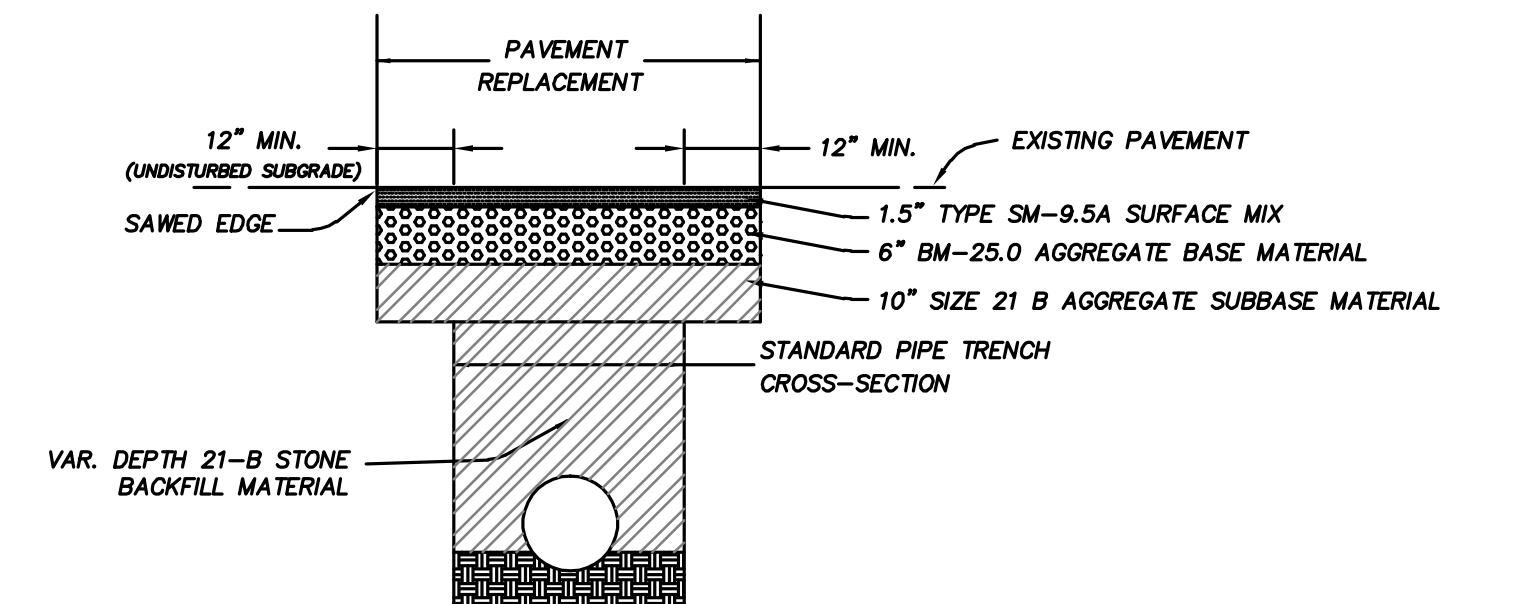
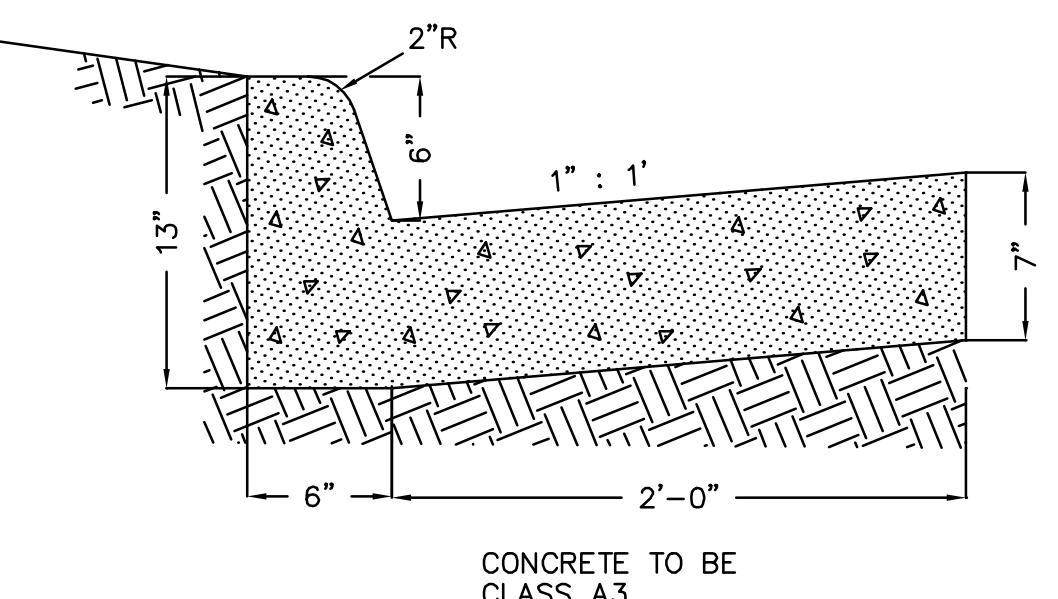


* NOTE: 1. MATCH EXIST. PAVEMENT SECTION IF GREATER THAN SHOWN ABOVE.

DRIVEWAY REPLACEMENT DETAIL



SEE VDOT ROAD & BRIDGE STANDARDS (MOST CURRENT EDITION) FOR ADDITIONAL CURB AND GUTTER NOTES AND DETAILS.



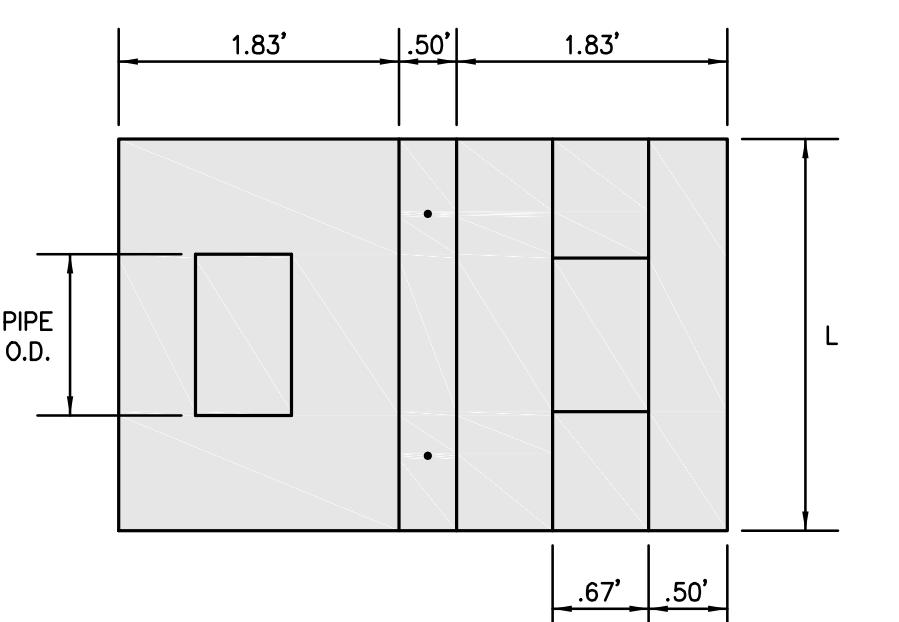
CONCRETE CURB (CG-6)

