VIRGINIA TECH - FORESTRY RESEARCH OPERATIONS CENTER

WORKING DESIGN SET

BLACKSBURG, VIRGINIA

SITE DATA:

TAX MAP PARCEL & OWNER INFO:	0.0905 256-A 1 VIRGINIA POLYTECHNIC INSTITUTE & STATE UNIVERSITY, NON- CAPITAL CONSTRUCTION 230 STERRETT DRIVE, 41E BLACKSBURG, VA. 24060
TOTAL ACREAGE:	1740.869 ACRES
LIMITS OF DISTURBANCE:	0.46 ACRES
ZONING:	RR-1
MAGISTERIAL DISTRICT:	PRICES FORK
OVERLAY DISTRICT:	CREEK VALLEY DISTRICT
CURRENT/PROPOSED USE:	VIRGINIA TECH - TIMBER HARVEST LAB
SOURCE TOPOGRAPHY:	JOSEPH C. MEDLEY TIMMONS GROUP 28 IMPERIAL DRIVE STAUNTON, VA 24401
DATE OF SURVEY:	JULY 14-15, 2026
DATUM:	HORIZONTAL: NAD83 VIRGINIA STATE GRID SOUTH ZONE VERTICAL: NAVD88
WATER AND SEWER:	VIRGINIA TECH
TOTAL EXISTING PARKING:	0 SPACES
PROPOSED PARKING:	9 SPACES (GRAVEL LOT) + 1 ADA SPACE
WETLAND IMPACTS:	NONE

THERE ARE NO CONSTRUCTION ACTIVITIES PROPOSED WITHIN THE 100-YR FLOODPLAIN.

DESIGN AND CONSTRUCTION STANDARDS:

VIRGINIA TECH DESIGN AND CONSTRUCTION STANDARDS MANUAL; 2023
VIRGINIA TECH STANDARDS AND SPECIFICATION FOR STORMWATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL: MAY 2025
ADA ACCESSIBILITY STANDARDS: ANSI A117.1: 2017
VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE STANDARDS AND SPECIFICATIONS, LATEST EDITION

NOTE: A CERTIFIED CONSTRUCTION RECORD DRAWING FOR PERMANENT SWM FACILITIES SHALL BE SUBMITTED TO VIRGINIA TECH SID FOR APPROVAL PER SECTION 4.1.2. OF THE VT ANNUAL STANDARDS AND SPECIFICATION FOR ESC AND SWM. CONSTRUCTION INSPECTIONS, PHOTOGRAPHS, AND SURVEYS, PERFORMED BY A LICENSED PROFESSIONAL, SHALL BE REQUIRED AT EACH STAGE OF INSTALLATION (CONSTRUCTION) AS NECESSARY TO CERTIFY THAT THE SWM FACILITY HAS BEEN BUILT IN ACCORDANCE WITH THE APPROVED PLAN AND DESIGN SPECIFICATIONS. THE CONTRACTOR SHALL PROVIDE A MINIMUM OF 2 BUSINESS DAYS' NOTICE TO THE CERTIFYING PROFESSIONAL TO ALLOW FOR CRITICAL INSPECTIONS.



VICINITY MAP

SCALE: 1" = 1,000'

OWNER:

VIRGINIA POLYTECHNIC INSTITUTE
230 STERRETT DRIVE, 41E
BLACKSBURG, VA 24061
CONTACT: JASON PALJUG, PROJECT MANAGER
VIRGINIA TECH NON- CAPITAL CONSTRUCTION
TELEPHONE: (540)-231-3295

ENGINEER OF RECORD:

TIMMONS GROUP
109 NORFOLK AVE. SW, SUITE 100
ROANOKE, VA. 24011
CONTACT: JOHN BRODIE, P.E.
TELEPHONE: 540-520-2412

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TOTAL # OF SHEETS = 15

COMMONWEALTH OF VIRGINIA
10/28/2026
JOHNATHAN C. BRODIE
Lic. No. 053540
PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

THIS DRAWING PREPARED AT THE
ROANOKE OFFICE
109 NORFOLK AVENUE, Suite 100 | ROANOKE, VA 24011
TEL 276.308.8255 WWW.TIMMONS.COM

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE: 10/28/26
DRAWN BY: M. KUHNS
DESIGNED BY: M. KUHNS
CHECKED BY: J. BRODIE
SCALE: AS SHOWN

TIMMONS GROUP

VIRGINIA TECH - FORESTRY RESEARCH OPERATIONS CENTER
BLACKSBURG, VA
COVER SHEET

JOB NO. 79501
SHEET NO. C0.0

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FROEHLING & ROBERTSON
Engineering Stability Since 1881

BORING LOG

Boring: B-1 (1 of 1)

Project No: 62E-0082
Client: Clark Nexsen
Project: VT FREC Wood Structures & Forest Harvesting Laboratory
City/State: Blacksburg, Virginia

Elevation: 2025
Total Depth: 12.0'
Boring Location: See Boring Location Plan
Latitude: 37.213323
Longitude: -80.438766

Drilling Method: 2.25" ID HSA
Hammer Type: Automatic
Hammer Efficiency: 1.45
Date Drilled: 6/24/26
Driller: B. Maxson

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks
2024.8	0.2	2" Surficial Soil	4-5-5	0.0	10	No subsurface water encountered immediately upon the completion of drilling.
		FILL: Sampled as stiff, tan, dry, FAT CLAY (CH), contains rock fragments		1.5		
			4-5-5	2.0	10	
2021.5	3.5	Sampled as firm, tan, moist, FAT CLAY (CH), trace sand	3-3-4	3.5	7	Cave-in depth measured at 3.5'.
				5.0		
2018.5	6.5	Sampled as firm, tan, moist, FAT CLAY (CH), contains rock fragments	2-3-4	6.5	7	
				8.0		
2016.5	8.5	**RESIDUUM:** Stiff, orange, moist, FAT CLAY (CH), contains rock fragments	3-4-5	8.5	9	
				10.0		
2013.0	12.0	Auger Skew at 12'				

BORING_LOG_62E-0082.GPJ I&R.GDT 6/12/26

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.

FROEHLING & ROBERTSON
Engineering Stability Since 1881

BORING LOG

Boring: B-2 (1 of 1)

Project No: 62E-0082
Client: Clark Nexsen
Project: VT FREC Wood Structures & Forest Harvesting Laboratory
City/State: Blacksburg, Virginia

Elevation: 2027
Total Depth: 13.0'
Boring Location: See Boring Location Plan
Latitude: 37.213452
Longitude: -80.438965

Drilling Method: 2.25" ID HSA
Hammer Type: Automatic
Hammer Efficiency: 1.45
Date Drilled: 6/24/26
Driller: B. Maxson

Elevation	Depth	Description of Materials (Classification)	* Sample Blows	Sample Depth (feet)	N-Value (blows/ft)	Remarks
2026.9	0.1	1.5" Surficial Soil	3-5-5	0.0	10	No subsurface water encountered immediately upon the completion of drilling.
		FILL: Sampled as stiff, tan, dry, LEAN CLAY (CL), contains rock fragments		1.5		
2025.5	1.5	Sampled as stiff, orange, moist, LEAN CLAY (CL), contains rock fragments	4-5-5	2.0	10	
				3.5		Cave-in depth measured at 2.9'.
2023.5	3.5	Sampled as stiff, brown, moist, CLAYEY GRAVEL (GC)	3-5-8		13	
				5.0		
2020.5	6.5	**RESIDUUM:** Firm, brown, moist, ELASTIC SILT (MH)	2-3-4	6.5	7	
				8.0		
			2-2-3	8.5	5	
				10.0		
2014.0	13.0	Auger Refusal at 13'				

BORING_LOG_62E-0082.GPJ I&R.GDT 6/12/26

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the second and third increments of penetration is termed the standard penetration resistance, N-Value.

BORING NOTE

1. SEE SHEET C1.0 FOR BORING LOCATIONS

GENERAL NOTES

1. THE CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS FOR THIS PROJECT FROM THE LOCAL OR STATE AGENCIES AT THEIR EXPENSE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
2. THE VIRGINIA POLYTECHNIC INSTITUTE *(VIRGINIA TECH)* SHALL RECEIVE WRITTEN NOTIFICATION AT LEAST ONE WEEK PRIOR TO STARTING WORK ON THIS PROJECT.
3. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONSULT THE ENGINEER AND VERIFY THE APPROVAL OF THE PLANS BY ALL FEDERAL, STATE AND LOCAL AGENCIES.
4. THE CONTRACTOR SHALL HAVE A SET OF APPROVED PLANS AVAILABLE AT THE SITE AT ALL TIMES WHEN WORK IS BEING PERFORMED. A DESIGNATED RESPONSIBLE EMPLOYEE SHALL BE AVAILABLE FOR CONTACT BY INSPECTORS.
5. THE CONTRACTOR SHALL VERIFY THE PROPOSED LAYOUT WITH ITS RELATIONSHIP TO THE EXISTING SITE SURVEY. ALSO VERIFY ALL DIMENSIONS, TIE-IN ELEVATIONS, SITE CONDITIONS, AND MATERIAL SPECIFICATIONS AND NOTIFY THE VIRGINIA POLYTECHNIC INSTITUTE AND THE ENGINEER OF ANY ERRORS, OMISSIONS, OR DISCREPANCIES BEFORE COMMENCING OR PROCEEDING WITH WORK.
6. DEVIATIONS FROM OR CHANGES TO THESE PLANS WILL NOT BE ALLOWED, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
7. PERFORM ALL WORK USING DIMENSIONS SHOWN ON THESE PLANS. DO NOT USE SCALES, RULERS, OR OTHER MEASURING DEVICES TO DETERMINE SPATIAL RELATIONSHIPS ON THESE DRAWINGS.
8. ALL GROUND COVER AND LANDSCAPING SHALL BE PROPERLY MAINTAINED IN A HEALTHY CONDITION AT ALL TIMES. DEAD PLANT MATERIALS SHALL BE REMOVED IN A REASONABLE TIME AND REPLACED DURING THE NORMAL PLANTING SEASON.
9. ALL TURF AREAS THAT ARE IMPACTED OR DISTURBED BY VEHICLES, EQUIPMENT, OR ACTIVITY SHALL BE REPAIRED, REGRADED, AND RESEEDED TO THE SATISFACTION OF THE OWNER.
10. NO STORED MATERIALS AND PARKED EQUIPMENT IS PERMITTED WITHIN TREE PROTECTION AREAS.
11. PROPERLY SECURE THE CONSTRUCTION AREA AT ALL TIMES AGAINST UNAUTHORIZED ENTRY AND ADEQUATELY PROTECT EQUIPMENT, MATERIALS, AND COMPLETED WORK FROM THEFT AND VANDALISM. THE OWNER IS NOT RESPONSIBLE FOR THE LOSS OF ANY MATERIAL STORED AT THE SITE. ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
12. CONTRACTOR SHALL PROVIDE ALL REQUIRED TRAFFIC CONTROL MEASURES (NOT DETAILED ON THE PLANS). ALL CONTROL MEASURES SHOULD FOLLOW THE GUIDELINES AND REQUIREMENTS OF THE VDOT VIRGINIA WORK AREA PROTECTION MANUAL, LATEST EDITION.
13. WHERE SIDEWALKS ARE TAKEN OUT OF SERVICE FOR PORTIONS OF THE WORK, THE CONTRACTOR SHALL PROVIDE AN ALTERNATIVE ACCESSIBLE CIRCULATION PATH FOR PEDESTRIANS, COORDINATING THE SIGNAGE AND EXTENT OF SIDEWALK CLOSURE WITH THE LOCATION OF ACCESSIBLE CROSSWALKS. SIGNAGE SHALL BE LOCATED TO MINIMIZE BACKTRACKING FROM A SIDEWALK CLOSURE. CONTRACTOR TO PROVIDE A PLAN TO VIRGINIA TECH FOR APPROVAL PRIOR TO STARTING CONSTRUCTION.
14. REQUIRED MEANS OF EGRESS FROM BUILDING TO THE PUBLIC WAY SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND DEMOLITION, OR A TEMPORARY ALTERNATE MEANS OF EGRESS PLAN SHALL BE SUBMITTED TO VIRGINIA TECH UBO FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.
15. CONTRACTOR SHALL COORDINATE ALL REQUIREMENTS FOR AS BUILT DOCUMENTATION, AS REQUIRED BY THE LOCALITY. THIS INCLUDES, BUT IS NOT LIMITED TO, TESTING, INSTALLATION DOCUMENTATION, SURVEY, ETC. ALL REQUIREMENTS SHALL BE DISCUSSED WITH THE LOCALITY PRIOR TO THE BEGINNING CONSTRUCTION.
16. CONTRACTOR SHALL NOT REMOVE ANY TREES THAT ARE SPECIFICALLY CALLED TO BE REMOVED IN THE PLANS. IF AN EXISTING TREE NEEDS TO BE REMOVED OR PRUNED THAT IS NOT IDENTIFIED ON THE PLAN, THE CONTRACTOR SHALL REACH OUT TO THE UNIVERSITY/ENGINEER PRIOR TO DISTURBING THE TREE.
17. ALL VEHICLE, BIKE, TRANSIT, (ROAD AND TRAIL), AND OTHER MOBILITY MODE DISRUPTIONS SHALL BE COORDINATED WITH THE VT PM AND SHALL REQUIRE A MINIMUM NOTICE OF 3 WEEKS BEGINNING WITH THE COMBINED SUBMISSION OF A DETAILED AND CLEAR PLAN AND A TRAFFIC AND CONSTRUCTION IMPACT REQUEST THROUGH THE VT CAMPUS CLOSURE MAP VIEWER WEBSITE. TRAFFIC DISRUPTION REQUESTS MAY BE INITIATED USING THE "SUBMIT CONSTRUCTION/ROAD CLOSURES REQUEST" LINK AT THE TOP OF THE WEB PAGE. CONTACT THE VT TRANSPORT PLANNING ENGINEER FOR MORE INFORMATION. TRAFFIC DISRUPTIONS DURING VT EVENTS SUCH AS LARGE HOME SPORTING EVENTS AND COMMENCEMENTS SHALL NOT BE PERMITTED. REQUESTS FOR EXCEPTIONS DURING THESE EVENTS SHALL BE SUBMITTED 6 MONTHS IN ADVANCE, BUT THESE REQUESTS ARE TYPICALLY DENIED.
18. ALL ROADWORK SHALL BE INSPECTED AT SUBGRADE PRIOR TO PAVEMENT OF BASE STONE, AT BASE STONE PRIOR TO PLACEMENT OF PAVEMENT, AND AT PAVEMENT PRIOR TO PAVEMENT MARKINGS.

UTILITY NOTES

1. ALL CONSTRUCTION MATERIALS, INSTALLATION, AND TESTING SHALL CONFORM TO THE 2023 EDITION OF THE VIRGINIA TECH DESIGN AND CONSTRUCTION STANDARDS MANUAL *(DCSM)*.
2. CONTACT THE VIRGINIA TECH UTILITY PROVIDER PRIOR TO ANY UTILITY SERVICE INTERRUPTIONS TO COORDINATE DOWN TIME AND WORK SCHEDULE.
3. THE LOCATION OF EXISTING UTILITY LINES, CONDUITS OR OTHER STRUCTURES ACROSS, UNDERNEATH, OR OTHERWISE ALONG THE LINE OF PROPOSED WORK ARE NOT NECESSARILY SHOWN ON THE PLANS, AND IF SHOWN MAY ONLY BE APPROXIMATE. THE CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF ALL UNDERGROUND UTILITIES IN AREAS OF CONSTRUCTION PRIOR TO STARTING WORK AT NO ADDITIONAL COST TO THE OWNER. CONTACT ENGINEER AND OWNER IMMEDIATELY IF LOCATION OR ELEVATION IS DIFFERENT FROM WHAT IS SHOWN ON THE PLANS, IF THERE APPEARS TO BE A CONFLICT, OR UPON DISCOVERY OF ANY UTILITY NOT SHOWN ON THE PLANS TO ALLOW REVISIONS IF NECESSARY. FOR ASSISTANCE IN LOCATING EXISTING UTILITIES CALL "MISS UTILITY" AT 1-800-552-7001 OR 811.
4. TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN HEREON AND ANY OTHER EXISTING UTILITIES NOT SHOWN ON THESE PLANS. IF A UTILITY IS DAMAGED DURING CONSTRUCTION, STOP WORK IMMEDIATELY AND NOTIFY THE ENGINEER. DAMAGE TO UTILITIES (INCLUDING UNDERGROUND) OR PROPERTY OF OTHERS BY CONTRACTOR DURING CONSTRUCTION SHALL BE REPAIRED TO PRE-CONSTRUCTION CONDITIONS BY CONTRACTOR AT NO COST TO OWNER.
5. ALL PROPOSED UTILITIES ARE TO BE INSTALLED UNDERGROUND. ALL OF THESE UTILITIES (WATER, SANITARY SEWER, ELECTRICITY, ETC.) SHALL BE INSTALLED AND TESTED SATISFACTORILY PRIOR TO THE PLACEMENT OF AGGREGATE BASE COURSE WHERE SUCH UTILITIES ARE WITHIN THE LIMITS OF PAVEMENT.
6. MINIMUM COVER OVER TOP OF WATER PIPE MUST BE 3.5 FEET. MINIMUM COVER OVER TOP OF SEWER PIPE MUST BE 3.0 FEET.
7. WATER AND SANITARY PIPE AND STRUCTURE MATERIALS, INSTALLATION, AND TESTING:
   7.1. REFER TO THE VIRGINIA TECH (VT) DESIGN AND CONSTRUCTION STANDARDS AND DESIGN MANUAL.
8. VIRGINIA TECH WATER LINES:
   8.1. WATER LINES 2" AND SMALLER SHALL BE SDR 9 HDPE PRESSURE PIPE
   8.2. WATER LINES 4" AND LARGER SHALL BE ONE OF THE FOLLOWING OPTIONS AT THE DIGRESSION OF THE CONTRACTOR:
      8.2.1. POLYVINYL CHLORIDE PIPE (PVC): ALL PIPE SHALL BE SDR-18, CLASS 150 WITH A SAFETY FACTOR OF 4:1 AGAINST MAX WORKING PRESSURE, WITH A STANDARD LAY LENGTH OF 20'. JOINTS SHALL BE PUSH-ON-TYPE; THE BASIS OF DESIGN SHALL BE RING-TITE OR EQUIVALENT WITH RINGS CONFORMING TO ASTM D3139 & ASTM F477. LUBRICANT FOR PVC JOINTS SHALL BE SUPPLIED BY THE PIPE MANUFACTURER, AND APPLIED AT VALVES, FITTINGS, HYDRANTS, AND OTHER SUITABLE PIPE MATERIAL. NO LUBRICANTS HARMFUL TO POLYVINYL CHLORIDE PLASTIC SHALL BE USED. ALL FITTINGS SHALL BE MADE OF PVC COMPONENTS AS DEFINED IN ASTM D1784 & AWWA C 900.
      8.2.2. DUCTILE IRON PIPE (DIP): ALL PIPE SHALL BE CLASS 350 IN ACCORDANCE AWWA C104 AND CAST IN ACCORDANCE WITH AWWA C151. ALL DIP LINES SHALL BE CEMENT-LINED IN ACCORDANCE WITH AWWA C104. ALL PIPES TO BE INSTALLED SHALL BE THE DIAMETER SPECIFIED ON THE DRAWINGS ISSUED FOR CONSTRUCTION.
   8.3. ALL WATER LINES SHALL HAVE A #12 AWG SOLID COPPER TRACER WIRE ATTACHED TO THE THE LINE. THE TRACER WIRE SHALL BE BROUGHT INTO THE VALVE BOX WITH ENOUGH SLACK TO ALLOW REMOVAL OF THE END OF THE WIRE FOR CONNECTION TO TRACING EQUIPMENT.
   8.4. THERE SHALL BE NO GRIPPER GASKETS ON RESTRAINING JOINTS
   8.5. REDUCED PRESSURE ZONE ASSEMBLIES (RPZ VALVES) SHALL BE USED ON DOMESTIC WATER LINES FOR BACKFLOW PREVENTION. RPZ SYSTEMS SHALL CONSIST OF TWO PARALLEL BACKFLOW PREVENTERS TO ACCOMMODATE SERVICING. ALL RPZ VALVES WILL BE SELECTED AND PURCHASED BY FACILITIES OPS MECHANICAL SERVICES, WHO WILL BE REIMBURSED FROM THE PROJECT FUNDS. SPECIAL PURPOSE BACKFLOW PREVENTION DEVICES SHALL BE DECIDED BASED ON THE BEST FIT FOR THE PURPOSE AND APPLICATION.
      8.5.1. THE BASIS OF DESIGN FOR PIPING 2" AND SMALLER IS ZURN WILKINS MODEL 975XL.
      8.5.2. THE BASIS FOR DESIGN FOR PIPING 2 ½" AND LARGER IS ZURN WILKINS MODEL 375A
   8.6. DOMESTIC WATER LINES SHALL BE BACTERIA TESTED. ALL WATER LINES SHALL BE TESTED AT 200 PSIG. REFER TO VPC-610 REGULATIONS AND THE VIRGINIA DEPARTMENT OF HEALTH REGULATIONS.
9. VIRGINIA TECH SANITARY SEWER PIPING:
   9.1. GRAVITY SEWER PIPES:
      9.1.1. ALL POLYVINYL CHLORIDE (PVC) SHALL BE SDR 35 OR SCHEDULE 40 PIPE.
      9.1.2. DUCTILE IRON PIPE: ALL DIP SHALL MEET OR EXCEED THE REQUIREMENTS OF AWWA C104, C150, AND C151.
   9.2. FORCE MAIN SEWER PIPES SHALL BE HDPE SDR 9
10. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES AND THE MEP ENGINEERS ON THE REQUIREMENTS FOR AND LIMITS OF ELECTRICAL, CHILLER WATER PIPING, AND OTHERS UTILITIES NOT DETAILED ON THE CIVIL PLANS.
11. THE OWNER OR THEIR REPRESENTATIVES WILL INSPECT ALL WATER AND SANITARY SEWER LINES, CONNECTIONS, AND APPURTENANCES THERETO, AS SHOWN ON THE UTILITY PLANS. FINAL ACCEPTANCE WILL NOT BE MADE UNTIL ALL WORK SHOWN ON THE PLANS IS COMPLETED; INCLUDING PAVING, GRADING, AND ALL REQUIRED ADJUSTMENTS.
12. THE CONTRACTOR SHALL LOCATE AND UNCOVER ALL SEWER MANHOLES OR WATER VALVE BOXES AFTER COMPLETION OF ALL PAVING AND TO ADJUST THEM TO THE FINAL GRADES. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR CLEANING OUT SEWER MAINS FOR FINAL INSPECTION, IF NECESSARY.
13. ALL EXCAVATION FOR UNDERGROUND PIPE INSTALLATION MUST COMPLY WITH OSHA STANDARDS FOR THE CONSTRUCTION INDUSTRY (29 CFR PART 1926).
14. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH SECTION 59.1-406, ET SEQ. OF THE CODE OF VIRGINIA (OVERHEAD) VOLTAGE LINES SAFETY ACT.

