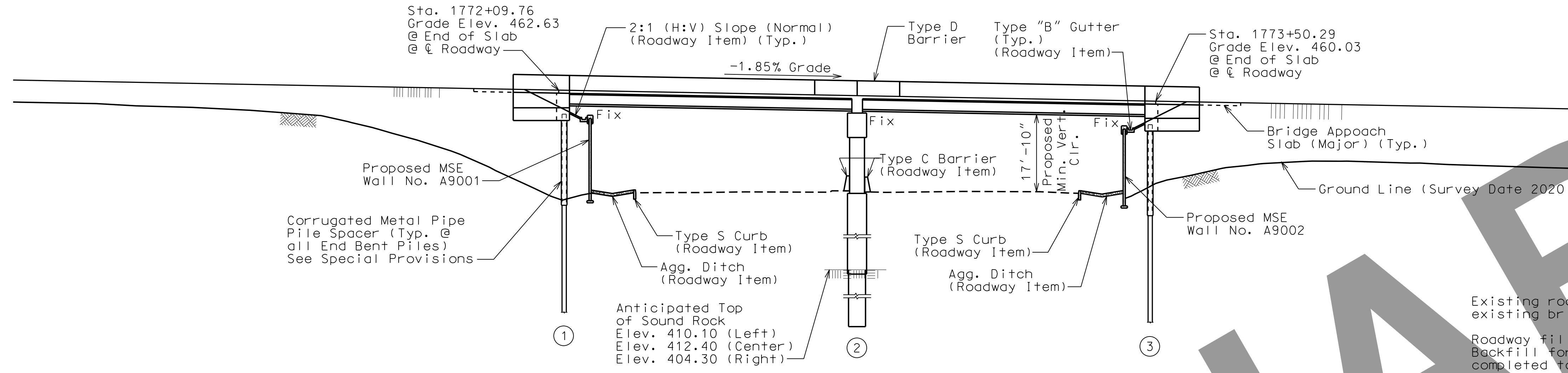
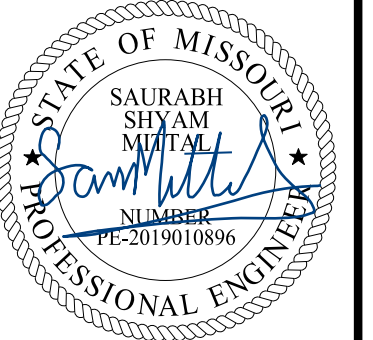


(69'-69') PRESTRESSED CONCRETE NU-GIRDER SPANS

SEC/SUR 114 TWP 47N RGE 7E

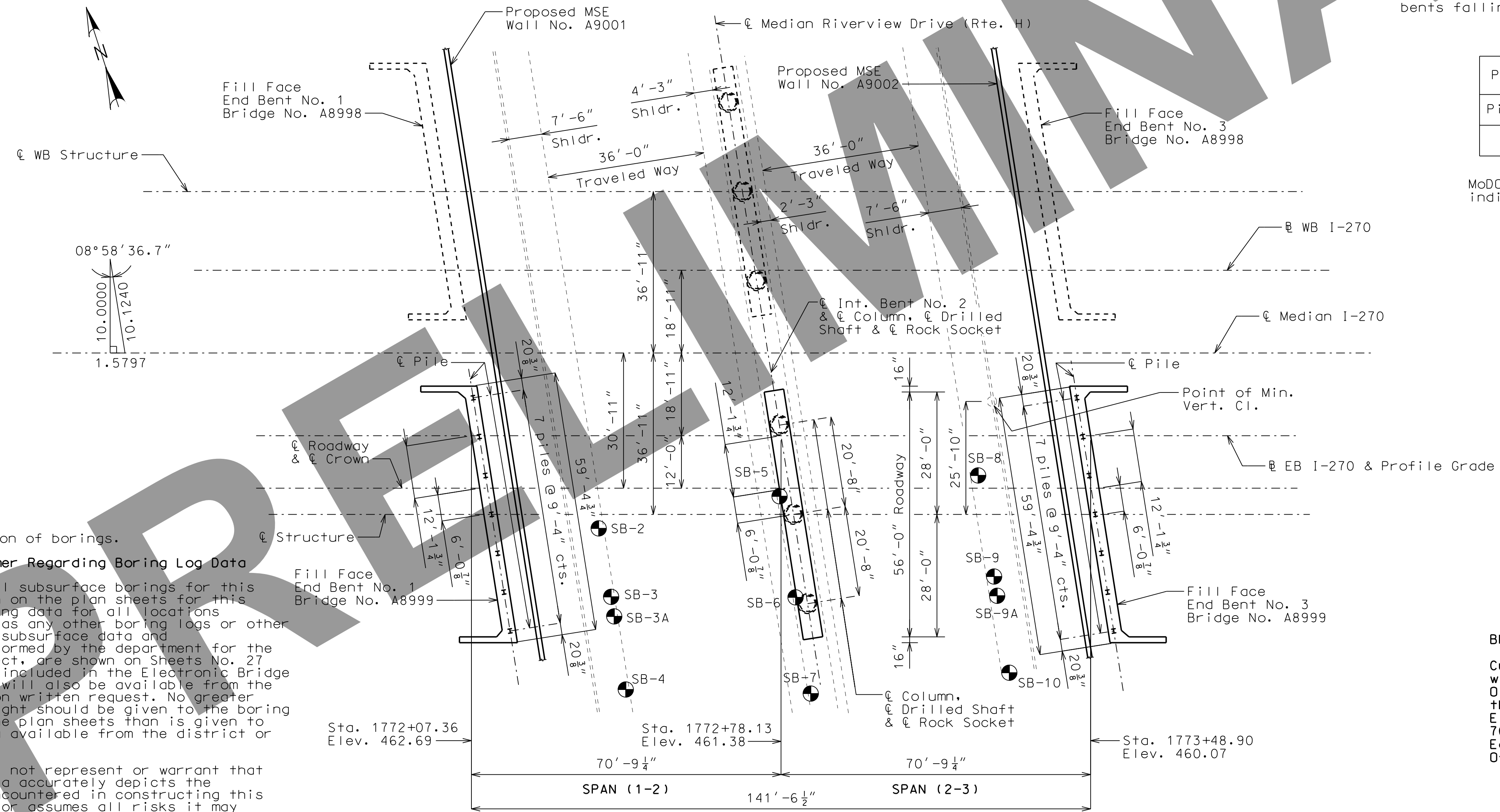


ELEVATION

Existing roadway fill under the east end of the existing bridge shall be removed. (Roadway Item)
 Roadway fill, exclusive of Select Granular Backfill for Structural Systems, 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.

Pile Encasement	Option Used (✓)
Pipe Pile Spacer	
Pile Jacket	

MoDOT Construction personnel will indicate the pile encasement used.



PLAN

⊕ 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 sheets 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 performed by the department for the design of the project, are shown on Sheets No. 27 thru 36 and may be included in the Electronic Bridge Deliverables. They will also be available from the Project Contact upon written request. No greater significance or weight should be given to the boring data depicted on the plan sheets than is given to the subsurface data available from the district or elsewhere.
 The Commission does not represent or warrant that any such boring data accurately depicts the conditions to be encountered in constructing this project. A contractor assumes all risks it may encounter in basing its bid prices, time or schedule of performance on the boring data depicted here or those available from the district, or on any other documentation not expressly warranted, which the contractor may obtain from the Commission.

BM 2316-4
 Cut "□" on southwest corner of wing wall at the west end of Old Chain of Rocks Bridge over the Mississippi River.
 Elev. = 439.761'
 763.844.05 N, 292.583.14 E
 Eastbound I-270 - Sta. 1778+73.98
 Offset 755.97' RT

BRIDGE: I-270 OVER ROUTE H (RIVERVIEW DRIVE)
 ROUTE I-270 (EB) FROM MISSOURI STATE LINE TO ROUTE 367
 ABOUT 0.6 MILES WEST OF MISSOURI STATE LINE
 BEGINNING STATION 1772+07.36 ALONG EB I-270

DATE PREPARED 3/14/2022	
ROUTE I-270	STATE MO
DISTRICT BR	SHEET NO. 1
COUNTY ST. LOUIS CITY	
JOB NO. J613020C	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A8999	

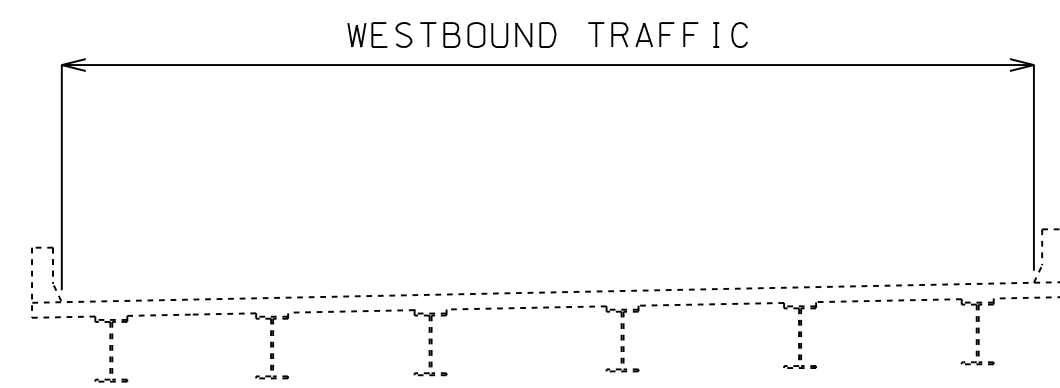
DESCRIPTION	DATE

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

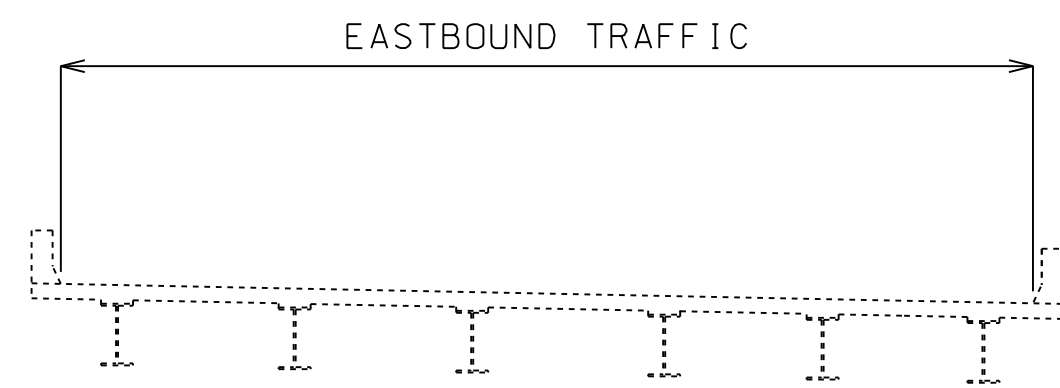
HORNER SHIFFRIN
 401 S. 18TH ST., STE. 400, ST. LOUIS, MO 63103
 314-591-4321 • FAX 314-591-4886
 WWW.HORNERSHIFFRIN.COM
 DISCIPLINE: PROFESSIONAL ENGINEERING
 CERTIFICATE OF AUTHORITY: 000159
 EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW EB BRIDGE GENERAL PLAN AND ELEVATION

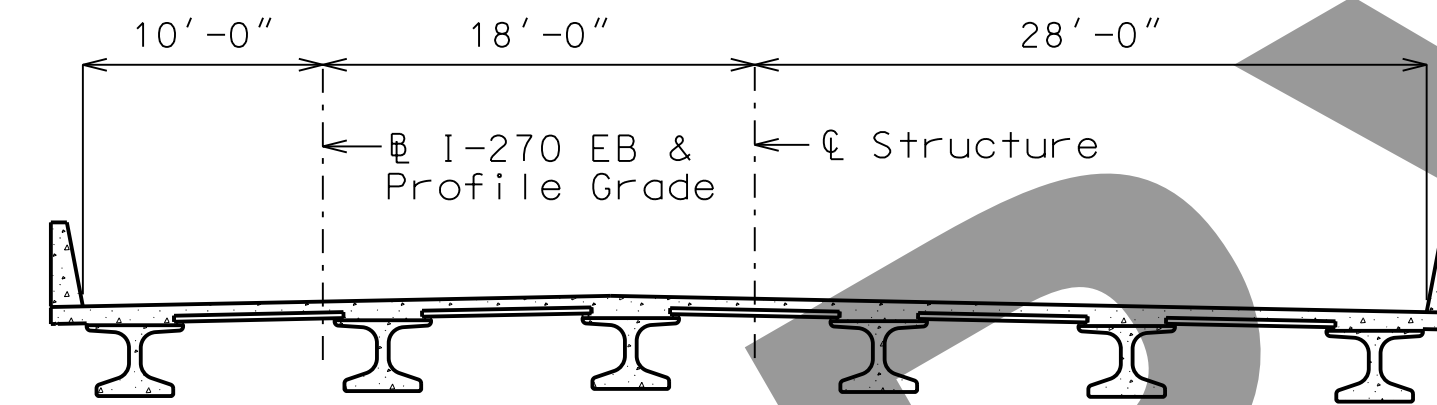
Designed: UVK
 Detailed: CAB/CBW
 Checked: TPL



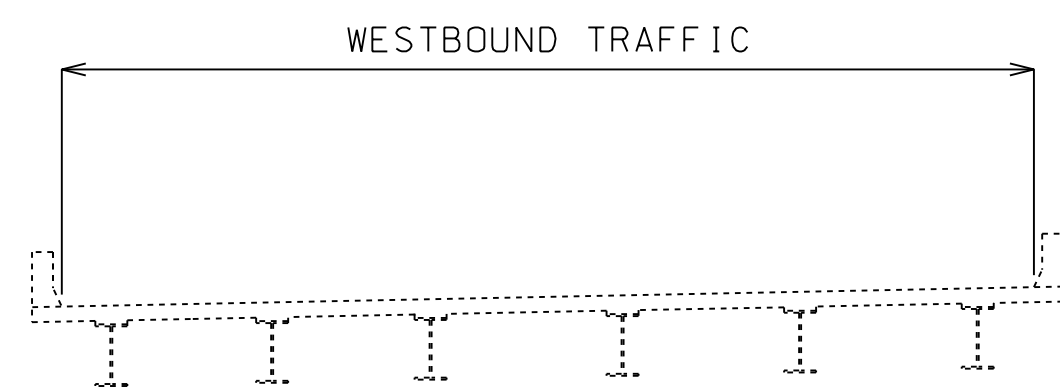
EXISTING WESTBOUND BRIDGE NO. A10251



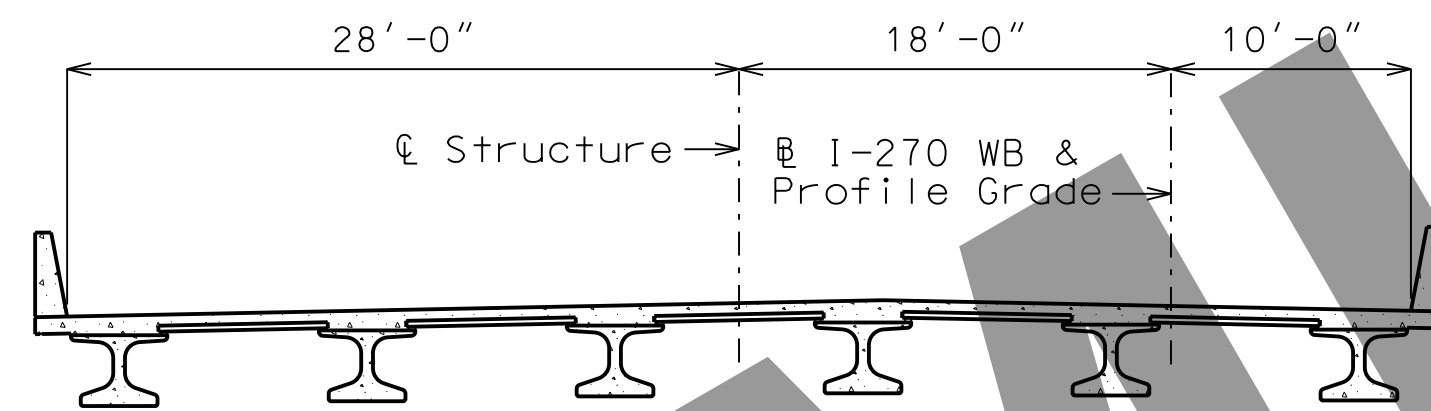
EXISTING EASTBOUND BRIDGE NO. A10241



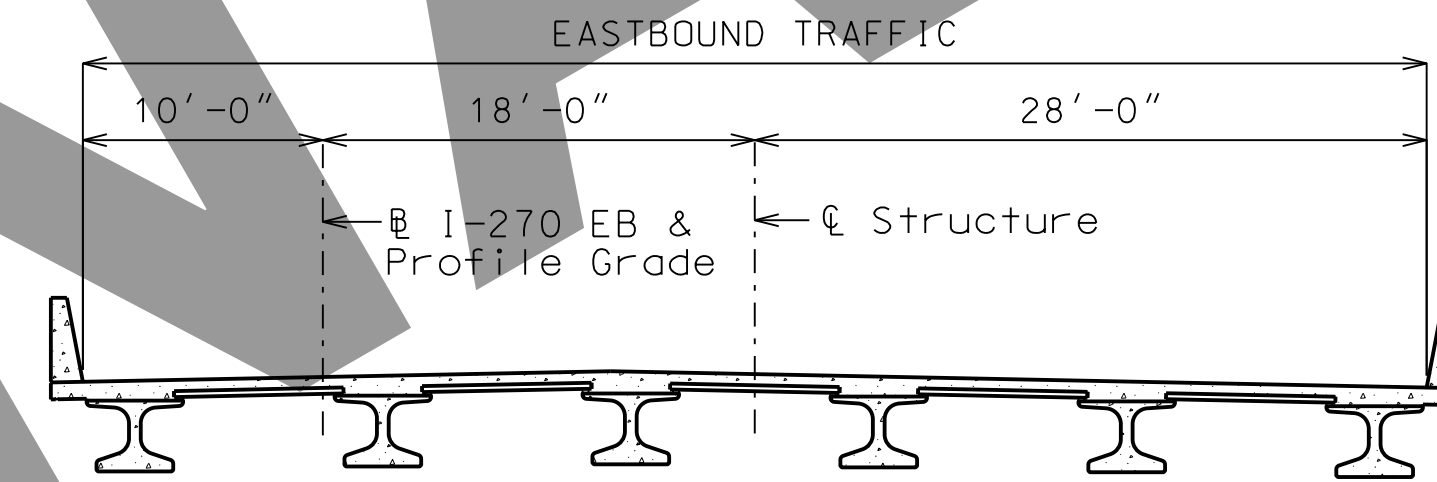
NEW EASTBOUND BRIDGE NO. A8999



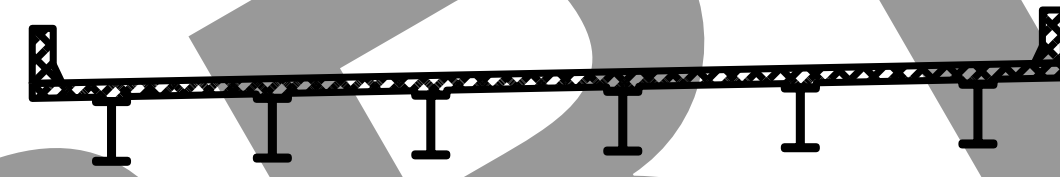
EXISTING WESTBOUND BRIDGE NO. A10251



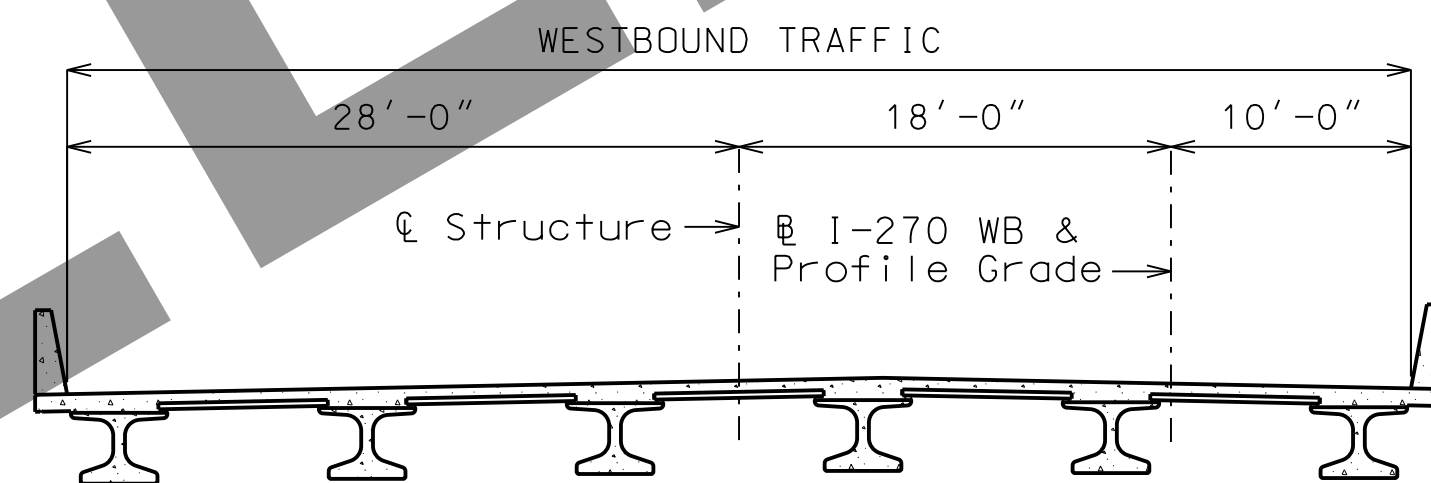
NEW WESTBOUND BRIDGE NO. A8998 AND REMOVE EXISTING EASTBOUND BRIDGE



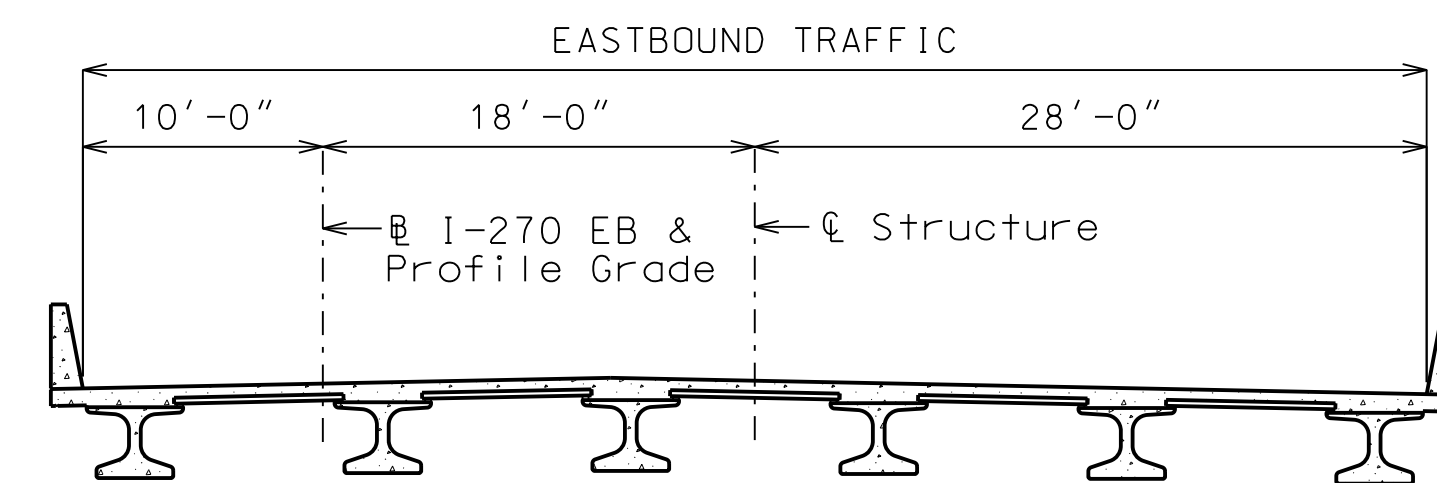
NEW EASTBOUND BRIDGE NO. A8999



REMOVE EXISTING WESTBOUND BRIDGE



NEW WESTBOUND BRIDGE NO. A8998



NEW EASTBOUND BRIDGE NO. A8999

STAGE 1

STAGE 2

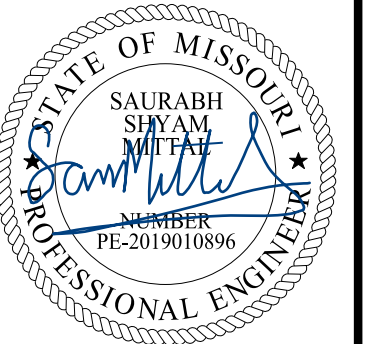
STAGE 3

STAGED CONSTRUCTION DETAILS

Designed: SSM
Detailed: CAB
Checked: TPL

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

Sheet No. 3 of 37



03/16/22

DATE PREPARED

3/14/2022

ROUTE I-270 STATE MO
DISTRICT BR SHEET NO. 3

COUNTY ST. LOUIS CITY

JOB NO. J613020C

CONTRACT ID.

PROJECT NO.

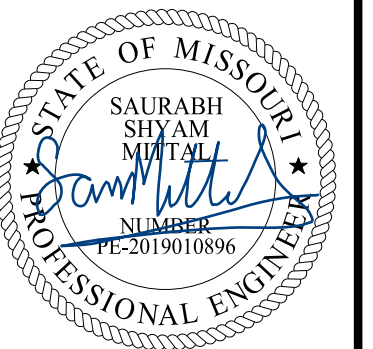
BRIDGE NO. A8999

DESCRIPTION	DATE

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

HORNER SHIFRIN
 401 S. 18TH ST. STE. 400 ST. LOUIS, MO 63103
 314-591-4321 FAX 314-591-8986
 WWW.HORNERSHIFRIN.COM
 DISCIPLINE: PROFESSIONAL ENGINEERING
 CERTIFICATE OF AUTHORITY: 000159
 EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW EB BRIDGE STAGED CONSTRUCTION DETAILS



DATE PREPARED 3/14/2022

ROUTE I-270 STATE MO

DISTRICT BR SHEET NO. 4

COUNTY ST. LOUIS CITY

JOB NO. J613020C

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A8999

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

MoDOT

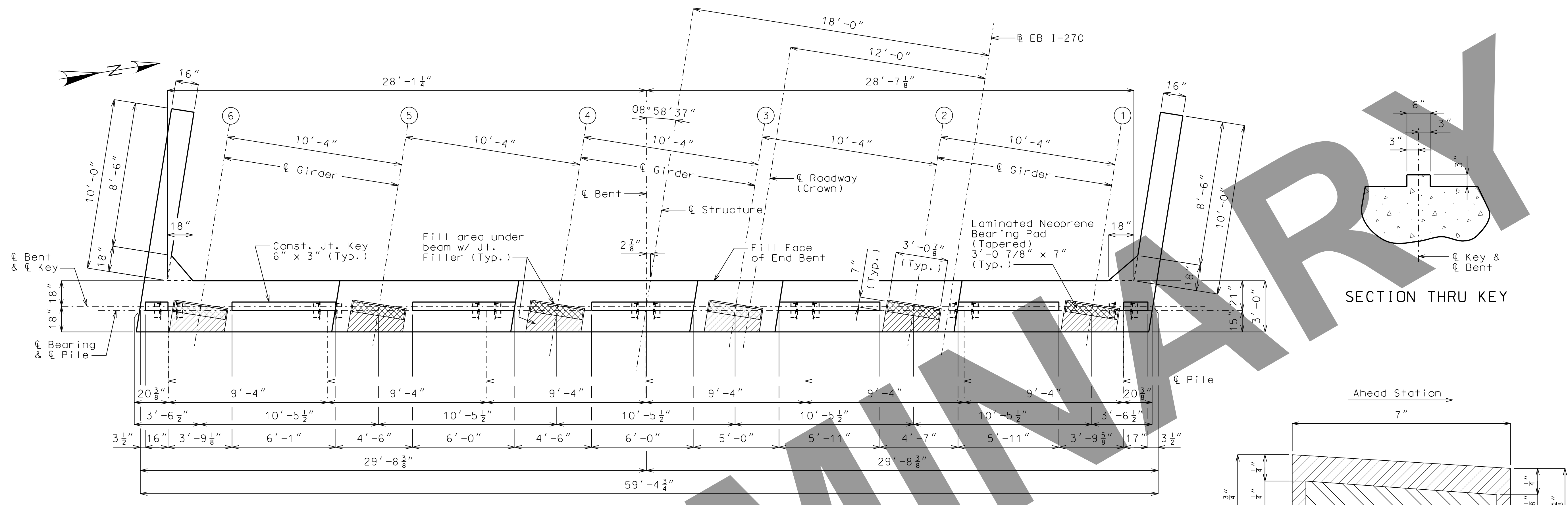
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MDOT (1-888-275-6636)

HORNER SHIFRIN

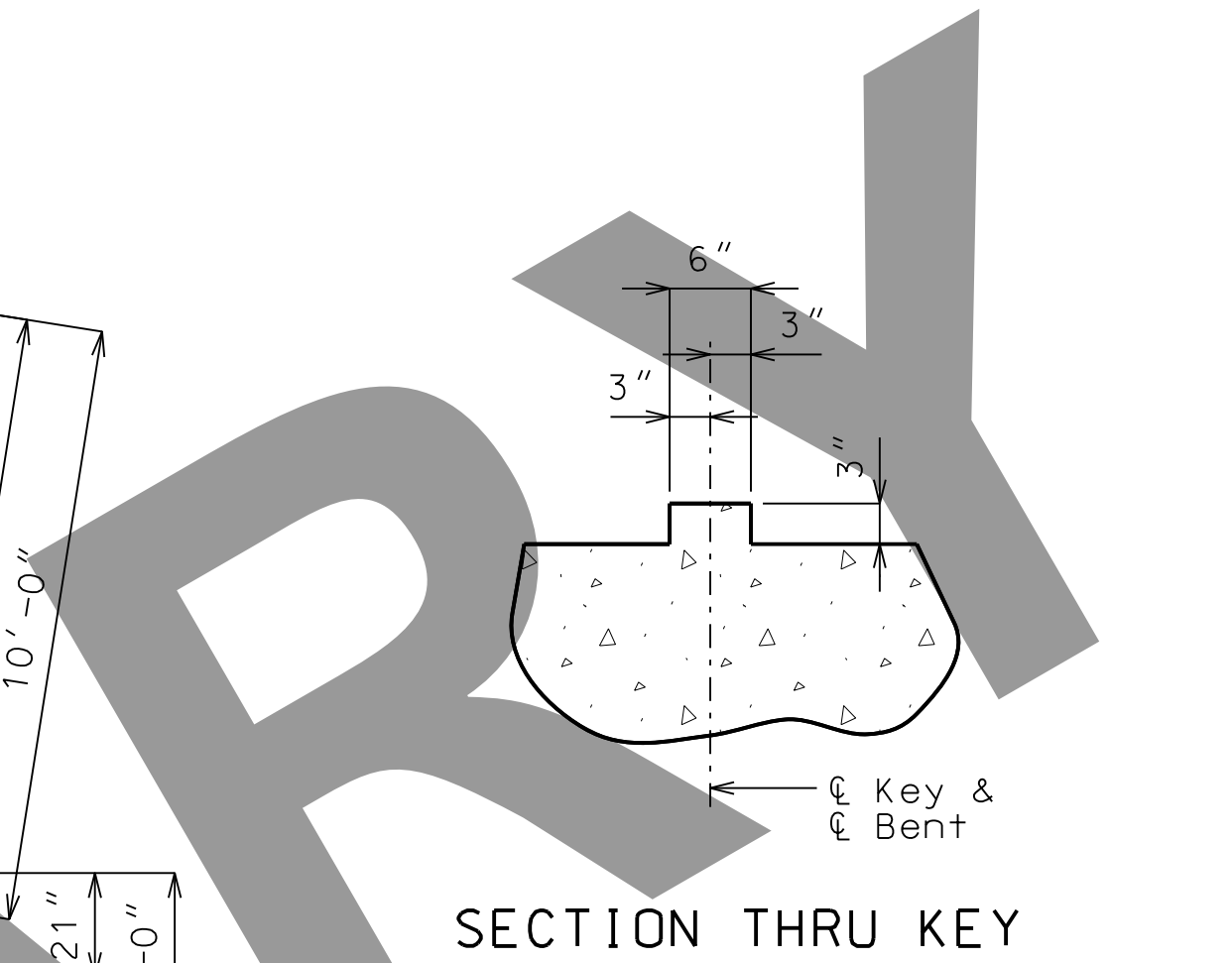
401 S. 18TH ST. STE. 400 ST. LOUIS, MO 63103
314-451-4321 FAX 314-551-8586
WWW.HORNERSHIFRIN.COM

DISCIPLINE: PROFESSIONAL ENGINEERING
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EXPIRATION DATE: DECEMBER 31, 2022

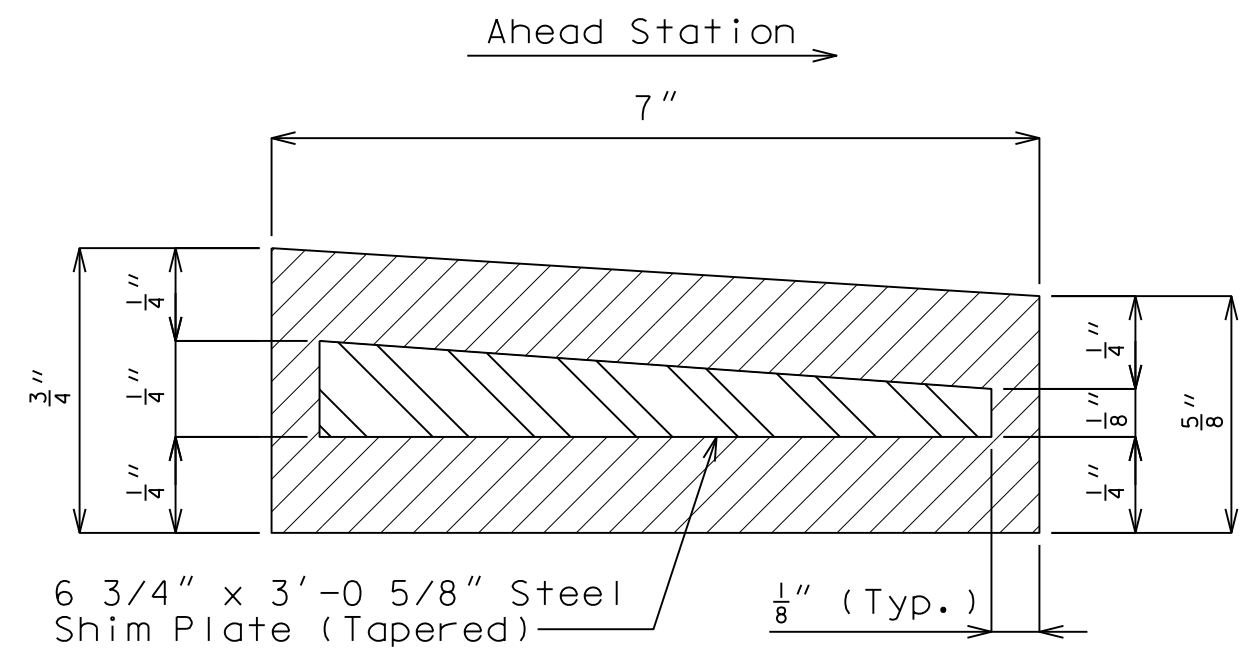
I-270 AND RIVERVIEW EB BRIDGE DETAILS OF END BENT NO. 1



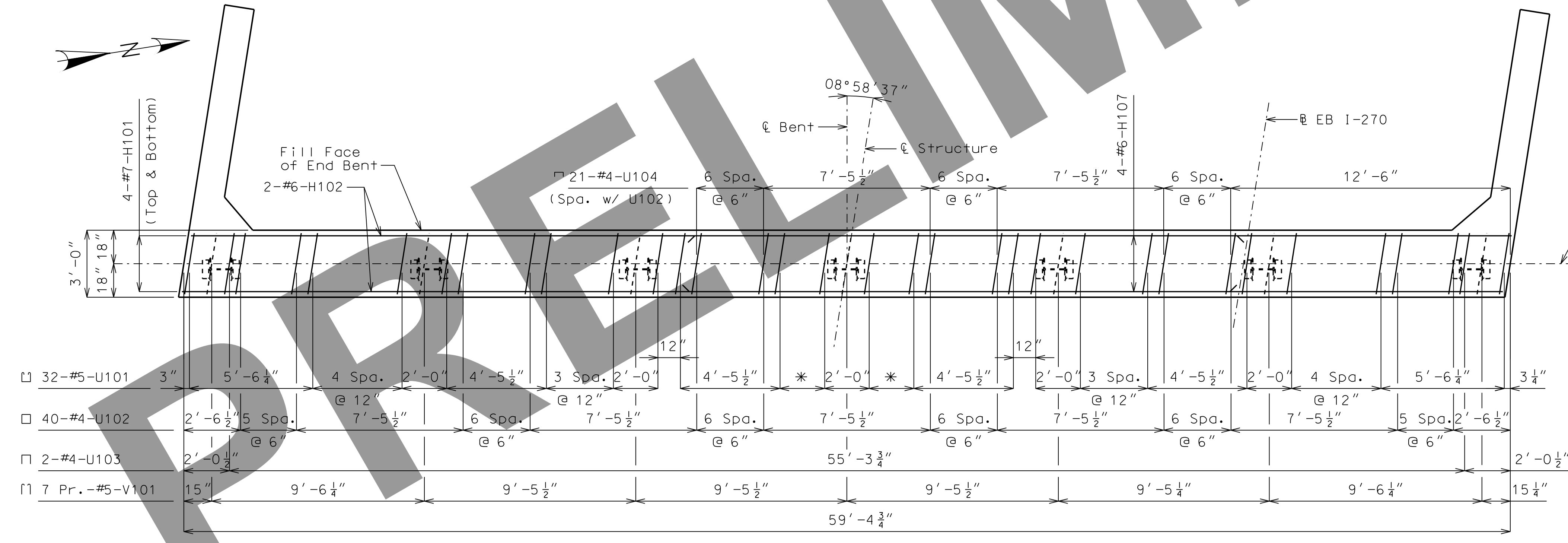
PLAN OF BEAM SHOWING DIMENSIONS



SECTION THRU KEY



TYPICAL SECTION THRU 7" X 3'-0 7/8" LAMINATED NEOPRENE BEARING PAD (TAPERED) (6 Required)



PLAN OF BEAM SHOWING REINFORCEMENT

Notes:
Work this sheet with Sheets No. 5 & 6.
For details of Vertical Drain at End Bents, see Sheet No. 7.

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

All U bars, Pr.-V bars, and #5-H109 bars shall be placed parallel to centerline of Roadway.

All bars shall be epoxy coated.

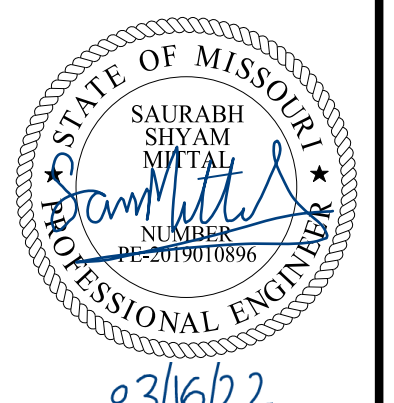
For details of HP pile splices and anchors, see Sheet No. 2.

DETAILS OF END BENT NO. 1

Designed: SSM
Detailed: CAB
Checked: MAB

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

Sheet No. 4 of 37



03/16/22
DATE PREPARED

3/14/2022

ROUTE I-270 STATE MO

DISTRICT BR SHEET NO. 5

COUNTY ST. LOUIS CITY

JOB NO. J613020C

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A8999

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102

1-888-ASK-MODOT (1-888-275-6636)

MoDOT

Horner Shiffrin

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314-591-4321 FAX 314-591-8888

WWW.HORNERSHIFFRIN.COM

DISCIPLINE: PROFESSIONAL ENGINEERING

CERTIFICATE OF AUTHORITY: 000159

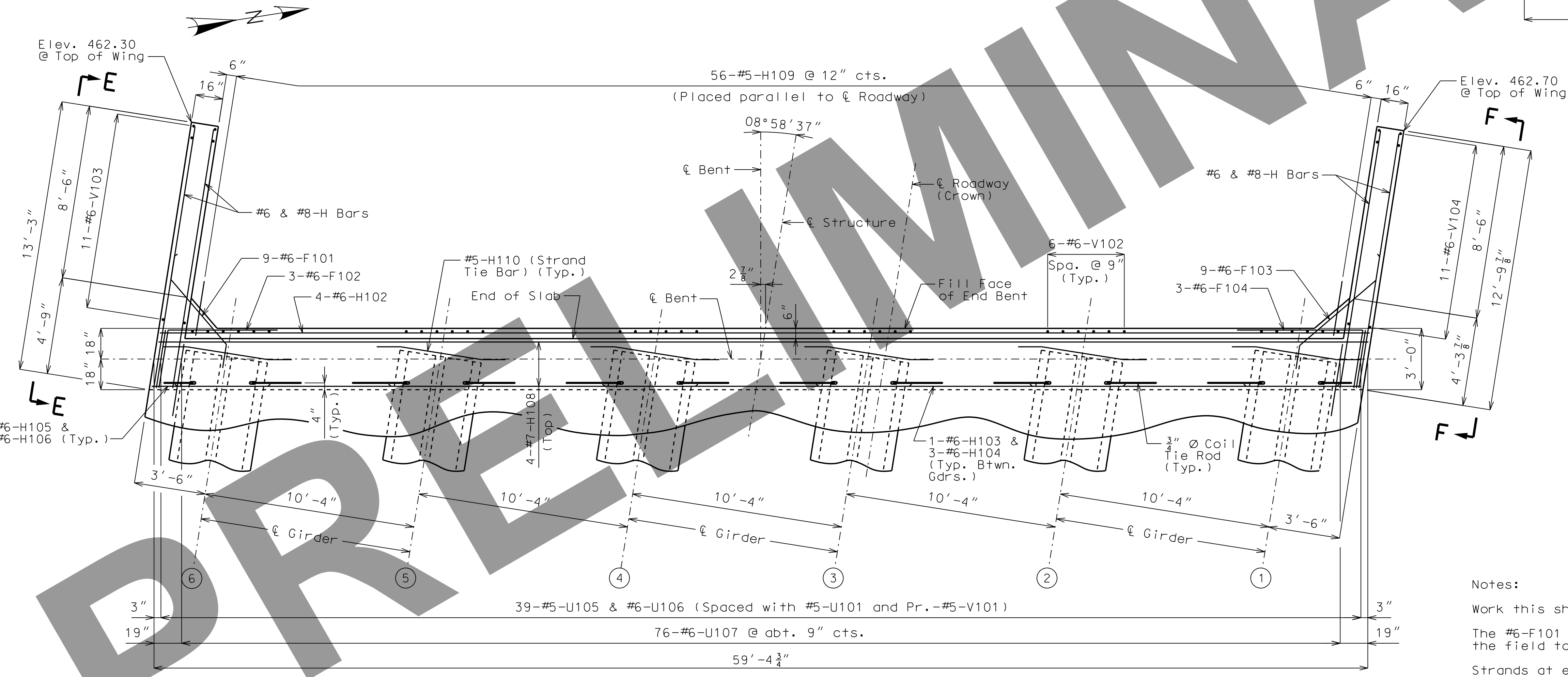
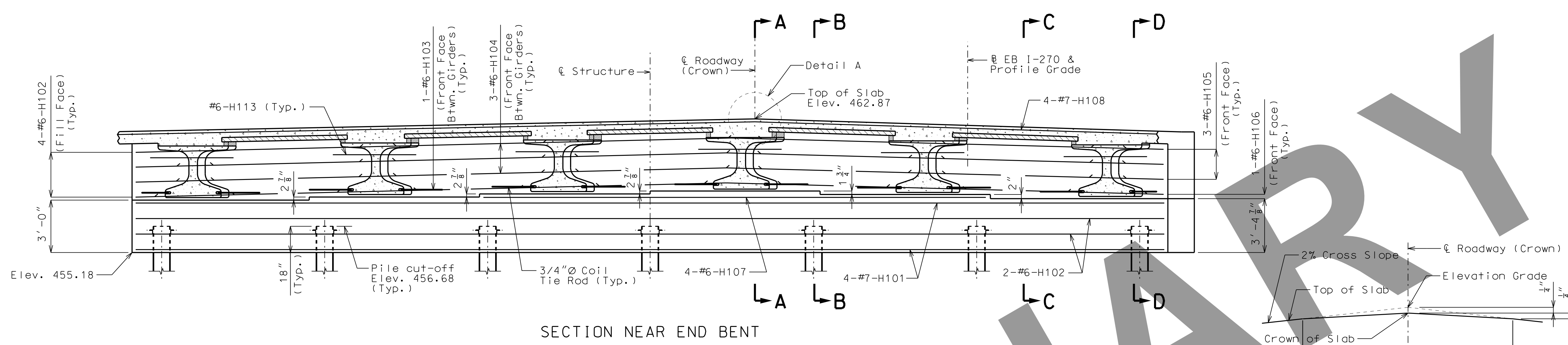
EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW

EB BRIDGE

DETAILS OF

END BENT NO. 1



Notes:
Work this sheet with Sheets No. 4 & 6.
The #6-F101 & F103 bars shall be bent in the field to clear beams.
Strands at end of the beams shall be field bent or, if necessary, cut in field to maintain 1 1/2" minimum clearance to fill face of end bent.
For location of Coil Tie Rods and #5-H110 (Strand Tie Bars), see Sheets No. 13 & 14.
All concrete in the end bent above top of beam and below top of slab shall be Class B-2.
All bars shall be epoxy coated.

