

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

DATE PREPARED		11/25/2019	
ROUTE	STATE	DISTRICT	SHEET NO.
BR	MO	BR	1
COUNTY		*	
JOB NO.		*	
CONTRACT ID.			
PROJECT NO.			
BRIDGE NO.		EXAMPLE	

DESCRIPTION	
DATE	

DATE	
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MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

MO Std. Plans (See EPG 751.5.2.1.3)

(59'-93'-59') PRESTRESSED CONCRETE I-GIRDER SPANS

This set of example plans is based on several bridge projects. It is intended to be used for reference only, covering a variety of structural components. Some details on the following sheets may not necessarily match what is shown on this front sheet.

These plans are to serve as an example only. They may not necessarily reflect current standards or practices. Contact Development Section with any questions or suggestions.

Border is attached as a Reference File, using Place Border option under the MoDOT pull-down menu.

Border is attached as a Reference File, using Place Border option under the MoDOT pull-down menu.

See EPG 751.5 for more information on front sheet details.

All note and dimension text shall be "small". (Use Tasks: General Annotation)

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

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

Cell in Tasks: Front Sheets (Boring Symbol)

Note E1.1, EPG 751.50 If required (when specified on Design Layout)

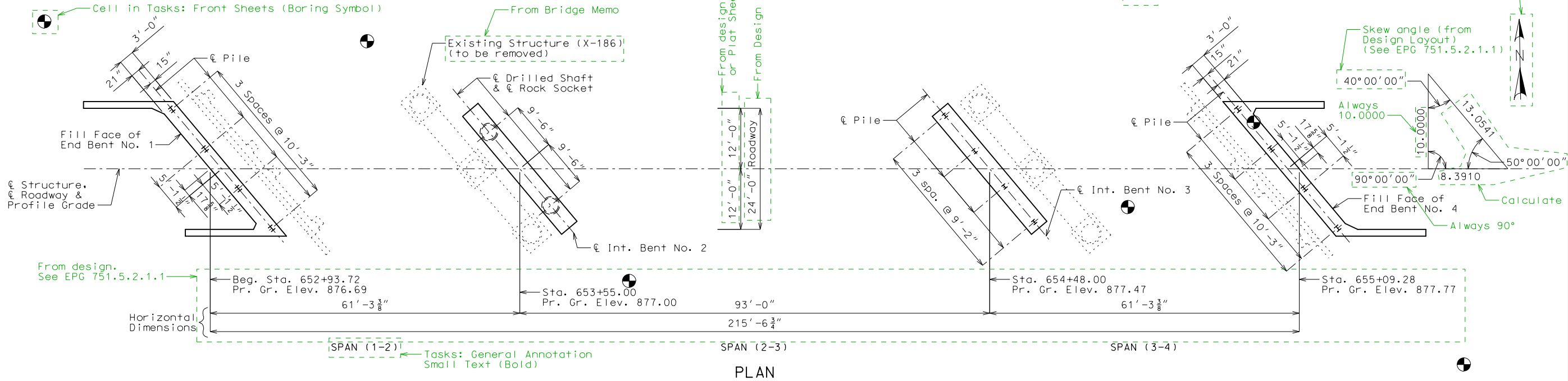
Note E1.4, EPG 751.50 if required.

GENERAL ELEVATION

Tasks: General Annotation Medium Text (Titles)

Boring locations from Layout folder or eProjects. Show location of all borings

Cell in Tasks: Front Sheets (North Arrow) If Location Sketch is shown on front sheet, North arrow should be shown there.



Front Sheet Text available as a cell in Tasks: General Annotation

Designed Aug. 2019  
Detailed Aug. 2019  
Checked Aug. 2019

Indicates location of borings.  
Notice and Disclaimer Regarding Boring Log Data

The locations of all subsurface borings for this structure are shown on the plan sheet(s) for this structure. The boring data for all locations indicated, as well as any other boring logs or other factual records of subsurface data and investigations performed by the department for the design of the project, are shown on Sheet No. 30 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.

Cell in Tasks: Bridge Detailing Notes (E3.2 Notice and Disclaimer). If the note will not fit on this sheet, keep the "Indicates location of borings." portion and add a line stating "For Notice and Disclaimer Regarding Boring Log Data, see Sheet No. X."

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.

From Plat sheet in Layout folder. See EPG 751.5.2.1.3  
B.M. 306 = SET "D" SQUARE CUT AT S.E. CORNER OF BRIDGE HEADWALL AT HORSE CREEK BRIDGE ON RTE. B. ELEV. 973.158

BRIDGE: ROUTE B OVER HORSE CREEK

ROUTE B FROM RTE. 71 TO RTE. 97 ABOUT 2.5 MILES WEST OF RTE. 97  
BEG. STA. 652+93.72

From Bridge Memo

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

### Estimated Quantities

Item	Substr.	Superstr.	Total
Class 1 Excavation	cu. yard	80	80
Removal of Bridges (X-186)	lump sum		1
Drilled Shafts (3 ft. 6 in. Dia.)	linear foot	94	94
Rock Sockets (3 ft. 0 in. Dia.)	linear foot	32	32
Video Camera Inspection	each	4	4
Foundation Inspection Holes	linear foot	72	72
Sonic Logging Testing	each	4	4
Galvanized Structural Steel Piles (12 in.)	linear foot	196	196
Pile Point Reinforcement	each	8	8
Class B Concrete (Substructure)	cu. yard	70.4	70.4
Slab on Concrete I-Girder	sq. yard		635
* Safety Barrier Curb	linear foot		491
Type 6 (54 in.), Prestressed Concrete I-Girder	linear foot		632
Reinforcing Steel (Bridges)	pound	15,270	15,270
Steel Intermediate Diaphragm for P/S Concrete Girders	each		6
Slab Drain	each		36
Vertical Drain at End Bents	each		2
Plain Neoprene Bearing Pad	each		6
Laminated Neoprene Bearing Pad	each		12

\* Safety barrier curb shall be cast-in-place option or slip-form option.

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

All reinforcement in the end bents is included in the Estimated Quantities for Slab on Concrete I-Girder.

All reinforcement in the intermediate bent concrete diaphragms except reinforcement embedded in the beam cap is included in the Estimated Quantities for Slab on Concrete I-Girder.

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

Notes B, EPG 751.50

### Foundation Data

Type	Design Data	Bent Number			
		1	2	3	4
Load Bearing Pile	Pile Type and Size	HP 12x53	---	---	HP 12x53
	Number	ea 4	---	---	4
	Approximate Length Per Each	ft 30	---	---	30
	Pile Point Reinforcement	ea All	---	---	All
	Min. Galvanized Penetration (Elev.)	ft Full length	---	---	Full length
	Pile Driving Verification Method	DF	---	---	DF
	Resistance Factor	0.4	---	---	0.4
Minimum Nominal Axial Compressive Resistance	kip	505	---	---	505
Rock Socket	Number	ea ---	2	2	---
	Foundation Material	---	Rock	Rock	---
	Elevation Range	ft ---	838-835	844-839	---
	Minimum Nominal Axial Compressive Resistance (Side Resistance)	ksf ---	28.6	28.6	---
	Foundation Material	---	Rock	Rock	---
	Elevation Range	ft ---	835-821	839-830	---
	Minimum Nominal Axial Compressive Resistance (Side Resistance)	ksf ---	28.6	28.6	---
Minimum Nominal Axial Compressive Resistance (Tip Resistance)	ksf ---	12.0	12.0	---	

DF = FHWA-modified Gates Dynamic Formula

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

$$\text{Minimum Nominal Axial Compressive Resistance (Side Resistance + Tip Resistance)} = \frac{\text{Maximum Factored Loads}}{\text{Resistance Factors}}$$

Notes E2, EPG 751.50

Manufactured pile point reinforcement shall be used on all piles in this structure.

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

Border text cell in Tasks: General Annotation (Second Sheet Text)

### General Notes: Notes A, EPG 751.50

Design Specifications:

2012 AASHTO LRFD Bridge Design Specifications (6th Ed.) and 2013 Interim Revisions  
Seismic Performance Category A ← From Design Layout. If not specified, use "A"

Design Loading:

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

Design Unit Stresses:

Class B Concrete (Substructure)  $f'c = 3,000$  psi  
Class B-2 Concrete (Drilled Shafts & Rock Sockets)  $f'c = 4,000$  psi  
Class B-1 Concrete (Safety Barrier Curb)  $f'c = 4,000$  psi  
Class B-2 Concrete (Superstructure, except Prestressed Girders and Safety Barrier Curb)  $f'c = 4,000$  psi  
Reinforcing Steel (Grade 60)  $fy = 60,000$  psi  
Steel Pile (ASTM A709 Grade 50)  $fy = 50,000$  psi  
For precast prestressed panel stresses, see Sheet No. 18.  
For prestressed girder stresses, see Sheets No. 14 & 15.

Neoprene Pads:

Neoprene bearing pads shall be 60 durometer and shall be in accordance with Sec 716.

Joint Filler:

All joint filler shall be in accordance with Sec 1057 for preformed sponge rubber expansion and partition joint filler, except as noted.

Reinforcing Steel:

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

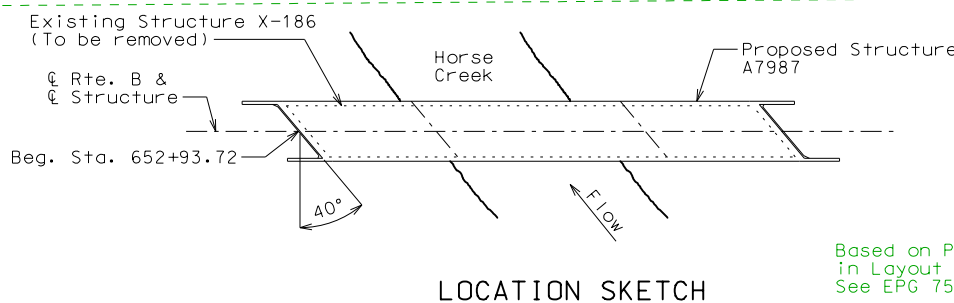
Traffic Handling:

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

Miscellaneous:

MoDOT Construction personnel will indicate the type of joint filler option used under the precast panels for this structure:

- Constant Joint Filler
- Variable Joint Filler



Cell in Tasks: Bridge Detailing Notes (E2.1 Foundation Data) Info from design & Design Layout

Cell in Tasks: Bridge Detailing Notes

From Bridge Memo (Note A3.8)

Cell in Tasks: Front Sheets (North Arrow)

Based on Plat sheet in Layout folder. See EPG 751.5.2.1.5

### Estimated Quantities for Slab on Concrete I-Girder

Item	cu. yard	Total
Class B-2 Concrete		204
Reinforcing Steel (Epoxy Coated)	pound	49,540

Cell in Tasks: Bridge Detailing Notes (B3.21 "Estimated Quantities For")

Round to nearest 1 cubic yard (see EPG 751.50, notes after B3.21)

Notes B3c, EPG 751.50

The table of Estimated Quantities for represents the quantities used by the State in preparing the cost estimate for concrete slabs. The area of the concrete slab will be measured to the nearest square yard longitudinally from end of slab to end of slab and transversely from out to out of bridge slab (or with the horizontal dimensions as shown on the plan of slab). Payment for prestressed panels, conventional forms, all concrete and epoxy coated reinforcing steel will be considered completely covered by the contract unit price for the slab. Variations may be encountered in the estimated quantities but the variations cannot be used for an adjustment in the contract unit price.

Method of forming the slab shall be as shown on the plans and in accordance with Sec 703. All hardware for forming the slab to be in place as a permanent part of the structure shall be coated in accordance with ASTM A123 or ASTM B633 with a thickness class SC 4 and a finish type I, II or III.

The Estimated Quantities for Slab on Concrete I-Girder are based on skewed precast prestressed end panels.

The prestressed panel quantities are not included in the table of Estimated Quantities for Slab on Concrete I-Girder.

Class B-2 Concrete quantity is based on minimum top flange thickness and minimum joint material thickness.

Cell in Tasks: Front Sheets (Hydrologic Data) See EPG 751.5.2.1.5 Info from Design Layout for stream crossing only.

### Hydrologic Data

Drainage Area = 18 mi <sup>2</sup>	
Design Flood Frequency = 50 years	
Design Flood Discharge = 5,700 cfs	
Design Flood (D.F.) Elevation = 354.4	
Base Flood (100-year)	
Base Flood Elevation = 354.8	
Base Flood Discharge = 6,700 cfs	
Estimated Backwater = 0.77 ft	
Average Velocity thru Opening = 5.7 ft/s	
Freeboard (50-year)	
Freeboard = 1.7 ft	
Roadway Overtopping	
Overtopping Flood Discharge = 3,700 cfs	
Overtopping Flood Frequency = 10 years	
Overtopping Flood Elevation = 354.1	

See EPG 751.50 for General Notes and Estimated Quantities notes. Notes marked with [MS Cell] in EPG are available as cells in Tasks: Bridge Detailing Notes.

"Notice and Disclaimer Regarding Boring Log Data" may be placed on this sheet if it would not fit on the front sheet. Add "For locations of borings, see Sheet No. 1"

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DATE PREPARED: 11/25/2019

ROUTE: \* STATE: MO

DISTRICT: BR SHEET NO.: 2

COUNTY: \*

JOB NO.: \*

CONTRACT ID.:

PROJECT NO.:

BRIDGE NO.: EXAMPLE

DESCRIPTION:

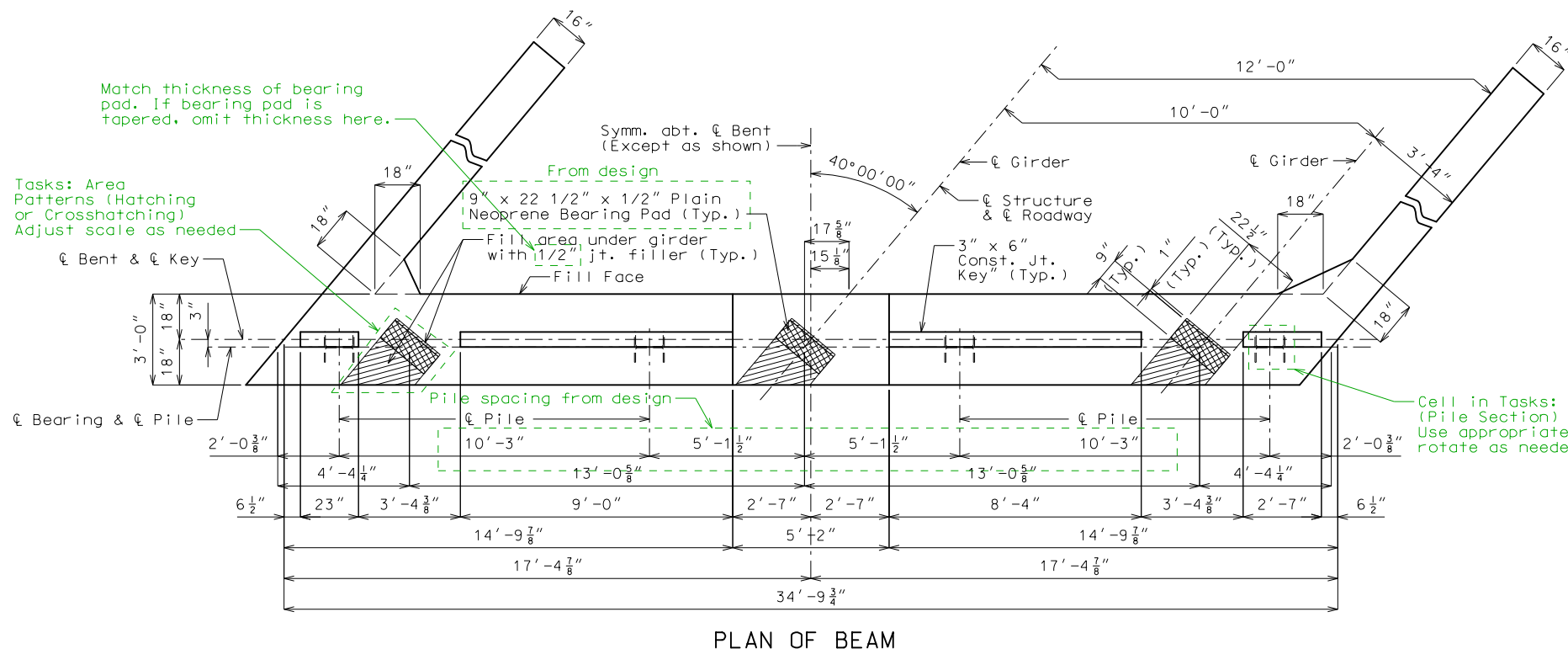
DATE:

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

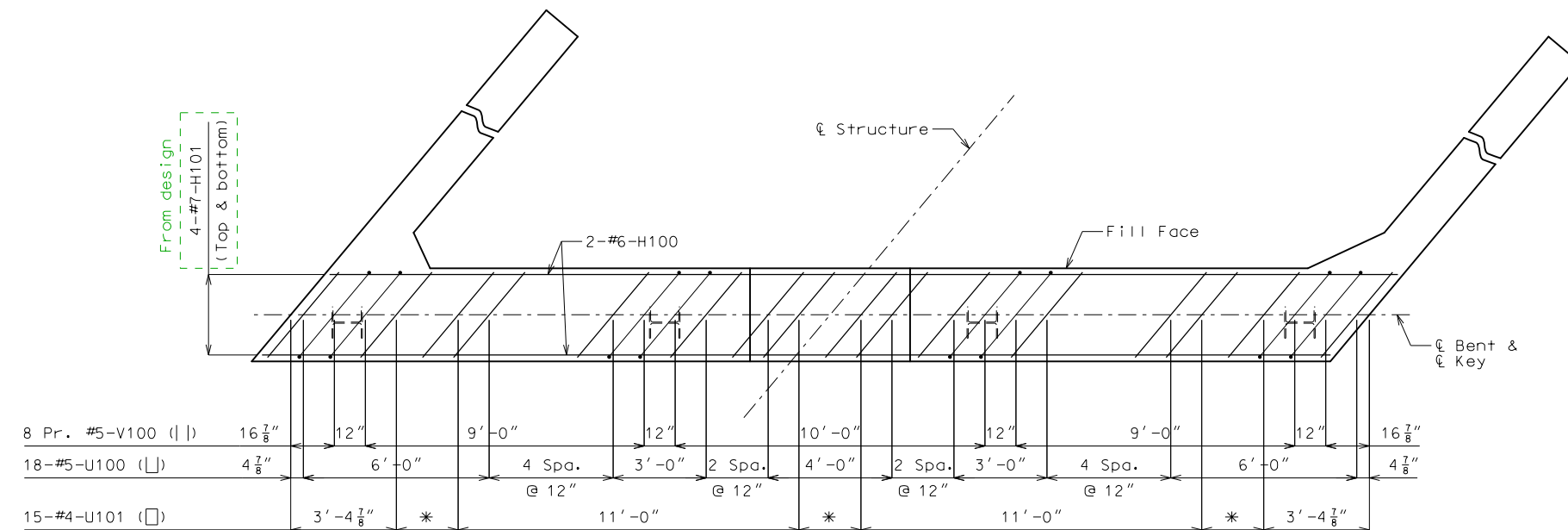
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

## GENERAL NOTES AND QUANTITIES

End Bent No. 1 is shown looking back-station.  
All other bents are shown looking ahead-station.



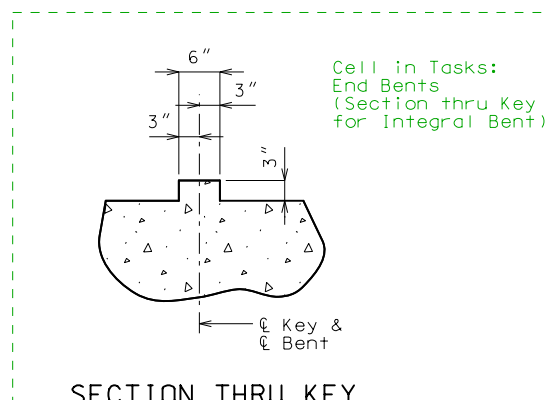
PLAN OF BEAM



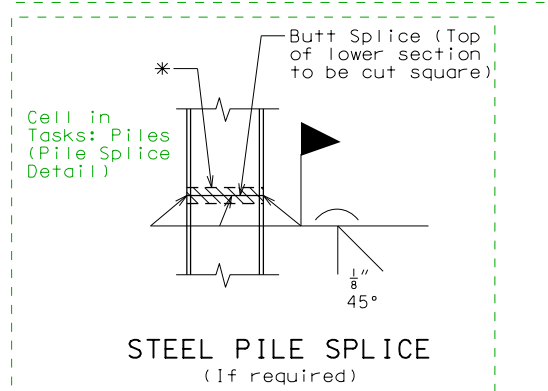
PLAN OF BEAM SHOWING REINFORCEMENT

\* 4 Spaces @ 6"

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



SECTION THRU KEY



STEEL PILE SPLICE  
(If required)

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

Notes from EPG 751.50

General Notes:

Work this sheet with Sheets No. 4 & 5.

G1.7.1 All U bars and pairs of V bars shall be placed parallel to centerline of roadway.

G1.20 Reinforcing steel shall be shifted to clear piles. U bars shall clear piles by at least 1 1/2 inches.

