

GENERAL NOTES

PRE-CONSTRUCTION MEETING AND CONSTRUCTION COMMENCEMENT:

- All construction methods and materials shall conform to the Construction Standards and Specifications of Roanoke County, the Western Virginia Water Authority, and the Virginia Department of Transportation.
- Stormwater Management Agreements with an attached 8 1/2" x 11" or 8 1/2" x 14" plat must be approved and recorded prior to the pre-construction meeting.
- Once all required items are submitted to Roanoke County, the developer must contact the Development Review Coordinator to indicate that a pre-construction meeting needs to be scheduled. The pre-construction meeting will be scheduled with the owner/developer two (2) working days later.
- All land disturbing projects that require approval of an erosion and sediment control plan, grading or clearing permit shall require that the applicant provide the name of an individual who will be responsible for land disturbing activities and that this individual hold a Responsible Land Disturber (RLD) Certificate from the Department of Environmental Quality. The Responsible Land Disturber can be anyone from the Project team that is certified by the Commonwealth of Virginia to be in charge of carrying out the land disturbing activity for the project.
- It is the responsibility of the owner/developer to notify the certified Responsible Land Disturber and the Utility Contractor to attend the pre-construction meeting.
- The Development Review Coordinator will schedule the pre-construction meeting with the County Review Engineer, the County Inspector, and the Western Virginia Water Authority and the Town of Vinton Public Works Department if applicable.
- An approved set of plans, Storm Water Pollution Prevention Plan (SWPPP), VSMP coverage letter, and all permits must be available at the construction site at all times.
- The developer and/or contractor shall supply all utility companies with copies of approved plans, advising them that all grading and installation shall conform to approved plans.
- The project engineer will inform the owner/developer verbally and in writing of the County's obligation to perform inspections on site. Everyone in the meeting will be required to sign a pre-construction checklist indicating their knowledge of Roanoke County's obligation to perform inspections on site.
- The Erosion Control Permit or Combined Erosion Control & VSMP Permit is given to the developer at this pre-construction meeting.
- Notify Roanoke County prior to beginning installation of ESC measures. The County will inspect initial installations to ensure compliance with approved plan prior to start of grading. The developer SHALL contact the project inspector 24 hours before beginning any grading or construction on the property.
- County inspectors must inspect storm drain / stormwater management / BMP installations during the process of installation. Please contact the site inspector 24 hours in advance.
- All work shall be subject to inspection by Roanoke County, the Western Virginia Water Authority and the Virginia Department of Transportation Inspectors.
- Contractors shall notify utilities of proposed construction at least two (2), but not more than ten (10) working days in advance. Area public utilities may be notified thru "Miss Utility": 1-800-552-7001 or VA 811.
- The 100 year Floodway shall be staked prior to any construction.
- Grade stakes shall be set for all curb and gutter, culvert, sanitary sewer and storm sewer at all times of construction.
- Roanoke County shall be notified when a spring is encountered during construction.
- Construction debris shall be containerized in accordance with the Virginia Litter Control Act. No less than one litter receptacle shall be provided on site.
- The contractor shall provide adequate means of cleaning mud from trucks and/or other equipment prior to entering public streets or rights of ways. It is the contractors responsibility to insure that the streets are in a clean, mud and dust free condition at all times.
- Plan approval in no way relieves the developer or contractors of the responsibilities contained within the erosion and sediment control or stormwater management policies.
- Field construction shall honor proposed drainage divides as shown on plans.
- Field corrections shall be approved by the Roanoke County and/or the Western Virginia Water Authority and the Professional of Record, prior to such construction.
- The developer or contractor shall supply the County and the Western Virginia Water Authority with correct As-Built plans before final acceptance.

VIRGINIA DEPARTMENT OF TRANSPORTATION:

- Plan approval by Roanoke County does not guarantee issuance of any permits by the Virginia Department of Transportation.
- A permit must be obtained from the Virginia Department of Transportation, Salem Residency Office prior to construction in the highway right-of-way.
- The preliminary pavement designs should be based on a predicted sub-grade CBR value of 7.0 and with a Resiliency Factor (RF) of 2.0 as shown in the current edition of the Virginia Department of Transportation Pavement Design Guide for Subdivision and Secondary Roads. The sub-grade 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 sub-grade CBR value and/or the RF value be less than the predicted values, additional base material will be required in accordance with Departmental specifications. Refer to the same manual as 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 sub-grade shall be approved by the Virginia Department of Transportation prior to placement of the base. Base shall be approved by the Virginia Department of Transportation for depth, template, and compaction before the surface is applied.
- Standard guardrail with safety end sections may be required on fills or in areas where hazards exist as deemed necessary. After completion of rough grading operations, the County Engineer and Virginia Department of Transportation shall be contacted to schedule a field review. Where guard rail is warranted, the standard shoulder width shall be provided and the guard rail shall be installed in accordance with the current edition of the VDOT Road and Bridge Standards as part of this development.
- Standard street and traffic control signs shall be erected at each intersection by the developer prior to final street acceptance.
- All traffic devices shall be in accordance with current edition of the "Manual on Uniform Traffic Control Devices" (MUTCD).
- All unsuitable material shall be removed from the construction limits of the roadway before placing embankment.

See Sheet N/A for Stormwater Site Statistics Table.
See Sheet N/A for New BMP Information Table.

The Project Engineer shall provide electronic copies of the approved plans to the Development Review Coordinator within 5 working days of the pre-construction meeting.
The notes on this sheet shall not be modified.



COUNTY OF ROANOKE, VA

NAME OF DEVELOPMENT: EASTERN ROANOKE RIVER GREENWAY, PHASE I	I, <u>CEM Hall</u> 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. ROANOKE HIGH GREENWAY - PHASE I
MAGISTERIAL DISTRICT(S): VINTON MAGISTERIAL DISTRICT	I HEREBY CERTIFY THAT I AGREE TO COMPLY WITH THESE REQUIREMENTS SHOWN ON THIS COVER SHEET UNLESS MODIFIED IN ACCORDANCE WITH LOCAL LAW.
OWNER (name, address, telephone): ROANOKE COUNTY DEPARTMENT OF PARK, RECREATION & TOURISM, 1206 KESSLER MILL ROAD, SALEM, VA 24153, (540)777-6324	
DEVELOPER (name, address, telephone): ROANOKE COUNTY DEPARTMENT OF PARK, RECREATION & TOURISM, 1206 KESSLER MILL ROAD, SALEM, VA 24153, (540)777-6324	
ENGINEER, ARCHITECT OR SURVEYOR (name, address, telephone): HURT & PROFFITT, 1861 PRATT DR. SUITE 1100, BLACKSBURG, VA 24060 (540)552-5592	
TAX MAP NO(S): TAX PARCEL ID: 080.00-01-35.00-0000, TAX PARCEL ID: 071.03-01-10.00-0000	

WATER AND SEWER NOTES

All construction methods and materials shall conform to the latest edition of the Design and Construction Standards and Specifications of the Western Virginia Water Authority (WVWA) available at www.westernvawater.org or by contacting the authority at 540-853-5700. The project shall also comply with the governing jurisdiction's standards and other agency standards (e.g. VDOT, DEQ, DCR, VDH, etc.) where applicable.

A minimum cover of three (3) feet is required on all WVWA water and sewer lines. All existing utilities may not be shown in their exact locations. The contractor shall notify Miss Utility and shall verify location and elevation of all underground utilities in the areas of construction prior to starting work.

Please show all WVWA water and sewer utilities on any development plan. The location of existing utilities across or along the line of proposed work are not necessarily shown on the plans and where shown are only approximately correct. The contractor shall on his own initiative and at no extra cost, locate all underground lines and structures and pothole as necessary. The contractor shall be responsible for any damage to underground structures. All damage incurred to existing utilities during construction shall be repaired at the contractor's expense.

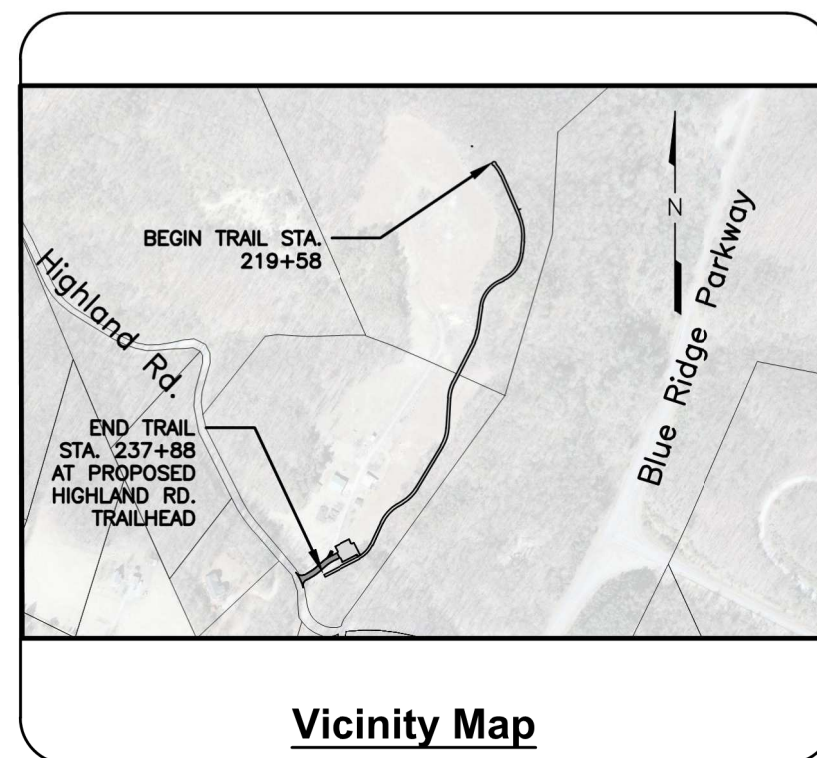
Plan approval by the WVWA does not remove the contractor's responsibility to remove or relocate any existing conflicts found during construction.

The contractor shall maintain a minimum of 18" clearance vertically and two (2) feet minimum horizontally from the outside of pipe to outside of pipe with all other underground utilities. Where this cannot be achieved, additional measures in accordance with the WVWA standards shall be enforced.

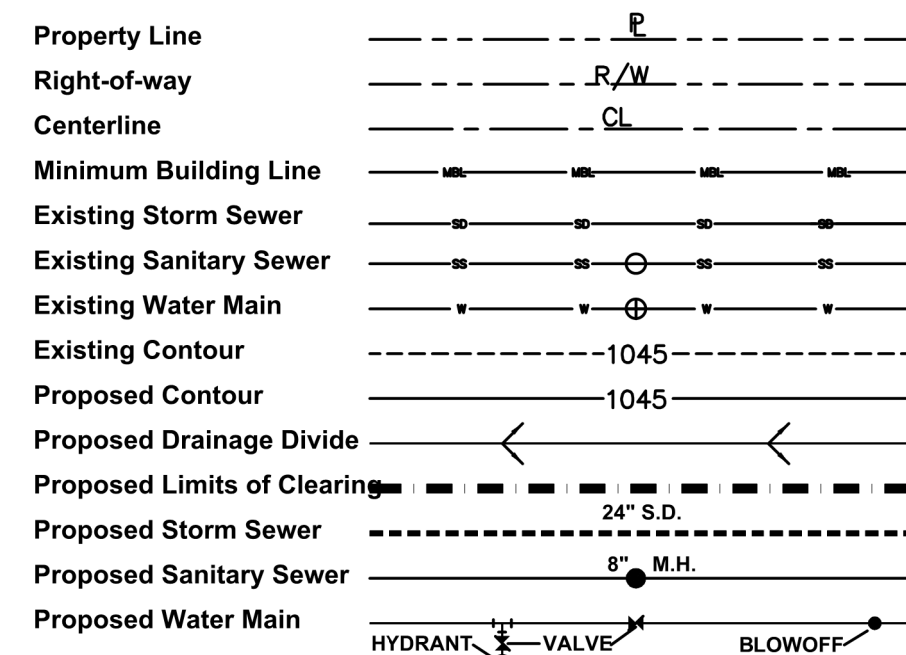
All utility grade adjustments shall be in accordance with WVWA standards and are the responsibility of the contractor.

Field changes shall be submitted by the engineer of record to the locality and approved by the WVWA.

Western Virginia Water Authority
Availability letter number: _____



LEGEND



PRIVATE UTILITIES

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 substituted for the code required devices.

PR #:	NOTES:

Revision Table

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- 2B. EROSION & SEDIMENT CONTROL NARRATIVE
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- 3 TO 5. PHASE 1 PLAN & PROFILE
6. HIGHLAND ROAD TRAILHEAD PLAN
7. PIPE PROFILES

Sheet Index

SURVEY INFORMATION

Horizontal and vertical control surveys were performed in year: 2014
By: ANDERSON & ASSOCIATES, INC.
All vertical elevations must be referenced to the National Geodetic Vertical Datum of 1929 or 1988. All horizontal elevations must be referenced to the North American Datum of 1927 or 1983.
Horizontal Datum: NAD 83 (2011) Vertical Datum: NAVD 88
Source of topographic mapping is dated 2014
Boundary was performed by ANDERSON & ASSOCIATES, INC. dated: 2014
Benchmark Information: 2014

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



HURT & PROFFITT

1861 PRATT DRIVE, SUITE 1100
BLACKSBURG, VIRGINIA 24060
800.763.5596 TOLL FREE
540.552.5592 MAIN
ENGINEERING • SURVEYING
LAND DEVELOPMENT • ENVIRONMENTAL
GEO-TECHNICAL
CONSTRUCTION TESTING & INSPECTION
CULTURAL RESOURCES

TIER 1 PROJECT

LOCALLY ADMINISTERED PROJECTS
ROANOKE RIVER GREENWAY - PHASE I

County of Roanoke Virginia
NAME OF LOCALITY

(SIGNATURE) Doug Blount
RECOMMENDED FOR APPROVAL FOR RIGHT OF WAY ACQUISITION

4/11/18 Roanoke Co. Parks, Rec. and Tourism Director
DATE TITLE OF POSITION

(SIGNATURE) David Henderson
RECOMMENDED FOR APPROVAL FOR CONSTRUCTION

5/5/22 County Engineer
DATE TITLE OF POSITION

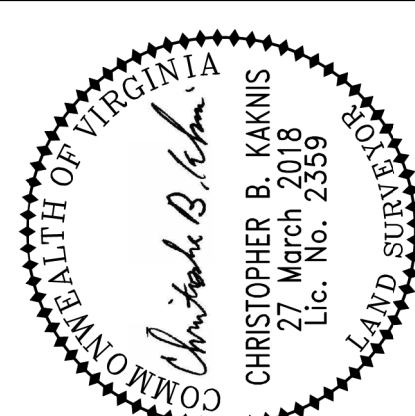
RECOMMENDED FOR APPROVAL FOR RIGHT OF WAY ACQUISITION

5/3/18 Thelma Ingle
DATE DISTRICT PLANNING AND INVESTMENT MANAGER

6/4/18 T. W. Digulian
DATE DISTRICT PROJECT DEVELOPMENT ENGINEER

APPROVED FOR RIGHT OF WAY ACQUISITION

6/4/18 K. H. King, Jr.
DATE DISTRICT ADMINISTRATOR



APPROVED



PLAN APPROVED
Denise Lender
REVIEW COORDINATOR: 5/6/2022

Eastern Roanoke River Greenway, Phase I
VDOT PROJECT #: EN08-080-105, P101, R201, C501
UPC #: 91191
FEDERAL #: TEA-5128(477)
**Roanoke County
Roanoke, Virginia**