NO SCALE

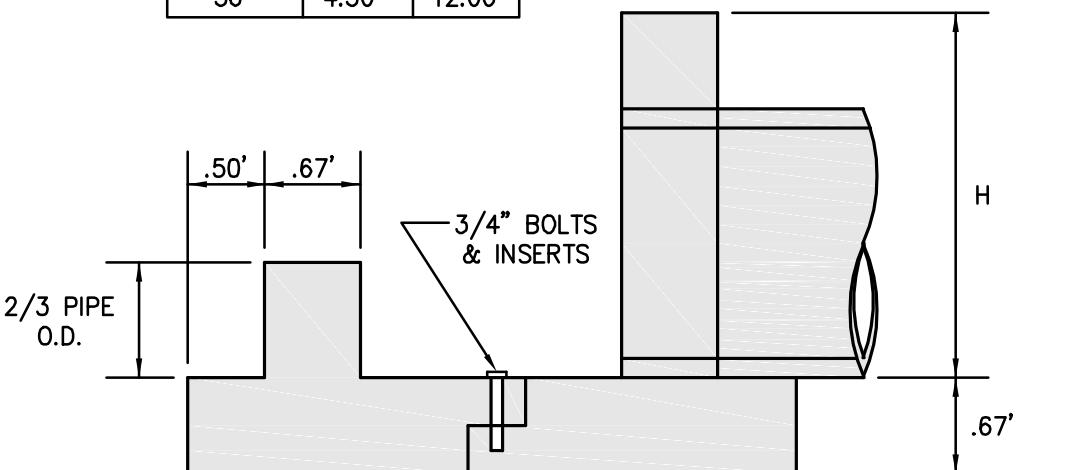
PAVEMENT REPLACEMENT DETAIL

NOTES:

1. SURFACE AND BASE REPLACEMENT WILL GENERALLY BE REQUIRED TO MATCH EXISTING ASPHALT LAYERS AND SHALL BE COMPAKTED IN LIFTS ACCORDING TO VIRGINIA DEPARTMENT OF TRANSPORTATION SPECIFICATION 520.
2. AGGREGATE BASE MATERIAL SHALL BE REPLACED TO A DEPTH GREATER THAN EXISTING STONE BASE TO ENSURE LOAD BEARING CAPACITY OF CUT RELATED TO UNDISTURBED EARTH AREAS. AGGREGATE BASE SHALL BE COMPACTED ACCORDING TO VIRGINIA DEPARTMENT SPECIFICATION 208.
3. BEDDING MATERIAL SHALL BE ACCORDING TO REQUIREMENT OF EACH UTILITY (GENERALLY FROM BOTTOM OF TRENCH TO SIX INCHES ABOVE PIPE WITH A MINIMUM OF FOUR INCHES BELOW THE PIPE).
4. CUT TO BE MADE WITH A MECHANICAL SAW AND SIDES TO BE TACKED WITH BITUMINOUS MATERIAL TYPE CRS-2 OR EQUAL.
5. ALL CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE AS SPECIFIED BY VDOT OR APPLICABLE LOCALITY.
6. PRIOR TO CONSTRUCTION, CONTRACTOR IS RESPONSIBLE FOR SECURING ALL REQUIRED PERMITS FROM VDOT AND/OR APPLICABLE LOCALITY.



PIPE I.D.	H	L
12"	2.00'	4.00'
15"	2.25'	5.00'
18"	2.50'	6.00'
24"	3.17'	8.00'
30"	3.83'	10.00'
36"	4.50'	12.00'



NOTES:

1. CONCRETE 4,000 P.S.I.
2. REINFORCING #4 @ 6" C.C. E.W. DOUBLE ROW THROUGHOUT.

EW-1 MODIFIED WITH ENERGY DISSIPATOR

NO SCALE

GENERAL NOTES

1. PROPERTY OWNERS:

7029 CROWN ROAD, S.W.
TM# 000-01-01-12-00
LESLIE K. GLASSMAN &
STANLEY S. GLASSMAN
INST. No. 200214719

7049 CROWN ROAD, S.W.
TM# 000-01-01-11-00
JOSEA A. LEONARD &
KARA S. CUNDIFF
INST. No. 200910914

7041 CROWN ROAD, S.W.
TM# 000-01-01-11-00
JOHN A. LEONARD &
COLLEEN R. LEONARD
D.B. 1266, PG. 1641

2. THIS PROPERTY IS NOT LOCATED WITHIN A SPECIAL FLOOD HAZARD AREA AS DESIGNATED BY FEMA. THIS OPINION IS BASED ON AN INSPECTION OF THE FLOOD INSURANCE RATE MAP AND HAS BEEN FIELD VERIFIED.

3. SEE COMMUNITY PANEL MAP # 510190 0251 G, DATED SEPTEMBER 28, 2007.

4. SOURCE OF TOPOGRAPHY IS BY FIELD SURVEY BY LUMSDEN ASSOCIATES, P.C. IN NOVEMBER 2020.

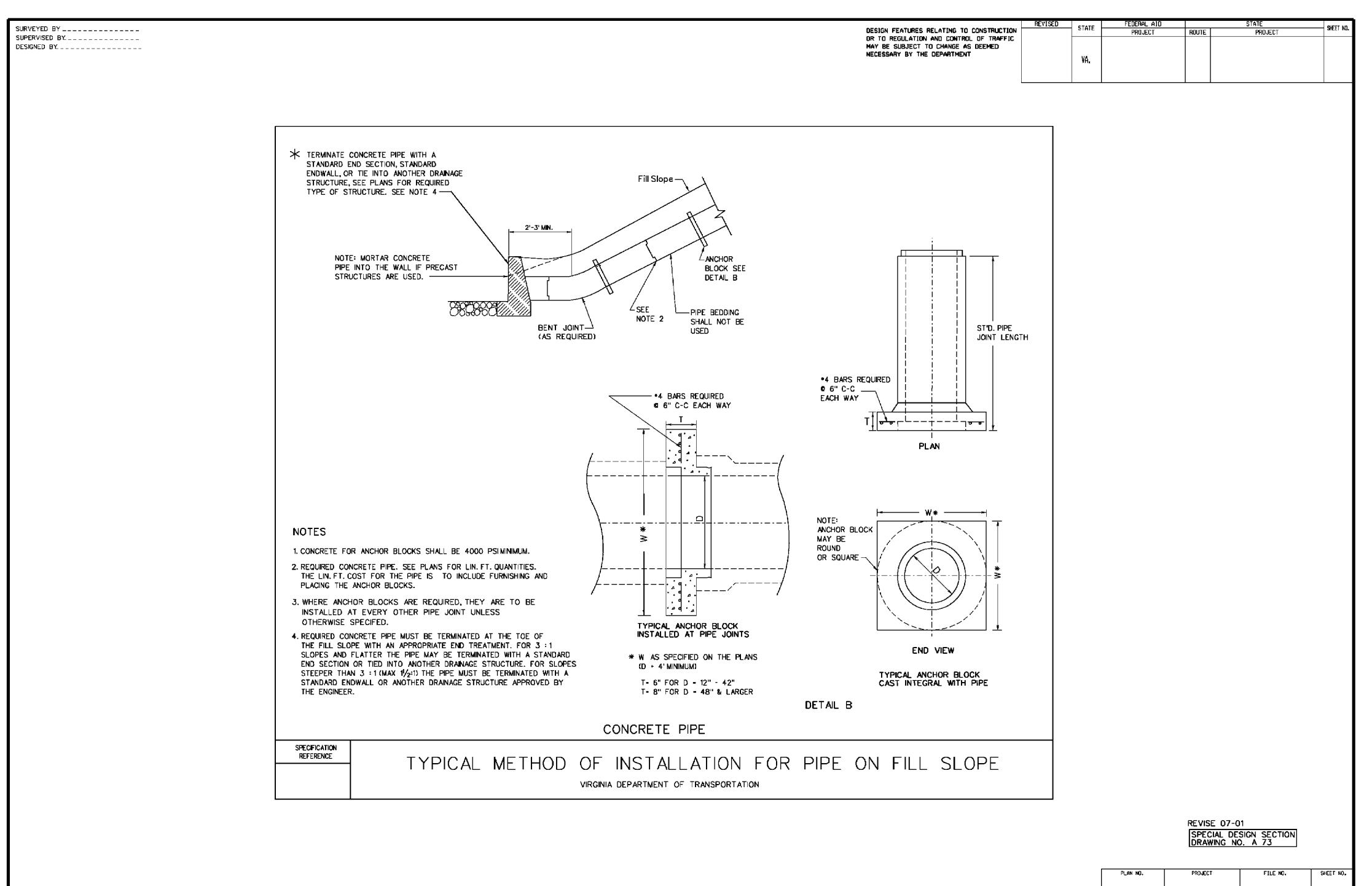
5. NO SITE REPORT WAS FURNISHED FOR THIS PROPERTY.

