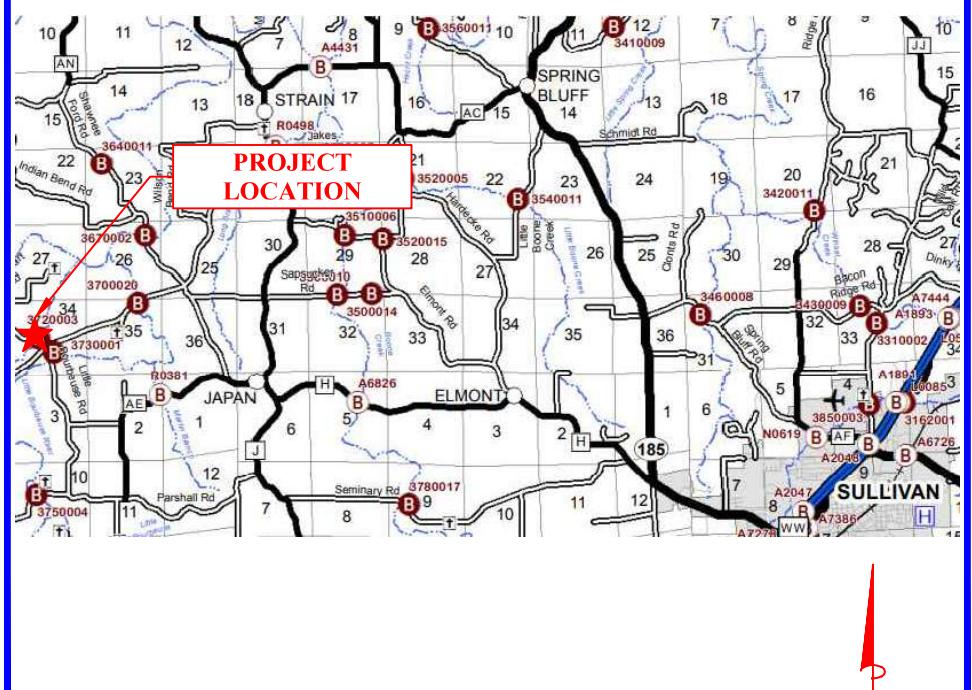


CONTACT INFORMATION

OWNER	MoDOT
FRANKLIN COUNTY	
REPRESENTATIVE: JIM GRUTSCH	REPRESENTATIVE: JOHN BRENDL
ADDRESS: 400 E LOCUST	ADDRESS: 1590 WOODLAKE DRIVE
UNION, MISSOURI 63084	CHESTERFIELD, MISSOURI 63017-5712
PHONE: (636) 583-6361	PHONE: (314) 453-1831
ELECTRIC	TELEPHONE, FIBER OPTIC
CRAWFORD ELECTRIC COOP INC.	FIDELITY COMMUNICATIONS
REPRESENTATIVE: KURTIS REED	REPRESENTATIVE: BRAD CONNELL
ADDRESS: 10301 NORTH SERVICE RD. W.	ADDRESS: 64 N. CLARK STREET
BOURBON, MISSOURI 65441	SULLIVAN, MISSOURI 63080
PHONE: (573) 732-4415	PHONE: (573) 205-4030
CONSULTANT	
COCHRAN	
REPRESENTATIVE: B. BRADFORD DUNAGAN, P.E.	REPRESENTATIVE: _____
ADDRESS: 737 RUDDER ROAD	ADDRESS: _____
FENTON, MISSOURI 63026	PHONE: _____
PHONE: (314) 842-4033	
REPRESENTATIVE: _____	REPRESENTATIVE: _____
ADDRESS: _____	ADDRESS: _____
PHONE: _____	PHONE: _____

LOCATION INFORMATION LENGTH OF PROJECT

QUADRANGLE/YEAR: ARGO/1948	START OF PROJECT: STA. 14+37.23
TOWNSHIP: 41N RANGE: 4W SECTION: 34	END OF PROJECT: STA. 17+30.00
ADDRESS: 7130 LOCKHART RD., CUBA, MO 65453	PROJECT LENGTH: 292.77 FEET
LATITUDE: 38.2487 LONGITUDE: -91.3593	



VICINITY MAP
NOT TO SCALE

FRANKLIN COUNTY, MO PROJECT NUMBER BRO-B036(33) LOCKHART ROAD BRIDGE

BRIDGE NO. 37200031
over **LOGAN BRANCH**



400 E. LOCUST
UNION, MO 63084
TELEPHONE (636) 583-6361



- Civil Engineering
- Site Development
- Land Surveying
- Master Planning
- Architecture
- General Consulting

737 RUDDER RD.
FENTON, MISSOURI 63026
TELEPHONE (314) 842-4033
FAX (314) 842-5957
www.cochraneng.com

COCHRAN PROJECT NO. SC21-1222
JANUARY 2024

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DESIGN DESIGNATION

FUNCTIONAL CLASSIFICATION: LOCAL ROAD
CURRENT POSTED SPEED: 30 MPH
DESIGN SPEED: 30 MPH
CURRENT AADT: 100 (2019)
DESIGN AADT: 150 (2039)

ALL OSHA RULES & REGULATIONS ESTABLISHED FOR THE TYPE OF CONSTRUCTION REQUIRED BY THESE PLANS SHALL BE STRICTLY FOLLOWED (IE. TRENCHING, BLASTING, ETC.)

TWO WORKING DAYS PRIOR TO THE START OF ANY EXCAVATION ON THIS SITE, CONTRACTOR SHALL CALL 1-800-DIG-RITE FOR UTILITY LOCATION INFORMATION.

WHERE THE TERM "STANDARD SPECIFICATIONS" IS USED, SUCH REFERENCE SHALL MEAN THE 2024 EDITION OF THE MISSOURI STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, EXCEPT AS OTHERWISE PROVIDED IN THE PROJECT MANUAL. IN CASE OF CONFLICT IN THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE REQUIREMENTS STATED IN THE PROJECT MANUAL, THE REQUIREMENTS IN THE PROJECT MANUAL SHALL PREVAIL.



B. BRADFORD DUNAGAN
P.E.
STATE OF MISSOURI
LICENSE NUMBER 2007006939
PROFESSIONAL ENGINEER
1/10/24

THIS SHEET HAS BEEN SIGNED,
SEALED AND DATED ELECTRONICALLY.

THE PROFESSIONAL'S SEAL AFFIXED TO THIS SHEET APPLIES ONLY TO ITEMS
ON THIS SHEET. ALL DRAWINGS OR OTHER DOCUMENTS NOT EXHIBITING
THIS SEAL SHALL NOT BE CONSIDERED PREPARED BY THIS PROFESSIONAL.

ENGINEERING CERTIFICATE OF AUTHORITY NUMBER - 2007006939
LAND SURVEYING CERTIFICATE OF AUTHORITY NUMBER - 2007004529

FRANKLIN COUNTY

ACCEPTED BY
JIM GRUTSCH
HIGHWAY ADMINISTRATOR

QUANTITIES

Bid No.	Spec. No.	Description	From STA	To STA	Unit	Quantity
ROADWAY ITEMS						
1	2013000	Clearing and Grubbing	14+37.23	17+30.00	AC	0.2
2	2022010	Removal of Improvements	14+37.23	17+30.00	LS	1
3	2035000	Unclassified Excavation	14+37.23	17+30.00	CY	100
4	2035500	Embankment in Place	14+37.23	17+30.00	CY	400
5	3040504	Type 5 Aggregate For Base (4") (Roadway)	14+37.23	17+30.00	SY	510
6	4011209	Bituminous Pavement Mix PG64-22 (BP-1)(2" Surface Course)	14+37.23	17+30.00	TON	60
7	4013000	Bituminous Pavement Mix PG64-22 (Base) (Two 3 Inch Lifts)	14+37.23	17+30.00	TON	170
8	6062304	Asymetrical Transition Section, 7.5 Ft. Posts	15+08.95	15+63.01	EA	4
9	6063037	Type A Crashworthy End Terminal (37.5')	14+52.69	15+08.95	EA	2
10	6063015	Type A Crashworthy End Terminal (50')	15+63.01	16+31.76	EA	2
11	6072004	Fencing - 4-Strand Barbed Wire	14+37.23	17+30.00	LF	481
12	6181000	Mobilization	14+37.23	17+30.00	LS	1
13	8061019	Silt Fence	14+98.85	15+73.35	LF	210
SIGNING/STRIPING/SIGNAL ITEMS						
14	6161005	Construction Signs	14+37.23	17+30.00	SF	224
15	6161031	Type III Moveable Barricade with Lights	14+37.23	17+30.00	EA	8
16	6206000/1C	4 In. White and Yellow Standard Waterborne Pavement Marking, Type P Beads	14+37.23	17+30.00	LF	1,088
LANDSCAPING/STREETSCAPING ITEMS						
17	8051000A	Seeding - Cool Season Mixtures	14+37.23	17+30.00	AC	0.3
BRIDGE ITEMS						
18	2061000	Class 1 Excavation	15+14.16	15+57.79	CY	430
19	2160500	Removal of Bridges	15+14.16	15+57.79	EA	1
20	5031010	Bridge Approach Slabs	14+94.16	15+77.79	SY	124.4
21	6113021	Furnishing Type 2 Rock Blanket	15+14.16	15+57.79	TON	210
22	6113041	Placing Type 2 Rock Blanket	15+14.16	15+57.79	TON	210
23	6240103A	Permanent Erosion Control Geotextile - Class 1	15+14.16	15+57.79	SY	220
24	7021010	Structural Steel Piles (10")	15+14.16	15+57.79	LF	360
25	7027000	Pile Point Reinforcement	15+14.16	15+57.79	EA	12
26	7032003	Class B Concrete (Substructure)	15+14.16	15+57.79	CY	79.1
27	7101000	Reinforcing Steel (Epoxy Coated)	15+14.16	15+57.79	LB	13,140
28	7135000	SL-1 Bridge Rail	15+08.95	15+63.01	LF	100
STEEL BEAM OPTION: 5 - W18X86# STEEL BEAMS						
29	7034212	Slab on Steel	15+14.16	15+57.79	SY	139.0
30	7121113	Fab. Str. Low Al. Steel (I-Beam) A709, Grade 50W	15+14.16	15+57.79	LB	21,770
PS CONCRETE BEAM OPTION: 5 - 17" PRESTRESSED CONC. BOX BEAMS						
31	7034222	Slab on Concrete Beam	15+14.16	15+57.79	SY	139.0
32	7056065	17 IN., Prestressed Concrete Spread Box Beam	15+14.16	15+57.79	LF	213
33	7161002	Neoprene Bearing Pads	15+14.16	15+57.79	EA	10



LOCKHART RD. BRIDGE
NO. 37200031 REPLACEMENT
FEDERAL PROJECT NO. BRO-B036(33)
FRANKLIN COUNTY, MISSOURI

DATE:	REVISION:
OWNED BY: A.J.M.	APPROVED BY: B.B.D.
DATE: JAN. 2024	SCALE: NOT TO SCALE
PROJ. NO.: SC21-1222	DWG. NO.: DWG. NO.

QUANTITIES

Q-1

THIS SITE LIES WITHIN SEC 34, T41N, R4W

LAND TIE: FOUND 1/2" IRON ROD IN STONE PILE IN THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 34, TOWNSHIP 41 NORTH, RANGE 4 WEST OF THE 5TH PRINCIPAL MERIDIAN ON THE SOUTH RIGHT-OF-WAY OF JAKES PRAIRIE ROAD AT THE NORTHWEST CORNER OF A TRACT OF LAND DESCRIBED IN DOC. NO. 2005-16644 OF THE FRANKLIN COUNTY RECORDS (\$1144'07" W - 1,869.84' OF CL OF ROAD AT STA. 10+00.00)

TOPOGRAPHIC SURVEY

(THIS DOES NOT CONSTITUTE A PROPERTY BOUNDARY SURVEY)

THIS PROJECT IS ORIENTED TO GRID NORTH DERIVED FROM GPS RAPID STATIC OPUS OBSERVATIONS OF ON-SITE CONTROL POINTS USING SPECTRA PRECISION SP-80 ROVER

PC : 11+86 55

P.T.: 12+81.63

5

11

1

11

- 7 -

38 + 76.27

11

NOTES

1. UNDERGROUND STRUCTURES, FACILITIES, AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS. THEREFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN.
2. TEMPORARY BENCHMARK IS A PK NAIL IN THE ASPHALT ON THE EAST SIDE OF LOCKHART DR. AT APPROXIMATELY STA. 15+50 AS SHOWN ABOVE, ELEV.= 724.59. SITE BENCHMARK DERIVED FROM GPS RAPID STATIC OPUS OBSERVATIONS OF ON-SITE CONTROL POINTS USING SPECTRA PRECISION SP-80 ROVER, VERTICAL DATUM (NAVD 88).
3. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION AND ELEVATION OF ALL POTENTIAL UTILITY CONFLICTS PRIOR TO ORDERING MATERIALS FOR CONSTRUCTION. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. LOCATION, RELOCATION AND CONNECTION OF THE UTILITIES SHALL BE COORDINATED WITH THE UTILITY COMPANIES.
4. TOPOGRAPHIC INFORMATION AS SHOWN HEREON PER FIELD WORK PERFORMED BY Z.B.H. OF COCHRAN, DATED MARCH, 2011.
5. THIS PROJECT IS ORIENTED TO GRID NORTH DERIVED FROM GPS RAPID STATIC OPUS OBSERVATIONS OF ON-SITE CONTROL POINTS USING SPECTRA PRECISION SP-80 ROVER.
6. THIS SITE LIES WITHIN SPECIAL FLOOD HAZARD AREA "ZONE A", (SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD, NO BASE ELEVATIONS DETERMINED) PER FEMA FLOOD INSURANCE RATE MAP NUMBER 29071C0390D, EFFECTIVE DATE OCTOBER 18, 2011.
7. THIS TOPOGRAPHIC SURVEY DOES NOT CONSTITUTE A PROPERTY BOUNDARY SURVEY.

LEGEND

LEGEND					
PROPERTY LINE		EXISTING UTILITY POLE		EXISTING SIGN	
RIGHT-OF-WAY		EXISTING STORM SEWER		EXISTING FENCE	
CENTERLINE OF ROAD		EXISTING UNDERGROUND TELEPHONE		EXISTING AERIAL ELECTRIC	
EXISTING STRIPING		EXISTING TELEPHONE PEDESTAL		EXISTING BUSH	
EXISTING MAJOR CONTOUR		EXISTING CONCRETE PAVEMENT		EXISTING TREE	
EXISTING MINOR CONTOUR		EXISTING GRAVEL		EXISTING UTILITY (TERMINUS UNKNOWN)	
EXISTING BUILDING		EXISTING ASPHALT PAVEMENT		EXISTING GUY WIRE	

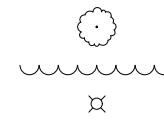
DATE:	REV/IS:
DWY. BY:	APPD. BY:
Z.B.H.	T.J.V.
DATE:	JAN. 2024
SCALE:	1" = 50'
PROJ. NO.:	SC21-1222
DWG. NO.:	

TS-1

LEGEND AND GENERAL NOTES

LEGEND, GENERAL NOTES AND ABBREVIATIONS SHALL APPLY TO ALL SHEETS UNLESS OTHERWISE NOTED ON INDIVIDUAL SHEET

LEGEND

EXISTING	NEW	EXISTING	NEW
500	INDEX CONTOUR	500	TREE
— — —	INTERMEDIATE CONTOUR	498	TREELINE
R/W	RIGHT-OF-WAY		LIGHT
	LOT LINE		COBRAHEAD LIGHT
— — —	PERMANENT EASEMENT	PE	LOAD CENTER
— — AE — —	AERIAL ELECTRIC	AE	HAND HOLE
○	UTILITY POLE	○	MAILBOX
— →	GUY WIRE	— →	SIGN
— — UGE — —	UNDERGROUND ELECTRIC	UGE	CORING LOCATION
— — CATV — —	UNDERGROUND CABLE TV	CATV	COMPACTED SHOULDER
— — UGT — —	UNDERGROUND TELEPHONE	UGT	CONCRETE PAVEMENT
— — FO — —	UNDERGROUND FIBER OPTIC	FO	ASPHALT PAVEMENT
— — SAN — —	SANITARY SEWER LINE	SAN	GRAVEL SURFACE
— — FM — —	SANITARY FORCEMAIN	FM	ROCK BLANKET/DITCH LINER
○	SANITARY SEWER MANHOLE	●	CONCRETE APPROACH
— — SS — —	STORM SEWER LINE	— — —	CONCRETE SIDEWALK
○	STORM SEWER MANHOLE	●	CURB RAMP
□	CURB/AREA INLET	— ■ —	ASPHALT DRIVEWAY
■	GRATED INLET	— ■ —	AGGREGATE DRIVEWAY
■	GRATED INLET W/ SIDE INTAKE	— ■ —	PAVEMENT MILLING
A	FLARED END SECTION	A	APPROACH SLAB
— — →	SWALE	— — →	BRIDGE
— — G — —	GAS LINE	G	RETAINING WALL
⑥	GAS VALVE	⑥	CONCRETE VERTICAL CURB
GM	GAS METER	GM	CONCRETE CURB AND GUTTER
— — W — —	WATER LINE	W	CONSTRUCTION LIMITS
○ — ○ — ○ —	FIRE HYDRANT	○ — ○ — ○ —	SILT FENCE
○	WATER VALVE	○	INLET CHECK
■	WATER METER	■	DITCH CHECK
— — —	GUARDRAIL	— — —	PROJECT BASELINE
— — —	FENCE	— — —	TEMPORARY CONSTRUCTION EASEMENT

GENERAL NOTES

TOPOGRAPHIC SURVEY NOTES:

NOTES:

1. UNDERGROUND STRUCTURES, FACILITIES, AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS. THEREFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN.
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3. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION AND ELEVATION OF ALL POTENTIAL UTILITY CONFLICTS PRIOR TO ORDERING MATERIALS FOR CONSTRUCTION. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. LOCATION, RELOCATION AND CONNECTION OF THE UTILITIES SHALL BE COORDINATED WITH THE UTILITY COMPANIES.
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7. THIS TOPOGRAPHIC SURVEY DOES NOT CONSTITUTE A PROPERTY BOUNDARY SURVEY.

DESIGN NOTES:

1. CONTRACTOR SHALL RELOCATE ALL EXISTING SIGNS, PLANTERS, MAILBOXES, AND PRIVATE LIGHTS AS NECESSARY FOR THE CONSTRUCTION OF THE IMPROVEMENTS. NEW LOCATIONS SHALL BE AS DIRECTED BY THE ENGINEER.
2. CONTRACTOR SHALL ADJUST TO GRADE ALL UTILITIES NECESSARY TO BRING THE UTILITY TO THE GRADE OF THE NEW CONSTRUCTION.
3. CONTRACTOR SHALL FIELD VERIFY THE LOCATION AND ELEVATION OF ALL POTENTIAL UTILITY CONFLICTS PRIOR TO ORDERING STORM SEWER PIPE AND STRUCTURES.
4. ALL AREAS OF CLEARING, GRUBBING AND STRIPPING NOT SHOWN IN PLANS, CONTRACTOR SHALL CONDUCT CLEARING, GRUBBING AND STRIPPING AS NECESSARY UNLESS OTHERWISE NOTED IN PLANS.