**SHEET
1
OF
7**

GENERAL NOTES

PLAN NOTES

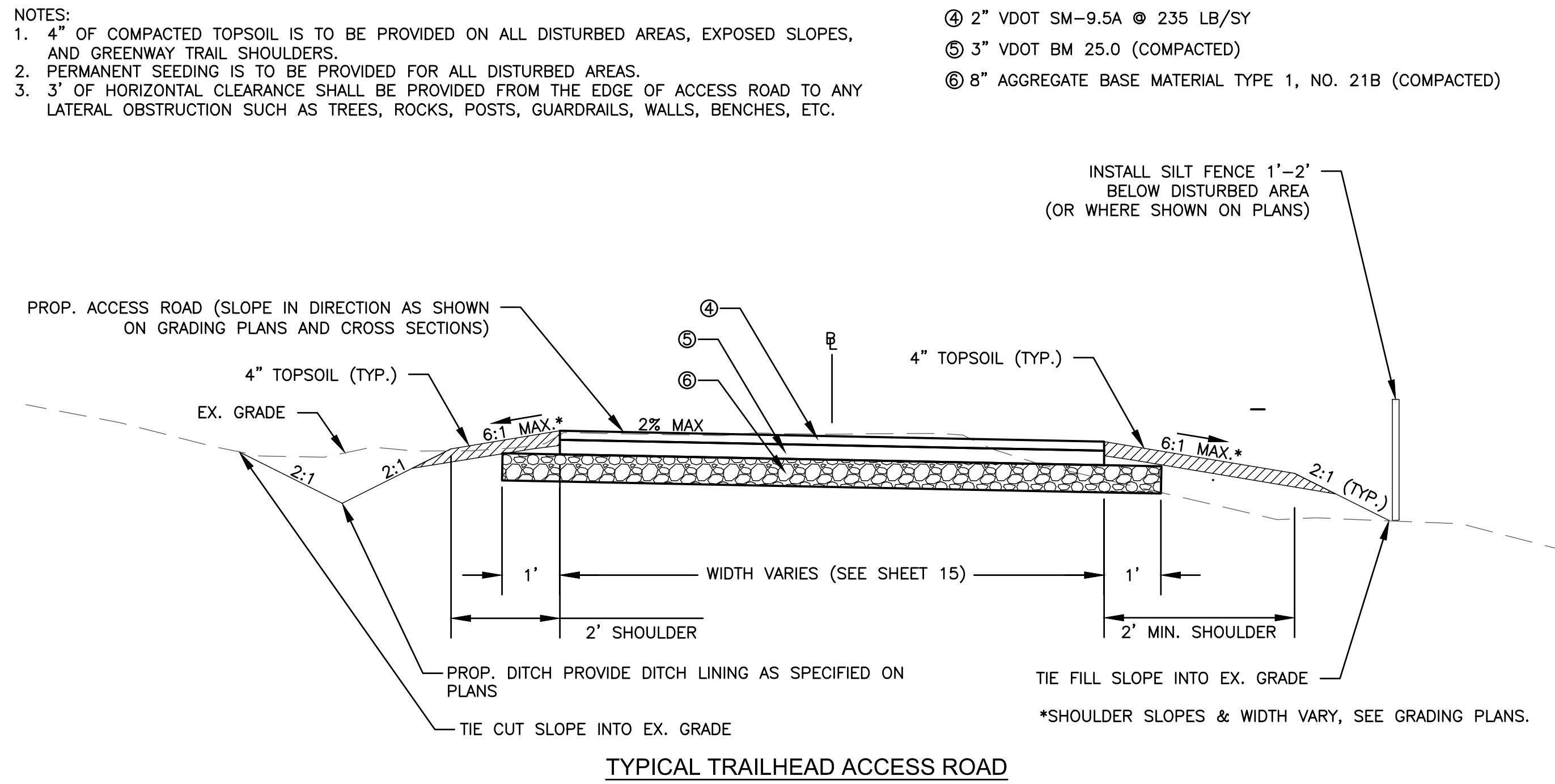
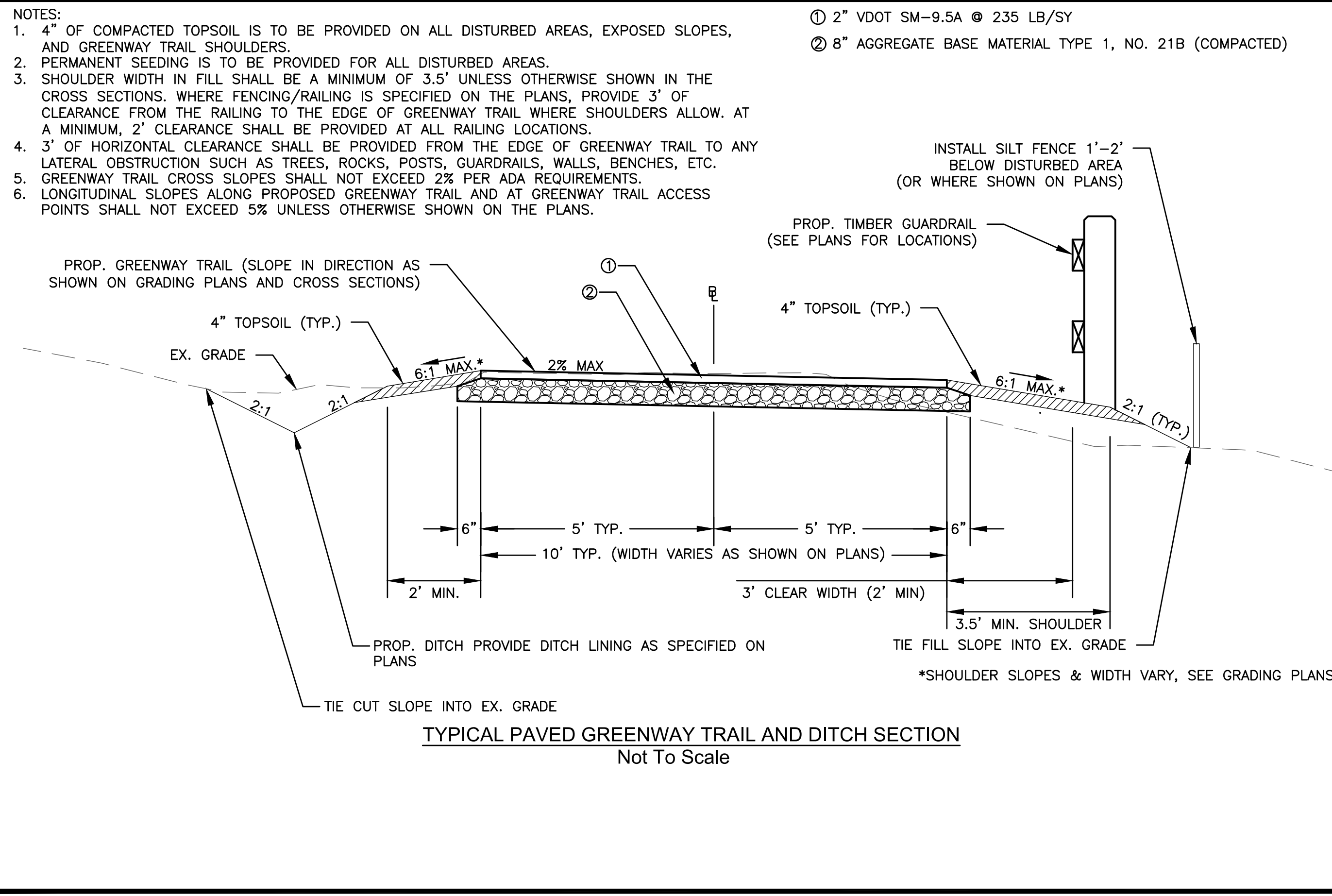
- THIS PROJECT IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT STANDARDS AND SPECIFICATIONS AND THE LATEST EDITION OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) ROAD AND BRIDGE SPECIFICATIONS, VDOT ROAD AND BRIDGE STANDARDS, THE VIRGINIA WORK AREA PROTECTION MANUAL, THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, THE STANDARD HIGHWAY SIGNS BOOK, AND THESE PLANS.
- TREES AND BRUSH SHALL BE CLEARED & GRUBBED WITHIN THE CONSTRUCTION LIMITS. DEBRIS AND REFUSE WITHIN THE PROPOSED TRAIL CORRIDOR AND AREAS OF DISTURBANCE/PROPOSED IMPROVEMENTS SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR.
- TESTING, QUALITY CONTROL, SHALL BE PROVIDED BY THE CONTRACTOR'S INDEPENDENT LABORATORY REPRESENTATIVE AND SHALL BE IN ACCORDANCE WITH VDOT SPECIFICATIONS. QUALITY ASSURANCE TESTING WILL BE PROVIDED BY THE OWNER.
- EXISTING UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE AND DO NOT REPRESENT ALL UTILITIES OR SERVICE LINES. PRIOR TO EXCAVATION, THE CONTRACTOR SHALL CONTACT THE PERTINENT UTILITY COMPANIES AND/OR UTILITY LOCATING SERVICES TO HAVE ALL UNDERGROUND UTILITIES LOCATED AND MARKED. THE CONTRACTOR SHALL PROTECT AND MAINTAIN EXISTING UTILITIES DURING CONSTRUCTION. WHERE PROPOSED IMPROVEMENTS, DRAINAGE CULVERTS, OR GRADING IS FOUND TO BE IN CONFLICT WITH EXISTING UTILITIES, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.
- THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING UTILITY RELOCATIONS WITH THE APPROPRIATE UTILITY OWNER(S).
- THE CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH THE REQUIREMENTS OF SECTION 59.1-406 ET SEQ. OF THE CODE OF VIRGINIA (OVERHEAD HIGH VOLTAGE LINE SAFETY ACT.)
- THE CONTRACTOR SHALL FURNISH AND INSTALL SIGNAGE IN ACCORDANCE WITH THESE PLANS, THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE STANDARD HIGHWAY SIGNS BOOK, AND VDOT SUPPLEMENTS LATEST ED.
- THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF TRAFFIC.
- THE CONTRACTOR IS RESPONSIBLE FOR SAFETY ON THE PROJECT. EXCAVATIONS SHALL NOT BE LEFT OPEN OVERNIGHT UNLESS APPROVED BY THE ENGINEER. THE MAIN ACCESS POINTS TO THE TRAIL SHALL BE GATED OR BARRICADED.
- PROPOSED CULVERTS SHALL BE CLASS III REINFORCED CONCRETE PIPE, UNLESS OTHERWISE NOTED, AND INSTALLED ACCORDING TO THE PLANS. MINOR FIELD ADJUSTMENTS MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.
- THE PROPOSED TRAIL SHALL PROVIDE SMOOTH TRANSITIONS AND SHALL NOT EXCEED A 5% MAX. LONGITUDINAL SLOPE UNLESS OTHERWISE NOTED IN THE PLANS.
- WHERE CROSS SLOPES TRANSITION FROM "GRADE LEFT" TO "GRADE RIGHT", THE TRANSITION SHOULD BE APPROXIMATELY 25' IN LENGTH.
- THE CONTRACTOR SHALL OBTAIN ALL PERMITS, THESE INCLUDE BUT ARE NOT LIMITED TO:
 - LAND USE PERMIT FROM VDOT PRIOR TO BEGINNING ANY ACTIVITIES/OPERATIONS ON STATE RIGHT OF WAY. THIS WOULD INCLUDE POSITIONING EQUIPMENT ON THE HIGHWAY SHOULDER/RIGHT OF WAY AND USE OF CONSTRUCTION ENTRANCE.
 - EROSION AND SEDIMENT CONTROL PERMIT FROM THE COUNTY OF ROANOKE. CONTRACTOR SHALL BE THE RESPONSIBLE LAND DISTURBER.
 - VSMP PERMIT.
 - BUILDING PERMIT (AS REQUIRED).
- ALL MATERIAL SHALL BE FROM VDOT PRE-APPROVED SOURCES. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING FULL SOURCE MATERIAL DOCUMENTATION (ON VDOT APPROVED FORMS) WITH SHOP SUBMITTALS.
- TREE TRIMMING OR REMOVAL MAY BE REQUIRED TO OBTAIN SIGHT DISTANCE ON HIGHLAND RD., CONTRACTOR TO COORDINATE.

SURVEYING NOTES:

- AERIAL MAPPING PORTION:**
THIS PHOTOGRAMMETRIC SURVEY WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF, MALCOLM C. MCKENZIE & JEFFREY L. SNYDER FROM AN ACTUAL AIRBORNE SURVEY MADE UNDER OUR SUPERVISION; THE IMAGERY WAS OBTAINED ON JANUARY 3, 2014 AND THIS DIGITAL GEOSPATIAL DATA INCLUDING METADATA MEETS MINIMUM ACCURACY STANDARDS UNLESS OTHERWISE NOTED. PREPARED FOR ANDERSON & ASSOC.
- A&A FIELD WORK PORTION:**
THE AERIAL CONTROL AND CONVENTIONAL TOPOGRAPHIC FIELD SURVEY WORK WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF, CHRIS KAKNIS, OF ANDERSON AND ASSOCIATES, INC. FROM AN ACTUAL GROUND SURVEY MADE UNDER HIS SUPERVISION; THAT THE IMAGERY AND/OR ORIGINAL DATA WAS OBTAINED DURING THE MONTHS OF JANUARY THRU APRIL OF 2014; AND THAT THIS TOPOGRAPHIC MAP MEETS MINIMUM ACCURACY STANDARDS UNLESS OTHERWISE NOTED.
- PROPERTY DATA:**
PROPERTY LINE DATA SHOWN ON THE PLANS IS BASED ON A COMPILATION OF DEED RESEARCH, FIELD SURVEYS, AND GIS DATA. ANDERSON & ASSOCIATES DID NOT PREPARE A FULL BOUNDARY SURVEY OR TITLE SEARCH OF EACH PARCEL SHOWN. DATA ON EXISTING EASEMENTS IS BASED ON TITLE INFORMATION PROVIDED BY THE COUNTY OF ROANOKE.

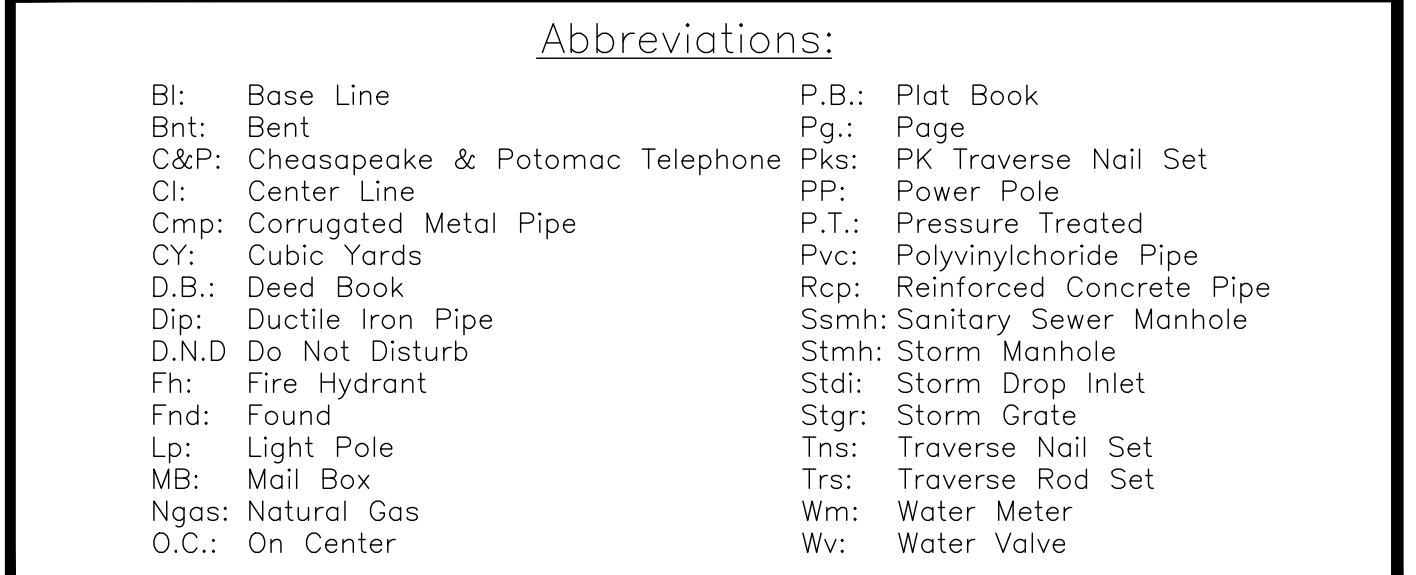
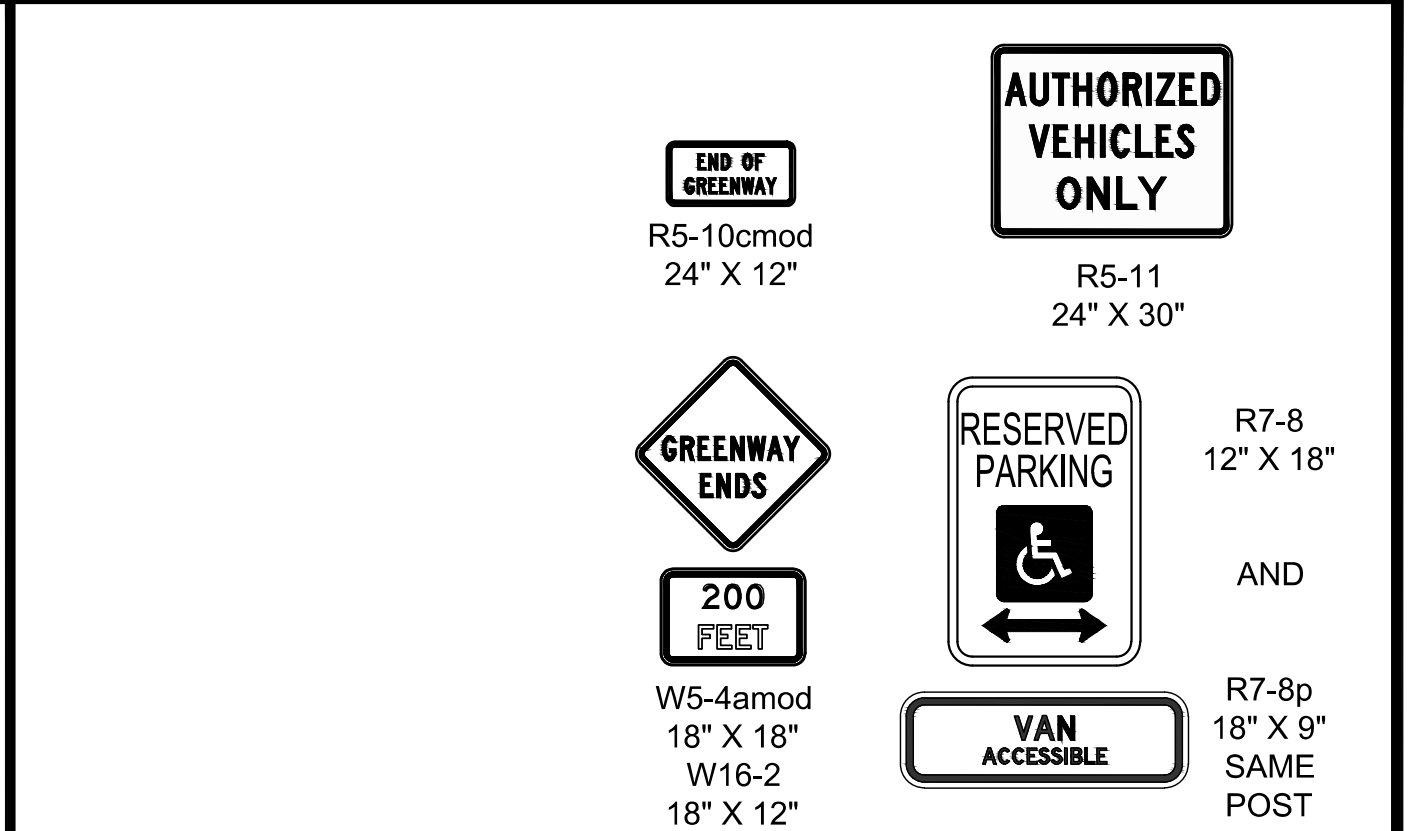
GENERAL EROSION & SEDIMENT CONTROL NOTES:

- 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 9VAC25-840 EROSION AND SEDIMENT CONTROL REGULATIONS.
- ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CLEARING.
- A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES AS WELL AS THE STORM WATER POLLUTION PREVENTION PLAN.
- PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFF-SITE BORROW OR WASTE AREAS), THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE PLAN APPROVING AUTHORITY.
- 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.
- 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.
- DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED INTO AN APPROVED FILTERING DEVICE.
- THE CONTRACTOR SHALL INSPECT ALL EROSION AND SEDIMENT CONTROL MEASURES PERIODICALLY AND AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.
- ALL AREAS DISTURBED DURING REMOVAL OF E&S MEASURES SHALL BE RESTORED AND SEEDED AT NO ADDITIONAL COST TO THE OWNER.
- SEE THESE PLANS AND THE "EROSION & SEDIMENT CONTROL AND STORMWATER MANAGEMENT NARRATIVE AND STORMWATER POLLUTION PREVENTION PLAN" FOR EROSION CONTROL PLANS, STANDARD DETAILS, AND FOR THE E&S CONTROL NARRATIVE.



THE FOLLOWING VDOT STANDARDS ARE MADE PART OF THESE PLANS BY REFERENCE:

102	ES-1
103	DI-1
113	EC-1
113	EC-4
113	EC-5
113	EC-11
503	FE-CL
503	FE-G



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ENGINEERING • SURVEYING
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GEOTECHNICAL • CONSTRUCTION TESTING & INSPECTION
CULTURAL RESOURCES

