

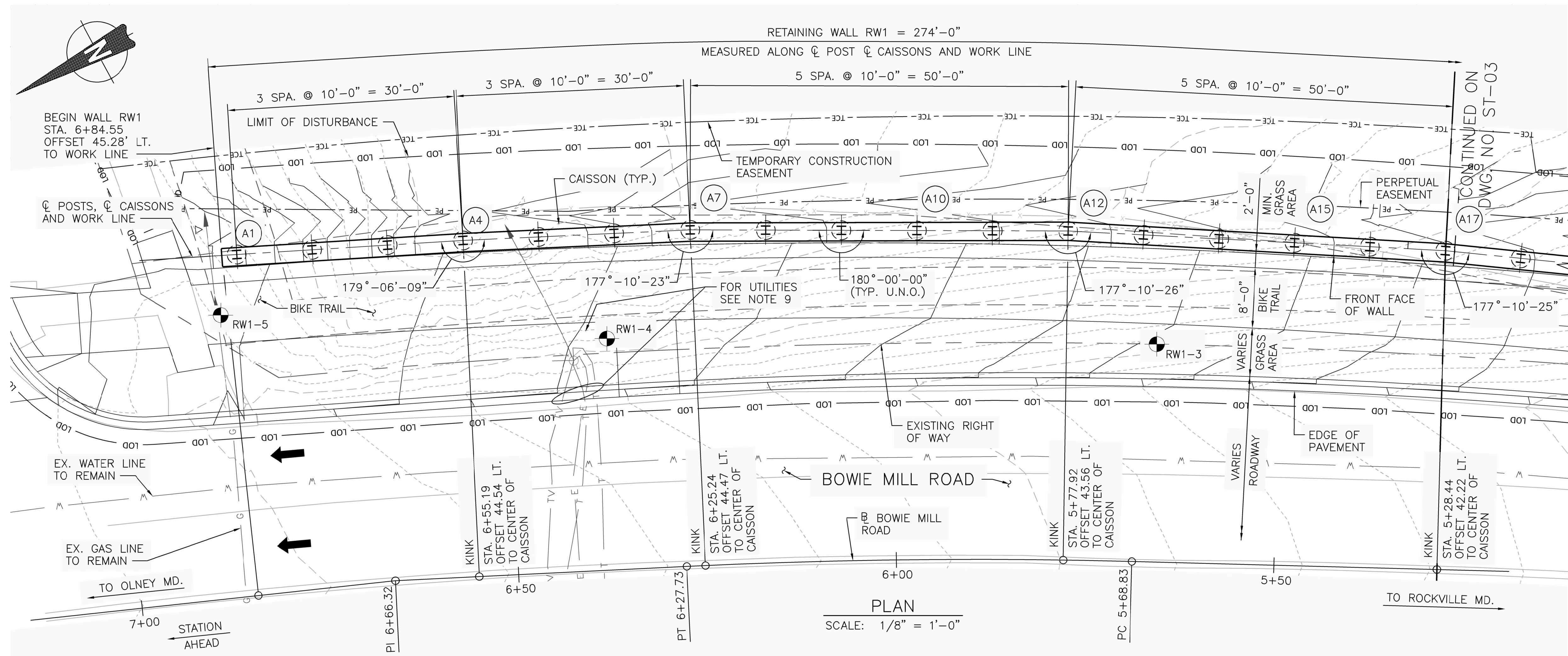


STRUCTURE LOCATION PLAN  
SCALE: 1" = 600'-0"

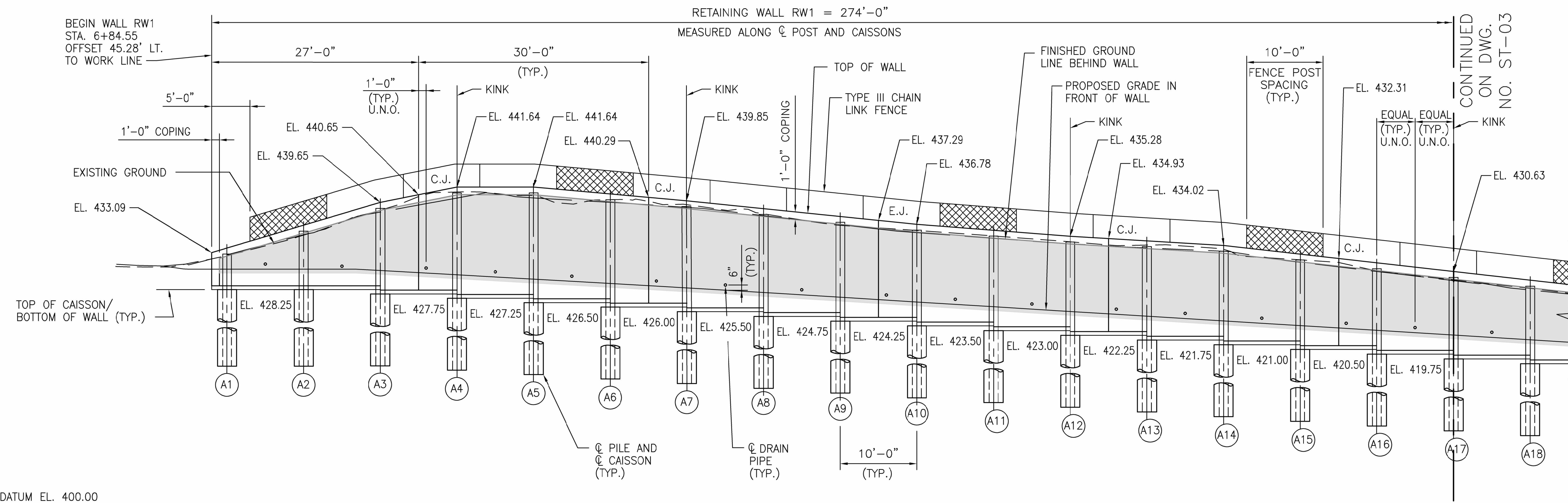
GENERAL NOTES:

- SPECIFICATIONS: MDOT SHA STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, DATED JULY, 2024.
- DESIGN: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION DATED 2020.
- CONCRETE: CONCRETE COMPRESSION STRENGTH FOR DESIGN SHALL BE:  
f'c = 3000 PSI FOR ELEMENTS USING MIX NO. 3 AND NO. 4  
f'c = 4000 PSI FOR ELEMENTS USING MIX NO. 6
- CONCRETE FOR WALL FACING AND COPING SHALL BE MIX NO. 3 (3500 PSI), FOR CAISSONS SHALL BE MIX. NO. 4 (3500 PSI), AND FOR PRECAST PANELS SHALL BE MIX NO. 6 (4500 PSI).
- REINFORCING STEEL: REINFORCING STEEL SHALL CONFORM TO ASTM A 615 GRADE 60, WITH A YIELD STRENGTH FOR DESIGN OF fy = 60000 psi.
- ALL SPLICES, NOT SHOWN, SHALL BE LAPPED AS PER BAR LAP CHARTS.
- REINFORCING STEEL SHALL BE EPOXY COATED WHEN NOTED WITH AN EP IN THE PLANS.
- MINIMUM CLEAR COVER FOR REINFORCING STEEL SHALL BE 2" UNLESS OTHERWISE NOTED.
- FOR TIES AND STIRRUPS, STANDARD ACI BENDING TOLERANCES ARE MODIFIED TO PLUS (+) ZERO INCHES, MINUS (-) NORMAL ACI BENDING TOLERANCES.
- ONLY GRADE 60 CAN BE USED ON THIS PRODUCT
- CHAMFER: ALL EXPOSED CORNERS OF CONCRETE SHALL BE CHAMFERED WITH 3/4" x 3/4" MILLED CHAMFER STRIPS.
- STRUCTURAL STEEL: STRUCTURAL STEEL FOR SOLDIER PILES SHALL CONFORM TO ASTM A 572 GRADE 50 INCLUDING THE ADDITIONAL REQUIREMENTS FOR CHARPY V-NOTCH TESTING OF M270 FOR PRIMARY LOAD CARRYING MEMBERS. REFER TO SECTION 909.01. SOLDIER PILES SHALL BE GALVANIZED IN ACCORDANCE WITH A123, A153, AND SECTION 465.
- KEYS: ALL KEYS ARE NOMINAL SIZE.
- ARCHITECTURAL TREATMENT: THE ARCHITECTURAL TREATMENT ON THE CAST-IN-PLACE CONCRETE WALL SHALL BE MINNESOTA ASHLAR HAVING A THICKNESS NOT TO EXCEED 2".
- EXISTING STRUCTURES: ALL DIMENSIONS AFFECTED BY THE GEOMETRY AND/OR LOCATION OF THE STRUCTURE(S): EXISTING STRUCTURE(S) SHALL BE CHECKED IN THE FIELD BY THE CONTRACTOR BEFORE ANY MATERIALS IS ORDERED OR FABRICATED OR CONSTRUCTION BEGINS.





- NOTES:
- FOR GENERAL NOTES AND LOCATION OF STRUCTURE WITHIN PROJECT, SEE NO. ST-01.
  - FOR TYPICAL WALL SECTION, SEE DWG. NO. ST-04.
  - FOR BORING LOCATIONS AND LOGS, SEE DWG. NOS. ST-06 AND ST-07.
  - FOR CAISSON SCHEDULE, SEE DWG. NO. ST-05.
  - FOR WALL DETAILS, SEE DWG. NOS. ST-20 TO ST-22.
  - OFFSET DIMENSIONS ARE MEASURED TO WORK LINE.
  - ALL DIMENSIONS ARE MEASURED ALONG THE FRONT FACE OF WALL.
  - FOR STANDARD DETAILS, SEE DWG. NOS. ST-23 AND ST-24.
  - SEE UTILITY DRAWINGS FOR EXISTING UTILITIES TO REMAIN AND TO BE RELOCATED.



NOTE:  
THE ARCHITECTURAL FINISH AND THE PROPOSED GRADE SHOWN ON THE DEVELOPED ELEVATION ARE ALONG THE FRONT FACE OF THE WALL. REFER TO THE TYPICAL SECTION FOR ADDITIONAL INFORMATION.

DEVELOPED ELEVATION  
SCALE: 1/8" = 1'-0"

90% DESIGN  
NOT FOR CONSTRUCTION

**ALA**  
Athavale, Lystad  
& Associates  
6720-B Rockledge Drive, Suite 160  
Bethesda, MD 20817

NO.	REVISION	DATE	BY

MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION GAITHERSBURG, MARYLAND	
RECOMMENDED FOR APPROVAL	
Chief, Design Section APPROVED	Date
Chief, Division of Transportation Engineering	Date
Designed by: JS	Drawn by: JE
Checked by: KA	

ST-02 RETAINING WALL 1 PLAN AND ELEVATION 1 OF 2	
BOWIE MILL ROAD BIKEWAY M-NCPPC PERMIT NO. MR2023016	
DATE: APRIL 2025	
Project No. : 502108	Sheet 165 of 393










SCALE:  $3/4" = 1'-0"$

- |   |          |      |    |   |  |  |  |  |  |  |  |
|---|----------|------|----|---|--|--|--|--|--|--|--|
| <p align="center"><b>90% DESIGN<br/>NOT FOR CONSTRUCTION</b></p>  |          |      |    | <p align="center">MONTGOMERY COUNTY<br/>DEPARTMENT OF TRANSPORTATION<br/>GAITHERSBURG, MARYLAND</p> |  |  |  | <p align="center"><b>ST-04<br/>RETAINING WALL 1<br/>TYPICAL SECTION</b></p>  |  |  |  |
|  <p align="center"><b>Athavale, Lystad<br/>&amp; Associates</b><br/>6720-B Rockledge Drive, Suite 160<br/>Bethesda, MD 20817</p> |          |      |    | <p align="center">RECOMMENDED FOR APPROVAL</p>  |  |  |  | <p align="center"><b>BOWIE MILL ROAD BIKEWAY</b><br/>M-NCPPC PERMIT NO. <u>MR2023016</u><br/><br/>DATE: APRIL 2025</p> |  |  |  |
|   |          |      |    | <p>Chief, Design Section _____ Date _____</p> <p>APPROVED</p>                                       |  |  |  |  |  |  |  |
|   |          |      |    | <p>Chief, Division of Transportation Engineering _____ Date _____</p>                               |  |  |  |  |  |  |  |
| NO.   | REVISION | DATE | BY | <p>Designed by: <u>JS</u>      Drawn by: <u>JE</u>      Checked by: <u>KA</u></p>                   |  |  |  | <p>Project No.: <u>502108</u>      Sheet <u>167</u> of <u>393</u></p>  |  |  |  |

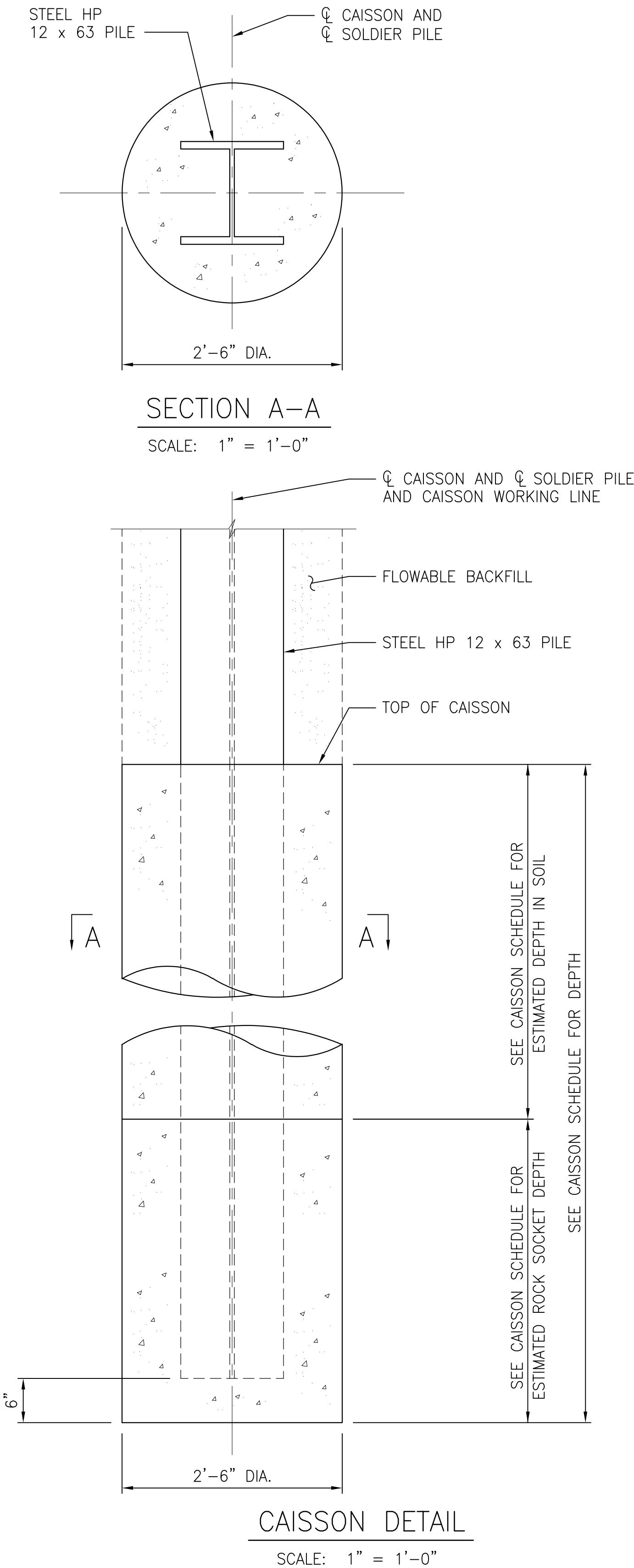



RETAINING WALL RW1 CAISSON SCHEDULE								
CAISSON NO.	STATION BASELINE BOWIE MILL ROAD	BOWIE MILL ROAD BASELINE OFFSET	COORDINATE		ELEVATION TOP OF CAISSON	CAISSON DEPTH IN SOIL (FT)	ESTIMATED ROCK SOCKET DEPTH (FT)	REMARKS
			NORTHING	EASTING				
A1	6+82.542	45.185	534903.0922	1278031.102	428.25	12.00	0	
A2	6+72.553	44.726	534893.975	1278026.994	428.25	15.00	0	
A3	6+65.188	44.411	534884.8578	1278022.886	427.75	18.00	0	
A4	6+55.192	44.543	534875.7439	1278018.779	427.25	21.00	0	
A5	6+45.188	44.519	534866.6885	1278014.528	426.50	22.00	0	
A6	6+35.188	44.495	534857.6365	1278010.278	426.00	22.00	0	
A7	6+25.241	44.472	534848.5052	1278005.989	425.50	21.00	0	
A8	6+15.781	44.047	534839.6689	1278001.294	424.75	21.00	0	
A9	6+06.324	43.743	534830.843	1277996.605	424.25	18.00	0	
A10	5+96.856	43.560	534822.0119	1277991.914	423.50	15.00	3.00	
A11	5+87.385	43.498	534813.1808	1277987.222	423.00	14.00	3.00	
A12	5+77.914	43.558	534804.3498	1277982.53	422.25	13.00	4.00	
A13	5+68.419	43.245	534795.7558	1277977.406	421.75	10.00	5.00	
A14	5+58.428	42.989	534787.1718	1277972.287	421.00	10.00	5.00	
A15	5+48.431	42.733	534778.5828	1277967.166	420.50	9.00	5.00	
A16	5+38.434	42.477	534769.9938	1277962.044	419.75	9.00	5.00	
A17	5+28.437	42.221	534761.4048	1277956.923	419.25	8.00	5.00	
A18	5+18.459	41.472	534753.074	1277951.381	418.50	8.00	5.00	
A19	5+10.405	41.098	534744.7529	1277945.845	417.50	7.00	5.00	
A20	5+00.409	40.816	534736.4268	1277940.307	417.50	6.00	5.00	
A21	4+90.413	40.533	534728.1008	1277934.768	416.75	5.00	5.00	
A22	4+80.785	40.284	534719.7748	1277929.229	416.00	5.00	5.00	
A23	4+71.298	39.662	534711.7274	1277923.283	415.25	5.50	4.50	
A24	4+61.808	39.166	534703.6893	1277917.344	414.25	6.00	4.00	
A25	4+52.302	38.793	534695.6465	1277911.401	413.50	6.50	3.50	
A26	4+42.789	38.546	534687.6037	1277905.459	412.75	7.00	3.00	
A27	4+33.282	38.012	534679.8129	1277899.19	412.00	7.00	3.00	
A28	4+23.735	37.602	534671.9984	1277892.901	412.00	10.00	0	

NOTE: FOR LOCATION OF RW1 CAISSONS, SEE DWG. NO. ST-02 AND ST-03.

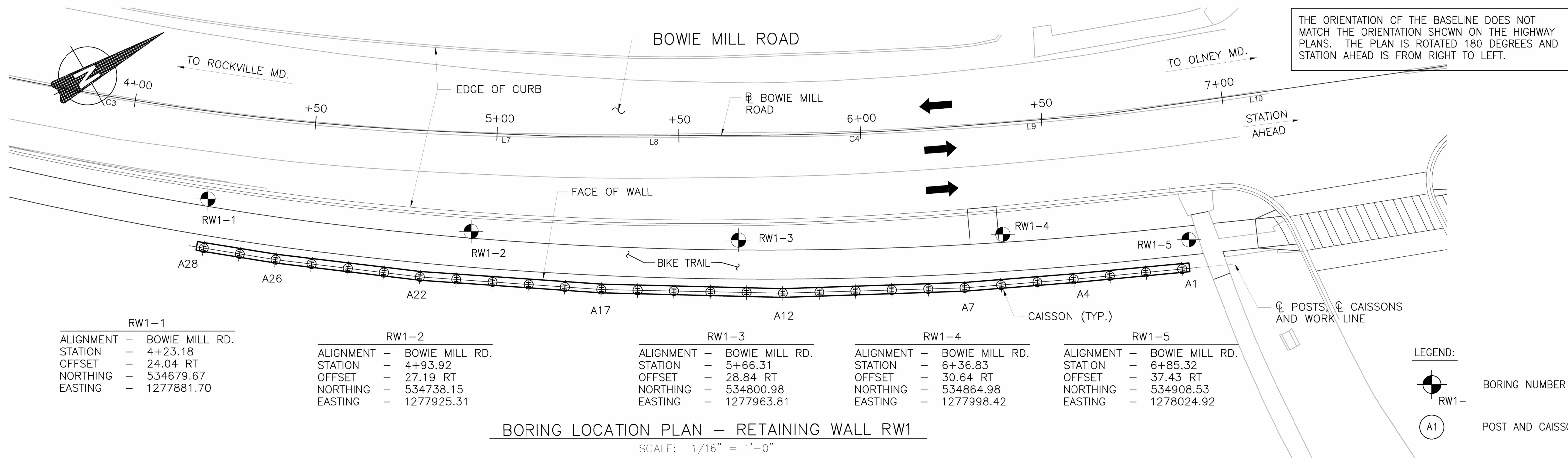
NOTES:

1. ESTIMATED CAISSON DEPTH IN SOIL AND ESTIMATED ROCK SOCKET DEPTH IS FOR THE CASE WHERE ROCK IS ENCOUNTERED APPROXIMATELY 10 FEET BELOW TOP OF CAISSON.
2. IF ROCK IS ENCOUNTERED BETWEEN 10’ AND 19’ BELOW TOP OF CAISSON, ROCK SOCKET DEPTH SHALL BE 4’ IN ALL CASES.
3. IF NO ROCK IS ENCOUNTERED, CAISSON DEPTH IN SOIL SHALL BE 19’.
4. IF ROCK IS ENCOUNTERED AT A DEPTH LESS THAN 10’ BELOW THE TOP OF CAISSON, CEASE DRILLING AND CONTACT THE ENGINEER FOR FURTHER DIRECTION.



90% DESIGN NOT FOR CONSTRUCTION				MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION GAITHERSBURG, MARYLAND		ST-05 RETAINING WALL 1 CAISSON SCHEDULE AND DETAILS	
 Athavale, Lystad & Associates 6720-B Rockledge Drive, Suite 160 Bethesda, MD 20817				RECOMMENDED FOR APPROVAL		BOWIE MILL ROAD BIKEWAY M-NCPPC PERMIT NO. <u>MR2023016</u>	
				Chief, Design Section APPROVED		Date	
				Chief, Division of Transportation Engineering		Date	
		NO.		DESIGNED BY: <u>JS</u>		DRAWN BY: <u>JE</u>	
		REVISION		DATE		CHECKED BY: <u>KA</u>	
						Project No. : <u>502108</u>	
						Sheet <u>168</u> of <u>393</u>	





- NOTES:
- TEST BORINGS WERE DRILLED IN SEPTEMBER 2022 BY KIM ENGINEERING, INC.
  - BLOWS = BLOWS ON SPLIT BARREL SAMPLER BY A 140 POUND WEIGHT AND DRIVE WEIGHT ASSEMBLY FREELY FALLING 30 INCHES.
  - CASING IS METHOD OF MAINTAINING OPEN BOREHOLE.
  - TEST BORINGS WERE DRILLED IN ACCORDANCE WITH AASHTO T206 AND ASTM D1586. ROCK CORING IN ACCORDANCE WITH AASHTO T225 AND ASTM D2113.
  - SOLID HAS BEEN IDENTIFIED BY A GEOTECHNICAL INSPECTOR.
  - THE BORING LOG SOIL SYMBOLS REFLECT ONLY THE MAJOR SOIL CONSTITUENT; FOR MORE COMPLETE SOIL CHARACTERISTICS REFER TO THE WRITTEN DESCRIPTION AT THE RESPECTIVE ELEVATION.
  - THE FIELD BORING LOGS RECORD OBSERVATIONS OF THE DRILLING OPERATIONS. THE LOGS ARE AVAILABLE UPON REQUEST.

