DESIGN DESIGNATION

AADT – 2022 = 40
AADT – 2042 = 46
T = 10%
V = 55 MPH

FUNCTIONAL CLASSIFICATION – RURAL LOCAL

NORMAL RIGHT OF WAY AND TEMPORARY EASEMENT

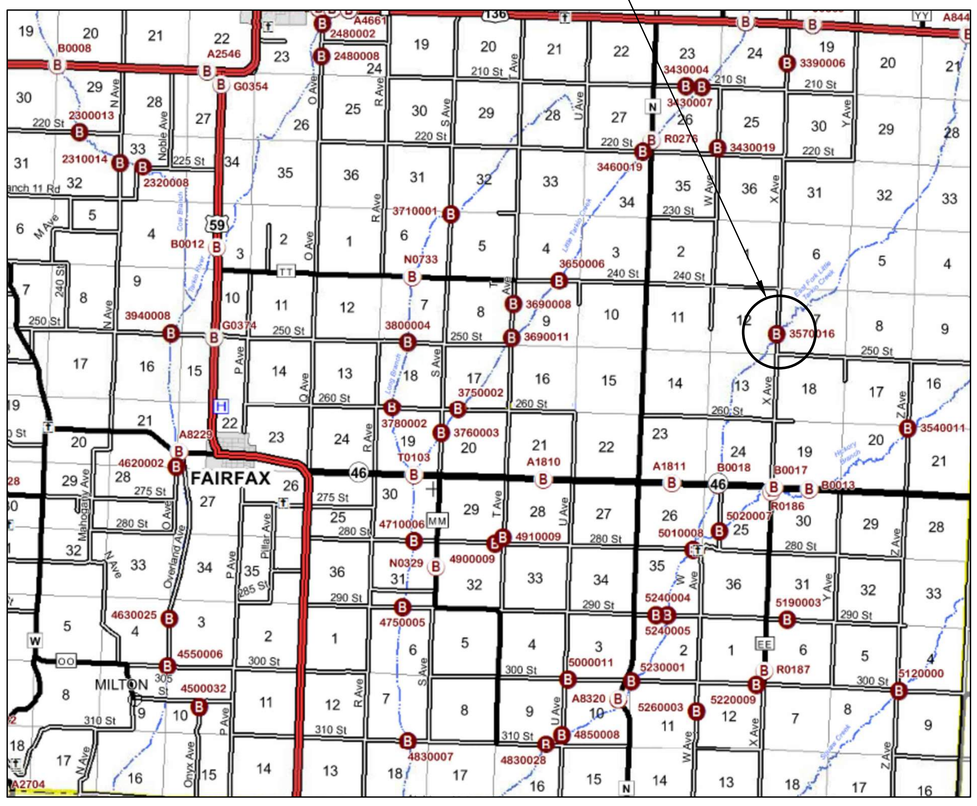
CONVENTIONAL SYMBOLS

- IRON PIN SET (TYPICAL) GREAT RIVER 2001011476
- IRON PIN FOUND, AS NOTED
- CUT CROSS
- RIGHT OF WAY MARKER
- STONE
- CONTROL POINT
- PERMANENT BENCHMARK
- CONTOUR MAJOR
- CONTOUR MINOR
- DECIDUOUS TREE, SIZE AS NOTED
- CONIFER TREE, SIZE AS NOTED
- BUSH, SIZE AS NOTED
- LIGHT POLE
- POWER POLE
- ELECTRIC RISER
- ELECTRIC BOX
- ELECTRIC METER
- GUY WIRE ANCHOR
- PEDESTAL, AS NOTED
- SANITARY SEWER CLEAN OUT
- SEPTIC TANK
- TELEPHONE RISER
- GAS VALVE
- GAS METER
- WELL
- WATER METER
- WATER VALVE
- FIRE HYDRANT
- WATER HYDRANT
- MAIL BOX
- SIGN
- POST
- FLAG POLE
- CABLE TV RISER
- SANITARY SEWER LINE
- FENCE CHAIN–LINK
- WIRE
- WOOD
- ELECTRIC LINE
- UNDERGROUND ELECTRIC LINE
- TELEPHONE LINE
- UNDERGROUND TELEPHONE LINE
- CABLE TV LINE
- GAS LINE
- WATER LINE
- GAS & WATER LINE
- FIBER OPTIC LINE
- TREE LINE

CONSTRUCTION PLANS FOR X AVENUE BRIDGE #35700161 OVER EAST FORK LITTLE TARKIO CREEK SECTION 12, TOWNSHIP 64 NORTH, RANGE 39 WEST BRO–R003(001)

ATCHISON COUNTY, MISSOURI

PROJECT LOCATION



SUBMITTED AND RECOMMENDED

PRESIDING COMMISSIONER

INDEX OF SHEETS

DESCRIPTION	SHEET NUMBER
TITLE SHEET	C1
QUANTITIES & TYPICAL SECTIONS	C2
PLAN & PROFILE	C3
GRADING & EROSION CONTROL PLAN	C4
CROSS SECTIONS	C5–C6
TRAFFIC MANAGEMENT PLAN	C7
TRAFFIC MANAGEMENT PLAN DETAILS	C8
BRIDGE PLAN & ELEVATION	S1
GENERAL NOTES & ESTIMATED QUANTITIES	S2
GALVANIZED CAST–IN–PLACE CONCRETE PILE	S3
BENT 1	S4–S6
BENT 2	S7–S8
BENT 3	S9–S10
BENT 4	S11–S13
SPREAD BOX BEAMS – SPANS (1–2) & (3–4)	S14
SPREAD BOX BEAMS – SPAN (2–3)	S15
CONCRETE DIAPHRAGMS AT BENTS 2 AND 3	S16
PRESTRESSED PANELS	S17
BEAM CAMBER, SLAB HAUNC. & BOT. OF SLAB ELEVS	S18
PLAN OF SLAB SHOWING REINFORCEMENT	S19
SECTION THRU SLAB AND SLAB POURING SEQUENCE	S20
TYPE H BARRIER	S21
TYPE H BARRIER AT END BENTS	S22
BILL OF REINFORCING STEEL	S23–S24
AS–BUILT PILE DATA	S25
BORING DATA	S26–S27
RIGHT–OF–WAY PLAN	RW

LENGTH OF PROJECT

BEGINNING OF PROJECT	STA 0+50
END OF PROJECT	STA 4+00
APPARENT LENGTH	350.00 FEET

Date | Revision/Issue | No.

STATE OF MISSOURI
MATT FAZIO
NUMBER
PE-2024046892
3/3/2026
PROFESSIONAL ENGINEER

MATT FAZIO
PE-2024046892

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers: Engineering: 2001016885, Land Surveying: 2001011476, Landscape Architecture: 2007013573

BRO–R003(001)
ATCHISON COUNTY, MISSOURI

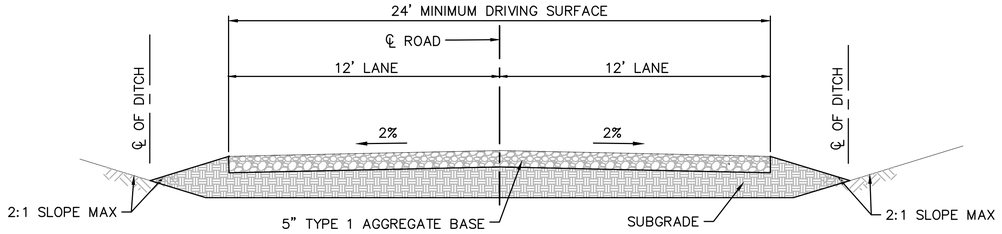
TITLE SHEET

3/2/2026

JOB 5051

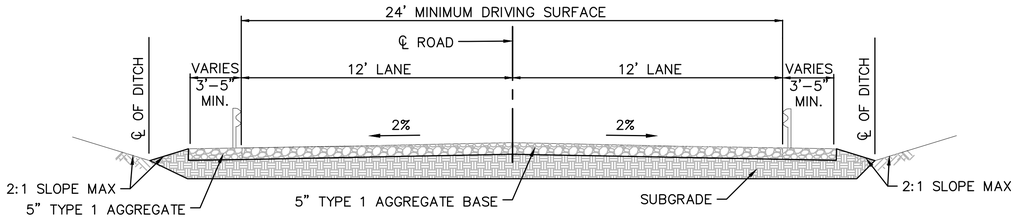
C1

Z:\Shared\Projects\5051 - Atchison County Bridge #3570016 BRO-R003(001)\Drawings\5051_Civil.dwg PLOT DATE: 3/2/2026 6:57:44 AM LAST SAVE: 3/2/2026 6:45:04 AM



TYPICAL SECTION

NOT TO SCALE



TYPICAL SECTION W/ GUARDRAIL

NOT TO SCALE

ROADWAY QUANTITIES

ITEM	TOTAL	UNITS
CLEARING AND GRUBBING	0.8	ACRE
UNCLASSIFIED EXCAVATION	52	CU. YARD
EMBANKMENT IN PLACE WITH COMPACTION	35	CU. YARD
TYPE 1 AGGREGATE FOR BASE(6 IN. THICK)	607	SQ. YARD
TYPE A CRASHWORTHY END TERMINAL	4	EACH
ASYMMETRICAL TRANSITION SECTION	4	EACH
BRIDGE ANCHOR SECTION	4	EACH
TYPE 2 ROCK BLANKET	150	CU. YARD
TYPE 3 ROCK BLANKET	1215	CU. YARD
CONSTRUCTION SIGNS	63	SQ. FOOT
TYPE III MOVEABLE BARRICADE W/LIGHTS	6	EACH
MOBILIZATION	1	LUMP SUM
SEEDING	0.6	ACRE
SILT FENCE	385	LIN. FOOT

Survey Control Point Table				
Point #	Northing	Easting	Elevation	Description
1	1531282.61	2583706.65	969.31	CP 1 60D 3' W EG
2	1531447.00	2583708.18	970.05	CP 2 60D 3' W EG
3	1530700.26	2583725.22	966.79	CP 3 60D 3' E EG
4	1530570.45	2583721.84	966.97	CP 4 60D 3' E EG

HORIZONTAL COORDINATES ARE BASED ON THE MISSOURI COORDINATE SYSTEM OF 1983: WEST ZONE

BENCHMARK DATA

BM – 5/8" REBAR SET 3 FEET SOUTHWEST OF TELEPHONE PEDESTAL AND 2.75 FEET NORTHWEST OF TELEPHONE MARKER POST LOCATED IMMEDIATELY SOUTH OF FIELD ENTRANCE NORTH OF BRIDGE ON EAST SIDE OF X AVENUE.

ELEVATION = 969.84'

(VERTICAL DATUM : NAVD88)

No.	Revision/Issue	Date

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PE-2024046892
3/3/2026
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PE-2024046892

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers:
Engineering: 2000156885, Land Surveying: 2001011476,
Landscape Architecture: 2007013573

BRO-R003(001)
ATCHISON COUNTY, MISSOURI

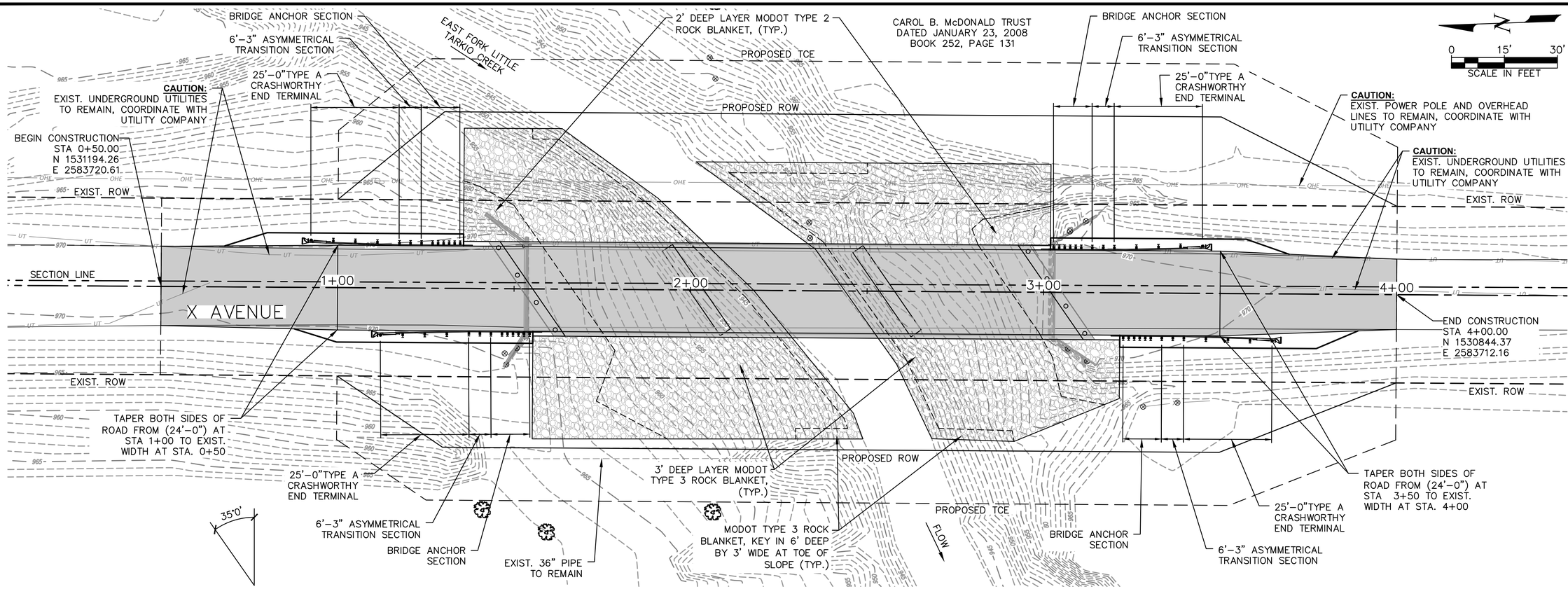
QUANTITIES & TYPICAL SECTIONS

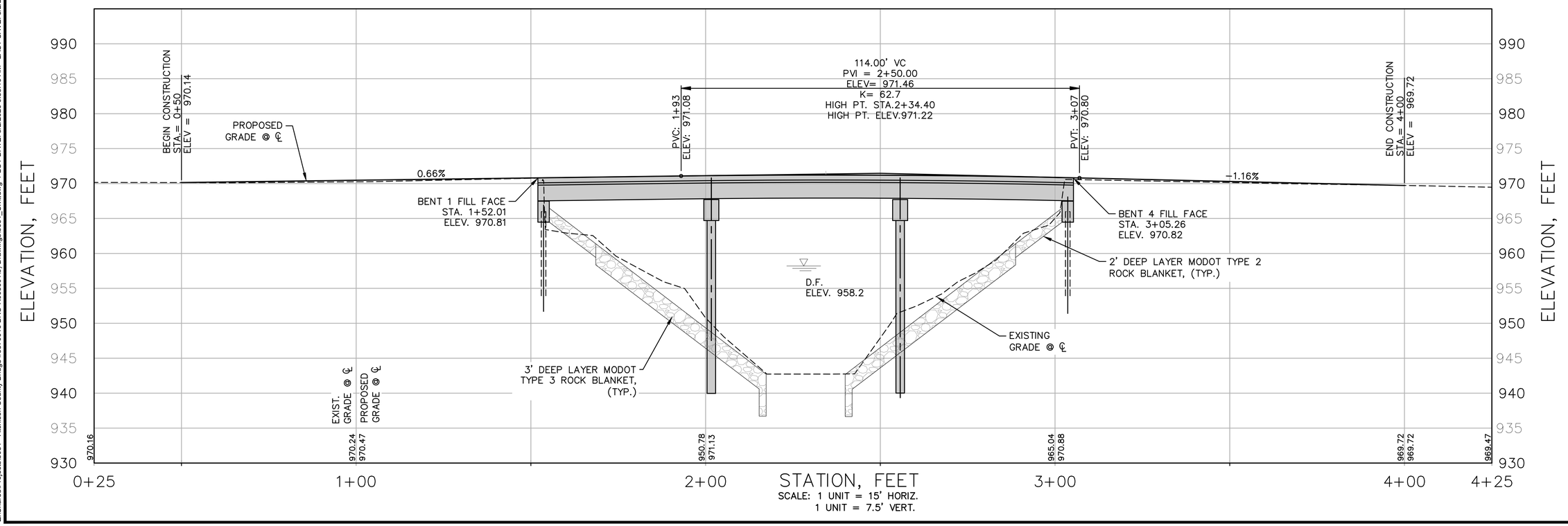
3/2/2026

JOB 5051

C2

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3/3/2026
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MATT FAZIO
PE-2024046892

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers: Engineering: 2000196885, Land Surveying: 2001011476, Landscape Architecture: 2007010573

BRO-R003(001)
ATCHISON COUNTY, MISSOURI

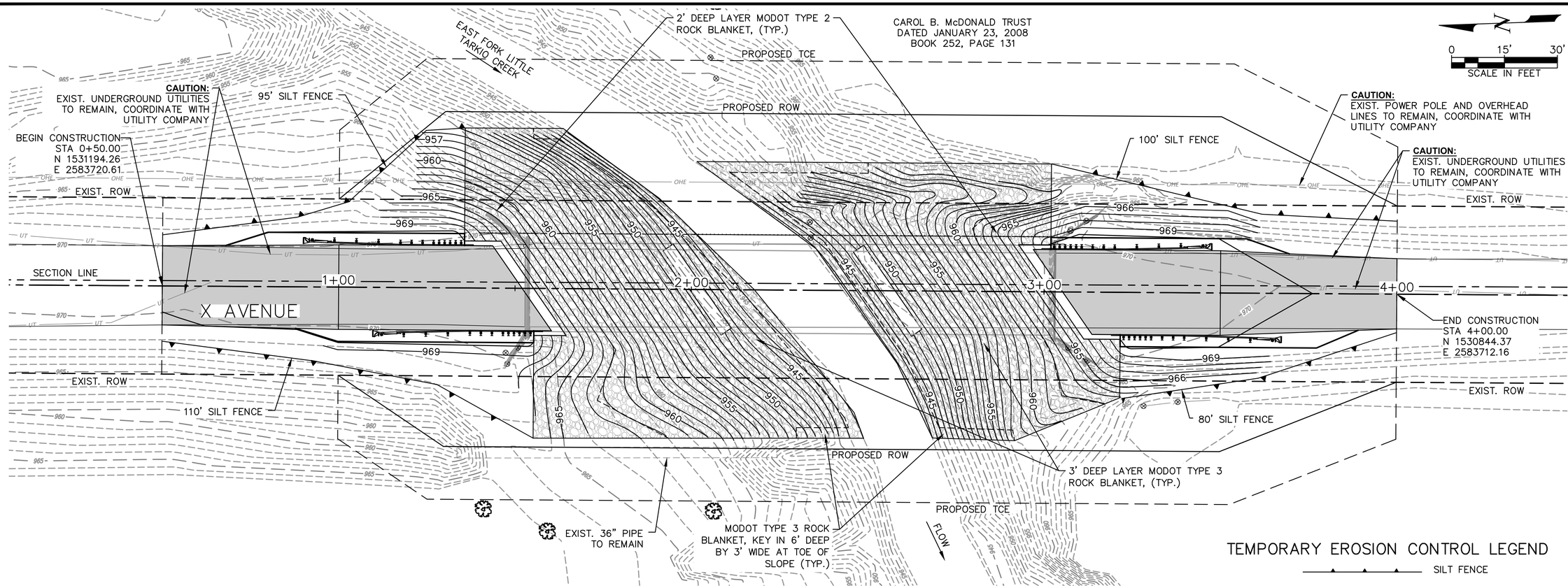
PLAN & PROFILE

3/2/2026

JOB 5051

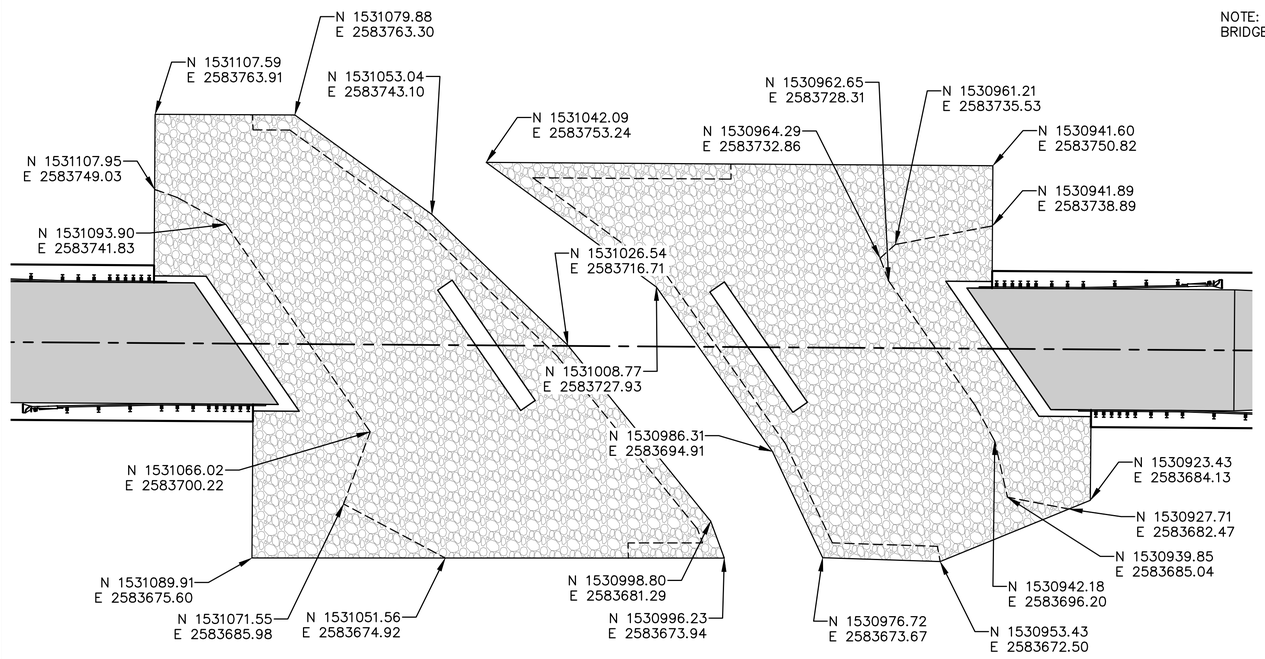
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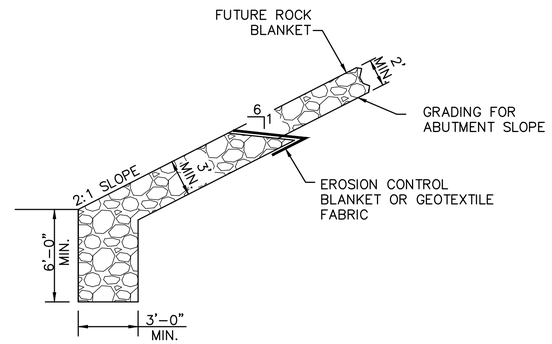


GRADING & EROSION CONTROL PLAN

NOTE:
BRIDGE DECK NOT SHOWN FOR CLARITY.



ROCK BLANKET LAYOUT



ROCK BERM

NOTES:

BERM SHALL BE BUILT TO HANDLE SIGNIFICANT RUN-OFF EVENTS.

ROCK BERM SHALL BE PLACED AT THE BEGINNING OF CONSTRUCTION AND WILL BE INCORPORATED INTO THE ROCK BLANKET. COST SHALL BE INCLUDED IN THE UNIT PRICE FOR TYPE 2 ROCK BLANKET.

PRIOR TO FINAL PLACEMENT OF TYPE 2 ROCK BLANKET, CONTRACTOR SHALL REMOVE GEOTEXTILE FABRIC AND ANY SILT BUILDUP ALONG TOP OF ROCK BERM. ALL WORK NECESSARY FOR REMOVAL SHALL BE INCIDENTAL TO BID ITEM TYPE 2 ROCK BLANKET.

No.	Revision/Issue	Date
1		
2		
3		
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7		

STATE OF MISSOURI
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PE-2024046892
3/3/2026
PROFESSIONAL ENGINEER

MATT FAZIO
PE-2024046892

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers:
Engineering: 2001166885, Land Surveying: 2001011476,
Landscape Architecture: 2007015673

BRO-R003(001)
ATCHISON COUNTY, MISSOURI

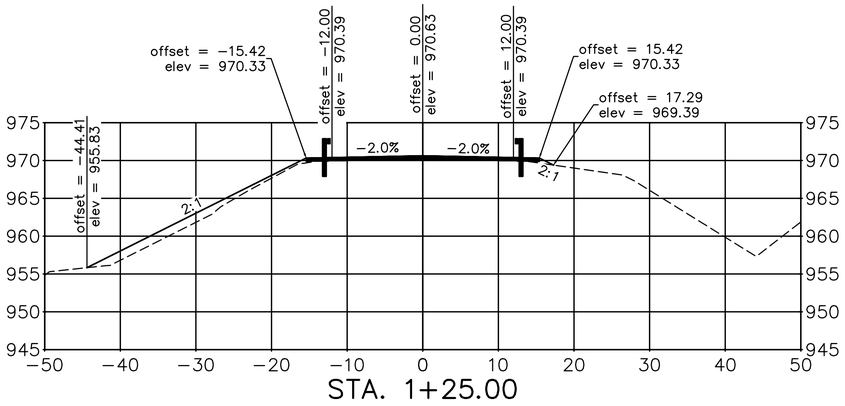
GRADING & EROSION CONTROL PLAN

3/2/2026

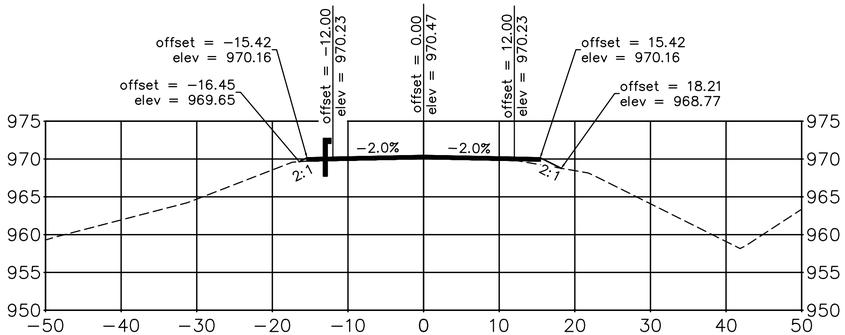
JOB 5051

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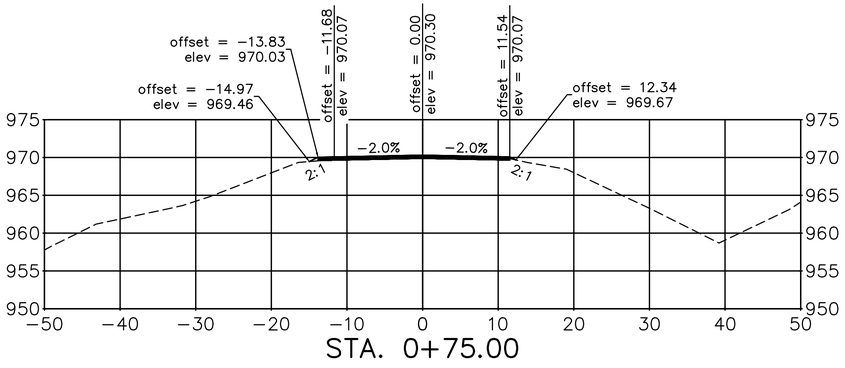
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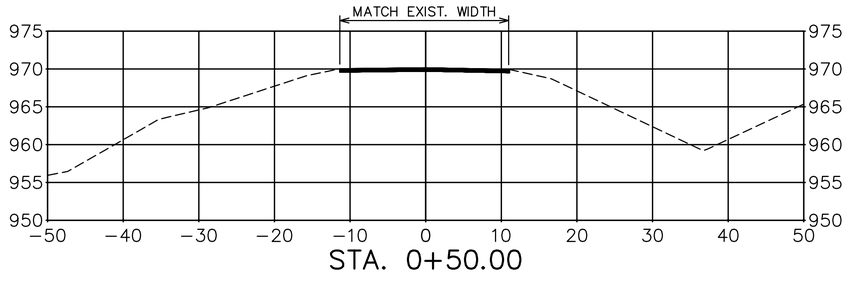
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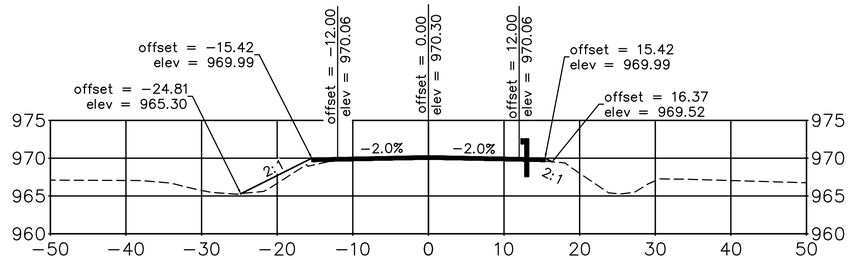
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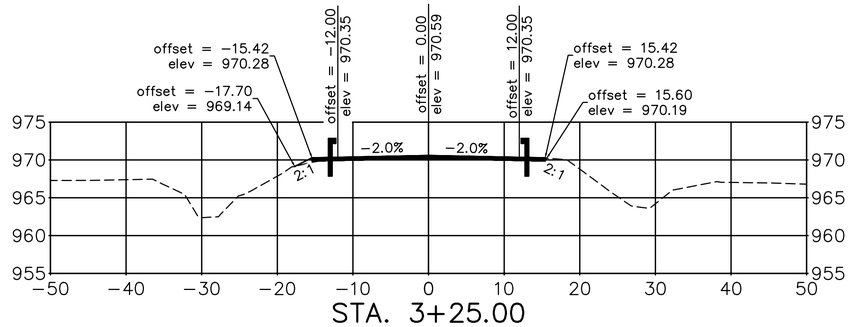
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STA. 0+50.00