1861 Pratt Dr. Suite 1100
Blacksburg, Va. 24060
540-552-5592

DATE	07 MAR 22	REV. #	COMMENTS	DATE
DESIGNED:	JMM			
DRAWN:	MDA			
CHECKED:	JMJ			
QA/QC:	JDW			

EASTERN ROANOKE RIVER GREENWAY, PHASE I
ROANOKE, VIRGINIA

GENERAL NOTES & DETAILS

DOCUMENT NO. 29681-002
SHEET 2 OF 7



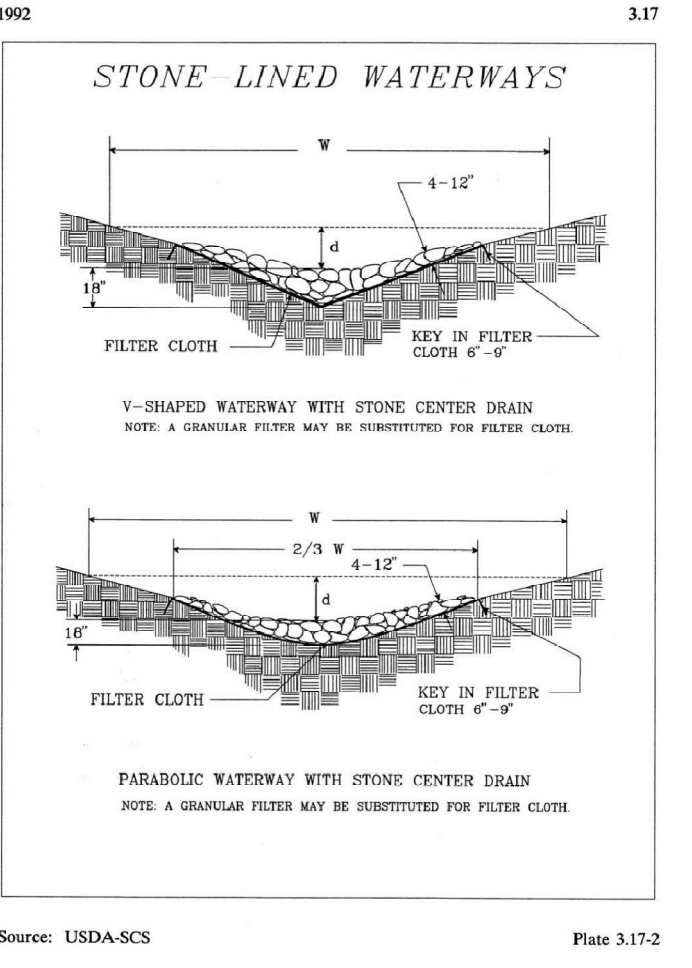
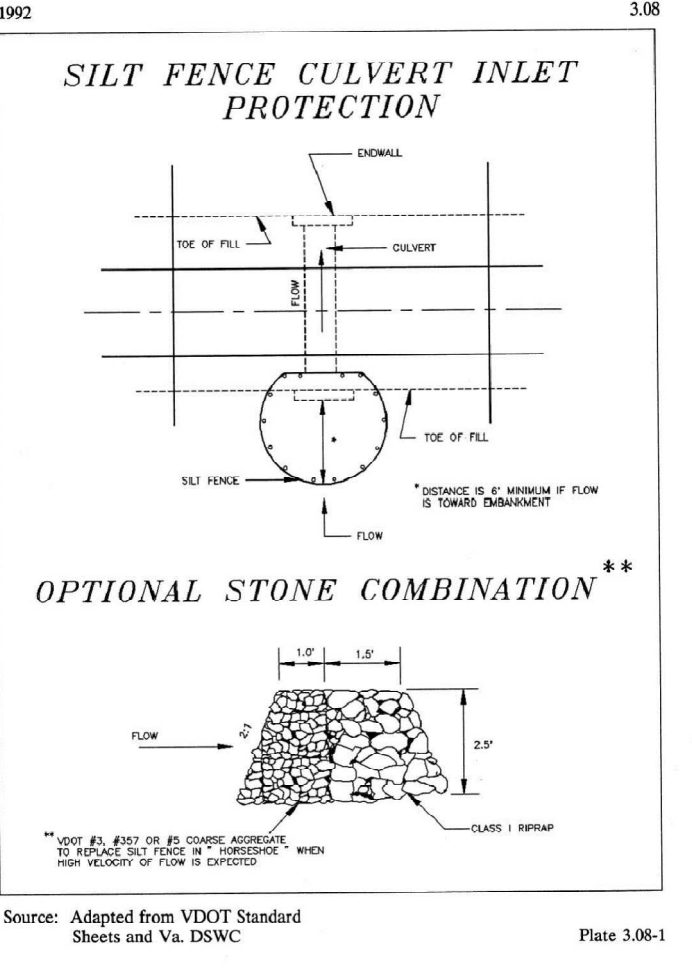
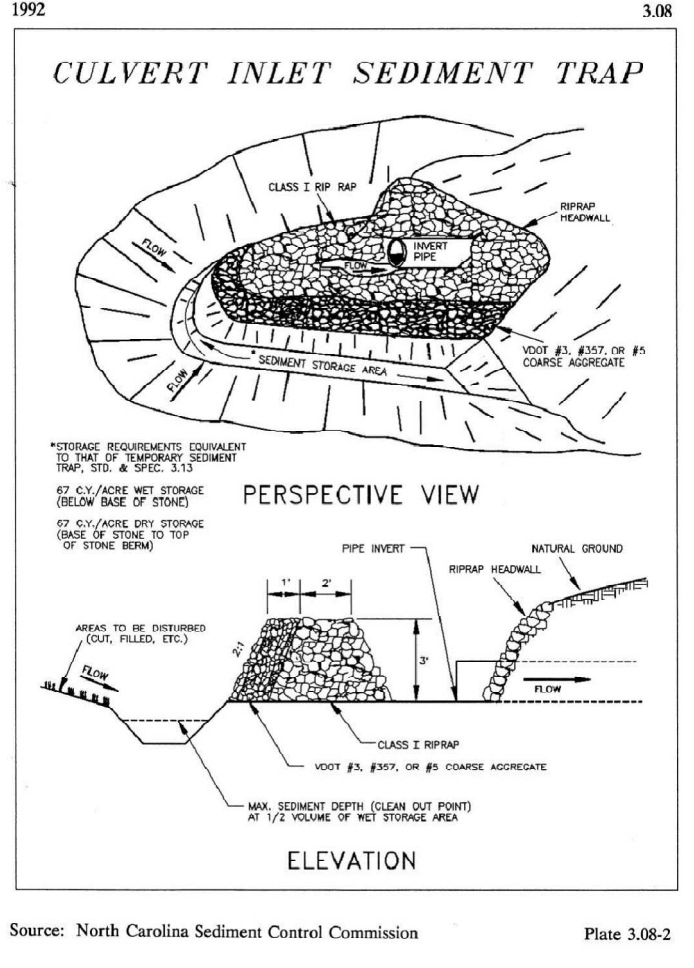
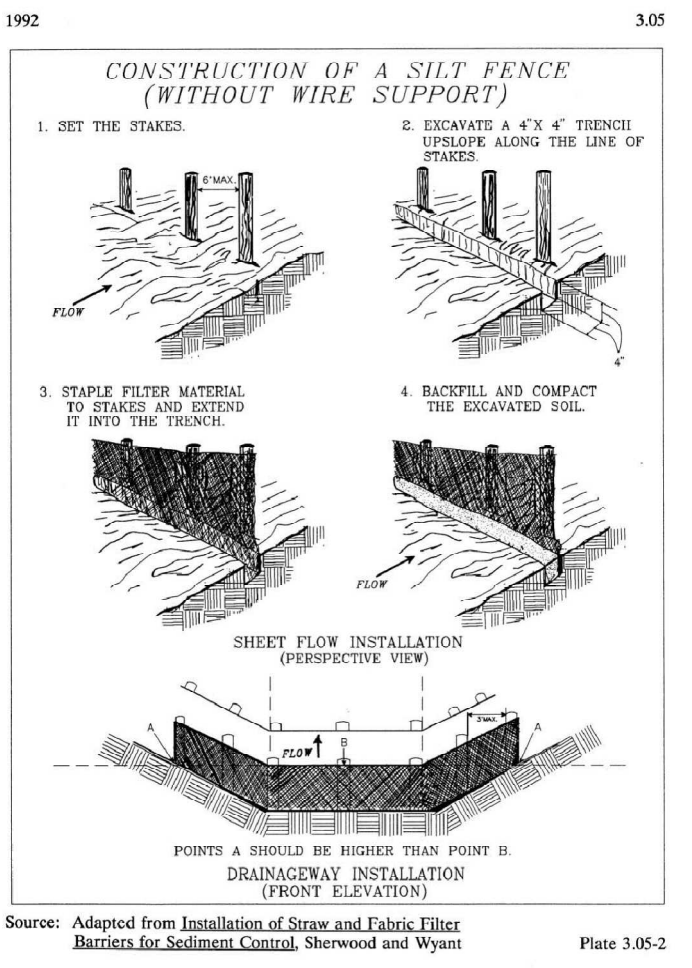
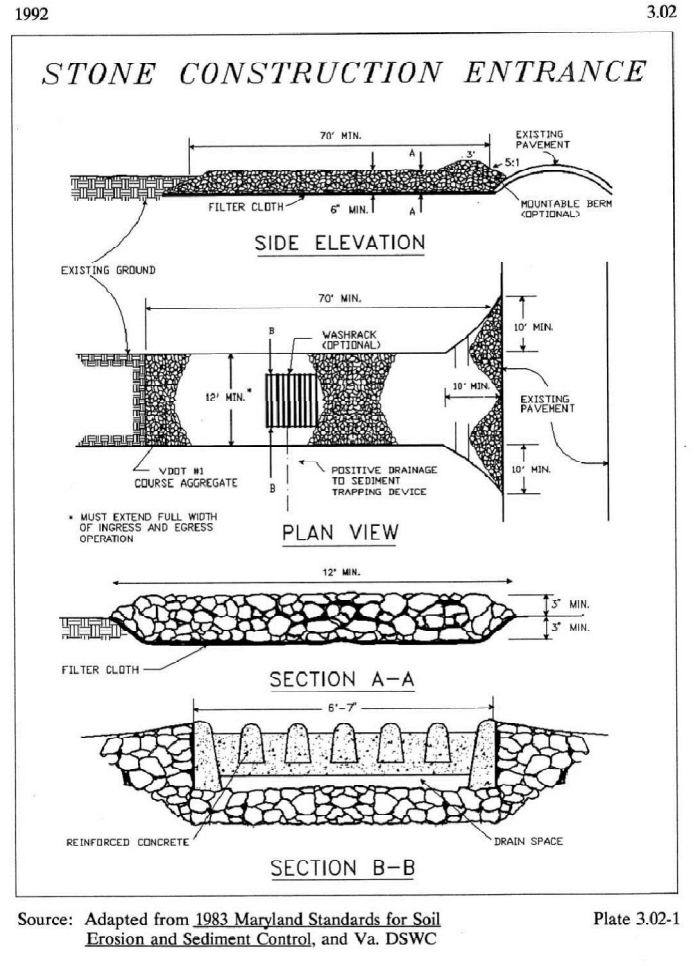
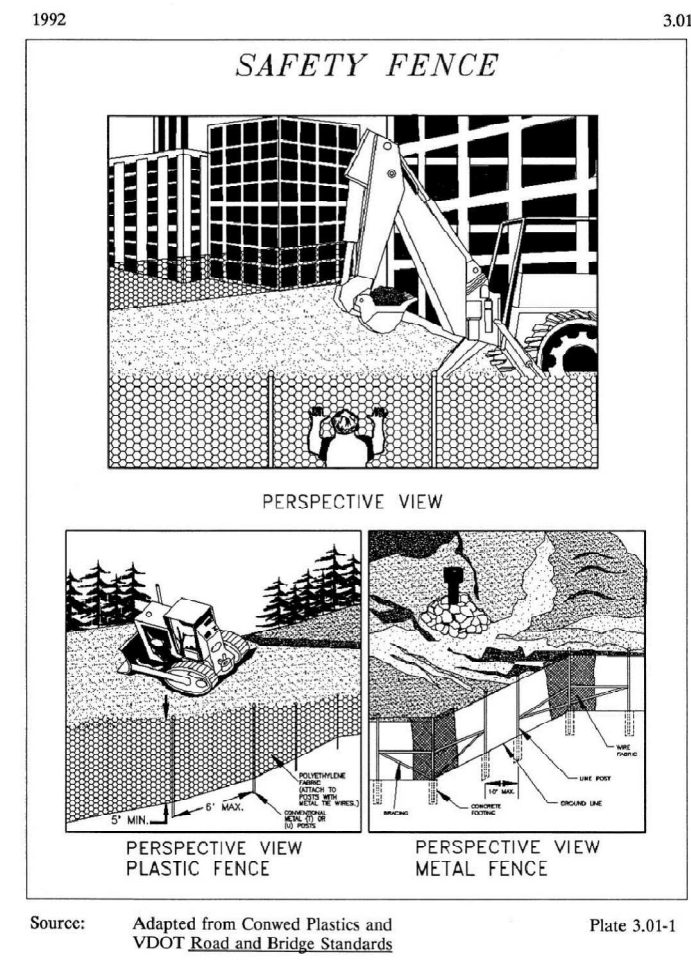


TABLE 3.13-C PERMANENT SEEDING SPECIFICATIONS FOR APPALACHIAN MOUNTAIN AREA

LAND USE	SEED SPECIES	APPLICATION RATES
Minimum Care Lawn (Commercial or Residential)	Tall Fescue Pernambuco Ryegrass ¹ Kentucky Bluegrass	90-100% 5-10% TOTAL: 200-250 lbs
High-Maintenance Lawn	Minimum of three (3) up to five (5) varieties of Kentucky Bluegrass from approved list for use in Virginia	TOTAL: 125 lbs
General Slope (4:1 or less)	Tall Fescue Red Top Grass or Creeping Red Fescue Seasonal Nurse Crop ²	125 lbs 2 lbs TOTAL: 127 lbs
Low-Maintenance Slope (Steeper than 3:1)	Tall Fescue ³ Red Top Grass or Creeping Red Fescue Seasonal Nurse Crop ² Crownvetch ⁴	125 lbs 2 lbs 20 lbs TOTAL: 147 lbs

1 - When selecting varieties of turfgrass, use the Virginia Crop Improvement Association (VCA) recommended turfgrass variety list. Quality seed will bear a label indicating that they are approved by VCA. A current turfgrass variety list is available at the local County Extension office or through VCA at 804-746-6366 or at <http://www.vca.org>

2 - Perennial Ryegrass will germinate faster and at lower soil temperatures than Tall Fescues, thereby providing cover and erosion resistance for seedbed.

3 - Use seasonal nurse crop in accordance with seeding dates as stated below:

March - April - May 15 th	Annual Ryegrass
May 16 th - August 15 th	Foxtail Millet
August 16 th - September, October	Annual Ryegrass
November - February	Winter Ryegrass

4 - All fescue seed must be properly inoculated. If Patuxent is used, increase to 30 lbs/acre. If Weeping Lovegrass is used, include in every slope or low maintenance measure during warmer seeding periods, increase to 30-40 lbs/acre.

FERTILIZER & LIME

- Apply 10-20-10 fertilizer at a rate of 600 lbs./acre (or 12 lbs./1,000 sq. ft.)
- Apply Pulverized Agricultural Limestone at a rate of 2 tons/acre (or 90 lbs./1,000 sq. ft.)

NOTE: 1 - A soil test is necessary to determine the actual amount of lime required to adjust the soil pH of site. 2 - Incorporate the lime and fertilizer into the top 4 - 6 inches of the soil by disking or by other means. 3 - When applying Slowly Available Nitrogen, use rates available in Erosion & Sediment Control Technical Bulletin #4-2003 Nutrient Management for Development Sites at <http://www.dcr.state.va.us/epsc/tds/tds.htm>

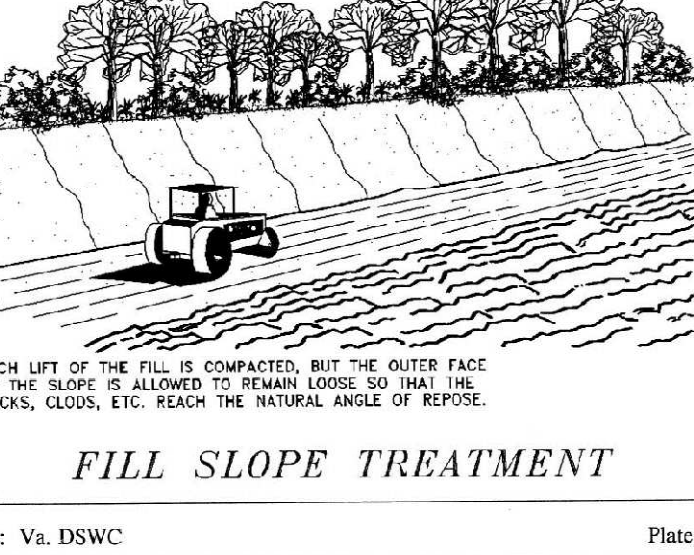
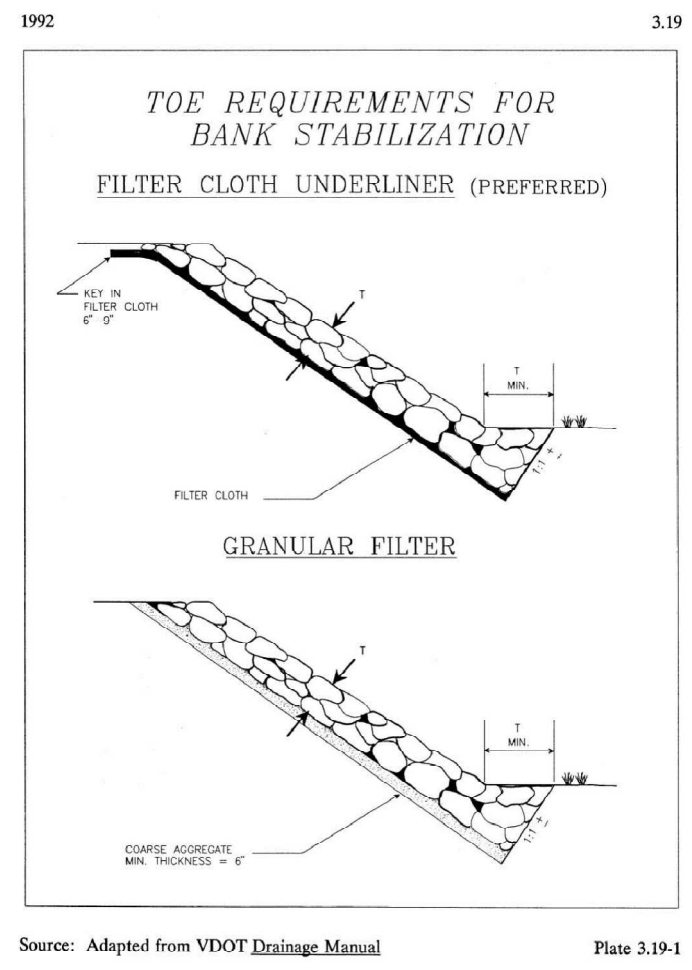
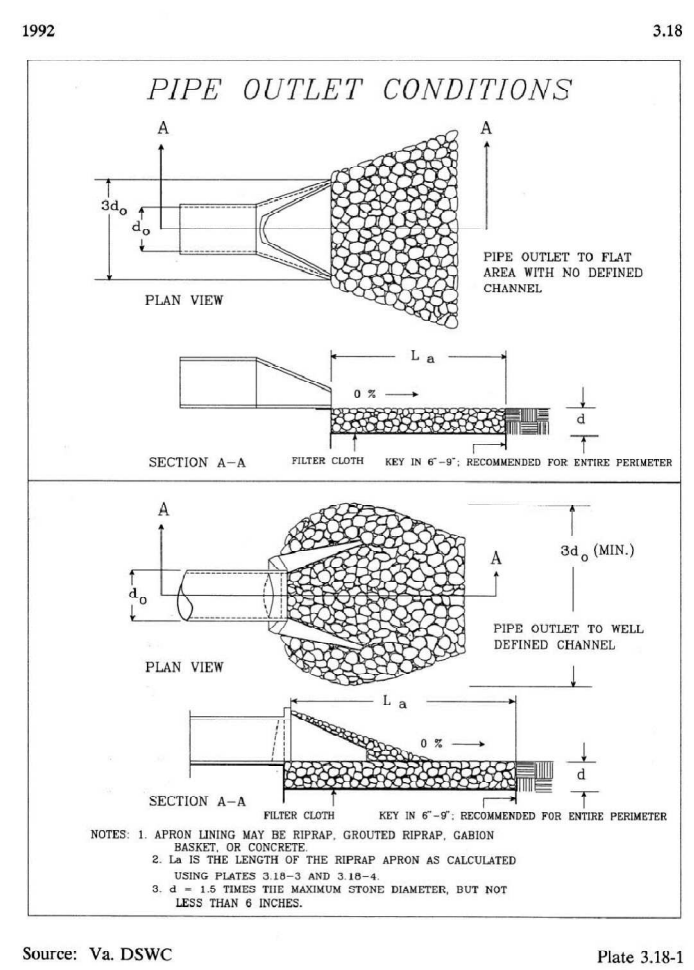
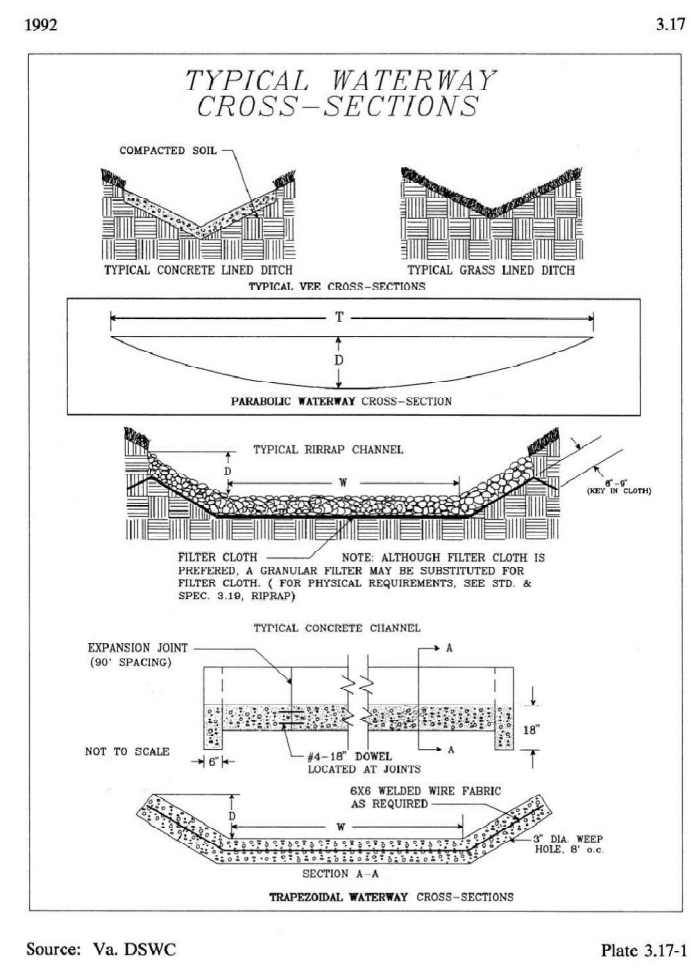


TABLE 3.31-B TEMPORARY SEEDING SPECIFICATIONS QUICK REFERENCE FOR ALL REGIONS

APPLICATION DATES	SEED SPECIES	APPLICATION RATES
Sept. 1 - Feb. 15	50/50 Mix of Annual Ryegrass (solum multi-formum) & Canal (solum multi-formum)	50-100 (lb/acre)
Feb. 16 - Apr. 30	Annual Ryegrass (solum multi-formum)	60-100 (lb/acre)
May 1 - Aug. 31	German Millet	50 (lb/acre)

FERTILIZER & LIME

- Apply 10-10-10 fertilizer at a rate of 400 lbs./acre (or 10 lbs./1,000 sq. ft.)
- Apply Pulverized Agricultural Limestone at a rate of 2 tons/acre (or 90 lbs./1,000 sq. ft.)

