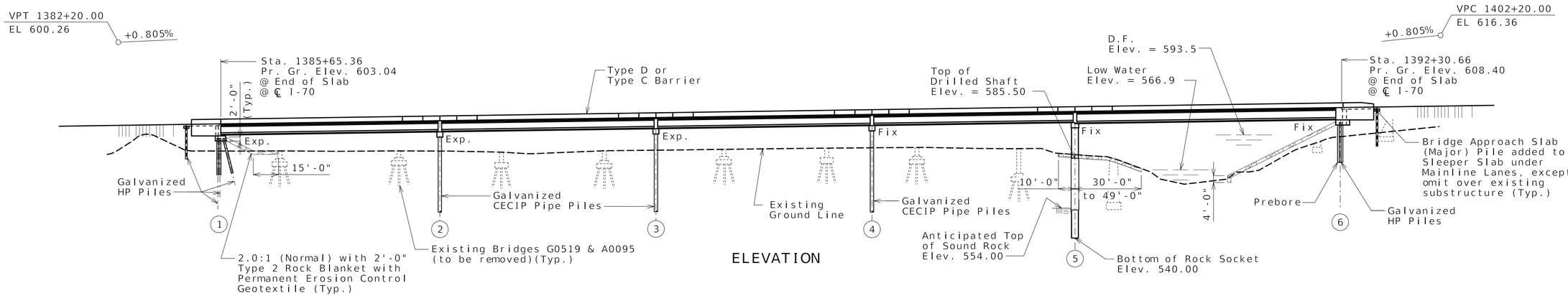
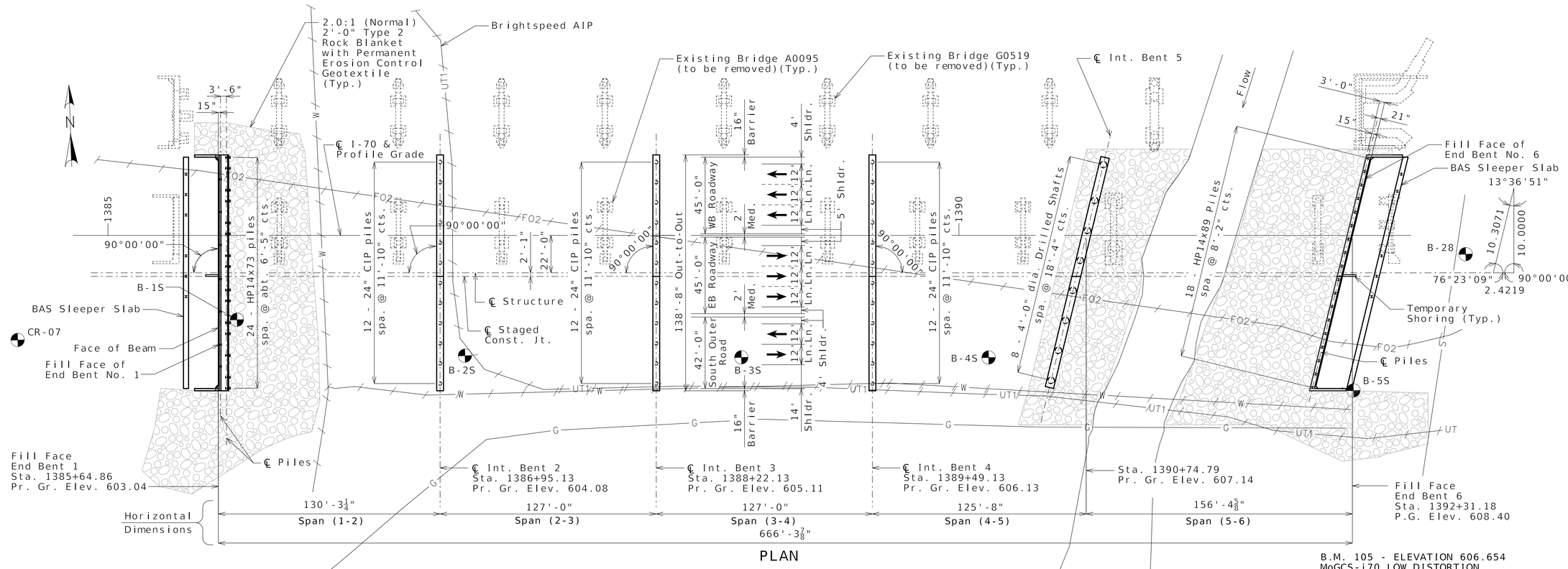
(126.8'-127'-127'-125.7'-154.6') PRESTRESSED CONCRETE NU GIRDER SPANS

SEC/SUR 8 TWP 48N RGE 13W



ELEVATION



PLAN

Note: Stations and Elevations are along ℄ I-70 unless otherwise noted.

B.M. 105 - ELEVATION 606.654
MoGCS-i70 LOW DISTORTION
LOW DISTORTION PROJECTION DEVELOPED
FOR THE I-70 CORRIDOR "MO I-70 FT"
NORTHING 1684542.1630
EASTING 719776.2243
POINT DESCRIPTION 74/IR

◓ Indicates location of borings.

Notice and Disclaimer Regarding Boring Log Data

The locations of all subsurface borings for this structure are shown on the plan sheet(s) for this structure. The boring data for all locations indicated, as well as any other boring logs or other factual records of subsurface data and investigations are shown on Sheets No. 72-78.

BRIDGE: I-70 AND SOUTH OUTER ROAD OVER PERCHE CREEK GENERAL PLAN AND ELEVATION

ROUTE I-70 FROM ROUTE 40 TO ROUTE 740
ABOUT 1.1 MILES EAST OF ROUTE 40
BEGINNING STATION 1385+64.86

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked MAC FEB 2026

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 1 of 78

STATE OF MISSOURI
MARTIN ALAN CHORKEY
PE-2013006488
7-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-01

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

EMERY SAPPS & SONS, INC

HORNER SHIFRIN
THE POWER OF INTEGRATED DESIGN
401 S. 18th St. Ste. 400
St. Louis, MO 63103
314-231-4321 FAX: 314-531-4866
www.HornerShifrin.com

IMPROVE I-70 ROCHEPORT TO COLUMBIA

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

B_JST0017_A9819_01_GPE.dgn 12:20:32 AM Eastern 16-JUL-2026

GENERAL NOTES

Design Specifications:

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

Seismic:

2023 AASHTO Guide Specifications for LRFD Seismic Bridge Design (3rd Ed.).

Seismic Design Category = A2 (Nonseismic Details)

Design earthquake response spectral acceleration coefficient at 1.0 second period, $S_{D1} < 0.15$
Acceleration Coefficient (effective peak ground acceleration coefficient), As = N/A

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 (Drilled Shafts & Rock Sockets).....f'c = 4,000 psi

Class B-2 Concrete (Superstructure, except Prestressed Girders & Barrier).....f'c = 4,000 psi

Class B-1 Concrete (Barrier).....f'c = 4,000 psi

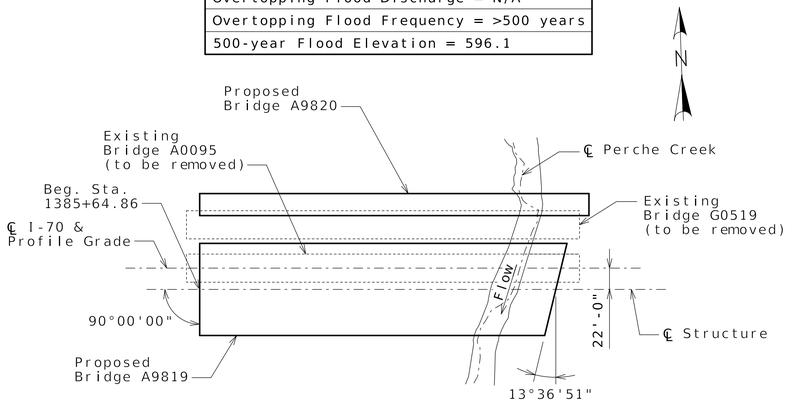
Reinforcing Steel (ASTM A615 Grade 60).....fy = 60,000 psi

Structural Steel HP Pile (ASTM A709 Grade 50).....fy = 50,000 psi

Welded or Seamless steel shell (pipe) for CIP pile (ASTM A252 Modified Grade 3).....fy = 50,000 psi

For prestressed girder stresses, see Sheets No. 31 through 35.

Hydrologic Data
Drainage Area = 278 mi^2
Design Flood Frequency = 100 years
Design Flood Discharge = 34,500 cfs
Design Flood (D.F.) Elevation = 593.5
Base Flood (100-year)
Base Flood Elevation = 593.5
Base Flood Discharge = 34,500 cfs
Estimated Backwater = 1.0 ft
Average Velocity thru Opening = 5.6 ft/s
Freeboard (50-year)
Freeboard = 7.7 ft
Roadway Overtopping
Overtopping Flood Discharge = N/A
Overtopping Flood Frequency = >500 years
500-year Flood Elevation = 596.1



LOCATION SKETCH

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 shll 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.

Mechanical bar splices may be used in lieu of providing the specified lap lengths between Phase 1 and Phase 2 construction.

MBS refers to mechanical bar splices. Mechanical bar splices shall be in accordance with Sec 706 or 710.

Miscellaneous:

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.

Stay-In-Place Corrugated Steel Forms:

Method of forming the slab shall be as 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.

Slab shall be cast-in-place with conventional forms or stay-in-place corrugated steel forms. Precast prestressed panels will not be permitted.

Corrugated steel forms, supports, closure elements and accessories shall be in accordance with grade requirement and coating designation G165 of ASTM A653. Complete shop drawings of the permanent steel deck forms shall be required in accordance with Sec 1080.

Corrugations of stay-in-place forms shall be filled with an expanded polystyrene material. The polystyrene material shall be placed in the forms with an adhesive in accordance with the manufacturer's recommendations.

Form sheets shall not rest directly on the top of girder flanges. Sheets shall be securely fastened to form supports with a minimum bearing length of one inch on each end. Form supports shall be placed in direct contact with the flange. Welding on or drilling holes in the girder flanges will not be permitted. All steel fabrication and construction shall be in accordance with Sec 1080 and 712. Certified field welders will not be required for welding of the form supports.

Traffic Handling:

Traffic to be maintained on structures during construction. See roadway plans for traffic control and Sheet No. 3 for staged construction details.

Foundation Data

Type	Design Data		Bent Number: Sleeper	1	2	3	4	5	6	Sleeper
Load Bearing Pile	Pile Type and Size		HP12x53	HP14x73	CECIP 24"	CECIP 24"	CECIP 24"	-	HP14x89	HP12x53
	Number	ea	6	24	12	12	12	-	18	5
	Approximate Length Per Each	ft	20	62	54	55	54	-	18	15
	Pile Point Reinforcement	ea	None	All	All	All	All	-	All	None
	Min. Galvanized Penetration (Elev.)	ft	Full Length	570	562	562	562	-	Full Length	Full Length
	Est. Max. Scour Depth 100 (Elev.)	ft	-	-	580	580	579	-	-	-
	Minimum Tip Penetration (Elev.)	ft	-	532	550	550	550	-	*	-
	Criteria for Min. Tip Penetration		-	Bear on Rock	Lateral Stability	Lateral Stability	Lateral Stability	-	-	-
	Pile Driving Verification Method			DT	DT	DT	DT		WEAP	
	Resistance Factor		-	0.65	0.65	0.65	0.65	-	0.50	-
	Minimum Nominal Axial Compressive Resistance	kip	-	660	1572	1572	1572	-	646	-
Rock Socket	Number		-	-	-	-	-	8	-	-
	Foundation Material		-	-	-	-	-	Rock	-	-
	Elevation Range	ft	-	-	-	-	-	547-520	-	-
	Design Side Friction Minimum Nominal Axial Compressive Resistance (Side Resistance)	ksf	-	-	-	-	-	27.2	-	-
	Design End Bearing Minimum Nominal Axial Compressive Resistance (Tip Resistance)	ksf	-	-	-	-	-	0	-	-

CECIP = Closed Ended Cast-In-Place concrete pile

DT = Dynamic Testing

WEAP = Wave Equation Analysis of Piles

Minimum Nominal Axial Compressive Resistance = Maximum Factored Loads/Resistance Factor.

* Piles at End Bent No. 6 shall be prebored 5 feet into rock. Anticipated tip elevations range from 572 to 580. See Sheet No. 27 for prebore detail.

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

Pile point reinforcement need not be galvanized. Shop drawings will not be required for pile point reinforcement.

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 contractor makes the necessary corrections to ensure the minimum penetration is achieved on subsequent piles.

All bridge piles are anticipated to be driven to refusal on rock. Review all borings for depth of rock and restrict driving as appropriate to comply with hard rock driving criteria in accordance with Sec 702. When pile refusal on rock occurs, as approved by the engineer, the minimum nominal axial compressive resistance is verified and no additional pile driving verification method is required.

Estimated Maximum Scour Depth (Elevation) shown is for verifying Minimum Nominal Axial Compressive Resistance using dynamic testing only where pile resistance contribution above this elevation shall not be considered.

GENERAL NOTES AND FOUNDATION DATA

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked MAC JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
PE-2013006488
7-16-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-02
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

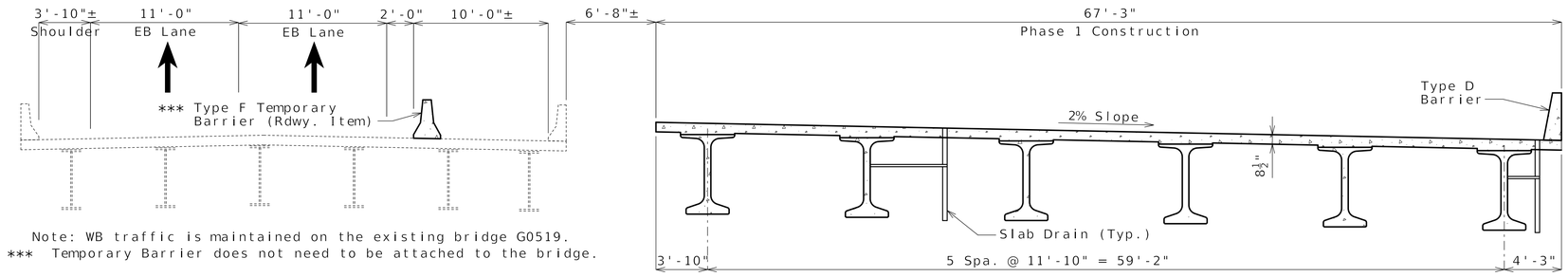
IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
THE POWER OF EXPERIENCE AND INNOVATION
401 S. 18th St., Ste. 400
St. Louis, MO 63103
314-531-4321 FAX: 314-531-4866
www.HornerShifrin.com

EMERY SAPPS SOMS, INC

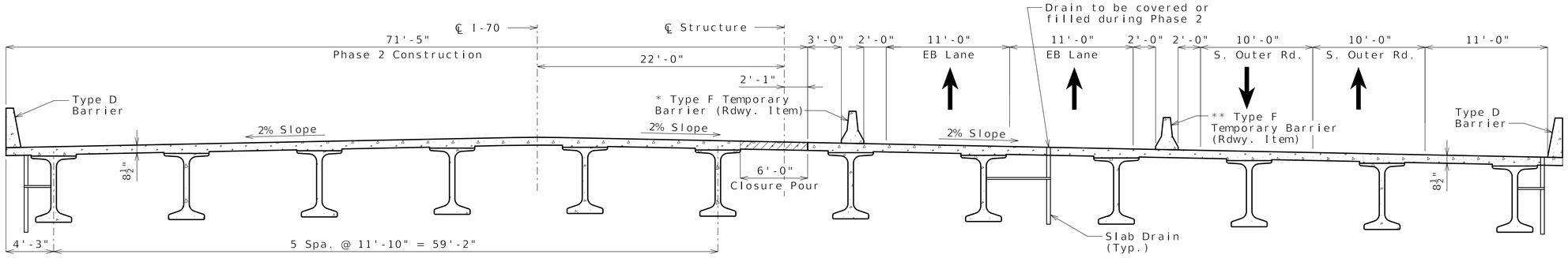
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc



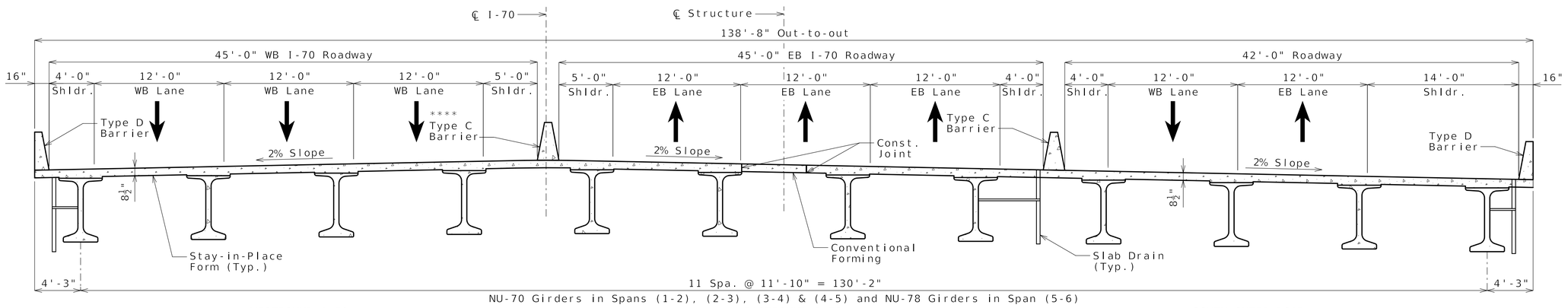
Note: WB traffic is maintained on the existing bridge G0519.
*** Temporary Barrier does not need to be attached to the bridge.

PHASE 1 CONSTRUCTION



PHASE 2 CONSTRUCTION

* Temporary barrier shall not be attached to the bridge.
** Method of attachment for temporary barrier shall be tie-down strap.



FINAL PROPOSED TYPICAL SECTION

**** Barrier constructed in a phase between Phase 3 and Final.

TYPICAL SECTION AND STAGED CONSTRUCTION

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked MAC FEB 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_03_Staged Construction.dgn 12:19:42 AM Eastern 16-JUL-2026

STATE OF MISSOURI — MARTIN ALAN CHORKEY — NUMBER PE-2013006488 — 7-17-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-03
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

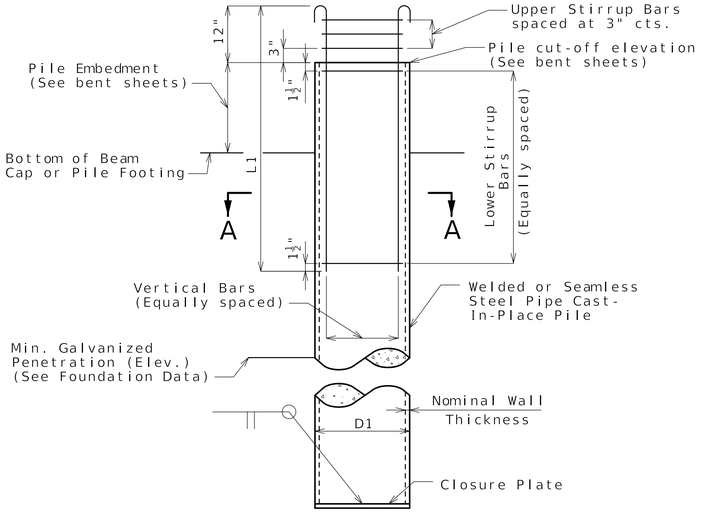
IMPROVE I-70 ROCHEPORT TO COLUMBIA

EMERY SAPPS SONS, INC

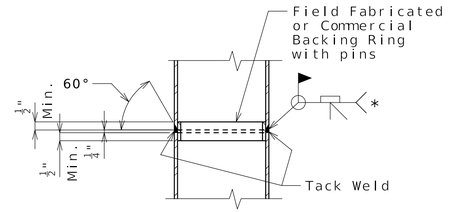
HORNER SHIFRIN
THE HORNER SHIFRIN GROUP INCORPORATION
801 S. 18th St., Ste. 400
St. Louis, MO 63103-2306
314-231-1021 FAX: 314-231-4866
www.hornershifrin.com

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc •

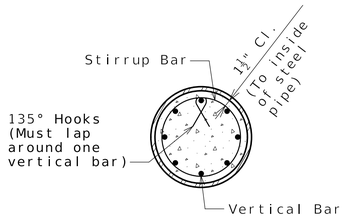


GALVANIZED CLOSED ENDED CAST-IN-PLACE (CECIP) CONCRETE PILE WITHOUT PILE POINT REINFORCEMENT



STEEL PIPE PILE SPLICE

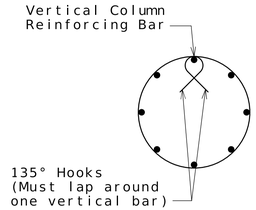
* Galvanizing material shall be omitted or removed one inch clear of weld locations in accordance with Sec 702.



SECTION A-A

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	2	3	4
D1, CECIP Pile (O.D.)	24"	24"	24"
Min. Nominal Wall Thickness	¾"	¾"	¾"
Closure Plate Thickness	1½"	1½"	1½"
Pile Point Reinforcement	Cruciform	Cruciform	Cruciform
Vertical Bars	12-#6-V200/V250	12-#6-V300/V350	12-#6-V400/V450
L1, Length of Vertical Bars	7'-3"	7'-3"	7'-3"
Upper Stirrup Bars	3-#4-P200/P250	3-#4-P300/P350	3-#4-P400/P450
Lower Stirrup Bars	7-#4-P200/P250	7-#4-P300/P350	7-#4-P400/P450



SEISMIC STIRRUP BAR

Notes:

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 and source material certification shall be required.

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

Steel for closure plate shall be ASTM A709 Grade 50.

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

Steel casting for conical pile point reinforcement shall be ASTM A148 Grade 90-60.

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.

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.

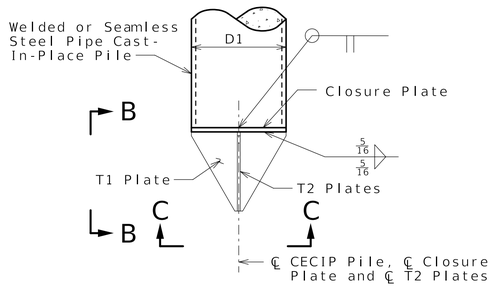
Splices of pipe for cast-in-place concrete pile shall be made watertight and to the full strength of the pipe above and below the splice to permit hard driving without damage. Pipe damaged during driving shall be replaced without cost to the state. Pipe sections used for splicing shall be at least 5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

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

Closure plate need not be galvanized.

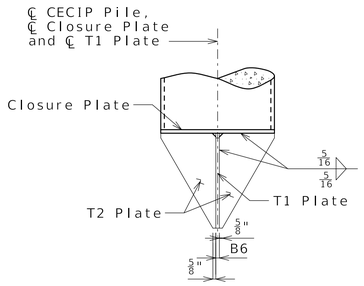
Reinforcing steel for cast-in-place piles is included in the Bill of Reinforcing Steel.

For Foundation Data table, see Sheet No. 2.

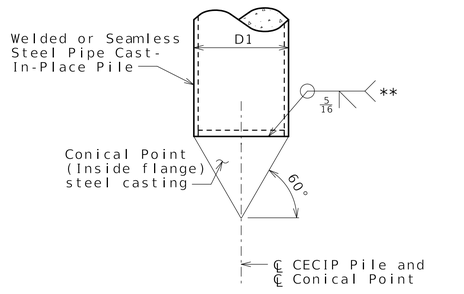


CRUCIFORM PILE POINT

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



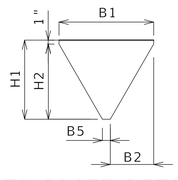
ELEVATION B-B



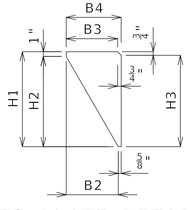
MANUFACTURED CONICAL PILE POINT

(Omit closure plate)

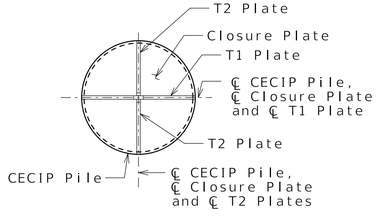
** If the conical pile point is not pre-beveled, place a 3/8" bevel at 40 degrees on the pipe.



T1 PLATE DETAILS



T2 PLATE DETAILS (2 REQUIRED)



SECTION C-C

CRUCIFORM PILE POINT REINFORCEMENT

GALVANIZED CLOSED ENDED CAST-IN-PLACE CONCRETE PILE

Designed SR FEB 2026
Detailed CAB FEB 2026
Checked MAC FEB 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_04_CIP Piles.dgn 12:22:02 AM Eastern 16-JUL-2026

STATE OF MISSOURI MARTIN ALAN CHORKEY PE-2013006488 REGISTERED ENGINEER 7-17-26

DATE PREPARED 16-JUL-2026
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. BR04-04
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

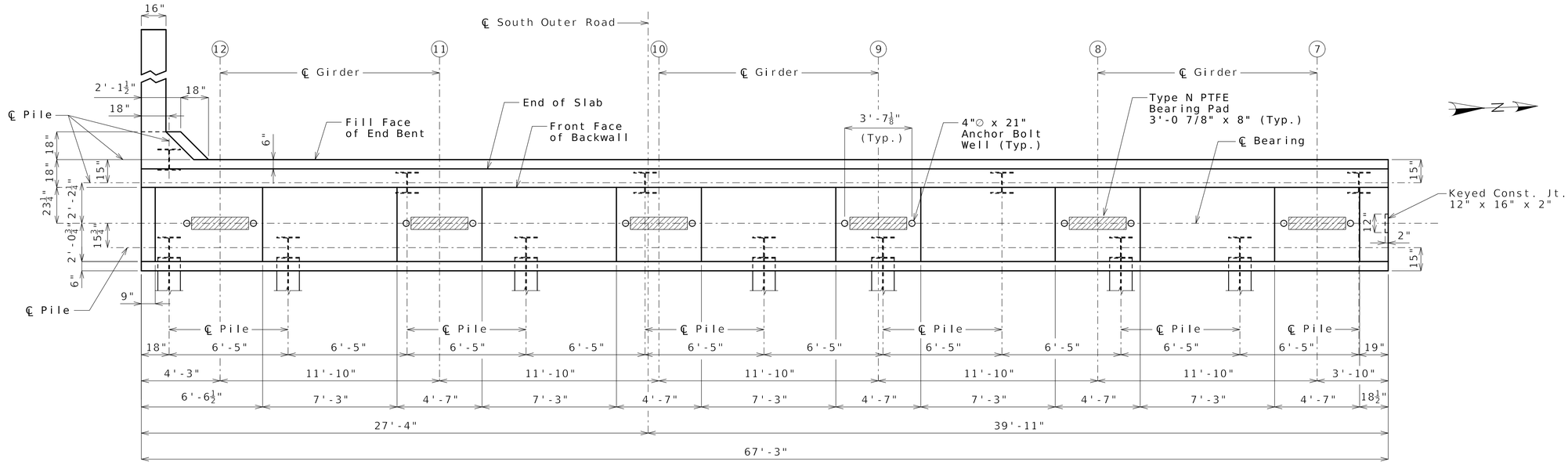
IMPROVE I-70 ROCHEPORT TO COLUMBIA

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

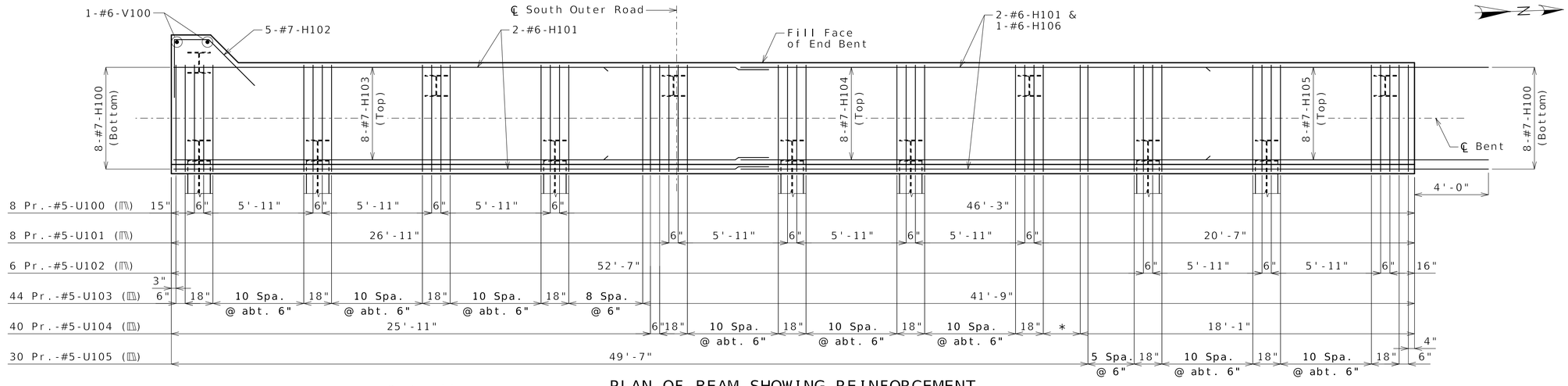
HORNER SHIFRIN
THE POWER OF BEING UNDERSTOOD
401 S. 18th St. Ste. 400
St. Louis, MO 63103
314-231-4321 FAX: 314-531-8866
www.HornerShifrin.com

EMERY SAPPS SONS, INC

REV. RevDesc

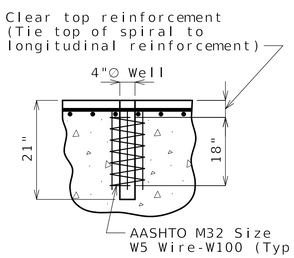


PLAN

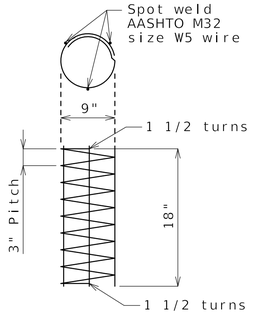


PLAN OF BEAM SHOWING REINFORCEMENT

Keyed construction joint not shown for clarity. * 4 Spa. @ 6"



ANCHOR BOLT WELLS



DETAIL OF SPIRAL REINFORCEMENT

General Notes:

Work this sheet with Sheets No. 6, 7, 8 & 9.

For details of Vertical Drain at End Bent No. 1, see Sheet No. 10.

For details of Bridge Approach Slab at End Bent No. 1, see Sheet No. 61.

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

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

All reinforcing bars shall be spaced to clear anchor bolt wells by at least 1/2inch.

For details of Type N PTFE Bearings, see Sheet No. 30.

Holes for anchor bolts may be drilled into the substructure.

Anchor bolt wells shall not be formed with galvanized corrugated steel pipe.

DETAILS FOR END BENT NO. 1 - PHASE 1

Designed UVK JUN 2026
Detailed CAB JUN 2026
Checked SR JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
PE-2013006488
07-17-2026

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-05
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

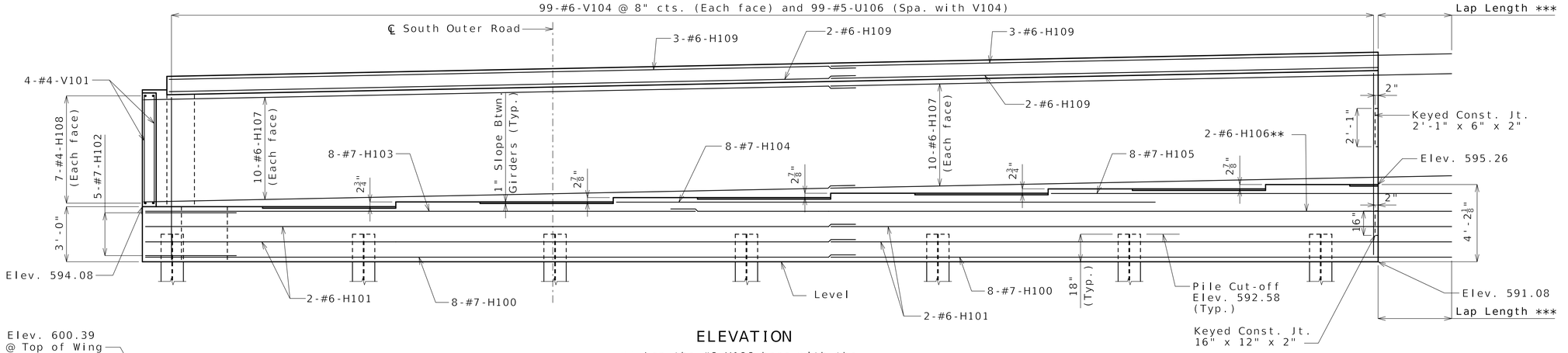
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
MoDOT
EMERY SAPPS SONS, INC
HORNER SHIFRIN
THE POWER OF EXPERIENCE AND INNOVATION
801 S. 18th St., Ste. 400
St. Louis, Missouri 63103
314-531-1021 FAX: 314-531-1966
www.HornerShifrin.com

IMPROVE I-70 ROCHEPORT TO COLUMBIA

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

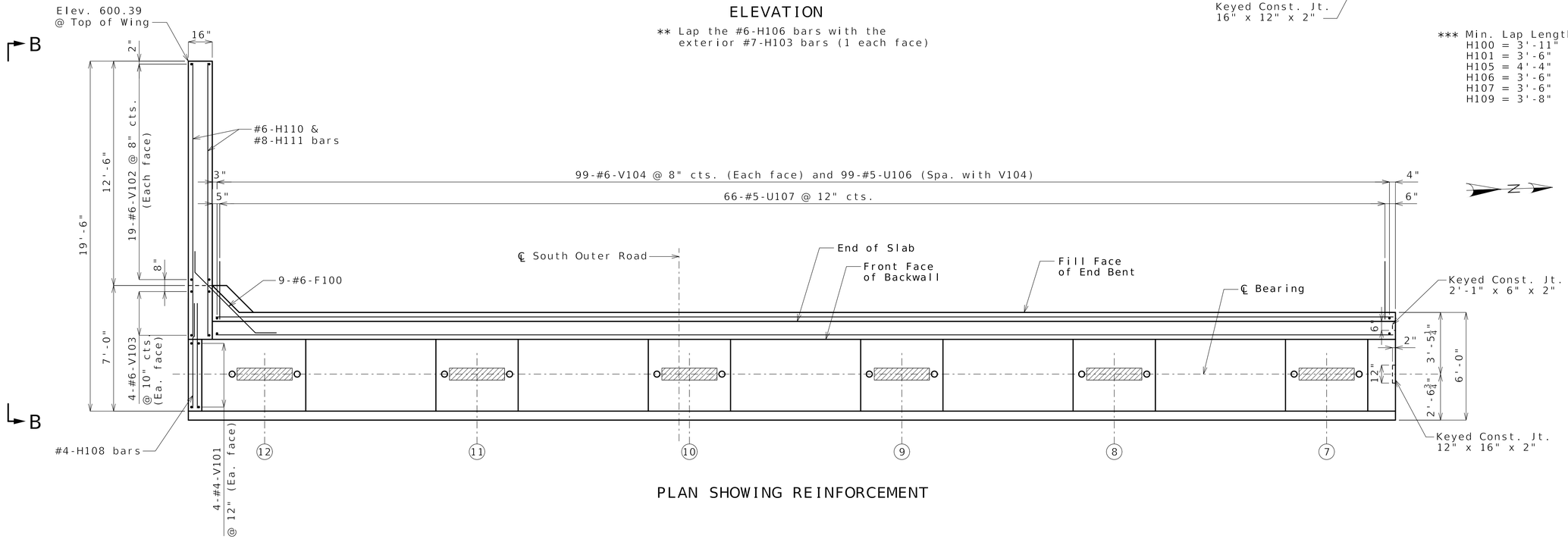
REV. RevDesc



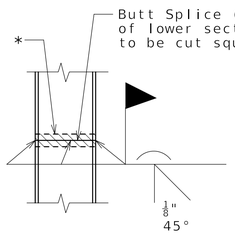
ELEVATION

** Lap the #6-H106 bars with the exterior #7-H103 bars (1 each face)

*** Min. Lap Lengths:
H100 = 3'-11"
H101 = 3'-6"
H105 = 4'-4"
H106 = 3'-6"
H107 = 3'-6"
H109 = 3'-8"



PLAN SHOWING REINFORCEMENT



STEEL PILE SPLICE
(If required)

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

General Notes:

Work this sheet with Sheets No. 5, 7, 8 & 9.

For Elevation B-B, see Sheet No. 9.

The #6-F100 bars shall be bent in the field to clear girders.

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

All concrete above the upper construction joint in backwall shall be Class B-2.

Top of Backwall and Expansion Device for End Bent No. 1 shall conform to the crown of roadway slab. Backwall above upper construction joints shall not be poured until the superstructure slab has been poured in the adjacent span.

For details of Vertical Drain at End Bent No. 1, see Sheet No. 10.

For details of Bridge Approach Slab at End Bent No. 1, see Sheet No. 61.

DETAILS FOR END BENT NO. 1 - PHASE 1

Designed UVK JUN 2026
Detailed CAB JUN 2026
Checked SR JUN 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_06_End Bent 1 Elevation 1.dgn 12:20:33 AM Eastern 16-JUL-2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
REGISTERED ENGINEER
7-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-06

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

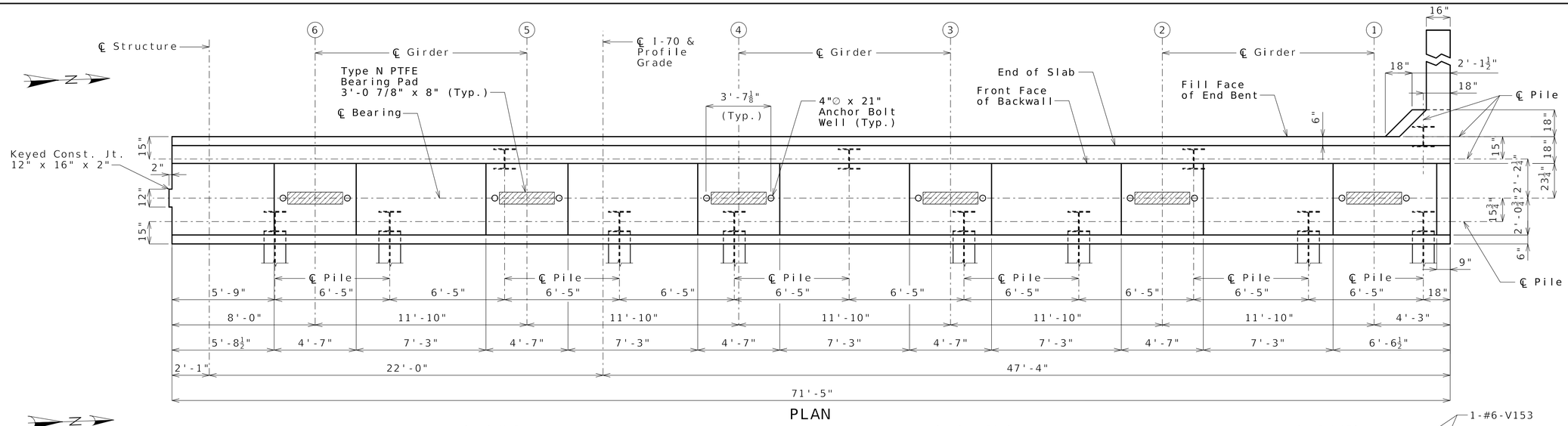
IMPROVE I-70 ROCHEPORT TO COLUMBIA

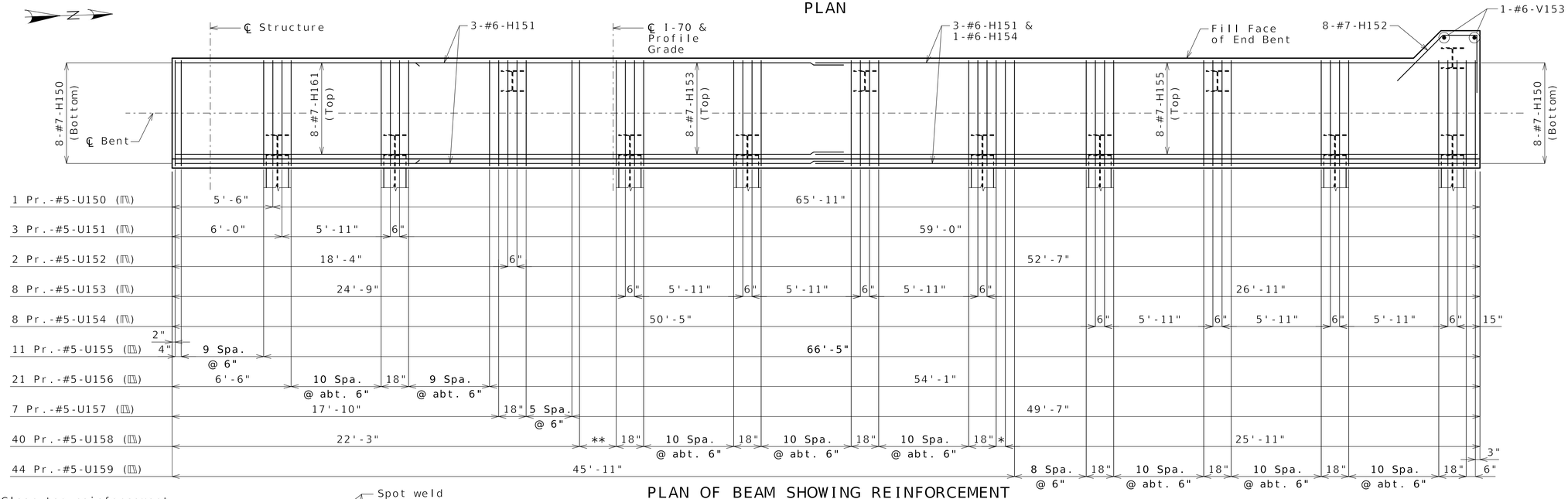
HORNER SHIFRIN
THE POWER OF SHIFT THINKING
401 S. 18th St., Ste. 100
ST. LOUIS, MISSOURI 63103
314-531-4321 FAX: 314-531-5866
www.hornershifrin.com

EMERY SAPP & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc





PLAN OF BEAM SHOWING REINFORCEMENT

Keyed construction joint not shown for clarity.

∗ 1 Spa. @ 6"
∗∗ 4 Spa. @ 6"

General Notes:

Work this sheet with Sheets No. 5, 6, 8 & 9.

For details of Vertical Drain at End Bent No. 1, see Sheet No. 10.

For details of Bridge Approach Slab at End Bent No. 1, see Sheet No. 61.

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

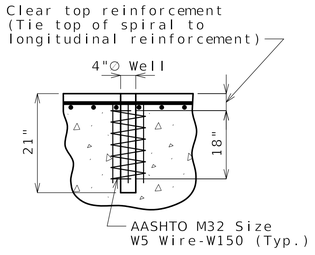
Reinforcing steel shall be shifted to clear piles. U bars shall clear piles by at least 1 1/2 inches.

All reinforcing bars shall be spaced to clear anchor bolt wells by at least 1/2 inch.

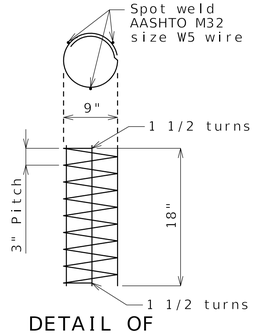
For details of Type N PTFE Bearings, see Sheet No. 30.

Holes for anchor bolts may be drilled into the substructure.

Anchor bolt wells shall not be formed with galvanized corrugated steel pipe.



ANCHOR BOLT WELLS



DETAIL OF SPIRAL REINFORCEMENT

DETAILS FOR END BENT NO. 1 - PHASE 2

Designed UVK JUN 2026
Detailed CAB JUN 2026
Checked SR JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
7-17-26

DATE PREPARED 16-JUL-2026
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. BR04-07
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

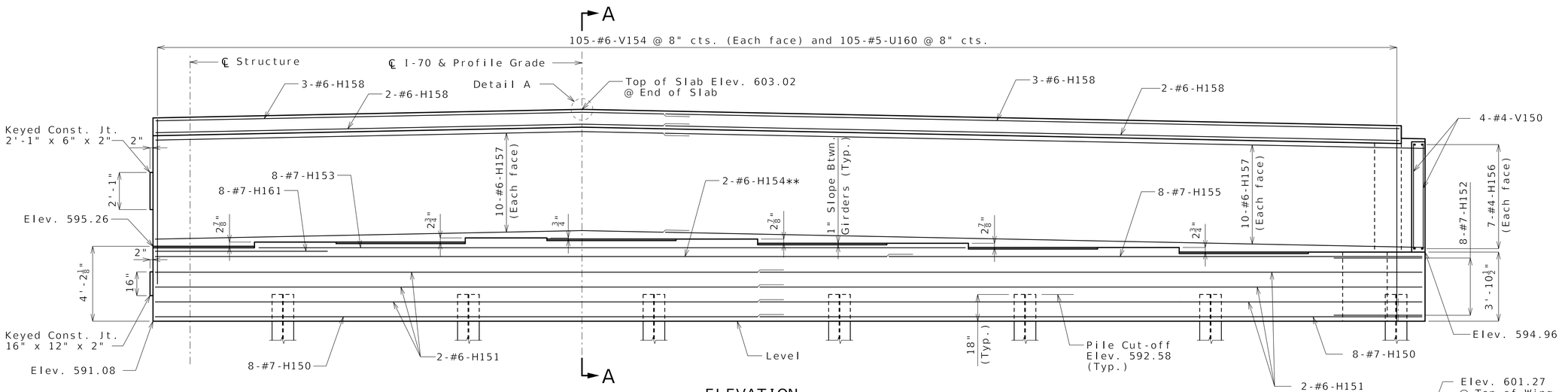
IMPROVE I-70 ROCHEPORT TO COLUMBIA

EMERY SAPPS SONS, INC

HORNER SHIFRIN
THE POWER OF EXPERIENCE AND INNOVATION
801 S. 18th St., Ste. 400
St. Louis, MO 63103-2306
314-531-1321 FAX: 314-531-4966
www.HornerShifrin.com

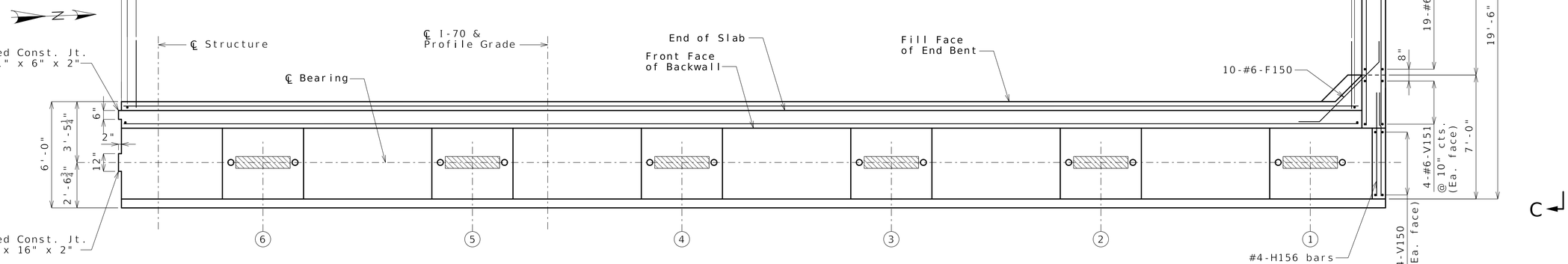
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

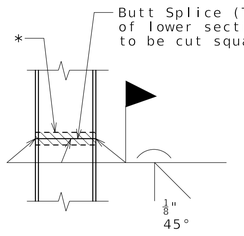


ELEVATION

** Lap the #6-H154 bars with the exterior #7-H155 bars (1 each face)



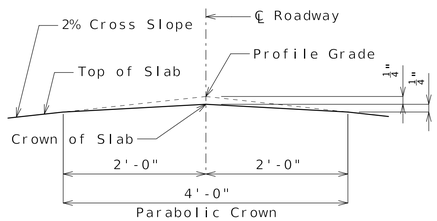
PLAN SHOWING REINFORCEMENT



STEEL PILE SPLICE

(If required)

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



DETAIL A

General Notes:

Work this sheet with Sheets No. 5, 6, 7 & 9.

For Section A-A and Elevation C-C, see Sheet No. 9.

The #6-F150 bars shall be bent in the field to clear girders.

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

All concrete above the upper construction joint in backwall shall be Class B-2.

Top of Backwall and Expansion Device for End Bent No. 1 shall conform to the crown of roadway slab. Backwall above upper construction joints shall not be poured until the superstructure slab has been poured in the adjacent span.

For details of Vertical Drain at End Bent No. 1, see Sheet No. 10.

For details of Bridge Approach Slab at End Bent No. 1, see Sheet No. 61.

DETAILS FOR END BENT NO. 1 - PHASE 2

Designed UVK JUN 2026
Detailed CAB JUN 2026
Checked SR JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI — MARTIN ALAN CHORKEY — NUMBER PE-2013006488 — PROFESSIONAL ENGINEER — 7-17-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-08
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

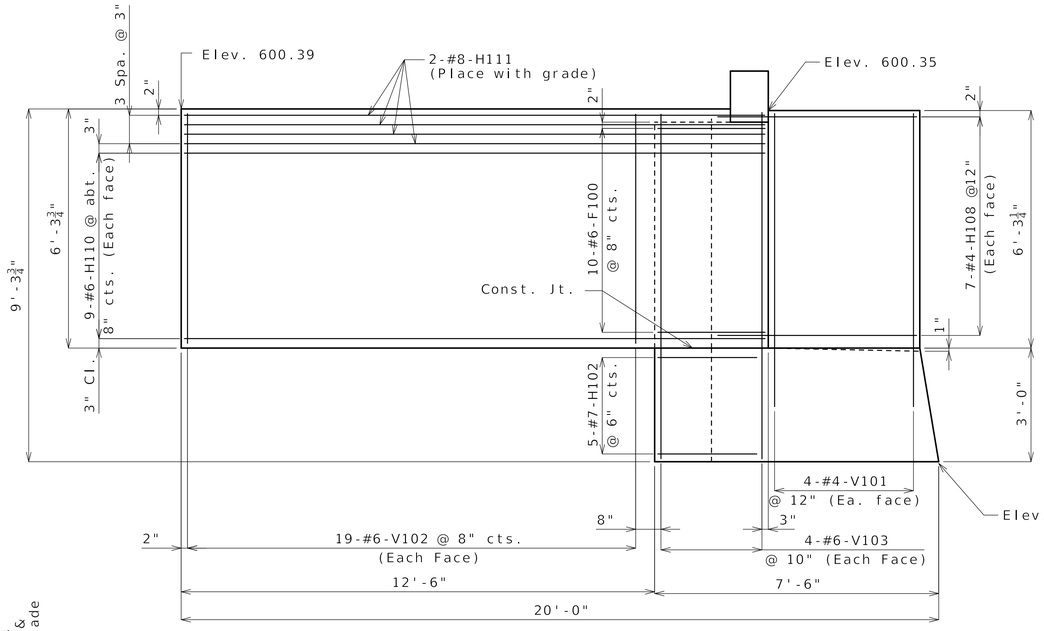
IMPROVE I-70 ROCHEPORT TO COLUMBIA

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

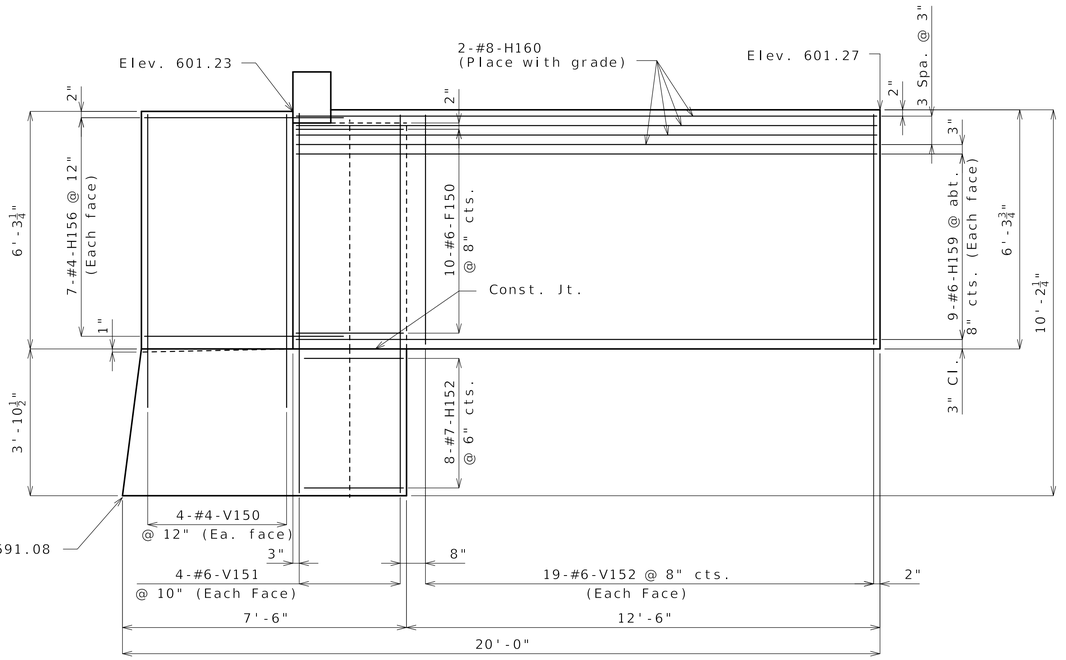
EMERY SAPP & SONS, INC

HORNER SHIFRIN — THE POWER OF SHIFT — 401 S. 18th St., Ste. 400, St. Louis, MO 63103, 314-531-4321 FAX 314-531-6866, www.HornerShifrin.com

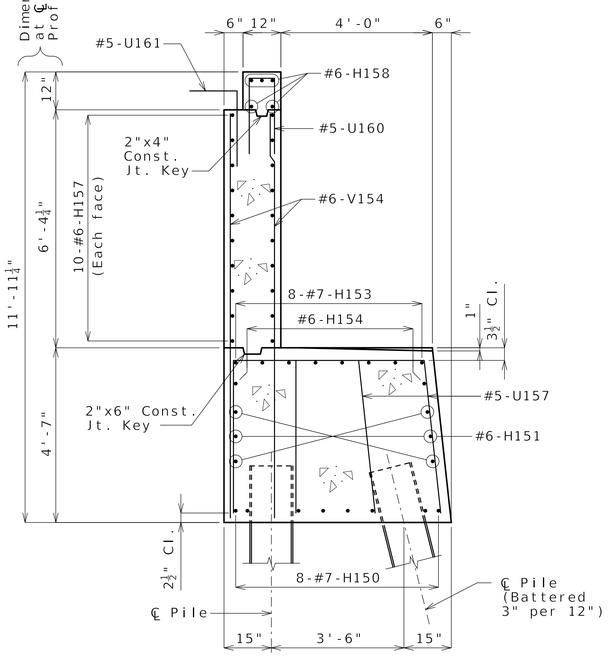
REV. RevDesc



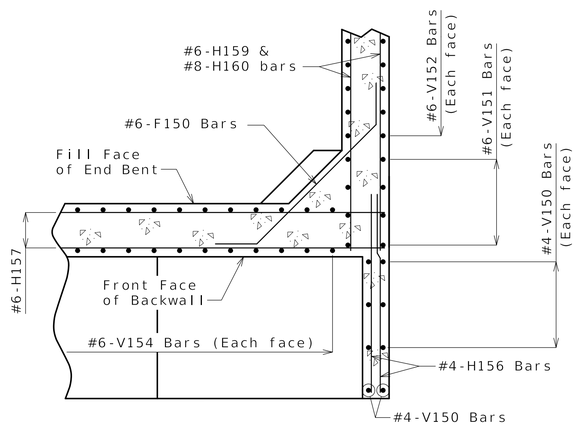
ELEVATION B-B



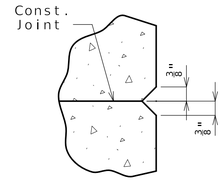
ELEVATION C-C



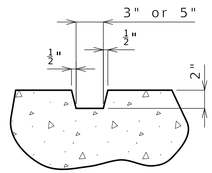
SECTION A-A



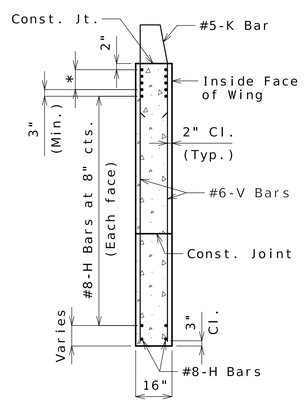
PART SECTION THRU BACKWALL AND WING



CHAMFER DETAIL



SECTION THRU KEY



TYPICAL SECTION
THRU WING

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

Note:
Seal face of backwall, top of beam cap and front face of beam cap with protective coating for concrete bents and piers (Epoxy) in accordance with Sec 711.

Construction Sequence:

1. Pour beam cap and backwall
2. Backfill no higher than top of beam cap
3. Set girders
4. Pour slab
5. Backfill remainder of backfill

Notes:

Work this sheet with Sheets No. 5, 6, 7 & 8.

For location of Section A-A and Elevations B-B & C-C, see Sheets No. 6 & 8.

For details of Bridge Approach Slab at End Bent No. 1, see Sheet No. 61.

DETAILS FOR END BENT NO. 1

Designed UVK JUN 2026
Detailed CAB JUN 2026
Checked SR JUN 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_09_End Bent 1 Sections.dgn 12:20:15 AM Eastern 16-JUL-2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
7-17-2026

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-09

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

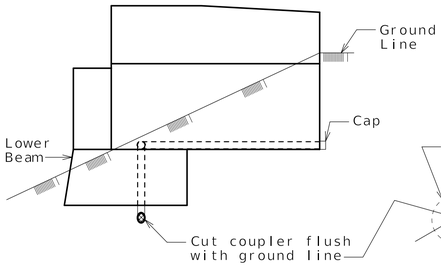
IMPROVE I-70 ROCHEPORT TO COLUMBIA

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

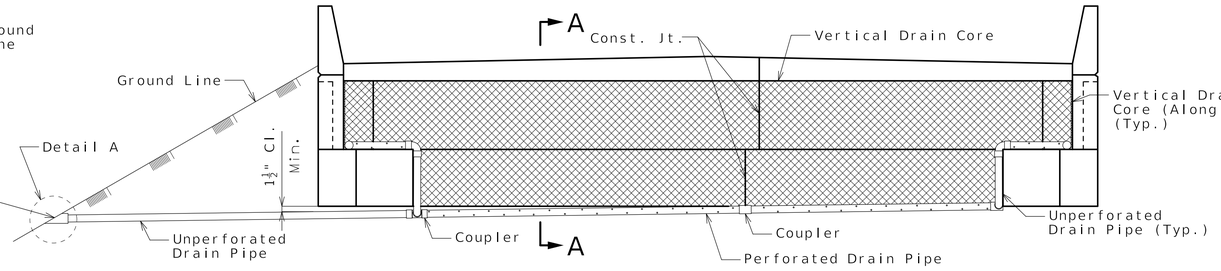
HORNER SHIFRIN
THE POWER OF EXPERIENCE AND INNOVATION
911 Locust, St. Ste. 400
St. Louis, MO 63101-1908
314-231-1321 FAX: 314-231-4966
www.hornershifrin.com

EMERY SAPPS SONS, INC

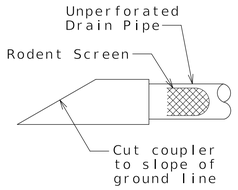
REV. RevDesc



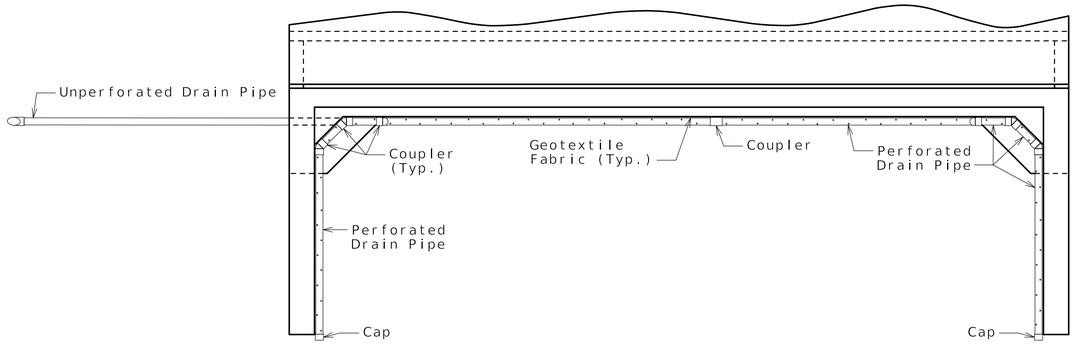
ELEVATION OF WING



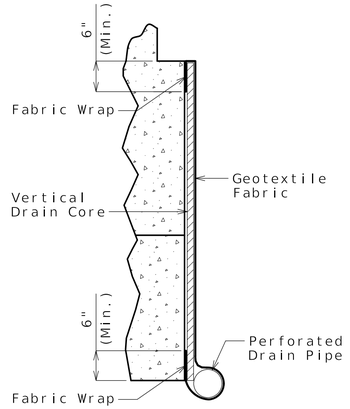
ELEVATION OF END BENT



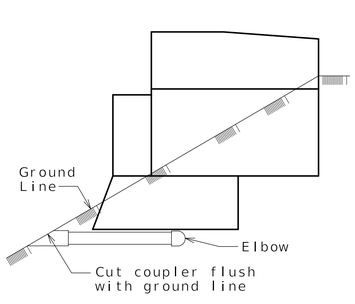
DETAIL A



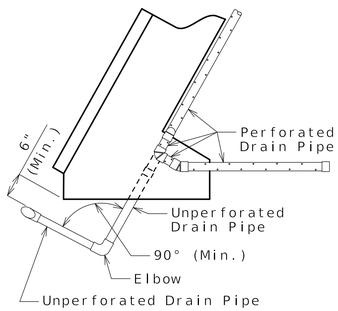
PLAN OF END BENT



PART SECTION A-A
(Section thru wing similar)



ELEVATION OF WING



PART PLAN

OPTIONAL TURNED DRAIN
(Use only when straight drain is not practical.)

General Notes:

All drain pipe shall be sloped 1 to 2 percent.

Drain pipe may be either 6-inch diameter corrugated metallic-coated steel pipe underdrain, 4-inch diameter corrugated polyvinyl chloride (PVC) drain pipe, or 4-inch diameter corrugated polyethylene (PE) drain pipe.

Drain pipe shall be placed at fill face of end bent and inside face of wings. The pipe shall slope to lowest grade of ground line, also missing the lower beam of end bent by a minimum of 1 1/2 inches.

Perforated pipe shall be placed at fill face side and inside face of wings at the bottom of end bent and plain pipe shall be used where the vertical drain ends to the exit at ground line.

VERTICAL DRAIN AT END BENT NO. 1

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
7-16-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-10
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
THE POWER OF BEING UNDERSTOOD
401 S. 18th St., Ste. 400
St. Louis, MO 63103
314-231-4321 FAX: 314-531-8866
www.HornerShifrin.com

EMERY SAPPS SONS, INC

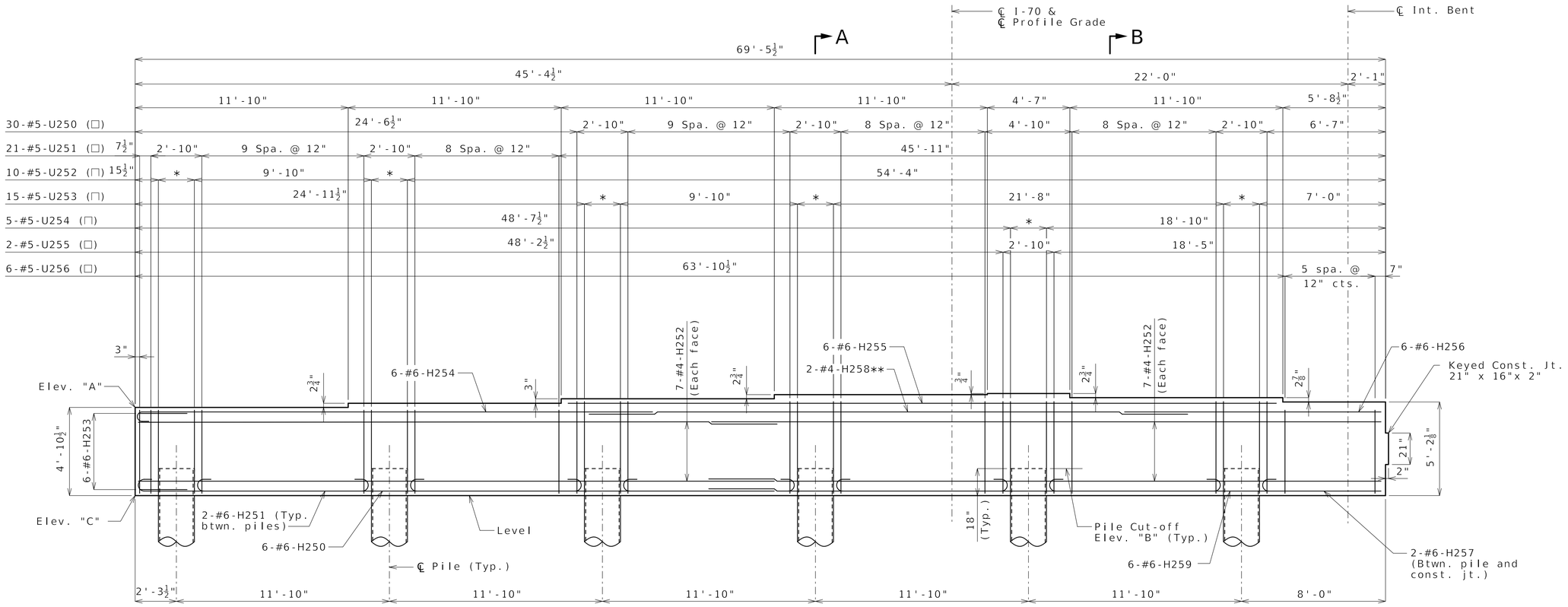
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked MAC FEB 2026

Note: This drawing is not to scale. Follow dimensions.

