# MARYLAND DEPARTMENT OF TRANSPORTATION

## STATE HIGHWAY ADMINISTRATION

S.H.A. CONTRACT NO. – DO2035180

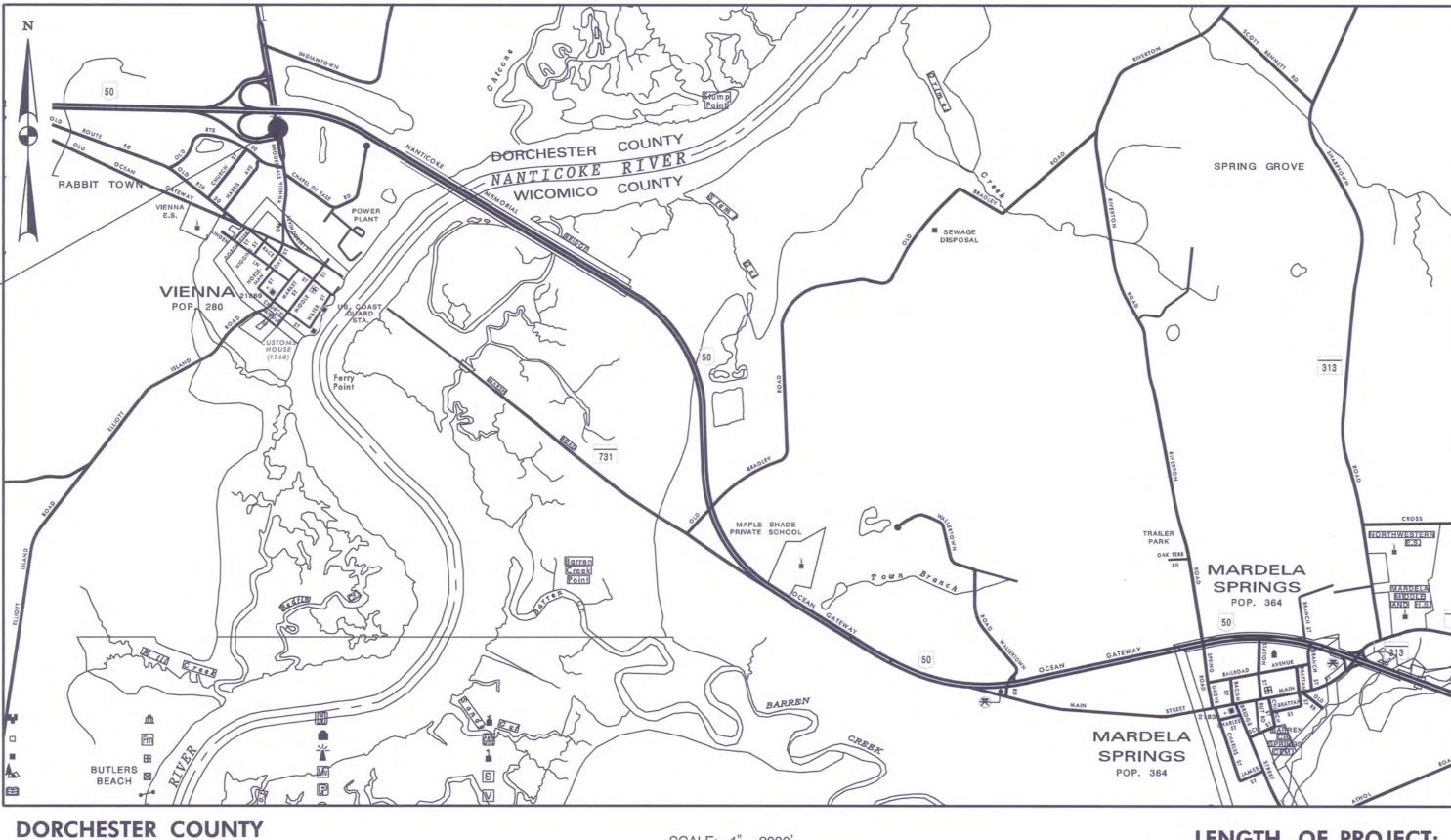
FEDERAL AID PROJECT NO. – N/A

PLANS FOR REPLACEMENT OF SMALL STRUCTURE NO. 09045X0

DOUBLE 36" DIAMETER REINFORCED CONCRETE PIPE

ON MD 331 (RHODESDALE VIENNA ROAD) AND RAMP 'C'

CARRYING TRIBUTARY OF NANTICOKE RIVER



HORIZONTAL DATUM NAD 83 /91

VERTICAL DATUM NAVD 88

SCALE: 1" = 2000'
2000 0 2000 4000 feet

LENGTH OF PROJECT: MD RTE. 331 = 0.028 MILES

MAINTENANCE OF TRAFFIC AND EROSION AND SEDIMENT CONTROL PLANS

SMALL STRUCTURE NO. 09045XO ON MD 331 (RHODESDALE VIENNA ROAD) CARRYING A TRIBUTARY OF

NANTICOKE RIVER

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

MD LICENSE NO. 24797 EXPIRATION DATE: 03/01/2020



#### REVISIONS NOTE: SEE SHEET NO. 2 FOR LIST OF SURVEY BOOK RIGHT OF WAY **DESIGN DESIGNATION NUMBERS PLAT NUMBERS** REVISED SHEET NUMBERS ROADWAY MD 331 31730 60709 ROADWAY LENGTH (MILES) 0.028 31724 **CONTROLS YEARS** 2016 / 2036 25594 AVERAGE DAILY TRAFFIC (A.D.T.) 1,650 / 2,025 DESIGN HOURLY VOLUME (D.H.V.) DIRECTIONAL DISTRIBUTION 53% % TRUCKS (A.D.T.) 9% % TRUCKS (D.H.V.) FUNCTIONAL CLASSIFICATION RURAL MINOR COLL CONTROL OF ACCESS NONE INTENSITY OF DEVELOPMENT LEVEL DESIGN SPEED (M. P. H.) ANTICIPATED POSTED SPEED (M. P. H.)

GEOMETRIC DESIGN CRITERIA

THIS PROJECT WAS DESIGNED IN ACCORDANCE WITH THE 2011 PUBLICATION OF AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS."

STANDARD SPECIFICATIONS BOOK, BOOK OF STANDARDS AND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)

ALL WORK ON THIS PROJECT SHALL CONFORM TO: THE LATEST APPROVED MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION (MDOT SHA) "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS" REVISIONS THEREOF OR ADDITIONS THERETO; AS INDICATED IN THE PROJECT DESCRIPTION OF THE INVITATION FOR BIDS BOOK; THE ADMINISTRATION'S "BOOK OF STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES" AND THE LATEST ADOPTED MUTCD.

#### RIGHT OF WAY

RIGHT OF WAY AND EASEMENT LINES SHOWN ON THESE PLANS ARE FOR ASSISTANCE IN INTERPRETING THE PLANS. THEY ARE NOT OFFICIAL. FOR OFFICIAL FEE RIGHT OF WAY AND EASEMENT INFORMATION, SEE APPROPRIATE RIGHT OF WAY PLATS.

#### UTILITIES

THE LOCATION OF UTILITIES SHOWN ON THE PLANS ARE FOR INFORMATION AND GUIDANCE ONLY. NO GUARANTEE IS MADE OF THE ACCURACY OF SAID LOCATIONS.

#### ADA COMPLIANCE

THE DESIGN OF THIS PROJECT HAS INCORPORATED FACILITIES TO ACCOMODATE PERSONS WITH DISABILITIES IN COMPLIANCE WITH STATE AND FEDERAL REQUIREMENTS.

#### ENVIRONMENTAL INFORMATION

ALL STORMWATER MANAGEMENT FACILITIES CONSTRUCTED FOR THIS CONTRACT SHALL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE MDOT SHA BEST MANAGEMENT PRACTICES (BMP) INSPECTION AND REMEDIATION PROGRAM.

#### STANDARD STABILIZATION NOTE:

FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1), AND SEVEN DAYS (7) AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

#### OWNERS / DEVELOPERS CERTIFICATION:

I / WE HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION AND/OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I HEREBY AUTHORIZE THE RIGHT OF ENTRY FOR PERIODIC ON-SITE EVALUATION BY MDE COMPLIANCE INSPECTORS.

## EXISTING STRUCTURE PLANS

THERE ARE NO PLANS FOR THE EXISTING STRUCTURE.

MDOT SHA Stormwater Management & Sediment Control
Final Approval

Chief, Plan Review Division
PRD No. 17-PR-0100

Expiration Date: 10/16/2022

Maingin Agustin 8/28/19
APPROVED DATE
DEPUTY DIRECTOR, STRUCTURES ENGINEERING

APPROVED Causalan

DIRECTOR, OFFICE OF STRUCTURES

APPROVED

DEPUTY ADMINISTRATOR / CHIEF ENGINEER

FOR PLANNING, ENGINEERING, REAL ESTATE AND ENVIRONMENT

29 AUG19

STRUCTURE INVENTORY NO.: 09045X0

N:\31747-045\CADD\ttl.dgn August 28, 2019

CONTRACT NO.: -

## INDEX OF SHEETS: 1. TITLE SHEET 2. NOTES AND ABBREVIATIONS SHEET 3. TYPICAL SECTIONS AND PAVING DETAILS 4. ROADWAY DETAILS 4. HOADWAY DETAILS 5. MAINTENANCE OF TRAFFIC – GENERAL NOTES AND DETAILS 6. MAINTENANCE OF TRAFFIC – TYPICAL SECTIONS 7. MAINTENANCE OF TRAFFIC – STAGE 1 8. MAINTENANCE OF TRAFFIC – STAGE 2 10. MAINTENANCE OF TRAFFIC – STAGE 2 11. MAINTENANCE OF TRAFFIC – STAGE 3 12. MAINTENANCE OF TRAFFIC - STAGE 3 12. MAINTENANCE OF TRAFFIC - STAGE 3 13. MAINTENANCE OF TRAFFIC - STAGE 4 14. MAINTENANCE OF TRAFFIC - STAGE 4 15. EROSION AND SEDIMENT CONTROL GENERAL NOTES 16. EROSION AND SEDIMENT CONTROL DETAILS 18. EROSION AND SEDIMENT CONTROL DETAILS 19. EROSION AND SEDIMENT CONTROL DETAILS 20. EROSION AND SEDIMENT CONTROL DETAILS 21. EROSION AND SEDIMENT CONTROL PLAN 22. EROSION AND SEDIMENT CONTROL PLAN 23. EROSION AND SEDIMENT CONTROL PLAN 24. EROSION AND SEDIMENT CONTROL PLAN 25. LIGHTING PLAN 26. GENERAL PLAN AND NOTES 27. PIPE PROFILE AND SECTION DETAILS 28. UPSTREAM HEADWALL DETAILS 29. UPSTREAM REINFORCING DETAILS 30. UPSTREAM CHANNEL PROTECTION DETAILS 31. DOWNSTREAM HEADWALL DETAILS 32. DOWNSTREAM REINFORCING DETAILS 33. DOWNSTREAM CHANNLE PROTECTION DETAILS 34. DETAILS 35. DETAILS 36. REINFORCING DETAILS

37. REINFORCING DETAILS

# CONVENTIONAL SIGNS

PROPOSED MEDIAN BARRIER	PROPOSED PIPE / CULVERT
ELECTRICAL HAND BOX - SIGNALS	EXISTING PIPE / CULVERT [====1]
FLOW LINE	EXISTING DROP INLET
STATE, COUNTY OR CITY LINES	UTILITY POLE
PROPOSED TRAFFIC BARRIER	WETLAND
EXISTING TRAFFIC BARRIER	WETLAND BUFFER B
PROPOSED FENCE LINEX	, WUS ~
EXISTING FENCE LINE	WATERS OF THE U.S.
RIGHT OF WAY LINE	HEDGE /TREE LINE
EXISTING ROADWAY	BUSH /TREE
RAILROAD	
BASE LINE OR SURVEY LINE	CONIFEROUS TREE
FIRE HYDRANT	GROUND ELEVATION DATUM LINE
HISTORIC BOUNDARY	0.22
WETLAND BOUNDARY 0 0 0 0	GRADE ELEVATION

# **ABBREVIATIONS**

AASHTO A	merican Association of State Highway	HDWL	Headwall	RW or RW Right of Way
	Transportation Officials		Horizontal Ellipitical Reinforced	RCPReinforced Concrete Pipe
ADTA	verage Daily Traffic		Concrete Pipe	RCPPReinforced Concrete Pressure Pip
AHD A	head	HP	High Point	R.Q.DRock Quality Designation
APPROXA	approximate	IN	Inch	R.MRootmat
B or B/L B	Baseline	I.S.T	Inlet Sediment Trap	SSouth
BKB		INV	Invert	SANSanitary Sewer
BIT B	Bituminous	J.B,	Junction Box	SB or S/B Southbound
B.CB	Bituminous Concrete	K	K Inlet	S.DStorm Drain
B.MB	Bench Mark	L	Length	S.D.DSurface Drain Ditch
BOTB	Bottom	LF	Linear Feet	S/ESuper Elevation
C.CC	Center of Curve	L.L	Liquid Limit	SFSilt Fence
CAP C	Corrugated Aluminum Pipe	LP	Low Point	SF Square Feet
CAPAC	Corrugated Aluminum Pipe Arch	L.P	Light Pole	SHTSheet
CATV C	Cable Television	LT	Left	SPP Structural Steel Plate Pipe
C.B.RC	California Bearing Ratio	MAC	Macadam	SPPAStructural Steel Plate Pipe Arch
€ or C/LC	Centerline	M.C	Moisture Content	S.P.TStandard Penetration Testing
CL C	Class	MAX	Maximum	SRPSteel Spiral Rib Pipe -
CLF C	Chainlink Fence	M.D.D	Maximum Dry Content	Aluminized Type 2
CMPC	Corrugated Metal Pipe	MOD	Modified	SRPASteel Spiral Rib Pipe Arch -
C.OC	Cleanout		Minimum	Aluminized Type 2
COMBC	Combination	N	North	SSDStopping Sight Distance
CONCC	Concrete	NB	Northbound	SSFSuper Silt Fence
CONSTRC	Construction	NE	Northeast	STDStandard
CORC	Corner	N.P	Non-Plastic	STAStation
CORRC	Correction	O.C	On Center	SOSingle Opening
CPP-SC	Corrugated Polyethylene Pipe - Type 'S'		Overhead Electric	SYSquare Yards
CSP C	Corrugated Steel Pipe - Aluminized Type 2	O.M	Optimum Moisture	SWM Stormwater Management
	Corrugated Steel Pipe Arch -	PAV' T	Pavement	T Tangent
	Aluminized Type 2	PC	Point of Curvature	T Telephone
DCD	Degree of Curve	PCC	Point of Compound Curvature	T.CTop of Cover
D.H.V D	Design Hourly Volume	P/C	Point of Crown	T.GTop of Grate
D.I D	Orop Inlet	P/GE	Profile Grade Elevation	T or TLTraverse Line
DIA D	Diameter	P.G.E	Profile Ground Elevation	T.MTop of Manhole
D.O D	Oouble Opening	P.G.L	Profile Grade Line	TRAV Traverse
EE	ast	P/GL	Profile Ground Line	TSTemporary Swale
EE	Electric	P/R	Point of Rotation	T.STop of Slab
EE	external Distance	P.I	Plasticity Index	T.STopsoil
EAE		PI	Point of Intersection	TYPTypical
EBE	astbound	POC	Point On Curve	U.DUnder Drain
ELEV E	Elevation	POT	Point On Tangent	U.GUnderground
ES E			Polyvinyl Chloride Profile Wall Pipe	U.PUtility Pole
EX or EXIST_E	existing		Proposed	USDAUnited States Department
FT F	eet		Point of Reverse Curve	of Agriculture
F or FLF	lowline		Point	VCLVertical Clearance
F.B.D F	flat Bottom Ditch		Point of Tangency	V.C.L Vertical Curve Length
F.HFi	ire Hydrant		Point of Vertical Curve	WWater
FWD F			Polyvinyl Chloride	WWest
GG			Point of Vertical Intersection	WBWestbound
G.VG		PVRC	Point of Vertical Reverse Curve	WB Wetland Buffer
H.BH	landbox		Point of Vertical Tangency	W.MWater Meter
HDPEH	ligh Density Polyetheylene		Radius	W.SWrapped Steel
			Rock Fragments	WUSWaters of the United States
		RT	그 그 그 그 그 그리는 이 어린 그리고 하는데 되었다.	W.VWater Valve

MDOT SHA Stormwater Management & Sediment Control
Final Approval

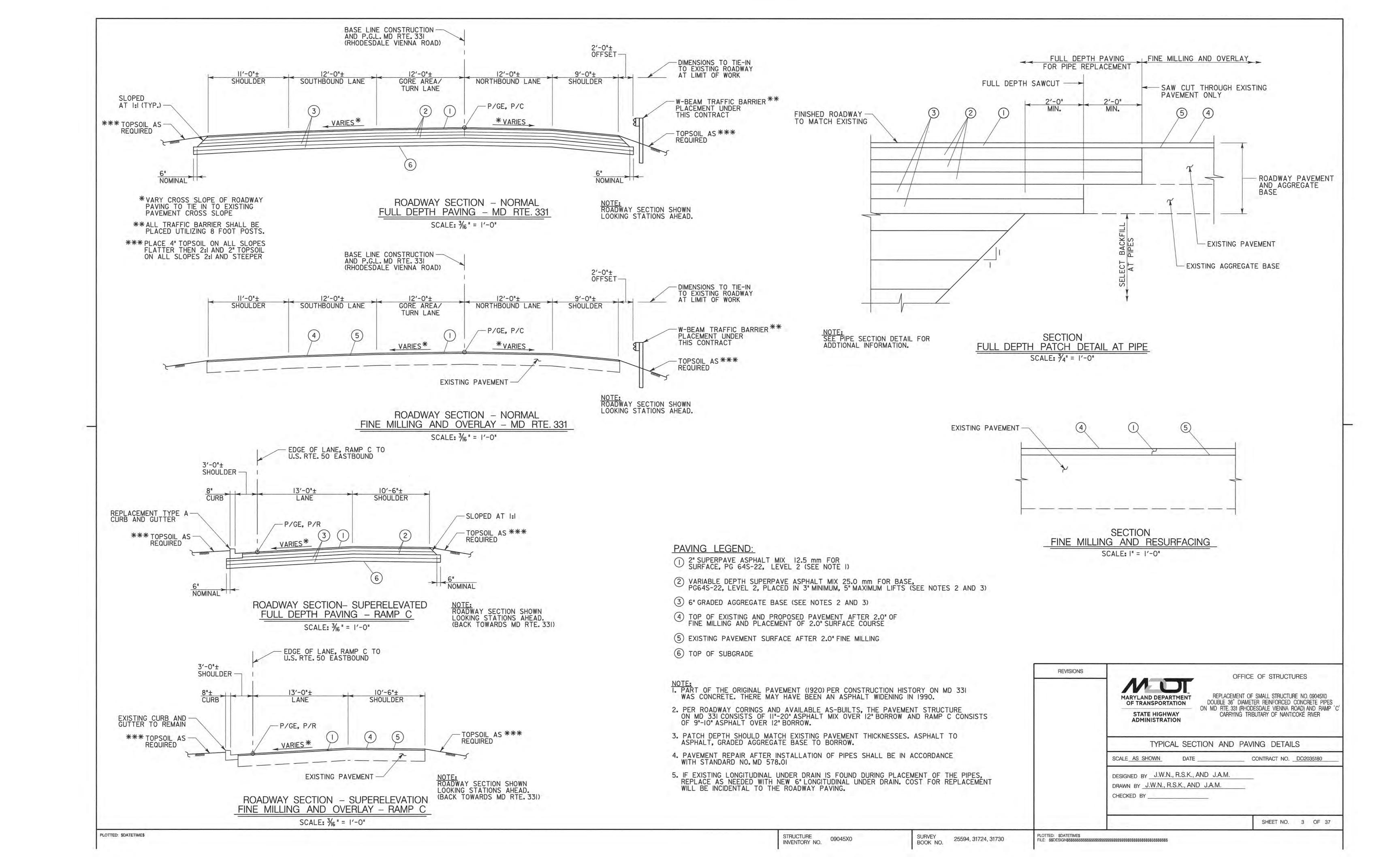
Chief, Plan Review Division
PRD No. 17-PR-0100 Expiration Date: 10/16/2022

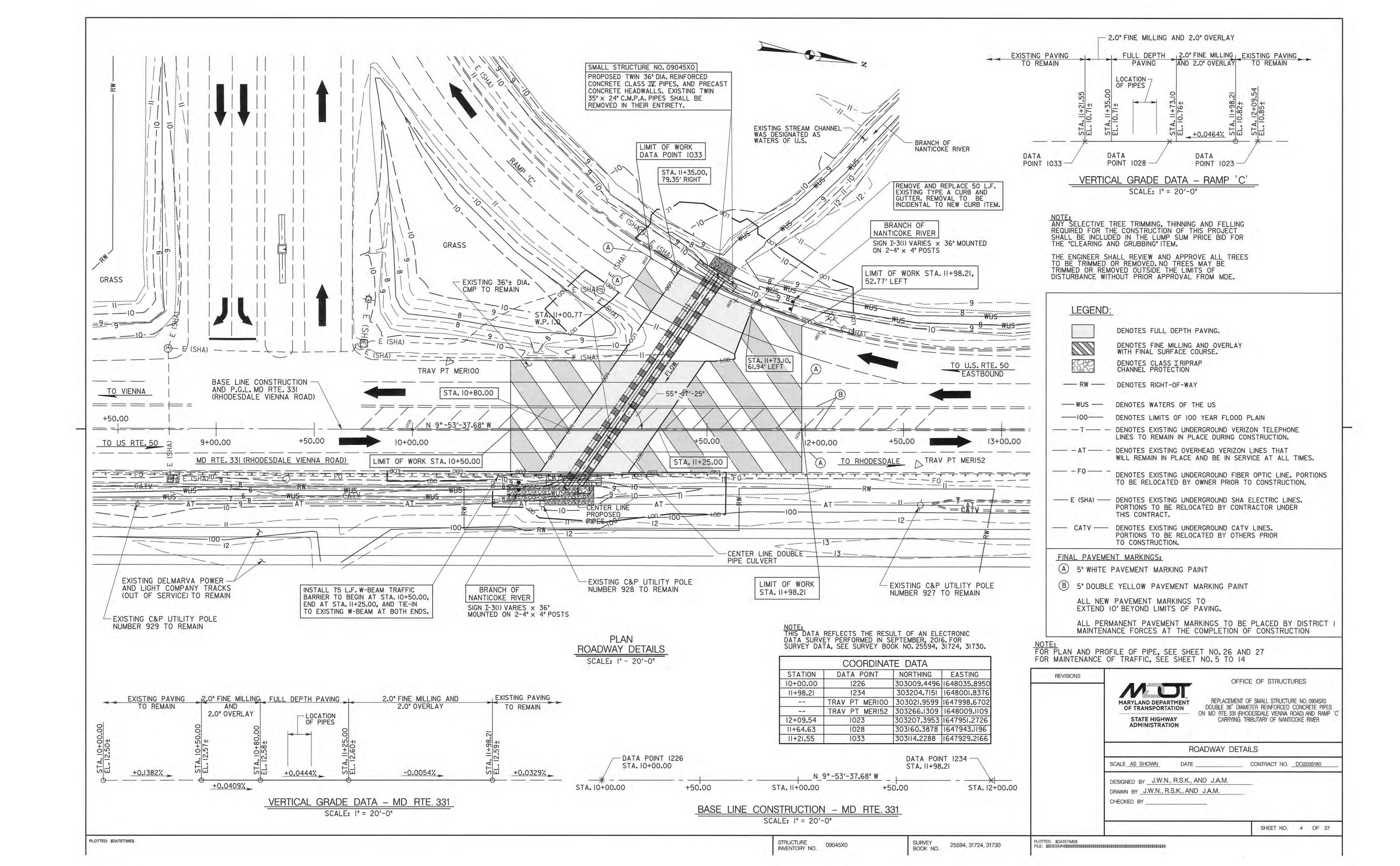
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	NOTES AND ABE	BREVIATIONS SHEET
	SCALE AS SHOWN DATE	CONTRACT NO. DO2035180
	DESIGNED BYJ.W.N., R.S.K., AND J.A. DRAWN BYJ.W.N., R.S.K., AND J.A.M. CHECKED BY	
		SHEET NO. 2 OF 37

PLOTTED: \$DATETIME\$

STRUCTURE 09045X0

SURVEY BOOK NO. 25594, 31724, 31730





#### WORK ZONE TRAFFIC CONTROL PLAN GENERAL NOTES / WORK RESTRICTIONS

- 1. ALL WORK SHALL BE CONDUCTED IN ACCORDANCE WITH THE LATEST VERSION OF THE MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION'S (MDOT SHA) BOOK OF STANDARDS FOR HIGHWAY AND INCIDENTAL STRUCTURES AND MDOT SHA'S MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MDMUTCD) 2011 EDITION.
- 2. EXISTING TRAFFIC SIGNS IN CONFLICT WITH THE WORK ZONE TRAFFIC CONTROL PLANS SHALL BE COVERED, RELOCATED, OR TAKEN DOWN, STORED, AND REPLACED AS DIRECTED BY THE ENGINEER. TEMPORARY TRAFFIC SIGNS SHALL BE INSTALLED ONLY AS NECESSARY FOR EACH INDIVIDUAL STAGE OF CONSTRUCTION, WITH SIGNS RELOCATED AS APPLICABLE BETWEEN SEPARATE STAGES.
- 3. ALL EXISTING PAVEMENT MARKINGS AND/OR TEMPORARY PAVEMENT MARKINGS FROM A PREVIOUS STAGE OF CONSTRUCTION IN CONFLICT WITH TEMPORARY PAVEMENT MARKINGS (IN CURRENT STAGE) SHALL BE REMOVED, AS DIRECTED BY THE ENGINEER. ALL EXISTING PAVEMENT MARKINGS TO BE REMOVED SHALL BE REMOVED OR OBLITERATED COMPLETELY.
- 4. CONTRACTOR SHALL REMOVE ALL EQUIPMENT AND MATERIAL FROM THE TRAVELED PORTION OF THE ROADWAY. ALSO, EQUIPMENT AND MATERIALS SHALL NOT BE STORED IN SUCH A MANNER AS TO OBSTRUCT SIGHT DISTANCE AT ANY INTERSECTING ROAD, NOR BE LOCATED WITHIN THE 30' CLEAR ZONE WITHOUT POSITIVE PROTECTION.
- 5. INSTALLATION OF CRASH CUSHION (SAND FILLED BARRELS) AND TYPE E END TREATMENTS MUST BE ADEQUATE FOR A 50 MPH DESIGN SPEED.
- 6. PRIOR TO PLACING TEMPORARY CONCRETE BARRIER AND/OR CRASH CUSHION ON UNPAVED SURFACES, THE GROUND MUST BE CLEARED AND GRADED FLATTER THAN 10:1 FOR PROPER INSTALLATION.
- 7. PORTABLE VARIABLE MESSAGE SIGNS SHALL BE PLACED ON MD 331 NEAR THE SITE 7 DAYS IN ADVANCE OF THE FLAGGING OPERATION IN ACCORDANCE WITH MD 104.01-22. APPROVED MESSAGE(S) TO BE OBTAINED FROM DISTRICT 1 TRAFFIC PRIOR TO THE PLACEMENT OF THE MESSAGE BOARDS.
- 8. REFLECTIVE LENSES FROM EXISTING RPMS SHALL BE REMOVED WHEN THE CURRENT PLACEMENT WILL CONFLICT WITH A NEW SHIFT IN TRAVEL. REMOVAL OF REFLECTIVE LENSES WILL NOT BE MEASURED BUT WILL BE INCIDENTAL TO THE LUMP SUM MOT ITEM.
- 9. WHEN PAVEMENT DROP-OFFS ARE PRESENT, THE PLACEMENT OF TEMPORARY TRAFFIC CONTROL DEVICES, INCLUDING SIGNS, CHANNELIZING DEVICES, AND BARRIERS, AS WELL AS SLOPE FILLET WEDGES, SHALL FOLLOW STD. NOS. MD 104.06-15, MD 104.06-16, MD 104.06-17, MD 104.06-18, MD 104.06-19, AND MD 104.01-28. THE ENGINEER MAY RECOMMEND ALTERNATIVE METHODS TO PROTECT THE PAVEMENT EDGE DROP-OFF, CONSIDERING FACTORS SUCH AS: PEDESTRIANS, BICYCLE, AND TRAFFIC VOLUMES, VEHICLE SPEEDS, SIZE OF WORK ZONE, DURATION OF WORK, ETC.
- 10. THE CONTRACTOR SHALL COORDINATE MOT ACTIVITES WITH ANY ADJACENT PROJECTS IN CONSTRUCTION PRIOR TO INSTALLING ANY TEMPORARY TRAFFIC CONTROL DEVICES.
- 11. DURING LANE CLOSURES ALONG MD 331, TRAFFIC SHALL BE MAINTAINED IN ACCORDANCE WITH STD. NOS. MD 104.02-09.

#### MAINTENANCE OF TRAFFIC ACTIVITIES

#### STAGE 1

1. INSTALL TEMPORARY TRAFFIC CONTROL DEVICES AS SHOWN ON THE PLANS. 2. INSTALL TEMPORARY CONCRETE BARRIERS AND TRAFFIC CONTROL DRUMS AS SHOWN ON THE PLANS.

#### STAGE 2

- 1. REMOVE THE TRAFFIC CONTROL DEVICES NOT REQUIRED FOR STAGE 2.
- 2. INSTALL TEMPORARY TRAFFIC CONTROL DEVICES AS SHOWN ON THE PLANS.
- 3. INSTALL TEMPORARY CONCRETE BARRIERS AND TRAFFIC CONTROL DRUMS AS SHOWN ON THE PLANS.
- 4. DURING PEAK HOURS MAINTAIN TRAFFIC WITH FLAGGING OPERATIONS AS SHOWN ON THE PLANS. DURING NON PEAK HOURS MAINTAIN TWO WAY TRAFFIC WITH EXISTING PAVEMENT MARKINGS AND STEEL PLATES COVERING TRENCHES FOLLOWING MD STD. 104.01-85.