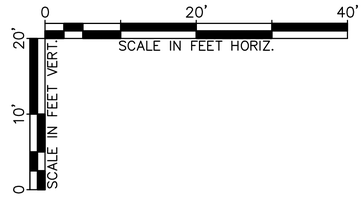


STA. 3+50.00



STA. 3+25.00

SECTIONS 1+52.01 THRU 3+05.26
NOT SHOWN DUE TO BRIDGE



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MATT FAZIO
PE-2024046892

GRE
GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers:
Engineering: 2000156885, Land Surveying: 2001011476,
Landscape Architecture: 2007013573

BRO-R003(001)
ATCHISON COUNTY, MISSOURI

CROSS SECTIONS

3/2/2026

JOB 5051

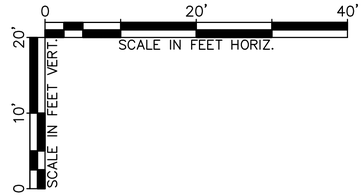
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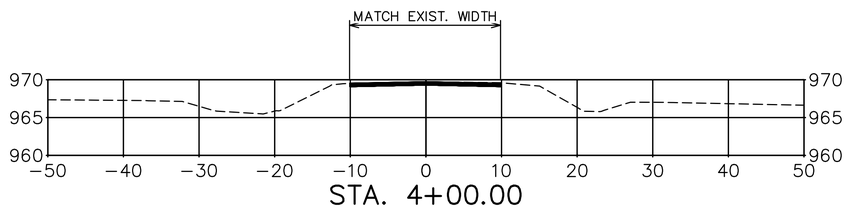
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EARTHWORK QUANTITIES

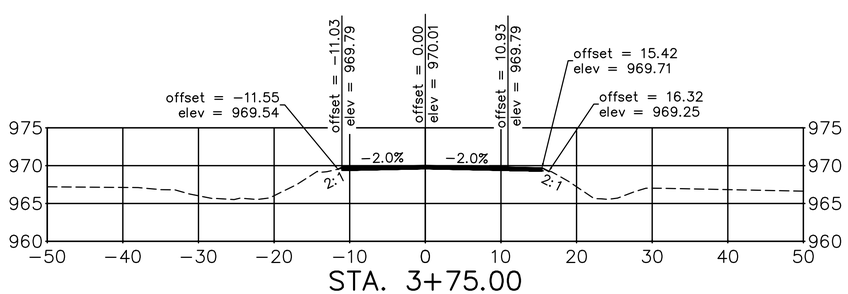
CUT = 52 CY
FILL = 35 CY

} NO ADJUSTMENT HAS BEEN MADE FOR SHRINKAGE OR SWELL





STA. 4+00.00



STA. 3+75.00

No.	Revision/Issue	Date
1		
2		
3		
4		
5		
6		
7		

STATE OF MISSOURI
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NUMBER
PE-2024046892
3/3/2026
PROFESSIONAL ENGINEER

MATT FAZIO
PE-2024046892

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers:
Engineering: 2001056885, Land Surveying: 2001011476,
Landscape Architecture: 2007013573

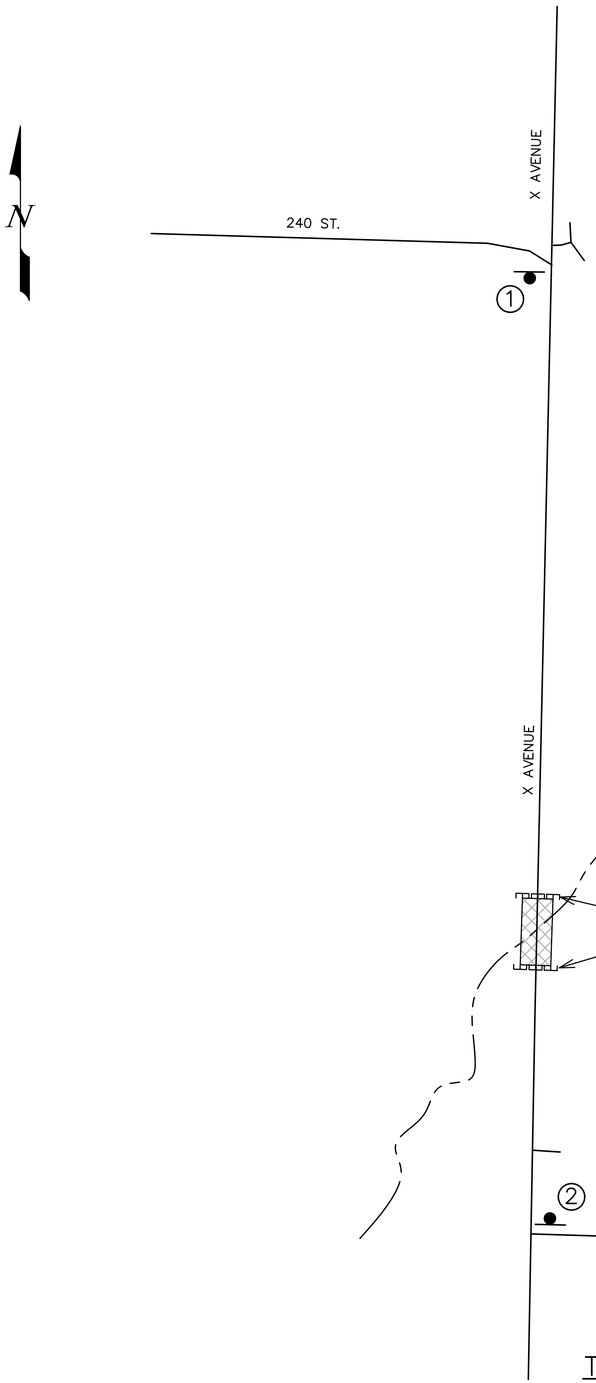
BRO-R003(001)
ATCHISON COUNTY, MISSOURI

CROSS SECTIONS

3/2/2026
JOB 5051

C6

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TRAFFIC MANAGEMENT PLAN

TRAFFIC CONTROL LEGEND

SIGN (SINGLE SIDED)

TYPE 3 BARRICADE

WORK AREA

NOTE:
ALL SIGNS SHOULD BE PLACED APPROX. 500' APART, OR AS DIRECTED BY THE COUNTY. USE IN PLACE ALL SIGNS WHICH DO NOT CONFLICT WITH THIS PLAN. COVER AND/OR REMOVE CONFLICTING SIGNS.

SEE MISSOURI STANDARD PLANS DRAWING 616.10 "TEMPORARY TRAFFIC CONTROL DEVICES" FOR DETAILS NOT SHOWN.

ROAD CLOSED
0.65 MILES AHEAD
LOCAL TRAFFIC ONLY

R11-3a
(60" x 30")
①

ROAD CLOSED
0.30 MILES AHEAD
LOCAL TRAFFIC ONLY

R11-3a
(60" x 30")
②

W20-3
(36" x 36")

ROAD CLOSED 500 FT

③

ADVANCED WARNING RAIL SYSTEM

SEQUENTIAL FLASHING WARNING LIGHT

ROAD CLOSED

R11-2
(48" x 30")
④

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Engineering: 2000156885, Land Surveying: 2001011476,
Landscape Architecture: 2007013573

BRO-R003(001)
ATCHISON COUNTY, MISSOURI

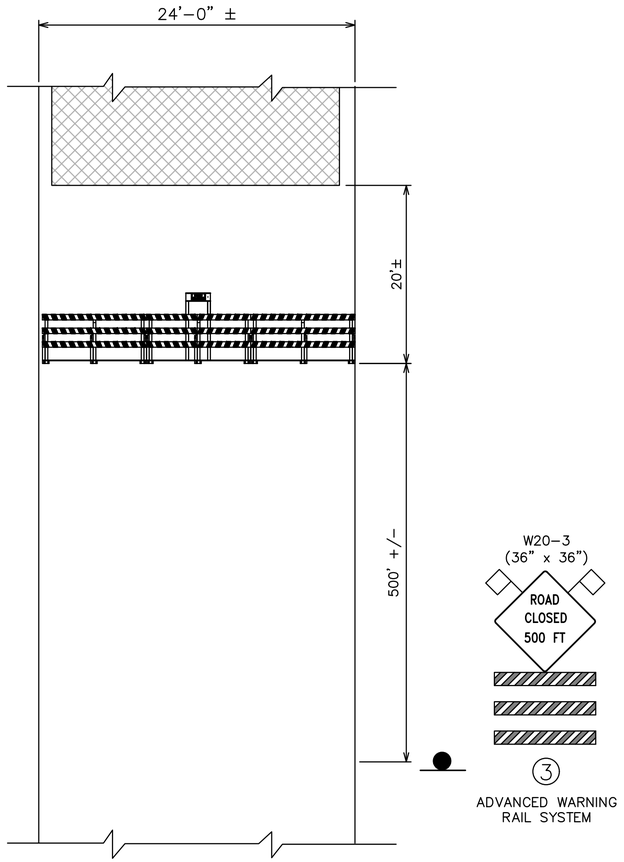
TRAFFIC MANAGEMENT PLAN

3/2/2026

JOB 5051

C7

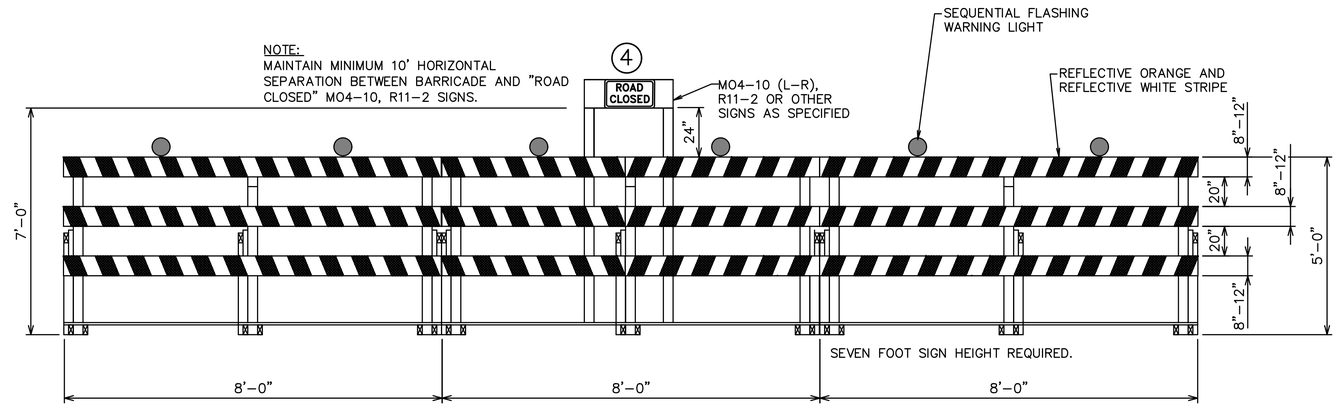
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TYPICAL HARD CLOSURE

TRAFFIC CONTROL NOTES:

1. ALL CONSTRUCTION SIGNS AND BARRICADES MUST BE UTILIZED AND MAINTAINED IN COMPLIANCE WITH PART VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, 2023 EDITION, OR LATEST REVISION THEREOF.
2. ALL EXISTING SIGNS SHALL BE MAINTAINED AND RELOCATED WHEN NECESSARY. SIGNING SHALL BE INSTALLED PRIOR TO OPENING ANY SECTION OF THE ROADWAY FOR TRAFFIC.
3. SIGNAGE SHOWN SHALL REMAIN IN PLACE FOR THE PROJECT DURATION AND BE MODIFIED AS NECESSARY AND AS DIRECTED BY THE ENGINEER.
4. ANY ALTERNATE TRAFFIC CONTROL PLAN MUST BE APPROVED IN WRITING BY THE ENGINEER PRIOR TO IMPLEMENTATION.
5. SIGN (4) MOUNTED ON TYPE 3 BARRICADES SHALL BE LIGHTWEIGHT.
6. ACCESS TO LOCAL PROPERTIES WITHIN THE WORK ZONE SHALL BE MAINTAINED AT ALL TIMES AND COORDINATED WITH PROPERTY OWNER.



TYPE III MOVABLE BARRICADE

NOTES:

1. ALL SIGNS TO MEET MoDOT STANDARD SPECIFICATIONS FOR REFLECTIVITY AND OTHER DETAILS. ALL SIGNAGE TO MEET MUTCD REQUIREMENTS. SHOULD CONFLICTS EXIST BETWEEN MoDOT AND MUTCD FOLLOW MUTCD.
2. ALL REFLECTORIZED SURFACES SHALL BE TYPE 1 SHEETING UNLESS OTHERWISE INDICATED. NO DIRECT PAYMENT WILL BE MADE FOR RELOCATION OF BARRICADES. NO PAYMENT WILL BE MADE FOR RELOCATING SIGNS ON MOVABLE BARRICADES WHICH ARE TO BE RELOCATED UNLESS THE SIGN LEGEND IS TO BE CHANGED. STRIPES SHALL SLOPE DOWNWARD TOWARD THE SIDE WHICH TRAFFIC IS TO PASS.
3. ALL SEQUENTIAL FLASHING WARNING LIGHTS SHALL COMPLY WITH MoDOT STANDARD SPECIFICATION SECTION 1063.6.

TYPE 3 BARRICADE WITH SEQUENTIAL FLASHING WARNING LIGHTS

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PE-2024046892

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers:
Engineering: 2000156885, Land Surveying: 2001011476,
Landscape Architecture: 2007013573

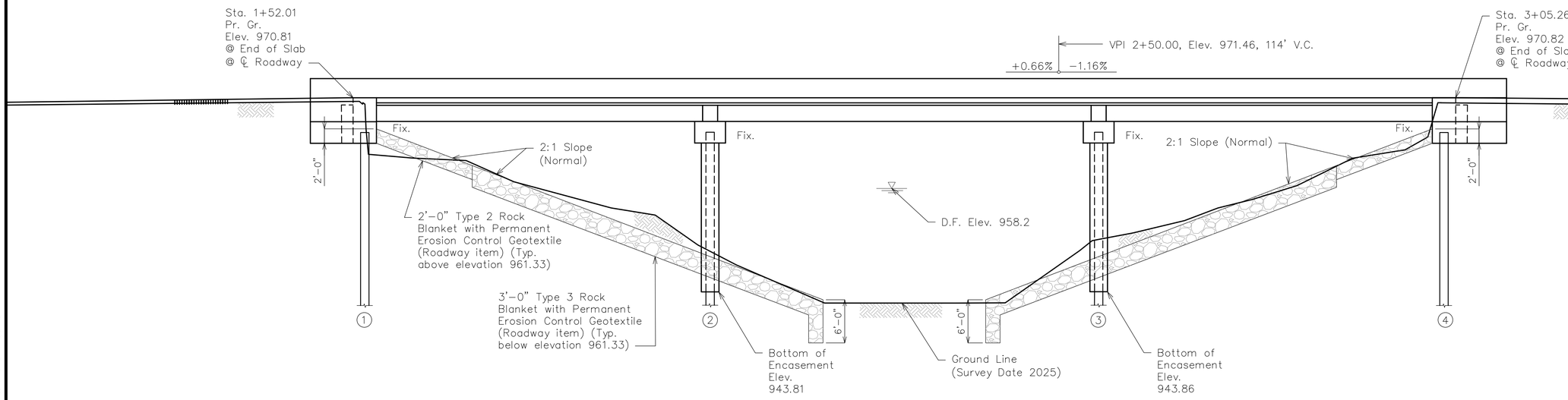
BRO-R003(001)
ATCHISON COUNTY, MISSOURI

TRAFFIC MANAGEMENT PLAN DETAILS

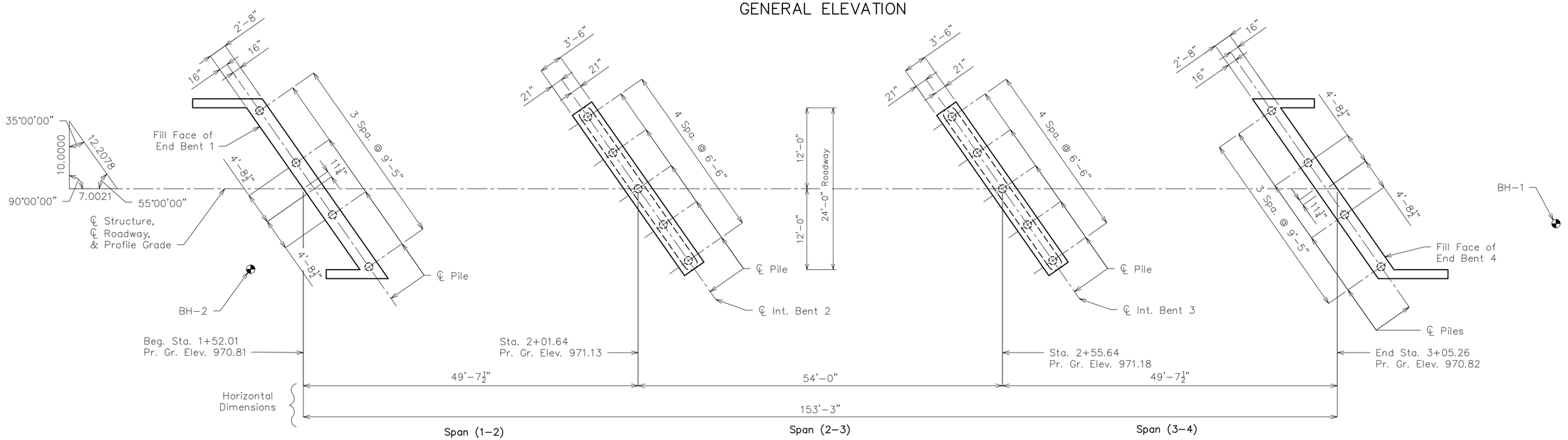
3/2/2026
JOB 5051
C8

Z:\Shared\Projects\5051 - Atchison County Bridge #3570016 BRO-R003(001)\9) Drawings\5051_Civil.dwg PLOT DATE: 3/2/2026 6:57:55 AM LAST SAVE: 3/2/2026 6:45:04 AM

(48'–54'–48') PRESTRESSED CONCRETE SPREAD BOX BEAM SPANS



GENERAL ELEVATION



PLAN

◔ Indicates location of borings

Notice and Disclaimer Regarding Boring Log Data

The location of all subsurface borings for this structure are shown on the plan sheet for this structure. The boring data for all locations indicated, as well as any other boring logs or other factual records of the subsurface data and investigation performed for the design of the project, are shown on the boring data sheet or will be available from the project contact upon written request. No greater significance or weight should be given to the boring data depicted on the plan sheets than is given to the subsurface data available from the owner or elsewhere.

The County does not represent or warrant that any such boring data accurately depicts the conditions to be encountered in constructing this project. A contractor assumes all risks it may encounter in basing its bid prices, time or schedule of performance on the boring data depicted here or those available from the district, or on any other documentation not expressly warranted, which the contractor may obtain from the County.

Notes:

This drawing not to scale. Follow dimensions.

Existing roadway fill under the ends of the bridge shall be removed as shown. Removal of existing roadway fill will be considered completely covered by the contract unit price for roadway excavation.

Roadway fill shall be completed to the final roadway section and up to the elevation of the bottom of the concrete beam within the limits of the structure and for not less than 25 feet in back of the fill face of the end bents before any piles are driven for any bents falling within the embankment section.

Existing structure not shown, to be removed.

No.	Revision/Issue	Date

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI
BOYD L. DENSON
NUMBER E-30094
05/04/2026
REGISTERED PROFESSIONAL ENGINEER

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers: Engineering: 2000156885, Land Surveying: 2001014?6, Landscape Architecture: 2007013073

BRO–R003(001)
ATCHISON COUNTY, MISSOURI

BRIDGE PLAN & ELEVATION

2026-05-04

JOB 5051

S1

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General Notes:

Design Specifications:

2020 AASHTO LRFD Bridge Design Specifications (9th Ed.)

2023 AASHTO Guide Specifications for LRFD Seismic Bridge Design (3rd Ed.)
Seismic Design Category = A (Nonseismic)
Design earthquake response spectral acceleration coefficient at 1.0 second period, S_{D1} = 0.04
Acceleration Coefficient (effective peak ground acceleration coefficient), A_s = 0.08

2026 MODOT Standard Specifications for Highway Construction (1st Edition)

Design Loading:

Vehicular = HL-93
Future Wearing Surface = 35 lb/sf
Earth = 120 lb/cf
Equivalent Fluid Pressure = 45 lb/cf (Min.)
Superstructure: Simply-Supported, Non-Composite for dead load.
Continuous, Composite for live load.

Design Unit Stresses:

Class B Concrete (Substructure)	f'c = 3,000 psi
Class B-2 Concrete (Superstructure, except Prestressed Beams and Barrier)	f'c = 4,000 psi
Reinforcing Steel (ASTM A615 Grade 60)	fy = 60,000 psi
Welded or Seamless steel shell (pipe) for CIP pile (ASTM A252 Modified Grade 3)	fy = 50,000 psi

For precast prestressed panel stresses, see Sheet S17.
For prestressed box beam stresses, see Sheets S14 thru S15.

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 reinforcing steel shall be 1 1/2", unless otherwise shown.

Minimum clearance between galvanized piles and uncoated (plain) reinforcing steel including bar supports shall be 1 1/2". Nylon, PVC, or polyethylene spacers shall be used to maintain clearance. Nylon cable ties shall be used to bind the spacers to the reinforcement.

Traffic Handling:

Structure to be closed during construction. Traffic to be maintained on other routes during construction. See roadway plans for traffic control.

Miscellaneous:

"Sec" refers to sections in the Missouri Standard Specification of Highway Construction and supplemental specifications.

Estimated Quantities

Item		Substr.	Superstr.	Total
Class 1 Excavation	cu. yard	115		115
Removal of Bridges (3570016)	lump sum			1
Galvanized Cast-in-Place Concrete Piles (14 in.)	linear foot	1,634		1,634
Dynamic Pile Testing	each	4		4
Dynamic Pile Restrike Testing	each	4		4
Pile Point Reinforcement	each	18		18
Class B Concrete (Substructure)	cu. yard	126.9		126.9
Type H Barrier	linear foot		333	333
Slab on Concrete Beam	sq. yard		454	454
27 in., Prestressed Concrete Spread Box Beam	linear foot		449	449
Reinforcing Steel (Bridges)	pound	10,010		10,010
Plain Neoprene Bearing Pad	each		6	6
Laminated Neoprene Bearing Pad	each		12	12

All concrete above the construction joint in the end bents is included in the Estimated Quantities for Slab on Concrete Beam.

All reinforcement in the end bents is included in the Estimated Quantities for Slab on Concrete Beam.

All reinforcement in the intermediate bent concrete diaphragms except reinforcement embedded in the beam cap are included in the Estimated Quantities for Slab on Concrete Beam.

All concrete above the intermediate beam cap is included in the Estimated Quantities for Slab on Concrete Beam.

Estimated Quantities for Slab on Concrete Beam

Item		Total
Class B-2 Concrete	cu. yard	137
Reinforcing Steel (Epoxy Coated)	pound	31,470

The table of Estimated Quantities for Slab on Concrete Beam represents the quantities used by the county in preparing the cost estimate for concrete slabs. The area of the concrete slab will be measured to the nearest square yard longitudinally from end of slab to end of slab and transversely from out to out of bridge slab (or with the horizontal dimensions as shown on the plan of slab). Payment for prestressed panels, conventional forms, all concrete and epoxy coated reinforcing steel will be considered completely covered by the contract unit price for the slab. 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 shown on the plans 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.

The Estimated Quantities for Slab on Concrete Beam are based on skewed precast prestressed end panels.

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 Beam.

Hydrologic Data

Drainage Area = 23 mi^2
Design Flood Frequency = 25 years
Design Flood Discharge = 5,000 cfs
Design Flood (D.F.) Elevation = 958.2 feet
Base Flood (100-Year)
Base Flood Elevation = 961.7 feet
Base Flood Discharge = 6,800 cfs
Estimated Backwater = -0.4 feet
Average Velocity Thru Opening = 10.8 ft/s
Freeboard (25-year)
Freeboard = 9.4 feet
Roadway Overtopping
Overtopping Flood Discharge = N/A cfs
Overtopping Flood Frequency = > 500 years
Overtopping Flood Elevation = 961.4 feet

Foundation Data

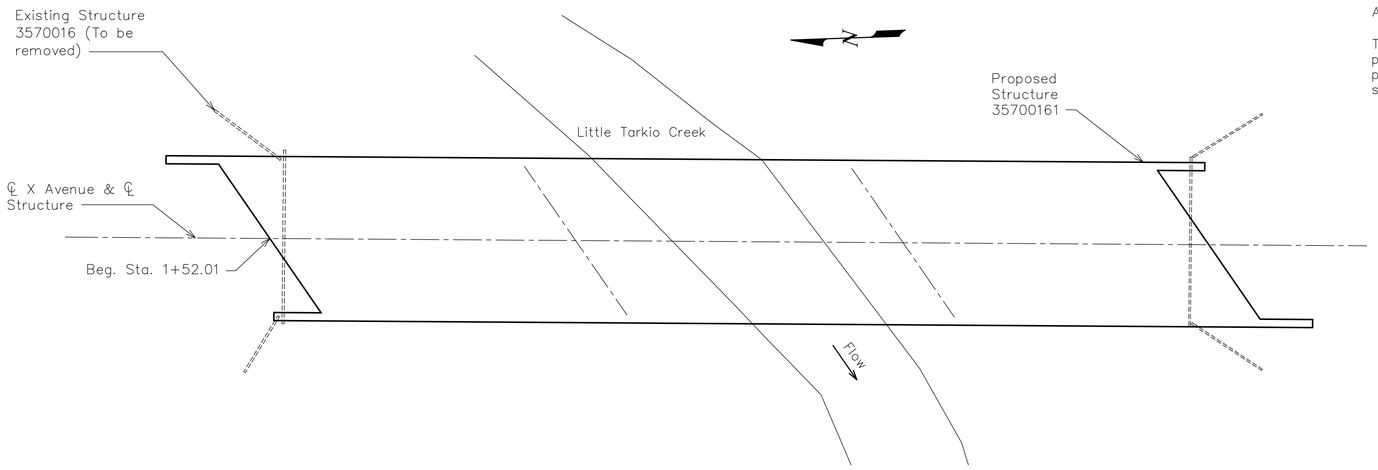
Type	Design Data		Bent 1	Bent 2	Bent 3	Bent 4
Load Bearing Pile	Pile Type & Size		CECIP 14"	CECIP 14"	CECIP 14"	CECIP 14"
	Number	ea	4	5	5	4
	Approximate Length Per Each	ft	73	107	107	68
	Pile Point Reinforcement	ea	4	5	5	4
	Min. Galvanized Penetration (Elev.)	ft	944	923	923	944
	Est. Max. Scour Depth (Elev.)	ft	–	–	–	–
	Minimum Tip Penetration (Elev.)	ft	942	918	918	942
	Criteria for Min. Tip Penetration		Lateral Stability			
	Pile Driving Verification Method		DT	DT	DT	DT
	Resistance Factor		0.65	0.65	0.65	0.65
	Minimum Nominal Axial Compressive Resistance	kip	236	384	384	236

DT = Dynamic Testing

Minimum Nominal Axial Compressive Resistance = $\frac{\text{Maximum Factored Loads}}{\text{Resistance Factor}}$

All piles shall be galvanized down to the minimum galvanized penetration (elevation).

The contractor shall make every effort to achieve the minimum galvanized penetration (elevation) shown on the plans for all piles. Deviations in penetration less than 5 feet of the minimum will be considered acceptable provided the contractors makes the necessary corrections to ensure the minimum penetration is achieved on subsequent piles.



LOCATION SKETCH

Date
Revision/Issue
No.