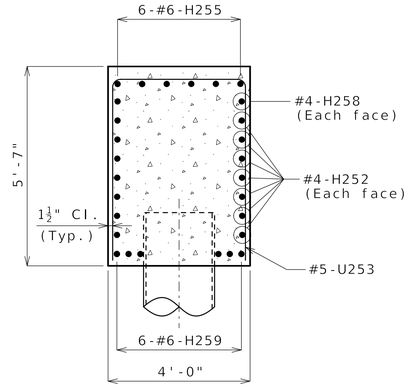
B_JST0017_A9819_10_Vertical Drain Bent 1.dgn 12:20:16 AM Eastern 16-JUL-2026



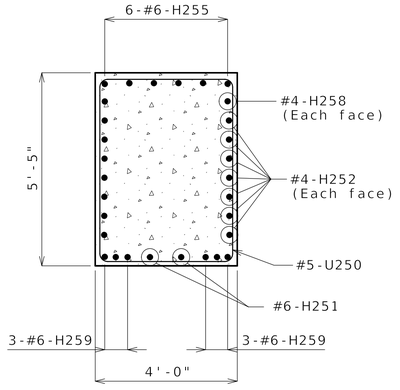
PARTIAL ELEVATION
(Looking ahead station)

∗ 4 Spa. @ 6"

∗∗ Lap the #4-H258 bars with the exterior #6-H256 bars & #6-H254 bars (1 each face)



SECTION A-A



SECTION B-B

Table of Variables		
Variable	Bent 2	Bent 3
"A"	595.64	596.87
"B"	592.26	593.49
"C"	590.76	591.99

Notes:

Work this sheet with Sheets No. 12, 13 & 14.

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

Bar marks for Intermediate Bent No. 2 shown (200 series), Intermediate Bent No. 3 similar (300 series).

DETAILS FOR INTERMEDIATE BENTS NO. 2 AND 3 - PHASE 2

Designed SR MAY 2026
Detailed CAB MAY 2026
Checked MAC JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
7-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-11

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

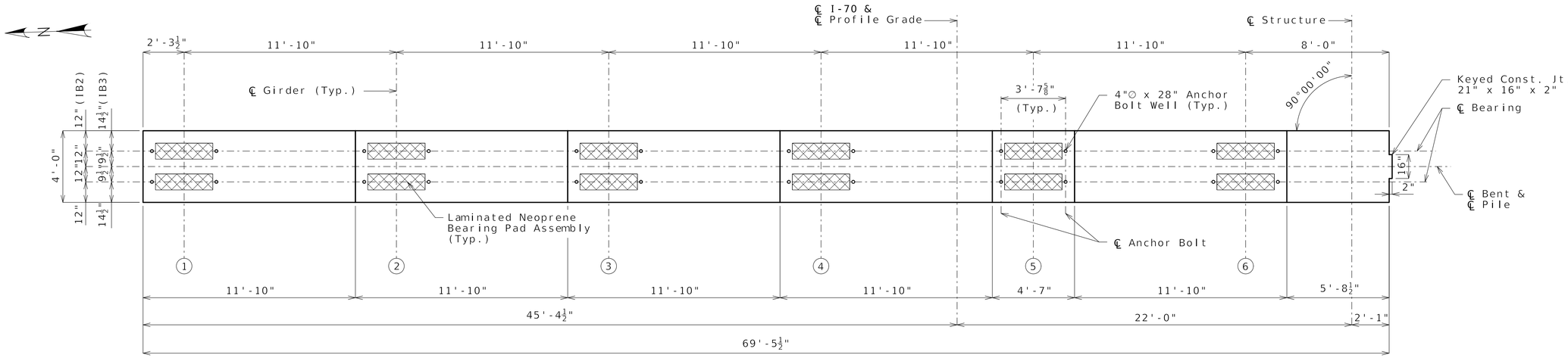
IMPROVE I-70 ROCHEPORT TO COLUMBIA

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

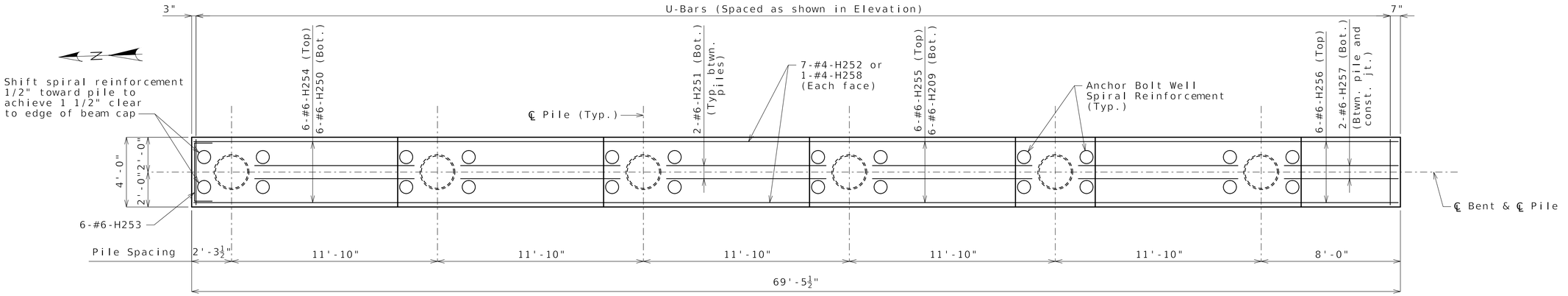
HORNER SHIFRIN
THE POWER OF EXPERIENCE AND INNOVATION
401 S. 18th St., Ste. 400
St. Louis, MO 63103
314-231-4321 FAX: 314-531-8866
www.hornershifrin.com

EMERY SAPPS SOMS, INC

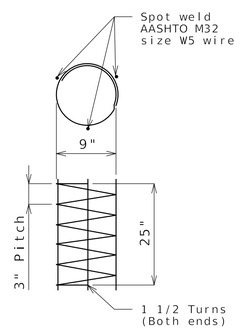
REV. RevDesc



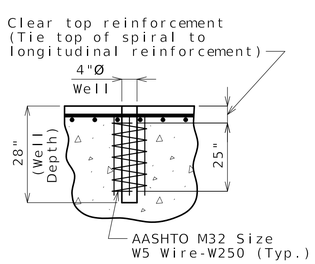
PLAN OF BEAM



PLAN OF BEAM SHOWING REINFORCEMENT
Construction joint not shown for clarity



DETAIL OF
SPIRAL REINFORCEMENT



ANCHOR BOLT WELLS

Notes:

Work this sheet with Sheets No. 11, 13 & 14.

For details of diaphragms at intermediate bents 2 & 3, see Sheet No. 41.

For details of bearings, see Sheet No. 29.

Bar marks for Intermediate Bent No. 2 shown (200 series), Intermediate Bent No. 3 similar (300 series).

Reinforcing steel shall be shifted to clear anchor bolt wells by at least 1/2".

Holes for anchor bolts may be drilled into the substructure.

Anchor bolt wells shall not be formed with galvanized corrugated steel pipe.

DETAILS FOR INTERMEDIATE BENTS NO. 2 AND 3 - PHASE 2

Designed SR MAY 2026
Detailed CAB MAY 2026
Checked MAC JUN 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_12_Int Bents 2 & 3 Plans 1.dgn 12:18:55 AM Eastern 16-JUL-2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
REGISTERED PROFESSIONAL ENGINEER
7-16-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-12

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

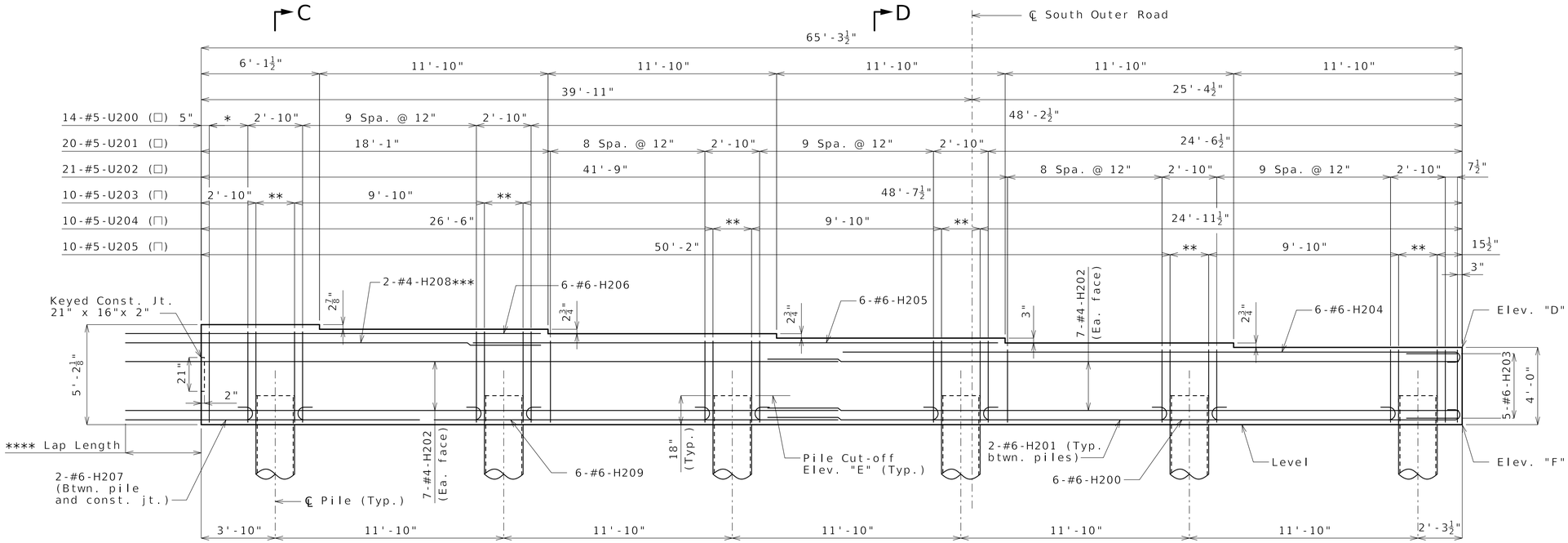
IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
THE POWER OF EXPERIENCE AND INNOVATION
401 S. 18th St., Ste. 400
ST. LOUIS, MISSOURI 63103
314-231-4321 FAX: 314-531-8866
www.hornershifrin.com

EMERY SAPPS SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc



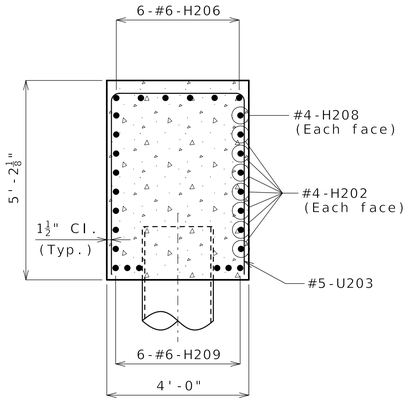
**** Min. Lap Lengths:
H202 = 18"
H206 = 2'-11"
H207 = 2'-3"
H208 = 2'-0"
H209 = 2'-3"

* 2 Spa. @ 12"

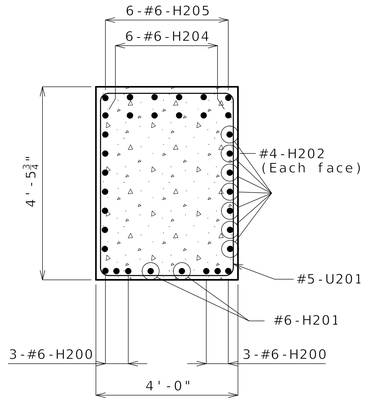
** 4 Spa. @ 6"

*** Lap the #4-H208 bars with the exterior #6-H205 bars (1 each face)

PARTIAL ELEVATION
(Looking ahead station)



SECTION C-C



SECTION D-D

Table of Variables		
Variable	Bent 2	Bent 3
"D"	594.76	595.99
"E"	592.26	593.49
"F"	590.76	591.99

Notes:

Work this sheet with Sheets No. 11, 12 & 14.

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

Bar marks for Intermediate Bent No. 2 shown (200 series), Intermediate Bent No. 3 similar (300 series).

DETAILS FOR INTERMEDIATE BENTS NO. 2 AND 3 - PHASE 1

Designed SR MAY 2026
Detailed CAB MAY 2026
Checked MAC JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI — MARTIN ALAN CHORKEY — NUMBER PE-2013006488 — PROFESSIONAL ENGINEER — 7-17-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-13
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

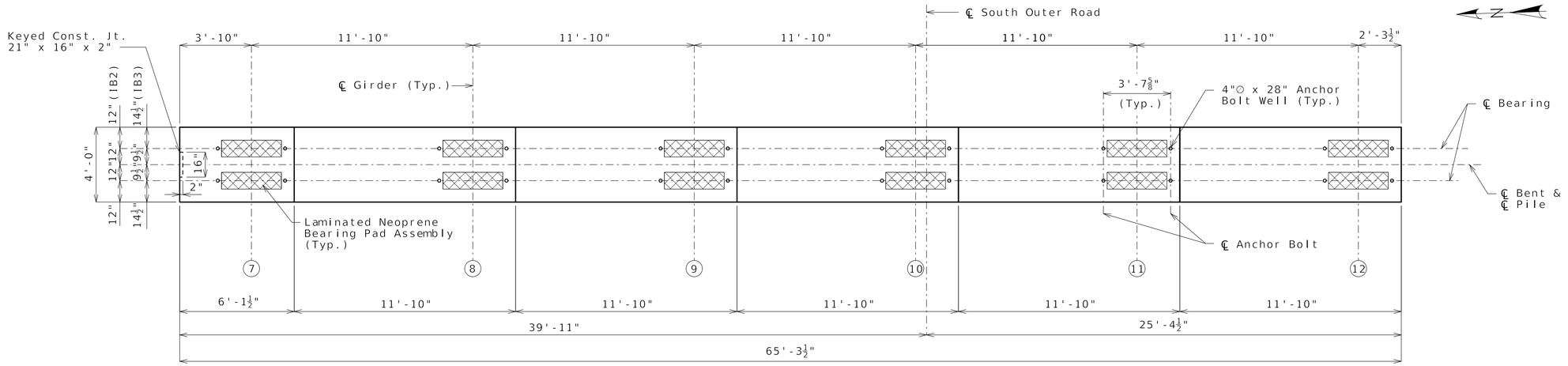
IMPROVE I-70 ROCHEPORT TO COLUMBIA

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

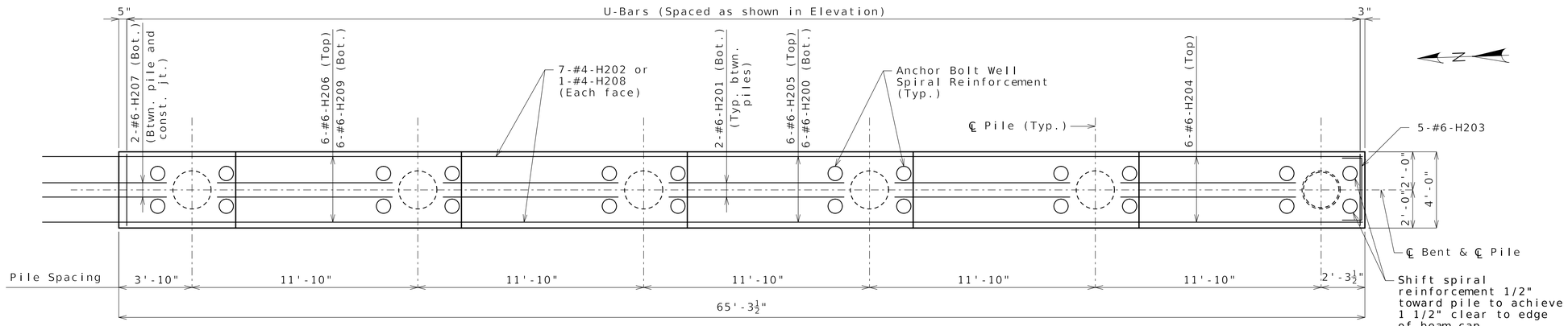
EMERY SAPP & SONS, INC

HORNER SHIFRIN
THE PROFESSIONAL PARTNERSHIP FOR WORK WITHIN
401 S. 18th St., Ste. 400
ST. LOUIS, MO 63103
314-531-1420 FAX: 314-531-0966
www.hornershifrin.com

REV. RevDesc

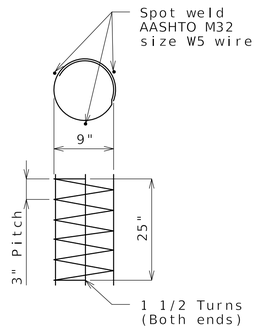


PLAN OF BEAM

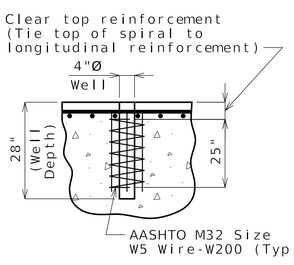


PLAN OF BEAM SHOWING REINFORCEMENT

Construction joint not shown for clarity



DETAIL OF
SPIRAL REINFORCEMENT



ANCHOR BOLT WELLS

Notes:

Work this sheet with Sheets No. 11, 12 & 13.

For details of diaphragms at intermediate bent, see Sheet No. 42.

For details of bearings, see Sheet No. 29.

Bar marks for Intermediate Bent No. 2 shown (200 series), Intermediate Bent No. 3 similar (300 series).

Reinforcing steel shall be shifted to clear anchor bolt wells by at least 1/2".

Holes for anchor bolts may be drilled into the substructure.

Anchor bolt wells shall not be formed with galvanized corrugated steel pipe.

DETAILS FOR INTERMEDIATE BENTS NO. 2 AND 3 - PHASE 1

Designed SR MAY 2026
Detailed CAB MAY 2026
Checked MAC JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
PE-2013006488
07-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-14

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

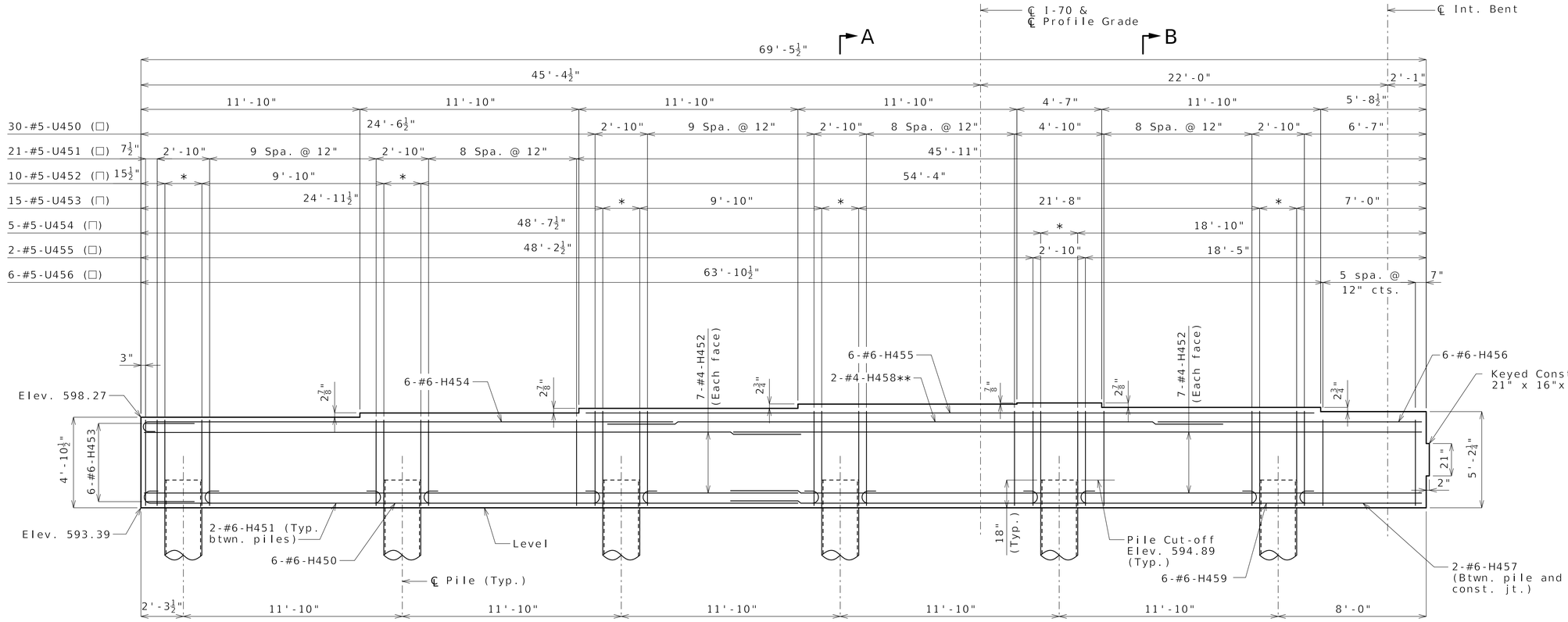
BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
MoDOT
IMPROVE I-70 ROCHEPORT TO COLUMBIA
EMERY SAPP & SONS, INC
HORNER SHIFRIN
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc



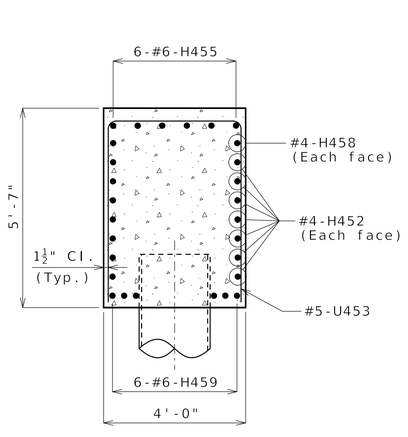
PARTIAL ELEVATION

(Looking ahead station)

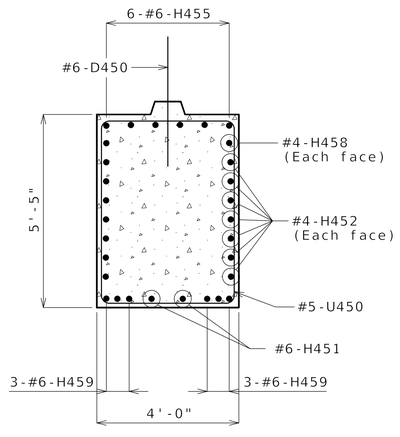
Notes:
Keys not shown for clarity.

* 4 Spa. @ 6"

** Lap the #4-H458 bars with the exterior #6-H456 and #6-H454 bars (1 each face)



SECTION A-A



SECTION B-B

Notes:

Work this sheet with Sheets No. 16, 17 & 18.

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

DETAILS FOR INTERMEDIATE BENT NO. 4 - PHASE 2

Designed SR MAY 2026
Detailed CAB MAY 2026
Checked MAC JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
REGISTERED PROFESSIONAL ENGINEER
7-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-15

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

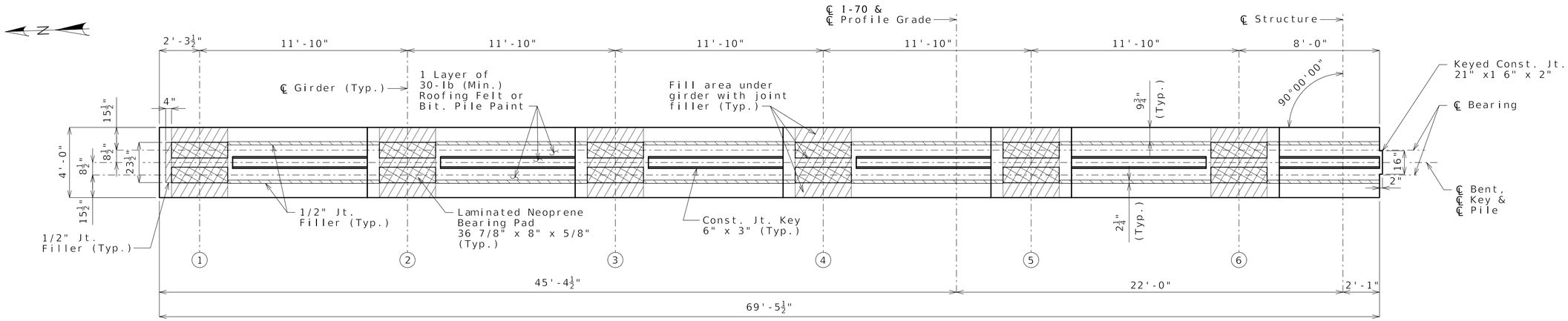
IMPROVE I-70 ROCHEPORT TO COLUMBIA

EMERY SAPP & SONS, INC

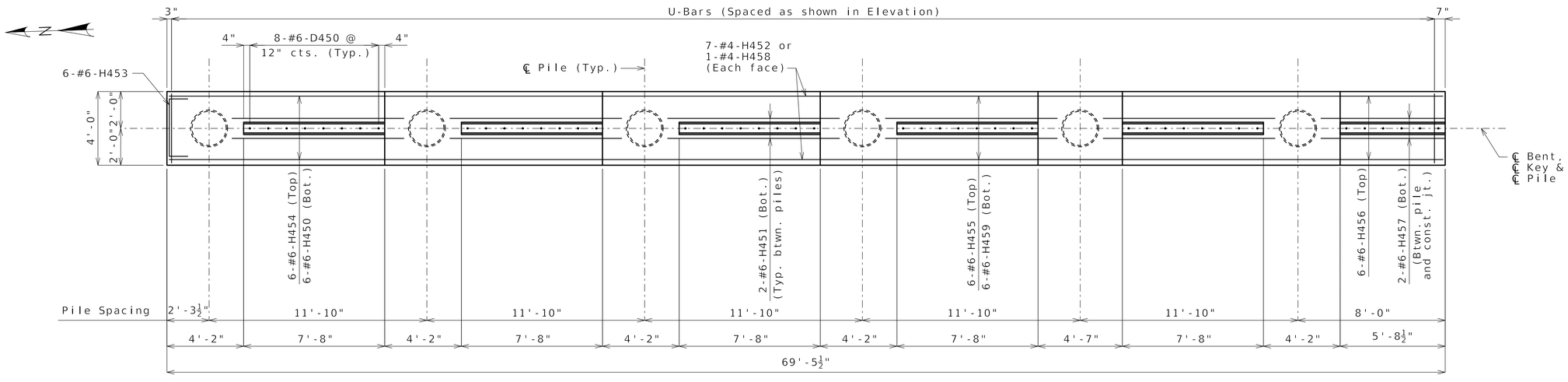
HORNER SHIFRIN
THE POWER OF MULTIDISCIPLINARY INNOVATION
401 S. 18th St., Ste. 400
ST. LOUIS, MO 63103
314-531-4321 FAX 314-531-6866
www.hornershifrin.com

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

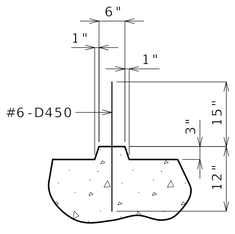


PLAN OF BEAM

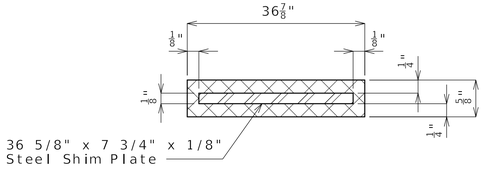


PLAN OF BEAM SHOWING REINFORCEMENT

Construction joint not shown for clarity



SECTION THRU KEY



TYPICAL SECTION THRU
LAMINATED NEOPRENE BEARING PAD

Notes:

Work this sheet with Sheets No. 15, 17 & 18.

For details of diaphragms at intermediate bent, see Sheet No. 43.

For steps 2 inches or more, use 2 1/4 x 1/2 inch joint filler up vertical face.

DETAILS FOR INTERMEDIATE BENT NO. 4 - PHASE 2

Designed SR MAY 2026
Detailed CAB MAY 2026
Checked MAC JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
REGISTERED ENGINEER
7-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-16

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

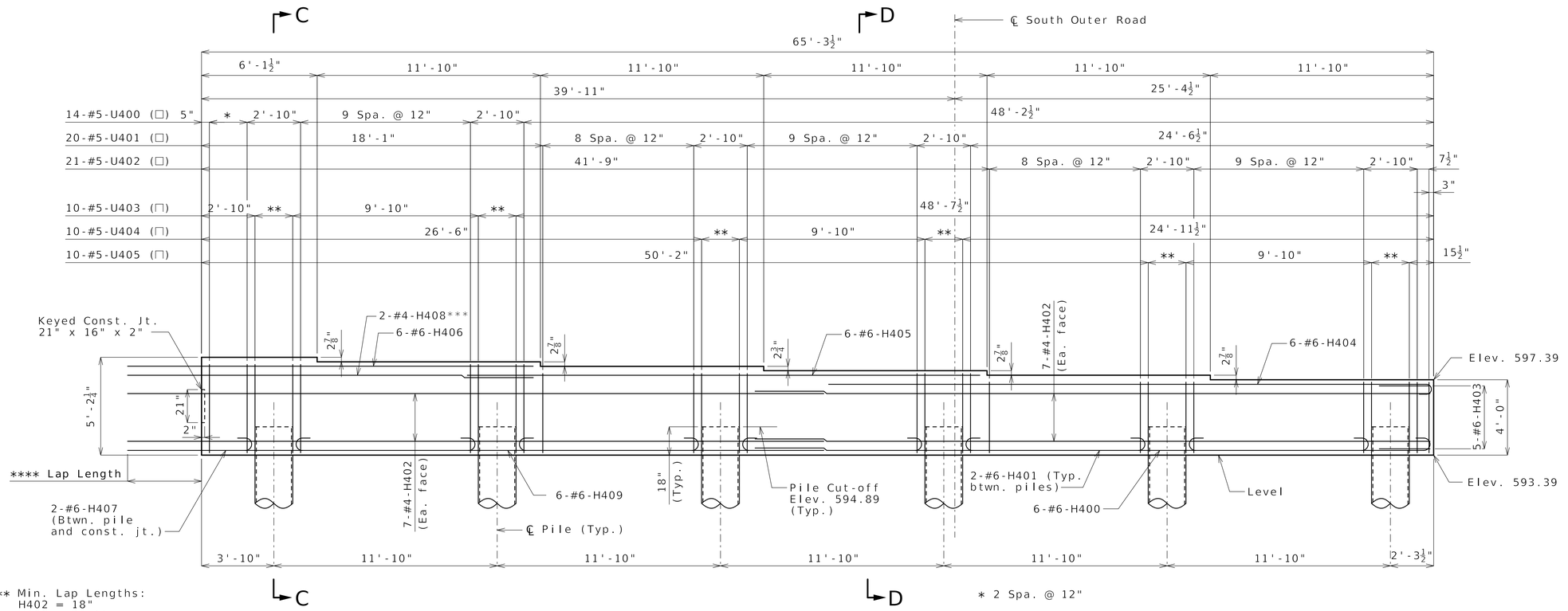
IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
THE HORNER SHIFRIN GROUP, INC.
801 S. 18th St., Ste. 400
St. Louis, MO 63103
314-531-1021 FAX: 314-531-2966
www.HornerShifrin.com

EMERY SAPP & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc



**** Min. Lap Lengths:
H402 = 18"
H406 = 2'-11"
H407 = 2'-3"
H408 = 2'-0"
H409 = 2'-3"

* 2 Spa. @ 12"

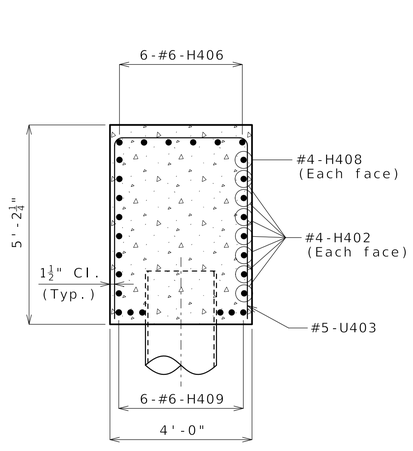
** 4 Spa. @ 6"

*** Lap the #4-H408 bars with the exterior #6-H405 bars (1 each face)

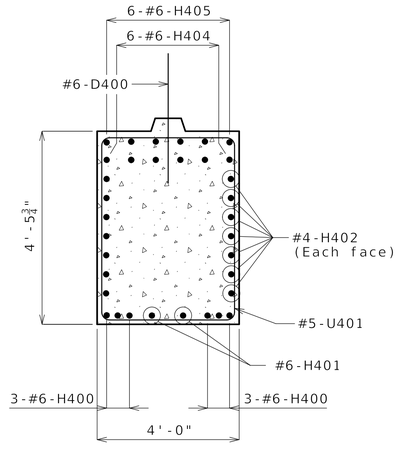
PARTIAL ELEVATION

(Looking ahead station)

Notes:
Keys not shown for clarity.



SECTION C-C



SECTION D-D

Notes:

Work this sheet with Sheets No. 15, 16 & 18.

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

DETAILS FOR INTERMEDIATE BENT NO. 4 - PHASE 1

Designed SR MAY 2026
Detailed CAB MAY 2026
Checked MAC JUN 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_17_Int Bent 4 Elevation 2.dgn 12:21:15 AM Eastern 16-JUL-2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
PE-2013006488
PROFESSIONAL ENGINEER
Martin Chorkey
7-17-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-17
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

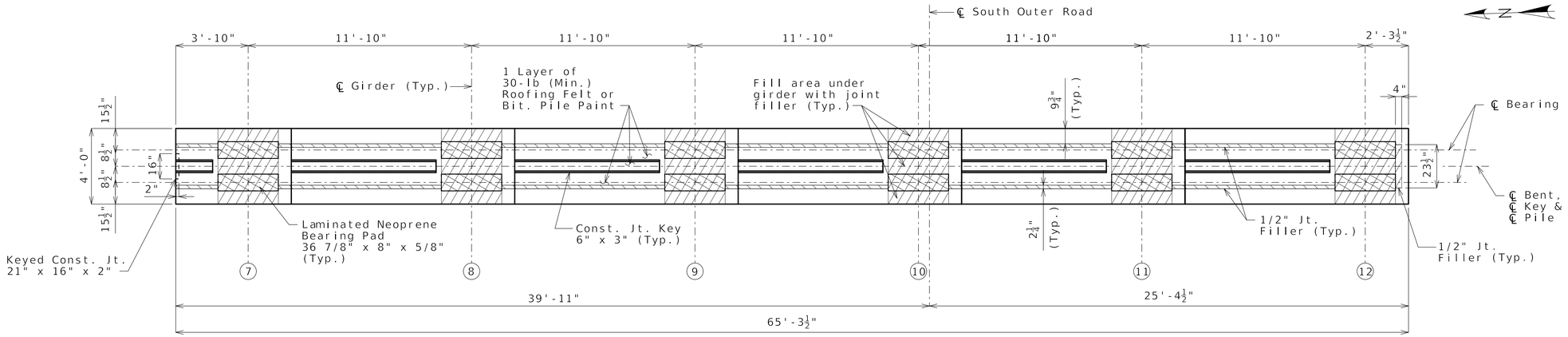
IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
THE PROFESSIONAL PARTNERSHIP
401 S. 18th St., Ste. 400
St. Louis, MO 63103
314-531-1420 FAX: 314-531-0966
www.hornershifrin.com

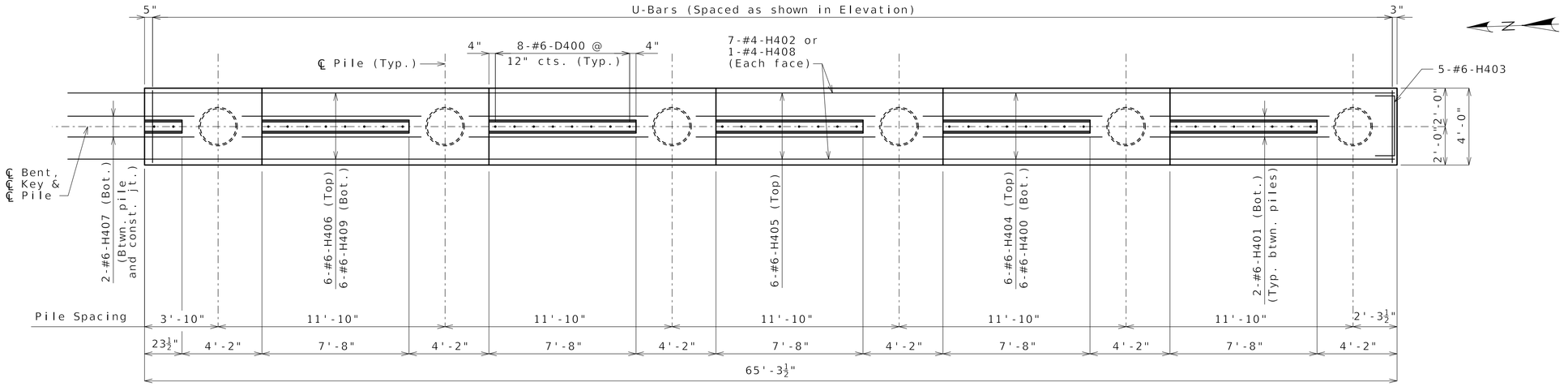
EMERY SAPP & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV: RevDesc

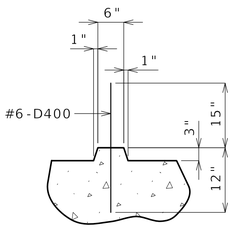


PLAN OF BEAM

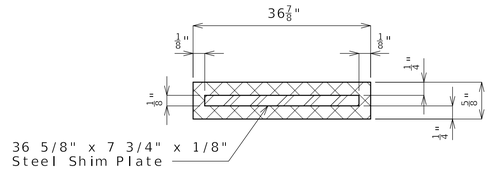


PLAN OF BEAM SHOWING REINFORCEMENT

Construction joint not shown for clarity



SECTION THRU KEY



TYPICAL SECTION THRU LAMINATED NEOPRENE BEARING PAD

Notes:

Work this sheet with Sheets No. 15, 16 & 17.

For details of diaphragms at intermediate bent, see Sheet No. 44.

For steps 2 inches or more, use 2 1/4 x 1/2 inch joint filler up vertical face.

DETAILS FOR INTERMEDIATE BENT NO. 4 - PHASE 1

Designed SR MAY 2026
Detailed CAB MAY 2026
Checked MAC JUN 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_18_Int Bent 4 Plan 2.dgn 12:22:27 AM Eastern 16-JUL-2026

STATE OF MISSOURI MARTIN ALAN CHORKEY PE-2013006488 7-17-2026

DATE PREPARED 16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-18

COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

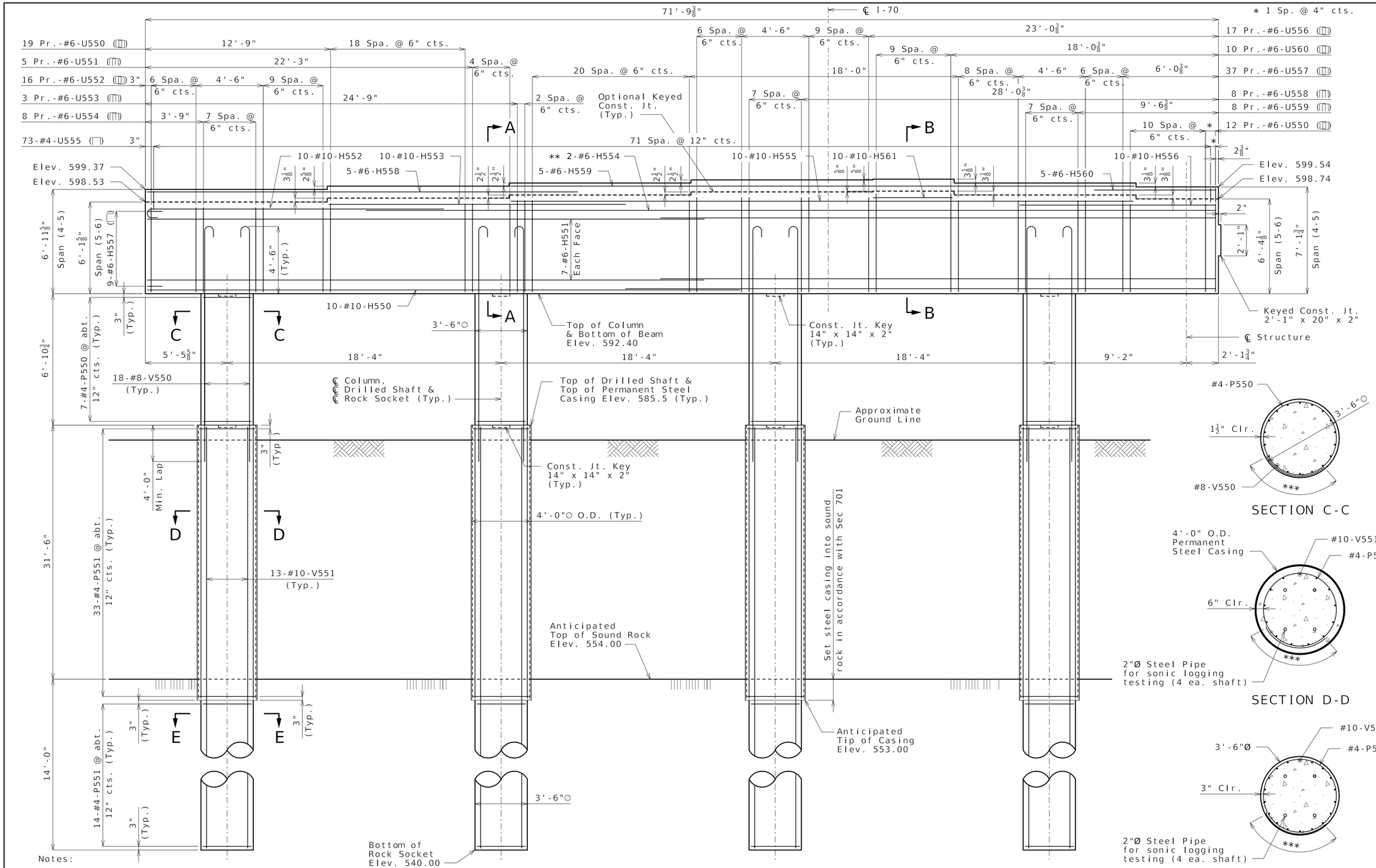
HORNER SHIFRIN — THE PROFESSIONAL PARTNERSHIP — 401 S. 18th St., Ste. 400, St. Louis, MO 63103-2709, 314-531-1420, FAX: 314-531-0966, www.hornershifrin.com

EMERY SAPP & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

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

REV: RevDesc



ELEVATION LOOKING UPSTATION

Beam keys not shown for clarity.

SECTION C-C

SECTION D-D

SECTION E-E

*** Minimum Lap = 2'-0"
(Stagger adjacent bar splices)

Notes:

Work this sheet with Sheets No. 20, 21 & 22.

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

** Lap the #6-H554 bars with the exterior #10-H552 bars (1 each face)

DETAILS FOR INTERMEDIATE BENT NO. 5 - PHASE 2

Designed SR MAY 2026
Detailed CAB MAY 2026
Checked UVK JUN 2026

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 19 of 78

B_JST0017_A9819_19_Int Bent 5 Elevation 1.dgn 12:20:53 AM Eastern 16-JUL-2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
PE-2013006488
17-JUL-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-19
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

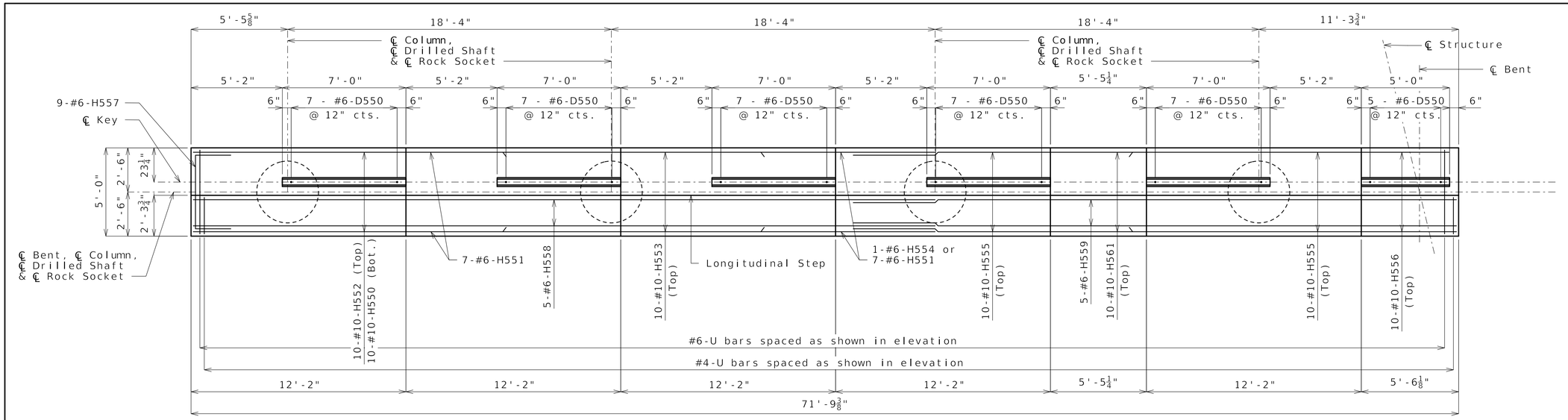
IMPROVE I-70 ROCHEPORT TO COLUMBIA

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

HORNER SHIFRIN
THE POWER OF INTEGRATION
401 S. 18th St., Ste. 400
St. Louis, MO 63103
314-531-4321 FAX 314-531-6866
www.hornershifrin.com

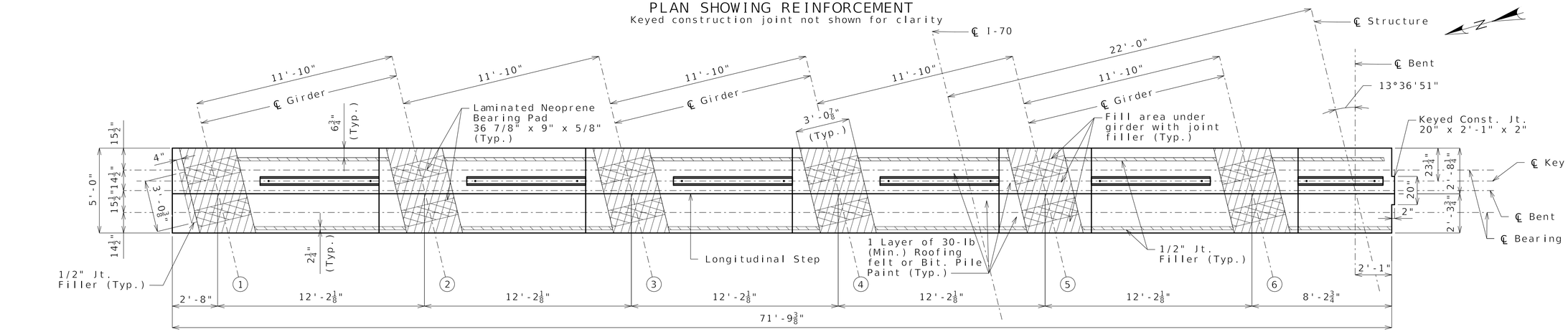
EMERY SAPPS SONS, INC

REV. RevDesc

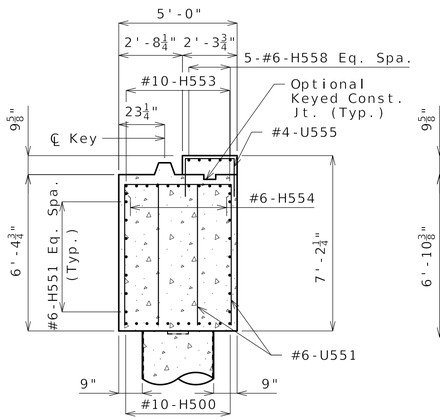


PLAN SHOWING REINFORCEMENT

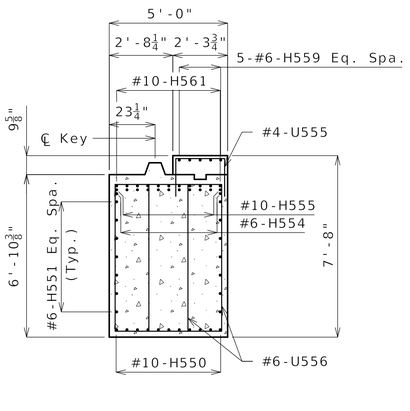
Keyed construction joint not shown for clarity



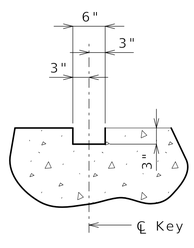
PLAN OF BEAM



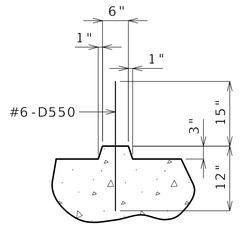
SECTION A-A



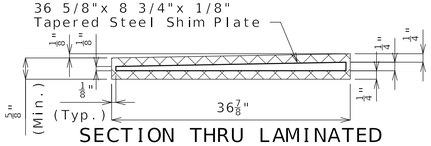
SECTION B-B



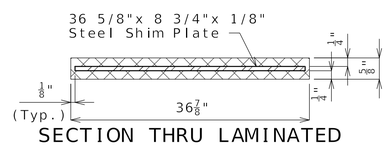
SECTION THRU OPTIONAL KEYED CONST. JT. KEY



SECTION THRU KEY



SECTION THRU LAMINATED NEOPRENE BEARING PAD (SPAN 4-5)



SECTION THRU LAMINATED NEOPRENE BEARING PAD (SPAN 5-6)

Notes:

Work this sheet with Sheets No. 19, 21 & 22.

Thickness of permanent steel casing shall be in accordance with Sec 701.

An additional 4 feet has been added to V bar lengths and additional 4-#4-P551 bars have been added for possible change in drilled shaft or rock socket length. The additional V bar length shall be cut off or included in the reinforcement lap if not required. The P bars shall be spaced similarly to that shown in Elevation, if required, or a lesser spacing if not required but not less than 6-inch centers.

Sonic logging testing shall be performed on all drilled shafts and rock sockets.

For steps 2 inches or more, use 2 1/4 x 1/2 inch joint filler up vertical face.

DETAILS FOR INTERMEDIATE BENT NO. 5 - PHASE 2

Designed SR MAY 2026
Detailed CAB JUN 2026
Checked UVK JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI — MARTIN ALAN CHORKEY — NUMBER PE-2013006488 — REGISTERED ENGINEER — 7-16-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-20
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

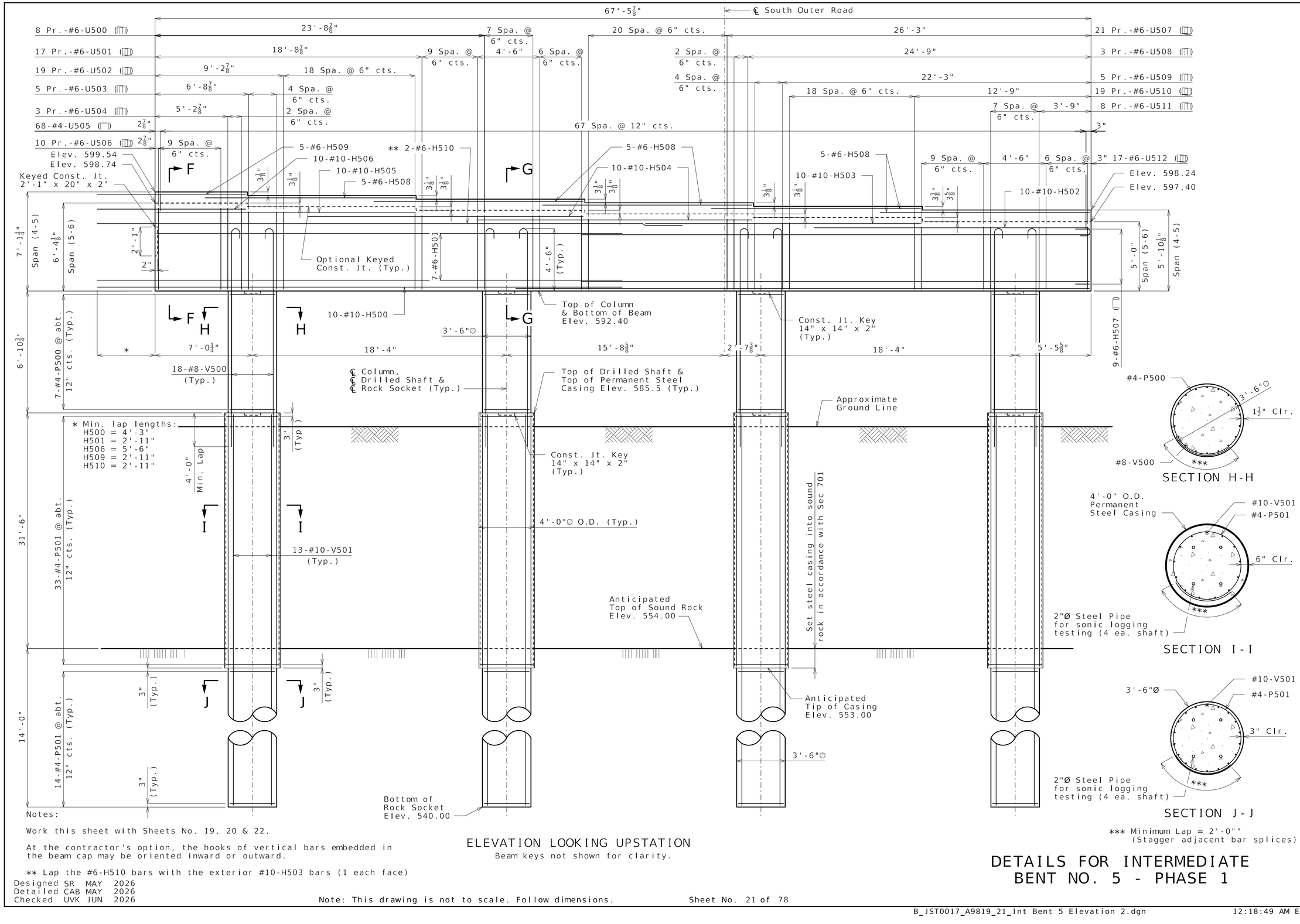
IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN — THE POWER OF STRUCTURAL INNOVATION — 401 S. 18th St., Ste. 400, St. Louis, MO 63103, 314-531-4321 FAX: 314-531-6866, www.HornerShifrin.com

EMERY SAPP & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc



Notes:

Work this sheet with Sheets No. 19, 20 & 22.

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

** Lap the #6-H510 bars with the exterior #10-H503 bars (1 each face)

*** Minimum Lap = 2'-0""
(Stagger adjacent bar splices)

ELEVATION LOOKING UPSTATION
Beam keys not shown for clarity.

DETAILS FOR INTERMEDIATE BENT NO. 5 - PHASE 1

Designed SR MAY 2026
Detailed CAB MAY 2026
Checked UVK JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
7-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-21

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

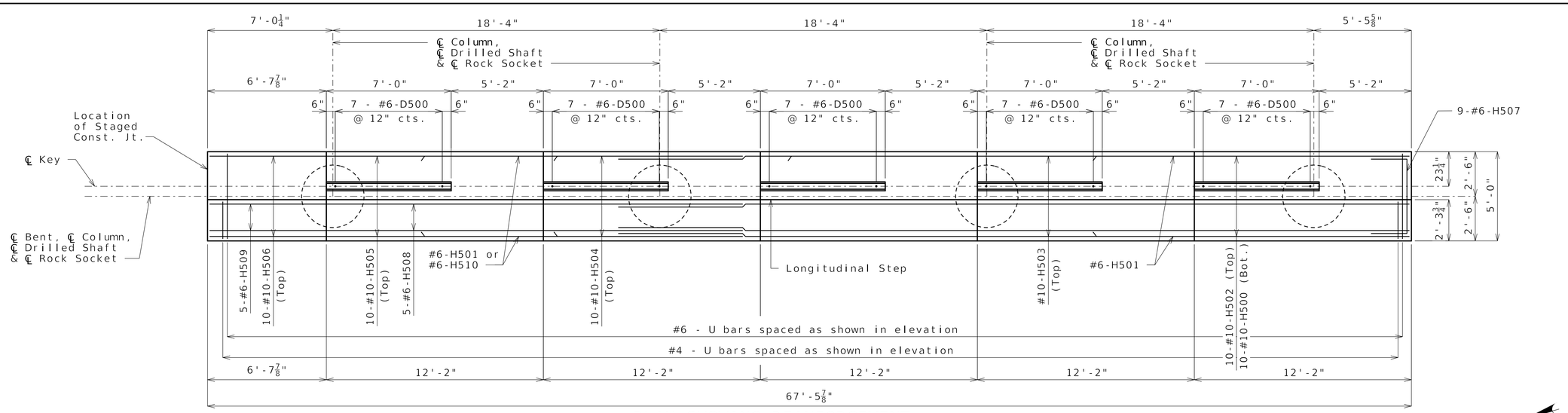
IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
THE POWER OF EXPERIENCE IN CONSTRUCTION
401 S. 18th St., Ste. 400
St. Louis, MO 63103-2305
314-231-4321 FAX: 314-531-8866
www.hornershifrin.com

EMERY SAPPS SONS, INC

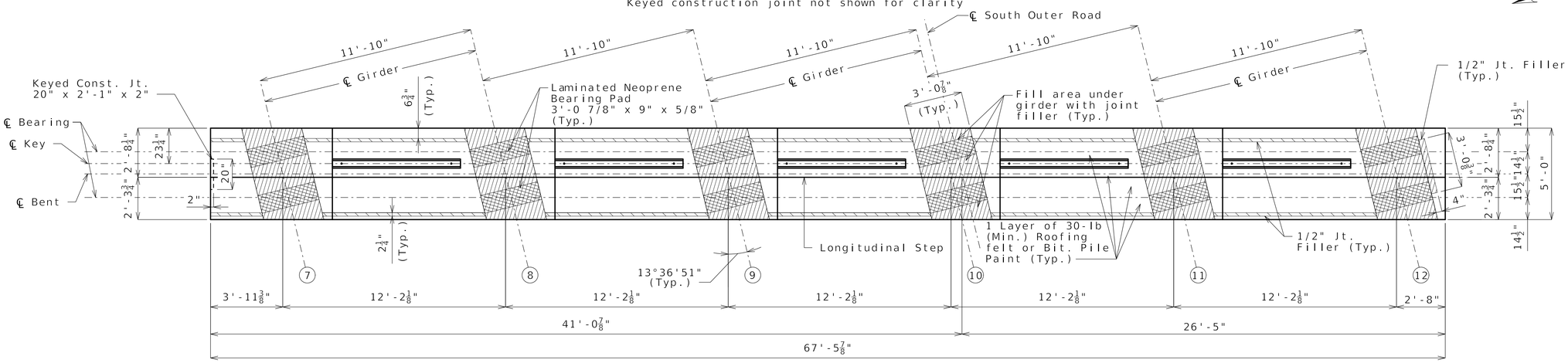
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

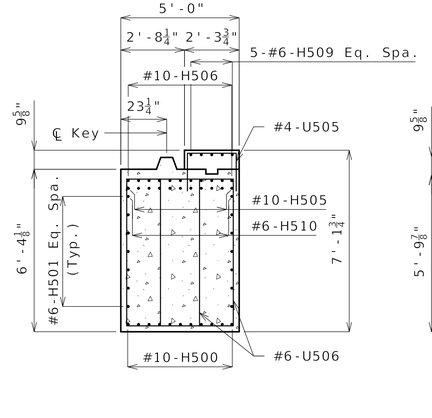


PLAN SHOWING REINFORCEMENT

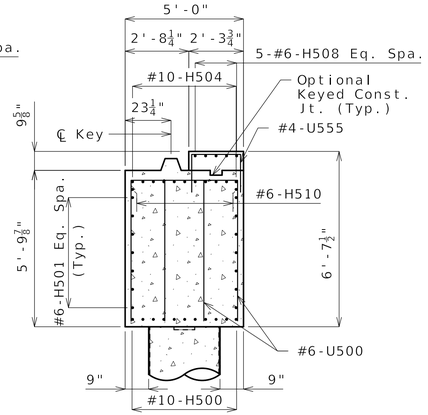
Keyed construction joint not shown for clarity



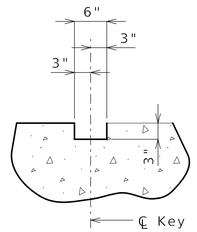
PLAN OF BEAM



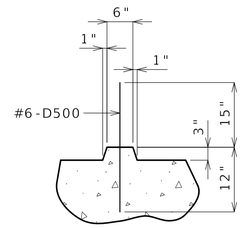
SECTION F-F



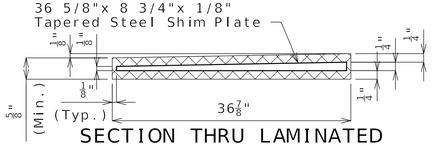
SECTION G-G



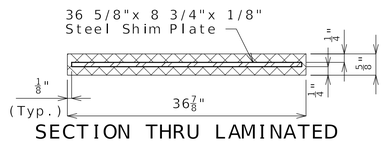
SECTION THRU OPTIONAL KEYED CONST. JT. KEY



SECTION THRU KEY



SECTION THRU LAMINATED NEOPRENE BEARING PAD (SPAN 4-5)



SECTION THRU LAMINATED NEOPRENE BEARING PAD (SPAN 5-6)

Notes:

Work this sheet with Sheets No. 19, 20 & 21.

Thickness of permanent steel casing shall be in accordance with Sec 701.

An additional 4 feet has been added to V bar lengths and additional 4-#4-P501 bars have been added for possible change in drilled shaft or rock socket length. The additional V bar length shall be cut off or included in the reinforcement lap if not required. The P bars shall be spaced similarly to that shown in Elevation, if required, or a lesser spacing if not required but not less than 6-inch centers.

Sonic logging testing shall be performed on all drilled shafts and rock sockets.

For steps 2 inches or more, use 2 1/4 x 1/2 inch joint filler up vertical face.

DETAILS FOR INTERMEDIATE BENT NO. 5 - PHASE 1

Designed SR MAY 2026
Detailed CAB JUN 2026
Checked UVK JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI MARTIN ALAN CHORKEY PE-2013006488 REGISTERED ENGINEER
DATE PREPARED 16-JUL-2026
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. BR04-22
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

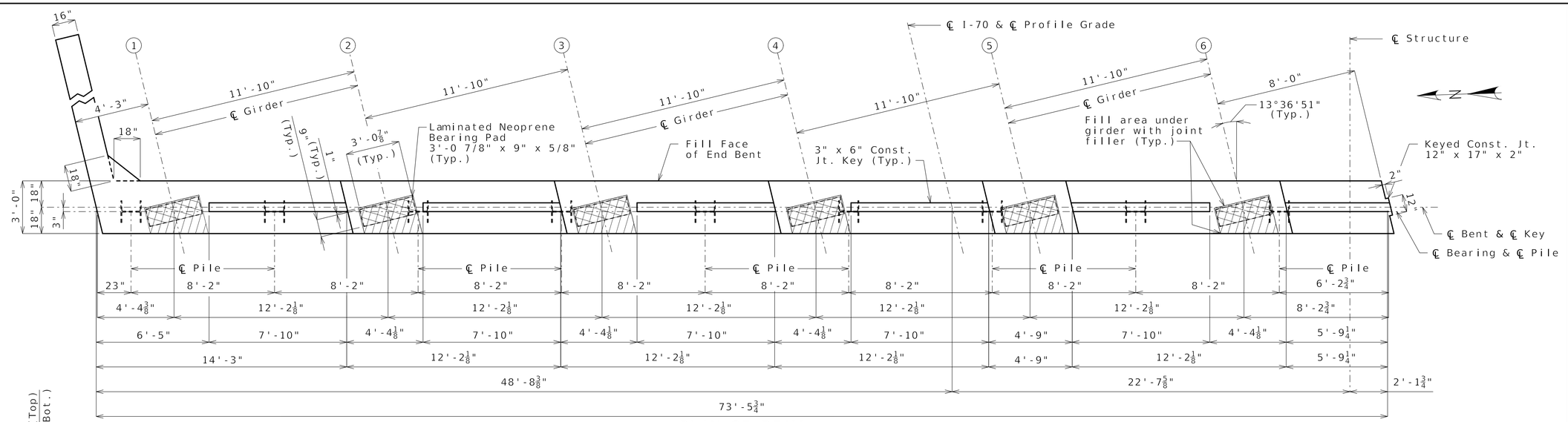
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

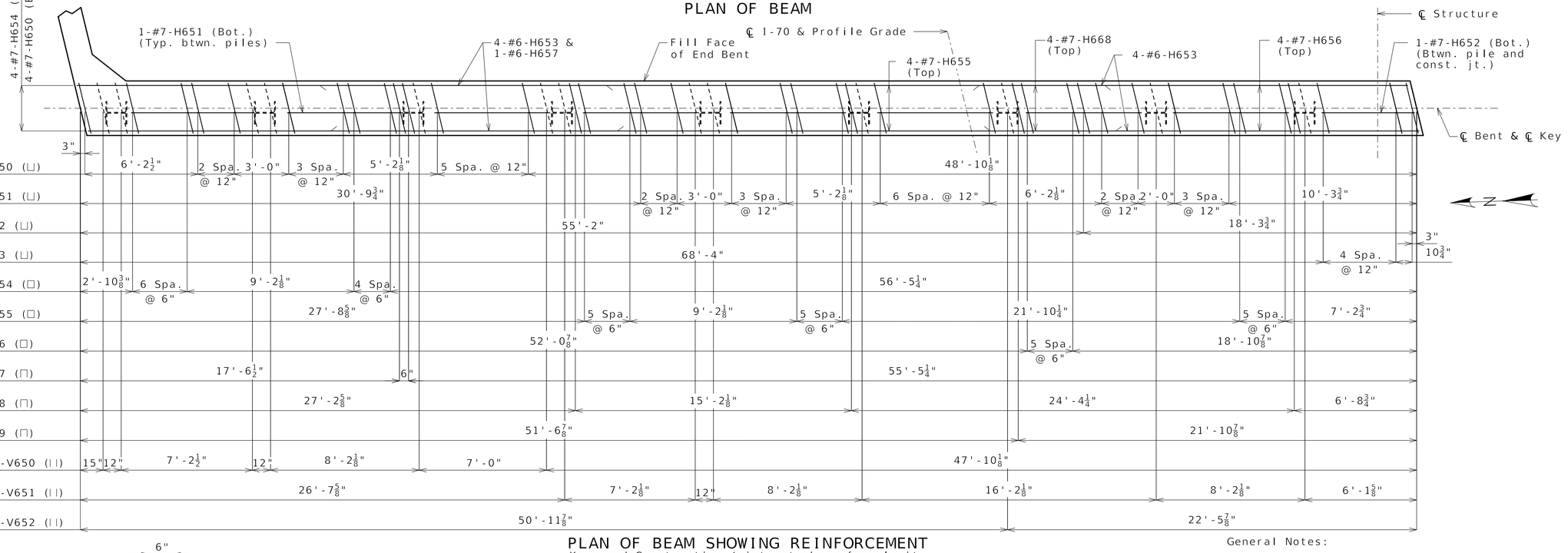
HORNER SHIFRIN — EMERY SAPP & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

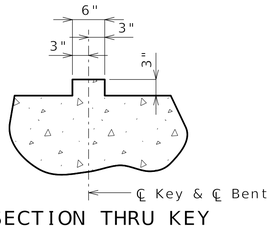


PLAN OF BEAM

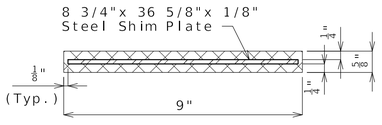


PLAN OF BEAM SHOWING REINFORCEMENT

Keys and Construction Joint not shown for clarity



SECTION THRU KEY



SECTION THRU LAMINATED NEOPRENE BEARING PAD (SPAN 5-6)

General Notes:

Work this sheet with Sheets No. 24, 25, 26 & 27.

