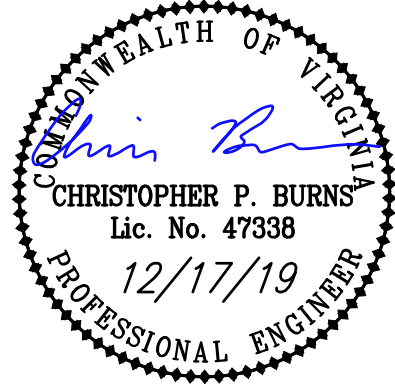


J:\18\000\04180095.00\WFRA WOOD HAVEN SITE\CIVIL\dwg\04180095.01 TURN LANE BASE.dwg PLOTTED: 12/17/2019 11:04:15 AM



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WOOD HAVEN TECHNOLOGY PARK ROAD IMPROVEMENTS

OVERALL PROPERTY MAP

CATAWBA DISTRICT
ROANOKE COUNTY, VIRGINIA

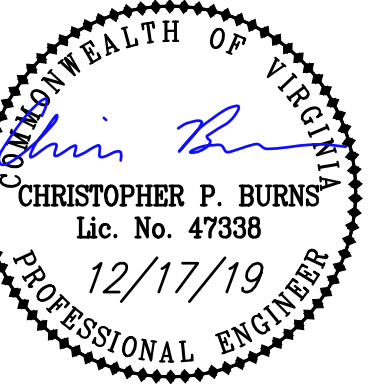
DRAWN BY: SKM
DESIGNED BY: JSF
CHECKED BY: CPB
DATE: 11/4/2019
SCALE: 1" = 120'
REVISIONS:
12/17/2019

C2

PROJECT NO. 04180095.00



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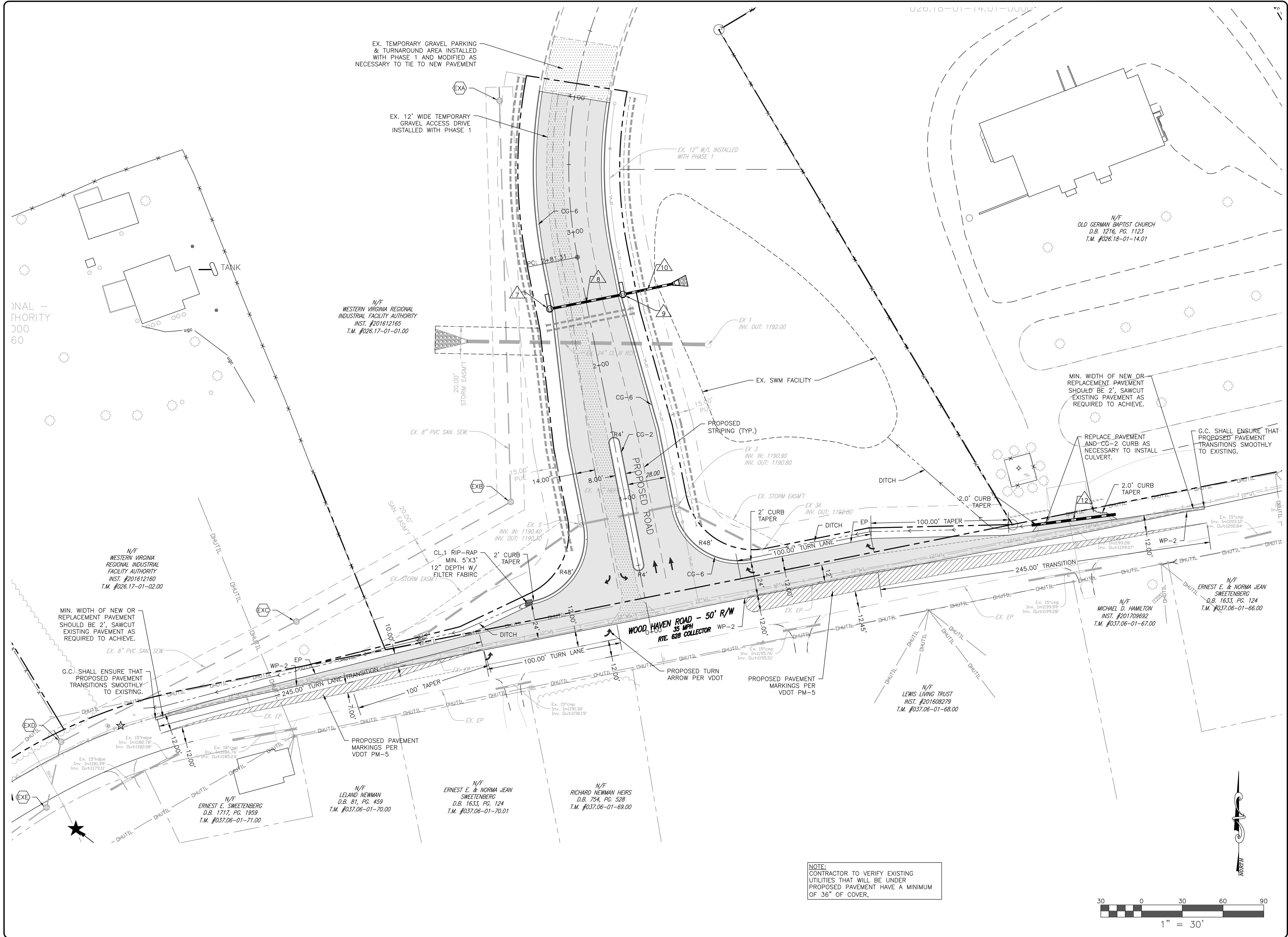
WOOD HAVEN TECHNOLOGY PARK ROAD IMPROVEMENT IS

LAYOUT AND UTILITY PLAN

ROANOKE COUNTY, VIRGINIA

DRAWN BY	SKM
DESIGNED BY	JSF
CHECKED BY	CPB
DATE	11/4/2019
SCALE	1" = 30'
REVISIONS	
11/17/2019	

C3



CONSTRUCTION SEQUENCING NOTES:

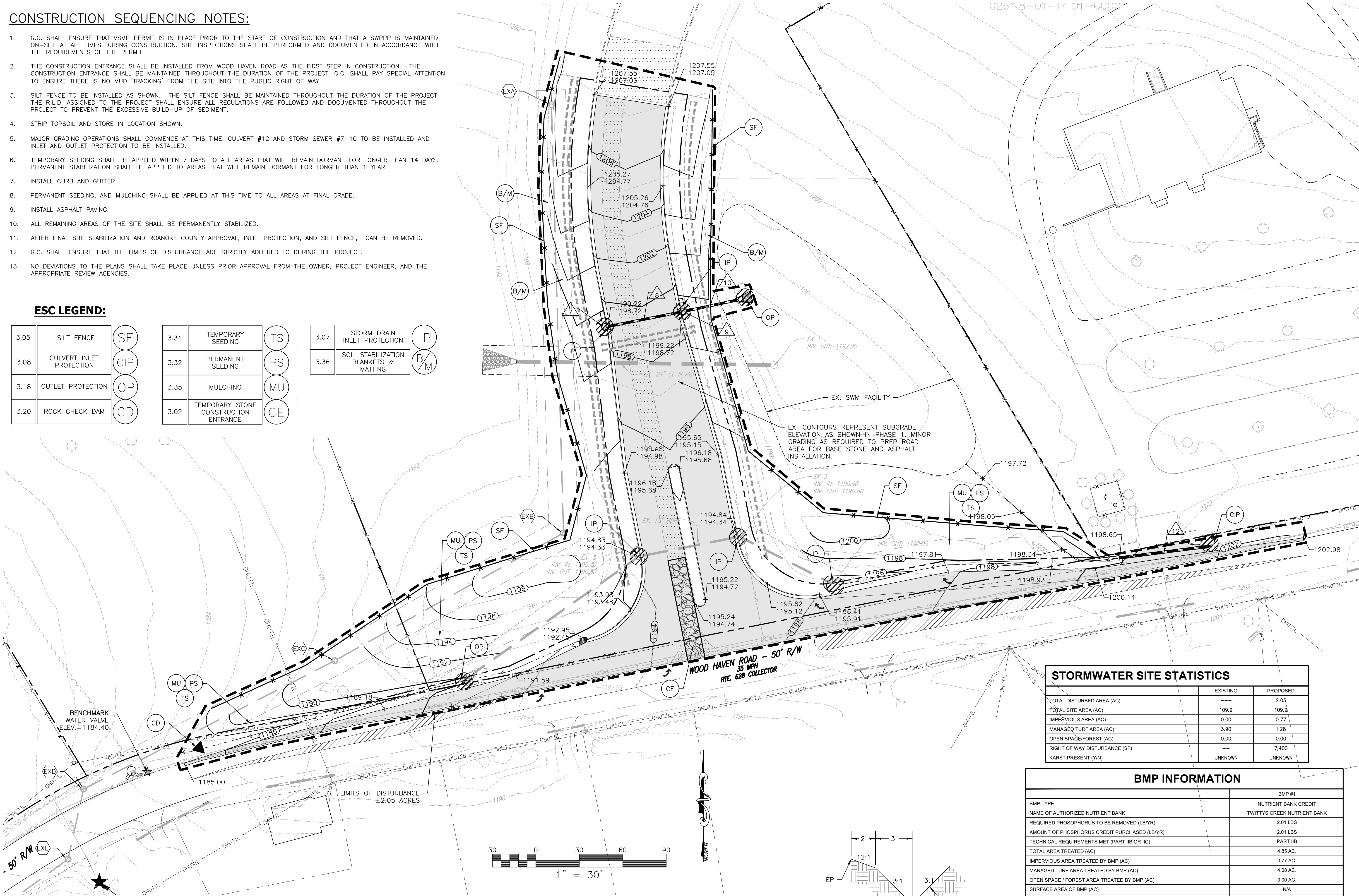
- G.C. SHALL ENSURE THAT VSMP PERMIT IS IN PLACE PRIOR TO THE START OF CONSTRUCTION AND THAT A SWPPP IS MAINTAINED ON-SITE AT ALL TIMES DURING CONSTRUCTION. SITE INSPECTIONS SHALL BE PERFORMED AND DOCUMENTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE PERMIT.
- THE CONSTRUCTION ENTRANCE SHALL BE INSTALLED FROM WOOD HAVEN ROAD AS THE FIRST STEP IN CONSTRUCTION. THE CONSTRUCTION ENTRANCE SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. G.C. SHALL PAY SPECIAL ATTENTION TO ENSURE THERE IS NO MUD "TRACKING" FROM THE SITE INTO THE PUBLIC RIGHT OF WAY.
- SILT FENCE TO BE INSTALLED AS SHOWN. THE SILT FENCE SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. THE R.L.D. ASSIGNED TO THE PROJECT SHALL ENSURE ALL REGULATIONS ARE FOLLOWED AND DOCUMENTED THROUGHOUT THE PROJECT TO PREVENT THE EXCESSIVE BUILD-UP OF SEDIMENT.
- STRIP TOPSOIL AND STORE IN LOCATION SHOWN.
- MAJOR GRADING OPERATIONS SHALL COMMENCE AT THIS TIME. CULVERT #12 AND STORM SEWER #7-10 TO BE INSTALLED AND INLET AND OUTLET PROTECTION TO BE INSTALLED.
- TEMPORARY SEEDING SHALL BE APPLIED WITHIN 7 DAYS TO ALL AREAS THAT WILL REMAIN DORMANT FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT WILL REMAIN DORMANT FOR LONGER THAN 1 YEAR.
- INSTALL CURB AND GUTTER.
- PERMANENT SEEDING, AND MULCHING SHALL BE APPLIED AT THIS TIME TO ALL AREAS AT FINAL GRADE.
- INSTALL ASPHALT PAVING.
- ALL REMAINING AREAS OF THE SITE SHALL BE PERMANENTLY STABILIZED.
- AFTER FINAL SITE STABILIZATION AND ROANOKE COUNTY APPROVAL, INLET PROTECTION, AND SILT FENCE, CAN BE REMOVED.
- G.C. SHALL ENSURE THAT THE LIMITS OF DISTURBANCE ARE STRICTLY ADHERED TO DURING THE PROJECT.
- NO DEVIATIONS TO THE PLANS SHALL TAKE PLACE UNLESS PRIOR APPROVAL FROM THE OWNER, PROJECT ENGINEER, AND THE APPROPRIATE REVIEW AGENCIES.