#### STAGE 3

- 1. REMOVE THE TRAFFIC CONTROL DEVICES NOT REQUIRED FOR STAGE 3.
- 2. INSTALL TEMPORARY TRAFFIC CONTROL DEVICES AS SHOWN ON THE PLANS.
- 3. INSTALL TEMPORARY CONCRETE BARRIERS AND TRAFFIC CONTROL DRUMS AS SHOWN ON THE PLANS.
- 4. DURING PEAK HOURS MAINTAIN TRAFFIC WITH FLAGGING OPERATIONS AS SHOWN ON THE PLANS. DURING NON PEAK HOURS MAINTAIN TWO WAY TRAFFIC WITH EXISTING PAVEMENT MARKING AND STEEL PLATES COVERING TRENCHES FOLLOWING MD STD. 104.01-85.

#### STAGE 4

- 1. REMOVE THE TRAFFIC CONTROL DEVICES NOT REQUIRED FOR STAGE 4.
- 2. INSTALL TEMPORARY TRAFFIC CONTROL DEVICES AS SHOWN ON THE PLANS.
- 3. INSTALL TEMPORARY CONCRETE TRAFFIC BARRIERS AND TRAFFIC CONTROL DRUMS AS SHOWN ON THE PLANS.

## STAGE 5 - NO PLANS PROVIDED

- 1. REMOVE THE TRAFFIC CONTROL DEVICES NO LONGER REQUIRED
- 2. PAVEMENT FINE MILLING & RESURFACE OPERATIONS SHALL BE PERFORMED IN COMPLIANCE WITH MDOT SHA STANDARDS OR AS APPROVED BY THE ENGINEER.

#### CONSTRUCTION ACTIVITIES

#### STAGE 1

1. CONSTRUCT PORTION OF PIPE CULVERT AND UPSTREAM HEADWALL AS SHOWN ON THE PLANS.

#### STAGE 2

1. CONSTRUCT PORTION OF PIPE CULVERT AS SHOWN ON THE PLANS.

#### STAGE 3

1. CONSTRUCT PORTION OF PIPE CULVERT AS SHOWN ON THE PLANS.

#### STAGE 4

1. CONSTRUCT PORTION OF PIPE CULVERT AND DOWNSTREAM HEADWALL AS SHOWN ON THE PLANS.

#### STAGE 5 - NO PLANS PROVIDED

- 1. CONSTRUCT THE FINAL PAVEMENT SURFACE COURSE.
- 2. INSTALL PERMANENT PAVEMENT MARKINGS AS SHOWN ON THE ROADWAY PLAN.

MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY

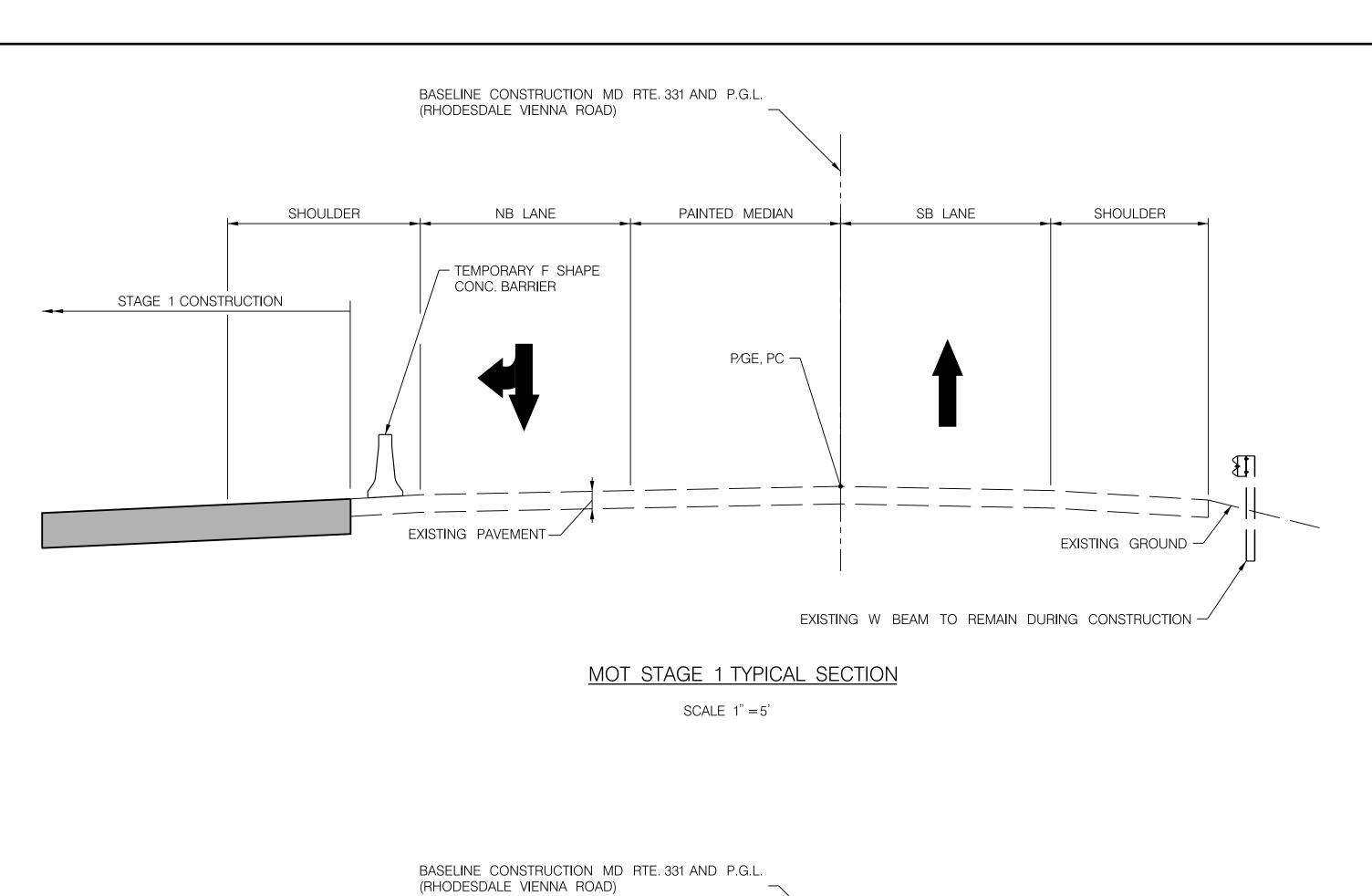
**ADMINISTRATION** 

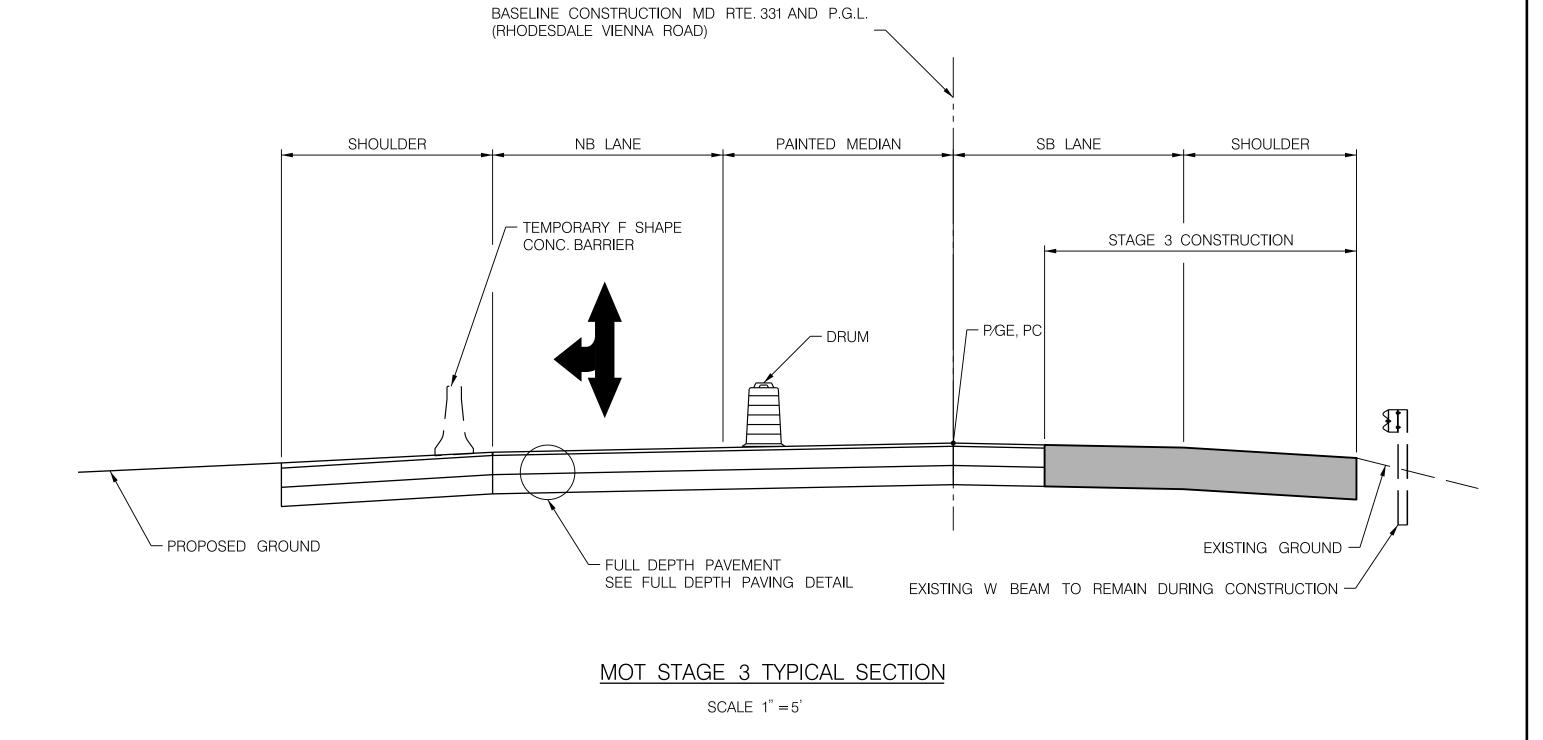
HIGHWAY DESIGN DIVISION

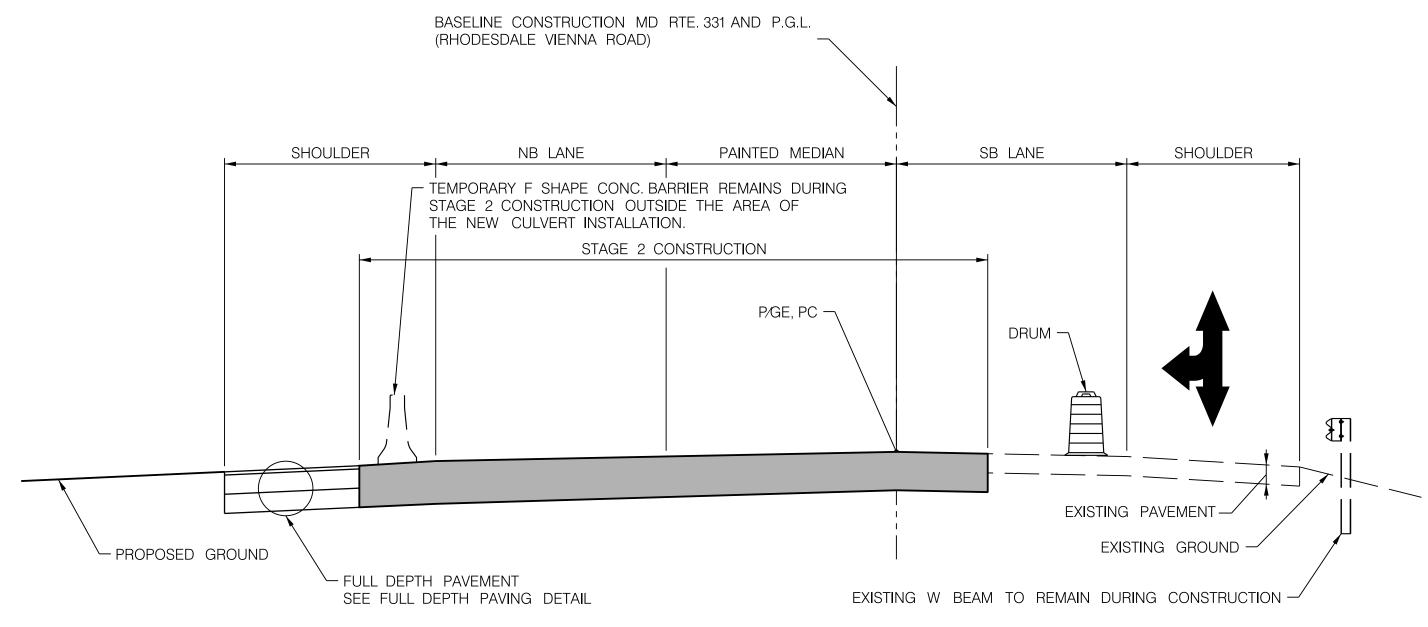
REPLACEMENT OF SMALL STRUCTURE NO. 09045X0 DOUBLE 36" DIA. REINFORCED CONCRETE PIPES ON MD RTE. 331 (RHODESDALE VIENNA ROAD) AND RAMP CARRYING A TRIBUTARY OF NANTICOKE RIVER

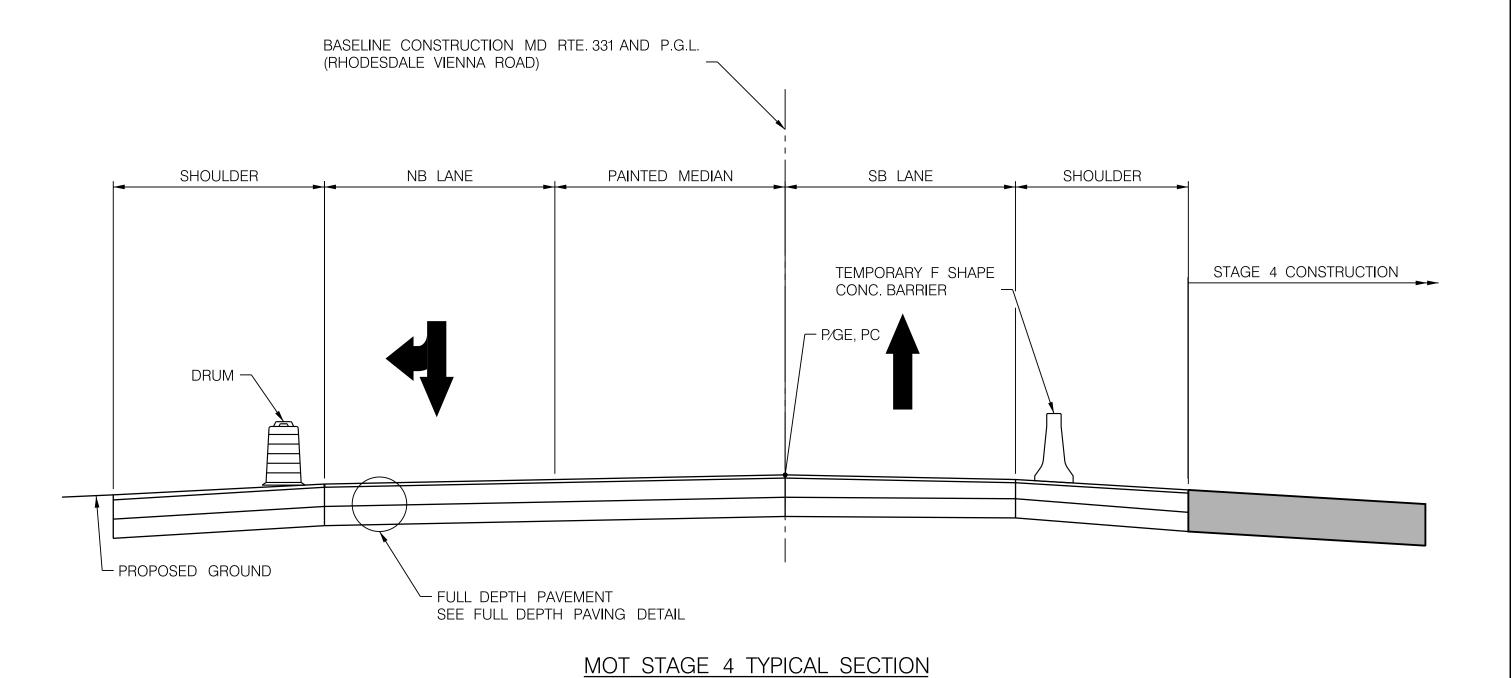
MOT GENERAL NOTES AND DETAILS REVISIONS DATE \_\_\_\_\_\_JUNE 2019 CONTRACT NO. \_\_\_\_\_DO2035180 DESIGNED BY \_\_\_ COUNTY \_\_\_\_ DORCHESTER DRAWN BY LOGMILE CHECKED BY \_\_\_\_ HORIZONTAL SCALE \_ MDE/PRD \_\_\_\_ 17-PR-0100 VERTICAL SCALE \_ MT-01 OF 10 SHEET NO. 5 OF 37 DRAWING NO.











MOT STAGE 2 TYPICAL SECTION

SCALE 1" = 5'

SCALE 1" = 5'

MARYLAND DEPARTMENT
OF TRANSPORTATION

STATE HIGHWAY
ADMINISTRATION

REPLACEMENT OF SMALL STRUCTURE NO. 09045X0 DOUBLE 36" DIA. REINFORCED CONCRETE PIPES

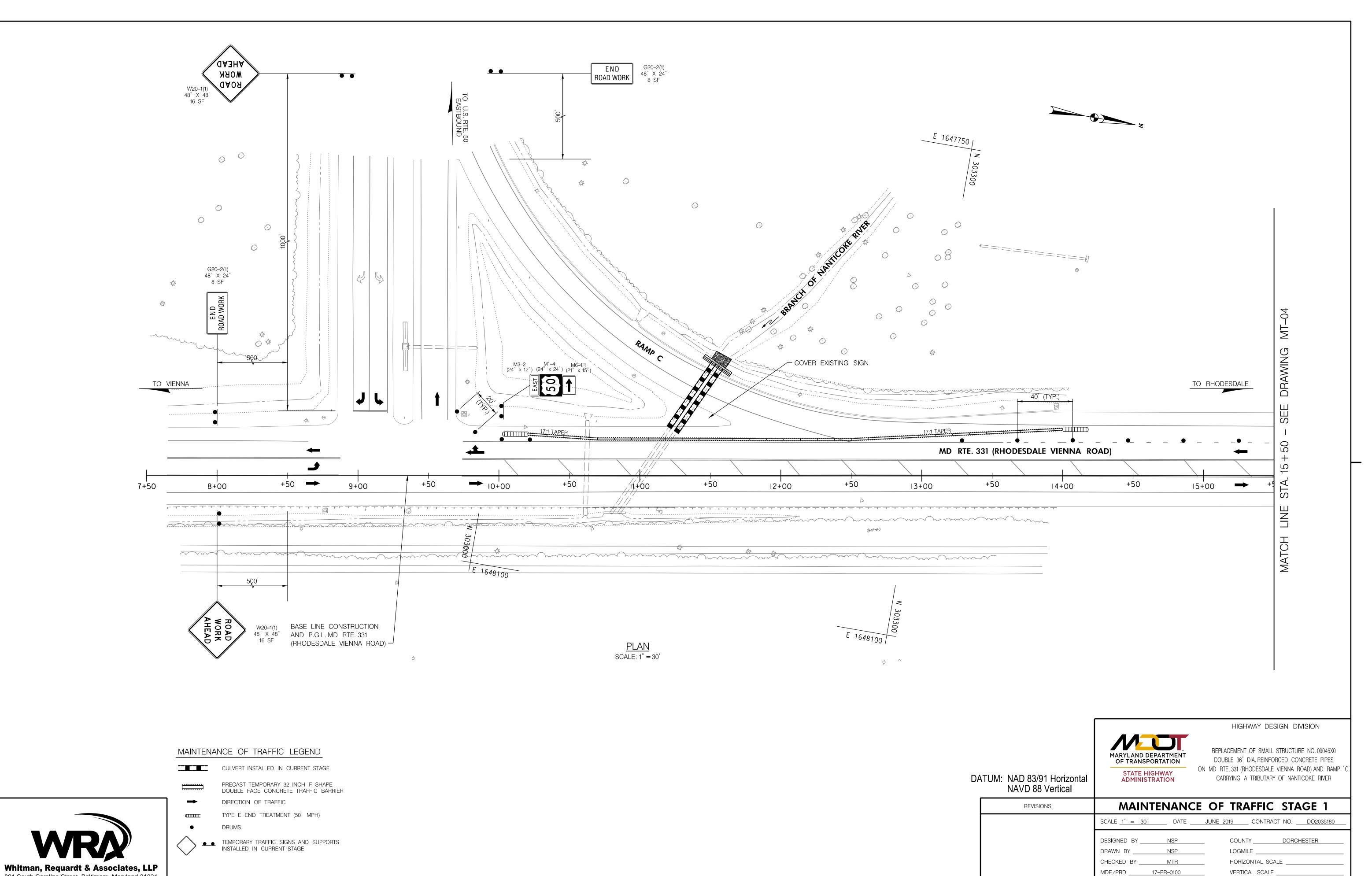
HIGHWAY DESIGN DIVISION

ON MD RTE. 331 (RHODESDALE VIENNA ROAD) AND RAMP 'CARRYING A TRIBUTARY OF NANTICOKE RIVER

REVISIONS		MOT TYP	ICAL SEC	CTIONS	
	SCALE <u>1" = 5'</u>	DATE	JUNE 2019 (	CONTRACT NO	DO2035180
	DRAWN BY	AMU AMU MTR 17–PR–0100	LOGMILE HORIZON	DORCH  ITAL SCALE  SCALE	
	DRAWING NO.	MOT-02	OF 10	SHEET NO.	6 OF 37

Whitman, Requardt & Associates, LLP 801 South Caroline Street, Baltimore, Maryland 21231