Tasks: Bridge Detailing Notes (G4.1, Substructure Quantity)

Substructure Quantity Table for Bent No. 1		
Item	Quantity	
Class 1 Excavation	cu. yard	40
Galvanized Structural Steel Piles (12 in.)	linear foot	120
Pile Point Reinforcement	each	4
Class B Concrete (Substructure)	cu. yard	16.7

These quantities are included in the estimated quantities table on Sheet No. 12.1

Note G4.2, EPG 751.50

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DATE PREPARED: 11/25/2019  
ROUTE: \* STATE: MO  
DISTRICT: BR SHEET NO.: 3  
COUNTY: \*  
JOB NO.: \*  
CONTRACT ID.: \*  
PROJECT NO.: \*  
BRIDGE NO.: EXAMPLE

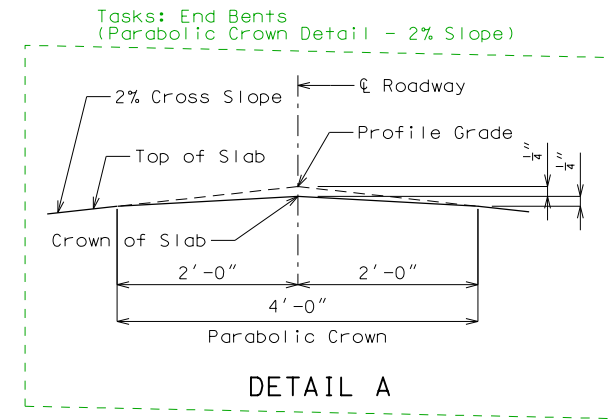
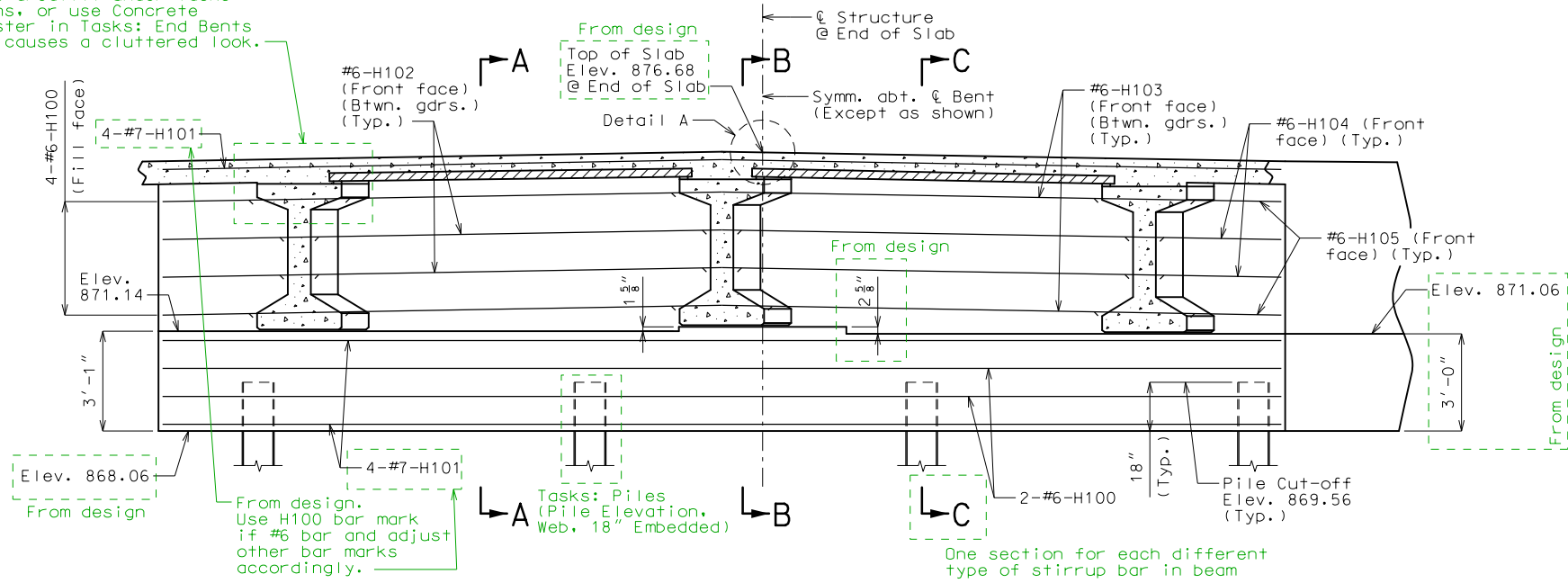
DESCRIPTION	DATE

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105 WEST CAPITOL JEFFERSON CITY, MO 65102  
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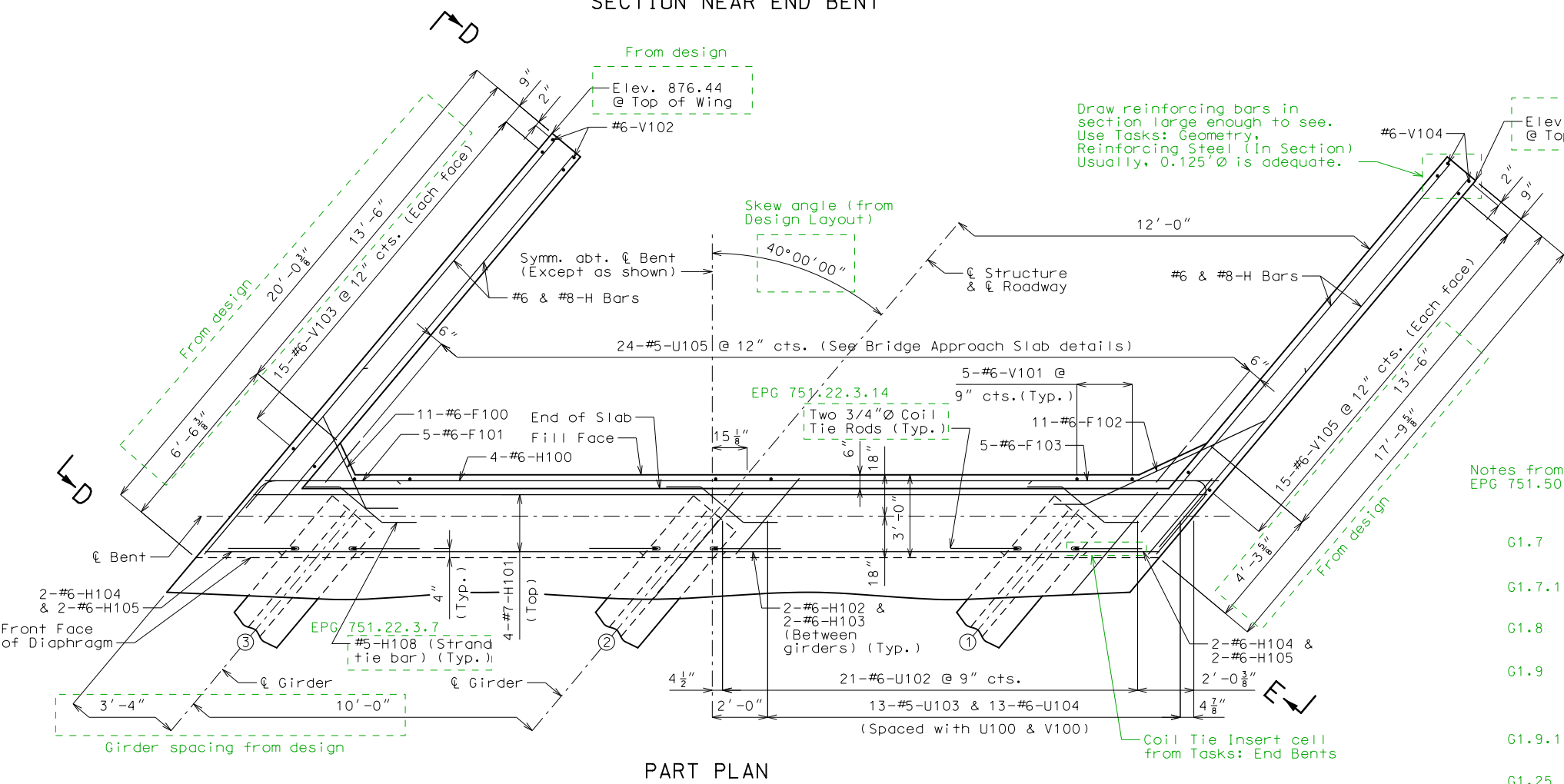


DETAILS OF END BENT NO. 1 Tasks: General Annotation Large Text (Sheet Titles)

Use concrete areafill under Tasks: Area Patterns, or use Concrete Pattern Cluster in Tasks: End Bents if areafill causes a cluttered look.



SECTION NEAR END BENT



PART PLAN

DETAILS OF END BENT NO. 1

Notes from EPG 751.50

- General Notes:  
 Work this sheet with Sheets No. 3 & 5.  
 For Sections A-A, B-B & C-C and Elevations D-D & E-E, see Sheet No. 15.
- G1.7 The #6-F100 and #6-F102 bars shall be bent in the field to clear girders.
  - G1.7.1 The U bars shall be placed parallel to centerline of roadway.
  - G1.8 All concrete in the end bent above top of beam and below top of slab shall be Class B-2.
  - G1.9 Strands at end of girders shall be field bent or, if necessary, cut in field to maintain 1 1/2-inch minimum clearance to fill face of end bent.
  - G1.9.1 For location of coil tie rods and #5-H108 (strand tie bar), see Sheet No. 14.
  - G1.25 For details of vertical drain at end bents, see Sheet No. 6.
  - G1.30 For details of bridge approach slab, see Sheet No. 26.

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DATE PREPARED: 11/25/2019

ROUTE: MO DISTRICT: BR COUNTY: \* JOB NO.: \* CONTRACT ID.: PROJECT NO.: BRIDGE NO.: EXAMPLE

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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DATE PREPARED  
11/25/2019  
ROUTE STATE  
\* MO  
DISTRICT SHEET NO.  
BR 5  
COUNTY  
\*  
JOB NO.  
\*  
CONTRACT ID.

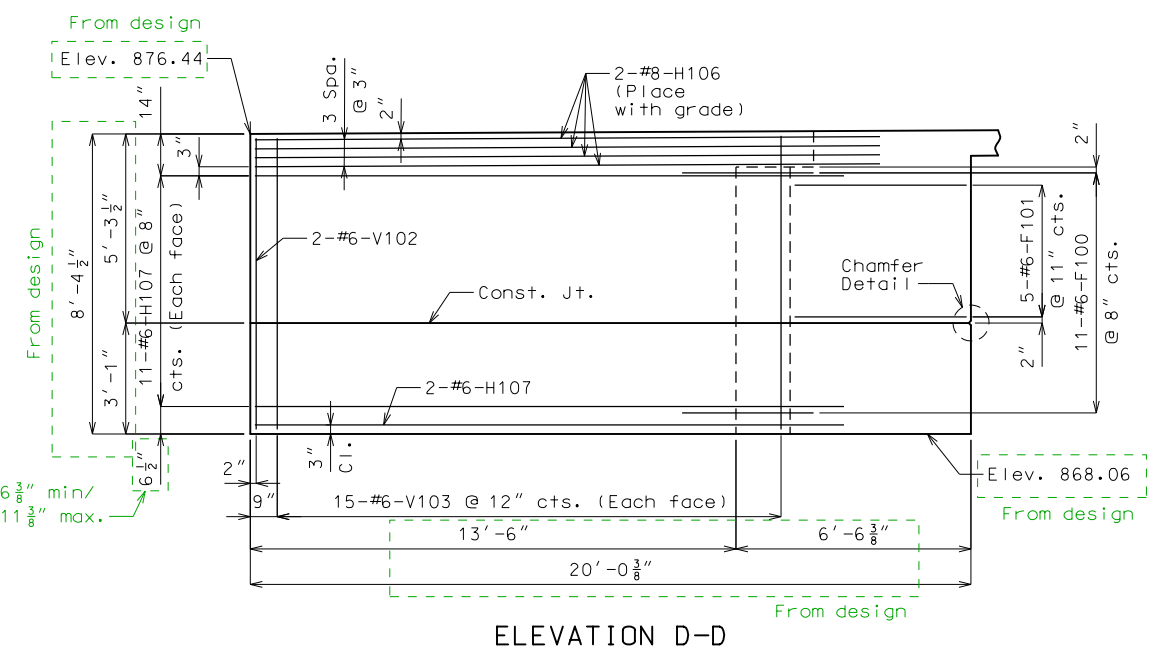
PROJECT NO.  
BRIDGE NO.  
EXAMPLE

DESCRIPTION

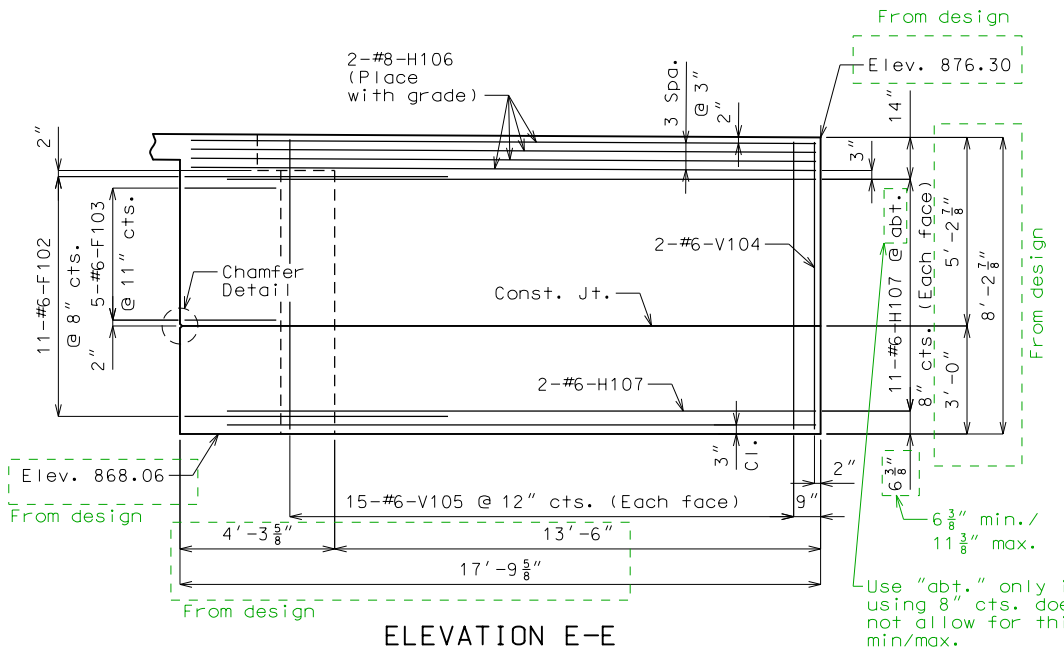
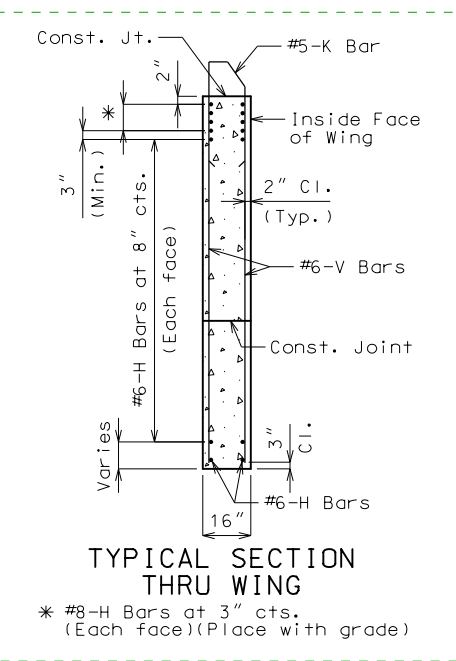
DATE

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

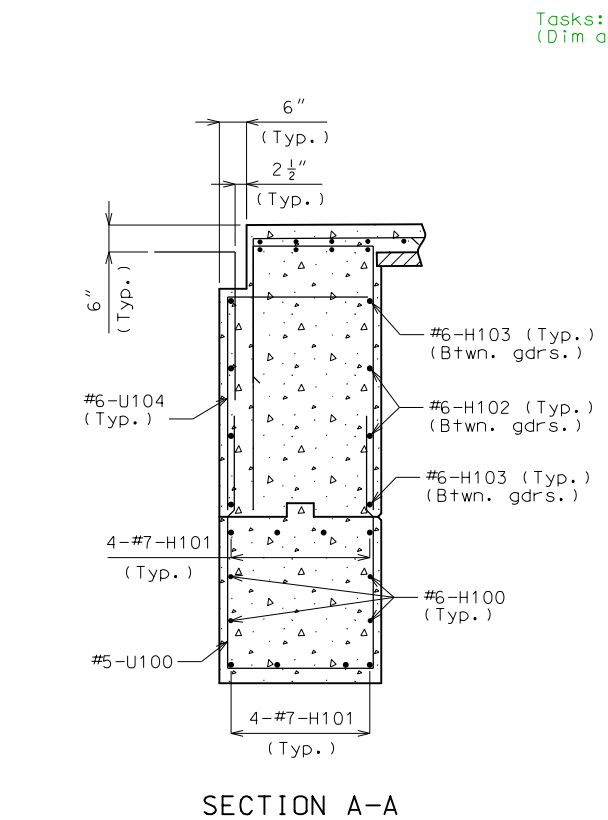
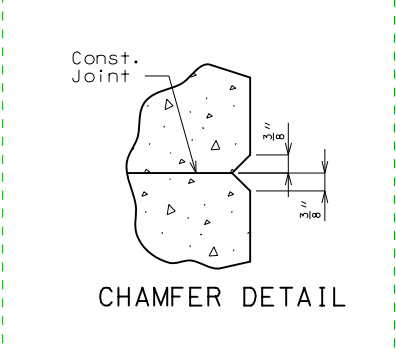
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



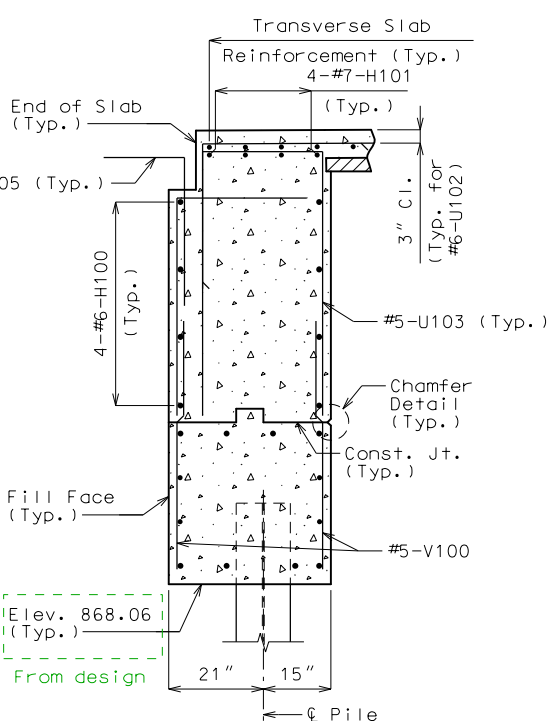
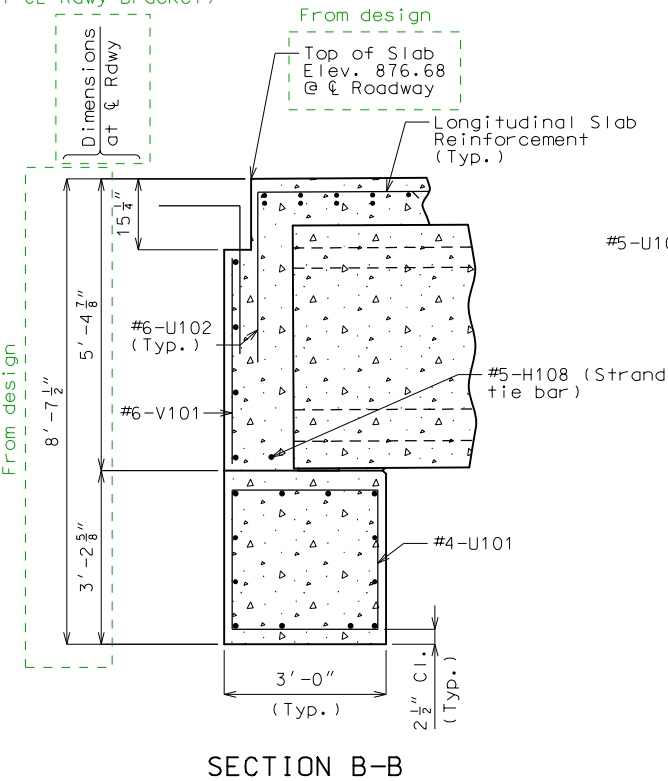
Tasks: End Bents  
(Typical Section thru Square Wing)  
See EPG 751.35.4.3



Tasks: End Bents (Chamfer Detail)  
See EPG 751.35.5.3.



Tasks: End Bents  
(Dim at CL Rdwy Bracket)



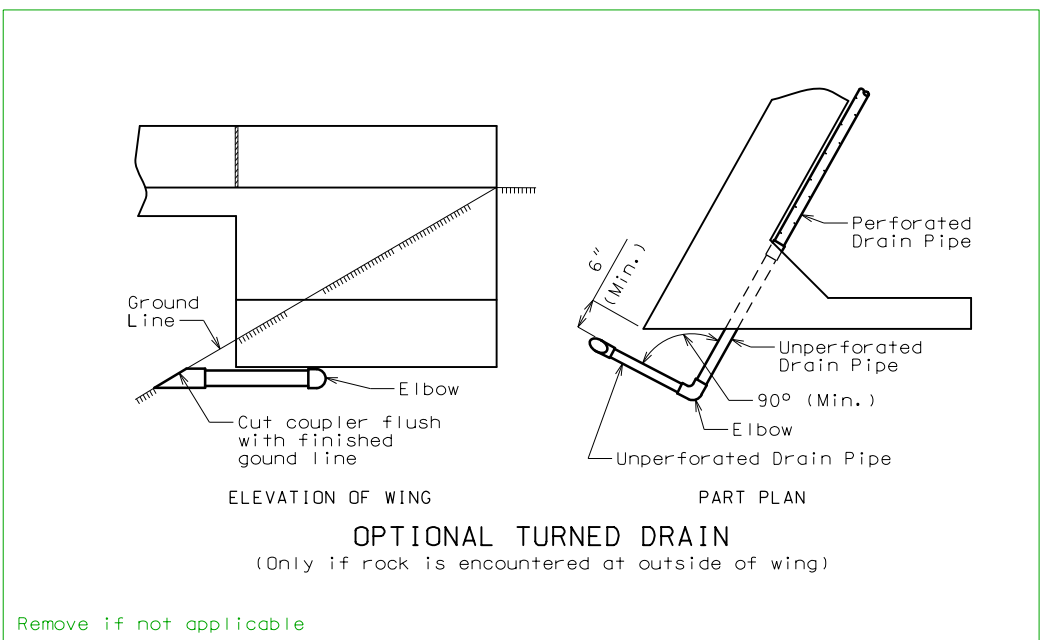
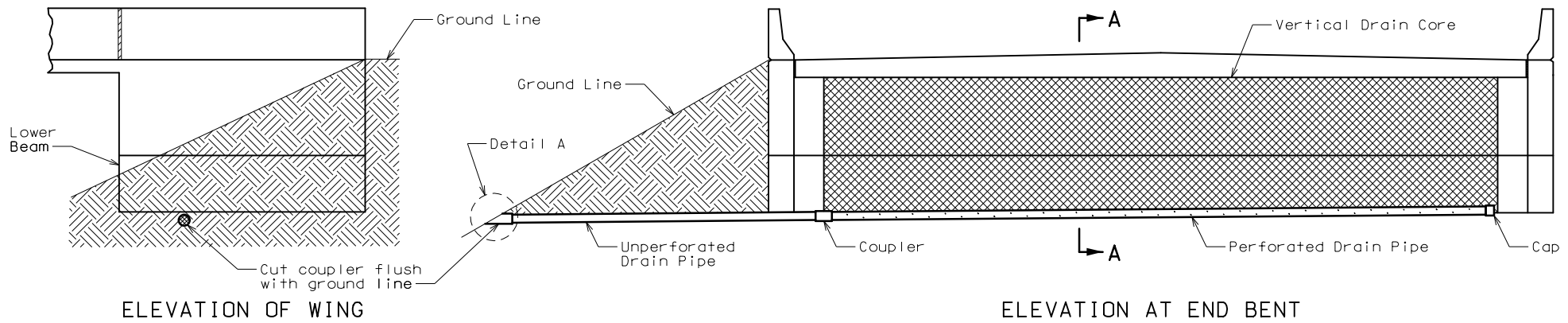
**General Notes:**  
Work this sheet with Sheets No. 3 & 4.  
For location of Sections A-A, B-B & C-C and Elevations D-D & E-E, see Sheet No. 4.  
For reinforcement of the safety barrier curb, see Sheet No. 24.

EPG 751.50  
Note G1.6

**DETAILS OF END BENT NO. 1**

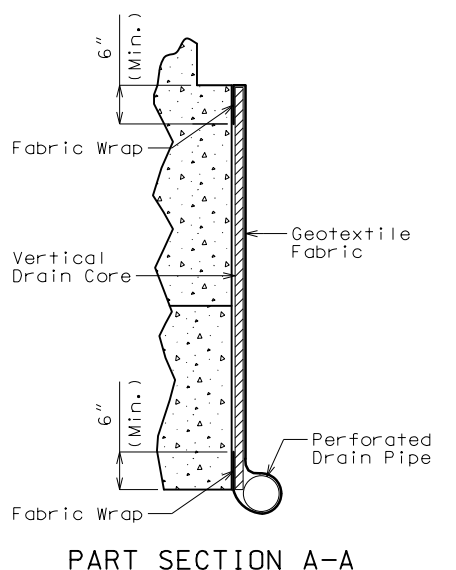
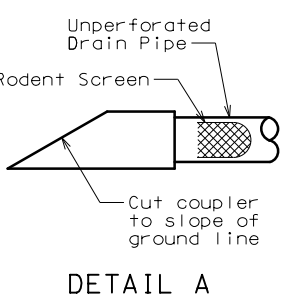
Use current standard sheet, found in ProjectWise under Bridge/A\_Bridge\_Standard\_Drawings/Drains/Current/ Open Read-only and Save As to your job's folder.

See EPG 751.35.5.2



Remove if not applicable

For end bents with intermediate wing, see Bridge Standard Drawings sheet DRAIN03.



**Note:**

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.

Place drain pipe at fill face of end bent and slope to lowest grade of ground line, also missing the lower beam of end bent by 1 1/2 inches. (See Elevation at End Bent.)

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

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DATE PREPARED		11/25/2019	
ROUTE	STATE	BR	MO
DISTRICT	SHEET NO.	BR	6
COUNTY			
VERNON			
JOB NO.			
J7S0546			
CONTRACT ID.			

PROJECT NO.

