P.O. Drawer 879
Florence, MS 39073-0879

Phone: 601-932-2060
Fax: 601-932-2550

Municipal & Public Works Construction Heavy & Highway Construction

March 27, 2026

City of Vicksburg
PO Box 150
Vicksburg, MS 39181

ATTN: Josh Burris

RE: Sewer Junction Box Replacement
Update 3/27/26

Dear Mr. Burris,

I'd like to provide an additional update to this project since the last update on 1/8/26. The shoring plan mentioned in the previous update has been produced by a local engineer. I submitted the engineer stamped plan yesterday to CPKC's permitting division, JLL. Once I hear back from JLL, I will notify you.

The scope of work has increased on this project, due to several reasons:

- Hemphill recently had a crew pothole and verify existing sewer line sizes at the site. During this time it was discovered that an existing 24" gravity sewer main flows into the junction box. This sewer main will need to be bypassed during replacement of the junction box, and connected to the new junction box.
- Also during potholing, we found that approximately 120 feet of 30" gravity sewer pipe which flows downstream from the junction box is badly deteriorated and requires replacement; this will be performed to facilitate reconnecting the 30" pipe to the new junction box.
- Due to CPKC's requirements, the shoring plan is based on driving sheet pile walls for the excavation, along with installation of steel walers and struts. Typically, in non-railroad areas, trench boxes would be utilized for OSHA approved shoring, which is cheaper and allows for much quicker installation than sheet piling. The steel sheet piling requires a large crane or a specially equipped trackhoe for installation and removal. A copy of the shoring plan has been attached to the end of this update for reference.
- The size of the force main flowing into the junction box was thought to be 18" in diameter. After potholing and verifying, the size of the force main is 24" in diameter. The 30" gravity sewer main flowing out of the junction box was originally thought to be 24" in diameter.
- Hemphill will include the required railroad flagman while working in the railroad's right-of-way or in the railroad's zone of influence.

I've updated the approximate cost of the project, based on the increased scope of work and the requirements of CPKC railroad. Please find the updated amounts outlined below:

Approximate Amount	Description
$24,000.00	Mobilize Material and Equipment
$157,000.00	Bypass Pumping System for 24" Gravity Sewer Main (Two 12" Pumps) *Includes Setup, Rental, Diesel Fuel, Breakdown and Removal of System*
$626,000.00	Construct Sheetpiled Pit for Pipe Replacement and Junction Box Replacement *Includes Walers, Struts, Sheet Pile Rental, Welders, Installing Sheet Piling, Removing Sheet Piling, Removing Walers, Removing Struts, Backfilling, Removing Existing Junction Box, and Installing New Junction Box*
$108,000.00	Install 24" Bypass Port with Valves on Existing 24" Force Main. Remove Bypass Piping at End of Project. *Includes 24" Valves, Ductile Iron Sleeves and Reducers, and 24" Piping Needed, Installation and Removal of Bypass System.*
$77,000.00	Tie-In to Existing 24" Gravity Sewer, 30" Gravity Sewer, and 24" Force Main *Includes Connecting New 24" and 30" Gravity Sewer Pipe to Existing Pipe Using Hardback Ferncos, Connecting 24" and 30" to New Junction Box, Connecting 24" Force Main to Junction Box, Connecting New 24" Force Main Pipe to Existing 24" HDPE Force Main Pipe. Approximately 120 LF of 30" Will Be Installed Due to Existing Deteriorated Pipe Condition.*
$5,965.00	Pre-CCTV to Locate Downstream Manhole from Junction Box
$33,500.00	Interior Coating of New Junction Box *To Minimize Future Deteroriation of New Junction Box*
$26,000.00	610 Crushed Limestone Bedding *Required Inside the Sheet Piled Trench Area*
$108,500.00	Railroad Flagmen *Required While Working within CPKC's Zone of Influence or Right-of-Way*
$1,165,965.00 to $1,265,965.00	**Approximate Total**

We are planning to proceed with replacement of the junction box once we receive written approval from CPKC railroad. If the City has any questions or would like further information, please let me know.

Sincerely,

HEMPHILL CONSTRUCTION COMPANY, INC.

Cody Roberts
Project Manager

SHORING CALCULATIONS

PROJECT:

SEWER, JUNCTION BOX REPLACEMENT
VICKSBURG, MISSISSIPPI
AER PROJECT 20-25047

CLIENT:

HEMPHILL CONSTRUCTION COMPANY
FLORENCE, MISSISSIPPI

PREPARED BY:

JERRY L. JONES, PE

JERRY LEONARD JONES
LICENSED PROFESSIONAL
ENGINEER
8773
STATE OF MISSISSIPPI
3/23/2026

MARCH 23, 2026

ADVANCED ENGINEERING RESOURCES, INC.

120 Solleftea Drive, Madison, Mississippi 39110 – P.O. Box 1277 Madison, Mississipp 39130

Table of Contents

Shoring Analysis and Design Summary

A. *Design Criteria:*

The criteria for designing the shoring was based on the following reference materials:

1. *AREMA Manual for Railroad Engineering*, Volume 2

2. Canadian Pacific Kansas City (CPKC) *Guidelines for the Design and Construction of Railroad Overpasses and Underpasses, Section IV: Design and Construction of Shoring Adjacent to and on Railroad Right-of-Way*

3. Geotechnical Engineering Associates, LLC, GEA Project 26004: Geotechnical Investigation, dated January 24, 2026.

B. *Sheetpile Analysis and Design:*

The shoring geometry is parallel-braced sheet pile walls with the near wall located 27 feet from the centerline of the railroad track. The wall was modeled using Civiltech® **Shoring Suite V8** software.

The soil was modeled as equivalent clay which does not use cohesion to reduce soil pressures. The water table on the active side of the wall was assumed to be two (2) feet below existing grade and the water table on the passive side was assumed to be at the bottom of the excavation. The project drawings show the geometry of the wall, track and bracing.

Since the excavation extends into shoring zone "A", the lateral pressures from an E80 railroad surcharge were added as required by AREMA.

The wall was modeled in 3 conditions as follows:

1. Cantilevered wall with excavation 96 feet insde the shoring.
2. Wale and struts at elevation 98 feet and excavation to elevation 91 feet inside the shoring.
3. Wales and struts at elevation 98 feet and 93 feet with excavation to elevation 85.92 feet.

Under each condition, the allowable stresses in the sheet and the sheet deflections were checked for compliance with CPKC shoring guidelines. The embedment of the sheet was determined for load condition 3 with a factor of safety of 1.3.

C. Wales and Struts Analysis and Design

The unfactored calculated wale loads were determined and used to design the wales and struts. Wales and struts were modeled and designed using Bentley® **STAAD.Pro** software. Wales and struts were sized to limit stresses and deflections within allowable limits.

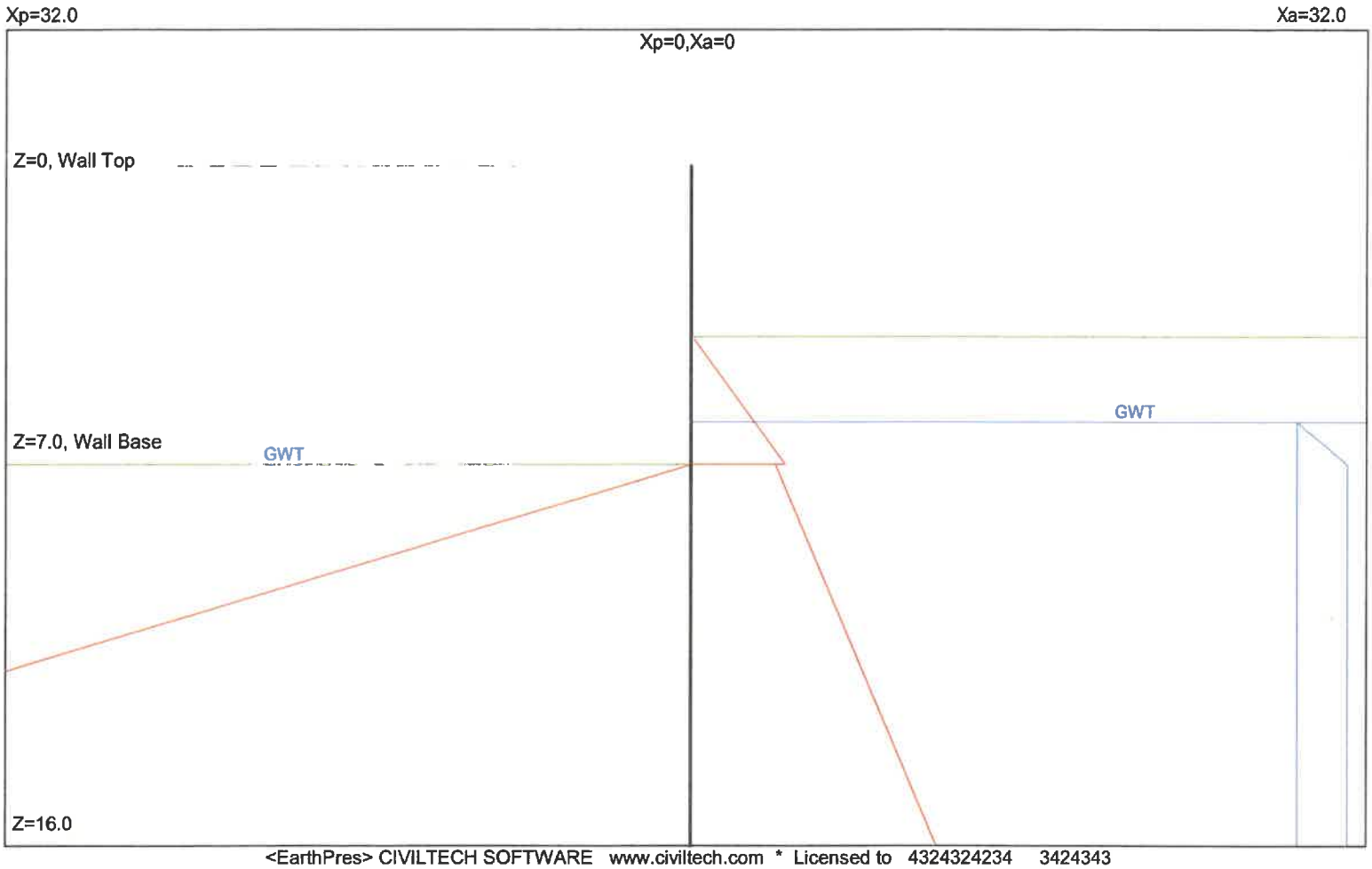
D. Summary of Analysis and Design Results:

Sheet pile size:	AZ26-700, 50 ksi yield
Sheetpile section modulus required:	15.3 inch3/ft
Sheetpile section modulus provided:	48.4 inch3/ft
Maximum sheetpile deflection:	0.3 inches
Minimum sheetpile embedment:	20 feet
Minimum length of sheetpile:	38 feet
Top wale load: 8.5 kips/ft	8.5 kips/ft
Bottom wale load:	14.6 kips/ft
Wales and Struts:	HP14x102, 50 ksi yield

Appendix A

Sheetpile Wall Analysis and Design

Vicksburg Sewer Junction Box



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UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf
Date: 3/18/2026 File: UNTITLED

* INPUT DATA *

Wall Height=7.0 Total Soil Types= 2

Soil No.	Weight	Saturate	Phi	Cohesion	Nspt	Type	Description
1	113.2	124.5	0.00	0.4	4	1	Eq. Clay
2	130.6	143.6	0.00	1.5	12	1	Eq. Clay

Ground Surface at Active Side:

Line	Z1	Xa1	Z2	Xa2	Soil No.	Description
1	4.0	0.0	4.0	800.0	1	Eq. Clay
2	28.5	0.0	28.5	800.0	2	Eq. Clay

Water Table at Active Side:

Point	Z-water	X-water
1	6.0	0.0
2	6.0	80000.0

Ground Surface at Passive Side:

Line	Z1	Xp1	Z2	Xp2	Soil No.	Description
1	7.0	0.0	7.0	800.0	1	Eq. Clay
2	28.5	0.0	28.5	800.0	2	Eq. Clay

Water Table at Passive Side:

Point	Z-water	X-water
1	7.0	0.0
2	7.0	80000.0

Wall Friction Options: 1.* No wall friction

* OUTPUT RESULTS *

Total Force above Base= 0.17 per one linear foot (or meter) width along wall height

Total Static Force above Base= 0.17. Distributed in Triangular Envelope along wall height. Ignore soil layers and water line

Driving Pressure above Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pa1	Z2	Pa2	Slope	K/Ka/Ko
4.00	0.00	7.00	0.12	0.0384	0.3389

Driving Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pa1	Z2	Pa2	Slope	Ka/Ko
7.00	0.10	16.00	0.30	0.0222	0.3568

Passive Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

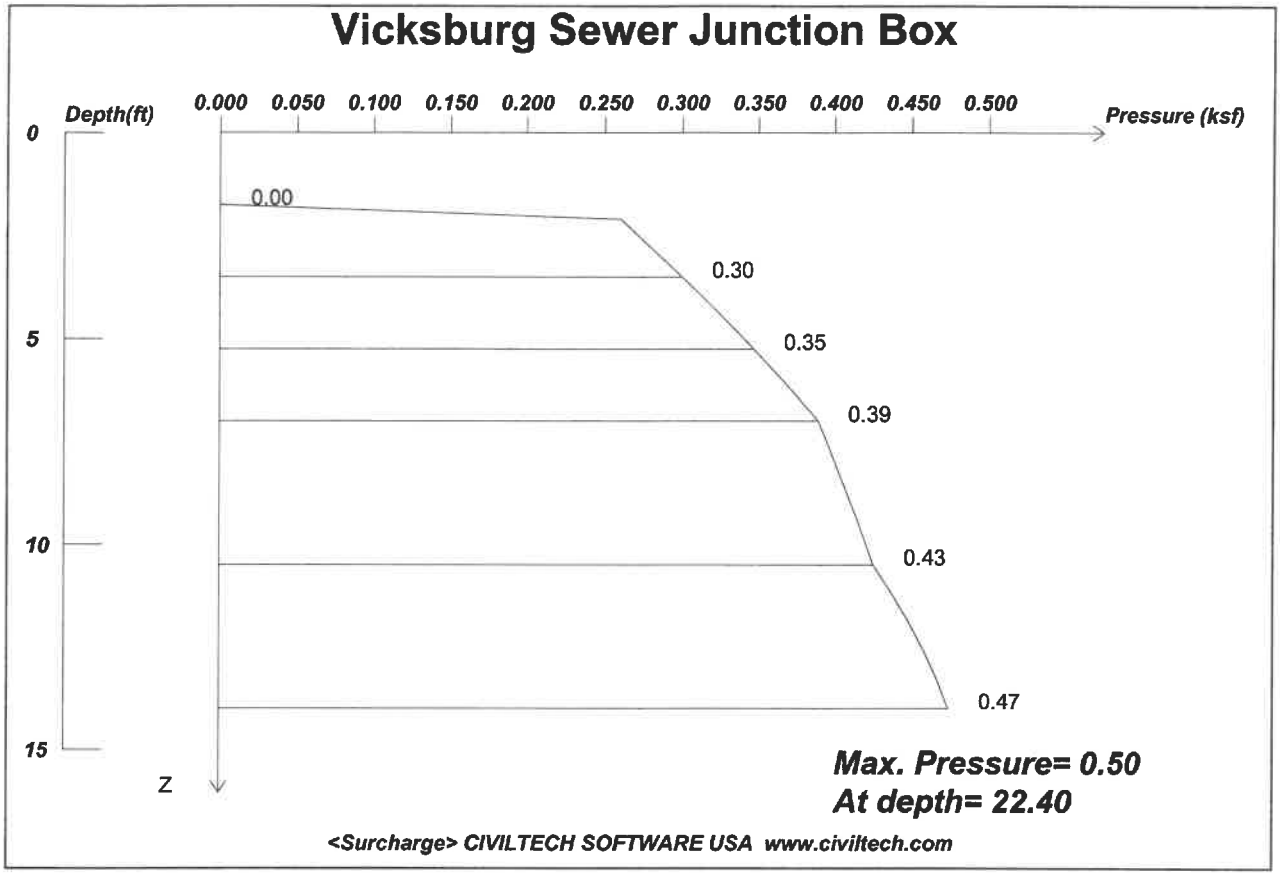
Z1	Pp1	Z2	Pp2	Slope	Kp
7.00	0.00	16.00	1.57	0.174	2.8029

Water Pressure - Output to Shoring - Multiplier of Pressure = 1

No	Z1	Pw1	Z2	Pw2	kw1
0	6.00	0.00	7.00	0.06	0.06
1	7.00	0.06	16.00	0.06	0.00

UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf

Date: 3/18/2026 File Name: UNTITLED



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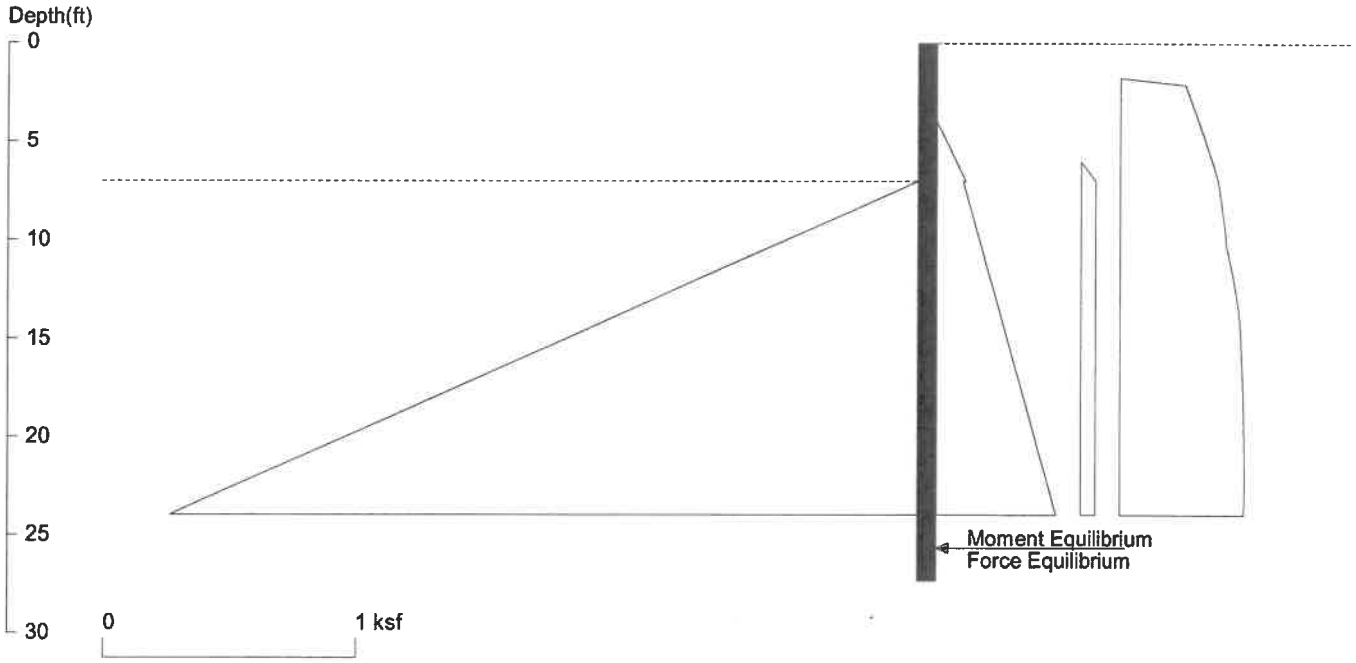
Wall Height, H= 7 Load Depth at Surface, D= 2
Load Factor of Surcharge Loading = 1 0.50 Max.
Rigid Wall Condition -- No movement or deflection of the wall are allowed.
Max. Pressure = 0.495 at depth = 22.40

Infinite Surcharge, Q=.25 Wayne-Teng Equation (Modified Boussinesq)

Cooper E80 Railroad Loading. From wall to railroad center, X=27

UNITS: LENGTH/DEPTH: ft, Qpoint: kip, Qline: kip/ft, Qstrip/Qarea/PRESSURE: ksf

Vicksburg Sewer Junction Box
No Wale - FS=1



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Wall Height=7.0 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=20.34 Min. Pile Length=27.34 (in graphics and analysis)
MOMENT IN PILE: Max. Moment=26.96 per Pile Spacing=1.0 at Depth=17.39

PILE SELECTION:
Request Min. Section Modulus = 9.8 in3/ft=527.11 cm3/m, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
AZ26 has Section Modulus = 48.4 in3/ft=2601.98 cm3/m. It is greater than Min. Requirements!
Top Deflection = 0.30(in) based on E (ksi)=29000.00 and I (in4)/foot=406.5

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
*	Above	Base		
4.000	0.000	7.000	0.115	0.038361
*	Below	Base		
7.000	0.103	28.500	0.579	0.022155
*	Water	Pres.		
6.000	0.000	7.000	0.062	0.062400
7.000	0.062	80.000	0.062	0.000000
*	Sur-	charge		
1.750	0.000	2.100	0.260	0.742990
2.100	0.260	2.450	0.270	0.028643
2.450	0.270	2.800	0.280	0.028520
2.800	0.280	3.150	0.290	0.028335
3.150	0.290	3.500	0.300	0.028092
3.500	0.300	3.850	0.310	0.027789
3.850	0.310	4.200	0.319	0.027431
4.200	0.319	4.550	0.329	0.027017
4.550	0.329	4.900	0.338	0.026550
4.900	0.338	5.250	0.347	0.026033

5.250	0.347	5.600	0.356	0.025469
5.600	0.356	5.950	0.365	0.024861
5.950	0.365	6.300	0.373	0.024211
6.300	0.373	6.650	0.381	0.023522
6.650	0.381	7.000	0.389	0.022798
7.000	0.389	7.700	0.397	0.011021
7.700	0.397	8.400	0.404	0.010630
8.400	0.404	9.100	0.412	0.010226
9.100	0.412	9.800	0.418	0.009811
9.800	0.418	10.500	0.425	0.009387
10.500	0.425	11.200	0.437	0.017476
11.200	0.437	11.900	0.448	0.015716
11.900	0.448	12.600	0.458	0.013945
12.600	0.458	13.300	0.467	0.012183
13.300	0.467	14.000	0.474	0.010452
14.000	0.474	15.400	0.480	0.004385
15.400	0.480	16.800	0.485	0.003576
16.800	0.485	18.200	0.489	0.002805
18.200	0.489	19.600	0.492	0.002077
19.600	0.492	21.000	0.494	0.001396
21.000	0.494	22.400	0.495	0.000944
22.400	0.495	23.800	0.493	-0.001185
23.800	0.493	25.200	0.489	-0.002921
25.200	0.489	26.600	0.483	-0.004287
26.600	0.483	28.000	0.476	-0.005322

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
*	Below	Base		
7.000	0.000	28.500	3.742	0.174062

ACTIVE SPACING:

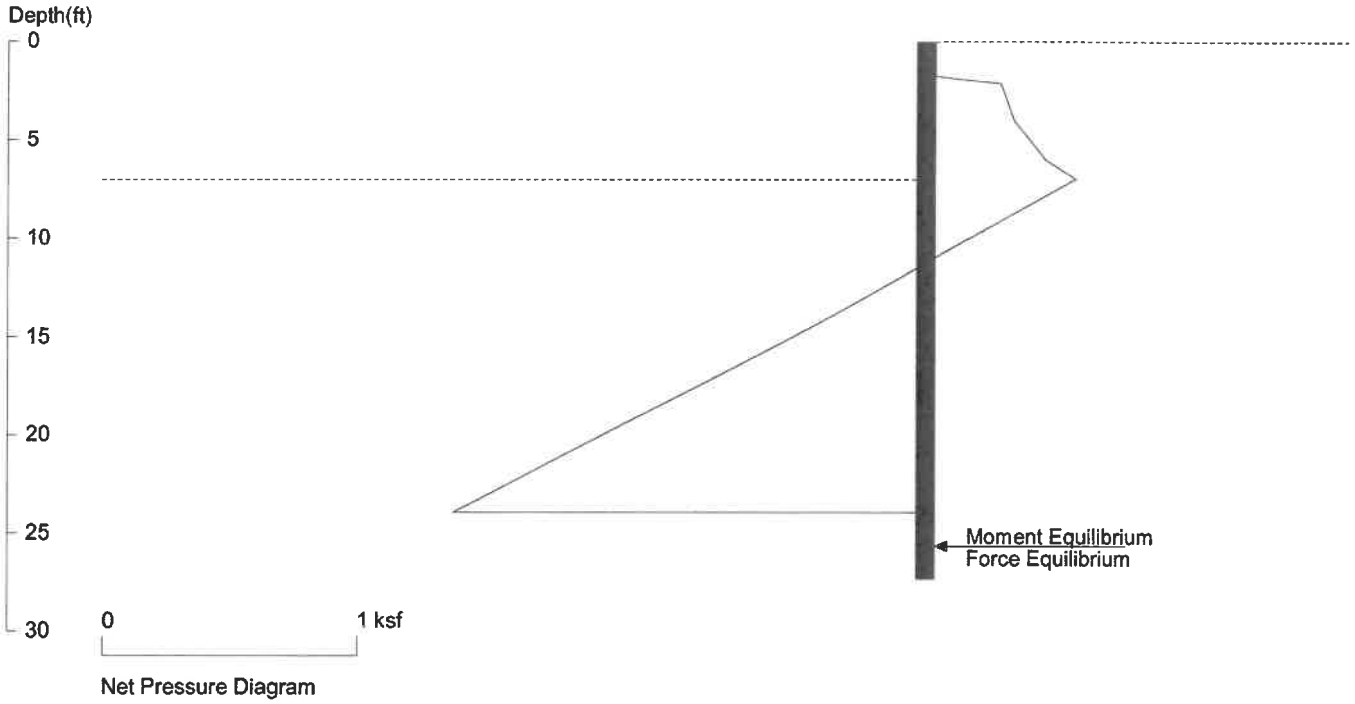
No.	Z depth	Spacing
1	0.00	1.00
2	7.00	1.00

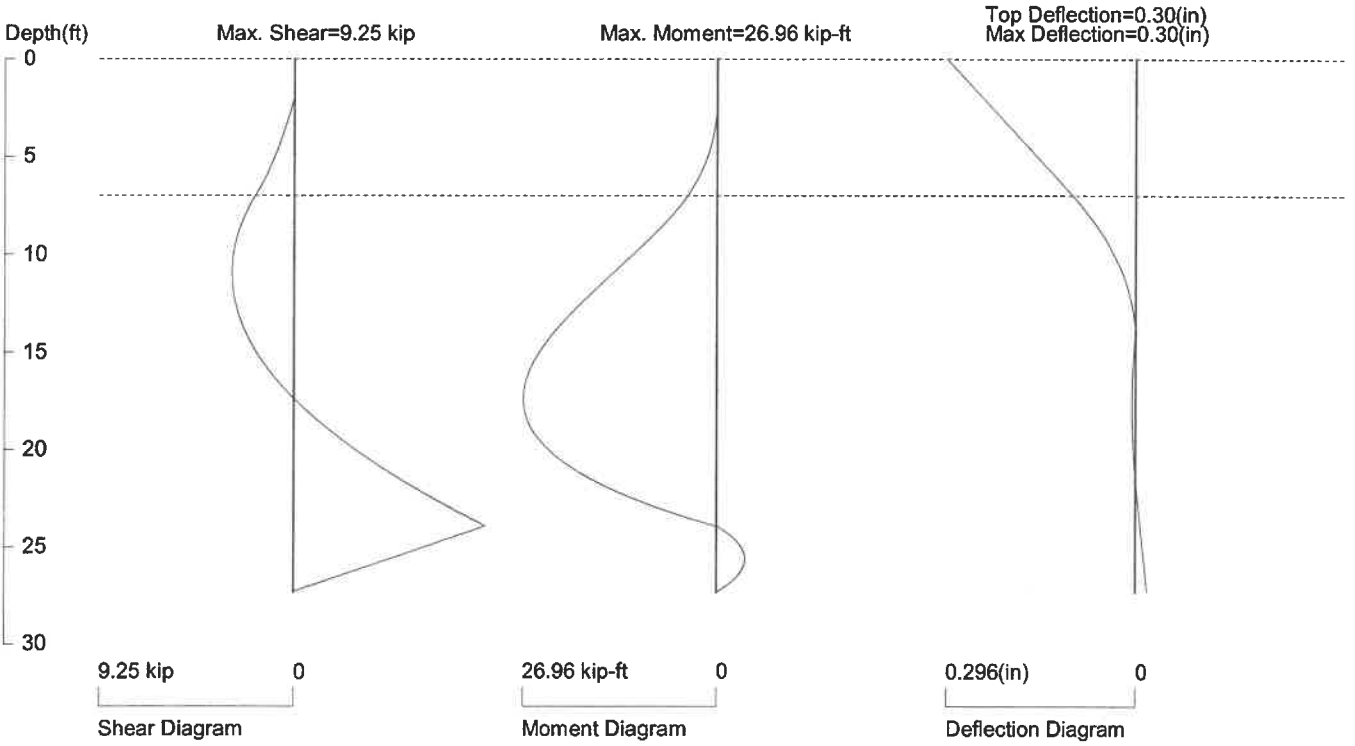
PASSIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in

Vicksburg Sewer Junction Box
No Wale - FS=1





PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

Based on pile spacing: 1.0 foot or meter

User Input Pile, az26: E (ksi)=29000.0, I (in4)/foot=406.5

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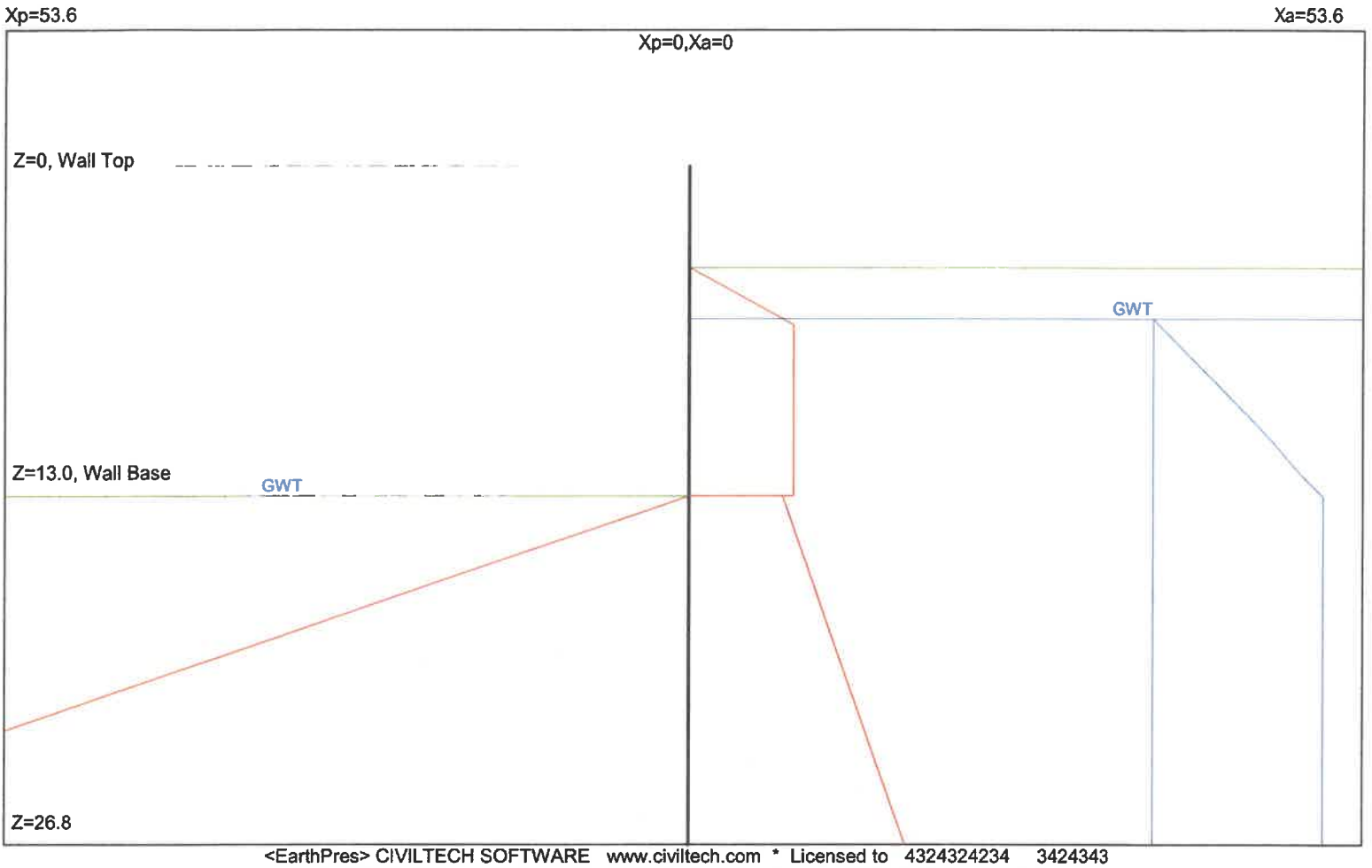
Vicksburg Sewer Junction Box - Shoring



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Date: 2/26/2026 File: UNTITLED

* INPUT DATA *

Wall Height=13.0 Total Soil Types= 2

Soil No.	Weight	Saturate	Phi	Cohesion	Nspt	Type	Description
1	115.0	126.5	0.00	0.5	4	1	Eq. Clay
2	130.8	143.9	0.00	1.5	12	1	Eq. Clay

Ground Surface at Active Side:

Line	Z1	Xa1	Z2	Xa2	Soil No.	Description
1	4.0	0.0	4.0	800.0	1	Eq. Clay
2	28.5	0.0	28.5	800.0	2	Eq. Clay

Water Table at Active Side:

Point	Z-water	X-water
1	6.0	0.0
2	6.0	80000.0

Ground Surface at Passive Side:

Line	Z1	Xp1	Z2	Xp2	Soil No.	Description
1	13.0	0.0	13.0	800.0	1	Eq. Clay
2	28.4	0.0	28.4	800.0	2	Eq. Clay

Water Table at Passive Side:

Point	Z-water	X-water
1	13.0	0.0
2	13.0	80000.0

Wall Friction Options: 1.* No wall friction

* OUTPUT RESULTS *

Total Force above Base= 1.18 per one linear foot (or meter) width along wall height

Total Static Force above Base= 1.18. Distributed in Apparent Envelope along wall height. Ignore soil layers and water line

Driving Pressure above Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pa1	Z2	Pa2	Slope	K/Ka/Ko
4.00	0.00	6.25	0.26	0.1169	1.0161
6.25	0.26	13.00	0.26	0.0000	0.0000

Driving Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pa1	Z2	Pa2	Slope	Ka/Ko
13.00	0.24	16.00	0.30	0.0222	0.3469
16.00	0.30	19.00	0.37	0.0222	0.3469
19.00	0.37	22.00	0.44	0.0222	0.3469
22.00	0.44	25.00	0.50	0.0222	0.3469
25.00	0.50	26.80	0.54	0.0222	0.3469

Passive Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pp1	Z2	Pp2	Slope	Kp
13.00	0.00	26.80	2.55	0.185	2.8826

Water Pressure - Output to Shoring - Multiplier of Pressure = 1

No	Z1	Pw1	Z2	Pw2	kw1
0	6.00	0.00	13.00	0.44	0.06
1	13.00	0.44	26.80	0.44	0.00

UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf

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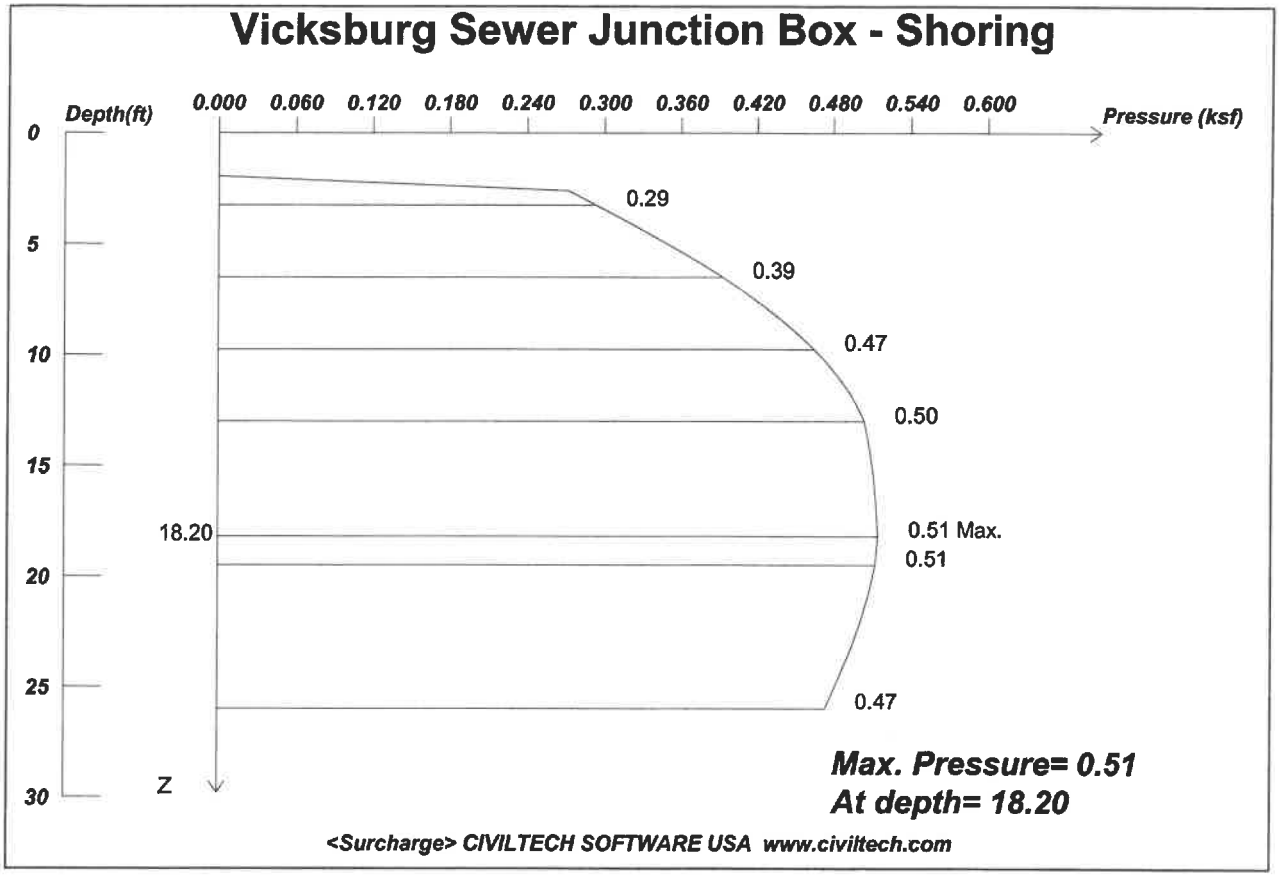

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Wall Height, H= 13 Load Depth at Surface, D= 2
Load Factor of Surcharge Loading = 1
Rigid Wall Condition -- No movement or deflection of the wall are allowed.
Max. Pressure = 0.515 at depth = 18.20

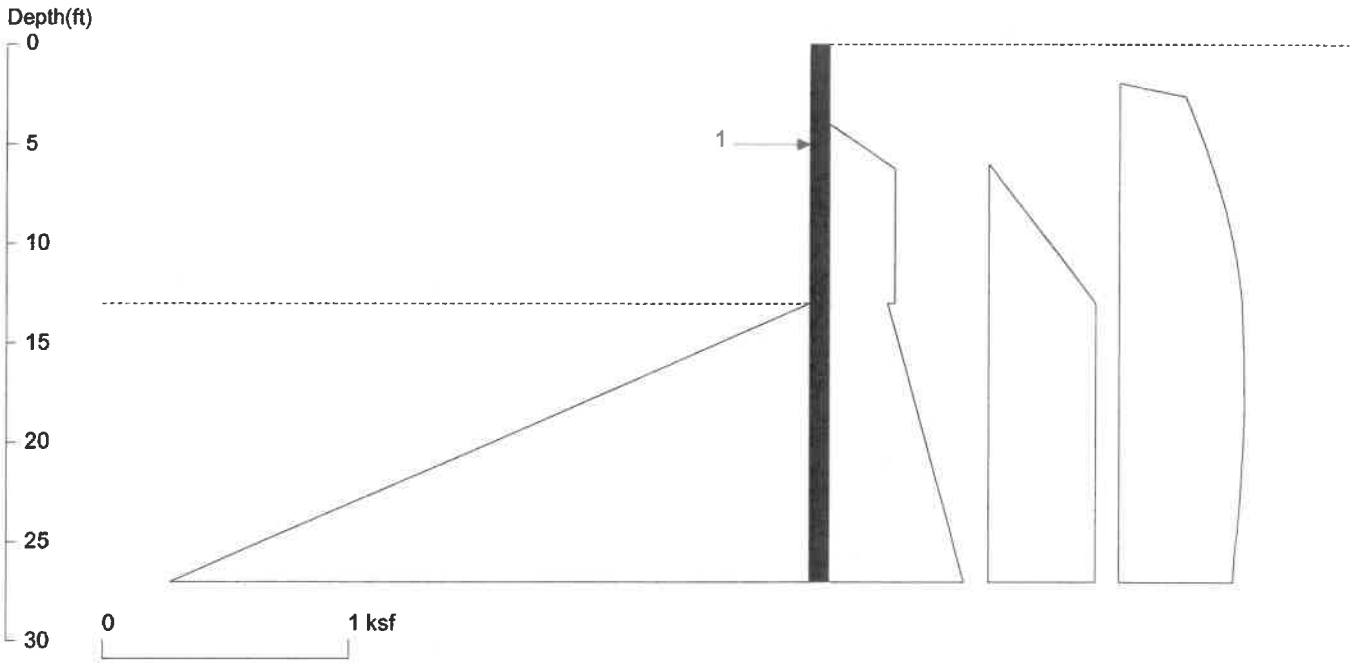
Infinite Surcharge, Q=.25 Wayne-Teng Equation (Modified Boussinesq)

Cooper E80 Railroad Loading. From wall to railroad center, X=25

UNITS: LENGTH/DEPTH: ft, Qpoint: kip, Qline: kip/ft, Qstrip/Qarea/PRESSURE: ksf

Vicksburg Sewer Junction Box - Shoring

1 Wale - Fs = 1



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Wall Height=13.0 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=14.03 Min. Pile Length=27.03 (in graphics and analysis)
MOMENT IN PILE: Max. Moment=34.83 per Pile Spacing=1.0 at Depth=13.40

PILE SELECTION:
Request Min. Section Modulus = 12.7 in3/ft=680.89 cm3/m, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
AZ26 has Section Modulus = 48.4 in3/ft=2601.98 cm3/m. It is greater than Min. Requirements!
Top Deflection = -0.16(in) based on E (ksi)=29000.00 and I (in4)/foot=406.5

BRACE FORCE: Strut, Tieback, Plate Anchor, and Deadman

No. & Type	Depth	Angle	Space	Total F.	Horiz. F.	Vert. F.	N/A	N/A
1. Strut	5.0	0.0	1.0	8.5	8.5	0.0	0.0	0.0

UNITS: Width,Diameter,Spacing,Length,Depth,and Height - ft; Force - kip; Bond Strength and Pressure - ksf

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
*	Above	Base		
4.000	0.000	6.250	0.263	0.116850
6.250	0.263	13.000	0.263	0.000000
*	Below	Base		
13.000	0.235	16.000	0.302	0.022237
16.000	0.302	19.000	0.369	0.022237
19.000	0.369	22.000	0.436	0.022237
22.000	0.436	25.000	0.502	0.022237
25.000	0.502	28.500	0.580	0.022237
*	Water	Pres.		
6.000	0.000	13.000	0.437	0.062400
13.000	0.437	134.000	0.437	0.000000
*	Sur-	charge		

1.950	0.000	2.600	0.272	0.418225
2.600	0.272	3.250	0.294	0.033316
3.250	0.294	3.900	0.315	0.032736
3.900	0.315	4.550	0.336	0.031882
4.550	0.336	5.200	0.356	0.030773
5.200	0.356	5.850	0.375	0.029433
5.850	0.375	6.500	0.393	0.027890
6.500	0.393	7.150	0.410	0.026174
7.150	0.410	7.800	0.426	0.024318
7.800	0.426	8.450	0.440	0.022355
8.450	0.440	9.100	0.453	0.020319
9.100	0.453	9.750	0.465	0.018241
9.750	0.465	10.400	0.476	0.016151
10.400	0.476	11.050	0.485	0.014077
11.050	0.485	11.700	0.493	0.012042
11.700	0.493	12.350	0.499	0.010068
12.350	0.499	13.000	0.505	0.008173
13.000	0.505	14.300	0.509	0.003185
14.300	0.509	15.600	0.512	0.002336
15.600	0.512	16.900	0.514	0.001542
16.900	0.514	18.200	0.515	0.000935
18.200	0.515	19.500	0.513	-0.001532
19.500	0.513	20.800	0.508	-0.003535
20.800	0.508	22.100	0.502	-0.005105
22.100	0.502	23.400	0.494	-0.006287
23.400	0.494	24.700	0.484	-0.007133
24.700	0.484	26.000	0.474	-0.007695
26.000	0.474	28.600	0.464	-0.004012

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
*	Below	Base		
13.000	0.000	28.400	2.846	0.184776

