

General Notes:

Design Specifications:

2020 AASHTO LRFD Bridge Design Specifications (9th Ed.) and 2011 AASHTO Guide Specifications for LRFD Seismic Bridge Design (2nd Ed.) and 2014 Interim Revisions (Seismic Details).
 Seismic Design Category = C (Seismic Details Only).
 Design earthquake response spectral acceleration coefficient at 1.0 second period, $SD1 = 0.42$.
 Acceleration Coefficient (effective peak ground acceleration coefficient), $As = 0.47$.

Design Loading:

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

Design Unit Stresses:

Class B Concrete (Substructure) $f'c = 3,000$ psi
 Class B-1 Concrete (Type D Barrier) $f'c = 4,000$ psi
 Class B-2 Concrete (Superstructure, except Prestressed Box Beams and Type D Barrier) $f'c = 4,000$ psi
 Reinforcing Steel (ASTM A706 Grade 60) $fy = 60,000$ psi
 Structural Steel (ASTM A709 Grade 50) $fy = 50,000$ psi
 Structural Carbon Steel (ASTM A709 Grade 36) $fy = 36,000$ psi
 For prestressed box beam stresses, see Sheets No. 19 thru 21.
 For precast prestressed panel stresses, see Sheet No. 23.

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 during construction. 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

Outline of existing work is indicated by light dash lines. Heavy lines indicate new work.

Foundation Data

Type	Design Data	Bent Number					
		1	2	3	4	5	6
Load Bearing Pile	Pile Type and Size	HP 14x89	HP 14x89	HP 14x89	HP 14x89	HP 14x89	HP 14x89
	Number	ea 6	ea 8	ea 8	ea 8	ea 8	ea 6
	Approximate Length Per Each	ft 96	ft 65	ft 57	ft 57	ft 55	ft 53
	Pile Point Reinforcement	ea All	ea All	ea All	ea All	ea All	ea All
	Est. Max. Scour Depth (Elev.)	ft -	ft 342	ft 342	ft 350	ft 349	ft -
	Minimum Tip Penetration (Elev.)	ft 286	ft 330	ft 327	ft 328	ft 329	ft 348
	Criteria for Min. Tip Penetration	**	**	**	**	**	**
	Min. Galvanized Penetration (Elev.)	ft Full Length	ft Full Length	ft Full Length	ft Full Length	ft Full Length	ft Full Length
	Pile Driving Verification Method	DF	DF	DF	DF	DF	DF
	Resistance Factor	0.4	0.4	0.4	0.4	0.4	0.4
Minimum Nominal Axial Compressive Resistance	kip	365	423	484	484	423	365

DF = FHWA-Modified Gates Dynamic Pile Formula

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

** - Penetration of anticipated soft geotechnical layers

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

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

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

Detailed Aug. 2024
 Checked Sep. 2024

Hydrologic Data		
	A9349	A9350
Drainage Area (mi ²)	29	
Design Flood Frequency (years)	50	
Design Flood Discharge (cfs)	18,600	3000
Design Flood (D.F.) Elevation	377.6	378.0
Base Flood (100-year)		
Base Flood Elevation	378.1	378.5
Base Flood Discharge (cfs)	21,400	3500
Estimated Backwater (ft)	0.2	0.3
Average Velocity thru Opening (ft/s)	5.6	-
Outlet Velocity (ft/s)	-	3.8
Freeboard (50-year)		
Freeboard (ft)	2.0	-
Roadway Overtopping		
Overtopping Flood Discharge (cfs)	15,400	2900
Overtopping Flood Frequency (years)	25	
Overtopping Flood Elevation	376.0	

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

Estimated Quantities			
Item	Substr.	Superstr.	Total
Class 1 Excavation	cu. yard 35		35
Removal of Bridges (T0788)	lump sum		1
Bridge Approach Slab (Minor)	sq. yard	117	117
Galvanized Structural Steel Piles (14 in.)	linear foot 2766		2766
Pile Point Reinforcement	each 44		44
Class B Concrete (Substructure)	cu. yard 76.8		76.8
Type D Barrier	linear foot	644	644
Slab on Concrete Beam	sq. yard	965	965
27 in., Prestressed Concrete Spread Box Beam	linear foot	1193	1193
Reinforcing Steel (Bridges)	lb 6900		6900
Fabricated Structural Carbon Steel (Misc.)	lb 1910		1910
Slab Drain	each	32	32
Vertical Drain at End Bents	each	2	2
Plain Neoprene Bearing Pad	each	8	8
Laminated Neoprene Bearing Pad	each	32	32

* Type D Barrier shall be cast-in-place or slip-form option.

** Fabricated Structural Carbon Steel (Misc.) shall be galvanized in accordance with ASTM A123 and Sec 1081.

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

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

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 Beam.

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

Cost of L4x4 ASTM A709 Grade 36 HP pile anchors and 3/4-inch diameter ASTM F3125 Grade A325 Type 1 bolts, complete in place, will be considered completely covered by the contract unit price for Galvanized Structural Steel Piles (14 in.).

Estimated Quantities for Slab on Concrete Beam

Item	Total
Class B-2 Concrete	cu. yard 271
Reinforcing Steel (Epoxy Coated)	lb 68,700