CONSTRUCTION NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT COUNTY OF ROANOKE AND VDOT STANDARDS AND SPECIFICATIONS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE OWNER AND THE ENGINEER OF ANY CHANGES OR CONDITIONS ATTACHED TO PERMITS OBTAINED FROM ANY AUTHORITY ISSUING PERMITS.
3. NO SUBSURFACE INVESTIGATIONS HAVE BEEN FURNISHED TO THE DESIGNING ENGINEER.
4. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY EXISTING CONDITIONS PRIOR TO STARTING CONSTRUCTION.
5. THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES PRIOR TO STARTING CONSTRUCTION.
6. SEE VDOT ROAD AND BRIDGE STANDARDS FOR CONCRETE CURB AND STORM DRAINAGE DETAILS.
7. THE CONTRACTOR AND OR OWNER SHALL PROVIDE A STORAGE CONTAINER FOR TEMPORARY STORAGE AND DISPOSAL OF LAND CLEARANCE DEBRIS AND BUILDING MATERIALS. ON-SITE BURIAL OF MATERIAL SHALL NOT BE PERMITTED.
8. DRAINAGE WAY TO BE KEPT FUNCTIONAL DURING CONSTRUCTION.
9. ROANOKE COUNTY ENGINEERING DEPARTMENT SHALL COORDINATE REMOVAL AND RELOCATION OF SWALE AND LANDSCAPING PLANTS CONFLICTING WITH CONSTRUCTION WITH INDIVIDUAL OWNERS.
10. ROANOKE COUNTY ENGINEERING DEPARTMENT SHALL COORDINATE WITH SURVEYOR TO RESET PROPERTY CORNER MONUMENTATION LOST IN THE COURSE OF CONSTRUCTION.
11. TOPSOIL & MATERIAL STOCKPILE LOCATIONS TO BE DETERMINED BY ROANOKE COUNTY ENGINEERING AND CONTRACTOR.
12. ALL MAINTENANCE OF TRAFFIC SHALL BE IN ACCORDANCE WITH THE VIRGINIA WORK AREA PROTECTION MANUAL (REVISION 1, APRIL 1, 2015).
13. CONTRACTOR TO MAINTAIN A MINIMUM OF TWO (2) FEET OF CLEARANCE WITHIN THE PUBLIC RIGHT-OF-WAY TO COORDINATE SOURCE OF CONSTRUCTION AND THE NEED OF ANY LANE CLOSURES, SIGNAGE, MESSAGE BOARDS, ADVERTISEMENTS, ETC.
14. ALL INLETS SHALL HAVE INVERT SHAPING AND ALL DI-3 CURB INLETS SHALL HAVE GUTTER WARPING AND A LOCAL DEPRESSION PER VDOT ROAD AND BRIDGE STANDARDS.
15. THE CONTRACTOR SHALL CONTACT THE T.O.C. PRIOR TO INSTALLING OR REMOVING TEMPORARY TRAFFIC CONTROL. TEL 540-375-0170.

GRADING NOTES

1. AREAS TO BE GRADED SHALL BE CLEARED OF ALL VEGETATION, STRUCTURES, AND OTHER PHYSICAL FEATURES IN PREPARATION FOR GRADING.
2. DIRT AND SOIL REMOVED FROM THE CLEARED AREA AND STOCKPILED FOR FUTURE USE.
3. A QUALIFIED GEOTECHNICAL ENGINEER LICENSED IN THE STATE OF VIRGINIA SHALL BE HIRED FOR THE CONSULTATION OF SOIL STABILITY, SLOPE STABILIZATION, SOIL COMPACTION, TESTING AND OTHER SOIL CHARACTERISTICS. LUMSDEN ASSOCIATES ASSUMES NO RESPONSIBILITY OR LIABILITY RELATING TO FAILURES RESULTING FROM SAME.
4. NO CONSTRUCTION/FIELD REVISIONS OR CHANGES TO THE LIMITS OF CLEARING AND GRADING ARE ALLOWED WITHOUT THE APPROVAL OF THE CONSULTING ENGINEER AND VDOT.



STORM DRAIN ANCHOR BLOCK

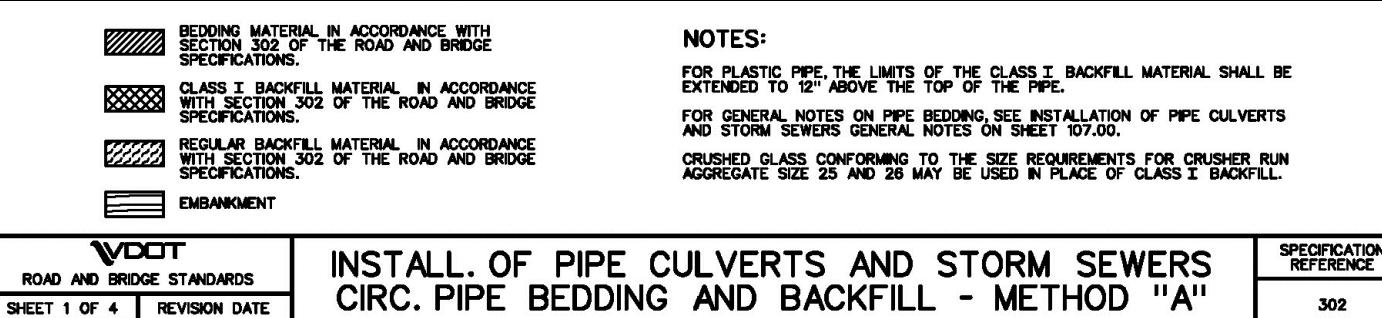
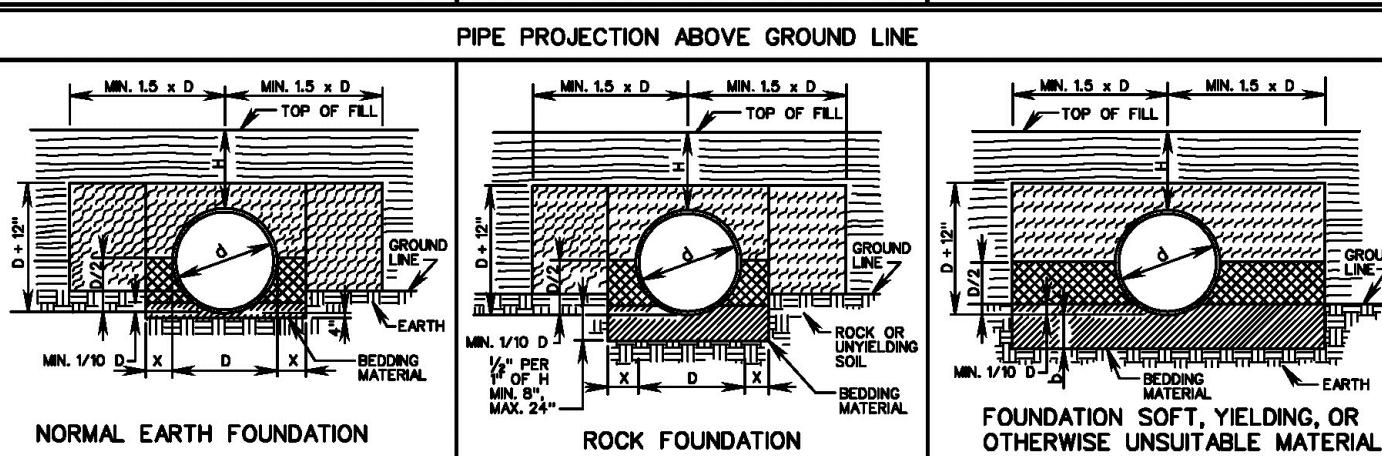
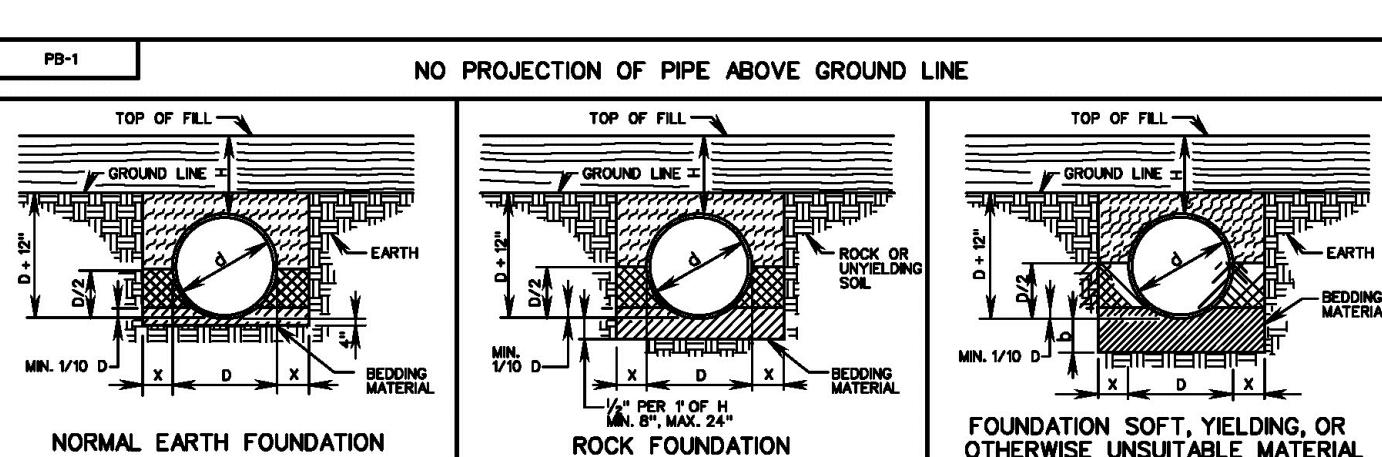
NO SCALE