ESC LEGEND:

3.05	SILT FENCE	SF
3.08	CULVERT INLET PROTECTION	CIP
3.18	OUTLET PROTECTION	OP
3.20	ROCK CHECK DAM	CD

3.31	TEMPORARY SEEDING	TS
3.32	PERMANENT SEEDING	PS
3.35	MULCHING	MU
3.02	TEMPORARY STONE CONSTRUCTION ENTRANCE	CE

3.07	STORM DRAIN INLET PROTECTION	IP
3.36	SOIL STABILIZATION BLANKETS & MATTING	B/M



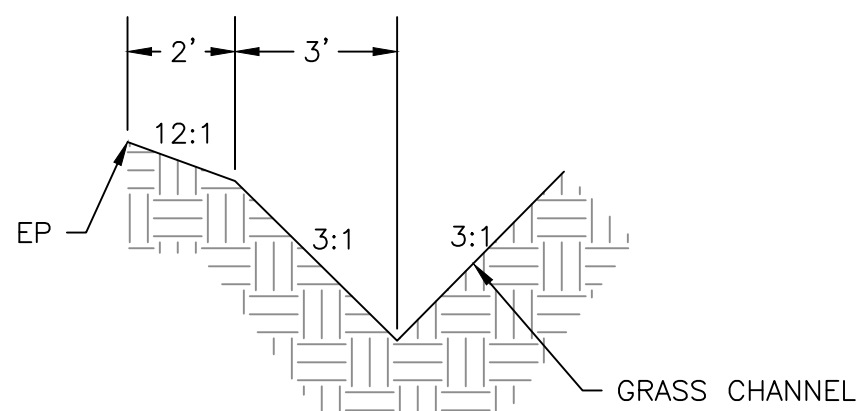
STORMWATER SITE STATISTICS

	EXISTING	PROPOSED
TOTAL DISTURBED AREA (AC)	---	2.05
TOTAL SITE AREA (AC)	109.9	109.9
IMPERVIOUS AREA (AC)	0.00	0.77
MANAGED TURF AREA (AC)	3.90	1.28
OPEN SPACE/FOREST (AC)	0.00	0.00
RIGHT OF WAY DISTURBANCE (SF)	--	7,400
KARST PRESENT (Y/N)	UNKNOWN	UNKNOWN

BMP INFORMATION

BMP TYPE	BMP #1
NAME OF AUTHORIZED NUTRIENT BANK	NUTRIENT BANK CREDIT
REQUIRED PHOSPHORUS TO BE REMOVED (LB/YR)	TWITTYS CREEK NUTRIENT BANK
AMOUNT OF PHOSPHORUS CREDIT PURCHASED (LB/YR)	2.01 LBS
TECHNICAL REQUIREMENTS MET (PART IIB OR IIC)	2.01 LBS
TOTAL AREA TREATED (AC)	PART IIB
IMPERVIOUS AREA TREATED BY BMP (AC)	4.85 AC
MANAGED TURF AREA TREATED BY BMP (AC)	0.77 AC
OPEN SPACE / FOREST AREA TREATED BY BMP (AC)	4.08 AC
SURFACE AREA OF BMP (AC)	0.00 AC
STORAGE VOLUME OF BMP (AC-FT)	N/A
QUALITY, QUANTITY, OR BOTH?	N/A
TMDL ADDRESSED? (PHOSPHORUS, BACTERIA, SEDIMENT, ETC)	QUALITY
NAME OF RECEIVING WATER (PROJECT SITE)	PHOSPHORUS
HYDROLOGIC UNIT CODE FOR PROJECT SITE (ALPHANUMERIC CODE RU14, ETC)	ROANOKE RIVER - PETERS CREEK
MAXIMUM AVERAGE DEPTH (FT)	RU14
LATITUDE (DECIMAL DEGREES XX.XXXX)	N/A
LONGITUDE (DECIMAL DEGREES XX.XXXX)	N/A

*NOTE: THE OFF-SITE SANITARY SEWER EXTENSION (0.3 ACRES) IS CONSIDERED A LINEAR PROJECT AND IS NOT INCLUDED IN THESE TABLES.



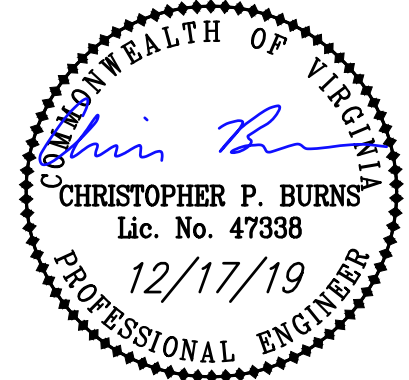
TYPICAL DITCH SECTION

STORM SCHEDULE											
STR #	TYPE	NOSE	TOP ELEV.	HEIGHT	LENGTH	DIAMETER	MATERIAL	SLOPE	INV. IN	INV. OUT	COMMENTS
7			1199.30	4.80							
8					54.83	1"	15" TYPE S HDPE	0.91%	1194.50	1194.00	
9			1199.30	5.40							
10					37.90	1"	15" TYPE S HDPE	1.06%	1193.90	1193.50	
12					62.04	1"	15" CL. IV RCP	1.37%	1199.50	1198.65	

WOOD HAVEN TECHNOLOGY PARK ROAD IMPROVEMENTS

GRADING AND ESC PLAN

DRAWN BY SKM
DESIGNED BY JSF
CHECKED BY CPB
DATE 11/4/2019
SCALE 1" = 30'
REVISIONS
12/17/2019



CATAMBA DISTRICT
ROANOKE COUNTY, VIRGINIA

GENERAL EROSION AND SEDIMENT CONTROL NOTES

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

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

ES-3: ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CLEARING.

ES-4: A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.

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

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

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

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

ES-10: ALL ASPHALT AREAS WILL BE STABILIZED WITH BASE STONE WITHIN 30 DAYS OF FINAL GRADING.

ES-11: PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE, BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.

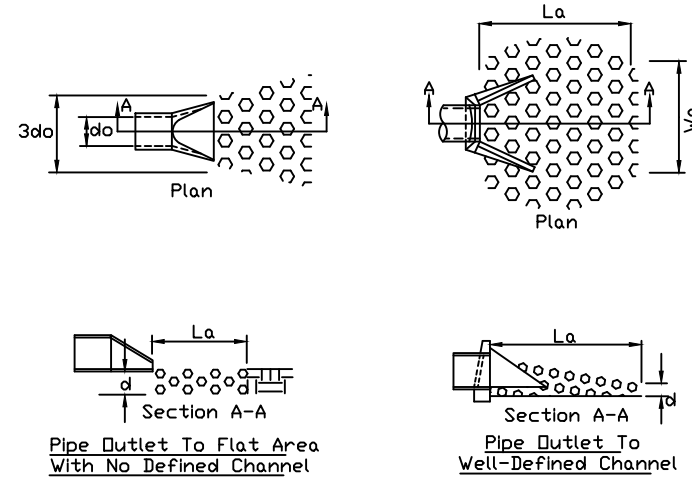
ES-12: THE LOCAL APPROVING AUTHORITY AND OTHER INTERESTED AGENCIES SHALL MAKE A CONTINUING REVIEW AND EVALUATION OF THE METHODS USED FOR THE OVERALL EFFECTIVENESS OF THE EROSION CONTROL PROGRAM. AN APPROVED EROSION AND SEDIMENT CONTROL PLAN MAY BE AMENDED BY THE APPROVING AUTHORITY OF ON SITE INSPECTION INDICATED THAT THE APPROVED CONTROL MEASURES ARE NOT EFFECTIVE IN CONTROLLING EROSION AND SEDIMENTATION OR IF BECAUSE OF CHANGED CIRCUMSTANCES, THE APPROVED PLAN CANNOT BE CARRIED OUT.

ES-13: IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LEAVE THE SITE ADQUATELY PROTECTED AGAINST EROSION, SEDIMENTATION, OR ANY DAMAGE TO ANY ADJACENT PROPERTY AT THE END OF EACH DAY'S WORK.

ES-14: ALL CONSTRUCTION TRAFFIC SHALL ENTER AND EXIT THE SITE VIA THE CONSTRUCTION ENTRANCES.

ES-15: 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.

TOTAL DISTURBED AREA = 2.05 AC. = 89,478 SQ. FT.



OUTLET PROTECTION STRUCTURE DATA:

OUTLET PROTECTION #1 (PIPE #12)
(MINIMUM PROTECTION REQUIRED)
EC-1 CLASS 1 RIP RAP
LENGTH OF APRON=6' (La)
WIDTH OF APRON=7' (Wa)
MIN. STONE SIZE=6"

OUTLET PROTECTION #2 (PIPE #6)
EC-1 CLASS 1 RIP RAP
LENGTH OF APRON=6' (La)
WIDTH OF APRON=7' (Wa)
MIN. STONE SIZE=6"

OUTLET PROTECTION #3 (PIPE #10)
(MINIMUM PROTECTION REQUIRED)
EC-1 CLASS 1 RIP RAP
LENGTH OF APRON=6' (La)
WIDTH OF APRON=7' (Wa)
MIN. STONE SIZE=6"

OP OUTLET PROTECTION

NOTES

1. Apron lining may be rip-rap, grouted rip-rap, or concrete.
2. La is the length of the rip-rap apron as calculated using plates 136d and 136e.
3. d = 15 times the maximum stone diameter, but not less than 6'.

EROSION AND SEDIMENT CONTROL NARRATIVE

PROJECT DESCRIPTION:

THE PURPOSE OF THE CURRENT PROJECT IS FOR THE CONSTRUCTION OF AN ASPHALT ACCESS ROAD, TURN LANES INTO THE SITE, AND ASSOCIATED IMPROVEMENTS. THE DISTURBED AREA FOR THIS PHASE IS APPROXIMATELY 2.05 ACRES.

EXISTING SITE CONDITIONS:

THE PROJECT AREA IS CURRENTLY DEVELOPED WITH SINGLE-FAMILY RESIDENCES AND ASSOCIATED IMPROVEMENTS AND MAINLY CONSISTS OF ROLLING FIELDS WITH GRASS COVER. THE SITE HAS BEEN GRADED FOR THE PROPOSED ACCESS ROAD, AND STORM SEWER HAS BEEN CONSTRUCTED IN PHASE ONE.

ADJACENT PROPERTY:

THE PROJECT AREA IS BOUNDED TO THE SOUTH BY THE RIGHT OF WAY OF WOOD HAVEN ROAD, TO THE EAST BY THE EXISTING CHURCH PROPERTY, AND ON ALL OTHER SIDES BY WOODHAVEN TECHNOLOGY PARK PROPERTY.

OFF-SITE AREAS:

THE SITE IS ANTICIPATED TO BE BALANCED WITH NO MATERIAL IMPORTED OR EXPORTED FROM THE SITE.