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	13.00	1.00

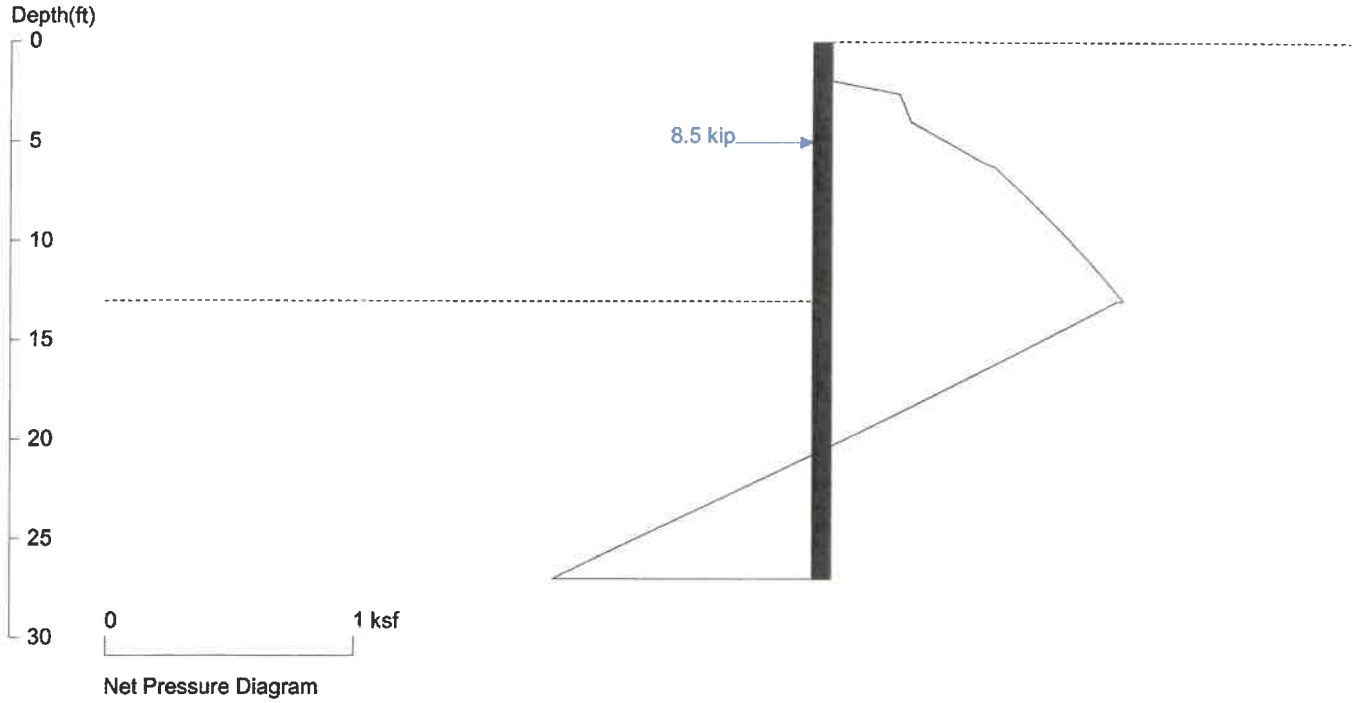
PASSIVE SPACING:

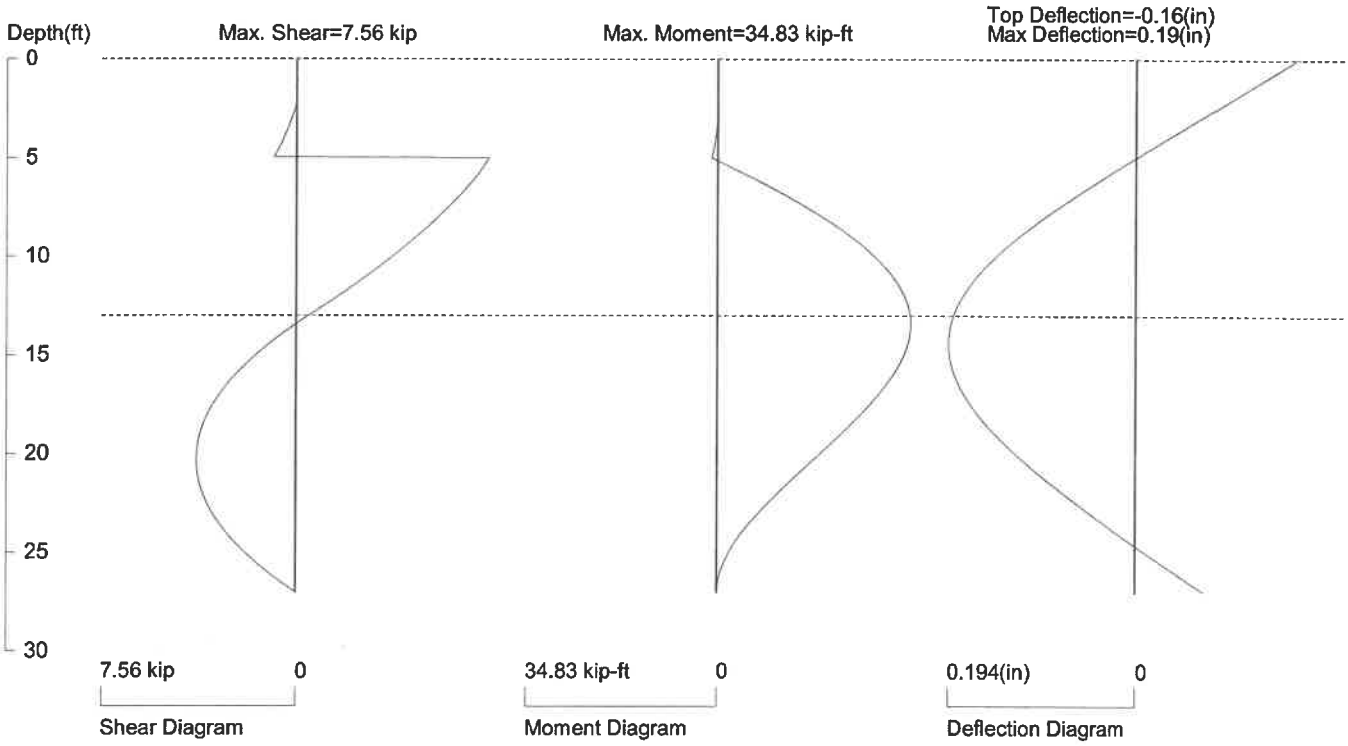
No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in

Vicksburg Sewer Junction Box - Shoring

1 Wale - Fs = 1





PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

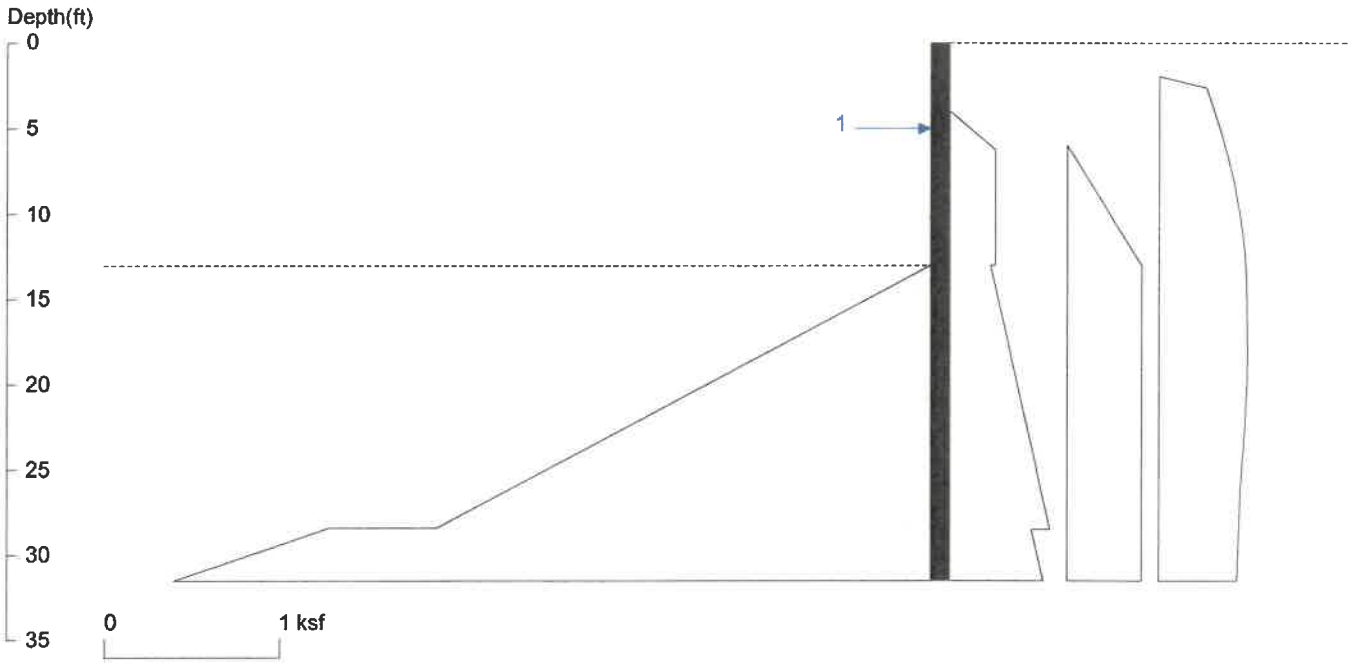
Based on pile spacing: 1.0 foot or meter

User Input Pile, az26: E (ksi)=29000.0, I (in4)/foot=406.5

File: UNTITLED

Vicksburg Sewer Junction Box - Shoring

1 Wale - Fs = 1.5



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Wall Height=13.0 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=18.52 Min. Pile Length=31.52 (in graphics and analysis)
MOMENT IN PILE: Max. Moment=51.71 per Pile Spacing=1.0 at Depth=15.15

PILE SELECTION:
Request Min. Section Modulus = 18.8 in3/ft=1010.89 cm3/m, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
AZ26 has Section Modulus = 48.4 in3/ft=2601.98 cm3/m. It is greater than Min. Requirements!
Top Deflection = -0.29(in) based on E (ksi)=29000.00 and I (in4)/foot=406.5

BRACE FORCE: Strut, Tieback, Plate Anchor, and Deadman

No. & Type	Depth	Angle	Space	Total F.	Horiz. F.	Vert. F.	N/A	N/A
1. Strut	5.0	0.0	1.0	10.3	10.3	0.0	0.0	0.0

UNITS: Width,Diameter,Spacing,Length,Depth,and Height - ft; Force - kip; Bond Strength and Pressure - ksf

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
*	Above	Base		
4.000	0.000	6.250	0.263	0.116850
6.250	0.263	13.000	0.263	0.000000
*	Below	Base		
13.000	0.235	16.000	0.302	0.022237
16.000	0.302	19.000	0.369	0.022237
19.000	0.369	22.000	0.436	0.022237
22.000	0.436	25.000	0.502	0.022237
25.000	0.502	28.500	0.580	0.022237
28.500	0.472	31.000	0.530	0.023010
31.000	0.530	34.000	0.599	0.023010
*	Water	Pres.		
6.000	0.000	13.000	0.437	0.062400

13.000	0.437	134.000	0.437	0.000000
*	Sur-	charge		
1.950	0.000	2.600	0.272	0.418225
2.600	0.272	3.250	0.294	0.033316
3.250	0.294	3.900	0.315	0.032736
3.900	0.315	4.550	0.336	0.031882
4.550	0.336	5.200	0.356	0.030773
5.200	0.356	5.850	0.375	0.029433
5.850	0.375	6.500	0.393	0.027890
6.500	0.393	7.150	0.410	0.026174
7.150	0.410	7.800	0.426	0.024318
7.800	0.426	8.450	0.440	0.022355
8.450	0.440	9.100	0.453	0.020319
9.100	0.453	9.750	0.465	0.018241
9.750	0.465	10.400	0.476	0.016151
10.400	0.476	11.050	0.485	0.014077
11.050	0.485	11.700	0.493	0.012042
11.700	0.493	12.350	0.499	0.010068
12.350	0.499	13.000	0.505	0.008173
13.000	0.505	14.300	0.509	0.003185
14.300	0.509	15.600	0.512	0.002336
15.600	0.512	16.900	0.514	0.001542
16.900	0.514	18.200	0.515	0.000935
18.200	0.515	19.500	0.513	-0.001532
19.500	0.513	20.800	0.508	-0.003535
20.800	0.508	22.100	0.502	-0.005105
22.100	0.502	23.400	0.494	-0.006287
23.400	0.494	24.700	0.484	-0.007133
24.700	0.484	26.000	0.474	-0.007695
26.000	0.474	28.600	0.464	-0.004012
28.600	0.464	31.200	0.453	-0.004082
31.200	0.453	33.800	0.443	-0.004078

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.5

Z1	P1	Z2	P2	Slope
*	Below	Base		
13.000	0.000	28.400	2.846	0.184776
28.400	3.466	134.000	33.854	0.287765

ACTIVE SPACING:

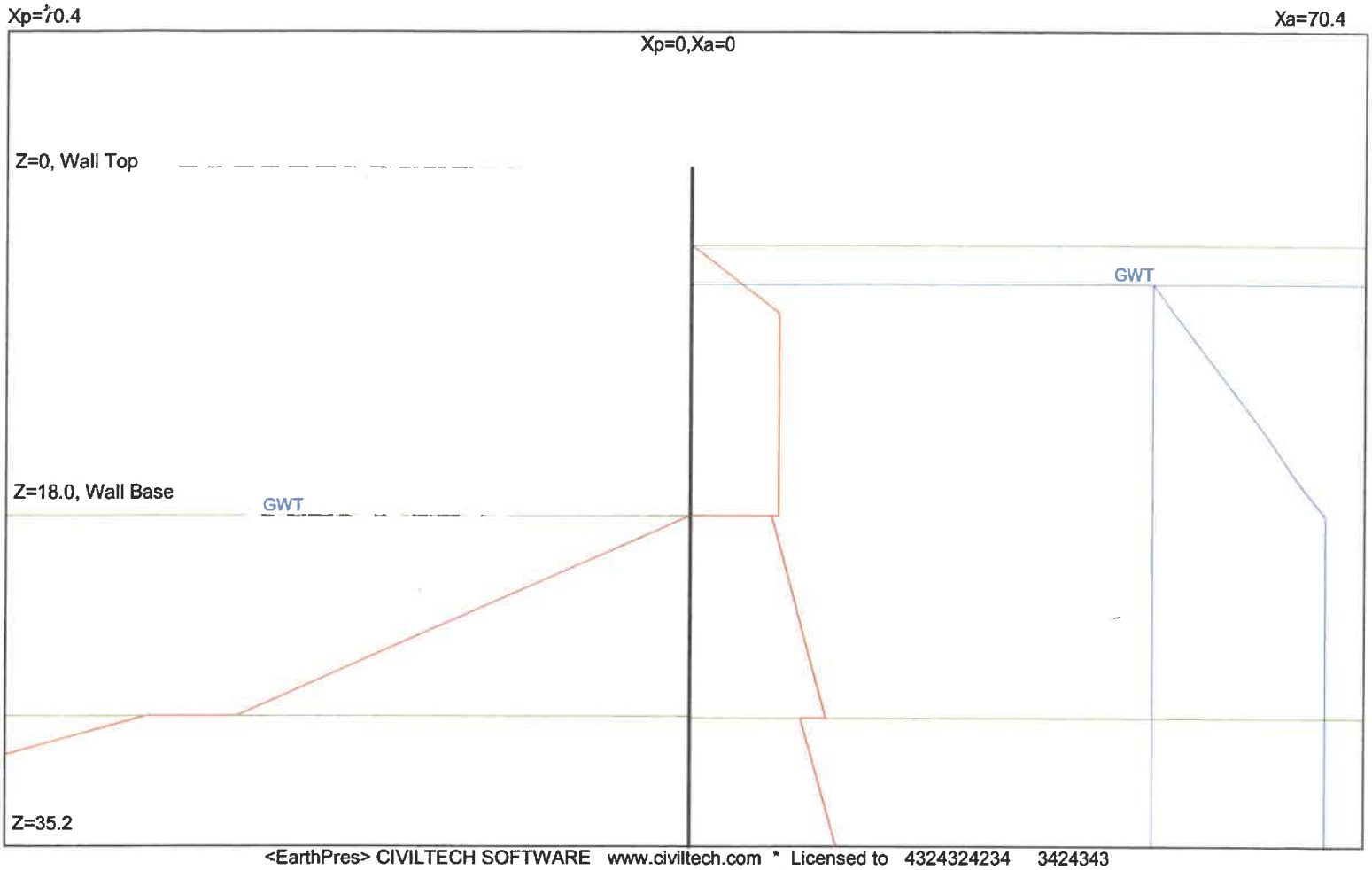
No.	Z depth	Spacing
1	0.00	1.00
2	13.00	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in

Vicksburg Sewer Junction Box - Shoring



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UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf
Date: 2/26/2026 File: UNTITLED

* INPUT DATA *

Wall Height=18.0 Total Soil Types= 2

Soil No.	Weight	Saturate	Phi	Cohesion	Nspt	Type	Description
1	115.0	126.5	0.00	0.5	4	1	Eq. Clay
2	130.8	143.9	0.00	1.5	12	1	Eq. Clay

Ground Surface at Active Side:

Line	Z1	Xa1	Z2	Xa2	Soil No.	Description
1	4.0	0.0	4.0	800.0	1	Eq. Clay
2	28.5	0.0	28.5	800.0	2	Eq. Clay

Water Table at Active Side:

Point	Z-water	X-water
1	6.0	0.0
2	6.0	80000.0

Ground Surface at Passive Side:

Line	Z1	Xp1	Z2	Xp2	Soil No.	Description
1	18.0	0.0	18.0	800.0	1	Eq. Clay
2	28.4	0.0	28.4	800.0	2	Eq. Clay

Water Table at Passive Side:

Point	Z-water	X-water
1	18.0	0.0
2	18.0	80000.0

Wall Friction Options: 1.* No wall friction

* OUTPUT RESULTS *

Total Force above Base= 2.64 per one linear foot (or meter) width along wall height

Total Static Force above Base= 2.64. Distributed in Apparent Envelope along wall height. Ignore soil layers and water line

Driving Pressure above Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pa1	Z2	Pa2	Slope	K/Ka/Ko
4.00	0.00	7.50	0.38	0.1077	0.9364
7.50	0.38	18.00	0.38	0.0000	0.0000

Driving Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pa1	Z2	Pa2	Slope	Ka/Ko
18.00	0.35	19.00	0.37	0.0222	0.3469
19.00	0.37	22.00	0.44	0.0222	0.3469
22.00	0.44	25.00	0.50	0.0222	0.3469
25.00	0.50	28.50	0.58	0.0222	0.3469
28.50	0.47	31.00	0.53	0.0230	0.2823
31.00	0.53	34.00	0.60	0.0230	0.2823
34.00	0.60	35.20	0.63	0.0230	0.2823

Passive Pressure below Base - Output to Shoring - Multiplier of Pressure = 1

Z1	Pp1	Z2	Pp2	Slope	Kp
18.00	0.00	28.40	1.92	0.185	2.8826
28.40	2.31	35.20	4.30	0.293	3.5896

Water Pressure - Output to Shoring - Multiplier of Pressure = 1

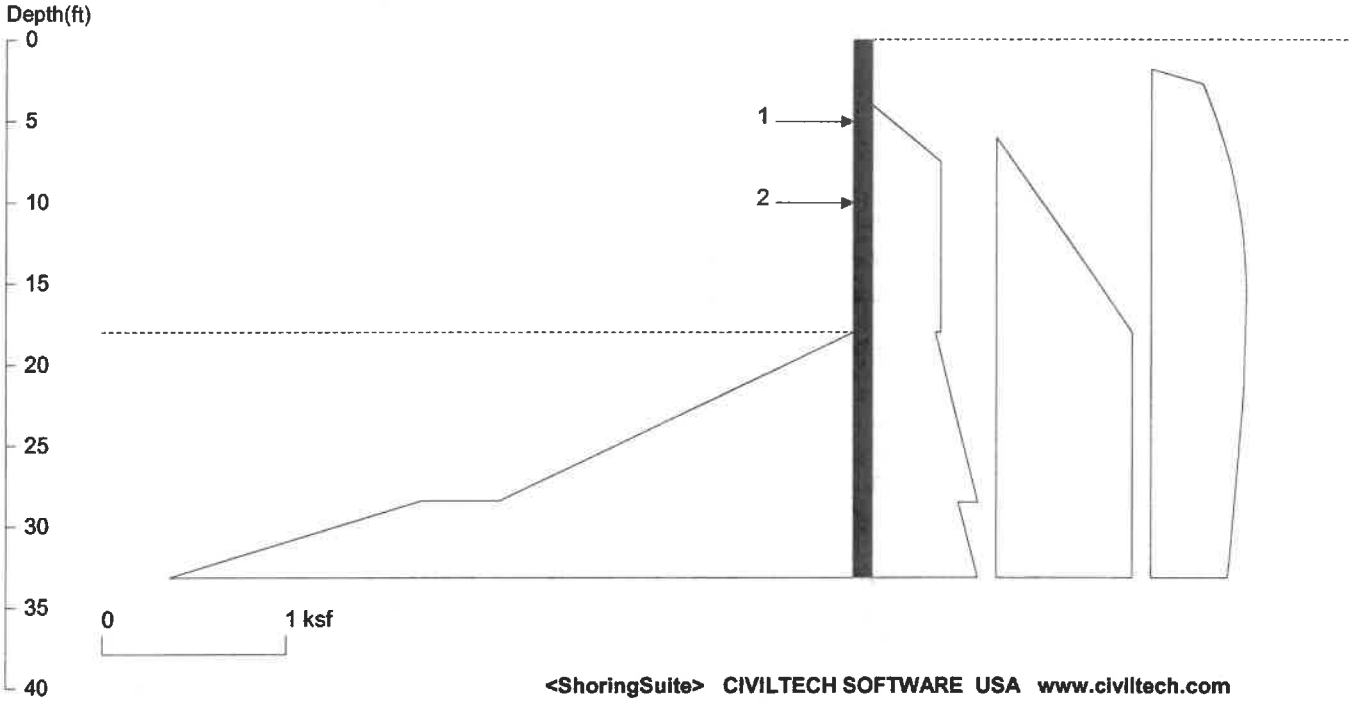
No	Z1	Pw1	Z2	Pw2	kw1
0	6.00	0.00	18.00	0.75	0.06
1	18.00	0.75	35.20	0.75	0.00

UNITS: DEPTH/DISTANCE: ft, UNIT WEIGHT: pcf, FORCE: kip/ft, PRESSURE: ksf, SLOPE: kcf

Date: 2/26/2026 File Name: UNTITLED

Vicksburg Sewer Junction Box - Shoring

2 wales - FS = 1



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File: UNTITLED

Wall Height=18.0 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=15.15 Min. Pile Length=33.15 (in graphics and analysis)
MOMENT IN PILE: Max. Moment=47.46 per Pile Spacing=1.0 at Depth=19.50

PILE SELECTION:
Request Min. Section Modulus = 17.3 in3/ft=927.85 cm3/m, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
AZ26 has Section Modulus = 48.4 in3/ft=2601.98 cm3/m. It is greater than Min. Requirements!
Top Deflection = 0.00(in) based on E (ksi)=29000.00 and I (in4)/foot=406.5