DETAILS OF END BENT NO. 1

Note: This drawing is not to scale. Follow dimensions. Sheet No. 5 of 37

Designed: SSM
Detailed: CAB
Checked: MAB



DATE PREPARED
3/14/2022

ROUTE I-270 STATE MO
DISTRICT BR SHEET NO. 6

COUNTY ST. LOUIS CITY
JOB NO. J613020C

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A8999

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102

1-888-ASK-MODOT (1-888-275-6636)

MoDOT

DISCIPLINE: PROFESSIONAL ENGINEERING
CERTIFICATE OF AUTHORITY: 000159
EXPIRATION DATE: DECEMBER 31, 2022

HORNER SHIFFRIN

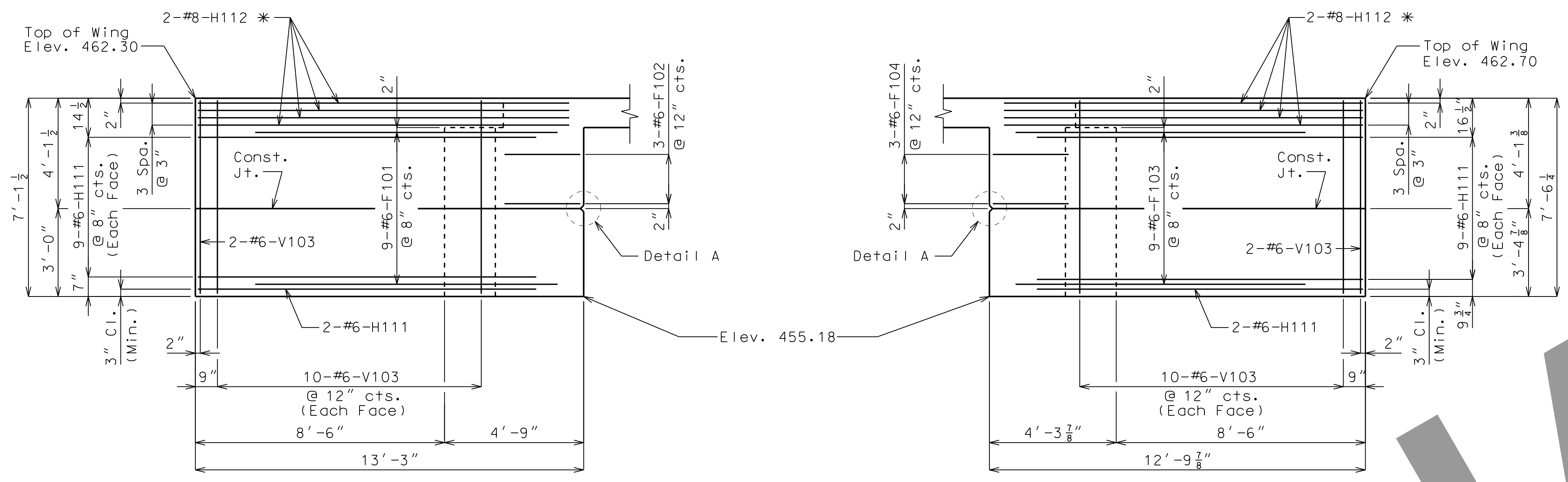
401 S. 18TH ST. STE. 400 ST. LOUIS, MO 63103
314-591-4321 FAX 314-591-8986
WWW.HORNERSHIFFRIN.COM

I-270 AND RIVERVIEW

EB BRIDGE

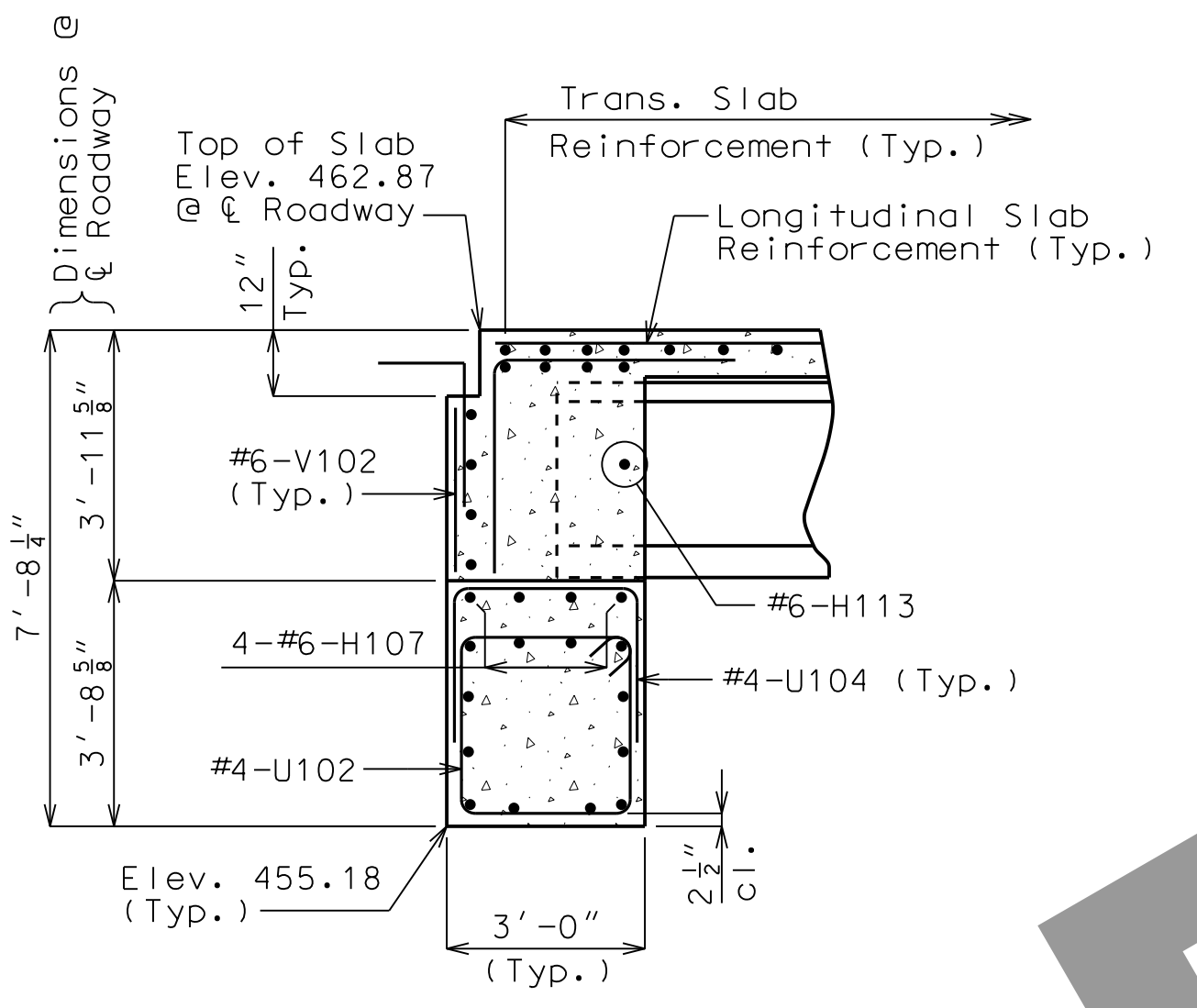
DETAILS OF

END BENT NO. 1

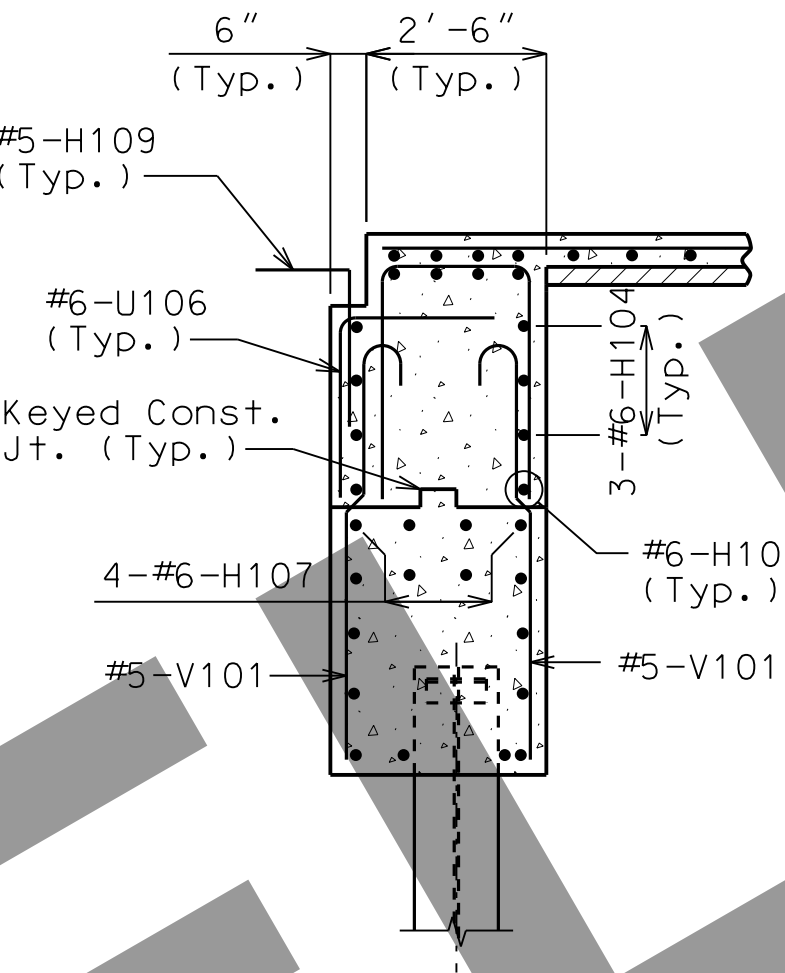


ELEVATION E-E

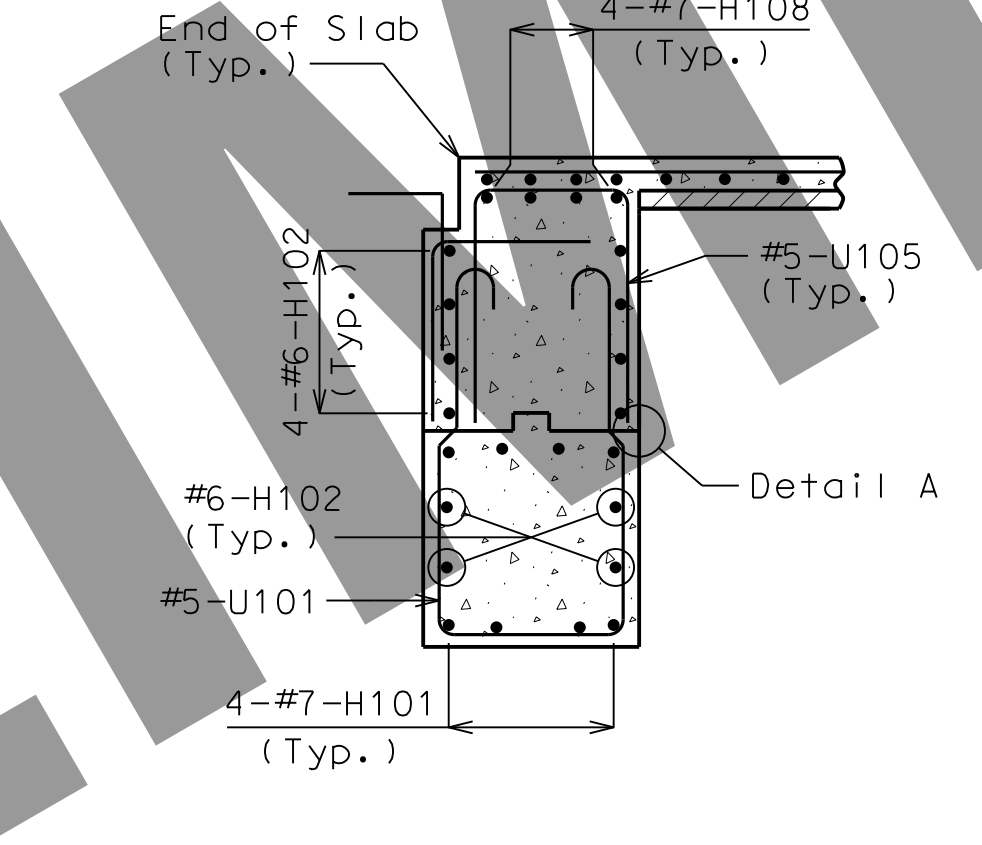
ELEVATION F-F



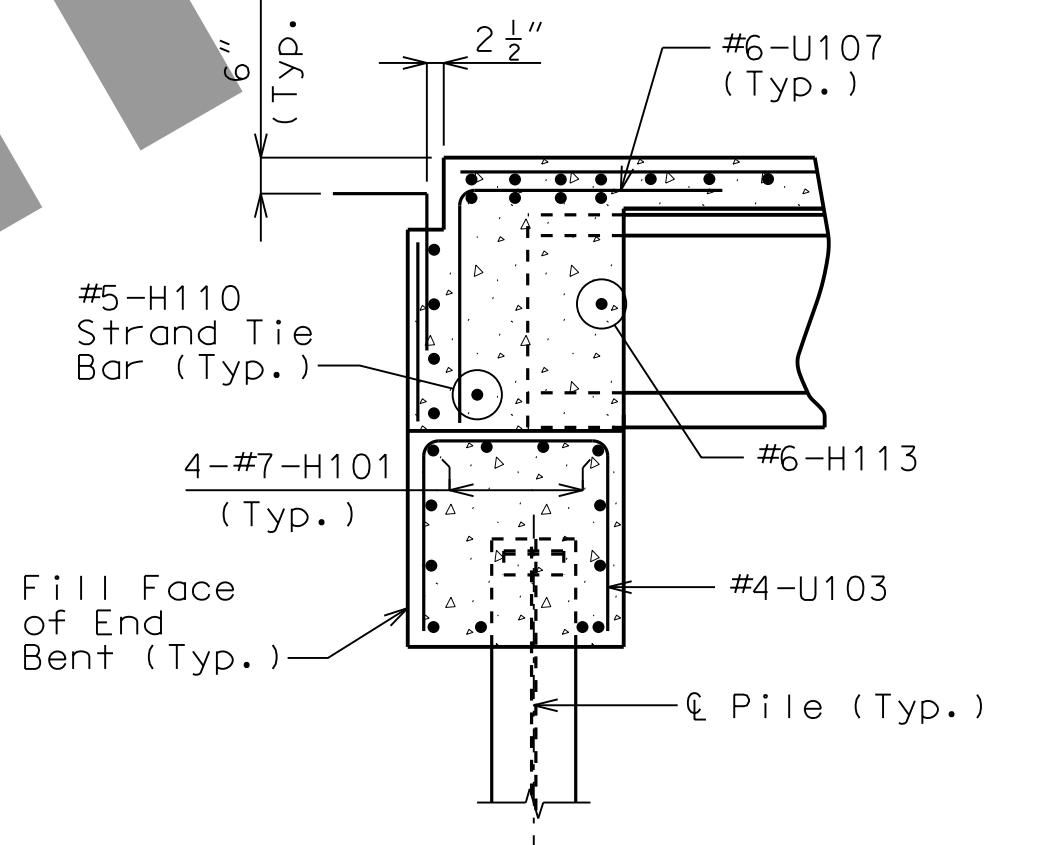
SECTION A-A



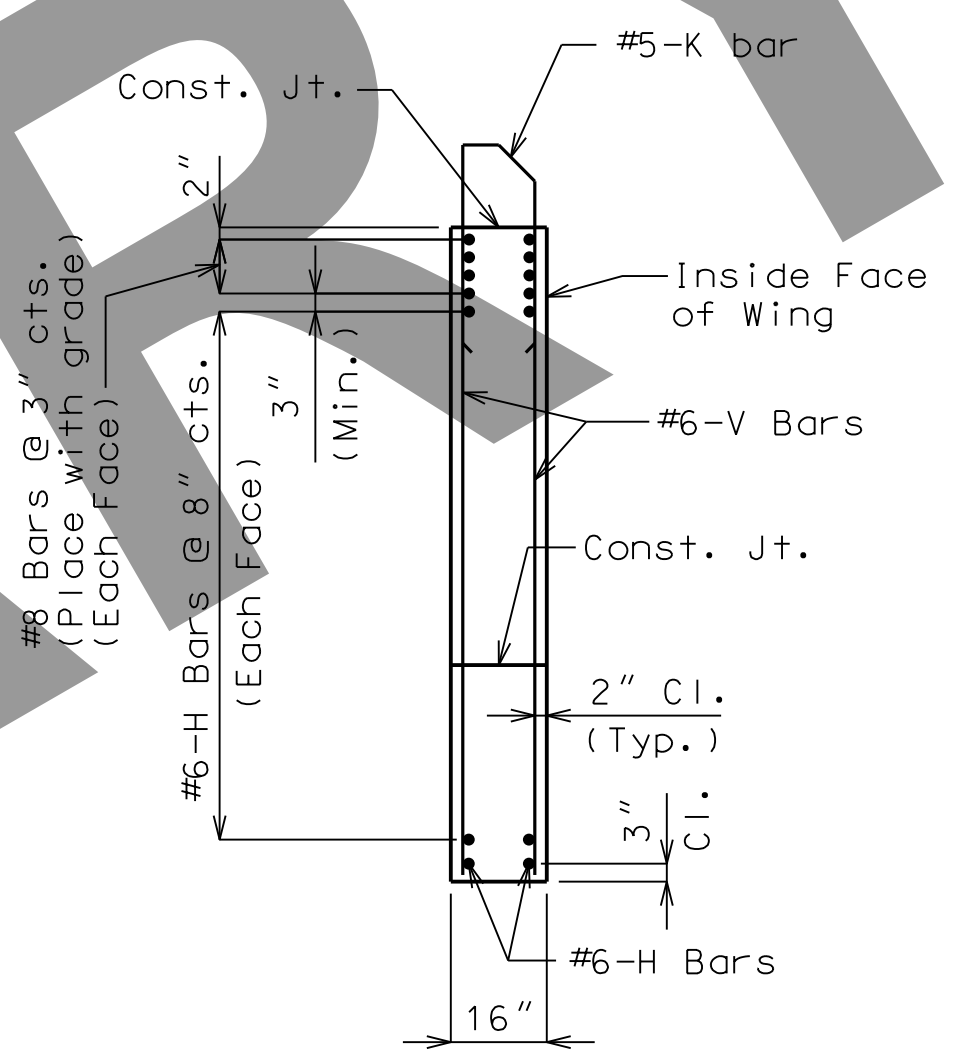
SECTION B-B



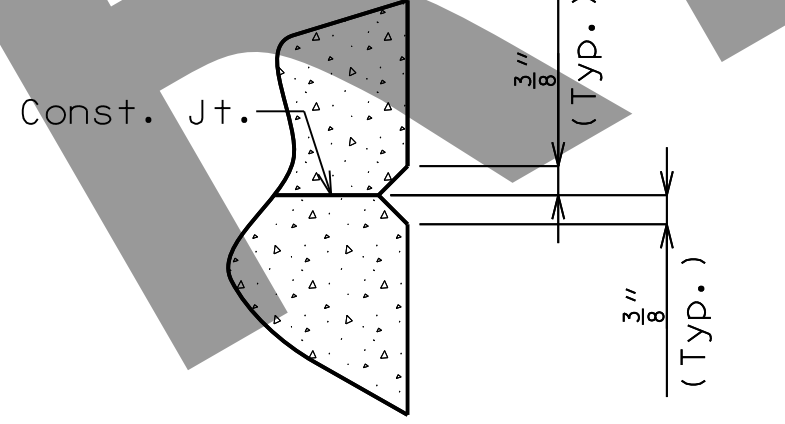
SECTION C-C



SECTION D-D



PART SECTION THRU WING



DETAIL A

Notes:
Work this sheet with Sheets No. 4 and 5.
For reinforcement of Barrier Curb at End Bents, see Sheet No. 22.
For details of Approach Slab, see Sheet No. 23.

Substructure Quantity Table for Bent No. 1		
Item	Unit	Quantity
Galvanized Structural Steel Pile (12 in.)	linear foot	336
Pile Point Reinforcement	each	7
Class B Concrete (Substructure)	cu. yard	25.8
Pipe Pile Spacers	each	7

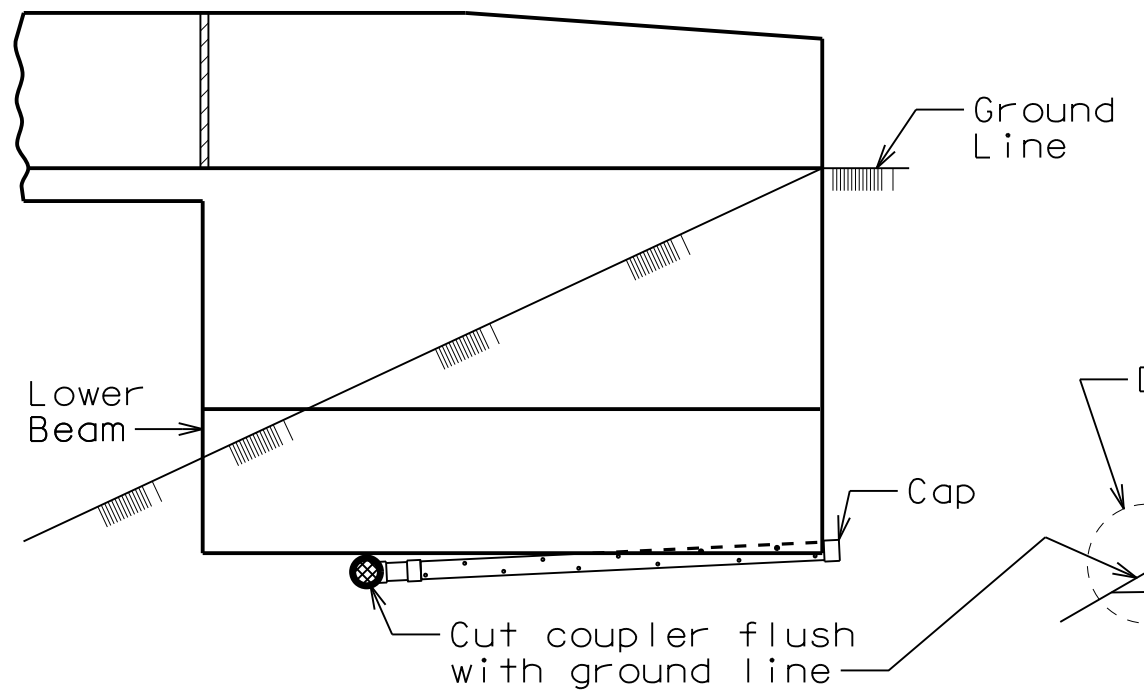
Note: These quantities are included in the estimated quantities table on Sheet No. 2.

DETAILS OF END BENT NO. 1

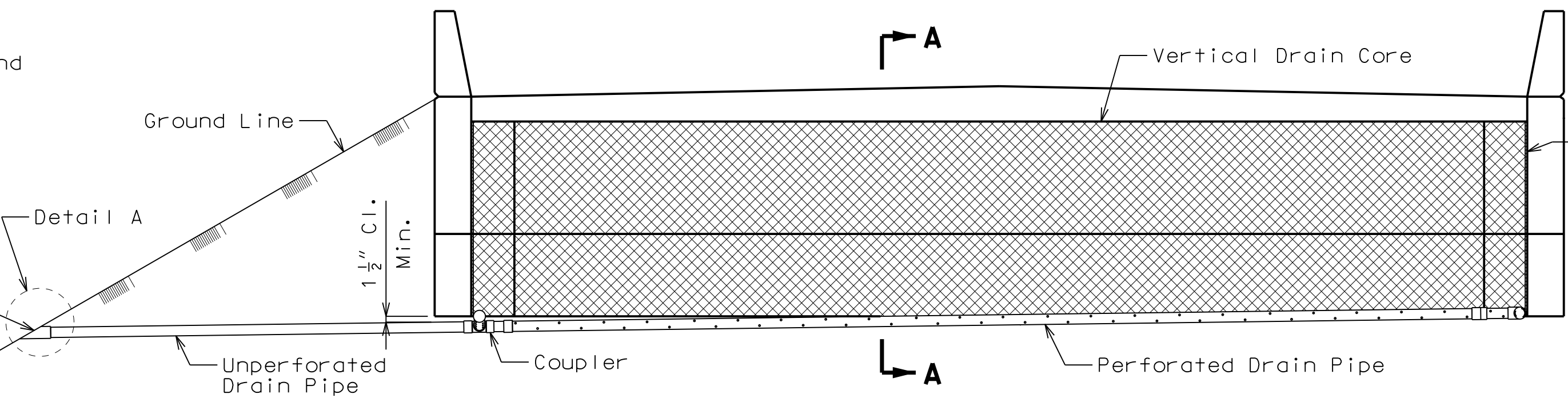
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 6 of 37

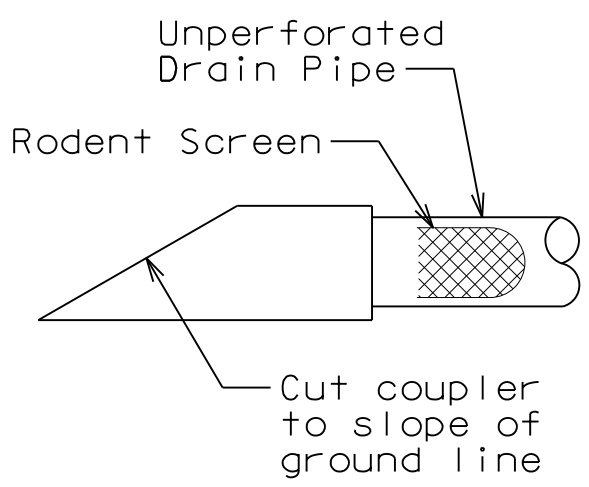
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Checked: MAB



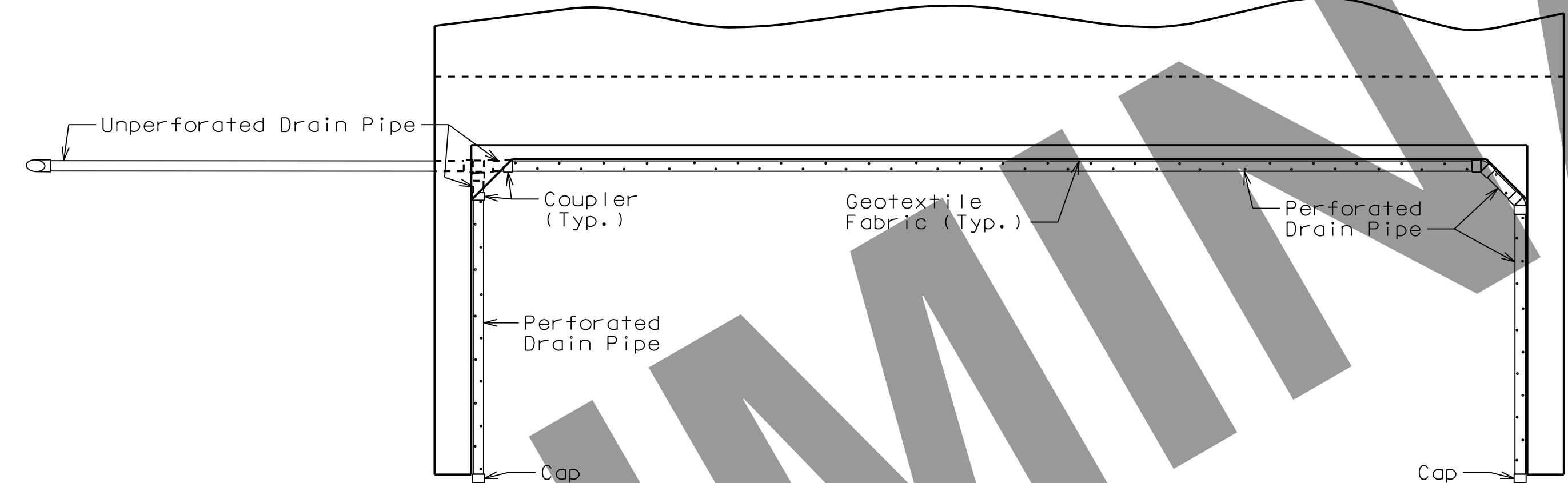
ELEVATION OF WING



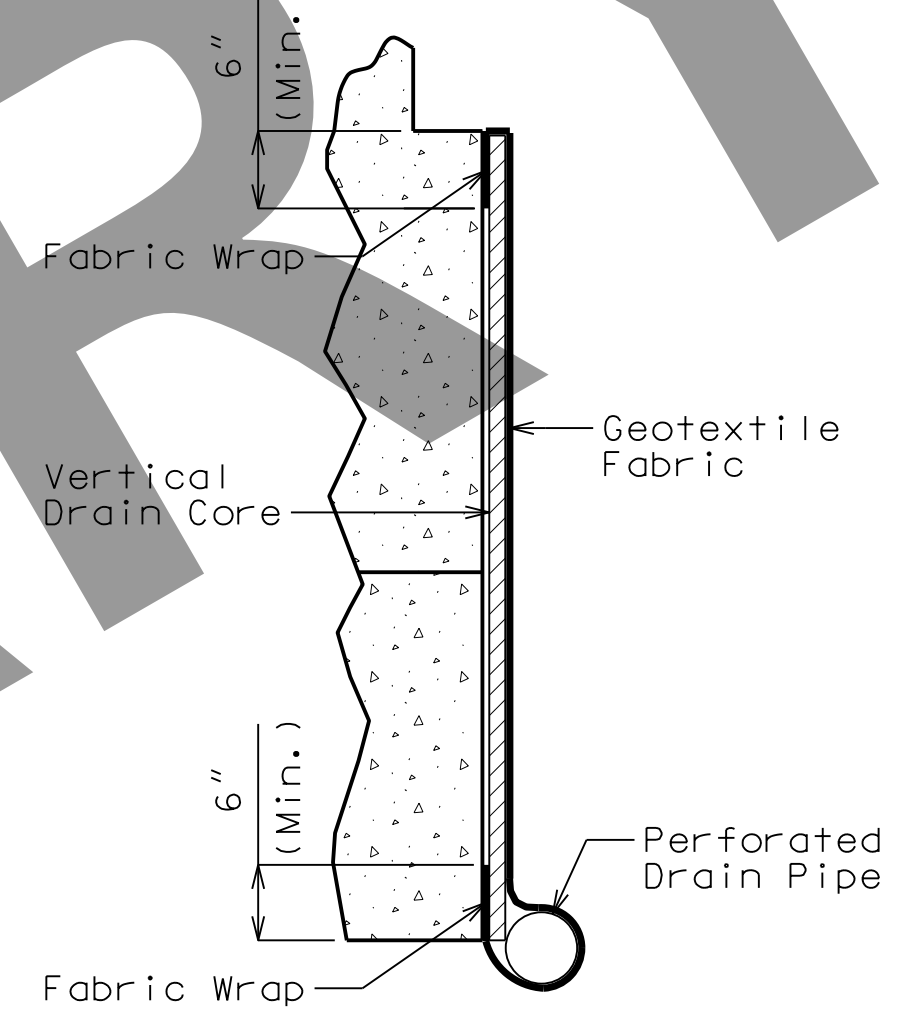
ELEVATION OF END BENT



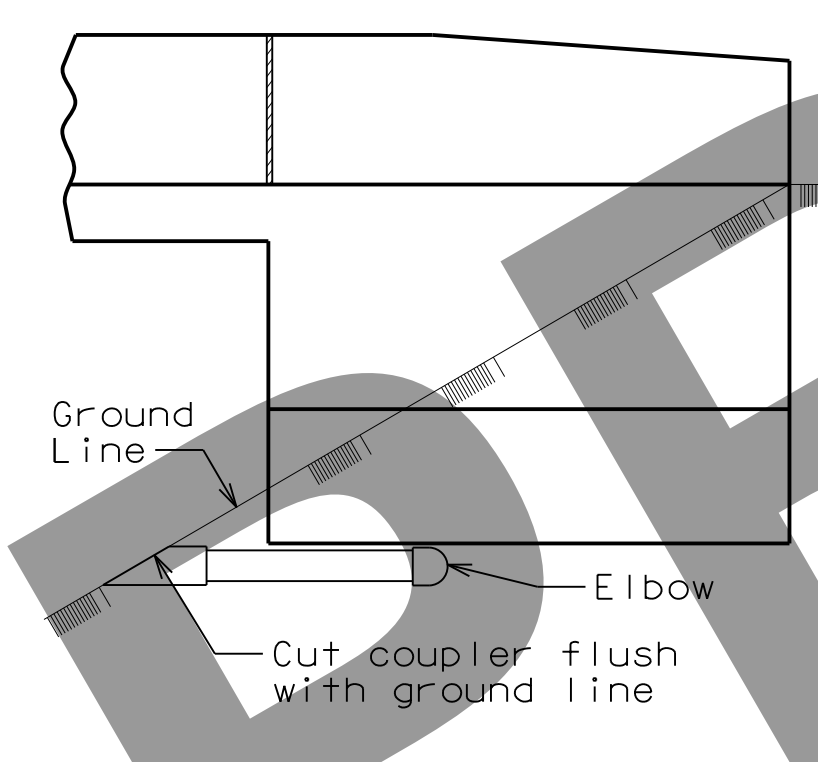
DETAIL A



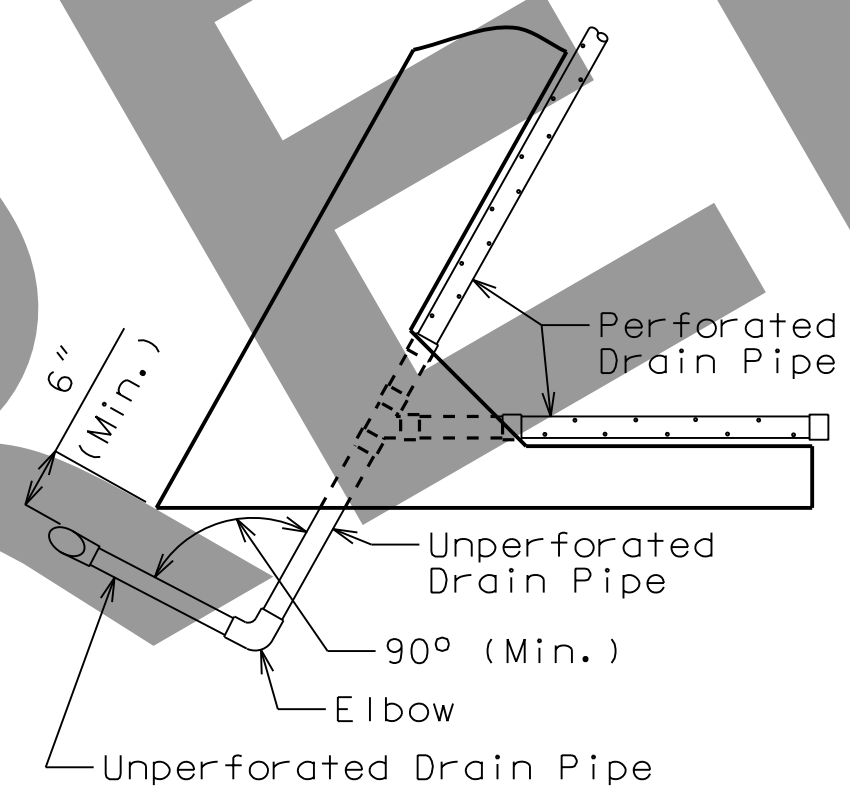
PLAN OF END BENT



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 BENTS
(Squared end bent shown, skewed end bent similar)

Designed: SSM
Detailed: CAB
Checked: TPL

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

Sheet No. 7 of 37



DATE PREPARED
3/14/2022

ROUTE I-270 STATE MO
DISTRICT BR SHEET NO. 7

COUNTY ST. LOUIS CITY
JOB NO. J613020C
CONTRACT ID.

PROJECT NO.

BRIDGE NO. A8999

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

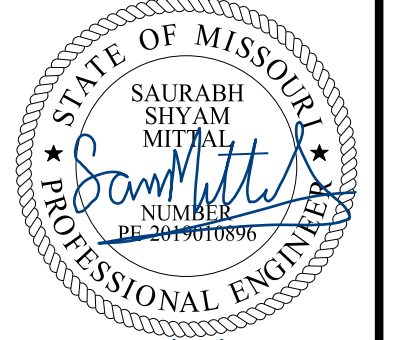
MoDOT

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

HORNER SHIFFRIN

401 S. 18TH ST. STE. 400 ST. LOUIS, MO 63103
314-451-8321 FAX 314-551-8988
WWW.HORNERSHIFFRIN.COM
DISCIPLINE: PROFESSIONAL ENGINEERING
CERTIFICATE OF AUTHORITY: 000159
EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW
EB BRIDGE
VERTICAL DRAIN AT END BENTS



DATE PREPARED 3/14/2022	
ROUTE I-270	STATE MO
DISTRICT BR	SHEET NO. 8
COUNTY ST. LOUIS CITY	
JOB NO. J613020C	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A8999	

DATE	DESCRIPTION

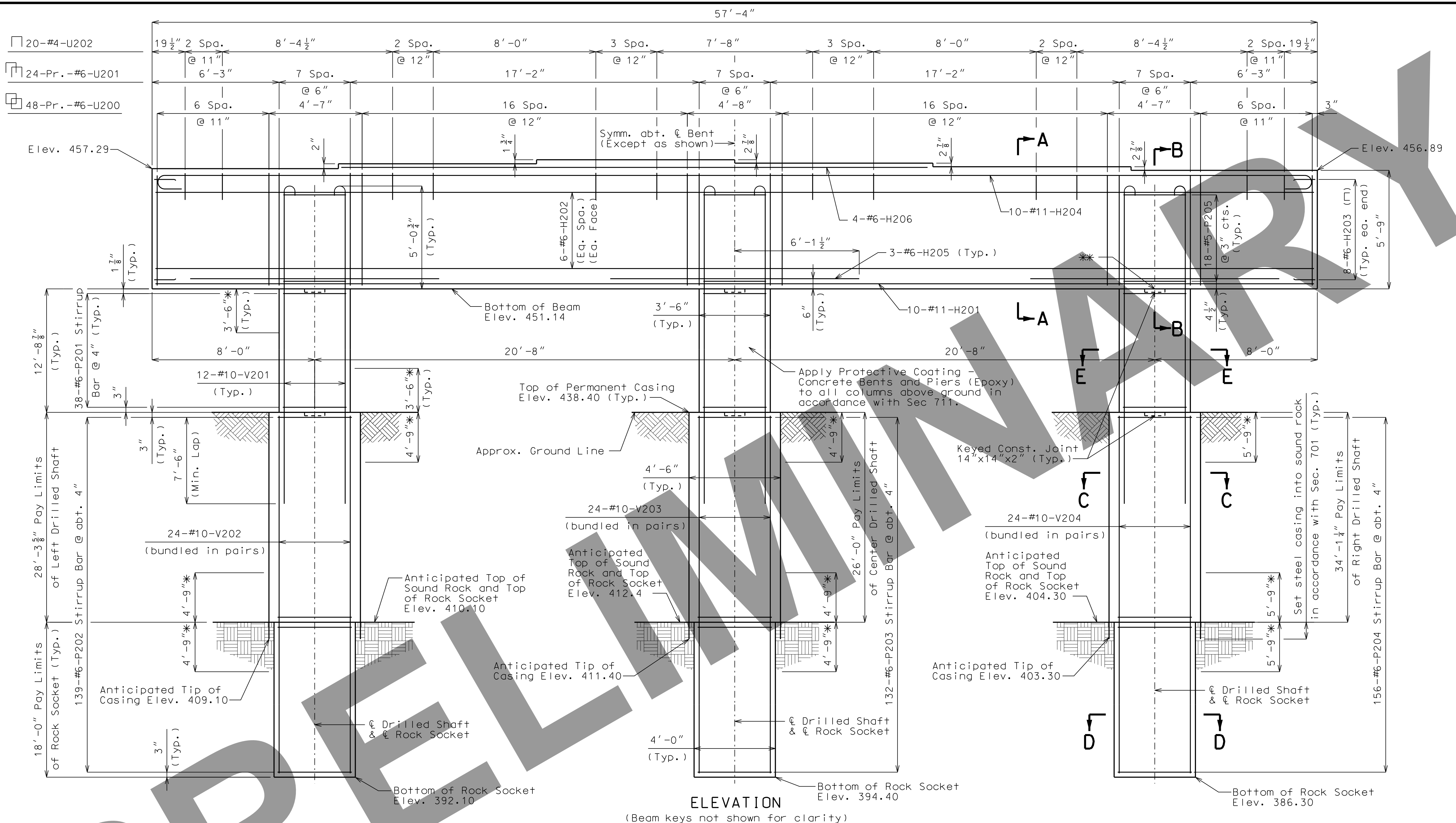
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HORNER SHIFRIN

401 S. 18TH ST., STE. 400 ST. LOUIS, MO 63103
314-451-4321 • FAX 314-551-8586
WWW.HORNERSHIFRIN.COM
DISCIPLINE: PROFESSIONAL ENGINEERING
CERTIFICATE OF AUTHORITY: 000159
EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW
EB BRIDGE
DETAILS OF INT. BENT NO. 2



* No splicing of V-bars permitted in this region.

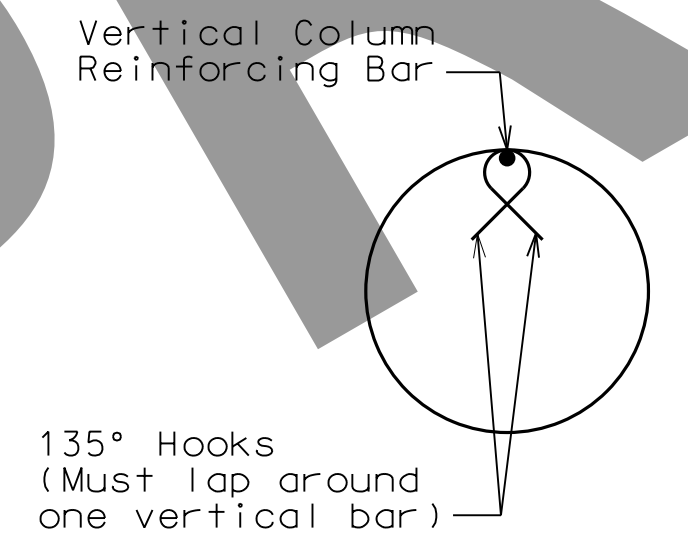
- Notes:
- Work this sheet with Sheet No. 9.
 - Sonic logging testing shall be performed on all drilled shafts and rock sockets.
 - Turning V-bar hooks outward, away from the column core, will not be allowed.
 - Contractor may cut-off three of the V201 hook bars per shaft, in order to install P205 Seismic stirrups in the cap.
 - The hooks for adjacent stirrup bars shall be rotated by 120 degrees and shall not be lined up at one location.

An additional 4 feet has been added to V-bar lengths and additional #6-P202, #6-P203 and #6-P204 bars have been added in the quantities, if required, 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 additional P-bars shall be spaced similarly to that shown in elevation, if required, or to a lesser spacing if not required, but not less than 6-inch centers.

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

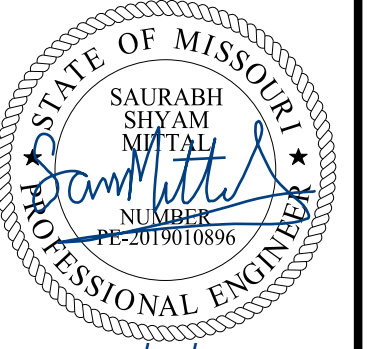
All steel above ground shall be epoxy coated.

The cost of any required excavation to the top of the drilled shafts will be considered completely covered by the contract unit price for other items.



DETAILS OF INTERMEDIATE BENT NO. 2

Designed: UVK
Detailed: GLC
Checked: TPL



DATE PREPARED
3/14/2022

ROUTE STATE
I-270 MO

DISTRICT SHEET NO.
BR 9

COUNTY
ST. LOUIS CITY

JOB NO.
J613020C

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A8999

DESCRIPTION	DATE

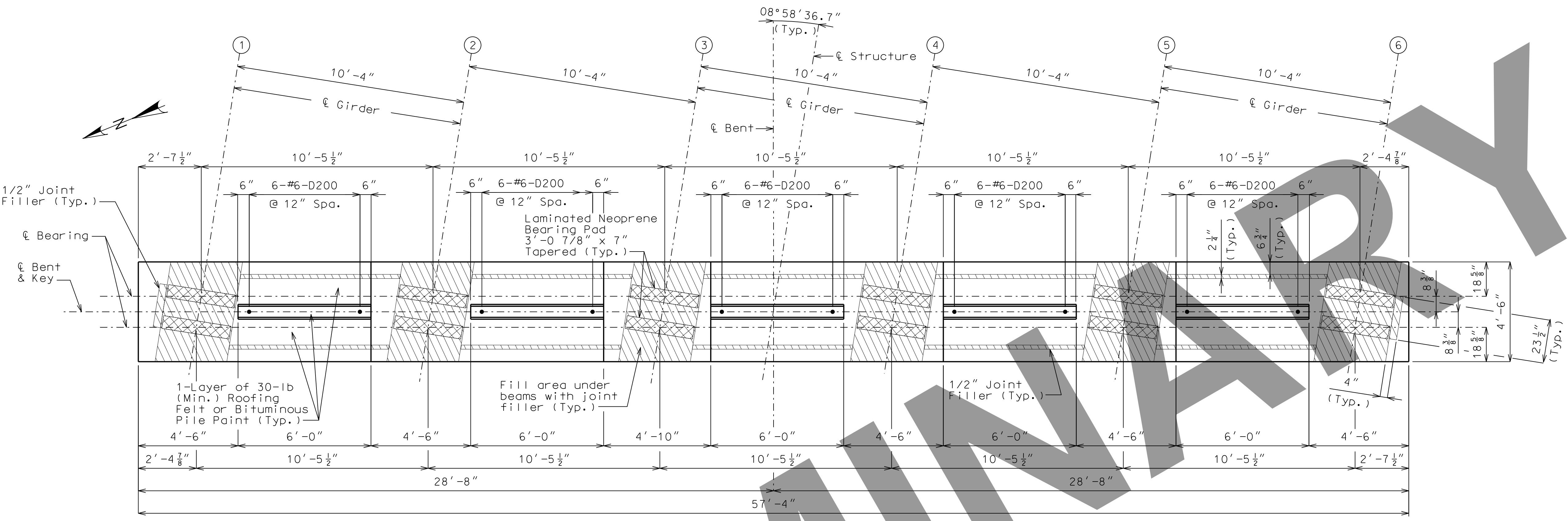
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

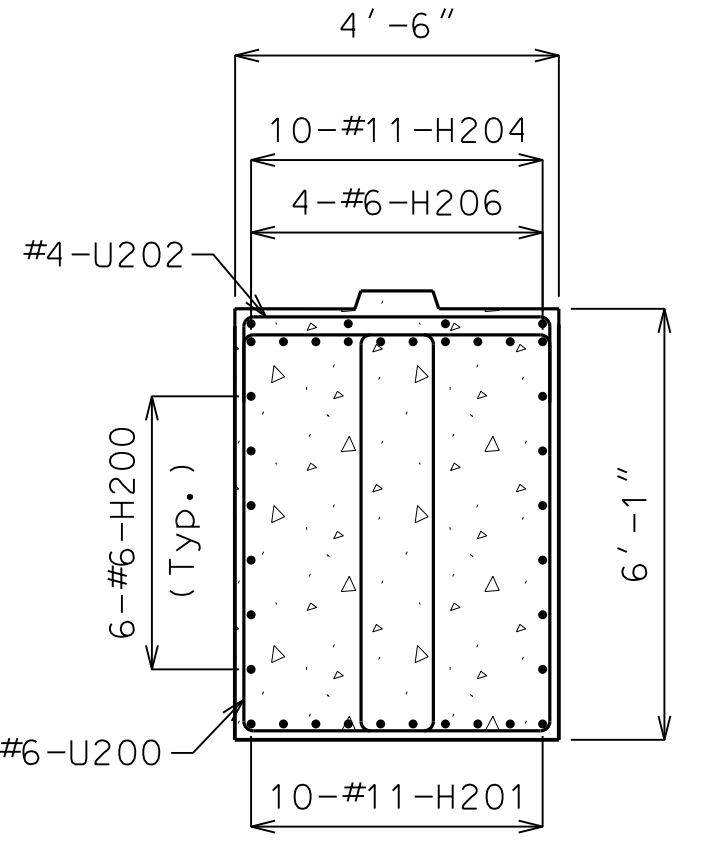
HORNER SHIFFRIN

401 S. 18TH ST. STE. 400 ST. LOUIS, MO 63103
314-451-4321 FAX 314-551-8986
WWW.HORNERSHIFFRIN.COM
DISCIPLINE: PROFESSIONAL ENGINEERING
CERTIFICATE OF AUTHORITY: 000159
EXPIRATION DATE: DECEMBER 31, 2022

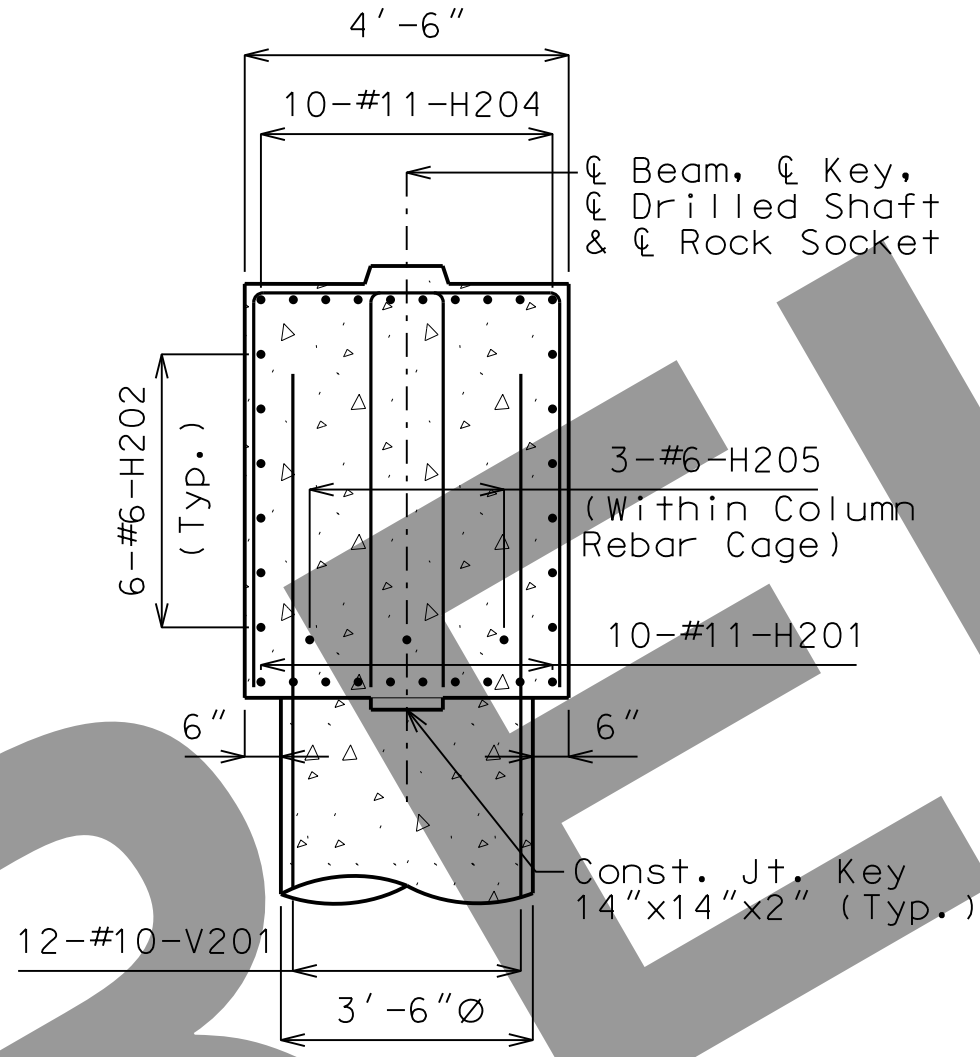
I-270 AND RIVERVIEW EB BRIDGE DETAILS OF INT. BENT NO. 2



PLAN OF BEAM

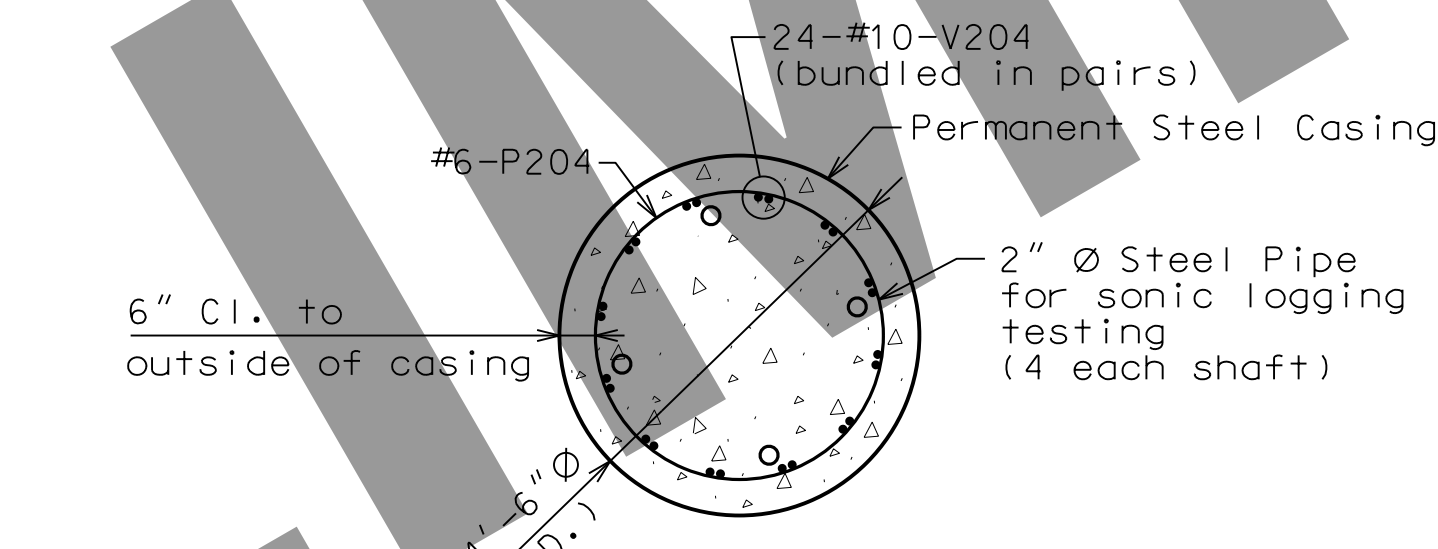


SECTION A-A

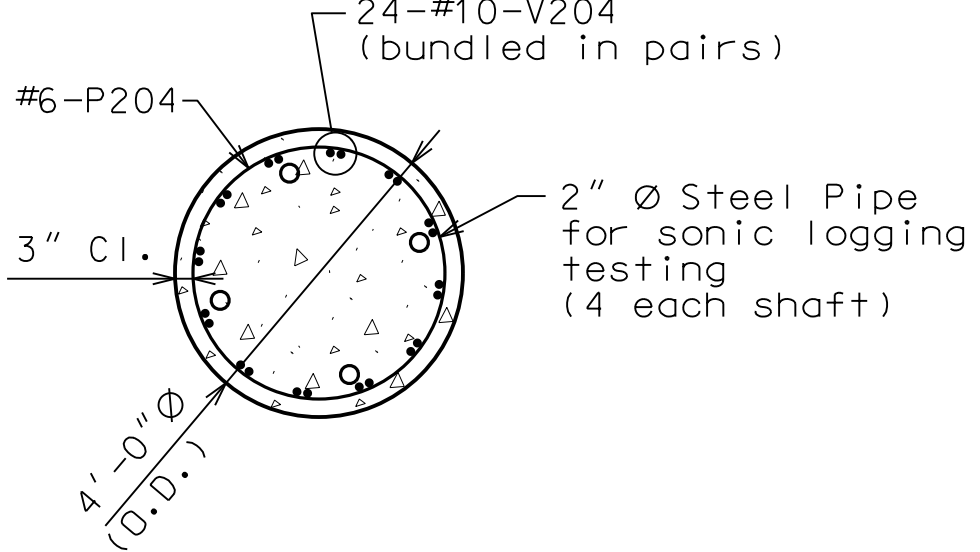


PART SECTION B-B

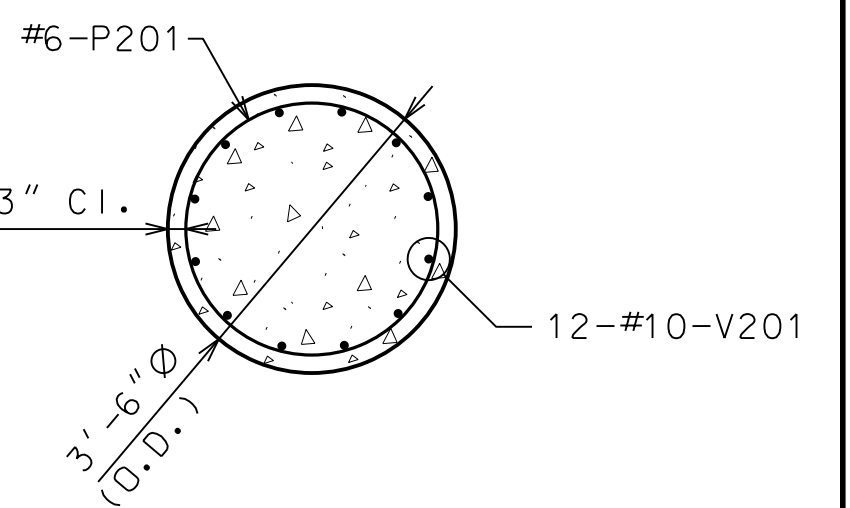
Note: #5-P205 stirrup bars not shown for clarity.