SOILS:

A SUBSURFACE INVESTIGATION HAS NOT BEEN PROVIDED. SOIL INFORMATION IS AVAILABLE ON THE RESIDUAL SOILS THAT IS SUGGESTED IN THE "SOIL SURVEY OF ROANOKE COUNTY AND THE CITIES OF ROANOKE AND SALEM, VIRGINIA" AS PREPARED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE. THIS SURVEY IDENTIFIES THE ORIGINAL SOIL MATERIALS ON THE SITE 3C3 - CHILHOWIE SILTY CLAY LOAM, 7 TO 15 PERCENT SLOPES, SEVERELY ERODED.

CRITICAL EROSION AREAS:

SPECIAL CARE SHALL BE TAKEN TO ENSURE THAT THE BORROW AREAS AND FILL SLOPES ON THE PROPERTY ARE PROPERLY STABILIZED FOLLOWING GRADING OPERATIONS AND THAT ADJACENT PROPERTIES ARE PROTECTED FROM SEDIMENT.

EROSION AND SEDIMENT CONTROL MEASURES:

UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, THIRD EDITION" (VESCH). THE MINIMUM STANDARDS OF THE VESCH SHALL BE ADHERED TO UNLESS OTHERWISE DIRECTED BY THE LOCAL PROGRAM ADMINISTRATOR.

STRUCTURAL -

CONSTRUCTION ENTRANCE-STD. 3.02.....A STONE PAD, LOCATED AT THE END OF THE EXISTING GREEN RIDGE COURT AND TO OFF THE EXISTING CARNER LANE ROADWAY" OR AT OTHER POINTS OF VEHICULAR INGRESS AND EGRESS TO THE CONSTRUCTION SITE, TO REDUCE THE SOIL TRANSPORTED ONTO PUBLIC ROADS AND OTHER PAVED AREAS.

SILT FENCE-STD. 3.05.....A TEMPORARY BARRIER CONSTRUCTED ALONG THE PERIMETER OF THE DISTURBED AREA AS REQUIRED TO INTERCEPT AND DETAIN SEDIMENT.

STORM DRAIN INLET PROTECTION-STD. 3.07.....A SEDIMENT FILTER AROUND A STORM DRAIN DROP INLET OR CURB INLET TO PREVENT SEDIMENT FROM ENTERING STORM DRAINAGE SYSTEMS PRIOR TO PERMANENT STABILIZATION OF THE DISTURBED AREA.

CULVERT INLET PROTECTION-STD. 3.08.....A SEDIMENT FILTER LOCATED AT THE INLET TO STORM SEWER CULVERTS TO PREVENT SEDIMENT FROM ENTERING, ACCUMULATING IN, AND BEING TRANSFERRED BY A CULVERT AND ASSOCIATED DRAINAGE SYSTEM.

OUTLET PROTECTION-STD. 3.18.....STRUCTURALLY LINED APRONS OR OTHER ACCEPTABLE ENERGY DISSIPATING DEVICES PLACED AT THE OUTLETS OF PIPES OR PAVED CHANNEL SECTIONS TO PREVENT SCOUR AT STORMWATER OUTLETS.

ROCK CHECK DAM-STD. 3.20.....SMALL TEMPORARY STONE DAM CONSTRUCTED ACROSS A SWALE OR DRAINAGE DITCH TO REDUCE THE VELOCITY OF CONCENTRATED STORMWATER FLOWS.

VEGETATIVE:

TEMPORARY SEEDING-STD. 3.31.....ESTABLISHMENT OF A TEMPORARY VEGETATIVE COVER ON DISTURBED AREAS THAT WILL NOT BE BROUGHT TO FINAL GRADE FOR PERIODS OF 14 DAYS TO 1-YEAR BY SEEDING WITH AN APPROPRIATE RAPIDLY GROWING SEED MIXTURE.

PERMANENT SEEDING-STD. 3.32.....ESTABLISHMENT OF A VEGETATIVE COVER BY PLANTING SEED ON ALL FINAL GRADED AREAS THAT WILL NOT RECEIVE AN IMPERVIOUS COVER OR RECEIVE TOPSOIL MATERIAL TO PROVIDE A STABILIZED SITE AFTER THE PROJECT IS COMPLETE.

MULCHING-STD. 3.35.....MULCH SHALL BE APPLIED TO ALL TEMPORARY AND PERMANENT SEEDING OPERATIONS TO PROMOTE THE GROWTH OF VEGETATION AND TO PROTECT THE SOIL SURFACE FROM RAINDROP IMPACTS.

SOIL STABILIZATION BLANKETS & MATTING-STD. 3.36.....THE INSTALLATION OF A PROTECTIVE COVERING OR SOIL STABILIZATION MAT ON A PREPARED PLANTING AREA OF A STEEP SLOPE TO AID IN CONTROLLING EROSION BY PROVIDING A MICROCLIMATE WHICH PROTECTS YOUNG VEGETATION AND PROMOTES ITS ESTABLISHMENT.

MANAGEMENT STRATEGIES:

- A) CONSTRUCTION WILL BE SEQUENCED SO THAT GRADING OPERATIONS CAN BEGIN AND END AS QUICKLY AS POSSIBLE.
- B) SEDIMENT TRAPPING MEASURES WILL BE INSTALLED AS A FIRST STEP IN GRADING.
- C) 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.
- D) ALL FILL AND CUT SLOPES SHALL BE SEDED WITHIN SEVEN (7) DAYS OF ACHIEVING FINAL GRADE.
- E) ONLY AFTER INSPECTION AND APPROVAL FROM THE LOCAL PROGRAM ADMINISTRATOR MAY ITEMS BE REMOVED FOLLOWING THE STABILIZATION OF THE CONTRIBUTING AREAS.

INSPECTIONS:

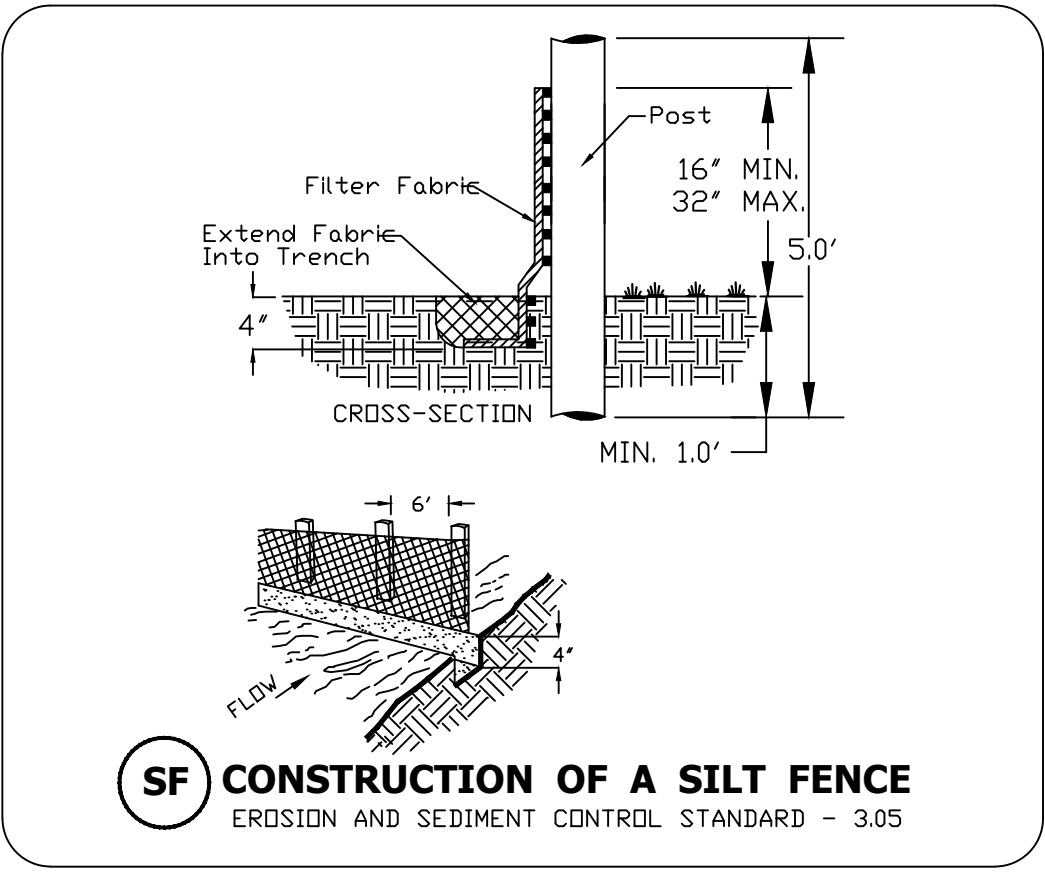
THE GENERAL CONTRACTOR SHALL INSPECT DISTURBED AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED, AND AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION, STRUCTURAL CONTROL MEASURES, AND THE AREA OF CONSTRUCTION VEHICLE ACCESS AT LEAST EVERY FOURTEEN (14) CALENDAR DAYS, AND WITHIN 48 HOURS OF THE END OF A STORM EVENT PRODUCING 1/2" OR GREATER OF PRECIPITATION, WHERE AREAS HAVE BEEN FINALLY OR TEMPORARILY STABILIZED OR RUNOFF IS UNLIKELY DUE TO WINTER CONDITIONS (SITE IS COVERED WITH SNOW, 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 REQUIRED TO REDUCE SEDIMENTATION OF STORM DRAINS, 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 MODIFICATIONS 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. IF IMPLEMENTATION BEFORE THE NEXT 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; LOCATIONS OF FAILED OR INADEQUATE CONTROLS; AND LOCATIONS WHERE ADDITIONAL CONTROLS ARE NEEDED.

STORM WATER MANAGEMENT:

A STORMWATER MANAGEMENT DETENTION POND HAS BEEN PREVIOUSLY CONSTRUCTED WITH PHASE 1 AT THE FRONT OF THE PROPERTY TO MEET STORMWATER QUANTITY REQUIREMENTS FOR THE DEVELOPMENT OF THE NEW ROAD. THE CURRENT TURN LANE IMPROVEMENTS WILL GENERALLY SHEET FLOW STORMWATER AWAY FROM THE ROADWAY AND IS NOT ANTICIPATED TO HAVE ANY SIGNIFICANT EFFECT ON DOWNSTREAM FLOODING OR EROSION.

BASED ON THE PROPOSED LAND COVER, THE REQUIRED PHOSPHOROUS LOAD REDUCTION FOR THE BASE BID SCOPE OF WORK IS 0.88 LB/YR. THE REQUIRED PHOSPHOROUS LOAD REDUCTION FOR THE FULL TURN LANES SCOPE OF WORK IS 2.01 LB/YR. THE REQUIRED PHOSPHOROUS LOAD REDUCTION FOR THE BASE BID SCOPE OF WORK 0.88 LBS/YEAR HAS BEEN PURCHASED. THE DEVELOPER IS PLANNING TO PURCHASE THE REMAINING 1.13 LBS/YEAR OF OFF-SITE NUTRIENT CREDITS TO MEET THIS REQUIREMENT.



SF CONSTRUCTION OF A SILT FENCE
EROSION AND SEDIMENT CONTROL STANDARD - 3.05

MINIMUM STANDARDS

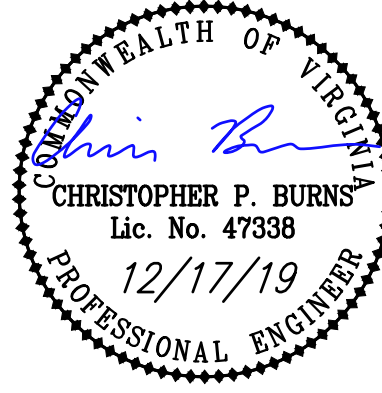
THE FOLLOWING STANDARDS ARE TO BE PROVIDED OR ADDRESSED ON EVERY DEVELOPMENT PROJECT EXCEEDING 5000 S.F. IN AREA OF DISTURBANCE. THESE STANDARDS ARE CONSIDERED A MINIMUM AND MAY REQUIRE ADDITIONAL MEASURES AS DEEMED NECESSARY BY THE LOCAL APPROVING AUTHORITY OR THE CONSULTING ENGINEER.