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STATE OF MISSOURI
BOYD L. DENSON
NUMBER E-30094
REGISTERED PROFESSIONAL ENGINEER
05/04/2026

GRE GREAT RIVER ENGINEERING

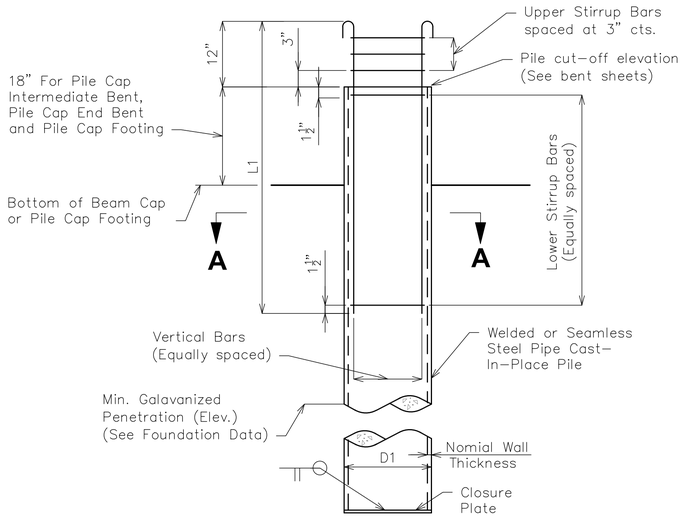
Missouri State Certificate of Authority Numbers:
Engineering: 2000156885, Land Surveying: 2001011476,
Landscape Architecture: 2007013073

BRO-R003(001)
ATCHISON COUNTY, MISSOURI

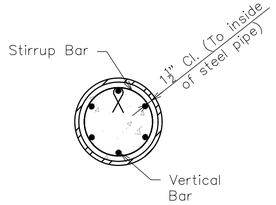
GENERAL NOTES & ESTIMATED QUANTITIES

2026-05-04
JOB 5051
S2

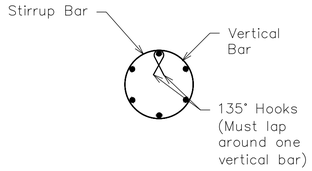
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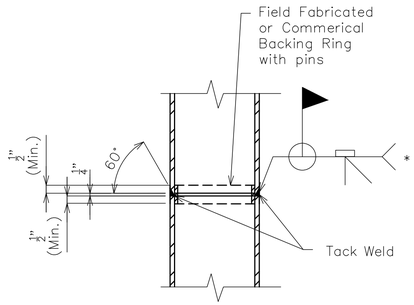
GALVANIZED CLOSED ENDED CAST–IN–PLACE (CECIP) CONCRETE PILE WITHOUT PILE POINT REINFORCEMENT



SECTION A–A

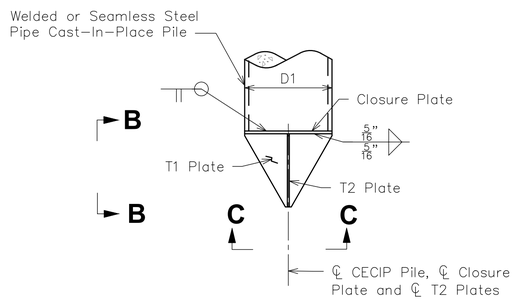


DETAIL OF SEISMIC STIRRUP BAR



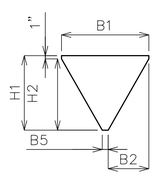
STEEL PIPE PILE SPLICE

* Galvanizing material shall be omitted or removed one inch clear of weld locations in accordance with Sec 702.

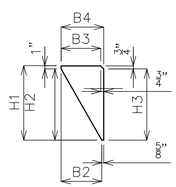


CRUCIFORM PILE POINT

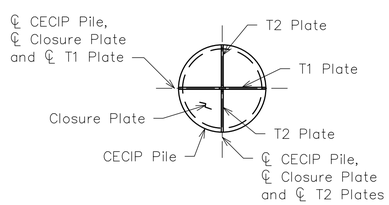
Note: Cost of closure plate is included with cast–in–place concrete pile.



T1 PLATE DETAILS

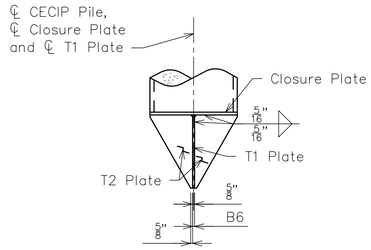


T2 PLATE DETAILS
(2 REQUIRED)



SECTION C–C

CRUCIFORM PILE POINT REINFORCEMENT



ELEVATION B–B

Cruciform Pile Point Reinforcement Data				
D1, CECIP Pile (O.D.)	14"	16"	20"	24"
B1	14"	16"	20"	24"
B2	6"	7"	8 7/8"	10 5/8"
B3	5 7/8"	6 7/8"	8 3/4"	10 1/2"
B4	6 5/8"	7 5/8"	9 1/2"	11 1/4"
B5	2"	2"	2 1/4"	2 3/4"
B6	3/4"	3/4"	1"	1 1/2"
H1	9 1/8"	10 1/2"	13"	15 3/8"
H2	8 1/8"	9 1/2"	12"	14 3/8"
H3	8 3/8"	9 3/4"	12 1/4"	14 5/8"
T1 and T2 Plate Thickness	3/4"	3/4"	1"	1 1/2"

Galvanized Closed Ended Cast–In–Place (CECIP) Concrete Pile Data				
Bent Number	1	2	3	4
D1, CECIP Pile (O.D.)	14"	14"	14"	14"
Min. Nominal Wall Thickness	1/2"	1/2"	1/2"	1/2"
Closure Plate Thickness	3/4"	3/4"	3/4"	3/4"
Pile Point Reinforcement	Cruciform	Cruciform	Cruciform	Cruciform
Vertical Bars	6–#5–V104	6–#5–V201	6–#5–V301	6–#5–V404
L1, Length of Vertical Bars	5'–3"	5'–3"	5'–3"	5'–3"
Upper Stirrup Bars	3–#4–P100	3–#4–P200	3–#4–P300	3–#4–P400
Lower Stirrup Bars	5–#4–P100	5–#4–P200	5–#4–P300	5–#4–P400

General Notes:

This drawing not to scale. Follow dimensions.

Welded or seamless steel shell (pipe) shall be ASTM A252 Modified Grade 3 (fy = 50,000 psi) with physical and chemical requirements that meet ASTM A572 Grade 50. Pipe certification requirements material certification shall be required.

Concrete for cast–in–place pile shall be Class B–1.

The minimum wall thickness of any spot or local area of any type shall not be more than 12.5% under the specified nominal wall thickness.

The contractor shall determine the pile wall thickness required to avoid damage from all driving activities but wall thickness shall not be less than the minimum specified. No additional payment will be made for furnishing a thicker pile wall than specified on the plans.

Splices of pipe for cast–in–place concrete pile shall be made watertight and to the full strength of the pipe above and below the splice to permit hard driving without damage. Pipe damaged during driving shall be replaced without cost to the commission. Pipe sections used for splicing shall be at least 5 feet in length.

At the contractor's option, the hooks of vertical bars embedded in the beam cap may be oriented inward or outward.

Reinforcing steel for cast–in–place pile is included in the Bill of Reinforcing Steel.

Reinforcing steel for cast–in–place pile at end bents is included in the estimated quanities for slab on concrete beams. Reinforcing steel for cast–in–place pile at intermediate bents is included in the substructure quantity tables.

For Foundation Data table, see Sheet S2.

Closed Ended Piles:

Steel for closure plate and cruciform pile point reinforcement shall be ASTM A709 Grade 50.

Closure plate shall not project beyond the outside diameter of the pipe pile. Satisfactory weldments may be made by beveling tip end of pipe or by use of inside backing rings. In either case, proper gaps shall be used to obtain weld penetration full thickness of pipe. Payment for furnishing and installing closure plate will be considered completely covered by the contract unit price for Galvanized Cast–In–Place Concrete Piles.

Closure plate need not be galvanized.

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ATCHISON COUNTY, MISSOURI

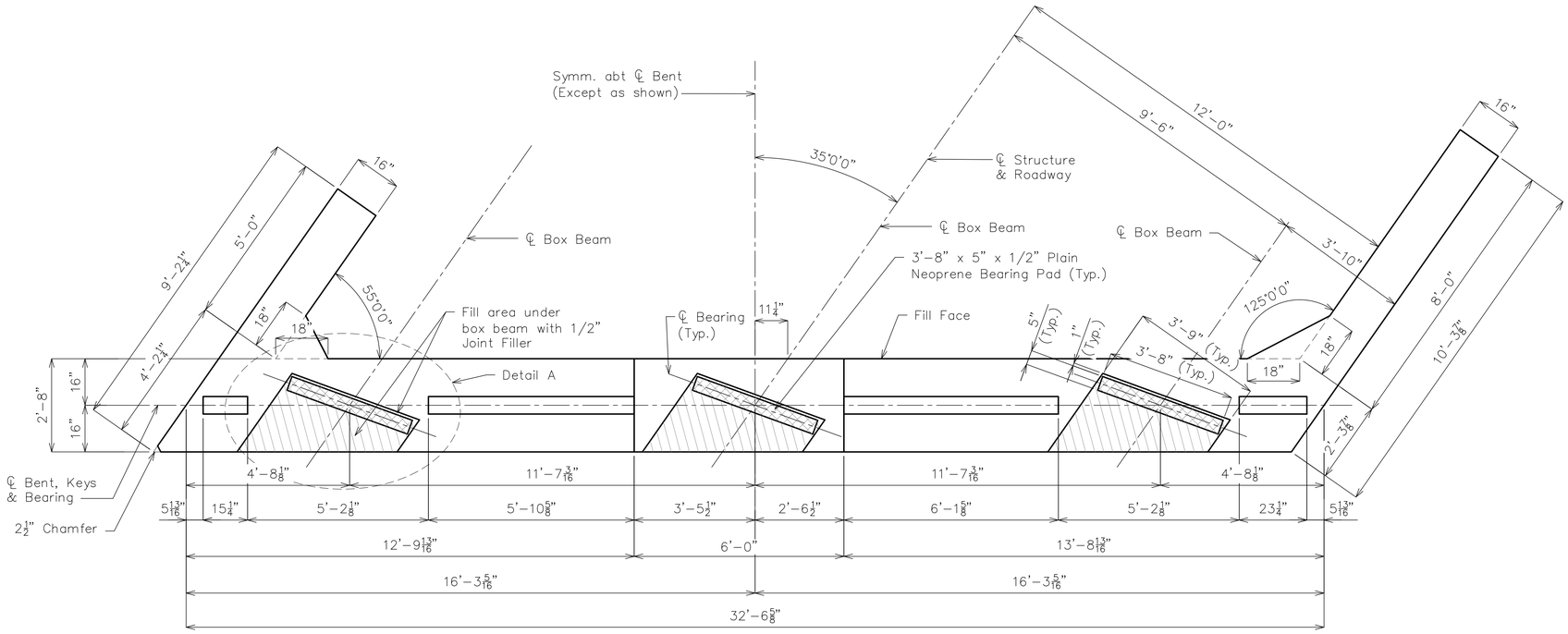
GALVANIZED CLOSED ENDED CAST–IN–PLACE CONCRETE PILE

2026-05-04

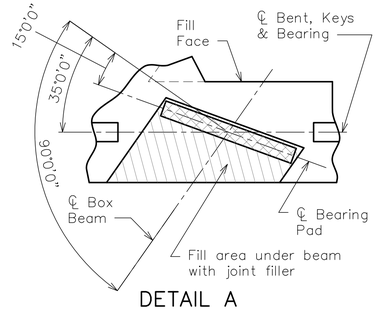
JOB 5051

S3

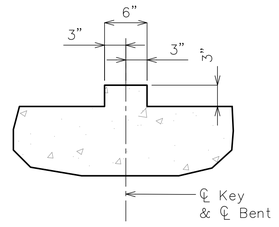
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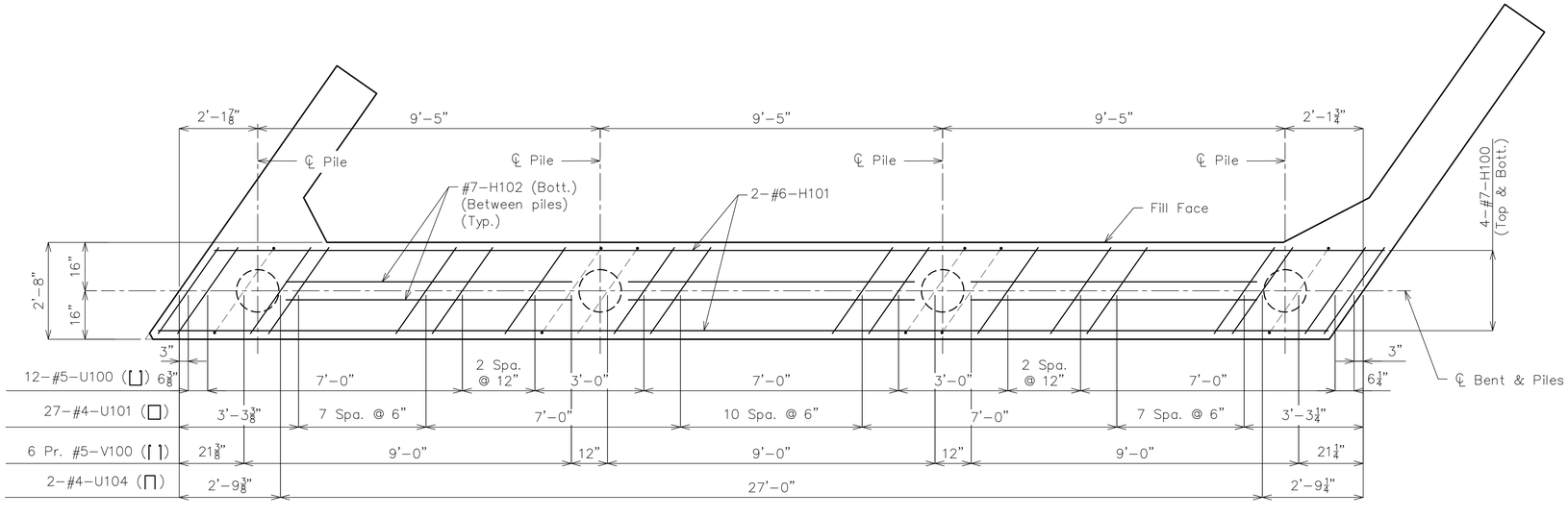
PLAN OF BEAM SHOWING DIMENSIONS



DETAIL A



SECTION THRU KEY



PLAN OF BEAM SHOWING REINFORCEMENT & PILES

Keys and steps not shown for clarity.

General Notes:

This drawing not to scale. Follow dimensions.

Work this sheet with Sheets S5 & S6.

Reinforcing Steel shall be shifted to clear piles. U bars shall clear piles by at least 1 1/2".

The U bars and pairs of V bars shall be placed parallel to centerline or roadway.

Substructure Quantity Table for Bent 1

Item		Quantity
Class 1 Excavation	cu. yard	25
Galvanized Cast–in–Place Concrete Piles (14 in.)	lin. foot	292
Dynamic Pile Testing	each	1
Dynamic Pile Restrike Testing	each	1
Pile Point Reinforcement	each	4
Class B Concrete (Substructure)	cu. yard	11.9

These quantities are included in the Estimated Quantities table on Sheet S2.

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05/04/2026

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Landscape Architecture: 2007015573

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ATCHISON COUNTY, MISSOURI

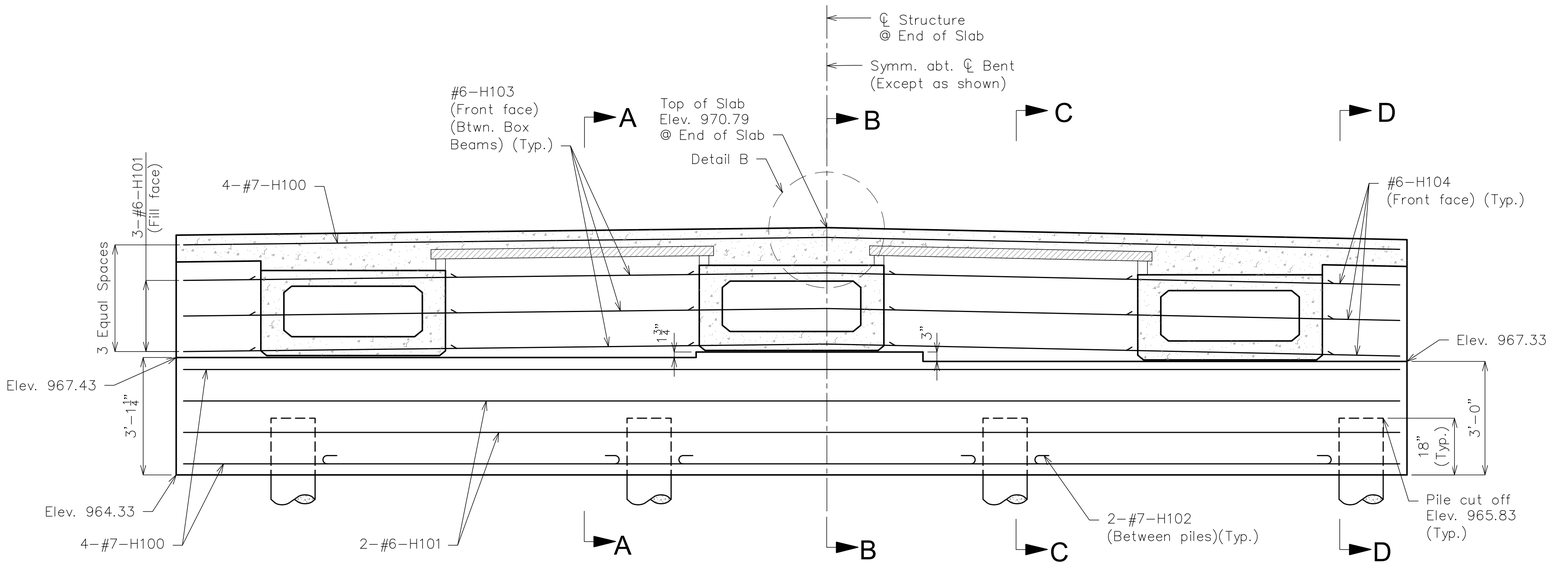
BENT 1

2026-05-04

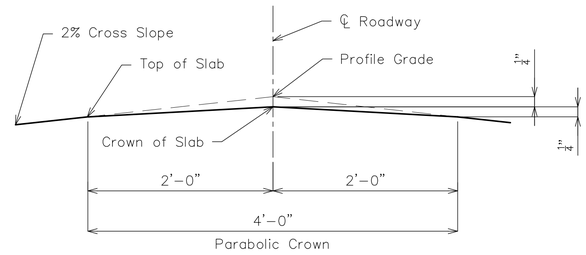
JOB 5051

S4

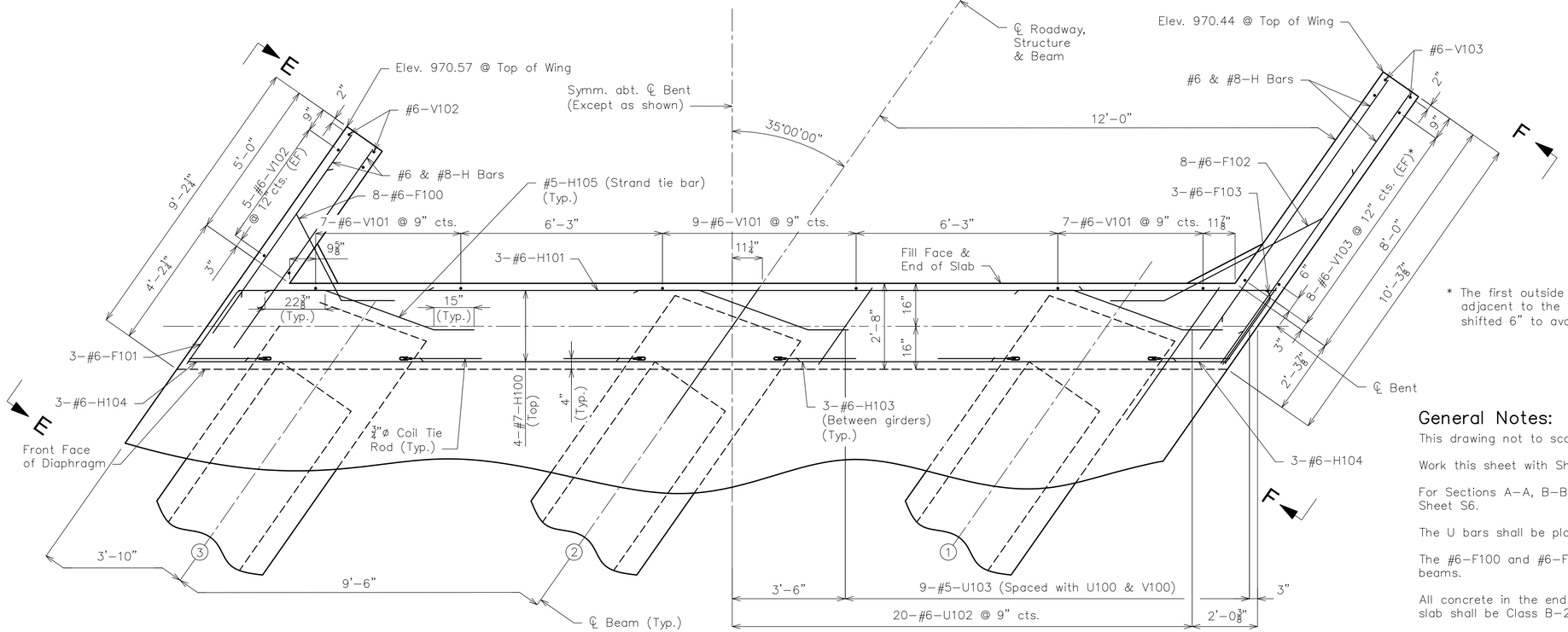
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SECTION NEAR END BENT



DETAIL B



PART PLAN

EF=Each Face

* The first outside face V103 bar adjacent to the beam shall be shifted 6" to avoid beam stirrups.

General Notes:

This drawing not to scale. Follow dimensions.

Work this sheet with Sheets S4 & S6.

For Sections A–A, B–B, C–C & D–D and Elevation E–E & F–F, see Sheet S6.

The U bars shall be placed parallel to centerline of roadway.

The #6–F100 and #6–F102 bars shall be bent in the field to clear beams.

All concrete in the end bent above top of beam and below top of slab shall be Class B–2.

Strands at end of beams shall be field bent or, if necessary, cut in field to maintain 1 1/2" minimum clearance to fill face of end bent.

For location of coil tie rods and #5–H105 (strand tie bar), see Sheet S14.

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ATCHISON COUNTY, MISSOURI

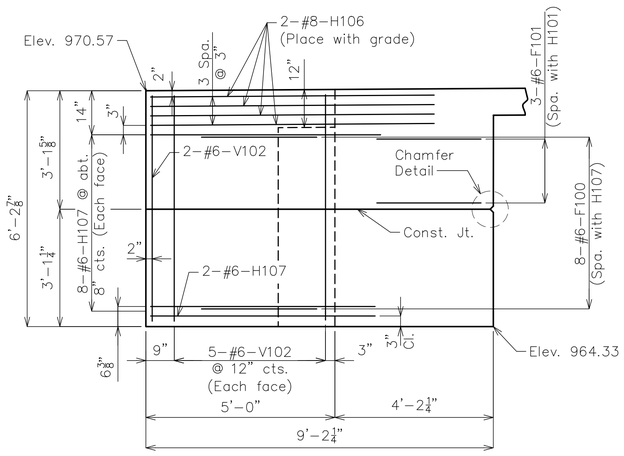
BENT 1

2026-05-04

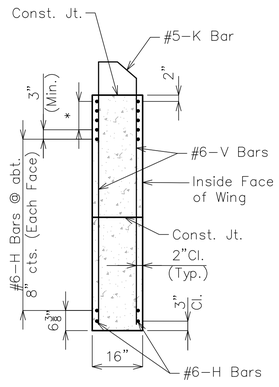
JOB 5051

S5

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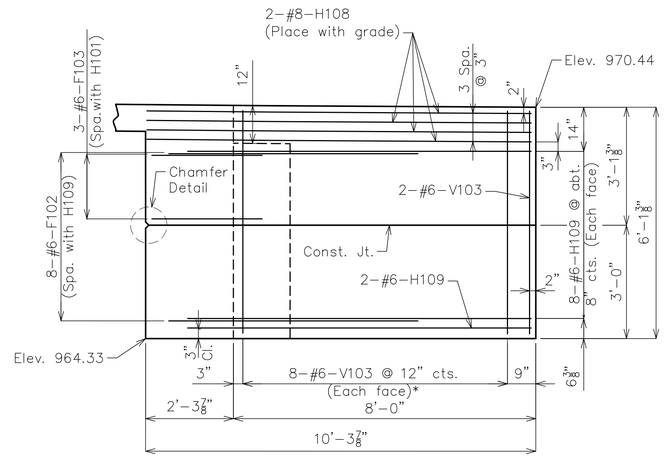


ELEVATION E–E



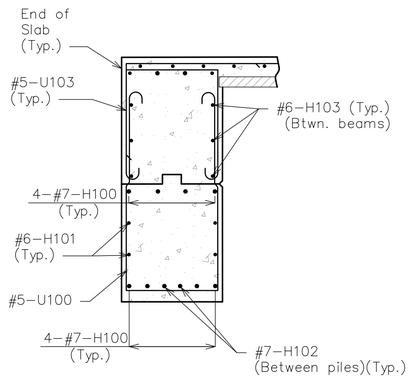
TYPICAL SECTION THRU WING

* #8–H Bars at 3" cts. (Each face) (Place with grade)

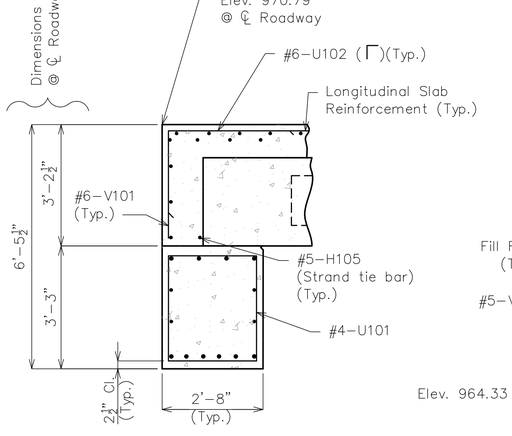


ELEVATION F–F

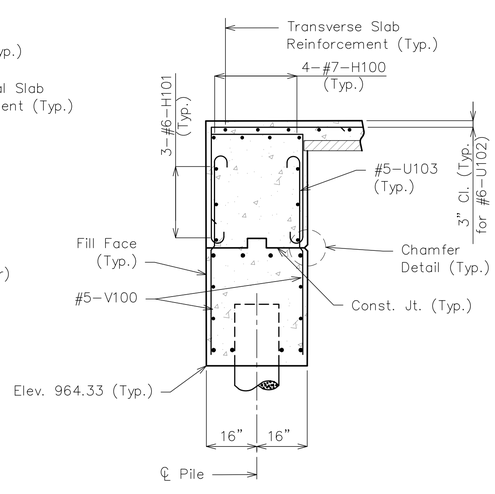
* The first outside face V403 bar adjacent to the beam shall be shifted 6" to avoid beam stirrups.



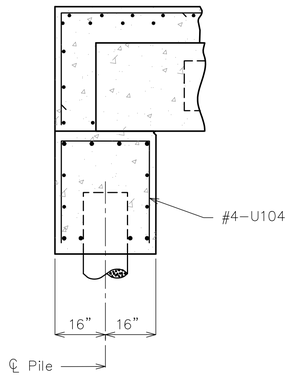
SECTION A–A



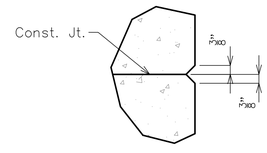
SECTION B–B



SECTION C–C



SECTION D–D



CHAMFER DETAIL

General Notes:

This drawing not to scale. Follow dimensions.

Work this sheet with Sheets S4 & S5.

For locations of Sections A–A, B–B, C–C & D–D and Elevation E–E & F–F, see Sheet S5.

For reinforcement of the barrier, see Sheet S21.

