

ADDENDUM NO. 1



TO: All Holders of Plans and Contract Documents for City of Monett,
OOOS(628) Chapell Dr over BNSF Railroad,
Bridge # 2870013

ISSUED: 07/02/2026

Name of Bidder

Receipt Acknowledged By

This Addendum is hereby made a part of the Contract Documents to the same extent as if it were originally included herein. This Addendum shall be inserted in the Contract Documents and submitted with the Bid, and includes the following items:

CONTRACT DOCUMENTS:

- Page 5 – Table of Contents
 - Addition to Table of Contents
 - Addition of Geotechnical Report
- Page 11 – Itemized Proposal
 - Revision to Itemized Proposal
 - Revision to Quantity for Item No. 702-60.00 Pre-bore for Piling from 595 LF to 787 LF
 - Addition of Item No. 703-99.03, Pedestrian Curb, LF, 310
 - Reordering of Line No.'s to accommodate addition of Item No. 703-99.03, Pedestrian Curb
 - Revision to Quantity for Item 720-12.00 Pile Spacers from 14 to 7
- Page 177-225 – Geotechnical Report
 - Addition of Geotechnical Report
 - Addition of Geotechnical report starting at page 177 and ending at page 225 (48 pages), placed before to the ADA checklist.

PLANS

- Sheet 04 – Quantities & General Notes
 - Revision to Summary of Quantity Tables
 - Replaced Summary of Quantity Table and Bid Alternate Quantity Table to remove Line No. and reorganize table presentation on sheet
- Sheet 26 – Bridge Plan and Profile
 - Addition to General Elevation
 - Addition of Anticipated Depth of Pre-bore at each bent
 - Addition of Anticipated Pile Tip Elevation at each bent

- Sheet 27 – Bridge Quantities & Notes
 - Revision to Summary of Quantities Table
 - Replaced Summary of Quantity Table to remove Line No. and reformat table
 - Revision to Quantity for Item No. 702-60.00 Pre-bore for Piling from 595 LF to 787 LF
 - Addition of Item No. 703-99.03, Pedestrian Curb, LF, 310
 - Revision to Estimated Quantities for Slab on Concrete NU-Girder
 - Revision to Reinforcing Steel Pounds Total from 103832 to 103,711
- Sheet 28 – End Bent 1
 - Addition to Substructure Quantity Table for Bent No. 1
 - Addition of Item “Pre-bore For Piling” for clarity relating to Summary of Quantities and Itemized proposal
- Sheet 32 – Intermediate Bent 2A
 - Addition to Substructure Quantity Table for Bent No. 2
 - Addition of Item “Pre-bore For Piling” for clarity relating to Summary of Quantities and Itemized proposal
- Sheet 35 – Intermediate Bent 3AA
 - Revision to Sheet Title from “Intermediate Bent 3AA” to “Intermediate Bent 3A”
 - Addition to Substructure Quantity Table for Bent No. 3
 - Addition of Item “Pre-bore For Piling” for clarity relating to Summary of Quantities and Itemized proposal
- Sheet 37 – End Bent 4
 - Addition to Substructure Quantity Table for Bent No. 4
 - Addition of Item “Pre-bore For Piling” for clarity relating to Summary of Quantities and Itemized proposal
 - Addition of “Pile Spacers” for clarity relating to Summary of Quantities and Itemized Proposal
- Sheet 41 – Details of NU Girders Span 1-2
 - Revision to Top Flange Blockout Details
 - Revised “Left Exterior Girder at Intermediate Bent”
 - Revised “Left Exterior Girder at Intermediate Bent” to “Left Exterior Girder at Intermediate Bent 2”
 - Revised exterior blockout dimension (top dimension) from 9” to 7½”
 - Revised interior blockout dimension (bottom dimension) from 18½” to 14½”
 - Revised “Interior Girder at All Bents & Exterior Girder at End Bents”
 - Revised “Interior Girder at All Bents & Exterior Girder at End Bents” to “Interior Girder at End Bent 1 and Intermediate Bent 2 & Exterior Girder at End Bent 1”
 - Revised “Int. Bent” dimension from 18½” to 14½”

- Sheet 42 – Details of NU Girders Span 2-3
 - Revision to Top Flange Blockout Details
 - Revised “Left Exterior Girder at Intermediate Bent”
 - Revised “Left Exterior Girder at Intermediate Bent” to “Left Exterior Girder at Intermediate Bent 2 and 3”
 - Revised exterior blockout dimension (top dimension) from 9” to 7½”
 - Revised interior blockout dimension (bottom dimension) from 18½” to 14½”
 - Revised “Interior Girder at All Bents & Exterior Girder at End Bents”
 - Revised “Interior Girder at All Bents & Exterior Girder at End Bents” to “Interior Girder at Intermediate Bent 2 and 3”
 - Revised “End Bent” to “Int. Bent 2”
 - Revised “Int. Bent 2” dimension from 18½” to 14½”
 - Revised “Int. Bent” to “Int. Bent 3”
 - Revised “Int. Bent 3” dimension from 18½” to 14½”
- Sheet 43 – Details of NU Girders Span 3-4
 - Revision to Top Flange Blockout Details
 - Revised “Left Exterior Girder at Intermediate Bent”
 - Revised “Left Exterior Girder at Intermediate Bent” to “Left Exterior Girder at Intermediate Bent 3”
 - Revised exterior blockout dimension (top dimension) from 9” to 7½”
 - Revised interior blockout dimension (bottom dimension) from 18½” to 14½”
 - Revised “Interior Girder at All Bents & Exterior Girder at End Bents”
 - Revised “Interior Girder at All Bents & Exterior Girder at End Bents” to “Interior Girder at End Bent 4 and Intermediate Bent 3 & Exterior Girder at End Bent 4”
 - Revised “Int. Bent” dimension from 18½” to 14½”
- Sheet 45 – Concrete Diaphragms at Bents
 - Revision to Section A-A
 - Revision to plan view to be drawn to scale
 - Revision to edge dimensions
 - Diaphragm edge out-out dimension from 3’-5” to 2’-10”
 - Diaphragm edge centerline-out dimension from 1’-8 ½” to 1’- 5”
 - Revision to Section B-B
 - Diaphragm width dimension added
 - Revision to Section C-C
 - Diaphragm edge dimension added
- Sheet 60 – Bill of Reinforcing
 - Revision to “Diaphragm At Intermediate Bents” Rebar dimensions
 - Revision to U500
 - Dimension C from 1’-6” to 2’-8”
 - Dimension D from 4’-0 ¾” to 4’-1”
 - Dimension E from 3’-0” to 1’-6”
 - Total weight from 468 to 432
 - Revision to U501
 - Dimension C from 2’-2” to 3’-6”
 - Dimension D from 4’-0 ¾” to 4’-1”
 - Dimension E from 3’-0” to 2’-2”
 - Total weight from 509 to 453
 - Revision to U502
 - Dimension C from 2’-2” to 3’-6”

- Dimension D from 4'-0 ³/₄" to 4'-1"
- Dimension E from 3'-0" to 2'-2"
- Total weight from 477 to 453
- Revision to U503
 - Dimension C from 2'-2" to 2'-4"
 - Dimension E from 2'-8" to 2'-2"
 - Total weight from 57 to 85
- Revision to U504
 - Dimension B from 4'-4½" to 4'-9"
 - Dimension C from 1'-11¼" to 1'-6"
 - Dimension D from 1'-5⁵/₈" to 1'-0"
 - Total weight from 59 to 60
- Revision to U505
 - Dimension B from 4'-8½" to 4'-9"
 - Dimension C from 1'-11¼" to 1'-6"
 - Dimension D from 1'-5⁵/₈" to 1'-7"
 - Total weight from 202 to 196
- Revision to V500
 - Dimension B from 6'-4" to 4'-8"
 - Total weight from 106 to 78
- Sheet 64 – Bill of Reinforcing
 - Revision to Bill of Reinforcing Totals Table
 - Updates in total weight per bar size reelecting changes in sheet 60 relating to the Concrete Diaphragm at Bents details

General Remarks:

- Relating to Pile Spacers
 - The Engineer is including pile spacers to be installed at End Bent 4 for the contractor's option should they determine the incorporation of the pile spacers will provide ease of construction. Should the contractor opt not to use them, they shall be deducted from the final price.
- Relating to Section 3.01.02 of BNSF C&M within the contract documents
 - The City will directly cover costs related to BNSF Inspector/Coordinator (I/C) and the contractor will not be responsible for these costs.
 - The City will directly cover the costs related to Railroad Flaggers and the contractor will not be responsible for these costs. The City reserves the right to charge the contractor for any misuse of flagger time on the job.

Sincerely,



Mitch Gibler
Project Manager

TABLE OF CONTENTS

Notice to Contractors

Proposed Work.....	(1)
Compliance With Contract Provisions.....	(2)
Period of Performance	(3)
Liquidated Damages	(4)
Bid Guaranty	(5)
Certifications for Federal Jobs	(6)
Antidiscrimination	(7)
Federal and State Inspection	(8)
Prevailing Wage.....	(9)
Worker Eligibility Requirements	(10)
OSHA Training Requirements.....	(11)
Buy America Requirements	(12)
Addendum Acknowledgement.....	(13)
Signature and Identity of Bidder	(14)
Trainees.....	(15)
Subcontractor Disclosure	(16)
Project Award	(17)
Materials Inspections	(18)
Prime Contractor Requirements	(19)
Tax Exempt Status	(20)
Design Exceptions.....	(21)
Work by Local Forces.....	(22)

Itemized Bid Sheets

Bid Bond

Bidder's List Quote Summary Form ([Fig. 136.9.12](#))

DBE Identification Submittal ([Fig. 136.9.9](#))

DBE Provisions ([Fig. 136.9.8](#))

General Provisions (Other Than MoDOT)

Job Special Provisions

BNSF C&M

Form FHWA 1273 ([Fig. 136.9.7](#))

Federal Aid Provisions

Applicable State Wage Rates

Applicable Federal Wage Rates

Applicable Environmental and Cultural Permits and Clearances

Geotechnical Report

ADA Checklist ([Fig. 136.9.4](#))

Contract Forms

[Fig 136.10.3 Sample Contract Agreement](#)

[Fig 136.10.4 Sample Contract Bond](#)

[Fig 136.10.5 Sample Contractors Acknowledgement](#)

BNSF C&C1

ITEMIZED BID: The bidder should complete the following section in accordance with Sec 102.7.
The bidder proposes to furnish all labor, materials, equipment, services, etc. required for the performance and completion of the work, as follows:

CHAPELL DRIVE OVER BNSF RAILROAD, BRIDGE #2870013, PROJECT #OOOS(628)						
ITEMIZED PROPOSAL						
LINE NO.	ITEM NO.	ITEM DESCRIPTION	UNITS	QUANTITY	UNIT PRICE	SUBTOTAL
		ROADWAY				
1	201-30.00	Clearing & Grubbing	ACRE	3.9	\$	\$
2	202-20.10	Removal of Improvements	LS	1	\$	\$
3	203-50.00	Unclassified Excavation	CY	15,882	\$	\$
4	203-55.00	Embankment in Place	CY	45,824	\$	\$
5	203-60.00	Compacting Embankment	CY	45,824	\$	\$
6	203-99.07	Geofoam Lightweight Fill (EPS 29)	CY	488	\$	\$
7	304-05.04	Type 5 Aggregate Base, 4" thick	SY	6,895.6	\$	\$
8	304-99.05	Integrated Approach	SY	184.2	\$	\$
9	401-12.09	Bituminous Pavement Mixture PG 64-22, (BP-1)	TONS	492.7	\$	\$
10	402-05.20	Bituminous Pavement Mixture PG 64-22, (Surface Leveling)	TONS	273.4	\$	\$
11	407-10.05	Tack Coat @ 0.05 gal/ SY (1 Coat)	GAL	142	\$	\$
12	502-11.08	Concrete Pavement (8" Non-Reinforced)	SY	5,834	\$	\$
13	609-10.51	Curb & Gutter Type A, 2'-0"	LF	2,954	\$	\$
14	609-20.13	Intergral Curb Type M	LF	34	\$	\$
15	611-30.20	Furnishing Type 2 Rock Blanket	CY	635	\$	\$
16	611-30.40	Placing Type 2 Rock Blanket	CY	635	\$	\$
17	614-30.20	4 FT. X 4 FT. Curb Inlet	EA	2	\$	\$
18	614-30.20	5 FT. X 4 FT. Curb Inlet	EA	4	\$	\$
19	614-30.20	5 FT. X 5 FT. Curb Inlet	EA	3	\$	\$
20	614-30.20	6 FT. X 4 FT. Curb Inlet	EA	2	\$	\$
21	618-10.00	Mobilization	LS	1	\$	\$
22	725-03.12A	12 IN. Pipe Group B (Concrete)	LF	82	\$	\$
23	725-03.18A	18 IN. Concrete Pipe Group B (Concrete)	LF	590	\$	\$
24	725-03.24A	24 IN. Concrete Pipe Group B (Concrete)	LF	639	\$	\$
25	725-03-36A	36 IN. Concrete Pipe Group B (Concrete Pipe-Arch)	LF	131	\$	\$
26	731-00.48	Precast Concrete Manhole - 48 IN.	LF	15.46	\$	\$
27	731-00.72	Precast Concrete Manhole - 72 IN.	LF	13.5	\$	\$
28	607-10.40	Drive Gate (Chain-Link)	EA	1	\$	\$
29	806-10.02	Sediment Basin Rock	CY	14.8	\$	\$
30	622-40.10	Modified Coldmilling (Depth Transitions)	SY	218.0	\$	\$
		ROADWAY SUBTOTAL =			\$	
SIGNING/STRIPING/SIGNAL						
31	607-99.03	5-Strand Woven Wire Fence	LF	757	\$	\$
32	616-10.05	Construction Signs	SF	137	\$	\$
33	616-10.30	Type III Moveable Barricade	EA	9	\$	\$
34	620-60.00D	4 IN. White Class 1 Pavement Paint (18-Mil, Type P Beads)	LF	135	\$	\$
35	620-60.01D	4 IN. Yellow Class 2 Pavement Paint (18-Mil, Type P Beads)	LF	2,204	\$	\$
36	620-00.19	Cold Applied Tape Pavement Marking, Left/Right Arrow	EA	1	\$	\$
37	620-00.15	Preformed Thermoplastic Pavement Marking, 24 IN White	LF	22	\$	\$
		SIGNING/STRIPING SUBTOTAL =			\$	

LANDSCAPING						
38	206-99.01	Temporary Stream By-pass	LS	1	\$	\$
39	805-10.00A	Seeding - Cool Season Mixtures	ACRE	3.6	\$	\$
40	806-10.05	Rock Ditch Check	LF	45	\$	\$
41	806-10.07A	Curb Inlet Check	EA	8	\$	\$
42	806-10.19	Silt Fence	LF	3,856	\$	\$
43	806-41.28	Type 1 turf reinforcement mat	SY	8,985	\$	\$
	LANDSCAPING SUBTOTAL =					\$
PEDESTRIAN FACILITIES						
44	608-10.10	Concrete Curb Ramp	SY	56.0	\$	\$
45	608-10.12	Truncated Domes	SF	80	\$	\$
46	608-60.04	Concrete Sidewalk, 4 in	SY	855.7	\$	\$
47	304-05.04	Type 5 Aggregate Base, 4" thick	SY	920.6	\$	\$
	PEDESTRIAN FACILITIES SUBTOTAL =					\$
BRIDGE						
48	206-10.00	Class 1 Excavation	CY	887	\$	\$
49	206-33.00	Class 4 Excavation	CY	334	\$	\$
50	216-35.01	Partial Removal of Culvert-Bridge Concrete	LS	1	\$	\$
51	607.10-67	(96 In.) Curved Top Pedestrian Fence (Structures)	LF	310	\$	\$
52	607.10-68	(120 In.) Pedestrian Fence (Structures)	LF	310	\$	\$
53	702-10.12	Structural Steel Pile (12 In.)	LF	2,143	\$	\$
54	702-60.00	Pre-bore for Piling	LF	 787	\$	\$
55	702-70.00	Pile Point Reinforcement	EACH	46	\$	\$
56	703-20.03	Class B-2 Concrete (Substructure)	CY	259.6	\$	\$
57	703-40.40	Class B-1 Concrete (Culvert-Bridge)	CY	559.9	\$	\$
58	703-42.19A	Type D Barrier	LF	620	\$	\$
59	703-42.21	Slab on Concrete NU-Girder	SY	1,434	\$	\$
60	703-99.03	Pedestrian Curb	LF	310	\$	\$
61	705-60.22	NU 43, Prestressed Concrete NU-Girder	LF	1,423	\$	\$
62	706-10.20	Reinforcing Steel (Culverts-Bridge)	LBS	82,790	\$	\$
63	706-10.60	Reinforcing Steel (Bridges)	LBS	35,189	\$	\$
64	715-10.01	Vertical Drains at End Bents	EACH	2	\$	\$
65	716-10.00	Plain Neoprene Bearing Pad	EACH	5	\$	\$
66	716-10.02	Laminated Neoprence Bearing Pad	EACH	5	\$	\$
67	716-10.03	Laminated Neoprence Bearing Pad (Tapered)	EACH	20	\$	\$
68	720-13.00	Pile Spacers	EACH	 7	\$	\$
	BRIDGE SUBTOTAL =					\$
	TOTAL CONSTRUCTION =					\$

LINE NO.	ITEM NO.	ITEM DESCRIPTION	UNITS	QUANTITY	UNIT PRICE	SUBTOTAL
ROADWAY (BID ALT)						
BID ALT-1	401-12.09	Bituminous Pavement Mixture PG 64-22, (BP-1)	TONS	369.8	\$	\$
BID ALT-2	401-30.00	Bituminous Pavement Mixture PG 64-22, (Base)	TONS	1294.4	\$	\$

Acknowledgement: Each bidder shall acknowledge receipt of addenda by their signature affixed hereto and addendum noted.

Contractor: _____

Signature: _____

Name: _____

Addendum No.(s) _____

Phone: _____

Date: _____

(please print)

**SUBSURFACE EXPLORATION
AND
GEOTECHNICAL ENGINEERING REPORT**

**CHAPELL DRIVE & BUSINESS 60
ROADWAY IMPROVEMENTS & PROPOSED BRIDGE
MONETT, MO**

**ANDERSON ENGINEERING
941 W. 141ST TERRACE
KANSAS CITY, MISSOURI 64145**

KCTE PROJECT NO. G20-21-066

1/04/2022



**SITE EXPLORATION
AND
GEOTECHNICAL ENGINEERING REPORT**

**CHAPELL DRIVE & BUSINESS 60
ROADWAY IMPROVEMENTS & PROPOSED BRIDGE
MONETT, MO**

KCTE NO. G20-21-066

Submitted to: Gary Strack
Anderson Engineering
941 W. 141st Terrace
Kansas City, MO 64145

Submitted by: Kansas City Testing and Engineering, LLC
1308 Adams Street
Kansas City, KS 66103

Prepared by: 
Clay Rathbun
Geotechnical Service Manager

Reviewed by: 
Scott E. Martens, P.E.
Vice President



TABLE OF CONTENTS

1.0 INTRODUCTION	4
2.0 PROJECT AND SITE DESCRIPTION	4
3.0 FIELD EXPLORATION PROGRAM	5
3.1 LABORATORY TESTING PROGRAM	6
4.0 SUBSURFACE CONDITIONS.....	6
4.1 SOIL STRATA	6
4.2 BEDROCK OBSERVATIONS	7
4.3 GROUNDWATER OBSERVATIONS	7
5.0 ANALYSIS AND RECOMMENDATIONS	7
5.1 DRIVEN PILES.....	8
5.2 DRILLED SHAFTS	9
5.3 GROUP EFFECT	10
5.4 DOWNDRAG.....	10
5.5 SEISMICITY	10
5.5.1 LIQUIFACTION POTENTIAL	11
5.6 SITE PREPARATION.....	11
5.7 CONTROLLED FILL.....	12
5.8 ROADWAY AND EMBANKMENT SUBGRADE CONSIDERATIONS.....	13
5.8.1 LOW VOLUME CHANGE MATERIAL.....	13
5.8.2 SETTLEMENT PLATES	14
5.9 DRAINAGE AND MAINTENANCE	14
5.10 EXCAVATION AND TRENCHES	14
6.0 GENERAL COMMENTS.....	15

Appendices

Appendix A	Project and Boring Location Map
Appendix B	Boring Logs and Laboratory Data
Appendix C	General Comments and Soil Classifications

1.0 INTRODUCTION

Kansas City Testing & Engineering, LLC (KCTE) has completed the subsurface exploration for the proposed construction of a new bridge and roadway located south of the intersection of Chapell Drive and Business 60, Monett MO. The exploration was performed at the request of Anderson Engineering in accordance with our proposal No. GP20-21-026 and executed subcontract dated March 18, 2021.

The exploration was completed in two phases. Phase 1 exploration consisted of B-3, B-7, and B-10 performed in August of 2021. The remaining boring were completed during the Phase II exploration in October of 2022.

The purpose of this geotechnical exploration was to identify the soil strata, on-site soil physical properties, and provide geotechnical recommendations for the proposed construction.

2.0 PROJECT AND SITE DESCRIPTION

KCTE understands that the project will consist of roadway and a three-span bridge over the BNSF railroad crossing on Chapell Drive. The new roadway and abutments at the bridge end bents will require approximately 25 feet of controlled fill to accomplish grade separation. The existing RCB and wing walls at Kelly Creek will be extended beyond the embankment fills. The site is located as depicted in the Appendix A Site Location Map. The boring locations are depicted in Appendix A Boring Location Map.

This report is limited to recommendations for the construction of the proposed construction at the locations depicted on the boring location map.



1. Image of Existing RR Crossing and RCB (beyond) at Kelly Creek Looking North



2. Image of Existing RCB Crossing over Kelly Creek

3.0 FIELD EXPLORATION PROGRAM

The site subsurface conditions were explored with 18 borings in proximity to the locations shown on the boring plan in Appendix A. The boring locations and numbers were selected by the client. Elevations of the boring were not provided.

The borings were drilled and sampled to approximate depths ranging from 3 to 70 ft. The shallow depth borings were generally along the approach fills while the deeper borings were drilled along the proposed bridge crossing. The borings were drilled using a truck mounted CME 55 rotary drill rig. Soil samples were obtained from the borings during the drilling process using standard penetration, split-barrel sampling techniques (ASTM D 1586). Sample depths are indicated on the attached boring logs in Appendix B.

The drill crew prepared field logs of the materials encountered during drilling. The field logs represent the conditions observed at the time of the exploration. The field logs have been edited to incorporate the results of laboratory test data.

Field samples obtained from the borings were returned to our laboratory where they were visually classified and logged. The laboratory tests consisted of unconfined compressive strength, moisture, density and Atterberg limits testing, in substantial compliance with ASTM Procedures. The test results were utilized in the development of the geotechnical recommendations.

3.1 LABORATORY TESTING PROGRAM

Laboratory testing was performed on the soil samples to estimate pertinent engineering and index properties of the materials. Results of the laboratory tests are presented in Appendix B and on the boring logs. The laboratory testing program consisted of the following:

- Visual classification (ASTM D 2488, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*)
- Moisture content tests (ASTM D 2216, *Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass*)
- Atterberg limits tests (ASTM D 4318, *Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils*)

4.0 SUBSURFACE CONDITIONS

KCTE has explored the subsurface conditions of the project site at selected boring locations that represent future bridge and roadway construction. The following sections describe the findings of our field exploration, laboratory testing and visual classification of the field samples.

The site is situated in highly weathered cherty limestone and clay strata. The stratigraphy at this site is made up of Mississippian age Burlington-Keokuk formation. Deep weathering profile of the parent material has resulted in cherty limestone/dolomite residuum consisting of alternating bands of cherty gravel and sand size particles and clay with bands of layered cherty limestone. Most borings encountered multiple layers of weathered cherty limestone measuring from a few inches to up to 2 feet thick, but not in sufficient thickness or lateral extent to be identified as bedrock.

This section presents a general summary of the materials encountered in the borings. Specific subsurface conditions encountered at the boring locations are presented on the respective boring logs in Appendix B. The stratification lines shown on the logs represent the approximate boundaries between material types; in many cases the transitions have been estimated.

4.1 SOIL STRATA

Stratum	Depth	Description	Comment
Stratum 1	0-1 ft	Topsoil	Present in borings B-7, B-9 and B-10
Stratum 2	0-8 ft	Asphalt Pavement/Subbase	Present in all boring except B-7,9,10
Stratum 3	0-17 ft	FILL	Present in borings B-1 and CB-3
Stratum 4	1.5-30 ft	SC Clayey Sand with Gravel Medium Dense to Very Dense	Present in all borings except B-1,4,6,7,8 CB-3,5,10
Stratum 5	2-70 ft	GC Clayey Gravel with Sand Medium Dense to Very Dense	Present in all borings except B-1,2,3,5 CB-3
Stratum 6	8-9 ft	GW Well Graded Gravel with Sand Medium Dense	Present in borings B-1

Stratum 7	1.5-17 ft	CL Sandy Lean Clay Soft to Very Stiff	Present in borings B-1,4 CB-1,4,5,7,9,10
-----------	-----------	--	---

The soils that were encountered typically consisted of topsoil or asphalt pavement and subbase overlying residuum, clayey sands with gravel, sandy clays with gravel, and clayey gravels with sand. Sampler refusal typically occurred weathered cherty limestone layers.

The blow counts or “N” number from the field split spoon testing indicate this material is of soft to medium stiff nature and characteristics are clay like with high cherty gravel content. The high blow count N in the clayey gravel deposits is generally misleading due to the presence of gravel that present high resistance to the split spoon sampler.

4.2 BEDROCK OBSERVATIONS

Bedrock was not encountered within the drilling depths of 70 ft. Multiple thin layers of cherty limestone were encountered in the borings.

4.3 GROUNDWATER OBSERVATIONS

Groundwater was not observed in all borings. Water was used typically as the flushing medium and masked ground water levels. Water level across the site should be approximately at the water elevation of Kelly Creek. The natural moisture contents of the clayey deposits, as high as 40%, the subsurface soils are very high in moisture content.

Our observations are based on the conditions encountered only at the actual boring locations at the time of drilling. Due to the low permeability of the clay soils encountered in the borings, a relatively long period of time may be required for a groundwater level to develop and stabilize in a borehole. Long term observations in piezometers or observation wells may be required to define groundwater levels in these materials or at this site.

Also, it should be understood that the level of groundwater might fluctuate at other times of the year depending upon climatic and rainfall conditions, and river elevations. Groundwater levels may be different during construction or at other times during the life of the project.

5.0 ANALYSIS AND RECOMMENDATIONS

The site conditions indicate that the Kelly Creek channel is flowing on a weathered rock. The creek is approximately 15 feet beneath the existing roadway. The elevation of the Kelly Creek is approximately at EL 1320 ft. and the existing Chapell Roadway is approximately at El 1335. The proposed embankments fills at the end bends will be on the order of 25 feet. It is anticipated that a new three span bridge will be constructed at this site.

Scour at this site should not be of concern as the creek channel will be contained. The existing box will be extended beyond the proposed fill limits.

We understand driven H-piles will be the preferred foundation type. There will likely be some construction difficulty in driving H-piles due to presence of gravel and thin layers of cherty limestone in the clayey deposits unless means such as pre-drilling and driving shoes at the tip of the pile are adopted.

Alternatively, a foundation system of drilled shafts cast in place can be adopted. For the abutment pile foundations, there will be additional concern of downdrag forces due to the settlements of foundation soil under the approach fills.

5.1 DRIVEN PILES

The driven piles draw their capacity from the side friction and bearing at the tip of the pile. The H-piles are low displacement piles while pipe piles (closed end) are displacement piles. Due to presence of cherty gravel in the soil deposits, it is recommended to use low displacement H-piles. The cherty gravel present in the subsurface soils, driving of H-pile would be hard and likely damage to the driving tip of the pile would occur. It is therefore recommended to use driving shoes as a tip point reinforcement for H-piles. Also, from the subsurface information the upper 15 feet approximately present varying soil type and consistency. In order to ensure sufficient length of friction piles, we recommend that upper fifteen feet of H-piles be installed through pre-drilled holes. After the pile installations the annular space between the pile and the surrounding soil should be filled with bentonite slurry. The piles in the abutments should also be predrilled through the embankment fill and annular space backfilled with flowable sand. We have computed the **unit skin frictions**, q_s , the **tip unit resistance**, q_t for depth intervals as shown in the table below. These capacity estimates were computed at three boring locations, CB2, CB-4 and CB-6. In order to estimate the capacity of a single pile, the unit skin friction q_s is to be multiplied by the perimeter area of pile in contact with the particular layer. The cumulative capacity is the sum of friction capacities of each layer. Note that these values are ultimate (nominal) and an appropriate **Factor of Safety** should be applied to the ultimate capacity. Similarly the tip resistance is computed by multiplying the q_t value with the area of the pile tip. Due to compact and dense nature of the deposits there will unlikely be formation of any plug in the H-section of the steel pile. Caution should be exercised during pile driving so that the maximum stress at the tip of the steel pile does exceed 12 ksi.

Note that these values are ultimate (nominal) and an appropriate **Factor of Safety** should be applied to the ultimate capacity. It is customary to apply a factor of safety of 3 for design based on field drilling SPT blow counts. However, if load tests or PDA (Pile Driving Analyzer) test are performed in the field proving the capacities are met then the factor safety can be reduced to 2.5. For Load Reduction Factor design, we recommend a Resistance Factor of 0.5 and a Performance Factor of 0.85

Estimate of H-pile capacities

Boring	Depths					
	0-15' Predrilled		15'-30'		30'-60'	
	q_s , unit skin friction (psf)	q_t , unit tip resistance (psf)	q_s , unit skin friction (psf)	q_t , unit tip resistance (psf)	q_s , unit skin friction (psf)	q_t , unit tip resistance (psf)
CB-2	0	0	950	18,000	1550	30,000
CB-4	0	0	1200	24,000	1550	30,000
CB-6	0	0	1060	14,000	1550	30,000

For piles end bearing in bedrock designed in accordance with the above recommendations, the anticipated settlements (other than elastic shortening of the pile) will be negligible, less than 1/2 inch. For friction piles settlements on the order of 1/2 inch should be considered in the design.

We understand the roadway grades will be raised, and given the approach fill depths we anticipate significant down drag on the abutment piles.

5.2 DRILLED SHAFTS

A system of drilled shafts foundation is also feasible for the bridge structure at this site. Since no free-flowing ground water was encountered in our borings, a dry method of constructing drilled shafts would be applicable. Some sandy layers have high moisture content and may carry limited amount of free water. We do not anticipate caving during drilled shaft construction.

The subsoils are essentially cohesive soils at the proposed bridge site. The ultimate capacities of drilled shafts in clays are usually governed by the conditions at the end of construction. Therefore, drilled shafts in cohesive materials are usually designed for total stress conditions (undrained strength). The shaft resistance is controlled by the relationship of the adhesion between the drilled shaft and the clays to the undrained shear strength of the clay. We have estimated the unit side friction and the unit end bearing for drilled shafts at this site, as shown in the table below. The undrained shear strengths used in the analyses are based on the SPT blow counts obtained during our field exploration. Note that these values are ultimate (nominal) and an appropriate **Factor of Safety** should be applied to the ultimate capacity. It is customary to apply a factor of safety of 3 for design based on field drilling SPT blow counts.

Also please note that the upper 5 ft and the bottom 1x diameter of the drilled shaft lengths are considered non-contributing in computing side friction resistance. Portions of the drilled shafts through any new embankment should also be considered non-contributing in the side resistance,

Estimate of Drilled Shaft capacities

Boring	Depths					
	5-15'		15'-30'		30'-60'	
	q _s , unit skin friction (psf)	q _t , unit tip resistance (psf)	q _s , unit skin friction (psf)	q _t , unit tip resistance (psf)	q _s , unit skin friction (psf)	q _t , unit tip resistance (psf)
CB-2	2060	18000	950	18,000	1550	30,000
CB-4	2370	20000	1200	24,000	1550	30,000
CB-6	2080	18000	1060	18,000	1550	30,000

5.3 GROUP EFFECT

To minimize group effect of piles for groups of friction piles, the spacing should be $5 \times \text{Diameter}$ (D) of the pile. For groups of drilled shafts in clays where the pile cap is in contact with the subgrade, the group of shafts will behave as a unit consisting of the shafts together with block of soil contained within the shafts. Since pile caps firm contact with the subgrade, in the long run, can not be ensured, the individual capacity of drilled shaft should be multiplied by an efficiency factor, η , where $\eta=0.7$ for a center-to-center spacing of $3D$ and $\eta=1.0$ for spacing of $6D$.