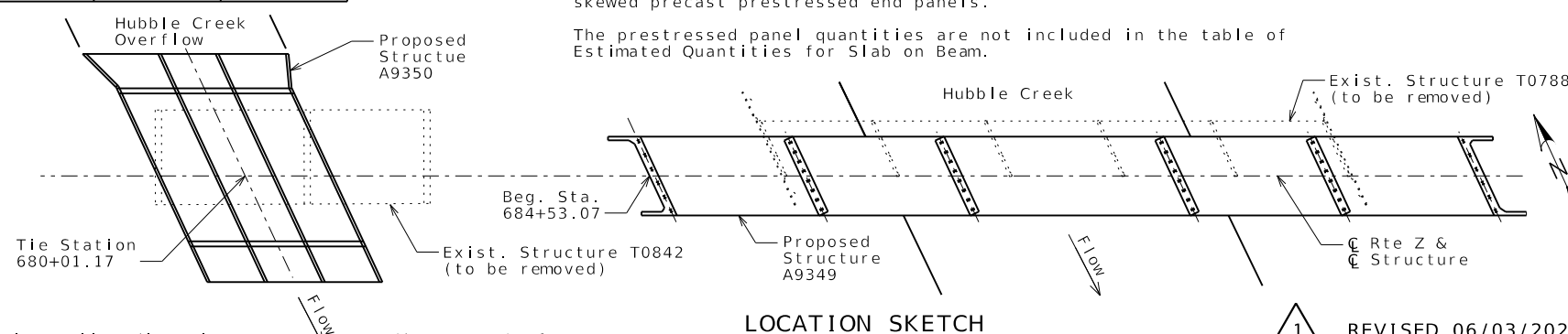
The table of Estimated Quantities for Slab on Concrete Beam represents the quantities used by the State in preparing the cost estimate for concrete slabs. The area of the concrete slab will be measured to the nearest square yard longitudinally from end of slab to end of slab and transversely from out 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 left in place as a permanent part of the structure shall be coated in accordance with ASTM A123 or ASTM B633 with a thickness class SC 4 and a finish type I, II or III.

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

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

The prestressed panel quantities are not included in the table of Estimated Quantities for Slab on Beam.



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

Sheet No. 2 of 44

LOCATION SKETCH

REVISED 06/03/2026

DATE PREPARED		06/03/2026	
ROUTE	STATE		
Z	MO		
DISTRICT	SHEET NO.		
BR	2		
COUNTY			
CAPE GIRARDEAU			
JOB NO.			
19S3738			
CONTRACT ID.			
PROJECT NO.			
BRIDGE NO.			
A9349			

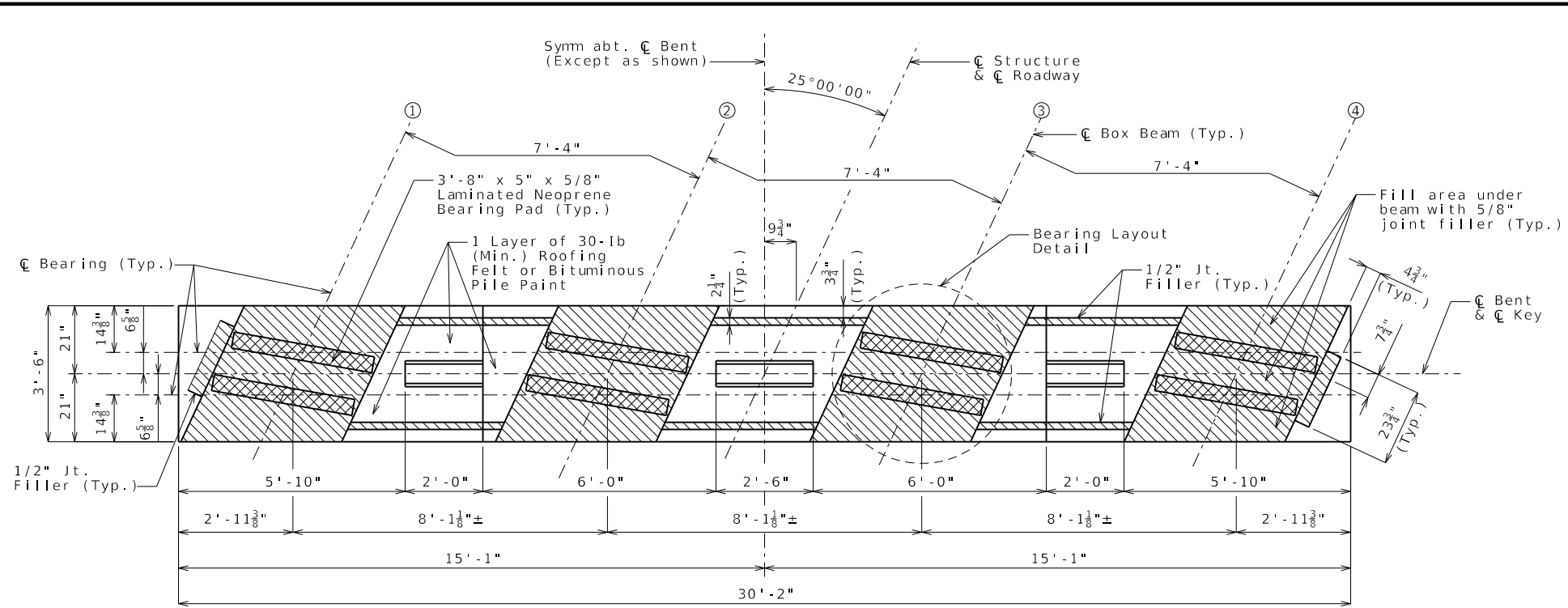
DATE	DESCRIPTION
06-03-26	ADDED FAB. STRUC. CARBON STEEL (MISC.)