No.	Revision/Issue	Date

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI — BOYD L. DENSON — NUMBER E-30094 — 05/04/2026 — REGISTERED PROFESSIONAL ENGINEER

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers: Engineering: 2001168885, Land Surveying: 2001011476, Landscape Architecture: 2007013573

BRO–R003(001)
ATCHISON COUNTY, MISSOURI

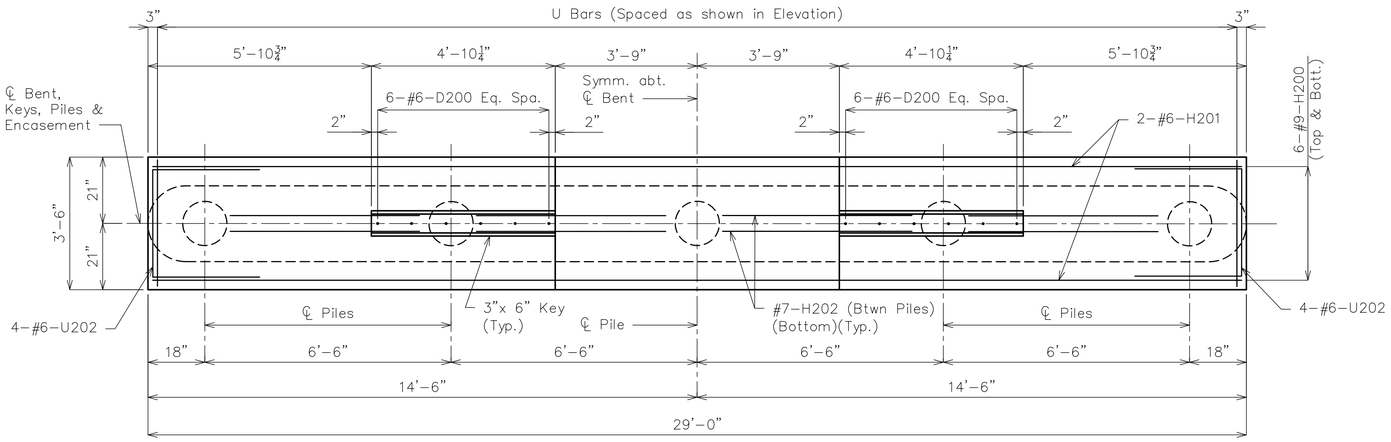
BENT 1

2026-05-04

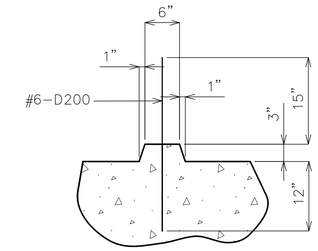
JOB 5051

S6

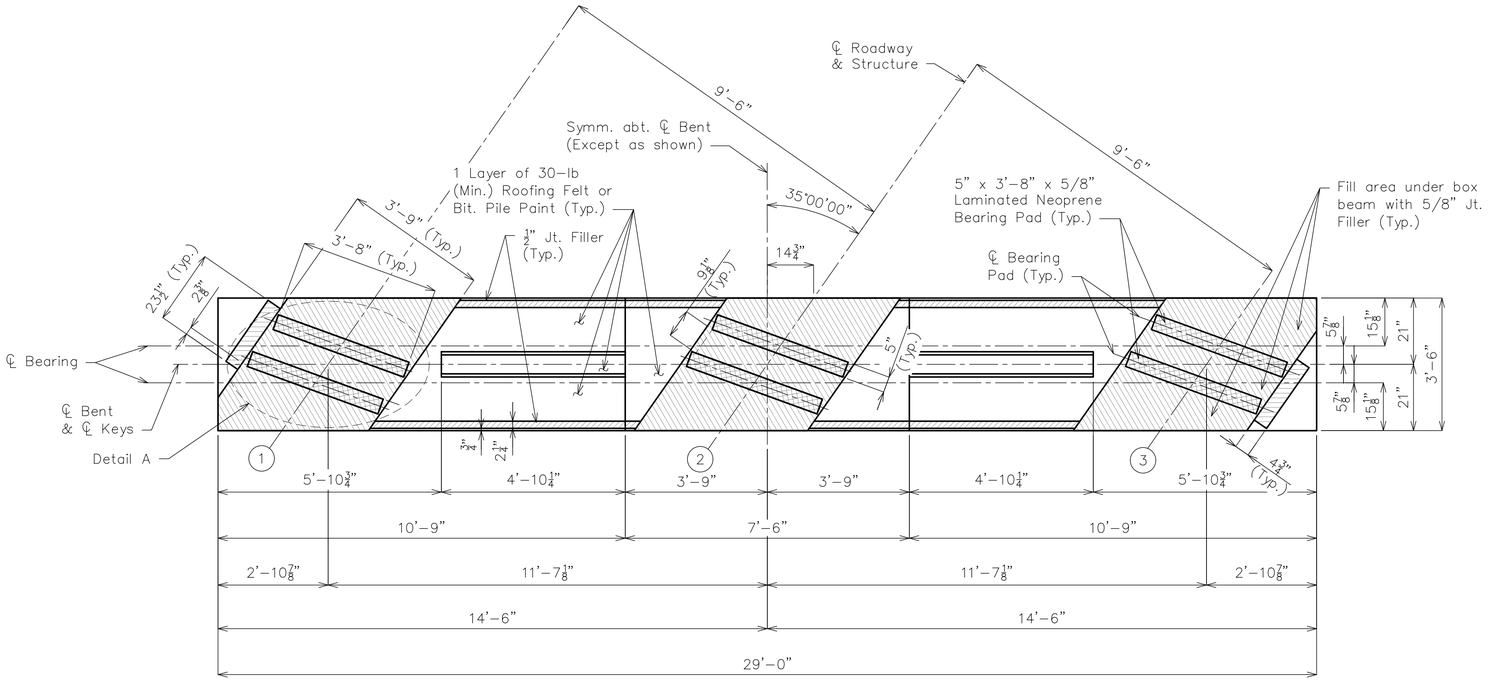
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PLAN OF BEAM SHOWING REINFORCEMENT AND PILES

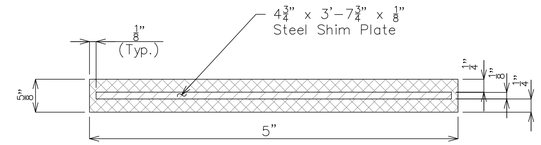


SECTION THRU KEY



PLAN OF BEAM

See end bent details for a similar Detail A.



SECTION THRU LAMINATED NEOPRENE BEARING PAD

General Notes:

This drawing not to scale. Follow dimensions.

Work this sheet with Sheet S8.

Reinforcing steel shall be shifted to clear piles. U bars shall clear piles by at least 1 1/2" inches.

For steps 2 inches or more, use 2¼" x ½" joint filler up vertical face.

Substructure Quantity Table for Bent 2

Item		Quantity
Class 1 Excavation	cu. yard	30
Galvanized Cast–in–Place Concrete Piles (14 in.)	lin. foot	535
Dynamic Pile Testing	each	1
Dynamic Pile Restrike Testing	each	1
Pile Point Reinforcement	each	5
Class B Concrete (Substructure)	cu. yard	51.5
Reinforcing Steel (Bridges)	pound	5,006

These quantities are included in the Estimated Quantities table on Sheet S2.

No.	Revision/Issue	Date

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI
BOYD L. DENSON
NUMBER E-30094
05/04/2026
REGISTERED PROFESSIONAL ENGINEER

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers: Engineering: 2000156885, Land Surveying: 2001011476, Landscape Architecture: 2007013073

BRO–R003(001)
ATCHISON COUNTY, MISSOURI

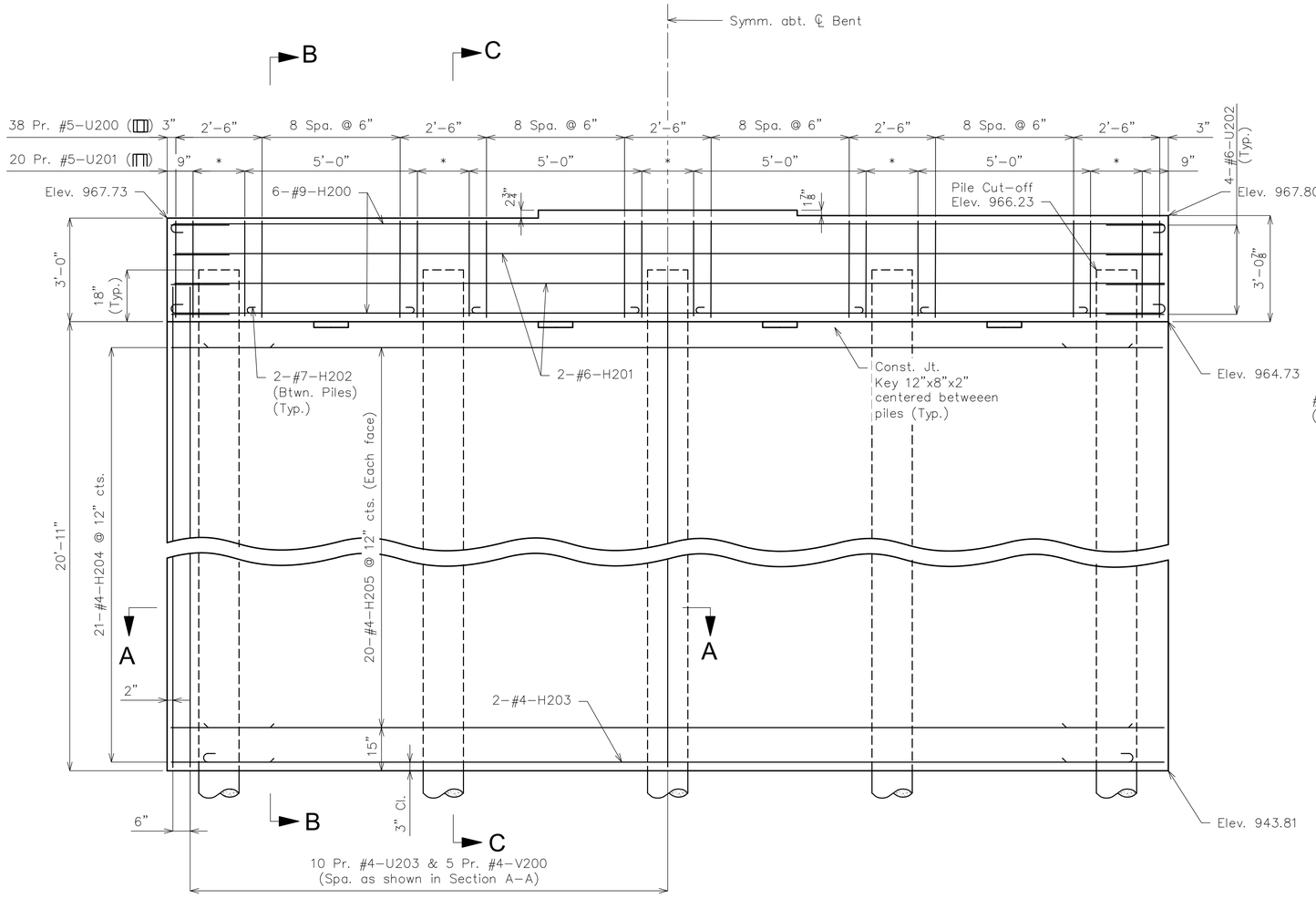
BENT 2

2026-05-04

JOB 5051

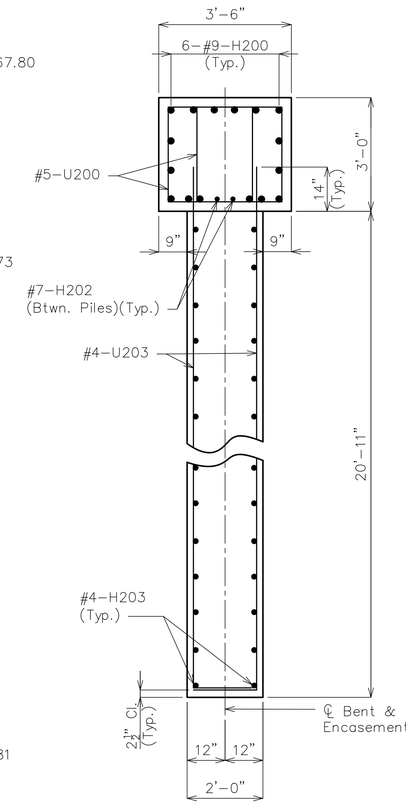
S7

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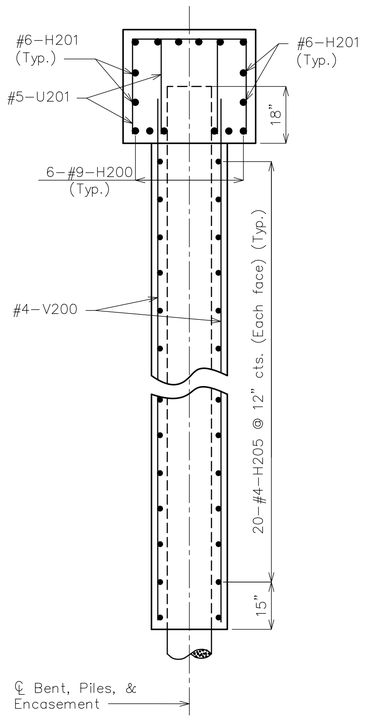


ELEVATION OF BEAM

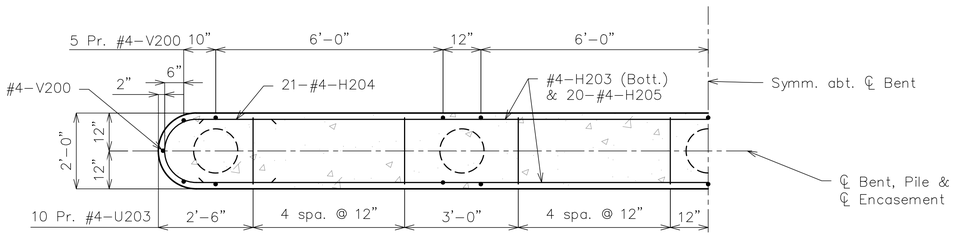
* 3 Spa. @ 6"



SECTION B–B



SECTION C–C



SECTION A–A

General Notes:

This drawing not to scale. Follow dimensions.

Work this sheet with Sheet S7.

No.	Revision/Issue	Date

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI
BOYD L. DENSON
NUMBER E-30094
05/04/2026
REGISTERED PROFESSIONAL ENGINEER

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers: Engineering: 2000156885, Land Surveying: 2001014476, Landscape Architecture: 2007013973

BRO–R003(001)
ATCHISON COUNTY, MISSOURI

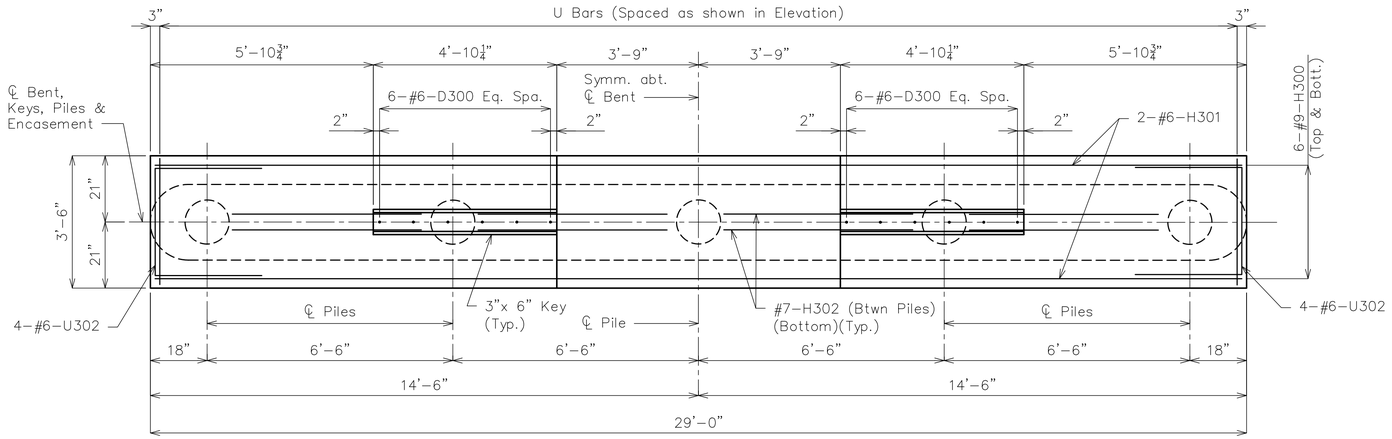
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2026-05-04

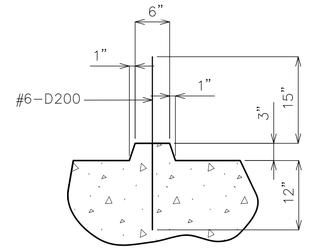
JOB 5051

S8

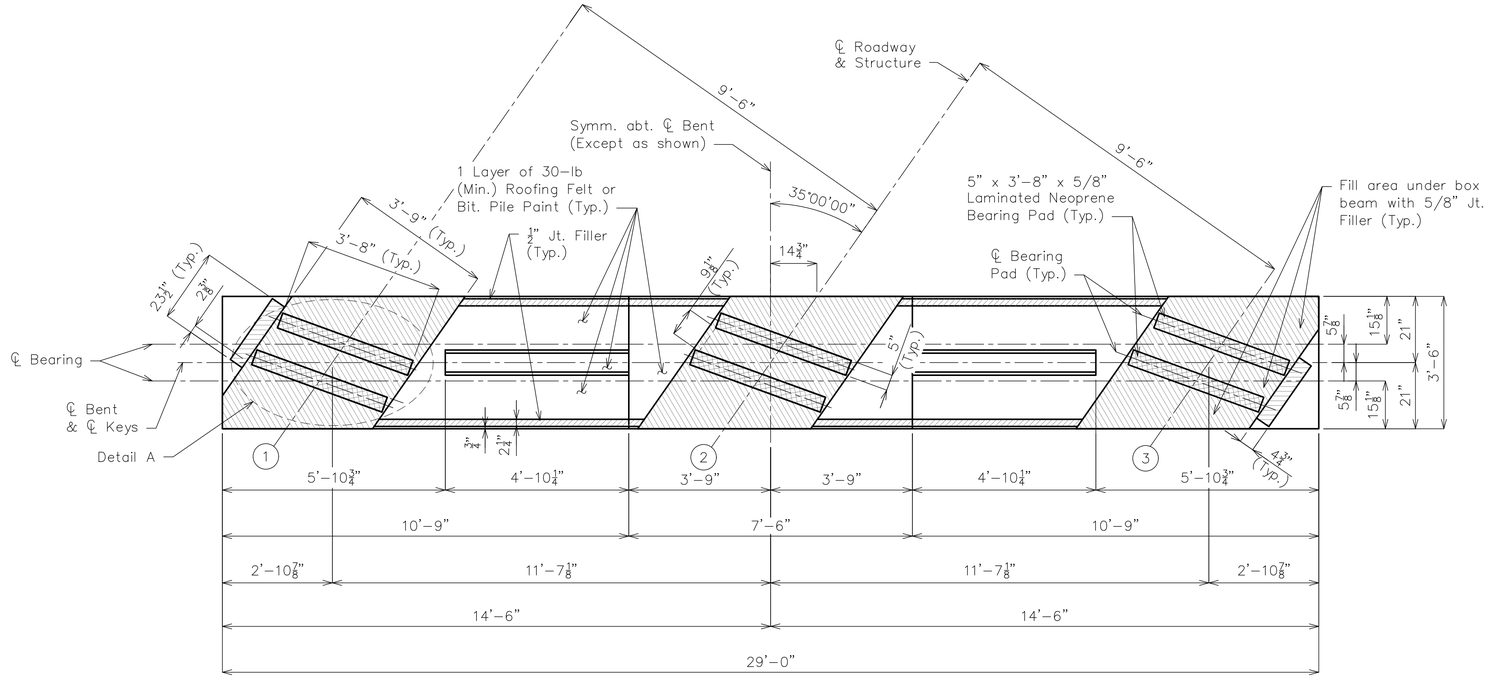
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PLAN OF BEAM SHOWING REINFORCEMENT AND PILES

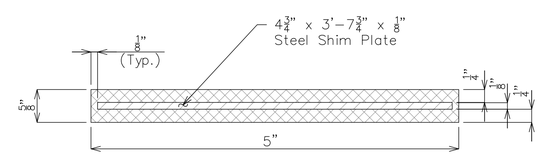


SECTION THRU KEY



PLAN OF BEAM

See end bent details for a similar Detail A.



SECTION THRU LAMINATED NEOPRENE BEARING PAD

General Notes:

This drawing not to scale. Follow dimensions.

Work this sheet with Sheet S10.

Reinforcing steel shall be shifted to clear piles. U bars shall clear piles by at least 1 1/2" inches.

For steps 2 inches or more, use 2¼" x ½" joint filler up vertical face.

Substructure Quantity Table for Bent 3

Item		Quantity
Class 1 Excavation	cu. yard	30
Galvanized Cast–in–Place Concrete Piles (14 in.)	lin. foot	535
Dynamic Pile Testing	each	1
Dynamic Pile Restrike Testing	each	1
Pile Point Reinforcement	each	5
Class B Concrete (Substructure)	cu. yard	51.5
Reinforcing Steel (Bridges)	pound	5,006

These quantities are included in the Estimated Quantities table on Sheet S2.

No.	Revision/Issue	Date

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI
BOYD L. DENSON
NUMBER E-30094
05/04/2026
REGISTERED PROFESSIONAL ENGINEER

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers: Engineering: 2000156885, Land Surveying: 2001011476, Landscape Architecture: 2007015573

BRO–R003(001)
ATCHISON COUNTY, MISSOURI

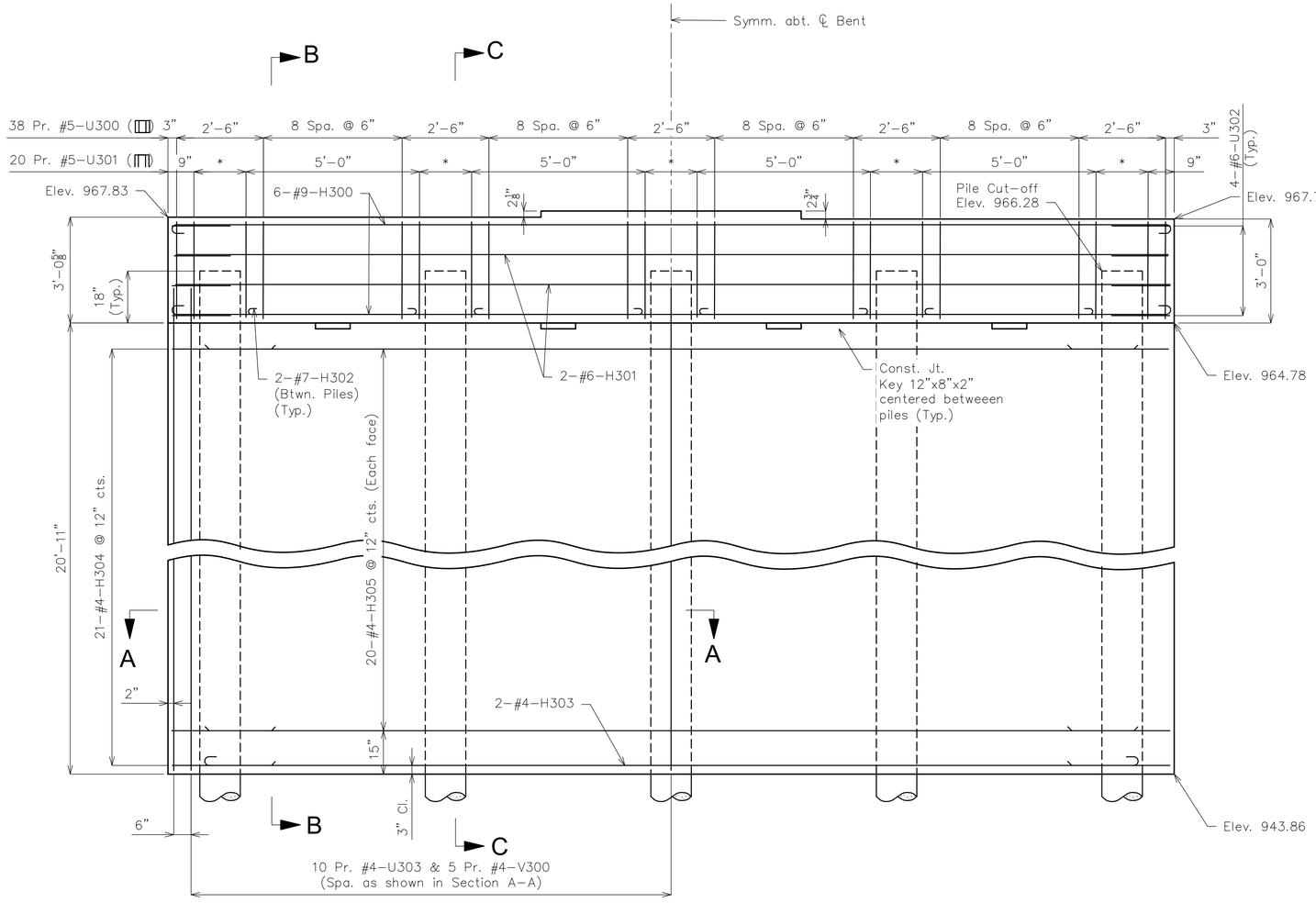
BENT 3

2026-05-04

JOB 5051

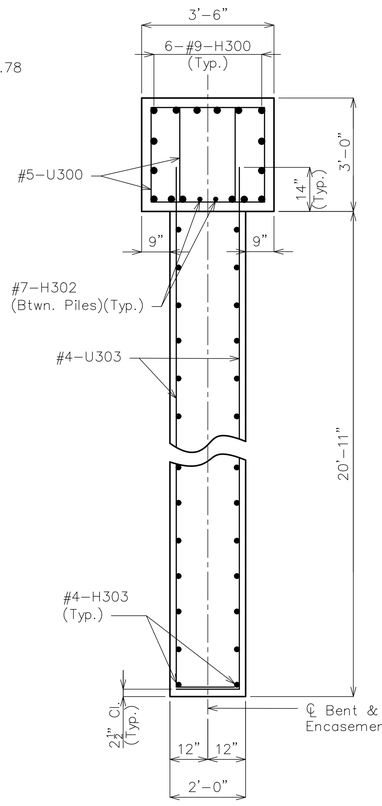
S9

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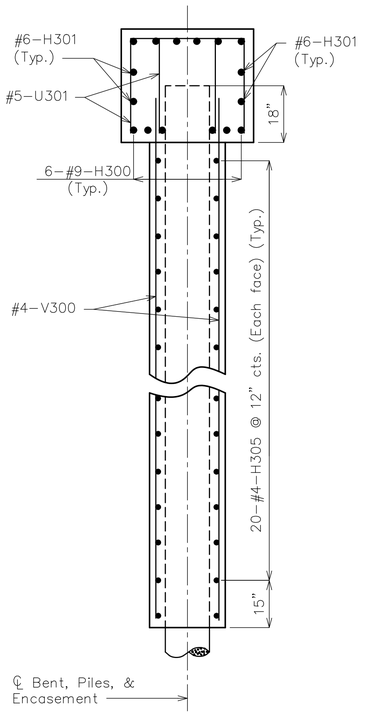


ELEVATION OF BEAM

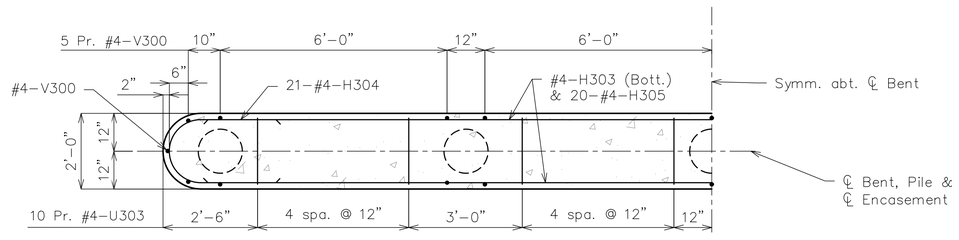
* 3 Spa. @ 6"



SECTION B–B



SECTION C–C



SECTION A–A

General Notes:

This drawing not to scale. Follow dimensions.

Work this sheet with Sheet S9.