For details of Vertical Drain at End Bent No. 6, see Sheet No. 28.

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

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

DETAILS FOR END BENT NO. 6 - PHASE 2

Designed SR FEB 2026
Detailed CAB FEB 2026
Checked SR JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI — MARTIN ALAN CHORKEY — NUMBER PE-2013006488 — REGISTERED ENGINEER — 7-17-26

DATE PREPARED 16-JUL-2026
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. BR04-23
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

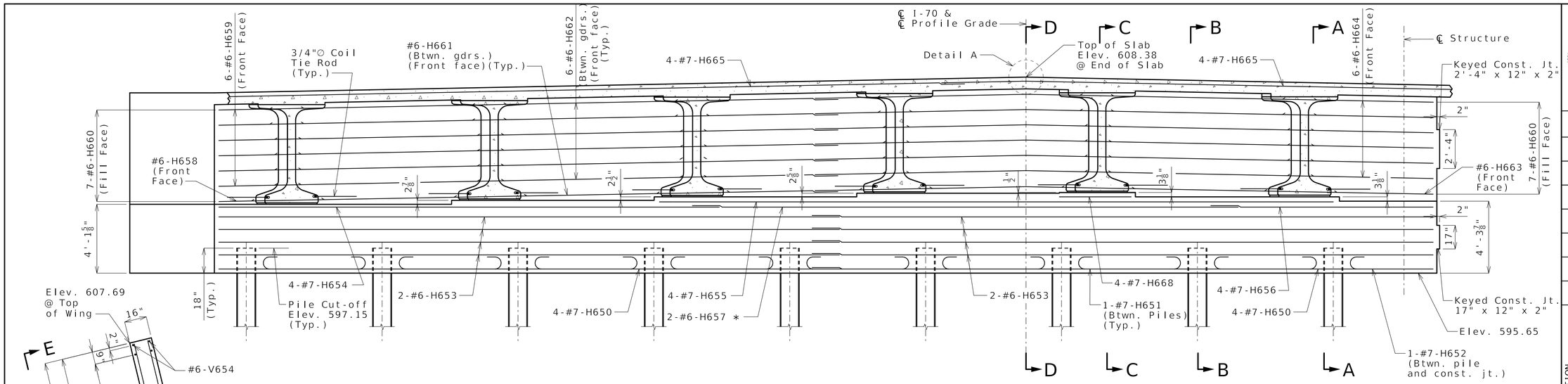
IMPROVE I-70 ROCHEPORT TO COLUMBIA

EMERY SAPPS SONS, INC

HORNER SHIFRIN
THE POWER OF COLLABORATION
401 S. 18th St. Ste. 400
St. Louis, MO 63103
314-531-4321 FAX: 314-531-8866
www.HornerShifrin.com

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

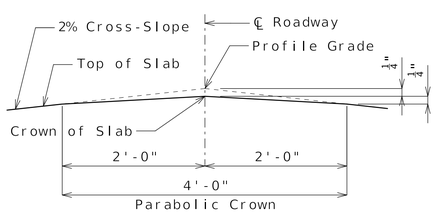
REV. RevDesc



SECTION NEAR END BENT

* Lap the #6-H657 bars with the exterior #7-H654 bars & #7-H656 bars (1 each face)

PART PLAN



DETAIL A

General Notes:

Work this sheet with Sheets No. 23, 25, 26 & 27.

For Sections A-A, B-B, C-C & D-D and Elevation E-E, see Sheet No. 27.

The #6-F650 bars shall be bent in the field to clear girders.

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

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

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

For location of coil tie rods and #5-H669 (Strand tie bar), see Sheet No. 35.

For details of Vertical Drain at End Bent No. 6, see Sheet No. 28.

For details of Bridge Approach Slab, see Sheet No. 62.

DETAILS FOR END BENT NO. 6 - PHASE 2

Designed SR FEB 2026
Detailed CAB FEB 2026
Checked SR JUN 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_24_End Bent 6 Elevation 1.dgn 12:20:17 AM Eastern 16-JUL-2026

STATE OF MISSOURI MARTIN ALAN CHORKEY PE-2013006488 7-17-26

DATE PREPARED 16-JUL-2026
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. BR04-24
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

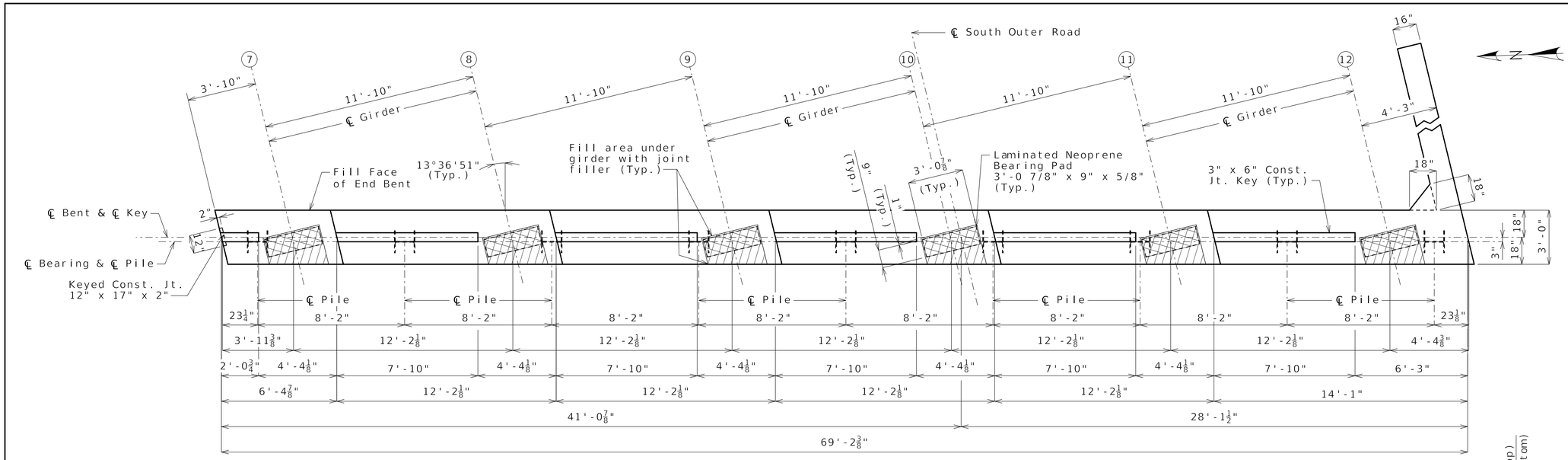
IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
The Power of Engineering Innovation
401 S. 18th St., Ste. 400
St. Louis, MO 63103
314-531-1420 FAX: 314-531-0966
www.hornershifrin.com

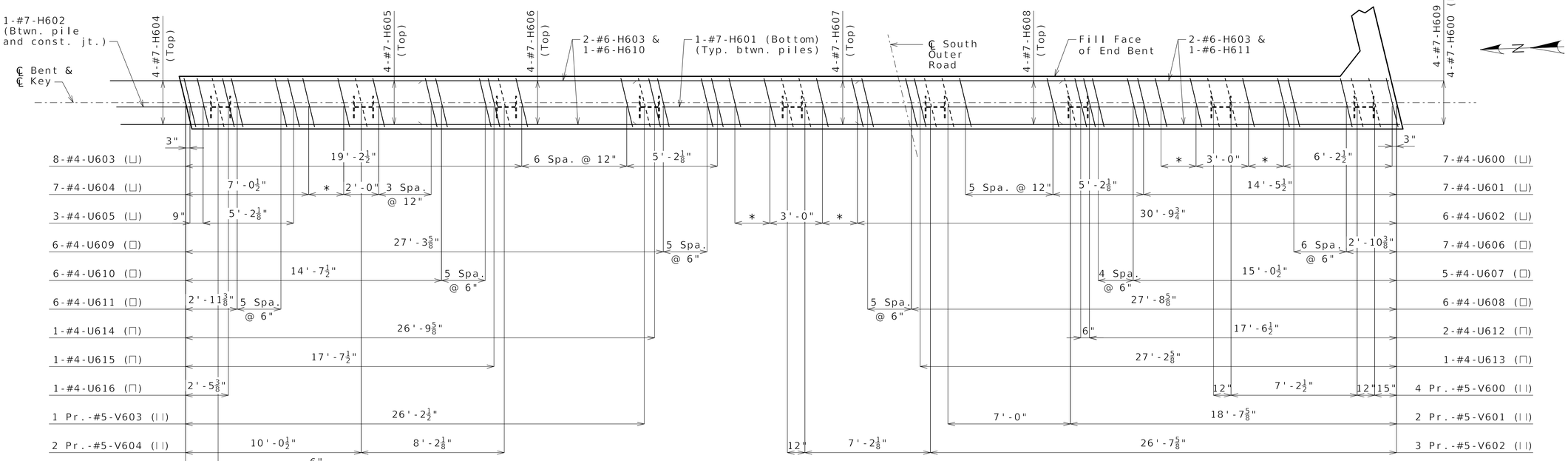
EMERY SAPP & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV: RevDesc



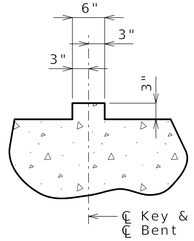
PLAN OF BEAM



PLAN OF BEAM SHOWING REINFORCEMENT

Keys and construction joint not shown for clarity

* 2 Spa. @ 12"



SECTION THRU KEY

General Notes:

Work this sheet with Sheets No. 23, 24, 26 & 27.

For details of Vertical Drain at End Bent No. 6, see Sheet No. 28.

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

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

DETAILS FOR END BENT NO. 6 - PHASE 1

Designed SR FEB 2026
Detailed CAB FEB 2026
Checked SR JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI — MARTIN ALAN CHORKEY — PE-2013006488 — REGISTERED PROFESSIONAL ENGINEER — 7-17-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-25
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

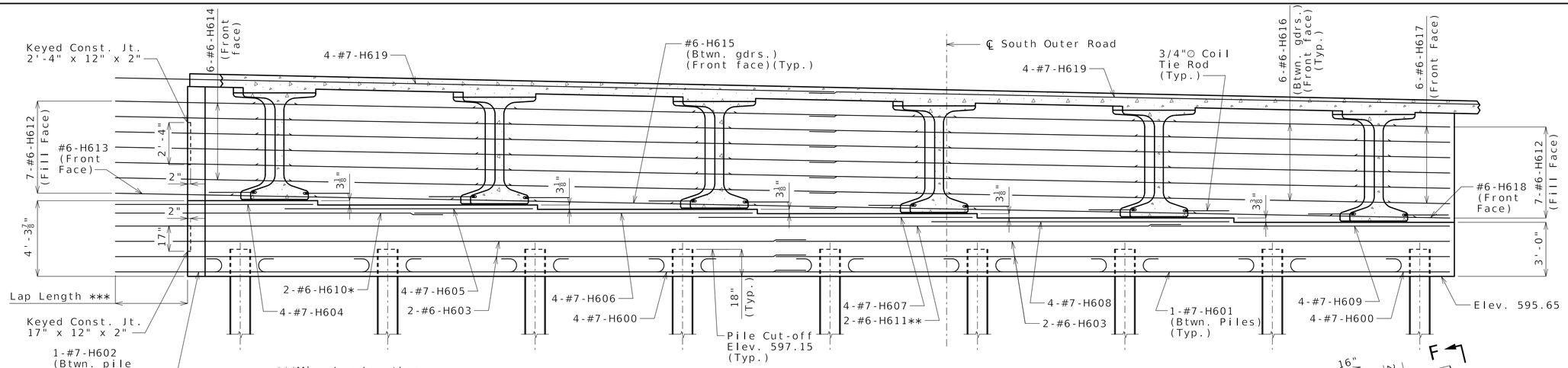
EMERY SAPP & SONS, INC

HORNER SHIFRIN — STRUCTURAL ENGINEERS — THE PENTHOUSE AT THE PARK — 401 S. 18th St., Ste. 400 — St. Louis, Missouri 63103 — 314-531-1420 FAX: 314-531-0966 — www.HornerShifrin.com

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

B_JST0017_A9819_25_End Bent 6 Plans 2.dgn 12:21:23 AM Eastern 16-JUL-2026



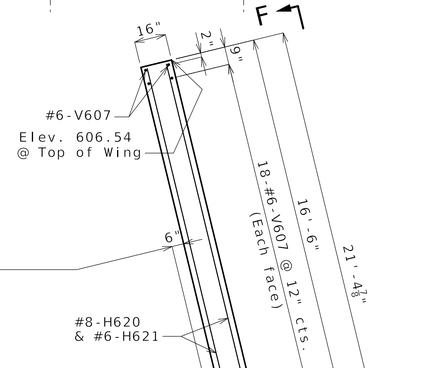
SECTION NEAR END BENT

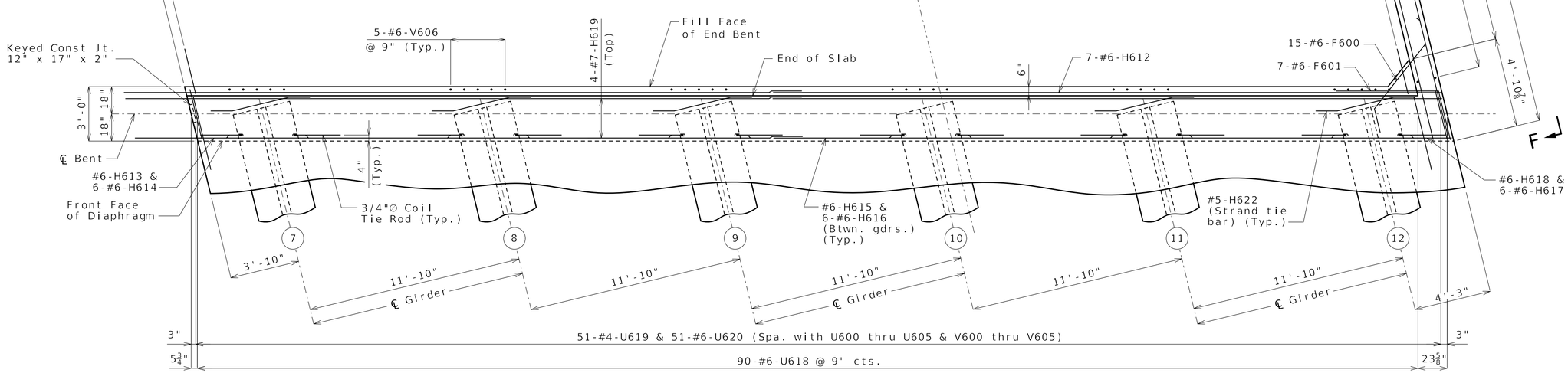
***Min. Lap Lengths:

H600 = 4'-6"
H602 = 4'-6"
H603 = 3'-10"
H604 = 4'-6"
H610 = 3'-10"
H611 = 3'-10"
H612 = 3'-10"
H613 = 3'-10"
H614 = 3'-10"
H619 = 4'-6"

* Lap the #6-H610 bars with the exterior #7-H606 bars (1 each face)

** Lap the #6-H611 bars with the exterior #7-H609 bars (1 each face)





PART PLAN

General Notes:

Work this sheet with Sheets No. 23, 24, 25 & 27.

For Elevation E-E, see Sheet No. 27.

The #6-F600 bars shall be bent in the field to clear girders.

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

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

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

For location of coil tie rods and #5-H622 (Strand tie bar), see Sheet No. 35.

For details of Vertical Drain at End Bent No. 6, see Sheet No. 28.

For details of Bridge Approach Slab, see Sheet No. 62

DETAILS FOR END BENT NO. 6 - PHASE 1

Designed SR FEB 2026
Detailed CAB FEB 2026
Checked SR JUN 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_26_End Bent 6 Elevation 2.dgn 12:19:22 AM Eastern 16-JUL-2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
16-JUL-2026

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-26

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

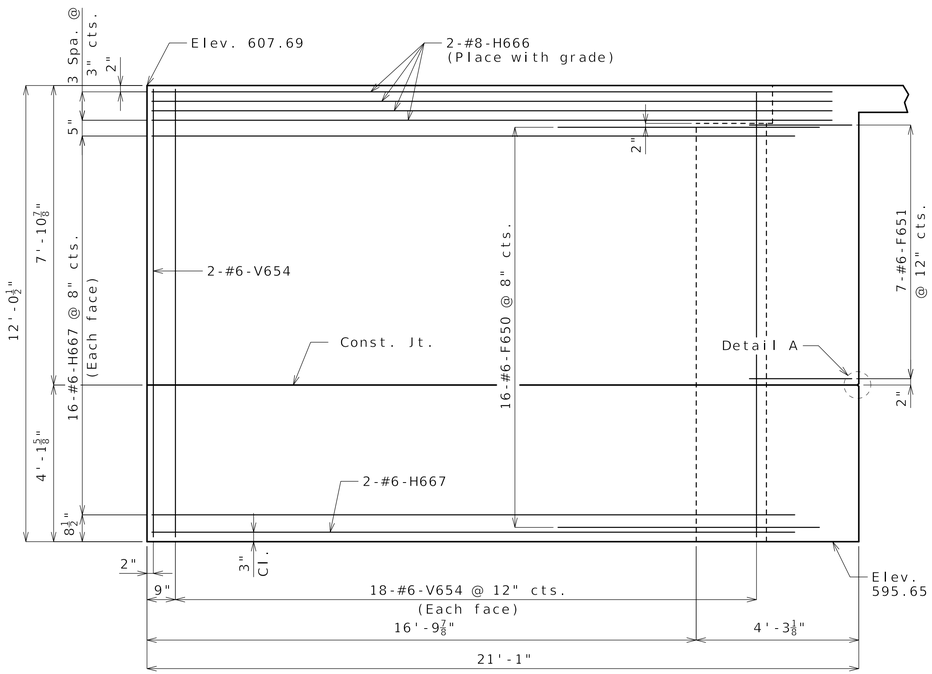
HORNER SHIFRIN
THE PROFESSIONAL PARTNERSHIP
401 S. 18th St. Ste. 400
ST. LOUIS, MISSOURI 63103
314-531-1420 FAX: 314-531-0660
www.hornershifrin.com

EMERY SAPP & SONS, INC

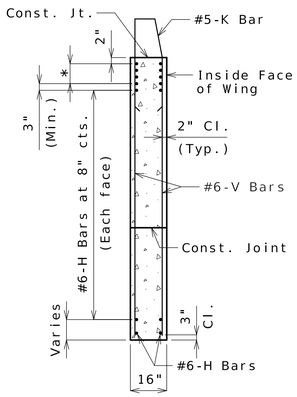
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV: RevDesc

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

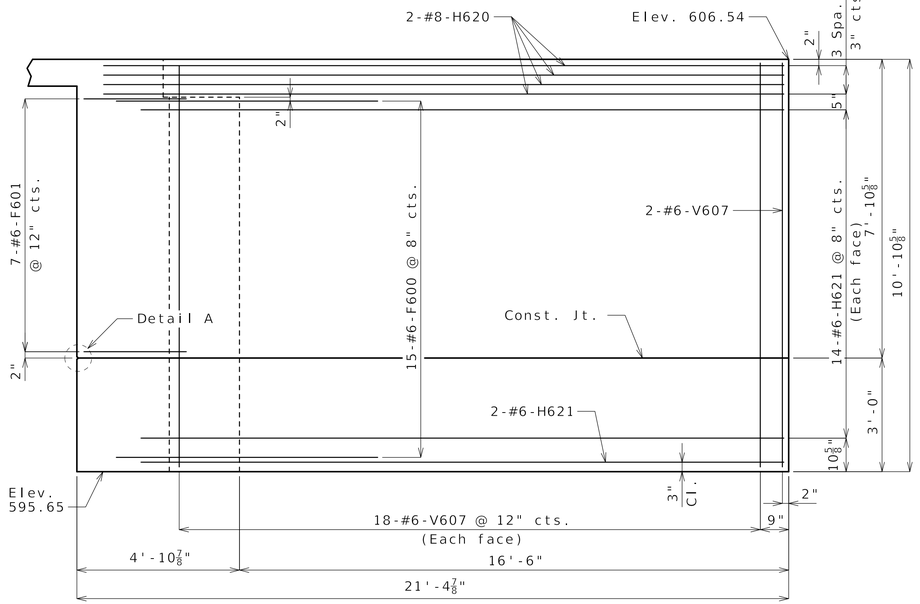


ELEVATION E-E

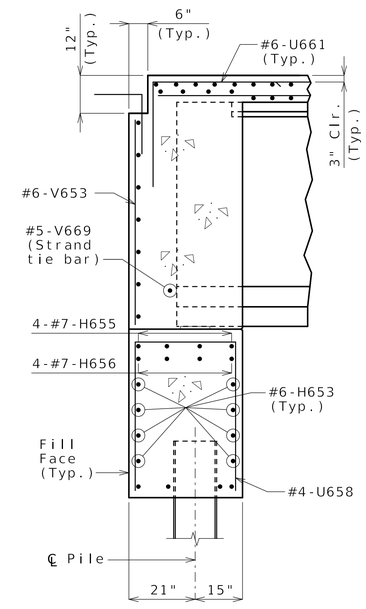


TYPICAL SECTION
THRU WING

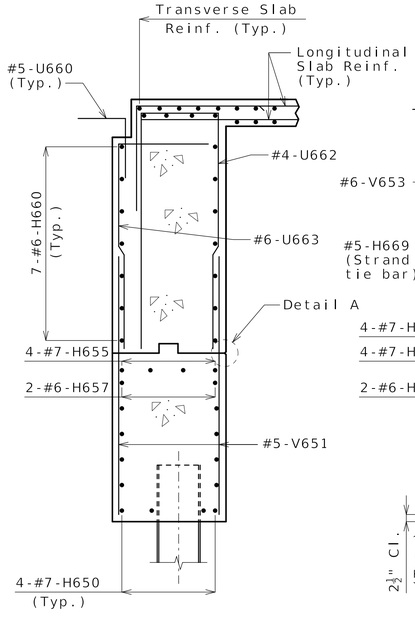
* #8-H Bars at 3" cts.
(Each face)(Place with grade)



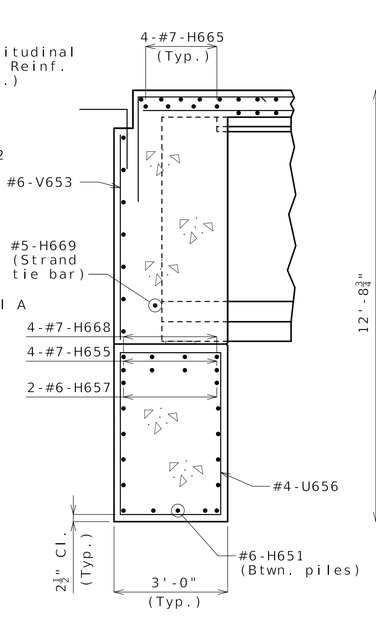
ELEVATION F-F



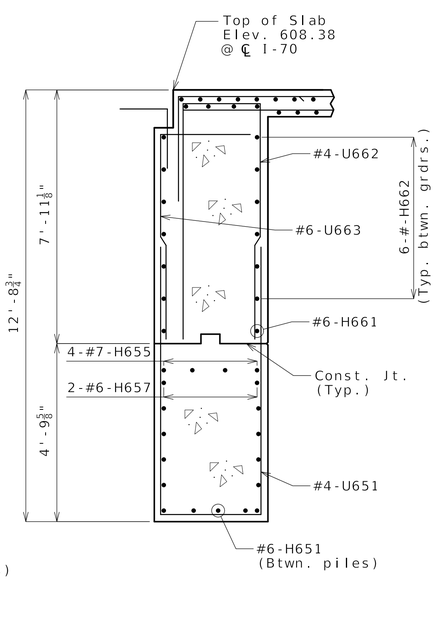
SECTION A-A



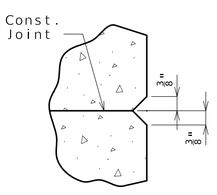
SECTION B-B



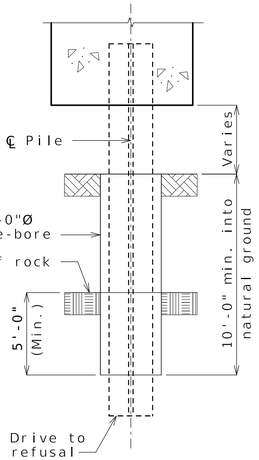
SECTION C-C



SECTION D-D



DETAIL A



PRE-BORE DETAIL

Pile Installation Sequence:
1. Pre-bore to specified depth into rock.
2. Place and set pile per Sec. 702.
3. Backfill with Class B-2 concrete to top of rock elevation and with sand above top of rock.

Notes:

All bars shall be epoxy coated.

Work this sheet with Sheets No. 23, 24, 25 & 26.

The F bars shall be bent in the field to clear girders.

For location of Sections A-A, B-B, C-C & D-D and Elevations E-E & F-F, see Sheets No. 24 & 26.

For details of Bridge Approach Slab, see Sheet No. 62.

DETAILS FOR END BENT NO. 6

Designed SR FEB 2026
Detailed CAB FEB 2026
Checked SR FEB 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_27_End Bent 6 Sections.dgn 12:20:41 AM Eastern 16-JUL-2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
PE-2013006488
7-17-2026

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-27

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

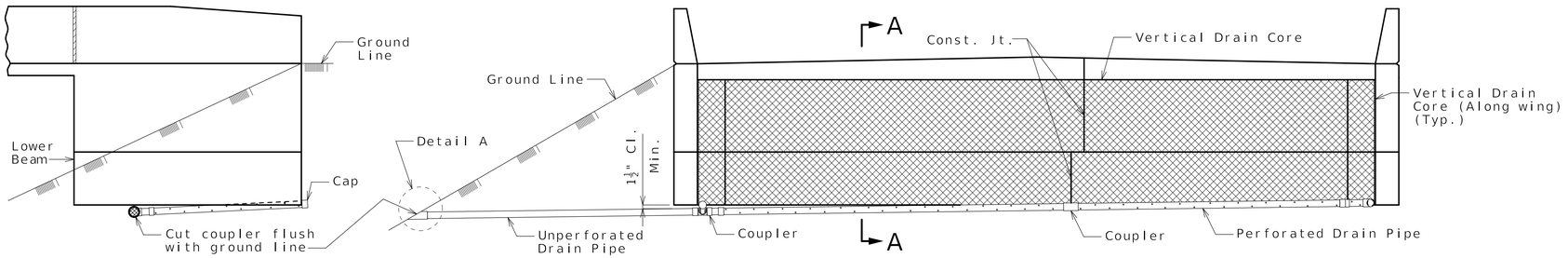
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

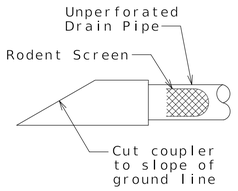
EMERY SAPP & SONS, INC
HORNER SHIFRIN
THE POWER OF TWO WORKING WITHIN
401 S. 18th St., Ste. 100
St. Louis, MO 63103
314-531-4321 FAX: 314-531-5866
www.HornerShifrin.com

REV. RevDesc

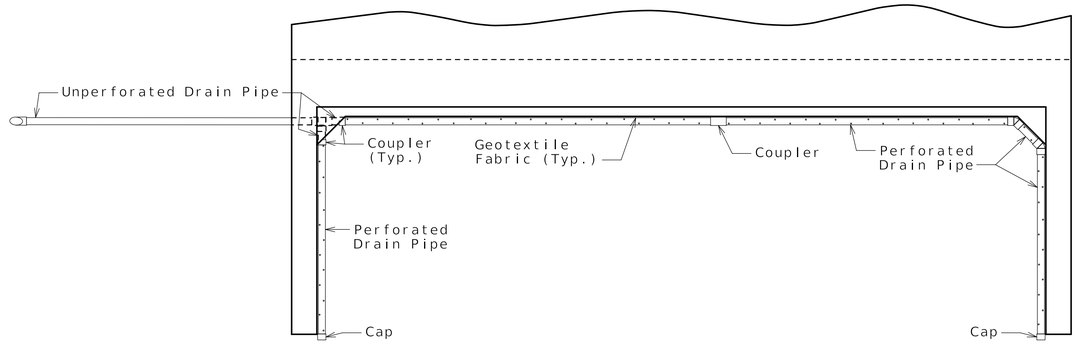


ELEVATION OF WING

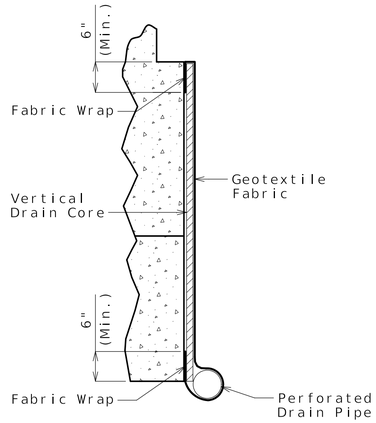
ELEVATION OF END BENT



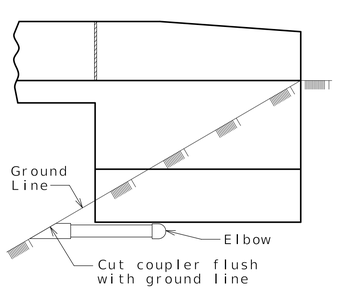
DETAIL A



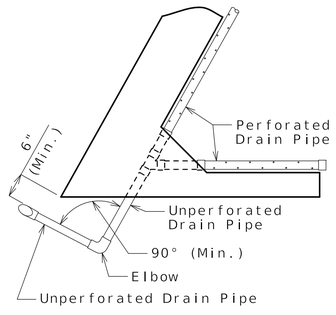
PLAN OF END BENT



PART SECTION A-A
(Section thru wing similar)



ELEVATION OF WING



PART PLAN

OPTIONAL TURNED DRAIN
(Use only when straight drain is not practical.)

General Notes:

All drain pipe shall be sloped 1 to 2 percent.

Drain pipe may be either 6-inch diameter corrugated metallic-coated steel pipe underdrain, 4-inch diameter corrugated polyvinyl chloride (PVC) drain pipe, or 4-inch diameter corrugated polyethylene (PE) drain pipe.

Drain pipe shall be placed at fill face of end bent and inside face of wings. The pipe shall slope to lowest grade of ground line, also missing the lower beam of end bent by a minimum of 1 1/2 inches.

Perforated pipe shall be placed at fill face side and inside face of wings at the bottom of end bent and plain pipe shall be used where the vertical drain ends to the exit at ground line.

VERTICAL DRAIN AT END BENT NO. 6

(Squared end bent shown, skewed end bent similar)

Note: This drawing is not to scale. Follow dimensions.

Designed MAC FEB 2026
Detailed CAB FEB 2026
Checked TPL MAR 2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-28

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

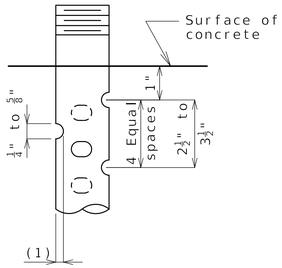
IMPROVE I-70 ROCHEPORT TO COLUMBIA

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

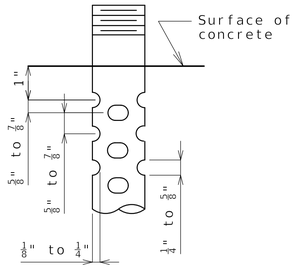
HORNER SHIFRIN
THE POWER OF BEING UNDERSTOOD
401 S. 18th St., Ste. 400
St. Louis, MO 63103-2212
314-621-6321 FAX: 314-621-6866
www.HornerShifrin.com

EMERY SAPPS SONS, INC

REV. RevDesc



DETAIL FOR 3/4"Ø THRU
2 1/2"Ø ANCHOR BOLTS

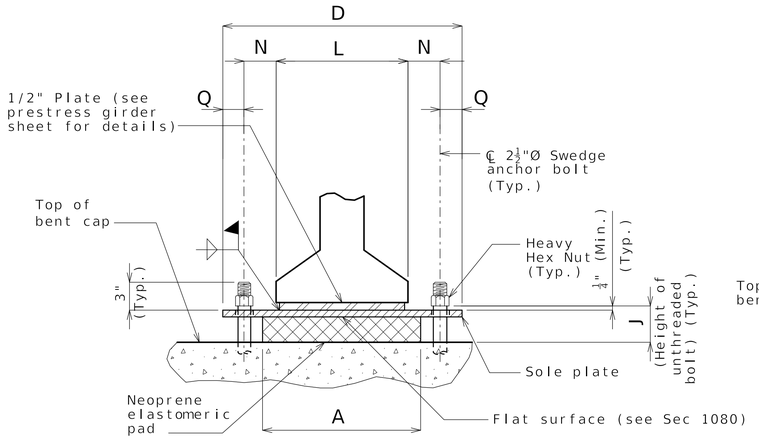


OPTIONAL DETAIL FOR 1 3/8"Ø
THRU 2 1/2"Ø ANCHOR BOLTS

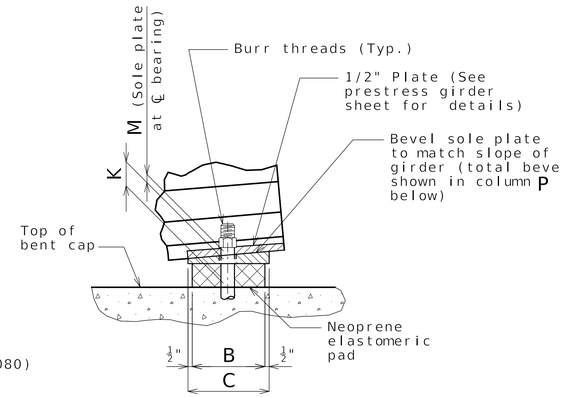
SWEDGE ANCHOR BOLT DETAILS

(1) $\frac{1}{8}$" for $\frac{3}{4}$"Ø thru $1\frac{1}{4}$"Ø anchor bolts

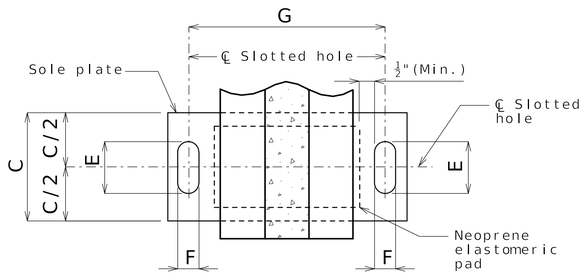
$\frac{1}{8}$" to $\frac{1}{4}$" for $1\frac{3}{8}$"Ø thru $2\frac{1}{2}$"Ø anchor bolts



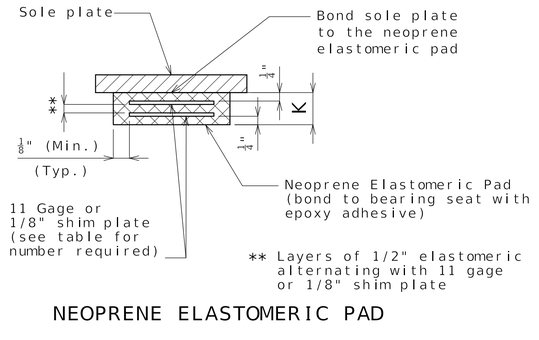
END VIEW



SIDE VIEW



PART PLAN VIEW



NEOPRENE ELASTOMERIC PAD

EXPANSION BEARINGS																
BENT NO.	A	B	C	D	E	F	G	J	K	L	M	N	P	Q	R	NUMBER OF SHIM PLATES *	NUMBER REQUIRED
2	$36\frac{7}{8}$"	15"	16"	$51\frac{1}{8}$"	$8\frac{1}{4}$"	$2\frac{5}{8}$"	$43\frac{5}{8}$"	8"	$6\frac{1}{4}$"	$38\frac{3}{8}$"	$1\frac{1}{2}$"	$2\frac{5}{8}$"	**	$3\frac{3}{4}$"	$0\frac{5}{16}$"	10	24
3	$36\frac{7}{8}$"	10"	11"	$51\frac{1}{8}$"	$6\frac{3}{4}$"	$2\frac{5}{8}$"	$43\frac{5}{8}$"	$5\frac{1}{2}$"	$3\frac{3}{4}$"	$38\frac{3}{8}$"	$1\frac{1}{2}$"	$2\frac{5}{8}$"	***	$3\frac{3}{4}$"	$0\frac{3}{16}$"	6	24
																TOTAL BEARINGS	48

* The required shim plate shall be placed between layers of elastomeric and molded together to form an integral unit.

** 0" Span 1 and 1/4" Span 2

*** 0" Span 2 and 1/8" Span 3

GENERAL NOTES:

Anchor bolts shall be 2 1/2"○ ASTM F1554 Grade 105 swedged bolts and shall extend 25" into the concrete with ASTM A563 Grade DH Heavy Hex nuts. Actual manufacturer's certified mill test reports (chemical and mechanical) shall be provided. Swedging shall be 1" less than extension into the concrete.

Anchor bolt shall be at the centerline of slotted hole at 60°F. Bearing position shall be adjusted R for each 10° fall or rise in temperature at installation.

Anchor bolts and heavy hex nuts shall be coated with a minimum of two coats of inorganic zinc primer to provide a total dry film thickness of 4 mils minimum, 6 mils maximum, or galvanized in accordance with ASTM F2329.

Neoprene Elastomeric Pads shall be 60 Durometer.

Structural steel for sole plate shall be ASTM A709 Grade 50 and shall be coated with a minimum of two coats of inorganic zinc primer to provide a total dry film thickness of 4 mils mimimum, 6 mils maximum.

Laminated Neoprene Bearing Pad Assembly shall be in accordance with Sec 716.

LAMINATED NEOPRENE BEARING PAD ASSEMBLY

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked SBH JUN 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_29_Bearing Pad.dgn 12:21:20 AM Eastern 16-JUL-2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
7-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-29

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

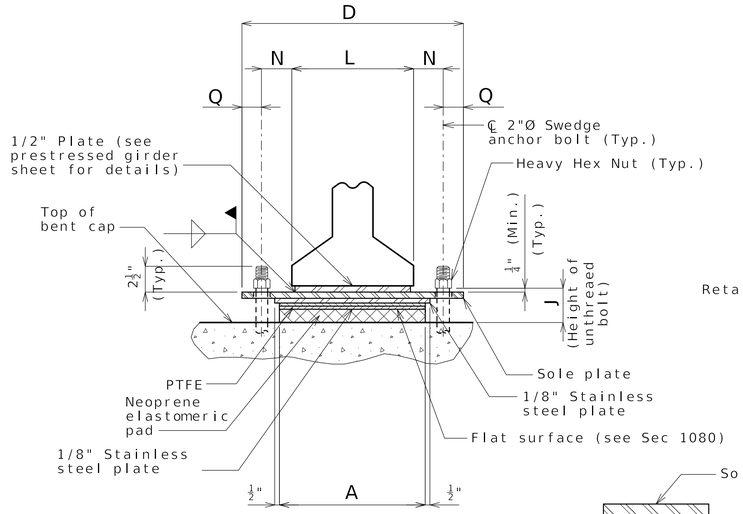
IMPROVE I-70 ROCHEPORT TO COLUMBIA

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

HORNER SHIFRIN
THE HORNER SHIFRIN GROUP, INC.
801 S 18th St, Ste 400
St. Louis, MO 63103
314-531-1021 FAX:314-531-0966
www.hornershifrin.com

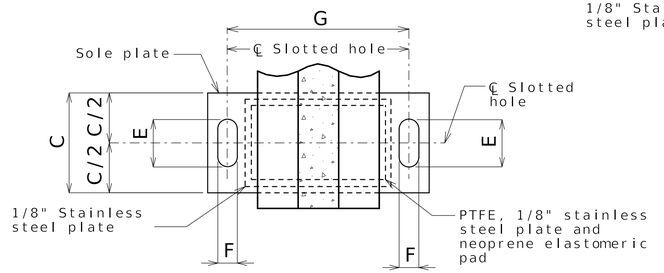
EMERY SAPP& SONS, INC

REV. RevDesc

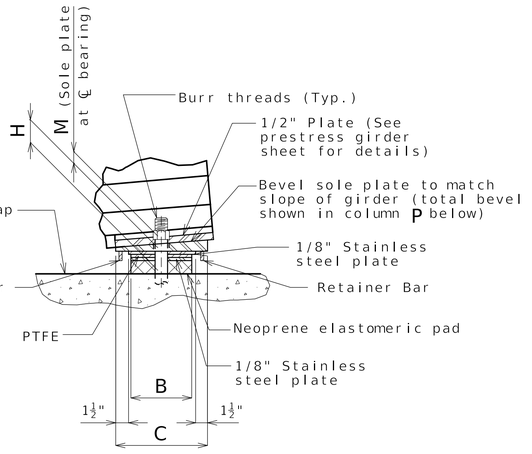


END VIEW

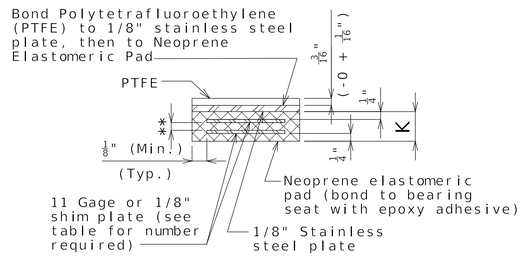




PART PLAN

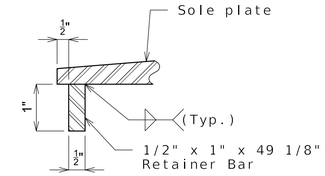


SIDE VIEW

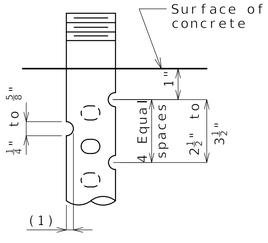


NEOPRENE ELASTOMERIC PAD

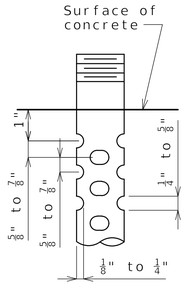
** Layers of 1/2" elastomeric pad alternating with 11 gage or 1/8" shim plate



DETAIL AT RETAINER BAR



DETAIL FOR 3/4"Ø THRU 2 1/2"Ø ANCHOR BOLTS



OPTIONAL DETAIL FOR 1 3/8"Ø THRU 2 1/2"Ø ANCHOR BOLTS

SWEDGE ANCHOR BOLT DETAILS

(1) ⅜" for ¾"Ø thru 1¼"Ø anchor bolts

⅛" to ¼" for 1⅜"Ø thru 2½"Ø anchor bolts

PTFE SLIDING BEARINGS																	
BENT NO.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	NUMBER OF SHIM PLATES *	NUMBER REQUIRED
1	36⅞"	8"	17"	49⅛"	8¼"	2⅛"	43⅛"	2 5/16"	4 1/16"	1⅞"	38⅜"	1½"	2⅜"	0"	3"	7/16"	3	12
																	TOTAL BEARINGS	12

* The required shim plate shall be placed between layers of elastomer and molded together to form an integral unit.

GENERAL NOTES:

Design coefficient of friction equals 4%.

Anchor bolts shall be 2"Ø ASTM F1554 Grade 105 swedged bolts and shall extend 18" into the concrete with ASTM A563 Grade DH Heavy Hex nuts. Actual manufacturer's certified mill test reports (chemical and mechanical) shall be provided. Swedging shall be 1" less than extension into the concrete.

Anchor bolt shall be at the centerline of slotted hole at 60°F. Bearing position shall be adjusted R for each 10° fall or rise in temperature at installation.

Anchor bolts and heavy hex nuts shall be coated with a minimum of two coats of inorganic zinc primer to provide a total dry film thickness of 4 mils minimum, 6 mils maximum, or galvanized in accordance with ASTM F2329.

Neoprene Elastomeric Pads shall be 70 Durometer.

Structural steel for sole plate shall be ASTM A709 Grade 50 and shall be coated with a minimum of two coats of inorganic zinc primer to provide a total dry film thickness of 4 mils minimum, 6 mils maximum. The stainless steel plate shall be protected from any coating.

Type N PTFE Bearings shall be in accordance with Sec 716.

PTFE surface shall be fabricated as a single piece. Splicing will not be permitted.

The PTFE surface shall be dimpled.

The depth of the dimples shall be at least 0.08 inch but less than one-half the PTFE thickness and the diameter shall be no more than 0.32 inch. Dimples shall be uniformly distributed and cover greater than 20% but less than 30% of the entire PTFE surface area. Dimples shall not be placed to intersect the edge of the PTFE surface.

Dimpled PTFE surfaces shall be lubricated with silicone grease meeting the Society of Automotive Engineers Specification SAE-AS8660.

TYPE N PTFE BEARINGS

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked SBH JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
7-17-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-30
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

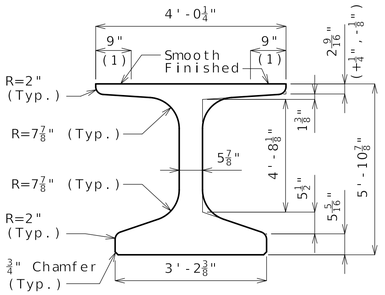
HORNER & SHIFRIN
THE POWER OF ENGINEERING DIVISION
401 S. 18th St. Ste. 400
St. Louis, MO 63103
314-621-4321 FAX: 314-621-4866
www.HornerShifrin.com

EMERY SAPPS SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

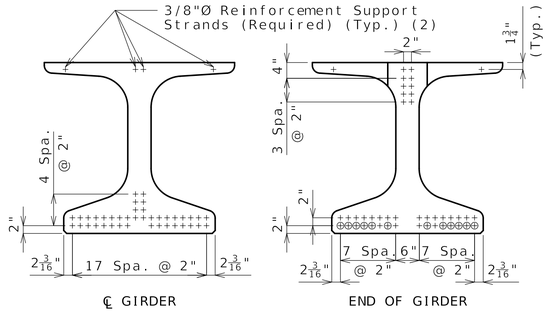
REV. RevDesc

(1) Fabricator shall apply a bond breaker to this region.



DIMENSIONS

(2) Outer strands tensioned to 2.02 kips/strand and inner strands to 8 kips/strand. Placed symmetrical about ℄ Girder. May be moved laterally in pairs.

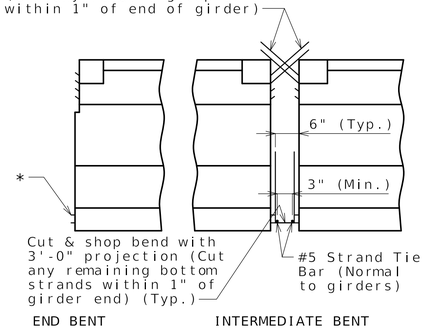


STRAND ARRANGEMENT

\+ Indicates prestressing strand.

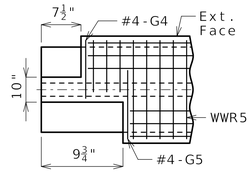
○ Indicates cut & shop bend with 3'-0" projection.

Cut top 2 rows of strands with a 12" projection and bend in shop (Cut any remaining top strands within 1" of end of girder)

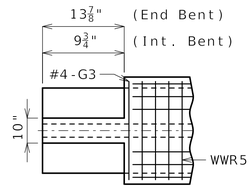


STRANDS AT GIRDER ENDS

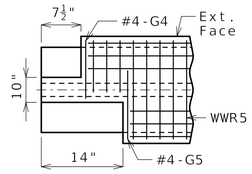
* Prestressing strands at End Bent 1 shall be trimmed to 1 inch and shall be encased in concrete diaphragm.



LEFT EXTERIOR GIRDER AT INTERMEDIATE BENT
Rotate 180° for right ext.



INTERIOR GIRDER AT ALL BENTS

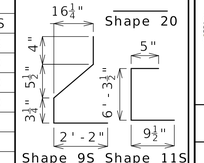


LEFT EXTERIOR GIRDER AT END BENT
Rotate 180° for right ext.

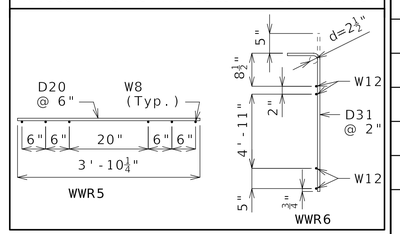
TOP FLANGE BLOCKOUT

Bill of Reinforcing Steel - Each Girder			
No.	Size/ Mark	Length	Shape
248	5 B1	7'-3"	11S
268	4 D1	4'-0"	9S
2	4 G3	3'-10¼"	20
2	4 G4	2'-3"	20
2	4 G5	2'-8⅛"	20

Bending Diagrams



Welded Wire Reinforcement - Each Girder



All dimensions are out to out.

Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures, Stirrup and Tie Dimensions.

Actual bar lengths are measured along centerline of bar to the nearest inch.

Minimum clearance to reinforcing shall be one inch.

All bar reinforcement shall be ASTM A615 or A706 Grade 60.

The two D1 bars may be furnished as one bar at the fabricator's option.

All B1 bars shall be epoxy coated.

G4 and G5 not required for interior girders. G3 not required for exterior girders.

** WWR6 shall terminate 1/2" from the top of girder at End Bent 1 and shall not be exposed.

General Notes:

Concrete for prestressed girders shall be Class A-1 with f'c = 9000 psi and f'ci = 7000 psi.

Use 40 strands, 0.6"Ø Grade 270, with an initial prestress force of 1758 kips.

Pretensioned members shall be in accordance with Sec 1029.

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

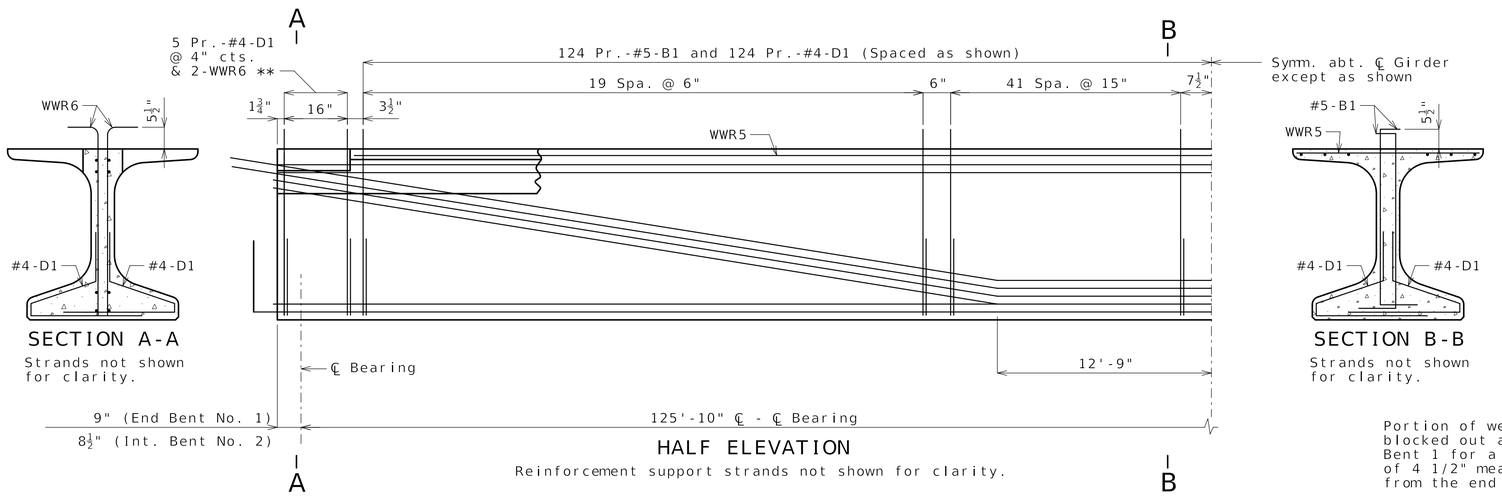
Exterior and interior girders are the same except: coil ties, top flange blockout, coil inserts for slab drains, holes for steel intermediate diaphragms.

For Girder Camber Diagram, see Sheets No. 47 and 48.

The 1 1/2"Ø holes shall be cast in the web for steel intermediate diaphragms. Drilling is not allowed. For location of holes and details of steel intermediate diaphragms, see Sheets No. 37 and 38.

For location of coil inserts at slab drains, see Sheet No. 49.

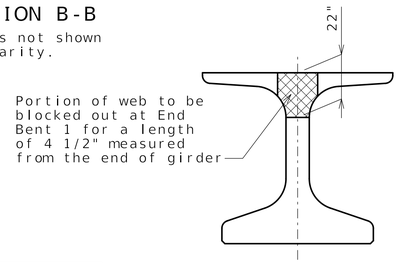
For location of coil ties at concrete diaphragms and integral bents, see Sheets No. 24, 26, and 41 thru 46.



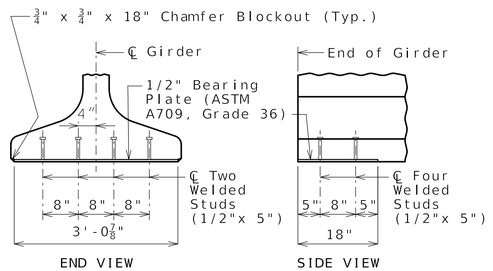
SECTION A-A
Strands not shown for clarity.

SECTION B-B
Strands not shown for clarity.

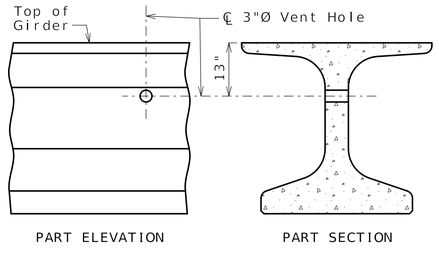
HALF ELEVATION
Reinforcement support strands not shown for clarity.



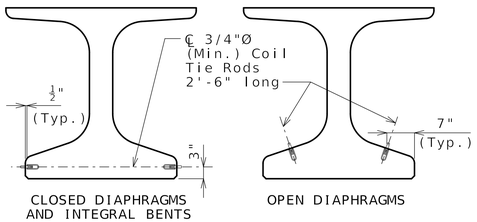
WEB BLOCKOUT DETAIL
Web blockout required for Girders in Span (1-2) at End Bent 1 only.



BEARING PLATE



VENT HOLE
Place vent holes at or near upgrade 1/3 point of girders and clear reinforcing steel or strands by 1 1/2" minimum and steel intermediate diaphragm bolt connections by 6" minimum.



COIL TIES
Exclude coil tie at exterior face of exterior girders except at integral end bents.

NU-GIRDERS SPAN (1-2)

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked SBH MAY 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_31_Girder Span 1.dgn 12:19:46 AM Eastern 16-JUL-2026

STATE OF MISSOURI MARTIN ALAN CHORKEY PE-2013006488 ENGINEER 7-17-26

DATE PREPARED 16-JUL-2026
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. BR04-31
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

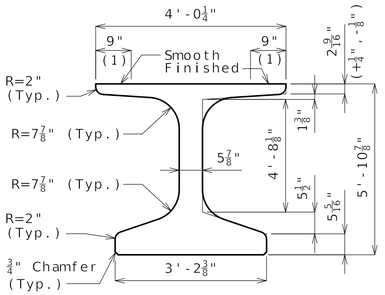
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

EMERY SAPP& SONS, INC

HORNER SHIFRIN
HORNER & SHIFRIN, INC.
THE PROFESSIONAL PARTNERSHIP
401 S. 18th St., Ste. 400
St. Louis, MO 63103
314-531-1420 FAX: 314-531-0966
www.hornershifrin.com

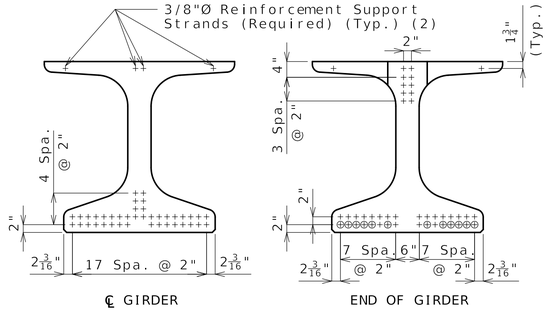
REV. RevDesc

(1) Fabricator shall apply a bond breaker to this region.



DIMENSIONS

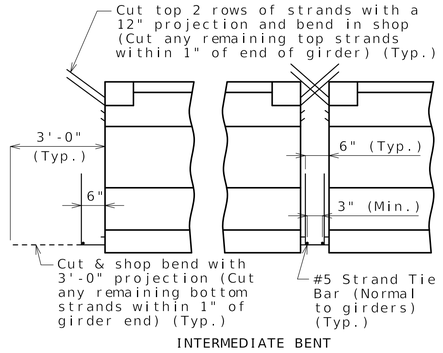
(2) Outer strands tensioned to 2.02 kips/strand and inner strands to 8 kips/strand. Placed symmetrical about ℄ Girder. May be moved laterally in pairs.



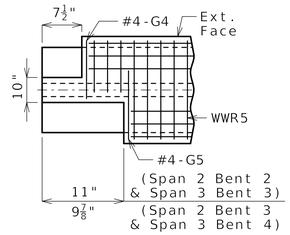
STRAND ARRANGEMENT

+ Indicates prestressing strand.

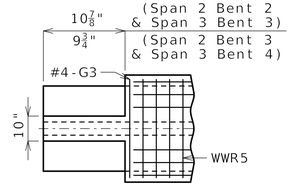
○ Indicates cut & shop bend with 3'-0" projection.



STRANDS AT GIRDER ENDS



LEFT EXTERIOR GIRDER AT INTERMEDIATE BENT
Rotate 180° for right ext.

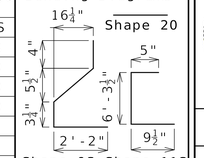


INTERIOR GIRDER AT INTERMEDIATE BENT

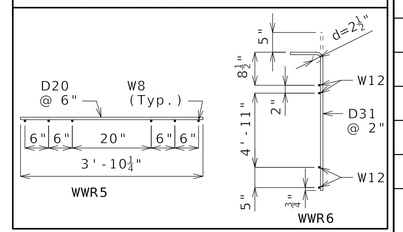
TOP FLANGE BLOCKOUT

Bill of Reinforcing Steel - Each Girder			
No.	Size/ Mark	Length	Shape
254	5 B1	7'-3"	11S
274	4 D1	4'-0"	9S
2	4 G3	3'-10¼"	20
2	4 G4	2'-3"	20
2	4 G5	2'-8⅛"	20

Bending Diagrams



Welded Wire Reinforcement - Each Girder



All dimensions are out to out.

Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures, Stirrup and Tie Dimensions.

Actual bar lengths are measured along centerline of bar to the nearest inch.

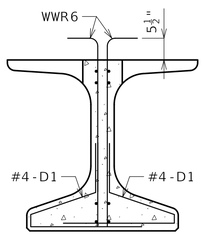
Minimum clearance to reinforcing shall be one inch.

All bar reinforcement shall be ASTM A615 or A706 Grade 60.

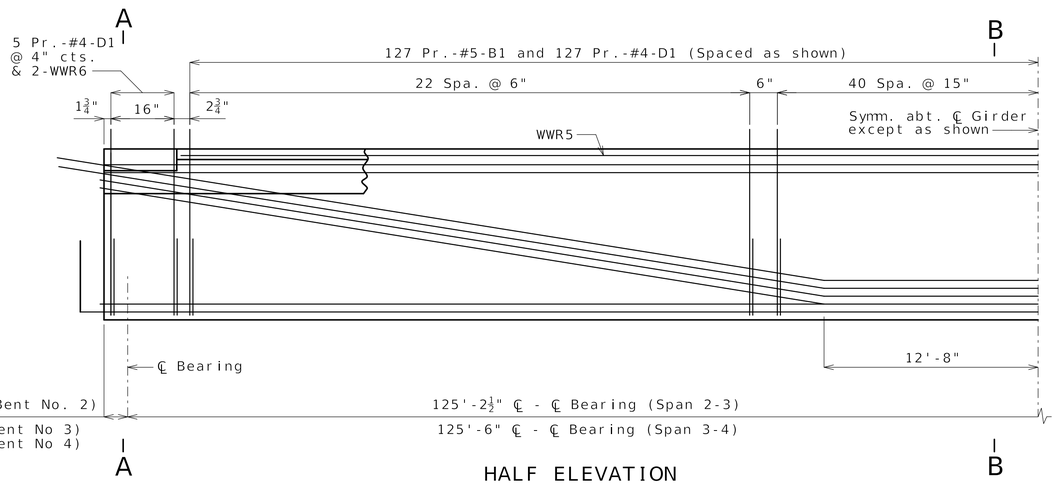
The two D1 bars may be furnished as one bar at the fabricator's option.

All B1 bars shall be epoxy coated.

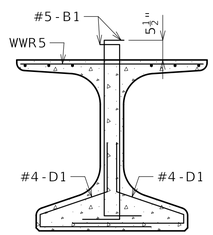
G4 and G5 not required for interior girders. G3 not required for exterior girders.



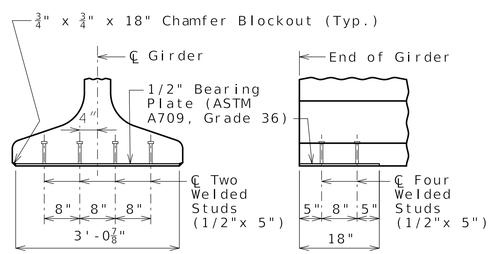
SECTION A-A
Strands not shown for clarity.



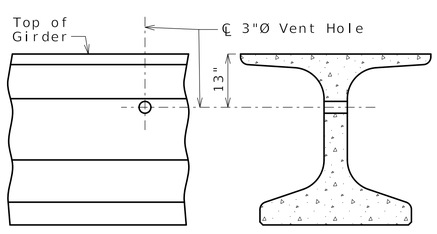
HALF ELEVATION
Reinforcement support strands not shown for clarity.



SECTION B-B
Strands not shown for clarity.

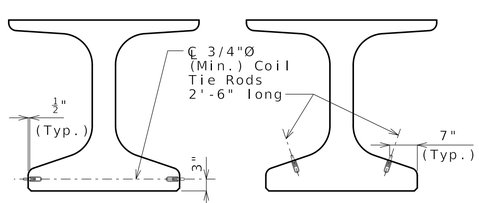


BEARING PLATE



VENT HOLE

Place vent holes at or near upgrade 1/3 point of girders and clear reinforcing steel or strands by 1 1/2" minimum and steel intermediate diaphragm bolt connections by 6" minimum.



COIL TIES

Exclude coil tie at exterior face of exterior girders except at integral end bents.

General Notes:

Concrete for prestressed girders shall be Class A-1 with f'c = 9000 psi and f'ci = 7000 psi.

Use 40 strands, 0.6"Ø Grade 270, with an initial prestress force of 1758 kips.

Pretensioned members shall be in accordance with Sec 1029.

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

Exterior and interior girders are the same except: coil ties, top flange blockout, coil inserts for slab drains, holes for steel intermediate diaphragms.

For Girder Camber Diagram, see Sheets No. 47 and 48.

The 1 1/2"Ø holes shall be cast in the web for steel intermediate diaphragms. Drilling is not allowed. For location of holes and details of steel intermediate diaphragms, see Sheets No. 37 and 38

For location of coil inserts at slab drains, see Sheet No. 49.

For location of coil ties at concrete diaphragms and integral bents, see Sheets No. 24, 26, and 41 thru 46.

NU-GIRDERS
SPANS (2-3) AND (3-4)

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked SBH MAY 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
REGISTERED PROFESSIONAL ENGINEER
7-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-32

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

IMPROVE I-70 ROCHEPORT TO COLUMBIA

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

EMERY SAPP & SONS, INC

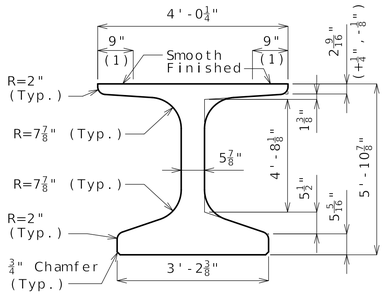
HORNER SHIFRIN
THE POWER OF STRUCTURAL KNOWLEDGE
401 S. 18th St., Ste. 100
St. Louis, MO 63103-2709
314-531-4321 FAX: 314-531-0866
www.hornershifrin.com

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

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

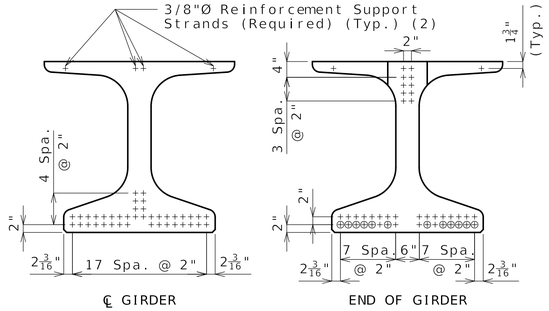
REV. RevDesc

(1) Fabricator shall apply a bond breaker to this region.



DIMENSIONS

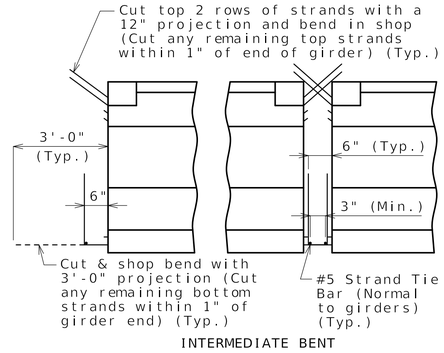
(2) Outer strands tensioned to 2.02 kips/strand and inner strands to 8 kips/strand. Placed symmetrical about ℄ Girder. May be moved laterally in pairs.



STRAND ARRANGEMENT

+ Indicates prestressing strand.

○ Indicates cut & shop bend with 3'-0" projection.

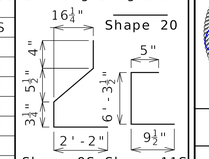


INTERMEDIATE BENT

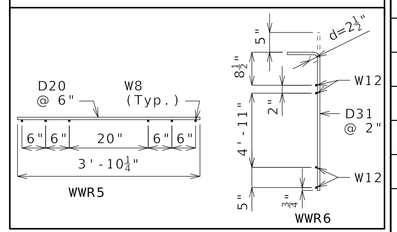
STRANDS AT GIRDER ENDS

Bill of Reinforcing Steel - Each Girder			
No.	Size/ Mark	Length	Shape
H	5 B1	7'-3"	11S
J	4 D1	4'-0"	9S
2	4 G3	3'-10¼"	20
2	4 G4	2'-3"	20
2	4 G5	2'-8⅛"	20
1	4 G6	3'-10⅞"	20

Bending Diagrams



Welded Wire Reinforcement - Each Girder



All dimensions are out to out.

Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures, Stirrup and Tie Dimensions.

Actual bar lengths are measured along centerline of bar to the nearest inch.

Minimum clearance to reinforcing shall be one inch.

All bar reinforcement shall be ASTM A615 or A706 Grade 60.

The two D1 bars may be furnished as one bar at the fabricator's option.

All B1 bars shall be epoxy coated.

G4 and G5 not required for interior girders. G3 and G6 not required for exterior girders.

General Notes:

Concrete for prestressed girders shall be Class A-1 with f'c = 9000 psi and f'ci = 7000 psi.

