

ROUTE 460 WATER MAIN EXTENSION

PRINCE GEORGE COUNTY DEPARTMENT OF ENGINEERING AND UTILITIES



Dewberry Engineers Inc.
4805 Lake Brook Drive, Suite 200
Glen Allen, Virginia 23060
PHONE: 804.290.7957
FAX: 804.290.7928
www.dewberry.com

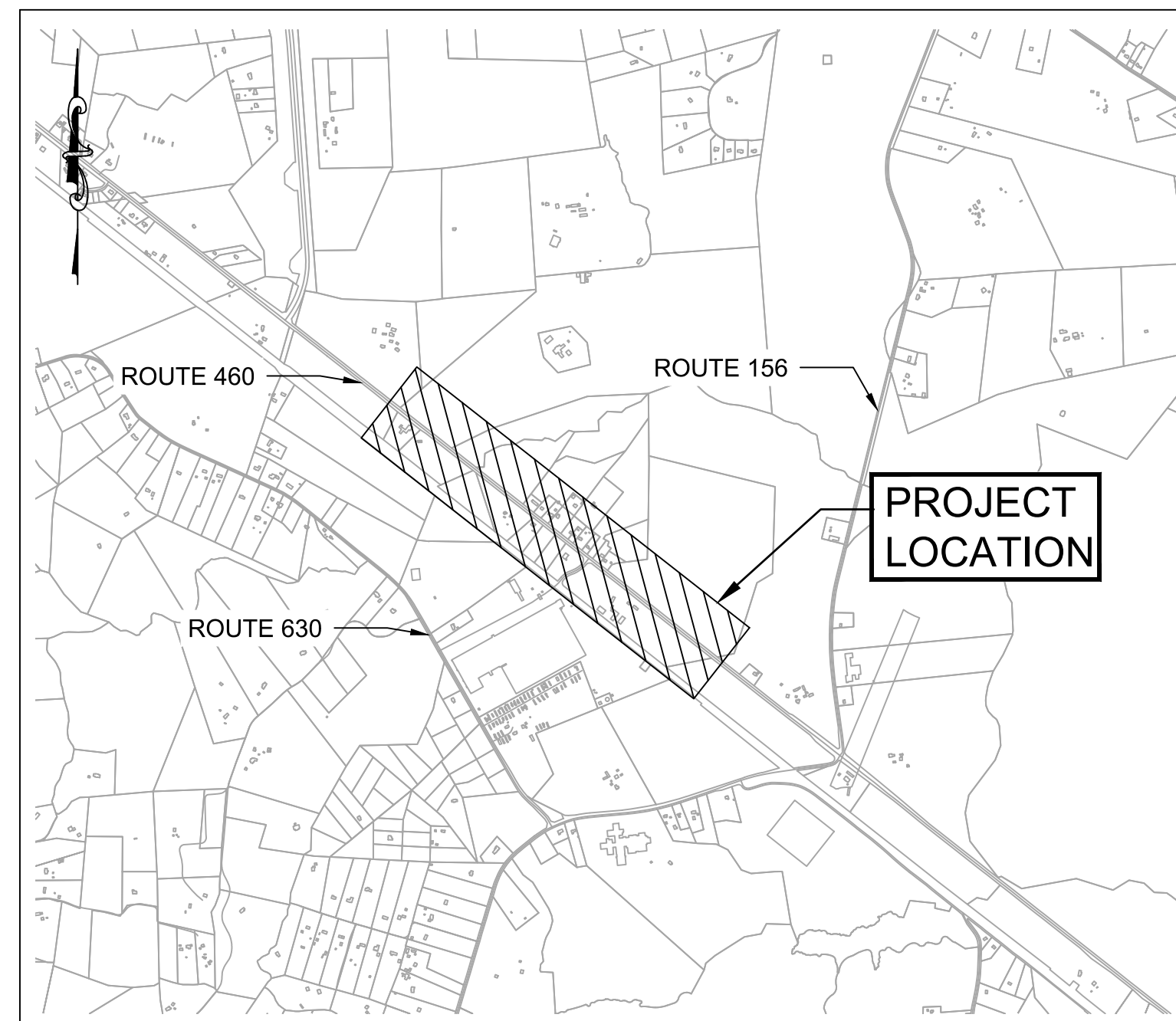
ROUTE 460
WATER MAIN EXTENSION

 PRINCE GEORGE COUNTY
DEPARTMENT OF ENGINEERING
AND UTILITIES

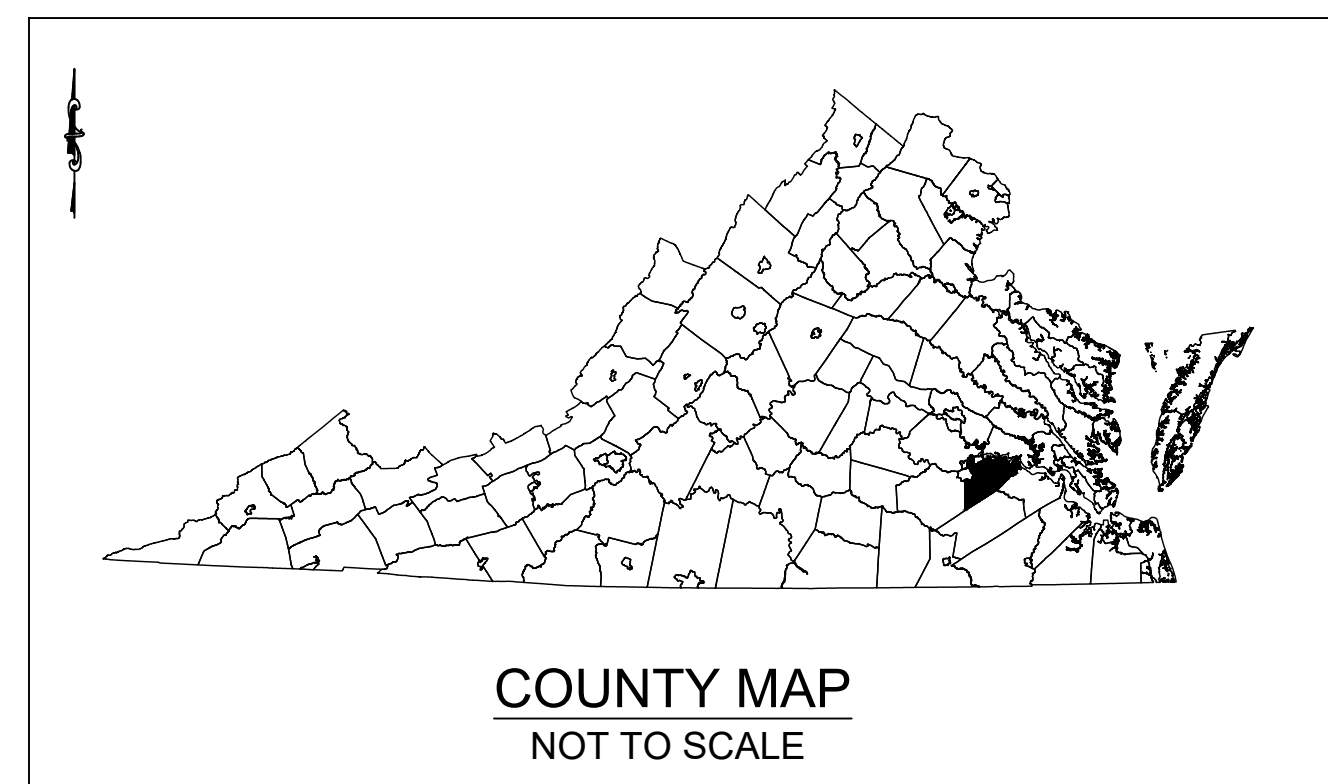
 PRINCE GEORGE COUNTY, VIRGINIA

RECORD DRAWING INFORMATION

CONTRACT INFORMATION	
ORIGINAL CONSTRUCTION CONTRACT AMOUNT:	\$838,417.24
ORIGINAL CONSTRUCTION CONTRACT TIME:	
SUBSTANTIAL COMPLETION:	180 DAYS
FINAL COMPLETION:	210 DAYS
NUMBER OF CHANGE ORDERS:	3
COST OF CHANGE ORDERS:	\$10,864.12
FINAL CONSTRUCTION CONTRACT AMOUNT:	\$849,218.36
FINAL CONSTRUCTION CONTRACT TIME:	
SUBSTANTIAL COMPLETION:	330 DAYS
FINAL COMPLETION:	360 DAYS
FINAL ACTUAL CONSTRUCTION TIME:	
SUBSTANTIAL COMPLETION:	330 DAYS
FINAL COMPLETION:	360 DAYS
DATE OF NOTICE TO PROCEED: NOVEMBER 13, 2020	
GENERAL CONTRACTOR:	PERKINSON CONSTRUCTION LLC 5500 PRINCE GEORGE DR. PRINCE GEORGE, VA 23875
CONTRACTOR PROJECT MANAGER:	SHAYNE BRIDGMAN (804) 452-3400 (804) 895-2862
CONSULTING ENGINEER:	DEWBERRY ENGINEERS INC. 4805 LAKE BROOK DRIVE, SUITE 200 GLEN ALLEN, VIRGINIA 23060
PROJECT ENGINEER:	MELANIE LECKEY, P.E. (804) 205-3333
PRINCE GEORGE COUNTY ENGINEERING AND UTILITIES DEPARTMENT REPRESENTATIVE:	FRANK HALTOM, P.E. (804) 704-0904



VICINITY MAP
SCALE : 1" = 2,000'



COUNTY MAP
NOT TO SCALE

DRAWING INDEX

- GENERAL
- G1.0 COVER SHEET
- CIVIL
- C1.0 GENERAL NOTES AND LEGEND
- C2.0 KEY PLAN
- C2.1 WATERLINE PLAN AND PROFILE
- C2.2 WATERLINE PLAN AND PROFILE
- C2.3 WATERLINE PLAN AND PROFILE
- C2.4 WATERLINE PLAN AND PROFILE
- C2.5 WATERLINE PLAN AND PROFILE
- C2.6 WATERLINE PLAN AND PROFILE
- C2.7 WATERLINE PLAN AND PROFILE
- C2.8 WATERLINE PLAN AND PROFILE
- C3.0 TEMPORARY TRAFFIC CONTROL GENERAL NOTES AND DETAILS
- C3.1 TEMPORARY TRAFFIC CONTROL PLAN
- C4.0 E&S CONTROL NARRATIVE & DETAILS
- C4.1 E&S CONTROL DETAILS
- C5.0 CONSTRUCTION DETAILS
- C5.1 CONSTRUCTION DETAILS
- C5.2 CONSTRUCTION DETAILS
- C5.3 CONSTRUCTION DETAILS
- C6.0 SWM NARRATIVE
- C6.1 SWM LAND USE
- C6.2 SWM LAND USE
- C6.3 SWM LAND USE
- C6.4 SWM LAND USE
- C6.5 SWM LAND USE
- C6.6 SWM LAND USE
- C6.7 SWM LAND USE
- C6.8 SWM LAND USE

CONTACTS:

OWNER: Prince George County Engineering and Utilities Department Frank Haltom, P.E. Director of Engineering and Utilities Prince George County P. O. Box 68 6602 Courts Drive, Second Floor Prince George, VA 23875 PH. (804) 722-8706 FAX: (804) 733-2779 fhaltom@princegeorgecountyva.gov	ENGINEER: Dewberry Engineers Inc. Melanie Leckey, P.E. 4805 Lake Brook Drive Suite 200 Glen Allen, VA 23060 Office: (804) 205-3333 mleckey@dewberry.com
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NOTES:

- THE DEWBERRY ENGINEERS SEALING ENGINEER SHALL BE THE RESPONSIBLE LAND DISTURBER (RLD) FOR THIS PROJECT FOR APPROVAL PURPOSES ONLY. ONCE THE PROJECT HAS BEEN AWARDED, THE CONTRACTOR SHALL PROVIDE A RLD AS NOTED ON PLAN SHEET C1.0.
- THE CONTRACTOR MUST OBTAIN A LAND USE PERMIT FROM THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) PRIOR TO THE COMMENCEMENT OF ANY WORK.

SUBMITTAL		SET NUMBER
<input type="checkbox"/> PRELIMINARY	<input type="checkbox"/> CONSTRUCTION	
<input type="checkbox"/> APPROVAL	<input type="checkbox"/> REVISION	
<input type="checkbox"/> BIDDING	<input checked="" type="checkbox"/> RECORD	

KEY PLAN

SEAL

RECORD DRAWING
12-2021
THESE DRAWINGS REFLECT WORK AS RECORDED BY OTHERS AT THE TIME OF CONSTRUCTION.

SCALE

No.	DATE	BY	Description
1	12/2021	TLR	RECORD DRAWINGS

REVISIONS

DRAWN BY: MWC
 APPROVED BY: DAV
 CHECKED BY: MRL
 DATE: APRIL 2020

TITLE

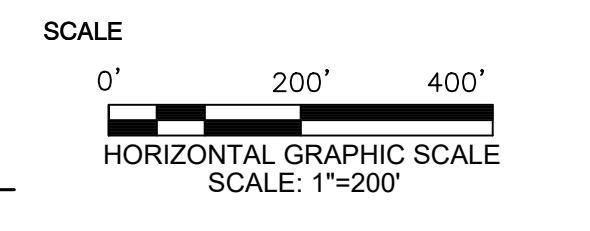
COVER SHEET

PROJECT NO. 50106065

G1.0

KEY PLAN

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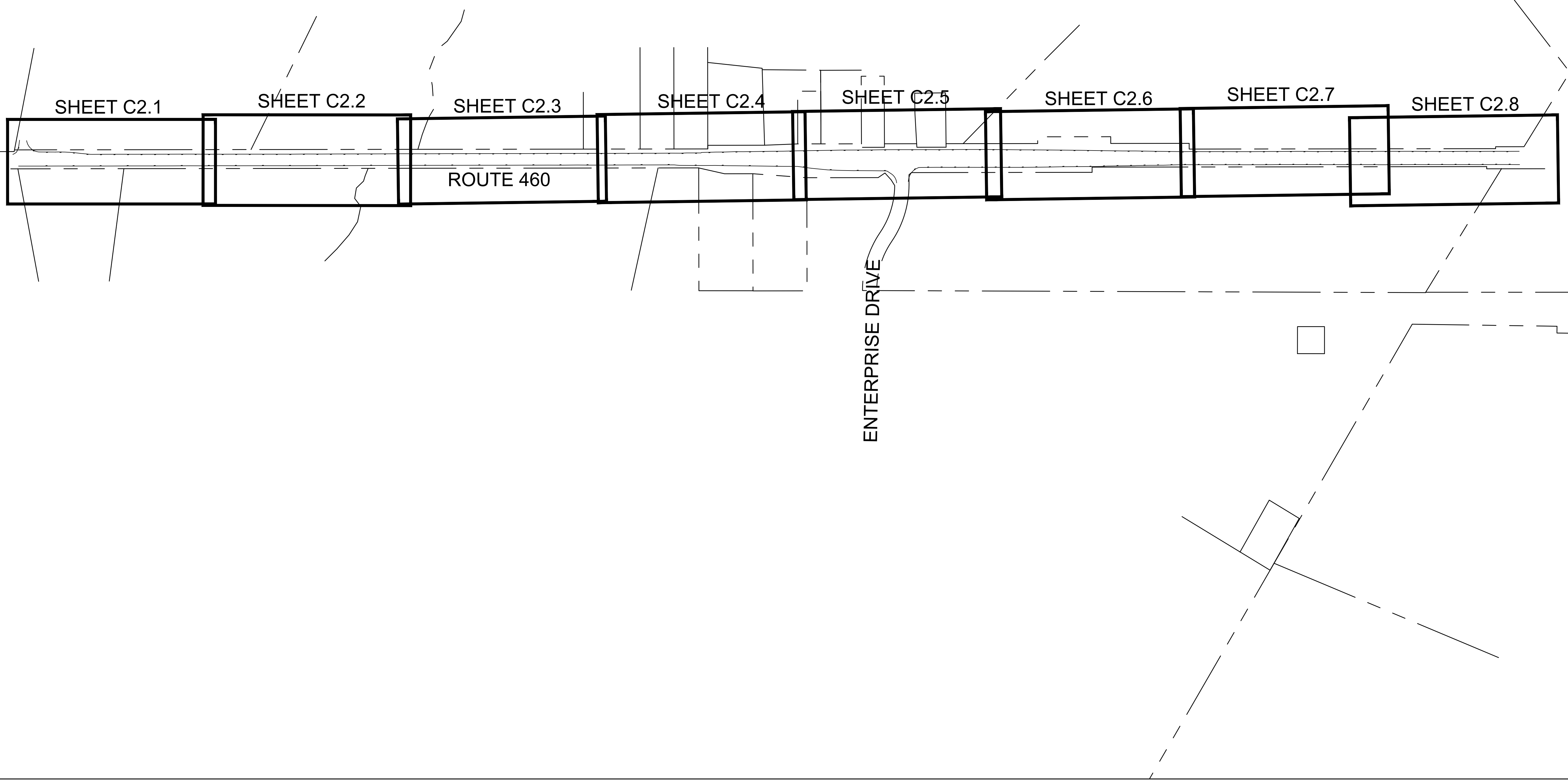
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PROJECT NO. 50106065

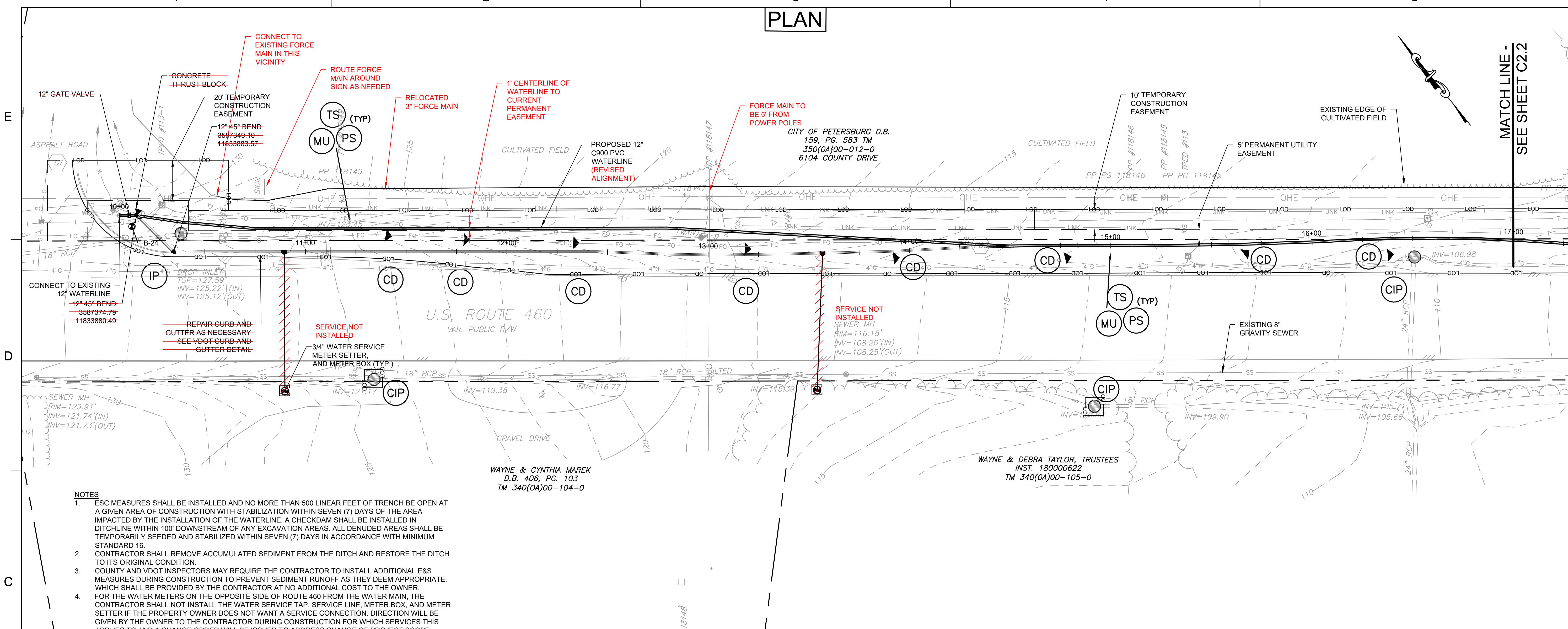
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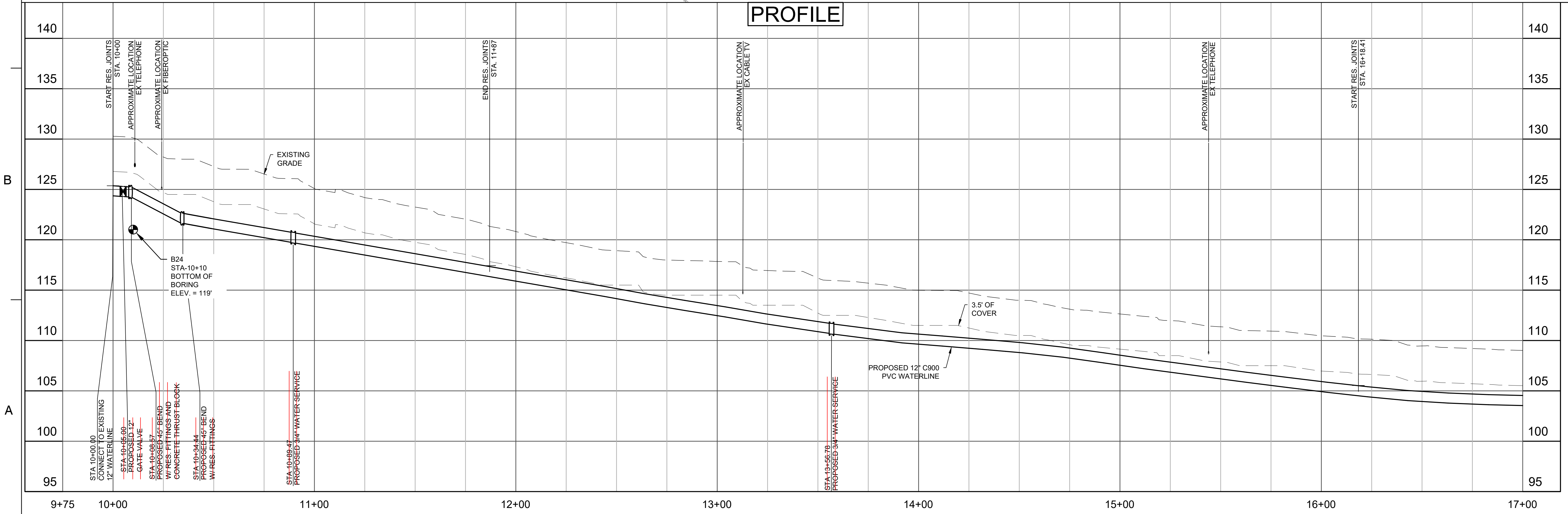


PLAN



- NOTES**
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PROFILE



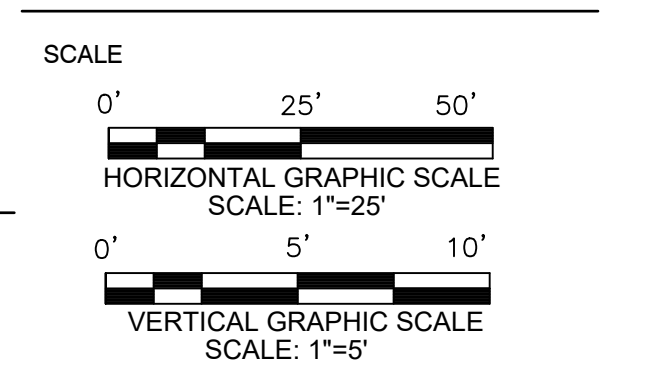
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**WATERLINE
 PLAN AND PROFILE**

PROJECT NO. 50106065

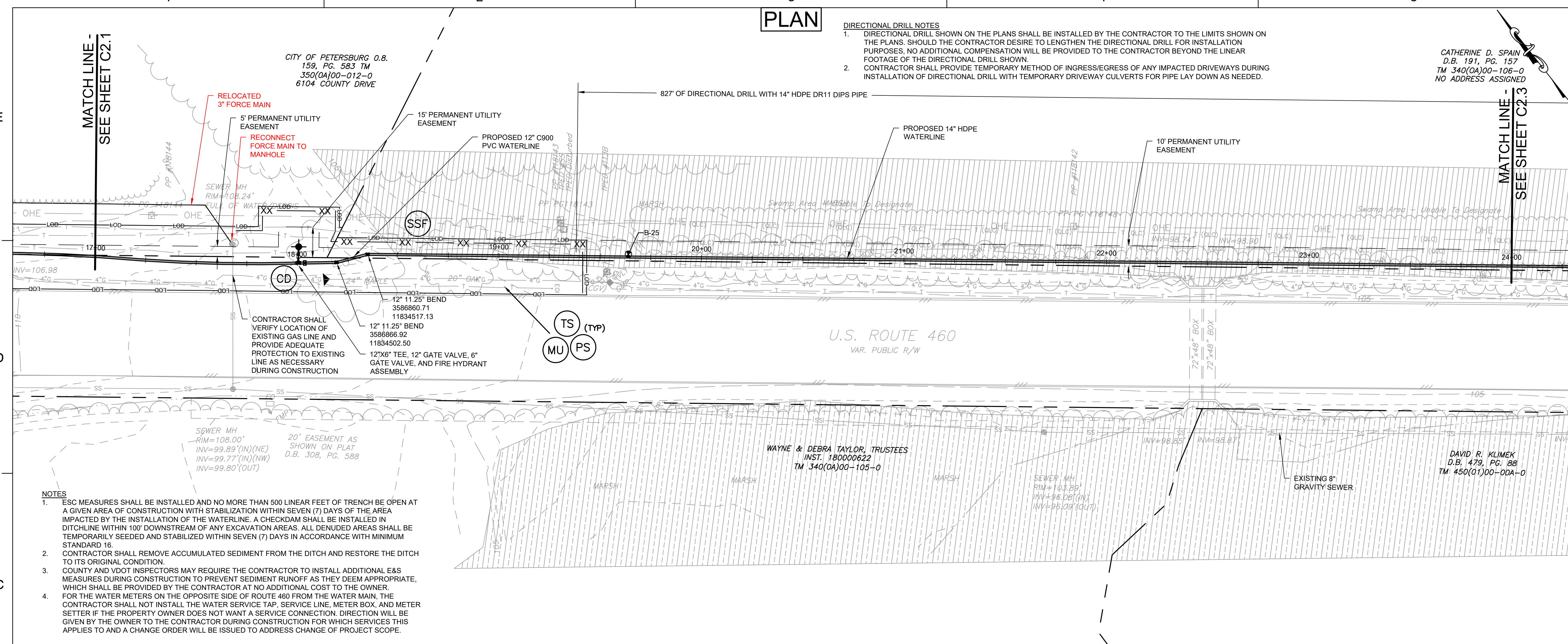
C2.1

PLAN

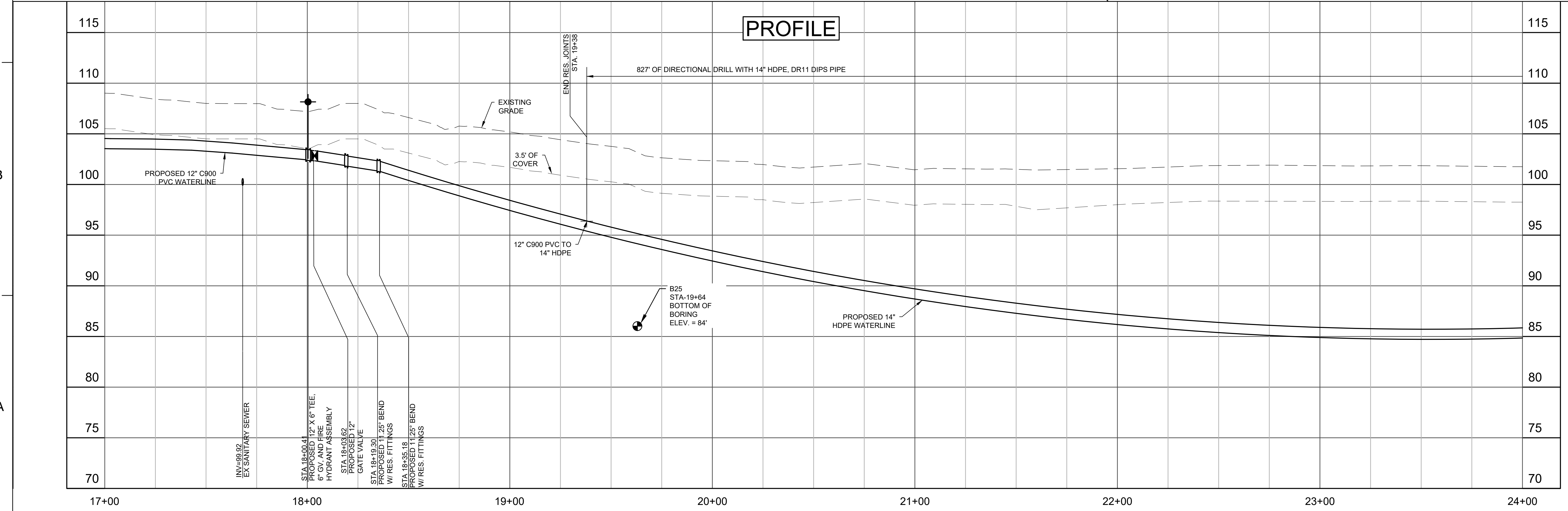
DIRECTIONAL DRILL NOTES

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CATHERINE D. SPAIN
 D.B. 191, PG. 157
 TM 340(OA)00-106-0
 NO ADDRESS ASSIGNED



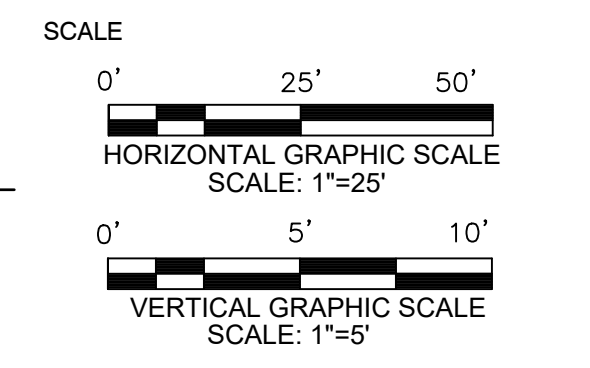
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**WATERLINE
 PLAN AND PROFILE**