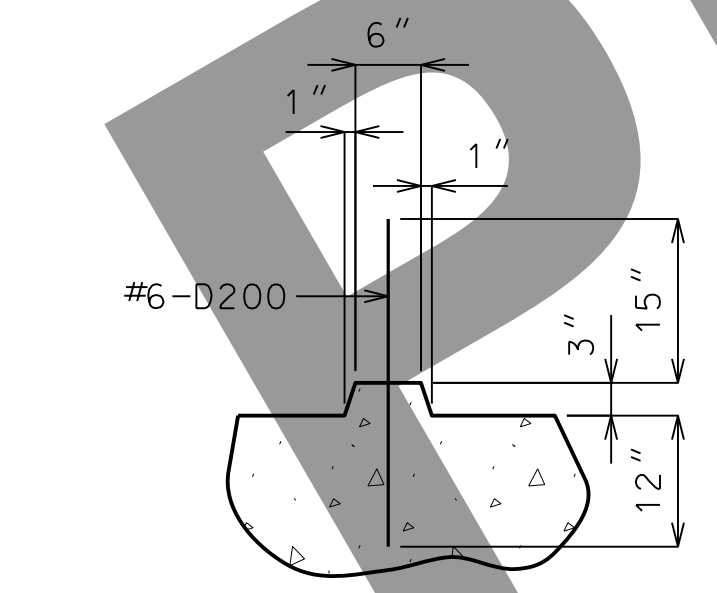
SECTION C-C (DRILLED SHAFT)



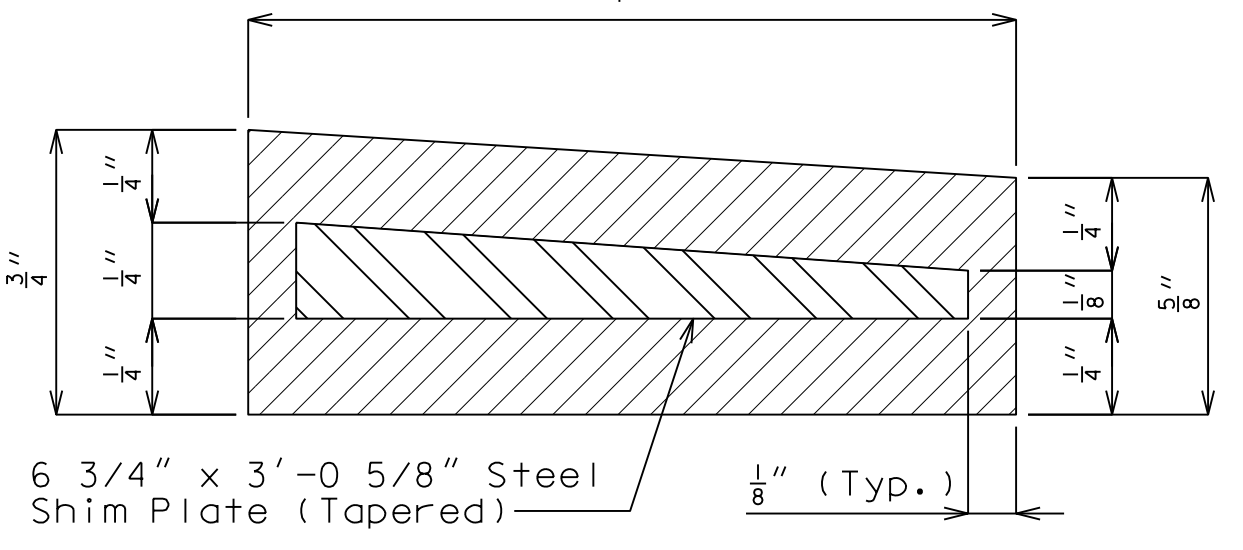
SECTION D-D (ROCK SOCKET)



SECTION E-E (COLUMN)



SECTION THRU KEY



TYPICAL SECTION THRU 7" x 3'-0 7/8" LAMINATED NEOPRENE BEARING PAD (TAPERED) (12 Required)

Item	Quantity	Unit
Drilled Shafts (4 ft. 6 in. Dia.)	88.4	linear foot
Rock Sockets (4 ft. 0 in. Dia.)	54	linear foot
Video Camera Inspection	3	each
Foundation Inspection Holes	84	linear foot
Sonic Logging Testing	3	each
Class B Concrete (Substructure)	72.1	cu. yard
Reinforcing Steel (Bridges)	24,270	pound
Reinforcing Steel (Epoxy Coated)	18,000	pound
Protective Coating - Concrete Bents and Piers (Epoxy)	1	lump sum

These quantities are included in the Estimated Quantities table on Sheet No. 2.

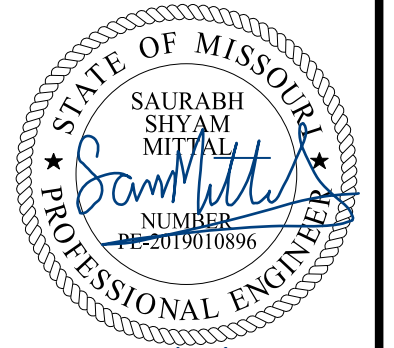
Note:
Work this sheet with Sheet No. 8.
For steps 2 inches or more, use 2 1/4 x 1/2 inch joint filler up vertical face.

DETAILS OF INTERMEDIATE BENT NO. 2

Designed: UVK
Detailed: GLC
Checked: TPL

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

Sheet No. 9 of 37



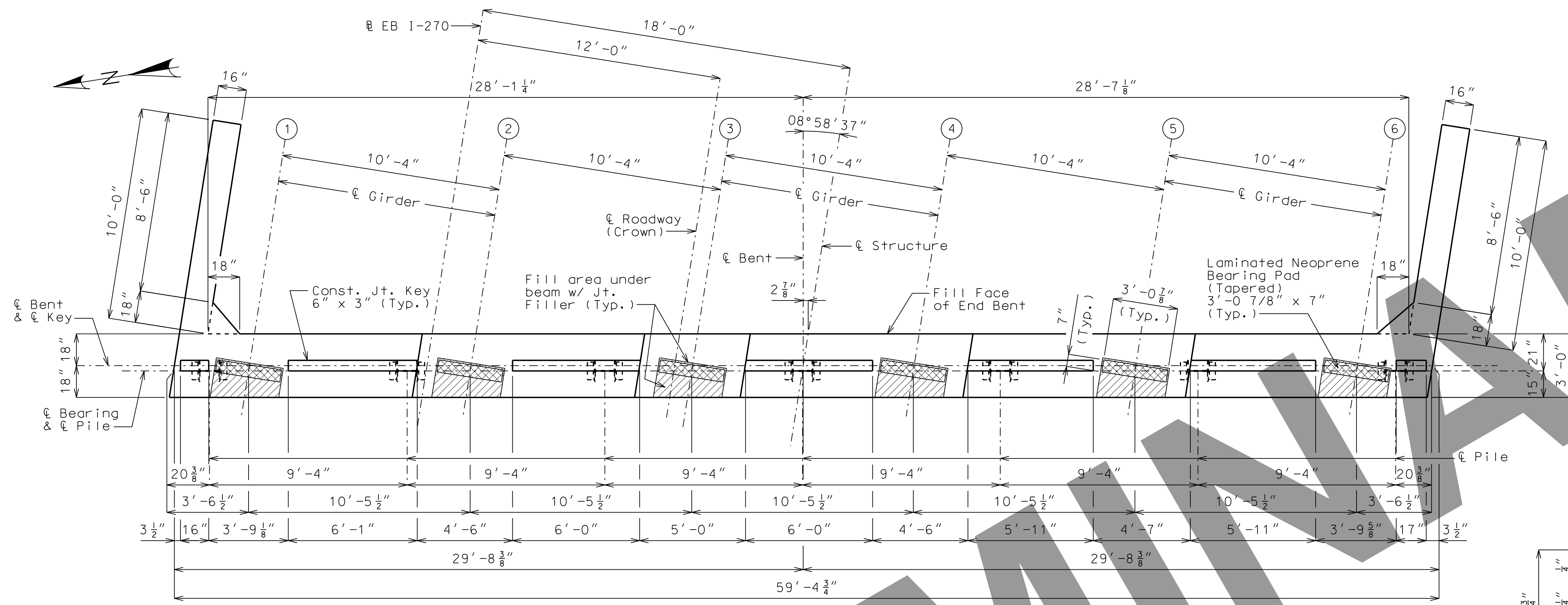
DATE PREPARED
3/14/2022

ROUTE I-270 STATE MO
DISTRICT BR SHEET NO. 10

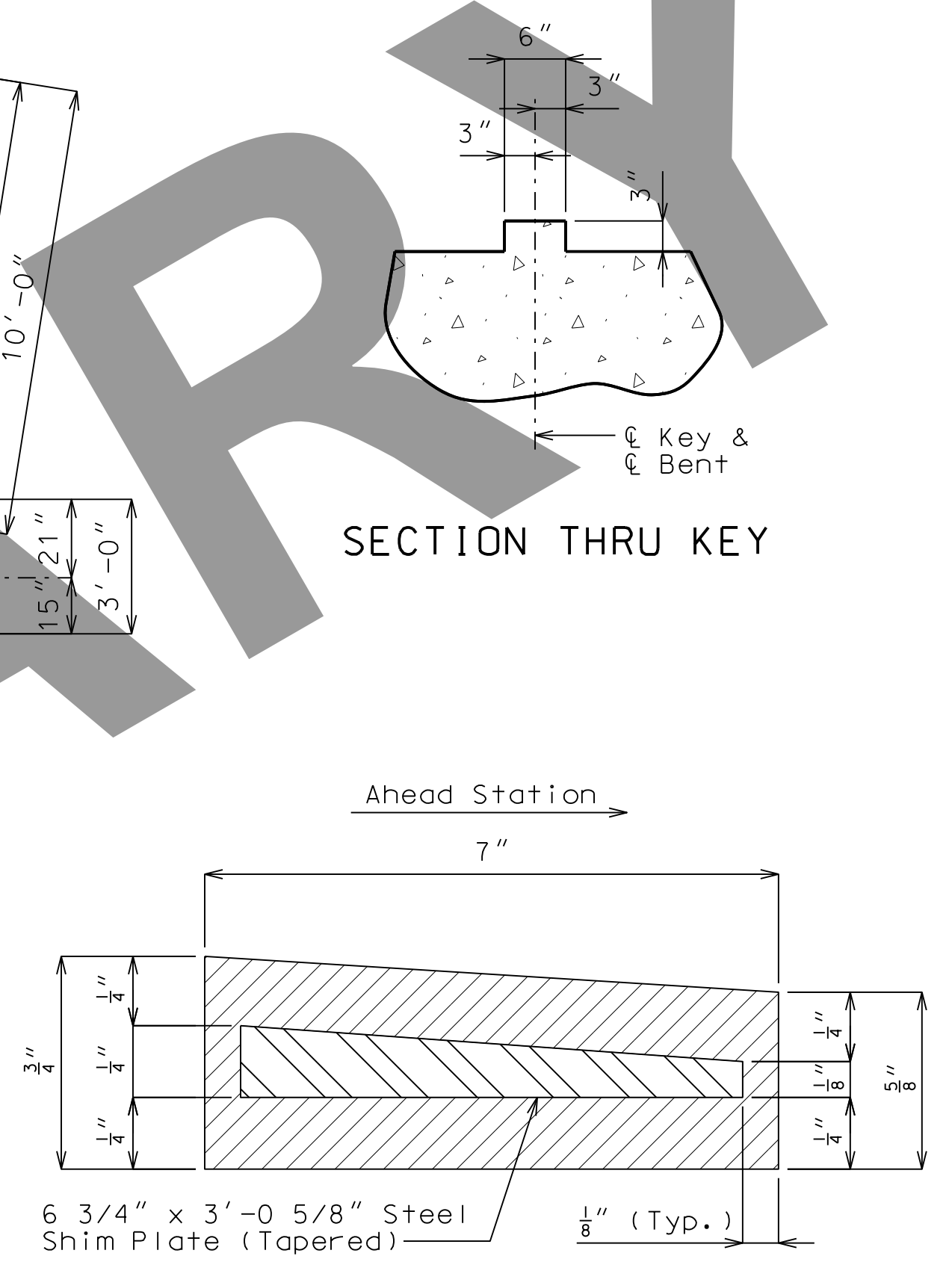
COUNTY ST. LOUIS CITY
JOB NO. J613020C
CONTRACT ID.

PROJECT NO.

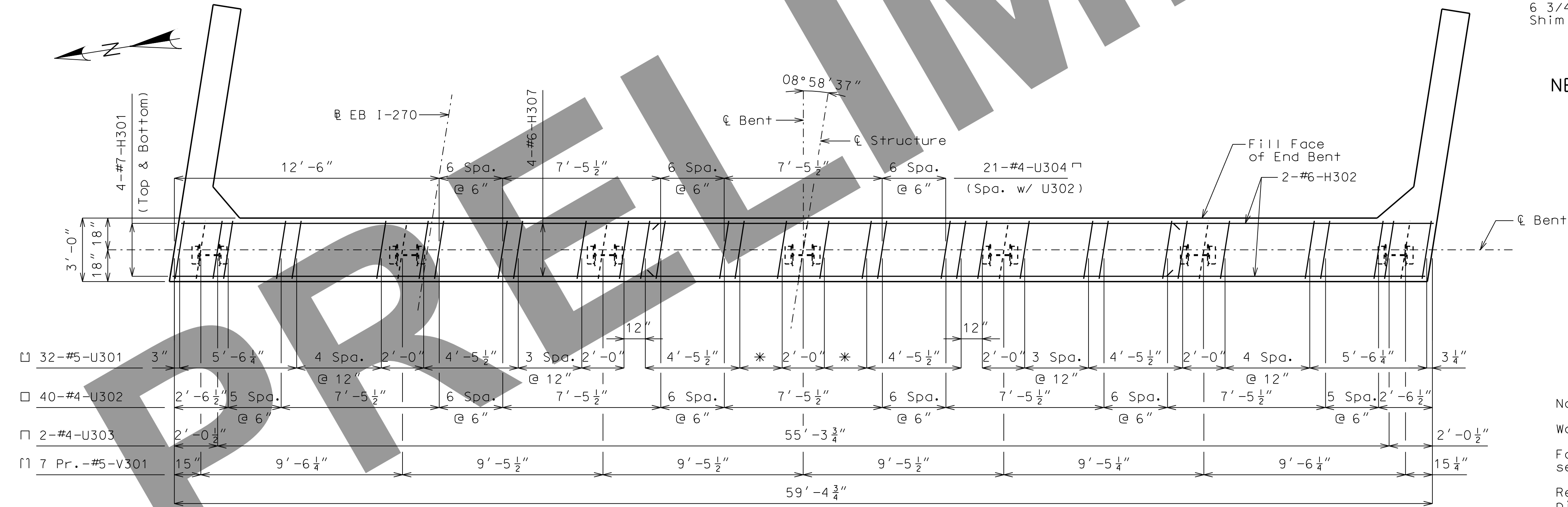
BRIDGE NO. A8999



PLAN OF BEAM SHOWING DIMENSIONS



TYPICAL SECTION THRU 7" x 3'-0 7/8" LAMINATED NEOPRENE BEARING PAD (TAPERED) (6 Required)



PLAN OF BEAM SHOWING REINFORCEMENT

DETAILS OF END BENT NO. 3

Notes:

Work this sheet with Sheets No. 11 & 12.

For details of Vertical Drain at End Bents, see Sheet No. 7.

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

All U bars, Pr.-V bars, and #5-H309 bars shall be placed parallel to ϵ Roadway.

All bars shall be epoxy coated.

For details of HP pile splices and anchors, see Sheet No. 2.

Designed: SSM
Detailed: CAB
Checked: MAB

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

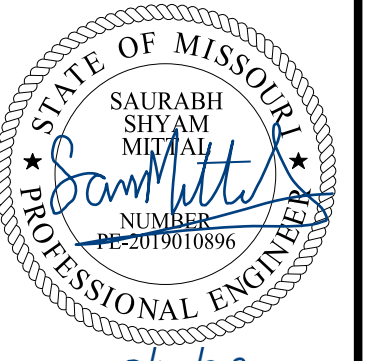
MoDOT

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

HORNER SHIFFRIN

401 S. 18TH ST. STE. 400 ST. LOUIS, MO 63103
314-591-4321 FAX 314-591-8986
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DISCIPLINE: PROFESSIONAL ENGINEERING
CERTIFICATE OF AUTHORITY: 000159
EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW
EB BRIDGE
DETAILS OF END BENT NO. 3



DATE PREPARED 3/14/2022

ROUTE I-270 STATE MO

DISTRICT BR SHEET NO. 11

COUNTY ST. LOUIS CITY

JOB NO. J613020C

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A8999

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102

1-888-ASK-MODOT (1-888-275-6636)

MoDOT

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314-451-4321 FAX 314-551-4586

WWW.HORNERSHIFFRIN.COM

DISCIPLINE: PROFESSIONAL ENGINEERING

CERTIFICATE OF AUTHORITY: 000159

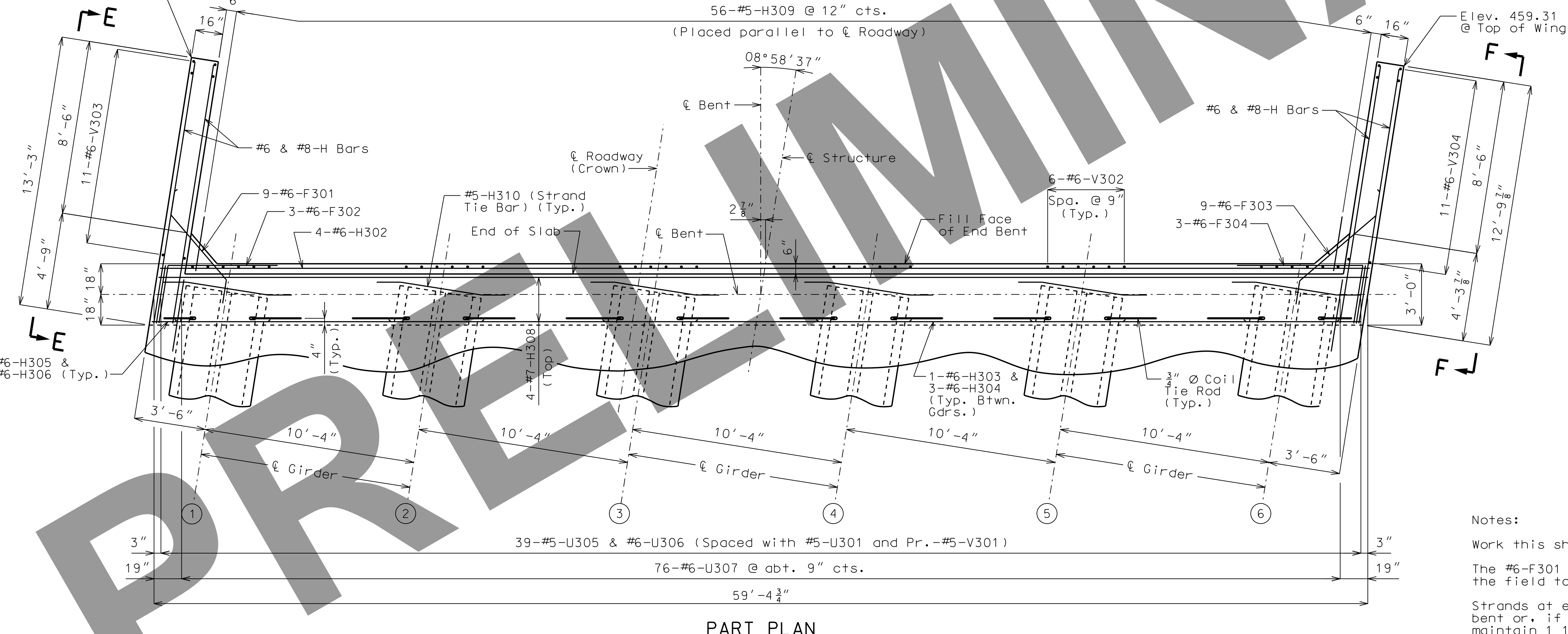
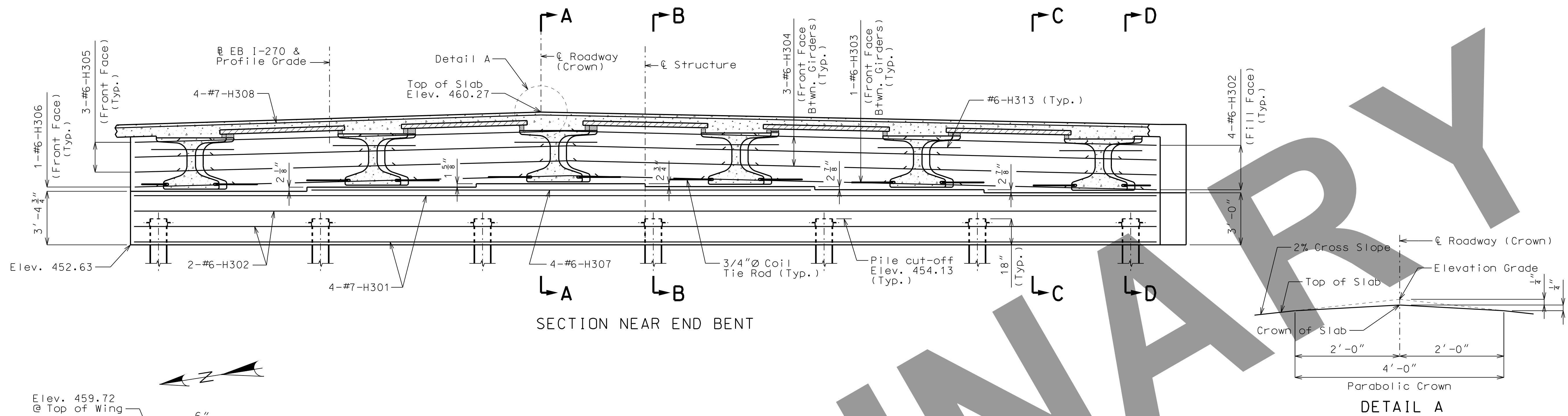
EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW

EB BRIDGE

DETAILS OF

END BENT NO. 3



Notes:

Work this sheet with Sheets No. 10 & 12.

The #6-F301 & F303 bars shall be bent in the field to clear beams.

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

For location of Coil Tie Rods and #5-H310 (Strand Tie Bars), see Sheets No. 13 & 14.

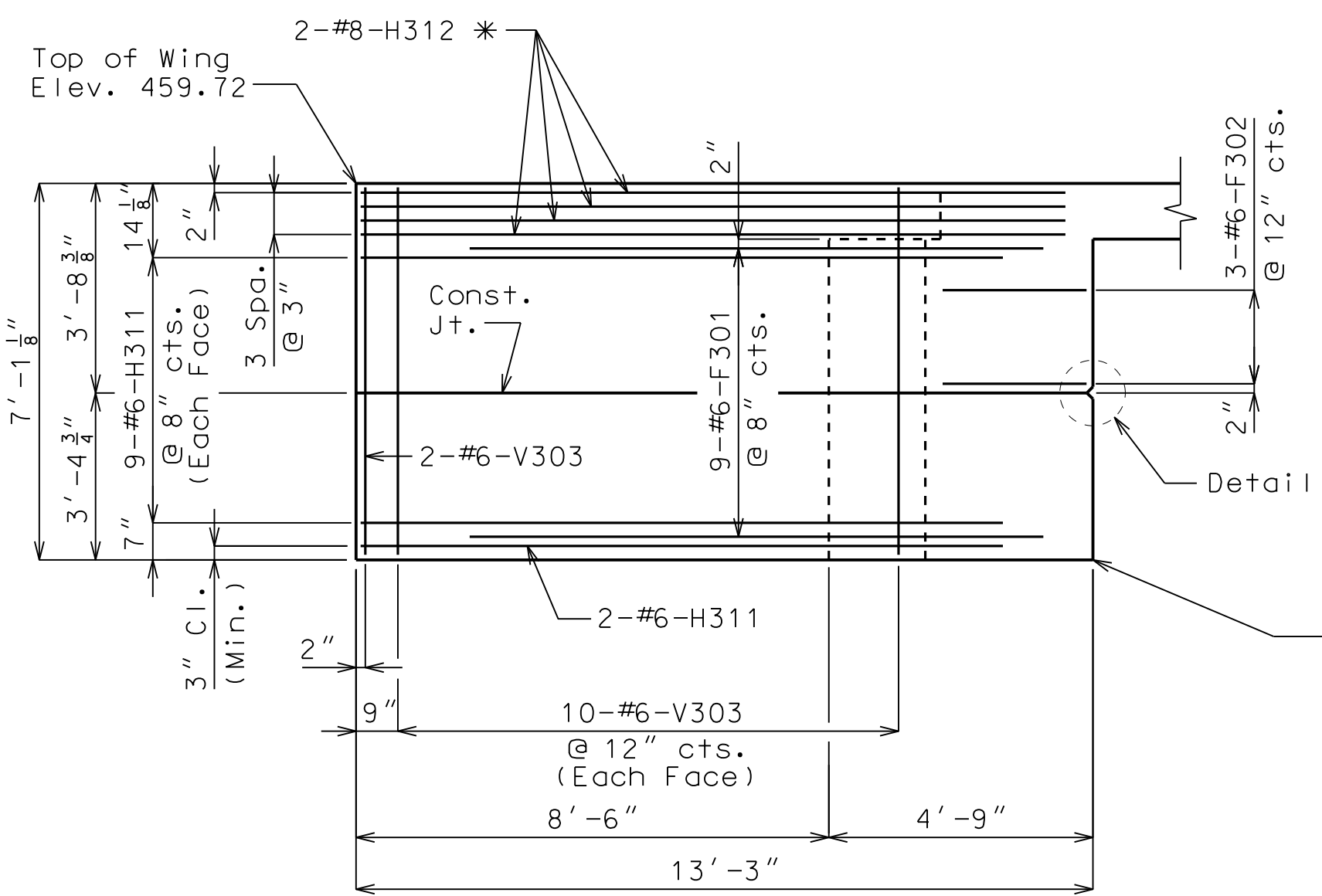
All concrete in the end bent above top of beam and below top of slab shall be Class B-2.

All bars shall be epoxy coated.

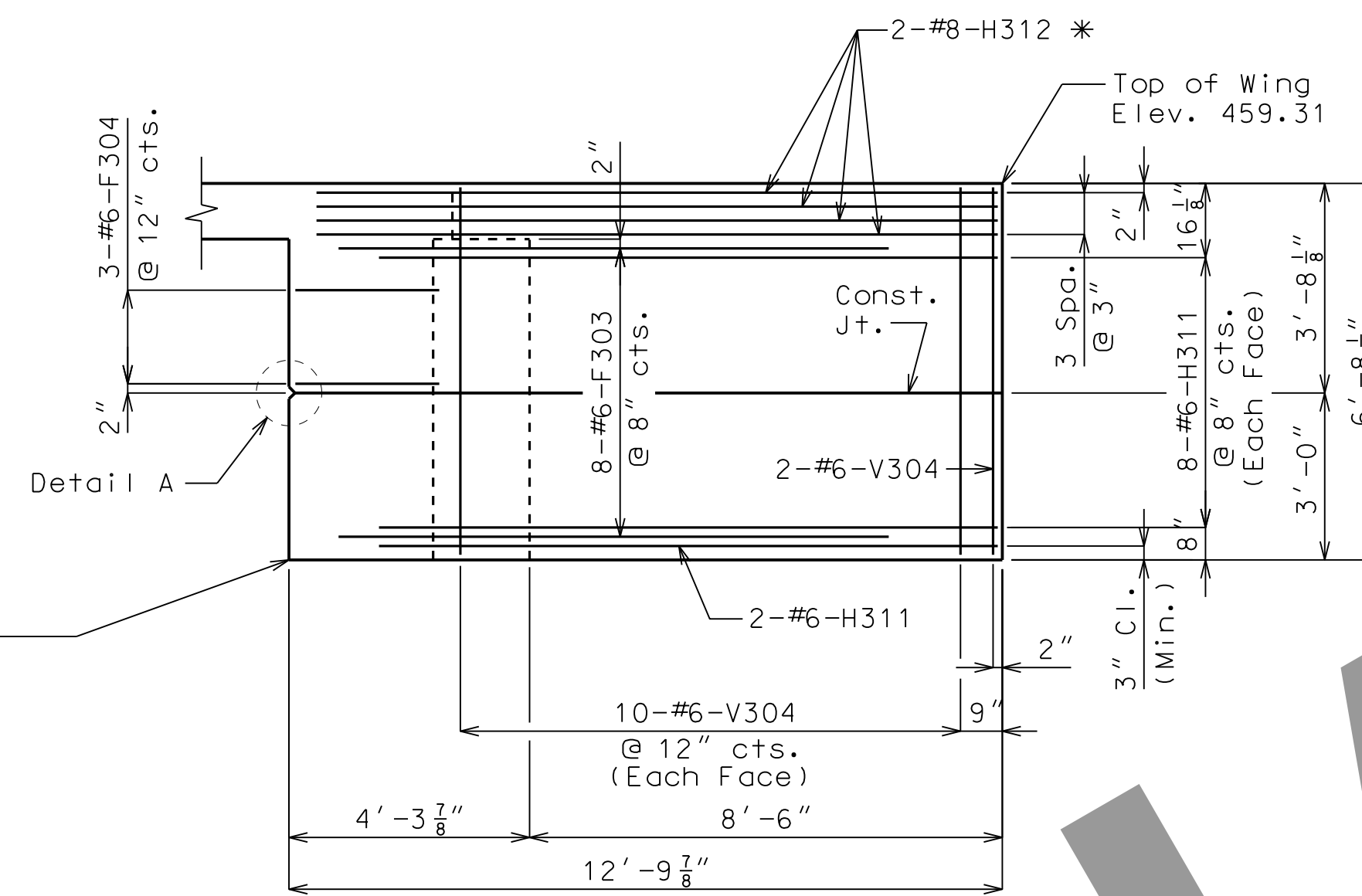
DETAILS OF END BENT NO. 3

Note: This drawing is not to scale. Follow dimensions. Sheet No. 11 of 37

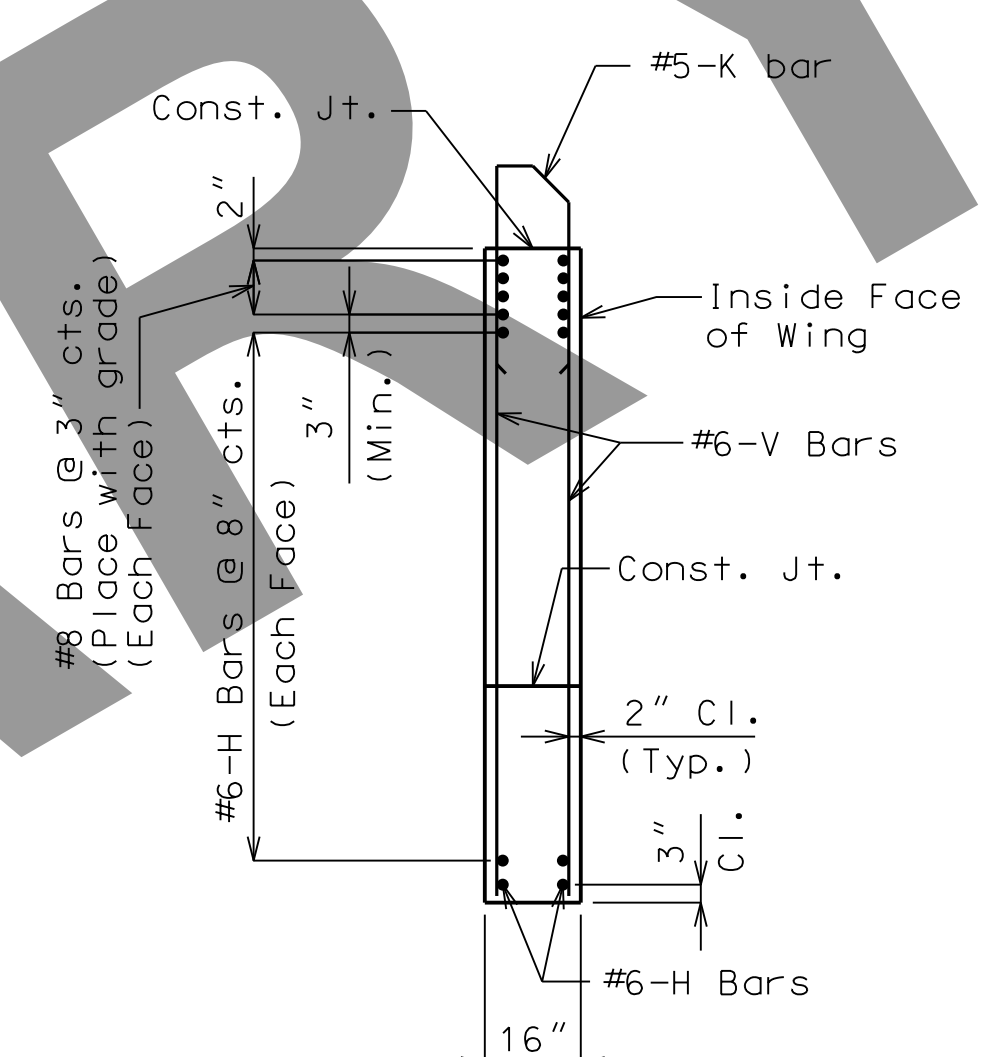
Designed: SSM
Detailed: CAB
Checked: MAB



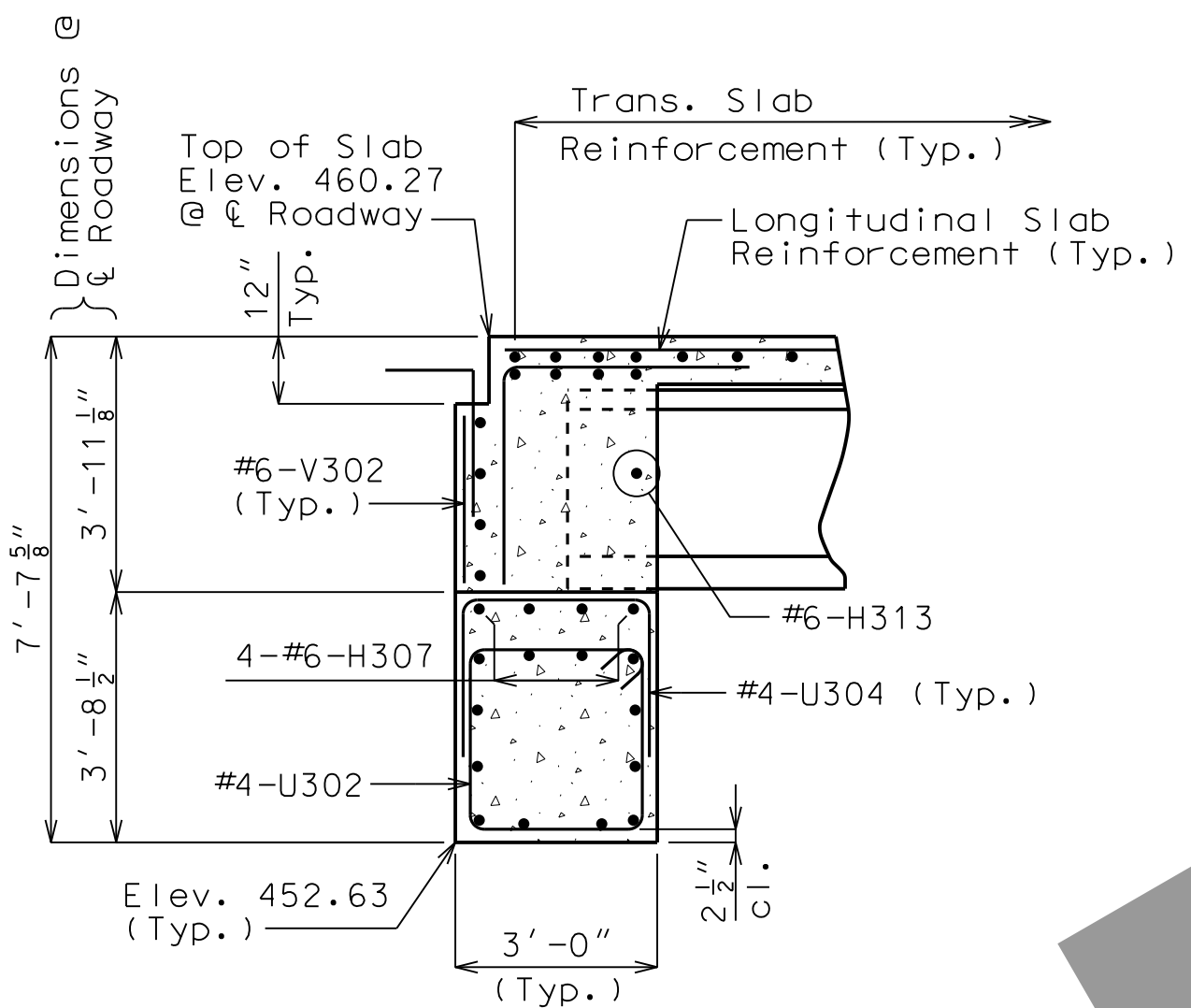
ELEVATION E-E



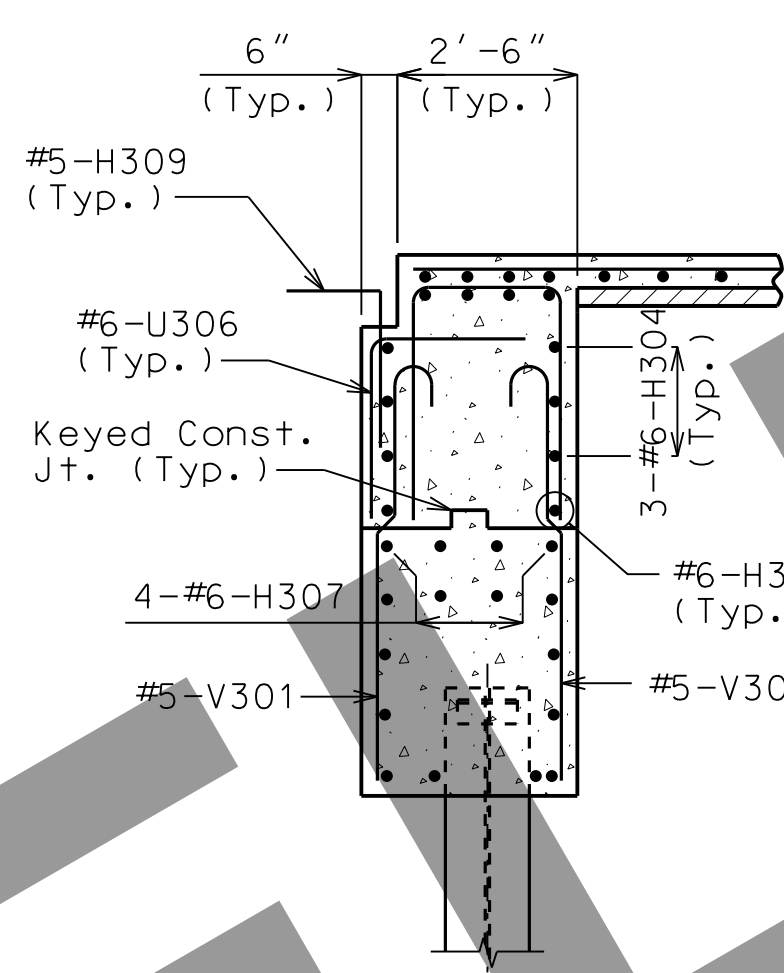
ELEVATION F-F



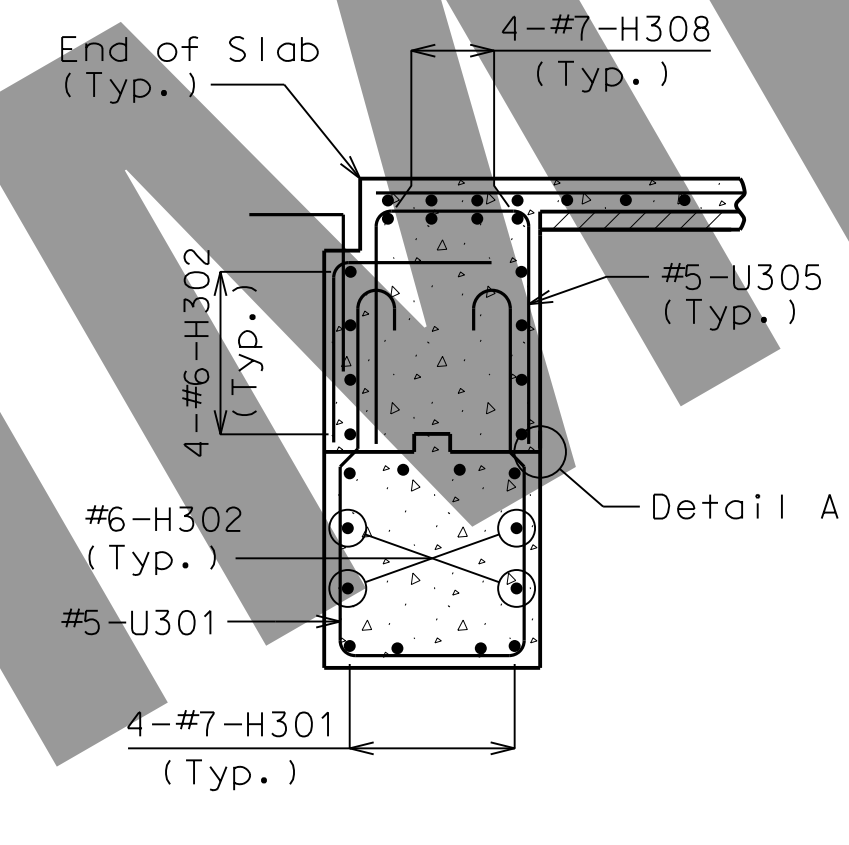
PART SECTION THRU WING



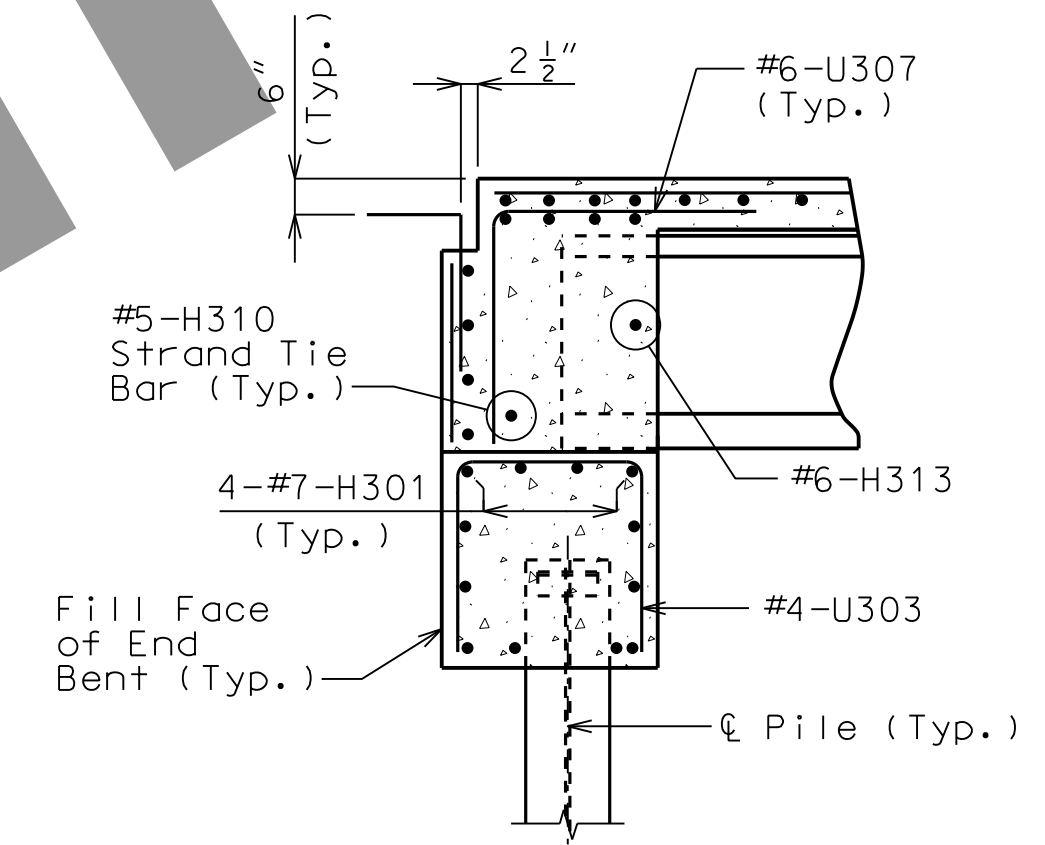
SECTION A-A



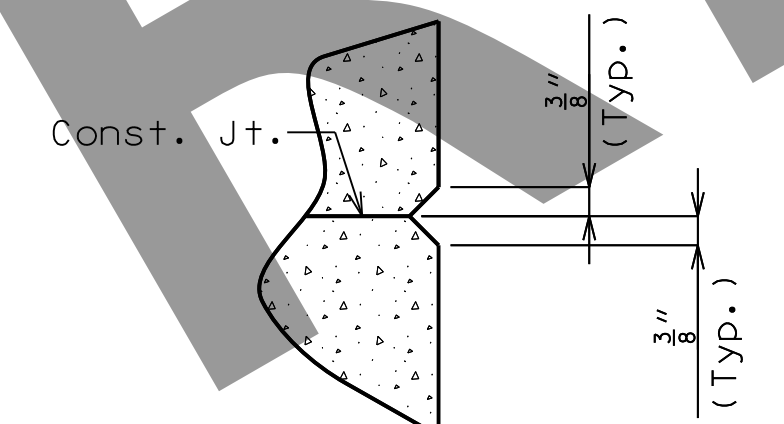
SECTION B-B



SECTION C-C



SECTION D-D



DETAIL A

* Place with grade

Notes:
 Work this sheet with Sheets No. 10 and 11.
 For reinforcement of Barrier Curb at End Bents, see Sheet No. 22.
 For details of Approach Slab, see Sheet No. 23.