RW1-1		RW1-2		RW1-3		RW1-4		RW1-5	
ALIGNMENT	- BOWIE MILL RD.	ALIGNMENT	- BOWIE MILL RD.	ALIGNMENT	- BOWIE MILL RD.	ALIGNMENT	- BOWIE MILL RD.	ALIGNMENT	- BOWIE MILL RD.
STATION	- 4+23.18	STATION	- 4+93.92	STATION	- 5+66.31	STATION	- 6+36.83	STATION	- 6+85.32
OFFSET	- 24.04 RT	OFFSET	- 27.19 RT	OFFSET	- 28.84 RT	OFFSET	- 30.64 RT	OFFSET	- 37.43 RT
NORTHING	- 534679.67	NORTHING	- 534738.15	NORTHING	- 534800.98	NORTHING	- 534864.98	NORTHING	- 534908.53
EASTING	- 1277881.70	EASTING	- 1277925.31	EASTING	- 1277963.81	EASTING	- 1277998.42	EASTING	- 1278024.92

BORING LOCATION PLAN - RETAINING WALL RW1

SCALE: 1/16" = 1'-0"

KIM ENGINEERING, INC.  
Consulting Geotechnical Engineers  
Baltimore, Maryland

## BORING NUMBER RW1-1

PAGE 1 OF 1

CLIENT <u>JMT</u>	PROJECT NAME <u>Bowie Mill Road Bikeway</u>
PROJECT NUMBER <u>G23106</u>	PROJECT LOCATION <u>Olney, MD</u>
DATE STARTED <u>2/6/24</u> COMPLETED <u>2/6/24</u>	GROUND ELEVATION <u>416 ft</u> HOLE SIZE <u>6"</u>
DRILLING CONTRACTOR <u>Kim Engineering Inc.</u>	GROUND WATER LEVELS:
DRILLING METHOD <u>H.S.A.</u>	AT TIME OF DRILLING <u>Dry</u>
LOGGED BY <u>SE</u> CHECKED BY <u>KB</u>	AT END OF DRILLING <u>Dry</u>
NOTES <u>Caved @ 16'</u>	24hrs AFTER DRILLING <u>Dry</u>

DEPTH (ft)	GRAPHIC LOG	ELEVATION	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RSD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
									PL	MC	LL	
									1	1	1	
									□ FINES CONTENT (%) □			
									20	40	60	80
		415.71	3.5-inches of Topsoil Dark brown, reddish brown, grayish brown, moist, loose to medium dense, Silty SAND with Gravel (SM)	SS 1	44	2-2.4 (6)						
				SS 2	106	3-8-12 (20)						
5			S-3: with rock fragments	SS 3	89	13-9-9 (18)						
				SS 4	89	8-7-10 (17)						
10				SS 5	89	6-6-13 (19)						
		402.50	DECOMPOSED ROCK classified as gray, grayish brown, moist, very dense, Silty SAND (SM)	SS 6	100	50/4"						
15				SS 7	100	50/4"						
20				SS 8	100	50/1"						
		395.90	Bottom of hole at 20.1 feet.									

GEOTECHNICAL PLOTS: BOWIE MILL RD BIKEWAY (S&W) DATE: 03/24

KIM ENGINEERING, INC.  
Consulting Geotechnical Engineers  
Baltimore, Maryland

## BORING NUMBER RW1-2

PAGE 1 OF 1

CLIENT	JMT	PROJECT NAME	Bowie Mill Road Bikeway
PROJECT NUMBER	G23106	PROJECT LOCATION	Olney, MD
DATE STARTED	2/6/24	COMPLETED	2/6/24
DRILLING CONTRACTOR	Kim Engineering Inc.	GROUND ELEVATION	419 ft
DRILLING METHOD	H.S.A.	HOLE SIZE	6"
LOGGED BY	SE	CHECKED BY	KB
NOTES		GROUND WATER LEVELS:	
		AT TIME OF DRILLING	Dry
		AT END OF DRILLING	Dry
		24hrs AFTER DRILLING	Dry

DEPTH (ft)	GRAPHIC LOG	ELEVATION	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲		
									PL	MC	LL

KIM ENGINEERING			KIM ENGINEERING, INC. Consulting Geotechnical Engineers Baltimore, Maryland		BORING NUMBER RW1-3 PAGE 1 OF 1						
CLIENT JMT			PROJECT NAME Bowie Mill Road Bikeway								
PROJECT NUMBER G23106			PROJECT LOCATION Olney, MD								
DATE STARTED 2/5/24		COMPLETED 2/6/24		GROUND ELEVATION 424 ft		HOLE SIZE 6"					
DRILLING CONTRACTOR Kim Engineering Inc.			GROUND WATER LEVELS:								
DRILLING METHOD H.S.A.			AT TIME OF DRILLING Dry								
LOGGED BY SE			CHECKED BY KB		AT END OF DRILLING Dry						
NOTES			24hrs AFTER DRILLING Dry								
DEPTH (ft)	GRAPHIC LOG	ELEVATION	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲		
									PL	MC	LL
<input type="checkbox"/> FINES CONTENT (%) <input type="checkbox"/>											
20 40 60 80											
		423.58	5-inches of Topsoil	SS 1	56	1-2-2 (4)					
			Reddish brown, grayish brown, dark brown, moist, very loose to dense, Silty SAND with Gravel, trace roots (SM)	SS 2	39	9-10-15 (25)					
5				SS 3	100	17-20-24 (44)					
		416.50	DECOMPOSED ROCK classified as gray, moist, very dense, Poorly Graded GRAVEL with Silt with rock fragments (GP-GM)	SS 4	100	50/6"					
10		414.00	DECOMPOSED ROCK classified as dark brown, reddish brown, brown, moist, very dense, Silty SAND with Gravel (SM)	SS 5	56	23-26-50 (76)					
		410.50	DECOMPOSED ROCK classified as gray, moist, very dense, Poorly Graded GRAVEL with Silt (GP-GM)	SS 6	100	50/2"					
		409.45	Bottom of hole at 14.6 feet.	SS 7	100	50/1"					

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90% DESIGN  
NOT FOR CONSTRUCTION



Athavale, Lystad  
& Associates

6720-B Rockledge Drive, Suite 160  
Bethesda, MD 20817

MONTGOMERY COUNTY  
DEPARTMENT OF TRANSPORTATION  
GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL

Chief, Design Section

APPROVED

Chief, Division of Transportation Engineering

Designed by: JS Drawn by: JE Checked by: KA

ST-06  
RETAINING WALL 1  
BORING LOGS AND LOCATION PLAN  
1 of 2

BOWIE MILL ROAD BIKEWAY

M-NCPPC PERMIT NO. MR2023016

DATE: APRIL 2025

Project No.: 502108 Sheet 169 of 393



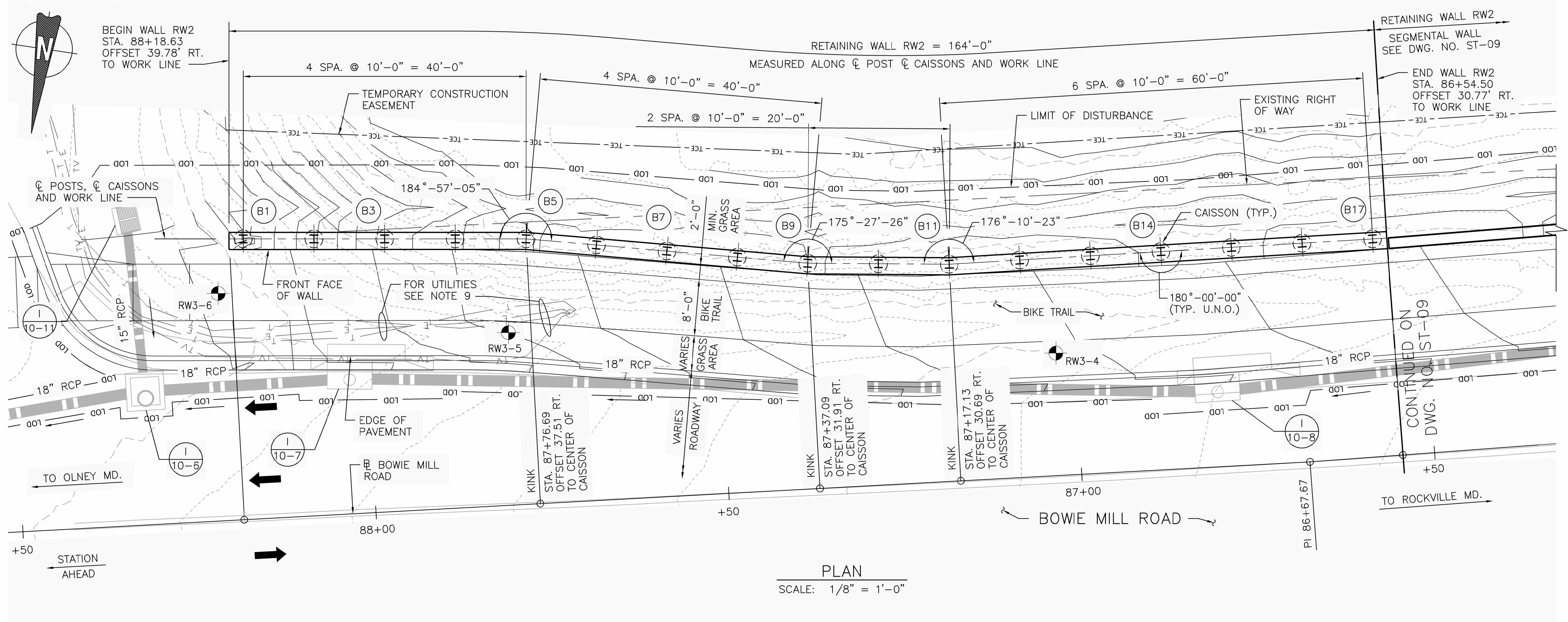
BOTTOM OF CAISSON  
EL. 402.00

BOTTOM OF CAISSON  
EL. 416.25

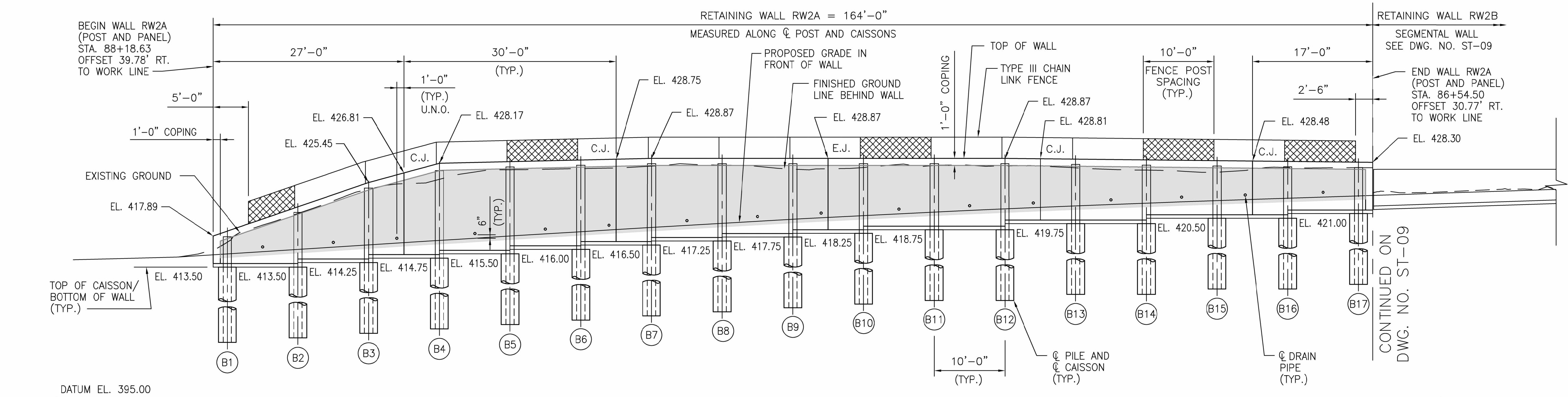
1. TEST BORINGS WERE DRILLED IN SEPTEMBER 2022 BY KIM ENGINEERING, INC.
2. BLOWS = BLOWS ON SPLIT BARREL SAMPLER BY A 140 POUND WEIGHT AND DRIVE WEIGHT ASSEMBLY FREELY FALLING 30 INCHES.
3. CASING IS METHOD OF MAINTAINING OPEN BOREHOLE.
4. TEST BORINGS WERE DRILLED IN ACCORDANCE WITH AASHTO T206 AND ASTM D1586. ROCK CORING IN ACCORDANCE WITH AASHTO T225 AND ASTM D2113.
5. SOLID HAS BEEN IDENTIFIED BY A GEOTECHNICAL INSPECTOR.
6. THE BORING LOG SOIL SYMBOLS REFLECT ONLY THE MAJOR SOIL CONSTITUENT; FOR MORE COMPLETE SOIL CHARACTERISTICS REFER TO THE WRITTEN DESCRIPTION AT THE RESPECTIVE ELEVATION.
7. THE FIELD BORING LOGS RECORD OBSERVATIONS OF THE DRILLING OPERATIONS. THE LOGS ARE AVAILABLE UPON REQUEST.

FILE NAME: C:\pwworking\jmt\d0798326\\_\_New\_ST-07\_Bowie Mill\_Retaining Wall 1 - Borings and Drive Test 2 of 2.dwg LAYOUT NAME: 24x36 PLOTTED: Friday, April 04, 2025 - 1:51pm USER: jelliott





- NOTES:
1. FOR GENERAL NOTES AND LOCATION OF STRUCTURE WITHIN PROJECT, SEE NO. ST-01.
  2. FOR TYPICAL WALL SECTION, SEE DWG. NO. ST-11.
  3. FOR BORING LOCATIONS AND LOGS, SEE DWG. NOS. ST-13, ST-14.
  4. FOR CAISSON SCHEDULE, SEE DWG. NO. ST-12.
  5. FOR WALL DETAILS, SEE DWG. NOS. ST-20 TO ST-22.
  6. OFFSET DIMENSIONS ARE MEASURED TO WORK LINE.
  7. ALL DIMENSIONS ARE MEASURED ALONG THE FRONT FACE OF WALL.
  8. FOR STANDARD DETAILS, SEE DWG. NOS. ST-23 AND ST-24.
  9. SEE UTILITY DRAWINGS FOR EXISTING UTILITIES TO REMAIN AND TO BE RELOCATED.



- LEGEND:
- [Hatched Box] DENOTES ARCHITECTURAL TREATMENT
  - (B1) POST AND CAISSON IDENTIFICATION

THE ORIENTATION OF THE BASELINE DOES NOT MATCH THE ORIENTATION SHOWN ON THE HIGHWAY PLANS. THE PLAN IS ROTATED 180 DEGREES AND STATION AHEAD IS FROM RIGHT TO LEFT.

NOTE:  
THE ARCHITECTURAL FINISH AND THE PROPOSED GRADE SHOWN ON THE DEVELOPED ELEVATION ARE ALONG THE FRONT FACE OF THE WALL. REFER TO THE TYPICAL SECTION FOR ADDITIONAL INFORMATION.

DEVELOPED ELEVATION  
SCALE: 1/8" = 1'-0"

90% DESIGN  
NOT FOR CONSTRUCTION

**ALA**  
Athavale, Lystad  
& Associates  
6720-B Rockledge Drive, Suite 160  
Bethesda, MD 20817

NO.	REVISION	DATE	BY

MONTGOMERY COUNTY  
DEPARTMENT OF TRANSPORTATION  
GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL

Chief, Design Section  
APPROVED \_\_\_\_\_ Date \_\_\_\_\_

Chief, Division of Transportation Engineering  
APPROVED \_\_\_\_\_ Date \_\_\_\_\_

Designed by: JS Drawn by: JE Checked by: KA

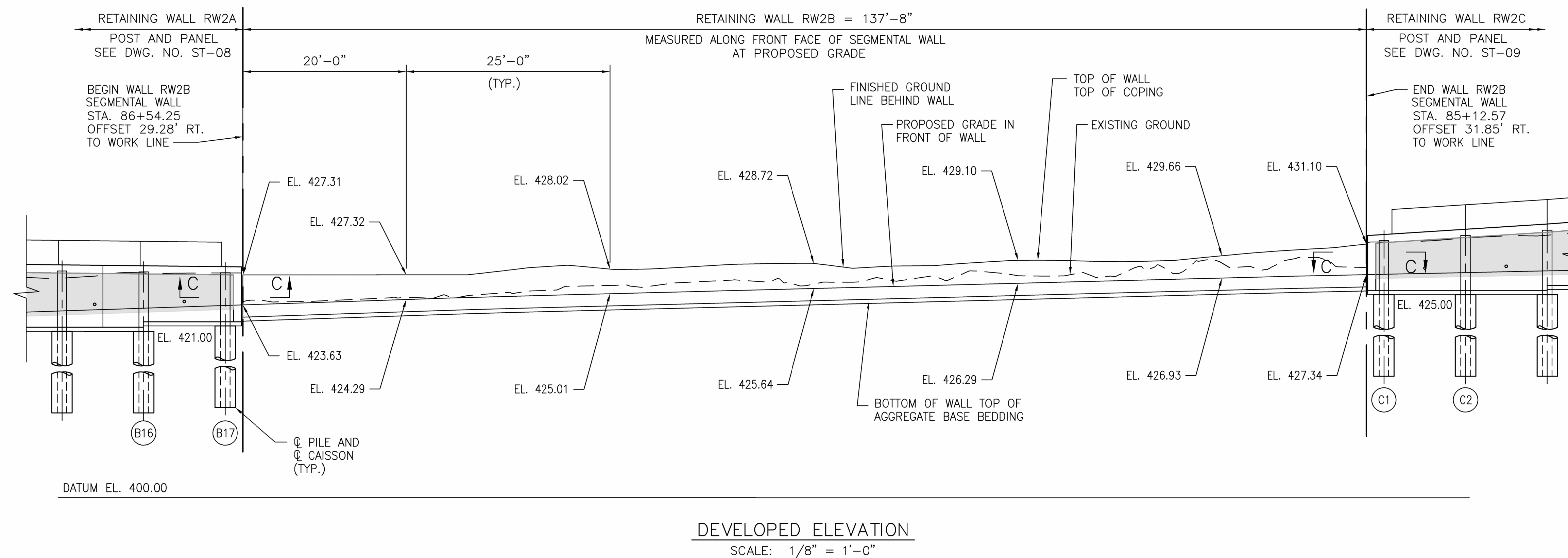
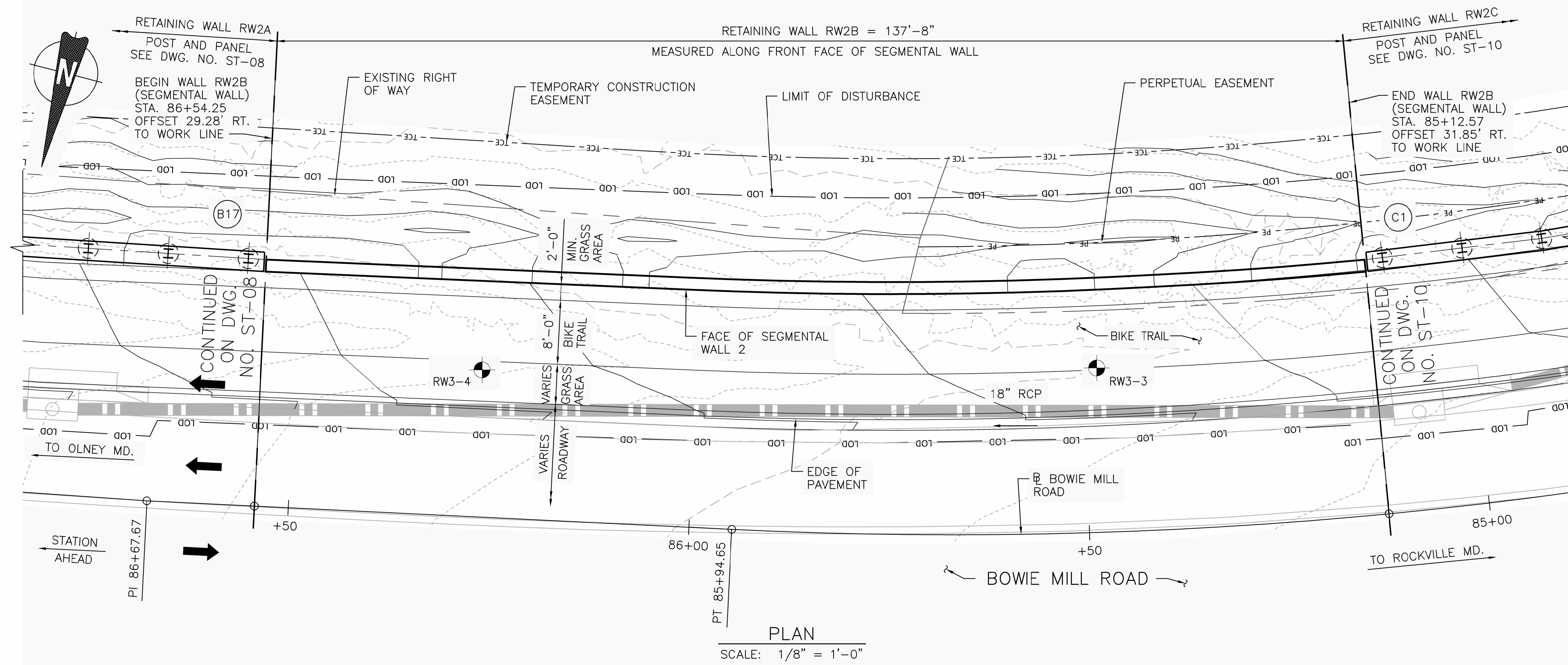
ST-08  
RETAINING WALL 2  
PLAN AND ELEVATION 1 OF 3

**BOWIE MILL ROAD BIKEWAY**  
M-NCPPC PERMIT NO. MR2023016

DATE: APRIL 2025

Project No. : 502108 Sheet 171 of 393







NOTE:


1. FOR NOTES, SEE DWG. NO. ST-08.

LEGEND:

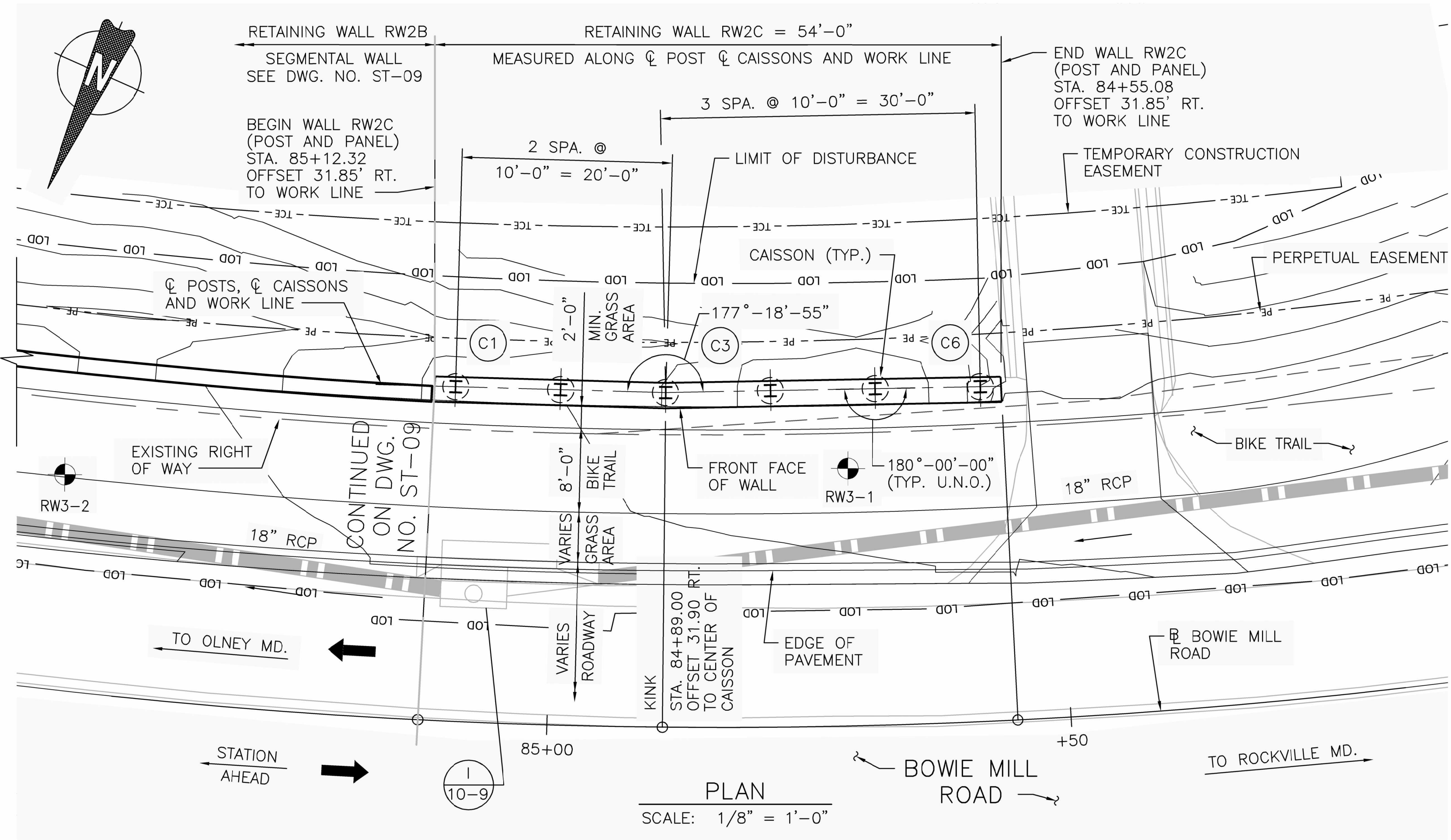
 DENOTES ARCHITECTURAL TREATMENT

 POST AND CAISSON IDENTIFICATION

THE ORIENTATION OF THE BASELINE DOES NOT MATCH THE ORIENTATION SHOWN ON THE HIGHWAY PLANS. THE PLAN IS ROTATED 180 DEGREES AND STATION AHEAD IS FROM RIGHT TO LEFT.