PROJECT NO. 50106065

C2.2

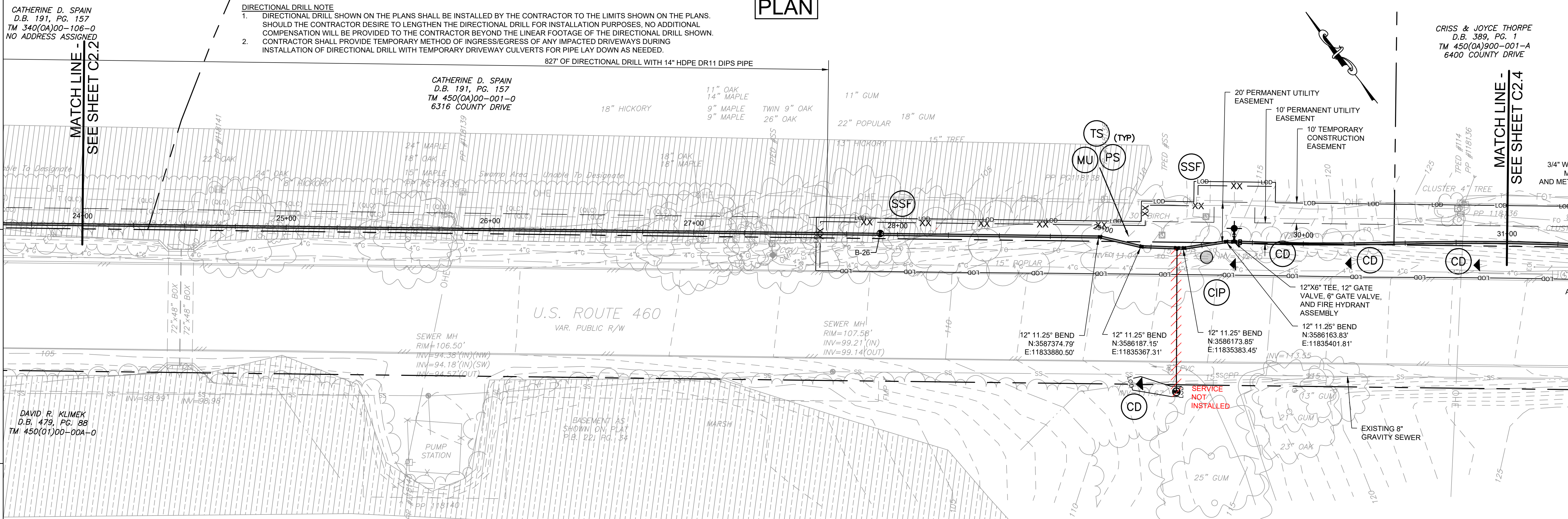
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REVISIONS			
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APPROVED BY		DAV	
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TITLE			

**WATERLINE
 PLAN AND PROFILE**

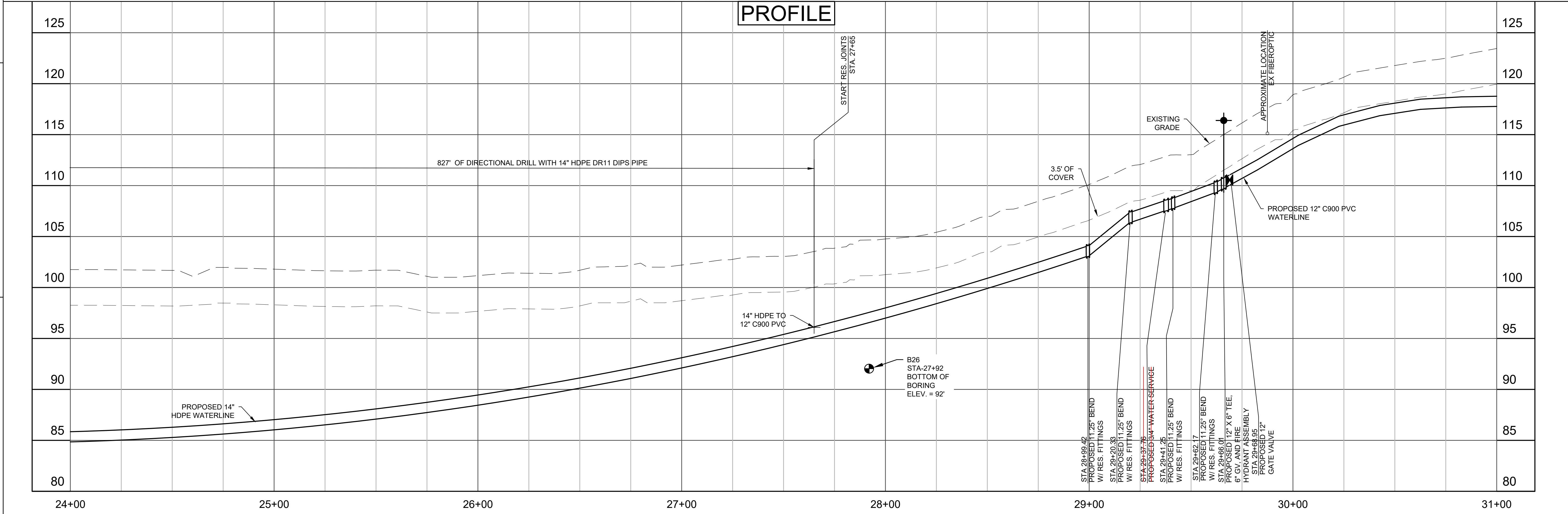
PLAN

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CRISS & JOYCE THORPE
D.B. 389, PG. 1
TM 450(OA)900-001-A
6400 COUNTY DRIVE

ROY & ANNIE GRANDERSON
D.B. 188, PG. 566
TM 450(OA)00-002-0
6408 COUNTY DRIVE

PAMELA ROACH CHERYL
WILLIAMS CHARLES MAYES, JR.
WF 150000081
D.B. 170, PG. 565
TM 450(OA)00-003-0
6412 COUNTY DRIVE

ANNE MASSENBURG ROY GRANDERSON
JOYCE ANN THORPE PAMELA ROACHE
CHERYL WILLIAMS CHARLES MAYES, JR.
INST 010002648
TM 450(OA)00-004-0
6418 COUNTY DRIVE

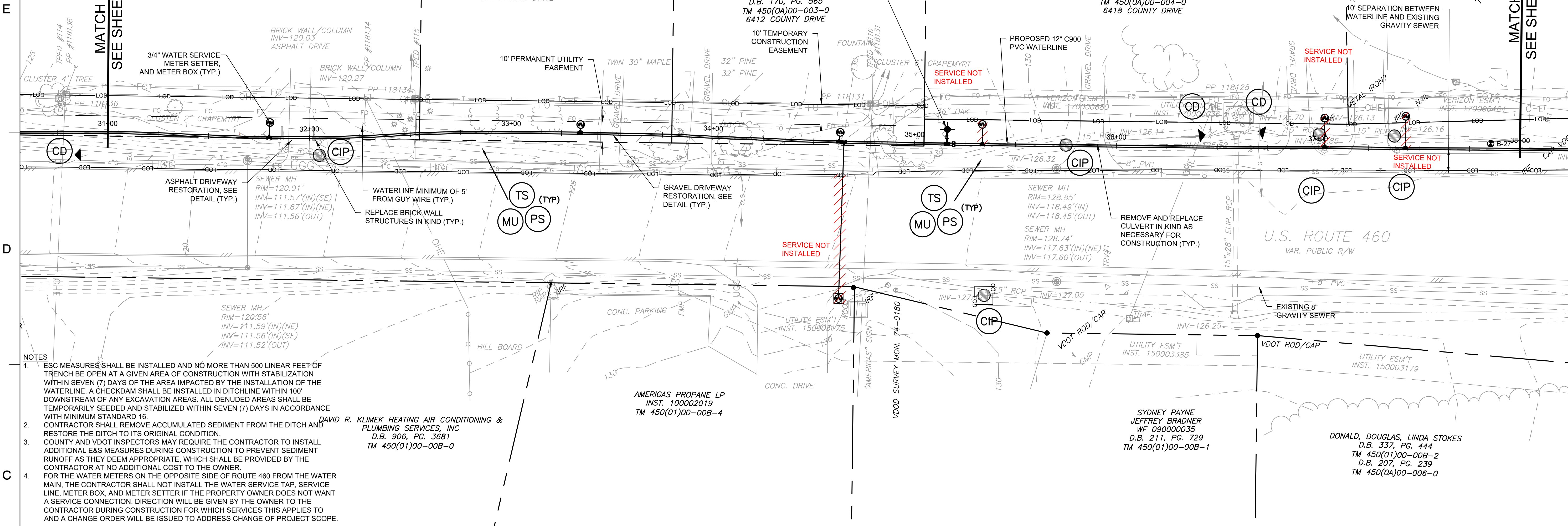
HOWARD MOORE BERNICE WALL
INST. 180002614
TM 450(OA)00-005-C
6424 COUNTY ROAD



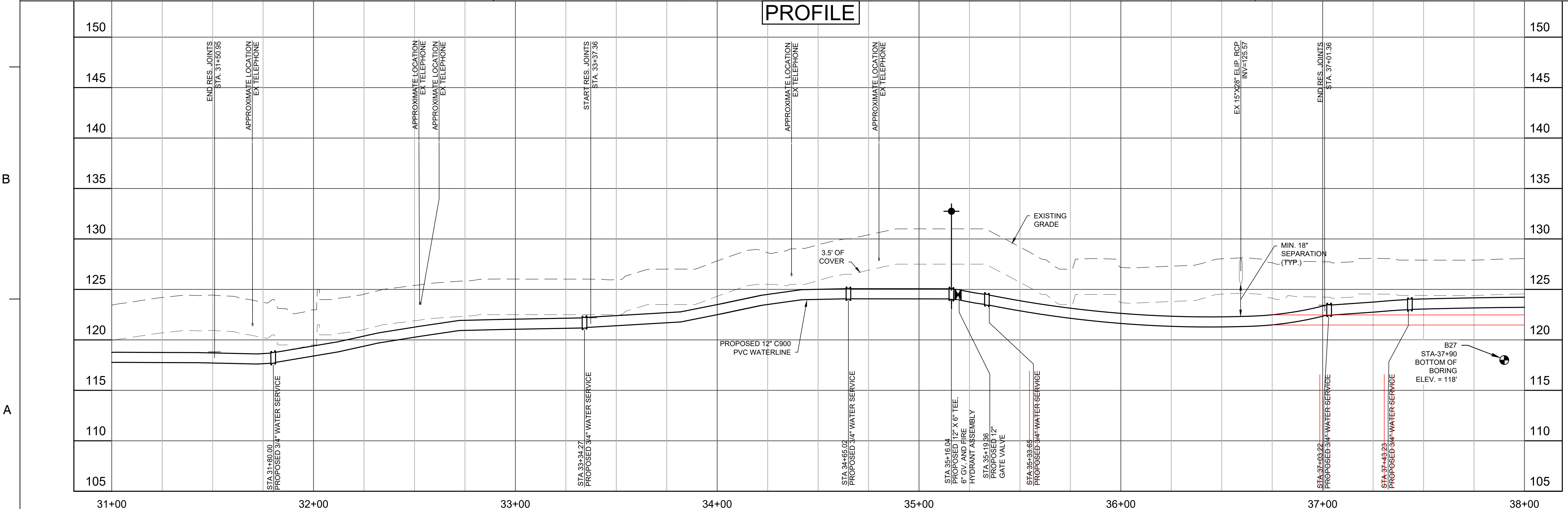
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PLAN



PROFILE



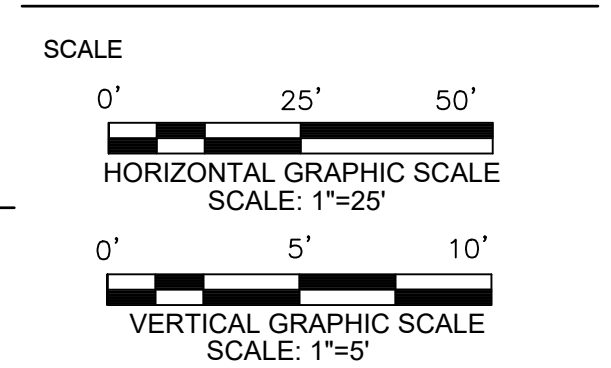
KEY PLAN

SEAL

RECORD DRAWING

12-2021

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No.	DATE	TLR	BY	RECORD DESCRIPTION
1	12/2021	TLR	RECORD	DRAWINGS

REVISIONS

DRAWN BY MWC

APPROVED BY DAV

CHECKED BY MRL

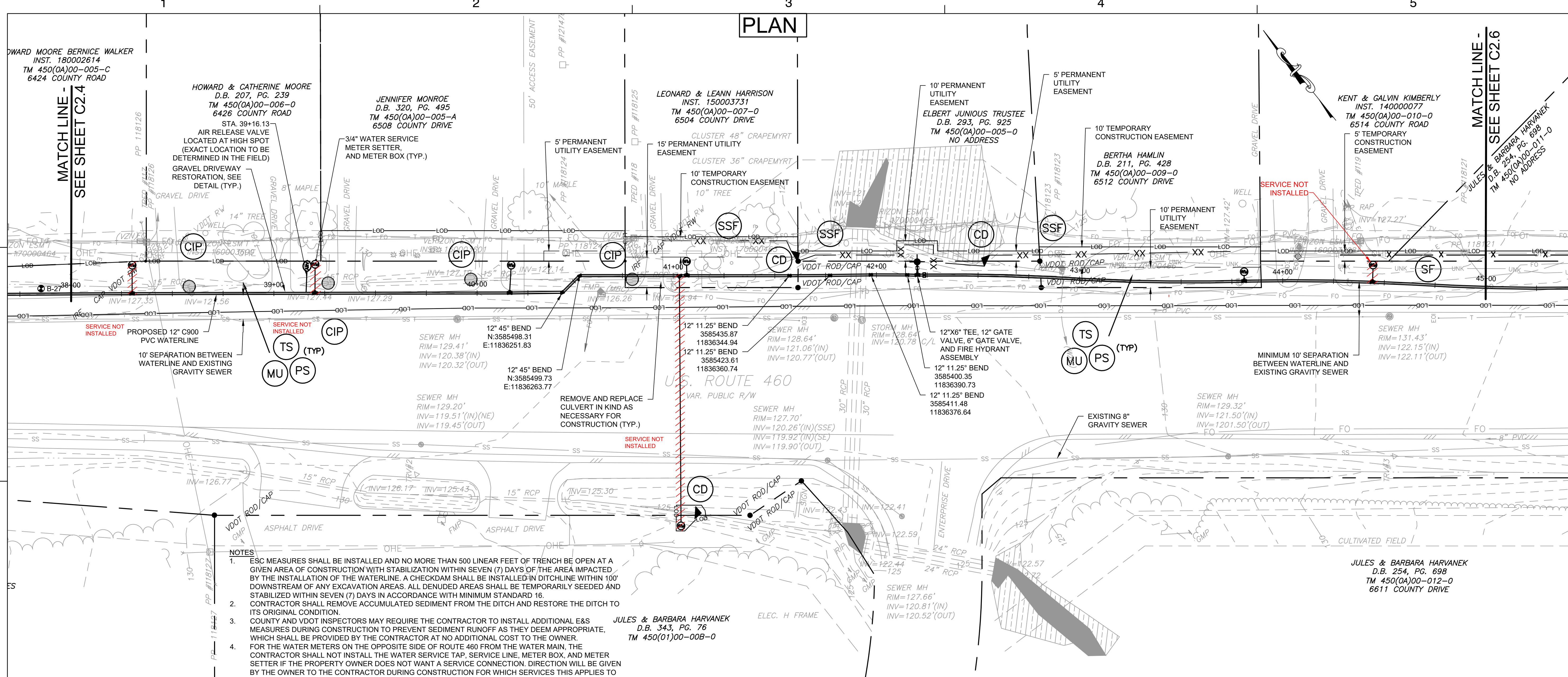
DATE APRIL 2020

TITLE

WATERLINE PLAN AND PROFILE

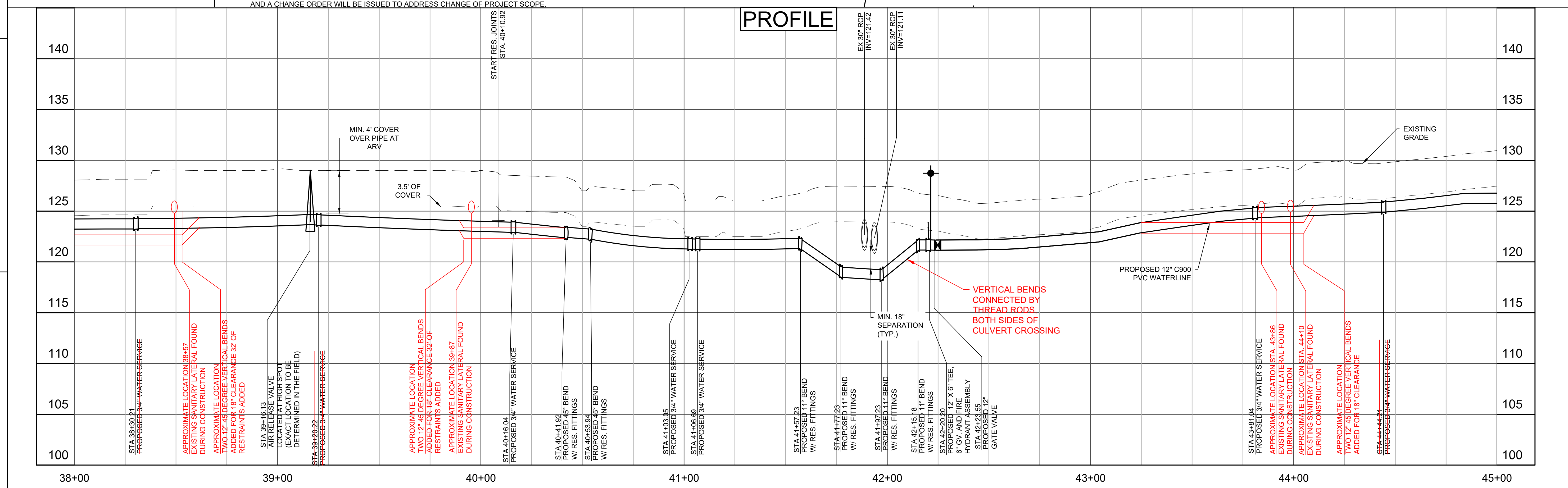
PROJECT NO. 50106065

C2.4



NOTES

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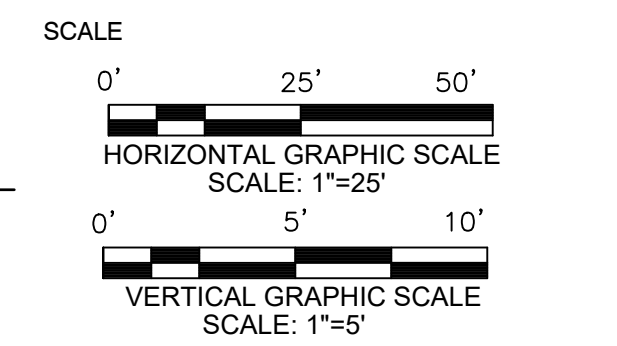
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TITLE: **WATERLINE PLAN AND PROFILE**

PROJECT NO. 50106065

C2.5

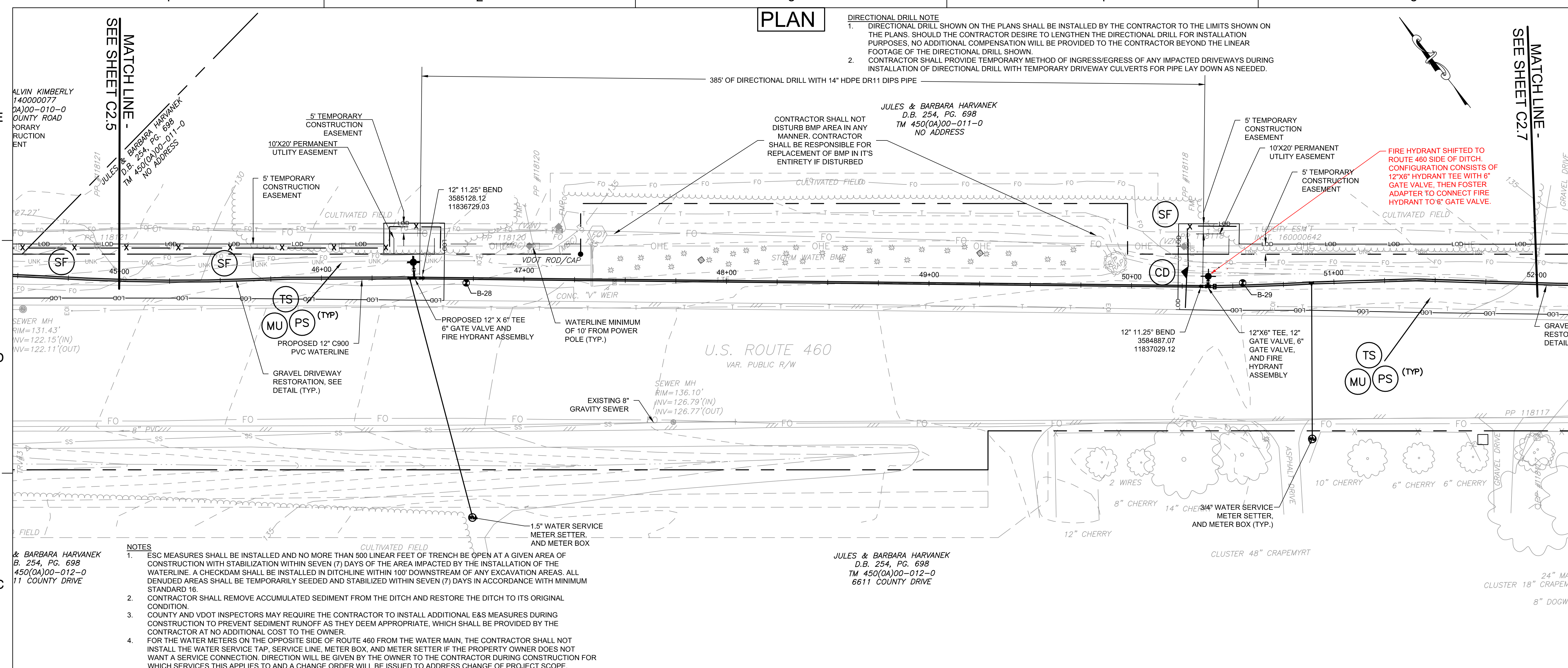
PLAN

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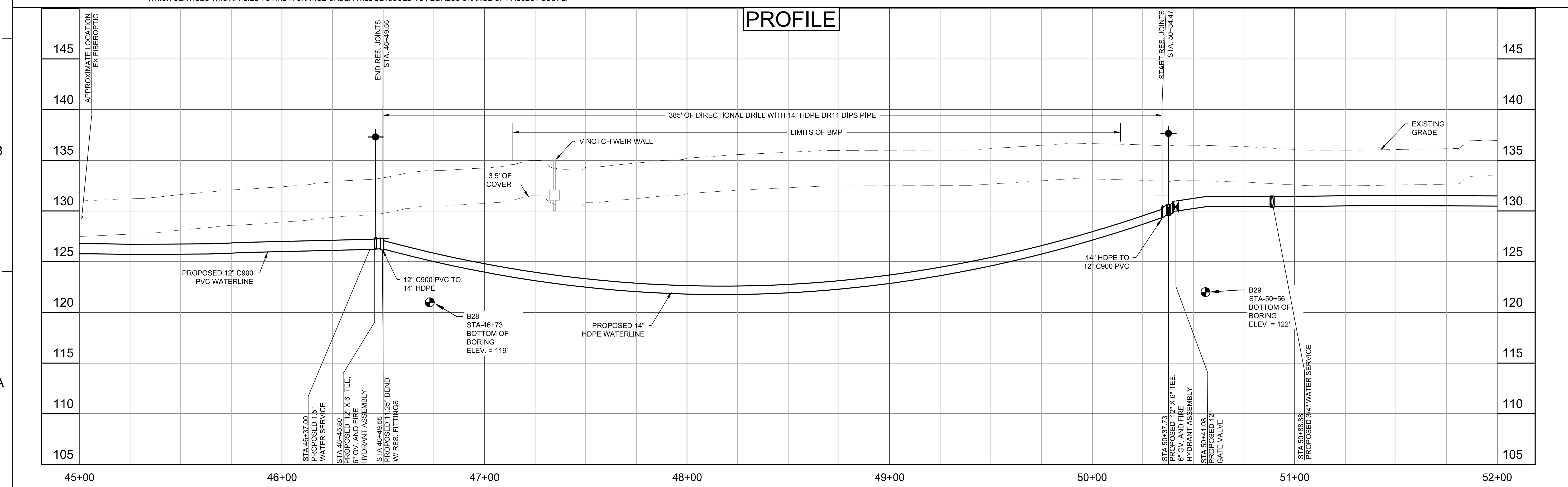
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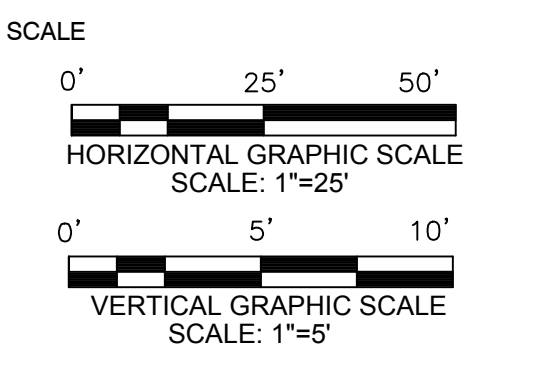
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PROFILE



KEY PLAN

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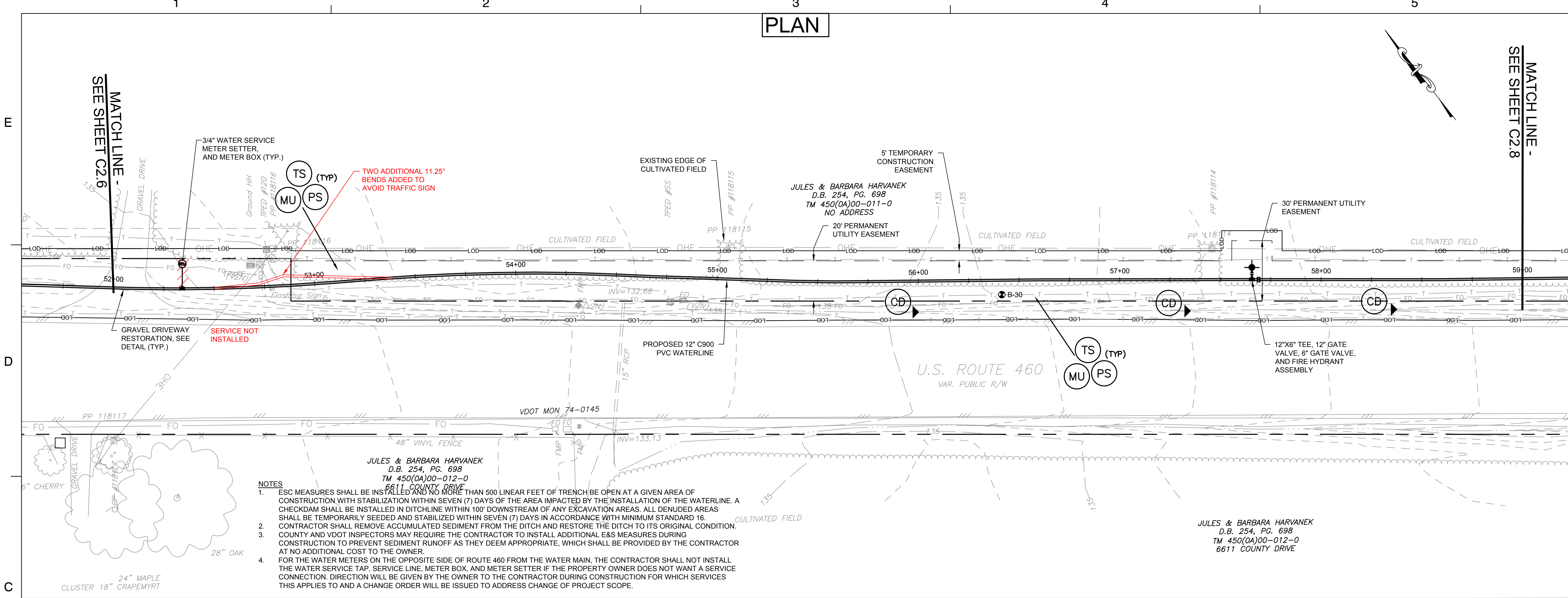
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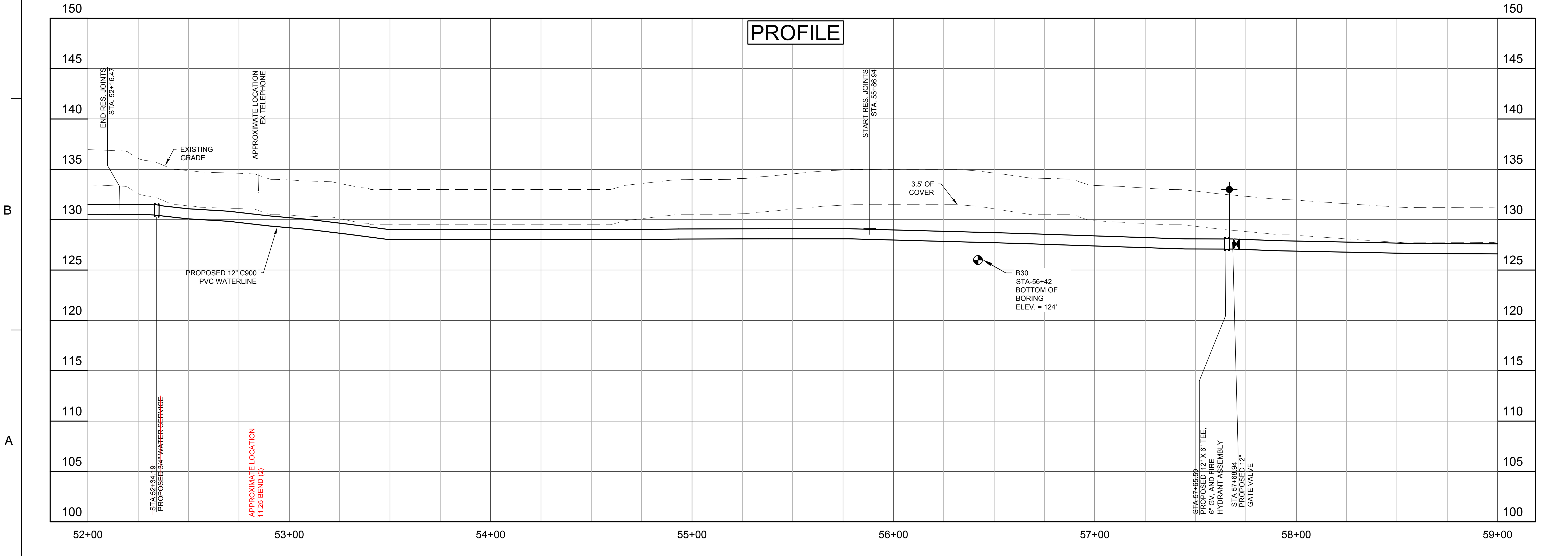
C2.6

PLAN



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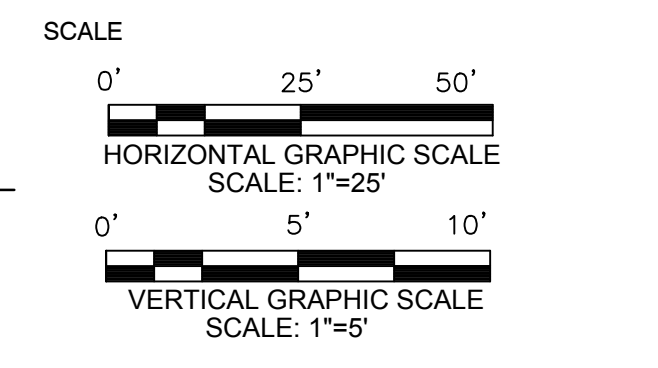