Item		Quantity
Galvanized Structural Steel Pile (12 in.)	linear foot	350
Pile Point Reinforcement	each	7
Class B Concrete (Substructure)	cu. yard	25.9
Pipe Pile Spacers	each	7

Note: These quantities are included in the estimated quantities table on Sheet No. 2.

DETAILS OF END BENT NO. 3

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

Sheet No. 12 of 37

Designed: SSM
 Detailed: CAB
 Checked: MAB



DATE PREPARED 3/14/2022	ROUTE I-270	STATE MO
DISTRICT BR	SHEET NO. 12	COUNTY ST. LOUIS CITY
JOB NO. J613020C	CONTRACT ID.	
PROJECT NO.		
BRIDGE NO. A8999		

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

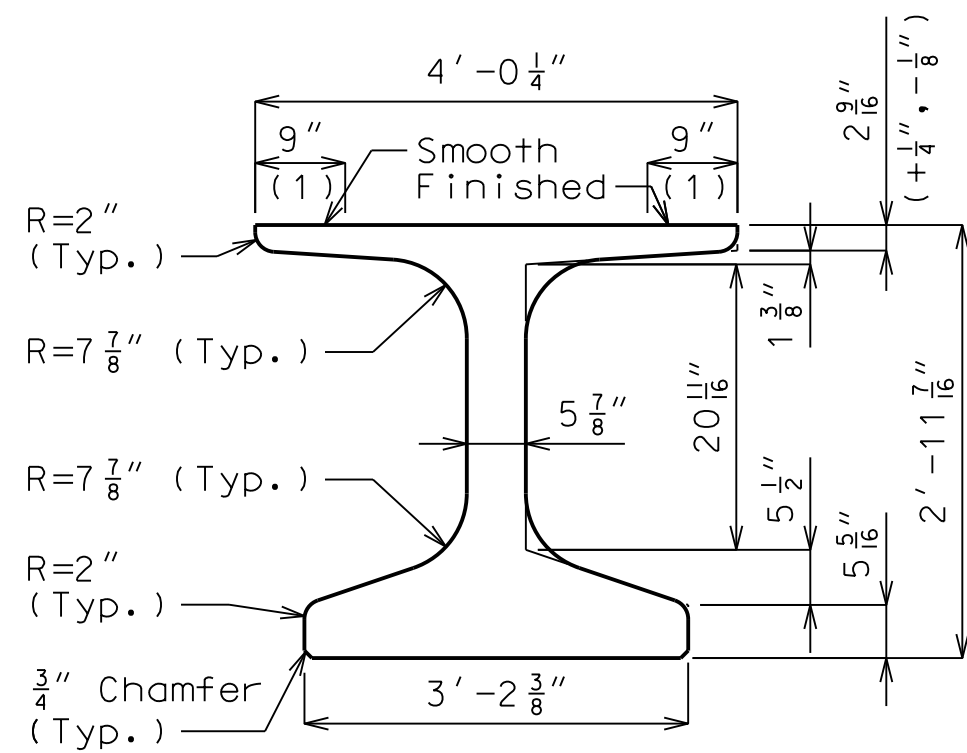
HORNER SHIFFRIN

401 S. 18TH ST. STE. 400 ST. LOUIS, MO 63103
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 DISCIPLINE: PROFESSIONAL ENGINEERING
 CERTIFICATE OF AUTHORITY: 000159
 EXPIRATION DATE: DECEMBER 31, 2022

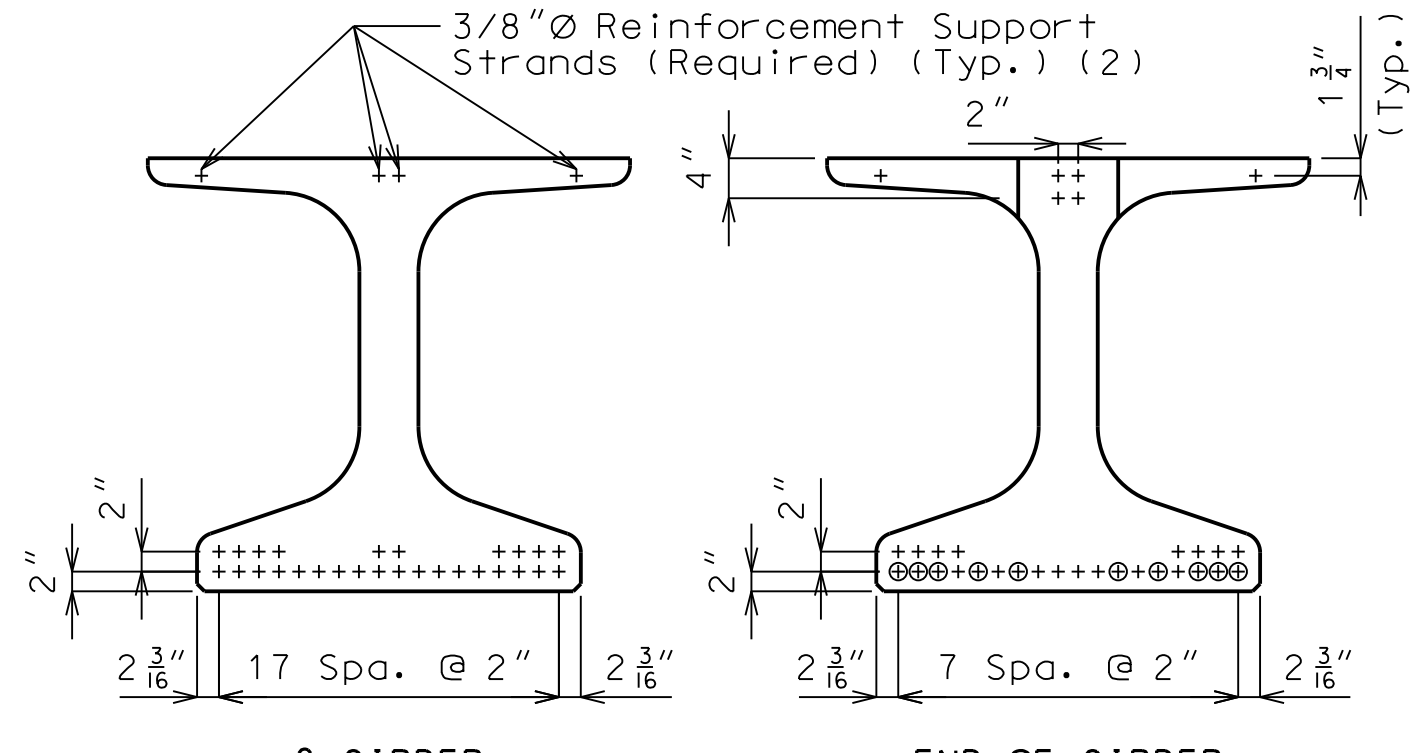
I-270 AND RIVERVIEW
 EB BRIDGE
 DETAILS OF
 END BENT NO. 3

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

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

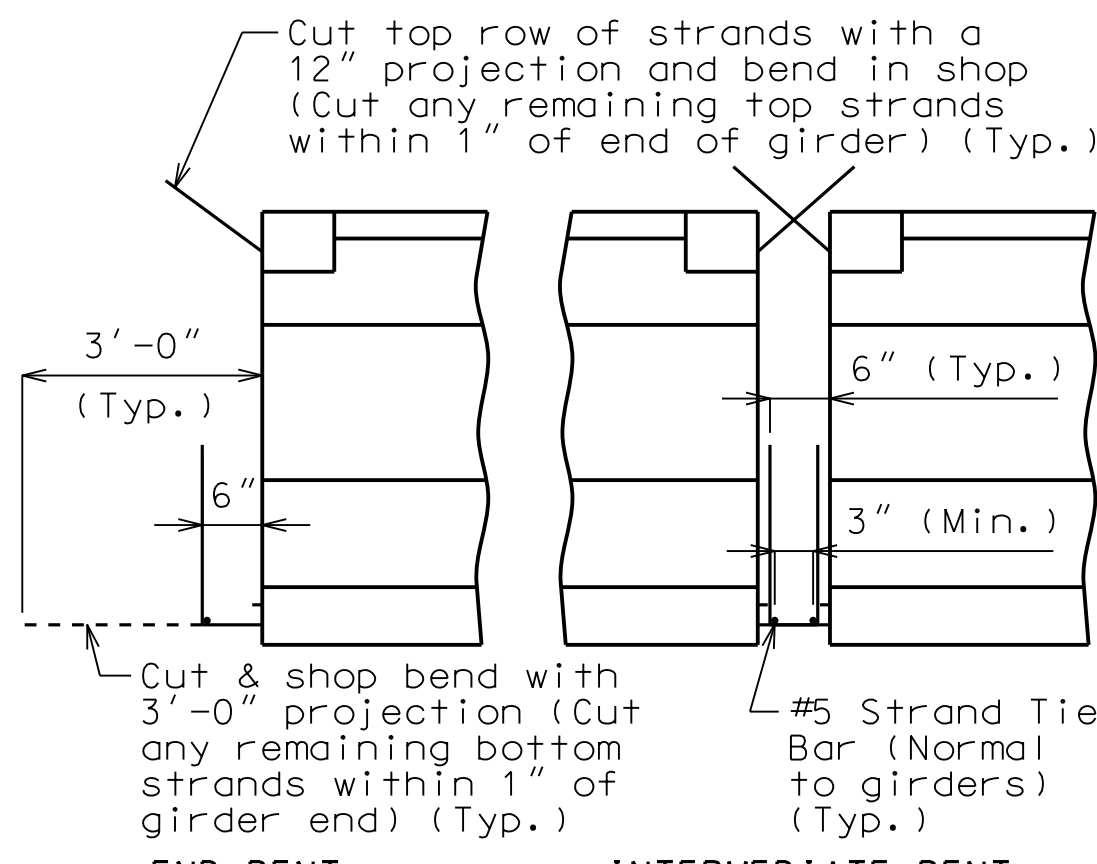


DIMENSIONS

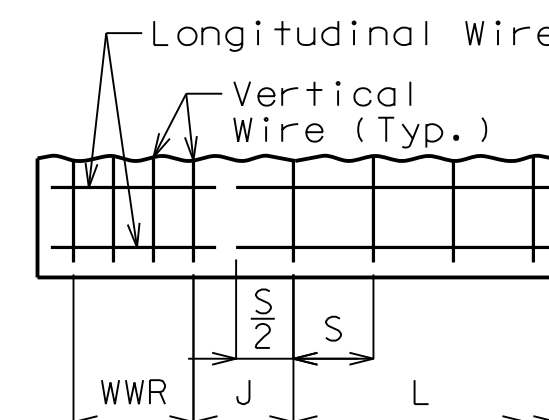


STRAND ARRANGEMENT

+ Indicates prestressing strand.
 o Indicates cut & shop bend with 3'-0" projection.



STRANDS AT GIRDER ENDS



WELDED WIRE PLACEMENT

S = Vertical wire spacing
 L = Length of WWR mats
 J = Distance between WWR mats

Bill of Reinforcing Steel					
Bars Each Girder					
No.	Size/Mark	Length	Shape	Bending Diagrams	
90	3 G1	2'-10"	8		
2	4 G3	3'-10 1/2"	20		
2	4 G4	2'-3"	20		
2	4 G5	2'-8 1/2"	20		
2	4 G6	3'-10 1/2"	20		
Welded Wire Each Girder					
Mark	Size	S	W	L	J
WWR1	D31	4"	W12	5'-4"	5"
WWR2	D31	8"	W12	12'-0"	12"
WWR3	D31	12"	W12	14'-0"	--
WWR6	D31	2"	W12	16"	4"

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 1", unless otherwise shown.

All bar reinforcement shall be Grade 60.
 WWR shall not be epoxy coated.

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

General Notes:
 Concrete for prestressed beams shall be Class A-1 with $f'c = 8000$ psi and $f'ci = 6500$ psi.

Use 28 1/2" ϕ Grade 270 strands with an initial prestress force of 867 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, holes for #6 bar, top flange blockout, application of bond breaker.

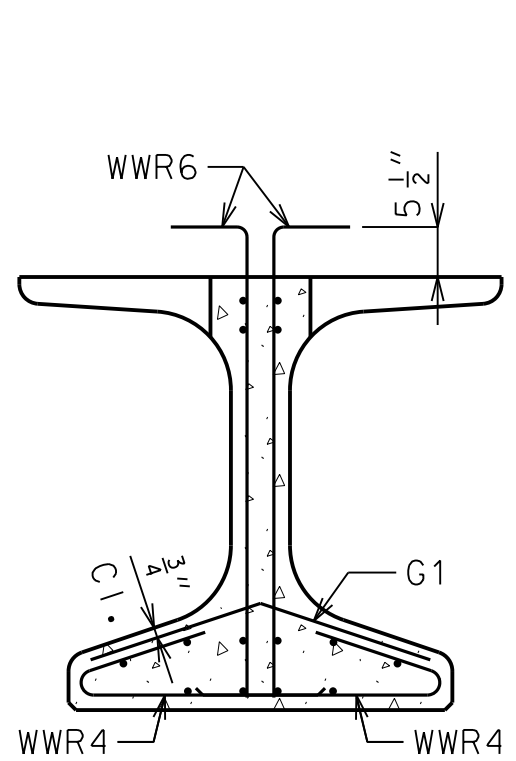
The contractor shall provide bracing necessary for lateral and torsional stability of the girders during construction of the concrete slab and remove the bracing after the slab has attained 75% design strength. Contractor shall not drill holes in the girders.

For Girder Camber Diagram, see Sheet No. 17.

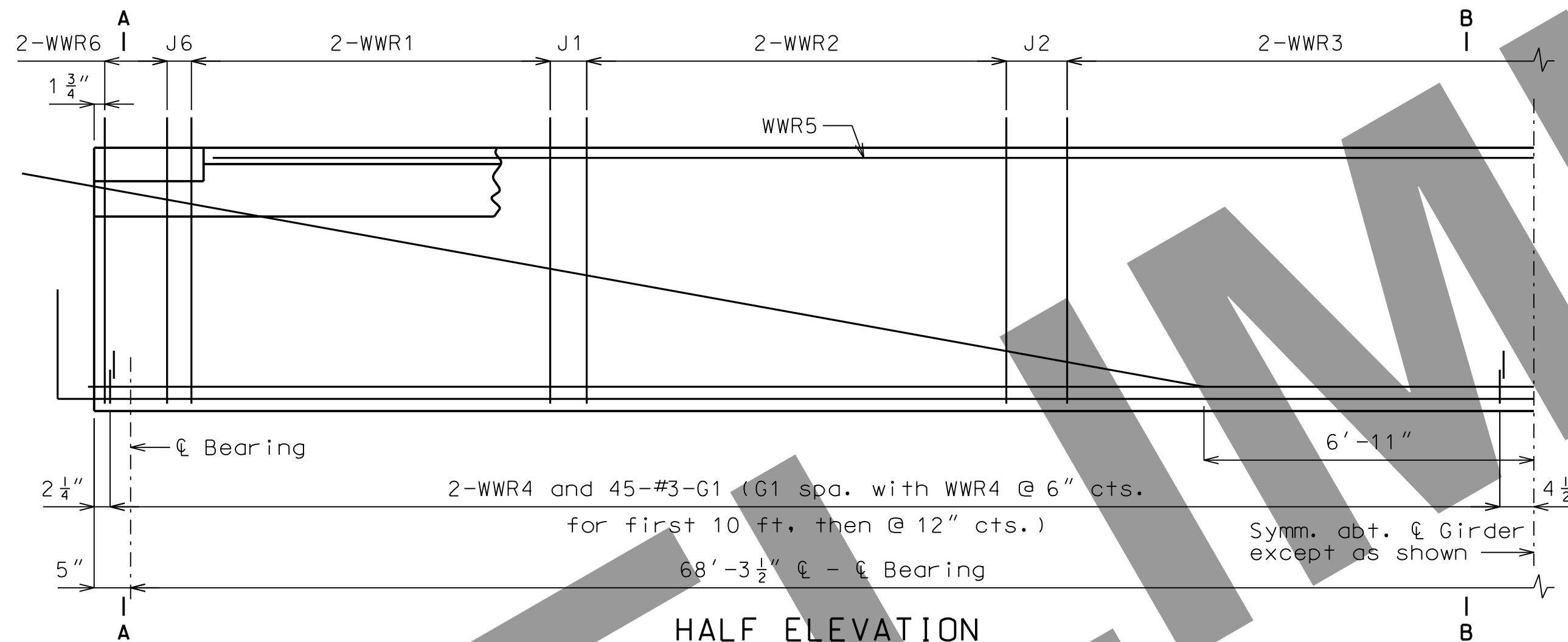
For location of coil ties and #6 bars at concrete bent diaphragms, see Sheets No. 5 & 11.

Alternate bar reinforcing steel details are provided and may be used. The same type of reinforcing steel shall be used for all girders in all spans.

For location of sign support bracket attachment holes, see Sheet No. 37.

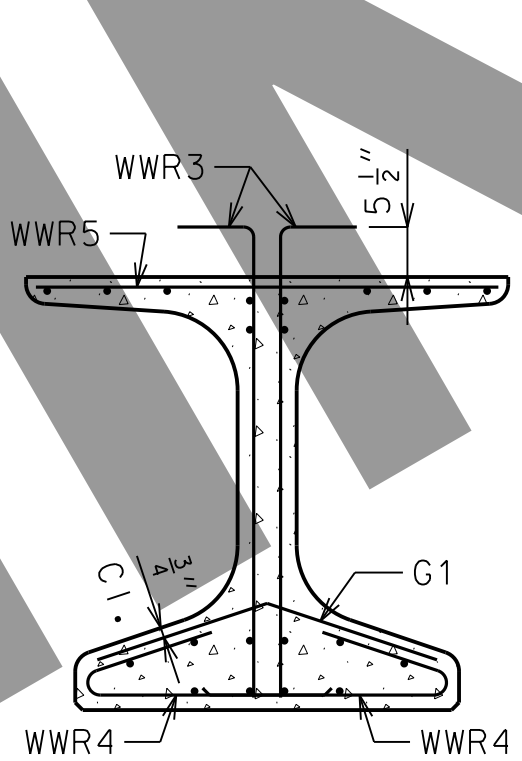


SECTION A-A
 Strands not shown for clarity.

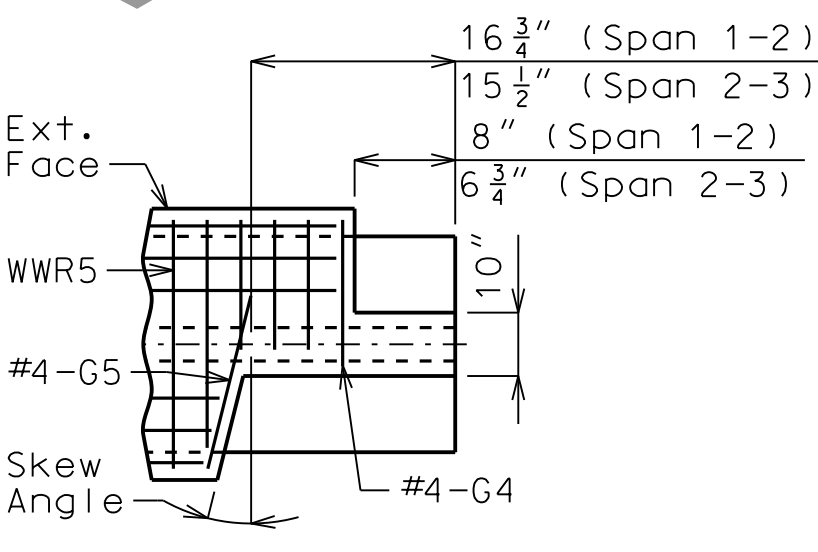


HALF ELEVATION

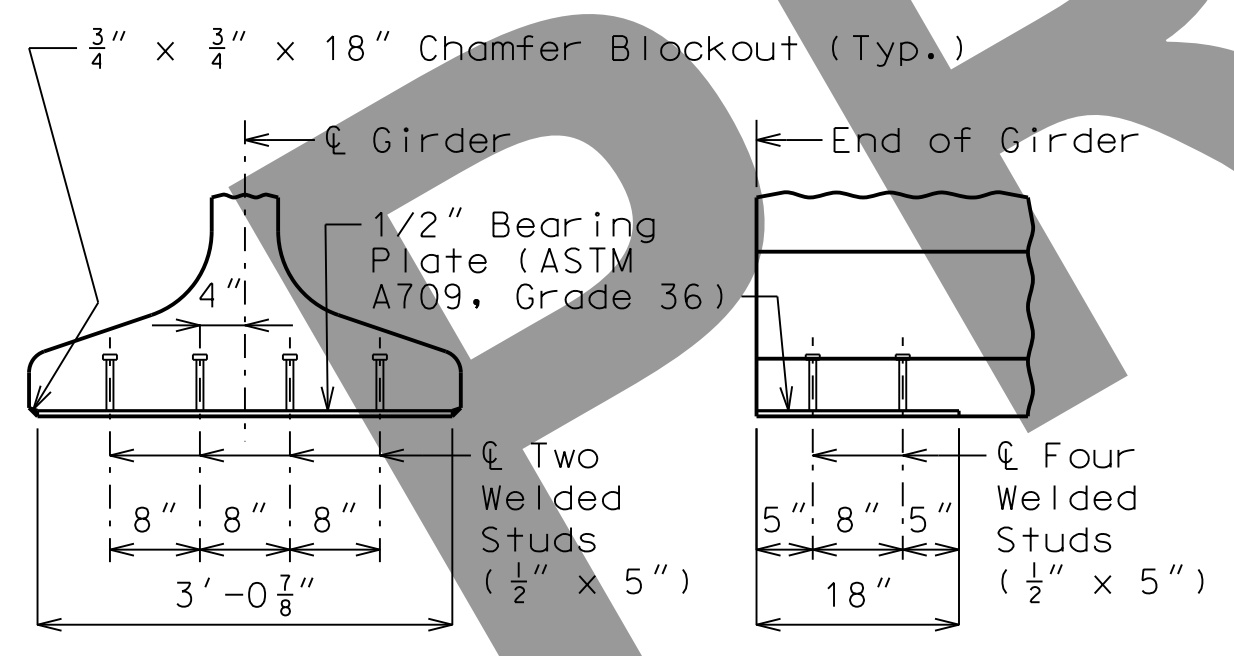
Reinforcement support strands not shown for clarity.



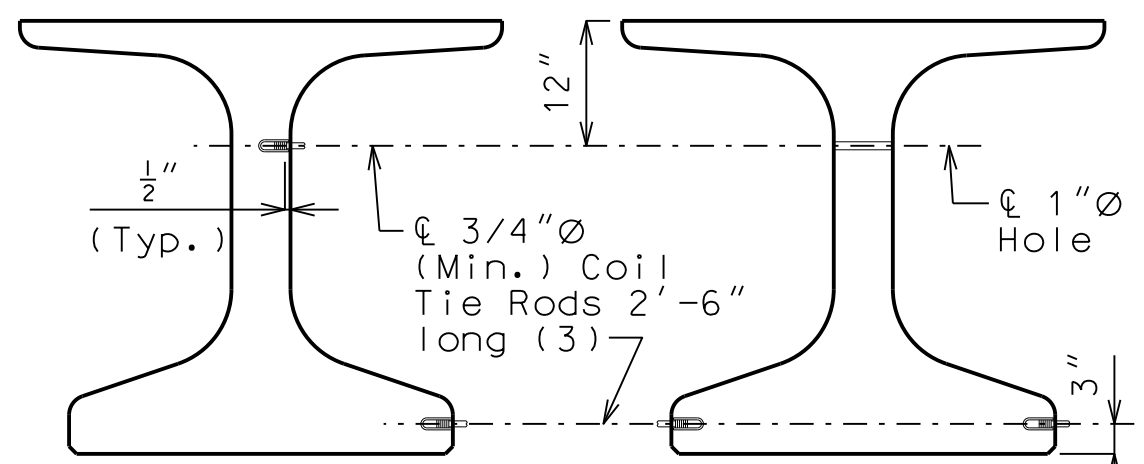
SECTION B-B
 Strands not shown for clarity.



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

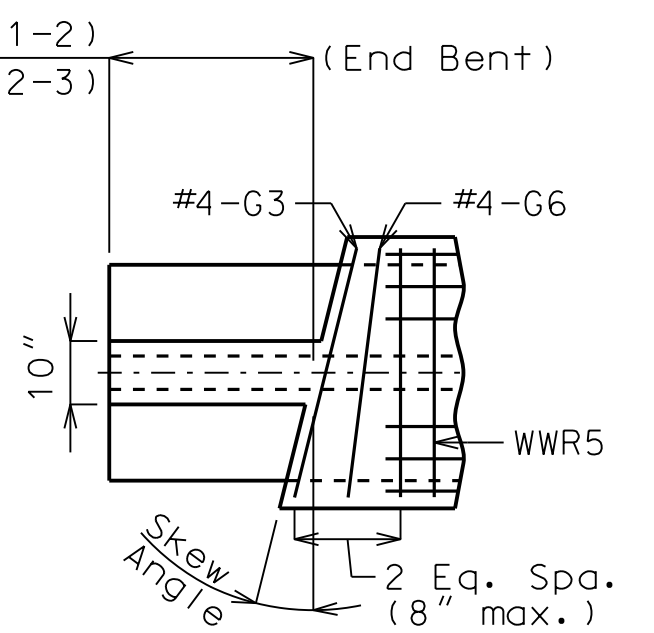


BEARING PLATE



COIL TIES

Cast 1" ϕ hole horizontally in girder for #6 bar 5'-6" long and clear reinforcing steel or strands by 1 1/2" minimum.



TOP FLANGE BLOCKOUT
 Mirror for right advanced.

NU-GIRDERS - SPANS (1-2) AND (2-3)

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

Sheet No.13 of 37

Designed: UVK
 Detailed: CAB
 Checked: TPL



DATE PREPARED: 3/14/2022
 ROUTE: I-270 STATE: MO
 DISTRICT: BR SHEET NO.: 13

COUNTY: ST. LOUIS CITY
 JOB NO.: J613020C
 CONTRACT ID.:

PROJECT NO.:

BRIDGE NO.: A8999

DESCRIPTION	DATE

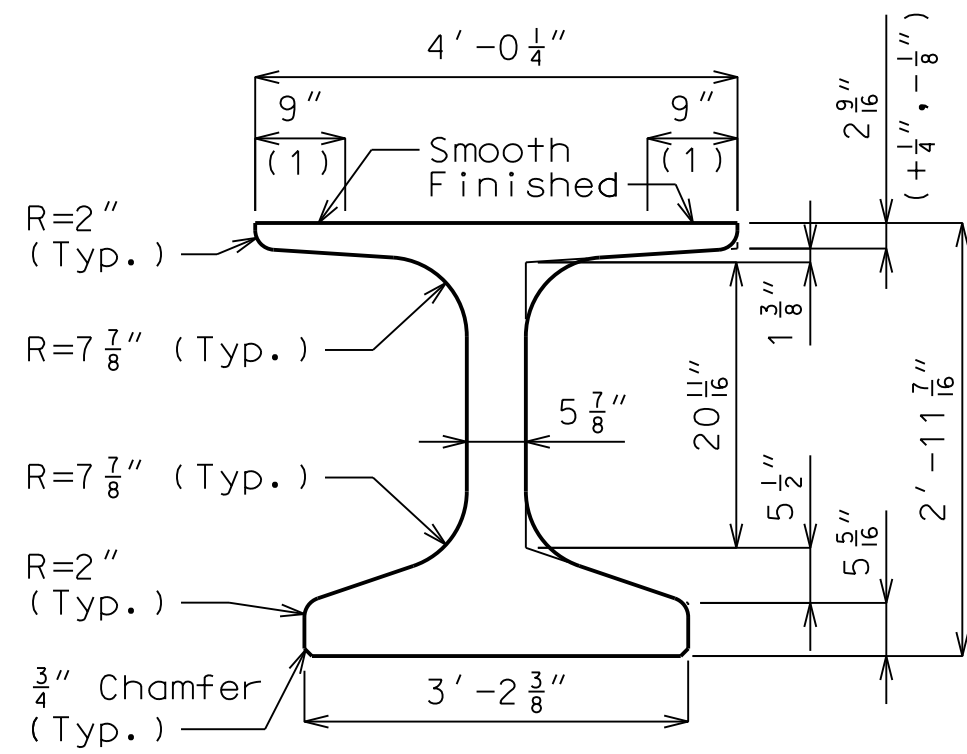
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 MoDOT
 105 WEST CAPITOL JEFFERSON CITY, MO 65102
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 314-451-4321 FAX 314-551-8586
 WWW.HORNERSHIFRIN.COM
 DISCIPLINE: PROFESSIONAL ENGINEERING
 CERTIFICATE OF AUTHORITY: 000159
 EXPIRATION DATE: DECEMBER 31, 2022

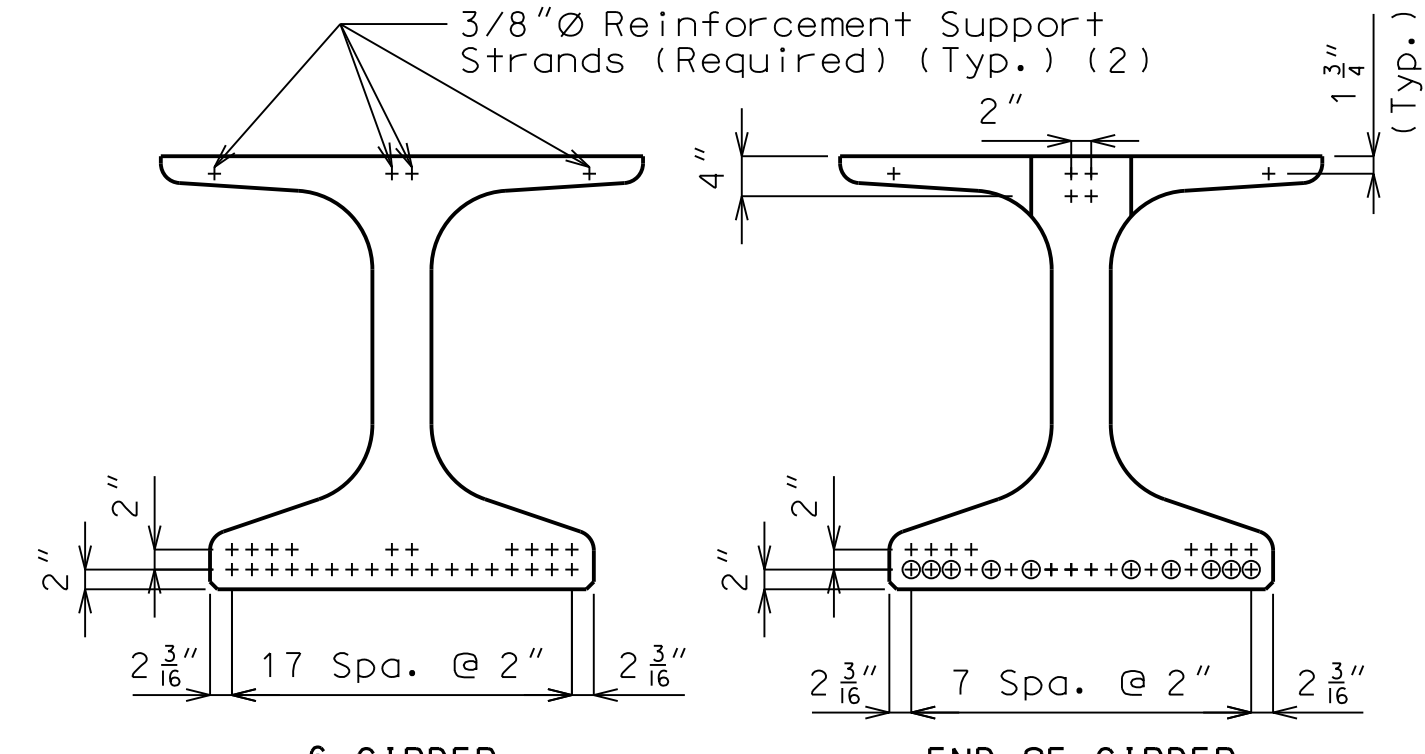
I-270 AND RIVERVIEW EB BRIDGE NU-GIRDERS SPANS (1-2) AND (2-3)

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

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

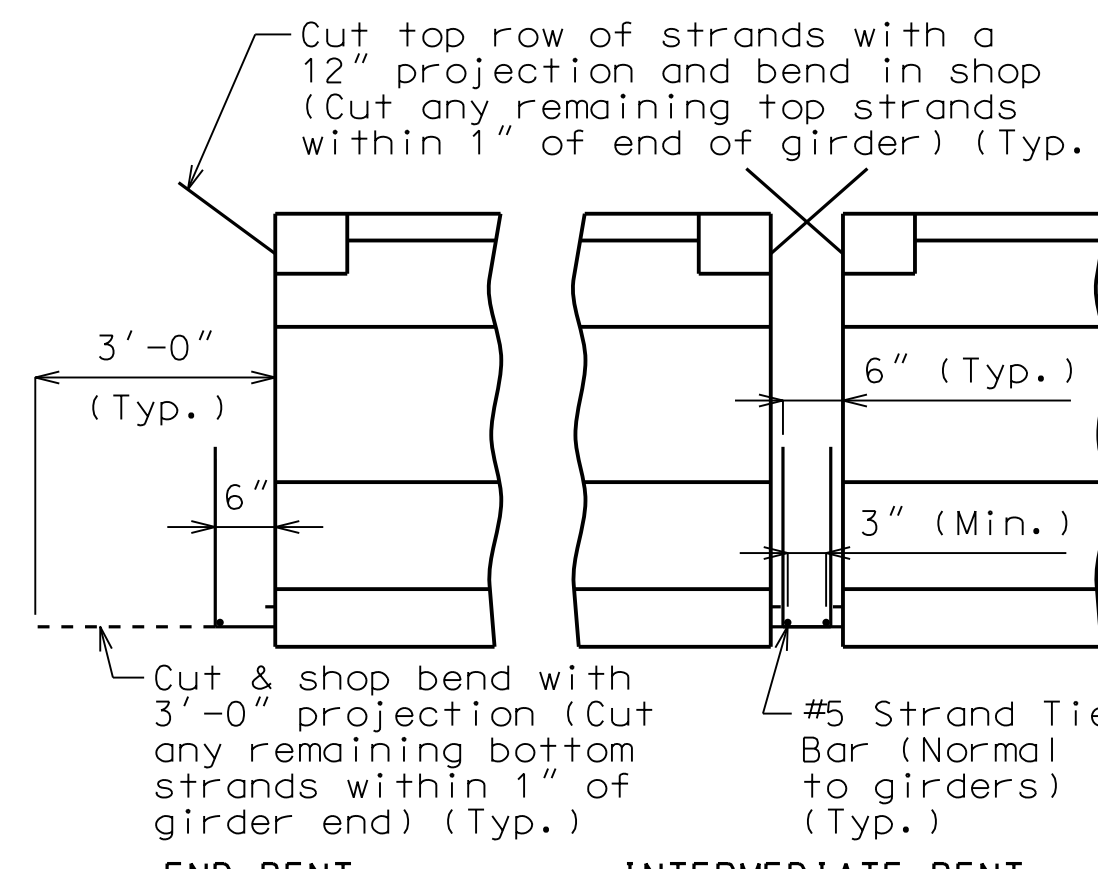


DIMENSIONS

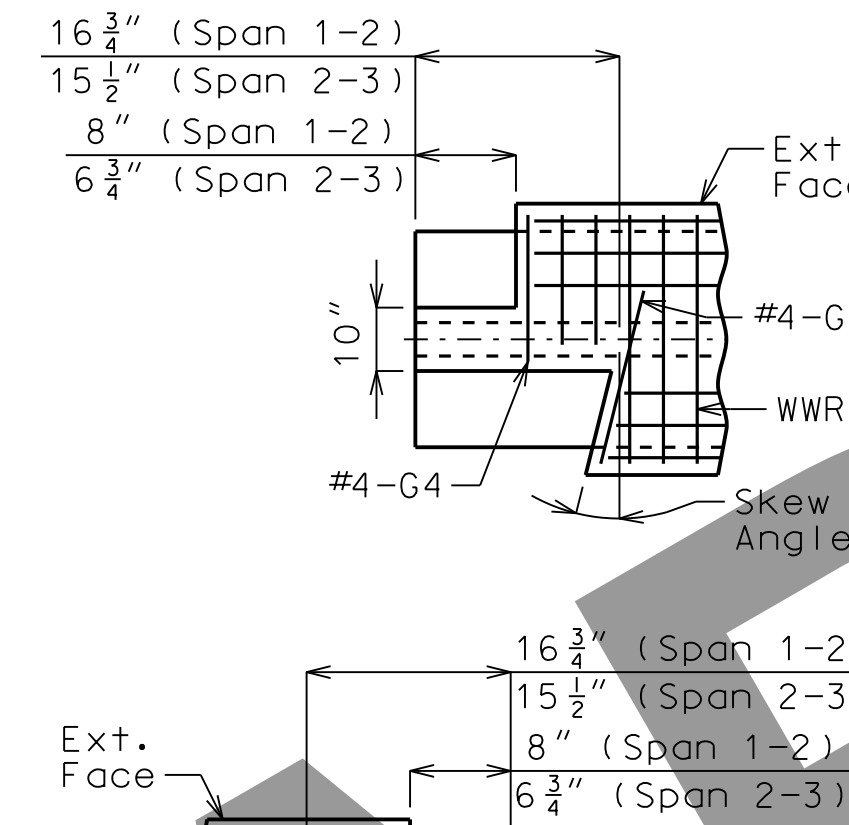


\bar{C} GIRDER STRAND ARRANGEMENT

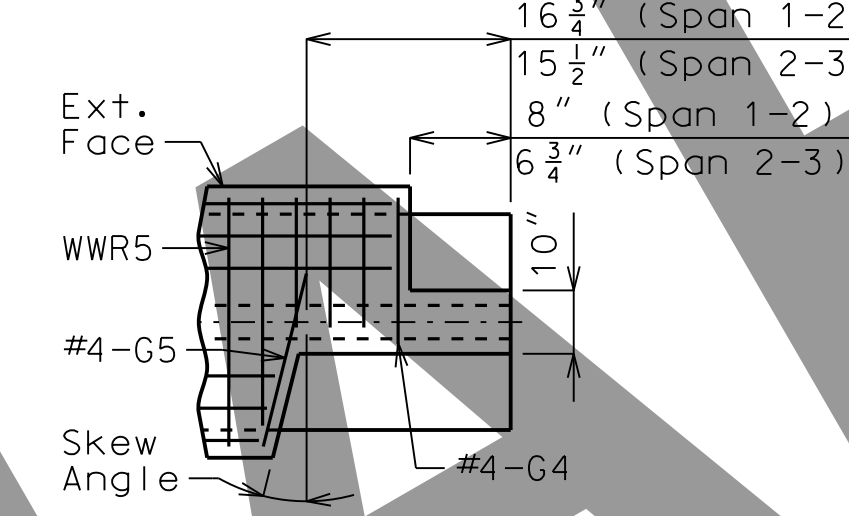
+ Indicates prestressing strand.
o Indicates cut & shop bend with 3'-0" projection.



END BENT INTERMEDIATE BENT STRANDS AT GIRDER ENDS

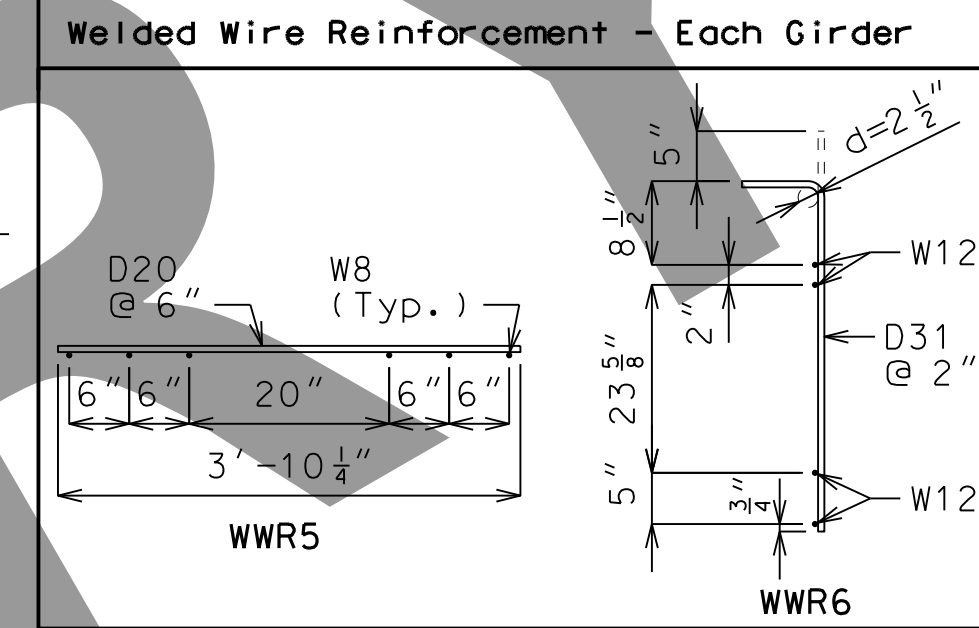


LEFT EXTERIOR GIRDER AT INTERMEDIATE BENT Rotate 180° for right ext.



INTERIOR GIRDER AT ALL BENTS & EXTERIOR GIRDER AT END BENT TOP FLANGE BLOCKOUT Mirror for right advanced.