5.4 DOWNDRAG

The approach fills near the abutments are going to be on the order of 20 feet. The subsurface soils are at depths of stiff consistency; however, the clay content is of high plasticity and is somewhat compressible under excessive loading. It is likely that the upper crust of the subsoils will behave like an overconsolidated strata due weathering and desiccation. Due to high chert gravel contents, it is difficult to obtain an undisturbed sample of the clays. No laboratory consolidation test data could thus be performed on an undisturbed soil sample. Based on the index properties of the soils an embankment loading of 20 ft could cause foundation soils to settle due to consolidation in the long term. The magnitude of settlement could be as high as 3 to 5 inches. This settlement is anticipated to occur within the upper 30 feet of the foundation soils, The settlement of this surrounding soil would affect the skin resistance of the pile and result in settlement of the pile unless the pile length below the settling layers is designed to withstand the additional load of the settling embankment. This additional loading is referred to as downdrag load or negative skin friction. At this site, taking the mid height of the upper 30 ft layer additional down drag or negative unit skin friction is estimated as 800 psf. A 30 ft thick settling layer thus could add load to the single pile equal to $800(\text{psf}) \times \text{pile-perimeter}(\text{ft}) \times 30(\text{ft})$ in lbs. If pre-drilling to a depth of 15 ft for pile installation is used, and the annulus is filled with bentonite slurry then the downdrag load can be reduced by half.

5.5 SEISMICITY

The bridge site lies in a low seismic hazard area. In accordance with the AASHTO design guidelines , the site is classified as "Site Class C". For a latitude of 30.41°N and a longitude of 94.91°W , an AASHTO seismic design spectrum at the Site Class B/C zone is shown below in Figure 5. For a 7% probability of exceedance in 75 years, the site-specific design parameters are given below:

Site Class C
SDs =0.065
SD1 =0.042

Site Coefficients: $F_{pga} = 1.2$
 $F_a = 1.2$
 $F_v = 1.7$

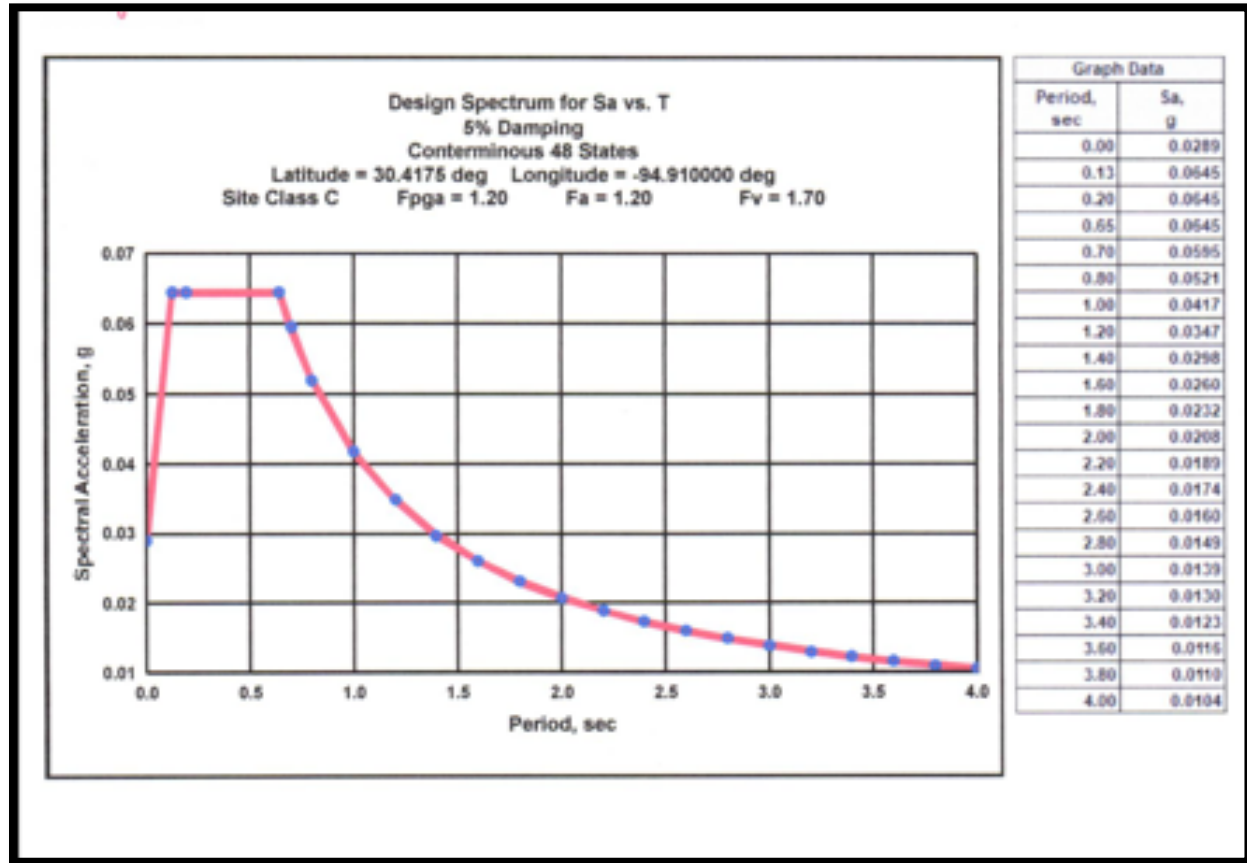


FIGURE 1. AASHTO SEISMIC DESIGN SPECTRUM

5.5.1 LIQUIFACTION POTENTIAL

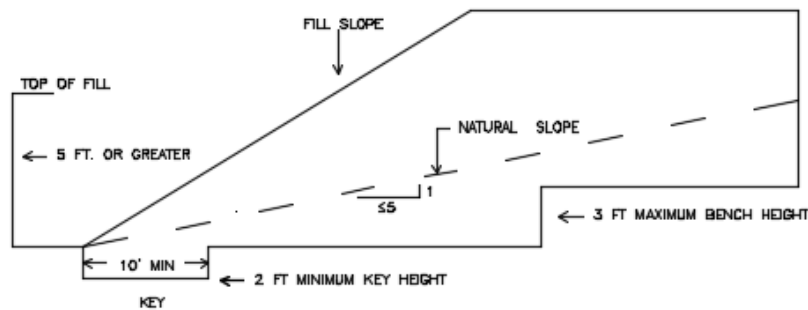
From the subsurface information there is a low potential for liquefaction during seismic activities at this site. There are some thin layers of saturated sands within the upper zones of the overburden deposits. However, we believe due to confinement and a low seismic hazard there exists a very low liquefaction potential in these thin layers.

5.6 SITE PREPARATION

KCTE recommends complete removal of unsuitable material (Strata 1 and 2) in roadways and bridge location prior to controlled fill placement. These materials should be removed and disposed of off-site or used in green spaces.

All natural slopes in soil steeper than 5 horizontal to 1 vertical (5H:1V) in areas to receive fill greater than 5 ft., should be benched prior to placement of fill. The benching of slopes allows interlocking of the fill and the natural soils, and in addition provides a level platform for the compaction of the fill. Benches should be cut as the fill progresses, and bench heights should be restricted to a maximum of 3 ft. with a minimum 2 ft. cut for keying of fill into the natural slope. The benches should have a minimum width of 4.5 ft. and the key should be a minimum of 10ft wide. KCTE

recommends fill slopes constructed no steeper than a 3H:1V for maintenance and promoting the growth of vegetation.



Recommended Benching Procedures

After the existing soil subgrade is excavated to the proposed subgrade level, the exposed material should be observed by a representative of the geotechnical engineer. The subgrade should be proof-rolled with a loaded tandem-axle dump truck, typically with an axle load of a minimum of 9 tons. Soft zones that are observed to rut or deflect excessively (typically greater than 1 inch) under the moving load during a proof-roll test should be undercut and replaced with properly compacted fill or stabilized in place. In place stabilization could be performed by moisture conditioning and recompaction. Alternately, soft soil could be removed and replaced with suitable on-site or off-site soil. The proof-rolling and undercutting activities should be observed by a representative of the geotechnical engineer and should be performed during a period of dry weather.

Subgrade soils should be dried, or moisture conditioned as necessary to achieve a moisture content in the range of -2 to 3% of the optimum moisture and compacted to at least 95% of the maximum dry density determined in accordance with the standard Proctor test (ASTM D698). The upper fine-grained soils encountered at this site may be sensitive to disturbances caused by construction traffic and changes in moisture content. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. In addition, soils that become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and subgrade preparation activities during dry weather.

5.7 CONTROLLED FILL

After subgrade preparation has been completed, fill placement may begin to establish construction grade. The first layer of fill material should be placed in a relatively uniform horizontal lift and be adequately keyed into the stripped and scarified subgrade soils. Fill materials should be free of organic or other deleterious material and have a maximum particle size less than 3 inches in any direction. The on-site soils may be suitable for reuse as engineered fill provided deleterious materials are removed prior to its use as engineered fill. A densely graded, crushed stone, equivalent to MoDOT Type 5 aggregate, is also acceptable as engineered fill material. All fill material should be unfrozen and be approved by the geotechnical engineer.

The geotechnical engineer should be notified at least 72 hours before fill is placed, to sample and test the material. No imported material should be delivered to the site without proper sampling

and testing. The fill material should be unfrozen and be approved by the geotechnical engineer prior to placement.

The fill material should be placed in loose lifts having a maximum thickness of 8 inches and compacted to at least 95% of the maximum dry density in accordance with ASTM D 698 at moisture contents between -2% and +3% of the optimum moisture content.

Backfill material over unsuitable soils (i.e., soft, wet, frozen, thawing, or spongy surface) or during unfavorable weather conditions should be prohibited. Where soil has been loosened or eroded by flooding or placement during rain, the damaged area should be removed and recompacted to the required density.

Backfilling of curbs and other structures whose foundation is unprotected from water should be accomplished as soon as the concrete has met the design strength and forms are removed to eliminate possibility of a loosened subbase below the structure.

Placement of soils may be difficult during wet weather conditions. If the native soils and imported soils are too wet and cannot be dried to near-optimum moisture within the construction schedule, they can be stabilized with the addition of lime or Portland cement to provide a stable subgrade material. As an alternate to stabilized subgrade, granular material may be placed at the site surface to provide a working platform. Stabilized soils may also be used for road embankment fill. Backfilling of curbs and other structures whose foundation is unprotected from water should be accomplished as soon as the concrete has met the design strength and forms are removed to eliminate possibility of a loosened subbase below the structure.

KCTE recommends observation and periodic testing of materials by the geotechnical engineer of record or their designated representative during the placement of fill and backfill material.

5.8 ROADWAY AND EMBANKMENT SUBGRADE CONSIDERATIONS

Material suitable for use in embankment fills and beneath roadways should conform to the requirements of MoDOT.

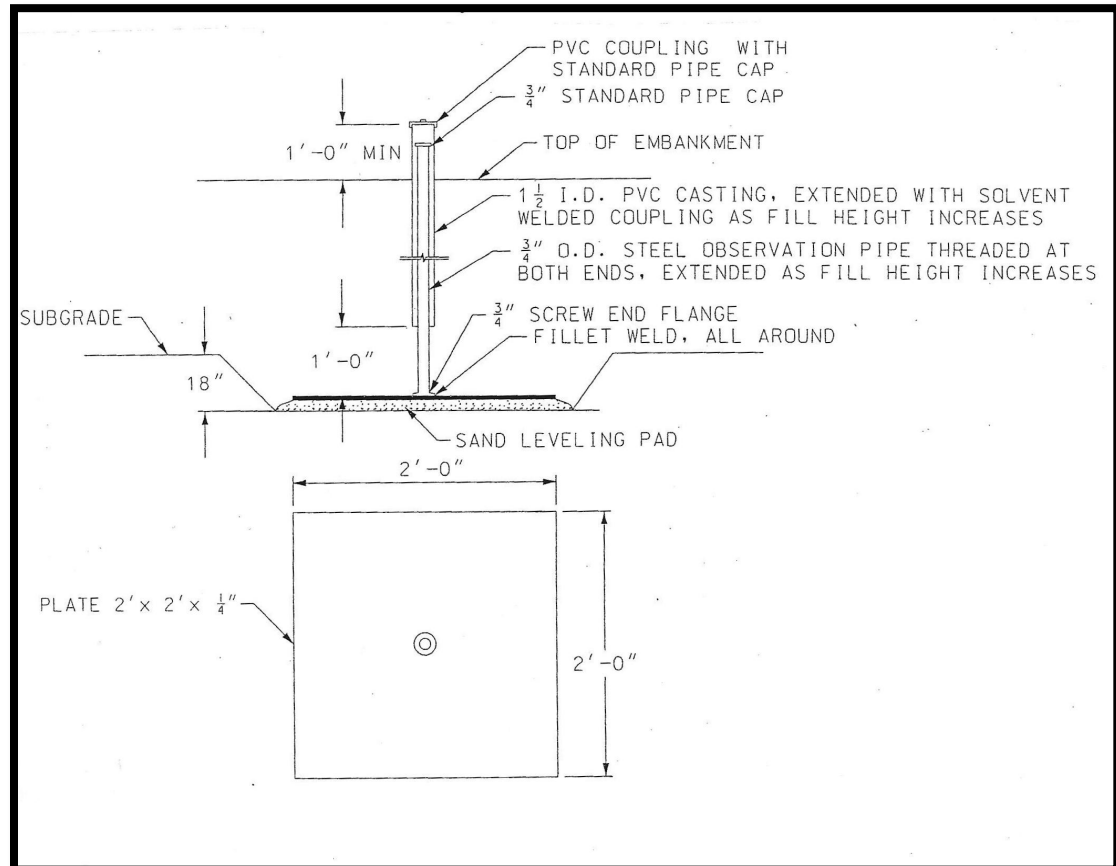
KCTE recommends the upper 24 inches of the subgrade below roadways should consist of a low volume change (LVC) material with a liquid limit (LL) less than 45 and a plasticity index (PI) below 23. The on-site materials do not consistently meet this requirement.

5.8.1 LOW VOLUME CHANGE MATERIAL

Soils or crushed stone used for the LVC layer should be tested prior to placement. Soil, if used should meet the requirements of (LVC) material with a liquid limit (LL) less than 45 and a plasticity index (PI) below 23. Crushed stone should be a well-graded stone similar in gradation MoDOT Type 5 aggregate. Compaction of low swell potential soil or crushed stone under the pavement should be to a minimum of 95 percent of the material's maximum dry density as determined by ASTM D 698 at a moisture content between 0 and +4 percent of the optimum.

5.8.2 SETTLEMENT PLATES

KCTE recommends settlement plates be installed to monitor settlement of the embankment fills. A minimum of 4 settlement plates, (2 at each abutment) should be installed in the upper 5 feet of the embankment fills. A period of up to 30 days or longer may be required to reach 90% consolidation as determined by time vs settlement plots. Construction may resume any time after 90% consolidation has occurred.



SETTLEMENT PLATES

5.9 DRAINAGE AND MAINTENANCE

Pavements should be sloped to provide rapid drainage of surface water. Water that is allowed to accumulate on or adjacent to pavements could saturate the subgrade and contribute to settlement or heave. KCTE recommends the installation of longitudinal perimeter drains. The drains should consist of at least 6" thick, clean aggregate column with a 4" inch minimum perforated pipe at the bottom. The pipes should be connected and allowed to daylight.

5.10 EXCAVATION AND TRENCHES

All temporary slopes and excavations should conform to Occupational Safety and Health Administration (OSHA) Standards for the Construction Industry (29 CFR Part 1026, Subpart P).

Excavations in the native soils should be possible with conventional excavation equipment. Excavation in bedrock is not anticipated at this project site. The contractor should review the boring logs to determine the appropriate method(s) for excavation at this site.

All excavations should be kept dry during subgrade preparation. Storm water runoff should be controlled and removed to prevent severe erosion of the subgrade and eliminate free standing water. Subgrade that has been rendered unsuitable from erosion or excessive wetting should be removed and replaced with controlled fill.

Trenches should be excavated so that pipes and culverts can be laid straight at uniform grade between the terminal elevations. Trench width should provide adequate working space and sidewall clearances. Trench subgrade should be removed and replaced with engineered fill if found to be wet, soft, loose, or frozen. The top 18 inches of trench backfill under roads should consist of crushed limestone with fines. (MoDOT Type 5) Trench subgrade should be compacted to a minimum of 95% of the maximum dry density in accordance with ASTM D 698 at moisture contents between -2% to +3% of the optimum moisture content. A representative of the geotechnical engineer should be on-site full-time during trench backfill operations to test each lift of fill material.

Granular bedding materials for pipes, such as well-graded sand or gravel, may be used provided that the bottom of the trench is graded so that water flows away from structure. Open-graded granular bedding may be used provided that a separation geotextile is used at the subgrade interface. Bedding material should be graded to provide a continuous support beneath all points of the pipe and joints. Embedment material should be deposited and compacted uniformly and simultaneous on each side of the pipe to prevent lateral displacement. Compacted engineered fill material will be required for the full depth of the trench above the embedment material. No backfill should be placed or compacted in standing water.

6.0 GENERAL COMMENTS

This report is presented in broad terms to provide an assessment of the subsurface conditions and their potential effect on the adequate design and economical construction of the proposed development. Any changes in the design or location of the proposed streets or utilities should be assumed to invalidate the conclusions and recommendations given in this report until we have had the opportunity to review the changes and, if necessary, modify our conclusions and recommendations accordingly. It is recommended that the geotechnical engineer be afforded the opportunity of a general review of the final design plans and specifications prior to construction in order to determine if they are consistent with the conclusions and recommendations given in this report. For this project, these geotechnical document review services will be provided as part of the geotechnical report cost. Particular details of foundation design, construction specifications or quality control may develop, and we would be pleased to respond to any questions that you may have regarding these details.

The scope of our services did not include any environmental assessment or investigation for the presence of hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site.

APPENDIX A

SITE AND BORING LOCATION MAPS



BORING LOCATION MAP





APPENDIX B

BORING LOGS AND LABORATORY DATA

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 11/17/22 09:59 - C:\USERS\KCTE\KANSAS CITY TESTING AND ENGINEERING LLC\KANSAS CITY TESTING & ENGINEERING - PROJECTS\G20-21-066 CHAPEL DR.



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER B-1

PAGE 1 OF 1

CLIENT	Anderson Engineering Inc.	PROJECT NAME	Chapell Dr. Monett
PROJECT NUMBER	G20-21-066	PROJECT LOCATION	Chapell Drive Over BNSF, Monett MO
DATE STARTED	10/5/22	COMPLETED	10/5/22
DRILLING CONTRACTOR	KCTE	GROUND ELEVATION	
DRILLING METHOD	CME 55, 3.25 HSA	HOLE SIZE	7 inches
LOGGED BY	JS	CHECKED BY	SC
NOTES			
GROUND WATER LEVELS:			
AT TIME OF DRILLING		---	
AT END OF DRILLING		---	
AFTER DRILLING		---	

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
								20	40	60	80
0.0		ASPHALT (4") AND CRUSHED STONE SUBBASE (12")						□ FINES CONTENT (%) □			
								20	40	60	80
2.5		LEAN SANDY CLAY WITH GRAVEL (FILL)									
5.0			SPT 1	78	4-9-13 (22)						
7.5											
		ASPHALT @ 8 FT (GW) WELL GRADED GRAVEL with Sand	SPT 2	33	5-6-7 (13)						
10.0		WEATHERED THIN BEDDED CHERTY LIMESTONE LAYERS WITH SANDY CLAY/CLAYEY SAND/GRAVEL									
		(GC) Clayey Gravel with Sand									
		Auger Refusal at 11 ft. in Weathered Cherty Limestone									

Bottom of borehole at 11.0 feet.



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER B-2

PAGE 1 OF 1

CLIENT Anderson Engineering Inc.

PROJECT NUMBER G20-21-066

DATE STARTED 10/5/22 COMPLETED 10/5/22

DRILLING CONTRACTOR KCTE

DRILLING METHOD CME 55, 3.25 HSA

LOGGED BY JS CHECKED BY SC

NOTES

PROJECT NAME Chapell Dr. Monett

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

GROUND ELEVATION _____ HOLE SIZE 7 inches

GROUND WATER LEVELS:
AT TIME OF DRILLING ---
AT END OF DRILLING ---
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0.0								20	40	60	80
		ASPHALT (4") AND CRUSHED STONE SUBBASE (14")									
		WEATHERED THIN BEDDED CHERTY LIMESTONE LAYERS WITH SANDY CLAY/CLAYEY SAND/GRAVEL									
2.5	△ △ △ △ △ △ △ △ △ △	(SC) Clayey Sand with Gravel									
		Auger Refusal at 4ft in Weathered Cherty Limestone Layer	SPT 1	100	50/1"						

Bottom of borehole at 4.0 feet.



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER B-3

PAGE 1 OF 1

CLIENT Anderson Engineering Inc.

PROJECT NAME Chapell Dr. Monett

PROJECT NUMBER G20-21-066

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

DATE STARTED 10/5/22

COMPLETED 10/5/22

GROUND ELEVATION _____ HOLE SIZE 7 inches

DRILLING CONTRACTOR KCTE

GROUND WATER LEVELS:

DRILLING METHOD CME 55, 3.25 HSA

AT TIME OF DRILLING ---

LOGGED BY JS

CHECKED BY SC

AT END OF DRILLING ---

NOTES

AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0.0								20	40	60	80
		ASPHALT (4") AND CRUSHED STONE SUBBASE (11")									
		WEATHERED THIN BEDDED CHERTY LIMESTONE LAYERS WITH SANDY CLAY/CLAYEY SAND/GRAVEL									
2.5											
		(SC) Clayey Sand with Gravel	SPT 1	61	5-9-15 (24)						
5.0		Auger Refusal at 7.5 ft in Weathered Cherty Limestone									
7.5		Bottom of borehole at 7.5 feet.	SPT 2		50/0"						



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER B-4

PAGE 1 OF 1

CLIENT Anderson Engineering Inc.

PROJECT NAME Chapell Dr. Monett

PROJECT NUMBER G20-21-066

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

DATE STARTED 10/4/22

COMPLETED 10/4/22

GROUND ELEVATION

HOLE SIZE 7 inches

DRILLING CONTRACTOR KCTE

GROUND WATER LEVELS:

DRILLING METHOD CME 55, 3.25 HSA

AT TIME OF DRILLING ---

LOGGED BY JS

CHECKED BY SC

AT END OF DRILLING ---

NOTES

AFTER DRILLING ---

[illegible]

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 11/17/22 09:59 - C:\USERS\KCTE\KANSAS CITY TESTING AND ENGINEERING LLC\KANSAS CITY TESTING & ENGINEERING - PROJECTS\2.0 ACTIVE PROJECTS\2021\4.0 GEO PROJECTS\G20-21-066 CHAPEL DR.



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER B-5

PAGE 1 OF 1

CLIENT Anderson Engineering Inc.

PROJECT NUMBER G20-21-066

DATE STARTED 10/4/22 COMPLETED 10/4/22

DRILLING CONTRACTOR KCTE

DRILLING METHOD CME 55, 4.25 HSA

LOGGED BY JS CHECKED BY SC

NOTES _____

PROJECT NAME Chapell Dr. Monett

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

GROUND ELEVATION _____ HOLE SIZE 8 inches

GROUND WATER LEVELS:
AT TIME OF DRILLING ---
AT END OF DRILLING ---
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
0.0								20	40	60	80
		ASPHALT (3) AND CRUSHED STONE SUBBASE (9)									
	△ △	WEATHERED THIN BEDDED CHERTY LIMESTONE LAYERS									
	△ △	WITH SANDY CLAY/CLAYEY SAND/GRAVEL									
	△ △	Sampler Refusal at 1 ft in Cherty LS									
2.5	△ △										
	△ △	Auger Refusal @ 3ft.	SPT 1	0	50-0/0"						
	△ △										

Bottom of borehole at 3.0 feet.

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 11/17/22 09:59 - C:\USERS\KCTE\KANSAS CITY TESTING AND ENGINEERING LLC\KANSAS CITY TESTING & ENGINEERING - PROJECTS\2021\4.0 GEO PROJECTS\G20-21-066 CHAPEL DR.



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER B-6

PAGE 1 OF 1

CLIENT Anderson Engineering Inc.

PROJECT NUMBER G20-21-066

DATE STARTED 10/4/22 COMPLETED 10/4/22

DRILLING CONTRACTOR KCTE

DRILLING METHOD CME 55.4.25 HSA

LOGGED BY JS CHECKED BY SC

NOTES

PROJECT NAME Chapell Dr. Monett

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

GROUND ELEVATION _____ HOLE SIZE 8 inches

GROUND WATER LEVELS:
AT TIME OF DRILLING ---
AT END OF DRILLING ---
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
								20	40	60	80
□ FINES CONTENT (%) □											
20 40 60 80											
0		ASPHALT (3) AND CRUSHED STONE SUBBASE (9)									
5		WEATHERED THIN BEDDED CHERTY LIMESTONE LAYERS WITH SANDY CLAY/CLAYEY SAND/GRAVEL	SPT 1	50	4-4-5 (9)						
		(SC) Red Brown Clayey Sand with Chert Gravel	SPT 2	100	4-5-6 (11)						
10		(SC) Red Brown Clayey Sand with Chert Gravel	SPT 3	100	5-10-10 (20)						
15		(GC) Clayey Gravel with Sand	SPT 4	56	12-15-12 (27)						
20		(SC) Red Brown Clayey Sand with Chert Gravel	SPT 5	100	7-9-9 (18)						
25		(SC) Red Brown Clayey Sand with Chert Gravel	SPT 6	50	8-8-9 (17)						

Bottom of borehole at 26.0 feet.

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 11/17/22 09:59 - C:\USERS\KCTE\KANSAS CITY TESTING AND ENGINEERING LLOKANSAS CITY TESTING & ENGINEERING - PROJECTS\2.0 ACTIVE PROJECTS\2021\4.0 GEO PROJECTS\G20-21-066 CHAPEL DR.



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER B-7

PAGE 1 OF 1

CLIENT Anderson Engineering Inc.

PROJECT NUMBER G20-21-066

DATE STARTED 10/4/22 COMPLETED 10/4/22

DRILLING CONTRACTOR KCTE

DRILLING METHOD CME 55, 4.25 HSA

LOGGED BY JS CHECKED BY SC

NOTES _____

PROJECT NAME Chapell Dr. Monett

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

GROUND ELEVATION _____ HOLE SIZE 8 inches

GROUND WATER LEVELS:
AT TIME OF DRILLING ---
AT END OF DRILLING ---
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20 40 60 80			
								PL MC LL			
								20 40 60 80			
								□ FINES CONTENT (%) □			
								20 40 60 80			
0.0		ASPHALT (3) AND CRUSHED STONE SUBBASE (9)									
	Δ Δ	WEATHERED THIN BEDDED CHERTY LIMESTONE LAYERS WITH SANDY CLAY/CLAYEY SAND/GRAVEL		33	20-21-25 (46)						
	Δ Δ										
	Δ Δ										
	Δ Δ										
	Δ Δ										
2.5	Δ Δ										
	Δ Δ										
	Δ Δ										
	Δ Δ										
	Δ Δ										
	Δ Δ	(GC) Clayey Gravel with Sand Auger Refusal at 4 ft in Weathered Cherty LS	SPT 2		50/0"						

□ FINES CONTENT (%) □

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 11/17/22 09:59 - C:\USERS\KCTE\KANSAS CITY TESTING AND ENGINEERING LLC\KANSAS CITY TESTING & ENGINEERING - PROJECTS\20 ACTIVE PROJECTS\2021\4.0 GEO PROJECTS\G20-21-066 CHAPELL DR.



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER B-8

PAGE 1 OF 1

CLIENT Anderson Engineering Inc.

PROJECT NUMBER G20-21-066

DATE STARTED 10/4/22

COMPLETED 10/4/22

DRILLING CONTRACTOR KCTE

DRILLING METHOD CME 55, 4.25 HSA

LOGGED BY JS

CHECKED BY SC

NOTES

PROJECT NAME Chapell Dr. Monett

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

GROUND ELEVATION

HOLE SIZE 8 inches

GROUND WATER LEVELS:

AT TIME OF DRILLING ---

AT END OF DRILLING ---

AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL MC LL			
0.0								20	40	60	80
		ASPHALT (3) AND CRUSHED STONE SUBBASE (9)									
	▲ ▲	WEATHERED THIN BEDDED CHERTY LIMESTONE LAYERS WITH SANDY CLAY/CLAYEY SAND/GRAVEL									
	▲ ▲										
	▲ ▲										
	▲ ▲										
2.5	▲ ▲										
	▲ ▲										
	▲ ▲										
	▲ ▲										
	▲ ▲										
	▲ ▲										
	▲ ▲	(GC) Clayey Gravel With Sand, Dense	SPT 1	72	11-22-23 (45)						
5.0	▲ ▲	Auger Refusal at 6 ft in Weathered Cherty LS									
	▲ ▲										
	▲ ▲										
	▲ ▲										

Bottom of borehole at 6.0 feet.

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 11/17/22 09:59 - C:\USERS\KCTE\KANSAS CITY TESTING AND ENGINEERING LLC\KANSAS CITY TESTING & ENGINEERING - PROJECTS\G20-21-066 CHAPEL DR.



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER CB-1

PAGE 1 OF 2

CLIENT Anderson Engineering Inc.

PROJECT NAME Chapell Dr. Monett

PROJECT NUMBER G20-21-066

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

DATE STARTED 10/10/22

COMPLETED 10/10/22

GROUND ELEVATION _____

HOLE SIZE 8 inches

DRILLING CONTRACTOR KCTE

GROUND WATER LEVELS:

DRILLING METHOD CME 55, 4.25 HSA, Casing Advancer

AT TIME OF DRILLING ---

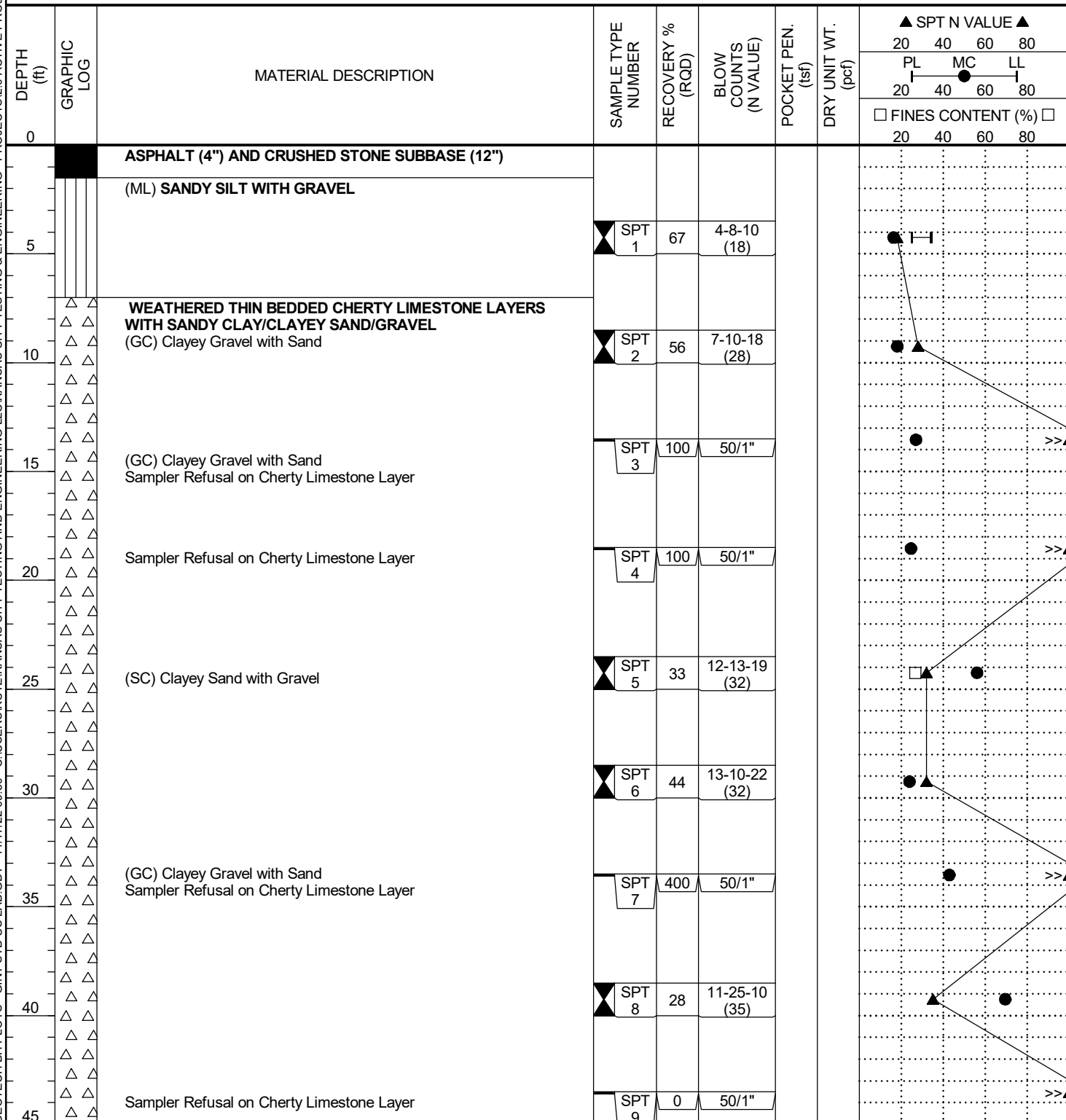
LOGGED BY JS

CHECKED BY SC

AT END OF DRILLING ---

NOTES _____

AFTER DRILLING ---



(Continued Next Page)



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER CB-1

PAGE 2 OF 2

CLIENT Anderson Engineering Inc.