BRIDGE NO. EXAMPLE

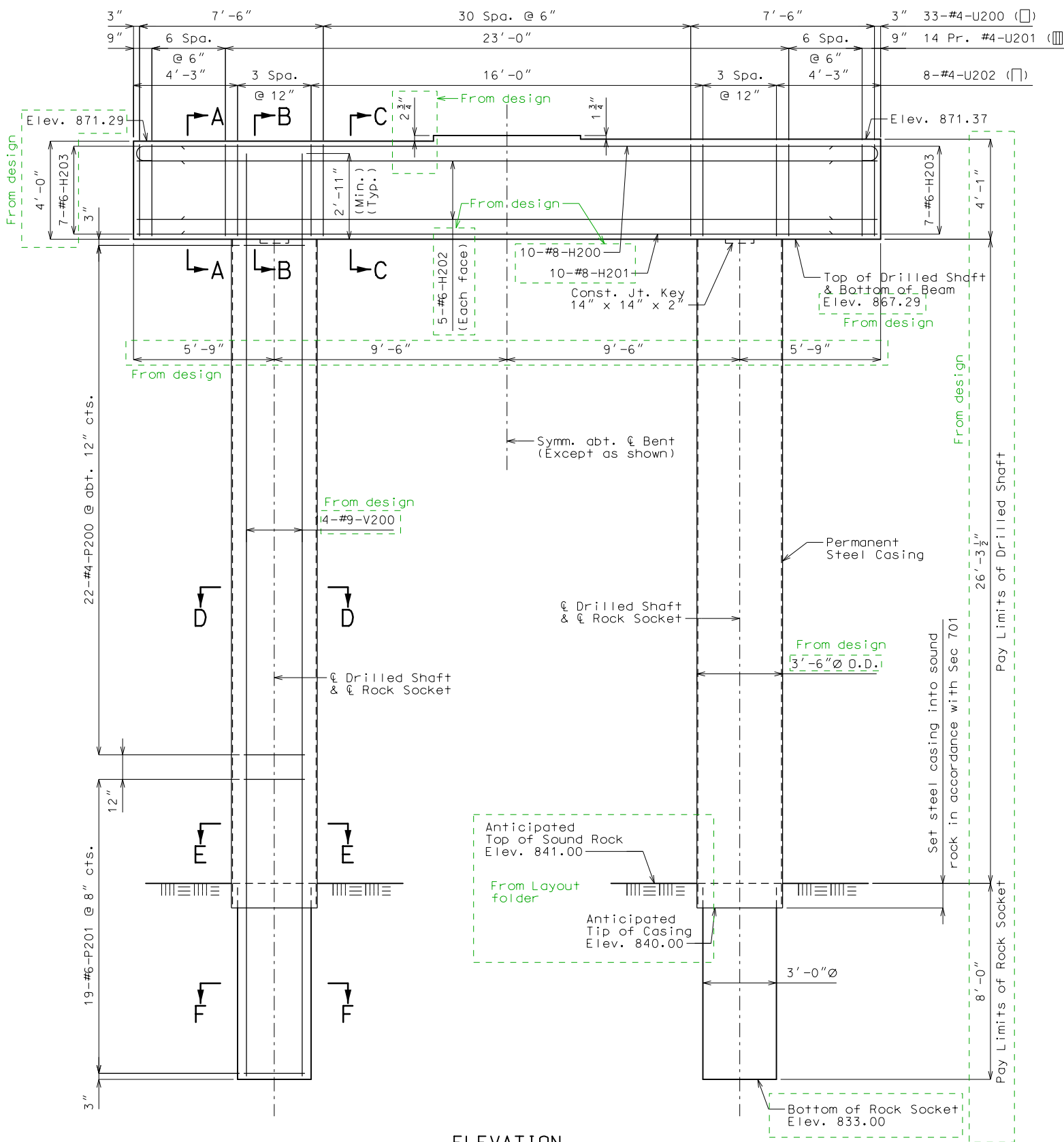
DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

**VERTICAL DRAIN AT END BENTS**

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

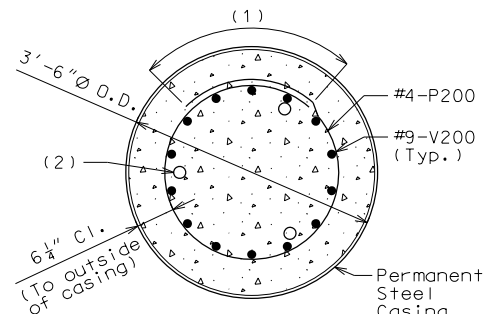


**ELEVATION**  
 Beam keys not shown for clarity.

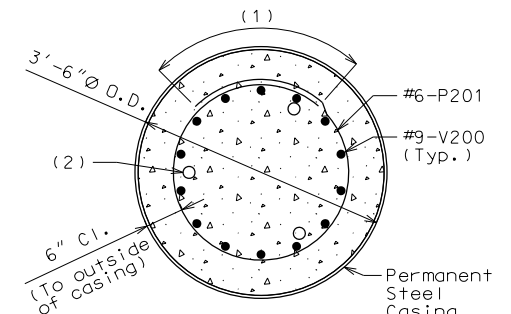
**DETAILS OF INTERMEDIATE BENT NO. 2**

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

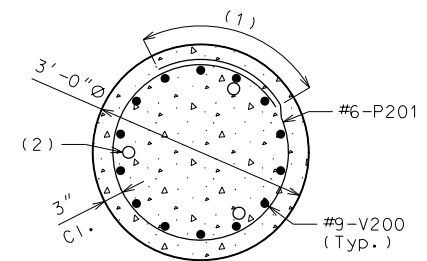
Sheet No. 7 of 30



**SECTION D-D**

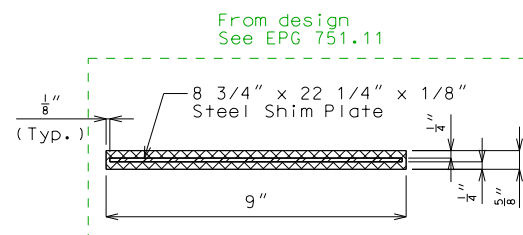


**SECTION E-E**



**SECTION F-F**

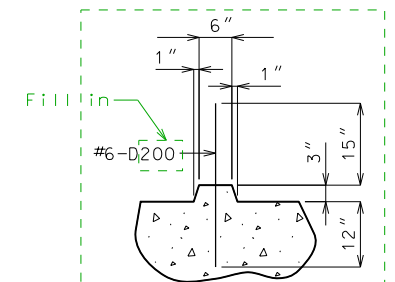
- (1) 2'-1" Min. Lap (#4-P200)  
 3'-1" Min. Lap (#6-P201)  
 (Stagger adjacent bar splices)
- (2) 2"Ø Steel Pipe for sonic logging testing (3 each shaft)



**SECTION THRU LAMINATED NEOPRENE BEARING PAD**

It is preferred that Key and Bearing Pad details are shown on the same sheet as the Plan of Beam if space allows.

Tasks: Intermediate Bents (Section thru Key)



**SECTION THRU KEY**

Tasks: Bridge Detailing Notes (G4.1 Substructure Quantity)

Substructure Quantity Table for Bent No. 2		
Item	Quantity	
Drilled Shafts (3 ft. 6 in. Dia.)	linear foot	53
Rock Sockets (3 ft. 0 in. Dia.)	linear foot	16
Video Camera Inspection	each	2
Foundation Inspection Holes	linear foot	36
Sonic Logging Testing	each	2
Class B Concrete (Substructure)	cu. yard	18.5
Reinforcing Steel (Bridges)	pound	7,820

G4.2 These quantities are included in the estimated quantities table on Sheet No. 2.

G4.3 All reinforcement in drilled shafts and rock sockets is included in the substructure quantities.

Notes from EPG 751.50

**General Notes:**

Work this sheet with Sheet No. 8.

E2.29 Thickness of permanent steel casing shall be in accordance with Sec 701.

E2.30 An additional 4 feet has been added to V-bar lengths and additional 12-#6-P201 bars have been added for possible change in drilled shaft or rock socket length. The additional V-bar length shall be cut off or included in the reinforcement lap if not required. The P bars shall be spaced similarly to that shown in Elevation, if required, or a lesser spacing if not required but not less than 6-inch centers.

E2.31 Sonic logging testing shall be performed on all drilled shafts and rock sockets.

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DATE PREPARED  
 11/25/2019

ROUTE STATE  
 \* MO  
 DISTRICT SHEET NO.  
 BR 7

COUNTY  
 \*  
 JOB NO.  
 \*  
 CONTRACT ID.

PROJECT NO.

BRIDGE NO.  
 EXAMPLE

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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DATE PREPARED  
11/25/2019  
ROUTE \* STATE MO  
DISTRICT BR SHEET NO. 8  
COUNTY \*  
JOB NO. \*  
CONTRACT ID.  
PROJECT NO.

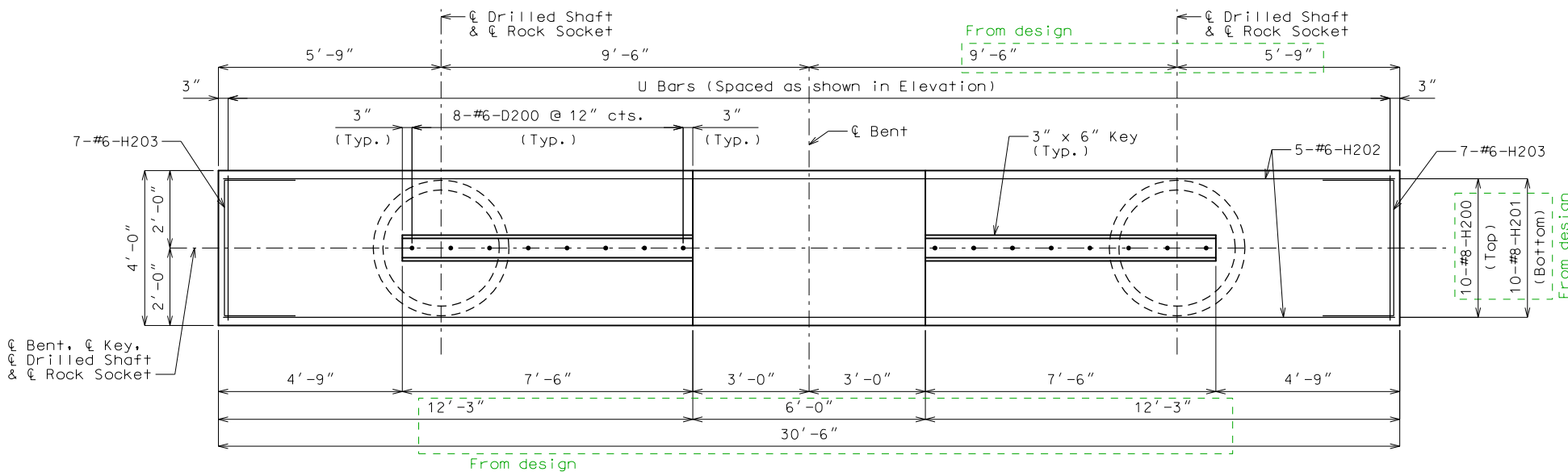
BRIDGE NO.  
EXAMPLE

DESCRIPTION	DATE

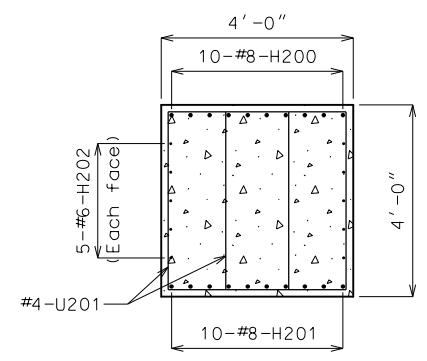
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

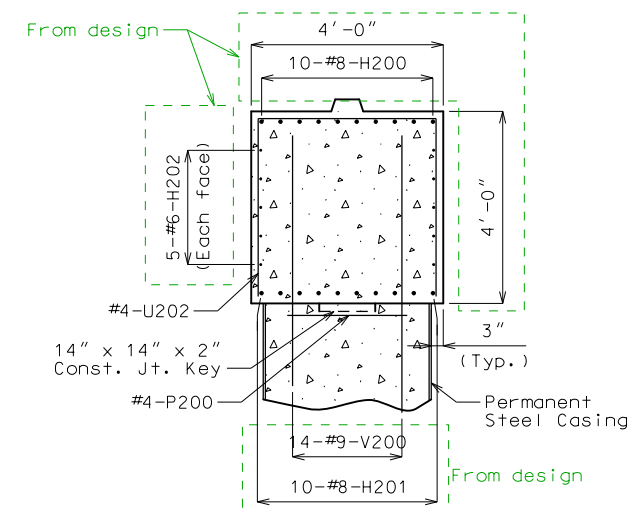
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



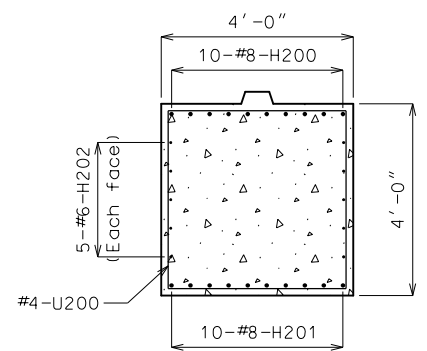
PLAN SHOWING REINFORCEMENT



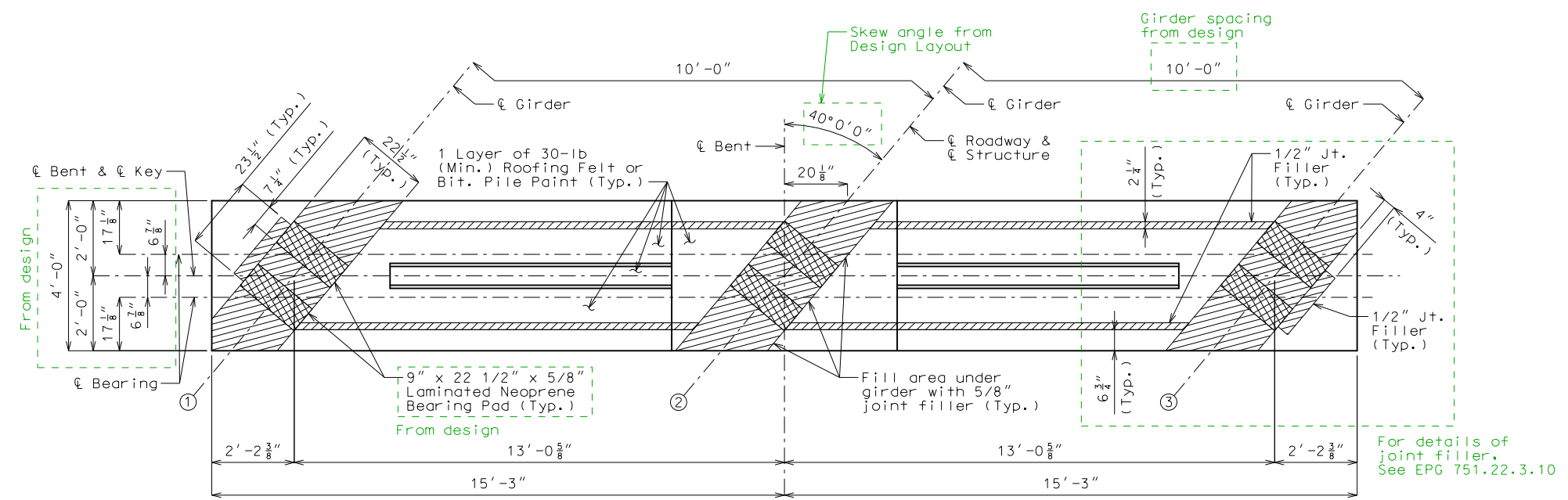
SECTION A-A



SECTION B-B



SECTION C-C



PLAN OF BEAM

General Notes:

Work this sheet with Sheet No. 7.

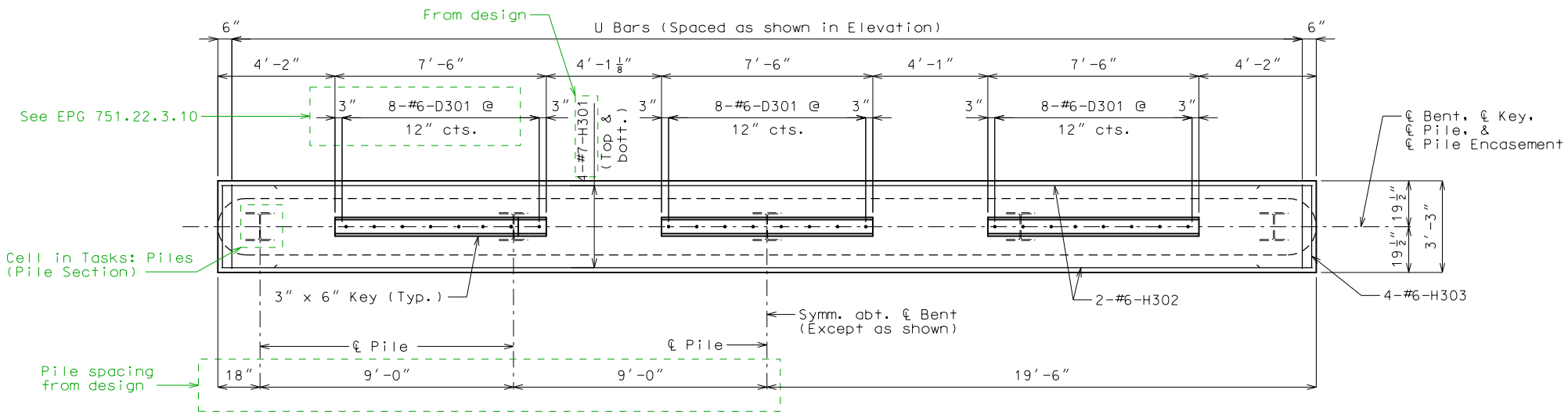
Note G1.40, EPG 751.50 For steps 2 inches or more, use 2 1/4 x 1/2-inch joint filler up vertical face.

DETAILS OF INTERMEDIATE BENT NO. 2



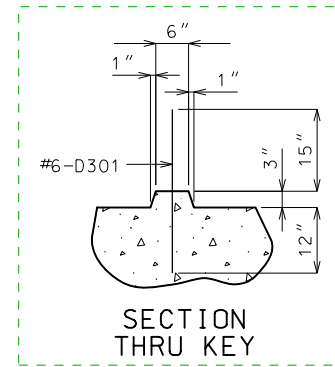
Example plans for Int. Bent No. 3 were taken from a different structure than the rest of the example plans. Therefore, some details may not match information shown on other sheets.

EPG 751.32.3 Concrete Pile Cap Intermediate Bent Details

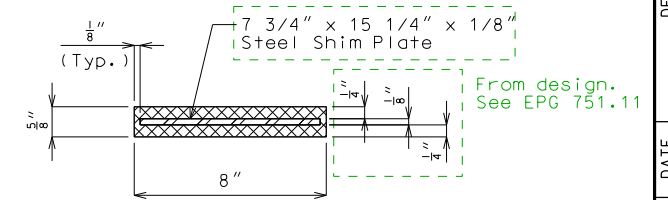


PLAN SHOWING REINFORCEMENT

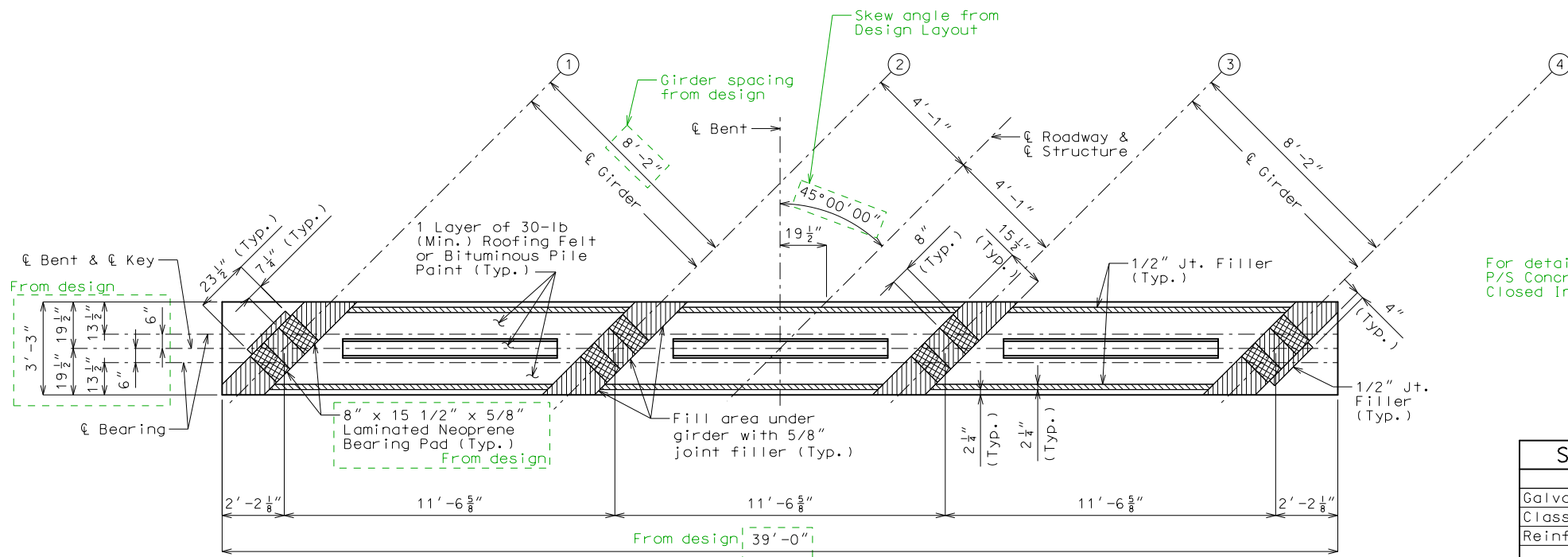
Cell in Tasks: Intermediate Bents (Section thru Key)



SECTION THRU KEY



SECTION THRU LAMINATED NEOPRENE BEARING PAD



PLAN OF BEAM

For details of Intermediate Bent No. 3 not shown, see Sheet No. 10.

Note G4.2, EPG 751.50

For details of joint filler, see EPG 751.22.3.10, P/S Concrete I Girders, Closed Intermediate Bent Diaphragms

Cell in Tasks: Bridge Detailing Notes (G4.1 Substructure Quantity)

Item	Quantity	
Galvanized Structural Steel Piles (12 in.)	linear foot	x
Class B Concrete (Substructure)	cu. yard	x
Reinforcing Steel (Bridges)	pound	x

These quantities are included in the estimated quantities table on Sheet No. 12.

General Notes:

Work this sheet with Sheet No. 10.