Use 40 strands, 0.6"Ø Grade 270, with an initial prestress force of 1758 kips.

Pretensioned members shall be in accordance with Sec 1029.

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

Exterior and interior girders are the same except: coil ties, top flange blockout, coil inserts for slab drains, holes for steel intermediate diaphragms.

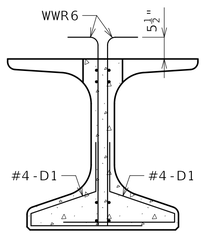
For Girder Camber Diagram, see Sheets No. 47 and 48.

The 1 1/2"Ø holes shall be cast in the web for steel intermediate diaphragms. Drilling is not allowed. For location of holes and details of steel intermediate diaphragms, see Sheets No. 37 and 38.

For location of coil inserts at slab drains, see Sheet No. 49.

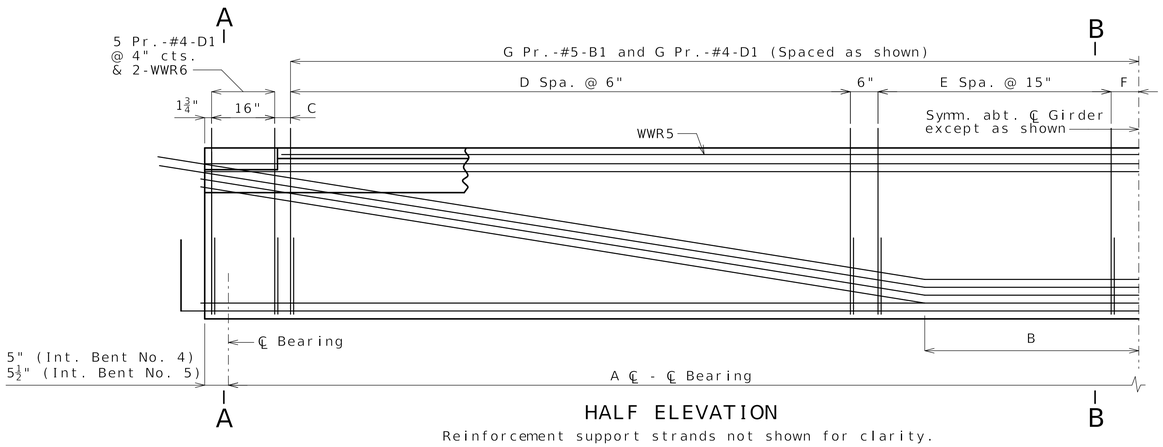
For location of coil ties at concrete diaphragms and integral bents, see Sheets No. 24, 26, and 41 thru 46.

For table of variables and Flange Blockout Details, see Sheet No. 34.



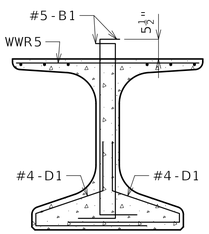
SECTION A-A

Strands not shown for clarity.



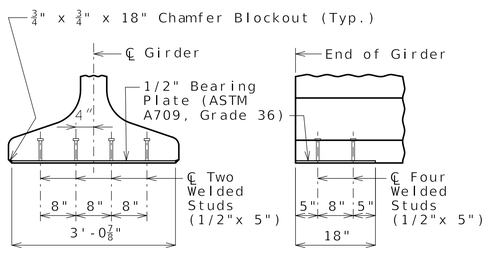
HALF ELEVATION

Reinforcement support strands not shown for clarity.

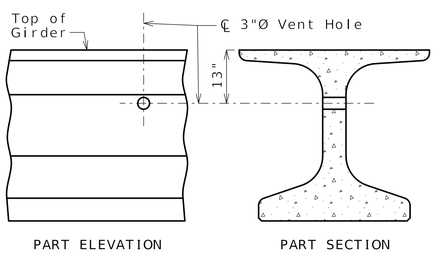


SECTION B-B

Strands not shown for clarity.

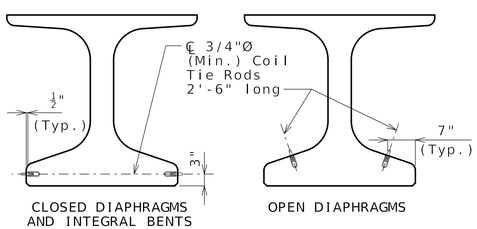


BEARING PLATE



VENT HOLE

Place vent holes at or near upgrade 1/3 point of girders and clear reinforcing steel or strands by 1 1/2" minimum and steel intermediate diaphragm bolt connections by 6" minimum.



COIL TIES

Exclude coil tie at exterior face of exterior girders except at integral end bents.

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked SBH MAY 2026

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 33 of 78

NU-GIRDERS
SPAN (4-5)

STATE OF MISSOURI MARTIN ALAN CHORKEY PE-2013006488 ENGINEER 7-17-26

DATE PREPARED 16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-33

COUNTY: BOONE

JOB NUMBER: JST0017

CONTRACT ID.: 251203-D01

PROJECT NO.: IS 70-2(128)

BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

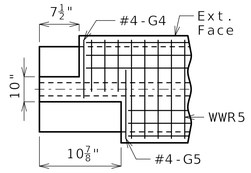
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

HORNER SHIFRIN
THE POWER OF EXPERIENCE AND INNOVATION
401 S. 18th St., Ste. 100
St. Louis, MO 63103-2709
314-531-4321 FAX: 314-531-0866
www.hornershifrin.com

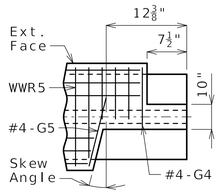
EMERY SAPP & SONS, INC

REV. RevDesc

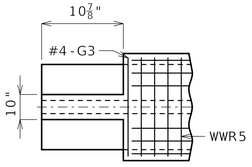
B_JST0017_A9819_33_Girder Span 4.dgn 12:22:30 AM Eastern 16-JUL-2026



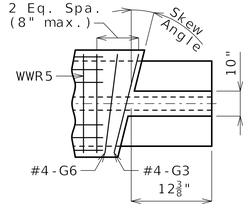
LEFT EXTERIOR GIRDER
AT INTERMEDIATE BENT 4
(Rotate 180° for right ext.)



LEFT EXTERIOR GIRDER
AT INTERMEDIATE BENT 5
(Rotate 180° for right ext.)



INTERIOR GIRDER
AT INTERMEDIATE BENT 4



INTERIOR GIRDER
AT INTERMEDIATE BENT 5

TOP FLANGE BLOCKOUT DETAILS

Table of Variables												
	Girder Number											
	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12
A	134'-0¾"	131'-2⅜"	128'-4"	125'-5⅝"	122'-7¼"	119'-8¾"	116'-10⅜"	114'-0"	111'-1⅝"	108'-3¼"	105'-4⅞"	102'-6½"
B	13'-6"	13'-2"	12'-11"	12'-8"	12'-4"	12'-1"	11'-9"	11'-6"	11'-2"	10'-11"	10'-8"	10'-4"
C	2⅞"	3 1/16"	3"	3 3/16"	3⅛"	3⅜"	3 3/16"	4"	3 5/16"	4⅛"	3 7/16"	4¼"
D	38	35	36	33	19	21	17	19	25	32	23	30
E	37	37	35	35	40	38	38	36	33	29	31	27
F	0"	0"	7½"	7½"	0"	0"	7½"	7½"	0"	0"	7½"	7½"
G	153	147	146	140	121	121	114	114	119	125	112	118
H	306	294	292	280	242	242	228	228	238	250	224	236
J	326	314	312	300	262	262	248	248	258	270	244	256

Note:
Work this sheet with Sheet No. 33.

NU-GIRDERS
SPAN (4-5)

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked SBH MAY 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
REGISTERED ENGINEER
7-16-2026

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-34

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

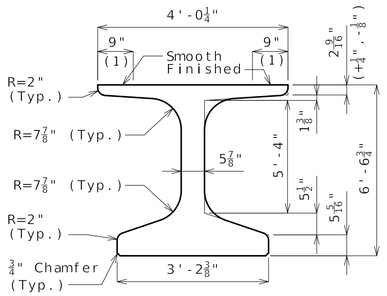
HORNER SHIFRIN
THE POWER OF COLLABORATION
401 S. 18th St., Ste. 400
St. Louis, MO 63103
314-621-4321 FAX: 314-621-6986
www.HornerShifrin.com

EMERY SAPPS & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

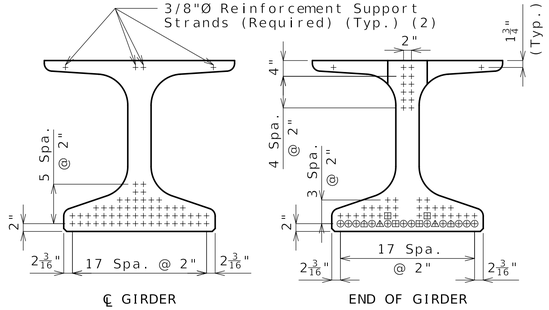
REV. RevDesc

(1) Fabricator shall apply a bond breaker to this region.



DIMENSIONS

(2) Outer strands tensioned to 2.02 kips/strand and inner strands to 8 kips/strand. Placed symmetrical about ℄ Girder. May be moved laterally in pairs.



℄ GIRDER END OF GIRDER

STRAND ARRANGEMENT

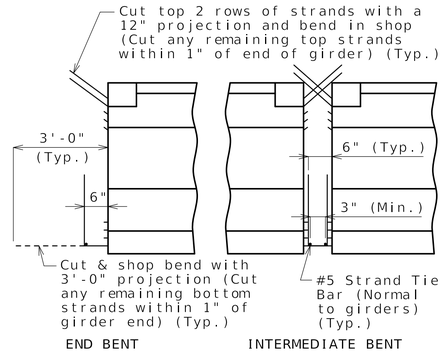
+ Indicates prestressing strand.

○ Indicates cut & shop bend with 3'-0" projection.

□ Indicates debonded for 4'-0" from end of girder.

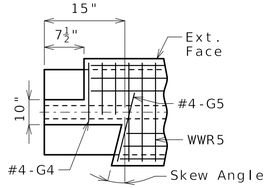
△ Indicates debonded for 7'-0" from end of girder.

⌂ Indicates debonded for 10'-0" from end of girder.



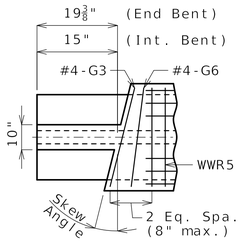
END BENT INTERMEDIATE BENT

STRANDS AT GIRDER ENDS



LEFT EXTERIOR GIRDER AT INTERMEDIATE BENT

Rotate 180° for right ext.

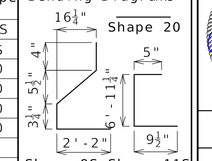


INTERIOR GIRDER AT ALL BENTS & EXTERIOR GIRDER AT END BENT

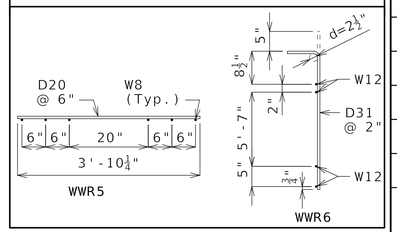
TOP FLANGE BLOCKOUT

Bill of Reinforcing Steel - Each Girder			
No.	Size/ Mark	Length	Shape
320	5 B1	7'-11"	11S
340	4 D1	4'-0"	9S
2	4 G3	3'-11½"	20
2	4 G4	2'-3"	20
2	4 G5	2'-9"	20
2	4 G6	3'-10⅞"	20

Bending Diagrams



Welded Wire Reinforcement - Each Girder



All dimensions are out to out.

Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures, Stirrup and Tie Dimensions.

Actual bar lengths are measured along centerline of bar to the nearest inch.

Minimum clearance to reinforcing shall be one inch.

All bar reinforcement shall be ASTM A615 or A706 Grade 60.

The two D1 bars may be furnished as one bar at the fabricator's option.

All B1 bars shall be epoxy coated.

G4 and G5 not required for interior girders. Half no. of G3, G4, G5 and G6 not required for ext. girders.

General Notes:

Concrete for prestressed girders shall be Class A-1 with f'c = 9000 psi and f'ci = 7000 psi.

Use 58 strands, 0.6"Ø Grade 270, with an initial prestress force of 2549 kips.

Pretensioned members shall be in accordance with Sec 1029.

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

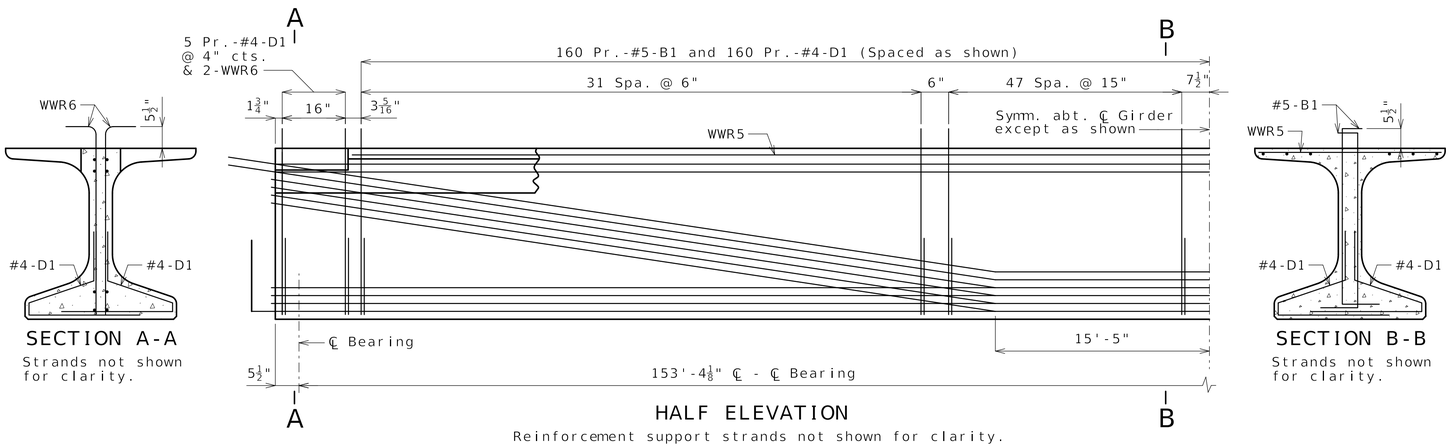
Exterior and interior girders are the same except: coil ties, top flange blockout, coil inserts for slab drains, holes for steel intermediate diaphragms.

For Girder Camber Diagram, see Sheets No. 47 and 48.

The 1 1/2"Ø holes shall be cast in the web for steel intermediate diaphragms. Drilling is not allowed. For location of holes and details of steel intermediate diaphragms, see Sheets No. 37 and 38.

For location of coil inserts at slab drains, see Sheet No. 49.

For location of coil ties at concrete diaphragms and integral bents, see Sheets No. 24, 26, and 41 thru 46.



SECTION A-A

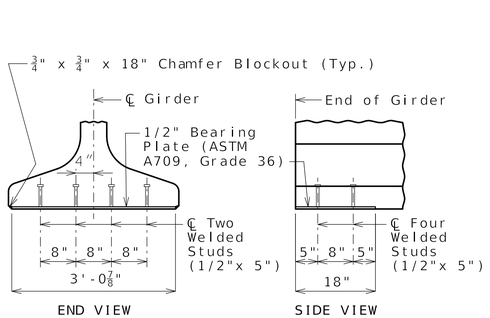
Strands not shown for clarity.

HALF ELEVATION

Reinforcement support strands not shown for clarity.

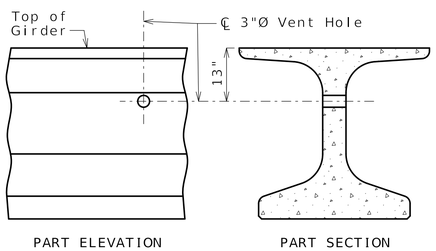
SECTION B-B

Strands not shown for clarity.



END VIEW SIDE VIEW

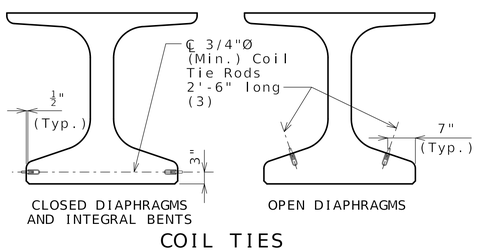
BEARING PLATE



PART ELEVATION PART SECTION

VENT HOLE

Place vent holes at or near upgrade 1/3 point of girders and clear reinforcing steel or strands by 1 1/2" minimum and steel intermediate diaphragm bolt connections by 6" minimum.



CLOSED DIAPHRAGMS AND INTEGRAL BENTS OPEN DIAPHRAGMS

COIL TIES

Exclude coil tie at exterior face of exterior girders except at integral end bents.

(3) 2'-2" at exterior face of exterior girders at end bent

NU-GIRDERS SPAN (5-6)

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked SBH MAY 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI MARTIN ALAN CHORKEY PE-2013006488 REGISTERED ENGINEER 7-17-26

DATE PREPARED 16-JUL-2026

ROUTE I-70 | STATE MO

DISTRICT BR | SHEET NO. BR04-35

COUNTY BOONE

JOB NUMBER JST0017

CONTRACT ID. 251203-D01

PROJECT NO. IS 70-2(128)

BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

IMPROVE I-70 ROCHEPORT TO COLUMBIA

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

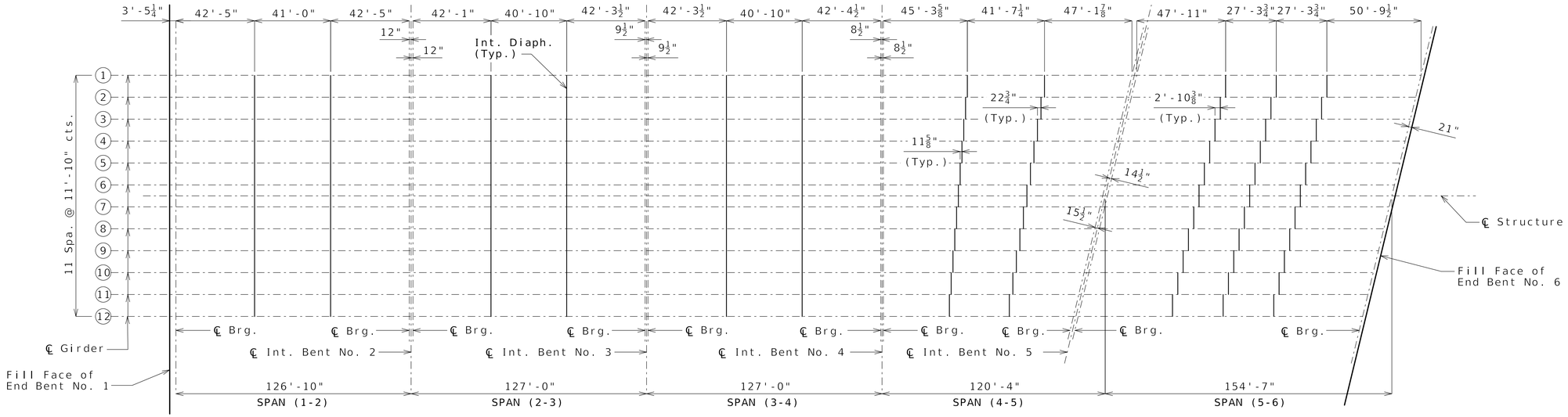
HORNER SHIFRIN
THE POWER OF EXPERIENCE
401 S. 18th St., Ste. 400
St. Louis, MO 63103-2709
314-231-4321 FAX: 314-231-4866
www.hornershifrin.com

EMERY SAPPS SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

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

REV. RevDesc



PLAN SHOWING LOCATION OF STEEL INTERMEDIATE DIAPHRAGMS

Longitudinal dimensions are horizontal.

Note:

Work this sheet with Sheets No. 37 & 38.

STEEL INTERMEDIATE DIAPHRAGM FRAMING PLAN

Designed SBH FEB 2026
Detailed CAB FEB 2026
Checked CMR JUN 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_36_Framing Plan.dgn 12:22:28 AM Eastern 16-JUL-2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
7-16-2026

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-36

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

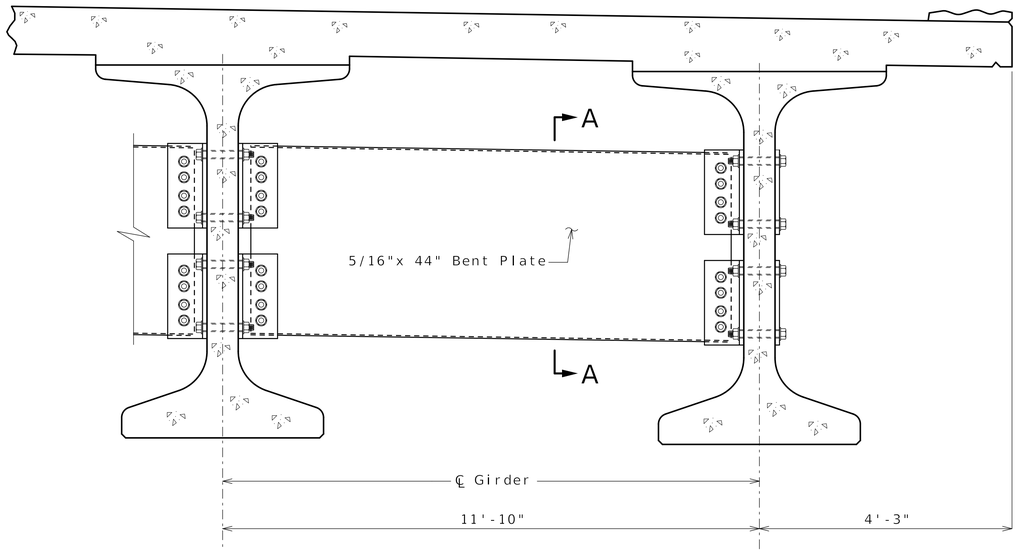
IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
THE POWER OF INTEGRATION
401 S. 18th St., Ste. 400
St. Louis, MO 63103
314-531-4321 FAX 314-531-6866
www.hornershifrin.com

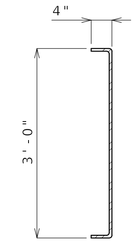
EMERY SAPPS SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

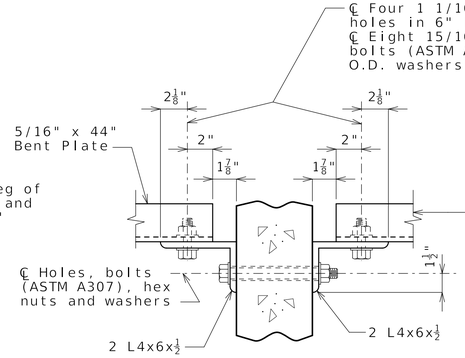
REV. RevDesc



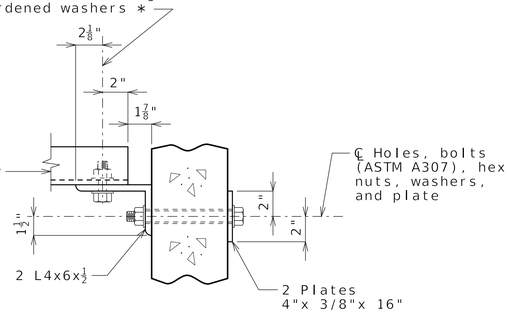
PART SECTION SHOWING
INTERMEDIATE DIAPHRAGMS



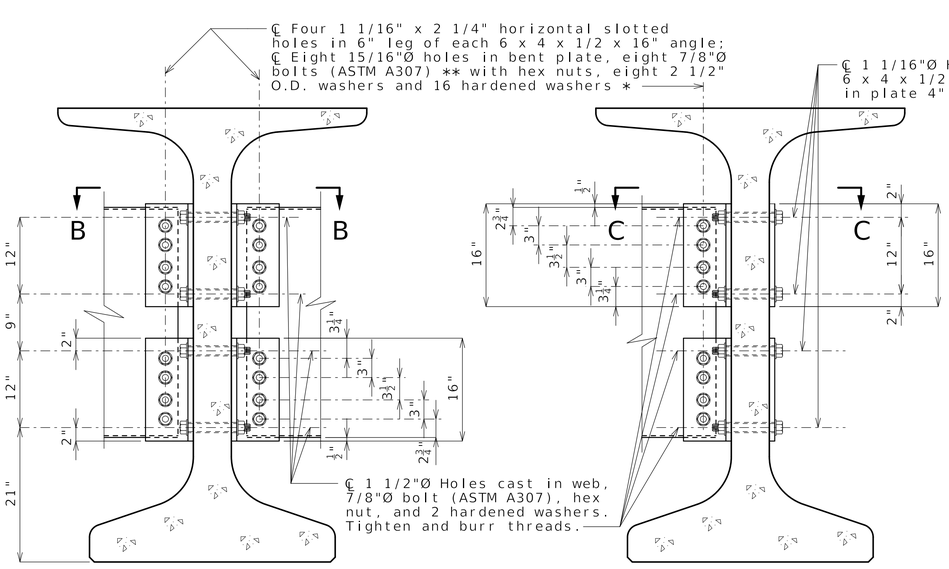
SECTION A-A



SECTION B-B



SECTION C-C



SECTION THRU INT. GIRDER
AT DIAPHRAGM

SECTION THRU EXT. GIRDER
AT DIAPHRAGM

STEEL DIAPHRAGM NOTES:

* In lieu of 2 1/2" outside diameter washers, contractor may substitute a 3/16" (Min. thickness) plate with four 15/16"Ø holes and one hardened washer per bolt.

** Bolts shall be tightened to provide a tension of one-half that specified in Sec 712 for high strength bolt installation. ASTM F3125 Grade A325 Type 1 bolts may be substituted for and installed in accordance with the requirements for the specified ASTM A307 bolts.

All diaphragm materials including bolts, nuts, and washers shall be galvanized.

Fabricated structural steel shall be ASTM A709 Grade 36 except as noted.

Shop drawings will not be required for steel intermediate diaphragms and angle connections.

For location of intermediate diaphragms, see Sheet No. 36.

STEEL INTERMEDIATE DIAPHRAGM DETAILS SPANS (1-2), (2-3) & (3-4)

Designed SBH FEB 2026
Detailed CAB FEB 2026
Checked CMR JUN 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_37_Intermediate Diaphragm squared.dgn 12:18:47 AM Eastern 16-JUL-2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
7-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-37

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

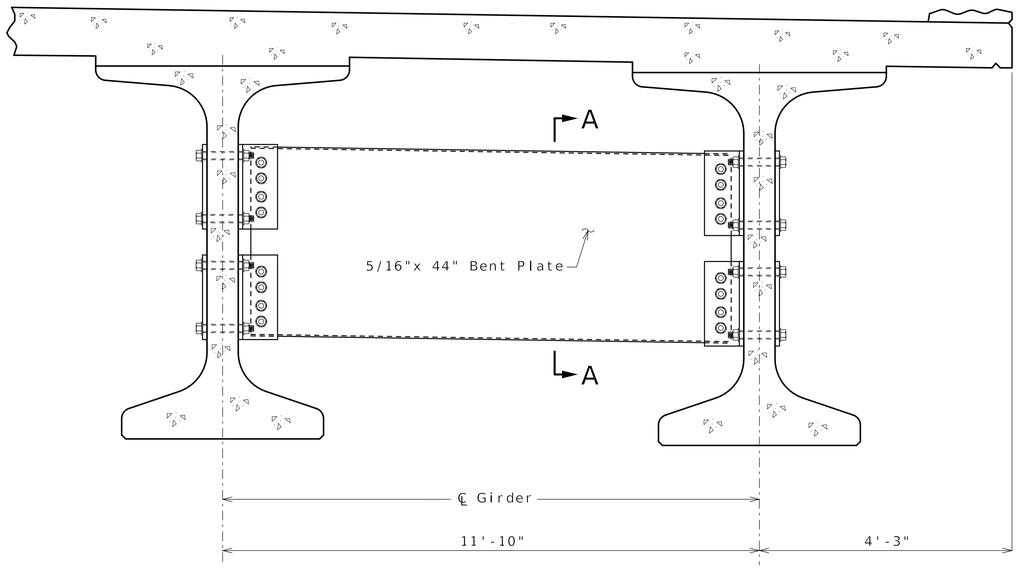
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

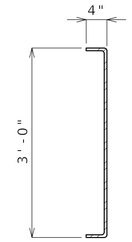
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

HORNER SHIFRIN
The Power of Integrated Solutions
401 S. 18th St., Ste. 400
St. Louis, MO 63103
314-531-1420 FAX: 314-531-0666
EMERY SAPPS SONS, INC
www.HornerShifrin.com

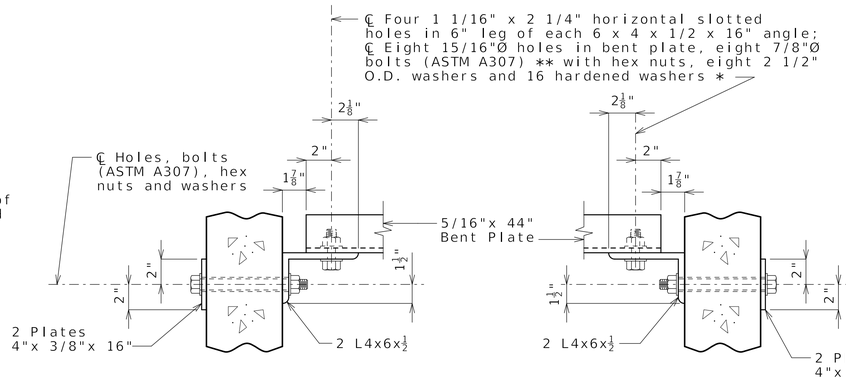
REV: RevDesc



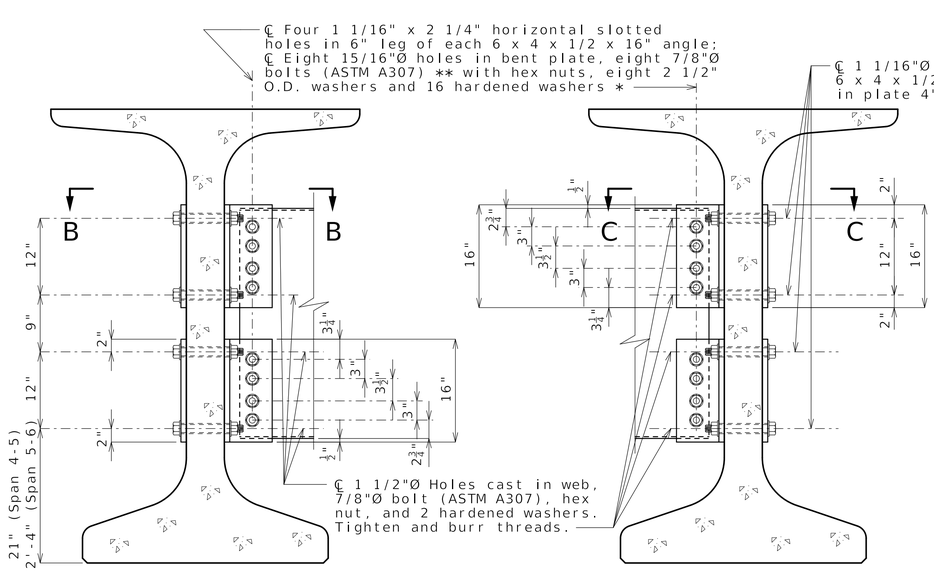
PART SECTION SHOWING
INTERMEDIATE DIAPHRAGMS



SECTION A-A



SECTION B-B SECTION C-C



SECTION THRU INT. GIRDER
AT DIAPHRAGM

SECTION THRU EXT. GIRDER
AT DIAPHRAGM

STEEL DIAPHRAGM NOTES:

* In lieu of 2 1/2" outside diameter washers, contractor may substitute a 3/16" (Min. thickness) plate with four 15/16" Ø holes and one hardened washer per bolt.

** Bolts shall be tightened to provide a tension of one-half that specified in Sec 712 for high strength bolt installation. ASTM F3125 Grade A325 Type 1 bolts may be substituted for and installed in accordance with the requirements for the specified ASTM A307 bolts.

All diaphragm materials including bolts, nuts, and washers shall be galvanized.

Fabricated structural steel shall be ASTM A709 Grade 36 except as noted.

Shop drawings will not be required for steel intermediate diaphragms and angle connections.

For location of intermediate diaphragms, see Sheet No. 36.

STEEL INTERMEDIATE DIAPHRAGM DETAILS SPANS (4-5) & (5-6)

Designed SBH JUN 2026
Detailed SLF JUN 2026
Checked CMR JUN 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_38_Intermediate Diaphragm Skewed.dgn 12:22:32 AM Eastern 16-JUL-2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
7-17-2026

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-38

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

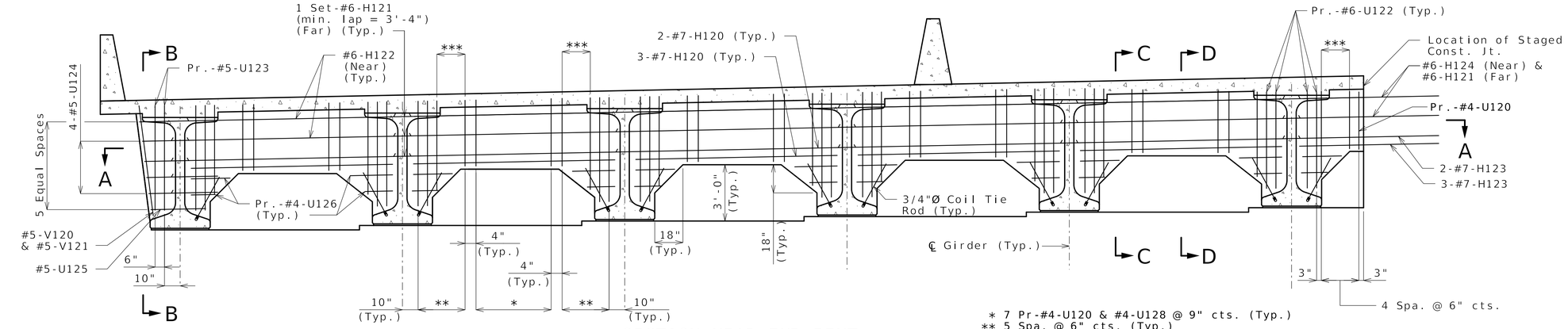
IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
HORNER & SHIFRIN, INC.
THE PROFESSIONAL ENGINEERING SYSTEM
401 S. 18th St., Ste. 400
ST. LOUIS, MO 63103
314-531-1420 FAX: 314-531-0966
www.hornershifrin.com

EMERY SAPP & SONS, INC

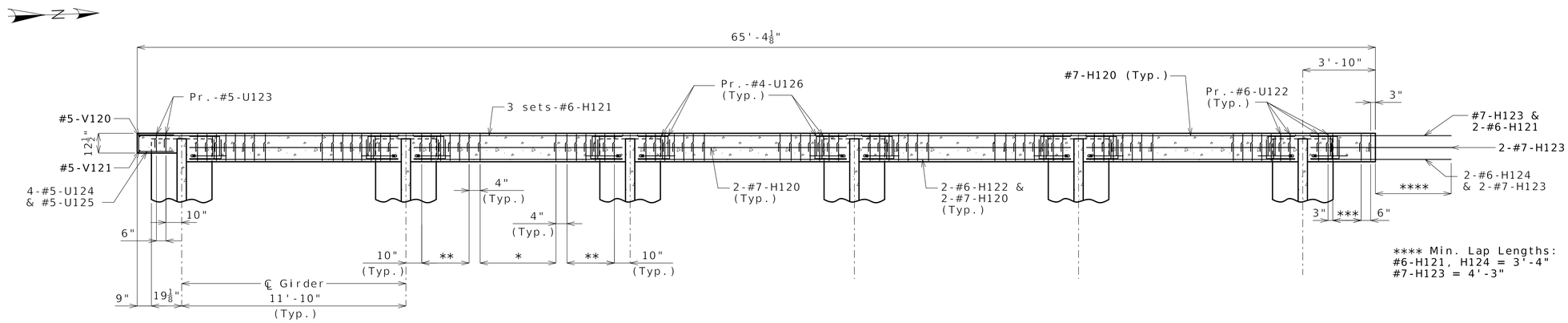
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV: RevDesc



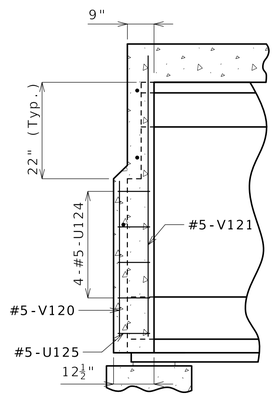
* 7 Pr-#4-U120 & #4-U128 @ 9" cts. (Typ.)
** 5 Spa. @ 6" cts. (Typ.)
*** 4 Pr.-#6-U121 & #4-U127 (Typ.)

SECTION NEAR END BENT
Normal to ℄ Structure

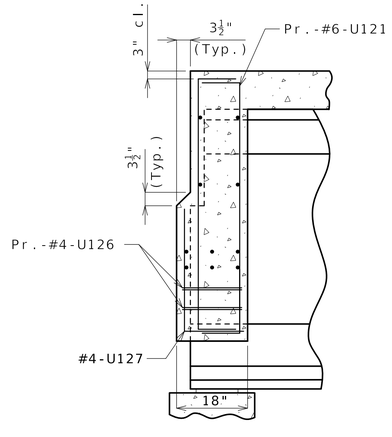


**** Min. Lap Lengths:
#6-H121, H124 = 3'-4"
#7-H123 = 4'-3"

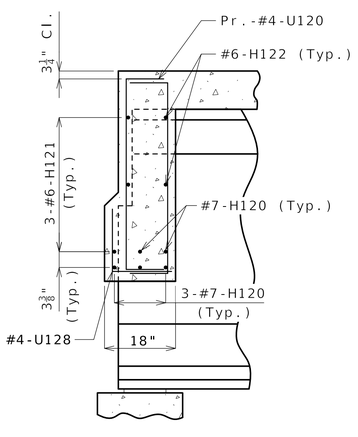
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

Bearing Replacement Procedure:

1. Erect temporary shoring beneath girders and loosen anchor bolt nuts.
2. Jack girder of bearing to be replaced 1/8".
3. Jack adjacent girders 1/8".
4. Jack girder of bearing to be replaced an additional 1/8" (1/4" total).
5. Replace bearing and reduce jack to 1/8" to match adjacent girders.
6. Reseat adjacent girders and remove jacks.
7. Reseat girder of replaced bearing.
8. Re-tighten anchor bolt nuts to original location and remove shoring.

Bearing Replacement Notes:

Jacking shall not be performed under the concrete diaphragms. Temporary shoring must be erected beneath girders.

Required temporary support load of 210 kips at each bearing is a service load without a factor of safety. It includes the girder dead load, slab, barriers, and 35 psf FWS as well as 32 kips of live load. The live load corresponds to the loading expected under a single lane closure over the bearing being replaced.

Notes:

For location of Strand Tie Bars, see Sheet No. 31.

For location and details of Coil Tie Rods, see Sheet No. 31.

Diaphragms at end bent shall be built vertical.

All U-bars in diaphragms are to be placed parallel to ℄ Roadway.

CONCRETE DIAPHRAGMS AT END BENT NO. 1 - PHASE 1

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked SBH JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
PE-2013006488
7-16-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-39
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

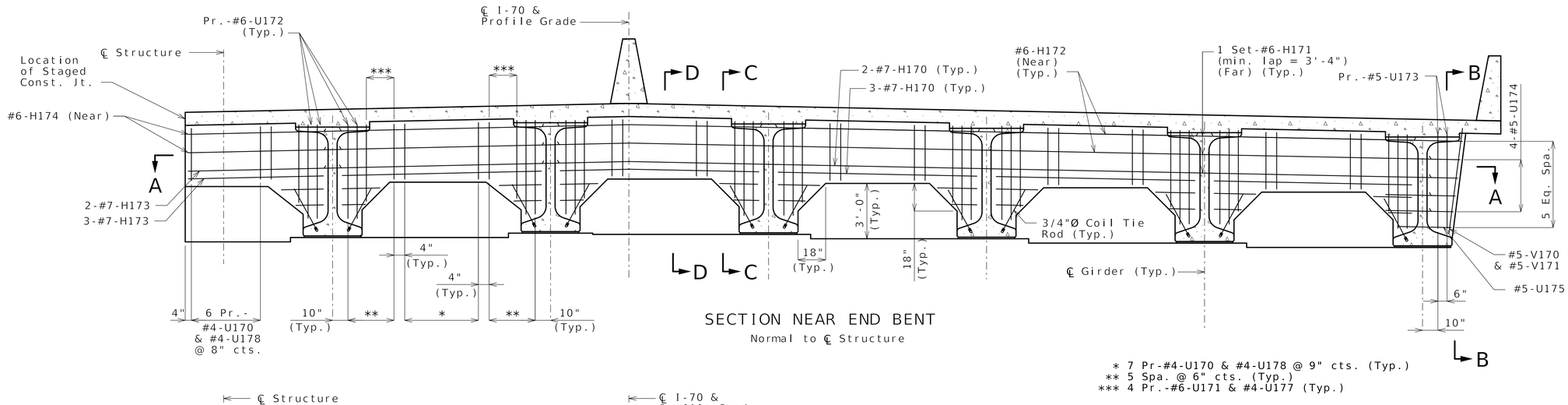
IMPROVE I-70 ROCHEPORT TO COLUMBIA

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

HORNER SHIFRIN
THE POWER OF COLLABORATION
911 Washington Ave., Ste. 400
St. Louis, MO 63101-1260
314-621-1621 FAX: 314-621-4986
www.HornerShifrin.com

EMERY SAPPS SONS, INC

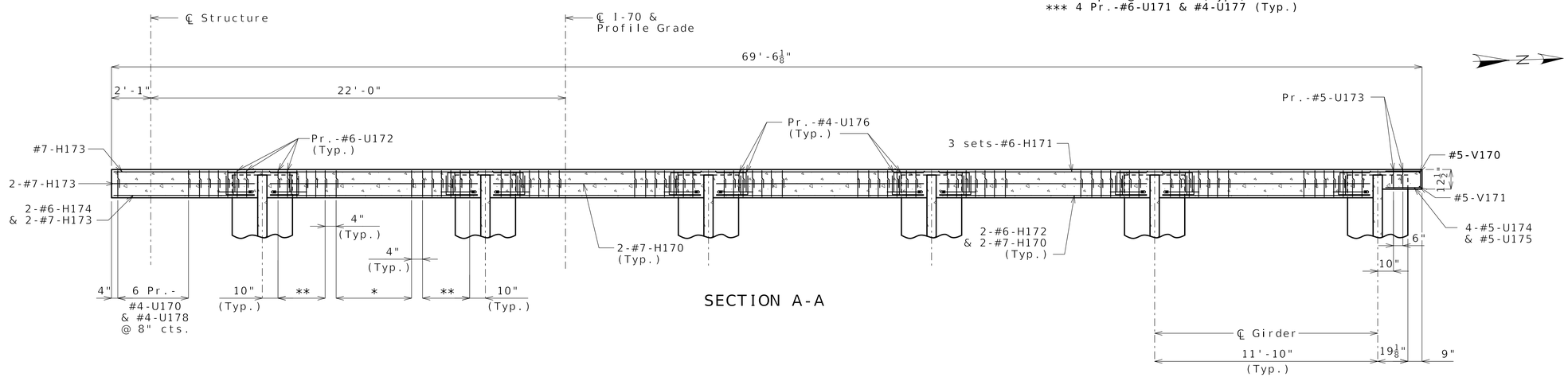
REV. RevDesc



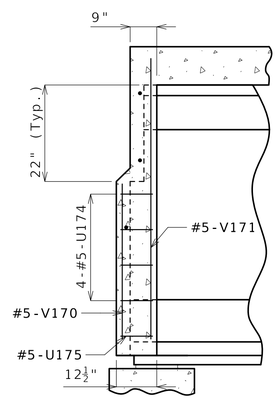
SECTION NEAR END BENT

Normal to ℄ Structure

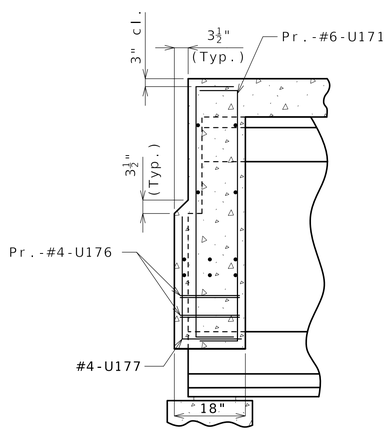
* 7 Pr-#4-U170 & #4-U178 @ 9" cts. (Typ.)
** 5 Spa. @ 6" cts. (Typ.)
*** 4 Pr.-#6-U171 & #4-U177 (Typ.)



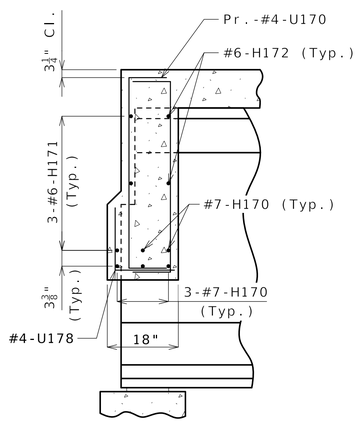
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

Notes:

For location of Strand Tie Bars, see Sheet No. 31.

For location and details of Coil Tie Rods, see Sheet No. 31.

Diaphragms at end bent shall be built vertical.

All U-bars in diaphragms are to be placed parallel to ℄ Roadway.

CONCRETE DIAPHRAGMS AT END BENT NO. 1 - PHASE 2

Designed CMR FEB 2026
Detailed SBH JUN 2026
Checked UVK JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
7-16-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-40

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

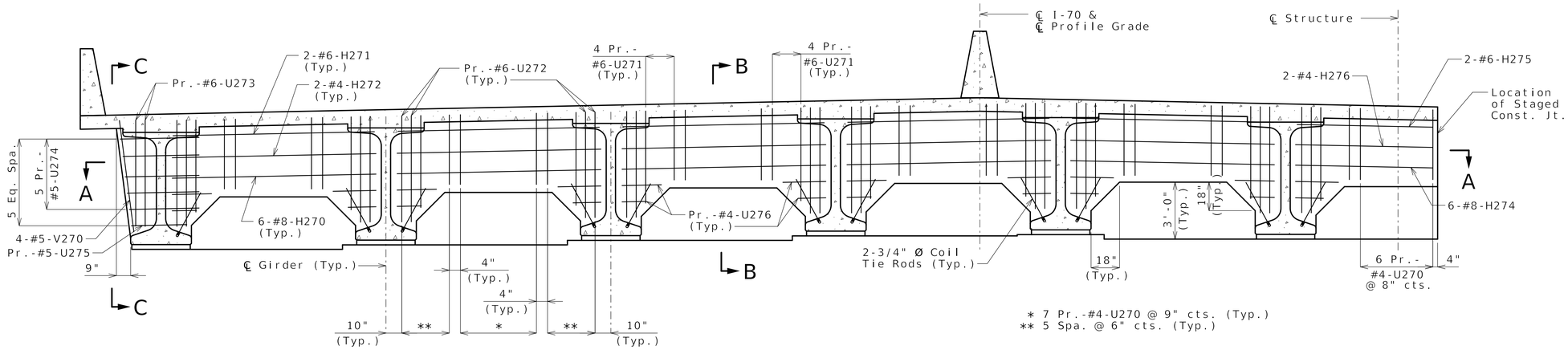
IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
THE POWER OF SHARED EXPERIENCE
401 S. 18th St., Ste. 100
ST. LOUIS, MO 63103-2709
314-531-4321 FAX: 314-531-6866
www.hornershifrin.com

EMERY SAPP & SONS, INC

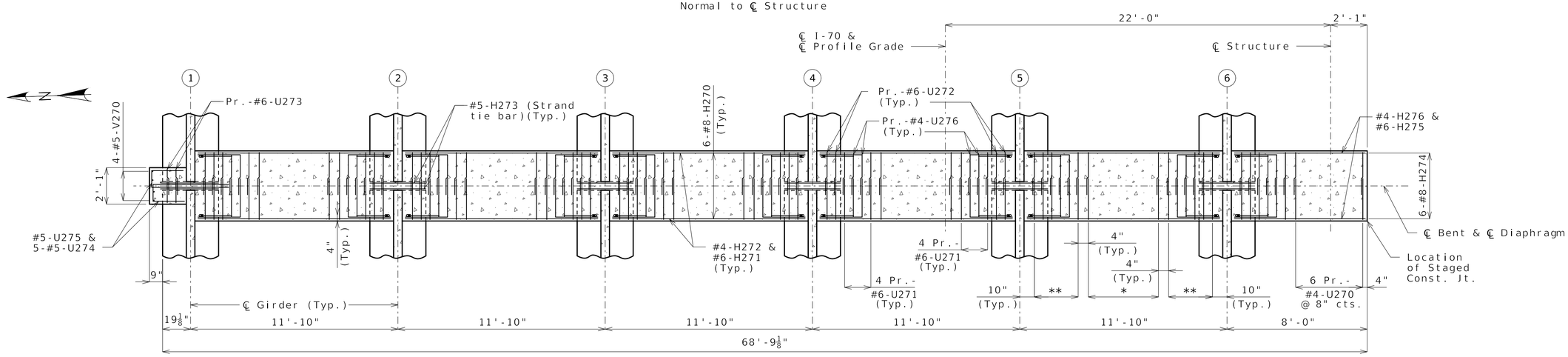
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

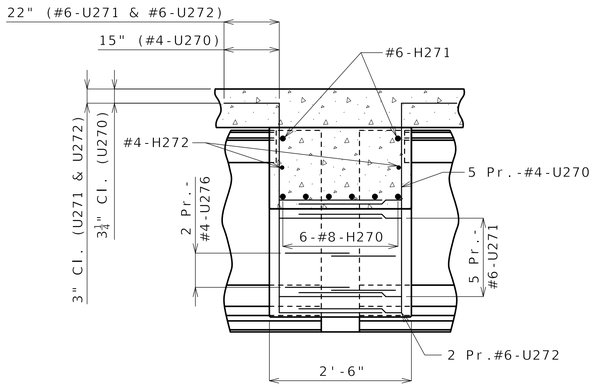


SECTION NEAR INTERMEDIATE BENT

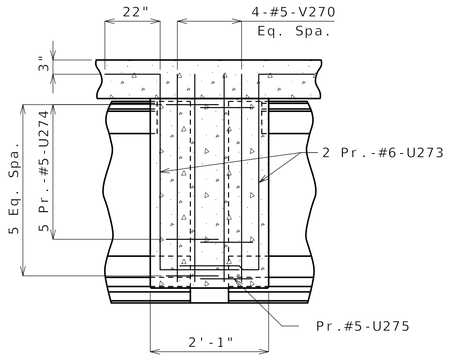
Normal to ℄ Structure



SECTION A-A



SECTION B-B



SECTION C-C

Bearing Replacement Procedure:

1. Erect temporary shoring beneath girder and loosen anchor bolt nuts.
2. Jack girder of bearing to be replaced 1/8".
3. Jack adjacent girders 1/8".
4. Jack girder of bearing to be replaced an additional 1/8" (1/4" total).
5. Replace bearing and reduce jack to 1/8" to match adjacent girders.
6. Reseat adjacent girders and remove jacks.
7. Reseat girder of replaced bearing.
8. Re-tighten anchor bolt nuts to original location and remove shoring.

Bearing Replacement Notes:

Jacking shall not be performed under the concrete diaphragms. Temporary shoring must be erected beneath girders.

Required temporary support load of 225 kips at each bearing is a service load without a factor of safety. It includes the girder dead load, slab, barriers, and 35 psf FWS as well as 32 kips of live load. The live load corresponds to the loading expected under a single lane closure over the bearing being replaced.

Notes:

For location of Strand Tie Bars, see Sheets No. 31 & 32.

For location and details of Coil Tie Rods, see Sheets No. 31 & 32.

Diaphragms at intermediate bents shall be built vertical.

All U-bars in diaphragms are to be placed parallel to ℄ Roadway.

Bar marks for Intermediate Bent No. 2 shown (200 series).
Intermediate Bent No. 3 similar (300 series).

CONCRETE DIAPHRAGMS AT INT. BENTS NO. 2 AND 3 - PHASE 2

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked UVK MAY 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
REGISTERED ENGINEER
7-16-26

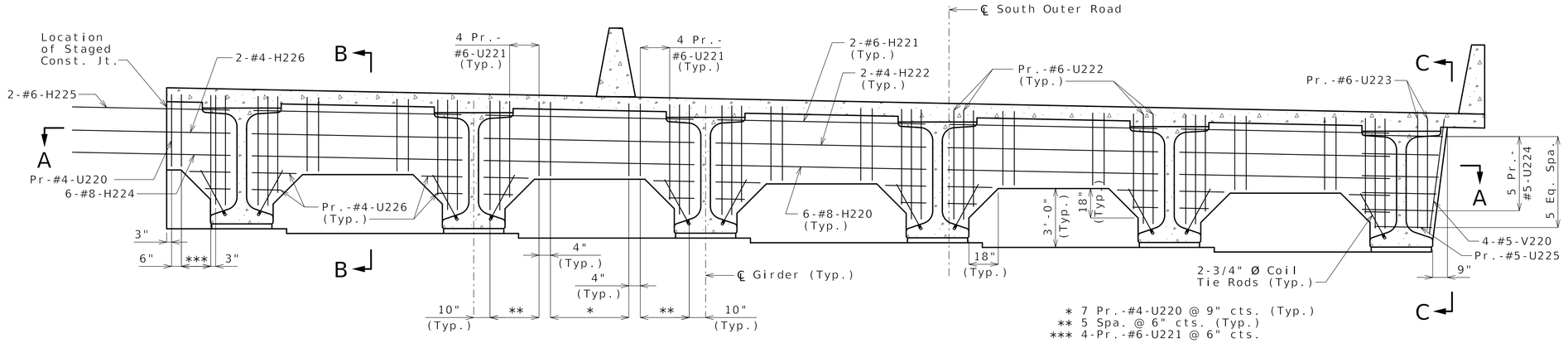
DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-41
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

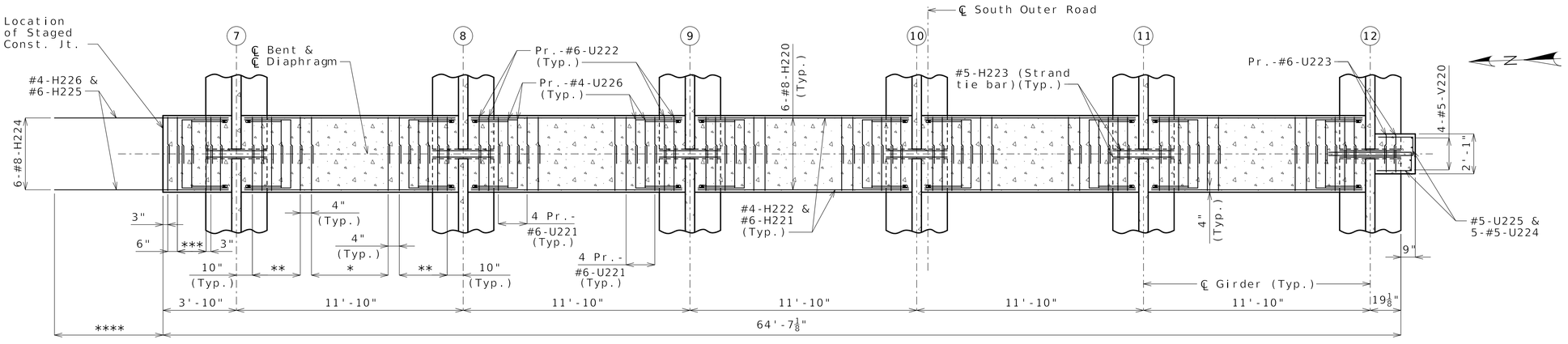
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
MoDOT
IMPROVE I-70 ROCHEPORT TO COLUMBIA
HORNER SHIFRIN
THE POWER OF COLLABORATION
401 S. 18th St. Ste. 400
St. Louis, MO 63103
314-531-1420 FAX: 314-531-1566
www.HornerShifrin.com
EMERY SAPPS SONS, INC
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc



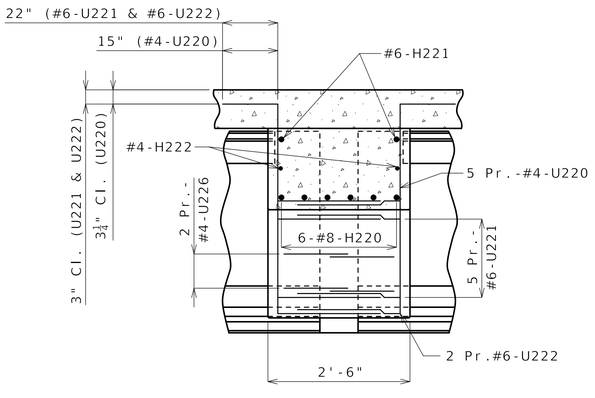
SECTION NEAR INTERMEDIATE BENT
Normal to ℄ Structure



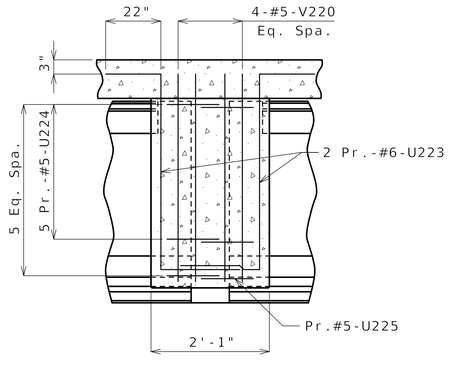
**** Min. Lap Lengths:
#8-H224 = 5'-3"
#6-H225 = 3'-4"
#4-H226 = 2'-3"

* 7 Pr.-#4-U220 @ 9" cts. (Typ.)
** 5 Spa. @ 6" cts. (Typ.)
*** 4-Pr.-#6-U221 @ 6" cts.

SECTION A-A



SECTION B-B



SECTION C-C

Notes:

For location of Strand Tie Bars, see Sheets No. 31 & 32.

For location and details of Coil Tie Rods, see Sheets No. 31 & 32.

Diaphragms at intermediate bents shall be built vertical.

All U-bars in diaphragms are to be placed parallel to ℄ Roadway.

Bar marks for Intermediate Bent No. 2 shown (200 series). Intermediate Bent No. 3 similar (300 series).

CONCRETE DIAPHRAGMS AT INT. BENTS NO. 2 AND 3 - PHASE 1

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked UVK MAY 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI — MARTIN ALAN CHORKEY — NUMBER PE-2013006488 — REGISTERED PROFESSIONAL ENGINEER — 7-1-2026

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-42
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

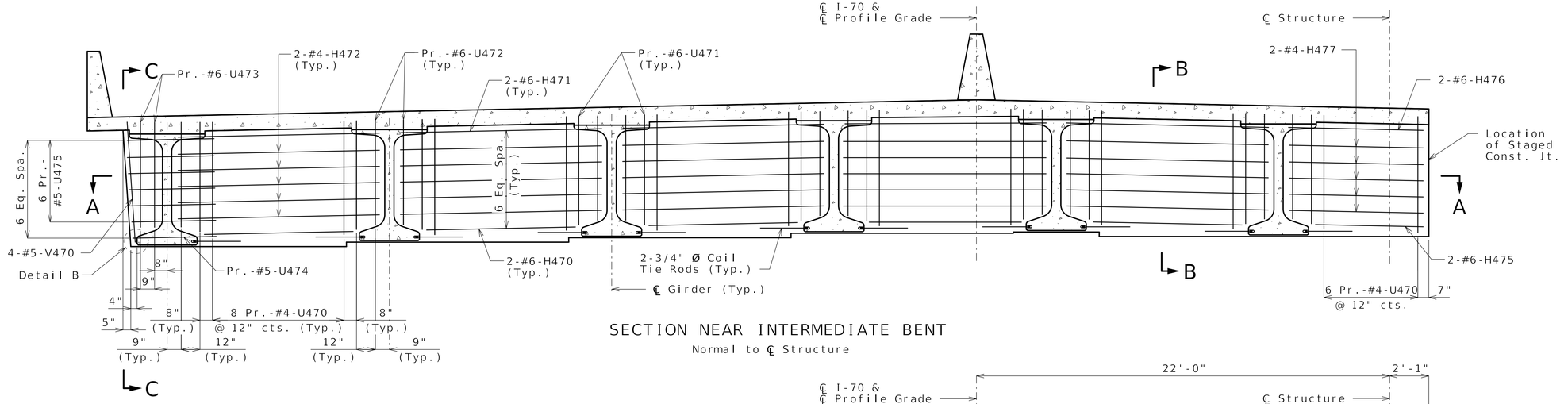
IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN — THE POWER OF EXPERIENCE AND INNOVATION — ST. LOUIS, MISSOURI — 401 S. 18th St., Ste. 400, 63103 — 314-231-4820 FAX: 314-231-4821 — www.HornerShifrin.com

EMERY SAPPS SONS, INC

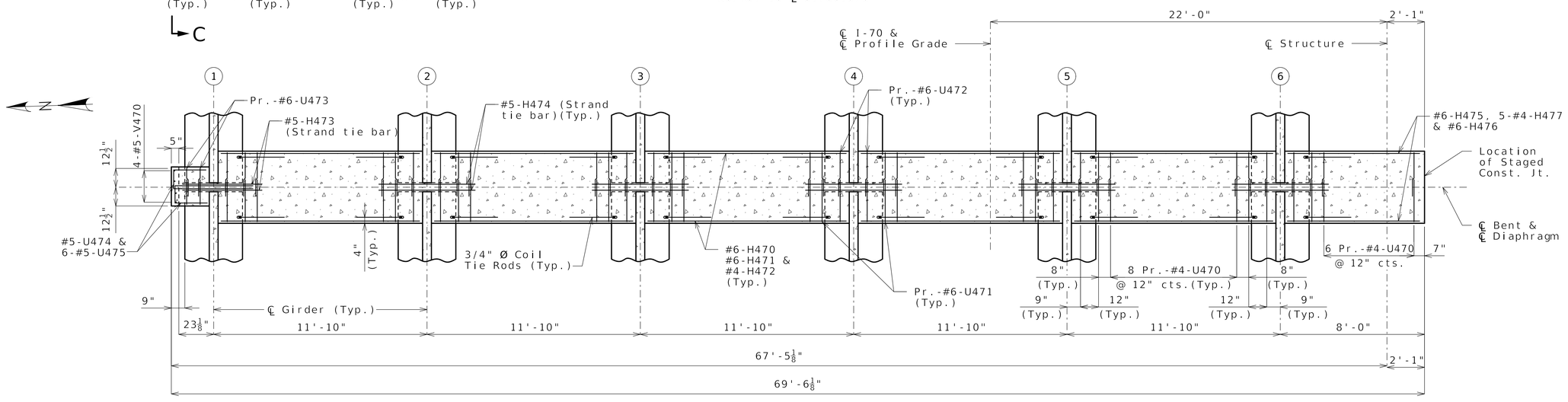
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

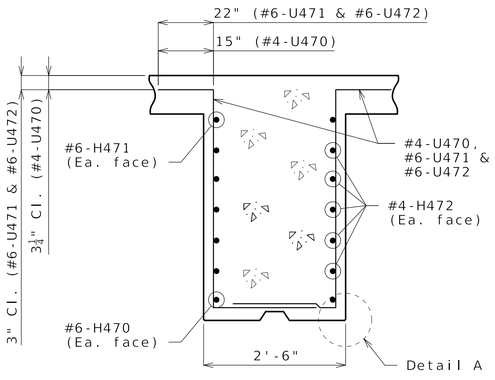


SECTION NEAR INTERMEDIATE BENT

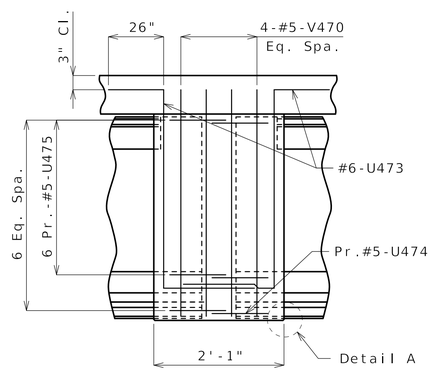
Normal to ℄ Structure



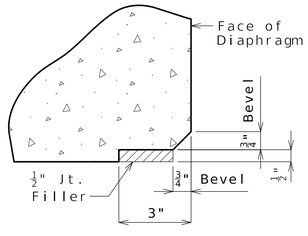
SECTION A-A



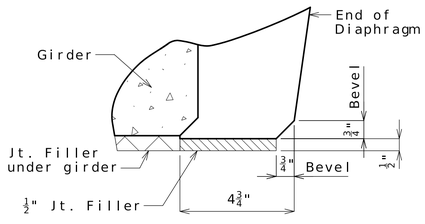
SECTION B-B



SECTION C-C



DETAIL A



DETAIL B

Notes:

For location of Strand Tie Bars, see Sheets No. 32 & 33.

For location and details of Coil Tie Rods, see Sheets No. 32 & 33.

Diaphragms at intermediate bents shall be built vertical.

All U-bars in diaphragms are to be placed parallel to ℄ Roadway.