PROJECT NAME Chapell Dr. Monett

PROJECT NUMBER G20-21-066

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

[illegible]

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 11/17/22 09:59 - C:\USERS\KCTE\KANSAS CITY TESTING AND ENGINEERING LLC\KANSAS CITY TESTING & ENGINEERING - PROJECTS\G20-21-066 CHAPEL DR.



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER CB-2

PAGE 1 OF 2

CLIENT Anderson Engineering Inc.

PROJECT NAME Chapell Dr. Monett

PROJECT NUMBER G20-21-066

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

DATE STARTED 10/12/22

COMPLETED 10/13/22

GROUND ELEVATION _____

HOLE SIZE 8 inches

DRILLING CONTRACTOR KCTE

GROUND WATER LEVELS:

DRILLING METHOD CME 55, 4.25 HSA, Casing Advancer

AT TIME OF DRILLING ---

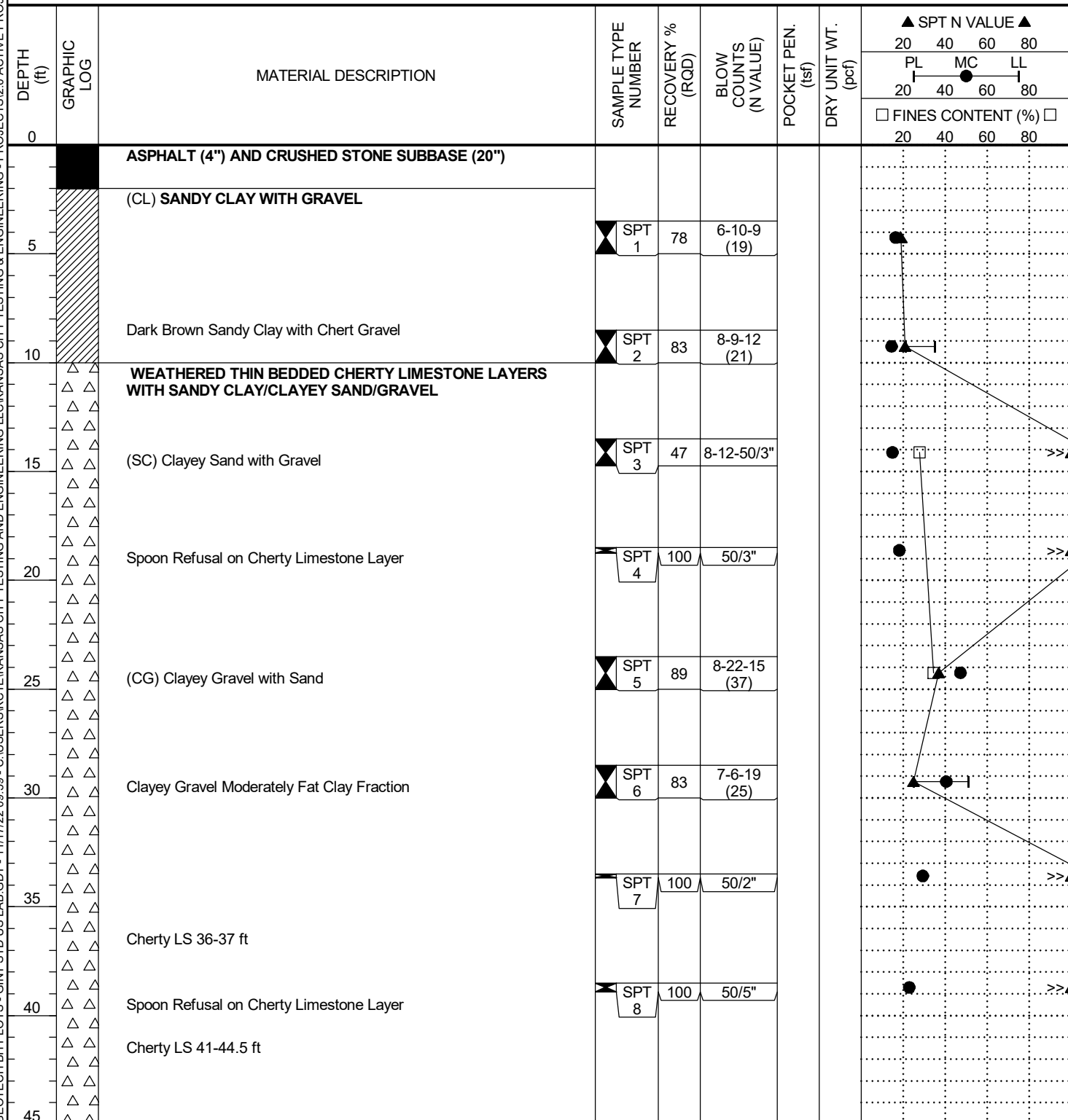
LOGGED BY JS

CHECKED BY SC

AT END OF DRILLING ---

NOTES _____

AFTER DRILLING ---



(Continued Next Page)



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER CB-2

PAGE 2 OF 2

CLIENT Anderson Engineering Inc.

PROJECT NAME Chapell Dr. Monett

PROJECT NUMBER G20-21-066

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

[illegible]



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER CB-3

PAGE 1 OF 1

CLIENT Anderson Engineering Inc.

PROJECT NAME Chapell Dr. Monett

PROJECT NUMBER G20-21-066

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

DATE STARTED 8/2/21 COMPLETED 8/2/21

GROUND ELEVATION _____ HOLE SIZE 7 inches

DRILLING CONTRACTOR KCTE

GROUND WATER LEVELS:

DRILLING METHOD CME 55 3.25 HSA,NQ

AT TIME OF DRILLING ---

LOGGED BY JS CHECKED BY LCR

AT END OF DRILLING ---

NOTES

AFTER DRILLING ---

[illegible]

Bottom of borehole at 33.0 feet.

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 11/17/22 10:00 - C:\USERS\KCTE\KANSAS CITY TESTING AND ENGINEERING LLC\KANSAS CITY TESTING & ENGINEERING - PROJECTS\2021\4.0 GEO PROJECTS\G20-21-066 CHAPEL DR.



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER CB-4

PAGE 1 OF 2

CLIENT Anderson Engineering Inc.

PROJECT NAME Chapell Dr. Monett

PROJECT NUMBER G20-21-066

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

DATE STARTED 10/7/22

COMPLETED 10/8/22

GROUND ELEVATION _____

HOLE SIZE 8 inches

DRILLING CONTRACTOR KCTE

GROUND WATER LEVELS:

DRILLING METHOD CME 55.4.25 HSA, Casing Advancer

AT TIME OF DRILLING ---

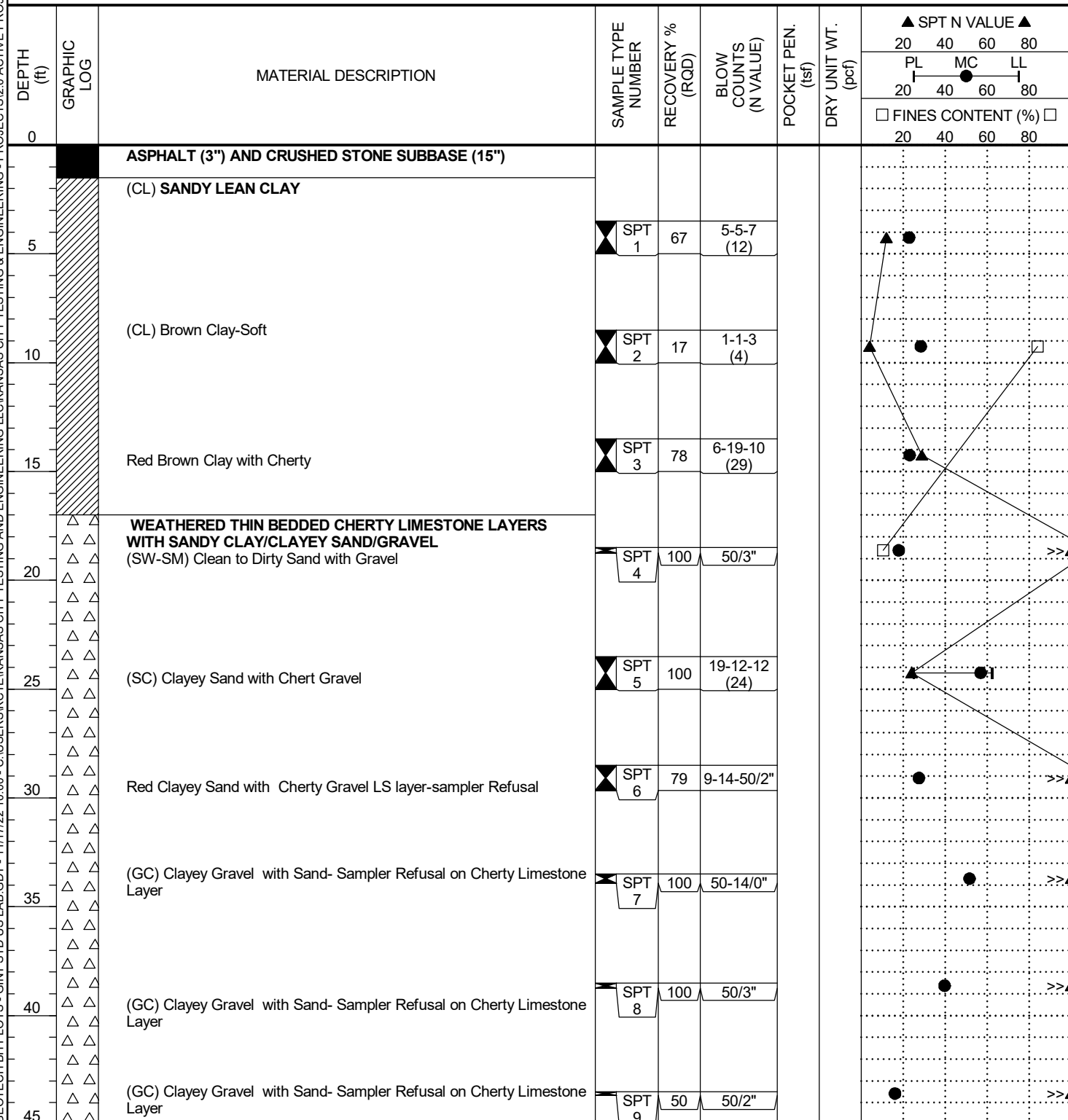
LOGGED BY JS

CHECKED BY SC

AT END OF DRILLING ---

NOTES _____

AFTER DRILLING ---



(Continued Next Page)



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER CB-4

PAGE 2 OF 2

CLIENT Anderson Engineering Inc.

PROJECT NAME Chapell Dr. Monett

PROJECT NUMBER G20-21-066

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
								20	40	60	80
								☐ FINES CONTENT (%) ☐			
								20	40	60	80
45											
	▲	WEATHERED THIN BEDDED CHERTY LIMESTONE LAYERS WITH SANDY CLAY/CLAYEY SAND/GRAVEL (continued)									
	▲										
	▲										
	▲										
	▲										
	▲										
50	▲										
	▲										
	▲										
	▲										
	▲										
	▲										
		(GC) Clayey Gravel with Sand- Sampler Refusal on Cherty Limestone Layer	SPT 10	0	50/1"						
Bottom of borehole at 53.7 feet.											

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 11/17/22 10:00 - C:\USERS\KCTE\KANSAS CITY TESTING AND ENGINEERING LLC\KANSAS CITY TESTING & ENGINEERING - PROJECTS\2021\4.0 GEO PROJECTS\G20-21-066 CHAPEL DR.



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER CB-5

PAGE 1 OF 1

CLIENT	Anderson Engineering Inc.	PROJECT NAME	Chapell Dr. Monett
PROJECT NUMBER	G20-21-066	PROJECT LOCATION	Chapell Drive Over BNSF, Monett MO
DATE STARTED	10/5/22	COMPLETED	10/5/22
DRILLING CONTRACTOR	KCTE	GROUND ELEVATION	
DRILLING METHOD	CME 55, 4.25 HSA, Mud Rotary	HOLE SIZE	8 inches
LOGGED BY	JS	CHECKED BY	SC
NOTES			
GROUND WATER LEVELS:		AT TIME OF DRILLING ---	
		AT END OF DRILLING ---	
		AFTER DRILLING ---	

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
								20	40	60	80
								20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
0		ASPHALT (3") AND CRUSHED STONE SUBBASE (15")									
		SANDY CLAY with GRAVEL									
		(SC) Clayey Sand with Gravel	▲ SPT 1	100	5-10-15 (25)						
5											
		WEATHERED THIN BEDDED CHERTY LIMESTONE LAYERS WITH SANDY CLAY/CLAYEY SAND/GRAVEL									
	△ △	Cherty Limestone layer at 7 ft	▲ SPT 2	78	5-9-12 (21)						
10	△ △	(SC) Clayey Sand with Gravel									
	△ △										
	△ △										
	△ △										
	△ △										
15	△ △	(SC) Clayey Sand with Gravel	▲ SPT 3	67	10-10-20 (30)						
	△ △										
	△ △										
	△ △										
	△ △										
20	△ △	(SC) Clayey Sand with Gravel	▲ SPT 4	39	5-10-10 (20)						
	△ △										
	△ △										
	△ △										
25	△ △	Cherty Limestone Layer at 23.5	▲ SPT 5	100	50/2"						
	△ △										
	△ △										
	△ △										
30	△ △	(SC) Red Brown Clayey Sand with Chert Gravel, Dense	▲ SPT 6	17	20-21-19 (40)						
	△ △										
	△ △										
	△ △										
35	△ △										
	△ △										
	△ △										
	△ △										
40	△ △	Red Brown Clayey Sand with Chert Gravel, Dense	▲ SPT 7	17	18-22-19 (41)						

Bottom of borehole at 40.0 feet.

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 11/17/22 10:00 - C:\USERS\KCTE\KANSAS CITY TESTING AND ENGINEERING LLC\KANSAS CITY TESTING & ENGINEERING - PROJECTS\20 ACTIVE PROJECTS\2021\4.0 GEO PROJECTS\G20-21-066 CHAPEL DR.



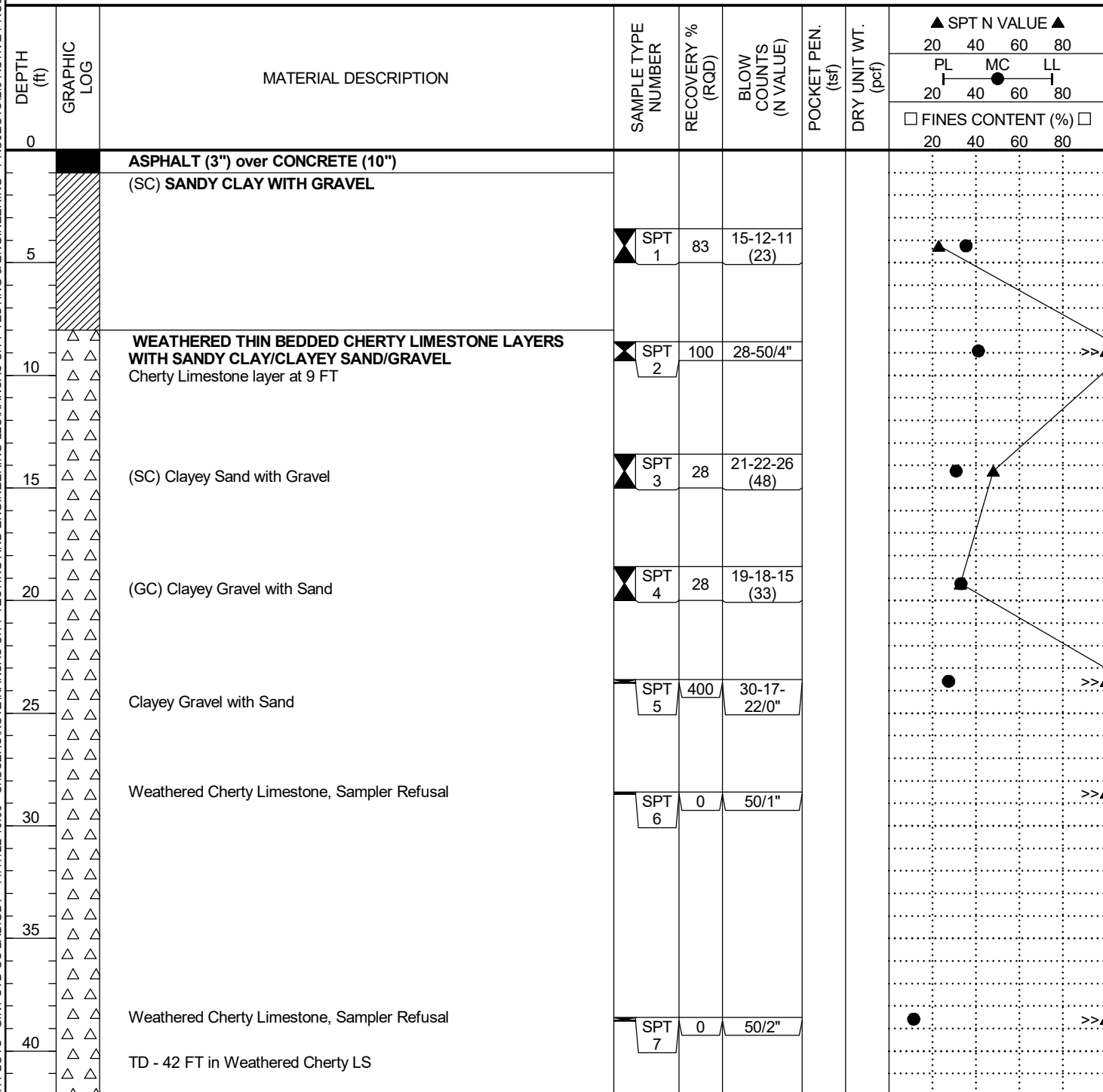
Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER CB-6

PAGE 1 OF 1

CLIENT Anderson Engineering Inc.
PROJECT NUMBER G20-21-066
DATE STARTED 10/6/22 **COMPLETED** 10/6/22
DRILLING CONTRACTOR KCTE
DRILLING METHOD CME 55, 4.25 HSA, Casing Advancer
LOGGED BY JS **CHECKED BY** SC
NOTES

PROJECT NAME Chapell Dr. Monett
PROJECT LOCATION Chapell Drive Over BNSF, Monett MO
GROUND ELEVATION **HOLE SIZE** 8 inches
GROUND WATER LEVELS:
AT TIME OF DRILLING ---
AT END OF DRILLING ---
AFTER DRILLING ---



Bottom of borehole at 42.0 feet.

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 11/17/22 10:00 - C:\USERS\KCTE\KANSAS CITY TESTING AND ENGINEERING LLC\KANSAS CITY TESTING & ENGINEERING - PROJECTS\20 ACTIVE PROJECTS\2021\4.0 GEO PROJECTS\G20-21-066 CHAPEL DR.



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER CB-7

PAGE 1 OF 1

CLIENT	Anderson Engineering Inc.	PROJECT NAME	Chapell Dr. Monett
PROJECT NUMBER	G20-21-066	PROJECT LOCATION	Chapell Drive Over BNSF, Monett MO
DATE STARTED	8/3/21	COMPLETED	8/4/21
GROUND ELEVATION		HOLE SIZE	8 inches
DRILLING CONTRACTOR	KCTE	GROUND WATER LEVELS:	
DRILLING METHOD	CME 55, 4.25 HSA, Mud Rotary	AT TIME OF DRILLING	---
LOGGED BY	JS	CHECKED BY	LCR
NOTES		AT END OF DRILLING	---
		AFTER DRILLING	---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
								20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
0		Topsoil									
		(SC) SANDY CLAY with Gravel	▲ SPT 1	28	5-4-5 (9)						
5			▲ SPT 2	56	6-5-7 (12)						
10		WEATHERED THIN BEDDED CHERTY LIMESTONE LAYERS WITH SANDY CLAY/CLAYEY SAND/GRAVEL	▲ SPT 3	56	7-7-10 (17)						
		(SC) Clayey Sand with Gravel									
15		(SC) Clayey Sand with Gravel	▲ SPT 4	56	13-12-9 (21)						
20		(CH) Sandy Fat Clay	▲ SPT 5	56	5-4-6 (10)						
25		(GW-GC) Clean to Dirty Gravel with Sand	▲ SPT 6	11	33-19-6 (25)						
30		Clayey Gravel with Sand	▲ SPT 7	6	8-16-19 (35)						
35			▲ SPT 8	17	10-14-21 (35)						

Clayey Gravel with Sand
Bottom of borehole at 35.0 feet.

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 11/17/22 10:00 - C:\USERS\KCTE\KANSAS CITY TESTING AND ENGINEERING LLC\KANSAS CITY TESTING & ENGINEERING - PROJECTS\G20-21-066 CHAPEL DR.



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER CB-8

PAGE 1 OF 2

CLIENT Anderson Engineering Inc.

PROJECT NAME Chapell Dr. Monett

PROJECT NUMBER G20-21-066

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

DATE STARTED 10/13/22

COMPLETED 10/14/22

GROUND ELEVATION _____

HOLE SIZE 8 inches

DRILLING CONTRACTOR KCTE

GROUND WATER LEVELS:

DRILLING METHOD CME 55, 4.25 HSA, Casing Advancer

AT TIME OF DRILLING ---

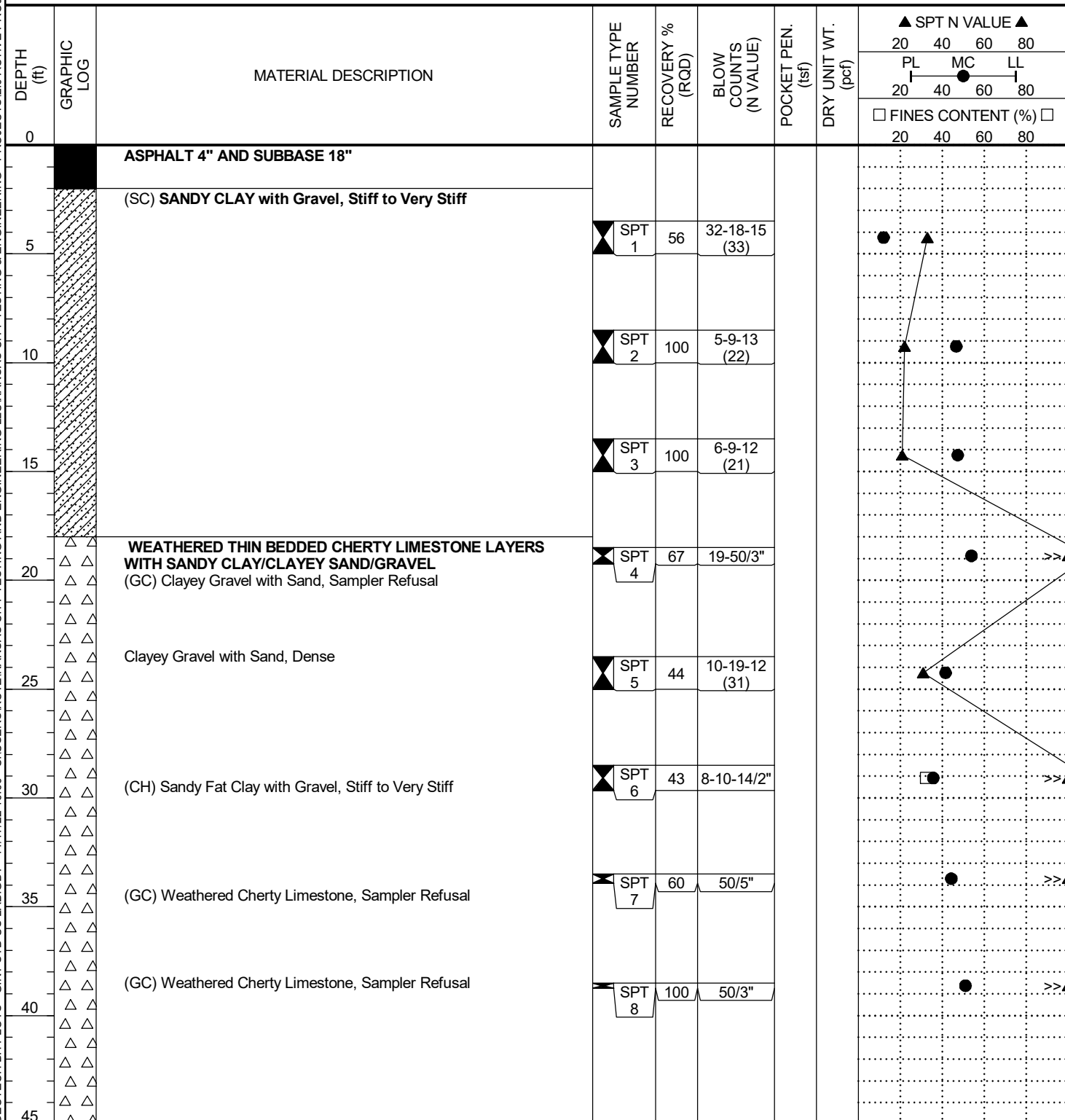
LOGGED BY JS

CHECKED BY SC

AT END OF DRILLING ---

NOTES _____

AFTER DRILLING ---



(Continued Next Page)



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER CB-8

PAGE 2 OF 2

CLIENT Anderson Engineering Inc.

PROJECT NAME Chapell Dr. Monett

PROJECT NUMBER G20-21-066

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲		
								20 40 60 80		
								PL	MC LL	
								20 40 60 80	20 40 60 80	
								□ FINES CONTENT (%) □		
								20 40 60 80	20 40 60 80	
45										
	Δ Δ Δ	WEATHERED THIN BEDDED CHERTY LIMESTONE LAYERS WITH SANDY CLAY/CLAYEY SAND/GRAVEL (<i>continued</i>) Weathered Cherty Limestone, Sampler Refusal on Cherty Layer								
	Δ Δ Δ									
	Δ Δ Δ									
	Δ Δ Δ									
50	Δ Δ Δ			SPT 9	100	50/2"			●	>>▲
	Δ Δ Δ									
	Δ Δ Δ									
	Δ Δ Δ									
	Δ Δ Δ									
55	Δ Δ Δ									
	Δ Δ Δ									
	Δ Δ Δ									
	Δ Δ Δ									
	Δ Δ Δ									
	Δ Δ Δ									
	Δ Δ Δ									
60	Δ Δ Δ	Weathered Cherty Limestone With Sandy Clay, Sampler Refusal	✂ SPT 10	25	21-50/2"			●	>>▲	
	Δ Δ Δ									
	Δ Δ Δ									
	Δ Δ Δ									
	Δ Δ Δ									
	Δ Δ Δ									
	Δ Δ Δ									
	Δ Δ Δ									
	Δ Δ Δ									
65	Δ Δ Δ	Weathered Cherty Limestone, Spoon Refusal on Cherty Layer	SPT 11	100	50/1"			●	>>▲	
Bottom of borehole at 65.0 feet.										

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 11/17/22 10:00 - C:\USERS\KCTE\KANSAS CITY TESTING AND ENGINEERING LLC\KANSAS CITY TESTING & ENGINEERING - PROJECTS\G20-21-066 CHAPEL DR.



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER CB-9

PAGE 1 OF 2

CLIENT Anderson Engineering Inc.

PROJECT NAME Chapell Dr. Monett

PROJECT NUMBER G20-21-066

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

DATE STARTED 10/11/22

COMPLETED 10/12/22

GROUND ELEVATION _____

HOLE SIZE 8 inches

DRILLING CONTRACTOR KCTE

GROUND WATER LEVELS:

DRILLING METHOD CME 55, 4.25 HSA, Casing Advancer

AT TIME OF DRILLING ---

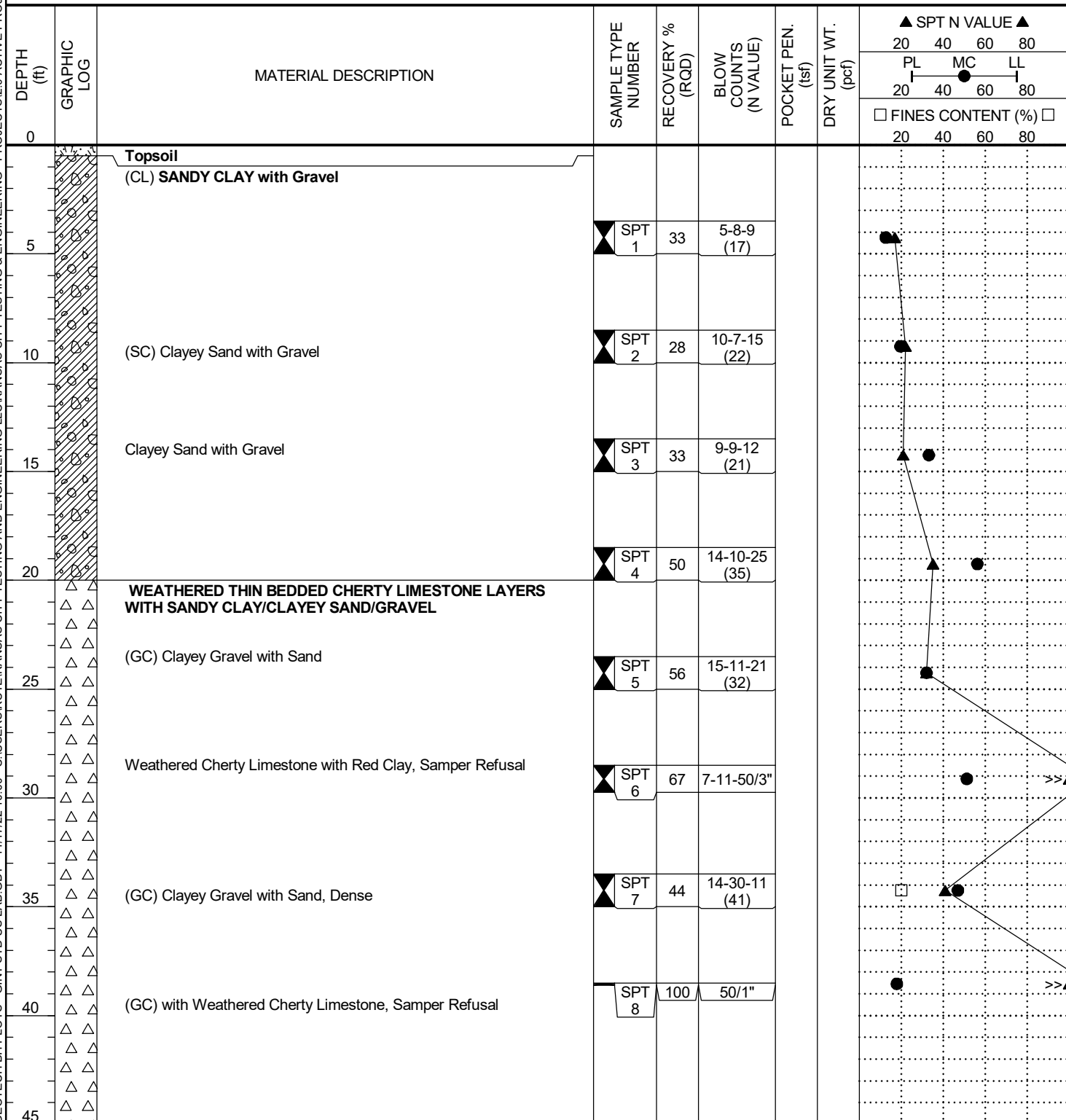
LOGGED BY JS

CHECKED BY SC

AT END OF DRILLING ---

NOTES _____

AFTER DRILLING ---



(Continued Next Page)



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER CB-9

PAGE 2 OF 2

CLIENT Anderson Engineering Inc.