NOTE: 1 - A soil test is necessary to determine the actual amount of lime required to adjust the soil pH of site. 2 - Incorporate the lime and fertilizer into the top 4 - 6 inches of the soil by disking or by other means. 3 - When applying Slowly Available Nitrogen, use rates available in Erosion & Sediment Control Technical Bulletin #4-2003 Nutrient Management for Development Sites at <http://www.dcr.state.va.us/epsc/tds/tds.htm>

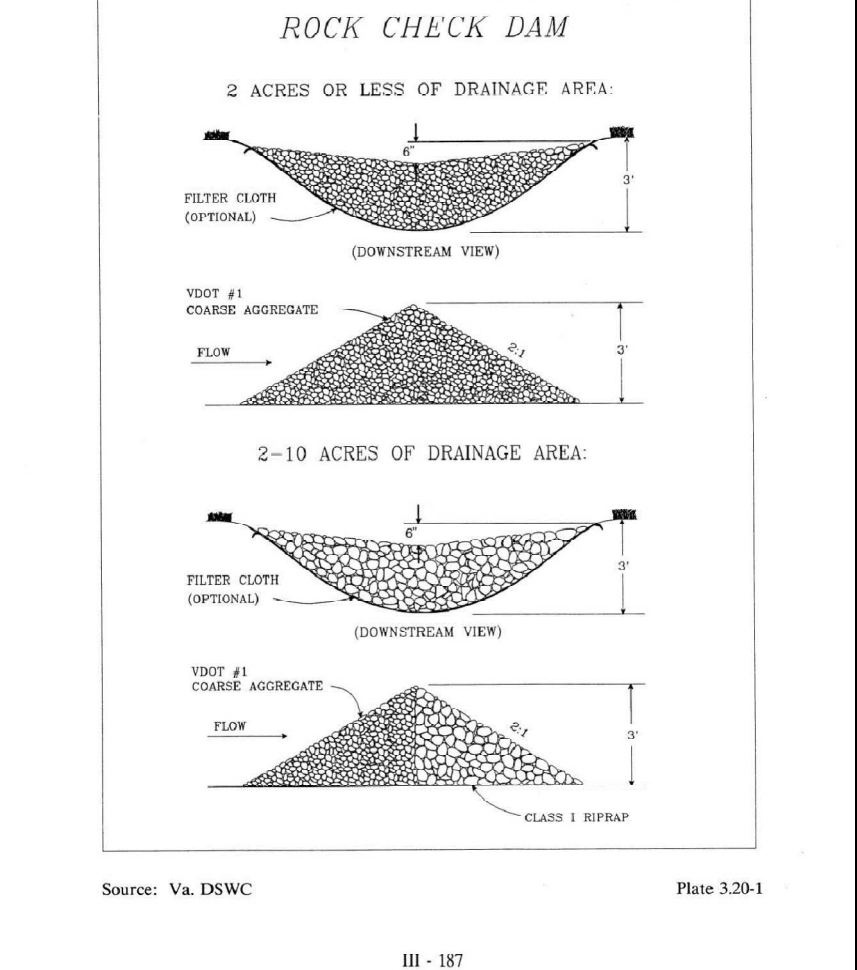
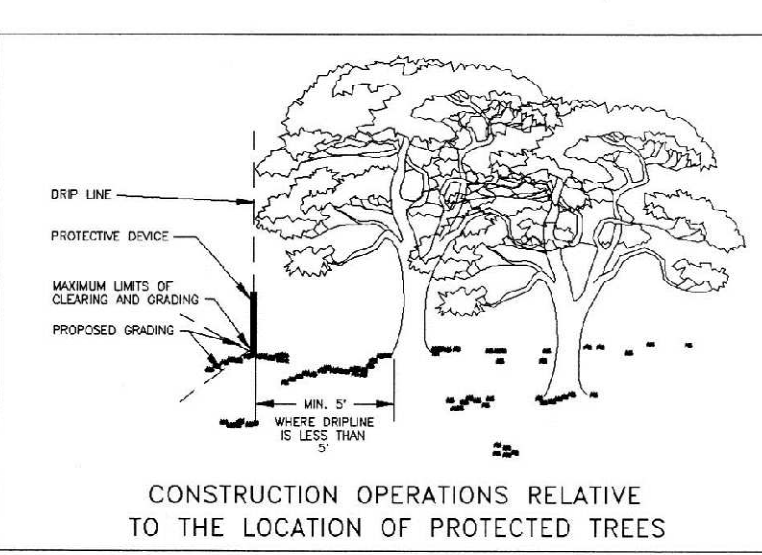
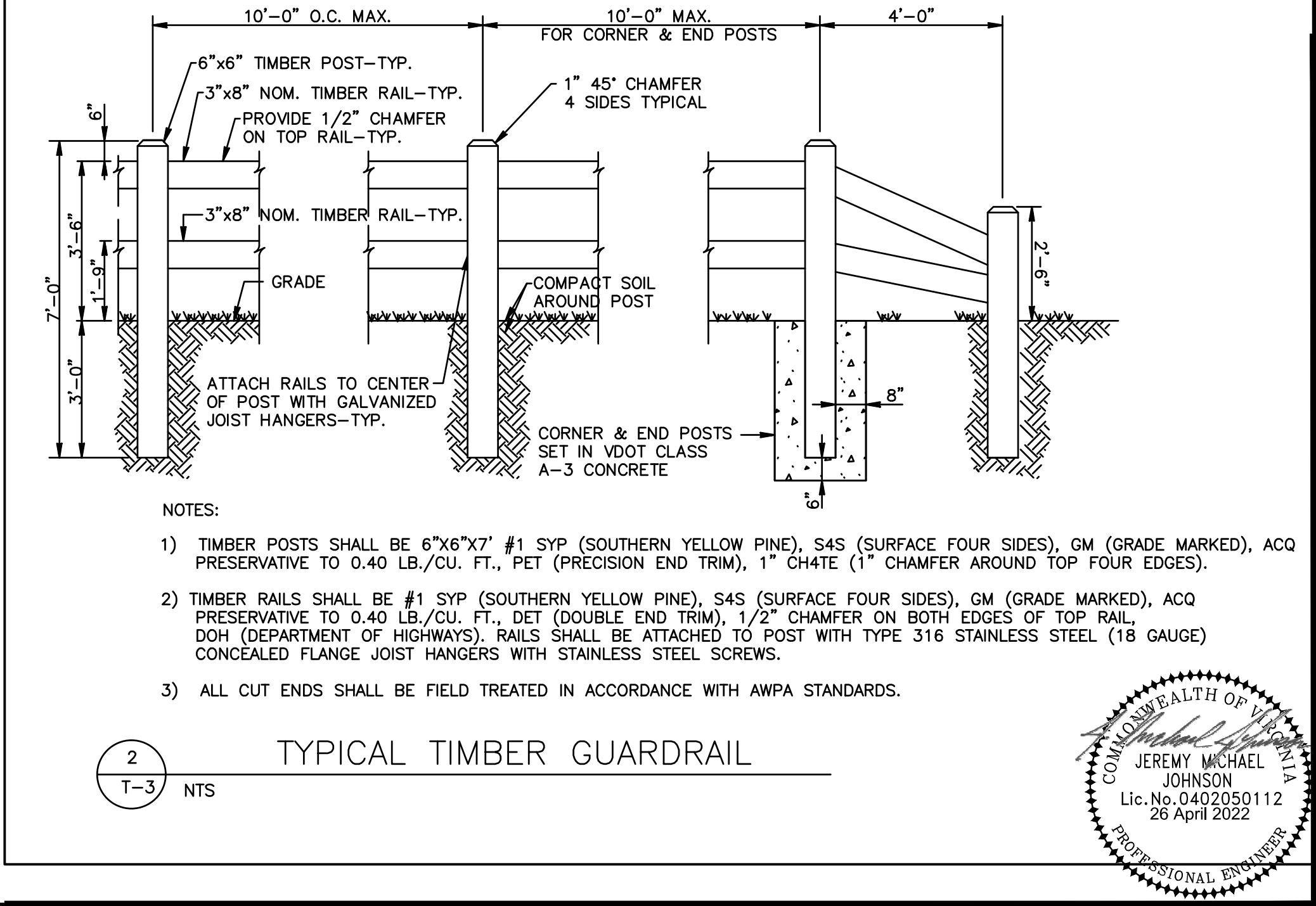
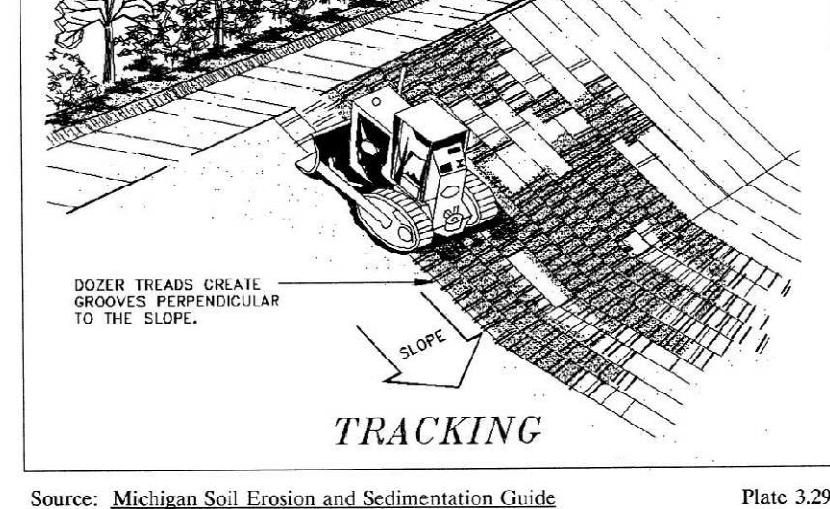
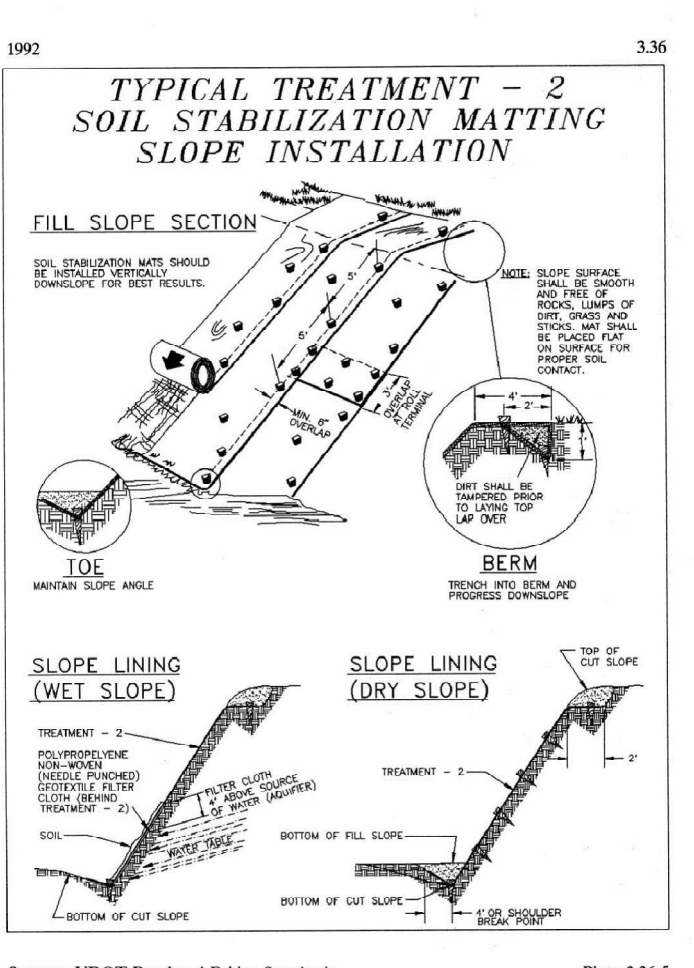
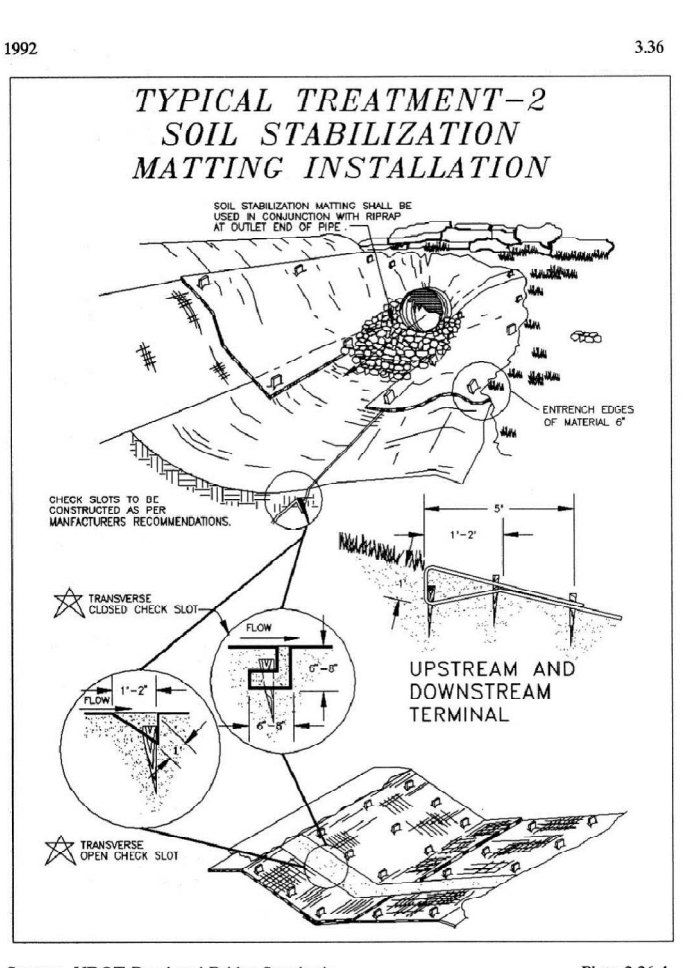
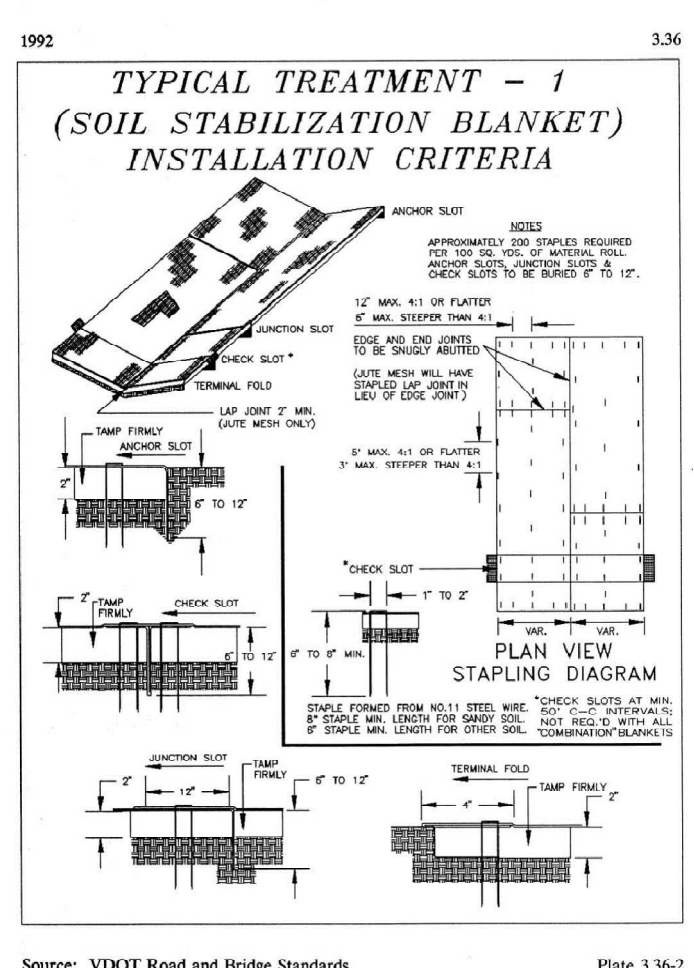


TABLE 3.35-A ORGANIC MULCH MATERIALS AND APPLICATION RATES

MULCHES	RATES	NOTES
Straw or Hay	1 1/2 - 2 tons (Minimum 2 tons for winter cover)	Free from weeds and coarse matter. Must be anchored. Spread with mulch blower or by hand.
Fiber Mulch	Minimum 1500 lbs.	Do not use as mulch for winter cover or during hot, dry periods. Apply as quickly.
Corn Stalks	4 - 6 bales 185 - 275 lbs.	Cut or shredded to 4-6" lengths. Air-dried. Do not use in fine turf areas. Apply with mulch blower or by hand.
Wood Chips	4 - 6 bales 185 - 275 lbs.	Free of coarse matter. Air-dried. Free 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 7000 lbs./ac. or 45 lbs./1000 sq. ft.

Source: Va. DSWC Plate 3.35-1



EROSION & SEDIMENT CONTROL NARRATIVE

1. Project Area

The project area runs generally parallel to the Roanoke River. The trail begins at a proposed overlook near the Niagra Dam, heading towards the trailhead termini at Highland Road. The Highland Road trailhead has parking for 12 vehicles with ADA accessibility.

No off-site areas will be disturbed by this project. If it is necessary to import borrow material or dispose of surplus material, the contractor shall be responsible for providing approved erosion and sediment control plan for the off-site borrow or waste areas.

2. Critical Areas

The proximity of the entire project area to the Roanoke River will require that particular attention is given to controlling sediment laden runoff to the maximum extent practicable.

Through the steep slope sections and other cut/fill areas a 2:1 slope is required to construct the greenway. These areas will require surface roughing and seeding to provide for a stabilized slope. Concentrated water will be directed to an adequate channel.

3. Erosion and Sediment Control Measures

The construction phase erosion and sediment controls shall be designed to retain sediment on site to the maximum extent practicable. All control measures must be properly selected, installed, and maintained in accordance with the manufacturers' specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately, or incorrectly, the permittee must replace or modify the control for site situations. If sediment escapes the construction site, offsite accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts (e.g. fugitive sediment in street could be washed into storm sewers by the next rain and/or pose a safety hazard to users of public streets). Sediment must be removed from sediment traps or sedimentation ponds when design capacity has been reduced by 50%. Litter, construction debris, and construction chemicals exposed to storm water shall be prevented from becoming a pollutant source for storm water discharges (e.g., screening outfalls, picked up daily).

The following measures will be used to control erosion and sediment-laden runoff on this project. See Appendix A for locations of specific erosion control measures which have been incorporated into the design plans. The Contractor shall be responsible for installation of appropriate soil stabilization measures as required by the construction sequencing.

- Safety Fence:** will prevent the public from entering the construction site. (VESCH Standard and Spec. 3.01)
- Construction Entrance:** will be used to reduce mud/sediment tracking onto public roads. (VESCH Standard and Spec. 3.02). If mud or sediment is transported onto a paved road surface, the road shall be cleaned thoroughly at the end of each day. Sediment and mud 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 and mud are removed in this manner.
- Silt Fence:** will be used to intercept and detain small amounts of sediment from disturbed areas during construction operations and to prevent sediment from leaving the site. (VESCH Standard and Spec. 3.05)
- Culvert Inlet Protection:** will prevent sediment from entering, accumulating in and being transferred by a culvert and associated drainage system prior to permanent stabilization of a disturbed project area. (VESCH Standard and Spec. 3.08)
- Stormwater Conveyance Channel:** will provide for the conveyance of concentrated surface runoff water to a receiving channel or system without damage from erosion. (VESCH Standard and Spec. 3.17)
- Outlet Protection:** will prevent scour at stormwater outlets, protect the outlet structure, and minimize the potential for downstream erosion by reducing the velocity and energy of concentrated stormwater flows. (VESCH Standard and Spec. 3.18)
- Riprap:** will protect the soil from the erosive forces of concentrated runoff and slow the velocity of concentrated runoff while enhancing the potential for infiltration and stabilizing slopes with seepage problems and/or non-cohesive soils. (VESCH Standard and Spec. 3.19)
- Surface Roughening (All Denuded Surfaces):** will aid in establishment of vegetative cover with seed, reduce runoff velocity, and increase infiltration, while reducing erosion and providing for sediment trapping. (VESCH Standard and Spec. 3.29)
- Topsoiling (All New Fill):** will provide a suitable growth medium for final site stabilization with vegetation. (VESCH Standard and Spec. 3.30)
- Temporary Seeding (As Required):** 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 (undisturbed) for longer than 30 days. (VESCH Standard and Spec. 3.31)
- Permanent Seeding (All Denuded Surfaces):** will be used to establish vegetative cover and to reduce silt runoff for any areas not paved or roofed. Permanent stabilization shall be applied to areas that are to be left dormant for more than one year. (VESCH Standard and Spec. 3.32)
- Mulching (All Denuded Surfaces):** will prevent erosion by protecting the soil surface from raindrop impact and reducing the velocity of overland flow. Will also foster the growth of vegetation by increasing available moisture and providing insulation against extreme heat and cold. (VESCH Standard and Spec. 3.35)
- Soil Stabilization Blankets & Matting (As Required):** will aid in controlling erosion on critical areas by providing a microclimate, which protects young vegetation and promotes its establishment. (VESCH Standard and Spec. 3.36)
- Dust Control (As Required):** will 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. (VESCH Standard and Spec. 3.39)

4. **Stabilization Practices**
No specific schedule other than those guidelines given in the Erosion and Sediment Control Measures descriptions of the vegetative practices (given above) will be used for temporary and permanent seeding measures. Riprap for areas requiring outlet protection shall be placed within two days after the outlet structures are functional.

