CITY OF ST PETERS
636.477.6600
bids@stpetersmo.net

April 27, 2015

RE: Addendum 1: Bid 14-158 – Willott Road Improvements – Bridge BRM 7305 (610) and Resurfacing 7305 (609)

To all Contract Bidders of Record,

This Addendum, consisting of one (1) page, plus attachment of seventy-six (76) pages of plans for Bridge, is issued to modify, explain or correct the original Contract documents as noted below, and is hereby made a part of the Contract documents.

- The bridge replacement plans were inadvertently omitted from the original bid packet.

Attachment:

Willott Road Bridge Replacement Plans

When submitting your bid, please include the following:

- Section O - Acknowledge receipt of Addendum 1.

Thank you,

City of St. Peters
bids@stpetersmo.net

UTILITIES

AT&T
KATHLEEN SMITH
(636) 949-1312

CHARTER COMMUNICATIONS
LISA WARD
815 CHARTER COMMONS
TOWN & COUNTRY, MO 63017
(636) 387-6663

AMERENUE
MARK RUSSO
2100 BLUESTONE DRIVE
ST. CHARLES, MO 63303
(636) 925-3214

LACLEDE GAS COMPANY
KENT THAEMERT
6400 GRAHAM ROAD
ST. LOUIS, MO 63134
(314) 658-5437

CITY OF ST. PETERS
BILL MALACH
CITY OF ST. PETERS
1 ST. PETERS CENTRE
ST. PETERS, MO 63376
(636) 477-6600 EXT. 1316

CONVENTIONAL SYMBOLS

(USED IN PLANS)

	EXISTING	NEW
BUILDINGS AND STRUCTURES		
CONCRETE RIGHT-OF-WAY MARKER		
STEEL RIGHT-OF-WAY MARKER		
LOCATION SURVEY MARKER		
UTILITIES		
SANITARY SEWER	S	
CABLE TV	CATV	
OVERHEAD TELEPHONE		
UNDERGROUND TELEPHONE	T	
OVERHEAD POWER	OH	
UNDERGROUND POWER	P	
GAS	G	
WATER	W	
GUY WIRE		
MANHOLE		
FIRE HYDRANT	HYD	
WATER VALVE / WATER METER	WV / WM	
GAS VALVE	GV	
DROP INLET		
LAND CORNER		
GROUND MOUNTED SIGN	SIGN	
LIGHT POLE / POWER POLE	PP	
TELEPHONE RISER / POWER RISER	T RISER / P RISER	
POWER AND CABLE POLE	P&C	
TREE		
TELEPHONE MANHOLE	TMH	
FENCE CHAIN LINK	X	
FENCE WOVEN WIRE	V	
IRON PIPE	I.P.	
MAILBOX		
BENCHMARK	BM	
SPRINKLER HEAD		
STREET LIGHT		
STOP BOX	SB	
TRUNCATED DOMES		
LANDSCAPE BOULDER		

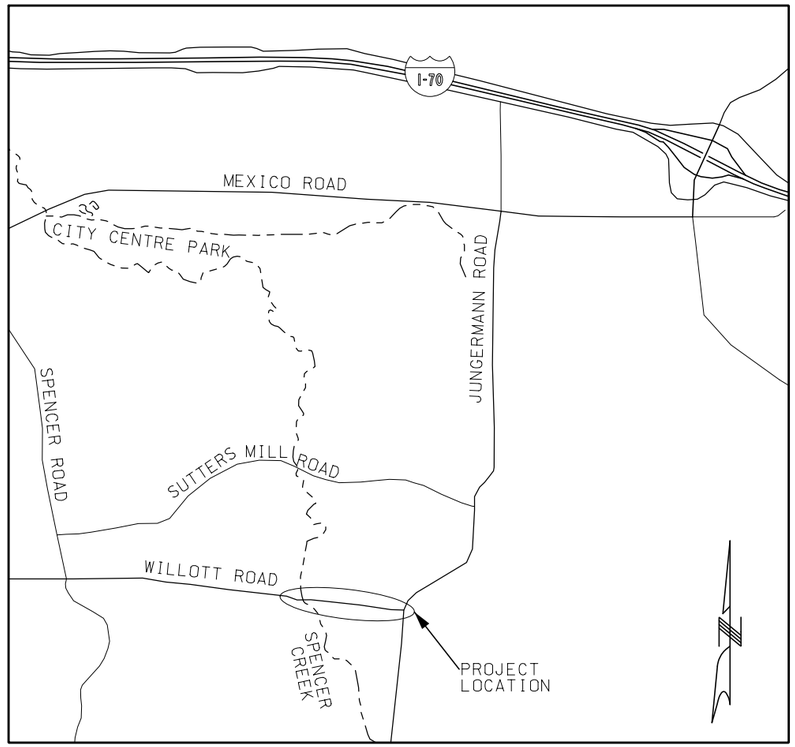
TO BE REMOVED	TBR
TO BE REMOVED AND RELOCATED	TBR&REL
TO BE REMOVED BY OTHERS	TBRBO
TO BE REMOVED AND RELOCATED BY OTHERS	TBR&RELBO
TO BE ABANDONED AND FILLED	TBA&F
TEMPORARY CONSTRUCTION EASEMENT	TCE
PERMANENT DRAINAGE & UTILITY EASEMENT	PDUE
ADJUST TO GRADE	ATG
ADJUST TO GRADE BY OTHERS	ATGBO
USE IN PLACE	UIP
TO BE REMOVED AND REPLACED	TBRR
TO BE REMOVED AND REPLACED BY OTHERS	TBRRBO
PERMANENT DRAINAGE EASEMENT	PDE