BRACE FORCE: Strut, Tieback, Plate Anchor, and Deadman

No. & Type	Depth	Angle	Space	Total F.	Horiz. F.	Vert. F.	N/A	N/A
1. Strut	5.0	0.0	1.0	2.9	2.9	0.0	0.0	0.0
2. Strut	10.0	0.0	1.0	14.6	14.6	0.0	0.0	0.0

UNITS: Width,Diameter,Spacing,Length,Depth,and Height - ft; Force - kip; Bond Strength and Pressure - ksf

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
*	Above	Base		
4.000	0.000	7.500	0.377	0.107686
7.500	0.377	18.000	0.377	0.000000
*	Below	Base		
18.000	0.347	19.000	0.369	0.022237
19.000	0.369	22.000	0.436	0.022237
22.000	0.436	25.000	0.502	0.022237
25.000	0.502	28.500	0.580	0.022237
28.500	0.472	31.000	0.530	0.023010
31.000	0.530	34.000	0.599	0.023010
*	Water	Pres.		
6.000	0.000	18.000	0.749	0.062400

18.000	0.749	176.000	0.749	0.000000
*	Sur-	charge		
1.800	0.000	2.700	0.280	0.311342
2.700	0.280	3.600	0.310	0.033005
3.600	0.310	4.500	0.339	0.031910
4.500	0.339	5.400	0.366	0.030326
5.400	0.366	6.300	0.391	0.028316
6.300	0.391	7.200	0.415	0.025961
7.200	0.415	8.100	0.436	0.023344
8.100	0.436	9.000	0.454	0.020555
9.000	0.454	9.900	0.470	0.017778
9.900	0.470	10.800	0.484	0.014793
10.800	0.484	11.700	0.494	0.011967
11.700	0.494	12.600	0.503	0.009259
12.600	0.503	13.500	0.509	0.006713
13.500	0.509	14.400	0.513	0.004361
14.400	0.513	15.300	0.515	0.002224
15.300	0.515	16.200	0.515	0.000313
16.200	0.515	17.100	0.514	-0.001369
17.100	0.514	18.000	0.511	-0.002828
18.000	0.511	19.800	0.507	-0.002036
19.800	0.507	21.600	0.503	-0.002557
21.600	0.503	23.400	0.491	-0.006313
23.400	0.491	25.200	0.478	-0.007393
25.200	0.478	27.000	0.464	-0.007969
27.000	0.464	28.800	0.449	-0.008167
28.800	0.449	30.600	0.435	-0.008094
30.600	0.435	32.400	0.420	-0.007835
32.400	0.420	34.200	0.407	-0.007457

PASSIVE PRESSURES:

Z1	P1	Z2	P2	Slope
*	Below	Base		
18.000	0.000	28.400	1.922	0.184776
28.400	2.346	176.000	44.798	0.287613

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	18.00	1.00

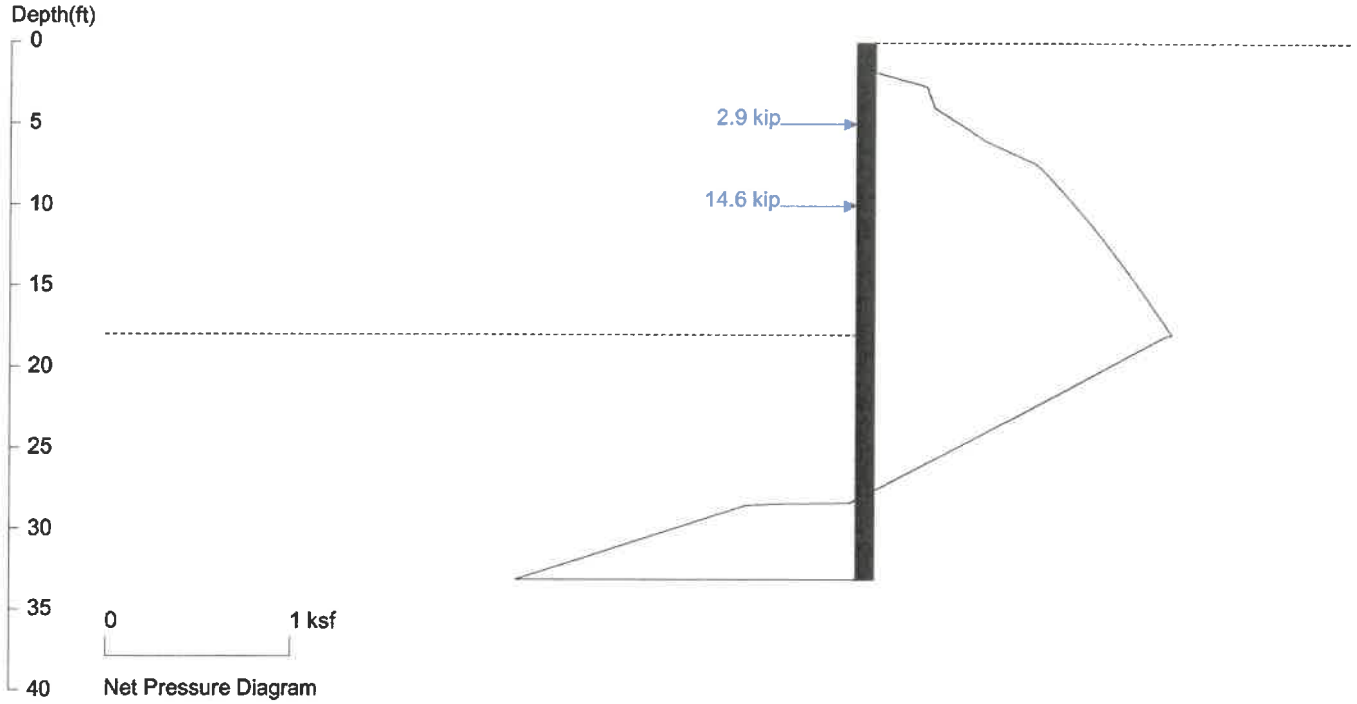
PASSIVE SPACING:

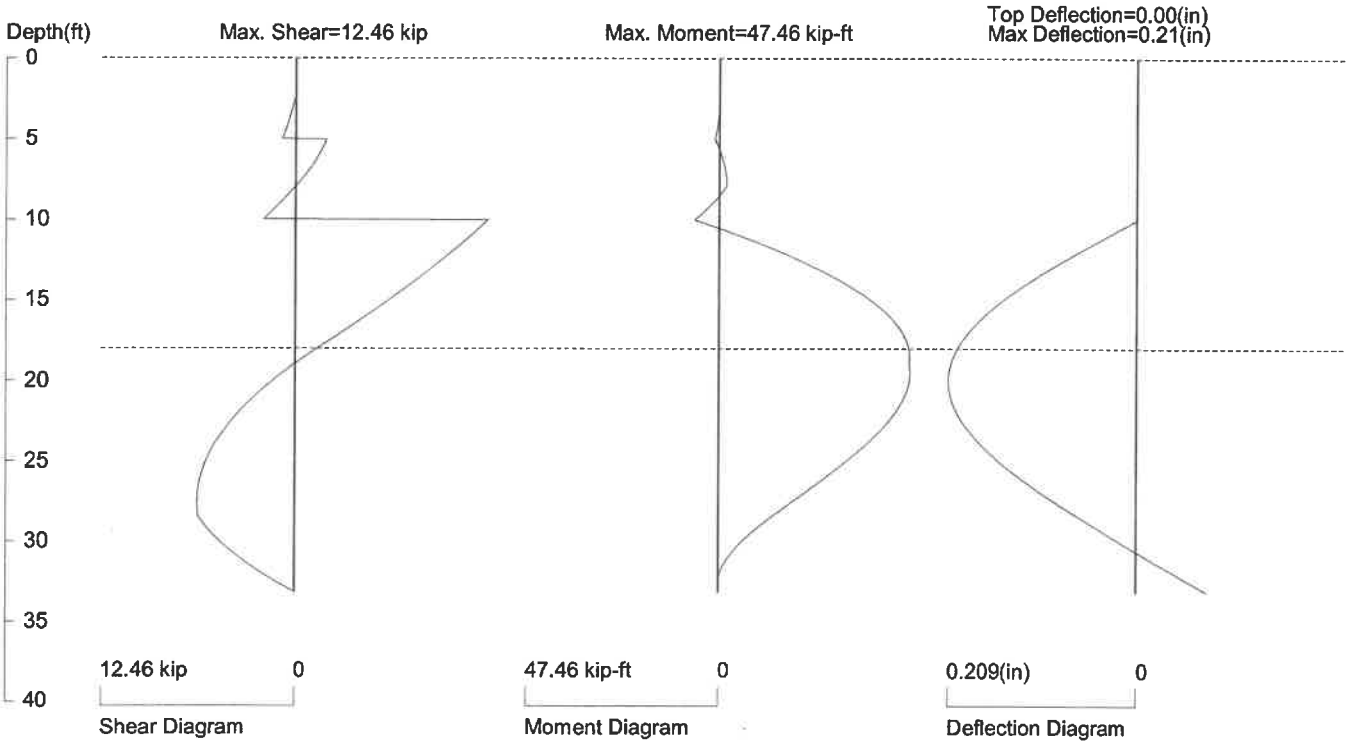
No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in

Vicksburg Sewer Junction Box - Shoring

2 wales - FS = 1





PRESSURE, SHEAR, MOMENT, AND DEFLECTION DIAGRAMS

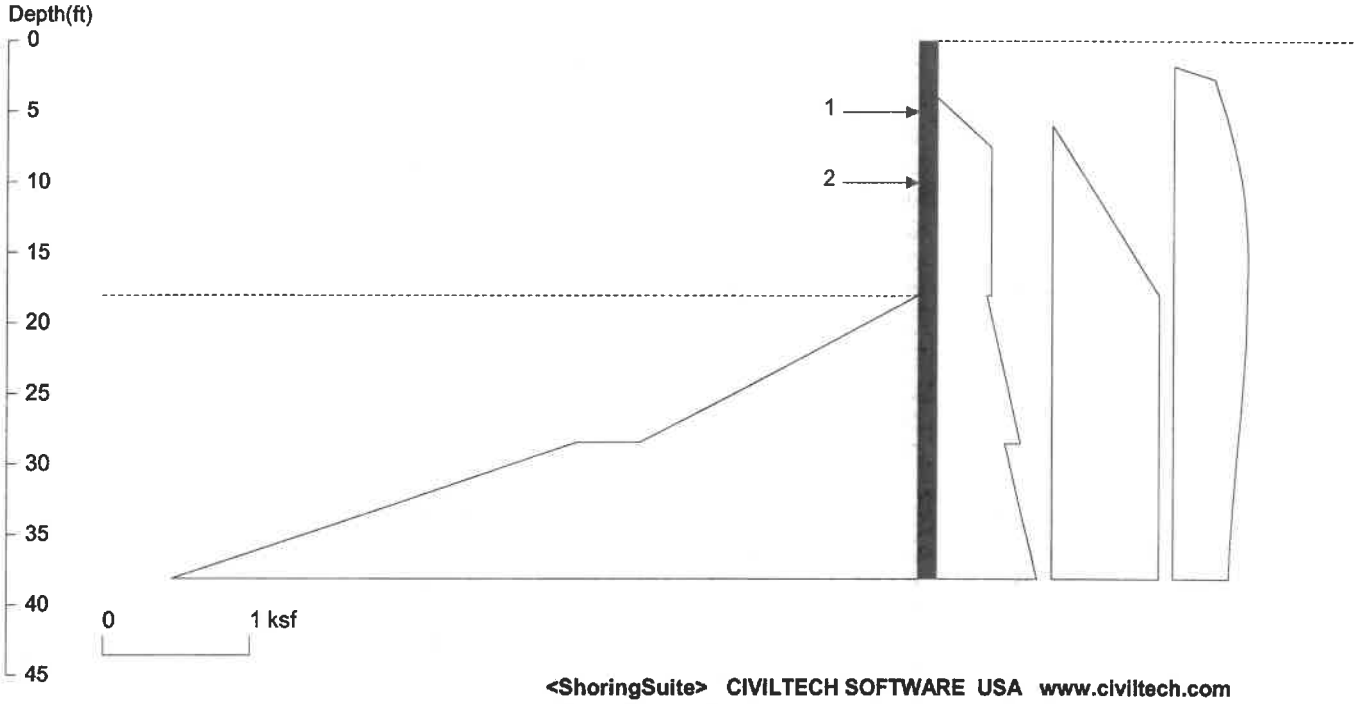
Based on pile spacing: 1.0 foot or meter

User Input Pile, az26: E (ksi)=29000.0, I (in4)/foot=406.5

File: UNTITLED

Vicksburg Sewer Junction Box - Shoring

2 wales - FS = 1.5



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Wall Height=18.0 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=20.12 Min. Pile Length=38.12 (in graphics and analysis)
MOMENT IN PILE: Max. Moment=65.66 per Pile Spacing=1.0 at Depth=21.23

PILE SELECTION:
Request Min. Section Modulus = 23.9 in3/ft=1283.57 cm3/m, Fy= 50 ksi = 345 MPa, Fb/Fy=0.66
AZ26 has Section Modulus = 48.4 in3/ft=2601.98 cm3/m. It is greater than Min. Requirements!
Top Deflection = 0.00(in) based on E (ksi)=29000.00 and I (in4)/foot=406.5

BRACE FORCE: Strut, Tieback, Plate Anchor, and Deadman

No. & Type	Depth	Angle	Space	Total F.	Horiz. F.	Vert. F.	N/A	N/A
1. Strut	5.0	0.0	1.0	2.9	2.9	0.0	0.0	0.0
2. Strut	10.0	0.0	1.0	16.9	16.9	0.0	0.0	0.0

UNITS: Width,Diameter,Spacing,Length,Depth,and Height - ft; Force - kip; Bond Strength and Pressure - ksf

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
*	Above	Base		
4.000	0.000	7.500	0.377	0.107686
7.500	0.377	18.000	0.377	0.000000
*	Below	Base		
18.000	0.347	19.000	0.369	0.022237
19.000	0.369	22.000	0.436	0.022237
22.000	0.436	25.000	0.502	0.022237
25.000	0.502	28.500	0.580	0.022237
28.500	0.472	31.000	0.530	0.023010
31.000	0.530	34.000	0.599	0.023010
34.000	0.598	37.000	0.670	0.024146
37.000	0.670	40.000	0.739	0.023077

*	Water	Pres.		
6.000	0.000	18.000	0.749	0.062400
18.000	0.749	176.000	0.749	0.000000
*	Sur-	charge		
1.800	0.000	2.700	0.280	0.311342
2.700	0.280	3.600	0.310	0.033005
3.600	0.310	4.500	0.339	0.031910
4.500	0.339	5.400	0.366	0.030326
5.400	0.366	6.300	0.391	0.028316
6.300	0.391	7.200	0.415	0.025961
7.200	0.415	8.100	0.436	0.023344
8.100	0.436	9.000	0.454	0.020555
9.000	0.454	9.900	0.470	0.017778
9.900	0.470	10.800	0.484	0.014793
10.800	0.484	11.700	0.494	0.011967
11.700	0.494	12.600	0.503	0.009259
12.600	0.503	13.500	0.509	0.006713
13.500	0.509	14.400	0.513	0.004361
14.400	0.513	15.300	0.515	0.002224
15.300	0.515	16.200	0.515	0.000313
16.200	0.515	17.100	0.514	-0.001369
17.100	0.514	18.000	0.511	-0.002828
18.000	0.511	19.800	0.507	-0.002036
19.800	0.507	21.600	0.503	-0.002557
21.600	0.503	23.400	0.491	-0.006313
23.400	0.491	25.200	0.478	-0.007393
25.200	0.478	27.000	0.464	-0.007969
27.000	0.464	28.800	0.449	-0.008167
28.800	0.449	30.600	0.435	-0.008094
30.600	0.435	32.400	0.420	-0.007835
32.400	0.420	34.200	0.407	-0.007457
34.200	0.407	36.000	0.394	-0.007009
36.000	0.394	39.600	0.383	-0.003264

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.5

Z1	P1	Z2	P2	Slope
*	Below	Base		
18.000	0.000	28.400	1.922	0.184776
28.400	2.346	176.000	44.798	0.287613

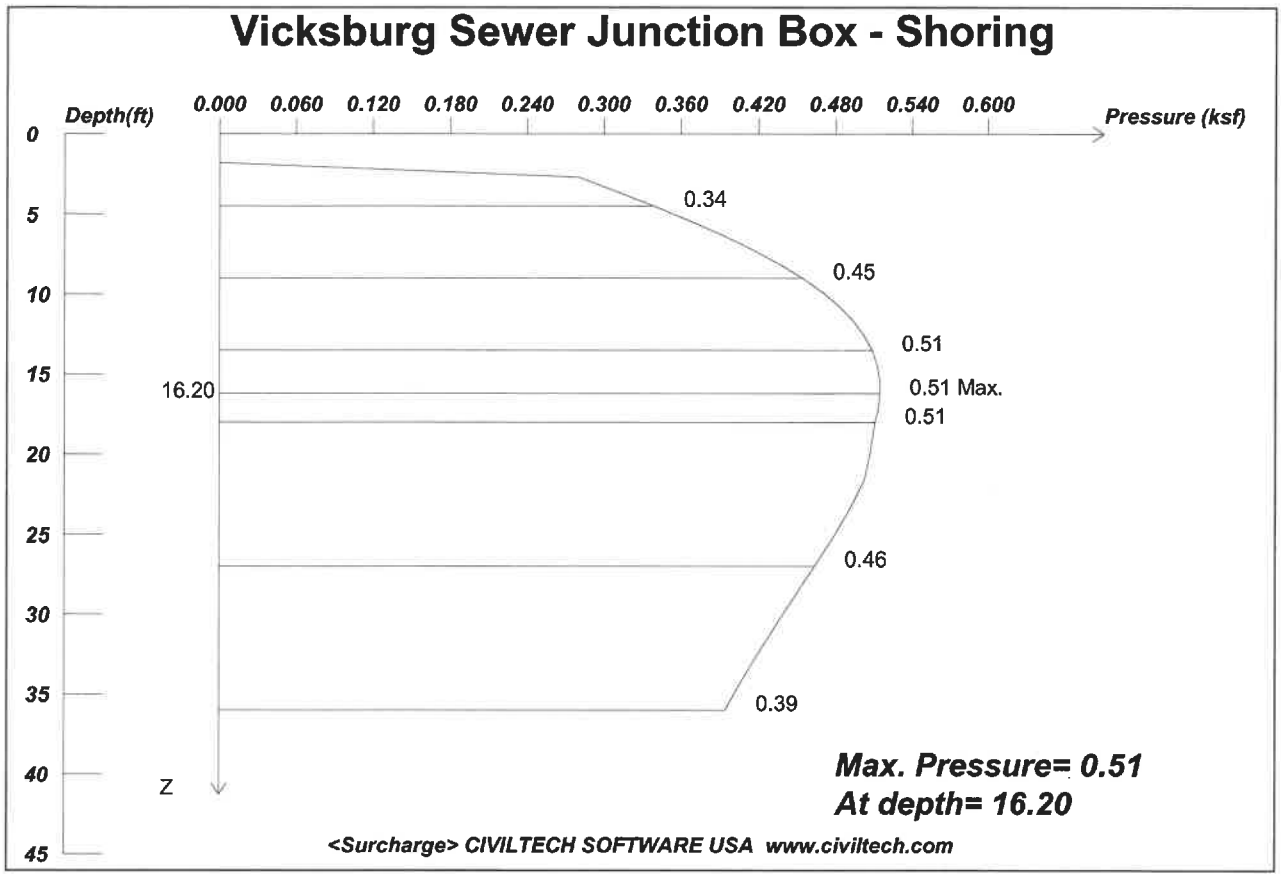
ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	18.00	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft3; Deflection - in



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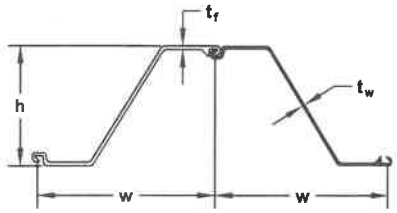
Wall Height, H= 18 Load Depth at Surface, D= 2
Load Factor of Surcharge Loading = 1
Rigid Wall Condition -- No movement or deflection of the wall are allowed.
Max. Pressure = 0.515 at depth = 16.20

Infinite Surcharge, Q=.25 Wayne-Teng Equation (Modified Boussinesq)