No.	Revision/Issue	Date

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI
BOYD L. DENSON
NUMBER E-30094
05/04/2026
REGISTERED PROFESSIONAL ENGINEER

GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers: Engineering: 2001168885, Land Surveying: 2001011476, Landscape Architecture: 2007013573

BRO–R003(001)
ATCHISON COUNTY, MISSOURI

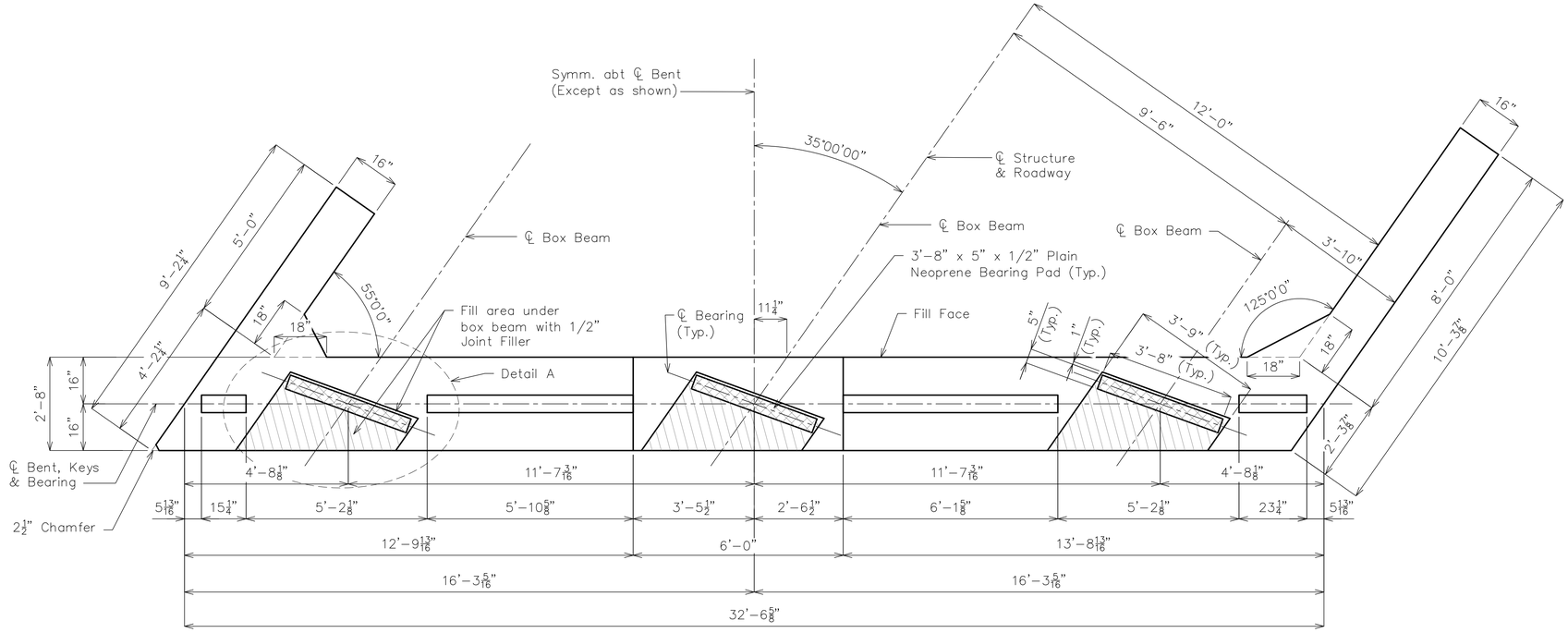
BENT 3

2026-05-04

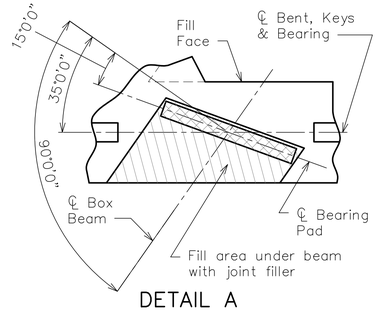
JOB 5051

S10

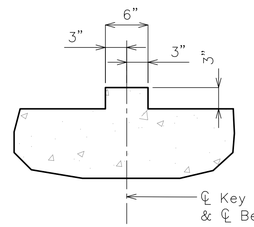
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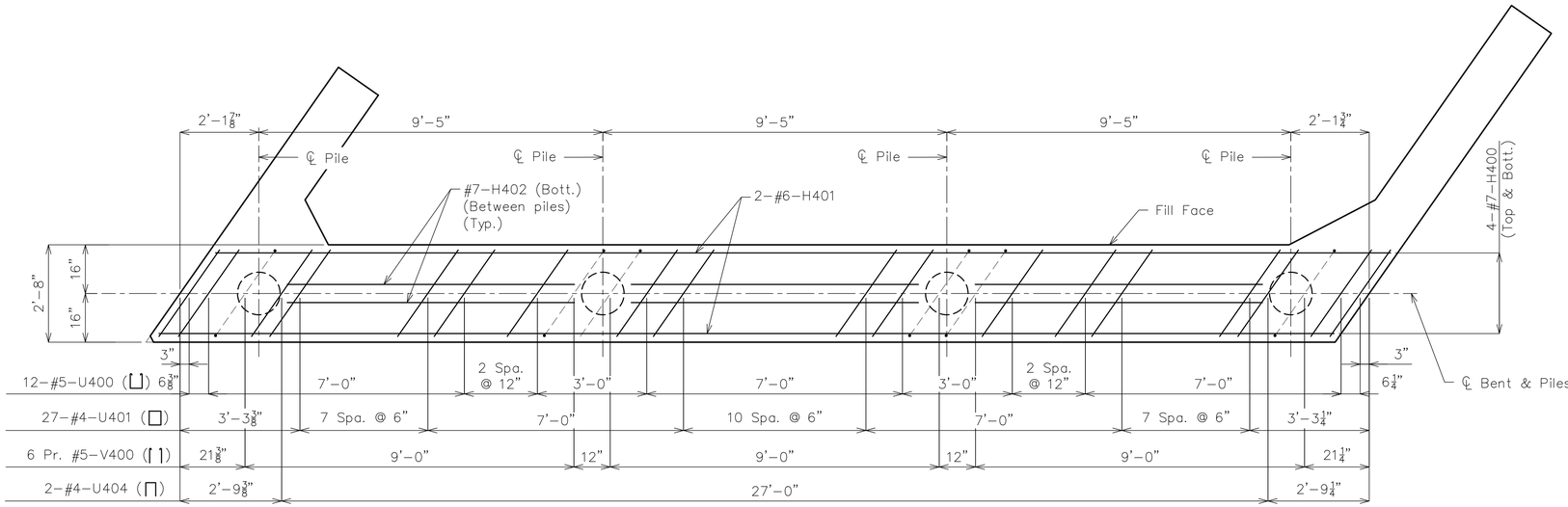
PLAN OF BEAM SHOWING DIMENSIONS



DETAIL A



SECTION THRU KEY



PLAN OF BEAM SHOWING REINFORCEMENT & PILES

Keys and steps not shown for clarity.

General Notes:

This drawing not to scale. Follow dimensions.

Work this sheet with Sheets S12 & S13.

Reinforcing Steel shall be shifted to clear piles. U bars shall clear piles by at least 1 1/2".

The U bars and pairs of V bars shall be placed parallel to centerline or roadway.

Substructure Quantity Table for Bent 4

Item		Quantity
Class 1 Excavation	cu. yard	30
Galvanized Cast–in–Place Concrete Piles (14 in.)	lin. foot	272
Dynamic Pile Testing	each	1
Dynamic Pile Restrike Testing	each	1
Pile Point Reinforcement	each	4
Class B Concrete (Substructure)	cu. yard	12.0

These quantities are included in the Estimated Quantities table on Sheet S2.

No.	Revision/Issue	Date

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI
BOYD L. DENSON
NUMBER E-30094
05/04/2026
REGISTERED PROFESSIONAL ENGINEER

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers:
Engineering: 2000156885; Land Surveying: 2001014476;
Landscape Architecture: 2007013073

BRO–R003(001)
ATCHISON COUNTY, MISSOURI

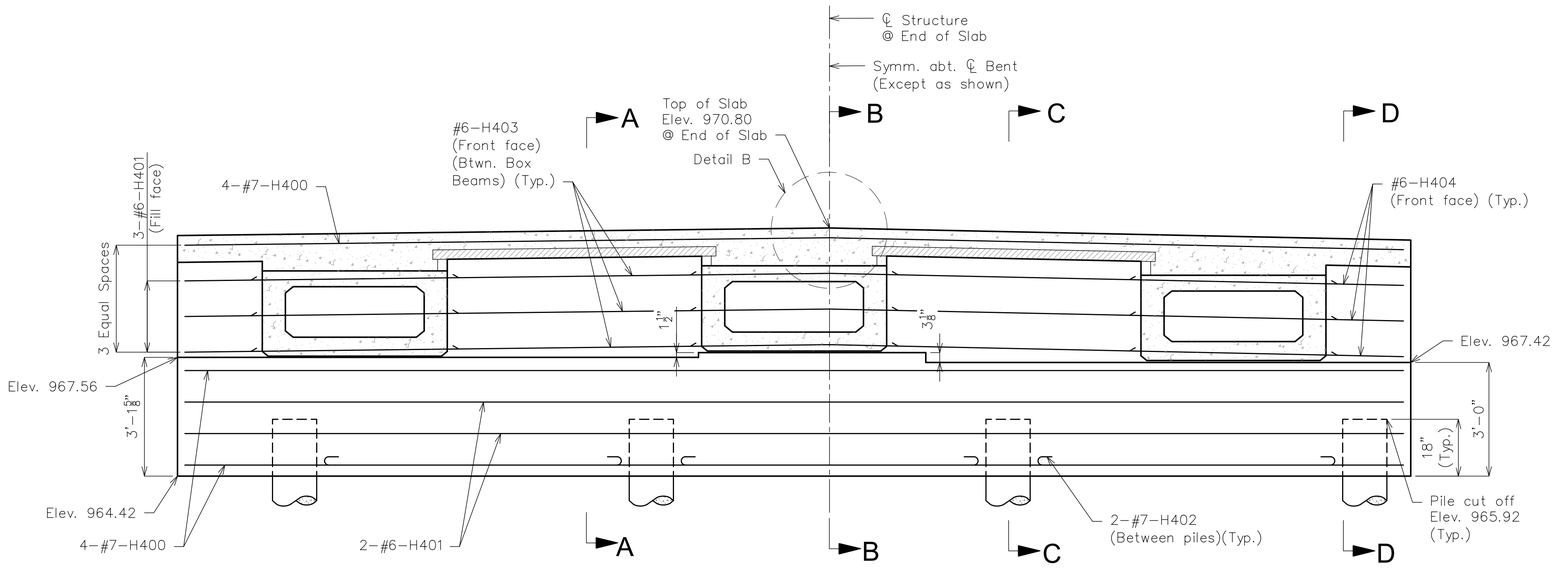
BENT 4

2026-05-04

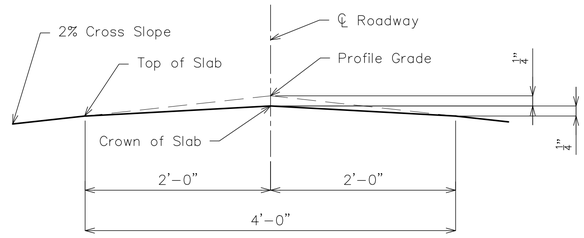
JOB 5051

S11

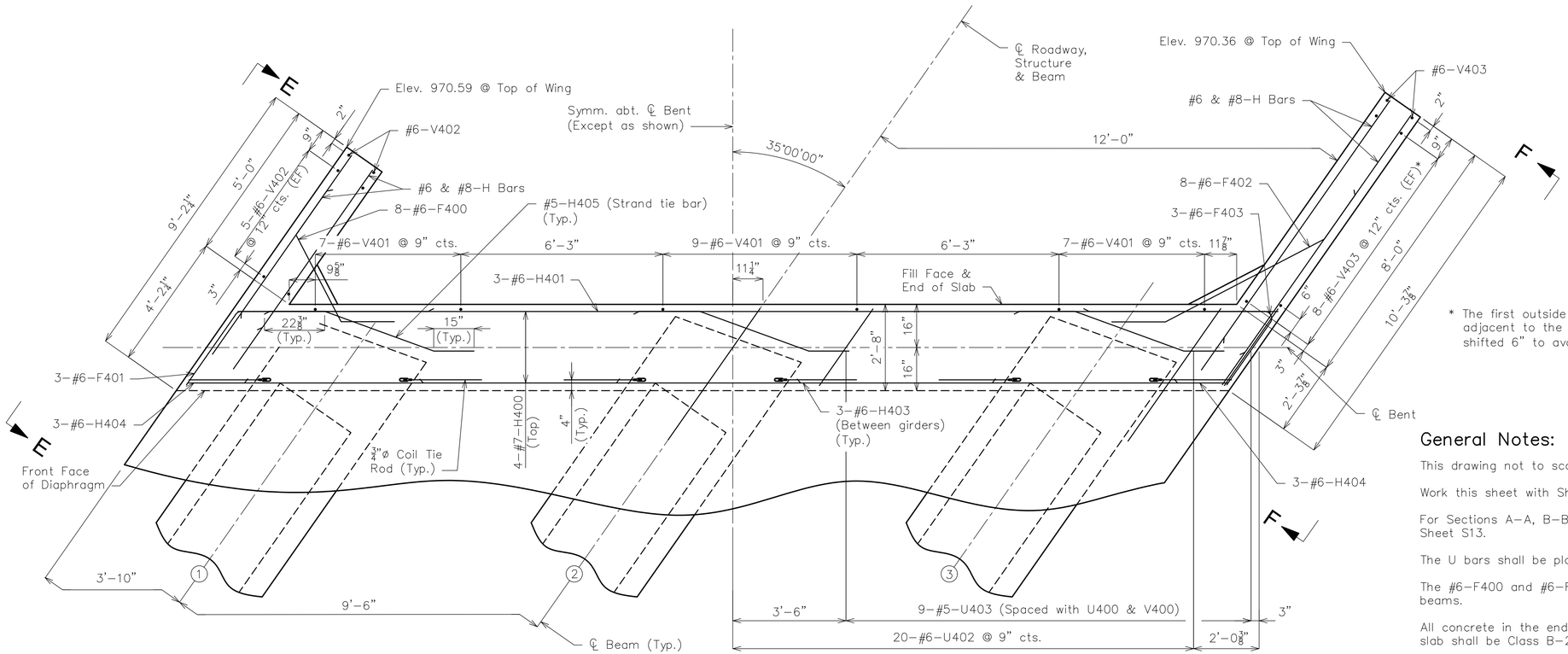
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SECTION NEAR END BENT



DETAIL B



* The first outside face V403 bar adjacent to the beam shall be shifted 6" to avoid beam stirrups.

PART PLAN
EF=Each Face

General Notes:

This drawing not to scale. Follow dimensions.

Work this sheet with Sheets S11 & S13.

For Sections A–A, B–B, C–C & D–D and Elevation E–E & F–F, see Sheet S13.

The U bars shall be placed parallel to centerline of roadway.

The #6–F400 and #6–F402 bars shall be bent in the field to clear beams.

All concrete in the end bent above top of slab shall be Class B–2.

Strands at end of beams shall be field bent or, if necessary, cut in field to maintain 1 1/2" minimum clearance to fill face of end bent.

For location of coil tie rods and #5–H406 (strand tie bar), see Sheet S14.

No.	Revision/Issue	Date

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI
BOYD L. DENSON
NUMBER E-30094
05/04/2026
REGISTERED PROFESSIONAL ENGINEER

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers:
Engineering: 2000156885, Land Surveying: 2001011476,
Landscape Architecture: 2007013673

BRO–R003(001)
ATCHISON COUNTY, MISSOURI

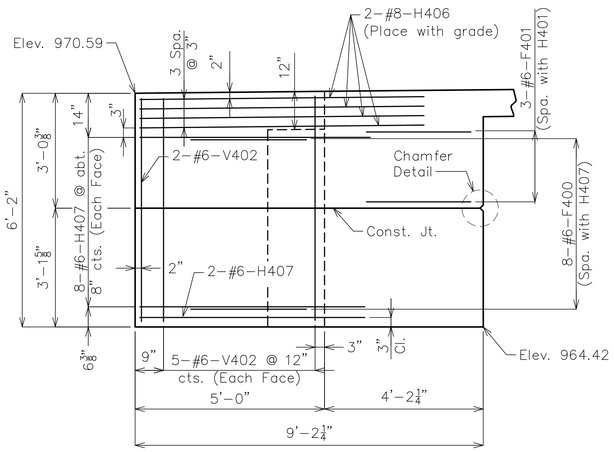
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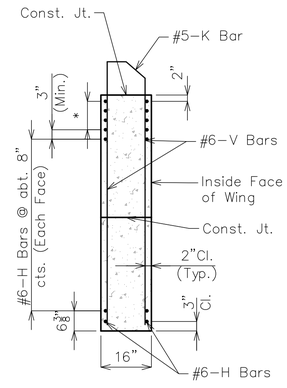
JOB 5051

S12

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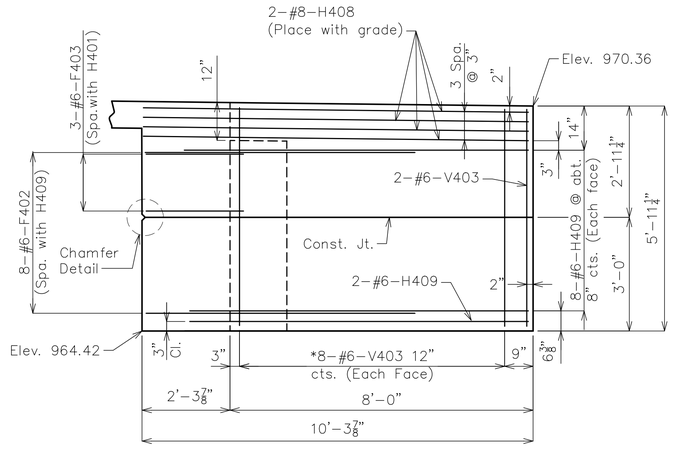


ELEVATION E–E



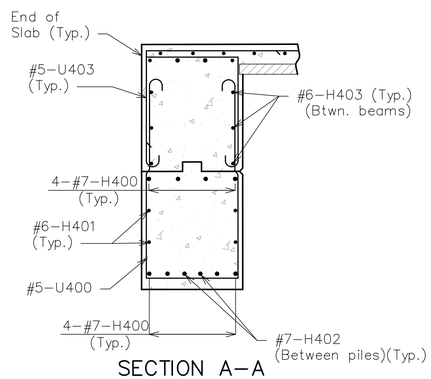
TYPICAL SECTION THRU WING

* #8–H Bars at 3" cts. (Each face) (Place with grade)

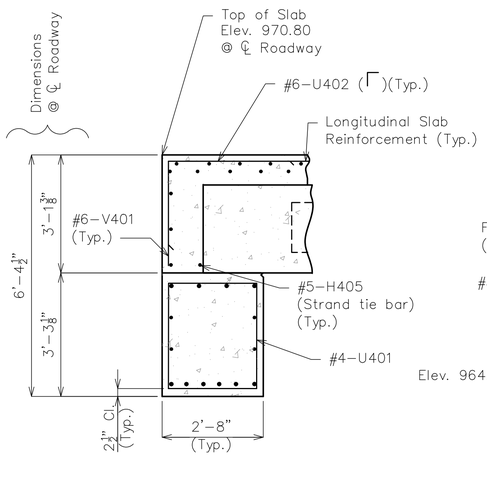


ELEVATION F–F

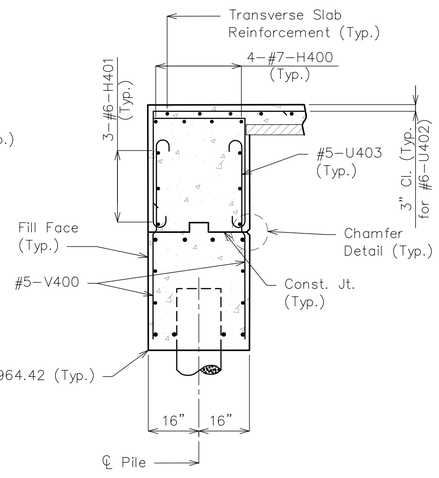
* The first outside face V403 bar adjacent to the beam shall be shifted 6" to avoid beam stirrups.



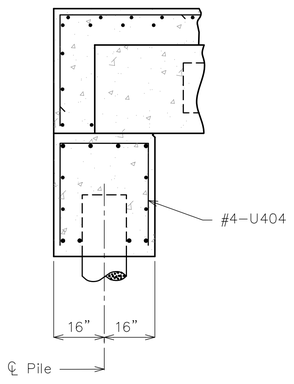
SECTION A–A



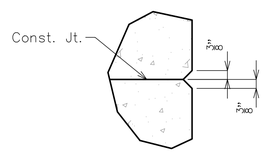
SECTION B–B



SECTION C–C



SECTION D–D



CHAMFER DETAIL

General Notes:

This drawing not to scale. Follow dimensions.

Work this sheet with Sheets S11 & S12.

For locations of Sections A–A, B–B, C–C & D–D and Elevation E–E & F–F, see Sheet S12.

For reinforcement of the barrier, see Sheet S21.

No.	Revision/Issue	Date

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI
BOYD L. DENSON
NUMBER E-30094
REGISTERED PROFESSIONAL ENGINEER
05/04/2026

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers: Engineering: 2000156885, Land Surveying: 2001011476, Landscape Architecture: 2007013073

BRO–R003(001)
ATCHISON COUNTY, MISSOURI

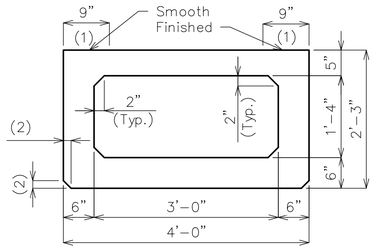
BENT 4

2026-05-04

JOB 5051

S13

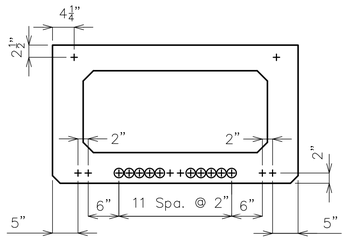
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DIMENSIONS

(1) Fabricator shall apply a bond breaker to this region excluding where joint filler will be applied.

(2) $1\frac{1}{2}$" (Typ.) ($\frac{3}{4}$" Optional)

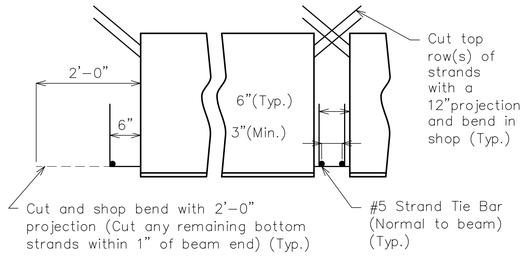


STRAND ARRANGEMENT

All strands are fully bonded unless otherwise noted.

\+ Indicates prestressing strand.

○ Indicates cut and shop bend with 2'–0" projection. Arrangment required for clearance to end bent reinforcement.

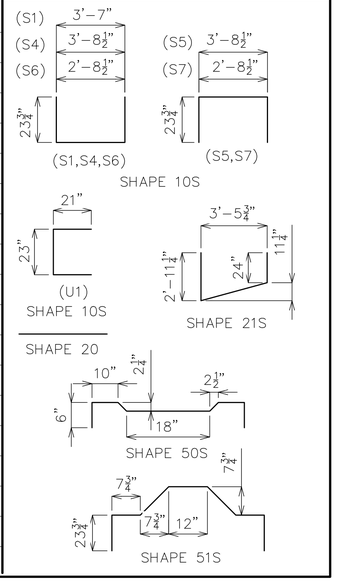


END BENT INTERMEDIATE BENT

STRANDS AT BEAM ENDS

BILL OF REINFORCING STEEL – EACH BEAM

NO.	SIZE & MARK	ACTUAL LENGTH	SHAPE	BENDING DIAGRAM
5	5 A1	47'–9"	20	
5	4 A2	47'–9"	20	
14	4 C1	3'–7"	20	
34	5 S1	7'–4"	10S	
34	5 S2	7'–9"	51S	
34	4 S3	4'–6"	50S	
18	5 S4	7'–6"	10S	
18	5 S5	7'–6"	10S	
2	5 S6	6'–6"	10S	
2	5 S7	6'–6"	10S	
12	6 U1	5'–1"	10S	
6	4 U2	8'–4"	21S	



All dimensions are out to out. Use symmetry for dimensions not shown.

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, unless otherwise shown.

All reinforcement shall be ASTM A615 or A706 Grade 60.

All S2 bars shall be epoxy coated.

General Notes:

This drawing is not to scale. Follow dimensions.

Concrete for prestressed beams shall be Class A–1 with f'c = 6,000 psi and f'ci = 4,500 psi.

Use 18 strands, 0.6"Ø Grade 270, with an initial prestress force of 791 kips.

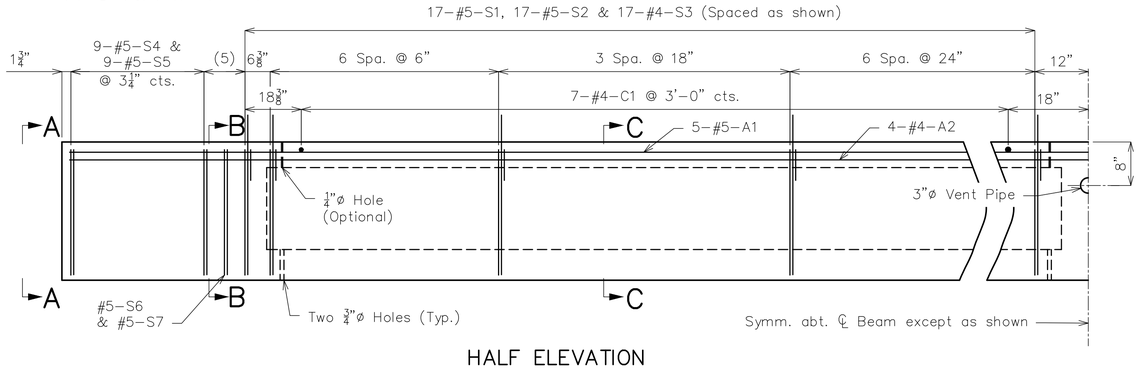
Pretensioned members shall be in accordance with Sec 1029.

Fabricator shall be responsible for location and design of lifting devices.

Exterior and interior beams are the same except: coil ties, application of bond breaker.

For Beam Camber Diagram, see Sheet S18.

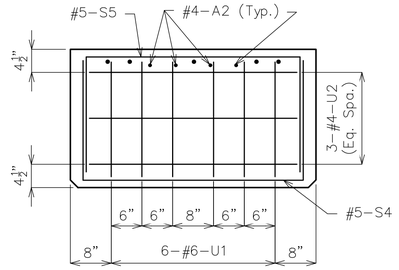
For location of coil ties at concrete bent diaphragms, see Sheets S5, S12 and S16.



HALF ELEVATION

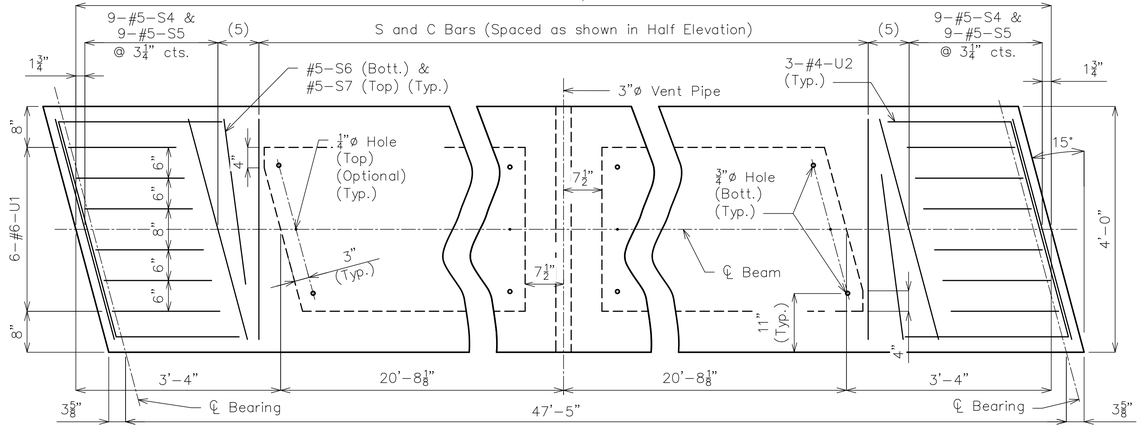
(5) 2 Spa. @ 4"

Dimensions taken along ℄ Beam.



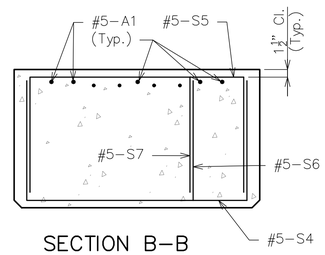
ELEVATION A–A

Strands not shown for clarity.



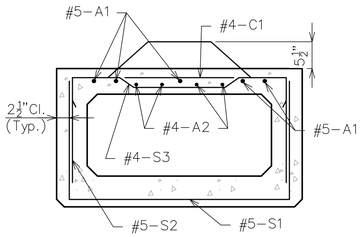
PART PLAN

Mirror about ℄ Beam for left advanced.

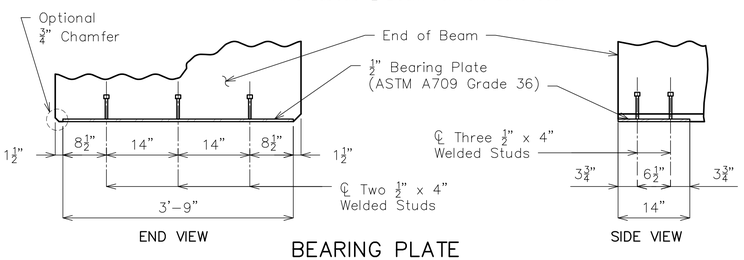


SECTION B–B

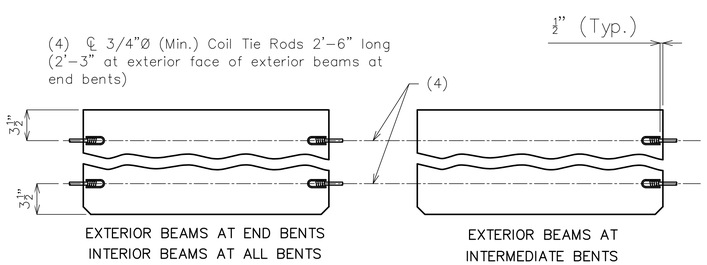
Mirror for left advanced.