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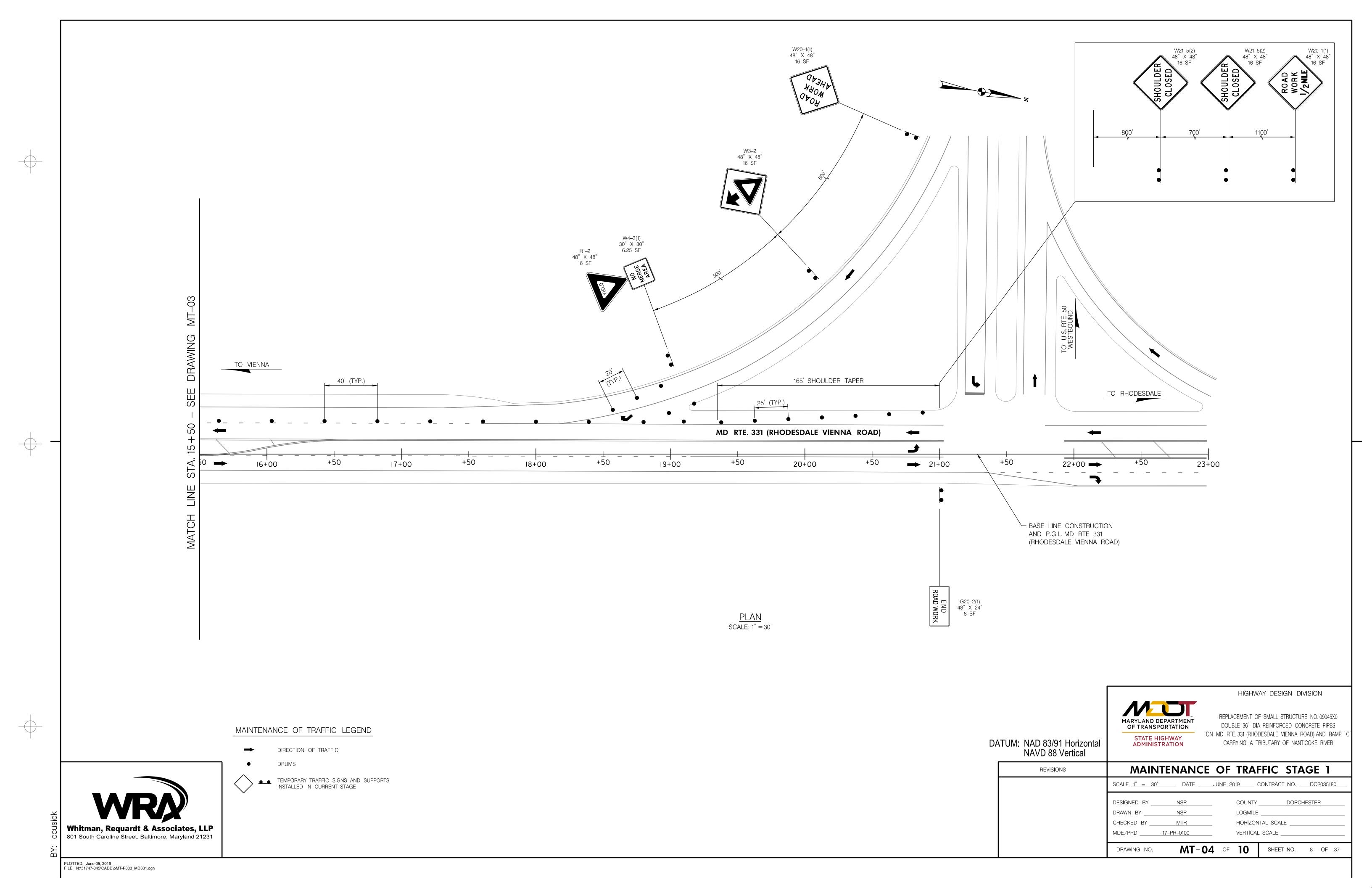
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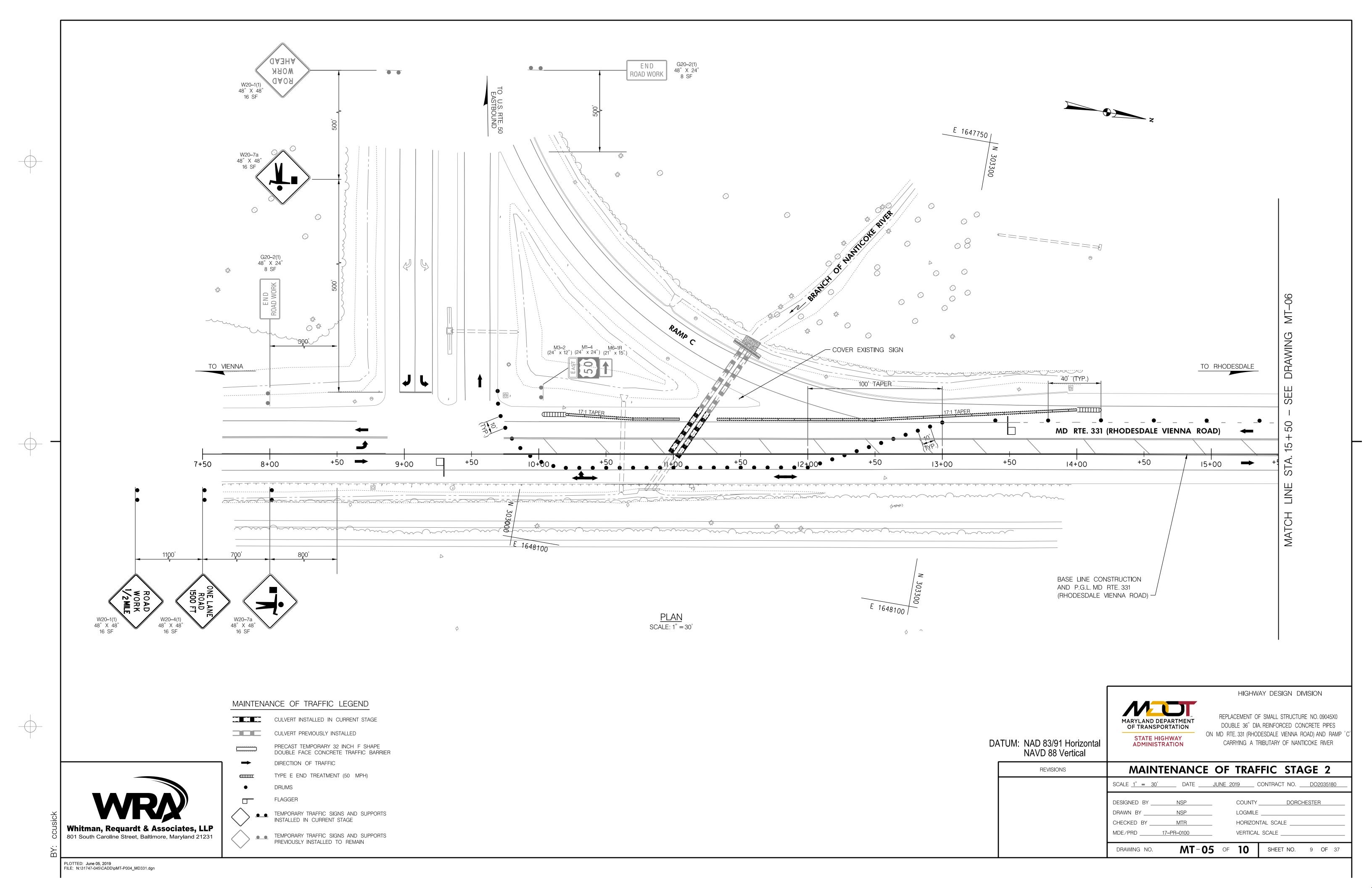
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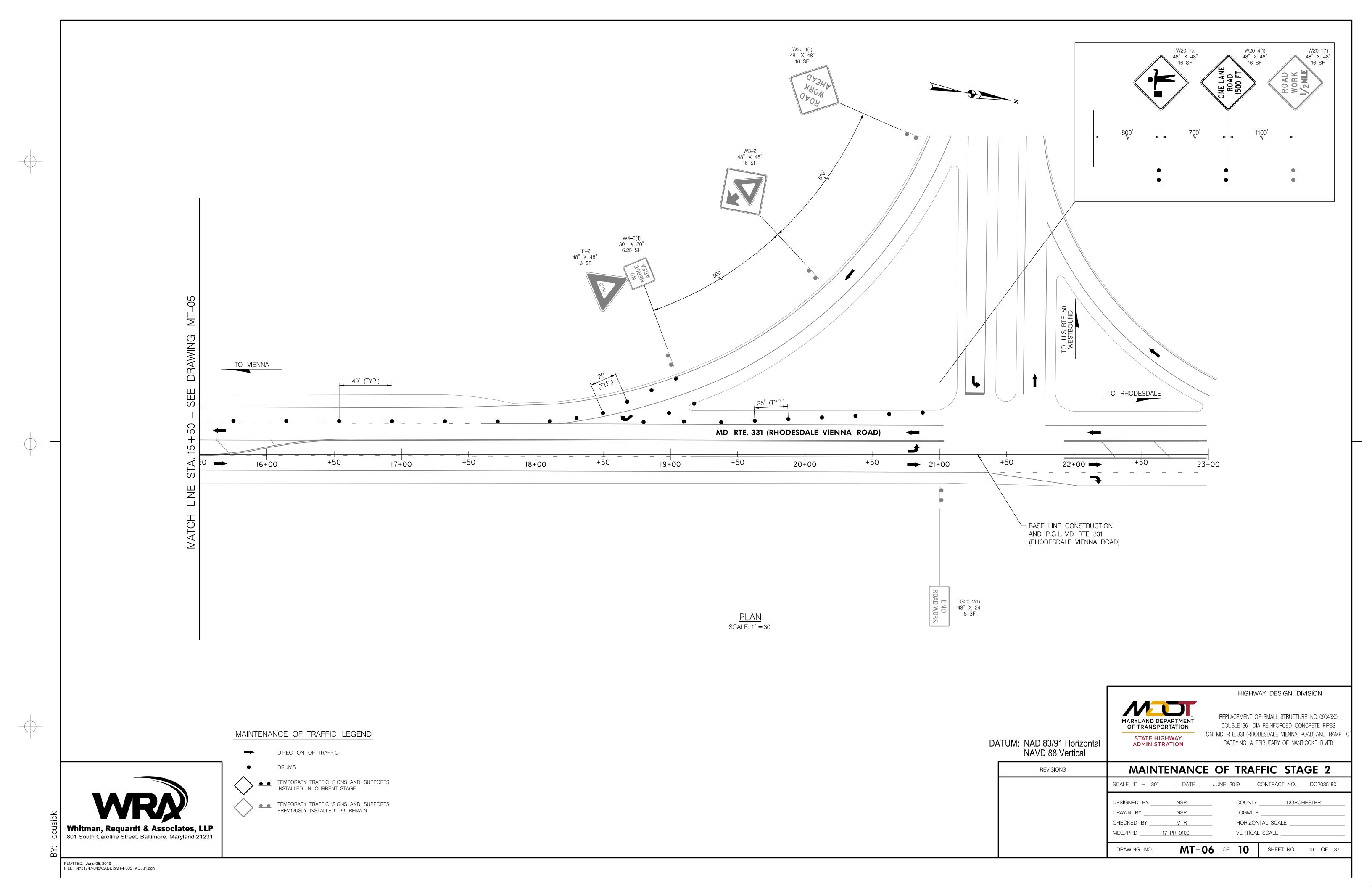
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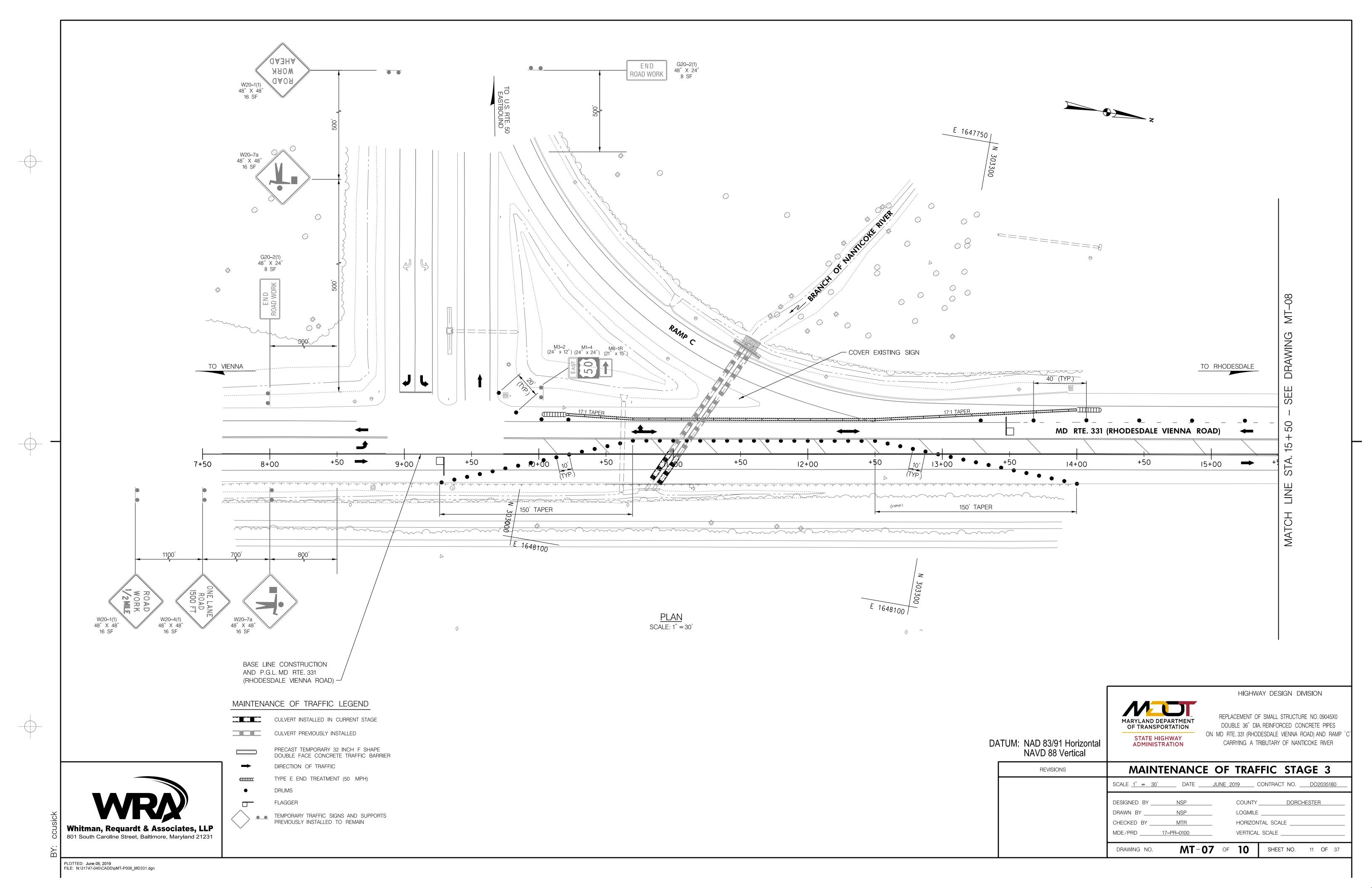
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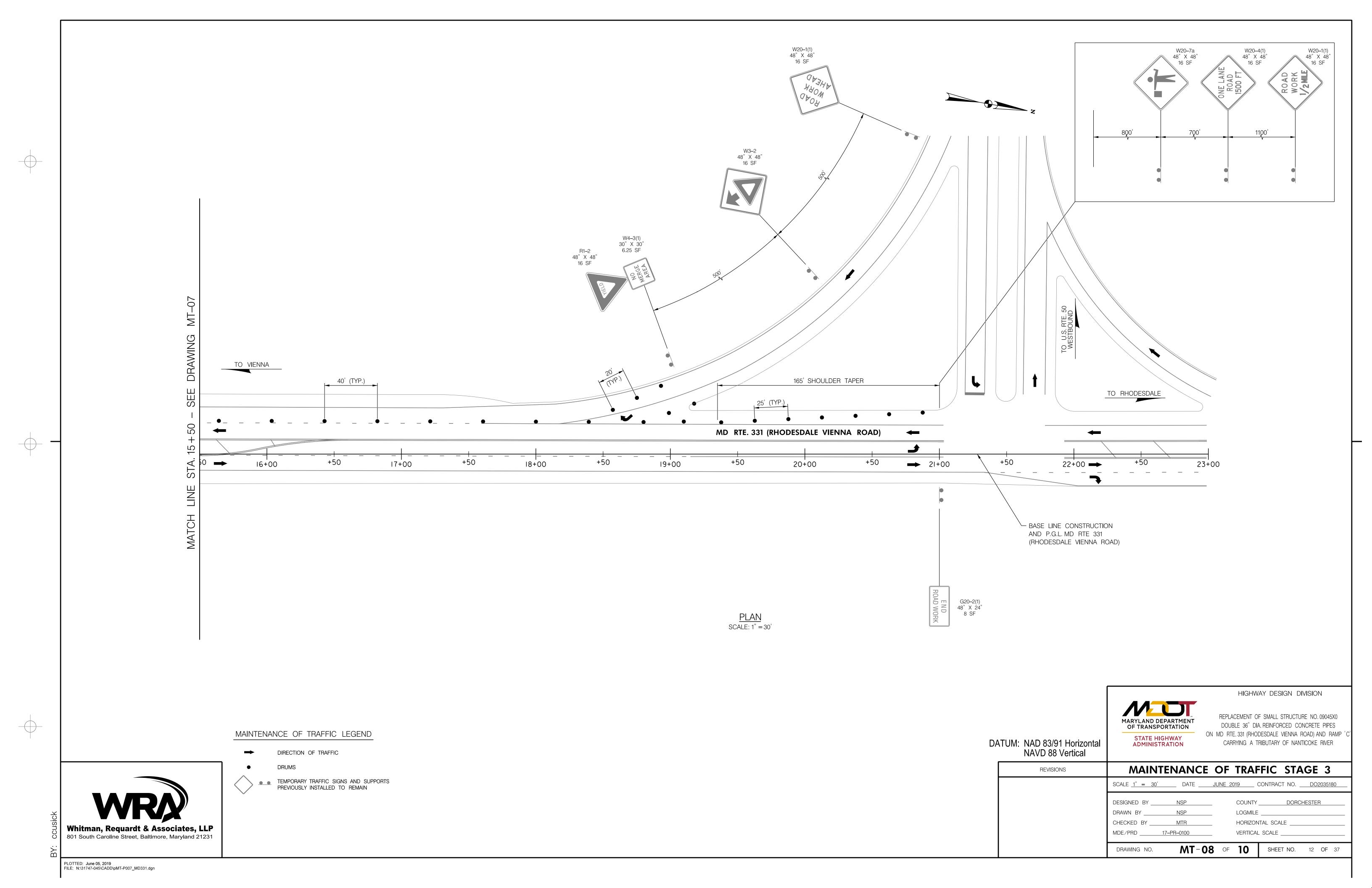
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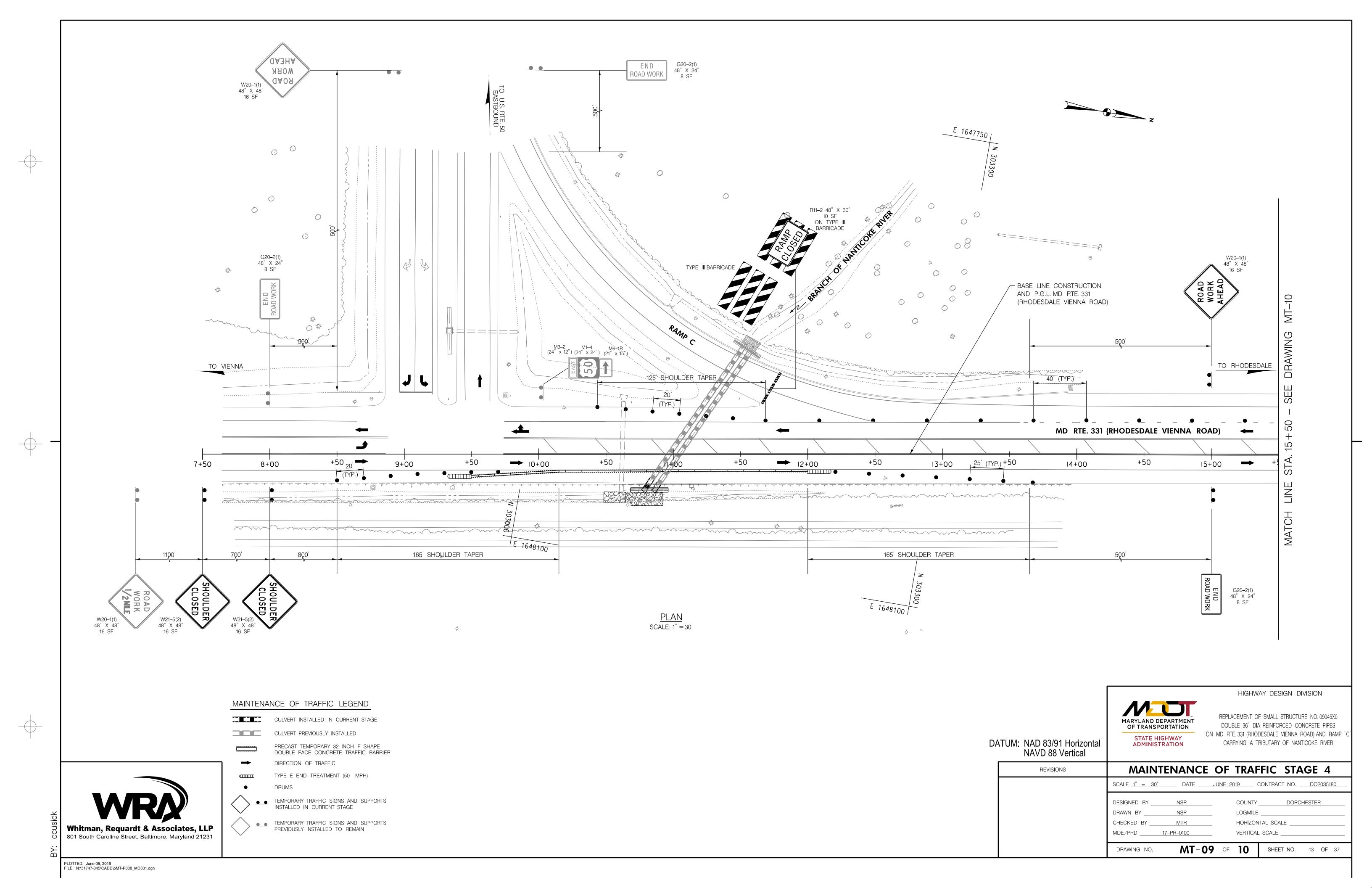


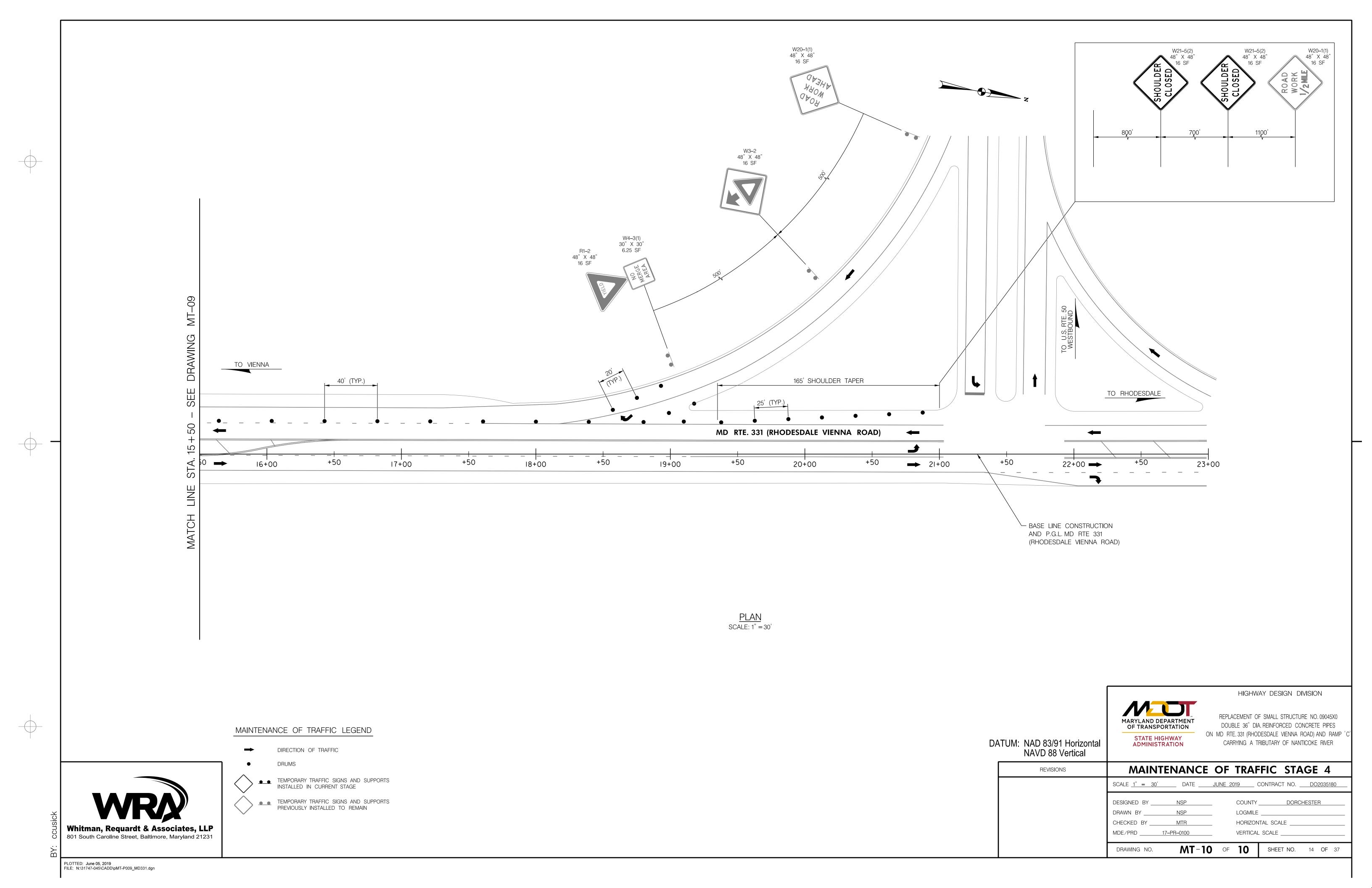












# EROSION AND SEDIMENT CONTROL - GENERAL NOTES

## 1. NOTIFICATION

NOTIFY THE REGIONAL ENVIRONMENTAL COORDINATOR (REC) IN WRITING AND/OR BY TELEPHONE AT (410) 365-0164 PRIOR TO THE FOLLOWING POINTS:

- PRE-CONSTRUCTION MEETING.
- EROSION AND SEDIMENT CONTROL (ESC) MEETING (MINIMUM 7 WORKING DAYS PRIOR TO COMMENCING EARTH DISTURBING
- UPON INSTALLATION OF INITIAL ESC MEASURES.
- INSTALLATION OF MAJOR ESC BASINS/TRAPS.
- REMOVAL OR MODIFICATION OF ANY ESC MEASURES.
- REMOVAL OF ALL ESC DEVICES.
   FINAL ACCEPTANCE BY THE ADMINISTRATION.

## 2. STANDARDS AND SPECIFICATIONS

CONSTRUCT THIS PLAN ACCORDING TO THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL", THE MDE "2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUMES I & II", THE MDOT SHA "FIELD GUIDE FOR EROSION AND SEDIMENT CONTROL", THE ANNOTATED CODE OF MARYLAND, THE CODE OF MARYLAND (COMAR) 26.17.01 AND 26.17.02, ALL REVISIONS THERE OF, AND AS SPECIFIED. KEEP A COPY OF THE 2011 "MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" ON THE SITE AT ALL TIMES. PERFORM VEGETATIVE STABILIZATION ACCORDING TO THOSE STANDARDS AND AS SPECIFIED.

## 3. INSPECTION

DAILY INSPECT ALL ESC MEASURES AND MAINTAIN THEM IN A CONTINUOUSLY-EFFECTIVE OPERATING CONDITION UNTIL REMOVED AS APPROVED BY THE REC AND THE ENGINEER.

## 4. SHUTDOWNS / LIQUIDATED DAMAGES

COMPLETE COMPLIANCE WITH THE APPROVED ESC PLAN IS EXPECTED AT ALL TIMES. IN CASES WHERE THE CONTRACTOR IS FOUND TO BE IN NON-COMPLIANCE, THE ADMINISTRATION WILL TAKE STEPS TO IMPOSE SELECTED OR TOTAL SHUTDOWNS AND MAY IMPOSE LIQUIDATED DAMAGES FOR NON-COMPLIANCE.

THE ADMINISTRATION'S DISTRICT ENGINEER MAY IMPOSE A TOTAL OR PARTIAL SHUTDOWN IF THE PROJECT MAY ADVERSELY IMPACT THE WATERS OF THE STATE.

## 5. RECORD KEEPING

ENSURE THE STORMWATER MANAGEMENT (SWM)/ESC APPROVAL LETTER, APPROVED EROSION AND SEDIMENT CONTROL PLANS, APPROVED MODIFICATIONS, MODIFICATION APPROVAL LETTER(S), DAILY LOG BOOKS, TEST REPORTS, AND NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) NOTICE OF INTENT (NOI) PERMIT ARE AVAILABLE ON-SITE FOR REVIEW AND INSPECTION BY THE ADMINISTRATION.

## 6. CLEARING AND GRUBBING

UNLESS OTHERWISE SPECIFIED OR APPROVED, LIMIT THE CLEARING AND GRUBBING AREA TO A SINGLE 20-ACRE GRADING UNIT PER GRADING OPERATION. ONCE THIS FIRST UNIT IS HALF GRADED, STABILIZATION MEASURES ARE IN PLACE, AND APPROVED, WORK MAY PROCEED TO A SECOND 20-ACRE GRADING UNIT. UNLESS SPECIFICALLY APPROVED, NO MORE THAN 30 ACRES MAY BE DISTURBED AT ANY TIME.

## 7. SENSITIVE AREAS

WITH THE APPROVAL AND ASSISTANCE OF THE ENGINEER, COORDINATE WITH THE APPROPRIATE ADMINISTRATION REPRESENTATIVES TO COORDINATE WITH THE APPROPRIATE REGULATORY AGENCIES TO ENSURE THAT ALL PERMIT CONDITIONS ARE MET PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES WITHIN SPECIFIED SENSITIVE AREAS. SENSITIVE AREAS INCLUDE BUT ARE NOT LIMITED TO FLOODPLAINS, WETLANDS, WETLAND BUFFERS, CHESAPEAKE BAY CRITICAL AREA, FORESTS, ARCHEOLOGICAL SITES, HISTORIC SITES, PARKLAND, AND OPEN WATERS. DESIGNATE A RESPONSIBLE PARTY TO MONITOR ALL WORK IN THESE AREAS AND ENSURE THAT REASONABLE CARE IS TAKEN DURING WORK IN AND ADJACENT TO THESE AREAS.

## 8. INGRESS / EGRESS CONTROLS

PROTECT ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS AND PREVENT THE DEPOSITION OF MATERIALS ON PUBLIC ROADS. IF DEPOSITION OCCURS, MECHANICALLY REMOVE ALL MATERIALS DEPOSITED ON PUBLIC ROADS IMMEDIATELY. FLUSHING OF ROAD SURFACES IS PROHIBITED. WHEN NO SCE IS PROVIDED, KEEP ALL CONSTRUCTION EQUIPMENT WITHIN THE LOD UNTIL THE WORK IS COMPLETE. CLEAN TREADS/TIRES PRIOR TO THE EQUIPMENT LEAVING THE LOD.

# 9. EROSION AND SEDIMENT CONTROL EXCAVATION

DISPOSE OF MATERIAL REMOVED FROM ESC DEVICES IN AN APPROVED WASTE SITE AS SPECIFIED IN SECTION 201. MATERIALS MAY BE STORED FOR RE-USE. MATERIALS STORED ON-SITE MAY BE REUSED ONCE IT IS DRIED AND IF IT MEETS THE REQUIREMENTS FOR EMBANKMENTS OR OTHER UNSPECIFIED NEEDS.

## 10. DEWATERING PRACTICES

OPERATE DEWATERING PRACTICES IN A MANNER THAT DOES NOT DISCHARGE SEDIMENT INTO WATERWAYS. NO VISIBLE CHANGES TO STREAM CLARITY ARE ACCEPTABLE.

## 11. STANDARD STABILIZATION NOTE

FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, COMPLETE PERMANENT OR TEMPORARY STABILIZATION WITHIN THREE (3) CALENDAR DAYS FOR SURFACES OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND SEVEN (7) DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE SITE. ENSURE CONTINUED STABILIZATION.

## 12. INCREMENTAL STABILIZATION

REFER TO THE MDE "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" FOR THE INCREMENTAL STABILIZATION OF CUT AND FILLS.

## 13. SEDIMENT TRAPS AND BASINS

PLAN DIMENSIONS ARE RELATIVE TO THE OUTLET ELEVATION.

MAINTAIN INFLOW AND OUTFLOW LOCATIONS FOR TRAPS AND BASINS
IN STABLE CONDITION.

## 14. OFF-SITE UTILITY WORK

FOLLOW ADDITIONAL BEST MANAGEMENT ESC PRACTICES FOR UTILITY CONSTRUCTION IN AREAS OUTSIDE OF DESIGNED CONTROLS:

- (a) CALL "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS
- PRIOR TO THE START OF WORK.

  (b) PLACE EXCAVATED MATERIAL ON THE HIGH SIDE OF TRENCHES.
- (c) BACKFILL, COMPACT, AND STABILIZE AT THE END OF EACH WORKING DAY ALL TRENCHES FOR UTILITY INSTALLATIONS. WHEN THIS IS NOT POSSIBLE, CONFORM TO (d).
- (d) PLACE TEMPORARY SILT FENCES IMMEDIATELY DOWNSTREAM OF ANY DISTURBED AREA THAT IS INTENDED TO REMAIN DISTURBED FOR MORE THAN ONE (1) DAY.

## 15. SITE INFORMATION\*

A. TOTAL AREA DISTURBED	0.26	ACRES
B. TOTAL CUT	835	CU. YDS.
C. TOTAL FILL	835	CU. YDS.
D. OFFSITE WASTE/BORROW		
AREA LOCATION (IF KNOWN)	TBD	

<sup>\* (</sup>NOT FOR BIDDING PURPOSES)

## 16. MODIFICATIONS

SUBMIT MODIFICATIONS OF THE ESC MEASURES OR PLAN TO THE ADMINISTRATION FOR APPROVAL. OBTAIN ALL APPROVALS PRIOR TO IMPLEMENTING ANY MODIFICATION.

		STANDARD SYMBO	L3		
100-YEAR FLOODPLAIN	<del></del>	MEDIAN INLET PROTECTION	MIP	STONE CHECK DAM	CD
AT-GRADE INLET PROTECTION	AGIP	MEDIAN SUMP INLET PROTECTION	MSIP	STONE/RIPRAP OUTLET SEDIMENT TRAP ST II	ST-II
BAFFLE BOARDS		MOUNTABLE BERM	MB	SUBSURFACE DRAINS	
BENCHING	BENCHING	PERIMETER DIKE/SWALE	₽DS-I € € €	SUMP PIT	⊠sp
CATCH BASIN INSERT	[]сві	PERMANENT SOIL STABILIZATION MATTING-TYPE B	BBBB	SUPER SILT FENCE	├──SSF── <del> </del>
CHESAPEAKE BAY CRITICAL AREA	CBCA ——— CE	PERMANENT SOIL STABILIZATION MATTING-TYPE C		TEMPORARY ACCESS BRIDGE	ТВ
CLEAR WATER DIVERSION PIPE NOTE: DESIGNATION CWD-12 REFERS TO CLEAR WATER DIVERSION WITH 12 INCH PIPE.	CWD - 12	PIPE OUTLET SEDIMENT TRAP ST I	ST-I	TEMPORARY ACCESS CULVERT	
CLEAR WATER PIPE	CWP	PIPE SLOPE DRAIN  NOTE: DESIGNATION PSD-12  REFERS TO PIPE SLOPE  DRAIN WITH 12 IN PIPE	PSD - 12	TEMPORARY ASPHALT BERM	T <u>AB</u>
COMBINATION INLET PROTECTION	COIP	PLUNGE POOL	PP	TEMPORARY BARRIER DIVERSION	TBD
CONCRETE WASHOUT STRUCTURE	CWS	PORTABLE SEDIMENT TANK	⊠PST	TEMPORARY GABION OUTLET STRUCTURE	TGOS
CURB INLET PROTECTION	[44] CIP	PROPOSED CONTOURS	<u> </u>	TEMPORARY ORANGE CONSTRUCTION FENCE (TOCF)	TOCF
DIVERSION FENCE	├── DF ───I	REMOVABLE PUMPING STATION	⊠RPS	TEMPORARY SOIL STABILIZATION MATTING-TYPE A	
DRAINAGE BOUNDARY	DA	RIPRAP INFLOW PROTECTION	RRP	TEMPORARY SOIL STABILIZATION MATTING-TYPE E	
NOTE: PLACE DESIGNATION (A-1, B-2, ETC.) ON FLOW CHANNEL SIDE OF DIKE.	<b>▲</b> A-I	RIPRAP OUTLET SEDIMENT TRAP ST III	ST-III	TEMPORARY SOIL STABILIZATION MATTING-TYPE D	
EMERGENCY SPILLWAY	ES	ROCK OUTLET PROTECTION I	ROPI	TEMPORARY STONE OUTLET STRUCTURE	<b>∜</b> SSS TSOS
EXISTING CONTOURS	<u> </u>	ROCK OUTLET PROTECTION II	ROPII	TEMPORARY SWALE  NOTE: PLACE DESIGNATION (A-1, B-2, ETC.) ON FLOW CHANNEL SIDE OF SWALE.	<b>♣</b> -I=
FILTER BAG	⊠ғв	ROCK OUTLET PROTECTION III	ROPIII	TREE PROTECTION FENCE	—— TPF ——
FILTER BERM	IFB-AI IFB-BI	SILT FENCE	⊢—— SF ——-	VERTICAL DRAW-DOWN DEVICE	VDDD
FILTER LOG  NOTE: DESIGNATION FL-18  REFERS TO FILTER LOG  WITH 18 INCH DIAMETER.	FL-18	SILT FENCE ON PAVEMENT	⊢—SF0P——I	WASH RACK OPTION	[MR]
GABION INFLOW PROTECTION	<b>GP G</b>	SOD	* * * * * * * * * * * * * * * * * * * *	WETLAND	• • • • •
GABION INLET PROTECTION	[GIP	STABILIZED CONSTRUCTION ENTRANCE (SCE)	SCE SCE	WETLAND BUFFER	— в ——
HORIZONTAL DRAW-DOWN DEVICE	HDDD	STANDARD INLET PROTECTION	[ SIP		
LIMIT OF DISTURBANCE	LOD	STOCKPILE AREA			





REVISIONS

HIGHWAY HYDRAULICS DIVISION

REPLACEMENT OF SMALL STRUCTURE NO. 09045X0

DOUBLE 36" DIA. REINFORCED CONCRETE PIPES

ON MD RTE. 331 (RHODESDALE VIENNA ROAD) AND RAMP 'CONCRETE PIPER

CARRYING A TRIBUTARY OF NANTICOKE RIVER



P.E. CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE
PREPARED OR APPROVED BY ME, AND THAT I AM
A DULY LICENSED PROFESSIONAL ENGINEER UNDE
THE LAWS OF THE STATE OF MARYLAND

LICENSE NO. 38855

EXPIRATION DATE: 06-09-2021

DESIGN CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH THE MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, THE 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUMES 1 & II INCLUDING SUPPLEMENTS, THE ENVIRONMENT ARTICLE SECTIONS 4–101 THROUGH 116 AND SECTIONS 4–201 AND 215, AND THE CODE OF MARYLAND REGULATIONS (COMAR) 26.17.01 AND COMAR 26.17.02 FOR EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT, RESPECTIVELY.