Cooper E80 Railroad Loading. From wall to railroad center, X=25

UNITS: LENGTH/DEPTH: ft, Qpoint: kip, Qline: kip/ft, Qstrip/Qarea/PRESSURE: ksf

AZ HOT ROLLED STEEL SHEET PILE SERIES



JD FIELDS & COMPANY, INC.			THICKNESS			WEIGHT		SECTION MODULUS			COATING AREA	
	Width (w)	Height (h)	Flange (t_f)	Web (t_w)	Cross Sec Area (A)	Single Pile	Wall Area	Elastic	Plastic	Moment of Inertia	Both Sides	Wall Surface
	in	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in³/ft	in⁴/ ft	ft²/ft of single	ft²/ft²
SECTION	mm	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm³/m	cm⁴/m	m²/m	m²/m²
AZ 12-770	**30.31**	**13.52**	**0.335**	**0.335**	**5.67**	**48.78**	**19.31**	**23.2**	**27.5**	**156.9**	**6.07**	**1.20**
	770	344	8.5	8.5	120.1	72.6	94.3	1245	1480	21430	1.85	1.20
AZ 13-770	**30.31**	**13.54**	**0.354**	**0.354**	**5.94**	**51.14**	**20.24**	**24.2**	**28.8**	**163.7**	**6.07**	**1.20**
	770	344	9.0	9.0	125.8	76.1	98.8	1300	1546	22360	1.85	1.20
*AZ 14-770	**30.31**	**13.56**	**0.375**	**0.375**	**6.21**	**53.42**	**21.14**	**25.2**	**30.0**	**170.6**	**6.07**	**1.20**
	770	345	9.5	9.5	131.5	79.5	103.2	1355	1611	23300	1.85	1.20
AZ 17-700	**27.56**	**16.52**	**0.335**	**0.335**	**6.28**	**49.12**	**21.38**	**32.2**	**37.7**	**265.3**	**6.10**	**1.33**
	700	420	8.5	8.5	133.0	73.1	104.4	1730	2027	36230	1.86	1.33
AZ 18-700	**27.56**	**16.54**	**0.354**	**0.354**	**6.58**	**51.41**	**22.39**	**33.5**	**39.4**	**276.8**	**6.10**	**1.33**
	700	420	9.0	9.0	139.2	76.5	109.3	1800	2116	37800	1.86	1.33
AZ 19-700	**27.56**	**16.56**	**0.375**	**0.375**	**6.88**	**53.76**	**23.35**	**34.8**	**41.0**	**288.4**	**6.10**	**1.33**
	700	421	9.5	9.5	145.6	80.0	114.3	1870	2206	39380	1.86	1.33
AZ 20-700	**27.56**	**16.57**	**0.394**	**0.394**	**7.18**	**56.11**	**24.43**	**36.2**	**42.7**	**300.0**	**6.10**	**1.33**
	700	421	10.0	10.0	152.0	83.5	119.3	1945	2296	40960	1.86	1.33
AZ 18-800	**31.5**	**17.68**	**0.335**	**0.335**	**6.07**	**54.26**	**20.67**	**34.2**	**39.7**	**302.6**	**6.82**	**1.30**
	800	449	8.5	8.5	128.6	80.7	100.9	1840	2135	41320	2.08	1.30
*AZ 20-800	**31.5**	**17.72**	**0.375**	**0.375**	**6.66**	**59.50**	**22.67**	**37.2**	**43.3**	**329.9**	**6.82**	**1.30**
	800	450	9.5	9.5	141.0	88.6	110.7	2000	2330	45050	2.08	1.30
AZ 22-800	**31.5**	**17.76**	**0.413**	**0.413**	**7.25**	**64.77**	**24.68**	**40.3**	**47.0**	**357.3**	**6.82**	**1.30**
	800	451	10.5	10.5	153.5	96.4	120.5	2165	2525	48790	2.08	1.30
AZ 23-800	**31.50**	**18.66**	**0.453**	**0.354**	**7.12**	**63.56**	**24.22**	**43.3**	**49.9**	**404.6**	**6.94**	**1.32**
	800	474	11.5	9.0	150.6	94.6	118.2	2330	2680	55260	2.11	1.32
*AZ 25-800	**31.50**	**18.70**	**0.492**	**0.394**	**7.71**	**68.91**	**26.26**	**46.5**	**53.8**	**435.1**	**6.94**	**1.32**
	800	475	12.5	10.0	163.3	102.6	128.2	2500	2890	59410	2.11	1.32
AZ 27-800	**31.50**	**18.74**	**0.531**	**0.433**	**8.31**	**74.26**	**28.29**	**49.7**	**57.6**	**465.5**	**6.94**	**1.32**
	800	476	13.5	11.0	176.0	110.5	138.1	2670	3100	63570	2.11	1.32
AZ 24-700	**27.56**	**18.07**	**0.441**	**0.441**	**8.23**	**64.30**	**28.00**	**45.2**	**53.5**	**408.8**	**6.33**	**1.38**
	700	459	11.2	11.2	174.1	95.7	136.7	2430	2867	55820	1.93	1.38
AZ 26-700	**27.56**	**18.11**	**0.480**	**0.480**	**8.84**	**69.12**	**30.10**	**48.4**	**57.1**	**437.3**	**6.33**	**1.38**
	700	460	12.2	12.2	187.2	102.9	146.9	2600	3070	59720	1.93	1.38
AZ 28-700	**27.56**	**18.15**	**0.520**	**0.520**	**9.46**	**73.93**	**32.19**	**51.3**	**60.9**	**465.9**	**6.33**	**1.38**
	700	461	13.2	13.2	200.2	110.0	157.2	2760	3273	63620	1.93	1.38
AZ 28-750	**29.53**	**20.04**	**0.472**	**0.394**	**8.09**	**67.73**	**27.53**	**52.3**	**60.3**	**523.9**	**6.93**	**1.41**
	750.0	509.0	12.00	10.00	171.2	100.80	134.40	2810	3245	71540	2.11	1.41
AZ 30-750	**29.53**	**20.08**	**0.512**	**0.433**	**8.73**	**73.08**	**29.70**	**55.9**	**64.8**	**561.5**	**6.93**	**1.41**
	750.0	510.0	13.00	11.00	184.7	108.80	145.00	3005	3485	76670	2.11	1.41
AZ 32-750	**29.53**	**20.12**	**0.551**	**0.472**	**9.37**	**78.44**	**31.88**	**59.5**	**69.2**	**599.0**	**6.93**	**1.41**
	750.0	511.0	14.00	12.00	198.3	116.70	155.60	3200	3720	81800	2.11	1.41
AZ 36-700N	**27.56**	**19.65**	**0.591**	**0.441**	**10.20**	**79.72**	**34.71**	**66.8**	**76.4**	**656.2**	**6.73**	**1.47**
	700	499	15.0	11.2	215.9	118.6	169.5	3590	4110	89610	2.05	1.47
*AZ 38-700N	**27.56**	**19.69**	**0.630**	**0.480**	**10.87**	**84.94**	**36.98**	**70.6**	**81.1**	**694.5**	**6.73**	**1.47**
	700	500	16.0	12.2	230.0	126.4	180.6	3795	4360	94840	2.05	1.47
AZ 40-700N	**27.56**	**19.72**	**0.669**	**0.520**	**11.54**	**90.16**	**39.26**	**74.3**	**85.7**	**732.9**	**6.73**	**1.47**
	700	501	17.0	13.2	244.2	134.2	191.7	3995	4605	100080	2.05	1.47
AZ 42-700N	**27.56**	**19.65**	**0.709**	**0.551**	**12.22**	**95.51**	**41.59**	**78.2**	**90.3**	**768.4**	**6.75**	**1.47**
	700	499	18.0	14.0	258.7	142.1	203.1	4205	4855	104930	2.06	1.47
AZ 44-700N	**27.56**	**19.69**	**0.748**	**0.591**	**12.89**	**100.74**	**43.87**	**81.9**	**95.0**	**806.6**	**6.75**	**1.47**
	700	500	19.0	15.0	272.8	149.9	214.2	4405	5105	110150	2.06	1.47
AZ 46-700N	**27.56**	**19.72**	**0.787**	**0.630**	**13.56**	**105.97**	**46.14**	**85.7**	**99.5**	**844.9**	**6.75**	**1.47**
	700	501	20.0	16.0	287.0	157.7	225.3	4605	5350	115370	2.06	1.47
AZ 48-700	**27.56**	**19.80**	**0.866**	**0.591**	**13.63**	**106.49**	**46.37**	**88.4**	**102.1**	**876.2**	**6.70**	**1.46**
	700.0	503.0	22.00	15.00	288.4	158.50	226.40	4755	5490	119650	2.04	1.46
AZ 50-700	**27.56**	**19.84**	**0.906**	**0.630**	**14.30**	**111.73**	**48.65**	**92.2**	**106.7**	**914.6**	**6.70**	**1.46**
	700.0	504.0	23.00	16.00	302.6	166.30	237.50	4955	5735	124890	2.04	1.46
AZ 52-700	**27.56**	**19.88**	**0.945**	**0.669**	**14.97**	**116.97**	**50.93**	**95.9**	**111.3**	**953.0**	**6.70**	**1.46**
	700.0	505.0	24.00	17.00	317.0	174.10	248.70	5155	5985	130140	2.04	1.46

*Indicates standard stocking sections. Please check with your local sales representative for material availability.

Appendix B

Wales and Struts Analysis and Design

Table of Contents

Job Information

	Engineer	Checked	Approved
Name:	KAN		
Date:	03-Oct-25		

Comments:	4 Controlling Wale Layouts were considered: Typical Top, Top @ Junction Box, Typical Bottom and Bottom @ Junction Box.
Structure Type:	SPACE FRAME

Geometry

Entity Type	Count	Highest
Nodes	36	54
Analytical Members	38	237

Load Cases

Load Case Type	Count
Primary	2

Included in this printout are data for:

All	The Whole Structure

Load Case Table

Included in this printout are results for load cases:

L/C	Type	Name
1	Primary	LOAD CASE 1
2	Primary	LOAD CASE 2

Materials

Mat	Name	E (kip/in2)	v	Density (kip/in3)	α (/°F)
1	STEEL	29,000.000	0.300	0.000	0.000

Sections

Prop	Name	Area (in2)	Iyy (in4)	Izz (in4)	J (in4)	Material	Source
1	HP14X102	30.100	380.000	1,050.000	5.390	STEEL	Standard

Basic Load Cases

Primary Load Cases

Number	Name	Type
1	LOAD CASE 1	None
2	LOAD CASE 2	None

Beam Loads

L/C	Beam	Type	Direction	Fa	Da (ft)	Fb	Db (ft)	Ecc. (ft)
1	200	UNI (kips/ft)	Y	14.600	0.000	0.000	0.000	0.000
	203	UNI (kips/ft)	Y	14.600	0.000	0.000	0.000	0.000
	206	UNI (kips/ft)	Y	14.600	0.000	0.000	0.000	0.000
	208	UNI (kips/ft)	Y	14.600	0.000	0.000	0.000	0.000
	211	UNI (kips/ft)	Y	14.600	0.000	0.000	0.000	0.000
	214	UNI (kips/ft)	Y	14.600	0.000	0.000	0.000	0.000
	217	UNI (kips/ft)	Y	14.600	0.000	0.000	0.000	0.000
	201	UNI (kips/ft)	Y	-14.600	0.000	0.000	0.000	0.000
	204	UNI (kips/ft)	Y	-14.600	0.000	0.000	0.000	0.000
	207	UNI (kips/ft)	Y	-14.600	0.000	0.000	0.000	0.000
	209	UNI (kips/ft)	Y	-14.600	0.000	0.000	0.000	0.000
	212	UNI (kips/ft)	Y	-14.600	0.000	0.000	0.000	0.000
	215	UNI (kips/ft)	Y	-14.600	0.000	0.000	0.000	0.000
	218	UNI (kips/ft)	Y	-14.600	0.000	0.000	0.000	0.000
2	219	UNI (kips/ft)	Y	8.500	0.000	0.000	0.000	0.000
	222	UNI (kips/ft)	Y	8.500	0.000	0.000	0.000	0.000
	225	UNI (kips/ft)	Y	8.500	0.000	0.000	0.000	0.000
	227	UNI (kips/ft)	Y	8.500	0.000	0.000	0.000	0.000
	230	UNI (kips/ft)	Y	8.500	0.000	0.000	0.000	0.000
	233	UNI (kips/ft)	Y	8.500	0.000	0.000	0.000	0.000
	236	UNI (kips/ft)	Y	8.500	0.000	0.000	0.000	0.000

Beam Loads Cont...

L/C	Beam	Type	Direction	Fa	Da (ft)	Fb	Db (ft)	Ecc. (ft)
2	220	UNI (kips/ft)	Y	-8.500	0.000	0.000	0.000	0.000
	223	UNI (kips/ft)	Y	-8.500	0.000	0.000	0.000	0.000
	226	UNI (kips/ft)	Y	-8.500	0.000	0.000	0.000	0.000
	228	UNI (kips/ft)	Y	-8.500	0.000	0.000	0.000	0.000
	231	UNI (kips/ft)	Y	-8.500	0.000	0.000	0.000	0.000
	234	UNI (kips/ft)	Y	-8.500	0.000	0.000	0.000	0.000
	237	UNI (kips/ft)	Y	-8.500	0.000	0.000	0.000	0.000

Static Check

L/C		FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
1	Loads	0.000	0.000	0.000	0.000	0.000	0.000
	Reactions	0.000	0.000	0.000	0.000	0.000	0.000
	Difference	0.000	0.000	0.000	0.000	0.000	0.000
2	Loads	0.000	0.000	0.000	0.000	0.000	0.000
	Reactions	0.000	0.000	0.000	0.000	0.000	0.000
	Difference	0.000	0.000	0.000	0.000	0.000	0.000

Node Displacement Summary

Type	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)	rX (rad)	rY (rad)	rZ (rad)
Max X	52	2	0.000	0.000	-0.018	0.018	0.000	-0.002	0.000
Min X	51	2	0.000	0.000	0.000	0.000	0.000	0.002	0.000
Max Y	19	1	0.000	0.000	0.414	0.414	0.000	0.006	0.000
Min Y	19	1	0.000	0.000	0.414	0.414	0.000	0.006	0.000
Max Z	19	1	0.000	0.000	0.414	0.414	0.000	0.006	0.000
Min Z	20	1	0.000	0.000	-0.465	0.465	0.000	-0.006	0.000
Max rX	19	1	0.000	0.000	0.414	0.414	0.000	0.006	0.000
Min rX	19	1	0.000	0.000	0.414	0.414	0.000	0.006	0.000
Max rY	26	1	0.000	0.000	-0.465	0.465	0.000	0.006	0.000

Node Displacement Summary Cont...

Type	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)	rX (rad)	rY (rad)	rZ (rad)
Min rY	20	1	0.000	0.000	-0.465	0.465	0.000	-0.006	0.000
Max rZ	19	1	0.000	0.000	0.414	0.414	0.000	0.006	0.000
Min rZ	19	1	0.000	0.000	0.414	0.414	0.000	0.006	0.000
Max Rst	20	1	0.000	0.000	-0.465	0.465	0.000	-0.006	0.000

Reaction Summary

	Node	L/C	Horizontal FX (kip)	Vertical FY (kip)	Horizontal FZ (kip)	Moment MX (kip-in)	MY (kip-in)	MZ (kip-in)
Max FX	46	2	0.000	0.000	0.000	0.000	0.000	0.000
Min FX	48	2	0.000	0.000	0.000	0.000	0.000	0.000
Max FY	21	1	0.000	0.000	0.000	0.000	0.000	0.000
Min FY	21	1	0.000	0.000	0.000	0.000	0.000	0.000
Max FZ	46	2	0.000	0.000	0.000	0.000	0.000	0.000
Min FZ	51	2	0.000	0.000	0.000	0.000	0.000	0.000
Max MX	21	1	0.000	0.000	0.000	0.000	0.000	0.000
Min MX	21	1	0.000	0.000	0.000	0.000	0.000	0.000
Max MY	21	1	0.000	0.000	0.000	0.000	0.000	0.000
Min MY	21	1	0.000	0.000	0.000	0.000	0.000	0.000
Max MZ	21	1	0.000	0.000	0.000	0.000	0.000	0.000
Min MZ	21	1	0.000	0.000	0.000	0.000	0.000	0.000

Utilization Ratio

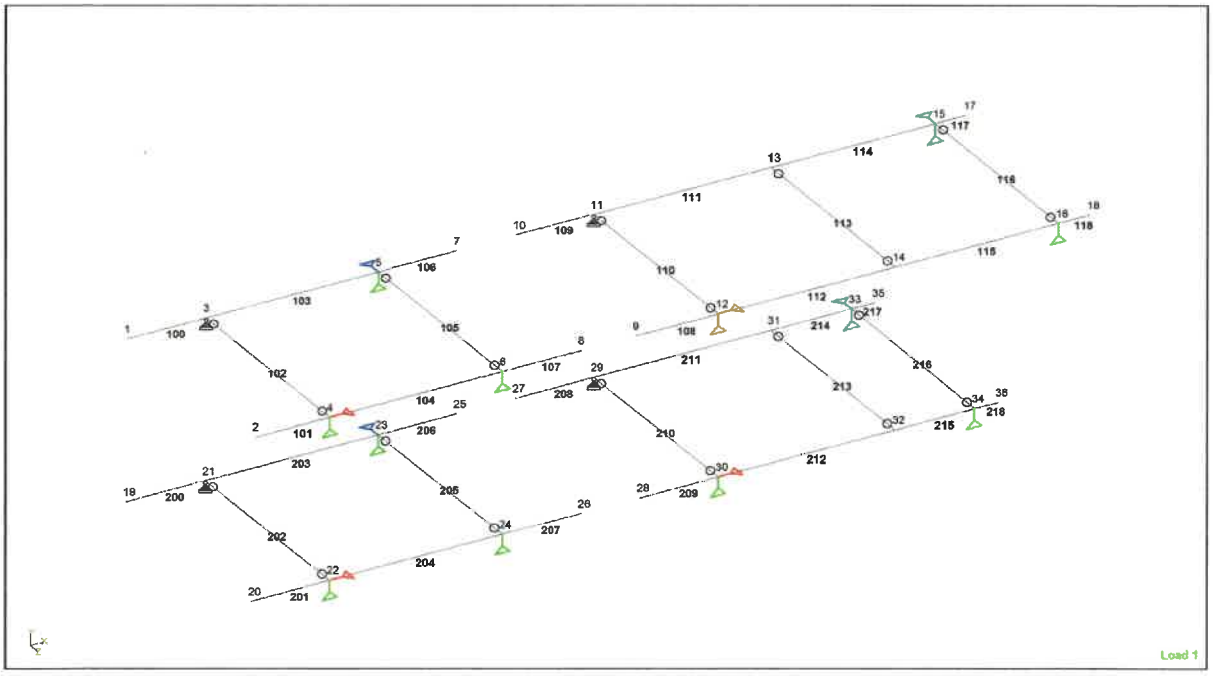
Beam	Analysis	Design	ActualRatio	AllowableRatio	Normalized Ratio (Actual/Allowable)	Clause	L/C
200	HP14X102	HP14X102	0.797	1.000	0.797	Eq. H1-1b	1
201	HP14X102	HP14X102	0.797	1.000	0.797	Eq. H1-1b	1
202	HP14X102	HP14X102	0.300	1.000	0.300	Eq. H1-1a	1
203	HP14X102	HP14X102	0.797	1.000	0.797	Eq. H1-1b	1
204	HP14X102	HP14X102	0.797	1.000	0.797	Eq. H1-1b	1

Utilization Ratio Cont...

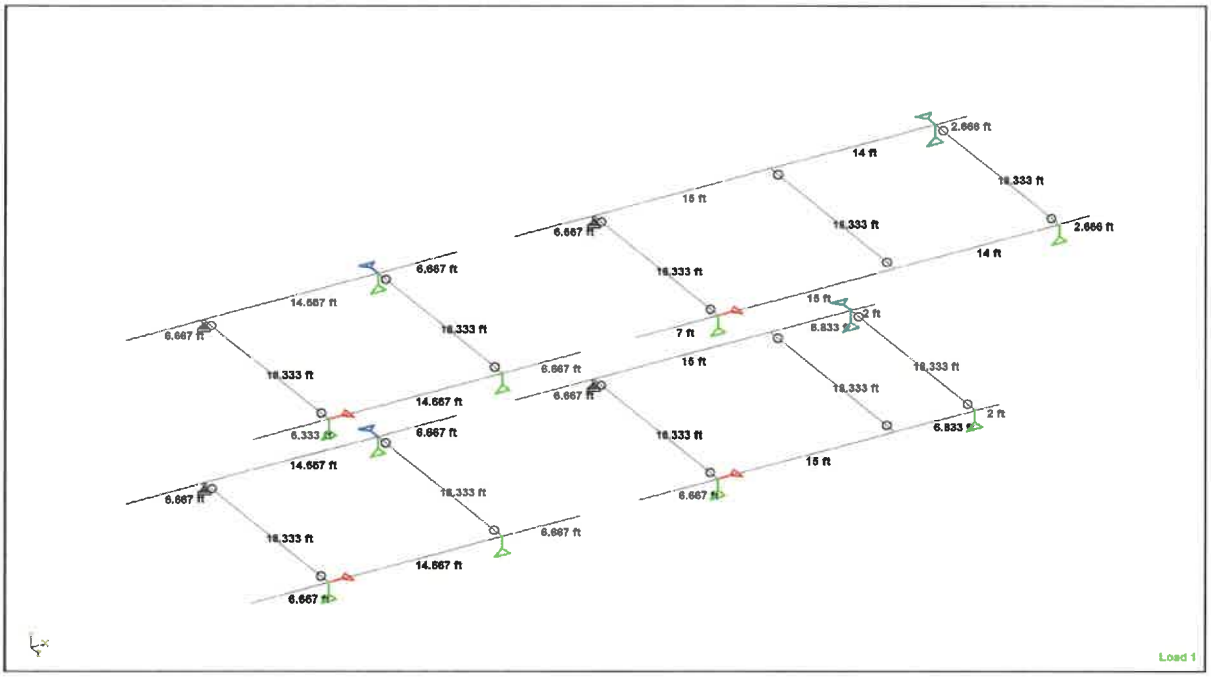
Beam	Analysis	Design	ActualRatio	AllowableRatio	Normalized Ratio (Actual/Allowable)	Clause	L/C
205	HP14X102	HP14X102	0.300	1.000	0.300	Eq. H1-1a	1
206	HP14X102	HP14X102	0.797	1.000	0.797	Eq. H1-1b	1
207	HP14X102	HP14X102	0.797	1.000	0.797	Eq. H1-1b	1
208	HP14X102	HP14X102	0.797	1.000	0.797	Eq. H1-1b	1
209	HP14X102	HP14X102	0.797	1.000	0.797	Eq. H1-1b	1
210	HP14X102	HP14X102	0.317	1.000	0.317	Eq. H1-1a	1
211	HP14X102	HP14X102	0.797	1.000	0.797	Eq. H1-1b	1
212	HP14X102	HP14X102	0.797	1.000	0.797	Eq. H1-1b	1
213	HP14X102	HP14X102	0.254	1.000	0.254	Eq. H1-1a	1
214	HP14X102	HP14X102	0.454	1.000	0.454	Eq. H1-1b	1
215	HP14X102	HP14X102	0.454	1.000	0.454	Eq. H1-1b	1
216	HP14X102	HP14X102	0.083	1.000	0.083	Sec. E1	1
217	HP14X102	HP14X102	0.148	1.000	0.148	Sec. G2.1(a)	1
218	HP14X102	HP14X102	0.148	1.000	0.148	Sec. G2.1(a)	1
219	HP14X102	HP14X102	0.464	1.000	0.464	Eq. H1-1b	2
220	HP14X102	HP14X102	0.464	1.000	0.464	Eq. H1-1b	2
221	HP14X102	HP14X102	0.175	1.000	0.175	Sec. E1	2
222	HP14X102	HP14X102	0.464	1.000	0.464	Eq. H1-1b	2
223	HP14X102	HP14X102	0.464	1.000	0.464	Eq. H1-1b	2
224	HP14X102	HP14X102	0.175	1.000	0.175	Sec. E1	2
225	HP14X102	HP14X102	0.464	1.000	0.464	Eq. H1-1b	2
226	HP14X102	HP14X102	0.464	1.000	0.464	Eq. H1-1b	2
227	HP14X102	HP14X102	0.464	1.000	0.464	Eq. H1-1b	2
228	HP14X102	HP14X102	0.464	1.000	0.464	Eq. H1-1b	2

Utilization Ratio Cont...

