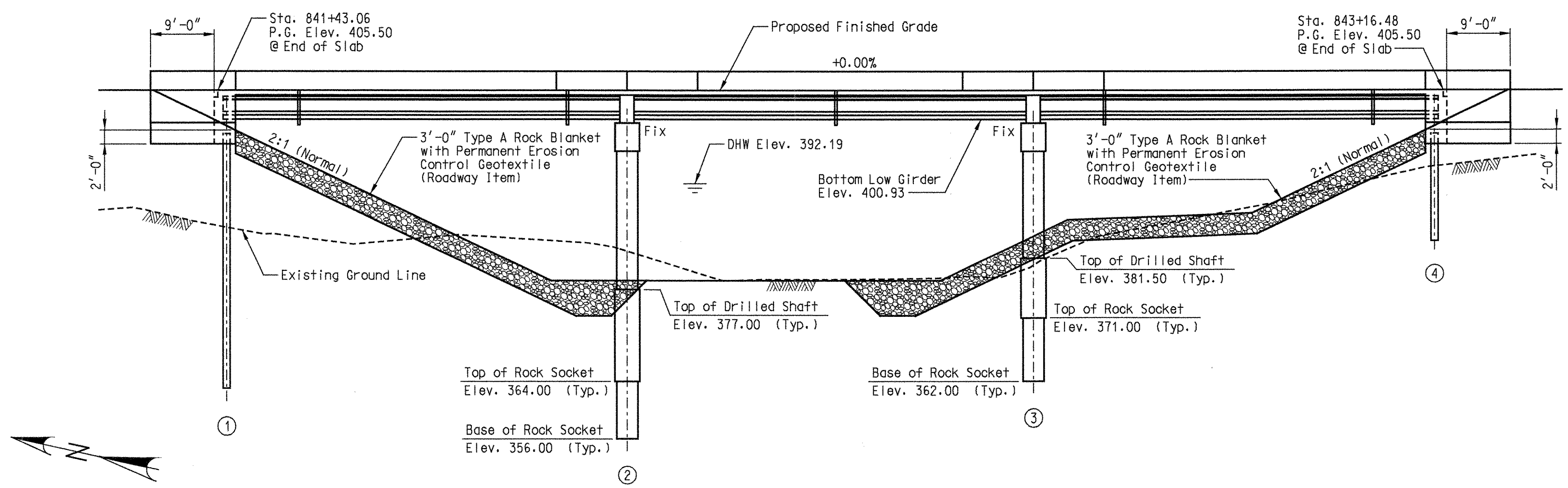
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

(57.5'-57.5'-57.5') Continuous Composite Prestressed Concrete I-Girder Spans

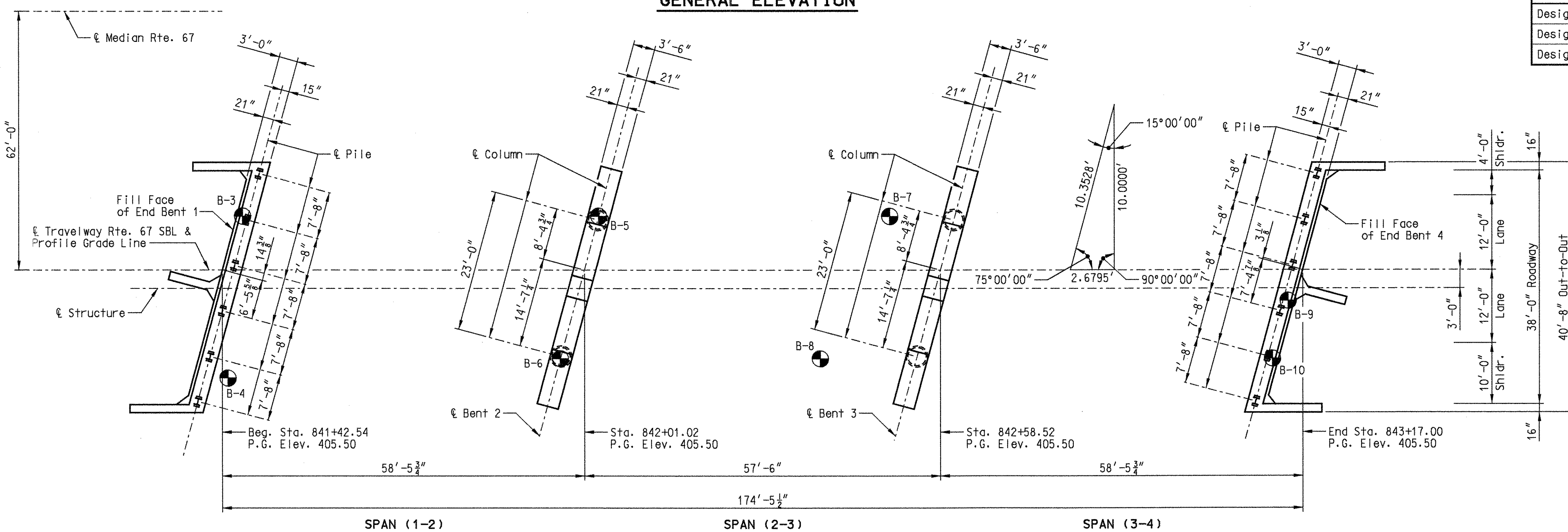
ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	01
JOB NO. JOP0930A			
CONTRACT ID			
PROJECT NO.			
COUNTY WAYNE			
SEC. 18	TWP. 27N	RGE. 6E	

STATE OF MISSOURI JEFFREY B. SMITH NUMBER E-27175 PROFESSIONAL ENGINEER 5-15-07

DATE 05/15/07

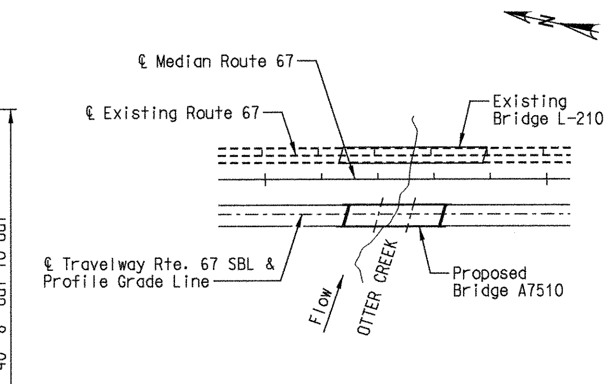


GENERAL ELEVATION



PLAN

HYDROLOGIC DATA
Drainage Area = 48.83 sq. mi. (Hilly)
BACKWATER/BASE FLOOD DATA (100 YEAR)
High Water Elev. = 394.60
Design Discharge = 13,925 cfs
Estimated Backwater = 1.86 ft
Average Velocity thru Opening = 10.82 ft/s
FREEBOARD
Design Frequency = 50 years
Design Discharge = 11,841 cfs
Freeboard = 9.19 ft
Design High Water (DHW) Elev. = 392.19
ROADWAY OVERTOPPING
Design Elev. (1' below shoulder) = 404.22
Design Discharge = > 18,907 cfs
Design Frequency = > 500 years



LOCATION SKETCH

Notice and Disclaimer Regarding Boring Log Data

Indicates location of borings.

The locations of all subsurface borings for this structure are shown on the bridge plan. Boring data for the numbered locations is shown on Sheet Nos. 3 thru 5. 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, is available from the Project Contact upon written request as outlined in the Project Special Provisions. No greater significance or weight should be given to the boring data depicted on the plan sheets than is subsurface data available from the district or elsewhere.

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

Notes:
All Bents are parallel.
All dimensions are horizontal.
All stations are along ℄ Median Rte. 67.
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.
SBL denotes South Bound Lane.

B.M. #209, PK Nail in NE BR Curb, 59' Lt. of Sta. 841+34.00 Elev. 402.35

B.M. #210, PK Nail in SW BR Curb, 26' Lt. of Sta. 843+95.00 Elev. 402.39

BRIDGE OVER OTTER CREEK

STATE ROAD: FROM RTE. F TO RTE. 172

ABOUT 4.6 MILES S. OF RTE. F

PROJECT NO. — STA. 841+42.54

JOB. NO. JOP0930A — RTE. 67

STD. 617.10

STD. 706.35

A7510

Detailed FEB 2007
Checked APR 2007

HNTB

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

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	02

JOB NO. J0P0930A

CONTRACT ID

PROJECT NO.

COUNTY WAYNE

STATE OF MISSOURI JEFFREY B. SMITH NUMBER E-27175 REGISTERED PROFESSIONAL ENGINEER 5-15-07

DATE 05/15/07

GENERAL NOTES:

Design Specifications:
2002 - AASHTO 17th Edition
Load Factor Design
Seismic Performance Category B
Acceleration Coefficient = 0.13

Design Loading:
HS20 Modified
35#/Sq. Ft. Future Wearing Surface
Military 24,000# Tandem Axle
Earth 120#/Cu. Ft., Equivalent Fluid Pressure 60#/Cu. Ft.
Superstructure: Simply-supported, non-composite for dead load. Continuous composite for live load.

Design Unit Stresses:
Class B Concrete (Substructure) f'c = 3,000 psi
Class B-2 Concrete (Drilled Shafts & Rock Sockets) f'c = 4,000 psi
Class B-2 Concrete (Superstructure, except Prestressed Girders and Safety Barrier Curb) f'c = 4,000 psi
Class B-1 Concrete (Safety Barrier Curb) f'c = 4,000 psi
Reinforcing Steel (Grade 60) fy = 60,000 psi
Structural Carbon Steel (ASTM A709 Grade 36) fy = 36,000 psi
Steel Pile (ASTM A709 Grade 36) fb = 9,000 psi fy = 36,000 psi
For precast prestressed panel stresses, see Sheet No. 23.
For prestressed girder stresses, see Sheet Nos. 18 and 19.

Neoprene Pads:
Bearings shall be 60 durometer neoprene pads.

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.

Miscellaneous:
"Sec" refers to the sections in the standard and supplemental specifications unless specified otherwise.
Bridge approach slabs at End Bents 1 and 4 will be constructed under Job No. J0P0930.

Abbreviations:
E.F. denotes Each Face
N.F. denotes Near Face
F.F. denotes Far Face

ESTIMATED QUANTITIES

	Item		Substr.	Superstr.	Total
	Drilled Shafts (3 ft. 6 in. Dia.)	linear foot	47.0	---	47.0
	Rock Sockets (3 ft. 0 in. Dia.)	linear foot	34.0	---	34.0
	Supplementary Television Camera Inspection	each	2	---	2
	Foundation Inspection Holes	linear foot	74.0	---	74.0
	Concrete Coring	linear foot	42.5	---	42.5
	Sonic Logging Testing	each	4	---	4
	Structural Steel Piles (12 in.)	linear foot	318	---	318
	Pre-Bore for Piling	linear foot	92	---	92
	Pile Point Reinforcement	each	12	---	12
	Class B Concrete (Substructure)	cu. yard	100.9	---	100.9
	Slab on Concrete I-Girder	sq. yard	---	784	784
*	Safety Barrier Curb	linear foot	---	385	385
	Prestressed Concrete I-Girder, 57 ft Span	each	---	15	15
	Reinforcing Steel (Bridges)	pound	27,890	---	27,890
	Mechanical Bar Splice	each	56	---	56
	Steel Intermediate Diaphragm for P/S Concrete Girders	each	---	12	12
	Slab Drain	each	---	10	10
	Vertical Drain at End Bents	each	---	---	2
	Plain Neoprene Bearing Pad	each	---	10	10
	Laminated Neoprene Bearing Pad	each	---	20	20

Notes:
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 bent cap is included in the Estimated Quantities for Slab on Concrete I-Girder.
Plain and Laminated Neoprene Bearing Pads shall be in accordance with Sec 716.
Cost of channel shear connectors C4 x 5.4 (ASTM A709 Grade 36) in place will be considered completely covered by the contract unit price for Structural Steel Piles (12 in.).
* Safety barrier curb shall be cast-in-place option or slip-form option.
Cost of any required excavation for bridge will be considered completely covered by the contract unit price for other items.

ESTIMATED QUANTITIES FOR SLAB ON CONCRETE I-GIRDER

Item		Total
Class B-2 Concrete	cu. yard	203.6
Reinforcing Steel	pound	11,900
Reinforcing Steel (Epoxy Coated)	pound	47,750

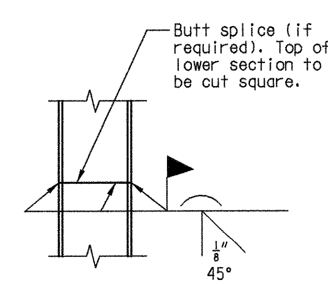
Notes:
The table of Estimated Quantities for Slab on Concrete I-Girder represents the quantities used by the State in preparing the cost estimate for concrete slabs. The area of the concrete slab will be measured to the nearest square yard with the horizontal dimensions as shown on the plan of slab. Payment for prestressed panels, conventional forms, all concrete, and coated and uncoated 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.

Precast Prestressed Panels:
The Estimated Quantities for Slab on Concrete I-Girder are based on skewed precast prestressed end panels.
Class B-2 Concrete quantity is based on minimum top flange thickness and minimum joint material thickness.
The prestressed panel quantities are not included in the table of Estimated Quantities for Slab on Concrete I-Girder.

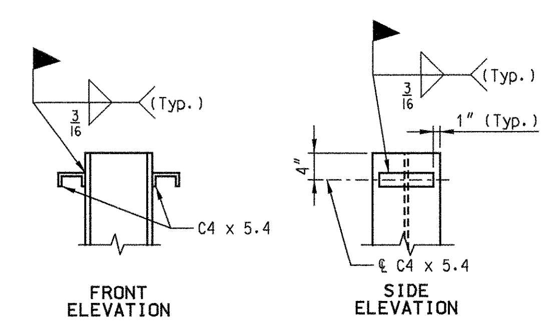
PILE AND ROCK SOCKET DATA

Bent No.			1	2	3	4
Bearing Pile	Pile Type and Size		HP12x53	---	---	HP12x53
	Number		6	---	---	6
	Approximate Length	foot	37	---	---	16
	Design Bearing	ton	59	---	---	59
	Hammer Energy Required	foot-pound	13,300	---	---	13,300
Rock Sockets	Foundation Material		---	Rock	Rock	---
	Number		---	2	2	---
	Design Side Friction	ton/sq. foot	---	4.5	4.5	---

Minimum energy requirement of hammer is based on plan length and design bearing value of piles.
All piles shall be driven to practical refusal.
Prebore for piles at End Bent 1 to Elevation 386.00.
Prebore to natural ground line at End Bent 4.
Manufactured pile point reinforcement shall be used on all piles in this structure.



STEEL PILE SPLICE



DETAILS OF PILE ANCHORS

STATE OF MISSOURI
LAWRENCE F. ROLWES
NUMBER PE-2006002847
REGISTERED PROFESSIONAL ENGINEER
5/15/07

DATE 05/15/07

QU(TSF)
P-Penet.
E-Equiv.
L-Labor.

STANDARD PENETRATION TEST

DEPTH	BLOWS/6"	
		ELEV. 388.6
		Reddish-brown lean clay, with fine grained sand, moist, stiff.
		ELEV. 377.1
		Brown clayey coarse grained sand, moist, dense.
		ELEV. 365.3
		Buff cherty limestone, hard.
		ELEV. 364.8

Boring No. B-3
End Bent 1
841+43.5, 9.0' Lt.

QU(TSF)
P-Penet.
E-Equiv.
L-Labor.

STANDARD PENETRATION TEST

QU(TSF)	DEPTH	BLOWS/6"	
			ELEV. 385.1
	5.0	3-5-5	
	10.0	2-6-7	Reddish-brown fine to coarse grained silty sand, dry from 0.0 to 2.9', wet from 2.9 to 18.8', gravelly from 7.1 to 11.8', medium dense.
	15.0	5-5-3	

ROCK CORE

QU(TSF)	DEPTH	REC%	RQD%	
				ELEV. 366.9
	23.8	84	20	
548.3L	27.3			
	28.8	100	60	
461.3L	31.7			Tannish-gray medium to coarse grained sandy dolomite, scattered chert nodules and partings, scattered calcite filled vugs and partings, clay seam from 22.3 to 23.1' and highly weathered layer at 40.6 to 41.8', which washed away during coring and accounts for loss in corresponding runs, moderately hard to hard, very poor to fair quality, cut with rockbit from 18.2 to 18.8'.
	33.8	100	48	
530.3L	37.0			
	38.8	100	46	
	43.8	76	20	
670.0L	47.7			
	48.8	100	30	ELEV. 336.3

Boring No. B-4
End Bent 1 (Core)
841+48.2, 18.3' Rt.

TYPICAL BORING

QU(TSF)
P-Penet.
E-Equiv.
L-Labor.

STANDARD PENETRATION TEST

QU(TSF)	DEPTH	BLOWS/6"	ELEV.
			ELEV. 902.2
	2.0	3-2-3	
657.6 L	3.5		
	7.0	50/3"	

ROCK CORE

DEPTH	REC%	RQD%	ELEV.
			ELEV. 892.2
15.0	82	0	ELEV. 887.2

Ground surface elevation

Unconfined Compressive Strength in tons per square foot as determined by P- Pocket Penetrometer, E- Equivalent or L- Laboratory Unconfined Compression Test. Depth of sample is indicated at top of the sampling interval.

Ground Water Level as measured at hours indicated after completion of boring.

0

Standard Penetration Test Results. The number of blows of a 140 lb. hammer falling 30" required to drive a 1-3/8" I.D., 2" O.D. split barrel sampler 6". Penetration of less than 6" is shown as 50/3"-Blows/penetration in inches. Depth of sample is indicated at top of the sample interval.

Stratum Line-Material Change

Elevation of Material Change

Interval of bedrock that was sampled with double tube core barrel. Depth of sample is indicated at the bottom of the sample interval.

RQD-(Rock Quality Designation) a modified core recovery in percent used as an index to rock quality.

RQD(%)	Rock Quality Designation
0-25	Very Poor
25-50	Poor
50-75	Fair
75-90	Good
90-100	Excellent

Core Run (REC%)- Core Recovery in percent for the indicated interval.

Boring No. B-3
Bent 2 (Core)
840+59, 9.0' Lt.

Substructure Unit Number

Boring Number

Boring Location

General Notes:
The borings shown on this drawing were drilled by the Missouri Department of Transportation, between December 7, 2006 and December 19, 2006.
For boring locations in plan, see Sheet No. 1.
The ground water levels shown were recorded during time of drilling. Porosity of soil strata, weather conditions, seasonal changes, site topography, etc., may cause changes in the water levels reported.
The boring information shown on this drawing is abbreviated. A complete copy of boring logs and test results are available upon request to the Department.
For notice and disclaimer regarding boring log data, see Sheet No. 1.

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	04

JOB NO. JOP0930A

CONTRACT ID

PROJECT NO.

COUNTY WAYNE

STATE OF MISSOURI LAWRENCE F. ROLWES NUMBER PE-2006002847 REGISTERED PROFESSIONAL ENGINEER

5/15/07

DATE 05/15/07

Boring No. B-5
Bent 2 (Core)
842+01.0, 9.0' Lt.

QU(TSF)
P-Penet.
E-Equiv.
L-Labor.

DEPTH	BLOWS/6" (STANDARD PENETRATION TEST)
5.0	1-4-8
10.0	1-1-6
15.0	3-6-6

ELEV. 383.5

Reddish-brown clayey medium to coarse grained sand, medium dense, with fine gravel interlayered with stiff moist gray sandy lean clay.

ELEV. 365.1

QU(TSF)	DEPTH (ROCK CORE)	REC%	RQD%
	24.3	94	16
1363.5L	25.1		
	28.6	100	28
952.3L	31.1		
	33.6	100	92
	38.6	100	74
1029.3L	41.3		
	43.6	94	60
234.3L	47.2		
	48.6	100	64

Tannish-gray medium to coarse grained sandy dolomite, with vertical fractures, scattered chert nodules and partings, scattered calcite filled vugs and partings, very poor to excellent quality, hard, cut with rockbit from 18.4 to 19.3'.

ELEV. 334.9

Boring No. B-6
Bent 2
842+01.0, 15.0' Rt.

QU(TSF)
P-Penet.
E-Equiv.
L-Labor.

STANDARD PENETRATION TEST: DEPTH | BLOWS/6"

ELEV. 381.0

Reddish-brown sandy lean clay, with gravel from 3.1 to 15.4', moist, medium stiff.

ELEV. 365.6

Buff cherty dolomite, hard.

ELEV. 365.2

Boring No. B-7
Bent 3
842+48.0, 9.0' Lt.

QU(TSF)
P-Penet.
E-Equiv.
L-Labor.

STANDARD PENETRATION TEST: DEPTH | BLOWS/6"

ELEV. 377.8

Reddish-brown coarse grained sand and gravel, wet, medium dense.

ELEV. 372.6

Buff cherty dolomite, hard.

ELEV. 371.8

Note:
For Typical Boring and General Notes, see Sheet No. 3.

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	05

JOB NO. J0P0930A

CONTRACT ID

PROJECT NO.

COUNTY WAYNE

STATE OF MISSOURI LAWRENCE ROLWES NUMBER PE-2006002847 REGISTERED PROFESSIONAL ENGINEER

5/15/07

DATE 05/15/07

Boring No. B-8

Bent 3 (Core)
842+43.0, 15.0' Rt.

QU(TSF) P-Penet. E-Equiv. L-Labor.	STANDARD PENETRATION TEST DEPTH	BLOWS/6"		
			ELEV. 377.8	
				Reddish-brown coarse grained sand and gravel, with clay, medium dense.
			ELEV. 373.0	
				Weathered dolomite.
			ELEV. 372.1	

ROCK CORE DEPTH	REC%	RQD%		
10.7	96	85		
15.7	100	90		Buff cherty dolomite, fine grained, thin to thick bedded.
20.7	100	98		
25.7	100	90	ELEV. 352.1	

Boring No. B-9

End Bent 4 (Core)
843+16.0, 2.3' Rt.

QU(TSF) P-Penet. E-Equiv. L-Labor.	STANDARD PENETRATION TEST DEPTH	BLOWS/6"		
			ELEV. 395.1	
3.5P	1.0			
3.0P	2.5	2-3-5		Reddish-orange fat clay, with tan mottles, with fine to coarse angular chert gravel, moist, very stiff.
2.2P	5.5			
3.8P	7.5	6-12/4"-10/0"	ELEV. 386.9	
				Tan sandy weathered dolomite, cut with rockbit.
			ELEV. 386.6	

QU(TSF)	ROCK CORE DEPTH	REC%	RQD%		
	13.5	100	100		
464.3L	18.1				Tannish-gray fine to medium grained sandy dolomite, scattered chert nodules and seams, red fat clay seam from 16.2 and 16.3', thick bedded, good to excellent quality, hard.
	18.5	98	84		
700.3L	23.2				
	23.5	100	100		
578.2L	27.7				
	28.0	100	100	ELEV. 367.1	

Boring No. B-10

End Bent 4
843+16.0, 15.0' Rt.

QU(TSF) P-Penet. E-Equiv. L-Labor.	STANDARD PENETRATION TEST DEPTH	BLOWS/6"		
			ELEV. 397.0	
				Reddish-brown fat clay, with gravel, stiff, moist.
			ELEV. 389.4	
				Reddish-brown to tan fat clay, with gravel, very stiff, moist.
			ELEV. 386.0	
				Rock, hard, probably dolomite.
			ELEV. 385.4	

Note:
For Typical Boring and General Notes, see Sheet No. 3.

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Detailed FEB 2007
Checked APR 2007

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

BORING DATA

A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	06

JOB NO. J0P0930A

CONTRACT ID

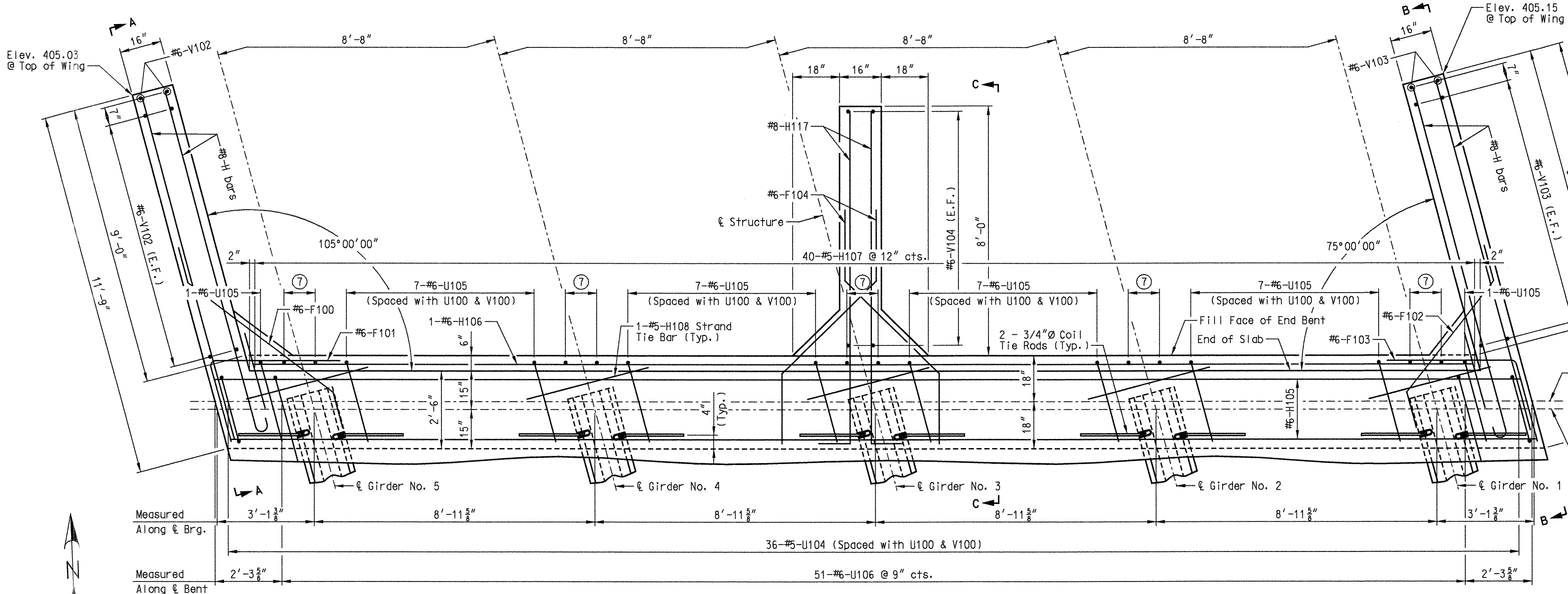
PROJECT NO.

COUNTY WAYNE

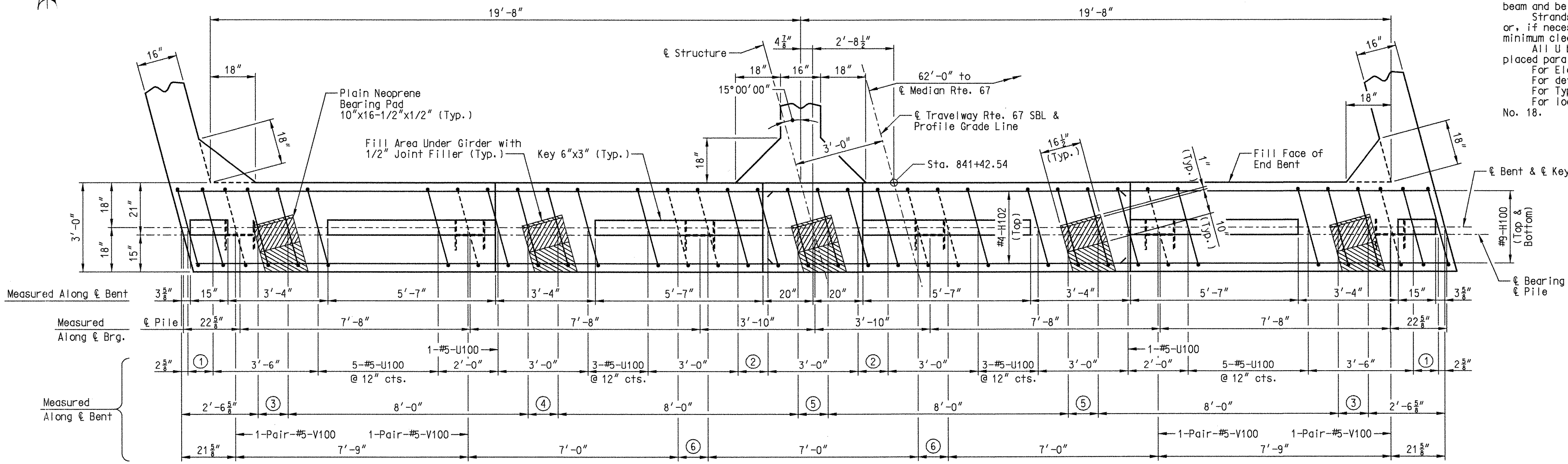
STATE OF MISSOURI JEFFREY B. SMITH NUMBER E-27175 REGISTERED PROFESSIONAL ENGINEER 5-15-07

DATE 05/15/07

(1) 3-#5-U100 @ 5" cts.
(2) 2-#5-U100 @ 12" cts.
(3) 3-#4-U102 @ 6" cts.
(4) 3-#4-U102 @ 6" cts.
(5) 3-#4-U103 @ 6" cts.
(6) 2-Pair-#5-V100 @ 12" cts.
(7) 3-#6-V101 @ 6" cts. (Spaced with U102 & U103)



PART PLAN



PLAN OF BEAM

Notes:
For reinforcement of the safety barrier curb, see Sheet Nos. 28, 29, and 30.
Bend F100, F102, and F104 bars in the field to clear girders.
All reinforcing bars in the substructure beams or caps shall be field adjusted to clear piles by at least 1-1/2".
All concrete in the end bent above top of beam and below top of slab shall be Class B-2.
Strands at end of girder shall be field bent or, if necessary, cut in field to maintain 1-1/2" minimum clearance to fill face of end bent.
All U bars and pairs of V bars are to be placed parallel to ℄ Structure.
For Elevation A-A, B-B, and C-C, see Sheet No. 8.
For detail of Bearing Pads, see Sheet No. 7.
For Typical Section Thru Key, see Sheet No. 7.
For location and details of coil ties, see Sheet No. 18.

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Detailed FEB 2007
Checked APR 2007

HNTB

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

END BENT 1 - PLANS

A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	07

JOB NO. JOP0930A

CONTRACT ID

PROJECT NO.