DRAINAGE NOTES

1. ALL STORM SEWER DESIGN AND CONSTRUCTION TO BE IN ACCORDANCE WITH VDOT STANDARDS, LATEST EDITION, EXCEPT WHERE THE VIRGINIA TECH DESIGN AND CONSTRUCTION STANDARDS ARE APPLICABLE OR WHERE NOTED OTHERWISE.
2. THE CONTRACTOR IS REQUIRED TO MAINTAIN ALL DITCHES, PIPES, AND OTHER DRAINAGE STRUCTURES FREE FROM OBSTRUCTION UNTIL WORK IS ACCEPTED BY THE OWNER. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGES CAUSED BY FAILURE TO MAINTAIN DRAINAGE STRUCTURE IN OPERABLE CONDITION.
3. ALL STORM SEWER PIPE SHALL BE HDPE IN ACCORDANCE WITH ASTM F2648, UNLESS OTHERWISE NOTED. PIPES SHALL HAVE SMOOTH INTERIOR AND ANNULAR EXTERIOR CORRUGATIONS. JOINTS SHALL BE WATERTIGHT ACCORDING TO ASTM D3212. JOINTS SHALL BE SEATED AND SEALED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
4. SHOP DRAWINGS SHALL BE SUBMITTED FOR THE ENGINEER'S REVIEW PRIOR TO PURCHASING FOR ALL STORM SEWER STRUCTURES AND THE UNDERGROUND DETENTION STRUCTURE.
5. ALL PIPES, INLETS AND OTHER STRUCTURES SHALL BE INSPECTED BY THE PROJECT'S INSPECTOR BEFORE BEING BACKFILLED OR BURIED. THE INSPECTOR MAY REQUIRE CONTRACTOR, AT NO ADDITIONAL COST, TO UNCOVER AND RE-COVER SUCH STRUCTURES IF THEY HAVE BEEN BACKFILLED OR BURIED WITHOUT SUCH INSPECTION.
6. ALL STORM SEWER PIPE AND DROP INLETS SHALL BE CLEARED OF DEBRIS AND ERODED MATERIAL PRIOR TO FINAL ACCEPTANCE.
7. ALL ROOF DRAINS SHALL BE CONNECTED TO THE STORM SEWER SYSTEM AS SHOWN ON THE PLANS. CONNECTIONS FROM THE DOWNSPOUT TO THE STORM SYSTEM SHALL BE MADE AT A STRUCTURE WHERE POSSIBLE. IF NO STRUCTURE IS NEAR, CONNECT TO THE STORM PIPE WITH A WATERTIGHT WYE FITTING.

FIRE PREVENTION NOTES

1. SMOKING SHALL BE PROHIBITED IN AREAS WHERE SMOKING CONDITIONS MAKE SMOKING A HAZARD AND THESE AREAS SHALL BE DESIGNATED WITH NO SMOKING SIGNS PER VIRGINIA STATEWIDE FIRE PREVENTION CODE.
2. AREAS WHERE SMOKING CAN OCCUR, SHALL HAVE APPROPRIATE RECEPTACLES FOR DISCARDED SMOKING MATERIALS PER VIRGINIA STATEWIDE FIRE PREVENTION CODE.
3. PER THE VIRGINIA STATEWIDE FIRE PREVENTION CODE, VEHICULAR ACCESS FOR FIREFIGHTING SHALL BE PROVIDED AT ALL CONSTRUCTION AND DEMOLITION SITES, PROVIDE ACCESS TO WITHIN 100 FT. OF TEMPORARY OR PERMANENT FIRE DEPARTMENT CONNECTIONS, AND HAVE NO OVERHEAD WIRING OR OTHER OVERHEAD OBSTRUCTIONS LOWER THAN 13 FT. 6 INCHES; THIS ACCESS MAY BE VIA PERMANENT OR TEMPORARY ROAD, BUT SHALL BE CAPABLE OF SUPPORTING FIRE APPARATUS IN ALL WEATHER CONDITIONS.
4. CONTRACTOR SHALL ENSURE THE STREET NUMBERS ARE ALWAYS PLAINLY VISIBLE FROM THE FRONTAGE STREET DURING CONSTRUCTION PER THE VIRGINIA STATEWIDE FIRE CODE.
5. AN APPROVED WATER SUPPLY FOR FIREFIGHTING OPERATIONS SHALL BE IN PLACE AND AVAILABLE AS SOON AS COMBUSTIBLE MATERIALS ARRIVE ON SITE.
6. WASTE AND COMBUSTIBLE DEBRIS SHALL BE REMOVED FROM THE BUILDING AT THE END OF EACH DAY AND DISPOSED OF IN ACCORDANCE WITH THE VIRGINIA STATEWIDE FIRE CODE.
7. FIRE EXTINGUISHERS SHALL BE PROVIDED, WITH NOT LESS THAN ONE APPROVED FIRE EXTINGUISHER AT EACH STAIRWELL, ON ALL FLOOR LEVELS WHERE COMBUSTIBLE MATERIALS HAVE ACCUMULATED, IN EVERY STORAGE AND CONSTRUCTION SHED AND IN AREAS OF SPECIAL HAZARDS, SUCH AS WHERE FLAMMABLE AND COMBUSTIBLE LIQUIDS ARE STORED OR USED, IN ACCORDANCE WITH THE VIRGINIA STATEWIDE FIRE CODE.
8. OPERATIONS INVOLVING THE USE OF CUTTING AND WELDING SHALL COMPLY WITH THE VIRGINIA STATEWIDE FIRE PREVENTION CODE AND SHALL REQUIRE A PERMIT FROM THE MONTGOMERY COUNTY FIRE MARSHAL'S OFFICE.
9. THE CONTRACTOR SHALL MAINTAIN EMERGENCY VEHICLE ACCESS TO ALL FIREFIGHTING ELEMENTS (FIRE HYDRANTS, PIV, FDC, ETC.) AND EXISTING BUILDINGS AT ALL TIMES. THE CONTRACTOR SHALL PREPARE SEQUENCING PLANS AND REVIEW WORK WITH THE MONTGOMERY COUNT, CITY OF BLACKSBURG, AND VIRGINIA TECH FIRE MARSHALS WITH REGARD TO MAINTAINING FIRE TRUCK ACCESS WHERE REQUIRED.

EARTHWORK NOTES

1. BLASTING SHALL NOT BE PERMITTED ON THIS PROJECT.
2. PRIOR TO REMOVING ANY VEGETATION, THE CONTRACTOR SHALL MEET WITH THE PROPERTY OWNERS AND THE ENGINEER TO REVIEW THE LIMITS OF CONSTRUCTION AND OBTAIN PERMISSION TO REMOVE VEGETATION REQUIRED TO DO THE WORK.
3. TREE AND PLANT ROOTS OR BRANCHES THAT MAY INTERFERE WITH THE WORK SHALL BE TRIMMED OR CUT ONLY WITH THE APPROVAL OF THE OWNER AND ENGINEER. ANY TREES OR PLANTS WHICH ARE SHOWN TO REMAIN THAT DO NOT INTERFERE WITH THE WORK, BUT ARE DAMAGED BY CONTRACTOR OR HIS SUBCONTRACTORS, SHALL BE REPAIRED OR REPLACED BY CONTRACTOR AT NO ADDITIONAL COST.
4. UPON DISCOVERY OF SOILS THAT ARE UNSUITABLE FOR FOUNDATIONS, SUBGRADES, OR OTHER ROADWAY CONSTRUCTION PURPOSES, THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE OWNER. THESE AREAS SHALL BE EXCAVATED BELOW PLAN GRADE AS DIRECTED BY THE OWNER'S REPRESENTATIVE, BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED IN ACCORDANCE WITH SPECIFICATIONS.
5. EXCEPT AS OTHERWISE SHOWN ON THE PLANS, ALL CUTS AND FILLS SHALL MATCH EXISTING SLOPES OR BE NO GREATER THAN 2:1.
6. ALL GRADING AND IMPROVEMENTS TO BE CONFINED TO THE PROJECT AREA UNLESS OTHERWISE INDICATED.
7. ANY UNUSUAL OR UNANTICIPATED SUBSURFACE CONDITIONS SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER.

CONCRETE NOTES

1. ALL MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT VIRGINIA DEPARTMENT OF TRANSPORTATION'S SPECIFICATIONS AND STANDARDS, EXCEPT WHERE THE VIRGINIA TECH DESIGN AND CONSTRUCTION STANDARDS MANUAL ARE APPLICABLE OR WHERE NOTED OTHERWISE.
2. ALL CONCRETE SHALL BE A3-AE (AIR ENTRAINED 3,000 PSI), UNLESS OTHERWISE NOTED.
3. ALL FORMS SHALL BE INSPECTED BY THE PROJECT'S INSPECTOR BEFORE ANY CONCRETE IS PLACED. THE INSPECTOR MAY REQUIRE CONTRACTOR, AT NO ADDITIONAL COST, TO REMOVE AND REPLACE CONCRETE PLACED PRIOR TO OR WITHOUT SUCH INSPECTION.
4. ALL MATERIAL INSIDE FORMS SHALL BE CLEAN AND FREE OF ALL ROCKS AND OTHER LOOSE DEBRIS. SUB-BASE MATERIAL SHALL BE COMPACTED BY MECHANICAL MEANS.
5. CONCRETE SHALL NOT BE PLACED UNLESS THE AIR TEMPERATURE IS AT LEAST 40 DEGREES FAHRENHEIT (F) IN THE SHADE AND RISING.
6. 1/2" PRE-MOLDED EXPANSION JOINT MATERIAL SHALL BE PLACED AT A MAXIMUM OF 30' INTERVALS ON NEW SIDEWALK, CURB, CURB & GUTTER, AT EACH END OF DRIVEWAY ENTRANCES, AT EACH END OF HANDICAP RAMPS, SOME POINT ON ENTRANCE WALKS AND STEPS ADJUSTMENTS, AND ALONG BUILDINGS AND WALLS WHERE NEW CONCRETE SIDEWALKS ARE PLACED AGAINST THEM.
7. AS DETERMINED BY THE ENGINEER, ANY DEFECTIVE, FAULTY, CRACKED, BROKEN OR GRAFFITIED SIDEWALKS, DRIVEWAYS, HANDICAP RAMPS OR CURB & GUTTER SHALL BE REMOVED AND REPLACED PRIOR TO FINAL ACCEPTANCE. NO ADDITIONAL PAYMENT WILL BE MADE FOR SUCH WORK.
8. ALL CONTROL JOINTS ARE TO BE SAWCUT TO CONFORM WITH THE VIRGINIA TECH DESIGN AND CONSTRUCTION STANDARDS MANUAL.
9. ALL EXPOSED VERTICAL CONCRETE EDGES ARE TO BE ¾" CHAMFERED AND ¼" ROUND OVER.

COMMONWEALTH OF VIRGINIA
10/28/2026
JOHNATHAN C. BRODIE
Lic. No. 053540
PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

THIS DRAWING PREPARED AT THE
ROANOKE OFFICE
109 NORFOLK AVENUE, Suite 100 | ROANOKE, VA 24011
TEL 276.308.8255 WWW.TIMMONS.COM

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REVISION DESCRIPTION	DATE

DATE: 10/28/26
DRAWN BY: M. KUHNS
DESIGNED BY: M. KUHNS
CHECKED BY: J. BRODIE
SCALE: N/A

TIMMONS GROUP

VIRGINIA TECH - FORESTRY RESEARCH OPERATIONS CENTER
BLACKSBURG, VA
GENERAL NOTES

JOB NO. 79501
SHEET NO. C0.1

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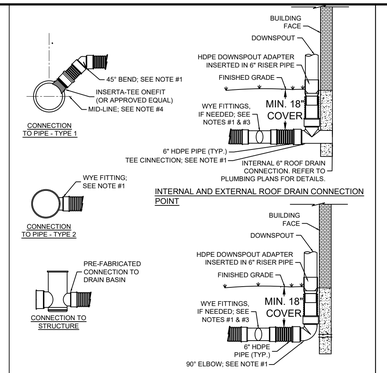


INTERNAL AND EXTERNAL ROOF DRAIN CONNECTION POINT

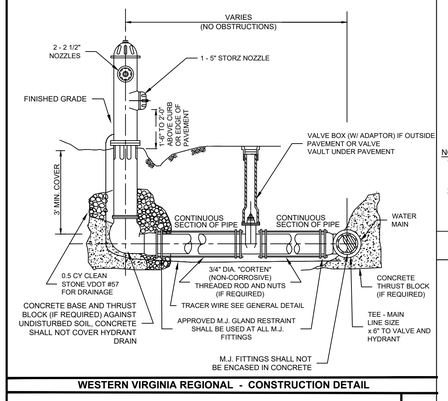
EXTERNAL DOWNSPOUT CONNECTION

NOTES:
1. ALL FITTINGS SHALL BE DUAL WALL, N-12 INJECTION MOLDED, & WATER TIGHT.
2. COORDINATE DOWNSPOUT LOCATIONS AND CONNECTIONS WITH THE ARCHITECTURAL PLANS.
3. INSTALL ADDITIONAL 6" INJECTION MOLDED FITTINGS AS NEEDED TO CONNECT ROOF DRAINS BEFORE MAIN/STRUCTURE.
4. TYPE 1 CONNECTION APPLICABLE WHERE LATERAL ENTERS MAIN ABOVE THE MID-POINT; OTHERWISE, USE TYPE 2.
5. REFER TO PLAN SHEET C401 AND PLUMBING PLANS FOR LOCATION OF INTERNAL AND EXTERNAL ROOFDRAIN CONNECTION POINTS.

ROOF DRAIN CONNECTION DETAIL

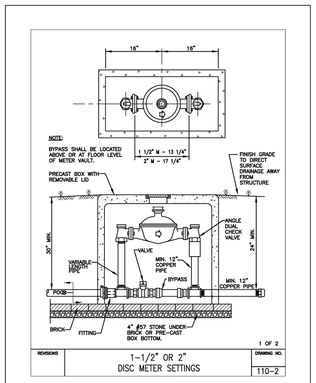
No Scale

1. PUBLIC HYDRANTS SHALL BE PAINTED SILVER WITH AN OIL-BASED PAINT. PRIVATE HYDRANTS SHALL ALSO BE PAINTED SILVER WITH AN OIL-BASED PAINT UNLESS OTHERWISE SPECIFIED BY THE JURISDICTIONAL FIRE MARSHALL.
2. FIRE HYDRANT SHALL BE INSTALLED 2' MIN. AND 4' MAX. FROM BACK OF CURB OR 6' MIN. AND 12' MAX. FROM EDGE OF PAVEMENT WHEN CURB IS NOT PRESENT. FIRE HYDRANT TO BE INSTALLED WITHIN RIGHT-OF-WAY OR EASEMENT LINE. OTHER LOCATIONS ARE ALLOWABLE WITH APPROVAL OF PARTICIPATING UTILITY.
3. AREA AROUND HYDRANT AT A RADIUS OF 4' TO BE LEVEL AND UNOBSTRUCTED.
4. WATERPROOF BAGS OR CUT OF SERVICE RINGS SHALL BE PLACED OVER ALL NEWLY INSTALLED FIRE HYDRANTS.
5. HYDRANT ASSEMBLIES SHALL RESTRAINED WITH APPROVED M.J. GLAND RESTRAINTS. HIGH PRESSURE (OVER 150 PSI) ALSO REQUIRES CONCRETE THRUST BLOCKS & RODS AS SHOWN BELOW.
6. IF DURING CONSTRUCTION THE SEASONAL WATER LEVEL IS NOTED TO BE ABOVE THE DRAIN OUTLETS OF THE PROPOSED HYDRANT, THE PARTICIPATING UTILITY WILL BE NOTIFIED IMMEDIATELY SO THAT THE HYDRANT CAN BE RELOCATED TO A SUITABLE LOCATION, OMITTED, OR THE DRAIN HOLE PLUGGED.
7. SEE TRACER WIRE DETAIL FOR TRACER WIRE INSTALLATION DETAILS REGARDING FIRE HYDRANTS.
8. WHERE HYDRANT LATERAL(S) IS APPROVED BY THE PARTICIPATING UTILITY TO BE LONGER IN LENGTH, MAKING THE CONTINUOUS SECTION OF PIPE ON EACH SIDE OF THE GATE VALVE UNFEASIBLE, RESTRAINED PIPE JOINTS SHALL BE INSTALLED BETWEEN THE TEE AND GATE VALVE.
9. INSTALL GATE VALVE AT MAIN TEE HOWEVER KEEP VALVE OUT OF PAVEMENT IF POSSIBLE.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

FIRE HYDRANT ASSEMBLY — 09/2024 — W-17



REVISIONS	1–1/2" OR 2" DISC METER SETTINGS	DRAWING NO.
		110–2

1 OF 2

NOTES:
1. METERSETTERS PROVIDED FOR 1–1/2" & 2" METERS SHALL HAVE REMOVABLE PACK JOINTS SUITABLE FOR COPPER PIPE.
2. REMOVABLE LID SHALL BE CAST IRON WITH LOCK WINGS, AND SHALL BE SIMILAR TO FORD, MUELLER, OR ANY MCDONALD.
3. BYPASS SHALL BE PROVIDED.
4. METER BOX TO BE AS NEAR TO THE WATER MAIN AS POSSIBLE WITHOUT PLACING BOX IN AREAS SUBJECT TO VEHICULAR TRAFFIC.

MATERIAL FOR 1 1/2" DISC METER WITH 1–1/2" INLET AND 1–1/2" OUTLET

QTY.	DESCRIPTION
1	1–1/2" DISC METER W/GASKETS, BOLTS AND NUTS
1	1–1/2" FLANGED ANGLE VALVE
1	1–1/2" ANGLE DUAL CHECK VALVE
5	1–1/2" BRASS PIPE (2 PCS. 12" LONG; 1 PC. VARIABLE LENGTH; PIPE TO BE CUT AND THREADED BY CONTRACTOR)
2	1–1/2" BRASS ELBOWS
1	1–1/2" BRASS BLIND CAP
1	1–1/2" BY–PASS PIPE AND SHUT–OFF VALVE

MATERIAL FOR 2" DISC METER WITH 2" INLET AND 2" OUTLET

QTY.	DESCRIPTION
1	2" DISC METER W/GASKETS, BOLTS AND NUTS
1	2" FLANGED ANGLE VALVE
1	2" FLANGED ANGLE VALVE
5	2" BRASS PIPE (2 PCS. 12" LONG; 1 PC. VARIABLE LENGTH; PIPE TO BE CUT AND THREADED BY CONTRACTOR)
2	2" BRASS ELBOWS
1	2" BRASS BLIND CAP
1	2" BY–PASS PIPE AND SHUT–OFF VALVE

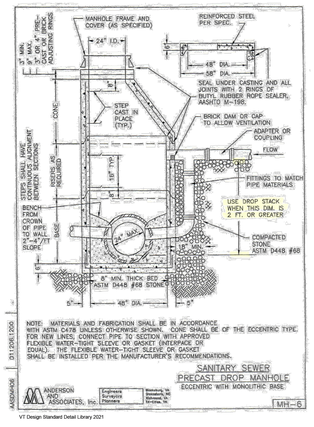
REVISIONS	NOTES AND MATERIALS LIST FOR 1–1/2" OR 2" DISC METER SETTING	DRAWING NO.
		110–3

2 OF 2

NOTE:
1. THE WATER METER SHALL BE 1.5" SHALL BE ONE OF THE THREE WATER METERS LISTED IN THE VIRGINIA TECH CONSTRUCTION AND DESIGN MANUAL (VT CDSM) LISTED IN SECTION 4.7.4.
2. ALL WATER METER MATERIALS AND INSTALLATION SHALL FOLLOW THE VT CSDM. CONTRACTOR TO SUBMIT SHOP DRAWINGS OF WATER METER AND CROCK FOR APPROVAL.

WATER METER

No Scale



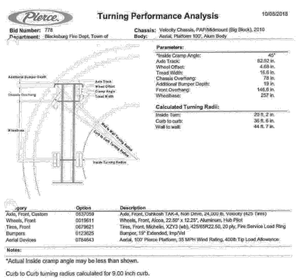
VT Design Standard Detail Library 2021

ADA PARKING SIGN



- Size: 12" wide by 18" tall
- Rust-free engineer-grade prismatic 0.080 aluminum
- White copy on blue field
- Reflective lettering
- Reflective background
- Holes centered top/bottom
- Rated for 7 years
- Fade resistant
- Signs are to be 7'-0" minimum above the finished grade

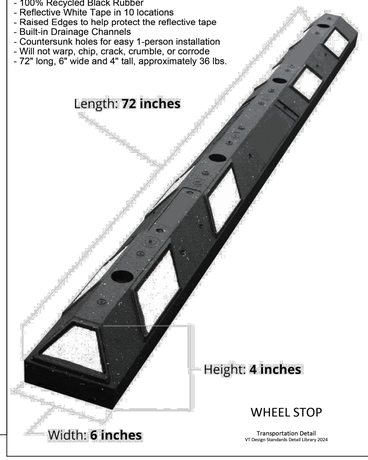
Transportation Detail
VT Design Standards Detail Library 2025



FIRE TRUCK TURNING MOVEMENTS

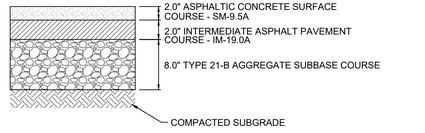
Transportation Detail
VT Design Standard Detail Library 2020

- 100% Recycled Black Rubber
- Reflective White Tape in 10 locations
- Raised Edges to help protect the reflective tape
- Built-in Drainage Channels
- Countersunk holes for easy 1-person installation
- Will not warp, chip, crack, crumble, or corrode
- 72" long, 6" wide and 4" tall, approximately 36 lbs.