NOTE: DASHED OR OPEN SYMBOLS INDICATE EXISTING FEATURES

CITY OF ST. PETERS CONSTRUCTION PLANS FOR WILLOTT ROAD BRIDGE REPLACEMENT

FEDERAL PROJECT # BRM-7305(610)

NOVEMBER 26, 2014



NOT TO SCALE

BENCHMARK - NATIONAL GEODETIC SURVEY STATION NUMBER CSC-03
STANDARD DISK IN THE TOP OF A CONCRETE MONUMENT
NAD 83 POSITION:
LATITUDE 38°46'01.823"
LONGITUDE 90°32'20.435"

HORNER & SHIFRIN, INC.
ENGINEERS
5200 OAKLAND AVE. ST. LOUIS, MO 63110
314-531-4321 FAX: 314-531-6966 www.HornerShifrin.com
Discipline: Professional Engineering
Certificate of Authority: 000159
Expiration Date: December 31, 2014

SPECIAL NOTE TO CONTRACTOR(S):

EXISTING UNDERGROUND AND ABOVE-GRADE FACILITIES, STRUCTURES, AND UTILITIES HAVE BEEN PLOTTED ON THESE CONTRACT DOCUMENTS BASED ON THE INFORMATION AND SURVEYS AVAILABLE AT THE TIME OF DRAWING PREPARATION. THE LOCATIONS OF THESE FEATURES MUST, THEREFORE, BE CONSIDERED APPROXIMATE, ONLY. IN ADDITION, THERE MAY BE OTHER FACILITIES, STRUCTURES, AND UTILITIES WHICH DID NOT EXIST (OR THE EXISTENCE OF WHICH WAS NOT KNOWN) AT THE TIME OF DRAWING PREPARATION. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR(S) TO HAVE ALL EXISTING FACILITIES, STRUCTURES, AND UTILITIES LOCATED IN THE FIELD PRIOR TO ANY EXCAVATION OR CONSTRUCTION ACTIVITY; AND TO PROTECT ALL SUCH FEATURES (EXCEPT THOSE SPECIFICALLY NOTED FOR REMOVAL OR DEMOLITION) DURING CONSTRUCTION.

CITY OF ST. PETERS
ONE ST. PETERS CENTRE BLVD
ST. PETERS, MO 63376
(636) 477-6600

DISCLAIMER
THE PROFESSIONAL WHOSE SIGNATURE AND PERSONAL SEAL APPEAR HEREON ASSUMES RESPONSIBILITY ONLY FOR WHAT APPEARS ON THIS PAGE, AND DISCLAIMS (PURSUANT TO SECTION 327.411 RSMO) SPECIFICATION, ESTIMATES, REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS NOT SEALED BY THE UNDERSIGNED PROFESSIONAL RELATING TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE PROJECT TO WHICH THIS PAGE REFERS.

WILLOTT ROAD BRIDGE	SHEET 1
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

INDEX OF SHEETS

DESCRIPTION	SHEET NUMBER
TITLE SHEET	1
SUMMARY OF QUANTITIES	2A
TYPICAL SECTIONS	2-4
SCHEDULE OF QUANTITIES	5B-8B
PLAN SHEETS	5-8
REFERENCE AND COORDINATE POINTS	9
INTERSECTION DETAILS	10
RETAINING WALL PLAN & PROFILE	11
BIKE TRAIL/CULVERT GRADING	12
STORM SEWER PROFILES	13
SANITARY SEWER PROFILE	14
PAVEMENT MARKING, EROSION PLAN	15-16
TRAFFIC CONTROL PLAN	17-19
TRAFFIC SIGNAL AND LIGHTING PLAN	20-26
BRIDGE PLAN SHEETS	27-60
BOX CULVERT SHEETS	61-62
WILLOTT ROAD CROSS SECTIONS	63-70

DESIGN DESIGNATION

WILLOTT ROAD
A.D.T. - EXISTING = 16,600
A.D.T. - PROPOSED = 18,000

POSTED SPEED = 40 M.P.H.

LENGTH OF PROJECT

BEGINNING OF PROJECT	STA.	107+00.00
END OF PROJECT	STA.	120+33.70
APPARENT LENGTH		1,333.70 FEET
EQUATIONS AND EXCEPTIONS		
TOTAL CORRECTIONS		0.0 FEET
NET LENGTH OF PROJECT		1,333.70 FEET
STATE LENGTH		0.25 MILES

CITY OF ST. PETERS, MO

APPROVED:

DIRECTOR OF TRANSPORTATION _____ DATE _____

SEAL

STATE OF MISSOURI
JARRETT D. KASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER
3/9/2015