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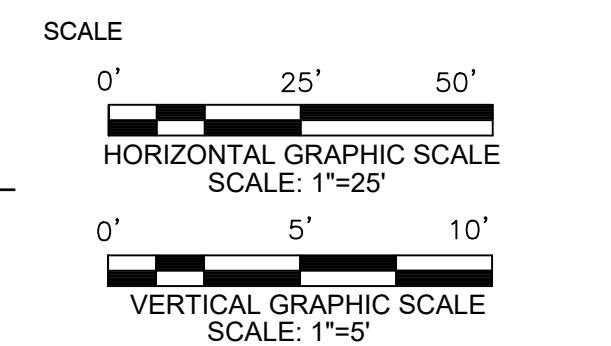
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C2.7

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1	12/2021	TLR	RECORD DRAWINGS

REVISIONS

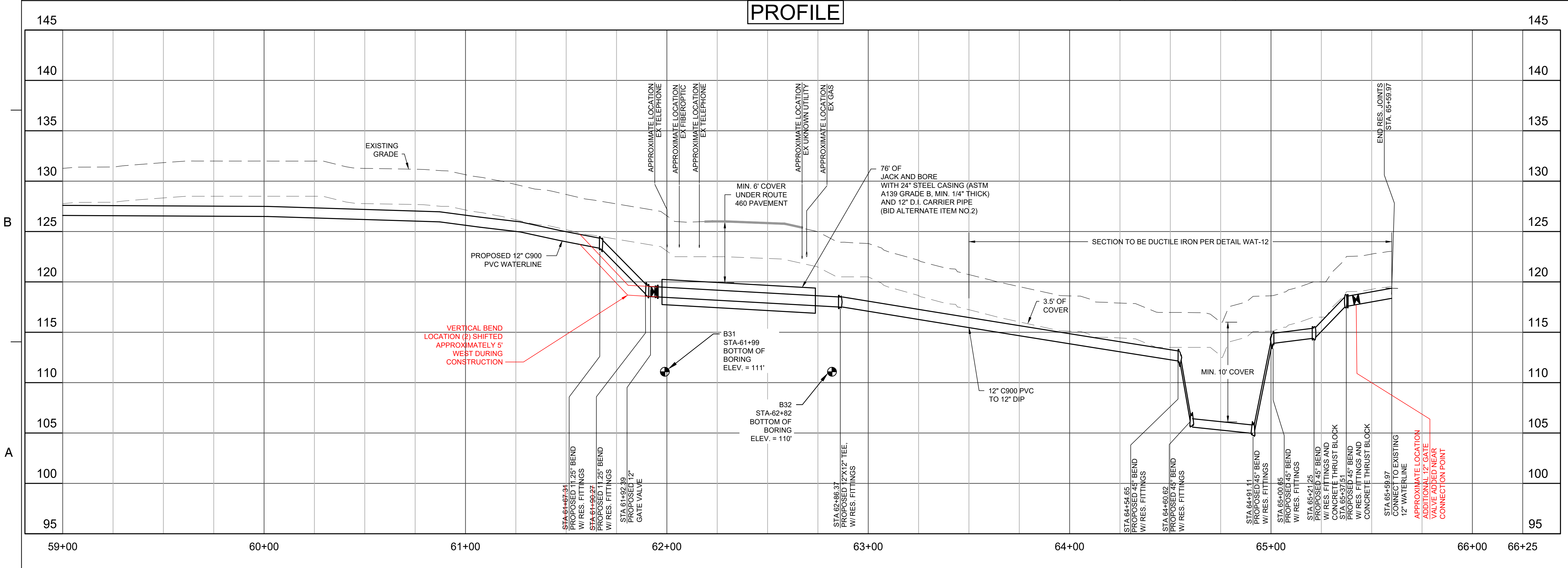
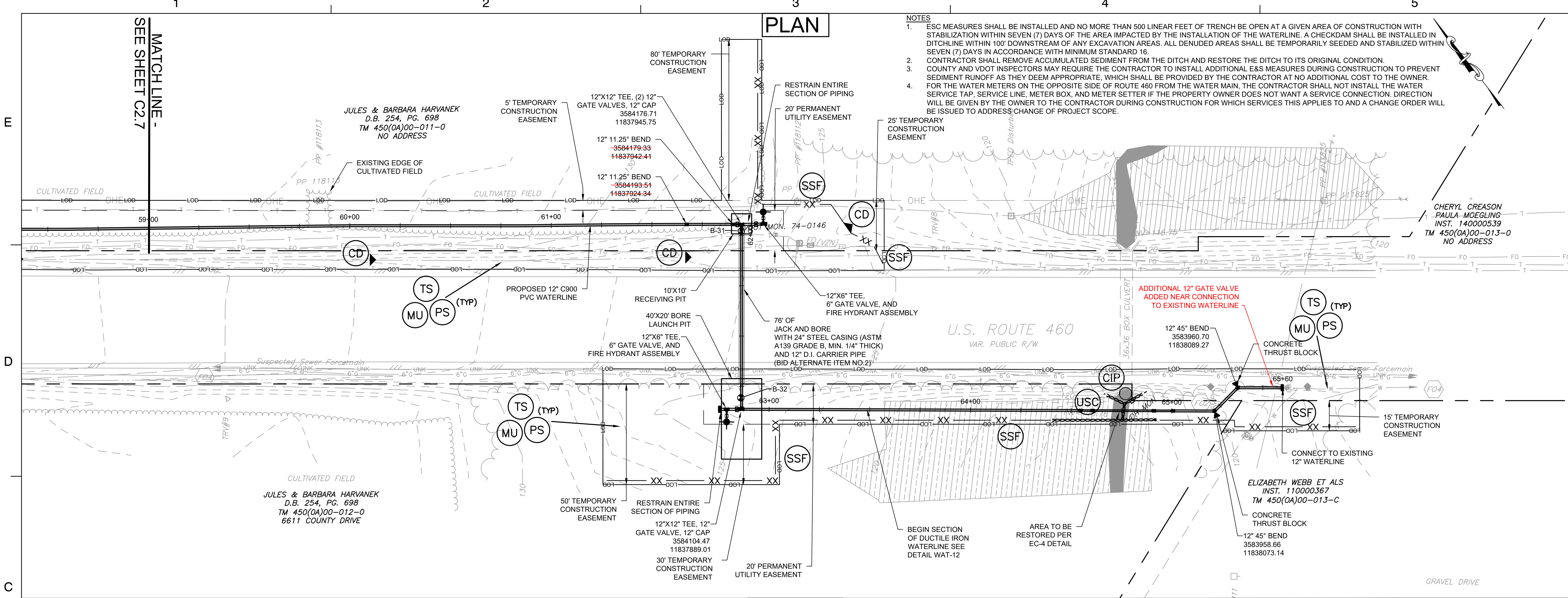
No.	DATE	BY	Description

DRAWN BY: MWC
 APPROVED BY: DAV
 CHECKED BY: MRL
 DATE: APRIL 2020

TITLE
**WATERLINE
 PLAN AND PROFILE**

PROJECT NO. 50106065

C2.8



PROJECT NOTES

- 1. The purpose of this project is the installation of a new water line along U.S. Route 460 in Prince George County, Virginia. Within the project limits U.S. Route 460 is a four lane undivided highway with a posted speed limit of 50 MPH and a clear zone of 20 feet.
2. The required traffic control operations to install the water line along U.S Route 460 are broken down based on the station ranges below:
- Sta. 10+00 to Sta. 12+50: Work to be performed under turn lane closure per TTC-29.2 and shoulder closure per TTC-4.2.
- Sta. 12+50 to Sta. 62+00: Work to be performed under shoulder closure per TTC-4.2.
- Sta. 63+00 to Sta. 65+61: Work to be performed under shoulder closure per TTC-4.2.
- Jack and Bore Operation: Work is to be performed under Shoulder Closure with Barrier per TTC-6.2 and sheet C3.1.
- Construction Staging Area & Equipment Storage: Shoulder Closure with Barrier per TTC-6.2 and sheet C3.1

TEMPORARY TRAFFIC CONTROL GENERAL NOTES

- 1. General work hours are Monday thru Friday from 9:00 A.M. to 3:30 P.M. unless otherwise approved by VDOT to have extended or overnight work hours.
2. If work is anticipated outside of working hours noted above, contractor shall follow compliance of local noise ordinance, obtain necessary permits, and approvals.
3. The traffic control devices and safety measures shall be in conformance with the most current version of the following adopted by VDOT and the most recent revision thereto.
4. Unless otherwise approved or directed by the Engineer, or VDOT, the Contractor shall plan and prosecute the work in accordance with the following:
5. It is not the intent of the sequence of construction/temporary traffic control plan to enumerate every detail which must be considered in the compliance of each stage, but only to show the general handling of traffic.
6. The existing conditions shown in these temporary traffic control plans have been compiled from web resources.
7. All areas excavated below existing pavement surface and within the clear zone at the conclusion of each work day shall be backfilled to form approximate 6:1 wedge against the existing pavement surface for the safety and protection of vehicular traffic.
8. Advance signing and any other traffic control devices shall be installed prior to beginning each stage of construction and shall be removed as necessary before proceeding to the next stage.
9. Sidewalk closures shall be installed as necessary. Pedestrian traffic shall be detoured around these closures and shall be signed appropriately and in accordance with the American with Disabilities Act accessibility guidelines.
10. The contractor shall notify the public and all adjacent property owners and businesses a minimum of two (2) weeks prior to beginning work.
11. The contractor shall provide access to adjacent properties at all times. The affected property owner shall be notified a minimum of 48 hours in advance of any activity which may block the driveways. All driveways must be reopened as soon as possible, but no later than the conclusion of each work day.
12. Any existing driveways, curb and gutter, sidewalks or drainage structures that are damaged during construction shall be repaired to their original condition.
13. All temporary and final pavement markings, reflective pavement markings and signage are the responsibility of the contractor. All final pavement markings shall be thermoplastic. Any pavement markings that are damaged or obliterated shall be restored.
14. The Contractor is responsible for inspecting the temporary pavement markings daily and repair any deficiencies immediately.
15. No parking or material storage shall be allowed in front of the ditch line any VDOT roadways unless an appropriate work zone is in place.
16. All traffic signs moved shall be reinstalled as soon as possible to meet VDOT specifications.
17. VDOT reserves the right to further limit, restrict, or suspend operations within the right of way if, in the opinion of VDOT, safety or traffic conditions warrant such action.
18. VDOT shall be notified prior to beginning work in the right of way if there are existing signs, traffic signals, or signal equipment in or near the proposed work zone.
19. Group 1 and Group 2 channelizing devices are to be placed as directed by the Va. WAPM, page A-7.
20. Traffic barrier service shall be installed and removed so as not to present any blunt end or hazard to the motoring public.
21. Lane closures required for the installation of traffic barrier, the removal of traffic barrier, and the offloading of equipment and supplies shall be performed in accordance with TTC-16.2 (Outside Lane Closure Operation On a Four-Lane Roadway) of the Va. WAPM.
22. Temporary lane widths are not to be less than the existing lane width (11' minimum) without concurrence of the Regional Traffic Engineer.
23. No objects, equipment, or stored materials may interfere with sight distance of entrances and intersections.
24. The contractor shall provide temporary drainage as required to prevent ponding of water on the roadway and adjacent properties at no cost to VDOT.
25. Contractor shall protect any existing guardrail and supports within construction area from damage.
26. All safety and warning devices and apparel shall meet the requirements and guidelines set forth in the MUTCD and the VA WAPM.
27. Contractor shall coordinate all work zones and traffic control with adjacent projects under construction.
28. This Transportation Management Plan was Reviewed by Trey M. Rydel who successfully completed the Advanced WZTC training that expires on 11/30/2022.

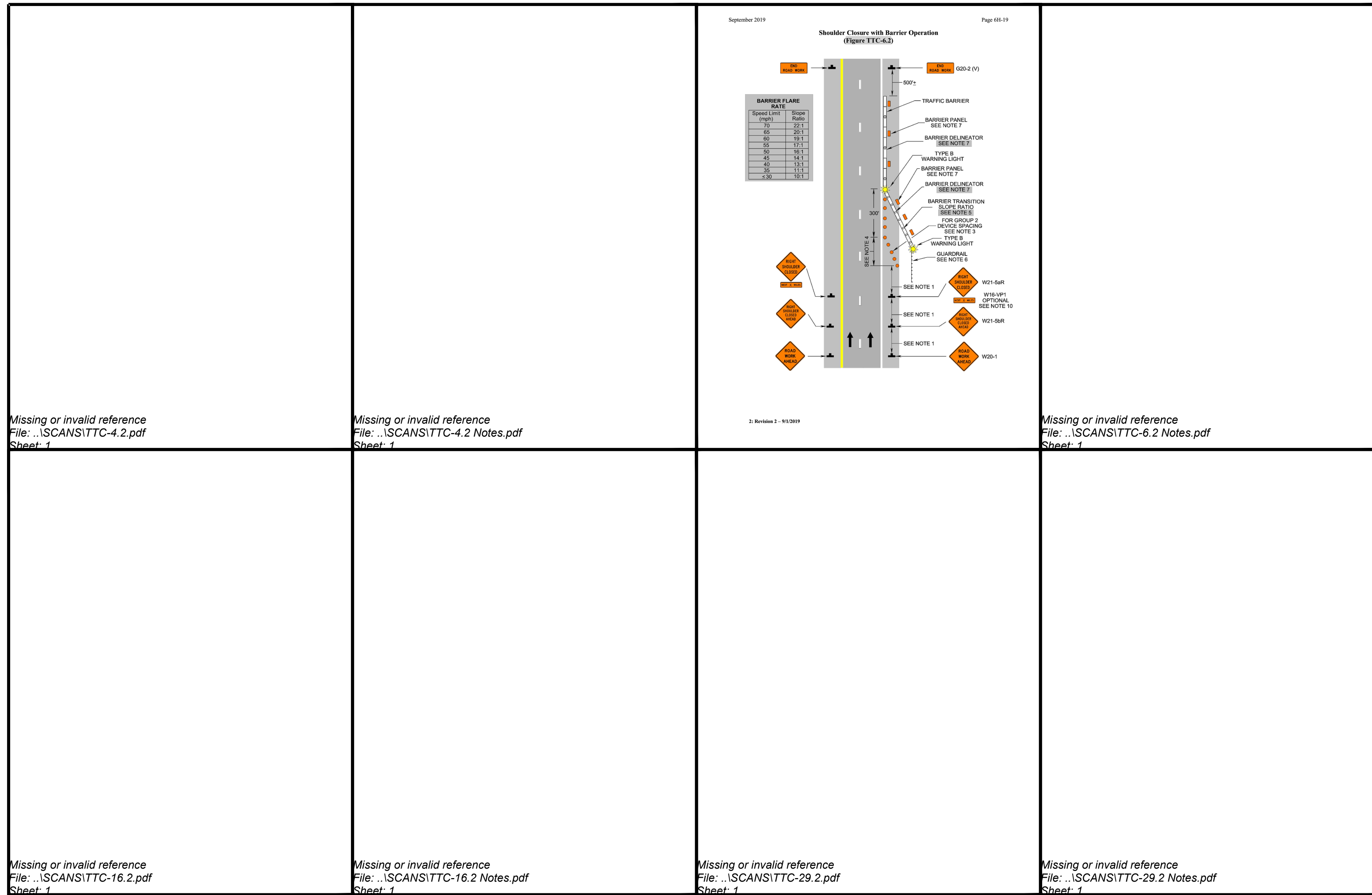
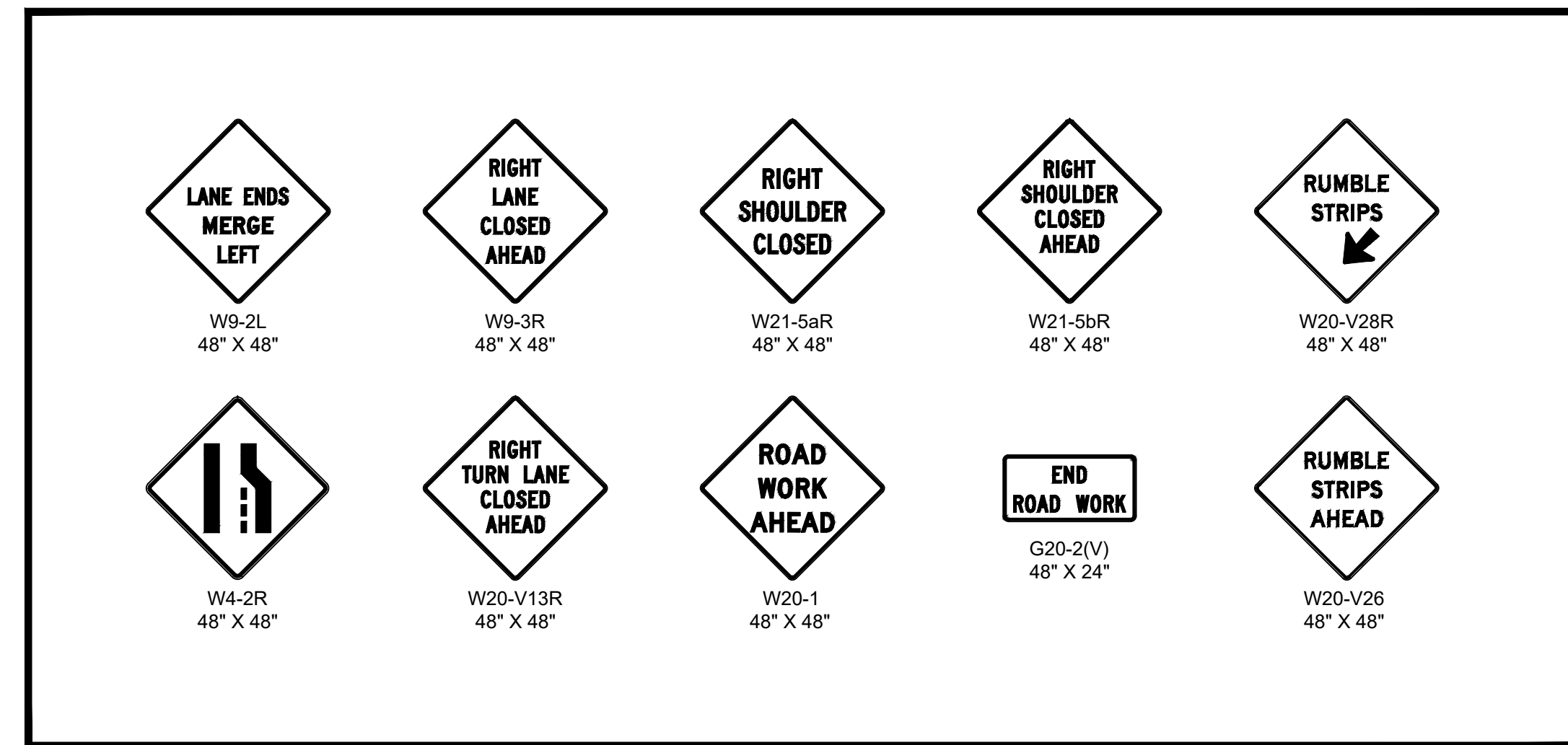
PUBLIC COMMUNICATIONS PLAN

- 1. Notification of construction start/end dates and work zone information will be entered into the VA. Traffic system.
2. The contractor is to notify VDOT ahead of any changes in traffic control.

TRANSPORTATION OPERATIONS PLAN

- 1. The process to notify the Regional Traffic Operation Center to place lane closure information on the 511 system and VA. Traffic will be:
a. Contractor is to advise the VDOT project inspector and/or Construction Manager of planned lane closures a minimum of 24 hours in advance of proposed lane closure.
b. All intended work shall be entered into the LCAMS and VA traffic programs by the contractor a minimum of one week prior to the start of work based on the Thursday of that week before 8:00 A.M.
c. The contractor shall call the traffic operations center control room 30 minutes prior to placing the first traffic control / warning device in the roadway.
2. The following is a list of Local Emergency contact agencies:
a. Virginia State Police - Division 1 - Area 7 Office: 911 or 804-733-8219
b. Prince George County Police Department: 911 or 804-733-2770
c. Prince George County Fire & EMS: 911 or 804-733-2770
d. Haz-Mat Center (if Spill Involved) 911
3. Procedures to respond to Traffic Incidents that may occur in the work zone:
a. Contractor to notify Virginia State Police, and VDOT inspector in charge and Regional Traffic Operation Center.
b. Depending upon severity of incident, contractor may have to shut down work.
c. Upon arrival on scene, Virginia State Police will determine response necessary to allow traveling public around incident.
d. Inspector to notify Construction Manager/Residency Administrator of incident and take pictures as necessary, especially pictures of contractor's work zone to verify the proper setup.
4. The Virginia State Police report of the incident will be reviewed by the Residency Administrator to determine if any modification of the Temporary Control Plan is necessary.

SIGN LEGEND



Dewberry logo and contact information for Dewberry Engineers Inc., including address, phone, fax, and website.

ROUTE 460 WATER MAIN EXTENSION PRINCE GEORGE COUNTY DEPARTMENT OF ENGINEERING AND UTILITIES PRINCE GEORGE COUNTY, VIRGINIA

KEY PLAN, SEAL, RECORD DRAWING, and AS RECORDED BY OTHERS AT THE TIME OF CONSTRUCTION.

Table with 4 columns: No., DATE, BY, Description. Includes a REVISIONS section and a table for tracking changes.

TITLE: TEMPORARY TRAFFIC CONTROL GENERAL NOTES AND DETAILS. PROJECT NO. 50106065

C3.0

SHOULDER CLOSURE WITH BARRIER (TTC-6.2)
FOR JACK AND BORE OPERATION



Dewberry Engineers Inc.
4805 Lake Brook Drive, Suite 200
Glen Allen, Virginia 23060
PHONE: 804.290.7957
FAX: 804.290.7928
www.dewberry.com

ROUTE 460
WATER MAIN EXTENSION
PRINCE GEORGE COUNTY
DEPARTMENT OF ENGINEERING
AND UTILITIES

PRINCE GEORGE COUNTY, VIRGINIA

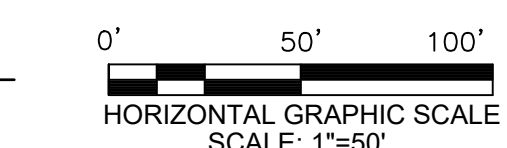
KEY PLAN

SEAL

RECORD DRAWING

12-2021
THESE DRAWINGS REFLECT WORK
AS RECORDED BY OTHERS AT THE
TIME OF CONSTRUCTION.