SUMMARY OF QUANTITIES (IN RIGHT-OF-WAY)

DESCRIPTION	UNIT	QUANTITY
MOBILIZATION	L.S.	LUMP SUM
DEMOLITION	L.S.	LUMP SUM
EXCAVATION, UNCLASSIFIED	L.S.	LUMP SUM
30" CLASS III RCP	L.F.	64
DI-3C CURB INLET L = 6'	EACH	1
DI-3C CURB INLET L = 16'	EACH	1
ROADWAY PAVEMENT REPLACEMENT	S.Y.	79
CG-6 CURB REPLACEMENT	L.F.	54
EROSION CONTROL INLET PROTECTION	EACH	2

SUMMARY OF QUANTITIES (OUT OF RIGHT-OF-WAY)

DESCRIPTION	UNIT	QUANTITY
MOBILIZATION	L.S.	LUMP SUM
DEMOLITION	L.S.	LUMP SUM
EXCAVATION, UNCLASSIFIED	L.S.	LUMP SUM
30" CLASS III RCP	L.F.	91
30" ES-1	EACH	1
30" EW-1 W/ ENERGY DISSIPATOR	EACH	1
CLASS A1 RIP-RAP	C.Y.	21
DRIVEWAY PAVEMENT REPLACEMENT	S.Y.	61
UNDERGROUND UTILITY REPLACEMENT	L.S.	LUMP SUM
EROSION CONTROL SILT FENCE	L.F.	45
EROSION CONTROL DIVERSION DIKE	L.F.	75
EROSION CONTROL CULVERT INLET PROTECTION	EACH	1
EROSION CONTROL OUTLET PROTECTION	EACH	1
EROSION CONTROL TEMPORARY & PERMANENT SEEDING	ACRE	0.1



NOTES:

FOR PLASTIC PIPE, THE LIMITS OF THE PIPE SHALL BE EXTENDED 12" IN THE DIRECTION OF THE TOP OF THE PIPE.

FOR CONCRETE PIPE, THE LIMITS OF THE PIPE SHALL BE EXTENDED 12" IN THE DIRECTION OF THE TOP OF THE PIPE.

CRUSHED STONE CONFORMING TO THE SIZE REQUIREMENTS FOR CRUSHER RUN AGGREGATE SIZE 25 AND 28 MAY BE USED IN PLACE OF CLASS 2 BACKFILL.