EROSION AND SEDIMENT CONTROL GENERAL NOTES

SCALE NTS
DATE \_\_\_\_JUNE 2019 \_\_\_\_CONTRACT NO. \_\_\_\_DO2035180

DESIGNED BY \_\_\_\_\_BPG \_\_\_\_\_COUNTY \_\_\_\_DORCHESTER \_\_\_\_\_\_

DRAWN BY \_\_\_\_\_BPG \_\_\_\_\_LOGMILE \_\_\_\_\_\_\_

CHECKED BY \_\_\_\_\_CSC \_\_\_\_\_\_HORIZONTAL SCALE \_\_\_\_\_\_\_\_

MDE/PRD \_\_\_\_\_17-PR-0100 \_\_\_\_\_\_\_

VERTICAL SCALE \_\_\_\_\_\_\_\_\_

DRAWING NO. \_\_\_\_\_\_\_\_\_\_

EN-01 OF 02 \_\_\_\_\_\_\_\_\_\_\_

SHEET NO. 15 OF 37

## SEQUENCE OF CONSTRUCTION

#### GENERAL SEQUENCE OF CONSTRUCTION NOTES:

- 1. THE CONTRACTOR SHALL CONTACT THE REGIONAL ENVIRONMENTAL COORDINATOR (REC) IN WRITING AND/OR BY TELEPHONE AT (410)365-0164 A MINIMUM OF SEVEN (7) DAYS PRIOR TO ANY EARTH DISTURBANCE TO SET UP A PRE-CONSTRUCTION MEETING BETWEEN PROJECT REPRESENTATIVES AND REPRESENTATIVES OF THE SHA QUALITY ASSURANCE DIVISION.
- 2. THE LIMITS OF DISTURBANCE MUST BE FIELD MARKED PRIOR TO CLEARING OF VEGETATION, INSTALLATION OF SEDIMENT CONTROL MEASURES, CONSTRUCTION OR OTHER LAND DISTURBING ACTIVITIES. ONLY AREAS WITHIN THE LOD MAY BE DISTURBED. NO DISTURBANCE OUTSIDE OF THE LOD SHOWN ON EROSION AND SEDIMENT CONTROL PLANS SHALL OCCUR.
- 3. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING MISS UTILITY TO MARK ALL UTILITIES WITHIN THE LIMIT OF DISTURBANCE. THE CONTRACTOR SHALL TEST PIT UTILITIES TO VERIFY THE DEPTH.
- 4. THE SEQUENCE OF CONSTRUCTION SHALL BE COORDINATED WITH THE MAINTENANCE OF TRAFFIC (MOT) PLANS.
- 5. NO IN-STREAM WORK IS PERMITTED BETWEEN MARCH 1 AND JUNE 15, INCLUSIVE.

### STAGE 1 SEQUENCE OF CONSTRUCTION (SHEET ES-01):

- 1. INSTALL TRAFFIC CONTROLS IN ACCORDANCE WITH MAINTENANCE OF TRAFFIC, STAGE 1 PLANS. DURING A 3-DAY NOAA DRY WEATHER FORECAST, PROCEED WITH INSTALLATION OF DIVERSION FENCES DF 1-1 AND 1-2, ROCK OUTLET PROTECTION 1-1, SANDBAG DIVERSIONS 1-1, 1-2, AND 1-3. UNDER A FLAGGING OPERATION, INSTALL SBD 1-4 TO PREVENT BACKWATER FROM INUNDATING THE WORK AREA AND INSTALL ROP 2-1 USING SAME DAY STABILIZATION. UPON INSTALLATION OF SANDBAG DIVERSIONS, INSTALL THE CLEAR WATER DIVERSION PUMP 1-1, 1-2, AND 1-3 AND PUMP OUTLET HOSES 1-1, 1-2, AND 1-3 IN ACCORDANCE WITH THE PLANS ON ES-01 AND EROSION AND SEDIMENT CONTROL DETAILS SHOWN ON ED-01, ENSURING A STABLE OUTLET DISCHARGE ONTO ROP 1-1. CLEARWATER DIVERSION PUMPS SHALL BE MONITORED 24 HOURS A DAY. INSTALL SUMP PIT SP-1-1 DURING DEWATERING AS REQUIRED DURING RECONSTRUCTION OF PROPOSED CULVERT.
- 2. REMOVE EXISTING ENDWALL AND PIPE WITHIN STAGE 1 LIMITS. INSTALL UPSTREAM ENDWALL PER PLANS. BLOCK PIPE OPENING FOR THE REMAINING STAGES OF WORK TO PREVENT SEDIMENT LADEN RUNOFF FROM DRAINING INTO THE PIPES. PROCEED WITH CULVERT REPLACEMENT BEGINNING AT THE UPSTREAM ENDWALL AND WORKING DOWNSTREAM TO THE WESTERN EDGE OF MD 331. INSTALL UPSTREAM RIPRAP APRON. INSTALL THE FULL DEPTH PAVEMENT REPLACEMENT IN ACCORDANCE WITH THE PLANS.
- 3. COMPLETE TEMPORARY STABILIZATION OF ALL STAGE 1 WORK AREAS. ALL STAGE 1 EROSION AND SEDIMENT CONTROLS SHALL REMAIN IN PLACE THROUGHOUT CONSTRUCTION.

## STAGE 2 SEQUENCE OF CONSTRUCTION (SHEET ES-02):

1. INSTALL TRAFFIC CONTROL IN ACCORDANCE WITH MAINTENANCE OF TRAFFIC STAGE 2 PLANS. CONTINUE CULVERT REPLACEMENT WORKING UPSTREAM TO DOWNSTREAM FOR STAGE 2 CONSTRUCTION PER THE MOT PLANS REMOVING EXISTING PIPE CONCURRENTLY. UPON COMPLETION OF CULVERT REPLACEMENT, INSTALL THE FULL DEPTH PAVEMENT REPLACEMENT IN ACCORDANCE WITH THE PLANS.

## STAGE 3 SEQUENCE OF CONSTRUCTION (SHEET ES-03):

1. INSTALL TRAFFIC CONTROL IN ACCORDANCE WITH MAINTENANCE OF TRAFFIC STAGE 3 PLANS. CONTINUE CULVERT REPLACEMENT WORKING UPSTREAM TO DOWNSTREAM FOR STAGE 3 CONSTRUCTION PER THE MOT PLANS REMOVING EXISTING PIPE CONCURRENTLY. UPON COMPLETION OF CULVERT REPLACEMENT, INSTALL THE FULL DEPTH PAVEMENT REPLACEMENT IN ACCORDANCE WITH THE PLANS.

## SEQUENCE OF CONSTRUCTION CONTINUED

#### STAGE 4 SEQUENCE OF CONSTRUCTION (SHEET ES-04):

- 1. INSTALL TRAFFIC CONTROLS IN ACCORDANCE WITH MAINTENANCE OF TRAFFIC, STAGE 4 PLANS. DURING A 3-DAY NOAA DRY WEATHER FORECAST, REMOVE SBD 1-4, PROCEED WITH INSTALLATION SANDBAG DIVERSIONS 2-1 AND 2-2. UPON INSTALLATION OF SANDBAG DIVERSIONS, INSTALL THE CLEAR WATER DIVERSION PUMP 2-1 AND PUMP OUTLET HOSE 2-1 IN ACCORDANCE WITH THE PLANS ON ES-02 AND EROSION AND SEDIMENT CONTROL DETAILS SHOWN ON ED-01, ENSURING A STABLE OUTLET DISCHARGE ONTO ROP 2-1. CLEARWATER DIVERSION PUMPS SHALL BE MONITORED 24 HOURS A DAY. INSTALL SUMP PIT SP-2-1 DURING RECONSTRUCTION OF PROPOSED CULVERT.
- 2. REMOVE EXISTING ENDWALL AND PIPE WITHIN THE LIMITS OF STAGE 4 CONSTRUCTION. PROCEED WITH CULVERT REPLACEMENT BEGINNING AT THE WESTERN EDGE OF MD 331 (LIMIT OF PREVIOUS STAGE 3 CONSTRUCTION) AND WORKING DOWNSTREAM. INSTALL DOWNSTREAM ENDWALL AND RIPRAP APRON. UPON COMPLETION OF THE CULVERT REPLACEMENT SHOWN IN STAGE 4, INSTALL THE FULL DEPTH PAVEMENT REPLACEMENT IN ACCORDANCE WITH THE PLANS.
- 3. PERFORM FINAL STABILIZATION OPERATIONS. UPON THE APPROVAL OF THE REC, UNDER A FLAGGING OPERATION UNBLOCK UPSTREAM PIPE OPENING AND REMOVE ALL EROSION AND SEDIMENT CONTROL DEVICES. THE AREA DISTURBED BY THE REMOVAL PROCESS SHALL BE STABILIZED IMMEDIATELY. ROP 2–1 SHALL NOT BE REMOVED AND REMAIN AS PERMANENT OUTFALL PROTECTION FOR THE EXISTING 36" CMP.
- 4. INSTALL ALL W-BEAM TRAFFIC BARRIER ALONG MD 331 ACCORDING TO PLANS, IMMEDIATELY STABILIZING ALL DISTURBED AREAS.

MDOT SHA Stormwater Management & Sediment Control Final Approval

Chief, Plan Review Division PRD No. 17-PR-0100

Expiration Date: 10/16/2022

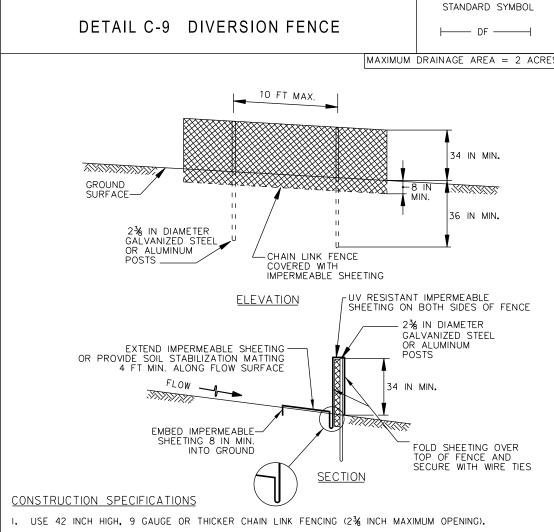
HIGHWAY HYDRAULICS DIVISION



REPLACEMENT OF SMALL STRUCTURE NO. 09045X0
DOUBLE 36" DIA. REINFORCED CONCRETE PIPES
ON MD RTE. 331 (RHODESDALE VIENNA ROAD) AND RAMP '(
CARRYING A TRIBUTARY OF NANTICOKE RIVER

REVISIONS	EROSION	AND SEDIMEN	IT CONTR	OL GENERAL NOTES
	SCALE NTS	DATEJUI	<u>NE 2019</u> C	ONTRACT NO. <u>DO2035180</u>
	DESIGNED BY_	BPG	COUNTY_	DORCHESTER
	DRAWN BY	BPG	LOGMILE	
	CHECKED BY _	CSC	HORIZON	FAL SCALE
	MDE/PRD	17-PR-0100	VERTICAL	SCALE
	DRAWING NO.	EN-02	OF <b>02</b>	SHEET NO. 16 OF 37

Whitman, Requardt & Associates, LLP
801 South Caroline Street, Baltimore, Maryland 21231

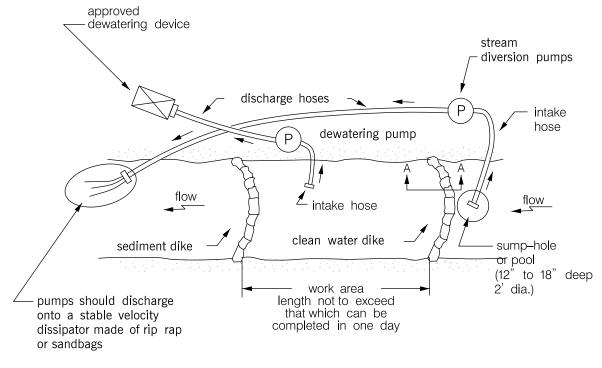


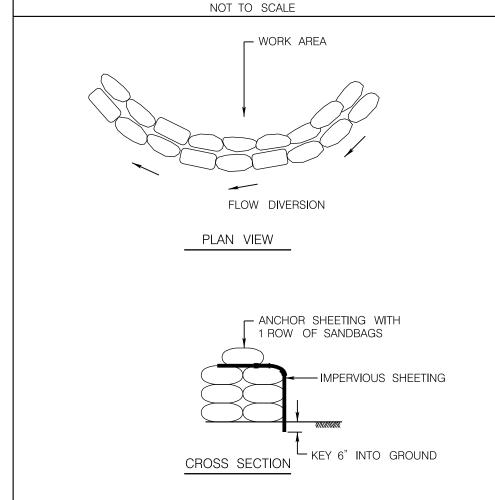
- 2. USE 2% INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN IO FEET APART. THE POSTS DO NOT NEED TO BE SET IN
- 3. FASTEN CHAIN LINK FENCE SECURELY TO THE FENCE POSTS WITH WIRE TIES.
- 4. SECURE IO MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING TO CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT TOP, MID SECTION, AND BELOW GROUND SURFACE.
- . EXTEND SHEETING A MINIMUM OF 4 FEET ALONG FLOW SURFACE AND EMBED END A MINIMUM OF 8 INCHES INTO GROUND. SOIL STABILIZATION MATTING MAY BE USED IN LIEU OF IMPERMEABLE SHEETING ALONG FLOW SURFACE.
- 6. WHEN TWO SECTIONS OF SHEETING ADJOIN EACH OTHER, OVERLAP BY 6 INCHES AND FOLD WITH SEAM
- . KEEP FLOW SURFACE ALONG DIVERSION FENCE AND POINT OF DISCHARGE FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE. REPLACE IMPERMEABLE SHEETING IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

### DETAIL 1.2: PUMP-AROUND PRACTICE

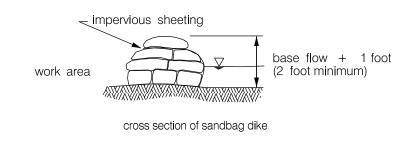
#### PLAN VIEW



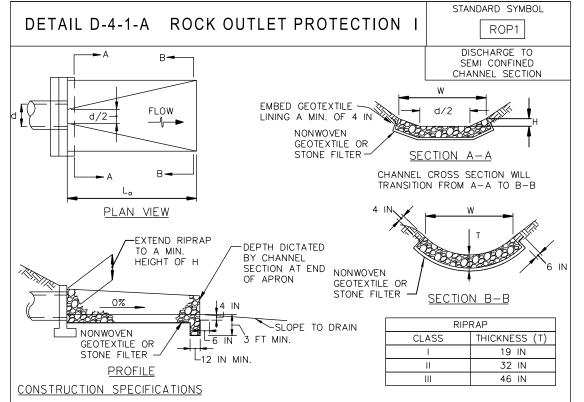


SANDBAG DIVERSION DETAIL

#### SECTION A-A



## REVISED NOVEMBER 2000



- RIPRAP AND STONE MUST CONFORM TO THE SPECIFIED CLASS.
- USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-I MATERIALS, AND PROTECT FROM PUNCTURING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE TOGETHER.
- PREPARE THE SUBGRADE FOR GEOTEXTILE OR STONE FILTER (3/4 TO 1/2 INCH STONE FOR 6 INCH MINIMUM DEPTH) AND RIPRAP TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
- EXTEND GEOTEXTILE AT LEAST 6 INCHES BEYOND EDGES OF RIPRAP AND EMBED AT LEAST 4 INCHES AT CONSTRUCT RIPRAP OUTLET TO FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. PLACE STONE FOR RIPRAP OUTLET IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENOUS WITH THE SMALLER STONES AND SPALLS
- TO THE STONE FILTER BLANKET OR GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY. WHERE NO ENDWALL IS USED, CONSTRUCT THE UPSTREAM END OF THE APRON SO THAT THE WIDTH IS TWO TIMES THE DIAMETER OF THE OUTLET PIPE, AND EXTEND THE STONE UNDER THE OUTLET BY A

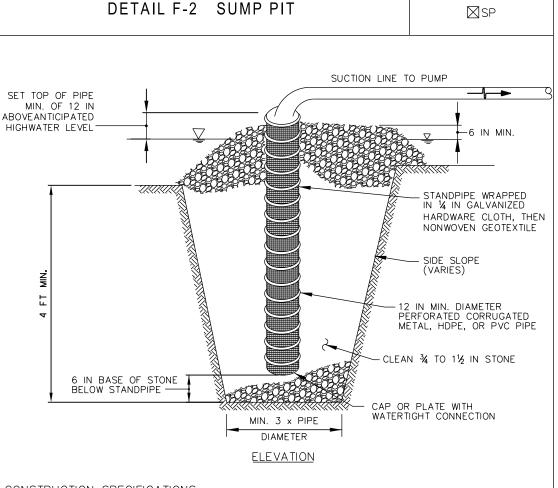
FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE RIPRAP IN A MANNER TO PREVENT DAMAGE

- MINIMUM OF 18 INCHES.
- THAT IT BLENDS IN WITH EXISTING GROUND.

CONSTRUCT APRON WITH 0% SLOPE ALONG ITS LENGTH AND WITHOUT OBSTRUCTIONS. PLACE STONE SO

MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.

MARYLAND STANDARDS AND SPE	CIFICATIONS FOR SOIL EF	ROSION AND SEDIMENT	CONTROL
U.S. DEPARTMENT OF AGRICULTURE	2011	MARYLAND DEPARTMEN	



STANDARD SYMBOL

## CONSTRUCTION SPECIFICATIONS

- USE 12 INCH OR LARGER DIAMETER CORRUGATED METAL, HDPE, OR PVC PIPE WITH 1 INCH DIAMETER PERFORATIONS, 6 INCHES ON CENTER. BOTTOM OF PIPE MUST BE CAPPED WITH WATERTIGHT SEAL. WRAP PIPE WITH 1/4 INCH GALVANIZED HARDWARE CLOTH AND WRAP NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVER THE HARDWARE CLOTH.
- EXCAVATE PIT TO THREE TIMES THE PIPE DIAMETER AND FOUR FEET IN DEPTH. PLACE ¼ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE, 6 INCHES IN DEPTH PRIOR TO PIPE PLACEMENT.
- . SET TOP OF PIPE MINIMUM 12 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION. . BACKFILL PIT AROUND THE PIPE WITH ¾ TO 1½ INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE AND EXTEND STONE A MINIMUM OF 6 INCHES ABOVE ANTICIPATED WATER SURFACE
- . DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
- '. A SUMP PIT REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, REMOVE PERFORATED PIPE AND REPLACE GEOTEXTILE AND STONE. KEEP POINT OF DISCHARGE FREE OF EROSION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL MARYLAND DEPARTMENT OF ENVIRONMENT NATURAL RESOURCES CONSERVATION SERVICE WATER MANAGEMENT ADMINISTRATION

#### Maryland's Guidelines to Waterway Construction DETAIL 1.2: PUMP-AROUND PRACTICE

#### DESCRIPTION

THE WORK SHOULD CONSIST OF INSTALLING A TEMPORARY PUMP AROUND AND SUPPORTING MEASURES TO DIVERT FLOW AROUND INSTREAM CONSTRUCTION SITES.

#### IMPLEMENTATION SEQUENCE:

SEDIMENT CONTROL MEASURES, PUMP-AROUND PRACTICES, AND ASSOCIATED CHANNEL AND BANK CONSTRUCTION SHOULD BE COMPLETED IN THE FOLLOWING SEQUENCE (REFER TO DETAIL 1.2):

CONSTRUCTION ACTIVITIES INCLUDING THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES SHOULD NOT BEGIN UNTIL ANY NECESSARY EASEMENTS AND OR RIGHT-OF-WAYS HAVE BEEN ACQUIRED. ALL EXISTING UTILITIES SHOULD BE MARKED IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR S RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES THAT MAY RESULT FROM CONSTRUCTION AND SHOULD REPAIR THE DAMAGE AT HER/HIS OWN EXPENSE TO THE COUNTY'S OR UTILITY COMPANY'S SATISFACTION.

2.THE CONTRACTOR SHOULD NOTIFY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT OR WMA SEDIMENT CONTROL INSPECTOR AT LEAST 5 DAYS BEFORE BEGINNING CONSTRUCTION. ADDITIONALLY, THE CONTRACTOR SHOULD INFORM THE LOCAL ENVIRONMENTAL PROTECTION AND RESOURCE MANAGEMENT INSPECTION AND RESOURCE MANAGEMENT INSPECTION AND ENFORCEMENT DIVISION AND THE PROVIDER OF LOCAL UTILITES A MINIMUM OF 48 HOURS BEFORE STARTING CONSTRUCTION.

3.THE CONTRACTOR SHOULD CONDUCT A PRE-CONSTRUCTION MEETING ON SITE WITH THE WMA SEDIMENT CONTROL INSPECTOR, THE COUNTY PROJECT MANAGER, AND THE ENGINEER TO REVIEW LIMITS OF DISTURBANCE, EROSION AND SEDIMENT CONTROL REQUIREMENTS, AND THE SEQUENCE OF CONSTRUCTION. THE CONTRACTOR SHOULD STAKE OUT ALL LIMITS OF DISTURBANCE PRIOR TO THE PRE-CONSTRUCTION MEETING SO THEY MAY BE REVIEWED. THE PARTICIPANTS WILL ALSO DESIGNATE THE CONTRACTOR'S STAGING AREAS AND FLAG ALL TREES WITHIN THE LIMIT OF DISTURBANCE WHICH WILL BE REMOVED FOR CONSTRUCTION ACCESS. TREES SHOULD NOT BE REMOVED WITHIN THE LIMIT OF DISTURBANCE WITHOUT APPROVAL FROM THE WMA OR LOCAL AUTHORITY.

4.CONSTRUCTION SHOULD NOT BEGIN UNTIL ALL SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED AND APPROVED BY THE ENGINEER AND THE SEDIMENT CONTROL INSPECTOR. THE CONTRACTOR SHOULD STAY WITHIN THE LIMITS OF DISTURBANCE AS SHOWN ON THE PLANS AND MINIMIZE DISTURBANCE WITHIN THE WORK AREA WHENEVER POSSIBLE.

5.UPON INSTALLATION OF ALL SEDIMENT CONTROL MEASURES AND APPROVAL BY THE SEDIMENT CONTROL INSPECTOR AND THE LOCAL ENVIRONMENTAL PROTECTION AND RESOURCE MANAGEMENT INSPECTION AND ENFORCEMENT DIVISION, THE CONTRACTOR SHOULD BEGIN WORK AT THE UPSTREAM SECTION AND PROCEED DOWNSTREAM BEGINNING WITH THE ESTABLISHMENT OF STABILIZED CONSTRUCTION ENTRANCES. IN SOME CASES. WORK MAY BEGIN DOWNSTREAM IF APPROPRIATE. THE SEQUENCE OF CONSTRUCTION MUST BE FOLLOWED UNLESS THE CONTRACTOR GETS WRITTEN APPROVAL FOR DEVEIATIONS FROM THE WMA OR LOCAL AUTHORITY. WORK SHOULD NOT BE CONDUCTED IN THE CHANNEL DURING RAIN EVENTS. THE PUMP AROUND SHALL REMAIN IN PLACE FOR THE DURATION OF THE CULVERT REPLACEMENT AND SHALL BE MANNED OCNINUOUSLY 24 HOURS PER DAY WHILE IN USE.

6.SANDBAG DIKES SHOULD BE SITUATED AT THE UPSTREAM AND DOWNSTREAM ENDS OF THE WORK AREA AS SHOWN ON THE PLANS, AND STREAM FLOW SHOULD BE PUMPED AROUND THE WORK AREA. THE PUMP SHOULD DISCHARGE ONTO A STABLE VELOCITY DISSIPATER MADE OF RIPRAP OR SANBAGS.

7.WATER FROM THE WORK AREA SHOULD BE PUMPED TO A SEDIMENT FILTERING MEASURE SUCH AS A DEWATERING BASIN SEDIMENT BAG OR OTHER APPROVED SOURCE. THE MEASURE SHOULD BE LOCATED SUCH THAT THE WATER DRAINS BACK INTO THE CHANNEL BELOW THE DOWNSTREAM SANDBAG DIKE.

8.TRAVERSING A CHANNEL REACH WITH EQUIPMENT WITHIN THE WORK AREA WHERE NO WORK IS PROPOSED SHOULD BE AVOIDED. IF EQUIPMENT HAS TO TRAVERSE SUCH A REACH FOR ACCESS TO ANOTHER AREA, THEN IMPER MATS OR SIMILAR MEASURES SHOULD BE USED TO MINIMIZE DISTURBANCE TO THE CHANNEL. TEMPORARY STREAM CROSSINGS SHOULD BE USED ONLY WHEN NECESSARY AND ONLY WHERE NOTED ON THE PLANS OR SPECIFIED (SEE SECTION 4, STREAM CROSSINGS, MARYLAND GUIDELINES TO WATERWAY CONSTRUCTION.

9.ALL STREAM RESTORATION MEASURES SHOULD BE INSTALLED AS INDICATED BY THE PLANS AND ALL BANKS GRADED IN ACCORDANCE WITH THE GRADING PLANS AND TYPICAL CROSS SECTIONS.

O.AFTER AN AREA IS COMPLETED AND STABILIZED, THE CLEAN WATER DIKE SHOULD BE REMOVED. AFTER THE FIRST SEDIMENT FLUSH, A NEW CLEAN WATER DIKE SHOULD BE ESTABLISHED UPSTREAM FROM THE OLD SEDIMENT DIKE. FINALLY, UPON ESTABLISHMENT OF A NEW SEDIMENT DIKE BELOW THE OLD ONE, THE OLD SEDIMENT DIKE SHOULD BE REMOVED.

II.A PUMP AROUND MUST BE INSTALLED ON ANY TRIBUTARY OR STROM DRAIN OUTFALL WHICH CONTRIBUTES BASEFLOW TO THE WORK AREA. THIS SHOULD BE ACCOMPLISHED BY LOCATING A SANDBAG DIKE AT THE DOWNSTREAM END OF THE TRIBUTARY OR STORM DRAIN OUTFALL AND PUMPING THE STREAM FLOW AROUND THE WORK AREA. THIS WATER SHOULD DISCHARGE ONTO THE SAME VELOCITY DISSIPATER USED FOR THE MAIN STEM PUMP AROUND.

12, F A TRIBUTARY IS TO BE RESTORED, CONSTRUCTION SHOULD TAKE PLACE ON THE TRIBUTARY BEFORE WORK ON THE MAIN STEM REACHES THE TRIBUTARY CONFLUENCE. CONSTRUCTION IN THE TRIBUTARY, INCLUDING PUMP AROUND PRACTICES, SHOULD FOLLOW THE SAME SEQUENCE AS FOR THE MAIN STEM OF THE RIVER OR STREAM. WHEN CONSTRUCTION ON THE TRIBUTAF ON THE MAIN STEM SHOULD RESUME. WATER FROM THE TRIBUTARY SHOULD CONTINUE TO BE PUMPED

3.THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ACCESS TO AND MAINTAINING ALL EROSION AND

AROUND THE WORK AREA IN THE MAIN STEM.

PLANTING PLAN.