SCALE



No.	DATE	BY	Description
REVISIONS			

DRAWN BY TMR

APPROVED BY MCT

CHECKED BY MRL

DATE JANUARY, 2020

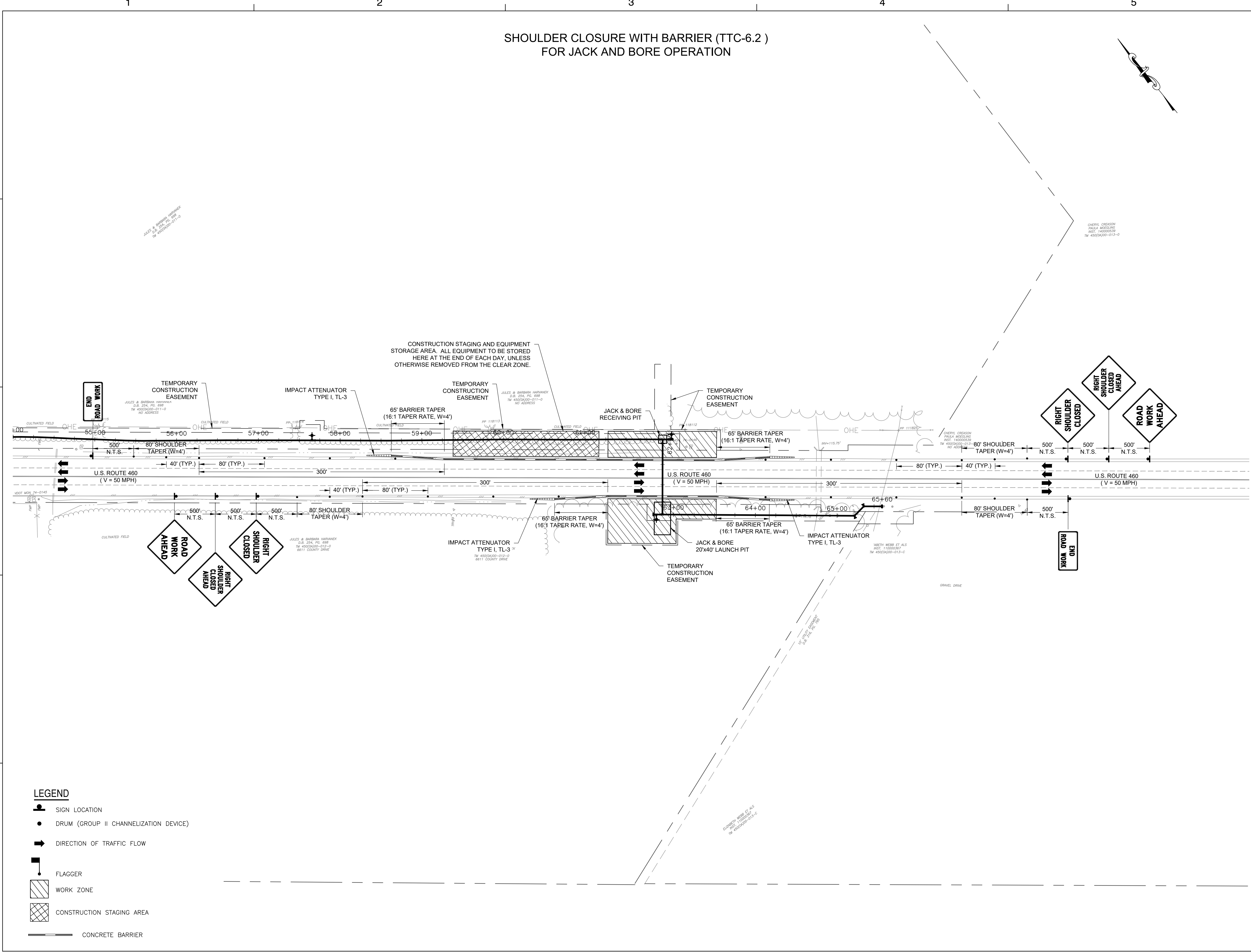
TITLE

**TEMPORARY
TRAFFIC CONTROL
PLAN**

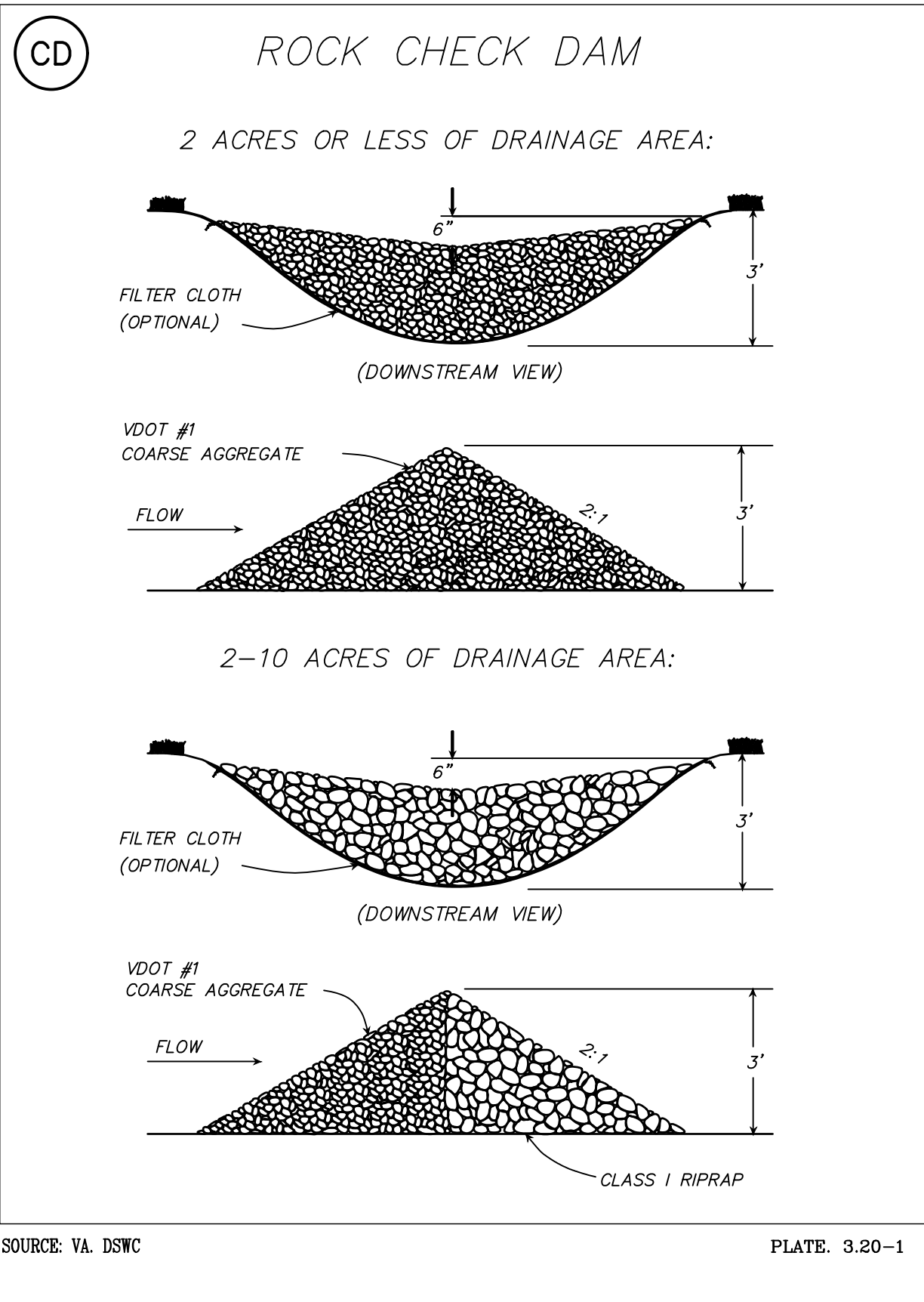
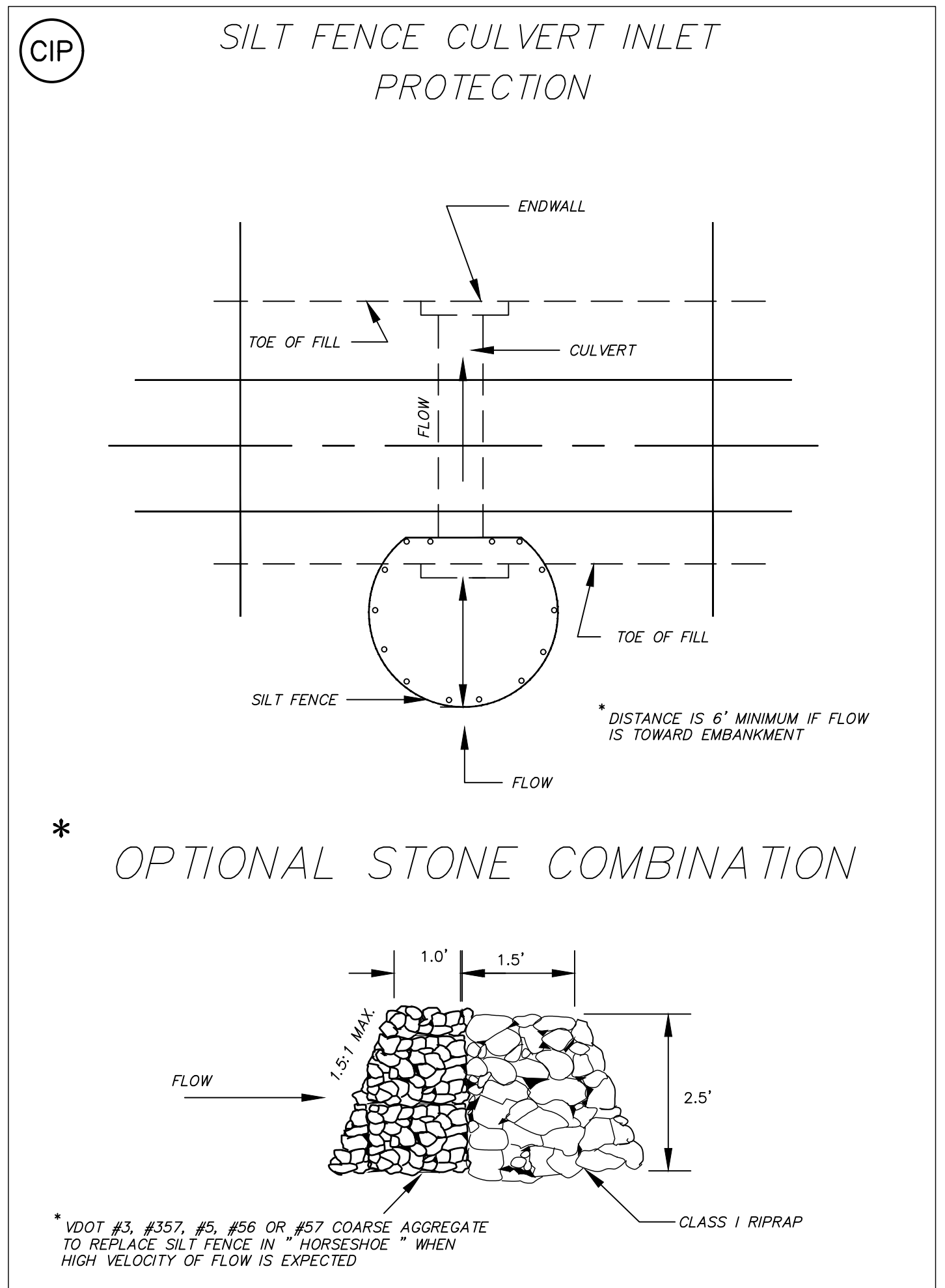
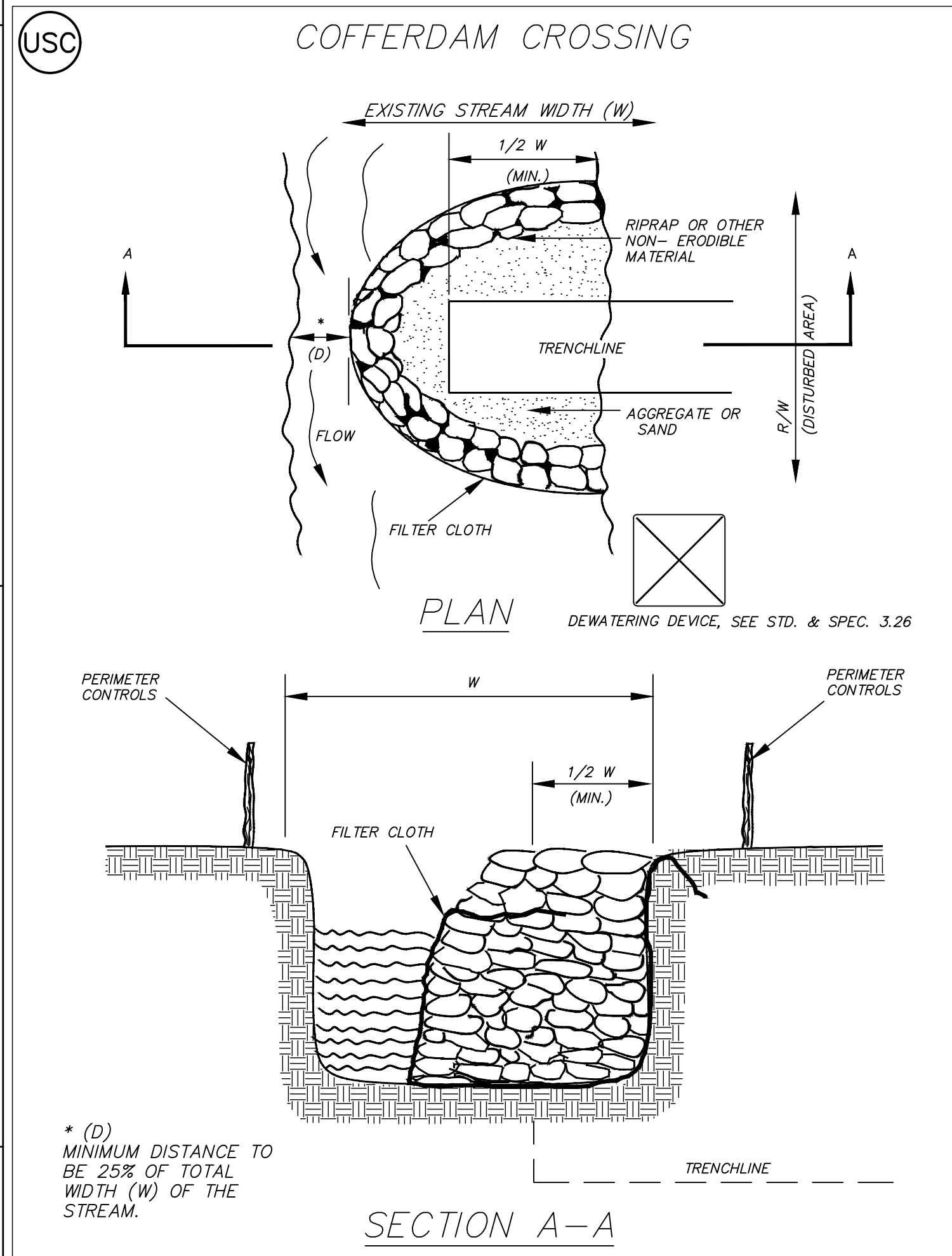
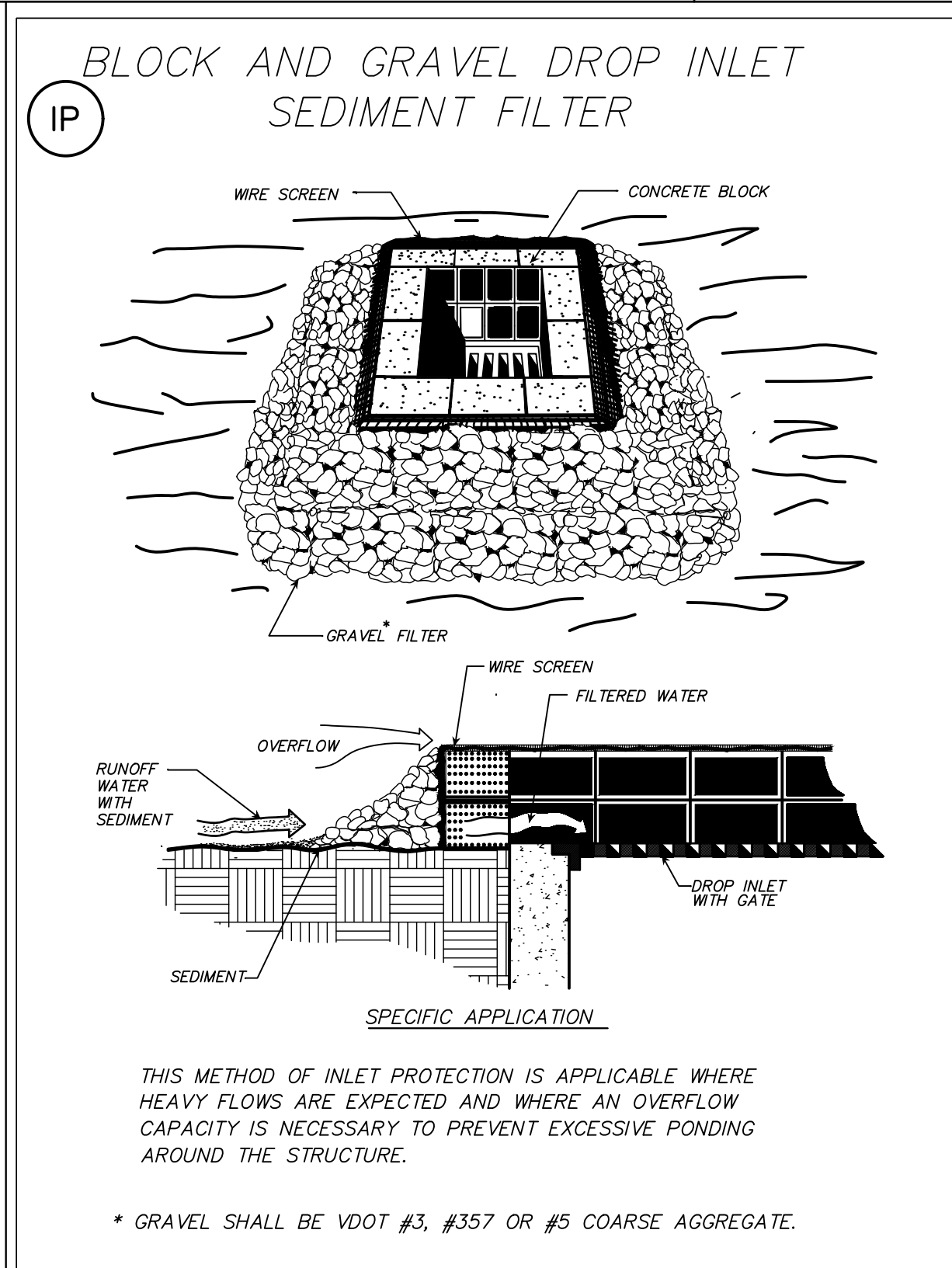
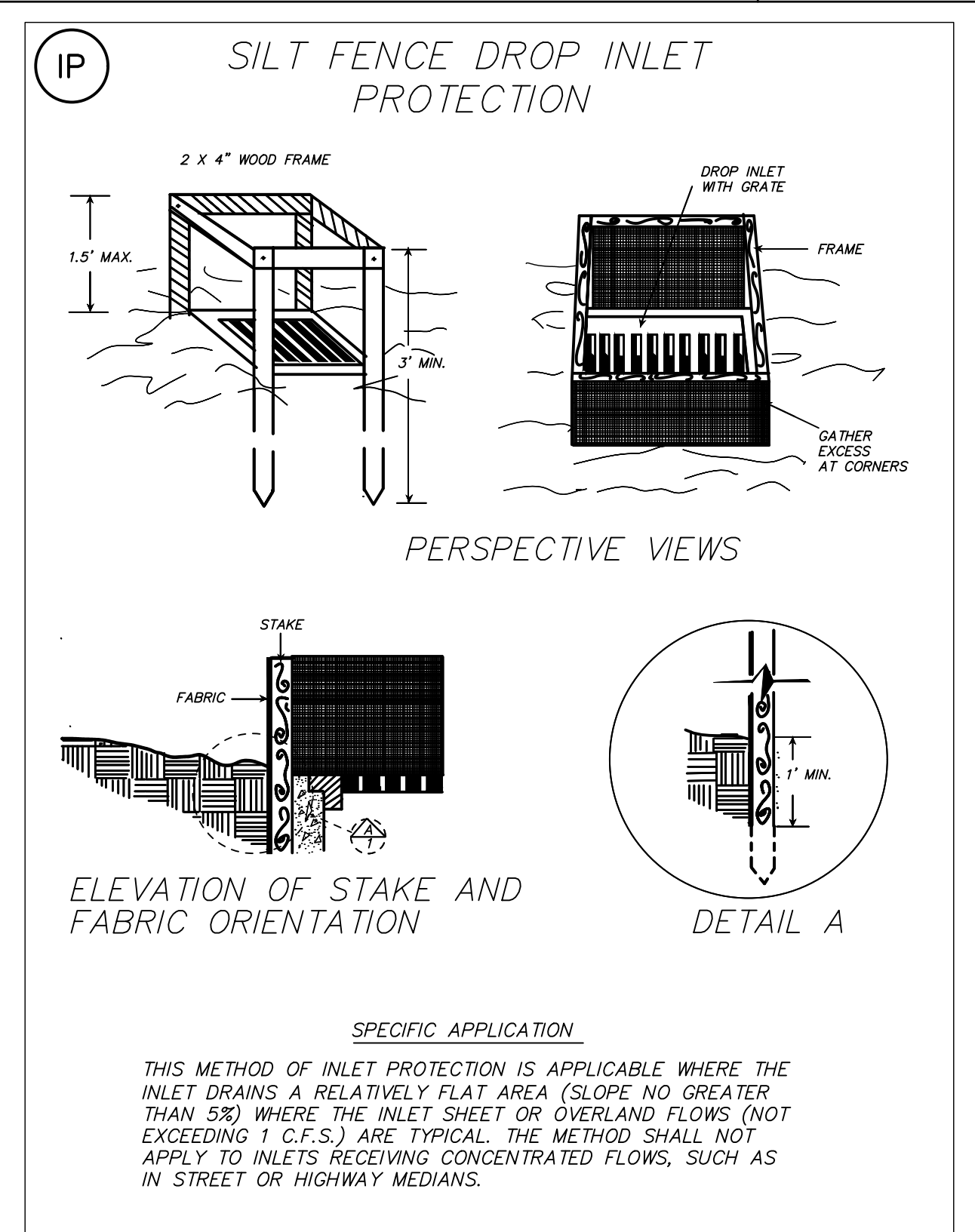
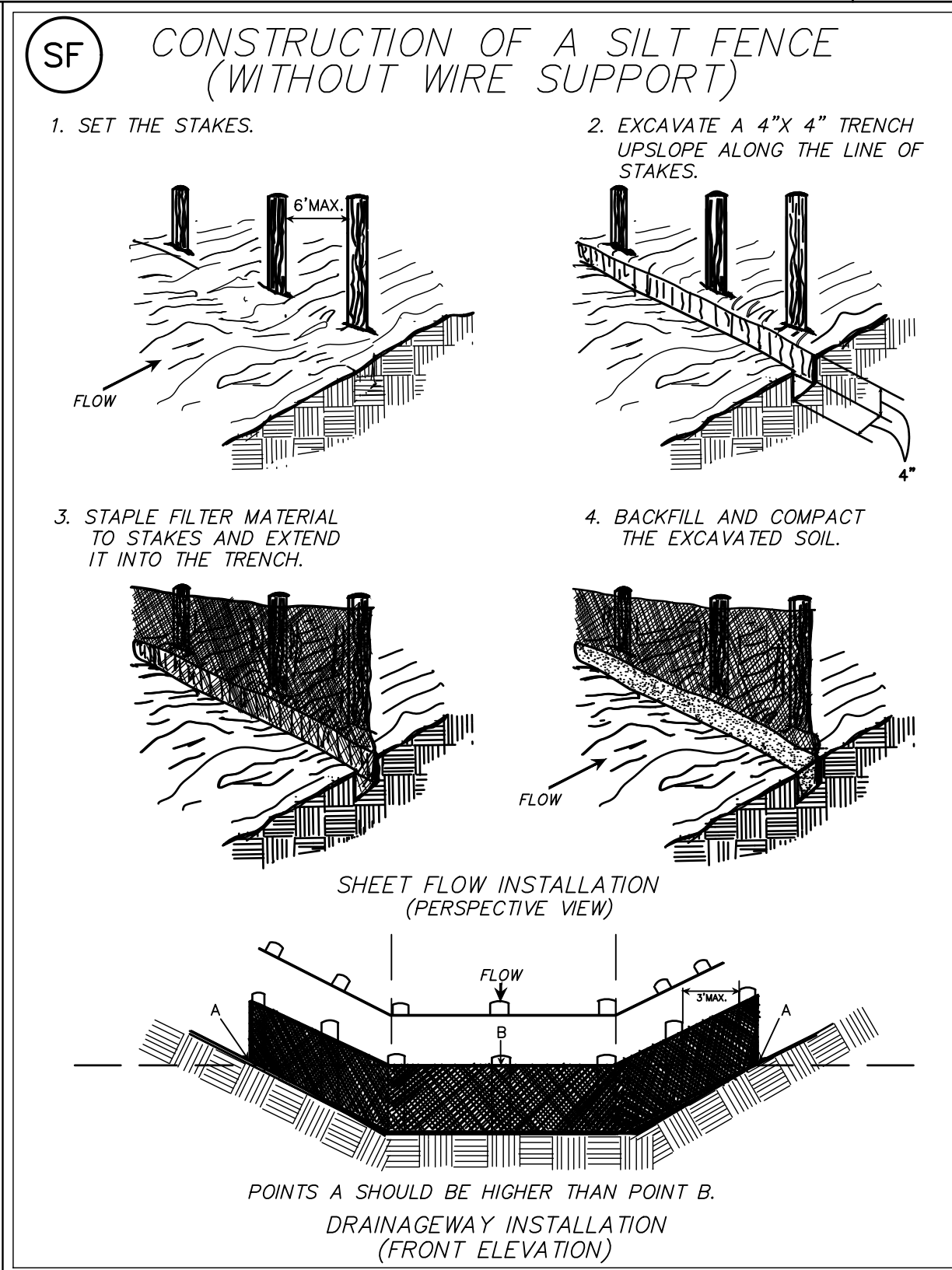
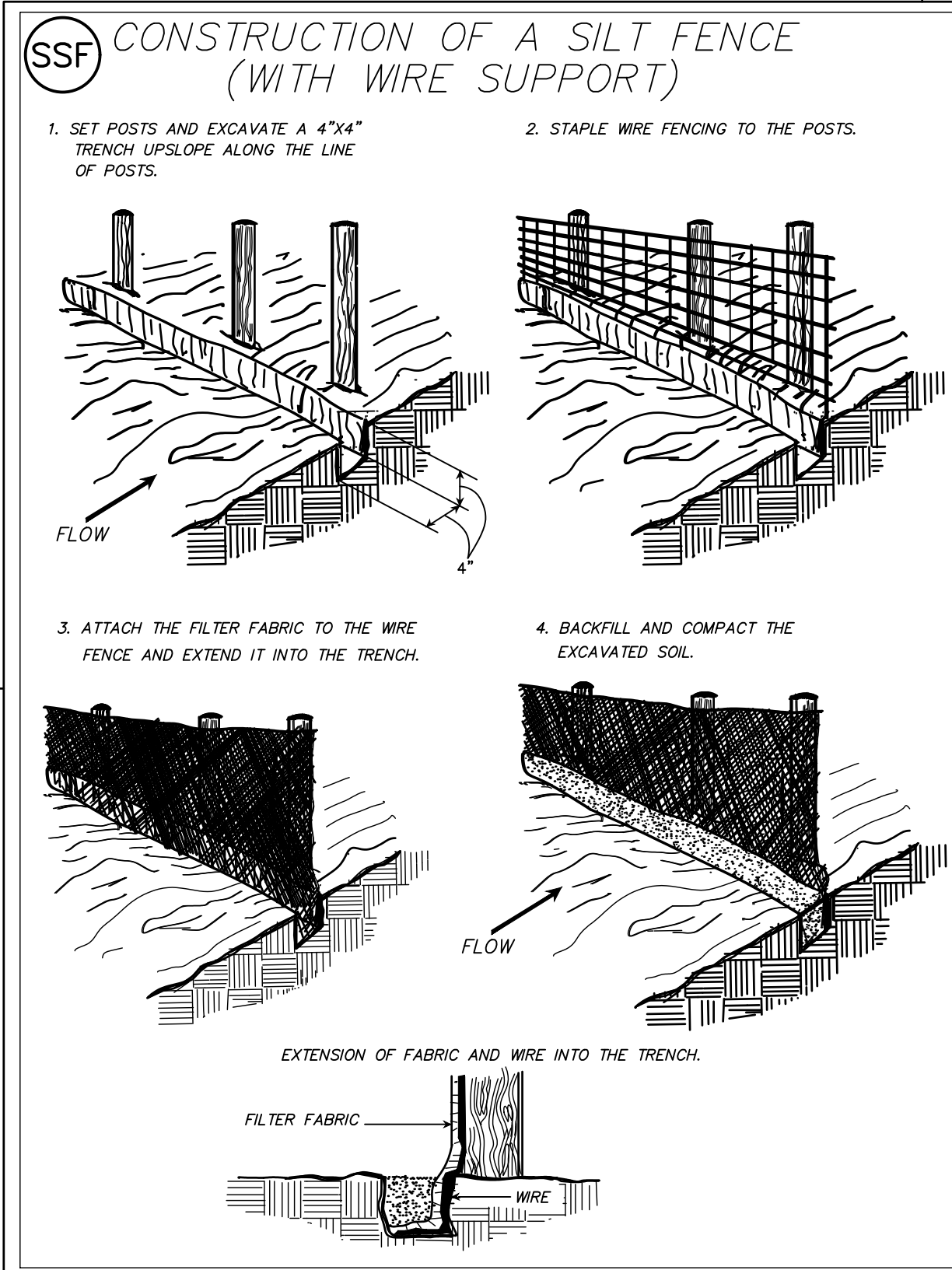
PROJECT NO. 50106065

C3.1

E
D
C
B
A



- LEGEND**
- SIGN LOCATION
 - DRUM (GROUP II CHANNELIZATION DEVICE)
 - DIRECTION OF TRAFFIC FLOW
 - FLAGGER
 - WORK ZONE
 - CONSTRUCTION STAGING AREA
 - CONCRETE BARRIER



KEY PLAN

SEAL

RECORD DRAWING
12-2021
THESE DRAWINGS REFLECT WORK AS RECORDED BY OTHERS AT THE TIME OF CONSTRUCTION.

SCALE

No.	DATE	BY	Description

DRAWN BY MWC
APPROVED BY DAV
CHECKED BY MRL
DATE APRIL 2020

TITLE

E&S CONTROL DETAILS

PROJECT NO. 50106065

C4.1

KEY PLAN

SEAL

RECORD DRAWING

12-2021

THESE DRAWINGS REFLECT WORK
AS RECORDED BY OTHERS AT THE
TIME OF CONSTRUCTION.

SCALE

Table with columns: No., DATE, BY, Description. Includes revision entries.

DRAWN BY: MWC

APPROVED BY: DAV

CHECKED BY: MRL

DATE: APRIL 2020

TITLE

CONSTRUCTION
DETAILS

PROJECT NO. 50106065

C5.0

PRINCE GEORGE COUNTY DEPARTMENT OF PUBLIC UTILITIES. BLOCKING DETAIL LOWER VERTICAL BENDS. Includes diagrams and a table for blocking dimensions based on pipe size and bend type.

PRINCE GEORGE COUNTY DEPARTMENT OF PUBLIC UTILITIES. BLOCKING DETAIL PLUGS, CAPS, AND HYDRANTS. Includes diagrams and a table for blocking dimensions for various pipe sizes and types.

PRINCE GEORGE COUNTY DEPARTMENT OF PUBLIC UTILITIES. BLOCKING DETAIL TEES. Includes diagrams and a table for blocking dimensions for different branch sizes and pipe diameters.

PRINCE GEORGE COUNTY DEPARTMENT OF PUBLIC UTILITIES. BLOCKING DETAIL HORIZONTAL BENDS. Includes diagrams and a table for blocking dimensions for horizontal bends of various pipe sizes.

PRINCE GEORGE COUNTY DEPARTMENT OF PUBLIC UTILITIES. TYPICAL FIRE HYDRANT DETAIL. Detailed cross-sectional diagram of a fire hydrant installation with various components labeled.

PRINCE GEORGE COUNTY DEPARTMENT OF PUBLIC UTILITIES. CASING DETAIL FOR WATER LINES & SEWER FORCE MAINS. Includes a diagram and a list of casing detail notes regarding carrier pipe, spacers, and restraints.

PRINCE GEORGE COUNTY DEPARTMENT OF PUBLIC UTILITIES. CASING PIPE REQUIREMENTS. Table listing minimum wall thickness for casing pipes based on carrier pipe diameter and criteria.

PRINCE GEORGE COUNTY DEPARTMENT OF PUBLIC UTILITIES. BLOCKING DETAIL UPPER VERTICAL BENDS. Includes diagrams and a table for blocking dimensions for upper vertical bends.

1 2 3 4 5

E D C B A

PRINCE GEORGE COUNTY
DEPARTMENT OF PUBLIC UTILITIES

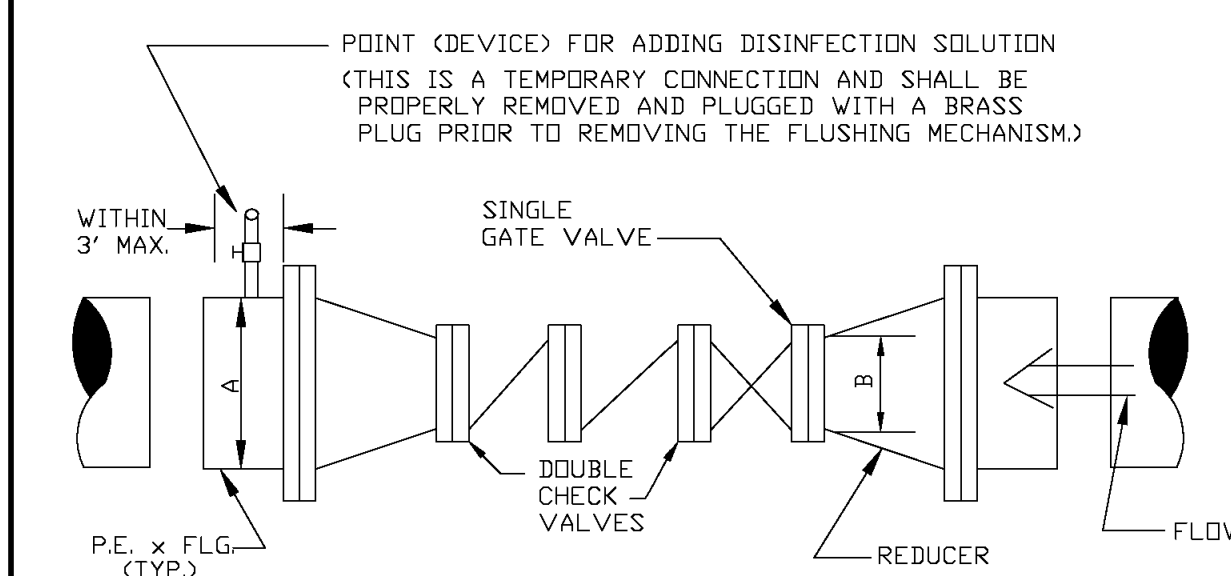
MINIMUM SPECIFIED TIME REQUIRED FOR A 1.0 PSIG PRESSURE DROP
FOR SIZE AND LENGTH OF PIPE INDICATED
PRESSURE DROP FROM 3.5 PSIG TO 2.5 PSIG*

PIPE DIAMETER (IN)	MINIMUM TIME (MIN SEC)	TIME FOR LENGTH (L) (SEC)	SPECIFICATION TIME FOR LENGTH (L) SHOWN (MIN:SEC)											
			100 FT.	150 FT.	200 FT.	250 FT.	300 FT.	350 FT.	400 FT.	450 FT.				
6	5:40	.854 L	5:40	5:40	5:40	5:40	5:40	5:42	6:24					
8	7:34	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24				
10	9:26	2.374 L	9:26	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48			
12	11:20	3.418 L	11:20	11:20	11:24	11:24	14:15	17:05	19:56	22:47	25:38			
15	14:10	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04				
18	17:00	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41				
21	19:50	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31				
24	22:40	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33				
27	25:30	17.306 L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48				
30	28:20	21.366 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15				
33	31:10	25.852 L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53				
36	34:00	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46				
42	45:21	41.883 L	69:48	104:47	139:37	174:31	209:25	244:19	279:13	314:07				

*The 3.5 psig test pressure shall be increased by adding the average vertical height in feet of ground water above the sewer pipe invert, divided by 2.31 but the maximum starting test pressure shall not exceed 9 psig.

DATE: JAN. 2008
REVIEWS:
PVC PIPE AIR TEST TABLE
BASED ON FORMULAS FROM UNI-B-6-90
DRWG. NO.: TST-2

PRINCE GEORGE COUNTY
DEPARTMENT OF PUBLIC UTILITIES



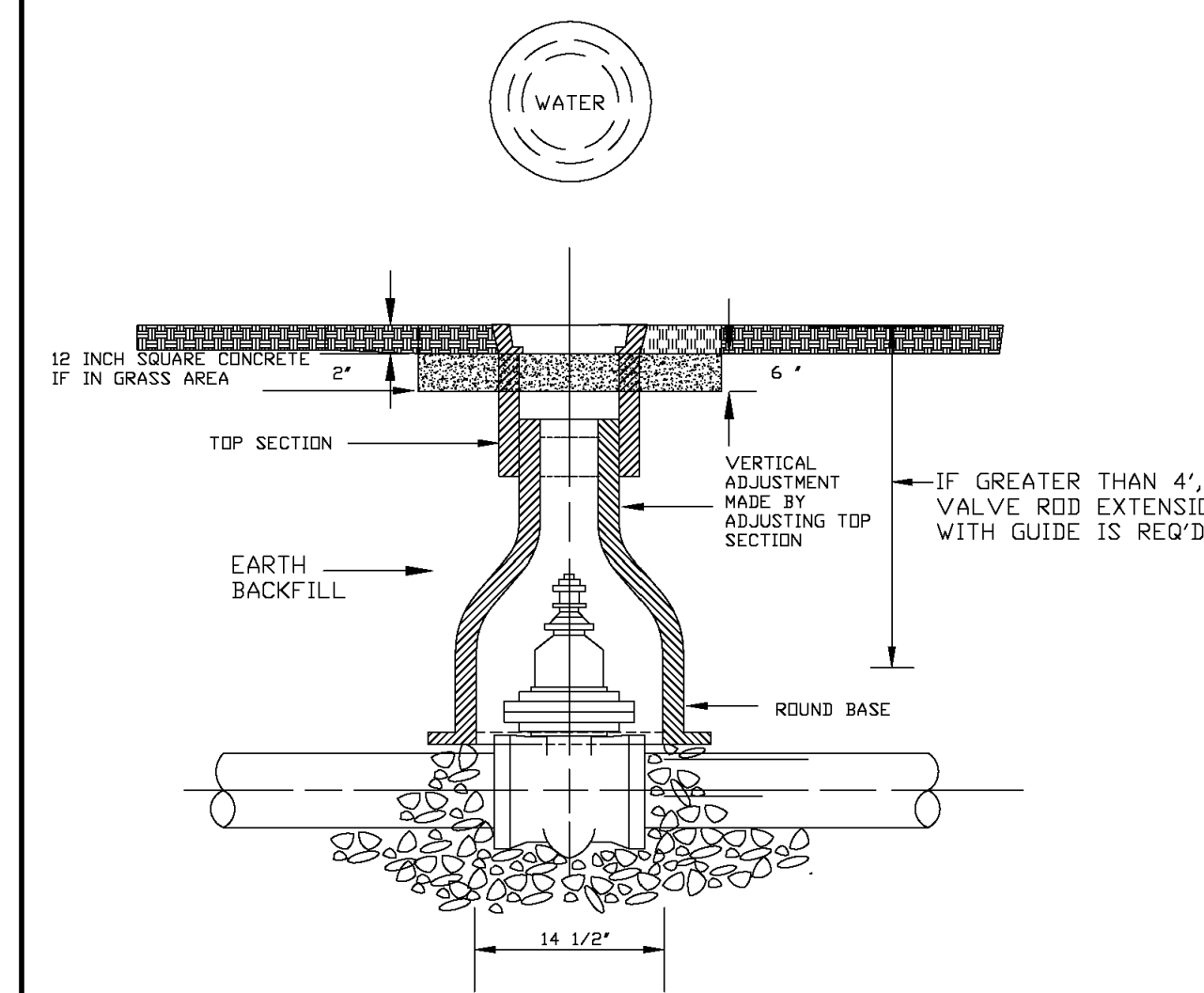
* TO BE DESIGNED BY CONSULTANT.