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

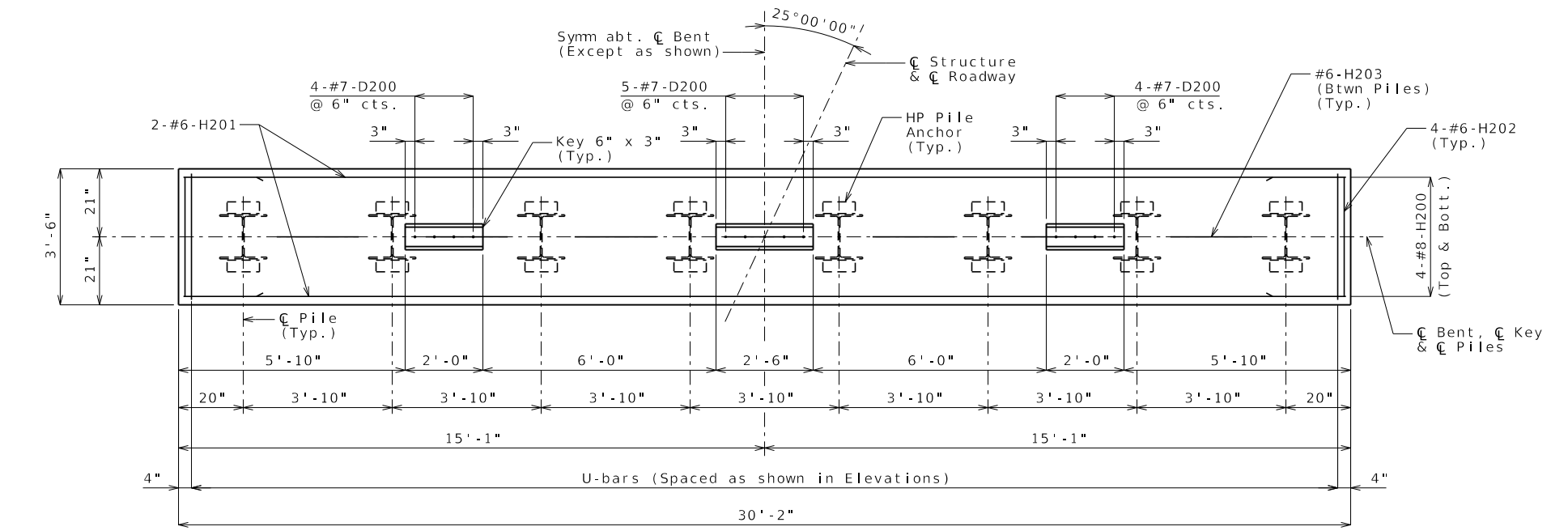
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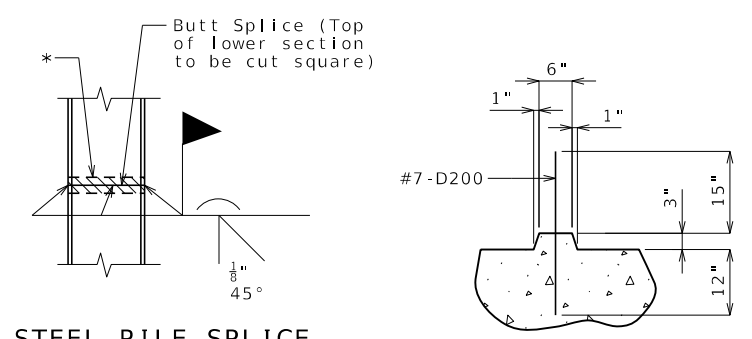




PLAN OF BEAM SHOWING DIMENSIONS



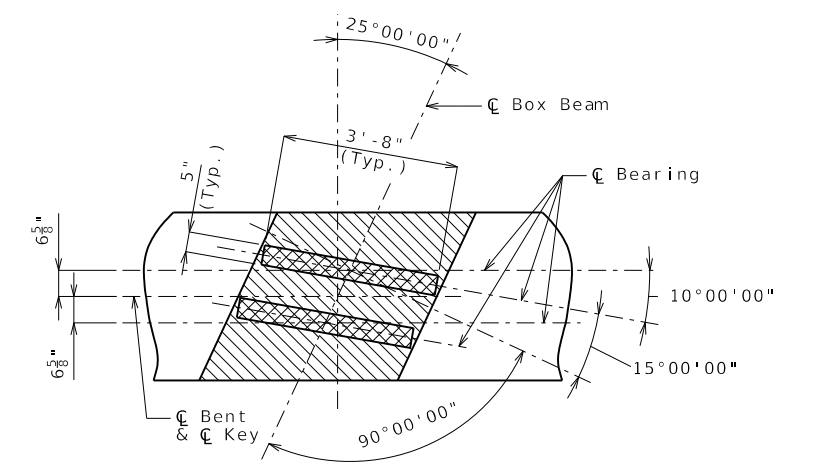
PLAN OF BEAM SHOWING REINFORCEMENT



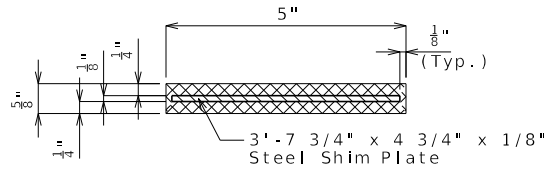
STEEL PILE SPLICE (If required)

SECTION THRU KEY

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



BEARING LAYOUT DETAIL



SECTION THRU LAMINATED NEOPRENE BEARING PAD

Substructure Quantity Table for Bent No. 2		
Item		Quantity
Galvanized Structural Steel Pile (14 in.)	linear foot	520
Pile Point Reinforcement	each	8
Class B Concrete (Substructure)	cu. yard	12.2
Reinforcing Steel (Bridges)	pound	1725
Fabricated Structural Carbon Steel (Misc.)	pound	477

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

Notes:
 Work this sheet with Sheet No. 8.
 For details of HP Pile Anchors, see Sheet No. 8.
 Reinforcing steel shall be shifted to clear piles, U-bars shall clear by at least 1 1/2".
 For steps 2 inches or more, use 2 1/4 x 1/2 inch joint filler up vertical face.
 Furnishing and installing W8x18 sway bracing shall be completely covered by the contract unit price for Fabricated Structural Carbon Steel (Misc.).