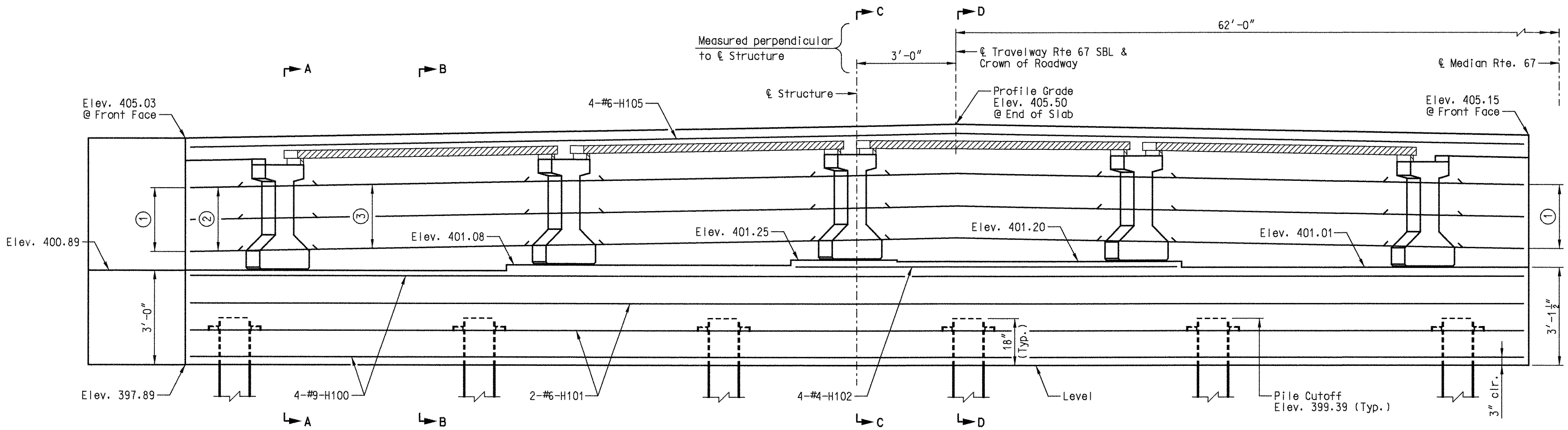
COUNTY WAYNE

DATE 05/15/07

(1) 3-#6-H103 @ 12″ cts. (Front Face)

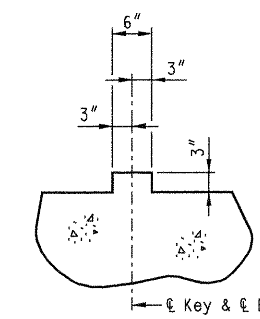
(2) 3-#6-H101 @ 12″ cts. (Fill Face) Continuous

(3) 3-#6-H104 @ 12″ cts. (Front Face Between Girders)(Typ.)

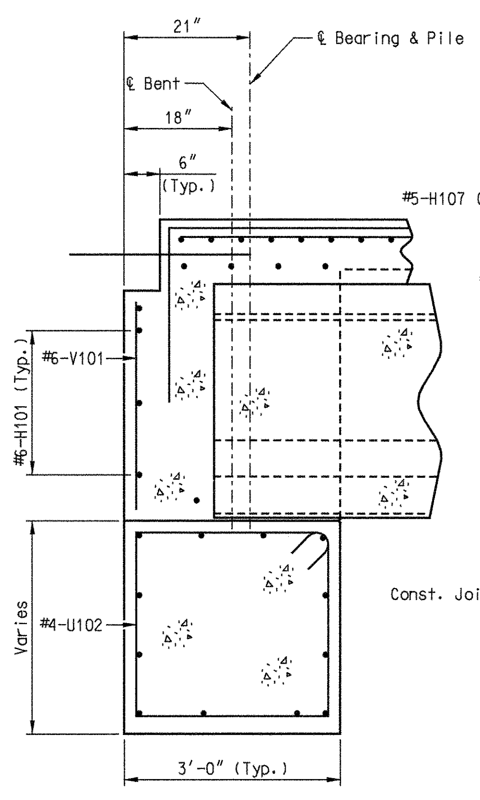


ELEVATION NEAR END BENT

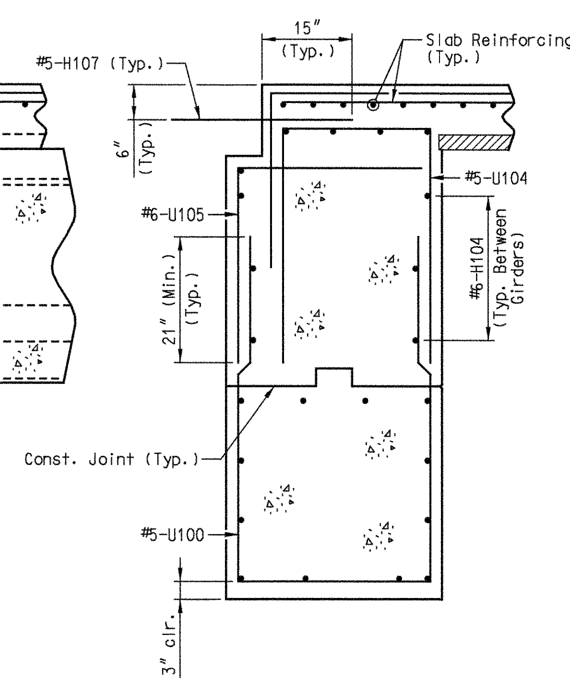
(Looking Downstation)



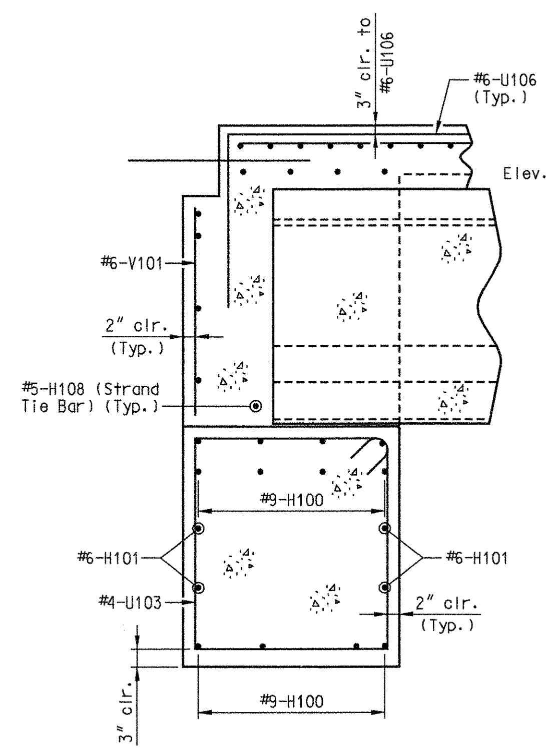
TYPICAL SECTION THRU KEY



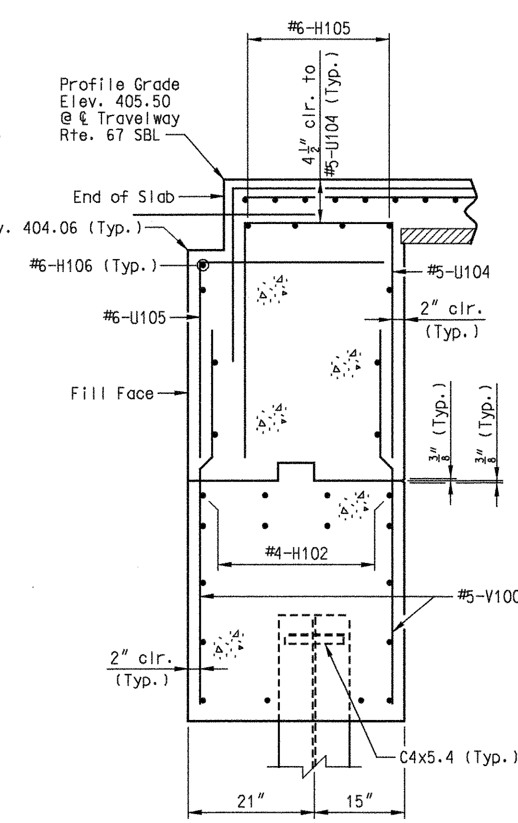
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

Notes:

All piles shall be HP12x53.

For details of End Bent not shown, see Sheet Nos. 6 & 8.

For Details of Pile Anchors, see Sheet No. 2.

For detail of Steel Pile Splice, see Sheet No. 2.

✱✱ SUBSTRUCTURE QUANTITY TABLE FOR END BENT 1

Item		Quantity
Structural Steel Piles (12 in.)	linear foot	222
Pre-Bore for Piling	linear foot	72
Pile Point Reinforcement	each	6
Class B Concrete (Substructure)	cu. yard	19.5

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

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Detailed FEB 2007
Checked APR 2007

HNTB

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

END BENT 1 - DETAILS

A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	08

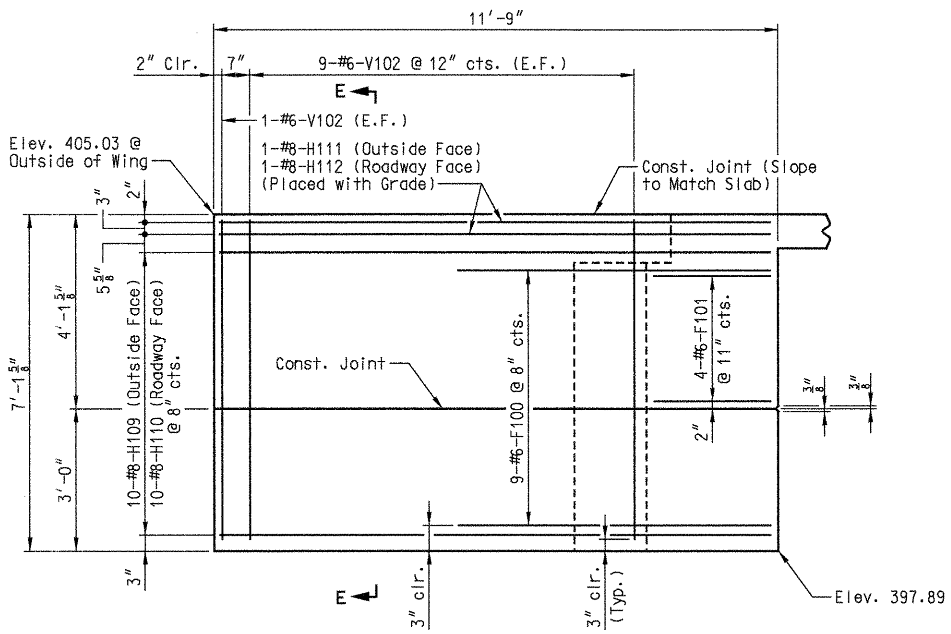
JOB NO. JOP0930A

CONTRACT ID

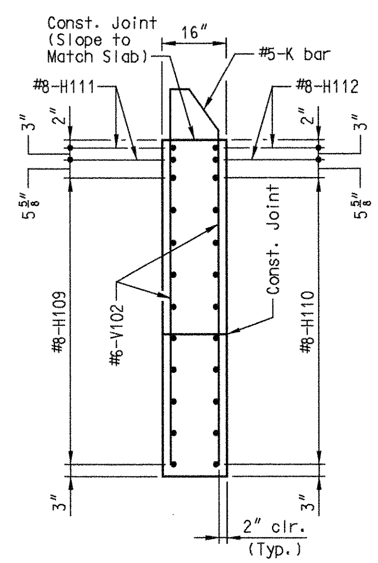
PROJECT NO.

COUNTY WAYNE

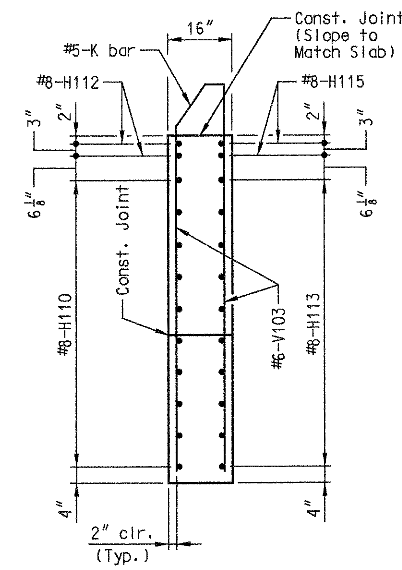
DATE 05/15/07



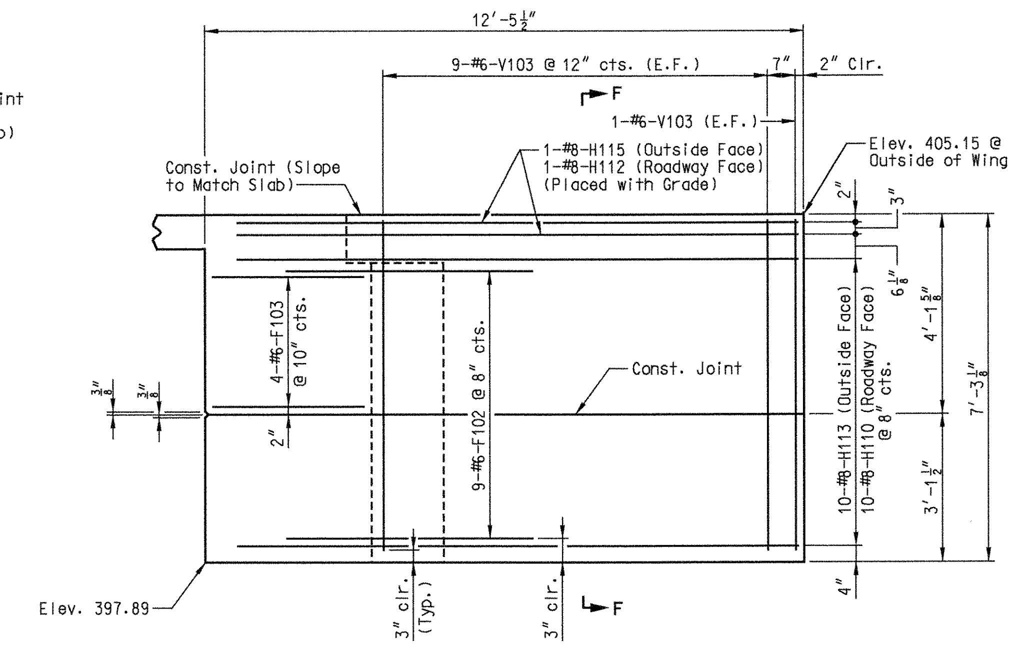
ELEVATION A-A



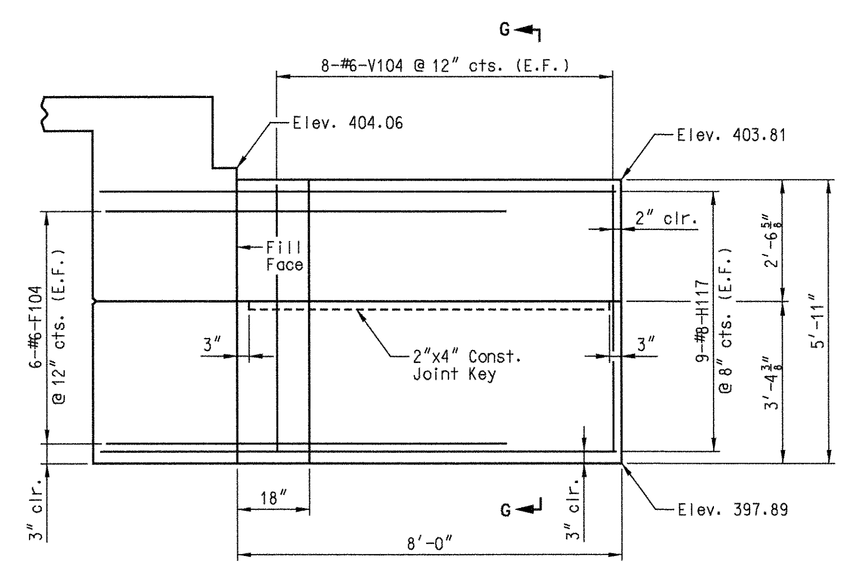
SECTION E-E



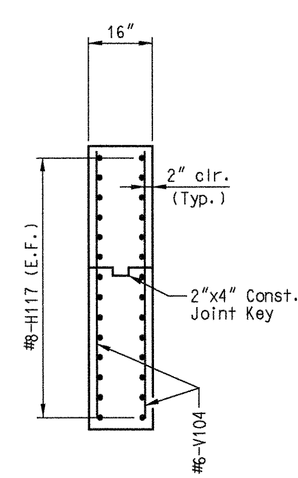
SECTION F-F



ELEVATION B-B



ELEVATION C-C



SECTION G-G

Notes:
For reinforcement of the safety barrier curb, see Sheet Nos. 28, 29, and 30.
For location of Elevations A-A, B-B, and C-C, see Sheet No. 6.

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Detailed FEB 2007
Checked APR 2007
HNTB

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

END BENT 1 - WING DETAILS

A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	09

JOB NO. JOP0930A

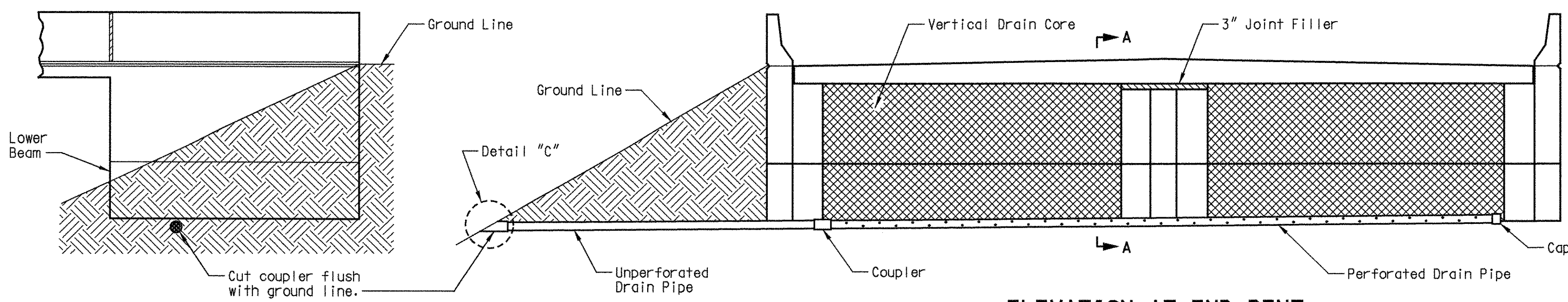
CONTRACT ID

PROJECT NO.

COUNTY WAYNE

STATE OF MISSOURI LAWRENCE E. ROLWES NUMBER E-2006002847 REGISTERED PROFESSIONAL ENGINEER 5/15/07

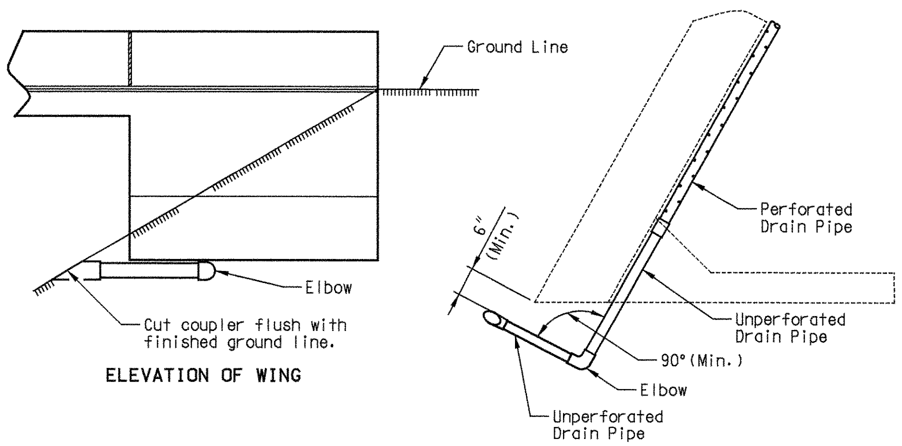
DATE 05/15/07



ELEVATION OF WING

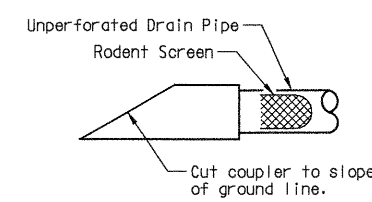
ELEVATION AT END BENT

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

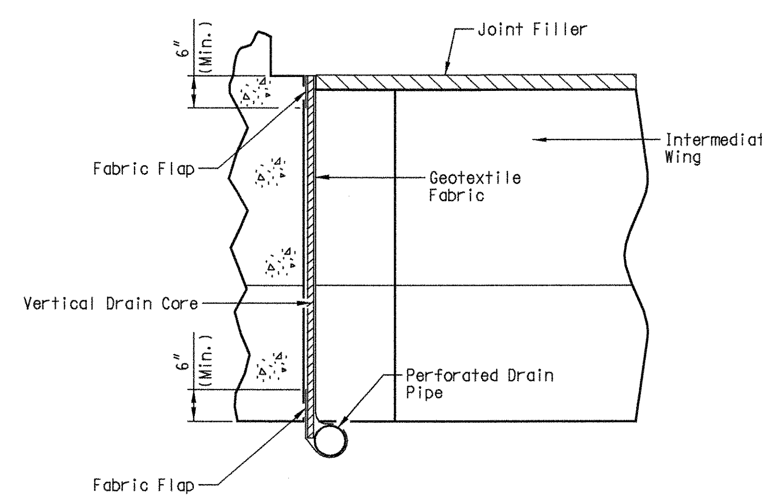


OPTIONAL BENT DRAIN (✱)

(✱) Only if rock is encountered at outside of wing.



DETAIL "C"



PART SECTION A-A

USER: hupshaw PLOTTED: 15-MAY-2007 10:51 M:\jobs\44514 Rte 67\Techprod\Bridges\A7510\Drawings\ZPLOT_JOP0930A_A7510_009_F.dgn

Detailed FEB 2007
Checked APR 2007

HNTB

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

VERTICAL DRAIN AT END BENTS

A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	10

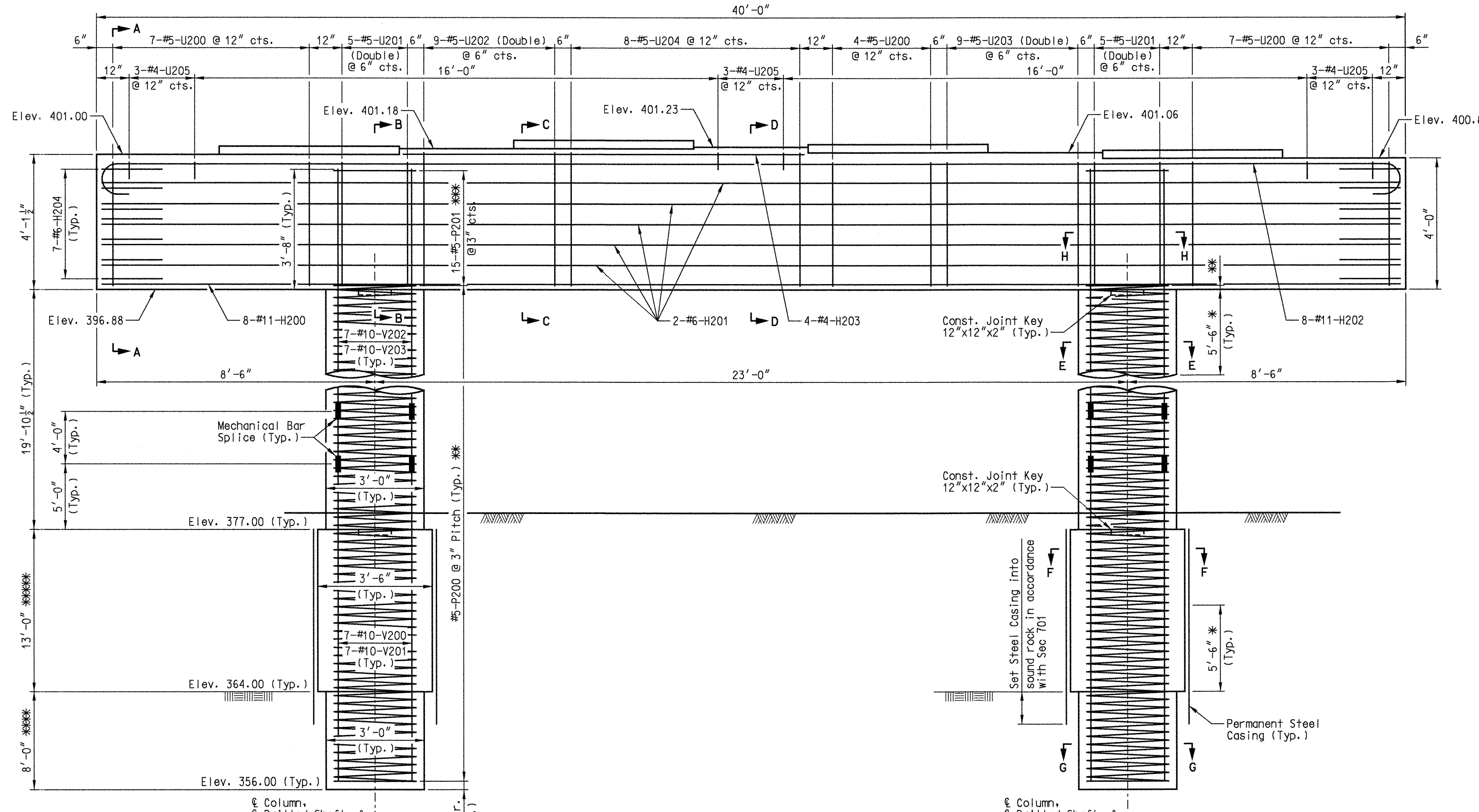
JOB NO. J0P0930A

CONTRACT ID

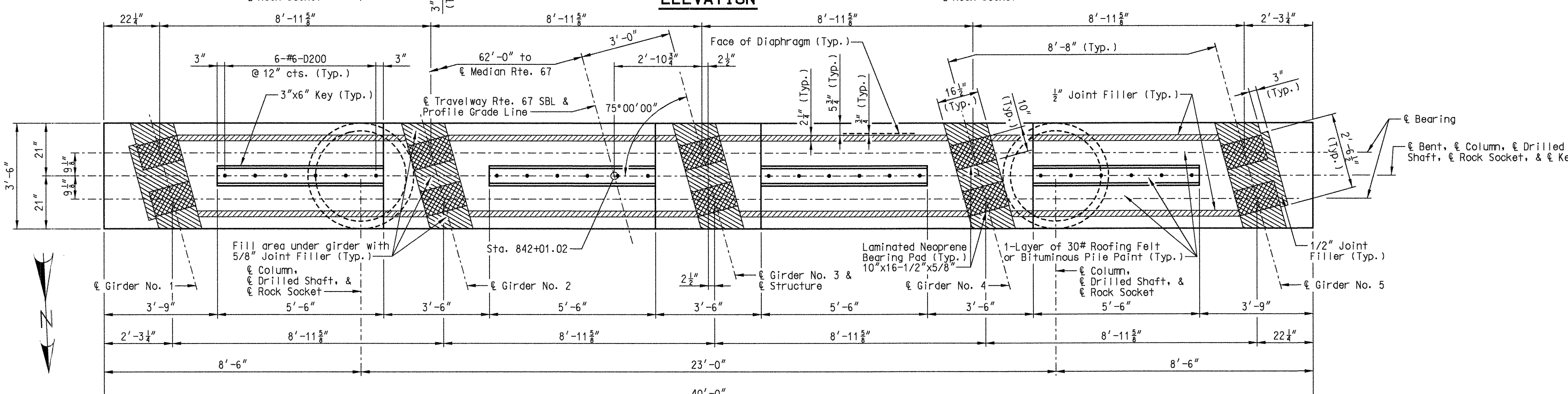
PROJECT NO.

COUNTY WAYNE

DATE 05/15/07



ELEVATION



PLAN

Notes:

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

An additional 4 feet has been added to #5-P200, #10-V200, and #10-V201 lengths for possible change in drilled shaft or rock socket depth. This excess length shall be cut-off if not required.

Concrete coring shall be performed on one of the drilled shafts in accordance with Sec 701. Sonic logging testing and foundation inspection holes shall be performed on all drilled shafts and rock sockets.

The contractor shall use a mechanical bar splice for #10-V200, #10-V201, #10-V202, and #10-V203 bars at the specified locations. The total bar lengths for bars indicated in the bill of reinforcing steel are determined based on the end of the bars being located at end of adjacent bar. No additional payment will be made for any additional bar lengths required for the mechanical bar splices. Mechanical bar splices shall be in accordance with Sec 706.

Alternatively, the contractor may eliminate the splices and use single vertical bars to replace the V200, V201, V202, and V203 bars. Lap splices will not be allowed.

The thickness of steel casing shall meet all the requirements of Sec 701 with minimum thickness being 1/2 inch.

For Sections A-A thru H-H, see Sheet No. 11.

For Typical Section Thru Laminated Neoprene Bearing Pad, see Sheet No. 11.

For Substructure Quantity Table, see Sheet No. 11.

* Lapping of spiral reinforcement in this region not permitted.

** Continue spiral bars to the bottom of the beam cap stirrup reinforcing bar.

Anchorage of spiral reinforcement shall be provided by 1-1/2 extra turns of spiral bar at each end of spiral unit.

*** Splice locations shall be staggered.

**** Pay Item Rock Socket (3 ft. 0 in. Dia.).

***** Pay Item Drilled Shaft (3 ft. 6 in. Dia.).

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

The cost of permanent casing will be considered completely covered by the contract unit price for other items.