DATE 3/9/2015

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SUMMARY OF QUANTITIES

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT	SHEET 5B BRM-7305(610)	SHEET 6B ROADWAY	SHEET 7B ROADWAY	SHEET 8B BRM-7305(610)	SHEET 15 BRM-7305(610)	SHEET 16 ROADWAY	SHEETS 17-19 BRM-7305(610)	SHEETS 17-19 ROADWAY	SHEETS 20-26 ROADWAY	BRIDGE SUBTOTAL	ROADWAY SUBTOTAL	TOTAL QUANTITY
	ROADWAY ITEMS:													
1	CLEARING AND GRUBBING	LS										1	1	1
2	REMOVAL OF IMPROVEMENTS	LS										1	1	1
3	CLASS A EXCAVATION	CY										4339	270	4609
4	COMPACTING EMBANKMENT	CY										167	2	169
5	FURNISHING TYPE 2 ROCK BLANKET	CY	390									390	0	390
6	PLACING TYPE 2 ROCK BLANKET	CY	390									390	0	390
7	TYPE 5 AGGREGATE BASE (4" THICK)	SY	923	401	363							923	764	1687
8	CONCRETE PAVEMENT (8" NON-REINFORCED)	SY	788	315	282							788	597	1385
9	CONCRETE APPROACH PAVEMENT	SY	359									359	0	359
10	CONVERT INLET TO MANHOLE AND ADJUST TO GRADE AND CONVERT LID TO PAMREX COVER	EACH		1								0	1	1
11	CURB AND GUTTER, VERTICAL	LF	522	214	209							522	423	945
12	BRIDGE ANCHOR SECTION	EACH	2									2	0	2
13	TRANSITION SECTION	EACH	2									2	0	2
14	CRASHWORTHY GUARDRAIL END TERMINAL	EACH	2									2	0	2
15	CHANNELIZERS (TRIM-LINE)	EACH								10		0	10	10
16	TYPE III BARRICADE	EACH							23	2		23	2	25
17	TRAFFIC CONTROL SIGNS	SF							178	58		178	58	236
18	CHANGEABLE MESSAGE SIGN	EACH							3			3	0	3
19	MOBILIZATION	LS										1	1	2
20	CONTRACTOR FURNISHED SURVEYING AND STAKING	LS										1	1	2
21	8" POLYVINYL CHLORIDE PIPE	LF				206						206	0	206
22	18" POLYVINYL CHLORIDE PIPE	LF				189						189	0	189
23	12" CLASS III REINFORCED CONCRETE PIPE	LF		18								0	18	18
24	15" CLASS III REINFORCED CONCRETE PIPE	LF			9							0	9	9
25	30" CLASS III REINFORCED CONCRETE PIPE	LF				268						268	0	268
26	PRECAST CONCRETE MANHOLE (48")	EACH			1	3						3	1	4
27	12" FLARED END SECTION	EACH		1								0	1	1
28	30" FLARED END SECTION	EACH				1						1	0	1
29	TRENCH DRAIN WITH CATCH BASIN	LF				28						28	0	28
30	CHECK VALVE	EACH				2						2	0	2
31	SINGLE CURB INLET, UNTRAPPED	EACH		1								0	1	1
32	MULTIPLE CURB INLET, UNTRAPPED	EACH			1							0	1	1
33	FIBER ROLLS	LF					9	18				9	18	27
34	SILT FENCE	LF					456					456	0	456
35	SEDIMENT REMOVAL	CY					4					4.1	0	4
36	MSD 5 - ROCK BLANKET	CY				4						4	0	4
37	CANTILEVERED 54"X96" INLET TOP	EACH	1									1	0	1
38	CANTILEVERED 54"X75" INLET TOP	EACH	1									1	0	1
39	MODULAR BLOCK WALL	SF				954						954	0	954
40	CHAIN LINK FENCE	LF				217						217	0	217
	SIGNALS/LIGHTING/SIGNING/STRIPING ITEMS:													
41	4 IN. WHITE ACRYLIC WATERBORNE PAVEMENT MARKING PAINT, 24 IN. WHITE	LF					800	3010				800	3010	3810
42	4 IN. YELLOW ACRYLIC WATERBORNE PAVEMENT MARKING PAINT	LF					1410	2620				1410	2620	4030
43	ACRYLIC WATERBORNE PAVEMENT MARKING PAINT, 12 IN. WHITE	LF						230				0	230	230
44	ACRYLIC WATERBORNE PAVEMENT MARKING PAINT, 24 IN. WHITE	LF						100				0	100	100
45	ACRYLIC WATERBORNE PAVEMENT MARKING PAINT, 8 IN. YELLOW	LF					180					180	0	180
46	ACRYLIC COPOLYMER FAST DRY PVMT. MKNG. PAINT, LEFT/RIGHT ARROW	EACH						17				0	17	17
47	ACRYLIC COPOLYMER FAST DRY PVMT. MKNG. PAINT, COMBINATION STRAIGHT-LEFT/RIGHT ARROW	EACH						2				0	2	2
48	ACRYLIC COPOLYMER FAST DRY PVMT. MKG. PAINT, BICYCLE SYMBOL	EACH					1	4				1	4	5
49	SIGNAL HEAD, TYPE 1S, PEDESTRIAN, W/ "HAND-WALKING PERSON" SYMBOL AND "COUNTDOWN" DISPLAY (16"X18", W/ ALL LED ILLUMINATION)	EACH									6	0	6	6
50	WIRE STRANDED GROUND, #6 GAUGE	LF									80	0	80	80
51	CABLE, PUSH BUTTON AND/OR DETECTOR LOOP LEAD-IN, #18 GUAGE, 2 CONDUCTOR (SHIELDED)	LF									660	0	660	660
52	SIGNAL HEAD, TYPE 3S	EACH									3	0	3	3
53	SIGNAL HEAD, TYPE 3B	EACH									7	0	7	7
54	POST, TYPE CL, 20 FT. ARM OR 6.1 M ARM	EACH									2	0	2	2
55	POST, TYPE CL, 30 FT. ARM OR 9.1 ARM	EACH									1	0	1	1
56	POST, TYPE CL, 40 FT. ARM OR 12.2 ARM	EACH									1	0	1	1
57	CONTROLLER ASSEMBLY HOUSING, NEMA TS2 CONTROLLER	EACH									1	0	1	1
58	DETECTOR, PUSHBUTTON	EACH									6	0	6	6
59	VIDEO DETECTION SYSTEM	EACH									1	0	1	1
60	CONDUIT, 2 IN., TRENCH	LF									277	0	277	277
61	CONDUIT, 3 IN., TRENCH	LF									90	0	90	90
62	CONDUIT, 2 IN., PUSHED	LF									1051	0	1051	1051
63	CONDUIT, 3 IN., PUSHED	LF									264	0	264	264
64	CABLE, 6 AWG 1 CONDUCTOR, POWER	LF									360	0	360	360
65	CABLE, 16 AWG 5 CONDUCTOR	LF									660	0	660	660
66	CABLE, 16 AWG 7 CONDUCTOR	LF									1270	0	1270	1270
67	PULL BOX, PREFORMED CLASS 1	EACH									1	0	1	1
68	PULL BOX, PREFORMED CLASS 2	EACH									3	0	3	3
69	PULL BOX, PREFORMED CLASS 3	EACH									2	0	2	2
70	PULL BOX, PREFORMED CLASS 5	EACH									2	0	2	2
71	BASE, CONCRETE	CY									15.3	0	15.3	15.3
72	REMOVE AND DELIVER OLD TRAFRFIC SIGNAL EQUIPMENT, POLES AND MAST ARMS TO CITY YARD	LS									1	0	1	1
73	POWER SUPPLY ASSEMBLY WITH BACKUP BATTERY, TYPE 2 WITH 120V LIGHTING CONTROL CABINET	EACH									1	0	1	1
74	LED LUMINAIRE	EACH									4	0	4	4
75	LED ILLUMINATED STREET NAME SIGN	EACH									4	0	4	4
76	SURFACE MOUNTED, MOTION ACTIVATED LED LIGHT FIXTURE	EACH									4	0	4	4
77	EMBEDDED JUNCTION BOX	EACH									4	0	4	4
78	CABLE, 14 AWG 3 CONDUCTOR	LF									1030	0	1030	1030
79	FIBER OPTIC CABLE, 48 FIBER, SINGLE MODE	LF									1240	0	1240	1240
80	CONDUIT, 3/4" ON STRUCTURE	LF									100	0	100	100
81	CABLE, 10 AWG 1 CONDUCTOR	LF									1250	0	1250	1250
82	SIGNAL SIGN, TYPE SHR2L-1	SF									28.1	0	28.1	28.1