<p align="center"><b>90% DESIGN NOT FOR CONSTRUCTION</b></p>				<p align="center">MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION GAITHERSBURG, MARYLAND</p>				<p align="center">ST-09 RETAINING WALL 2 PLAN AND ELEVATION 2 OF 3</p>			
 <p align="center"><b>Athavale, Lystad &amp; Associates</b></p> <p align="center">6720-B Rockledge Drive, Suite 160 Bethesda, MD 20817</p>				<p align="center">RECOMMENDED FOR APPROVAL</p>				<p align="center"><b>BOWIE MILL ROAD BIKEWAY</b></p> <p align="center">M-NCPPC PERMIT NO. <u>MR2023016</u></p> <p align="right">DATE: APRIL 2025</p>			
				<p>Chief, Design Section _____ Date _____</p> <p align="center">APPROVED</p>							
				<p>Chief, Division of Transportation Engineering _____ Date _____</p>							
				<p>Designed by: JS      Drawn by: JE      Checked by: KA</p>							
				<p>Project No. : 502108      Sheet 172 of 393</p>							
NO.	REVISION	DATE	BY								

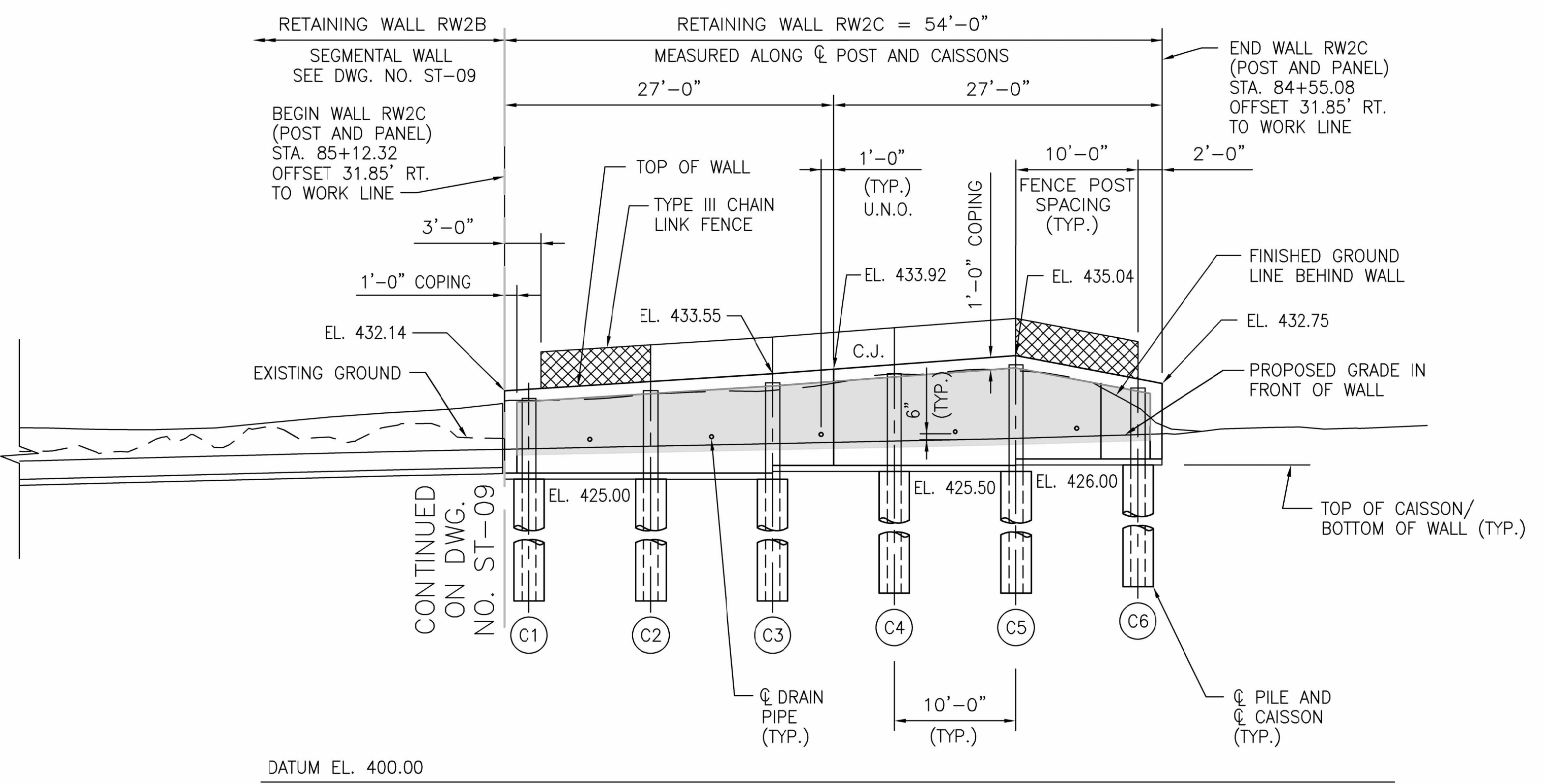




NOTE:  
1. FOR NOTES, SEE DWG. NO. ST-08.

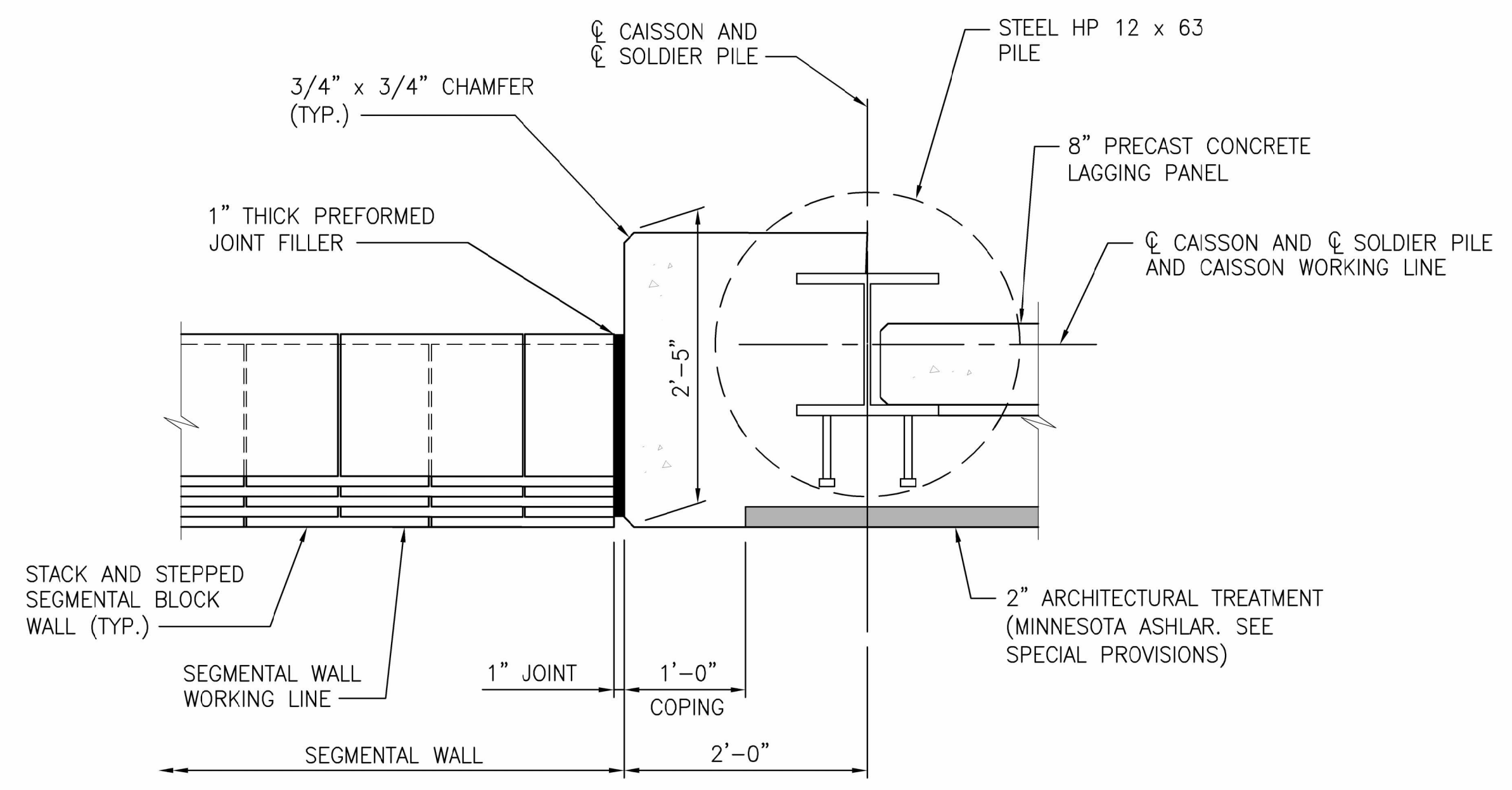
- LEGEND:
- [Hatched Box] DENOTES ARCHITECTURAL TREATMENT
  - (C1) POST AND CAISSON IDENTIFICATION

THE ORIENTATION OF THE BASELINE DOES NOT MATCH THE ORIENTATION SHOWN ON THE HIGHWAY PLANS. THE PLAN IS ROTATED 180 DEGREES AND STATION AHEAD IS FROM RIGHT TO LEFT.



NOTE:  
THE ARCHITECTURAL FINISH AND THE PROPOSED GRADE SHOWN ON THE DEVELOPED ELEVATION ARE ALONG THE FRONT FACE OF THE WALL. REFER TO THE TYPICAL SECTION FOR ADDITIONAL INFORMATION.

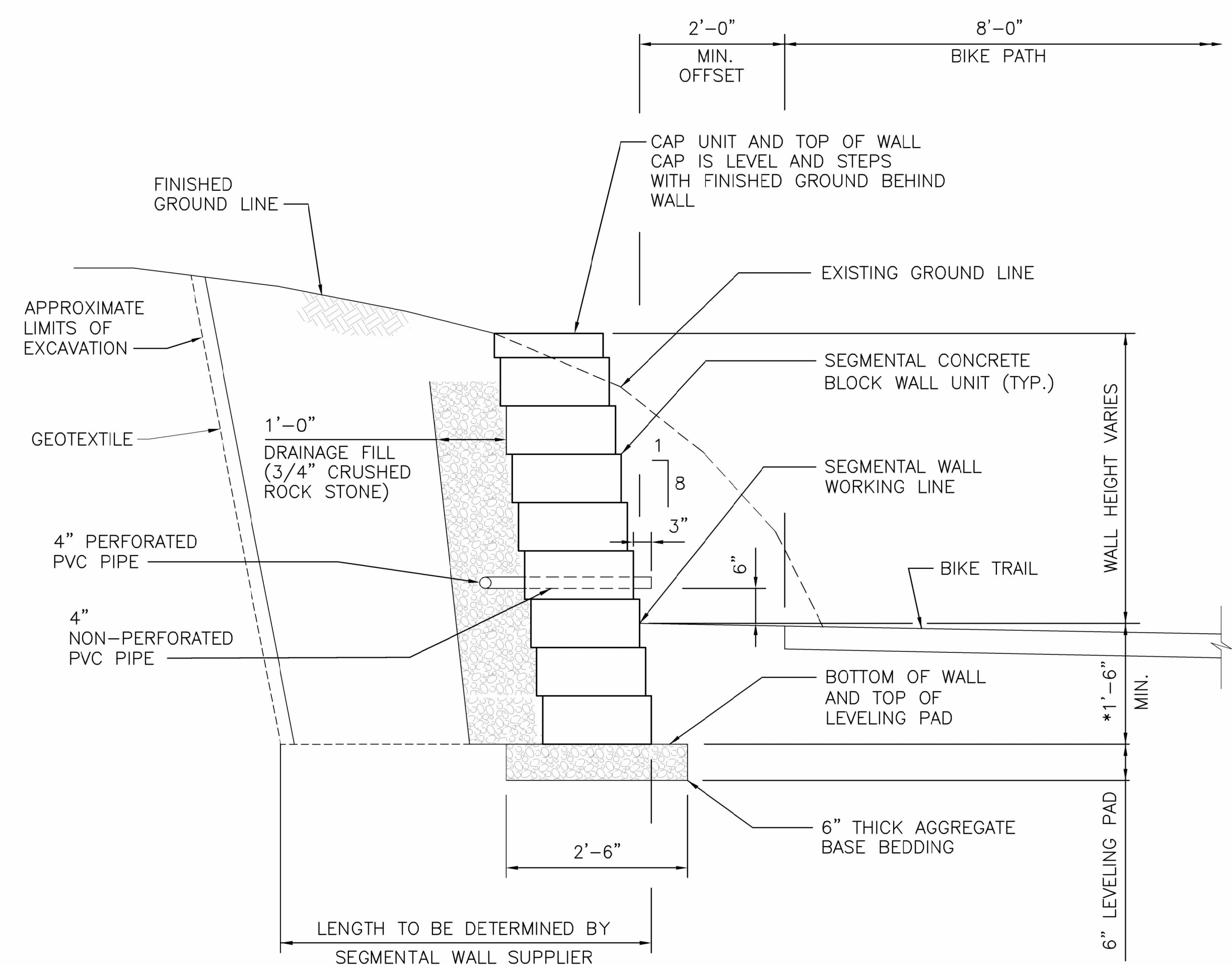
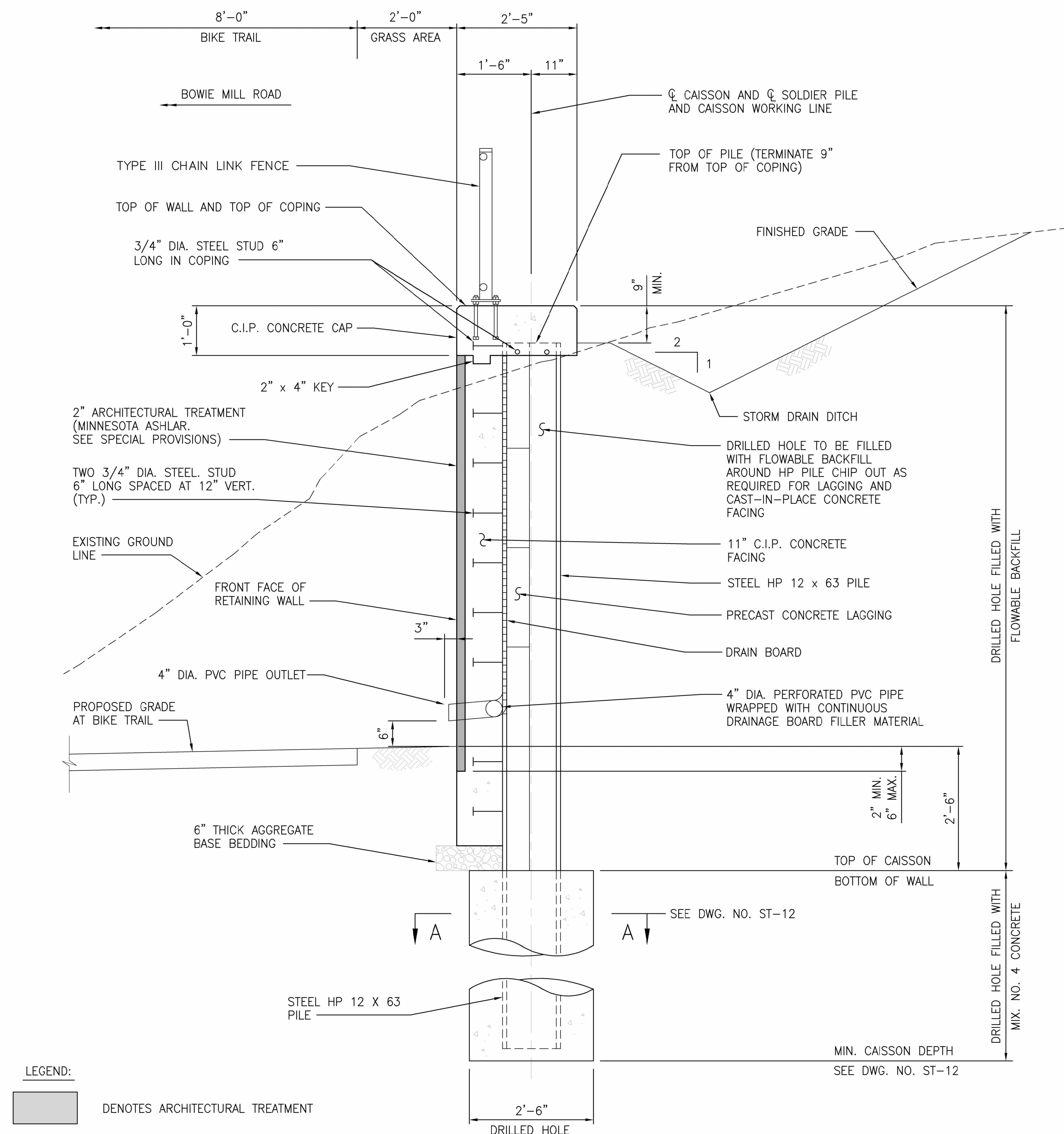
DEVELOPED ELEVATION  
SCALE: 1/8" = 1'-0"



SECTION C-C  
SCALE: 1" = 1'-0"

<b>90% DESIGN NOT FOR CONSTRUCTION</b>	<div><b>Athavale, Lystad &amp; Associates</b> 6720-B Rockledge Drive, Suite 160 Bethesda, MD 20817</div>	MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION GAITHERSBURG, MARYLAND				<b>ST-10 RETAINING WALL 2 PLAN AND ELEVATION 3 OF 3</b>  <b>BOWIE MILL ROAD BIKEWAY</b> M-NCPPC PERMIT NO. <u>MR2023016</u>  DATE: APRIL 2025
		RECOMMENDED FOR APPROVAL				
		Chief, Design Section APPROVED _____ Date _____  Chief, Division of Transportation Engineering APPROVED _____ Date _____				
NO. REVISION DATE BY		Designed by: <u>JS</u> Drawn by: <u>JE</u> Checked by: <u>KA</u>		Project No. : <u>502108</u>	Sheet <u>173</u> of <u>393</u>	





- POST AND PANEL NOTES:

1. BACKFILL AROUND STEEL PILE ABOVE TOP OF CONCRETE CAISSON SHALL BE FLOWABLE BACKFILL IN ACCORDANCE WITH MDOT SHA STANDARD SPECIFICATION SECTION 314.02 AND 314.03.
2. FOR CONSTRUCTION SEQUENCE AND REQUIREMENTS, SEE SPECIAL PROVISIONS.
3. COST FOR FLOWABLE FILL, 6" AGGREGATE BASE, DRAIN BOARD AND PIPE SHALL BE CONSIDERED INCIDENTAL TO THE LUMP SUM PAYMENT FOR "RETAINING WALLS".
4. FOR CAISSON SCHEDULE, SEE DWG. NO. ST-12.
5. FOR SECTION A-A, SEE DWG. NO. ST-12.
6. FOR WALL DETAILS, SEE DWG. NOS. ST-20 TO ST-22.
7. ARCHITECTURAL FORMLINER SHALL BE MINNESOTA ASHLAR WITH MAXIMUM RELIEF NOT TO EXCEED 2". CONTRACTOR SHALL REFER TO SECTIONS 450.02 AND 450.03 OF THE SHA SPECIFICATIONS AND THE SPECIAL PROVISIONS FOR TREATMENT REQUIREMENTS. THE CONTRACTOR SHALL SUBMIT THE FORMLINER PATTERN AND STAINING TO THE COUNTY FOR APPROVAL.
8. FOR TYPE III CHAIN LINK DETAILS, SEE DWG. NO. ST-23.

- SEGMENTAL WALL NOTES:

1. THE MAXIMUM ALLOWABLE BEARING PRESSURE UNDER THE SEGMENTAL WALL SHALL BE 1.5 TONS PER SQUARE FOOT.
- \*2. THE WALL EMBEDMENT DEPTH SHALL BE INCREASED AS REQUIRED FOR WALL GLOBAL STABILITY.
3. REINFORCED SOIL SHALL BE #57 STONE UNLESS OTHERWISE SPECIFIED BY THE WALL SUPPLIER.
4. FOR ADDITIONAL REQUIREMENTS FOR THE SEGMENTAL WALL, SEE SPECIAL PROVISIONS "SEGMENTAL RETAINING WALL".
5. FOR ROADWAY SECTIONS, SEE ROADWAY PLANS.
6. WHEN SITE CONDITIONS REQUIRE, WRAP DRAINAGE PIPE IN 3/4" AGGREGATE AND FILTER FABRIC.



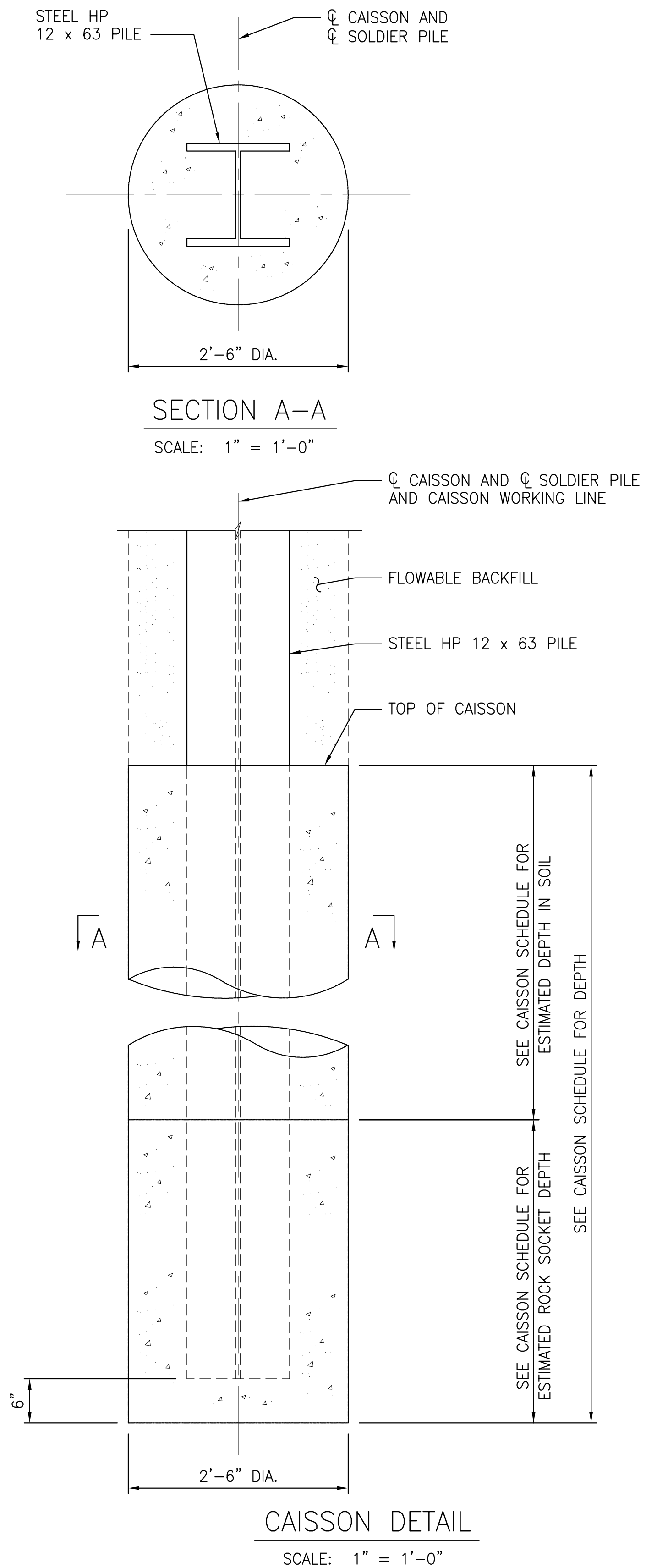
## RETAINING WALL RW2 CAISSON SCHEDULE


CAISSON NO.	STATION BASELINE BOWIE MILL ROAD	BOWIE MILL ROAD BASELINE OFFSET	COORDINATE		ELEVATION TOP OF CAISSON	CAISSON DEPTH IN SOIL (FT)	ESTIMATED ROCK SOCKET DEPTH (FT)	REMARKS
			NORTHING	EASTING				
B1	88+16.630	39.676	540267.6999	1282140.202	413.50	9.00	0	
B2	88+06.645	39.135	540266.1737	1282130.319	413.50	12.00	0	
B3	87+96.660	38.595	540264.6475	1282120.437	414.25	15.00	0	
B4	87+86.675	38.054	540263.1212	1282110.554	414.75	17.00	0	
B5	87+76.690	37.513	540261.595	1282100.671	415.00	17.00	0	
B6	87+66.789	36.113	540260.9275	1282090.693	416.00	18.00	0	
B7	87+56.888	34.712	540260.2599	1282080.716	416.50	18.00	0	
B8	87+46.987	33.312	540259.5924	1282070.738	417.25	16.00	0	
B9	87+37.086	31.911	540258.9248	1282060.76	417.75	16.00	0	
B10	87+27.107	31.300	540257.4694	1282050.869	418.25	14.00	3.00	
B11	87+17.126	30.688	540256.0137	1282040.975	418.75	14.00	3.00	
B12	87+07.126	30.743	540253.9009	1282031.201	418.75	14.00	3.00	
B13	86+97.126	30.799	540251.7882	1282021.427	419.75	13.00	3.00	
B14	86+87.126	30.855	540249.6754	1282011.652	419.75	13.00	3.00	
B15	86+77.126	30.910	540247.5626	1282001.878	420.50	12.00	3.00	
B16	86+66.504	30.949	540245.4498	1281992.104	420.50	10.00	3.00	
B17	86+56.505	30.804	540243.3363	1281982.33	421.00	8.00	3.00	
C1	85+10.197	31.891	540204.6394	1281846.307	425.00	7.00	3.00	
C2	84+99.599	31.990	540200.7816	1281837.082	425.00	8.00	5.00	
C3	84+89.000	31.900	540196.9235	1281827.856	425.00	8.00	5.00	
C4	84+78.405	32.092	540192.639	1281818.824	425.50	10.00	3.00	
C5	84+67.803	32.096	540188.3529	1281809.789	425.50	10.00	3.00	
C6	84+57.204	31.912	540184.0669	1281800.755	426.00	9.00	0	

NOTE: FOR LOCATION OF RW2 CAISSONS, SEE DWG. NO. ST-08 AND ST-10.