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USER: hupshaw PLOTTED: 15-MAY-2007 10:42

Detailed FEB 2007
Checked APR 2007

HNTB

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

BENT 2 – PLAN & ELEVATION

A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	11

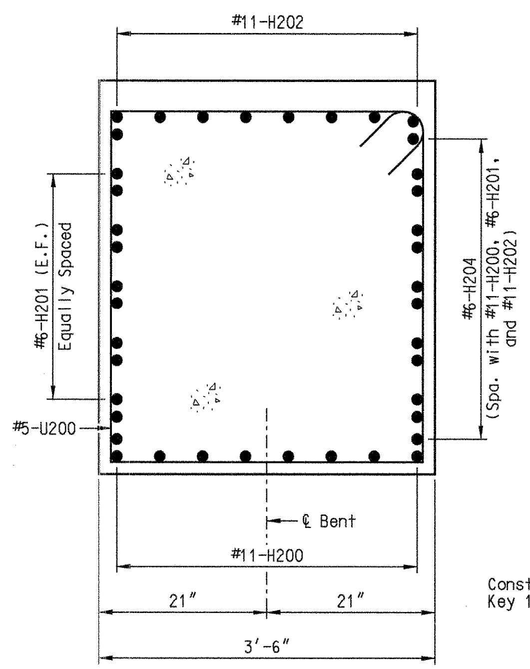
JOB NO. J0P0930A

CONTRACT ID

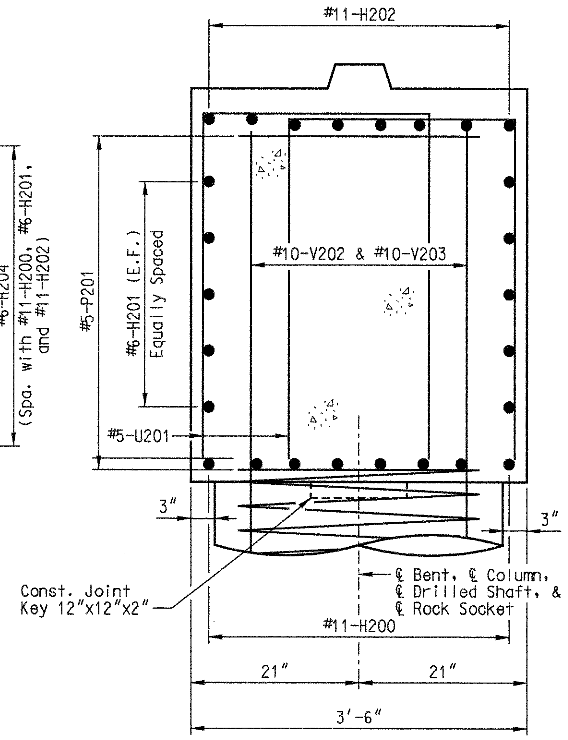
PROJECT NO.

COUNTY WAYNE

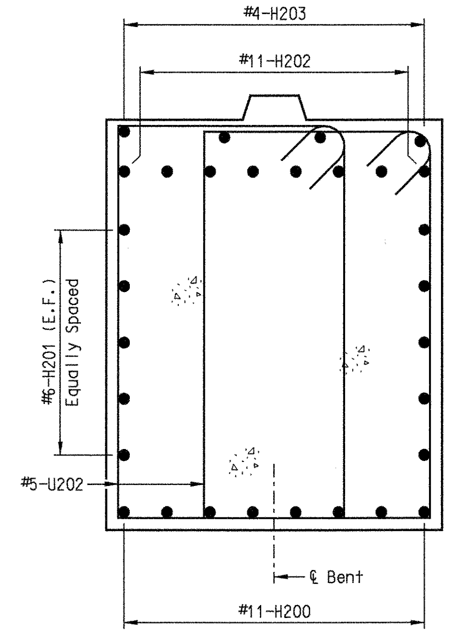
DATE 05/15/07



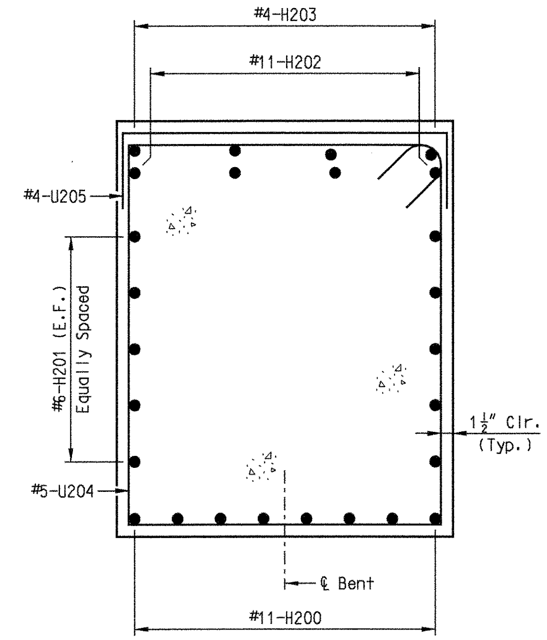
SECTION A-A



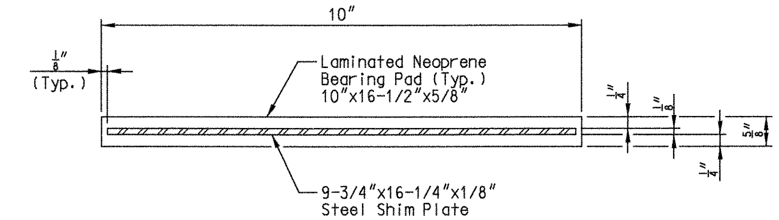
SECTION B-B



SECTION C-C



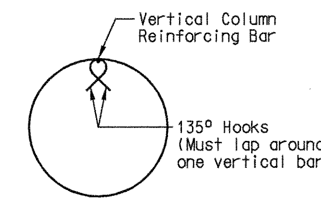
SECTION D-D



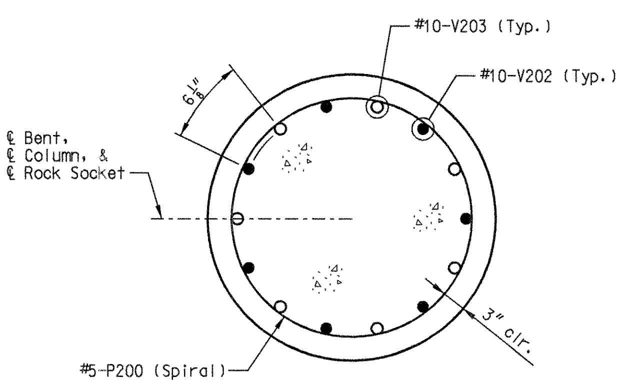
TYPICAL SECTION THRU LAMINATED NEOPRENE BEARING PAD

10 Required

Notes:
The required shim plate shall be placed between layers of elastomer and molded together to form an integral unit.
Shop drawings are not required for laminated neoprene bearings on structures without sole plates.

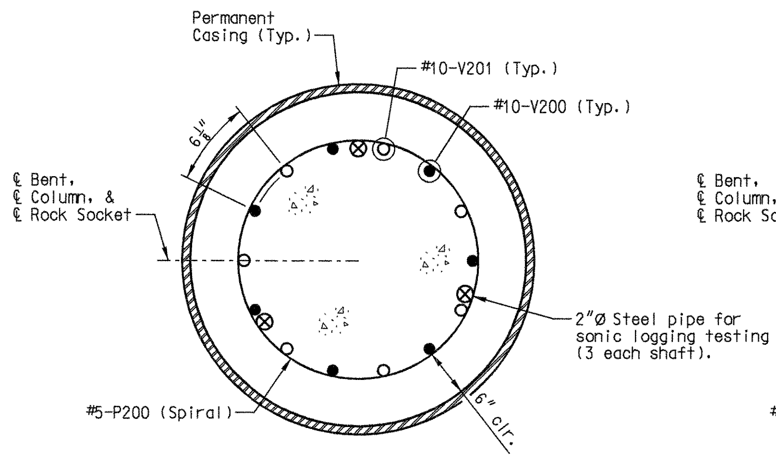


DETAIL OF SEISMIC STIRRUP BAR (#5-P201)



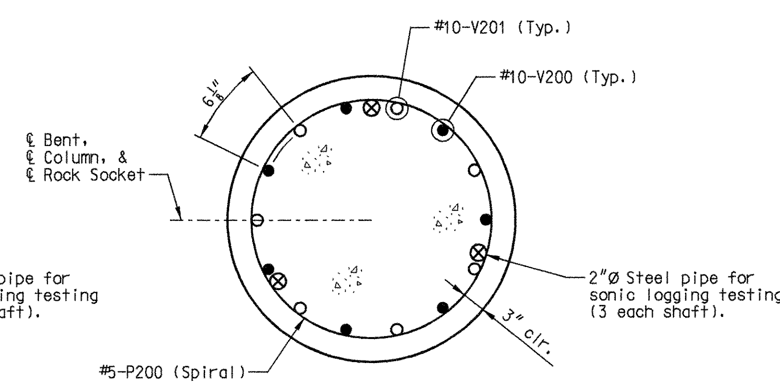
SECTION E-E

(3′-0″ Diameter)



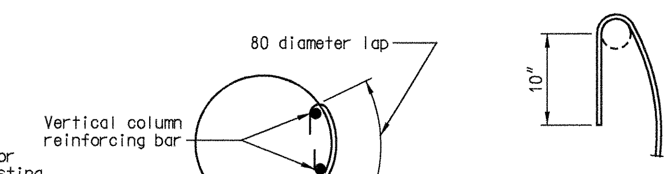
SECTION F-F

(3′-6″ Diameter)



SECTION G-G

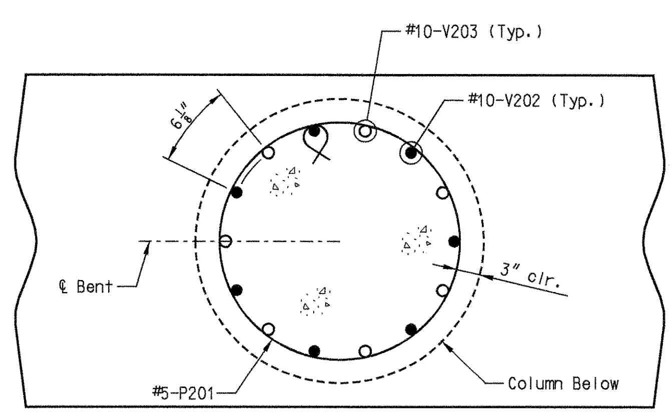
(3′-0″ Diameter)



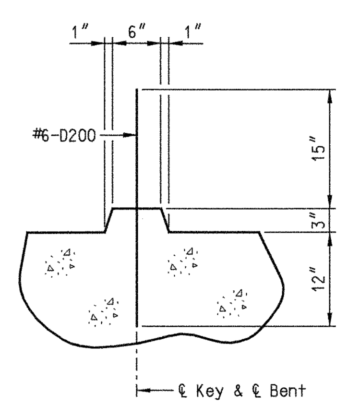
DETAILS OF 135° SEISMIC SPIRAL TIE HOOK

ANCHOR SPLICES IN SPIRAL AROUND VERTICAL BAR (USE FOR INTERMEDIATE SPLICES OF SPIRALS)

Note:
For location of Sections A-A thru H-H, see Sheet No. 10.



SECTION H-H



TYPICAL SECTION THRU KEY

⁂ SUBSTRUCTURE QUANTITY TABLE FOR BENT 2

Item		Quantity
Drilled Shafts (3 ft. 6 in. Dia.)	linear foot	26.0
Rock Sockets (3 ft. 0 in. Dia.)	linear foot	16.0
Supplementary Television Camera Inspection	each	1
Foundation Inspection Holes	linear foot	36.0
Concrete Coring	linear foot	22.0
Sonic Logging Testing	each	2
Class B Concrete (Substructure)	cu. yard	32.1
Reinforcing Steel (Bridges)	pound	14,500
Mechanical Bar Splice	each	28

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

USER: hupshaw PLOTTED: 15-MAY-2007 10:42 M:\jobs\44514 Rte 67\Techprod\Bridges\A7510\Drawings\ZPLOT_J0P0930A_A7510_011_F.dgn

Detailed	FEB	2007
Checked	APR	2007

HNTB

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

BENT 2 - DETAILS

A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	12

JOB NO. JOP0930A

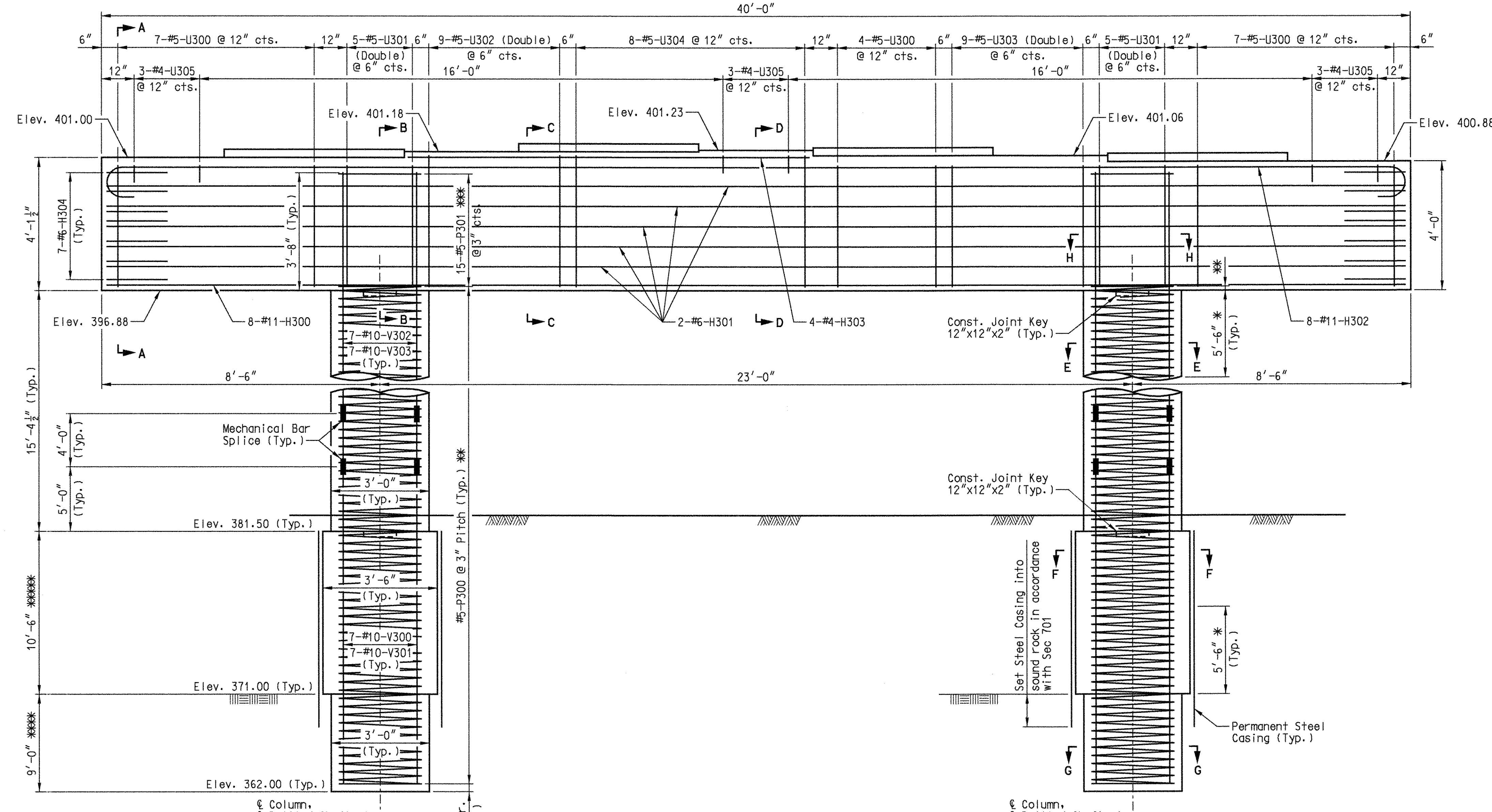
CONTRACT ID

PROJECT NO.

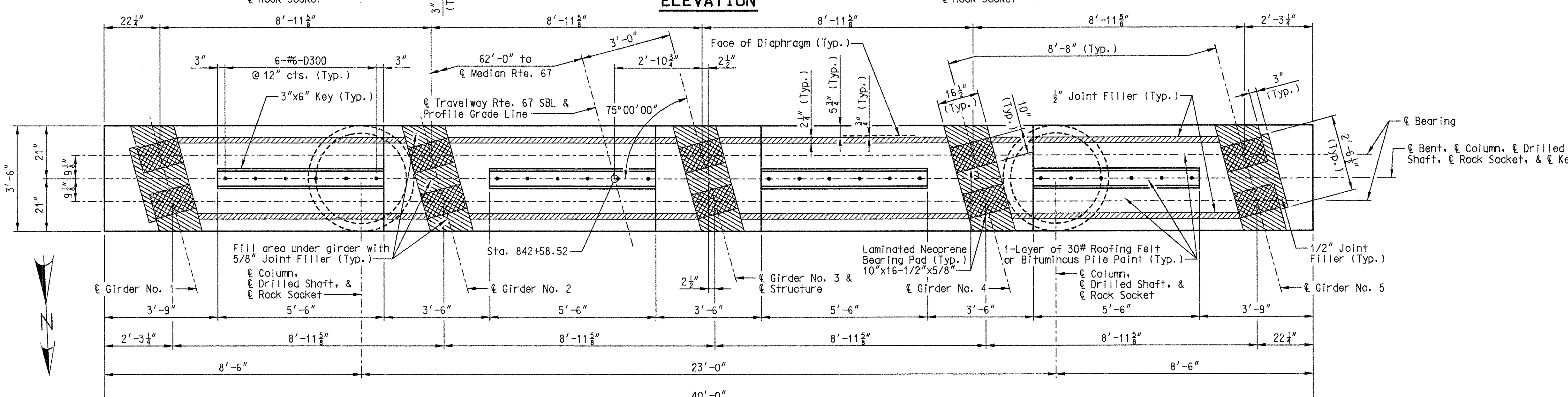
COUNTY WAYNE

STATE OF MISSOURI — JEFFREY B. SMITH — NUMBER E-27175 — PROFESSIONAL ENGINEER — 5-15-07

DATE 05/15/07



ELEVATION



PLAN

Notes:

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

An additional 4 feet has been added to #5-P300, #10-V300, and #10-V301 lengths for possible change in drilled shaft or rock socket depth. This excess length shall be cut-off if not required.

Concrete coring shall be performed on one of the drilled shafts in accordance with Sec 701. Sonic logging testing and foundation inspection holes shall be performed on all drilled shafts and rock sockets.

The contractor shall use a mechanical bar splice for #10-V300, #10-V301, #10-V302, and #10-V303 bars at the specified locations. The total bar lengths for bars indicated in the bill of reinforcing steel are determined based on the end of the bars being located at end of adjacent bar. No additional payment will be made for any additional bar lengths required for the mechanical bar splices. Mechanical bar splices shall be in accordance with Sec 706.

Alternatively, the contractor may eliminate the splices and use single vertical bars to replace the V300, V301, V302, and V303 bars. Lap splices will not be allowed.

The thickness of steel casing shall meet all the requirements of Sec 701 with minimum thickness being 1/2 inch.

For Sections A-A thru H-H, see Sheet No. 13.

For Typical Section Thru Laminated Neoprene Bearing Pad, see Sheet No. 13.

For Substructure Quantity Table, see Sheet No. 13.

* Lapping of spiral reinforcement in this region not permitted.

** Continue spiral bars to the bottom of the beam cap stirrup reinforcing bar.

Anchorage of spiral reinforcement shall be provided by 1-1/2 extra turns of spiral bar at each end of spiral unit.

*** Splice locations shall be staggered.

**** Pay Item Rock Socket (3 ft. 0 in. Dia.).

***** Pay Item Drilled Shaft (3 ft. 6 in. Dia.).

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

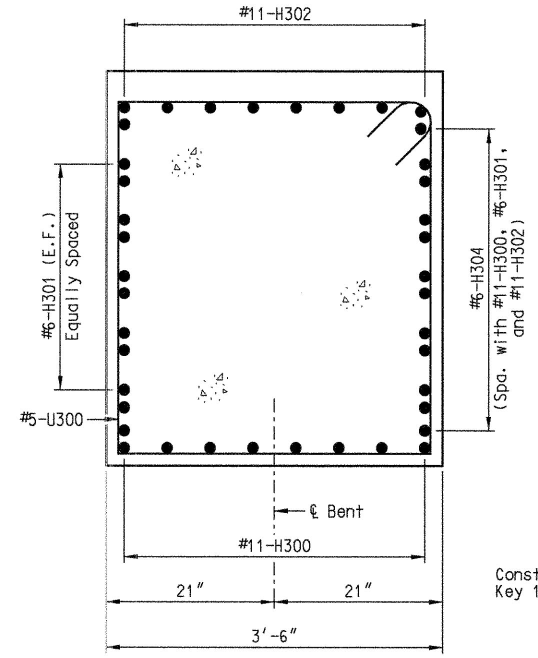
The cost of permanent casing will be considered completely covered by the contract unit price for other items.

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	13

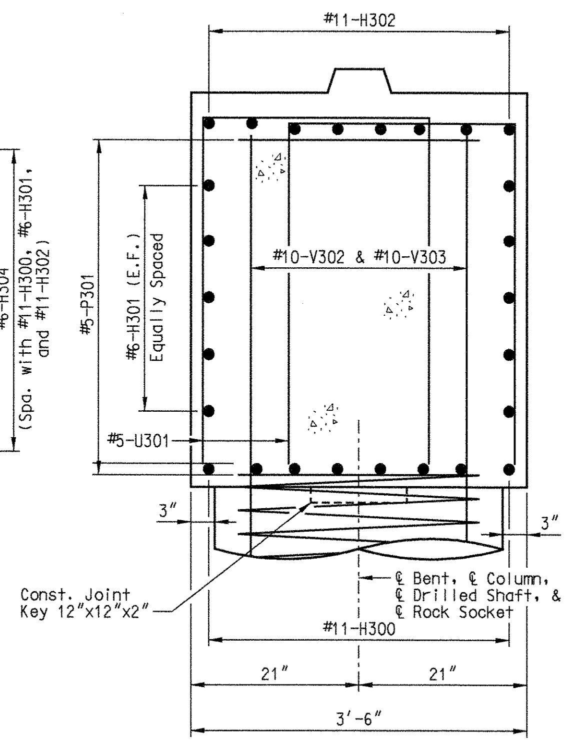
JOB NO. JOP0930A
CONTRACT ID
PROJECT NO.
COUNTY WAYNE

STATE OF MISSOURI — JEFFREY B. SMITH — NUMBER PE-27175 — REGISTERED PROFESSIONAL ENGINEER — 5-15-07

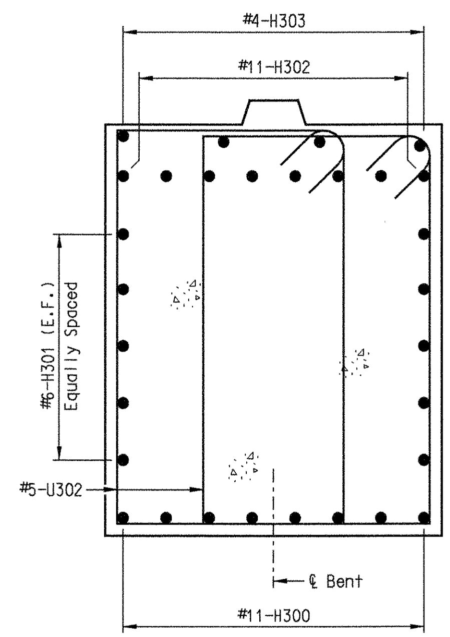
DATE 05/15/07



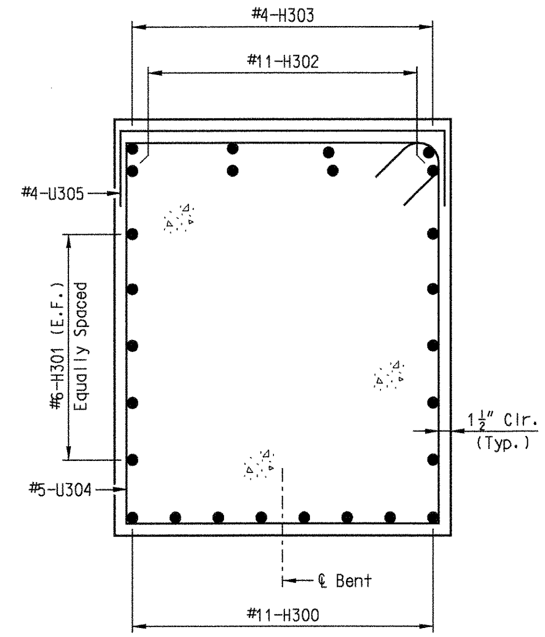
SECTION A-A



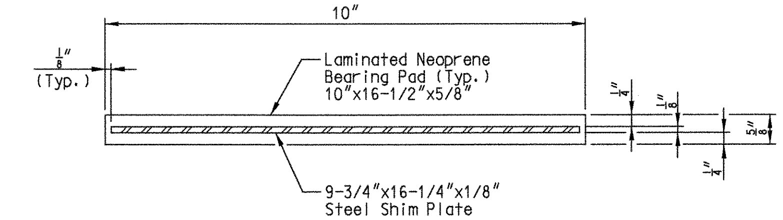
SECTION B-B



SECTION C-C



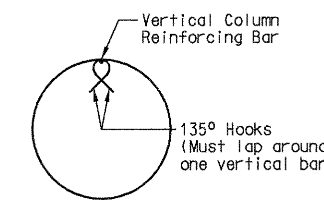
SECTION D-D



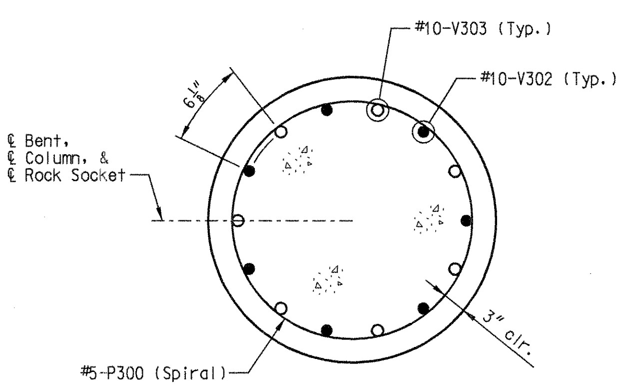
TYPICAL SECTION THRU LAMINATED NEOPRENE BEARING PAD

10 Required

Notes:
The required shim plate shall be placed between layers of elastomer and molded together to form an integral unit.
Shop drawings are not required for laminated neoprene bearings on structures without sole plates.

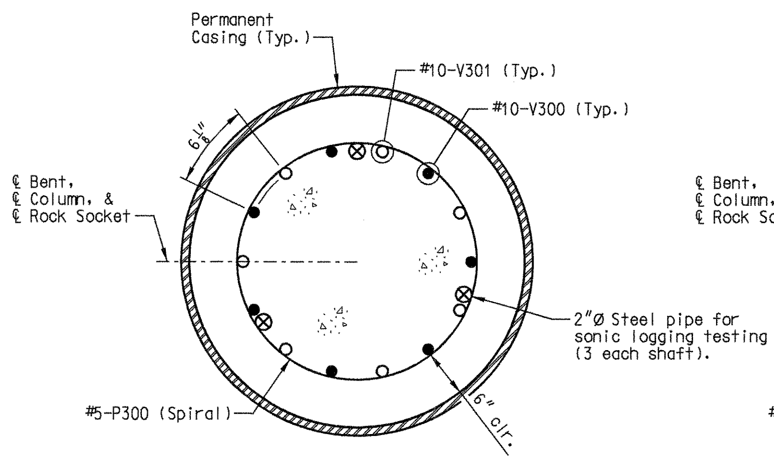


DETAIL OF SEISMIC STIRRUP BAR (#5-P301)



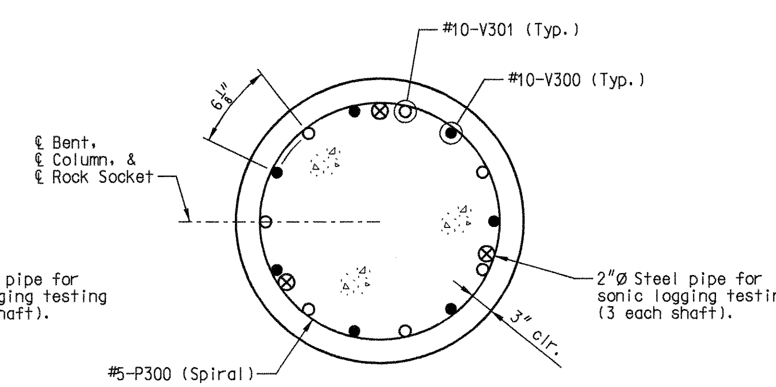
SECTION E-E

(3′-0″ Diameter)



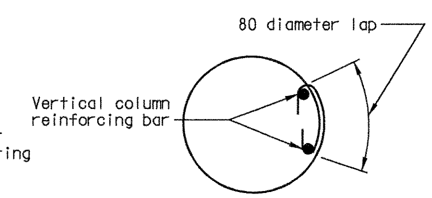
SECTION F-F

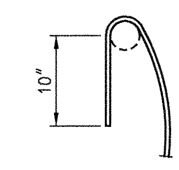
(3′-6″ Diameter)



SECTION G-G

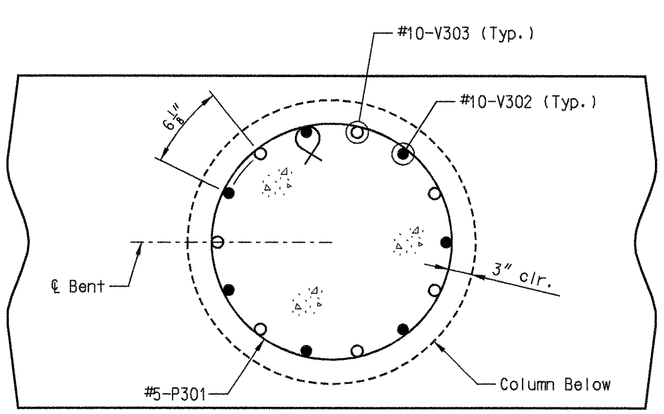
(3′-0″ Diameter)



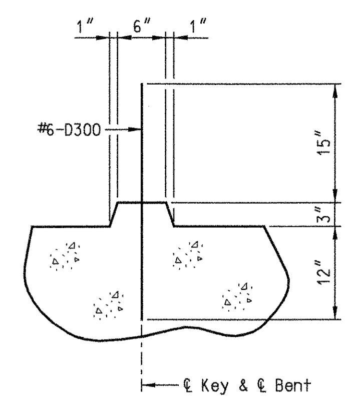


DETAILS OF 135° SEISMIC SPIRAL TIE HOOK

ANCHOR SPLICES IN SPIRAL AROUND VERTICAL BAR (USE FOR INTERMEDIATE SPLICES OF SPIRALS)



SECTION H-H



TYPICAL SECTION THRU KEY

Note:
For location of Sections A-A thru H-H, see Sheet No. 12.