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DATE PREPARED: 11/25/2019

ROUTE: \* STATE: MO

DISTRICT: BR SHEET NO.: 9

COUNTY: \*

JOB NO.: \*

CONTRACT ID.:

PROJECT NO.:

BRIDGE NO.: EXAMPLE

DESCRIPTION:

DATE:

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

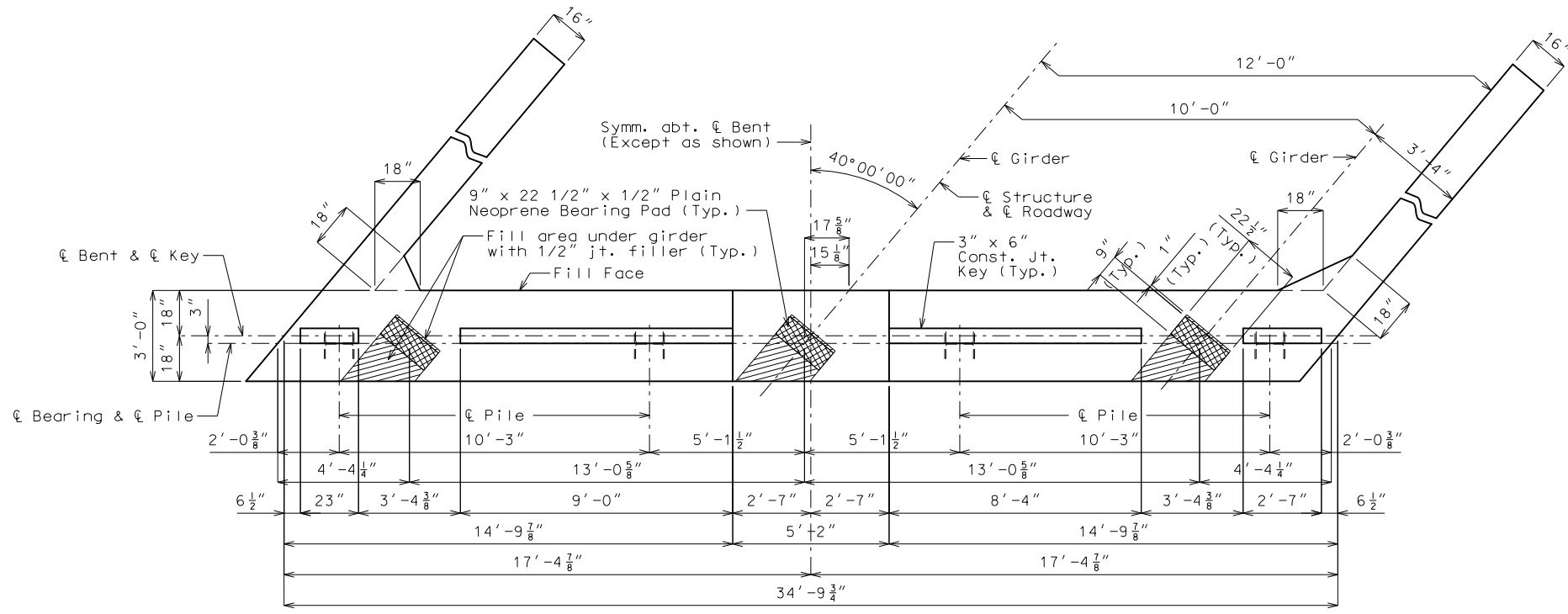
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DETAILS OF INTERMEDIATE BENT NO. 3

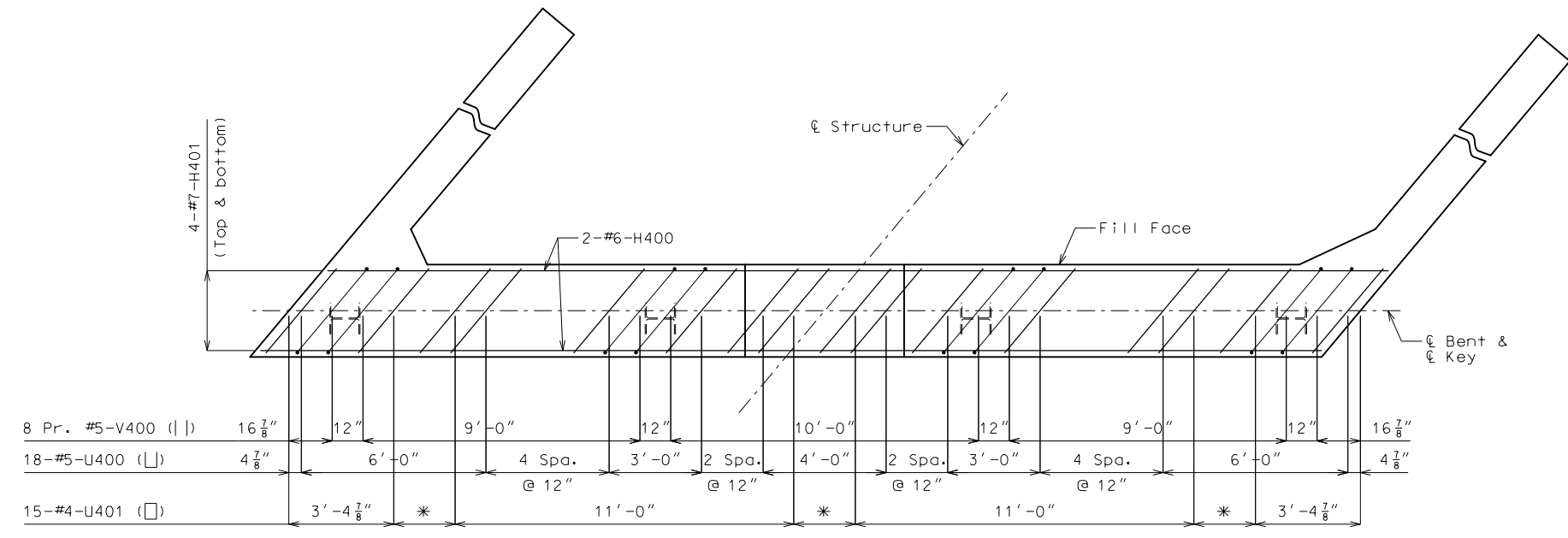


See notations for End Bent No. 1.

Wing dimensions for End Bent No. 4 may not be the same as End Bent No. 1. See design.

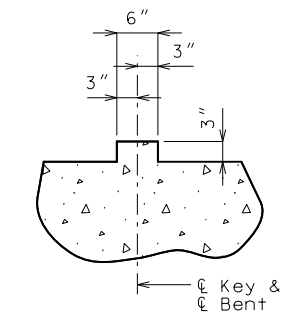


PLAN OF BEAM

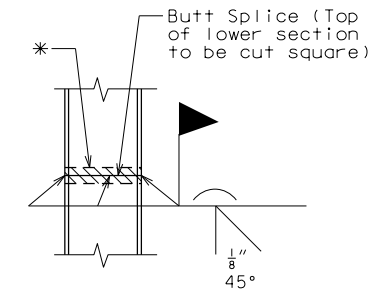


PLAN OF BEAM SHOWING REINFORCEMENT  
Keys not shown for clarity.

\* 4 Spaces @ 6"



SECTION THRU KEY



STEEL PILE SPLICE  
(If required)

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

General Notes:

Work this sheet with Sheets No. 12 & 13.

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

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

Substructure Quantity Table for Bent No. 4			
Item	Quantity	Unit	Quantity
Class 1 Excavation	40	cu. yard	
Galvanized Structural Steel Piles (12 in.)	120	linear foot	
Pile Point Reinforcement	4	each	
Class B Concrete (Substructure)	16.7	cu. yard	

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

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DISTRICT: BR SHEET NO.: 11  
COUNTY: \*  
JOB NO.: \*  
CONTRACT ID.: \*  
PROJECT NO.: \*  
BRIDGE NO.: EXAMPLE

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION  
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DETAILS OF END BENT NO. 4

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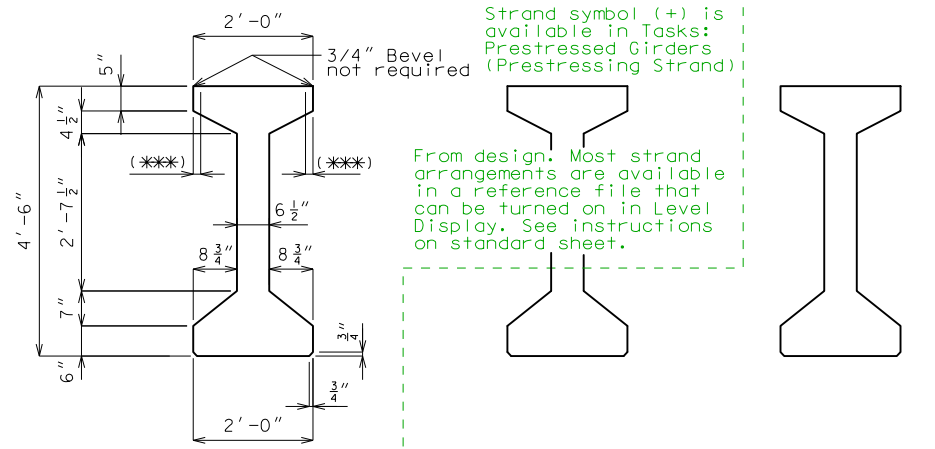


Concrete for prestressed girders shall be Class A-1 with  $f'c = 6000$  psi and  $f'ci = 4500$  psi.

(+) indicates prestressing strand. From design 31 kips per strand

Use 18 strands with an initial prestress force of 558 kips.

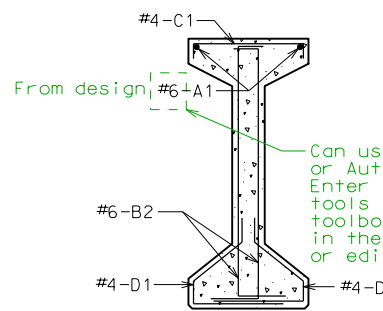
Prestressing tendons shall be uncoated, seven-wire, low-relaxation strands, 1/2 inch diameter in accordance with AASHTO M 203, Grade 270. Pretensioned members shall be in accordance with Sec 1029.



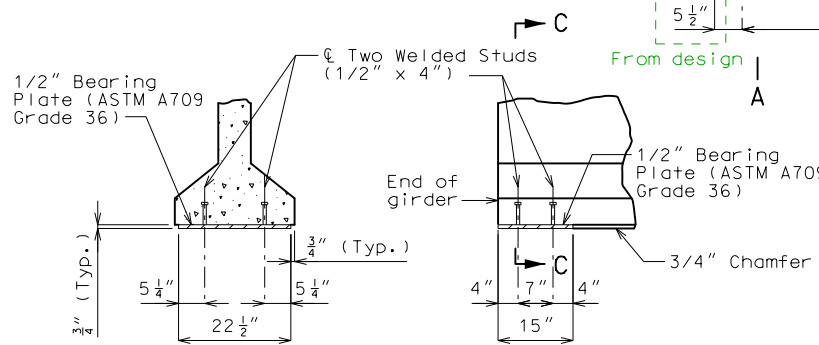
GIRDER DIMENSIONS and STRAND ARRANGEMENTS

Use current standard sheet, found in ProjectWise under Bridge/A\_Bridge\_Standard\_Drawings/PSI\_Girders\_PSI/Current/ (use appropriate girder type and size)

EPG 751.22 P/S Concrete I Girders



SECTION A-A Strands not shown for clarity.



SECTION C-C and PART ELEVATION AT END OF GIRDER BEARING PLATE DETAILS

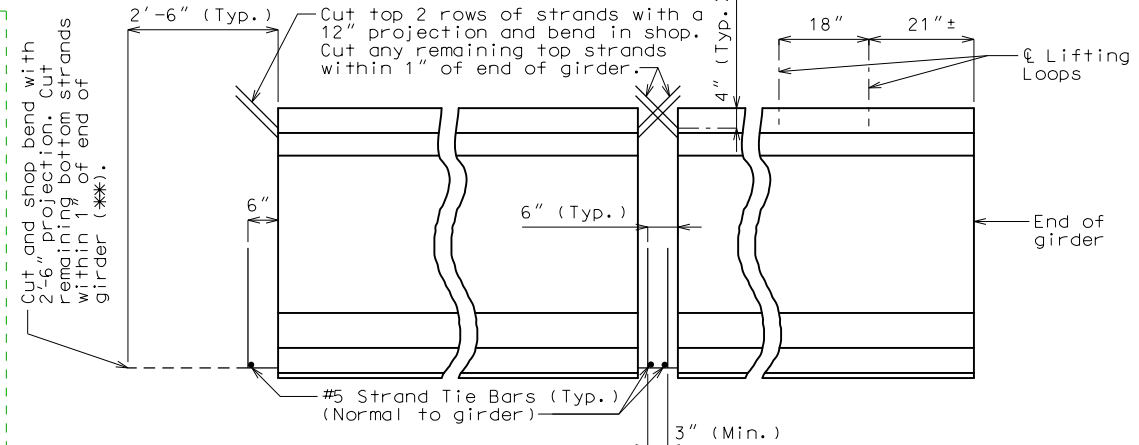
Galvanize the 1/2" bearing plate (ASTM A709 Grade 36) in accordance with ASTM A123.

Cost of furnishing, galvanizing, and installing the 1/2" bearing plate (ASTM A709 Grade 36) and welded studs in the prestressed girder will be considered completely covered by the contract unit price for Prestressed Concrete I-Girder.

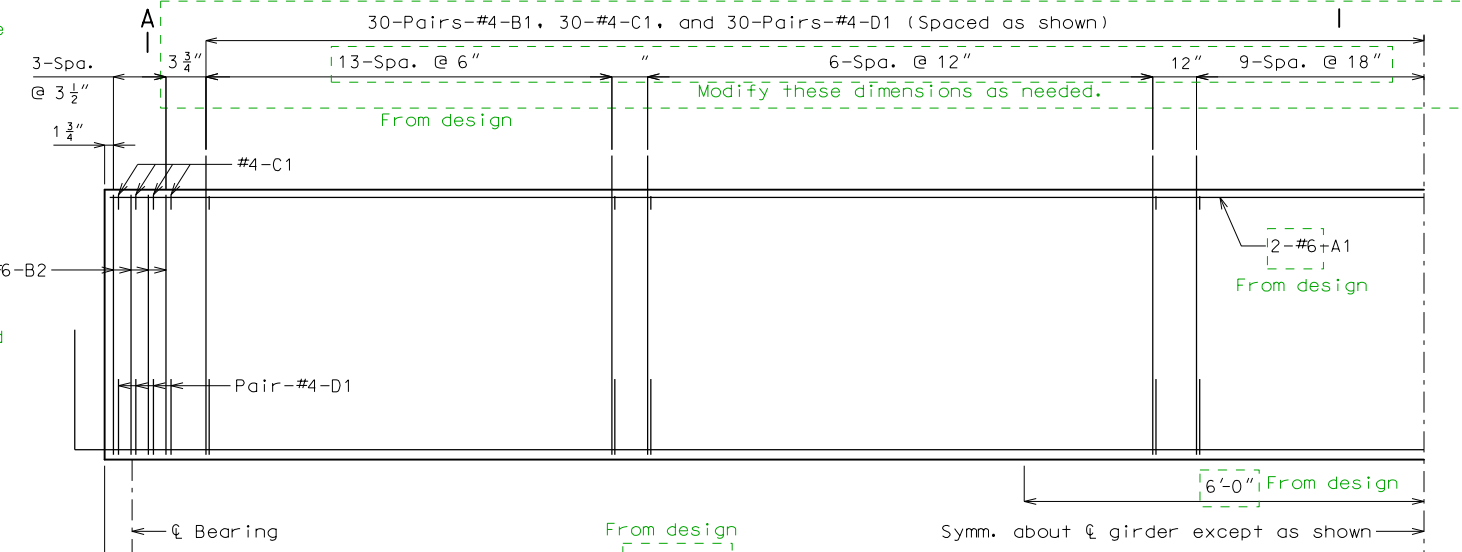
Detailed Checked

\*\* At the contractor's option the location for bent-up strands may be varied from that shown. The total number of bent-up strands shall not be changed. One strand tie bar is required for each layer of bent-up strands except at end bents which require one bar on the bottom layer of strands only. No additional payment will be made if additional strand tie bars are required.

\*\*\* At contractor's option a 3" to 3 1/4" smooth finish strip is permitted to facilitate placement of preformed fiber expansion joint material or expanded or extruded polystyrene bedding material for the prestressed panels.

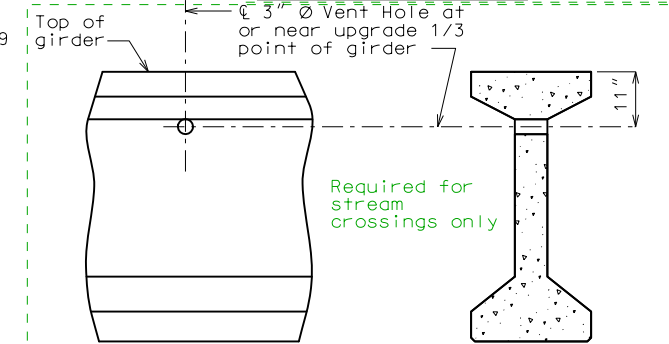


END BENT and INTERMEDIATE BENT STRAND DETAILS AT GIRDER ENDS



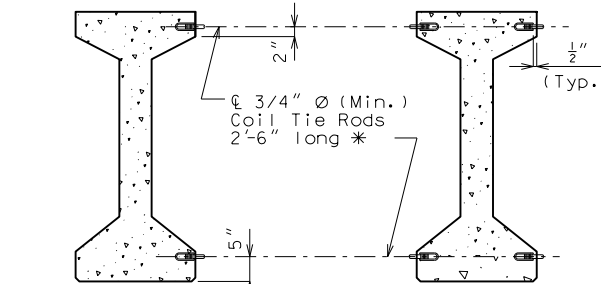
HALF ELEVATION OF GIRDER SPAN

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



PART ELEVATION OF GIRDER and PART SECTION NEAR VENT HOLE

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



DETAILS OF COIL TIES

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

Sheet No. 14 of 30

Detailer calculates marked values.

Table with columns: NO., SIZE & MARK, ACTUAL LENGTH, SHAPE, and BENDING DIAGRAM. It lists reinforcement bar specifications for various shapes like SHAPE 10, 9, 20, and 11.

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

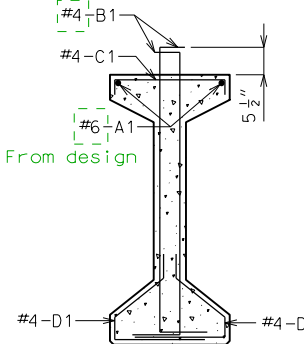
Minimum clearance to reinforcing shall be 1".

All reinforcement shall be Grade 60.

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

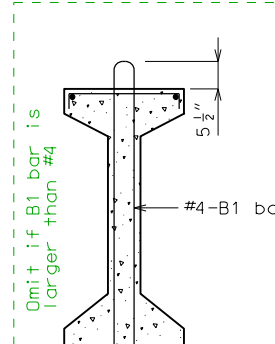
All B1 bars shall be epoxy coated.

From design



SECTION B-B

Strands not shown for clarity.



B1 BAR PERMISSIBLE ALTERNATE SHAPE

Cost of 3/4" Ø coil tie rods placed in diaphragms will be considered completely covered by the contract unit price for Prestressed Concrete I-Girder.

Coil ties shall be held in place in the forms by slotted wire-setting-studs projecting through forms. Studs are to be left in place or replaced with temporary plugs until girders are erected, then replaced by coil tie rods.

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

For location of coil ties, see Sheets No. &

The 1 1/2" Ø holes shall be cast in the web for steel intermediate diaphragms. Drilling is not allowed.

For details of diaphragms, see Sheet No. &

For Girder Camber Diagram, see Sheet No. &

\* Length of coil tie rods at exterior girders at end bents = 2'-4".

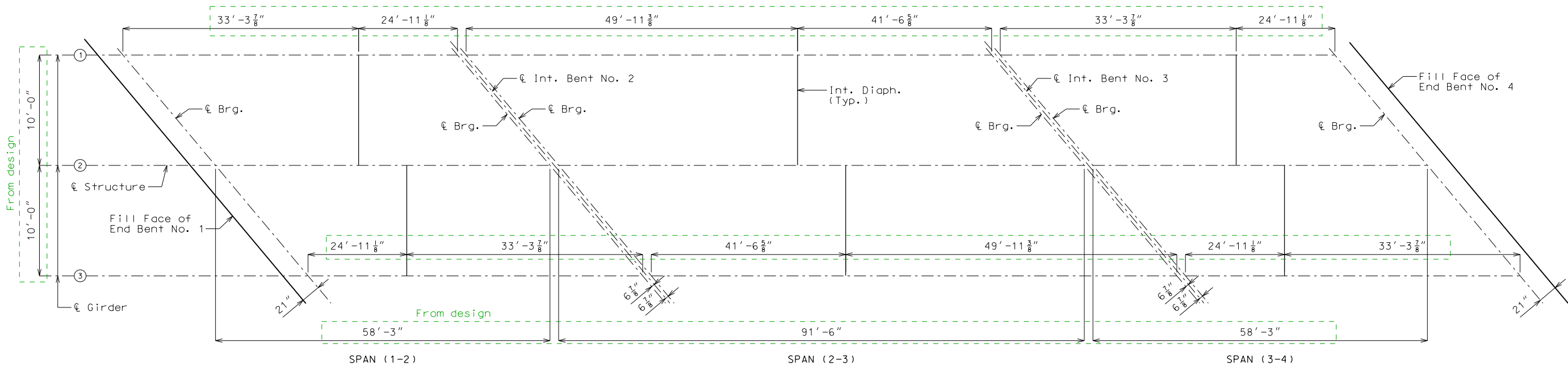
Omit if length is ≥ 2'-6" See EPG 751.22.3.14

Vertical sidebar containing project information: DATE PREPARED (11/25/2019), ROUTE (BR), STATE (MO), DISTRICT (BR), COUNTY (\*), JOB NO. (\*), CONTRACT ID., PROJECT NO., BRIDGE NO. (EXAMPLE), and MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION logo.

Omitted Sheet No. 15 (Prestressed Girder) because it is similar to this sheet.

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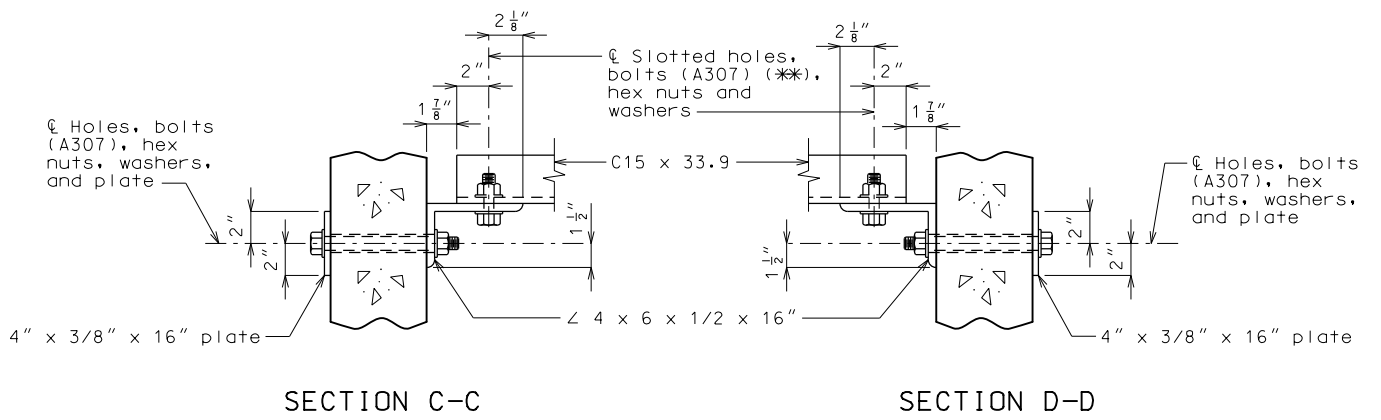
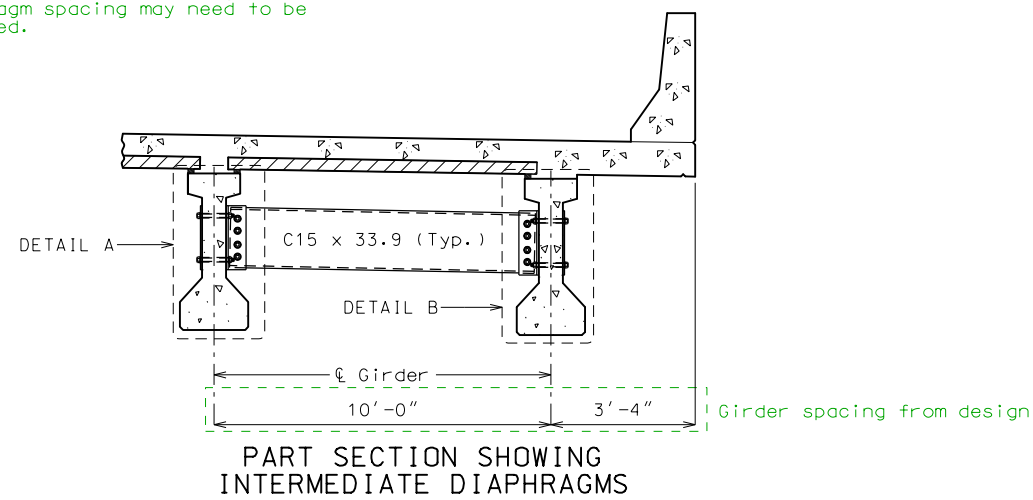
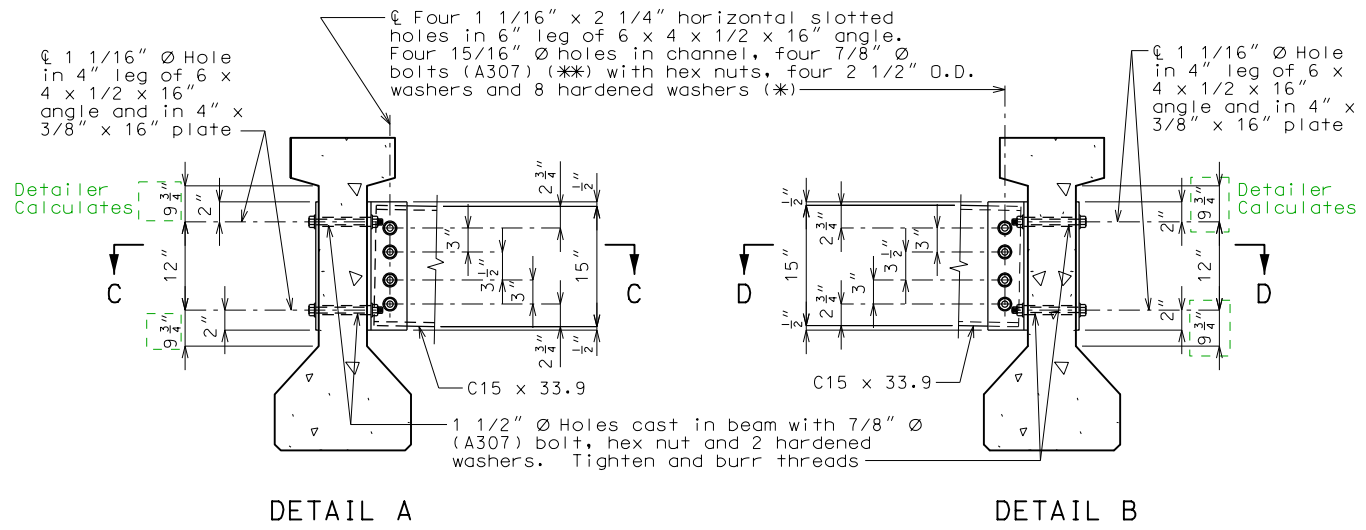
EPG 751.22.3.13 P/S Concrete I-Girders, Intermediate Diaphragms  
 Steel intermediate diaphragms are used when a span is over 50'.