ABBREVIATIONS

AI - AREA INLET	MIN - MINIMUM	Ø - DIAMETER
ARC - ARC LENGTH	NO - NUMBER	Φ - CENTERLINE
ATG - ADJUST TO GRADE	O/S - OFFSET	(1) - KEYED NOTE
BF - BOTTOM OF FOOTING	OC - ON CENTER	
BOP - BEGINNING OF PAVEMENT	PC - POINT OF CURVATURE	
BW - BOTTOM OF WALL	PCC - POINT OF COMPOUND CURVATURE	
CB - CHORD BEARING	PE - PERMANENT EASEMENT	
CHD - CHORD LENGTH	PI - POINT OF INTERSECTION	
CI - CURB INLET	PRC - POINT OF REVERSE CURVATURE	
CMP - CORRUGATED METAL PIPE	PT - POINT OF TANGENCY	
DCI - DOUBLE CURB INLET	R/W - RIGHT-OF-WAY	
DGI - DOUBLE GRATED INLET	RAD - RADIUS	
ELEV - ELEVATION	RCP - RE-INFORCED CONCRETE PIPE	
EOP - END OF PAVEMENT	RT - RIGHT	
FES - FLARED END SECTION	SSD - STOPPING SIGHT DISTANCE	
FL - FLOW LINE	STA - STATION	
GI - GRATED INLET	TBR - TO BE REMOVED	
GIS - GRATED INLET WITH SIDE INTAKE	TBR&R - TO BE REMOVED AND REPLACED	
HDPE - HIGH-DENSITY POLYETHYLENE	TCE - TEMPORARY CONSTRUCTION EASEMENT	
JB - JUNCTION BOX	TW - TOP OF WALL	
LF - LINEAR FEET	TYP - TYPICAL	
LT - LEFT	VPC - VERTICAL POINT OF CURVATURE	
MAX - MAXIMUM	VPI - VERTICAL POINT OF INTERSECTION	
MH - MANHOLE	VPT - VERTICAL POINT OF TANGENCY	

LEGEND AND GENERAL NOTES

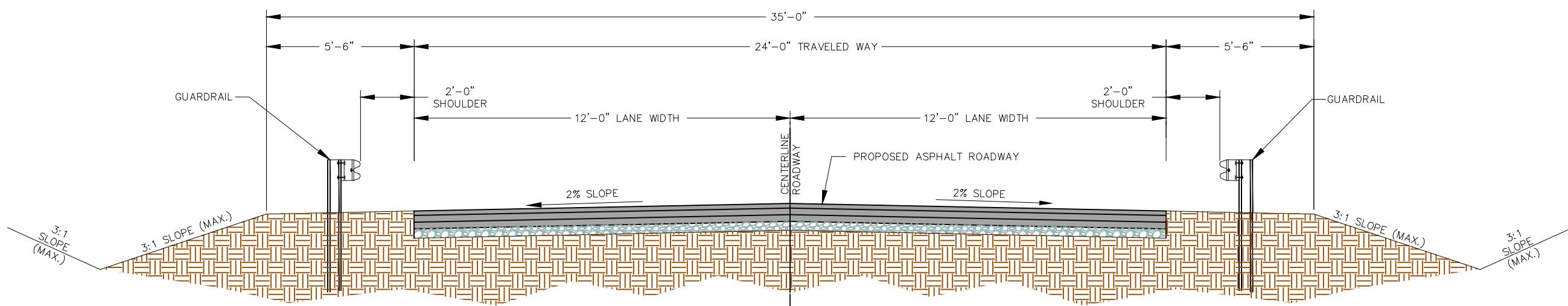
DATE	REVISION	OWNED BY	APPD. BY
		A.J.M.	B.B.D.
DATE:	JAN. 2024		
SCALE:	NOT TO SCALE		
PROJ. NO.:	SC21-1222		
DWG. NO.:			

LG-1

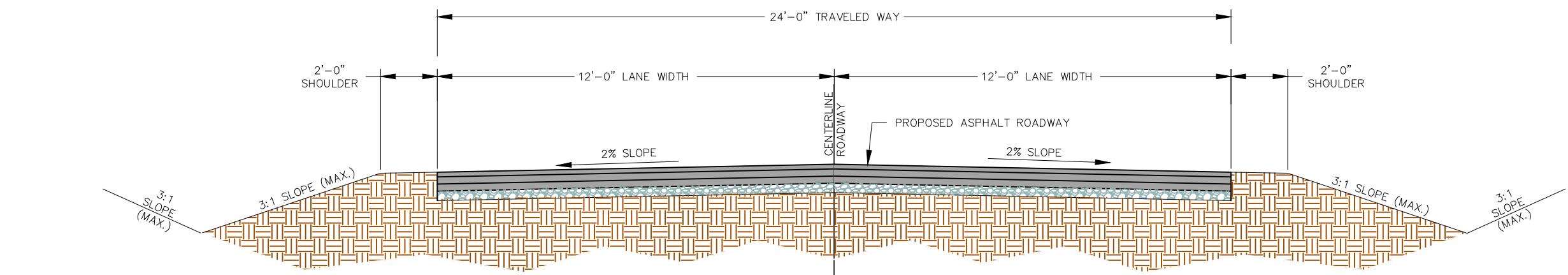


LOCKHART RD. BRIDGE
NO. 37200031 REPLACEMENT
FEDERAL PROJECT NO. BRO-B036(33)
FRANKLIN COUNTY, MISSOURI

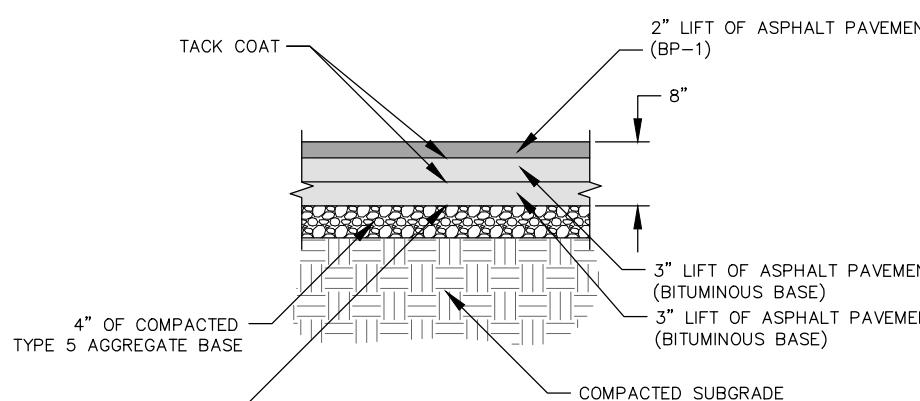
TYPICAL ROADWAY SECTIONS



TYPICAL ROADWAY CROSS SECTION WITH GUARDRAIL



TYPICAL ROADWAY CROSS SECTION



PROPOSED PAVEMENT SECTION

NO SCALE

NOTE: THIS DRAWING IS NOT TO SCALE. PLEASE FOLLOW DIMENSIONS.

TYPICAL ROADWAY SECTIONS	
DATE:	REVISION:
DOWN BY:	APPD BY:
A.J.M.	B.B.D.
DATE:	
JAN. 2024	
SCALE:	
NOT TO SCALE	
PROJ. NO.:	
SC21-1222	
DWG. NO.:	

TXS-1

THE PROFESSIONAL'S SEAL AFFIXED TO
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ON THIS SHEET. ALL DRAWINGS OR
OTHER DOCUMENTS OR INFORMATION
THAT THIS SEAL IS ATTACHED TO
SHALL NOT BE CONSIDERED
PREPARED BY THIS PROFESSIONAL.

THIS SHEET HAS BEEN SIGNED,
SEALED AND DATED ELECTRONICALLY

314-842-4033 (tel)
314-842-5657 (fax)
www.cochraneng.com
• Civil Engineering
• Land Surveying
• Architecture
• Site Development
• General Planning
• General Consulting
• Master Planning
• General Consulting
• Land Surveying CERTIFICATE OF AUTHORITY NUMBER - 200709937
• Land Surveying CERTIFICATE OF AUTHORITY NUMBER - 200704529

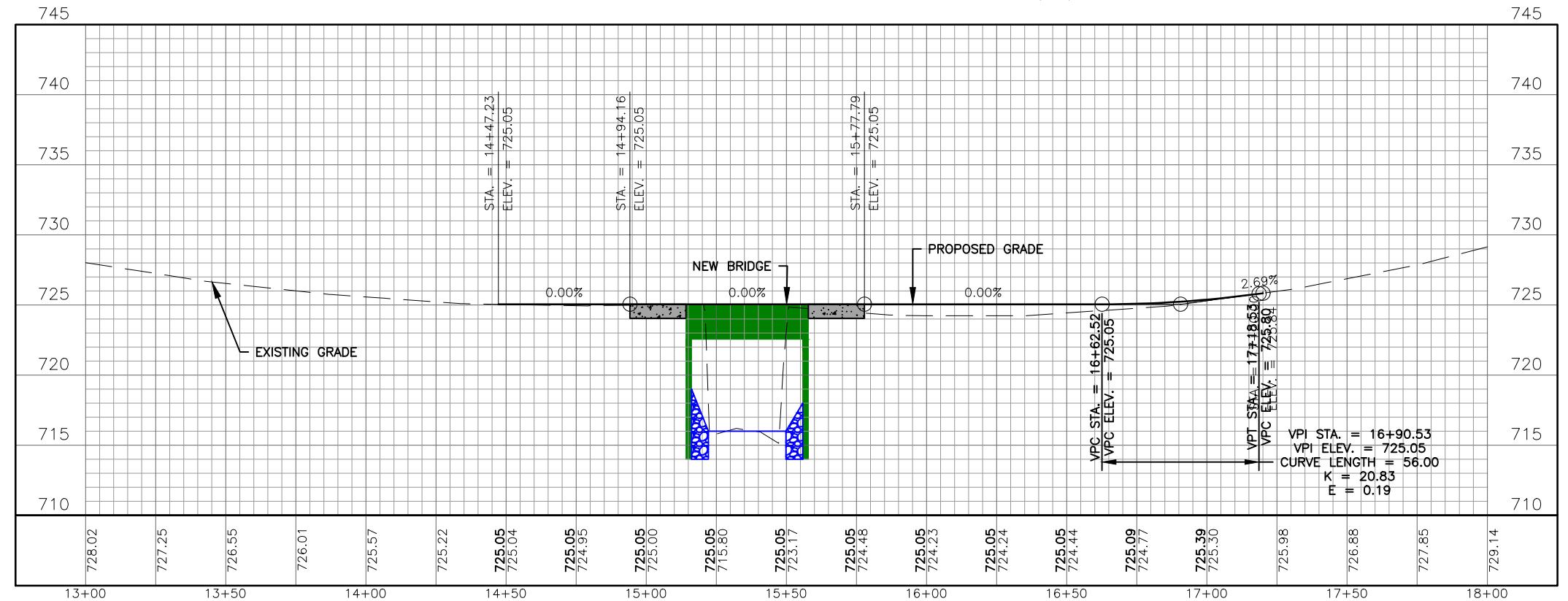


B. BRADFORD DUNAGAN
NO. E-22970
STATE OF MISSOURI
REGISTERED PROFESSIONAL ENGINEER
FOR SC ENGINEERING LLC
DBA COCHRAN

1/10/24

LOCKHART RD. BRIDGE
NO. 37200031 REPLACEMENT
FEDERAL PROJECT NO. BRO-B036(33)
FRANKLIN COUNTY, MISSOURI

ROADWAY PLAN AND PROFILE



ROADWAY PLAN AND PROFILE

DWN. BY:	APPD. BY:
A.J.M.	B.B.D.
DATE:	JAN. 2024
SCALE:	1" = 50'
PROJ. NO.:	SC21-1222
DWG. NO.:	<i>RD-1</i>

*LOCKHART RD. BRIDGE
NO. 37200031 REPLACEMENT
FEDERAL PROJECT NO. BRO-B036(33)
FRANKLIN COUNTY, MISSOURI*

RIGHT-OF-WAY PLAN

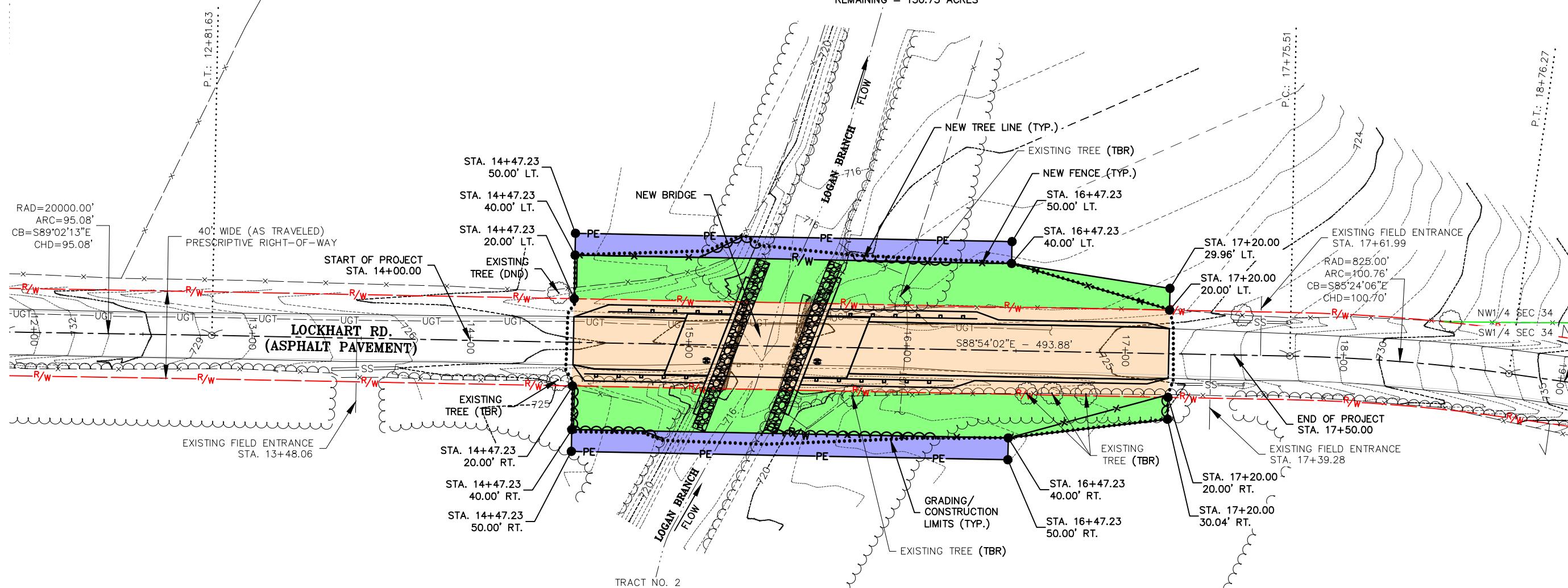
THIS SITE LIES WITHIN SEC 34, T41N, R4W

LAND TIE: FOUND 1/2" IRON ROD IN STONE PILE IN THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 34, TOWNSHIP 41 NORTH, RANGE 4 WEST OF THE 5TH PRINCIPAL MERIDIAN ON THE SOUTH RIGHT-OF-WAY OF JAKES PRAIRIE ROAD AT THE NORTHWEST CORNER OF A TRACT OF LAND DESCRIBED IN DOC. NO. 2005-16644 OF THE FRANKLIN COUNTY RECORDS (S11°44'07" W - 1,869.84' OF CL OF ROAD AT STA. 10+00.00)

THIS PROJECT IS ORIENTED TO GRID NORTH DERIVED FROM GPS RAPID STATIC OPUS OBSERVATIONS OF ON-SITE CONTROL POINTS USING SPECTRA PRECISION SP-80 ROVER

TRACT NO. 1
PARCEL 26-8-34.0-0-000-006.000
7130 LOCKHART RD.
RUWWE, HELEN M.
DOC. NO. 1410652
151.00 ACRES

PRESCRIPTIVE RIGHT-OF-WAY = 0.13 ACRES
NEW RIGHT-OF-WAY = 0.12 ACRES
PERMANENT MAINTENANCE EASEMENT = 2,000 S.F.
REMAINING = 150.75 ACRES



TRACT NO. 2

PARCEL 26-8-34.0-0-000-013.000
8636 JAKES PRAIRIE RD.
BELL, BYRON J. TRUST
DOC. NO. 0705292
167.80 ACRES

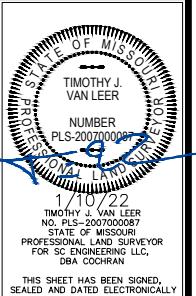
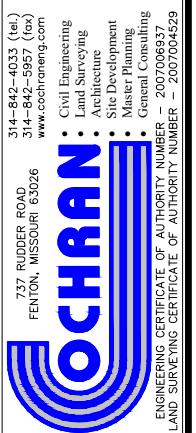
PRESCRIPTIVE RIGHT-OF-WAY = 0.13 ACRES
NEW RIGHT-OF-WAY = 0.12 ACRES
PERMANENT MAINTENANCE EASEMENT = 2,000 S.F.
ACREAGE REMAINING = 167.55 ACRES

LEGEND

PROPERTY LINE		EXISTING ASPHALT PAVEMENT		NEW TREE LINE	
EXISTING RIGHT-OF-WAY		EXISTING FENCE		NEW GUARDRAIL	
CENTERLINE OF ROAD		NEW FENCE		PERMANENT MAINTENANCE EASEMENT	
EXISTING MAJOR CONTOUR		NEW ROCK BLANKET		NEW RIGHT-OF-WAY	
EXISTING MINOR CONTOUR		GRADING/CONSTRUCTION LIMITS		PRESCRIPTIVE RIGHT-OF-WAY	
EXISTING UNDERGROUND TELEPHONE		NEW ASPHALT PAVEMENT		TO BE REMOVED	
EXISTING SIGN		NEW TREE LINE		DO NOT DISTURB	
EXISTING TREE LINE					

RIGHT-OF-WAY PLAN

LOCKHART RD. BRIDGE
NO. 37200031 REPLACEMENT
FEDERAL PROJECT NO. BRO-B036(33)
FRANKLIN COUNTY, MISSOURI



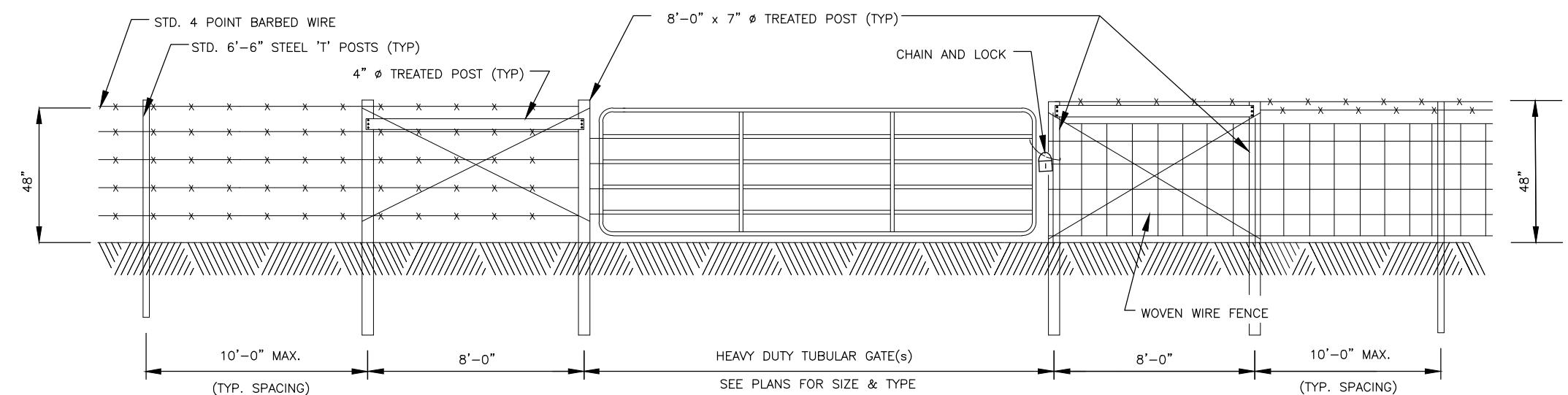
1/10/22
TIME: 10:44 AM
NO. PLS-2007000057
STATE OF MISSOURI
PROFESSIONAL LAND SURVEYOR
FOR SC ENGINEERS, LLC
DBA COCHRAN

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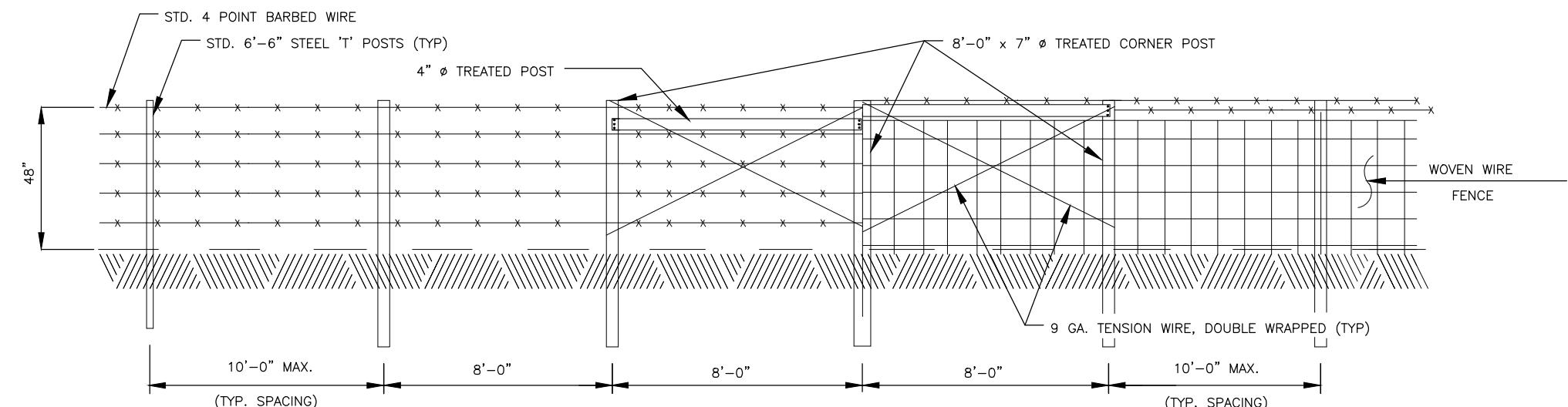
RIGHT-OF-WAY PLAN	DATE:	REVISION:
DWN. BY: J.W.B.	APPD. BY: T.J.V.	
DATE: JAN, 2024	SCALE: 1" = 50'	PROJ. NO: SC21-1222
DWG. NO: DWG. NO: RW-1		

FENCING



TYPICAL FENCE GATE AND BRACING

(FOR BARBED WIRE & WOVEN WIRE FENCING)



TYPICAL CORNER AND BRACING

(FOR BARBED WIRE & WOVEN WIRE)

NOTES:

1. FENCING SHOWN IN THIS DETAIL IS THE MINIMUM REQUIRED BY THE ENGINEER. ACTUAL REPLACEMENT FENCE SHALL BE EQUAL TO OR BETTER THAN THE EXISTING.
2. TIES TO EXISTING FENCE REQUIRE THE SAME LAYOUT AS FENCE CORNERS (i.e. CORNER POSTS WITH BRACING AND TENSION WIRE).
3. INSTALL BREAKAWAY WATER GAP IF SPECIFIED ON THE SITE PLAN.
4. TEMPORARY FENCING TO BE INSTALLED TO MAINTAIN CONTINUITY OF FENCING DURING CONSTRUCTION (INCIDENTAL TO CONSTRUCTION).