A = MAIN SIZE
B = CHECKVALVE AND GATE VALVE SIZE

NOTE: CONTRACTOR SHALL USE IN ACCORDANCE WITH FLUSHING SCHEDULE, SEE PART III & IV (SECTIONS ENTITLED "DISINFECTION SYSTEM" AND "SUPPLEMENTAL PROCEDURES FOR DISINFECTING, TESTING, AND FLUSHING") AND TABLE 1 ENTITLED "FLUSHING SCHEDULE".

DATE: JAN. 2008
REVIEWS:
PREASSEMBLED FLUSHING MECHANISM
DRWG. NO.: WAT-6

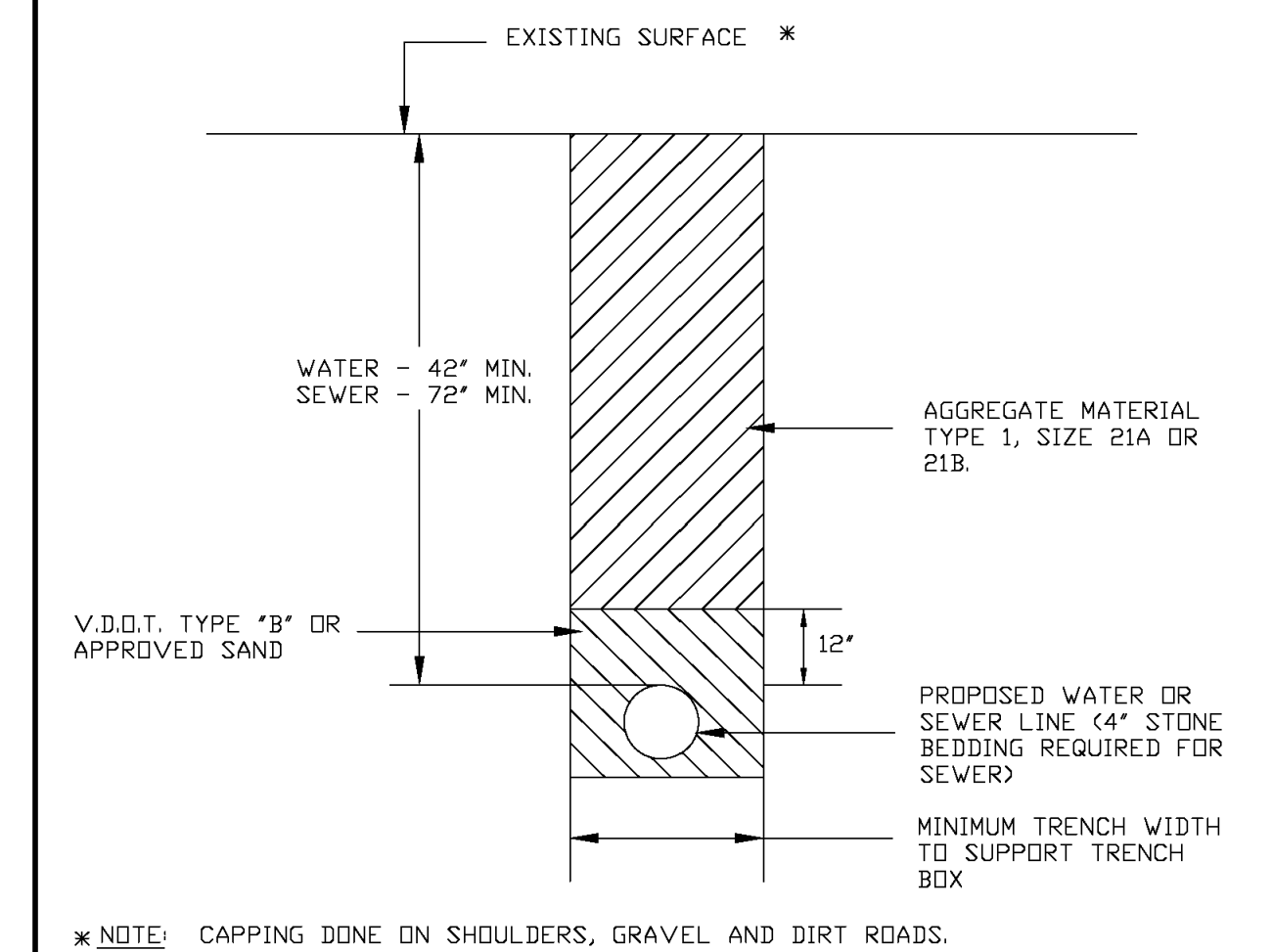
PRINCE GEORGE COUNTY
DEPARTMENT OF PUBLIC UTILITIES



USE STANDARD DESIGNED VALVE BOX OF THE APPROPRIATE LENGTH (HEIGHT) UTILIZING APPROVED MANUFACTURERS OF VALVE BOX APPURTENANCES.

DATE: JAN. 2008
REVIEWS:
SMALL VALVE BOX
DRWG. NO.: WAT-7

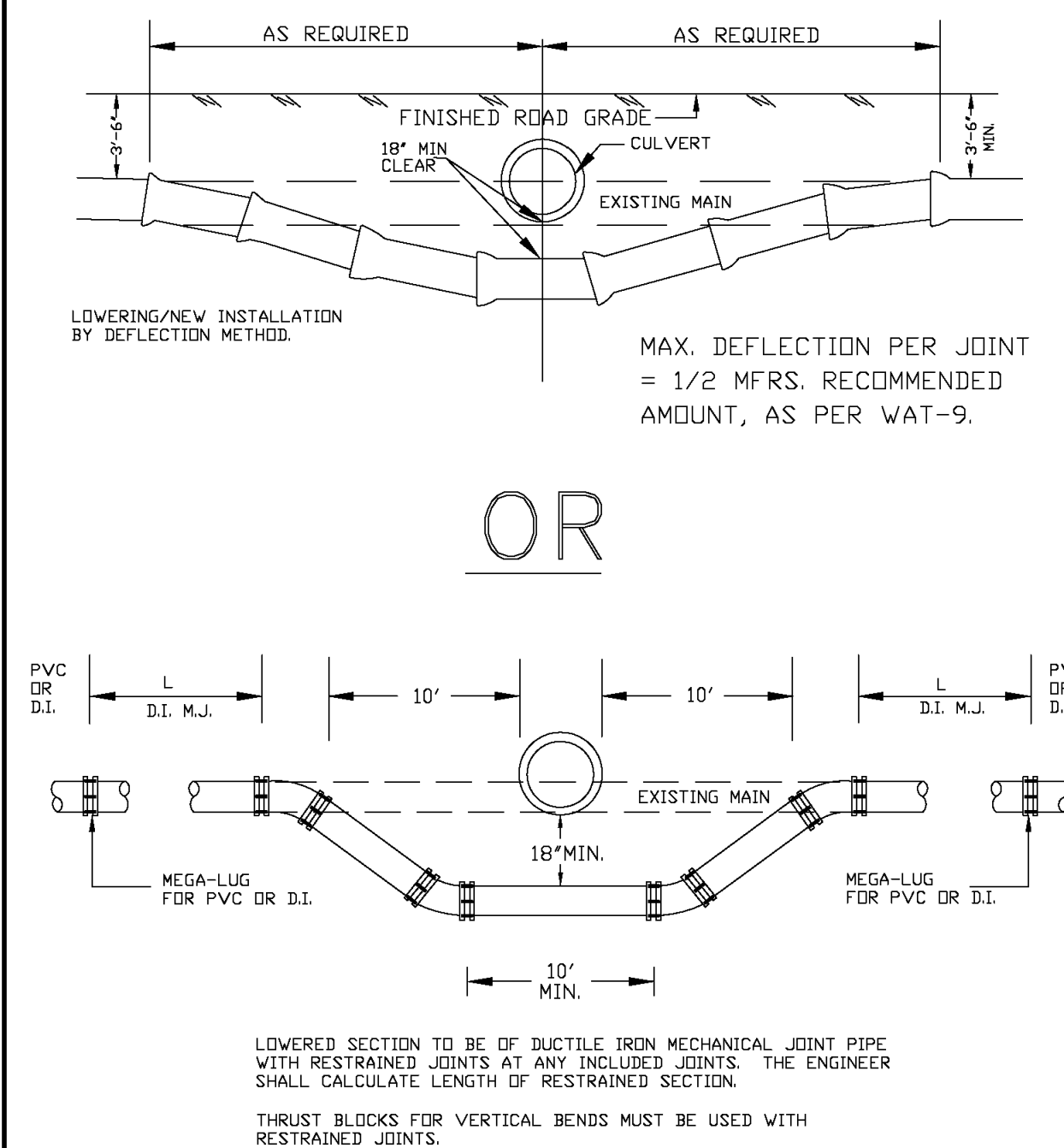
PRINCE GEORGE COUNTY
DEPARTMENT OF PUBLIC UTILITIES
VDOT APPROVED



* NOTE: CAPPING DONE ON SHOULDERS, GRAVEL AND DIRT ROADS.

DATE: JAN. 2008
REVIEWS:
TYPICAL SECTION FOR REPAIR OF "PRIMARY" ROADWAY SHOULDERS OR OTHER UNPAVED TRAVELED AREAS FOR WATER & SEWER LINE CROSSINGS
DRWG. NO.: PAV-1

PRINCE GEORGE COUNTY
DEPARTMENT OF PUBLIC UTILITIES



DATE: JAN. 2008
REVIEWS:
LOWERING WATER MAIN OR NEW INSTALLATION
DRWG. NO.: WAT-8

PRINCE GEORGE COUNTY
DEPARTMENT OF PUBLIC UTILITIES

DISCHARGE TABLE FOR HYDRANTS**

OUTLET PRESSURE MEASURED BY PILOT GAGE.

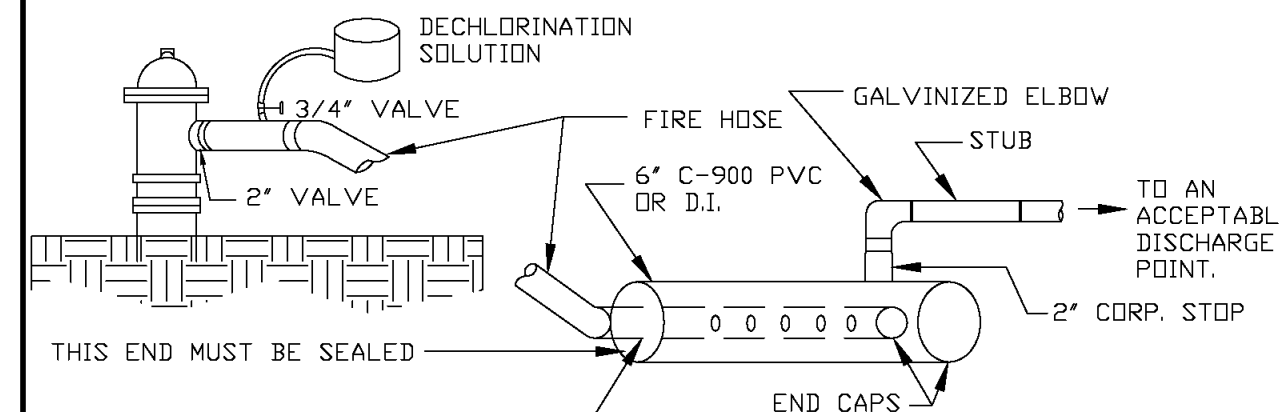
FLOWING PRESSURE IN lb./sq. ft.	OUTLET DIAMETER IN INCHES																	
	2 3/8"			2 1/2"			2 5/8"			3 1/4"			3 7/8"			4 1/2"		
	2 3/8"	2 1/2"	2 5/8"	2 3/4"	2 5/8"	3 1/4"	3 7/8"	4"	4 3/8"	4 1/2"	4 5/8"	5"	5 1/4"	5 1/2"	5 3/4"			
1	150	170	180	200	220	240	260	400	430	510	540	580						
2	210	240	260	290	310	340	370	570	610	720	770	810						
3	260	290	320	350	380	420	450	700	740	890	940	990						
4	300	340	370	410	440	480	530	810	860	1050	1090	1150						
5	340	380	410	450	500	540	590	900	960	1150	1220	1290						
6	370	410	450	500	540	590	640	990	1050	1260	1340	1410						
7	400	440	490	540	590	640	690	1070	1140	1360	1440	1520						
8	430	480	520	570	630	680	740	1140	1220	1450	1540	1620						
9	450	500	550	610	670	730	790	1210	1290	1540	1640	1720						
10	480	530	580	640	700	760	830	1280	1360	1630	1730	1820						
11	500	560	610	670	730	800	870	1340	1430	1710	1810	1910						
12	520	580	640	700	770	840	910	1400	1490	1780	1890	1990						
13	550	610	670	730	800	870	950	1450	1550	1850	1960	2070						
14	570	630	690	760	830	900	980	1510	1610	1920	2040	2150						
15	590	650	720	790	860	940	1020	1560	1660	1990	2110	2220						
16	610	670	740	810	890	970	1050	1620	1720	2060	2180	2300						
17	620	690	760	840	910	1000	1080	1660	1770	2120	2240	2370						
18	640	710	780	860	940	1030	1110	1710	1820	2170	2300	2440						
19	660	730	810	890	960	1050	1140	1760	1870	2240	2370	2510						
20	680	750	830	910	990	1080	1170	1800	1920	2290	2430	2570						
22	710	790	870	950	1040	1130	1230	1890	2020	2400	2550	2700						
24	740	820	910	1000	1090	1180	1290	1970	2110	2500	2660	2810						
26	770	860	940	1040	1130	1230	1340	2050	2190	2600	2770	2930						
28	800	890	980	1070	1170	1280	1390	2130	2280	2700	2880	3040						
30	830	920	1010	1110	1210	1320	1430	2210	2360	2800	2990	3150						
32	860	950	1050	1150	1260	1370	1480	2290	2430	2910	3090	3250						
34	890	980	1080	1180	1290	1410	1530	2350	2500	3000	3170	3350						
36	910	1010	1110	1220	1330	1450	1580	2420	2580	3090	3260	3440						
38	930	1040	1140	1250	1370	1490	1620	2480	2650	3170	3350	3540						
40	960	1060	1170	1280	1400	1530	1660	2550	2720	3250	3440	3630						

*Computed with coefficient, C = 0.90, to nearest 10 gals. per min. **From Natl. Bd. of Fire Underwriters. EQUIPMENT FOR APPROXIMATING HYDRANT FLOWS (per R.C. Bennett's, Engr. Natl. Bd. of Fire Underwriters).

The equipment necessary consists of either a standard pilot tube or a hydrant cap topped to take a pressure gage. If the hydrants used as a discharge point for flushing has two or more outlets a pressure gage on one outlet while another outlet is flowing will give approximately the same results as the use of a pilot tube.

DATE: JAN. 2008
REVIEWS:
DISCHARGE FLOW RATES FOR FLUSHING
DRWG. NO.: WAT-9

PRINCE GEORGE COUNTY
DEPARTMENT OF PUBLIC UTILITIES



NOTE: THIS DETAIL IS A RECOMMENDED DESIGN CONCEPT. ALTERNATE METHOD(S) MAY BE SUBMITTED TO THE UTILITIES DEPARTMENT'S CONSTRUCTION SECTION FOR APPROVAL PRIOR TO SCHEDULED FLUSHING.

DATE: JAN. 2008
REVIEWS:
NEUTRALIZATION STATION
DRWG. NO.: WAT-10

PRINCE GEORGE COUNTY
DEPARTMENT OF PUBLIC UTILITIES

PIPE MATERIAL TYPE AND SIZE	MAXIMUM DEFLECTION AT EACH JOINT	DEFLECTIONS (INCHES EACH JOINT) 19' LAYING LENGTH	RADIUS (MINIMUM)
DUCTILE IRON (PUSH-IN JOINT)			
6" TO 12"	2" 30'	9.5"	413'
14" TO 16"	2" 00'	7.5"	516'
18" +	1" 30'	5.5"	688'
DUCTILE IRON (MECHANICAL JOINT)			
6"	3" 30'	13.5"	291'
8" TO 12"	3" 00'	11.5"	344'
16"	2" 00'	7.5"	516'
24"	1" 30'	5.5"	688'

Note: Any deflection not listed for iron pipe may be derived by: $R = \frac{90'}{1/2 \text{ Manufacturer's } X 18' \times X 2 \text{ Max. Jt. Deflection}} \times \text{Deflection} = \tan \text{ joint deflection } X 18' \times X 12'$

PIPE NOM. DIA.	PIPE I.D.	RADIUS (MIN.)	PRESSURE RATING - DIMENSION RATIO
6"	6.9"	272.5'	150 psi DR 18
8"	9.05"	326.3'	150 psi DR 18
10"	11.10"	377.5'	150 psi DR 18
12"	13.20"	430.0'	150 psi DR 18
14"	15.30"	482.5'	165 psi DR 26
16"	17.40"	535.0'	165 psi DR 26
18"	19.50"	587.5'	165 psi DR 26
20"	21.60"	640.0'	165 psi DR 26
24"	25.80"	745.0'	165 psi DR 26

Notes: 1. Any radius not listed for PVC pipe may be derived by: Do 300 + 100 (Do = outside diameter in feet) 2. Due to the difficulty of measuring deflections on curved pipe, no deflections are given. It is expected that curved water lines will be properly shown on the plans and staked in the field.

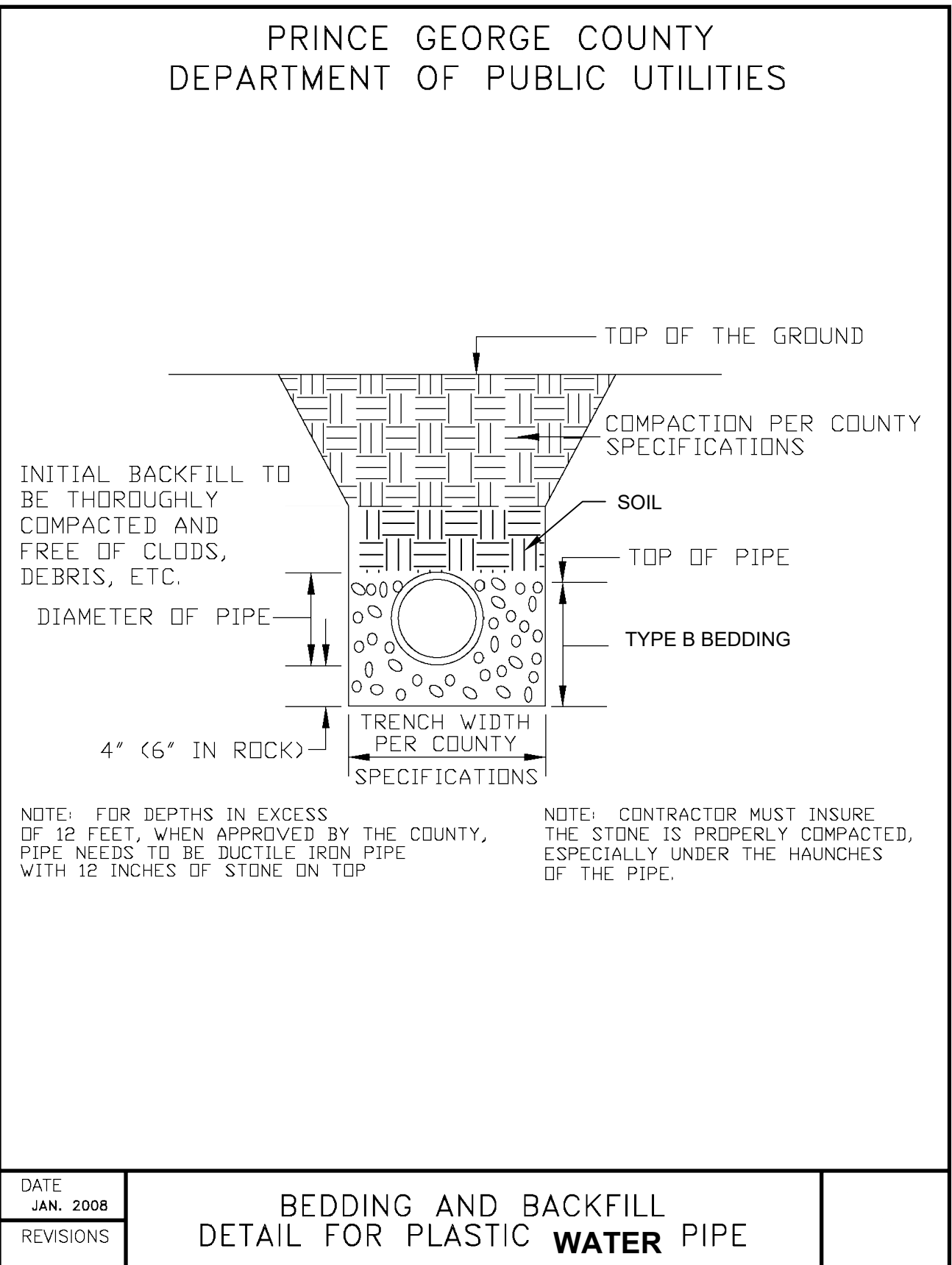
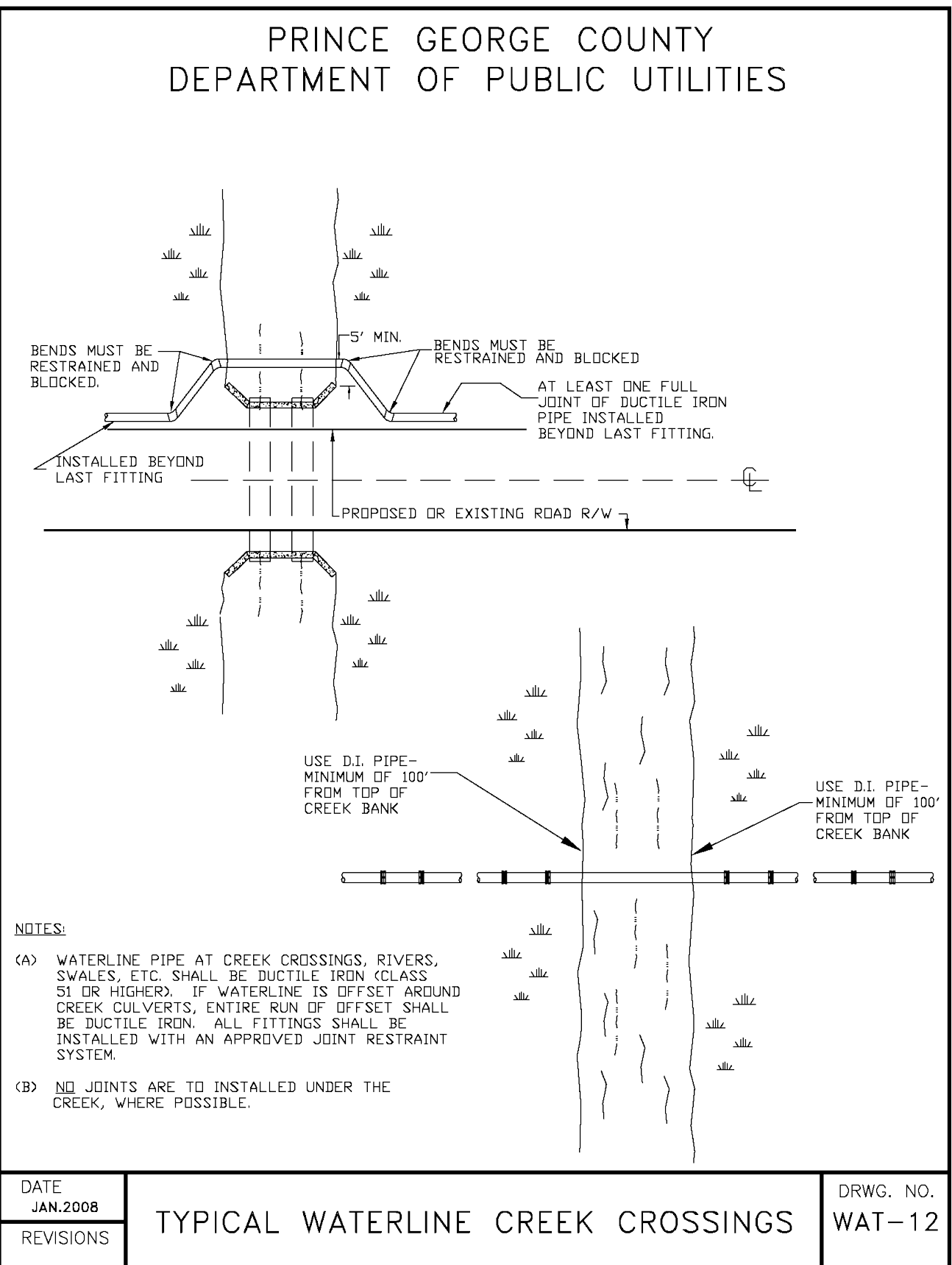
DATE: JAN. 2008
REVIEWS:
ALLOWABLE DEFLECTIONS FOR WATER PIPE
DRWG. NO.: WAT-11

ROUTE 460
WATER MAIN EXTENSION
PRINCE GEORGE COUNTY
DEPARTMENT OF ENGINEERING
AND UTILITIES
PRINCE GEORGE COUNTY, VIRGINIA

RECORD DRAWING
12-2021
THESE DRAWINGS REFLECT WORK AS RECORDED BY OTHERS AT THE TIME OF CONSTRUCTION.

No.	DATE	BY	Description
1	12/2021	TLR	RECORD DRAWINGS

REVISIONS
DRAWN BY: MWC
APPROVED BY: DAV
CHECKED BY: MRL
DATE: APRIL 2020
TITLE: CONSTRUCTION DETAILS



PRINCE GEORGE COUNTY DEPARTMENT OF PUBLIC UTILITIES

MINIMUM TEST TIME TWO HOURS

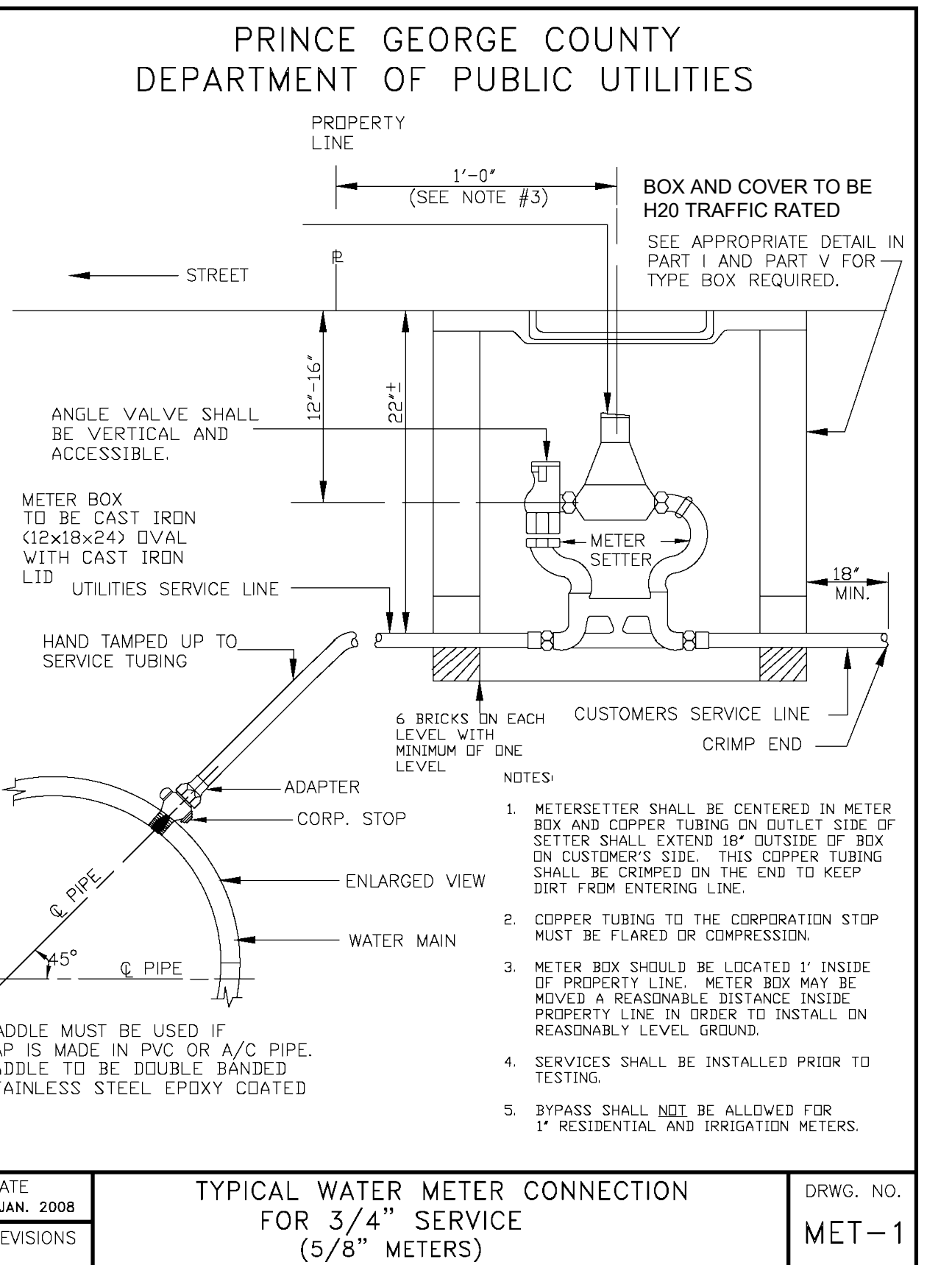
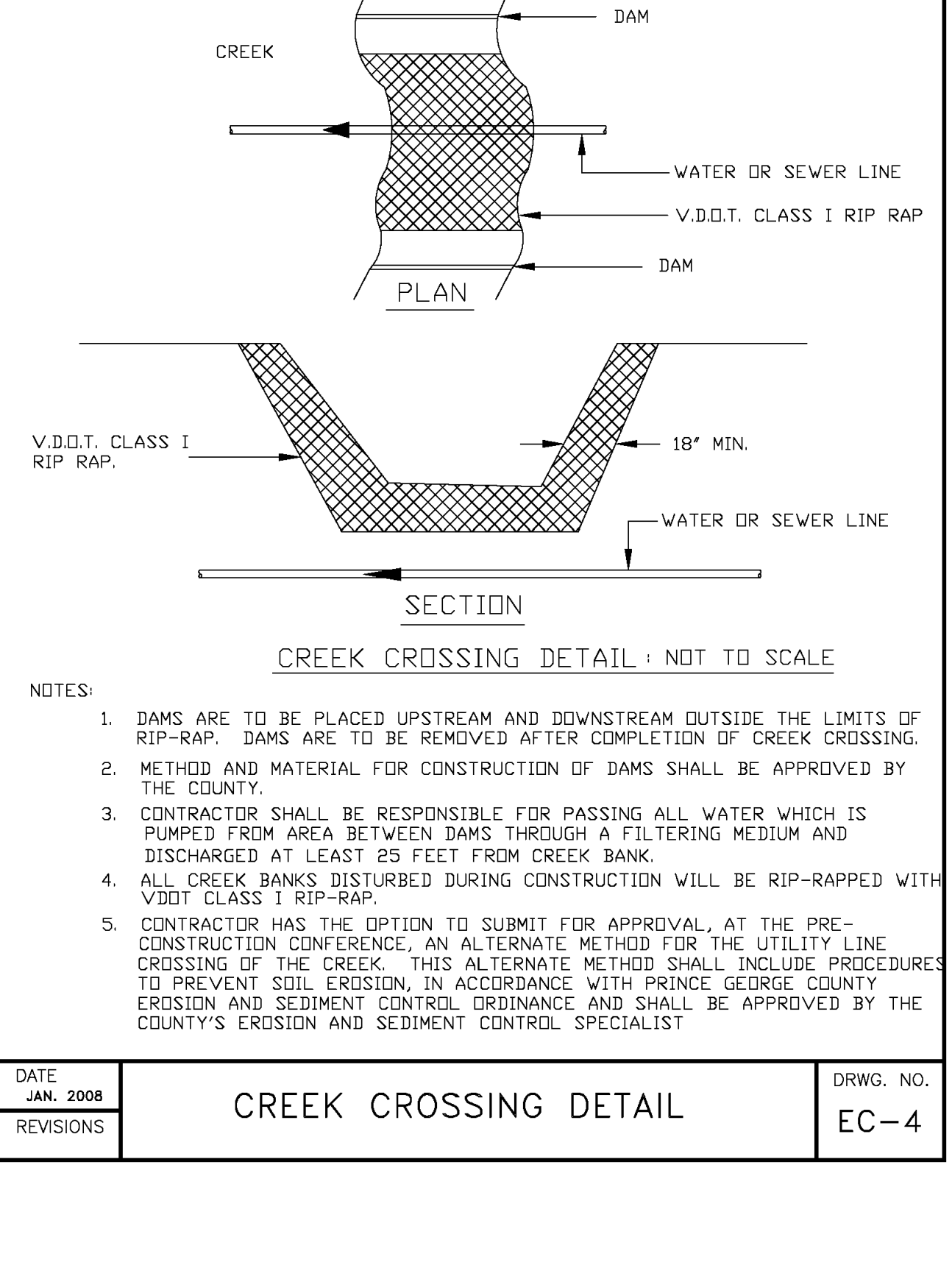
WATER LINE TEST BASED ON 150 PSI		WATER LINE TEST BASED ON 150 PSI	
SIZE	MAX. ALLOWABLE LEAKAGE	SIZE	MAX. ALLOWABLE LEAKAGE
3/4"	.0138 (GAL/2 HRS)/100 L.F.	16"	.2942 (GAL/2 HRS)/100 L.F.
1"	.0184 (GAL/2 HRS)/100 L.F.	20"	.3678 (GAL/2 HRS)/100 L.F.
1 1/2"	.0276 (GAL/2 HRS)/100 L.F.	24"	.4413 (GAL/2 HRS)/100 L.F.
2"	.0368 (GAL/2 HRS)/100 L.F.	30"	.5517 (GAL/2 HRS)/100 L.F.
3"	.0552 (GAL/2 HRS)/100 L.F.	36"	.6620 (GAL/2 HRS)/100 L.F.
4"	.0736 (GAL/2 HRS)/100 L.F.	42"	.7724 (GAL/2 HRS)/100 L.F.
6"	.1103 (GAL/2 HRS)/100 L.F.	48"	.8827 (GAL/2 HRS)/100 L.F.
8"	.1471 (GAL/2 HRS)/100 L.F.	54"	.9930 (GAL/2 HRS)/100 L.F.
12"	.2207 (GAL/2 HRS)/100 L.F.		