WILLOTT ROAD BRIDGE

SHEET 2A

CITY OF ST. PETERS

OF 70

FEDERAL PROJECT NO. BRM-7305(610)

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
BRIDGE REPLACEMENT
SUMMARY OF QUANTITIES
SHEET 1 OF 2

HORNER & SHIFRIN, INC.

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SUMMARY OF QUANTITIES

ITEM NUMBER	PAY ITEM DESCRIPTION	UNIT	SHEET 5B BRM-7305(610)	SHEET 6B ROADWAY	SHEET 7B ROADWAY	SHEET 8B BRM-7305(610)	SHEET 15 BRM-7305(610)	SHEET 16 ROADWAY	SHEETS 17-19 BRM-7305(610)	SHEETS 17-19 ROADWAY	SHEETS 20-26 ROADWAY	BRIDGE SUBTOTAL	ROADWAY SUBTOTAL	TOTAL QUANTITY
	PEDESTRIAN ITEMS:													
83	CONCRETE SIDEWALK, CURB RAMP (7" THICK)	SY		22	11							0	33	33
84	TRUNCATED DOMES FOR CURB RAMPS (NEW CONSTRUCTION)	SF		36	20							0	56	56
85	CONCRETE SIDEWALK (4" THICK)	SY	439	145	138							439	283	722
86	ASPHALT BASE MIX (4" THICK)	SY				851						851	0	851
87	TYPE 5 AGGREGATE BASE (6" THICK)	SY				906						906	0	906
	LANDSCAPING ITEMS:													
88	SEEDING	ACRE		0.1	0.1	0.6						0.6	0.2	0.8
	BRIDGE ITEMS:													
89	CLASS 1 EXCAVATION	CY										120	0	120
90	CLASS 2 EXCAVATION	CY										27	0	27
91	REMOVAL OF BRIDGES	LS										1	0	1
92	BRIDGE APPROACH SLAB (BRIDGE)	SY										242	0	242
93	(72 IN.) BICYCLE RAILING	LF										212	0	212
94	SAFETY BARRIER CURB RAILING	LF										235	0	235
95	STRUCTURAL STEEL PILES (12 IN.)	LF										751	0	751
96	PILE POINT REINFORCEMENT	EACH										29	0	29
97	CLASS B CONCRETE (SUBSTRUCTURE)	CY										157	0	157
98	SAFETY BARRIER CURB	LF										237	0	237
99	SLAB ON CONCRETE BEAM	SY										604	0	604
100	27 IN. PRESTRESSED CONCRETE SPREAD BOX BEAM	LF										511	0	511
101	REINFORCING STEEL (BRIDGES)	LB										12090	0	12090
102	SLAB DRAIN	EACH										3	0	3
103	VERTICAL DRAIN AT END BENTS	EACH										2	0	2
104	PLAIN NEOPRENE BEARING PAD	EACH										12	0	12
105	LAMINATED NEOPRENE BEARING PAD	EACH										12	0	12
	CULVERT ITEMS:													
106	CLASS 4 EXCAVATION	CY										360	0	360
107	CLASS B-1 CONCRETE (CULVERTS)	CY										200	0	200
108	FORM LINERS	SY										66	0	66
109	REINFORCING STEEL (CULVERTS)	LB										36260	0	36260

EARTHWORK - BRM-7305(610)					
LOCATION	STATION	STATION	CLASS A EXCAVATION (CY)	COMPACTING EMBANKMENT (CY)	REMARKS
ROADWAY	107+00.00	111+00.00	285	11	
BRIDGE WEST			858	6	
BRIDGE EAST / CULVERT			3196	150	
TOTALS			4339	167	
EXCESS MATERIAL (HAUL OFF)			4172		
REMOVAL OF EXISTING PAVEMENT IS INCLUDED IN REMOVAL OF IMPROVEMENTS AND IS NOT INCLUDED IN EARTHWORK. NO ADDITIONAL PAYMENT WILL BE MADE FOR THE HAUL OFF OF EXCESS MATERIAL.					