SECTION C–C



BEARING PLATE



COIL TIES

Date

Revision/Issue

No.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI
DUSTIN L. BOYD
DENSON
NUMBER E-30094
REGISTERED PROFESSIONAL ENGINEER
05/04/2026

GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers: Engineering: 2001166885, Land Surveying: 2001011476, Landscape Architecture: 2007015073

BRO–R003(001)

ATCHISON COUNTY, MISSOURI

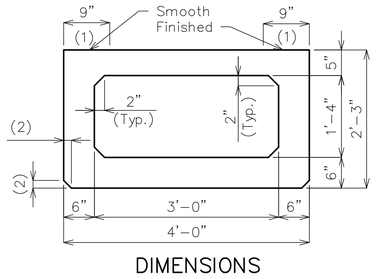
SPREAD BOX BEAMS – SPANS (1–2) & (3–4)

2026-05-04

JOB 5051

S14

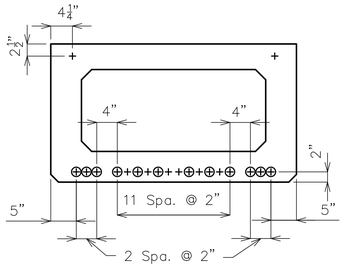
Z:\Shared\Projects\5051 - Atchison County Bridge #3570016 BRO-R00300119\Drawings\5051_STRUCTURAL.dwg PLOT DATE: 5/4/2026 12:40:08 PM LAST SAVE: 5/4/2026 12:38:15 PM



DIMENSIONS

(1) Fabricator shall apply a bond breaker to this region excluding where joint filler will be applied.

(2) 1½" (Typ.) (¾" Optional)

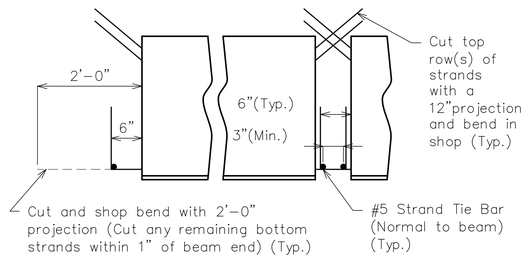


STRAND ARRANGEMENT

All strands are fully bonded unless otherwise noted.

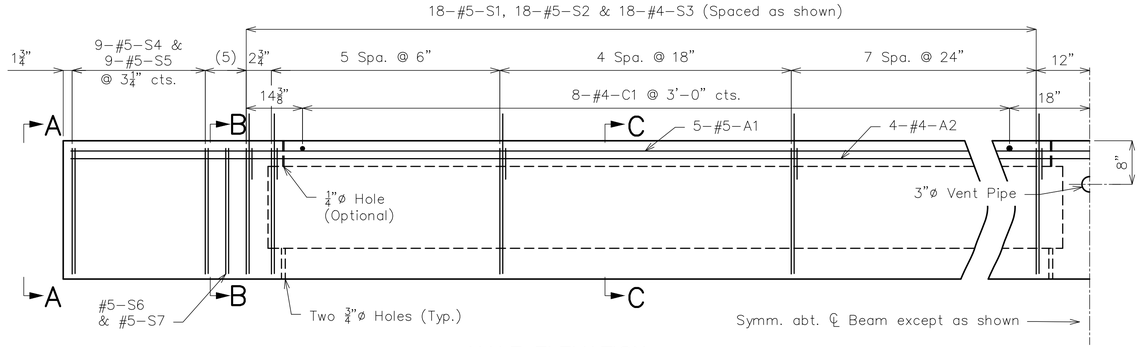
\+ Indicates prestressing strand.

○ Indicates cut and shop bend with 2'-0" projection.



END BENT INTERMEDIATE BENT

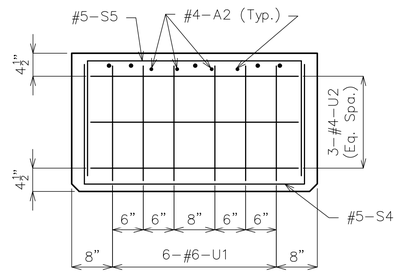
STRANDS AT BEAM ENDS



HALF ELEVATION

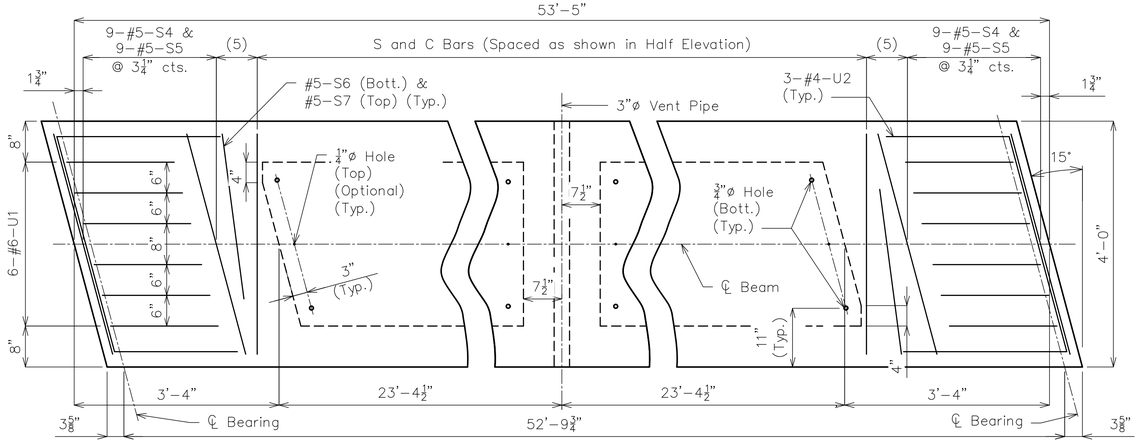
Dimensions taken along ℄ Beam.

(5) 2 Spa. @ 4"



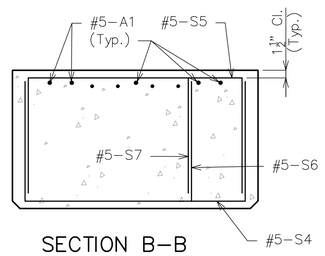
ELEVATION A–A

Strands not shown for clarity.



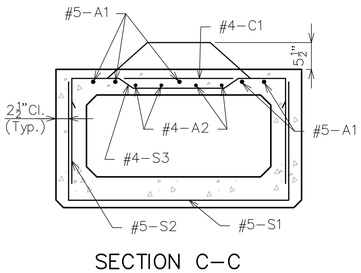
PART PLAN

Mirror about ℄ Beam for left advanced.

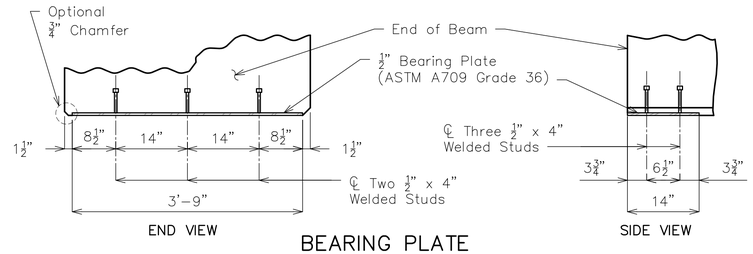


SECTION B–B

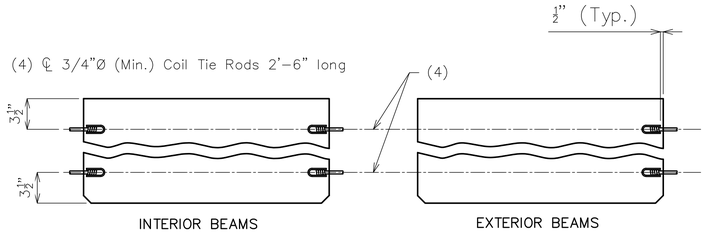
Mirror for left advanced.



SECTION C–C



BEARING PLATE

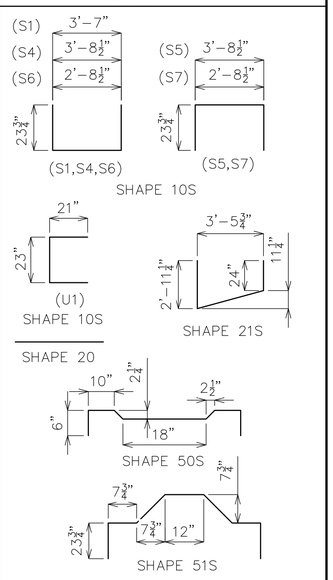


COIL TIES

BILL OF REINFORCING STEEL – EACH BEAM

NO.	SIZE & MARK	ACTUAL LENGTH	SHAPE
5	5 A1	53'–2"	20
4	4 A2	53'–2"	20
16	4 C1	3'–7"	20
36	5 S1	7'–4"	10S
36	5 S2	7'–9"	51S
36	4 S3	4'–6"	50S
18	5 S4	7'–6"	10S
18	5 S5	7'–6"	10S
2	5 S6	6'–6"	10S
2	5 S7	6'–6"	10S
12	6 U1	5'–1"	10S
6	4 U2	8'–4"	21S

BENDING DIAGRAM



All dimensions are out to out. Use symmetry for dimensions not shown.

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, unless otherwise shown.

All reinforcement shall be ASTM A615 or A706 Grade 60.

All S2 bars shall be epoxy coated.

General Notes:

This drawing is not to scale. Follow dimensions.

Concrete for prestressed beams shall be Class A–1 with f'c = 6,000 psi and f'ci = 4,500 psi.

Use 20 strands, 0.6"Ø Grade 270, with an initial prestress force of 878.9 kips.

Pretensioned members shall be in accordance with Sec 1029.

Fabricator shall be responsible for location and design of lifting devices.

Exterior and interior beams are the same except: coil ties, application of bond breaker.

For Beam Camber Diagram, see Sheet S18.

For location of coil ties at concrete bent diaphragms, see Sheet S16.

Date

Revision/Issue

No.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI
BOYD L. DENSON
NUMBER E-30094
05/04/2026
REGISTERED PROFESSIONAL ENGINEER

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers: Engineering: 2000156885, Land Surveying: 2001011476, Landscape Architecture: 2007015073

BRO–R003(001)
ATCHISON COUNTY, MISSOURI

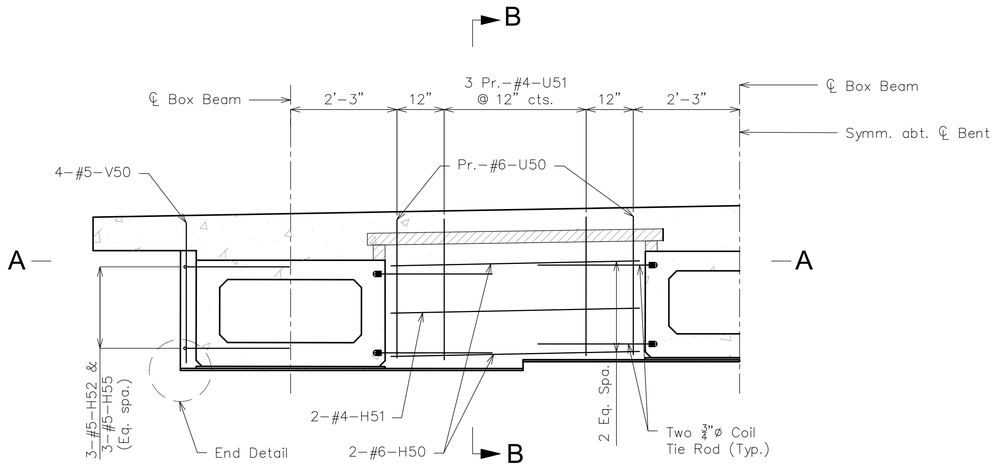
SPREAD BOX BEAMS – SPAN (2–3)

2026-05-04

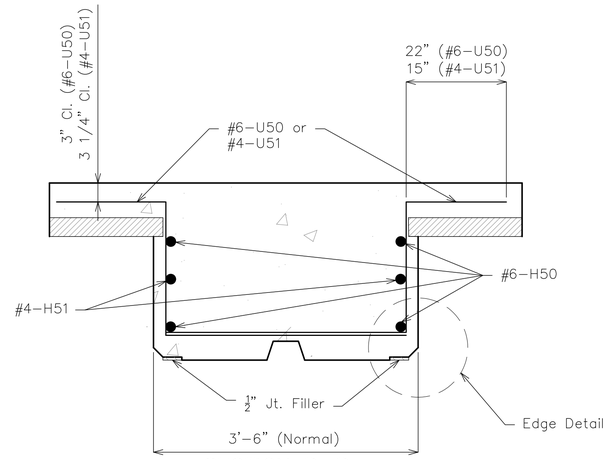
JOB 5051

S15

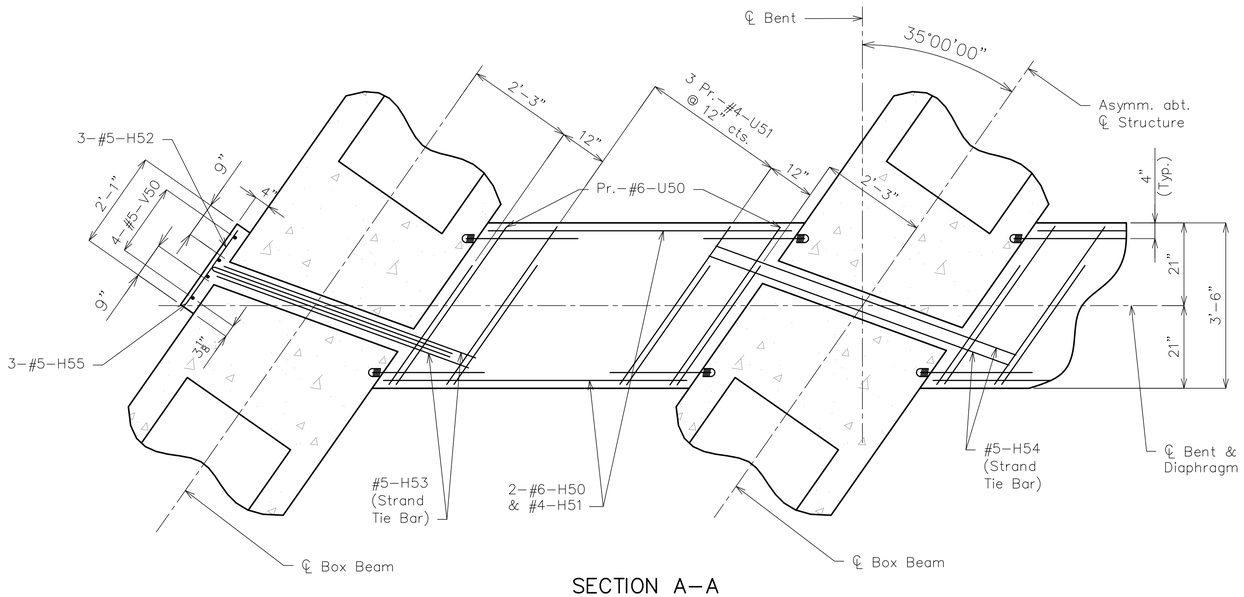
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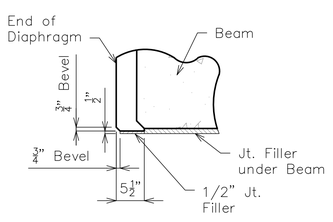
SECTION NEAR DIAPHRAGM
(Normal to centerline of beams)



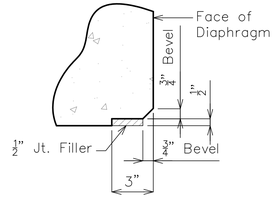
SECTION B–B



SECTION A–A



END DETAIL



EDGE DETAIL

General Notes:

This drawing not to scale. Follow dimensions.

For location of coil tie rods and strand tie bars, see Sheets S14 and S15.

Diaphragms at intermediate bents shall be built vertical.

The U bars shall be placed parallel to centerline of roadway.

No.	Revision/Issue	Date

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI
BOYD L. DENSON
NUMBER E-30094
REGISTERED PROFESSIONAL ENGINEER
05/04/2026

GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers: Engineering: 2000156885, Land Surveying: 2001011476, Landscape Architecture: 2007013573

BRO-R003(001)
ATCHISON COUNTY, MISSOURI

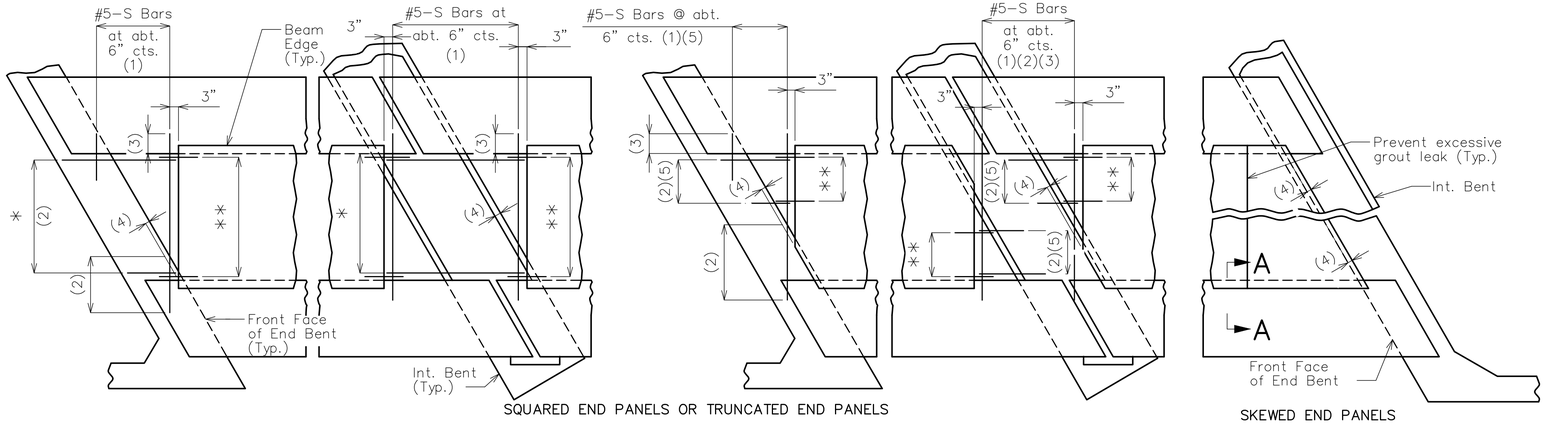
CONCRETE DIAPHRAGMS AT BENTS 2 AND 3

2026-05-04

JOB 5051

S16

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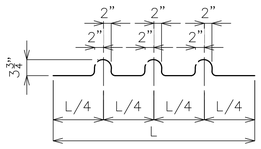


SQUARED END PANELS OR TRUNCATED END PANELS

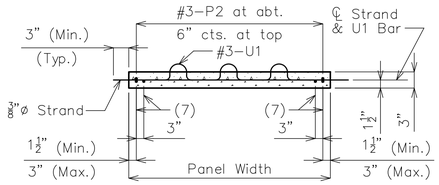
SKEWED END PANELS

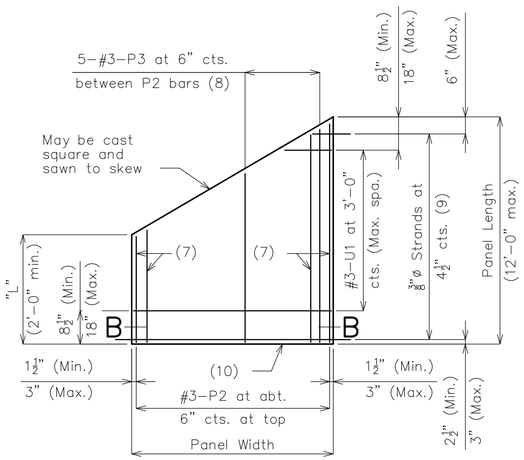
PLAN SHOWING PANEL PLACEMENT

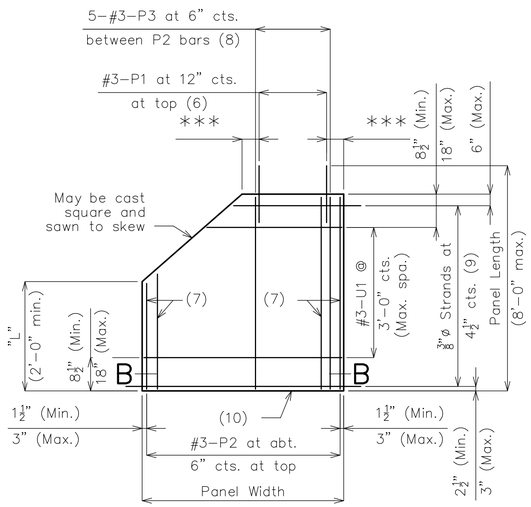
* #5–S Bars at abt. 9" cts. (1)
** #3–P1 at 12" cts. (End panels only)



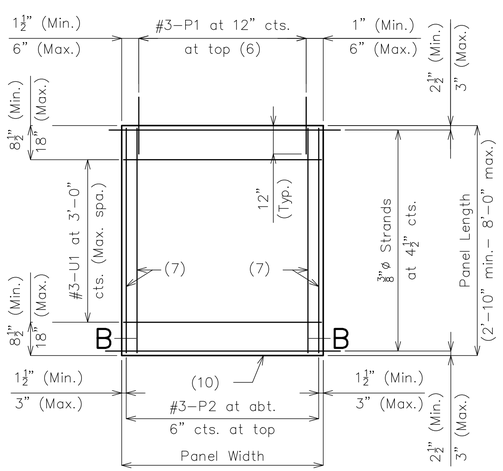
U1 Bars may be oriented at right angles to location and spacing shown. U1 Bars shall be placed between P1 bars.

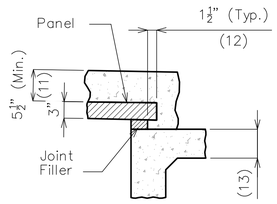






*** 3" (Min.), 6" (Max.)





Joint Filler Dimensions		
Width	Height	
	Min.	Max.
3"	1"	4"

Reference Notes:

Plan of Panels Placement:

(1) S–bars shown are bottom steel in slab between panels and used with squared and truncated end panels only.

(2) Extend S–bars 18 inches beyond the front face of end bents and int. bents for squared and truncated end panels only.

(3) Extend S–bars 9 inches beyond edge of girder (Typ.).

(4) End panels shall be dimensioned 1/2" min. to 1 1/2" max. from the inside face of diaphragm.

(5) For truncated end panels, use a min. of #5–S bars at 6" crossings in openings, or min. 4x4–W7xW7.

(6) For end panels only, P1 bars shall be 2'–0" in length and embedded 12". P1 bars will not be required for panels at squared integral end bents.

(7) #3–P2 bars near edge of panel at bottom (under strands).

(8) Use #3–P3 bars if panel is skewed 45° or greater.

(9) Any strand 2'–0" or shorter shall have a #4 reinforcing bar on each side of it, centered between strands. Strands 2'–0" or shorter may then be debonded at the fabricator's option.

(10) Optional 1/2" x 45° Chamfer one or both sides at bottom.

Section A-A:

(11) Slab thickness over prestressed panels varies due to girder camber. In order to maintain minimum slab thickness, it may be necessary to raise the grade uniformly throughout the structure. No payment will be made for additional labor or materials required for necessary grade adjustment.

(12) Contractor shall ensure proper consolidation under and between panels.

(13) At the contractor's option, the variation in slab thickness over prestressed panels may be eliminated or reduced by increasing and varying the girder top flange thickness. Dimensions shall be shown on the shop drawings.

General Notes:

This drawing not to scale. Follow dimensions.

Prestressed Panels:

Concrete for prestressed panels shall be Class A–1 with f'c = 6,000 psi, f'ci = 4,000 psi.

The top surface of all panels shall receive a scored finish with a depth of scoring of 1/8" perpendicular to the prestressing strands in the panels.

Prestressing tendons shall be high–tensile strength, uncoated, seven–wire, low–relaxation strands for prestressed concrete in accordance with AASHTO M 203 Grade 270, with nominal diameter of strand = 3/8" and nominal area = 0.085 sq.in. and minimum ultimate strength = 22.95 kips (270 ksi). Larger strands may be used with the same spacing and initial tension.

Initial prestressing force = 17.2 kips/strand.

The method and sequence of releasing the strands shall be shown on the shop drawings.

Suitable anchorage devices for lifting panels may be cast in panels, provided the devices are shown on the shop drawings and approved by the engineer. Panel lengths shall be determined by the contractor and shown on the shop drawings.

When squared end panels are used at skewed bents, the skewed portion shall be cast full depth. No separate payment will be made for additional concrete and reinforcing required.

Support from diaphragm forms is required under the optional skewed end until cast–in–place concrete has reached 3,000 psi compressive strength.

Prestressed panels shall be brought to saturated surface–dry (SSD) condition just prior to the deck pour. There shall be no free standing water on the panels or in the area to be cast.

The prestressed panel quantities are not included in the table of estimated quantities for the slab.

Reinforcing Steel:

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.

Minimum clearance to reinforcing steel shall be 1 1/2", unless shown.

If U1 bars interfere with placement of slab steel, U1 loops may be bent over, as necessary, to clear slab steel.

Deformed welded wire reinforcement (WWR) providing a minimum area of reinforcing perpendicular to strands of 0.22 sq in./ft, with spacing parallel to strands sufficient to ensure proper handling, may be used in lieu of the #3–P2 bars shown. Wire diameter shall not be larger than 0.375 inch. The above alternative reinforcement criteria may be used in lieu of the #3–P3 bars, when required, and placed over a width not less than 2 feet.

The following reinforcing steel shall be tied securely to the strands with the following maximum spacing in each direction:
#3–P2 bars at 16 inches.
WWR at 24 inches.

The #3–U1 bars shall be tied securely to #3–P2 bars, to WWR or to strands (when placed between P1 bars) at about 3–foot centers.

Minimum reinforcement steel length shall be 2'–0".

All reinforcement other than prestressing strands shall be epoxy coated.

Precast panels may be in contact with stirrup reinforcing in diaphragms.

S–bars are not listed in the bill of reinforcing.

Cost of S–bars will be considered completely covered by the contract unit price for the slab.

Joint Filler:

Joint filler shall be preformed fiber expansion joint material in accordance with Sec 1057 or expanded or extruded polystyrene bedding material in accordance with Sec 1073.

Use Slab Haunching Diagram on Sheet S18 for determining thickness of joint filler within the limits noted in the table of Joint Filler Dimensions.

Thicker material may be used on one or both sides of the girder to reduce cast–in–place concrete thickness to within tolerances.

The same thickness of preformed fiber expansion joint material shall be used under any one edge of any panel except at locations where top flange thickness may be stepped. The maximum changeinthickness between adjacent panels shall be 1/2 inch. The polystyrene bedding material may be cut with a transition to match haunch height above top of flange.

Joint filler shall be glued to the girder. When thickness exceeds 1 1/2 inches, the joint filler shall be glued top and bottom. The glue used shall be the type recommended by the joint filler manufacturer.

Edges of panels shall be uniformly seated on the joint filler before slab reinforcement is placed.

No.	Revision/Issue	Date

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI
DOUGLAS L. DENSON
NUMBER E-30094
REGISTERED PROFESSIONAL ENGINEER
05/04/2026

GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers:
Engineering: 2000156885, Land Surveying: 2001014476,
Landscape Architecture: 2007013973

BRO–R003(001)
ATCHISON COUNTY, MISSOURI

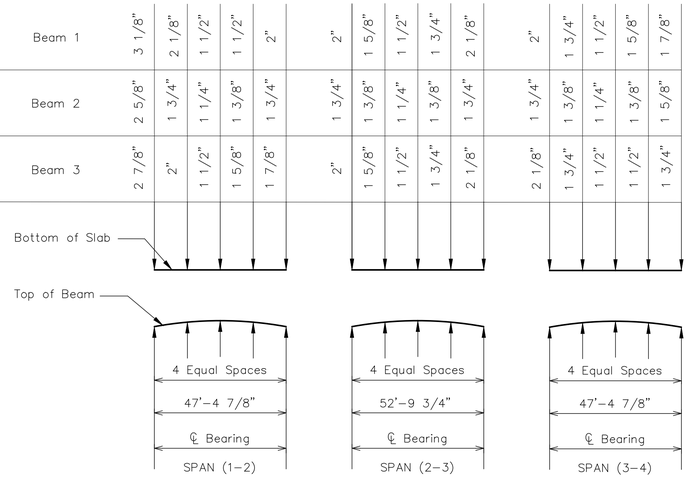
PRESTRESSED PANELS

2026-05-04

JOB 5051

S17

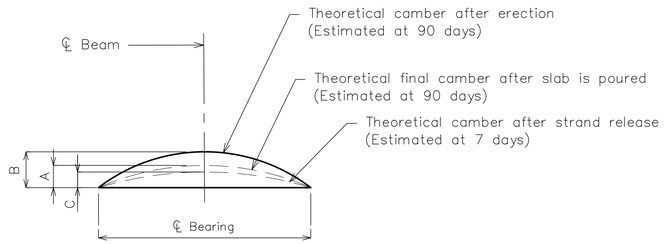
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THEORETICAL SLAB HAUNCHING DIAGRAM (ESTIMATED AT 90 DAYS)

If beam camber is different from that shown in the camber diagram, in order to maintain minimum slab thickness, an adjustment of the slab haunches, an increase in slab thickness or a raise in grade uniformly throughout the structure shall be necessary. No payment will be made for additional labor or materials required for variation in haunching, slab thickness, or grade adjustment.