DETAILS OF INTERMEDIATE BENT NO. 2

Detailed Aug. 2024
 Checked Sep. 2024

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

Sheet No. 7 of 44

1 REVISED 06/03/2026

DATE PREPARED 06/03/2026	
ROUTE Z	STATE MO
DISTRICT BR	SHEET NO. 7
COUNTY CAPE GIRARDEAU	
JOB NO. 19S3738	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A9349	
DESCRIPTION MODDED FAB. STRUC. CARBON STEEL (MISC.)	
DATE 06-03-26	

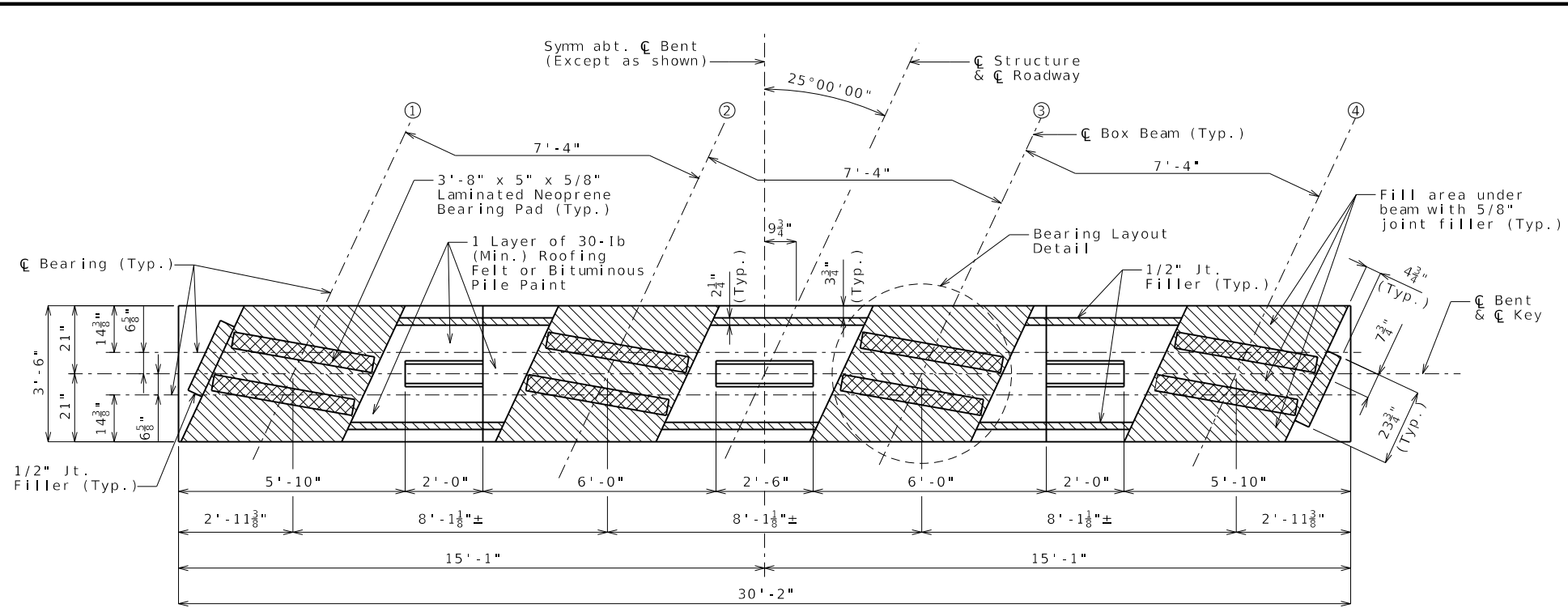
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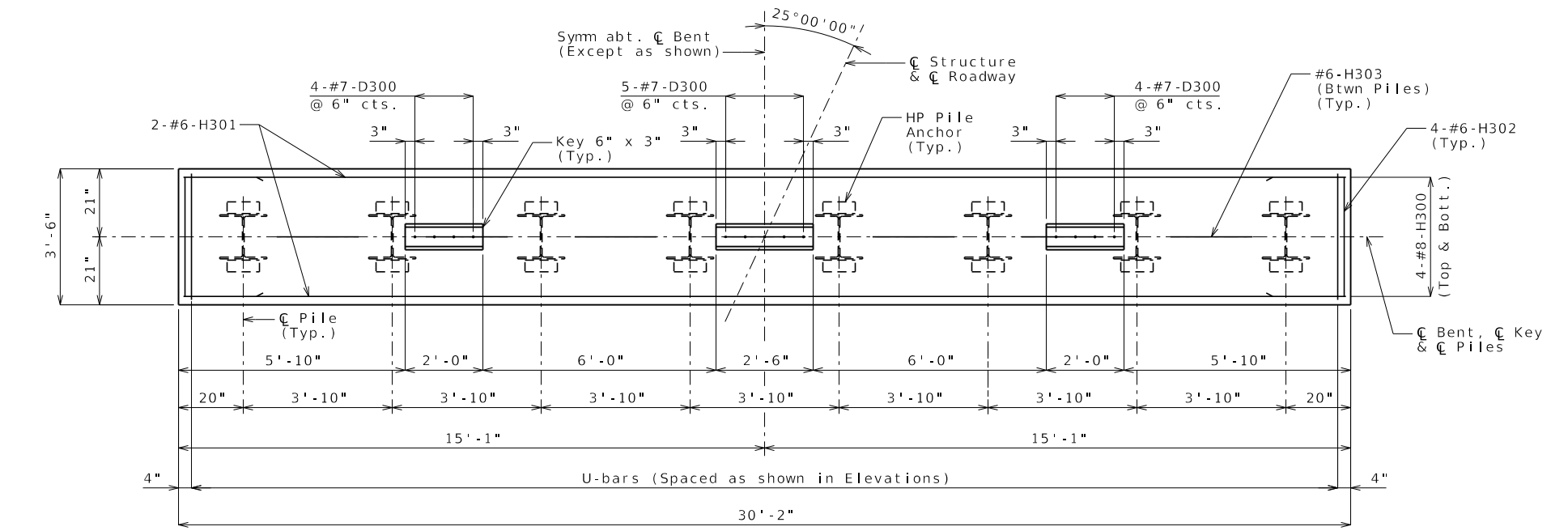