PROJECT NAME Chapell Dr. Monett

PROJECT NUMBER G20-21-066

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
								20	40	60	80
								☐ FINES CONTENT (%) ☐			
								20	40	60	80
45											
	△ △	WEATHERED THIN BEDDED CHERTY LIMESTONE LAYERS WITH SANDY CLAY/CLAYEY SAND/GRAVEL <i>(continued)</i>									
	△ △										
	△ △										
	△ △										
	△ △										
Weathered Cherty Limestone Layer, Samper Refusal Bottom of borehole at 49.3 feet.			SPT 9	100	50/3"				●		>>

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 11/17/22 10:00 - C:\USERS\KCTE\KANSAS CITY TESTING AND ENGINEERING LLC\KANSAS CITY TESTING & ENGINEERING - PROJECTS\20 ACTIVE PROJECTS\2021\4.0 GEO PROJECTS\G20-21-066 CHAPEL DR.



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

BORING NUMBER CB-10

PAGE 1 OF 1

CLIENT	Anderson Engineering Inc.	PROJECT NAME	Chapell Dr. Monett
PROJECT NUMBER	G20-21-066	PROJECT LOCATION	Chapell Drive Over BNSF, Monett MO
DATE STARTED	8/5/21	COMPLETED	8/6/21
GROUND ELEVATION		HOLE SIZE	7 inches
DRILLING CONTRACTOR	KCTE	GROUND WATER LEVELS:	
DRILLING METHOD	CME 55 3.25 HSA,NQ	AT TIME OF DRILLING	---
LOGGED BY	JS	CHECKED BY	LCR
NOTES		AT END OF DRILLING	---
		AFTER DRILLING	---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								20	40	60	80
								PL	MC	LL	
								20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
0		Topsoil									
		(CL) SANDY CLAY with Gravel	▲ SPT 1	44	10-9-8 (17)						
5			▲ SPT 2	22	3-4-9 (13)						
		WEATHERED THIN BEDDED CHERTY LIMESTONE LAYERS WITH SANDY CLAY/CLAYEY SAND/GRAVEL									
		(GW) Well graded Cherty Limestone Gravel with Sand Begin Coing 9-19 ft. Badly Broken Highly Weathered Cherty Limestone. 20% Recovery - 0 RQD	▲ SPT 3	20	19-50/4"						
10			RC 4	20 (0)							
15			RC 5	13 (0)							
20											
25		(GC) Clayey Cherty Limestone Gravel with Sand, Poor Recovery	▲ SPT 6	6	10-16- 50/5"						

Bottom of borehole at 25.0 feet.



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

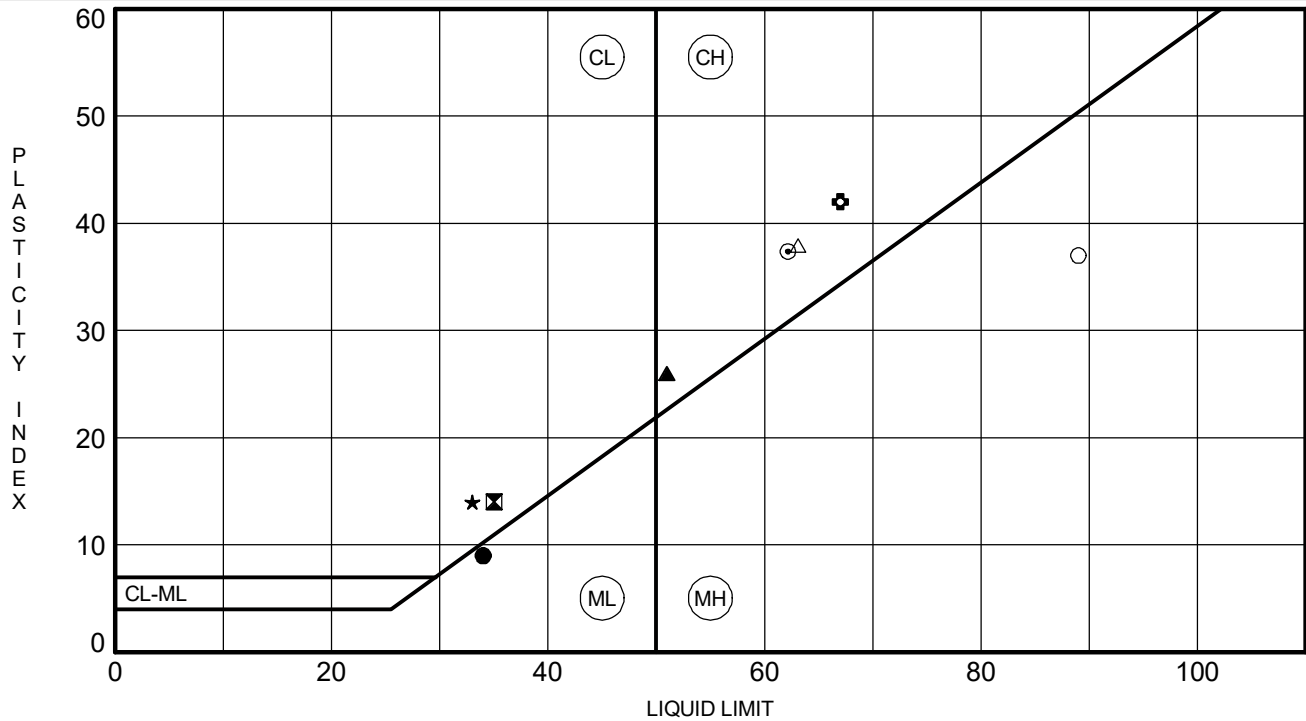
ATTERBERG LIMITS' RESULTS

CLIENT Anderson Engineering Inc.

PROJECT NAME Chapell Dr. Monett

PROJECT NUMBER G20-21-066

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO

[illegible]



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

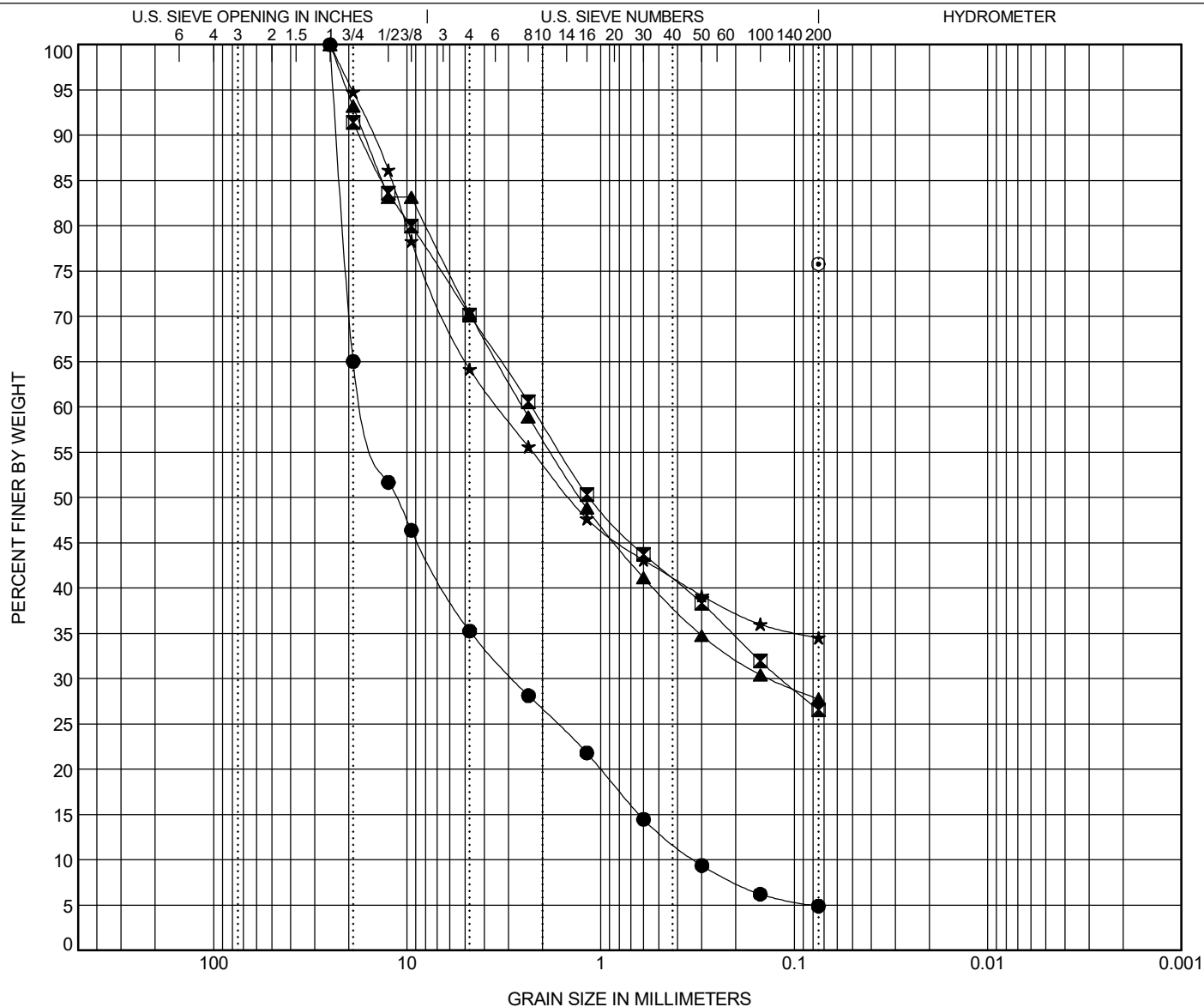
GRAIN SIZE DISTRIBUTION

CLIENT Anderson Engineering Inc.

PROJECT NAME Chapell Dr. Monett

PROJECT NUMBER G20-21-066

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE		DEPTH	Classification					LL	PL	PI	Cc	Cu
●	B-1	7.5	WELL-GRADED GRAVEL with SAND(GW)								1.52	49.70
☒	CB-1	23.5										
▲	CB-2	13.5										
★	CB-2	23.5										
◎	CB-3	8.5										
BOREHOLE		DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	B-1	7.5	25	16.225	2.834	0.326	64.7	30.4	4.9			
☒	CB-1	23.5	19	2.272	0.116		21.3	43.6	26.6			
▲	CB-2	13.5	25	2.521	0.134		29.7	42.6	27.7			
★	CB-2	23.5	25	3.377			35.8	29.7	34.5			
◎	CB-3	8.5	0.075						75.8			

GRAIN SIZE - GINT STD US LAB.GDT - 11/17/22 10:01 - C:\USERS\KCTE\KANSAS CITY TESTING & ENGINEERING - PROJECTS\2021\4.0 GEO PROJECTS\G20-21-066 CHAPEL DR. MONETT\TC



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

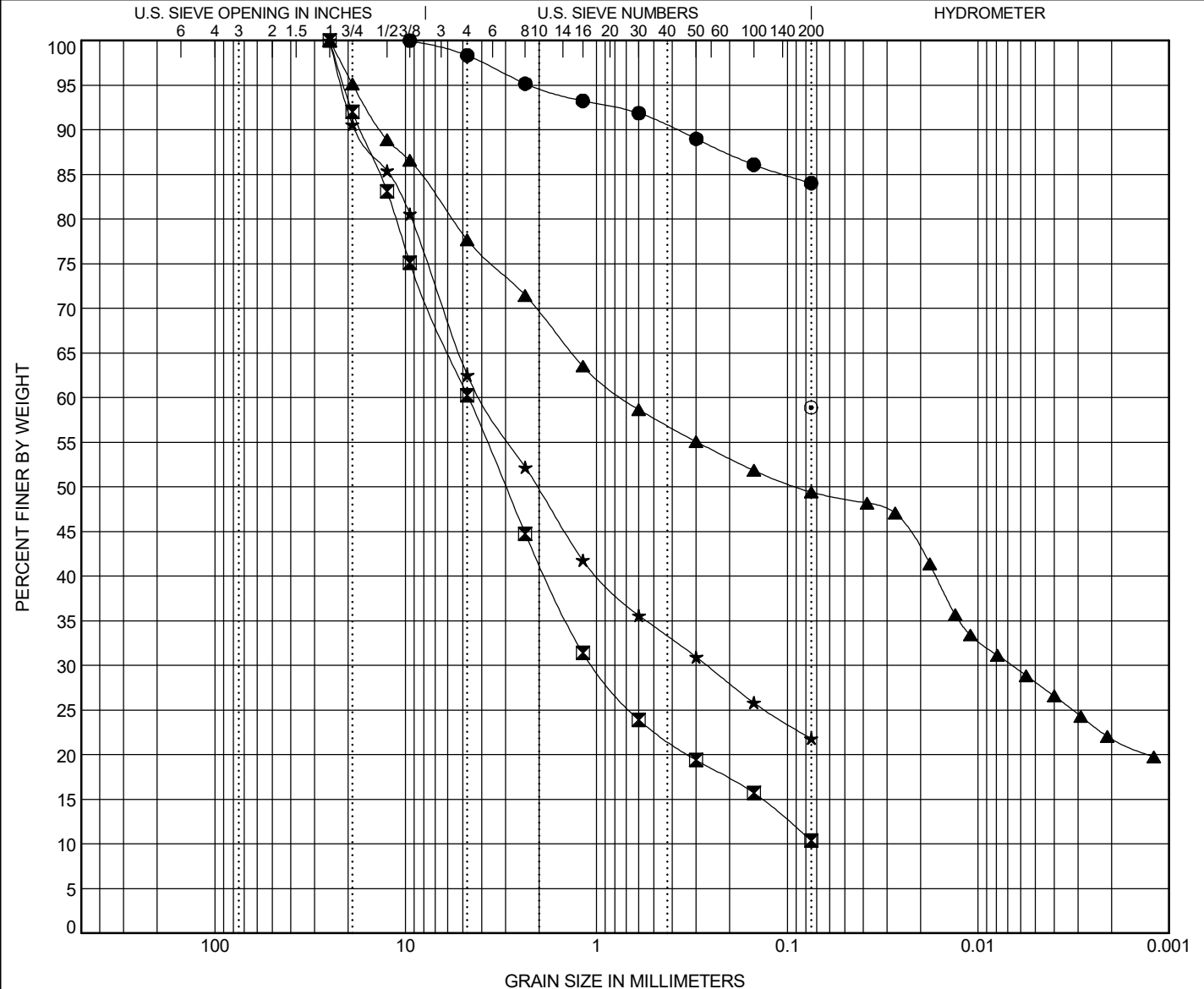
GRAIN SIZE DISTRIBUTION

CLIENT Anderson Engineering Inc.

PROJECT NAME Chapell Dr. Monett

PROJECT NUMBER G20-21-066

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	Classification					LL	PL	PI	Cc	Cu
● CB-4	8.5										
☒ CB-4	18.5									3.22	65.66
▲ CB-5	3.5										
★ CB-5	13.5										
◎ CB-7	18.5										
BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
● CB-4	8.5	9.5				1.7	14.3	84.0			
☒ CB-4	18.5	25	4.687	1.038		39.7	49.9	10.4			
▲ CB-5	3.5	25	0.722	0.007		22.3	28.3	21.3		28.1	
★ CB-5	13.5	25	4.003	0.264		37.5	40.7	21.8			
◎ CB-7	18.5	0.075						58.9			



Kansas City Testing and Engineering, LLC
1141 Southwest Blvd.
Kansas City, KS 66103
Tel: 913-321-8100
Fax: 913-321-8181

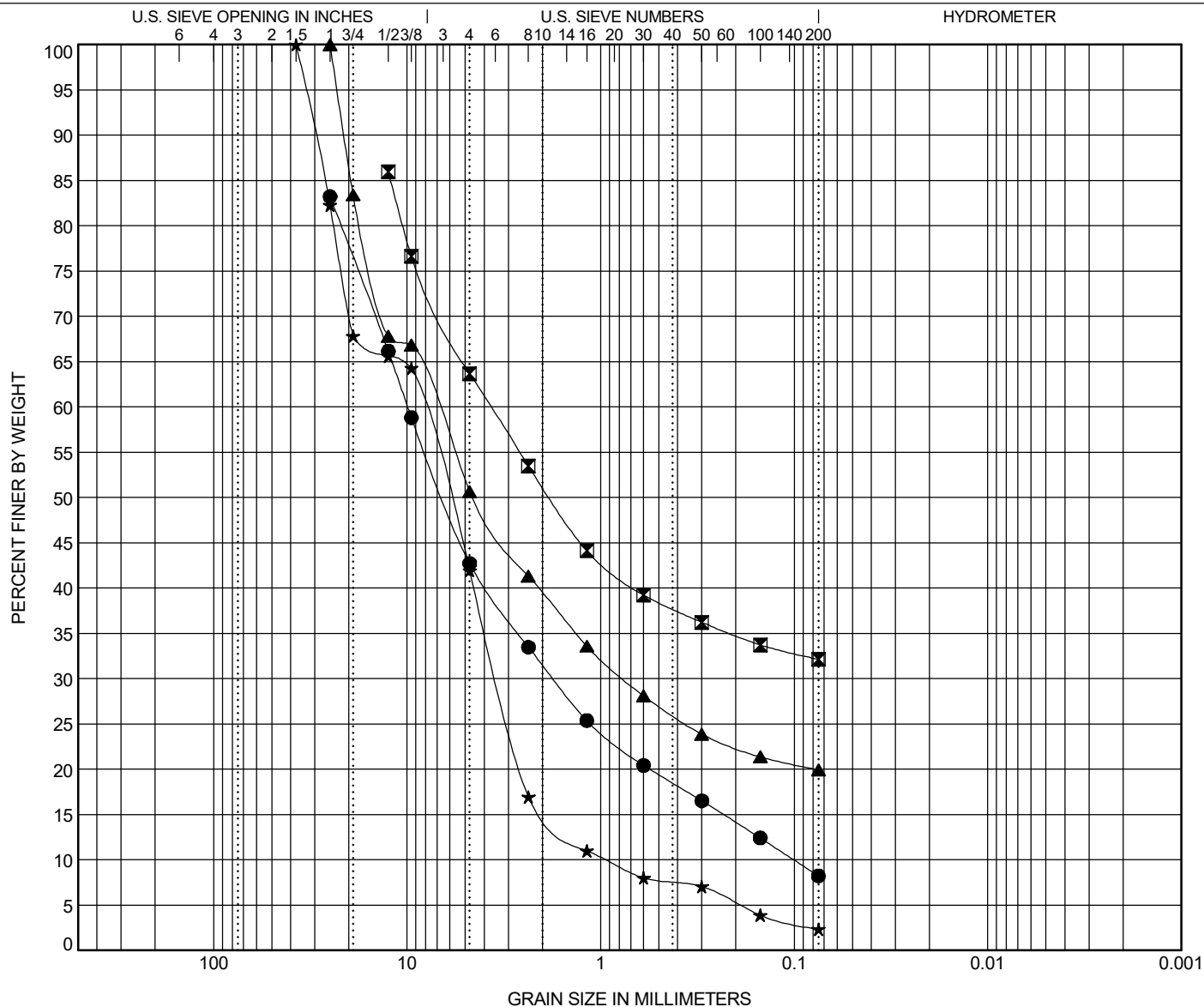
GRAIN SIZE DISTRIBUTION

CLIENT Anderson Engineering Inc.

PROJECT NAME Chapell Dr. Monett

PROJECT NUMBER G20-21-066

PROJECT LOCATION Chapell Drive Over BNSF, Monett MO



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

[illegible]



APPENDIX C

GENERAL NOTES AND SOIL CLASSIFICATIONS

DRILLING NOTES

DRILLING AND SAMPLING SYMBOLS

AS	Auger Sample	* The Standard Penetration Test (SPT) is conducted in conjunction with the split-spoon sampling procedure. The "N" value corresponds to the number of blows required to drive the the last 1 foot of an 18-inch-long, 2-inch O.D. split-spoon sampler with a 140-lb hammer falling a distance of 30 inches. The Standard Penetration Test is carried out according to ASTM D 1586.
CS	Continuous Sampler	
HA	Hand Auger	
HS	Hollow Stem Auger	
PA	Power Auger	
CF	Continuous Flight Auger	
WB	Wash Bore	
RB	Rock Bit	
SS*	Split Spoon	
ST	Shelby Tube	

WATER LEVEL MEASUREMENTS

ATD	At Time of Drilling
EOD	End of Drilling
AD	After Drilling

SOIL PROPERTIES & DESCRIPTIONS

TEXTURE		COMPOSITION		Soil descriptions are based on the Unified Soil Classification System (USCS) as outlined in ASTM D 2487 and D 2488. The USCS group symbol on the boring logs corresponds to the group names listed below. The descriptions include soil constituents, consistency or relative density, color and other appropriate descriptive terms. Geologic description of bedrock, when encountered, also is shown in the description column.
PARTICLE	SIZE	SAND & GRAVEL		
Clay	<0.002 mm	trace	< 15%	
Silt	<#200 Sieve	with	15% - 29%	
Sand	#4 to #200 Sieve	some	> 30%	
Gravel	3 inch to #4 Sieve	FINES (clay & silt)		
Cobbles	12 inch to 3 inch	trace	< 5%	
Boulders	> 12 inch	with	5% - 12%	
		some	> 12%	

COHESIVE SOILS

CONSISTENCY	UNCONFINED COMPRESSIVE STRENGTH	
	(psf)	(kPa)
Very Soft	< 500	< 24
Soft	500-1000	24-48
Medium Stiff	1001-2000	49-96
Stiff	2001-4000	97-192
Very Stiff	4001-8000	193-383
Hard	> 8001	> 384

	PLASTICITY
	Liquid Limit, %
Lean	< 45
Lean to Fat	45 - 49
Fat	> 50

COHESIONLESS SOILS

RELATIVE DENSITY	N VALUE
Very Loose	0 - 3
Loose	4 - 9
Medium Dense	10 - 29
Dense	30 - 49
Very Dense	> 49

BEDROCK PROPERTIES & DESCRIPTIONS

ROCK QUALITY DESIGNATION (RQD**)

QUALITY	RQD, %
Very Poor	0-25
Poor	25-50
Fair	50-75
Good	75-90
Excellent	90-100

**RQD is defined as the total length of sound core pieces, 4 inches (102 mm) or greater in length, expressed as a percentage of the total length cored. RQD provides an indication of the integrity of the rock mass and relative extent of seams and bedding planes.

DEGREE OF WEATHERING

Slightly Weathered	Slight decomposition of parent material.
Weathered	Well developed and decomposed.
Highly Weathered	Highly decomposed, may be extremely broken.

SOLUTION AND VOID CONDITIONS

Solid	Contains no voids.
Vuggy	Containing small cavities < 1/2 " (13mm)
Porous	Containing numerous voids, may be interconnected.
Cavernous	Containing cavities, sometime large.

When classification of bedrock materials has been estimated from disturbed samples, core samples and petrographic analysis may reveal other rock types.

HARDNESS & DEGREE OF CEMENTATION

LIMESTONE

Hard	Difficult to scratch with knife.
Moderately Hard	Scratch with knife but not fingernail.
Soft	Can be scratched with fingernail.

SHALE

Hard	Scratch with knife but not fingernail.
Moderately hard	Can be scratched with fingernail.
Soft	Can be molded easily with fingers.

SANDSTONE

Well Cemented	Capable of scratching with a knife.
Cemented	Can be scratched with knife.
Poorly Cemented	Can be broken easily with fingers.

BEDDING CHARACTERISTICS

TERM	THICKNESS, INCHES (MM)
Very Thick Bedded	> 36 (915)
Thick Bedded	12-36 (305-915)
Medium Bedded	4-12 (102-305)
Thin Bedded	1-4 (25-102)
Very Thin Bedded	0.4-1 (10-25)
Laminated	0.1-0.4 (2.5-10)
Thinly Laminated	< 0.1 (<2.5)

Bedding Planes - Planes dividing layers, beds or strata of rocks.

Joint - Fracture in rock, usually vertical or transverse to bedding.

Seam - Applies to bedding plane with unspecified weathering.

CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES

ASTM Designation: D 2487 – 11
 (Based on Unified Soil Classification System)

MAJOR DIVISIONS				GROUP SYMBOL	GROUP NAME
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines	$Cu \geq 4$ and $1 \leq Cc \leq 3^E$	GW	Well graded gravel ^F
			$Cu < 4$ and/or $1 > Cc > 3^E$	GP	Poorly graded gravel ^F
		Gravels with Fines More than 12% fines	Fines classify as ML or MH	GM	Silty gravel ^{F G H}
			Fines classify as CL or CH	GC	Clayey gravel ^{F G H}
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines	$Cu \geq 6$ and $1 \leq Cc \leq 3^E$	SW	Well-graded sand ^I
			$Cu < 6$ and/or $1 > Cc > 3^E$	SP	Poorly graded sand ^I
		Sands with Fines More than 12% fines	Fines classify as ML or MH	SM	Silty Sand ^{G H I}
			Fines classify as CL or CH	SC	Clayey sand ^{G H I}
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays Liquid limit less than 50	Inorganic	$PI > 7$ and plots on or above "A" line	CL	Lean clay ^{K L M}
			$PI < 4$ or plots below "A" line	ML	Silt ^{K L M}
		Organic	<u>Liquid limit – oven dried</u> Liquid limit – not dried < 0.75	OL	Organic clay ^{K L M N} Organic silt ^{K L M O}
			PI plots on or above "A" line	CH	Fat clay ^{K L M}
	Silts and Clays Liquid limit 50 or more	Inorganic	PI plots below "A" line	MH	Elastic silt ^{K L M}
		Organic	<u>Liquid limit – oven dried</u> Liquid limit – not dried < 0.75	OH	Organic clay ^{K L M O} Organic silt ^{K L M O}
Highly organic soils	Primarily organic matter, dark in color, and organic odor			PT	Peat

^A Based on the material passing the 3-in. (75-mm) sieve.

^B If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

^C Gravels with 5 to 12% require dual symbols:
 GW-GM well-graded gravel with silt
 GW-GC well-graded gravel with clay
 GP-GM poorly graded gravel with silt
 GP-GC poorly graded gravel with clay

^D Sands with 5 to 12% fines require dual symbols:
 SW-SM well-graded sand with silt
 SW-SC well-graded sand with clay
 SP-SM poorly graded sand with silt
 SP-SC poorly graded sand with clay

^E $Cu = D_{60}/D_{10}$ $Cc = (D_{30})^2 / (D_{10} \times D_{60})$

^F If soil contains $\geq 15\%$ sand, add "with sand" to group name.

^G If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

^H If fines are organic, add "with organic fines" to group name.

^I If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.

If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.

^J If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay.

^K If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel", whichever is predominant.

^L If solid contains $\geq 30\%$ plus No. 200, predominantly sand, add "sandy" to group name.

^M If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.

^N $PI \geq 4$ and plots on or above "A" line.

^O $PI < 4$ or plots below "A" line.

^P PI plots on or above "A" line.

^Q PI plots below "A" line.

SUMMARY OF QUANTITIES			
ITEM NO.	ITEM DESCRIPTION	UNITS	QUANTITY
ROADWAY			
201-30.00	Clearing & Grubbing	ACRE	3.9
202-20.10	Removal of Improvements	LS	1
203-50.00	Unclassified Excavation	CY	15,882
203-55.00	Embankment in Place	CY	45,824
203-60.00	Compacting Embankment	CY	45,824
203-99.07	Geofoam Lightweight Fill (EPS 29)	CY	488
304-05.04	Type 5 Aggregate Base, 4" thick	SY	6,895.6
304-99.05	Integrated Approach	SY	184.2
401-12.09	Bituminous Pavement Mixture PG 64-22, (BP-1)	TONS	492.7
402-05.20	Bituminous Pavement Mixture PG 64-22, (Surface Leveling)	TONS	273.4
407-10.05	Tack Coat @ 0.05 gal/ SY (1 Coat)	GAL	142
502-11.08	Concrete Pavement (8" Non-Reinforced)	SY	5,834
609-10.51	Curb & Gutter Type A, 2'-0"	LF	2,954
609-20.13	Integral Curb Type M	LF	34
611-30.20	Furnishing Type 2 Rock Blanket	CY	635
611-30.40	Placing Type 2 Rock Blanket	CY	635
614-30.20	4 FT. X 4 FT. Curb Inlet	EA	2
614-30.20	5 FT. X 4 FT. Curb Inlet	EA	4
614-30.20	5 FT. X 5 FT. Curb Inlet	EA	3
614-30.20	6 FT. X 4 FT. Curb Inlet	EA	2
618-10.00	Mobilization	LS	1
725-03.12A	12 IN. Pipe Group B (Concrete)	LF	82
725-03.18A	18 IN. Concrete Pipe Group B (Concrete)	LF	590
725-03.24A	24 IN. Concrete Pipe Group B (Concrete)	LF	639
725-03-36A	36 IN. Concrete Pipe Group B (Concrete Pipe-Arch)	LF	131
731-00.48	Precast Concrete Manhole - 48 IN.	LF	15.46
731-00.72	Precast Concrete Manhole - 72 IN.	LF	13.5
607-10.40	Drive Gate (Chain-Link)	EA	1
806-10.02	Sediment Basin Rock	CY	14.8
622-40.10	Modified Coldmilling (Depth Transitions)	SY	218.0
SIGNING/STRIPING/SIGNAL			
607-99.03	5-Strand Woven Wire Fence	LF	757
616-10.05	Construction Signs	SF	137
616-10.30	Type III Moveable Barricade	EA	9
620-60.00D	4 IN. White Class 1 Pavement Paint (18-Mil, Type P Beads)	LF	135
620-60.01D	4 IN. Yellow Class 2 Pavement Paint (18-Mil, Type P Beads)	LF	2,204
620-00.19	Cold Applied Tape Pavement Marking, Left/Right Arrow	EA	1
620-00.15	Preformed Thermoplastic Pavement Marking, 24 IN White	LF	22
LANDSCAPING			
206-99.01	Temporary Stream By-pass	LS	1
805-10.00A	Seeding - Cool Season Mixtures	ACRE	3.6
806-10.05	Rock Ditch Check	LF	45
806-10.07A	Curb Inlet Check	EA	8
806-10.19	Silt Fence	LF	3,856
806-41.28	Type 1 turf reinforcement mat	SY	8,985
PEDESTRIAN FACILITIES			
608-10.10	Concrete Curb Ramp	SY	56.0
608-10.12	Truncated Domes	SF	80
608-60.04	Concrete Sidewalk, 4 in	SY	855.7
304-05.04	Type 5 Aggregate Base, 4" thick	SY	920.6

ITEM NO.	ITEM DESCRIPTION	UNITS	QUANTITY
ROADWAY (BID ALT)			
401-12.09	Bituminous Pavement Mixture PG 64-22, (BP-1)	TONS	369.8
401-30.00	Bituminous Pavement Mixture PG 64-22, (Base)	TONS	1294.4

NOTES:

QUANTITIES SHOWN ON THESE PLANS ARE NOT GUARANTEED BY THE OWNER AND ARE USED SOLELY FOR THE PURPOSE OF COMPARING BIDS AND AWARDING THE CONTRACT, AND MAY OR MAY NOT REPRESENT THE ACTUAL QUANTITIES ON THE JOB. SEE SPECIFICATIONS.

ANY ITEMS NOT SHOWN IN BID TAB, SHALL BE CONSIDERED SUBSIDIARY TO OTHER ITEMS

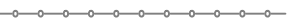
IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SUBMIT FORM 106, TO MISSOURI DEPARTMENT OF NATURAL RESOURCES, HISTORIC PRESERVATION PROGRAM FOR ANY BORROW AREAS TO BE USED ON THIS PROJECT.