EMBANKMENT

REVISIONS

DESCRIPTION

NO. DATE

1. 10/02/2024

2. 10/02/2024

3. 10/02/2024

4. 10/02/2024

5. 10/02/2024

SPECIFICATION REFERENCE

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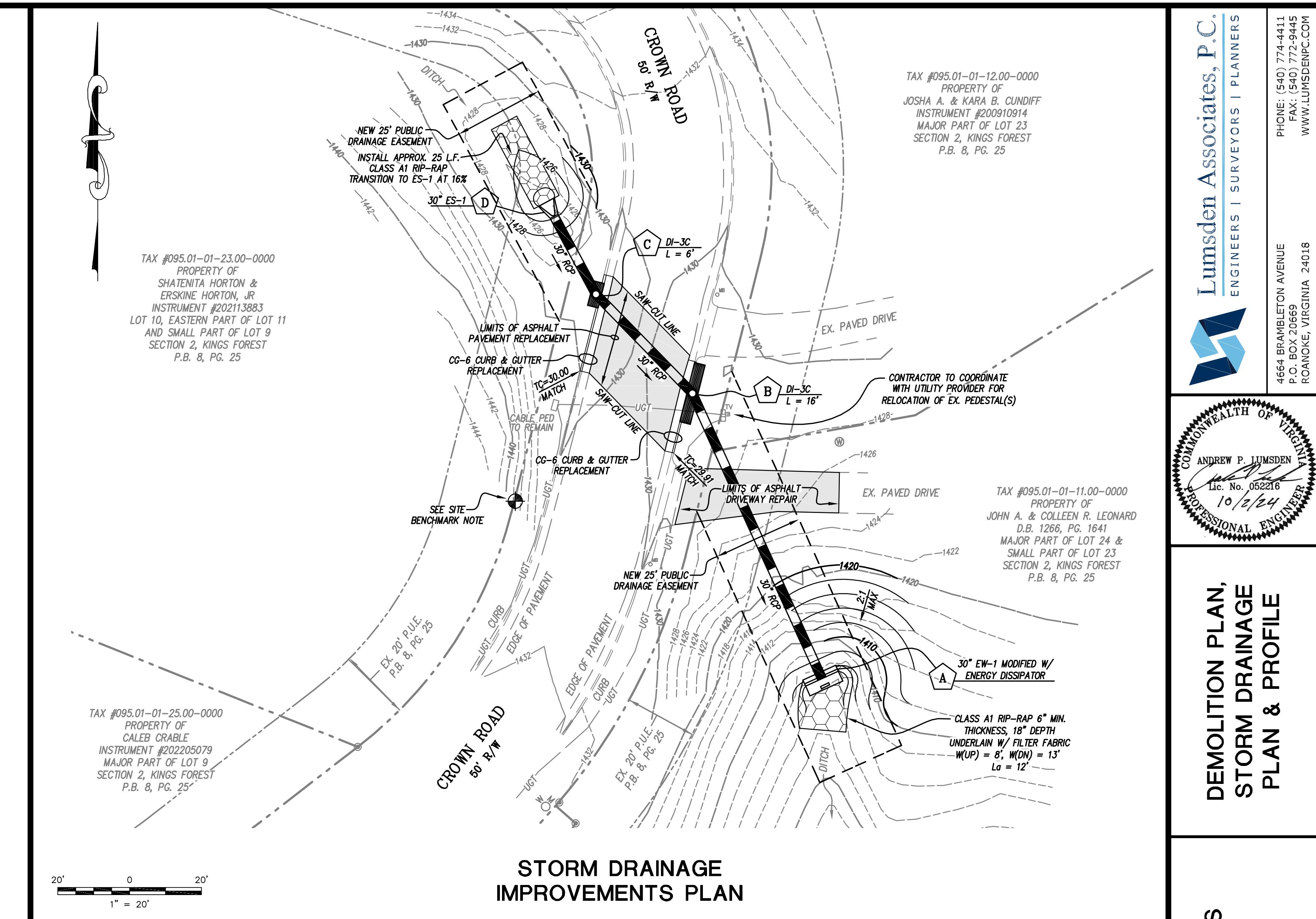
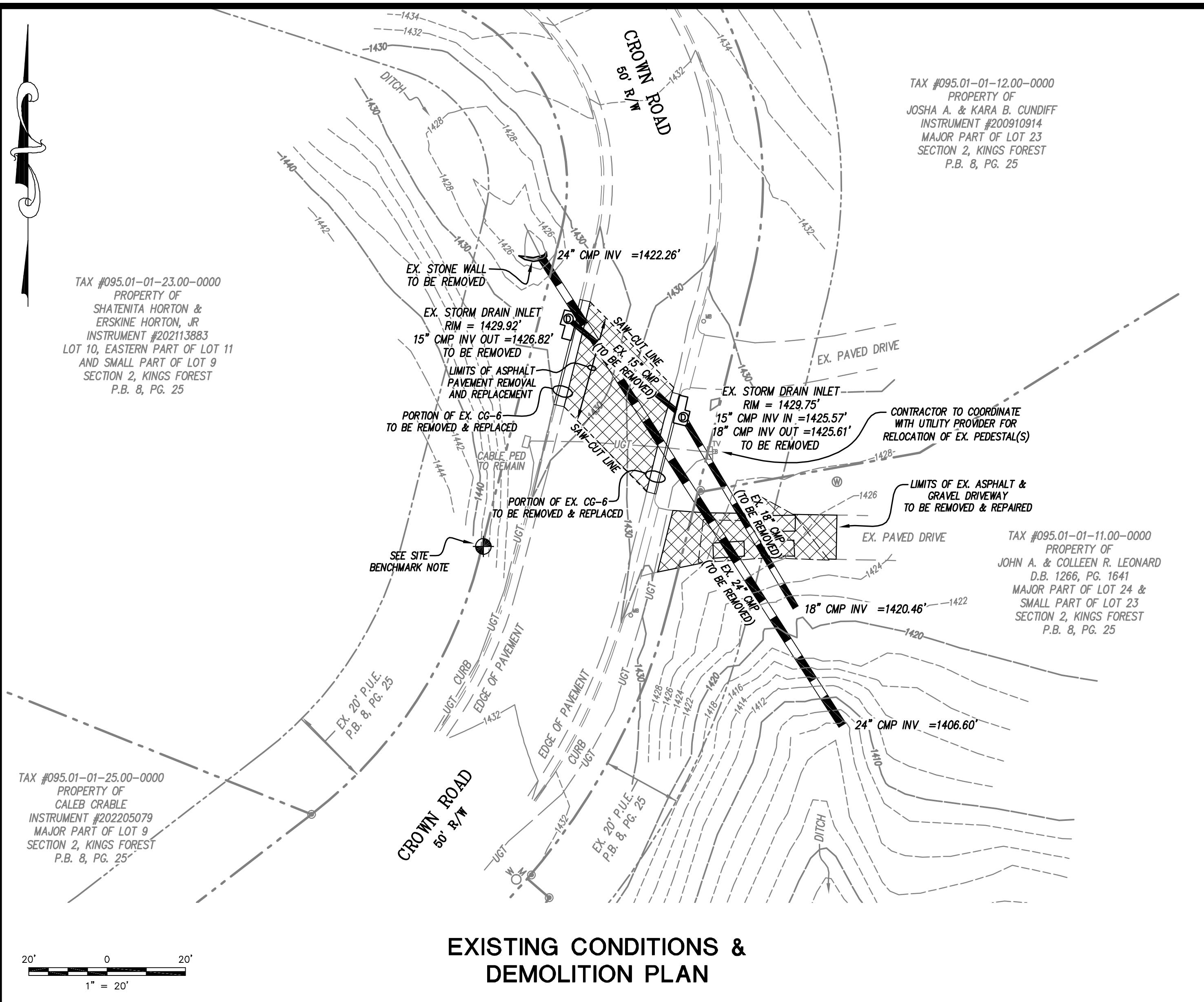
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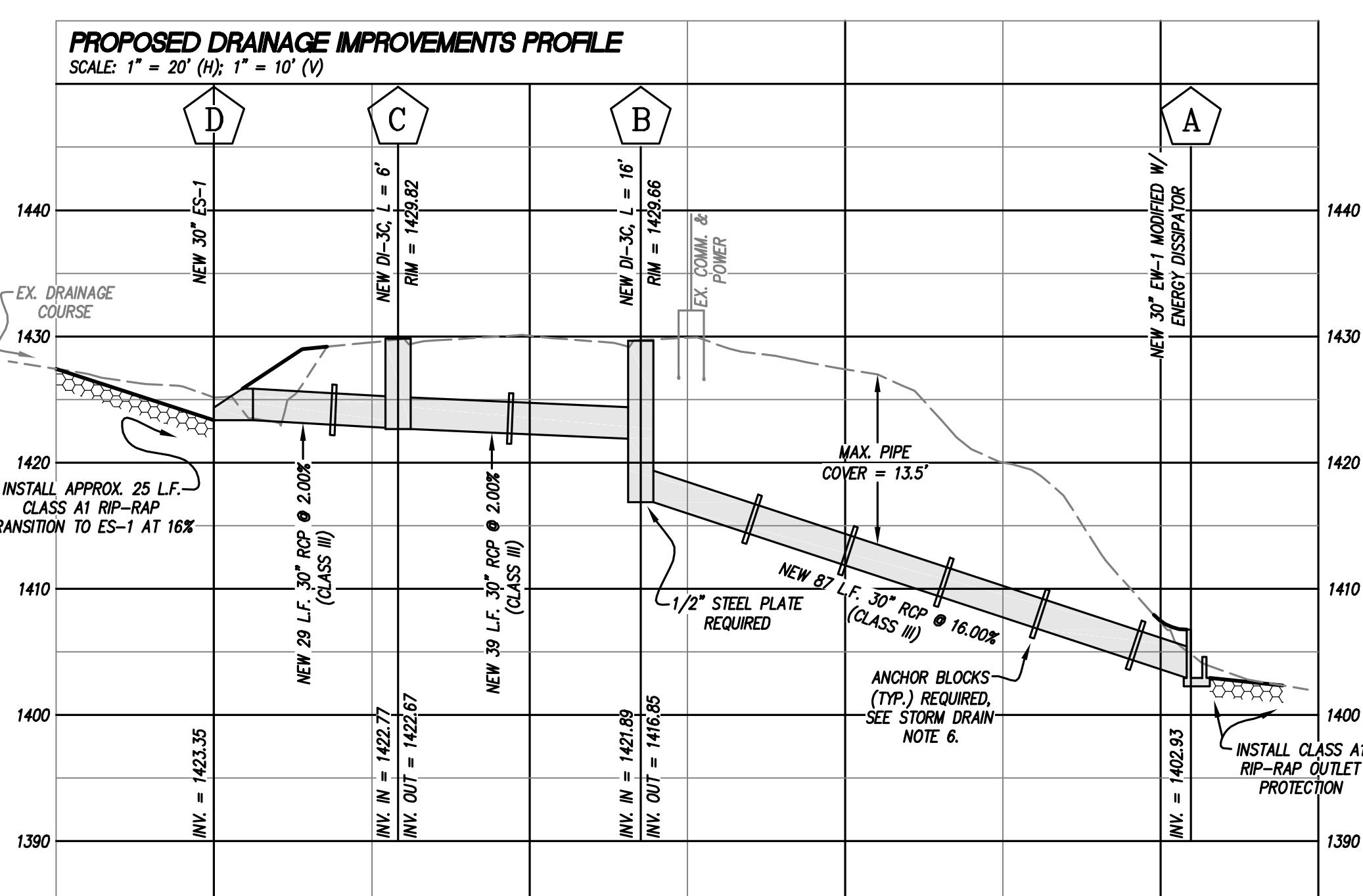


SITE BENCHMARK

BENCHMARK: EXISTING IRON PIN, ELEVATION = 1436.54'
NOTE: FIELD VERIFY BEFORE USE.