✱✱ SUBSTRUCTURE QUANTITY TABLE FOR BENT 3		
Item		Quantity
Drilled Shafts (3 ft. 6 in. Dia.)	linear foot	21.0
Rock Sockets (3 ft. 0 in. Dia.)	linear foot	18.0
Supplementary Television Camera Inspection	each	1
Foundation Inspection Holes	linear foot	38.0
Concrete Coring	linear foot	20.5
Sonic Logging Testing	each	2
Class B Concrete (Substructure)	cu. yard	29.8
Reinforcing Steel (Bridges)	pound	13,390
Mechanical Bar Splice	each	28

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

Detailed FEB 2007
Checked APR 2007
HNTB

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

BENT 3 - DETAILS

A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	14

JOB NO. J0P0930A

CONTRACT ID

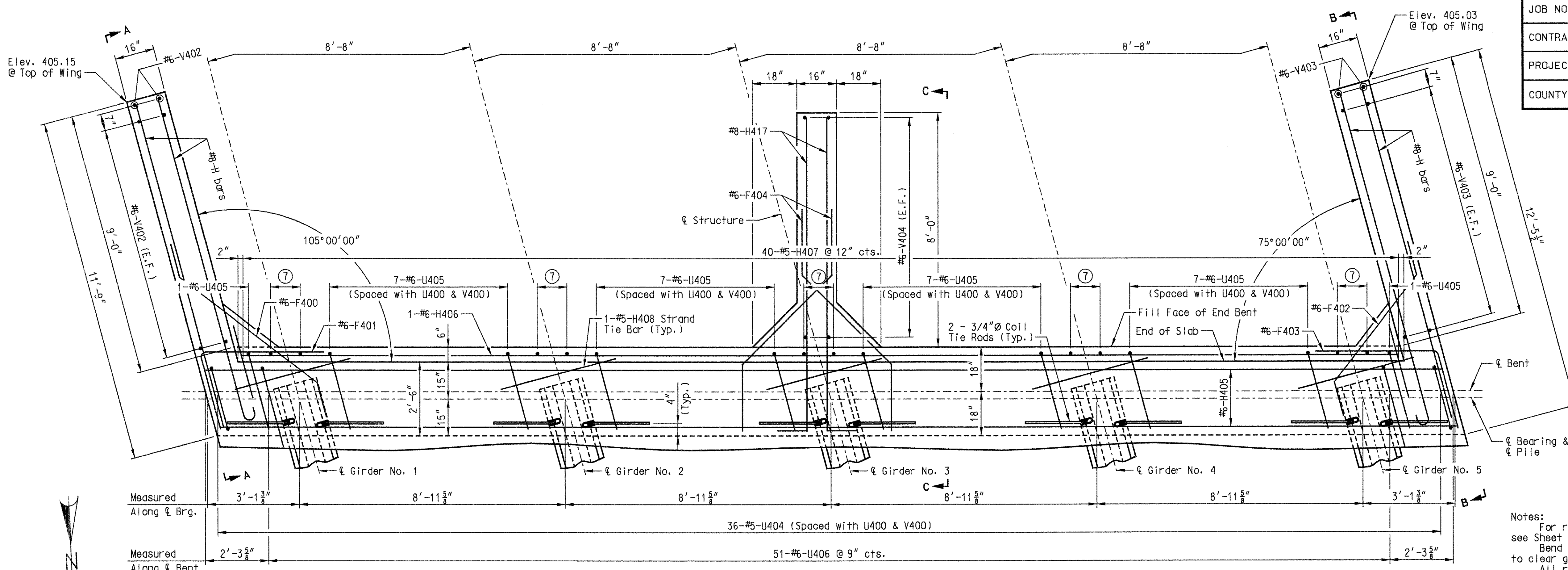
PROJECT NO.

COUNTY WAYNE

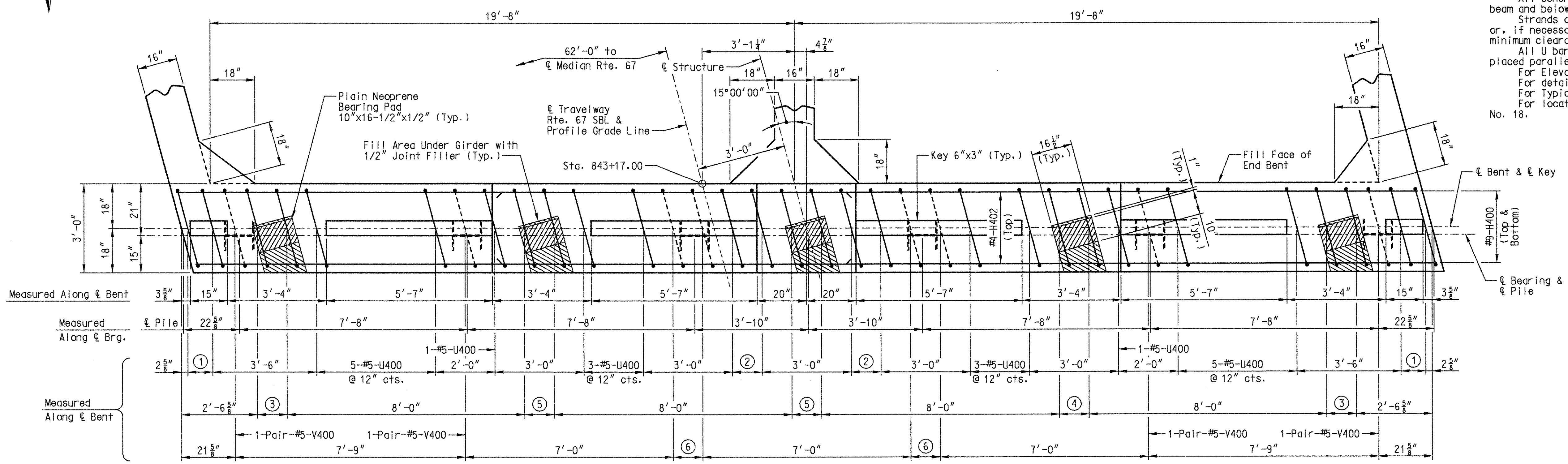
DATE 05/15/07

STATE OF MISSOURI JEFFREY B. SMITH NUMBER E-27175 REGISTERED PROFESSIONAL ENGINEER 5-15-07

(1) 3-#5-U400 @ 5″ cts.
(2) 2-#5-U400 @ 12″ cts.
(3) 3-#4-U402 @ 6″ cts.
(4) 3-#4-U402 @ 6″ cts.
(5) 3-#4-U403 @ 6″ cts.
(6) 2-Pair-#5-V400 @ 12″ cts.
(7) 3-#6-V401 @ 6″ cts. (Spaced with U402 & U403)



PART PLAN



PLAN OF BEAM

Notes:

For reinforcement of the safety barrier curb, see Sheet Nos. 28, 29, and 30.

Bend F400, F402, and F404 bars in the field to clear girders.

All reinforcing bars in the substructure beams or caps shall be field adjusted to clear piles by at least 1-1/2″.

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

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

All U bars and pairs of V bars are to be placed parallel to ℄ Structure.

For Elevation A-A, B-B, and C-C, see Sheet No. 16.

For detail of Bearing Pads, see Sheet No. 15.

For Typical Section Thru Key, see Sheet No. 15.

For location and details of coil ties, see Sheet No. 18.

USER: hupshaw PLOTTED: 15-MAY-2007 10:42 M:\jobs\44514 Rte 67\Techprod\Bridges\A7510\Drawings\ZPLOT_J0P0930A_A7510_014_F.dgn

Detailed FEB 2007
Checked APR 2007

HNTB

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

END BENT 4 - PLANS

A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	15

JOB NO. J0P0930A

CONTRACT ID

PROJECT NO.

COUNTY WAYNE

STATE OF MISSOURI
JEFFREY B. SMITH
NUMBER E-27175
REGISTERED PROFESSIONAL ENGINEER

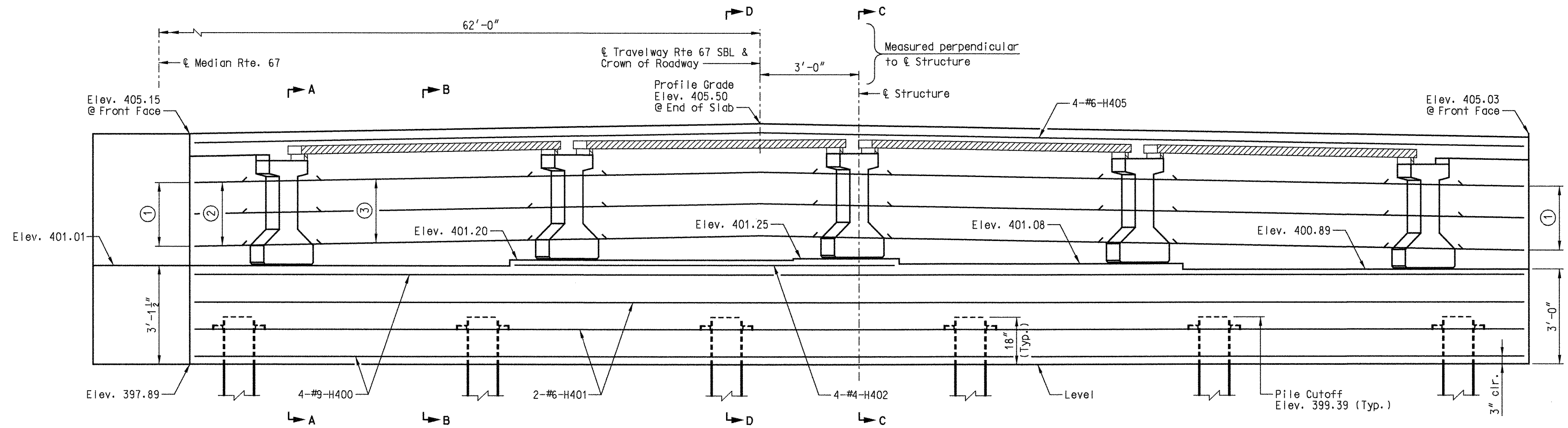
5.15.07

DATE 05/15/07

(1) 3-#6-H403 @ 12" cts. (Front Face)

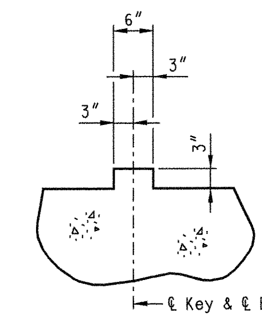
(2) 3-#6-H401 @ 12" cts. (Fill Face) Continuous

(3) 3-#6-H404 @ 12" cts. (Front Face Between Girders)(Typ.)

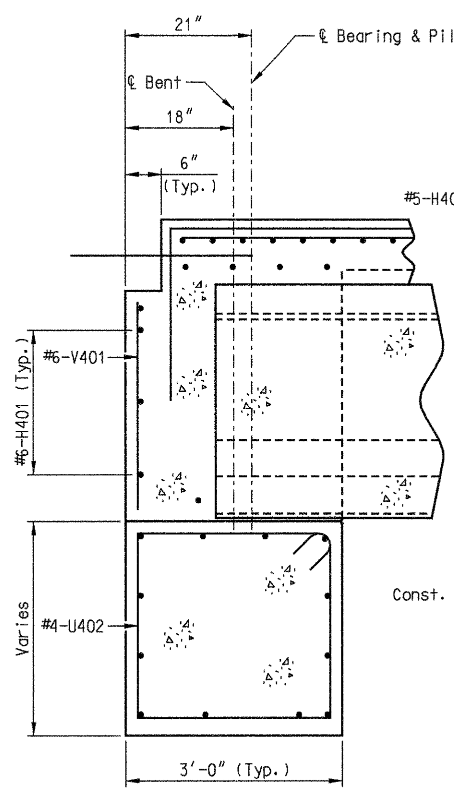


ELEVATION NEAR END BENT

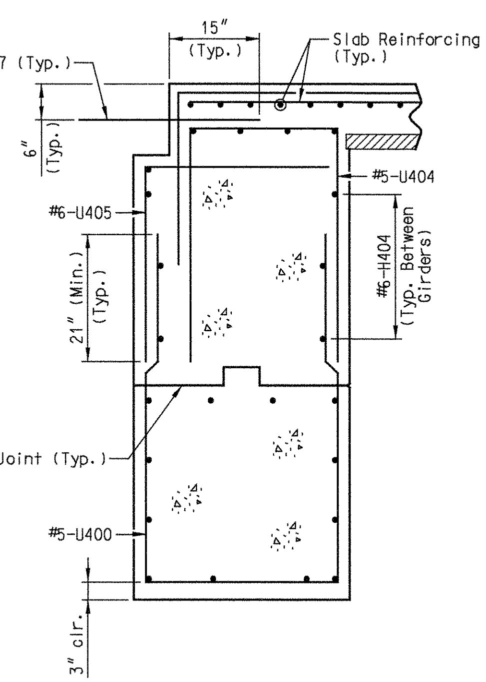
(Looking Upstation)



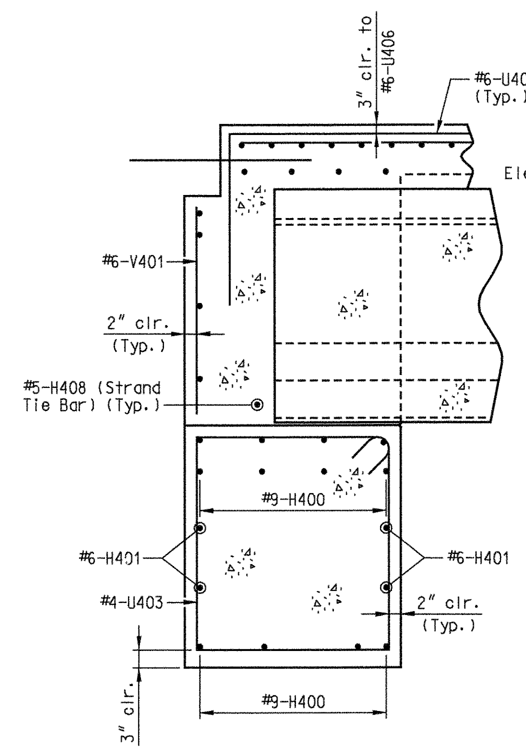
TYPICAL SECTION THRU KEY



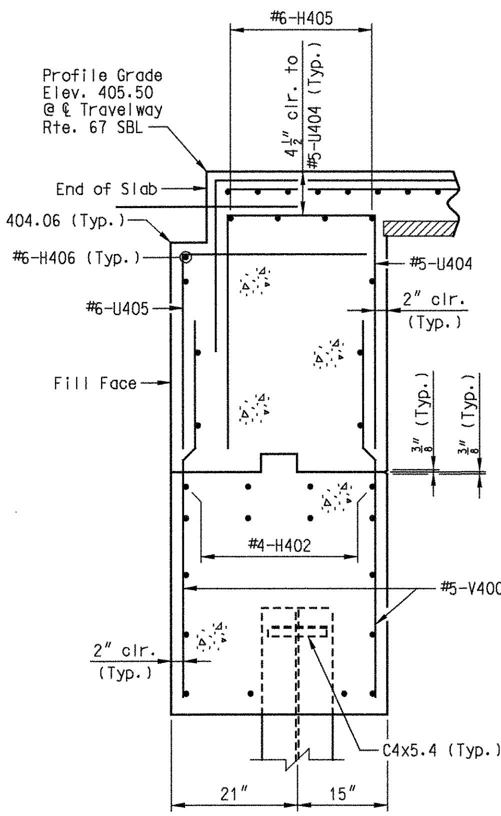
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

Notes:
All piles shall be HP12x53.
For details of End Bent not shown, see Sheet Nos. 14 & 16.
For Details of Pile Anchors, see Sheet No. 2.
For detail of Steel Pile Splice, see Sheet No. 2.

✱✱ SUBSTRUCTURE QUANTITY TABLE FOR END BENT 4

Item		Quantity
Structural Steel Piles (12 in.)	linear foot	96
Pre-Bore for Piling	linear foot	20
Pile Point Reinforcement	each	6
Class B Concrete (Substructure)	cu. yard	19.5

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

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USER: hupshaw PLOTTED: 15-MAY-2007 10:42

Detailed FEB 2007
Checked APR 2007

HNTB

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

END BENT 4 - DETAILS

A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	16

JOB NO. JOP0930A

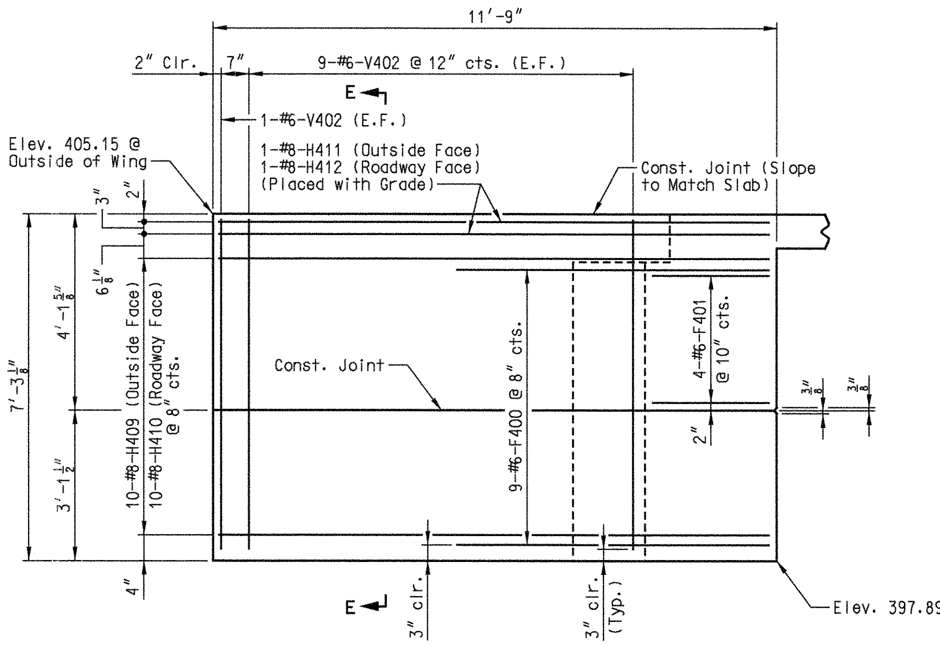
CONTRACT ID

PROJECT NO.

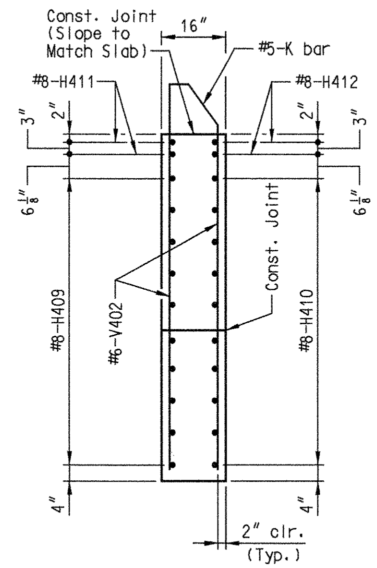
COUNTY WAYNE

STATE OF MISSOURI JEFFREY B. SMITH NUMBER E-27175 REGISTERED PROFESSIONAL ENGINEER 5-15-07

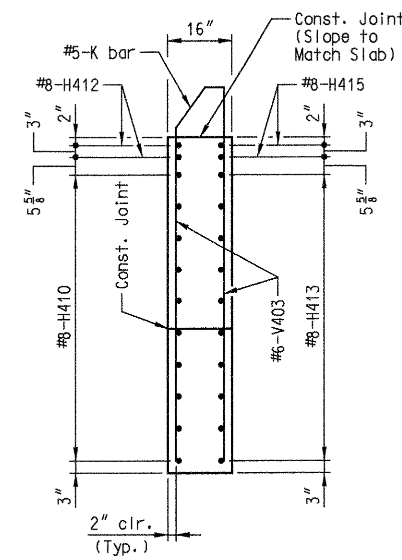
DATE 05/15/07



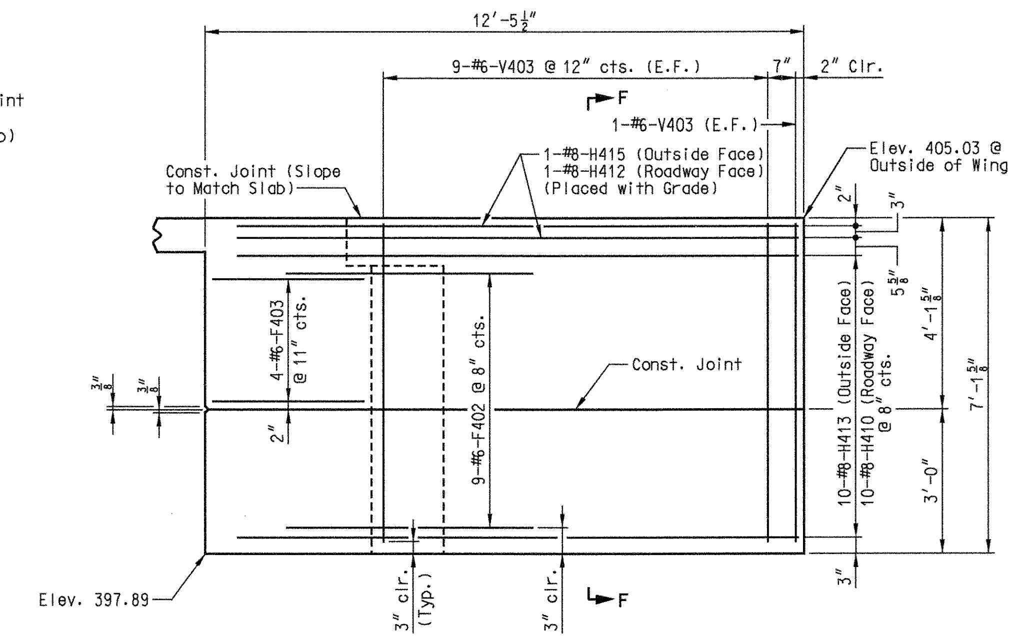
ELEVATION A-A



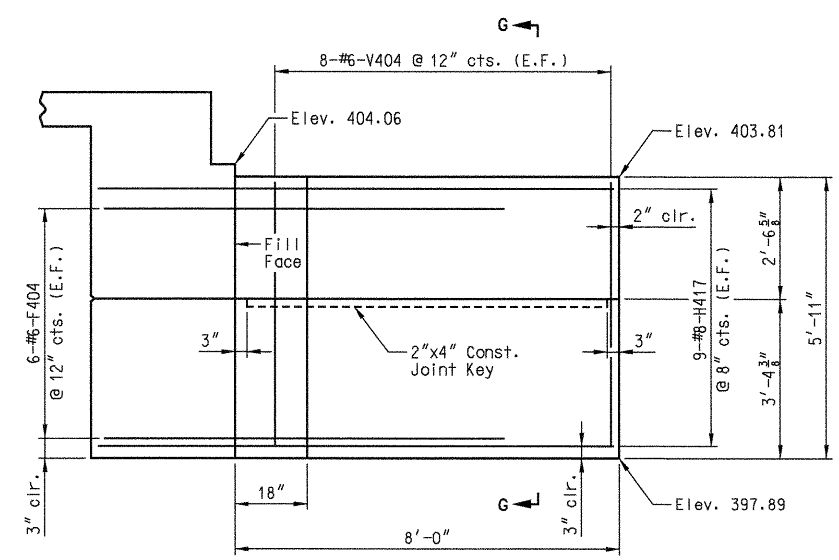
SECTION E-E



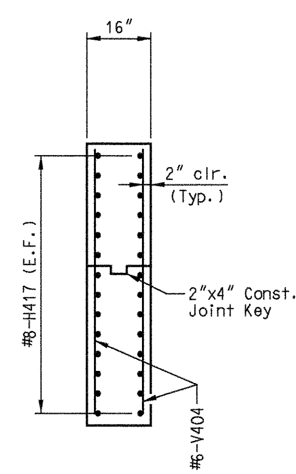
SECTION F-F



ELEVATION B-B



ELEVATION C-C



SECTION G-G

Notes:
For reinforcement of the safety barrier curb, see Sheet Nos. 28, 29, and 30.
For location of Elevations A-A, B-B, and C-C, see Sheet No. 14.

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USER: hupshow
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Detailed FEB 2007
Checked APR 2007

HNTB

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

END BENT 4 - WING DETAILS

A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	17

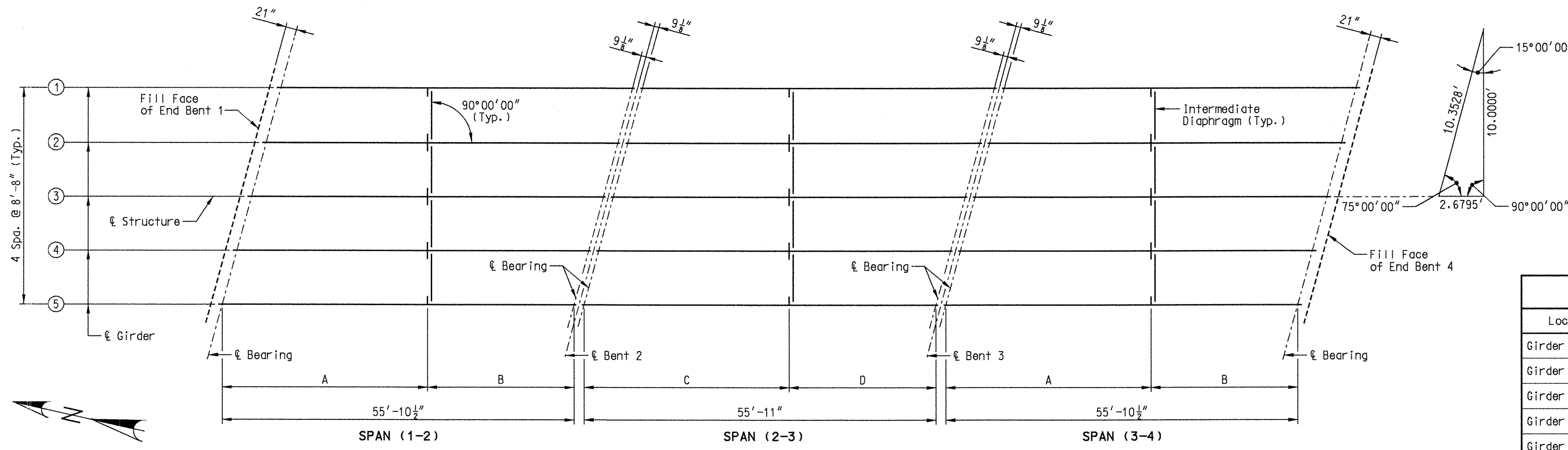
JOB NO. JOP0930A

CONTRACT ID

PROJECT NO.

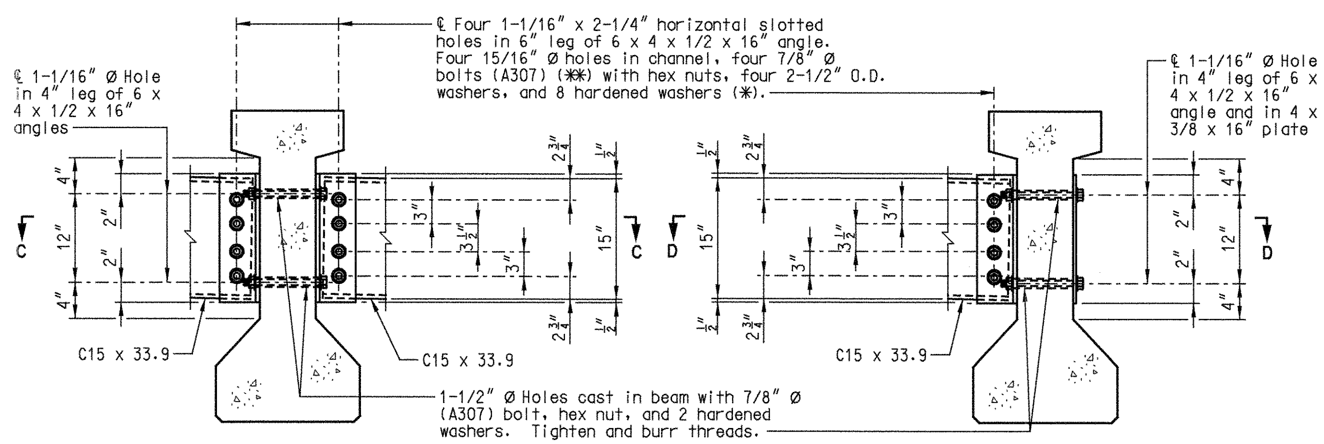
COUNTY WAYNE

DATE 05/15/07



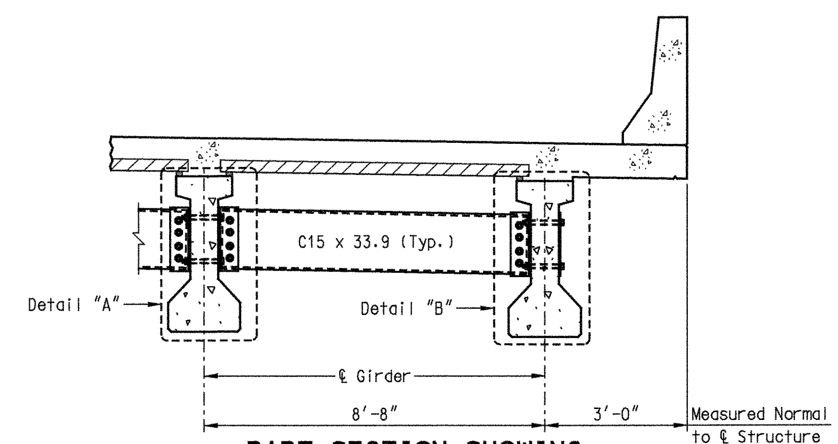
FRAMING PLAN

TABLE OF DIMENSIONS				
Location	A	B	C	D
Girder No. 1	23'-3½"	32'-7"	23'-3¾"	32'-7¼"
Girder No. 2	25'-7⅜"	30'-3⅛"	25'-7⅝"	30'-3⅜"
Girder No. 3	27'-11¼"	27'-11¼"	27'-11½"	27'-11½"
Girder No. 4	30'-3⅛"	25'-7⅜"	30'-3⅜"	25'-7⅝"
Girder No. 5	32'-7"	23'-3½"	32'-7¼"	23'-3¾"

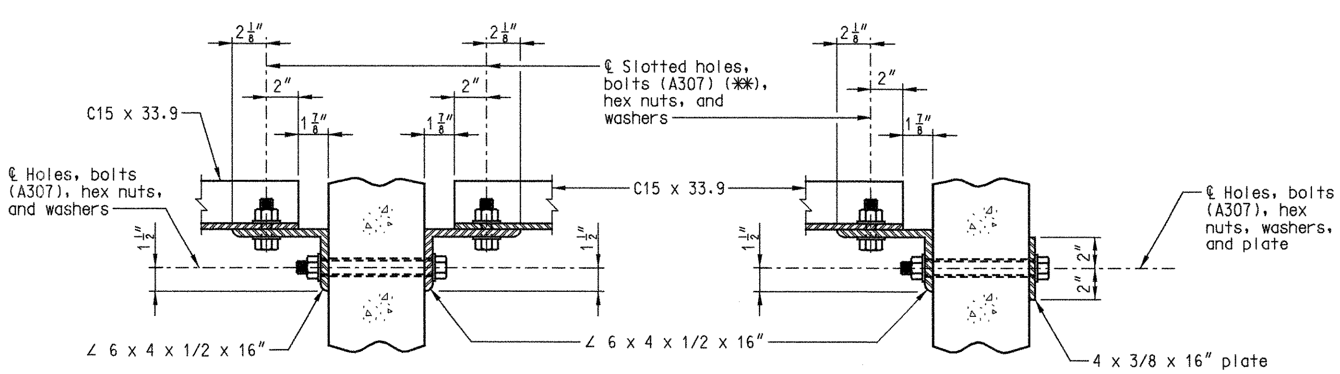


DETAIL "A"

DETAIL "B"



PART SECTION SHOWING INTERMEDIATE DIAPHRAGMS



SECTION C-C

SECTION D-D

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.