CONSTRUCTION NOTES:

3. ANY SHORING SYSTEM THAT IMPACT THE RAILROAD OPERATIONS AND/OR SUPPORTS RAILROAD EMBANKMENT SHALL BE DESIGNED AND CONSTRUCTED PER THE RAILROAD TEMPORARY SHORING REQUIREMENTS.
2. ALL DEMOLITION WITHIN THE RAILROAD RIGHT-OF-WAY AND/OR DEMOLITION THAT MAY IMPACT THE RAILROAD TRACKS OR OPERATIONS SHALL COMPLY WITH THE RAILROAD DEMOLITION REQUIREMENTS.
3. ERECTION OVER THE RAILROAD RIGHT-OF-WAY SHALL BE DESIGNED TO CAUSE NO INTERRUPTION TO ALL RAILROAD OPERATIONS.
4. THE ELEVATION OF THE EXISTING TOP-OF-RAIL PROFILE SHALL BE VERIFIED BEFORE BEGINNING CONSTRUCTION. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE RAILROAD PRIOR TO CONSTRUCTION.
5. THE PROPOSED GRADE SEPARATION PROJECT SHALL NOT CHANGE THE QUANTITY AND/OR CHARACTERISTICS OF THE FLOW IN THE RAILROAD DITCHES AND/OR DRAINAGE STRUCTURES.
6. THE CONTRACTOR MUST SUBMIT A PROPOSED METHOD OF EROSION AND SEDIMENT CONTROL AND HAVE THE METHOD APPROVED BY THE RAILROAD PRIOR TO BEGINNING ANY GRADING ON THE PROJECT SITE.
7. FOR RAILROAD COORDINATION PLEASE REFER TO THE RAILROAD'S COORDINATION REQUIREMENTS AS PART OF THE SPECIFICATIONS OR SPECIAL PROVISIONS OF THE PROJECT.
8. TEMPORARY CONSTRUCTION CLEARANCES, INCLUDING FALSEWORK CLEARANCES, SHALL COMPLY WITH THE MINIMUM CONSTRUCTION CLEARANCES DETAIL PROVIDED ON SHEET 14.
9. ALL PERMANENT CLEARANCES SHALL BE VERIFIED BEFORE PROJECT CLOSEOUT.
10. A FLAGGER IS REQUIRED WHEN ANY WORK IS PERFORMED WITHIN 25 FEET OF THE TRACK CENTERLINE. NO WORK IS ALLOWED WITHIN 50 FEET OF TRACK CENTERLINE WHEN A TRAIN PASSES THE WORK SITE, AND ALL PERSONNEL MUST CLEAR THE AREA WITHIN 25 FEET OF TRACK CENTERLINE AND SECURE ALL EQUIPMENT WHEN TRAINS ARE PRESENT.

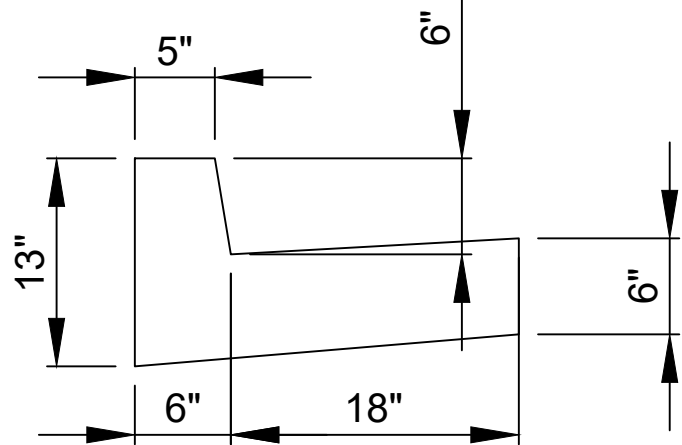
LEGEND

(USED IN PLANS)

	EXISTING CONTOUR (MAJOR)		EXISTING MAILBOX
	EXISTING CONTOUR (MINOR)		EXISTING GATE POST
	EXISTING FEATURE		EXISTING STORM INLET
	EXISTING FENCE		EXISTING WATER METER
	EXISTING GUARDRAIL		EXISTING WATER VALVE
	SECTION LINE		EXISTING FIRE HYDRANT
	EXISTING PROPERTY LINE		EXISTING SANITARY MANHOLE
	EXISTING EASEMENT		EXISTING POWER POLE
	EXISTING STORM WATER		EXISTING LIGHT POLE
	EXISTING GAS LINE		EXISTING GUY WIRE ANCHOR
	EXISTING WATER LINE		EXISTING TELEPHONE PEDESTAL
	EXISTING SANITARY SEWER		EXISTING SIGN
	EXISTING UNDERGROUND ELECTRIC		EXISTING TREE
	EXISTING OVERHEAD ELECTRIC		CONTROL POINT
	EXISTING UNDERGROUND TELEPHONE		FOUND CORNER
	EXISTING OVERHEAD TELEPHONE		EXISTING BENCHMARK
	SLOPE LIMITS		

NOTE:
DASHED OR SCREENED SYMBOL INDICATES EXISTING FEATURE.
DARKER LINES ARE TO SHOW PROPOSED FEATURES
LIGHTER LINES ARE TO SHOW EXISTING FEATURES

TYPE A CURB & GUTTER



GENERAL NOTES:

DESIGN SPECIFICATIONS:
2011 AASHTO ROADSIDE DESIGN GUIDE, 4TH EDITION

CONSTRUCTION SPECIFICATIONS:
MISSOURI STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 2025 EDITION

MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION, 2025 EDITION

NOTES:

1. EXISTING UTILITIES AND UNDERGROUND INSTALLATIONS HAVE BEEN LOCATED TO THE GREATEST EXTENT PRACTICAL THROUGH REVIEW OF CONSTRUCTION PLANS AND SURFACE OBSERVATIONS. THE CONTRACTOR SHALL FIELD VERIFY ALL HORIZONTAL AND VERTICAL LINES AND GRADES OF EXISTING UTILITIES PRIOR TO THE CONSTRUCTION OF IMPROVEMENTS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY UPON DISCOVERING A DISCREPANCY BETWEEN THE CONTRACT DRAWINGS AND ACTUAL FIELD CONDITIONS. CONTACT ONE CALL.
2. CALL TO LOCATE EXISTING RAILROAD UTILITIES - BNSF: WWW.BNSF.COM OR CALL 1-800-533-2891
3. THE CONTRACTOR MUST COORDINATE CONSTRUCTION WITH THE NECESSARY AUTHORITIES.
4. NO WORK SHALL COMMENCE UNTIL ALL NECESSARY PERMITS ARE OBTAINED BY THE OWNER.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL LINE AND GRADE STAKES.
6. CONTRACTOR SHALL REMOVE, PRESERVE, AND REPLACE ALL SIGNS, MAIL BOXES, FENCES, METAL FLAG POLE BASES AND THE LIKE, WITHIN THE LIMITS OF THE PROPOSED IMPROVEMENTS. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.
7. ALL TRAFFIC WAYS INCLUDING DRIVEWAYS, ALLEYWAYS, ETC., SHALL REMAIN ACCESSIBLE TO RESIDENTIAL AND EMERGENCY VEHICLES DURING PROJECT DURATION.
8. ALL CONSTRUCTION AND EXCAVATION ACTIVITIES SHALL BE CONFINED TO EASEMENTS, ROAD RIGHT-OF-WAY, AND/OR WORK AREA LIMITS AS SHOWN ON DRAWINGS.
9. CONTRACTOR SHALL RAISE OR LOWER ALL AFFECTED MANHOLE RIMS AND VALVE BOXES IN THE WORK AREA TO MATCH PROPOSED GRADE.
10. ALL AREAS DISTURBED BY CONSTRUCTION ARE FIRST TO BE FINE GRADED AND THEN FOLLOWED BY SEED AND STRAW MULCH, UNLESS OTHERWISE NOTED, OVER, MIN. 4" TOPSOIL STOCKPILED FROM SITE OR HAULED IN AS REQUIRED.
11. PROVIDE POSITIVE DRAINAGE FROM ALL IMPROVED AREAS, SO THAT RUNOFF DRAINS TO DRAIN WAYS.
12. ALL CONTOURS AND SPOT ELEVATIONS SHOWN ARE FINISH GRADE.
13. ANY DAMAGE TO EXISTING STRUCTURES, VEGETATION, OR IMPROVEMENTS RESULTING FROM NEW CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
14. ALL SIDEWALKS AND ADA RAMPS SHALL BE IN ACCORDANCE WITH ADA REGULATIONS.
15. CONTRACTOR TO PROTECT ANY STORM INLETS, THAT RECEIVE STORM WATER FROM THE AREA OF CONSTRUCTION, FROM SEDIMENT. EROSION CONTROL DEVICES SHALL BE MAINTAINED DURING THE WHOLE CONSTRUCTION PERIOD BY THE CONTRACTOR. ALL EROSION CONTROL DEVICES, NOT LISTED IN THE PLANS, SHALL BE INCIDENTAL TO CONSTRUCTION.
16. ALL TRENCHES, WHICH LIE UNDER PROPOSED PAVEMENT, OR LIE WITHIN TWO FEET OF BACK OF CURB, SHALL BE BACKFILLED TO PAVEMENT SUB-GRADE WITH COMPACTED GRANULAR BACK FILL.
17. TRENCHES SHALL BE COMPACTED TO 95% STANDARD PROCTOR WHEN PIPES ARE LAID IN FILL.
18. ALL REMOVALS NECESSARY TO COMPLETE THE PROJECT AS SHOWN ON THE PLANS, SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.

ABBREVIATION TABLE

BC:	BACK OF CURB
C:	CENTERLINE
CONT.	CONTINUOUS
C.P.	CONTROL POINT
EG:	EXISTING GRADE
EX.	EXISTING
FG:	FINISH GRADE
FL:	FLOW LINE
GL:	GUTTER LINE
MAX.	MAXIMUM
MIN.	MINIMUM
OFF:	OFFSET
P:	PROPERTY LINE
PR.	PROPOSED
ROW	RIGHT-OF-WAY
STA:	STATION
TBM	TEMPORARY BENCHMARK
T.C.E.	TEMPORARY CONSTRUCTION EASEMENT
TEMP.	TEMPORARY
TYP.	TYPICAL

UTILITIES INFORMATION

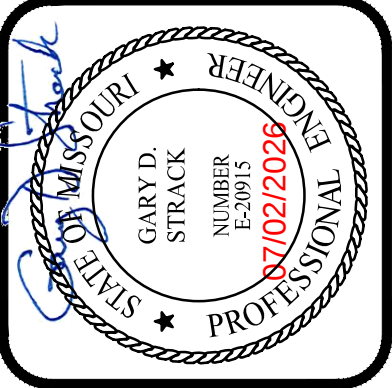
AT&T - TELEPHONE
Gene Lollis
IL0967@att.com
903 US-60 C
Monett, MO 65605
(660) 429-6645

SUDDENLINK COMMUNICATIONS - TELEPHONE
 Matt Smith
 Matthew.smith@alticetechserviceusa.com
 304 S Madison Ave
 Aurora, MO 65605
 (417) 231-2747

MoDOT SW DISTRICT [JOPLIN] - ELECTRIC
Karen Lane,
karen.lane@modot.mo.gov
600 NE Colbern Rd
Lee's Summit, MO 64086
(417) 291-6195

SPIRE - GAS
Ken Stegall
Ken.stegall@spireenergy.com
7500 E 35th Terrace
Kansas City, MO 64129
(417) 626-4831

CITY OF MONETT - WATER AND SEWER
Skip Schaller
utilities@cityofmonett.com
217 5th St
Monett, MO 65708
(417) 235-3763



REVISIONS			DRAWING INFO.	
NO.	DESCRIPTION	BY	DATE	FIELD BY:
△	ADDENDUM NO.1	MPG	6/30/26	NDO
				CHECK BY: GDS
				DATE: 7/1/2026
				FIELD BOOK:
				JOB NUMBER: RRP-000IS(628)

© COPYRIGHT ANDERSON ENGINEERING, INC. 2012

QUANTITIES & GENERAL NOTES

CHAPPELL DRIVE
ROADWAY IMPROVEMENTS & PROPOSED BNSF BRIDGE

CITY OF MONETT, MISSOURI

G:\Shared drives\40 MO\Monett\21KC40008 Monett Chapell Dr BNSF Overpass\CADD\Plans\General Notes & Quantities

SHEET NUMBER

04

94 OF

SUMMARY OF QUANTITIES			
ITEM NO.	ITEM DESCRIPTION	UNITS	QUANTITY
BRIDGE			
206-10.00	Class 1 Excavation	CY	887
206-33.00	Class 4 Excavation	CY	334
216-35.01	Partial Removal of Culvert-Bridge Concrete	LS	1
607.10-67	(96 In.) Curved Top Pedestrian Fence (Structures)	LF	310
607.10-68	(120 In.) Pedestrian Fence (Structures)	LF	310
702-10.12	Structural Steel Pile (12 In.)	LF	2,143
702-60.00	Pre-bore for Piling	LF	787
702-70.00	Pile Point Reinforcement	EACH	46
703-20.03	Class B-2 Concrete (Substructure)	CY	259.6
703-40.40	Class B-1 Concrete (Culvert-Bridge)	CY	559.9
703-42.19A	Type D Barrier	LF	620
703-42.21	Slab on Concrete NU-Girder	SY	1,434
703-99.03	Pedestrian Curb	LF	310
705-60.22	NU 43, Prestressed Concrete NU-Girder	LF	1,423
706-10.20	Reinforcing Steel (Culverts-Bridge)	LBS	82,790
706-10.60	Reinforcing Steel (Bridges)	LBS	35,189
715-10.01	Vertical Drains at End Bents	EACH	2
716-10.00	Plain Neoprene Bearing Pad	EACH	5
716-10.02	Laminated Neoprence Bearing Pad	EACH	5
716-10.03	Laminated Neoprence Bearing Pad (Tapered)	EACH	20
720-13.00	Pile Spacers	EACH	7

ALL CONCRETE ABOVE THE CONSTRUCTION JOINT IN THE END BENTS IS INCLUDED IN THE ESTIMATED QUANTITIES FOR SLAB ON CONCRETE NU-GIRDER.

ALL REINFORCEMENT IN THE END BENTS IS INCLUDED IN THE ESTIMATED QUANTITIES FOR SLAB ON CONCRETE NU-GIRDER.

ALL REINFORCEMENT IN THE INTERMEDIATE BENT CONCRETE DIAPHRAGM EXCEPT REINFORCEMENT EMBEDDED IN THE BEAM CAP IS INCLUDED IN THE ESTIMATED QUANTITIES FOR SLAB ON CONCRETE I-GIRDER.

ALL CONCRETE ABOVE INTERMEDIATE BEAM CAP IS INCLUDED IN THE ESTIMATED QUANTITIES FOR SLAB ON CONCRETE NU-GIRDER.

THE CONTRACTOR SHALL PROVIDE BRACING NECESSARY FOR LATERAL AND TORSIONAL STABILITY OF THE GIRDERS DURING CONSTRUCTION OF THE CONCRETE SLAB AND REMOVE THE BRACING AFTER THE SLAB HAS ATTAINED 75% DESIGN STRENGTH. CONTRACTOR SHALL NOT DRILL HOLES IN THE GIRDERS. THE COST FOR FURNISHING, INSTALLING, AND REMOVING BRACING WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR PRESTRESSED CONCRETE NU-GIRDER.

ESTIMATED QUANTITIES FOR SLAB ON CONCRETE NU-GIRDER		
ITEM	UNIT	TOTAL
CLASS B-2 CONCRETE	CUBIC YARDS	456.8
REINFORCING STEEL	POUNDS	103,711

THE TABLE OF ESTIMATED QUANTITIES FOR SLAB ON CONCRETE NU-GIRDER REPRESENTS THE QUANTITIES USED BY THE OWNER IN PREPARING THE COST ESTIMATE FOR CONCRETE SLABS. THE AREA OF THE CONCRETE SLAB WILL BE MEASURED TO THE NEAREST SQUARE YARD WITH THE HORIZONTAL DIMENSIONS AS SHOWN ON THE PLAN OF SLAB. PAYMENT FOR PRESTRESSED PANELS, CONVENTIONAL FORMS, ALL CONCRETE AND COATED AND UNCOATED REINFORCING STEEL WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR SLAB ON CONCRETE NU-GIRDER. VARIATIONS MAY BE ENCOUNTERED IN THE ESTIMATED QUANTITIES BUT THE VARIATIONS CANNOT BE USED FOR AN ADJUSTMENT IN THE CONTRACT UNIT PRICE.

METHOD OF FORMING THE SLAB SHALL BE AS SHOWN ON THE SHOP DRAWINGS AND IN ACCORDANCE WITH SEC 703. ALL HARDWARE FOR FORMING THE SLAB TO BE LEFT IN PLACE AS A PERMANENT PART OF THE STRUCTURE SHALL BE COATED IN ACCORDANCE WITH ASTM A123 OR ASTM B633 WITH A THICKNESS CLASS SC 4 AND A FINISH TYPE I, II OR III.

CLASS B-2 CONCRETE QUANTITY IS BASED ON MINIMUM TOP FLANGE THICKNESS AND MINIMUM JOINT MATERIAL THICKNESS.

THE PRESTRESSED PANEL QUANTITIES ARE NOT INCLUDED IN THE TABLE OF ESTIMATED QUANTITIES FOR SLAB ON CONCRETE NU-GIRDER.

FOUNDATION DATA					
TYPE	DESIGN DATA	BENT NUMBER			
		1	2	3	4
LOAD BEARING PILES	PILE TYPE AND SIZE	HP 12x53	HP 12x53	HP 12x53	HP 12x53
	NUMBER	7	16	16	7
	APPROXIAMTE LENGTH PER EACH	FEET	72	37	37
	PILE POINT REINFORCEMENT	EACH	All	All	All
	PILE DRIVING VERIFICATION METHOD		DF	DF	DF
	RESISTANCE FACTOR		0.4	0.4	0.4
	MIN. NOM. AXIAL COMP. RES.	KIP	552	492	492

DF = FHWA-MODIFIED GATES DYNAMIC FORMULA

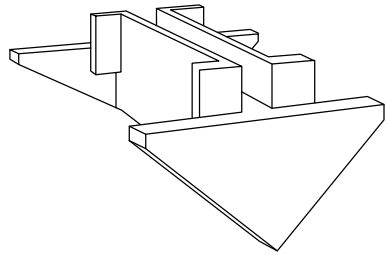
LOAD BEARING PILES: MINIMUM NOMINAL AXIAL COMPRESSIVE RESISTANCE = $\frac{\text{MAXIMUM FACTORED LOADS}}{\text{RESISTANCE FACTOR}}$

ALL PILES SHALL BE DRIVEN TO PRACTICAL REFUSAL.

MINIMUM PILE LENGTHS SHALL BE IN ACCORDANCE WITH SECTION 702.4.11 OF THE STANDARD SPECIFICATIONS.

PAYMENT FOR PILE SPLICES WILL ONLY BE MADE FOR PILES REACHING LENGTHS BEYOND 40 FEET.

NOTE:
THE PILE POINT REINFORCEMENT SHALL BE A ONE-PIECE UNIT OF CAST STEEL. THE CUTTING EDGES SHALL BE HARDENED. THE PILE POINT SHALL BE DESIGNED TO PENETRATE BOULDERS WITHOUT DAMAGE TO THE PILE. THE PILE POINTS SHALL BE WELDED, IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, TO EACH STEEL PILE AT THE END BENT BEFORE DRIVING.



CAST STEEL PILE POINT

GENERAL NOTES:

DESIGN SPECIFICATIONS:

- 2020 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS (9TH ED.)
- SEISMIC PERFORMANCE CATEGORY A
- 2011 AASHTO ROADSIDE DESIGN GUIDE, 4TH EDITION

CONSTRUCTION SPECIFICATIONS:

- MISSOURI STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 2025 EDITION
- MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION, 2025 EDITION

DESIGN LOADING:

- HL-93
- FUTURE WEARING SURFACE = 35 LB/SF
- EARTH PRESSURE = 120 LB/CF
- EQUIVALENT FLUID PRESSURE = 45 LB/CF
- SUPERSTRUCTURE:
 - SIMPLY SUPPORTED NON-COMPOSITE FOR DEAD LOAD.
 - CONTINUOUS COMPOSITE FOR LIVE LOAD.

DESIGN UNIT STRESSES:

- CLASS B CONCRETE (SUBSTRUCTURE) $f_c = 4,000$ p.s.i.
- CLASS B-2 CONCRETE (SUPERSTRUCTURE) $f_c = 4,000$ p.s.i.
- REINFORCING STEEL (GRADE 60) $f_y = 60,000$ p.s.i.
- STEEL PILE (ASTM A709 GRADE 50) $f_y = 50,000$ p.s.i.

FOR PRECAST PRESTRESSED PANEL STRESSES, SEE SHEET NO. 43.
FOR PRESTRESSED GIRDER STRESSES, SEE SHEET NO. 40-42.

NEOPRENE PADS:

NEOPRENE BEARING PADS SHALL BE 60 DUROMETER AND SHALL BE IN ACCORDANCE WITH SEC 716.

JOINT FILLER:

ALL JOINT FILLER SHALL BE IN ACCORDANCE WITH SEC 1057 FOR PREFORMED SPONGE RUBBER EXPANSION AND PARTITION JOINT FILLER, EXCEPT AS NOTED.

REINFORCING STEEL:

MINIMUM CLEARANCE TO THE REINFORCING STEEL SHALL BE 1-1/2 INCHES, UNLESS OTHERWISE SHOWN.

TRAFFIC HANDLING:

STRUCTURE TO BE CLOSED DURING CONSTRUCTION. TRAFFIC TO BE MAINTAINED ON OTHER ROUTES DURING CONSTRUCTION. SEE ROADWAY PLANS FOR TRAFFIC CONTROL.

PROTECTIVE COATINGS:

- STRUCTURAL STEEL PILES TO BE CLEANED AND BITUMINOUS COATED AT 3' BELOW THE BOTTOM OF THE CAP, PER MODOT SPECIFICATION 702.4.8.1
- THE CONTRACTOR MAY CHOOSE TO GALVANIZE THE ENTIRE PILE IN LIEU OF BITUMINOUS COATING REQUIREMENTS.
- GALVANIZED STRUCTURAL STEEL PILES SHALL BE IN ACCORDANCE WITH MODOT SPECIFICATION 702.4.8.2

ACCEPTANCE OF NU-GIRDERS:

THE FOLLOWING PROCEDURES HAVE BEEN ESTABLISHED FOR THE ACCEPTANCE OF NU-GIRDERS. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL. THE APPROVAL WILL COVER ONLY THE GENERAL DESIGN FEATURES, AND IN NO CASE SHALL THIS APPROVAL BE CONSIDERED TO COVER ERRORS OR OMISSIONS IN THE SHOP DRAWINGS. THE LOCAL AGENCY OR THEIR CONSULTANT HAS THE OPTION OF INSPECTING THE PRECAST UNITS DURING FABRICATION OR REQUIRING THE FABRICATOR TO FURNISH A CERTIFICATION OF CONTRACT COMPLIANCE AND SUBSTANTIATING TEST REPORTS. IN ADDITION, THE FOLLOWING REPORTS WILL BE REQUIRED.

- CERTIFIED MILL TEST REPORTS, INCLUDING RESULTS OF PHYSICAL TEST ON THE PRESTREESD STRANDS, AND REINFORCEMENT AS REQUIRED.
- TEST REPORTS ON CONCRETE CYLINDER BREAKS.

THE LOCAL AGENCY OR CONSULTANT MUST VERIFY AND DOCUMENT THAT DIMENSIONS OF THE UNITS WERE CHECKED AT THE JOB AND FOUND TO BE IN COMPLIANCE WITH THE SHOP DRAWINGS.
MODOT AND FHWA MAY MAKE INSPECTIONS OF THE WORK AND THE CONTRACTOR SHALL GRANT THEM ACCESS TO ALL PARTS OF THE WORK.

NOTE:

QUANTITIES SHOWN ON THESE PLANS ARE NOT GUARANTEED BY THE OWNER AND ARE USED SOLELY FOR THE PURPOSE OF COMPARING BIDS AND AWARDING THE CONTRACT, AND MAY OR MAY NOT REPRESENT THE ACTUAL QUANTITIES ON THE JOB, SEE SPECIFICATIONS.

ANY ITEMS NOT SHOWN IN BID TAB, SHALL BE CONSIDERED SUBSIDIARY TO OTHER ITEMS.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SUBMIT FORM 106, TO MISSOURI DEPARTMENT OF NATURAL RESOURCES, HISTORIC PRESERVATION PROGRAM FOR ANY BORROW AREAS TO BE USED ON THIS PROJECT.

ANDERSON
ENGINEERING
EMPLOYEE OWNED

ENGINEERS • SURVEYORS • LABORATORIES • DRILLING
1748 S. GARRISON AVE. • CARTHAGE, MISSOURI 64836 • PHONE 417/358-9551
ANDERSON CORP. 00002 • JASON ECKHART PE#30102

REVISIONS		DRAWING INFO.			
NO.	DESCRIPTION	BY	DATE	FIELD BY:	FIELD BOOK:
1	ADDENDUM NO.1	MPG	6/30/26	DRAWN BY: NDO	
				CHECK BY: GDS	7/22/26
				DATE:	
				FIELD BOOK:	
				JOB NUMBER:	RRP-006(S)(23)

© COPYRIGHT ANDERSON ENGINEERING, INC. 2012

BRIDGE QUANTITIES & NOTES

CHAPELL DRIVE

ROADWAY IMPROVMENTS & PROPOSED BNSF BRIDGE

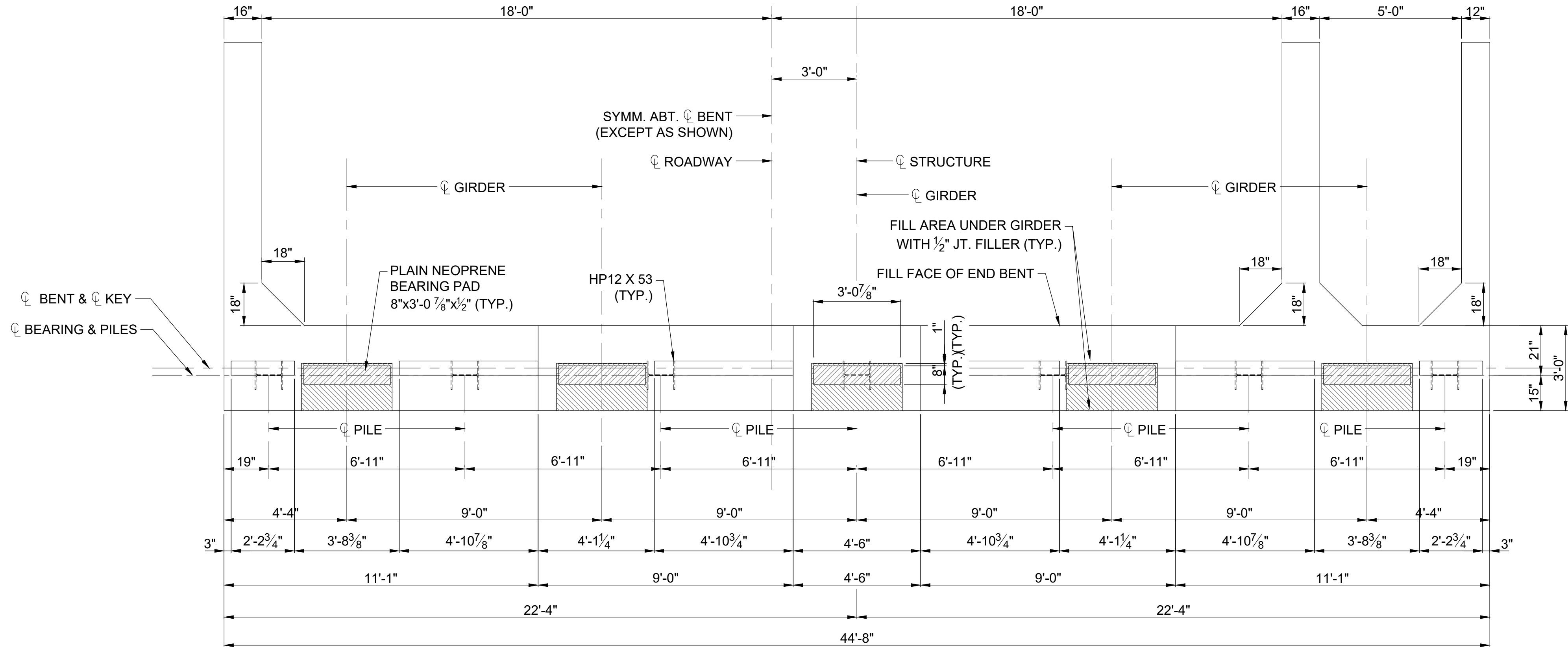
SECTION 26, T27N, R32 & 33W

CITY OF MONETT, MISSOURI

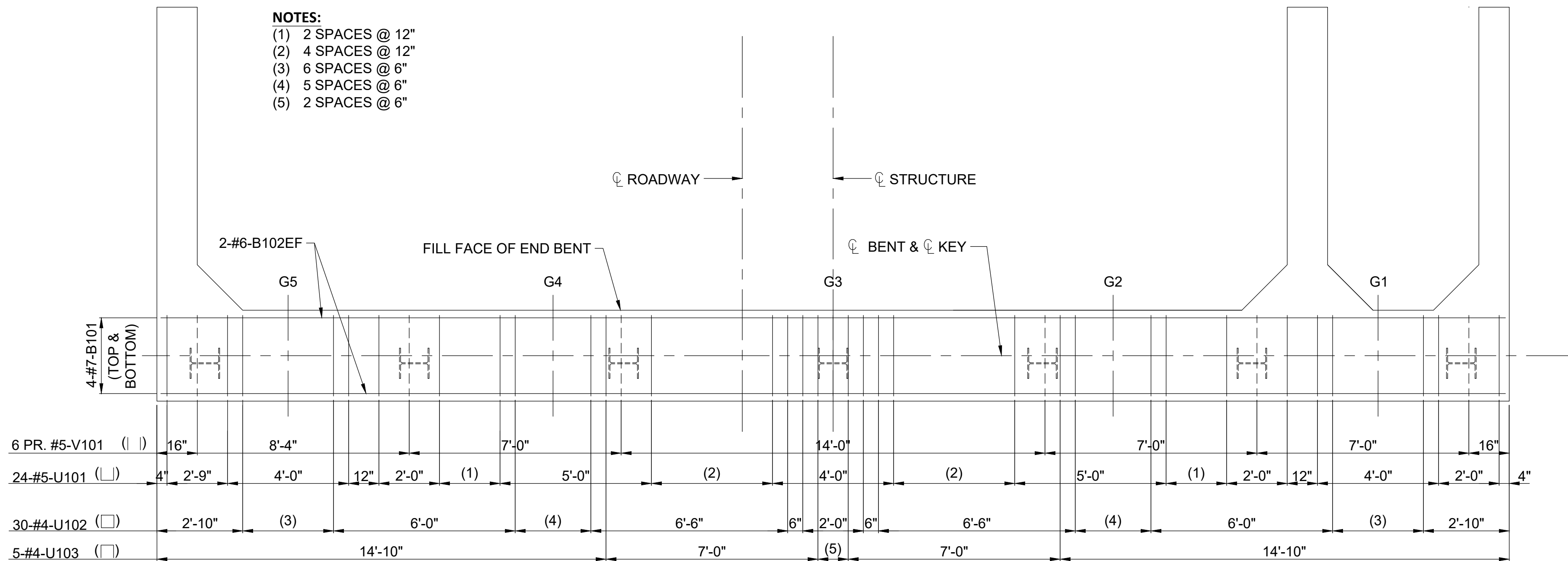
SHEET NUMBER

27

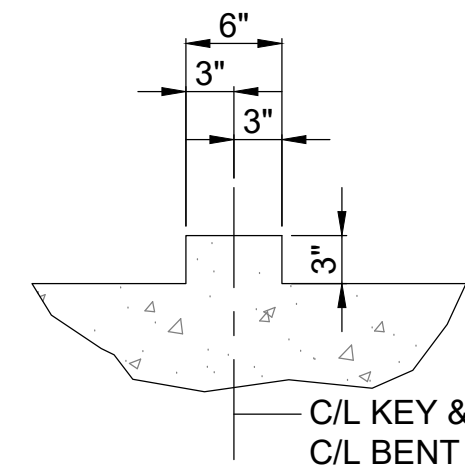
OF 94



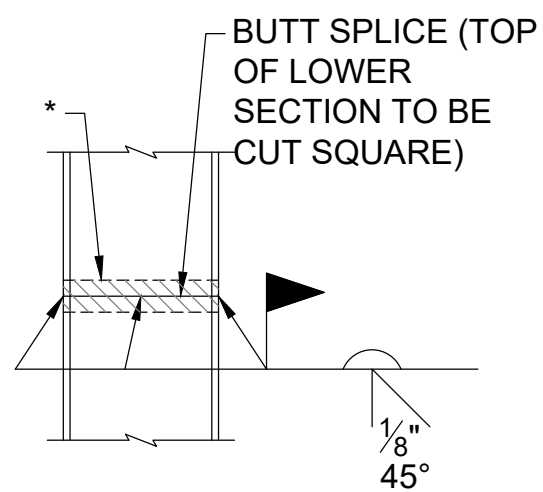
PLAN OF BEAM



PLAN OF BEAM SHOWING REINFORCEMENT
KEYS NOT SHOWN FOR CLARITY.