See Section B.11, SWPPP Support Documents for Record of Grading Activities, a log to be used by the contractor to document all major grading activities, any cessation, temporary or permanent, of construction activity, and when stabilization measures are implemented. This record shall be kept throughout the duration of the project. The permittee shall ensure that these records are updated, maintained, and become a permanent part of this overall plan.

Construction will be sequenced so that grading operations can begin and end as quickly as possible. Stabilization measures shall be implemented on disturbed areas as soon as practicable. Embankment walls, upon reaching final grade, must be immediately seeded and fertilized to ensure proper stabilization. Permanent seeding shall be installed within 7 days of reaching final grade. Denuded areas which are not at final grade but which will remain dormant for more than 30 days shall be temporarily seeded. Areas that are not to be disturbed must be clearly marked by flags, signs, etc.

After the construction is completed, the site will be permanently stabilized in accordance with VESCH Standard and Specification 3.32, unless otherwise noted in the plans.

5. **Maintenance**
All erosion and sediment control structures and systems shall be maintained, inspected, and repaired as needed to ensure continued performance of their intended function. In general, all erosion and sediment control measures shall be

checked at least every 14 days and after each rain event over 0.5 inches of precipitation. The following items shall be checked in particular:

- The construction entrance shall be checked to ensure that the stone does not become clogged with mud.
- The seeded areas shall be checked every 2 days to ensure that a good stand of grass is maintained. Grassed areas should be fertilized and reseeded as needed.
- Silt fence shall be checked for undermining or deterioration (of the fabric) and cleaned when sediment levels have reached half of the silt fence height.
- Inlet and outlet protection areas around culverts, temporary slope drains, and drop inlets shall be checked for buildup of sediment. If significant clogging is found (the capacity of the structure has been reduced by half), they will either be cleaned out or replaced.

Specific requirements related to inspection and maintenance of each erosion control measure are discussed in the VESCH Standards and Specifications. The contractor shall be responsible for maintenance of all erosion control measures to the satisfaction of local review authorities, as well as the installation of additional measures as needed to ensure that sediment-laden runoff does not leave the site.

6. Inspection

Disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, structural control measures, and locations where vehicles enter or exit the site shall be inspected at least once every 14 calendar days and within 48 hours of the end of a storm event that is 0.5 inches or greater. In those areas that have been finalized, temporarily stabilized, or runoff is unlikely due to winter conditions, inspections shall take place at least once a month.

Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. ESC measures shall be checked to see they are operating correctly. At accessible discharge points, inspection shall take place to ensure these control measures are effective at preventing significant impacts to receiving waters. Nearby downstream locations shall be inspected if discharge points are inaccessible. Sites of vehicle entrance or exit shall be inspected for evidence of offsite sediment tracking.

If existing control measures or Best Management Practices (BMPs) require modification or additional measures, such changes shall be made within 7 calendar days of the inspection or before the next anticipated storm event, as implementation is practicable.

Include inspection reports of all stormwater and erosion & sediment control measures along with any required actions as a result of inspections, with the stormwater pollution prevention plan. These reports shall include the name and qualifications of the inspector, dates of inspection, major observations and actions taken in response to inspections. Major observations include: the location of discharge of sediment or pollutant from the site, locations of BMPs that need to be maintained, locations of BMPs that failed to operate or proved inadequate, and locations where additional BMPs are needed that didn't exist at the time of inspection. These reports shall include incidents of noncompliance. If the report does not include any noncompliance incidents, the report shall contain a certification that the facility is in compliance with the stormwater pollution prevention plan and permit.

1. Other Pollutant Controls

Materials, Garbage, Debris

No solid materials, including building materials, garbage, and debris shall be discharged to surface waters of the State. The permittee shall ensure that these items are not left in a location where they could be transported by stormwater runoff off the site.

Expected Construction and Waste Materials

Construction and waste materials that could potentially be stored on site include topsoil, fill dirt, excavated material, storm drainage and utility piping, timber and block building materials, fertilizer for seeding operations, stone to be placed on gravel areas, stone for riprap, fuel and silt fence material.

Any stockpiles of topsoil, excavated material or fill dirt that are needed shall be surrounded on the downslope side by silt fence. Fertilizer must be kept in watertight containers, preferably in portable storage units and out from exposure to the weather, during storage on site. Care must be taken to minimize spillage of fertilizer if mixing operations are required to prepare the fertilizer for application.

If overnight storage of fuel is required, the fuel storage container must be equipped with a fueling mechanism disable device. To minimize the effect of any potential spills, maintain all on-site fueling operations as far away from surrounding wetlands, surface waters and drainage facilities as is practical. Daily inspections of the fuel storage container must be implemented to detect the presence of leaks. The fueling operator shall have a safe fill, shutdown, and transfer procedure in place to minimize spillage during fueling activities. The operator must maintain a fully equipped spill kit on site at all times with the stored fuel. The kit must at least include absorbent mats or material to cleanup any spilled fuel. For any fuel spill on site equal to or exceeding 25 gallons, immediately create an appropriately-sized berm around the area of spillage to minimize surface movement of the fuel. Contact local hazmat authorities, the ENGINEER, and the regional DEQ office in Roanoke as quickly as possible to report the spill and seek further assistance with spill cleanup.

Construction materials which could be carried offsite by stormwater (plastics, paper, timber, etc.) shall be picked up daily and placed in appropriate waste disposal containers.

8. Non-Stormwater Discharges

No non-storm water discharges other than those permitted by the VPDES general permit for Stormwater Discharge from Construction Activities are anticipated during this project.

9. Minimum Standards (MS-19)

All applicable Virginia Erosion and Sediment Control Regulations and Minimum Standards shall be adhered to during all phases of construction. If plan details and specifications are more stringent, then they shall supersede the Minimum Standards. The Minimum Standards include, but are not limited to the following:

- STABILIZATION OF DENUDED AREAS:**
Permanent or temporary soil stabilization shall be applied to bare 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 or undisturbed for longer than 14 days. Permanent stabilization shall be applied at areas that are to be left dormant for more than 1 year.
Applicable: The Contractor shall establish permanent within seven days after final grade. If Contractor elects to rough grade areas of the trail or postpone permanent seeding until other sections of the greenway are complete which will remain dormant or undisturbed for more than 30 days then temporary seeding shall be applied at the Contractor's expense.
- STABILIZATION OF SOIL STOCKPILES:**
During construction of the project, soil stockpiles shall be stabilized or protected with sediment trapping measures. The applicant is responsible for temporary protection and permanent stabilization of all soil stockpiles on site as well as soil intentionally transported from the project site.
Applicable: Due to limited space, existing easements, and floodplain limits, stockpiling off site may be required. With approved property owner agreements obtained by the contractor, stockpiles will be allowed offsite. The Contractor shall provide the required E&S permits and temporary and permanent stabilization measures for areas offsite and ensure that on site stockpiles include appropriate stabilization measures.
- PERMANENT VEGETATIVE COVER**
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 authority (Roanoke County), is uniform and mature enough to survive to inhibit erosion.
Applicable: The Contractor must seed and mulch all denuded areas per the project specifications. Over-seeding may be required at the Contractor's expense until an adequate ground cover is achieved as determined by Roanoke County. ESC measures shall not be removed until approved by the County. Areas of rutting shall be filled in and reseeded at the Contractor's expense.

4. TIMING & STABILIZATION OF SILT TRAPPING MEASURES:

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.

Applicable: The Contractor shall install construction entrances, perimeter silt fence, and inlet protection on existing structures as denoted on the plans prior to any land disturbance. Once proposed storm pipes are installed, culvert inlet and outlet protection shall be installed immediately after installation.

5. STABILIZATION OF EARTHEN STRUCTURES:

Stabilization measures shall be applied to earthen structures such as dams, dikes and diversions immediately after installation.

Not Applicable: Dams, dikes, and diversions are not proposed.

6. SEDIMENT TRAPS AND BASINS:

A sediment basin shall control surface runoff from disturbed areas that is comprised of flow from drainage areas greater than or equal to three acres. The sediment basin shall be designed and constructed to accommodate the anticipated sediment loading for the land disturbing activity. The outfall device or system device shall take into account the total drainage area flowing through the disturbed area to be served by the basin.

Not Applicable: No sediment traps or basins are proposed since concentrated drainage crosses the trail perpendicularly and there is minor land disturbance per outfall.

7. CUT AND FILL SLOPES:

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 stabilizing measures until the problem is corrected.

Applicable: Prior to final acceptance, there shall be no evidence of excessive erosion and the cut/fill slopes shall be stabilized with permanent stabilization acceptable to the Roanoke County. In the event that excessive erosion is present within one year after project acceptance, the Contractor shall be responsible for remediation.

8. CONCENTRATED RUN-OFF DOWN CUT OR FILL SLOPES:

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: Concentrated runoff is not designed to flow down cut or fill slopes.

9. WATER SEEPS FROM A SLOPE FACE:

Whenever water seeps from a slope face, adequate drainage or other protection shall be provided.

Not Applicable: Based on site investigation, there are no existing water seeps (springs) in proximity to the project corridor.

10. STORM SEWER INLET PROTECTION:

All storm sewer inlets that are made operable during construction shall be protected so that sediment-laden water cannot enter the conveyance system without first being filtered or otherwise treated to remove sediment.

Applicable: The Contractor shall protect the installed storm sewer system with inlet protection as shown on the plans. The Contractor shall protect proposed culverts from sediment laden water with culvert inlet protection as shown on the plans. All inlet protection shall be maintained until final completion.

11. STABILIZATION OF OUTLETS:

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.

Applicable: Concentrated runoff crossing perpendicular to the trail requires a culvert and a riprap lined outlet ditch. In order to comply with this standard, the Contractor will be required to construct or reconstruct the outlet ditch from the end of the culvert and install permanent outlet protection prior to the installation of the culvert. If construction activity allows the installation of the culvert and outlet ditch protection within the same day, then this will be an acceptable approach.

12. WORK IN LIVE WATERCOURSES:

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: No work is proposed within live watercourses.

13. CROSSING A LIVE WATERCOURSE:

When a live watercourse must be crossed by construction vehicles more than twice in any six month period, a temporary stream crossing constructed of non-erodible materials shall be provided.

Not Applicable: No stream crossing are proposed.

14. APPLICABLE REGULATIONS:

All applicable federal, state and local regulations pertaining to working in or crossing live watercourses shall be met.

Applicable: No work is permitted within live watercourses.

15. STABILIZATION OF BED AND BANKS

The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse is completed.

Applicable: No work is permitted within live watercourses.

16. UNDERGROUND UTILITIES:

Underground utilities shall be installed in accordance with the following standards in addition to other criteria:

- No more than 500 linear feet of trench may be opened at one time.
 - Excavated material shall be placed on the uphill side of trenches
 - Effluent for dewatering operations shall be filtered or passed through approved sediment trapping device, or both, and discharged in a manner that does not adversely affect flowing streams or offsite property.
 - Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization.
 - Re-stabilization shall be accomplished in accordance with these regulations.
 - Applicable safety regulations shall be complied with.
- Not Applicable:** All drainage pipes and structures shall comply with requirements above.

17. CONSTRUCTION ACCESS ROUTES:

Where construction vehicle access routes intersect paved public roads, provisions shall be made to minimize the transport of sediment by vehicular tracking onto paved surfaces. Where sediment is transported onto a public road surface, the road shall be cleaned thoroughly at the end of each day. Sediment shall be removed 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 lots as well as to larger land disturbing activities.

Applicable: The Contractor shall install and maintain the construction entrance as shown on the plans. In the event another construction access to the site is obtained by the Contractor, a construction entrance shall be installed and maintained at the Contractor's expense. When no longer utilized, the construction entrances shall be removed and the areas restored prior to final acceptance.

18. TEMPORARY E&S CONTROL MEASURE REMOVAL:

All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after temporary measures are no longer needed, unless otherwise authorized by the local program authority. Trapped sediment and the disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion and sediment.

Applicable: After the site is stabilized and approved by Roanoke County, silt fence, inlet protection, construction entrances,

and other temporary ESC measures shall be removed within 30 days. The areas of removal shall be smoothly graded, seeded, and mulched. Any remaining buildup of sediment shall be removed from the site by the Contractor.

19. ADEQUACY OF RECEIVING CHANNELS:

Properties and waterways downstream from the development site shall be protected from sediment deposition, erosion, and damage, due to increases in volume, velocity and peak flow rates of stormwater runoff for the stated frequency storm of 24-hour duration in accordance with the following standards and criteria:

- Concentrated stormwater runoff leaving a development site shall be discharged 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 analysis at the outfall of the pipe or pipe system shall be performed.
- Adequacy of all channels and pipes shall be verified in the following manner:

1. The applicant shall demonstrate that the total drainage areas 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. Each of the following:

- 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; and
 - 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
 - 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 natural receiving channels or previously constructed man-made channels or pipes are not adequate, the applicant shall:

- Improve the channel 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
- Improve the pipe or pipe system to a condition where the ten-year storm is contained within the appurtenances; or
- 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 onto a man-made channel, or
- Provide a combination of channel improvement, stormwater detention or other measures which is satisfactory to the plan-approving authority to prevent downstream erosion.

d. The applicant shall provide evidence of permission to make the improvements.

e. All hydraulic analyses shall be based in the existing watershed characteristics and the ultimate development of the subject project.

f. If the applicant chooses an option that includes stormwater detention, he shall obtain approval from the locality of a plan for maintenance of the detention facilities. The plan shall set forth the maintenance 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 dissipaters 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.


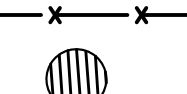

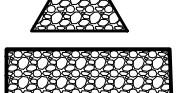



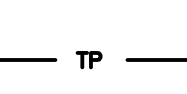





i. Increased Volumes of sheet flows that may cause erosion or sedimentation on adjacent properties shall be diverted to a stable outlet, adequate channel, pipe or pipe system, or to a detention facility.

j. In applying these stormwater runoff 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.

Applicable: Each outfall has been analyzed and found that there are no increases in the peak flow rates. Proposed culverts and outfalls have been analyzed and found to be adequate. The receiving channel is the Roanoke River which has a drainage areas more than a 100 times the project site. There is no runoff from the post development condition that is collected in an existing or proposed storm sewer system.

EROSION AND SEDIMENT CONTROL LEGEND

-  **CE** 3.02 CONSTRUCTION ENTRANCE
-  **SF** 3.05 SILT FENCE
-  **IP-A** **IP-B** 3.07 INLET PROTECTION
-  **IP-C** 3.08 CULVERT INLET PROTECTION
-  **OP** 3.18 OUTLET PROTECTION
-  **RR** 3.19 RIPRAP
-  **CD-1** **CD-2** 3.20 ROCK CHECK DAMS
-  **SR** 3.29 SURFACE ROUGHENING
-  **TO** 3.30 TOPSOILING
-  **TS** 3.31 TEMPORARY SEEDING
-  **PS** 3.32 PERMANENT SEEDING
-  **TP** 3.38 TREE PROTECTION
-  **DC** 3.39 DUST CONTROL



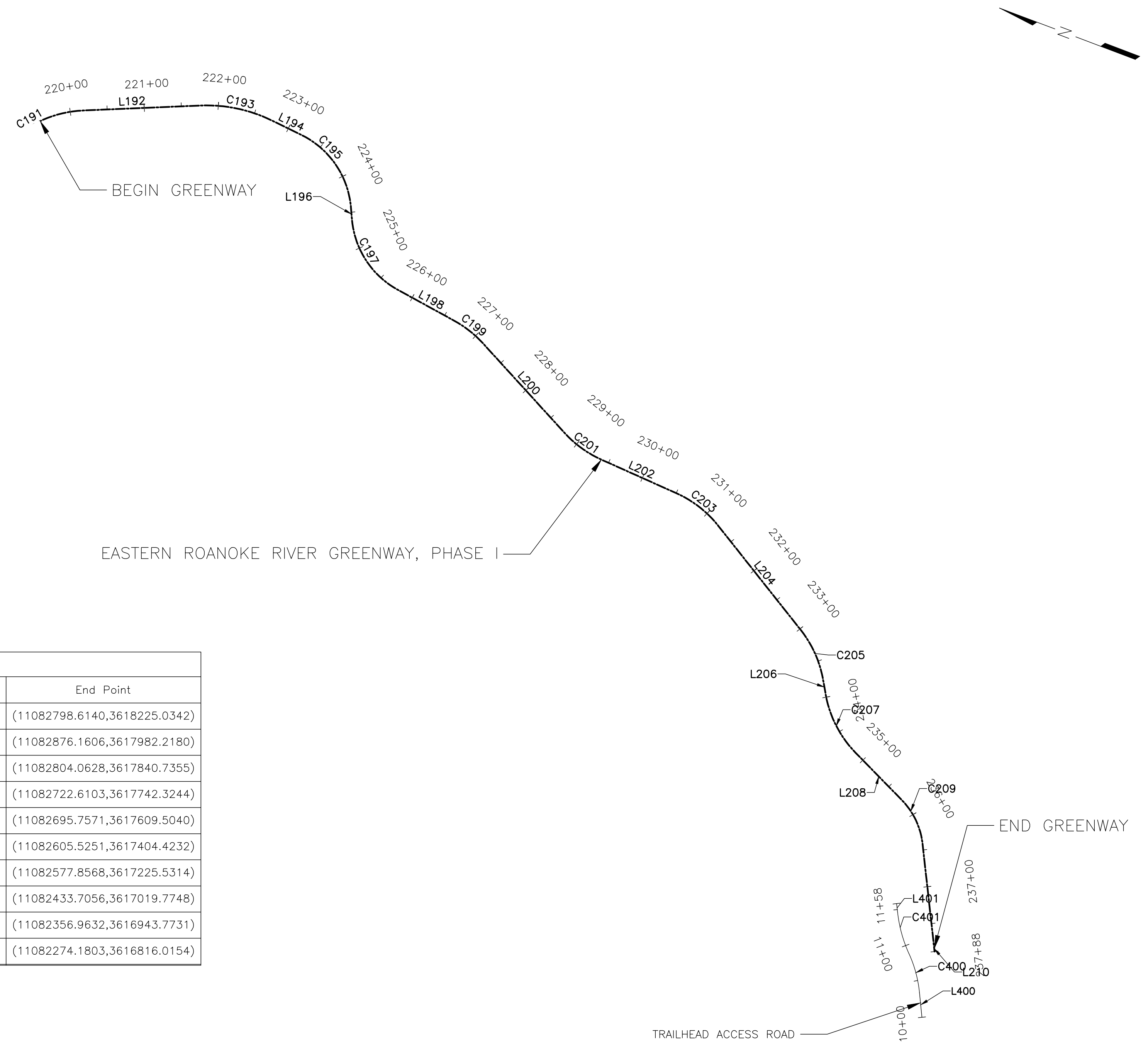
HURT & PROFFITT
ENGINEERING • SURVEYING
LAND DEVELOPMENT • ENVIRONMENTAL
GEO-TECHNICAL • CONSTRUCTION TESTING & INSPECTION
CULTURAL RESOURCES
1861 Pratt Dr. Suite 1100
Blacksburg, Va. 24060
540-552-5592

DATE DESIGNED: JMM	07 MAR 22	REV. #	COMMENTS	DATE
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CHECKED: JMJ				
QA/QC: JDW				