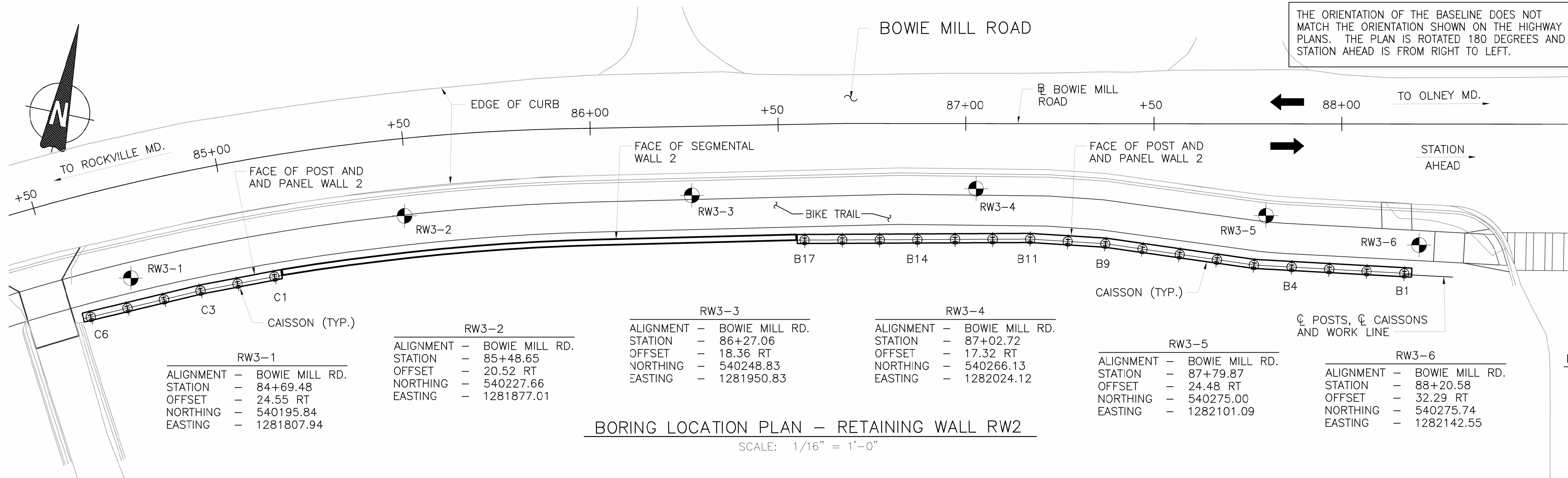
NOTES:

1. ESTIMATED CAISSON DEPTH IN SOIL AND ESTIMATED ROCK SOCKET DEPTH IS FOR THE CASE WHERE ROCK IS ENCOUNTERED APPROXIMATELY 10 FEET BELOW TOP OF CAISSON.
2. IF ROCK IS ENCOUNTERED BETWEEN 10' AND 19' BELOW TOP OF CAISSON, ROCK SOCKET DEPTH SHALL BE 4' IN ALL CASES.
3. IF NO ROCK IS ENCOUNTERED, CAISSON DEPTH IN SOIL SHALL BE 19'.
4. IF ROCK IS ENCOUNTERED AT A DEPTH LESS THAN 10' BELOW THE TOP OF CAISSON, CEASE DRILLING AND CONTACT THE ENGINEER FOR FURTHER DIRECTION.



<p>90% DESIGN NOT FOR CONSTRUCTION</p>				<p>MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION GAITHERSBURG, MARYLAND</p>				<p>ST-12 RETAINING WALL 2 CAISSON SCHEDULE AND DETAILS</p>			
 <p><b>Athavale, Lystad &amp; Associates</b> 6720-B Rockledge Drive, Suite 160 Bethesda, MD 20817</p>				<p>RECOMMENDED FOR APPROVAL</p> <p>Chief, Design Section _____ Date _____ APPROVED</p> <p>Chief, Division of Transportation Engineering _____ Date _____</p>				<p><b>BOWIE MILL ROAD BIKEWAY</b> M-NCPPC PERMIT NO. <u>MR2023016</u></p>			
<p>NO.      REVISION      DATE      BY</p>				<p>Designed by: <u>JS</u>      Drawn by: <u>JE</u>      Checked by: <u>KA</u></p>				<p>Project No. : <u>502108</u>      Sheet <u>175</u> of <u>393</u></p>			





- NOTES:
- TEST BORINGS WERE DRILLED IN SEPTEMBER 2022 BY KIM ENGINEERING, INC.
  - BLOWS = BLOWS ON SPLIT BARREL SAMPLER BY A 140 POUND WEIGHT AND DRIVE WEIGHT ASSEMBLY FREELY FALLING 30 INCHES.
  - CASING IS METHOD OF MAINTAINING OPEN BOREHOLE.
  - TEST BORINGS WERE DRILLED IN ACCORDANCE WITH AASHTO T206 AND ASTM D1586. ROCK CORING IN ACCORDANCE WITH AASHTO T225 AND ASTM D2113.
  - SOLID HAS BEEN IDENTIFIED BY A GEOTECHNICAL INSPECTOR.
  - THE BORING LOG SOIL SYMBOLS REFLECT ONLY THE MAJOR SOIL CONSTITUENT; FOR MORE COMPLETE SOIL CHARACTERISTICS REFER TO THE WRITTEN DESCRIPTION AT THE RESPECTIVE ELEVATION.
  - THE FIELD BORING LOGS RECORD OBSERVATIONS OF THE DRILLING OPERATIONS. THE LOGS ARE AVAILABLE UPON REQUEST.

<

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BORING NUMBER RW3-3									
KIM ENGINEERING, INC. Consulting Geotechnical Engineers Baltimore, Maryland									
CLIENT <u>JMT</u>			PROJECT NAME <u>Bowie Mill Road Bikeway</u>						
PROJECT NUMBER <u>G23106</u>			PROJECT LOCATION <u>Olney, MD</u>						
DATE STARTED <u>2/14/24</u>		COMPLETED <u>2/14/24</u>		GROUND ELEVATION <u>424 ft</u>		HOLE SIZE <u>6"</u>			
DRILLING CONTRACTOR <u>Kim Engineering Inc.</u>			GROUND WATER LEVELS:						
DRILLING METHOD <u>H.S.A.</u>			AT TIME OF DRILLING <u>Dry</u>						
LOGGED BY <u>SE</u>			AT END OF DRILLING <u>Dry</u>						
CHECKED BY <u>KB</u>			24hrs AFTER DRILLING <u>NR</u>						
NOTES <u>Caved @ 13.08'</u>									
DEPTH (ft)	GRAPHIC LOG	ELEVATION	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (ROD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲ PL   MC   LL <input type="checkbox"/> FINES CONTENT (%) <input type="checkbox"/> 20 40 60 80
		423.63	3.5-inches of Topsoil	SS 1	89	2-3-3 (6)			
5			Orange, reddish brown, black, gray, grayish brown, dark brown, moist, loose to dense, Silty SAND with mica (SM)	SS 2	78	3-8-10 (18)			
				SS 3	100	7-12-15 (27)			
				SS 4	100	15-17-18 (35)			
10				SS 5	89	17-18-18 (36)			
		410.50	DECOMPOSED ROCK classified as grayish brown, dark brown, moist, very dense, Silty SAND with rock fragment (SM)	SS 6	80	18-50/4"			>>
15		408.57	Bottom of hole at 15.3 feet.	SS 7		50/1"			>>>

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**ALA**  
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& Associates  
6720-B Rockledge Drive, Suite 160  
Bethesda, MD 20817

MONTGOMERY COUNTY  
DEPARTMENT OF TRANSPORTATION  
GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL

Chief, Design Section \_\_\_\_\_ Date \_\_\_\_\_

Chief, Division of Transportation Engineering \_\_\_\_\_ Date \_\_\_\_\_

Designed by: JS Drawn by: JE Checked by: KA

ST-13  
RETAINING WALL 2  
BORING LOGS AND LOCATION PLAN  
1 OF 2

BOWIE MILL ROAD BIKEWAY  
M-NCPPC PERMIT NO. MR2023016

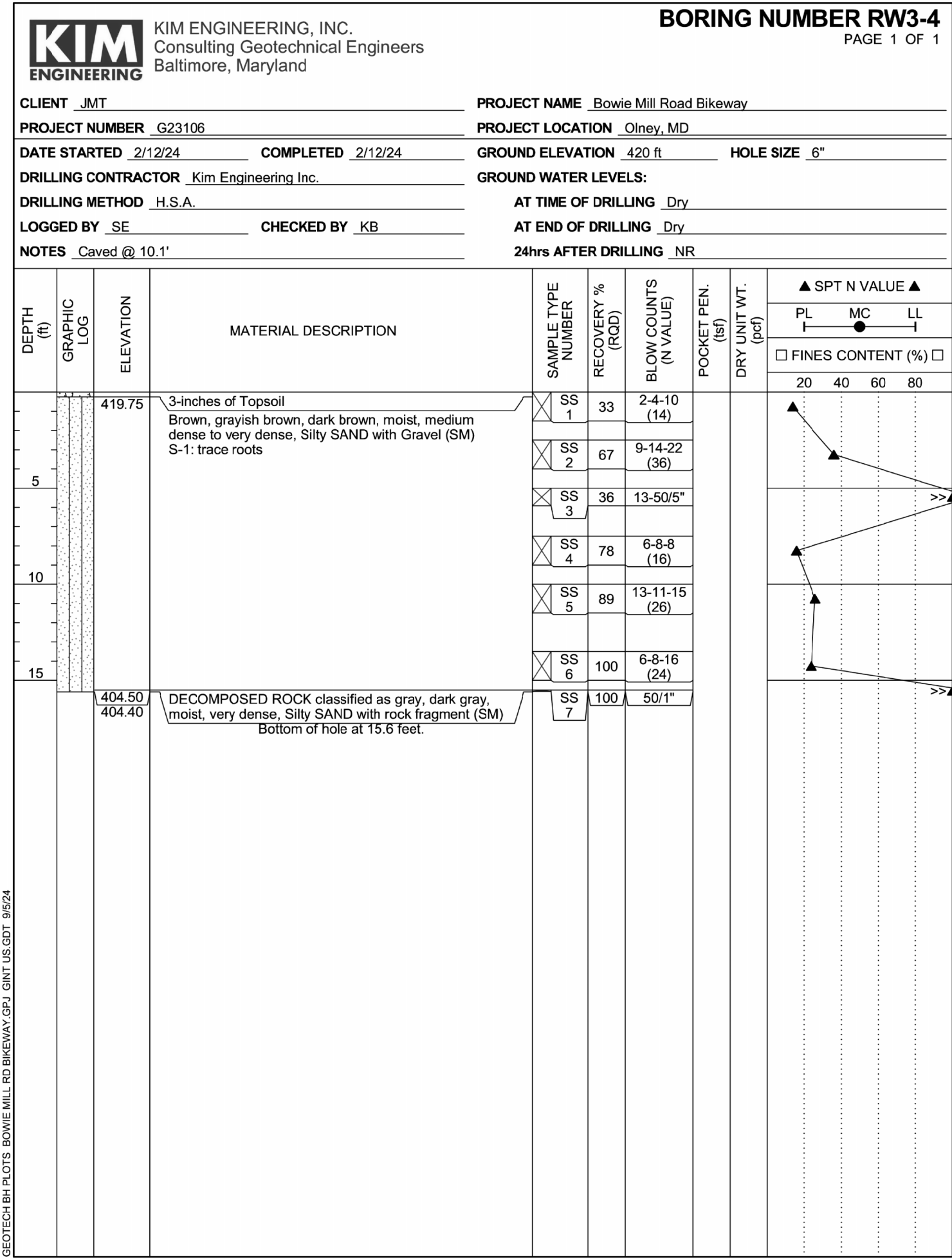
DATE: APRIL 2025

Project No.: 502108 Sheet 176 of 393



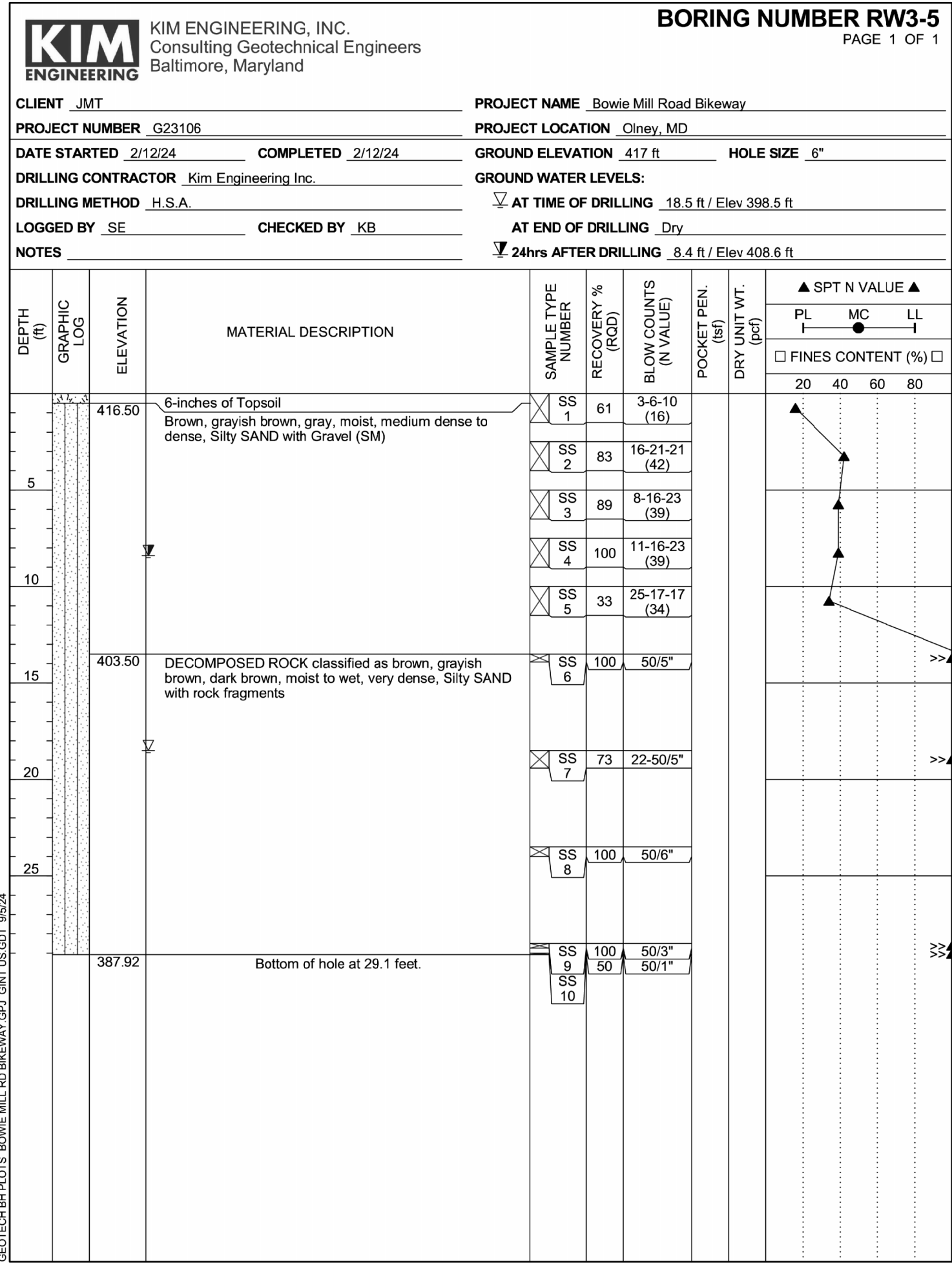
TOP OF CAISSON  
EL. 418.75

BOTTOM OF CAISSON  
EL. 401.75



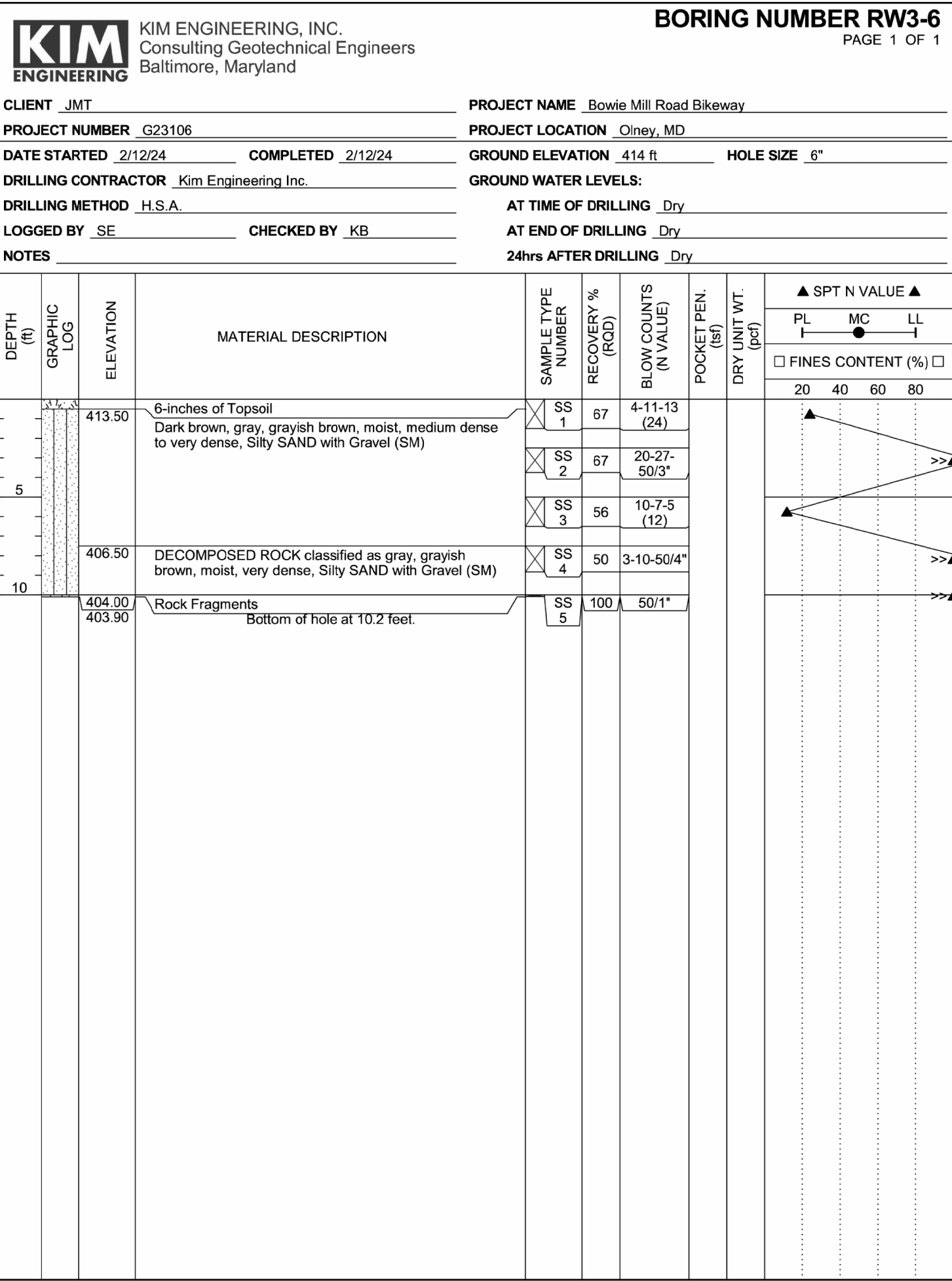
TOP OF CAISSON  
EL. 415.00

BOTTOM OF CAISSON  
EL. 398.00



TOP OF CAISSON  
EL. 413.50

BOTTOM OF CAISSON  
EL. 404.50



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- THE BORING LOG SOIL SYMBOLS REFLECT ONLY THE MAJOR SOIL CONSTITUENT; FOR MORE COMPLETE SOIL CHARACTERISTICS REFER TO THE WRITTEN DESCRIPTION AT THE RESPECTIVE ELEVATION.
- THE FIELD BORING LOGS RECORD OBSERVATIONS OF THE DRILLING OPERATIONS. THE LOGS ARE AVAILABLE UPON REQUEST.