CONCRETE DIAPHRAGM AT INTERMEDIATE BENT NO. 4 - PHASE 2

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked UVK JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
REGISTERED ENGINEER
7-17-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-43
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

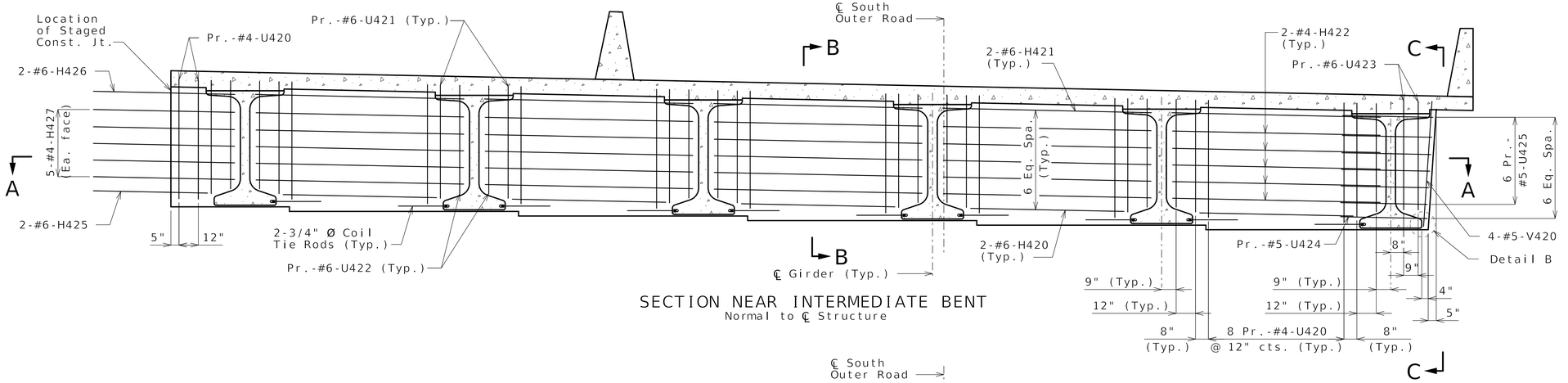
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)
MoDOT
EMERY SAPPE & SONS, INC
HORNER SHIFRIN
THE POWER OF THE RIGHT CONNECTION
401 S. 18th St., Ste. 400
ST. LOUIS, MO 63103
314-531-4321 FAX 314-531-8866
www.hornershifrin.com

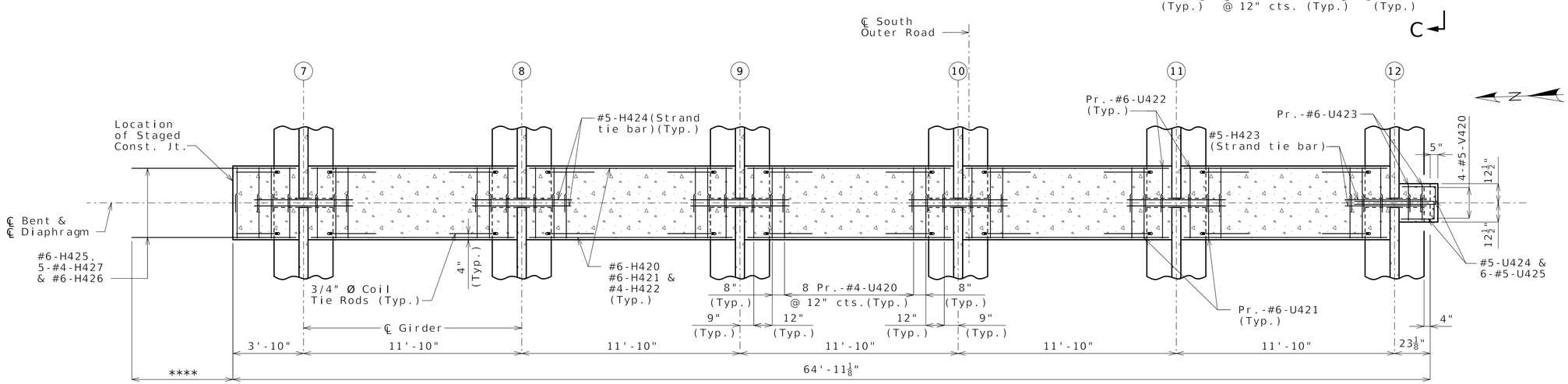
IMPROVE I-70 ROCHEPORT TO COLUMBIA

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

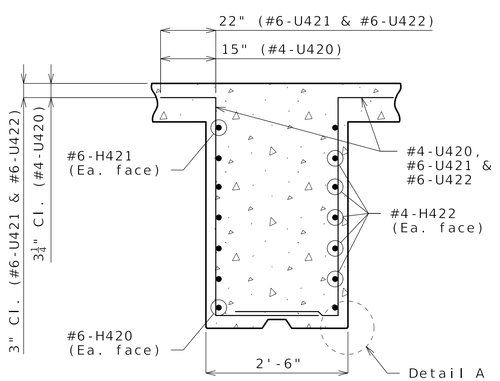


SECTION NEAR INTERMEDIATE BENT
Normal to ℄ Structure

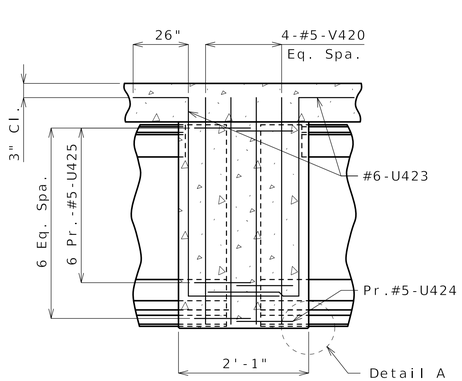


SECTION A-A

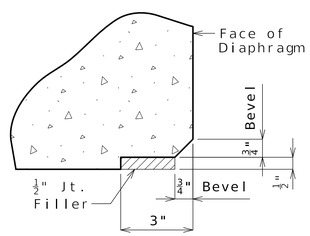
**** Min. Lap Lengths:
#6-H425 = 3'-0"
#6-H426 = 3'-4"
#4-H427 = 2'-3"



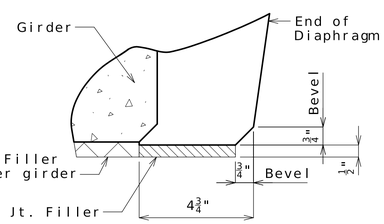
SECTION B-B



SECTION C-C



DETAIL A



DETAIL B

Notes:

For location of Strand Tie Bars, see Sheets No. 32 & 33.

For location and details of Coil Tie Rods, see Sheets No. 32 & 33.

Diaphragms at intermediate bents shall be built vertical.

All U-bars in diaphragms are to be placed parallel to ℄ Roadway.

CONCRETE DIAPHRAGM AT INTERMEDIATE BENT NO. 4 - PHASE 1

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked UVK MAY 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI — MARTIN ALAN CHORKEY — NUMBER PE-2013006488 — REGISTERED PROFESSIONAL ENGINEER — 7-16-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-44
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

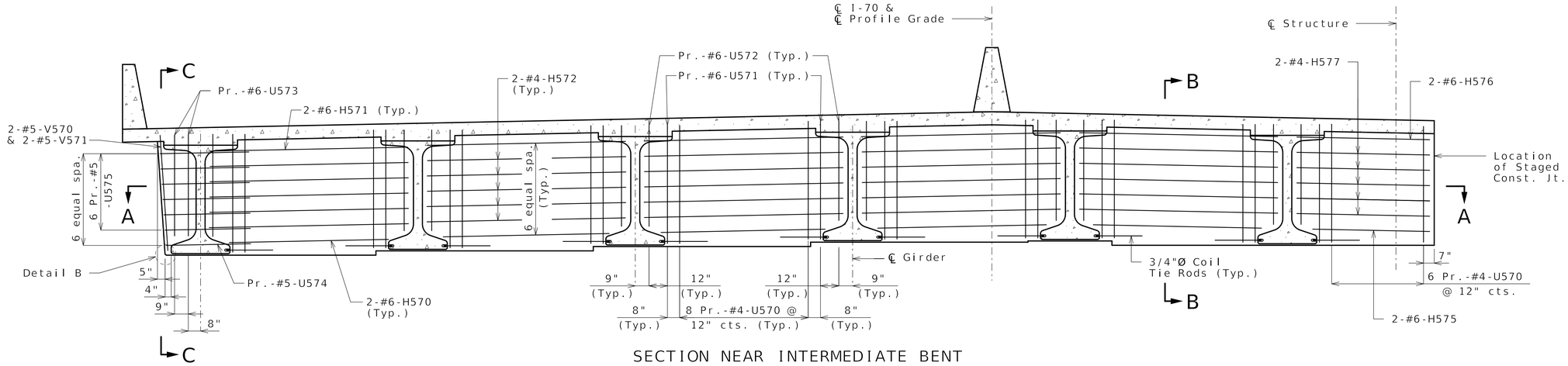
IMPROVE I-70 ROCHEPORT TO COLUMBIA

EMERY SAPPS SONS, INC

HORNER SHIFRIN — THE POWER OF STRUCTURAL INNOVATION — 401 S. 18th St., Ste. 400, St. Louis, MO 63103, 314-531-4321 FAX 314-531-6866, www.hornershifrin.com

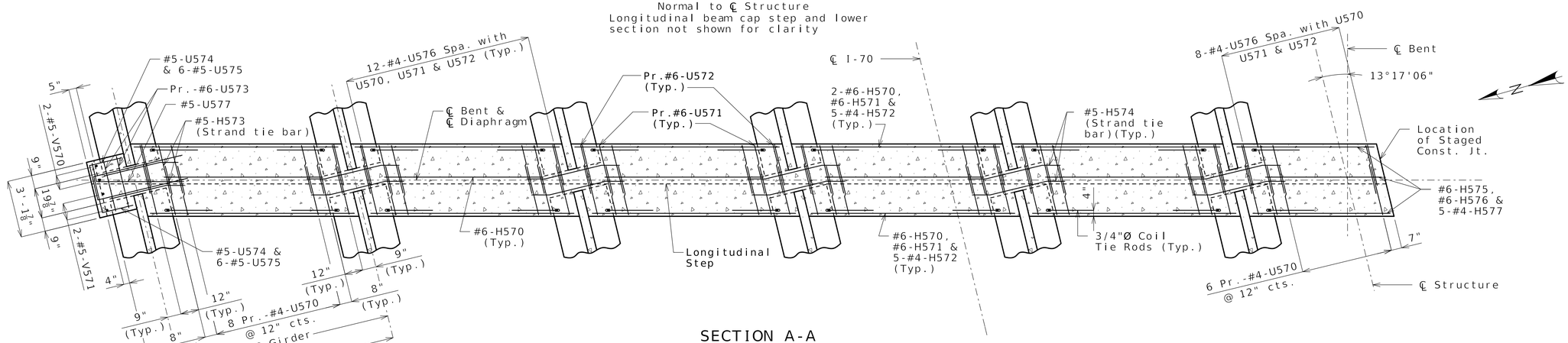
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

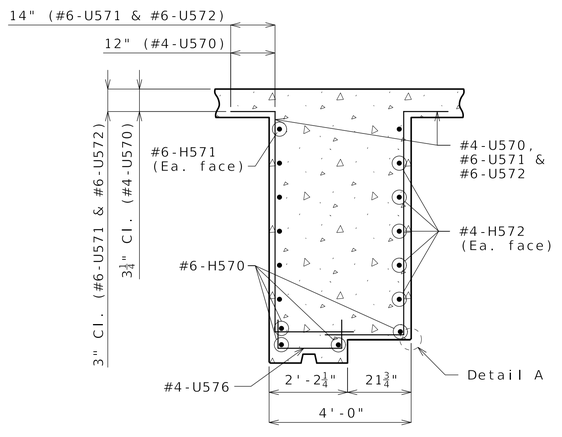


SECTION NEAR INTERMEDIATE BENT

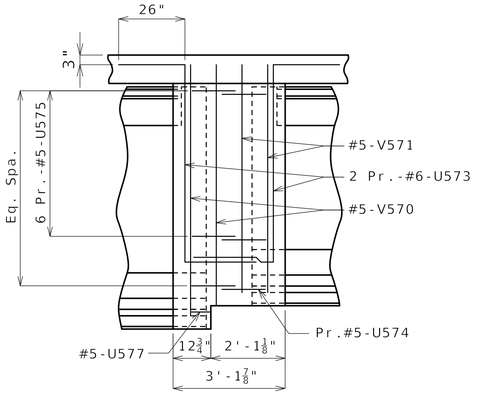
Normal to ℄ Structure
Longitudinal beam cap step and lower
section not shown for clarity



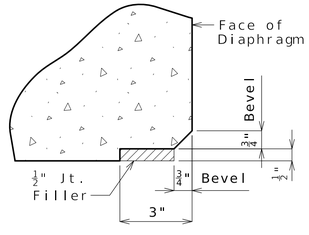
SECTION A-A



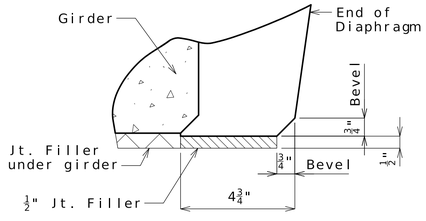
SECTION B-B



SECTION C-C



DETAIL A



DETAIL B

Notes:

For location of Strand Tie Bars, see Sheets No. 33 & 35.

For location and details of Coil Tie Rods, see Sheets No. 33 & 35.

Diaphragms at intermediate bents shall be built vertical.

All U-bars in diaphragms are to be placed parallel to ℄ Roadway.

CONCRETE DIAPHRAGM AT INTERMEDIATE BENT NO. 5 - PHASE 2

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked UVK MAY 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
7-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-45

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

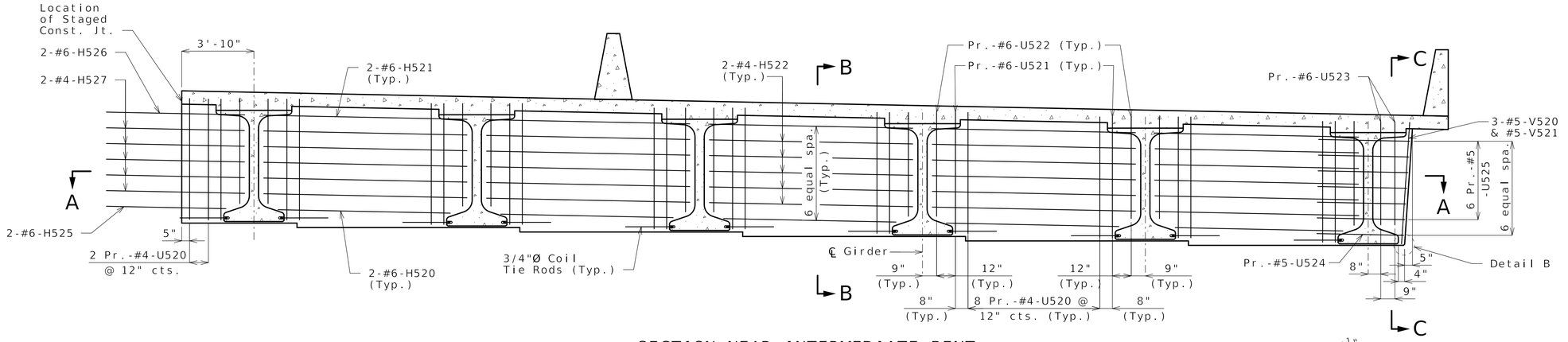
IMPROVE I-70 ROCHEPORT TO COLUMBIA

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

EMERY SAPPS SONS, INC

HORNER SHIFRIN
THE POWER OF COLLABORATION
801 E. 18th St., Ste. 400
St. Louis, MO 63106-2506
314-531-1021 FAX: 314-531-4966
www.HornerShifrin.com

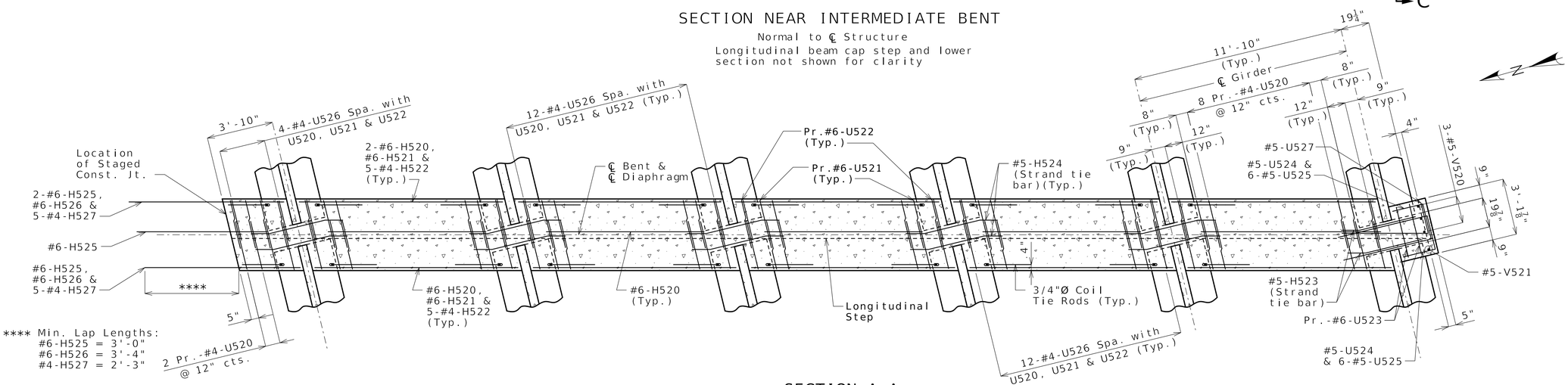
REV. RevDesc



SECTION NEAR INTERMEDIATE BENT

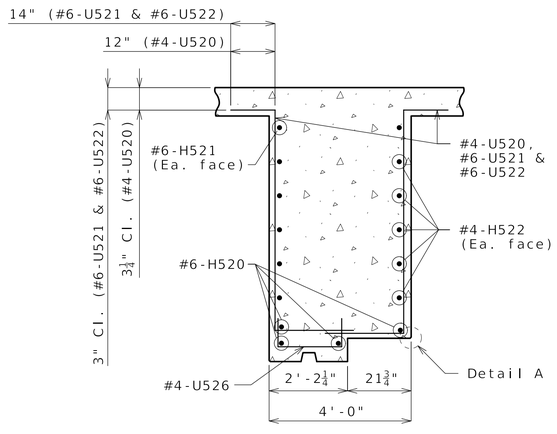
Normal to ℄ Structure

Longitudinal beam cap step and lower section not shown for clarity

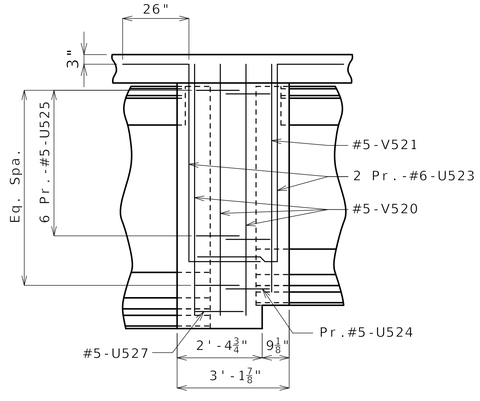


**** Min. Lap Lengths:
#6-H526 & #6-H525 = 3'-0"
#6-H526 = 3'-4"
#4-H527 = 2'-3"

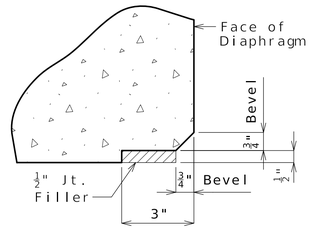
SECTION A-A



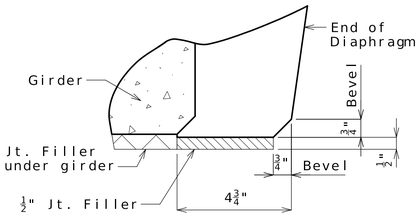
SECTION B-B



SECTION C-C



DETAIL A



DETAIL B

Notes:

For location of Strand Tie Bars, see Sheets No. 33 & 35.

For location and details of Coil Tie Rods, see Sheets No. 33 & 35.

Diaphragms at intermediate bents shall be built vertical.

All U-bars in diaphragms are to be placed parallel to ℄ Roadway.

CONCRETE DIAPHRAGM AT INTERMEDIATE BENT NO. 5 - PHASE 1

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked UVK MAY 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
Martin Chorkey 7-16-26

DATE PREPARED 16-JUL-2026
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. BR04-46
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

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

REV | DATE | DESCRIPTION
0 | 071726 | RFC BRIDGE A9819

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

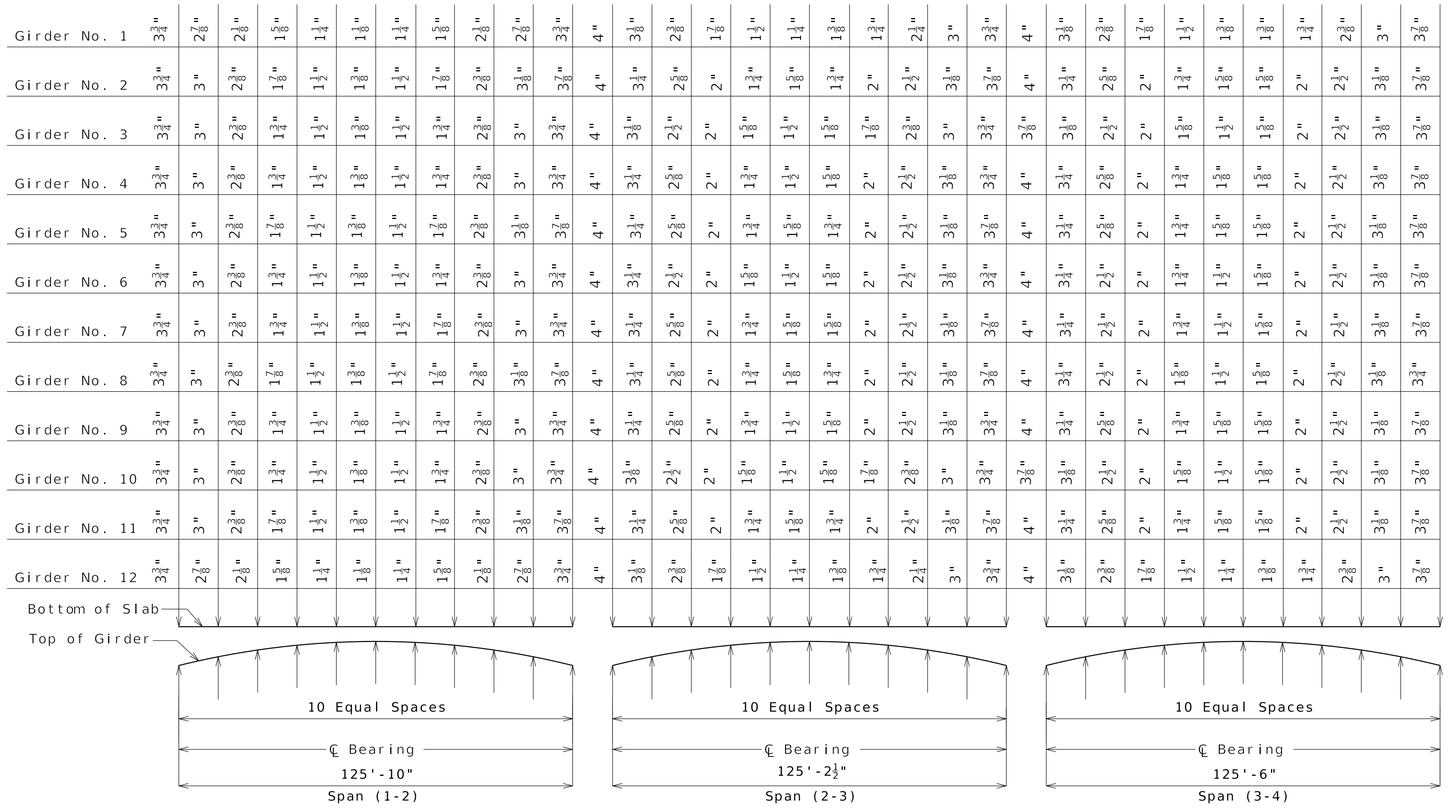
IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
THE POWER OF EXPERIENCE AND INNOVATION
401 S. 18th St., Ste. 400
St. Louis, MO 63103-2709
314-621-4021 FAX: 314-621-4866
www.hornershifrin.com

EMERY SAPPS SOMS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc



THEORETICAL SLAB HAUNCHING DIAGRAM (ESTIMATED AT 90 DAYS)

If girder 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. The haunch shall be limited to ensure the projecting girder reinforcement or hairpin bar is embedded into slab at least 2 inches.

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

Girder Number	Span (1-2) (125'-10" ℄ Brg. - ℄ Brg.)											Girder Number	Span (3-4) (125'-6" ℄ Brg. - ℄ Brg.)										
	℄ Brg.	.10	.20	.30	.40	.50	.60	.70	.80	.90	℄ Brg.		℄ Brg.	.10	.20	.30	.40	.50	.60	.70	.80	.90	℄ Brg.
1	601.49	601.65	601.79	601.93	602.06	602.16	602.26	602.33	602.40	602.46	602.51	1	603.54	603.69	603.84	603.97	604.10	604.21	604.30	604.38	604.44	604.50	604.55
2	601.73	601.89	602.05	602.19	602.32	602.42	602.52	602.59	602.65	602.70	602.74	2	603.78	603.94	604.09	604.23	604.36	604.47	604.56	604.63	604.69	604.75	604.79
3	601.97	602.13	602.28	602.42	602.55	602.66	602.75	602.83	602.89	602.94	602.98	3	604.02	604.17	604.33	604.47	604.59	604.70	604.80	604.87	604.93	604.98	605.03
4	602.20	602.36	602.52	602.66	602.79	602.90	602.99	603.06	603.12	603.17	603.22	4	604.25	604.41	604.56	604.70	604.83	604.94	605.03	605.11	605.17	605.22	605.26
5	602.27	602.43	602.59	602.73	602.86	602.96	603.06	603.13	603.19	603.24	603.28	5	604.32	604.48	604.63	604.77	604.90	605.01	605.10	605.17	605.24	605.29	605.33
6	602.03	602.19	602.35	602.49	602.62	602.73	602.82	602.89	602.95	603.00	603.05	6	604.08	604.24	604.39	604.53	604.66	604.77	604.86	604.94	605.00	605.05	605.09
7	601.80	601.96	602.11	602.25	602.38	602.49	602.58	602.66	602.72	602.77	602.81	7	603.85	604.00	604.16	604.30	604.42	604.53	604.63	604.70	604.76	604.81	604.86
8	601.56	601.72	601.88	602.02	602.15	602.25	602.35	602.42	602.48	602.53	602.57	8	603.61	603.77	603.92	604.06	604.19	604.30	604.39	604.46	604.53	604.58	604.62
9	601.32	601.48	601.64	601.78	601.91	602.02	602.11	602.18	602.24	602.29	602.34	9	603.37	603.53	603.68	603.82	603.95	604.06	604.15	604.23	604.29	604.34	604.38
10	601.09	601.25	601.40	601.54	601.67	601.78	601.87	601.95	602.01	602.06	602.10	10	603.14	603.29	603.45	603.59	603.71	603.82	603.92	603.99	604.05	604.10	604.15
11	600.85	601.01	601.17	601.31	601.44	601.54	601.64	601.71	601.77	601.82	601.86	11	602.90	603.06	603.21	603.35	603.48	603.59	603.68	603.76	603.82	603.87	603.91
12	600.61	600.77	600.91	601.05	601.18	601.28	601.38	601.46	601.52	601.58	601.63	12	602.66	602.81	602.96	603.09	603.22	603.33	603.42	603.50	603.57	603.62	603.67

Girder Number	Span (2-3) (125'-2½" ℄ Brg. - ℄ Brg.)										
	℄ Brg.	.10	.20	.30	.40	.50	.60	.70	.80	.90	℄ Brg.
1	602.52	602.67	602.81	602.95	603.07	603.18	603.27	603.35	603.42	603.48	603.53
2	602.76	602.91	603.06	603.20	603.33	603.44	603.53	603.61	603.67	603.72	603.77
3	603.00	603.15	603.30	603.44	603.57	603.68	603.77	603.84	603.91	603.96	604.00
4	603.23	603.39	603.54	603.68	603.80	603.91	604.00	604.08	604.14	604.19	604.24
5	603.30	603.45	603.60	603.74	603.87	603.98	604.07	604.15	604.21	604.26	604.31
6	603.06	603.22	603.37	603.51	603.63	603.74	603.83	603.91	603.97	604.02	604.07
7	602.83	602.98	603.13	603.27	603.40	603.51	603.60	603.67	603.74	603.79	603.83
8	602.59	602.74	602.89	603.03	603.16	603.27	603.36	603.44	603.50	603.55	603.60
9	602.35	602.51	602.66	602.80	602.92	603.03	603.12	603.20	603.26	603.31	603.36
10	602.12	602.27	602.42	602.56	602.69	602.80	602.89	602.96	603.03	603.08	603.12
11	601.88	602.03	602.18	602.32	602.45	602.56	602.65	602.73	602.79	602.84	602.89
12	601.64	601.79	601.93	602.07	602.19	602.30	602.39	602.47	602.54	602.60	602.65

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 and barrier.

Note:

Work this sheet with Sheet No. 48.

SLAB HAUNCHING, ELEVATIONS AND CAMBER-SPANS (1-2), (2-3) & (3-4)

Designed SBH FEB 2026
Detailed CAB FEB 2026
Checked CMR JUN 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_47_Slab Haunch and Camber 1.dgn 12:19:48 AM Eastern 16-JUL-2026

STATE OF MISSOURI MARTIN ALAN CHORKEY PE-2013006488 REGISTERED PROFESSIONAL ENGINEER 7-17-26

DATE PREPARED 16-JUL-2026
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. BR04-47
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

EMERY SAPP & SONS, INC

HORNER SHIFRIN
THE ART & SCIENCE OF BRIDGE DESIGN
401 S. 18th St., Ste. 300
St. Louis, MO 63103-2709
314-531-1420 FAX: 314-531-6866
www.HornerShifrin.com

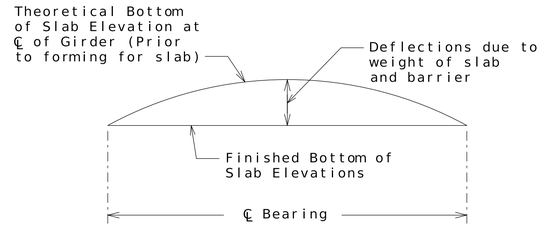
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

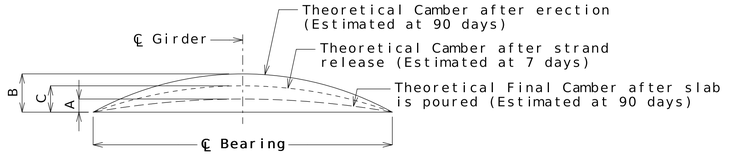


THEORETICAL SLAB HAUNCHING DIAGRAM (ESTIMATED AT 90 DAYS)

If girder camber is different from that shown in the camber diagram, in order to maintain minimum slab thickness, an increase in slab haunches, an increase in slab thickness or a raise in grade uniformly throughout the structure shall be necessary. The haunch shall be limited to ensure the projecting girder reinforcement or hairpin bar is embedded into slab at least 2 inches.



TYPICAL SLAB ELEVATIONS DIAGRAM



Girder	Span (1-2) A	Span (1-2) B	Span (1-2) C
Exterior	2 5/8"	4 1/2"	2 7/8"
Interior	2 3/8"		
	Span (2-3) A	Span (2-3) B	Span (2-3) C
Exterior	2 5/8"	4 3/8"	2 3/4"
Interior	2 3/8"	4 1/2"	
	Span (3-4) A	Span (3-4) B	Span (3-4) C
Exterior	2 5/8"	4 1/2"	2 3/4"
Interior	2 3/8"		2 7/8"
	Span (5-6) A	Span (5-6) B	Span (5-6) C
Exterior	*	**	5 1/4"
Interior			

Girder	Span (4-5) A	Span (4-5) B	Span (4-5) C
1	2 1/4"	4 5/8"	2 7/8"
2	2 1/8"	4 5/8"	2 7/8"
3	2 1/4"	4 1/2"	2 7/8"
4	2 3/8"	4 1/2"	2 3/4"
5	2 3/8"	4 3/8"	2 3/4"
6	2 1/2"	4 1/4"	2 5/8"
7	2 1/2"	4 1/8"	2 5/8"
8	2 5/8"	4"	2 1/2"
9	2 5/8"	3 7/8"	2 1/2"
10	2 5/8"	3 3/4"	2 3/8"
11	2 5/8"	3 5/8"	2 1/4"
12	2 5/8"	3 1/2"	2 1/8"

* 5 1/8" (Girders 1 and 12)
* 4 5/8" (Girders 2 thru 5 and 8 thru 11)
* 4 3/4" (Girders 6 and 7)

** 8 1/4" (Girder 1)
** 8 3/8" (Girders 2 thru 12)

GIRDER CAMBER DIAGRAM

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

0.1 pt. = 0.314 x 0.5 pt.
0.2 pt. = 0.593 x 0.5 pt.
0.3 pt. = 0.813 x 0.5 pt.
0.4 pt. = 0.952 x 0.5 pt.

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

Girder Number	Span (4-5) (Varies ℄ Brg. - ℄ Brg.) ℄ Brg.	.10	.20	.30	.40	.50	.60	.70	.80	.90	℄ Brg.
1	604.56	604.73	604.90	605.05	605.19	605.30	605.40	605.48	605.54	605.60	605.64
2	604.80	604.97	605.14	605.29	605.42	605.54	605.63	605.71	605.77	605.82	605.86
3	605.04	605.20	605.36	605.50	605.63	605.75	605.84	605.92	605.98	606.03	606.07
4	605.27	605.43	605.58	605.72	605.85	605.95	606.05	606.12	606.18	606.24	606.28
5	605.34	605.49	605.63	605.77	605.89	605.99	606.08	606.16	606.22	606.28	606.33
6	605.10	605.25	605.38	605.51	605.63	605.73	605.82	605.90	605.96	606.02	606.07
7	604.87	605.00	605.13	605.26	605.37	605.47	605.56	605.63	605.70	605.75	605.81
8	604.63	604.76	604.88	605.00	605.11	605.21	605.29	605.37	605.43	605.49	605.55
9	604.39	604.52	604.64	604.75	604.85	604.95	605.03	605.11	605.17	605.23	605.29
10	604.16	604.27	604.39	604.50	604.60	604.69	604.77	604.84	604.91	604.97	605.03
11	603.92	604.03	604.14	604.25	604.34	604.43	604.51	604.58	604.65	604.71	604.77
12	603.68	603.79	603.89	603.99	604.08	604.16	604.24	604.31	604.38	604.45	604.51
Girder Number	Span (5-6) (153'-4 1/8" ℄ Brg. - ℄ Brg.) ℄ Brg.	.10	.20	.30	.40	.50	.60	.70	.80	.90	℄ Brg.
1	605.67	605.88	606.08	606.27	606.43	606.57	606.68	606.76	606.82	606.87	606.90
2	605.88	606.10	606.32	606.51	606.68	606.82	606.93	607.01	607.06	607.09	607.11
3	606.09	606.32	606.53	606.73	606.90	607.04	607.14	607.22	607.27	607.31	607.33
4	606.31	606.53	606.74	606.94	607.11	607.25	607.36	607.44	607.49	607.52	607.54
5	606.35	606.57	606.79	606.98	607.15	607.29	607.40	607.48	607.53	607.56	607.58
6	606.09	606.31	606.53	606.72	606.89	607.03	607.14	607.22	607.27	607.30	607.32
7	605.83	606.05	606.27	606.46	606.63	606.77	606.88	606.96	607.01	607.04	607.06
8	605.57	605.79	606.01	606.20	606.37	606.51	606.62	606.70	606.75	606.78	606.80
9	605.31	605.53	605.75	605.94	606.11	606.25	606.36	606.44	606.49	606.53	606.54
10	605.05	605.27	605.49	605.69	605.86	606.00	606.10	606.18	606.23	606.27	606.29
11	604.79	605.02	605.23	605.43	605.60	605.74	605.84	605.92	605.97	606.01	606.03
12	604.53	604.74	604.95	605.13	605.30	605.44	605.55	605.63	605.69	605.73	605.77

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 and barrier.

Note:

Work this sheet with Sheet No. 47.

SLAB HAUNCHING, ELEVATIONS AND CAMBER-SPANS (4-5) & (5-6)

Designed SBH FEB 2026
Detailed CAB FEB 2026
Checked CMR JUN 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_48_Slab Haunch and Camber 2.dgn 12:21:51 AM Eastern 16-JUL-2026

STATE OF MISSOURI MARTIN ALAN CHORKEY PE-2013006488 7-17-26

DATE PREPARED 16-JUL-2026
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. BR04-48
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

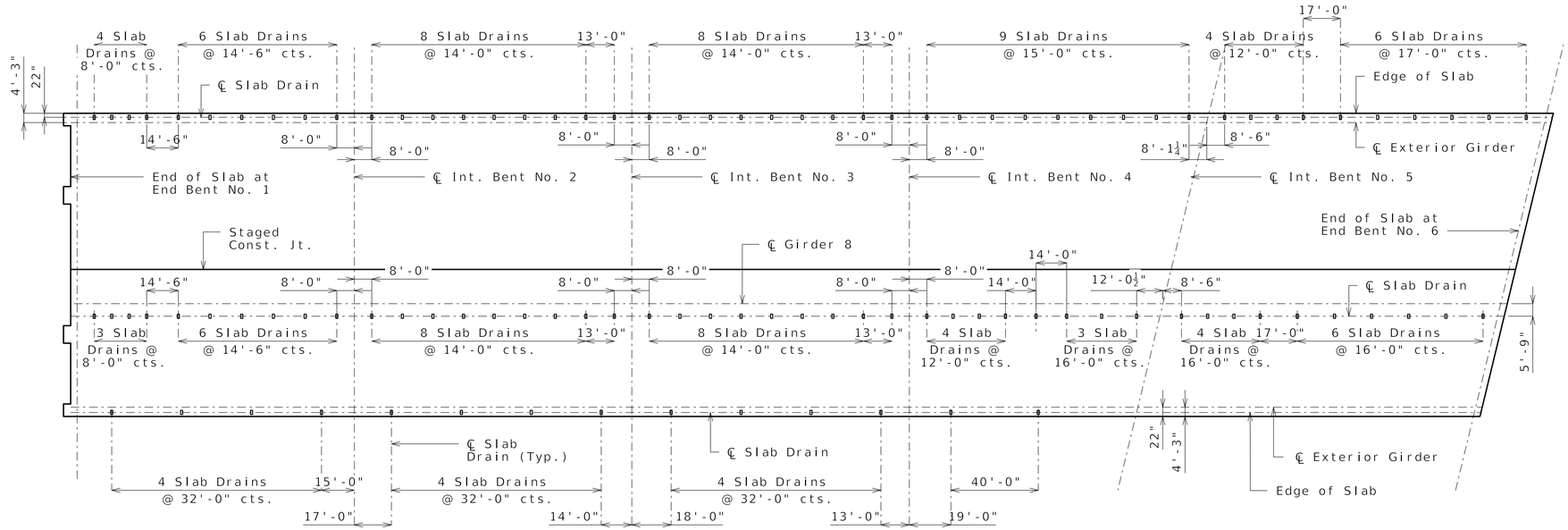
IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
THE HORNER & SHIFRIN GROUP OF COMPANIES
801 E. 18th St., Ste. 400
KANSAS CITY, MISSOURI 64108
816-471-1741 FAX: 816-471-1701
314-531-1431 FAX: 314-531-4866
www.HornerShifrin.com

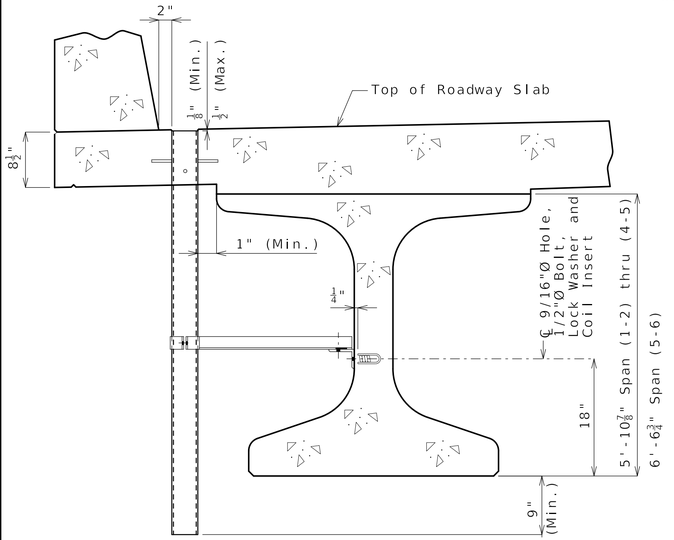
EMERY SAPP& SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

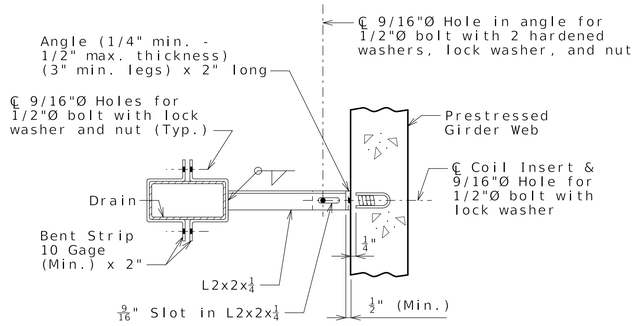
REV. RevDesc



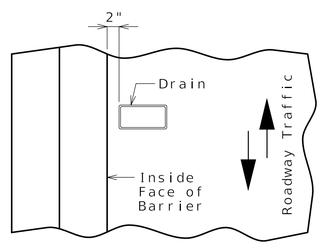
PLAN OF SLAB SHOWING SLAB DRAIN LOCATIONS



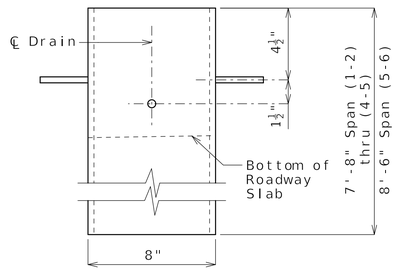
PART SECTION NEAR DRAIN



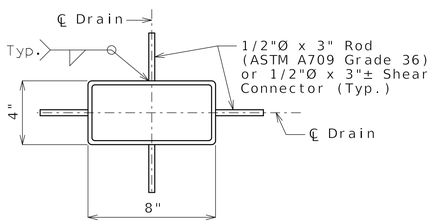
PART SECTION SHOWING BRACKET ASSEMBLY



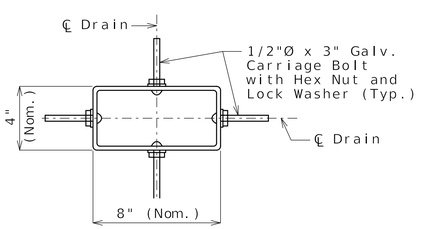
PART PLAN OF SLAB AT DRAIN



ELEVATION OF DRAIN



PLAN OF STEEL DRAIN OPTION



PLAN OF FRP DRAIN OPTION

General Notes:

Contractor shall have the option to construct either steel or FRP slab drains. All drains shall be of same type.

Slab drain bracket assembly shall be ASTM A709 Grade 36 steel.

Locate drains in slab by dimensions shown in Part Section Near Drain.

Reinforcing steel shall be shifted to clear drains.

The coil inserts and bracket assembly shall be galvanized in accordance with ASTM A123.

All bolts, hardened washers, lock washers and nuts shall be galvanized in accordance with AASHTO M 232 (ASTM A153), Class C.

All 1/2"Ø bolts shall be ASTM A307.

Shop drawings will not be required for the slab drains and the bracket assembly.

The coil insert required for the bracket assembly attachment shall be located on the prestressed girder shop drawings.

Coil inserts shall have a concrete pull-out strength (ultimate load) of at least 2,500 pounds in 5,000 psi concrete.

The bolt required to attach the slab drain bracket assembly to the prestressed girder web shall be supplied by the prestressed girder fabricator.

Notes for Steel Drain:

Slab drains may be fabricated of either 1/4" welded sheets of ASTM A709 Grade 36 steel or from 1/4" structural steel tubing ASTM A500 or A501.

Outside dimensions of drains are 8" x 4".

The drains shall be galvanized in accordance with ASTM A123.

Notes for FRP Drain:

Drains shall be machine filament-wound thermosetting resin tubing meeting the requirements of ASTM D2996 with the following exceptions:

Shape of drains shall be rectangular with outside nominal dimensions of 8" x 4".

Minimum reinforced wall thickness shall be 1/4 inch.

The resin used shall be ultraviolet (UV) resistant and/or have UV inhibitors mixed throughout. Drains may have an exterior coating for additional UV resistance.

The color of the slab drain shall be gray (Federal Standard #26373). The color shall be uniform throughout the resin and any coating used.

The combination of materials used in the manufacture of the drains shall be tested for UV resistance in accordance with ASTM D4329 Cycle A. The representative material shall withstand at least 500 hours of testing with only minor discoloration and without any physical deterioration. The contractor shall furnish the results of the required ultraviolet testing prior to acceptance of the slab drains.

At the contractor's option, drains may be field cut. The method of cutting FRP slab drain shall be as recommended by the manufacturer to ensure a smooth, chip free cut.

SLAB DRAINS

Designed SR APR 2026
Detailed CAB FEB 2026
Checked TPL MAY 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI — MARTIN ALAN CHORKEY — PE-2013006488 — 7-16-26

DATE PREPARED 16-JUL-2026
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. BR04-49
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

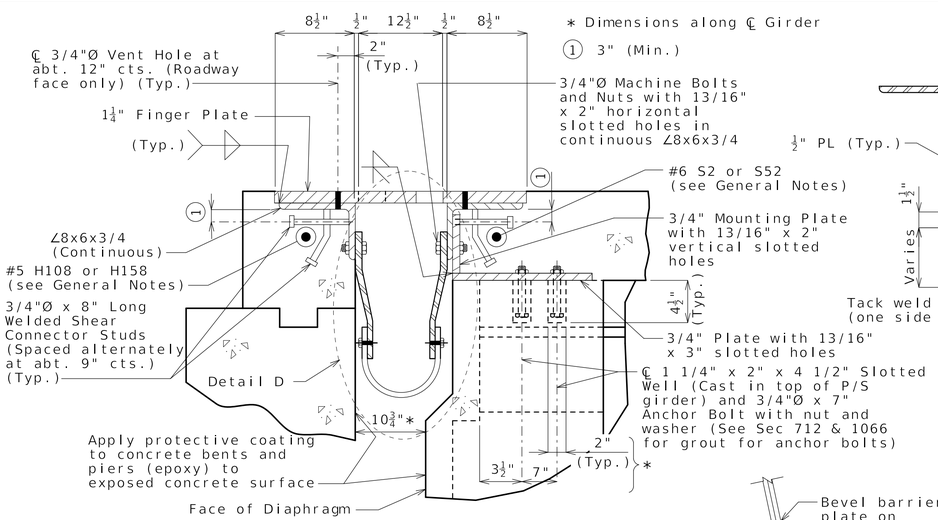
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN — THE POWER OF EXPERIENCE AND INNOVATION — 401 S. 18th St., Ste. 400, St. Louis, MO 63103-2709, 314-531-1420, FAX: 314-531-4966, www.HornerShifrin.com
EMERY SAPPS & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

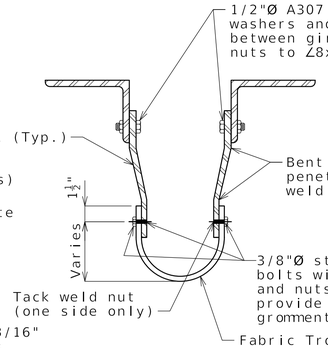


SECTION THRU DEVICE

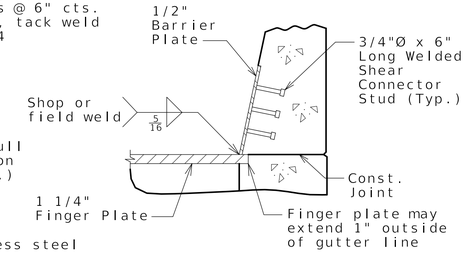
Note:
Concrete shall be forced under and around finger plate supporting hardware, anchors, angles and bars. Proper consolidation shall be achieved by localized internal vibration.

∗ Dimensions along ℄ Girder

(1) 3" (Min.)

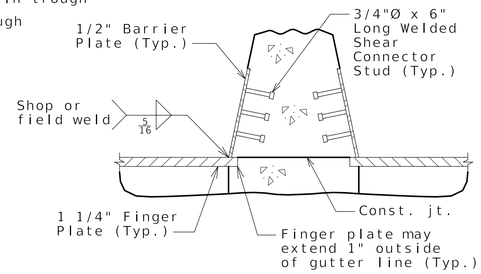


DETAIL D



SECTION A-A

(at Type D Barrier)



SECTION A-A

(at Type C Median)

GENERAL NOTES:

Finger plate shall be cut with a machine guided gas torch from one plate. The plate from which fingers are cut may be spliced before fingers are cut. The surface of cut shall be perpendicular to the surface of the plate. The cut shall not exceed 1/8" in width. The centerline of cut shall not deviate more than 1/16" from the position of centerline of cut shown. No splicing of finger plate or finger plate assembly will be allowed after fingers are cut. The expansion device shall be fabricated and installed to the crown and grade of the roadway.

Plan dimensions are based on installation at 60°F. The expansion gap and other dimensions shall be increased or decreased 3/8" for each 10° fall or rise in temperature at installation.

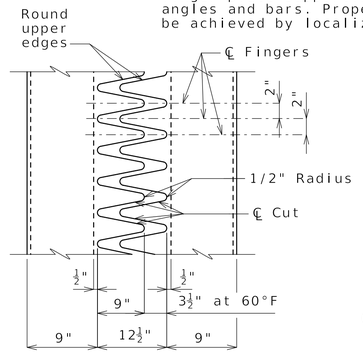
Material for the expansion device shall be ASTM A709 Grade 36 structural steel. Anchors for the expansion device shall be in accordance with Sec 1037.

Structural steel for the expansion device and barrier plate shall be coated with a minimum of two coats of inorganic zinc primer to provide a total dry film thickness of 4 mils minimum, 6 mils maximum, or galvanized in accordance with ASTM A123. Anchors need not be protected from overspray.

Longitudinal reinforcing steel shall be placed so that ends shall not be more than ±1" from the 3/4" vertical mounting plate at the expansion device.

Complete joint penetration welds utilized in the fabrication of the expansion device shall be nondestructively tested by an approved method.

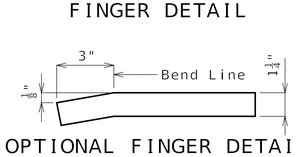
Place #6-S2/S52 and #5-H108/H158 in between shear studs as shown. Cutting bars may be necessary for placement but should be done at a minimum. Lapping will not be required.



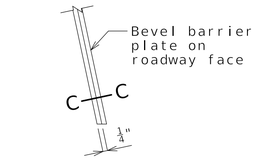
PART PLAN OF FINGER PLATE



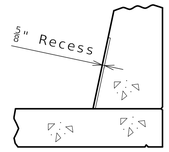
FINGER DETAIL



OPTIONAL FINGER DETAIL

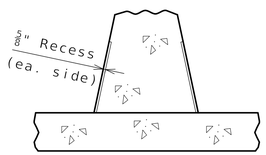


PART ELEVATION AT END OF BARRIER PLATE



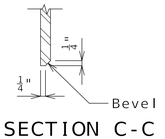
SECTION B-B

(at Type D Barrier)

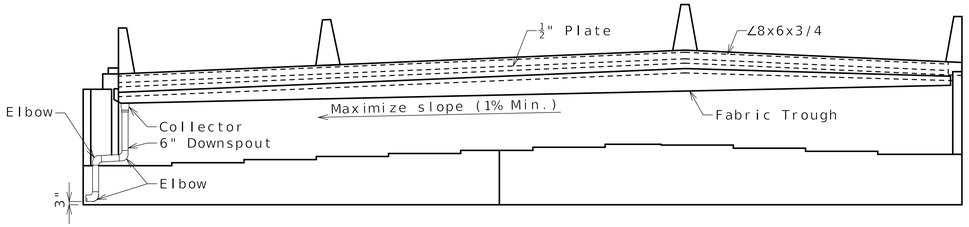


SECTION B-B

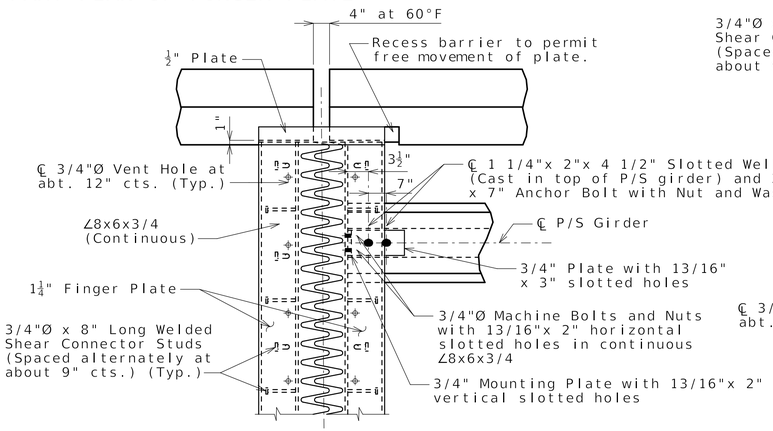
(at Type C Median)



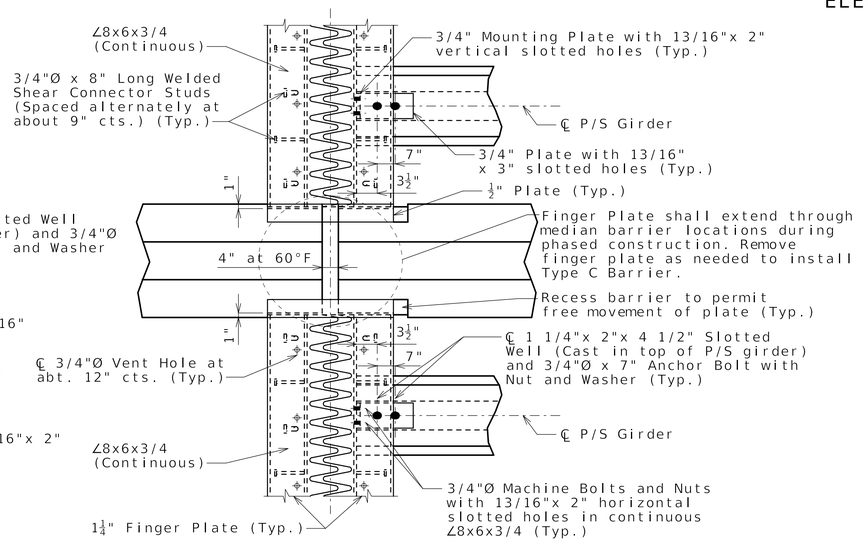
SECTION C-C



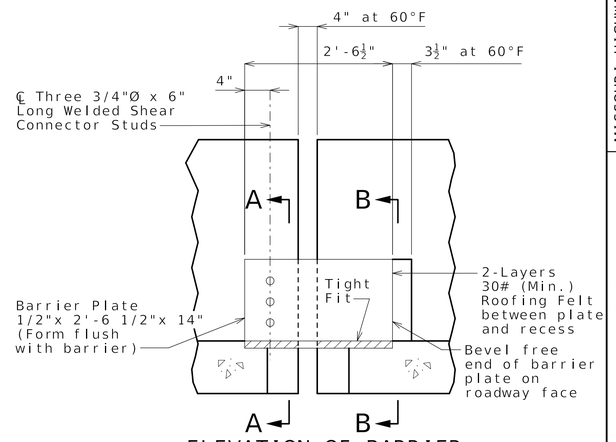
ELEVATION SHOWING FABRIC TROUBLE



PART PLAN OF DEVICE AT TYPE D BARRIER



PART PLAN OF DEVICE AT TYPE C MEDIAN



ELEVATION OF BARRIER

FINGER PLATE EXPANSION DEVICE AT END BENT NO. 1

Designed SR APR 2026
Detailed CAB FEB 2026
Checked TPL MAY 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
PE-2013006488
7-17-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-50
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

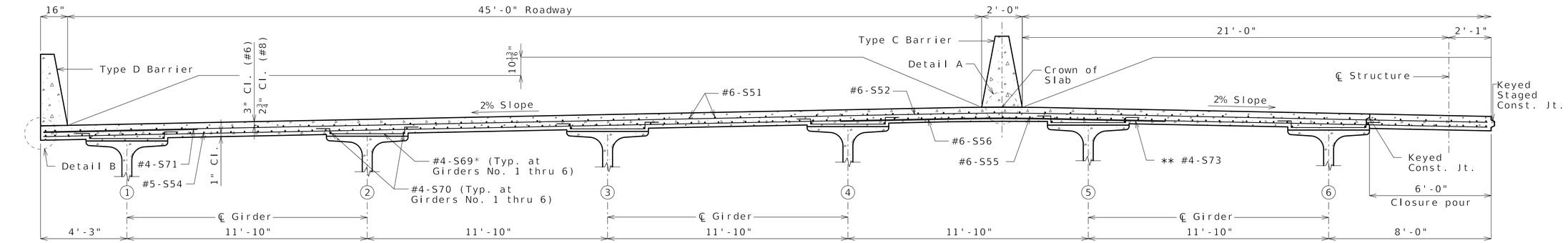
IMPROVE I-70 ROCHEPORT TO COLUMBIA

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

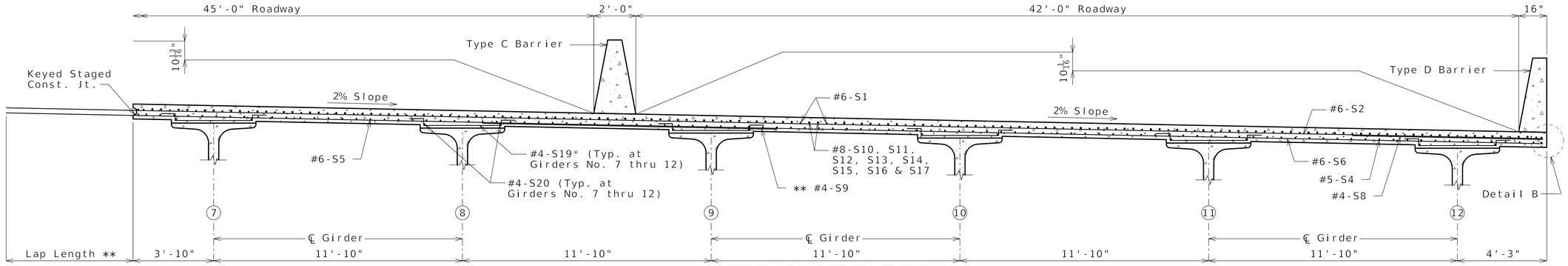
EMERY SAPP& SONS, INC
HORNER SHIFRIN
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

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

REV. RevDesc



HALF SECTION NEAR MIDSPAN



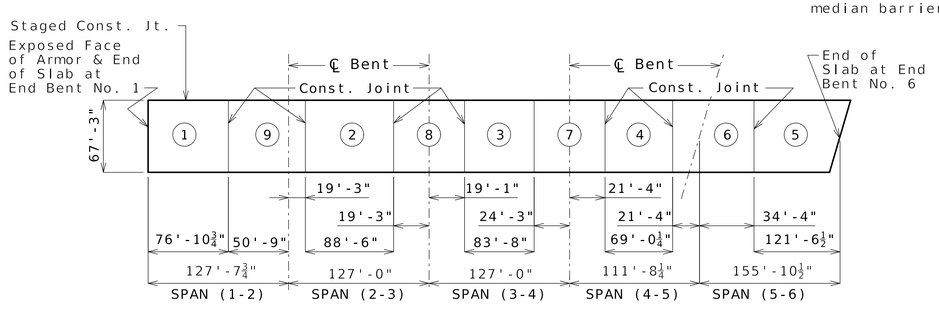
HALF SECTION NEAR INTERMEDIATE BENT

** Min. Lap Lengths:
#6-S2, S52, S3 & S22 = 2'-4"
#6-S6, S56, S7 & S26 = 5'-3"

SECTION THRU SLAB

* #4-S19 & S69 hairpin bars may be placed at an angle to meet clearances.

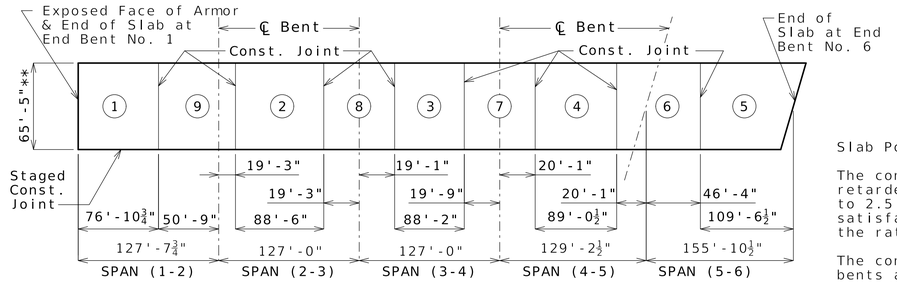
** #4-S9 & #4-S73 bars shall be centered about the CL of their respective median barriers.



POUR 1 - PHASE 1 CONSTRUCTION

	Sequence of Pours									Min. Rate of Pour Cu. Yds./Hr.
	Direction									With Retarder
Basic Sequence	1	2	3	4	5	6	7	8	9	35
	1 TO 9									
Alternate pours to the basic skip sequence are subject to the approval of the engineer in accordance with Sec 703.										
Alternate A Pours	1		9 + 2		8 + 3		7 + 4		6 + 5	83
	End to 9		1 to 8		2 to 7		3 to 6		4 to End	
Alternate B Pours	1 + 9 + 2			8 + 3			7 + 4 + 6 + 5			83
	End to 8			2 to 7			3 to End			
Alternate C Pours	1 + 9 + 2 + 8 + 3					7 + 4 + 6 + 5				83
	End to 7					3 to End				
Alternate D Pours	1 + 9 + 2 + 8 + 3 + 7 + 4 + 6 + 5									83
	End to End									

SLAB POURING SEQUENCE - PHASE 1



POUR 2 - PHASE 2 CONSTRUCTION

** 6'-0" Closure pour not included in Phase 2 pour sequence.

	Sequence of Pours									Min. Rate of Pour Cu. Yds./Hr.
	Direction									With Retarder
Basic Sequence	1	2	3	4	5	6	7	8	9	34
	1 TO 9									
Alternate pours to the basic skip sequence are subject to the approval of the engineer in accordance with Sec 703.										
Alternate A Pours	1		9 + 2		8 + 3		7 + 4		6 + 5	80
	End to 9		1 to 8		2 to 7		3 to 6		4 to End	
Alternate B Pours	1 + 9 + 2			8 + 3			7 + 4 + 6 + 5			80
	End to 8			2 to 7			3 to End			
Alternate C Pours	1 + 9 + 2 + 8 + 3					7 + 4 + 6 + 5				80
	End to 7					3 to End				
Alternate D Pours	1 + 9 + 2 + 8 + 3 + 7 + 4 + 6 + 5									80
	End to End									

SLAB POURING SEQUENCE - PHASE 2

Slab Pouring Sequence Notes:

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 bent shall be poured a minimum of 30 minutes and a maximum of 2 hours before the slab is poured.

End diaphragm at expansion device at End Bent No. 1 may be poured with a construction joint between the diaphragm and slab, or monolithic with the slab.

General Notes:

For reinforcement of barrier not shown, see Sheets No. 56, 57 & 60.

For Theoretical Bottom of Slab Elevations, Girder Camber Diagram and Theoretical Slab Haunching Diagram, see Sheets No. 47 & 48.

For Plan of Slab Showing Reinforcement, see Sheets No. 52 thru 55.

Expansive Class B-2 concrete shall be used in the closure pour.

SLAB SECTION AND DETAILS

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked CBW MAY 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI MARTIN ALAN CHORKEY PE-2013006488 11-26

DATE PREPARED 16-JUL-2026
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. BR04-51
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

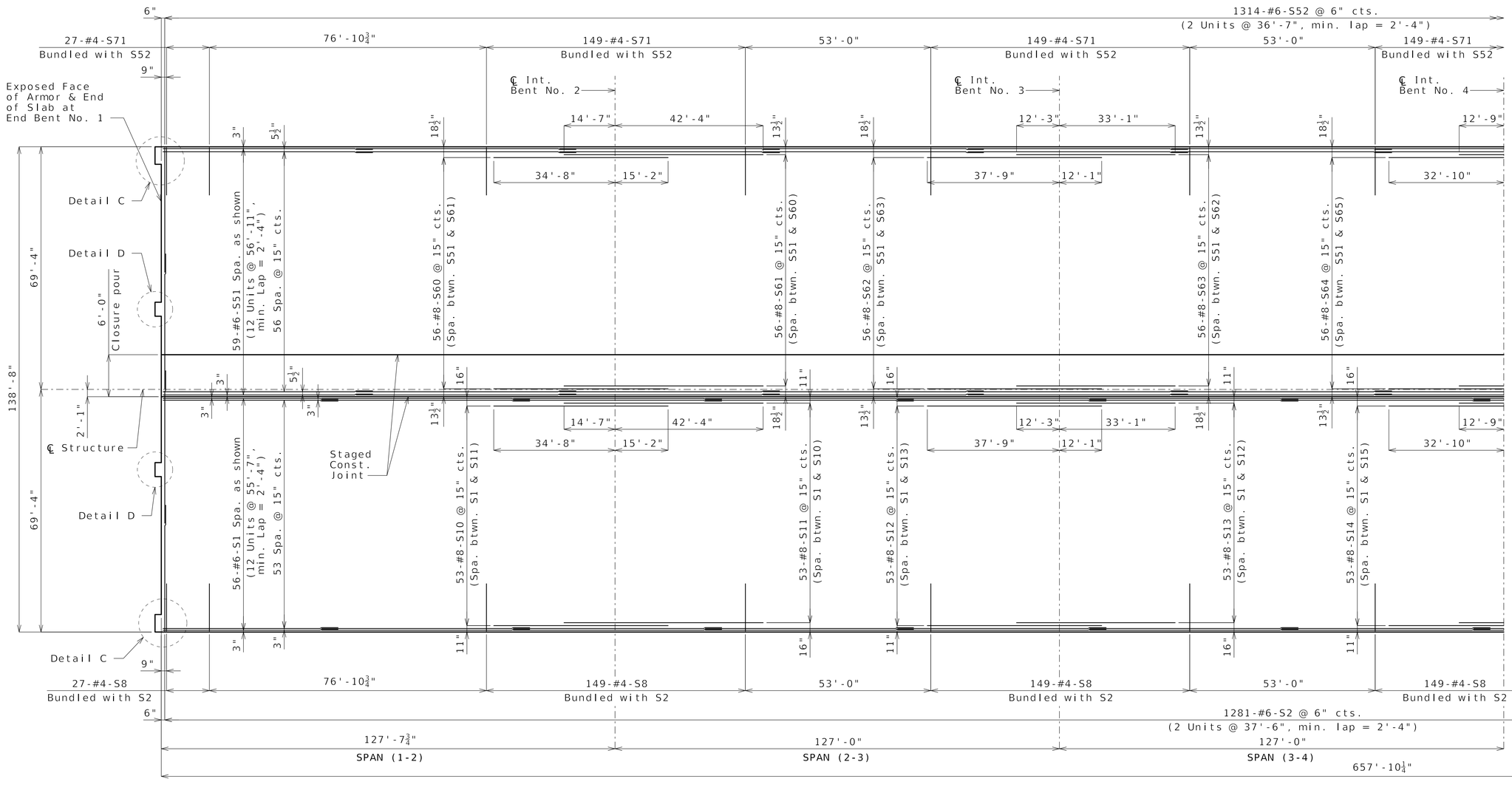
IMPROVE I-70 ROCHEPORT TO COLUMBIA

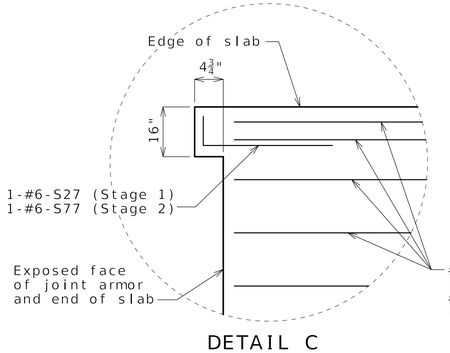
HORNER SHIFRIN
THE POWER OF COLLABORATION
401 S. 18th St. Ste. 400
St. Louis, Missouri 63103
314-231-4321 FAX: 314-531-6866
www.HornerShifrin.com

EMERY SAPPS SONS, INC

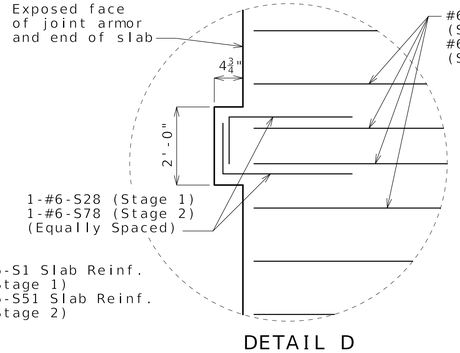
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

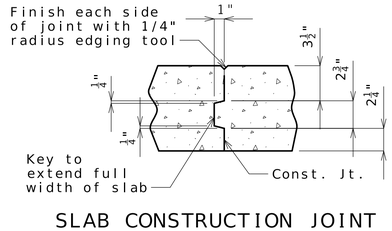




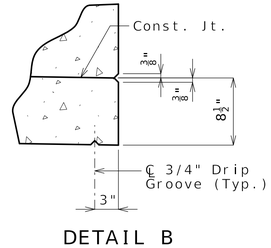
DETAIL C



DETAIL D



SLAB CONSTRUCTION JOINT



DETAIL B

Notes:

Work this sheet with Sheets No. 51 & 53.