SEDIMENT CONTROL DEVICES UNTIL THE SEDIMENT CONTROL INSPECTOR APPROVES THEIR REMOVAL. 14.AFTER CONSTRUCTION. ALL DISTURBED AREAS SHOULD BE REGRADED AND REVEGETATED AS PER THE

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

TEMPORARY INSTREAM MARYLAND DEPARTMENT OF ENVIRONMENT CONSTRUCTION MEASURES WATER MANAGEMENT ADMINISTRATION

> MDOT SHA Stormwater Management & Sediment Control Chief, Plan Review Division Expiration Date: 10/16/2022 PRD No. 17-PR-0100



STATE HIGHWAY

**ADMINISTRATION** 

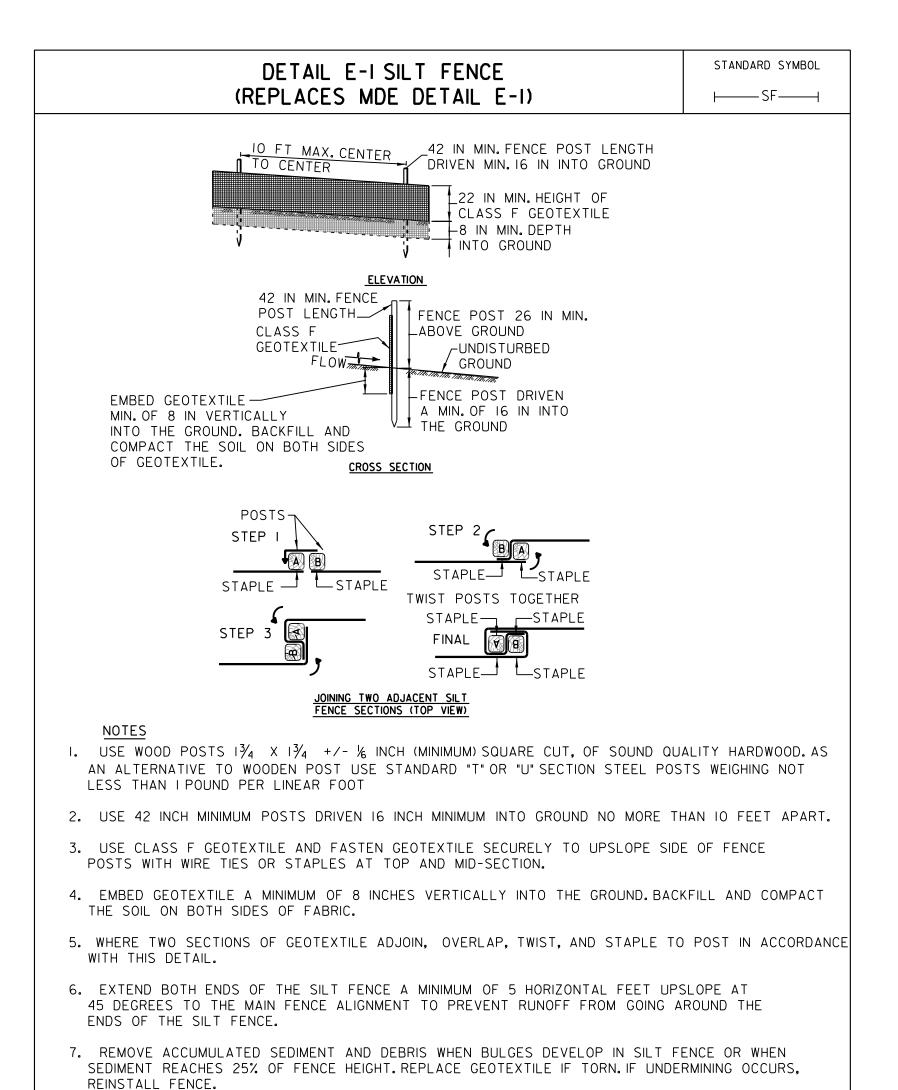
HIGHWAY HYDRAULICS DIVISION

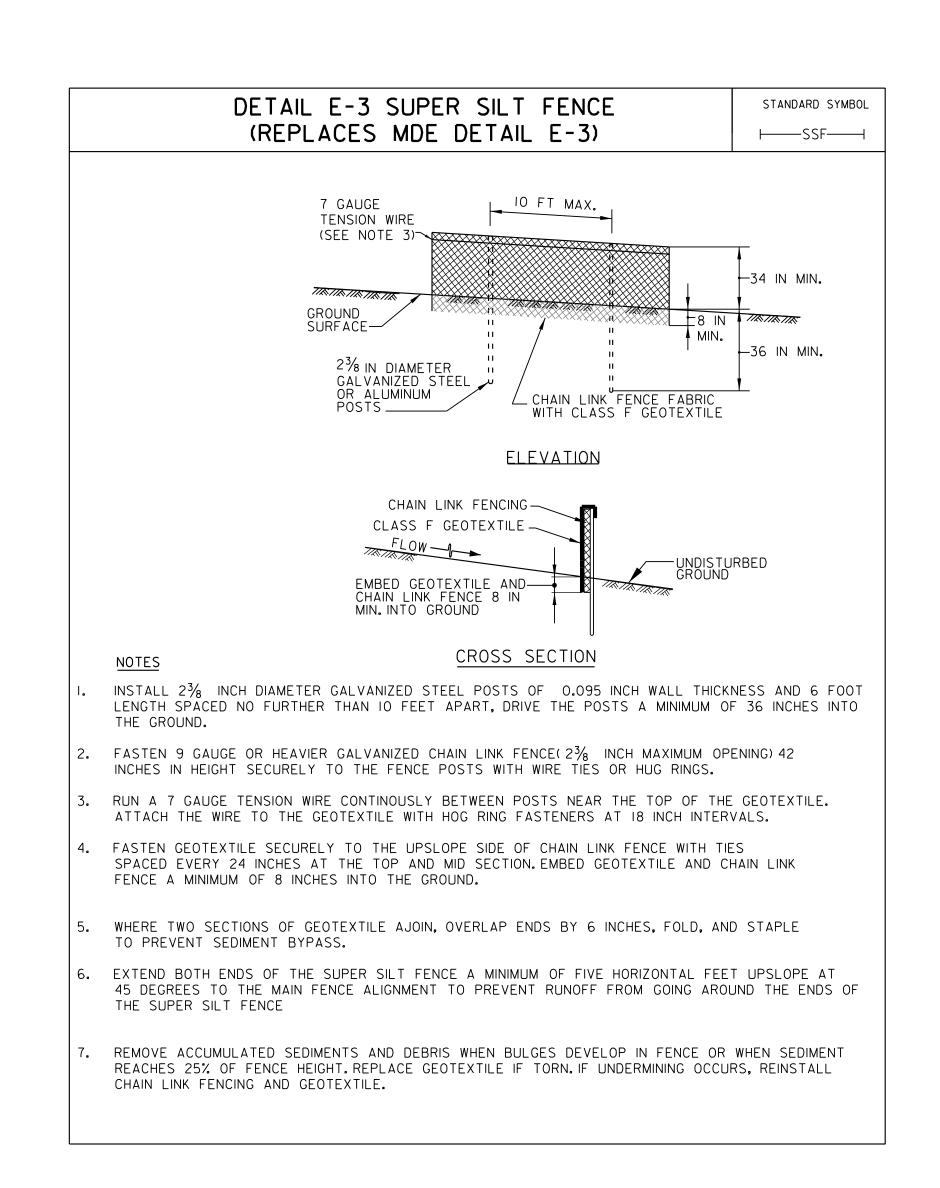
REPLACEMENT OF SMALL STRUCTURE NO. 09045X0 DOUBLE 36" DIA. REINFORCED CONCRETE PIPES ON MD RTE. 331 (RHODESDALE VIENNA ROAD) AND RAMP '( CARRYING A TRIBUTARY OF NANTICOKE RIVER

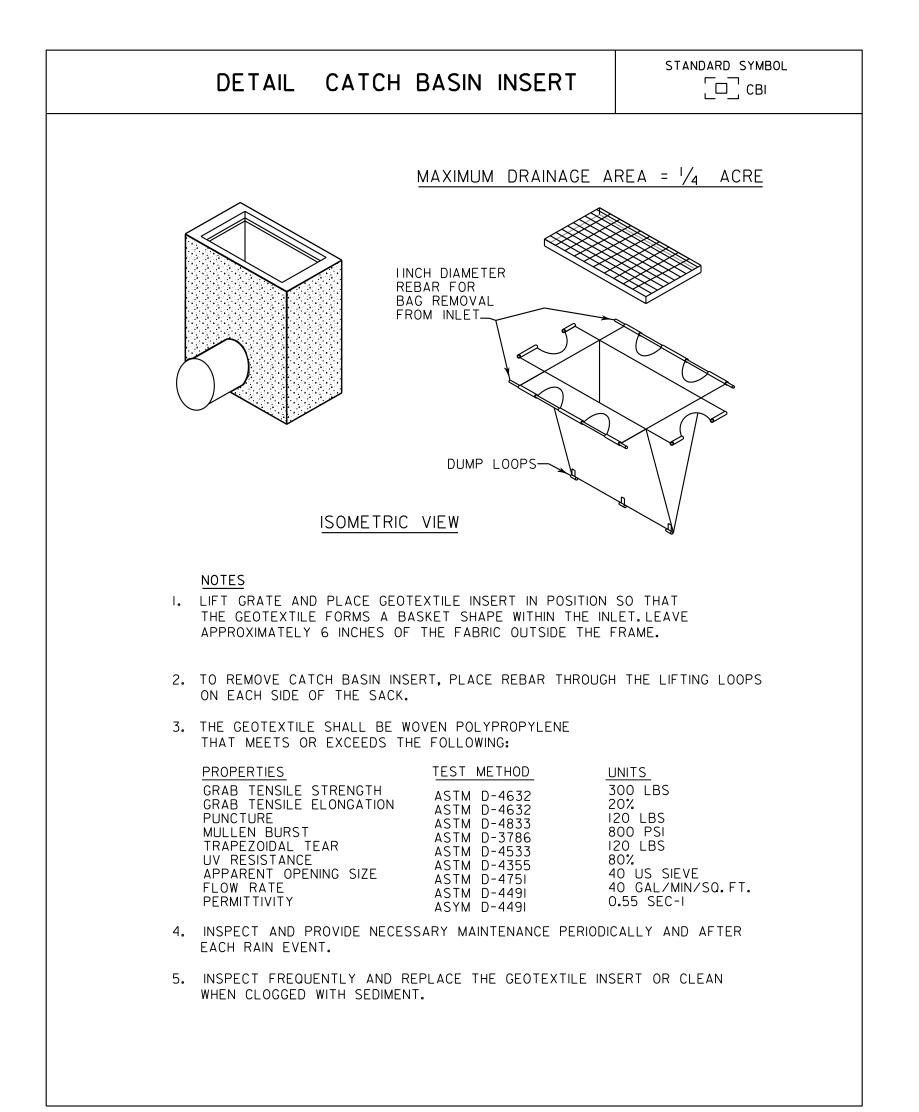
REVISIONS	EROSION	AND SE	DIMENT (	CONTROL	<b>DETAILS</b>
	SCALE NTS	DATE	JUNE 2019	CONTRACT NO	DO2035180
	DESIGNED BY	BPG	_ COUNTY	/DORCHI	ESTER
	DRAWN BY	BPG	LOGMILI	E	
	CHECKED BY	CSC	_ HORIZO	NTAL SCALE	
	MDE/PRD	17-PR-0100	_ VERTICA	AL SCALE	
	DRAWING NO.	ED-01	OF <b>04</b>	SHEET NO.	17 OF 37

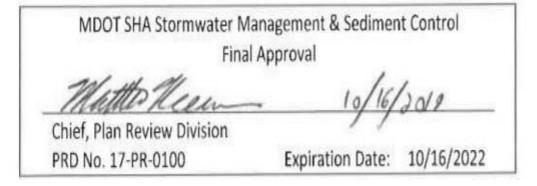
Whitman, Requardt & Associates, LLP 801 South Caroline Street, Baltimore, Maryland 21231

# EROSION AND SEDIMENT CONTROL - DETAILS











**ADMINISTRATION** 

## HIGHWAY HYDRAULICS DIVISION

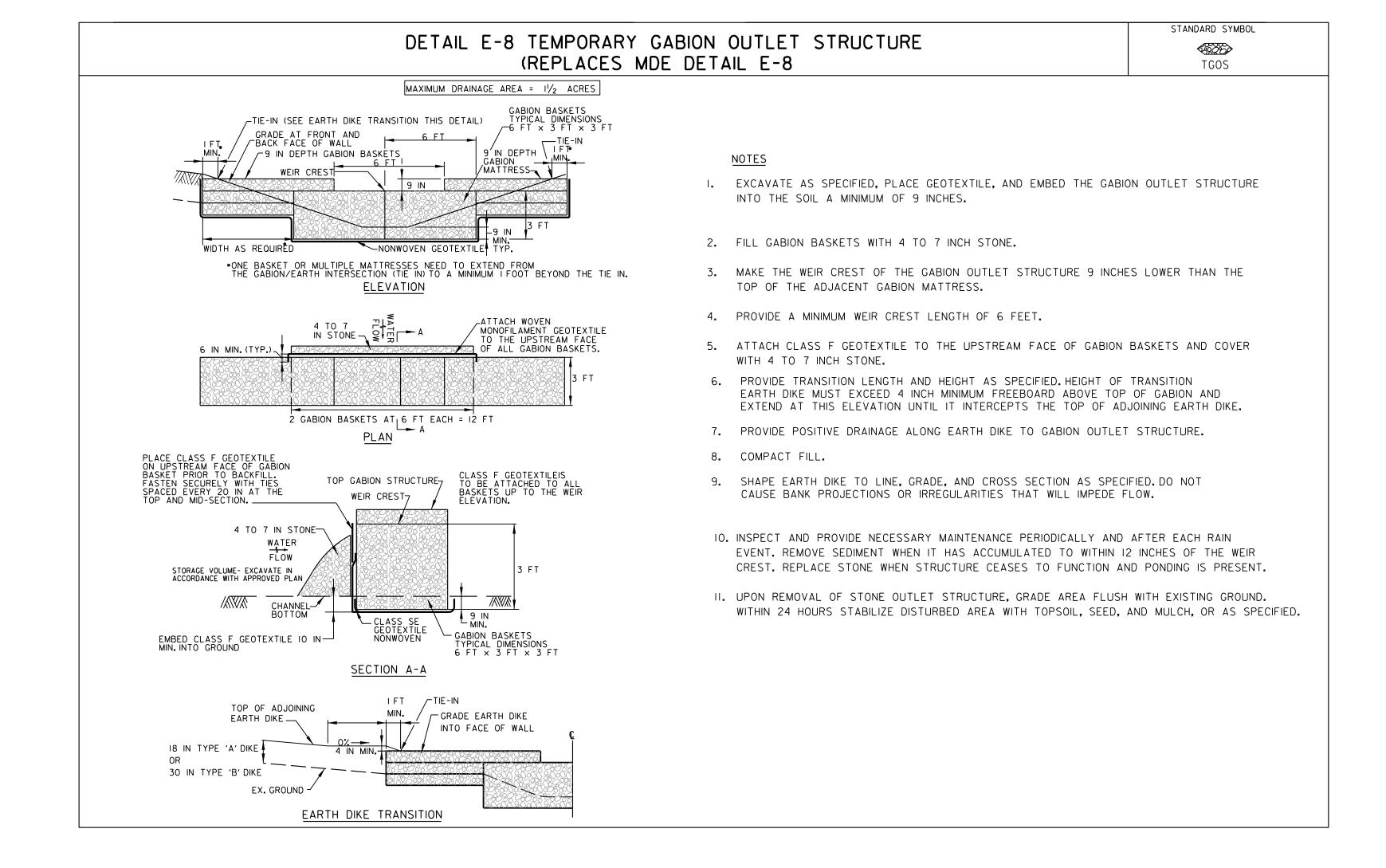
REPLACEMENT OF SMALL STRUCTURE NO. 09045X0 DOUBLE 36" DIA. REINFORCED CONCRETE PIPES ON MD RTE. 331 (RHODESDALE VIENNA ROAD) AND RAMP '( CARRYING A TRIBUTARY OF NANTICOKE RIVER

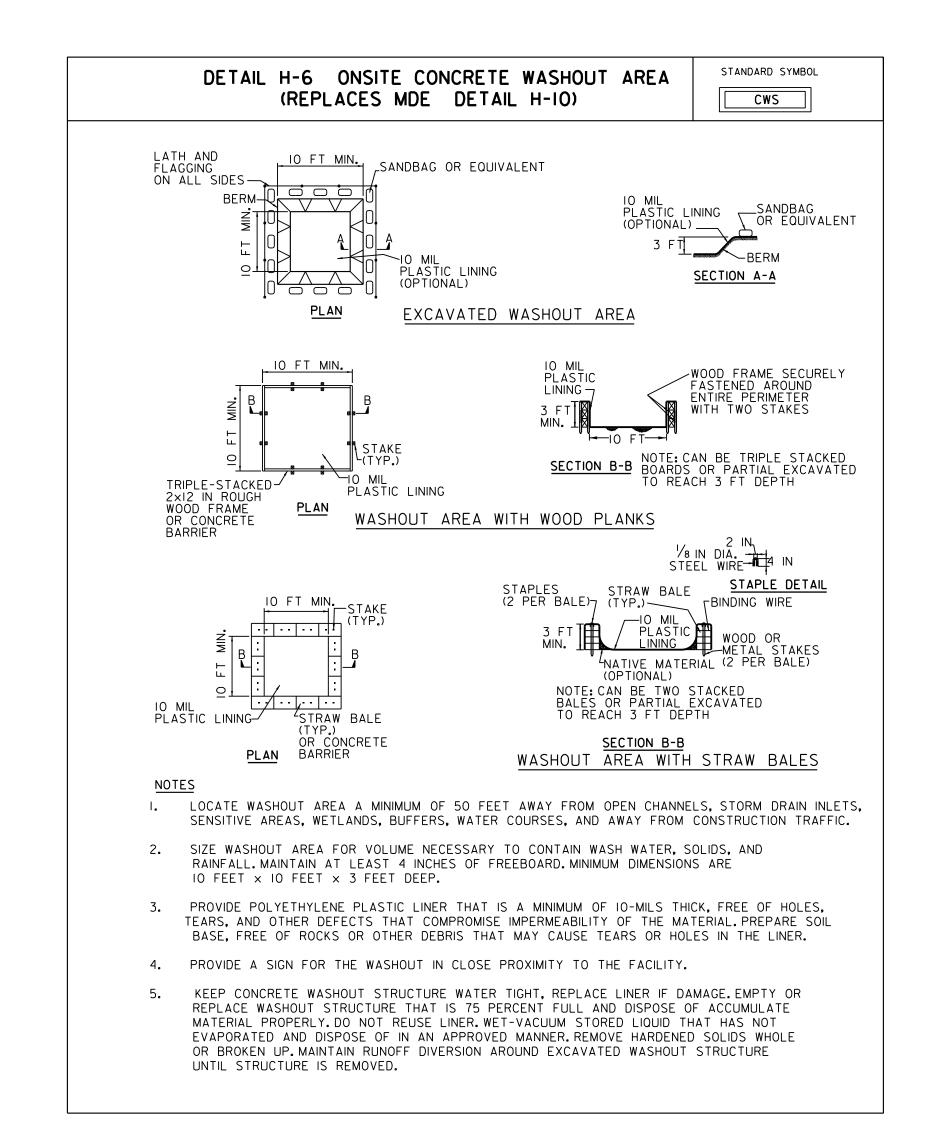
AND	<b>SEDIMENT</b>	CONTROL	<b>DETAILS</b>
DATE	JUNE 2019	_ CONTRACT NO	DO2035180
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REVISIONS	<b>EROSION</b>	AND SEC	DIMENT	CONTROL	<b>DETAILS</b>
	SCALE NTS	DATE	JUNE 2019	_ CONTRACT NO	DO2035180
	DESIGNED BY	BPG	COUN	TY DORCHE	ESTER
	DRAWN BY	BPG	LOGMI	LE	
	CHECKED BY	CSC	HORIZ	ONTAL SCALE	
	MDE/PRD	17-PR-0100	VERTIC	CAL SCALE	
	DRAWING NO.	ED-02	OF <b>04</b>	SHEET NO.	18 OF 37



# EROSION AND SEDIMENT CONTROL - DETAILS





MDOT SHA Stormwater Management & Sediment Control Final Approval Chief, Plan Review Division Expiration Date: 10/16/2022 PRD No. 17-PR-0100

MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY

**ADMINISTRATION** 

HIGHWAY HYDRAULICS DIVISION

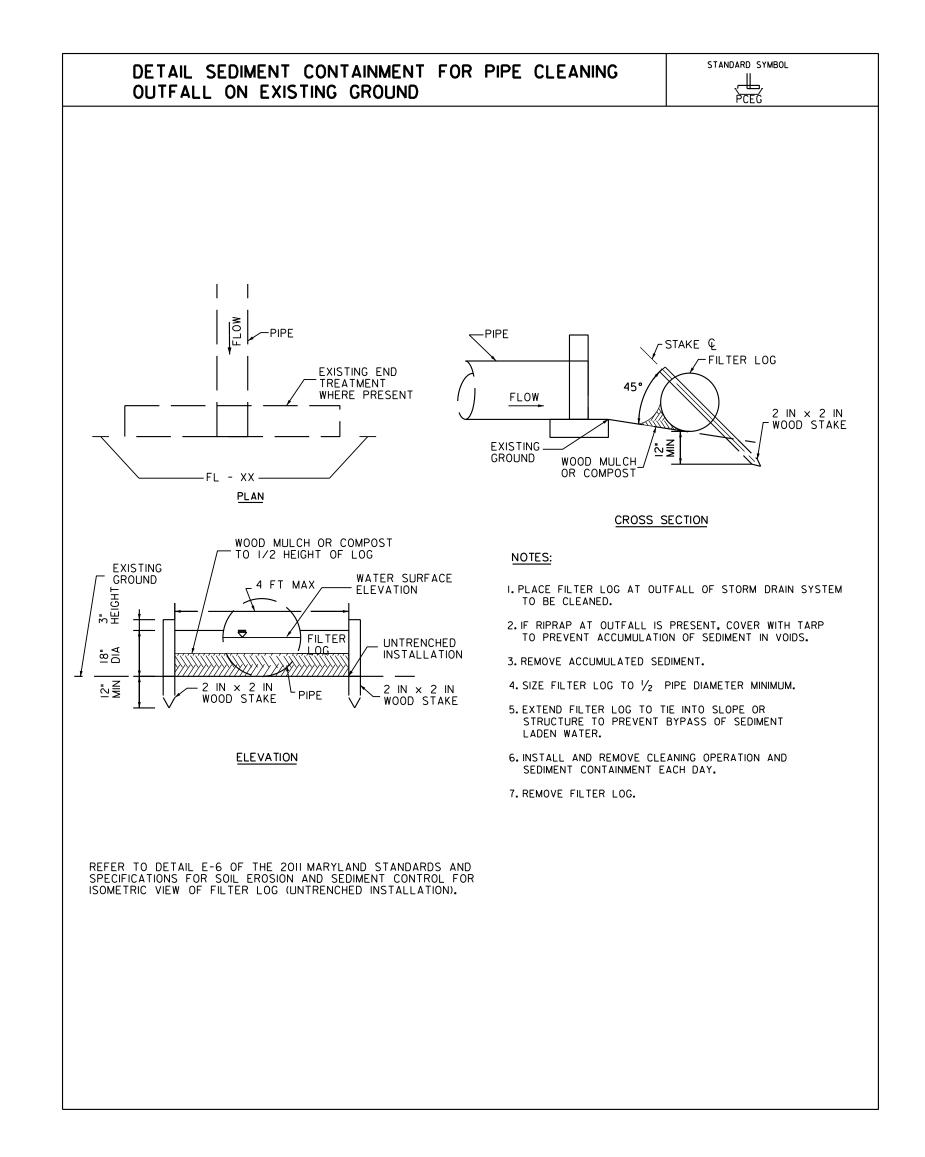
REPLACEMENT OF SMALL STRUCTURE NO. 09045X0 DOUBLE 36" DIA. REINFORCED CONCRETE PIPES ON MD RTE. 331 (RHODESDALE VIENNA ROAD) AND RAMP '

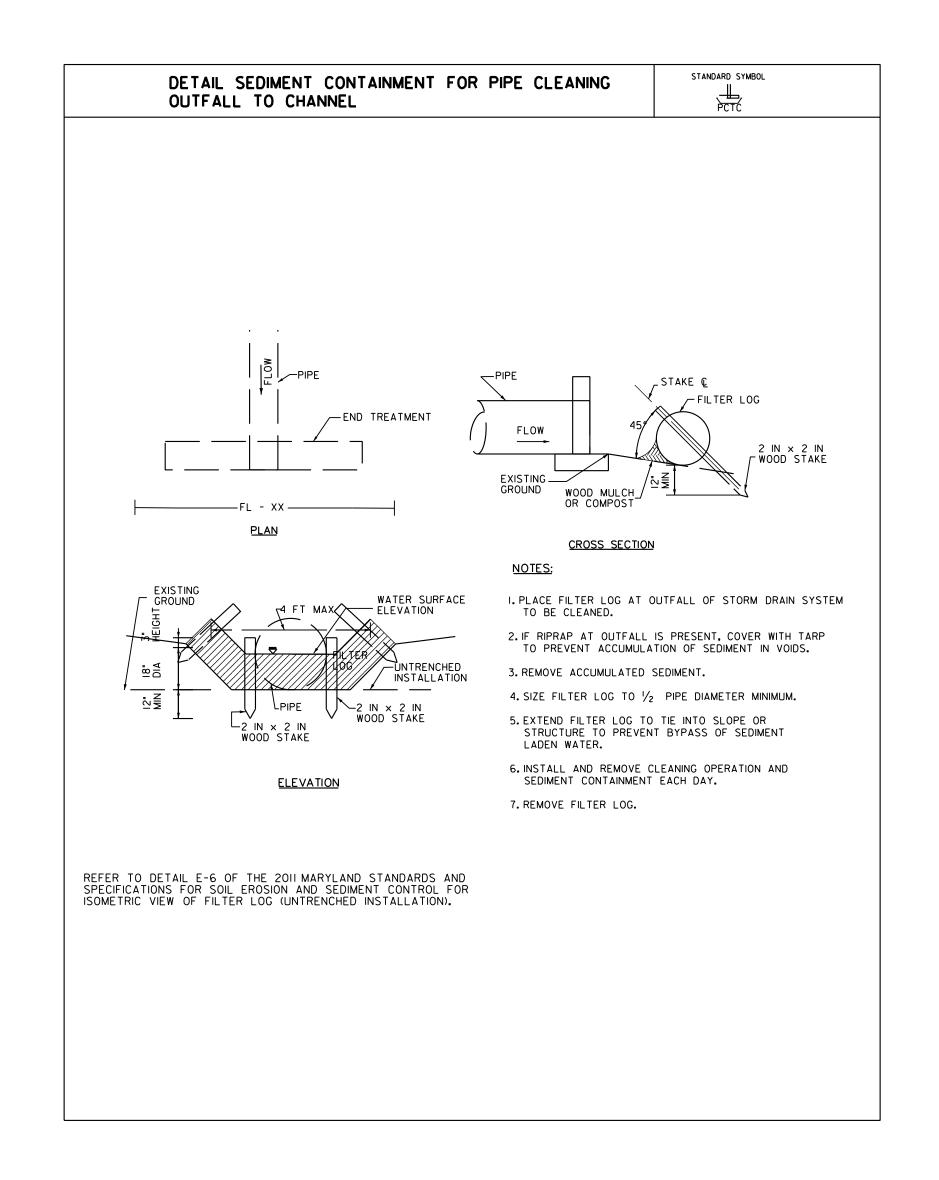
CARRYING A TRIBUTARY OF NANTICOKE RIVER

**EROSION AND SEDIMENT CONTROL DETAILS** REVISIONS DATE JUNE 2019 CONTRACT NO. DO2035180 DESIGNED BY \_\_ COUNTY \_\_\_ DORCHESTER LOGMILE CSC HORIZONTAL SCALE \_ CHECKED BY \_\_\_\_ MDE/PRD \_\_\_\_ 17-PR-0100 VERTICAL SCALE \_ ED-03 OF 04 DRAWING NO. SHEET NO. 19 OF 37