**PLAN SHOWING LOCATION OF STEEL INTERMEDIATE DIAPHRAGMS**  
 Longitudinal dimensions are horizontal.

Use current standard sheet, found in ProjectWise under  
 Bridge/A\_Bridge\_Standard\_Drawings/Diaphragms\_DIA/  
 Current/ (Use appropriate version for girder type,  
 skew, precast panels or cast in place slab.)

Detailer: Check that the 1 1/2"Ø holes  
 for the diaphragms shown on the plans  
 will provide a minimum clearance of  
 1 1/2" to any prestressing strands.  
 Diaphragm spacing may need to be  
 adjusted.



**STEEL DIAPHRAGM NOTES:**

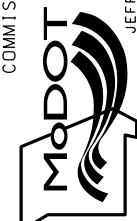
- (\*) In lieu of 2 1/2" outside diameter washers, contractor may substitute a 3/16" (Min. thickness) plate with four 15/16" Ø holes and one hardened washer per bolt.
- (\*\*) Bolts shall be tightened to provide a tension of one-half that specified in Sec 712 for high strength bolt installation. A325 bolts may be substituted for and installed in accordance with the requirements for the specified A307 bolts.
- All diaphragm materials including bolts, nuts, and washers shall be galvanized.
- Fabricated structural steel shall be ASTM A709 Grade 36 except as noted.
- Payment for furnishing and installing steel intermediate diaphragms will be considered completely covered by the contract unit price for Steel Intermediate Diaphragm for P/S Concrete Girders.
- Shop drawings will not be required for steel intermediate diaphragms and angle connections.

**STEEL INTERMEDIATE DIAPHRAGM DETAILS**

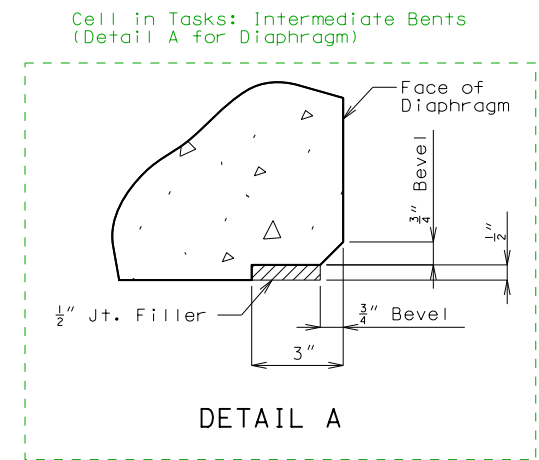
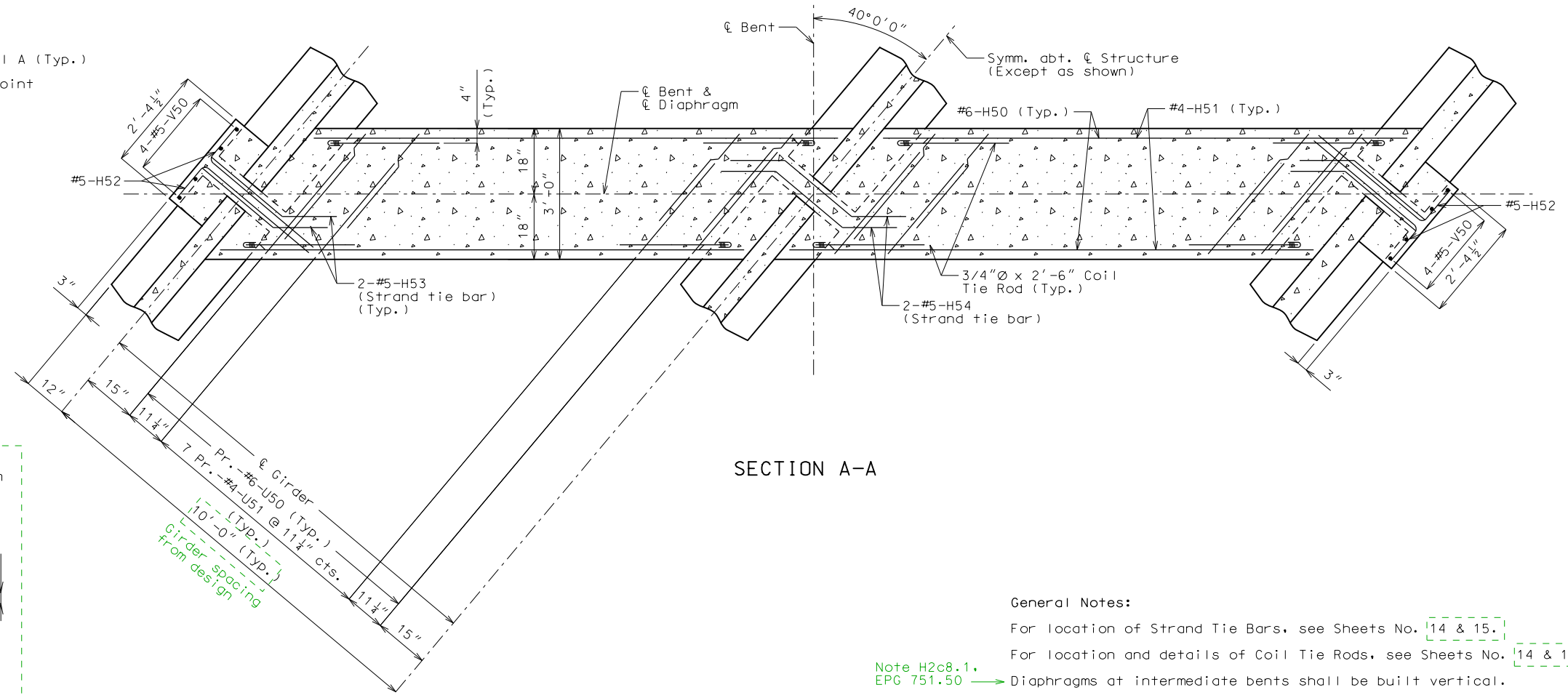
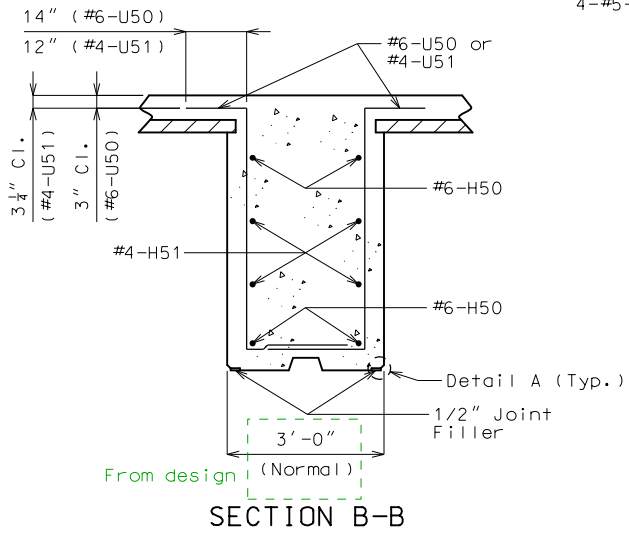
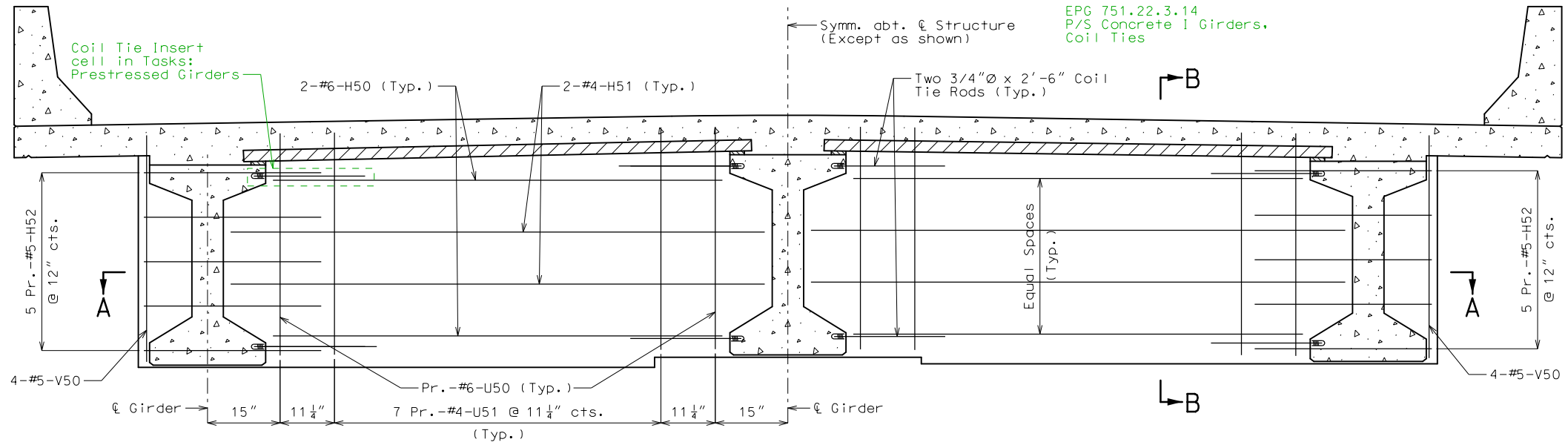
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DATE PREPARED 11/25/2019	
ROUTE *	STATE MO
DISTRICT BR	SHEET NO. *
COUNTY *	
JOB NO. *	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. EXAMPLE	
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SECTION NEAR INTERMEDIATE BENT  
Normal to  $\ell$  Structure

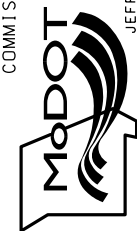
SECTION A-A

General Notes:  
For location of Strand Tie Bars, see Sheets No. 14 & 15.  
For location and details of Coil Tie Rods, see Sheets No. 14 & 15.  
Note H2c8.1, EPG 751.50 → Diaphragms at intermediate bents shall be built vertical.  
All U-bars in diaphragms are to be placed parallel to  $\ell$  Roadway.

DETAILS OF CONCRETE DIAPHRAGMS AT INTERMEDIATE BENTS NO. 2 & 3

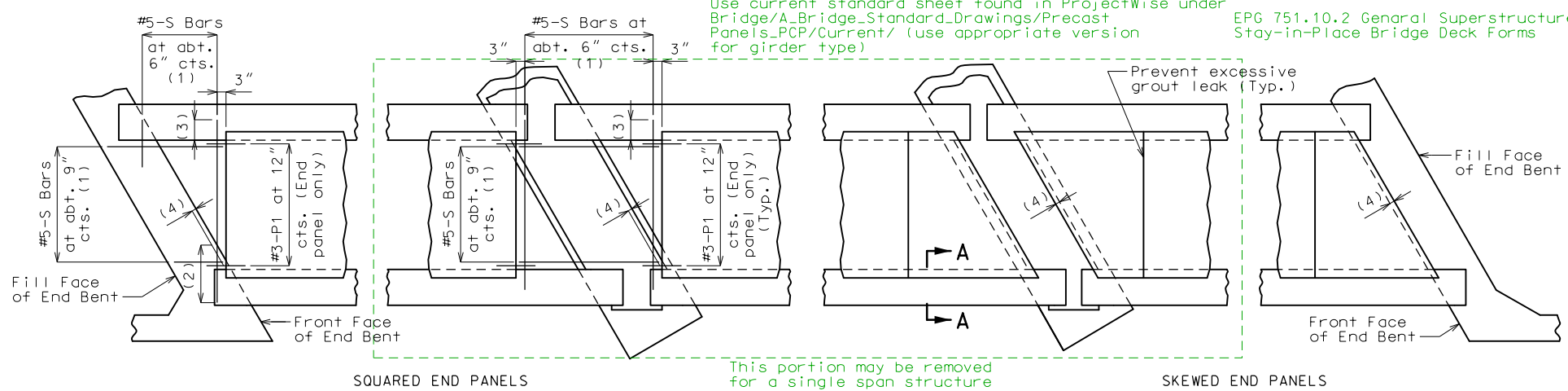
Note: This drawing is not to scale. Follow dimensions. Sheet No. 17 of 30

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DATE PREPARED 11/25/2019	
ROUTE B	STATE MO
DISTRICT BR	SHEET NO. 17
COUNTY VERNON	
JOB NO. J7S0546	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. EXAMPLE	
DESCRIPTION	DATE
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)





Use current standard sheet found in ProjectWise under Bridge/A\_Bridge\_Standard\_Drawings/Precast Panels\_PCP/Current/ (use appropriate version for girder type) EPG 751.10.2 General Superstructure, Stay-in-Place Bridge Deck Forms

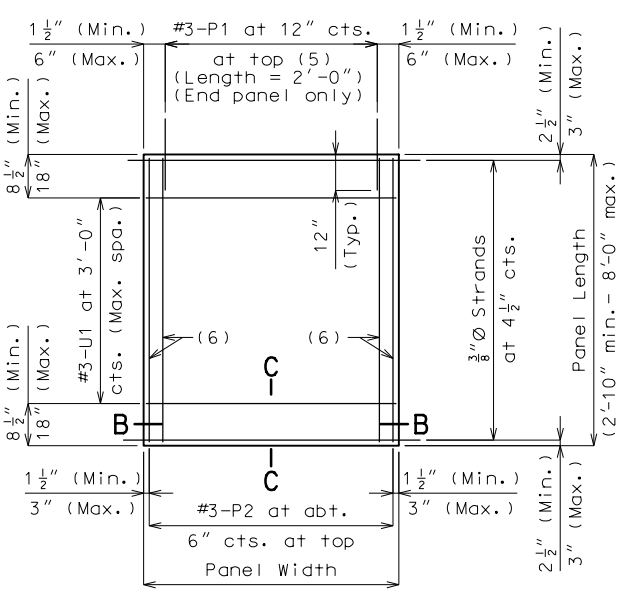


PLAN OF PANEL PLACEMENT  
 SQUARED END PANELS  
 SKewed END PANELS  
 This portion may be removed for a single span structure

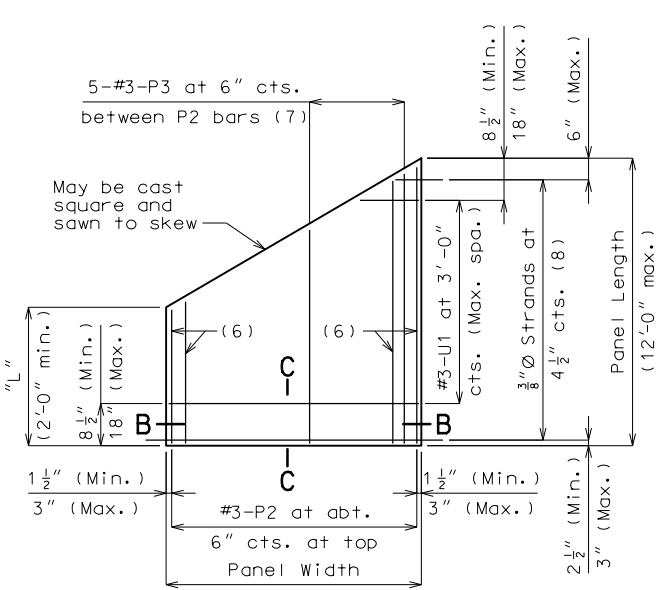
**General Notes:**  
 Prestressed Panels:  
 Concrete for prestressed panels shall be Class A-1 with  $f'c = 6,000$  psi,  $f'ci = 4,000$  psi.  
 The top surface of all panels shall receive a scored finish with a depth of scoring of 1/8" perpendicular to the prestressing strands in the panels.  
 Prestressing 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.  
 Precast 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.  
 Welded wire fabric or welded deformed bar mats 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 or bar 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 reinforcing steel shall be tied securely to the 3/8"Ø strands with the following maximum spacing in each direction:  
 #3-P2 bars at 16 inches.  
 Welded wire fabric or welded deformed bar mats at 2'-0".  
 Tie the #3-U1 bars to the #3-P2 bars, to the welded wire fabric or the welded deformed bar mats at about 3'-0" 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. Fill in  
 Use Slab Haunching Diagram on Sheet No. XX 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.

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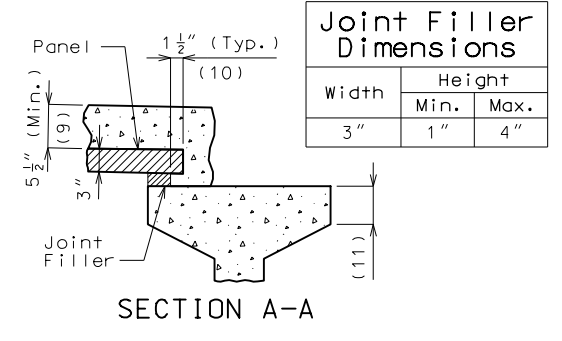
DATE PREPARED	
11/25/2019	
ROUTE	STATE
* BR	MO
DISTRICT	SHEET NO.
BR	*
COUNTY	
*	
JOB NO.	
*	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
EXAMPLE	



PLAN OF SQUARED PANEL



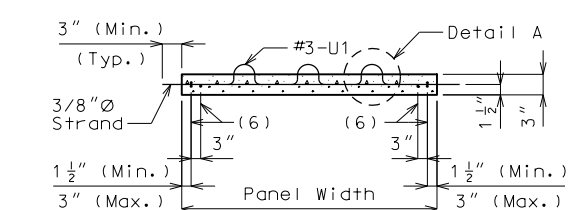
PLAN OF OPTIONAL SKewed END PANEL



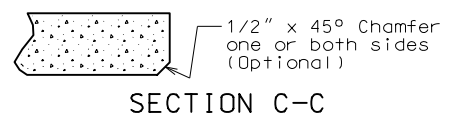
**Joint Filler Dimensions**

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

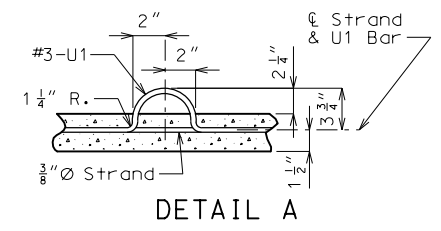
**Reference Notes:**  
 Plan of Panel Placement:  
 (1) S-bars shown are bottom steel in slab between panels and used with squared end panels only.  
 (2) Extend S-bars 18 inches beyond the front face of end bents only.  
 (3) Extend S-bars 9 inches beyond edge of girder.  
 (4) End panels shall be dimensioned 1/2" min. to 1 1/2" max. from the inside face of diaphragm.  
 Plans of Panel:  
 (5) P1 bars not required for square integral end bents.  
 (6) #3-P2 bars near edge of panel at bottom (under strands).  
 (7) Use #3-P3 bars if panel is skewed 45° or greater.  
 (8) 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.  
 Section A-A:  
 (9) 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.  
 (10) Contractor shall ensure proper consolidation under and between panels.  
 (11) 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.