No.	CRITERIA, TECHNIQUE OR METHOD	PRACTICES PROVIDED
1	PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN (7) DAYS AFTER FINAL GRADE HAS BEEN REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN (7) DAYS TO DENUDED AREAS THAT MAY BE AT FINAL GRADE BUT WILL REMAIN DORMANT (UNDISTURBED) FOR LONGER THAN FOURTEEN (14) DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE (1) YEAR.	TS PS MU
2	DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.	SF TS PS
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, IN THE OPINION OF THE LOCAL PROGRAM ADMINISTRATOR OR DESIGNATED AGENT, IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION.	TS PS MU
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.	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 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 CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES THAT ARE FOUND TO BE ERODING EXCESSIVELY WITHIN ONE (1) YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADDITIONAL SLOPE STABILIZATION MEASURES UNTIL THE PROBLEM IS CORRECTED.	TS PS MU
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.	SHOULD SEEPS OCCUR IN ANY EXISTING OR NEW CUT OR FILL SLOPE, THE CONTRACTOR SHALL FIRST ENSURE THAT THERE ARE NOT AREAS OF PONDED WATER AT THE TOPS OF THE SLOPES, AND THEN SHALL CONTACT BOTH THE DESIGN ENGINEER AND THE PROJECT GEOLOGICAL ENGINEER FOR ON-SITE EVALUATION OF THE AREAS OF SEEPAGE.
10	ALL CULVERT 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.	CIP IF
11	BEFORE NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS 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.	OF CD
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. NONERODIBLE MATERIAL SHALL BE USED FOR THE CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS. EARTHEN FILL MAY BE USED FOR THESE STRUCTURES IF ARMORED BY NONERODIBLE COVER MATERIALS.	NO DISTURBANCE OF SURFACE WATERS IS PROPOSED WITH THIS PROJECT.
13	WHEN A LIVE WATERCOURSE MUST BE CROSSED BY CONSTRUCTION VEHICLES MORE THAN TWICE IN ANY SIX (6) MONTH PERIOD, A TEMPORARY STREAM CROSSING CONSTRUCTED OF NONERODIBLE MATERIAL.	
14	ALL APPLICABLE FEDERAL, STATE AND LOCAL CHAPTERS PERTAINING TO WORKING IN OR CROSSING LIVE WATERCOURSES SHALL BE MET. THE BEDS AND BANKS OF ANY WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.	
15	THE BEDS AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.	SF
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 ANY TRENCH MAY BE OPENED AT ONE TIME. 2)EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES. 3)EFFLUENT FROM DEWATERING 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. 4)MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION. 5)RESTALLIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THESE CHAPTERS. 6)APPLICABLE SAFETY REGULATIONS 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.	CE
18	ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN THIRTY (30) DAYS AFTER FINAL SITE STABILIZATION. THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE VESOP 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.	TS PS MU
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 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 THE TWO-YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP CHANNEL BANKS NOR CAUSE EROSION OF CHANNEL BED OR BANKS; AND (b) ALL PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS SHALL BE ANALYZED BY THE USE OF THE 10-YEAR STORM TO VERIFY THAT STORMWATER WILL NOT OVERTOP ITS BANKS AND BY THE USE OF A 2-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 SYSTEM c. IF EXISTING NATURAL RECEIVING CHANNELS OR PREVIOUSLY CONSTRUCTED MAN-MADE CHANNELS OR PIPES ARE NOT ADEQUATE, THE APPLICANT SHALL: (1) IMPROVE THE CHANNEL TO A CONDITION WHERE A 10-YEAR STORM WILL NOT OVERTOP THE BANKS AND A 2-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 10-YEAR STORM IS CONTAINED WITHIN THE APPURTANCES; 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 10-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 VESOP 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 VESOP 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 (i) DETAIN THE WATER QUALITY VOLUME AND TO RELEASE IT OVER 48 HOURS; (ii) DETAIN AND RELEASE OVER A 24-HOUR PERIOD THE EXPECTED RAINFALL RESULTING FROM THE ONE YEAR, 24-HOUR STORM; AND (iii) 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 SITE ASSUMING IT WAS IN A GOOD FORESTED CONDITION, ACHIEVED THROUGH MULTIPLICATION OF THE FORESTED PEAK 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. 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 QUANTITY 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 (VSMP) PERMIT REGULATIONS. n. COMPLIANCE WITH THE WATER QUANTITY MINIMUM STANDARDS SET OUT IN 4VAC50-60-66 OF THE VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) PERMIT REGULATIONS SHALL BE DEEMED TO SATISFY THE REQUIREMENTS OF MINIMUM STANDARD 19.	SEE SUPPLEMENTAL CALCULATIONS FOR COMPLIANCE WITH VSMP REGULATIONS



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WOOD HAVEN TECHNOLOGY PARK ROAD IMPROVEMENTS

ESC NOTES

DRAWN BY SKM
DESIGNED BY JSF
CHECKED BY CPB
DATE 11/4/2019
SCALE AS NOTED
REVISIONS
12/17/2019

C5

PROJECT NO. 04180095.00

TABLE 3.32-D
SITE SPECIFIC SEEDING MIXTURES FOR PIEDMONT AREA

MINIMUM CARE LAWN	TOTAL LBS PER ACRE
COMMERCIAL OR RESIDENTIAL	175-200 LBS
- KENTUCKY 31 OR TURF-TYPE TALL FESCUE	95-100%
- IMPROVED PERENNIAL RYEGRASS	0-5%
- KENTUCKY BLUEGRASS	0-5%
HIGH-MAINTENANCE LAWN	
- KENTUCKY 31 OR TURF-TYPE TALL FESCUE	200-250 LBS
GENERAL SLOPE (3:1 OR LESS)	
- KENTUCKY 31 FESCUE	128 LBS
- RED TOP GRASS	2 LBS
- SEASONAL NURSE CROP *	20 LBS
- CROWN VETCH **	150 LBS
LOW-MAINTENANCE SLOPE (STEEPER THAN 3:1)	
- KENTUCKY 31 FESCUE	108 LBS
- RED TOP GRASS	2 LBS
- SEASONAL NURSE CROP *	20 LBS
- CROWN VETCH **	150 LBS

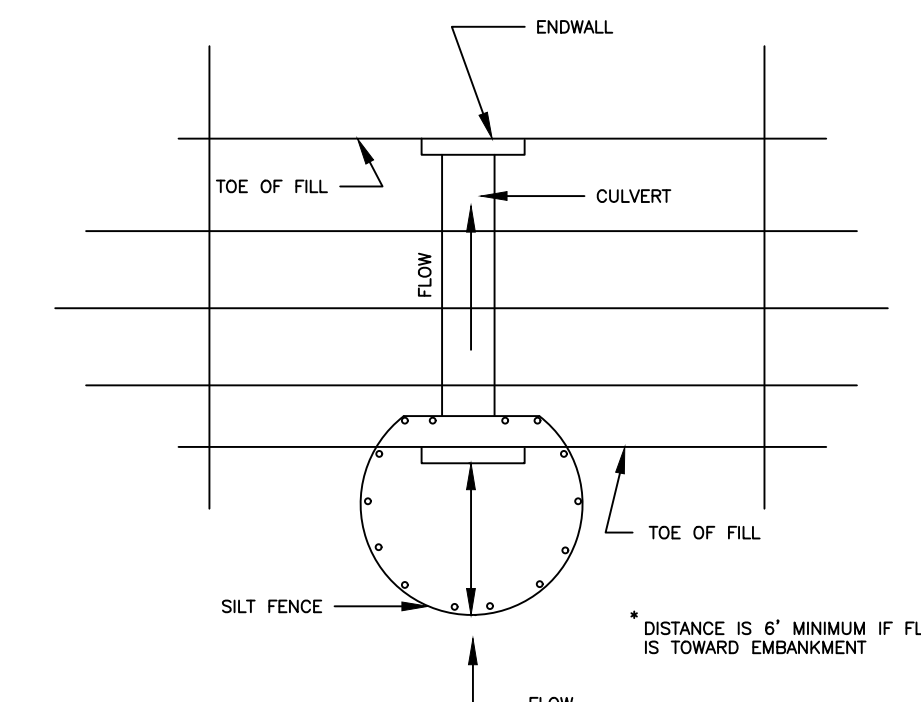
* USE SEASONAL NURSE CROP IN ACCORDANCE WITH SEEDING DATES AS STATED BELOW:
FEBRUARY 16TH THROUGH APRILANNUAL RYE
MAY 1ST THROUGH AUGUST 15THFOXTAIL MILLET
AUGUST 16TH THROUGH OCTOBERANNUAL RYE
NOVEMBER THROUGH FEBRUARY 15THWINTER RYE

** SUBSTITUTE SERICEA LESPEDEZA FOR CROWN VETCH EAST OF FARMVILLE, VA. (MAY THROUGH SEPTEMBER USE HULLED SERICEA, ALL OTHER PERIODS, USE UNHULLED SERICEA). IF FLATPEA IS USED IN LIEU OF CROWN VETCH, INCREASE RATE TO 30 LBS/ACRE. ALL LEGUME SEED MUST BE PROPERLY INOCULATED. WEEPING LOVEGRASS MAY BE ADDED TO ANY SLOPE OR LOW-MAINTENANCE MIX DURING WARMER SEEDING PERIODS; ADD 10-20 LBS/ACRE IN MIXES.

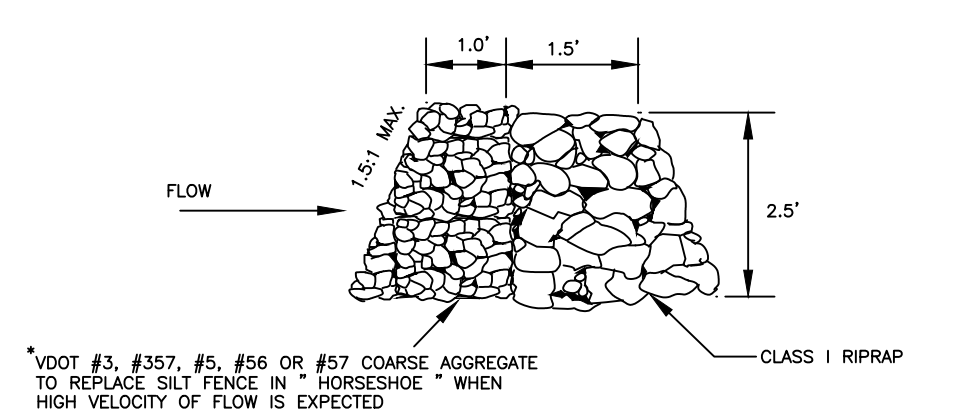
TABLE 3.31-B
ACCEPTABLE TEMPORARY SEEDING PLANT MATERIALS
"QUICK REFERENCE FOR ALL REGIONS"