EARTHWORK - ROADWAY					
LOCATION	STATION	STATION	CLASS A EXCAVATION (CY)	COMPACTING EMBANKMENT (CY)	REMARKS
WILLOTT ROAD	115+63.80	120+22.07	270	2	
TOTALS			270	2	
EXCESS MATERIAL (HAUL OFF)			268		
REMOVAL OF EXISTING PAVEMENT IS INCLUDED IN REMOVAL OF IMPROVEMENTS AND IS NOT INCLUDED IN EARTHWORK. NO ADDITIONAL PAYMENT WILL BE MADE FOR THE HAUL OFF OF EXCESS MATERIAL.					

WILLOTT ROAD BRIDGE

SHEET 2A

CITY OF ST. PETERS

OF 70

FEDERAL PROJECT NO. BRM-7305(610)

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
BRIDGE REPLACEMENT
SUMMARY OF QUANTITIES
SHEET 2 OF 2

HORNER & SHIFRIN, INC.

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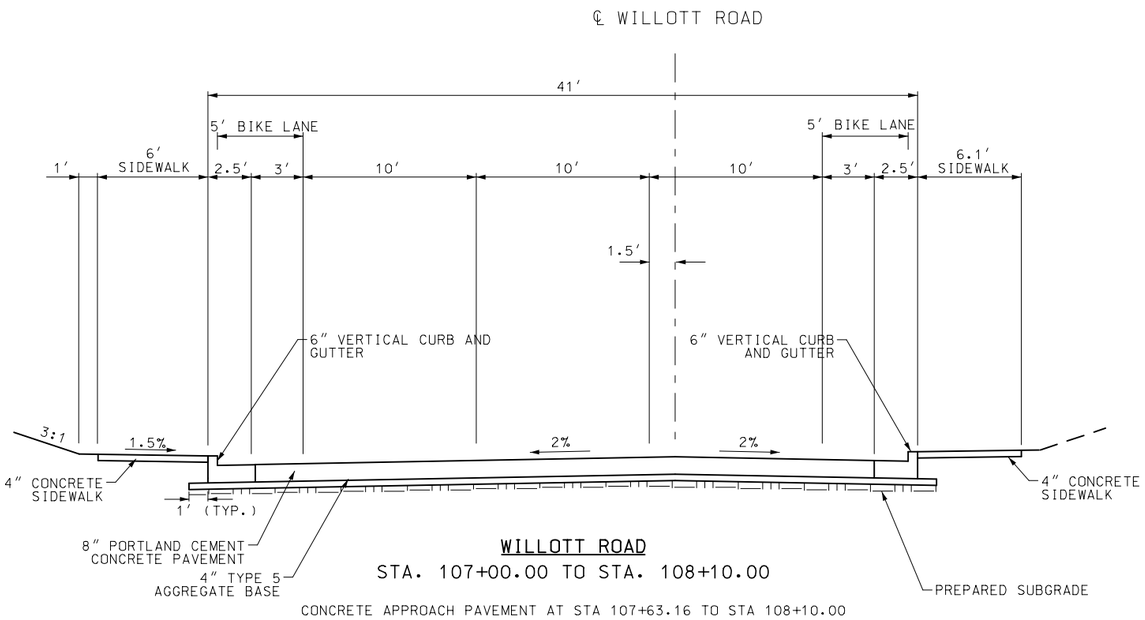
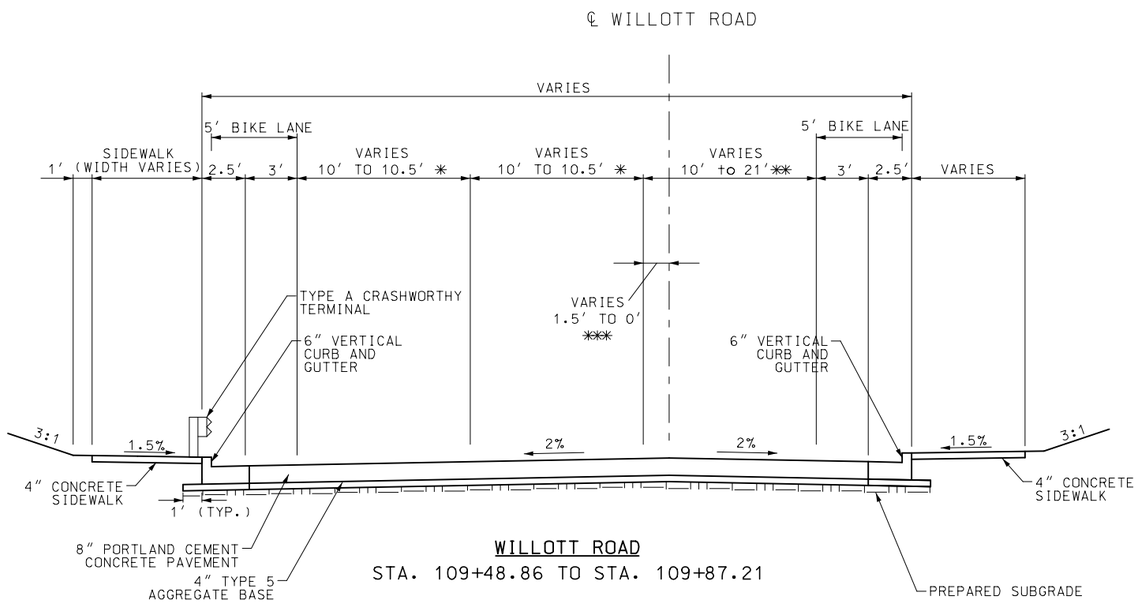
WILLOTT ROAD BRIDGE	SHEET 2
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