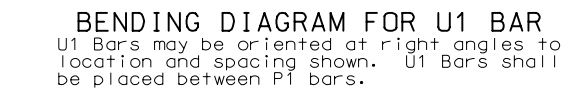
SECTION B-B



SECTION C-C



DETAIL A



**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.

**DETAILS OF PRECAST PRESTRESSED PANELS**

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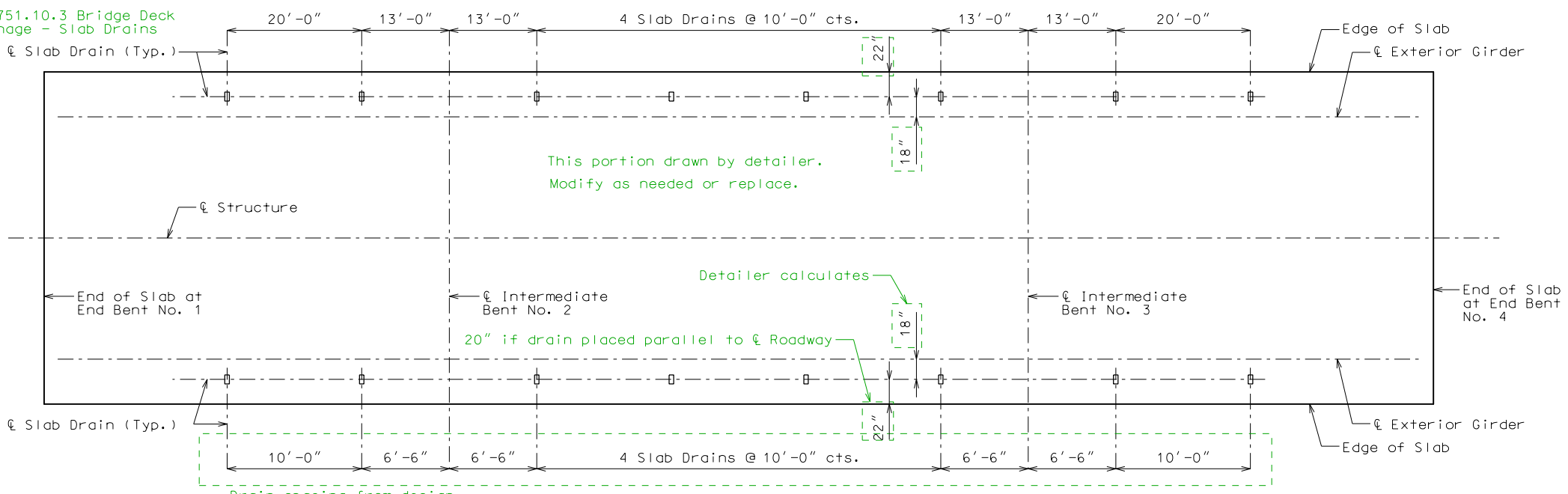
DESCRIPTION

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

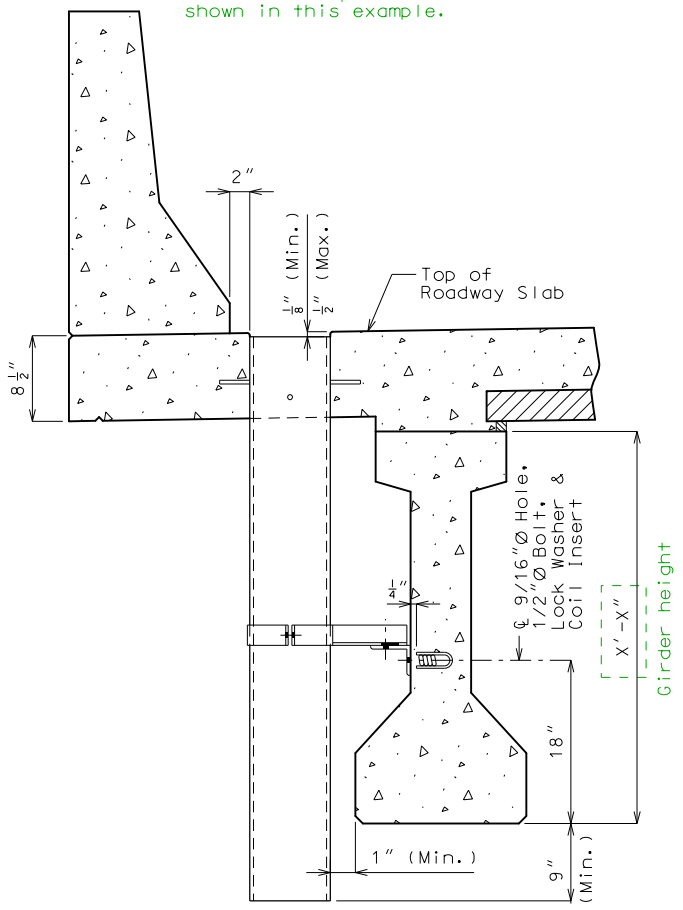
Use current standard sheet found in ProjectWise Bridge/A\_Bridge\_Standard\_Drawings/Drains\_DRA/current/ (use appropriate version for girder type)

EPG 751.10.3 Bridge Deck Drainage - Slab Drains

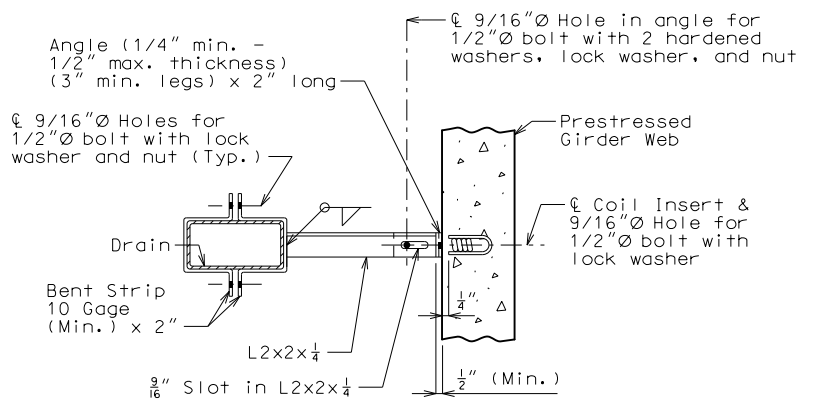


PLAN OF SLAB SHOWING SLAB DRAIN LOCATIONS

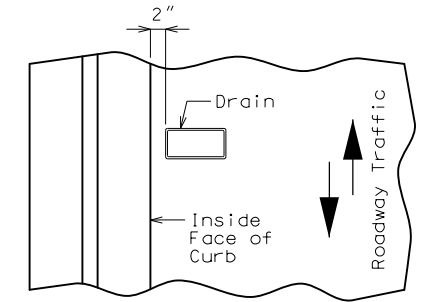
On Standard Drawing, Details of Drains Parallel to Roadway are drawn outside the border. If needed, use those in place of details for transverse drains shown in this example.



PART SECTION NEAR DRAIN

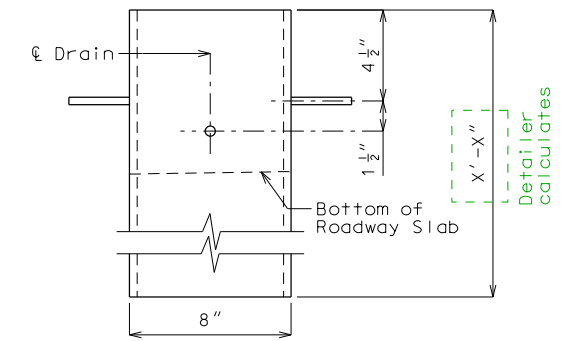


PART SECTION SHOWING BRACKET ASSEMBLY

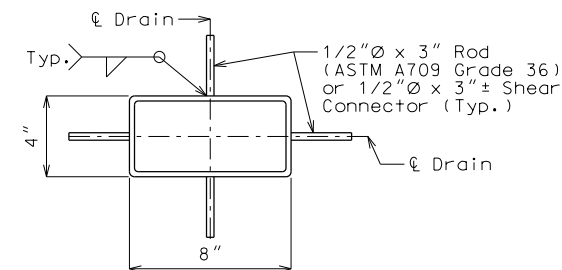


PART PLAN OF SLAB AT DRAIN

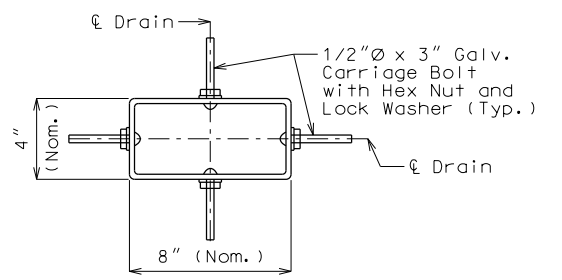
SLAB DRAIN DETAILS



ELEVATION OF DRAIN



PLAN OF STEEL DRAIN



PLAN OF OPTIONAL FRP DRAIN

General Notes:

Slab drain bracket assembly shall be ASTM A709 Grade 36 steel.  
 Locate drains in slab by dimensions shown in Part Section Near Drain.  
 Reinforcing steel shall be shifted to clear drains.  
 The coil inserts and bracket assembly shall be galvanized in accordance with ASTM A123.

All bolts, hardened washers, lock washers and nuts shall be galvanized in accordance with ASTM A153.  
 Shop drawings will not be required for the slab drains and the bracket assembly.

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

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

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

Notes (Steel Drain):

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

Outside dimensions of drains are 8" x 4".

The drains shall be galvanized in accordance with ASTM A123.

Notes (Optional FRP Drain)

Fiberglass Reinforced Polymer (FRP) slab drains may be substituted for steel slab drains as a contractor's option.

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

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

Minimum reinforced wall thickness shall be 1/4 inch.

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

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

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

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

No additional payment will be made for this substitution.

Include notes and details of FRP drains if option is to be used.

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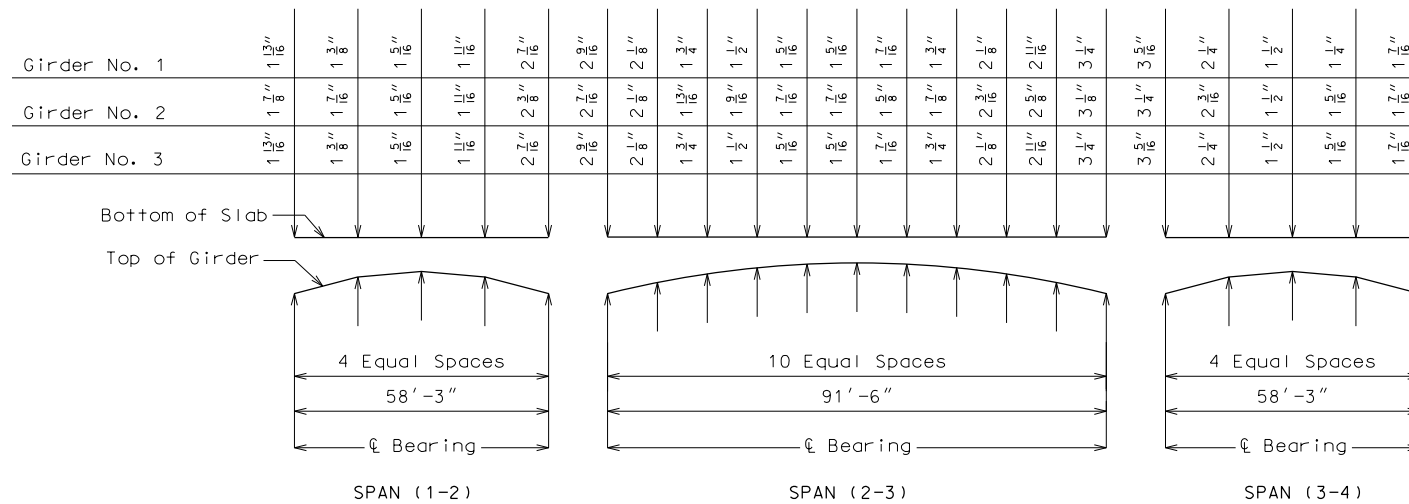
DATE PREPARED 11/25/2019	
ROUTE *	STATE MO
DISTRICT BR	SHEET NO. *
COUNTY *	
JOB NO. *	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. EXAMPLE	

DESCRIPTION	DATE

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

Cell in Tasks: Slab Sheet Details (Haunching Diagram - Quarter Pts or Haunching Diagram - Tenth Pts)  
Fill in information from design.



THEORETICAL SLAB HAUNCHING DIAGRAM

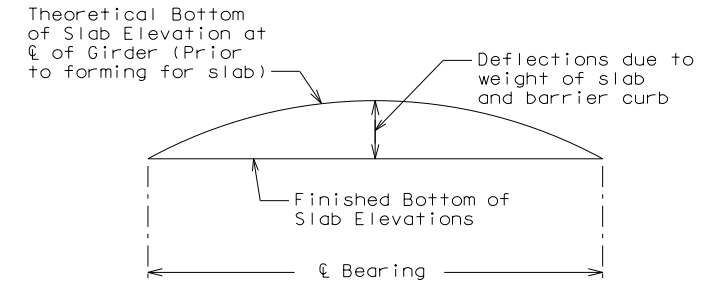
Use quarter points for spans less than 75'.  
Use tenth points for spans 75' or more.

Cell in Tasks: Slab Sheet Details (Bottom of Slab Elevations - Quarter Pts or Bottom of Slab Elevations - Tenth Pts)  
Fill in information from design.

Theoretical Bottom of Slab Elevations at $\text{\O}$ of Girder (Prior to forming for slab) **											
Girder Number	Span (1-2) (58'-3" $\text{\O}$ brg. - $\text{\O}$ brg.)										
	$\text{\O}$ brg.	.25	.50	.75	$\text{\O}$ brg.						$\text{\O}$ brg.
1	875.75	875.84	875.92	875.99	876.05						876.05
2	875.98	876.06	876.14	876.21	876.27						876.27
3	875.84	875.92	876.00	876.07	876.13						876.13
Girder Number	Span (2-3) (91'-6" $\text{\O}$ brg. - $\text{\O}$ brg.)										
	$\text{\O}$ brg.	.10	.20	.30	.40	.50	.60	.70	.80	.90	$\text{\O}$ brg.
1	876.05	876.13	876.21	876.28	876.34	876.39	876.43	876.46	876.48	876.50	876.51
2	876.28	876.36	876.44	876.52	876.58	876.63	876.67	876.70	876.72	876.73	876.73
3	876.14	876.22	876.29	876.36	876.42	876.47	876.51	876.55	876.57	876.58	876.59
Girder Number	Span (3-4) (58'-3" $\text{\O}$ brg. - $\text{\O}$ brg.)										
	$\text{\O}$ brg.	.25	.50	.75	$\text{\O}$ brg.						
1	876.52	876.60	876.68	876.75	876.81						
2	876.74	876.83	876.91	876.97	877.03						
3	876.60	876.69	876.77	876.83	876.89						

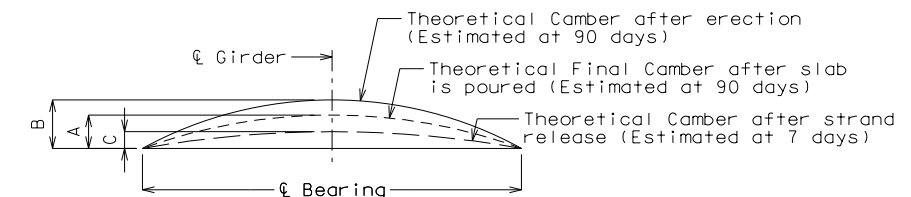
\*\* Elevations are based on a constant slab thickness of 8 1/2" and include allowance for theoretical dead load deflections due to weight of slab (including precast panel and barrier curb).

Cell in Tasks: Slab Sheet Details (Bottom of Slab Elevation Diagram)



TYPICAL SLAB ELEVATIONS DIAGRAM

Cell in Tasks: Slab Sheet Details (P/S Girder Camber Diagram)  
Fill in information from design.



Girder	Span (1-2)			Span (2-3)			Span (3-4)		
	A	B	C	A	B	C	A	B	C
Exterior	7/8"	1 1/16"	3/4"	1 9/16"	2 7/8"	1 1/4"	7/8"	1 1/16"	3/4"
Interior	13/16"	1 1/16"	3/4"	1 5/16"	2 7/8"	1 1/4"	13/16"	1 1/16"	3/4"

GIRDER CAMBER DIAGRAM

If girder camber is different from that shown in the camber diagram, in order to maintain minimum slab thickness 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 I-Girder.

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.

0.25 pt. = 0.7125 x 0.5 pt.

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DATE PREPARED 11/25/2019

ROUTE B STATE MO

DISTRICT BR SHEET NO. 20

COUNTY VERNON

JOB NO. J7S0546

CONTRACT ID.

PROJECT NO.

BRIDGE NO. EXAMPLE

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

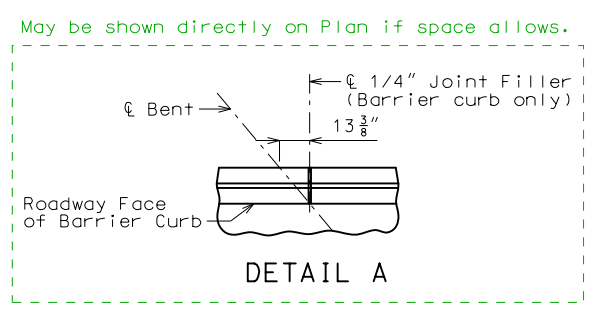
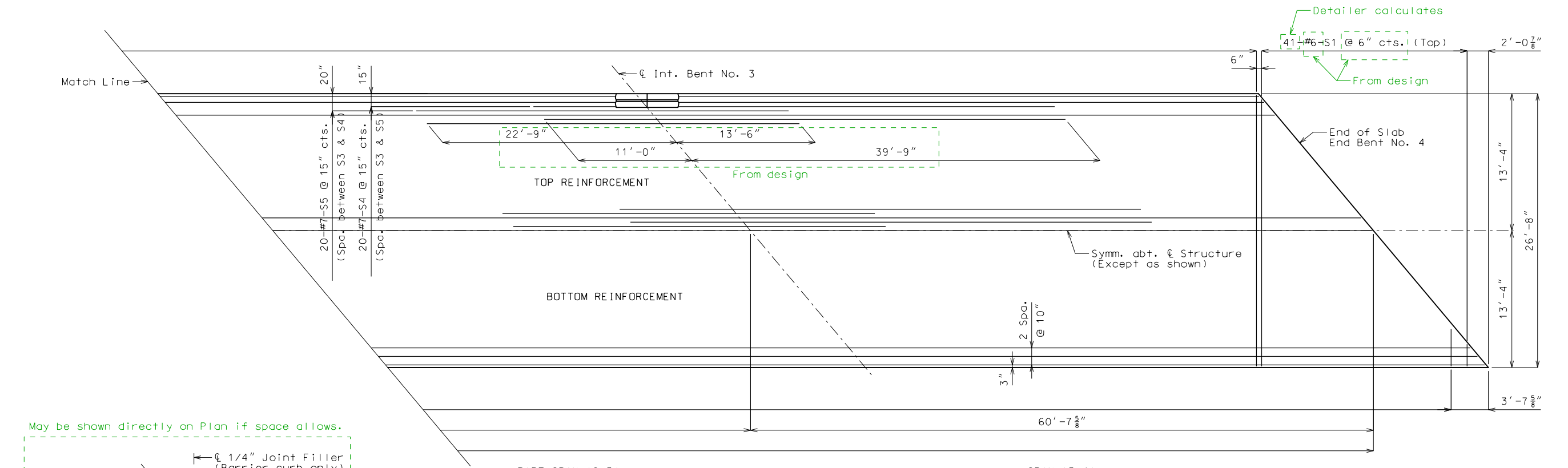
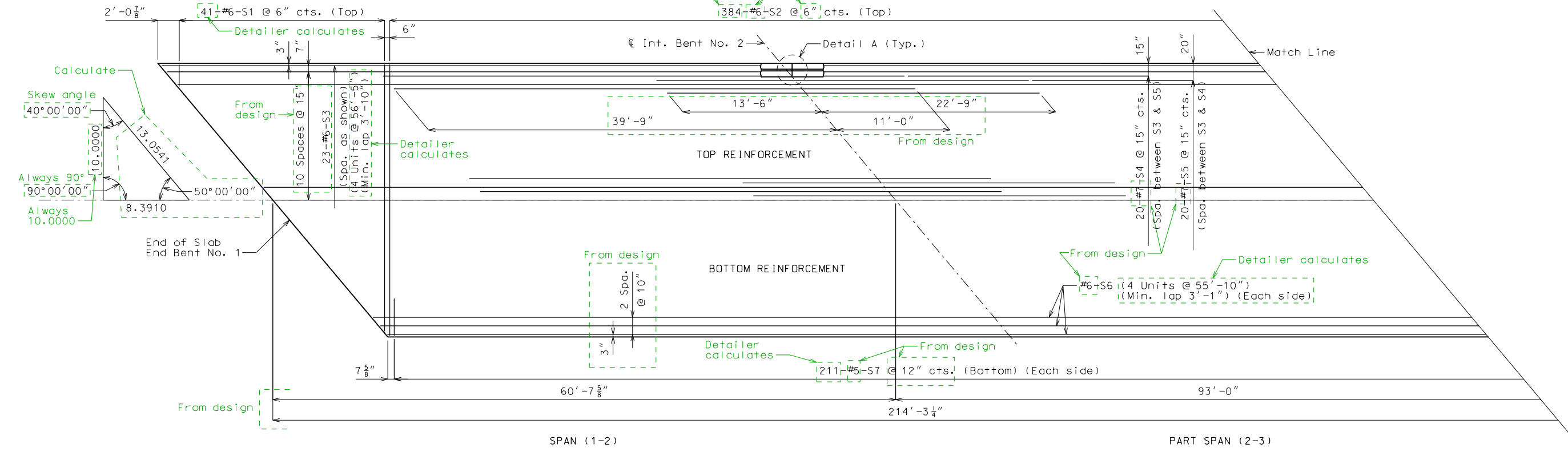
105 WEST CAPITOL JEFFERSON CITY, MO 65102

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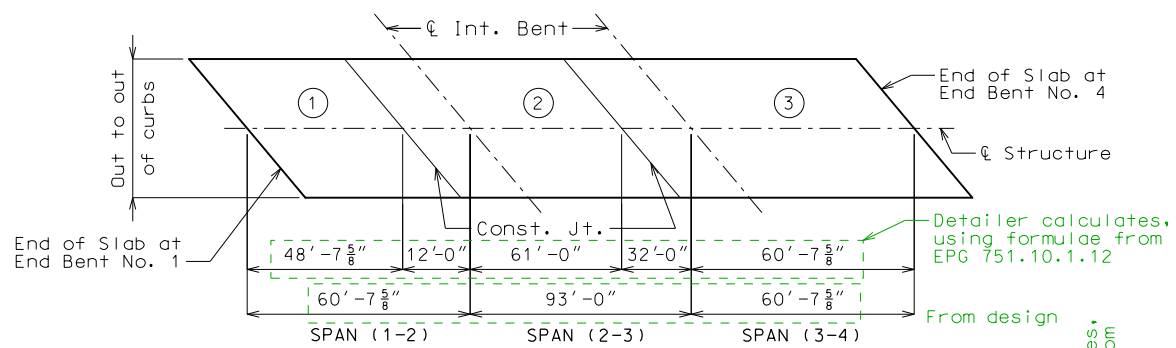
3:38:32 PM 11/25/2019



**General Notes:**  
 Longitudinal dimensions shown are horizontal.  
 For Section Thru Slab and Slab Pouring Sequence, see Sheet No. 22.  
 For Details and Reinforcement of Safety Barrier Curb not shown, see Sheets No. 23, 24 & 25.  
 For Theoretical Slab Haunching Diagram, see Sheet No. 20.  
 For Details of Precast Prestressed Panels, see Sheet No. 18.  
 For Theoretical Bottom of Slab Elevations, see Sheet No. 20.  
 For details and locations of Slab Drains, see Sheet No. 19.

### PLAN OF SLAB SHOWING REINFORCEMENT

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 DATE PREPARED: 11/25/2019  
 ROUTE: B STATE: MO  
 DISTRICT: BR SHEET NO.: 21  
 COUNTY: VERNON  
 JOB NO.: J7S0546  
 CONTRACT ID.:  
 PROJECT NO.:  
 BRIDGE NO.: EXAMPLE  
 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION  
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 105 WEST CAPITOL  
 JEFFERSON CITY, MO 65102  
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 IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



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

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

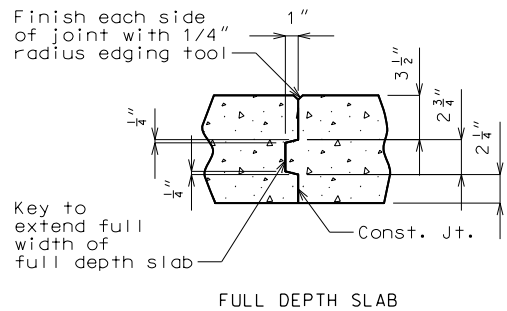
The concrete diaphragm at the intermediate bents and integral end bents shall be poured a minimum of 30 minutes and a maximum of 2 hours before the slab is poured.

### SLAB POURING SEQUENCE

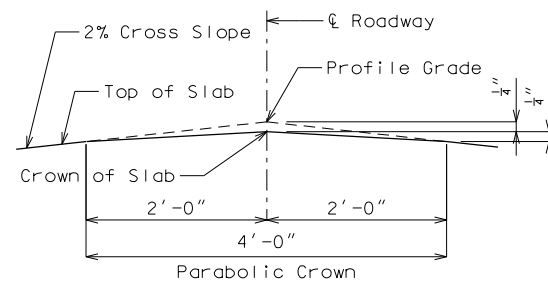
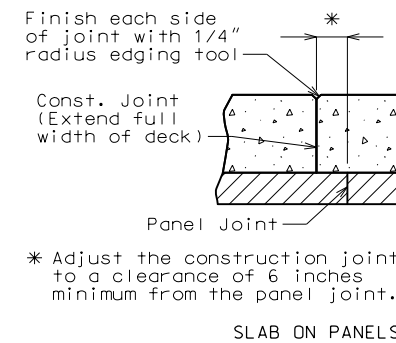
Cell in Tasks: Slab Pouring Sequences. See EPG 751.10.1.12. If using Case 1 for a prestressed girder bridge, remove "No Retarder" column and see EPG 751.50 (H6) for proper notes. Adjust detail to the appropriate skew.