WHEEL STOP

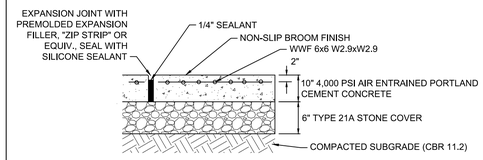
Transportation Detail
VT Design Standards Detail Library 2024



DENOTES HEAVY DUTY ASPHALT PAVEMENT ON PLANS

HEAVY DUTY ASPHALT PAVEMENT SECTION

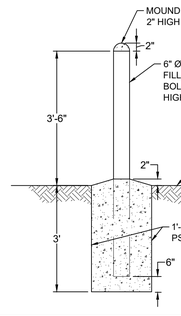
No Scale



DENOTES CONCRETE SERVICE AREA PAVEMENT ON PLANS

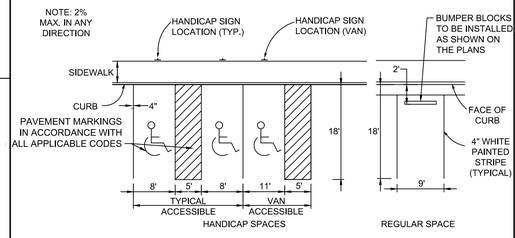
HEAVY DUTY CONCRETE SECTION

No Scale



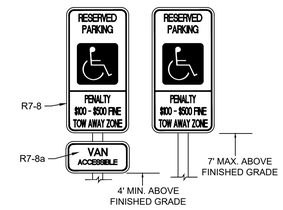
BOLLARD DETAIL

No Scale



TYPICAL PARKING SPACE DETAILS

No Scale

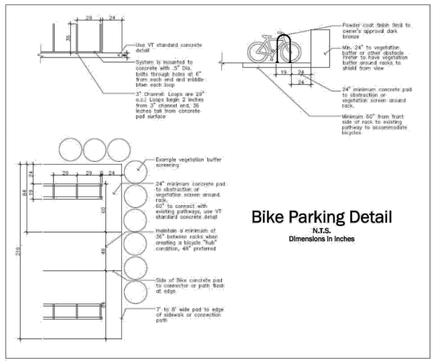


FEDERAL: SIGN FOR THE DISABLED ON 0.80 GAUGE ALUMINUM. COLORS: GREEN BORDER & TEXT, BLUE SYMBOL FOR ACCESSIBILITY, WHITE BACKGROUND.

SPACES SHALL BE IDENTIFIED BY ABOVE GRADE SIGNS AS RESERVED FOR PHYSICALLY DISABLED PERSONS. PROVIDE 12"x18" R7-8 SIGNS WITH 4" INTERNATIONAL WHEELCHAIR SYMBOL AT EACH PARKING SPACE INDICATED ON SITE PLAN. ON THE SAME SIGN, OR A SEPARATE SIGN BELOW, "PENALTY, $100-$500 FINE, TOW AWAY ZONE" MUST BE INCLUDED (VA CODE 36-99.11). BELOW THESE SIGNS, PROVIDE A 12"x6" R7-8a SIGN FOR SPACES IDENTIFIED AS 'VAN' ON THE PLANS. POST SHALL BE 2" SQUARE TUBE WITH TYPE D FOUNDATIONS IN ACCORDANCE WITH VDOT STANDARD STP-1.

PARKING SIGNS FOR THE DISABLED

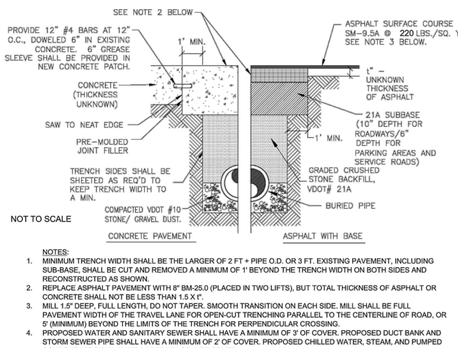
No Scale



Bike Parking Detail

N.T.S.
Dimensions in Inches

Transportation Detail
VT Design Standard Detail Library 2020

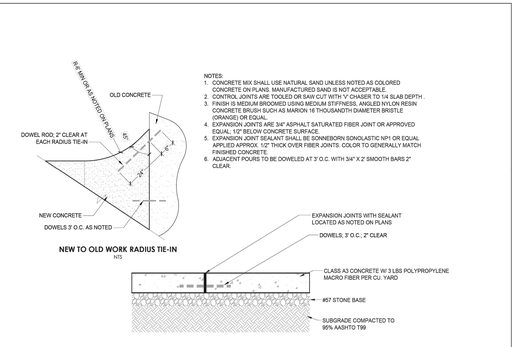


NOT TO SCALE

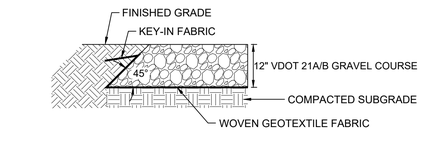
NOTES:
1. MINIMUM TRENCH WIDTH SHALL BE THE LARGER OF 2 FT + PIPE O.D. OR 3 FT. EXISTING PAVEMENT, INCLUDING SUB-BASE, SHALL BE CUT AND REMOVED A MINIMUM OF 1' BEYOND THE TRENCH WIDTH ON BOTH SIDES AND RECONSTRUCTED AS SHOWN.
2. REPLACE ASPHALT PAVEMENT WITH 8" BM-25.0 (PLACED IN TWO LIFTS), BUT TOTAL THICKNESS OF ASPHALT OR CONCRETE SHALL NOT BE LESS THAN 1.5 X 'r'.
3. MILL 1.5" DEEP, FULL LENGTH, DO NOT TAPER. SMOOTH TRANSITION ON EACH SIDE. MILL SHALL BE FULL PAVEMENT WIDTH OF THE TRAVEL LANE FOR OPEN-CUT TRENCHING PARALLEL TO THE CENTERLINE OF ROAD, OR 5' (MINIMUM) BEYOND THE LIMITS OF THE TRENCH FOR PERPENDICULAR CROSSING.
4. PROPOSED WATER AND SANITARY SEWER SHALL HAVE A MINIMUM OF 3' OF COVER. PROPOSED DUCT BANK AND STORM SEWER PIPE SHALL HAVE A MINIMUM OF 2' OF COVER. PROPOSED CHILLED WATER, STEAM, AND PUMPED CONDENSATE SHALL HAVE A MINIMUM OF 4' OF COVER.
5. ALL BACKFILL SHALL BE MINIMUM 95% COMPACTION.
6. CONTRACTOR SHALL MATCH EXISTING PAVEMENT TYPE FOR REPAIRS.
7. INSTALL UNDERGROUND UTILITY MARKER AND TRACER WIRE PER SPECIFICATION SECTION 330526.
8. ALL PAVEMENT MARKINGS DAMAGED OR DESTROYED BY TRENCH EXCAVATION ACTIVITY SHALL BE REPLACED IN ACCORDANCE WITH CURRENT VDOT STANDARDS AND SPECIFICATIONS.

PAVEMENT REPAIR DETAIL

Transportation Detail — VT Design and Construction Standards Detail Library 2023



VT Design Standard Detail Library 2023



DENOTES GRAVEL PATHWAY ON PLANS

GRAVEL PATHWAY SECTION

No Scale

COMMONWEALTH OF VIRGINIA
JOHNATHAN C. BRODIE
Lic. No. 053540
PROFESSIONAL ENGINEER
10/28/2026
NOT FOR CONSTRUCTION

THIS DRAWING PREPARED AT THE
ROANOKE OFFICE
109 NORFOLK AVENUE, Suite 100 | ROANOKE, VA 24011
TEL 276.308.8255 WWW.TIMMONS.COM

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DATE 10/28/26
DRAWN BY M. KUHNS
DESIGNED BY M. KUHNS
CHECKED BY J. BRODIE
SCALE N/A

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VIRGINIA TECH - FORESTRY RESEARCH OPERATIONS CENTER
BLACKSBURG, VA
GENERAL DETAILS

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DEMOLITION PLAN NOTES:

1. A PRE-CONSTRUCTION MEETING IS MANDATORY BEFORE ANY WORK IS DONE AT THE SITE. CONTACT VIRGINIA TECH ENGINEER AND INSPECTOR, AS WELL AS THE PROJECT ENGINEER. COORDINATE WITH THE EROSION AND SEDIMENT CONTROL PLAN AND ITS RESPECTIVE SEQUENCING.
2. THE CONTRACTOR MUST VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO THE START OF CONSTRUCTION. NOTIFY "MISS UTILITY" AT 1-800-552-7001 AT LEAST 48 HOURS PRIOR TO CONSTRUCTION ACTIVITIES. ALSO NOTIFY THE ENGINEER IF THERE IS A CONFLICT.
3. SUBSURFACE UTILITY LOCATIONS SHALL BE PERFORMED THROUGHOUT THE CONSTRUCTION PROJECT AND THE CONTRACTOR SHALL COORDINATE WITH THE VT PM. SEE DCSM SECTION 4.1.
4. COORDINATE WITH THE EROSION AND SEDIMENT CONTROL PLAN FOR INSTALLATION OF STONE FOR CONSTRUCTION ACCESS AND STAGING AREAS, SILT FENCING, TREE PROTECTION, CULVERT INLET PROTECTION, AND INLET PROTECTION AS SHOWN ON THE E&S PLAN.
5. NO LAND DISTURBANCE OUTSIDE THE LIMITS OF CONSTRUCTION IS TO TAKE PLACE UNTIL AUTHORIZED BY THE VIRGINIA TECH ENVIRONMENTAL INSPECTOR.
6. EXISTING FEATURES TO REMAIN THAT ARE DAMAGED BY THE CONTRACTOR MUST BE RESTORED / REPLACED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.
7. CONTRACTOR SHALL TAKE SPECIAL CARE WHEN WORKING AROUND SEWERS, ELECTRICAL, AND WATER FACILITIES THAT ARE TO REMAIN TO AVOID DAMAGING THE UTILITY.
8. IF ANY UTILITIES ARE DISCOVERED THAT ARE NOT SHOWN ON THE DRAWINGS, CONFIRM THE UTILITY IS NOT ACTIVE PRIOR TO ABANDONMENT / REMOVAL. NOTIFY THE ENGINEER IF THERE IS A CONFLICT.
9. MINIMAL CLEARING AND GRUBBING TO BE PREFORMED IN ORDER TO INSTALL E&S PHASE I PERIMETER CONTROLS. THIS INCLUDES CONSTRUCTION ENTRANCE, TREE PROTECTION AND SILT FENCE. SEE SHEET C2.00-C2.03 FOR E&S PHASE I PLANS. UPON COMPLETION OF PERIMETER CONTROLS, PROCEED WITH DEMOLITION PLAN AS INDICATED ON SHEET C2.00.
10. CONTRACTOR TO COORDINATE WITH VIRGINIA TECH ABOUT REMOVAL OF EXISTING CONTAINERS, DUMPSTER, DEAD TREES & GRAVEL AREA.
11. TBR = TO BE REMOVED

THIS TOPOGRAPHIC SURVEY WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF JOSEPH C. MEDLEY FROM AN ACTUAL GROUND SURVEY MADE UNDER MY SUPERVISION; THAT THE ORIGINAL DATA WAS OBTAINED ON THE FOLLOWING DATES: JULY 15-16, 2026. THIS BASE-MAP AND DIGITAL GEOSPATIAL DATA INCLUDING METADATA MEETS MINIMUM ACCURACY STANDARDS UNLESS OTHERWISE NOTED.

LEGEND

- WATER VALVE
- TELCOM / FIBER VAULT
- SANITARY MANHOLE (MHS)
- CLEAN-OUT
- LAMP / LIGHT POLE
- UTILITY / POWER POLE
- STORM MANHOLE (MHD)
- STORM INLET W/ GRATE
- ROOF DRAIN / DOWNSPOUT
- UNDERGROUND GAS UTILITY
- UNDERGROUND TELCOM / FIBER
- WATER LINE
- SANITARY SEWER PIPE
- OVERHEAD POWER UTITLITY
- EDGE OF PAVEMENT (EP)
- CONCRETE SIDEWALK SIGN
- CONIFEROUS TREE
- DECIDUOUS TREE
- TREE REMOVAL (BY HAND)
- GRAVEL REMOVAL
- ASPHALT REMOVAL

NAD 83

SCALE 1"=10'
0 10' 20'

COMMONWEALTH OF VIRGINIA
10/28/2026
JOHNATHAN C. BRODIE
Lic. No. 053540
PROFESSIONAL ENGINEER

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DRAWN BY M. KUHNS
DESIGNED BY M. KUHNS
CHECKED BY J. BRODIE
SCALE 1"=10'

TIMMONS GROUP

VIRGINIA TECH - FORESTRY RESEARCH OPERATIONS CENTER
BLACKSBURG, VA
EXISTING CONDITIONS AND DEMOLITION PLAN

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VIRGINIA TECH GENERAL EROSION AND SEDIMENT CONTROL NOTES

ES-1 – UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE VIRGINIA TECH ANNUAL STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT AND THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH), LATEST EDITIONS. THE CONTRACTOR CAN USE MANUFACTURED EROSION AND SEDIMENT CONTROL MEASURES WITH PRIOR APPROVAL FROM VTSID.

ES-2 – VIRGINIA TECH SITE AND INFRASTRUCTURE DEVELOPMENT SHALL 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 – THE NARRATIVE PREPARED FOR THE PLAN IS PART OF THE PLANS AND SHALL BE USED IN CONJUNCTION WITH THE PLANS. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN AND NARRATIVE AND THE RELEVANT VESCH SECTIONS, SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.

ES-5 – PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN THE 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 AND SEDIMENT CONTROL PLAN TO VIRGINIA TECH SITE AND INFRASTRUCTURE DEVELOPMENT FOR REVIEW AND APPROVAL.

ES-6 – INSTALL ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES AS REQUIRED TO PREVENT SEDIMENT-LADEN RUNOFF FROM LEAVING THE SITE, AND AS DETERMINED BY VIRGINIA TECH SITE AND INFRASTRUCTURE DEVELOPMENT.

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 – FOR THE PURPOSES OF PLAN APPROVAL, THE ENGINEER OF RECORD FOR THE EROSION AND SEDIMENT CONTROL PLAN AND NARRATIVE WILL BE THE CERTIFIED RESPONSIBLE LAND DISTURBER FOR THIS PROJECT UP TO THE AWARD OF THE CONTRACT. UPON AWARD OF THE CONTRACT, THE CONTRACTOR SHALL HAVE A CERTIFIED RESPONSIBLE LAND DISTURBER FOR THIS PROJECT.

ES-10 – THE RESPONSIBLE LAND DISTURBER SHALL BE ADDED TO THE PLAN AT THE PRE-CONSTRUCTION CONFERENCE.

ES-11 – THE RESPONSIBLE LAND DISTURBER SHALL INSPECT EROSION AND SEDIMENT CONTROL MEASURES AND PRACTICES FOR PROPER INSTALLATION AND DEFICIENCIES IMMEDIATELY AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT, AT LEAST DAILY DURING PROLONGED RAINFALL, AND BI-WEEKLY WHEN NO RAINFALL EVENTS OCCUR. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MADE IMMEDIATELY.

ES-12 – AS THE EROSION AND SEDIMENT CONTROL PLAN APPROVING AUTHORITY, VIRGINIA TECH SITE AND INFRASTRUCTURE DEVELOPMENT MAY REVISE THE APPROVED PLAN IF INSPECTION REVEALS THAT THE APPROVED PLAN IS INADEQUATE TO SATISFY APPLICABLE STANDARDS.

ES-13 – STORE EXCAVATED TOPSOIL IN TOPSOIL STOCKPILES WITHIN THE LIMITS OF CONSTRUCTION WITH SILT FENCE ON THE DOWNSLOPE SIDE IN ACCORDANCE WITH THE VESCH, LATEST EDITION.

ES-14 – ALL DISTURBED AREAS NOT OTHERWISE HARDSCAPED AND STABILIZED ARE TO BE SEEDED IN ACCORDANCE WITH THE SEEDING SPECIFICATIONS IN THE VESCH, LATEST EDITION.

ES-15 – SEED AND MULCH ALL SOIL STOCKPILES AND MATERIALS LEFT UNDISTURBED IN ACCORDANCE WITH THE VESCH, LATEST EDITION: VTSID: EROSION AND SEDIMENT CONTROL NOTES V1-19.

ES-16 – ALL CULVERT INLET PROTECTION AND STORM DRAIN INLET PROTECTION MUST REMAIN IN PLACE UNTIL FINAL UPSLOPE STABILIZATION IS ACHIEVED.

ES-17 – THE FOLLOWING EROSION AND SEDIMENT CONTROL MEASURES REQUIRE CERTIFICATION BY THE DESIGN PROFESSIONAL UPON INSTALLATION AND PRIOR TO COMMENCING GENERAL SITE CONSTRUCTION. IF THESE MEASURES ARE NOT UTILIZED THEN THE PLAN SHALL STATE THAT FACT.

A. SEDIMENT BASIN
B. CONVEYANCE CHANNELS
C. DETENTION BASINS SERVING AS SEDIMENT BASINS

ES-18 – SOIL TEST SHALL BE DONE BY VIRGINIA TECH EXTENSION SERVICE OR OTHER APPROVED TESTING SERVICES PRIOR TO SEEDING. THE SOIL TEST SHOULD DETERMINE A MINIMUM OF THE FOLLOWING: MECHANICAL ANALYSIS; MAGNESIUM, POTASSIUM, AND PHOSPHORUS LEVELS; SOLUBLE SALT LEVEL; PH; ORGANIC MATTER AND RECOMMENDED AMENDMENTS. SOIL TESTS SHALL BE TAKEN FROM EACH CONTIGUOUS PLANTING AREA. THE SOIL TEST RESULTS AND RECOMMENDED AMENDMENTS SHALL BE SUBMITTED TO THE PROFESSIONAL AND VTSID. NUTRIENTS LISTED SHALL BE EVALUATED IN TERMS OF "PLANTS AVAILABLE" NUTRIENTS.

ES-19 – TOPSOIL SHALL BE OBTAINED FROM IN-SITE OR OFF-SITE SOURCES, AS APPLICABLE TO PROVIDE 6-INCH MINIMUM DEPTH OVER ALL AREAS DISTURBED DURING CONSTRUCTION. TOPSOIL SHALL BE FERTILE, FRIABLE LOAM, CONTAINING NOT LESS THAN 2% BY WEIGHT OF FINELY DIVIDED, DECOMPOSED VEGETABLE MATTER. TOPSOIL SHALL BE FREE OF SUBSOIL, CLAY LUMPS, BRUSH, WEEDS, ROOTS LARGER THAN ½ INCH DIAMETER, STONES LARGER THAN ½ INCH DIAMETER, AND OTHER MATERIAL TOXIC OR HARMFUL TO GROWTH. TOPSOIL SHALL BE FREE OF PLANT PARTS OR BERMUDAGRASS, QUACKGRASS, JOHNSONGRASS, MUGWORT, NUTSEDGE, POISON IVY, CANADIAN THISTLE OR OTHERS AS SPECIFIED.

A. TOPSOIL SHALL MEET ACCEPTABLE SOIL TEST LEVELS AS SPECIFIED IN SOIL TESTING. A CERTIFICATE OF SOIL TEST ANALYSIS MUST BE SUBMITTED TO THE PROFESSIONAL FOR APPROVAL BEFORE ANY TOPSOIL IS DELIVERED TO THE PROJECT.

B. TOPSOIL SALVAGED FROM THE SITE SHALL BE TESTED AS SPECIFIED IN SOIL TESTING. IF TESTS SHOW DEFICIENCIES, THE SOIL SHALL BE AMENDED TO COMPLY WITH ACCEPTABLE SOIL TEST RESULTS OR REPLACED WITH ACCEPTABLE SOIL.

C. TOPSOIL INSTALLED ON-GRADE SHALL ATTEMPT TO MATCH EXISTING SOIL TEXTURE EXCEPT FOR SITUATIONS WHERE A CLAY SUBSOIL EXISTS WHERE A CLAY SUBSOIL EXISTS, USE LOAN OR SILT LOAM TOPSOILS.

ES-20 – CONTRACTOR IS RESPONSIBLE FOR GETTING APPROVAL OF GRASS SEED MIXTURE FROM VTSID TO VERIFY COMPLIANCE WITH VESCH SPECIFICATION 3.32. THIS APPROVAL IS REQUIRED PRIOR TO FINAL SITE STABILIZATION.

EROSION AND SEDIMENT CONTROL NARRATIVE

PROJECT DESCRIPTION
THIS PROJECT WILL INCLUDE THE CONSTRUCTION OF A SINGLE STORY BUILDING HOUSING LAB THAT INCLUDES OFFICE, GARAGE, AND STORAGE SPACES. CONCRETE PARKING SPACES, GRAVEL DRIVE AISLES AND ASSOCIATED UTILITIES ARE ALSO PROPOSED. THE PROPOSED IMPROVEMENTS COMPRISE APPROXIMATELY 0.46 ACRES.

ADJACENT PROPERTY
THE PROJECT SITE IS BOUND TO THE NORTH BY A WOODED AREA AND TRAIL/PRIVATE ACCESS ROAD. BEYOND THE WOODED AREA ARE FARMING FIELDS THAT RUN ALONG THE HUCKLEBERRY TRAIL. THE SITE IS BOUND TO THE EAST BY PLANTATION ROAD NW. EAST OF THE SITE IS THE BSE RESEARCH BUILDING. THE SITE IS BOUND TO THE WEST BY INVENTIVE LANE. WEST OF THE SITE IS UNMANNED SYSTEMS LABORATORY BUILDINGS.