WILLOTT ROAD

STA. 107+00.00 TO STA. 108+10.00

CONCRETE APPROACH PAVEMENT AT STA 107+63.16 TO STA 108+10.00



WILLOTT ROAD

STA. 109+48.86 TO STA. 109+87.21

CONCRETE APPROACH PAVEMENT AT STA 109+48.86 TO STA 109+89.64

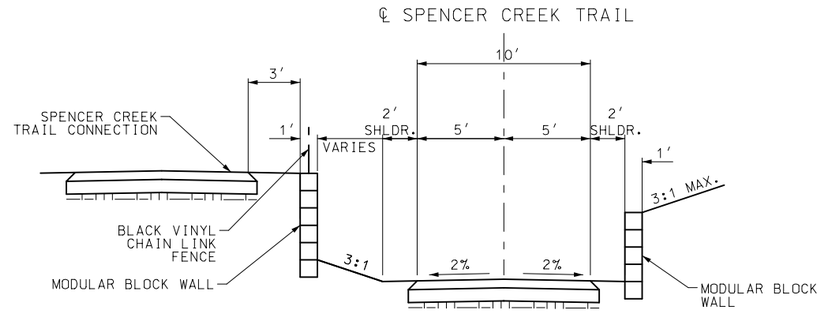
✳ VARIES FROM 10′ AT STA 109+17.21 TO 10.5′ AT STA 109+87.21

✳✳ VARIES FROM 10′ AT STA 109+17.21 TO 21′ AT STA 111+00.00

✳✳✳ VARIES FROM 1.5′ AT STA 109+17.21 TO 0′ AT STA 109+87.21

NOTES:

1) DO NOT SCALE DRAWING. FOLLOW DIMENSIONS.
2) ALL NECESSARY PAVEMENT MARKINGS MUST COMPLY WITH THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
3) SECTIONS SHOWN MAY NOT APPLY AT INTERSECTIONS.
4) EXISTING 12′ LANES ON WILLOTT ROAD WILL BE RESTRIPED.
5) ALL SAWCUTS SHALL BE INCIDENTAL TO REMOVAL OF IMPROVEMENTS. NO DIRECT PAY FOR SAWCUTS.
6) DOWEL BARS TO BE USED PER ST. LOUIS COUNTY STANDARD SPECIFICATIONS AND DETAILS. NO ADDITIONAL PAYMENT SHALL BE MADE FOR DOWEL BARS.
7) ALL WORK SHALL CONFORM TO THE PROJECT SPECIFICATIONS AND CITY OF ST. PETERS DESIGN CRITERIA AND STANDARD SPECIFICATIONS FOR STREET CONSTRUCTION. ST. LOUIS COUNTY STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION SHALL BE USED FOR ANY ITEMS NOT COVERED IN THE CITY OF ST. PETERS DESIGN CRITERIA AND STANDARD SPECIFICATIONS FOR STREET CONSTRUCTION. THE MISSOURI STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2011) SHALL BE USED WHEN SPECIFICALLY REFERENCED IN THIS DOCUMENT. ALL STORM SEWERS SHALL BE CONSTRUCTED PER THE METROPOLITAN ST. LOUIS SEWER DISTRICT'S STANDARD CONSTRUCTION SPECIFICATIONS FOR SEWERS AND DRAINAGE FACILITIES, 2009.

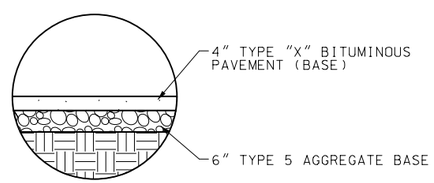


TYPICAL MODULAR BLOCK WALL SECTION

SPENCER CREEK TRAIL

STA. 14+00.00 RT TO STA. 14+80.00 RT – WALL A

STA. 13+37.69 LT TO STA. 14+52.53 LT – WALL B



SPENCER CREEK TRAIL CONNECTION

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD BRIDGE REPLACEMENT
TYPICAL SECTIONS
SHEET 1 OF 3

HORNER & SHIFRIN, INC.

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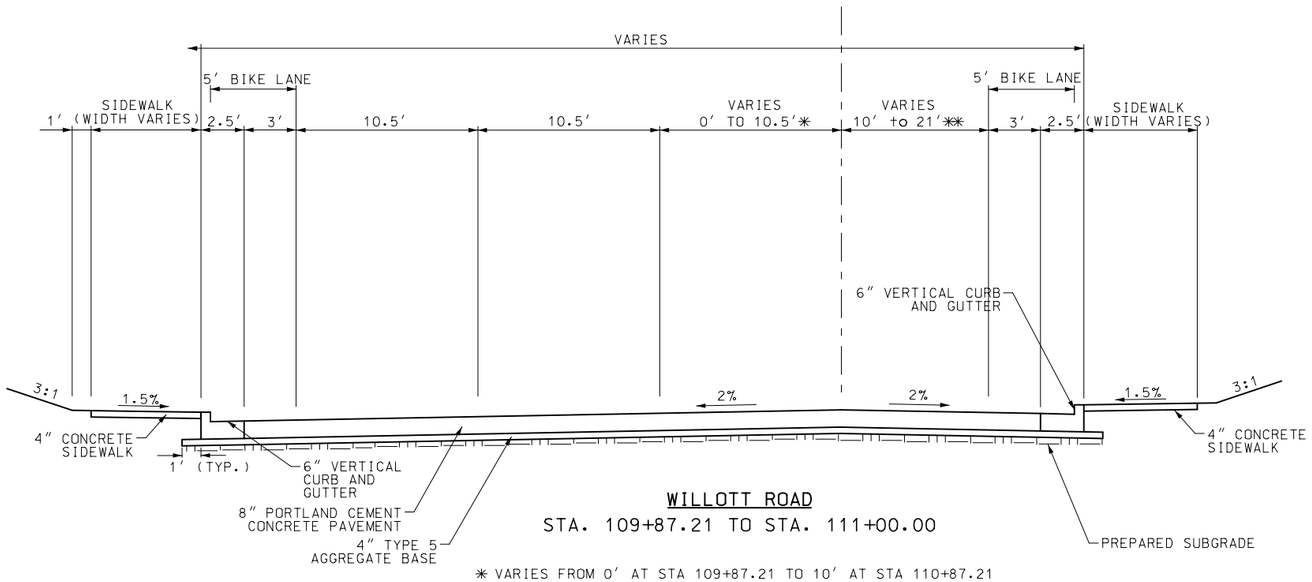
WILLOTT ROAD BRIDGE	SHEET 3
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