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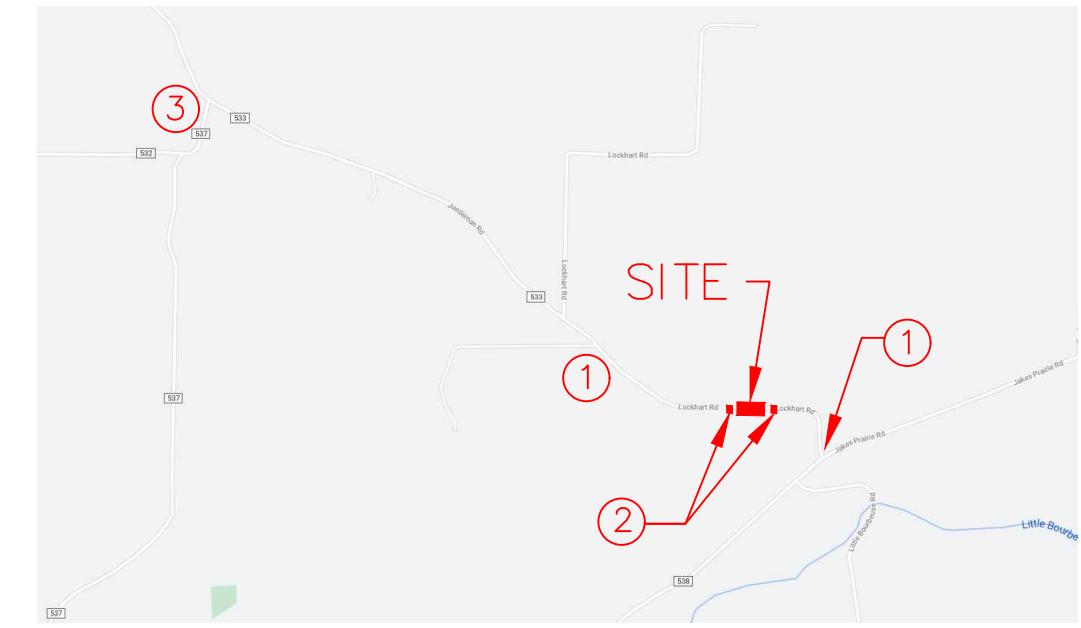
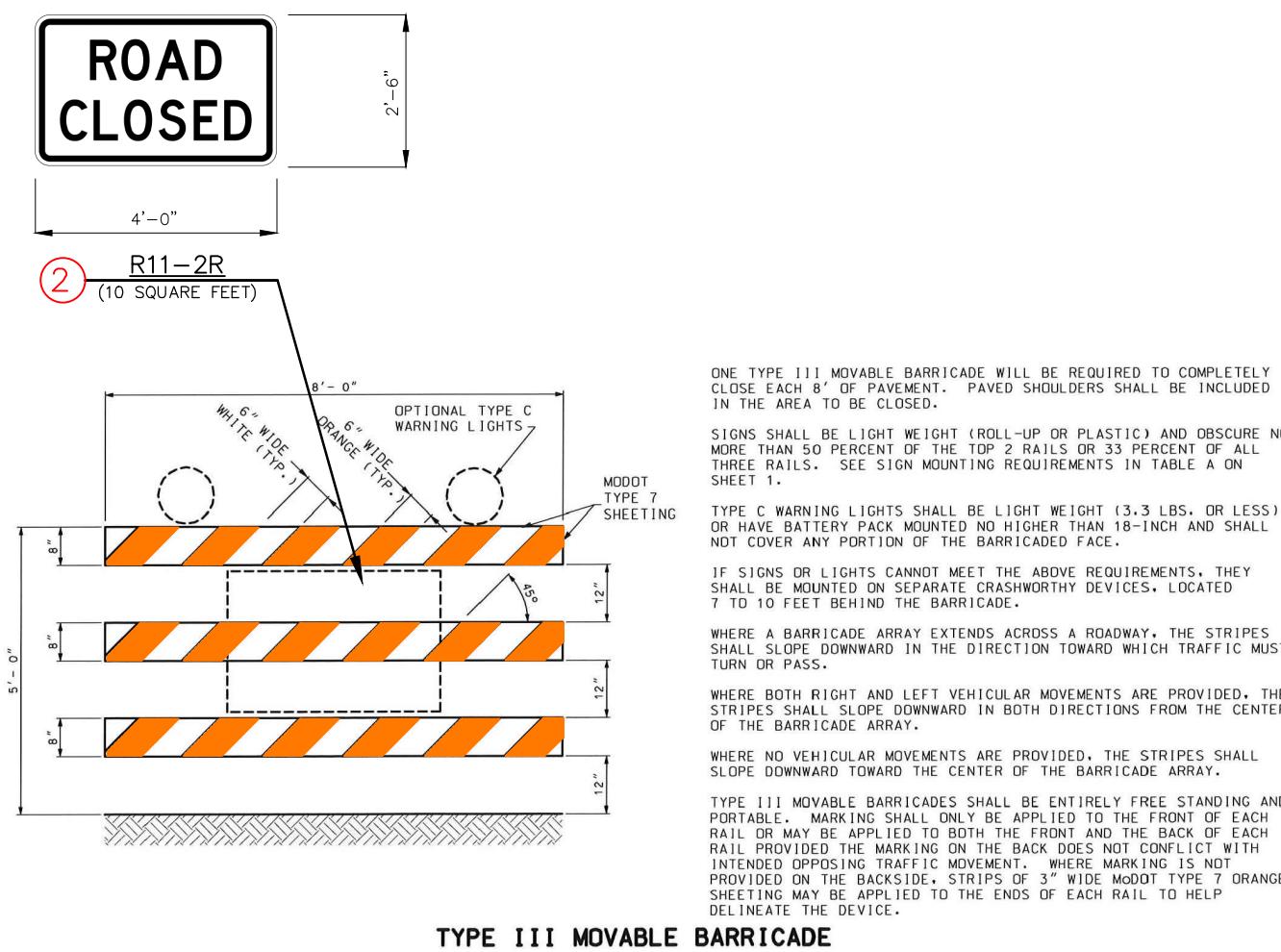
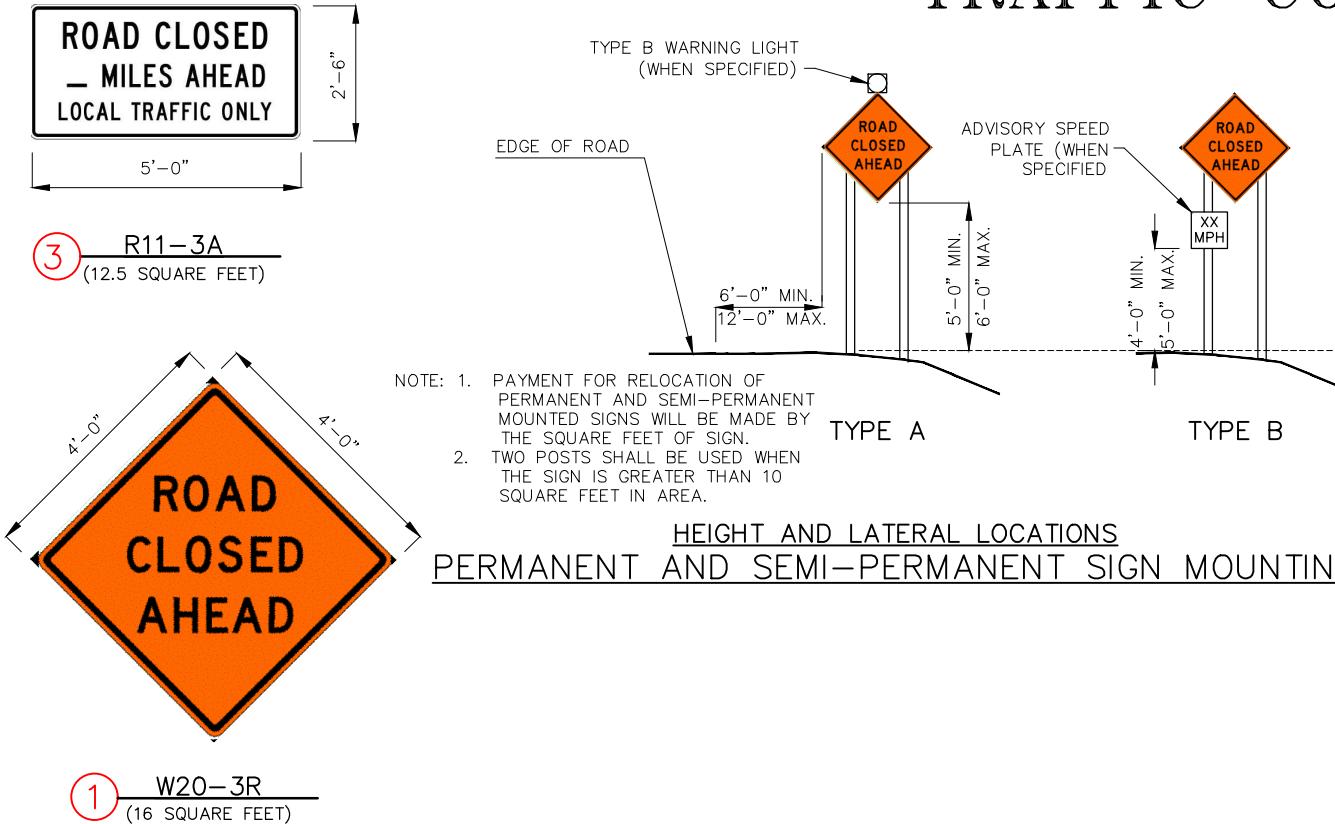
LOCKHART RD. BRIDGE
NO. 37200031 REPLACEMENT
FEDERAL PROJECT NO. BRO-B036(33)
FRANKLIN COUNTY, MISSOURI

737 RUDDER ROAD
FENTON, MISSOURI 63026
314-842-4033 (tel)
314-842-5057 (fax)
www.cochraneng.com
• Civil Engineering
• Land Surveying
• Architecture
• Site Development
• General Planning
• Master Planning
• General Consulting
LAND SURVEYING CERTIFICATE OF AUTHORITY NUMBER - 200706937
LAND SURVEYING CERTIFICATE OF AUTHORITY NUMBER - 2007064529

STATE OF MISSOURI
B. BRADFORD DUNAGAN
NO. E-22970
STL. MISSOURI
REGISTERED PROFESSIONAL ENGINEER
FOR SC ENGINEERING LLC,
DBA COCHRAN

5/27/22
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TRAFFIC CONTROL PLAN



TRAFFIC CONTROL LAYOUT
NO SCALE

TRAFFIC CONTROL SCHEDULE		
PLAN DESIGNATION	SIGN	COMMENTS
①	W20-3R	1,000' FROM INTERSECTION OR PROJECT SITE
②	R11-2R	FOUR TYPE III MOVABLE BARRICADES WITH OPTIONAL TYPE C WARNING LIGHTS, AT EACH LOCATION
③	R11-3A	ROAD CLOSED 1.33 MILES AHEAD LOCAL TRAFFIC ONLY

NOTE: ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

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LAND SURVEYING CERTIFICATE OF AUTHORITY NUMBER - 200709937
ENGINEERING CERTIFICATE OF AUTHORITY NUMBER - 200704529

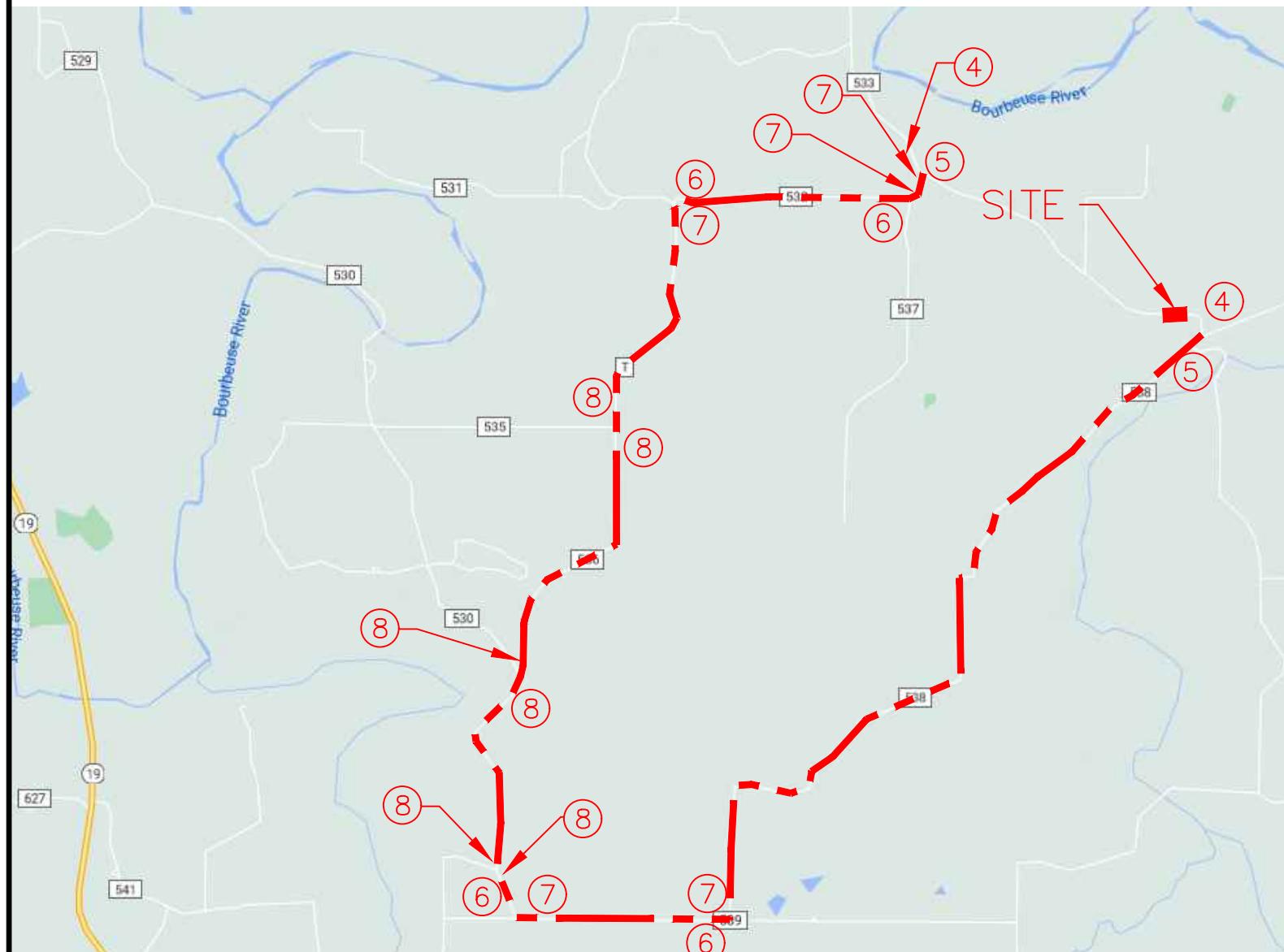
COCHRAN

1/10/24
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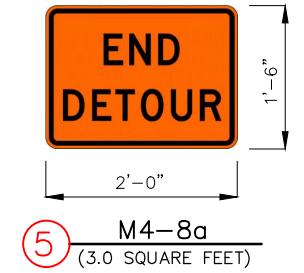
LOCKHART RD. BRIDGE
NO. 37200031 REPLACEMENT
FEDERAL PROJECT NO. BRO-B036(33)
FRANKLIN COUNTY, MISSOURI

TRAFFIC CONTROL
DATE:
REVISION:
DWN. BY: APPD. BY:
A.J.M. B.B.D.
DATE: JAN. 2024
SCALE: NOT TO SCALE
PROJ. NO: SC21-1222
DWG. NO:
TC-1

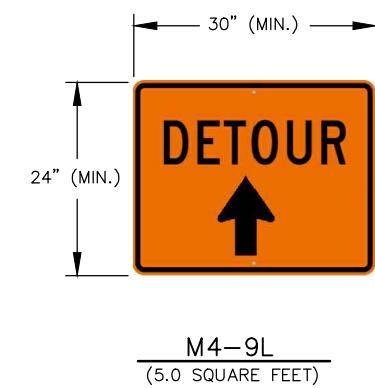
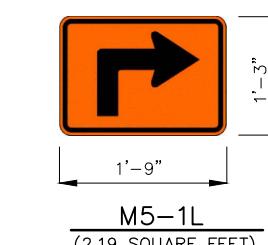
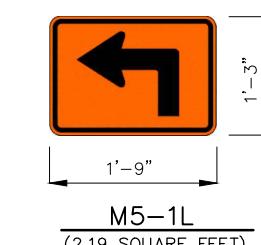
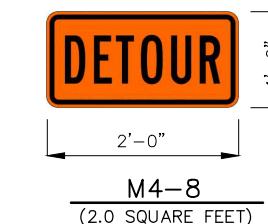
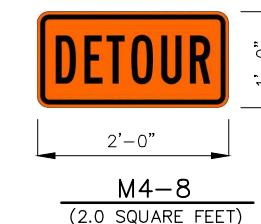
TRAFFIC CONTROL PLAN



DETOUR PLAN LAYOUT
NO SCALE



TRAFFIC CONTROL QUANTITIES			
PLAN DESIGNATION	QUANTITY	SQ. FT. (EACH)	SQ. FT. (TOTAL)
①	2	16	32.00
②	8	10	80.00
③	1	12.5	18.00
④	2	12.5	25.0
⑤	2	3.0	6.00
⑥	4	4.19	16.76
⑦	5	4.19	20.95
⑧	6	5.0	30



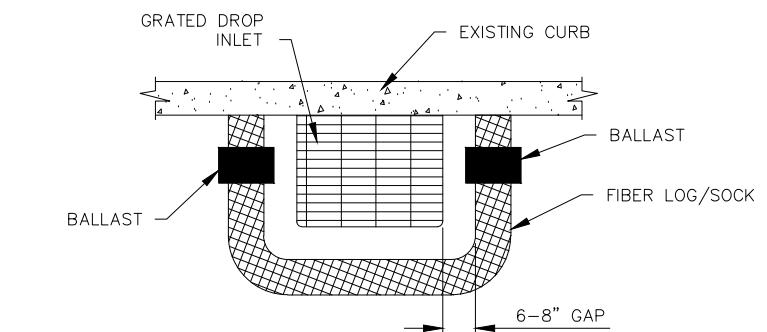
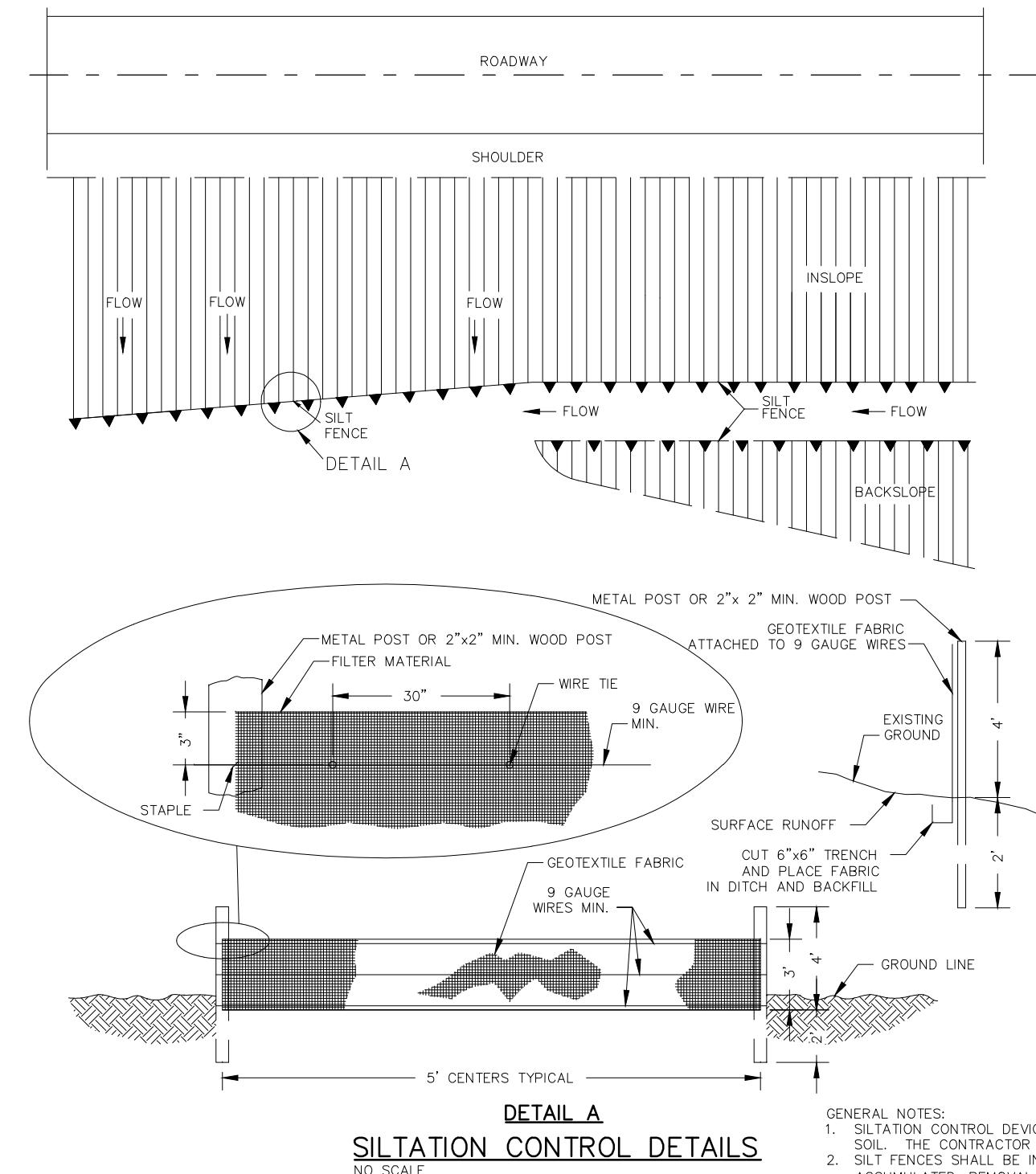
NOTE: ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

TRAFFIC CONTROL	
DATE:	
DOWN BY:	APP'D BY:
A.J.M.	B.B.D.
DATE:	
JAN. 2024	
SCALE:	
NOT TO SCALE	
PROJ. NO.:	
SC21-1222	
DWG. NO.:	
TC-2	

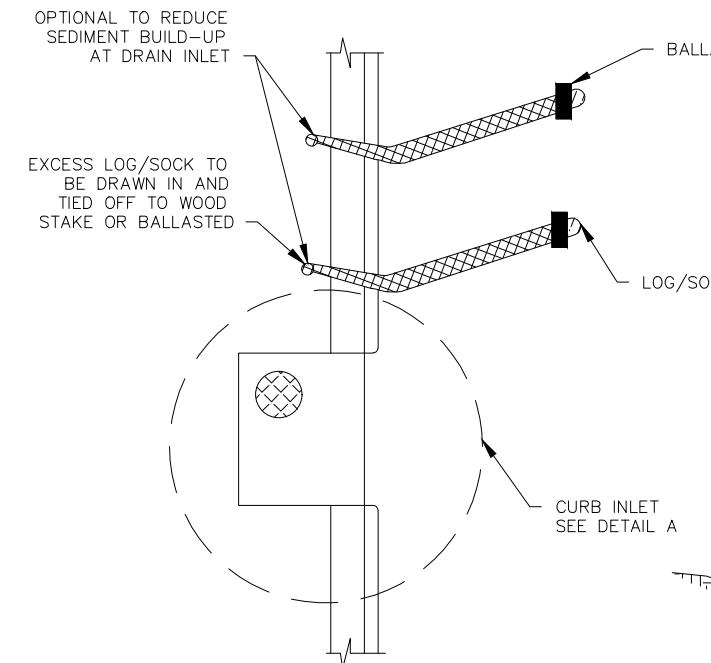
*LOCKHART RD. BRIDGE
NO. 37200031 REPLACEMENT
FEDERAL PROJECT NO. BRO-B036(33)
FRANKLIN COUNTY, MISSOURI*



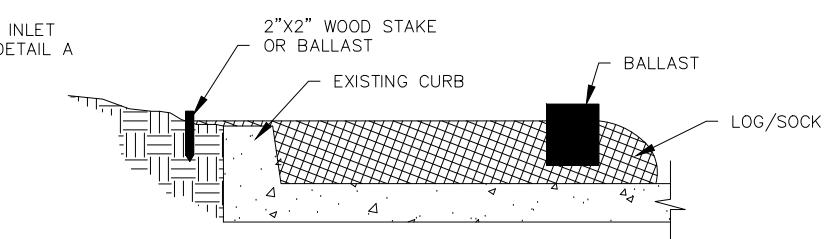
EROSION CONTROL



CURB DROP INLET PROTECTION



CURB INLET PROTECTION



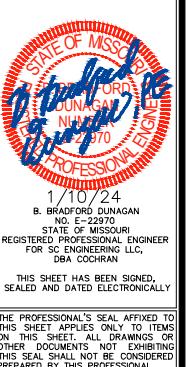
GENERAL NOTES:

1. SILTATION CONTROL DEVICES TO REMAIN IN PLACE UNTIL ADEQUATE VEGETATIVE GROWTH ENSURES NO FURTHER EROSION OF THE SOIL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING THE SILT FENCE.
2. SILT FENCES SHALL BE INSPECTED PERIODICALLY FOR DAMAGE AND FOR THE AMOUNT OF SEDIMENTATION WHICH HAS ACCUMULATED. REMOVAL OF SEDIMENT WILL BE REQUIRED WHEN IT REACHES 1/2 OF THE HEIGHT OF THE SILT FENCE.
3. ATTACHMENT OF THE GEOTEXTILE FABRIC TO BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION.
4. SILTATION CONTROL SHALL BE INSTALLED AS NEEDED OR AS DIRECTED BY THE ENGINEER TO ENSURE THAT NO SILT LEAVES THE CONSTRUCTION AREA.
5. USE SILT FENCE FOR ALL SLOPES OVER 3 FEET IN HEIGHT.
6. FOR FABRIC SILT FENCE:
MINIMUM LONGITUDINAL SPLICING OVERLAP SHALL BE 2' WITH A POST AT EACH END.
SECURE FABRIC TO POSTS.
7. SILT FENCE SHALL NOT BE USED ACROSS DRAINAGE DITCHES AND DRAINS. DITCH CHECK SHALL BE USED AS SHOWN ON SHEET EC-2 OR AS DIRECTED BY ENGINEER.
8. CONTRACTOR SHALL USE INLET CHECK EROSION CONTROL DEVICES TO PREVENT ANY SILT OR DEBRIS FROM ENTERING ANY NEW OR EXISTING CURB INLETS DURING CONSTRUCTION.