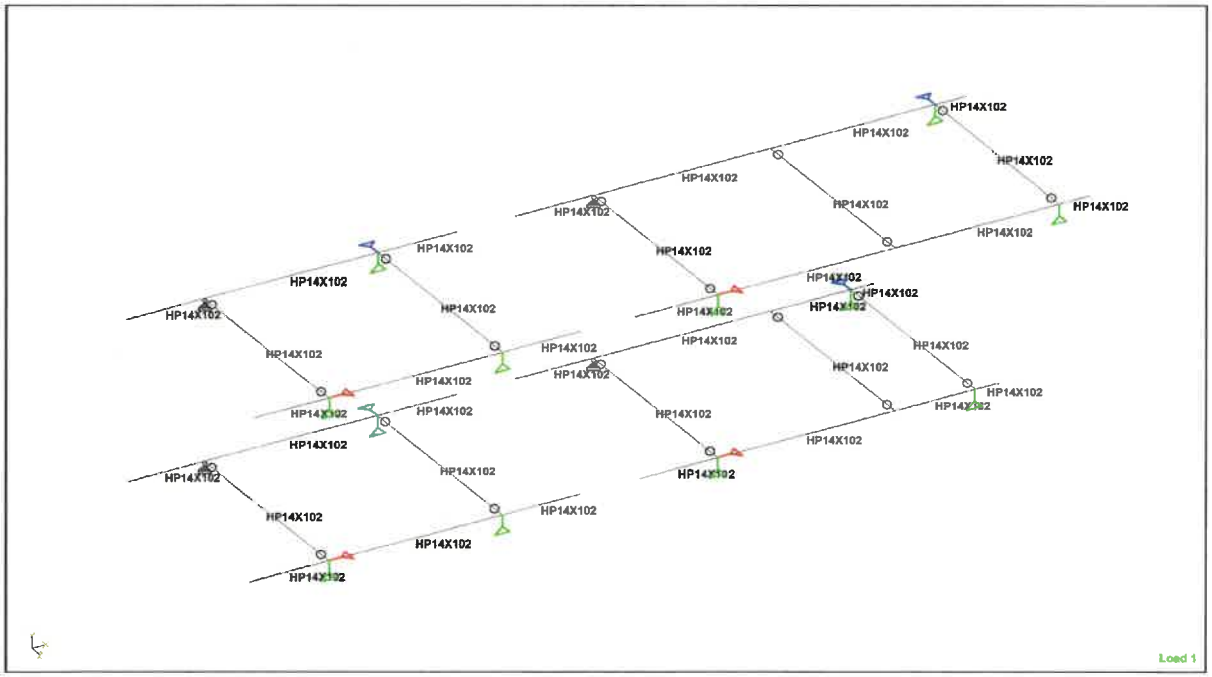
Beam	Analysis	Design	ActualRatio	AllowableRatio	Normalized Ratio (Actual/Allowable)	Clause	L/C
229	HP14X102	HP14X102	0.179	1.000	0.179	Sec. E1	2
230	HP14X102	HP14X102	0.464	1.000	0.464	Eq. H1-1b	2
231	HP14X102	HP14X102	0.464	1.000	0.464	Eq. H1-1b	2
232	HP14X102	HP14X102	0.193	1.000	0.193	Sec. E1	2
233	HP14X102	HP14X102	0.406	1.000	0.406	Eq. H1-1b	2
234	HP14X102	HP14X102	0.406	1.000	0.406	Eq. H1-1b	2
235	HP14X102	HP14X102	0.106	1.000	0.106	Sec. E1	2
236	HP14X102	HP14X102	0.115	1.000	0.115	Sec. G2.1(a)	2
237	HP14X102	HP14X102	0.115	1.000	0.115	Sec. G2.1(a)	2



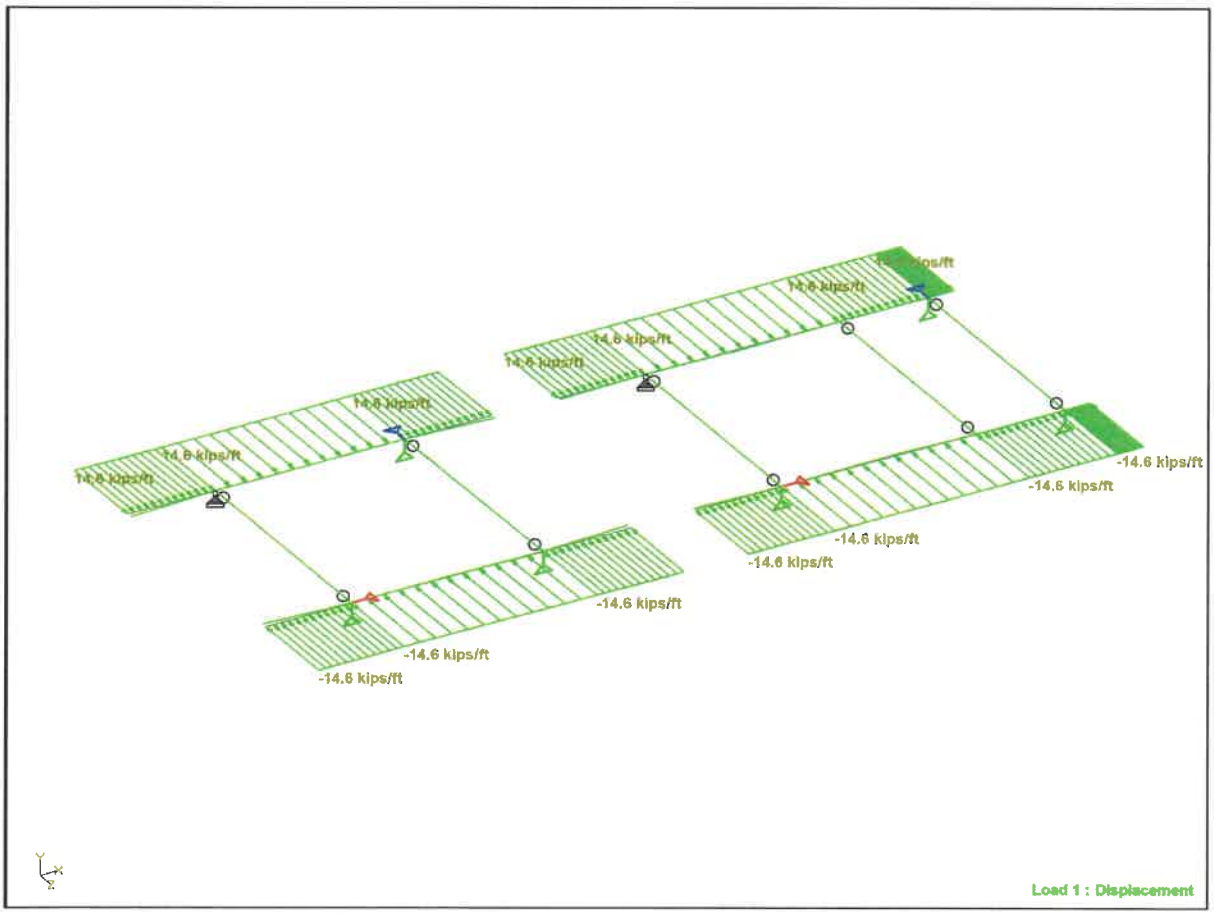
Structural Model - Node and Beam Labels



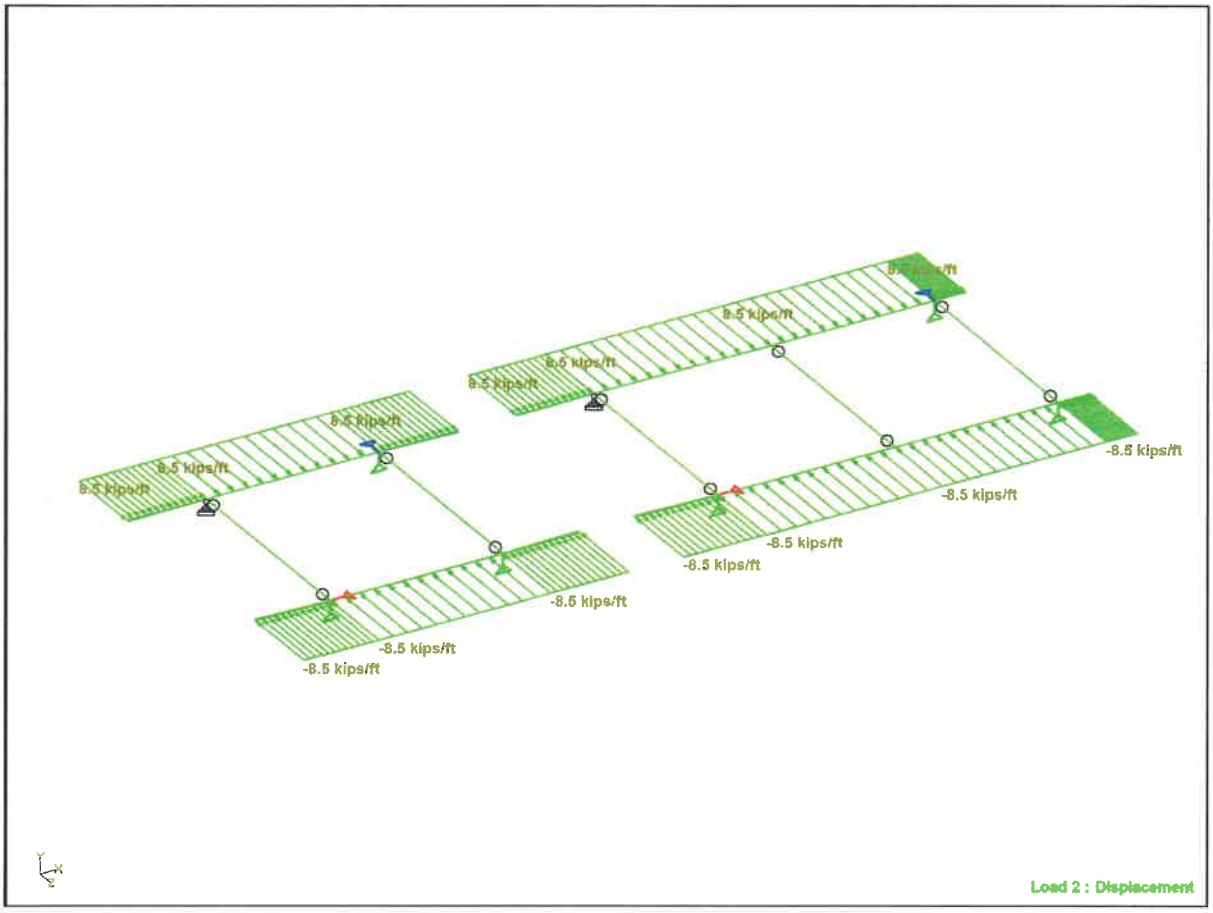
Beam Lengths



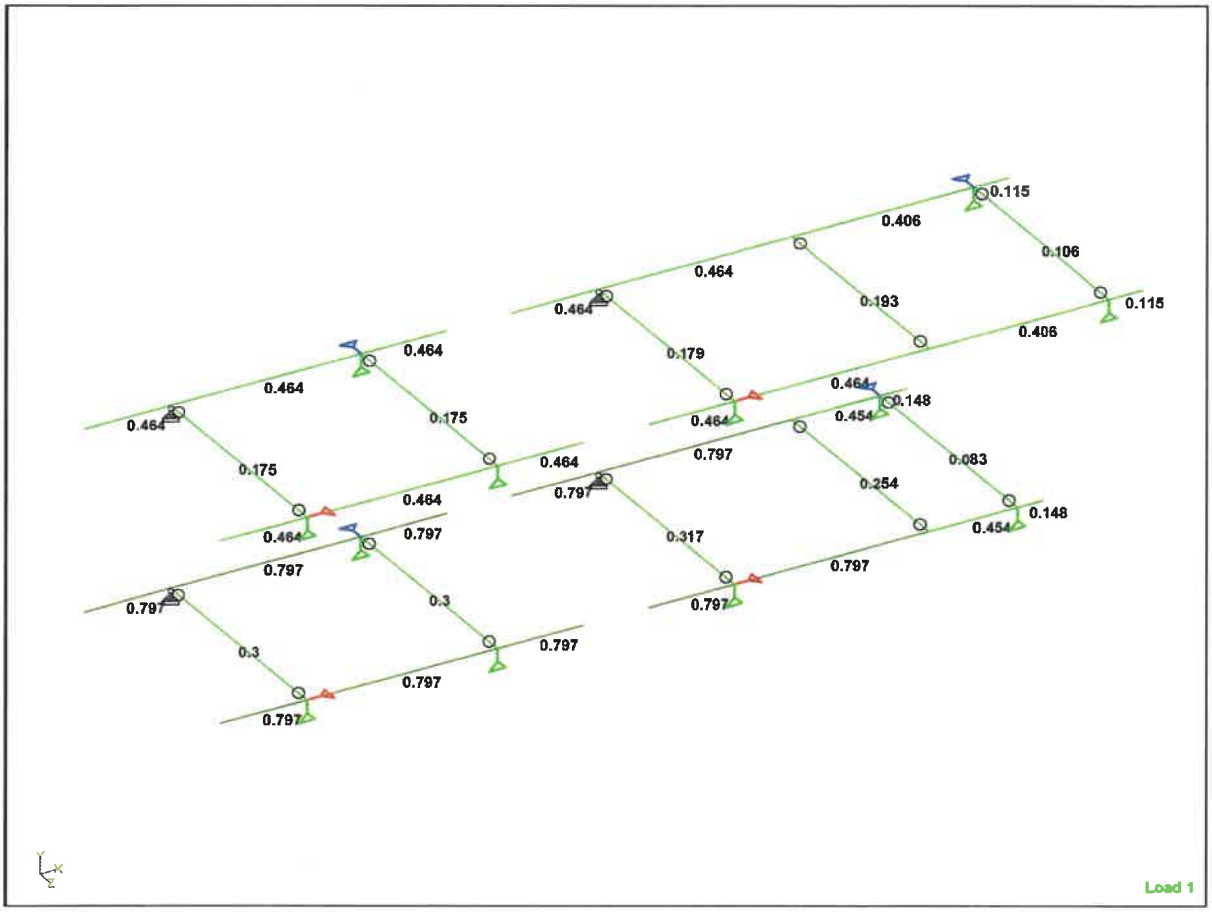
Beam Sections



Bottom Wales Loading: LOAD CASE 1



Top Wales Loading: LOAD CASE 2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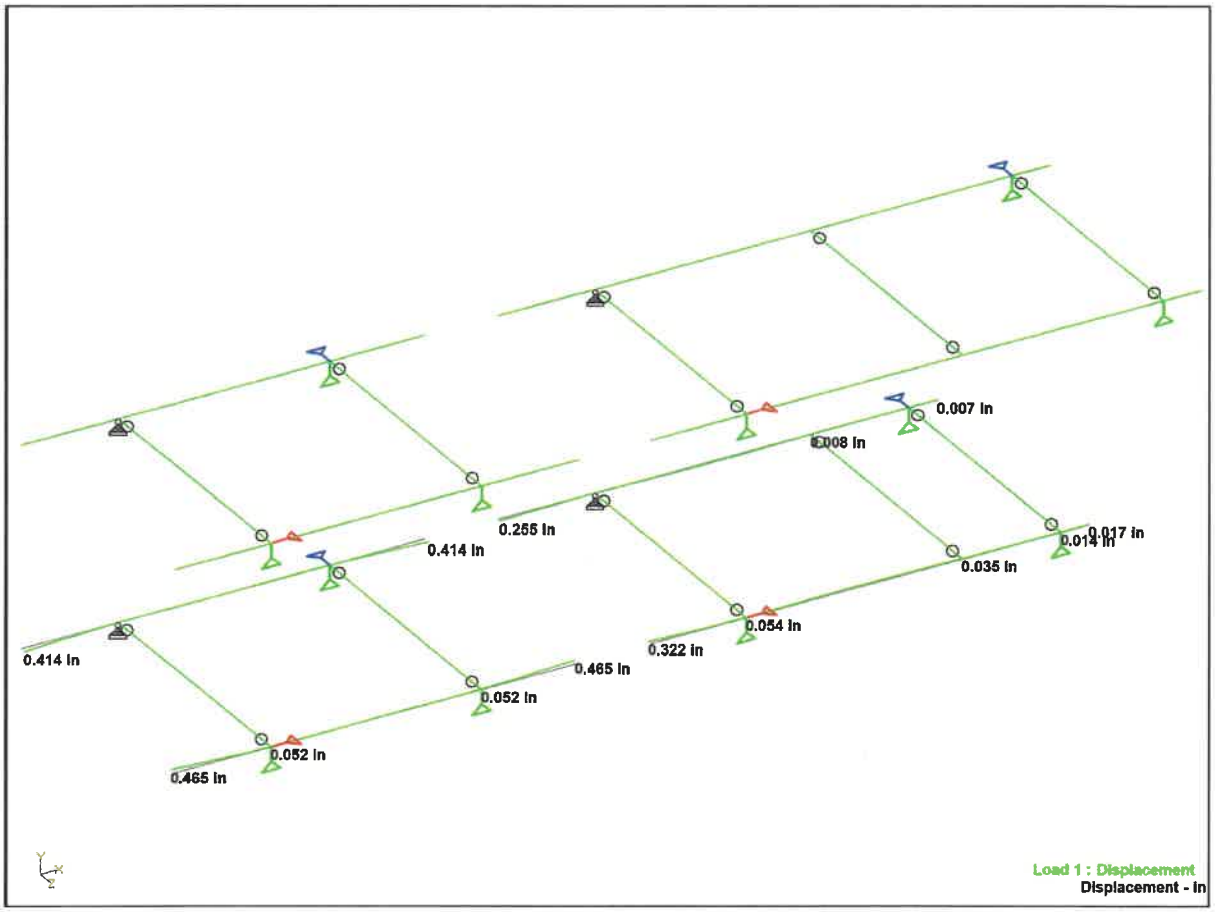
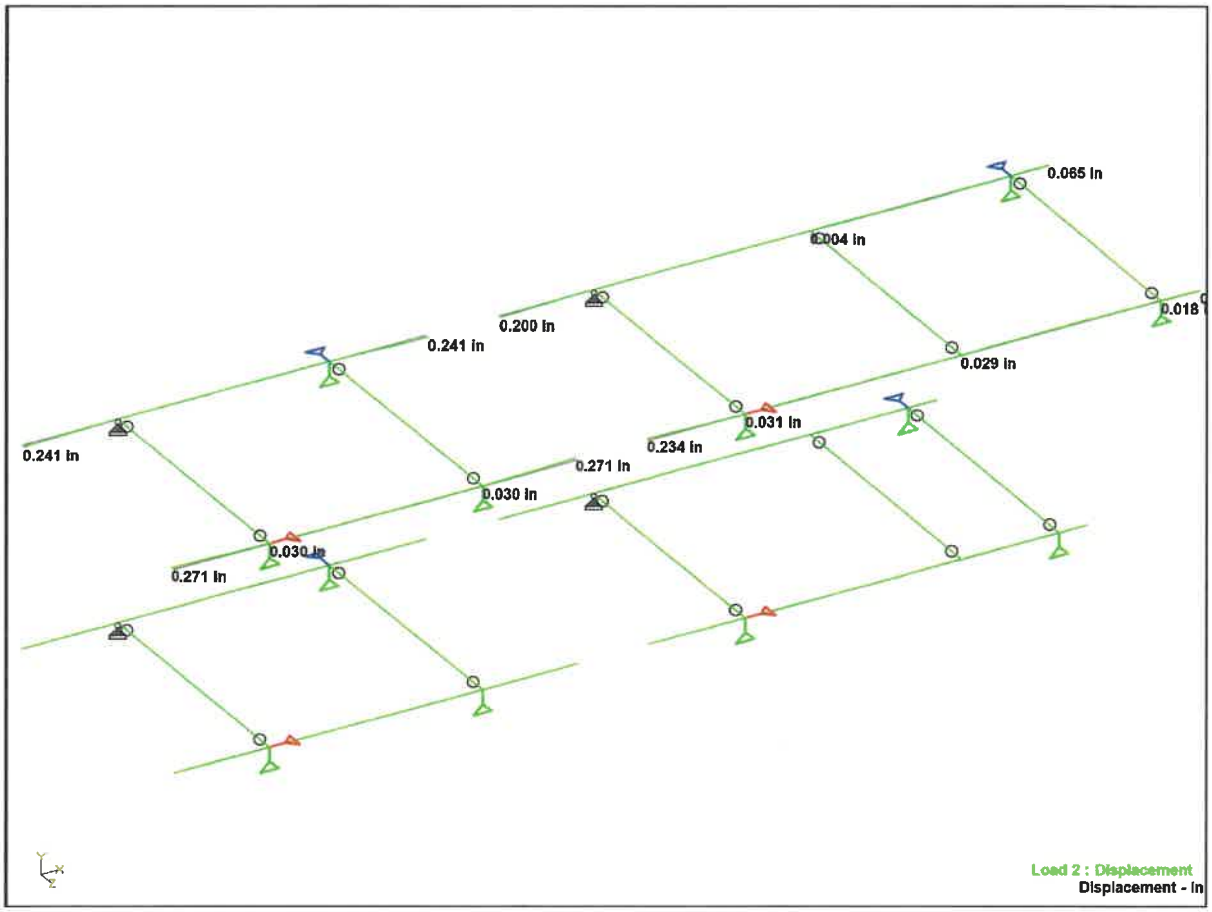
Unity Check



Whole Structure Displacements: LOAD CASE 1



Whole Structure Displacements: LOAD CASE 2

Appendix C

Geotechnical Report

(Geotechnical Engineering Associates, LLC – 1/24/26)

Geotechnical Engineering Associates, LLC
Post Office Box 86, Brandon, MS 39043
1647 W. Government Cove, Brandon, MS 39042

David M. Coleman, P.E. Principal Engineer **Phone: 601-824-2060** **Fax: 601-824-2466**

January 24, 2026

Mr. Jerry L Jones, P.E.
Advanced Engineering Resources, Inc.
120 Solleftea Drive
Madison, Mississippi 39110

RE: Geotechnical Investigation
Sewer Line Junction Box Replacement
Vicksburg, Mississippi
GEA Project: 26004

Dear Mr. Jones:

Submitted herein are the results of our geotechnical investigation for the above-referenced project. This work was performed in accordance with our January 7, 2026 proposal as approved by Jerry L. Jones, P.E. of Advanced Engineering Resources, Inc. (AER) on January 12, 2026.

1.0 INTRODUCTION

1.1 Purpose and Scope

Geotechnical Engineering Associates, LLC (GEA) was retained AER to provide a geotechnical investigation for the design of shoring at a sewer junction box near the CPKC Railroad and Patton Street in Vicksburg, Mississippi.

This investigation was intended to provide a general understanding of the subsurface soil and groundwater conditions at the site and to provide guideline soil parameters for the required shoring. The geotechnical investigation conducted for this project included the following:

- reconnaissance of the project site by the project geotechnical engineer to document physical conditions pertinent to the geotechnical investigation;
- the advancement of one (1) soil boring to a terminal depth of 30 feet below ground surface;
- laboratory testing to determination of index, engineering, and strength properties of selected soil samples by means of visual classification, moisture content, Atterberg limits determination, grain size distribution determination, unconsolidated undrained triaxial compression testing and unconfined compression testing;
- performance of engineering analyses to characterize the soil and groundwater conditions and develop guideline soil parameters for shoring design; and
- preparation of this report to present the findings of the investigation and guideline engineering recommendations.

1.2 Procedures

This investigation followed procedures established by our firm as routine for a geotechnical investigation of this nature with soil sampling and laboratory testing performed in general accordance with appropriate guidelines established by the American Society for Testing and Materials (ASTM).

1.2.1 Boring Locations

The soil boring location were selected by the GEA project geotechnical engineer in conjunction with the City of Vicksburg Public Works Department to avoid the existing sewer line and gas line utilities near the junction box. Upon completion of the soil boring the latitude and longitude of each boring was determined with a hand-held GPS receiver with an accuracy of about 15 feet. The ground surface elevations at the boring location was determined by surveying conducted by Foster Jones and Associates, Inc. The location and ground surface elevation information is shown in the top portion of the soil boring logs.