EXISTING SITE CONDITIONS
THE EXITING SITE IS OCCUPIED BY A GRAVEL DRIVEWAY, STORAGE CONTAINERS AND OTHER LARGE MISCELLANEOUS EQUIPMENT (TO BE REMOVED). DRAINAGE ON THE SITE IS DIVIDE INTO TWO AREAS. A PORTION OF THE PROPERTY CLOSEST TO INVENTIVE LANE FLOWS INTO A ROAD SWALE ALONG INVENTIVE LINE AND THEN EVENTUALLY INTO AN EXISTING INLET DOWN STREAM. THE REST OF THE SITE FLOWS FROM THE NORTH TO SOUTH AND OUTFALLS INTO AN EXISTING CULVERT LOCATED BEYOND THE REAR SIDE OF THE PROPERTY.

OFF-SITE AREAS
ALL MATERIALS RESULTING FROM DEMOLITION WORK, EXCEPT AS INDICATED OR SPECIFIED OTHERWISE, SHALL BECOME THE PROPERTY OF THE CONTRACTOR, SHALL BE REMOVED FROM THE PROPERTY, AND SHALL BE DISPOSED OF IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS. EXCESS CUT THAT IS HAULED OFFSITE SHALL BE HAULED TO A SITE WITH AN EXISTING LAND DISTURBANCE PERMIT.

CRITICAL EROSION AREAS
EARLY ESTABLISHMENT AND PROPER MAINTENANCE OF PERIMETER CONTROLS WILL PROVIDE SEDIMENT CONTROL. ALL SLOPES STEEPER THAN 3:1 SHALL BE STABILIZED WITH BLANKET MATTING. THE CONTRACTOR SHALL MAKE REPAIRS AND / OR ADJUSTMENTS TO THE PROPOSED ON-SITE EROSION AND SEDIMENT CONTROL MEASURES AS REQUIRED TO ESTABLISH STABILIZATION ON THESE SLOPES.

STORMWATER RUNOFF CONSIDERATIONS
IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAKE SURE ALL EROSION AND SEDIMENT CONTROL DEVICES ARE MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE VSMH.

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 CURRENT ADDITIONS OF THE VIRGINIA TECH ANNUAL STANDARDS AND SPECIFICATIONS AND THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK. THE MINIMUM STANDARDS OF THE VIRGINIA STORMWATER MANAGEMENT HANDBOOK *(VSMH)* SHALL BE ADHERED TO UNLESS OTHERWISE WAIVED OR APPROVED BY A VARIANCE BY LOCAL AUTHORITIES HAVING JURISDICTION.

EROSION AND SEDIMENT CONTROL MAINTENANCE
ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED IN ACCORDANCE WITH VSMH AND THE CONSTRUCTION SEQUENCE, INCLUDING THE INSPECTION OF ALL MEASURES AFTER ALL RAIN EVENTS.

STRUCTURAL PRACTICES:
1. TEMPORARY CONSTRUCTION ENTRANCE - C-SCM-03 A TEMPORARY CONSTRUCTION ENTRANCE SHALL BE PROVIDED AT THE LOCATION INDICATED ON THE PLANS. IT IS IMPERATIVE THAT THIS MEASURE BE MAINTAINED THROUGHOUT CONSTRUCTION. ITS PURPOSE IS TO REDUCE THE AMOUNT OF MUD TRANSPORTED ONTO PAVED PUBLIC ROADS BY MOTOR VEHICLES OR RUNOFF.
2. REINFORCED SILT FENCE - C-PCM-04 REINFORCED SILT FENCE SEDIMENT BARRIERS SHALL BE INSTALLED DOWNSLOPE OF AREAS WITH MINIMAL GRADES TO FILTER SETTLEMENT LADEN RUNOFF FROM SHEET FLOW AS INDICATED. ITS PURPOSE IS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
3. STORM DRAIN INLET PROTECTION - C-SCM-04 FILTERS SHALL BE PLACED AT THE INLET OF ALL DRAINAGE STRUCTURES AS INDICATED ON PLANS. ITS PURPOSE IS TO PREVENT SEDIMENT FROM ENTERING THE STORM DRAINAGE SYSTEM PRIOR TO PERMANENT STABILIZATION.
4. TREE PROTECTION - C-SSM-01 TEMPORARY FENCING INSTALLED AROUND THE PERIMETER OF THE SITE TO PROTECT TREES TO REMAIN.
5. DUST CONTROL - C-SCM-01 DUST CONTROL IS TO BE USED THROUGH CONSTRUCTION IN AREAS SUBJECT TO SURFACE AND AIR MOVEMENT TO MINIMIZE AIRBORNE MATERIALS FROM LEAVING THE SITE.
6. CULVERT INLET PROTECTION - C-SCM-05 A SEDIMENT FILTER BARRIER LOCATED AT THE INVERTS OF CULVERTS TO PREVENT SEDIMENT FROM ENTERING OR ACCUMULATING IN CULVERTS AND ASSOCIATED DRAINAGE SYSTEMS.
7. SAFETY FENCE - CPCM-01 A TEMPORARY PROTECTIVE BARRIER TO PREVENT ACCESS TO A LAND-DISTURBING ACTIVITY OR EROSION CONTROL MEASURE

VEGETATIVE PRACTICES:
8. TOPSOILING - C-SSM-02 TOPSOIL WILL BE STRIPPED FROM AREAS TO BE GRADED AND STOCKPILED FOR LATER USE. STOCKPILE LOCATIONS SHALL BE LOCATED ON-SITE AND ARE TO BE STABILIZED WITH TEMPORARY VEGETATION. ENSURE THE TOPSOILING IS IN COMPLIANCE WITH DCSM 4.3.1.
9. TEMPORARY SEEDING - C-SSM-09 ALL DENUDED AREAS WHICH WILL BE LEFT DORMANT FOR MORE THAN 14 DAYS SHALL BE SEEDED WITH FAST GERMINATING TEMPORARY VEGETATION IMMEDIATELY FOLLOWING GRADING OF THOSE AREAS. SELECTION OF THE SEED MIXTURE SHALL DEPEND ON THE TIME OF YEAR IT IS APPLIED.
10. PERMANENT SEEDING - C-SSM-10 FOLLOWING GRADING ACTIVITIES, ESTABLISH PERENNIAL VEGETATIVE COVER BY PLANTING SEED TO REDUCE EROSION, STABILIZE DISTURBED AREAS, AND ENHANCE NATURAL BEAUTY.
11. MULCHING - C-SSM-11 APPLICATION OF PLANT RESIDUES OR OTHER SUITABLE MATERIALS TO THE SOIL SURFACE. AREAS WHICH HAVE BEEN PERMANENTLY SEEDED SHOULD BE MULCHED IMMEDIATELY FOLLOWING SEEDING.

MANAGEMENT STRATEGIES
1. PROVIDE SEDIMENT TRAPPING MEASURES SUCH AS SILT FENCE AS A FIRST STEP IN GRADING, SEED AND MULCH IMMEDIATELY FOLLOWING INSTALLATION.
2. PROVIDE TEMPORARY SEEDING OR OTHER STABILIZATION IMMEDIATELY AFTER GRADING.
3. ISOLATE TRENCHING FOR UTILITIES AND DRAINAGE FROM DOWNSTREAM CONVEYANCES IN ORDER TO MINIMIZE PERIMETER CONTROLS.
4. ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE MAINTAINED UNTIL THEY ARE NO LONGER REQUIRED TO COMPLY WITH THE CONTRACT DOCUMENTS OR STATE LAW.

PERMANENT STABILIZATION
ALL NON-PAVED AREAS DISTURBED BY CONSTRUCTION SHALL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY FOLLOWING FINISHED GRADING. SEEDING SHALL BE IN ACCORDANCE WITH LOCAL GUIDELINES. TOPSOIL AND MULCH (STRAW OR FIBER) SHALL BE USED ON ALL SEEDED SURFACES. IN ALL SEEDING OPERATIONS SEED, FERTILIZER AND LIME SHALL BE APPLIED PRIOR TO MULCHING. INSTALL BLANKET MATTING ON ALL SLOPES 4:1 AND STEEPER.

SEQUENCE OF INSTALLATION
PHASE 1
1. A PRE-CONSTRUCTION MEETING IS WILL BE REQUIRED. CONTACT VIRGINIA TECH TO SET UP THE MEETING AT LEAST FIVE (5) BUSINESS DAYS PRIOR TO STARTING CONSTRUCTION.
2. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING ALL APPLICABLE PERMITS ARE IN PLACE PRIOR TO STARTING CONSTRUCTION. PRIOR TO ANY LAND DISTURBING ACTIVITY, CONTRACTOR SHALL PROVIDE THE NAME, CERTIFICATION INFORMATION, AND CONTACT INFORMATION OF THE DESIGNATED RESPONSIBLE LAND DISTURBER (RLD) TO THE APPROPRIATE AUTHORITIES.
3. ALL ITEMS OF WORK NECESSARY TO COMPLETE THIS PROJECT SHALL BE IN COMPLIANCE WITH ALL LOCAL, STATE, AND FEDERAL CODES.
4. PRIOR TO STARTING CONSTRUCTION OR EARTHWORK ACTIVITIES, INITIAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MADE OPERATIONAL AS SHOWN ON THE PLANS.
   4.1. INSTALL CONSTRUCTION ENTRANCE
   4.2. INSTALL PERIMETER MEASURES INCLUDING, BUT NOT LIMITED TO, SILT FENCE, TREE PROTECTION, & SAFETY FENCE.
   4.3. INSTALL INLET PROTECTION ON EXISTING INLETS. INSTALL CULVERT INLET PROTECTION ON EXISTING CULVERTS
   4.4. SEED ALL DENUDED AREAS PER VSMH STANDARDS.
5. AFTER ALL MEASURES ARE INSTALLED, COORDINATE INSPECTION WITH VIRGINIA TECH INSPECTOR. DEMOLISH/REMOVE EXISTING FEATURES AS SHOWN IN THE PLAN SET. BEGIN ROUGH GRADING

PHASE 2
1. BEGIN CLEARING AND GRUBBING OF THE SITE. TOPSOIL SHOULD BE STOCKPILED AND SAVED FOR USE DURING FINAL SITE GRADING. CLEARING AND GRUBBING ACTIVITIES SHOULD BE PERFORMED AS NEEDED FOR THE NEXT CONSTRUCTION ACTIVITY AND NOT ACROSS THE ENTIRE SITE AT ONCE. ALL EXCAVATED MATERIAL AND DEBRIS SHALL BE STOCKPILED OR DISPOSED OF IN A LAWFUL MANNER. GENERAL CONSTRUCTION WASTE MUST BE DISPOSED OF AT A LICENSED, PERMITTED MSW LANDFILL AND THE CONTRACT SHALL MAINTAIN RECORDS OF WASTE DISPOSAL. REFER TO THE VIRGINIA TECH DESIGN AND CONSTRUCTION STANDARD MANUAL: "CONSTRUCTION WASTE AND DISPOSAL" FOR MORE INFORMATION.
2. ALL STOCKPILES SHALL BE SURROUNDED BY SILT FENCE AND SEEDED IN COMPLIANCE WITH MS-2.
3. APPLY TEMPORARY SEEDING, DUST CONTROL AND MULCHING AS NECESSARY.
4. MAINTAIN ALL PERIMETER EROSION AND SEDIMENT CONTROL MEASURES. EROSION AND SEDIMENTATION CONTROLS SHALL BE MAINTAINED UNTIL SUCH A TIME AS A VEGETATIVE COVER IS ESTABLISHED OR HARDSCAPE IS INSTALLED ON ALL AREAS UPHILL OF THE MEASURES.
5. INSTALL ALL ADDITIONAL MEASURES SHOWN ON THE PLANS AND AS DEEMED NECESSARY THROUGH INSPECTIONS BY THE RLD, VIRGINIA TECH, OR THE ENGINEER.
6. INSTALL INLET PROTECTION ON ALL INLETS AS THEY ARE INSTALLED.
7. FINALIZE ROUGH GRADING ACTIVITIES AND COMPLETE UTILITY INSTALLATION. APPLY PERMANENT SEEDING, TOPSOIL, AND STRAW MULCHING TO ALL DISTURBED AREAS AS THEY REACH FINISHED GRADE.
8. PROCEED WITH BUILDING AND HARDSCAPE CONSTRUCTION.
9. INSTALL INLET PROTECTION AS INLETS ARE INSTALLED.
10. FINE GRADE PROJECT AREA. APPLY PERMANENT SOIL STABILIZATION TO THESE AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS ACHIEVED.
11. ALL STORMWATER PIPES AND STRUCTURES SHALL BE CLEANED OR BLOWN OUT OF ALL SEDIMENT BUILD UP PRIOR TO THE CONNECTION TO THE EXISTING INLET AS SHOWN ON THE PLANS.
12. APPLY PERMANENT SEEDING, TOPSOIL, AND STRAW MULCHING TO ALL DISTURBED AREAS AS THEY REACH FINISH GRADE.
13. ONCE THE SITE WORK IS FINALIZED AND ALL FINAL STABILIZATION MEASURES ARE IN PLACE, NOTIFY THE INSPECTORS FOR FINAL INSPECTION, ONCE APPROVAL IS OBTAINED FROM THE INSPECTOR AND ALL UPSTREAM AREAS HAVE ESTABLISHED VEGETATION, ALL REMAINING EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED IN 30 DAYS.
14. REMOVE ALL EQUIPMENT, CONSTRUCTION MATERIALS, AND DEBRIS FROM THE SITE AND PROVIDE ALL APPROPRIATE INFORMATION NEEDED TO CLOSE OUT THE LAND DISTURBANCE PERMIT, INCLUDING ASSISTING IN PREPARING CERTIFICATION DOCUMENTS.

MAINTENANCE
ALL MEASURES SHALL BE INSPECTED WEEKLY AND AFTER EACH RAINFALL EVENT. ANY DAMAGE OR CLOGGING TO STRUCTURAL MEASURES SHALL BE REPAIRED IMMEDIATELY. SILT TRAPS SHALL BE CLEANED WHEN 50% OF THE WET STORAGE VOLUME IS FILLED WITH SEDIMENT. ALL SEEDED AREAS SHALL BE RESEEDED WHEN NECESSARY TO ACHIEVE A GOOD STAND OF GRASS. SILT FENCE AND DIVERSION DYKES WHICH COLLECT SEDIMENT TO HALF THEIR HEIGHT MUST BE CLEANED AND REPAIRED IMMEDIATELY.

MINIMUM STANDARDS:

AN EROSION AND SEDIMENT CONTROL PROGRAM ADOPTED BY A DISTRICT OR LOCALITY MUST BE CONSISTENT WITH THE FOLLOWING CRITERIA, TECHNIQUES AND METHODS:

MS-1. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO DENUDED AREAS WITHIN SEVEN DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED WITHIN SEVEN DAYS TO DENUDED AREAS THAT MAY NOT BE AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN 14 DAYS. PERMANENT STABILIZATION SHALL BE APPLIED TO AREAS THAT ARE TO BE LEFT DORMANT FOR MORE THAN ONE YEAR.
SEE EROSION AND SEDIMENT CONTROL NARRATIVE, THIS SHEET

MS-2. DURING CONSTRUCTION OF THE PROJECT, SOIL STOCKPILES AND BORROW AREAS SHALL BE STABILIZED OR PROTECTED WITH SEDIMENT TRAPPING MEASURES. THE APPLICANT IS RESPONSIBLE FOR THE TEMPORARY PROTECTION AND PERMANENT STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS BORROW AREAS AND SOIL INTENTIONALLY TRANSPORTED FROM THE PROJECT SITE.
SEE EROSION AND SEDIMENT CONTROL NARRATIVE, THIS SHEET

MS-3. A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED ON DENUDED AREAS NOT OTHERWISE PERMANENTLY STABILIZED. PERMANENT VEGETATION SHALL NOT BE CONSIDERED ESTABLISHED UNTIL A GROUND COVER IS ACHIEVED THAT IS UNIFORM, MATURE ENOUGH TO SURVIVE AND WILL INHIBIT EROSION.
SEE EROSION AND SEDIMENT CONTROL NARRATIVE, THIS SHEET

MS-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.
NOT APPLICABLE TO THIS PROJECT.

MS-5. STABILIZATION MEASURES SHALL BE APPLIED TO EARTHEN STRUCTURES SUCH AS DAMS, DIKES AND DIVERSIONS IMMEDIATELY AFTER INSTALLATION.
DIVERSION DIKES WILL BE STABILIZED IMMEDIATELY AFTER CONSTRUCTION.

MS-6. SEDIMENT TRAPS AND SEDIMENT BASINS SHALL BE DESIGNED AND CONSTRUCTED BASED UPON THE TOTAL DRAINAGE AREA TO BE SERVED BY THE TRAP OR BASIN.
A. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT TRAP SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA AND THE TRAP SHALL ONLY CONTROL DRAINAGE AREAS LESS THAN THREE ACRES.
B. SURFACE RUNOFF FROM DISTURBED AREAS THAT IS COMPRISED OF FLOW FROM DRAINAGE AREAS GREATER THAN OR EQUAL TO THREE ACRES SHALL BE CONTROLLED BY A SEDIMENT BASIN. THE MINIMUM STORAGE CAPACITY OF A SEDIMENT BASIN SHALL BE 134 CUBIC YARDS PER ACRE OF DRAINAGE AREA. THE OUTFALL SYSTEM SHALL, AT A MINIMUM, MAINTAIN THE STRUCTURAL INTEGRITY OF THE BASIN DURING A 25-YEAR STORM OF 24-HOUR DURATION. RUNOFF COEFFICIENTS USED IN RUNOFF CALCULATIONS SHALL CORRESPOND TO A BARE EARTH CONDITION OR THOSE CONDITIONS EXPECTED TO EXIST WHILE THE SEDIMENT BASIN IS UTILIZED.
NOT APPLICABLE TO THIS PROJECT.

MS-7. CUT AND FILL SLOPES SHALL BE DESIGNED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. SLOPES THAT ARE FOUND TO BE ERODING EXCESSIVELY WITHIN ONE YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADDITIONAL SLOPE STABILIZING MEASURES UNTIL THE PROBLEM IS CORRECTED.
SITE IS DESIGNED TO HAVE A MAXIMUM PROPOSED SLOPE OF 3:1 TO MINIMIZE EXCESSIVE EROSION.

MS-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.
ALL CONCENTRATED FLOW IS DIRECTED TO AN APPROPRIATE EROSION OR PERMANENT DRAINAGE STRUCTURE AND WILL NO FLOW DIRECTLY DOWN CUT OR FILL SLOPES.

MS-9. WHENEVER WATER SEEPS FROM A SLOPE FACE, ADEQUATE DRAINAGE OR OTHER PROTECTION SHALL BE PROVIDED.
NOT ANTICIPATED TO BE APPLICABLE TO THIS PROJECT. CONTRACTOR TO NOTIFY DESIGN ENGINEER IF SLOPE SEEPAGE IS ENCOUNTERED DURING CONSTRUCTION.

MS-10. ALL STORM SEWER INLETS THAT ARE MADE OPERABLE DURING CONSTRUCTION SHALL BE PROTECTED SO THAT SEDIMENT-LADEN WATER CANNOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR OTHERWISE TREATED TO REMOVE SEDIMENT.
INLET PROTECTION SHALL BE ADDED TO ALL NEW INLETS BEFORE BRINGING THEM ONLINE. SEE E&S PHASE 2 ON SHEET C2.3.

MS-11. BEFORE NEWLY CONSTRUCTED STORMWATER CONVEYANCE CHANNELS OR PIPES ARE MADE OPERATIONAL, ADEQUATE OUTLET PROTECTION AND ANY REQUIRED TEMPORARY OR PERMANENT CHANNEL LINING SHALL BE INSTALLED IN BOTH THE CONVEYANCE CHANNEL AND RECEIVING CHANNEL.
OUTLET PROTECTION TO BE INSTALLED AT ALL OUTFLOW POINTS. SEE E&S PHASE 2 ON SHEET C2.3.

MS-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.
NOT APPLICABLE TO THIS PROJECT.

MS-13. WHEN A LIVE WATERCOURSE MUST BE CROSSED BY CONSTRUCTION VEHICLES MORE THAN TWICE IN ANY SIX-MONTH PERIOD, A TEMPORARY VEHICULAR STREAM CROSSING CONSTRUCTED OF NONERODIBLE MATERIAL SHALL BE PROVIDED.
NOT APPLICABLE TO THIS PROJECT.

MS-14. ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS PERTAINING TO WORKING IN OR CROSSING LIVE WATERCOURSES SHALL BE MET.
NOT APPLICABLE TO THIS PROJECT.

MS-15. THE BED AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY AFTER WORK IN THE WATERCOURSE IS COMPLETED.
NOT APPLICABLE TO THIS PROJECT.