DRAWN BY:	APPD. BY:
A.J.M.	B.B.D.
DATE:	REVISION:
JAN. 2024	
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DWG. NO.:	

EROSION CONTROL

EC-1



LOCKHART RD. BRIDGE
NO. 37200031 REPLACEMENT
FEDERAL PROJECT NO. BRO-B036(33)
FRANKLIN COUNTY, MISSOURI

BRIDGE NOTES

HYDRAULIC DATA

DRAINAGE AREA	2.86 SQUARE MILES
BASIN SLOPE	60.48 ft/mi
CHANNEL SLOPE IN THE VICINITY OF THE STRUCTURE	0.0068 ft/ft
DESIGN FREQUENCY	100 YEAR
DESIGN DISCHARGE	2,510 CFS
DESIGN HIGH WATER ELEVATION AT THE STRUCTURE	726.45 FEET
MAXIMUM BACKWATER FOR DESIGN FREQUENCY	2.40 FEET
LOW ELEVATION OF STRUCTURE	722.55 FEET
100-YEAR DISCHARGE	2,510 CFS
APPROACH ROADWAY OVERTOPPING FREQUENCY	>100 YEAR

NOTE:

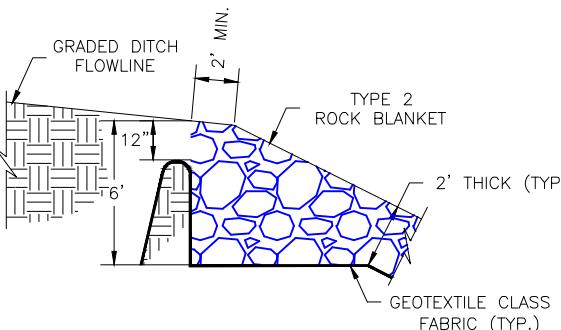
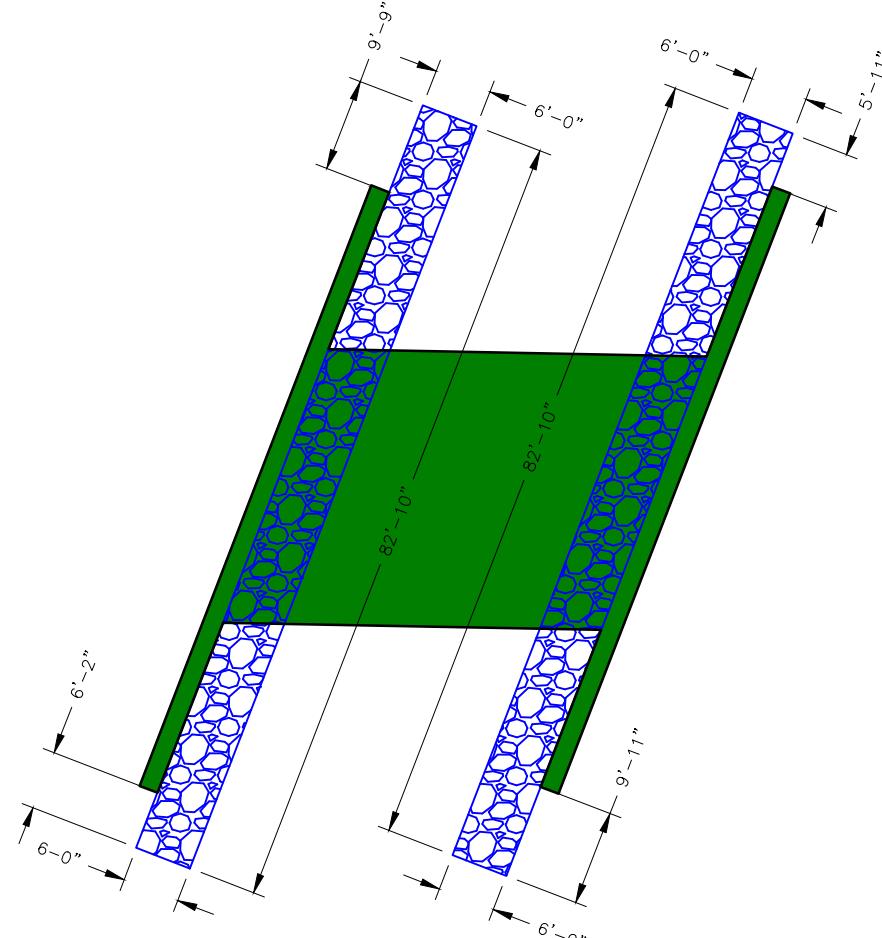
A PORTION OF THIS PROJECT AREA LIES WITHIN ZONE "A" OF THE FLOOD HAZARD AREA SUBJECT TO THE 1% ANNUAL CHANCE FLOOD AS SHOWN ON THE FEMA MAP FOR FRANKLIN COUNTY, MISSOURI AND INCORPORATED AREAS, MAP NUMBER 29071C0550D.

ESTIMATED QUANTITIES FOR SLAB ON STEEL OR CONCRETE BEAM	
ITEM	TOTAL
CLASS B2 CONCRETE (SUPERSTRUCTURE), CY	43.4
REINFORCING STEEL, LBS	14,840

NOTES:

SLAB CONCRETE SHALL BE CLASS B2. ALL SUPERSTRUCTURE CONCRETE AND REINFORCING STEEL SHALL BE PAID FOR UNDER THE LINE ITEM "SLAB ON CONCRETE BEAM" OR "SLAB ON STEEL".

STAY IN PLACE FORMS OR PREFABRICATED CONCRETE PANELS WILL NOT BE ALLOWED.



TYPICAL SECTION AT INTERSECTION OF GRADED DITCH AND TYPE 2 ROCK BLANKET

PROPOSED STRUCTURE

SINGLE SPAN (41'-6")
PRESTRESSED CONCRETE BOX GIRDER OPTION
STEEL GIRDERS OPTION
CURB-TO-CURB WIDTH = 28'-0"
OUT-TO-OUT WIDTH = 28'-8"
SKEW = 20.00° LA
GRADE = 0.00%

PROPOSED ROADWAY

TRAVELED WAY WIDTH = 24'-0"
ROADWAY WIDTH = 28'-0"
SHOULDER WIDTH = 2'-0"
NORMAL CROWN = 2.00%

GENERAL NOTES:

DESIGN SPECIFICATIONS:
2020 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR HIGHWAY BRIDGES, 9TH EDITION.
2002 AASHTO LFD (17TH ED.) STANDARD SPECIFICATIONS (SEISMIC DETAILS)
SEISMIC PERFORMANCE CATEGORY 'A'

CONSTRUCTION SPECIFICATIONS:

MATERIALS AND CONSTRUCTION PROCEDURES SHALL CONFORM TO THE MISSOURI STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION 2022 AND CURRENT SUPPLEMENTAL SPECIFICATIONS AND REVISIONS, UNLESS MODIFIED BY THE PROJECT SPECIFICATIONS.

DESIGN LOADING:

HL-93 LOADING
FUTURE WEARING SURFACE 35 LBS./SQUARE FOOT
EARTH 120 LBS./CUBIC FOOT
EQUIVALENT FLUID PRESSURE= 60 LBS./CUBIC FT.

SUPERSTRUCTURE:

SIMPLY SUPPORTED AND NON-COMPOSITE FOR DEAD LOAD 1.
SIMPLY SUPPORTED AND COMPOSITE FOR DEAD LOAD 2 AND LIVE LOAD.

DESIGN UNIT STRESSES:

CLASS B CONCRETE (SUBSTRUCTURE)	$f'_c = 3,000$ p.s.i.
CLASS B-2 CONCRETE (SUPERSTRUCTURE)	$f'_c = 4,000$ p.s.i.
REINFORCING STEEL (GRADE 60)	$fy = 60,000$ p.s.i.
STRUCTURAL CARBON STEEL (ASTM A709 GRADE 36)	$fy = 36,000$ p.s.i.
STEEL PILE (ASTM A709 GRADE 50)	$fy = 50,000$ p.s.i.

ALL JOINT FILLER SHALL MEET THE REQUIREMENTS OF MISSOURI STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION SECTION 1057.7.4.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 2" UNLESS OTHERWISE SHOWN.

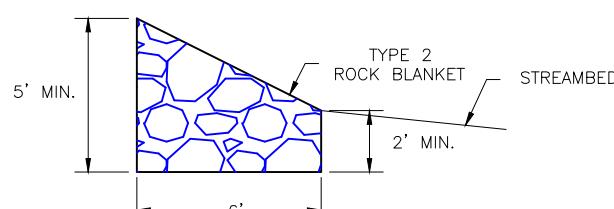
ALL BAR CHAIR SUPPORTS AND WIRE USED FOR TIEING THE REINFORCING STEEL SHALL BE EPOXY COATED OR PLASTIC COATED.

BEARINGS SHALL BE 60 DUROMETER NEOPRENE PADS.

BACKFILL SHALL NOT BE PLACED HIGHER ON ONE SIDE OF THE WALL THAN THE OTHER UNTIL AFTER THE SLAB HAS BEEN POURED.

THE PROJECT SHALL BE OPEN FOR INSPECTIONS OF THE WORK BY REPRESENTATIVES OF MODOT AND FHWA. THE CONTRACTOR SHALL GRANT ACCESS TO ALL PORTIONS OF THE WORK.

THE BRIDGE DECK SHALL BE FORMED WITH REMOVABLE FORMS.
STAY-IN-PLACE FORM WORK WILL NOT BE ALLOWED.

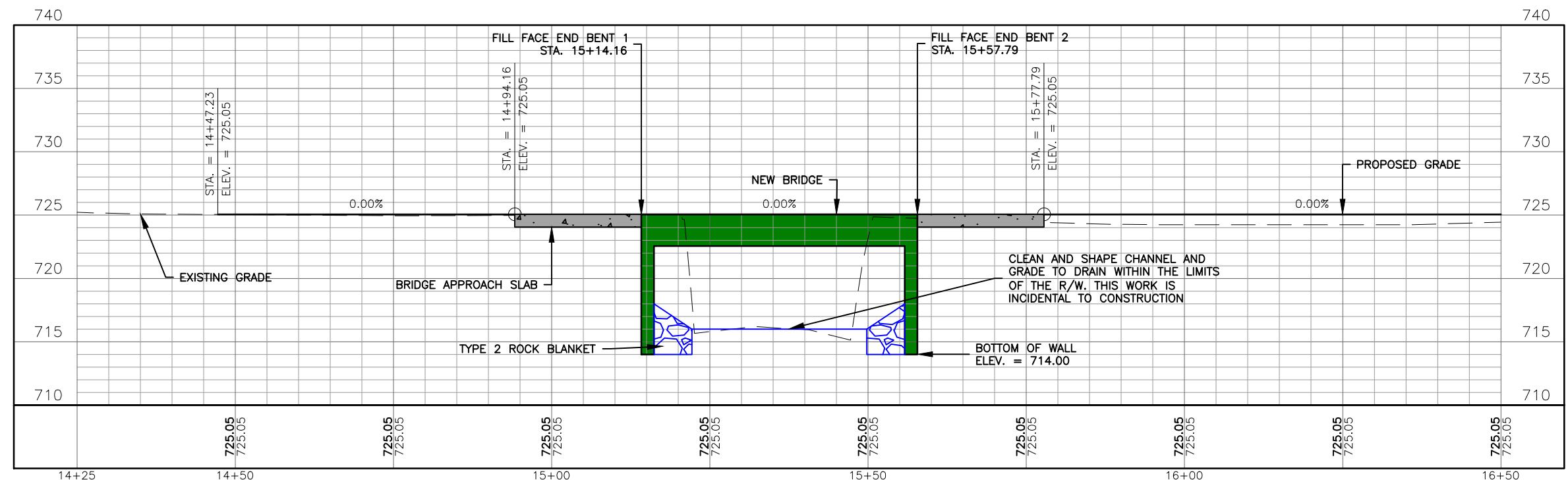
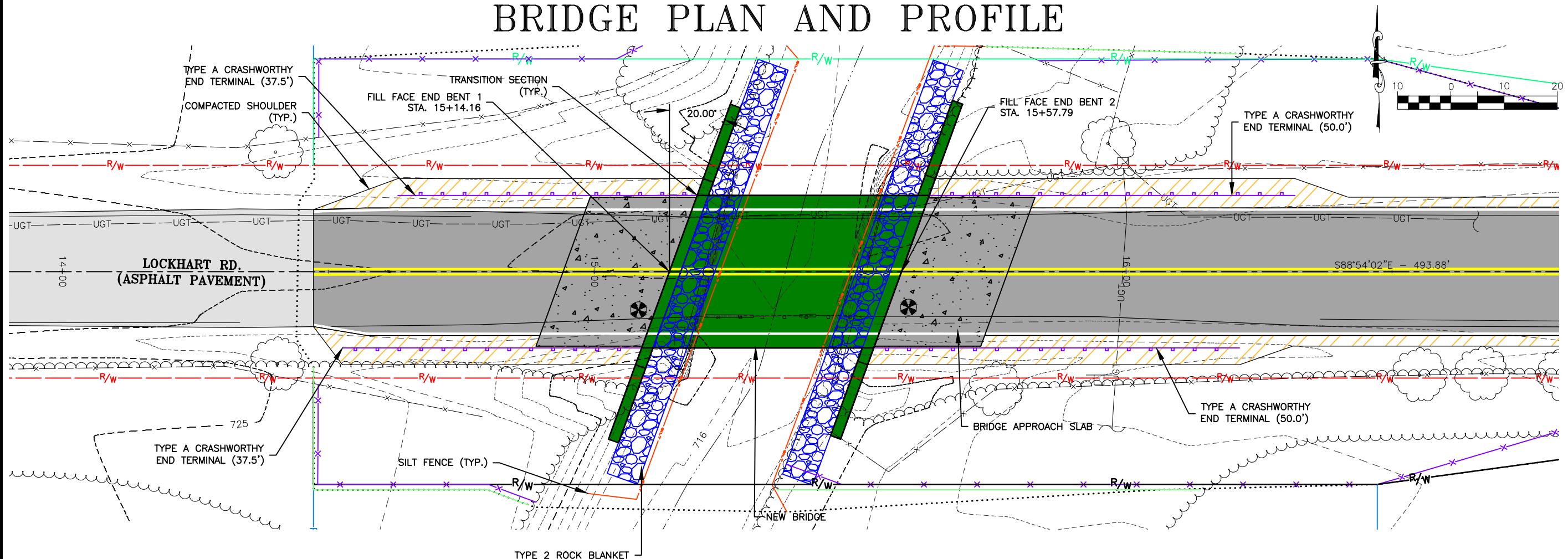


TYPICAL SECTION THROUGH LOWER END OF TYPE 2 ROCK BLANKET

NOTE: THIS DRAWING IS NOT TO SCALE. PLEASE FOLLOW DIMENSIONS.

BRIDGE PLAN AND PROFILE

Drawing name: 100021-1222 Location: road between Franklin County and Multnomah County, Oregon Date: 2004-07-02 Drawn by: amiller



NOTE: ALL BACKFILL BEHIND END BENTS TO BE INCIDENTAL TO "CLASS 1 EXCAVATION".

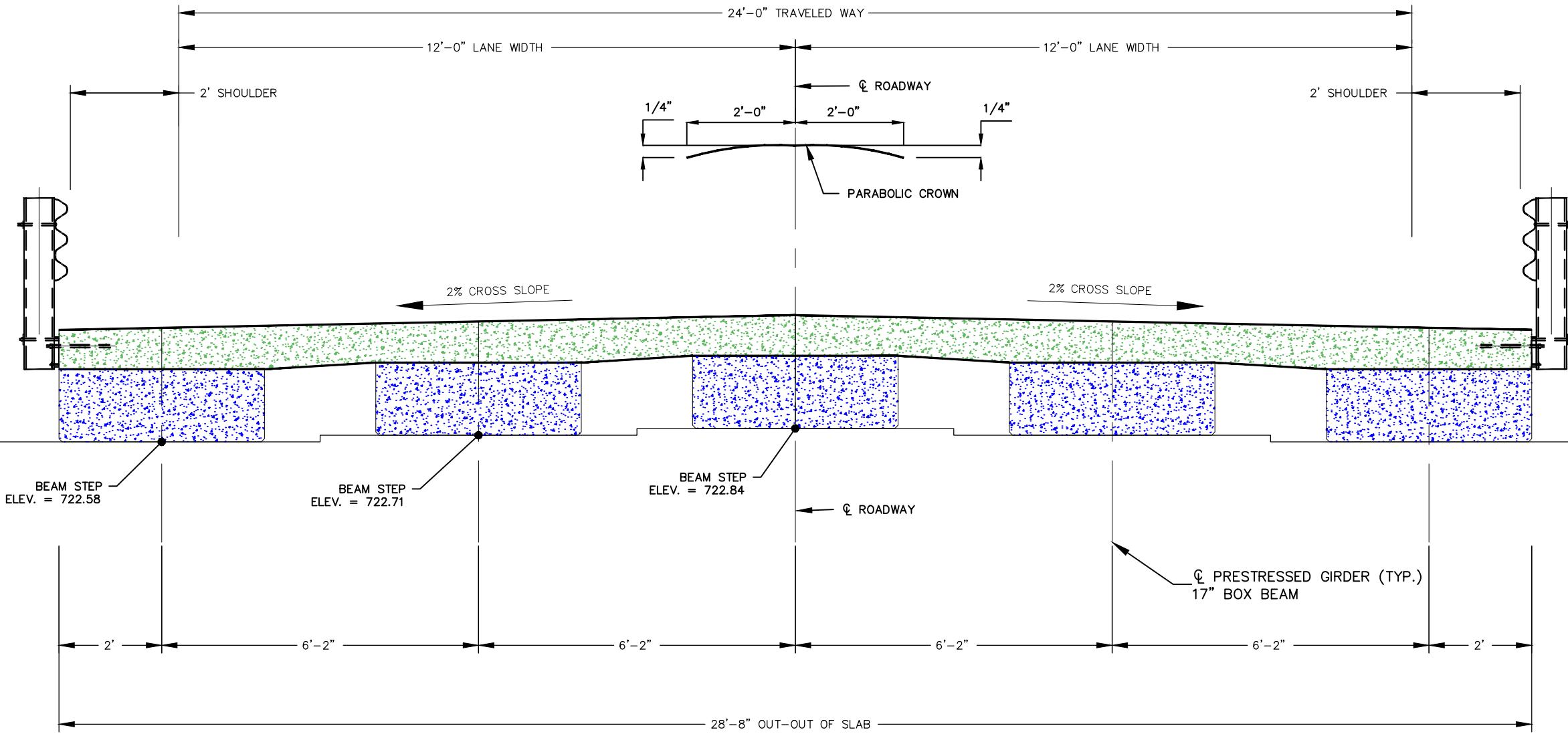
BRIDGE PLAN AND PROFILE	
DATE:	REASON:
DRAWN BY:	APPD. BY:
A.J.M.	B.B.D.
DATE:	JAN. 2024
SCALE:	1" = 20'
PROJ. NO.:	SC21-1222
DWG. NO.:	