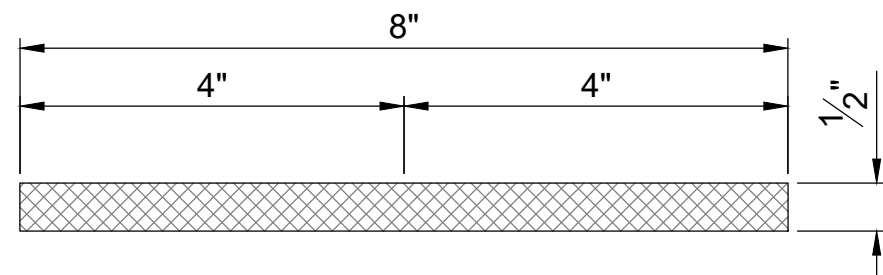


SECTION THRU KEY



STEEL PILE SPLICE
(IF REQUIRED)

* GALVANIZING MATERIAL SHALL BE OMITTED OR REMOVED ONE INCH CLEAR OF WELD LOCATIONS IN ACCORDANCE WITH SEC 702.



PLAIN NEOPRENE BEARING PAD

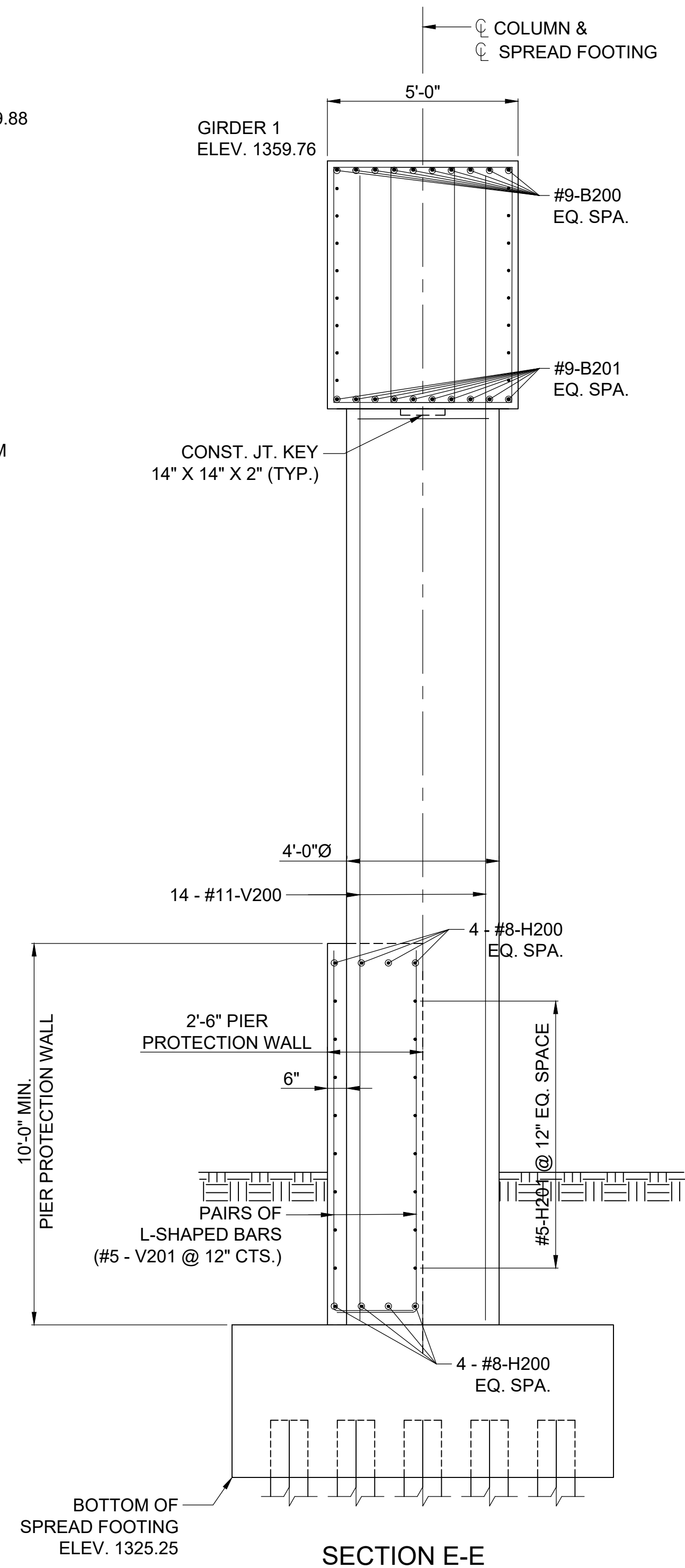
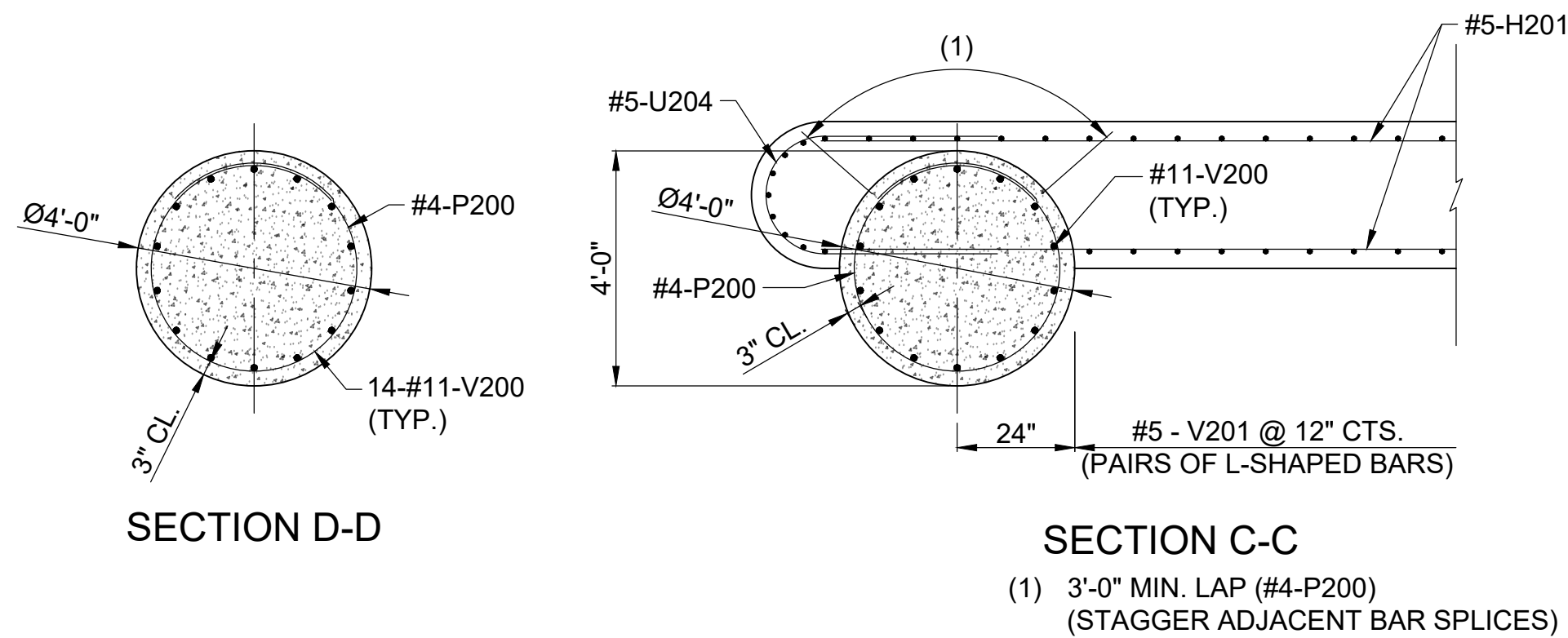
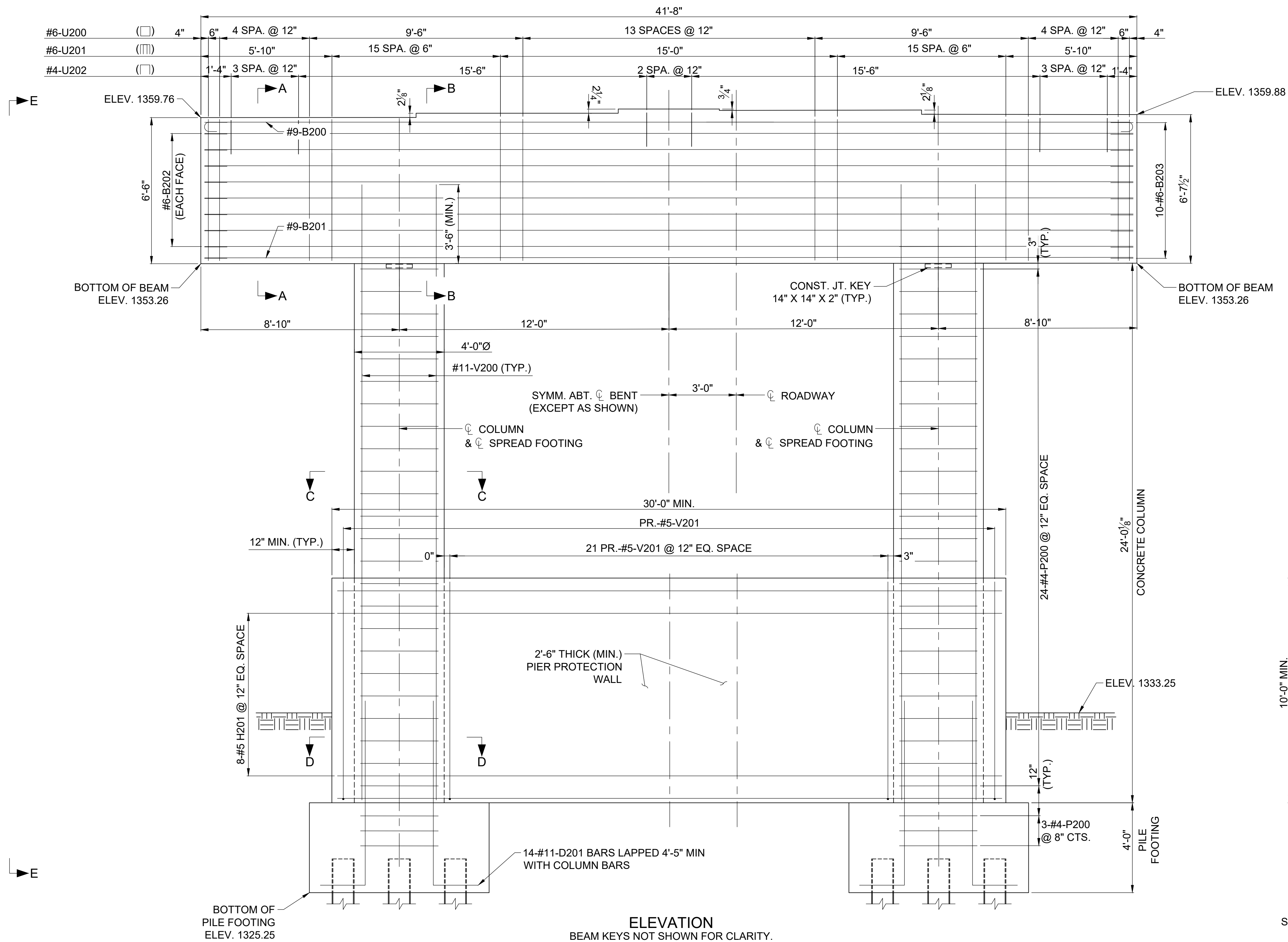
GENERAL NOTES:

WORK THIS SHEET WITH SHEET NO. 29 & 30.
ALL U BARS AND PAIRS OF V BARS SHALL BE PLACED PARALLEL TO CENTERLINE OF ROADWAY.
REINFORCING STEEL SHALL BE SHIFTED TO CLEAR PILES. U BARS SHALL CLEAR PILES BY AT LEAST 1 1/2 INCHES.

SUBSTRUCTURE QUANTITY TABLE FOR BENT NO. 1		
ITEM	UNIT	QUANTITY
STRUCTURAL STEEL PILES (12 IN.)	LINEAR FOOT	504
PILE POINT REINFORCEMENT	EACH	7
CLASS B-2 CONCRETE (SUBSTRUCTURE)	CU. YARD	22.1
PLAIN NEOPRENE BEARING PAD	EACH	5
PRE-BORE FOR PILING	LINEAR FOOT	259

THESE QUANTITIES ARE INCLUDED IN THE ESTIMATED QUANTITIES TABLE ON SHEET NO. 27.

REVISIONS		DRAWING INFO.	
NO.	DESCRIPTION	BY	DATE
1	ADDENDUM NO. 1	MPG	6/30/26
		DRAWN BY:	NDO
		CHECK BY:	GDS
		DATE:	7/2/2026
		FIELD BOOK:	
		JOB NUMBER:	RRP-000S(23)

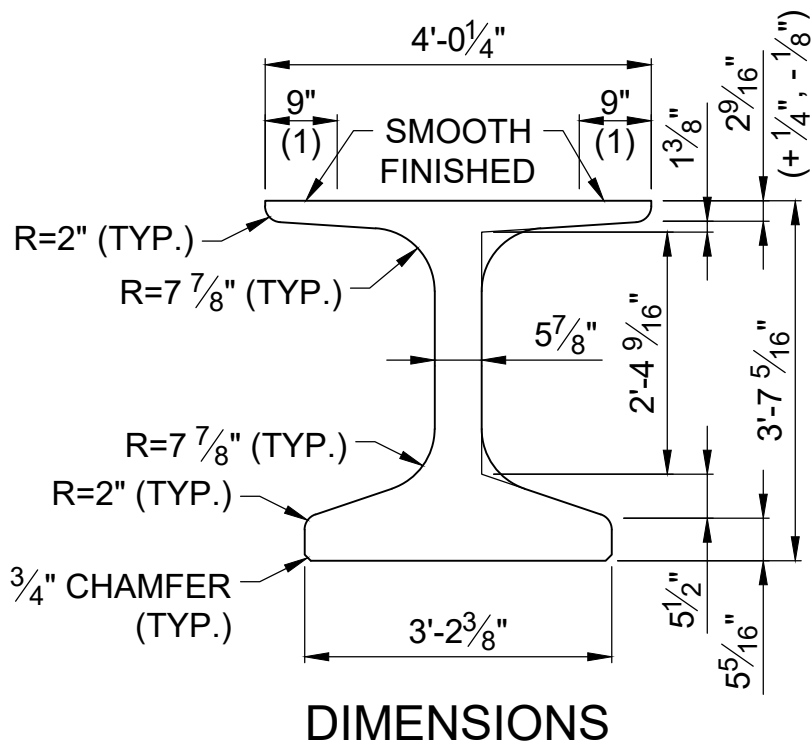


SUBSTRUCTURE QUANTITY TABLE FOR BENT NO. 2			
ITEM			QUANTITY
STRUCTURAL STEEL PILES (12 IN.)	LINEAR FOOT		592
CLASS 1 EXCAVATION	CU. YARD		443.5
CLASS B-2 CONCRETE (SUBSTRUCTURE)	CU. YARD		103.1
LAMINATED NEOPRENE BEARING PADS	EACH		5
LAMINATED NEOPRENE BEARING PADS (TAPERED)	EACH		5
RIENFORCING STEEL (BRIDGES)	POUND		17889
PRE-BORE FOR PILING	LINEAR FOOT		144

GENERAL NOTES:
WORK THIS SHEET WITH SHEET NO. 31 & 33.

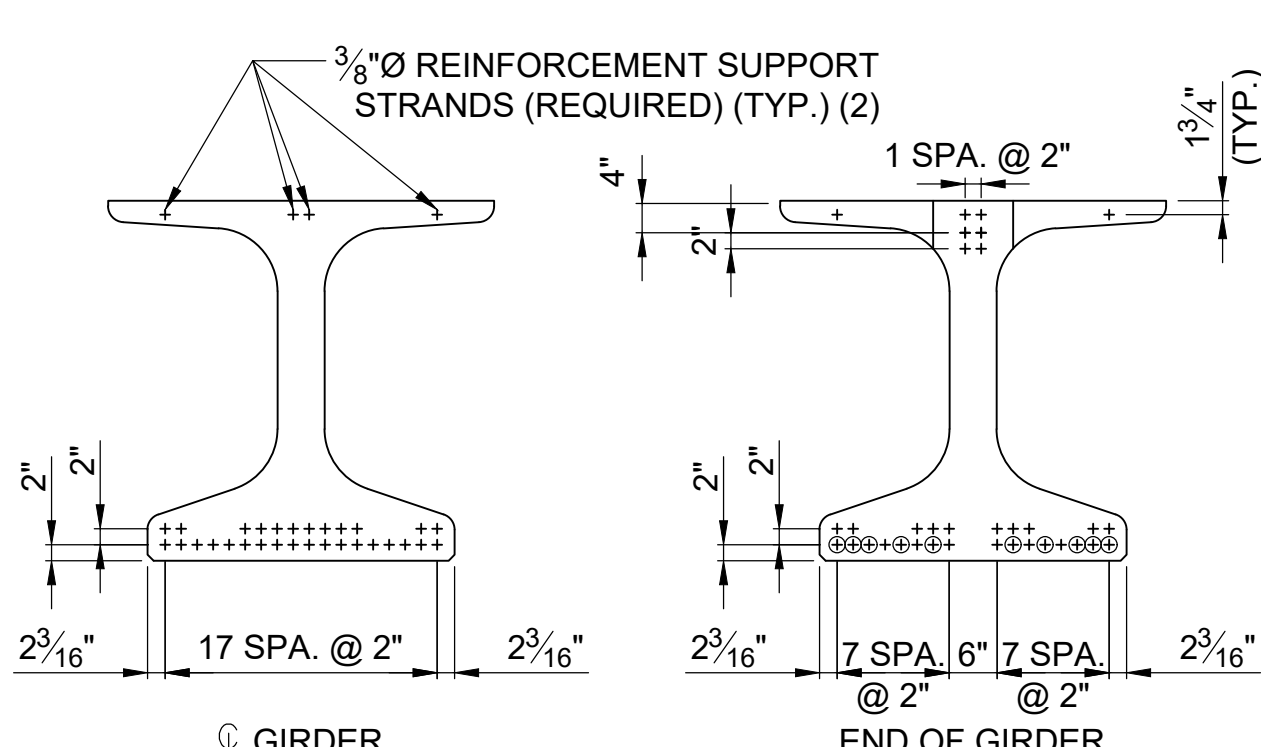
REVISIONS		DRAWING INFO.	
NO.	DESCRIPTION	BY	DATE
1	ADDENDUM NO. 1	MPG	6/30/26
		DRAWN BY:	NDO
		CHECK BY:	GDS
		DATE:	7/1/2026
		FIELD BOOK:	
		JOB NUMBER:	RRP-000S(23)

(1) FABRICATOR SHALL APPLY A BOND BREAKER TO THIS REGION EXCLUDING WHERE JOINT FILLER WILL BE APPLIED.



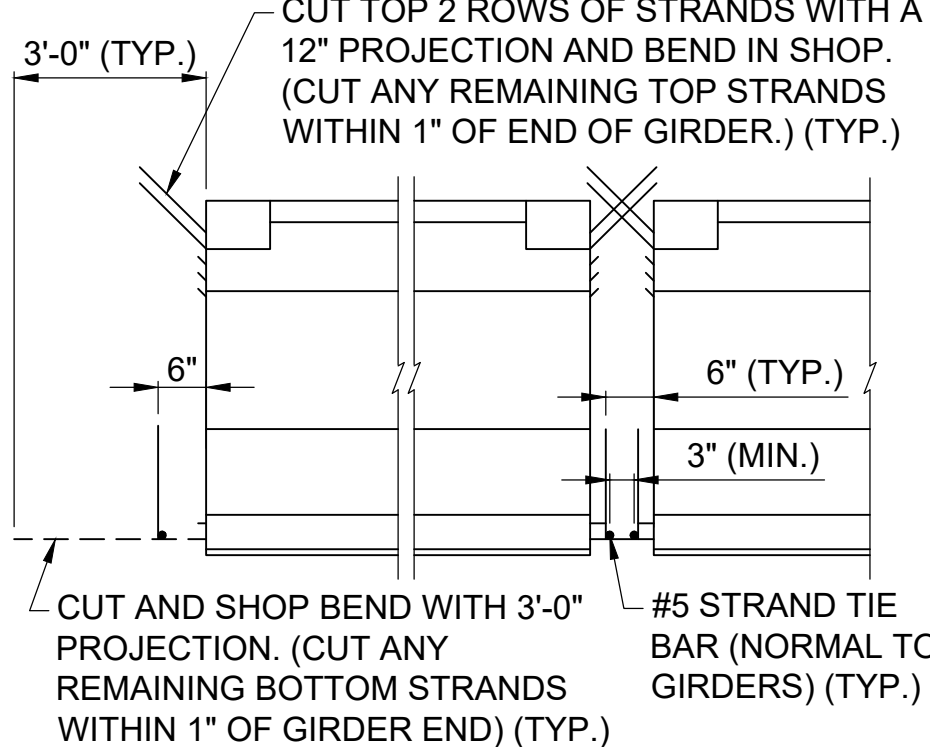
DIMENSIONS

(2) OUTER STRANDS TENSIONED TO 2.02 KIPS/STRAND AND INNER STRANDS TO 8 KIPS/STRAND. PLACED SYMMETRICAL ABOUT $\bar{C}$ GIRDER. MAY BE MOVED Laterally IN PAIRS.

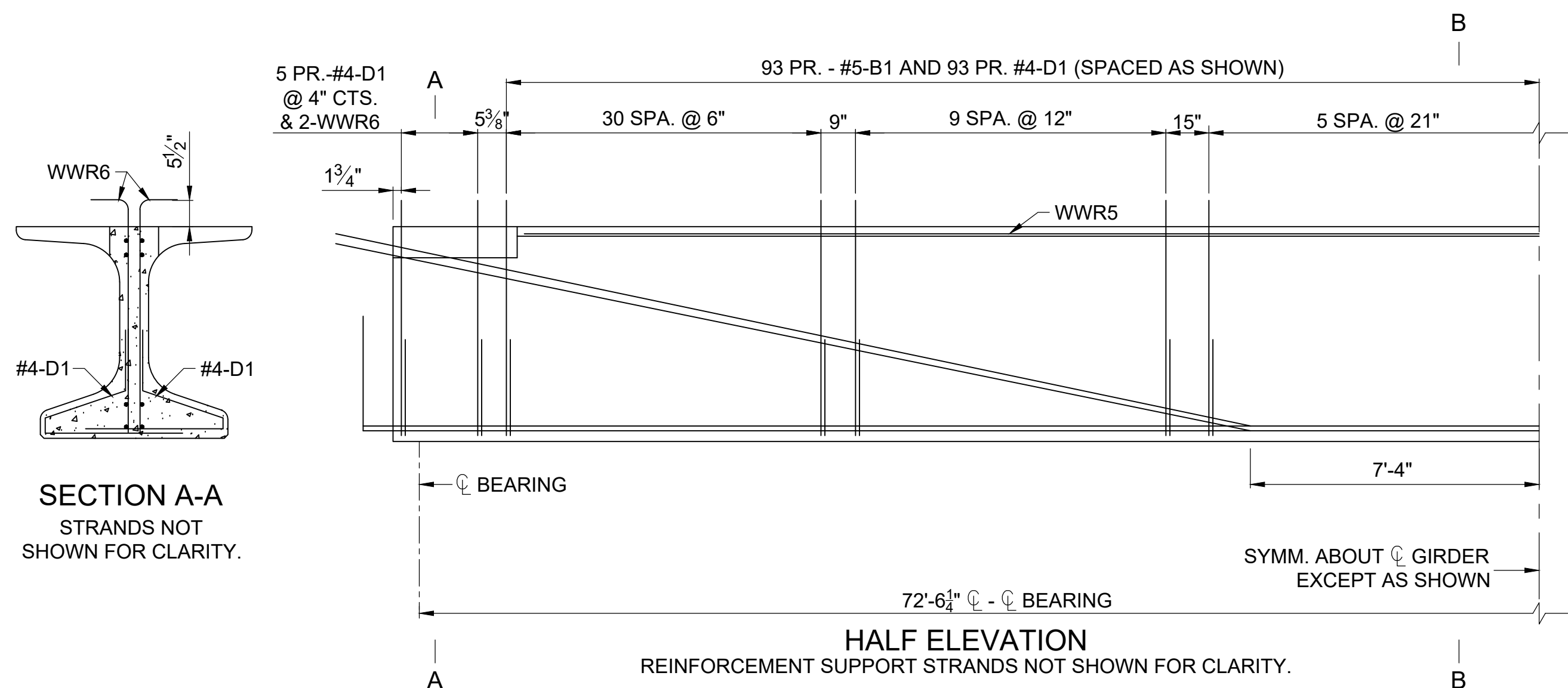


STRAND ARRANGEMENT

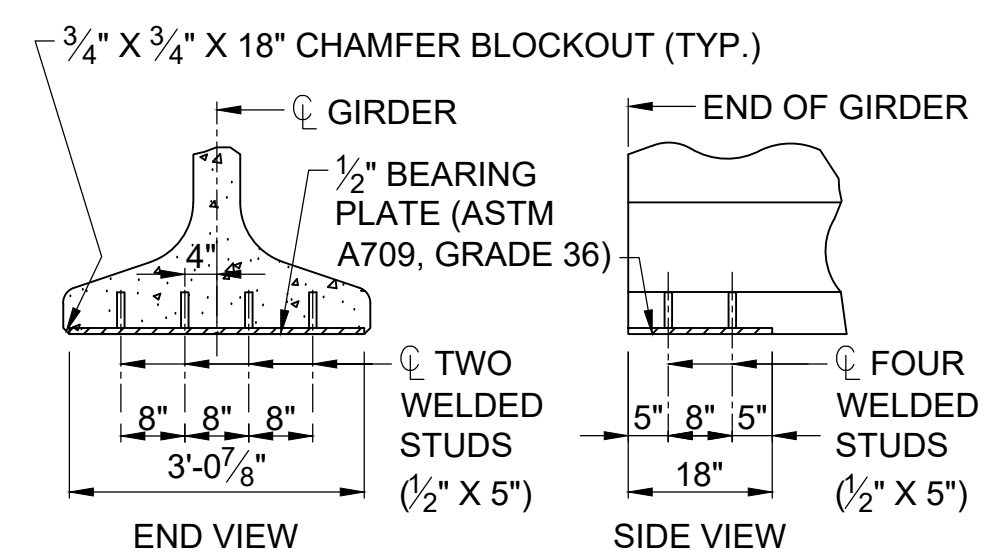
+ INDICATES PRESTRESSING STRAND. ○ INDICATES CUT AND SHOP BEND WITH 3'-0" PROJECTION.



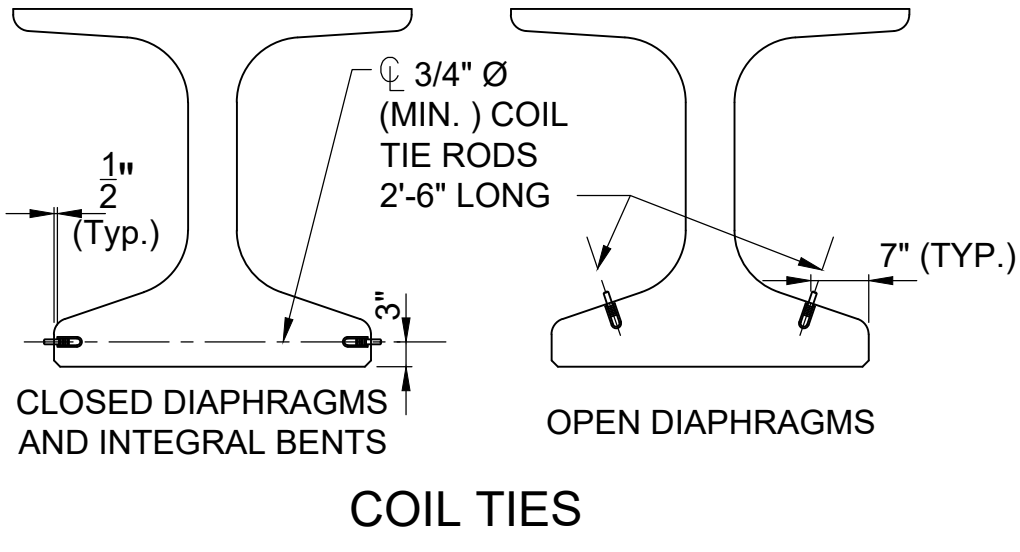
STRANDS AT GIRDER ENDS



HALF ELEVATION
REINFORCEMENT SUPPORT STRANDS NOT SHOWN FOR CLARITY.

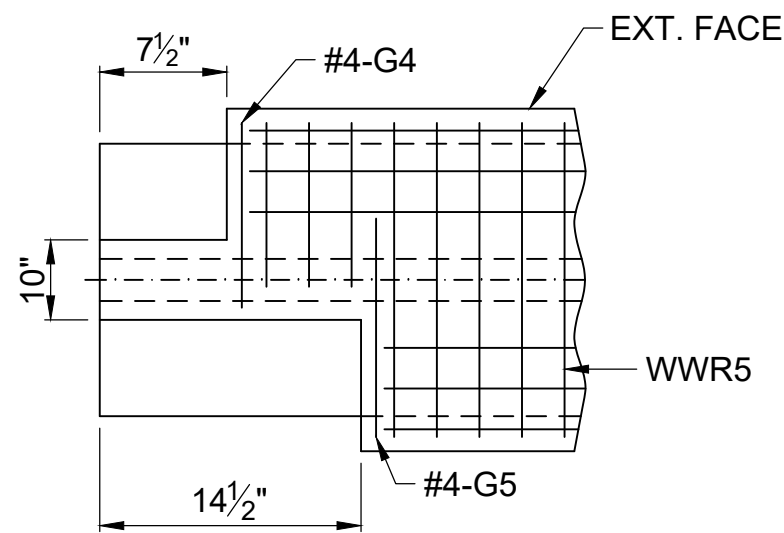


BEARING PLATE

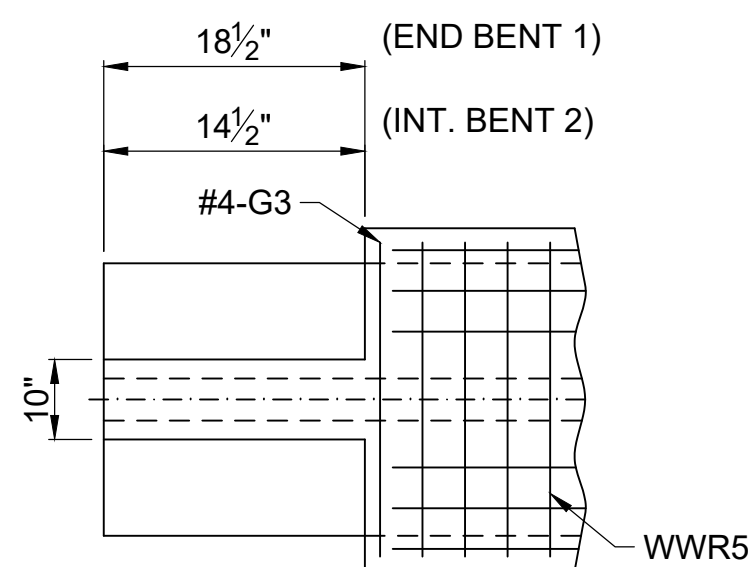


COIL TIES

EXCLUDE COIL TIE AT EXTERIOR FACE OF EXTERIOR GIRDERS EXCEPT AT INTEGRAL END BENTS.



LEFT EXTERIOR GIRDER
AT INTERMEDIATE BENT 2
ROTATE 180° FOR RIGHT EXT.