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GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL

Chief, Design Section \_\_\_\_\_ Date \_\_\_\_\_

Chief, Division of Transportation Engineering \_\_\_\_\_ Date \_\_\_\_\_

Designed by: \_JS\_ Drawn by: \_JE\_ Checked by: \_KA\_

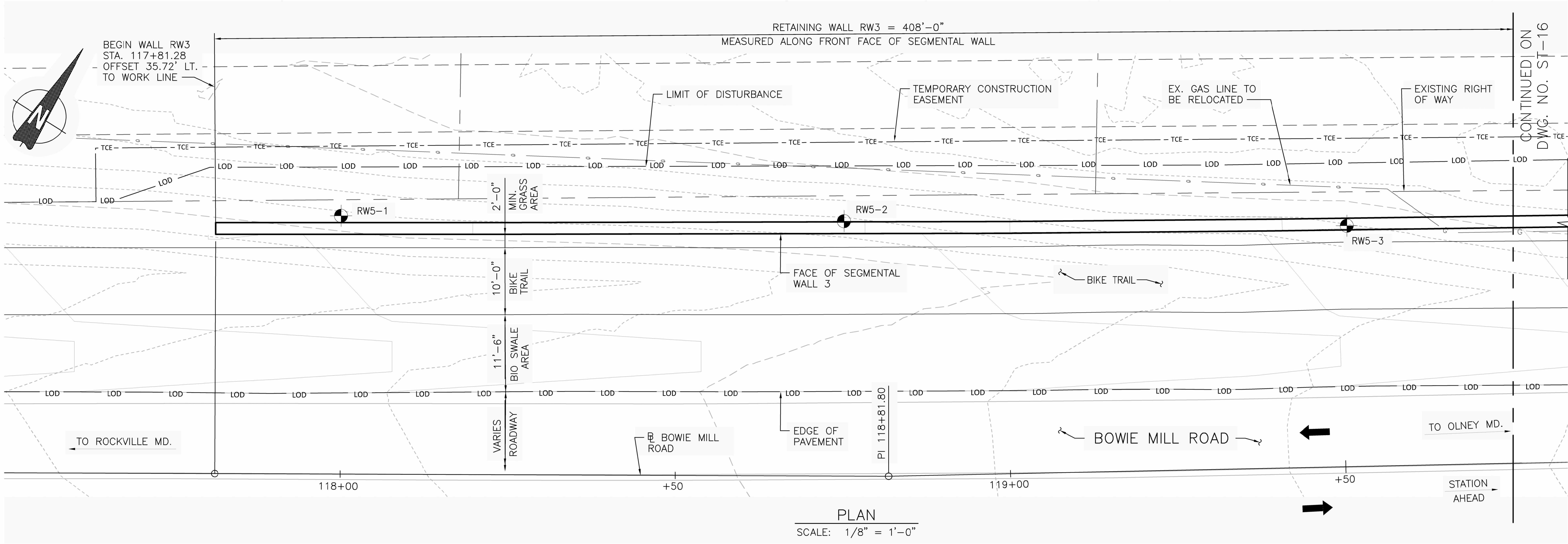
ST-14  
RETAINING WALL 2  
BORING LOGS AND LOCATION PLAN  
2 OF 2

**BOWIE MILL ROAD BIKEWAY**  
M-NCPPC PERMIT NO. MR2023016

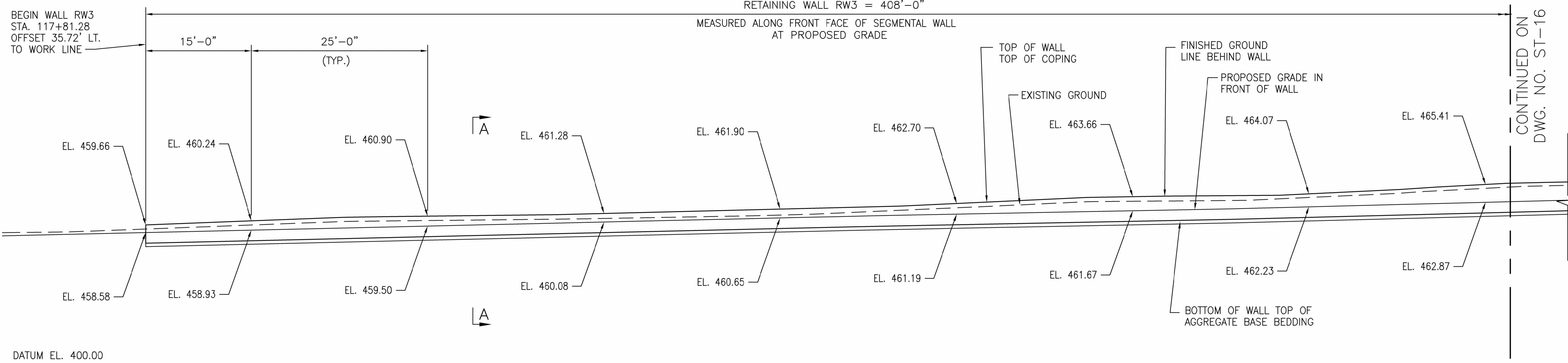
DATE: APRIL 2025

Project No. : 502108 Sheet 177 of 393





- NOTES:
1. FOR GENERAL NOTES AND LOCATION OF STRUCTURE WITHIN PROJECT, SEE NO. ST-01.
  2. FOR TYPICAL WALL SECTION, SEE DWG NO. ST-17.
  3. FOR BORING LOCATIONS AND LOGS, SEE DWG. NOS. ST-18 AND ST-19.
  4. FOR WALL DETAILS, SEE DWG. NOS. ST-20 TO ST-22.
  5. OFFSET DIMENSIONS ARE MEASURED TO WORK LINE.
  6. ALL DIMENSIONS ARE MEASURED ALONG THE FRONT FACE OF WALL.
  7. FOR STANDARD DETAILS, SEE DWG. NOS. ST-23 AND ST-24.
  8. SEE UTILITY DRAWINGS FOR EXISTING UTILITIES TO REMAIN AND TO BE RELOCATED.



90% DESIGN  
NOT FOR CONSTRUCTION

**ALA**  
Athavale, Lystad  
& Associates  
6720-B Rockledge Drive, Suite 160  
Bethesda, MD 20817

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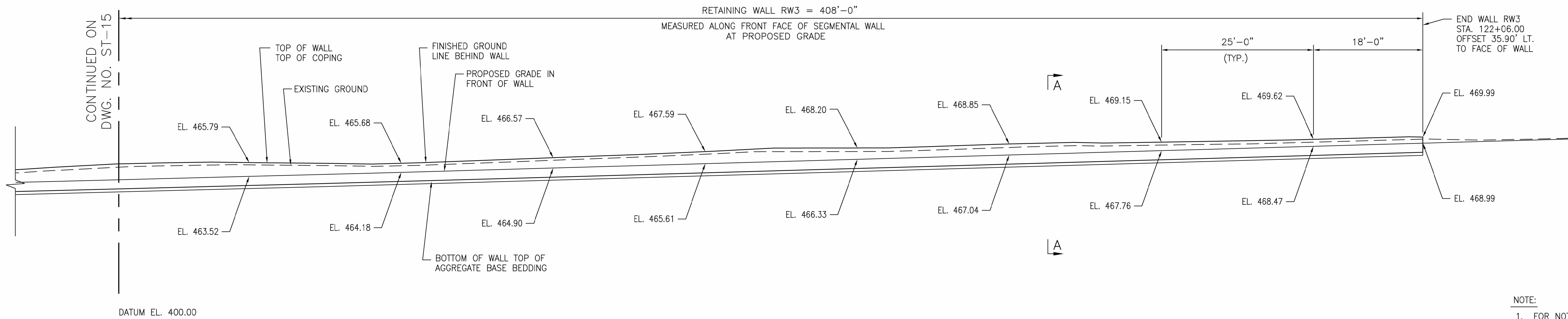
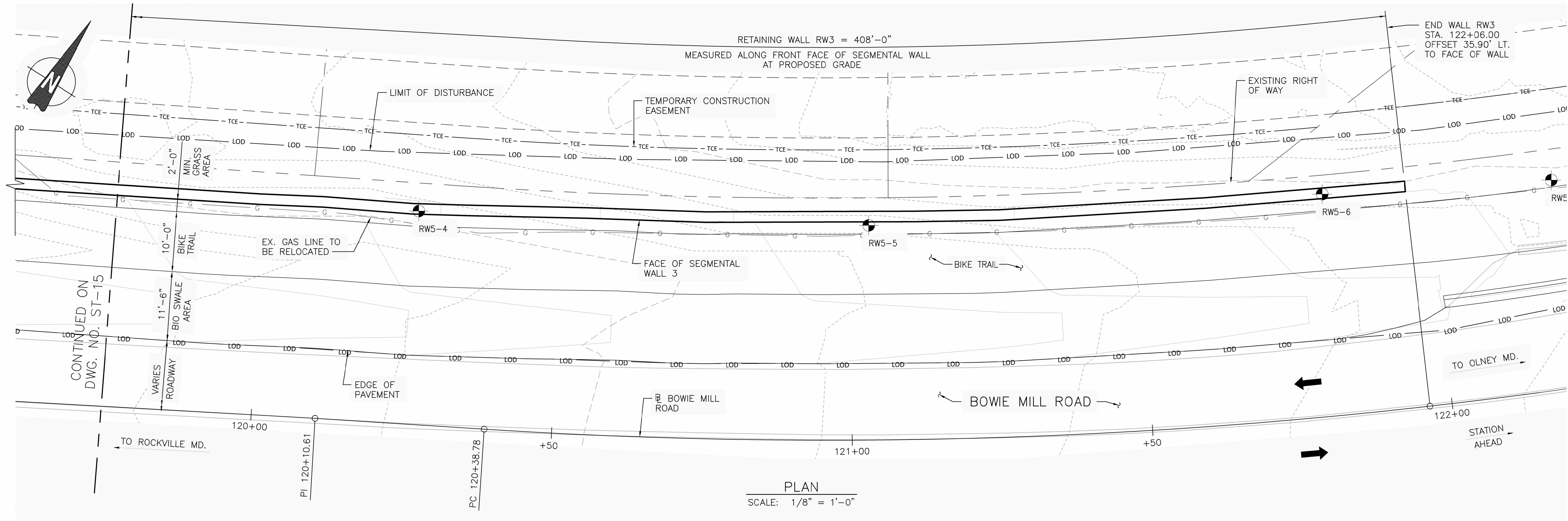
ST-15  
RETAINING WALL 3  
PLAN AND ELEVATION 1 OF 2

**BOWIE MILL ROAD BIKEWAY**  
M-NCPPC PERMIT NO. MR2023016

DATE: APRIL 2025

Project No. : 502108 Sheet 178 of 393





NOTE:  
1. FOR NOTES, SEE DWG.  
NO. ST-15.

90% DESIGN  
NOT FOR CONSTRUCTION

**ALA**  
Athavale, Lystad  
& Associates  
6720-B Rockledge Drive, Suite 160  
Bethesda, MD 20817

MONTGOMERY COUNTY  
DEPARTMENT OF TRANSPORTATION  
GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL

Chief, Design Section  
APPROVED

Date

Chief, Division of Transportation Engineering

Date

Designed by: JS Drawn by: JE Checked by: KA

ST-16  
RETAINING WALL 3  
PLAN AND ELEVATION 2 OF 2

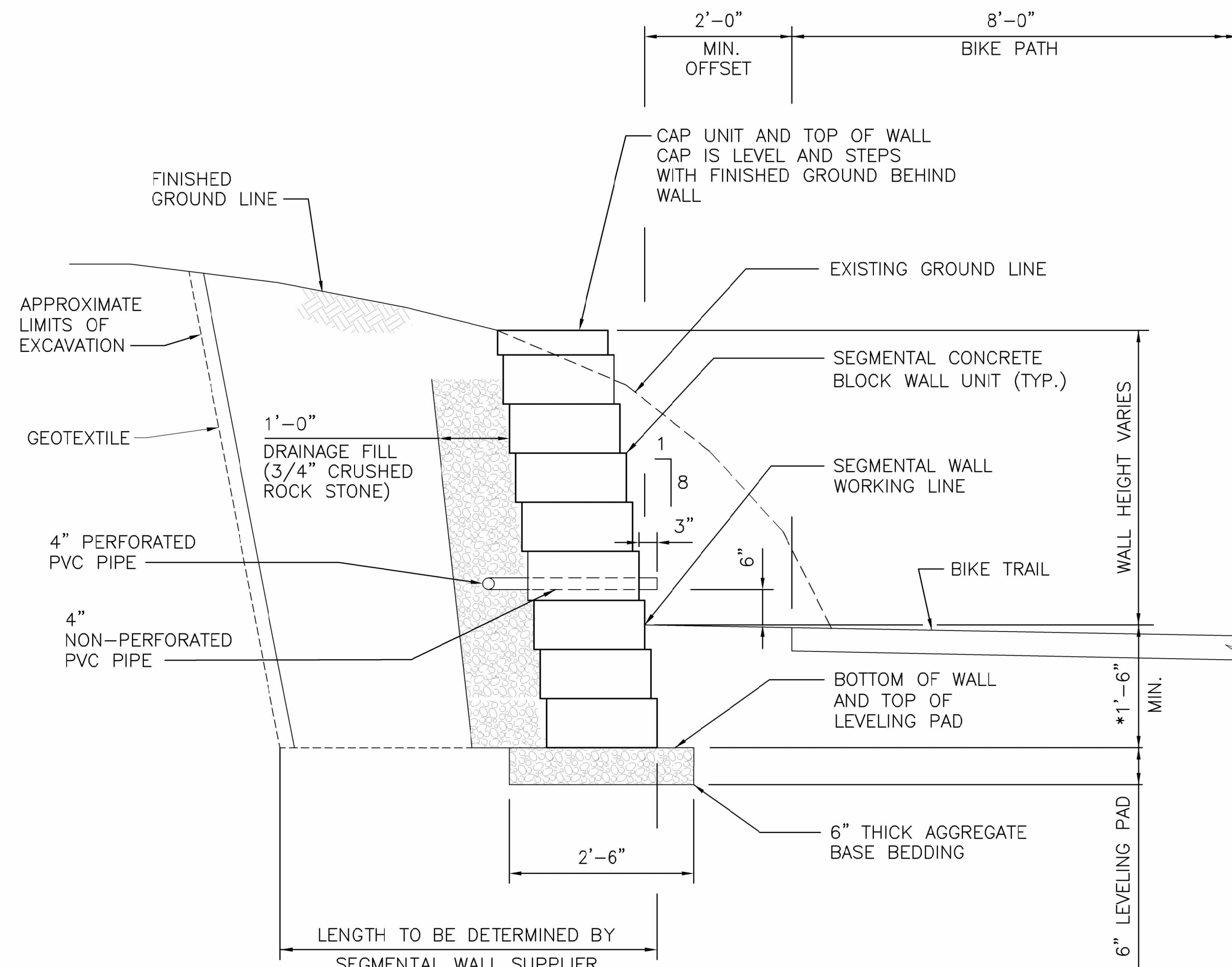
**BOWIE MILL ROAD BIKEWAY**  
M-NCPPC PERMIT NO. MR2023016

DATE: APRIL 2025

Project No. : 502108

Sheet 179 of 393






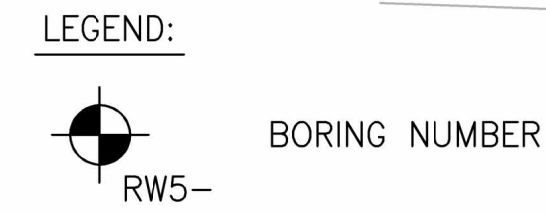
TYPICAL WALL SECTION — SEGMENTAL WALL  
SCALE: 3/4" = 1'-0"

SEGMENTAL WALL NOTES:

1. THE MAXIMUM ALLOWABLE BEARING PRESSURE UNDER THE SEGMENTAL WALL SHALL BE 1.5 TONS PER SQUARE FOOT.
- \*2. THE WALL EMBEDMENT DEPTH SHALL BE INCREASED AS REQUIRED FOR WALL GLOBAL STABILITY.
3. REINFORCED SOIL SHALL BE #57 STONE UNLESS OTHERWISE SPECIFIED BY THE WALL SUPPLIER.
4. FOR ADDITIONAL REQUIREMENTS FOR THE SEGMENTAL WALL, SEE SPECIAL PROVISIONS "SEGMENTAL RETAINING WALL".
5. FOR ROADWAY SECTIONS, SEE ROADWAY PLANS.
6. WHEN SITE CONDITIONS REQUIRE, WRAP DRAINAGE PIPE IN 3/4" AGGREGATE AND FILTER FABRIC.

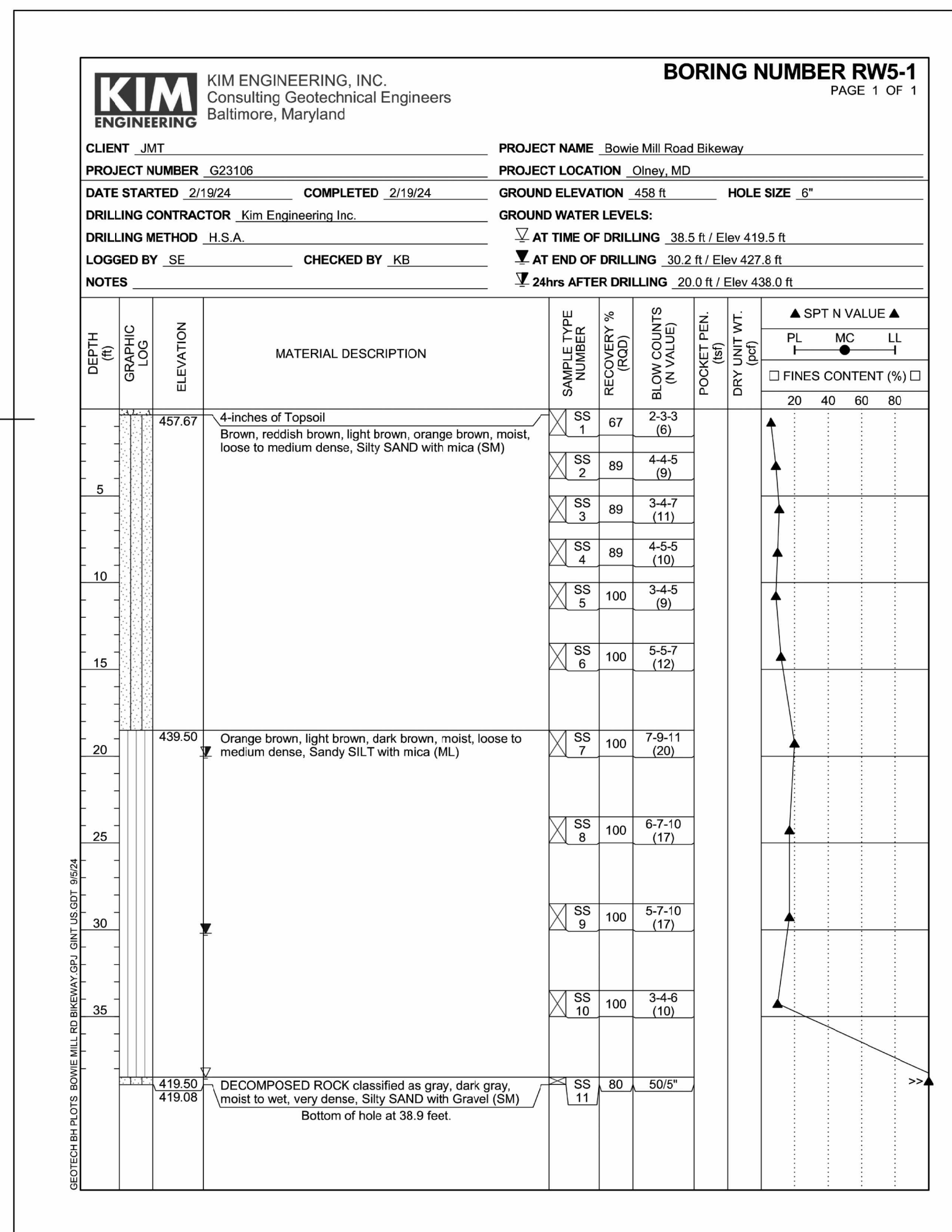
90% DESIGN NOT FOR CONSTRUCTION								MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION GAITHERSBURG, MARYLAND				ST-17 RETAINING WALL 3 TYPICAL SECTION			
<div><p><b>Athavale, Lystad &amp; Associates</b></p><p>6720-B Rockledge Drive, Suite 160 Bethesda, MD 20817</p></div>								RECOMMENDED FOR APPROVAL				<div><p><b>BOWIE MILL ROAD BIKEWAY</b></p><p>M-NCPPC PERMIT NO. <u>MR2023016</u></p><p>DATE: APRIL 2025</p></div>			
								Chief, Design Section APPROVED _____ Date _____							
								Chief, Division of Transportation Engineering _____ Date _____							
								Designed by: <u>JS</u> Drawn by: <u>JE</u> Checked by: <u>KA</u>							
NO.	REVISION	DATE	BY	Project No. : <u>502108</u>				Sheet <u>180</u> of <u>393</u>							



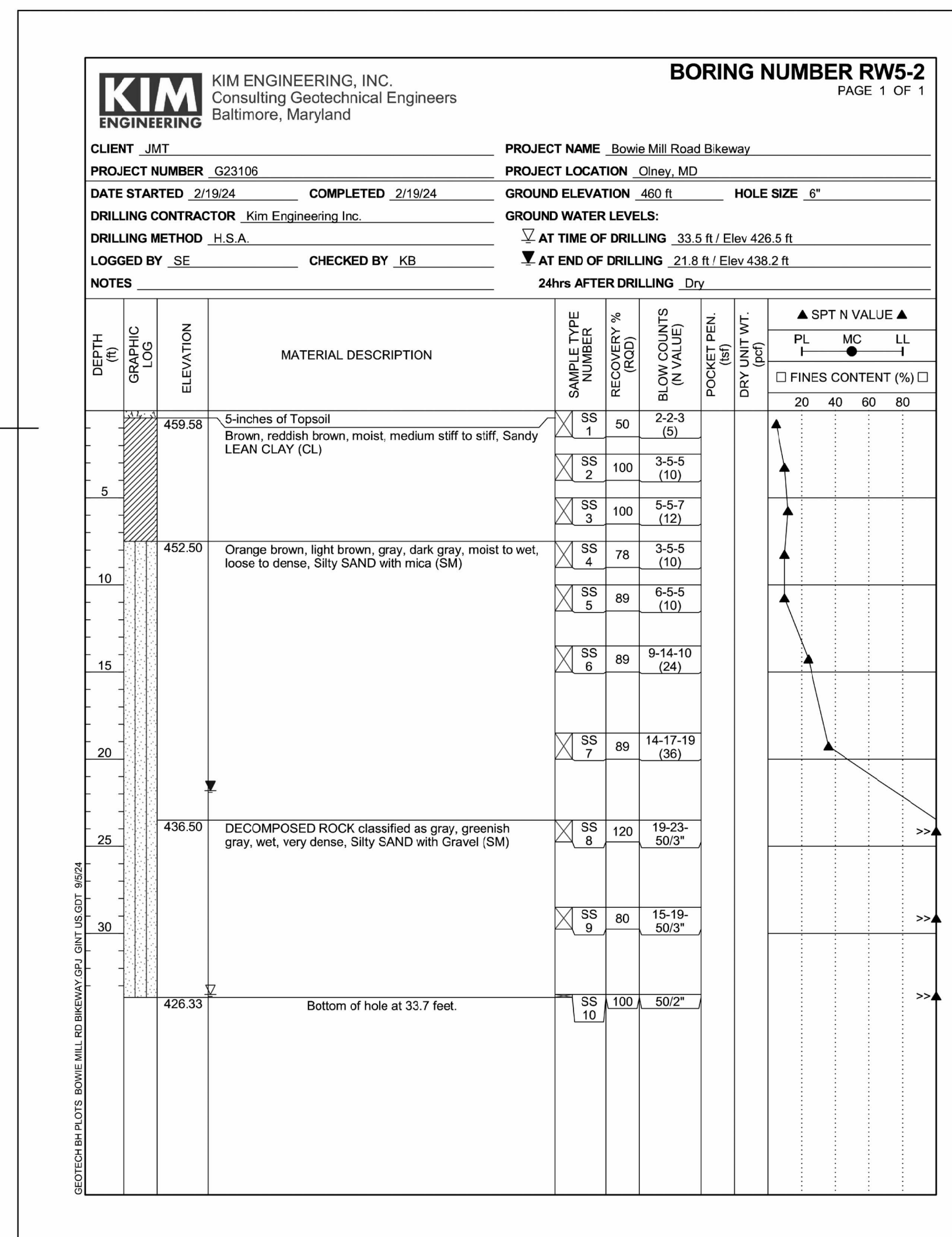


RW5-1			RW5-2			RW5-3			RW5-4			RW5-5			RW5-6			RW5-7		
ALIGNMENT	-	BOWIE MILL RD.	ALIGNMENT	-	BOWIE MILL RD.	ALIGNMENT	-	BOWIE MILL RD.	ALIGNMENT	-	BOWIE MILL RD.	ALIGNMENT	-	BOWIE MILL RD.	ALIGNMENT	-	BOWIE MILL RD.	ALIGNMENT	-	BOWIE MILL RD.
STATION	-	118+00.00	STATION	-	118+75.00	STATION	-	119+50.91	STATION	-	120+25.63	STATION	-	121+03.26	STATION	-	122+81.85	STATION	-	122+21.54
OFFSET	-	38.56 LT	OFFSET	-	38.06 LT	OFFSET	-	35.97 LT	OFFSET	-	35.51 LT	OFFSET	-	35.71 LT	OFFSET	-	36.95 LT	OFFSET	-	34.74 LT
NORTHING	-	541496.70	NORTHING	-	541536.64	NORTHING	-	541576.68	NORTHING	-	541618.12	NORTHING	-	541661.59	NORTHING	-	541711.22	NORTHING	-	541736.12
EASTING	-	1284837.99	EASTING	-	1284901.47	EASTING	-	1284964.89	EASTING	-	1285027.39	EASTING	-	1285088.54	EASTING	-	1285145.25	EASTING	-	1285174.16