EASTERN ROANOKE RIVER GREENWAY, PHASE I
ROANOKE, VIRGINIA

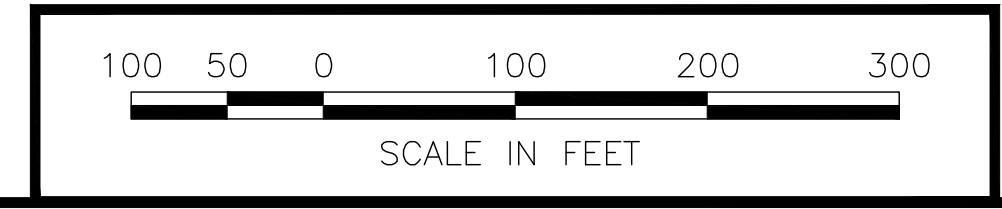
EROSION & SEDIMENT CONTROL NARRATIVE

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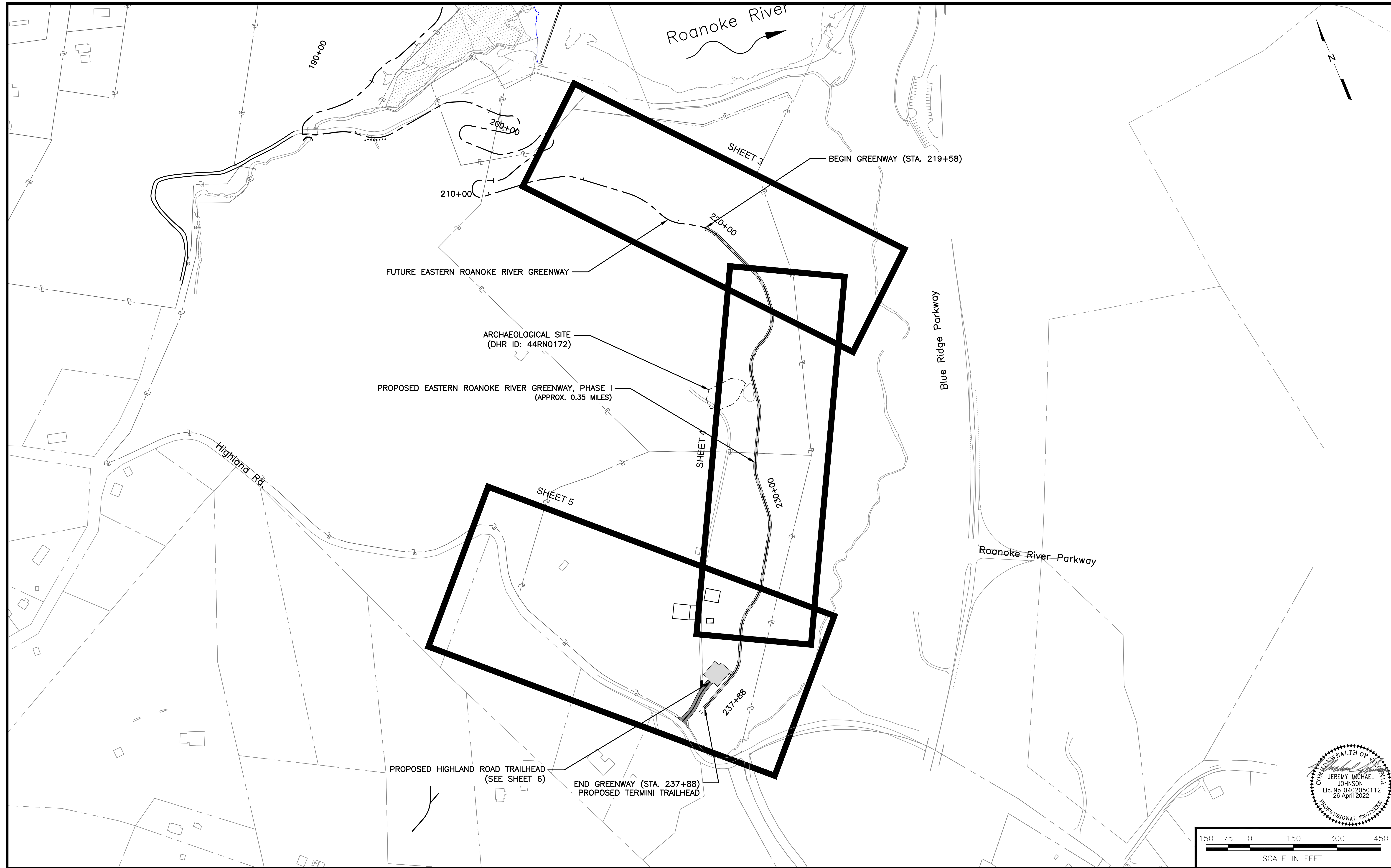
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L192	158.351	S23° 09' 47.23"E	(11082798.6140,3618225.0342)	(11082860.9014,3618079.4480)
L194	44.427	S5° 19' 28.92"W	(11082876.1606,3617982.2180)	(11082872.0378,3617937.9832)
L196	15.639	S64° 34' 53.53"W	(11082804.0628,3617840.7355)	(11082789.9375,3617834.0227)
L198	86.568	S7° 59' 33.09"W	(11082722.6103,3617742.3244)	(11082710.5735,3617656.5975)
L200	163.853	S26° 56' 10.91"W	(11082695.7571,3617609.5040)	(11082621.5315,3617463.4271)
L202	110.959	S3° 25' 09.16"W	(11082605.5251,3617404.4232)	(11082598.9074,3617293.6620)
L204	179.456	S30° 55' 13.10"W	(11082577.8568,3617225.5314)	(11082485.6443,3617071.5793)
L206	20.363	S59° 13' 40.34"W	(11082433.7056,3617019.7748)	(11082416.2099,3617009.3568)
L208	89.269	S24° 57' 35.81"W	(11082356.9632,3616943.7731)	(11082319.2931,3616862.8418)
L210	146.480	S62° 54' 16.40"W	(11082274.1803,3616816.0154)	(11082143.7764,3616749.2974)

Curve Table: Alignments					
Curve #	Radius	Length	Chord Direction	Start Point	End Point
C191	150.000	59.888	S41° 43' 00.65"E	(11082735.0914,3618296.2882)	(11082798.6140,3618225.0342)
C193	200.000	99.441	S8° 55' 09.15"E	(11082860.9014,3618079.4480)	(11082876.1606,3617982.2180)
C195	120.000	124.107	S34° 57' 11.23"W	(11082872.0378,3617937.9832)	(11082804.0628,3617840.7355)
C197	120.000	118.520	S36° 17' 13.31"W	(11082789.9375,3617834.0227)	(11082722.6103,3617742.3244)
C199	150.000	49.595	S17° 27' 52.00"W	(11082710.5735,3617656.5975)	(11082695.7571,3617609.5040)
C201	150.000	61.568	S15° 10' 40.03"W	(11082621.5315,3617463.4271)	(11082605.5251,3617404.4232)
C203	150.000	71.998	S17° 10' 11.13"W	(11082598.9074,3617293.6620)	(11082577.8568,3617225.5314)
C205	150.000	74.109	S45° 04' 26.72"W	(11082485.6443,3617071.5793)	(11082433.7056,3617019.7748)
C207	150.000	89.713	S42° 05' 38.07"W	(11082416.2099,3617009.3568)	(11082356.9632,3616943.7731)
C209	100.000	66.226	S43° 55' 56.10"W	(11082319.2931,3616862.8418)	(11082274.1803,3616816.0154)



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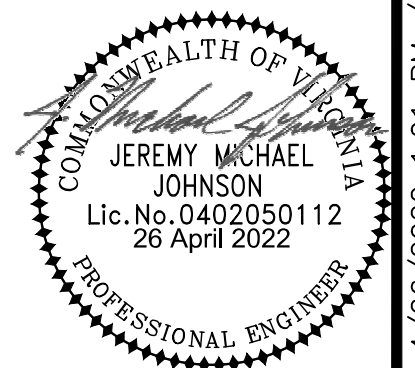
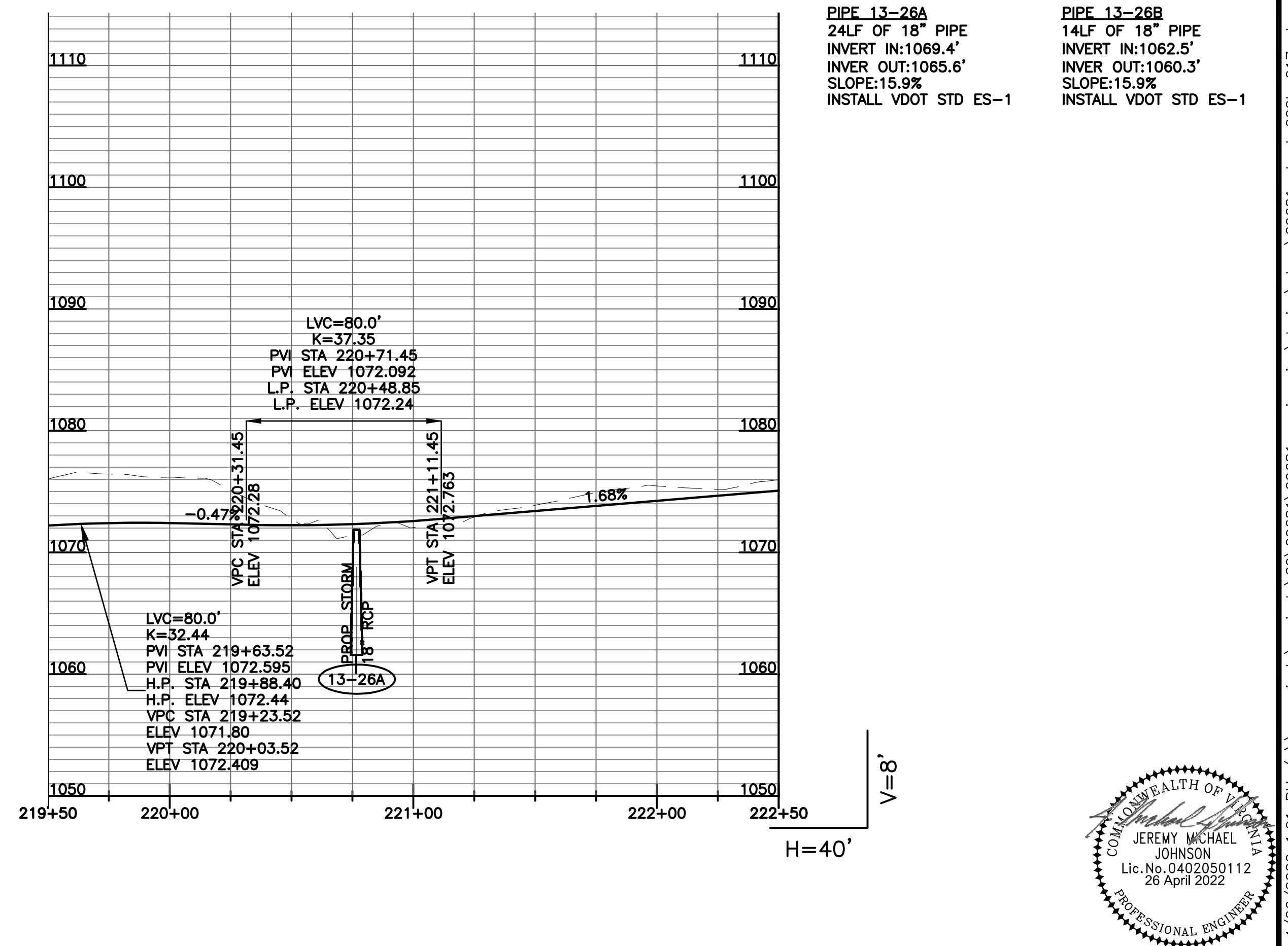
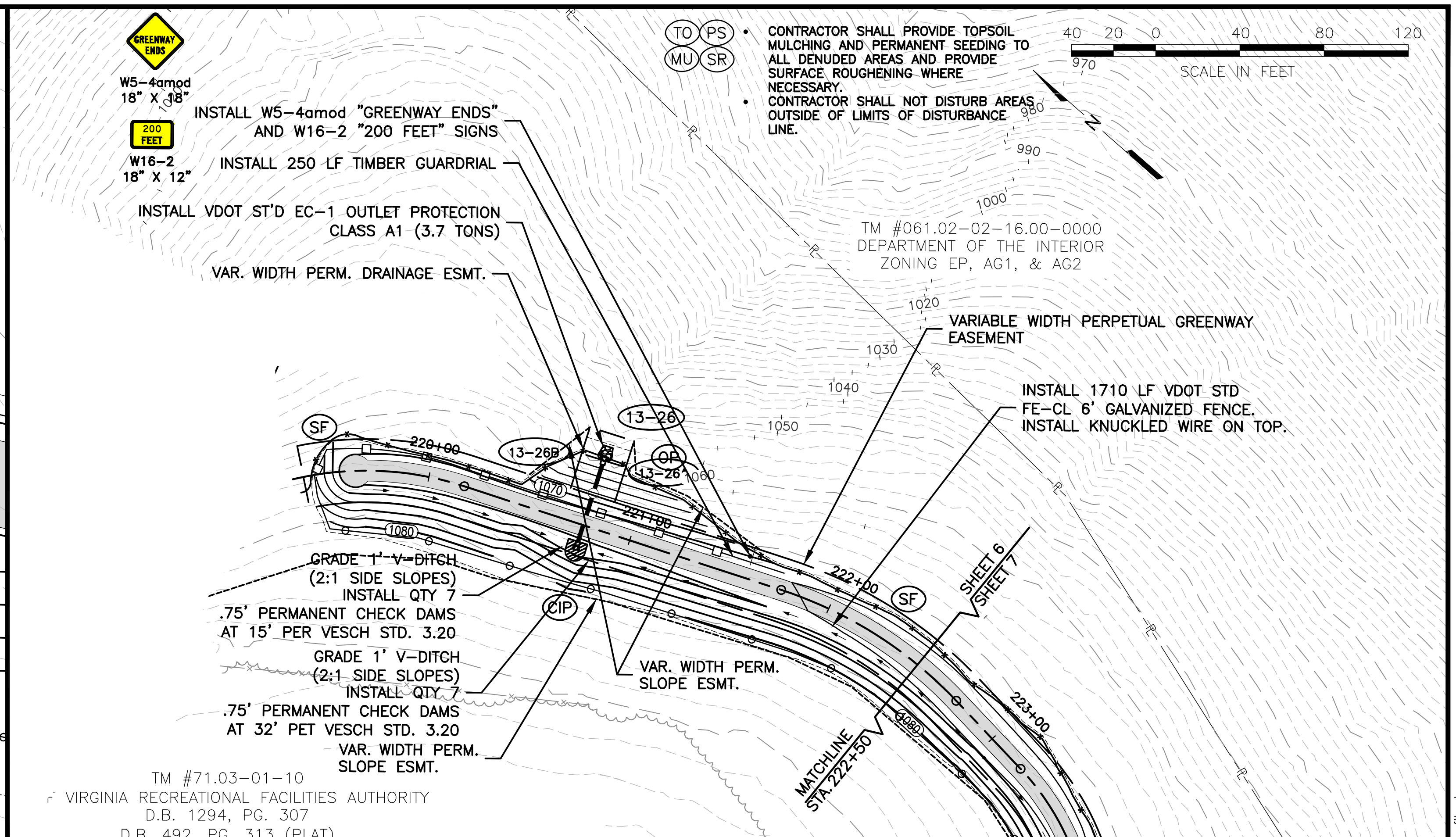
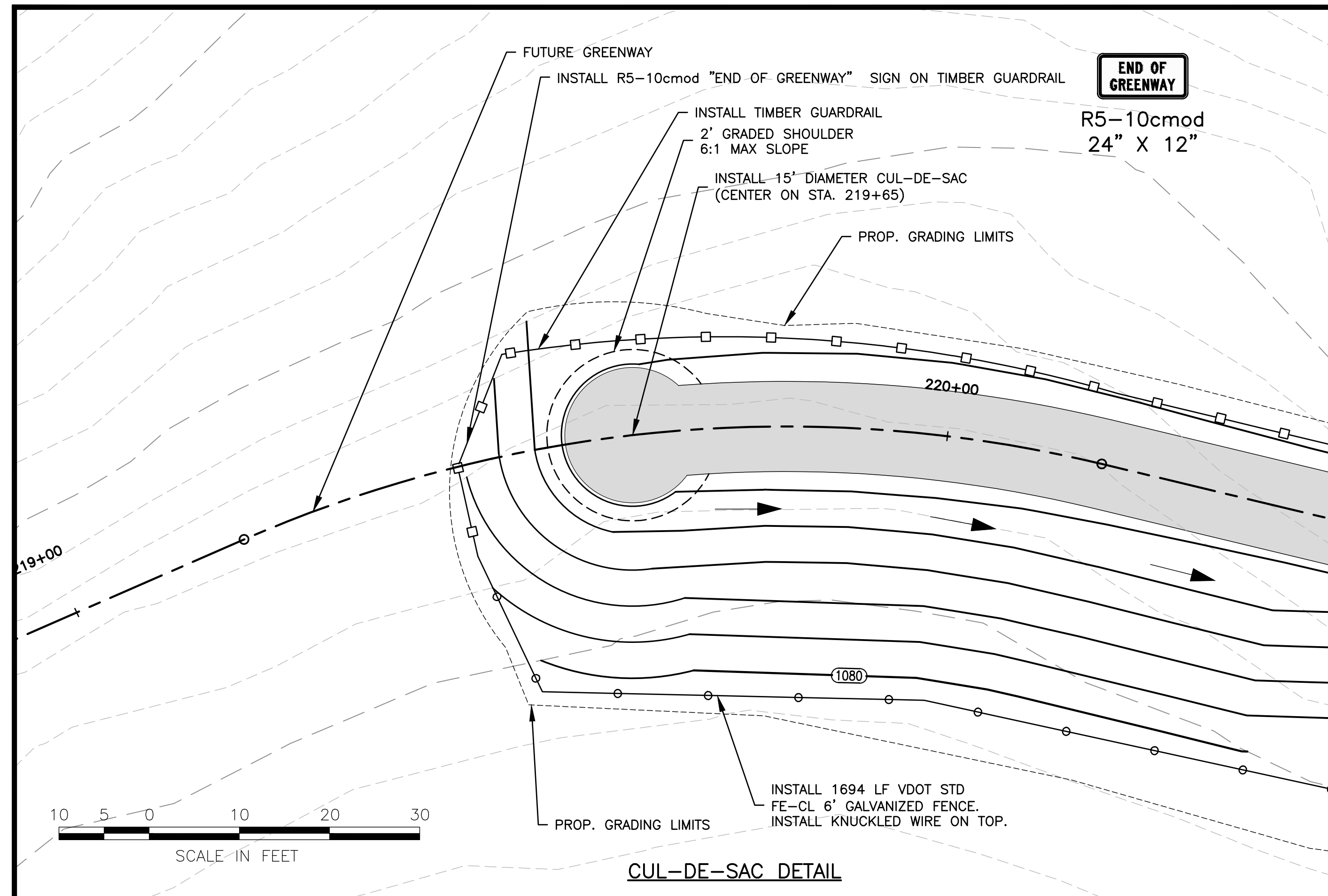
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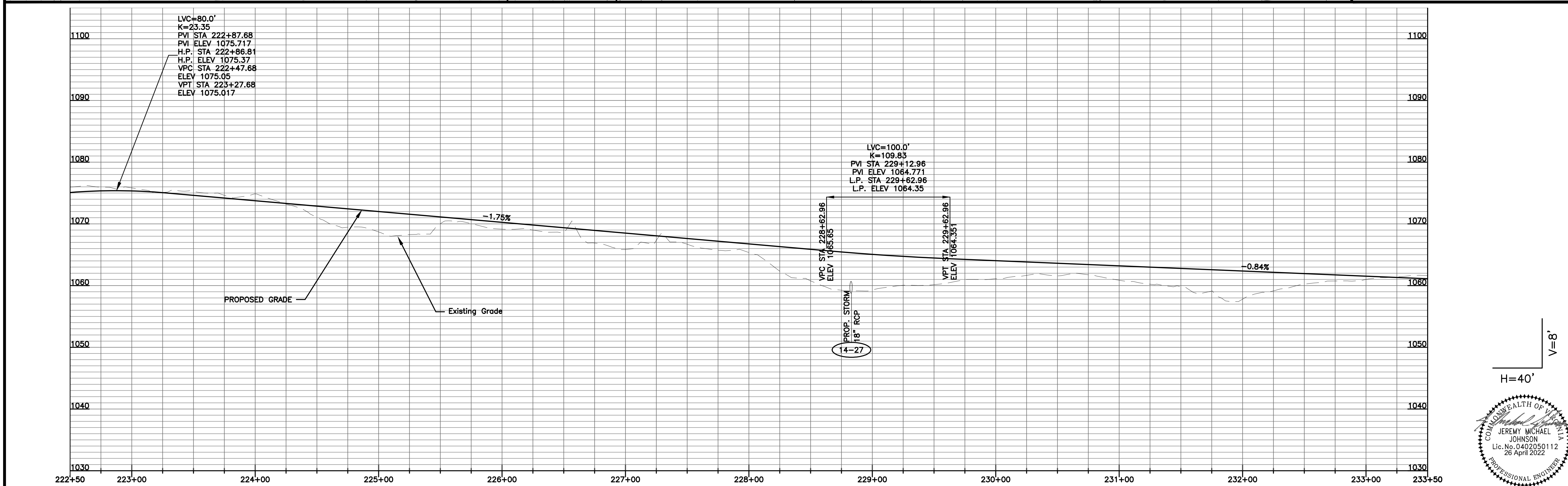
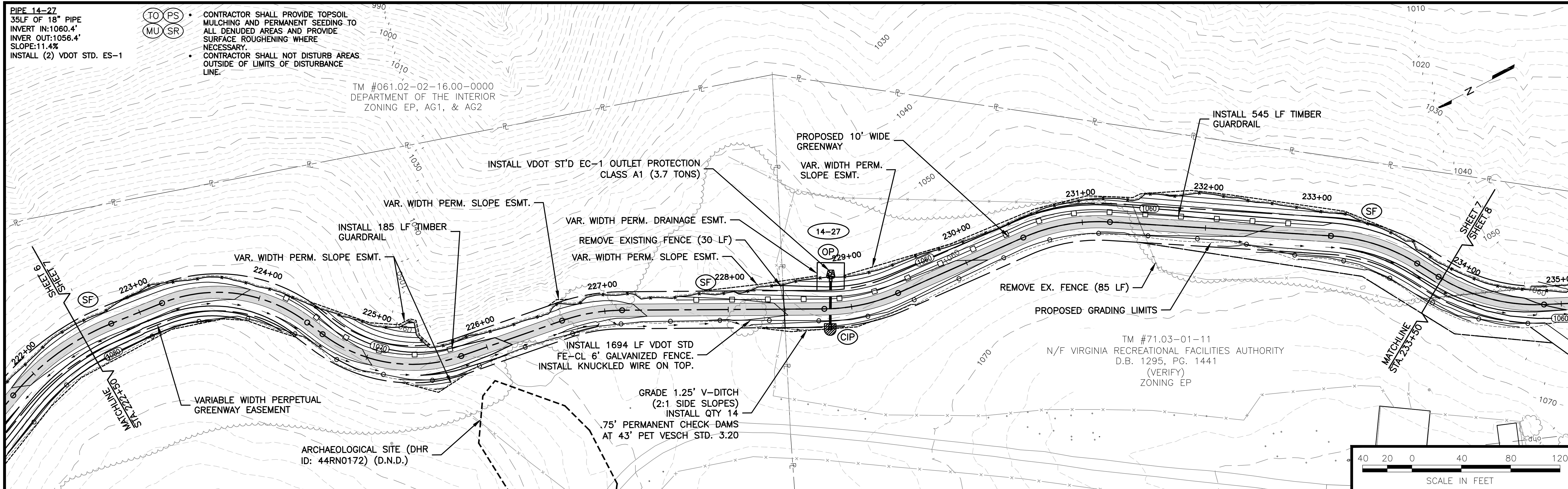
EASTERN ROANOKE RIVER GREENWAY, PHASE I
 ROANOKE, VIRGINIA