Detailer calculates using formulae from EPG 751.10.1.12

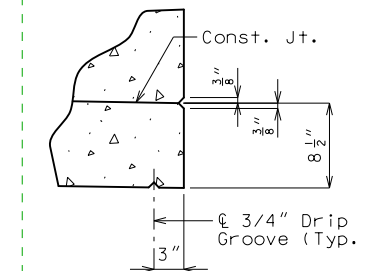
Cell in Tasks: Slab Pouring Sequences (Const. Joint Detail - P/C P/S Panel Deck)



### SLAB CONSTRUCTION JOINT



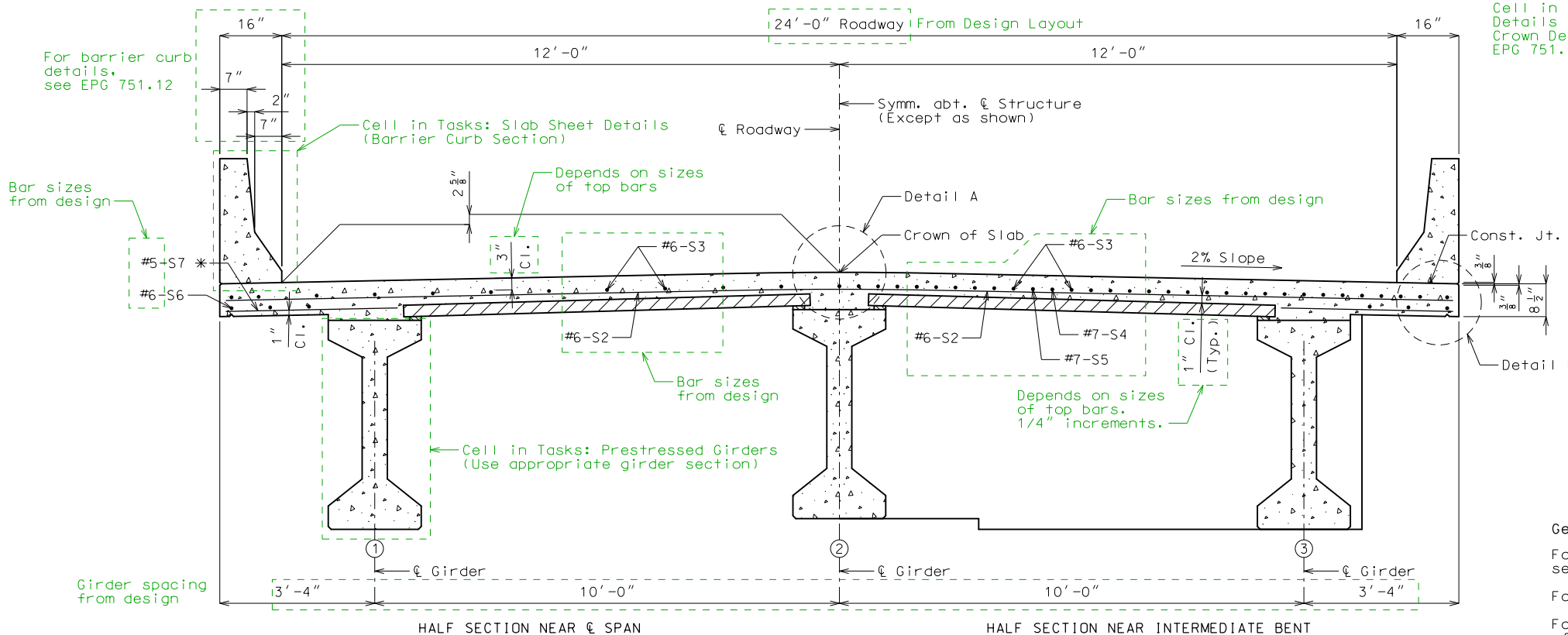
### DETAIL A



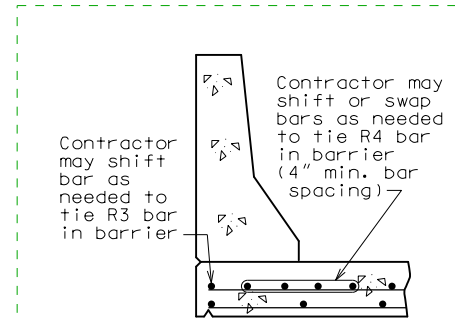
### DETAIL B

Cell in Tasks: Slab Sheet Details (Parabolic Crown Detail) EPG 751.10.1.9

Cell in Tasks: Slab Sheet Details (Drip Groove & Chamfer Detail) See EPG 751.10.1.13 for guidelines on when to use drip groove(s).



### SECTION THRU SLAB



### OPTIONAL SHIFTING TOP BARS AT BARRIER

Cell in Tasks: Slab Sheet Details (Optional Shifting Top Bars at Barrier) EPG 751.10.1.7

#### General Notes:

For details and reinforcement of Safety Barrier Curb, see Sheets No. 23 thru 25.

For Plan of Slab Showing Reinforcement, see Sheet No. 21.

For Theoretical Slab Haunching Diagram and Theoretical Bottom of Slab Elevations, see Sheet No. 20.

For Details of Precast Prestressed Panels, see Sheet No. 18.

For details and locations of Slab Drains, see Sheet No. 19.

\* Alternate bar shape available, see Safety Barrier Curb sheet.

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

Sheet No. 22 of 30

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DATE PREPARED: 11/25/2019

ROUTE: MO DISTRICT: BR SHEET NO.: 22

COUNTY: \* JOB NO.: \* CONTRACT ID.: PROJECT NO.: BRIDGE NO.: EXAMPLE

DESCRIPTION

DATE

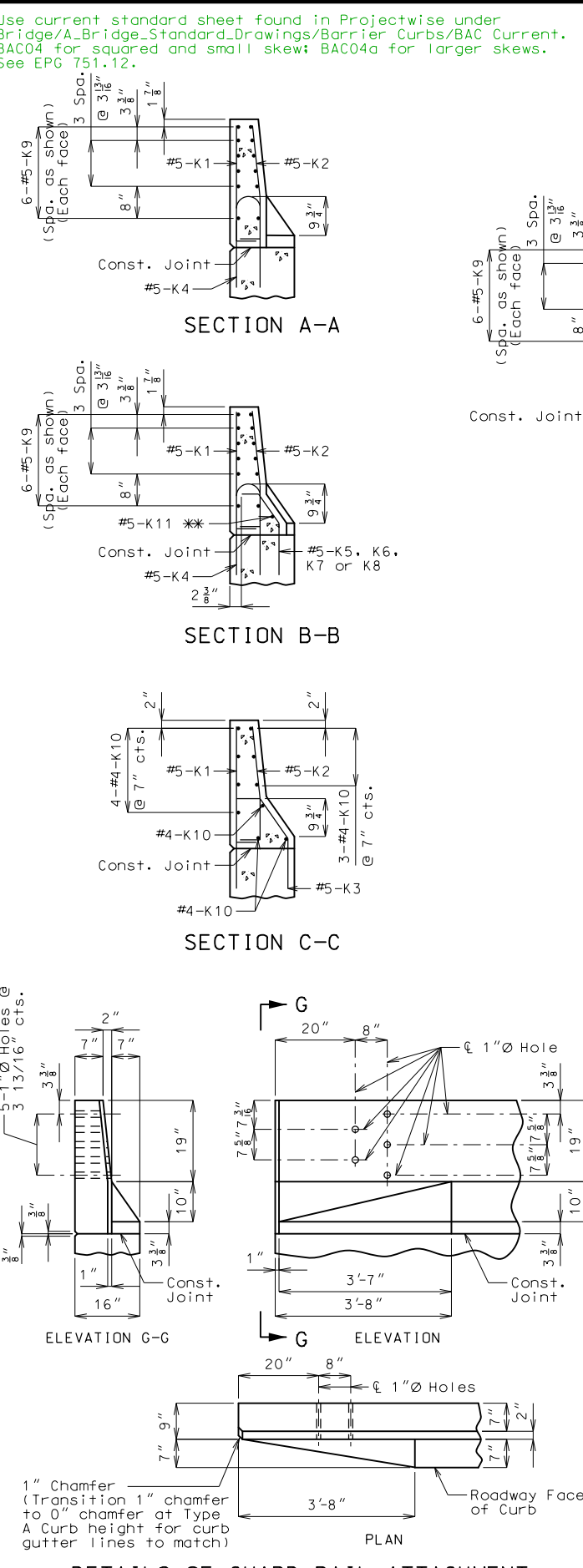
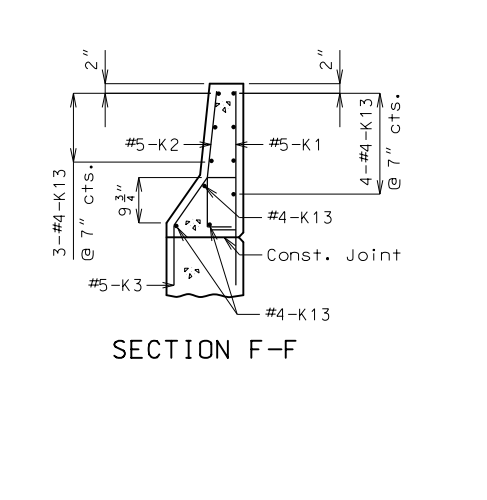
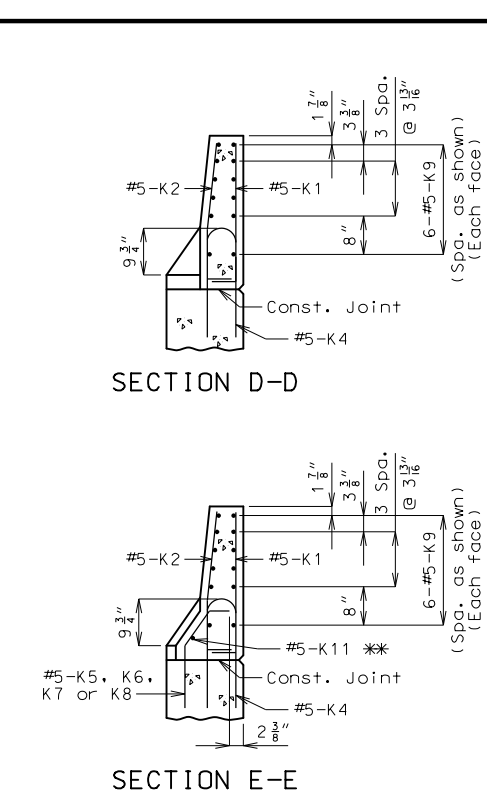
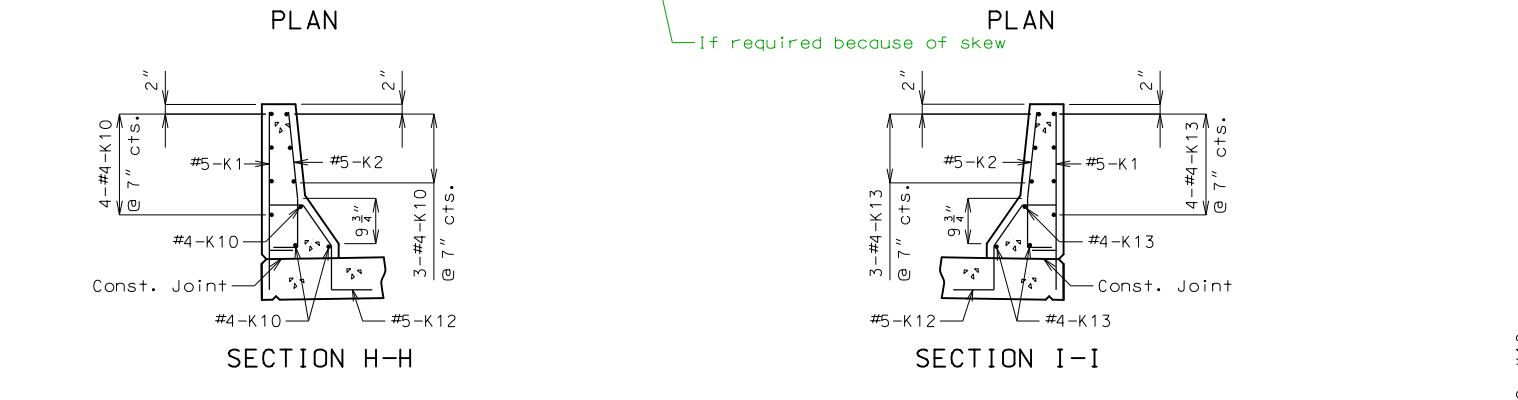
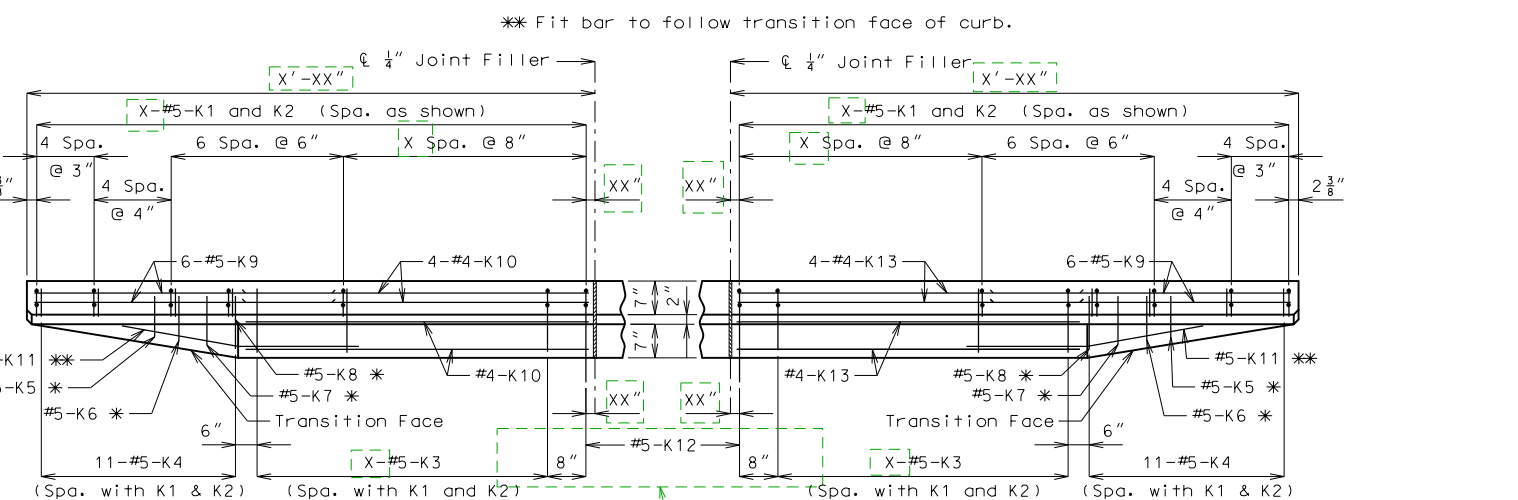
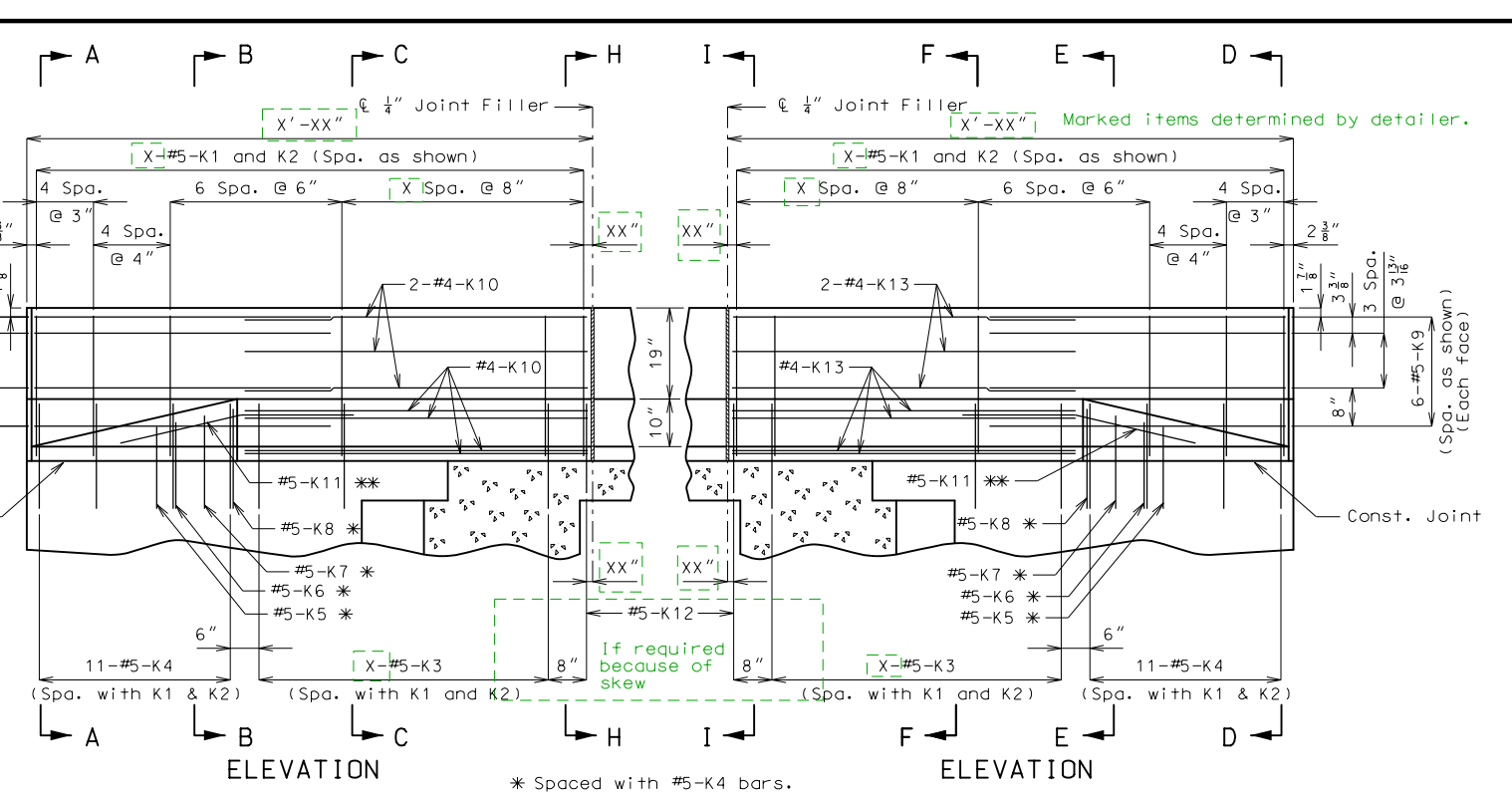
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

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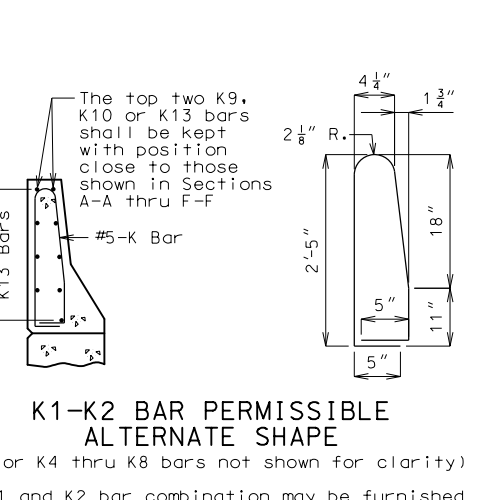
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.





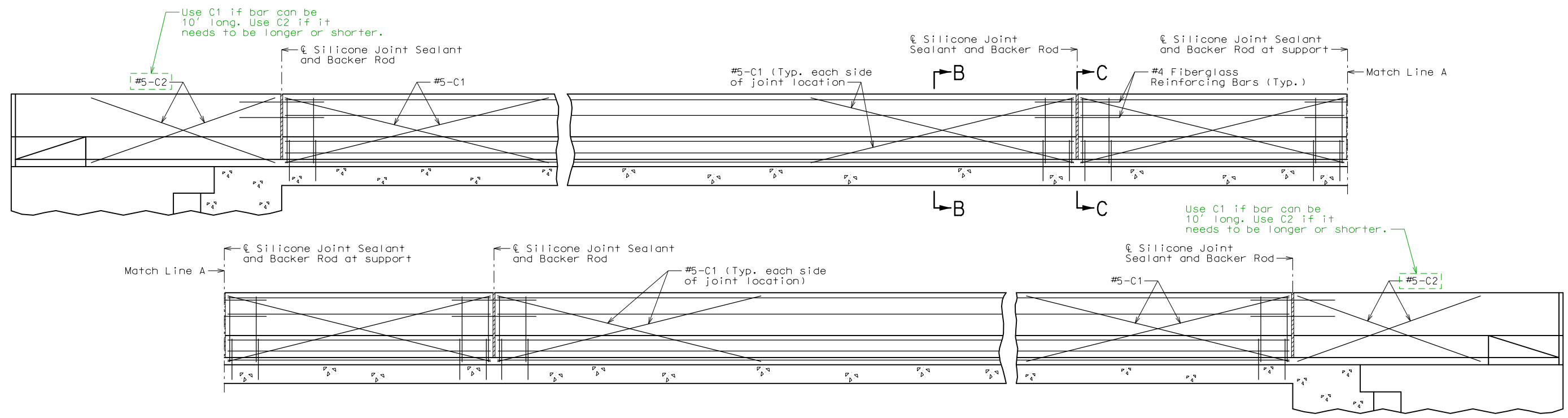
Note: Use a minimum lap of 2'-0" between K9 and K10 or K13 bars.

Concrete traffic barrier delineators shall be placed on top of the safety barrier curb as shown on Missouri Standard Plans 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 Safety Barrier Curb.

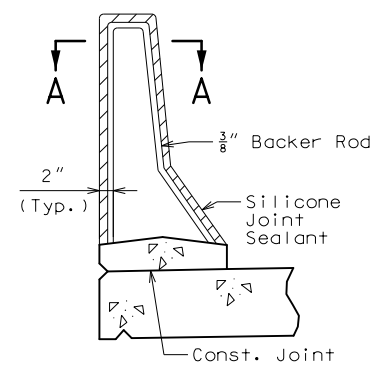


The K1 and K2 bar combination may be furnished as one bar as shown, at the contractor's option.

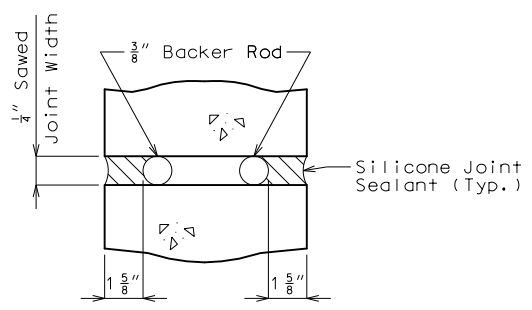
"THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT."	
DATE PREPARED 11/25/2019	
ROUTE *	STATE MO
DISTRICT BR	SHEET NO. 24
COUNTY *	
JOB NO. *	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. EXAMPLE	
DESCRIPTION	DATE
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)



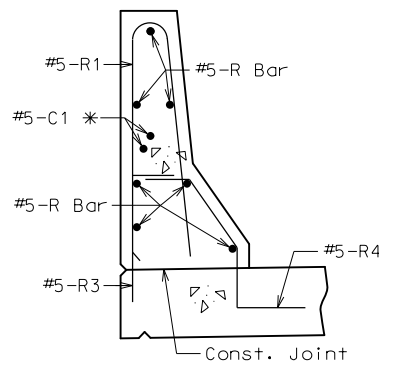
TYPICAL ELEVATION OF SAFETY BARRIER CURB AT SUPPORT LOCATIONS



SECTION THRU JOINT

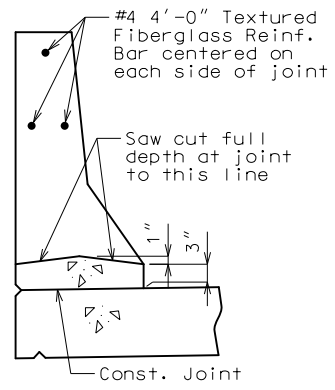


SECTION A-A

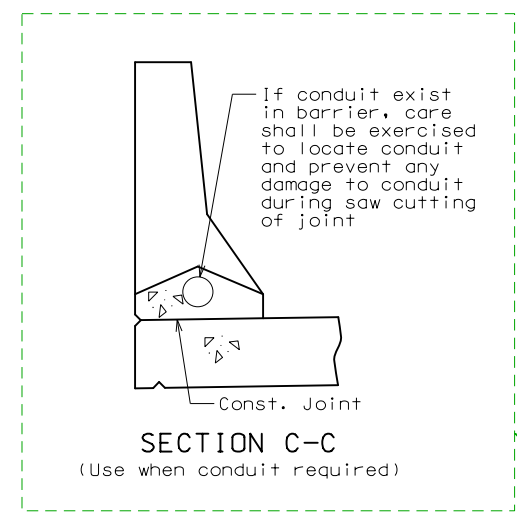


SECTION B-B

\* Each side of joint location.