B-2

*LOCKHART RD. BRIDGE
NO. 37200031 REPLACEMENT
FEDERAL PROJECT NO. BRO-B036(33)
FRANKLIN COUNTY, MISSOURI*

B-2

TYPICAL BRIDGE SECTION WITH PRESTRESSED CONCRETE GIRDER OPTION



TYPICAL BRIDGE CROSS SECTION

TYPICAL BRIDGE SECTION	
DATE:	REVISION:
A.J.M.	B.B.D.
DATE:	
JAN. 2024	
SCALE:	
NOT TO SCALE	
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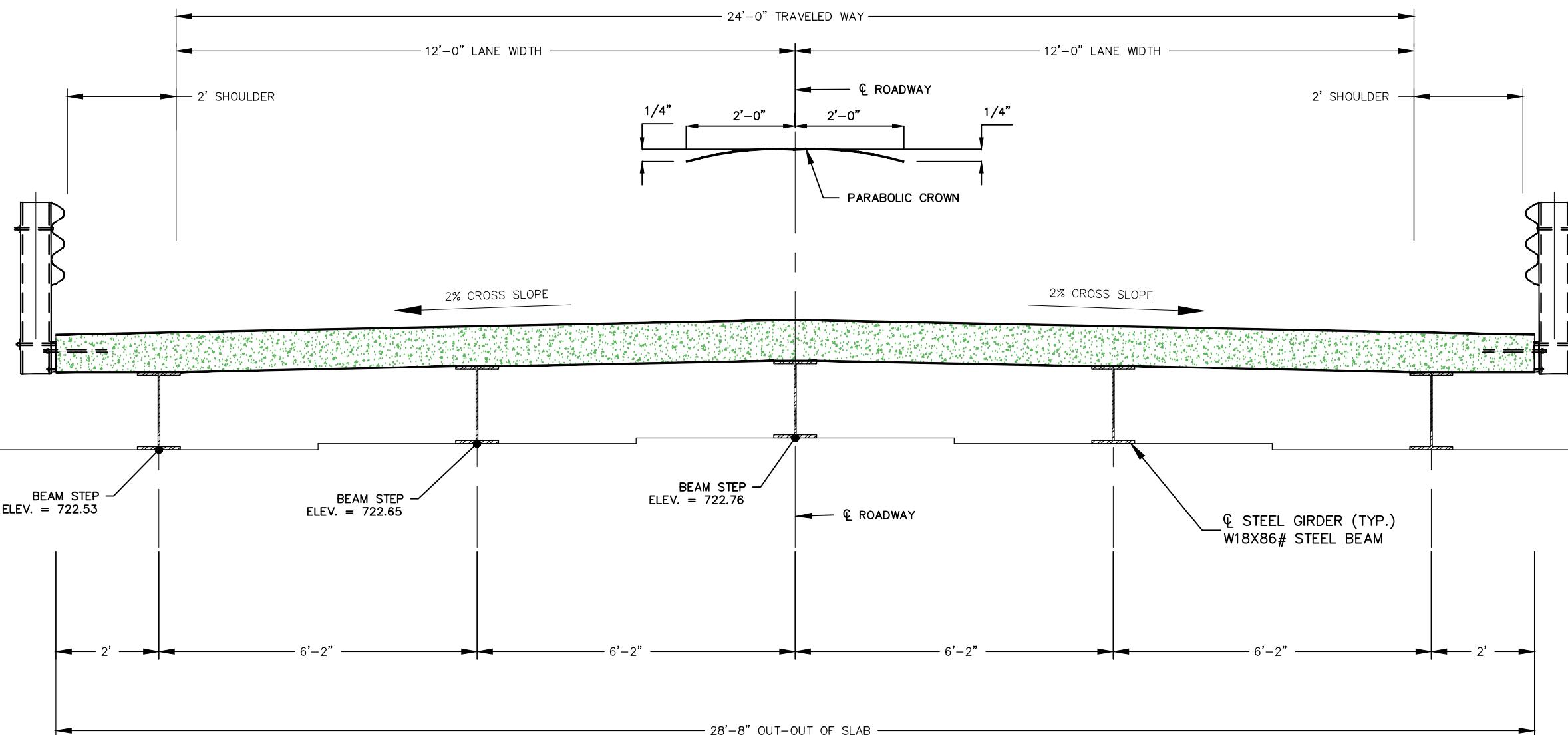
LOCKHART RD. BRIDGE
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FRANKLIN COUNTY, MISSOURI

STATE OF MISSOURI
B. BRADFORD DUNAGAN
NO. E-22970
ST. LOUIS, MISSOURI
REGISTERED PROFESSIONAL ENGINEER
FOR SC ENGINEERING LLC,
DBA COCHRAN
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TYPICAL BRIDGE SECTION

STEEL GIRDER OPTION



TYPICAL BRIDGE CROSS SECTION

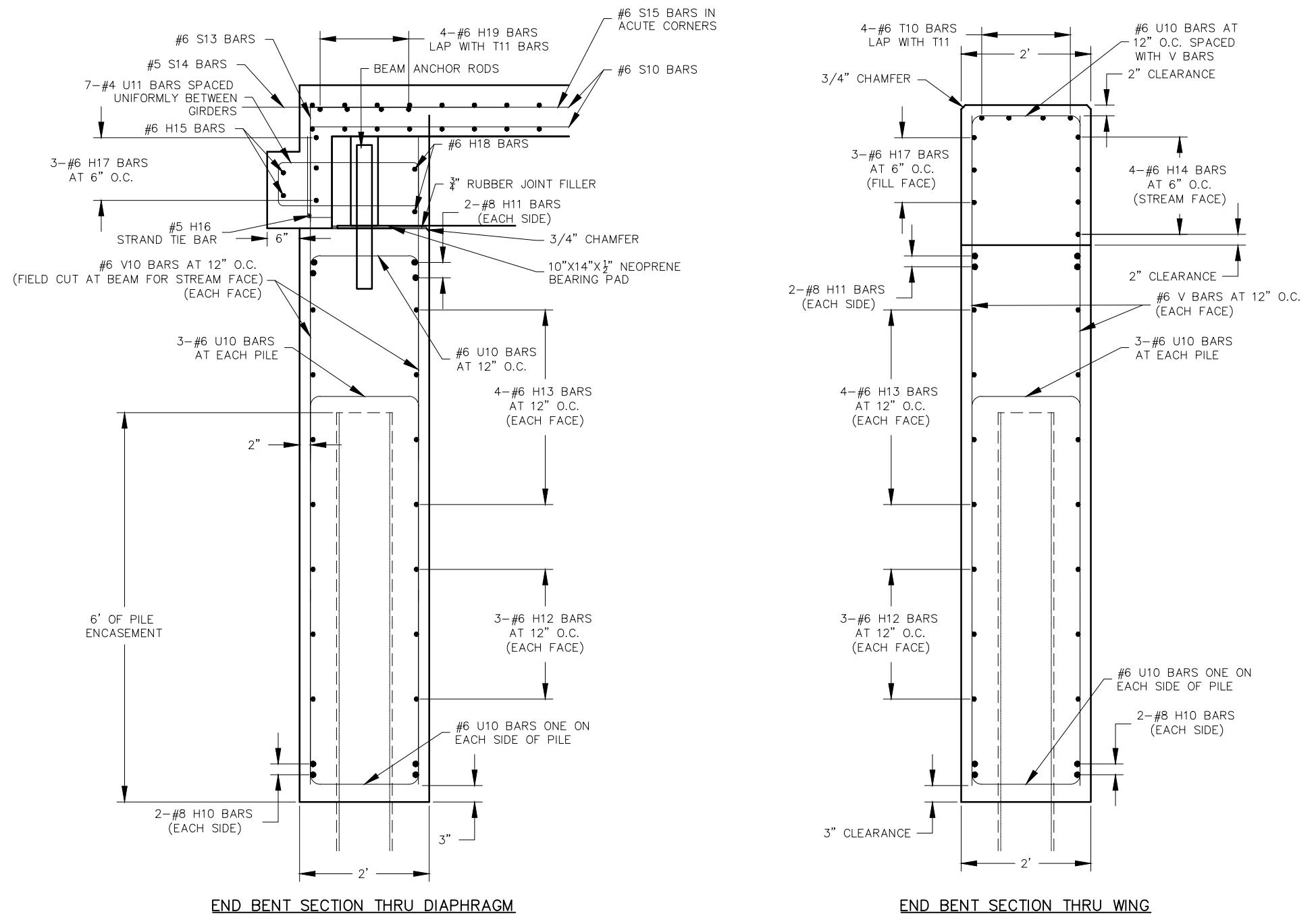
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REF. NO.:	APPD. BY:
DATE:	A.J.M. / B.B.D.
SCALE:	NOT TO SCALE
PROJ. NO.:	SC21-1222
DWG. NO.:	B-4



1/10/24
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NO. 37200031 REPLACEMENT
FEDERAL PROJECT NO. BRO-B036(33)
FRANKLIN COUNTY, MISSOURI

END BENT SECTIONS



END BENT SECTIONS	
DWG. BY:	APPD. BY:
A.J.M.	B.B.D.
DATE:	
JAN. 2024	
SCALE:	
NOT TO SCALE	
PROJ. NO.:	SC21-1222
DWG. NO.:	

B-6



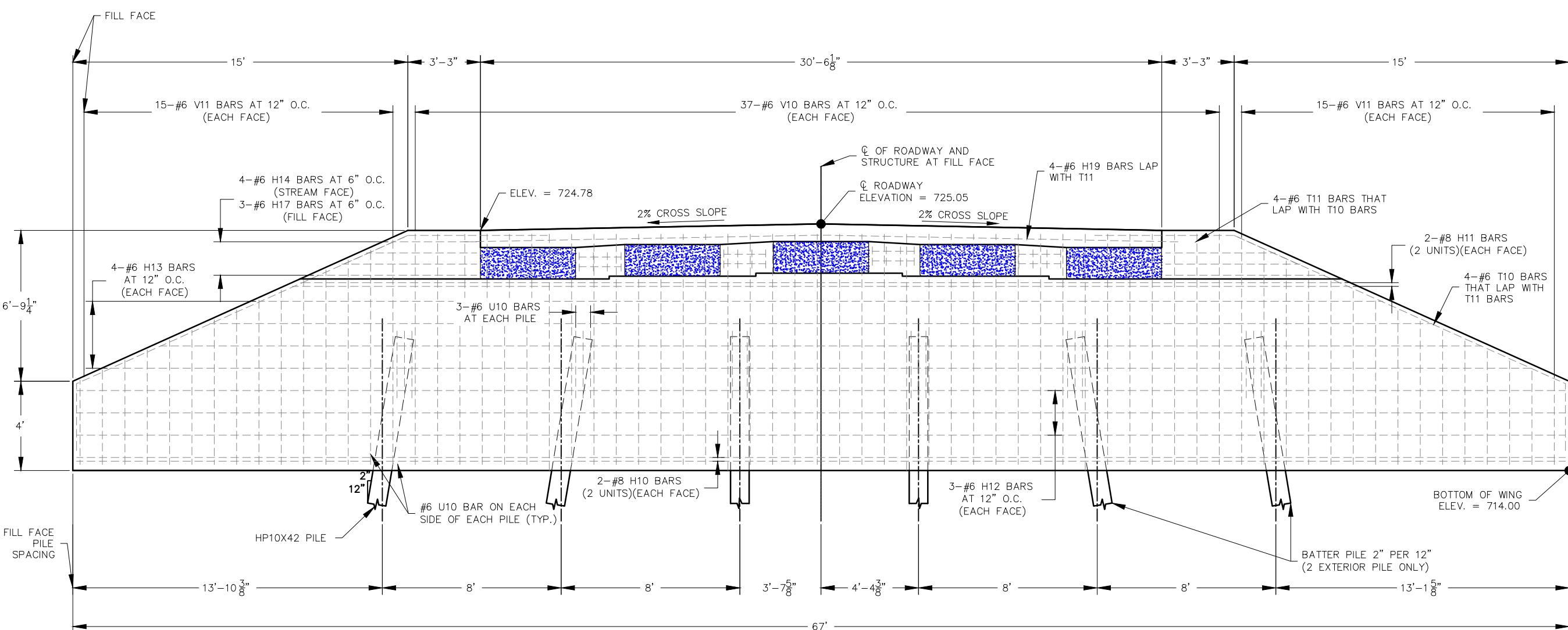
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END BENT ELEVATION



END BENT ELEVATION	DATE:	REVISION:
DWG. BY:	A.J.M.	APPD BY:
DATE:	JAN. 2024	
SCALE:	NOT TO SCALE	
PROJ. NO.:	SC21-1222	
DWG. NO.:		



1/10/24
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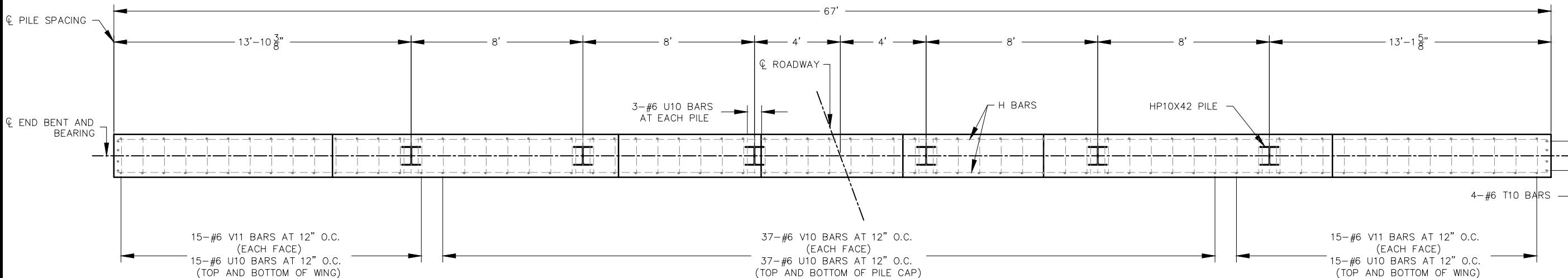
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THE PROFESSIONAL'S SEAL AFFIXED TO
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ON THIS SHEET. ALL DRAWINGS OR
OTHER DOCUMENTS CONTAINING
THIS SEAL SHALL NOT BE CONSIDERED
PREPARED BY THIS PROFESSIONAL.

LOCKHART RD. BRIDGE
NO. 37200031 REPLACEMENT
FEDERAL PROJECT NO. BRO-B036(33)
FRANKLIN COUNTY, MISSOURI

737 RUDDER ROAD
FENTON, MISSOURI 63026
314-842-4033 (tel)
314-842-5957 (fax)
www.cochraneng.com
• Civil Engineering
• Land Surveying
• Architecture
• Site Development
• Master Planning
• General Consulting
LAND SURVEYING CERTIFICATE OF AUTHORITY NUMBER 200700937
ENGINEERING CERTIFICATE OF AUTHORITY NUMBER 2007004529

END BENT PLAN



END BENT PLAN AT CONSTRUCTION JOINT

END BENT PLAN
DWG. NO. SC21-1222
DWG. NO. B-8

LOCKHART RD. BRIDGE
NO. 37200031 REPLACEMENT
FEDERAL PROJECT NO. BRO-B036(33)
FRANKLIN COUNTY, MISSOURI



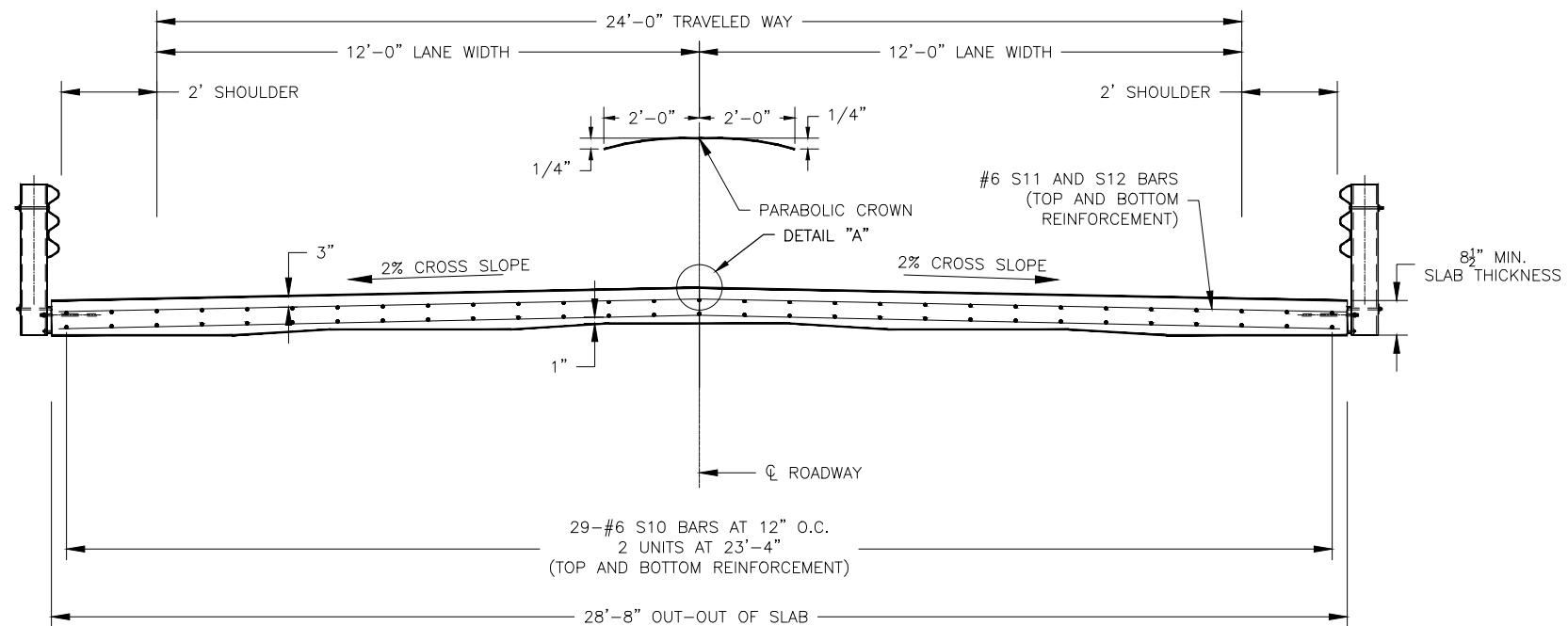
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SLAB REINFORCEMENT

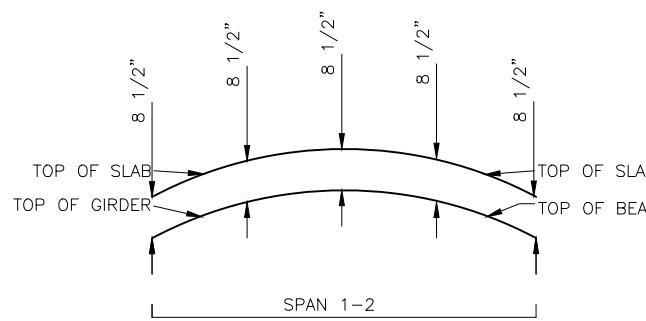
Drawing name: J:\sc21-1222 lockhart road bridge # 37200031 - franklin county, mo\AUTOCAD DRAWINGS\END BENTS.dwg Plotted on: Apr 02, 2024 - 11:17am Plotted by: amueler

franklin county, mo\AUTOCAD DRAWINGS\END BENTS.dwg Tab

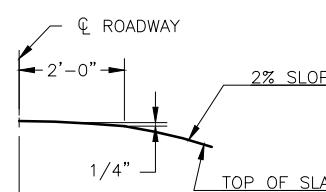
Plotted on: Apr 02, 2024 - 11:17am Plotted by: amuelle



SECTION NEAR MIDSPAN



SLAB HAUNCH DIAGRAM



DETAIL "A

NOTES:

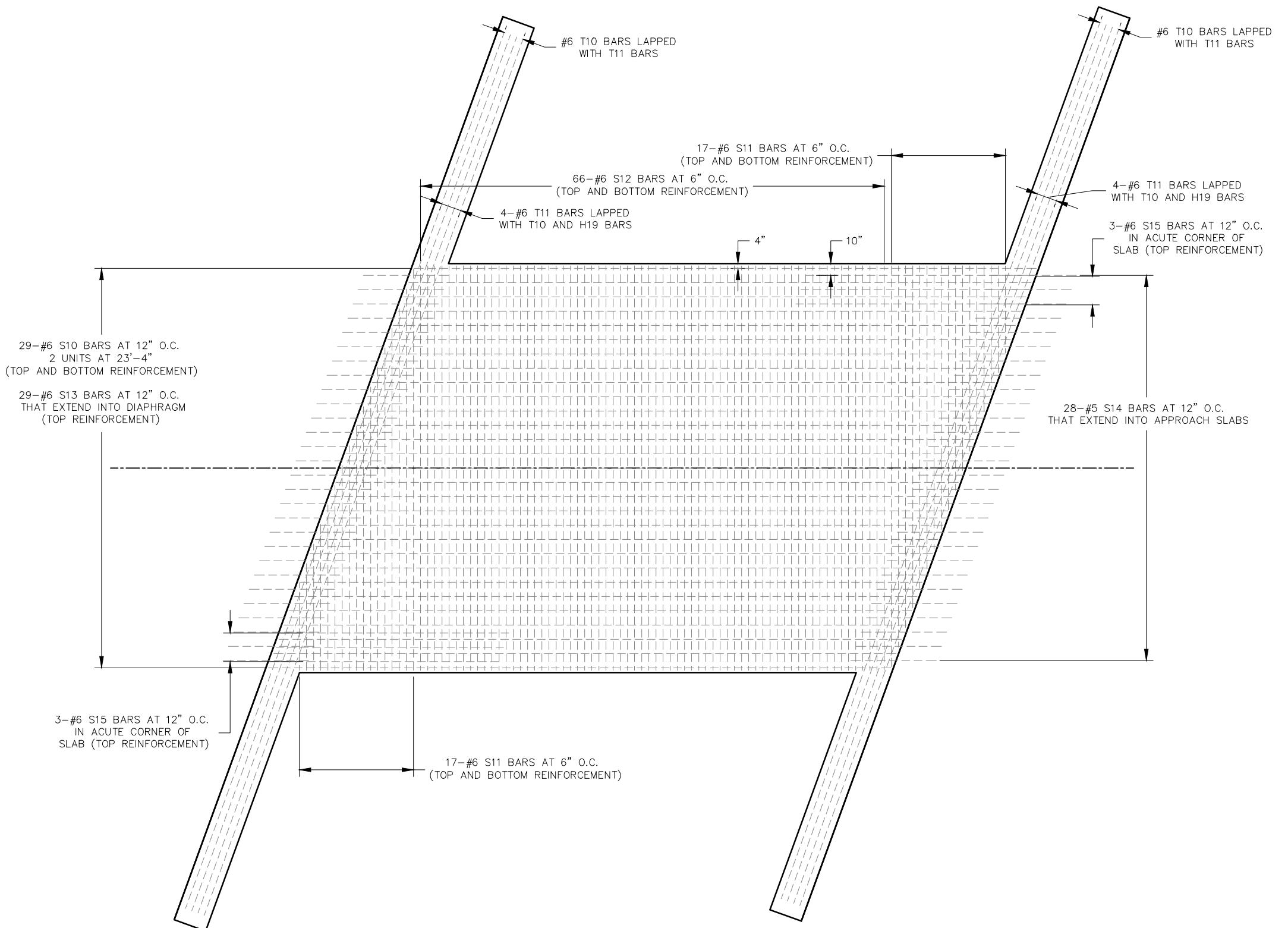
1. THE SLAB SHALL BE POURED WITH A MINIMUM SLAB THICKNESS OF $8\frac{1}{2}$ " ABOVE THE GIRDERS. IF GIRDER CAMBER IS DIFFERENT FROM THAT SHOWN IN THE CAMBER DIAGRAM, IT SHALL BE NECESSARY TO ADJUST THE SLAB HAUNCHES, OR TO INCREASE THE SLAB THICKNESS. NO PAYMENT WILL BE MADE FOR ADDITIONAL LABOR OR MATERIALS REQUIRED FOR VARIATION IN HAUNCHING, SLAB THICKNESS OR GRADE ADJUSTMENT.
2. THE CONTRACTOR SHALL FURNISH AN APPROVED RETARDER TO RETARD THE SET OF CONCRETE TO 2.5 HOURS. THE RATE OF POUR MAY BE REDUCED TO NOT LESS THAN 25 CUBIC YARDS PER HOUR.
3. MACHINE FINISHING OF THE RIDING SURFACE WILL BE REQUIRED. THE RAILS FOR THE FINISHING MACHINE SHALL EXTEND 15' BEYOND THE FILL FACE TO ALLOW THE FINISHING MACHINE TO FINISH TO THE FILL FACE OF THE BRIDGE.
4. THE DIAPHRAGMS OF THE END BENTS SHALL BE POURED A MINIMUM OF 30 MINUTES AND A MAXIMUM OF 2 HOURS BEFORE THE SLAB IS POURED ACROSS THE DIAPHRAGM.
5. ALL SUPPORTS, BAR CHAIRS, AND WIRE USED FOR TIEING THE REINFORCING STEEL SHALL BE EPOXY COATED OR PLASTIC COATED.
6. THE CONCRETE SLAB SHALL BE CURED AND SEALED, MEETING THE REQUIREMENTS OF MISSOURI STANDARD SPECIFICATIONS 703.3.6 AND 703.3.8 RESPECTIVELY. THIS WORK SHALL BE INCLUDED IN THE UNIT BID PRICE FOR "SLAB ON CONCRETE BEAM" OR "SLAB ON STEEL".
7. SLAB CONCRETE SHALL BE CLASS B2. ALL SUPERSTRUCTURE CONCRETE AND REINFORCING STEEL SHALL BE PAID FOR UNDER THE LINE ITEM "SLAB ON CONCRETE BEAM" OR "SLAB ON STEEL".
8. STAY IN PLACE FORMS OR PREFABRICATED CONCRETE PANELS WILL NOT BE ALLOWED.

NOTE: THIS DRAWING IS NOT TO SCALE. PLEASE FOLLOW DIMENSIONS

SLAB REINFORCEMENT	
<i>DATE:</i>	<i>REV/1</i>
<i>DWN. BY:</i>	
A.J.M. B.B.D.	
<i>DATE:</i>	
JAN. 2024	
<i>SCALE:</i>	
NOT TO SCALE	
<i>PROJ. NO.:</i>	
SC21-1222	
<i>DWG. NO.:</i>	
B-10	

B-10

SLAB REINFORCEMENT



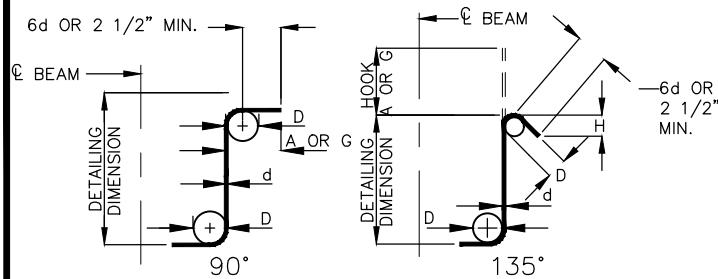
SLAB REINFORCEMENT	
DATE:	REVISION:
DATE:	APPD BY:
DATE:	A.J.M. B.B.D.
SCALE:	NOT TO SCALE
PROJ. NO.:	SC21-1222
DWG. NO.:	B-11

LOCKHART RD. BRIDGE
NO. 37200031 REPLACEMENT
FEDERAL PROJECT NO. BRO-B036(33)
FRANKLIN COUNTY, MISSOURI



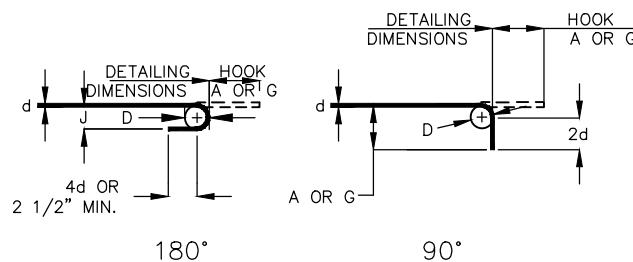
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ENGINEERING CERTIFICATE OF AUTHORITY NUMBER 200704529

BILL OF REINFORCING



STIRRUP HOOK DIMENSIONS				
GRADES 40-50-60 KSI				
BAR SIZE	D (IN.)	90° HOOK	135° HOOK	APPROX. H
		A OR G	A OR G	
#3	1 1/2"	4"	4"	2 1/2"
#4	2"	4 1/2"	4 1/2"	3"
#5	2 1/2"	6"	5 1/2"	3 3/4"
#6	4 1/2"	8"	7"	4 1/2"

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



SIZE OF 180° HOOKS (GRADE 40 KSI)
D=5d FOR #3 THROUGH #11
D=10d FOR #14 AND #18

SIZE OF 90° HOOKS (ALL GRADES)
AND 180° HOOKS (GRADE 60 KSI)
D=6d FOR #3 THROUGH #8
D=8d FOR #9, #10 AND #11
D=10d FOR #14 AND #18

END HOOK DIMENSIONS				
180° HOOKS			90° HOOKS	
BAR SIZE	GRADE 40		GRADE 60	
	A OR G	J	A OR G	J
#3	5"	2 3/4"	5"	3"
#4	6"	3 1/2"	6"	4"
#5	7"	4 1/2"	7"	5"
#6	8"	5 1/4"	8"	6"
#7	9"	6 1/4"	10"	7"
#8	10"	7"	11"	8"
#9	12"	8"	15"	11 1/4"
#10	13"	9"	17"	12 3/4"
#11	14"	10"	19"	14 1/4"
#14	2'-2"	20 1/2"	2'-2"	20 1/2"
#18	2'-11"	2'-3"	2'-11"	2'-3"
				3'-5"

NOTE:
ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREES TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEGREE STANDARD 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 LOCATED IN THE SUBSTRUCTURE

V = BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE

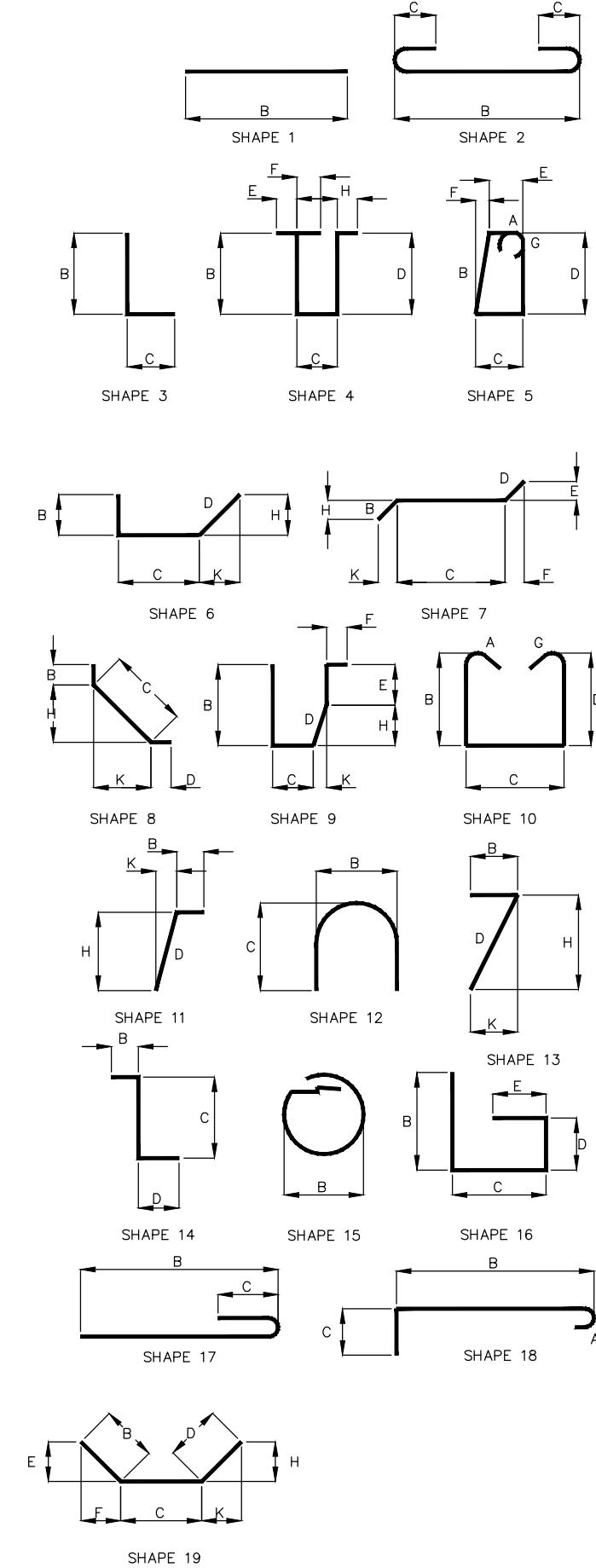
NO. EACH = NUMBER OF BARS OF EACH LENGTH.

DIMENSIONS SHOWN ARE OUT TO OUT DIMENSIONS. LENGTH SHOWN IS MEASURED ALONG CENTERLINE OF BAR.

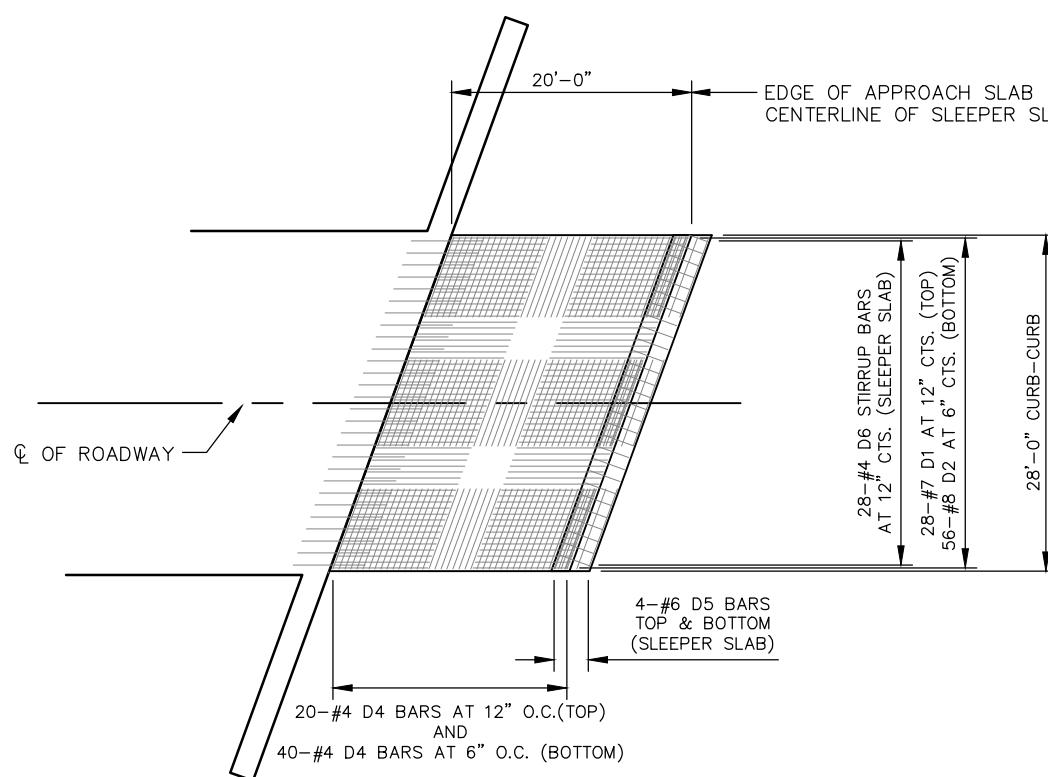
LENGTHS AND QUANTITIES OF BARS SHOWN IN TABLE ARE FOR BIDDING PURPOSES ONLY. CONTRACTOR SHALL VERIFY ALL QUANTITIES AND DIMENSIONS PRIOR TO FABRICATING STEEL.

FOR SHAPES 2 AND 17, USE STANDARD HOOK IF NO "C" DIMENSION IS GIVEN.

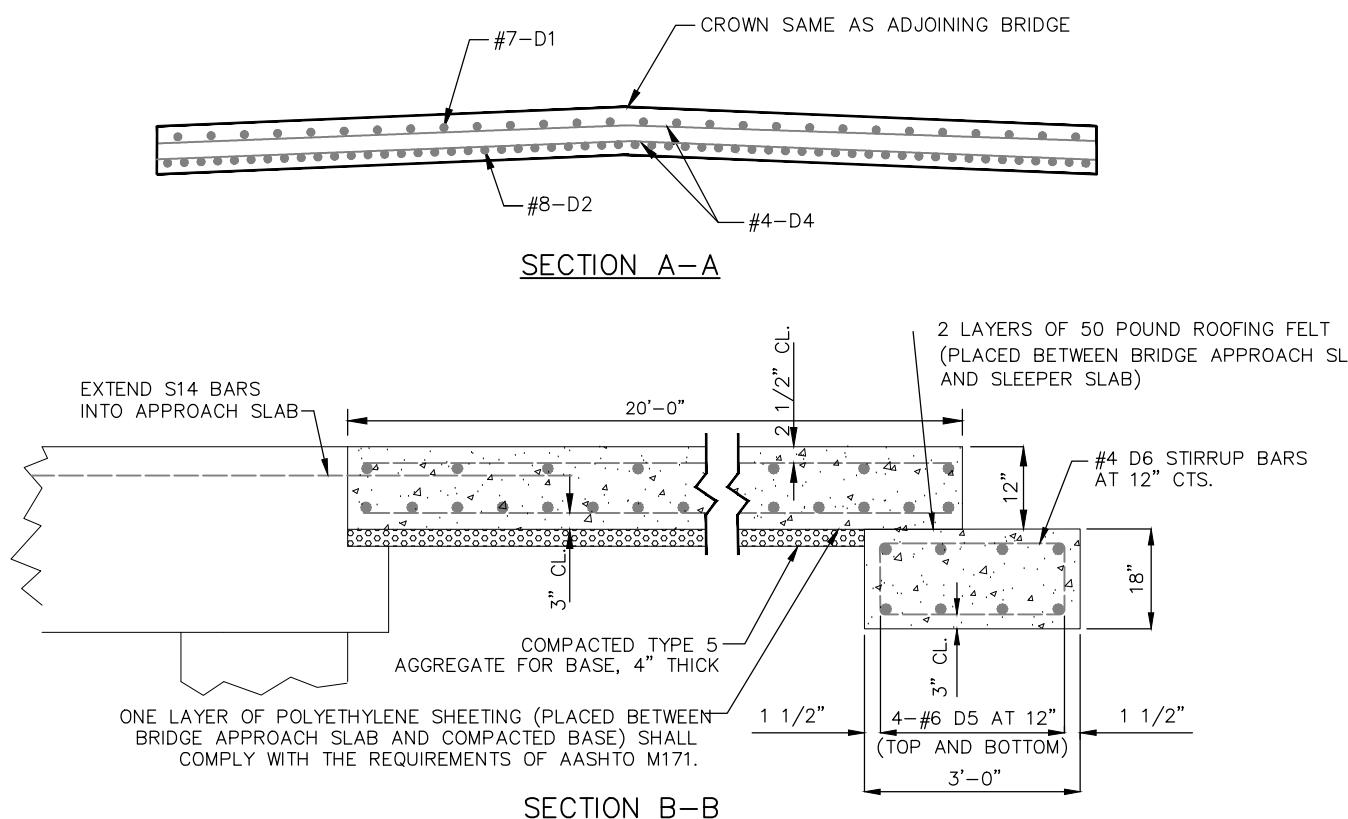
BILL OF REINFORCING									
Substructure Steel (LBS.) 13,134									
(E)	NO. REQUIRED	SIZE	MARK	LOCATION	SHAPE	STIRRUP	SUBSTRUCTURE	VARIES	NO EACH
E	8	8	H10	BEAM/WING	1	X			35.33
E	8	8	H11	BEAM/WING	1	X			25.66
E	12	6	H12	BEAM/WING	1	X			34.83
E	16	6	H13	BEAM/WING	1	X	V 4		33.30
E	6	H13	inc. = 2.22'		1	X	V 4		26.64
E	74	6	V10	BEAM/DIAPHRAGM	1	X			10.33
E	60	6	V11	BEAM/WING	1	X	V 4		10.08
E	6	V11	inc. = 0.45'		1	X	V 4		3.77
E	166	6	U10	BEAM/WING	4	X			3.00
E	8	6	T10	WING	11	X			3.00
									16.25
									14.88
									6.66
									19.25
									231
									6,567
END BENT #2 SIMILAR									
DIAPHRAGM - END BENT #1									
E	8	6	H14	WING	1	V 2	7.14		7.14
E	6	H14	inc. = 1.11'		1	V 2	3.82		3.82
E	2	6	H15	BAS NOTCH	1		27.67		27.67
E	5	5	H16	DIAPHRAGM	1		4.00		4.00
E	6	6	H17	DIAPHRAGM	1		24.67		24.67
E	8	6	H18	DIAPHRAGM	1		5.25		5.25
E	4	6	H19	DIAPHRAGM	1		30.50		30.50
E	8	6	T11	DIAPHRAGM/WING	11		3.17		183
E	28	4	U11	DIAPHRAGM	5	X	2.30	0.67	6.68
									125
									1,020
DIAPHRAGM - END BENT #2 SIMILAR									
SLAB									
E	116	6	S10	SLAB	1		23.33		23.33
E	68	6	S11	SLAB	1	V 4	28.31		28.31
E	6	S11	inc. = 1.37		1	V 4	6.33		6.33
E	132	6	S12	SLAB	1		28.33		28.33
E	58	6	S13	SLAB/DIAPHRAGM	3		8.00	1.75	5,617
E	56	5	S14	APPROACH/SLAB	1		6.00		9.75
E	6	6	S15	SLAB	1		16.00		849
									350
									144



BRIDGE APPROACH SLAB



APPROACH SLAB



SECTION A-A

SECTION B-B

NOTES:

THE APPROACH SHALL BE POURED IN A CONTINUOUS UNIT USING STATIONARY SIDE FORMS.

ALL REINFORCING STEEL SHALL BE GRADE 60, EPOXY COATED.

APPROACH SLAB QUANTITIES ARE FOR REFERENCE ONLY. COST OF D BARS, CLASS B1 CONCRETE, SLEEPER SLAB, POLYETHYLENE SHEETING, MUD-JACK HOLES, AND COMPAKTED TYPE 5 AGGREGATE FOR BASE, SHALL BE INCLUDED IN THE UNIT BID PRICE FOR "BRIDGE APPROACH SLAB", PER SQUARE YARD.

SEAL THE JOINT BETWEEN APPROACH SLAB AND THE BRIDGE WITH "SILICONE JOINT SEALANT FOR SAW CUT AND FORMED JOINTS" IN ACCORDANCE WITH SEC. 717.

BILL OF REINFORCING STEEL							
EPOXY	NO.	SIZE & MARK	VARIES	NO.	ACTUAL LENGTH	TOTAL WEIGHT	BENDING DIAGRAM
E	56	#7 D1			19'-8"		D1,D2,D3,D4,D5
E	112	#8 D2			19'-8"		
E	120	#4 D4			29'-5"		
E	16	#6 D5			29'-5"		
E	56	#4 D6			7'-11"		
							13 1/2"
							2'-8"
							D6

BRIDGE APPROACH SLAB	
DATE:	REVISION:
A.J.M.	B.B.D.
DATE:	APPD. BY:
JAN. 2024	
SCALE:	NOT TO SCALE
PROJ. NO.:	SC21-1222
DWG. NO.:	

LOCKHART RD. BRIDGE	
NO. 37200031 REPLACEMENT	
FEDERAL PROJECT NO. BRO-B036(33)	
FRANKLIN COUNTY, MISSOURI	

737 RUDDER ROAD FENTON, MISSOURI 63026 314-842-4033 (tel) 314-842-5657 (fax) www.cochraneng.com
CIVIL ENGINEERING LAND SURVEYING ARCHITECTURE GENERAL PLANNING SITE DEVELOPMENT GENERAL CONSULTING
ENGINEERING CERTIFICATE OF AUTHORITY NUMBER - 200709937 LAND SURVEYING CERTIFICATE OF AUTHORITY NUMBER - 200704529

The diagram shows an elevation view of a bridge structure. At the top, a horizontal line represents the rail height, with dimensions: '37'-6" TYPE "A" CRASHWORTHY END SECTION" on the left, a '6'-3" gap, '50'-0" OF THRIE BEAM RAIL ON STEEL POSTS AT 6'-3" SPACING" in the center, another '6'-3" gap, and '50'-0" TYPE "A" CRASHWORTHY END SECTION" on the right. Below the rail, the bridge deck is shown with a 'TRANSITION SECTION THRIE BEAM ON BRIDGE' in the center. The bridge is supported by steel posts and has a wavy profile. At the bottom, a horizontal line indicates the bridge's footprint with dimensions: '3'-2" on the left, '43'-7½" BRIDGE LENGTH" in the center, and '3'-2" on the right. The entire diagram is labeled 'ELEVATION VIEW' at the bottom center.