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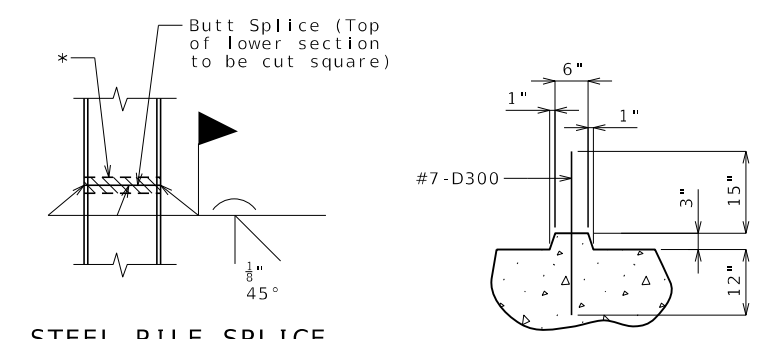
PLAN OF BEAM SHOWING DIMENSIONS



PLAN OF BEAM SHOWING REINFORCEMENT

Substructure Quantity Table for Bent No. 3		
Item	Quantity	
Galvanized Structural Steel Pile (14 in.)	linear foot	456
Pile Point Reinforcement	each	8
Class B Concrete (Substructure)	cu. yard	12.1
Reinforcing Steel (Bridges)	pound	1725
Fabricated Structural Carbon Steel (Misc.)	pound	477

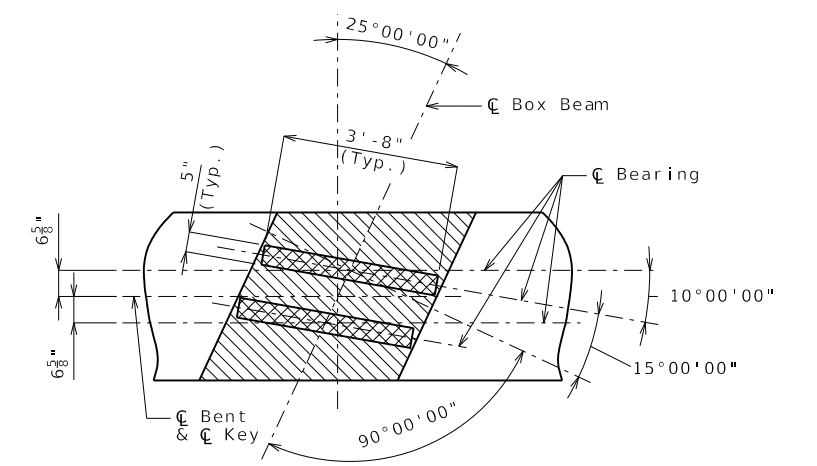
These quantities are included in the Estimated Quantities table on Sheet No. 2.



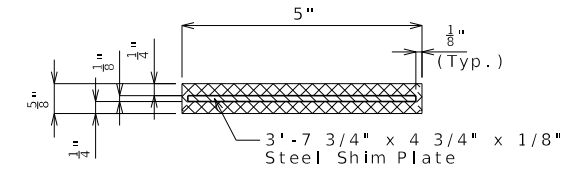
STEEL PILE SPLICE (If required)

SECTION THRU KEY

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



BEARING LAYOUT DETAIL



SECTION THRU LAMINATED NEOPRENE BEARING PAD

Notes:
 Work this sheet with Sheet No. 10.
 For details of HP Pile Anchors, see Sheet No. 10.
 Reinforcing steel shall be shifted to clear piles, U-bars shall clear by at least 1 1/2".
 For steps 2 inches or more, use 2 1/4 x 1/2 inch joint filler up vertical face.
 Furnishing and installing W8x18 sway bracing shall be completely covered by the contract unit price for Fabricated Structural Carbon Steel (Misc.).

DETAILS OF INTERMEDIATE BENT NO. 3

Detailed Aug. 2024
 Checked Sep. 2024

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

Sheet No. 9 of 44

1 REVISED 06/03/2026

\$FILES \$TIMES \$DATES

DATE PREPARED		06/03/2026	
ROUTE	Z	STATE	MO
DISTRICT	BR	SHEET NO.	9

COUNTY	CAPE GIRARDEAU
JOB NO.	19S3738
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A9349

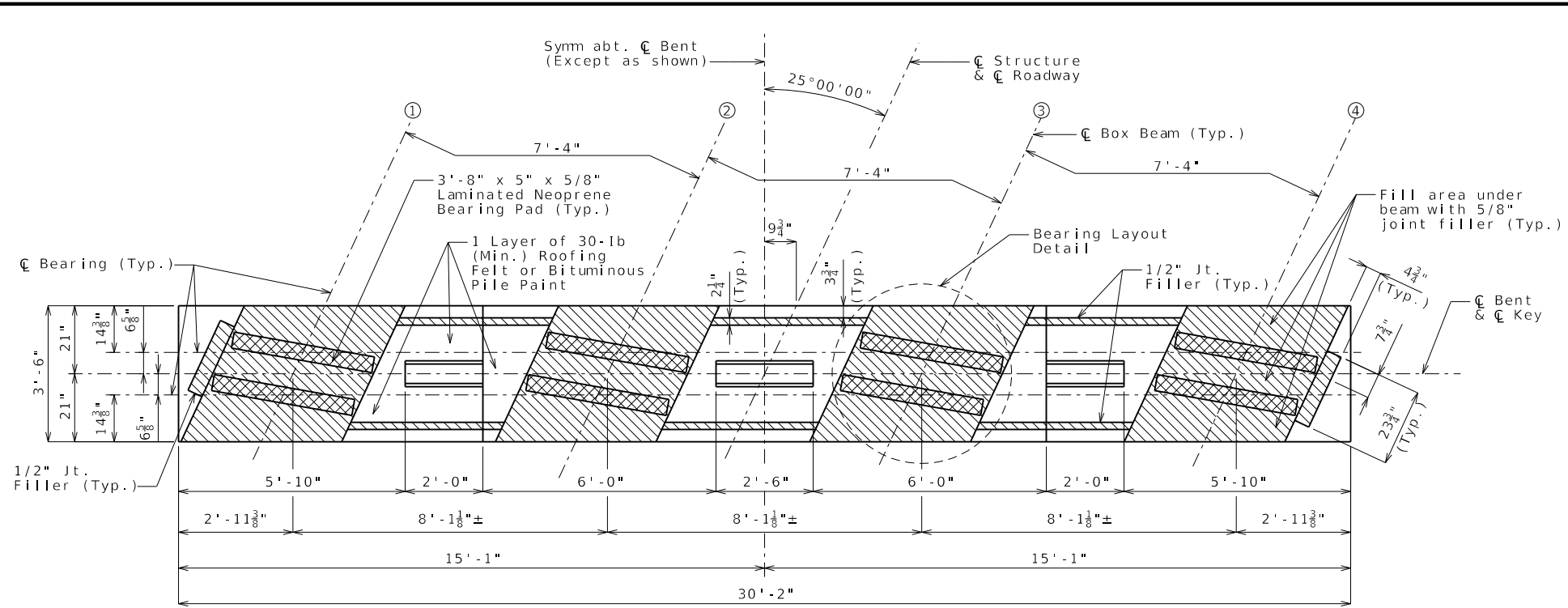
DATE	DESCRIPTION
06-03-26	ADDED FAB. STRUC. CARBON STEEL (MISC.)