℄ WILLOTT ROAD



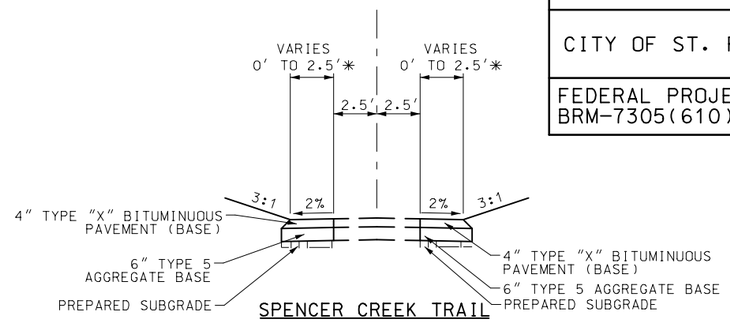
WILLOTT ROAD

STA. 109+87.21 TO STA. 111+00.00

✳ VARIES FROM 0′ AT STA 109+87.21 TO 10′ AT STA 110+87.21

✳✳ VARIES FROM 10′ AT STA 109+17.21 TO 21′ AT STA 111+00.00

℄ SPENCER CREEK TRAIL

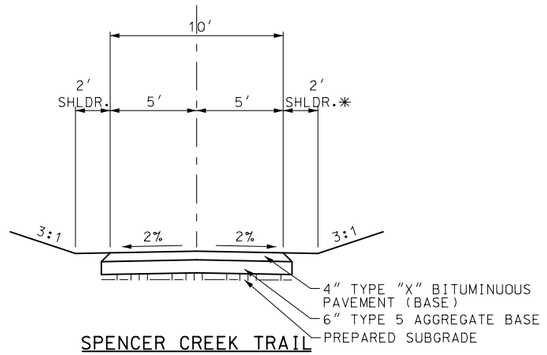


SPENCER CREEK TRAIL

STA. 9+91.00 TO STA. 10+16.00

✳ VARIES FROM 0′ AT STA 9+91.00 TO 2.5′ AT STA 10+16.00

℄ SPENCER CREEK TRAIL

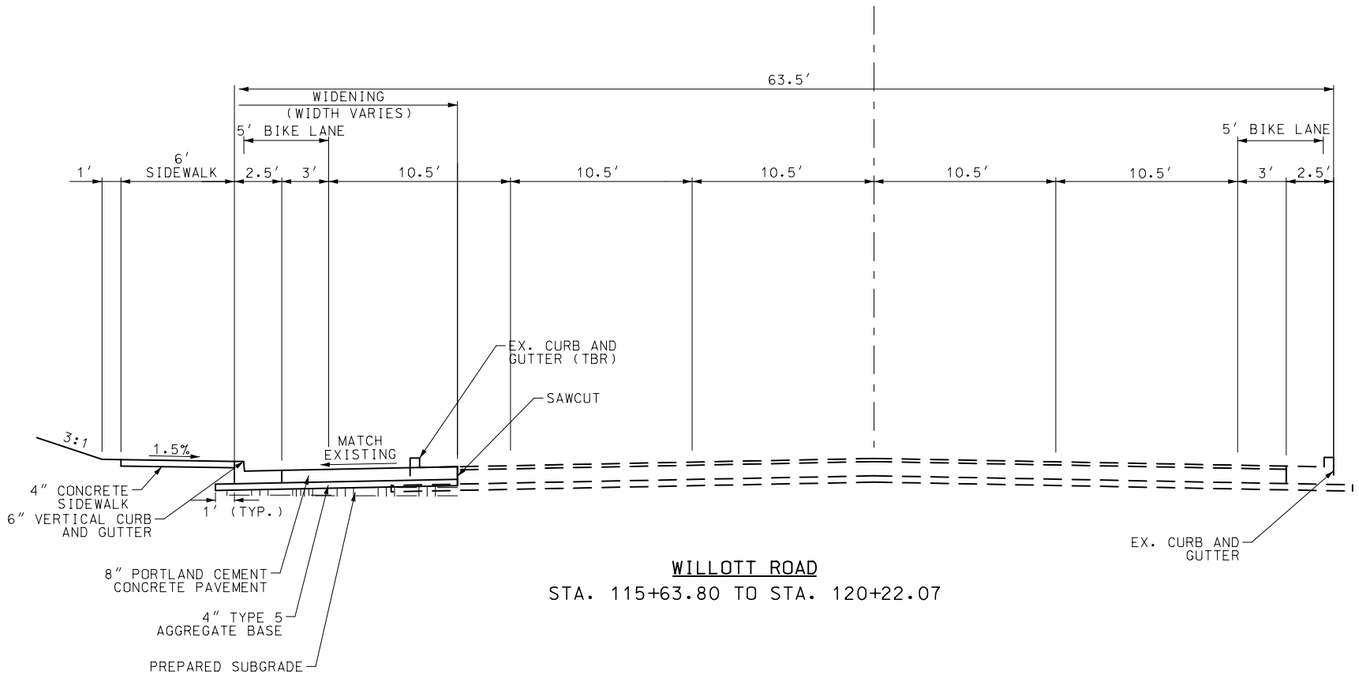


SPENCER CREEK TRAIL

STA. 10+16.00 TO STA. 12+15.67
STA. 13+37.68 TO STA. 15+06.97

✳ VARIES FROM 2′ AT STA 14+60.00 TO 0.2′ AT STA 14+80.00

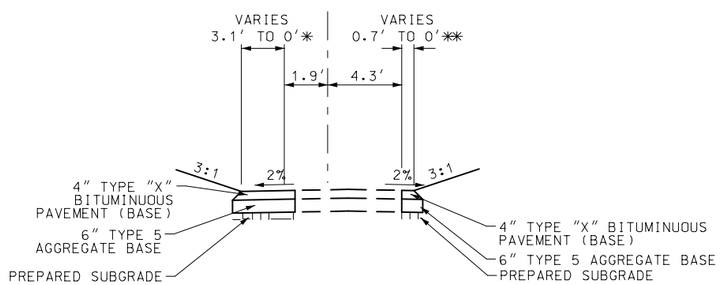
℄ WILLOTT ROAD



WILLOTT ROAD