PLAN VIEW

6 SPACES AT 6'-3" = 37'-6" (7 G2 POSTS) 6'-3" 50'-0" OF THRIE BEAM RAIL ON STEEL POSTS AT 6'-3" SPACING 6'-3" 8 SPACES AT 6'-3" = 50'-0" (9 G2 POSTS)

7 BRIDGE POSTS (STEEL) AT 6'-3"

The diagram shows a bridge structure with a total length of 50'-0". It consists of a central section with a span of 50'-0" supported by 7 steel posts, and two end sections. The left end section has a span of 37'-6" supported by 7 G2 posts. The right end section has a span of 50'-0" supported by 9 G2 posts. The bridge is supported by 7 bridge posts (steel) spaced at 6'-3". The rail is a three-beam rail on steel posts with a 6'-3" spacing.

PLAN VIEW

SECTION THRU THRIE BEAM RAIL

(*) VERIFY BY RAIL TRANSITION SUPPLIER

Technical drawing of a base plate with the following dimensions and features:

- Width: 8"
- Length: 7"
- Thickness: 1/2"
- Top edge width: 5 1/2"
- Top edge height from base: 2 1/2"
- Top edge thickness: 3/4"
- Bottom edge height from base: 4 1/2"
- Bottom edge thickness: 3/4"
- Left edge height from base: 5 3/4"
- Left edge thickness: 1 1/2"
- Left edge width: 1 1/2" ϕ
- Right edge height from base: 2 1/2"
- Right edge thickness: 3/4"
- Center hole diameter: 3/4"
- Left hole diameter: 3/4"
- Right hole diameter: 3/4"
- Bottom hole diameter: 3/8"
- Bottom hole length: 1 1/2"
- Bottom hole thread: 3/8"-16 UNC TH
- Top hole diameter: 3/4"
- Top hole length: 1 1/2"
- Top hole thread: 3/4"-10 UNC TH

REARING PLATE

Bradford Dunagan No. E-22970
Registered Professional Engineer
State of Missouri for Cochran

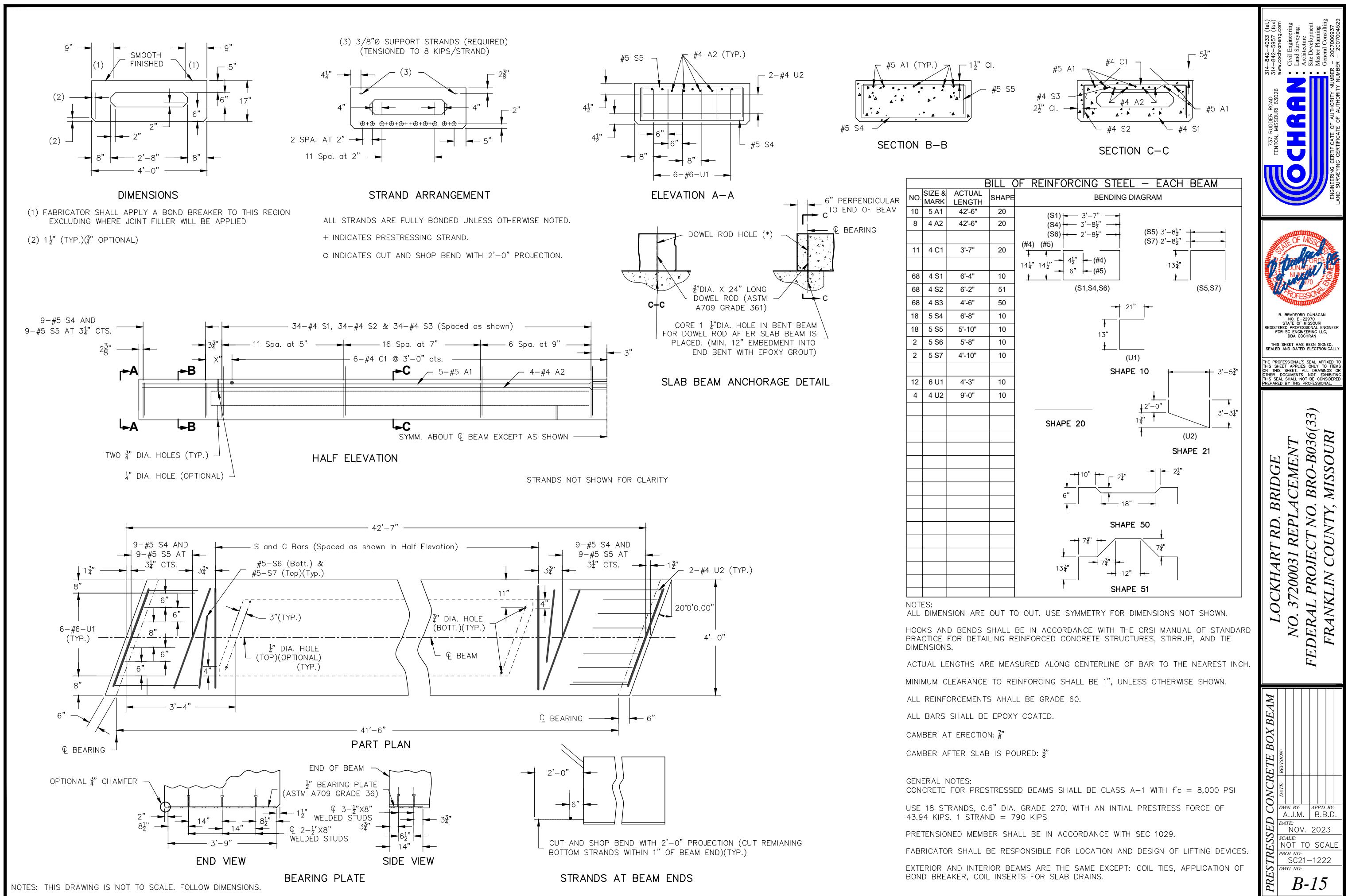
NOTE: THIS DRAWING IS NOT TO SCALE. FOLLOW DIMENSIONS.

*LOCKHART RD. BRIDGE
NO. 37200031 REPLACEMENT
FEDERAL PROJECT NO. BRO-B036(33)
EDDANKI IN COUNTY MISSOURI*

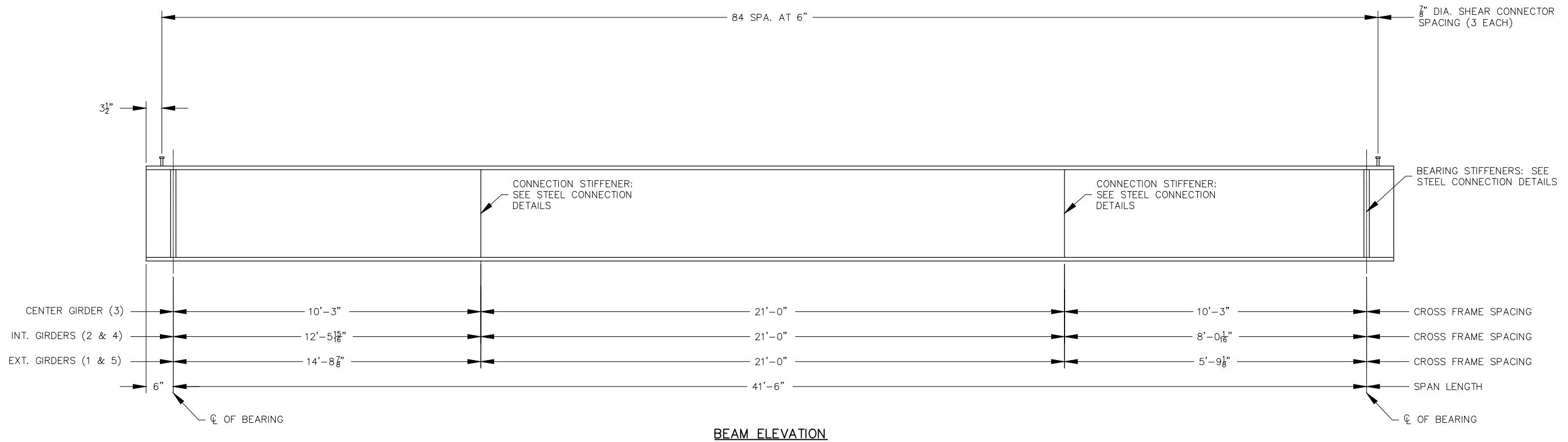
SL-1 BRIDGE RAIL
 D/W
 D/WN. BY: APPD. BY:
 A.J.M. B.B.D.
DATE:
 JAN. 2024
SCALE:
 NOT TO SCALE
PROL. NO.:
 SC21-1222
DWG. NO.:
B-14

B-14

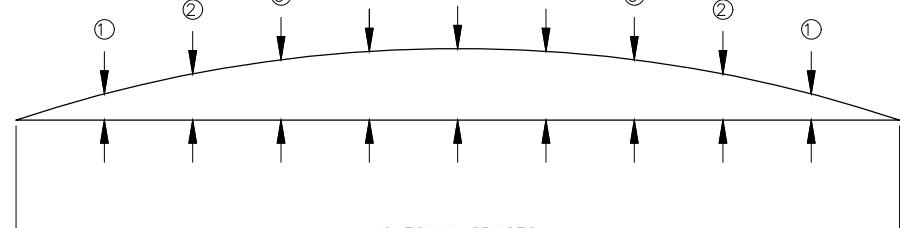
The seal is circular with a double outer ring. The outer ring contains the words "STATE OF MISSOURI" at the top and "PROFESSIONAL ENGINEER" at the bottom. The inner circle contains "B. BRADFORD DUNAGAN" in the center, with "NO. E-22970" to the left and "ST. LOUIS, MISSOURI" to the right. The date "1/10/24" is at the bottom. A blue ink signature of "B. Bradford Dunagan" is overlaid on the seal.



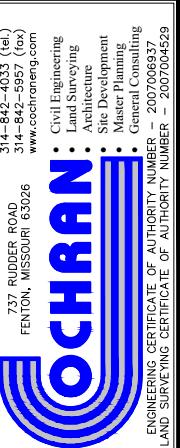
STEEL BEAM DETAILS



STEEL D.L. CAMBER - IN.					TOTAL D.L. CAMBER - IN.				
①	②	③	④	⑤	①	②	③	④	⑤
0.04"	0.08"	0.11"	0.13"	0.14"	0.59"	1.11"	1.52"	1.79"	1.88"



CAMBER DIAGRAM



B. BRADFORD DUNAGAN NO. E-22970 STATE OF MISSOURI REGISTERED PROFESSIONAL ENGINEER FOR SC ENGINEERING LLC, DBA COCHRAN

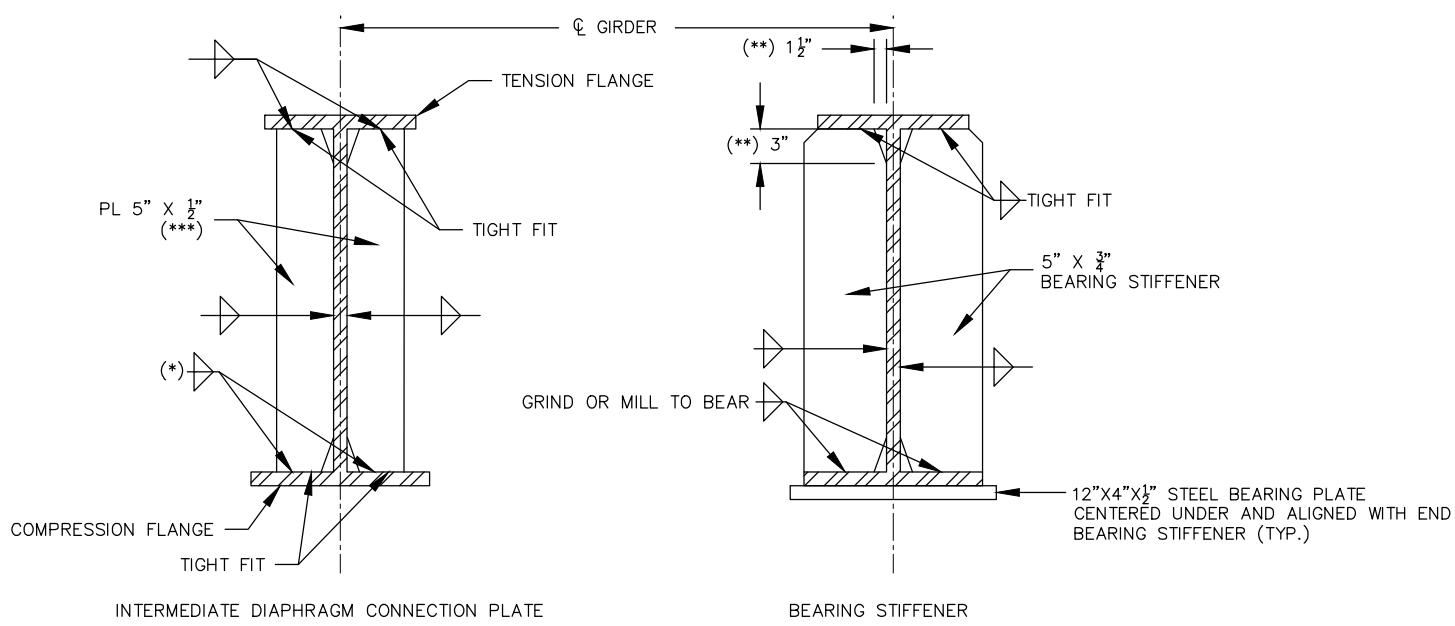
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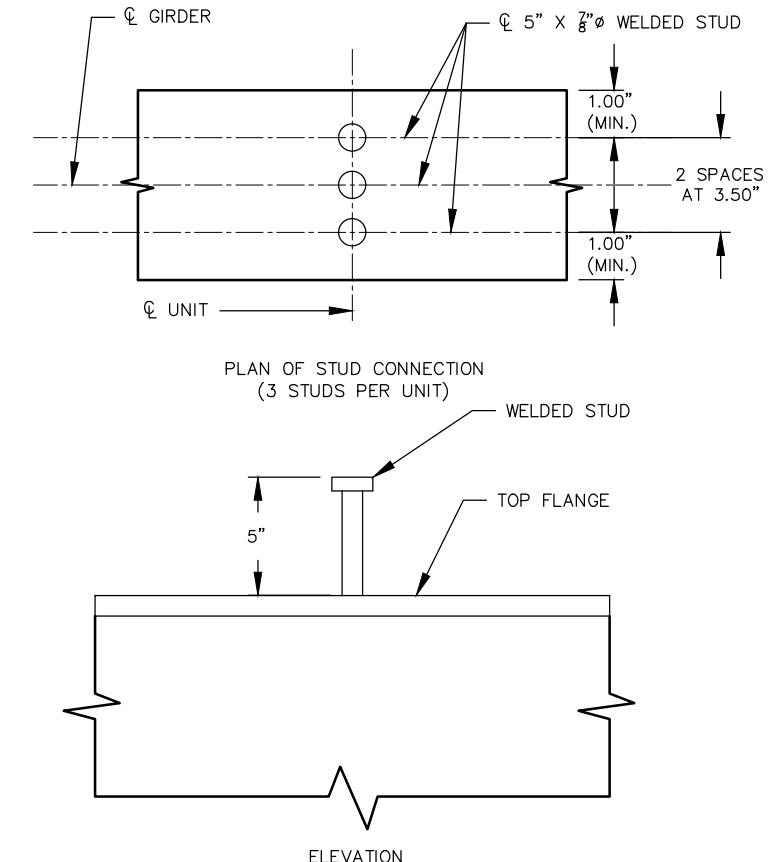
LOCKHART RD. BRIDGE
NO. 37200031 REPLACEMENT
FEDERAL PROJECT NO. BRO-B036(33)
FRANKLIN COUNTY, MISSOURI

STEEL BEAM DETAILS
DWN. BY: A.J.M. APPD. BY: B.B.D.
DATE: JAN. 2024
SCALE: NOT TO SCALE
PROJ. NO: SC21-1222
DWG. NO: B-16

STEEL CONNECTION DETAILS

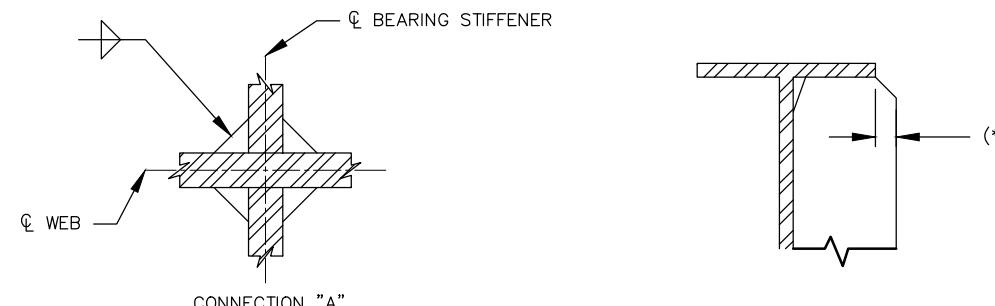
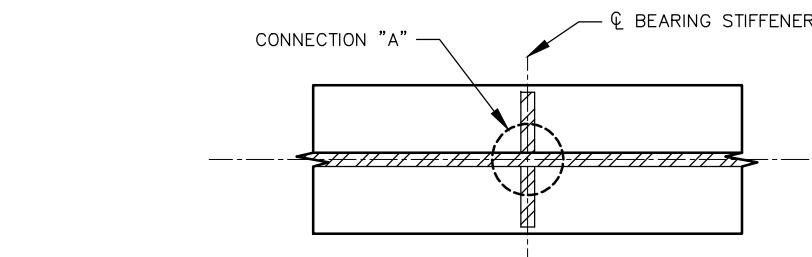


NOTE: (*): WELD TO TENSION FLANGE AS LOCATED ON ELEVATION OF GIRDER.
 (**): 1 $\frac{1}{2}$ " X 3" TYPICAL FOR INTERMEDIATE DIAPHRAGM CONNECTION PLATE AND BEARING STIFFENER.
 (***): EXTERIOR GIRDERS REQUIRE ONLY ONE PLATE ON THE INTERIOR SIDE OF GIRDER.



DETAILS OF SHEAR CONNECTORS

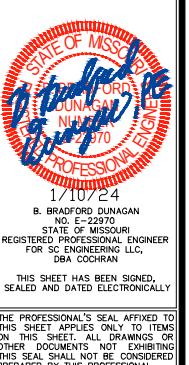
NOTE: WEIGHT OF 1200 LBS. OF SHEAR CONNECTORS IS INCLUDED IN THE WEIGHT OF FABRICATED STRUCTURAL CARBON STEEL.
 SHEAR CONNECTORS SHALL BE A-709 GRADE 50 STEEL.



DETAILS THROUGH BEVEL PLATE FOR BEARING STIFFENER

WELDING DETAILS

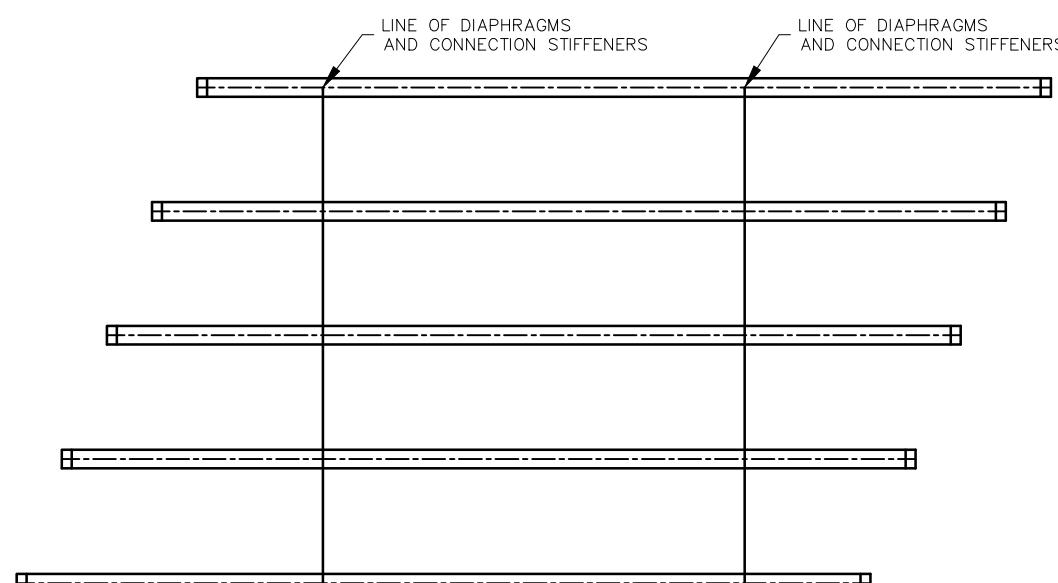
NOTE: (**): WHEN DIMENSIONS EXCEEDS $\frac{1}{2}$ ", BEVEL STIFFENER PLATE AT 1:1.