Concrete in the slab haunches is included in the Estimated Quantities for Slab on Concrete Beam.



Beam	Span (1–2)			Span (2–3)			Span (3–4)		
	A	B	C	A	B	C	A	B	C
1 & 3	1"	1 3/8"	13/16"	1 1/4"	1 13/16"	1 1/8"	1"	1 3/8"	13/16"
2	15/16"			1 3/16"			15/16"		

BEAM CAMBER DIAGRAM

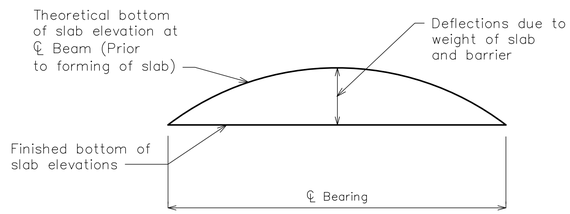
Conversion Factors for Beam Camber (Estimated at 90 days):

0.25 pt. = 0.7125 x 0.5 pt.

Theoretical Bottom of Slab Elevations at Centerline of Beam (Prior to forming for slab) (Estimated at 90 days)

Beam	Span (1–2) (47'–4 7/8" ℄ Brg. – ℄ Brg.)				
	℄ Brg.	0.25	0.50	0.75	℄ Brg.
1	969.88	969.98	970.07	970.14	970.19
2	970.09	970.20	970.28	970.35	970.40
3	969.97	970.07	970.16	970.23	970.27
Beam	**Span (2–3) (52'–9 3/4" ℄ Brg. – ℄Brg.)**				
	℄ Brg.	0.25	0.50	0.75	℄ Brg.
1	970.20	970.30	970.36	970.36	970.31
2	970.41	970.50	970.54	970.52	970.46
3	970.27	970.34	970.37	970.34	970.26
Beam	**Span (3–4) (47'–4 7/8" ℄ Brg. – ℄ Brg.)**				
	℄ Brg.	0.25	0.50	0.75	℄ Brg.
1	970.30	970.29	970.23	970.14	970.01
2	970.45	970.42	970.36	970.25	970.11
3	970.26	970.21	970.13	970.02	969.86

Elevations are based on a constant slab thickness of 8 1/2" and include allowance for theoretical dead load deflections due to weight of slab (including prestressed panel) and Barrier.



TYPICAL SLAB ELEVATIONS DIAGRAM

Date								
Revision/Issue								
No.	1	2	3	4	5	6	7	8

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI
BOYD L. DENSON
NUMBER E-30094
05/04/2026
REGISTERED PROFESSIONAL ENGINEER

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers: Engineering: 2000156885, Land Surveying: 2001011476, Landscape Architecture: 2007013573

BRO-R003(001)
ATCHISON COUNTY, MISSOURI

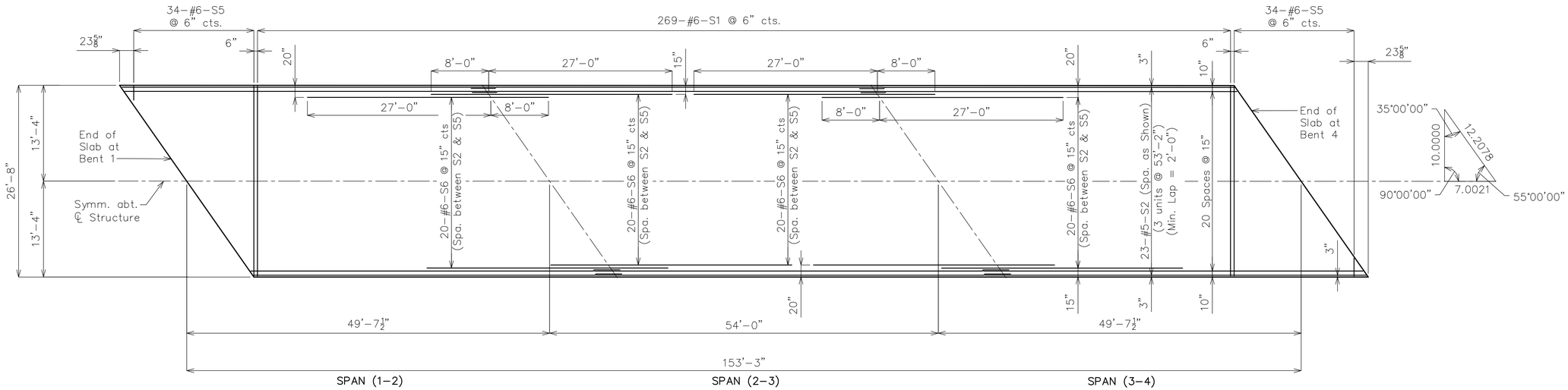
BEAM CAMBER, SLAB HAUNCHING & BOTTOM OF SLAB ELEVATIONS

2026-05-04

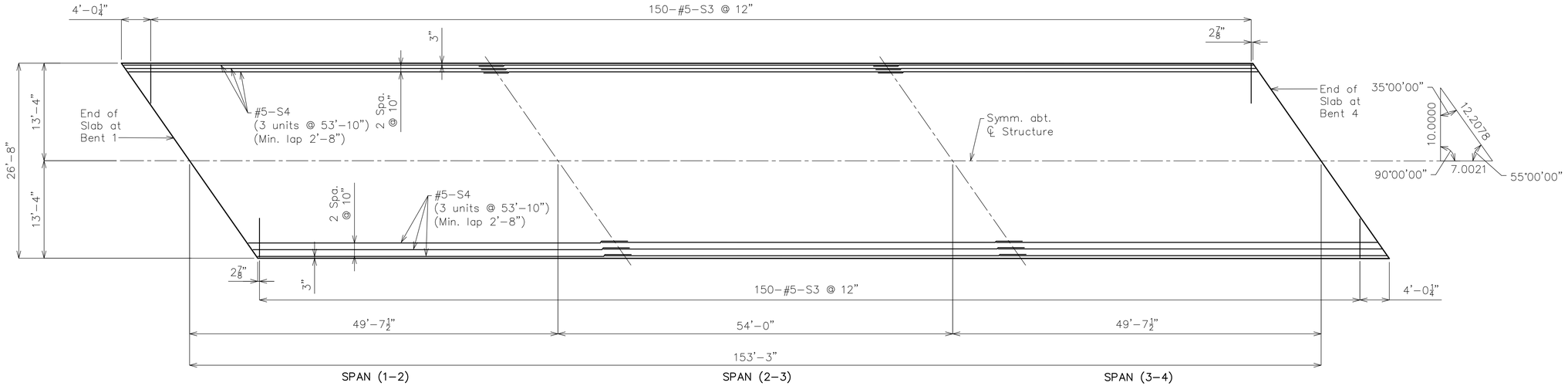
JOB 5051

S18

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PLAN OF SLAB SHOWING TOP REINFORCEMENT



PLAN OF SLAB SHOWING BOTTOM REINFORCEMENT

General Notes:

This drawing not to scale. Follow dimensions.

For Section Thru Slab and Slab Pouring Sequence, see Sheet S20.

Longitudinal slab dimensions are measured horizontally.

For Details and Reinforcement of Type H Barrier, see Sheets S21 & S22.

No.	Revision/Issue	Date

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BRO–R003(001)
ATCHISON COUNTY, MISSOURI

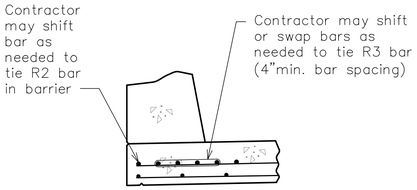
PLAN OF SLAB SHOWING REINFORCEMENT

2026-05-04

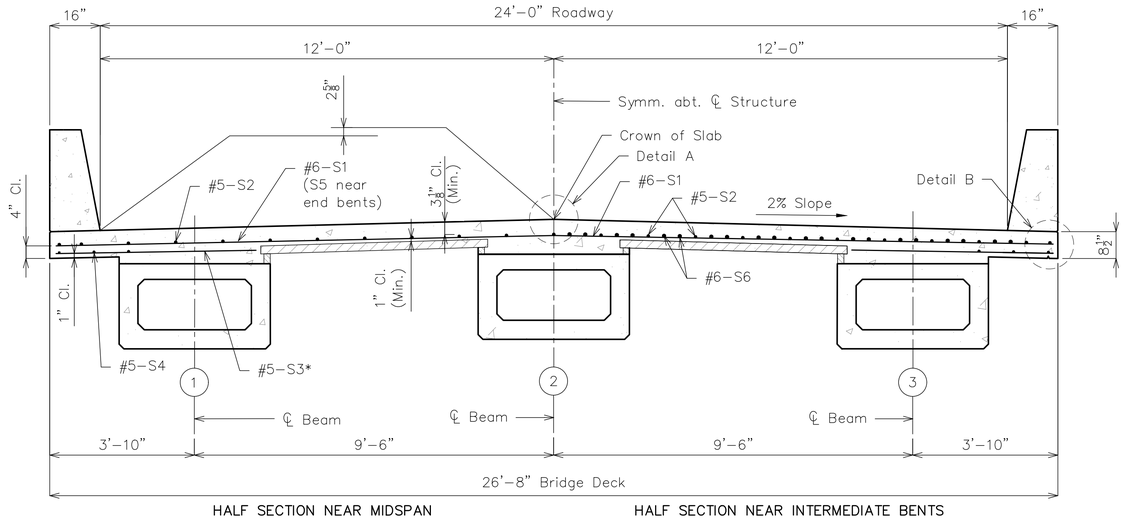
JOB 5051

S19

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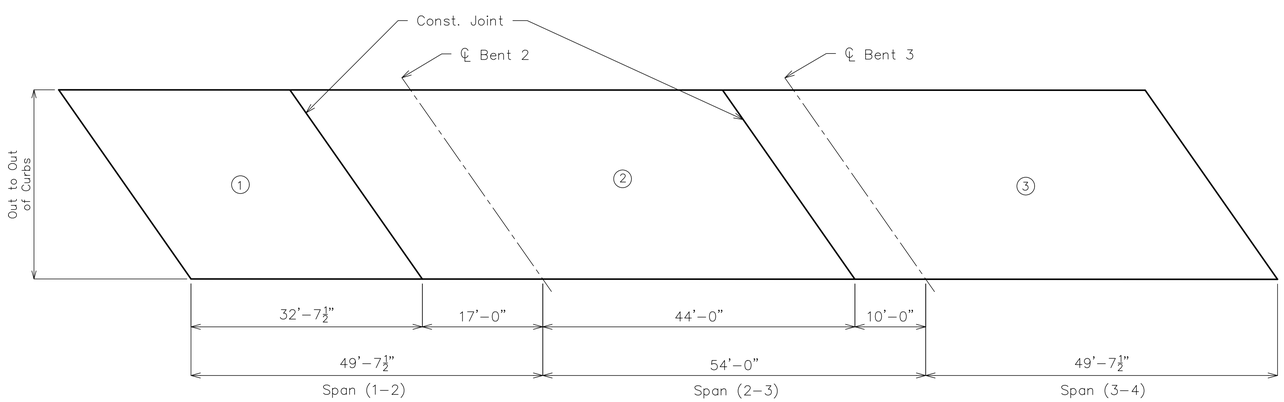


OPTIONAL SHIFTING
TOP BARS AT BARRIER



SECTION THRU SLAB

* Alternate bar shape available, see barrier sheet.

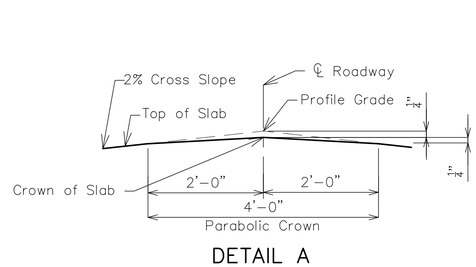


	Sequence of Pours			Min. Rate of Pour Cu. Yds./Hr.
	Directions			With Retarder
Basic Sequence	1	2	3	25
	End to 2	1 to 3	2 to End	
Alternate pours to the basic sequence are subject to the approval of the engineer in accordance with Sec 703.				
Alternate A Pours	1 + 2		3	25
	End to 2		2 to End	
Alternate B Pours	1 + 2 + 3			25
	End to End			

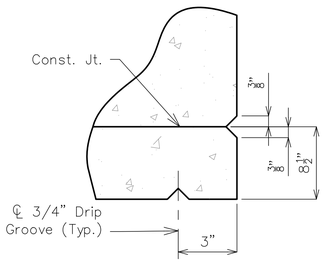
The contractor shall furnish an approved retarder to retard the set of the concrete to 2.5 hours, and shall pour and satisfactorily finish the slab pours at the rate given.

The concrete diaphragm at the intermediate bents and integral end bents shall be poured a minimum of 30 minutes and a maximum of 2 hours before the slab is poured.

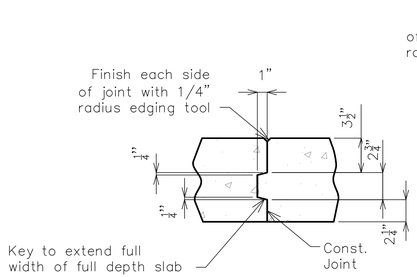
SLAB POURING SEQUENCE



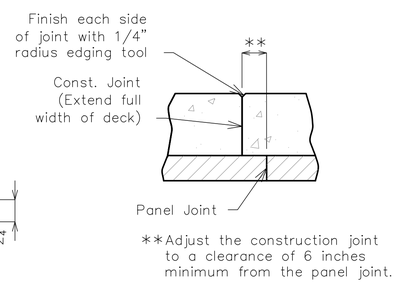
DETAIL A



DETAIL B



FULL DEPTH SLAB



SLAB ON PANELS

SLAB CONSTRUCTION JOINT

General Notes:

This drawing not to scale. Follow dimensions.

For details of precast prestressed panels, see Sheet S17.

For theoretical bottom of slab elevations, beam camber diagram, and theoretical slab haunching diagram, see Sheet S18.

For details and reinforcement of barrier not shown, see Sheet S21.

No.	Revision/Issue	Date

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STATE OF MISSOURI
BOYD L. DENSON
NUMBER E-30094
05/04/2026
REGISTERED PROFESSIONAL ENGINEER

GREAT RIVER ENGINEERING

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ATCHISON COUNTY, MISSOURI

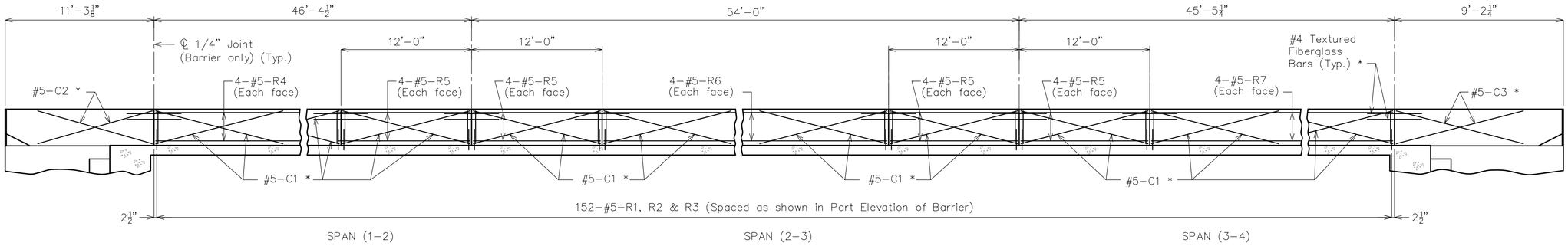
SECTION THRU SLAB AND SLAB POURING SEQUENCE

2026-05-04

JOB 5051

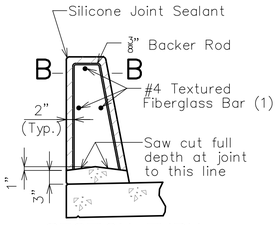
S20

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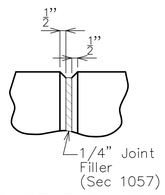


ELEVATION OF BARRIER

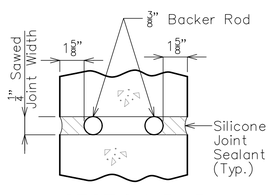
(Left barrier shown, right barrier similar)
Longitudinal dimensions are horizontal.



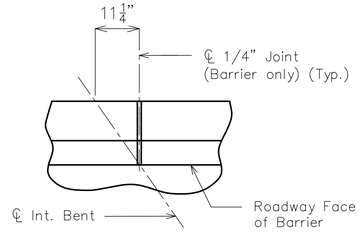
SECTION THRU SAW CUT JOINT



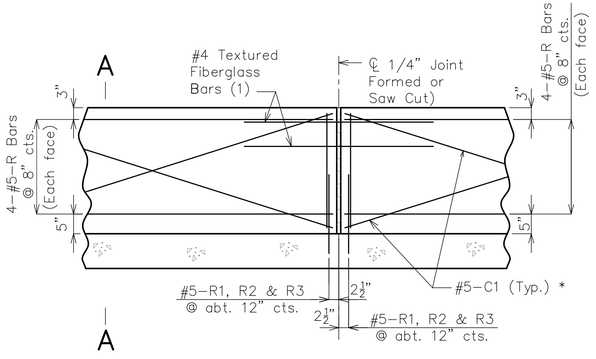
PART ELEVATION AT FORMED JOINT



SECTION B–B

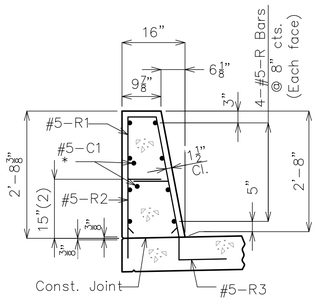


PART PLAN SHOWING JOINT LOCATION



PART ELEVATION OF BARRIER

(1) Four feet long, centered on joint, slip–formed option only

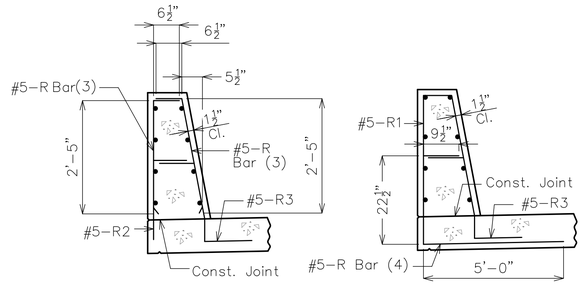


SECTION A–A

Use a minimum lap of 2'–6" for #5 horizontal barrier bars.

The cross–sectional area above the slab is 2.89 square feet.

(2) To top of bar



R–BAR PERMISSIBLE ALTERNATE SHAPE

(3) The R1 bar may be separated into two bars as shown, at the contractor's option, only when slip forming is not used. (All dimensions are out to out.)

(4) The R2 bar and #5 bottom transverse slab bar in cantilever (prestressed panels only) combination may be furnished as one bar as shown, at the contractor's option.

General Notes:

This drawing is not to scale. Follow dimensions.

* Slip–formed option only.

Conventional forming or slip forming may be used. Saw cut joints may be used with conventional forming.

Top of barrier shall be built parallel to grade and barrier joints (except at end bents) normal to grade.

All exposed edges of barrier shall have either a 1/2–inch radius or a 3/8–inch bevel, unless otherwise noted.

Payment for all concrete and reinforcement, complete in place, will be considered completely covered by the contract unit price for Type H Barrier per linear foot.

Concrete in barrier shall be Class B–1.

Measurement of barrier is to the nearest linear foot for each structure, measured along the outside top of slab from end of wing to end of wing.

Concrete traffic barrier delineators shall be placed on top of the barrier as shown on Missouri Standard Plan 617.10 and in accordance with Sec 617. Delineators on bridges with two–lane, two–way traffic shall have retroreflective sheeting on both sides. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for Type H Barrier.

Joint sealant and backer rods shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.

For slip–formed option, both sides of barrier shall have a vertically broomed finish and the top shall have a transversely broomed finish.

No.	Revision/Issue	Date

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ATCHISON COUNTY, MISSOURI

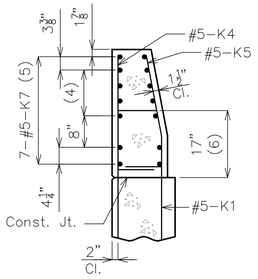
TYPE H BARRIER

2026-05-04

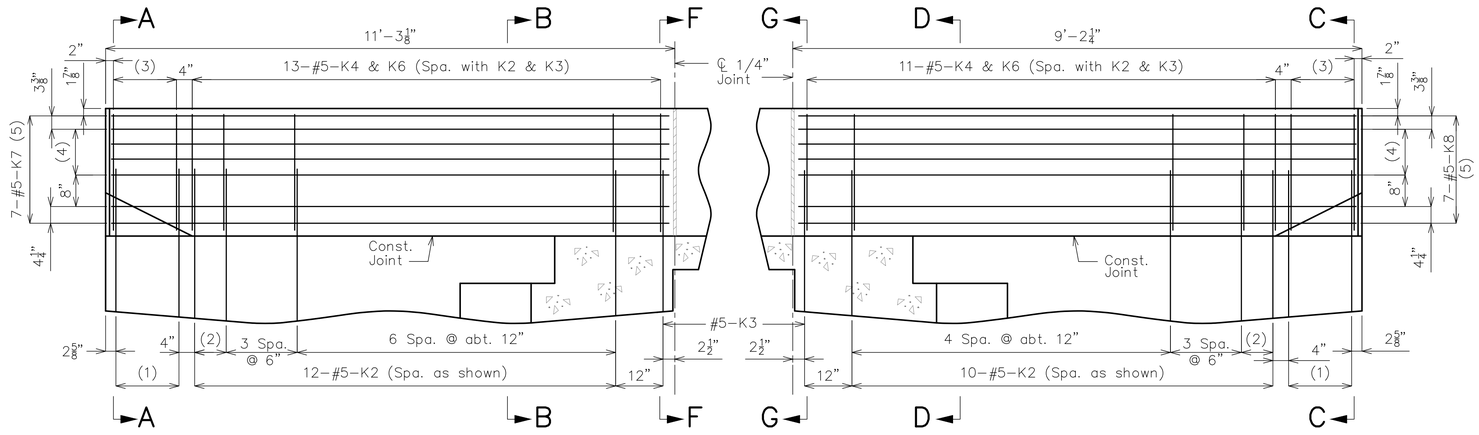
JOB 5051

S21

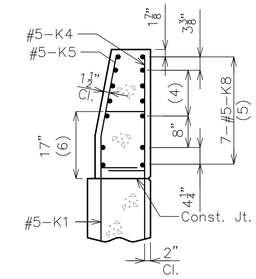
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SECTION A–A



PART ELEVATION



SECTION C–C

(1) 5–#5-K1 @ 4" cts.

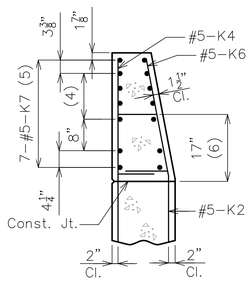
(2) 2 Spaces @ 4"

(3) 5–#5-K4 and 5–#5-K5, spaced with K1

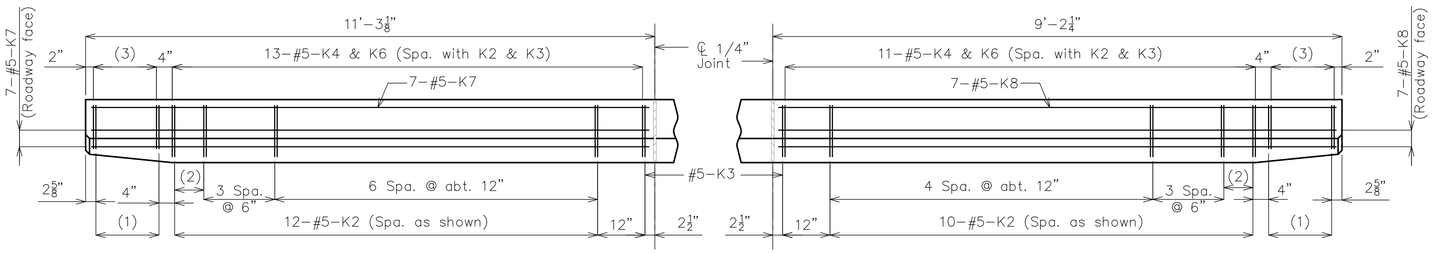
(4) 3 Spaces @ 3 13/16"

(5) Spaced as shown, each face

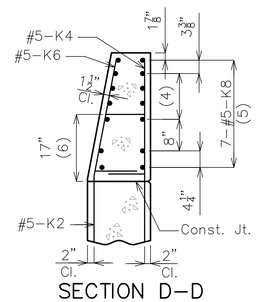
(6) To top of bar



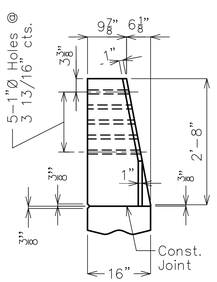
SECTION B–B



PART PLAN

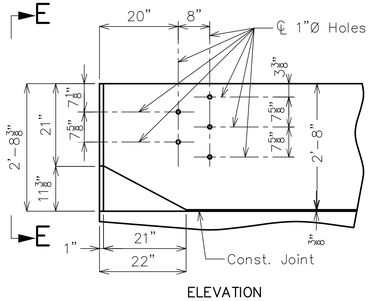


SECTION D–D

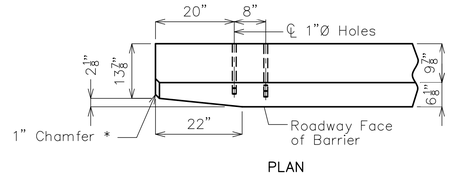


ELEVATION E–E

* Transition to zero at Type A curb for gutter lines to match.

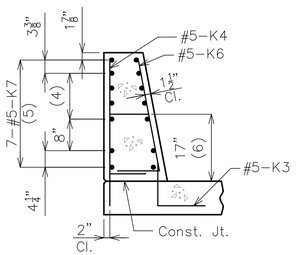


ELEVATION

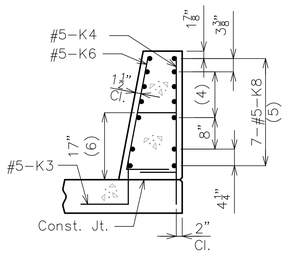


PLAN

DETAILS OF GUARD RAIL ATTACHMENT



SECTION F–F



SECTION G–G

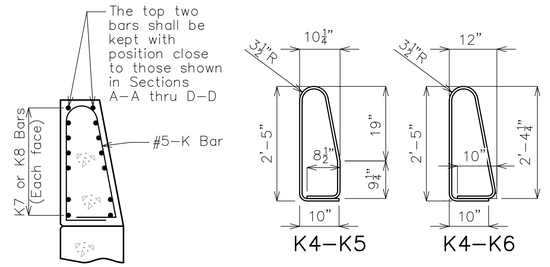
General Notes:

This drawing is not to scale. Follow dimensions.

Concrete traffic barrier delineators shall be placed on top of the barrier as shown on Missouri Standard Plan 617.10 and in accordance with Sec 617. Delineators on bridges with two–lane, two–way traffic shall have retro reflective sheeting on both sides. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for Type H Barrier.

Reinforcing Steel:

Minimum clearance to reinforcing steel shall be 1 1/2" except as shown for bars embedded into end bent.



PERMISSIBLE ALTERNATE SHAPES

(Other K bars not shown for clarity)

The K4–K5 and K4–K6 bar combination may be furnished as one bar as shown, at the contractor's option.

All dimensions are out to out.