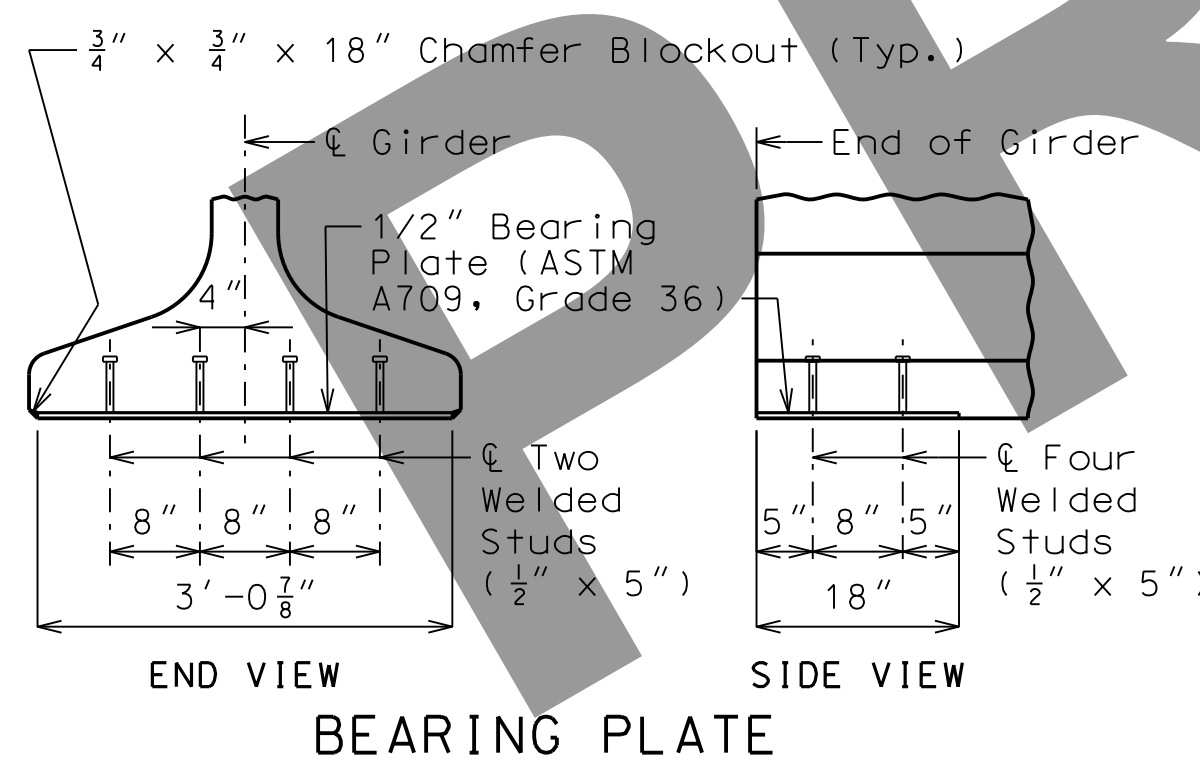
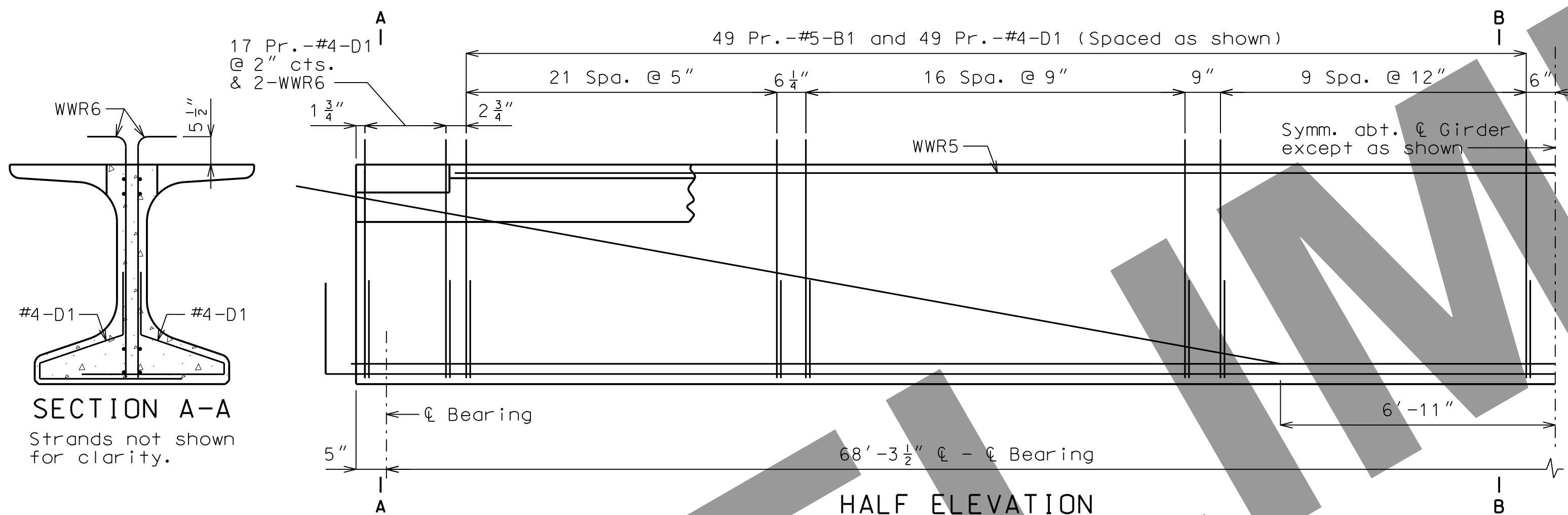
Bill of Reinforcing Steel - Each Girder				
No.	Size/Mark	Length	Shape	Bending Diagrams
196	5 B1	4'-4"	11	Shape 20
264	4 D1	4'-0"	9	Shape 9 Shape 11
2	4 G3	3'-10 7/8"	20	
2	4 G4	2'-3"	20	
2	4 G5	2'-8 1/2"	20	
2	4 G6	3'-10 1/2"	20	



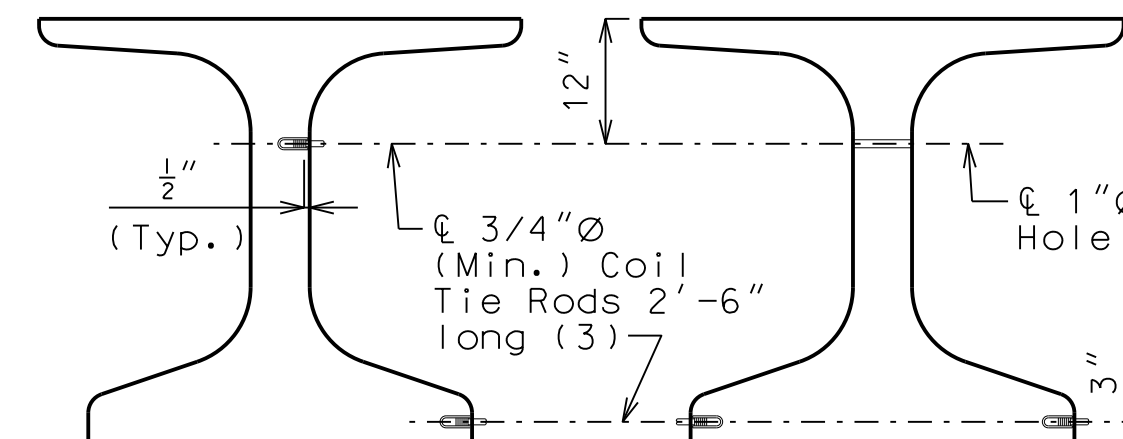
All dimensions are out to out.
Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures, Stirrup and Tie Dimensions.
Actual bar lengths are measured along centerline of bar to the nearest inch.
Minimum clearance to reinforcing shall be 1".
All bar reinforcement shall be Grade 60.
The two D1 bars may be furnished as one bar at the fabricator's option.
All B1 bars shall be epoxy coated.
G4 and G5 not required for interior girders. G3 and G6 not required for exterior girders of intermediate spans. Half no. of G3, G4, G5 and G6 not required for ext. girders of end spans.

General Notes:

Concrete for prestressed girders shall be Class A-1 with $f'c = 8000$ psi and $f'ci = 6500$ psi.
Use 28 1/2" \bar{C} Grade 270 strands with an initial prestress force of 867 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, holes for #6 bar, top flange blockout, application of bond breaker.
The contractor shall provide bracing necessary for lateral and torsional stability of the girders during construction of the concrete slab and remove the bracing after the slab has attained 75% design strength. Contractor shall not drill holes in the girders.
For Girder Camber Diagram, see Sheet No. 17.
For location of coil ties and #6 bars at concrete bent diaphragms, see Sheets No. 5 & 11.
Alternate bar reinforcing steel details are provided and may be used. The same type of reinforcing steel shall be used for all girders in all spans.
For location of sign support bracket attachment holes, see Sheet No. 37.



END VIEW SIDE VIEW BEARING PLATE



EXTERIOR GIRDER AT INTERMEDIATE BENTS EXTERIOR GIRDER AT END BENTS INTERIOR GIRDER AT ALL BENTS

(3) 1'-11" at exterior face of exterior girders at end bents

COIL TIES

Cast 1" \bar{C} hole horizontally in girder for #6 bar 5'-6" long and clear reinforcing steel or strands by 1 1/2" minimum.

NU-GIRDERS (ALTERNATE REINFORCEMENT) - SPANS (1-2) AND (2-3)

Designed: UVK
Detailed: CAB
Checked: TPL

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

Sheet No. 14 of 37



DATE PREPARED 3/14/2022	
ROUTE I-270	STATE MO
DISTRICT BR	SHEET NO. 14
COUNTY ST. LOUIS CITY	
JOB NO. J613020C	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A8999	

DESCRIPTION	DATE

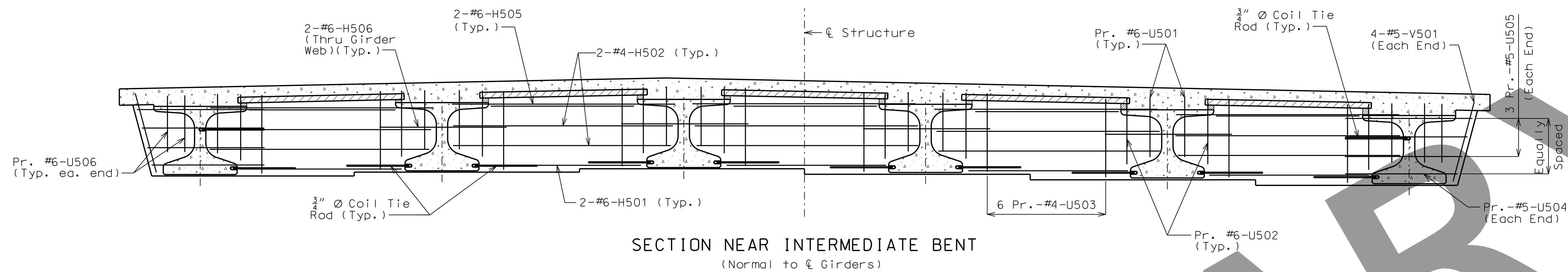
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

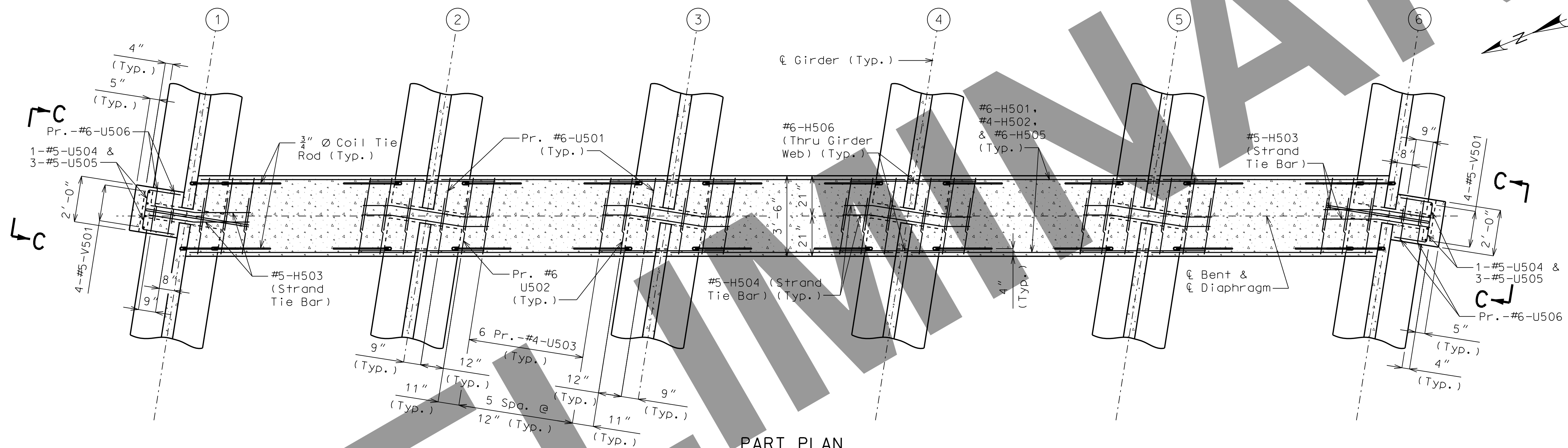
HORNER SHIFFRIN

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DISCIPLINE: PROFESSIONAL ENGINEERING
CERTIFICATE OF AUTHORITY: 000159
EXPIRATION DATE: DECEMBER 31, 2022

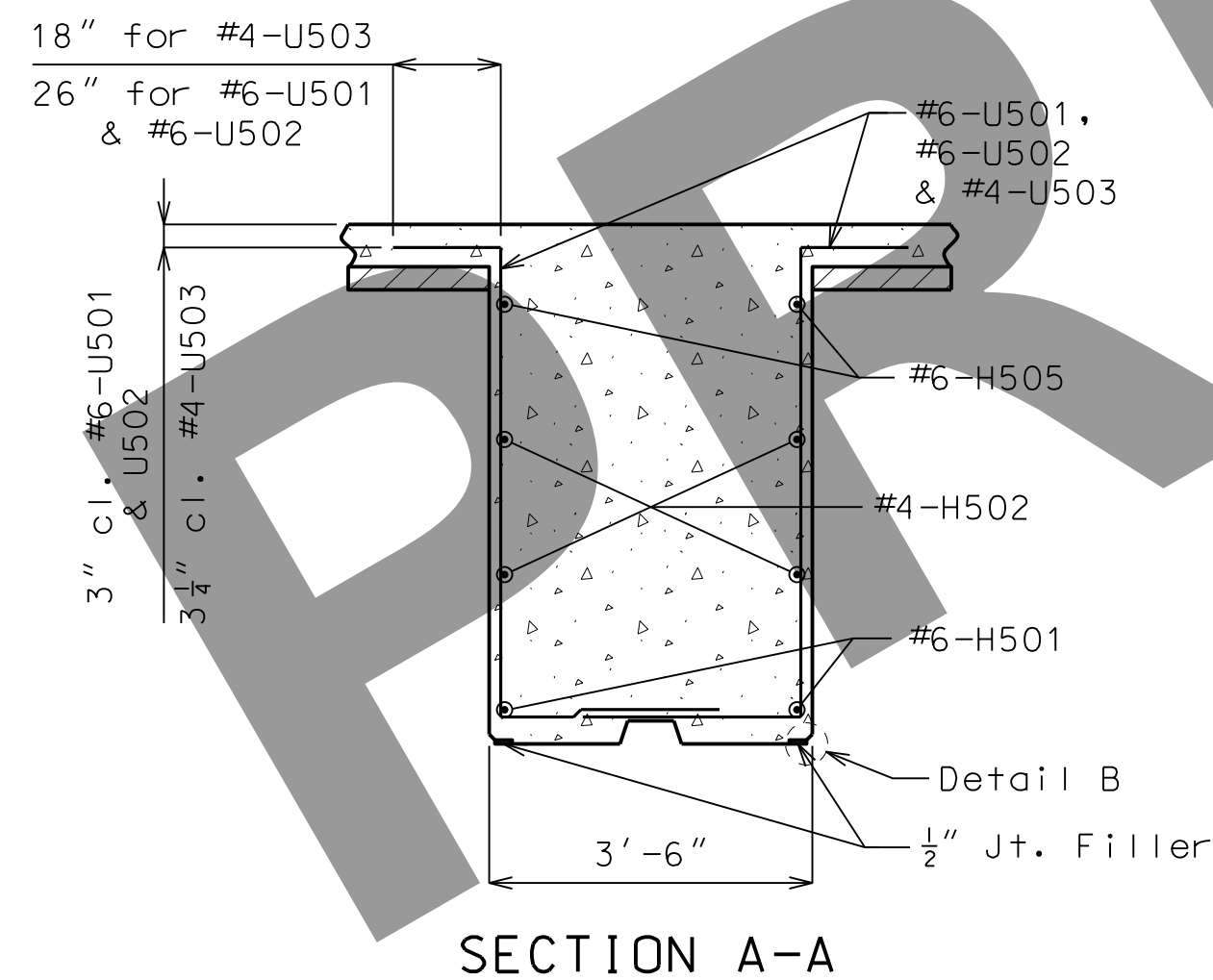
I-270 AND RIVERVIEW EB BRIDGE NU-GIRDERS (ALT. REINFORCING) SPANS (1-2) AND (2-3)



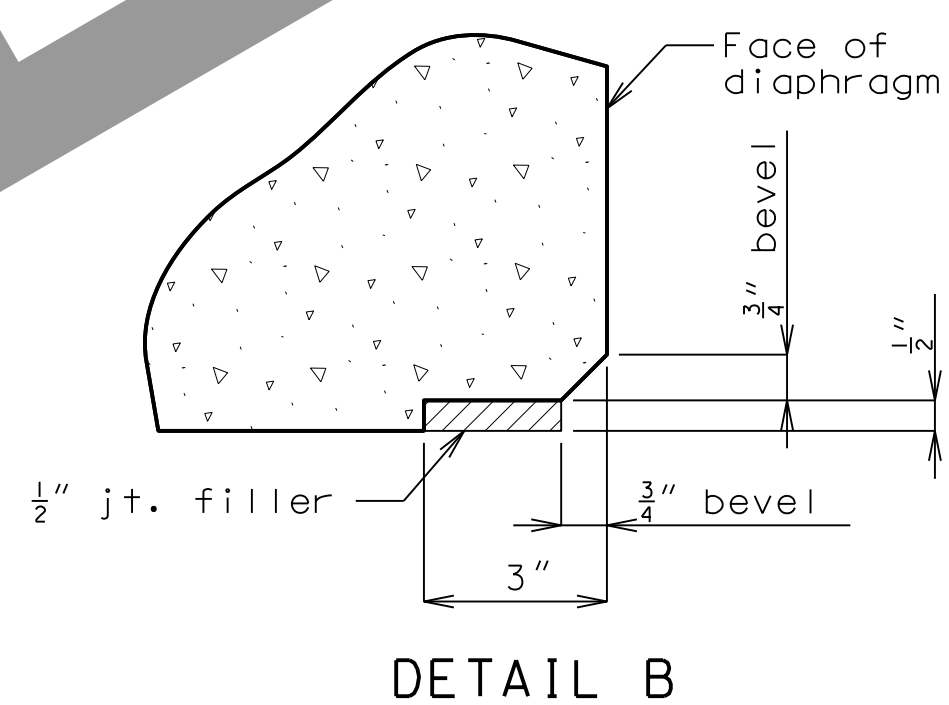
SECTION NEAR INTERMEDIATE BENT
(Normal to Girders)



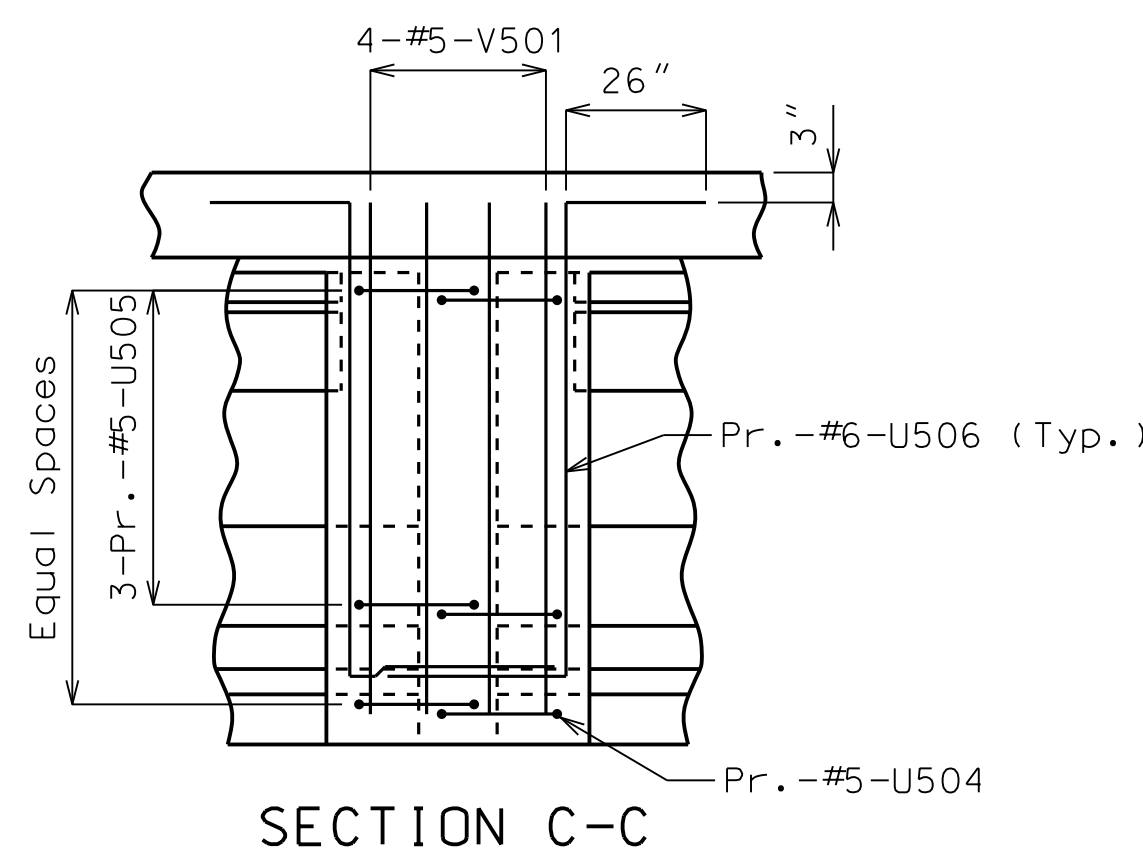
PART PLAN



SECTION A-A



DETAIL B



SECTION C-C

Notes:

Diaphragms at Intermediate Bents shall be built vertical.

For locations of strand tie bars and coil tie bars, see Sheets No. 13 & 14.

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

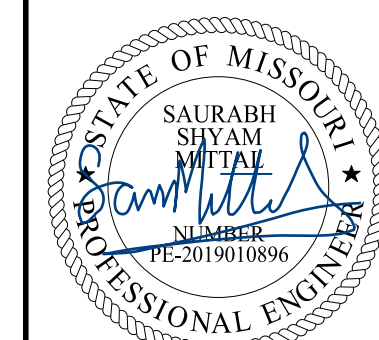
All reinforcing bars in Intermediate Bent Diaphragm shall be epoxy coated.

Designed: UVK
Detailed: CAB
Checked: TPL

DETAILS OF DIAPHRAGM AT INT. BENT NO. 2

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

Sheet No. 15 of 37



03/16/22

DATE PREPARED

3/14/2022

ROUTE I-270 STATE MO

DISTRICT BR SHEET NO. 15

COUNTY ST. LOUIS CITY

JOB NO. J613020C

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A8999

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITAL JEFFERSON CITY, MO 65102

1-888-ASK-MODOT (1-888-275-6636)

MO DOT

401 S. 18TH ST. STE. 400 ST. LOUIS, MO 63103

314-451-4321 FAX 314-521-6886

WWW.HORNERSHIFFRIN.COM

DISCIPLINE: PROFESSIONAL ENGINEERING

CERTIFICATE OF AUTHORITY: 000159

EXPIRATION DATE: DECEMBER 31, 2022

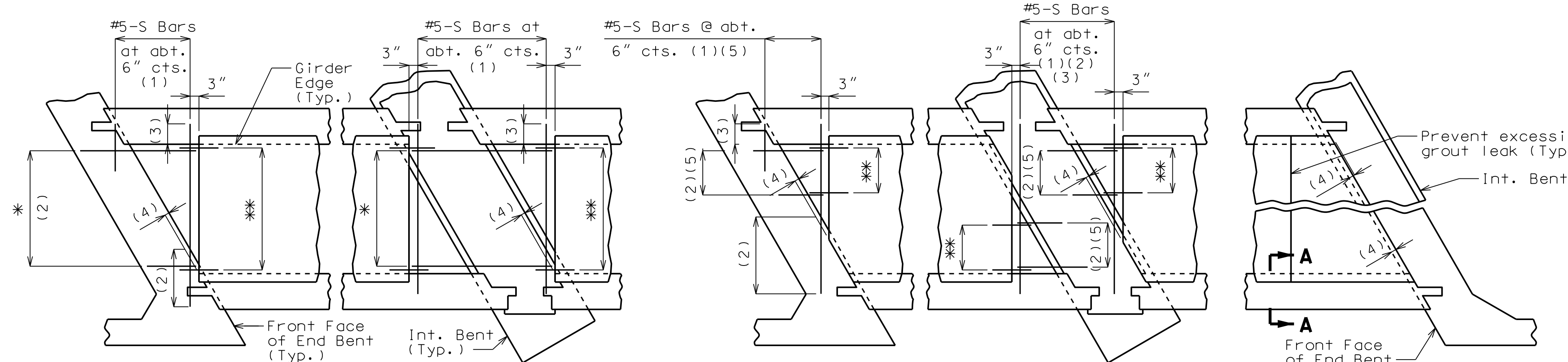
I-270 AND RIVERVIEW

EB BRIDGE

DETAILS OF

DIAPHRAGM AT

INT. BENT NO. 2

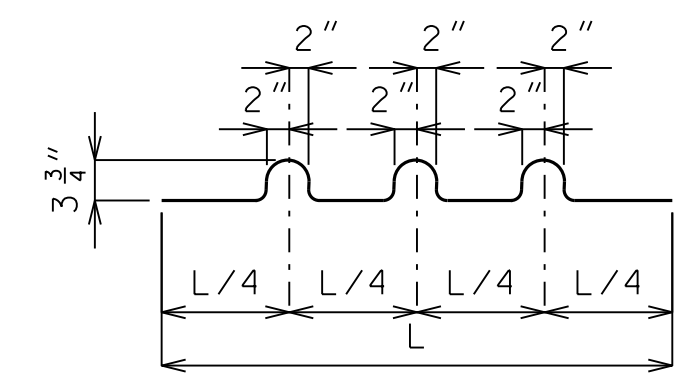


SQUARED END PANELS OR TRUNCATED END PANELS
PLAN SHOWING PANELS PLACEMENT

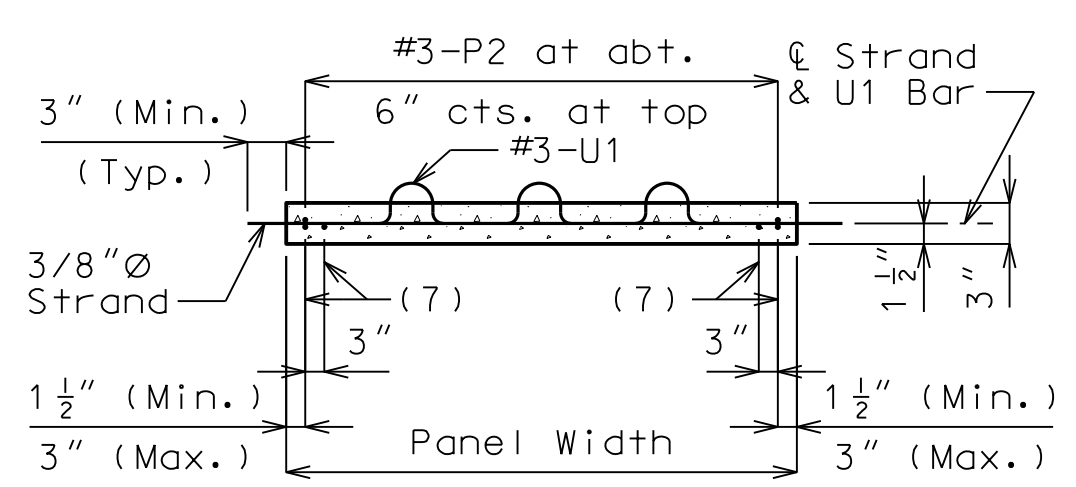
* #5-S Bars at abt. 9" cts. (1)
** #3-P1 at 12" cts. (End panels only)

SKewed END PANELS
Joint Filler Dimensions

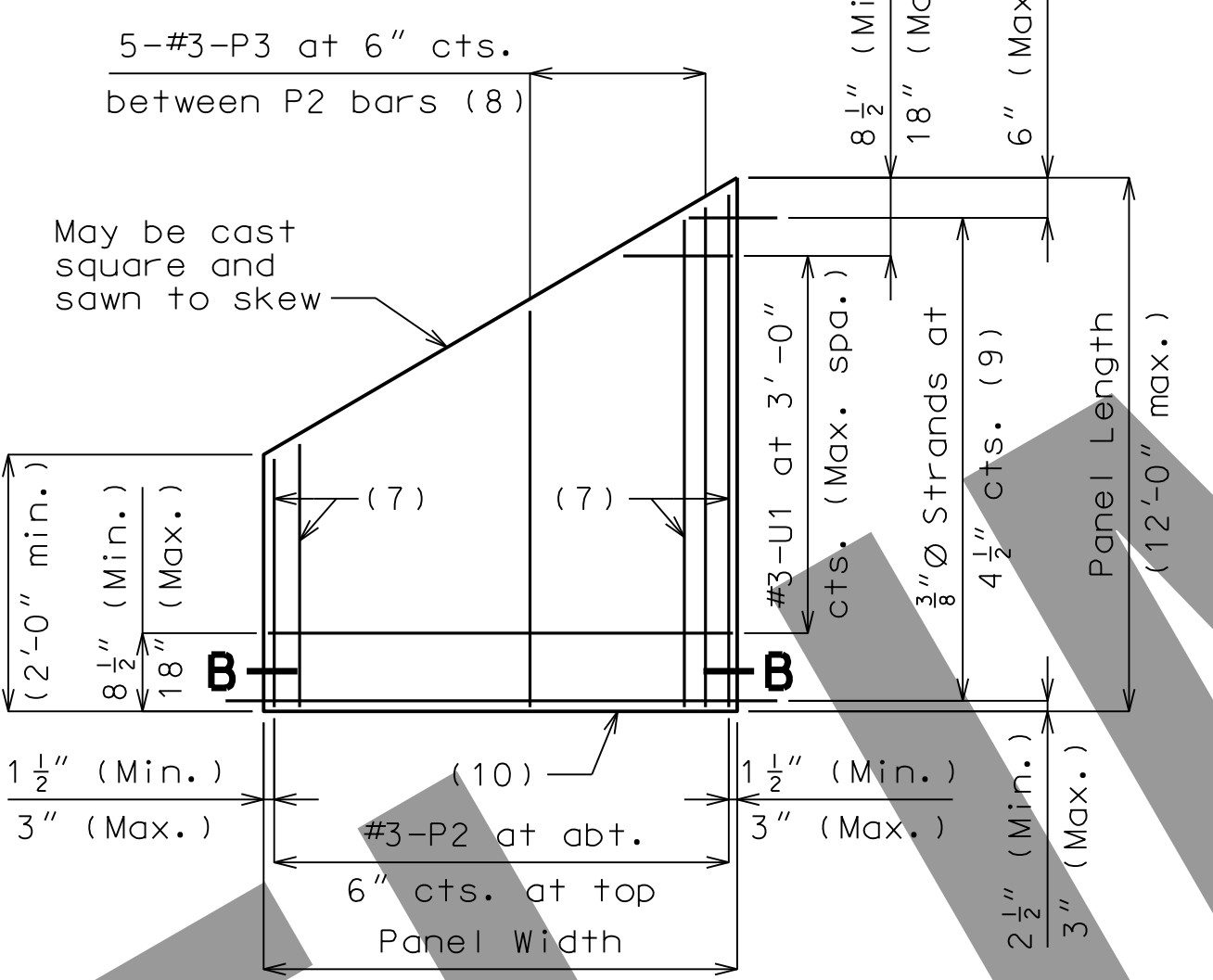
Width	Height	
	Min.	Max.
3"	1"	4"



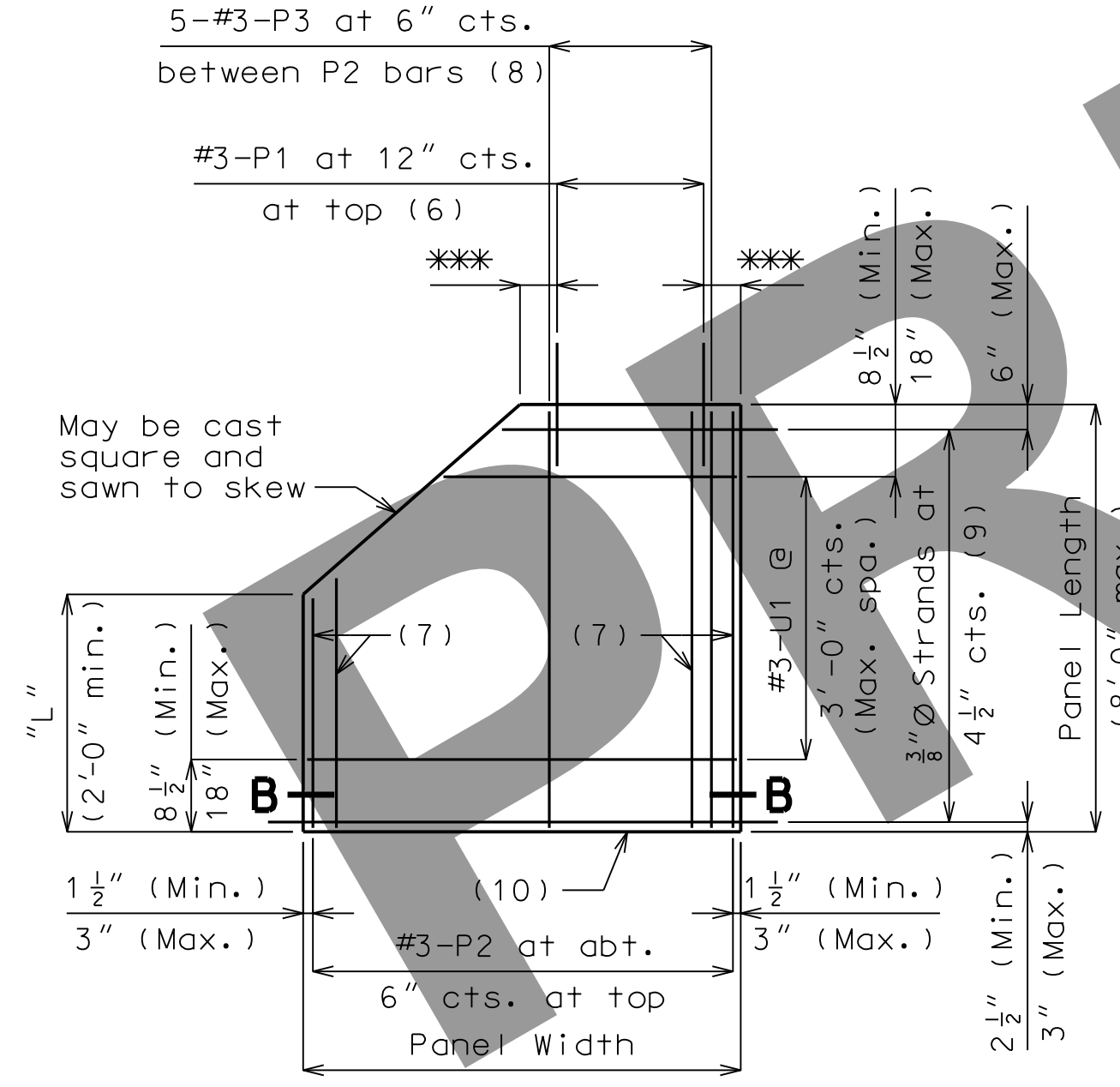
BENDING DIAGRAM FOR U1 BAR
U1 Bars may be oriented at right angles to location and spacing shown. U1 Bars shall be placed between P1 bars.



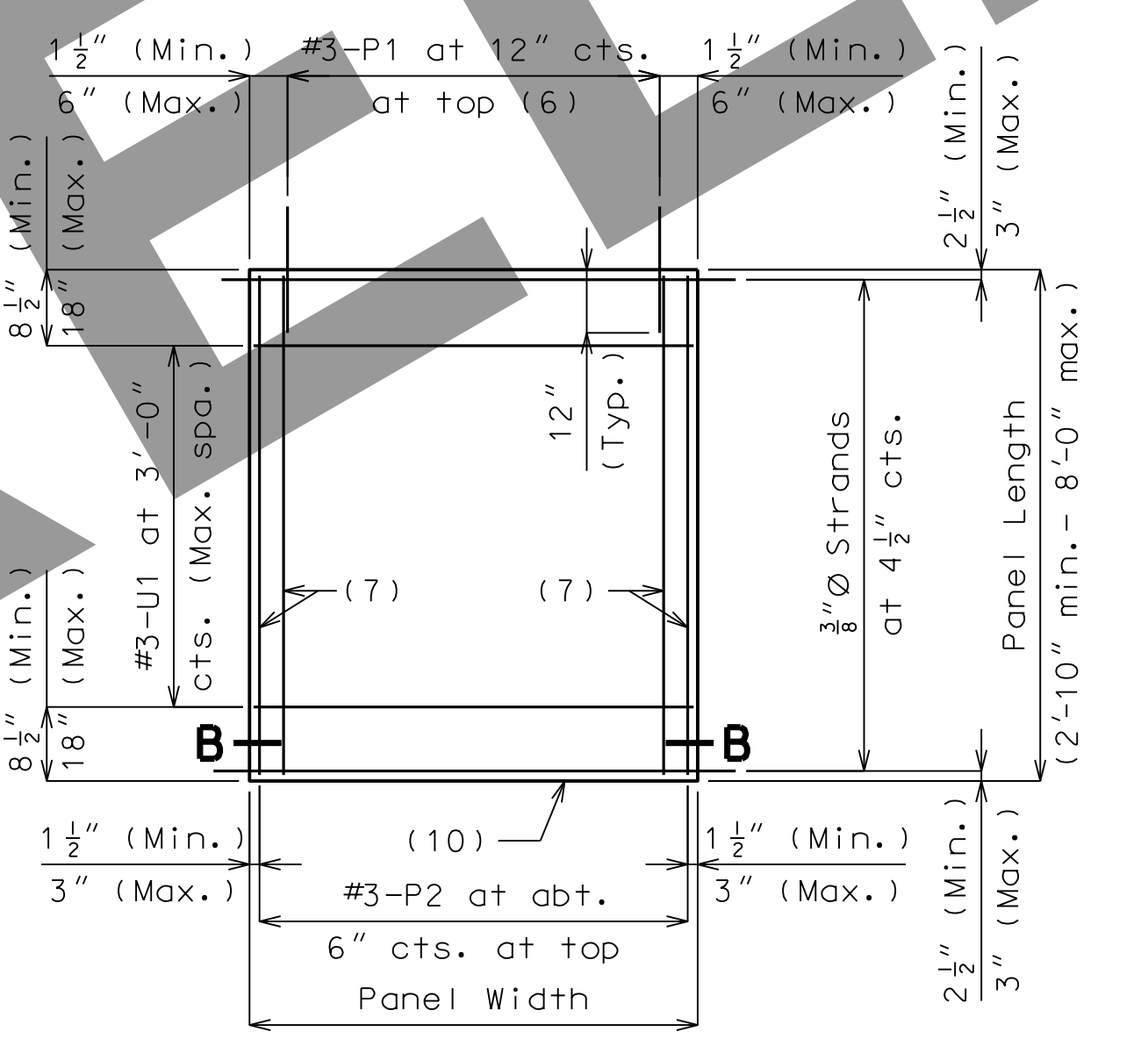
SECTION B-B



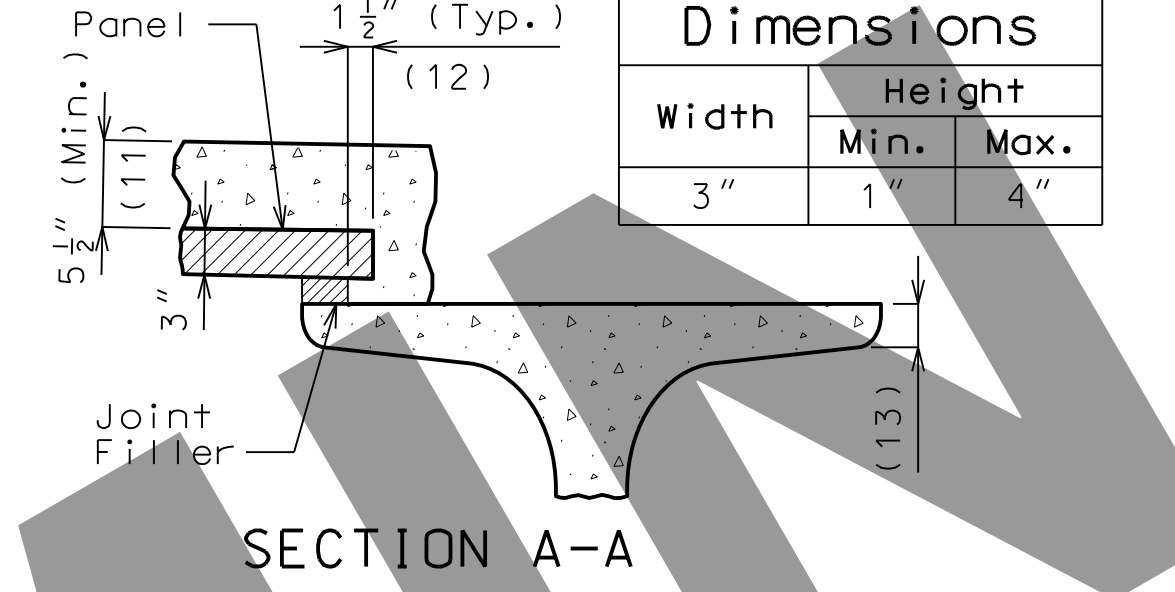
PLAN OF OPTIONAL SKEWED END PANEL



PLAN OF OPTIONAL TRUNCATED END PANEL



PLAN OF SQUARED PANEL



SECTION A-A

Reference Notes:
Plan of Panels Placement:

- (1) S-bars shown are bottom steel in slab between panels and used with squared and truncated end panels only.
- (2) Extend S-bars 18 inches beyond the front face of end bents and int. bents for squared and truncated end panels only.
- (3) Extend S-bars 9 inches beyond edge of girder (Typ.).
- (4) End panels shall be dimensioned 1/2" min. to 1 1/2" max. from the inside face of diaphragm.
- (5) For truncated end panels, use a min. of #5-S bars at 6" crossings in openings, or min. 4x4-W7x7.
- (6) For end panels only, P1 bars shall be 2'-0" in length and embedded 12". P1 bars will not be required for panels at squared integral end bents.
- (7) #3-P2 bars near edge of panel at bottom (under strands).
- (8) Use #3-P3 bars if panel is skewed 45° or greater.
- (9) Any strand 2'-0" or shorter shall have a #4 reinforcing bar on each side of it, centered between strands. Strands 2'-0" or shorter may then be debonded at the fabricator's option.
- (10) Optional 1/2" x 45° Chamfer one or both sides at bottom.
- (11) Slab thickness over prestressed panels varies due to girder camber. In order to maintain minimum slab thickness, it may be necessary to raise the grade uniformly throughout the structure. No payment will be made for additional labor or materials required for necessary grade adjustment.
- (12) Contractor shall ensure proper consolidation under and between panels.
- (13) At the contractor's option, the variation in slab thickness over prestressed panels may be eliminated or reduced by increasing and varying the girder top flange thickness. Dimensions shall be shown on the shop drawings.

Plans of Panels:

Section A-A:

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

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

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

General Notes:

Prestressed Panels:
Concrete for prestressed panels shall be Class A-1 with $f'_c = 6,000$ psi, $f'_{ci} = 4,000$ psi.

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

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

Initial prestressing force = 17.2 kips/strand.

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

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

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

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

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

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

Reinforcing Steel:
All dimensions are out to out.

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

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

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

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

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

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

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

All reinforcement other than prestressing strands shall be epoxy coated.

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

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

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

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

Use Slab Haunching Diagram on Sheet No. 17 for determining thickness of joint filler within the limits noted in the table of Joint Filler Dimensions.

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

The same thickness of preformed fiber expansion joint material shall be used under any one edge of any panel except at locations where top flange thickness may be stepped. The maximum change in thickness between adjacent panels shall be 1/4 inch. The polystyrene bedding material may be cut with a transition to match haunch height above top of flange.

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

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

DETAILS OF PRESTRESSED PANELS

Note: This drawing is not to scale. Follow dimensions. Sheet No. 16 of 37

Designed: SSM
Detailed: CAB
Checked: TPL



DATE PREPARED: 03/16/22
ROUTE: I-270
STATE: MO
DISTRICT: BR
SHEET NO.: 16
COUNTY: ST. LOUIS CITY
JOB NO.: J613020C
CONTRACT ID.

PROJECT NO.:
BRIDGE NO.: A8999

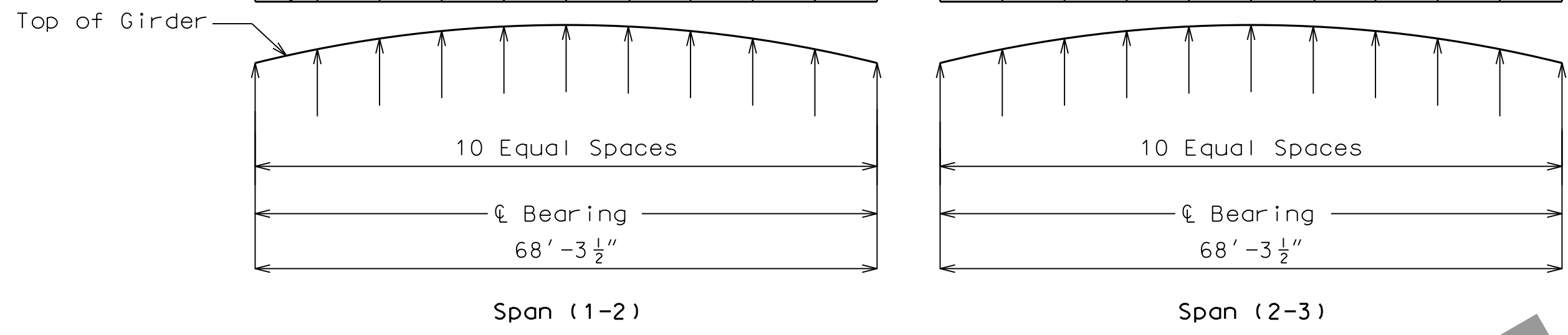
DESCRIPTION	DATE

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

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CERTIFICATE OF AUTHORITY: 000169
EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW EB BRIDGE DETAILS OF PRESTRESSED PANELS

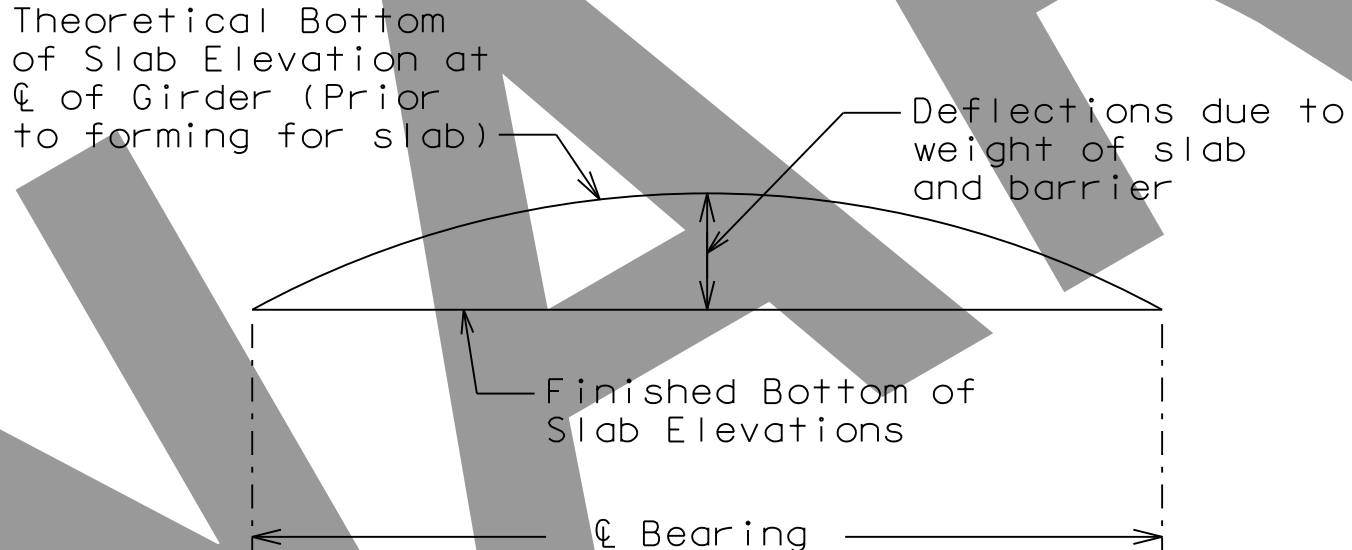
Girder No. 1	2 3/4"	2 3/4"	2 3/4"	1 7/8"	1 7/8"	1 7/8"	1 7/8"	1 7/8"	1 7/8"	2 1/2"	2 1/2"	2 3/4"	2 3/4"	2 3/4"	1 7/8"	1 7/8"	1 7/8"	1 7/8"	1 7/8"	2 1/2"	2 1/2"	2 3/4"	2 3/4"	
Girder No. 2	2 3/4"	2 1/2"	2 1/2"	1 7/8"	1 7/8"	1 7/8"	1 3/4"	1 3/4"	1 3/4"	1 7/8"	2 1/2"	2 1/2"	2 3/4"	2 3/4"	2 3/4"	2 1/2"	1 7/8"	1 7/8"	1 3/4"	1 3/4"	2 1/2"	2 1/2"	2 3/4"	2 3/4"
Girder No. 3	2 3/4"	2 3/4"	2 1/2"	1 7/8"	1 3/4"	1 3/4"	1 3/4"	1 3/4"	1 3/4"	1 7/8"	2 1/2"	2 1/2"	2 3/4"	2 3/4"	2 3/4"	2 1/2"	1 7/8"	1 3/4"	1 3/4"	1 3/4"	2 1/2"	2 1/2"	2 3/4"	2 3/4"
Girder No. 4	2 3/4"	2 3/4"	2 1/2"	1 7/8"	1 3/4"	1 3/4"	1 3/4"	1 3/4"	1 3/4"	1 7/8"	2 1/2"	2 1/2"	2 3/4"	2 3/4"	2 3/4"	2 1/2"	1 7/8"	1 3/4"	1 3/4"	1 3/4"	2 1/2"	2 1/2"	2 3/4"	2 3/4"
Girder No. 5	2 3/4"	2 3/4"	2 1/2"	1 7/8"	1 3/4"	1 3/4"	1 3/4"	1 3/4"	1 3/4"	1 7/8"	2 1/2"	2 1/2"	2 3/4"	2 3/4"	2 3/4"	2 1/2"	1 7/8"	1 3/4"	1 3/4"	1 3/4"	2 1/2"	2 1/2"	2 3/4"	2 3/4"
Girder No. 6	2 3/4"	2 3/4"	2 1/2"	1 7/8"	1 3/4"	1 3/4"	1 3/4"	1 3/4"	1 3/4"	1 7/8"	2 1/2"	2 1/2"	2 3/4"	2 3/4"	2 3/4"	2 1/2"	1 7/8"	1 3/4"	1 3/4"	1 3/4"	2 1/2"	2 1/2"	2 3/4"	2 3/4"



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. No payment will be made for additional labor or materials required for variation in haunching, slab thickness or grade adjustment.