MS-16. UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA:
A. NO MORE THAN 500 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME.
B. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.
C. EFFLUENT FROM 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.
D. MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION.
E. RESTABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THESE REGULATIONS.
F. APPLICABLE SAFETY REGULATIONS SHALL BE COMPLIED WITH.
ALL UNDERGOUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH MS-16

MS-17. WHERE CONSTRUCTION VEHICLE ACCESS ROUTES INTERSECT PAVED OR PUBLIC ROADS, PROVISIONS SHALL BE MADE TO MINIMIZE THE TRANSPORT OF SEDIMENT BY VEHICULAR TRACKING ONTO THE PAVED SURFACE. WHERE SEDIMENT IS TRANSPORTED ONTO A PAVED OR PUBLIC ROAD SURFACE, THE ROAD SURFACE SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM THE ROADS BY SHOVELING OR SWEEPING AND TRANSPORTED TO A SEDIMENT CONTROL DISPOSAL AREA. STREET WASHING SHALL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER. THIS PROVISION SHALL APPLY TO INDIVIDUAL DEVELOPMENT LOTS AS WELL AS TO LARGER LAND-DISTURBING ACTIVITIES.
SEE CONSTRUCTION ENTRANCE LOCATION ON SHEET C2.2 & C3.3

MS-18. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED BY THE 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 SEDIMENTATION.
SEE EROSION AND SEDIMENT CONTROL NARRATIVE, THIS SHEET

MS-19. PROPERTIES AND WATERWAYS DOWNSTREAM FROM DEVELOPMENT SITES SHALL BE PROTECTED FROM SEDIMENT DEPOSITION, EROSION AND DAMAGE DU

GENERAL CONSTRUCTION NOTES FOR EROSION AND SEDIMENT CONTROL

1. 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.
2. ALL EROSION AND SEDIMENT CONTROL MEASURES 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.
3. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CLEARING.
4. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.
5. PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFF-SITE BORROW OR WASTE AREAS), THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE PLAN APPROVING AUTHORITY.
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.
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.
8. DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED INTO AN APPROVED FILTERING DEVICE.
9. THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUNOFF-PRODUCING EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.
10. ALL FILL MATERIAL TO BE TAKEN FROM AN APPROVED, DESIGNATED BORROW AREA.
11. ALL WASTE MATERIALS SHALL BE TAKEN TO AN APPROVED WASTE AREA. EARTH FILL SHALL BE INERT MATERIALS ONLY, FREE OF ROOTS, STUMPS, WOOD, RUBBISH, AND OTHER DEBRIS.
12. BORROW OR WASTE AREAS ARE TO BE RECLAIMED WITHIN 7 DAYS OF COMPLETION PER ZONING ORDINANCE SECTION 5.1.28.
13. ALL INERT MATERIALS SHALL BE TRANSPORTED IN COMPLIANCE WITH LOCAL REQUIREMENTS.
14. BORROW, FILL OR WASTE ACTIVITY INVOLVING INDUSTRIAL-TYPE POWER EQUIPMENT SHALL BE LIMITED TO THE HOURS OF 7:00AM TO 9:00PM.
15. BORROW, FILL OR WASTE ACTIVITY SHALL BE CONDUCTED IN A SAFE MANNER THAT MAINTAINS LATERAL SUPPORT, OR ORDER TO MINIMIZE ANY HAZARD TO PERSONS, PHYSICAL DAMAGE TO ADJACENT LAND AND STRUCTURES/IMPROVEMENTS, AND DAMAGE TO ANY PUBLIC STREET BECAUSE OF SLIDES, SINKING, OR COLLAPSE.
16. THE DEVELOPER SHALL RESERVE THE RIGHT TO INSTALL, MAINTAIN, REMOVE OR CONVERT TO PERMANENT STORMWATER MANAGEMENT FACILITIES WHERE APPLICABLE ALL EROSION CONTROL MEASURES REQUIRED BY THIS PLAN REGARDLESS OF THE SALE OF ANY LOT, UNIT, BUILDING OR OTHER PORTION OF THE PROPERTY.
17. TEMPORARY STABILIZATION SHALL BE TEMPORARY SEEDING AND MULCHING. SEEDING IS TO BE AT 75 LBS/ACRE, AND IN THE MONTHS OF SEPTEMBER TO FEBRUARY TO CONSIST A 50/50 MIX OF ANNUAL RYEGRASS AND CEREAL WINTER RYE, OR IN MARCH AND APRIL TO CONSIST OF ANNUAL RYE, OR MAY THROUGH AUGUST TO CONSIST OF GERMAN MILLET. STRAW MULCH IS TO BE APPLIED AT 80LBS/100SF. ALTERNATIVES ARE SUBJECT TO APPROVAL BY THE COUNTY EROSION CONTROL INSPECTOR.
18. PERMANENT STABILIZATION SHALL BE LIME AND FERTILIZER, PERMANENT SEEDING, AND MULCH. AGRICULTURAL GRADE LIMESTONE SHALL BE APPLIED AT 90LBS/1000SF, INCORPORATED INTO THE TOP 4-6 INCHES OF SOIL. FERTILIZER SHALL BE APPLIED AT 1000LBS/ACRE AND CONSIST OF A 10-20-10 NUTRIENT MIX. PERMANENT SEEDING SHALL BE APPLIED AT 180LBS/ACRE AND CONSIST OF 95% KENTUCKY 31 OR TALL FESCUE AND 0-5% PERENNIAL RYEGRASS OR KENTUCKY BLUEGRASS. STRAW MULCH IS TO BE APPLIED AT 80LBS/100SF. ALTERNATIVES ARE SUBJECT TO APPROVAL BY THE COUNTY EROSION CONTROL INSPECTOR.
19. MAINTENANCE: ALL MEASURES SHALL BE INSPECTED WEEKLY AND AFTER EACH RAINFALL EVENT. ANY DAMAGE OR CLOGGING TO STRUCTURAL MEASURES SHALL BE REPAIRED IMMEDIATELY. SILT TRAPS SHALL BE CLEANED WHEN 50% OF THE WET STORAGE VOLUME IS FILLED WITH SEDIMENT. ALL SEEDED AREAS SHALL BE RESEEDED WHEN NECESSARY TO ACHIEVE A GOOD STAND OF GRASS. SILT FENCE AND DIVERSION DYKES WHICH COLLECT SEDIMENT TO HALF THEIR HEIGHT MUST BE CLEANED AND REPAIRED IMMEDIATELY.
20. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS OF FINAL SITE STABILIZATION, WHEN MEASURES ARE NO LONGER NEEDED, SUBJECT TO APPROVAL BY THE COUNTY EROSION CONTROL INSPECTOR.
21. THIS PLAN SHALL BE VOID IF THE OWNER DOES NOT OBTAIN A PERMIT WITHIN 1 YEAR OF THE DATE OF APPROVAL. (WATER PROTECTION ORDINANCE SECTION 17-204G.)
22. PERMANENT VEGETATION SHALL BE INSTALLED ON ALL DENUDED AREAS WITHIN NINE (9) MONTHS AFTER THE DATE THE LAND DISTURBING ACTIVITY COMMENCED. (WATER PROTECTION ORDINANCE SECTION 17-207B)
23. ADDITIONAL MEASURES MAY BE REQUIRED AT THE REQUEST OF THE VIRGINIA TECH INSPECTOR.

SOILS INFORMATION:

11B - DUFFIELD-ERNEST COMPLEX, 2 TO 6 PERCENT SLOPES. 0-7 INCHES: SILT LOAM; 7-37 INCHES: SILTY CLAY LOAM; 37-79 INCHES: CLAY. WELL DRAINED. HYDROLOGIC SOIL GROUP: B.

16C - GROSECLOSE AND POPLIMENTO SOILSL 7 TO 15 PERCENT SLOPES. 0-10 INCHES: LOAM; 10-28 INCHES: CLAY; 28-39 INCHES: CLAY; 39-51 INCHES: CLAY; 51-79 INCHES: CLAY LOAM. HYDROLOGIC SOIL GROUP: C.

TABLE 3.32-C
SITE SPECIFIC SEEDING MIXTURES FOR APPALACHIAN/MOUNTAIN AREA

	TOTAL LBS. PER ACRE
MINIMUM CARE LAWN	
COMMERCIAL OR RESIDENTIAL	200-250 LBS.
KENTUCKY 31 OR TURF-TYPE TALL FESCUE	90-100%
IMPROVED PERENNIAL RYEGRASS *	0-10%
KENTUCKY BLUEGRASS	0-10%
HIGH-MAINTENANCE LAWN	
MINIMUM OF THREE (3) UP TO FIVE (5) VARIETIES OF BLUEGRASS FROM APPROVED LIST FOR USE IN VIRGINIA.	125 LBS.
GENERAL SLOPE (3:1 OR LESS)	
KENTUCKY 31 FESCUE	128 LBS.
RED TOP GRASS	2 LBS.
SEASONAL NURSE CROP **	20 LBS.
	150 LBS.
LOW-MAINTENANCE SLOPE (STEEPER THAN 3:1)	
KENTUCKY 31 FESCUE	108 LBS.
RED TOP GRASS	2 LBS.
SEASONAL NURSE CROP **	20 LBS.
CROWNVETCH ***	20 LBS.
	150 LBS.

* PERENNIAL RYEGRASS WILL GERMINATE FASTER AND AT LOWER SOIL TEMPERATURES THAN FESCUE, THEREBY PROVIDING COVER AND EROSION RESISTANCE FOR SEEDBED.

** USE SEASONAL NURSE CROP IN ACCORDANCE WITH SEEDING DATES AS STATED BELOW:
MARCH, APRIL THROUGH MAY 15TH..... ANNUAL RYE
MAY 16TH THROUGH AUGUST 15TH..... FOXTAIL MILLET
AUGUST 16TH THROUGH SEPTEMBER, OCTOBER..... ANNUAL RYE
NOVEMBER THROUGH FEBRUARY..... WINTER RYE

*** IF FLATPEA IS USED, INCREASE TO 30 LBS./ACRE. ALL LEGUME SEED MUST BE PROPERLY INOCULATED. WEEPING LOVEGRASS MAY ALSO BE INCLUDED IN ANY SLOPE OR LOW-MAINTENANCE MIXTURE DURING WARMER SEEDING PERIODS; ADD 10-20 LBS./ACRE IN MIXES.

PS | 3.32

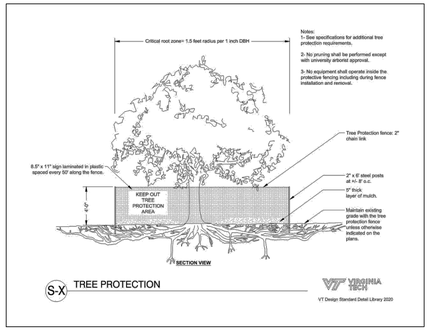
PERMANENT SEEDING MIX FOR APPALACHIAN/MOUNTAIN AREA
No Scale

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

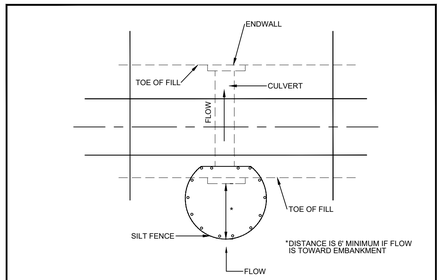
TS | 331

TEMPORARY SEEDING PLANT MATERIALS
No Scale

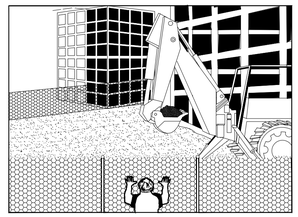


S-X TREE PROTECTION

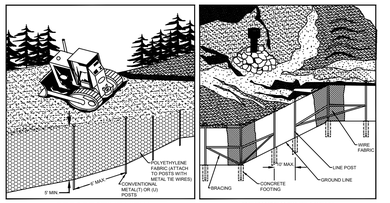
VT Design Standard Detail Library 2020



DEQ VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY | v1.1 | SILT FENCE CULVERT INLET PROTECTION | SOURCE: VA. DSWC, VDOT | C-SCM-05-1

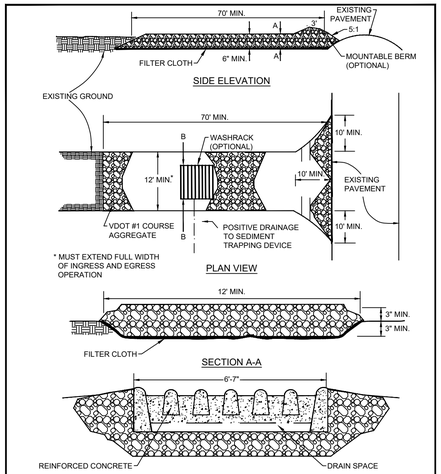


PERSPECTIVE VIEW

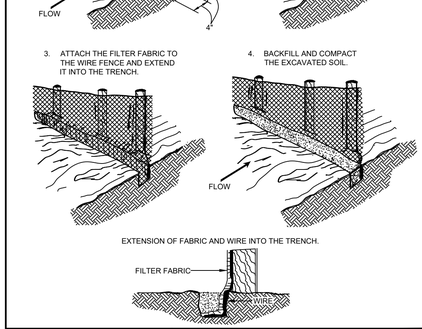


PERSPECTIVE VIEW PLASTIC FENCE | PERSPECTIVE VIEW METAL FENCE

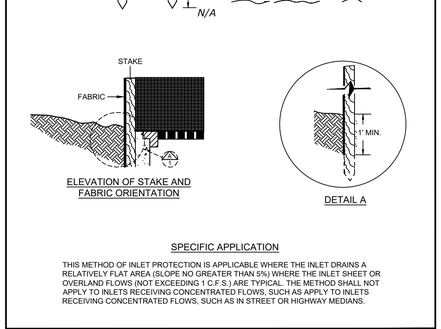
DEQ VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY | v1.1 | SAFETY FENCE | SOURCE: VDOT STDS., VA DSWC, CONWED PLASTICS | C-PCM-01-1



DEQ VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY | v1.1 | STONE CONSTRUCTION ENTRANCE | SOURCE: VA. DSWC, MD ESC STDS | C-SCM-03-1



DEQ VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY | CONSTRUCTION OF SILT FENCE WITH WIRE SUPPORT INSTALLATION | SOURCE: ADAPTED FROM STRAW & FAB. BARRIERS, SHERWOOD & WYANT | v1.1 | C-PCM-04-2



SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPE NO GREATER THAN 5%) WHERE THE INLET SHEET OR OVERLAND FLOWS (NOT EXCEEDING 1 C.F.S.) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.

DEQ VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY | v1.1 | SILT FENCE DROP INLET PROTECTION | SOURCE: NC ESC DESIGN MAN. | C-SCM-04-1

COMMONWEALTH OF VIRGINIA
10/28/2026
JOHNATHAN C. BRODIE
Lic. No. 053540
PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

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109 NORFOLK AVENUE, Suite 100 | ROANOKE, VA 24011
TEL 276.308.8255 WWW.TIMMONS.COM

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DESIGNED BY: M. KUHNS
CHECKED BY: J. BRODIE
SCALE:

TIMMONS GROUP

VIRGINIA TECH - FORESTRY RESEARCH OPERATIONS CENTER
BLACKSBURG, VA

EROSION AND SEDIMENT CONTROL DETAILS

JOB NO. 79501
SHEET NO. C2.1

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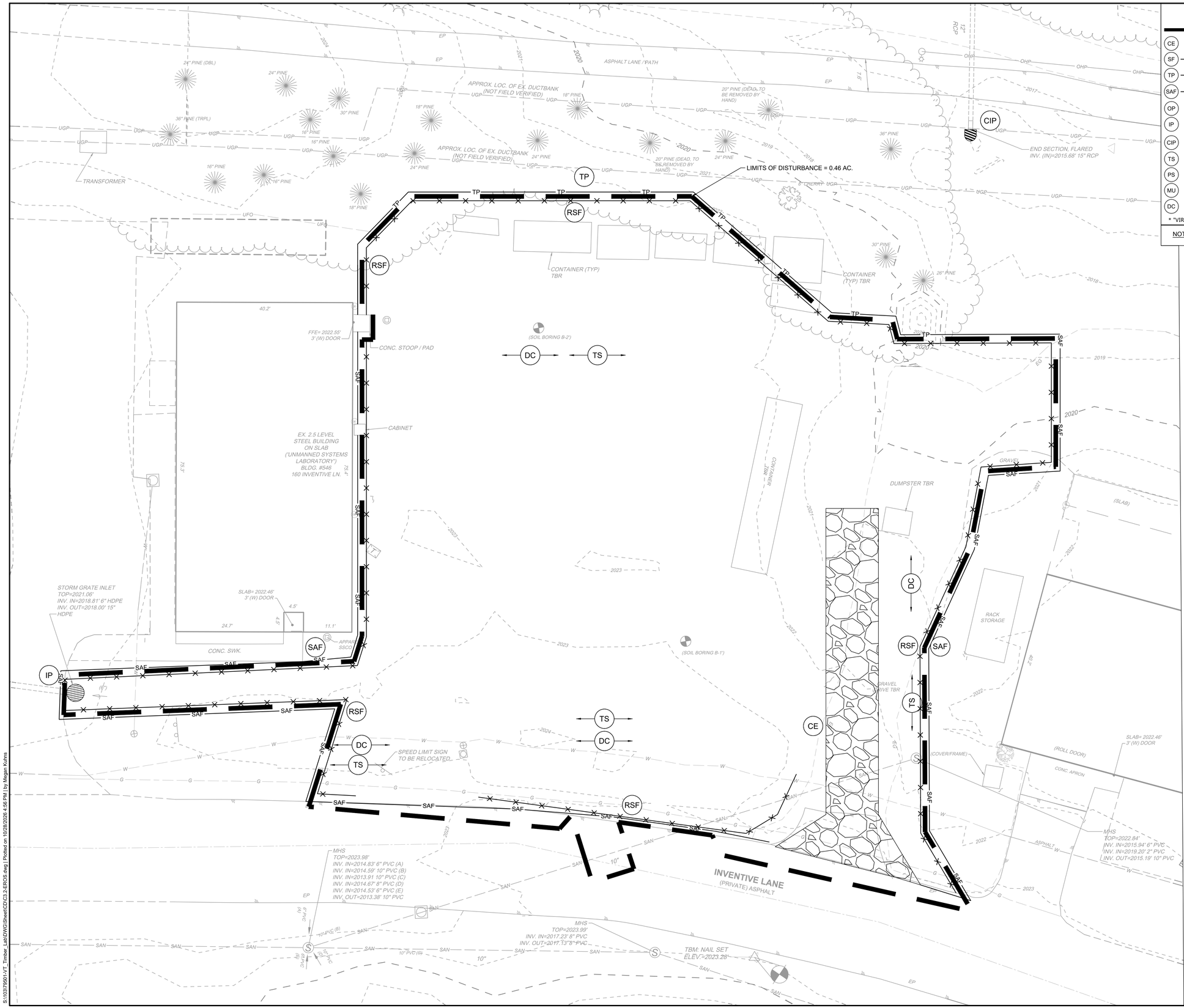

EROSION CONTROL LEGEND

			*
		LIMITS OF DISTURBANCE	-
CE		CONSTRUCTION ENTRANCE	C-SCM-03
SF	SF	REINFORCED SILT FENCE	C-PCM-04
TP	TP	TREE PROTECTION	C-SSM-01
SAF	SAF	SAFETY FENCE	C-PCM-01
OP		OUTLET PROTECTION	C-ECM-15
IP		INLET PROTECTION	C-SCM-04
CIP		CULVERT INLET PROTECTION	C-SCM-05
TS		TEMPORARY SEEDING	C-SSM-09
PS		PERMANENT SEEDING	C-SSM-10
MU		MULCHING	C-SSM-11
DC		DUST CONTROL	C-SCM-01

* "VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK" SPECIFICATION NUMBER

NOTE: REFER TO SHEET C2.0 FOR ESC PHASE 1 GENERAL NOTES

GENERAL NOTES:

A. REFER TO SHEETS C2.0 AND C2.1 FOR EROSION AND SEDIMENT CONTROL NOTES, LEGEND, NARRATIVE, SEQUENCE OF CONSTRUCTION, AND DETAILS.
B. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO DEMOLITION AND REMAIN IN PLACE UNTIL ALL UPSTREAM AREAS HAVE BEEN PERMANENTLY STABILIZED WITH SUFFICIENT GRASS COVER TO ELIMINATE EROSION OR ARE REPLACED BY OTHER MEASURES.
C. EROSION AND SEDIMENT CONTROL MINIMUM STANDARDS (MS-1 THROUGH MS-19) SHALL BE FOLLOWED AT ALL TIMES.
D. ALL CONSTRUCTION TRAFFIC SHALL ENTER AND EXIT THE SITE USING THE APPROVED CONSTRUCTION ENTRANCE.
E. REMOVE AND AND DISPOSE OF ALL MATERIAL IN A LAWFUL MANNER. ALL OFFSITE AREAS USED FOR HAULING SOILS SHALL HAVE AN APPROVED EROSION AND SEDIMENT CONTROL PLAN AND LAND DISTURBING PERMIT.
F. UTILIZE TEMPORARY SEEDING, STRAW MULCHING, AND DUST CONTROL FOR ALL EXPOSED AREAS DURING CONSTRUCTION.
G. ADDITIONAL SILT FENCE SHALL BE ADDED ALONG INTERNAL HARDSCAPES WHERE HARDSCAPES ARE CONSTRUCTED AND UPSTREAM AREAS BEYOND ARE UNSTABILIZED; NOT SHOWN ON PLANS.
H. PERIMETER CONTROLS SHALL COINCIDE WITH THE LOD IN FIELD CONDITIONS; CONTROLS ARE SHOWN OFFSET FOR PLAN READABILITY.
I. INSTALL AND ADJUST CLEAN WATER DIVERSION AS NEEDED TO DIVERT UPSTREAM WATER AROUND THE SITE.
J. AREAS TO BE DISTURBED FOR UTILITY TRENCHING SHALL BE STABILIZED AT THE END OF EACH WORK DAY, SILT FENCE SHALL BE PLACED AT THE TOP OF THE SLOPE AND REINSTALLED BY THE CONTRACTOR AS NEEDED FOR ACCESS.
K. SUBSURFACE UTILITY LOCATIONS SHALL BE PERFORMED THROUGHOUT THE CONSTRUCTION PROJECT AND THE CONTRACTOR SHALL COORDINATE WITH THE VT PM. SEE DCSM SECTION 4.1.

UTILITY NOTE

SUBSURFACE UTILITY LOCATIONS SHALL BE PERFORMED THROUGHOUT THE CONSTRUCTION PROJECT AND THE CONTRACTOR SHALL COORDINATE WITH THE VT PM. SEE DCSM SECTION 4.1.