Longitudinal slab dimensions are measured horizontally.

For Section Thru Slab and Slab Pouring Sequence, see Sheet No. 51.

For Details and Reinforcement of Barriers not shown, see Sheets No. 56, 57 & 60.

For Theoretical Slab Haunching Diagram and Theoretical Bottom of Slab Elevations, see Sheets No. 47 & 48.

For details and locations of slab drains, see Sheet No. 49.

PLAN OF SLAB SHOWING TOP REINFORCEMENT

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked CBW MAY 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
7-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-52

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

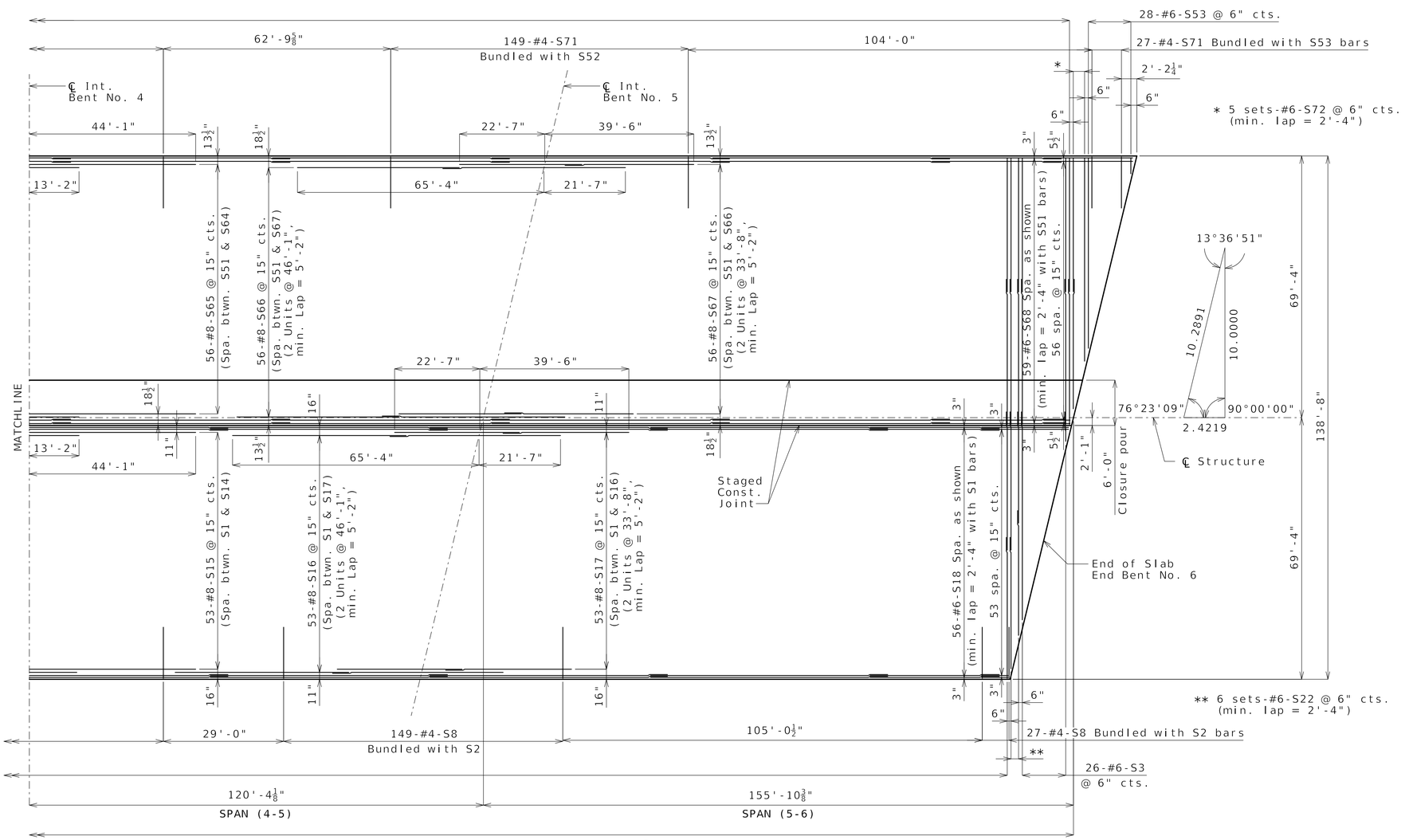
IMPROVE I-70 ROCHEPORT TO COLUMBIA

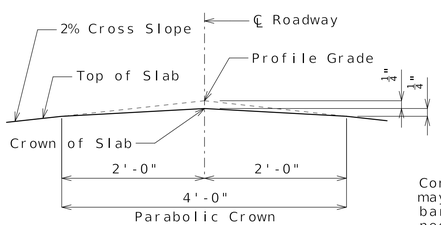
HORNER SHIFRIN
1010 PINE STREET, SAINT LOUIS, MISSOURI 63101
401 S. 18th St., Ste. 300
Omaha, NE 68102-1331
314-531-4321 FAX: 314-531-6966
E-mail: info@HornerShifrin.com
www.HornerShifrin.com

EMERY SAPP & SONS, INC

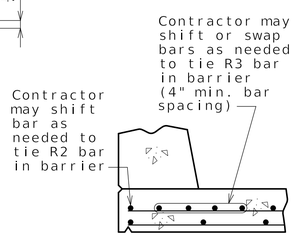
MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

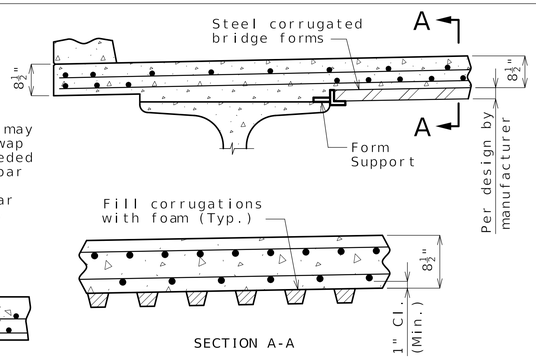




DETAIL A



OPTIONAL SHIFTING TOP BARS AT BARRIER



OPTIONAL STAY-IN-PLACE FORM DETAILS

Stay-In-Place Forms:

Corrugated steel forms, supports, closure elements and accessories shall be in accordance with grade requirement and coating designation G165 of ASTM A653. Complete shop drawings of the permanent steel deck forms shall be required in accordance with Sec 1080.

Corrugations of stay-in-place forms shall be filled with an expanded polystyrene material. The polystyrene material shall be placed in the forms with an adhesive in accordance with the manufacturer's recommendations.

Form sheets shall not rest directly on the top of girder flanges. Sheets shall be securely fastened to form supports with a minimum bearing length of one inch on each end. Form supports shall be placed in direct contact with the flange. Drilling holes in the girder flanges will not be permitted. All steel fabrication and construction shall be in accordance with Sec 1080 and 712. Certified field welders will not be required for welding of the form supports.

The design of stay-in-place corrugated steel forms is per manufacturer which shall be in accordance with Sec 703 for false work and forms. Maximum actual weight of corrugated steel forms allowed shall be 4 psf assumed for girder loading.

Notes:

Work this sheet with Sheets No. 51 & 52.

Longitudinal slab dimensions are measured horizontally.

For Section Thru Slab and Slab Pouring Sequence, see Sheet No. 51.

For Details and Reinforcement of Barriers not shown, see Sheets No. 56, 57, & 60.

For Theoretical Slab Haunching Diagram and Theoretical Bottom of Slab Elevations, see Sheets No. 47 & 48.

For details and locations of slab drains, see Sheet No. 49.

PLAN OF SLAB SHOWING TOP REINFORCEMENT

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked CBW MAY 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_53_Slab Plan Top 2.dgn 12:20:03 AM Eastern 16-JUL-2026

STATE OF MISSOURI MARTIN ALAN CHORKEY NUMBER PE-2013006488 REGISTERED ENGINEER
7-17-26

DATE PREPARED 16-JUL-2026
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. BR04-53
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

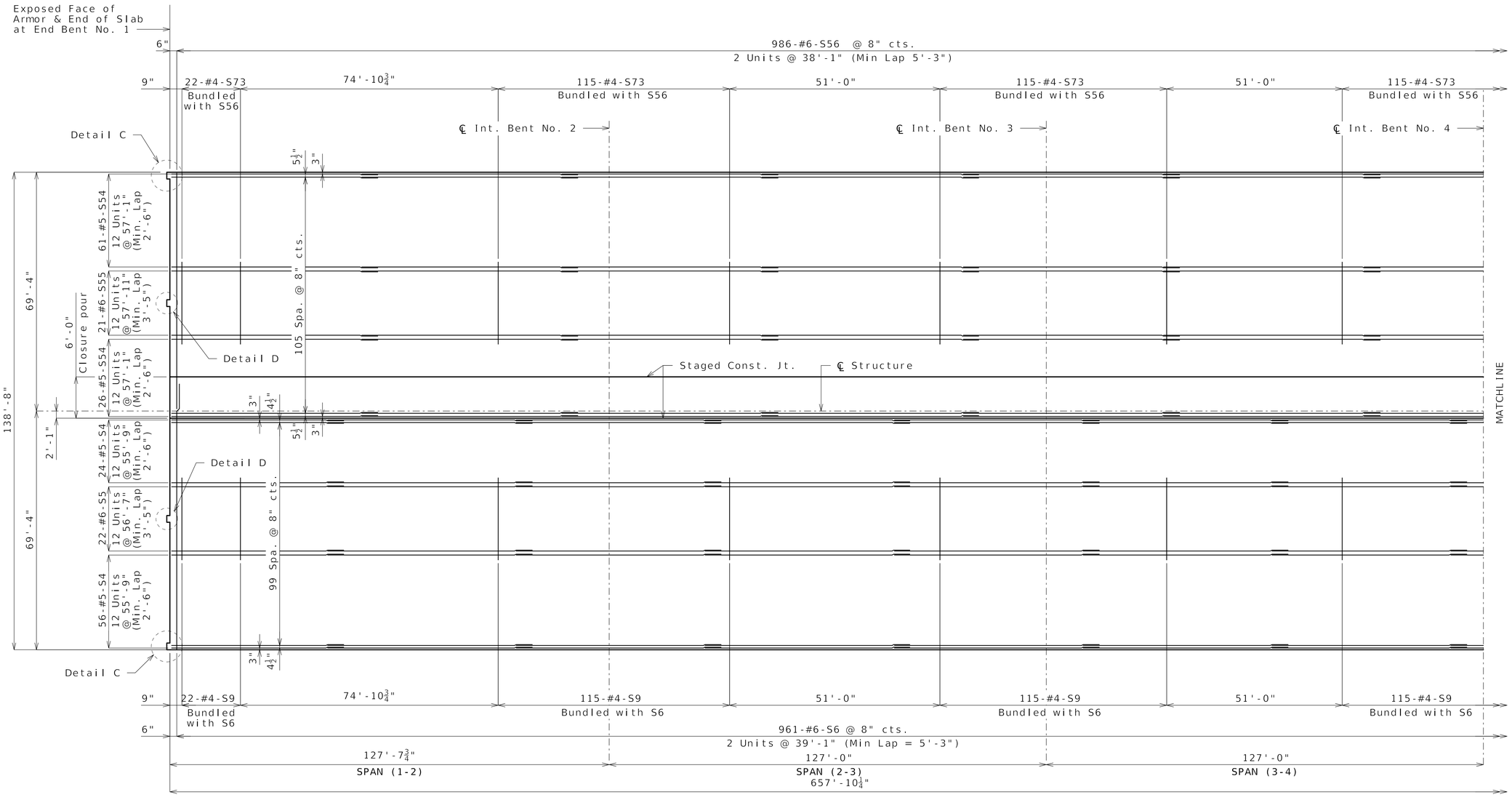
HORNER SHIFRIN
THE POWER OF INTEGRATED SOLUTIONS
401 S. 18th St., Ste. 400
St. Louis, MO 63103-2709
314-531-1420 FAX: 314-531-2666
www.HornerShifrin.com

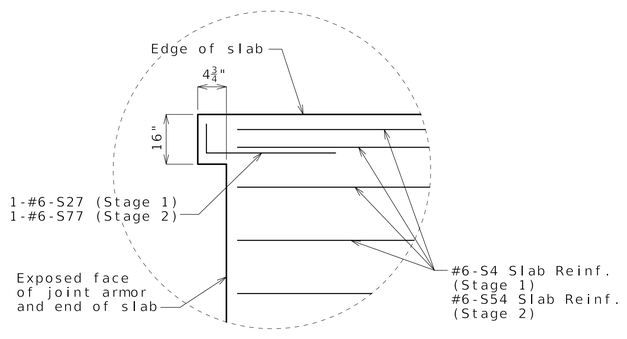
EMERY SAPP & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

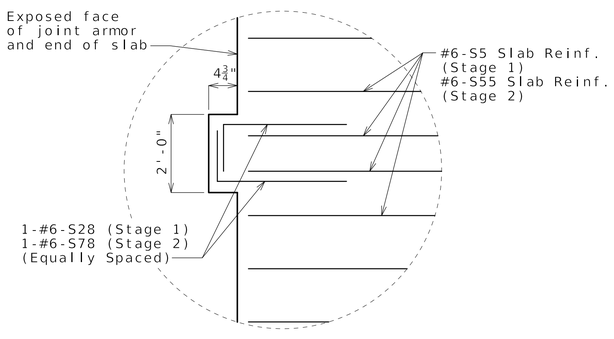
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

REV: RevDesc





DETAIL C



DETAIL D

Notes:

Work this sheet with Sheets No. 51 & 55.

Longitudinal slab dimensions are measured horizontally.

For Section Thru Slab and Slab Pouring Sequence, see Sheet No. 51.

For Details and Reinforcement of Barriers not shown, see Sheets No. 56, 57 & 60.

For Theoretical Slab Haunching Diagram and Theoretical Bottom of Slab Elevations, see Sheets No. 47 & 48.

For details and locations of slab drains, see Sheet No. 49.

PLAN OF SLAB SHOWING BOTTOM REINFORCEMENT

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked CBW MAY 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
PE-2013006488
REGISTERED PROFESSIONAL ENGINEER
7-17-2026

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-54

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

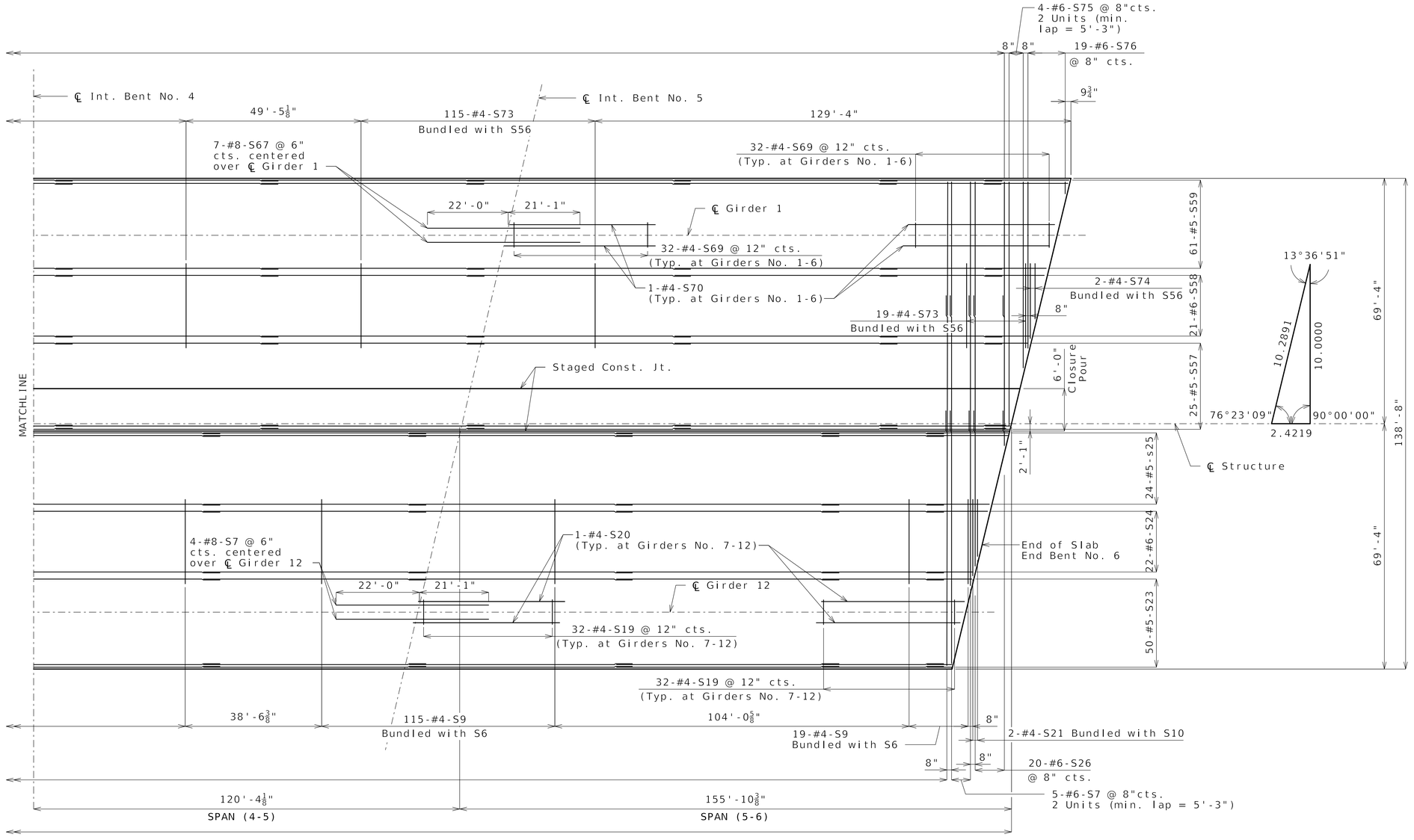
IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
THE POWER OF INTEGRATION
401 S. 18th St., Ste. 100
ST. LOUIS, MO 63103
314-531-4321 FAX: 314-531-5866
www.hornershifrin.com

EMERY SAPP & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc



Notes:

Work this sheet with Sheets No. 51 & 54.

Longitudinal slab dimensions are measured horizontally.

For Section Thru Slab and Slab Pouring Sequence, see Sheets No. 51.

For Details and Reinforcement of Barrier not shown, see Sheets No. 56, 57 & 60.

For Theoretical Slab Haunching Diagram and Theoretical Bottom of Slab Elevations, see Sheets No. 47 & 48.

For details and locations of slab drains, see Sheet No. 49.

PLAN OF SLAB SHOWING BOTTOM REINFORCEMENT

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked CBW MAY 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
REGISTERED PROFESSIONAL ENGINEER
7-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-55

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

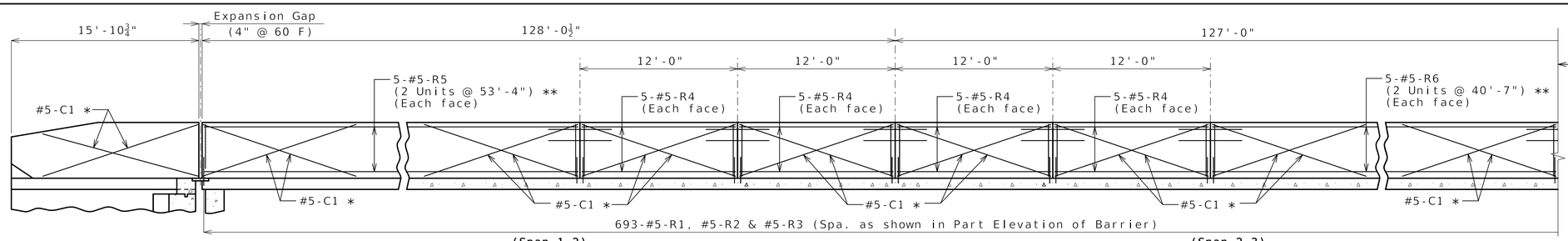
IMPROVE I-70 ROCHEPORT TO COLUMBIA

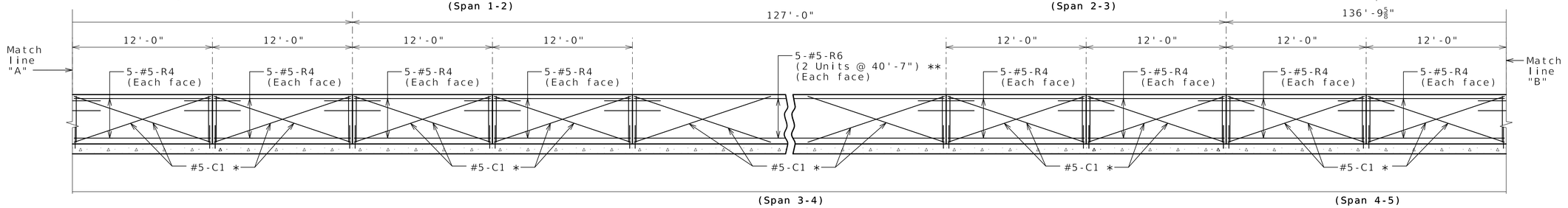
HORNER SHIFRIN
THE POWER OF COLLABORATION
801 E. 18th St., Ste. 400
St. Louis, MO 63106-2506
314-531-1321 FAX: 314-531-4966
www.HornerShifrin.com

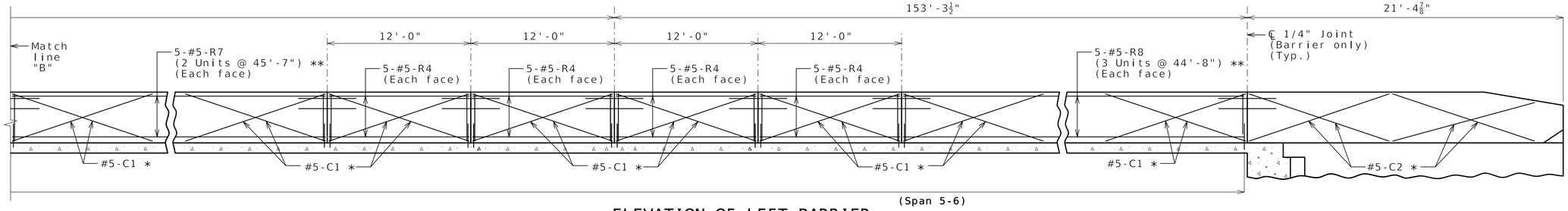
EMERY SAPPS SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

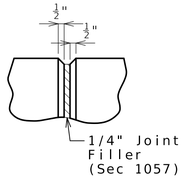




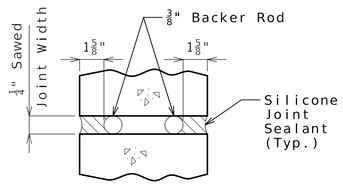


ELEVATION OF LEFT BARRIER

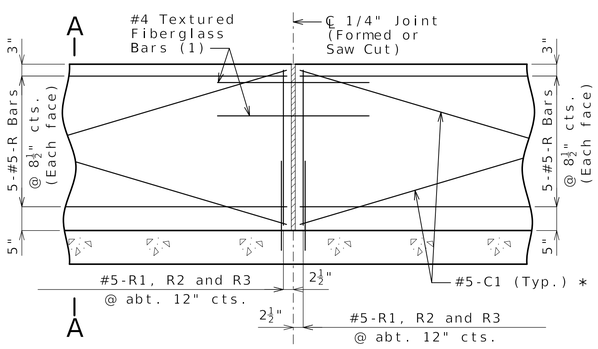
** 2'-6" Min. Lap Splice (Typ.)



PART ELEVATION AT FORMED JOINT

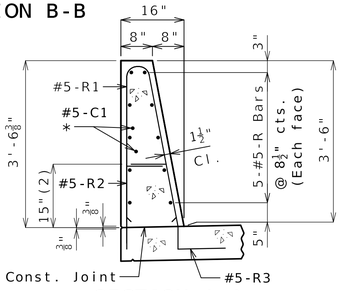


SECTION B-B



PART ELEVATION OF BARRIER

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

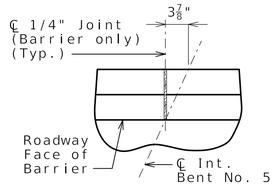


SECTION A-A

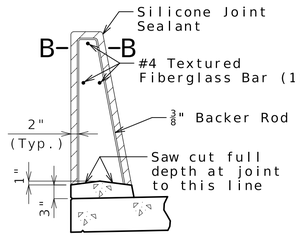
Use a minimum lap of 2'-6" for #5 horizontal barrier bars.

The cross-sectional area above the slab is 3.52 square feet.

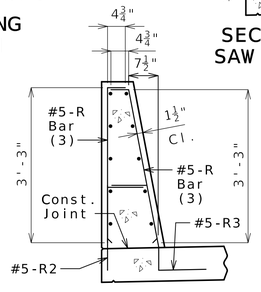
(2) To top of bar



PART PLAN SHOWING JOINT LOCATION



SECTION THRU SAW CUT JOINT



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.)

General Notes:

Longitudinal dimensions are horizontal.

* 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.

Concrete in barrier shall be Class B-1.

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.

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.

For details of finger plate expansion joint see Sheet No. 50.

LEFT TYPE D BARRIER

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked SBH MAY 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
7-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-56

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

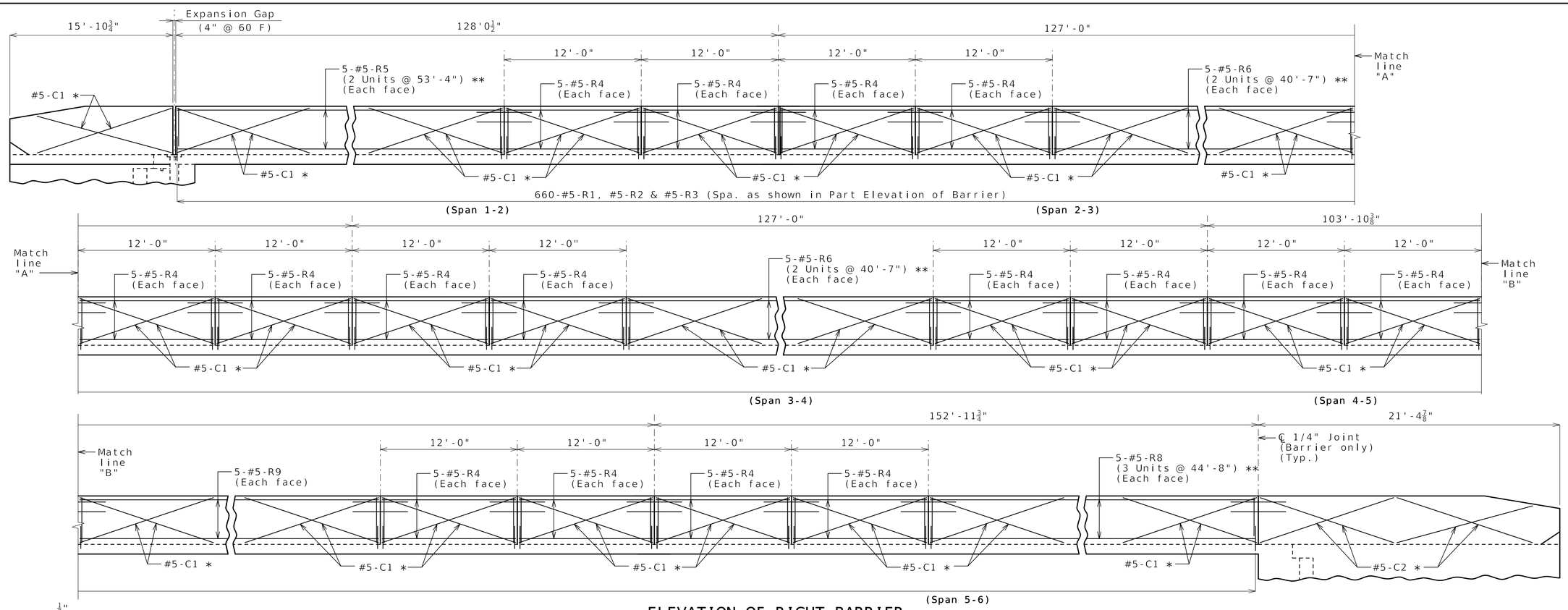
IMPROVE I-70 ROCHEPORT TO COLUMBIA

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

HORNER SHIFRIN
THE HORNER & SHIFRIN GROUP
801 S. 18th St., Ste. 400
St. Louis, MO 63103
314-231-1021 FAX: 314-231-4986
www.hornershifrin.com

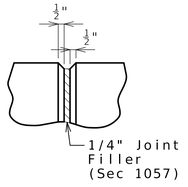
EMERY SAPP& SONS, INC

REV. RevDesc •

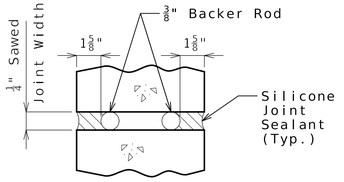


ELEVATION OF RIGHT BARRIER

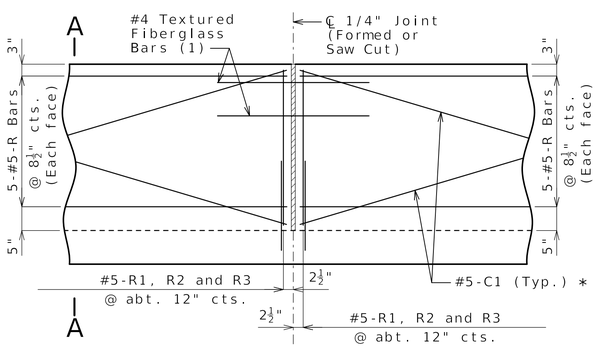
** 2'-6" Min. Lap Splice (Typ.)



PART ELEVATION AT FORMED JOINT

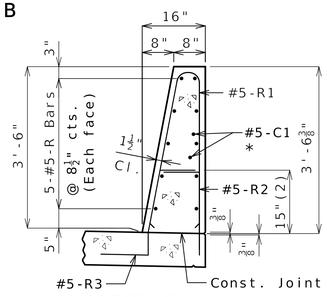


SECTION B-B



PART ELEVATION OF BARRIER

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

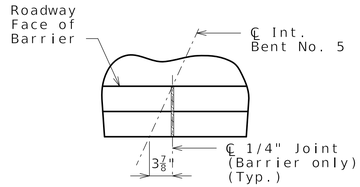


SECTION A-A

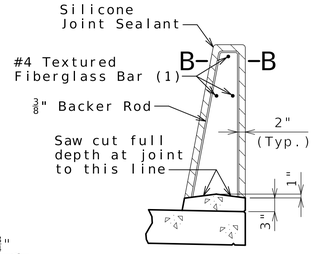
Use a minimum lap of 2'-6" for #5 horizontal barrier bars.

The cross-sectional area above the slab is 3.52 square feet.

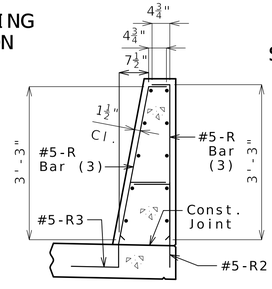
(2) To top of bar



PART PLAN SHOWING JOINT LOCATION



SECTION THRU SAW CUT JOINT



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.)

General Notes:

Longitudinal dimensions are horizontal.

* 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.

Concrete in barrier shall be Class B-1.

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.

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.

For details of finger plate expansion joint see Sheet No. 50.

RIGHT TYPE D BARRIER

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked SBH MAY 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
7-17-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-57
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

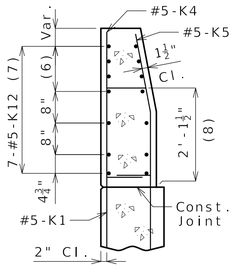
IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
THE HORNER & SHIFRIN GROUP OF COMPANIES
801 S. 18th St., Ste. 400
St. Louis, MO 63103-2908
314-531-1021 FAX: 314-531-0966
www.hornershifrin.com

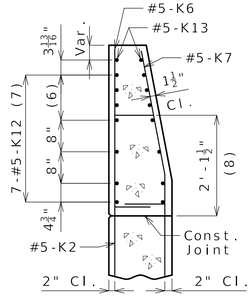
EMERY SAPP& SONS, INC
GREENVILLE, MISSOURI

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

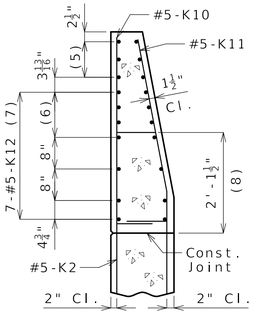
REV. RevDesc



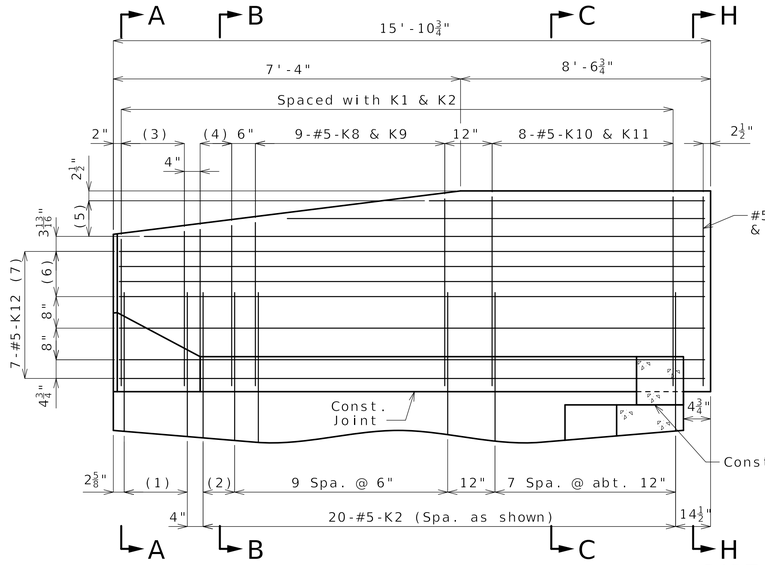
SECTION A-A



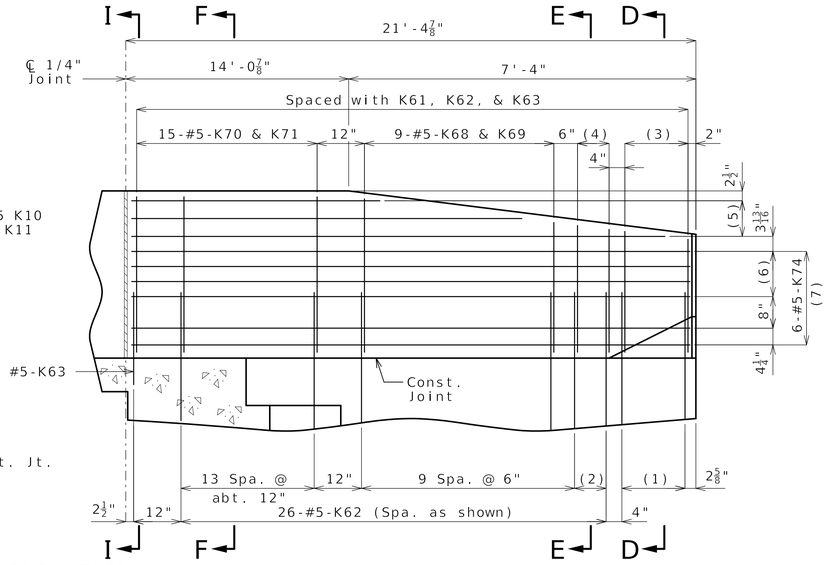
SECTION B-B

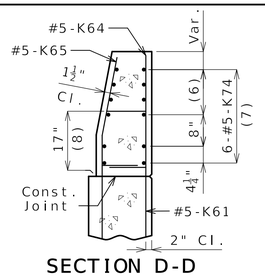


SECTION C-C

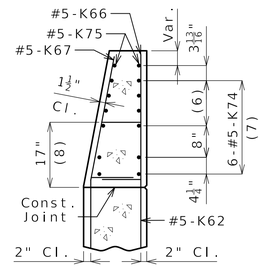


PART ELEVATION

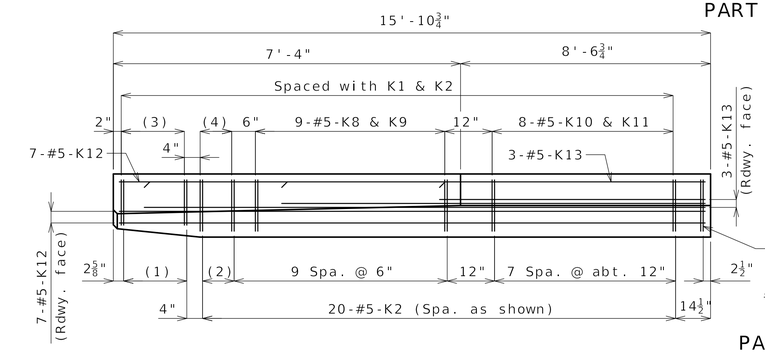




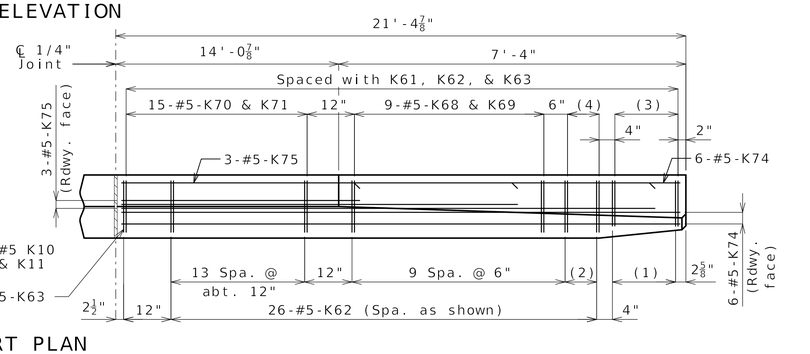
SECTION D-D

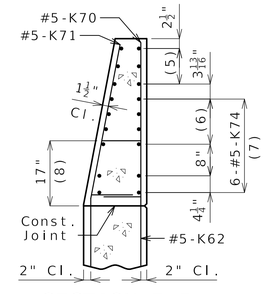


SECTION E-E



PART PLAN





SECTION F-F

Table of Variables		
Variable	Bent No. 1	Bent No. 6
"A"	$8\frac{7}{8}$"	$0\frac{3}{8}$"
"B"	4'-$2\frac{5}{8}$"	3'-$6\frac{3}{8}$"
"C"	3'-$3\frac{5}{8}$"	2'-$7\frac{3}{8}$"
"D"	$19\frac{7}{8}$"	$11\frac{3}{8}$"
"E"	3'-$11\frac{1}{2}$"	3'-3"
"F"	$8\frac{1}{2}$"	0"

(1) 5-#5-K1 @ 4" cts.(Bent No. 1)
5-#5-K61 @ 4" cts. (Bent No. 6)

(2) 2 spaces @ 4"

(3) 5-#5-K4 & K5 (Bent No. 1)
5-#5-K64 & K65 (Bent No. 6)

(4) 3-#5-K6 & K7 (Bent No. 1)
3-#5-K66 & K67 (Bent No. 6)

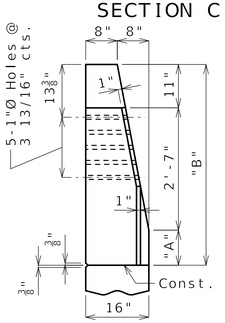
(5) 3-#5-K13 @ 4½" cts.,
each face (Bent No. 1)

3-#5-K75 @ 4½" cts.,
each face (Bent No. 6)

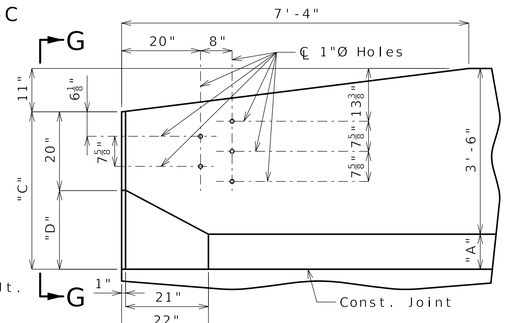
(6) 3 Spaces @ $3\frac{13}{16}$"

(7) Spaced as shown, each face

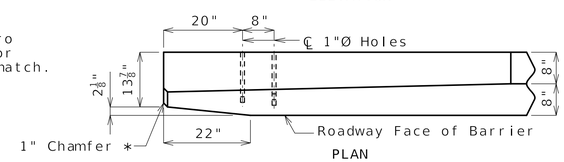
(8) To top of bar



ELEVATION G-G



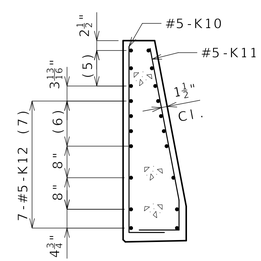
ELEVATION



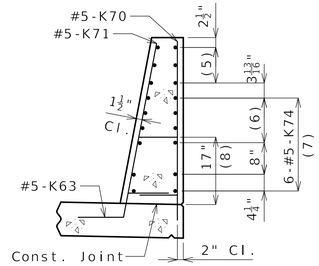
PLAN

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

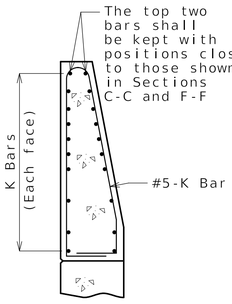
DETAILS OF GUARD RAIL ATTACHMENT

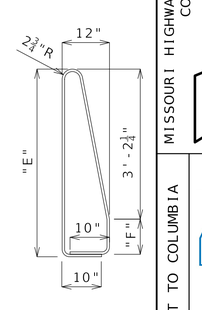


SECTION H-H



SECTION I-I





K10-K11 & K70-K71 BAR PERMISSIBLE ALTERNATE SHAPE

(Other K bars not shown for clarity)

The K10-K11 & K70-K71 bar combination may be furnished as one bar as shown, at the contractor's option.

All dimensions are out to out.

General Notes:

Reinforcing Steel:

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.

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

LEFT TYPE D BARRIER AT END BENTS

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked TPL MAR 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
PE-2013006488
12-17-25

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-58
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

MoDOT

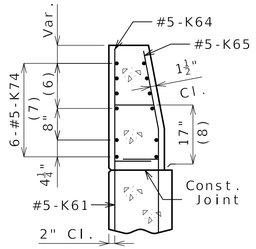
IMPROVE I-70 ROCHEPORT TO COLUMBIA

EMERY SAPPS SONS, INC

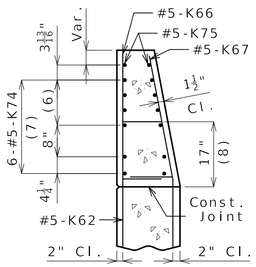
HORNER SHIFRIN
THE POWER OF INTEGRATION
401 S. 18th St., Ste. 400
St. Louis, MO 63103
314-531-4321 FAX 314-531-4986
www.hornershifrin.com

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

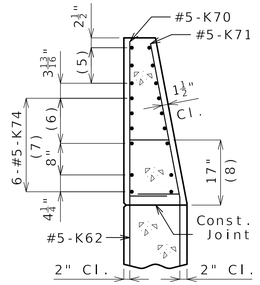
REV. RevDesc



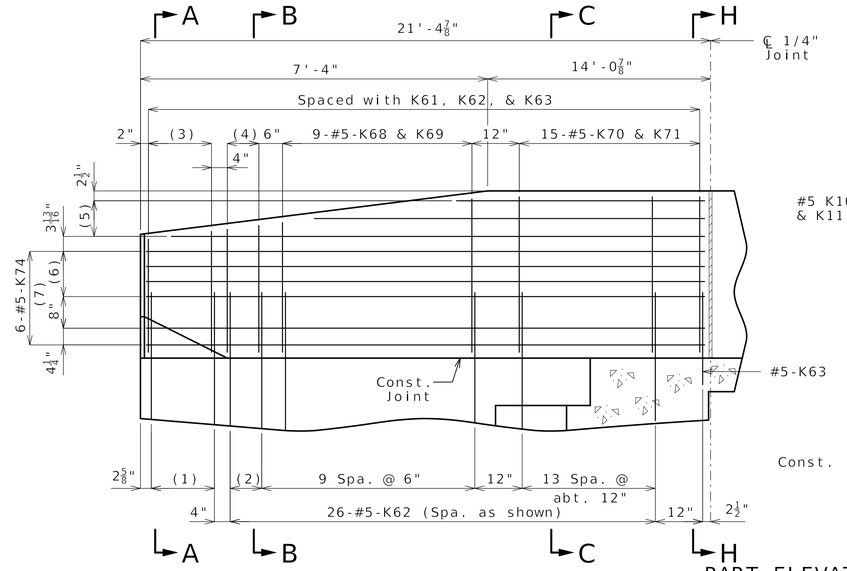
SECTION A-A

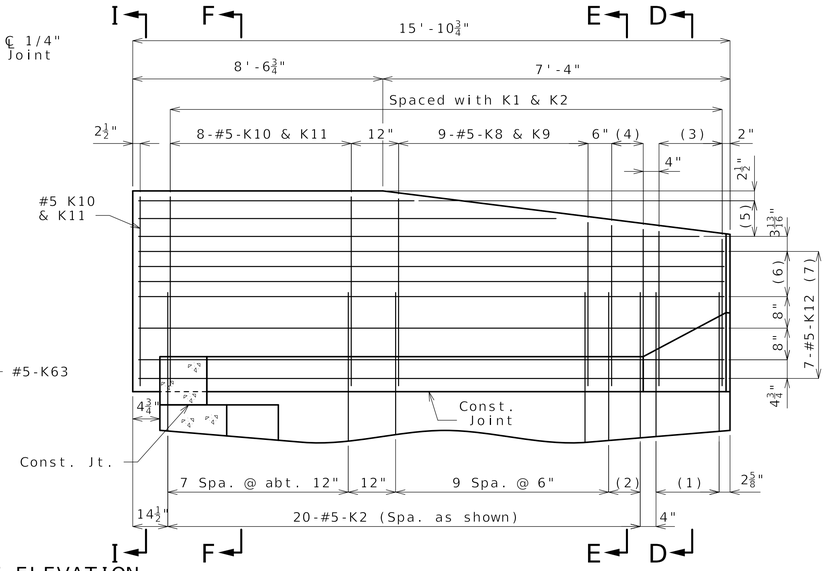


SECTION B-B

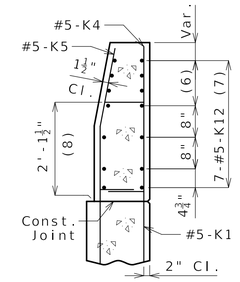


SECTION C-C

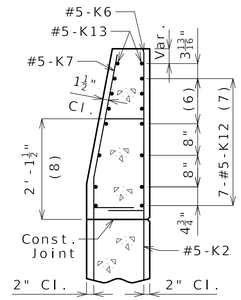




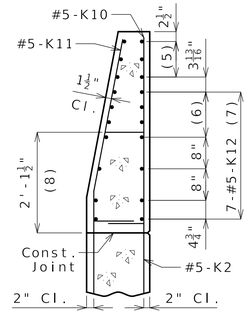
PART ELEVATION



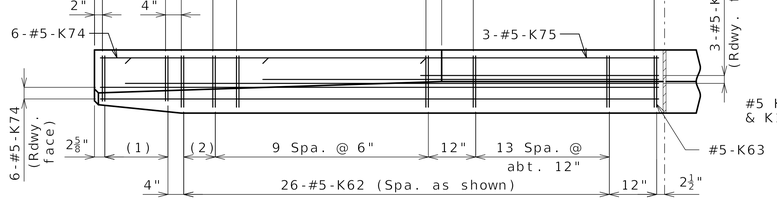
SECTION D-D

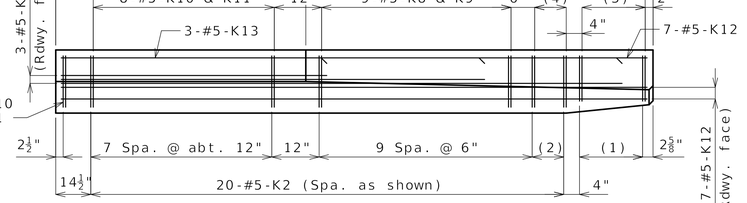


SECTION E-E



SECTION F-F





PART PLAN

Table of Variables		
Variable	Bent No. 1	Bent No. 6
"A"	$8\frac{6}{8}$"	$0\frac{3}{8}$"
"B"	4'-$2\frac{6}{8}$"	3'-$6\frac{3}{8}$"
"C"	3'-$3\frac{6}{8}$"	2'-$7\frac{3}{8}$"
"D"	$19\frac{6}{8}$"	$11\frac{3}{8}$"
"E"	3'-$11\frac{1}{2}$"	3'-3"
"F"	$8\frac{1}{2}$"	0"

(1) 5-#5-K1 @ 4" cts.(Bent No. 1)
5-#5-K61 @ 4" cts. (Bent No. 6)

(2) 2 spaces @ 4"

(3) 5-#5-K4 & K5 (Bent No. 1)
5-#5-K64 & K65 (Bent No. 6)

(4) 3-#5-K6 & K7 (Bent No. 1)
3-#5-K66 & K67 (Bent No. 6)

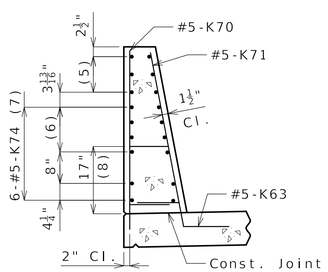
(5) 3-#5-K13 @ 4½" cts.,
each face (Bent No. 1)

3-#5-K75 @ 4½" cts.,
each face (Bent No. 6)

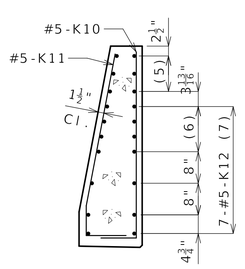
(6) 3 Spaces @ $3\frac{13}{16}$"

(7) Spaced as shown, each face

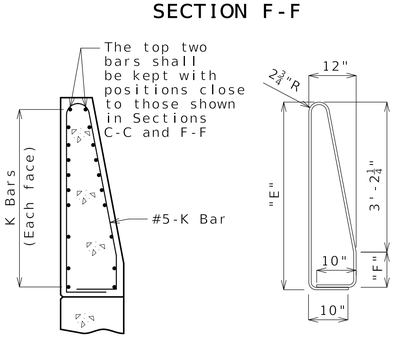
(8) To top of bar



SECTION H-H



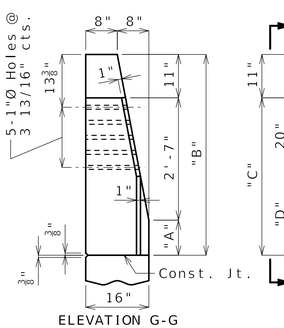
SECTION I-I



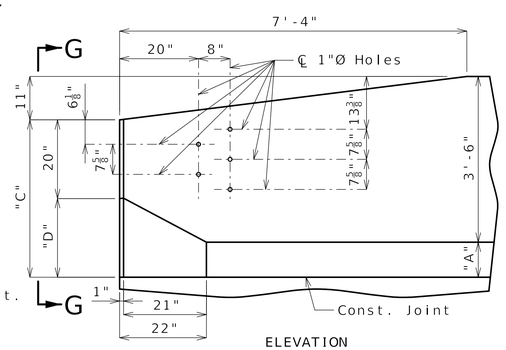
K10-K11 & K70-K71 BAR
PERMISSIBLE ALTERNATE SHAPE
(Other K bars not shown for clarity)

The K10-K11 & K70-K71 bar combination may be furnished as one bar as shown, at the contractor's option.

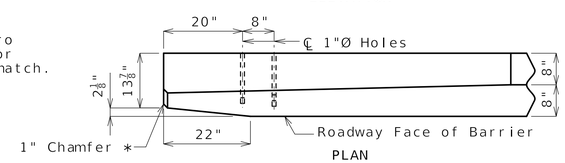
All dimensions are out to out.



ELEVATION G-G



ELEVATION



PLAN

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

DETAILS OF GUARD RAIL ATTACHMENT

General Notes:

Reinforcing Steel:

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.

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

RIGHT TYPE D BARRIER AT END BENTS

Designed CMR MAY 2026
Detailed SLF MAY 2026
Checked TPL MAY 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI
MARTIN ALAN CHORKEY
PE-2013006488
7-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-59

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

IMPROVE I-70 ROCHEPORT TO COLUMBIA

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

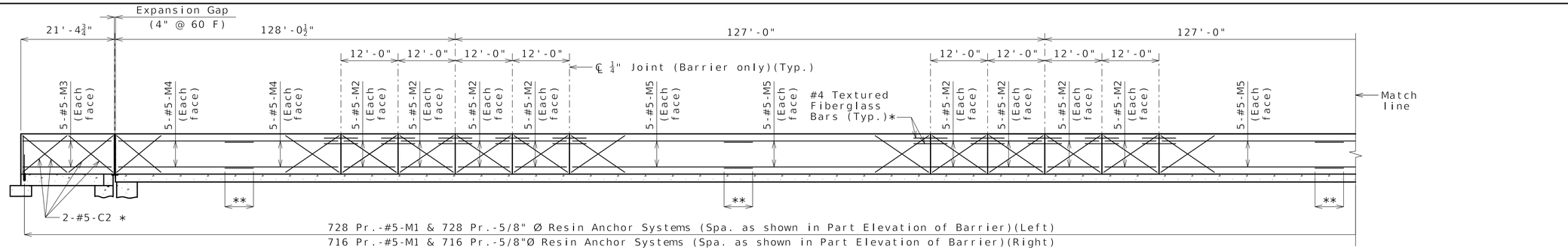
HORNER SHIFRIN
THE POWER OF SHIFT THINKING
401 S. 18th St., Ste. 400
ST. LOUIS, MISSOURI 63103
314-531-4321 FAX 314-531-6866
www.hornershifrin.com

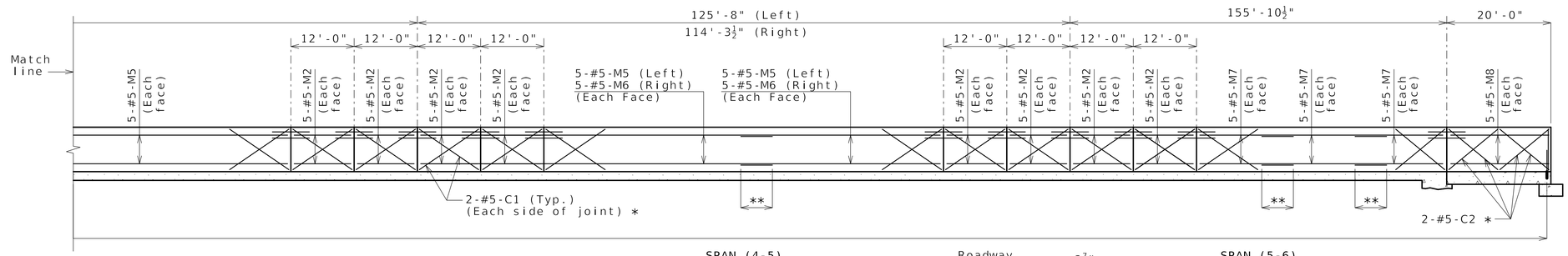
EMERY SAPP & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

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

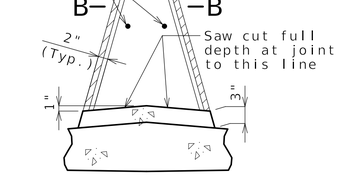
REV. RevDesc



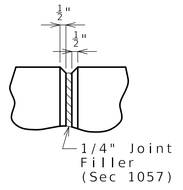


ELEVATION OF BARRIER

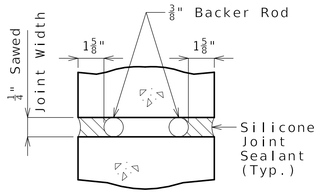
Longitudinal dimensions are horizontal.
** 2'-6" Min. Lap Splice (Typ.)



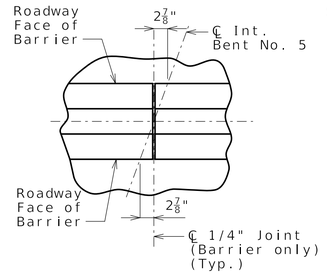
SECTION THRU SAW CUT JOINT



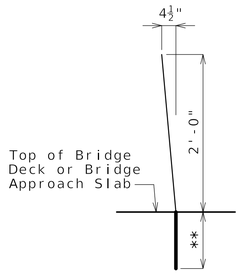
PART ELEVATION AT FORMED JOINT



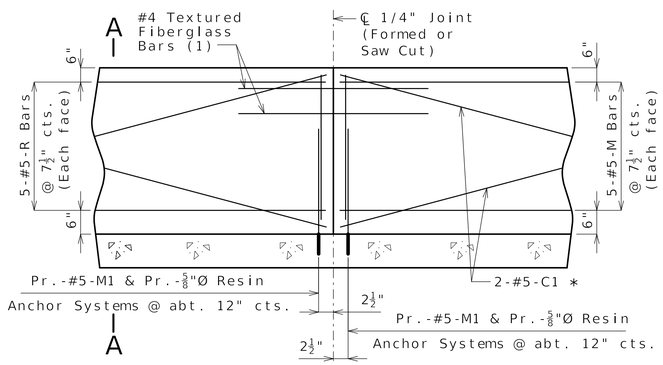
SECTION B-B



PART PLAN SHOWING JOINT LOCATION

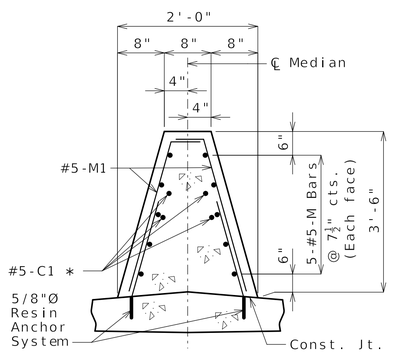


RESIN ANCHOR SYSTEM
(2888 required)
** Manufacturer's embedment length (5" minimum)



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 4.65 square feet.

General Notes:

* 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 with barrier joints 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.

Concrete in the barrier shall be Class B-1.

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 shall have retroreflective sheeting on both sides.

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.

The contractor shall use one of the qualified resin anchor systems in accordance with 1039.

The minimum embedment depth in concrete with f'c = 4,000 psi for the resin anchor system shall be that required to meet the minimum ultimate pullout strength in accordance with Sec 1039 but shall not be less than 5 inches.

An epoxy coated #5 Grade 60 reinforcing bar shall be substituted for the 5/8-inch diameter threaded rod.

TYPE C BARRIER

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked SBH MAY 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_60_Type C Barrier.dgn 12:19:59 AM Eastern 16-JUL-2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
PE-2013006488
DATE 7-17-26

DATE PREPARED
16-JUL-2026
ROUTE I-70
STATE MO
DISTRICT BR
SHEET NO. BR04-60
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV | DATE | DESCRIPTION
0 | 071726 | RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

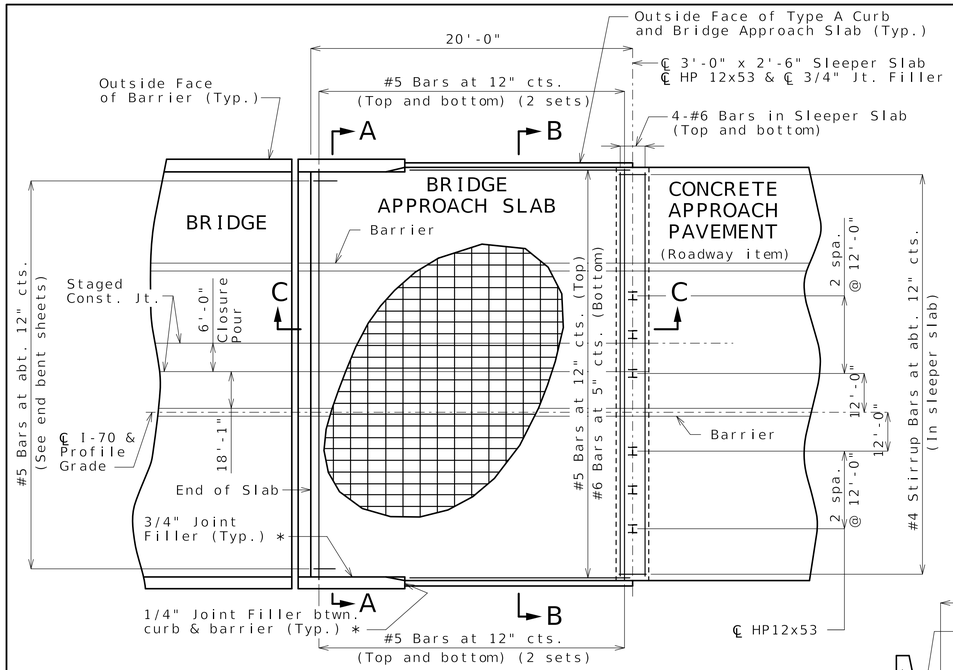
IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
7911 FORSYTH BLVD., SUITE 300, CLAYTON, MISSOURI 63105
401 S. 18th St., Ste. 400, St. Louis, MO 63103
314-621-6101 FAX: 314-621-6866
www.HornerShifrin.com

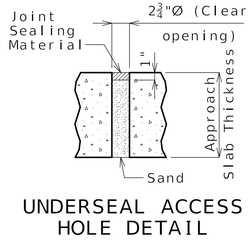
EMERY SAPP & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

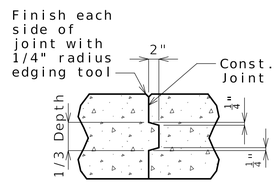


PART PLAN SHOWING REINFORCEMENT



UNDERSEAL ACCESS HOLE DETAIL

(If required)



CONSTRUCTION JOINT DETAIL

General Notes:

All concrete for the bridge approach slab and sleeper slab shall be in accordance with Sec 503 (f'c = 4,000 psi).

The reinforcing steel in the bridge approach slab and the sleeper slab shall be epoxy coated Grade 60 with fy = 60,000 psi.

Drain pipe may be either 6" diameter corrugated metallic-coated pipe underdrain, 4" diameter corrugated polyvinyl chloride (PVC) drain pipe, or 4" diameter corrugated polyethylene (PE) drain pipe.

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

The reinforcing steel in the bridge approach slab and the sleeper slab shall be continuous. The transverse reinforcing steel may be made continuous by providing a minimum lap splice of 24 inches for #5 bars and 40 inches for #6 bars, or by mechanical bar splice.

Mechanical bar splices shall be in accordance with Sec 710. (Estimated 48 splices)

All joint filler shall be in accordance with Sec 1057 for preformed fiber expansion joint filler except as noted.

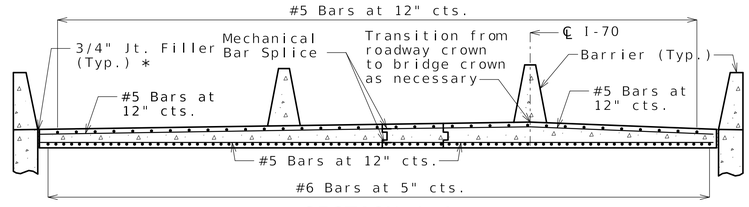
The contractor shall pour and satisfactorily finish the bridge slab before placing the bridge approach slab.

Longitudinal construction joints in approach slab and sleeper slab shall be aligned with longitudinal construction joints in bridge slab.

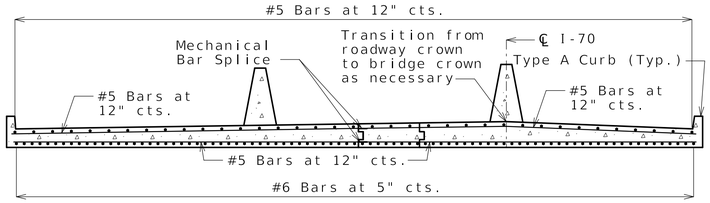
For concrete approach pavement details, see roadway plans.

See Missouri Standard Plan 609.00 for details of Type A curb.

* Seal joint between vertical face of approach slab and wing with sealant in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.

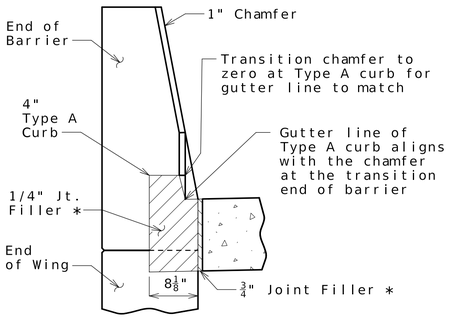


SECTION A-A

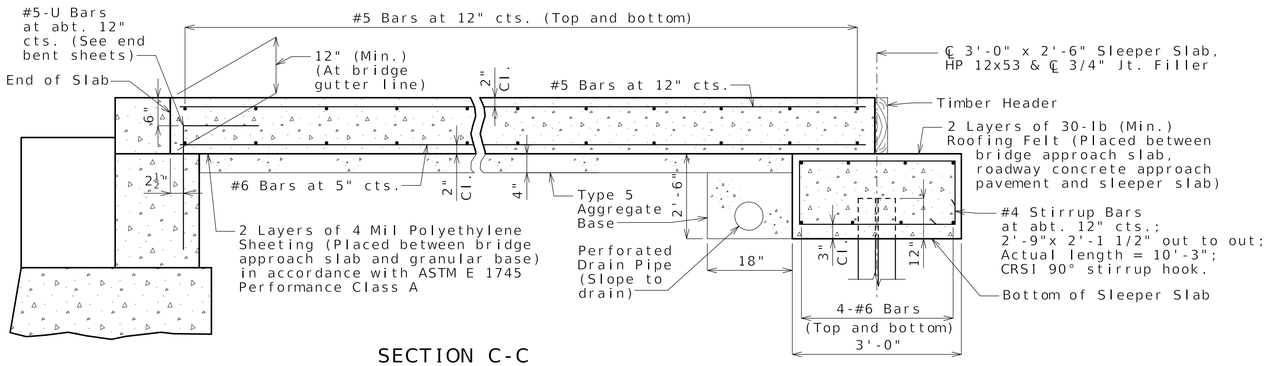


SECTION B-B

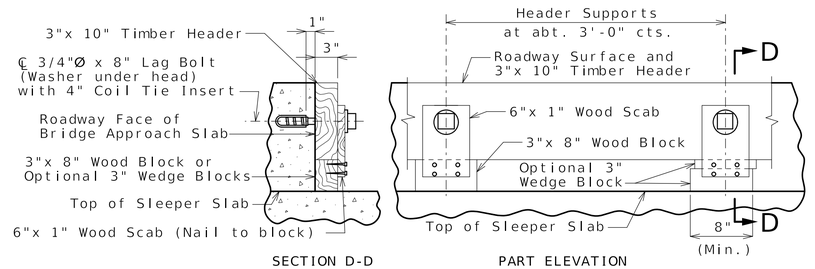
With the approval of the engineer, the contractor may crown the bottom of the approach slab to match the crown of the roadway surface.