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

SILT FENCE CULVERT INLET PROTECTION

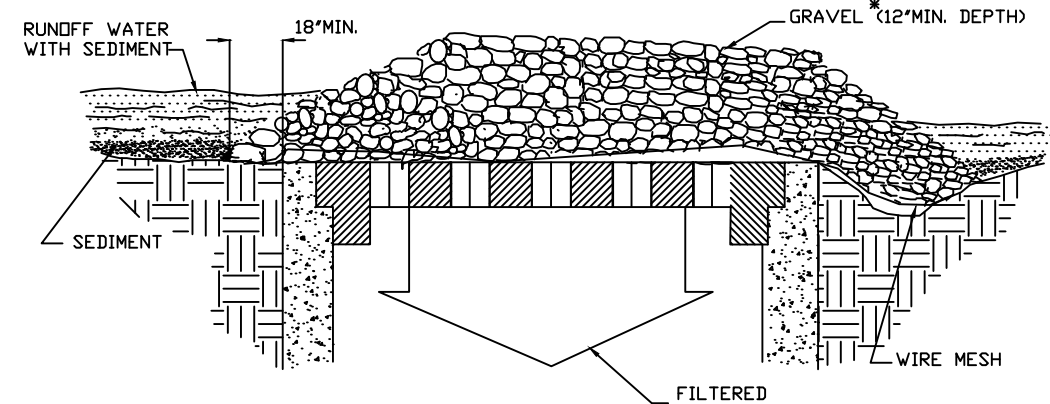


* OPTIONAL STONE COMBINATION



SOURCE: ADAPTED FROM VDOT Standard Sheets and Va. DSWC

PLATE. 3.08-1



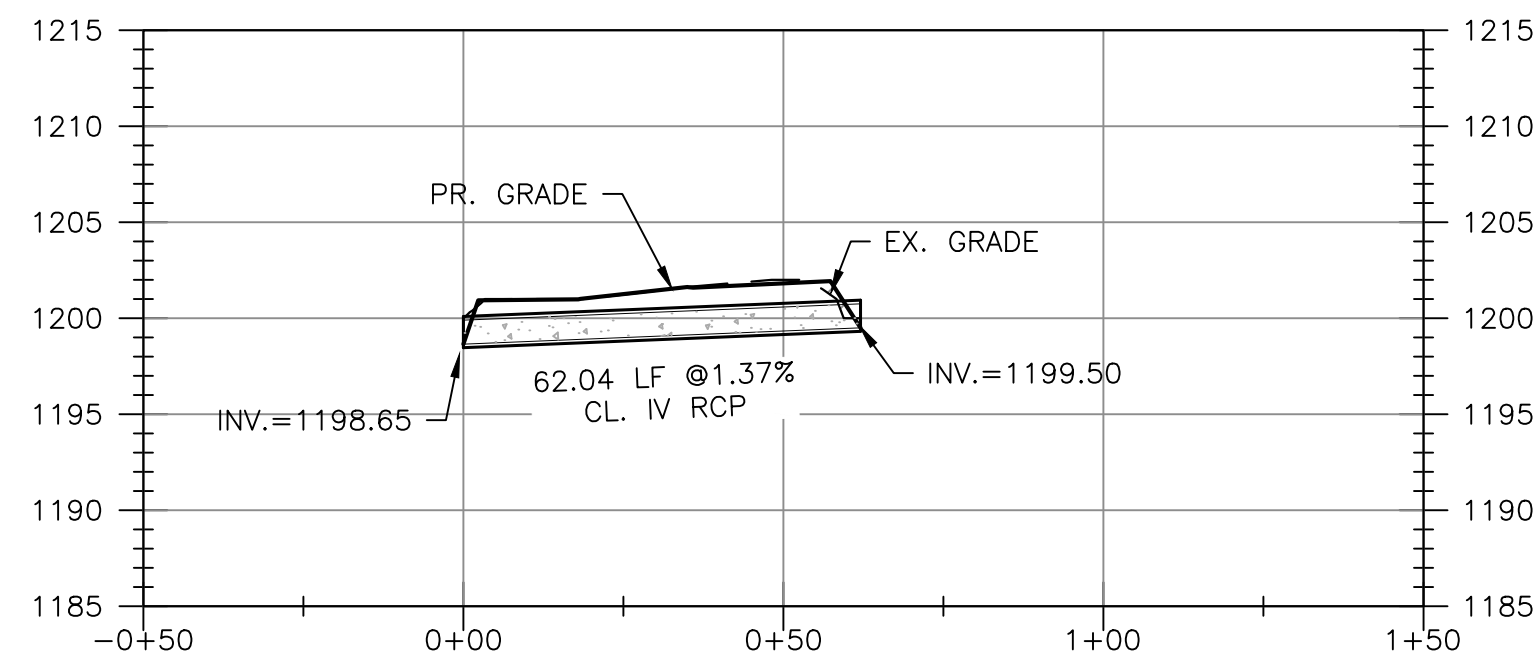
SPECIFIC APPLICATION

This method of inlet protection is applicable where heavy concentrated flows are expected, but not where ponding around the structure might cause excessive inconvenience or damage to adjacent structures and unprotected areas.

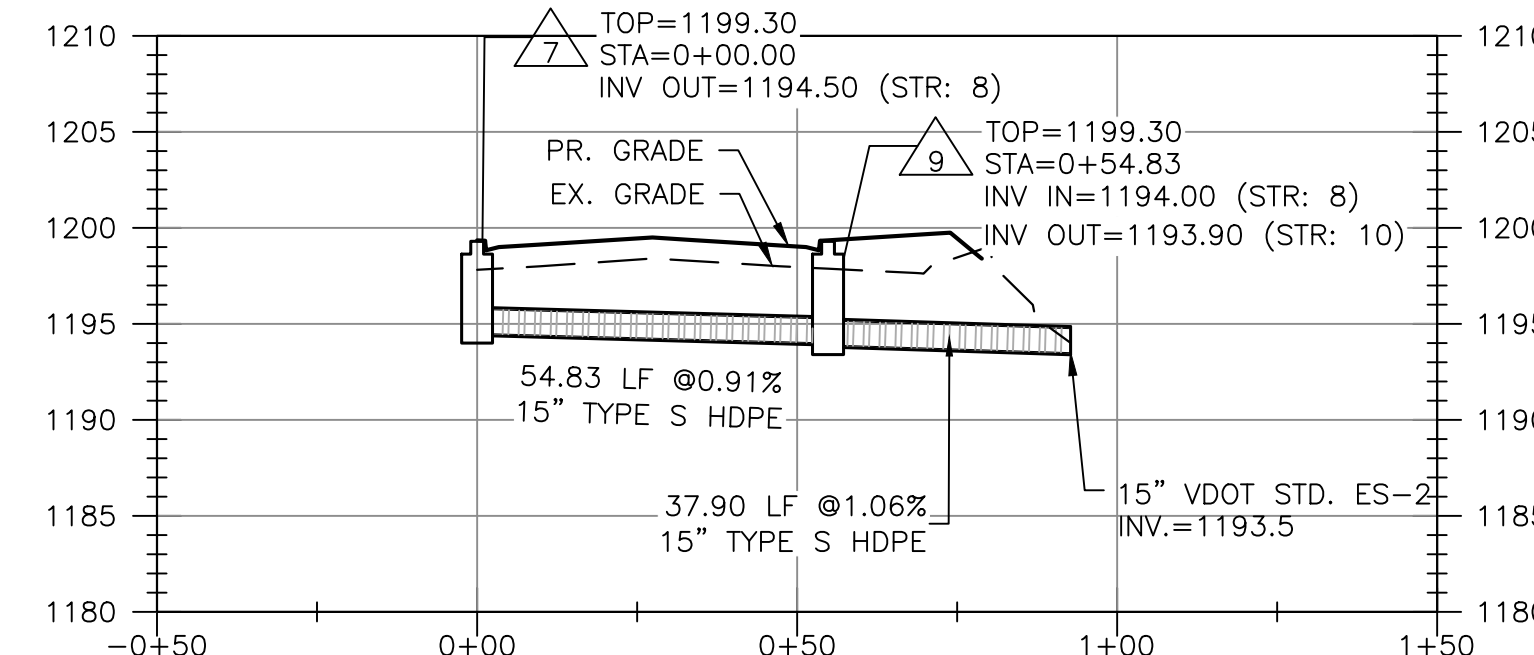
* Gravel shall be VDOT #3, #357 or #5 coarse aggregate.

(IP) GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER

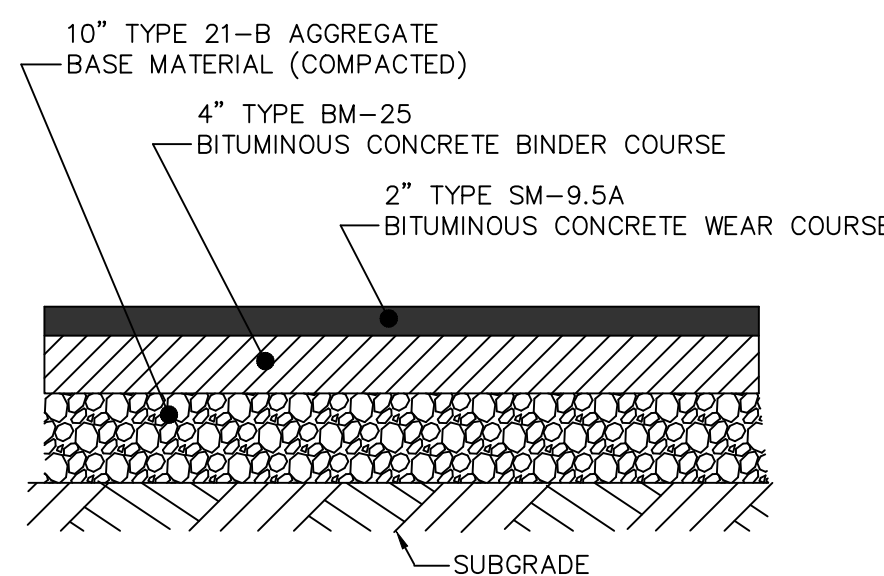
CULVERT 12 PROFILE



STORM 7-10 PROFILE



TYPICAL PAVEMENT SECTION

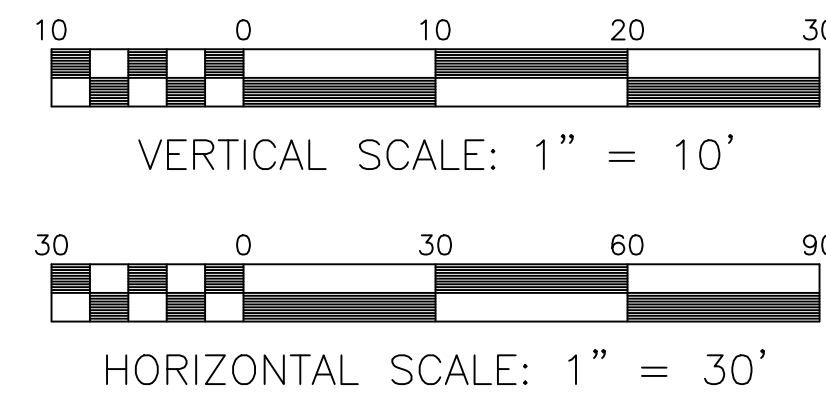


NOTE:
FOR AN EXCAVATED SUBGRADE, THE SUBGRADE AREA SHALL BE SCARIFIED TO A DEPTH OF 6 INCHES FOR A DISTANCE OF 2 FEET BEYOND THE PROPOSED EDGES OF THE PAVEMENT ON EACH SIDE. SUBGRADE MATERIAL SHALL BE COMPACTED AT OPTIMUM MOISTURE ($\pm 2\%$) TO THE REQUIREMENTS SET FORTH BY SEC. 305.03 OF THE VDOT ROAD AND BRIDGE SPECIFICATIONS.

FOR AN IMPORTED SUBGRADE, THE TOP 6 INCHES OF THE FINISHED SUBGRADE SHALL BE COMPACTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE ABOVE PROVISIONS.