For details of P/S Girders, see Sheet Nos. 18 and 19.

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Detailed FEB 2007
Checked APR 2007
HNTB

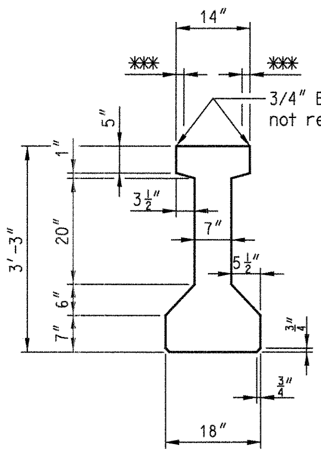
Note: This drawing is not to scale. Follow dimensions.

FRAMING PLAN

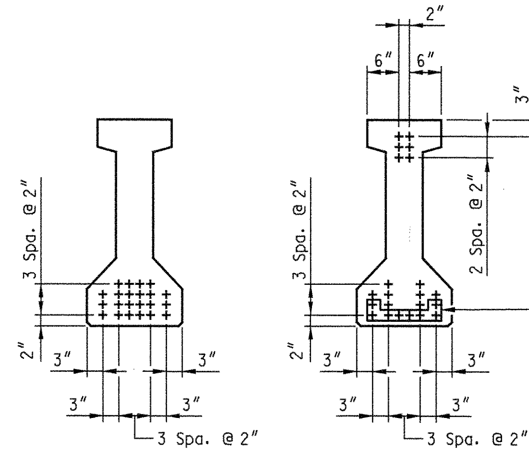
A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	18

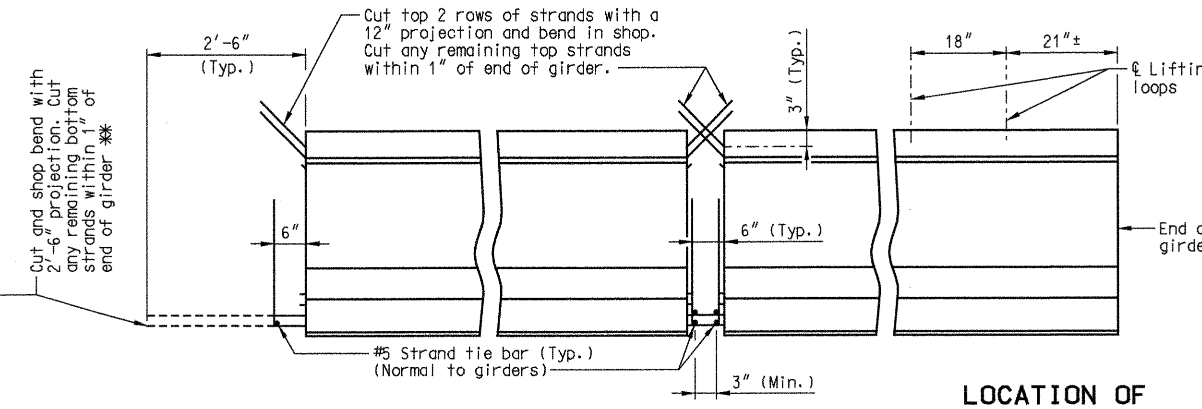
JOB NO. JOP0930A
CONTRACT ID
PROJECT NO.
COUNTY WAYNE
DATE 05/15/07



GIRDER DIMENSIONS



STRAND ARRANGEMENTS



STRAND DETAILS AT GIRDER ENDS

LOCATION OF LIFTING LOOPS

Concrete for prestressed girders shall be Class A-1 with f'c = 6,000 psi and f'ci = 5,000 psi.

(+) indicates prestressing strand.

Use 22 strands with an initial prestress force of 682 kips.

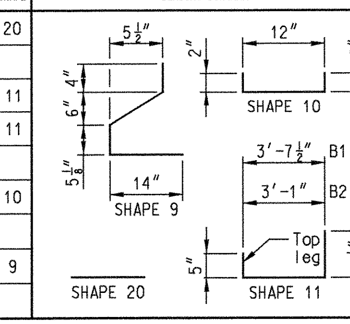
Prestressing tendons shall be uncoated, seven-wire, low-relaxation strands, 1/2 inch diameter in accordance with AASHTO M 203, Grade 270. Pretensioned members shall be in accordance with Sec 1029.

※ 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.

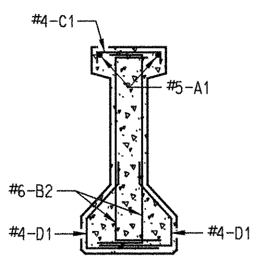
※※ At contractor's option a 1-1/2" to 1-3/4" smooth finish strip is permitted to facilitate placement of preformed fiber expansion joint material or expanded or extruded polystyrene bedding material for the prestressed panels.

BILL OF REINFORCING STEEL - EACH GIRDER			
NO.	SIZE & MARK	ACTUAL LENGTH	SHAPE
2	5 A1	56'-9"	20
188	4 B1	4'-8"	11
16	6 B2	4'-1"	11
102	4 C1	14"	10
204	4 D1	2'-6"	9

BENDING DIAGRAM

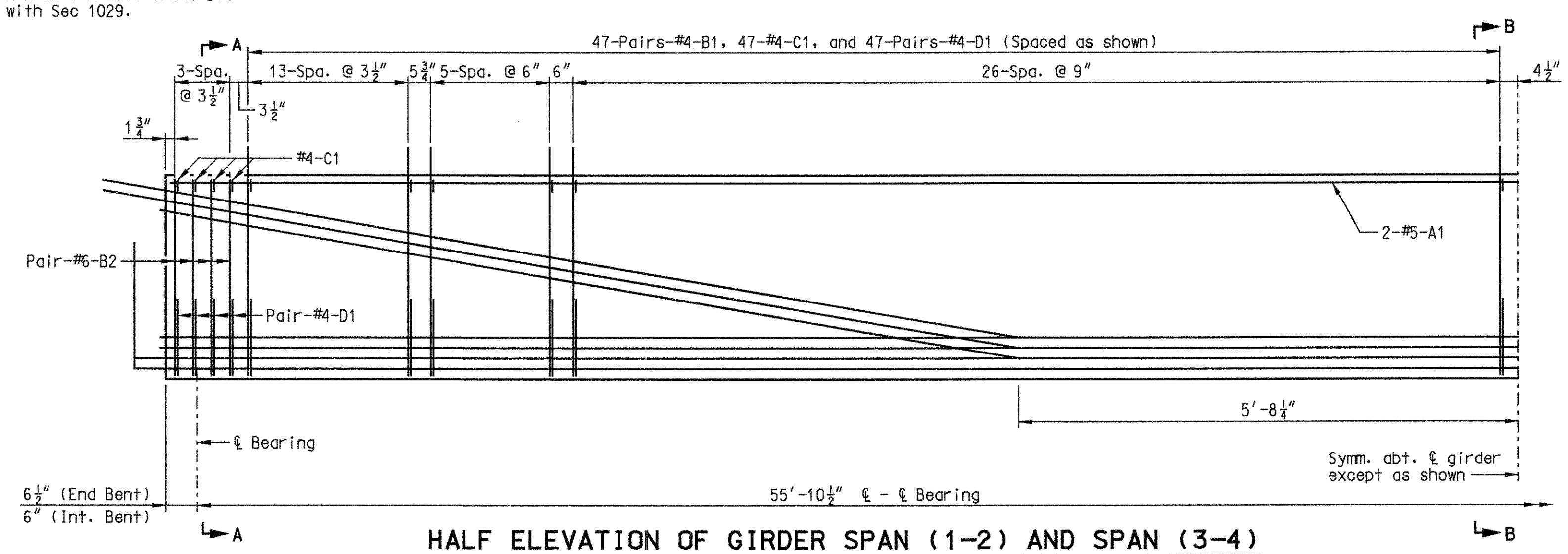


Notes:
All dimensions are out-to-out.
Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures, Stirrup and Tie Dimensions.
Actual lengths are measured along centerline of bar to the nearest inch.
Minimum clearance to reinforcing shall 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.



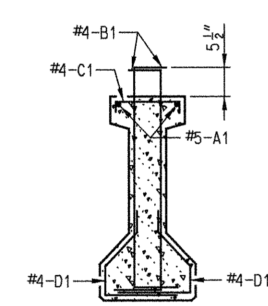
SECTION A-A

Strands not shown for clarity.



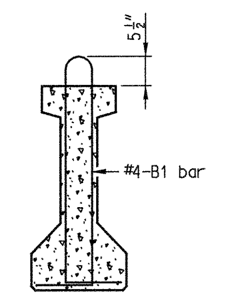
HALF ELEVATION OF GIRDER SPAN (1-2) AND SPAN (3-4)

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

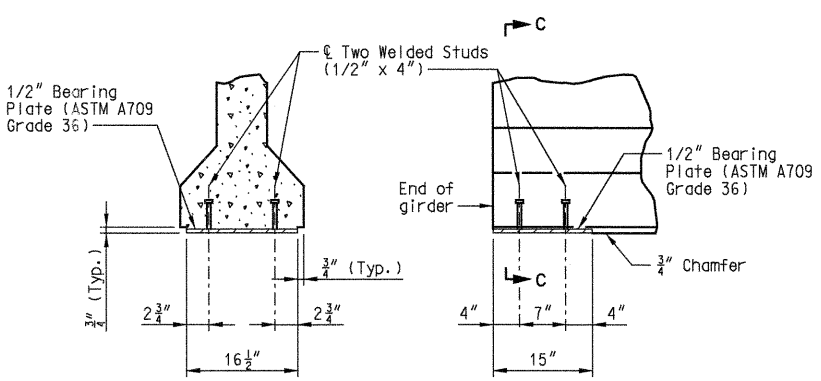


SECTION B-B

Strands not shown for clarity.



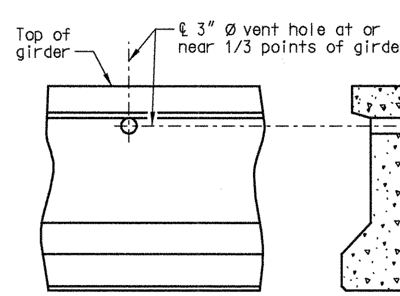
B1 BAR PERMISSIBLE ALTERNATE SHAPE



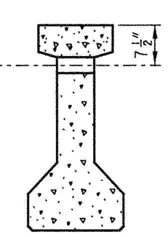
BEARING PLATE DETAILS

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 per each.

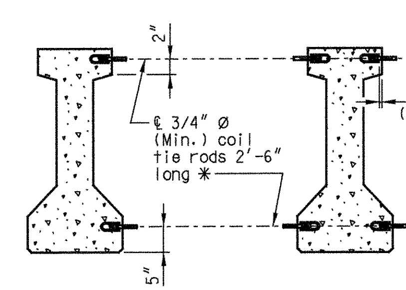


PART ELEVATION OF GIRDER



SECTION NEAR VENT HOLE

Place vent holes at or near 1/3 points 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

Notes:
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. 27.
For location of coil ties, see Sheet Nos. 6, 14, and 20.
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. 20.
For Girder Camber Diagram, see Sheet No. 22.
✳ Length of coil tie rods at exterior girders at end bents = 2'-4 1/2".

TYPE 3 P/S GIRDER - SPAN (1-2) AND SPAN (3-4)

A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	19

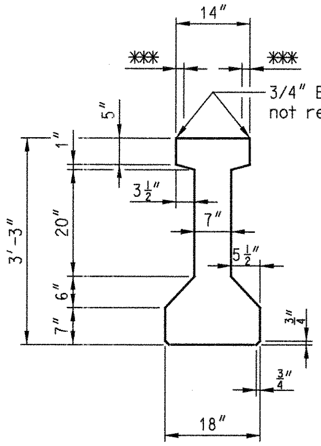
JOB NO. JOP0930A

CONTRACT ID

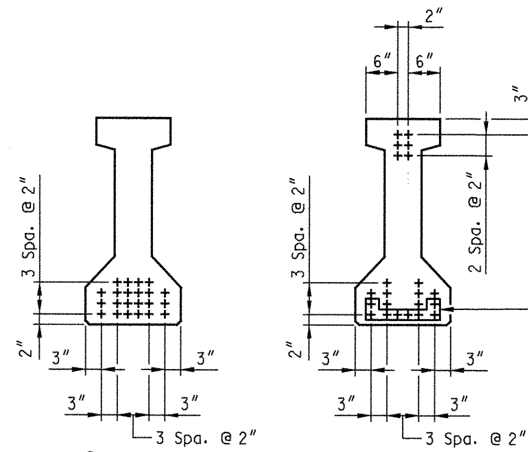
PROJECT NO.

COUNTY WAYNE

DATE 05/15/07



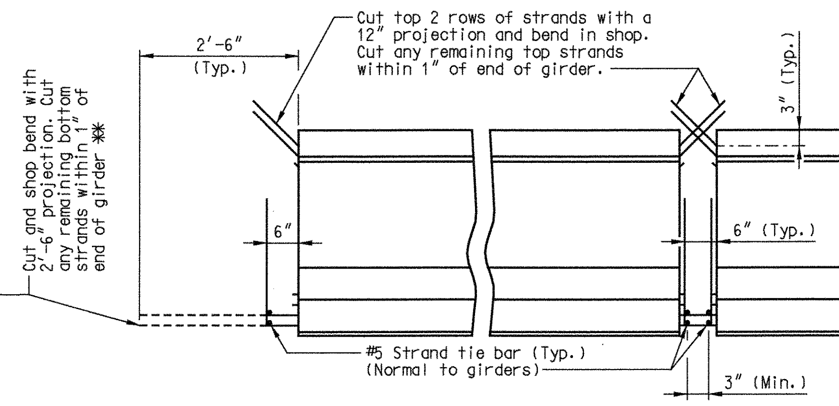
GIRDER DIMENSIONS



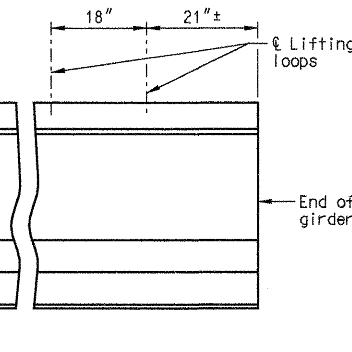
℄ GIRDER

END OF GIRDER

STRAND ARRANGEMENTS



STRAND DETAILS AT GIRDER ENDS



LOCATION OF LIFTING LOOPS

** 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 1-1/2" to 1-3/4" 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.

Concrete for prestressed girders shall be Class A-1 with f'c = 6,000 psi and f'ci = 5,000 psi.

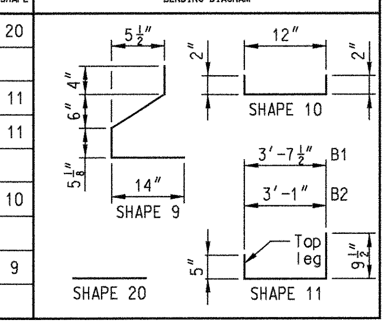
(+) indicates prestressing strand.

Use 22 strands with an initial prestress force of 682 kips.

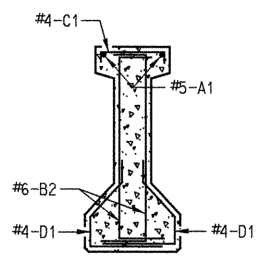
Prestressing tendons shall be uncoated, seven-wire, low-relaxation strands, 1/2 inch diameter in accordance with AASHTO M 203, Grade 270. Pretensioned members shall be in accordance with Sec 1029.

BILL OF REINFORCING STEEL - EACH GIRDER			
NO.	SIZE & MARK	ACTUAL LENGTH	SHAPE
2	5 A1	56'-9"	20
188	4 B1	4'-8"	11
16	6 B2	4'-1"	11
102	4 C1	14"	10
204	4 D1	2'-6"	9

BENDING DIAGRAM

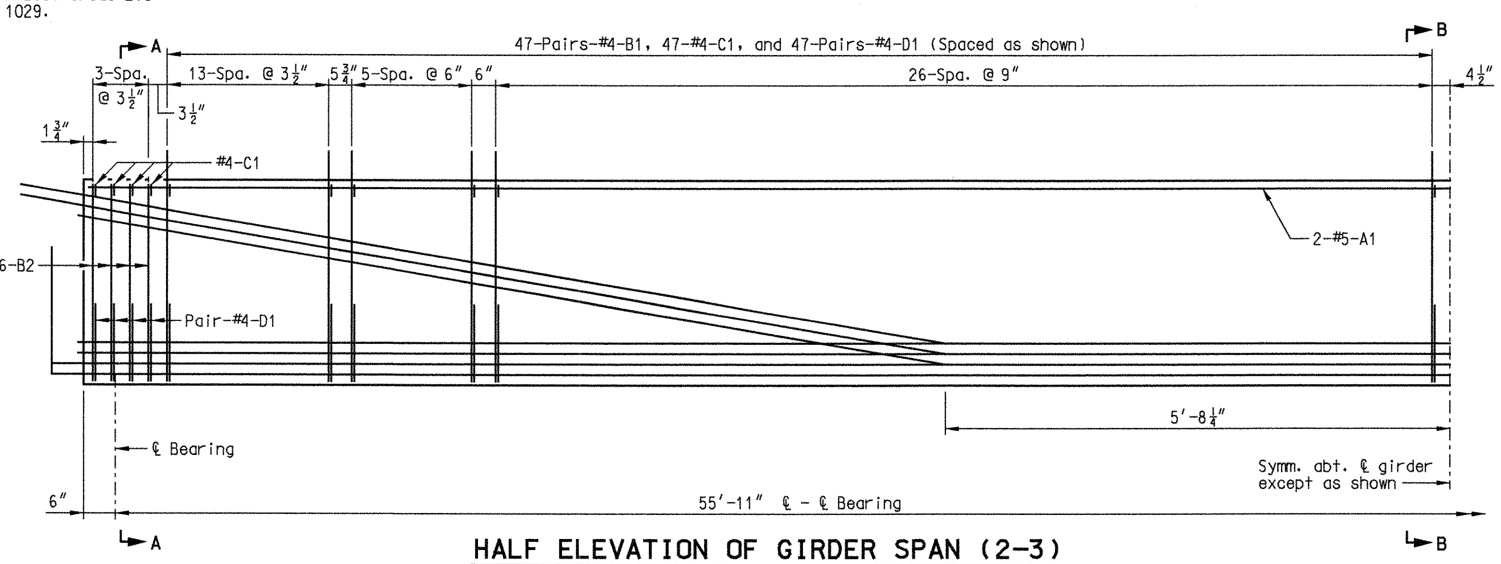


Notes:
All dimensions are out-to-out.
Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures, Stirrup and Tie Dimensions.
Actual lengths are measured along centerline of bar to the nearest inch.
Minimum clearance to reinforcing shall 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.



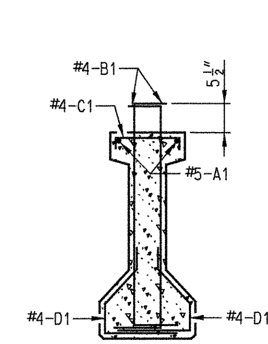
SECTION A-A

Strands not shown for clarity.



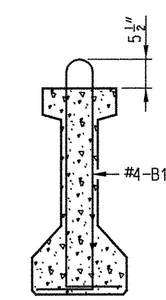
HALF ELEVATION OF GIRDER SPAN (2-3)

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

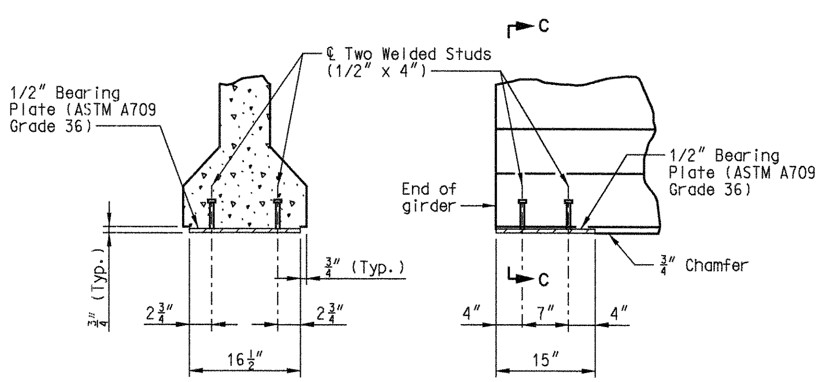


SECTION B-B

Strands not shown for clarity.



B1 BAR PERMISSIBLE ALTERNATE SHAPE



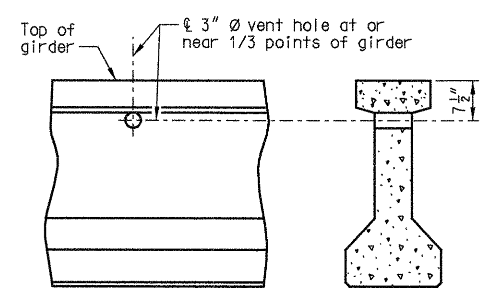
SECTION C-C

PART ELEVATION AT END OF GIRDER

BEARING PLATE DETAILS

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

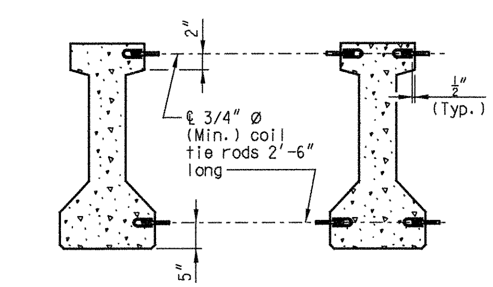
Cost of furnishing, galvanizing, and installing the 1/2" bearing plate (ASTM A709 Grade 36), and welded studs in the prestressed girder will be considered completely covered by the contract unit price for Prestressed Concrete I-Girder per each.



PART ELEVATION OF GIRDER

SECTION NEAR VENT HOLE

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



EXTERIOR GIRDERS AT INT. BENTS

INTERIOR GIRDERS AT ALL BENTS

DETAILS OF COIL TIES

Notes:
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. 27.
For location of coil ties, see Sheet No. 20.
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. 20.
For Girder Camber Diagram, see Sheet No. 22.

Detailed FEB 2007
Checked APR 2007
HNTB

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

TYPE 3 P/S GIRDER - SPAN (2-3)

A7510

USER: hupshaw PLOTTED: 15-MAY-2007 10:51 M:\jobs\44514 Rte 67\Techprod\Bridges\A7510\Drawings\ZPLOT_JOP0930A_A7510_019_F.dgn

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	20

JOB NO. J0P0930A

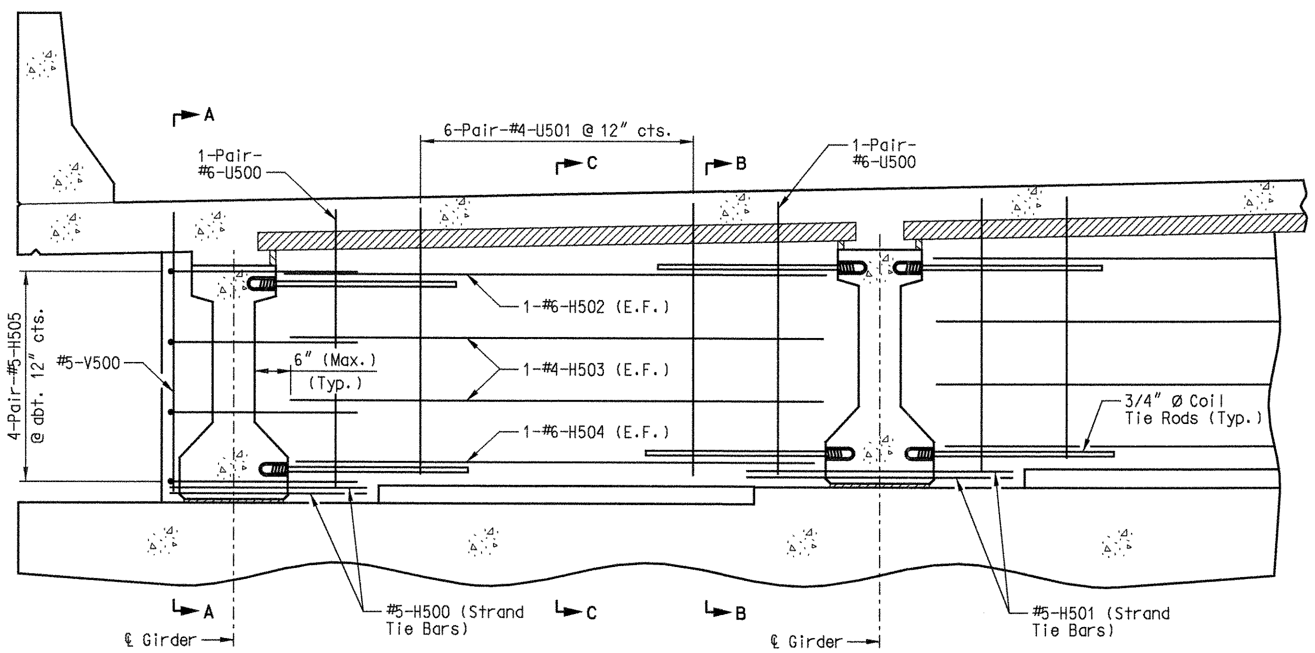
CONTRACT ID

PROJECT NO.

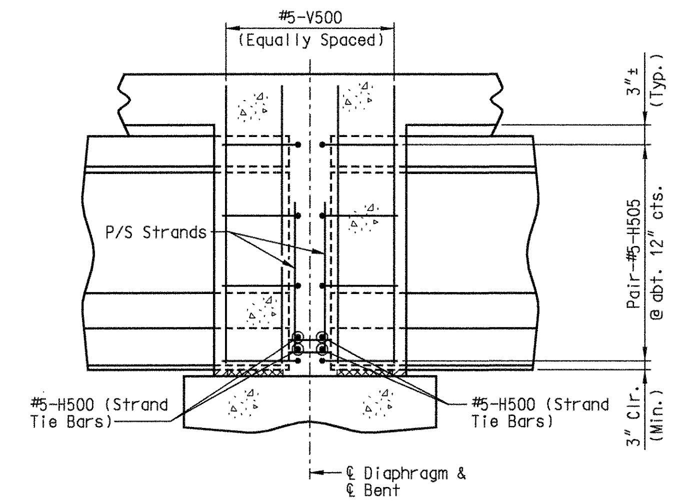
COUNTY WAYNE

STATE OF MISSOURI LAWRENCE R. ROLWES NUMBER PE-2006002847 REGISTERED PROFESSIONAL ENGINEER 5/15/07

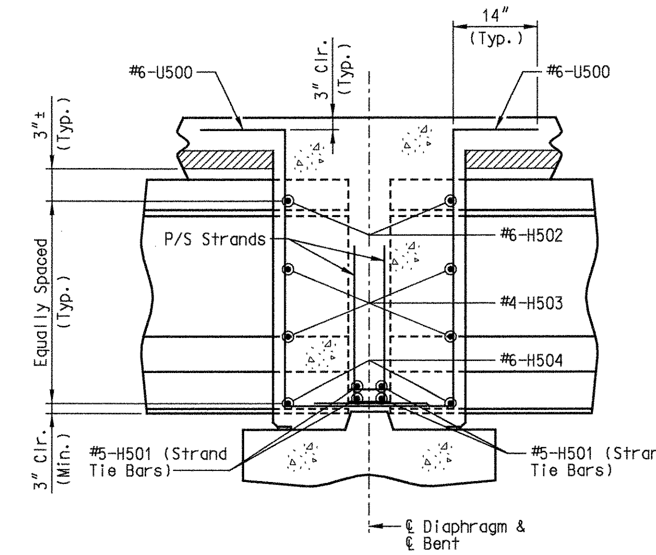
DATE 05/15/07



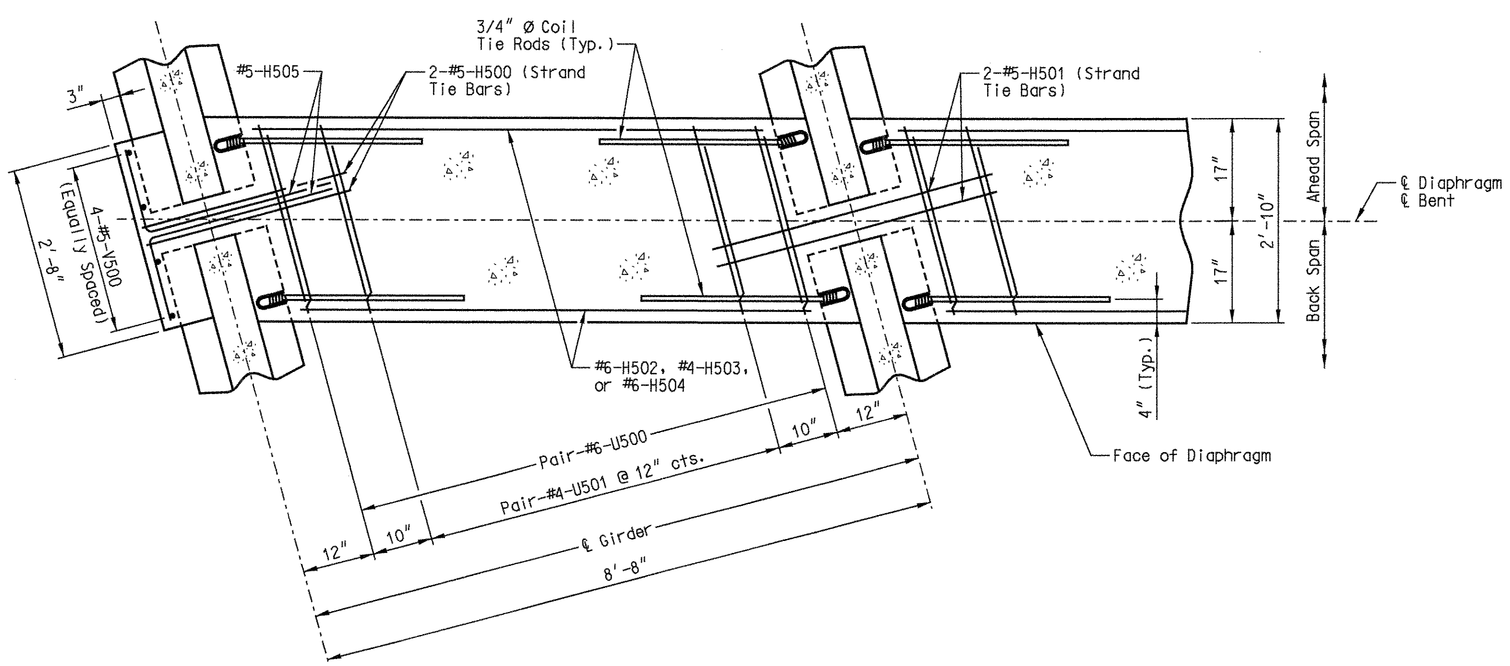
TYPICAL PART ELEVATION



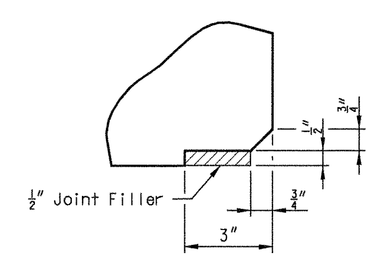
SECTION A-A



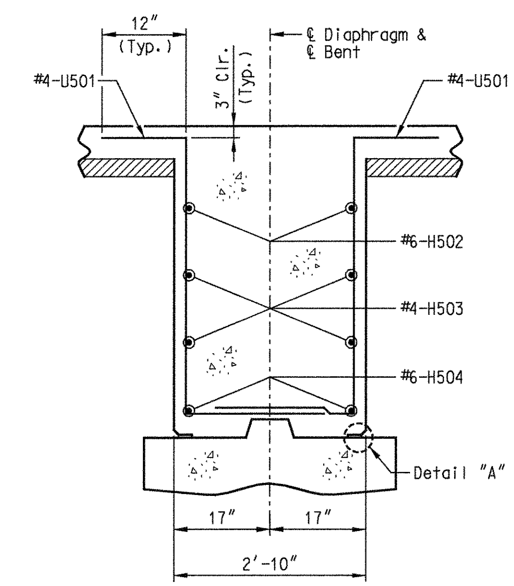
SECTION B-B



TYPICAL PART PLAN



DETAIL "A"



SECTION C-C

Notes:
For location of #5-H500 and #5-H501 (Strand Tie Bars), see Sheet Nos. 18 and 19.
Diaphragms at intermediate bents shall be built vertical.
For location and details of coil ties, see Sheet Nos. 18 and 19.