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

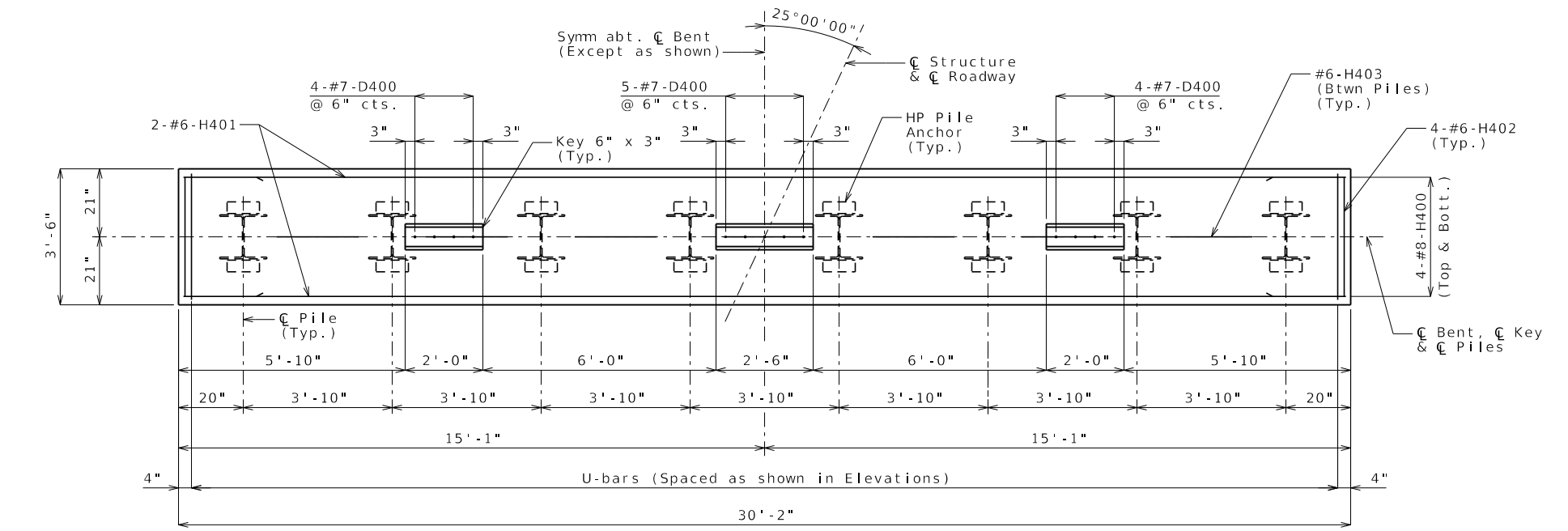
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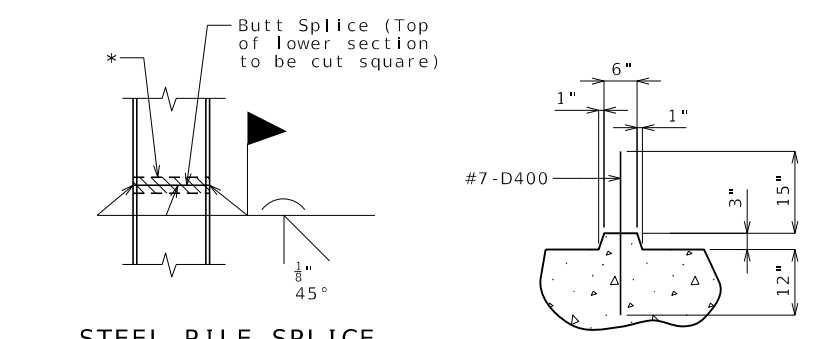
PLAN OF BEAM SHOWING DIMENSIONS



PLAN OF BEAM SHOWING REINFORCEMENT

Substructure Quantity Table for Bent No. 4		
Item	Quantity	
Galvanized Structural Steel Pile (14 in.)	linear foot	456
Pile Point Reinforcement	each	8
Class B Concrete (Substructure)	cu. yard	12.1
Reinforcing Steel (Bridges)	pound	1725
Fabricated Structural Carbon Steel (Misc.)	pound	477

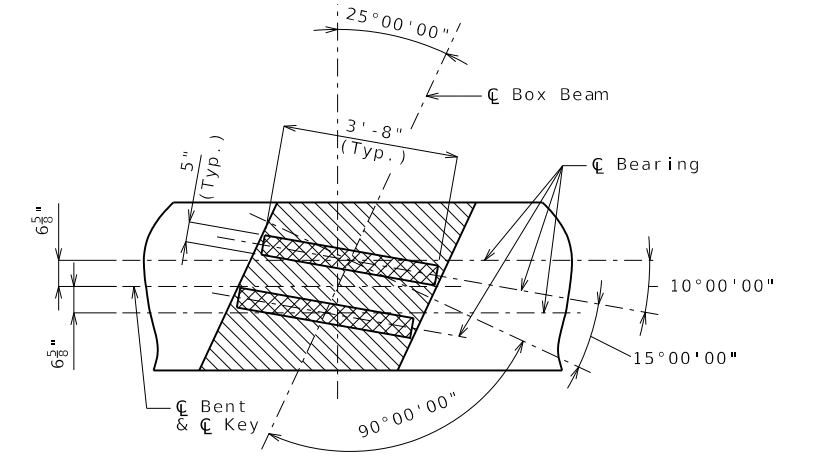
These quantities are included in the Estimated Quantities table on Sheet No. 2.