MAXIMUM ALLOWABLE LEAKAGE FOR THE WATER MAIN WILL BE CALCULATED USING THE FOLLOWING FORMULA:

$$L = \frac{SD\sqrt{P}}{148000}$$

WHERE:
L = MAXIMUM ALLOWABLE LEAKAGE, GALLONS/HOUR
S = LENGTH OF PIPE IN TEST SECTION, IN FEET
D = NOMINAL DIAMETER OF TESTED PIPE, IN INCHES
P = TEST PRESSURE, POUNDS PER SQUARE INCH 150 PSI OR 1 1/2 THE WORKING PRESSURE WHICHEVER IS GREATER MEASURED AT THE HIGH POINT OF THE TEST SYSTEM.

DATE: JAN. 2008
DRWG. NO.: TST-3



RESTRAINED PIPE DETAIL

NOMINAL PIPE SIZE (INCHES)	NUMBER OF TWIST-OFF NUTS	NUMBER OF T-BOLTS	RATED PRESSURE	
			350 PSI	250 PSI
3	2	4	350 PSI	250 PSI
4	2	4	350 PSI	250 PSI
6	3	6	350 PSI	250 PSI
8	4	6	350 PSI	250 PSI
10	6	8	350 PSI	250 PSI
12	8	8	350 PSI	250 PSI
16	12	12	350 PSI	250 PSI
18	12	12	250 PSI	250 PSI
24	16	16	250 PSI	250 PSI
30	20	20	250 PSI	250 PSI
36	24	24	250 PSI	250 PSI
42	28	28	250 PSI	250 PSI

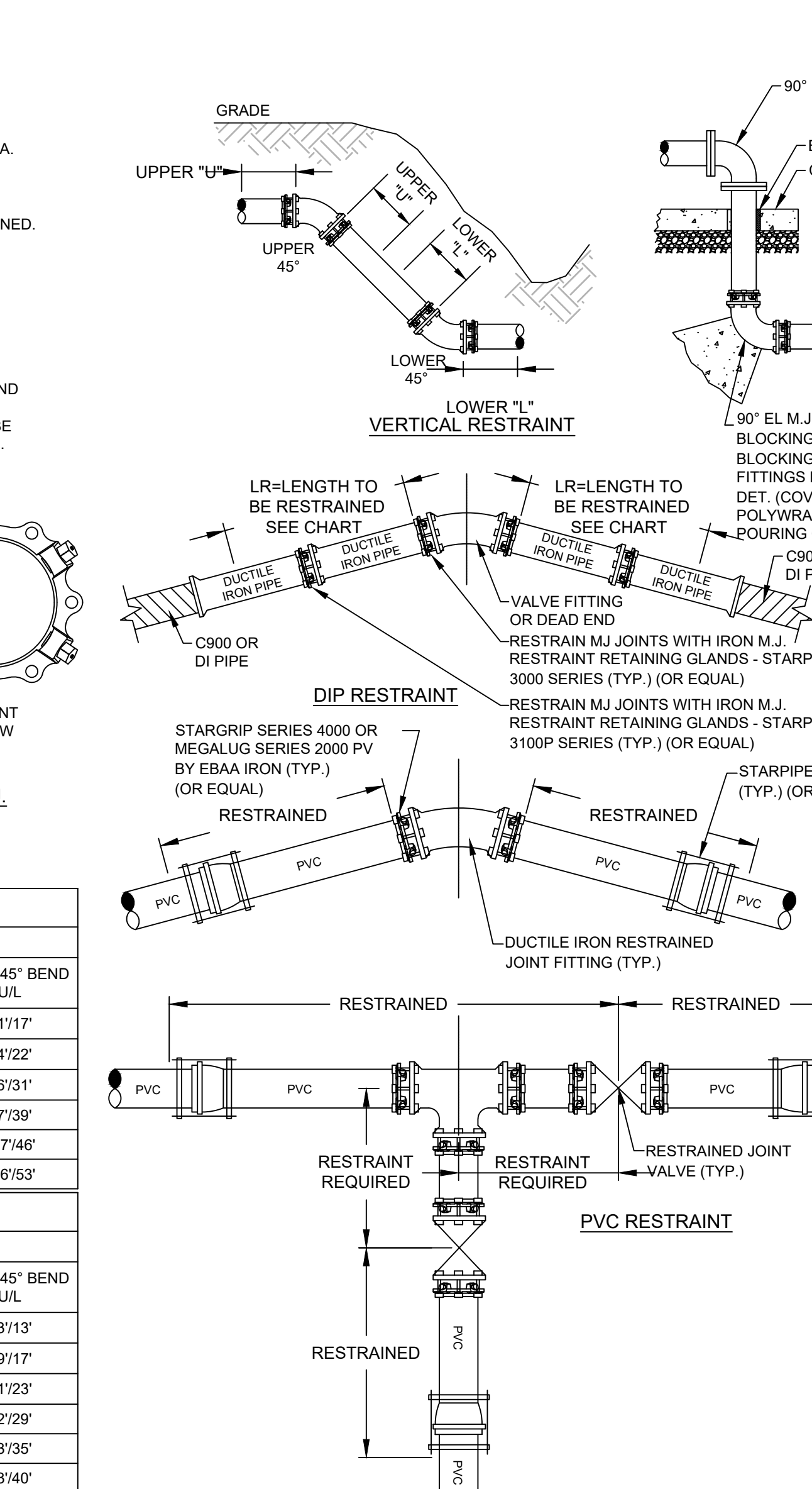
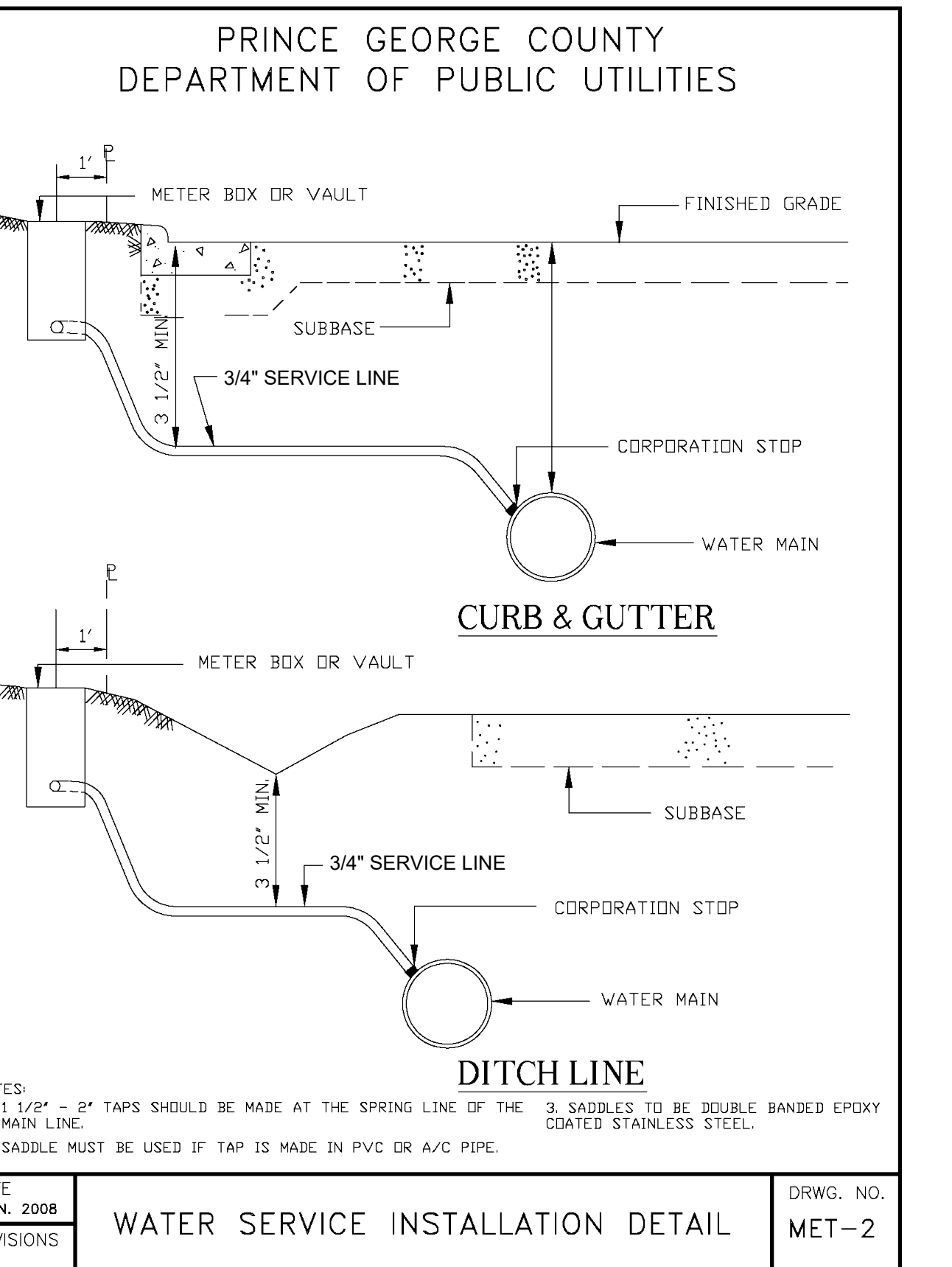
JOINT RESTRAINT TABLE - PVC

RESTRAIN ALL JOINTS WITHIN THESE LENGTHS. (LF EA. SIDE OF FITTING)							
PIPE SIZE (INCHES)	11 1/4" BEND	22 1/2" BEND	45° BEND	90° BEND	DEAD END/ VALVE	REDUCER	VERT. 45° BEND U/L
6"	4	8	17	41	99	6"x8" 54"	41/17'
8"	6	11	22	53	129	8"x12" 97"	54/22'
12"	8	15	31	73	182	12"x16" 99"	76/31'
16"	10	19	39	93	233	16"x20" 99"	97/39'
20"	11	22	46	111	282	20"x24" 99"	117/46'
24"	13	26	53	127	328	-	136/53'

JOINT RESTRAINT TABLE - DIP

RESTRAIN ALL JOINTS WITHIN THESE LENGTHS. (LF EA. SIDE OF FITTING)							
PIPE SIZE (INCHES)	11 1/4" BEND	22 1/2" BEND	45° BEND	90° BEND	DEAD END/ VALVE	REDUCER	VERT. 45° BEND U/L
6"	3	6	13	30	54	6"x8" 54"	23/13'
8"	4	8	17	39	70	8"x12" 97"	29/17'
12"	6	11	23	55	98	12"x16" 99"	41/23'
16"	7	14	29	69	126	16"x20" 99"	52/29'
20"	9	17	35	83	152	20"x24" 99"	63/35'
24"	10	19	40	96	177	-	73/40'

DATE: JAN. 2008
DRWG. NO.: MET-2



KEY PLAN

SEAL

RECORD DRAWING

12-2021

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SCALE

No.	DATE	TLR	RECORD DRAWINGS
1	12/2021	TLR	RECORD DRAWINGS

REVISIONS

No.	DATE	BY	Description

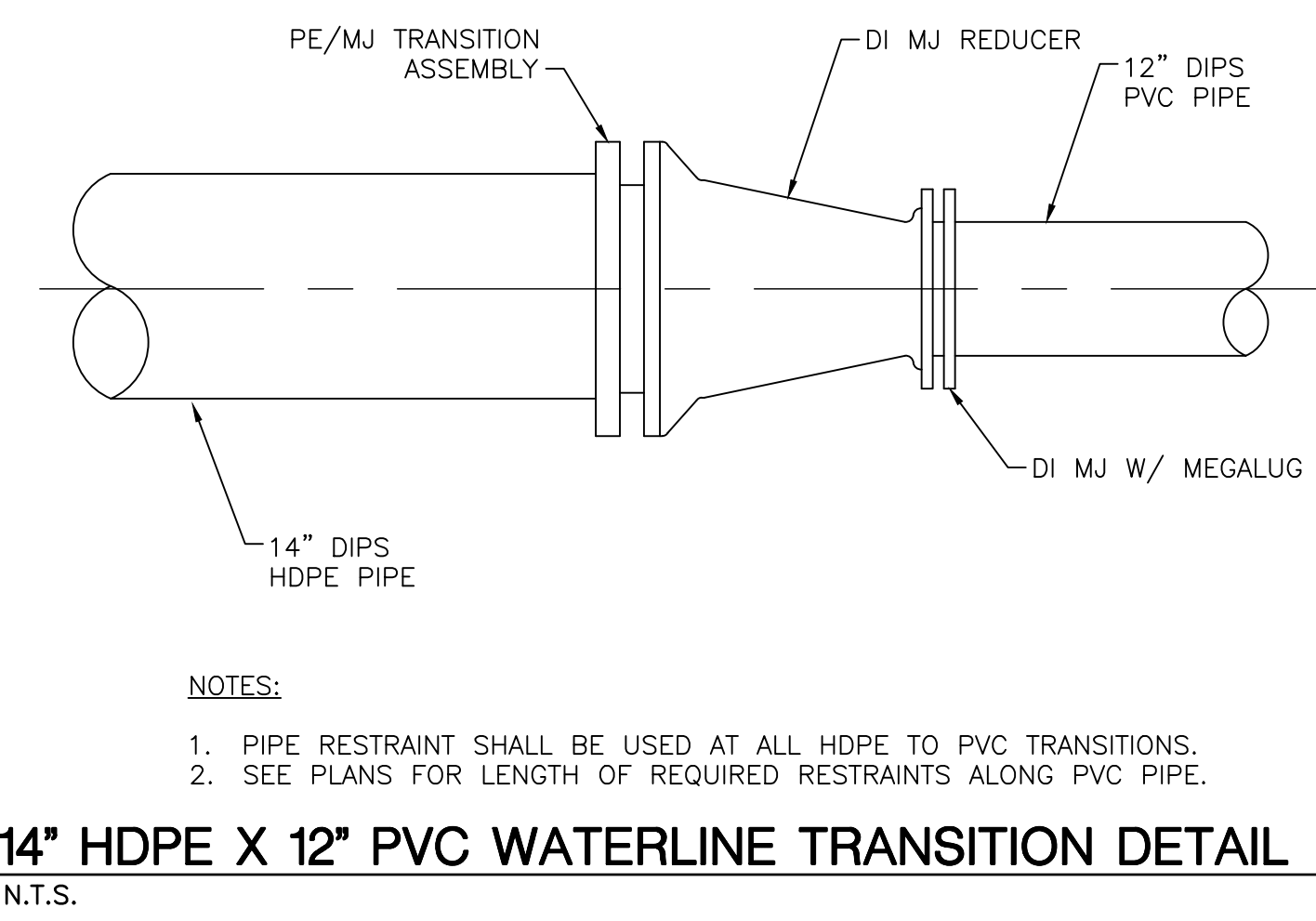
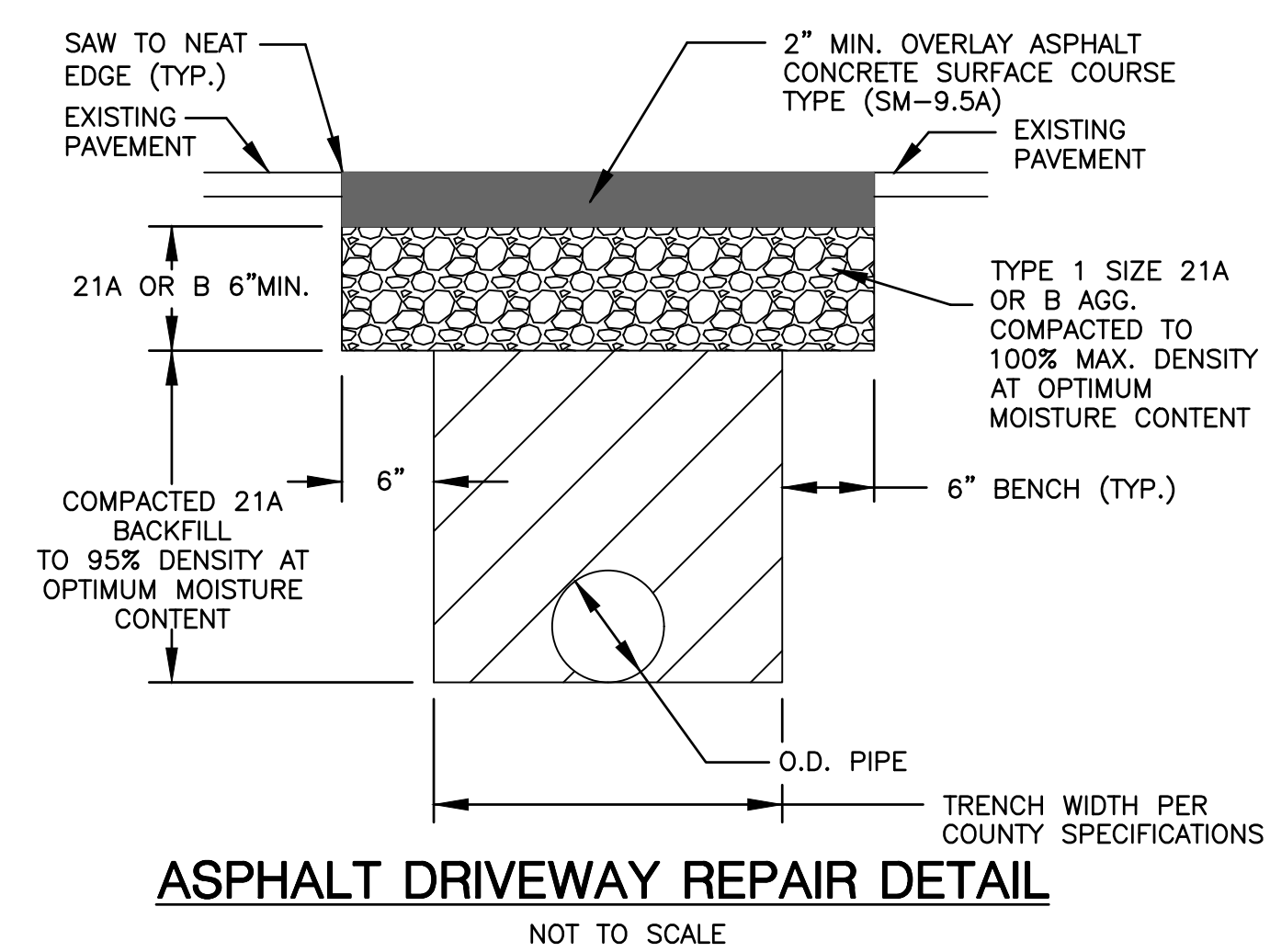
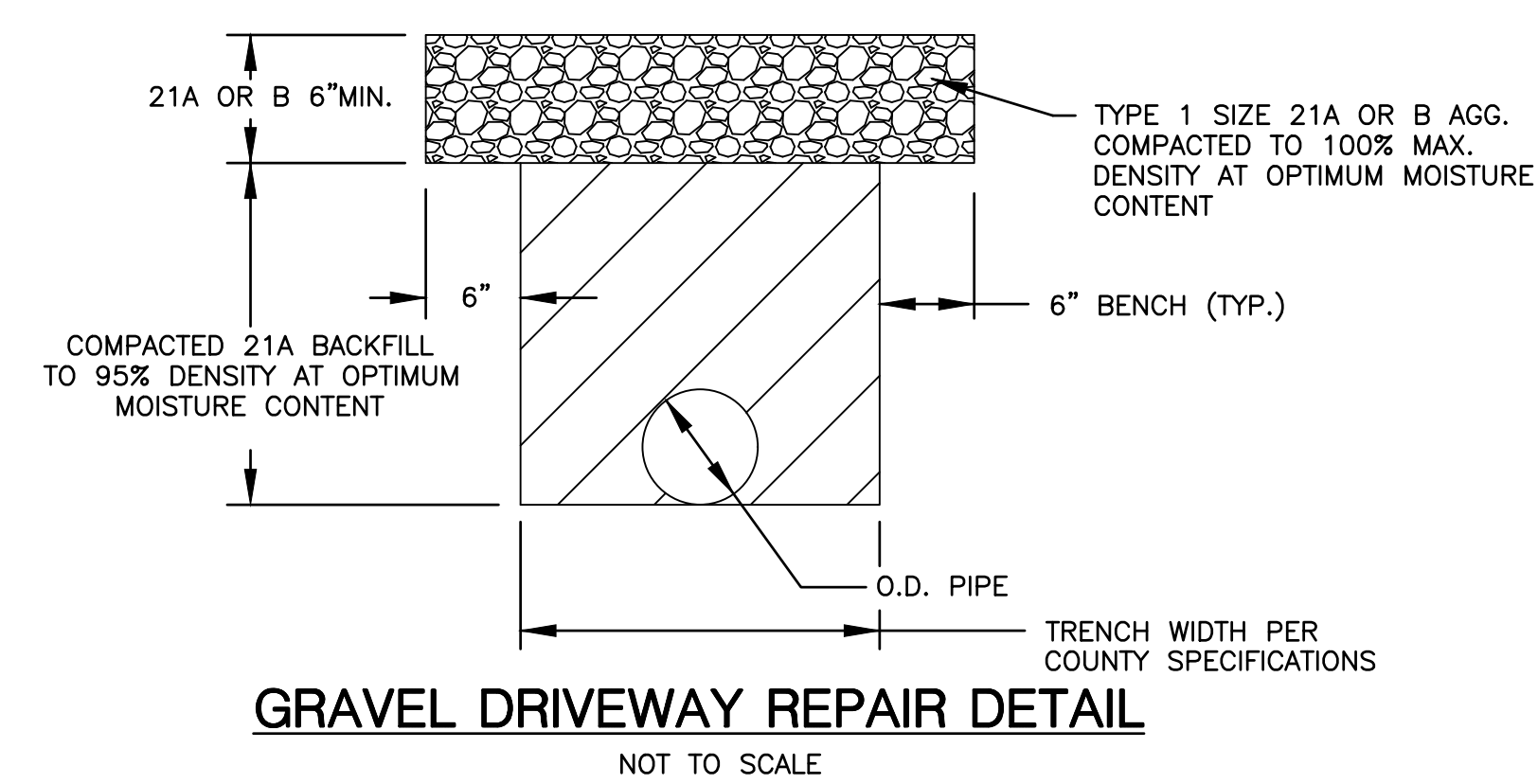
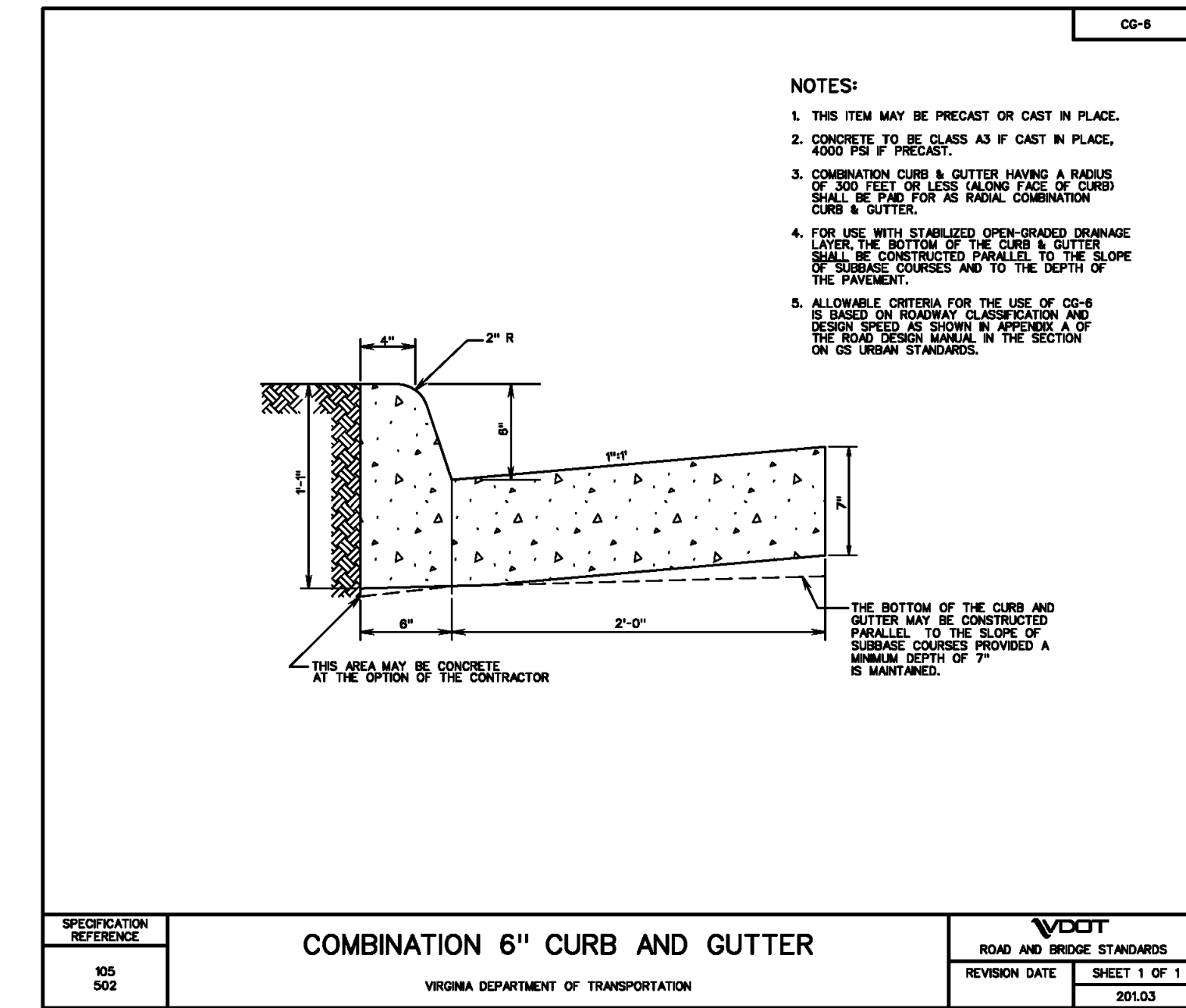
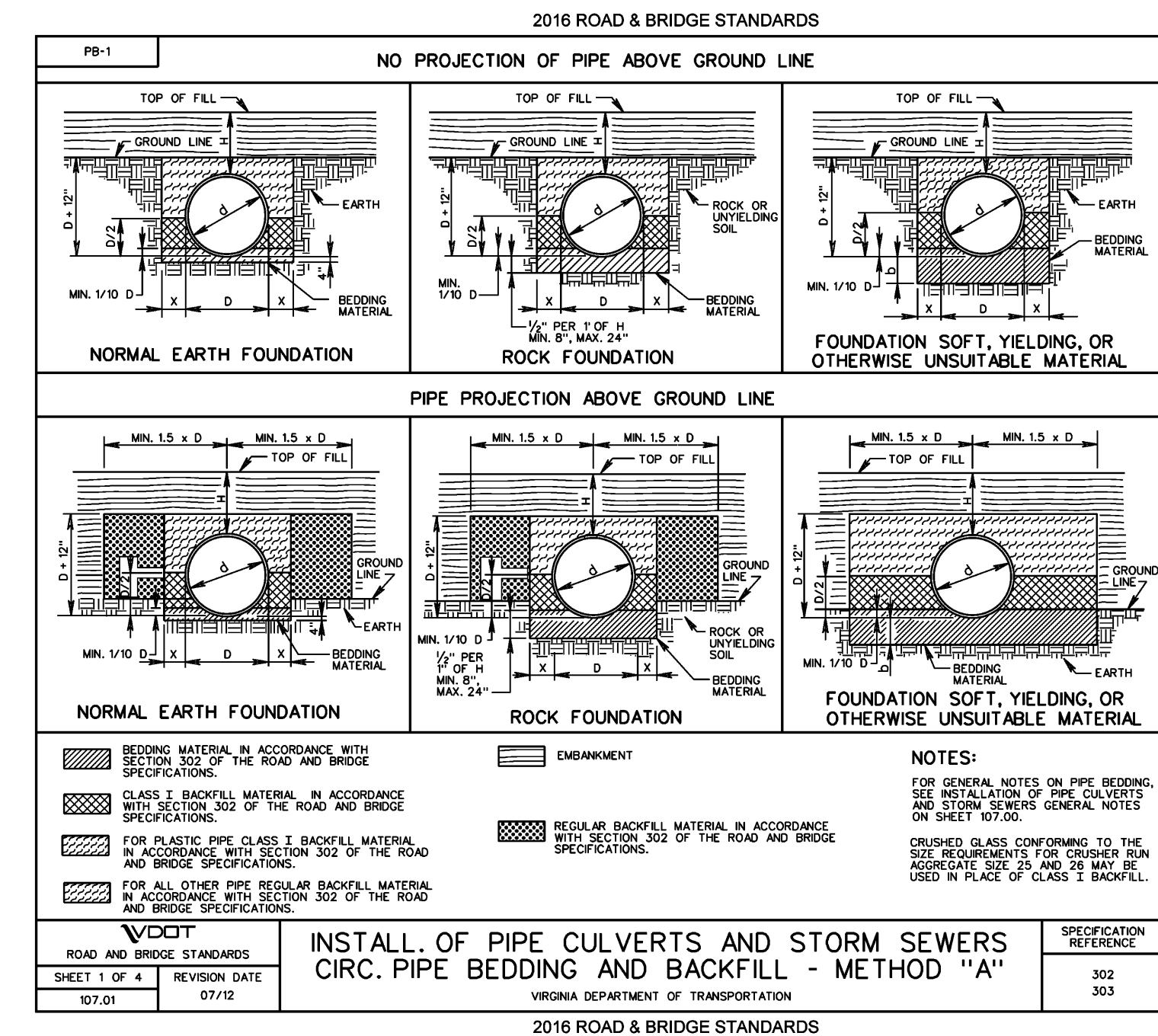
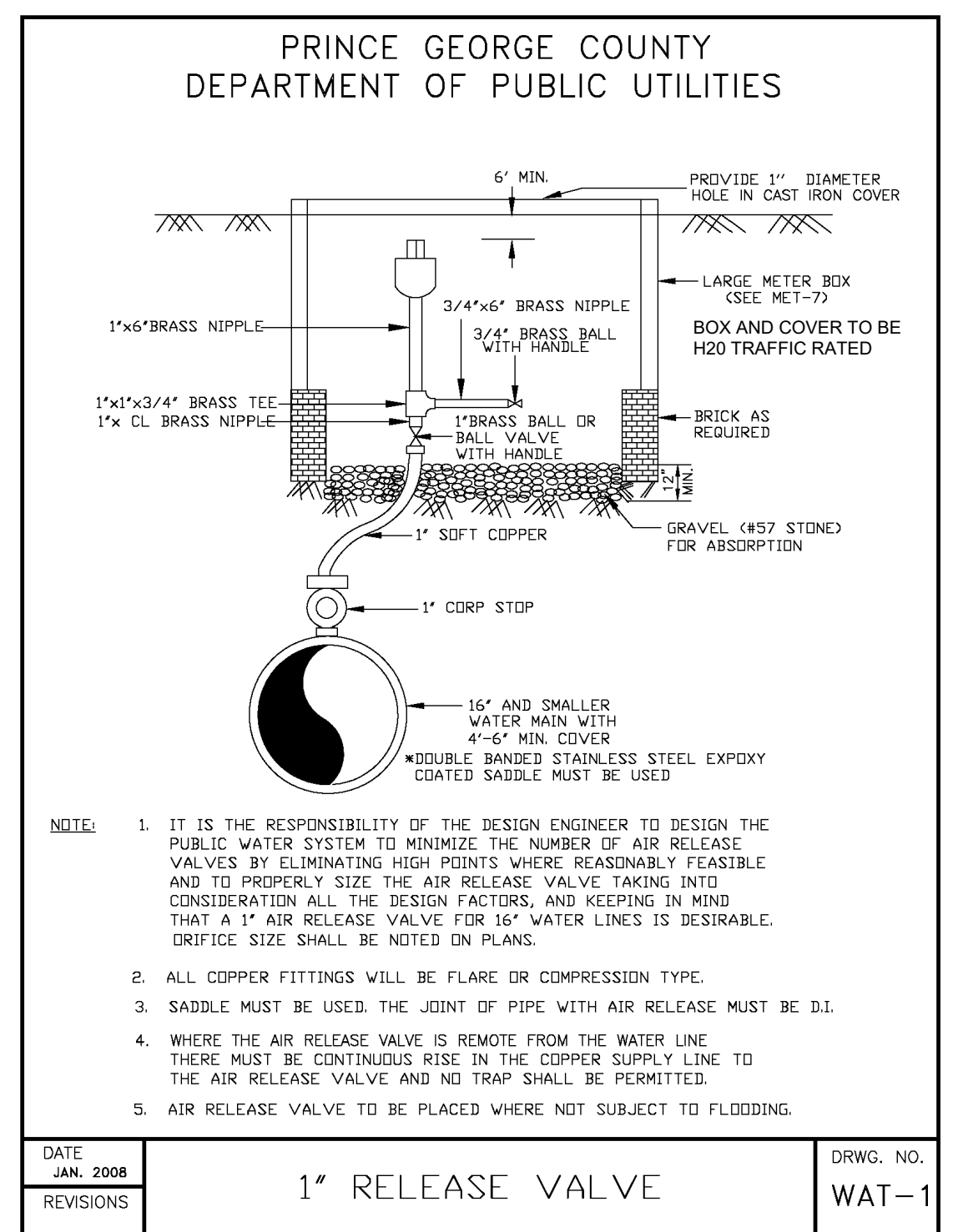
DRAWN BY: MWC
APPROVED BY: DAV
CHECKED BY: MRL
DATE: APRIL 2020
TITLE:

CONSTRUCTION DETAILS

PROJECT NO. 50106065

C5.2

E
D
C
B
A



KEY PLAN

SEAL

RECORD DRAWING

12-2021

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SCALE

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CHECKED BY		MRL	
DATE		APRIL 2020	
TITLE			

CONSTRUCTION DETAILS

PROJECT NO. 50106065

C5.3

STORMWATER MANAGEMENT NARRATIVE

PROJECT BACKGROUND/SUMMARY:

THIS PROJECT INVOLVES THE INSTALLATION OF A NEW 12" WATERLINE AND ASSOCIATED CONNECTIONS TO EXISTING LINES IN PRINCE GEORGE COUNTY. THE PROJECT IS LOCATED ALONG ROUTE 460 FROM APPROXIMATELY 3,250 FT WEST TO APPROXIMATELY 2,300 FT EAST OF ENTERPRISE DRIVE. THE LIMITS OF DISTURBANCE IS APPROXIMATELY 3.36 ACRES. THIS ACREAGE INCLUDES THE AREAS THAT WILL BE RETURNED TO EXISTING CONDITIONS (MANAGED TURF AND IMPERVIOUS).

THE PROJECT WILL NOT INCREASE IMPERVIOUS IN POST DEVELOPMENT CONDITIONS. THE EXISTING FLOW PATHS WILL REMAIN UNCHANGED. THERE IS APPROXIMATELY 0.60 ACRES OF CLEARING WITHIN THE PROPOSED UTILITY EASEMENT - THIS AREA WAS ANALYZED FOR WATER QUALITY AND QUANTITY. THERE ARE HSG B AND D SOILS ON SITE ACCORDING TO THE NRCS SOIL SURVEY BY THE UNITED STATES DEPARTMENT OF AGRICULTURE. THE PROJECT IS LOCATED IN THE SECOND SWAMP (CUS2) VIA HUC 6. THIS PROJECT ADHERES TO THE VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY IIB STORMWATER MANAGEMENT CRITERIA TO MEET WATER QUALITY AND QUANTITY REQUIREMENTS.

STORMWATER MANAGEMENT - WATER QUALITY:

WATER QUALITY WAS ANALYZED USING THE REDEVELOPMENT CRITERIA FOR THE VIRGINIA RUNOFF REDUCTION METHOD FOR THE AREA WITHIN THE LOD THAT WILL BE CLEARED AND WILL CHANGE FROM FORESTED IN EXISTING CONDITIONS TO MANAGED TURF IN POST CONDITIONS. THERE IS APPROXIMATELY 0.60 ACRES OF CLEARING FOR THIS PROJECT. THE OTHER AREAS WITHIN THE LOD WILL BE RETURNED TO EXISTING CONDITIONS AND THEREFORE FOR THESE AREAS, THE PROJECT DOES NOT SIGNIFICANTLY ALTER THE PREDEVELOPMENT RUNOFF CHARACTERISTICS AS MENTIONED IN DEQ GUIDANCE MEMO NO. 15-2003.

A SUMMARY OF THE VRRM CALCULATIONS IS BELOW. THIS ANALYSIS DETERMINED THAT THE REQUIRED PHOSPHOROUS REMOVAL FOR THE ROUTE 460 WATER MAIN EXTENSION PROJECT IS 0.07 LB/YR. THIS REMOVAL WILL BE MET THROUGH THE PURCHASE OF OFF-SITE NUTRIENT CREDITS. SEE SHEETS C6.1 TO C6.8 FOR THE VRRM LAND USE MAPS.

REDEVELOPMENT VRRM SUMMARY:

Pre Development	Post Development	Net Change
0.50	0.50	0.00
0.30	0.30	0.00
0.20	0.20	0.00
0.10	0.10	0.00
0.05	0.05	0.00
0.01	0.01	0.00
Total	Total	0.00

STORMWATER MANAGEMENT - WATER QUANTITY:

THROUGHOUT THE PROJECT AREA, FLOW LEAVES THE SITE IN EXISTING AND PROPOSED CONDITIONS AS SHEET FLOW ALONG EXISTING FLOW PATHS OR CONVEYED THROUGH EXISTING CHANNELS. THE ULTIMATE OUTFALL FOR THE PROJECT IS SECON SWAMP. THE PROJECT WAS ANALYZED FOR SHEET FLOW TO MEET WATER QUANTITY REQUIREMENTS.

SHEET FLOW

ACCORDING TO THE NRCS SOIL SURVEY, THE EXISTING SOILS HAVE AN AASHTO CLASSIFICATION OF A-4 (2.3 FPS), A-2 (4.5 FPS), AND A-2-4 (4.5 FPS). THE PERMISSIBLE VELOCITY OF A-4 SOILS, 2.3 FPS (VDOT DRAINAGE MANUAL APPENDIX 7D-2), WAS USED FOR THE ENTIRE SITE AS A CONSERVATIVE PERMISSIBLE VELOCITY. DUE TO THE LINEAR NATURE OF THIS PROJECT, 3 LOCATIONS WERE CHOSEN TO PERFORM SHEET FLOW CALCULATIONS. THE THREE LOCATIONS WERE PLACED IN AREAS ALONG THE PROJECT WHERE THE MAJORITY OF CLEARING WOULD OCCUR. THE SHEET FLOW ANALYSIS DETERMINED THAT ALL FLOW LEAVING THE SITE WAS NON-EROSIVE AND THEREFORE WATER QUANTITY IS MET.

SHEET FLOW ANALYSIS

STATION	MAX PERMISSIBLE VELOCITY (FPS)	2-YR VELOCITY (FPS)	10-YR VELOCITY (FPS)
18+00 TO 19+00	2.30	0.32	0.40
27+50 TO 30+00	2.30	0.35	0.44
63+00 TO 65+00	2.30	0.34	0.42

Project: Route 460 Waterline
Outfall: 18+00 to 19+00

Analysis: 2-year

Parameter	Value
Surface description	Grass
Manning's roughness coeff., n	0.150
Flow length, L	30 (ft)
Two-yr 24-hr rainfall, P2	3.4 (in)
Land slope, s	0.167 (ft/ft)
$T_t = [0.007(nL)^{0.8}] / [(P2^{0.5})(s^{0.4})]$	0.026 (hr)
Velocity (fps)	0.32
Velocity = L / (3600 * T _t)	0.32 fps
Soil Type (See Note 3):	Silty Loam (A-4)
Max Permissible Velocity (See Note 2):	2.3 fps
Water Quantity Requirements met through Sheet Flow:	YES

Notes:

- 1.) Based on SCS Segmental Approach (TR-55)
- 2.) From VDOT Drainage Manual Appendix 7D-2
- 3.) From USDA Soil Survey

Project: Route 460 Waterline
Outfall: 18+00 to 19+00

Analysis: 10-year

Parameter	Value
Surface description	Grass
Manning's roughness coeff., n	0.150
Flow length, L	30 (ft)
Ten-yr 24-hr rainfall, P10	5.18 (in)
Land slope, s	0.167 (ft/ft)
$T_t = [0.007(nL)^{0.8}] / [(P10^{0.5})(s^{0.4})]$	0.021 (hr)
Velocity (fps)	0.40
Velocity = L / (3600 * T _t)	0.40 fps
Soil Type (See Note 3):	Silty Loam (A-4)
Max Permissible Velocity (See Note 2):	2.3 fps
Water Quantity Requirements met through Sheet Flow:	YES

Notes:

- 1.) Based on SCS Segmental Approach (TR-55)
- 2.) From VDOT Drainage Manual Appendix 7D-2
- 3.) From USDA Soil Survey

Project: Route 460 Waterline
Outfall: 27+50 to 30+00

Analysis: 2-year

Parameter	Value
Surface description	Grass
Manning's roughness coeff., n	0.150
Flow length, L	19 (ft)
Two-yr 24-hr rainfall, P2	3.4 (in)
Land slope, s	0.263 (ft/ft)
$T_t = [0.007(nL)^{0.8}] / [(P2^{0.5})(s^{0.4})]$	0.015 (hr)
Velocity (fps)	0.35
Velocity = L / (3600 * T _t)	0.35 fps
Soil Type (See Note 3):	Silty Loam (A-4)
Max Permissible Velocity (See Note 2):	2.3 fps
Water Quantity Requirements met through Sheet Flow:	YES

Notes:

- 1.) Based on SCS Segmental Approach (TR-55)
- 2.) From VDOT Drainage Manual Appendix 7D-2
- 3.) From USDA Soil Survey

Project: Route 460 Waterline
Outfall: 27+50 to 30+00

Analysis: 10-year

Parameter	Value
Surface description	Grass
Manning's roughness coeff., n	0.150
Flow length, L	19 (ft)
Two-yr 24-hr rainfall, P10	5.18 (in)
Land slope, s	0.263 (ft/ft)
$T_t = [0.007(nL)^{0.8}] / [(P10^{0.5})(s^{0.4})]$	0.012 (hr)
Velocity (fps)	0.44
Velocity = L / (3600 * T _t)	0.44 fps
Soil Type (See Note 3):	Silty Loam (A-4)
Max Permissible Velocity (See Note 2):	2.3 fps
Water Quantity Requirements met through Sheet Flow:	YES

Notes:

- 1.) Based on SCS Segmental Approach (TR-55)
- 2.) From VDOT Drainage Manual Appendix 7D-2
- 3.) From USDA Soil Survey

Project: Route 460 Waterline
Outfall: 63+00 to 65+00

Analysis: 2-year

Parameter	Value
Surface description	Grass
Manning's roughness coeff., n	0.150
Flow length, L	27 (ft)
Two-yr 24-hr rainfall, P2	3.4 (in)
Land slope, s	0.204 (ft/ft)
$T_t = [0.007(nL)^{0.8}] / [(P2^{0.5})(s^{0.4})]$	0.022 (hr)
Velocity (fps)	0.34
Velocity = L / (3600 * T _t)	0.34 fps
Soil Type (See Note 3):	Silty Loam (A-4)
Max Permissible Velocity (See Note 2):	2.3 fps
Water Quantity Requirements met through Sheet Flow:	YES

Notes:

- 1.) Based on SCS Segmental Approach (TR-55)
- 2.) From VDOT Drainage Manual Appendix 7D-2
- 3.) From USDA Soil Survey

Project: Route 460 Waterline
Outfall: 63+00 to 65+00

Analysis: 10-year

Parameter	Value
Surface description	Grass
Manning's roughness coeff., n	0.150
Flow length, L	27 (ft)
Ten-yr 24-hr rainfall, P10	5.18 (in)
Land slope, s	0.204 (ft/ft)
$T_t = [0.007(nL)^{0.8}] / [(P10^{0.5})(s^{0.4})]$	0.018 (hr)
Velocity (fps)	0.42
Velocity = L / (3600 * T _t)	0.42 fps
Soil Type (See Note 3):	Silty Loam (A-4)
Max Permissible Velocity (See Note 2):	2.3 fps
Water Quantity Requirements met through Sheet Flow:	YES

Notes:

- 1.) Based on SCS Segmental Approach (TR-55)
- 2.) From VDOT Drainage Manual Appendix 7D-2
- 3.) From USDA Soil Survey

NUTRIENT CREDIT AVAILABILITY LETTER:



July 28, 2021

Hannah Gill, PE, CFM
Dewberry
4805 Lake Brook Drive, Suite 200
Glen Allen, VA 23060-9278

Eco-Cap, LLC - Blackwater Nutrient Bank - Availability Letter

Project Reference: Route 460 Waterline Extension

This letter is to confirm the availability of Nutrient Credits sufficient to meet your project requirements at the Blackwater Nutrient Bank located in Isle of Wight County, Virginia. The Blackwater Nutrient Bank received approval and release from the Virginia Department of Environmental Quality on March 25th, 2021 with a release of 37.59 lbs. The nutrient reductions resulting from this activity will generate nonpoint source Nutrient "Credits" which are transferable to those entities requiring nutrient reductions in accordance with the Chesapeake Bay Watershed Nutrient Credit Exchange Program (VA Code § 62.1-44.19-14) and the Virginia Stormwater Credit Program (VA Code § 62.1-44.15-35).

The facility currently has **35.67** Credits available and will be able to meet your removal requirement of approximately **0.07** Credits.

Feel free to contact me if you require further assistance.

Cathy J. Jensen

Cathy J. Jensen
President
Eco-Cap, LLC

Manager
Blackwater Nutrient Bank

Phone: (804) 836-6636 | Email: ecocapva@gmail.com | Website: ecocapva.us



Dewberry Engineers Inc.
4805 Lake Brook Drive, Suite 200
Glen Allen, Virginia 23060
PHONE: 804.290.7957
FAX: 804.290.7928
www.dewberry.com

**ROUTE 460
WATER MAIN EXTENSION**

**PRINCE GEORGE COUNTY
DEPARTMENT OF ENGINEERING
AND UTILITIES**

PRINCE GEORGE COUNTY, VIRGINIA

KEY PLAN

SCALE

RECORD DRAWING
12-2021
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SCALE

No.	DATE	TLR BY	RECORD DRAWINGS Description
1	12/2021	TLR	RECORD DRAWINGS

REVISIONS

DRAWN BY: JEC
APPROVED BY: MRL
CHECKED BY: HCG
DATE: JULY 2021
TITLE: SWM NARRATIVE

PROJECT NO. 50106065

C6.0

**ROUTE 460
 WATER MAIN EXTENSION**
 PRINCE GEORGE COUNTY
 DEPARTMENT OF ENGINEERING
 AND UTILITIES

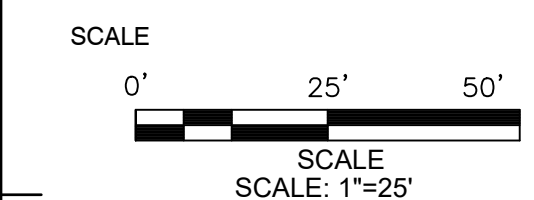
PRINCE GEORGE COUNTY, VIRGINIA

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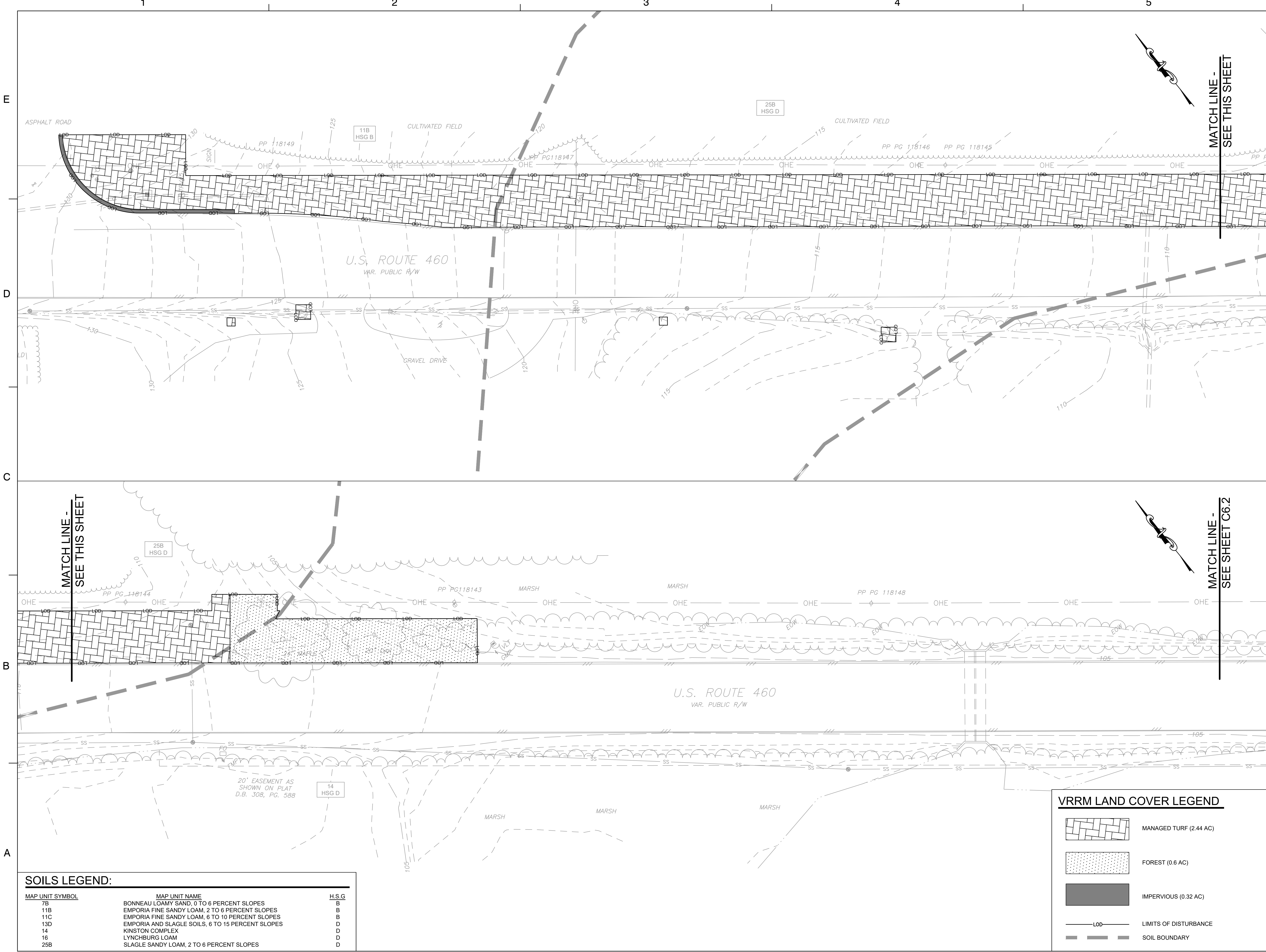
REVISIONS

DRAWN BY: JEC
 APPROVED BY: MRL
 CHECKED BY: HCG
 DATE: JULY 2021

TITLE
**PRE
 DEVELOPMENT
 LAND USE
 MAP**

PROJECT NO. 50106065

C6.1



SOILS LEGEND:

MAP UNIT SYMBOL	MAP UNIT NAME	H.S.G
7B	BONNEAU LOAMY SAND, 0 TO 6 PERCENT SLOPES	B
11B	EMPORIA FINE SANDY LOAM, 2 TO 6 PERCENT SLOPES	B
11C	EMPORIA FINE SANDY LOAM, 6 TO 10 PERCENT SLOPES	B
13D	EMPORIA AND SLAGLE SOILS, 6 TO 15 PERCENT SLOPES	D
14	KINSTON COMPLEX	D
16	LYNCHBURG LOAM	D
25B	SLAGLE SANDY LOAM, 2 TO 6 PERCENT SLOPES	D

VRRM LAND COVER LEGEND

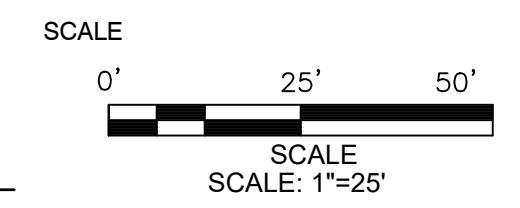
	MANAGED TURF (2.44 AC)
	FOREST (0.6 AC)
	IMPERVIOUS (0.32 AC)
	LIMITS OF DISTURBANCE
	SOIL BOUNDARY

**ROUTE 460
 WATER MAIN EXTENSION**
 PRINCE GEORGE COUNTY
 DEPARTMENT OF ENGINEERING
 AND UTILITIES
 PRINCE GEORGE COUNTY, VIRGINIA

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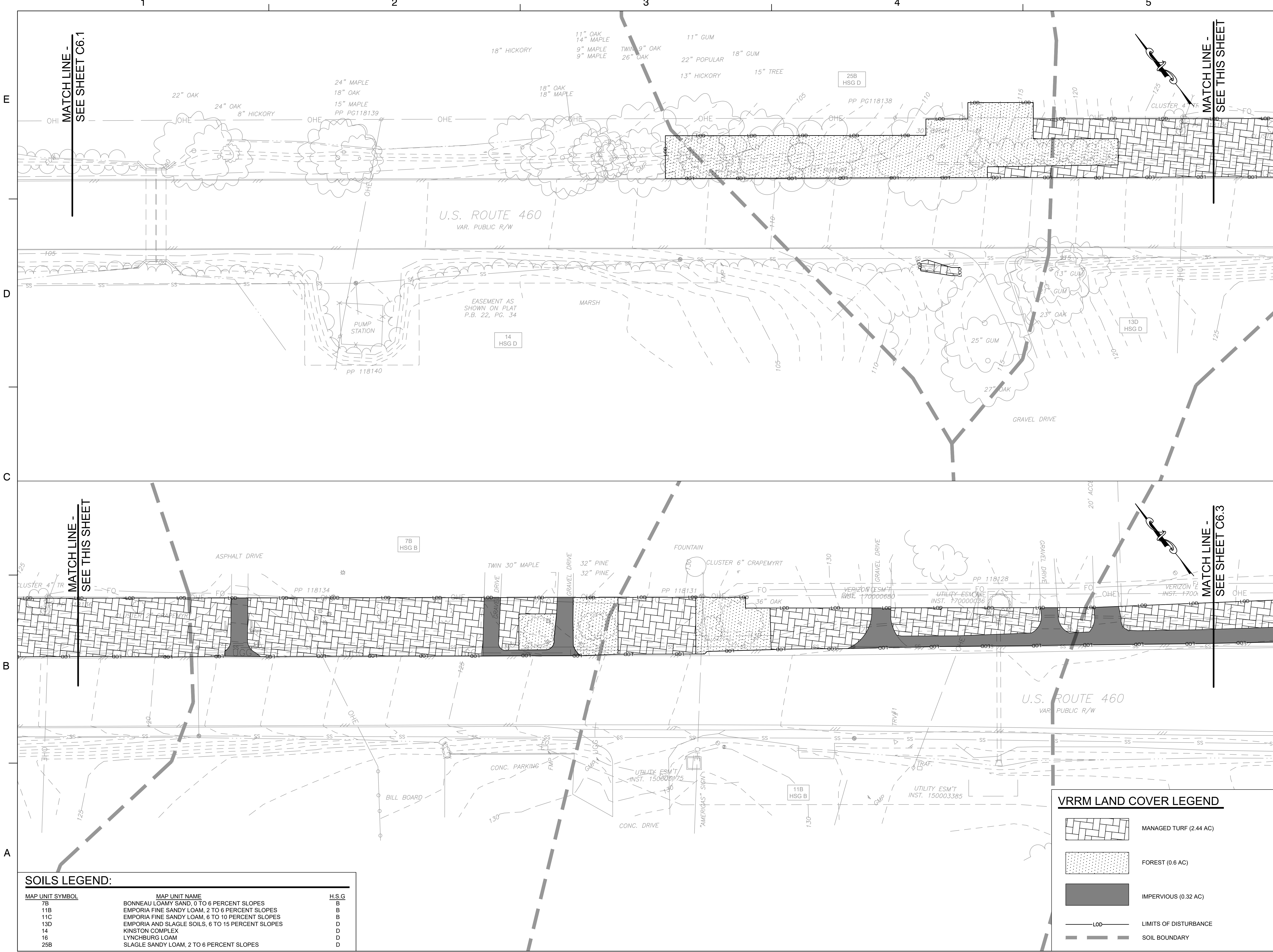
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 DATE: JULY 2021

TITLE
**PRE DEVELOPMENT
 LAND USE
 MAP**
 PROJECT NO. 50106065

C6.2



SOILS LEGEND:

MAP UNIT SYMBOL	MAP UNIT NAME	H.S.G.
7B	BONNEAU LOAMY SAND, 0 TO 6 PERCENT SLOPES	B
11B	EMPORIA FINE SANDY LOAM, 2 TO 6 PERCENT SLOPES	B
11C	EMPORIA FINE SANDY LOAM, 6 TO 10 PERCENT SLOPES	B
13D	EMPORIA AND SLAGLE SOILS, 6 TO 15 PERCENT SLOPES	D
14	KINSTON COMPLEX	D
16	LYNCHBURG LOAM	D
25B	SLAGLE SANDY LOAM, 2 TO 6 PERCENT SLOPES	D