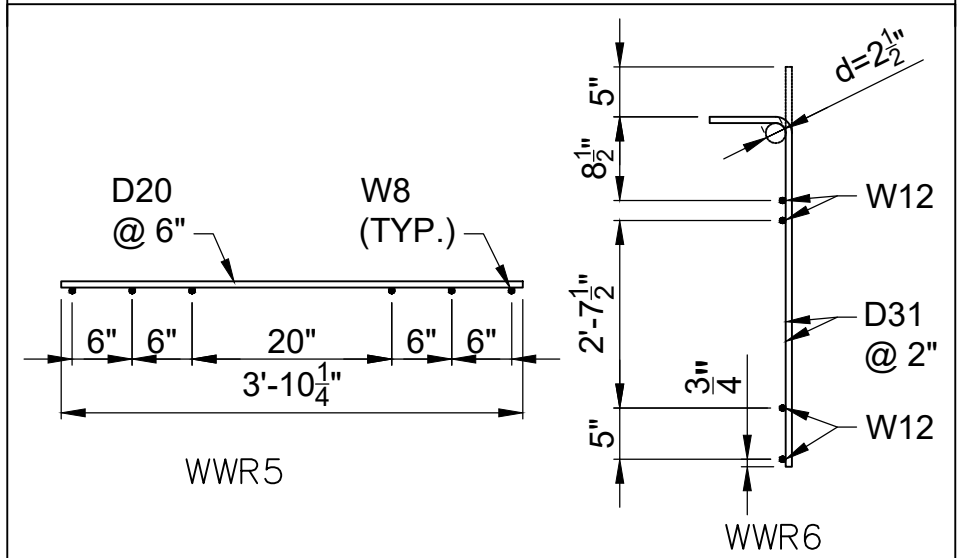


INTERIOR GIRDER AT END BENT 1
AND INTERMEDIATE BENT 2 &
EXTERIOR GIRDER AT END BENT 1

TOP FLANGE BLOCKOUT ⚠

Bill of Reinforcing Steel – Each Girder					Bending Diagrams	
No.	Size/Mark	Length	Shape			
93	5 B1	5'-0"	11S		Shape 20	
103	4 D1	4'-0"	9S			
2	4 G3	3'-10"	20			
2	4 G4	2'-3"	20			
2	4 G5	2'-8"	20			

Welded Wire Reinforcement – Each Girder



ALL DIMENSIONS ARE OUT TO OUT.

HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE CRSI MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES, STIRRUP AND TIE DIMENSIONS.

ACTUAL BAR LENGTHS ARE MEASURED ALONG CENTERLINE OF BAR TO THE NEAREST INCH.

MINIMUM CLEARANCE TO REINFORCING SHALL BE ONE INCH.

ALL BAR REINFORCEMENT SHALL BE GRADE 60.

THE TWO D1 BARS MAY BE FURNISHED AS ONE BAR AT THE FABRICATOR'S OPTION.

ALL B1 BARS SHALL BE EPOXY COATED.

G4 AND G5 NOT REQUIRED FOR INTERIOR GIRDERS. G3 AND G6 NOT REQUIRED FOR EXTERIOR GIRDERS OF INTERMEDIATE SPANS. HALF NO. OF G3, G4, G5 AND G6 NOT REQUIRED FOR EXT. GIRDERS OF END SPANS.

GENERAL NOTES:

CONCRETE FOR PRESTRESSED GIRDERS SHALL BE CLASS A-1 WITH F'C = 9500 PSI AND F'CI = 7000 PSI.

USE 30 STRANDS, 0.6"Ø GRADE 270, WITH AN INITIAL PRESTRESS FORCE OF 43.94 KIPS PER STRAND, TOTALING 1319 KIPS.

PRETENSIONED MEMBERS SHALL BE IN ACCORDANCE WITH SEC 1029.

FABRICATOR SHALL BE RESPONSIBLE FOR LOCATION AND DESIGN OF LIFTING DEVICES.

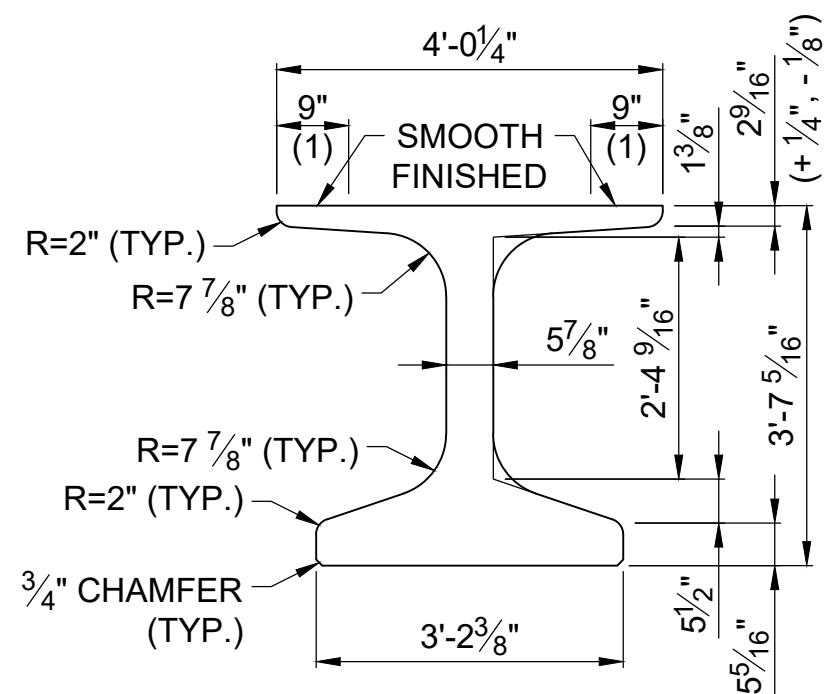
EXTERIOR AND INTERIOR GIRDERS ARE THE SAME EXCEPT: COIL TIES, TOP FLANGE BLOCKOUT, APPLICATION OF BOND BREAKER.

THE CONTRACTOR SHALL PROVIDE BRACING NECESSARY FOR LATERAL AND TORSIONAL STABILITY OF THE GIRDERS DURING CONSTRUCTION OF THE CONCRETE SLAB AND REMOVE THE BRACING AFTER THE SLAB HAS ATTAINED 75% DESIGN STRENGTH. CONTRACTOR SHALL NOT DRILL HOLES IN THE GIRDERS.

FOR GIRDER CAMBER DIAGRAM, SEE SHEET NO. 45.

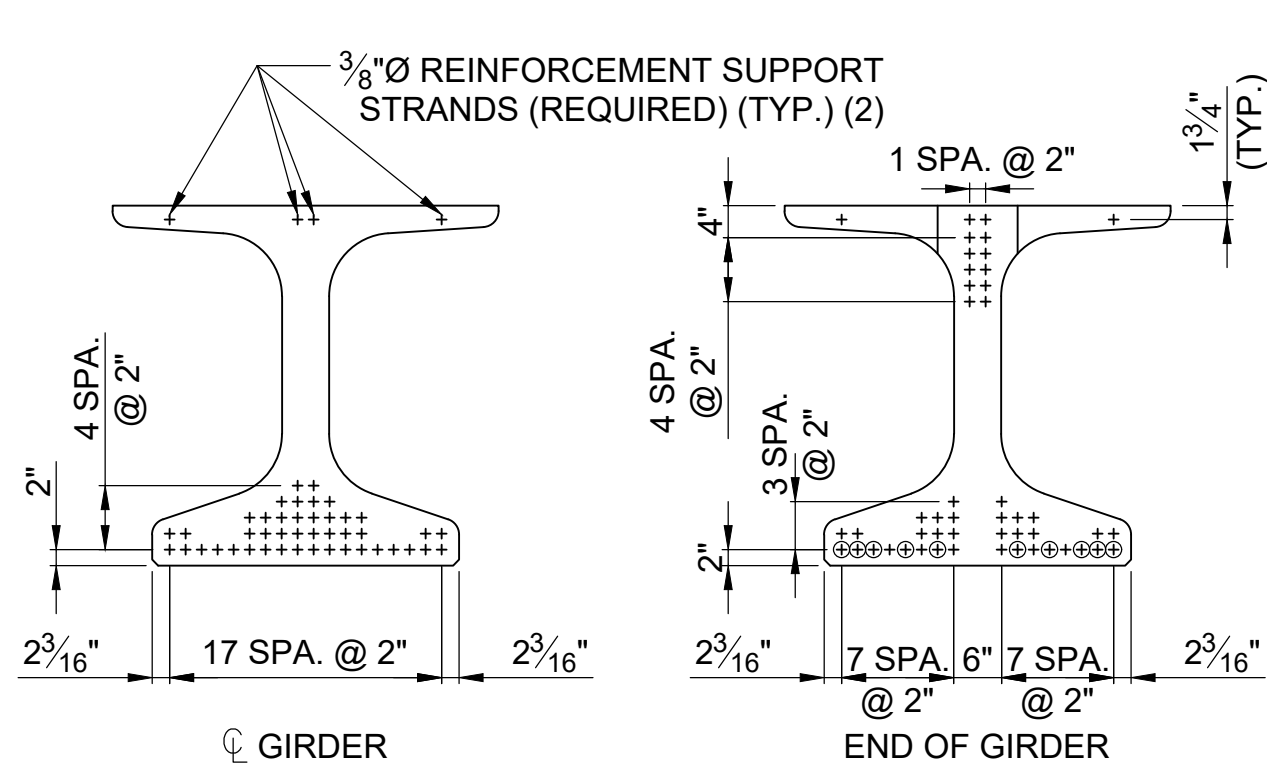
FOR LOCATION OF COIL TIES AT CONCRETE DIAPHRAGMS AND INTEGRAL BENTS, SEE SHEETS NO. 28, 37 AND 44.

(1) FABRICATOR SHALL APPLY A BOND BREAKER TO THIS REGION EXCLUDING WHERE JOINT FILLER WILL BE APPLIED.



DIMENSIONS

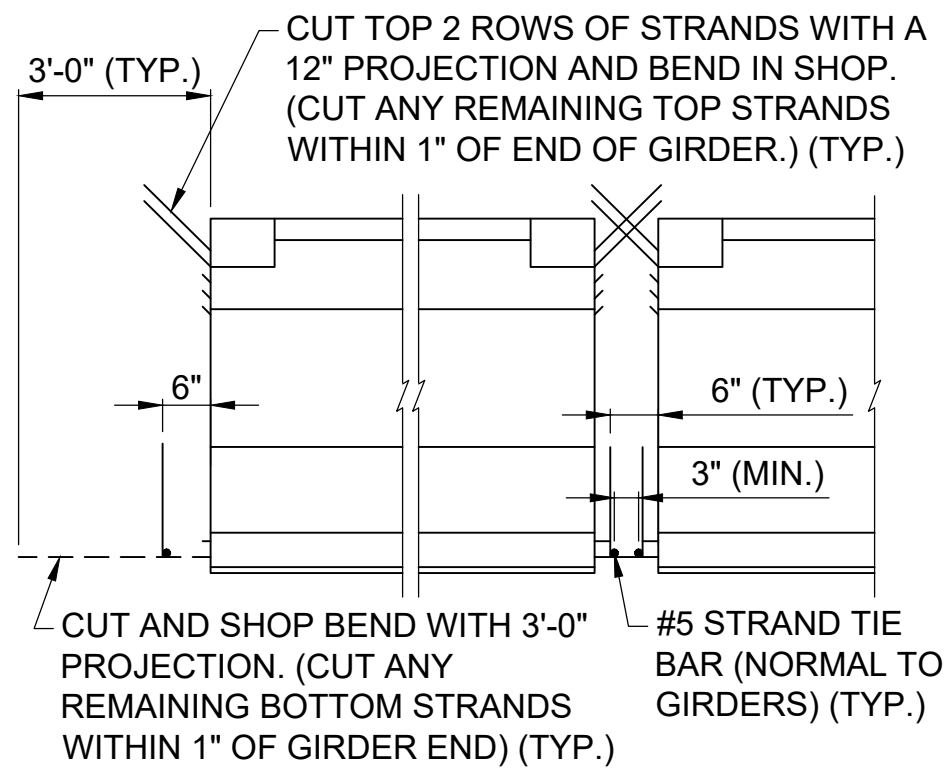
(2) OUTER STRANDS TENSIONED TO 2.02 KIPS/STRAND AND INNER STRANDS TO 8 KIPS/STRAND. PLACED SYMMETRICAL ABOUT CL GIRDER. MAY BE MOVED Laterally IN PAIRS.



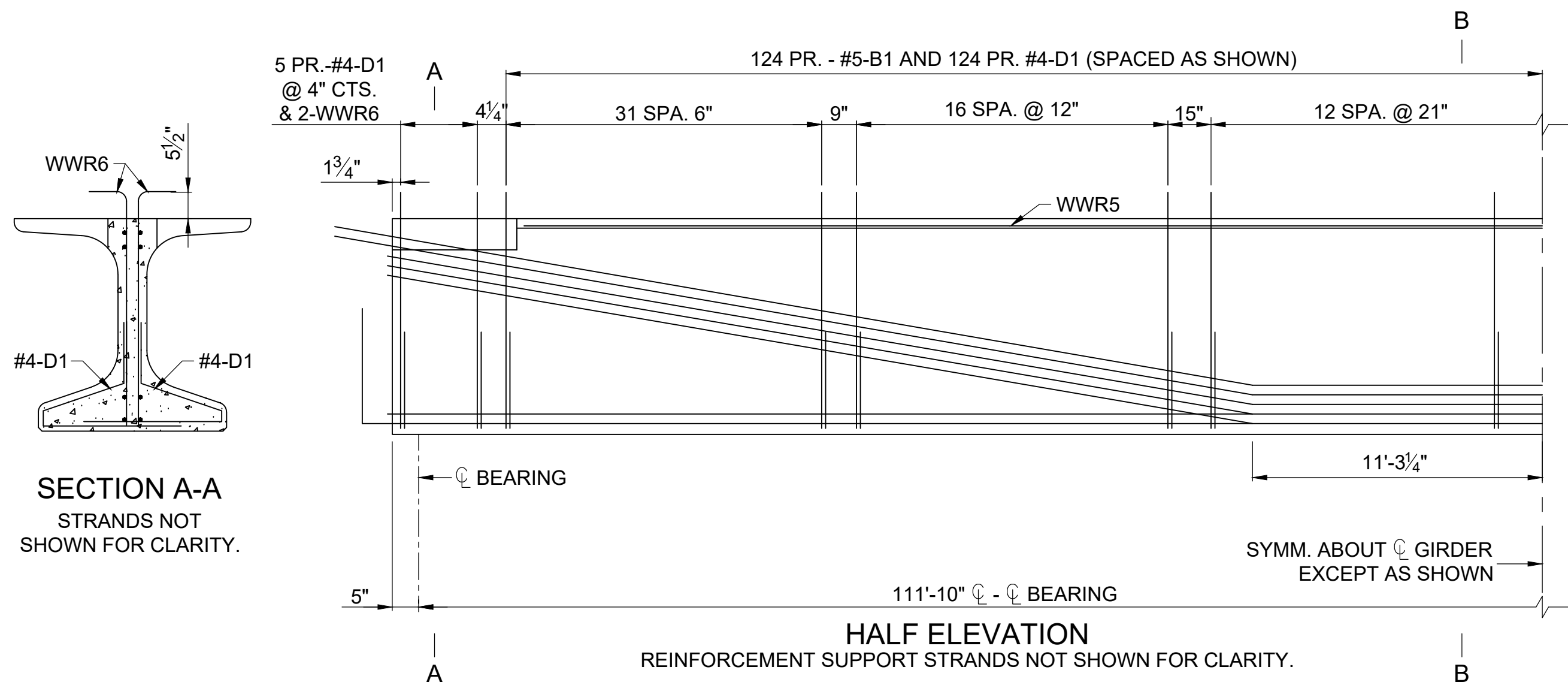
STRAND ARRANGEMENT

+ INDICATES PRESTRESSING STRAND.

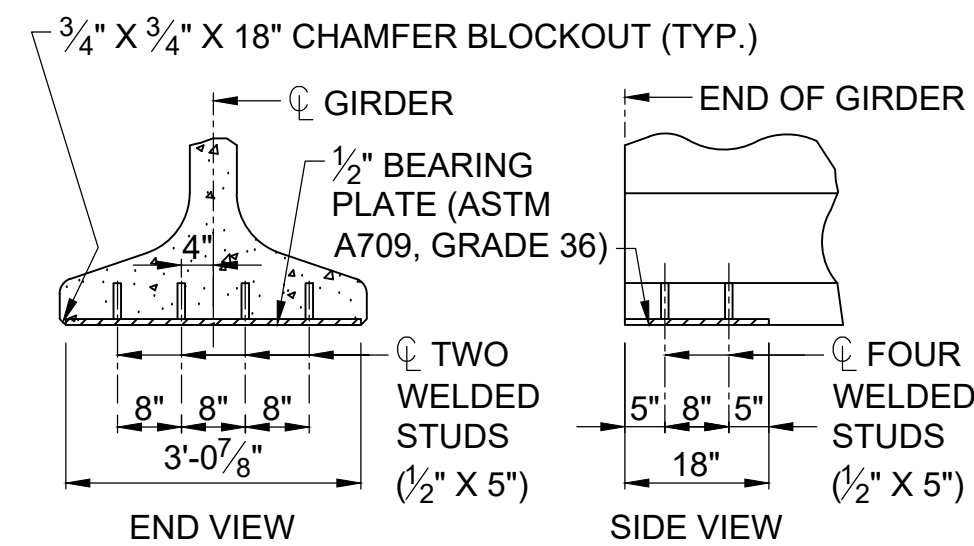
o INDICATES CUT AND SHOP BEND WITH 3'-0" PROJECTION.



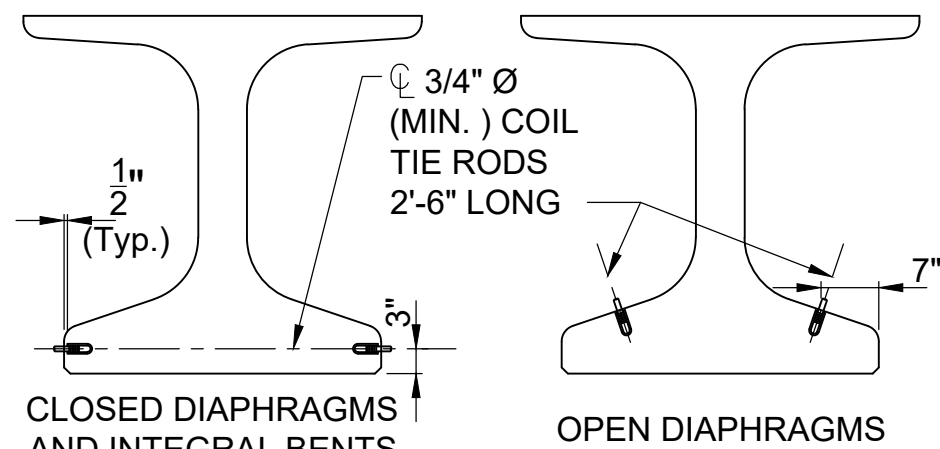
STRANDS AT GIRDER ENDS



HALF ELEVATION
REINFORCEMENT SUPPORT STRANDS NOT SHOWN FOR CLARITY.

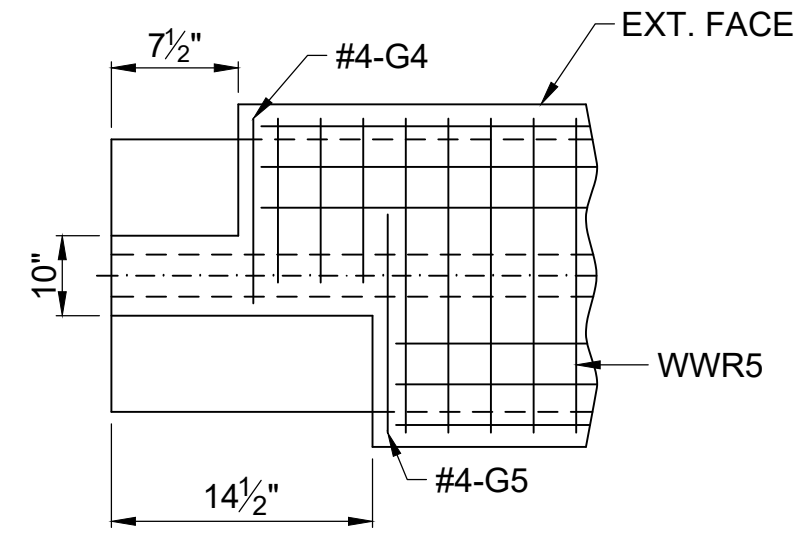


BEARING PLATE

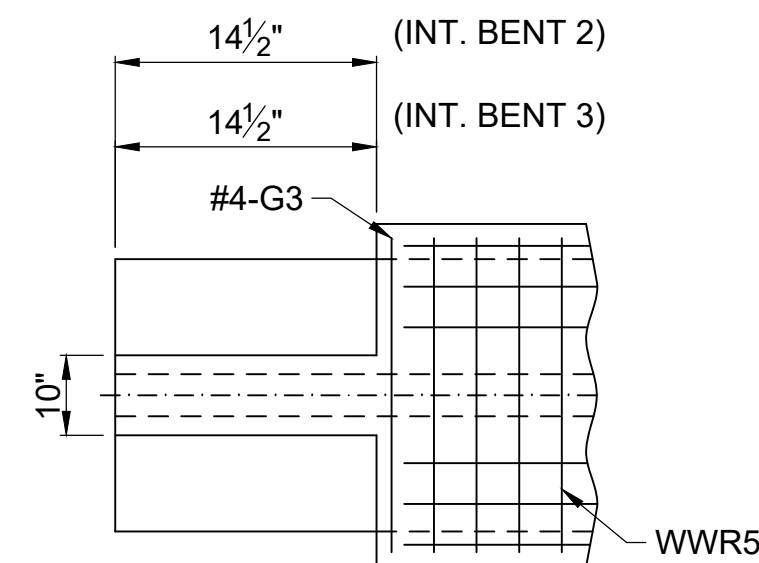


COIL TIES

EXCLUDE COIL TIE AT EXTERIOR FACE OF EXTERIOR GIRDERS EXCEPT AT INTEGRAL END BENTS.

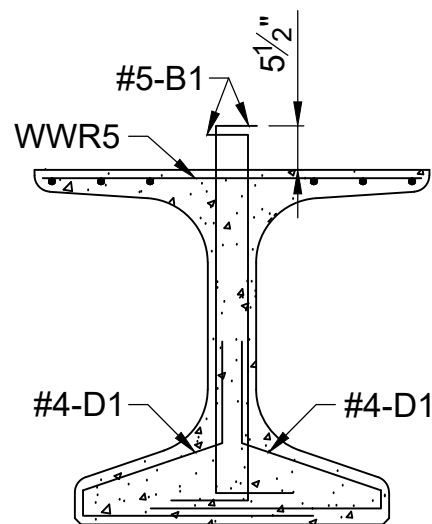


LEFT EXTERIOR GIRDER
AT INTERMEDIATE BENT 2 AND 3
ROTATE 180° FOR RIGHT EXT.



INTERIOR GIRDER AT
INTERMEDIATE BENT 2 AND 3

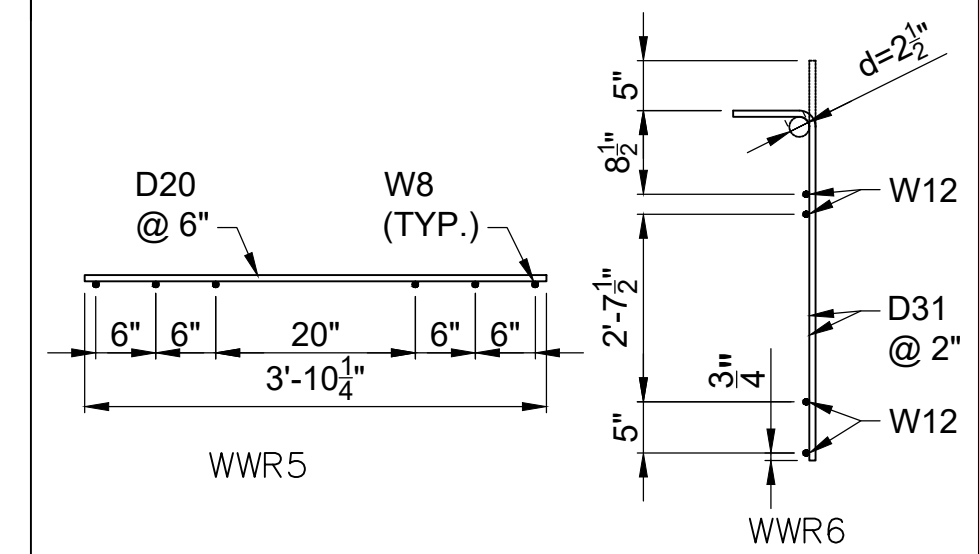
TOP FLANGE BLOCKOUT ⚠



SECTION B-B
STRANDS NOT
SHOWN FOR CLARITY.

Bill of Reinforcing Steel — Each Girder					Bending Diagrams	
No.	Size/Mark	Length	Shape			
124	5 B1	5'-0"	11S		Shape 20	
134	4 D1	4'-0"	9S			
2	4 G3	3'-10"	20			
2	4 G4	2'-3"	20			
2	4 G5	2'-8"	20			
					Shape 9S	Shape 11S

Welded Wire Reinforcement — Each Girder



ALL DIMENSIONS ARE OUT TO OUT.

HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE CRSI MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES, STIRRUP AND TIE DIMENSIONS.

ACTUAL BAR LENGTHS ARE MEASURED ALONG CENTERLINE OF BAR TO THE NEAREST INCH.

MINIMUM CLEARANCE TO REINFORCING SHALL BE ONE INCH.

ALL BAR REINFORCEMENT SHALL BE GRADE 60.

THE TWO D1 BARS MAY BE FURNISHED AS ONE BAR AT THE FABRICATOR'S OPTION.

ALL B1 BARS SHALL BE EPOXY COATED.

G4 AND G5 NOT REQUIRED FOR INTERIOR GIRDERS. G3 AND G6 NOT REQUIRED FOR EXTERIOR GIRDERS OF INTERMEDIATE SPANS. HALF NO. OF G3, G4, G5 AND G6 NOT REQUIRED FOR EXT. GIRDERS OF END SPANS.

GENERAL NOTES:

CONCRETE FOR PRESTRESSED GIRDERS SHALL BE CLASS A-1 WITH F'C = 9500 PSI AND F'CI = 7000 PSI.

USE 44 STRANDS, 0.6"Ø GRADE 270, WITH AN INITIAL PRESTRESS FORCE OF 43.94 KIPS PER STRAND, TOTALING 1934 KIPS.

PRETENSIONED MEMBERS SHALL BE IN ACCORDANCE WITH SEC 1029.

FABRICATOR SHALL BE RESPONSIBLE FOR LOCATION AND DESIGN OF LIFTING DEVICES.

EXTERIOR AND INTERIOR GIRDERS ARE THE SAME EXCEPT: COIL TIES, TOP FLANGE BLOCKOUT, APPLICATION OF BOND BREAKER.

THE CONTRACTOR SHALL PROVIDE BRACING NECESSARY FOR LATERAL AND TORSIONAL STABILITY OF THE GIRDERS DURING CONSTRUCTION OF THE CONCRETE SLAB AND REMOVE THE BRACING AFTER THE SLAB HAS ATTAINED 75% DESIGN STRENGTH. CONTRACTOR SHALL NOT DRILL HOLES IN THE GIRDERS.

FOR GIRDER CAMBER DIAGRAM, SEE SHEET NO. 45.

FOR LOCATION OF COIL TIES AT CONCRETE DIAPHRAGMS AND INTEGRAL BENTS, SEE SHEETS NO. 28, 37 AND 44.

REVISIONS		DRAWING INFO.	
NO.	DESCRIPTION	BY	DATE
1	ADDENDUM NO. 1	MPG	6/30/26
		DRAWN BY:	NDO
		CHECK BY:	GDS
		DATE:	7/1/2026
		FIELD BOOK:	
		JOB NUMBER:	RRP-0005(S23)

[illegible]

Figure 10.10 shows two reinforcement details for a T-beam. (a) Reinforcement detail for a T-beam with a top flange. (b) Reinforcement detail for a T-beam with a bottom flange. Both diagrams show reinforcement bars, stirrups, and dimensions.

(a) Reinforcement detail for a T-beam with a top flange. The diagram shows a T-beam cross-section with a top flange. The reinforcement includes 3/8" diameter reinforcement support strands (required) (typ.) (2) at the top. The bottom reinforcement consists of 17 #4 bars at 2" spacing. The top flange width is 23 1/8". The total width of the beam is 23 1/8". The height of the beam is 4 SPA. @ 2". The bottom flange height is 2". The top flange height is 2". The bottom flange width is 23 1/8". The top flange width is 23 1/8".

(b) Reinforcement detail for a T-beam with a bottom flange. The diagram shows a T-beam cross-section with a bottom flange. The reinforcement includes 1 #4 bar at 2" spacing at the top. The bottom reinforcement consists of 7 #4 bars at 2" spacing. The top flange width is 23 1/8". The total width of the beam is 23 1/8". The height of the beam is 4 SPA. @ 2". The bottom flange height is 2". The top flange height is 2". The bottom flange width is 23 1/8". The top flange width is 23 1/8".

+ INDICATES
PRESTRESSING STRAND.

3'-0" (TYP.)

CUT TOP 2 ROWS OF STRANDS WITH A 12" PROJECTION AND BEND IN SHOP. (CUT ANY REMAINING TOP STRANDS WITHIN 1" OF END OF GIRDER.) (TYP.)

6"

6" (TYP.)

3" (MIN.)

CUT AND SHOP BEND WITH 3'-0" PROJECTION. (CUT ANY REMAINING BOTTOM STRANDS WITHIN 1" OF GIRDER END) (TYP.)

#5 STRAND TIE BAR (NORMAL TO GIRDERS) (TYP.)

Technical drawing of a wall section showing reinforcement details. The drawing includes dimensions: 7 1/2" for the top horizontal distance, 10" for the vertical distance, and 14 1/2" for the bottom horizontal distance. Reinforcement bars are labeled #4-G4 (top horizontal), #4-G5 (bottom horizontal), and WWR5 (vertical). The right edge is labeled "EXT. FACE".

18 1/2" (END BENT 4)
14 1/2" (INT. BENT 3)
#4-G3
10"
Grid pattern of the deck is shown with dashed lines.

SECTION A-A
STRANDS NOT SHOWN FOR CLARITY.

HALF ELEVATION
REINFORCEMENT SUPPORT STRANDS NOT SHOWN FOR CLARITY.

5 PR. -#4-D1 @ 4" CTS. & 2-WWR6

123 PR. -#5-B1 AND 123 PR. #4-D1 (SPACED AS SHOWN)

41 SPA. @ 6" 9" 9 SPA. @ 12" 18" 9 SPA. @ 21"

WWR6 5 1/2"

WWR5

9'-10 1/4"

97'-8" C - C BEARING

CL BEARING

5"

CL GIRDER EXCEPT AS SHOWN

SYMM. ABOUT CL GIRDER EXCEPT AS SHOWN

REINFORCEMENT SUPPORT STRANDS NOT SHOWN FOR CLARITY.

3/4" X 3/4" X 18" CHAMFER BLOCKOUT (TYP.)

CL GIRDER

1/2" BEARING PLATE (ASTM A709, GRADE 36)

CL TWO WELDED STUDS (1/2" X 5")

CL FOUR WELDED STUDS (1/2" X 5")

END OF GIRDER

8" 8" 8" 3'-0 7/8"

5" 8" 5" 18"

END VIEW

SIDE VIEW

1" / 2 (Typ.)

3/4" Ø (MIN.) COIL TIE RODS 2'-6" LONG

CLOSED DIAPHRAGMS AND INTEGRAL BENTS

OPEN DIAPHRAGMS

EXCLUDE COIL TIE AT EXTERIOR FACE OF EXTERIOR
GIRDERS EXCEPT AT INTEGRAL END BENTS.

[illegible]

WWR5

WWR6

G4 AND G5 NOT REQUIRED FOR INTERIOR GIRDERS. G3 AND G6 NOT REQUIRED FOR EXTERIOR GIRDERS OF INTERMEDIATE SPANS. HALF NO. OF G3, G4, G5 AND G6 NOT REQUIRED FOR EXT. GIRDERS OF END SPANS.