STORM DRAIN NOTES:

1. ALL NEW STORM DRAIN PIPE SHOWN ON THIS PLAN IS 30" CLASS III RCP OR APPROVED EQUAL, EXCEPT WHERE OTHER DIAMETERS AND/OR MATERIALS ARE INDICATED.
2. ALL 100' STANDARD STORM DRAIN INLET AND MANHOLE STRUCTURES SHALL INCLUDE IS-1 INLET SHAPING UNLESS INDICATED OTHERWISE.
3. WHERE STORM DRAIN MANHOLES ARE INDICATED AS STEP-DOWN STRUCTURES, CONTRACTOR SHALL INSTALL 1/2" STEEL PLATE ARMORING TO BASE OF MANHOLE, PER VDOT DDM.
4. ALL DRAINAGE STRUCTURES DEEPER THAN 4.0 FEET SHALL HAVE STEPS (VDOT STD. ST-1) INSTALLED.
5. SAFETY SLABS (VDOT STD. SL-1) ARE REQUIRED IN ALL DRAINAGE STRUCTURES WITH A DEPTH OF 12.0 FEET OR GREATER. SPACING OF THE SAFETY SLABS SHOULD BE 8 TO 12 FEET WITH NO SLAB LOCATED WITHIN 6.0 FEET OF THE TOP OR BOTTOM OF THE STRUCTURE.
6. ANCHOR BLOCKS SHALL BE REQUIRED ON EACH PROPOSED PIPE SECTION. REFER TO VDOT DETAIL A-73 ON SHEET 2 FOR DETAILS REGARDING SPACING, SIZING, AND MATERIAL REQUIREMENTS.



CROWN ROAD DRAINAGE IMPROVEMENTS
PREPARED FOR
ROANOKE COUNTY
ENGINEERING DEPARTMENT
WINDSOR HILLS MAGISTERIAL DISTRICT
ROANOKE COUNTY, VIRGINIA

**DEMOLITION PLAN,
STORM DRAINAGE
PLAN & PROFILE**

Lumsden Associates, P.C.
ENGINEERS | SURVEYORS | PLANNERS
4664 BRAMBLETON AVENUE
P.O. BOX 20659
ROANOKE, VIRGINIA 24018

ANDREW P. LUMSDEN
LIC. NO. 052216
10/24/24

COLONIAL COMMONWEALTH OF VIRGINIA
PROFESSIONAL ENGINEER

TAX #095.01-01-12.00-0000
PROPERTY OF
JOSH A. & KARA B. CUNDIFF
INSTRUMENT #200910914
MAJOR PART OF LOT 23
SECTION 2, KINGS FOREST
P.B. 8, PG. 25

TAX #095.01-01-23.00-0000
PROPERTY OF
SHATENITA HORTON &
ERSKINE HORTON, JR
INSTRUMENT #202113883
LOT 10, EASTERN PART OF LOT 11
AND SMALL PART OF LOT 9
SECTION 2, KINGS FOREST
P.B. 8, PG. 25

TAX #095.01-01-11.00-0000
PROPERTY OF
JOHN A. & COLLEEN R. LEONARD
D.B. 1266, PG. 1641
MAJOR PART OF LOT 24 &
SMALL PART OF LOT 23
SECTION 2, KINGS FOREST
P.B. 8, PG. 25

TAX #095.01-01-25.00-0000
PROPERTY OF
CALEB CRABLE
INSTRUMENT #202205079
MAJOR PART OF LOT 9
SECTION 2, KINGS FOREST
P.B. 8, PG. 25

TAX #095.01-01-12.00-0000
PROPERTY OF
JOSH A. & KARA B. CUNDIFF
INSTRUMENT #200910914
MAJOR PART OF LOT 23
SECTION 2, KINGS FOREST
P.B. 8, PG. 25

PHONE: (540) 774-4411
FAX: (540) 772-8445
WWW.LUMSDENPC.COM

EROSION CONTROL NARRATIVE

PROJECT DESCRIPTION
THE PROJECT AREA IS LOCATED ALONG CROWN ROAD IN ROANOKE COUNTY WITH THE MAJORITY OF THE CONSTRUCTION WITHIN TAX MAP NO. 005-01-01-23-00 AND 005-01-01-11-00. THE PROPOSED CONSTRUCTION FOR THIS PROJECT CONSISTS OF GRAVAGE IMPROVEMENTS TO HELP ALLEGE RUNOFF CONCERN WITH EXISTING INADEQUATE AND FAILING STORM DRAINAGE SYSTEM. THE TOTAL DISTURBED AREA IS APPROXIMATELY 6,950 S.F. (0.16 ACRES)

EXISTING SITE CONDITIONS

THE MAJORITY OF THE PROJECT CONSTRUCTION WILL BE PERFORMED WITHIN THE EXISTING DRAINAGE WAY. THIS DRAINAGE WAY COLLECTS AND CONVEYS RUNOFF FROM THE NORTHEAST AND ALONG CROWN ROAD, THEN DISCHARGES THE RUNOFF TO THE SOUTH OF CROWN ROAD. THE IMPROVEMENTS ARE PROPOSED TO MAKE THE EXISTING SYSTEM MORE EFFICIENT WHILE MAKING REPAIRS AS NEEDED.

ADJACENT AREAS

THE PROJECT LOTS ARE LOCATED WITHIN THE RIGHT-OF-WAY OF CROWN ROAD AND ON BOTH THE NORTHEAST AND SOUTH EAST OF CROWN ROAD (BEING RESIDENTIAL PROPERTY). THE MAJORITY OF THE UPGRADE DRAINAGE SHED IS UNDEVELOPED WOODLANDS WITH A FEW SINGLE FAMILY RESIDENTIAL LOTS.

OFFSITE AREAS

NO OFFSITE AREAS ARE CURRENTLY ASSOCIATED WITH THIS PLAN. ALL MATERIAL THAT IS REMOVED FROM OR DELIVERED TO THIS SITE IN ASSOCIATION WITH THIS PROJECT SHALL BE FROM A PERMITTED SITE. THE LOCATION OF ALL OFF-SITE FILL OR BORROW AREAS ASSOCIATED WITH THE CONSTRUCTION PROJECT WILL BE PROVIDED TO ROANOKE COUNTY DEPARTMENT OF COMMUNITY DEVELOPMENT. AN EROSION CONTROL PLAN OR MEASURES MAY BE REQUIRED FOR THIS AREA.