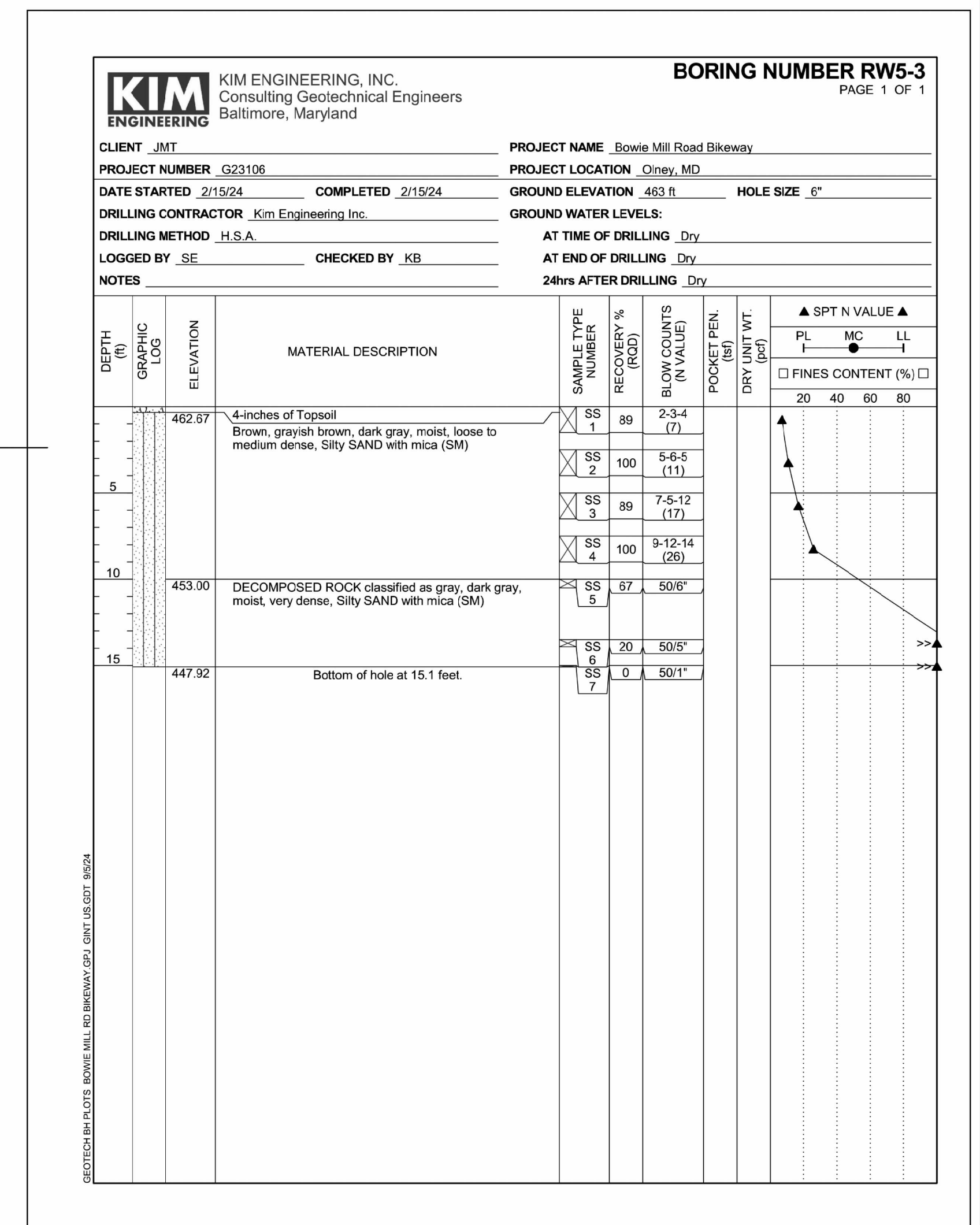
BOTTOM OF WALL  
EL. 457.50




BOTTOM OF WALL  
EL. 459.00



BOTTOM OF WALL  
EL. 460.70

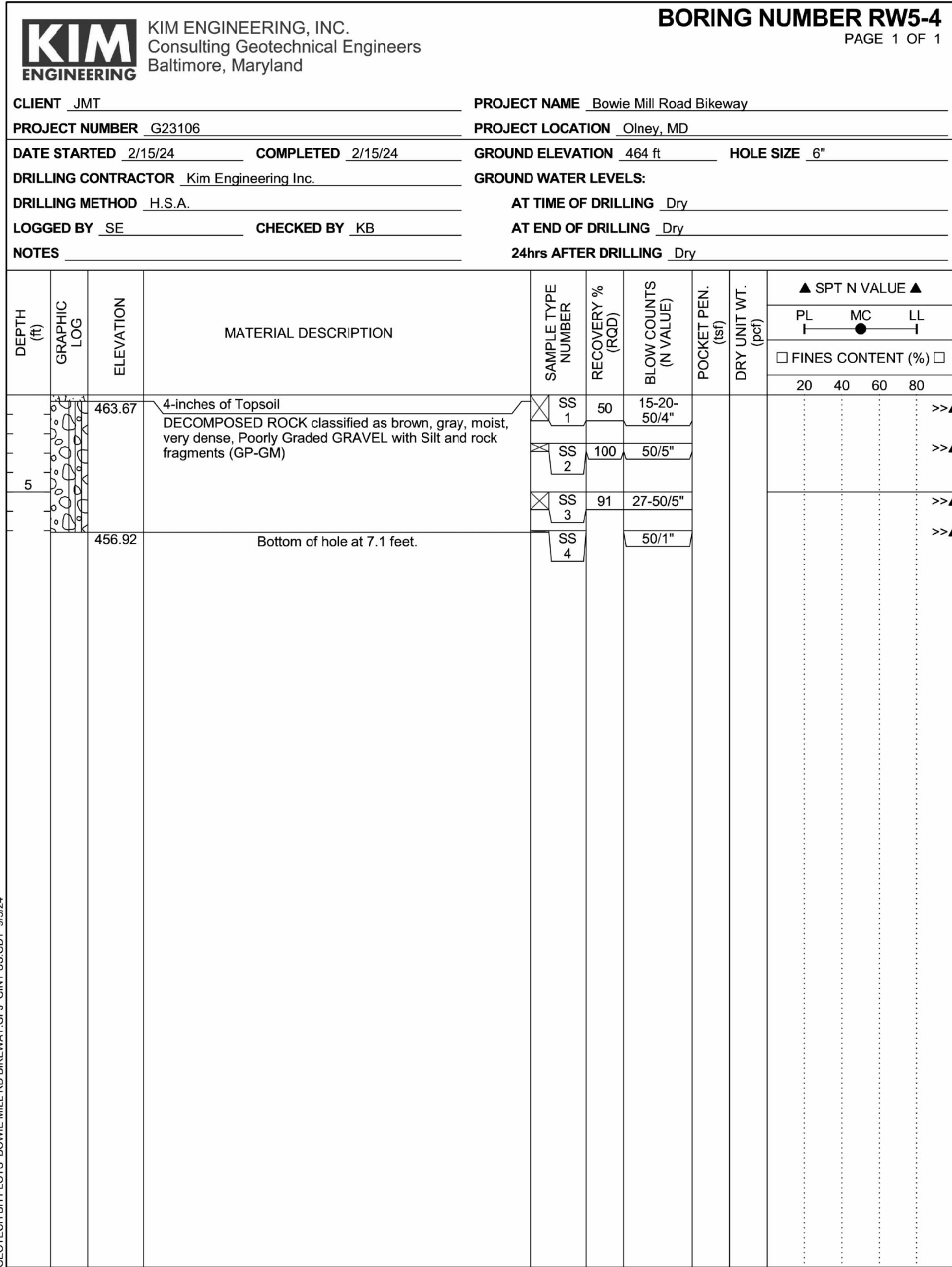


- NOTES:
1. TEST BORINGS WERE DRILLED IN SEPTEMBER 2022 BY KIM ENGINEERING, INC.
  2. BLOWS = BLOWS ON SPLIT BARREL SAMPLER BY A 140 POUND WEIGHT AND DRIVE WEIGHT ASSEMBLY FREELY FALLING 30 INCHES.
  3. CASING IS METHOD OF MAINTAINING OPEN BOREHOLE.
  4. TEST BORINGS WERE DRILLED IN ACCORDANCE WITH AASHTO T206 AND ASTM D1586. ROCK CORING IN ACCORDANCE WITH AASHTO T225 AND ASTM D2113.
  5. SOLID HAS BEEN IDENTIFIED BY A GEOTECHNICAL INSPECTOR.
  6. THE BORING LOG SOIL SYMBOLS REFLECT ONLY THE MAJOR SOIL CONSTITUENT; FOR MORE COMPLETE SOIL CHARACTERISTICS REFER TO THE WRITTEN DESCRIPTION AT THE RESPECTIVE ELEVATION.
  7. THE FIELD BORING LOGS RECORD OBSERVATIONS OF THE DRILLING OPERATIONS. THE LOGS ARE AVAILABLE UPON REQUEST.

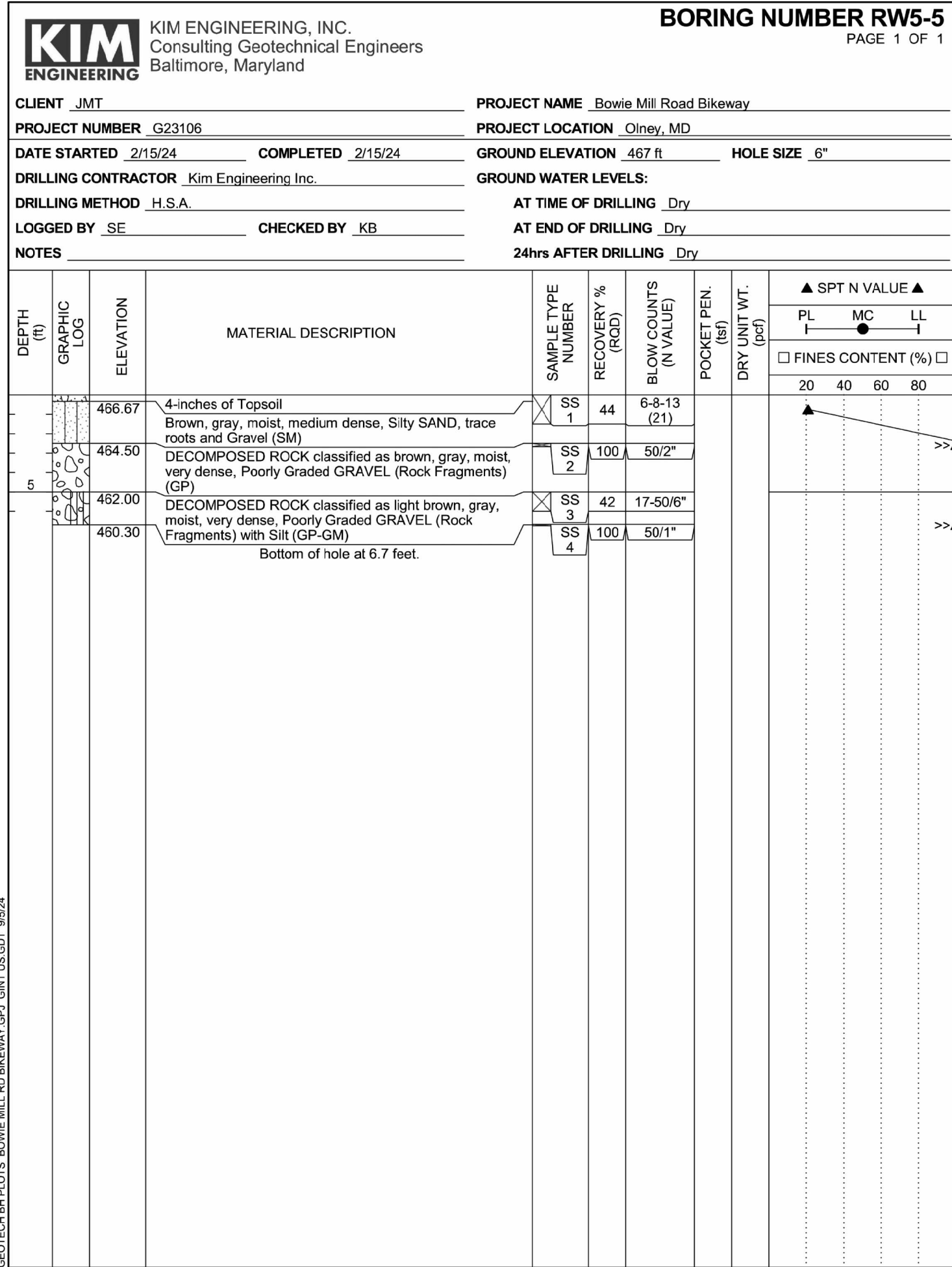
<p align="center"><b>90% DESIGN NOT FOR CONSTRUCTION</b></p>				<p align="center">MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION GAITHERSBURG, MARYLAND</p>				<p align="center">ST-18 RETAINING WALL 3 BORING LOGS AND LOCATION PLAN 1 OF 2</p>			
 <p align="center"><b>Athavale, Lystad &amp; Associates</b> 6720-B Rockledge Drive, Suite 160 Bethesda, MD 20817</p>				<p align="center">RECOMMENDED FOR APPROVAL</p>				<p align="center"><b>BOWIE MILL ROAD BIKEWAY</b> M-NCPPC PERMIT NO. <u>MR2023016</u>  DATE: APRIL 2025</p>			
				<p>Chief, Design Section _____ Date _____</p> <p>APPROVED</p>							
				<p>Chief, Division of Transportation Engineering _____ Date _____</p>							
NO.	REVISION	DATE	BY	<p>Designed by: <u>JS</u>      Drawn by: <u>JE</u>      Checked by: <u>KA</u></p>				<p>Project No. : <u>502108</u>      Sheet <u>181</u> of <u>393</u></p>			



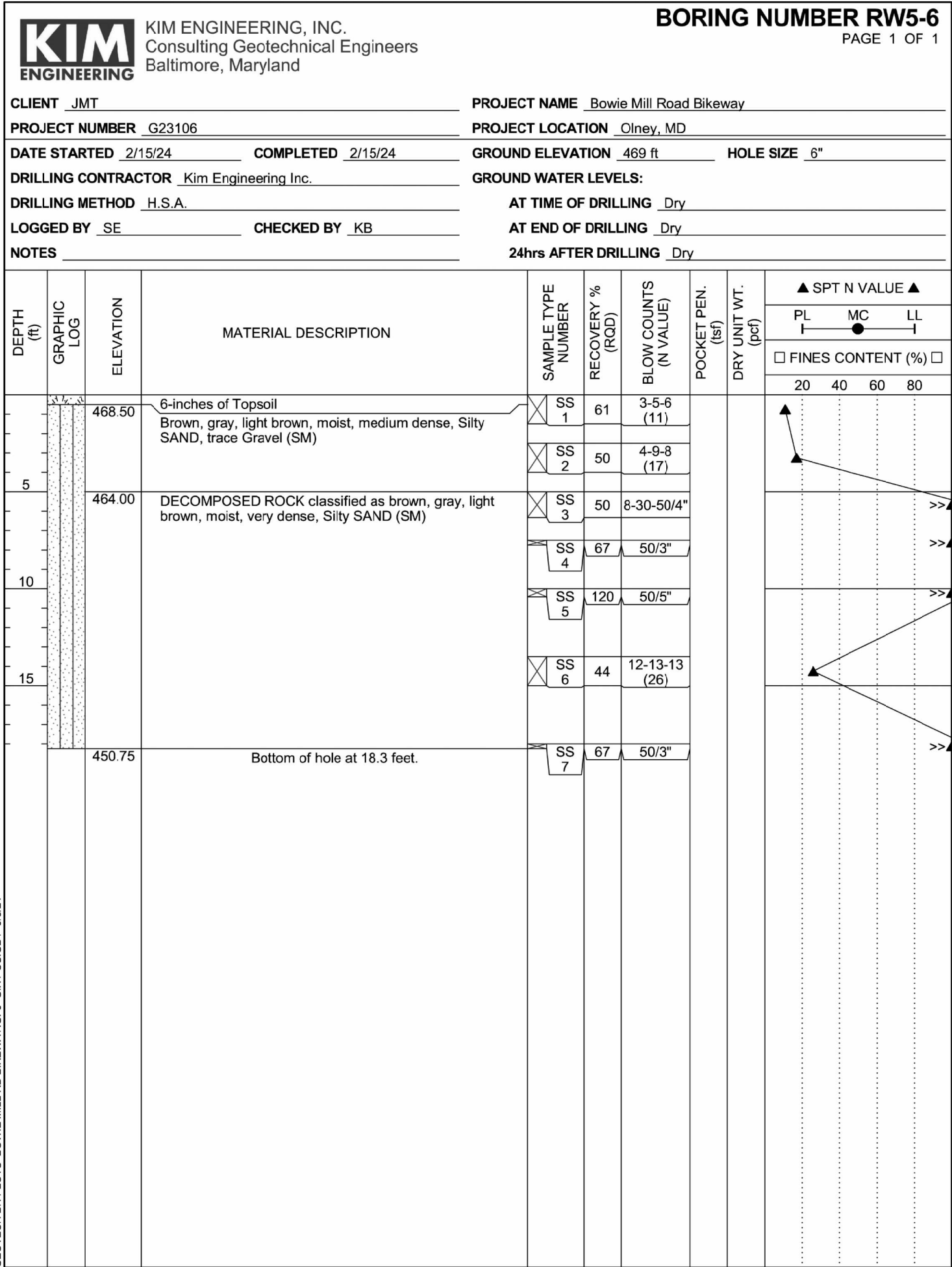
BOTTOM OF WALL  
EL. 462.67



BOTTOM OF WALL  
EL. 464.83



BOTTOM OF WALL  
EL. 467.25



NOTES:

- TEST BORINGS WERE DRILLED IN SEPTEMBER 2022 BY KIM ENGINEERING, INC.
- BLOWS = BLOWS ON SPLIT BARREL SAMPLER BY A 140 POUND WEIGHT AND DRIVE WEIGHT ASSEMBLY FREELY FALLING 30 INCHES.
- CASING IS METHOD OF MAINTAINING OPEN BOREHOLE.
- TEST BORINGS WERE DRILLED IN ACCORDANCE WITH AASHTO T206 AND ASTM D1586. ROCK CORING IN ACCORDANCE WITH AASHTO T225 AND ASTM D2113.
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- THE FIELD BORING LOGS RECORD OBSERVATIONS OF THE DRILLING OPERATIONS. THE LOGS ARE AVAILABLE UPON REQUEST.