SECTION BETWEEN CURB AND BARRIER



SECTION C-C



SECTION D-D PART ELEVATION

DETAILS OF TIMBER HEADER

Remove timber header when concrete pavement is placed.

BRIDGE APPROACH SLAB (MAJOR) AT END BENT NO. 1

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked SBH JUN 2026

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 61 of 78

STATE OF MISSOURI MARTIN ALAN CHORKEY NUMBER PE-2013006488 PROFESSIONAL ENGINEER
Martin Chorkey 7-17-26

DATE PREPARED 16-JUL-2026
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. BR04-61
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

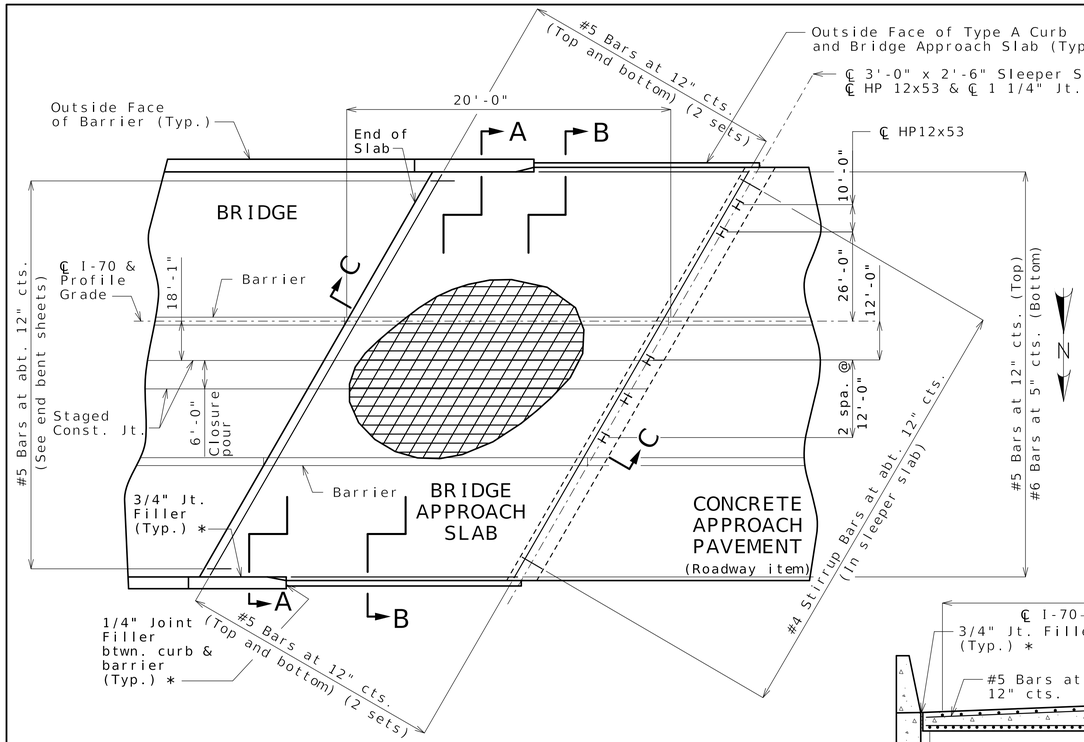
HORNER SHIFRIN
THE PROFESSIONAL ASSOCIATION
401 S. 18th St. Ste. 400
St. Louis, MO 63103
314-531-1420 FAX: 314-531-0966
www.hornershifrin.com

EMERY SAPP & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

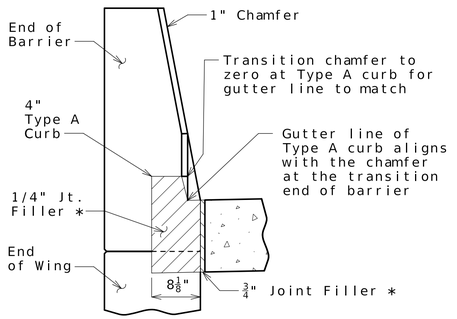
REV: RevDesc

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

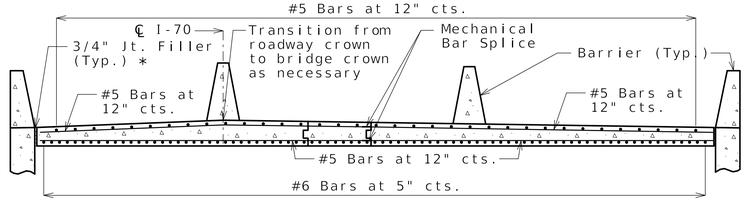


PART PLAN SHOWING REINFORCEMENT

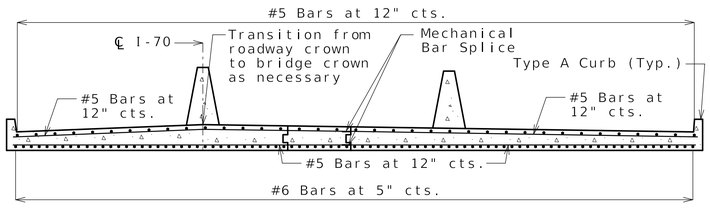
Longitudinal reinforcement in sleeper slab not shown for clarity.



SECTION BETWEEN CURB AND BARRIER

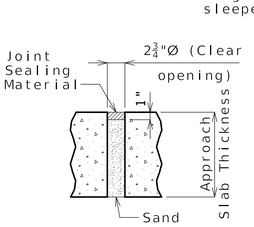


SECTION A-A



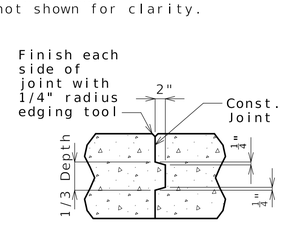
SECTION B-B

With the approval of the engineer, the contractor may crown the bottom of the approach slab to match the crown of the roadway surface.

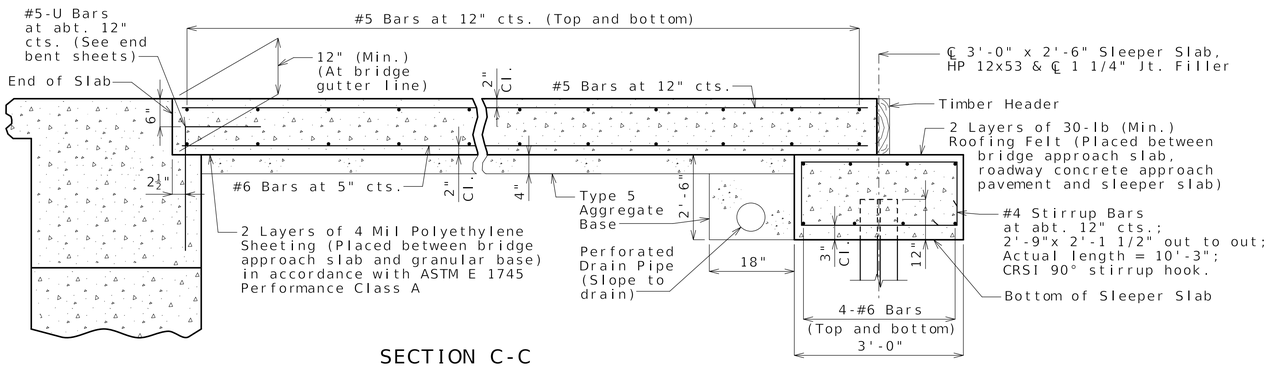


UNDERSEAL ACCESS HOLE DETAIL

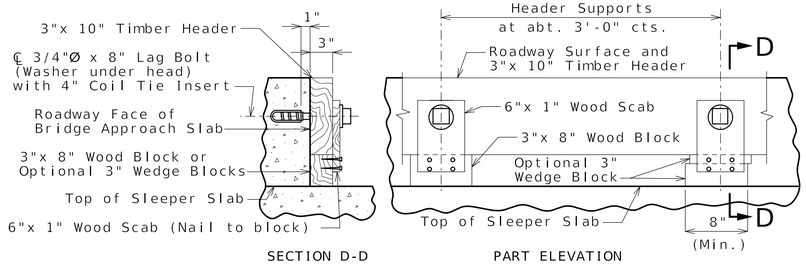
(If required)



CONSTRUCTION JOINT DETAIL



SECTION C-C



SECTION D-D PART ELEVATION

DETAILS OF TIMBER HEADER

Remove timber header when concrete pavement is placed.

BRIDGE APPROACH SLAB (MAJOR) AT END BENT NO. 6

General Notes:

All concrete for the bridge approach slab and sleeper slab shall be in accordance with Sec 503 (f'c = 4,000 psi).

The reinforcing steel in the bridge approach slab and the sleeper slab shall be epoxy coated Grade 60 with fy = 60,000 psi.

Drain pipe may be either 6" diameter corrugated metallic-coated pipe underdrain, 4" diameter corrugated polyvinyl chloride (PVC) drain pipe, or 4" diameter corrugated polyethylene (PE) drain pipe.

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

The reinforcing steel in the bridge approach slab and the sleeper slab shall be continuous. The transverse reinforcing steel may be made continuous by providing a minimum lap splice of 24 inches for #5 bars and 40 inches for #6 bars, or by mechanical bar splice.

Mechanical bar splices shall be in accordance with Sec 710. (Estimated 48 splices)

All joint filler shall be in accordance with Sec 1057 for preformed fiber expansion joint filler except as noted.

The contractor shall pour and satisfactorily finish the bridge slab before placing the bridge approach slab.

Longitudinal construction joints in approach slab and sleeper slab shall be aligned with longitudinal construction joints in bridge slab.

For concrete approach pavement details, see roadway plans.

See Missouri Standard Plan 609.00 for details of Type A curb.

* Seal joint between vertical face of approach slab and wing with sealant in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked SBH JUN 2026

Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI — MARTIN ALAN CHORKEY — PE-2013006488 — 7-17-26

DATE PREPARED 16-JUL-2026
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. BR04-62
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

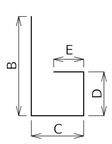
IMPROVE I-70 ROCHEPORT TO COLUMBIA

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

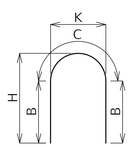
HORNER SHIFRIN — THE POWER OF BEING UNDERSTOOD — 401 S. 18th St., Ste. 400, St. Louis, MO 63103, 314-531-4321 FAX 314-531-4866, www.hornershifrin.com

EMERY SAPPE SONS, INC

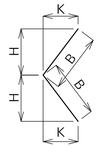
REV. RevDesc



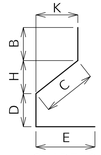
SHAPE 6
or 6S



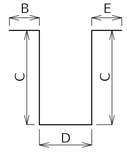
SHAPE 7



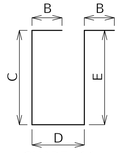
SHAPE 8
or 8S



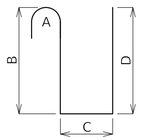
SHAPE 9
or 9S



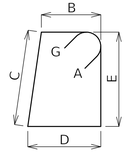
SHAPE 10
or 10S



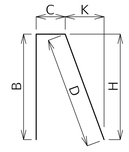
SHAPE 11
or 11S



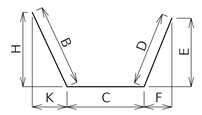
SHAPE 12



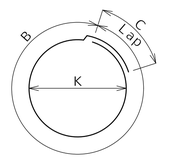
SHAPE 13S



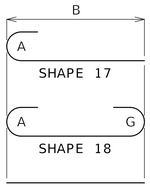
SHAPE 14
or 14S



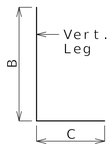
SHAPE 15
or 15S



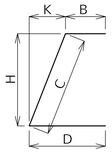
SHAPE 16



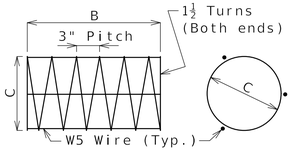
SHAPE 17
SHAPE 18
SHAPE 20



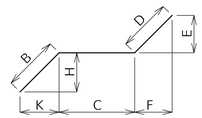
SHAPE 19
or 19S



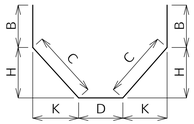
SHAPE 21
or 21S



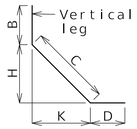
SHAPE 22



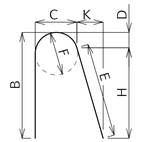
SHAPE 23
or 23S



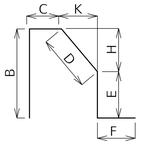
SHAPE 24
or 24S



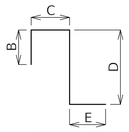
SHAPE 25
or 25S



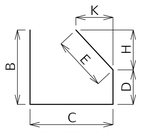
SHAPE 26



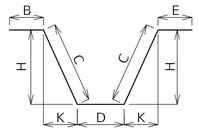
SHAPE 27S



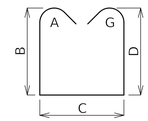
SHAPE 28
or 28S



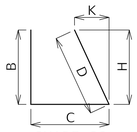
SHAPE 29
or 29S



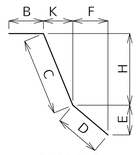
SHAPE 30
or 30S



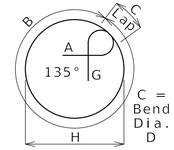
SHAPE 31S



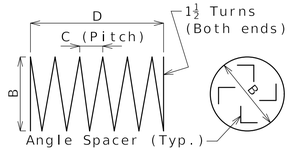
SHAPE 32
or 32S



SHAPE 33
or 33S



SHAPE 34S



SHAPE 35 (1)

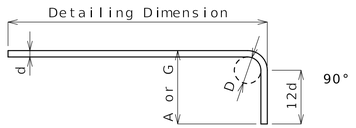


SHAPE 36

Finished Bend Diameters D and Hook Dimensions

Standard Pin Bend Shapes

Size	Case	D	A or G		J
			90°	180°	180°
#4	1	3"	8"	6"	4"
#5	1	3¾"	10"	7"	5"
#6	1	4½"	12"	8¼"	6"
#7	2	5¼"	14"	9¾"	7"
	3	7"	15"	11½"	8¾"
#8	2	6"	16"	11"	8"
	3	8"	17"	13¼"	10"
#9	1	9½"	19½"	15½"	11¾"
#10	1	10¾"	22"	17½"	13¼"
#11	1	12"	24½"	19½"	14⅞"
#14	1	18¼"	31¼"	27½"	21⅜"
#18	1	24"	41½"	36¼"	28½"

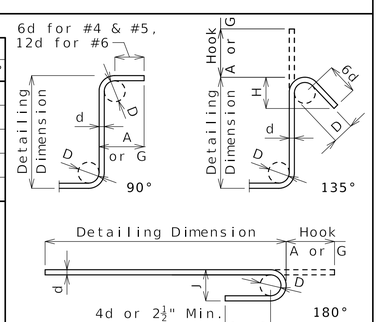


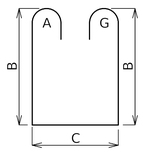
Stirrup Pin Bend Shapes (S)

Size	Case	D	A or G			H	J
			90°	135°	180°	135°	180°
#4	2	2"	4½"	4½"	5"	2⅝"	3"
	3	3"	5"	5¼"	6"	3"	4"
#5	2	2½"	5¾"	5¾"	5¾"	3⅝"	3¾"
	3	3¾"	6¼"	6½"	7"	3⅞"	5"
#6	1	4½"	12"	7¾"	8¼"	4⅝"	6"

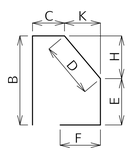
Applicable for all grades of steel.

Case 1 applies to all reinforcement. Case 2 applies to all reinforcement except for galvanized bars. Case 3 applies to galvanized bars only.





SHAPE 37S



SHAPE 38S

BENDING DIAGRAMS

All dimensions are out to out.

Shapes ending with an S shall be bent in accordance with stirrup pin bend shapes.

Unless otherwise noted, finished bending diameter D is the same for all bends of a shape.

(1) Shall be a deformed or plain spiral bar or wire.

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.

Notes for Bar Lists:

Nominal lengths are based on out to out dimensions shown in bending diagrams and are listed to the nearest inch for fabricator's use. Actual lengths are measured along centerline bar to the nearest inch. Weights are based on actual lengths.

Reinforcing steel (ASTM A615 Grade 60) fy = 60,000 psi

Codes: C = Required coatings, where E = Epoxy Coated and G = Galvanized.

SH = Required shape, see bending diagrams.

V = Sets of varied bars and number of bars of each length. Bar dimensions vary in equal increments between dimensions shown on this line and the following line and the actual length dimension shown on this line and the following line vary by the specified increment.

BENDING DIAGRAMS

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked SBH JUN 2026

Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_63_Bending Diagram.dgn 12:20:44 AM Eastern 16-JUL-2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
07-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO
DISTRICT	SHEET NO.
BR	BR04-63

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
EMERY SAPP & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
		SUBSTRUCTURE													
		INT. BENT NO. 2													
		PHASE 1													
6	6 H200	BEAM		17		34 10.000							35 6	35 6	320
10	6 H201	BEAM		18		9 6.000							10 11	10 11	164
28	4 H202	BEAM		20		34 3.000							34 3	34 3	641
5	6 H203	BEAM		10S			1 0.000	3 7.500					5 8	5 4	40
6	6 H204	BEAM		17		26 8.000							27 4	27 4	246
6	6 H205	BEAM		20		26 8.000							26 8	26 8	240
6	6 H206	BEAM		20		20 11.000							20 11	20 11	189
2	6 H207	BEAM		17		5 0.000							5 8	5 8	17
2	4 H208	BEAM		20		19 10.000							19 10	19 10	26
6	6 H209	BEAM		20		34 10.000							34 10	34 10	314
60	4 P200	CIP PILE		34S							1 7.500		5 10	5 9	230
14	5 U200	BEAM		13S		3 9.000	4 8.250	3 9.000	4 8.250				17 10	17 6	256
20	5 U201	BEAM		13S		3 9.000	4 2.750	3 9.000	4 2.750				16 11	16 7	346
21	5 U202	BEAM		13S		3 9.000	3 9.000	3 9.000	3 9.000				16 0	15 8	343
10	5 U203	BEAM		10S			4 8.250	3 9.000					13 2	12 11	135
10	5 U204	BEAM		10S			4 2.750	3 9.000					12 3	12 0	125
10	5 U205	BEAM		10S			3 9.000	3 9.000					11 3	11 0	115
72	6 V200	CIP PILE		17		7 3.000							7 11	7 11	856
24	W5 W200	ANCHOR WELL		22		2 1.000	0 9.000						33 1	32 4	132
		PHASE 2													
6	6 H250	BEAM		17		35 9.000							36 5	36 5	328
10	6 H251	BEAM		18		9 6.000							10 11	10 11	164
28	4 H252	BEAM		20		35 5.000							35 5	35 5	662
6	6 H253	BEAM		10S			1 0.000	3 7.500					5 8	5 4	48
6	6 H254	BEAM		17		26 8.000							27 4	27 4	246
6	6 H255	BEAM		20		39 9.000							39 9	39 9	358
6	6 H256	BEAM		20		8 9.000							8 9	8 9	79
2	6 H257	BEAM		17		6 8.000							7 4	7 4	22
2	4 H258	BEAM		20		39 5.000							39 5	39 5	53
6	6 H259	BEAM		20		35 9.000							35 9	35 9	322
60	4 P250	CIP PILE		34S							1 7.500		5 10	5 9	230
30	5 U250	BEAM		13S		3 9.000	5 1.250	3 9.000	5 1.250				18 8	18 4	574
21	5 U251	BEAM		13S		3 9.000	4 7.500	3 9.000	4 7.500				17 9	17 5	381
10	5 U252	BEAM		10S			4 7.500	3 9.000					13 0	12 9	133
15	5 U253	BEAM		10S			5 1.250	3 9.000					14 0	13 9	215
5	5 U254	BEAM		10S			5 4.750	3 9.000					14 7	14 4	75
2	5 U255	BEAM		13S		3 9.000	5 4.750	3 9.000	5 4.750				19 3	18 11	39
6	5 U256	BEAM		13S		3 9.000	4 11.000	3 9.000	4 11.000				18 4	18 0	113
72	6 V250	CIP PILE		17		7 3.000							7 11	7 11	856
24	W5 W250	ANCHOR WELL		22		2 1.000	0 9.000						33 1	32 4	132
		INT. BENT NO. 3													
		PHASE 1													
6	6 H300	BEAM CAP		17		34 10.000							35 6	35 6	320
10	6 H301	BEAM CAP		18		9 6.000							10 11	10 11	164
28	4 H302	BEAM CAP		20		34 3.000							34 3	34 3	641
5	6 H303	BEAM CAP		10S			1 0.000	3 7.500					5 8	5 4	40
6	6 H304	BEAM CAP		17		26 8.000							27 4	27 4	246
6	6 H305	BEAM CAP		20		26 8.000							26 8	26 8	240
6	6 H306	BEAM CAP		20		20 11.000							20 11	20 11	189
2	6 H307	BEAM CAP		17		5 0.000							5 8	5 8	17
2	4 H308	BEAM CAP		20		19 10.000							19 10	19 10	26
6	6 H309	BEAM CAP		20		34 10.000							34 10	34 10	314
60	4 P300	CIP PILE		34S							1 7.500		5 10	5 9	230
14	5 U300	BEAM CAP		13S		3 9.000	4 8.250	3 9.000	4 8.250				17 10	17 6	256
20	5 U301	BEAM CAP		13S		3 9.000	4 2.750	3 9.000	4 2.750				16 11	16 7	346
21	5 U302	BEAM CAP		13S		3 9.000	3 9.000	3 9.000	3 9.000				16 0	15 8	343
10	5 U303	BEAM CAP		10S			4 8.250	3 9.000					13 2	12 11	135
10	5 U304	BEAM CAP		10S			4 2.750	3 9.000					12 3	12 0	125
10	5 U305	BEAM CAP		10S			3 9.000	3 9.000					11 3	11 0	115

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
72	6 V300	CIP PILE		17		7 3.000							7 11	7 11	856
24	W5 W300	ANCHOR WELL		22		2 1.000	0 9.000						33 1	32 4	132
		PHASE 2													
6	6 H350	BEAM CAP		17		35 9.000							36 5	36 5	328
10	6 H351	BEAM CAP		18		9 6.000							10 11	10 11	164
28	4 H352	BEAM CAP		20		35 5.000							35 5	35 5	662
6	6 H353	BEAM CAP		10S			1 0.000	3 7.500					5 8	5 4	48
6	6 H354	BEAM CAP		17		26 8.000							27 4	27 4	246
6	6 H355	BEAM CAP		20		39 9.000							39 9	39 9	358
6	6 H356	BEAM CAP		20		8 9.000							8 9	8 9	79
2	6 H357	BEAM CAP		17		6 8.000							7 4	7 4	22
2	4 H358	BEAM CAP		20		39 5.000							39 5	39 5	53
6	6 H359	BEAM CAP		20		35 9.000							35 9	35 9	322
60	4 P350	CIP PILE		34S							1 7.500		5 10	5 9	230
30	5 U350	BEAM CAP		13S		3 9.000	5 1.250	3 9.000	5 1.250				18 8	18 4	574
21	5 U351	BEAM CAP		13S		3 9.000	4 7.500	3 9.000	4 7.500				17 9	17 5	381
10	5 U352	BEAM CAP		10S			4 7.500	3 9.000					13 0	12 9	133
15	5 U353	BEAM CAP		10S			5 1.250	3 9.000					14 0	13 9	215
5	5 U354	BEAM CAP		10S			5 4.750	3 9.000					14 7	14 4	75
2	5 U355	BEAM CAP		13S		3 9.000	5 4.750	3 9.000	5 4.750				19 3	18 11	39
6	5 U356	BEAM CAP		13S		3 9.000	4 11.000	3 9.000	4 11.000				18 4	18 0	113
72	6 V350	CIP PILE		17		7 3.000							7 11	7 11	856
24	W5 W350	ANCHOR WELL		22		2 1.000	0 9.000						33 1	32 4	132
		INT. BENT NO. 4													
		PHASE 1													
42	6 D400	DOWELS		20		2 3.000							2 3	2 3	142
6	6 H400	BEAM CAP		17		34 10.000							35 6	35 6	320
10	6 H401	BEAM CAP		18		9 6.000							10 11	10 11	164
28	4 H402	BEAM CAP		20		34 3.000							34 3	34 3	641
5	6 H403	BEAM CAP		10S			1 0.000	3 7.500					5 8	5 4	40
6	6 H404	BEAM CAP		17		26 8.000							27 4	27 4	246
6	6 H405	BEAM CAP		20		26 8.000							26 8	26 8	240
6	6 H406	BEAM CAP		20		20 11.000							20 11	20 11	189
2	6 H407	BEAM CAP		17		5 0.000							5 8	5 8	17
2	4 H408	BEAM CAP		20		19 10.000							19 10	19 10	26
6	6 H409	BEAM CAP		20		34 10.000							34 10	34 10	314
60	4 P400	CIP PILE		34S							1 7.500		5 10	5 9	230
14	5 U400	BEAM CAP		13S		3 9.000	4 8.250	3 9.000	4 8.250				17 10	17 6	256
20	5 U401	BEAM CAP		13S		3 9.000	4 2.750	3 9.000	4 2.750				16 11	16 7	346
21	5 U402	BEAM CAP		13S		3 9.000	3 9.000	3 9.000	3 9.000				16 0	15 8	343
10	5 U403	BEAM CAP		10S			4 8.250	3 9.000					13 2	12 11	135
10	5 U404	BEAM CAP		10S			4 2.750	3 9.000					12 3	12 0	125
10	5 U405	BEAM CAP		10S			3 9.000	3 9.000					11 3	11 0	115
72	6 V400	CIP PILE		17		7 3.000							7 11	7 11	856
		PHASE 2													
42	6 D450	DOWELS		20		2 3.000							2 3	2 3	142
6	6 H450	BEAM CAP		17		35 9.000							36 5	36 5	328
10	6 H451	BEAM CAP		18		9 6.000							10 11	10 11	164
28	4 H452	BEAM CAP		20		35 5.000							35 5	35 5	662
6	6 H453	BEAM CAP		10S			1 0.000	3 7.500					5 8	5 4	48
6	6 H454	BEAM CAP		17		26 8.000							27 4	27 4	246
6	6 H455	BEAM CAP		20		39 9.000							39 9	39 9	358
6	6 H456	BEAM CAP		20		8 9.000							8 9	8 9	79
2	6 H457	BEAM CAP		17		6 8.000							7 4	7 4	22
2	4 H458	BEAM CAP		20		39 5.000							39 5	39 5	53
9	9 H459	BEAM CAP		20		35 9.000							35 9	35 9	1094
60	4 P450	CIP PILE		34S							1 7.500		5 10	5 9	230
30	5 U450	BEAM CAP		13S		3 9.000	5 1.250	3 9.000	5 1.250				18 8	18 4	574
21	5 U451	BEAM CAP		13S		3 9.000	4 7.500	3 9.000	4 7.500				17 9	17 5	381
10	5 U452	BEAM CAP		10S			4 7.500	3 9.000					13 0	12 9	133
15	5 U453	BEAM CAP		10S			5 1.250	3 9.000					14 0	13 9	215
5	5 U454	BEAM CAP		10S			5 4.750	3 9.000					14 7	14 4	75

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked MAC FEB 2026

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 64 of 78

BILL OF REINFORCING STEEL

STATE OF MISSOURI
MARTIN ALAN CHORKEY
PE-2013006488
17-2026

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-64
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

EMERY SAPP & SONS, INC

HORNER SHIFRIN
HORNER & SHIFRIN, INC.
THE PEOPLE WHO MAKE IT HAPPEN
401 S. 18th St., Ste. 400
ST. LOUIS, MISSOURI 63103
314-531-1420 FAX: 314-531-0966
www.HornerShifrin.com

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

B_JST0017_A9819_64_Barbill tables 1.dgn 12:18:47 AM Eastern 16-JUL-2026

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
2	5 U455	BEAM CAP		13S		3 9.000	5 4.750	3 9.000	5 4.750				19 3	18 11	39
6	5 U456	BEAM CAP		13S		3 9.000	4 11.250	3 9.000	4 11.250				18 4	18 0	113
72	6 V450	CIP PILE		17		7 3.000							7 11	7 11	856
		INT. BENT NO. 5													
		PHASE 1													
35	6 D500	SHEAR KEY		20		2 3.000							2 3	2 3	118
20	10 H500	BEAM		20		38 0.000							38 0	38 0	3270
28	6 H501	BEAM		20		36 8.000							36 8	36 8	1542
10	10 H502	BEAM		17		17 8.000							19 2	19 2	825
10	10 H503	BEAM		20		17 8.000							17 8	17 8	760
20	10 H504	BEAM		20		17 8.000							17 8	17 8	1520
10	10 H505	BEAM		20		17 8.000							17 8	17 8	760
10	10 H506	BEAM		20		12 3.000							12 3	12 3	527
9	6 H507	BEAM		10S			1 0.000	4 7.000					6 7	6 3	84
25	6 H508	BEAM STEP		20		15 0.000							15 0	15 0	563
5	6 H509	BEAM STEP		20		9 8.000							9 8	9 8	73
2	6 H510	BEAM STEP		20		43 6.000							43 6	43 6	131
28	4 P500	COLUMN		16S			2 0.000					3 3.000	12 3	12 1	226
204	4 P501	DRILLED SHAFT		16S			2 0.000					3 0.000	11 5	11 4	1544
16	6 U500	BEAM		10S			5 6.750	3 2.000					14 4	14 0	336
34	6 U501	BEAM		13S		3 2.000	5 6.750	3 2.000	5 6.750				18 9	18 3	932
38	6 U502	BEAM		13S		3 2.000	5 10.000	3 2.000	5 10.000				19 4	18 10	1075
10	6 U503	BEAM		10S			5 10.000	3 2.000					14 10	14 6	218
6	6 U504	BEAM		10S			6 1.000	3 2.000					15 4	15 0	135
68	4 U505	BEAM STEP		10S			1 4.000	2 0.750					4 9	4 7	208
20	6 U506	BEAM		13S		3 2.000	6 1.000	3 2.000	6 1.000				19 10	19 4	581
42	6 U507	BEAM		13S		3 2.000	5 3.750	3 2.000	5 3.750				18 3	17 9	1120
6	6 U508	BEAM		10S			5 3.750	3 2.000					13 10	13 6	122
10	6 U509	BEAM		10S			5 0.500	3 2.000					13 3	12 11	194
38	6 U510	BEAM		13S		3 2.000	5 0.500	3 2.000	5 0.500				17 9	17 3	985
16	6 U511	BEAM		10S			4 9.000	3 2.000					12 8	12 4	296
34	6 U512	BEAM		13S		3 2.000	4 9.000	3 2.000	4 9.000				17 2	16 8	851
72	8 V500	COLUMN		17		15 5.000							16 4	16 4	3140
52	10 V501	DRILLED SHAFT		20		49 2.000							49 2	49 2	11001
		PHASE 2													
40	6 D550	SHEAR KEY		20		2 3.000							2 3	2 3	135
20	10 H550	BEAM		20		38 0.000							38 0	38 0	3270
28	6 H551	BEAM		20		37 3.000							37 3	37 3	1567
10	10 H552	BEAM		17		17 8.000							19 2	19 2	825
10	10 H553	BEAM		20		17 8.000							17 8	17 8	760
2	6 H554	BEAM		20		56 11.000							56 11	56 11	171
10	10 H555	BEAM		20		41 7.000							41 7	41 7	1789
10	10 H556	BEAM		20		10 11.000							10 11	10 11	470
9	6 H557	BEAM		10S			1 0.000	4 7.000					6 7	6 3	84
5	6 H558	BEAM STEP		20		27 2.000							27 2	27 2	204
5	6 H559	BEAM STEP		20		41 7.000							41 7	41 7	312
5	6 H560	BEAM STEP		20		8 4.000							8 4	8 4	63
10	10 H561	BEAM		20		5 1.250							5 1	5 1	219
28	4 P550	COLUMN		16S			2 0.000					3 3.000	12 3	12 1	226
204	4 P551	DRILLED SHAFT		16S			2 0.000					3 0.000	11 5	11 4	1544
62	6 U550	BEAM		13S		3 2.000	6 1.000	3 2.000	6 1.000				19 10	19 4	1800
10	6 U551	BEAM		10S			6 1.000	3 2.000					15 4	15 0	225
32	6 U552	BEAM		13S		3 2.000	5 10.500	3 2.000	5 10.500				19 5	18 11	909
6	6 U553	BEAM		10S			6 4.250	3 2.000					15 11	15 7	140
16	6 U554	BEAM		10S			5 10.500	3 2.000					14 11	14 7	350
73	4 U555	BEAM STEP		10S			1 4.000	2 0.750					4 9	4 7	224
34	6 U556	BEAM		13S		3 2.000	6 6.750	3 2.000	6 6.750				20 9	20 3	1034
74	6 U557	BEAM		13S		3 2.000	6 4.250	3 2.000	6 4.250				20 4	19 10	2204
16	6 U558	BEAM		10S			6 6.750	3 2.000					16 4	16 0	385
16	6 U559	BEAM		10S			6 4.250	3 2.000					15 11	15 7	374
20	6 U560	BEAM		13S		3 2.000	6 7.250	3 2.000	6 7.250				20 10	20 4	611
72	8 V550	COLUMN		17		15 5.000							16 4	16 4	3140
52	10 V551	DRILLED SHAFT		20		49 2.000							49 2	49 2	11001

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
		END BENT 1													
		STAGE 1													
9	6 F100	WING BRACE	E	15		1 7.750	5 3.750	1 7.750	1 2.000	1 2.000	1 2.000	1 2.000	8 7	8 7	116
16	7 H100	BEAM	E	20		37 6.000							37 6	37 6	1226
8	6 H101	BEAM	E	20		37 1.000							37 1	37 1	446
5	7 H102	BEAM	E	14		5 3.500	1 10.750	7 2.125			5 10.250	4 1.750	14 4	14 2	145
8	7 H103	BEAM	E	20		29 10.000							29 10	29 10	488
8	7 H104	BEAM	E	20		29 10.000							29 10	29 10	488
8	7 H105	BEAM	E	20		22 4.000							22 4	22 4	365
2	6 H106	BEAM	E	20		44 4.000							44 4	44 4	133
40	6 H107	BACKWALL	E	20		37 2.000							37 2	37 2	2233
14	4 H108	CURTAIN WALL	E	20		5 11.000							5 11	5 11	55
10	6 H109	BACKWALL	E	20		35 8.000							35 8	35 8	536
18	6 H110	WING	E	20		15 2.000							15 2	15 2	410
8	8 H111	WING	E	20		15 2.000							15 2	15 2	324
16	5 U100	BEAM	E	14S		2 6.000	3 0.000	2 6.375			2 6.000	0 5.000	8 0	7 10	131
16	5 U101	BEAM	E	14S		2 11.500	3 0.000	2 11.875			2 11.500	0 5.000	8 11	8 9	146
12	5 U102	BEAM	E	14S		3 5.250	3 0.000	3 5.500			3 5.250	0 5.000	9 11	9 9	122
88	5 U103	BEAM	E	13S		3 0.000	2 6.375	3 5.000	2 6.000				12 5	12 1	1109
80	5 U104	BEAM	E	13S		3 0.000	2 11.875	3 5.000	2 11.500				13 4	13 0	1085
60	5 U105	BEAM	E	13S		3 0.000	3 5.500	3 5.000	3 5.250				14 3	13 11	871
99	5 U106	BACKWALL	E	10S			4 9.000	0 9.000					10 3	10 0	1033
66	5 U107	APPR SLAB	E	19S		2 0.000	1 3.000						3 3	3 2	218
2	6 V100	BEAM	E	20		2 8.000							2 8	2 8	8
8	4 V101	CURTAIN WALL	E	20		7 8.000							7 8	7 8	41
38	6 V102	WING	E	20		5 11.000							5 11	5 11	338
8	6 V103	WING	E	20		8 11.000							8 11	8 11	107
198	6 V104	BACKWALL	E	20		8 10.000							8 10	8 10	2627
12	W5 W100	BEAM	E	22		1 6.000	0 9.000						25 9	25 2	51
		STAGE 2													
10	6 F150	WING BRACE	E	15		1 7.750	5 3.750	1 7.750	1 2.000	1 2.000	1 2.000	1 2.000	8 7	8 7	129
16	7 H150	BEAM	E	20		37 7.000							37 7	37 7	1229
12	6 H151	BEAM	E	20		37 4.000							37 4	37 4	673
8	7 H152	BEAM	E	14		5 3.500	1 10.750	7 2.125			5 10.250	4 1.750	14 4	14 2	232
8	7 H153	BEAM	E	20		40 1.000							40 1	40 1	655
2	6 H154	BEAM	E	20		42 0.000							42 0	42 0	126
8	7 H155	BEAM	E	20		32 11.000							32 11	32 11	538
14	4 H156	CURTAIN WALL	E	20		5 11.000							5 11	5 11	55
40	6 H157	BACKWALL	E	20		37 5.000							37 5	37 5	2248
10	6 H158	BACKWALL	E	20		36 9.000							36 9	36 9	552
18	6 H159	WING	E	20		15 2.000							15 2	15 2	410
8	8 H160	WING	E	20		15 2.000							15 2	15 2	324
8	7 H161	BEAM	E	20		10 1.000							10 1	10 1	165
2	5 U150	BEAM	E	14S		3 8.000	3 0.000	3 8.250			3 8.000	0 5.000	10 4	10 2	21
6	5 U151	BEAM	E	14S		3 11.000	3 0.000	3 11.250			3 11.000	0 5.000	10 10	10 8	67
4	5 U152	BEAM	E	14S		4 1.750	3 0.000	4 2.000			4 1.750	0 5.000	11 4	11 1	46
16	5 U153	BEAM	E	14S		3 10.000	3 0.000	3 10.250			3 10.000	0 5.000	10 8	10 6	175
16	5 U154	BEAM	E	14S		3 4.500	3 0.000	3 4.750			3 4.500	0 5.000	9 9	9 7	160
22	5 U155	BEAM	E	13S		3 0.000	3 8.250	3 5.000	3 8.000				14 9	14 5	331
42	5 U156	BEAM	E	13S		3 0.000	3 11.250	3 5.000	3 11.000				15 3	14 11	653
14	5 U157	BEAM	E	13S		3 0.000	4 2.000	3 5.000	4 1.750				15 8	15 4	224
80	5 U158	BEAM	E	13S		3 0.000	3 10.250	3 5.000	3 10.000				15 1	14 9	1231
88	5 U159	BEAM	E	13S		3 0.000	3 4.750	3 5.000	3 4.500				14 2	13 10	1270
105	5 U160	BACKWALL	E	10S			4 9.000	0 9.000					10 3	10 0	1095
70	5 U161	APPR SLAB	E	19S		2 0.000	1 3.000						3 3	3 2	231
8	4 V150	CURTAIN WALL	E	20		7 8.000							7 8	7 8	41
8	6 V151	WING	E	20		9 10.000							9 10	9 10	118
38	6 V152	WING	E	20		5 11.000							5 11	5 11	338
2	6 V153	BEAM	E	20		3 4.000							3 4	3 4	10
210	6 V154	BACKWALL	E	20		8 10.000							8 10	8 10	2786
12	W5 W150	BEAM	E	22		1 6.000	0 9.000						25 9	25 2	51

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked SBH JUN 2026

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 65 of 78

BILL OF REINFORCING STEEL

B_JST0017_A9819_65_Barbill tables 2.dgn 12:19:43 AM Eastern 16-JUL-2026

STATE OF MISSOURI MARTIN ALAN CHORKEY PE-2013006488 1-16-26

DATE PREPARED 16-JUL-2026
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. BR04-65
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

MoDOT

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

EMERY SAPP & SONS, INC

HORNER SHIFRIN
THE PROFESSIONAL ART OF ENGINEERING
401 S. 18th St., Ste. 400
St. Louis, Missouri 63103
314-531-1420 FAX: 314-531-0966
www.hornershifrin.com

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
		END BENT 6													
		STAGE 1													
15	6 F600	WING BRACE	E	23		1 8.000	4 7.250	1 8.000	1 3.750	1 0.250	1 3.750	1 0.250	7 11	7 10	176
7	6 F601	DIAPHRAGM	E	14			5 9.000	2 9.125			2 8.250	0 7.750	8 6	8 5	88
8	7 H600	BEAM	E	20		39 1.000							39 1	39 1	639
8	7 H601	BEAM	E	18		6 9.000							8 5	8 5	138
1	7 H602	BEAM	E	17		5 8.000							6 6	6 6	13
8	6 H603	BEAM	E	20		38 5.000							38 5	38 5	462
4	7 H604	BEAM	E	20		10 11.000							10 11	10 11	89
4	7 H605	BEAM	E	20		16 8.000							16 8	16 8	136
4	7 H606	BEAM	E	20		16 8.000							16 8	16 8	136
4	7 H607	BEAM	E	20		16 8.000							16 8	16 8	136
4	7 H608	BEAM	E	20		16 8.000							16 8	16 8	136
4	7 H609	BEAM	E	20		18 6.000							18 6	18 6	151
2	6 H610	BEAM	E	20		21 9.000							21 9	21 9	65
2	6 H611	BEAM	E	20		58 4.000							58 4	58 4	175
14	6 H612	DIAPHRAGM	E	20		38 5.000							38 5	38 5	808
1	6 H613	DIAPHRAGM	E	20		6 1.000							6 1	6 1	9
6	6 H614	DIAPHRAGM	E	20		7 5.000							7 5	7 5	67
5	6 H615	DIAPHRAGM	E	20		8 7.000							8 7	8 7	64
30	6 H616	DIAPHRAGM	E	20		11 4.000							11 4	11 4	511
6	6 H617	DIAPHRAGM	E	20		3 10.000							3 10	3 10	35
1	6 H618	DIAPHRAGM	E	20		2 5.000							2 5	2 5	4
8	7 H619	SLAB	E	20		39 1.000							39 1	39 1	639
8	8 H620	WING	E	20		20 6.000							20 6	20 6	438
30	6 H621	WING	E	20		19 2.000							19 2	19 2	864
6	5 H622	STRAND TIE	E	23		1 2.875	3 2.250	1 2.875	0 3.500	1 2.500	0 3.500	1 2.500	5 8	5 8	35
7	4 U600	BEAM	E	10S			6 0.000	2 10.000					14 10	14 8	69
7	4 U601	BEAM	E	10S			6 4.000	2 10.000					15 6	15 4	72
6	4 U602	BEAM	E	10S			6 7.000	2 10.000					16 0	15 10	63
8	4 U603	BEAM	E	10S			6 10.000	2 10.000					16 6	16 4	87
7	4 U604	BEAM	E	10S			7 1.000	2 10.000					17 0	16 10	79
3	4 U605	BEAM	E	10S			7 4.000	2 10.000					17 6	17 4	35
7	4 U606	BEAM	E	13S		2 10.000	2 8.000	2 10.000	2 8.000				11 9	11 6	54
5	4 U607	BEAM	E	13S		2 10.000	2 11.250	2 10.000	2 11.250				12 4	12 0	40
6	4 U608	BEAM	E	13S		2 10.000	3 2.500	2 10.000	3 2.500				12 10	12 7	50
6	4 U609	BEAM	E	13S		2 10.000	3 5.500	2 10.000	3 5.500				13 4	13 1	52
6	4 U610	BEAM	E	13S		2 10.000	3 8.750	2 10.000	3 8.750				13 11	13 7	54
6	4 U611	BEAM	E	13S		2 10.000	3 11.750	2 10.000	3 11.750				14 5	14 1	56
2	4 U612	BEAM	E	10S			2 11.250	2 10.000					8 9	8 6	11
1	4 U613	BEAM	E	10S			3 2.500	2 10.000					9 3	9 1	6
1	4 U614	BEAM	E	10S			3 5.500	2 10.000					9 9	9 7	6
1	4 U615	BEAM	E	10S			3 8.750	2 10.000					10 4	10 1	7
1	4 U616	BEAM	E	10S			3 11.750	2 10.000					10 10	10 7	7
66	5 U617	APPR SLAB	E	19S		2 0.000	1 3.000						3 3	3 2	218
90	6 U618	DIAPHRAGM	E	19S		2 10.000	4 10.000						7 8	7 6	1014
51	4 U619	DIAPHRAGM	E	10S			7 4.000	2 3.750					17 0	16 10	573
51	6 U620	DIAPHRAGM	E	19S		6 8.000	2 10.000						9 6	9 4	715
8	5 V600	BEAM	E	20		6 0.000							6 0	6 0	50
4	5 V601	BEAM	E	20		6 1.000							6 1	6 1	25
6	5 V602	BEAM	E	20		6 4.000							6 4	6 4	40
2	5 V603	BEAM	E	20		6 7.000							6 7	6 7	14
4	5 V604	BEAM	E	20		6 10.000							6 10	6 10	29
2	5 V605	BEAM	E	20		7 1.000							7 1	7 1	15
30	6 V606	DIAPHRAGM	E	20		6 7.000							6 7	6 7	297
36	6 V607	WING	E	20		10 4.000							10 4	10 4	559
		STAGE 2													
16	6 F650	WING BRACE	E	23		1 8.000	5 9.250	1 8.000	1 0.250	1 3.750	1 0.250	1 3.750	9 1	9 1	218
7	6 F651	DIAPHRAGM	E	21		5 9.000		2 9.000			5 7.000	1 4.250	8 6	8 2	86
8	7 H650	BEAM	E	20		38 11.000							38 11	38 11	636
8	7 H651	BEAM	E	18		6 9.000							8 5	8 5	138
1	7 H652	BEAM	E	17		5 5.000							6 3	6 3	13
16	6 H653	BEAM	E	20		38 7.000							38 7	38 7	927
4	7 H654	BEAM	E	20		30 10.000							30 10	30 10	252
4	7 H655	BEAM	E	20		41 0.000							41 0	41 0	335
4	7 H656	BEAM	E	20		10 2.000							10 2	10 2	83

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
2	6 H657	BEAM	E	20		40 2.000							40 2	40 2	121
1	6 H658	DIAPHRAGM	E	20		2 5.000							2 5	2 5	4
6	6 H659	DIAPHRAGM	E	20		3 10.000							3 10	3 10	35
14	6 H660	DIAPHRAGM	E	20		38 7.000							38 7	38 7	811
5	6 H661	DIAPHRAGM	E	20		8 7.000							8 7	8 7	64
30	6 H662	DIAPHRAGM	E	20		11 4.000							11 4	11 4	511
1	6 H663	DIAPHRAGM	E	20		6 4.000							6 4	6 4	10
6	6 H664	DIAPHRAGM	E	20		7 8.000							7 8	7 8	69
8	7 H665	DIAPHRAGM	E	20		38 11.000							38 11	38 11	636
8	8 H666	WING	E	20		20 9.000							20 9	20 9	443
34	6 H667	WING	E	20		19 5.000							19 5	19 5	992
4	7 H668	BEAM	E	20		4 6.000							4 6	4 6	37
6	5 H669	STRAND TIE	E	23		1 2.875	3 2.250	1 2.875	0 3.500	1 2.500	0 3.500	1 2.500	5 8	5 8	35
14	4 U650	BEAM	E	10S			7 2.000	2 10.000					17 2	17 0	159
21	4 U651	BEAM	E	10S			7 7.000	2 10.000					18 0	17 10	250
1	4 U652	BEAM	E	10S			7 8.000	2 10.000					18 2	18 0	12
6	4 U653	BEAM	E	10S			7 3.000	2 10.000					17 4	17 2	69
12	4 U654	BEAM	E	13S		2 10.000	3 9.500	2 10.000	3 9.500				14 0	13 9	110
18	4 U655	BEAM	E	13S		2 10.000	4 3.000	2 10.000	4 3.000				14 11	14 8	176
6	4 U656	BEAM	E	13S		2 10.000	4 6.000	2 10.000	4 6.000				15 5	15 2	61
2	4 U657	BEAM	E	10S			3 9.500	2 10.000					10 5	10 3	14
3	4 U658	BEAM	E	10S			4 3.000	2 10.000					11 4	11 2	22
1	4 U659	BEAM	E	10S			4 6.000	2 10.000					11 10	11 8	8
70	5 U660	APPR SLAB	E	19S		2 0.000	1 3.000						3 3	3 2	231
96	6 U661	DIAPHRAGM	E	19S		2 10.000	4 10.000						7 8	7 6	1081
55	4 U662	DIAPHRAGM	E	10S			7 4.000	2 3.750					17 0	16 10	618
55	6 U663	DIAPHRAGM	E	19S		6 8.000	2 10.000						9 6	9 4	771
12	5 V650	BEAM	E	20		7 2.000							7 2	7 2	90
12	5 V651	BEAM	E	20		7 7.000							7 7	7 7	95
2	5 V652	BEAM	E	20		7 8.000							7 8	7 8	16
30	6 V653	DIAPHRAGM	E	20		6 7.000							6 7	6 7	297
38	6 V654	WING	E	20		11 4.000							11 4	11 4	647

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked SBH JUN 2026

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 66 of 78

BILL OF REINFORCING STEEL

B_JST0017_A9819_66_Barbill tables 3.dgn 12:22:10 AM Eastern 16-JUL-2026

STATE OF MISSOURI MARTIN ALAN CHORKEY PE-2013006488 REGISTERED PROFESSIONAL ENGINEER 7-17-26

DATE PREPARED 16-JUL-2026

ROUTE I-70 | STATE MO

DISTRICT BR | SHEET NO. BR04-66

COUNTY BOONE

JOB NUMBER JST0017

CONTRACT ID. 251203-D01

PROJECT NO. IS 70-2(128)

BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

EMERY SAPP & SONS, INC

HORNER SHIFRIN
HORNER & SHIFRIN, INC. ENGINEERS/ARCHITECTS/PLANNERS/SURVEYORS
401 S. 18th St., Ste. 400
St. Louis, MO 63103-2709
314-531-1420 FAX: 314-531-0966
www.hornershifrin.com

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
		SUPERSTRUCTURE													
		END BENT NO. 1													
		STAGE 1													
25	7 H120	DIAPHRAGM	E	20		11 0.000							11 0	11 0	562
6	6 H121	DIAPHRAGM	E	20		36 0.000							36 0	36 0	324
10	6 H122	DIAPHRAGM	E	20		11 0.000							11 0	11 0	165
5	7 H123	DIAPHRAGM	E	20		7 8.000							7 8	7 8	78
2	7 H124	DIAPHRAGM	E	20		6 9.000							6 9	6 9	28
72	4 U120	DIAPHRAGM	E	10S			3 10.250	0 11.500					8 8	8 6	409
88	6 U121	DIAPHRAGM	E	10S	22		3 10.500	0 11.500					8 9	8 5	
		INCREMENT =					5 4.500	0 11.500					11 9	11 5	1311
		6.000 IN													
44	6 U122	DIAPHRAGM	E	10S			5 10.000	0 11.500					12 8	12 4	815
4	5 U123	DIAPHRAGM	E	10S			5 10.000	0 6.000					12 2	11 11	50
4	5 U124	DIAPHRAGM	E	10S			1 9.500	0 9.500					4 5	4 2	17
1	5 U125	DIAPHRAGM	E	10S			1 1.000	0 9.500					3 0	2 9	3
44	4 U126	DIAPHRAGM	E	19S	22	1 5.000	1 3.000						2 8	2 7	
		INCREMENT =		19S		2 5.000	1 3.000						3 8	3 7	91
		1 FT 0.000 IN													
44	4 U127	DIAPHRAGM	E	19S	11	1 3.000	1 3.000						2 6	2 5	
		INCREMENT =		19S		2 9.000	1 3.000						4 0	3 11	93
		6.000 IN													
36	4 U128	DIAPHRAGM	E	19S		1 3.000	1 3.000						2 6	2 5	58
1	5 V120	DIAPHRAGM	E	20		3 5.000							3 5	3 5	4
1	5 V121	DIAPHRAGM	E	20		6 1.000							6 1	6 1	6
		STAGE 2													
25	7 H170	DIAPHRAGM	E	20		11 0.000							11 0	11 0	562
6	6 H171	DIAPHRAGM	E	20		36 6.000							36 6	36 6	329
10	6 H172	DIAPHRAGM	E	20		11 0.000							11 0	11 0	165
5	7 H173	DIAPHRAGM	E	20		7 5.000							7 5	7 5	76
2	7 H174	DIAPHRAGM	E	20		7 5.000							7 5	7 5	30
82	4 U170	DIAPHRAGM	E	10S			3 10.250	0 11.500					8 8	8 6	466
88	6 U171	DIAPHRAGM	E	10S	22		3 10.500	0 11.500					8 9	8 5	
		INCREMENT =		10S			5 4.500	0 11.500					11 9	11 5	1311
		6.000 IN													
44	6 U172	DIAPHRAGM	E	10S			5 10.000	0 11.500					12 8	12 4	815
4	5 U173	DIAPHRAGM	E	10S			5 10.000	0 6.000					12 2	11 11	50
4	5 U174	DIAPHRAGM	E	10S			1 9.500	0 9.500					4 5	4 2	17
1	5 U175	DIAPHRAGM	E	10S			1 1.000	0 9.500					3 0	2 9	3
44	4 U176	DIAPHRAGM	E	19S	22	1 5.000	1 3.000						2 8	2 7	
		INCREMENT =		19S		2 5.000	1 3.000						3 8	3 7	91
		1 FT 0.000 IN													
44	4 U177	DIAPHRAGM	E	19S	11	1 3.000	1 3.000						2 6	2 5	
		INCREMENT =		19S		2 9.000	1 3.000						4 0	3 11	93
		6.000 IN													
41	4 U178	DIAPHRAGM	E	19		1 3.000	1 3.000						2 6	2 5	66
1	5 V170	DIAPHRAGM	E	20		3 5.000							3 5	3 5	4
1	5 V171	DIAPHRAGM	E	20		6 1.000							6 1	6 1	6
		INT. BENT NO. 2													
		STAGE 1													
30	8 H220	DIAPHRAGM	E	20		11 0.000							11 0	11 0	881
10	6 H221	DIAPHRAGM	E	20		11 0.000							11 0	11 0	165

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
10	4 H222	DIAPHRAGM	E	20		11 0.000							11 0	11 0	73
12	5 H223	STRAND TIE	E	20		2 10.000							2 10	2 10	35
6	8 H224	DIAPHRAGM	E	20		8 8.000							8 8	8 8	139
6	6 H225	DIAPHRAGM	E	20		6 9.000							6 9	6 9	61
2	4 H226	DIAPHRAGM	E	20		5 8.000							5 8	5 8	8
72	4 U220	DIAPHRAGM	E	28S			1 3.000	4 2.000	2 2.000				7 7	7 5	357
88	6 U221	DIAPHRAGM	E	28S	22		1 10.000	4 2.250	2 3.000				8 3	8 0	
		INCREMENT =		28S			1 10.000	5 8.250	2 3.000				9 9	9 6	1151
		6.000 INCHES													
44	6 U222	DIAPHRAGM	E	28S			1 10.000	5 11.000	2 3.000				10 0	9 8	639
4	6 U223	DIAPHRAGM	E	28S			1 10.000	5 11.000	1 10.000				9 7	9 3	56
10	5 U224	DIAPHRAGM	E	6S		4 8.000	1 1.000	1 10.000					7 7	7 4	76
2	5 U225	DIAPHRAGM	E	6S		2 10.250	1 1.000	1 10.000					5 9	5 7	12
44	4 U226	DIAPHRAGM	E	19S	22	1 5.000	2 2.000						3 7	3 6	
		INCREMENT =		19S		2 5.000	2 2.000						4 7	4 6	118
		12.000 INCHES													
4	5 V220	DIAPHRAGM	E	20		6 1.000							6 1	6 1	25
		STAGE 2													
30	8 H270	DIAPHRAGM	E	20		11 0.000							11 0	11 0	881
10	6 H271	DIAPHRAGM	E	20		11 0.000							11 0	11 0	165
10	4 H272	DIAPHRAGM	E	20		11 0.000							11 0	11 0	73
12	5 H273	STRAND TIE	E	20		2 10.000							2 10	2 10	35
6	8 H274	DIAPHRAGM	E	20		7 5.000							7 5	7 5	119
2	8 H275	DIAPHRAGM	E	20		7 5.000							7 5	7 5	40
2	4 H276	DIAPHRAGM	E	20		7 5.000							7 5	7 5	10
82	4 U270	DIAPHRAGM	E	28S			1 3.000	4 2.000	2 2.000				7 7	7 5	406
88	6 U271	DIAPHRAGM	E	28S	22		1 10.000	4 2.250	2 3.000				8 3	8 0	
		INCREMENT =		28S			1 10.000	5 8.250	2 3.000				9 9	9 6	1151
		6.000 INCHES													
44	6 U272	DIAPHRAGM	E	28S			1 10.000	5 11.000	2 3.000				10 0	9 8	639
4	6 U273	DIAPHRAGM	E	28S			1 10.000	5 11.000	1 10.000				9 7	9 3	56
10	5 U274	DIAPHRAGM	E	6S		4 8.000	1 1.000	1 10.000					7 7	7 4	76
2	5 U275	DIAPHRAGM	E	6S		2 10.250	1 1.000	1 10.000					5 9	5 7	12
44	4 U276	DIAPHRAGM	E	19S	22	1 5.000	2 2.000						3 7	3 6	
		INCREMENT =		19S		2 5.000	2 2.000						4 7	4 6	118
		12.000 INCHES													
4	5 V270	DIAPHRAGM	E	20		6 1.000							6 1	6 1	25
		INT. BENT NO. 3													
		STAGE 1													
30	8 H320	DIAPHRAGM	E	20		11 0.000							11 0	11 0	881
10	6 H321	DIAPHRAGM	E	20		11 0.000							11 0	11 0	165
10	4 H322	DIAPHRAGM	E	20		11 0.000							11 0	11 0	73
12	5 H323	STRAND TIE	E	20		2 10.000							2 10	2 10	35
6	8 H324	DIAPHRAGM	E	20		8 8.000							8 8	8 8	139
6	6 H325	DIAPHRAGM	E	20		6 9.000							6 9	6 9	61
2	4 H326	DIAPHRAGM	E	20		5 8.000							5 8	5 8	8
72	4 U320	DIAPHRAGM	E	28S			1 3.000	3 11.500	2 2.000				7 5	7 2	345
88	6 U321	DIAPHRAGM	E	28S	22		1 10.000	3 11.750	2 3.000				8 1	7 9	
		INCREMENT =		28S			1 10.000	5 5.750	2 3.000				9 7	9 3	1123
		6.000 INCHES													
44	6 U322	DIAPHRAGM	E	28S			1 10.000	5 11.000	2 3.000				10 0	9 8	639
4	6 U323	DIAPHRAGM	E	28S			1 10.000	5 11.000	1 10.000				9 7	9 3	56
10	5 U324	DIAPHRAGM	E	6S		4 8.000	1 1.000	1 10.000					7 7	7 4	76
2	5 U325	DIAPHRAGM	E	6S		2 10.250	1 1.000	1 10.000					5 9	5 7	12
44	4 U326	DIAPHRAGM	E	19S	22	1 5.000	2 2.000						3 7	3 6	
		INCREMENT =		19S		2 5.000	2 2.000						4 7	4 6	118
		12.000 INCHES													
4	5 V320	DIAPHRAGM	E	20		6 1.000							6 1	6 1	25
		STAGE 2													
30	8 H370	DIAPHRAGM	E	20		11 0.000							11 0	11 0	881
10	6 H371	DIAPHRAGM	E	20		11 0.000							11 0	11 0	165
10	4 H372	DIAPHRAGM	E	20		11 0.000							11 0	11 0	73
12	5 H373	STRAND TIE	E	20		2 10.000							2 10	2 10	35
6	8 H374	DIAPHRAGM	E	20		7 5.000							7 5	7 5	119
2	8 H375	DIAPHRAGM	E	20		7 5.000							7 5	7 5	40
2	4 H376	DIAPHRAGM	E	20		7 5.000							7 5	7 5	10

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked TPL JUN 2026

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 67 of 78

BILL OF REINFORCING STEEL

B_JST0017_A9819_67_Barbill tables 4.dgn 12:21:04 AM Eastern 16-JUL-2026

STATE OF MISSOURI — MARTIN ALAN CHORKEY — PE-2013006488 — 7-17-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-67
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

EMERY SAPP & SONS, INC

HORNER SHIFRIN
THE PROFESSIONAL ART OF ENGINEERING
401 S. 18th St., Ste. 400
St. Louis, MO 63103-2709
314-531-1420 FAX: 314-531-0966
www.hornershifrin.com

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

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

REV. RevDesc

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
82	4 U370	DIAPHRAGM	E	28S			1 3.000	3 11.500	2 2.000				7 5	7 2	393
88	6 U371	DIAPHRAGM	E	28S	22		1 10.000	3 11.750	2 3.000				8 1	7 9	
		INCREMENT =		28S			1 10.000	5 5.750	2 3.000				9 7	9 3	1123
		6.000 INCHES													
44	6 U372	DIAPHRAGM	E	28S			1 10.000	5 11.000	2 3.000				10 0	9 8	639
4	6 U373	DIAPHRAGM	E	28S			1 10.000	5 11.000	1 10.000				9 7	9 3	56
10	5 U374	DIAPHRAGM	E	6S		4 8.000	1 1.000	1 10.000					7 7	7 4	76
2	5 U375	DIAPHRAGM	E	6S		2 10.250	1 1.000	1 10.000					5 9	5 7	12
44	4 U376	DIAPHRAGM	E	19S	22	1 5.000	2 2.000						3 7	3 6	
		INCREMENT =		19S		2 5.000	2 2.000						4 7	4 6	118
		12.000 INCHES													
4	5 V370	DIAPHRAGM	E	20		6 1.000							6 1	6 1	25
		INT. BENT NO. 4													
		STAGE 1													
10	6 H420	DIAPHRAGM	E	20		8 4.000							8 4	8 4	125
10	6 H421	DIAPHRAGM	E	20		11 0.000							11 0	11 0	165
50	4 H422	DIAPHRAGM	E	20		11 0.000							11 0	11 0	367
2	5 H423	STRAND TIE	E	20		4 6.000							4 6	4 6	9
10	5 H424	STRAND TIE	E	20		5 9.000							5 9	5 9	60
2	6 H425	DIAPHRAGM	E	20		6 6.000							6 6	6 6	20
2	6 H426	DIAPHRAGM	E	20		6 10.000							6 10	6 10	21
10	4 H427	DIAPHRAGM	E	20		5 9.000							5 9	5 9	38
84	4 U420	DIAPHRAGM	E	28S			1 3.000	6 4.000	2 3.000				9 10	9 8	542
22	6 U421	DIAPHRAGM	E	28S			1 10.000	6 3.750	2 3.000				10 5	10 1	333
22	6 U422	DIAPHRAGM	E	28S			1 10.000	5 10.000	2 3.000				9 11	9 7	317
4	6 U423	DIAPHRAGM	E	28S			2 2.000	5 10.000	1 10.000				9 10	9 6	57
2	5 U424	DIAPHRAGM	E	19S		4 5.000	1 1.000						5 6	5 5	11
12	5 U425	DIAPHRAGM	E	6S		4 4.000	1 1.000	1 10.000					7 3	7 0	88
4	5 V420	DIAPHRAGM	E	20		6 7.000							6 7	6 7	27
		STAGE 2													
10	6 H470	DIAPHRAGM	E	20		8 4.000							8 4	8 4	125
10	6 H471	DIAPHRAGM	E	20		11 0.000							11 0	11 0	165
50	4 H472	DIAPHRAGM	E	20		11 0.000							11 0	11 0	367
2	5 H473	STRAND TIE	E	20		4 6.000							4 6	4 6	9
10	5 H474	STRAND TIE	E	20		5 9.000							5 9	5 9	60
2	6 H475	DIAPHRAGM	E	20		6 0.000							6 0	6 0	18
2	6 H476	DIAPHRAGM	E	20		7 5.000							7 5	7 5	22
10	4 H477	DIAPHRAGM	E	20		7 5.000							7 5	7 5	50
92	4 U470	DIAPHRAGM	E	28S			1 3.000	6 4.000	2 3.000				9 10	9 8	594
22	6 U471	DIAPHRAGM	E	28S			1 10.000	6 1.000	2 3.000				10 2	9 10	325
22	6 U472	DIAPHRAGM	E	28S			1 10.000	5 10.000	2 3.000				9 11	9 7	317
4	6 U473	DIAPHRAGM	E	28S			2 2.000	5 10.000	1 10.000				9 10	9 6	57
2	5 U474	DIAPHRAGM	E	19S		4 5.000	1 1.000						5 6	5 5	11
12	5 U475	DIAPHRAGM	E	6S		4 4.000	1 1.000	1 10.000					7 3	7 0	88
4	5 V470	DIAPHRAGM	E	20		6 7.000							6 7	6 7	27
		INT. BENT NO. 5													
		STAGE 1													
20	6 H520	DIAPHRAGM	E	20		8 6.000							8 6	8 6	255
10	6 H521	DIAPHRAGM	E	20		11 4.000							11 4	11 4	170
50	4 H522	DIAPHRAGM	E	20		11 4.000							11 4	11 4	379
2	5 H523	STRAND TIE	E	14			3 4.750	1 2.875			0 3.500	1 2.500	4 8	4 8	10
10	5 H524	STRAND TIE	E	23		1 2.875	3 2.250	1 2.875	0 3.500	1 2.500	0 3.500	1 2.500	5 8	5 8	59
4	6 H525	DIAPHRAGM	E	20		5 2.000							5 2	5 2	31
2	6 H526	DIAPHRAGM	E	20		6 11.000							6 11	6 11	21
10	4 H527	DIAPHRAGM	E	20		5 10.000							5 10	5 10	39
84	4 U520	DIAPHRAGM	E	28S			1 3.000	6 7.000	2 3.000				10 1	9 11	556
22	6 U521	DIAPHRAGM	E	28S			1 10.000	6 6.750	2 3.000				10 8	10 4	341
22	6 U522	DIAPHRAGM	E	28S			1 10.000	5 10.000	2 3.000				9 11	9 7	317
4	6 U523	DIAPHRAGM	E	28S			2 2.000	5 10.000	1 10.000				9 10	9 6	57
2	5 U524	DIAPHRAGM	E	19S		4 5.000	1 1.000						5 6	5 5	11
12	5 U525	DIAPHRAGM	E	6S		4 4.000	1 1.000	1 10.000					7 3	7 0	88
53	4 U526	DIAPHRAGM	E	10S			1 0.000	1 11.000					3 11	3 9	133
1	5 U527	DIAPHRAGM	E	21S		2 1.750		4 6.000			2 1.000	0 6.000	6 8	6 5	7
3	5 V520	DIAPHRAGM	E	20		7 3.000							7 3	7 3	23
1	5 V521	DIAPHRAGM	E	20		6 7.000							6 7	6 7	7