COMMONWEALTH OF VIRGINIA
10/28/2026
JOHNATHAN C. BRODIE
Lic. No. 053540
PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

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CHECKED BY J. BRODIE
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VIRGINIA TECH - FORESTRY RESEARCH OPERATIONS CENTER
BLACKSBURG, VA
EROSION & SEDIMENT CONTROL - PHASE 1

JOB NO. 79501
SHEET NO. C2.2

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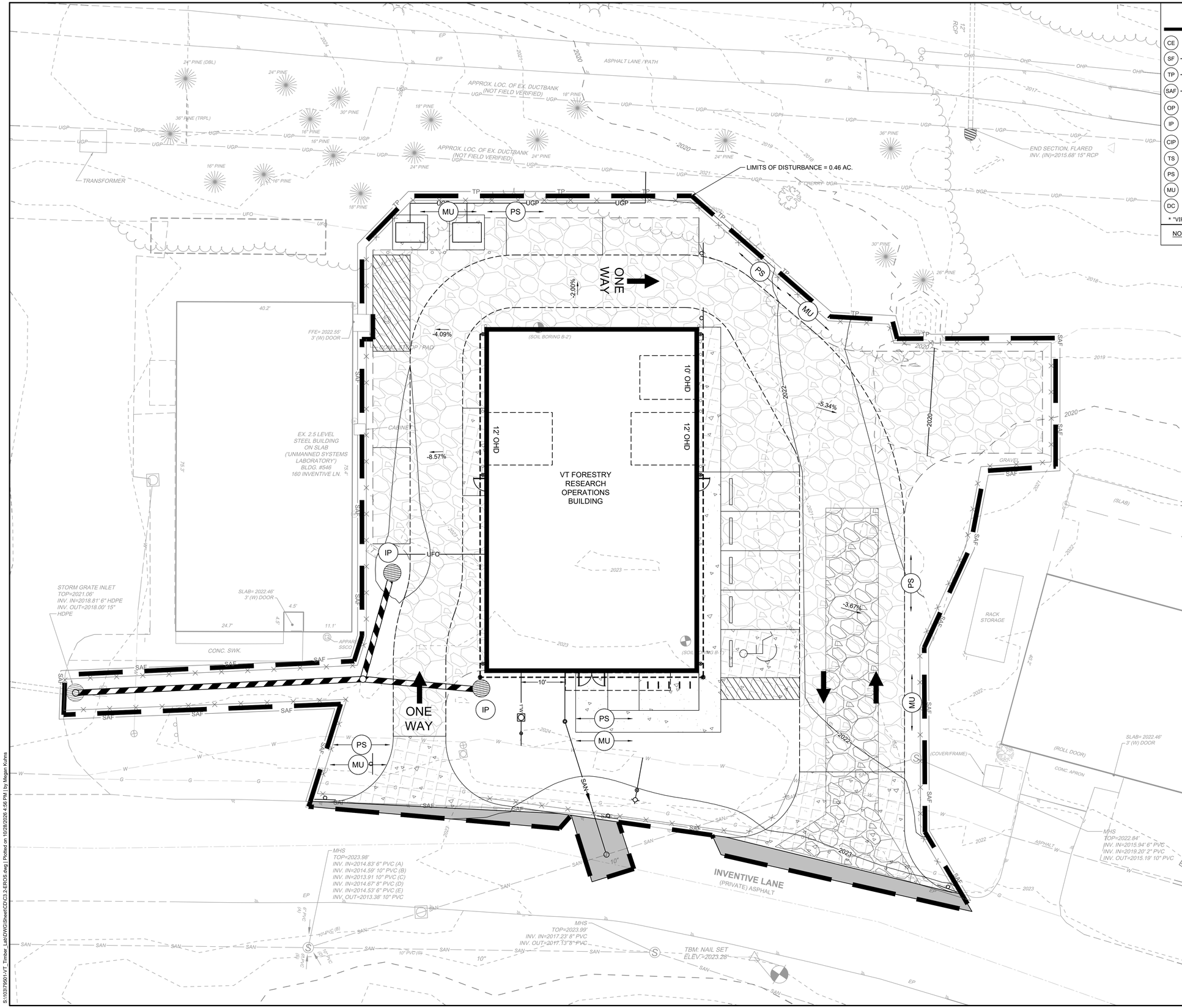

EROSION CONTROL LEGEND

			*
		LIMITS OF DISTURBANCE	-
CE		CONSTRUCTION ENTRANCE	C-SCM-03
SF		REINFORCED SILT FENCE	C-PCM-04
TP	TP	TREE PROTECTION	C-SSM-01
SAF	SAF	SAFETY FENCE	C-PCM-01
OP		OUTLET PROTECTION	C-ECM-15
IP		INLET PROTECTION	C-SCM-04
CIP		CULVERT INLET PROTECTION	C-SCM-05
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PS		PERMANENT SEEDING	C-SSM-10
MU		MULCHING	C-SSM-11
DC		DUST CONTROL	C-SCM-01

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K. SUBSURFACE UTILITY LOCATIONS SHALL BE PERFORMED THROUGHOUT THE CONSTRUCTION PROJECT AND THE CONTRACTOR SHALL COORDINATE WITH THE VT PM. SEE DCSM SECTION 4.1.

UTILITY NOTE

SUBSURFACE UTILITY LOCATIONS SHALL BE PERFORMED THROUGHOUT THE CONSTRUCTION PROJECT AND THE CONTRACTOR SHALL COORDINATE WITH THE VT PM. SEE DCSM SECTION 4.1.

SCALE 1"=10'
0 10' 20'

COMMONWEALTH OF VIRGINIA
10/28/2026
JOHNATHAN C. BRODIE
Lic. No. 053540
PROFESSIONAL ENGINEER
NOT FOR CONSTRUCTION

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EROSION & SEDIMENT CONTROL - PHASE 2

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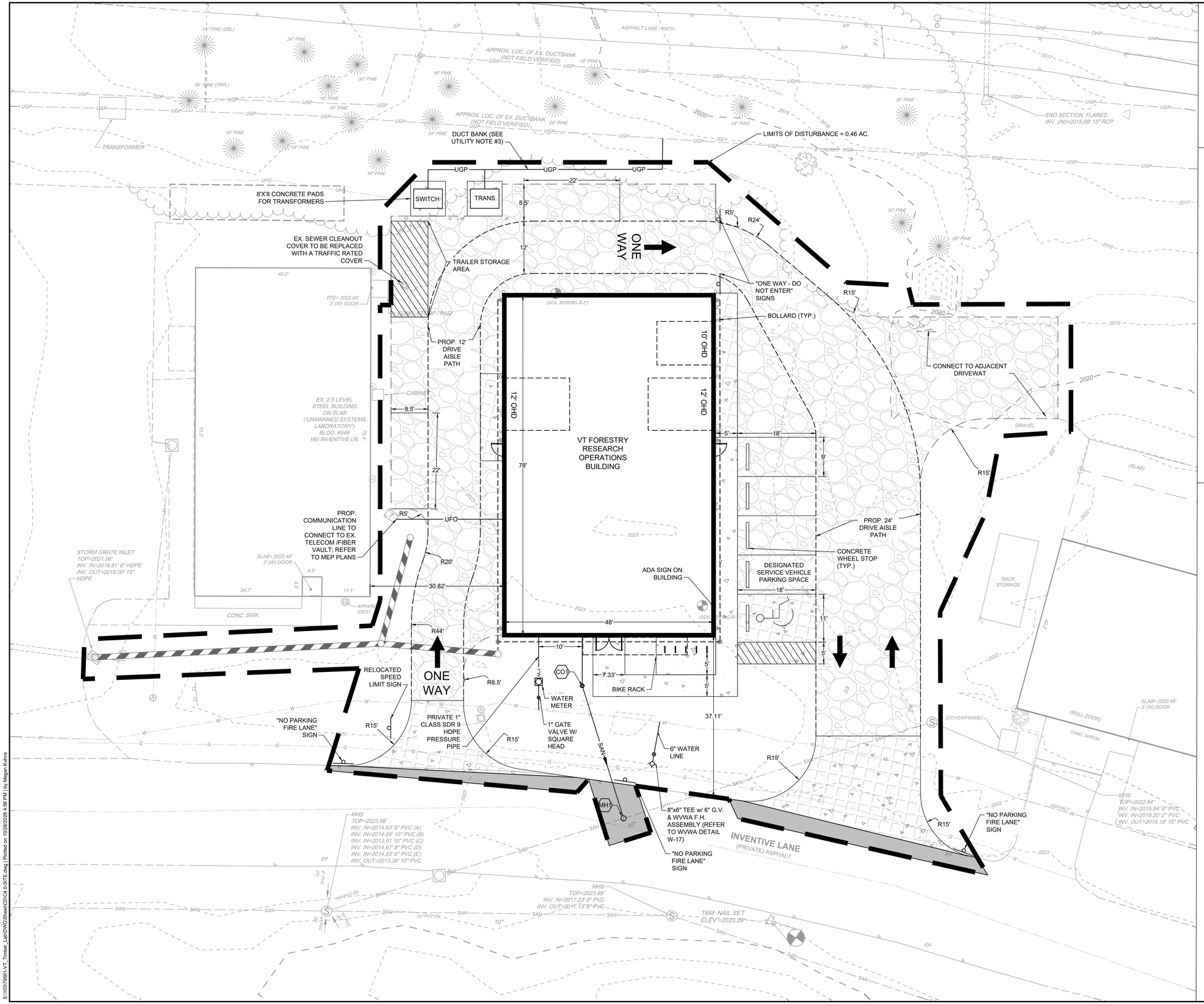

HATCH LEGEND:

- PROPOSED LIGHT DUTY CONCRETE
- PROPOSED HEAVY DUTY CONCRETE
- PROPOSED GRAVEL
- PROPOSED ASPHALT REPAIR

GENERAL SITE NOTES:

1. ALL DIMENSIONS ARE TAKEN FROM THE FACE OF CURB AND OUTSIDE FACE OF BUILDING UNLESS OTHERWISE NOTED.
2. FOR SIGNAGE AND STRIPING NOTES, REFER TO SHEET C0.2.
3. ALL SAWCUTS AT TIE IN POINTS TO EXISTING PAVEMENT SHALL BE STRAIGHT AND SMOOTH.
4. BUILDING DIMENSIONS ARE FOR REFERENCE ONLY; REFER TO ARCHITECT PLANS.
5. SLOPES ON ALL PATHS SHALL MEET ADA REQUIREMENTS; SEE GRADING PLAN FOR DETAILS.
6. ONE WAY AND DIRECTIONAL ARROWS SHOWN FOR REFERENCE ONLY TO ILLUSTRATE THE PROPOSED TRAFFIC FLOW PATTERNS. THESE ITEMS WILL NOT BE PHYSICALLY STRIPED IN THE FIELD.

UTILITY NOTES:

1. ALL SANITARY AND WATER SYSTEM MATERIALS AND INSTALLATION SHALL MEET THE REQUIREMENTS OF THE UNIVERSITY'S FACILITY DESIGN MANUAL AND CONSTRUCTION STANDARDS.
2. WATER SERVICES TO ADJACENT FACILITIES SHALL NOT BE DISRUPTED DURING CONSTRUCTION.
3. ELECTRICAL AND COMMUNICATION DUCTBANKS SHALL BE COMPLETED BY VES AND VT NI&S. THIS WORK SHALL BE PERFORMED UNDER AN ASSOCIATED MASTER PERMIT AND IS THEREFORE EXCLUDED FROM THE LIMITS OF DISTURBANCE OF THIS PROJECT.
4. SUBSURFACE UTILITY LOCATIONS SHALL BE PERFORMED THROUGHOUT THE CONSTRUCTION PROJECT AND THE CONTRACTOR SHALL COORDINATE WITH THE VT PM. SEE DCSM SECTION 4.1.

COMMONWEALTH OF VIRGINIA
10/28/2026
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SCALE: 1"=10'

TIMMONS GROUP

VIRGINIA TECH - FORESTRY RESEARCH OPERATIONS CENTER
BLACKSBURG, VA
SITE AND UTILITY LAYOUT

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SHEET NO. C3.0

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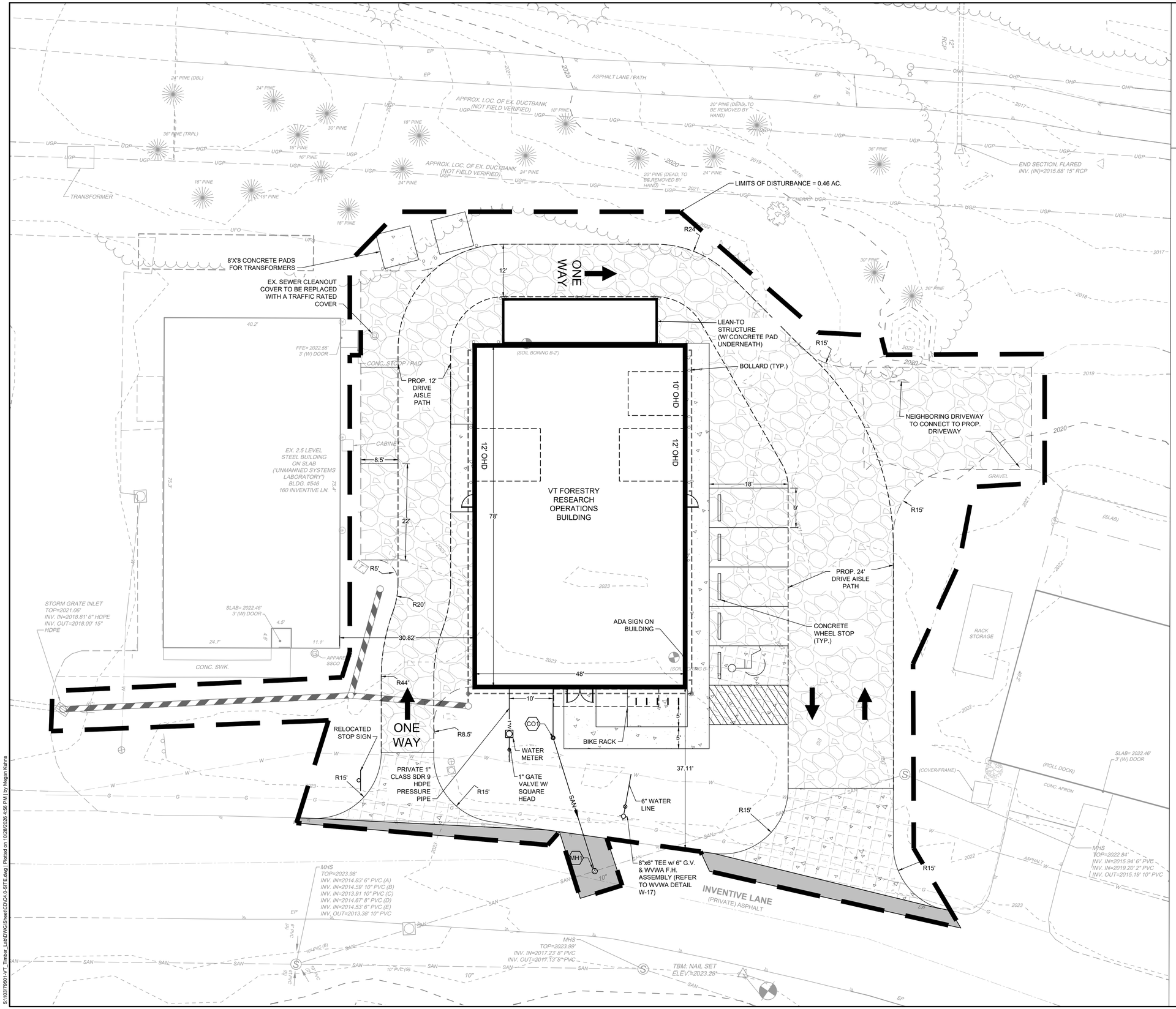

HATCH LEGEND:

- PROPOSED LIGHT DUTY CONCRETE
- PROPOSED HEAVY DUTY CONCRETE
- PROPOSED GRAVEL
- PROPOSED ASPHALT REPAIR

ADDITIVE BID ITEM NOTE:

1. IN THIS ADDITIVE BID ITEM, A LEAN-TO STRUCTURE WITH CONCRETE PAD IS PROVIDED AS INDICATED ON THIS SHEET. REFER TO ARCHITECTURAL PLANS FOR A DESCRIPTION OF LEAN-TO ITEMS INCLUDED IN THIS ALTERNATE. PAVING, PARKING, AND ELECTRICAL SERVICE EQUIPMENT SHALL BE CONSTRUCTED IN THE CONFIGURATION SHOWN ON THIS SHEET.

COMMONWEALTH OF VIRGINIA
10/28/2026
JOHNATHAN C. BRODIE
Lic. No. 053540
PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

THIS DRAWING PREPARED AT THE
ROANOKE OFFICE
109 NORFOLK AVENUE, Suite 100 | ROANOKE, VA 24011
TEL 276.308.8255 WWW.TIMMONS.COM

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE	10/28/26
DRAWN BY	M. KUHNS
DESIGNED BY	M. KUHNS
CHECKED BY	J. BRODIE
SCALE	1"=10'

TIMMONS GROUP

VIRGINIA TECH - FORESTRY RESEARCH OPERATIONS CENTER

BLACKSBURG, VA

ADDITIVE BID ITEM SITE AND UTILITY LAYOUT

JOB NO.	SHEET NO.
79501	C3.1

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LIMITS OF DISTURBANCE = 0.46 AC.

ONE WAY

VT FORESTRY RESEARCH OPERATIONS BUILDING

EX. 2.5 LEVEL STEEL BUILDING ON SLAB ('UNMANNED SYSTEMS LABORATORY') BLDG #546 160 INVENTIVE LN.

FFE= 2022.55'
3' (W) DOOR

CONC. STOOP / PAD

CABINET

SLAB= 2022.46'
3' (W) DOOR

CONC. SWK.

STORM GRATE INLET
TOP=2021.06'
INV. IN=2018.81' 6" HDPE
INV. OUT=2018.00' 15" HDPE

APPARATUS

112.74'

126.55' FIRE ACCESS DISTANCE (ACCESS LANE TO REAR OF BUILDING)

150' HOSE LAY FROM HYDRANT TO FURTHEST END OF BUILDING

29.01'

47.64'

FIRE HYDRANT ASSEMBLY

INVENTIVE LANE
(PRIVATE) ASPHALT

MHS
TOP=2023.98'
INV. IN=2014.83' 6" PVC (A)
INV. IN=2014.59' 10" PVC (B)
INV. IN=2013.81' 10" PVC (C)
INV. IN=2014.67' 8" PVC (D)
INV. IN=2014.53' 6" PVC (E)
INV. OUT=2013.38' 10" PVC

MHS
TOP=2023.99'
INV. IN=2017.23' 8" PVC
INV. OUT=2017.13' 8" PVC

TBM: NAIL SET
ELEV=2023.28'

MHS
TOP=2022.84'
INV. IN=2015.94' 6" PVC
INV. IN=2019.20' 2" PVC
INV. OUT=2015.19' 10" PVC

RACK STORAGE

(ROLL DOOR)

CONC. APRON

ASPHALT

GRAVEL

(SLAB)

ASPHALT LANE / PATH

END SECTION, FLARED
INV. (IN)=2015.68' 15" RCP

APPROX. LOC. OF EX. DUCTBANK (NOT FIELD VERIFIED)

TRANSFORMER

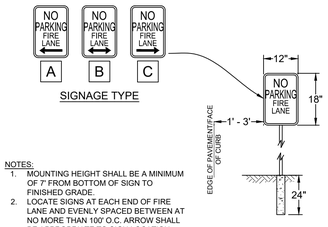
24" PINE (DBL)
24" PINE
36" PINE (TRPL)
30" PINE
18" PINE
16" PINE
26" PINE
36" PINE
6" CHERRY

(SOIL BORING B-2')

(SOIL BORING B-1')

(COVER/FRAME)

SIGNAGE TYPE



NOTES:
1. MOUNTING HEIGHT SHALL BE A MINIMUM OF 7' FROM BOTTOM OF SIGN TO FINISHED GRADE.
2. LOCATE SIGNS AT EACH END OF FIRE LANE AND EVENLY SPACED BETWEEN AT NO MORE THAN 100' O.C. ARROW SHALL BE APPROPRIATE TO SIGN LOCATION.

FIRE LANE SIGNAGE DETAIL
No Scale

FIRE MARSHALL NOTES:

1. ALL PRIVATE FIRE HYDRANTS SHALL BE PAINTED WHITE WITH THE TOP PAINTED IN ACCORDANCE WITH THE AVAILABLE FLOW.
2. LANDSCAPING SHALL NOT BE PLACED WITHIN 4 FEET OF A FIRE HYDRANT OR WITHIN 3 FEET OF AN FDC.
3. FIRE LANE SIGNS SHALL BE MOUNTED NO FURTHER THAN 6' FROM THE PAVEMENT WITH THE BOTTOM OF THE SIGN PLACED AT 7' ABOVE PAVEMENT.
4. SEE ARCHITECTURAL PLANS FOR KNOX BOX LOCATION AND DETAILS.