Concrete in the slab haunches is included in the Estimated Quantities for Slab on Concrete NU-Girder.



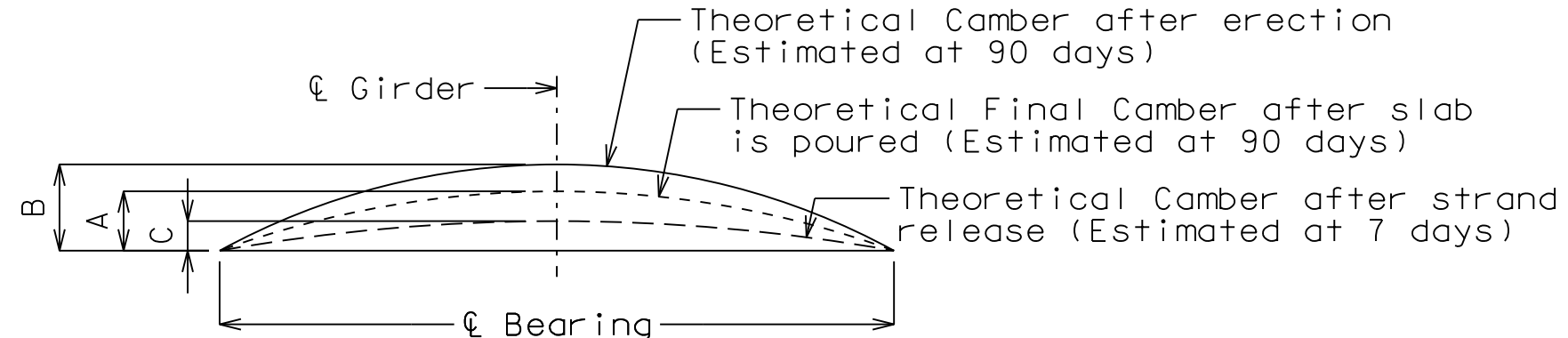
TYPICAL SLAB ELEVATIONS DIAGRAM

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

Girder Number	Span (1-2) (68' - 3 1/2" C/L Brg. - C/L Brg.)										
	C/L Brg.	.10	.20	.30	.40	.50	.60	.70	.80	.90	C/L Brg.
1	461.82	461.71	461.60	461.50	461.38	461.25	461.13	460.99	460.84	460.70	460.55
2	461.99	461.90	461.79	461.68	461.57	461.44	461.31	461.18	461.03	460.89	460.73
3	462.14	462.04	461.93	461.83	461.71	461.58	461.46	461.32	461.17	461.03	460.87
4	461.90	461.80	461.70	461.59	461.47	461.35	461.22	461.08	460.94	460.79	460.64
5	461.66	461.57	461.46	461.35	461.24	461.11	460.98	460.85	460.70	460.55	460.40
6	461.42	461.32	461.21	461.11	460.99	460.86	460.74	460.60	460.45	460.31	460.16

Girder Number	Span (2-3) (68' - 3 1/2" C/L Brg. - C/L Brg.)										
	C/L Brg.	.10	.20	.30	.40	.50	.60	.70	.80	.90	C/L Brg.
1	460.53	460.42	460.31	460.21	460.09	459.96	459.84	459.70	459.56	459.41	459.26
2	460.70	460.61	460.50	460.39	460.28	460.15	460.02	459.89	459.74	459.60	459.44
3	460.85	460.75	460.64	460.54	460.42	460.29	460.17	460.03	459.88	459.74	459.58
4	460.61	460.51	460.41	460.30	460.18	460.06	459.93	459.79	459.65	459.50	459.35
5	460.37	460.28	460.17	460.06	459.95	459.82	459.69	459.56	459.41	459.26	459.11
6	460.13	460.03	459.92	459.82	459.70	459.57	459.45	459.31	459.16	459.02	458.87

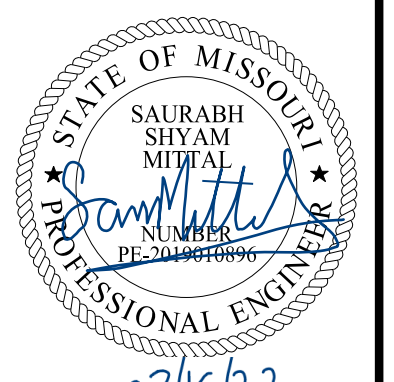
Elevations are based on a constant slab thickness of 8 1/2" and include allowance for theoretical dead load deflections due to weight of slab (including precast panel) and barrier.



Girder	Span (1-2)			Span (2-3)		
	A	B	C	A	B	C
Exterior	1 1/8"	1 15/16"	1 3/16"	1 1/8"	1 15/16"	1 3/16"
Interior	1"	1 1/16"	1 3/16"	1"	1 15/16"	1 3/16"

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.



DATE PREPARED	3/14/2022	
ROUTE	I-270	STATE MO
DISTRICT	BR	SHEET NO. 17
COUNTY	ST. LOUIS CITY	
JOB NO.	J613020C	
CONTRACT ID.		
PROJECT NO.		
BRIDGE NO.	A8999	
DESCRIPTION		
DATE		

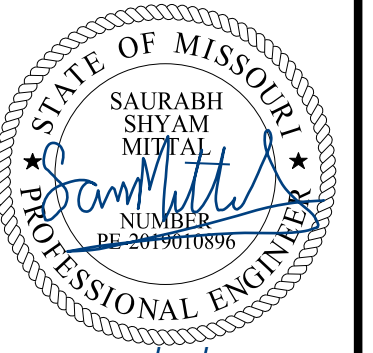
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HORNER SHIFRIN

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EXPIRATION DATE: DECEMBER 31, 2022

**I-270 AND RIVERVIEW
EB BRIDGE SLAB HAUNCH, CAMBER AND THEORETICAL BOT. SLAB ELEV.**



03/16/22

DATE PREPARED
3/14/2022

ROUTE STATE
I-270 MO

DISTRICT SHEET NO.
BR 18

COUNTY
ST. LOUIS CITY

JOB NO.
J613020C

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
A8999

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITAL JEFFERSON CITY, MO 65102

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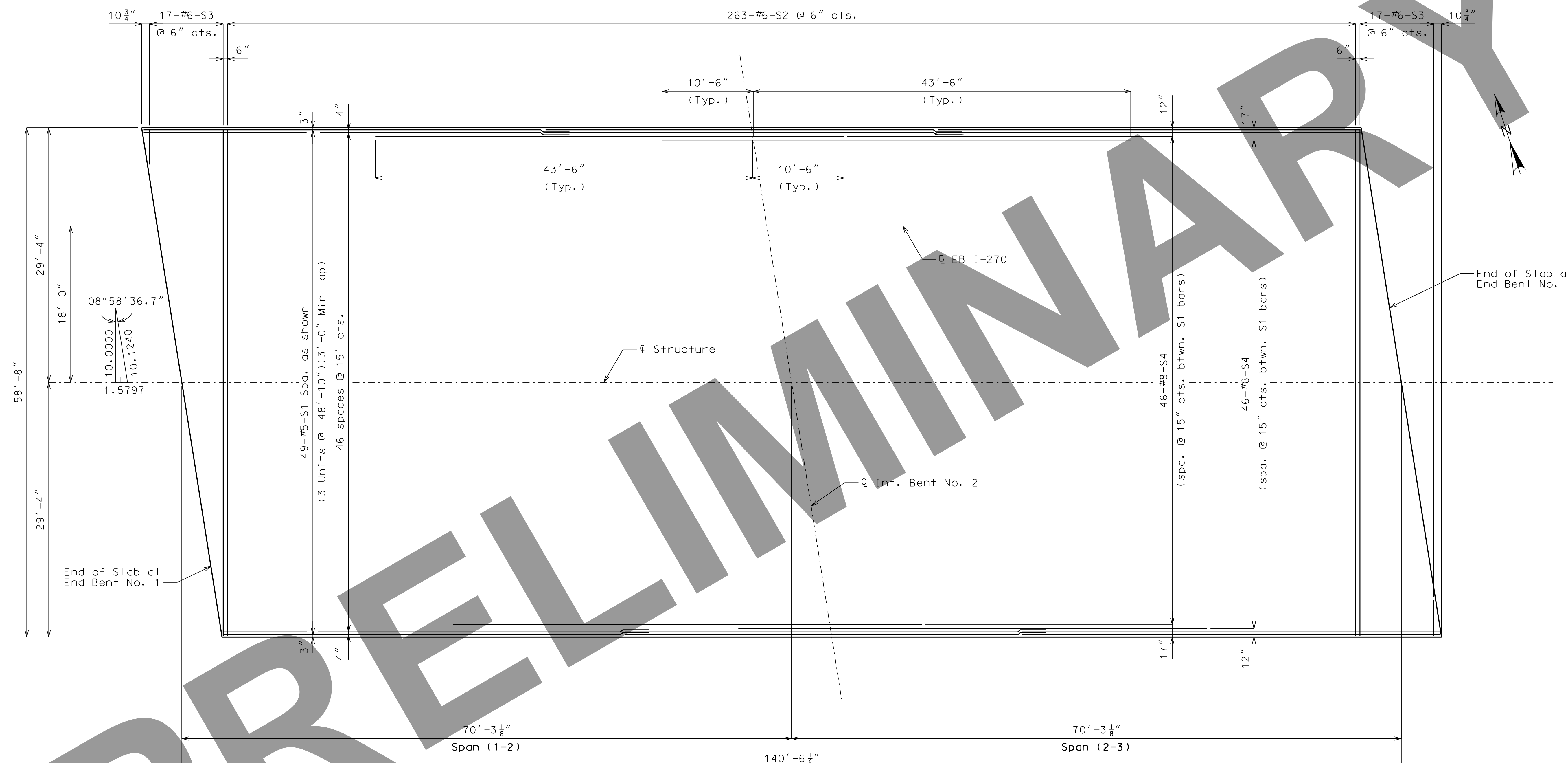
DISCIPLINE: PROFESSIONAL ENGINEERING

CERTIFICATE OF AUTHORITY: 000159

EXPIRATION DATE: DECEMBER 31, 2022

HORNER SHIFRIN

I-270 AND RIVERVIEW EB BRIDGE SLAB PLAN SHOWING REINFORCEMENT (TOP)



SLAB PLAN SHOWING REINFORCEMENT (TOP)

Designed: UVK
Detailed: CAB
Checked: TPL

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

Sheet No. 18 of 37

Notes:

- Longitudinal slab dimensions are measured horizontally.
- For Section thru Slab, see Sheet No. 20.
- For Slab Pouring Sequence, see Sheet No. 20.
- For Theoretical Bottom of Slab Elevations, Beam Camber Diagram, and Theoretical Slab Haunching Diagram, see Sheet No. 17.
- For Details of Safety Barrier Curb, see Sheets No. 21 & 22.



DATE PREPARED
3/14/2022

ROUTE STATE
I-270 MO
DISTRICT SHEET NO.
BR 19

COUNTY
ST. LOUIS CITY
JOB NO.
J613020C
CONTRACT ID.

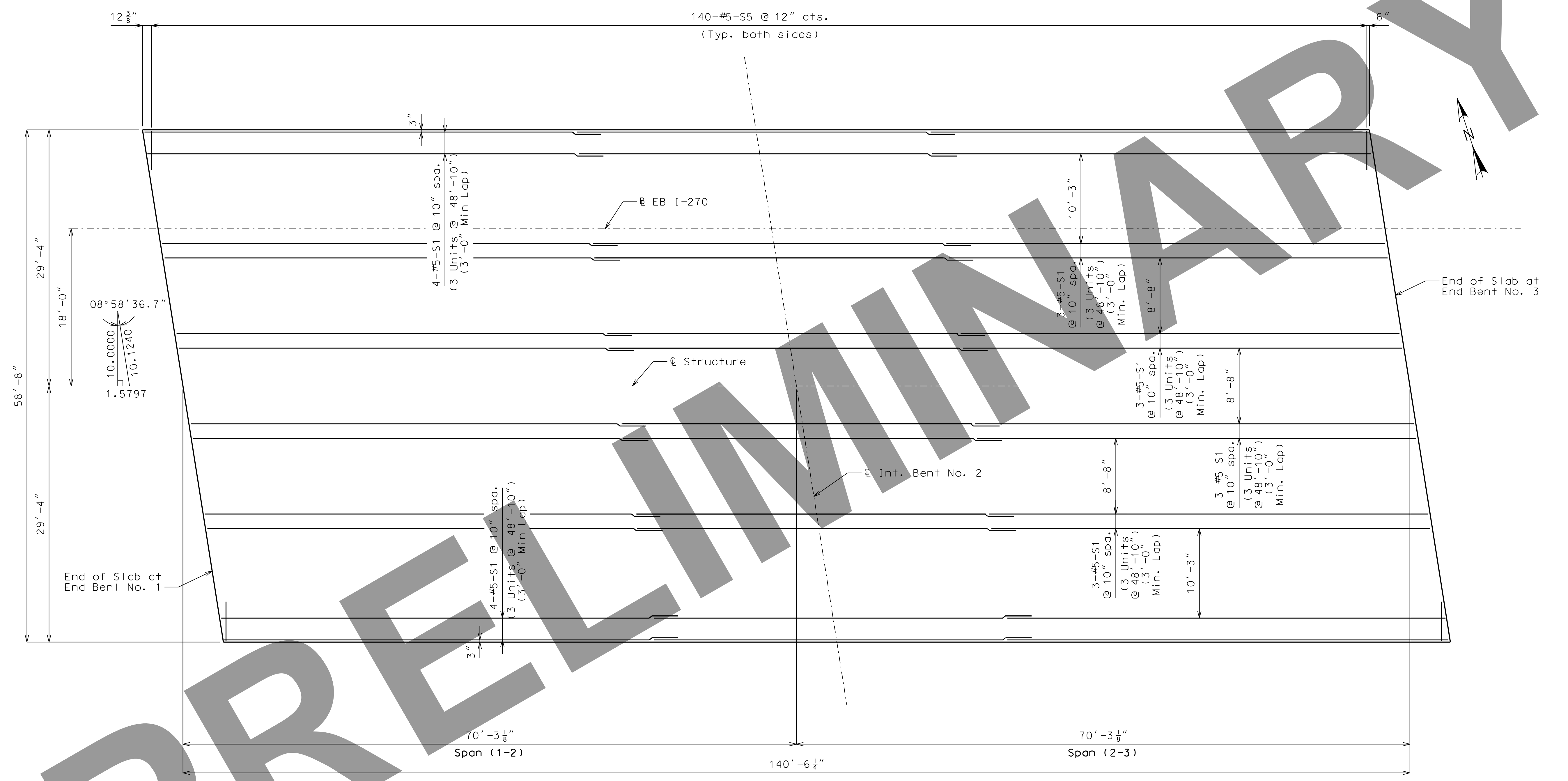
PROJECT NO.
BRIDGE NO.
A8999

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION
COMMISSION
MoDOT
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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CERTIFICATE OF AUTHORITY: 000159
EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW
EB BRIDGE
SLAB PLAN SHOWING
REINFORCEMENT
(BOTTOM)



SLAB PLAN SHOWING REINFORCEMENT (BOTTOM)

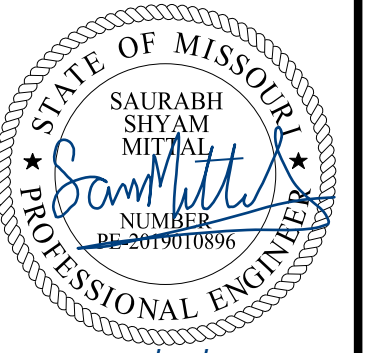
Designed: UVK
Detailed: CAB
Checked: TPL

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

Sheet No. 19 of 37

Notes:

- Longitudinal slab dimensions are measured horizontally.
- For Section thru Slab, see Sheet No. 20.
- For Slab Pouring Sequence, see Sheet No. 20.
- For Theoretical Bottom of Slab Elevations, Beam Camber Diagram, and Theoretical Slab Haunching Diagram, see Sheet No. 17.
- For Details of Safety Barrier Curb, see Sheets No. 21 & 22.



03/16/22

DATE PREPARED
3/14/2022

ROUTE I-270 STATE MO

DISTRICT BR SHEET NO. 20

COUNTY ST. LOUIS CITY

JOB NO. J613020C

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A8999

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102

1-888-ASK-MODOT (1-888-275-6636)

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401 S. 18TH ST. STE. 400 ST. LOUIS, MO 63103

314-451-4321 FAX 314-551-8586

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DISCIPLINE: PROFESSIONAL ENGINEERING

CERTIFICATE OF AUTHORITY: 000159

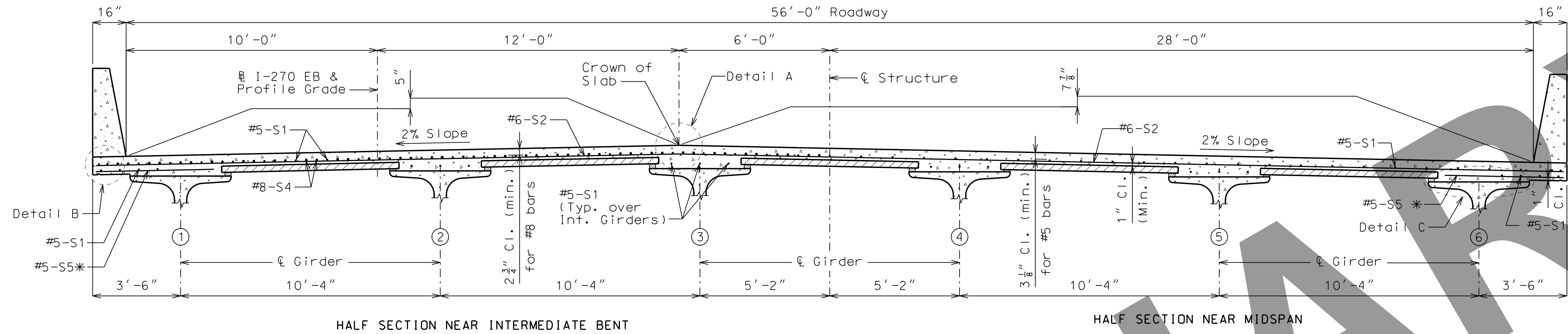
EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW

EB BRIDGE

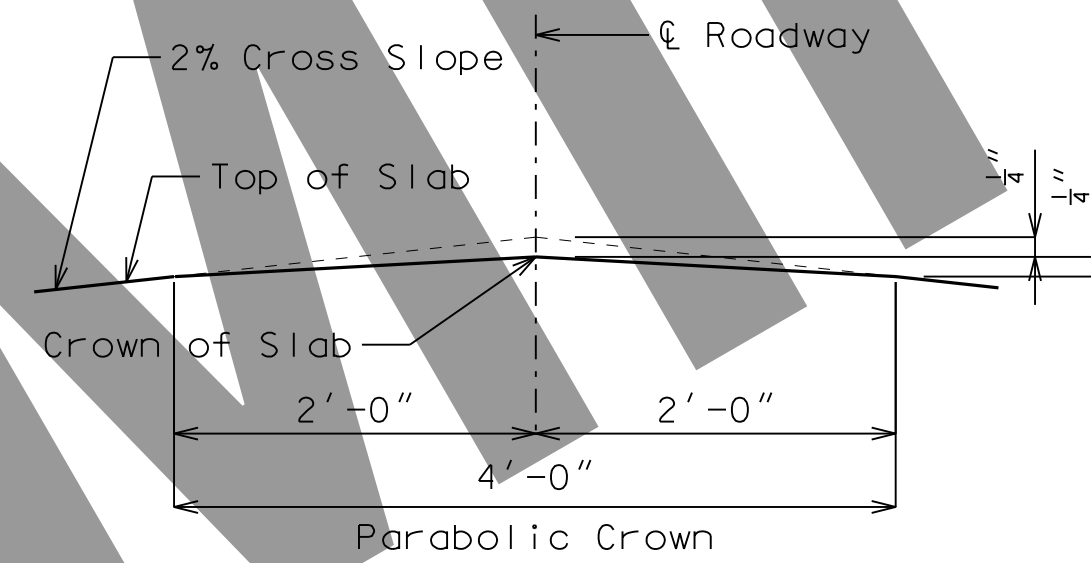
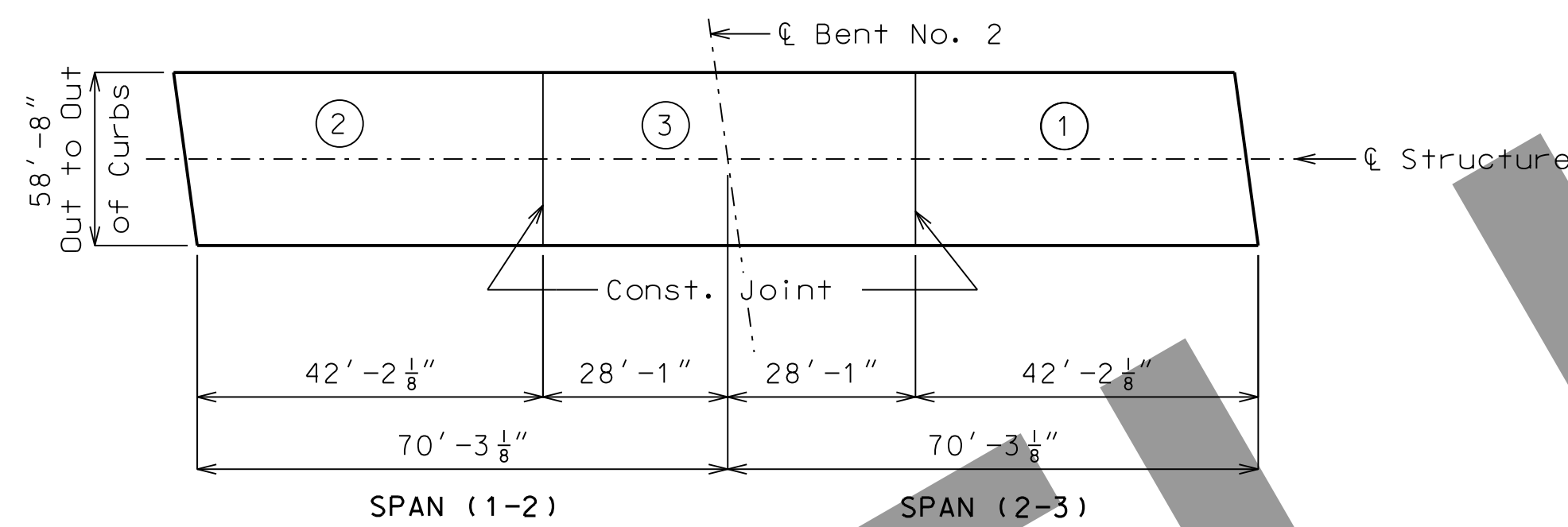
SLAB SECTION

AND DETAILS

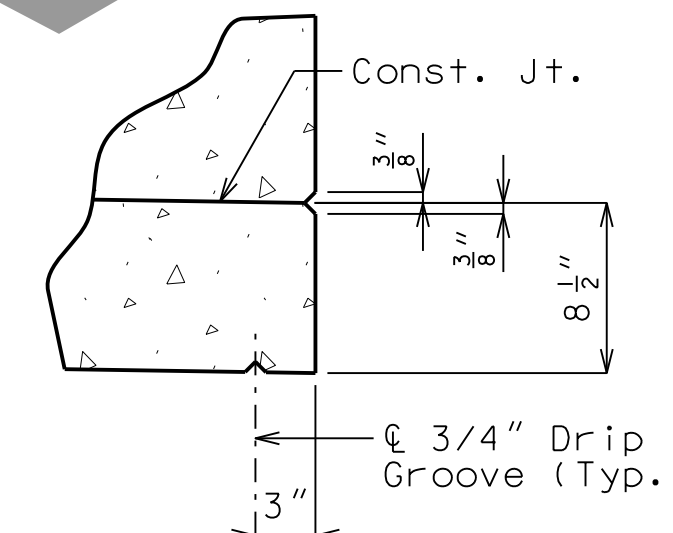


SECTION THRU SLAB

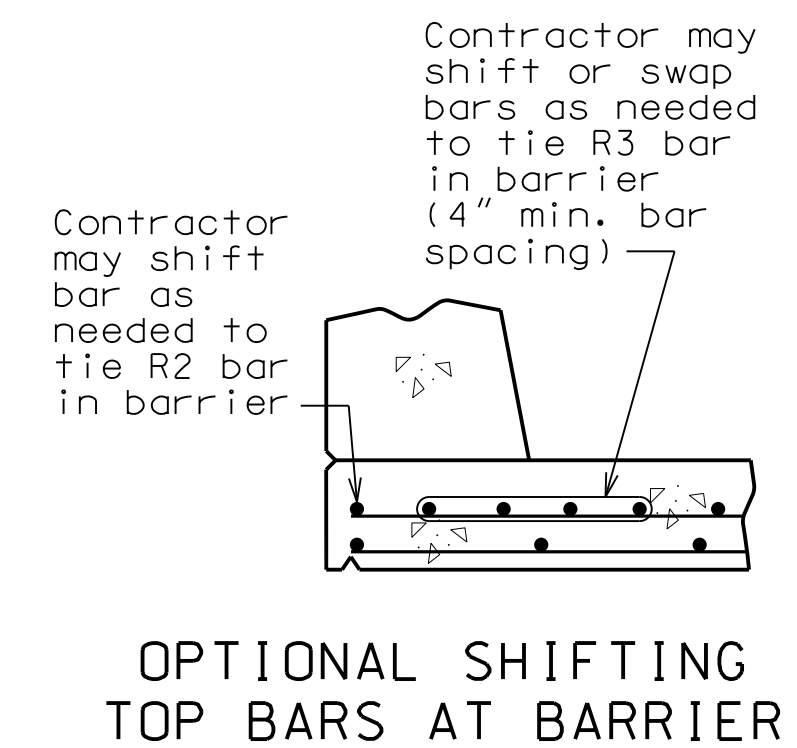
* Alternate bar shape available, see barrier sheet.



DETAIL A



DETAIL B



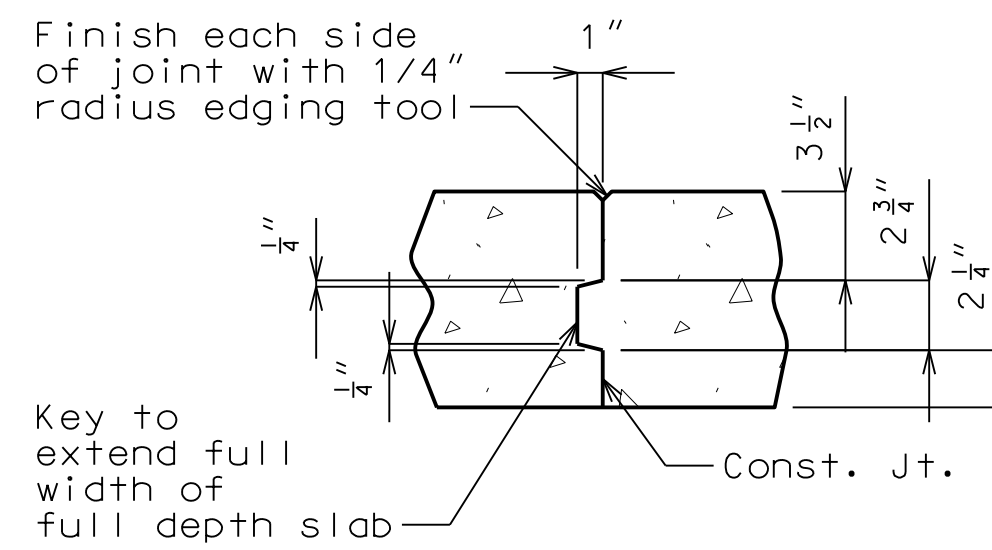
OPTIONAL SHIFTING TOP BARS AT BARRIER

Sequence of Pours	Direction			Min. Rate of Pour Cu. Yds./Hr. With Retarder
	1	2	3	
Basic Sequence	Either Direction			25
Alternate pours to the basic skip sequence are subject to the approval of the engineer in accordance with Sec 703.				
Alternate A Pours	1	3 + 2		34
Alternate B Pours	End to 3	1 to End		34
	1 + 3 + 2			
	End to End			

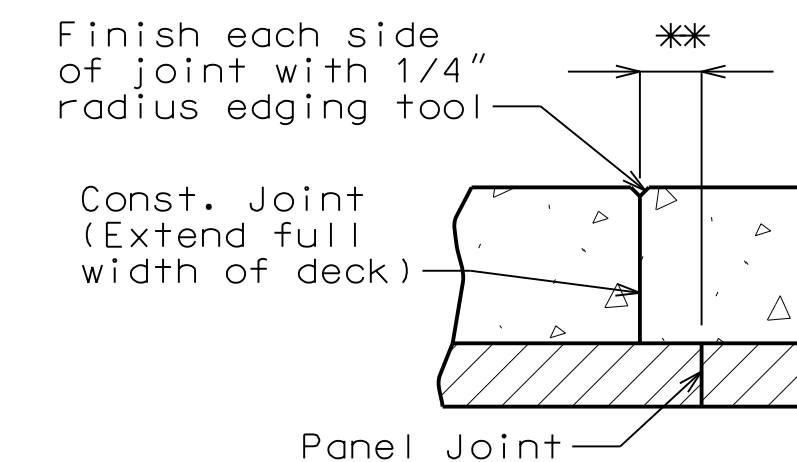
The contractor shall furnish an approved retarder to retard the set of the concrete to 2.5 hours and shall pour and satisfactorily finish the slab pours at the rate given.

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

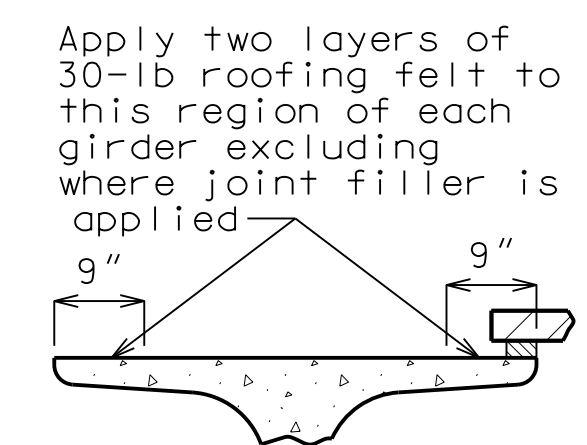
SLAB POURING SEQUENCE



FULL DEPTH SLAB



SLAB ON PANELS



DETAIL C

SLAB CONSTRUCTION JOINT

** Adjust the construction joint to a clearance of 6 inches minimum from the panel joint.

Notes:

For details of precast prestressed panels, see Sheet No. 16.

For reinforcement of barrier not shown, see Sheets No. 21 & 22.

For Theoretical Bottom of Slab Elevations, Girder Camber Diagram and Theoretical Slab Haunching Diagram, see Sheet No. 17.

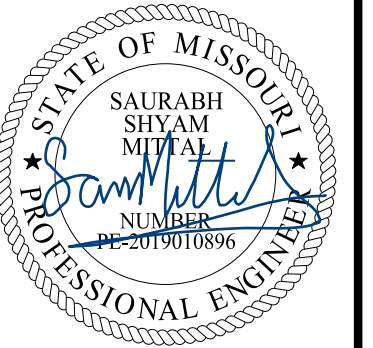
For Plan of Slab Showing Reinforcement, see Sheets No. 18 & 19.

SLAB DETAILS

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

Sheet No. 20 of 37

Designed: UVK
Detailed: CAB
Checked: TPL



DATE PREPARED
03/14/2022

ROUTE I-270 STATE MO

DISTRICT BR SHEET NO. 21

COUNTY ST. LOUIS CITY

JOB NO. J613020C

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A8999

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102

1-888-ASK-MODOT (1-888-275-6636)

MoDOT

HORNER SHIFFRIN

401 S. 18TH ST. STE. 400 ST. LOUIS, MO 63103

314-591-4321 FAX 314-591-4398

WWW.HORNERSHIFFRIN.COM

DISCIPLINE: PROFESSIONAL ENGINEERING

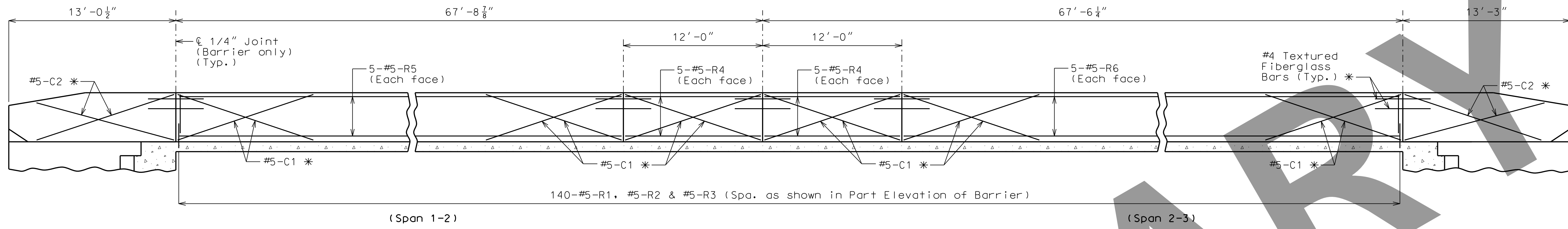
CERTIFICATE OF AUTHORITY: 000159

EXPIRATION DATE: DECEMBER 31, 2022

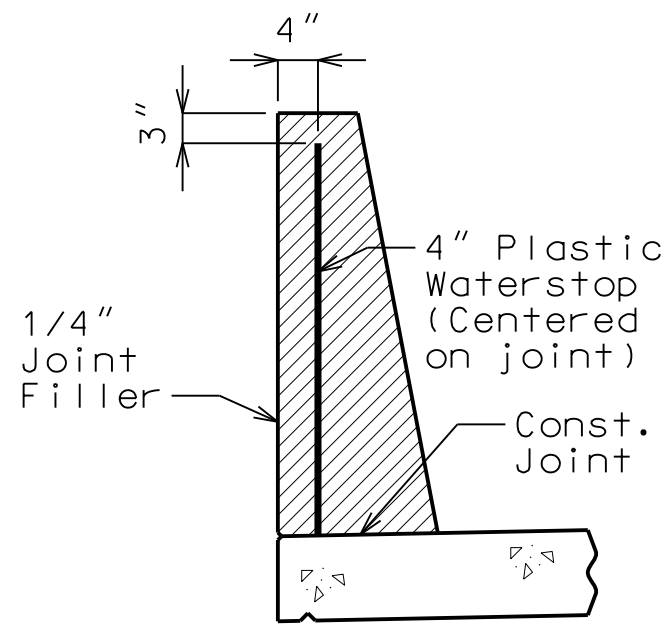
I-270 AND RIVERVIEW

EB BRIDGE

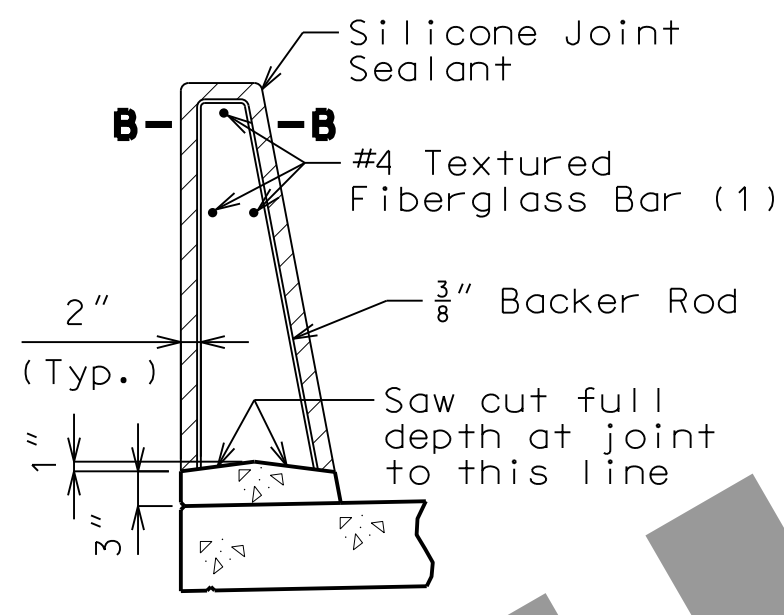
TYPE D BARRIER



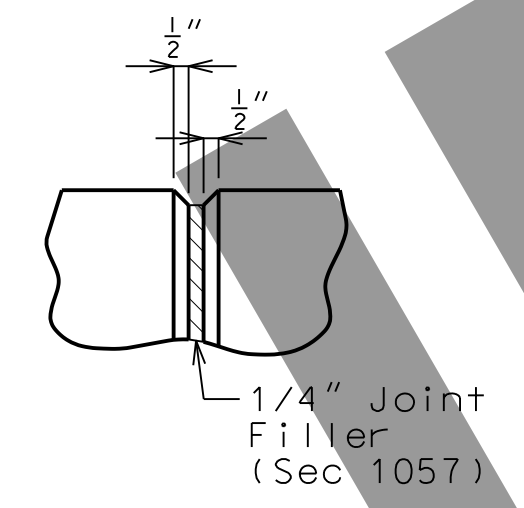
ELEVATION OF LEFT BARRIER
(Left Barrier shown, Right Barrier similar)
Longitudinal dimensions are horizontal.



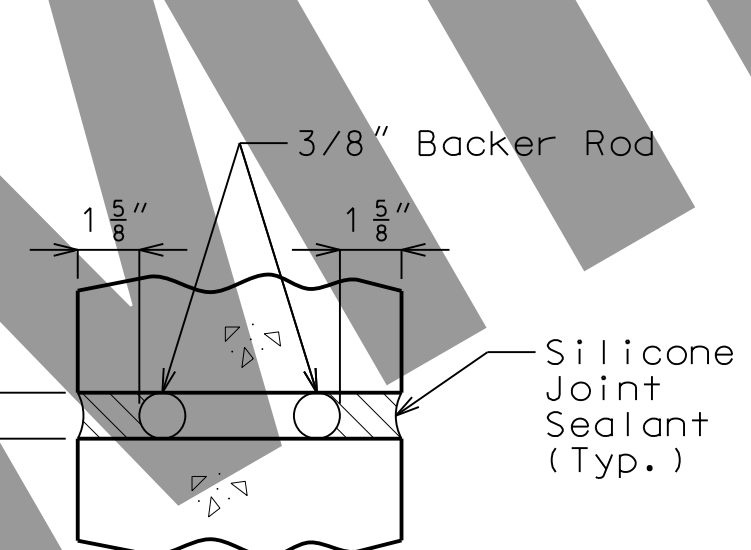
WATERSTOP DETAIL
Plastic waterstop shall be placed in all formed joints, except structures with superelevation, use on lower joints only.
Cost of plastic waterstop, complete in place, will be considered completely covered by the contract unit price for Type D Barrier.



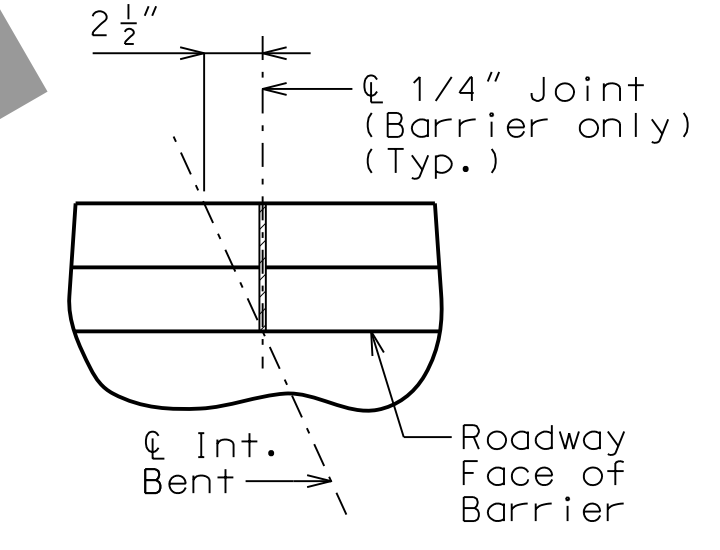
SECTION THRU SAW CUT JOINT



PART ELEVATION AT FORMED JOINT



SECTION B-B



PART PLAN SHOWING JOINT LOCATION

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 and barrier joints (except at end bents) normal to grade.
All exposed edges of barrier shall have either a 1/2-inch radius or a 3/8-inch bevel, unless otherwise noted.

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

Concrete in barrier shall be Class B-1.

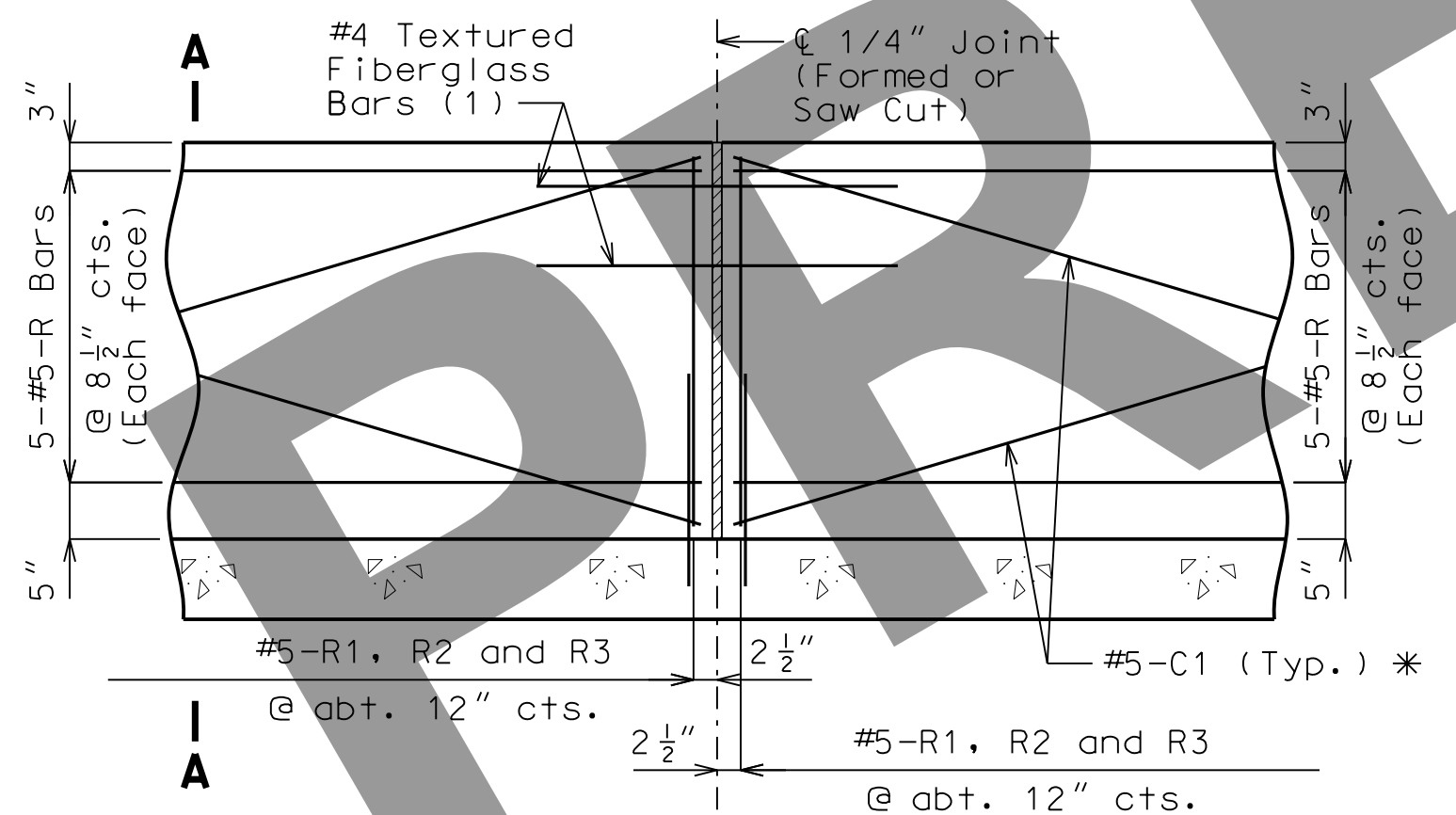
Measurement of barrier is to the nearest linear foot for each structure, measured along the outside top of slab from end of wing to end of wing.

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

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

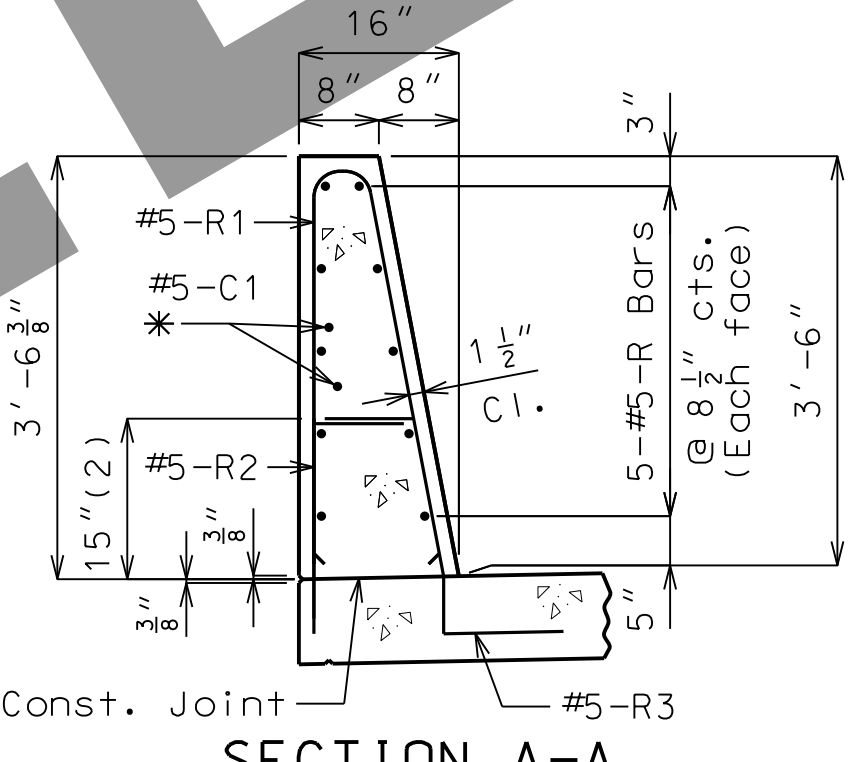
For slip-formed option, both sides of barrier shall have a vertically broomed finish and the top shall have a transversely broomed finish.

Plastic waterstop shall not be used with saw cut joints.