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
		STAGE 2													
20	6 H570	DIAPHRAGM	E	20		8 6.000							8 6	8 6	255
10	6 H571	DIAPHRAGM	E	20		11 4.000							11 4	11 4	170
50	4 H572	DIAPHRAGM	E	20		11 4.000							11 4	11 4	379
2	5 H573	STRAND TIE	E	14			3 4.750	1 2.875			0 3.500	1 2.500	4 8	4 8	10
10	5 H574	STRAND TIE	E	23		1 2.875	3 2.250	1 2.875	0 3.500	1 2.500	0 3.500	1 2.500	5 8	5 8	59
4	6 H575	DIAPHRAGM	E	20		6 2.000							6 2	6 2	37
2	6 H576	DIAPHRAGM	E	20		7 7.000							7 7	7 7	23
10	4 H577	DIAPHRAGM	E	20		7 7.000							7 7	7 7	51
92	4 U570	DIAPHRAGM	E	28S			1 3.000	6 7.000	2 3.000				10 1	9 11	609
22	6 U571	DIAPHRAGM	E	28S			1 10.000	6 6.750	2 3.000				10 8	10 4	341
22	6 U572	DIAPHRAGM	E	28S			1 10.000	5 10.000	2 3.000				9 11	9 7	317
4	6 U573	DIAPHRAGM	E	28S			2 2.000	5 10.000	1 10.000				9 10	9 6	57
4	5 U574	DIAPHRAGM	E	19S		4 5.000	1 1.000						5 6	5 5	23
12	5 U575	DIAPHRAGM	E	6S		4 4.000	1 1.000	1 10.000					7 3	7 0	88
57	4 U576	DIAPHRAGM	E	10S			1 0.000	1 11.000					3 11	3 9	143
1	5 U577	DIAPHRAGM	E	14S			4 6.000	0 9.750			0 9.500	0 2.250	5 4	5 3	5
2	5 V570	DIAPHRAGM	E	20		7 3.000							7 3	7 3	15
2	5 V571	DIAPHRAGM	E	20		6 7.000							6 7	6 7	14
		SLAB													
		STAGE 1													
672	6 S1	SLAB	E	20		55 7.000							55 7	55 7	56103
2562	6 S2	SLAB	E	20		37 6.000							37 6	37 6	144305
26	6 S3	SLAB	E	20	1	59 11.000							59 11	59 11	
		INCREMENT =				8 4.250							8 4	8 4	1333
		2 FT 0.750 INCH													
960	5 S4	SLAB	E	20		55 9.000							55 9	55 9	55821
264	6 S5	SLAB	E	20		56 7.000							56 7	56 7	22437
1922	6 S6	SLAB	E	20		39 1.000							39 1	39 1	112827
10	6 S7	SLAB	E	20	2	38 5.000							38 5	38 5	
		INCREMENT =				32 11.000							32 11	32 11	536
		16.500 INCH													
650	4 S8	SLAB	E	20		7 0.000							7 0	7 0	3039
501	4 S9	SLAB	E	20		14 0.000							14 0	14 0	4685
53	8 S10	SLAB	E	20		49 10.000							49 10	49 10	7052
53	8 S11	SLAB	E	20		56 11.000							56 11	56 11	8054
53	8 S12	SLAB	E	20		49 10.000							49 10	49 10	7052
53	8 S13	SLAB	E	20		45 4.000							45 4	45 4	6415
53	8 S14	SLAB	E	20		46 0.000							46 0	46 0	6509
53	8 S15	SLAB	E	20		56 10.000							56 10	56 10	8042
106	8 S16	SLAB	E	20		46 1.000							46 1	46 1	13043
106	8 S17	SLAB	E	20		33 8.000							33 8	33 8	9528
56	6 S18	SLAB	E	20	1	18 7.250							18 7	18 7	
		INCREMENT =				2 0.000							2 0	2 0	866
		3.625 INCH													
384	4 S19	SLAB	E	10		0 6.000	0 7.000	3 8.000	0 6.000				5 10	5 5	1389
24	4 S20	SLAB	E	20		33 4.000							33 4	33 4	534
2	4 S21	SLAB	E	20	1	12 6.000							12 6	12 6	
		INCREMENT =				9 9.000							9 9	9 9	15
		2 FT 9.000 INCH													
12	6 S22	SLAB	E	20	2	37 3.000							37 3	37 3	
		INCREMENT =				32 3.000							32 3	32 3	626
		12.000 INCH													
50	5 S23	SLAB	E	20	1	10 8.000							10 8	10 8	
		INCREMENT =				2 6.000							2 6	2 6	343
		2.000 INCH													
22	6 S24	SLAB	E	20	1	15 6.000							15 6	15 6	
		INCREMENT =				12 0.000							12 0	12 0	454
		2.000 INCH													
24	5 S25	SLAB	E	20	1	18 8.000							18 8	18 8	
		INCREMENT =				14 10.000							14 10	14 10	419
		2.000 INCH													
20	6 S26	SLAB	E	20	1	57 10.000							57 10	57 10	
		INCREMENT =				7 2.000							7 2	7 2	976
		2 FT 8.000 INCH													
2	6 S27	SLAB	E	19		3 0.000	1 0.000						4 0	3 10	12
4	6 S28	SLAB	E	19		4 0.000	1 0.000						5 0	4 10	29
		STAGE 2													
708	6 S51	SLAB	E	20		56 11.000							56 11	56 11	60526
2628	6 S52	SLAB	E	20		36 7.000							36 7	36 7	144404

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked TPL JUN 2026

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 68 of 78

BILL OF REINFORCING STEEL

B_JST0017_A9819_68_Barbill tables 5.dgn 12:18:55 AM Eastern 16-JUL-2026

STATE OF MISSOURI — MARTIN ALAN CHORKEY — PE-2013006488 — 7-16-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-68
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

EMERY SAPP & SONS, INC

HORNER SHIFRIN
ENGINEERS ARCHITECTS PLANNERS
THE PENTHOUSE AT THE PLAZA
401 S. 18th St., Ste. 400
St. Louis, Missouri 63103-2709
314-531-1420 FAX: 314-531-0966
www.hornershifrin.com

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

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

REV. RevDesc

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
28	6 S53	SLAB	E	20	1	59 3.000							59 3	59 3	
		INCREMENT =				3 6.750							3 7	3 7	1321
		2 FT 0.750 INCH													
1044	5 S54	SLAB	E	20		57 1.000							57 1	57 1	62158
252	6 S55	SLAB	E	20		57 11.000							57 11	57 11	21922
1972	6 S56	SLAB	E	20		38 1.000							38 1	38 1	112801
25	5 S57	SLAB	E	20	1	6 8.000							6 8	6 8	
		INCREMENT =				2 8.000							2 8	2 8	122
		2.000 INCH													
21	6 S58	SLAB	E	20	1	10 10.000							10 10	10 10	
		INCREMENT =				7 6.000							7 6	7 6	289
		2.000 INCH													
61	5 S59	SLAB	E	20	1	19 8.000							19 8	19 8	
		INCREMENT =				9 8.000							9 8	9 8	933
		2.000 INCH													
56	8 S60	SLAB	E	20		49 10.000							49 10	49 10	7451
56	8 S61	SLAB	E	20		56 11.000							56 11	56 11	8510
56	8 S62	SLAB	E	20		49 10.000							49 10	49 10	7451
56	8 S63	SLAB	E	20		45 4.000							45 4	45 4	6778
56	8 S64	SLAB	E	20		46 0.000							46 0	46 0	6878
56	8 S65	SLAB	E	20		56 10.000							56 10	56 10	8498
112	8 S66	SLAB	E	20		46 1.000							46 1	46 1	13781
112	8 S67	SLAB	E	20		33 8.000							33 8	33 8	10068
59	6 S68	SLAB	E	20	1	20 0.000							20 0	20 0	
		INCREMENT =				2 5.750							2 6	2 6	997
		3.625 INCH													
384	4 S69	SLAB	E	10		0 6.000	0 7.000	3 8.000	0 6.000				5 10	5 5	1389
24	4 S70	SLAB	E	20		33 4.000							33 4	33 4	534
650	4 S71	SLAB	E	20		7 0.000							7 0	7 0	3039
10	6 S72	SLAB	E	20	2	36 0.000							36 0	36 0	
		INCREMENT =				31 10.000							31 10	31 10	509
		12.500 INCH													
501	4 S73	SLAB	E	20		14 0.000							14 0	14 0	4685
2	4 S74	SLAB	E	20	1	12 9.000							12 9	12 9	
		INCREMENT =				10 0.000							10 0	10 0	15
		2 FT 9.000 INCH													
8	6 S75	SLAB	E	20	2	36 10.000							36 10	36 10	
		INCREMENT =				32 8.500							32 9	32 9	418
		1 FT 4.500 INCH													
19	6 S76	SLAB	E	20	1	57 4.000							57 4	57 4	
		INCREMENT =				7 10.000							7 10	7 10	930
		2 FT 9.000 INCH													
2	6 S77	SLAB	E	19		3 0.000	1 0.000						4 0	3 10	12
4	6 S78	SLAB	E	19		4 0.000	1 0.000						5 0	4 10	29
		BARRIERS													
1353	5 R1	TYPE D BARRIER	E	26		3 3.000	0 5.500	0 2.250		0 5.500	3 0.750	0 6.750	6 8	6 7	9290
1353	5 R2	TYPE D BARRIER	E	19S		1 8.500	0 9.500						2 6	2 5	3410
1353	5 R3	TYPE D BARRIER	E	27S			0 9.500	1 3.250	0 5.000	1 0.000	1 3.000	0 3.000	3 6	3 4	4704
320	5 R4	TYPE D BARRIER	E	20		11 8.000							11 8	11 8	3894
40	5 R5	TYPE D BARRIER	E	20		53 4.000							53 4	53 4	2225
80	5 R6	TYPE D BARRIER	E	20		40 7.000							40 7	40 7	3386
20	5 R7	LEFT TYPE D	E	20		45 7.000							45 7	45 7	951
60	5 R8	TYPE D BARRIER	E	20		44 8.000							44 8	44 8	2795
10	5 R9	RIGHT TYPE D	E	20		55 7.000							55 7	55 7	580
2888	5 M1	MEDIAN BARR.	E	14S			0 5.000	3 3.750			3 3.000	0 7.500	3 9	3 8	11045
320	5 M2	MEDIAN BARR.	E	20		11 8.000							11 8	11 8	3894
20	5 M3	MEDIAN BARR.	E	20		21 1.000							21 1	21 1	440
40	5 M4	MEDIAN BARR.	E	20		53 3.000							53 3	53 3	2222
100	5 M5	MEDIAN BARR.	E	20		40 8.000							40 8	40 8	4242
20	5 M6	MEDIAN BARR.	E	20		34 4.000							34 4	34 4	716
60	5 M7	MEDIAN BARR.	E	20		45 7.000							45 7	45 7	2853
20	5 M8	MEDIAN BARR.	E	20		19 8.000							19 8	19 8	410
		SLIP FORM OPTION													
316	5 C1	TYPE D BARRIER	E	20		12 0.000							12 0	12 0	3955
40	5 C2	TYPE D BARRIER	E	20		8 0.000							8 0	8 0	334
10	5 K1	BARRIER	E	27S		4 1.500	0 9.250	0 5.375	3 8.250		0 5.250	0 1.000	9 0	8 10	92
40	5 K2	BARRIER	E	27S		4 1.500	0 9.250	1 2.500	2 11.250		1 2.250	0 2.750	9 1	8 10	369
10	5 K4	BARRIER	E	19S	2	3 0.750	0 10.000						3 11	3 10	
		INCREMENT =				3 2.750	0 10.000						4 1	4 0	40
		0.500 INCH													
10	5 K5	BARRIER	E	38S	2			1 6.500	1 6.000	0 8.250	1 6.000	0 4.000	3 9	3 6	
		INCREMENT =						1 8.500	1 6.000	0 8.250	1 8.000	0 4.500	3 11	3 9	38
		0.500 INCH													

Bill of Reinforcing Steel

No. Req.	Size/ Mark	Location	Codes C	SH	V	Dimensions B ft in.	C ft in.	D ft in.	E ft in.	F ft in.	H ft in.	K ft in.	Nom. Length ft in.	Actual Length ft in.	Weight lb
6	5 K6	BARRIER	E	19S		3 3.250	0 10.000						4 1	4 0	25
6	5 K7	BARRIER	E	38S				2 6.375	0 8.750	0 10.000	2 5.750	0 6.250	4 1	3 11	25
18	5 K8	BARRIER	E	19S	2	3 5.000	0 10.000						4 3	4 2	
		INCREMENT =				3 11.000	0 10.000						4 9	4 8	83
		0.750 INCH													
18	5 K9	BARRIER	E	38S	2			2 8.250	0 8.750	0 10.000	2 7.500	0 6.750	4 3	4 1	
		INCREMENT =						3 2.250	0 8.750	0 10.000	3 1.500	0 7.750	4 9	4 7	81
		0.750 INCH													
18	5 K10	BARRIER	E	19S		3 11.500	0 10.000						4 10	4 8	88
18	5 K11	BARRIER	E	38S				3 2.750	0 8.750	0 10.000	3 2.000	0 7.750	4 10	4 7	86
28	5 K12	BARRIER	E	20		15 7.750							15 8	15 8	458
12	5 K13	BARRIER	E	20	4	8 10.750							8 11	8 11	
		INCREMENT =				14 10.750							14 11	14 11	149
		36.000 INCH													
10	5 K61	BARRIER	E	27S		3 5.000	0 9.250	0 5.375	2 11.750		0 5.250	0 1.000	7 7	7 5	77
52	5 K62	BARRIER	E	27S		3 5.000	0 9.250	1 2.500	2 2.750		1 2.250	0 2.750	7 8	7 5	402
2	5 K63	BARRIER	E	27S		1 10.500	0 9.250	1 2.500	0 7.750	1 0.000	1 2.250	0 2.750	5 6	5 2	11
10	5 K64	BARRIER	E	19S	2	2 4.250	0 10.000						3 2	3 1	
		INCREMENT =				2 6.250	0 10.000						3 4	3 3	33
		0.500 INCH													
10	5 K65	BARRIER	E	38S	2			1 6.500	0 9.500	0 8.250	1 6.000	0 4.000	3 0	2 10	
		INCREMENT =						1 8.500	0 9.500	0 8.250	1 8.000	0 4.500	3 2	3 0	30
		0.500 INCH													
6	5 K66	BARRIER	E	19S		2 6.750	0 10.000						3 5	3 4	21
6	5 K67	BARRIER	E	21S		2 6.625		0 10.000				2 6.000	0 6.250	3 5	3 2	20
18	5 K68	BARRIER	E	19S	2	2 8.500	0 10.000						3 7	3 5	
		INCREMENT =				3 2.500	0 10.000						4 1	3 11	70
		0.7500 INCH													
18	5 K69	BARRIER	E	21S	2	2 8.500		0 10.000				2 7.750	0 6.750	3 6	3 4	
		INCREMENT =				3 2.500		0 10.000				3 1.750	0 7.750	4 1	3 10	67
		0.7500 INCH													
30	5 K70	BARRIER	E	19S		3 3.000	0 10.000						4 1	4 0	125
30	5 K71	BARRIER	E	21S		3 3.000		0 10.000				3 2.250	0 7.750	4 1	3 10	120
24	5 K74	BARRIER	E	20		21 1.750							21 2	21 2	530
12	5 K75	BARRIER	E	20	4	14 4.750							14 5	14 5	
		INCREMENT =				20 4.750							20 5	20 5	218
		36.000 INCH													

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked TPL JUN 2026

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 69 of 78

BILL OF REINFORCING STEEL

B_JST0017_A9819_69_Barbill tables 6.dgn 12:22:23 AM Eastern 16-JUL-2026

STATE OF MISSOURI MARTIN ALAN CHORKEY PE-2013006488 REGISTERED ENGINEER 7-16-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-69
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

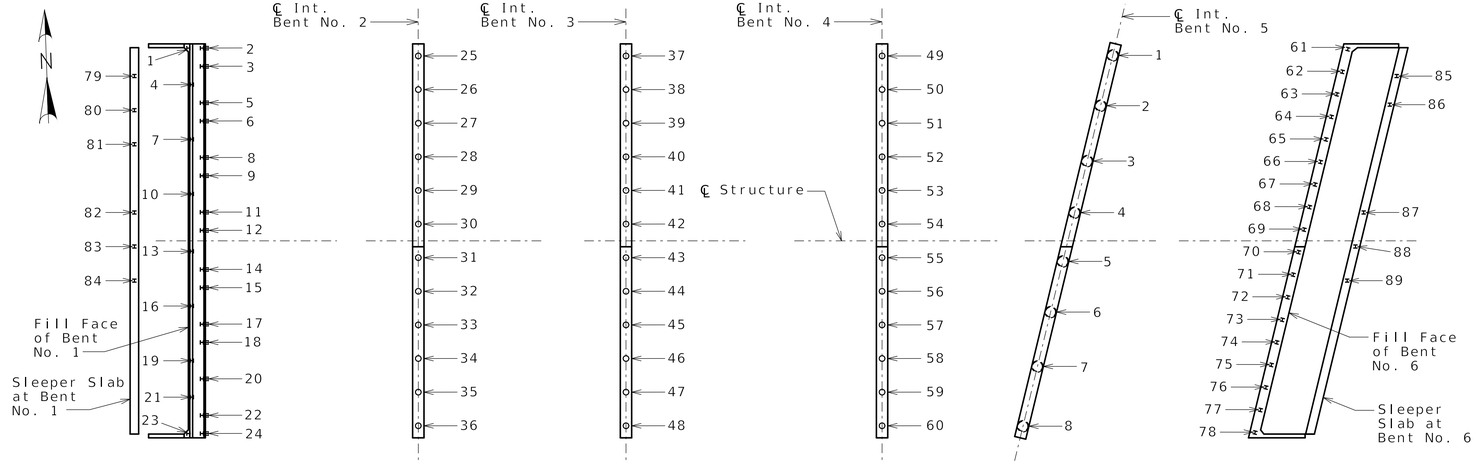
IMPROVE I-70 ROCHEPORT TO COLUMBIA

EMERY SAPP & SONS, INC

HORNER SHIFRIN
ENGINEERS ARCHITECTS PLANNERS
THE PENTHOUSE AT PARK PLAZA
401 S. 18th St., Ste. 400
ST. LOUIS, MISSOURI 63103
314-531-1420 FAX: 314-531-0966
www.hornershifrin.com

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc



PART PLAN SHOWING PILE NUMBERING FOR RECORDING AS-BUILT PILE DATA AND DRILLED SHAFT NUMBERING FOR RECORDING AS-BUILT DRILLED SHAFT DATA

As-Built Pile Data

Pile No.	Length in Place (ft)	Computed Nominal Axial Compressive Resistance (kips)	PDA End of Drive Blow Count (blows/in.)	Actual End of Drive Blow Count (blows/in.)	Remarks
					End Bent No. 1
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
					Sleeper Slab at End Bent No. 1
79					
80					
81					
82					
83					
84					

As-Built Pile Data

Pile No.	Length in Place (ft)	Computed Nominal Axial Compressive Resistance (kips)	PDA End of Drive Blow Count (blows/in.)	Actual End of Drive Blow Count (blows/in.)	Remarks
					Intermediate Bent No. 2
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
					Intermediate Bent No. 3
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					

As-Built Pile Data

Pile No.	Length in Place (ft)	Computed Nominal Axial Compressive Resistance (kips)	PDA End of Drive Blow Count (blows/in.)	Actual End of Drive Blow Count (blows/in.)	Remarks
					Intermediate Bent No. 4
49					
50					
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					

Note:

Indicate in remarks column:
A. Pile type and grade
B. Batter
C. Driven to practical refusal
D. PDA test pile
E. Minimum tip elevation controlled

(Use when actual blow count is less than PDA blow count due to minimum tip elevation requirement. A plus sign (+) shall be placed after the PDA nominal axial compressive resistance value indicating actual value is higher than PDA value.)

This sheet to be completed by MoDOT construction personnel.

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked MAC FEB 2026

Note: This drawing is not to scale. Follow dimensions.

Sheet No. 70 of 78

AS BUILT PILE DATA AND AS BUILT DRILLED SHAFT DATA SHEET 1

B_JST0017_A9819_70_As Built Data.dgn 12:20:52 AM Eastern 16-JUL-2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
REGISTERED PROFESSIONAL ENGINEER
7-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO

DISTRICT	SHEET NO.
BR	BR04-70

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

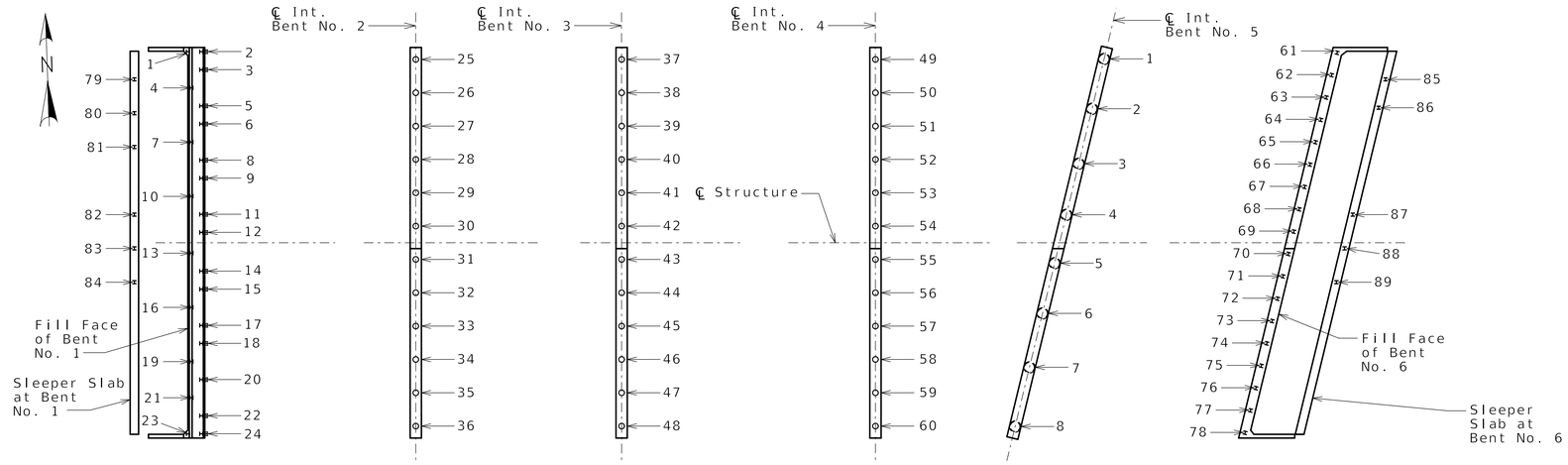
EMERY SAPPE SONS, INC

HORNER SHIFRIN
THE POWER OF INTEGRATION
401 S. 18th St., Ste. 400
St. Louis, MO 63103
314-531-4321 FAX 314-531-6866
www.HornerShifrin.com

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

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

REV. RevDesc



PART PLAN SHOWING PILE NUMBERING FOR RECORDING AS-BUILT PILE DATA AND DRILLED SHAFT NUMBERING FOR RECORDING AS-BUILT DRILLED SHAFT DATA

As-Built Drilled Shaft Data

Shaft No.	Top of Sound Rock (Elev.)	Tip of Casing (Elev.)	Bottom of Rock Socket (Elev.)	Remarks
				Intermediate Bent No. 5
1				
2				
3				
4				
5				
6				
7				
8				

Note:

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

This sheet to be completed by MoDOT construction personnel.

As-Built Pile Data

Pile No.	Length in Place (ft)	Computed Nominal Axial Compressive Resistance (kips)	Remarks
			End Bent No. 6
61			
62			
63			
64			
65			
66			
67			
68			
69			
70			
71			
72			
73			
74			
75			
76			
77			
78			
			Sleeper Slab at End Bent No. 6
85			
86			
87			
88			
89			

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked MAC FEB 2026

Note: This drawing is not to scale. Follow dimensions.

AS BUILT PILE DATA AND
AS BUILT DRILLED SHAFT DATA
SHEET 2

B_JST0017_A9819_71_As Built Data.dgn 12:22:21 AM Eastern 16-JUL-2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
PROFESSIONAL ENGINEER
7-17-26

DATE PREPARED
16-JUL-2026

ROUTE	STATE
I-70	MO

DISTRICT	SHEET NO.
BR	BR04-71

COUNTY
BOONE

JOB NUMBER
JST0017

CONTRACT ID.
251203-D01

PROJECT NO.
IS 70-2(128)

BRIDGE NO.
A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
THE POWER OF TWO DIVISION
401 S. 18th St., Ste. 400
St. Louis, MO 63103
314-531-4321 FAX 314-531-6866
www.hornershifrin.com

EMERY SAPPE & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

Missouri Department of Transportation
Construction and Materials

BORING NO. B-1S
Page 1 of 2

Job No.: ST0017 (SCI No. 2025-0017.10) **County:** Boone **Route:** 70 Outer Roads
Design: **Skew:** **Location:** Columbia, Missouri
Bent: **Logged By:** Tina Cowan **Operator:** Palmerton and Parrish, Inc.
Station: **Northing:** 1142410.927 **Date of Work:** 05/15/25
Offset: **Easting:** 1665353.847 **Depth to Water:** 14.0
Elevation: 585.4 **Requested Northing:** **Depth Hole Open:** 63.8
Requested Station: **Requested Easting:** **Time Change:**
Requested Offset: **Equipment:** CME-55,Split-Spoon Sampler, Shelby Tube, NQ
Requested Elevation: **Location Note:**
Drill No.: **Hammer Efficiency:** 84.7% **Drilling Method:** Continuous Flight Auger, Mud rotary

Depth (ft)	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
0	0.0-2.0' (FILL) CONCRETE RUBBLE, with brown, lean clay	585						
	2.0-5.5' (FILL) Reddish brown, FAT CLAY, with crushed rock, with concrete rubble 3.5' Becomes gray and brown, no crushed rock, no concrete rubble			39	5-3-6 (13)			MC = 16.7%
5		580		78	2-3-5 (11)			MC = 22.1%
	5.5-12.0' (CL) Brown, LEAN CLAY			75		Qu Test Results UCS = 2.00 ksf MC = 26.4% γ_{moist} = 123.4 pcf		LL = 40 PL = 21
10		575		33	1-1-2 (4)			MC = 25.9%
	12.0-17.0' (SM) Brown, SILTY SAND, fine-grained 13.0' *ATTERBERG LIMIT PERFORMED: Non-plastic* 13.0' *INSUFFICIENT COHESIVE SAMPLE FOR MEANINGFUL STRENGTH OR DENSITY TESTING* 15.0' Switched to mud rotary			96				
15		570						
	17.0-26.8' (SP-SC) Gray, POORLY GRADED SAND WITH CLAY, fine-grained, trace coal, clay is lean			67	3-3-4 (10)			MC = 24.1% Sieve Analysis Sieve # % Passing #10 100.0 #20 100.0 #40 99.2 #60 61.3 #100 13.3 #140 6.7 #200 5.3
20		565						
				61	3-4-4 (11)			MC = 20.8%
25		560						
	26.8-38.8' (CL) Gray, LEAN CLAY, trace fine-grained sand			61	2-1-2 (4)			MC = 24.8%
30		555						
35				33	3-2-2 (6)			MC = 29.4%

N_{60} = (Em/60)Nm N_{60} - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1988 **Coordinate Zone:** Missouri Central **Coordinate Proj. Factor:** 1.00000000
Coordinate Datum: NAD 88 (CONUS) **Coordinate Units:** U.S. Survey Feet

* Persons using this information are cautioned that the materials shown are determined by the equipment noted and accuracy of the "log of materials" is limited thereby and by judgement of the operator. THIS INFORMATION IS FOR DESIGN PURPOSES ONLY.

LETTER BOREHOLE - MODOT 20150728.GDT - 7/31/25 12:09 - N:\LABORATORY\ACTIVE GINT PROJECTS\2025-0017.10 PERCHE CREEK MODOT.GPJ

Missouri Department of Transportation
Construction and Materials

BORING NO. B-1S
Page 2 of 2

Job No.: ST0017 (SCI No. 2025-0017.10) **County:** Boone **Route:** 70 Outer Roads
Design: **Skew:** **Location:** Columbia, Missouri
Bent: **Logged By:** Tina Cowan **Operator:** Palmerton and Parrish, Inc.
Station: **Northing:** 1142410.927 **Date of Work:** 05/15/25
Offset: **Easting:** 1665353.847 **Depth to Water:** 14.0
Elevation: 585.4 **Requested Northing:** **Depth Hole Open:** 63.8
Requested Station: **Requested Easting:** **Time Change:**
Requested Offset: **Equipment:** CME-55,Split-Spoon Sampler, Shelby Tube, NQ
Requested Elevation: **Location Note:**
Drill No.: **Hammer Efficiency:** 84.7% **Drilling Method:** Continuous Flight Auger, Mud rotary

Depth (ft)	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
35	26.8-38.8' (CL) Gray, LEAN CLAY, trace fine-grained sand *(continued)*	550						
40	38.8-42.0' (SM) Gray, SILTY SAND, fine- to coarse-grained, trace fine gravel	545		61	6-8-6 (20)			MC = 19.0%
	42.0-50.3' (SP) Gray, POORLY GRADED SAND WITH GRAVEL, fine- to coarse-grained, trace clay, gravel is fine to coarse			61	14-21-22 (61)			MC = 8.3%
45		540						
50		535		100	18-16-12 (40)			MC = 12.3%
	50.3-53.8' Weak Rock: Limestone							
55	53.8-63.8' LIMESTONE: Gray, hard, micritic, medium bedding, moderately weathered, dense 54.8' 7" Vertical fracture filled with clay	530		0 76 (45)	50/0.3'	Qu Test Results UCS = 632 ksf MC = 0% γ_{moist} = 157.9 pcf		MC = 21.9%
				100 (82)				
60	59.8' Becomes vuggy 60.0' Becomes slightly weathered 62.0' Medium to massive bedding	525		100 (88)		Qu Test Results UCS = 1010 ksf MC = 0% γ_{moist} = 163.6 pcf		
	Refusal at 53.8 feet. Bottom of borehole at 63.8 feet.							

N_{60} = (Em/60)Nm N_{60} - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1988 **Coordinate Zone:** Missouri Central **Coordinate Proj. Factor:** 1.00000000
Coordinate Datum: NAD 88 (CONUS) **Coordinate Units:** U.S. Survey Feet

* Persons using this information are cautioned that the materials shown are determined by the equipment noted and accuracy of the "log of materials" is limited thereby and by judgement of the operator. THIS INFORMATION IS FOR DESIGN PURPOSES ONLY.

LETTER BOREHOLE - MODOT 20150728.GDT - 7/31/25 12:09 - N:\LABORATORY\ACTIVE GINT PROJECTS\2025-0017.10 PERCHE CREEK MODOT.GPJ

STATE OF MISSOURI
MARTIN ALAN CHORKEY
NUMBER PE-2013006488
07-17-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-72
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
THE POWER OF BEING UNDERSTOOD
401 S. 18th St., Ste. 100
St. Louis, MO 63103-2759
314-531-4321 FAX: 314-531-0866
www.hornershifrin.com

EMERY SAPPS & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

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

REV. RevDesc

BORING DATA

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked TPL MAY 2026

Note: For locations of borings, see Sheet No. 1.
Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_72_Boring Log 1.dgn 12:19:52 AM Eastern 16-JUL-2026

Missouri Department of Transportation
Construction and Materials

BORING NO. B-2S
Page 1 of 3

Job No.: ST0017 (SCI No. 2025-0017.10)
County: Boone
Route: 70 Outer Roads
Design:
Skew:
Location: Columbia, Missouri
Bent:
Logged By: Tina Cowan
Operator: Palmerton and Parrish, Inc.
Station:
Northing: 1142384.837
Date of Work: 05/12/25
Offset:
Easting: 1665486.923
Depth to Water: 13.5
Elevation: 582.7
Requested Northing:
Depth Hole Open: 72.0
Requested Station:
Requested Easting:
Time Change:
Requested Offset:
Equipment: CME-55,Split-Spoon Sampler, Shelby Tube, NQ
Requested Elevation:
Location Note:
Drill No.:
Hammer Efficiency: 84.7%
Drilling Method: Continuous Flight Auger, Mud rotary

Depth (ft)	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
0	0.0-3.0' (FILL) Grayish brown, LEAN CLAY, trace fine-grained sand	580		11	4-4-6 (14)			MC = 25.1%
5	3.0-11.0' (CL) Gray, LEAN CLAY, with iron staining, with fine to coarse gravel			92		Qu Test Results UCS = 3.00 ksf MC = 23.8% γ_{moist} = 123.9 pcf		LL = 42 PL = 21 MC = 24.5%
	5.5' No gravel	575		0	1-2-3 (7)			
10	8.0' Becomes brown, with fine- to coarse-grained sand			92		Qu Test Results UCS = 0.600 ksf MC = 27.7% γ_{moist} = 130.5 pcf		LL = 27 PL = 20
	11.0-14.0' (SM) Gray and brown, SILTY SAND, fine- to coarse-grained	570						
15	14.0-17.0' (CL) Gray and brown, LEAN CLAY, with fine- to coarse-grained sand 15.0' Switched to mud rotary			100	1-0-1 (1)			MC = 22.6%
20	17.0-22.0' (SP) Gray, POORLY GRADED SAND, fine- to coarse-grained	565		50	4-4-4 (11)			MC = 22.6%
	22.0-24.0' (SC) Gray, CLAYEY SAND, fine- to coarse-grained, clay is lean	560		44	2-1-3 (6)			MC = 22.9%
25	24.0-27.0' (CL) Gray, SANDY LEAN CLAY, sand is fine- to coarse-grained							
30	27.0-33.3' (SC) Gray, CLAYEY SAND, fine- to coarse-grained, with fine to coarse gravel, clay is lean	555		39	3-5-4 (13)			MC = 16.2%
	33.0' 3" LEAN CLAY	550		61	4-5-5 (14)			MC = 19.6%
35								

N_{60} = (Em/60)Nm N_{60} - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1988 **Coordinate Zone:** Missouri Central **Coordinate Proj. Factor:** 1.00000000
Coordinate Datum: NAD 88 (CONUS) **Coordinate Units:** U.S. Survey Feet

* Persons using this information are cautioned that the materials shown are determined by the equipment noted and accuracy of the "log of materials" is limited thereby and by judgement of the operator. THIS INFORMATION IS FOR DESIGN PURPOSES ONLY.

LETTER BOREHOLE - MODOT 20150728.GDT - 7/31/25 12:09 - N:\LABORATORY\ACTIVE GINT PROJECTS\2025-0017.10 PERCHE CREEK MODOT.GPJ

Missouri Department of Transportation
Construction and Materials

BORING NO. B-2S
Page 2 of 3

Job No.: ST0017 (SCI No. 2025-0017.10)
County: Boone
Route: 70 Outer Roads
Design:
Skew:
Location: Columbia, Missouri
Bent:
Logged By: Tina Cowan
Operator: Palmerton and Parrish, Inc.
Station:
Northing: 1142384.837
Date of Work: 05/12/25
Offset:
Easting: 1665486.923
Depth to Water: 13.5
Elevation: 582.7
Requested Northing:
Depth Hole Open: 72.0
Requested Station:
Requested Easting:
Time Change:
Requested Offset:
Equipment: CME-55,Split-Spoon Sampler, Shelby Tube, NQ
Requested Elevation:
Location Note:
Drill No.:
Hammer Efficiency: 84.7%
Drilling Method: Continuous Flight Auger, Mud rotary

Depth (ft)	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
35	33.3-37.0' (SP-SC) Gray, POORLY GRADED SAND WITH CLAY, fine- to medium-grained, clay is lean *(continued)*	545						
	37.0-42.0' (SP) Gray, POORLY GRADED SAND, fine- to coarse-grained, trace fine to coarse gravel, trace lean clay			56	4-10-11 (30)			MC = 14.6%
40	42.0-46.5' (GP-GC) Gray, POORLY GRADED GRAVEL WITH CLAY, fine to coarse, with fine- to coarse-grained sand, clay is lean	540						
45	46.5-47.0' WEAK ROCK, limestone			56	14-11-10 (30)			MC = 9.6% Sieve Analysis Sieve # % Passing 3/4-inch 100.0 3/8-inch 76.6 #4 52.9 #10 34.6 #20 24.8 #40 16.3 #60 11.3 #100 9.6 #140 8.1 #200 7.2
	47.0-72.0 LIMESTONE: Gray, hard, micritic, thick to medium bedding, weathered, dense	535		100 (31)				
50	49.5' Trace chert	530		100 (55)		Qu Test Results UCS = 2080 ksf MC = 0% γ_{moist} = 164 pcf		
55	56.0' Slightly weathered	525		99 (99)		Qu Test Results UCS = 842 ksf MC = 0% γ_{moist} = 161.7 pcf		
60	57.0' Thick to massive bedding	520		98 (98)		Qu Test Results UCS = 745 ksf MC = 0% γ_{moist} = 163.2 pcf		
65		515		100 (98)		Qu Test Results UCS = 897 ksf MC = 0% γ_{moist} = 163.1 pcf		
70								

N_{60} = (Em/60)Nm N_{60} - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1988 **Coordinate Zone:** Missouri Central **Coordinate Proj. Factor:** 1.00000000
Coordinate Datum: NAD 88 (CONUS) **Coordinate Units:** U.S. Survey Feet

* Persons using this information are cautioned that the materials shown are determined by the equipment noted and accuracy of the "log of materials" is limited thereby and by judgement of the operator. THIS INFORMATION IS FOR DESIGN PURPOSES ONLY.

LETTER BOREHOLE - MODOT 20150728.GDT - 7/31/25 12:09 - N:\LABORATORY\ACTIVE GINT PROJECTS\2025-0017.10 PERCHE CREEK MODOT.GPJ

BORING DATA

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked TPL MAY 2026

Note: For locations of borings, see Sheet No. 1.
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 73 of 78

B_JST0017_A9819_73_Boring Log 2.dgn 12:22:09 AM Eastern 16-JUL-2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
PE-2013006488
16-JUL-2026

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-73
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

HORNER SHIFRIN
THE POWER OF BUILDING KNOWLEDGE
401 S. 18th St., Ste. 400
St. Louis, MO 63103
314-531-4321 FAX 314-531-6866
www.hornershifrin.com

EMERY SAPPE SONS, INC

REV. RevDesc

Missouri Department of Transportation
Construction and Materials

BORING NO. B-2S
Page 3 of 3

Job No.: ST0017 (SCI No. 2025-0017.10) **County:** Boone **Route:** 70 Outer Roads
Design: **Skew:** **Location:** Columbia, Missouri
Bent: **Logged By:** Tina Cowan **Operator:** Palmerton and Parrish, Inc.
Station: **Northing:** 1142384.837 **Date of Work:** 05/12/25
Offset: **Easting:** 1665486.923 **Depth to Water:** 13.5
Elevation: 582.7 **Requested Northing:** **Depth Hole Open:** 72.0
Requested Station: **Requested Easting:** **Time Change:**
Requested Offset: **Equipment:** CME-55,Split-Spoon Sampler, Shelby Tube, NQ
Requested Elevation: **Location Note:**
Drill No.: **Hammer Efficiency:** 84.7% **Drilling Method:** Continuous Flight Auger, Mud rotary

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
70		47.0-72.0' LIMESTONE: Gray, hard, micritic, thick to medium bedding, weathered, dense *(continued)*			100 (100)		Qu Test Results UCS = 1140 ksf MC = 0% γ_{moist} = 159.3 pcf		
		Refusal at 47.0 feet. Bottom of borehole at 72.0 feet.							

N_{60} = (Em/60)Nm N_{60} - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1988 **Coordinate Zone:** Missouri Central **Coordinate Proj. Factor:** 1.00000000
Coordinate Datum: NAD 88 (CONUS) **Coordinate Units:** U.S. Survey Feet

* Persons using this information are cautioned that the materials shown are determined by the equipment noted and accuracy of the "log of materials" is limited thereby and by judgement of the operator. THIS INFORMATION IS FOR DESIGN PURPOSES ONLY.

LETTER BOREHOLE - MODOT 20150728.GDT - 7/31/25 12:09 - N:\LABORATORY\ACTIVE GINT PROJECTS\2025-0017.10 PERCHE CREEK MODOT.GPJ

Missouri Department of Transportation
Construction and Materials

BORING NO. B-3S
Page 1 of 2

Job No.: ST0017 (SCI No. 2025-0017.10) **County:** Boone **Route:** 70 Outer Roads
Design: **Skew:** **Location:** Columbia, Missouri
Bent: **Logged By:** Tina Cowan **Operator:** Palmerton and Parrish, Inc.
Station: **Northing:** 1142377.875 **Date of Work:** 05/13/25
Offset: **Easting:** 1665649.168 **Depth to Water:** 13.5
Elevation: 583.1 **Requested Northing:** **Depth Hole Open:** 70.0
Requested Station: **Requested Easting:** **Time Change:**
Requested Offset: **Equipment:** CME-55,Split-Spoon Sampler, Shelby Tube, NQ
Requested Elevation: **Location Note:**
Drill No.: **Hammer Efficiency:** 84.7% **Drilling Method:** Continuous Flight Auger, Mud rotary

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
0		0.0-5.5' (CL) Gray and brown, LEAN CLAY	580		100		Qu Test Results UCS = 1.20 ksf MC = 21.9% γ_{moist} = 121.4 pcf		LL = 36 PL = 21
5					89	4-5-5 (14)			MC = 22.7%
		5.5-12.0' (CL) Gray and brown, SANDY LEAN CLAY, sand is fine-grained, with fine to coarse gravel	575		88		Qu Test Results MC = 24.3% γ_{moist} = 112.6 pcf		LL = 30 PL = 14
10		6.0' *INSUFFICIENT COHESIVE SAMPLE FOR MEANINGFUL STRENGTH TESTING* 8.0' No gravel			50	2-3-3 (8)			MC = 23.2%
		12.0-22.0' (SM) Brown and gray, SILTY SAND, fine-grained ▽	570		83	2-2-3 (7)			MC = 20.6%
15		15.0' Switched to mud rotary							
		17.0' Becomes gray, fine-grained	565		67	3-4-4 (11)			MC = 18.8%
20		22.0-27.0' (SC) Gray, CLAYEY SAND, fine- to coarse-grained, trace fine to coarse gravel, trace wood, clay is lean	560		61	2-1-2 (4)			MC = 27.7%
25		27.0-28.8' (CL) Gray, LEAN CLAY	555		78	5-6-7 (18)			MC = 21.5%
30		28.8-32.0' (SP) Gray, POORLY GRADED SAND, fine- to coarse-grained 29.5' Becomes fine-grained							
		32.0-42.0' (CH) Gray, FAT CLAY	550		100	2-3-3 (8)			MC = 49.6%
35									

N_{60} = (Em/60)Nm N_{60} - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1988 **Coordinate Zone:** Missouri Central **Coordinate Proj. Factor:** 1.00000000
Coordinate Datum: NAD 88 (CONUS) **Coordinate Units:** U.S. Survey Feet

* Persons using this information are cautioned that the materials shown are determined by the equipment noted and accuracy of the "log of materials" is limited thereby and by judgement of the operator. THIS INFORMATION IS FOR DESIGN PURPOSES ONLY.

LETTER BOREHOLE - MODOT 20150728.GDT - 7/31/25 12:09 - N:\LABORATORY\ACTIVE GINT PROJECTS\2025-0017.10 PERCHE CREEK MODOT.GPJ

MISSOURI OF MISSOURI MARTIN ALAN CHORKEY PE-2013006488 ENGINEER
Martin Chorkey 7-16-26

DATE PREPARED 16-JUL-2026
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. BR04-74
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
MoDOT
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
THE POWER OF BEING UNDERSTOOD
401 S. 18th St., Ste. 400
St. Louis, MO 63103
314-621-4321 FAX: 314-621-6986
www.HornerShifrin.com

EMERY SAPPS SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

BORING DATA

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked TPL MAY 2026

Note: For locations of borings, see Sheet No. 1.
Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_74_Boring Log 3.dgn 12:18:51 AM Eastern 16-JUL-2026

Missouri Department of Transportation
Construction and Materials

BORING NO. B-3S
Page 2 of 2

Job No.: ST0017 (SCI No. 2025-0017.10) **County:** Boone **Route:** 70 Outer Roads
Design: **Skew:** **Location:** Columbia, Missouri
Bent: **Logged By:** Tina Cowan **Operator:** Palmerton and Parrish, Inc.
Station: **Northing:** 1142377.875 **Date of Work:** 05/13/25
Offset: **Easting:** 1665649.168 **Depth to Water:** 13.5
Elevation: 583.1 **Requested Northing:** **Depth Hole Open:** 70.0
Requested Station: **Requested Easting:** **Time Change:**
Requested Offset: **Equipment:** CME-55,Split-Spoon Sampler, Shelby Tube, NQ
Requested Elevation: **Location Note:**
Drill No.: **Hammer Efficiency:** 84.7% **Drilling Method:** Continuous Flight Auger, Mud rotary

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
35		32.0-42.0' (CH) Gray, FAT CLAY *(continued)*							
40			545		83	2-2-3 (7)			MC = 28.4%
		42.0-45.0' (SP) Gray, POORLY GRADED SAND WITH GRAVEL, fine- to coarse-grained, gravel is fine to coarse	540		83	22-16-8 (34)			MC = 10.2%
45		45.0-70.0' LIMESTONE: Gray, hard, micritic, thin to medium bedding, slightly weathered, dense, trace shale	535		100 (58)		Qu Test Results UCS = 1140 ksf MC = 0% γ_{moist} = 167.4 pcf		
50			530		100 (82)		Qu Test Results UCS = 1310 ksf MC = 0% γ_{moist} = 162.2 pcf		
55		57.0' Thick bedding	525		100 (100)		Qu Test Results UCS = 1230 ksf MC = 0% γ_{moist} = 160.3 pcf		
60		61.0' Trace chert	520		97 (88)		Qu Test Results UCS = 1040 ksf MC = 0% γ_{moist} = 162.6 pcf		
65		65.0' Medium to thick bedding	515		100 (85)		Qu Test Results UCS = 1130 ksf MC = 0% γ_{moist} = 165.1 pcf		
70		Refusal at 45.0 feet. Bottom of borehole at 70.0 feet.							

N_{60} = (Em/60)Nm N_{60} - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1988 **Coordinate Zone:** Missouri Central **Coordinate Proj. Factor:** 1.00000000
Coordinate Datum: NAD 88 (CONUS) **Coordinate Units:** U.S. Survey Feet

* Persons using this information are cautioned that the materials shown are determined by the equipment noted and accuracy of the "log of materials" is limited thereby and by judgement of the operator. THIS INFORMATION IS FOR DESIGN PURPOSES ONLY.

LETTER BOREHOLE - MODOT 20150728.GDT - 7/31/25 12:09 - N:\LABORATORY\ACTIVE GINT PROJECTS\2025-0017.10 PERCHE CREEK MODOT.GPJ

Missouri Department of Transportation
Construction and Materials

BORING NO. B-4S
Page 1 of 2

Job No.: ST0017 (SCI No. 2025-0017.10) **County:** Boone **Route:** 70 Outer Roads
Design: **Skew:** **Location:** Columbia, Missouri
Bent: **Logged By:** Tina Cowan **Operator:** Palmerton and Parrish, Inc.
Station: **Northing:** 1142372.416 **Date of Work:** 05/15/25
Offset: **Easting:** 1665794.317 **Depth to Water:** 14.0
Elevation: 584.9 **Requested Northing:** **Depth Hole Open:** 58.3
Requested Station: **Requested Easting:** **Time Change:**
Requested Offset: **Equipment:** CME-55,Split-Spoon Sampler, Shelby Tube, NQ
Requested Elevation: **Location Note:**
Drill No.: **Hammer Efficiency:** 84.7% **Drilling Method:** Continuous Flight Auger, Mud rotary

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
0		0.0-22.0' (CL) Gray, LEAN CLAY, trace fine-grained sand			56	2-1-2 (4)			MC = 23.9%
5		3.0' Becomes gray and brown	580		61	1-1-2 (4)			MC = 20.5%
		5.5' Becomes brown			67	2-2-2 (6)			MC = 19.5%
10		8.0' With fine- to coarse-grained sand	575		100		Qu Test Results UCS = 1.00 ksf MC = 23.4% γ_{moist} = 128 pcf		LL = 29 PL = 18
15		14.5' Interbedded with silty sand 15.0' Switched to mud rotary	570		100	0-0-1 (1)			MC = 32.5%
20		17.0' With fine-grained sand	565		100	0-0-0 (0)			MC = 26.0%
25		22.0-24.5' (CL) Gray, SANDY LEAN CLAY, fine-grained	560		89	3-4-6 (14)			MC = 20.2%
		24.5-27.0' (GC) Gray, CLAYEY GRAVEL, fine to coarse, clay is lean							
30		27.0-31.5' (SC) Gray, CLAYEY SAND WITH GRAVEL, fine- to coarse-grained, trace weathered sandstone, clay is lean, gravel is fine to coarse	555		61	11-11-12 (32)			MC = 8.1% Sieve Analysis Sieve # % Passing 3/4-inch 100.0 3/8-inch 74.1 #4 66.1 #10 58.5 #20 50.7 #40 39.0 #60 25.8 #100 17.7
35		31.5-33.0' WEAK ROCK, likely limestone	550		93 (0)				

N_{60} = (Em/60)Nm N_{60} - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1988 **Coordinate Zone:** Missouri Central **Coordinate Proj. Factor:** 1.00000000
Coordinate Datum: NAD 88 (CONUS) **Coordinate Units:** U.S. Survey Feet

* Persons using this information are cautioned that the materials shown are determined by the equipment noted and accuracy of the "log of materials" is limited thereby and by judgement of the operator. THIS INFORMATION IS FOR DESIGN PURPOSES ONLY.

LETTER BOREHOLE - MODOT 20150728.GDT - 7/31/25 12:09 - N:\LABORATORY\ACTIVE GINT PROJECTS\2025-0017.10 PERCHE CREEK MODOT.GPJ

STATE OF MISSOURI
MARTIN ALAN CHORKEY
PE-2013006488
07-17-26

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-75
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
THE HORNER SHIFRIN GROUP, INC.
801 S. 18th St., Ste. 400
St. Louis, MO 63103
314-531-1021 FAX: 314-531-0966
www.hornershifrin.com

EMERY SAPP & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

BORING DATA

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked TPL MAY 2026

Note: For locations of borings, see Sheet No. 1.
Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_75_Boring Log 4.dgn 12:21:25 AM Eastern 16-JUL-2026

Missouri Department of Transportation
Construction and Materials

BORING NO. B-4S
Page 2 of 2

Job No.: ST0017 (SCI No. 2025-0017.10)
Design:
Bent:
Station:
Offset:
Elevation: 584.9
Requested Station:
Requested Offset:
Requested Elevation:
Drill No.:

County: Boone
Skew:
Logged By: Tina Cowan
Northing: 1142372.416
Easting: 1665794.317
Requested Northing:
Requested Easting:
Equipment: CME-55,Split-Spoon Sampler, Shelby Tube, NQ
Location Note:
Hammer Efficiency: 84.7%

Route: 70 Outer Roads
Location: Columbia, Missouri
Operator: Palmerton and Parrish, Inc.
Date of Work: 05/15/25
Depth to Water: 14.0
Depth Hole Open: 58.3
Time Change:
Drilling Method: Continuous Flight Auger, Mud rotary

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
35									#140 15.0 #200 13.2
		33.0-58.5' LIMESTONE: Gray, hard, micritic, thin bedding, slightly to moderately weathered, trace chert, dense *(continued)* 37.0' Thin to medium bedding 37.7' 4" Vertical fracture			97 (63)		Qu Test Results UCS = 897 ksf MC = 0% γ_{moist} = 162.1 pcf		
40			545				Qu Test Results UCS = 856 ksf MC = 0% γ_{moist} = 164.9 pcf		
					100 (97)				
45		43.5' Medium to thick bedding, fresh to slightly weathered	540						
		45.5' Trace chert							
					97 (97)		Qu Test Results UCS = 829 ksf MC = 0% γ_{moist} = 156 pcf		
50			535				Qu Test Results UCS = 767 ksf MC = 0% γ_{moist} = 153.9 pcf		
		52.0' Thick bedding			100 (100)				
55			530				Qu Test Results UCS = 745 ksf MC = 0% γ_{moist} = 162.1 pcf		
					100 (100)				
		Refusal at 33.0 feet. Bottom of borehole at 58.5 feet.							

N_{60} = (Em/60)Nm N_{60} - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1988 **Coordinate Zone:** Missouri Central **Coordinate Proj. Factor:** 1.00000000
Coordinate Datum: NAD 88 (CONUS) **Coordinate Units:** U.S. Survey Feet

* Persons using this information are cautioned that the materials shown are determined by the equipment noted and accuracy of the "log of materials" is limited thereby and by judgement of the operator. THIS INFORMATION IS FOR DESIGN PURPOSES ONLY.

LETTER BOREHOLE - MODOT 20150728.GDT - 7/31/25 12:09 - N:\LABORATORY\ACTIVE GINT PROJECTS\2025-0017.10 PERCHE CREEK MODOT.GPJ

Missouri Department of Transportation
Construction and Materials

BORING NO. B-5S
Page 1 of 1

Job No.: ST0017 (SCI No. 2025-0017.10)
Design:
Bent:
Station:
Offset:
Elevation: 589.1
Requested Station:
Requested Offset:
Requested Elevation:
Drill No.:

County: Boone
Skew:
Logged By: Tina Cowan
Northing: 1142345.124
Easting: 1666007.793
Requested Northing:
Requested Easting:
Equipment: CME-55,Split-Spoon Sampler, Shelby Tube, NQ
Location Note:
Hammer Efficiency: 84.7%

Route: 70 Outer Roads
Location: Columbia, Missouri
Operator: Palmerton and Parrish, Inc.
Date of Work: 05/19/25
Depth to Water: None
Depth Hole Open: 20.5
Time Change:
Drilling Method: Continuous Flight Auger

Depth (ft)	Graphic	Description	Elevation (ft)	Sample Type	REC % (RQD %)	Blow Counts (N_{60})	Shear Data	Field Tests	Index Tests
0		0.0-2.0' (FILL) Brown, FAT CLAY, with fine to coarse gravel			46	4-5-50/0.1'			
		2.0-2.8' Weak rock: Limestone (likely a boulder)			0	50/0.2'			
		2.8-8.0' (CH) Brown, FAT CLAY	585						
5		5.8' With fine to coarse gravel			17	4-4-6			
		8.0-10.3' (CL) Reddish brown, LEAN CLAY, with fine to coarse gravel, few fine- to coarse-grained sand	580		100 78	8-3-4			LL = 46 PL = 19 MC = 16.3% MC = 25.4%
		8.0' *INSUFFICIENT COHESIVE SAMPLE FOR MEANINGFUL STRENGTH TESTING*			100 (0)				
10		10.3-18.8' LIMESTONE: Gray, moderately hard, thin bedding, moderately weathered, dense 10.5' Becomes hard, medium bedding, slightly weathered	575		95 (69)		Qu Test Results MC = 0% γ_{moist} = 162.5 pcf		
15									
			570		100 (84)				
20		18.8-20.3' CALCAREOUS SHALE: Gray, moderately hard, weathered weathered, dense							
		Refusal at 10.3 feet. Bottom of borehole at 20.5 feet.							

N_{60} = (Em/60)Nm N_{60} - Corrected N value for standard 60% SPT efficiency; Em - Measured hammer efficiency in percent; Nm - Observed N-value
(1) = Assumed, (2) = Actual

Coordinate System: Modified U.S. State Plane 1988 **Coordinate Zone:** Missouri Central **Coordinate Proj. Factor:** 1.00000000
Coordinate Datum: NAD 88 (CONUS) **Coordinate Units:** U.S. Survey Feet

* Persons using this information are cautioned that the materials shown are determined by the equipment noted and accuracy of the "log of materials" is limited thereby and by judgement of the operator. THIS INFORMATION IS FOR DESIGN PURPOSES ONLY.

LETTER BOREHOLE - MODOT 20150728.GDT - 7/31/25 12:09 - N:\LABORATORY\ACTIVE GINT PROJECTS\2025-0017.10 PERCHE CREEK MODOT.GPJ

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

DATE PREPARED: 16-JUL-2026
ROUTE: I-70 | STATE: MO
DISTRICT: BR | SHEET NO.: BR04-76
COUNTY: BOONE
JOB NUMBER: JST0017
CONTRACT ID.: 251203-D01
PROJECT NO.: IS 70-2(128)
BRIDGE NO.: A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN
THE POWER OF EXPERIENCE AND INNOVATION
401 S. 18th St., Ste. 400
St. Louis, MO 63103-2705
314-621-4321 FAX: 314-621-4986
www.HornerShifrin.com

EMERY SAPPS SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

BORING DATA

Designed CMR FEB 2026
Detailed CAB FEB 2026
Checked TPL MAY 2026

Note: For locations of borings, see Sheet No. 1.
Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_76_Boring Log 5.dgn 12:22:14 AM Eastern 16-JUL-2026

Surface Elevation: 608.2
Datum: NAVD88
Completion Date: 7/19/23
Northing: 1142422.79
Easting: 1666076.67

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS (N60) CORE RECOVERY/RQD	SAMPLES	SHEAR STRENGTH, tsf (Δ - UU/2, ○ - QU/2, □ - PP/2) 0.5 1.0 1.5 2.0 2.5 / STANDARD PENETRATION RESISTANCE ▲ N-VALUE (BLOWS PER FOOT) (ASTM D 1586)	WATER CONTENT, % PL 10 20 30 40 50 LL
		Asphalt - 1 inch					
		Concrete - 9 inches					
		Granular Base - 6 inches					
		(1.3 to 8.0 ft) FILL: soft to medium stiff, brown, lean clay, little gravel		1-2-2 (5)	SS1		
				101	ST2		
5	603.2						
				1-2-3 (7)	SS3		
		(8.0 to 17.0 ft) Medium stiff to stiff, brown, FAT CLAY - CH					
				1-3-4 (9)	SS4		
10	598.2						
				2-5-8 (17)	SS5		
15	593.2						
		(17.0 to 24.0 ft) Stiff, reddish-brown, FAT CLAY, some weathered limestone gravel					
				40-17-11 (37)	SS6		
20	588.2						
				50/2"	SS7		
		(24.0 to 25.5 ft) Core Loss - 18 inches (rock core not recovered)		0%	NQ1		

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

N60 BORING LOG (WITH PAGE #) B-27 AND B-28.GPJ 00 CLONE ME.GPJ 11/8/23

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM ___ FEET
RR DRILLER VTZ LOGGER
CME 55HTX DRILL RIG
HAMMER TYPE Auto
HAMMER EFFICIENCY 80 %

REMARKS:

Drawn by: VTZ	Checked by: CKK	App'vd. by: CKK
Date: 8/1/23	Date: 11/8/23	Date: 11/8/23

GEOTECHNOLOGY
A Universal Engineering Sciences Company

I-70 Improvements
I-70 over Perche Creek
Boone County, Missouri

LOG OF BORING: B-28
Page 1 of 2

Project No. J036741.01

Surface Elevation: 608.2
Datum: NAVD88
Completion Date: 7/19/23
Northing: 1142422.79
Easting: 1666076.67

DEPTH IN FEET	ELEVATION IN FEET	DESCRIPTION OF MATERIAL	GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS (N60) CORE RECOVERY/RQD	SAMPLES	SHEAR STRENGTH, tsf (Δ - UU/2, ○ - QU/2, □ - PP/2) 0.5 1.0 1.5 2.0 2.5 / STANDARD PENETRATION RESISTANCE ▲ N-VALUE (BLOWS PER FOOT) (ASTM D 1586)	WATER CONTENT, % PL 10 20 30 40 50 LL
				0%			
		(25.5 to 26.8 ft) Strong, gray, finely crystalline, thin to medium bedded, moderately to slightly weathered, slightly pitted LIMESTONE					
		unconfined compressive strength = 10,855 psi (1,563 ksf)		75% 25%	NQ2		
		(26.8 to 27.1 ft) Core Loss - 4 inches (rock core not recovered)					
		(27.1 to 28.6 ft) limestone cont.					
		(28.6 to 29.1 ft) Core Loss - 6 inches (rock core not recovered)					
30	578.2	(29.1 to 30.0 ft) limestone cont.					
		(30.0 to 30.5 ft) Core Loss - 6 inches (rock core not recovered)					
		(30.5 to 35.8 ft) Strong to medium strong, gray and brown, finely crystalline, thin to thick bedded, slightly weathered to unweathered LIMESTONE		97% 93%	NQ3		
		unconfined compressive strength = 7,977 psi (1,149 ksf)					
35	573.2	unconfined compressive strength = 4,634 psi (667 ksf)		33%/0%	NQ4		
		(35.8 to 36.0 ft) Core Loss - 3 inches (rock core not recovered)					
		Boring terminated at 36 feet.					
40	568.2						
45	563.2						

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

N60 BORING LOG (WITH PAGE #) B-27 AND B-28.GPJ 00 CLONE ME.GPJ 11/8/23

GROUNDWATER DATA

X FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

___ AUGER 3 3/4" HOLLOW STEM
WASHBORING FROM ___ FEET
RR DRILLER VTZ LOGGER
CME 55HTX DRILL RIG
HAMMER TYPE Auto
HAMMER EFFICIENCY 80 %

REMARKS:

Drawn by: VTZ	Checked by: CKK	App'vd. by: CKK
Date: 8/1/23	Date: 11/8/23	Date: 11/8/23

GEOTECHNOLOGY
A Universal Engineering Sciences Company

I-70 Improvements
I-70 over Perche Creek
Boone County, Missouri

LOG OF BORING: B-28
Page 2 of 2

Project No. J036741.01

BORING DATA

Designed MAC JUL 2026
Detailed SLF JUL 2026
Checked MAC JUL 2026

Note: For locations of borings, see Sheet No. 1.
Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_77_Boring Log 6.dgn 2:01:35 AM Eastern 16-JUL-2026

STATE OF MISSOURI
MARTIN ALAN CHORKEY
PE-2013006488
7-17-26

DATE PREPARED 16-JUL-2026
ROUTE I-70 | STATE MO
DISTRICT BR | SHEET NO. BR04-77
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

EMERY SAPP & SONS, INC

HORNER SHIFRIN
THE POWER OF COLLABORATION
401 S. 18th St., Ste. 700
ST. LOUIS, MISSOURI 63103
314-531-4321 FAX: 314-531-5866
www.hornershifrin.com

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

REV. RevDesc

Crockett GTL
1000 W Nifong Blvd, Bldg 1
Columbia, MO 65203
Telephone: 573-447-0292

CROCKETT GEOTECHNICAL - TESTING LAB

BORING NUMBER CR-07

CLIENT Parsons
PROJECT NAME Perche Creek High Fill
PROJECT NUMBER G251248
PROJECT LOCATION Columbia, Missouri
DATE STARTED 2/27/26 **COMPLETED** 2/27/26
GROUND ELEVATION 584.9 ft MSL **HOLE SIZE** 4"
DRILL RIG IPES Mobile B-57 (Hammer Efficiency = 91.7%)
GROUND WATER LEVELS:
DRILLING METHOD 4" SSA
AT TIME OF DRILLING 23.50 ft / Elev 561.40 ft
LOGGED BY Korn **CHECKED BY** Lidholm
AT END OF DRILLING 28.00 ft / Elev 556.90 ft
NOTES Borehole backfilled upon completion
0.5hrs AFTER DRILLING 22.00 ft / Elev 562.90 ft

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY LENGTH	BLOW COUNTS (N VALUE)	PENETROMETER (tsf)	UNC. COMP. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
0		NORTHING: 1684543.711 / EASTING: 723626.807										
		0.5 TOPSOIL (6-inches) 584.4										
		LEAN CLAY: Brown, trace gray, mottled, trace rust and lignite stains	ST 1	6					24			
5			ST 2	17		3.0	2.41	103	22			
10		--: becomes gray, silty texture	ST 3	24		1.1		92	27	34	21	13
		12.0 572.9										
		SILT: Gray, trace sand	ST 4	24		0.4	0.53	95	29	32	23	9
15		17.0 567.9										
		SAND: Brownish gray	ST 5	24		sand			23			
20												
25		--: becomes gray	SPT 6	9	1-2-3 (5)	sand			45			
30			SPT 7	11	2-2-2 (4)	sand			19			
35		--: trace gravel	SPT 8	9	4-5-5 (10)	sand			21			
40		40.0 544.9	SPT 9	9	2-3-2 (5)	sand			22			

No refusal.
Bottom of borehole at 40.0 feet.

SAMPLE LENGTH REPORT (TSP) - LAT-LONG TEMPLATE GDT - 4/16/26 11:43 - V:\==PROJECTS==\GEOT PROJECTS\2025\G251248 - I-70 RC-2\== 03 PERCHE CREEK\G251248 - PERCHE HIGH FILL.GPJ

BORING DATA

Designed MAC JUL 2026
Detailed SLF JUL 2026
Checked MAC JUL 2026

Note: For locations of borings, see Sheet No. 1.
Note: This drawing is not to scale. Follow dimensions.

B_JST0017_A9819_78_Boring Log 7.dgn 2:01:33 AM Eastern 16-JUL-2026

STATE OF MISSOURI MARTIN ALAN CHORKEY NUMBER PE-2013006488 REGISTERED ENGINEER 4-17-26

DATE PREPARED 16-JUL-2026
ROUTE I-70 STATE MO
DISTRICT BR SHEET NO. BR04-78
COUNTY BOONE
JOB NUMBER JST0017
CONTRACT ID. 251203-D01
PROJECT NO. IS 70-2(128)
BRIDGE NO. A9819

REV	DATE	DESCRIPTION
0	071726	RFC BRIDGE A9819

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IMPROVE I-70 ROCHEPORT TO COLUMBIA

HORNER SHIFRIN — THE HORNER SHIFRIN GROUP, A CORPORATION — 801 S 18th St, Ste 400, St. Louis, MO 63103-2966, 314-531-1021 FAX 314-531-2966, www.HornerShifrin.com

EMERY SAPP & SONS, INC

MO STATE CERTIFICATE OF AUTHORITY #000159 ENGINEERING

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

REV. RevDesc