NAD 83

SCALE 1"=10'
0 10' 20'

COMMONWEALTH OF VIRGINIA
10/28/2026
JOHNATHAN C. BRODIE
Lic. No. 053540
PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

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REVISION DESCRIPTION	DATE

DATE: 10/28/26
DRAWN BY: M. KUHNS
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CHECKED BY: J. BRODIE
SCALE: 1"=10'

TIMMONS GROUP

VIRGINIA TECH - FORESTRY RESEARCH OPERATIONS CENTER
BLACKSBURG, VA
FIRE MARSHAL PLAN

JOB NO. 79501
SHEET NO. C3.2

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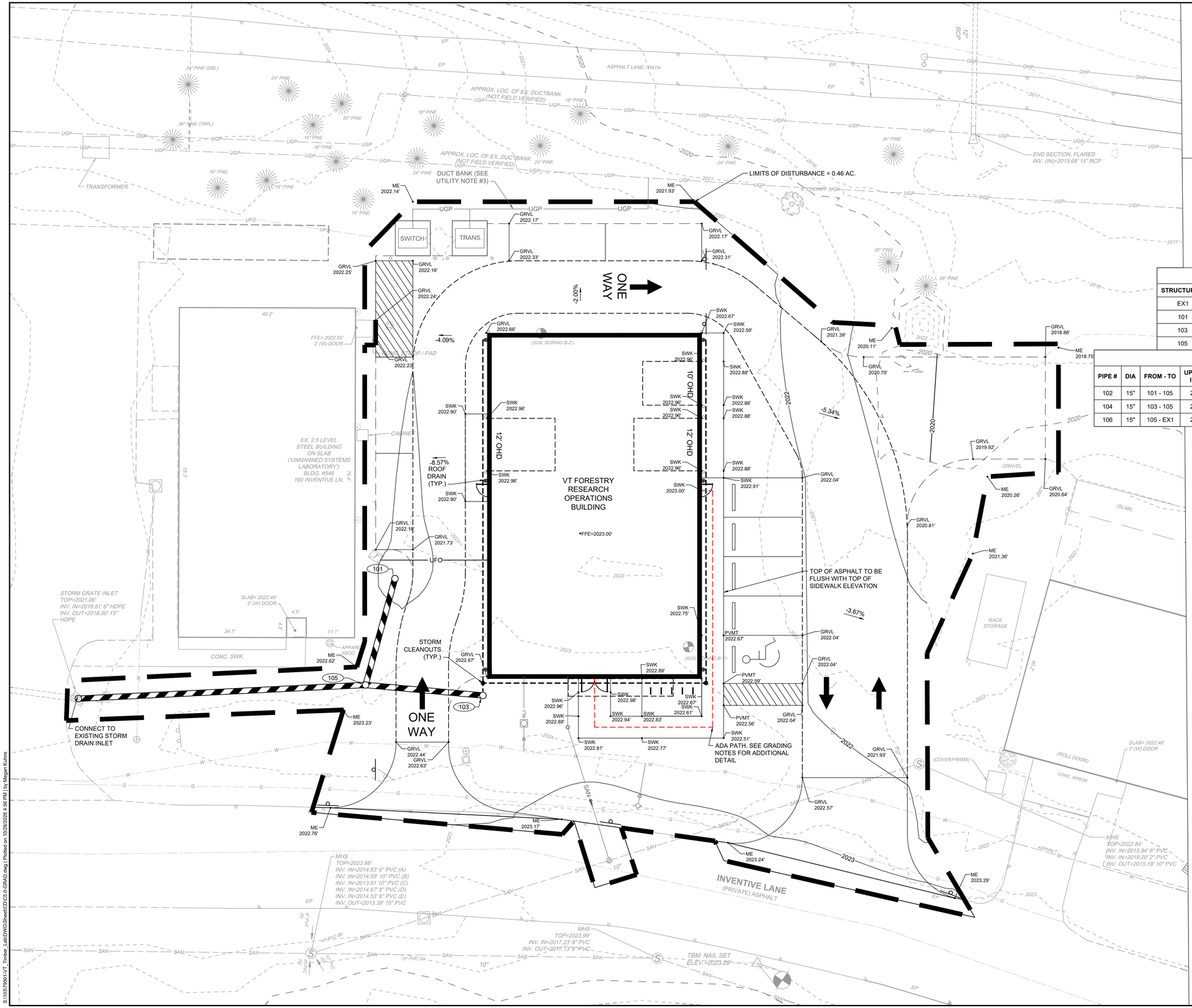

GRADING NOTES:

1. MAX SIDEWALK CROSS SLOPE TO BE 1.8%.
2. MAX LONGITUDINAL SLOPE ALONG ADA PATH TO BE 4.8%.
3. CONTRACTOR TO ENSURE SMOOTH TRANSITIONS AT CONNECTION TO EXISTING GRADE.
4. ALL ADA SPACES AND ACCESS AISLES SHALL HAVE A MAX 2% SLOPE IN ALL DIRECTIONS AND MUST MEET ADA / UD STANDARDS.
5. ALL STORM ROOF LEADERS SHALL BE 8" HDPE PIPE WITH MIN 1% SLOPE. PROVIDE A MINIMUM OF 12" OF VERTICAL SEPARATION BETWEEN SANITARY LATERAL AND STORM ROOF LEADERS.

SPOT GRADE LEGEND

- FFE = FINISH FLOOR ELEVATION
- GRVL = GRAVEL
- SWK = SIDEWALK
- ME = MATCH EXISTING

STORM STRUCTURE TABLE

STRUCTURE #	TOP	STRUCTURE HEIGHT	DESCRIPTION
EX1	2021.18	3.18'	18" Basin - Circular Grate
101	2021.60	2.00'	18" Basin - Circular Grate
103	2022.35	2.51'	18" Basin - Circular Grate
105	2022.35	2.88'	18" Basin - Circular Grate

STORM PIPE TABLE

PIPE #	DIA	FROM - TO	UPSTREAM INVERT	DOWNSTREAM INVERT	SLOPE	LENGTH	DESCRIPTION
102	15"	101 - 105	2019.60	2019.47	0.52%	25.21 LF	15" HDPE
104	15"	103 - 105	2019.84	2019.57	1.00%	26.92 LF	15" HDPE
106	15"	105 - EX1	2019.47	2018.81	1.00%	65.71 LF	15" HDPE

UTILITY NOTE

SUBSURFACE UTILITY LOCATIONS SHALL BE PERFORMED THROUGHOUT THE CONSTRUCTION PROJECT AND THE CONTRACTOR SHALL COORDINATE WITH THE VT PM. SEE DCSM SECTION 4.1.

COMMONWEALTH OF VIRGINIA
10/28/2026
JOHNATHAN C. BRODIE
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TIMMONS GROUP

VIRGINIA TECH - FORESTRY RESEARCH OPERATIONS CENTER
BLACKSBURG, VA
GRADING & DRAINAGE PLAN

JOB NO. 79501
SHEET NO. C4.0

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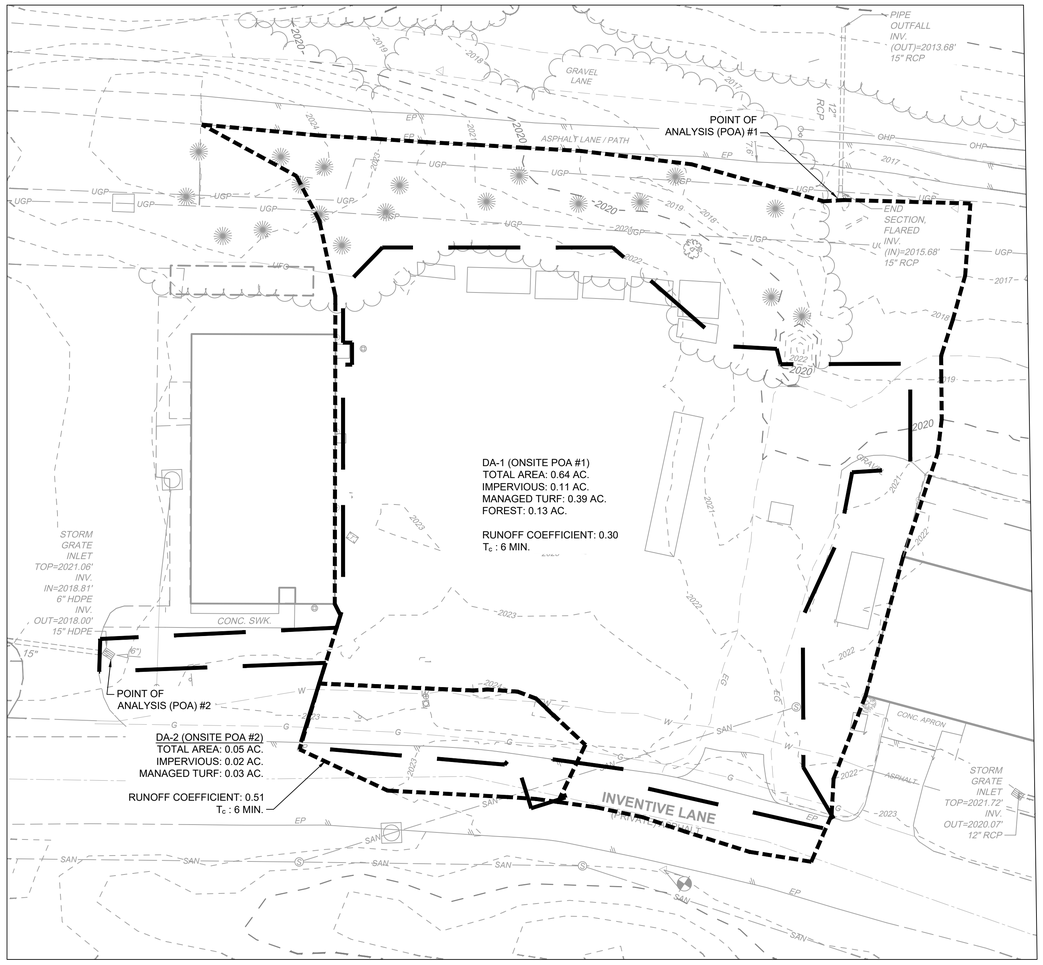
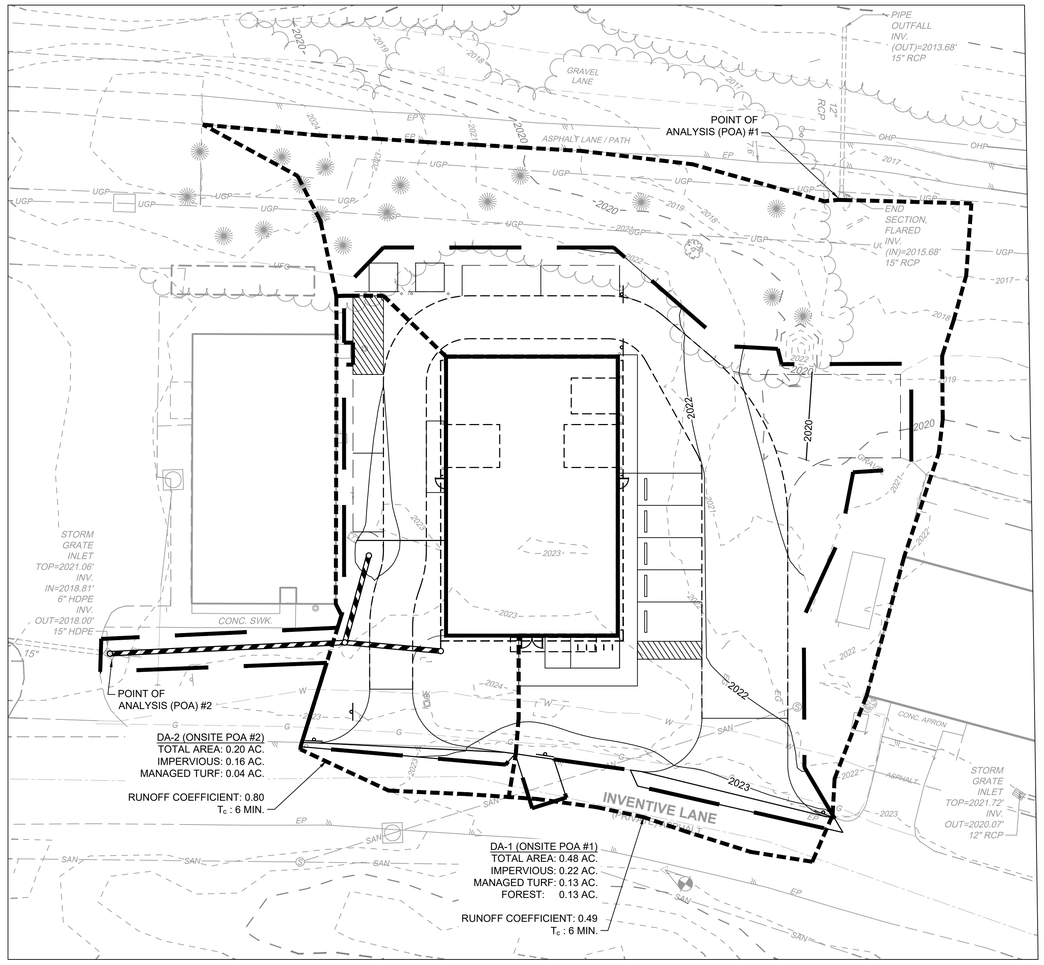


EXISTING SITE DRAINAGE AREAS



POST DEVELOPMENT SITE DRAINAGE AREAS

STORM WATER MANAGEMENT NARRATIVE

IN EXISTING CONDITIONS, THE SITE IS DIVIDED INTO TWO DRAINAGE AREAS DISCHARGING TO DIFFERENT POINTS OF ANALYSIS (POA). FOR DRAINAGE AREA 1 (DA-1), THE MAJORITY OF THE SITE DISCHARGES FROM SOUTH TO NORTH VIA SHEET FLOW THROUGH MANAGED TURF GRASS AND LIGHT WOODED CONDITIONS INTO AN EXISTING CULVERT, WHICH IS LABELED AS POA #1. FOR DRAINAGE AREA 2 (DA-2), A HIGH POINT EXISTS ON SITE NEAR THE ROADWAY. STORMWATER DRAINS FROM THIS HIGH POINT TOWARD AN EXISTING GRASS SWALE, WHICH FLOW WESTWARD FROM THE SITE TO AN EXISTING INLET LOCATED IN FRONT OF THE ADJACENT PROPERTY. THIS INLET IS IDENTIFIED AS POA #2.

IN PROPOSED CONDITIONS, THE SITE CONTINUES TO BE DIVIDED INTO TWO DRAINAGE AREAS DISCHARGING TO DIFFERENT POA's. FOR DA-1, RUNOFF FROM MOST OF THE DRIVE AISLE, PARKING SPACES, AND SIDEWALKS ON THE EASTERN AND NORTHERN SECTIONS OF THE DEVELOPMENT WILL CONTINUE TO LEAVE THE SITE VIA SHEET FLOW THROUGH MANAGED TURF GRASS AND LIGHT WOODED CONDITIONS INTO THE THE EXISTING CULVERT (POA #1). FOR DA #2, RUNOFF FROM THE ROOF OF THE PROPOSED STRUCTURE AND WESTERN DRIVE AISLES ARE CONVEYED INTO STORM DRAIN INLETS. STORMWATER THEN FLOWS THROUGH THE PROPOSED STORM DRAIN NETWORK AND CONNECTS TO THE EXISTING INLET (POA #2).

THE RUNOFF RATE FOR BOTH EXISTING AND PROPOSED CONDITIONS WAS ANALYZED USING THE RATIONAL METHOD:

$$Q_{(\text{RUNOFF RATE})} = C_{(\text{RUNOFF COEFFICIENT})} * I_{(\text{DESIGN RAINFALL INTENSITY})} * A_{(\text{DRAINAGE AREA})}$$

THE RATIONAL METHOD WAS USED TO COMPUTE PEAK RUNOFF RATES FOR THE SUBJECT SITE. THE AREA OF EACH DRAINAGE AREA UNDER BOTH EXISTING AND PROPOSED CONDITIONS WAS ENTERED INTO THE HYDROLOGIC MODEL. THE WEIGHTED RUNOFF COEFFICIENT (C) FOR EACH DRAINAGE AREA WAS CALCULATED USING TABLE A-11.1 OF THE VIRGINIA DEQ MANUAL. SOIL AND LAND-COVER TYPES WITHIN EACH DRAINAGE AREA WERE IDENTIFIED AND WEIGHTED BASED ON THEIR RESPECTIVE RUNOFF COEFFICIENTS. THE DESIGN RAINFALL INTENSITY FOR THE SUBJECT SITE WAS OBTAINED FROM THE NOAA ATLAS 12 POINT PRECIPITATION FREQUENCY ESTIMATES DATABASE. THE INTENSITY VALUE FOR THE 2 YEAR STORM WAS **4.21 IN/HR** AND THE INTENSITY VALUE FOR THE 10 YEAR STORM WAS **5.66 IN/HR**.

SEE THE 2 YEAR AND 10 YEAR FLOW RATES FOR EXISTING AND PROPOSED CONDITIONS:

	EX. DA-1 (ONSITE POA #1)	EX. DA-2 (ONSITE POA #2)	PROP. DA-1 (ONSITE POA #1)	PROP. DA-2 (ONSITE POA #2)
DRAINAGE AREA (AC.)	0.64	0.05	0.48	0.20
RUNOFF COEFF.	0.30	0.51	0.49	0.16
TIME OF CONC. (MIN)	6	6	6	6
Q_{2YEAR} (CFS)	**0.758**	**0.100**	**0.963**	**0.642**
$Q_{10\ YEAR}$ (CFS)	**1.022**	**0.135**	**1.298**	**0.865**

SINCE THE EXISTING AND PROPOSED DRAINAGE PATTERNS ULTIMATELY RESULT IN A SHEET FLOW CONDITION ACROSS PASTURE LAND, PER SECTION 9VA25-875-600.D, INCREASED VOLUMES OF SHEET FLOW FROM EXISTING TO PROPOSED CONDITIONS THAT DO NOT CAUSE DOWN GRADIENT EROSION, SEDIMENTATION, OR FLOODING, NO FURTHER WATER QUANTITY CONTROLS ARE REQUIRED.

FOR DA-1 IN PROPOSED CONDITIONS, RUNOFF WILL CONTINUE TO SHEET FLOW FROM THE SITE INTO THE EXISTING CULVERT. RUNOFF FROM THE SITE HAS A VELOCITY OF 4.6057 x 10^{-5} FT/S, WHICH WAS DERIVED FROM THE FLOW RATE OF THE 2 YEAR STORM OVER THE ENTIRE DRAINAGE AREA (V = 0.963 CFS / 0.48 AC.). THE RESULTING FLOW VELOCITY IS SUFFICIENTLY LOW TO PREVENT EROSIVE CONDITIONS AND MINIMIZE THE POTENTIAL FOR DOWNSTREAM IMPACTS.

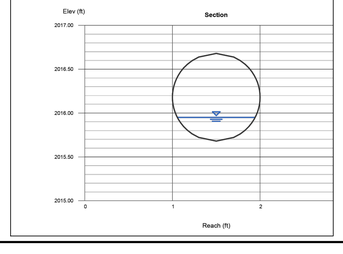
IN ADDITION, THE EXITING CULVERT WAS ANALYZED USING THE EXPRESS TOOL TO SEE OF THE PIPE CAN SUSTAIN THE ADDITIONAL CAPACITY FROM DA-1. THE FLOW RATE FROM THE 10 YR WAS IMPUTED INTO THE SYSTEM ALONG WITH THE EXISTING CULVERT INFORMATION. BASED ON THE CHANNEL REPORT, THE EXISTING CULVERT IS CURRENTLY OPERATING BELOW ITS FULL HYDRAULIC CAPACITY AND HAS SUFFICIENT CAPACITY TO ACCOMMODATE THE ADDITIONAL PROPOSED FLOW. SEE REPORT BELOW:

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Aug 20 2026

VT TIMBER LAB EXISTING CULVERT

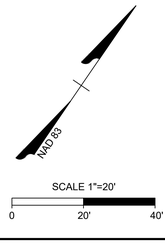
Circular		**Highlighted**	
Diameter (ft)	= 1.00	Depth (ft)	= 0.27
		Q (cfs)	= 1.298
		Area (sqft)	= 0.17
Invert Elev (ft)	= 2015.68	Velocity (ft/s)	= 7.55
Slope (%)	= 4.50	Wetted Perim (ft)	= 1.09
N-Value	= 0.012	Crit Depth, Yc (ft)	= 0.48
		Top Width (ft)	= 0.89
Calculations		EGL (ft)	= 1.16
Compute by:	Known Q		
Known Q (cfs)	= 1.30		



FOR DA-2 IN EXISTING CONDITIONS, RUNOFF FROM THE SUBJECT SITE FLOWS ONTO THE ADJACENT WESTERN PROPERTY, WHICH MAY CONTRIBUTE TO LOCALIZED PONDING. TO MINIMIZE THE POTENTIAL FOR RUNOFF TO ENTER THE EXISTING STRUCTURE, AND GIVEN THE LIMITED SPACE AVAILABLE ON SITE, A SYSTEM OF INLETS AND STORM DRAINS IS PROPOSED TO INTERCEPT AND CONVEY A LIMITED AMOUNT OF RUNOFF FROM THE PROPOSED DEVELOPMENT, THEREBY REDUCING THE POTENTIAL FOR ADVERSE IMPACTS TO THE EXISTING STRUCTURE.

AS DA-2 IN PROPOSED CONDITIONS IS A SMALLER DRAINAGE AREA, IT WILL NOT HAVE ANY ADVERSE AFFECTS TO THE EXISTING STORM DRAIN SYSTEM IT IS CONNECTING TO. THE SYSTEM ITSELF IS ABLE TO WITH STAND THE ADDITIONAL FLOW. SEE THE PIPE CALCULATIONS ON SHEET C5.0. FROM THE EXISTING SYSTEM, WATER FLOWS THROUGH THE SYSTEM ALONG INVENTIVE LANE AND ULTIMATELY DISCHARGES INTO A FARM FIELD APPROXIMATELY 650 FEET FROM THE SITE. THE WATER THEN SHEET FLOWS ACROSS THE FIELD AND EVENTUALLY ENTERS STROUBLES CREEK. IN PROPOSED CONDITIONS FOR DA-2, THERE WILL BE NO DOWNSTREAM EROSIVE CONDITIONS AS IT IS CONNECTING TO AN EXISTING SYSTEM THAT CAN HANDLE THE ADDITIONAL FLOW RATE FROM THE DEVELOPMENT.

THE QUALITY REQUIREMENTS FOR THE SITE WERE BASED OFF OF THE TOTAL DISTURBED AREA (0.46 AC.). PRE AND POST DEVELOPMENT LAND COVER WAS ANALYZED TO SEE HOW MUCH TOTAL PHOSPHORUS LOAD REDUCTION IS REQUIRED FOR THE DEVELOPMENT. THE REMAINING TP LOAD REDUCTION REQUIRED IS **0.16 LB/YR**. THE OWNER WILL PURCHASE NUTRIENT CREDITS TO SATISFY THE QUALITY REQUIREMENTS.