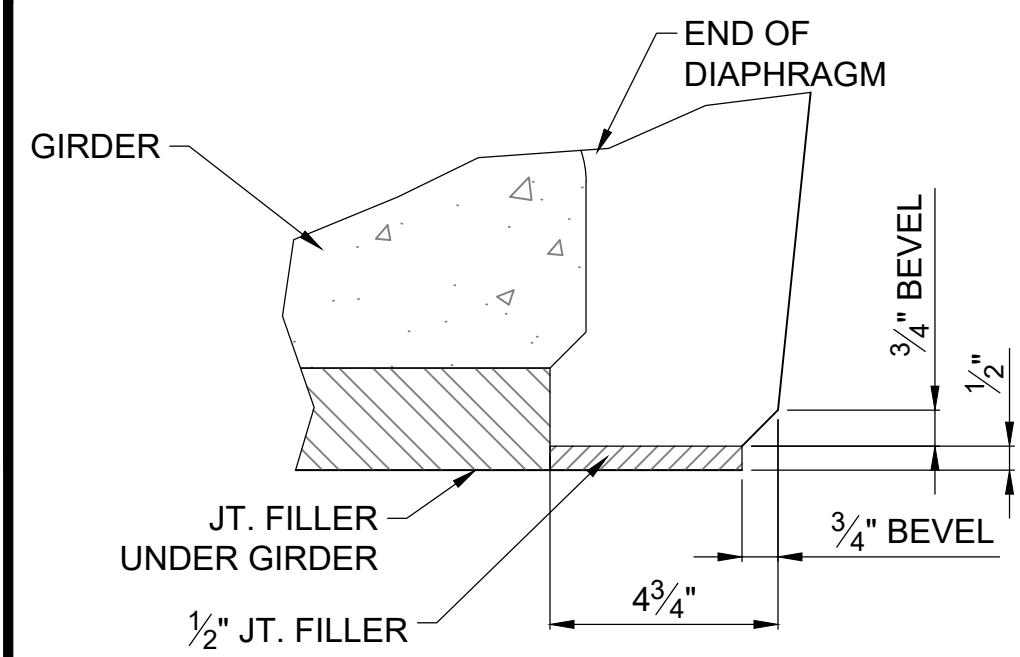
FOR LOCATION OF COIL TIES AT CONCRETE DIAPHRAGMS
AND INTEGRAL BENTS, SEE SHEETS NO. 28, 37 AND 44.



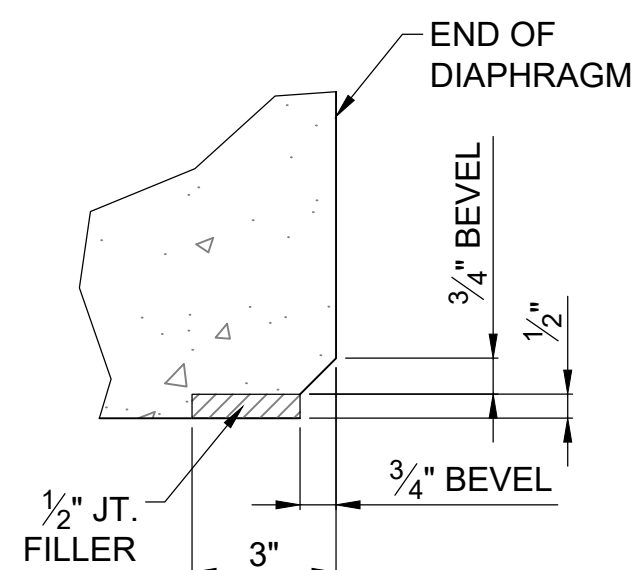
REVISIONS			DRAWING INFO.	
NO.	DESCRIPTION	BY	DATE	FIELD BY:
△	ADDENDUM NO.1	MPG	6/30/26	NDO
				CHECK BY: GDS
				DATE: 7/1/2026
				FIELD BOOK:
				JOB NUMBER: RRP-Q00S(229)

DETAILS OF NU GIRDERS SPAN 3-4
CHAPELL DRIVE
ROADWAY IMPROVEMENTS & PROPOSED BNSF BRIDGE
SECTION 26, T27N, R32 & 33W
CITY OF MONETT, MISSOURI

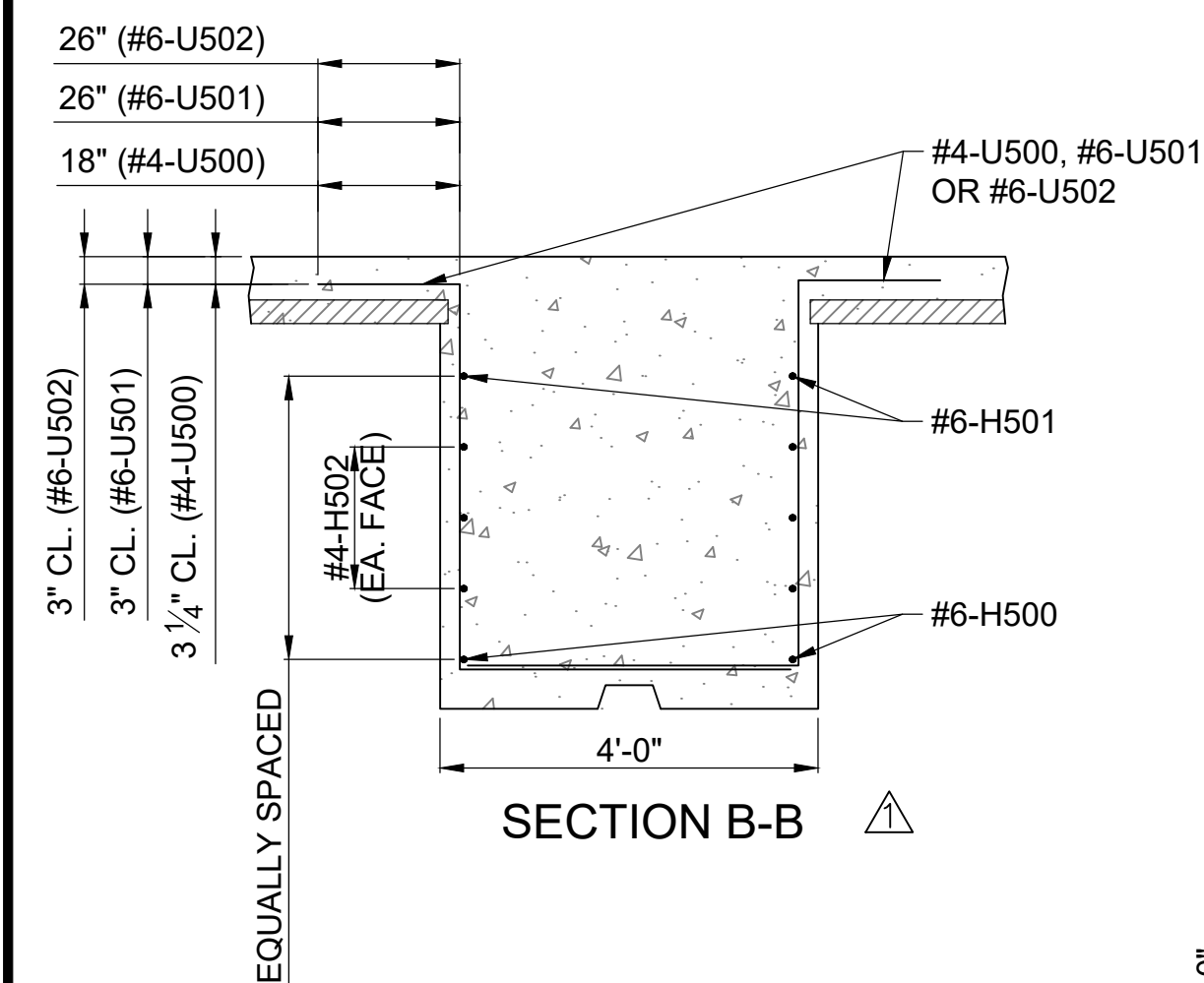
SHEET NUMBER
43
OF 94



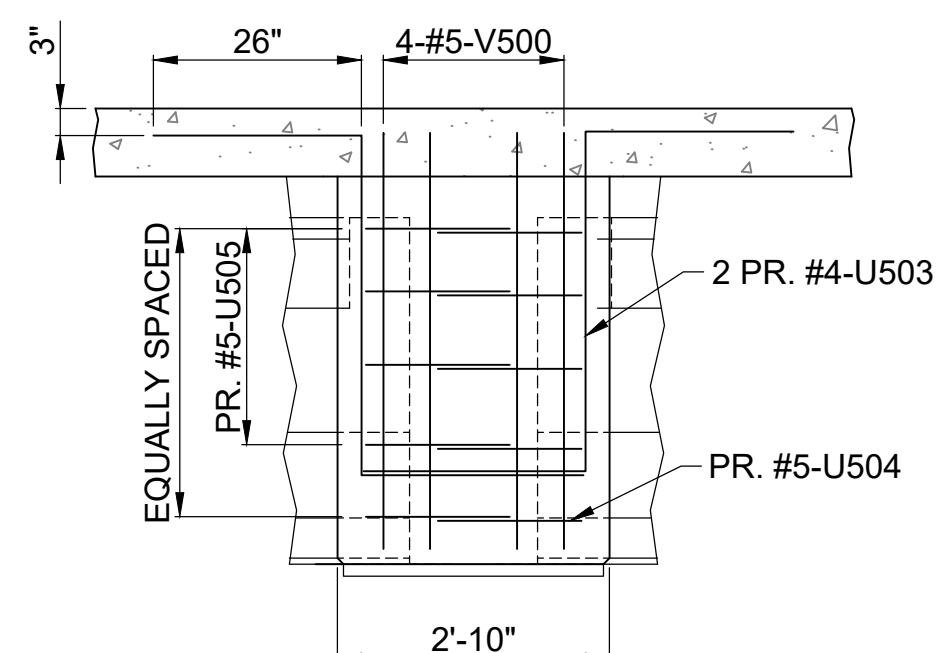
END DETAIL



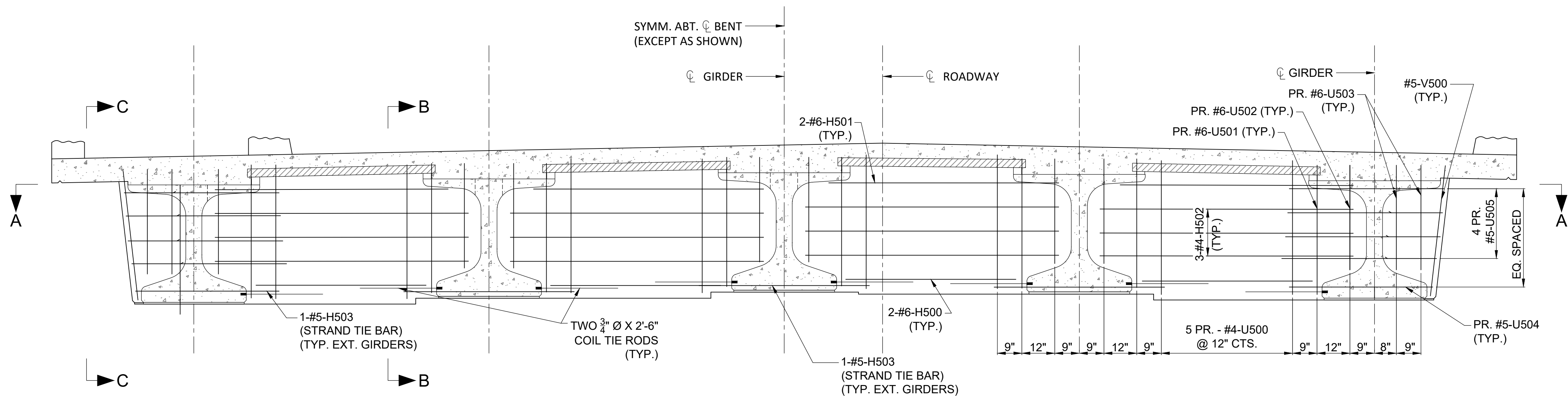
EDGE DETAIL



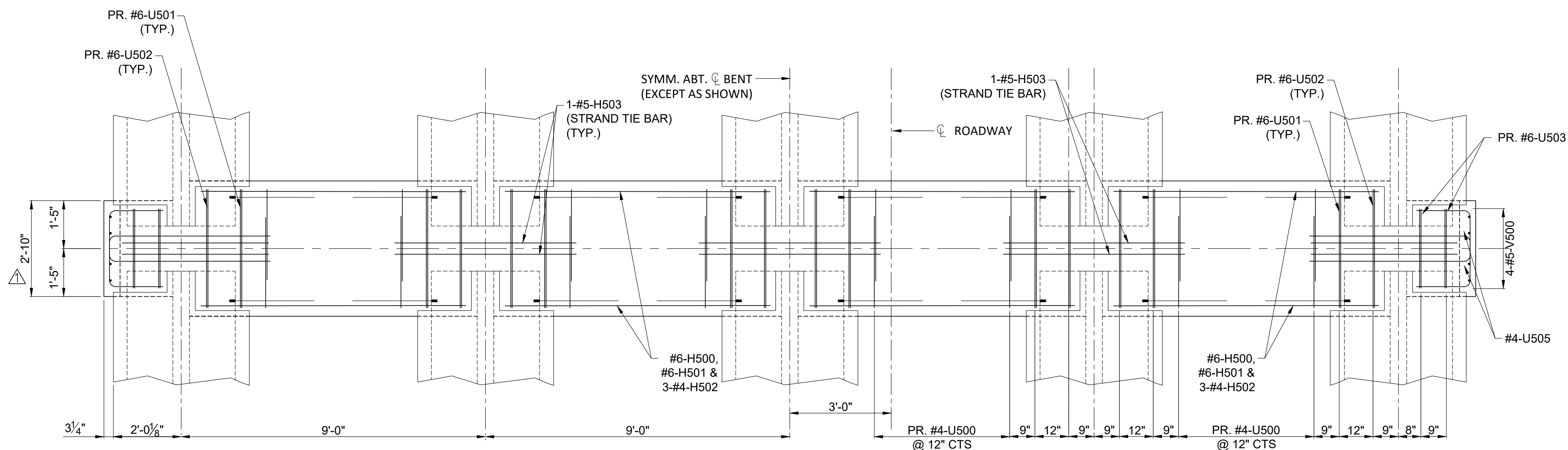
SECTION B-B



SECTION C-C



SECTION NEAR INTERMEDIATE BENT
NORMAL TO C/L STRUCTURE



SECTION A-A

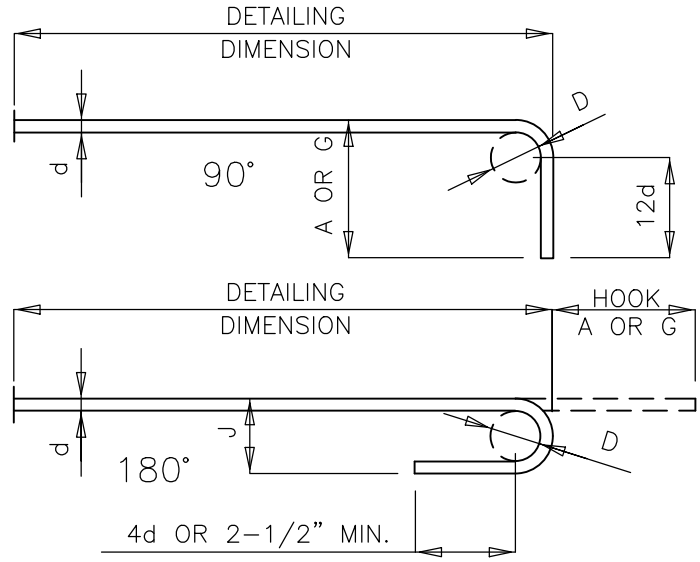
CONCRETE DIAPHRAGMS AT INTERMEDIATE BENTS NO. 2 & 3

GENERAL NOTES:

FOR LOCATION OF STRAND TIE BARS, SEE SHEETS NO. 41, 42 & 43.
FOR LOCATION AND DETAILS OF COIL TIE RODS, SEE SHEETS NO. 41, 42 & 43.
DIAPHRAGMS AT INTERMEDIATE BENTS SHALL BE BUILT VERTICAL.
ALL U-BARS IN DIAPHRAGMS ARE TO BE PLACED PARALLEL TO C/L ROADWAY.

REVISIONS		DRAWING INFO.	
NO.	DESCRIPTION	BY	DATE
1	ADDENDUM NO. 1	MPG	8/30/26
		DRAWN BY:	NDO
		CHECK BY:	GDS
		DATE:	7/12/26
		FIELD BOOK:	
		JOB NUMBER:	RRP-0005(23)

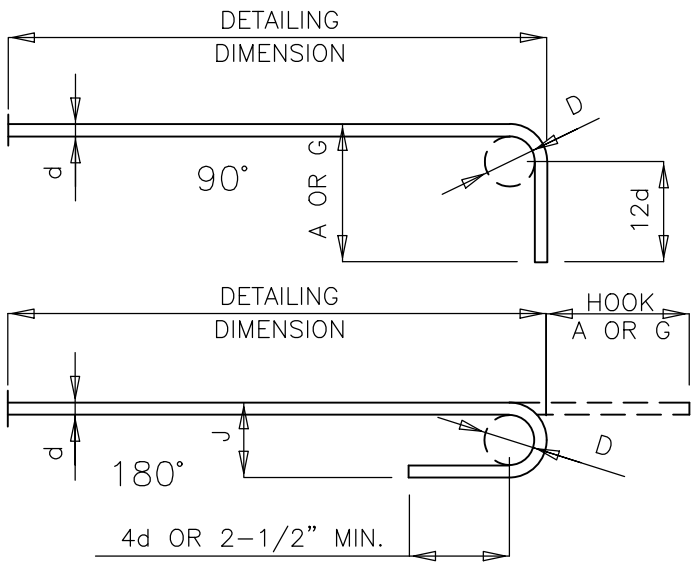
BILL OF REINFORCING STEEL																														
NO. REQD.	MARK NO.		LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS																NOMINAL LENGTH		ACTUAL LENGTH		WEIGHT
	SIZE	MARK								B		C		D		E		F		H		K								
										FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	LBS.		
SUPERSTRUCTURE																														
END BENT 1																														
8	7	B101	Beam	E	20					44	5.000												44	5	44	5	726			
4	6	B102	Beam	E	20					44	5.000												44	5	44	5	267			
4	6	D100	Diaphragm	E	20					44	5.000												44	5	44	5	267			
4	6	D101	Diaphragm	E	20					7	2.000												7	2	7	2	43			
8	6	D102	Diaphragm	E	20					7	10.000												7	10	7	10	94			
4	6	D103	Diaphragm	E	20					5	1.625												5	2	5	2	31			
6	6	D104	Diaphragm	E	20					3	7.000												3	7	3	7	32			
2	6	D105	Diaphragm	E	20					2	4.000												2	4	2	4	7			
4	7	D106	Diaphragm	E	20					44	5.000												44	5	44	5	363			
5	5	D107	Strand Tie	E	20					5	9.000												5	9	5	9	30			
24	5	U101	Beam	E	10	S						6	2.000	2	8.000								15	0	14	8	367			
30	4	U102	Beam	E	13	S				2	8.000	3	0.000	2	8.000	3	0.000						12	8	12	2	244			
5	4	U103	Beam	E	10	S						3	0.000	2	8.000								8	8	8	4	28			
57	6	U104	Diaphragm	E	19	S				2	6.375	4	6.000										7	0	6	10	585			
30	6	U105	Diaphragm	E	19	S				2	11.750	2	8.000										5	8	5	6	248			
30	6	U106	Diaphragm	E	10	S						3	4.000	2	2.000								8	10	8	6	383			
12	6	V101	Beam	E	20					6	9.250												6	9	6	9	122			
25	6	V102	Diaphragm	E	20					3	1.000												3	1	3	1	116			
6	6	V103	Wing	E	20					7	5.750												7	6	7	6	68			
60	6	V104	Wing	E	20			V	6	7	9.250												7	9	7	9	680			
			INCREMENT=							7	3.500												7	4	7	4				
			0.125 INCH																											
66	6	H100	Wing	E	20					10	2.750												10	3	10	3	1,016			
24	8	H101	Wing	E	20					11	6.500												11	7	11	7	742			
40	6	F100	Beam	E	23					2	5.125	4	3.625	1	0.000	0	9.125	0	9.125	1	8.375	1	8.375	7	9	7	8	461		
8	6	F101	Beam	E	21							7	3.750	2	8.000								10	0	10	0	120			
END BENT 4																														
8	7	B401	Beam	E	20					44	5.000												44	5	44	5	726			
4	6	B402	Beam	E	20					44	5.000												44	5	44	5	267			
4	6	D400	Diaphragm	E	20					44	5.000												44	5	44	5	267			
4	6	D401	Diaphragm	E	20					7	2.000												7	2	7	2	43			
8	6	D402	Diaphragm	E	20					7	10.000												7	10	7	10	94			
4	6	D403	Diaphragm	E	20					5	1.625												5	2	5	2	31			
6	6	D404	Diaphragm	E	20					3	7.000												3	7	3	7	32			
2	6	D405	Diaphragm	E	20					2	4.000												2	4	2	4	7			
4	7	D406	Diaphragm	E	20					44	5.000												44	5	44	5	363			
5	5	D407	Strand Tie	E	20					5	9.000												5	9	5	9	30			
24	5	U401	Beam	E	10	S						6	2.000	2	8.000								15	0	14	8	367			
30	4	U402	Beam	E	13	S				2	8.000	3	0.000	2	8.000	3	0.000						12	8	12	2	244			
5	4	U403	Beam	E	10	S						3	0.000	2	8.000								8	8	8	4	28			
57	6	U404	Diaphragm	E	19	S				2	6.375	4	6.000										7	0	6	10	585			
30	6	U405	Diaphragm	E	19	S				2	11.750	2	8.000										5	8	5	6	248			
30	6	U406	Diaphragm	E	10	S						3	4.000	2	2.000								8	10	8	6	383			
12	6	V401	Beam	E	20					6	9.250												6	9	6	9	122			
25	6	V402	Diaphragm	E	20					3	1.000												3	1	3	1	116			
6	6	V403	Wing	E	20					7	5.750												7	6	7	6	68			
60	6	V404	Wing	E	20			V	6	7	9.250												7	9	7	9	680			
			INCREMENT=							7	3.500												7	4	7	4				
			0.125 INCH																											
66	6	H400	Wing	E	20					10	2.750												10	3	10	3	1,016			
24	8	H401	Wing	E	20					11	6.500												11	7	11	7	742			
40	6	F400	Beam	E	23					2	5.125	4	3.625	1	0.000	0	9.125	0	9.125	1	8.375	1	8.375	7	9	7	8	461		
8	6	F401	Beam	E	15							7	3.750	2	8.000								10	0	10	0	120			
DIAPHRAGM AT INTERMEDIATED BENTS																														
16	6	H500	Diaphragm	E	20					5	2.250												5	2	5	2	124			
16	6	H501	Diaphragm	E	20					7	0.000												7	0	7	0	168			
48	4	H502	Diaphragm	E	20					7	8.625												7	9	7	9	248			
20	5	H503	Strand Tie Bar	E	20					5	2.375												5	2	5	2	108			
80	4	U500	Diaphragm	E	28							2	8.000	4	1.000	1	6.000						8	3	8	1	432			
32	6	U501	Diaphragm	E	28							3	6.000	4	1.000	2	2.000						9	9	9	5	453			
32	6	U502	Diaphragm	E	28							3	6.000	4	1.000	2	2.000						9	9	9	5	453			
16	4	U503	Diaphragm	E	28							2	4.000	3	6.500	2	2.000						8	1	7	11	85			
8	5	U504	Diaphragm	E	6					4	9.000	1	6.000	1	0.000								7	3	7	3	60			
24	5	U505	Diaphragm	E	6					4	9.000	1	6.000	1	7.000								7	10	7	10	196			
16	5	V500	Diaphragm	E	20					4	8.000												4	8	4	8	78			



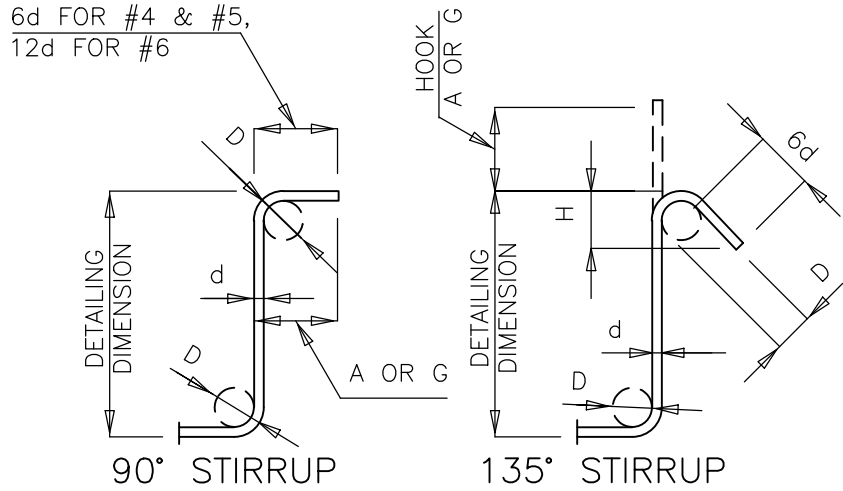
END HOOK DIMENSIONS					
BAR SIZE	D. (IN.)	ALL GRADES			
		180° HOOKS		90° HOOKS	
		A OR G	J	A OR G	
#3	2-1/4"	5"	3"	6"	
#4	3"	6"	4"	8"	
#5	3-3/4"	7"	5"	10"	
#6	4-1/2"	8"	6"	12"	
#7	5-1/4"	10"	7"	14"	
#8	6"	11"	8"	16"	
#9	6-1/2"	15"	11-3/4"	19"	
#10	10-3/4"	17"	13-1/4"	22"	
#11	12"	19"	14-3/4"	22-0"	
#14	18-1/4"	21-3"	21-3/4"	22-7"	

BILL OF REINFORCING STEEL																										
NO. REQ'D.	MARK NO.		LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS												NOMINAL LENGTH		ACTUAL LENGTH		WEIGHT
	SIZE	MARK								B		C		D		E		F		H						
										FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.
TOTALS																										
	4																					12,288				
	4			E																		2,267				
	5																					24,548				
	5			E																		31,387				
	6																					54,899				
	6			E																		68,225				
	7																					1,684				
	7			E																		2,178				
	8																					1,848				
	8			E																		15,902				
	9																					12,248				
	11																					10,464				
			TOTAL																			117,979				
			TOTAL	E																		119,959				
SLAB ON GIRDER																										
	4			E																		1,309				
	5			E																		16,097				
	6			E																		68,225				
	7			E																		2,178				
	8			E																		15,902				
			TOTAL																			103,711				
REINFORCING STEEL (BRIDGES)																										
	4																					964				
	5																					2,440				
	6																					7,813				
	8																					1,260				
	9																					12,248				
	11																					10,464				
			TOTAL																			35,189				
REINFORCING STEEL (CULVERTS)																										
	4																					11,324				
	5																					22,108				
	6																					47,086				
	7																					1,684				
	8																					588				
			TOTAL																			82,790				
SAFETY BARRIER CURB																										
	5			E																		14,701				
			TOTAL																			14,701				
SLIP FORM OPTION																										
	5			E																		589				
			TOTAL																			589				
PEDESTRIAN CURB																										
	4			E																		958				
			TOTAL																			958				

NOTE:
TWO ADDITIONAL BARS, OF EACH SIZE, ARE REQUIRED FOR TESTING BUT ARE NOT INCLUDED IN THE BAR BILL.
ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEG. TO BE BENT WITH THE SAME PROCEDURE AS FOR 90 DEG. STD. HOOKS. HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.
E = EPOXY COATED REINFORCEMENT
S = STIRRUP
X = BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES.
V = BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE.
NO. EA. = NUMBER OF BARS OF EACH LENGTH.
NOMINAL LENGTHS ARE BASED ON OUT TO OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRIATORS USE (NEAREST INCH).
ACTUAL LENGTHS ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.
PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.
FOUR ANGLE OR CHANNEL SPACERS ARE REQUIRED FOR EACH COLUMN SPIRAL. SPACERS ARE TO BE PLACED ON INSIDE OF SPIRALS. LENGTH AND MASS OF COLUMN SPIRALS DO NOT INCLUDE SPLICES OR SPACERS.
REINFORCING STEEL (GRADE 60) = FY 60,000 PSI.

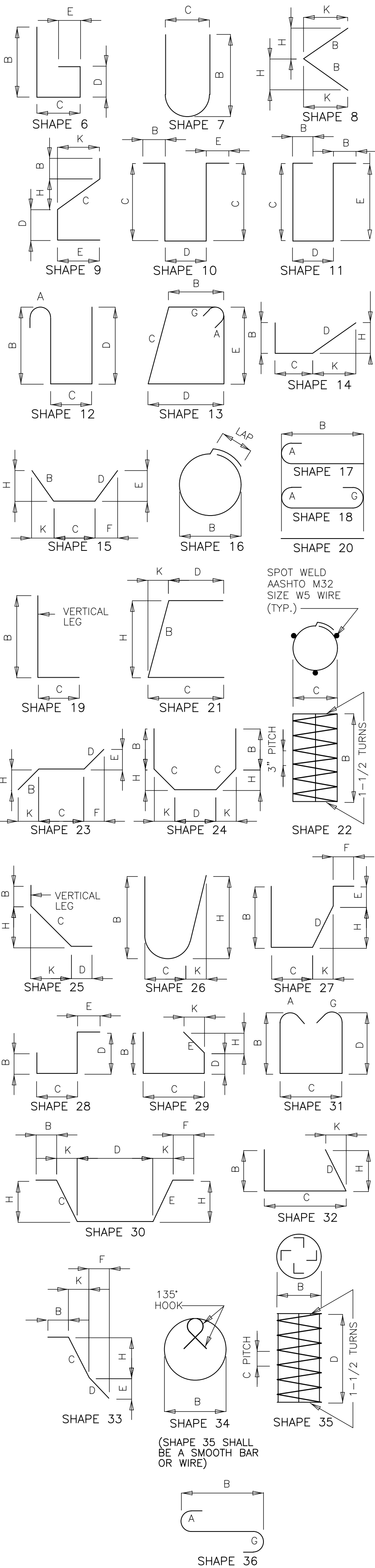


END HOOK DIMENSIONS				
BAR SIZE	D (IN.)	ALL GRADES		
		180° HOOKS	90° HOOKS	
		A OR G	J	A OR G
#3	2-1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3-3/4"	7"	5"	10"
#6	4-1/2"	8"	6"	12"
#7	5-1/4"	10"	7"	14"
#8	6"	11"	8"	16"
#9	9-1/2"	15"	11-3/4"	19"
#10	10-3/4"	17"	13-1/4"	22"
#11	12"	19"	14-3/4"	2'-0"
#14	18-1/4"	2'-3"	21-3/4"	2'-7"



STIRRUP HOOK DIMENSIONS				
GRADES 40 - 50 - 60 KSI				
BAR SIZE	D (IN.)	90° HOOK	135° HOOK	
		HOOK A OR G	HOOK A OR G	APPROX. H
#4	2"	4-1/2"	4-1/2"	3"
#5	2-1/2"	6"	5-1/2"	3-3/4"
#6	4-1/2"	12"	8"	4-1/2"

NOTE: UNLESS OTHERWISE NOTED
DIAMETER "D" IS THE SAME FOR ALL
BENDS AND HOOKS ON A BAR.



ANDERSON ENGINEERING
EMPLOYEE OWNED
ENGINEERS • SURVEYORS • LABORATORIES • DRILLING
1745 S. GARRISON AVE. • CARTHAGE, MISSOURI 64836 • PHONE 417 358-9551
ANDERSON CORP. 000022 • JASON ECKHART PE# 30102

SEAL
GARY D. STRACK
PROFESSIONAL ENGINEER
NUMBER E-20915
EXPIRES 12/02/2026

REVISIONS		DRAWING INFO.	
NO.	DESCRIPTION	BY	DATE
1		MPG	6/30/26
ADDENDUM NO.1		DRAWN BY:	NDO
		CHECK BY:	GDS
		DATE:	7/1/2026
		FIELD BOOK:	
		JOB NUMBER:	RRP-000S(23)

BILL OF REINFORCING
CHAPELL DRIVE
ROADWAY IMPROVEMENTS & PROPOSED BNSF BRIDGE
SECTION 26, T27N, R32 & 33W
CITY OF MONETT, MISSOURI

SHEET NUMBER
64
OF 94

G:\Shared drives\RAI_M\Monett\21NC24Q08 Monett Chapel Dr BNSF Overpass\CADD\Plan\21NC24Q08-BDR