# EROSION AND SEDIMENT CONTROL - DETAILS









**ADMINISTRATION** 

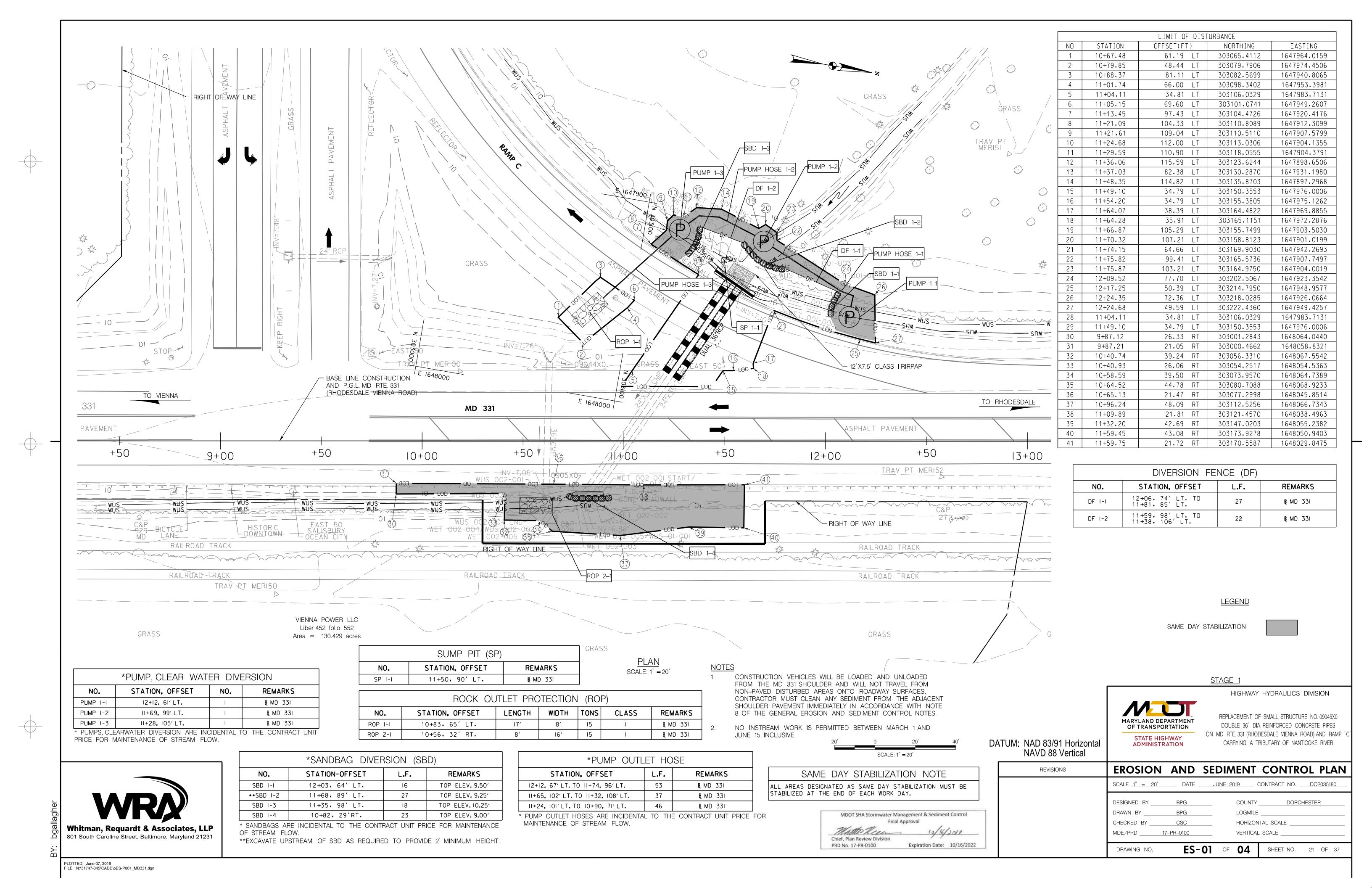
HIGHWAY HYDRAULICS DIVISION

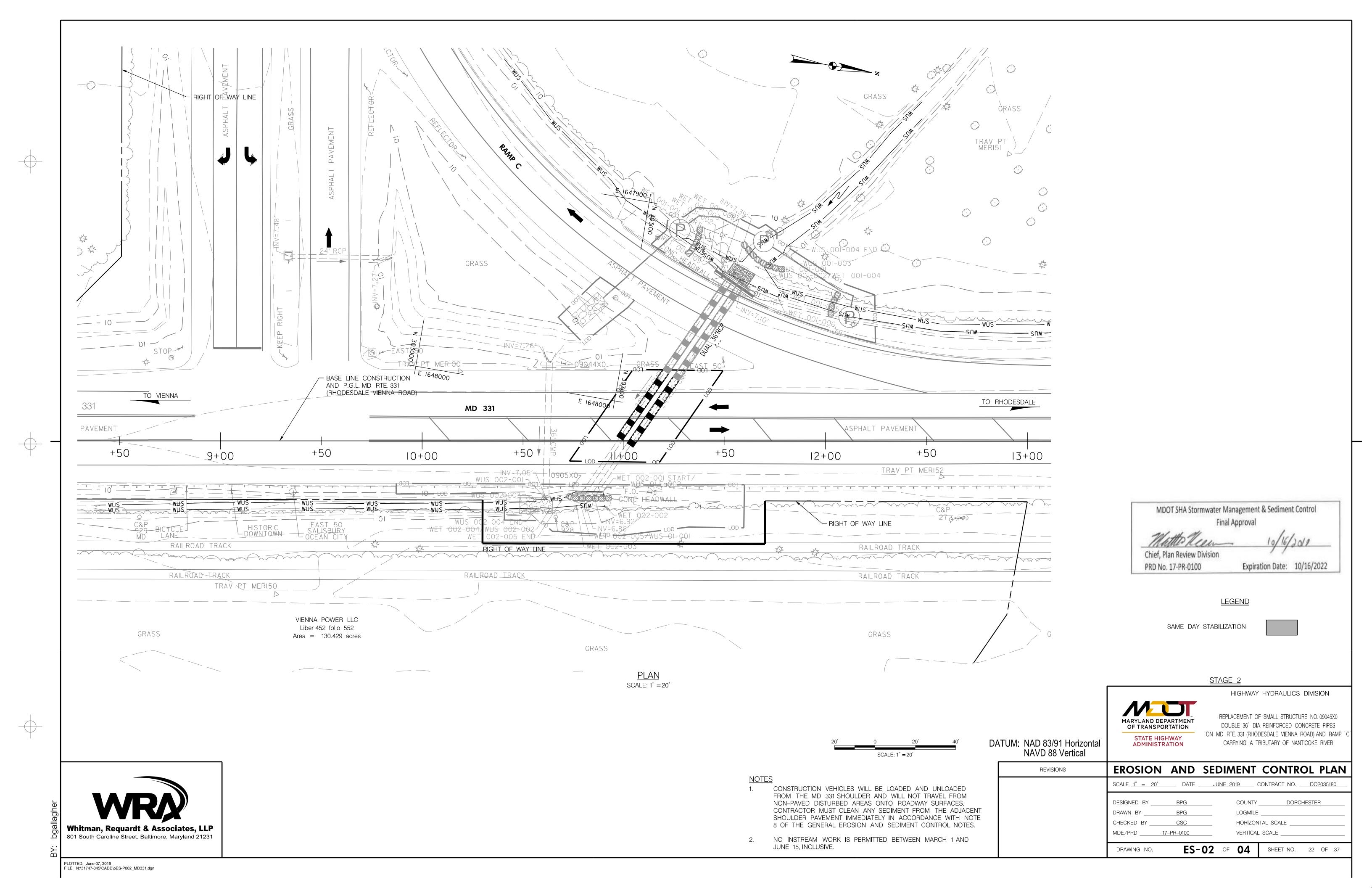
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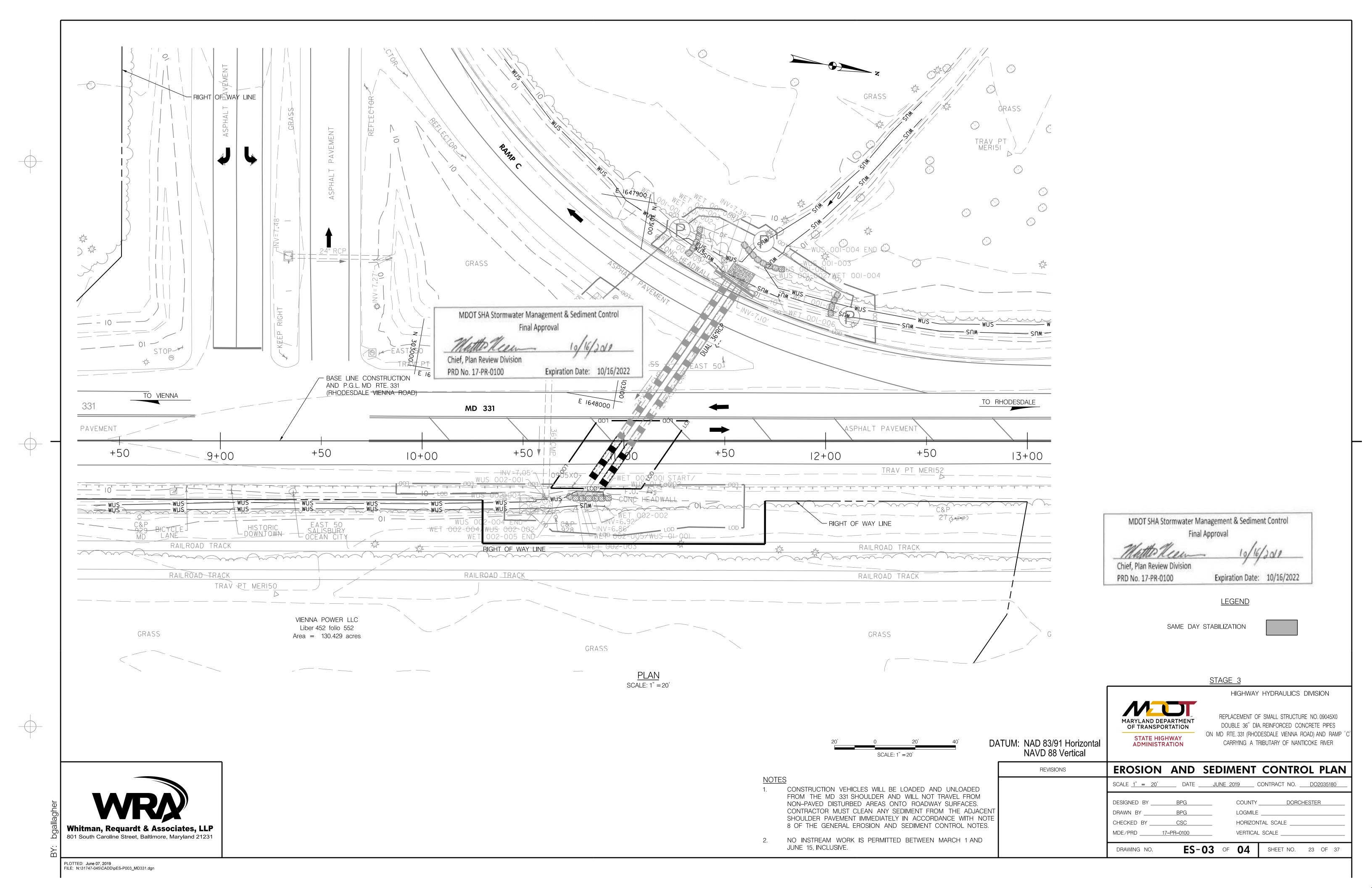
ON MD RTE. 331 (RHODESDALE VIENNA ROAD) AND RAMP 'C CARRYING A TRIBUTARY OF NANTICOKE RIVER

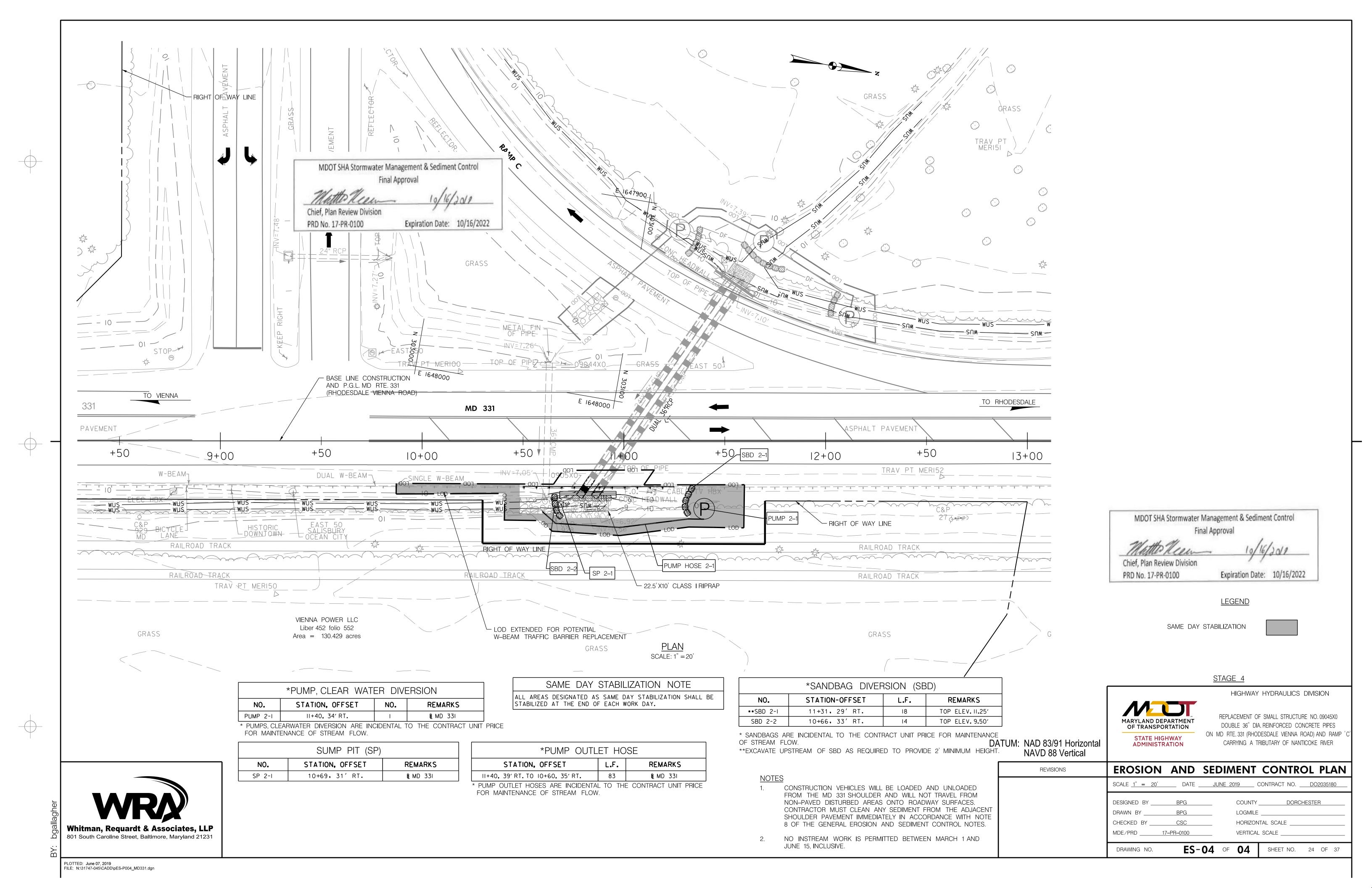
REVISIONS	EROSION AND SEDIMENT CONTROL DETAILS
	SCALE NTS DATE JUNE 2019 CONTRACT NO. DO2035180
	DESIGNED BY BPG COUNTY DORCHESTER
	DRAWN BYBPG LOGMILE
	CHECKED BY CSC HORIZONTAL SCALE
	MDE/PRD17-PR-0100 VERTICAL SCALE
	DRAWING NO. <b>ED-04</b> OF <b>04</b> SHEET NO. 20 OF 37