PART ELEVATION OF BARRIER

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

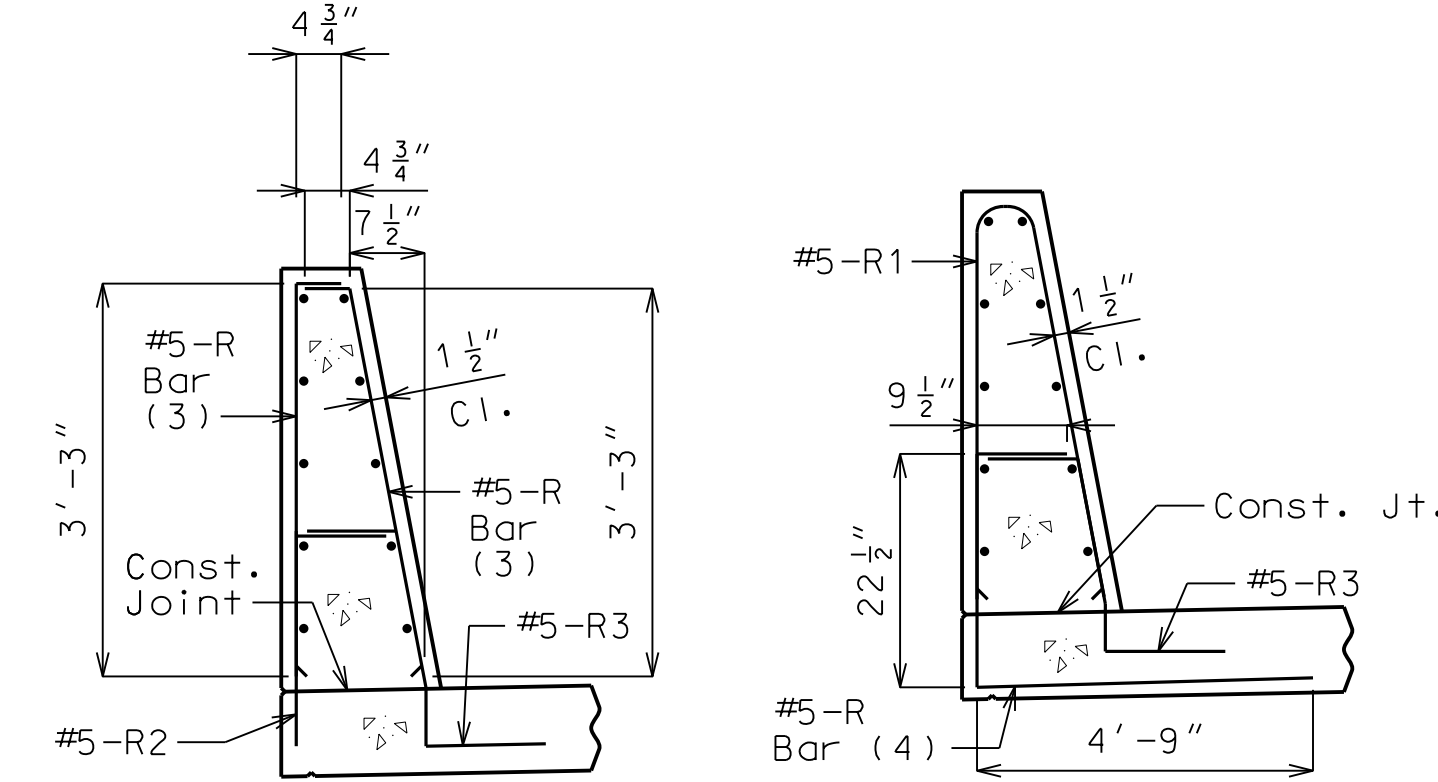


SECTION A-A

Use a minimum lap of 3'-1" for #5 horizontal barrier bars.

The cross-sectional area above the slab is 3.52 square feet.

(2) To top of bar



R-BAR PERMISSIBLE ALTERNATE SHAPE

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

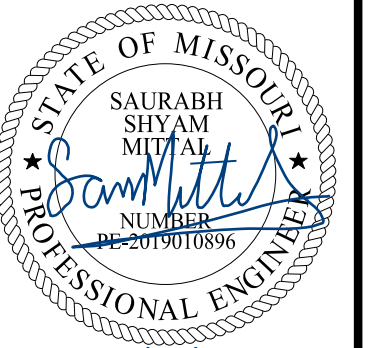
(4) The R2 bar and #5 bottom transverse slab bar in cantilever (prestressed panels only) combination may be furnished as one bar as shown, at the contractor's option.

TYPE D BARRIER

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

Sheet No. 21 of 37

Designed: SSM
Detailed: CAB
Checked: TPL



DATE PREPARED 3/14/2022	
ROUTE I-270	STATE MO
DISTRICT BR	SHEET NO. 22
COUNTY ST. LOUIS CITY	
JOB NO. J613020C	
CONTRACT ID.	

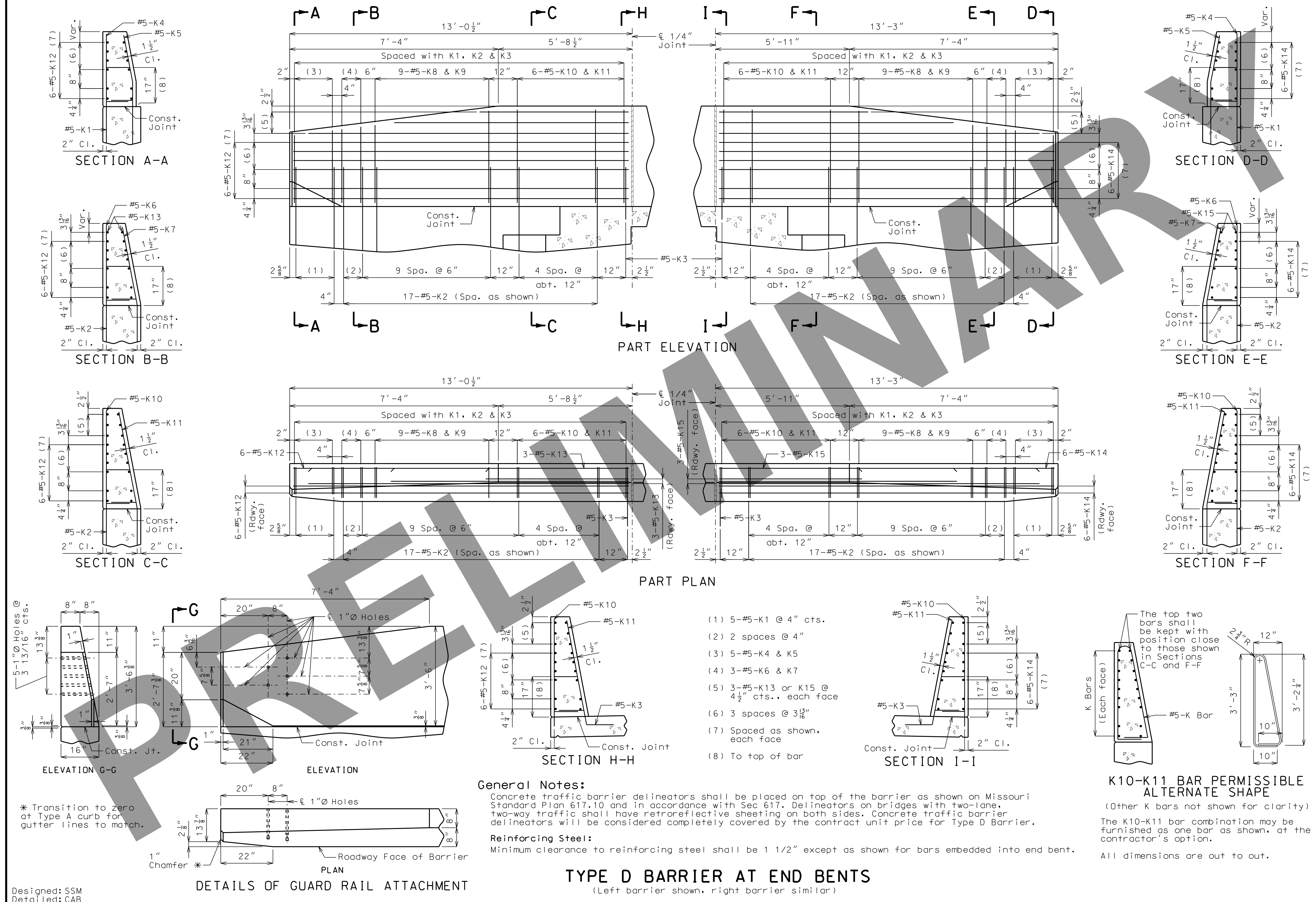
PROJECT NO.
BRIDGE NO. A8999

DESCRIPTION	DATE

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

HORNER SHIFFRIN
 401 S. 18TH ST., STE. 400 ST. LOUIS, MO 63103
 314-531-8321 • FAX 314-531-8888
 WWW.HORNERSHIFFRIN.COM
 DISCIPLINE: PROFESSIONAL ENGINEERING
 CERTIFICATE OF AUTHORITY: 000159
 EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW EB BRIDGE TYPE D BARRIER AT END BENTS



Designed: SSM
 Detailed: CAB
 Checked: TPL

DETAILS OF GUARD RAIL ATTACHMENT

TYPE D BARRIER AT END BENTS
 (Left barrier shown, right barrier similar)

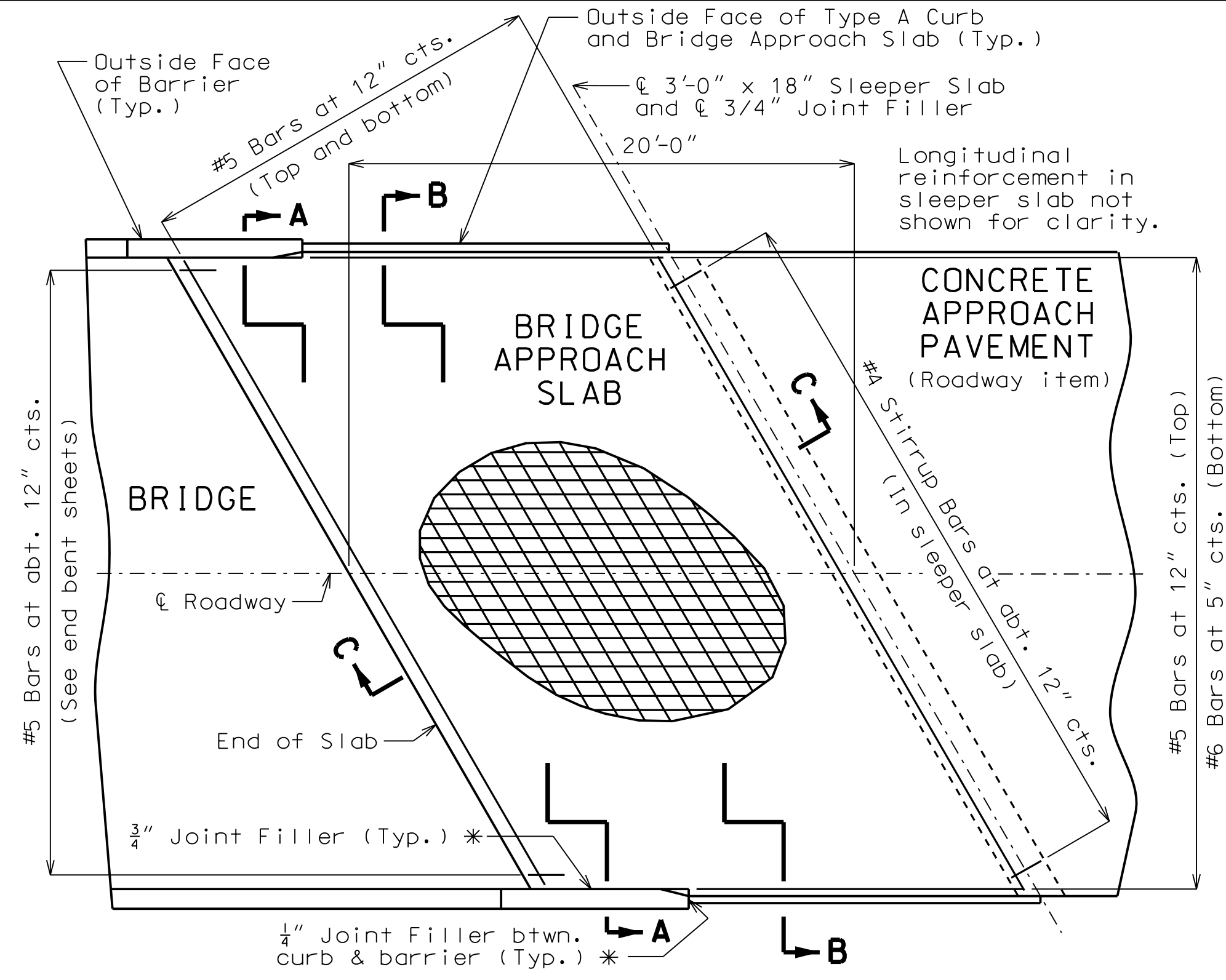
General Notes:
 Concrete traffic barrier delineators shall be placed on top of the barrier as shown on Missouri Standard Plan 617.10 and in accordance with Sec 617. Delineators on bridges with two-lane, two-way traffic shall have retroreflective sheeting on both sides. Concrete traffic barrier delineators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

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

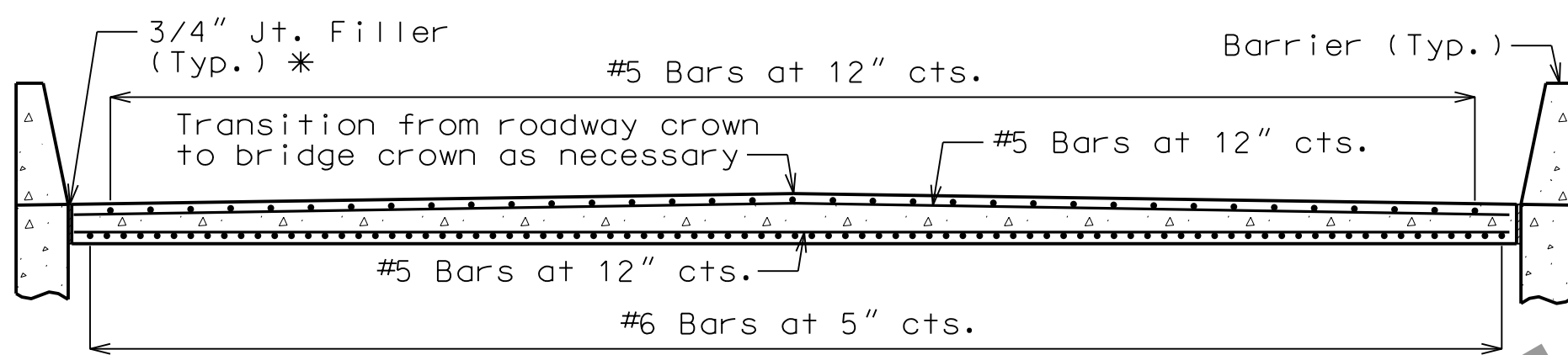
- (1) 5-#5-K1 @ 4" cts.
- (2) 2 spaces @ 4"
- (3) 5-#5-K4 & K5
- (4) 3-#5-K6 & K7
- (5) 3-#5-K13 or K15 @ 4 1/2" cts., each face
- (6) 3 spaces @ 3 13/16"
- (7) Spaced as shown, each face
- (8) To top of bar

K10-K11 BAR PERMISSIBLE ALTERNATE SHAPE

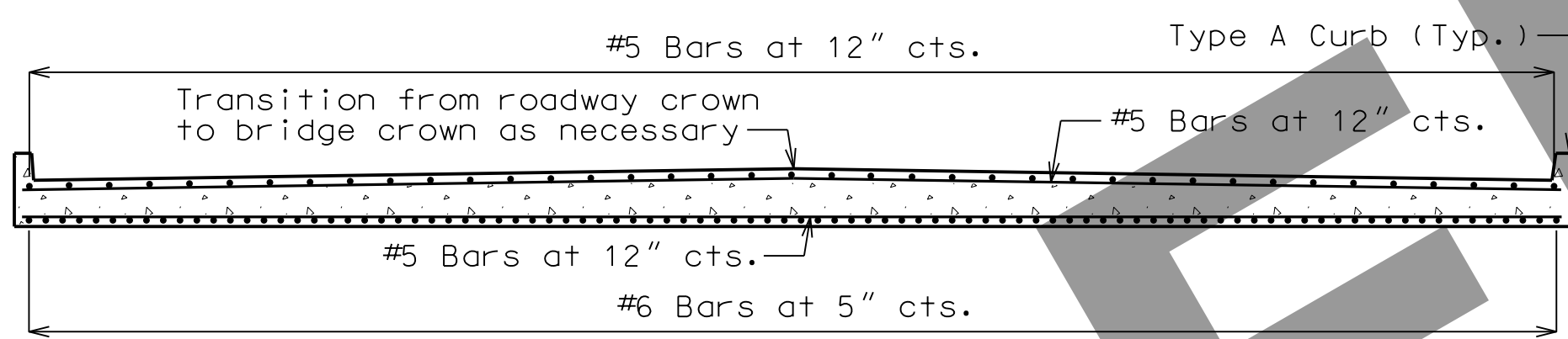
(Other K bars not shown for clarity)
 The K10-K11 bar combination may be furnished as one bar as shown, at the contractor's option.
 All dimensions are out to out.



PART PLAN SHOWING REINFORCEMENT

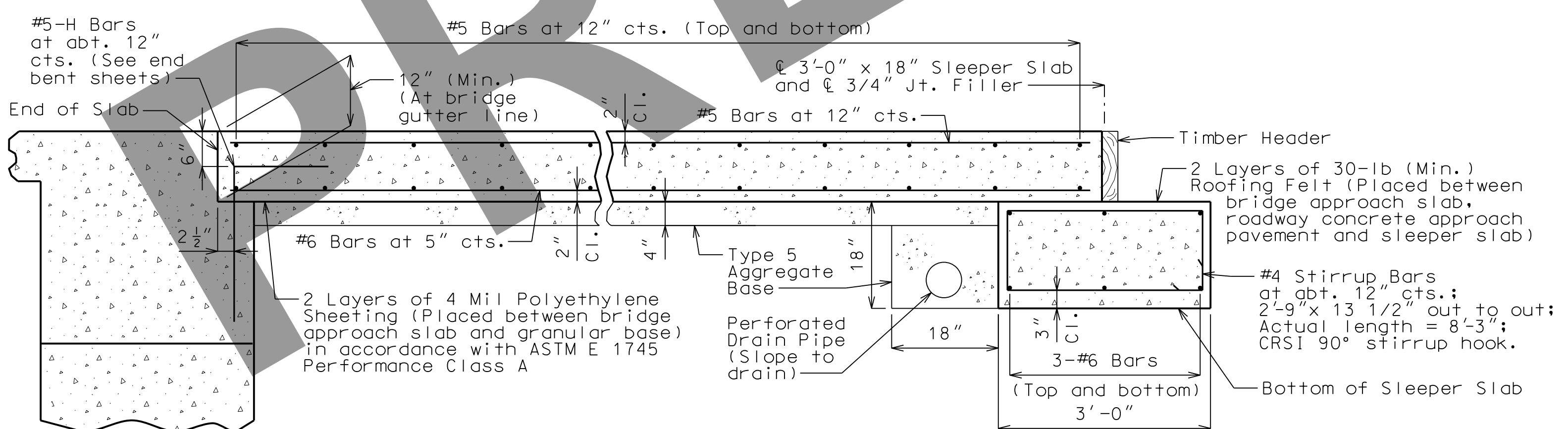


SECTION A-A

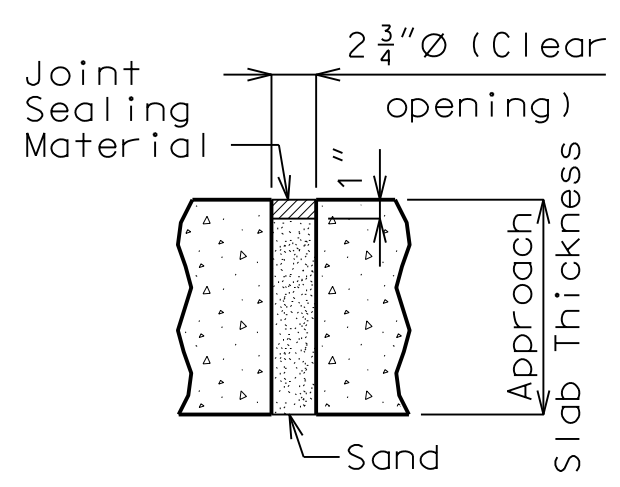


SECTION B-B

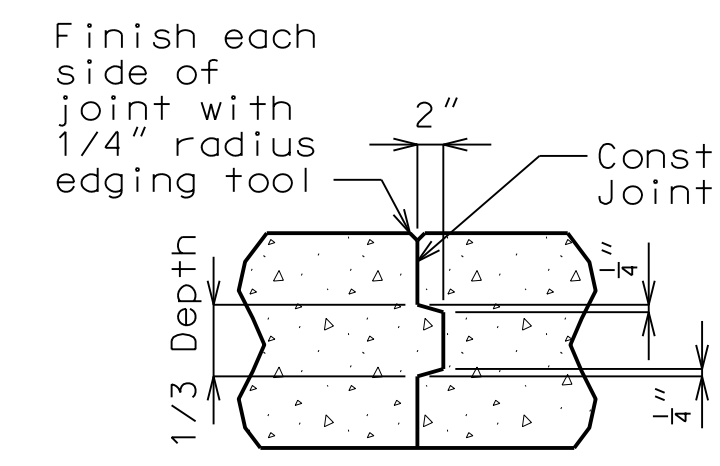
With the approval of the engineer, the contractor may crown the bottom of the approach slab to match the crown of the roadway surface.



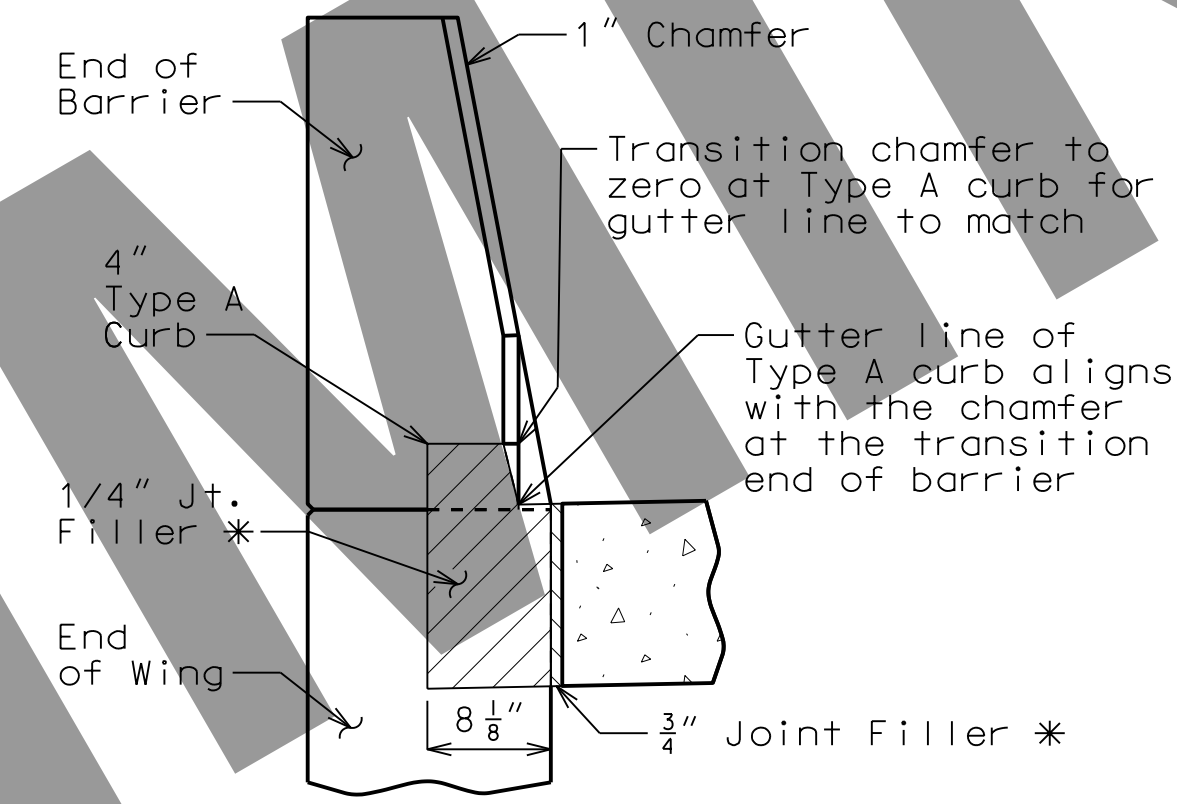
SECTION C-C



UNDERSEAL ACCESS HOLE DETAIL (If required)



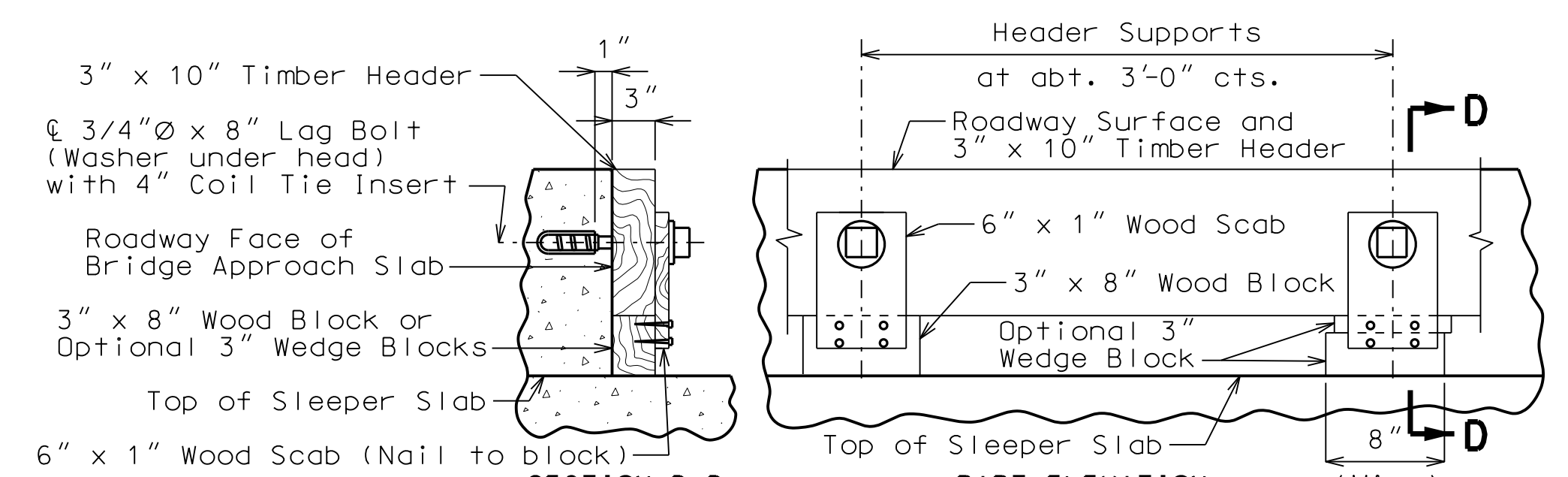
CONSTRUCTION JOINT DETAIL



SECTION BETWEEN CURB AND BARRIER

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 under drain, 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 lap splicing the #5 bars 29" or by mechanical bar splice.
- Mechanical bar splices shall be in accordance with Sec 710.
- 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.
- Payment for furnishing all materials, labor and excavation necessary to construct the approach slab, including the timber header, sleeper slab, underdrain, Type 5 aggregate base, joint filler and all other appurtenances and incidental work as shown on this sheet, complete in place, will be considered completely covered by the contract unit price for Bridge Approach Slab (Major) per square yard.
- * 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 D-D PART ELEVATION DETAILS OF TIMBER HEADER Remove timber header when concrete pavement is placed.

BRIDGE APPROACH SLAB (MAJOR)

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

Sheet No. 23 of 37

Designed: SSM
Detailed: CAB
Checked: TPL



DATE PREPARED: 03/17/2022

ROUTE	STATE
I-270	MO
DISTRICT	SHEET NO.
BR	23
COUNTY	
ST. LOUIS CITY	
JOB NO.	
J613020C	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
A8999	

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

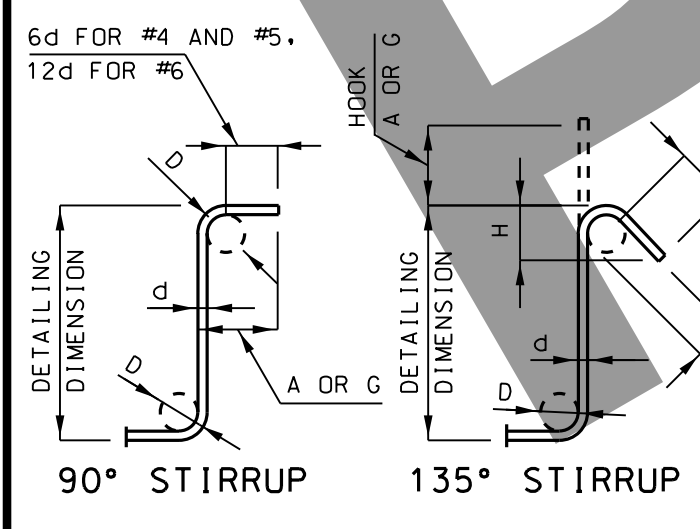
HORNER SHIFFRIN

401 S. 18TH ST. STE. 400 ST. LOUIS, MO 63103
314-451-4321 FAX 314-551-8886
WWW.HORNERSHIFFRIN.COM
DISCIPLINE: PROFESSIONAL ENGINEERING
CERTIFICATE OF AUTHORITY: 000159
EXPIRATION DATE: DECEMBER 31, 2022

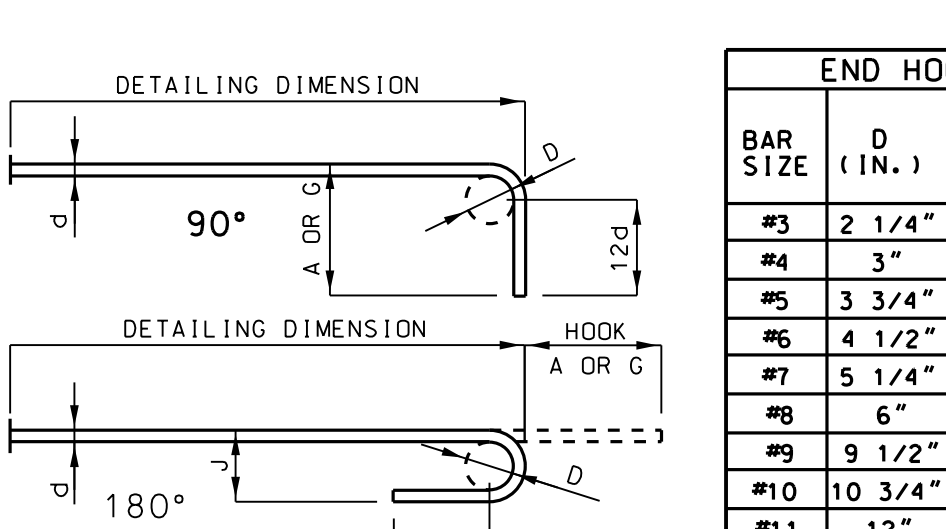
I-270 AND RIVERVIEW
EB BRIDGE
BRIDGE APPROACH SLAB (MAJOR)

BILL OF REINFORCING STEEL

Table with columns: NO., REQ'D., MARK NO., SIZE, MARK, LOCATION, DIMENSIONS (B, C, D, E, F, H, K), NOMINAL LENGTH, ACTUAL LENGTH, WEIGHT. Includes substructure and superstructure details.



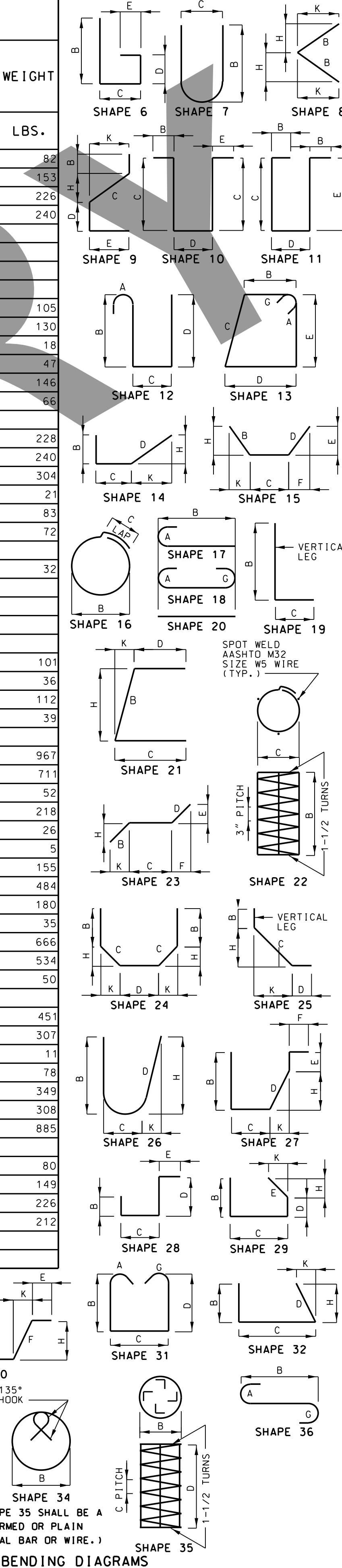
STIRRUP HOOK DIMENSIONS GRADES 40 - 50 - 60 KSI. Table with columns: BAR SIZE, D (IN.), 90° HOOK, 135° HOOK, APPROX. H.



Designed: SSM Detailed: CAB Checked: XXX

BILL OF REINFORCING STEEL

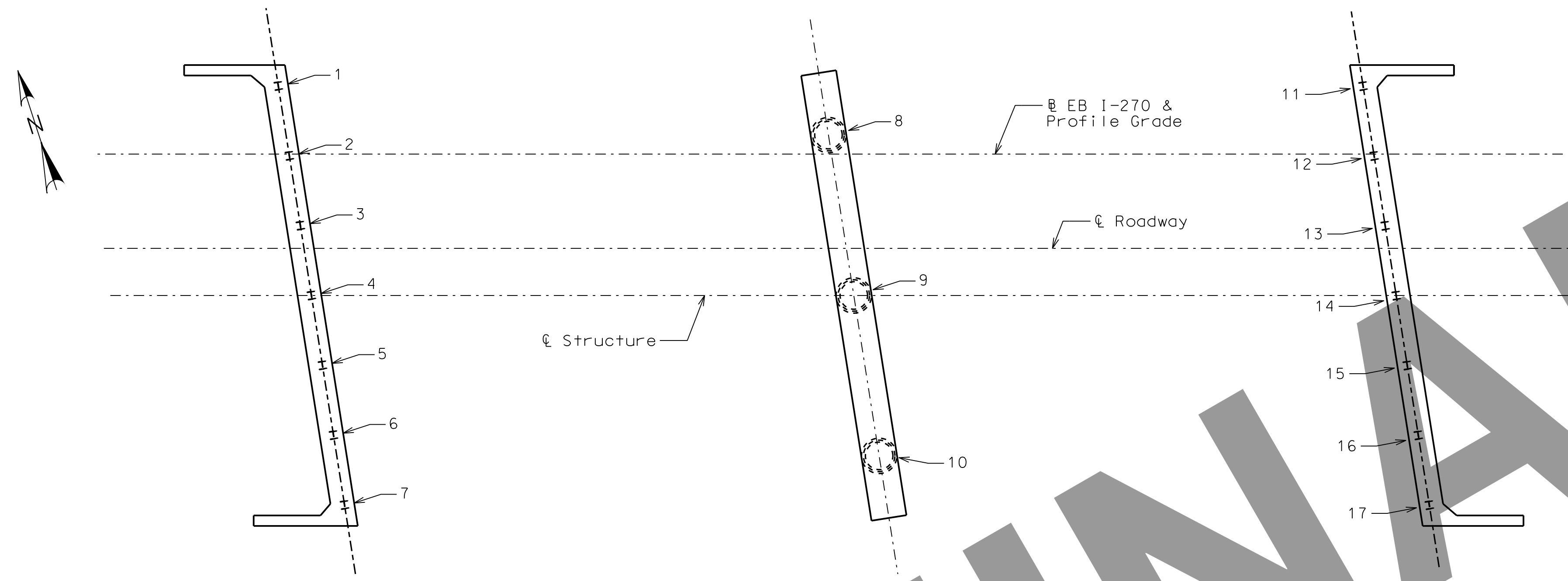
Table with columns: NO., REQ'D., MARK NO., SIZE, MARK, LOCATION, DIMENSIONS (B, C, D, E, F, H, K), NOMINAL LENGTH, ACTUAL LENGTH, WEIGHT. Continuation of the first table.



NOTE: ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEGREE STANDARD HOOKS. HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.

Note: This drawing is not to scale. Follow dimensions. Sheet No. 24 of 37

Professional Engineer seal for SAURABH SHYAM MISHRA, MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION, MISSOURI DOT logo, project details for I-270 and EB BRIDGE, and date 3/14/2022.



PART PLAN SHOWING PILE NUMBERING FOR RECORDING AS-BUILT PILE DATA AND AS-BUILT DRILLED SHAFT DATA

As-Built Pile Data			
Pile No.	Length in Place (ft)	Computed Nominal Axial Compressive Resistance (kips)	Remarks
			End Bent No. 1
1			
2			
3			
4			
5			
6			
7			
			End Bent No. 3
11			
12			
13			
14			
15			
16			
17			

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. 2
8				
9				
10				

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 AND DRILLED SHAFT DATA



03/16/22
 DATE PREPARED: 3/14/2022
 ROUTE: I-270 STATE: MO
 DISTRICT: BR SHEET NO.: 26
 COUNTY: ST. LOUIS CITY
 JOB NO.: J613020C
 CONTRACT ID.:
 PROJECT NO.:
 BRIDGE NO.: A8999

DESCRIPTION	DATE

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

HORNER SHIFFRIN
 401 S. 18TH ST., STE. 400 ST. LOUIS, MO 63103
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 DISCIPLINE: PROFESSIONAL ENGINEERING
 CERTIFICATE OF AUTHORITY: 000159
 EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW EB BRIDGE AS BUILT PILE AND DRILLED SHAFT DATA



03/16/22
 DATE PREPARED
 3/14/2022
 ROUTE STATE
 I-270 MO
 DISTRICT SHEET NO.
 BR 27
 COUNTY
 ST. LOUIS CITY
 JOB NO.
 J613020C
 CONTRACT ID.

PROJECT NO.
 BRIDGE NO.
 A8999

DATE	DESCRIPTION

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

HORNER & SHIFRIN
 401 S. 18TH ST. STE. 400 ST. LOUIS, MO 63103
 314-531-8321 FAX 314-531-8986
 WWW.HORNERSHIFRIN.COM
 DISCIPLINE: PROFESSIONAL ENGINEERING
 CERTIFICATE OF AUTHORITY: 000159
 EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW EB BRIDGE BORING DATA

BORING NUMBER NB-1

PAGE 1 OF 1

CLIENT Horner & Shifrin, Inc. **PROJECT NAME** Interstate 270 at Riverview Drive Improvements

PROJECT NUMBER MG20007 **PROJECT LOCATION** St. Louis, Missouri

DATE STARTED 3/23/20 **COMPLETED** 3/23/20 **GROUND ELEVATION** 438.8 ft **HOLE SIZE** inches

DRILLING CONTRACTOR Bulldog, CME75LC, Efficiency: 94% **GROUND WATER LEVELS:**

DRILLING METHOD Hollow Stem Auger **AT TIME OF DRILLING** 8.00 ft / Elev 430.80 ft

LOGGED BY B.Fisher **CHECKED BY** J. Schaeffer **AT END OF DRILLING** --- not measured

NOTES AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (ROD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		Concrete (10.0")	438									
0 - 5		FILL: Light brown to light grey, lean CLAY, with silt and organic material, trace sand and gravel - pushed 1000 psi, no recovery - 3.0" of wood at 3.5 ft	ST 1	0	8-6-6 (12)	2.5						
5			SS 1	50				11				
5 - 10			ST 2	0	4-6-8 (14)	2.5						
10			SS 2	94				21				
10 - 15		Dark grey, lean CLAY (CL) - undrained shear strength at 13.0 ft = 1.71 TSF	ST 3	83		3.5	106	21				
15												
15 - 20		Blue-grey to brown, fat CLAY (CH)										
20		SHALE: Brown to grey, highly weathered	SS 4	78	5-4-8 (12)	3.5		14				
20												
20 - 21.5		Refusal at 21.5 feet. Bottom of borehole at 21.5 feet.										

BORING NUMBER NB-2

PAGE 1 OF 1

CLIENT Horner & Shifrin, Inc. **PROJECT NAME** Interstate 270 at Riverview Drive Improvements

PROJECT NUMBER MG20007 **PROJECT LOCATION** St. Louis, Missouri

DATE STARTED 3/25/20 **COMPLETED** 3/25/20 **GROUND ELEVATION** 439 ft **HOLE SIZE** inches

DRILLING CONTRACTOR Bulldog, CME75LC, Efficiency: 94% **GROUND WATER LEVELS:**

DRILLING METHOD Hollow Stem Auger **AT TIME OF DRILLING** --- not encountered

LOGGED BY B.Fisher **CHECKED BY** J. Schaeffer **AT END OF DRILLING** --- not measured

NOTES AFTER DRILLING ---

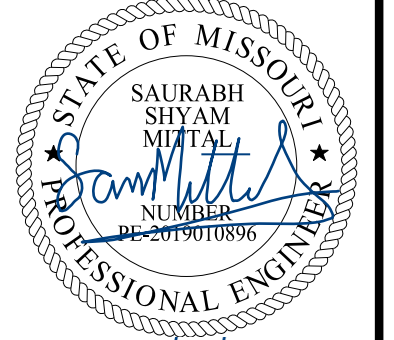
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (ROD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		Concrete (12.0")	438									
0 - 5		Dark grey, lean CLAY (CL), with sand - undrained shear strength at 3.0 ft = 0.29 TSF	ST 1	83		0.25	100	21				
5												
5 - 10		Grey to brown, lean CLAY (CL), with silt, trace sand - undrained shear strength at 8.0 ft = 0.52 TSF	ST 2	100		0.75	103	21				
10												
10 - 15		Grey to orange to brown below 13.0 ft - undrained shear strength at 13.0 ft = 1.00 TSF	ST 3	100		1.5	104	22				
15												
15 - 20		Blue-grey, fat CLAY (CH), with sand, trace gravel										
20			SS 4	100	3-3-4 (7)	0.25		14				
20												
20 - 23.8		Blue-grey to brown, weathered, shaly, fat CLAY (CH) SHALE: Light grey to blue-grey, weathered, calcareous Refusal at 23.8 feet. Bottom of borehole at 23.8 feet.	SS 5	100	50/4"			8				

Designed: SSM
 Detailed: CAB
 Checked: TPL

BORING DATA

Note: For locations of borings, see Sheet No. 1.

Note: This drawing is not to scale. Follow dimensions. Sheet No. 27 of 37



BORING NUMBER SB-3
 PAGE 1 OF 2
 Millennium Professional Services

CLIENT Horner & Shifrin, Inc. PROJECT NAME Interstate 270 at Riverview Drive Improvements
 PROJECT NUMBER MG20007 PROJECT LOCATION St. Louis, Missouri
 DATE STARTED 3/3/20 COMPLETED 3/3/20 GROUND ELEVATION 438.3 ft HOLE SIZE inches
 DRILLING CONTRACTOR Bulldog, CME550X, Efficiency: 95% GROUND WATER LEVELS:
 DRILLING METHOD Hollow Stem Auger, NQ Rock Core ∇ AT TIME OF DRILLING 7.00 ft / Elev 431.30 ft
 LOGGED BY B.Fisher CHECKED BY J.Schaeffer AT END OF DRILLING --- not measured
 NOTES 5.0 ft west of design due to location of marked utilities AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		Concrete (10.0")										
0 - 4.5		Brown-orange to grey, lean CLAY (CL), trace sand										
4.5 - 5.0		- possible sand layer below 8.0 ft	SS 1	100	3-5-5 (10)	2.5			17			
5.0 - 10.0		- no recovery at ST-2, classifications from cuttings	ST 2	0								
10.0 - 14.5		Grey, fat CLAY (CH), trace sand and gravel										
14.5 - 15.0		- undrained shear strength at 15.0 ft = 0.60 TSF	SS 3	89	3-2-3 (5)	1.75			22			
15.0 - 18.5		- with sand below 18.5 ft	ST 4	100		0.75	102	24				
18.5 - 20.0			SS 5	83	2-2-4 (6)	1.0			18			
20.0 - 24.5			SS 6	56	2-2-5 (7)	1.0			10			
24.5 - 25.0												
25.0 - 409.8												

(Continued Next Page)

BORING NUMBER SB-3
 PAGE 2 OF 2
 Millennium Professional Services

CLIENT Horner & Shifrin, Inc. PROJECT NAME Interstate 270 at Riverview Drive Improvements
 PROJECT NUMBER MG20007 PROJECT LOCATION St. Louis, Missouri

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	FINES CONTENT (%)
30.0 - 30.5		LIMESTONE: Grey, moderately hard, thin bedded, coarsely-crystalline, moderately weathered	SS 7	100	50/1"			10				
30.5 - 31.0		SHALE: Grey, soft to moderately hard, calcareous	RC 1	100 (87)								
31.0 - 32.5		SHALY LIMESTONE: Grey, moderately hard, finely-crystalline, thin to medium bedded, moderately weathered										
32.5 - 35.0		SHALE: Grey, soft to moderately hard	RC 2	100 (77)								
35.0 - 35.5		- soft below 35.0 ft - rock core qu at 35.5 ft = 5,090 psi										
35.5 - 40.0		LIMESTONE: Grey, argillaceous, moderately hard, thin to thick bedded, very finely-crystalline, slightly weathered - with shale inclusions from 38.0-38.5 ft	RC 3	100 (100)								
40.0 - 40.5			RC 4	93 (82)								
40.5 - 409.8		Refusal at 28.5 feet. Bottom of borehole at 43.5 feet.										

Designed: SSM
Detailed: CAB
Checked: TPL

Note: For locations of borings, see Sheet No. 1.

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

Sheet No. 28 of 37

DATE PREPARED: 3/14/2022
 ROUTE: I-270 STATE: MO
 DISTRICT: BR SHEET NO.: 28
 COUNTY: ST. LOUIS CITY
 JOB NO.: J613020C
 CONTRACT ID.:
 PROJECT NO.:
 BRIDGE NO.: A8999
 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 MO DOT
 105 WEST CAPITOL JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-275-6636)

HORNER & SHIFRIN
 401 S. 18TH ST. STE. 400 ST. LOUIS, MO 63103
 314-531-4321 FAX 314-531-4386
 WWW.HORNERSHIFRIN.COM
 DISCIPLINE: PROFESSIONAL ENGINEERING
 CERTIFICATE OF AUTHORITY: 000159
 EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW EB BRIDGE BORING DATA

BORING NUMBER SB-3A
PAGE 1 OF 1

Millennia Professional Services

CLIENT Horner & Shifrin, Inc. PROJECT NAME Interstate 270 at Riverview Drive Improvements
 PROJECT NUMBER MG20007 PROJECT LOCATION St. Louis, Missouri
 DATE STARTED 3/25/20 COMPLETED 3/25/20 GROUND ELEVATION 438.3 ft HOLE SIZE inches
 DRILLING CONTRACTOR Bulldog, CME75LC, Efficiency: 94% GROUND WATER LEVELS:
 DRILLING METHOD Hollow Stem Auger AT TIME OF DRILLING --- not encountered
 LOGGED BY B.Fisher CHECKED BY J. Schaeffer AT END OF DRILLING --- not measured
 NOTES 1.0 ft south of existing SB-3 AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		Concrete (10.0")	437.5									
		Grey, lean to fat CLAY (CL-CH), with silt, trace sand										
		- undrained shear strength at 3.0 ft = 2.28 TSF										
5			ST 1	100		2.5	106	19	50	19	31	

Bottom of borehole at 5.0 feet.