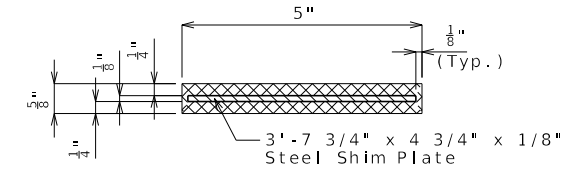
STEEL PILE SPLICE (If required)

SECTION THRU KEY

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



BEARING LAYOUT DETAIL



SECTION THRU LAMINATED NEOPRENE BEARING PAD

Notes:
 Work this sheet with Sheet No. 12.
 For details of HP Pile Anchors, see Sheet No. 12.
 Reinforcing steel shall be shifted to clear piles, U-bars shall clear by at least 1 1/2".
 For steps 2 inches or more, use 2 1/4 x 1/2 inch joint filler up vertical face.

Furnishing and installing W8x18 sway bracing shall be completely covered by the contract unit price for Fabricated Structural Carbon Steel (Misc.).

DETAILS OF INTERMEDIATE BENT NO. 4

Detailed Aug. 2024
 Checked Sep. 2024

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

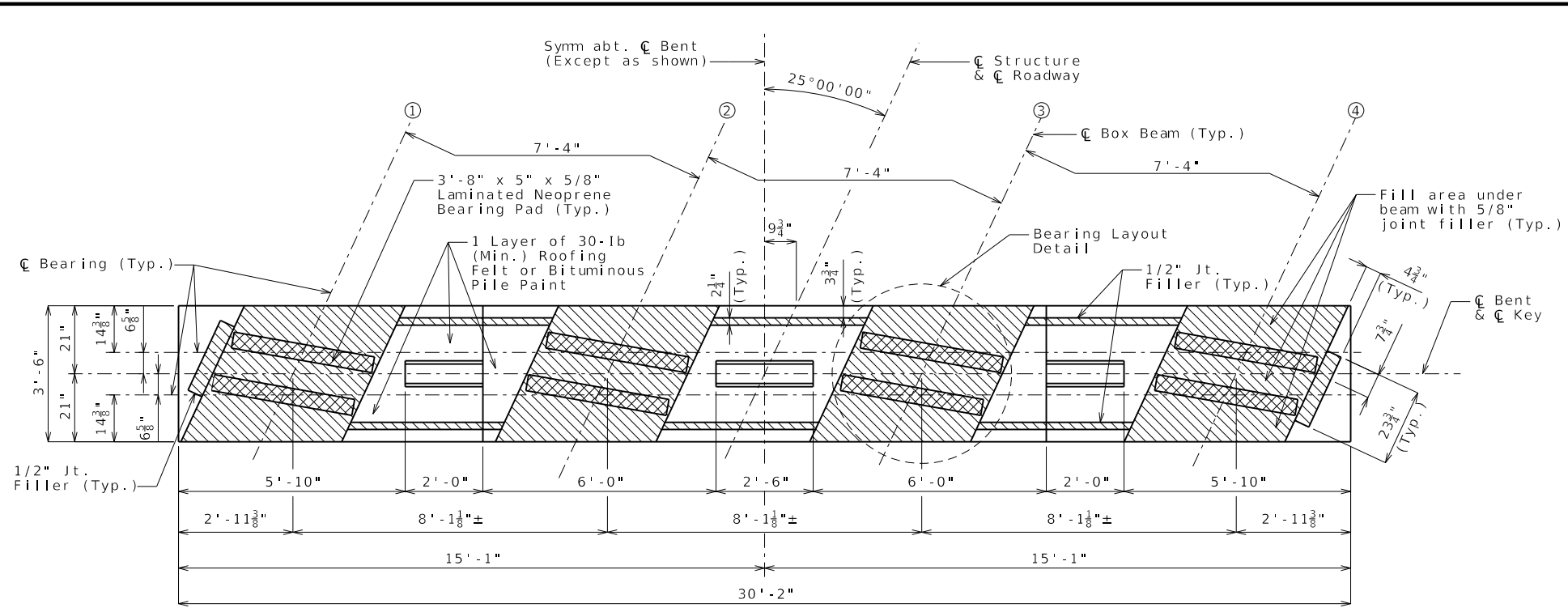
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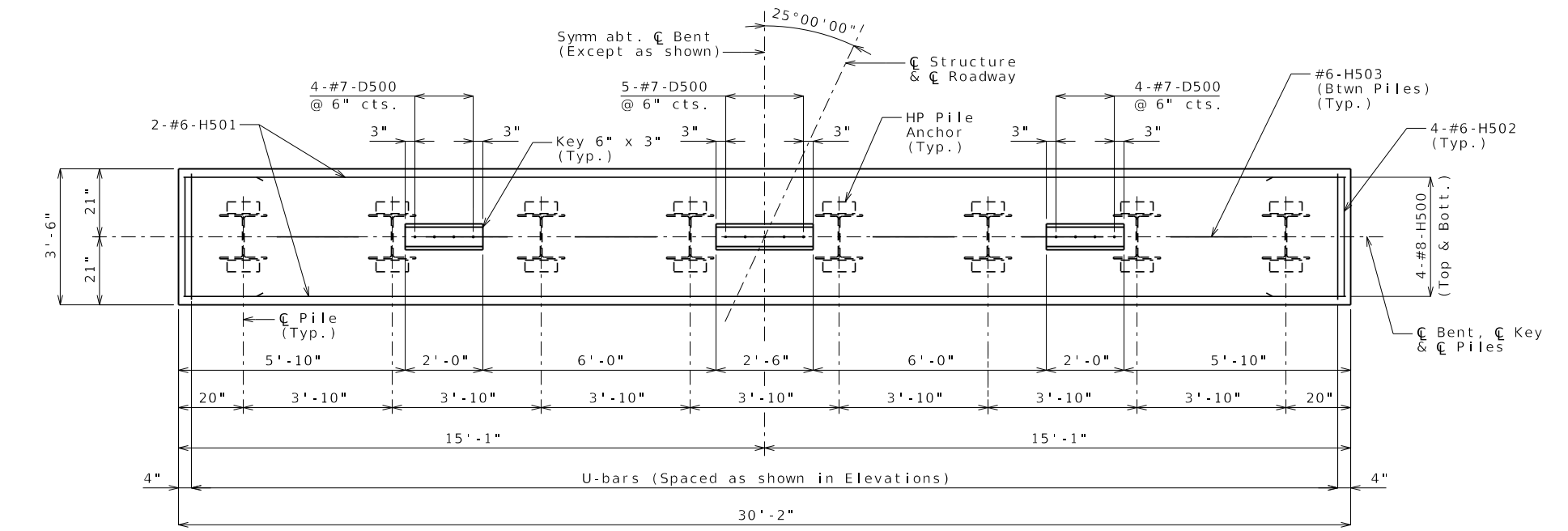
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DISTRICT BR	SHEET NO. 11
COUNTY CAPE GIRARDEAU	
JOB NO. 19S3738	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A9349	
DESCRIPTION MODDED FAB. STRUC. CARBON STEEL (MISC.)	DATE 06-03-26
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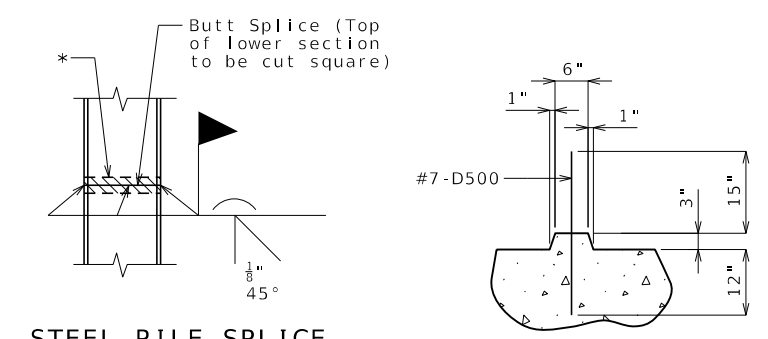
PLAN OF BEAM SHOWING DIMENSIONS