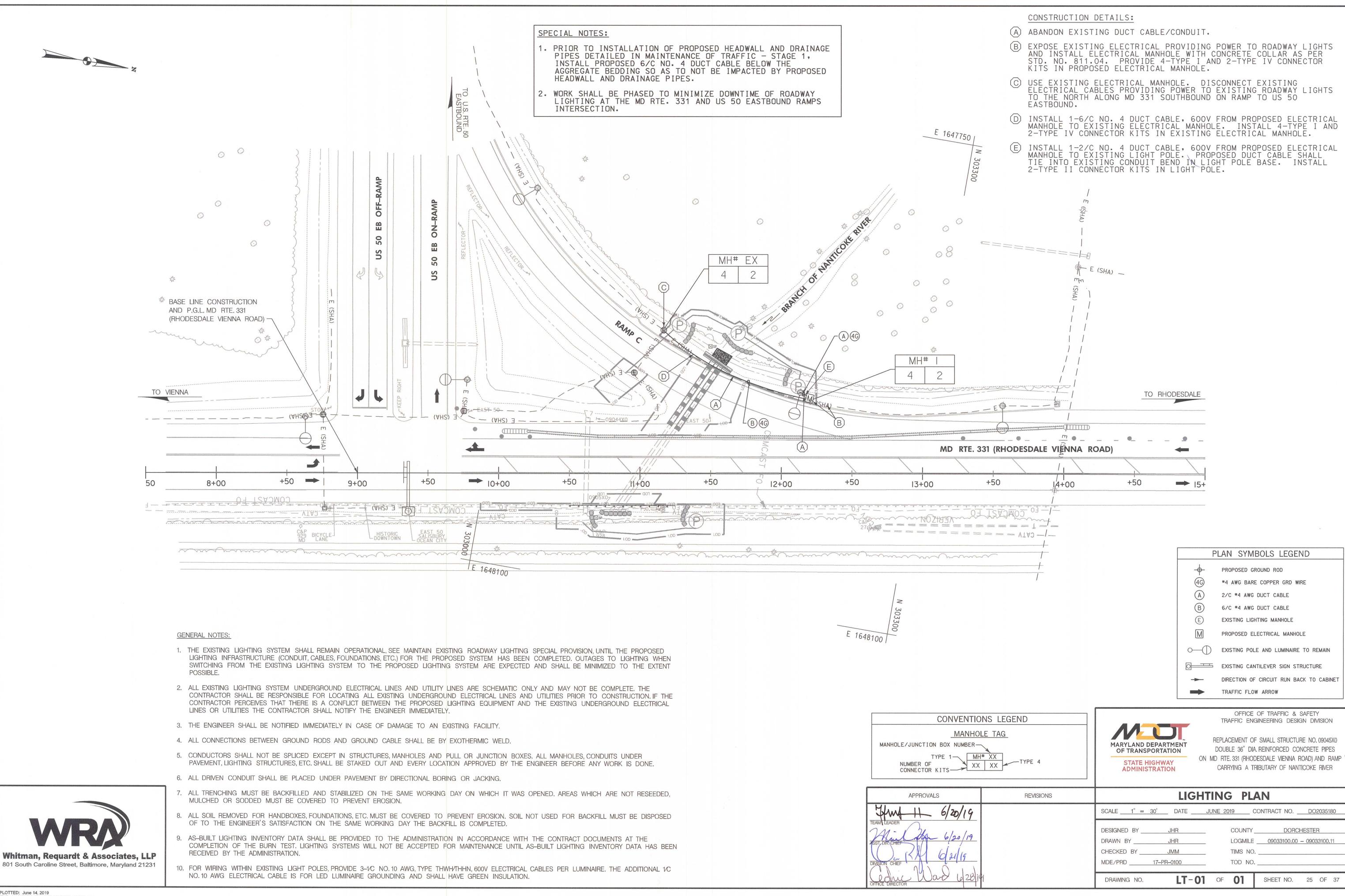


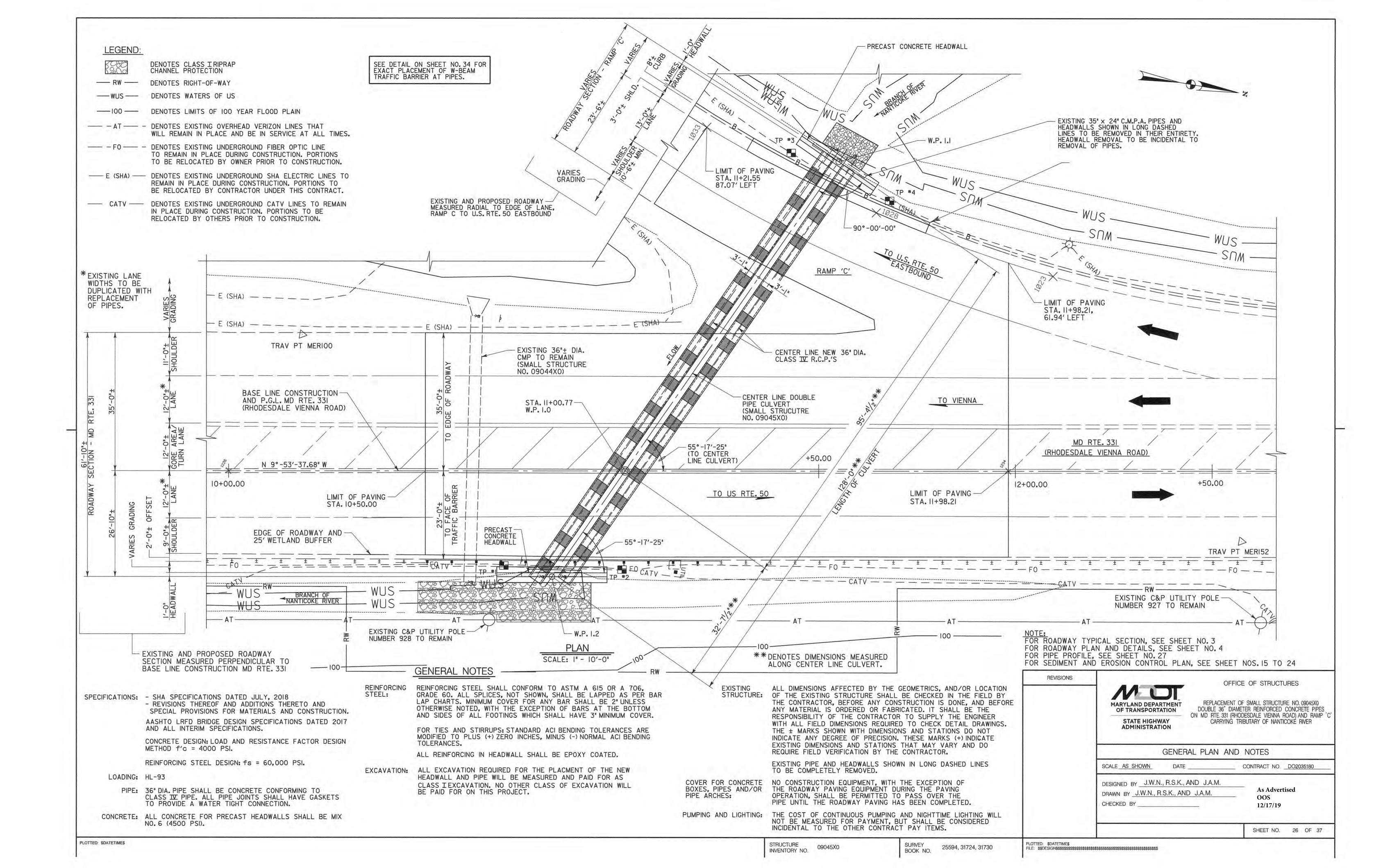


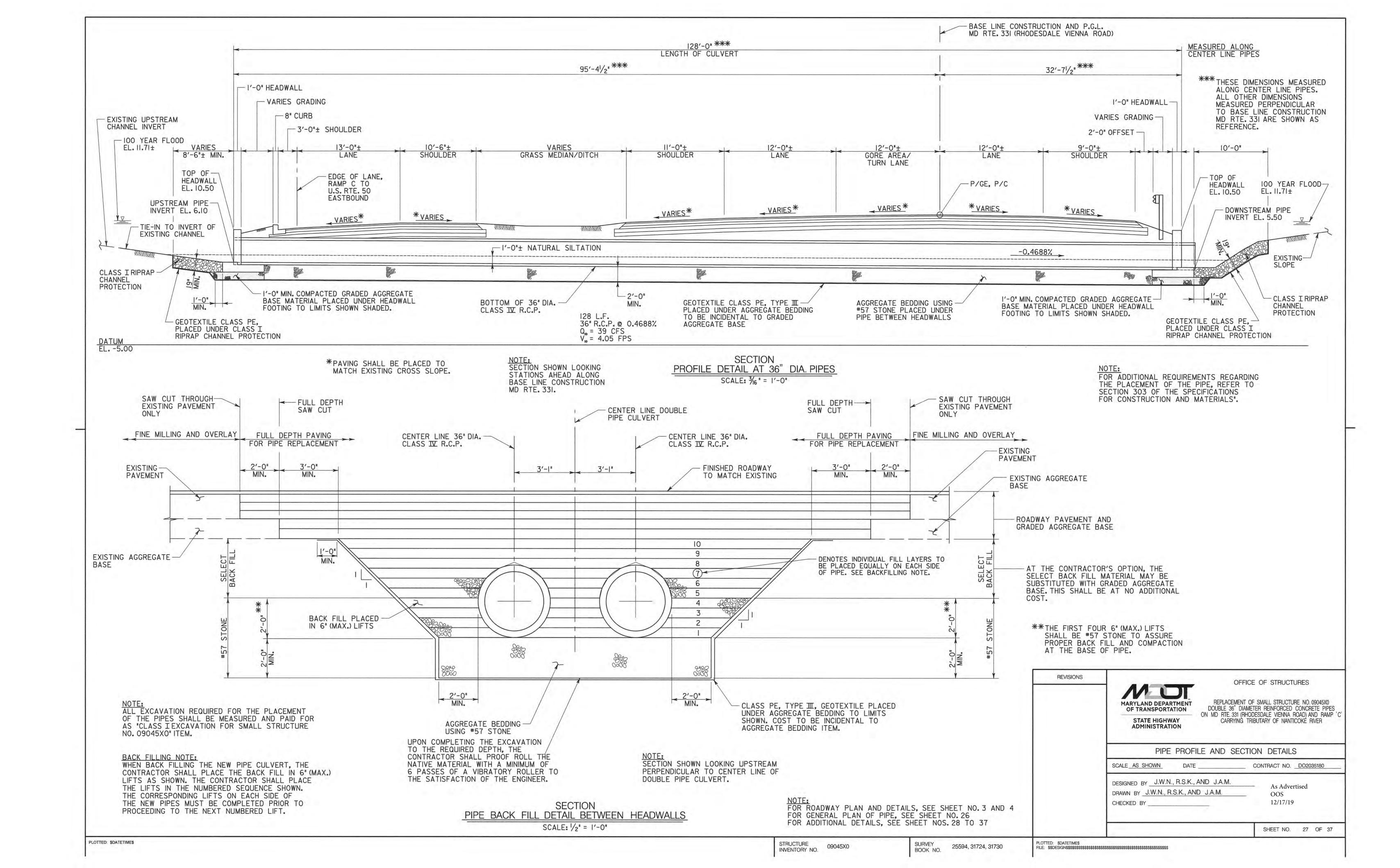


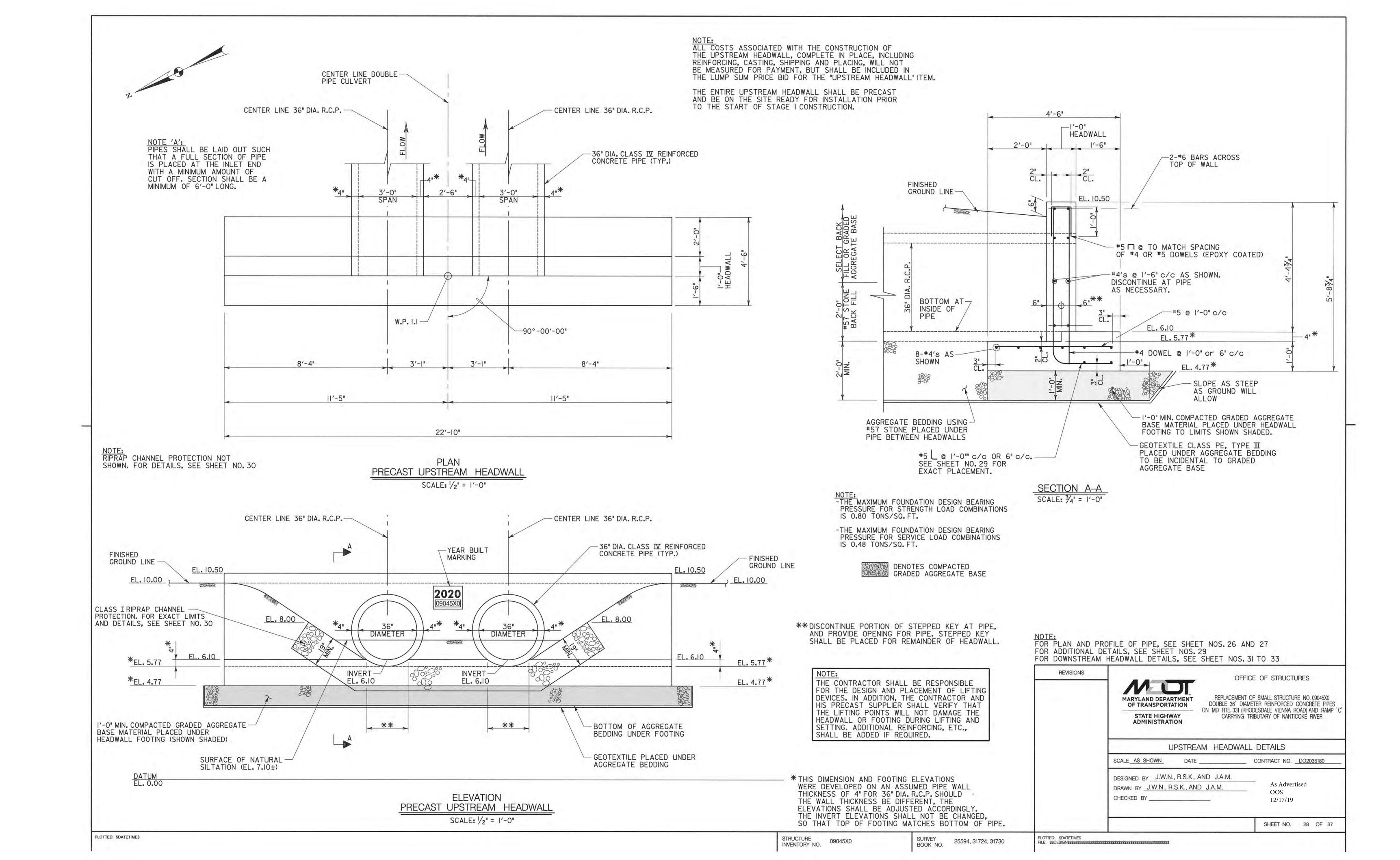


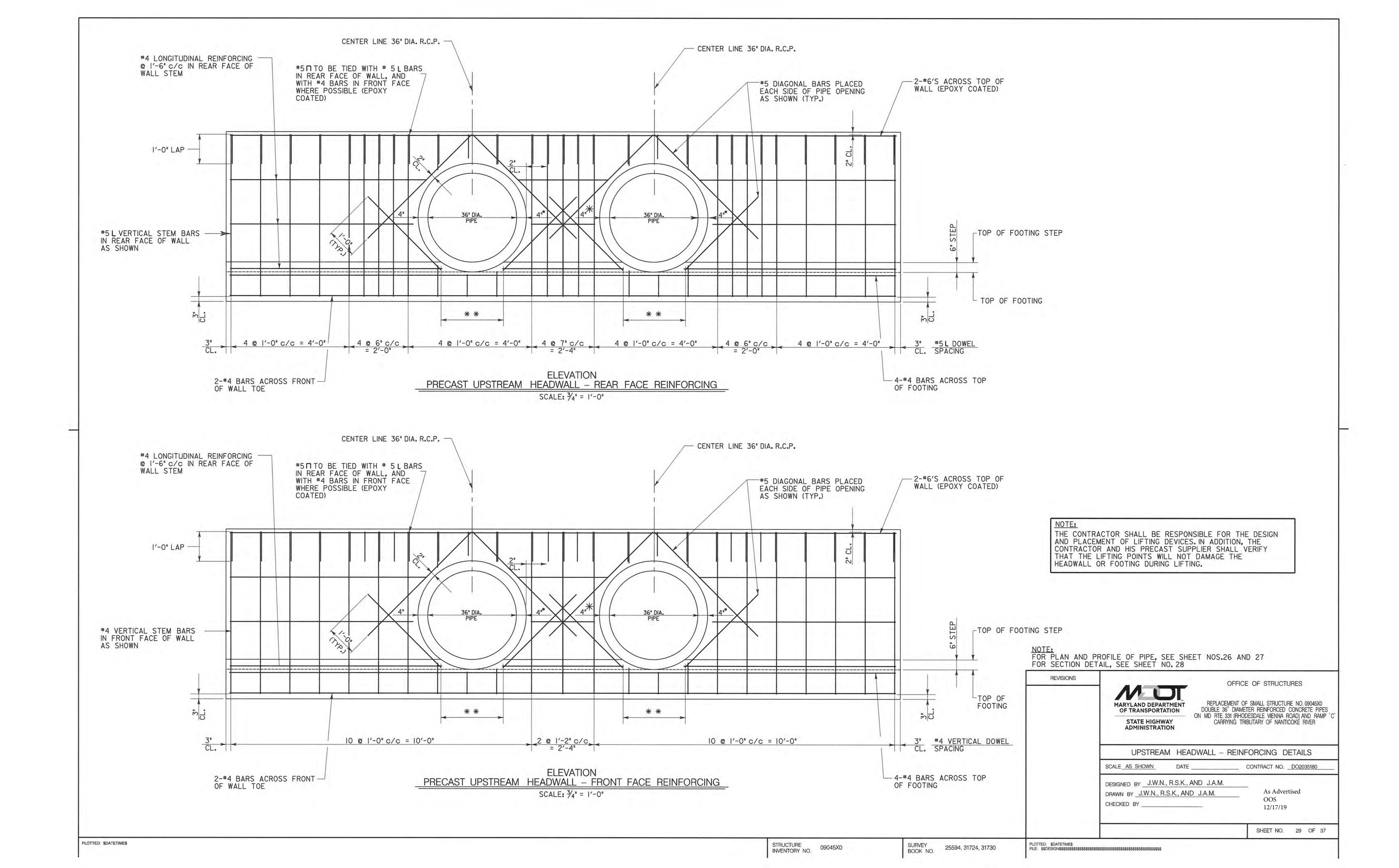


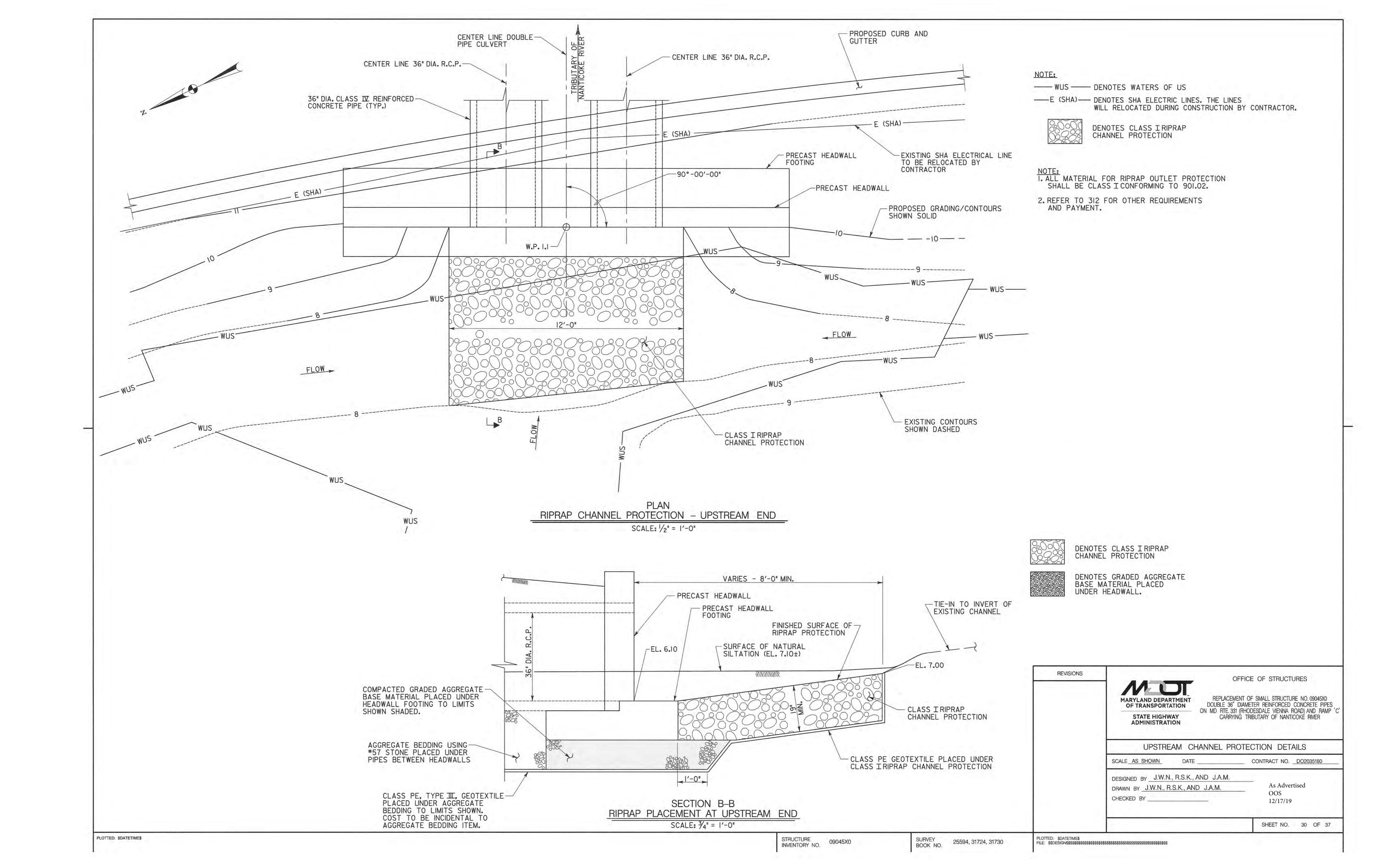


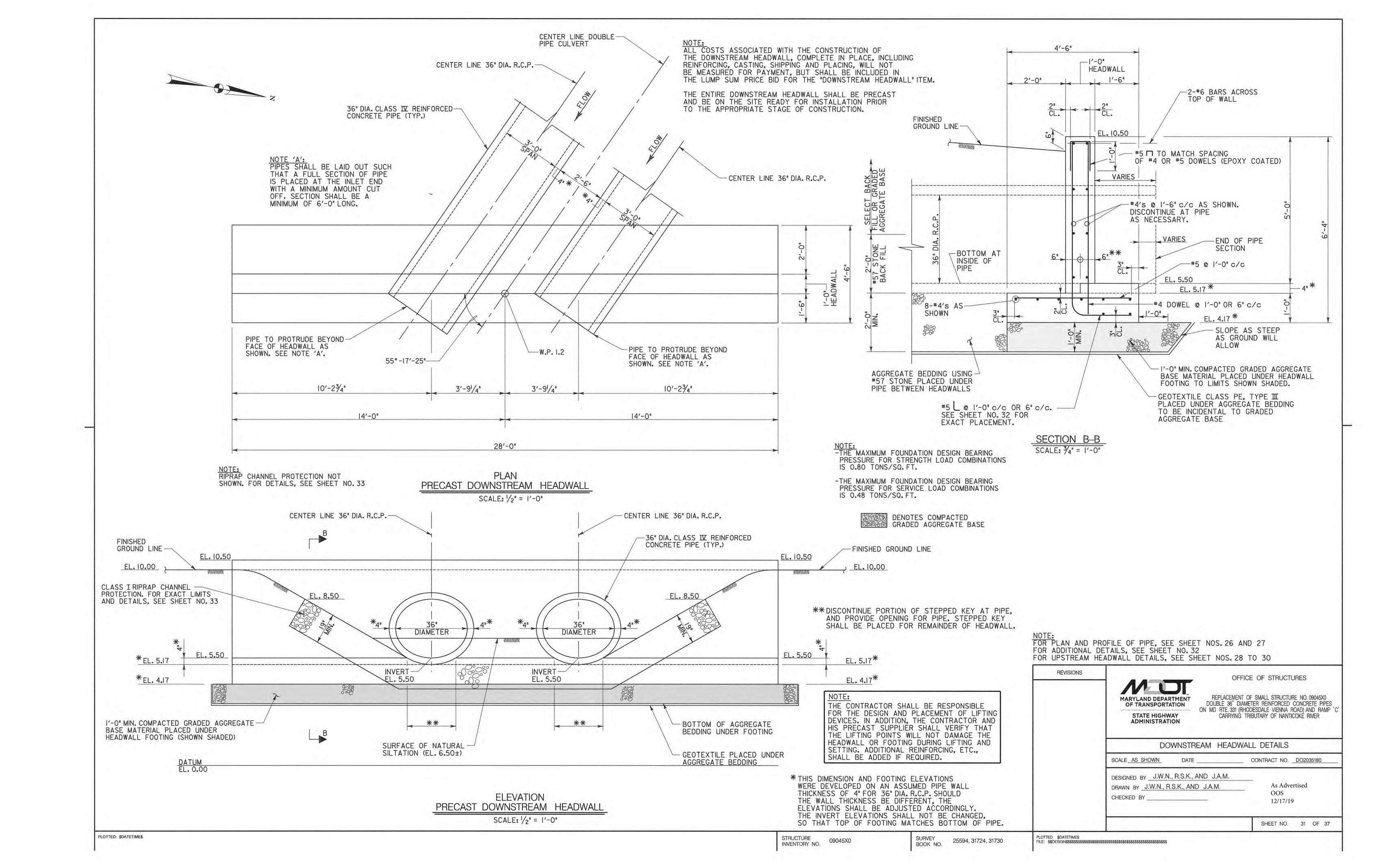


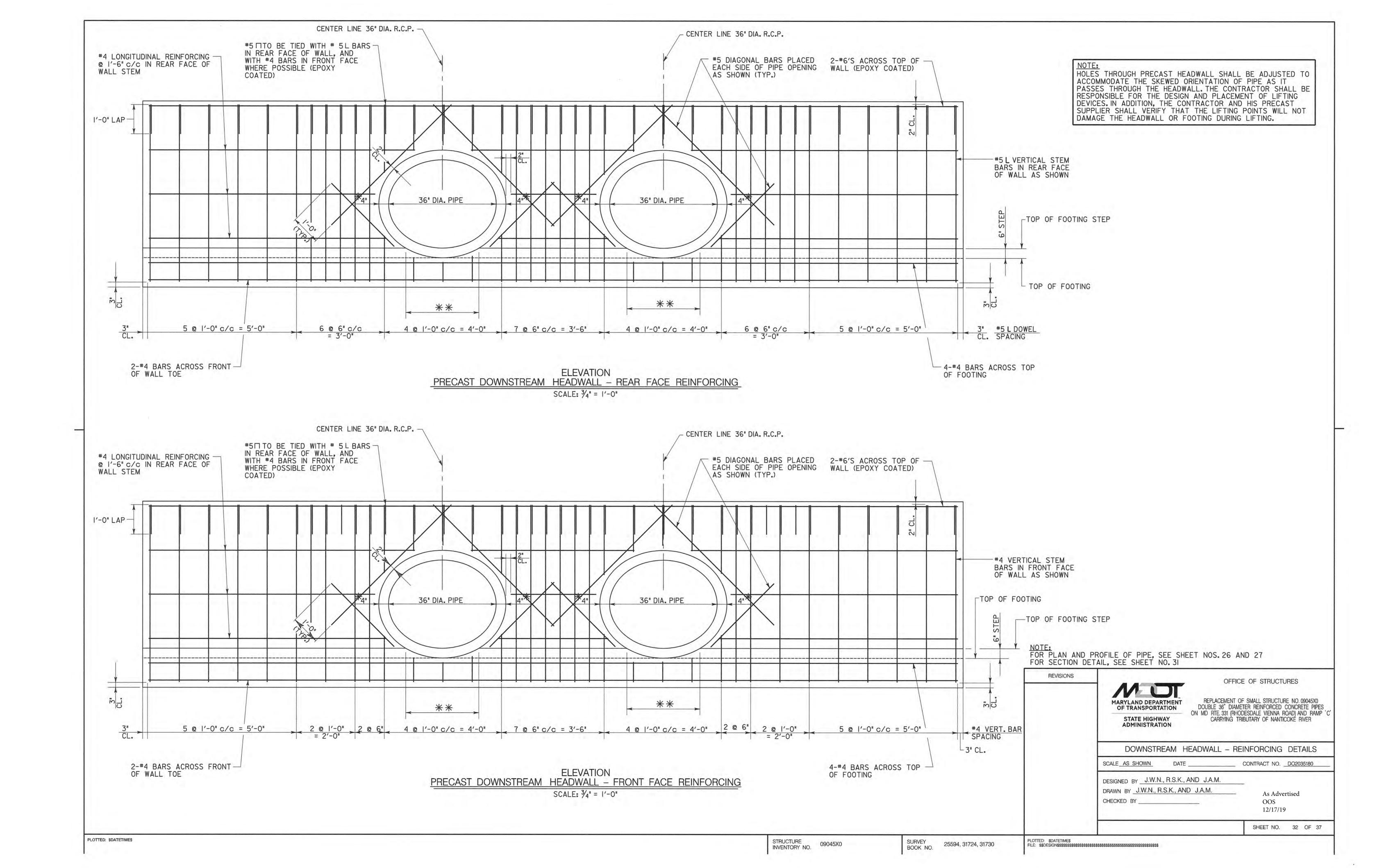


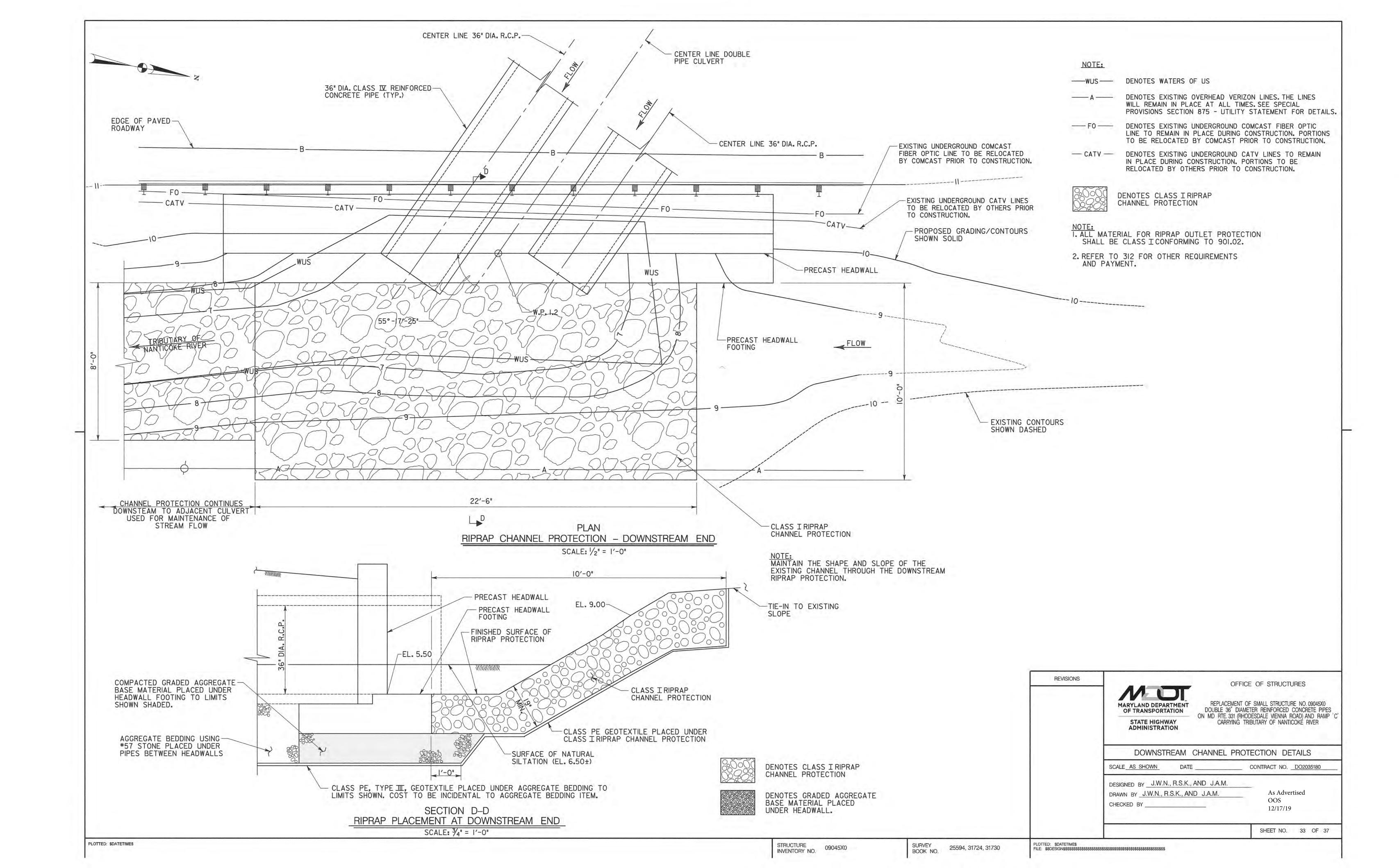


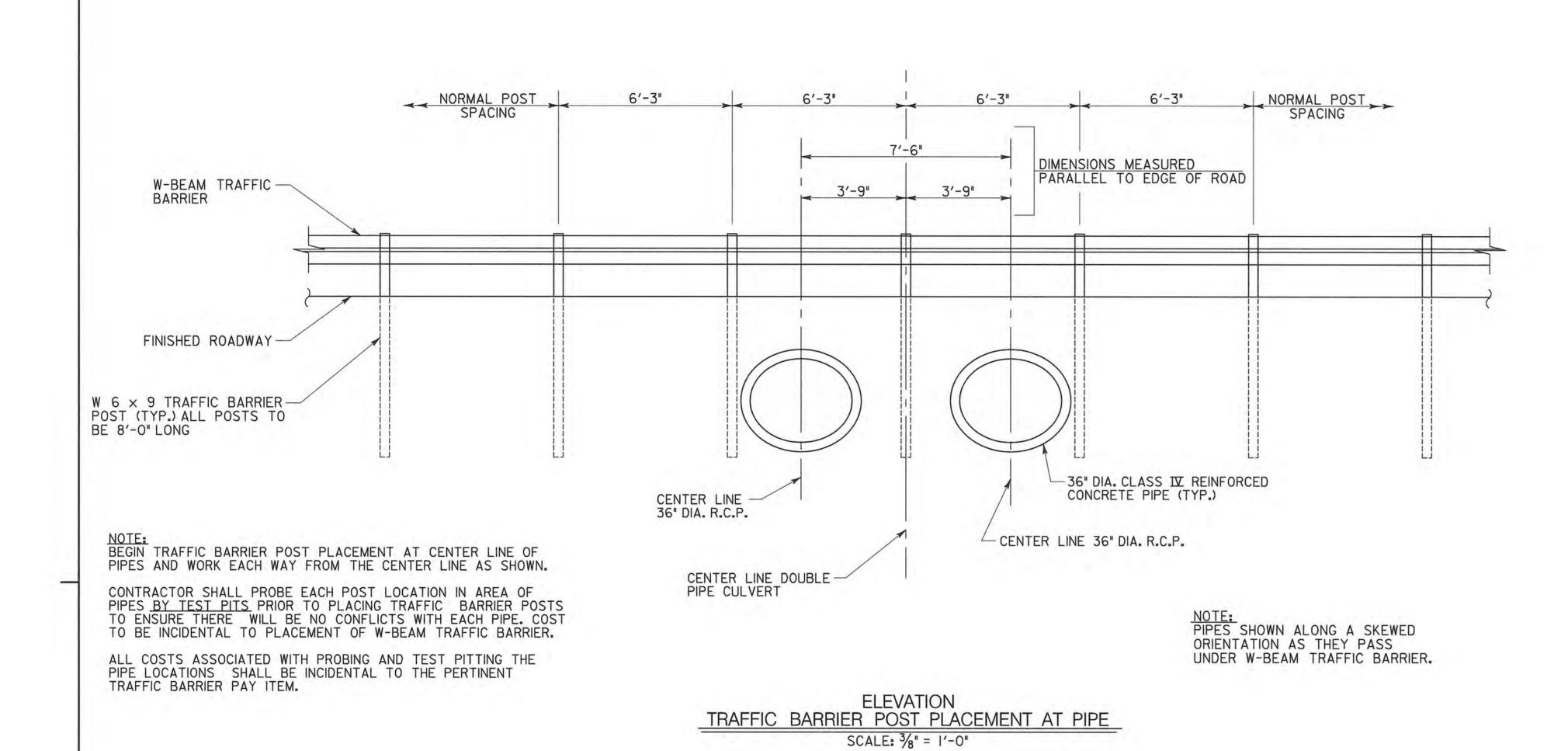












I'-O"
PRECAST HEADWALL \*\* GAP SHALL BE TERMINATED AT THE BOTTOM OF PIPES TO ALLOW IT TO BEAR FIRMLY ON HEADWALL FOOTING. \*\*\* ASSUMED WALL THICKNESS FOR 36" DIA. CLASS IX R.C.P. 2" MAXIMUM GAP IN HEADWALL\*\* STEM AROUND PIPE TO PERMIT PI TO BE PLACED INTO HEADWALL NON-SHRINK GROUT PLACED IN -GAP AROUND PIPE ONCE IT IS SET IN PLACE (SHOWN SHADED) 2 PLY WATERPROOFING MEMBRANE 16" -MIN. WIDTH CENTERED ON JOINT (TYP.) WALL OF 36" DIA. R.C.P. PROTRUDING-INTO PRECAST HEADWALL 4"\*\* WALL HICKNESS SECTION
PRECAST HEADWALL DETAIL AT PIPE OPENING

NOTE:
FOR PLAN VIEW OF PIPES, SEE SHEET NO. 26
FOR PIPE PROFILE, SEE SHEET NO. 27
FOR UPSTREAM HEADWALL DETAILS, SEE SHEET NOS. 28 TO 30
FOR DOWNSTREAM HEADWALL DETAILS, SEE SHEET NOS. 31 TO 33

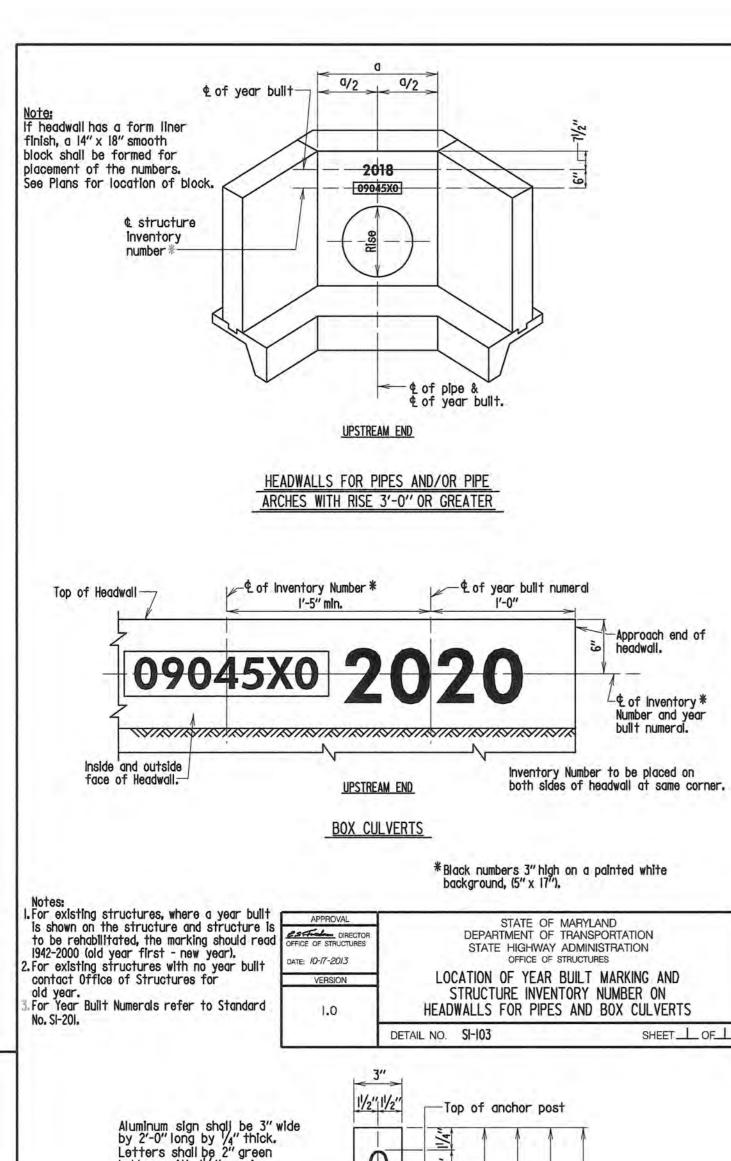
SCALE: 3" = 1'-0"

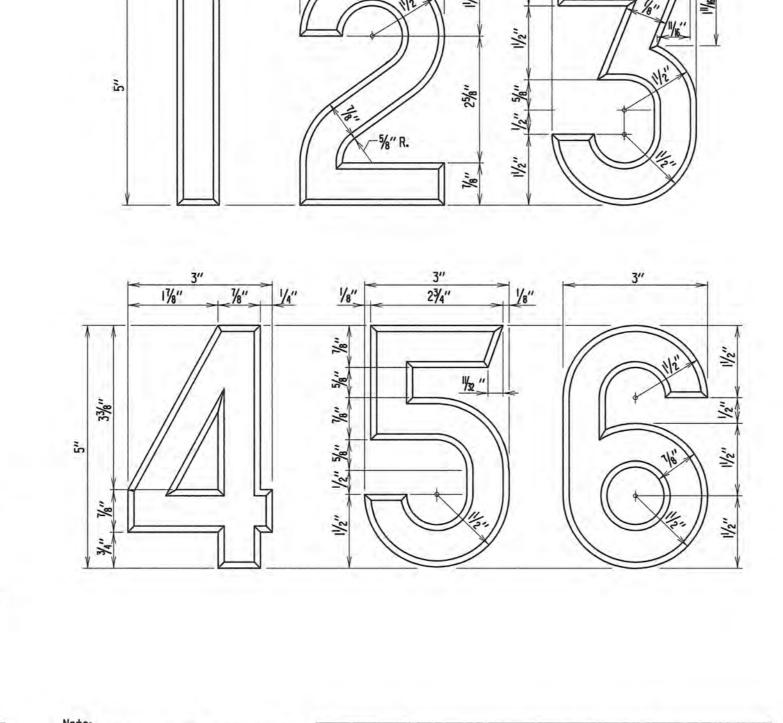
**REVISIONS** OFFICE OF STRUCTURES REPLACEMENT OF SMALL STRUCTURE NO. 09045X0 MARYLAND DEPARTMENT OF TRANSPORTATION DOUBLE 36" DIAMETER REINFORCED CONCRETE PIPES ON MD RTE. 331 (RHODESDALE VIENNA ROAD) AND RAMP 'C CARRYING TRIBUTARY OF NANTICOKE RIVER STATE HIGHWAY ADMINISTRATION **DETAILS** DATE \_\_\_ SCALE AS SHOWN CONTRACT NO. DO2035180 DESIGNED BY J.W.N., R.S.K., AND J.A.M. DRAWN BY J.W.N., R.S.K., AND J.A.M. As Advertised CHECKED BY \_\_\_\_\_ OOS 12/17/19 SHEET NO. 34 OF 37 

PLOTTED: \$DATETIME\$

STRUCTURE 09045X0

SURVEY BOOK NO. 25594, 31724, 31730



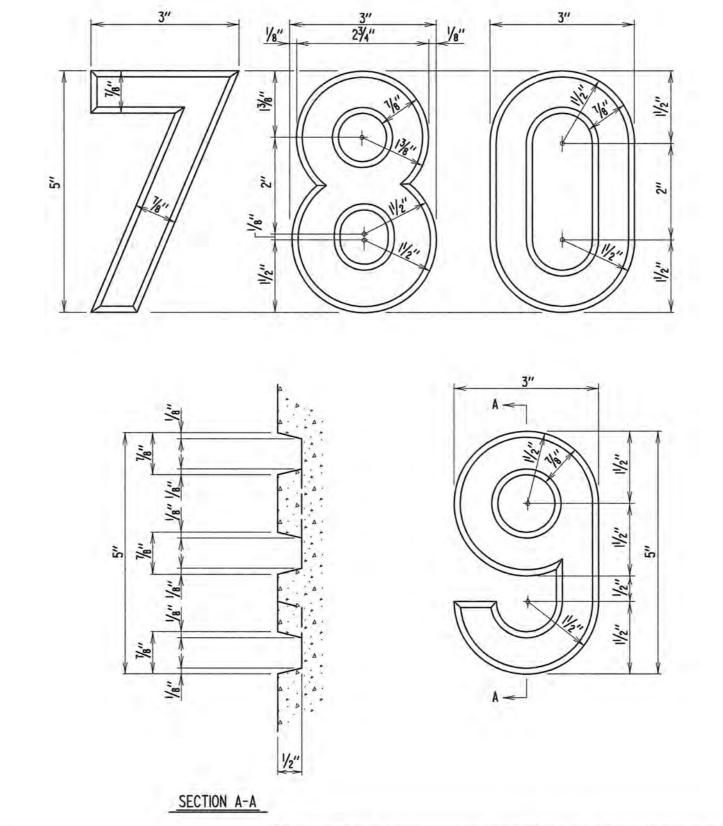


OFFICE OF STRUCTURES

1.0

Year built numerals to be indented into

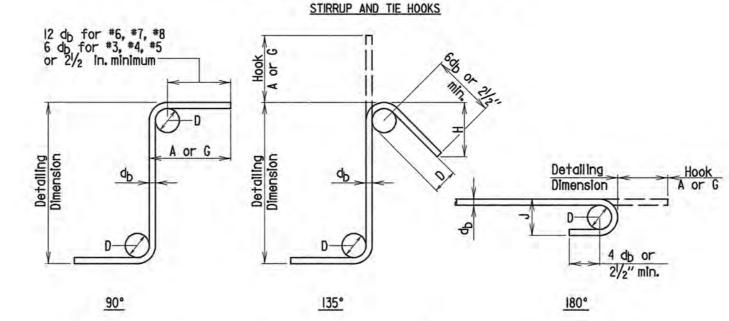
concrete (unpainted) - as indicated on Standard Nos. SI-101, SI-103 and SI-104.



STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION OFFICE OF STRUCTURES STATE HIGHWAY ADMINISTRATION OFFICE OF STRUCTURES NUMERALS FOR YEAR BUILT MARKING ON STRUCTURES SHEET 2 OF 2 DETAIL NO. SI-201

> HOOKS TABLE II REFERENCES

 ACI Types SI thru SII
 ACI Types TI thru T8
 SHA Ties and Stirrups (Note: Tie and stirrup types supplied in sizes #3-#8)



BAR	D, In.	90 - deg hook	135 - d	eg hook
BAR		A or G	A or G	H, approx
*3	1/2	4	4	21/2
#4	2	41/2	41/2	3
*5	21/2	6	5/2	37/4
#6	41/2	1-0	73/4	41/2
#7	51/4	1-2	9	51/4
*8	6	1-4	101/4	6

	RECOMMENDED END	HOOKS, ALL GR	RADES	
BAR b	Finished bend diameter	180 - deg hook		
IZE	D, In.	A or G In	J, In.	
#3	21/4	5	3	
#4	3	6	4	
<b>*</b> 5	3 1/4	7	5	
#6	41/2	8	6	
#7	5/4	10	7	
#8	6		8	

STRUCTURE

INVENTORY NO.