SECTION C-C



SECTION C-C

(Use when conduit required)

May be removed if not applicable.

**General Notes:**

- Top of safety barrier curb shall be built parallel to grade with barrier curb joints (except at end bents) normal to grade.
- All exposed edges of safety barrier curb 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 Safety Barrier Curb per linear foot.
- Concrete in the safety barrier curb shall be Class B-1.
- Measurement of safety barrier curb 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 safety barrier curb as shown on Missouri Standard Plans 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 Safety Barrier Curb.
- Joint sealant and backer rods shall be used on all slip-form barrier curbs instead of joint filler and shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.
- Plastic waterstop shall not be used with slip-form option.
- For slip-form option, all sides of the safety barrier curb shall have a vertically broomed finish and the curb top shall have a transversely broomed finish.
- C bars (slip-form option only) shall be used in addition to cast-in-place conventional forming reinforcement for bridge safety barrier curb.
- Cost of silicone joint sealant and backer rod, complete in place, will be considered completely covered by the contract unit price for Safety Barrier Curb.

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DATE PREPARED: 11/25/2019

ROUTE: B STATE: MO DISTRICT: BR SHEET NO.: 25

COUNTY: VERNON JOB NO.: J7S0546 CONTRACT ID.:

PROJECT NO.:

BRIDGE NO. EXAMPLE

DESCRIPTION:

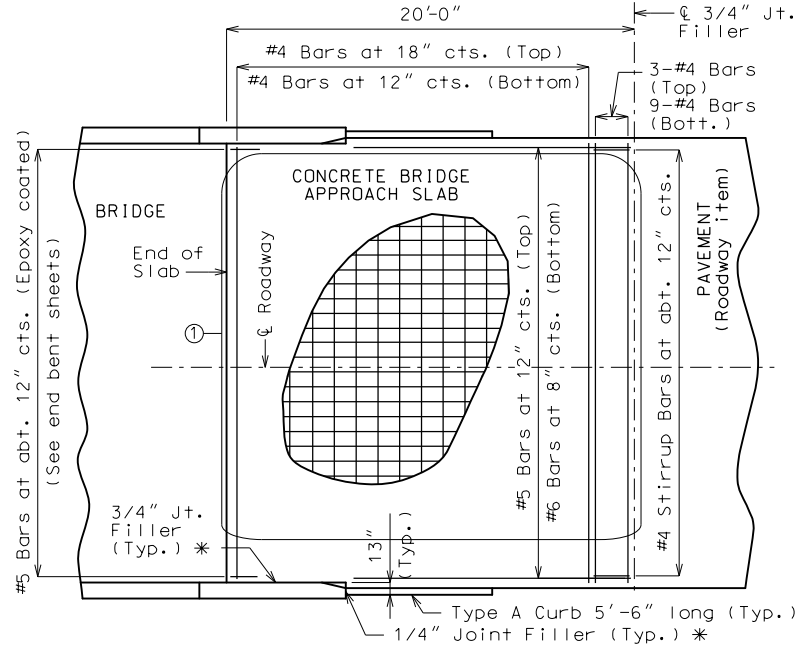
DATE:

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

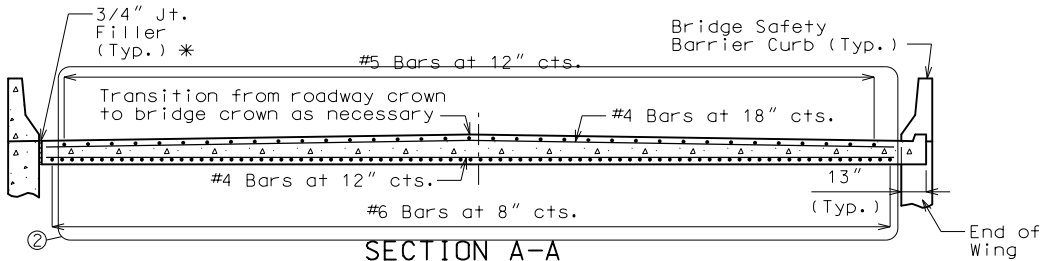
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)

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



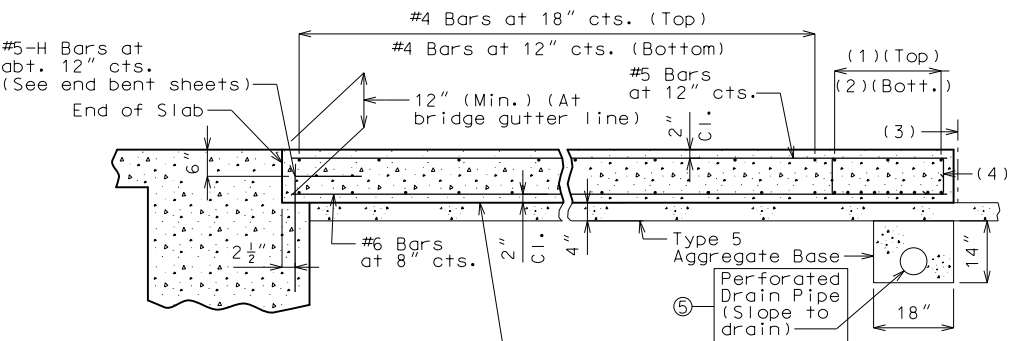


PART PLAN OF SQUARED STRUCTURE

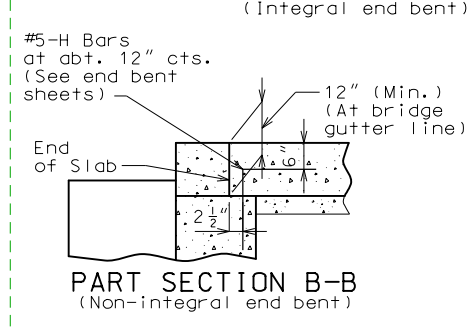


SECTION A-A

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

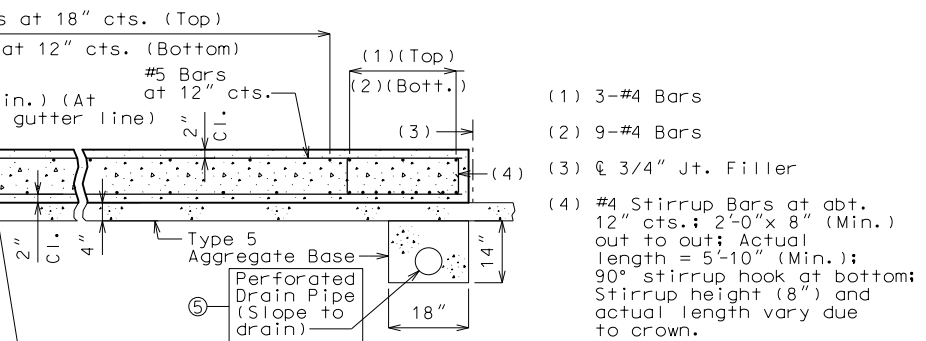


SECTION B-B (Integral end bent)

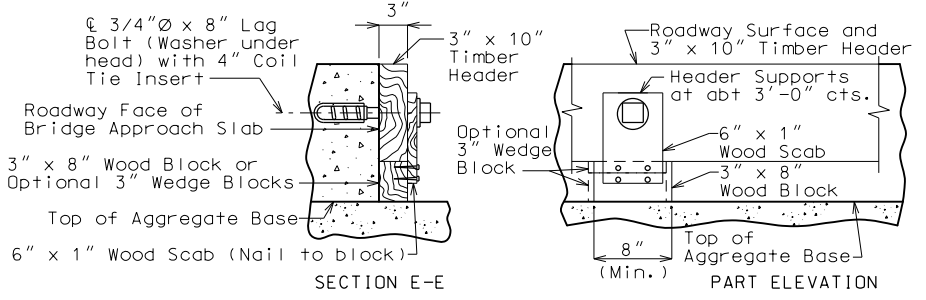


PART SECTION B-B (Non-integral end bent)

May be removed if not applicable.



2 Layers of 4 Mil Polyethylene Sheeting between bridge approach slab and granular base in accordance with ASTM E 1745 Performance Class A



DETAILS OF TIMBER HEADER

Remove timber header when concrete pavement is placed.

OPTIONAL CONCRETE SLAB

DETAILS OF BRIDGE APPROACH SLAB (MINOR ROAD)

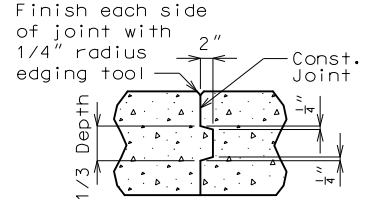
[Integral end bents shown, non-integral end bent similar.] May be removed if not applicable.

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



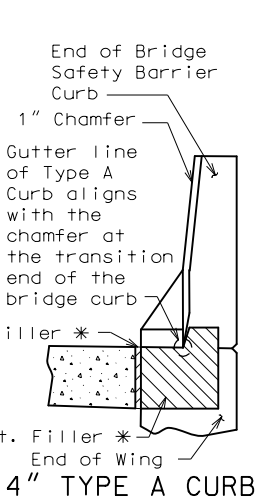
UNDERSEAL ACCESS HOLE DETAIL

(If required)



CONCRETE CONST. JOINT DETAIL

(If required)



4" TYPE A CURB

Notes For Concrete Slab Only:

All concrete for the bridge approach slab shall be in accordance with Sec 503 (f'c = 4,000 psi).  
 The reinforcing steel in the bridge approach slab shall be epoxy coated Grade 60 with fy = 60,000 psi.  
 Longitudinal construction joints in bridge approach slab shall be aligned with longitudinal construction joints in bridge slab.  
 Minimum clearance to reinforcing steel shall be 1 1/2", unless otherwise shown.  
 The reinforcing steel in the bridge approach slab shall be continuous. The transverse reinforcing steel may be made continuous by lap splicing the #4 bars 23" 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.  
 Payment for furnishing all materials, labor and excavation necessary to construct the concrete bridge approach slab, including the timber header, 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 (Minor Road) per square yard.

See Missouri Standard Plans Drawing 609.00 for details of Type A Curb.

\* Seal joint between vertical face of bridge approach slab and wing with "Silicone Joint Sealant for Saw Cut and Formed Joints" in accordance with Sec 717.

General Notes:

Contractor shall have the option to construct either slab except as noted.

The contractor shall pour and satisfactorily finish the bridge slab before placing the bridge approach slab.

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

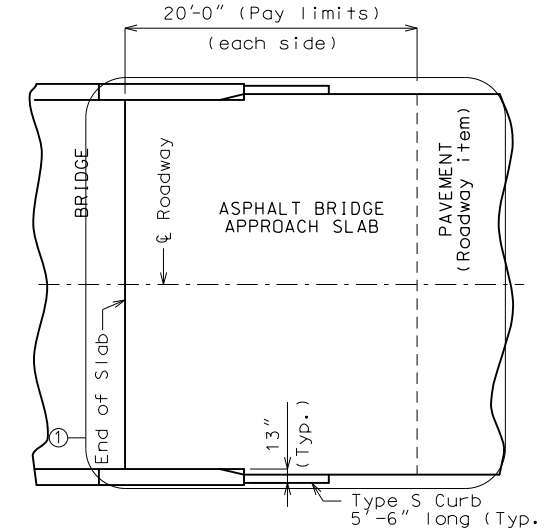
MoDOT Construction personnel will indicate the bridge approach slab used for this structure:

- Concrete Bridge Approach Slab
- Asphalt Bridge Approach Slab

Notes For Asphalt Slab Only:

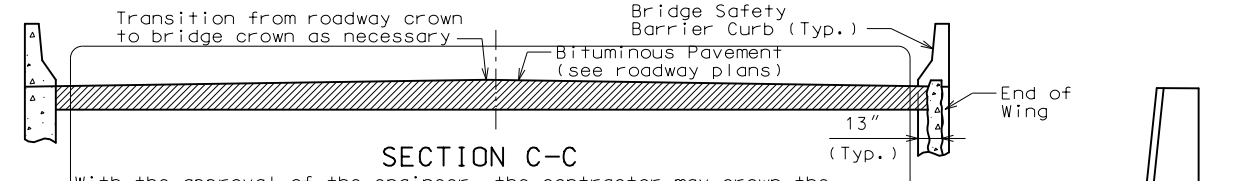
Payment for furnishing all materials, labor and excavation necessary to construct the asphalt bridge approach slab, including tack, curb, underdrain and Type 5 aggregate base within the pay limits shown, complete in place, will be considered completely covered by the contract unit price for Bridge Approach Slab (Minor Road) per square yard.

Application of tack is required between lifts per Sec 403.



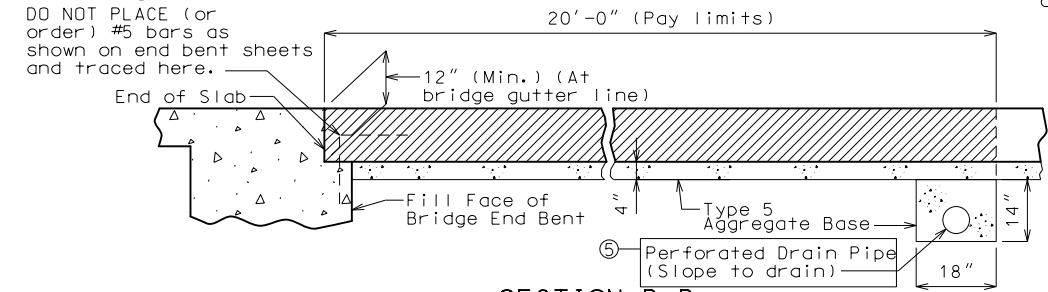
PART PLAN

(Squared structure shown, skewed structure similar)



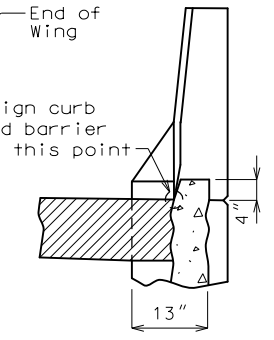
SECTION C-C

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 D-D

OPTIONAL ASPHALT SLAB (NOT ALLOWED WITH CONCRETE PAVEMENT)



4" TYPE S CURB

See Missouri Standard Plans Drawing 609.00 for details of Type S Curb.

THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT.

DATE PREPARED: 1/15/2020

ROUTE: MO DISTRICT: BR SHEET NO. \*

COUNTY: \* JOB NO. \* CONTRACT ID. PROJECT NO. BRIDGE NO.

DESCRIPTION: MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

MoDOT

### BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO.	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	DIMENSIONS								NOMINAL LENGTH	ACTUAL LENGTH	WEIGHT						
								B		C		D		E					F		H		K	
								FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.				FT.	IN.	FT.	IN.	FT.	IN.
		SUBSTRUCTURE																						
		INT. BENT 2																						
16	6 D200	KEY		20	X			2	6.000						2	6	2	6	60					
10	8 H200	BEAM		18	X			30	3.000						32	1	32	1	857					
10	8 H201	BEAM		20	X			30	3.000						30	3	30	3	808					
10	6 H202	BEAM		20	X			30	3.000						30	3	30	3	454					
14	6 H203	BEAM		10	S	X				22.000	3	8.000			7	4	7	0	147					
44	4 P200	SHAFT		16	X			2	5.500	2	1.000				8	7	8	7	252					
50	6 P201	SHAFT		16	X			2	6.000	3	1.000				9	2	9	2	688					
33	4 U200	BEAM		13	S	X		3	9.000	3	9.000	3	9.000	3	9.000	15	9	15	6	342				
28	4 U201	BEAM		13	S	X		2	6.000	3	9.000	2	6.000	3	9.000	13	3	13	0	243				
8	4 U202	BEAM		10	S	X				3	9.000	3	9.000			11	3	11	1	59				
28	9 V200	SHAFT		20	X			41	1.000						41	1	41	1	3911					
		INT. BENT 3																						
16	6 D300	KEY		20	X			2	6.000						2	6	2	6	60					
10	8 H300	BEAM		18	X			30	3.000						32	1	32	1	857					
10	8 H301	BEAM		20	X			30	3.000						30	3	30	3	808					
10	6 H302	BEAM		20	X			30	3.000						30	3	30	3	454					
14	6 H303	BEAM		10	S	X				22.000	3	8.000			7	4	7	0	147					
34	4 P300	SHAFT		16	X			2	5.500	2	1.000				8	7	8	7	195					
66	6 P301	SHAFT		16	X			2	6.000	3	1.000				9	2	9	2	909					
33	4 U300	BEAM		13	S	X		3	9.000	3	9.000	3	9.000	3	9.000	15	9	15	6	342				
28	4 U301	BEAM		13	S	X		2	6.000	3	9.000	2	6.000	3	9.000	13	3	13	0	243				
8	4 U302	BEAM		10	S	X				3	9.000	3	9.000			11	3	11	1	59				
28	9 V300	SHAFT		20	X			35	6.000						35	6	35	6	3380					
		SUPERSTR.																						
		END BENT 1																						
11	6 F100	WING		E 15	S			14.000	3	8.000	14.000	12.750	5.875	12.750	5.875	6	0	5	10	96				
5	6 F101	DIAPHRAGM		E 23	S			3	5.625	4	11.000					2	7.875	2	2.750	8	5	8	4	63
11	6 F102	WING		E 15	S			14.000	7	2.000	14.000	5.875	12.750	5.875	12.750	9	6	9	6	157				
5	6 F103	DIAPHRAGM		E 21	S			6	10.125	3	5.625					5	2.875	4	4.750	10	4	9	9	73
8	6 H100	BEAM & DIAPH		E 20				34	5.000						34	5	34	5	414					
12	7 H101	BEAM & DIAPH		E 20				34	5.000						34	5	34	5	845					
4	6 H102	DIAPHRAGM		E 20				12	0.000						12	0	12	0	72					
4	6 H103	DIAPHRAGM		E 20				10	1.000						10	1	10	1	61					
4	6 H104	DIAPHRAGM		E 20				3	8.000						3	8	3	8	22					
4	6 H105	DIAPHRAGM		E 20				2	8.000						2	8	2	8	16					
16	8 H106	WING		E 20				17	5.000						17	5	17	5	744					
48	6 H107	WING		E 20				16	5.000						16	5	16	5	1184					
3	5 H108	STRAND TIE		E 23	S			15.000	2	0.000	15.000	9.625	11.500	9.625	11.500	4	6	4	5	14				

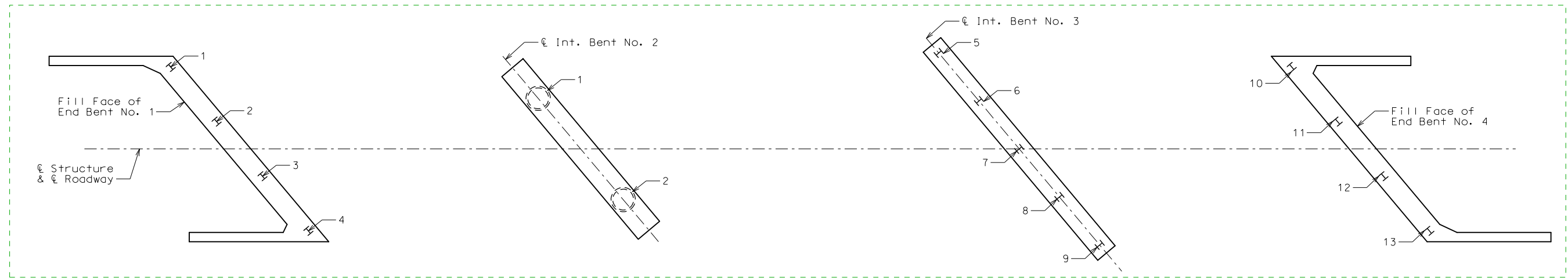
### BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO.	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	DIMENSIONS								NOMINAL LENGTH	ACTUAL LENGTH	WEIGHT						
								B		C		D		E					F		H		K	
								FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.				FT.	IN.	FT.	IN.	FT.	IN.
18	5 U100	BEAM		E 10	S					4	11.000	3	7.000			13	5	13	3	249				
15	4 U101	BEAM		E 13	S			3	7.000	2	7.500	3	7.000	2	7.500	13	2	12	11	129				
42	6 U102	DIAPHRAGM		E 19	S			2	11.000	5	6.000					8	5	8	3	520				
26	5 U103	DIAPHRAGM		E 10	S					4	9.500	2	11.000			12	6	12	4	334				
26	6 U104	DIAPHRAGM		E 19	S			3	10.500	3	7.000					7	6	7	4	286				
24	5 U105	DIAPHRAGM		E 20				2	6.000						2	6	2	6	63					
16	5 V100	BEAM		E 20				4	11.000						4	11	4	11	82					
9	6 V101	DIAPHRAGM		E 20				3	10.000						3	10	3	10	52					
2	6 V102	WING		E 20				8	1.000						8	1	8	1	24					
30	6 V103	WING		E 20				8	1.000						8	1	8	1	364					
2	6 V104	WING		E 20				7	11.000						7	11	7	11	24					
30	6 V105	WING		E 20				7	11.000						7	11	7	11	357					
		END BENT 4																						
11	6 F400	WING		E 15	S			14.000	3	8.000	14.000	12.750	5.875	12.750	5.875	6	0	5	10	96				
5	6 F401	DIAPHRAGM		E 23	S			3	5.625	4	11.000					2	7.875	2	2.750	8	5	8	4	63
11	6 F402	WING		E 15	S			14.000	7	2.000	14.000	5.875	12.750	5.875	12.750	9	6	9	6	157				
5	6 F403	DIAPHRAGM		E 21	S			6	10.125	3	5.625					5	2.875	4	4.750	10	4	9	9	73
8	6 H400	BEAM & DIAPH		E 20				34	5.000						34	5	34	5	414					
12	7 H401	BEAM & DIAPH		E 20				34	5.000						34	5	34	5	845					
4	6 H402	DIAPHRAGM		E 20				12	0.000						12	0	12	0	72					
4	6 H403	DIAPHRAGM		E 20				10	1.000						10	1	10	1	61					
4	6 H404	DIAPHRAGM		E 20				3	8.000						3	8	3	8	22					
4	6 H405	DIAPHRAGM		E 20				2	8.000						2	8	2	8	16					
16	8 H406	WING		E 20				17	5.000						17	5	17	5	744					
48	6 H407	WING		E 20				16	5.000						16	5	16	5	1184					
3	5 H408	STRAND TIE		E 23	S			15.000	2	0.000	15.000	9.625	11.500	9.625	11.500	4	6	4	5	14				
18	5 U400	BEAM		E 10	S					4	11.000	3	7.000			13	5	13	3	249				
15	4 U401	BEAM		E 13	S			3	7.000	2	7.500	3	7.000	2	7.500	13	2	12	11	129				
42	6 U402	DIAPHRAGM		E 19	S			2	11.000	5	6.000					8	5	8	3	520				
26	5 U403	DIAPHRAGM		E 10	S					4	9.500	2	11.000			12	6	12	4	334				
26	6 U404	DIAPHRAGM		E 19	S			3	10.500	3	7.000					7	6	7	4	286				
24	5 U405	DIAPHRAGM		E 20				2	6.000						2	6	2	6	63					
16	5 V400	BEAM		E 20				4	11.000						4	11	4	11	82					
9	6 V401	DIAPHRAGM		E 20				3	10.000						3	10	3	10	52					
2	6 V402	WING																						



Standard sheet found in ProjectWise under Bridge/A\_Bridge\_Standard\_Drawings/PILE\_PILE/Current/PILE02\_dynamic\_formula\_as\_built\_pile\_data.dgn

As Built Drilled Shaft Data standard drawing can be found in ProjectWise under Bridge/A\_Bridge\_Standard\_Drawings/Drilled Shaft with Socket\_DSS/Current/DSS\_02\_as\_built\_dshaft.dgn



This portion drawn by detailer

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

Modify tables as needed

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			
Intermediate Bent No. 3			
5			
6			
7			
8			
9			
End Bent No. 4			
10			
11			
12			
13			

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				
1				
2				

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.

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

DATE PREPARED  
11/25/2019  
 ROUTE \* STATE MO  
 DISTRICT BR SHEET NO. 29  
 COUNTY \*  
 JOB NO. \*  
 CONTRACT ID.  
 PROJECT NO.  
 BRIDGE NO. EXAMPLE

DESCRIPTION	DATE

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

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