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

DIAPHRAGMS AT BENTS 2 AND 3

A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	21

JOB NO. JOP0930A

CONTRACT ID

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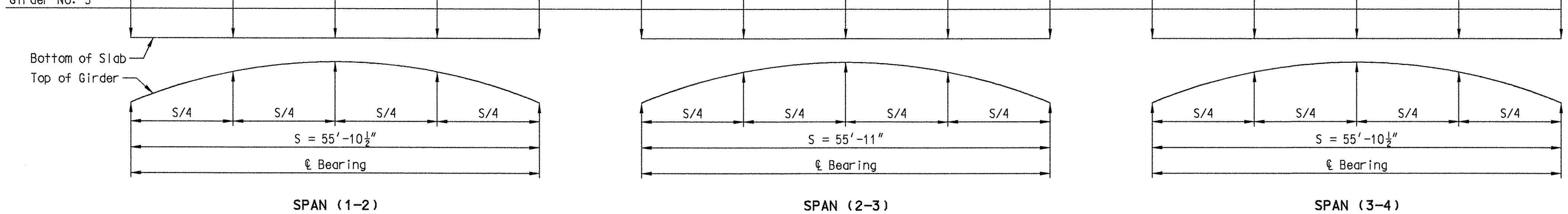
Girder No. 1	2 3/8"	1 1/2"	1 3/16"	1 1/2"	2 3/8"	2 3/8"	1 1/2"	1 1/8"	1 1/2"	2 3/8"	2 3/8"	1 1/2"	1 3/16"	1 1/2"	2 3/8"
Girder No. 2	2 1/4"	1 1/2"	1 3/16"	1 9/16"	2 3/8"	2 3/8"	1 9/16"	1 1/4"	1 9/16"	2 3/8"	2 3/8"	1 9/16"	1 3/16"	1 1/2"	2 1/4"
Girder No. 3	2 1/4"	1 1/2"	1 3/16"	1 9/16"	2 3/8"	2 3/8"	1 9/16"	1 1/4"	1 9/16"	2 3/8"	2 3/8"	1 9/16"	1 3/16"	1 1/2"	2 1/4"
Girder No. 4	2 1/4"	1 1/2"	1 3/16"	1 9/16"	2 3/8"	2 3/8"	1 9/16"	1 1/4"	1 9/16"	2 3/8"	2 3/8"	1 9/16"	1 3/16"	1 1/2"	2 1/4"
Girder No. 5	2 3/8"	1 1/2"	1 3/16"	1 1/2"	2 3/8"	2 3/8"	1 1/2"	1 1/8"	1 1/2"	2 3/8"	2 3/8"	1 1/2"	1 3/16"	1 1/2"	2 3/8"



Notes:
If girder camber is different from that shown in the camber diagram, 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.

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

THEORETICAL SLAB HAUNCHING DIAGRAM

A7510

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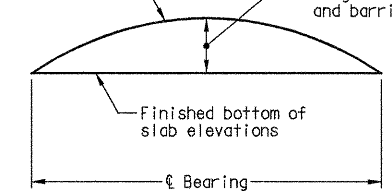
LAWRENCE E. ROLWES
NUMBER PE-2006002847
REGISTERED PROFESSIONAL ENGINEER
5/15/07

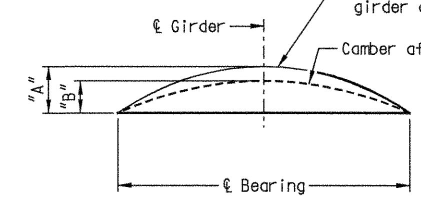
DATE 05/15/07

THEORETICAL BOTTOM OF SLAB ELEVATIONS AT ℄ OF GIRDER (PRIOR TO FORMING FOR SLAB) ✱✱					
	Span (1-2) (55′-10½″ ℄ Brg. - ℄ Brg.)				
	℄ Brg.	0.25	0.50	0.75	℄ Brg.
Girder No. 1	404.50	404.54	404.55	404.54	404.50
Girder No. 2	404.68	404.72	404.74	404.72	404.68
Girder No. 3	404.73	404.77	404.79	404.77	404.73
Girder No. 4	404.56	404.60	404.62	404.60	404.56
Girder No. 5	404.38	404.42	404.43	404.42	404.38
	Span (2-3) (55′-11″ ℄ Brg. - ℄ Brg.)				
	℄ Brg.	0.25	0.50	0.75	℄ Brg.
Girder No. 1	404.50	404.54	404.55	404.54	404.50
Girder No. 2	404.68	404.72	404.74	404.72	404.68
Girder No. 3	404.73	404.77	404.79	404.77	404.73
Girder No. 4	404.56	404.60	404.62	404.60	404.56
Girder No. 5	404.38	404.42	404.43	404.42	404.38
	Span (3-4) (55′-10½″ ℄ Brg. - ℄ Brg.)				
	℄ Brg.	0.25	0.50	0.75	℄ Brg.
Girder No. 1	404.50	404.54	404.55	404.54	404.50
Girder No. 2	404.68	404.72	404.74	404.72	404.68
Girder No. 3	404.73	404.77	404.79	404.77	404.73
Girder No. 4	404.56	404.60	404.62	404.60	404.56
Girder No. 5	404.38	404.42	404.43	404.42	404.38

✱✱ Elevations are based on a constant slab thickness of 8-1/2″ and include allowance for theoretical dead load deflections due to weight of slab (including prestressed panels) and barrier curbs.



TYPICAL SLAB ELEVATIONS DIAGRAM



	Span (1-2)		Span (2-3)		Span (3-4)	
	"A"	"B"	"A"	"B"	"A"	"B"
Girder No. 1	1 13/16″	1 1/4″	1 13/16″	1 1/4″	1 13/16″	1 1/4″
Girder No. 2	1 13/16″	1 1/8″	1 13/16″	1 1/8″	1 13/16″	1 1/8″
Girder No. 3	1 13/16″	1 1/8″	1 13/16″	1 1/8″	1 13/16″	1 1/8″
Girder No. 4	1 13/16″	1 1/8″	1 13/16″	1 1/8″	1 13/16″	1 1/8″
Girder No. 5	1 13/16″	1 1/4″	1 13/16″	1 1/4″	1 13/16″	1 1/4″

Conversion factors for girder camber:
0.25 pt. = 0.7125 x 0.5 pt.

GIRDER CAMBER DIAGRAM

THEORETICAL BOTTOM OF SLAB ELEVATIONS AND GIRDER CAMBER DIAGRAM

A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	23

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PROJECT NO.

COUNTY WAYNE

STATE OF MISSOURI LAWRENCE E. ROLWES, JR. NUMBER PE-2006002847 REGISTERED PROFESSIONAL ENGINEER 5/15/07

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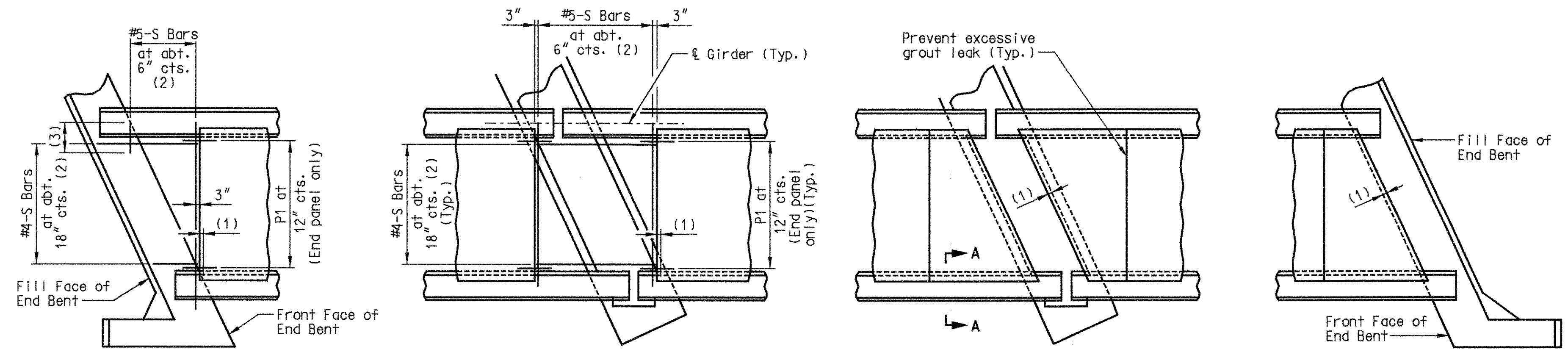
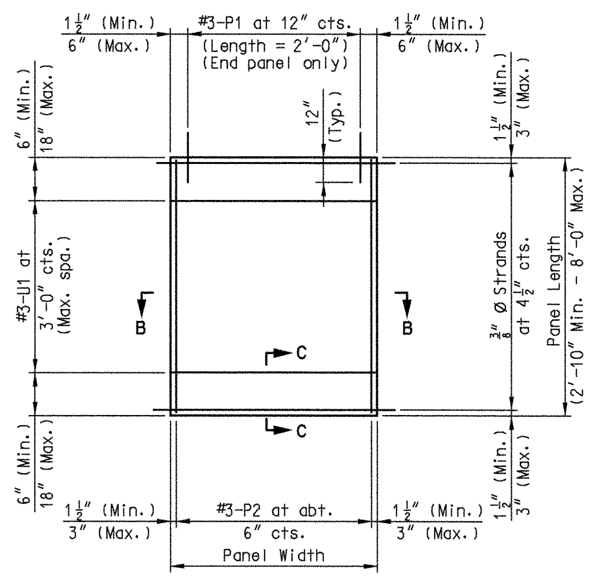


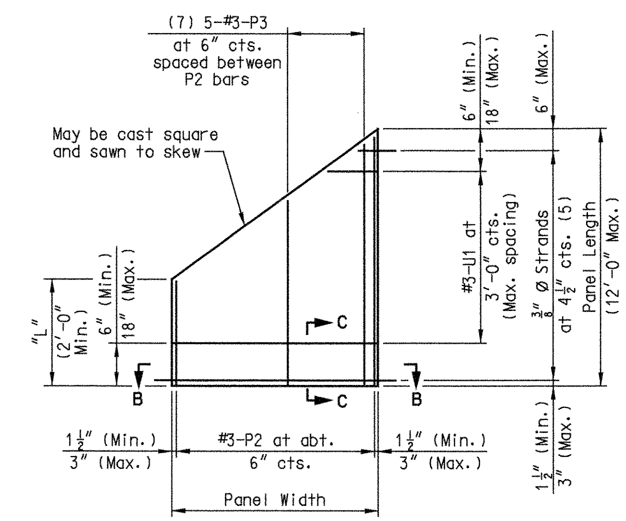
PANELS-SQUARED ENDS

PANELS-SKEWED ENDS

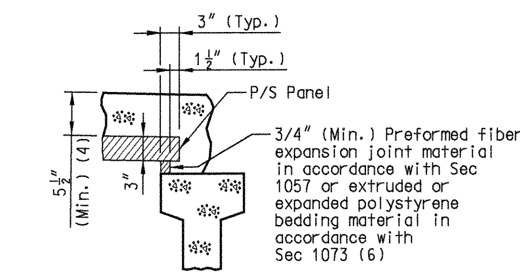
PLAN OF PRECAST PRESTRESSED PANELS PLACEMENT



PLAN OF PRECAST PRESTRESSED PANEL

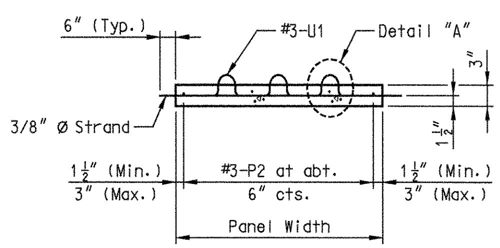


PLAN OF PRECAST PRESTRESSED PANEL
(SKEWED END-OPTIONAL)

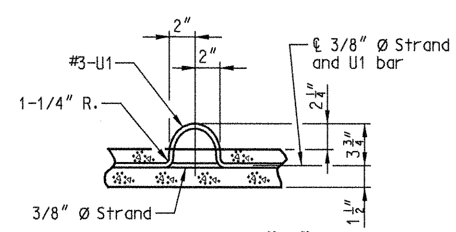


SECTION A-A

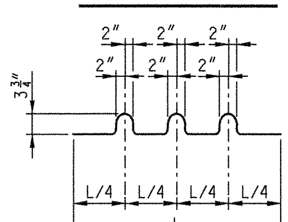
Note: Use slab haunching diagram on Sheet No. 21 for determining thickness of preformed fiber expansion joint material or polystyrene bedding material within the limits noted in general notes.



SECTION B-B

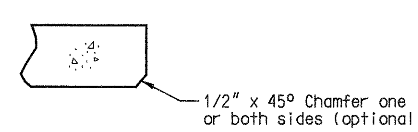


DETAIL "A"



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).



SECTION C-C

NOTES:

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

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

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

(2) S-bars shown are bottom steel in slab between panels and used with squared end panels only.

(3) Extend S-bars 18 inches beyond the front face of end bents only.

(4) 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.

(5) 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.

(6) All panel support pads shall be glued to the girder. When support thickness exceeds 1-1/2 inches, the pads shall be glued top and bottom. The glue used shall be the type recommended by the panel support pads manufacturer.

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

GENERAL NOTES:

PRESTRESSED PANELS:

Concrete for prestressed panels shall be Class A-1 with f'c = 6,000 psi, f'ci = 3,500 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 square 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.

Minimum preformed fiber expansion joint material or polystyrene bedding material thickness shall be 3/4 inch. Thicker material may be used on one or both sides of the girder to reduce cast-in-place concrete thickness to within tolerances. No more than 2 inches total thickness shall be used.

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.

Slab thickness over prestressed panels varies due to girder camber.

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.

REINFORCING STEEL:

All dimensions are out-to-out.

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

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

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

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

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 insure proper handling, may be used in lieu of the #3-P2 bars shown. Wire or bar diameter shall not be larger than 0.375 inches. 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.

All reinforcement other than prestressing strands shall be epoxy coated.

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

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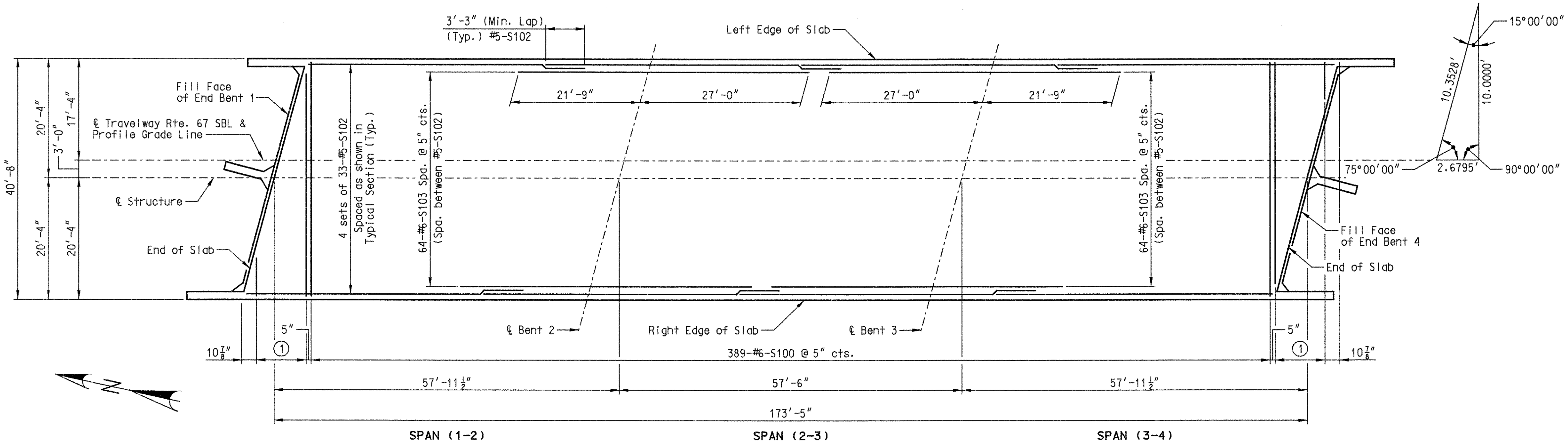
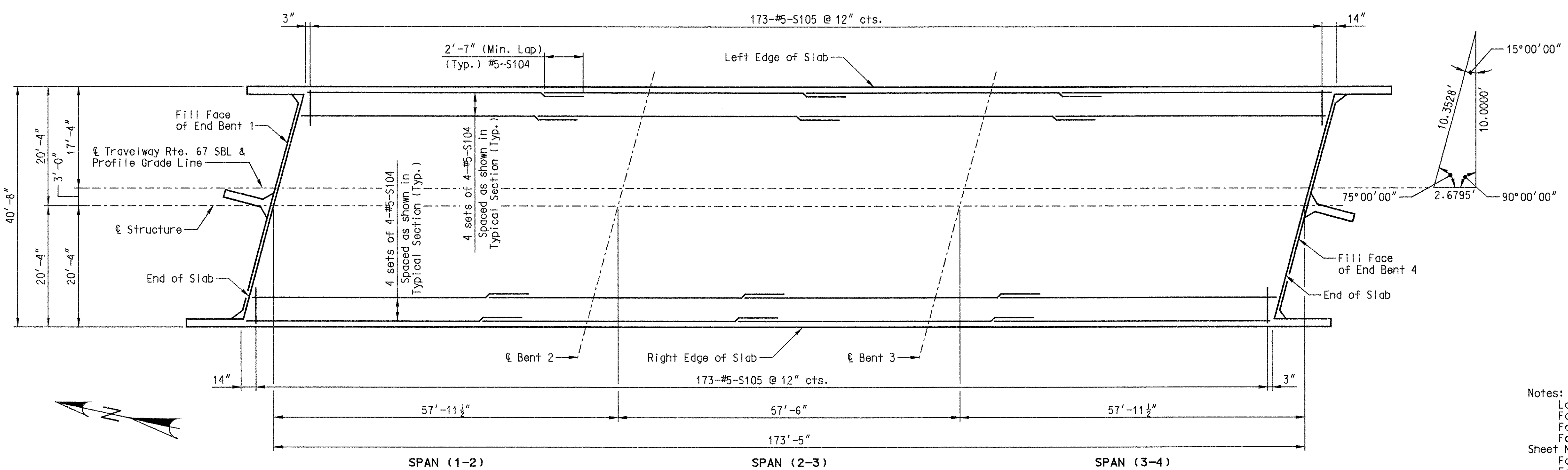


TOP REINFORCEMENT

(1) 25-#6-S101 @ 5" cts.



BOTTOM REINFORCEMENT

Notes:
Longitudinal slab dimensions are measured horizontally.
For Typical Section, see Sheet No. 25.
For location of slab drains, see Sheet No. 27.
For details and reinforcing of safety barrier curbs, see Sheet Nos. 28 and 29.
For Slab Pouring Sequence, see Sheet No. 26.
For reinforcing at End Bent Diaphragms, see Sheet Nos. 6, 7, 14, and 15.

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

SLAB PLAN SHOWING REINFORCING

A7510

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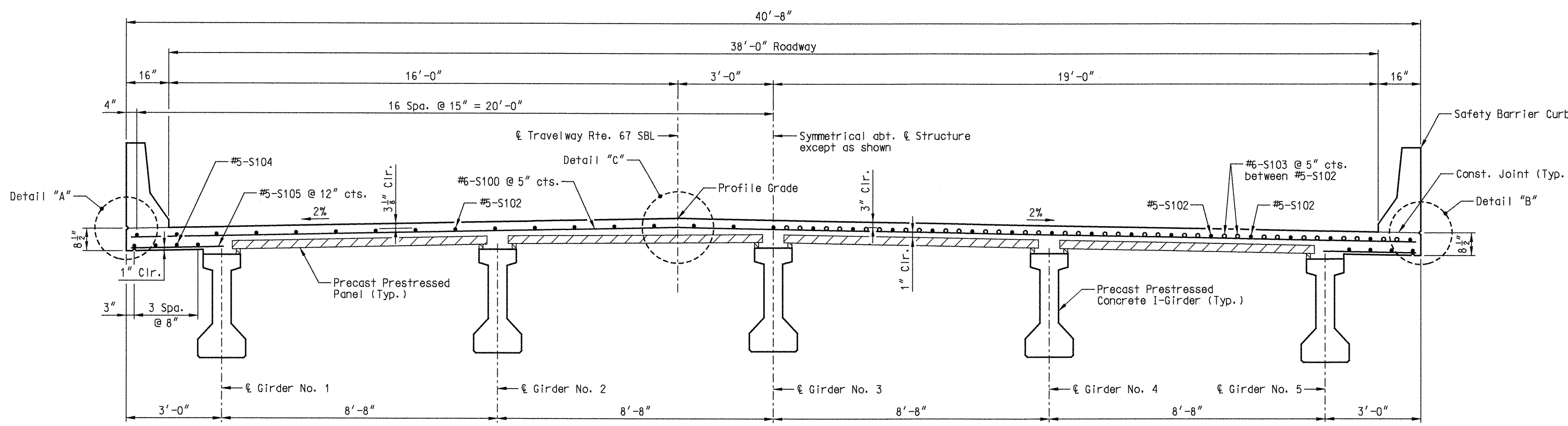
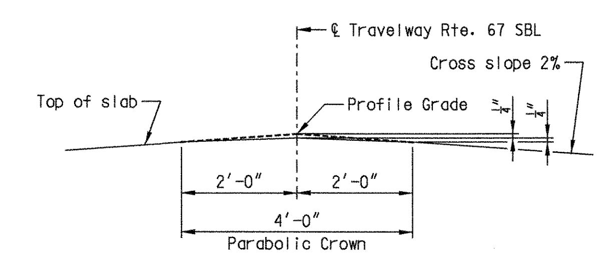
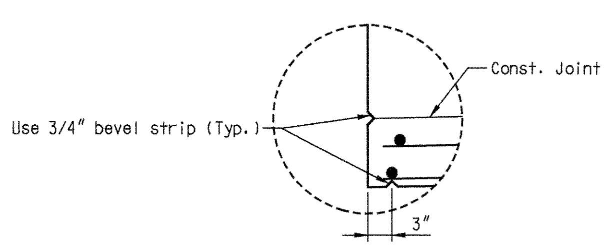


TYPICAL SECTION



DETAIL "C"



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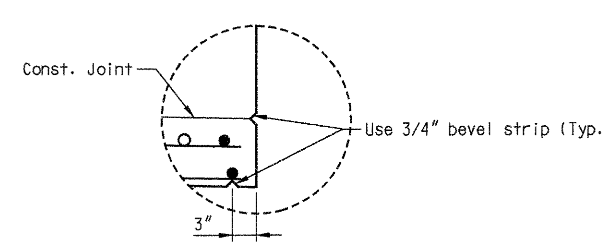

DETAIL "B"

Notes:
Transverse slab dimensions are measured horizontally.
For Slab Pouring Sequence, see Sheet No. 26.
For Theoretical Slab Haunching Diagram, see Sheet No. 21.
For details and reinforcement of barrier curbs, see Sheet Nos. 28 and 29.
For details of precast panels, see Sheet No. 23.
For location of slab drains, see Sheet No. 27.

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

Sheet No. 25 of 36

SLAB CROSS SECTION

A7510

STATE OF MISSOURI
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REGISTERED PROFESSIONAL ENGINEER
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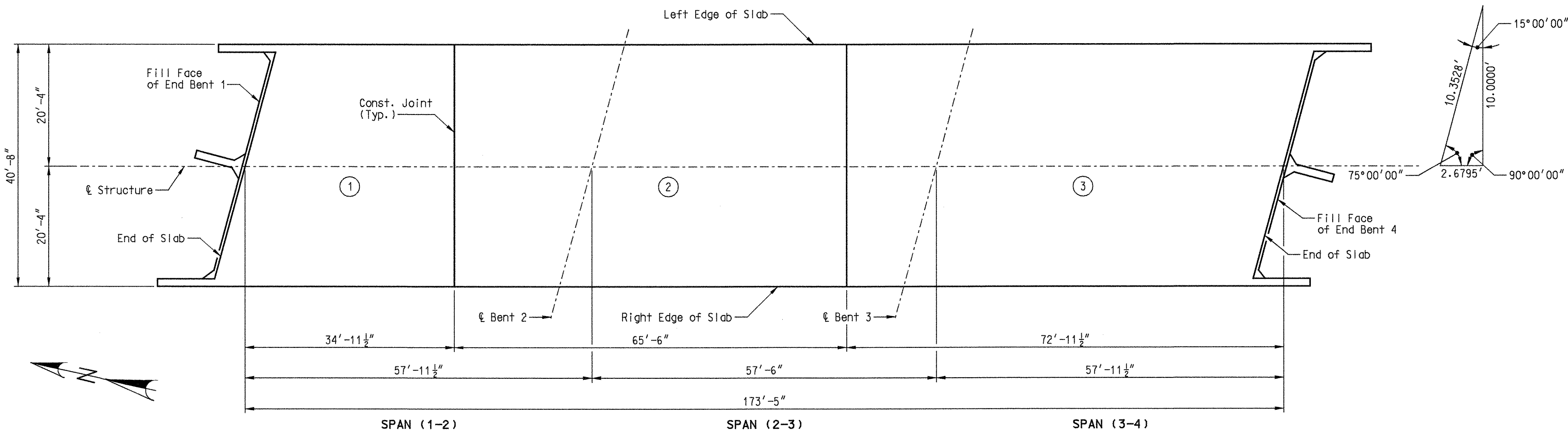
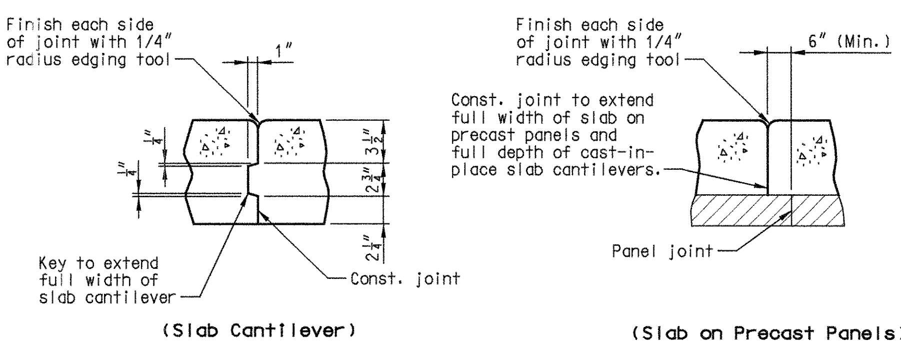


SLAB POURING SEQUENCE



SLAB CONSTRUCTION JOINT DETAILS

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

Notes:
Longitudinal and transverse dimensions are measured horizontally.
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.