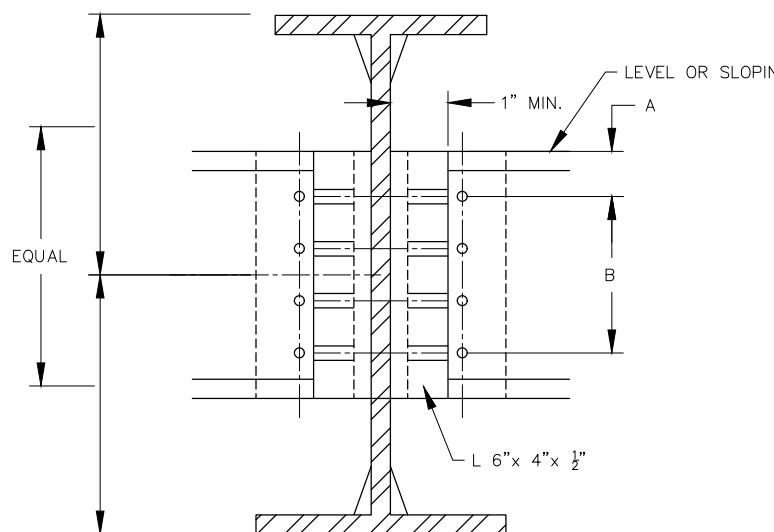
LOCKHART RD. BRIDGE
 NO. 37200031 REPLACEMENT
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 FRANKLIN COUNTY, MISSOURI

STEEL CONNECTION DETAILS	
DATE:	REVISION:
A.J.M.	B.B.D.
DATE:	APPD. BY:
JAN. 2024	B.B.D.
SCALE:	NOT TO SCALE
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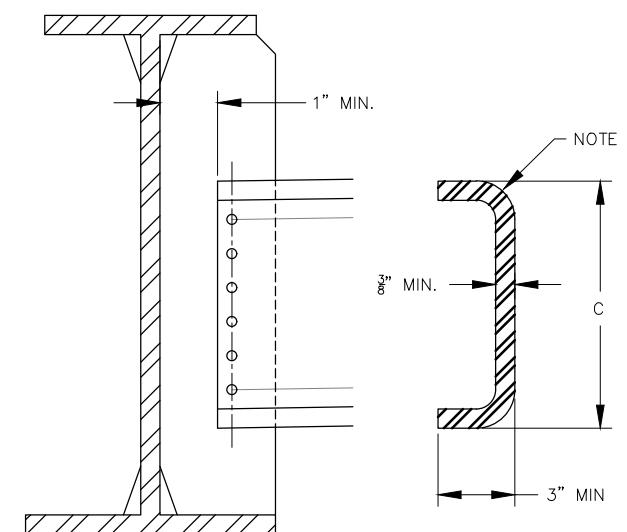
STEEL DIAPHRAGM DETAILS



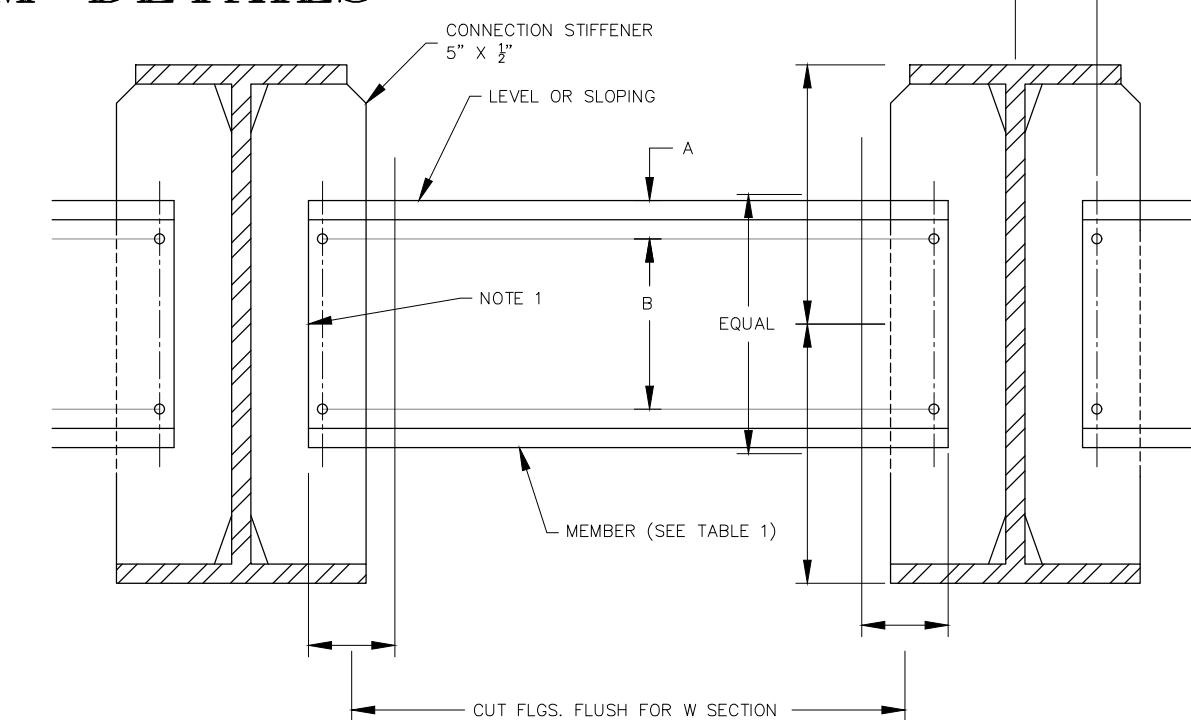
DIAPHRAGM LAYOUT



INTERMEDIATE DIAPHRAGM ALTERNATE DETAIL



OPTIONAL BENT PLATE DIAPHRAGM



INTERMEDIATE DIAPHRAGM

DIAPHRAGM SIZE	DIMENSIONS		
	A	B	C
C15x33.9	3"	3 AT 3"	15"

NOTES:

1. SLOPE DIAPHRAGM AND KEEP HOLES VERTICAL IN STIFFENER AT CONSTANT DIMENSIONS (TO KEEP ALL STIFFENERS THE SAME) AND CUT ENDS OF DIAPHRAGM SQUARE.
2. MINIMUM RADIUS AS PER AASHTO/NSBA FABRICATION S2.1 TABLE 4.3.2-1. PER SECTION 4.3.2, IF THE BEND IS PARALLEL TO DIRECTION OF ROLLING, MULTIPLY THE MINIMUM RADII BY 1.5.
3. ALL HOLES TO BE $\frac{15}{16}$ " DIA. FOR $\frac{7}{8}$ " DIA. HS BOLTS, ASTM A325 TYPE 3 W/ F436-3 WASHERS (RCT).
4. THREADS EXCLUDED FROM SHEAR PLANE.
5. BOTTOM FLANGES SHALL BE BRACED ACROSS ENTIRE WIDTH OF BRIDGE (OUTSIDE GIRDER - OUTSIDE GIRDER) AT EACH OVERHANG BRACKET DURING CONSTRUCTION
6. THE TOP AND BOTTOM FLANGE OF THE C15 CHANNEL MAY BE COPED AT THE BOLTED CONNECTIONS TO CLEAR THE FLANGES OF THE W-BEAM, IF NECESSARY.

STEEL DIAPHRAGM DETAILS
DWG. BY: A.J.M. APPD. BY: B.B.D.
DATE: JAN. 2024
SCALE: NOT TO SCALE
PROJ. NO: SC21-1222
DWG. NO: B-18

LOCKHART RD. BRIDGE
NO. 37200031 REPLACEMENT
FEDERAL PROJECT NO. BRO-B036(33)
FRANKLIN COUNTY, MISSOURI

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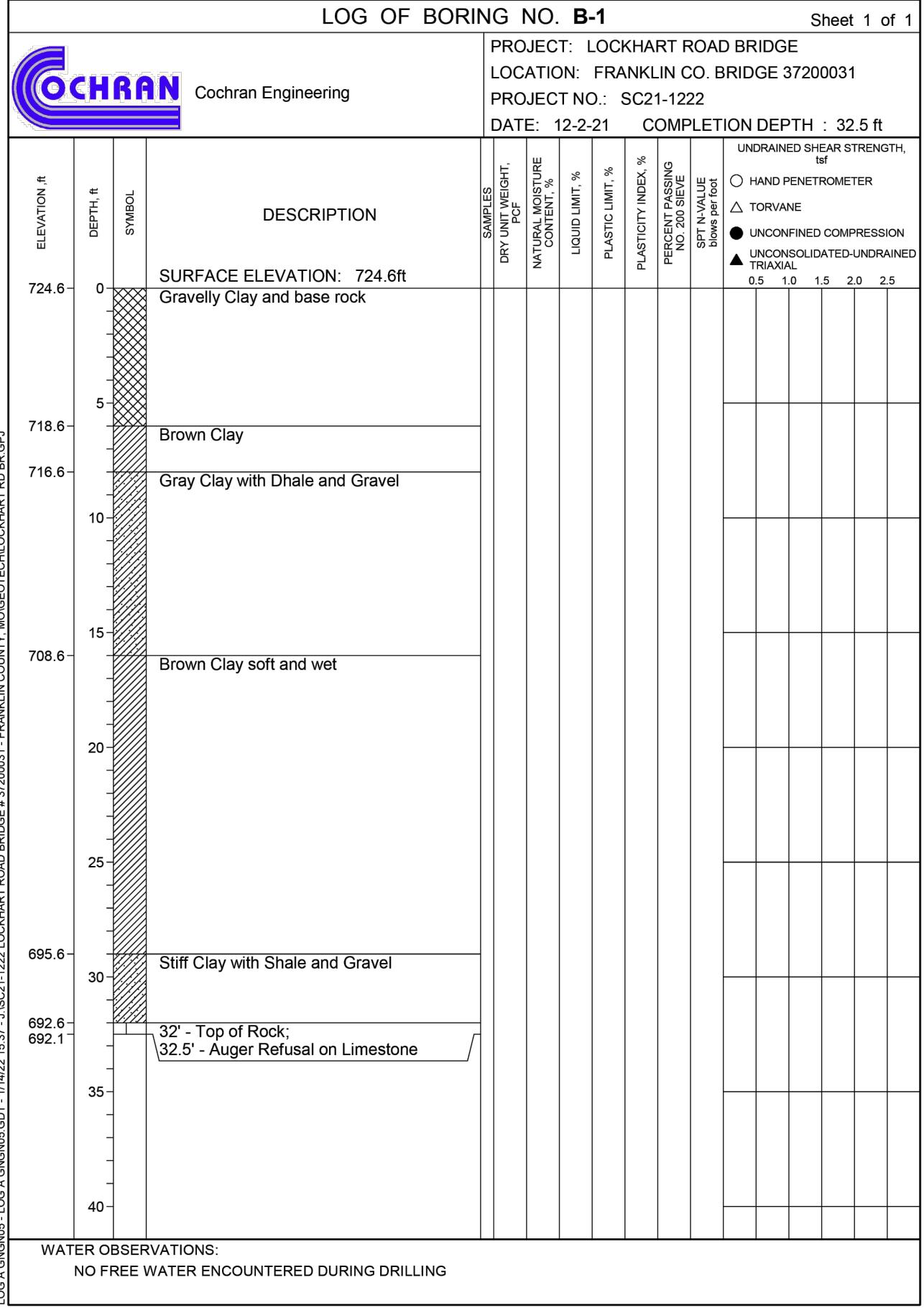
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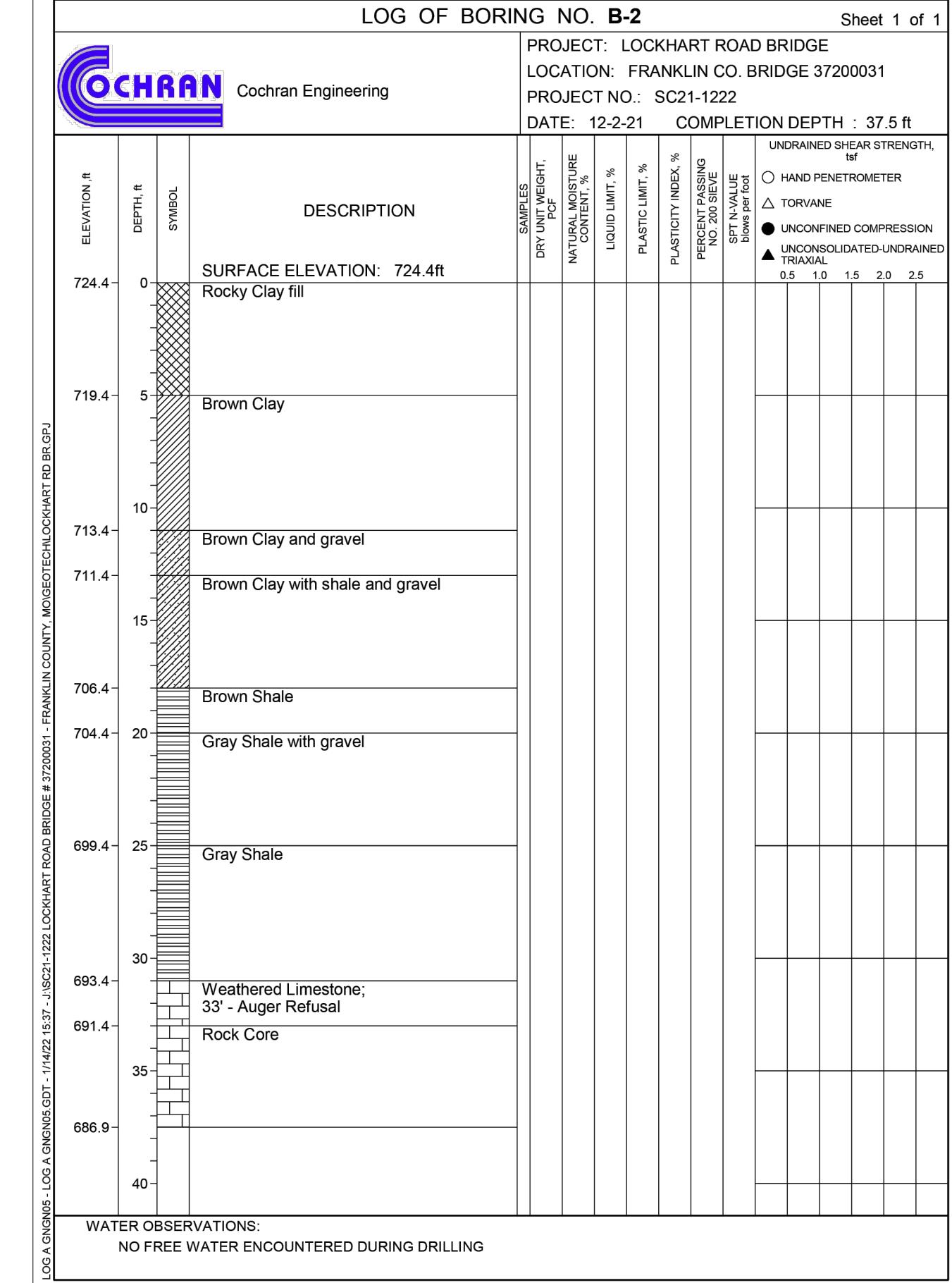
LOG OF BORING NO. B-1

Sheet 1 of 1



LOG OF BORING NO. B-2

Sheet 1 of 1



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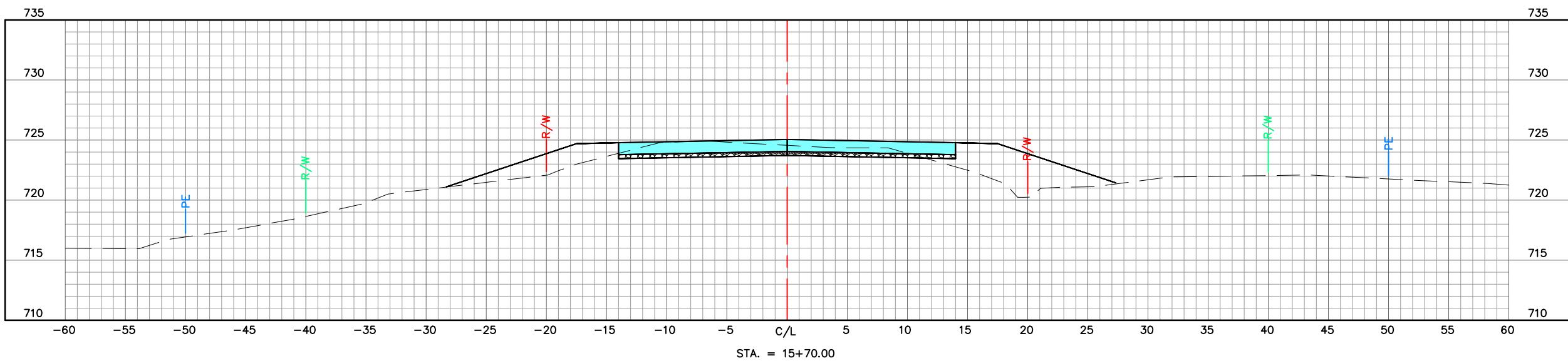
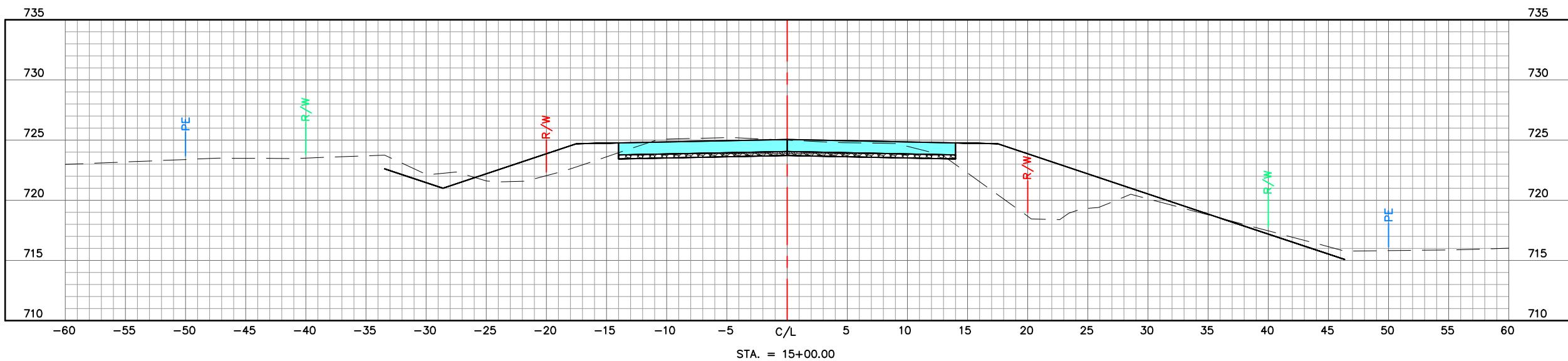
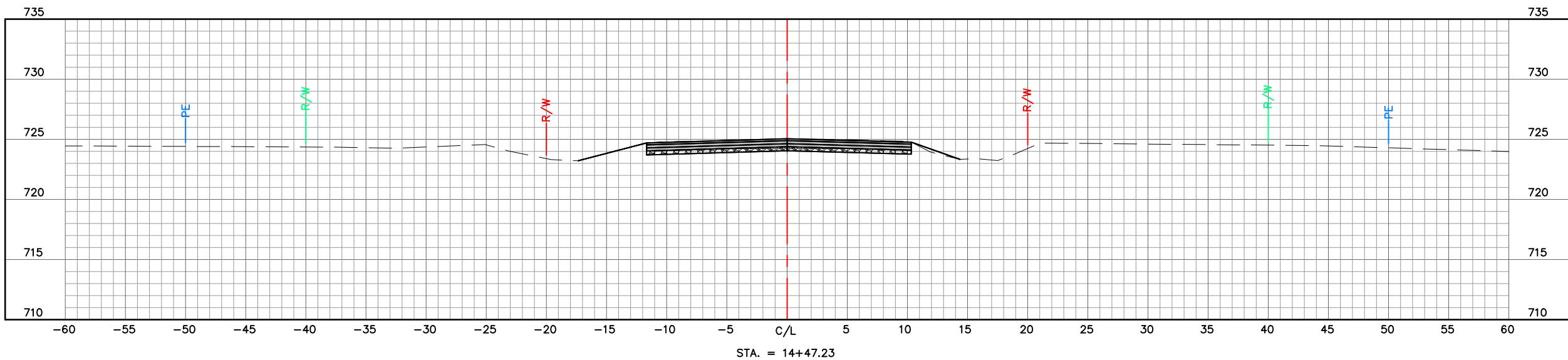
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FEDERAL PROJECT NO. BRO-B036(33)
FRANKLIN COUNTY, MISSOURI

BORING LOGS
DATE: REVISION:
DWN. BY: APPD. BY:
A.J.M. B.B.D.
DATE: JAN. 2024
SCALE: NOT TO SCALE
PROJ. NO.: SC21-1222
DWG. NO.: BL-1

CROSS SECTIONS



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FRANKLIN COUNTY, MISSOURI



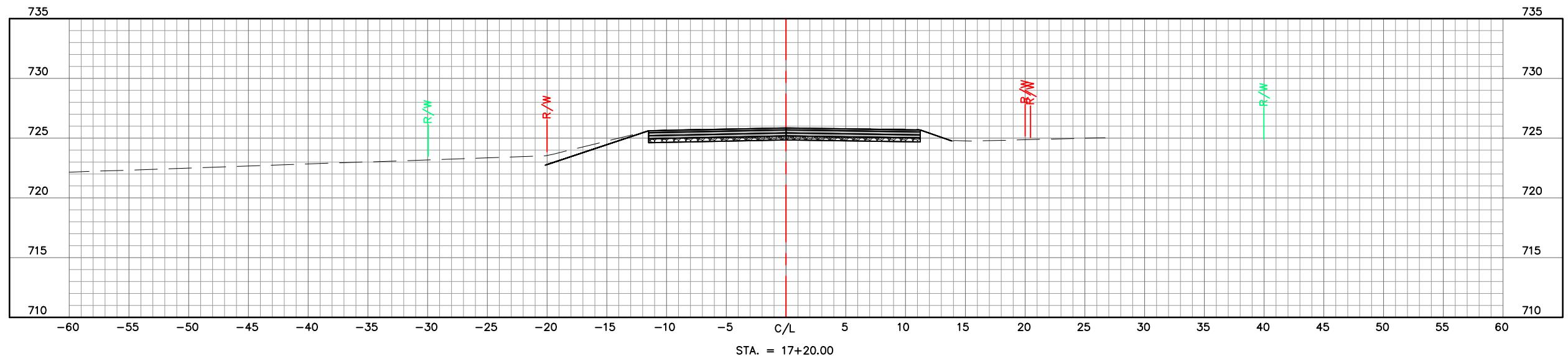
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CROSS SECTIONS



CROSS SECTIONS
DWG. NO.: SC21-1222
PROJ. NO.: XS-3

LOCKHART RD. BRIDGE
NO. 37200031 REPLACEMENT
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