PLAN OF BEAM SHOWING REINFORCEMENT

Substructure Quantity Table for Bent No. 5		
Item	Quantity	Unit
Galvanized Structural Steel Pile (14 in.)	440	linear foot
Pile Point Reinforcement	8	each
Class B Concrete (Substructure)	12.2	cu. yard
Reinforcing Steel (Bridges)	1725	pound
Fabricated Structural Carbon Steel (Misc.)	477	pound

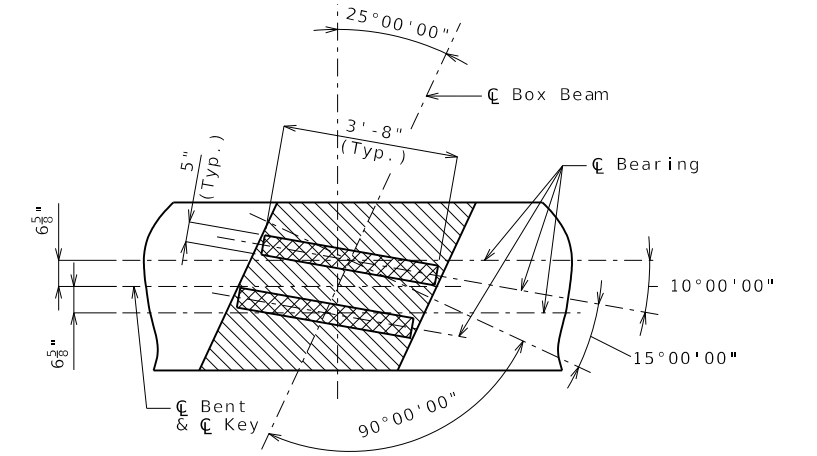
These quantities are included in the Estimated Quantities table on Sheet No. 2.



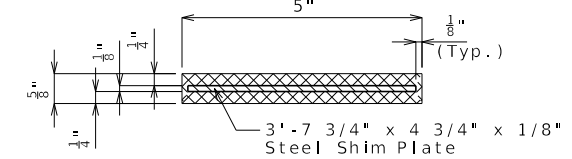
STEEL PILE SPLICE (If required)

SECTION THRU KEY

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



BEARING LAYOUT DETAIL



SECTION THRU LAMINATED NEOPRENE BEARING PAD

Notes:
 Work this sheet with Sheet No. 14.
 For details of HP Pile Anchors, see Sheet No. 14.
 Reinforcing steel shall be shifted to clear piles, U-bars shall clear by at least 1 1/2".
 For steps 2 inches or more, use 2 1/4 x 1/2 inch joint filler up vertical face.
 Furnishing and installing W8x18 sway bracing shall be completely covered by the contract unit price for Fabricated Structural Carbon Steel (Misc.).

DETAILS OF INTERMEDIATE BENT NO. 5

Detailed Aug. 2024
 Checked Sep. 2024

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

Sheet No. 13 of 44

1 REVISED 06/03/2026

DATE PREPARED 06/03/2026	
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DISTRICT BR	SHEET NO. 13
COUNTY CAPE GIRARDEAU	
JOB NO. 19S3738	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A9349	
DESCRIPTION MODDED FAB. STRUC. CARBON STEEL (MISC.)	DATE 06-03-26
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	
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