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BRO–R003(001)
ATCHISON COUNTY, MISSOURI

TYPE H BARRIER AT END BENTS

2026-05-04

JOB 5051

S22

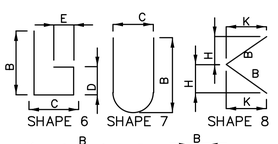
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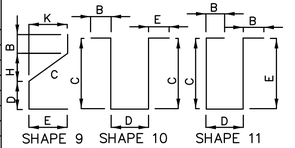
BILL OF REINFORCING STEEL

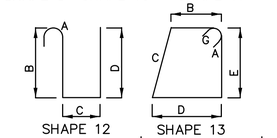
NO. REQ'D.	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			SUBSTRUCTURE																									
			BENT 2																									
12	6	D200	KEY		20		X			2	6.000													2	6	2	6	45
12	9	H200	BEAM TOP & BOT.		18		X			28	8.500													31	2	31	2	1272
4	6	H201	BEAM SIDES		20		X			28	8.000													28	8	28	8	172
8	7	H202	BEAM BOTTOM		18		X			4	11.000													6	7	6	7	108
2	4	H203	ENCASEMENT BOT.		18		X			27	0.000													28	0	28	0	37
42	4	H204	ENCASEMENT ENDS		7		X			3	0.000	19	6.500											6	11	6	11	194
40	4	H205	ENCASEMENT SIDE		20		X			27	0.000													27	0	27	0	721
40	4	P200	CIP PILE		34	S	X			10	0.000													3	4	3	4	89
76	5	U200	BEAM STIRRUP		13	S	X			2	7.000	2	8.500	2	7.000	2	8.500							11	6	11	2	885
40	5	U201	BEAM STIRRUP		10	S	X					2	8.500	2	7.000									8	0	7	9	323
8	6	U202	BEAM ENDS		10	S	X					12	0.000	3	0.250									5	0	4	8	56
40	4	U203	ENCASEMENT SIDE		19		X			21	11.000	20	0.500											23	8	23	6	628
20	4	V200	ENCASEMENT SIDE		20		X			21	11.000													21	11	21	11	293
30	5	V201	CIP PILE		17		X			5	3.000													5	10	5	10	183
			BENT 3																									
12	6	D300	KEY		20		X			2	6.000													2	6	2	6	45
12	9	H300	BEAM TOP & BOT.		18		X			28	8.500													31	2	31	2	1272
4	6	H301	BEAM SIDES		20		X			28	8.000													28	8	28	8	172
8	7	H302	BEAM BOTTOM		18		X			4	11.000													6	7	6	7	108
2	4	H303	ENCASEMENT BOT.		18		X			27	0.000													28	0	28	0	37
42	4	H304	ENCASEMENT ENDS		7		X			3	0.000	19	6.500											6	11	6	11	194
40	4	H305	ENCASEMENT SIDE		20		X			27	0.000													27	0	27	0	721
40	4	P300	CIP PILE		34	S	X			10	0.000													3	4	3	4	89
76	5	U300	BEAM STIRRUP		13	S	X			2	7.000	2	8.500	2	7.000	2	8.500							11	6	11	2	885
40	5	U301	BEAM STIRRUP		10	S	X					2	8.500	2	7.000									8	0	7	9	323
8	6	U302	BEAM ENDS		10	S	X					12	0.000	3	0.250									5	0	4	8	56
40	4	U303	ENCASEMENT SIDE		19		X			21	11.000	20	0.500											23	8	23	6	628
20	4	V300	ENCASEMENT SIDE		20		X			21	11.000													21	11	21	11	293
30	5	V301	CIP PILE		17		X			5	3.000													5	10	5	10	183
			SUPERSTRUCTURE																									
			END BENT 1																									
8	6	F100	WING BRACE	E	15	S				20	.375	3	0.875	20	.375	18	.125	9	.250	18	.125	9	.250	6	6	6	4	76
3	6	F101	DIAPHRAGM	E	21	S				2	9.875	6	0.750							2	3.875	19	.250	8	11	8	5	38
8	6	F102	WING BRACE	E	15	S				20	.250	5	6.625	20	.250	9	.875	17	.750	9	.875	17	.750	8	11	8	11	107
3	6	F103	DIAPHRAGM	E	21	S				2	10.375	6	0.875							2	3.875	20	.125	8	11	8	5	38
12	7	H100	BEAM & DIAPH	E	20					32	1.000													32	1	32	1	787
7	6	H101	BEAM & DIAPH	E	20					32	1.000													32	1	32	1	337
6	7	H102	BEAM BOTTOM	E	18					7	10.000													9	6	9	6	117
6	6	H103	DIAPHRAGM BAY	E	20					6	4.000													6	4	6	4	57
6	6	H104	DIAPHRAGM END	E	20					1	11.000													1	11	1	11	17
3	5	H105	STRAND TIE	E	23	S				1	10.625	3	7.250	1	3.250	5	.750	1	2.125	8	.250	1	9.125	6	9	6	9	21
8	8	H106	RT WING WALL	E	20					7	7.000													7	7	7	7	162
18	6	H107	RT WING WALL	E	20					6	1.000													6	1	6	1	164
8	8	H108	LT WING WALL	E	20					10	0.000													10	0	10	0	214
18	6	H109	LT WING WALL	E	20					9	1.000													9	1	9	1	246
32	4	P100	CIP PILE	E	34	S				10	0.000													3	4	3	4	71
12	5	U100	BEAM	E	37	S				5	3.000	2	10.750											14	4	14	2	177
27	4	U101	BEAM	E	13	S				2	10.750	2	8.000	2	10.750	2	8.000							11	11	11	7	209
39	6	U102	DIAPHRAGM	E	19	S				2	3.500	5	3.250											7	7	7	5	434

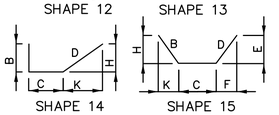
BILL OF REINFORCING STEEL

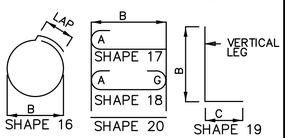
NO. REQ'D.	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
18	5	U103	DIAPHRAGM	E	37	S				2	7.000	2	10.750											9	0	8	10	166
2	4	U104	BEAM	E	10	S						2	8.000	2	10.750									8	3	8	1	11
12	5	V100	BEAM	E	17					5	3.000													5	10	5	10	73
23	6	V101	DIAPHRAGM	E	20					2	10.000													2	10	2	10	98
12	6	V102	RT WING WALL	E	20					5	11.000													5	11	5	11	107
18	6	V103	LT WING WALL	E	20					5	9.000													5	9	5	9	155
24	5	V104	CIP PILE	E	17					5	3.000													5	10	5	10	146
			END BENT 4																									
8	6	F400	WING BRACE	E	15	S				1	8.375	3	0.875	1	8.375	1	6.125	9	.250	1	6.125	9	.250	6	6	6	4	76
3	6	F401	DIAPHRAGM	E	21	S				2	9.875	6	0.750							2	3.875	7	.250	8	11	8	5	38
8	6	F402	WING BRACE	E	15	S				1	8.250	5	6.625	1	8.250	9	.875	1	5.750	9	.875	1	5.750	8	11	8	11	107
3	6	F403	DIAPHRAGM	E	21	S				2	10.375	6	0.875							2	3.875	8	.125	8	11	8	5	38
12	7	H400	BEAM & DIAPH	E	20					32	1.000													32	1	32	1	787
7	6	H401	BEAM & DIAPH	E	20					32	1.000													32	1	32	1	337
6	7	H402	BEAM BOTTOM	E	18					7	10.000													9	6	9	6	117
6	6	H403	DIAPHRAGM BAY	E	20					6	4.000													6	4	6	4	57
6	6	H404	DIAPHRAGM END	E	20					1	11.000													1	11	1	11	17
3	5	H405	STRAND TIE	E	23	S				1	10.625	3	7.250	1	3.250	5	.750	1	2.125	8	.250	1	9.125	6	9	6	9	21
8	8	H406	LT WING WALL	E	20					7	7.000													7	7	7	7	162
18	6	H407	LT WING WALL	E	20					6	1.000													6	1	6	1	164
8	8	H408	RT WING WALL	E	20					10	0.000													10	0	10	0	214
18	6	H409	RT WING WALL	E	20					9	1.000													9	1	9	1	246
32	4	P400	CIP PILE	E	34	S				10	0.000													3	4	3	4	71
12	5	U400	BEAM	E	37	S				5	2.000	2	10.750											14	2	14	0	175
27	4	U401	BEAM	E	13	S				2	10.750	2	8.000	2	10.750	2	8.000							11	11	11	7	209
39	6	U402	DIAPHRAGM	E	19	S				2	3.500	5	3.250											7	7	7	5	434
18	5	U403	DIAPHRAGM	E	37	S				2	4.000	2	10.750											8	6	8	4	156
2	4	U404	BEAM	E	10	S						2	8.000	2	10.750									8	3	8	1	11
12	5	V400	BEAM	E	17					5	2.000													5	9	5	9	72
23	6	V401	DIAPHRAGM	E	20					2	7.000													2	7	2	7	89
12	6	V402	LT WING WALL	E	20					5	10.000													5	10	5	10	105
18	6	V403	RT WING WALL	E	20					5	7.000													5	7	5	7	151
24	5	V404	CIP PILE	E	17					5	3.000													5	10	5	10	146
			DIAP @ INT BENTS																									
16	6	H50	TOP/BOTT INTER	E	20					6	4.000													6	4	6	4	152
8	4	H51	SIDE INTERIOR	E	20					6	4.000													6	4	6	4	34
12	5	H52	ENDS	E	21	S				1	1.750	5	5.250									1	1.125	4	.125	6	7	6	5	80
8	5	H53	EXT. STRAND TIE	E	20					5	8.000													5	8	5	8	47
4	5	H54	INT. STRAND TIE	E	20					6	9.000													6	9	6	9	28
12	5	H55	ENDS	E	21	S				1	0.375			5	5.250							1	0.000	3	.125	6	6	6	5	80
16	6	U50	SIDE INTERIOR	E	28	S						3	3.000	2	6.000	1	10.000							7	7	7	3	174
24	4	U51	SIDE INTERIOR	E	28	S						2	11.000	2	5.750	1	3.000							6	8	6	6	104
16	5	V50	ENDS	E	20					2	8.000													2	8	2	8	45
			SLAB																									
269	6	S1	TOP TRANSVERSE	E	20					26	4.000													26	4	26	4	10640
69	5	S2	TOP LONGITUD	E	20					53	2.000													53	2	53	2	3826
300	5	S3	BOTTOM TRANSV	E	20					5	0.000													5	0	5	0	1565
18	5	S4	BOTTOM LONGITUD	E	20					53	10.000													53	10	53	10	1011
68	6	S5	TOP TRAN @ ENDS	E	20			V	2	2	4.000													2	4	2	4	1443
			INCR. = 8.625"							25	11.000													25	11	25	11	
80	6	S6	LONGITUD @ BENT	E	20					35	1.000													35	1	35	1	4216

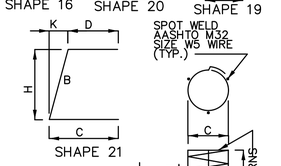


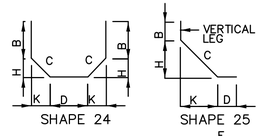


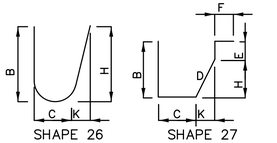


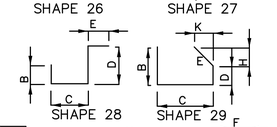


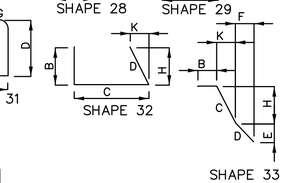


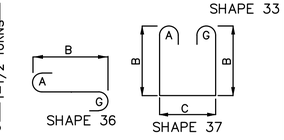




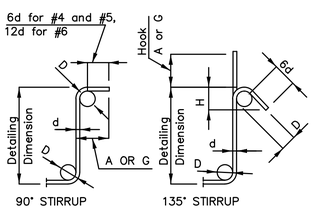






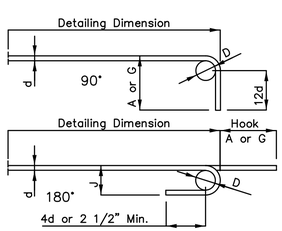


BENDING DIAGRAMS



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.



END HOOK DIMENSIONS			
Bar Size	D (In.)	All Grades	
		180° Hooks	90° Hooks
		A or G	J
#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"

NOTE:
All standard hooks and bends other than 180 degree are 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 included in Substructure Quantities.
VS = Bar dimensions vary in equal increments between dimensions shown on this line and the following VL 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 fabricators use. (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 Weight of column spirals do not include splices or spacers.
Reinforcing steel (ASTM A615 Grade 60) fy = 60,000 psi.

Note: This drawing not to scale. Follow dimensions.

No.	Revision/Issue	Date

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI
DOUGLAS L. BOYD
DENSON
NUMBER E-30094
REGISTERED PROFESSIONAL ENGINEER
05/04/2026

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers:
Engineering: 2000156885, Land Surveying: 2001011476,
Landscape Architecture: 2007015073

BRO-R003(001)
ATCHISON COUNTY, MISSOURI

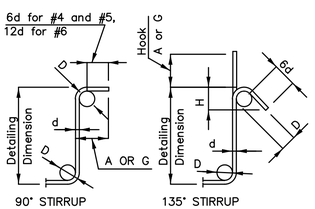
BILL OF REINFORCING STEEL

2026-05-04
JOB 5051
S23

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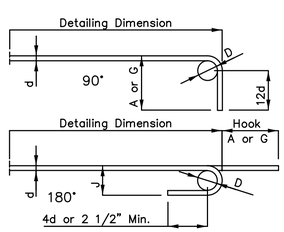
BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			TYPE H BARRIER																									
20	5	K1	AT END BENT	E	27	S				3	5.000	9.250		5.375		2	11.750				5.250		1.000	7	7	7	4	153
44	5	K2	AT END BENT	E	27	S				3	5.000	9.250		1	2.500	2	2.750			1	2.250		2.750	7	8	7	4	337
4	5	K3	AT END BENT	E	27	S				1	10.500	9.250		1	2.500		7.750	1	0.000	1	2.250		2.750	5	6	5	2	22
68	5	K4	AT END BENT	E	19	S				2	5.000	10.000												3	3	3	2	225
20	5	K5	AT END BENT	E	27	S					8.250	9.500		1	7.250						4.250	1	6.750	3	1	2	10	59
48	5	K6	AT END BENT	E	21	S				2	4.875	10.000								2	4.250		6.000	3	3	3	1	154
28	5	K7	AT END BENT	E	20					10	11.000													10	11	10	11	319
28	5	K8	AT END BENT	E	20					8	10.000													8	10	8	10	258
304	5	R1	ELEVATION	E	14	S				2	5.000	6.500		2	5.500					2	5.000		5.500	5	5	5	3	1665
304	5	R2	ELEVATION	E	19	S				1	8.500	9.500												2	6	2	5	766
304	5	R3	ELEVATION	E	27	S						9.500		1	3.250		5.000	1	0.000	1	3.000		3.000	3	6	3	4	1057
16	5	R4	ELEVATION	E	20					34	1.000													34	1	34	1	569
64	5	R5	ELEVATION	E	20					11	8.000													11	8	11	8	779
16	5	R6	ELEVATION	E	20					29	8.000													29	8	29	8	495
16	5	R7	ELEVATION	E	20					33	1.000													33	1	33	1	552
			SLIP FORM																									
40	5	C1	NEXT TO JOINT	E	20					12	0.000													12	0	12	0	501
4	5	C2	ABOVE 8' WINGS	E	20					8	9.000													8	9	8	9	37
4	5	C3	ABOVE 5' WINGS	E	20					6	9.000													6	9	6	9	28
			TOTALS																									
	4																											3924
	4			E																								720
	5																											2782
	5			E																								15811
	6																											546
	6			E																								20358
	7																											216
	7			E																								1808
	8																											752
	9																											2544
			TOTAL																									10012
			TOTAL	E																								39449
			SLAB ON CONCRETE BEAM																									
	4			E																								720
	5			E																								7835
	6			E																								20358
	7			E																								1808
	8			E																								752
			TOTAL	E																								31473
			REINFORCING STEEL (BRIDGES)																									
	4																											3924
	5																											2782
	6																											546
	7																											216
	9																											2544
			TOTAL																									10012
			TYPE H BARRIER																									
	5			E																								7976
			TOTAL	E																								7976



STIRRUP HOOK DIMENSIONS			
GRADES 40 – 50 – 60 KSI			
Bar Size	D (In.)	90° Hook Hook A or G	135° Hook Hook A or G	135° Hook 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"

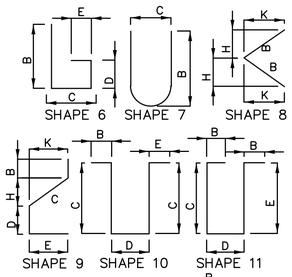
Note: Unless otherwise noted diameter "D" is the same for all bends and hooks on a bar.



END HOOK DIMENSIONS				
		All Grades		
Bar Size	D (In.)	180° Hooks A or G	180° Hooks J	90° Hooks 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"

NOTE:
All standard hooks and bends other than 180 degree are 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 included in Substructure Quantities.
VS = Bar dimensions vary in equal increments between dimensions shown on this line and the following VL 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 fabricators use. (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 Weight of column spirals do not include splices or spacers.
Reinforcing steel (ASTM A615 Grade 60) fy = 60,000 psi.

Note: This drawing not to scale. Follow dimensions.



BENDING DIAGRAMS

No.	Revision/Issue	Date

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI
BOYD L. DENSON
NUMBER E-30094
05/04/2026
REGISTERED PROFESSIONAL ENGINEER

GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers:
Engineering: 2000156885; Land Surveying: 2001011476;
Landscape Architecture: 2007013073

BRO-R003(001)
ATCHISON COUNTY, MISSOURI

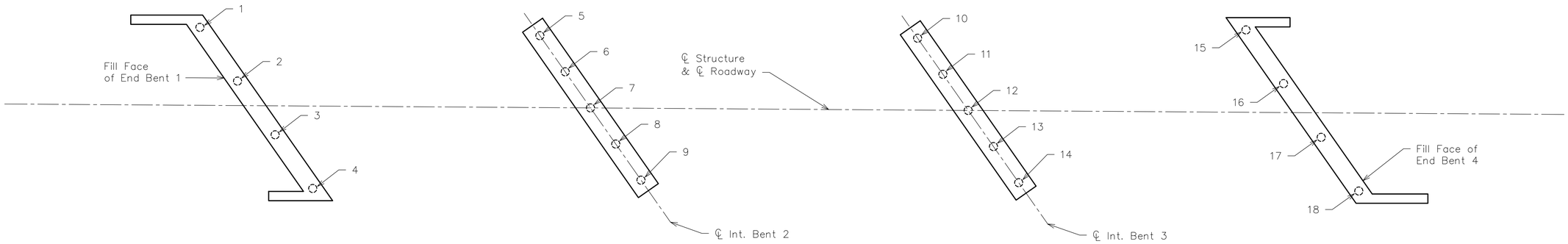
BILL OF REINFORCING STEEL

2026-05-04

JOB 5051

S24

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PART PLAN SHOWING PILE NUMBERING FOR RECORDING AS–BUILT PILE DATA

As–Built Pile Data			
Pile No.	Length in Place (ft)	Computed Nominal Axial Compressive Resistance (kips)	Remarks
			End Bent 1
1			
2			
3			
4			
			Intermediate Bent 2
5			
6			
7			
8			
9			

As–Built Pile Data			
Pile No.	Length in Place (ft)	Computed Nominal Axial Compressive Resistance (kips)	Remarks
			Intermediate Bent 3
10			
11			
12			
13			
14			
			End Bent 4
15			
16			
17			
18			

Note:
Indicate in remarks column:
A. Pile type & grade
B. Batter
C. Driven to practical refusal

Date	Revision/Issue	No.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI
BOYD L. DENSON
NUMBER E-30094
05/04/2026
REGISTERED PROFESSIONAL ENGINEER

GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers: Engineering: 2000156885, Land Surveying: 2001011476, Landscape Architecture: 2007013073

BRO–R003(001)
ATCHISON COUNTY, MISSOURI

AS–BUILT PILE DATA

2026-05-04

JOB 5051

S25

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BORING NUMBER BH-1

CLIENT Atchison County
PROJECT NAME Bridge #3570016
PROJECT NUMBER 5051
PROJECT LOCATION Fairfax, MO
DATE STARTED 6/30/25 **COMPLETED** 7/3/25
GROUND ELEVATION 970.11 ft **HOLE SIZE** 4
DRILLING CONTRACTOR Great River Engineering
GROUND WATER LEVELS:
DRILLING METHOD Mud Rotary
AT TIME OF DRILLING ---
LOGGED BY C. Southard **CHECKED BY** C. Gibson
AT END OF DRILLING ---
NOTES Restrike required after at least 7 days
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		ROADWAY FILL										
		DARK GRAY SILTY LEAN CLAY, MOIST, MEDIUM FIRM TO STIFF										
10		GRAY LEAN CLAY, MOIST, STIFF	SPT		4-4-4 (8)			25.3				
			SPT		3-3-5 (8)			29.6	41	23		
20		VERY MOIST, MEDIUM FIRM	SPT		5-5-6 (11)			19.1				
			SPT		3-3-2 (5)			40.7				
30			SPT		2-2-3 (5)			32.3				
			SPT		3-2-2 (4)			35.3				
40			SPT		3-3-3 (6)			39.9				
			SPT		4-5-5 (10)			38.3	38	30		
50												

(Continued Next Page)

BORING NUMBER BH-1

CLIENT Atchison County
PROJECT NAME Bridge #3570016
PROJECT NUMBER 5051
PROJECT LOCATION Fairfax, MO

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
50		DARK GRAY SILTY LEAN CLAY, MOIST, MEDIUM FIRM TO STIFF *(continued)*	SPT		4-5-8 (13)			22.2				
		GRAY SILTY LEAN CLAY, MOIST, STIFF	SPT		6-7-8 (15)			22.7				
60		GRAY FINE SAND WITH CLAY, MOIST, MEDIUM DENSE	SPT		4-8-8 (16)			24.4	21	15		
		BORE HOLE COLLAPSING, SKIPPED SAMPLE										
70		GRAY LEAN CLAY WITH TRACE AMOUNTS OF GRAVEL, MOIST, VERY STIFF	SPT		12-18-18 (36)			32.1				
			SPT		10-11-13 (24)			17.3	39	13		
80		LIGHT GRAY LEAN CLAY WITH TRACE AMOUNTS OF GRAVEL, MOIST, VERY STIFF	SPT		8-13-16 (29)			18.7				
			SPT		8-14-15 (29)			19.9				
90			SPT		10-12-15 (27)			13.5				
			SPT		10-12-15 (27)			21.6				
100												

Bottom of borehole at 100.0 feet.

For locations of borings, see Sheet S1.

No.	Revision/Issue	Date

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI — BOYD L. DENSON — NUMBER E-30094 — REGISTERED PROFESSIONAL ENGINEER — 05/04/2026

GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers: Engineering: 2001056885; Land Surveying: 2001011476; Landscape Architecture: 2007013073

BRO-R003(001)
ATCHISON COUNTY, MISSOURI

BORING DATA

2026-05-04
JOB 5051

S26

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BORING NUMBER BH-2

CLIENT Atchison County
PROJECT NAME Bridge #3570016
PROJECT NUMBER 5051
PROJECT LOCATION Fairfax, MO
DATE STARTED 6/30/25 **COMPLETED** 7/3/25
GROUND ELEVATION 970.65 ft **HOLE SIZE** 4
DRILLING CONTRACTOR Great River Engineering
GROUND WATER LEVELS:
DRILLING METHOD Mud Rotary
AT TIME OF DRILLING ---
LOGGED BY C. Southard **CHECKED BY** C. Gibson
AT END OF DRILLING ---
NOTES Restrike required after at least 7 days
AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0		ROADWAY FILL										
		GRAY SILTY LEAN CLAY, MOIST TO VERY MOIST, MEDIUM FIRM										
10		VERY MOIST, MEDIUM FIRM	SPT		4-3-2 (5)			27.3				
			SPT		3-3-2 (5)			39.0				
20		VERY MOIST TO MOIST, MEDIUM FIRM TO STIFF	SPT		2-2-3 (5)			32.0	30	19		
			SPT		2-2-2 (4)			32.3				
30		VERY MOIST, SOFT TO MEDIUM FIRM	SPT		3-3-2 (5)			39.8				
			SPT		1-1-2 (3)							
40		GRAY SILTY LEAN CLAY, MOIST, STIFF	SPT		4-4-4 (8)			47.0	39	25		
50			SPT		6-5-5 (10)							

(Continued Next Page)

BORING NUMBER BH-2

CLIENT Atchison County
PROJECT NAME Bridge #3570016
PROJECT NUMBER 5051
PROJECT LOCATION Fairfax, MO

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
50		GRAY SILTY LEAN CLAY, MOIST, STIFF	SPT		6-6-9 (15)			13.5				
			SPT		5-11-10 (21)			18.6	28	22		
60		GRAVEL AND SAND MIX, MEDIUM DENSE, HARDER DRILLING, HOLE CAVING	SPT		6-12-8 (20)			21.3				
			SPT		18-11-12 (23)							
70		DARK GRAY LEAN CLAY WITH GRAVEL, MOIST, VERY STIFF	SPT		9-9-10 (19)			28.8	30	14		
80			SPT		10-11-14 (25)			44.7	38	17		
			SPT		10-14-16 (30)			14.3				
90			SPT		10-15-12 (27)							
100												

Bottom of borehole at 100.0 feet.

For locations of borings, see Sheet S1.

No.	Revision/Issue	Date

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

STATE OF MISSOURI
BOYD L. DENSON
NUMBER E-30094
REGISTERED PROFESSIONAL ENGINEER
05/04/2026

GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers: Engineering: 2000156885; Land Surveying: 2001011476; Landscape Architecture: 2007013073

BRO-R003(001)
ATCHISON COUNTY, MISSOURI

BORING DATA

2026-05-04

JOB 5051

S27

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FOUND 5/8" REBAR
WEST QUARTER CORNER
SECTION 7, TOWNSHIP 64 NORTH,
RANGE 38 WEST
CERTIFIED DOC. # 600-77563

SW 1/4
SECTION 7
TOWNSHIP 64 NORTH
RANGE 38 WEST

② NORTHWEST MISSOURI FARMS, LLC,
A MISSOURI LIMITED LIABILITY COMPANY
1700 W. COLLEGE ST., MARSHALL, MO 65340
ORIGINAL TRACT AREA: 1,213.77 ACRES±
REMAINING TRACT AREA: 1,213.77 ACRES±
EXISTING R/W: 0.19 ACRES±
NEW R/W (P.E.) AREA: 0.15 ACRES±
TCE AREA: 0.11 ACRES±
BOOK 243, PAGE 364

EXISTING 50' RIGHT OF WAY

15' T.C.E.

NEW RW LINE S01°23'02"W 220.00'

S38°25'18"E 39.05'

S01°23'02"W 50.00'

S01°22'28"W 897.89'

N01°16'17"E 350.00'

S01°23'02"W 350.00'

S27°56'56"W 55.90'

SECTION LINE

X AVENUE

S20°25'03"E 53.85'

BEGIN PROJECT STATION 0+50.00

END PROJECT STATION 4+00.00

1+24.57 65.00' LT
1+39.00 50.00' LT
1+00.00 25.00' LT
1+00.00 44.53' LT
0+50.00 25.00' LT
3+50.00 50.00' LT
3+53.54 65.00' LT
4+00.00 41.77' LT
4+00.00 25.00' LT
4+00.00 2.21' LT
0+50.00 1.52' LT
0+50.00 25.00' RT
1+00.00 25.00' RT
1+00.00 43.03' RT
1+30.00 45.00' RT
1+25.46 60.00' RT
4+00.00 41.16' RT
4+00.00 25.00' RT
3+50.00 45.00' RT
3+52.89 60.00' RT

L1 L2 L3 L4 L5

① HARLEY C. McDONALD,
MATTHEW C. McDONALD
& JONATHAN H. McDONALD,
TRUSTEES OF THE CAROL B. McDONALD
SPOUSAL LIFETIME ACCESS TRUST
DATED THE 28TH DAY OF DECEMBER, 2021
BOOK 252, PAGE 131
17 STOCKTON DRIVE, MERRITT ISLAND, FL 32952
ORIGINAL TRACT AREA: 956.70 ACRES±
REMAINING TRACT AREA: 956.70 ACRES±
EXISTING R/W: 0.22 ACRES±
NEW R/W (P.E.) AREA: 0.12 ACRES±
TCE AREA: 0.11 ACRES±

EAST FORK LITTLE TARKIO RIVER

SE 1/4
SECTION 12
TOWNSHIP 64 NORTH
RANGE 39 WEST

LINE TABLE		
LINE #	DIRECTION	LENGTH
L1	S35°04'26"W	36.06'
L2	S88°36'58"E	27.21'
L3	N88°36'58"W	26.52'
L4	N88°36'58"W	22.79'
L5	S88°36'58"E	23.48'

NOTES

1. BEARINGS ARE BASED ON GRID NORTH, MISSOURI COORDINATE SYSTEM OF 1983, WEST ZONE.
2. GRADING LIMITS INDICATED BY DESIGN CONTOURS (CONTOUR INTERVAL: ONE FOOT).
3. THE EXISTING RIGHT OF WAY SHOWN HEREON IS A PERPETUAL EASEMENT. THE AREA OF NEW RIGHT OF WAY SHOWN HEREON IS TO BE CONVEYED AS A PERPETUAL EASEMENT, NOT AS TITLE TO THE LAND IN FEE SIMPLE.

30' 0' 30'

SCALE: 1 INCH = 30 FEET

LEGEND

- FOUND MONUMENT
- SL — SLOPE LINE
- R/W — RIGHT OF WAY
- T.C.E. — TEMPORARY CONSTRUCTION EASEMENT

STATE OF MISSOURI
BRAD WILLIAM FERGUSON
PLS-2007017959
06-11-25
PROFESSIONAL LAND SURVEYOR

No.	Revision/Issue	Date

"THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT."

GRE GREAT RIVER ENGINEERING

Missouri State Certificate of Authority Numbers:
Engineering: 2000156885, Land Surveying: 2001014476,
Landscape Architecture: 2007013073

BRO-R003(001)
ATCHISON COUNTY BRIDGE #3570016
ATCHISON COUNTY, MISSOURI

RIGHT-OF-WAY PLAN

6/5/2025
JOB 5051
RW

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