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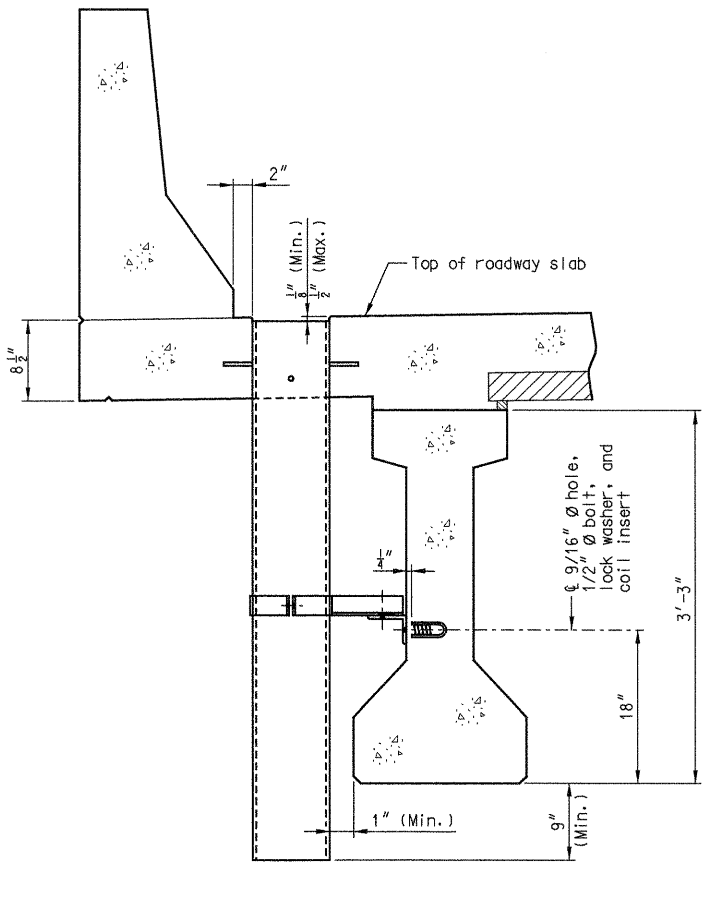
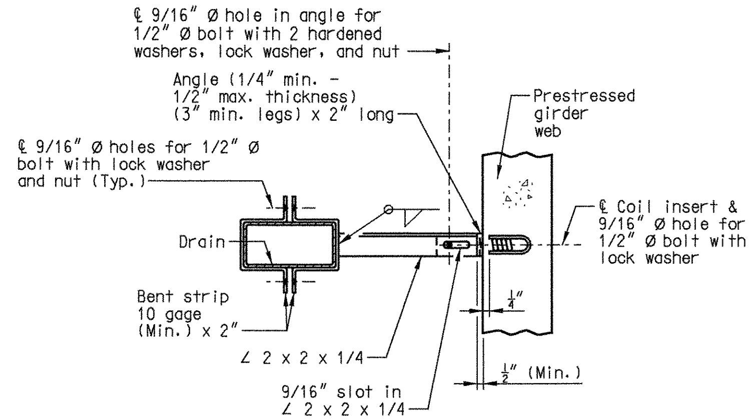
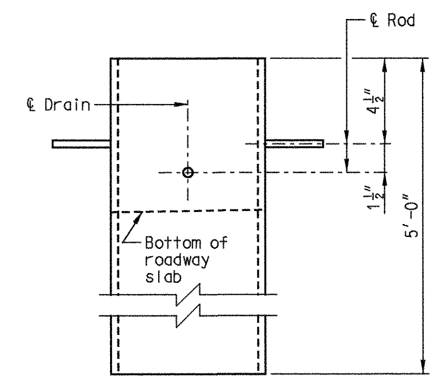


PART SECTION NEAR DRAIN



PART PLAN SHOWING BRACKET ASSEMBLY



ELEVATION OF DRAIN

Notes:

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.

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

Outside dimensions of drains are 8" x 4".

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

Shift reinforcing steel in field where necessary to clear drains.

The drains, coil inserts, and bracket assemblies shall be galvanized in accordance with ASTM A123.

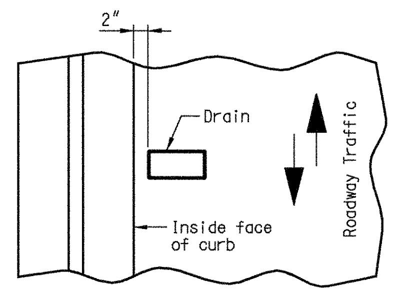
All bolts, hardened washers, lock washers, and nuts shall be galvanized in accordance with ASTM A153.

The coil insert required for the bracket assembly attachment shall be located on the Prestressed I-Girder shop drawings.

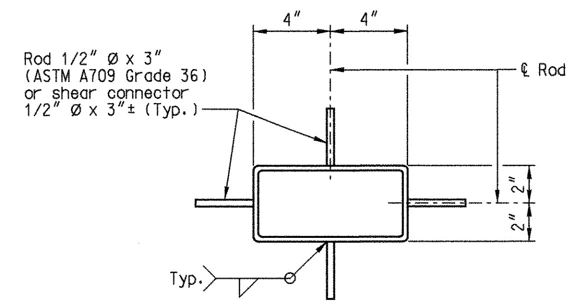
Shop drawings will not be required for the slab drains and the bracket assemblies.

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

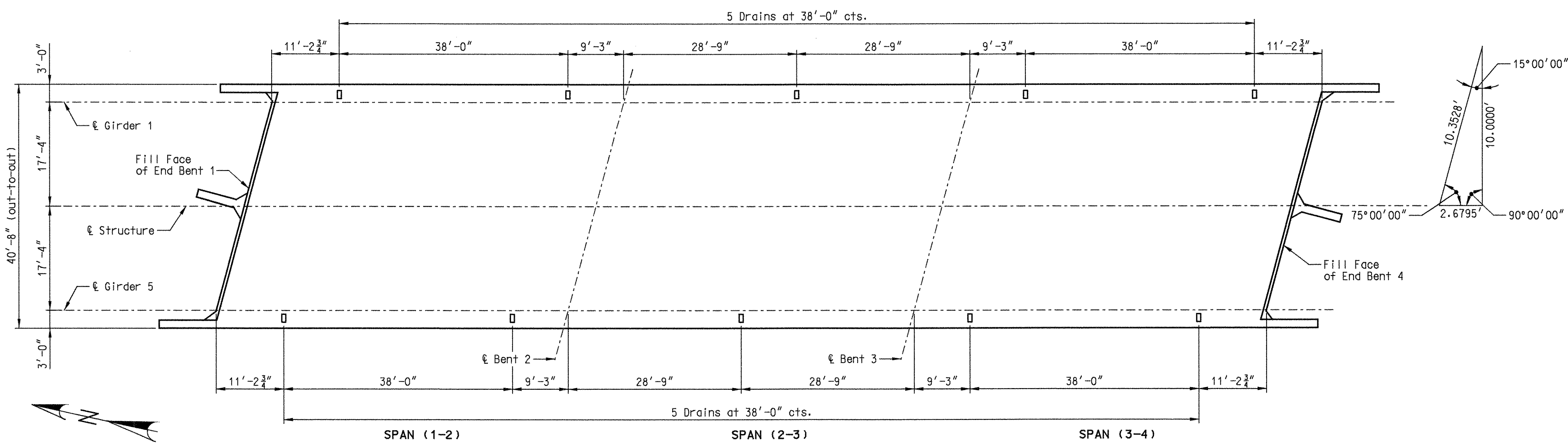
The bolt required to attach the slab drain bracket assembly to the prestresssed girder web shall be supplied by the prestressed I-Girder fabricator.



PART PLAN OF SLAB AT DRAIN



PLAN OF DRAIN



LOCATION OF SLAB DRAINS

M:\jobs\44514 Rte 67\Techprod\Bridges\A7510\Drawings\ZPLOT_J0P0930A_A7510_027_F.dgn

USER: hupshaw
PLOTTED: 15-MAY-2007 10:52

Detailed FEB 2007
Checked APR 2007

HNTB

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

SLAB DRAIN DETAILS

A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	28

JOB NO. J0P0930A

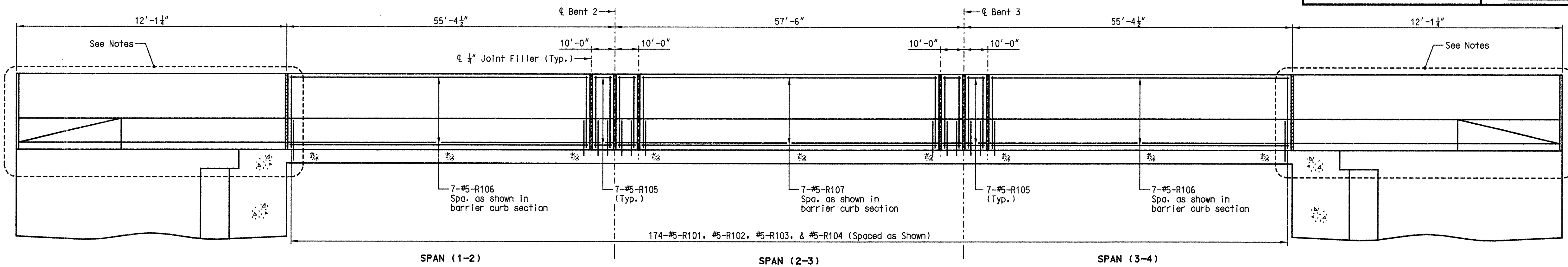
CONTRACT ID

PROJECT NO.

COUNTY WAYNE

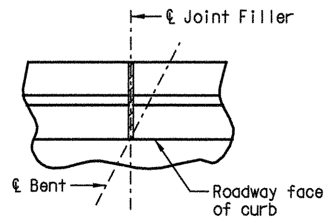
STATE OF MISSOURI LAWRENCE B. ROLWES, JR. NUMBER PE-2006002847 REGISTERED PROFESSIONAL ENGINEER 5/15/07

DATE 05/15/07

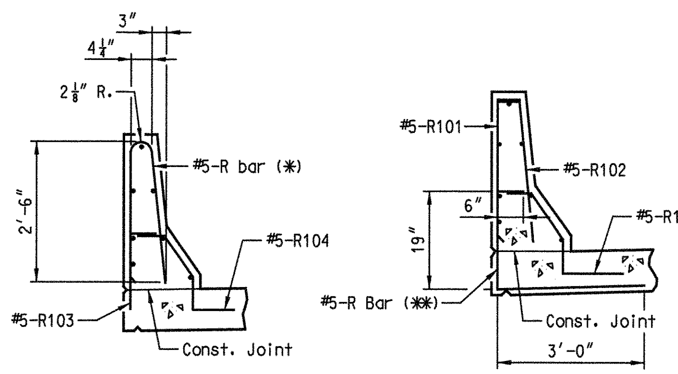


SECTION NEAR LEFT BARRIER CURB

(Right Barrier Curb Similar)



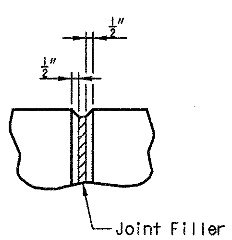
PART PLAN SHOWING SAFETY BARRIER CURB JOINT



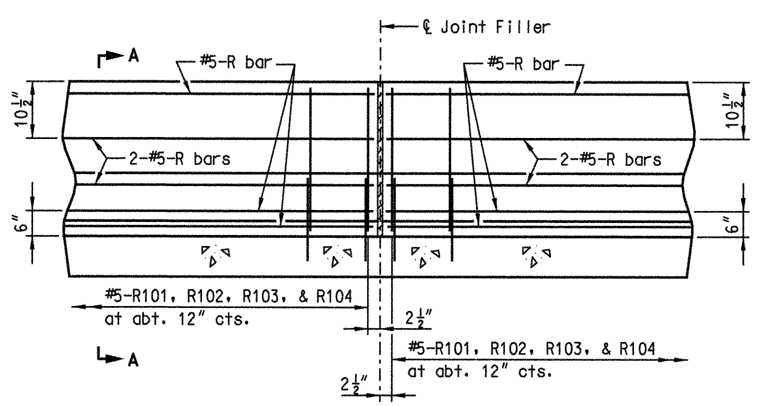
R-BAR PERMISSIBLE ALTERNATE SHAPE

(*) The R101 and R102 bar combination may be furnished as one bar, as shown, at the contractor's option. (All dimensions are out-to-out.)

(**) The R103 bar and #5 bottom transverse slab bar in cantilever (P/S panels only) combination may be furnished as one bar as shown, at the contractor's option.

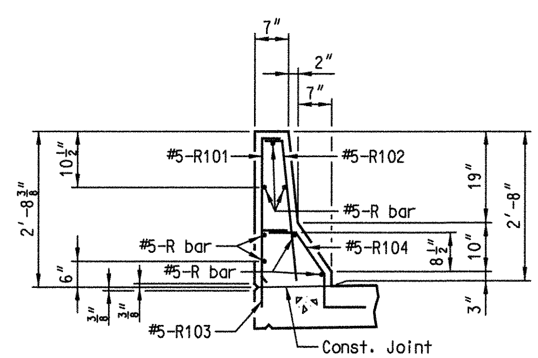


FILLED JOINT DETAIL



PART SECTION NEAR LEFT SAFETY BARRIER CURB

(Cast-in-Place Conventional Forming Option)



PART SECTION A-A

Notes:
Use a minimum lap of 2'-11" for #5 horizontal safety barrier curb bars.
The cross-sectional area above the slab = 2.28 sq. ft.

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" radius or a 3/8" 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. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Safety Barrier Curb".
The curb shall be cured by application of Type 1-D or Type 2 Liquid Membrane-Forming Compound in accordance with Sec 1055. Surface sealing for concrete in accordance with Sec 703 will not be permitted.
Longitudinal dimensions are horizontal dimensions.
Longitudinal dimensions are along top of outside edge of slab parallel to grade.
For safety barrier curb at End Bents, see Sheet No. 29.

USER: hupshaw PLOTTED: 15-MAY-2007 16:43 M:\jobs\44514 Rte 67\Techprod\Bridges\A7510\Drawings\J0P0930A_A7510_028_F.dgn

Detailed FEB 2007
Checked APR 2007

HNTB

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

SAFETY BARRIER CURB

A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	29

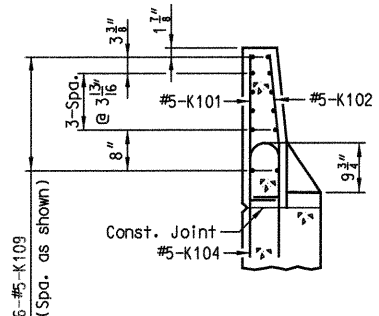
JOB NO. J0P0930A

CONTRACT ID

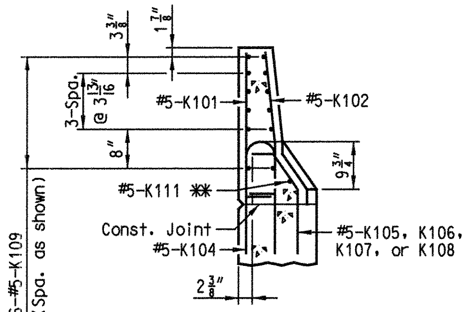
PROJECT NO.

COUNTY WAYNE

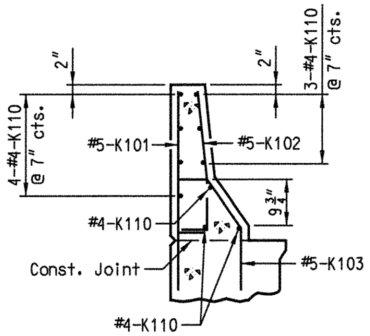
DATE 05/15/07



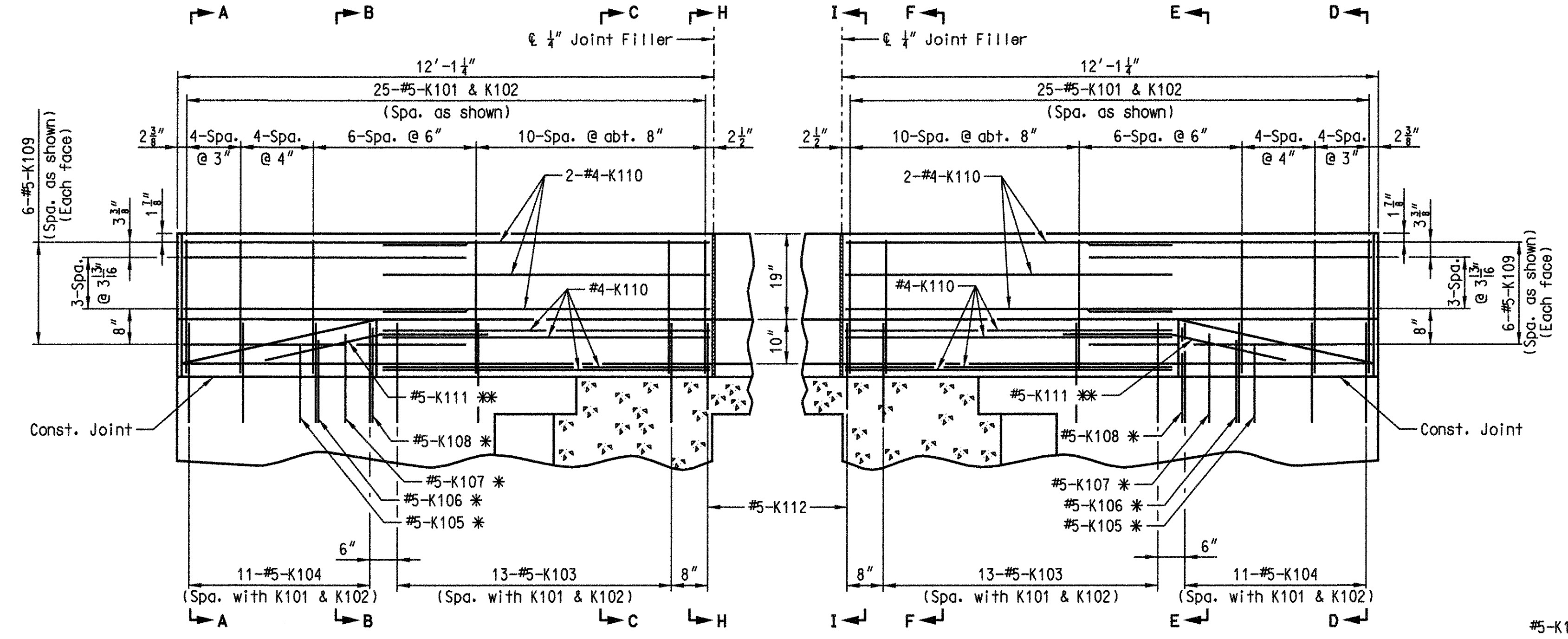
SECTION A-A



SECTION B-B

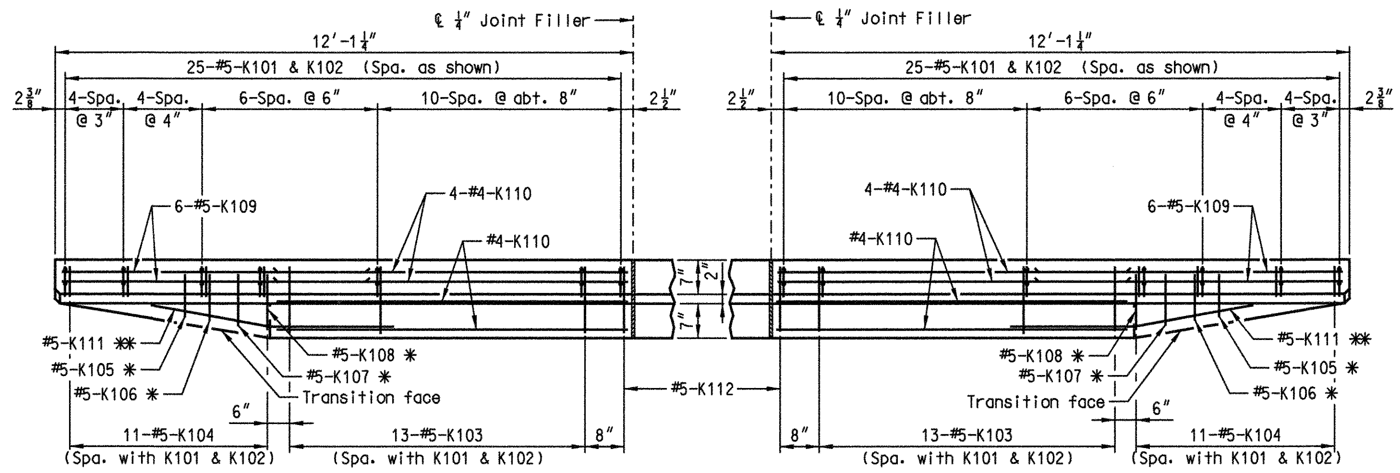


SECTION C-C



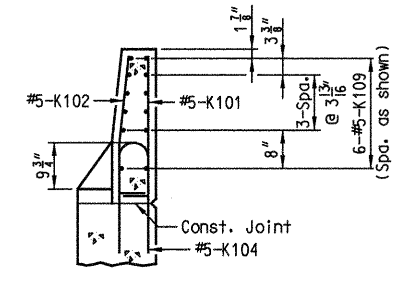
✱ Spaced with #5-K104 bars.

✱✱ Fit bar to follow transition face of curb.

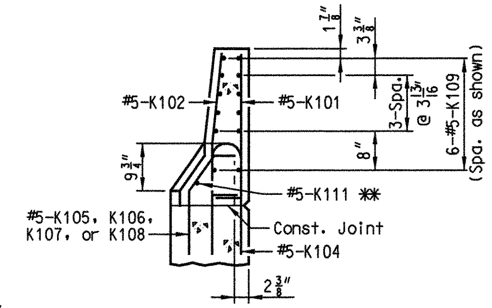


DETAILS OF SAFETY BARRIER CURB AT END BENTS

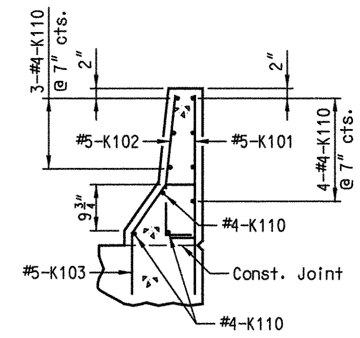
(Left barrier curb shown, right barrier curb similar.)



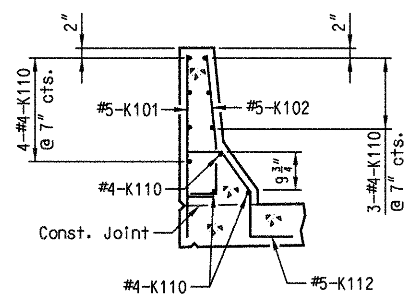
SECTION D-D



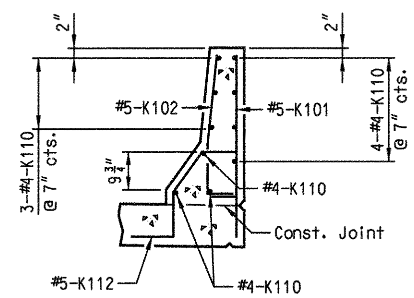
SECTION E-E



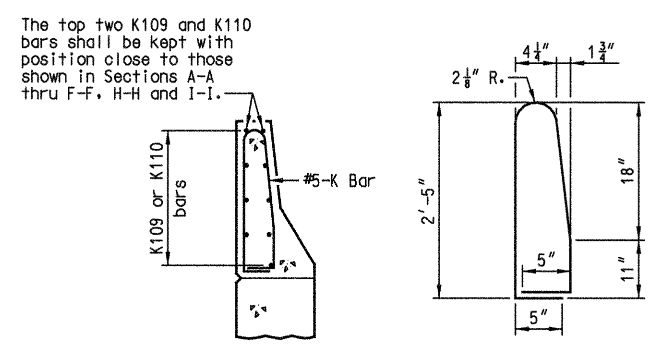
SECTION F-F



SECTION H-H



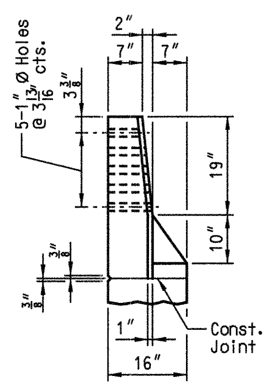
SECTION I-I



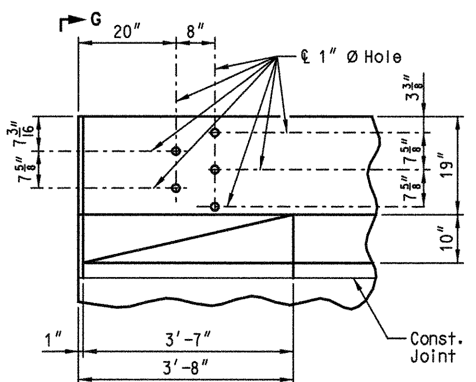
(K103 or K104 thru K108 bars not shown for clarity)

K101-K102 BAR PERMISSIBLE ALTERNATE SHAPE (✱✱✱)

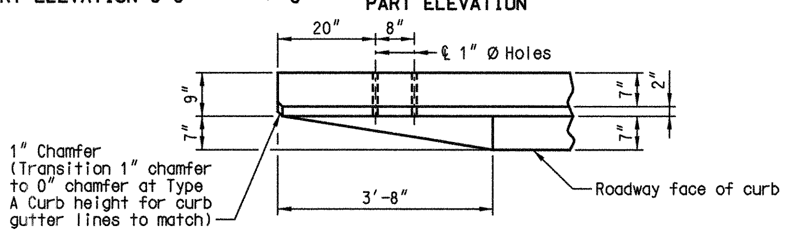
(✱✱✱) The K101 and K102 bar combination may be furnished as one bar, as shown, at the contractor's option.



PART ELEVATION G-G



PART ELEVATION



PART PLAN

DETAILS OF GUARD RAIL ATTACHMENT

Notes:
Use a minimum lap of 2'-0" between K109 and K110 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. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Safety Barrier Curb".

DETAILS OF SAFETY BARRIER CURB AT END BENTS

A7510

Detailed FEB 2007
Checked APR 2007
HNTB

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

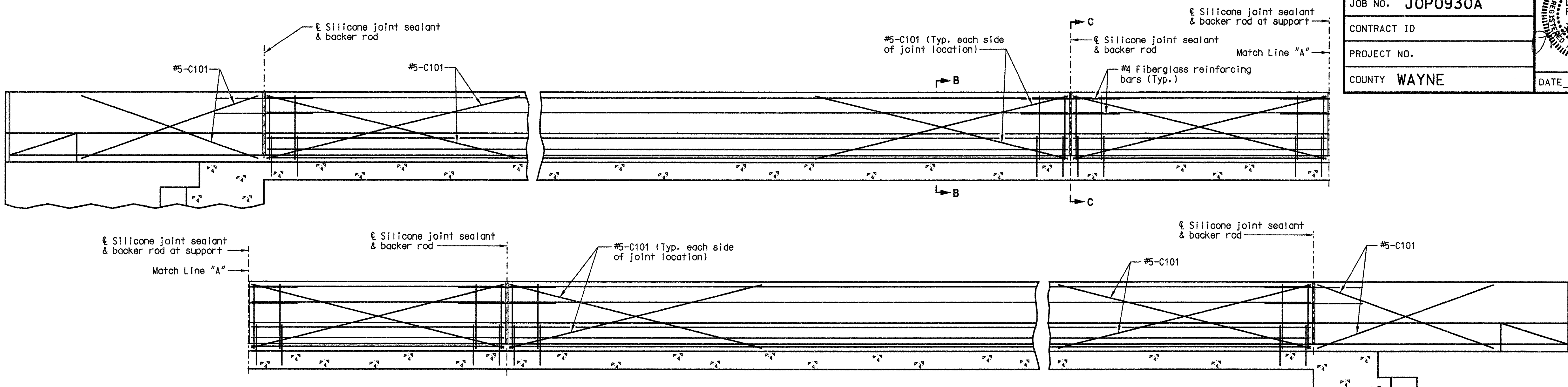
USER: hupshaw
PLOTTED: 15-MAY-2007 16:45 M:\jobs\44514 Rte 67\Techprod\Bridges\A7510\Drawings\J0P0930A_A7510_029_F.dgn

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	30

JOB NO. J0P0930A
CONTRACT ID
PROJECT NO.
COUNTY WAYNE

LAWRENCE E. ROLWES, JR. NUMBER PE-2006002847 STATE OF MISSOURI PROFESSIONAL ENGINEER 5/15/07

DATE 05/15/07



TYPICAL SECTION NEAR SAFETY BARRIER CURB AT SUPPORT LOCATIONS

(Optional Slip-Form Bridge Safety Barrier Curb)

Notes:

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

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.

The curb shall be cured by application of Type 1-D or Type 2 Liquid Membrane-Forming Compound in accordance with Sec 1055. Surface sealing for concrete in accordance with Sec 703 will not be permitted.

Notes:

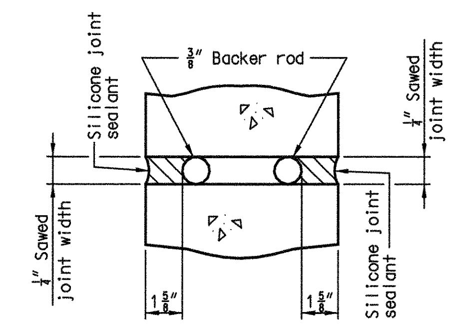
Joint sealant and backer rods shall be used on all slip-form barrier curbs instead of joint filler and shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.

Plastic waterstop shall not be used with slip-form option.

C Bars (Slip-Form Option only) shall be used in addition to cast-in-place conventional forming reinforcement for bridge safety barrier curb.

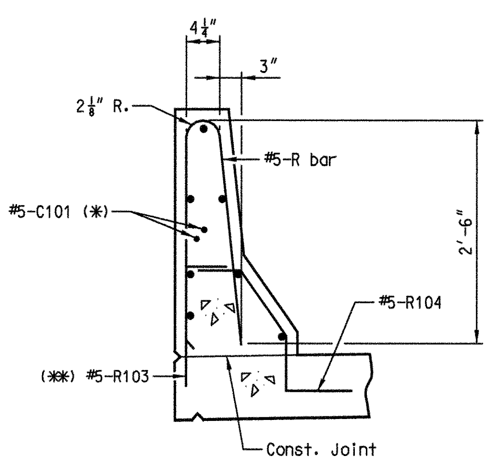
For Slip-Form Option, all sides of the safety barrier curb shall have a vertically broomed finish and the curb top shall have a transversely broomed finish.

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. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Safety Barrier Curb".

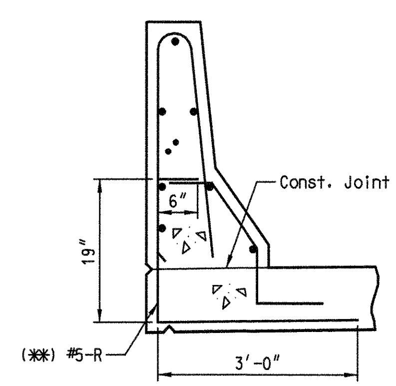


SECTION A-A

Note:
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.

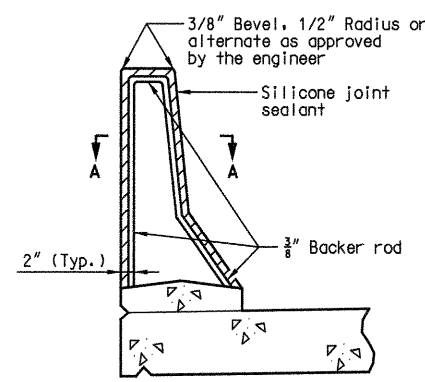


PART SECTION B-B

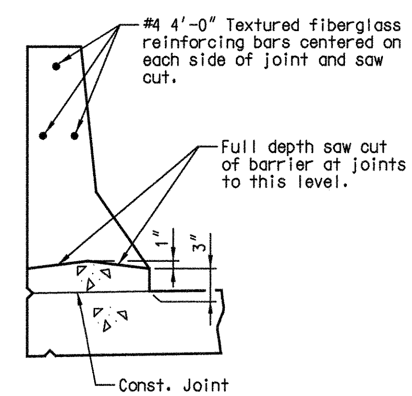


PART SECTION B-B

(Optional #5-R bar shown)



SECTION THRU JOINT



PART SECTION C-C

Notes:

(✱) Each side of joint location.