SOILS

SOILS INFORMATION IS BASED ON AN INSPECTION OF THE USDA WEB SOIL SURVEY AND HAS NOT BEEN FIELD VERIFIED. THE ON-SITE SOILS ARE INDICATED TO BE AS FOLLOWS:

EDNEYVILLE SOIL: FINE SANDY LOAM 25 TO 55% SLOPES (MAP UNIT 16)

HYDROLOGIC SOIL GROUP: A
DEPTH THE RESTRICTIVE FEATURE: MORE THAN 80 INCHES
DEPTH TO THE RESTRICTIVE FEATURE: MORE THAN 80 INCHES

DRAINAGE CLASS: WELL DRAINED

AVAILABLE WATER CAPACITY: MODERATE

SOL PROFILE: 0 TO 4 INCHES: FINE SANDY LOAM, 4 TO 31 INCHES: SANDY LOAM, 31 TO 62 INCHES: SANDY LOAM.

CRITICAL AREAS

THE CONTRACTOR SHALL TAKE SPECIAL CARE TO ENSURE THAT SEDIMENT IS NOT ALLOWED TO FLOW INTO EITHER THE NEW STORM DRAIN OR THE EXISTING DOWNSTREAM RECEIVING CHANNEL. ENSURE THAT ALL ESC MEASURES ARE STABILIZED AND FUNCTIONING TO MINIMIZE THE POTENTIAL FOR ANY SEDIMENT LEAVING THE SITE.

MINIMUM STANDARDS

REFERR TO DEO MINIMUM STANDARDS

EROSION AND SEDIMENT CONTROL MEASURES

CONSTRUCTION ENTRANCE (3.02) - A STONE CONSTRUCTION ENTRANCE WILL BE INSTALLED TO MINIMIZE THE AMOUNT OF MUD TRANSPORTED INTO EXISTING ROADS.

SILT FENCE (3.03) - SILT FENCE WILL BE INSTALLED AT THE LOWER ENDS OF THE PROJECT SITE TO INTERCEPT SEDIMENT LADEN RUN-OFF PRIOR TO EXITING THE SITE.

INLET PROTECTION (3.07) - INLET PROTECTION WILL BE INSTALLED AT EACH STORM DRAIN INLET TO MINIMIZE THE AMOUNT OF SEDIMENT LADEN RUNOFF FROM ENTERING THE STORM DRAIN SYSTEM.

TEMPORARY DIVERSION DIKE (3.09) - A TEMPORARY RIDGE OF COMPAKED SOIL WILL BE CONSTRUCTED TO DIVERT UPSLOPE RUNOFF AWAY FROM A DISTURBED AREA, AND/OR TO DIVERT SEDIMENT LADEN RUNOFF FROM A DISTURBED AREA TO A SEDIMENT TRAPPING MEASURE.

OUTLET PROTECTION (3.18) - THE INSTALLATION OF RIP RAP CHANNEL SECTIONS BELOW STORM DRAIN OUTLETS.

TEMPORARY SEEDING (3.31) - TEMPORARY SEEDING SHALL BE APPLIED TO TEMPORARY DIVERSION Dikes, TOPSOIL STOCKPILES, AND ALL AREAS TO BE ROUGH GRADED, BUT NOT FINISHED GRADED DURING THE INITIAL PHASE OF CONSTRUCTION. TEMPORARY SEEDING SHALL BE FAST GERMINATING, TEMPORARY VEGETATION AND INSTALLED IMMEDIATELY FOLLOWING GRADING, OR INSTALLATION IF A TEMPORARY MEASURE. SEE ALSO MINIMUM STANDARDS.

PERMANENT SEEDING (3.32) - PERMANENT SEEDING SHALL BE INSTALLED ON ALL DISTURBED AREAS OF THE SITE NOT OTHERWISE STABILIZED.

MULCHING (3.35) - ALL DISTURBED AREAS SHALL BE MULCHED AFTER SEEDING. STRAW MULCH SHALL BE APPLIED AT A RATE OF TWO TONS PER ACRE AND ANCHORED WITH 750 LBS PER ACRE OF FIBER MULCH OVER THE SEEDED AREA.

SOL STABILIZATION BLANKETS & MATTING (3.36) - THE INSTALLATION OF PROTECTIVE BLANKETS (TYPE 1) ON A PREPARED PLANTING OF A STEEP SLOPE.

PERMANENT STABILIZATION
AREAS NOT COVERED BY LANDSCAPING OR OTHER PERMANENT HARD SURFACE SHALL BE STABILIZED WITH PERMANENT SEEDING. THE CONTRACTOR SHALL ENSURE THAT A STRONG STAND OF GRASS IS ESTABLISHED BEFORE THE REMOVAL OF EROSION CONTROL MEASURES.

MANTENANCE:
ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED BI-WEEKLY AND AFTER EVERY RUNOFF PRODUCING RAINFALL. A LOG OF DATES AND INSPECTIONS SHALL BE KEPT. ANY DEFICIENCIES THAT ARE FOUND SHALL BE CORRECTED IMMEDIATELY. ACCUMULATED SEDIMENT AT TRAPPING MEASURES SHALL BE ROUTINELY REMOVED.

EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED UNTIL AFTER ALL DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED AND THEN TEMPORARY MEASURES PROPERLY REMOVED. REMOVAL OF ESC MEASURES MUST BE APPROVED BY ROANOKE COUNTY BEFORE REMOVED.

STORMWATER MANAGEMENT CONSIDERATION:
THE TOTAL PROJECT DISTURBANCE IS LESS THAN 1 ACRE AND THEREFORE DOES NOT REQUIRE STORMWATER MANAGEMENT COMPLIANCE. ALTHOUGH, THE DRAINAGE IMPROVEMENTS SHOWN IN THESE PLANS ARE DESIGNED TO RETURN THE PROPERTY TO ITS ORIGINAL HYDROLOGIC STATE, THEREFORE, THE PROPOSED IMPROVEMENTS OF THIS SITE DO NOT ALTER EXISTING DRAINAGE PATTERNS AND DOES NOT INCREASE THE RUNOFF VOLUME, VELOCITY, OR PEAK FLOW RATES.

CONTRACTOR SHALL PAY PARTICULAR ATTENTION TO THE FOLLOWING MINIMUM STANDARDS:

- 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. **APPLY SEEDING MATURES IN ACCORDANCE WITH SPECIFICATIONS 3.31 AND 3.32 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESC) TO ALL AREAS THAT DO NOT HAVE A NON-ERODABLE SURFACE AS SHOWN ON THE PLAN.**
- During construction of the project, soil stock piles and borrow areas shall be stabilized or protected with sediment trapping measures. The applicant is responsible for the temporary protection of borrow areas and the protection of the site from soil erosion until all borrow areas and soil intended to be transported from the project site. **NO ON-SITE STOCKPILE IS CURRENTLY PLANNED FOR THIS PROJECT.**
- 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 MINIMUM STANDARD 1.**
- Sediment basins and traps, perimeter channels, 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. **INSTALL EROSION CONTROL MEASURES AS OUTLINED IN THE CONSTRUCTION SEQUENCE.**
- Stabilization measures shall be applied to earthen structures such as dams, dikes and diversions immediately after installation. **INSTALL DIVERSION DIKES AS PROPOSED WITH THIS PLAN.**
- sediment traps and sediment basins shall be designed and constructed based upon the total drainage area to be served by the trap or basin.
 - 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.
 - 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 outlet system shall, at a minimum, maintain the structural integrity of the basin during a 25-year storm of 24-hour duration. Runoff controls 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 NO SEDIMENT TRAPS OR SEDIMENT BASINS ARE PROPOSED WITH THIS PLAN.**

REFER TO DEO MINIMUM STANDARDS

EROSION AND SEDIMENT CONTROL MEASURES

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EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED UNTIL AFTER ALL DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED AND THEN TEMPORARY MEASURES PROPERLY REMOVED. REMOVAL OF ESC MEASURES MUST BE APPROVED BY ROANOKE COUNTY BEFORE REMOVED.