PLAN SHEET LAYOUT

DOCUMENT NO. 29681-007
SHEET 2D
OF 7

APPROVED, 5/4/2022





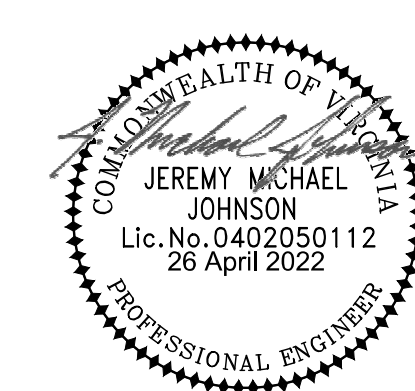
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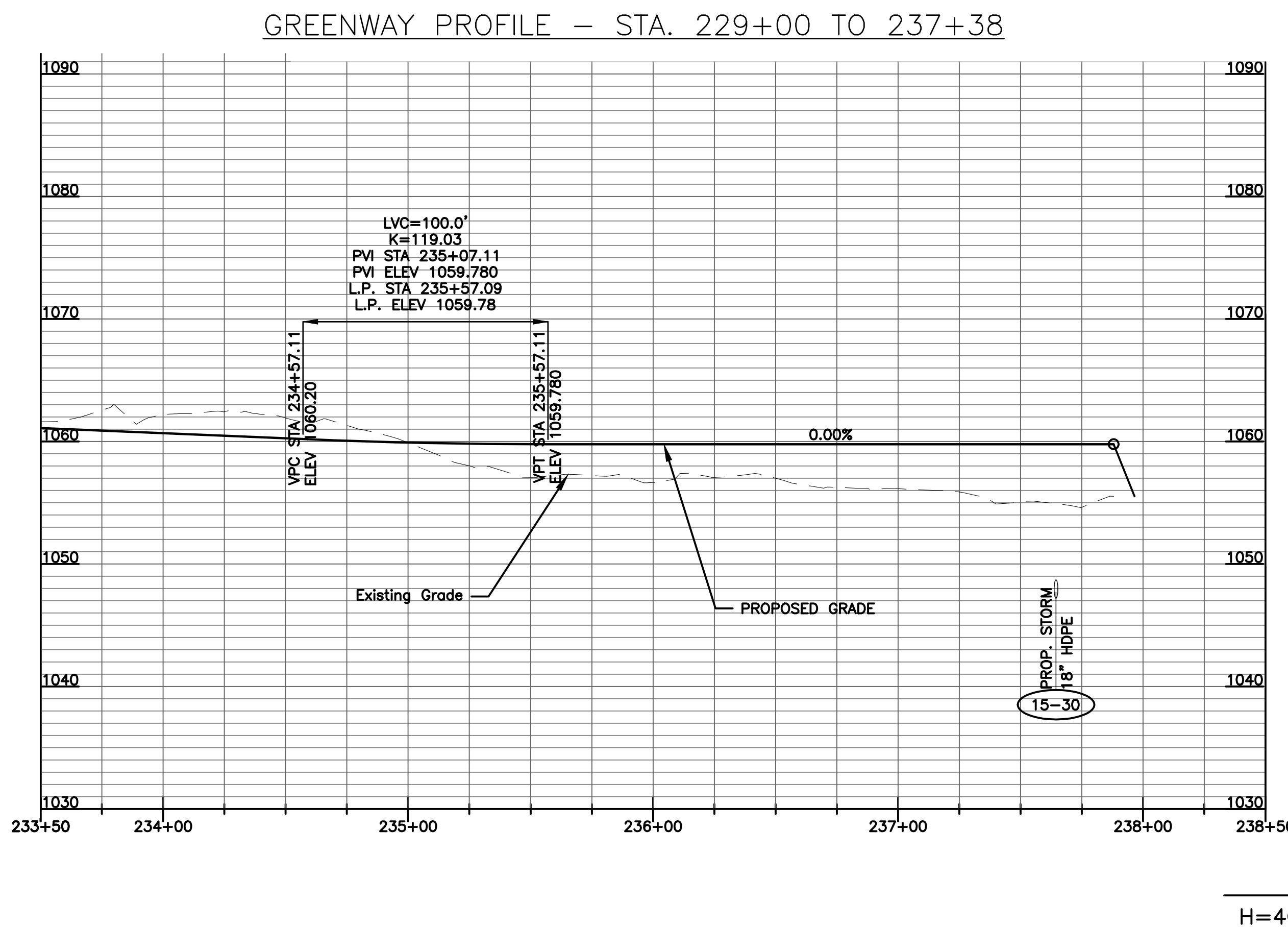
EASTERN ROANOKE RIVER GREENWAY, PHASE I
 ROANOKE, VIRGINIA

NIAGRA DAM OVERLOOK PLAN & PROFILE
 STA: 222+50 TO 233+50

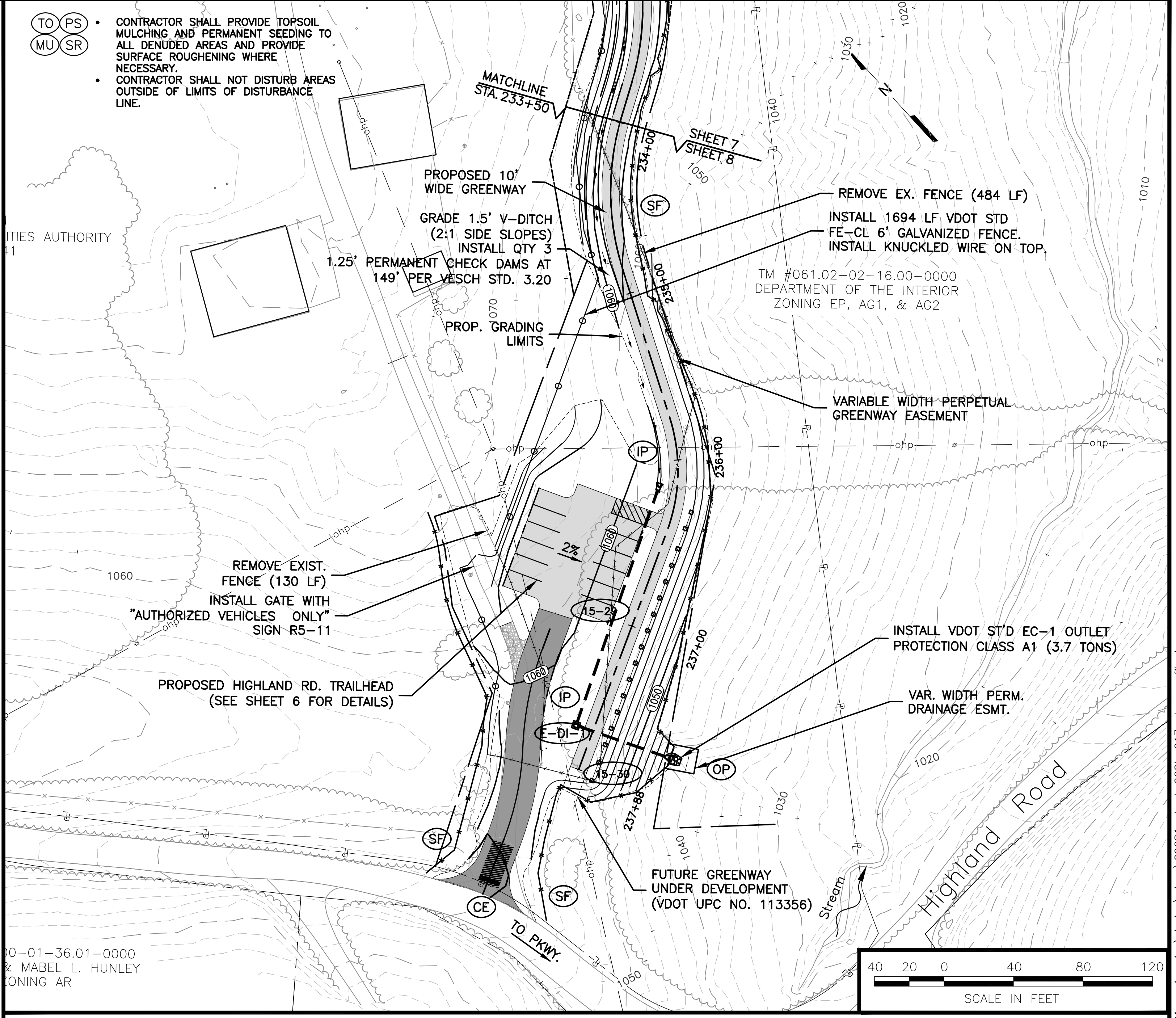
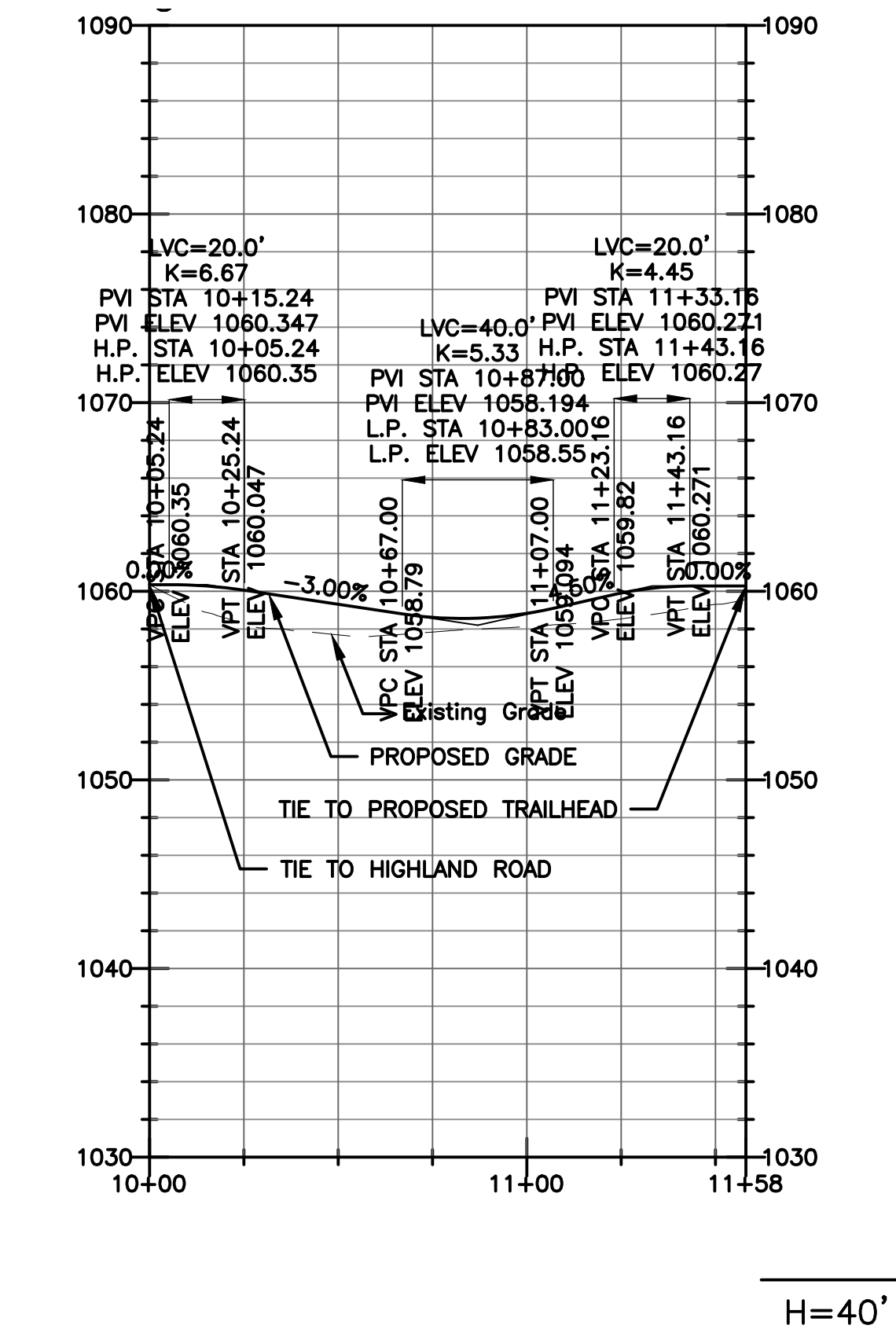
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4 OF **7**



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PROFILE: HIGHLAND ROAD TRAILHEAD ACCESS ROAD



PIPE 15-29 143LF OF 18" PIPE INVERT IN:1057.5' INVERT OUT:1055.7' SLOPE:1.2% INSTALL VDOT STD. ES-1	PIPE 15-30 54LF OF 18" PIPE INVERT IN:1048.8' INVERT OUT:1040.1' SLOPE:16.0% INSTALL VDOT STD. ES-1
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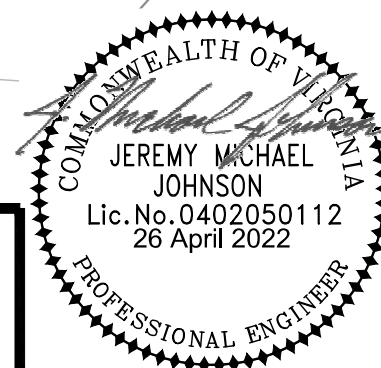
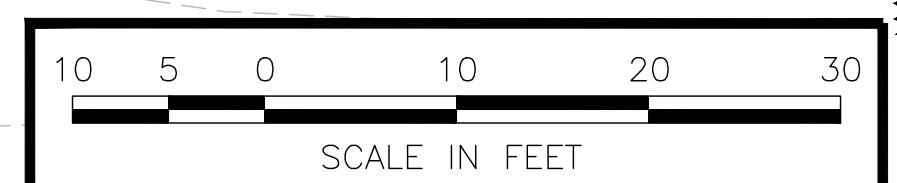
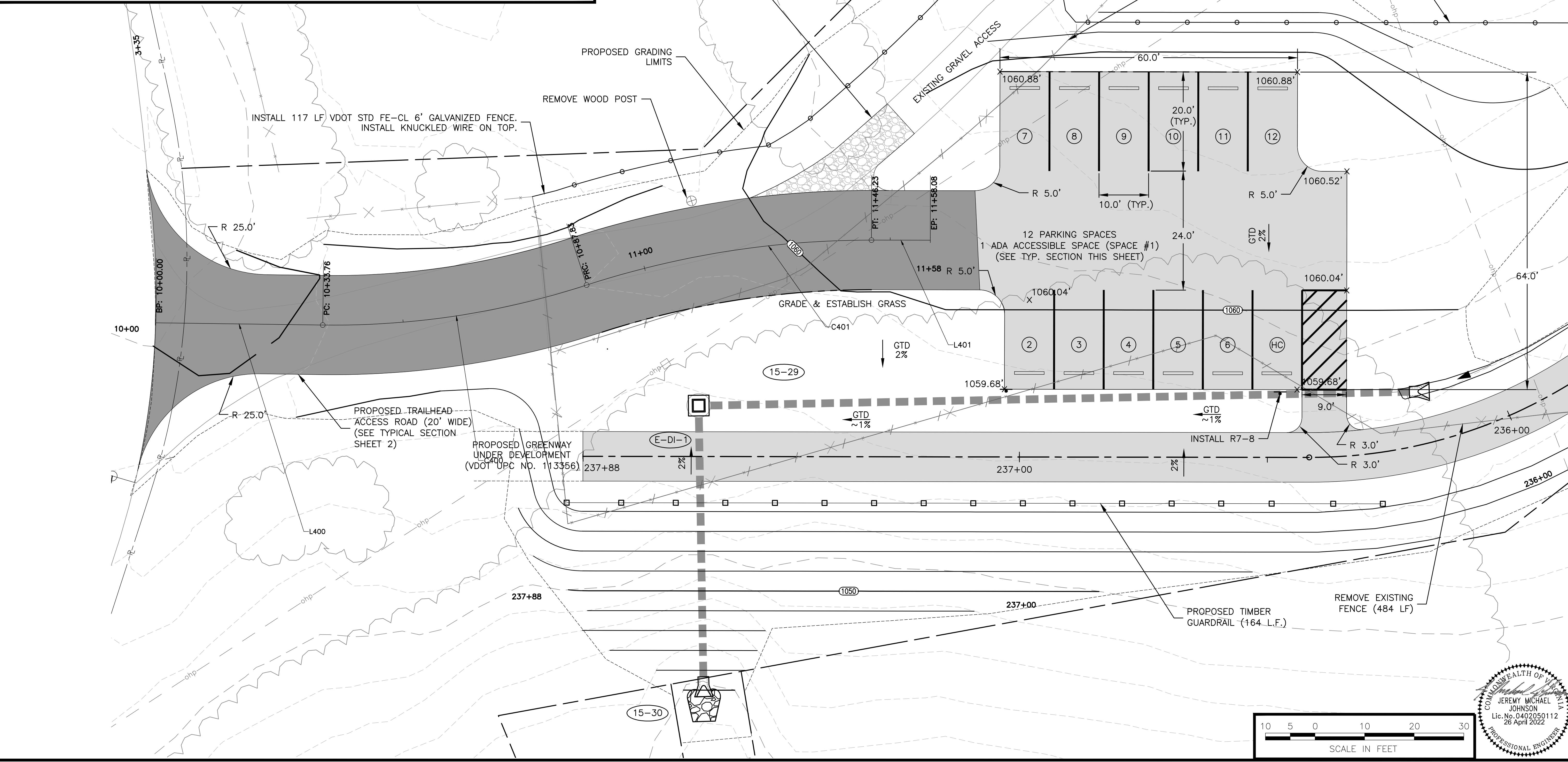
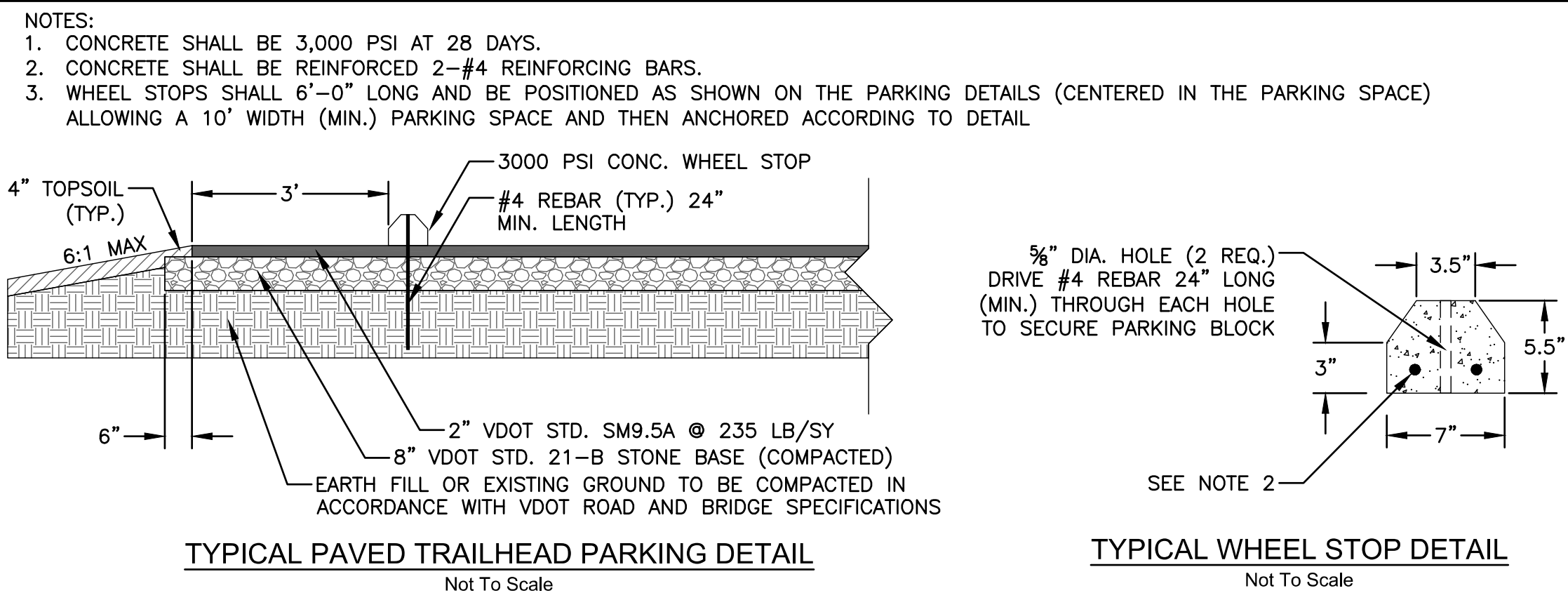
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EASTERN ROANOKE RIVER GREENWAY, PHASE I
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NIAGRA DAM OVERLOOK PLAN & PROFILE
 STA: 233+50 TO 237+88