(✱✱) The R103 bar and #5 bottom transverse slab bar in cantilever (P/S panels only) combination may be furnished as one bar at the contractor's option.

USER: hupshow
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Detailed FEB 2007
Checked APR 2007

HNTB

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

OPTIONAL SLIP-FORM
BRIDGE SAFETY BARRIER CURB

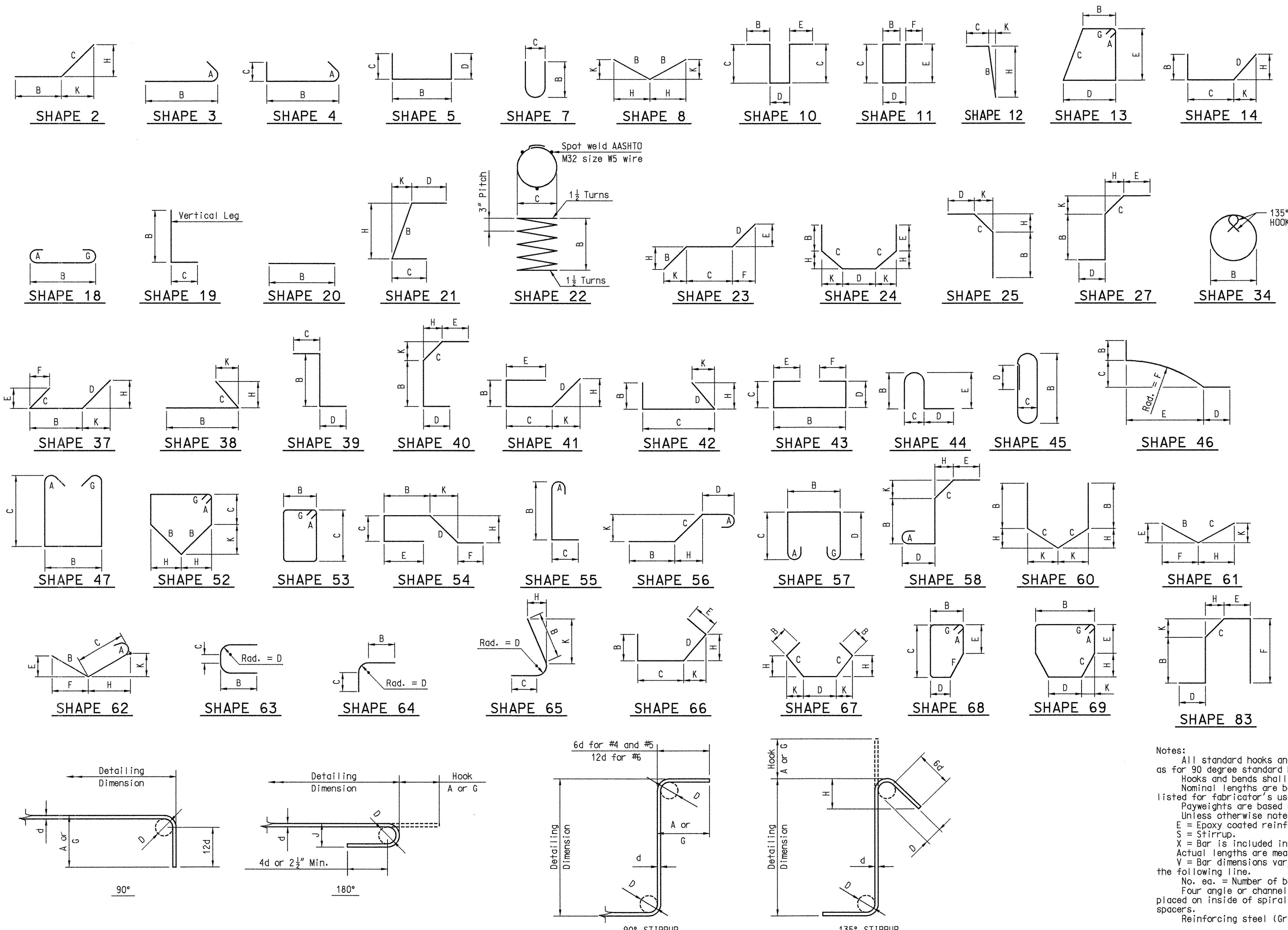
A7510

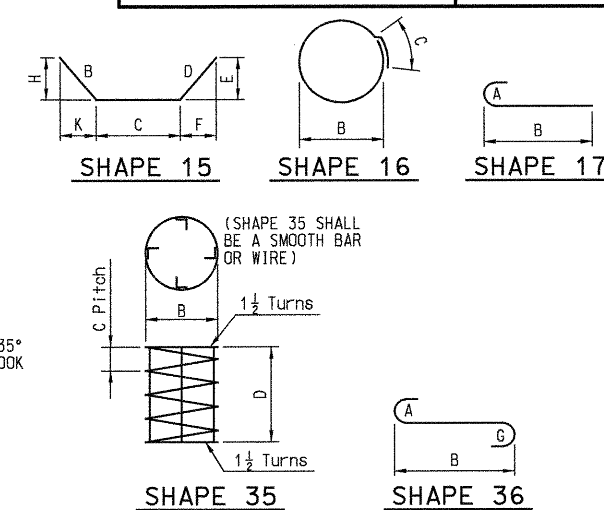
ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	31

JOB NO. J0P0930A
CONTRACT ID
PROJECT NO.
COUNTY WAYNE

STATE OF MISSOURI
LAWRENCE E. ROLWES
NUMBER PE-2006002847
PROFESSIONAL ENGINEER
5/15/07

DATE 05/15/07





STIRRUP HOOK DIMENSIONS

Bar Size	D (in)	All Grades		
		90° Hooks	135° Hooks	
		Hook A or G (in)	Hook A or G (in)	Approx. H (in)
#4	2"	4½"	4½"	3"
#5	2½"	6"	5½"	3¾"
#6	4½"	12"	8"	4½"

END HOOK DIMENSIONS

Bar Size	D (in)	All Grades		
		180° Hooks		90° Hooks
		Hook A or G (in)	J (in)	Hook A or G (in)
#3	2¼"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3¾"	7"	5"	10"
#6	4½"	8"	6"	12"
#7	5¼"	10"	7"	14"
#8	6"	11"	8"	16"
#9	9½"	15"	11¾"	19"
#10	10¾"	17"	13¼"	22"
#11	12"	19"	14¾"	2'-0"
#14	18¼"	2'-3"	21¾"	2'-7"
#18	2'-0"	3'-0"	2'-4½"	3'-5"

Notes:

All standard hooks and bends other than 180 degree are to be bent with same procedure as for 90 degree standard hooks.

Hooks and bends shall be in accordance with the procedures as shown on this sheet.

Nominal lengths are based on out-to-out dimensions shown in bending diagrams and are listed for fabricator's use. (Nearest inch)

Payweights are based on actual lengths.

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

E = Epoxy coated reinforcement.

S = Stirrup.

X = Bar is included in substructure quantities.

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

V = Bar dimensions vary in equal increments between dimensions shown on this line and the following line.

No. ea. = Number of bars of each length.

Four angle or channel spacers are required for each column spiral. Spacers are to be placed on inside of spirals. Length and weight of column spirals do not include splices or spacers.

Reinforcing steel (Grade 60) fy = 60,000 psi.

BAR BENDING DIAGRAMS

A7510

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	32

JOB NO. J0P0930A

CONTRACT ID

PROJECT NO.

COUNTY WAYNE

STATE OF MISSOURI JEFFREY B. SMITH NUMBER E-27175 REGISTERED PROFESSIONAL ENGINEER 5-15-07

DATE 05/15/07

BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. (SIZE MARK)	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B (FT. IN.)	C (FT. IN.)	D (FT. IN.)	E (FT. IN.)	F (FT. IN.)	H (FT. IN.)	K (FT. IN.)	NOMINAL LENGTH (FT. IN.)	ACTUAL LENGTH (FT. IN.)	WEIGHT (LBS.)
		END BENT 1																
9	6F100	Wingwall		23					14"	5'-9"	14"	8 1/2"	11 1/8"	8 1/2"	11 1/8"	8'-1"	8'-1"	109
4	6F101	Wingwall		38					2'-8"	5'-0"				4'-9 3/4"	15 1/2"	7'-8"	7'-8"	46
9	6F102	Wingwall		23					14"	4'-6"	14"	11 1/8"	8 1/2"	11 1/8"	8 1/2"	6'-10"	6'-10"	92
4	6F103	Wingwall		2					2'-8"	4'-6"				4'-4 1/8"	14"	7'-2"	7'-2"	43
12	6F104	Int. Wingwall		23					2'-3"	3'-10"	2'-3"	19 1/8"	19 1/8"	19 1/8"	19 1/8"	8'-4"	8'-4"	150
8	9H100	Beam		20					41'-9"							41'-9"	41'-9"	1,136
7	6H101	Beam & Backwall		20					41'-9"							41'-9"	41'-9"	439
4	4H102	Beam		20					11'-11"							11'-11"	11'-11"	32
6	6H103	Backwall		20					2'-2"							2'-2"	2'-2"	20
12	6H104	Backwall		20					7'-4"							7'-4"	7'-4"	132
4	6H105	Backwall	E	20					41'-9"							41'-9"	41'-9"	251
1	6H106	Appr. Seat		20					39'-1"							39'-1"	39'-1"	59
40	5H107	Appr. Seat	E	20					2'-6"							2'-6"	2'-6"	104
5	5H108	Backwall		20					4'-0"							4'-0"	4'-0"	21
10	8H109	Wingwall		20					11'-6"							11'-6"	11'-6"	307
20	8H110	Wingwall		17					11'-7"							12'-6"	12'-6"	668
4	8H111	Wingwall *	E	20					11'-6"							11'-6"	11'-6"	123
4	8H112	Wingwall	E	20					11'-7"							11'-7"	11'-7"	124
10	8H113	Wingwall		20					12'-1"							12'-1"	12'-1"	323
2	8H115	Wingwall	E	20					12'-1"							12'-1"	12'-1"	65
18	8H117	Int. Wingwall		19					10'-7"	16"						11'-11"	11'-9"	565
28	5U100	Beam & Backwall		5	S				2'-9"	5'-2"	5'-2"					13'-1"	12'-10"	375
9	4U102	Beam		53	S				2'-9"	2'-7"						11'-5"	11'-2"	67
6	4U103	Beam		53	S				2'-9"	2'-10 3/4"						12'-1"	11'-10"	47
36	5U104	Backwall	E	5	S				2'-3"	3'-7"	3'-7"					9'-5"	9'-2"	344
30	6U105	Backwall		19	S				2'-7"	2'-9"						5'-4"	5'-3"	237
51	6U106	Backwall	E	19	S				3'-9"	5'-0"						8'-9"	8'-8"	664
16	5V100	Beam & Backwall		20					5'-2"							5'-2"	5'-2"	86
15	6V101	Backwall		20					2'-7"							2'-7"	2'-7"	58
20	6V102	Wingwall		20					6'-9"							6'-9"	6'-9"	203
20	6V103	Wingwall		20					6'-10 1/2"							6'-11"	6'-11"	208
16	6V104	Int. Wingwall		20					5'-6"							5'-6"	5'-6"	132

* Two additional #8-H111 are included in the bar bill for testing.

BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. (SIZE MARK)	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B (FT. IN.)	C (FT. IN.)	D (FT. IN.)	E (FT. IN.)	F (FT. IN.)	H (FT. IN.)	K (FT. IN.)	NOMINAL LENGTH (FT. IN.)	ACTUAL LENGTH (FT. IN.)	WEIGHT (LBS.)
		END BENT 4																
9	6F400	Wingwall		23					14"	5'-9"	14"	8 1/2"	11 1/8"	8 1/2"	11 1/8"	8'-1"	8'-1"	109
4	6F401	Wingwall		38					2'-8"	5'-0"				4'-9 3/4"	15 1/2"	7'-8"	7'-8"	46
9	6F402	Wingwall		23					14"	4'-6"	14"	11 1/8"	8 1/2"	11 1/8"	8 1/2"	6'-10"	6'-10"	92
4	6F403	Wingwall		2					2'-8"	4'-6"				4'-4 1/8"	14"	7'-2"	7'-2"	43
12	6F404	Int. Wingwall		23					2'-3"	3'-10"	2'-3"	19 1/8"	19 1/8"	19 1/8"	19 1/8"	8'-4"	8'-4"	150
8	9H400	Beam		20					41'-9"							41'-9"	41'-9"	1,136
7	6H401	Beam & Backwall		20					41'-9"							41'-9"	41'-9"	439
4	4H402	Beam		20					11'-11"							11'-11"	11'-11"	32
6	6H403	Backwall		20					2'-2"							2'-2"	2'-2"	20
12	6H404	Backwall		20					7'-4"							7'-4"	7'-4"	132
4	6H405	Backwall	E	20					41'-9"							41'-9"	41'-9"	251
1	6H406	Appr. Seat		20					39'-1"							39'-1"	39'-1"	59
40	5H407	Appr. Seat	E	20					2'-6"							2'-6"	2'-6"	104
5	5H408	Backwall		20					4'-0"							4'-0"	4'-0"	21
10	8H409	Wingwall		20					11'-6"							11'-6"	11'-6"	307
20	8H410	Wingwall		17					11'-7"							12'-6"	12'-6"	668
2	8H411	Wingwall	E	20					11'-6"							11'-6"	11'-6"	61
4	8H412	Wingwall	E	20					11'-7"							11'-7"	11'-7"	124
10	8H413	Wingwall		20					12'-1"							12'-1"	12'-1"	323
2	8H415	Wingwall	E	20					12'-1"							12'-1"	12'-1"	65
18	8H417	Int. Wingwall		19					10'-7"	16"						11'-11"	11'-9"	565
28	5U400	Beam & Backwall		5	S				2'-9"	5'-2"	5'-2"					13'-1"	12'-10"	375
9	4U402	Beam		53	S				2'-9"	2'-7"						11'-5"	11'-2"	67
6	4U403	Beam		53	S				2'-9"	2'-10 3/4"						12'-1"	11'-10"	47
36	5U404	Backwall	E	5	S				2'-3"	3'-7"	3'-7"					9'-5"	9'-2"	344
30	6U405	Backwall		19	S				2'-7"	2'-9"						5'-4"	5'-3"	237
51	6U406	Backwall	E	19	S				3'-9"	5'-0"						8'-9"	8'-8"	664
16	5V400	Beam & Backwall		20					5'-2"							5'-2"	5'-2"	86
15	6V401	Backwall		20					2'-7"							2'-7"	2'-7"	58
20	6V402	Wingwall		20					6'-10 1/2"							6'-11"	6'-11"	208
20	6V403	Wingwall		20					6'-9"							6'-9"	6'-9"	203
16	6V404	Int. Wingwall		20					5'-6"							5'-6"	5'-6"	132

Note:
For bar bending diagram, see Sheet No. 31.

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ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	33

JOB NO. J0P0930A

CONTRACT ID

PROJECT NO.

COUNTY WAYNE

STATE OF MISSOURI
JEFFREY B. SMITH
NUMBER E-27175
PROFESSIONAL ENGINEER
5-15-07

DATE 05/15/07

BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. (SIZE MARK)	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT. IN.	C FT. IN.	D FT. IN.	E FT. IN.	F FT. IN.	H FT. IN.	K FT. IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.
		BENT 2																
24	6D200	Shear Key		20		X			2′-6″							2′-6″	2′-6″	90
8	11H200	Bent Cap		20		X			39′-8″							39′-8″	39′-8″	1,686
10	6H201	Bent Cap		20		X			39′-8″							39′-8″	39′-8″	596
8	11H202	Bent Cap		18		X			39′-8″							42′-10″	42′-10″	1,821
4	4H203	Bent Cap		20		X			12′-2″							12′-2″	12′-2″	33
14	6H204	Bent Cap		5	S	X			3′-3″	22″	22″					6′-11″	6′-8″	140
2	5P200	Columns		35		X			2′-6″	3″	44′-9″					1395′-7″	1395′-7″	2,911
30	5P201	Bent Cap		34	S	X			2′-6″							8′-8″	8′-8″	271
18	5U200	Bent Cap		53	S	X			3′-3″	3′-9″						14′-11″	14′-8″	275
20	5U201	Bent Cap		5	S	X			2′-5″	3′-9″	3′-9″					9′-11″	9′-8″	202
18	5U202	Bent Cap		53	S	X			2′-5″	4′-0⅝″						13′-11″	13′-7″	255
18	5U203	Bent Cap		53	S	X			2′-5″	3′-9″						13′-3″	13′-0″	244
8	5U204	Bent Cap		53	S	X			3′-3″	4′-0⅝″						15′-7″	15′-3″	127
9	4U205	Bent Cap		5	S	X			3′-3″	6″	6″					4′-3″	4′-1″	25
14	10V200	Columns		20		X			29′-9″							29′-9″	29′-9″	1,792
14	10V201	Columns		20		X			33′-9″							33′-9″	33′-9″	2,033
14	10V202	Columns		20		X			18′-7″							18′-7″	18′-7″	1,119
14	10V203	Columns		20		X			14′-7″							14′-7″	14′-7″	879
		BENT 3																
24	6D300	Shear Key		20		X			2′-6″							2′-6″	2′-6″	90
8	11H300	Bent Cap		20		X			39′-8″							39′-8″	39′-8″	1,686
10	6H301	Bent Cap		20		X			39′-8″							39′-8″	39′-8″	596
8	11H302	Bent Cap		18		X			39′-8″							42′-10″	42′-10″	1,821
4	4H303	Bent Cap		20		X			12′-2″							12′-2″	12′-2″	33
14	6H304	Bent Cap		5	S	X			3′-3″	22″	22″					6′-11″	6′-8″	140
2	5P300	Columns		35		X			2′-6″	3″	38′-9″					1210′-11″	1210′-11″	2,526
30	5P301	Bent Cap		34	S	X			2′-6″							8′-8″	8′-8″	271
18	5U300	Bent Cap		53	S	X			3′-3″	3′-9″						14′-11″	14′-8″	275
20	5U301	Bent Cap		5	S	X			2′-5″	3′-9″	3′-9″					9′-11″	9′-8″	202
18	5U302	Bent Cap		53	S	X			2′-5″	4′-0⅝″						13′-11″	13′-7″	255
18	5U303	Bent Cap		53	S	X			2′-5″	3′-9″						13′-3″	13′-0″	244
8	5U304	Bent Cap		53	S	X			3′-3″	4′-0⅝″						15′-7″	15′-3″	127
9	4U305	Bent Cap		5	S	X			3′-3″	6″	6″					4′-3″	4′-1″	25
14	10V300	Columns		20		X			28′-3″							28′-3″	28′-3″	1,702
14	10V301	Columns		20		X			32′-3″							32′-3″	32′-3″	1,943
14	10V302	Columns		20		X			14′-1″							14′-1″	14′-1″	848
14	10V303	Columns		20		X			10′-1″							10′-1″	10′-1″	607
		SLAB																
391	6S100	Slab *	E	20					40′-5″							40′-5″	40′-5″	23,736
50	6S101	Slab	E	20			V	2	2′-9″							2′-9″	2′-9″	1,608
		Increment = 18⅝″							40′-1″							40′-1″	40′-1″	
132	5S102	Slab	E	20					45′-9″							45′-9″	45′-9″	6,299
128	6S103	Slab	E	20					48′-9″							48′-9″	48′-9″	9,372
32	5S104	Slab	E	20					45′-3″							45′-3″	45′-3″	1,510
346	5S105	Slab	E	20					3′-0″							3′-0″	3′-0″	1,083

* Two additional #4-K110, #5-R105, and #6-S100 are included in the bar bill for testing.

BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. (SIZE MARK)	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT. IN.	C FT. IN.	D FT. IN.	E FT. IN.	F FT. IN.	H FT. IN.	K FT. IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.
		DIAPHRAGM AT INT. BENTS																
16	5H500	Int. Bents		20					2′-10½″							2′-11″	2′-11″	49
24	5H501	Int. Bents		20					4′-0″							4′-0″	4′-0″	100
16	6H502	Int. Bents		20					7′-7″							7′-7″	7′-7″	182
32	4H503	Int. Bents		20					7′-6″							7′-6″	7′-6″	160
16	6H504	Int. Bents		20					7′-3″							7′-3″	7′-3″	174
32	5H505	Int. Bents		19					2′-7½″	12½″						3′-8″	3′-7″	120
32	6U500	Int. Bents	E	39	S				3′-9½″	14″	2′-8″					7′-8″	7′-4″	352
96	4U501	Int. Bents	E	39	S				3′-7″	12″	2′-5″					7′-0″	6′-10″	438
16	5V500	Int. Bents	E	20					3′-9″							3′-9″	3′-9″	63
		BARRIER CURB																
48	5C101	Slip-Form Option	E	20					10′-0″							10′-0″	10′-0″	501
100	5K101	Barrier Curb	E	19	S				2′-5″	5⅛″						2′-11″	2′-9″	287
100	5K102	Barrier Curb	E	14	S				5⅛″	11⅛″	18″			2″	17⅞″	2′-11″	2′-9″	287
52	5K103	Barrier Curb	E	40	S				5⅛″	12″	3′-0″	2′-2⅛″		9⅞″	6⅞″	6′-8″	6′-4″	343
44	5K104	Barrier Curb	E	7					3′-0″	6″						6′-3″	6′-3″	287
4	5K105	Barrier Curb	E	25	S				2′-6½″	6¾″	4⅜″			5½″	4″	3′-6″	3′-4″	14
4	5K106	Barrier Curb	E	25	S				2′-5½″	7⅞″	4⅜″			6½″	4½″	3′-6″	3′-5″	14
4	5K107	Barrier Curb	E	25	S				2′-4⅛″	9⅝″	4⅜″			7⅞″	5½″	3′-7″	3′-5″	14
4	5K108	Barrier Curb	E	25	S				2′-2¾″	11¼″	4⅜″			9¼″	6½″	3′-7″	3′-5″	14
48	5K109	Barrier Curb	E	20					5′-7″							5′-7″	5′-7″	280
42	4K110	Barrier Curb *	E	20					8′-4″							8′-4″	8′-4″	234
4	5K111	Barrier Curb	E	8					2′-2⅛″					2′-2″	2⅜″	4′-5″	4′-5″	18
4	5K112	Barrier Curb	E	83	S				7⅛″	12″	12″	5⅛″	17″	6⅞″	9⅞″	4′-6″	4′-1″	17
348	5R101	Barrier Curb	E	19	S				2′-6″	3½″						2′-10″	2′-8″	968
348	5R102	Barrier Curb	E	12	S				2′-6⅛″	3½″				2′-6″	3″	2′-10″	2′-10″	1,028
348	5R103	Barrier Curb	E	19	S				17″	6″						23″	22″	665
348	5R104	Barrier Curb	E	27	S				7″	11¼″	12″	6″		6⅜″	9¼″	3′-1″	2′-9″	998
58	5R105	Barrier Curb *	E	20					9′-8″							9′-8″	9′-8″	585
28	5R106	Barrier Curb	E	20					45′-1″							45′-1″	45′-1″	1,317
14	5R107	Barrier Curb	E	20					37′-2″							37′-2″	37′-2″	543

Note:
For bar bending diagram, see Sheet No. 31.

STATE OF MISSOURI
JEFFREY B. SMITH
NUMBER E-27175
REGISTERED PROFESSIONAL ENGINEER
5-15-07

DATE 05/15/07

BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT. IN.	C FT. IN.	D FT. IN.	E FT. IN.	F FT. IN.	H FT. IN.	K FT. IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.
			TOTALS																
	4																		568
	4			E															672
	5																		9,418
	5			E															18,031
	6																		5,864
	6			E															36,898
	8																		3,726
	8			E															562
	9																		2,272
	10																		10,923
	11																		7,014
			SLAB ON CONCRETE I-GIRDER																
	4																		452
	4			E															438
	5																		1,233
	5			E															9,851
	6																		4,212
	6			E															36,898
	8																		3,726
	8			E															562
	9																		2,272
			REINFORCING STEEL (BRIDGES)																
	4																		116
	5																		8,185
	6																		1,652
	10																		10,923
	11																		7,014
			BARRIER CURB																
	4			E															234
	5			E															7,679
			SLIP FORM OPTION																
	5			E															501

BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT. IN.	C FT. IN.	D FT. IN.	E FT. IN.	F FT. IN.	H FT. IN.	K FT. IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.

Note:
For bar bending diagram, see Sheet No. 31.

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	35

JOB NO. J0P0930A

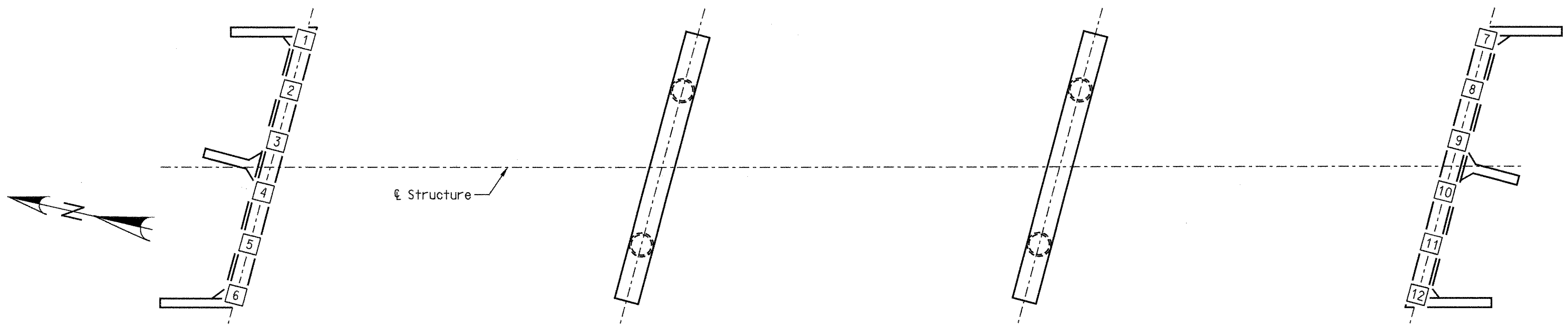
CONTRACT ID

PROJECT NO.

COUNTY WAYNE

STATE OF MISSOURI
LAWRENCE F. ROLWES JR.
NUMBER
E-2006002847
PROFESSIONAL ENGINEER
5/15/07

DATE 05/15/07



END BENT 1 BENT 2 BENT 3 END BENT 4

PART PLAN SHOWING PILE NUMBERING FOR RECORDING "AS-BUILT PILE" DATA

"AS-BUILT PILE" DATA

PILE NO.	LENGTH IN PLACE (FT.)	COMPUTED BEARING (TONS)	REMARKS
			END BENT 1
1			
2			
3			
4			
5			
6			

"AS-BUILT PILE" DATA

PILE NO.	LENGTH IN PLACE (FT.)	COMPUTED BEARING (TONS)	REMARKS
			END BENT 4
7			
8			
9			
10			
11			
12			

"AS-BUILT PILE" DATA

PILE NO.	LENGTH IN PLACE (FT.)	COMPUTED BEARING (TONS)	REMARKS

Note: Indicate in remark column:
A.) If piling were driven to practical refusal.
B.) Pile batter if other than shown on bent detail sheet.
C.) Type of piling used.

NOTE: THIS SHEET TO BE COMPLETED BY MoDOT CONSTRUCTION PERSONNEL.

ROUTE	STATE	DISTRICT	SHEET NO.
67	MO	BR	36

JOB NO. J0P0930A

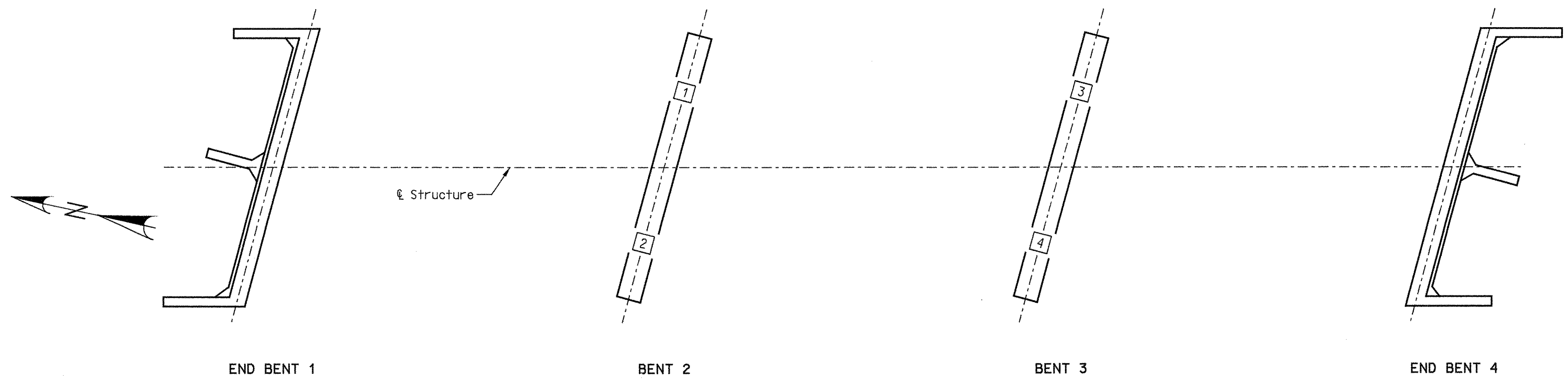
CONTRACT ID

PROJECT NO.

COUNTY WAYNE

STATE OF MISSOURI
LAWRENCE F. ROLWES, JR.
NUMBER E-2006002847
REGISTERED PROFESSIONAL ENGINEER
5/15/07

DATE 05/15/07



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

"AS-BUILT DRILLED SHAFT" DATA

SHAFT NO.	BOTTOM OF DRILLED SHAFT (ELEV.)	BOTTOM OF ROCK SOCKET (ELEV.)	REMARKS
			BENT 2
1			
2			

"AS-BUILT DRILLED SHAFT" DATA

SHAFT NO.	BOTTOM OF DRILLED SHAFT (ELEV.)	BOTTOM OF ROCK SOCKET (ELEV.)	REMARKS
			BENT 2
3			
4			

"AS-BUILT DRILLED SHAFT" DATA

SHAFT NO.	BOTTOM OF DRILLED SHAFT (ELEV.)	BOTTOM OF ROCK SOCKET (ELEV.)	REMARKS

NOTE: THIS SHEET TO BE COMPLETED BY MoDOT CONSTRUCTION PERSONNEL.