SCALE 1"=20'

0 20' 40'

COMMONWEALTH OF VIRGINIA
10/28/2026
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VIRGINIA TECH - FORESTRY RESEARCH OPERATIONS CENTER
BLACKSBURG, VA
STORMWATER MANAGEMENT PLAN

JOB NO. 79501
SHEET NO. C4.1

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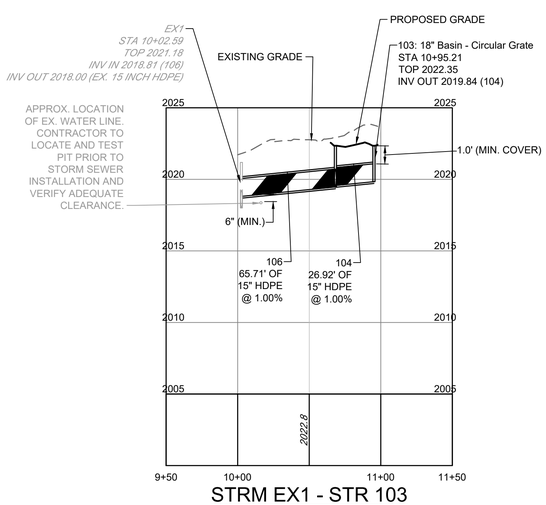
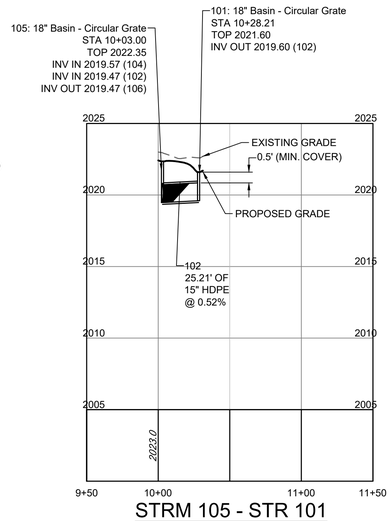


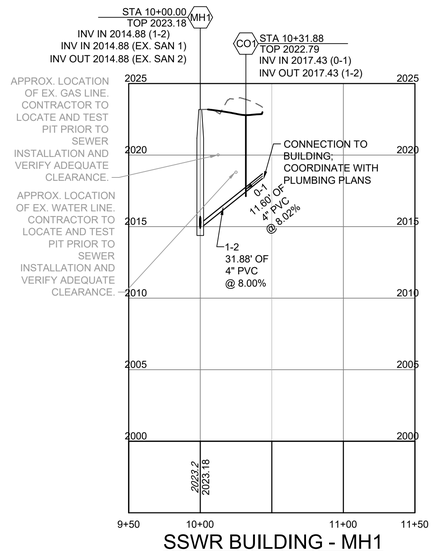
STRM EX1 - STR 103

HORIZ SCALE: 1"=50'
VERT SCALE: 1"=5'



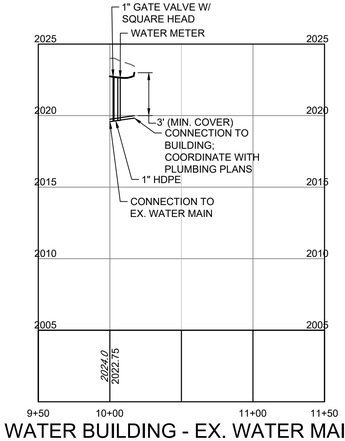
STRM 105 - STR 101

HORIZ SCALE: 1"=50'
VERT SCALE: 1"=5'



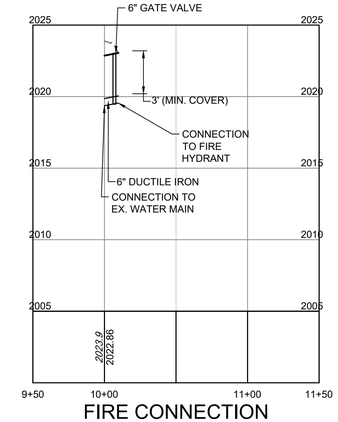
SSWR BUILDING - MH1

HORIZ SCALE: 1"=50'
VERT SCALE: 1"=5'



WATER BUILDING - EX. WATER MAIN

HORIZ SCALE: 1"=50'
VERT SCALE: 1"=5'



FIRE CONNECTION

HORIZ SCALE: 1"=50'
VERT SCALE: 1"=5'

STRM 200
STORM SEWER DESIGN COMPUTATIONS

PROJECT: TIMBER HARVEST
LOCATION: INVENTIVE LANE, BLACKSBURG VA
COUNTY: MONTGOMERY

Designed by: MK
Checked by: JB

STORM FREQUENCY **2**

UNITS **ENGLISH**

PIPE NO	FROM POINT REFERENCE	FROM POINT STA.	TO POINT REFERENCE	TO POINT STA.	DRAIN. AREA "A" Acre	RUNOFF COEFF. "C"	CA INCRE-MENT	CA ADDTL CA	CA ACCUM-ULATED	TOTAL INLET TIME Minutes	RAIN FALL In/Hr	RUNOFF Q CFS	INVERT ELEVATIONS UPPER END	INVERT ELEVATIONS LOWER END	LENGTH of Pipe Ft.	SLOPE Ft./Ft.	SIZE (Dia. Or Span/Rise) In.	SHAPE	Capacity CFS	Friction Slope Ft./Ft.	VEL Vn Ft/Sec	FLOW TIME Min.	REMARKS
	(1)		(2)		(3)	(4)	(5)		(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)		(15)		(16)	(17)	(18)
102	101		105		0.060	0.790	0.047	0.000	0.047	5.000	5.650	0.268	2019.600	2019.470	25.210	0.005	15.000	Circular	5.024	0.000	2.179	0.193	
104	103		105		0.130	0.770	0.100	0.000	0.100	5.000	5.650	0.566	2019.840	2019.570	26.916	0.010	15.000	Circular	7.007	0.000	3.436	0.131	
106	105		EX1		0.000	0.000	0.000	0.000	0.148	5.131	5.637	0.831	2019.470	2018.810	65.711	0.010	15.000	Circular	7.012	0.000	3.848	0.285	
EX. 15 INCH HDPE	EX1		5		0.000	0.000	0.000	0.000	0.148	5.415	5.609	0.827	2018.000	2017.900	5.224	0.019	15.000	Circular	9.679	0.000	4.827	0.018	

STRM 200
STORM SEWER DESIGN COMPUTATIONS

PROJECT: TIMBER HARVEST
LOCATION: INVENTIVE LANE, BLACKSBURG VA
COUNTY: MONTGOMERY

Designed by: MK
Checked by: JB

STORM FREQUENCY **10**

UNITS **ENGLISH**

PIPE NO	FROM POINT REFERENCE	FROM POINT STA.	TO POINT REFERENCE	TO POINT STA.	DRAIN. AREA "A" Acre	RUNOFF COEFF. "C"	CA INCRE-MENT	CA ADDTL CA	CA ACCUM-ULATED	TOTAL INLET TIME Minutes	RAIN FALL In/Hr	RUNOFF Q CFS	INVERT ELEVATIONS UPPER END	INVERT ELEVATIONS LOWER END	LENGTH of Pipe Ft.	SLOPE Ft./Ft.	SIZE (Dia. Or Span/Rise) In.	SHAPE	Capacity CFS	Friction Slope Ft./Ft.	VEL Vn Ft/Sec	FLOW TIME Min.	REMARKS
	(1)		(2)		(3)	(4)	(5)		(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)		(15)		(16)	(17)	(18)
102	101		105		0.060	0.790	0.047	0.000	0.047	5.000	6.410	0.304	2019.600	2019.470	25.210	0.005	15.000	Circular	5.024	0.000	2.262	0.186	
104	103		105		0.130	0.770	0.100	0.000	0.100	5.000	6.410	0.642	2019.840	2019.570	26.916	0.010	15.000	Circular	7.007	0.000	3.566	0.126	
106	105		EX1		0.000	0.000	0.000	0.000	0.148	5.126	6.385	0.942	2019.470	2018.810	65.711	0.010	15.000	Circular	7.012	0.000	3.989	0.275	
EX. 15 INCH HDPE	EX1		5		0.000	0.000	0.000	0.000	0.148	5.400	6.310	0.931	2018.000	2017.900	5.224	0.019	15.000	Circular	9.679	0.000	4.996	0.017	

STRM 200
HYDRAULIC GRADE LINE ANALYSIS

PROJECT: TIMBER HARVEST

DESIGNED BY: MK
Checked: JB

INCIDENCE PROBABILITY **2** **Year**

INLET OR JUNCTION	INLET STATION	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In)	DESIGN DISCH. Qo (CFS)	LENGTH PIPE Lo (Ft)	FRICTION SLOPE, Sfo (FT/FT)	FRICTION LOSS Hf (Ft)	JUNCTION LOSS Vo	Ho (Ft)	Qi	Vi	QiVi	Vi^2/2g	Hi	Angle	HΔ	Ht	1.3 Ht	0.5 Ht	FINAL H (Ft)	Inlet Water Surface Elevation	Rim Elev	Comments
EX1		2018.90	15	0.83	5.22	0.0001	0.00	4.83	0.09	0.83	3.85	3.20	0.23	0.08	16.52	0.05	0.22	0	FALSE	0.22	2019.12	2021.19	OK -2.07
105		2019.81	15	0.83	65.71	0.0001	0.01	3.85	0.06	0.57	3.44	1.94	0.18	0.06	71.83	0.05	0.17	0	FALSE	0.18	2019.99	2022.47	OK -2.48
101		2020.47	15	0.27	25.21	0.0000	0.00	2.18	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.024	FALSE	0.02	2020.49	2021.98	OK -1.48
103		2020.57	15	0.57	26.92	0.0001	0.00	3.44	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.0596	FALSE	0.06	2020.63	2022.48	OK -1.85

STRM 200
HYDRAULIC GRADE LINE ANALYSIS

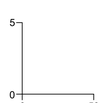
PROJECT: TIMBER HARVEST

DESIGNED BY: MK
Checked: JB

INCIDENCE PROBABILITY **10** **Year**

INLET OR JUNCTION	INLET STATION	OUTLET WATER SURFACE ELEV.	DIA. PIPE Do (In)	DESIGN DISCH. Qo (CFS)	LENGTH PIPE Lo (Ft)	FRICTION SLOPE, Sfo (FT/FT)	FRICTION LOSS Hf (Ft)	JUNCTION LOSS Vo	Ho (Ft)	Qi	Vi	QiVi	Vi^2/2g	Hi	Angle	HΔ	Ht	1.3 Ht	0.5 Ht	FINAL H (Ft)	Inlet Water Surface Elevation	Rim Elev	Comments
EX1		2018.90	15	0.93	5.22	0.0002	0.00	5.00	0.10	0.94	3.99	3.76	0.25	0.09	16.52	0.05	0.23	0	FALSE	0.23	2019.13	2021.19	OK -2.05
105		2019.81	15	0.94	65.71	0.0002	0.01	3.99	0.06	0.64	3.57	2.29	0.20	0.07	71.83	0.05	0.18	0	FALSE	0.19	2020.00	2022.47	OK -2.47
101		2020.47	15	0.30	25.21	0.0000	0.00	2.26	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02583	FALSE	0.03	2020.50	2021.98	OK -1.48
103		2020.57	15	0.64	26.92	0.0001	0.00	3.57	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.06416	FALSE	0.07	2020.64	2022.48	OK -1.85

NOTES:
1. ADJUST ALL EXISTING STRUCTURES TO MATCH FINISHED GRADE ELEVATION. REMOVE TOP AND CONE/RISER SECTIONS AS REQUIRED. ADD BACK STANDARD VDOT PRECAST SECTIONS AS NEEDED TO ACHIEVE REQUIRED ADJUSTMENT.
2. ALL DRAIN BASINS SHALL BE NYLOPLAST OR APPROVED EQUAL. PAINT INTERIOR OF ALL DRAIN BASINS BLACK.
3. CONTRACTOR TO VERIFY GRATE COLORS WITH OWNER PRIOR TO PURCHASING.
4. FILL SUMPS OF DRAIN BASINS WITH CONCRETE TO INVERT OUT.



COMMONWEALTH OF VIRGINIA
10/28/2026
JOHNATHAN C. BRODIE
Lic. No. 053540
PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

THIS DRAWING PREPARED AT THE
ROANOKE OFFICE
109 NORFOLK AVENUE, Suite 100 | ROANOKE, VA 24011
TEL 276.308.8255 WWW.TIMMONS.COM

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REVISION DESCRIPTION

DATE

DATE 10/28/26
DRAWN BY M. KUHNS
DESIGNED BY M. KUHNS
CHECKED BY J. BRODIE
SCALE 1" = 50'

TIMMONS GROUP

VIRGINIA TECH - FORESTRY RESEARCH OPERATIONS CENTER
BLACKSBURG, VA
UTILITY PROFILES

JOB NO. 79501
SHEET NO. C5.0

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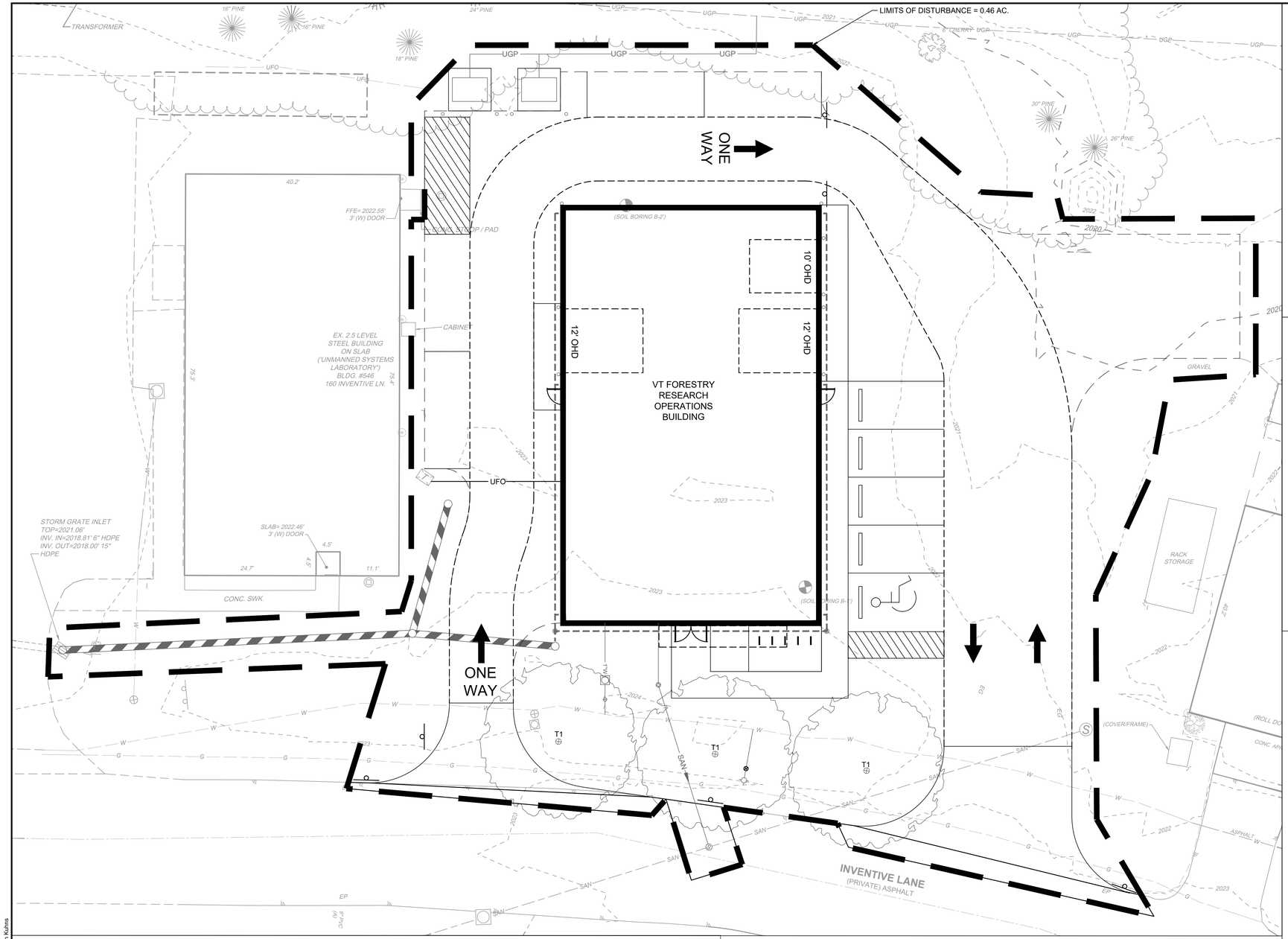


PLANT_SCHEDULE_1						
CODE	QTY	BOTANICAL NAME	COMMON NAME	MIN. INSTALLED SIZE	ROOT	CANOPY
CANOPY TREES						
T1	3	QUERCUS BICOLOR	SWAMP WHITE OAK	0'-3.50"	BXB	AS SHOWN

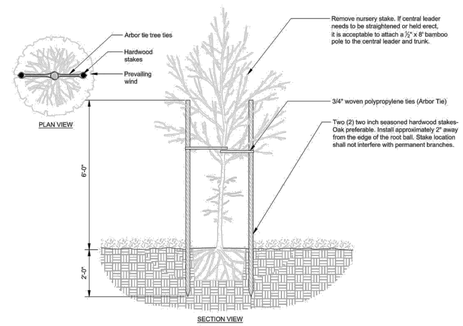
NOTE:

1. QUANTITIES ARE PROVIDED FOR CONVENIENCE ONLY AND SHALL BE VERIFIED BY CONTRACTOR PRIOR TO BIDDING.
2. SEED ALL DISTURBED AREAS NOT OTHERWISE CALLED OUT ON PLAN.

NAD 83

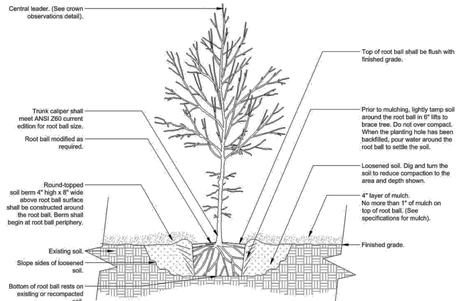
SCALE 1"=10'

0 10' 20'



P-X TREE STAKING

VT Design Standard Detail Library 2020



P-X TREE w/ BERM (EXISTING SOIL NOT MODIFIED)

VT Design Standard Detail Library 2020

GENERAL NOTES

PRE-CONSTRUCTION

- CONTRACTOR IS RESPONSIBLE FOR CONTACTING "MISS UTILITY" AT 1.800.552.7001 FOR LOCATION OF ALL UTILITY LINES.TREES SHALL BE LOCATED A MINIMUM OF 5 FEET FROM SEWER/WATER CONNECTIONS. NOTIFY LANDSCAPE ARCHITECT OF CONFLICTS.
- VERIFY ALL PLANT MATERIAL QUANTITIES ON THE PLAN PRIOR TO BIDDING, PLANT LIST TOTALS ARE FOR CONVENIENCE ONLY AND SHALL BE VERIFIED PRIOR TO BIDDING.
- PROVIDE PLANT MATERIALS OF QUANTITY, SIZE, GENUS, SPECIES, AND VARIETY INDICATED ON PLANS. ALL PLANT MATERIALS AND INSTALLATION SHALL COMPLY WITH RECOMMENDATIONS AND REQUIREMENTS OF VIRGINIA TECH DESIGN AND CONSTRUCTION STANDARDS MANUAL APPROVED PLANT AND TREE LISTS. IF SPECIFIED PLANT MATERIAL IS NOT OBTAINABLE, SUBMIT PROOF OF NON AVAILABILITY TO THE LANDSCAPE ARCHITECT, TOGETHER WITH PROPOSAL FOR USE OF EQUIVALENT MATERIAL.
- PROVIDE AND INSTALL ALL PLANTS AS IN ACCORDANCE WITH DETAILS AND CONTRACT SPECIFICATIONS.
- SOIL TESTS SHALL BE PERFORMED TO DETERMINE SOIL CHARACTER AND QUALITY. NECESSARY SOIL AMENDMENTS SHALL BE PERFORMED PER TEST RESULTS TO ENSURE PLANT HEALTH.

CONSTRUCTION/INSTALLATION

- LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY PLANTS AND MATERIALS THAT ARE IN AN UNHEALTHY OR UNSIGHTLY CONDITION, AS WELL AS PLANTS AND MATERIALS THAT DO NOT CONFORM TO VIRGINIA TECH DESIGN AND CONSTRUCTION STANDARDS MANUAL APPROVED PLANT AND TREE LISTS.
- LABEL AT LEAST ONE TREE AND ONE SHRUB OF EACH VARIETY AND CALIPER WITH A SECURELY ATTACHED, WATERPROOF TAG BEARING THE DESIGNATION OF BOTANICAL AND COMMON NAME.
- INSTALL LANDSCAPE PLANTINGS AT ENTRANCES/EXITS AND PARKING AREAS ACCORDING TO PLANS SO THAT MATERIALS WILL NOT INTERFERE WITH SIGHT DISTANCES.
- CONTRACTOR IS RESPONSIBLE FOR WATERING ALL PLANT MATERIAL DURING INSTALLATION AND UNTIL FINAL INSPECTION AND ACCEPTANCE BY OWNER. CONTRACTOR SHALL NOTIFY OWNER OF CONDITIONS WHICH AFFECTS THE GUARANTEE.

INSPECTIONS/GUARANTEE

- UPON COMPLETION OF LANDSCAPE INSTALLATION, THE LANDSCAPE CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR WHO WILL VERIFY COMPLETENESS, INCLUDING THE REPLACEMENT OF ALL DEAD PLANT MATERIAL. CONTRACTOR IS RESPONSIBLE FOR SCHEDULING A FINAL INSPECTION BY THE LANDSCAPE ARCHITECT.
- ALL EXTERIOR PLANT MATERIALS SHALL BE GUARANTEED FOR ONE FULL YEAR AFTER DATE OF FINAL INSPECTION AGAINST DEFECTS INCLUDING DEATH AND UNSATISFACTORY GROWTH. DEFECTS RESULTING FROM NEGLECT BY THE OWNER, ABUSE OR DAMAGE BY OTHERS, OR UNUSUAL PHENOMENA OR INCIDENTS WHICH ARE BEYOND THE CONTRACTORS CONTROL ARE NOT THE RESPONSIBILITY OF THE CONTRACTOR.
- PLANT MATERIAL QUANTITIES AND SIZES WILL BE INSPECTED FOR COMPLIANCE WITH APPROVED PLANS BY A SITE PLAN REVIEW AGENT OF THE PLANNING DEPARTMENT PRIOR TO THE RELEASE OF THE CERTIFICATE OF OCCUPANCY.
- REMOVE ALL GUY WIRES AND STAKES 12 MONTHS AFTER INSTALLATION.

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PLANTING PLAN

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