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EASTERN ROANOKE RIVER GREENWAY, PHASE I
 ROANOKE, VIRGINIA

HIGHLAND ROAD TRAILHEAD PLAN

DOCUMENT NO. 29681-017
SHEET 6
OF 7

APPROVED, 5/4/2022

ROADWAY CLASSIFICATION

- Highland Road Rte 618 - MINOR ARTERIAL (30 MPH)
*Speed study performed by Anderson & Associates, dated 22 December 2014

PROJECT NUMBERS

- FEDERAL PROJECT NUMBER: TEA-5128(477)
- VDOT PROJECT NUMBER: EN08-080-105, P101, R201, C501
- UPC: 91191

TEMPORARY TRAFFIC CONTROL REFERENCES

- TTC-1.1: WORK BEYOND THE SHOULDER OPERATION
- TTC-5.2: SHOULDER OPERATION WITH MINOR ENCROACHMENT
- TTC-23.2: LANE CLOSURE ON A TWO-LANE ROADWAY USING FLAGGERS
- TTC-53.0: SIGNING FOR PROJECT LIMITS

LOCAL EMERGENCY RESPONSE AGENCY CONTACT LIST (911)

- ROANOKE COUNTY (POLICE) 540-562-3265
- ROANOKE COUNTY (FIRE & RESCUE) 540-777-8701
- VDOT TRAFFIC OPERATIONS CENTER 540-375-0170
- VIRGINIA STATE POLICE (DIV. 6 AREA 40) 540-375-9518 & 540-375-9538
- SMART TRAFFIC 1-866-378-7743

PROPOSED CONSTRUCTION SEQUENCE

EACH STAGE OF CONSTRUCTION WILL INCLUDE THE FOLLOWING GENERAL STEPS:

- INSTALLATION OF PROJECT LIMITS SIGNING.
- INSTALLATION OF APPROVED TEMPORARY TRAFFIC CONTROL MEASURES.
- PERFORM DEMOLITION ACTIVITIES.
- INSTALLATION OF PROPOSED IMPROVEMENTS.
- RESTORATION OF PROPERTY.
- REMOVAL OF TEMPORARY TRAFFIC CONTROL MEASURES.
- REMOVAL OF PROJECT LIMITS SIGNING.

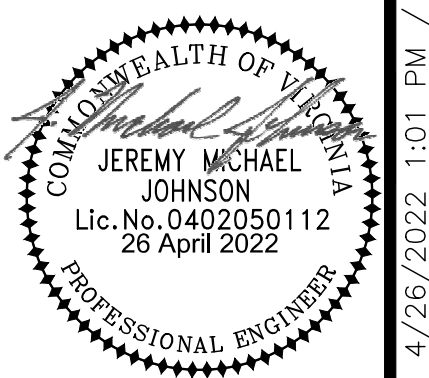
PROPOSED CONSTRUCTION PHASES INCLUDE (AS DETERMINED BY THE CONTRACTOR):

CONSTRUCTION OF TRAILHEAD ENTRANCE ON THE NORTH SIDE OF HIGHLAND ROAD (RT. 618)

CONSTRUCTION OF THE TRAILHEAD ACCESS ROAD ADJACENT TO HIGHLAND ROAD WILL BEGIN WITH INSTALLATION OF TEMPORARY TRAFFIC CONTROL AND E&S MEASURES FOLLOWED BY CLEARING AND GRUBBING WITHIN THE SHOULDERS. CONSTRUCTION OPERATIONS WITHIN THE CLEAR ZONE WILL BE COMPLETED USING TTC 1.1. ONCE THE ACCESS ROAD IS ESTABLISHED, THE NORTHBOUND LANE OF HIGHLAND ROAD WILL BE CLOSED USING TTC 5.2 TO COMPLETE CONSTRUCTION OF THE ENTRANCE AND ROADWAY TIE IN. RESTORATION OF PROPERTY AND PERMANENT SEEDING WILL BE INSTALLED. FINALLY E&S MEASURES WILL BE REMOVED, AND TEMPORARY TRAFFIC CONTROL REMOVED.

NOTES

- PROJECT CATEGORY: TYPE A, CATEGORY I.
- THIS PLAN DEPICTS A SUGGESTED SEQUENCE OF CONSTRUCTION FOR THIS PROJECT. THE CONTRACTOR SHALL SUBMIT A CONSTRUCTION SEQUENCE PLAN TO GAIN APPROVAL FROM VDOT PRIOR TO BEGINNING CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF LANE CLOSURES WITH VDOT.
- TWO-LANE TRAFFIC SHALL BE MAINTAINED AT ALL TIMES UNLESS APPROVED BY THE ENGINEER. LANE WIDTHS SHALL BE A MINIMUM OF 10 FEET. FLAGGING OPERATIONS MAY BE REQUIRED FOR CERTAIN TASKS. THE USE OF FLAGGING OPERATIONS SHALL BE CARRIED OUT AS APPROVED AND DIRECTED BY THE ENGINEER.
- VEHICULAR ACCESS TO ADJOINING PROPERTIES SHALL BE MAINTAINED AT ALL TIMES.
- ALL TEMPORARY TRAFFIC CONTROL PLANS AND MEASURES SHALL BE COMPLETED PER THE 2011 VDOT WORK AREA PROTECTION MANUAL (LATEST REVISION) AND AT NO ADDITIONAL COST TO THE OWNER.



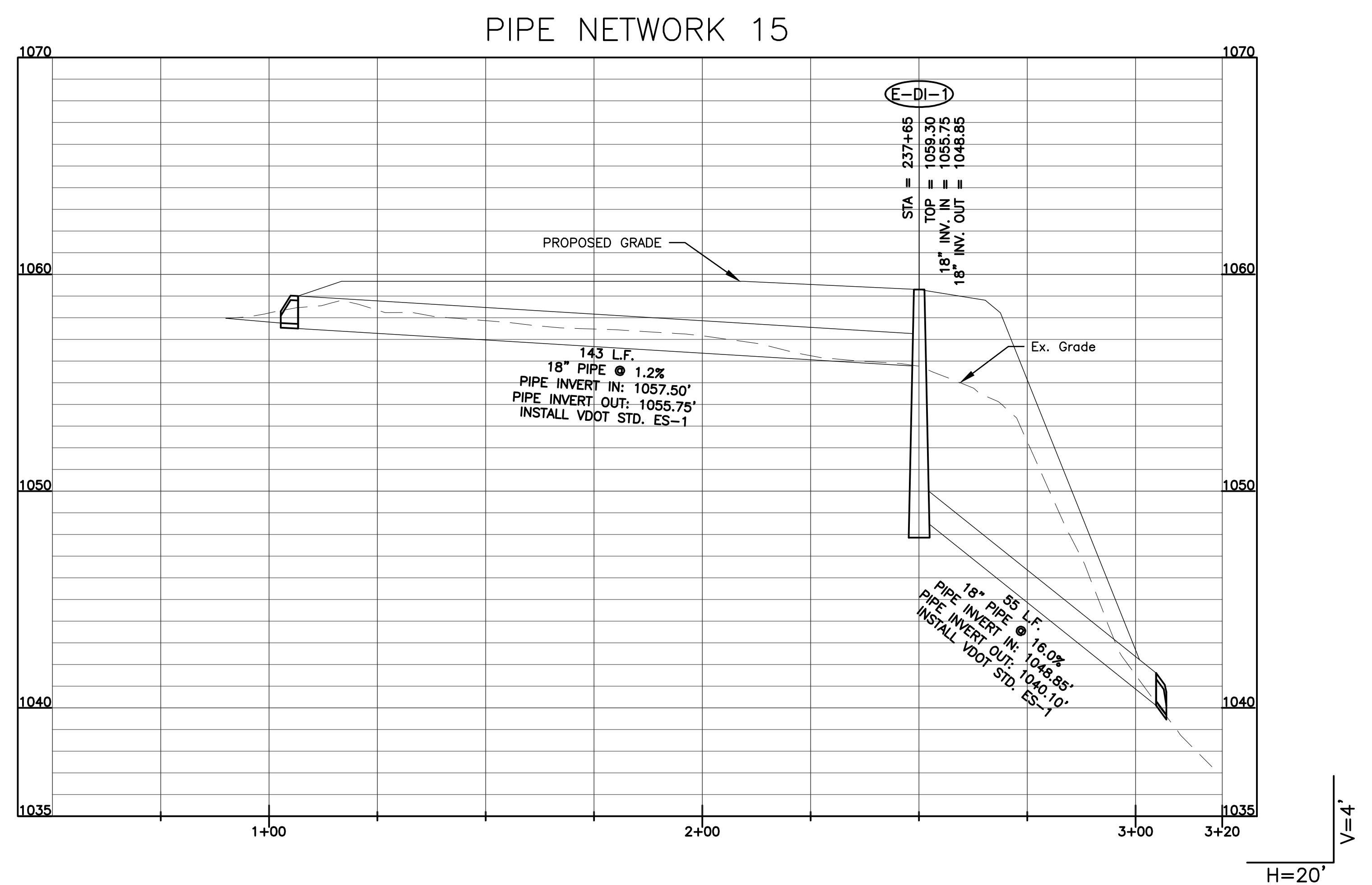
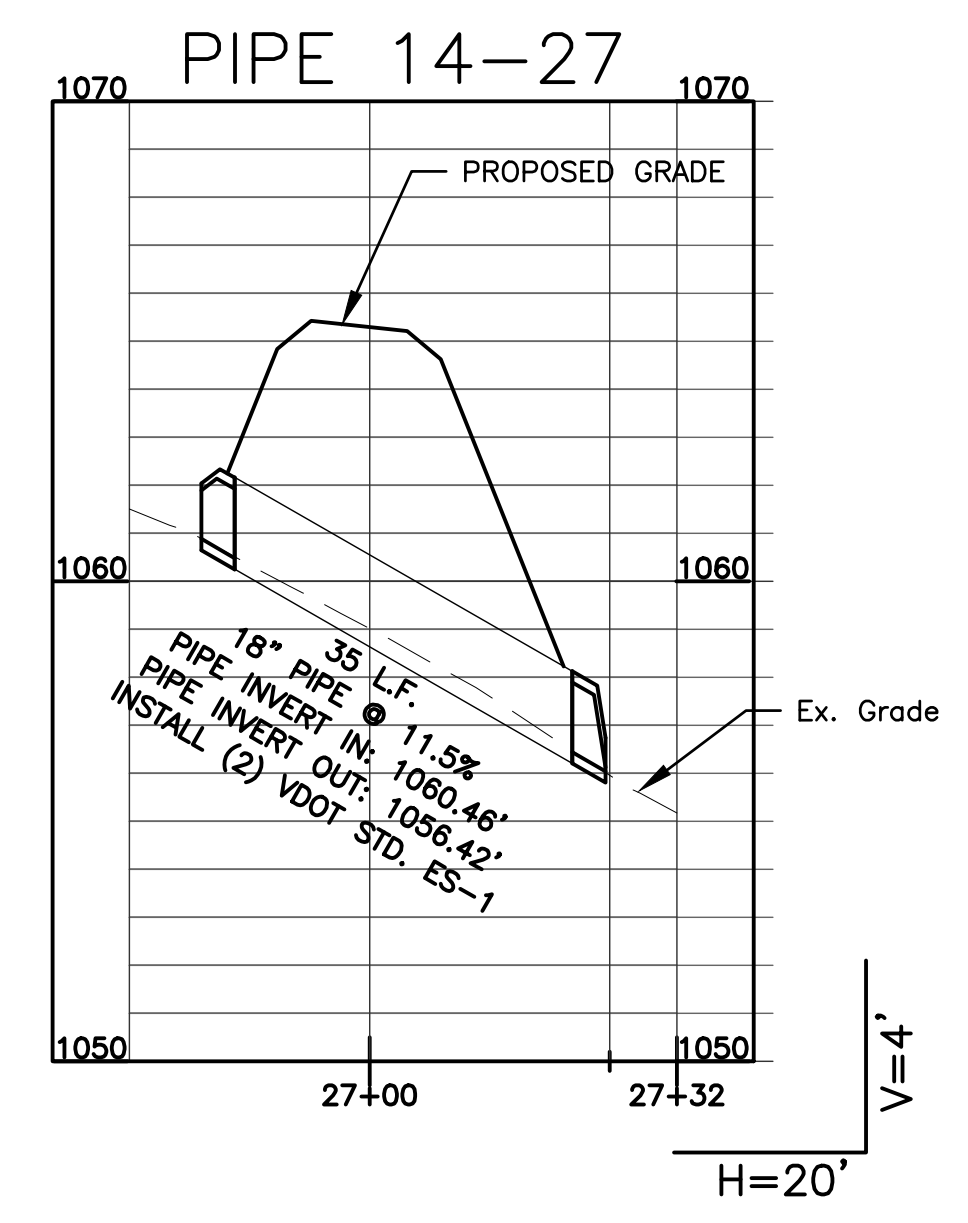
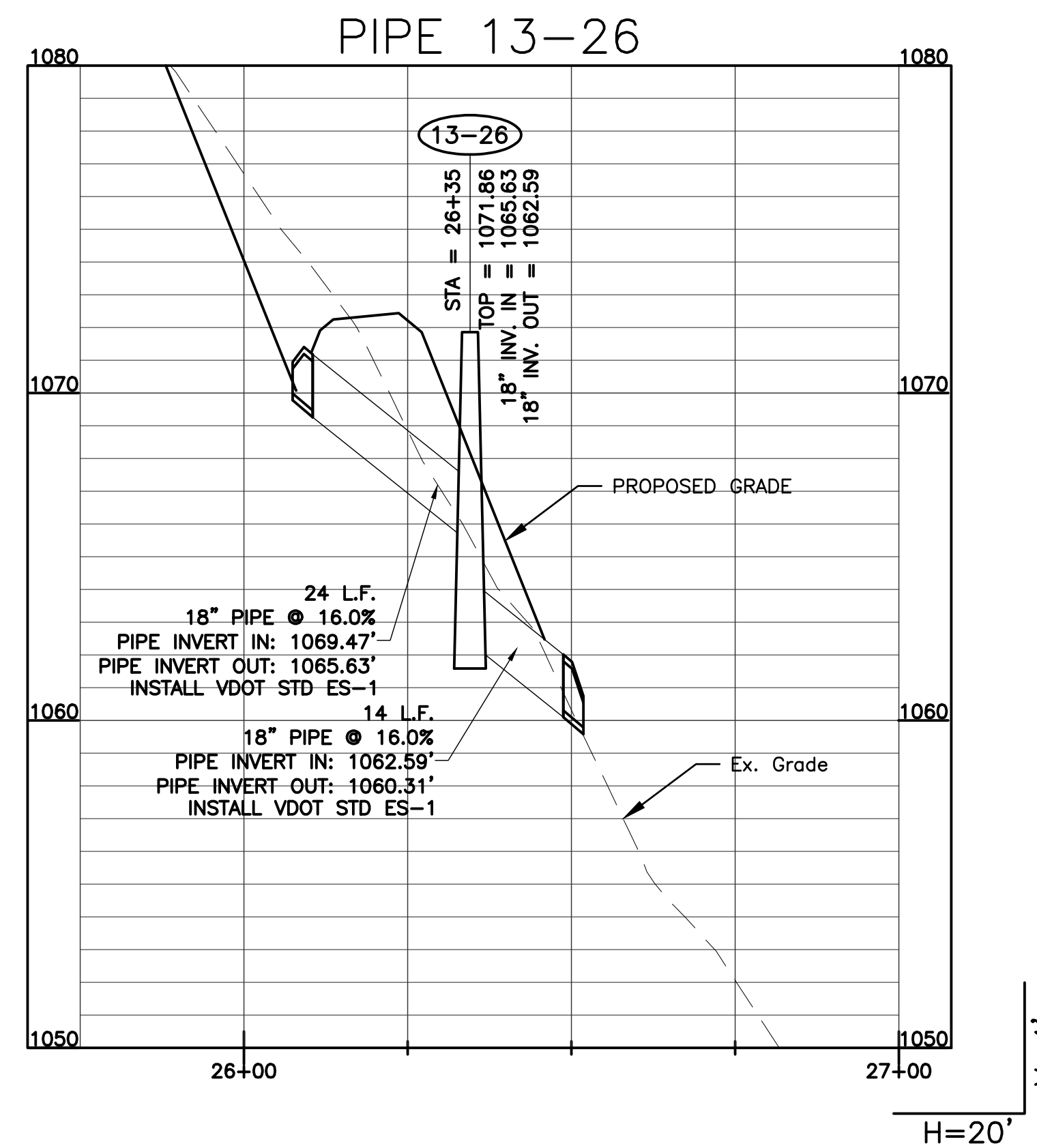
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EASTERN ROANOKE RIVER GREENWAY, PHASE I
 ROANOKE, VIRGINIA

TRANSPORTATION MANAGEMENT PLAN

DOCUMENT NO.	29681 - 009
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LEGEND

Existing Grade - - - - -

PROPOSED GRADE ———



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