1.2.2 Boring Advancement

For this project, GEA mobilized a truck mounted drill rig which was staffed by a 3-man drill crew. The borehole logging and sample collection were performed by a GEA soils technician.

All borings were advanced dry using a 6-inch diameter flight auger and machine-auger drilling techniques (ASTM D1452). This technique allows for the observation of soil cuttings and accurate determination of the depth where groundwater was encountered. The boring was advanced by rotating the six-inch diameter, earth flight auger with the drill rig to the required sampling depth, removing the auger from the boring, and installing the split-spoon sampler for Standard Penetration Test (SPT) sampling or a Shelby tube sampler for undisturbed (tube) sampling. After sampling, the auger was then replaced and reinserted to advance the borehole to the next sampling interval.

When groundwater was encountered, drilling operations were suspended for about 15 minutes to allow the determination of the initial and intermediate groundwater depth readings. The depth at which groundwater was first encountered is marked by an open blue triangle in the "Material Description" column of the soil boring log and also in the "Ground Water Levels" section at the top of the log. The intermediate groundwater level was determined about 15 minutes after the groundwater was first encountered and is denoted by a blue triangle with a vertical line on the boring log. All borings were allowed to remain open until the field exploration was completed to determine a final groundwater level at each boring location. The groundwater depths and observation times are also noted on the boring log.

1.2.3 Soil Sampling

The soil sampling for this boring consisted of using a split-spoon sampler with Standard Penetration Test (SPT) blow counts recorded to provide a determination of the soil strength for the initial, surface sample followed by undisturbed sampling with a Shelby tube for the remaining samples.

With the split spoon sampler representative disturbed samples were obtained by driving a 2-inch outside diameter split-spoon sampler a distance of 18 inches into the soil with blows from a 140-pound hammer falling a distance of 30 inches (ASTM D1586). The number of blows required to drive the sampler for each 6-inch increment was recorded. The standard penetration resistance is the number of blows required to drive the split-spoon sampler the final 12 inches of penetration. Information related to the penetration resistance is presented in the "Blow Counts N-value" column of the boring logs as the number of blows per foot and the N-value below. Representative samples were removed from the split-spoon sampler and sealed in plastic jars to minimize moisture loss and provide a sample for laboratory testing. Two crossed slashes in the "Sample Type" column of the boring logs indicate depths at which split-spoon samples were taken.

Relatively undisturbed samples were obtained in the remainder of the boring by pushing a three-inch diameter, Shelby tube sampler a distance of 24 inches into the soil in general accordance with ASTM D1587. A dark shaded portion in the "Sample Type" column of the attached boring logs indicates depths at which these undisturbed samples were obtained. After the Shelby tube was removed from the boring, the sample was extruded in the field and visually classified.

Relative strength estimates of the sample were obtained by pocket penetrometer readings. These penetrometer readings in units of tons per square foot are in the "Pocket Pen" column of the boring logs. Disturbed portions of the sample were discarded, and the undisturbed sample was wrapped in aluminum foil and sealed in a plastic bag prior to being placed in a protective tube container for transportation to the laboratory. An additional portion of disturbed sample was placed in a plastic jar to minimize moisture loss during transport to the laboratory and to aid in visual classification of the sample.

1.2.4 Borehole Abandonment

The boring conducted for this field exploration was sealed full depth with cement grout. Some extra soil cuttings were placed over the bore hole to allow for future settlement.

1.2.5 Laboratory Testing

Laboratory testing of selected soil samples was performed in accordance with the appropriate ASTM or AASHTO Standard as shown in Table 1 below.

Table 1
Laboratory Testing ASTM / AASHTO Standards

Test Procedure	ASTM / AASHTO Standard Number
Visual Classification	ASTM D2488
Moisture Content Determination	ASTM D2216
Atterberg Limits Determination	ASTM D4318
Grain Size Distribution	ASTM D6913
Unconfined Compression Testing	ASTM D2166
Unconsolidated-Undrained Triaxial Compression Testing	ASTM D2850

The reader is referred to the appropriate ASTM or AASHTO Standard for details of these test procedures. Results of the laboratory testing are presented in the "Laboratory Test Results" section of the soil boring log.

1.3 Limitations

The analyses and recommendations presented in this report are based on the results of the one soil boring performed for this investigation. Evaluations have been made based upon the assumption that the soil and groundwater conditions beneath the site are represented by the conditions encountered in the soil borings. Variations in the soil and groundwater conditions can and do occur between or away from the boring locations. Variations in these conditions should be expected.

This investigation and these findings are intended for specific application to the site described herein. Application of this data or the findings, opinions, or recommendations expressed in this report to any other location may not be applicable.

If the location or nature of the project should change from the descriptions provided herein, the findings and recommendations should be reevaluated.

GEA is not responsible for misinterpretation or misapplication by others of the findings and recommendations provided herein. The project geotechnical engineer should be consulted should questions arise related to this investigation.

The only warranty made in connection with the services provided, is that we have used that degree of care and skill ordinarily exercised under similar conditions by reputable members of our profession practicing in the same or similar locality. No other warranty, expressed or implied, is made or intended.

2.0 SITE DESCRIPTION, SOIL AND GROUNDWATER CONDITIONS

2.1 Physical Setting

The sewer junction box that is currently failing and must be replaced is located at the end of Patton Street, in an open area between Patton Street and the CPKC Railroad. The junction box is located approximately 30 feet from the centerline of the CPKC mainline.

Topographically, the site of the junction box is flat with a slight downward slope to the west toward a railroad drainage ditch. The estimated elevation difference across the site from the wood line to the is estimated to be less than about 3 feet. The site rises to the east away from the junction box toward Patton Street. Overall, the site drainage should be considered to be fair to good.

Vegetation in the vicinity of the junction box and boring location vegetation consisted of ankle high grass. Brush and vines were in the ditch area between the junction box and the railroad and the area east of the junction box going up the slope to Patton Street was wooded.

2.2 Soil Conditions

One (1) soil boring was competed for this investigation. The boring location is shown on Figure 1. The soil boring log presenting the field and laboratory data is presented as Figure 2 with a Soil Boring Legend presented as Figure 3.

The soils encountered at this location consisted of firm to soft, brown Silty Clay (Unified Soil Classification – CL) that extended from the ground surface to a depth of 24 feet. Medium dense, gray Clayey Silt with sand (CL-ML) was present between the depths of 24 and 28 feet with firm gray Silty Clay (CL) present from 28 to 30 feet.

2.3 Groundwater Conditions

Groundwater was initially encountered at a depth of 8 feet in the boring and rose to 7.5 feet below the ground surface by the time the boring was completed.

Proper note should be taken that groundwater levels will vary seasonally with variations in local rainfall; with changes in the water levels of nearby streams, rivers, or lakes; and depending on the local ground surface topography or the presence of nearby leaking utilities. Additionally, the variable locations and thicknesses of granular soil strata and differences in soil permeability may result in the presence of a perched water table during and after rain events or during wet times of the year.

Groundwater conditions can often cause problems with sites where excavations are required. It is recommended that additional investigation of groundwater conditions by means of test pits be performed at the time of construction to verify the groundwater conditions and to allow for development of mitigation plans prior to the initiation of actual excavations.

3.0 GEOTECHNICAL CONSIDERATIONS

This section provides our guideline recommendations for soil parameters and groundwater conditions to use in the design of a shoring system to allow the replacement of the junction box. These recommendations are provided in Table 2 below.

Table 2 Recommended Soil Parameters for Deep Foundation Design								
Depth Below Natural Ground / Elevation (feet)	Stratum Description	Cohesion c (ksf)	Friction Angle ϕ (degrees)	Moist Unit Weight γ_m (pcf)	Buoyant Unit Weight γ_b (pcf)	Lateral Earth Pressure Coefficients		
						K_o	K_a	K_p
0 – 24 / 99.6 – 75.6	Soft Sandy Clay (CL) and Loose Clayey Sand (SC)	0	28	121	59	0.481	0.361	2.770
24 - 30 / 75.6 – 69.6	Firm to Stiff Sandy Clay (CL) and Medium Dense Clayey Sand (SC)	0	30	132	70	0.45	0.333	3.000
Groundwater was encountered at a depth of 7.5 feet, elevation 92.1 feet during drilling.								

We anticipate that groundwater will be an issue at this location. For design of the shoring, groundwater acting on the outside of the structure should be considered to be present at and below a depth of 7 feet below the ground surface. It is likely that control of groundwater within the excavation by pumping will be required during the junction box replacement.

4.0 CLOSING

We appreciate the opportunity to assist you with this project. We are available to provide additional engineering consultation and review of the project plans and specifications as they are being developed. Please call if we can answer any questions or provide any additional information.

Sincerely,

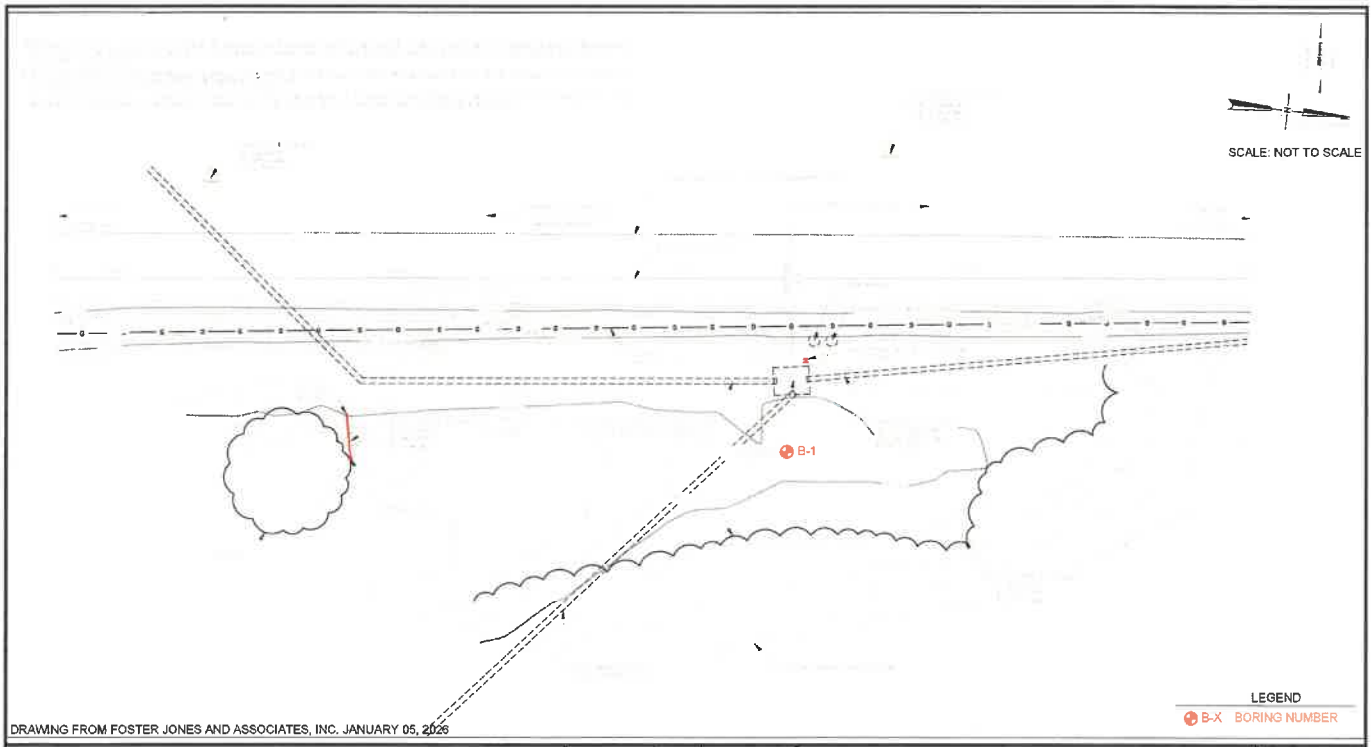
Geotechnical Engineering Associates, LLC

David M. Coleman, P.E.

DMC/dim

Electronic Submittals: Jerry Jones, P.E. jerryjones@a-e-r.com

Geotechnical Engineering Associates, LLC
Mississippi Certificate of Authorization E-2061
Expires December 31, 2026



DRAWING FROM FOSTER JONES AND ASSOCIATES, INC. JANUARY 05, 2026

G E A
GEOTECHNICAL ENGINEERING ASSOCIATES, LLC
POST OFFICE BOX 86
BRANDON, MS 39043
PHONE 601-824-2060

	BY	DATE
DRAWN	DMC	01-24-2026
CHECKED	DMC	01-24-2026
REVISED		
DWG NAME	26004Fig1.DWG	

BORING LOCATION

SEWER LINE JUNCTION BOX REPLACEMENT
VICKSBURG, MISSISSIPPI

ADVANCED ENGINEERING RESOURCES, INC.
MADISON, MISSISSIPPI

FIGURE
1

Geotechnical Engineering Associates
1647 W. Government Cove
Brandon, MS 39042

Soil Boring B-1

CLIENT Advanced Engineering Associates, Inc.
PROJECT NUMBER 26004
LATITUDE 32.32035° **LONGITUDE** -90.89463°
DATE STARTED 1/20/26 **COMPLETED** 1/20/26
DRILLER John Lewis **RIG:** Lewis Truck 1
DRILL METHOD 6" Earth Auger
LOGGER Charles Byrd
GROUND SURFACE Open, ankle high grass
NOTES Boring located 24 feet east of failing junction box.

PROJECT NAME Vicksburg Sewer Line Junction Box
PROJECT LOCATION Vicksburg, Mississippi
STATION Not Applicable **OFFSET FT** Not Applicable
GROUND ELEVATION FT 99.56± assumed datum
GROUND WATER LEVELS
INITIAL ▽ 8 feet
END OF DRILLING ▽ 7.5 feet
AFTER DRILLING ▼ Not Determined

DEPTH (feet) Below Ground Surface	ELEV (feet)	SAMPLE TYPE	MATERIAL DESCRIPTION	UNIFIED SOIL CLASSIFICATION	BLOW COUNTS & N VALUE (bpf)	POCKET PEN (tsf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			SIEVE (%)			UNDRAINED SHEAR STRENGTH (ksf)	UNIT WT.	
								LIQUID	PLASTIC	PLASTICITY INDEX	GRAVEL	SAND	FINES		MOIST (pcf)	DRY (pcf)
0	99.6		0' - 24'		14 bpf											
		X	Firm brown SILTY CLAY	CL	4-7-7		23.9									
			loose, moist below 2 feet			0.50	26.7	31	19	12	0.0	0.5	99.5	0.541	122.8	95.6
			stiff below 4 feet			1.50	26.3							1.240	120.6	95.5
	91.6	▽				2.00	25.4							2.671	126.6	100.9
10			wet soft below 8 feet			<0.25	32.1									
						<0.25	33.9	36	21	15	0.0	0.4	99.6	0.368	119.4	89.2
20						<0.25	32.8							0.422	121.4	91.4
	75.6					0.50										
			24' - 28'			2.75	18.0	21	16	5	0.0	14.8	85.2	1.163	132.5	112.2
			Medium dense gray CLAYEY SILT with sand	CL-ML												
30	69.6		28' - 30'													
			Firm gray SILTY CLAY	CL		<0.25	28.6	29	18	11	0.0	0.8	99.2	0.898	131.0	101.8
			Boring Terminated at 30 feet													
			Grouted with Portland Cement													

Figure 2

SOIL BORING LEGEND

SAMPLE TYPES		GROUNDWATER OBSERVATIONS		FIELD TESTS	
	Auger		Level Initially Encountered	bpf	blows per foot during Standard Penetration Test
	Shelby Tube		Level After Specified Period	tsf	Pocket Penetrometer (tons per square foot)
	Split Spoon				
	No Recovery		Final Groundwater Level After Specified Period	ksf	kips per square foot
	Rock Core			ND	Not Determined
		NFW	No Free Water	NA	Not Applicable

STRENGTH TERMS

COARSE GRAINED SOILS Generally Noncohesive		FINE GRAINED SOILS Generally Cohesive	
More than 50% retained on No. 200 sieve Includes gravels, sands, and silts. Density determined by the Standard Penetration Test (ADTM D 1586).		50% or more passing the No. 200 sieve Includes inorganic and organic silts and clays; gravelly, sandy, or silty clays and clayey silts. Consistency determined by laboratory shear strength testing or by field visual-manual procedures.	
Descriptive Term (Density)	Standard Penetration Resistance (blows per foot)	Descriptive Term (Consistency)	Undrained Shear Strength (kips per square foot or ksf)
Very Loose	0 to 4	Very Soft	Less than 0.25
Loose	5 to 9	Soft	0.25 to 0.50
Medium Dense	10 to 29	Firm	0.51 to 1.00
Dense	30 to 50	Stiff	1.01 to 2.00
Very Dense	Above 50	Very Stiff	2.01 to 4.00
		Hard	Above 4.00

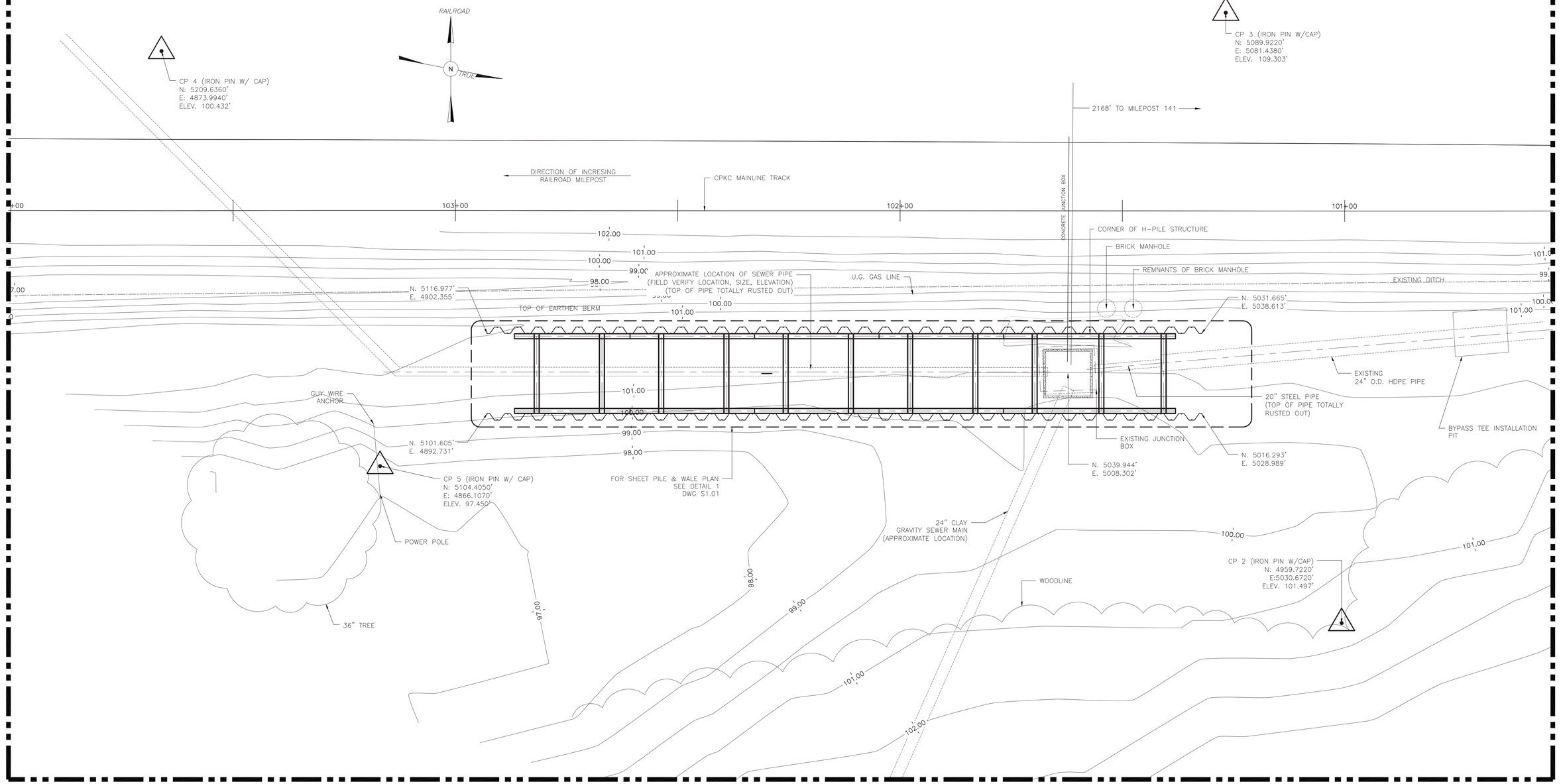
SOIL STRUCTURE TERMS

Blocky - Having a structure that can be broken into smaller angular lumps which resist further breakdown.
Calcareous - Containing appreciable quantities of calcium carbonate.
Fissured - Having definite fracture planes with little resistance to fracturing.
Friable - Easily crumbled.
Glauconitic - Containing a green mineral commonly occurring in soils of marine origin.
Heterogeneous - Having differing or various colors, appearance, or texture throughout.
Homogeneous - Having the same color and appearance throughout.
Jointed - A fissured condition with fracture planes that are numerous and limited in extent.
Indurated - Hardened by pressure or cementation.
Layer - A soil deposit with a thickness of about 6 inches.
Parting - A very small thickness of soil within another soil.
Seam - A bed of soil less that 6 inches thick deposited within another soil mass.
Slickensided - Having fracture planes that appear polished and glossy.
Stratified - Composed of alternating layers of varying material or color.