NOTE:
THE PRELIMINARY PAVEMENT DESIGNS SHOWN ARE BASED ON A PREDICTED SUBGRADE CBR VALUE OF 7.0 AND A RESILIENCY FACTOR (RF) OF 2.0 AS SHOWN IN APPENDIX I OF THE "2009 VIRGINIA DEPARTMENT OF TRANSPORTATION PAVEMENT DESIGN GUIDE FOR SUBDIVISION AND SECONDARY ROADS". THE SUBGRADE SOIL IS TO BE TESTED BY AN INDEPENDENT LABORATORY AND THE RESULTS SUBMITTED TO THE VIRGINIA DEPARTMENT OF TRANSPORTATION PRIOR TO BASE CONSTRUCTION. SHOULD THE SUBGRADE CBR VALUE AND/OR THE RF VALUE BE LESS THAN THE PREDICTED VALUES, VDOT MAY REQUIRE AN INCREASE IN THE STRUCTURE BASED ON THE ACTUAL RESULTS. REFER TO THE SAME MANUAL FOR THE NUMBER AND LOCATIONS OF THE REQUIRED SOIL SAMPLES TO BE TESTED. ALL PAVEMENT DESIGNS SHALL BE SUBMITTED TO THE DEPARTMENT FOR REVIEW AND APPROVAL.

THE SUBGRADE SHALL BE APPROVED BY VDOT PRIOR TO PLACEMENT OF THE BASE. BASE SHALL BE APPROVED BY VDOT FOR DEPTH, TEMPLATE AND COMPACTION BEFORE SURFACE IS APPLIED. THE SUBBASE WILL NOT BE INSPECTED BY VDOT PRIOR TO RECEIVING THE CBR TESTS AND SOIL CLASSIFICATIONS. CONTACT VDOT SEVEN (7) DAYS PRIOR TO SCHEDULING PLACEMENT OF AGGREGATE BASE COURSE(S) FOR AN INSPECTION.



EROSION & SEDIMENT CONTROL COST ESTIMATE

ALL COSTS GIVEN ARE COMPLETE IN PLACE

DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
CONSTRUCTION ENTRANCE	EA	1	\$ 1,200.00	\$ 1,200.00
SILT FENCE	LF	1,050	4.00	4,200.00
INLET PROTECTION	EA	5	150.00	750.00
CULVERT INLET PROT.	EA	1	400.00	400.00
OUTLET PROTECTION	EA	2	250.00	500.00
TEMP SEEDING	SF	89,475	0.04	3,579.00
PERM SEEDING	SF	58,450	0.05	2,923.00
BLANKET MATTING	SF	3,630	0.25	908.00
CHECK DAM	EA	1	100.00	100.00
SUB-TOTAL				\$ 14,560.00
10% CONTINGENCY				\$ 1,456.00
TOTAL PROJECT COST				\$ 16,016.00

*NOTE: THIS COST ESTIMATE TABLE IS PROVIDED FOR BIDDING PURPOSES ONLY. VERIFICATION OF ALL QUANTITIES AND PRICES FOR BIDDING PURPOSES SHALL BE THE RESPONSIBILITY OF THE BIDDER.

1992 3.35

TABLE 3.35-A
ORGANIC MULCH MATERIALS AND APPLICATION RATES

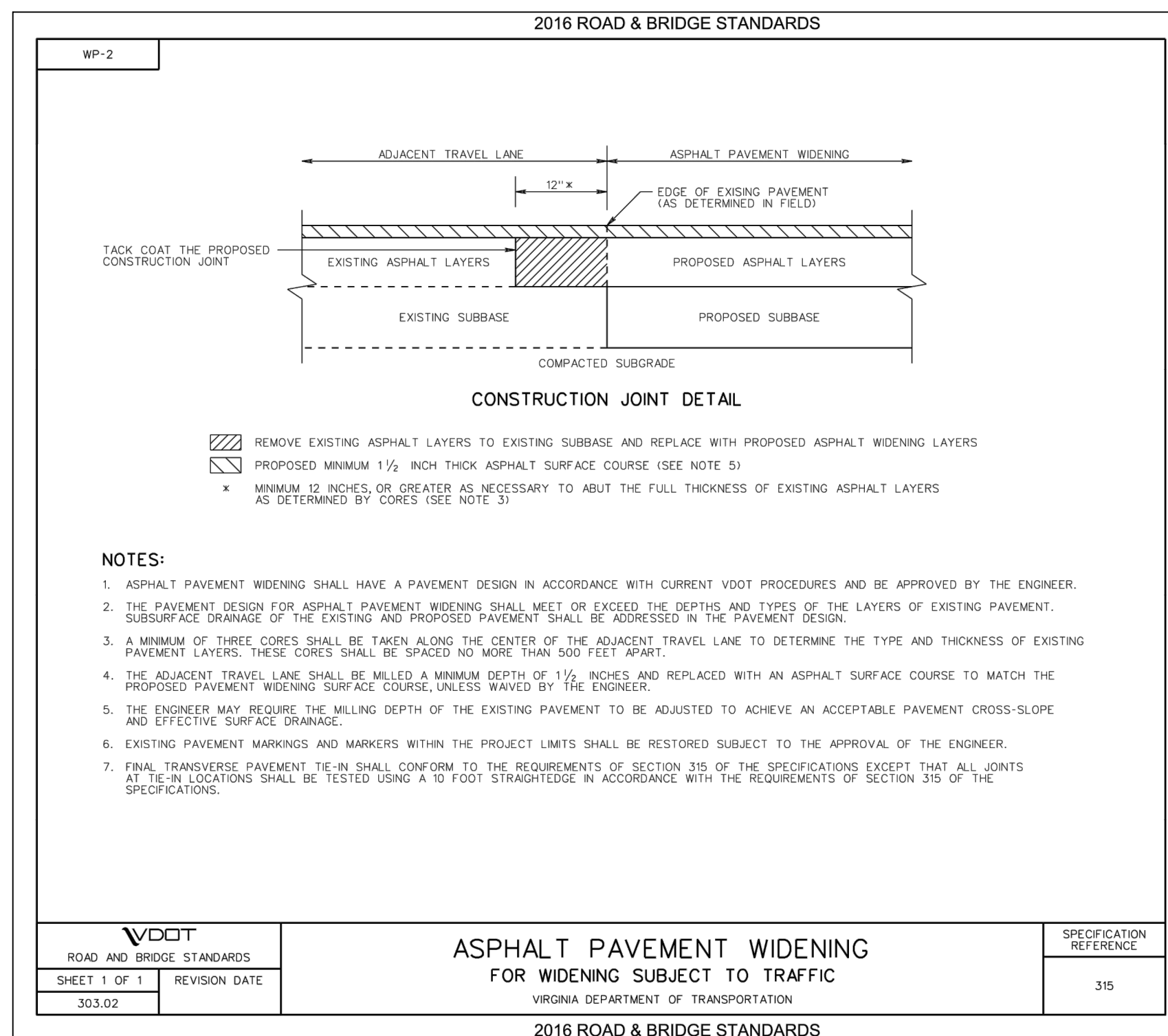
MULCHES:	RATES:		NOTES:
	Per Acre	Per 1000 sq. ft.	
Straw or Hay	1 1/2 - 2 tons (Minimum 2 tons for winter cover)	70 - 90 lbs.	Free from weeds and coarse matter. Must be anchored. Spread with mulch blower or by hand.
Fiber Mulch	Minimum 1500 lbs.	35 lbs.	Do not use as mulch for winter cover or during hot, dry periods.* Apply as slurry.
Corn Stalks	4 - 6 tons	185 - 275 lbs.	Cut or shredded in 4-6' lengths. Air-dried. Do not use in fine turf areas. Apply with mulch blower or by hand.
Wood Chips	4 - 6 tons	185 - 275 lbs.	Free of coarse matter. Air-dried. Treat with 12 lbs nitrogen per ton. Do not use in fine turf areas. Apply with mulch blower, chip handler, or by hand.
Bark Chips or Shredded Bark	50 - 70 cu. yds.	1-2 cu. yds.	Free of coarse matter. Air-dried. Do not use in fine turf areas. Apply with mulch blower, chip handler, or by hand.

* When fiber mulch is the only available mulch during periods when straw should be used, apply at a minimum rate of 2000 lbs./ac. or 45 lbs./1000 sq. ft.

Source: Va. DSWC

III - 353

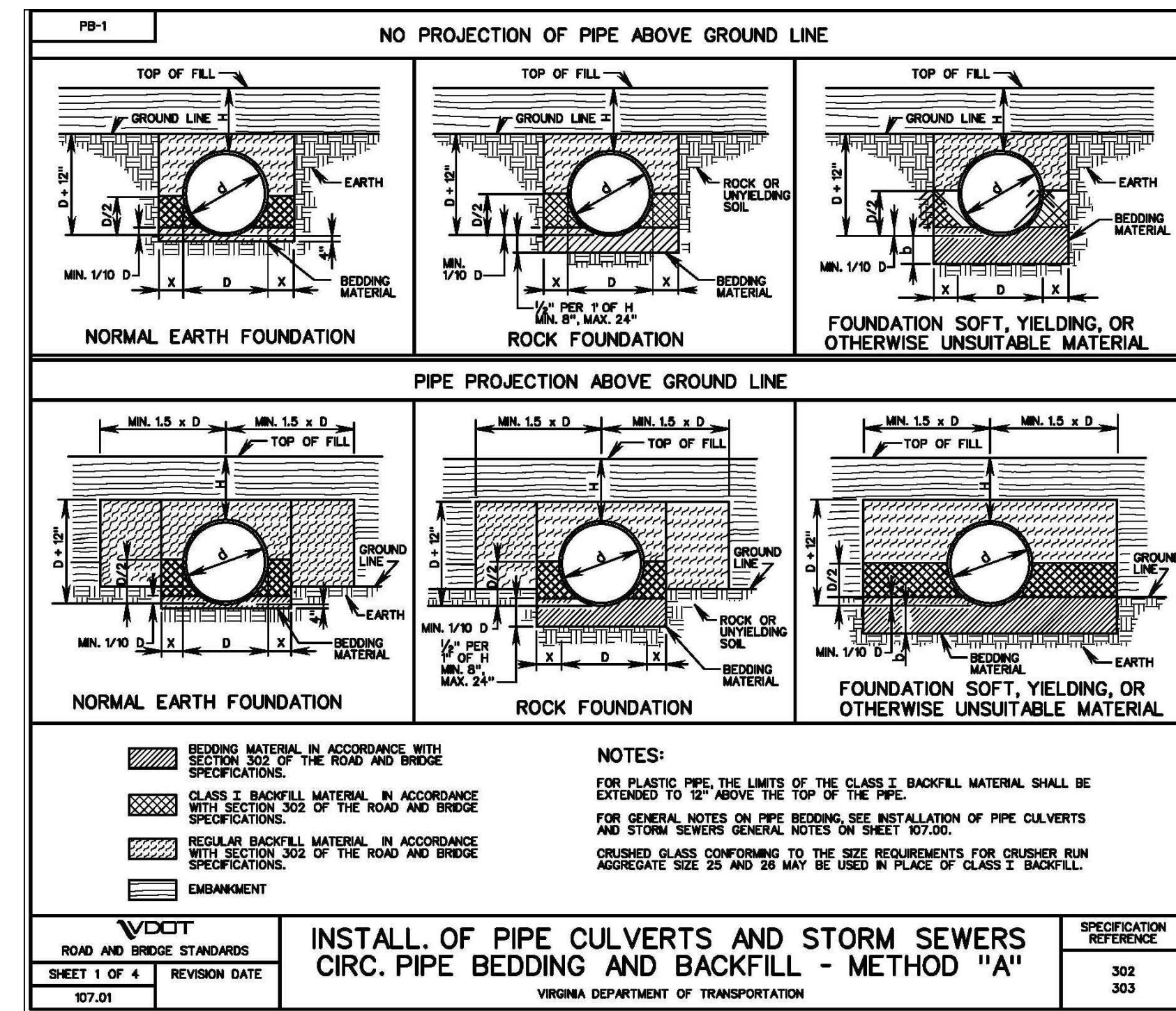
MULCHING SPECIFICATIONS



NOTES:

- ASPHALT PAVEMENT WIDENING SHALL HAVE A PAVEMENT DESIGN IN ACCORDANCE WITH CURRENT VDOT PROCEDURES AND BE APPROVED BY THE ENGINEER.
- THE PAVEMENT DESIGN FOR ASPHALT PAVEMENT WIDENING SHALL MEET OR EXCEED THE DEPTHS AND TYPES OF THE LAYERS OF EXISTING PAVEMENT. SUBSURFACE DRAINAGE OF THE EXISTING AND PROPOSED PAVEMENT SHALL BE ADDRESSED IN THE PAVEMENT DESIGN.
- A MINIMUM OF THREE CORES SHALL BE TAKEN ALONG THE CENTER OF THE ADJACENT TRAVEL LANE TO DETERMINE THE TYPE AND THICKNESS OF EXISTING PAVEMENT LAYERS. THESE CORES SHALL BE SPACED NO MORE THAN 500 FEET APART.
- THE ADJACENT TRAVEL LANE SHALL BE MILLED A MINIMUM DEPTH OF 1 1/2" DEPTHS AND REPLACED WITH AN ASPHALT SURFACE COURSE TO MATCH THE PROPOSED PAVEMENT WIDENING SURFACE COURSE, UNLESS WANTED BY THE ENGINEER.
- THE ENGINEER MAY REQUIRE THE MILLING DEPTH OF THE EXISTING PAVEMENT TO BE ADJUSTED TO ACHIEVE AN ACCEPTABLE PAVEMENT CROSS-SLOPE AND EFFECTIVE SURFACE DRAINAGE.
- EXISTING PAVEMENT MARKINGS AND MARKERS WITHIN THE PROJECT LIMITS SHALL BE RESTORED SUBJECT TO THE APPROVAL OF THE ENGINEER.
- FINAL TRANSVERSE PAVEMENT TIE-IN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 319 OF THE SPECIFICATIONS EXCEPT THAT ALL JOINTS AT TIE-IN LOCATIONS SHALL BE TESTED USING A 10 FOOT STRAIGHTEDGE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 315 OF THE SPECIFICATIONS.

VDOT ROAD AND BRIDGE STANDARDS		ASPHALT PAVEMENT WIDENING FOR WIDENING SUBJECT TO TRAFFIC		SPECIFICATION REFERENCE	
SHEET 1 OF 1	REVISION DATE	VIRGINIA DEPARTMENT OF TRANSPORTATION		315	
303.02					



*NOTE: VDOT #57 STONE IS NOT ACCEPTABLE AS BACKFILL FOR STORM SEWER.

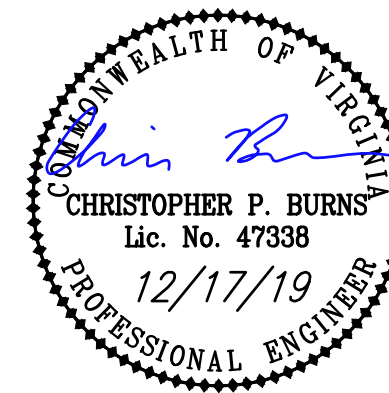


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WOOD HAVEN TECHNOLOGY PARK ROAD IMPROVEMENTS

ESC DETAILS AND STORMWATER PROFILES

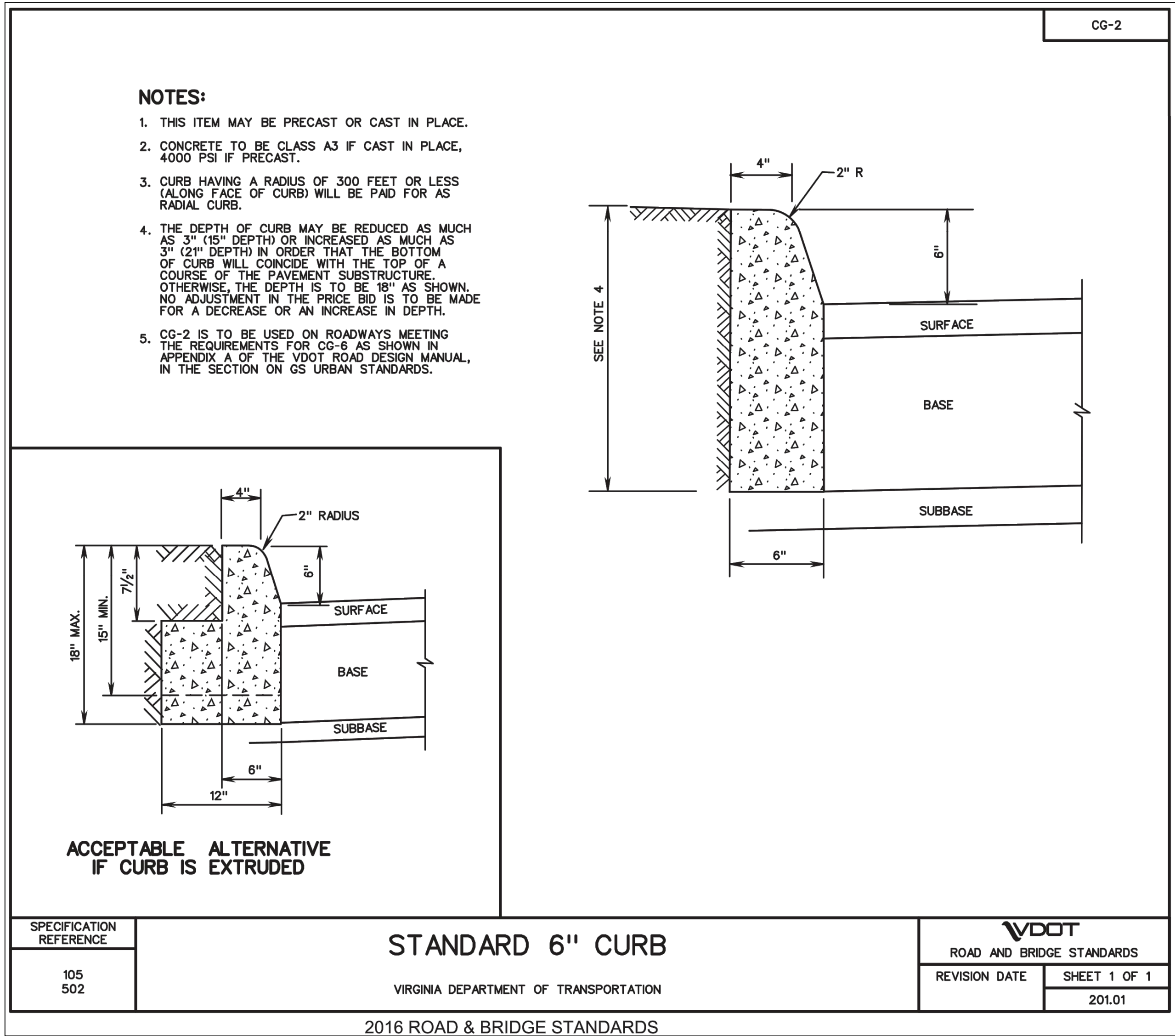
CATAMBA DISTRICT
ROANOKE COUNTY, VIRGINIA

DRAWN BY: SKM
DESIGNED BY: JSF
CHECKED BY: CPB
DATE: 11/4/2019
SCALE: AS NOTED
REVISIONS:
12/17/2019

C6

PROJECT NO. 04180095.00

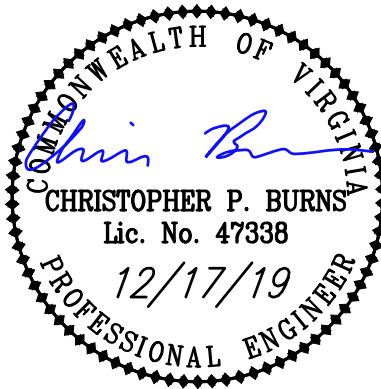
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WOOD HAVEN TECHNOLOGY PARK ROAD IMPROVEMENTS

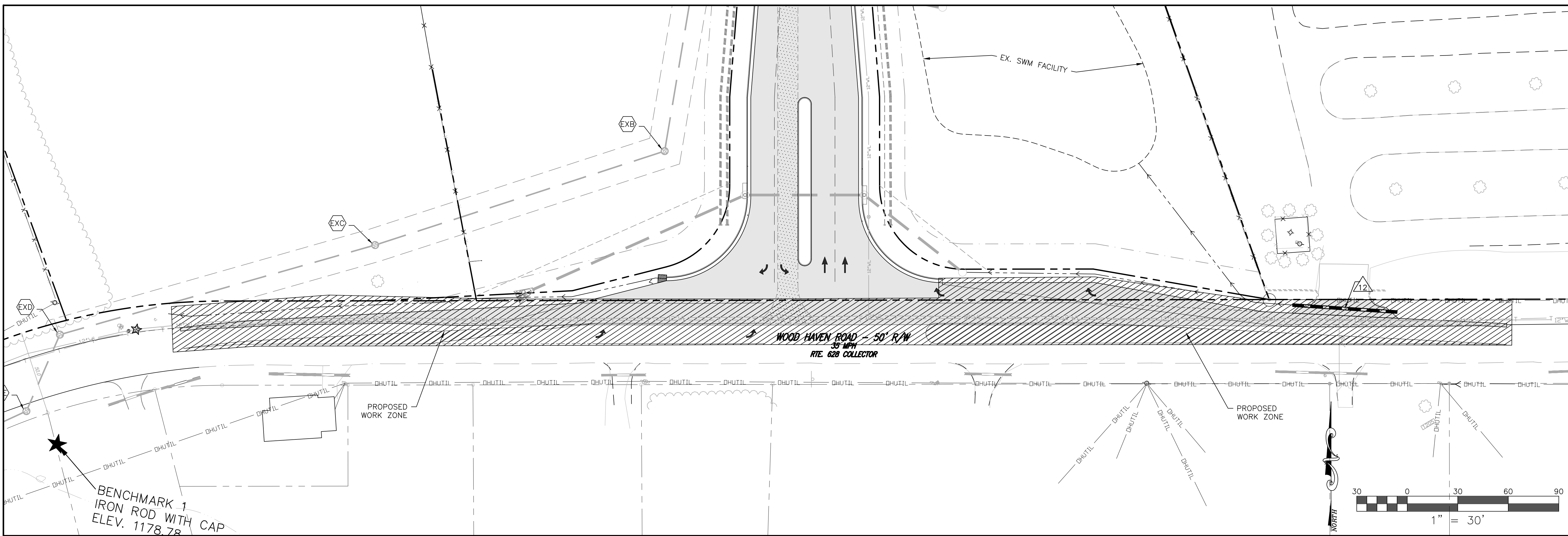
MAINTENANCE OF TRAFFIC PLAN

CATAWBA DISTRICT
ROANOKE COUNTY, VIRGINIA

DRAWN BY SKM
DESIGNED BY JSF
CHECKED BY CPB
DATE 11/4/2019
SCALE AS NOTED
REVISIONS
12/17/2019

C7

PROJECT NO. 04180095.00



GENERAL NOTES:

- PROJECT CATEGORY (MINIMUM TMP REQUIREMENTS):
 - THIS WILL BE A CATEGORY I PROJECT (MINIMAL LEVEL OF CONSTRUCTION)
 - THIS WILL BE PERMITTED WORK.
 - THIS PROJECT WILL INVOLVE TRAFFIC CONTROL DEVICES AND A LANE CLOSURE TO ENSURE SAFE TRAVEL AROUND THE WORK ZONE.
- G.C. SHALL BE RESPONSIBLE FOR ENSURING THAT ALL SIGNAGE IS PLACED THE CORRECT DISTANCE BEFORE OR AFTER THE WORK ZONE AS SHOWN IN THE WORK AREA PROTECTION MANUAL (LATEST ADDITION) AND AS DICTATED BY THE SPECIFIC SITE. ALL SIGN LOCATIONS SHALL BE COORDINATED WITH VDOT.
- THIS MAINTENANCE OF TRAFFIC PLAN IS INTENDED TO PROVIDE A BASIC OVERVIEW OF THE TYPES OF TRAFFIC CONTROL MEASURES NECESSARY FOR THE WORK ZONE ON THIS PROJECT. THIS PLAN IS NOT INTENDED TO SHOW EVERY FEATURE OF THE TRAFFIC CONTROL PLAN. THE G.C. SHALL PROVIDE VDOT WITH A COMPLETE MAINTENANCE OF TRAFFIC PLAN PRIOR TO COMMENCEMENT OF WORK WITHIN THE EXISTING RIGHT-OF-WAY AND THE G.C. SHALL ULTIMATELY BE RESPONSIBLE FOR ENSURING SAFE TRAVEL AROUND ALL WORK AREAS.
- PUBLIC COMMUNICATION PLAN
 - ROANOKE COUNTY
 - SALEM TRAFFIC OPERATIONS CENTER (540) 375-0170*
 - *THE TOC SHALL BE NOTIFIED OF PROPOSED LANE CLOSURES AT THE BEGINNING AND END OF EACH WORK DAY.
 - ROANOKE COUNTY POLICE (540) 777-8601
 - ROANOKE COUNTY FIRE & RESCUE (540) 777-8701
 - ROANOKE COUNTY COMMUNICATION CENTER (540) 562-3265
 - ROANOKE COUNTY SCHOOLS - DR. LORRAINE LANGE (540) 562-3900
 - ROANOKE COUNTY BOARD OF SUPERVISORS ADMINISTRATOR OFFICE (540) 772-2003
 - VIRGINIA STATE POLICE (540) 375-9500

TRAFFIC CONTROL NOTES:

- ONE WORK ZONE IS SHOWN ON THIS PLAN AND CONSISTS OF A LANE CLOSURE ON WOOD HAVEN ROAD TO BE PERFORMED IN ACCORDANCE WITH THE MOST CURRENT EDITION OF THE VIRGINIA WORK AREA PROTECTION MANUAL.
- G.C. SHALL CONTACT THE VDOT REPRESENTATIVE IN WRITING WITH A WORK SCHEDULE TWO WEEKS BEFORE STARTING WORK. THE VDOT REPRESENTATIVE WILL DETERMINE IF POLICE PATROL IS NECESSARY FOR TRAFFIC CONTROL.
- THE CONTRACTOR SHALL COORDINATE THE SEQUENCE OF CONSTRUCTION WITH VDOT.
- TRAFFIC CONTROL DEVICES/SIGNAGE SHALL BE PROVIDED ALONG WOOD HAVEN ROAD AS NECESSARY. SPACING MAY BE ADJUSTED TO FIT FIELD CONDITIONS WITH VDOT APPROVAL.
- ALL PAVEMENT MARKINGS CONFLICTING WITH TRAFFIC PATTERNS SHALL BE ERADICATED AND RE-STRIPED AS NECESSARY.
- WHEN WORK IS NOT BEING PERFORMED, THE CLEAR ZONE OF THE ROADWAY SHALL BE FREE OF STORED MATERIALS AND PARKED EQUIPMENT.
- ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH THE 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 ENTRANCE PERMIT.
- THE POSTED SPEED LIMIT ON THIS SECTION OF WOOD HAVEN ROAD IS 35 MPH. ALL TAPER LENGTHS, BUFFER LENGTHS, AND CHANNELIZING SHALL BE BASED ON THIS SPEED.
- NO WORK SHALL BE PERFORMED ON-SITE UNTIL AN ENTRANCE PERMIT HAS BEEN ISSUED FOR THE SUBJECT PROPERTY.
- SAFE ACCESS TO ALL EXISTING PUBLIC ROADWAYS SHALL BE MAINTAINED AT ALL TIMES.
- CONSTRUCTION WORK AFTER DARK SHALL OCCUR WITH FLOODLIGHTS BEING UTILIZED WHERE EXISTING LIGHT IS NOT ADEQUATE. THE FLOODLIGHTS SHALL NOT CREATE A DISTRACTING GLARE TO ADJACENT DRIVERS.
- CHANNELIZING DEVICES SUCH AS CONES OR BARRELS SHALL BE UTILIZED WHERE REQUIRED AND FOLLOW THE WORK AREA PROTECTION MANUAL.
- G.C. SHALL MAINTAIN ALL EXISTING ROADWAY SIGNAGE DURING ALL PHASES OF THIS PROJECT.

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

NOTES

Guidance:

- Sign spacing distance should be 350'-500' where the posted speed limit is 45 mph or less, and 500'-800' where the posted speed limit is greater than 45 mph.
- Care should be exercised when establishing the limits of the work zone to insure maximum possible sight distance in advance of the flagger station and transition, based on the posted speed limit and at least equal to or greater than the values in Table 6H-3. Generally speaking, motorists should have a clear line of sight from the graphic flagger symbol sign to the flagger.
- To maintain efficient traffic flow in a flagging operation on a two-lane roadway, the maximum time motorists should be stopped at a flagger station is 8 minutes for high volume roadways (average daily traffic of 500 or more vehicles per day) to a maximum of 12 minutes for low volume roadways (less than 500 vehicles per day). For additional information see Section 6E.07.2

Standard:

- Portable Temporary Rumble Strips (PTRS) shall be used as noted in Section 6F.99.
- Flagging stations shall be located far enough in advance of the work space to permit approaching traffic to reduce speed and/or stop before passing the work space and allow sufficient distance for departing traffic in the left lane to return to the right lane before reaching opposing traffic (see Table 6H-3 on Page 6H-5).
- All flaggers shall be state certified and have their certification card in their possession when performing flagging duties (see Section 6E.01, Qualifications for Flaggers).
- Cone spacing shall be based on the posted speed and the values in Table 6H-4 on Page 6H-6.1
- A shadow vehicle with at least one high intensity amber rotating, flashing, or¹ oscillating light shall be parked 80'-120' in advance of the first work crew.

Option:

- A SLOW (W21-V10) sign² may be required in this area to give advance warning of the operation ahead by slowing approaching traffic prior to reaching the flagger station or queued traffic.

Guidance:

- If the queue of traffic reaches the BE PREPARED TO STOP (W3-4) sign then the signs, and if used the PTRS¹ should be readjusted at greater distances.
- When a highway-rail crossing exists within or upstream of the transition area and it is anticipated that queues resulting from the lane closure might extend through the highway-rail grade crossing, the temporary traffic control zone should be extended so that the transition area precedes the highway-rail crossing (see Figure TTC-36 for additional information on highway-rail crossings).

Standard:

- At night, flagger stations shall be illuminated, except in emergencies (see Section 6E.08).

Option:

- Cones may be eliminated when using a pilot vehicle operation or when the total roadway width is 20 feet or less.
- For low-volume situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger, positioned to be visible to road users approaching from both directions, may be used (see Chapter 6E).

Standard:

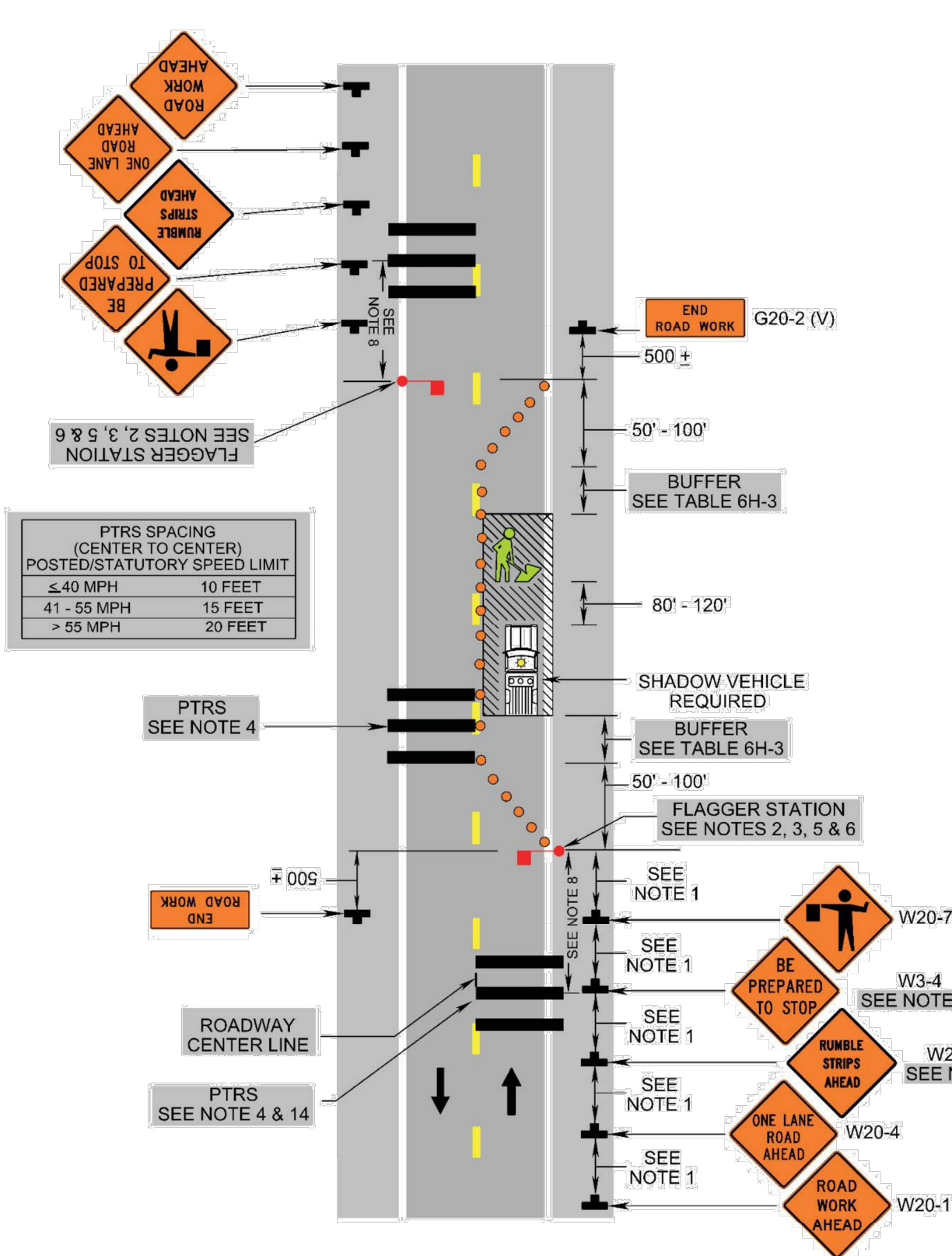
- When used², three portable temporary rumble (PTRS) strips shall be installed across the entire travel lane adjacent to the BE PREPARED TO STOP (W3-4) sign. The portable temporary rumble strips shall be monitored and adjusted as necessary during the work shift to ensure proper placement on the roadway. When the PTRS are installed, the RUMBLE STRIPS AHEAD (W20-V26) sign shall also be utilized.

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

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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