09045X0

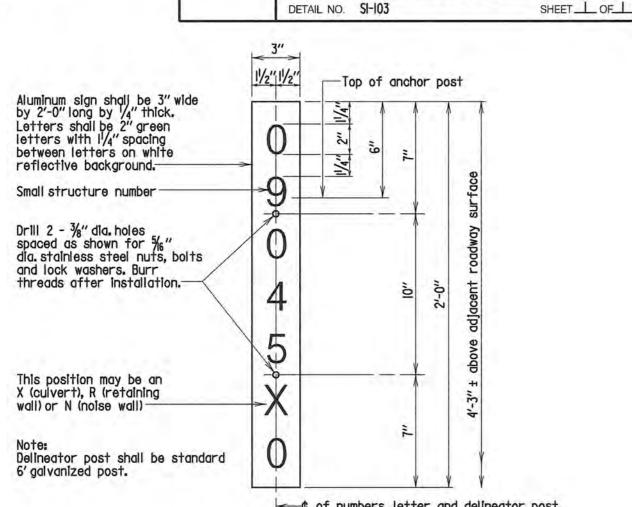
APPROVAL	STATE OF MARYLAND
CS Falo DIRECTOR	DEPARTMENT OF TRANSPORTATION
OFFICE OF STRUCTURES	STATE HIGHWAY ADMINISTRATION
DATE: 11/17/1997	OFFICE OF STRUCTURES
VERSION	
	REINFORCING STEEL HOOK TABLES AND DIAGRAMS
1.0	
	DETAIL NO. REBAR-BB-102 SHEET 2 OF 2

BOOK NO.

25594, 31724, 31730

REVISIONS	MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION	REPLACEMENT ( DOUBLE 36" DIAM	DE OF STRUCTURES  OF SMALL STRUCTURE NO. 09045X0 ETER REINFORCED CONCRETE PIPES DDESDALE VIENNA ROAD) AND RAMP RIBUTARY OF NANTICOKE RIVER				
		DETAILS					
	SCALE AS SHOWN DATE		CONTRACT NO. DO2035180				
	DESIGNED BY J.W.N., R.S.K., DRAWN BY J.W.N., R.S.K., AN CHECKED BY	D J.A.M.	As Advertised OOS 12/17/19				
			SHEET NO. 35 OF 37				

PLOTTED: \$DATETIME\$



c of numbers, letter and delineator post. SMALL STRUCTURE SIGN

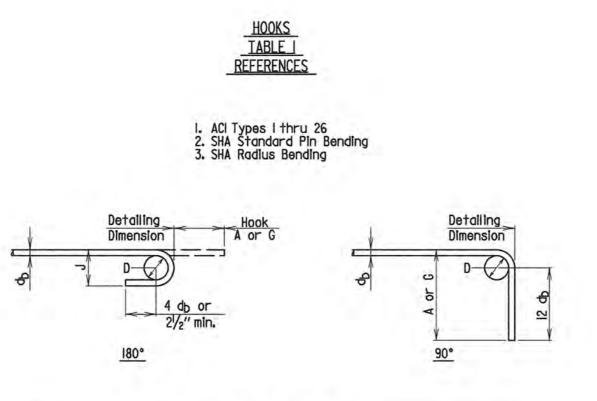
## Placement Notes:

- 1. The small structure sign shall be placed behind traffic barriers where applicable, (delineator post to be driven within traffic barrier w-beam post). The sign shall be placed at the approach ends of the structure on the right side of the road, at roadway level.
- 2. Divided highways shall have only one sign placed at each approach end.

Scale: None

- If traffic barriers are not present, place small structure sign as close to end of structure as possible but sign must be visible from the approach
- 4. For noise walls and retaining walls place one small structure sign at each end.
- 5. For retaining walls that are not visible from the approach roadway, place small structure sign as close to end of structure as possible but sign must be visible from approach roadway. For retaining walls that are visible from the approach roadway, refer to SI-104.
- Always locate small structure sign so that it will be in the safest position possible relative to highway and pedestrian traffic.

1.0	SMALL STRU SIGN AND PLACEME	
VERSION	CHALL CERT	CTUDE
OFFICE OF STRUCTURES  DATE: 09-20-2005	DEPARTMENT OF TRA STATE HIGHWAY AD OFFICE OF STRU	ANSPORTATION MINISTRATION
APPROVAL	STATE OF MA	RYI AND



DETAIL NO. SI-201

STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION

STATE HIGHWAY ADMINISTRATION

OFFICE OF STRUCTURES

NUMERALS FOR YEAR BUILT MARKING ON STRUCTURES

SHEET\_\_\_OF\_2

	RE	COMMENDED END	HOOKS, ALL GI	RADES
BAR	Finished bend diameter	180 - de	g hook	90 - deg hook
SIZE	D, in.	A or G in	J, In.	A or G in
#3	21/4	5	3	6
*4	3	6	4	8
5	33/4	7	5	10
6	41/2	8	6	1-0
7	51/4	10	7	1-2
8	6	11	8	1-4
#9	91/2	1-3	113/4	1-7
10	103/4	1-5	1-11/4	1-10
11	12	1-7	1-27/4	2-0
14	181/4	2-3	1-93/4	2-7
18	24	3-0	2-4/2	3-5

1.0	REINFORCING STEEL HOOK TABLE	S AND DIAGRAMS			
VERSION					
OFFICE OF STRUCTURES  DATE: 11/17/1997	STATE HIGHWAY ADMINIS' OFFICE OF STRUCTURES	TRATION			
APPROVAL DIRECTOR	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION				

			LOCAT	TION CATEG	ORY A					
BAR SIZE	CENTER TO CENTER SPACING									
	3	"	4	<b>,</b> "	5"		Σ	6"		
#4	2'-1"	2'-8"	2'-1"	2'-6"	2'-1"	2'-6"	2'-1"	2'-6"		
#5	2'-8"	3′-6″	2'-7"	3'-4"	2'-7"	3'-1"	2'-7"	3'-1"		
#6	3'-10"	5′-0″	3'-1"	4'-0"	3'-1"	4'-0"	3'-1"	4'-0"		
#7	5′-3″	6'-10"	3'-11"	5'-1"	3'-7"	4'-8"	3′-7″	4'-8"		
#8	6'-10"	8'-11"	5'-1"	6'-8"	4'-1"	5′-4″	4'-1"	5'-4"		
#9	8'-8"	11'-3"	6'-6"	8'-6"	5'-2"	6'-9"	5'-1"	6'-7"		
#10	-	-	8'-3"	10'-9"	6'-7"	8'-7"	6'-3"	8'-2"		
#11	-	-	10'-1"	13'-3"	8'-1"	10'-7"	7'-6"	9'-9"		

Location Category A - Bars in horizontal layers in top of pour with 12" or more of concrete below them such as in: footings, pier caps, etc.

			LOCAT	TION CATEG	ORY B				
BAR	CENTER TO CENTER SPACING								
SIZE	3	3"	4	"	5	"	2	6"	
#4	1'-7"	2'-5"	1'-7"	1'-11"	1'-7"	1'-11"	1'-7"	1'-11"	
#5	2'-1"	3'-1"	2'-0"	3'-0"	2'-0"	2'-5"	2'-0"	2'-5"	
#6	3′-0"	4'-5"	2'-5"	3′-7″	2'-5"	3′-7″	2'-5"	3′-7″	
#7	4'-0"	6'-0"	3'-0"	4'-6"	2'-9"	4'-2"	2'-9"	4'-2"	
#8	5′-3″	7'-10"	3'-11"	5'-11"	3'-2"	4'-9"	3′-2″	4'-9"	
#9	6'-8"	10'-0"	5'-0"	7′-6″	4'-0"	6'-0"	3'-11"	5'-10"	
*10	J.A.	e l	6'-4"	9'-6"	5'-1"	7'-7"	4'-10"	7'-2"	
#	-		7'-10"	11'-8"	6'-3"	9'-4"	5'-9"	8'-8"	

Location Category B - All bars not in Location Category A.

T-	
= Non-epoxy coated	= Epoxy coated

the Plans, the above dimensions

shall be used. 2. These bar laps do not apply when splices are 1.3 times the bar is in lightweight concrete. this material. 3. These bar laps only apply where provided is at least twice that

the General Notes Indicate Reinforcing Steel Design, fy = 60 ksi, and Concrete Design, f'c = 4000 psi. 4. These bar laps assume cover of 2". Greater lap lengths will be

required for cover less than 2".

I. When bar lap is not specified on 5. These bar laps are Class B splices required by analysis over the based on the development lengths entire length of the lap splice in Std. No. REBAR-DL-103. Class B and (b) one-half or less of the total reinforcement is spliced development length. within the required lap splice Greater lengths are required for 6. Class A splices may be used when length. Class A splices are 1.0 (a) the area of reinforcement times the development length.

APPROVAL		STATE OF MAR	YI AND
OFFICE OF STRUCTURES  DATE: 03/21/2017	1	DEPARTMENT OF TRAN STATE HIGHWAY ADM OFFICE OF STRUC	NSPORTATION MINISTRATION
VERSION		BAR LAP DIMENSI	ONS FOR
1.0	IN	GRADE 60 REINFORG MIX NO.6 (4500 P.S	S.I.) CONCRETE
	DETAIL NO.	REBAR-BL-103	SHEET_L OF_L

			LOCAT	TION CATEG	ORY A						
BAR SIZE	CENTER TO CENTER SPACING										
	3	"	4	"	5	"	2	6′′			
#4	1'-7"	2'-1"	1'-7"	1'-11"	1'-7"	1'-11"	1'-7"	1'-11"			
#5	2'-1"	2'-8"	2'-0"	2'-7"	2'-0"	2'-5"	2'-0"	2'-5"			
#6	3′-0′′	3'-10"	2'-5"	3'-1"	2'-5"	3'-1"	2'-5"	3'-1"			
#7	4'-0''	5'-3"	3'-0"	3'-11"	2'-9"	3'-7"	2'-9"	3′-7″			
#8	5′-3″	6'-10"	3'-11"	5'-2"	3'-2"	4'-1"	3'-2"	4'-1"			
#9	6'-8"	8'-8"	5'-0"	6'-6"	4'-0"	5'-3"	3'-11"	5'-1"			
#10	17.27	T 040 1	6'-4"	8'-3"	5'-1"	6'-7"	4'-10"	6'-3"			
#[]		-	7'-10"	10'-2"	6'-3"	8'-2"	5'-9"	7'-6"			

Location Category A - Bars in horizontal layers in top of pour with 12" or more of concrete below them such as in: footings, pier caps, etc.

			LOCAT	TION CATEG	ORY B				
BAR SIZE	CENTER TO CENTER SPACING								
	3"		4"		5"		≥ 6"		
#4	1'-3"	1'-10"	1'-3"	1'-6"	1'-3"	1'-6"	1'-3"	1'-6"	
#5	1'-7"	2'-5"	1'-6"	2'-3"	1'-6"	1'-10"	1'-6"	1'-10"	
#6	2'-3"	3'-5"	1'-10"	2'-9"	1'-10"	2'-9"	1'-10"	2'-9"	
#7	3'-1"	4'-8"	2'-4"	3'-6"	2'-2"	3'-2"	2'-2"	3'-2"	
#8	4'-0''	6'-0"	3′-0″	4'-6"	2'-5"	3′-8″	2'-5"	3'-8"	
#9	5'-2"	7'-8"	3'-10"	5′-9″	3′-1″	4'-7"	3′-0″	4'-6"	
#10	1 2	-	4'-11"	7'-4"	3'-11"	5'-10"	3'-9"	5'-7"	
#[]	7,54		6'-0"	9'-0"	4'-10"	7'-2"	4'-5"	6'-8"	

Location Category B - All bars not in Location Category A.

= Non-epoxy coated	= Epoxy coated

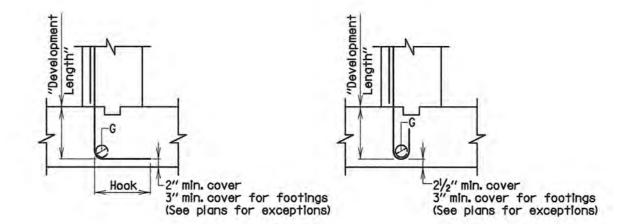
specified on the Plans, the above was assumed to be 1.0 when dimensions shall be used.

apply when bar is in lightweight calculating the Reinforcement concrete. Greater lengths are required for this material. 3. These development lengths only apply where the General Notes

= 60 ksi, and Concrete Design, f'c = 4000 psl. 4. These development lengths assume cover of 2". Greater development lengths will be required for cover less than 2".

I. When development length is not 5. The Excess Reinforcement Factor 7. If depth of member does not allow bar development length Indicated in Location Categories calculating these dimensions. 2. These development lengths do not 6. Atr was assumed to be 0 when A and B; then hooks shall be added to all bars not conforming, as per D, E, and F per Std. No. Confinement Factor.

required for this mater		KEBAR-DL-203.				
<ol> <li>These development lengt apply where the General Indicate Reinforcing Steet = 60 ksi, and Concrete D 4000 psi.</li> </ol>	Notes al Design, fy	RECTOR TURES 0/7	STATE OF MARY DEPARTMENT OF TRANS STATE HIGHWAY ADMII OFFICE OF STRUCTU	SPORTATION NISTRATION URES		
4. These development lengt	hs assume VERSION	DE'	IMENSIONS FOR			
cover of 2". Greater development lengths will be required for cover	velopment	II.	GRADE 60 REINFORCING STEEL IN MIX NO.6 (4500 P.S.I.) CONCRETE			
less than 2".		DETAIL NO.	REBAR-DL-103	SHEET_LOF_L		



STANDARD 90° HOOK

STANDARD 180° HOOK

BAR	* LOCATION CATEGORY				
SIZE	D	E	F		
#4	7"	10"	8"		
#5	9"	1'-0"	10"		
#6	10"	1'-3"	1'-0"		
#7	1'-0"	1'-5"	1'-2"		
*8	1'-2"	1'-7"	1'-4"		
#9	1'-4"	1'-10"	1'-6"		
*10	1'-5"	2'-1"	1'-8"		
#[]	1'-7"	2'-3"	1'-10"		

For Hook Dimensions and Bends, see Std. No. REBAR-BB-102.

D-All bars terminating with a standard 180°hook with side cover (normal to plane of hook) not less

than 2½", and for 90°deg. hook, cover on bar extension beyond hook not less than 2".

E- All bars <u>not</u> in Category D.

F- All bars with hook enclosed vertically or horizontally within ties or stirrup-ties spaced along the full development length not greater than 3d where d is the diameter of the hooked bar.

I. When development length is not specified on the Plans, the above dimensions shall be used. 2. These development lengths do not apply when bar is in lightweight concrete or any other strength of concrete.

3. These development lengths only apply where the General Notes indicate Reinforcing
Steel Design, fy = 60 ksi. and
Concrete Design, f'c = 4000 psi.

4. If depth of member does not allow bar development length indicated in Categories A, B, and C: Std. No. REBAR-DL-103; then hook shall be added to all bars not conforming,

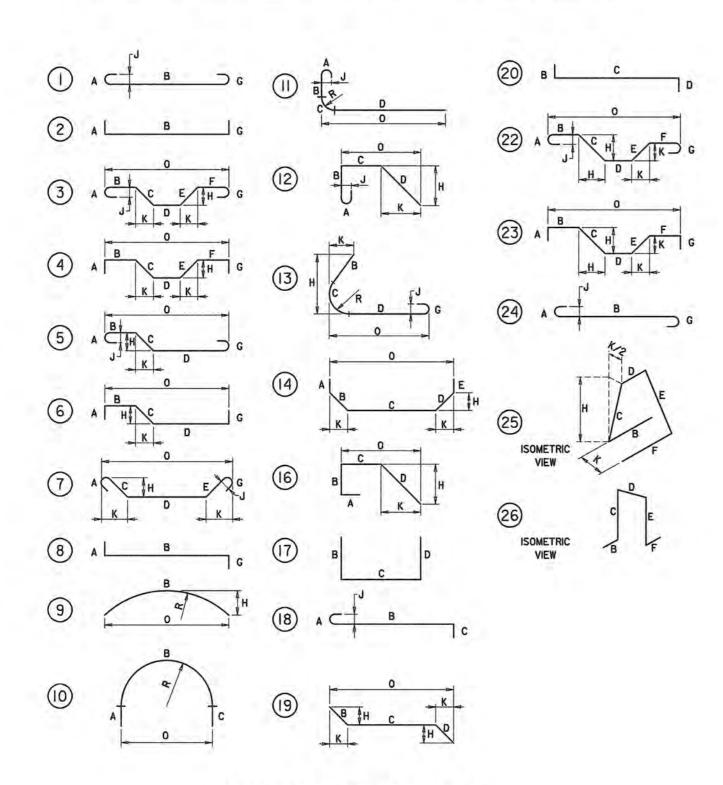
as per D,E & F.

OFFICE OF STRUCTURES DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION DATE: 05/10/2011 DETAIL NO. REBAR-DL-203

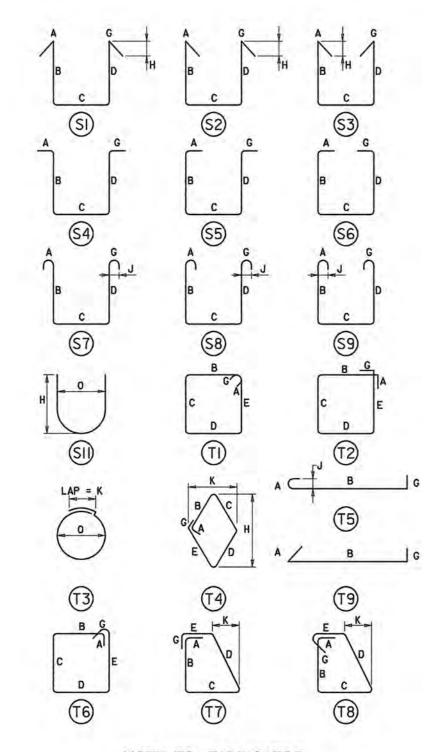
> REVISIONS OFFICE OF STRUCTURES REPLACEMENT OF SMALL STRUCTURE NO. 09045X0 MARYLAND DEPARTMENT DOUBLE 36" DIAMETER REINFORCED CONCRETE PIPES OF TRANSPORTATION ON MD RTE. 331 (RHODESDALE VIENNA ROAD) AND RAMP 'C CARRYING TRIBUTARY OF NANTICOKE RIVER STATE HIGHWAY ADMINISTRATION REINFORCING DETAILS SCALE AS SHOWN DATE \_\_\_\_\_ CONTRACT NO. \_\_DO2035180 DESIGNED BY J.W.N., R.S.K., AND J.A.M. DRAWN BY J.W.N., R.S.K., AND J.A.M. As Advertised OOS CHECKED BY \_\_\_\_\_ 12/17/19 SHEET NO. 36 OF 37

BOOK NO.

# ACI TYPICAL BAR BENDS



## STANDARD PIN BENDING

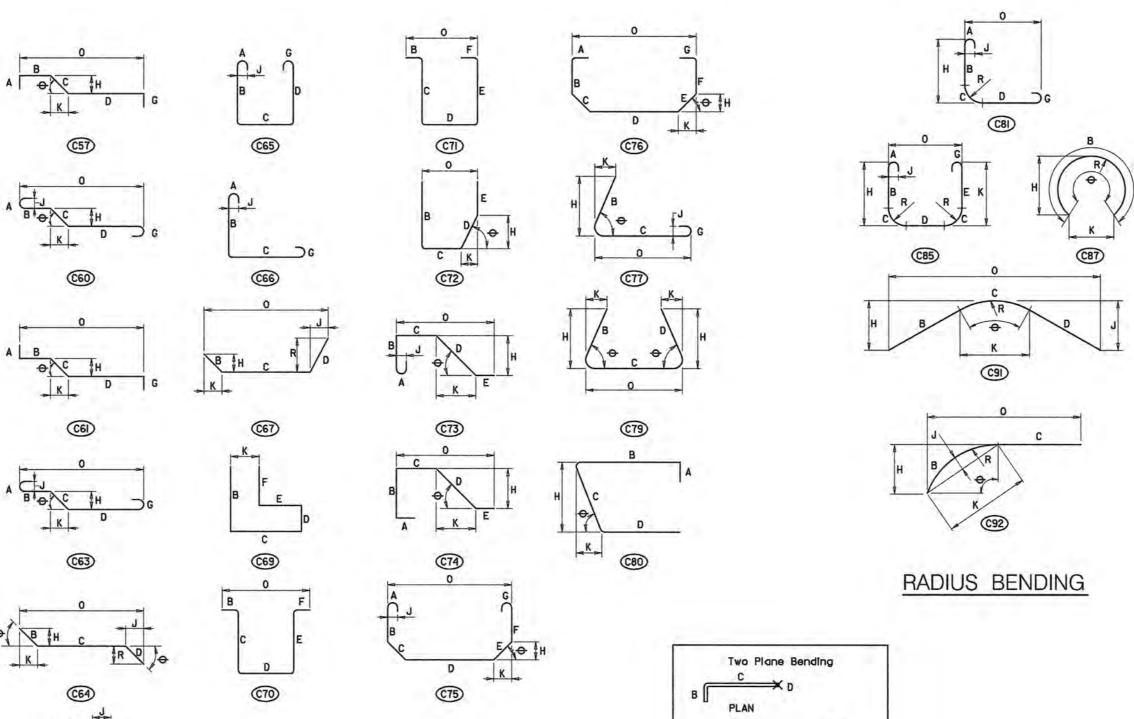


NOTE TO FABRICATOR

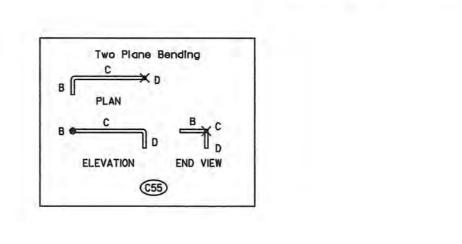
BENDING TOLERANCE NOTE TIES AND STIRRUPS SHALL BE BENT WITH A PLUS ZERO INCH (+0") MINUS (-) NORMAL ACI BENDING TOLERANCES

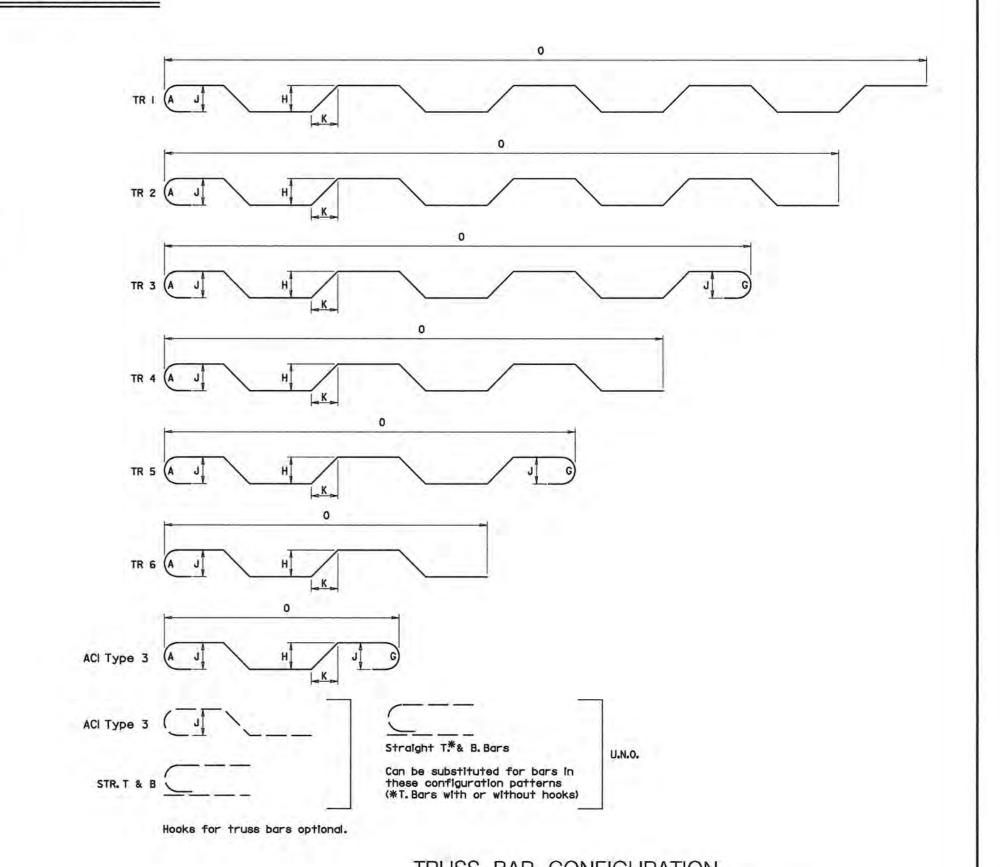
TIES AND STIRRUPS

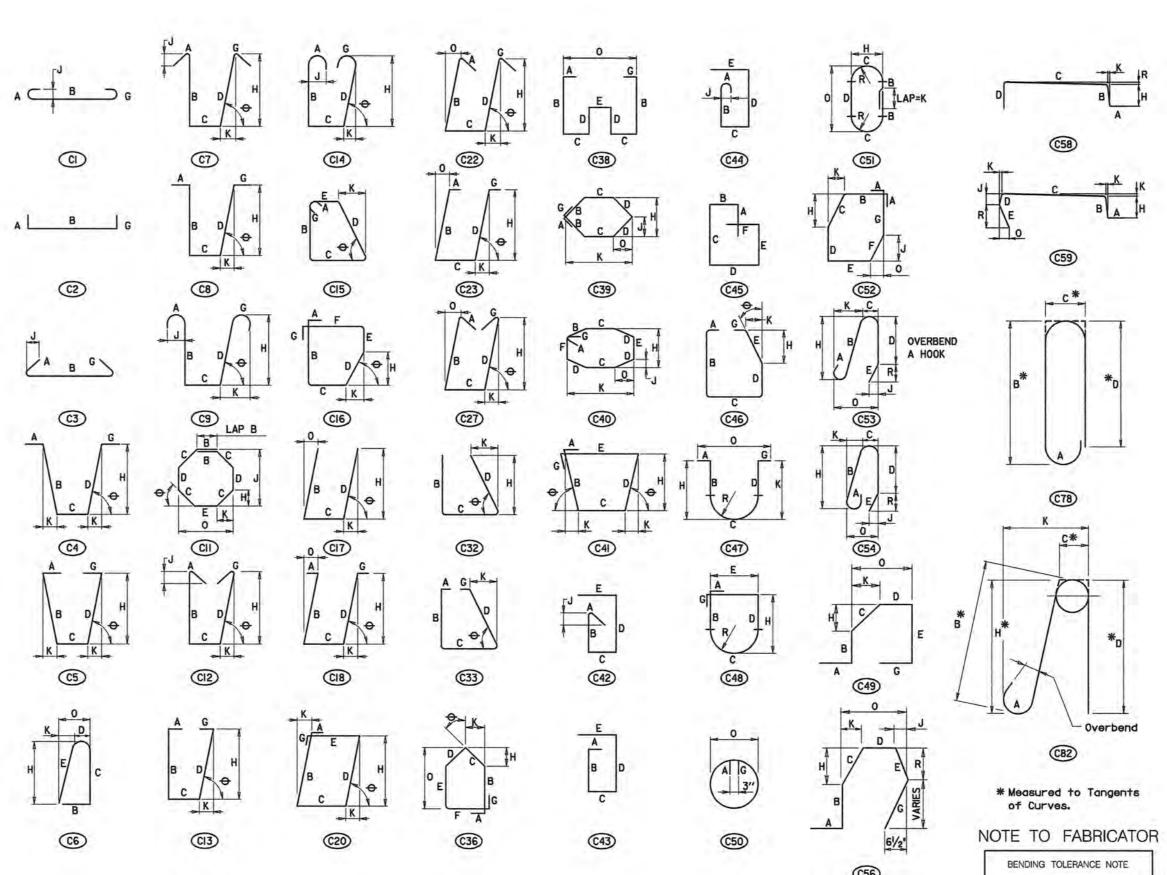
# TYPICAL BAR BENDS



STANDARD PIN BENDING

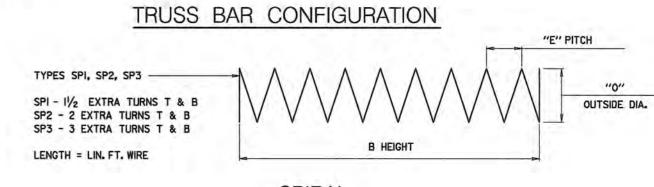






TIES AND STIRRUPS

TIES AND STIRRUPS SHALL BE BENT WITH A PLUS ZERO INCH (+0") MINUS (-) NORMAL ACI BENDING TOLERANCES



## SPIRAL

Unless otherwise noted diameter D is the same for all bends and hooks on a bar Where slope differs from 45° dimensions 'H' and 'K' must be shown

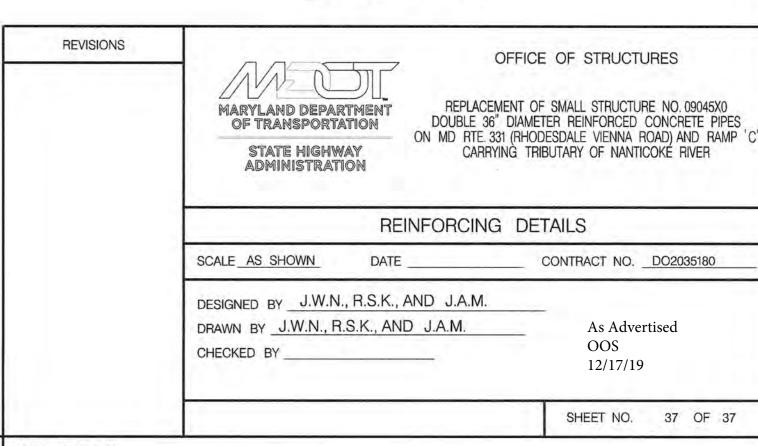
## ENLARGED VIEW SHOWING BAR BENDING DETAILS

I.All dimensions are out to out of bar or to tangent points for 135° and 180° hooks.

2. 'J' dimensions on 180° hooks to be shown only where necessary to restrict hook size. Otherwise standard hooks are to be used.

3. Where 'J' is not shown. 'J' will be kept equal to or less than 'H' on truss bars. Where 'J' can exceed 'H' it should be shown. 4.'H' dimension on stirrups to be shown where necessary to fit within concrete. 5. Where bars are to be bent more accurately than standard bending tolerances, bending dimensions which require closer fabrication should have limits indicated.

## GENERAL NOTES



PLOTTED: \$DATETIME\$

09045X0 INVENTORY NO.

25594, 31724, 31730

BOOK NO.

PLOTTED: \$DATETIME\$