Appendix D

Project Drawings

(Geotechnical Engineering Associates, LLC – 1/24/26)



TERRY LEONARD JONES
LICENSED PROFESSIONAL
ENGINEER
8773
STATE OF MISSISSIPPI
3/NOV/2026

GRAPHICAL SCALE IN FEET
0 5 10 15 20

NOTICE

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REVISIONS

NO.	DESCRIPTION	DRFT	DATE	ENG.	DATE
0	FOR REVIEW	EDY	3/19/26	JLJ	3/19/26

REVISIONS

NO.	DESCRIPTION	DRFT	DATE	ENG.	DATE

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MS CERTIFICATE OF AUTHORIZATION E-0292

120 SOLLEFTEA DRIVE, MADISON, MS 39110
ADVANCED ENGINEERING RESOURCES, INC.

CLIENT:	PROJECT:
HEMPHILL CONSTRUCTION	VICKSBURG SEWER JUNCTION BOX REPAIR
LOCATION: VICKSBURG, MS	DRAWING TITLE: SEWER REPAIR SHORING LOCATION PLAN

PLOT SCALE:	DWG. SCALE:	DRAWN BY:	DATE:	DRAWING NO.	REV.
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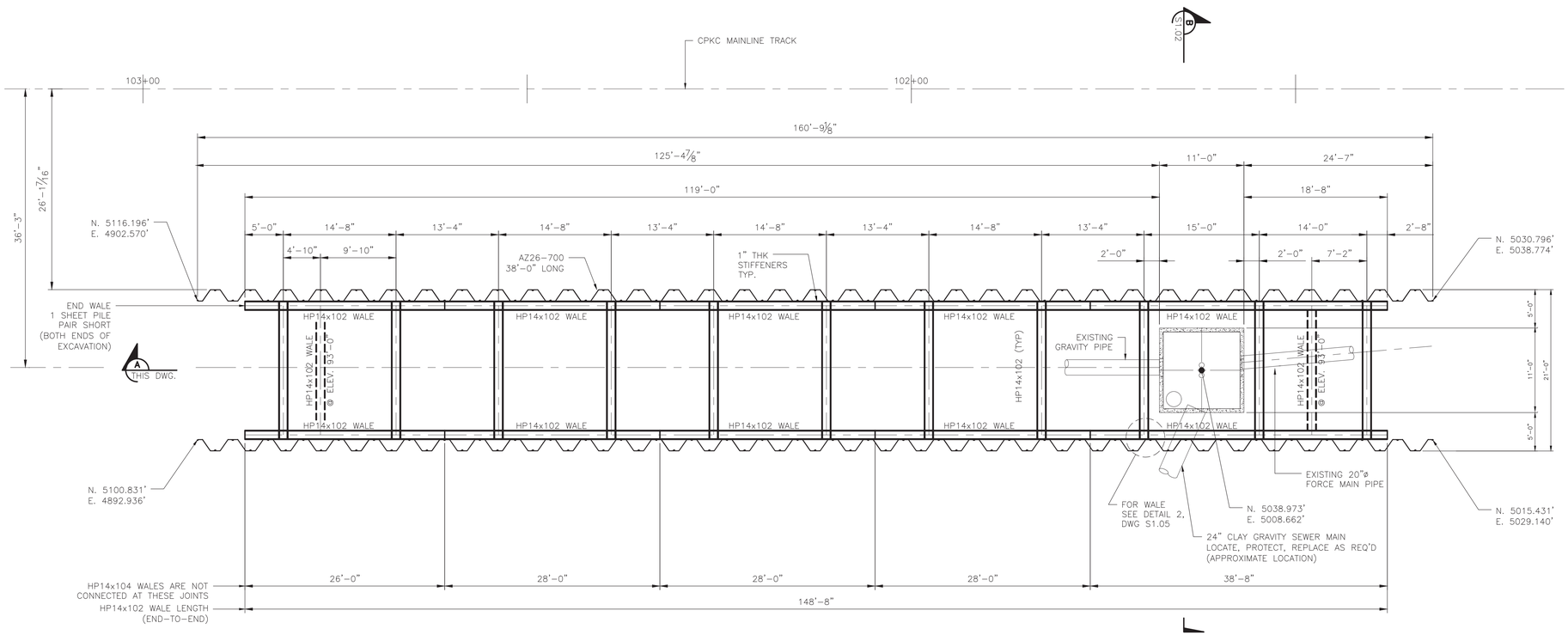

1 DETAIL JUNCTION BOX SHORING PLAN
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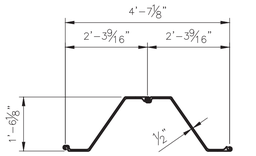
N



AZ26-700 PROFILE
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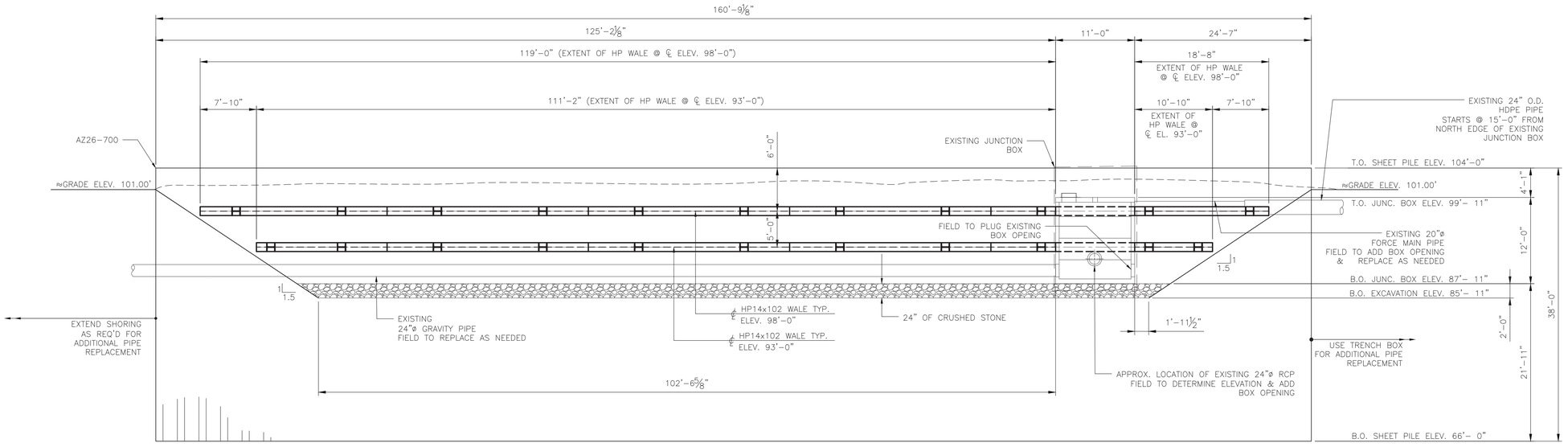

A SECTION
THIS DWG. 1/8" = 1'-0"

GRAPHICAL SCALE IN FEET
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REVISIONS

NO.	DESCRIPTION	DRFT	DATE	ENG.	DATE
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REVISIONS

NO.	DESCRIPTION	DRFT	DATE	ENG.	DATE

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MS CERTIFICATE OF AUTHORIZATION E-0292

120 SOLLEFTEA DRIVE, MADISON, MS 39110

ADVANCED ENGINEERING RESOURCES, INC.

CLIENT:	HEMPHILL CONSTRUCTION
LOCATION:	VICKSBURG, MS
PROJECT:	VICKSBURG SEWER JUNCTION BOX REPAIR
DRAWING TITLE:	SEWER REPAIR SHORING PLAN & SECTION A

PLOT SCALE:	DWG. SCALE:	DRAWN BY:	DATE:	DRAWING NO.	REV.
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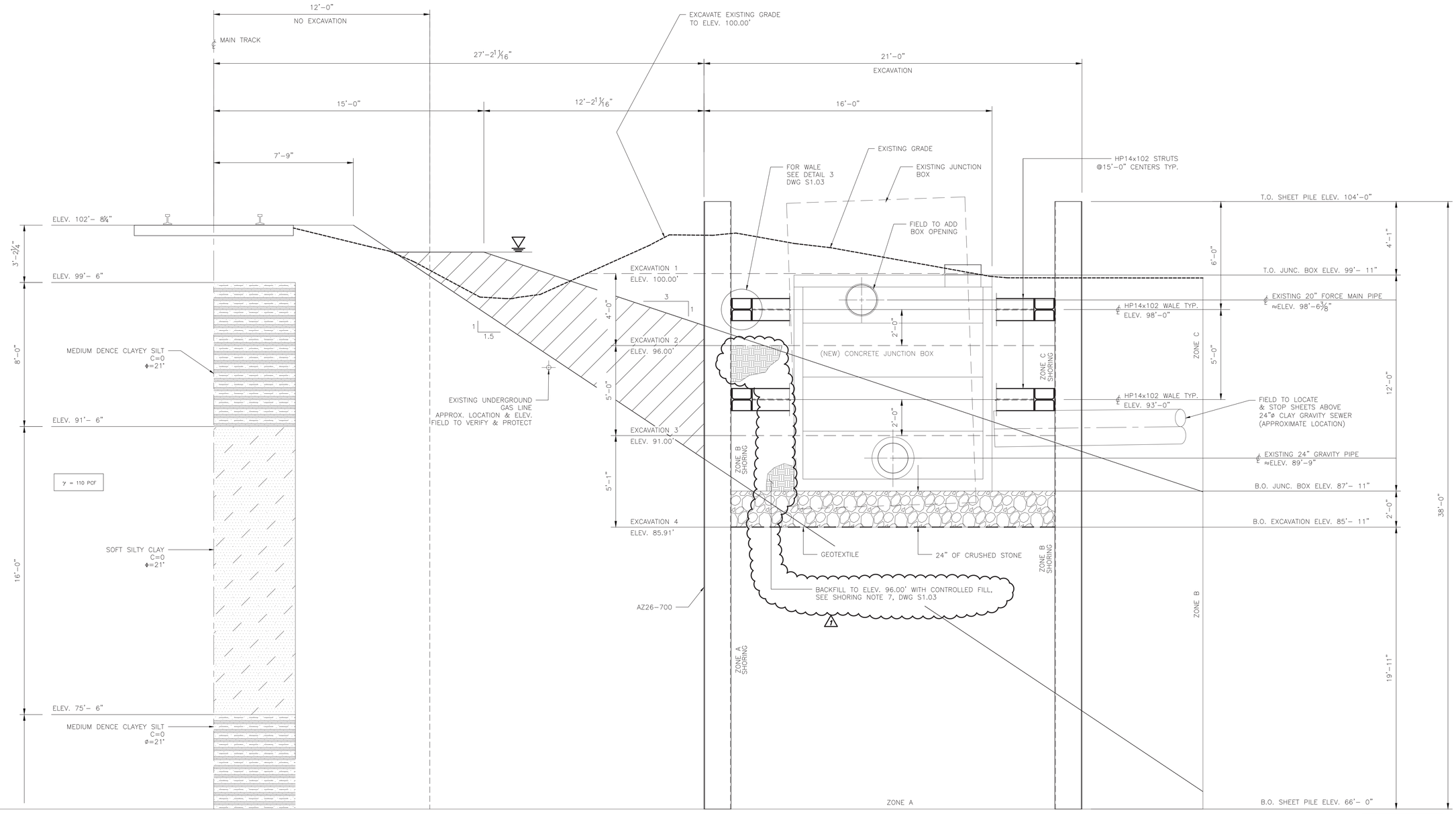

B SECTION
S1.01 3/8" = 1'-0"

JERRY LEONARD JONES LICENSED PROFESSIONAL ENGINEER 8773 STATE OF MISSISSIPPI
3/23/2026

GRAPHICAL SCALE IN FEET
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REVISIONS

NO.	DESCRIPTION	DRFT	DATE	ENG.	DATE
0	FOR REVIEW	EDY	3/19/26	JLJ	3/19/26
1	AS NOTED	BTC	3/23/26	JLJ	3/23/26

REVISIONS

NO.	DESCRIPTION	DRFT	DATE	ENG.	DATE

FILE NAME: Z:\Projects\Hemphill Construction\20-25047.000 Hemphill – City Of Vicksburg MS – Sewer Repair Shoring At KCSRR\Drawings\Working\Hemphill Vicksburg Sewer Repair

MS CERTIFICATE OF AUTHORIZATION E-0292

120 SOLLEFTEA DRIVE, MADISON, MS 39110
ADVANCED ENGINEERING RESOURCES, INC.

CLIENT: HEMPHILL CONSTRUCTION
LOCATION: VICKSBURG, MS
PROJECT: VICKSBURG SEWER JUNCTION BOX REPAIR
DRAWING TITLE: SEWER REPAIR SHORING SECTION B

PLOT SCALE:	DWG. SCALE:	DRAWN BY:	DATE:	DRAWING NO.	REV.
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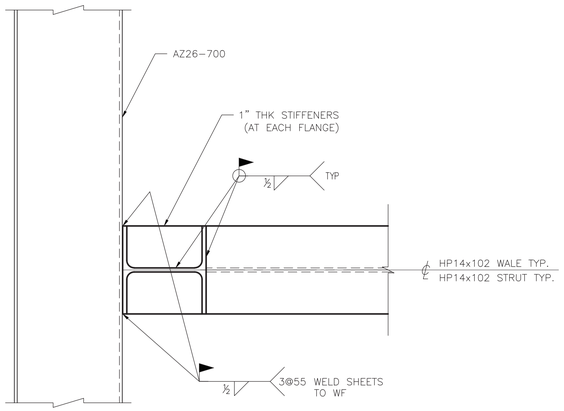


2 DETAIL WALE ASSEMBLY
S1.01 & S1.02 1"=1'-0"

SHORING NOTES:

1. CONSTRUCTION SHALL CONFORM TO INTERNATIONAL BUILDING CODE LATEST EDITION AND APPLICABLE OSHA REGULATIONS.
2. GEOTECHNICAL INFORMATION FROM GEOTECHNICAL ENGINEERING ASSOCIATES, LLC REPORT FOR PROJECT #26004 DATED JAN. 24, 2026
3. STEEL CONSTRUCTION SHALL CONFORM TO AISC 360-05 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS.
4. SHEET PILES SHALL BE AZ26-700 ASTM A572, GRADE 50.
5. ROLLED STEEL HP SHAPES SHALL BE ASTM A992, GRADE 50.
6. STEEL PLATE SHALL BE ASTM A572, GRADE 50.
7. BACKFILL FROM ELEVATION 88.00' TO ELEVATION 96.00' WITH EXCAVATED MATERIAL OR SELECT MATERIAL (SANDY CLAY OR CLAYEY SAND) COMPACTED TO 95% MAXIMUM STANDARD DENSITY PER ASTM D698.

SEQUENCE OF CONSTRUCTION

1. DEWATER SITE AND MAINTAIN WATER TABLE BELOW ELEV. 84.00' THROUGHOUT THE INSTALLATION.
2. LEVEL SITE TO ELEV. 100.00' & INSTALL AZ26-700 SHEET PILES TO DEPTHS SHOWN.
3. EXCAVATE TO EL. 96.00' & INSTALL HP14x102 WALE & STRUTS @ EL. 98.00'.
4. EXCAVATE TO EL. 91.00' & INSTALL HP14x102 WALE & STRUTS @ EL. 93.00'.
6. EXCAVATE TO EL. 85.92' & INSTALL GEOTEXTILE AND FILL WITH 2'-0" CRUSHED STONE.
7. INSTALL JUNCTION BOX & NEW PIPING AS REQUIRED.
8. BACKFILL TO ELEV. 91.00' & REMOVE WALES & STRUTS @ ELEV. 93.00'.
9. BACKFILL TO ELEV. 96.00' & REMOVE WALES & STRUTS @ ELEV. 98.00'.
10. BACKFILL TO GRADE & REMOVE SHEET PILES.

REFERENCES:

ELEVATIONS AND LAYOUT
BASED ON FOSTER, JONES, AND ASSOCIATES
SITE SURVEY DATED DEC. 19, 2025

PROJECT # 25-065, DWG.# "PLAN"

CP2 (IRON PIN W/CAP)
N:4959.7220'
E:5030.6720'
ELEV. 101.497

CP3 (IRON PIN W/CAP)
N: 5089.9220'
E: 5081.4380'
ELEV. 109.303'

CP4 (IRON PIN W/CAP)
N: 5209.6360'
E: 4873.9940'
ELEV. 100.432'

CP5 (IRON PIN W/CAP)
N: 5104.4050'
E: 4866.1070'
ELEV. 97.450'

JERRY LEONARD JONES
LICENSED PROFESSIONAL
ENGINEER
8773
STATE OF MISSISSIPPI
3/23/2026

GRAPHICAL SCALE IN FEET
0 1.5 3

REVISIONS

NO.	DESCRIPTION	DRFT	DATE	ENG.	DATE
0	FOR REVIEW	EDY	3/19/26	JLJ	3/19/26
1	AS NOTED	BC	3/23/26	JLJ	3/23/26

REVISIONS

NO.	DESCRIPTION	DRFT	DATE	ENG.	DATE

FILE NAME: Z:\Projects\Hemphill Construction\20-25047.000 Hemphill - City Of Vicksburg MS - Sewer Repair Shoring At KCSRR\Drawings\Working\Hemphill Vicksburg Sewer Repair

MS CERTIFICATE OF AUTHORIZATION E-0292
120 SOLLEFTEA DRIVE, MADISON, MS 39110
ADVANCED ENGINEERING RESOURCES, INC.

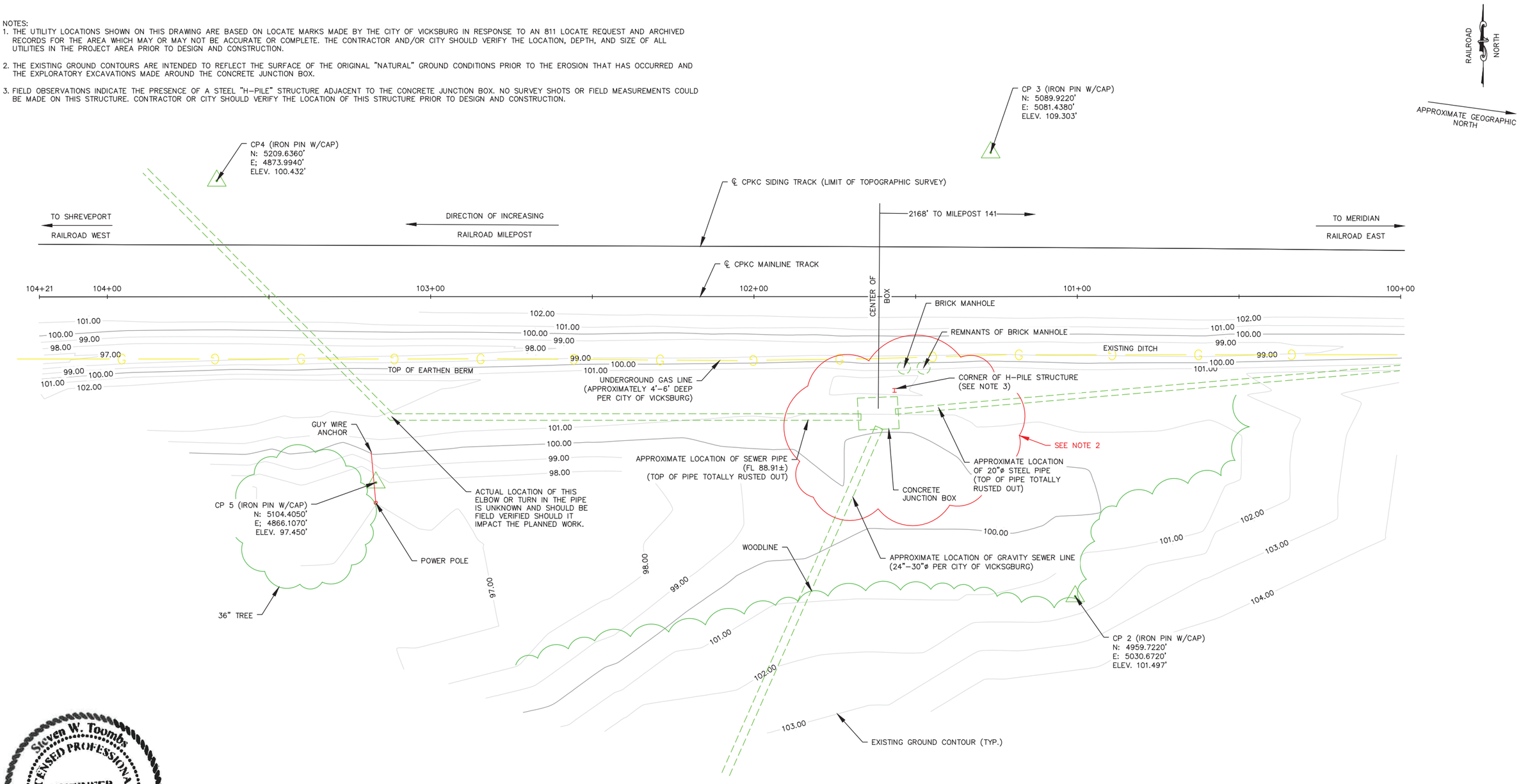
CLIENT:	PROJECT:
HEMPHILL CONSTRUCTION	VICKSBURG SEWER JUNCTION BOX REPAIR
LOCATION: VICKSBURG, MS	DRAWING TITLE: SEWER REPAIR SHORING DETAILS & NOTES

PLOT SCALE:	DWG. SCALE:	DRAWN BY:	DATE:	DRAWING NO.	REV.
1:12	1""=1'-0"	EDY	3/4/26	20-26047-S1.03	1

NOTES:
1. THE UTILITY LOCATIONS SHOWN ON THIS DRAWING ARE BASED ON LOCATE MARKS MADE BY THE CITY OF VICKSBURG IN RESPONSE TO AN 811 LOCATE REQUEST AND ARCHIVED RECORDS FOR THE AREA WHICH MAY OR MAY NOT BE ACCURATE OR COMPLETE. THE CONTRACTOR AND/OR CITY SHOULD VERIFY THE LOCATION, DEPTH, AND SIZE OF ALL UTILITIES IN THE PROJECT AREA PRIOR TO DESIGN AND CONSTRUCTION.

2. THE EXISTING GROUND CONTOURS ARE INTENDED TO REFLECT THE SURFACE OF THE ORIGINAL "NATURAL" GROUND CONDITIONS PRIOR TO THE EROSION THAT HAS OCCURRED AND THE EXPLORATORY EXCAVATIONS MADE AROUND THE CONCRETE JUNCTION BOX.

3. FIELD OBSERVATIONS INDICATE THE PRESENCE OF A STEEL "H-PILE" STRUCTURE ADJACENT TO THE CONCRETE JUNCTION BOX. NO SURVEY SHOTS OR FIELD MEASUREMENTS COULD BE MADE ON THIS STRUCTURE. CONTRACTOR OR CITY SHOULD VERIFY THE LOCATION OF THIS STRUCTURE PRIOR TO DESIGN AND CONSTRUCTION.



Steven W. Toombs
LICENSED PROFESSIONAL ENGINEER
17418
STATE OF MISSISSIPPI
3-19-26

REMARKS:

0 30' 60'
SCALE : 1:30

REFERENCE DRAWINGS

REVISIONS			
REV	ITEM	BY	DATE
A	ISSUED FOR INFORMATION	FJA	12-23-25
B	ISSUED FOR INFORMATION	FJA	01-20-26
C	REVISED UTILITY LOCATIONS AND NOTE 1	FJA	02-27-26
D	REVISED DRAWING NUMBER AND DRAWING TITLE	FJA	03-19-26

FOSTER, JONES & ASSOCIATES, INC.
ENGINEERING AND CONSTRUCTION MANAGEMENT
120 SOLLEFTEA DRIVE, SUITE C MADISON, MS 39110
(601) 898-1404
JOB # 25-065

CERTIFICATE OF AUTHORIZATION		DRAWN BY	DATE DRAWN
STATE : MS	NO : 2586	FJA	12-19-25

COMPANY	HEMPHILL CONSTRUCTION
LOCATION	VICKSBURG, MS
CAD FILE	HEMPHILL VICKSBURG SEWER-BASE.DWG
PROJECT	VICKSBURG SEWER REPAIR
DRAWING TITLE	SEWER REPAIR SHORING SURVEY PLAN
DRAWING NO.	25-065-000
REV.	D