STORMWATER MANAGEMENT CONSIDERATION:
THE TOTAL PROJECT DISTURBANCE IS LESS THAN 1 ACRE AND THEREFORE DOES NOT REQUIRE STORMWATER MANAGEMENT COMPLIANCE. ALTHOUGH, THE DRAINAGE IMPROVEMENTS SHOWN IN THESE PLANS ARE DESIGNED TO RETURN THE PROPERTY TO ITS ORIGINAL HYDROLOGIC STATE, THEREFORE, THE PROPOSED IMPROVEMENTS OF THIS SITE DO NOT ALTER EXISTING DRAINAGE PATTERNS AND DOES NOT INCREASE THE RUNOFF VOLUME, VELOCITY, OR PEAK FLOW RATES.

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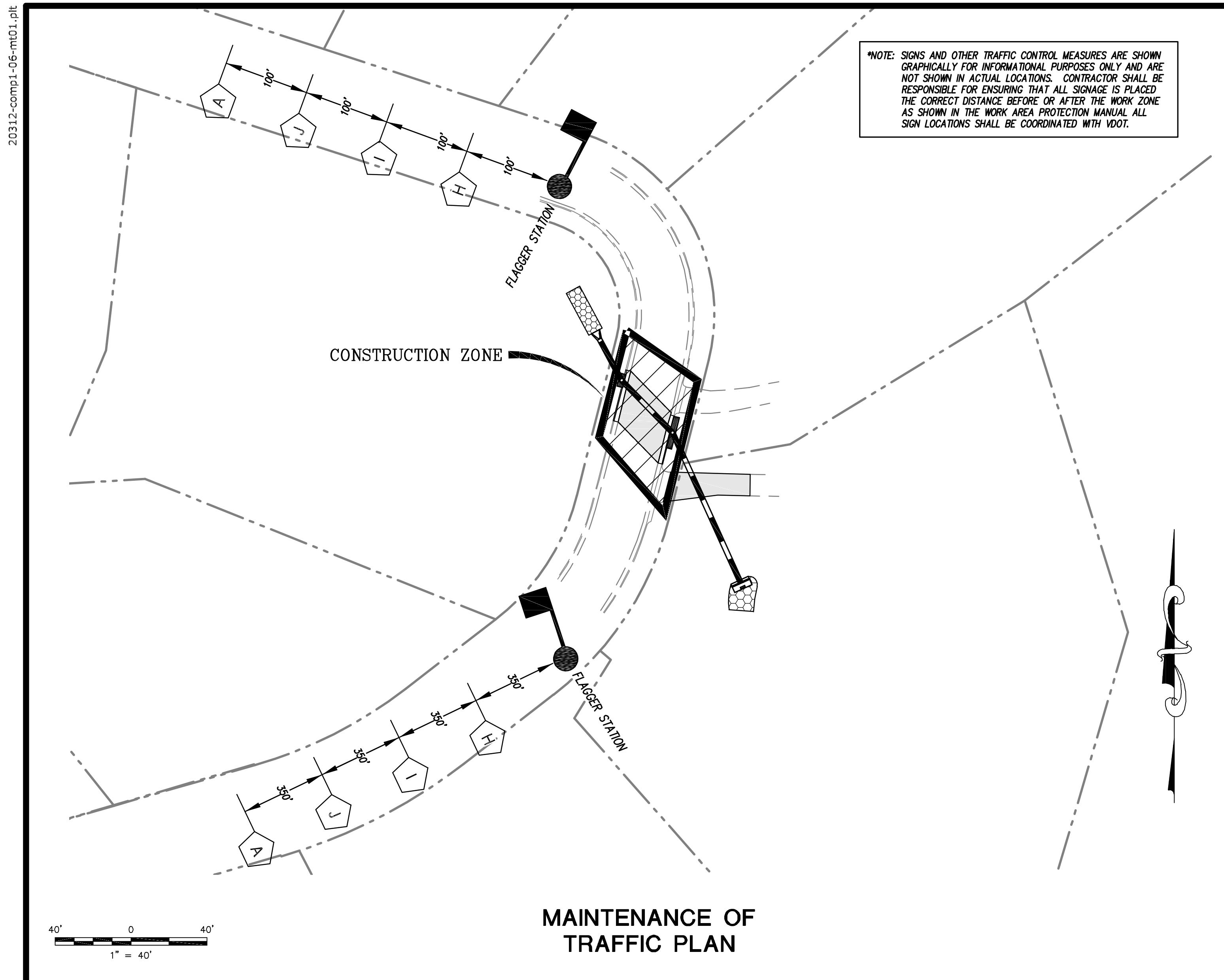
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September 2019
**Typical Traffic Control
Lane Closure on a Two-Lane Roadway Using Flaggers
(FIGURE TTC-23.2)**

NOTES**Guidance:**

1. Sign spacing distance should be 350'-500' where the posted speed limit is 45 mph or less, and 500'-800' where the posted speed limit is greater than 45 mph.
2. Care should be exercised when establishing the limits of the work zone to insure maximum possible sight distance in advance of the flagger station and transition, based on the posted speed limit and at least equal to or greater than the values in Table 6H-3. Generally speaking, motorists should have a clear line of sight from the graphic flagger symbol sign to the flagger.
3. To maintain efficient traffic flow in a flagging operation on a two-lane roadway, the maximum time motorists should be stopped at a flagger station is 8 minutes for high-volume roadways (average daily traffic of 500 or more vehicles per day) to a maximum 12 minutes for low volume roadways (less than 500 vehicles per day). For additional information see Section 6E.07.

Standard:

4. **Portable Temporary Rumble Strips (PTRS)** shall be used as noted in Section 6F.99.²
5. Flagging stations shall be located far enough in advance of the work space to permit approaching traffic to reduce speed and/or stop before passing the work space and allow sufficient distance for departing traffic in the left lane to return to the right lane before reaching opposing traffic (see Table 6H-3 on Page 6H-5).
6. All flaggers shall be state certified and have their certification card in their possession when performing flagging duties (see Section 6E.01, Qualifications for Flaggers).
7. Cone spacing shall be based on the posted speed and the value in Table 6H-4 on Page 6H-6.¹
8. A shadow vehicle with at least one high intensity amber rotating, flashing, or¹ oscillating light shall be parked 80'-120' in advance of the first work crew.

Option:

8. A **SLOW (W21-V10)** sign³ may be required in this area to give advance warning of the operation ahead by slowing approaching traffic prior to reaching the flagger station or queued traffic.

Guidance:

9. If the queue of traffic reaches the **BE PREPARED TO STOP (W3-4)** sign then the signs, and if used the PTRS¹ should be readjusted at greater distances.
10. When a highway-rail crossing exists within or upstream of the transition area and it is anticipated that queues resulting from the lane closure might extend through the highway-rail grade crossing, the temporary traffic control zone should be extended so that the transition area precedes the highway-rail crossing (see Figure TTC-56 for additional information on highway-rail crossings).

Standard:

11. At night, flagger stations shall be illuminated, except in emergencies (see Section 6E.08).
12. Cones may be eliminated when using a pilot vehicle operation or when the total roadway width is 20 feet or less.
13. For low-volume situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger, positioned to be visible to road users approaching from both directions, may be used (see Chapter 6E).

Standard:

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

1: Revision 1 - 4/1/2015

2: Revision 2 - 9/1/2019

September 2019
**Lane Closure on a Two-Lane Roadway Using Flaggers
(FIGURE TTC-23.2)**

NOTES**Guidance:**

1. Sign spacing distance should be 350'-500' where the posted speed limit is 45 mph or less, and 500'-800' where the posted speed limit is greater than 45 mph.

Standard:**Portable Temporary Rumble Strips (PTRS)**

SEE NOTES 2, 3, 5 & 6

SEE TABLE 6H-3

500' - 100'

80' - 120'

SHADOW VEHICLE REQUIRED

SEE NOTE 4

BUFFER

SEE TABLE 6H-3

50' - 100'

FLAGGER STATION

SEE NOTES 2, 3, 5 & 6

SEE NOTE 1

SEE NOTE 1