VRRM LAND COVER LEGEND

	MANAGED TURF (2.44 AC)
	FOREST (0.6 AC)
	IMPERVIOUS (0.32 AC)
	LIMITS OF DISTURBANCE
	SOIL BOUNDARY

**ROUTE 460
 WATER MAIN EXTENSION**
 PRINCE GEORGE COUNTY
 DEPARTMENT OF ENGINEERING
 AND UTILITIES

PRINCE GEORGE COUNTY, VIRGINIA

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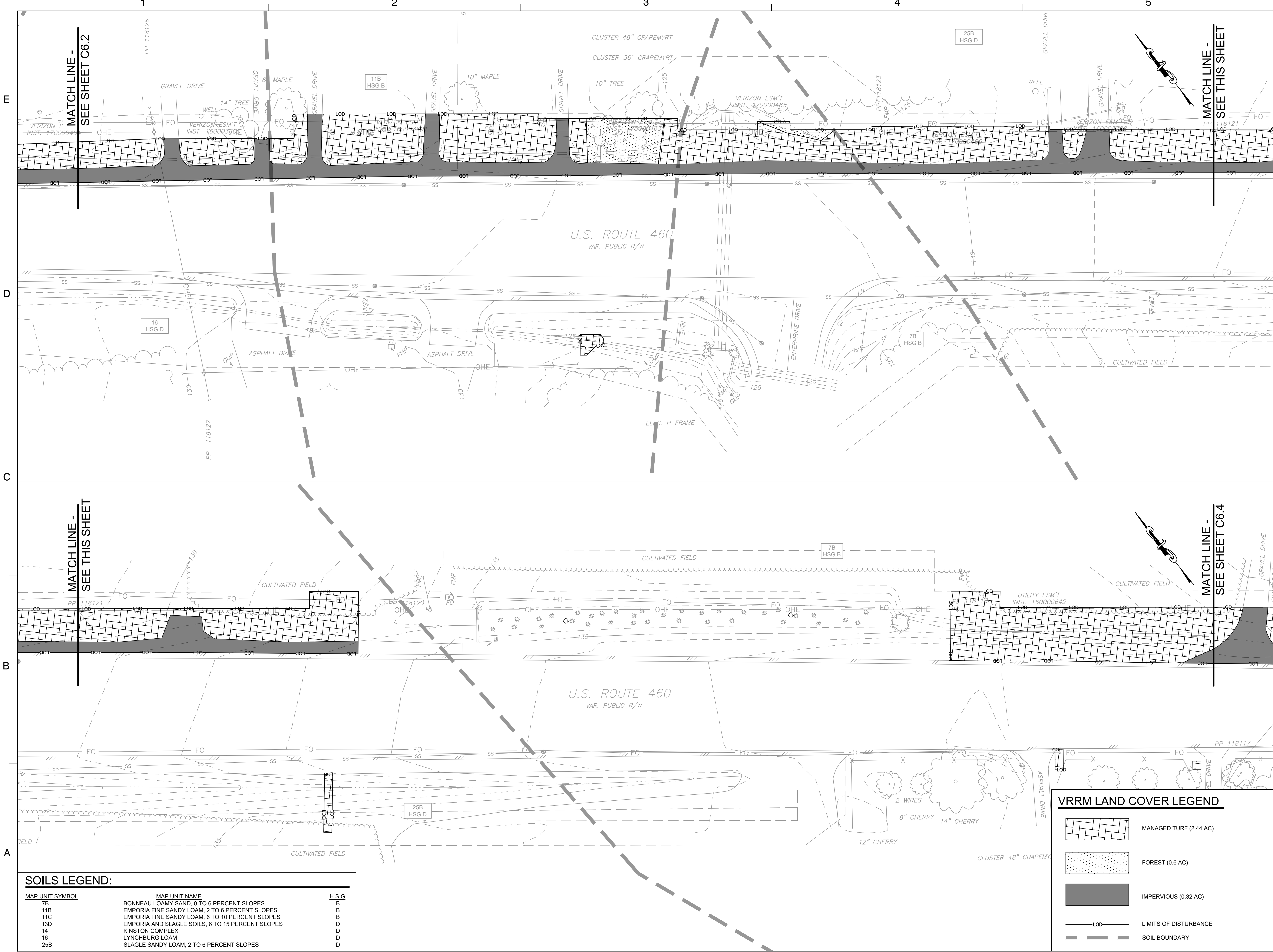
REVISIONS

DRAWN BY	JEC
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CHECKED BY	HCG
DATE	JULY 2021

TITLE
**PRE
 DEVELOPMENT
 LAND USE
 MAP**

PROJECT NO. 50106065

C6.3



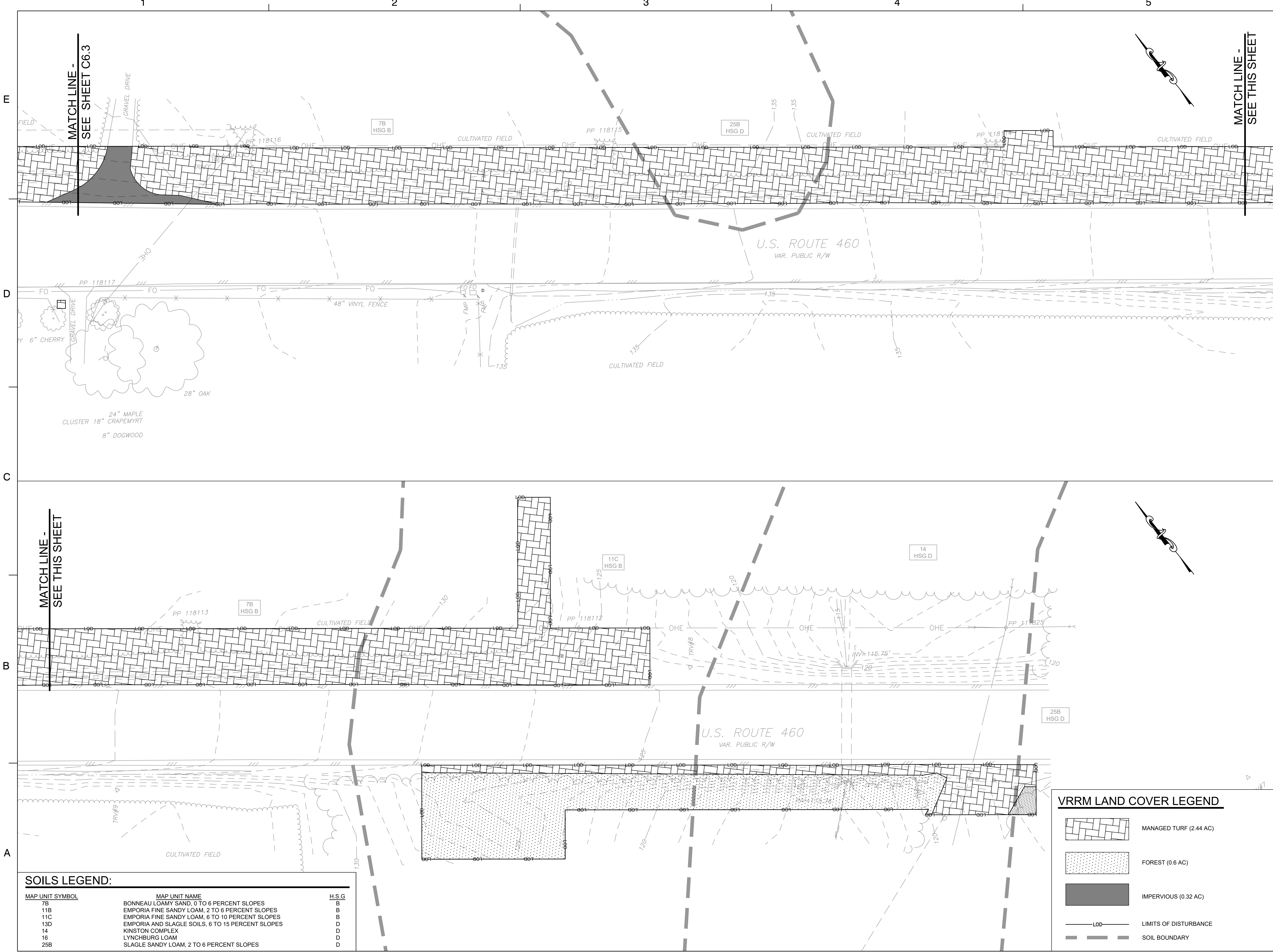
SOILS LEGEND:

MAP UNIT SYMBOL	MAP UNIT NAME	H.S.G
7B	BONNEAU LOAMY SAND, 0 TO 6 PERCENT SLOPES	B
11B	EMPORIA FINE SANDY LOAM, 2 TO 6 PERCENT SLOPES	B
11C	EMPORIA FINE SANDY LOAM, 6 TO 10 PERCENT SLOPES	B
13D	EMPORIA AND SLAGLE SOILS, 6 TO 15 PERCENT SLOPES	D
14	KINSTON COMPLEX	D
16	LYNCHBURG LOAM	D
25B	SLAGLE SANDY LOAM, 2 TO 6 PERCENT SLOPES	D

VRRM LAND COVER LEGEND

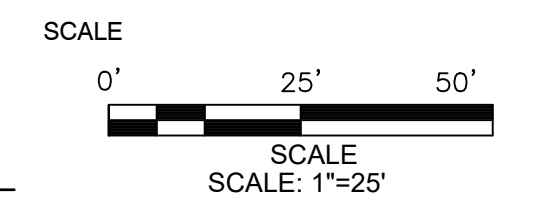
	MANAGED TURF (2.44 AC)
	FOREST (0.6 AC)
	IMPERVIOUS (0.32 AC)
	LIMITS OF DISTURBANCE
	SOIL BOUNDARY

**ROUTE 460
 WATER MAIN EXTENSION**
 PRINCE GEORGE COUNTY
 DEPARTMENT OF ENGINEERING
 AND UTILITIES
 PRINCE GEORGE COUNTY, VIRGINIA



KEY PLAN

SEAL
RECORD DRAWING
 12-2021
 THESE DRAWINGS REFLECT WORK
 AS RECORDED BY OTHERS AT THE
 TIME OF CONSTRUCTION.



No.	DATE	BY	Description
1	12/2021	TLR	RECORD DRAWINGS

REVISIONS

DRAWN BY: JEC
 APPROVED BY: MRL
 CHECKED BY: HCG
 DATE: JULY 2021

TITLE
**PRE
 DEVELOPMENT
 LAND USE
 MAP**

PROJECT NO. 50106065

C6.4

SOILS LEGEND:

MAP UNIT SYMBOL	MAP UNIT NAME	H.S.G.
7B	BONNEAU LOAMY SAND, 0 TO 6 PERCENT SLOPES	B
11B	EMPORIA FINE SANDY LOAM, 2 TO 6 PERCENT SLOPES	B
11C	EMPORIA FINE SANDY LOAM, 6 TO 10 PERCENT SLOPES	B
13D	EMPORIA AND SLAGLE SOILS, 6 TO 15 PERCENT SLOPES	D
14	KINSTON COMPLEX	D
16	LYNCHBURG LOAM	D
25B	SLAGLE SANDY LOAM, 2 TO 6 PERCENT SLOPES	D

VRRM LAND COVER LEGEND

	MANAGED TURF (2.44 AC)
	FOREST (0.6 AC)
	IMPERVIOUS (0.32 AC)
	LIMITS OF DISTURBANCE
	SOIL BOUNDARY

**ROUTE 460
 WATER MAIN EXTENSION**
 PRINCE GEORGE COUNTY
 DEPARTMENT OF ENGINEERING
 AND UTILITIES

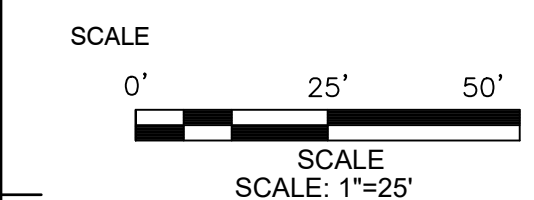
PRINCE GEORGE COUNTY, VIRGINIA

KEY PLAN

SEAL

RECORD DRAWING

12-2021
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 TIME OF CONSTRUCTION.



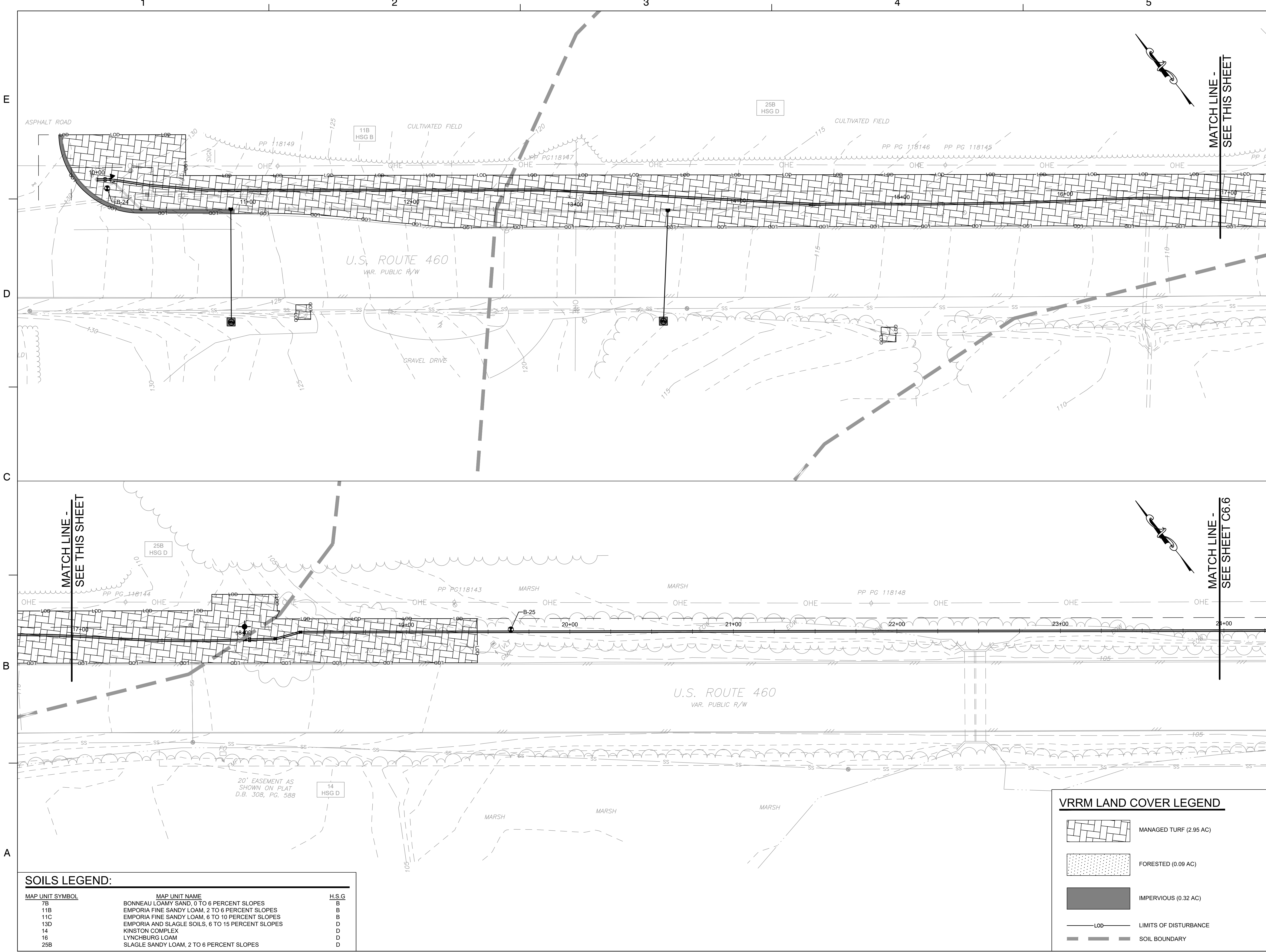
No.	DATE	BY	DESCRIPTION
1	12/2021	TLR	RECORD DRAWINGS

REVISIONS
 DRAWN BY: JEC
 APPROVED BY: MRL
 CHECKED BY: HCG
 DATE: JULY 2021

TITLE
**POST
 DEVELOPMENT
 LAND USE
 MAP**

PROJECT NO. 50106065

C6.5



SOILS LEGEND:

MAP UNIT SYMBOL	MAP UNIT NAME	H.S.G
7B	BONNEAU LOAMY SAND, 0 TO 6 PERCENT SLOPES	B
11B	EMPORIA FINE SANDY LOAM, 2 TO 6 PERCENT SLOPES	B
11C	EMPORIA FINE SANDY LOAM, 6 TO 10 PERCENT SLOPES	B
13D	EMPORIA AND SLAGLE SOILS, 6 TO 15 PERCENT SLOPES	D
14	KINSTON COMPLEX	D
16	LYNCHBURG LOAM	D
25B	SLAGLE SANDY LOAM, 2 TO 6 PERCENT SLOPES	D

VRRM LAND COVER LEGEND

	MANAGED TURF (2.95 AC)
	FORESTED (0.09 AC)
	IMPERVIOUS (0.32 AC)
	LIMITS OF DISTURBANCE
	SOIL BOUNDARY

MATCH LINE -
SEE THIS SHEET

MATCH LINE -
SEE SHEET C6.6

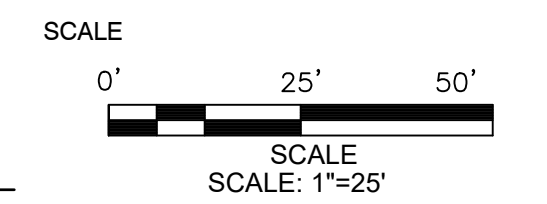
MATCH LINE -
SEE THIS SHEET

KEY PLAN

SEAL

RECORD DRAWING

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 TIME OF CONSTRUCTION.



1	12/2021	TLR	RECORD DRAWINGS
No.	DATE	BY	Description

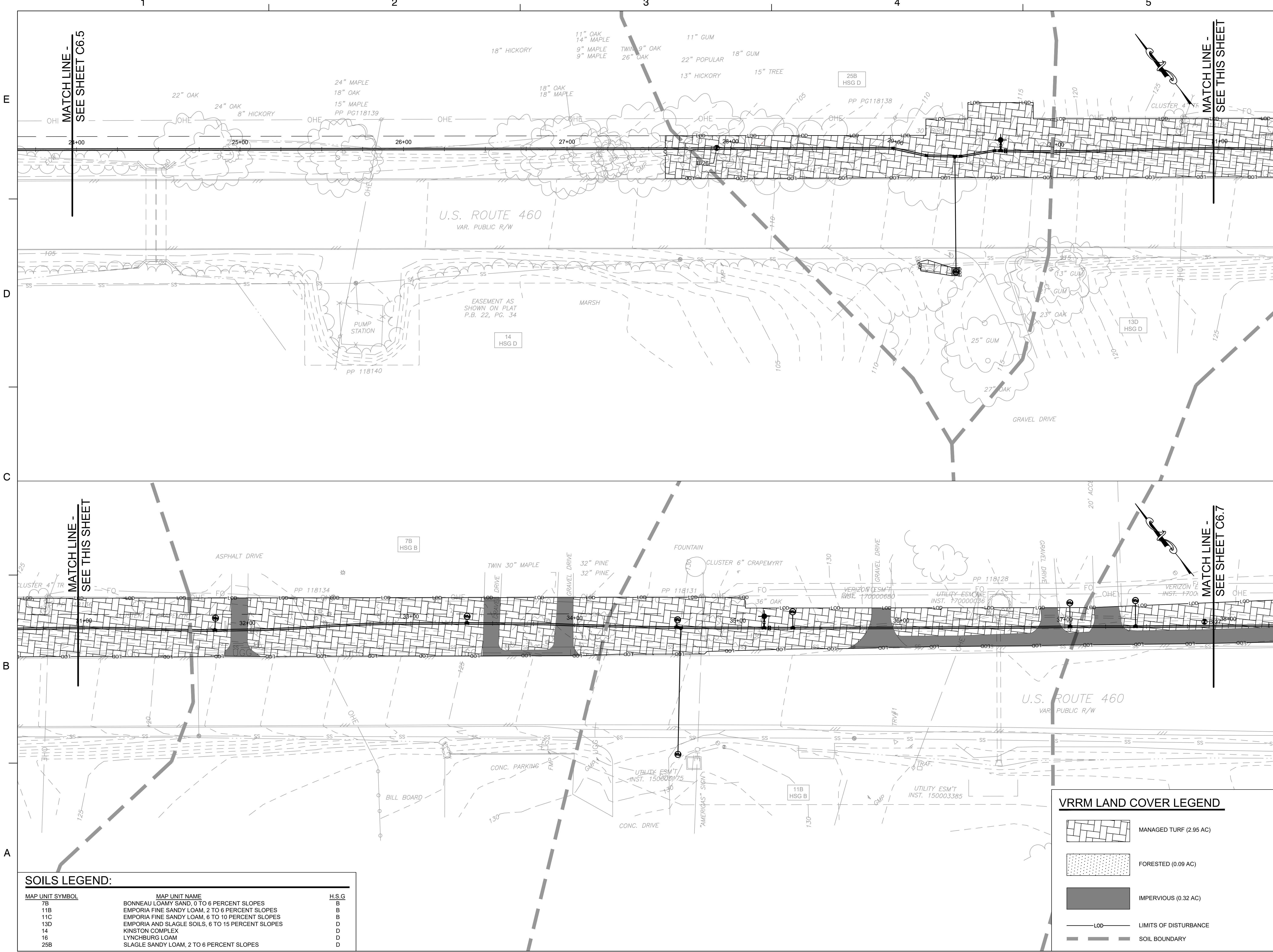
REVISIONS

DRAWN BY	JEC
APPROVED BY	MRL
CHECKED BY	HCG
DATE	JULY 2021

TITLE
**POST
 DEVELOPMENT
 LAND USE
 MAP**

PROJECT NO. 50106065

C6.6

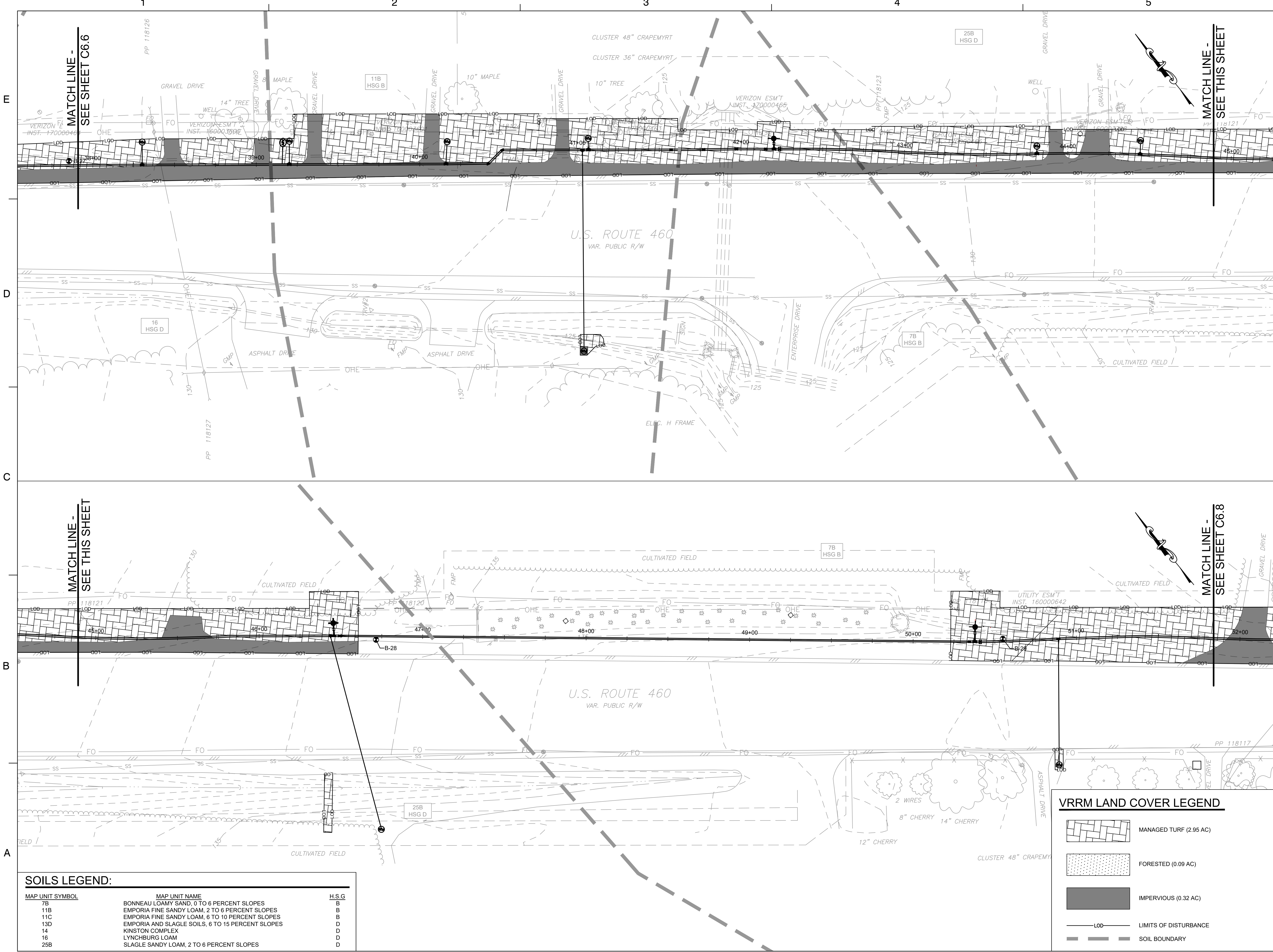


SOILS LEGEND:

MAP UNIT SYMBOL	MAP UNIT NAME	H.S.G
7B	BONNEAU LOAMY SAND, 0 TO 6 PERCENT SLOPES	B
11B	EMPORIA FINE SANDY LOAM, 2 TO 6 PERCENT SLOPES	B
11C	EMPORIA FINE SANDY LOAM, 6 TO 10 PERCENT SLOPES	B
13D	EMPORIA AND SLAGLE SOILS, 6 TO 15 PERCENT SLOPES	D
14	KINSTON COMPLEX	D
16	LYNCHBURG LOAM	D
25B	SLAGLE SANDY LOAM, 2 TO 6 PERCENT SLOPES	D

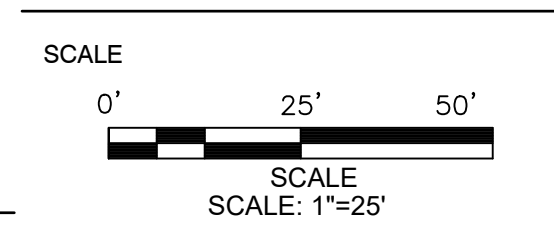
VRRM LAND COVER LEGEND

	MANAGED TURF (2.95 AC)
	FORESTED (0.09 AC)
	IMPERVIOUS (0.32 AC)
	LIMITS OF DISTURBANCE
	SOIL BOUNDARY



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REVISIONS
 DRAWN BY: JEC
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 DATE: JULY 2021

TITLE
**POST DEVELOPMENT
 LAND USE
 MAP**

PROJECT NO. 50106065

C6.7

SOILS LEGEND:

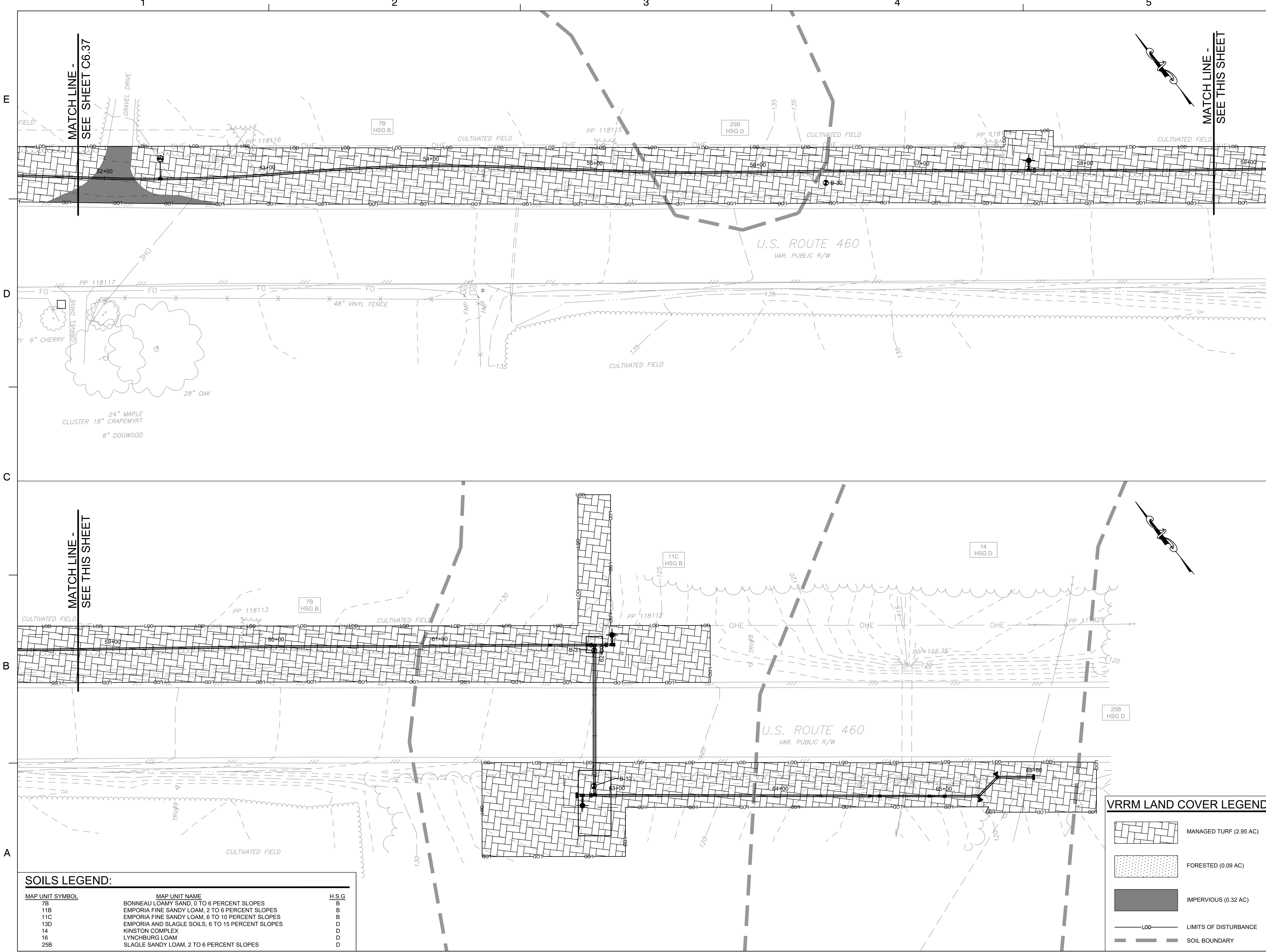
MAP UNIT SYMBOL	MAP UNIT NAME	H.S.G.
7B	BONNEAU LOAMY SAND, 0 TO 6 PERCENT SLOPES	B
11B	EMPORIA FINE SANDY LOAM, 2 TO 6 PERCENT SLOPES	B
11C	EMPORIA FINE SANDY LOAM, 6 TO 10 PERCENT SLOPES	B
13D	EMPORIA AND SLAGLE SOILS, 6 TO 15 PERCENT SLOPES	D
14	KINSTON COMPLEX	D
16	LYNCHBURG LOAM	D
25B	SLAGLE SANDY LOAM, 2 TO 6 PERCENT SLOPES	D

VRRM LAND COVER LEGEND

	MANAGED TURF (2.95 AC)
	FORESTED (0.09 AC)
	IMPERVIOUS (0.32 AC)
	L00 LIMITS OF DISTURBANCE
	SOIL BOUNDARY

**ROUTE 460
 WATER MAIN EXTENSION**
 PRINCE GEORGE COUNTY
 DEPARTMENT OF ENGINEERING
 AND UTILITIES

PRINCE GEORGE COUNTY, VIRGINIA



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**POST
 DEVELOPMENT
 LAND USE
 MAP**

PROJECT NO. 50106065

C6.8

SOILS LEGEND:

MAP UNIT SYMBOL	MAP UNIT NAME	H.S.G
7B	BONNEAU LOAMY SAND, 0 TO 6 PERCENT SLOPES	B
11B	EMPORIA FINE SANDY LOAM, 2 TO 6 PERCENT SLOPES	B
11C	EMPORIA FINE SANDY LOAM, 6 TO 10 PERCENT SLOPES	B
13D	EMPORIA AND SLAGLE SOILS, 6 TO 15 PERCENT SLOPES	D
14	KINSTON COMPLEX	D
16	LYNCHBURG LOAM	D
25B	SLAGLE SANDY LOAM, 2 TO 6 PERCENT SLOPES	D

VRRM LAND COVER LEGEND

	MANAGED TURF (2.95 AC)
	FORESTED (0.09 AC)
	IMPERVIOUS (0.32 AC)
	LIMITS OF DISTURBANCE
	SOIL BOUNDARY