90% DESIGN  
NOT FOR CONSTRUCTION



Athavale, Lystad  
& Associates

6720-B Rockledge Drive, Suite 160  
Bethesda, MD 20817

MONTGOMERY COUNTY  
DEPARTMENT OF TRANSPORTATION  
GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL

Chief, Design Section  
APPROVED

Chief, Division of Transportation Engineering

Designed by: JS

Drawn by: JE

Checked by: KA

ST-19  
RETAINING WALL 3  
BORING LOGS AND LOCATION PLAN  
2 OF 2

BOWIE MILL ROAD BIKEWAY  
M-NCPPC PERMIT NO. MR2023016

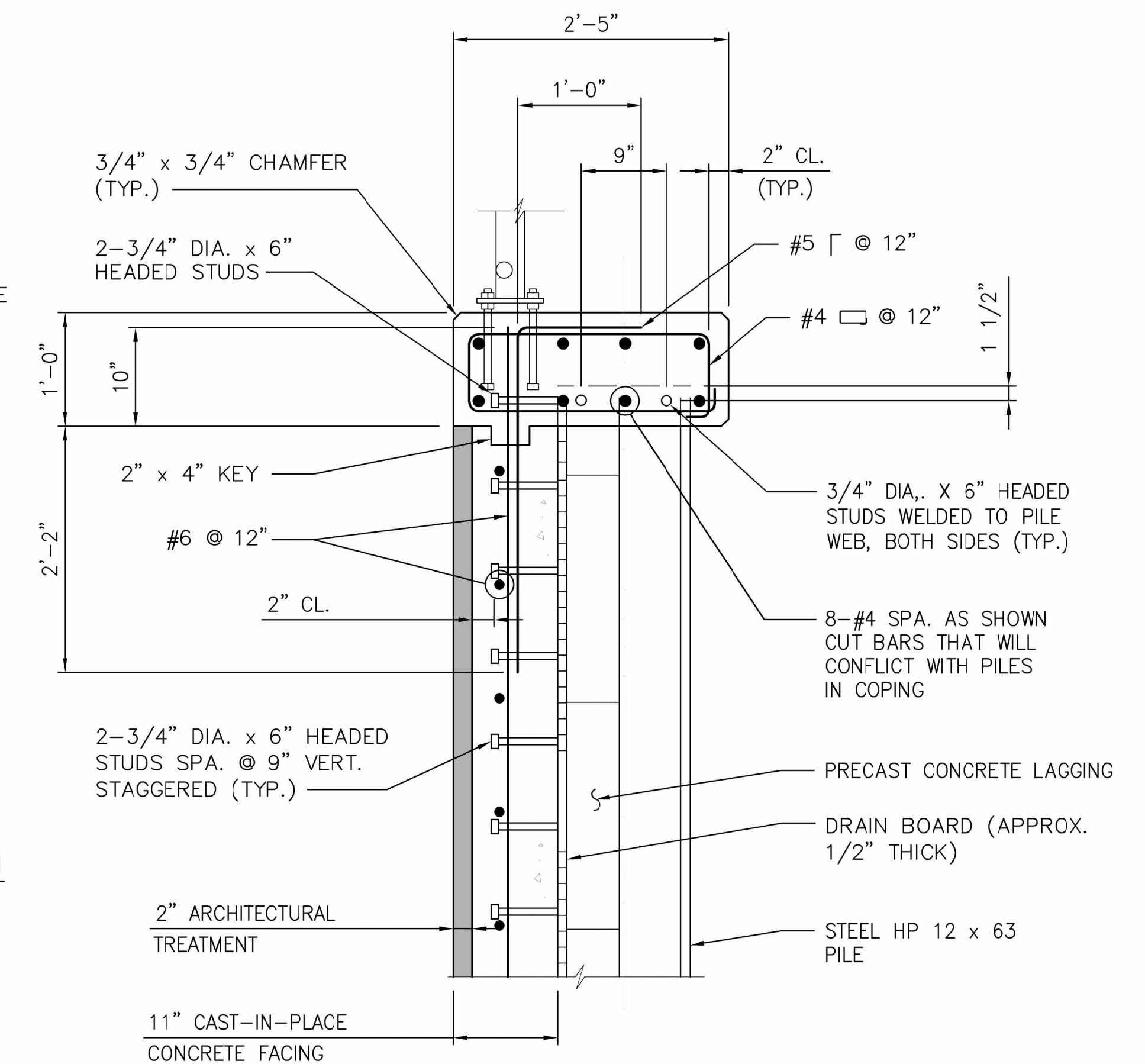
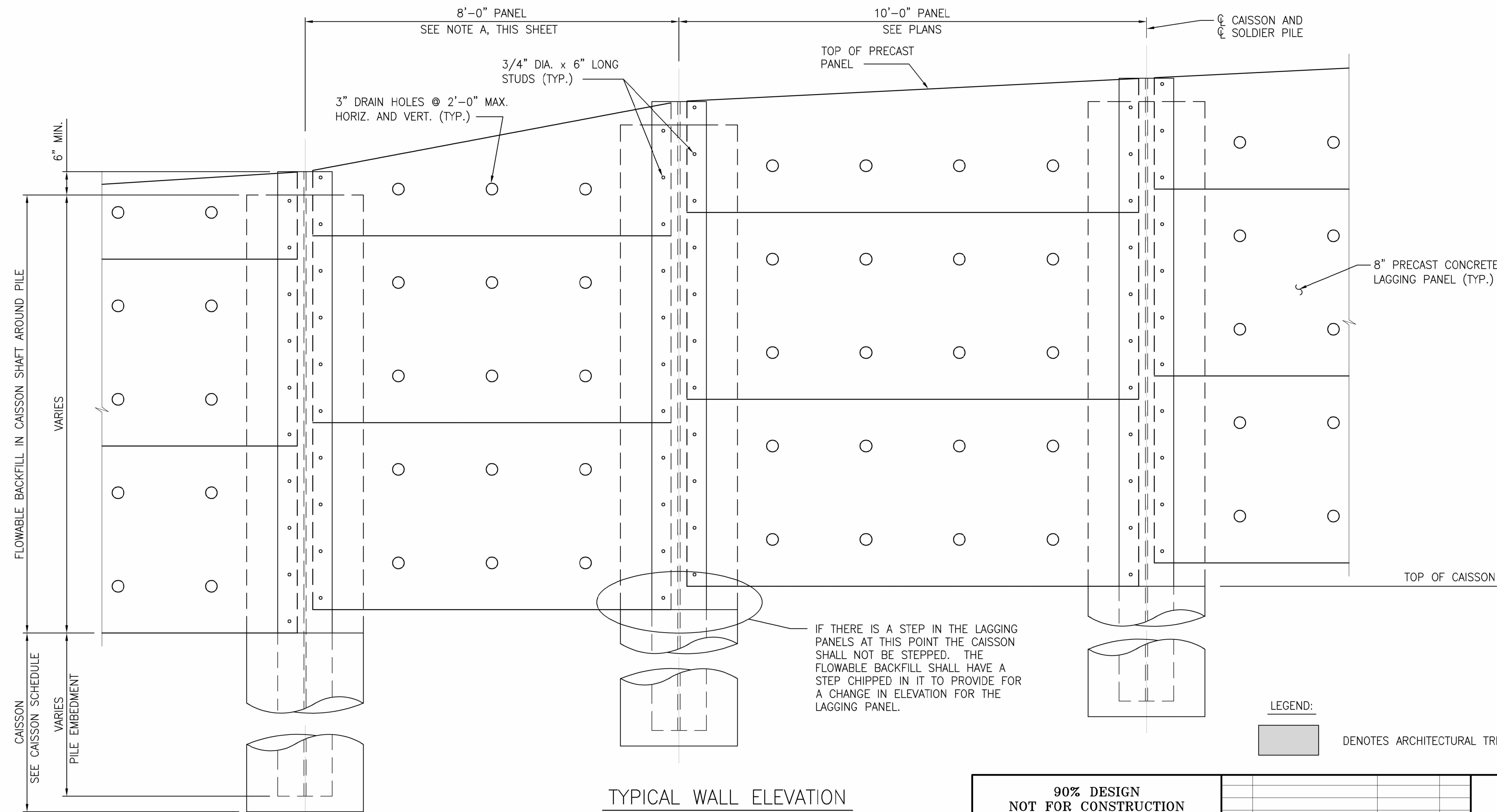
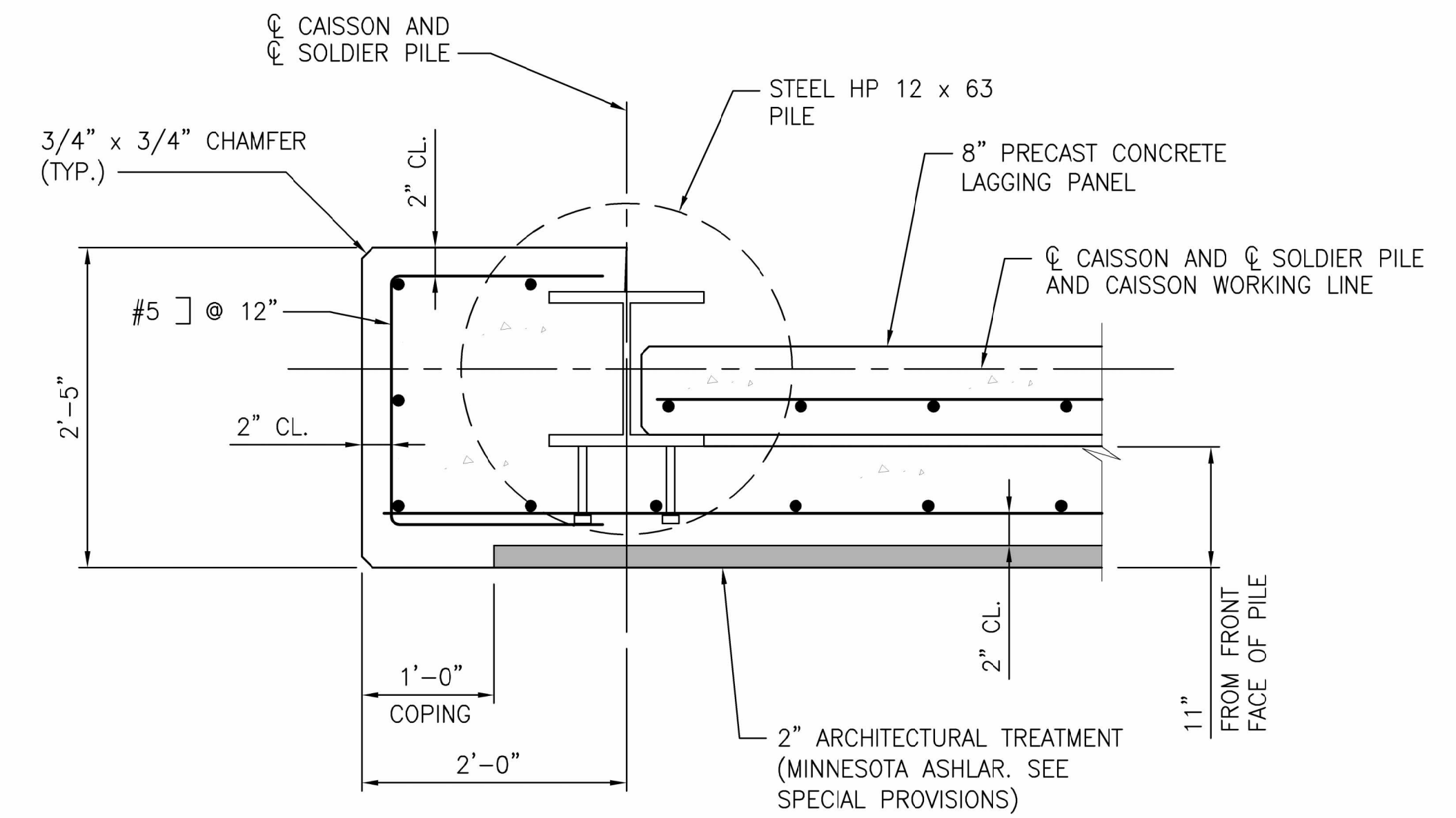
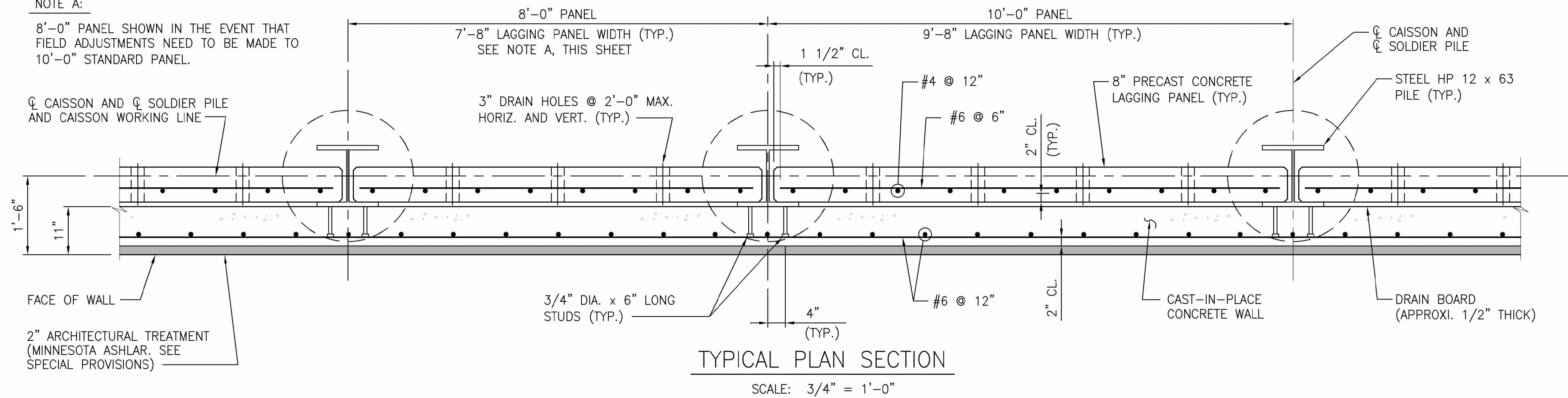
Project No. : 502108

DATE: APRIL 2025

Sheet 182 of 393



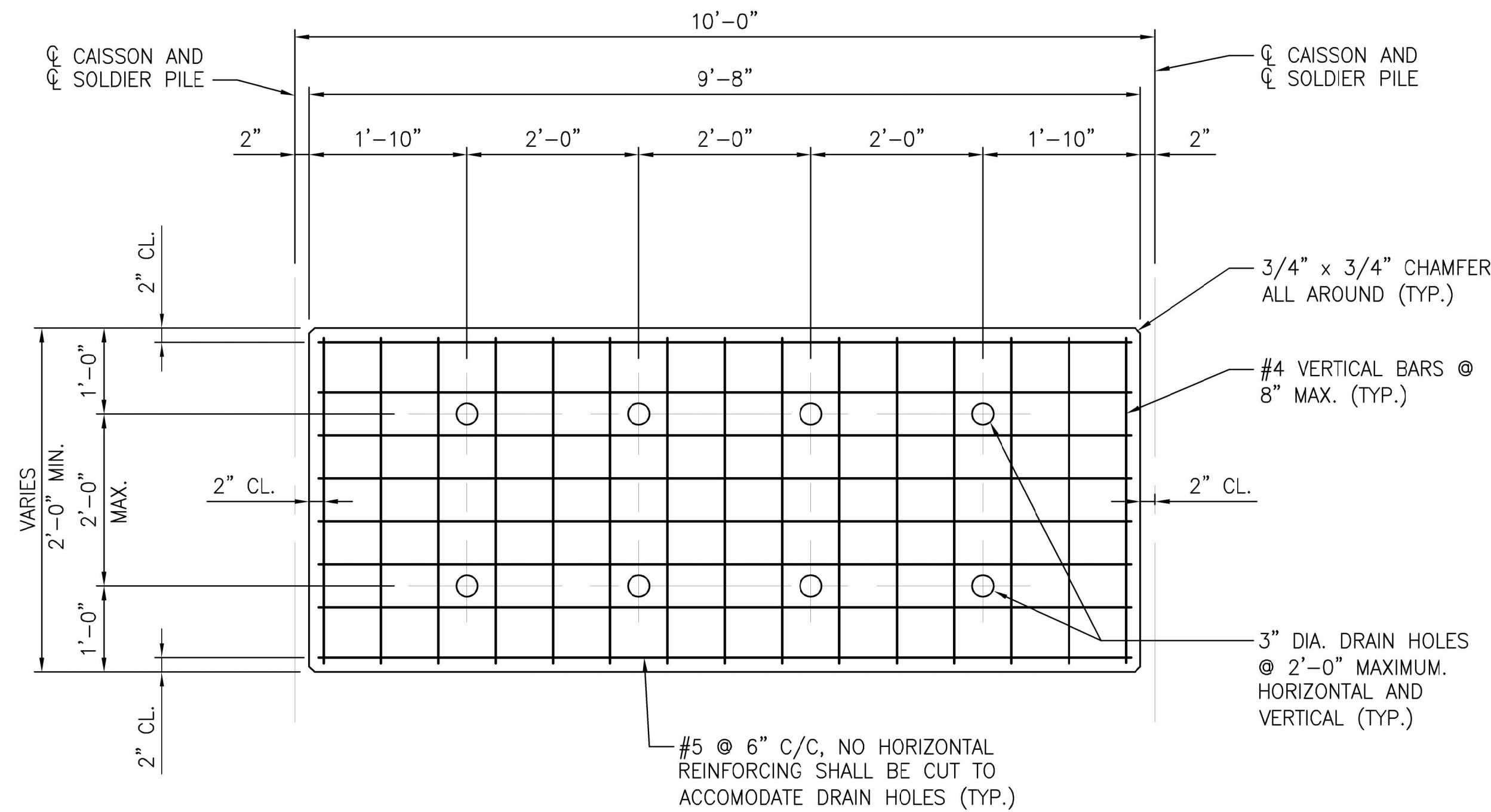
8'-0" PANEL SHOWN IN THE EVENT THAT  
FIELD ADJUSTMENTS NEED TO BE MADE TO  
10'-0" STANDARD PANEL.



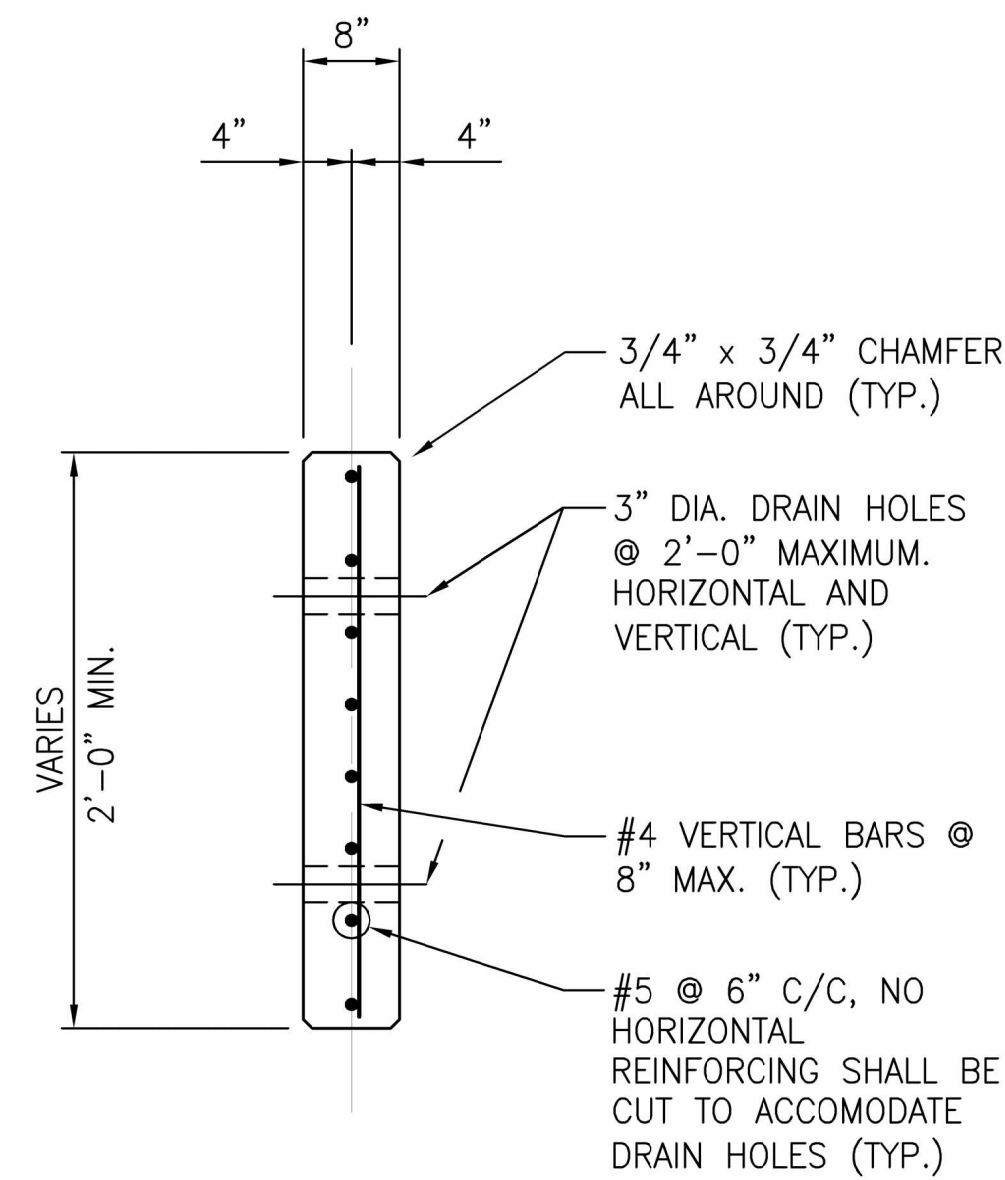
DENOTES ARCHITECTURAL TREATMENT

Project No. : 502108 Sheet 183 of 393

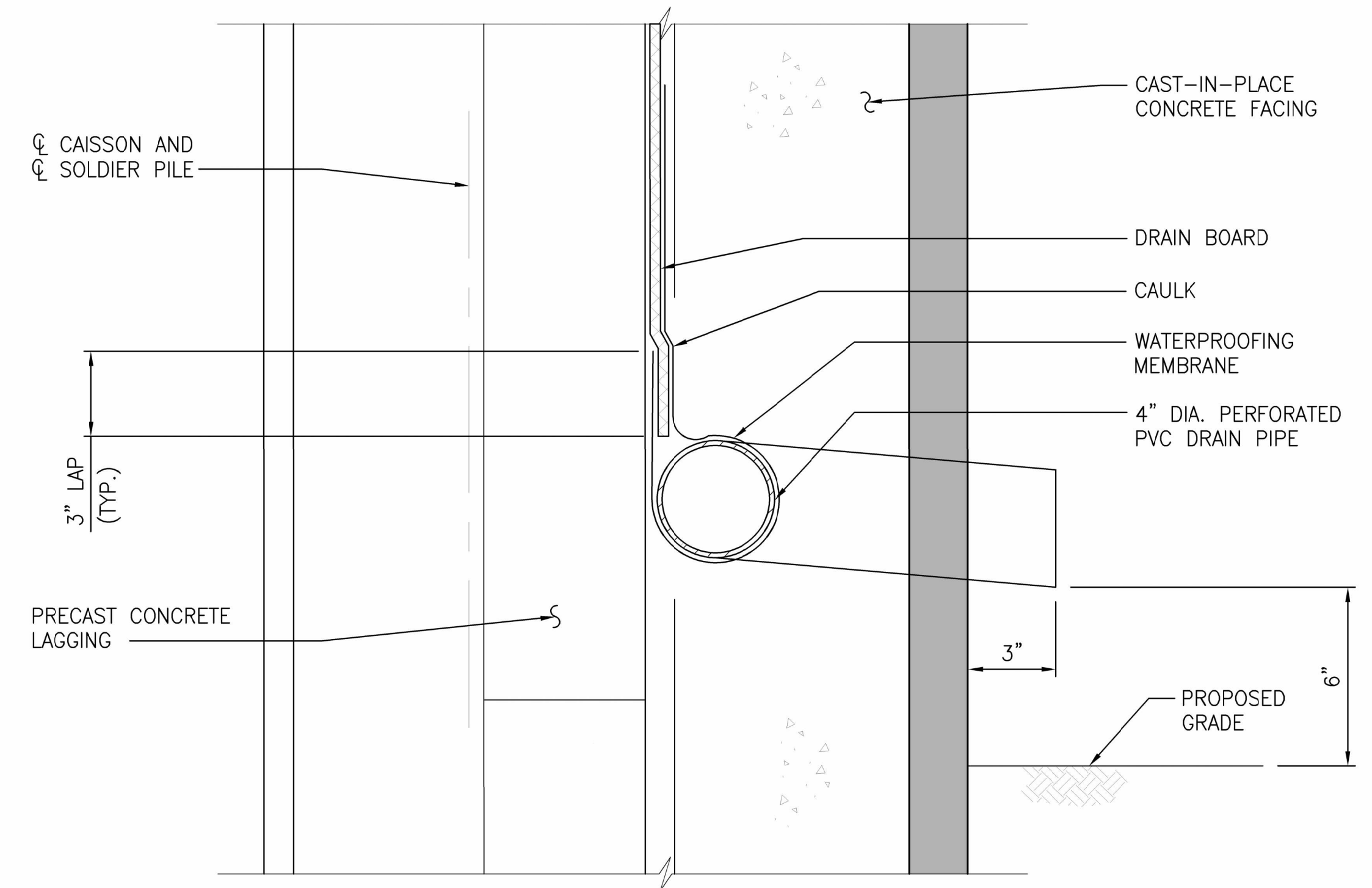




ELEVATION OF STANDARD PANEL



SECTION



DETAIL A

SCALE: 3/4" = 1'-0"

NOTE:  
THE WRAPPING IS BETWEEN THE  
OUTLET PIPE LOCATIONS.

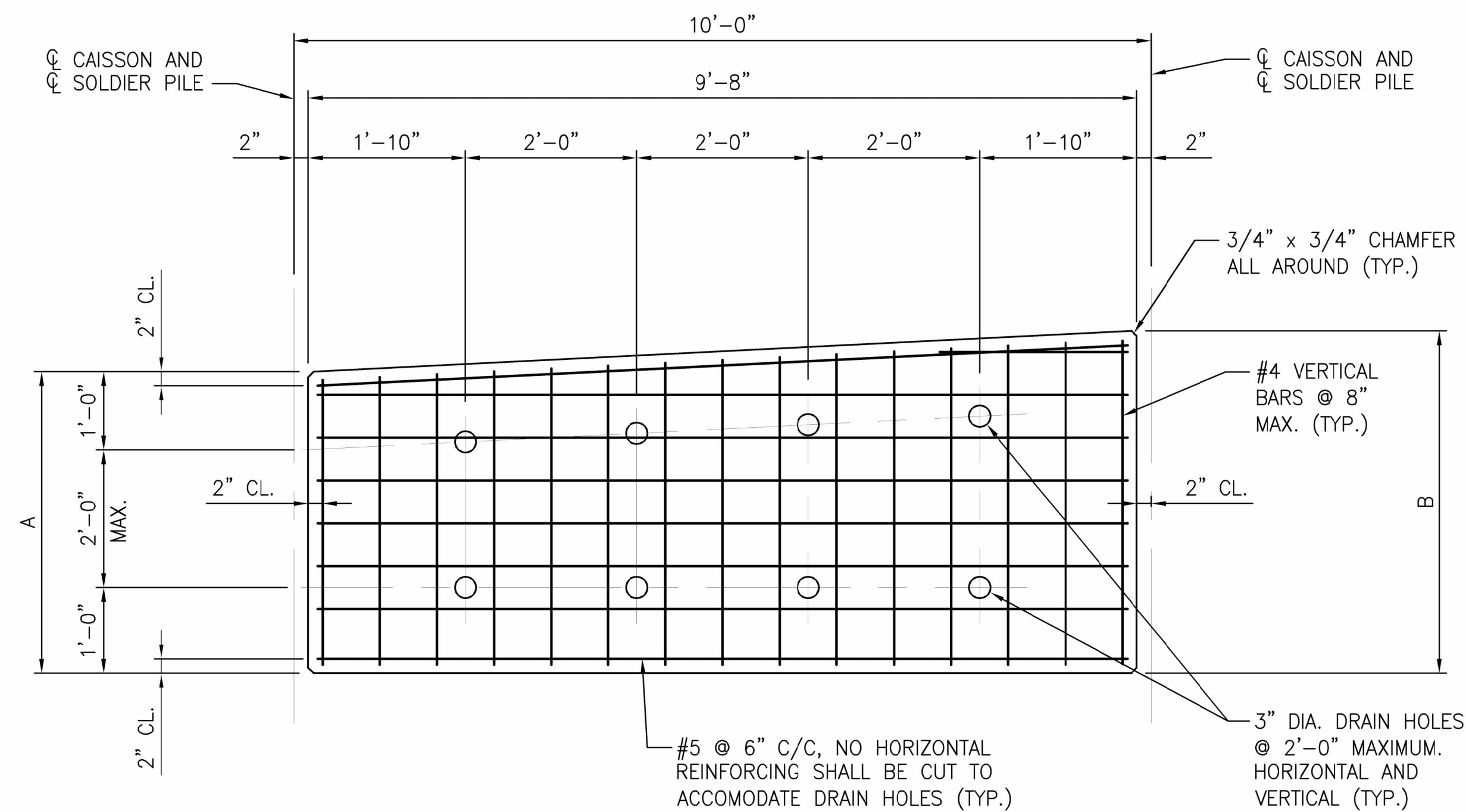
LEGEND:

■ DENOTES ARCHITECTURAL TREATMENT

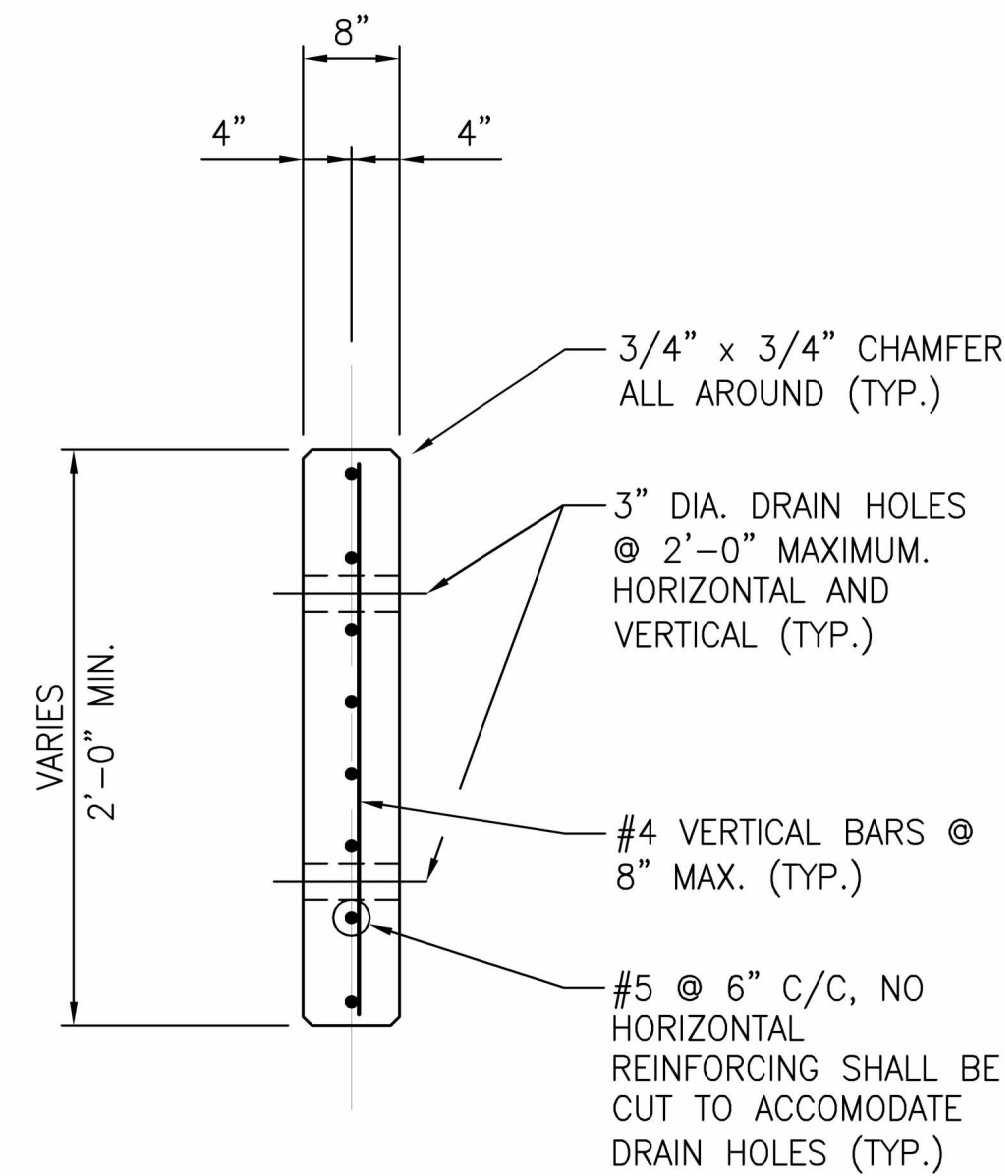
PRECAST CONCRETE LAGGING PANEL DETAILS

SCALE: 3/4" = 1'-0"

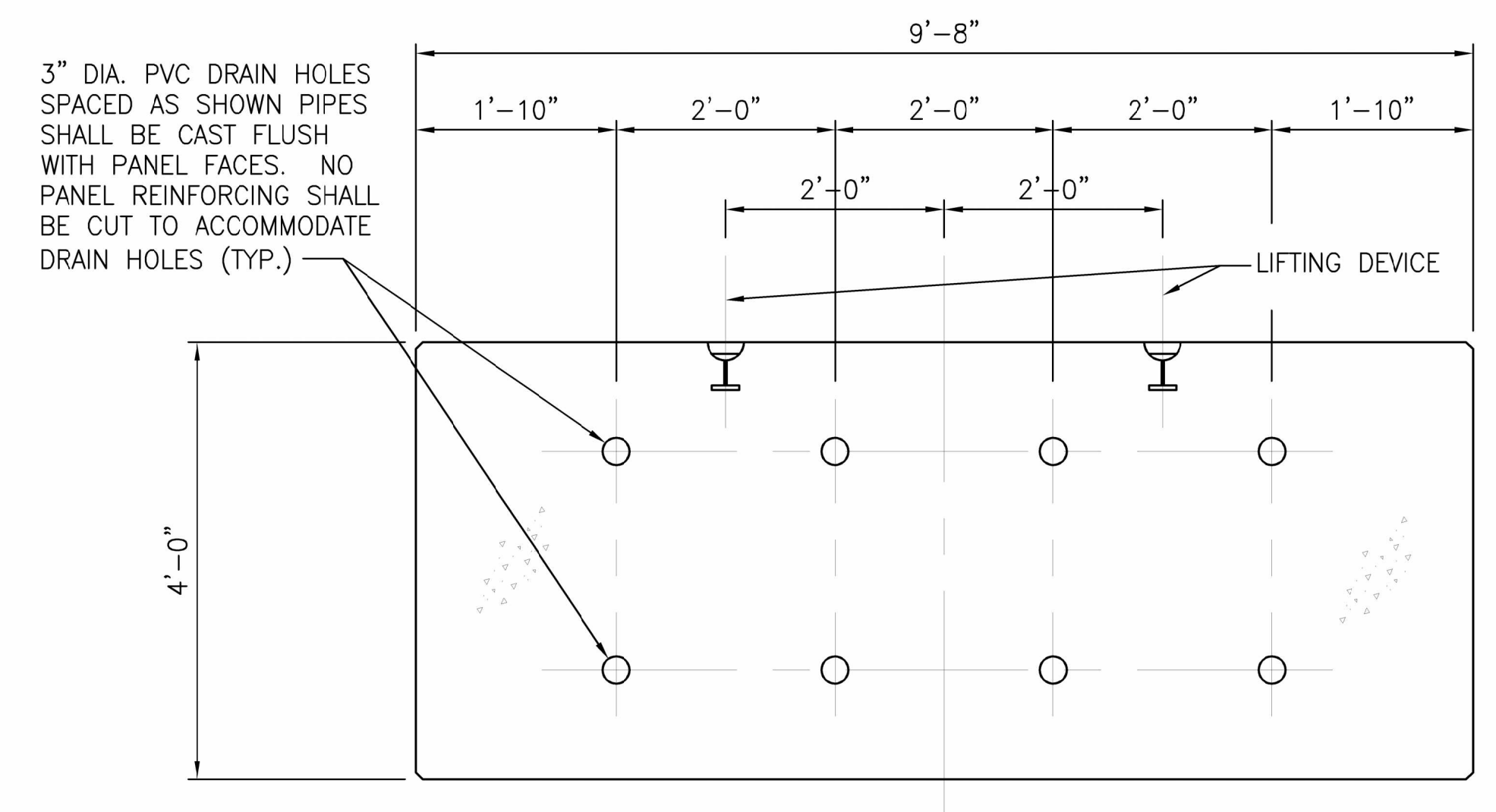
10'-0" PANEL SHOWN, SEE PLANS FOR ADDITIONAL SIZES.



ELEVATION OF TOP PANEL



SECTION



ELEVATION PRECAST CONCRETE LAGGING PANEL DETAIL

SCALE: 3/4" = 1'-0"

10'-0" PANEL SHOWN, SEE PLANS FOR ADDITIONAL SIZES.

PRECAST CONCRETE LAGGING PANEL DETAILS

SCALE: 3/4" = 1'-0"

10'-0" PANEL SHOWN, SEE PLANS FOR ADDITIONAL SIZES.

90% DESIGN  
NOT FOR CONSTRUCTION

**ALA**

**Athavale, Lystad  
& Associates**

6720-B Rockledge Drive, Suite 160  
Bethesda, MD 20817

MONTGOMERY COUNTY  
DEPARTMENT OF TRANSPORTATION  
GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL

Chief, Design Section \_\_\_\_\_ Date \_\_\_\_\_

APPROVED

Chief, Division of Transportation Engineering \_\_\_\_\_ Date \_\_\_\_\_

Designed by: JS Drawn by: JE Checked by: KA

**ST-21**  
**TYPICAL RETAINING WALL**  
**SECTIONS AND DETAILS - 2**

**BOWIE MILL ROAD BIKEWAY**

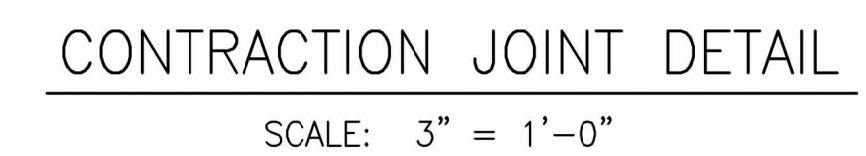
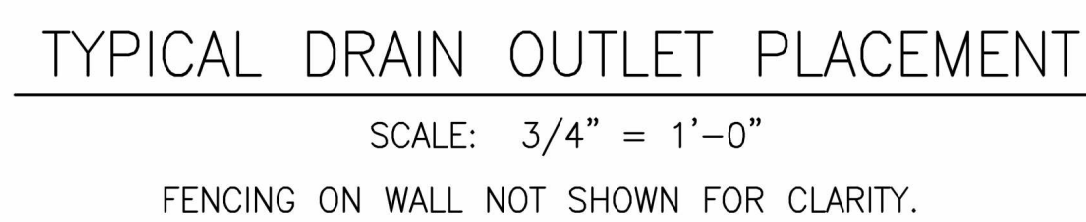
M-NCPPC PERMIT NO. MR2023016

DATE: APRIL 2025

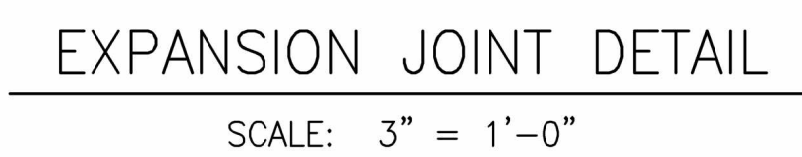
Project No. : 502108

Sheet 184 of 393






NOTE:  
JOINT SHALL BE PLACED MINIMUM  
6" AWAY FROM THE CENTER OF  
ANY OUTLET PIPE IN PRECAST  
CONCRETE LAGGING PANEL.



NOTE:  
JOINT SHALL BE PLACED MINIMUM  
6" AWAY FROM THE CENTER OF  
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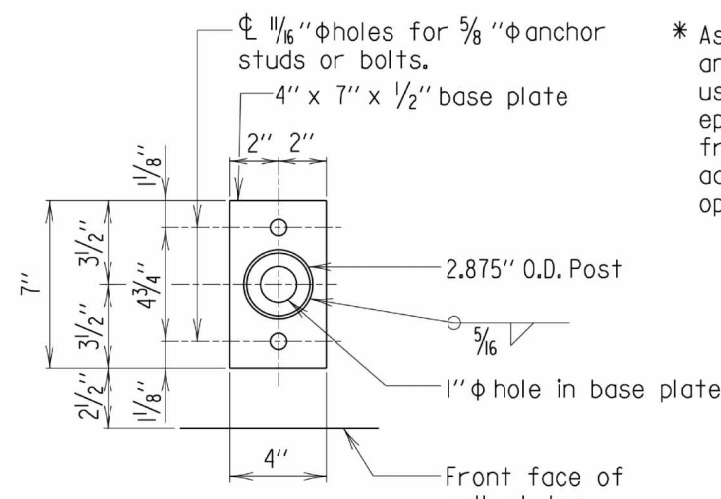
10

DENOTES ARCHITECTURAL TREATMENT

<p>90% DESIGN NOT FOR CONSTRUCTION</p>				<p>MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION GAITHERSBURG, MARYLAND</p>				<p>ST-22 TYPICAL RETAINING WALL SECTIONS AND DETAILS - 3</p>			
 <p><b>Athavale, Lystad &amp; Associates</b> 6720-B Rockledge Drive, Suite 160 Bethesda, MD 20817</p>				<p>RECOMMENDED FOR APPROVAL</p>				<p><b>BOWIE MILL ROAD BIKEWAY</b> M-NCPPC PERMIT NO. <u>MR2023016</u> DATE: APRIL 2025</p>			
				<p>Chief, Design Section _____ Date _____ APPROVED</p>							
				<p>Chief, Division of Transportation Engineering _____ Date _____</p>							
				<p>Designed by: <u>JS</u> Drawn by: <u>JE</u> Checked by: <u>KA</u></p>							
NO.	REVISION	DATE	BY					<p>Project No. : <u>502108</u> Sheet <u>185</u> of <u>393</u></p>			



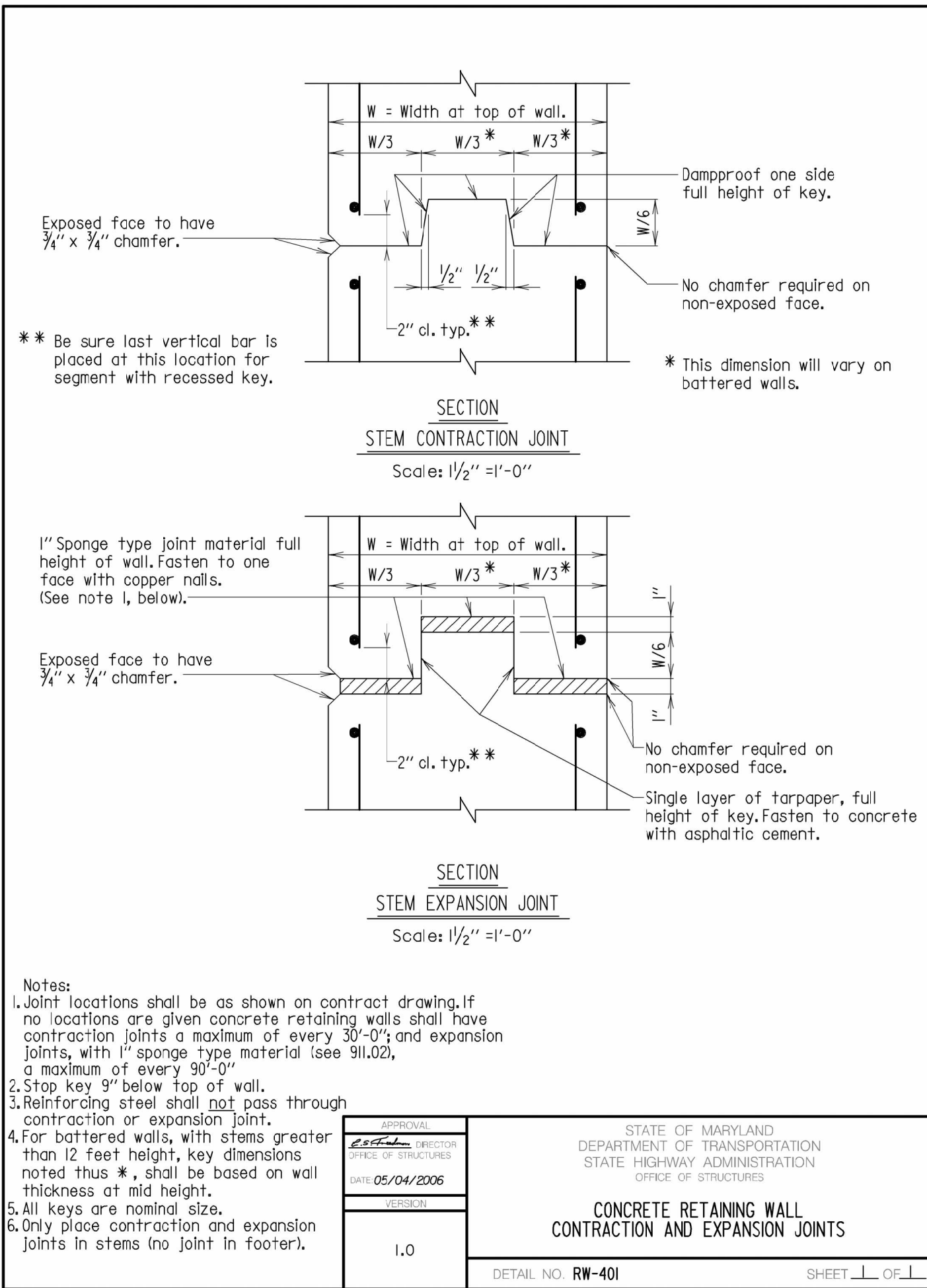
Specifications:	Latest SHA Specifications and Special Provisions for materials and construction. Latest AASHTO Standard Specifications for Highway Bridges for design.
Materials:	<p>Posts and rails shall conform to ASTM F1083, Schedule 80. Fabric shall be 6 gauge, 2" PVC coated mesh conforming to 914.01.</p> <p>All posts, braces, fittings and hardware shall be PVC coated. Coating shall conform to 914.03 except that nuts, bolts and washers shall also be PVC coated and touched up after installation.</p> <p>All plates shall be steel conforming to ASTM A 709 Grade 36.</p> <p>Anchor studs or anchor bolts shall conform to ASTM A 276, Type 430 or type 304 stainless steel, annealed, hot-finished, ultimate strength 10,000 psi min., 20% min. elongation. Threads may be rolled or cut.</p> <p>Epoxy grout for anchor studs in cored holes shall conform to 902.01d.</p> <p>PVC color for all elements of fence shall be black unless otherwise noted.</p>
Construction:	<p>All longitudinal rails shall be parallel to top of wall.</p> <p>All posts shall be set normal to top of wall for roadway grades 6% or less. For grades over 6% posts shall be set plumb.</p> <p>The chain link fence shall be true to line, taut, tight fit to top of wall (1/2" maximum gap) and shall comply with the best practice for fence construction of this type.</p> <p>Post and rails shall be permanently positioned before fabric is placed.</p> <p>For post spacing see pertinent structure sheets.</p> <p>Precoated longitudinal rails, if cut, shall have the cut end coated with PVC touch up material supplied by the manufacturer prior to erection.</p> <p>If Contractor elects to place anchor studs after placing concrete wall, newly placed rebars shall be located so that grout does not damage same, all holes shall be cored (not drilled) and the diameter of the cored holes for the anchor studs shall be 1/2".</p>
Measurement and Payment:	<p>The furnishing, fabricating, erecting, etc., of all new chain link fence on the retaining wall or culvert headwalls and wing walls, complete in place, will not be measured for payment but all costs thereof shall be included in the Contract lump sum prices for the pertinent Retaining Wall or Box Culvert item(s).</p> <p>Any defects uncovered by the inspection of welds on base plates and poles shall be repaired or replaced by new members at no additional cost to the Administration.</p>



APPROVAL <i>costa</i> DIRECTOR OFFICE OF STRUCTURES DATE: 01/14/2004	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION OFFICE OF STRUCTURES	
VERSION	TYPE III CHAIN LINK SAFETY FENCE RETAINING WALLS AND BOX CULVERTS	
I.O	DETAIL NO. SUP-FR(FN)-302	SHEET

APPROVAL <i>ccf</i> DIRECTOR OFFICE OF STRUCTURES DATE: 01/14/2004	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION OFFICE OF STRUCTURES
VERSION  I.O	TYPE III CHAIN LINK SAFETY FENCE RETAINING WALLS AND BOX CULVERTS
DETAIL NO. SUP-FR(FN)-302	SHEET





LOCATION CATEGORY A									
BAR SIZE	CENTER TO CENTER SPACING								
	3"	4"	5"	6"	7"	8"	9"	10"	
#4	2'-5"	3'-1"	2'-5"	2'-10"	2'-5"	2'-10"	2'-5"	2'-10"	
#5	3'-1"	4'-0"	3'-0"	3'-10"	3'-0"	3'-7"	3'-0"	3'-7"	
#6	4'-5"	5'-9"	3'-7"	4'-8"	3'-7"	4'-8"	3'-7"	4'-8"	
#7	6'-0"	7'-10"	4'-6"	5'-11"	4'-2"	5'-5"	4'-2"	5'-5"	
#8	7'-10"	10'-3"	5'-11"	7'-8"	4'-9"	6'-2"	4'-9"	6'-2"	
#9	10'-0"	13'-0"	7'-6"	9'-9"	6'-0"	7'-10"	5'-10"	7'-8"	
#10	-	-	9'-6"	12'-5"	7'-7"	9'-11"	7'-2"	9'-5"	
#11	-	-	11'-8"	15'-3"	9'-4"	12'-3"	8'-8"	11'-4"	

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.

LOCATION CATEGORY B									
BAR SIZE	CENTER TO CENTER SPACING								
	3"	4"	5"	6"	7"	8"	9"	10"	
#4	1'-10"	2'-9"	1'-10"	2'-2"	1'-10"	2'-2"	1'-10"	2'-2"	
#5	2'-5"	3'-7"	2'-4"	3'-5"	2'-4"	2'-9"	2'-4"	2'-9"	
#6	3'-5"	5'-1"	2'-9"	4'-1"	2'-9"	4'-1"	2'-9"	4'-1"	
#7	4'-8"	6'-11"	3'-6"	5'-3"	3'-2"	4'-9"	3'-2"	4'-9"	
#8	6'-11"	9'-1"	4'-7"	6'-10"	3'-8"	5'-5"	3'-8"	5'-5"	
#9	7'-8"	11'-6"	5'-9"	8'-8"	4'-8"	6'-11"	4'-6"	6'-9"	
#10	-	-	7'-4"	10'-11"	5'-10"	8'-9"	5'-7"	8'-4"	
#11	-	-	9'-0"	13'-6"	7'-2"	10'-9"	6'-8"	10'-0"	

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

Legend:  = Non-epoxy coated  = Epoxy coated

Notes:

- When bar lap is not specified on the Plans, the above dimensions shall be used.
- These bar laps do not apply when bar is in lightweight concrete. Greater lengths are required for this material.
- These bar laps only apply where the General Notes indicate Reinforcing Steel Design,  $f_y = 60$  ksi, and Concrete Design,  $f'_c = 3000$  psi.
- These bar laps assume cover of 2". Greater lap lengths will be required for cover less than 2".
- These bar laps are Class B splices based on the development lengths in Det. No. REBAR-DL-101. Class B splices are 1.3 times the development length.
- Class A splices may be used when (a) the area of reinforcement provided is at least twice that required by analysis over the entire length of the lap splice and (b) one-half or less of the total reinforcement is spliced within the required lap splice length. Class A splices are 1.0 times the development length.

APPROVAL	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION OFFICE OF STRUCTURES
DATE: 03/21/2011	BAR LAP DIMENSIONS FOR GRADE 60 REINFORCING STEEL IN MIX NO. 3 (3500 P.S.I.) CONCRETE
VERSION	
I.0	DETAIL NO. REBAR-BL-101 SHEET 1 OF 1

LOCATION CATEGORY A									
BAR SIZE	CENTER TO CENTER SPACING								
	3"	4"	5"	6"	7"	8"	9"	10"	
#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.

LOCATION CATEGORY B									
BAR SIZE	CENTER TO CENTER SPACING								
	3"	4"	5"	6"	7"	8"	9"	10"	
#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	-	-	6'-4"	9'-6"	5'-1"	7'-7"	4'-10"	7'-2"	
#11	-	-	7'-10"	11'-8"	6'-3"	9'-4"	5'-9"	8'-8"	

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

Legend:  = Non-epoxy coated  = Epoxy coated

Notes:

- When bar lap is not specified on the Plans, the above dimensions shall be used.
- These bar laps do not apply when bar is in lightweight concrete. Greater lengths are required for this material.
- These bar laps only apply where the General Notes indicate Reinforcing Steel Design,  $f_y = 60$  ksi, and Concrete Design,  $f'_c = 4000$  psi.
- These bar laps assume cover of 2". Greater lap lengths will be required for cover less than 2".
- These bar laps are Class B splices based on the development lengths in Det. No. REBAR-DL-103. Class B splices are 1.3 times the development length.
- Class A splices may be used when (a) the area of reinforcement provided is at least twice that required by analysis over the entire length of the lap splice and (b) one-half or less of the total reinforcement is spliced within the required lap splice length. Class A splices are 1.0 times the development length.

APPROVAL	STATE OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION OFFICE OF STRUCTURES
DATE: 03/21/2011	BAR LAP DIMENSIONS FOR GRADE 60 REINFORCING STEEL IN MIX NO. 6 (4500 P.S.I.) CONCRETE
VERSION	
I.0	DETAIL NO. REBAR-BL-103 SHEET 1 OF 1