BORING NUMBER SB-4
PAGE 1 OF 1

Millennia Professional Services

CLIENT Horner & Shifrin, Inc. PROJECT NAME Interstate 270 at Riverview Drive Improvements
 PROJECT NUMBER MG20007 PROJECT LOCATION St. Louis, Missouri
 DATE STARTED 3/3/20 COMPLETED 3/3/20 GROUND ELEVATION 438.1 ft HOLE SIZE inches
 DRILLING CONTRACTOR Bulldog, CME550X, Efficiency: 95% GROUND WATER LEVELS:
 DRILLING METHOD Hollow Stem Auger AT TIME OF DRILLING 9.00 ft / Elev 429.10 ft
 LOGGED BY B.Fisher CHECKED BY J. Schaeffer AT END OF DRILLING --- not measured
 NOTES 2.0 ft north and 5.0 ft west of design due to location of marked utilities AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		Concrete (10.0")	437.3									
		Orange-brown to grey, lean to fat CLAY (CL-CH), with sand, trace gravel										
		- undrained shear strength at 13.0 ft = 0.76 TSF										
		- with gravel below 14.0 ft										
5			SS 1	94	3-3-6 (9)	2.5		14	49	18	31	
		Grey, lean CLAY (CL), trace sand lenses										
10			SS 2	89	2-2-4 (6)	1.0		17				
		Tan SAND (SC) with silt and clay										
		Grey, lean CLAY (CL), trace sand and gravel										
		- undrained shear strength at 13.0 ft = 0.76 TSF										
		- with gravel below 14.0 ft										
15			ST 3	83		1.5	110	20				
		Grey, lean CLAY (CL), trace sand and gravel										
		- undrained shear strength at 13.0 ft = 0.76 TSF										
		- with gravel below 14.0 ft										
20			SS 4	100	1-2-2 (4)	1.25		23				
		Grey, lean CLAY (CL), trace sand and gravel										
		- undrained shear strength at 13.0 ft = 0.76 TSF										
		- with gravel below 14.0 ft										
25			SS 5	78	4-3-3 (6)	2.0		25				
		Grey, lean CLAY (CL), trace sand and gravel										
		- undrained shear strength at 13.0 ft = 0.76 TSF										
		- with gravel below 14.0 ft										
		- 2.0" fragmented rock layer at 23.8 ft										
		Refusal at 27.5 feet. Bottom of borehole at 27.5 feet.	SS 6	100	50/0"							

Refusal at 27.5 feet. Bottom of borehole at 27.5 feet.



DATE PREPARED 3/14/2022
 ROUTE I-270 STATE MO
 DISTRICT BR SHEET NO. 29
 COUNTY ST. LOUIS CITY
 JOB NO. J613020C
 CONTRACT ID. _____
 PROJECT NO. _____
 BRIDGE NO. A8999

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HORNER SHIFRIN
 401 S. 18TH ST. STE. 400 ST. LOUIS, MO 63103
 314-451-4321 FAX 314-551-8586
 WWW.HORNERSHIFRIN.COM
 DISCIPLINE: PROFESSIONAL ENGINEERING
 CERTIFICATE OF AUTHORITY: 000159
 EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW EB BRIDGE BORING DATA

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/17/20 11:22 - G:\PROJECT FILES\2020\MG20007 I-270 RIVERVIEW DRIVE INTERCHANGE\FIELD DATA\I270 AT RIVERVIEW DRIVE INTERCHANGE.GINT.GPJ

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 12/17/20 11:22 - G:\PROJECT FILES\2020\MG20007 I-270 RIVERVIEW DRIVE INTERCHANGE\FIELD DATA\I270 AT RIVERVIEW DRIVE INTERCHANGE.GINT.GPJ

BORING DATA

Note: For locations of borings, see Sheet No. 1.

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

Sheet No. 29 of 37

Designed: SSM
Detailed: CAB
Checked: TPL

BORING NUMBER SB-5 PAGE 1 OF 2
Millennia Professional Services
CLIENT Horner & Shifrin, Inc. **PROJECT NAME** Interstate 270 at Riverview Drive Improvements
PROJECT NUMBER MG20007 **PROJECT LOCATION** St. Louis, Missouri
DATE STARTED 3/6/20 **COMPLETED** 3/6/20 **GROUND ELEVATION** 438.6 ft **HOLE SIZE** inches
DRILLING CONTRACTOR Bulldog, CME550X, Efficiency: 95% **GROUND WATER LEVELS:**
DRILLING METHOD Hollow Stem Auger, NQ Rock Core **AT TIME OF DRILLING** 24.50 ft / Elev 414.10 ft
LOGGED BY B.Fisher **CHECKED BY** J. Schaeffer **AT END OF DRILLING** --- not measured
NOTES **AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		Concrete (10.0")										
		Dark grey, lean CLAY (CL), with silt										
5			SS 1	78	5-2-3 (5)	0.25		21				
10		Grey, fat CLAY (CH), with silt	SS 2	100	5-4-3 (7)	0.75		24				
15		Grey, sandy SILT (ML)	ST 3	100				21				
20		Brown, fat CLAY (CH)	SS 4	100	2-2-4 (6)	1.25		24				
25		- with coarse sand below 23.5 ft	SS 5	28	4-5-11 (16)			12				
410.1												

(Continued Next Page)

BORING NUMBER SB-5 PAGE 2 OF 2
Millennia Professional Services
CLIENT Horner & Shifrin, Inc. **PROJECT NAME** Interstate 270 at Riverview Drive Improvements
PROJECT NUMBER MG20007 **PROJECT LOCATION** St. Louis, Missouri

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
30		LIMESTONE: Greenish grey, argillaceous, soft, thick bedded, slightly weathered, with shale inclusions	SS 6	100	50/2"			9				
		- rock core qu at 31.5 ft = 5,590 psi	RC 1	95 (70)								
35		SHALE: Greenish grey to brown, calcareous, soft to moderately hard, with limestone inclusions										
		- rock core qu at 35.5 ft = 7,040 psi	RC 2	100 (92)								
40			RC 3	100 (40)								
		- soft below 41.2 ft - very soft below 42.0 ft										
45			RC 4	100 (67)								
		LIMESTONE: Greyish white, moderately hard to hard, thin to thick bedded, slightly weathered, medium-crystalline	RC 5	100 (100)								
50		- coarsely-grained below 48.5 ft - rock core qu at 49.0 ft = 10,560 psi	RC 6	100 (92)								
		- stylolites at 53.1 ft, 53.3 ft, and 53.7 ft										
55		- fractured, with stylolites from 54.8 to 56.0 ft	RC 7	100 (47)								
		- high angle fracture from 57.0-58.0 ft										
380.1		Refusal at 28.5 feet. Bottom of borehole at 58.5 feet.										

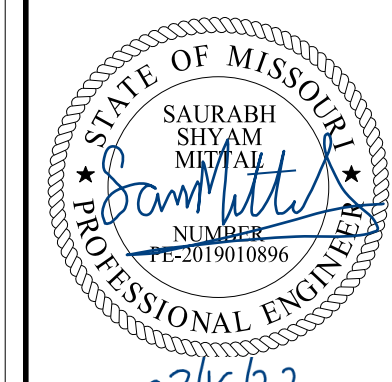
BORING DATA

Note: For locations of borings, see Sheet No. 1.

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

Sheet No. 30 of 37

Designed: SSM
 Detailed: CAB
 Checked: TPL



DATE PREPARED: 3/14/2022
 ROUTE: I-270 STATE: MO
 DISTRICT: BR SHEET NO.: 30
 COUNTY: ST. LOUIS CITY
 JOB NO.: J613020C
 CONTRACT ID.:

PROJECT NO.:

BRIDGE NO. A8999

DESCRIPTION	DATE

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

HORNER & SHIFRIN
 401 S. 18TH ST. STE. 400 ST. LOUIS, MO 63103
 314-531-4321 FAX 314-531-4386
 WWW.HORNERSHIFRIN.COM
 DISCIPLINE: PROFESSIONAL ENGINEERING
 CERTIFICATE OF AUTHORITY: 000159
 EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW EB BRIDGE BORING DATA

BORING NUMBER SB-6
PAGE 1 OF 2

Millennia Professional Services

CLIENT Horner & Shifrin, Inc. **PROJECT NAME** Interstate 270 at Riverview Drive Improvements

PROJECT NUMBER MG20007 **PROJECT LOCATION** St. Louis, Missouri

DATE STARTED 3/10/20 **COMPLETED** 3/10/20 **GROUND ELEVATION** 438.4 ft **HOLE SIZE** inches

DRILLING CONTRACTOR Bulldog, CME550X, Efficiency: 95% **GROUND WATER LEVELS:**

DRILLING METHOD Hollow Stem Auger, NQ Rock Core **AT TIME OF DRILLING** 16.00 ft / Elev 422.40 ft

LOGGED BY B.Fisher **CHECKED BY** J. Schaeffer **AT END OF DRILLING** --- not measured

NOTES **AFTER DRILLING** ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)	
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX		
0		Concrete (10.0")											
		Dark grey, lean CLAY (CL), with silt											
5			SS 1	56	12-23-3 (26)			21					
			ST 2	8				15					
10													
15		- trace cobbles, blue-grey below 13.5 ft											
		Brown, lean CLAY (CL)	SS 3	89	7-7-6 (13)	4.5		20					
20		- with coarse-grained sand and gravel below 18.5 ft	SS 4	33	5-6-4 (10)			14					
25		Dark grey, fat CLAY (CH), with silt, trace sand lenses	SS 5	100	2-2-4 (6)	1.5		15					
		Light purple, weathered, shaly fat CLAY (CH)											
		SHALE: Purple to brown to blue-grey, weathered											
30			SS 6	100	30-32-50/3"			6					

(Continued Next Page)

BORING NUMBER SB-6
PAGE 2 OF 2

Millennia Professional Services

CLIENT Horner & Shifrin, Inc. **PROJECT NAME** Interstate 270 at Riverview Drive Improvements

PROJECT NUMBER MG20007 **PROJECT LOCATION** St. Louis, Missouri

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)	
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX		
30		SHALE: Grey to blue-grey, soft to moderately hard, calcareous, little to slight weathering	RC 1	100 (98)									
		- rock core qu at 32.5 ft = 2,330 psi											
35			RC 2	98 (92)									
		- rock core qu at 36.5 ft = 2,460 psi											
		- trace pyrite inclusions at 38.5 ft											
40			RC 3	93 (53)									
		- moderately to highly weathered, highly fractured below 42.0 ft											
		- trace pyrite inclusions at 42.5 ft											
		- loss of 6.0" of core at 43.0 ft											
45			RC 4	83 (58)									
		- rock core qu at 45.3 ft = 175 psi											
		- rock core qu at 47.5 ft = 8,650 psi											
		- rock core qu at 48.5 ft = 788 psi											
50		SHALY LIMESTONE: Grey to white, highly fractured, moderately weathered, clay-rich	RC 5	100 (100)									
		- 1.0" clayey shale seam at 49.9 ft											
		LIMESTONE: Light grey to white, slightly pitted, massive, hard	RC 6	90 (87)									
		- rock core qu at 52.5 ft = 13,180 psi											
		- moderately fractured from 53.5-54.0 ft											
55			RC 7	100 (28)									
		- highly fractured below 55.5 ft											
		- highly weathered below 56.5 ft											
		Refusal at 30.0 feet. Bottom of borehole at 57.5 feet.											



DATE PREPARED 3/14/2022

ROUTE I-270 STATE MO

DISTRICT BR SHEET NO. 31

COUNTY ST. LOUIS CITY

JOB NO. J613020C

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A8999

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HORNER & SHIFRIN

401 S. 18TH ST. STE. 400 ST. LOUIS, MO 63103
314-531-4321 FAX 314-531-8586
WWW.HORNERSHIFRIN.COM
DISCIPLINE: PROFESSIONAL ENGINEERING
CERTIFICATE OF AUTHORITY: 000159
EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW EB BRIDGE BORING DATA


BORING DATA

Note: For locations of borings, see Sheet No. 1.

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

Sheet No. 31 of 37

Designed: SSM
Detailed: CAB
Checked: TPL




BORING NUMBER SB-7
PAGE 1 OF 2

Millennia Professional Services

CLIENT <u>Horner & Shifrin, Inc.</u>	PROJECT NAME <u>Interstate 270 at Riverview Drive Improvements</u>
PROJECT NUMBER <u>MG20007</u>	PROJECT LOCATION <u>St. Louis, Missouri</u>
DATE STARTED <u>3/11/20</u> COMPLETED <u>3/11/20</u>	GROUND ELEVATION <u>438.2</u> ft HOLE SIZE <u> </u> inches
DRILLING CONTRACTOR <u>Bulldog, CME550X, Efficiency: 95%</u>	GROUND WATER LEVELS: ▽ AT TIME OF DRILLING <u>20.00</u> ft / Elev <u>418.20</u> ft
DRILLING METHOD <u>Hollow Stem Auger, NQ Rock Core</u>	AT END OF DRILLING <u>---</u> not measured
LOGGED BY <u>F. Khan</u> CHECKED BY <u>J. Schaeffer</u>	AFTER DRILLING <u>---</u>
NOTES	

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		Concrete (10.0") Brown, lean CLAY (CL), trace sand		437.4								
5		- with sand and gravel below 8.0 ft - undrained shear strength at 8.0 ft = 0.77 TSF	SS 1	78	3-2-2 (4)	0.5		18				
			GB 2					17				
10			ST 3	67		1.5	104	16				
15			SS 4	89	3-7-11 (18)	1.0		22				
20		- grey below 18.5 ft	SS 5	56	3-3-3 (6)	0.25		18				
25		- decayed wood fragments observed at 23.5 ft	SS 6	94	1-3-4 (7)	1.75		20				
30		SHALE: Purplish grey, clayey	SS 7	94	4-6-7 (13)	2.0		14				

(Continued Next Page)



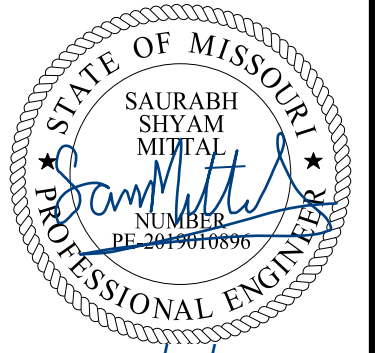
BORING NUMBER SB-7
PAGE 2 OF 2

Millennia Professional Services

CLIENT <u>Horner & Shifrin, Inc.</u>	PROJECT NAME <u>Interstate 270 at Riverview Drive Improvements</u>
PROJECT NUMBER <u>MG20007</u>	PROJECT LOCATION <u>St. Louis, Missouri</u>

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
30		SHALE: Purplish grey, clayey (continued)										
35		SHALE: Grey, weathered, calcareous, soft to moderately hard - core loss from 34.0-35.0 ft	SS 8	100	50/5"			9				
		- rock core qu at 38.25 ft = 5,140 psi	RC 1	80 (68)								
40		- rock core qu at 41.0 ft = 3,460 psi - black shale inclusion at 41.7 ft	RC 2	100 (87)								
		LIMESTONE: Greenish grey, moderately hard, thin to medium-bedded, slightly weathered, finely-crystalline, with shale inclusions										
45		SHALE: Greenish grey, soft to moderately hard, calcareous	RC 3	97 (83)								
		- dark grey with soft seams below 47.2 ft										
50		- near vertical, clay-filled fractures at 49.3 ft and 50.7 ft - very soft, interbedded with limestone below 51.0 ft	RC 4	95 (60)								
		LIMESTONE: Blueish grey, moderately hard to hard, banded to thin-bedded, slightly weathered, with brown to black clay seams										
55		- rock core qu at 53.0 ft = 10,480 psi - healed fracture at 53.4 ft - healed fractures from 54.0-56.0 ft - vertical and horizontal fractures from 55.0-56.0 ft - light grey below 55.5 ft - slightly pitted below 56.0 ft - rock core qu at 56.75 ft = 6,520 psi - thick to massive-bedded below 57.0 ft - stylolites at 56.0 ft, 57.0 ft, 58.0 ft, 62.2 ft, 62.8 ft, and 63.9 ft	RC 5	100 (82)								
60		- healed fractures from 62.8-64.0 ft	RC 6	100 (100)								

Refusal at 34.0 feet.
Bottom of borehole at 64.0 feet.



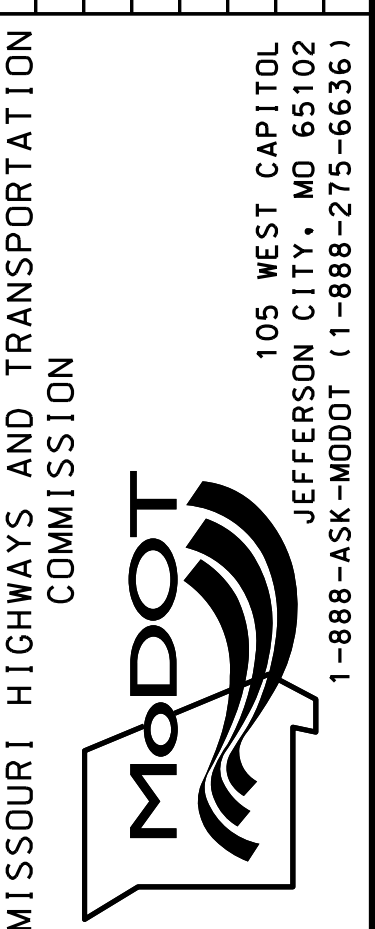
03/16/22

DATE PREPARED: 3/14/2022

ROUTE: I-270	STATE: MO
DISTRICT: BR	SHEET NO.: 32
COUNTY: ST. LOUIS CITY	
JOB NO.: J613020C	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.: A8999	

DESCRIPTION	DATE

DESCRIPTION	DATE



I-270 AND RIVERVIEW
EB BRIDGE
BORING DATA

BORING DATA

Note: For locations of borings, see Sheet No. 1.

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

Sheet No. 32 of 37

Designed: SSM
Detailed: CAB
Checked: TPL

BORING NUMBER SB-8
PAGE 1 OF 2

Millennia Professional Services

CLIENT Horner & Shifrin, Inc. PROJECT NAME Interstate 270 at Riverview Drive Improvements
 PROJECT NUMBER MG20007 PROJECT LOCATION St. Louis, Missouri
 DATE STARTED 3/17/20 COMPLETED 3/17/20 GROUND ELEVATION 438.7 ft HOLE SIZE inches
 DRILLING CONTRACTOR Bulldog, CME75LC, Efficiency: 94% GROUND WATER LEVELS:
 DRILLING METHOD Hollow Stem Auger, NQ Rock Core ∇ AT TIME OF DRILLING 19.00 ft / Elev 419.70 ft
 LOGGED BY B.Fisher CHECKED BY J.Schaeffer AT END OF DRILLING --- not measured
 NOTES 5.0 ft west of design due to location of marked utilities AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		Concrete (10.0")										
		FILL: Brown to grey, lean CLAY, with silt, trace organics and gravel	SS 1	83	4-7-8 (15)	4.5		13				
		Blue-grey, fat CLAY (CH), with silt	SS 2	100	7-6-9 (15)	3.5		23	52	19	33	
		- dark brownish grey silt layers observed at 5 ft and 6 ft (Possibly organic silt)										
		Brown and grey, lean CLAY (CL)	SS 3	89	3-4-8 (12)	3.75		16				
			SS 4	89	3-2-3 (5)	2.5		19				
		- with sand below 13.5 ft - undrained shear strength at 14.0 ft = 0.44 TSF	ST 5	100		2.5	100	22				
		- brown-orange, with sand lenses below 18.0 ft	SS 6	89	3-4-9 (13)	2.75		15				
		- weathered rock fragments with coal pieces at 20.0 ft										
		Brown, clayey SAND (SC)	SS 7	100	8-8-12 (20)			37				
		Dark grey to blue-grey, shaly, fat CLAY (CH)	SS 8	83	16-25-24 (49)	4.5		12				

(Continued Next Page)

BORING NUMBER SB-8
PAGE 2 OF 2

Millennia Professional Services

CLIENT Horner & Shifrin, Inc. PROJECT NAME Interstate 270 at Riverview Drive Improvements
 PROJECT NUMBER MG20007 PROJECT LOCATION St. Louis, Missouri

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
30		Dark grey to blue-grey, shaly, fat CLAY (CH) (continued)										
		LIMESTONE: Greenish grey, argillaceous, soft to moderately hard, thin to medium-bedded, slightly weathered, with shale inclusions	SS 9 RC 1	100 100 (81)	50/3"			8				
		- rock core qu at 36.5 ft = 5,840 psi	RC 2	100 (100)								
		SHALE: Grey, soft to moderately hard	RC 3	100 (71)								
		- rock core qu at 42.7 ft = 5,790 psi	RC 4	96 (93)								
		LIMESTONE: White to grey, moderately hard to hard, thin to medium-bedded, slightly weathered - interbedded with shale from 44.3-44.9 ft - shale partings at 45.0 and 46.2 ft - 1.5" chert seam at 47.0 ft - stylolites at 47.6, 47.7, 48.0, and 48.4 ft	RC 5	100 (75)								
		Refusal at 33.8 feet. Bottom of borehole at 49.5 feet.										

GEO TECH BH COLUMNS - GINT STD US LAB.GDT - 12/17/20 11:22 - G:\PROJECT FILES\2020\MG20007_I-270 RIVERVIEW DRIVE INTERCHANGE\FIELD DATA\I270 AT RIVERVIEW DRIVE INTERCHANGE GINT.GPJ



DATE PREPARED
3/14/2022

ROUTE I-270 STATE MO
 DISTRICT BR SHEET NO. 33
 COUNTY ST. LOUIS CITY
 JOB NO. J613020C
 CONTRACT ID. _____
 PROJECT NO. _____
 BRIDGE NO. A8999

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HORNER & SHIFRIN

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 314-451-4321 FAX 314-551-6586
 WWW.HORNERSHIFRIN.COM
 DISCIPLINE: PROFESSIONAL ENGINEERING
 CERTIFICATE OF AUTHORITY: 000159
 EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW
 EB BRIDGE
 BORING DATA

BORING DATA

Note: For locations of borings, see Sheet No. 1.

Note: This drawing is not to scale. Follow dimensions. Sheet No. 33 of 37

Designed: SSM
 Detailed: CAB
 Checked: TPL

BORING NUMBER SB-9
PAGE 1 OF 2

Millennia Professional Services

CLIENT Horner & Shifrin, Inc. PROJECT NAME Interstate 270 at Riverview Drive Improvements
 PROJECT NUMBER MG20007 PROJECT LOCATION St. Louis, Missouri
 DATE STARTED 3/13/20 COMPLETED 3/13/20 GROUND ELEVATION 438.6 ft HOLE SIZE inches
 DRILLING CONTRACTOR Bulldog, CME550X, Efficiency: 95% GROUND WATER LEVELS:
 DRILLING METHOD Hollow Stem Auger ∇ AT TIME OF DRILLING 28.50 ft / Elev 410.10 ft
 LOGGED BY F. Khan CHECKED BY J. Schaeffer ∇ AT END OF DRILLING 27.00 ft / Elev 411.60 ft
 AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		Concrete (10.0")										
		POSSIBLE FILL: Brown and grey, lean CLAY (CL)										
4.33.1		POSSIBLE FILL: Dark grey, lean CLAY (CL), trace pockets of fat clay, trace organics - undrained shear strength at 6.0 ft = 1.48 TSF	SS 1	72	6-6-6 (12)	2.5		22				
4.26.6		Brown and grey, lean CLAY (CL)	SS 3	89	3-3-3 (6)	1.5	103	22				
4.22.1		Brown to orange, lean CLAY (CL), with sand, trace gravel	SS 4	100	2-3-3 (6)	2.0		11				
4.17.1		SHALE: Tan to yellow-brown, weathered, clayey	SS 5	89	2-7-6 (13)			29				
			SS 6	72	8-8-9 (17)			15				
			SS 7	100	11-20-26 (46)			12				
30		- grey below 28.5 ft						14				

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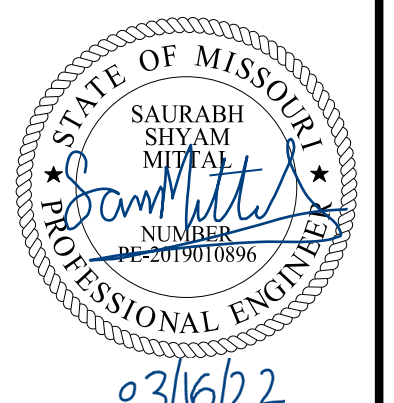
BORING NUMBER SB-9
PAGE 2 OF 2

Millennia Professional Services

CLIENT Horner & Shifrin, Inc. PROJECT NAME Interstate 270 at Riverview Drive Improvements
 PROJECT NUMBER MG20007 PROJECT LOCATION St. Louis, Missouri

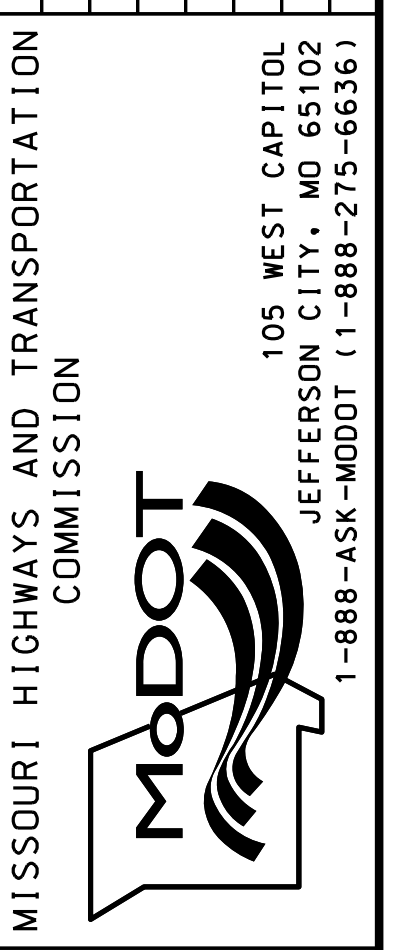
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
30		SHALE: Tan to yellow-brown, weathered, clayey (continued)										
35			SS 8	100	10-21-36 (57)			11				
39.8		Refusal at 38.5 feet. Bottom of borehole at 38.8 feet.	SS 9	100	50/3"			10				

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DATE PREPARED 3/14/2022

ROUTE I-270 STATE MO
 DISTRICT BR SHEET NO. 34
 COUNTY ST. LOUIS CITY
 JOB NO. J613020C
 CONTRACT ID. _____
 PROJECT NO. _____
 BRIDGE NO. A8999



I-270 AND RIVERVIEW
 EB BRIDGE
 BORING DATA

BORING DATA

Note: For locations of borings, see Sheet No. 1.

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

Sheet No. 34 of 37

Designed: SSM
 Detailed: CAB
 Checked: TPL

BORING NUMBER SB-9A
PAGE 1 OF 1

Millennia Professional Services

CLIENT Horner & Shifrin, Inc. PROJECT NAME Interstate 270 at Riverview Drive Improvements

PROJECT NUMBER MG20007 PROJECT LOCATION St. Louis, Missouri

DATE STARTED 3/23/20 COMPLETED 3/23/20 GROUND ELEVATION 438.6 ft HOLE SIZE inches

DRILLING CONTRACTOR Bulldog, CME75LC, Efficiency: 94% GROUND WATER LEVELS:

DRILLING METHOD Hollow Stem Auger AT TIME OF DRILLING --- not encountered

LOGGED BY B. Fisher CHECKED BY J. Schaeffer AT END OF DRILLING --- not measured

NOTES 1.0 ft south of existing SB-9 AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		Concrete (10.0")	437.8									
		Dark grey, lean CLAY (CL)										
		- undrained shear strength at 3.0 ft = 2.42 TSF										
5			ST 1	75		>4.5	108	20				

Bottom of borehole at 5.0 feet.

BORING NUMBER SB-10
PAGE 1 OF 2

Millennia Professional Services

CLIENT Horner & Shifrin, Inc. PROJECT NAME Interstate 270 at Riverview Drive Improvements

PROJECT NUMBER MG20007 PROJECT LOCATION St. Louis, Missouri

DATE STARTED 3/17/20 COMPLETED 3/17/20 GROUND ELEVATION 438.5 ft HOLE SIZE inches

DRILLING CONTRACTOR Bulldog, CME550X, Efficiency: 95% GROUND WATER LEVELS:

DRILLING METHOD Hollow Stem Auger, NQ Rock Core AT TIME OF DRILLING ▽ 18.50 ft / Elev 420.00 ft

LOGGED BY F. Khan CHECKED BY J. Schaeffer AT END OF DRILLING --- not measured

NOTES 5.0 ft west of design due to location of marked utilities AFTER DRILLING ---

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0		Concrete (10.0")	437.7									
		Grey, lean CLAY (CL), with pockets of fat clay										
		- trace sand below 9.0 ft	SS 1	67	5-4-5 (9)	2.75		21				
			SS 2	61	2-2-3 (5)	2.0		22				
			ST 3	100		2.25	102	17				
		- grey to brown below 13.5 ft										
			SS 4	100	2-3-4 (7)	1.25		25				
		▽ Brown to grey, lean CLAY (CL), pockets of fat clay										
		-with sand below 19.0 feet.	SS 5	67	1-3-2 (5)	1.5		27				
			SS 6	94	7-14-15 (29)			12				
		SHALE: Grey, weathered										
			SS 7	100	2-3-4 (7)	1.25		19				
		Brownish-grey, fat CLAY (CH)										

(Continued Next Page)



DATE PREPARED 3/14/2022

ROUTE I-270 STATE MO

DISTRICT BR SHEET NO. 35

COUNTY ST. LOUIS CITY

JOB NO. J613020C

CONTRACT ID.

PROJECT NO.

BRIDGE NO. A8999

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HORNER & SHIFRIN

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DISCIPLINE: PROFESSIONAL ENGINEERING
CERTIFICATE OF AUTHORITY: 000159
EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW EB BRIDGE BORING DATA

Designed: SSM
Detailed: CAB
Checked: TPL

BORING DATA
Note: For locations of borings, see Sheet No. 1.

MILLENNIA Professional Services		BORING NUMBER SB-10 PAGE 2 OF 2											
CLIENT Horner & Shifrin, Inc.		PROJECT NAME Interstate 270 at Riverview Drive Improvements											
PROJECT NUMBER MG20007		PROJECT LOCATION St. Louis, Missouri											
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)	
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX		
30		Brownish-grey, fat CLAY (CH) (continued)											
35		SHALE: Grey, soft - rock core qu at 37.0 ft = 1,550 psi - calcareous from 37.5-39.0 ft	SS 8	100	23-50/5"			10					
40		- very soft below 42.0 ft - blue-grey below 44.0 ft	RC 1	80 (72)									
45		LIMESTONE: Greyish-white, moderately hard to hard, thin to medium bedded, with shale seams - healed vertical fracture from 48.5-49.0 ft	RC 2	88 (47)									
			RC 3	95 (90)									
		Refusal at 34.0 feet. Bottom of borehole at 49.0 feet.											



03/16/22
DATE PREPARED 3/14/2022
ROUTE I-270 STATE MO
DISTRICT BR SHEET NO. 36
COUNTY ST. LOUIS CITY
JOB NO. J613020C
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A8999

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

 105 WEST CAPITOL
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 WWW.HORNERSHIFRIN.COM
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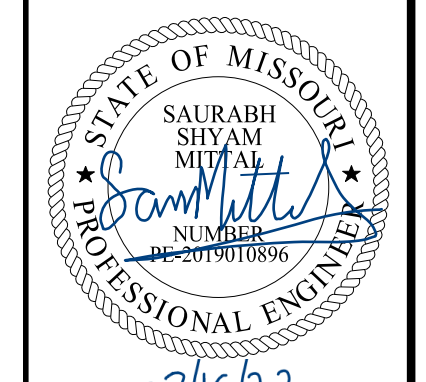
I-270 AND RIVERVIEW
 EB BRIDGE
 BORING DATA

BORING DATA

Note: For locations of borings, see Sheet No. 1.

Note: This drawing is not to scale. Follow dimensions. Sheet No. 36 of 37

Designed: SSM
 Detailed: CAB
 Checked: TPL



DATE PREPARED 3/14/2022	
ROUTE I-270	STATE MO
DISTRICT BR	SHEET NO. 37
COUNTY ST. LOUIS CITY	
JOB NO. J613020C	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A8999	
DESCRIPTION	
DATE	

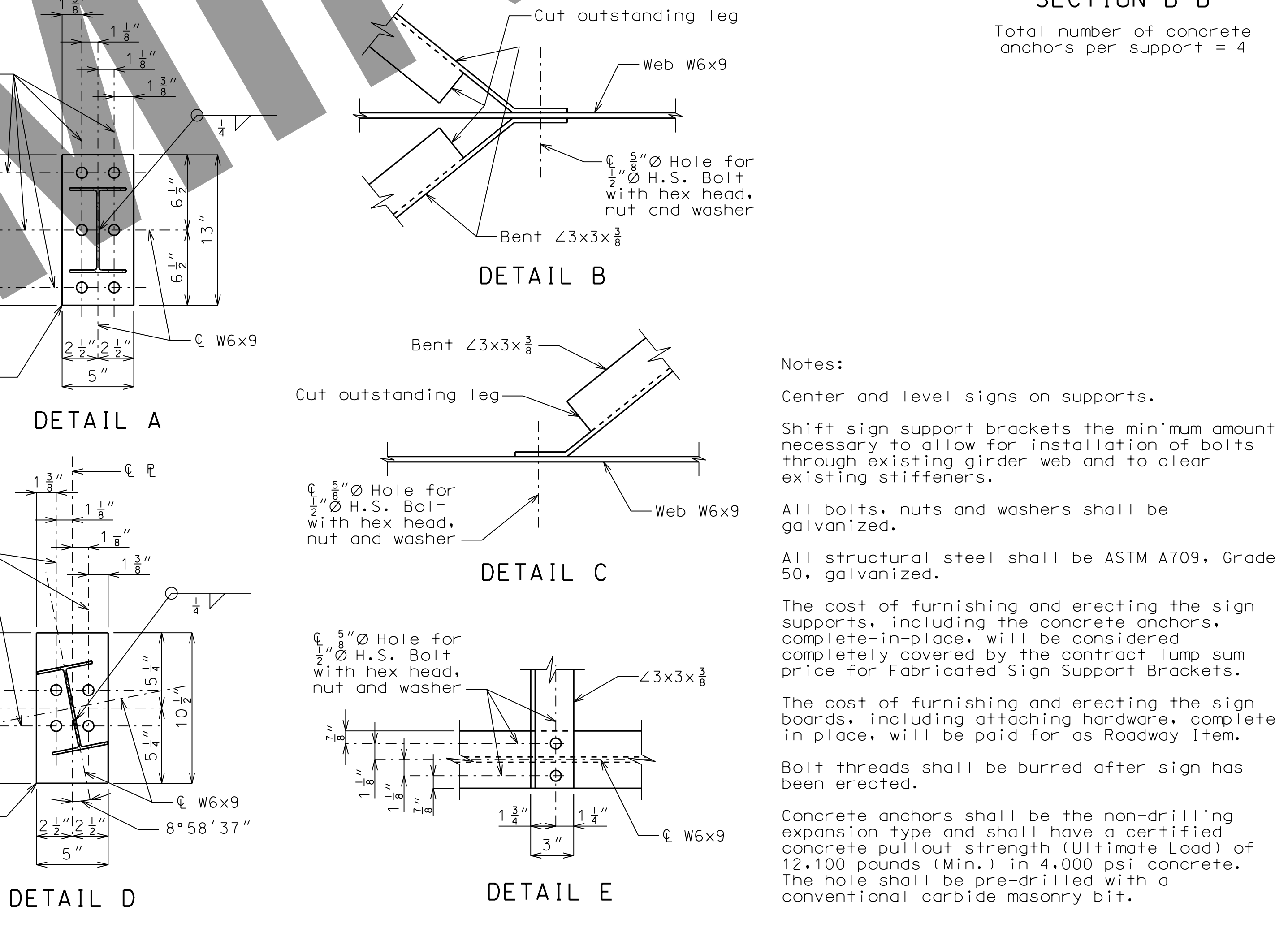
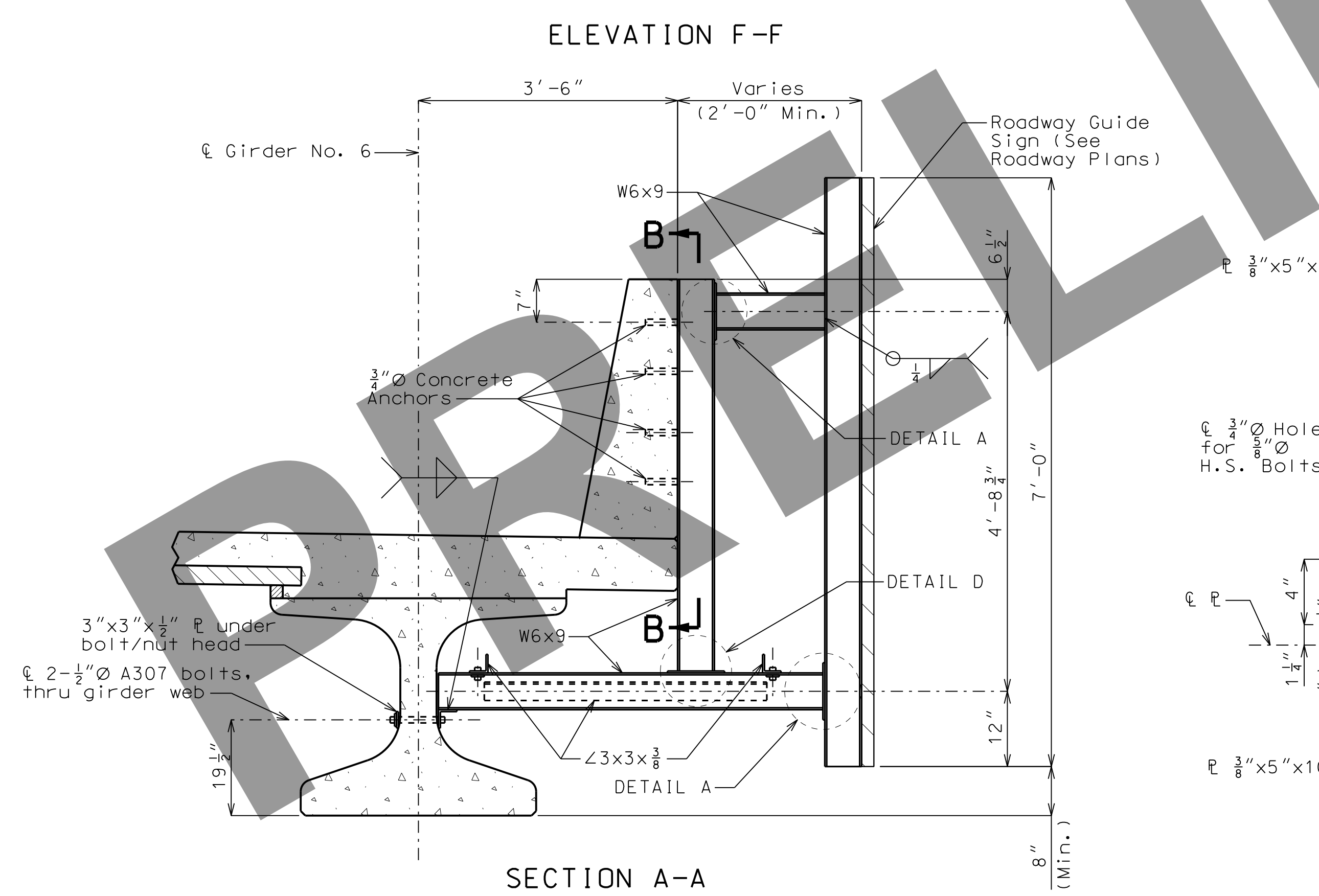
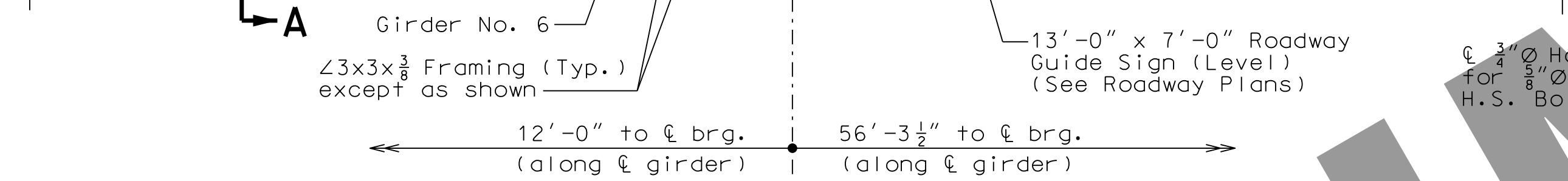
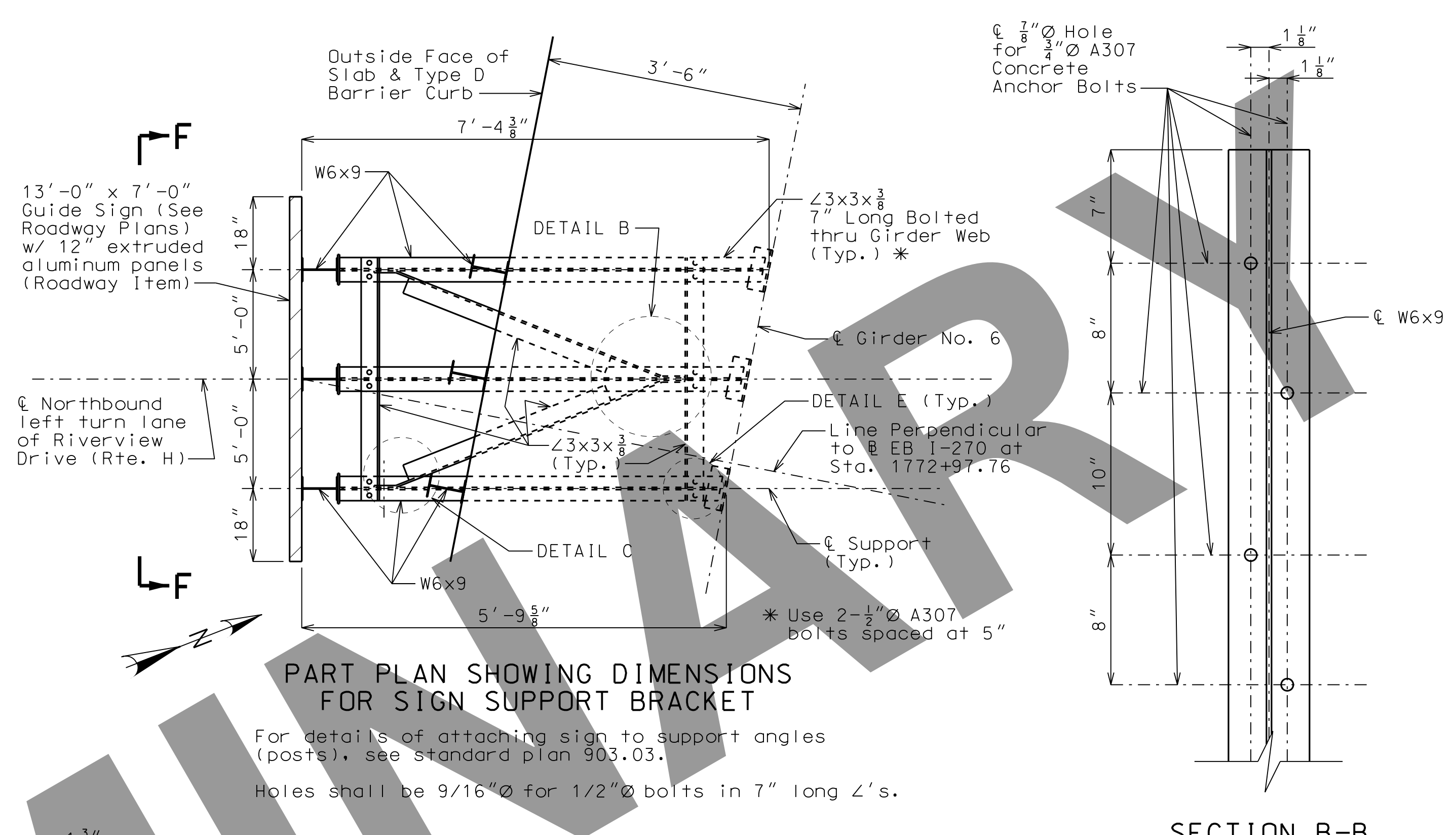
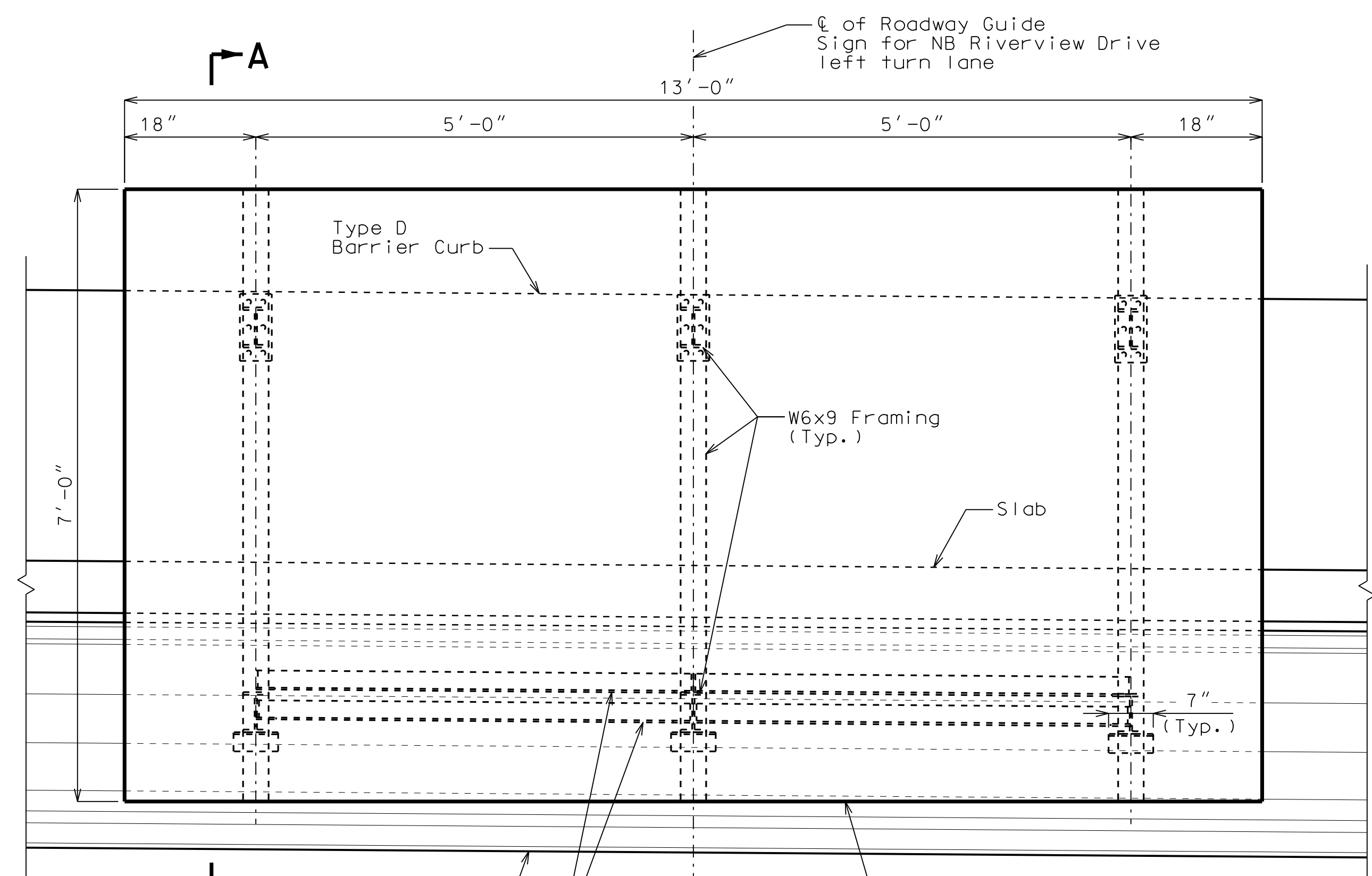
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
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1-888-ASK-MODOT (1-888-275-6636)

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WWW.HORNERSHIFFRIN.COM
DISCIPLINE: PROFESSIONAL ENGINEERING
CERTIFICATE OF AUTHORITY: 000159
EXPIRATION DATE: DECEMBER 31, 2022

I-270 AND RIVERVIEW EB BRIDGE FABRICATED SIGN SUPPORT BRACKET DETAILS



Notes:

- Center and level signs on supports.
- Shift sign support brackets the minimum amount necessary to allow for installation of bolts through existing girder web and to clear existing stiffeners.
- All bolts, nuts and washers shall be galvanized.
- All structural steel shall be ASTM A709, Grade 50, galvanized.
- The cost of furnishing and erecting the sign supports, including the concrete anchors, complete-in-place, will be considered completely covered by the contract lump sum price for Fabricated Sign Support Brackets.
- The cost of furnishing and erecting the sign boards, including attaching hardware, complete in place, will be paid for as Roadway Item.
- Bolt threads shall be burred after sign has been erected.
- Concrete anchors shall be the non-drilling expansion type and shall have a certified concrete pullout strength (Ultimate Load) of 12,100 pounds (Min.) in 4,000 psi concrete. The hole shall be pre-drilled with a conventional carbide masonry bit.

Designed: SSM
Detailed: CAB
Checked: MAB