STA. 115+63.80 TO STA. 120+22.07

℄ SPENCER CREEK TRAIL



SPENCER CREEK TRAIL

STA. 15+06.97 TO STA. 15+36.97

✳ VARIES FROM 3.1′ AT STA 15+06.97 TO 0′ AT STA 15+36.97

✳✳ VARIES FROM 0.7′ AT STA 15+06.97 TO 0′ AT STA 15+16.97

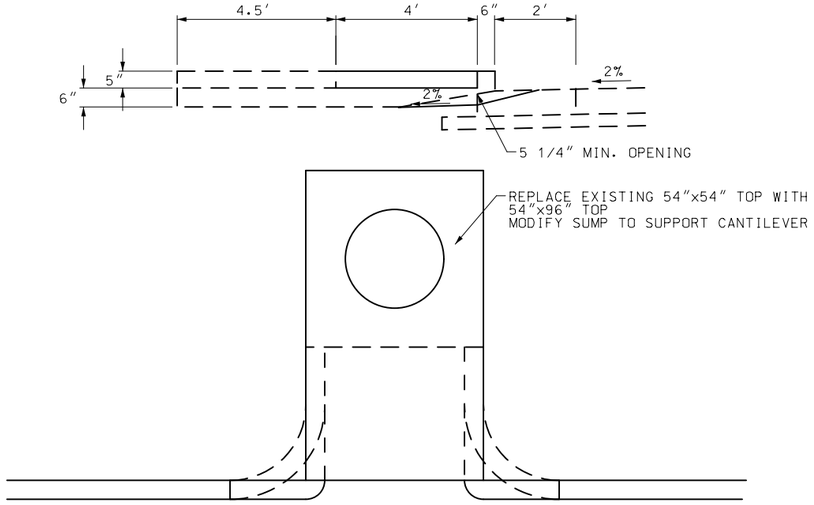
STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
BRIDGE REPLACEMENT
TYPICAL SECTIONS
SHEET 2 OF 3

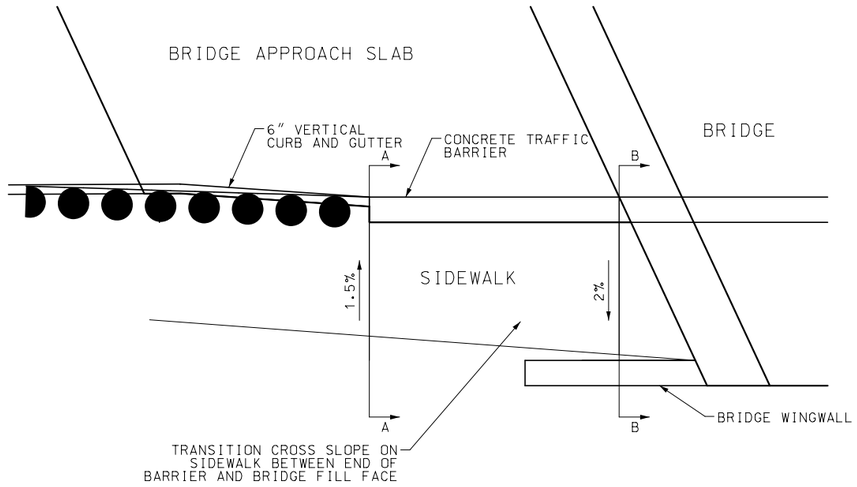
HORNER & SHIFRIN, INC.

...\002_Typical_1330800.dgn 2:36:52 PM 3/9/2015

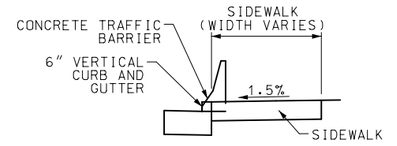
WILLOTT ROAD BRIDGE	SHEET 4
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



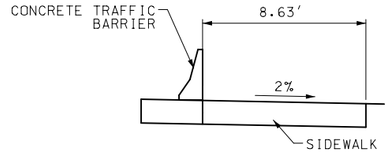
SPECIAL SUMP DETAIL 1



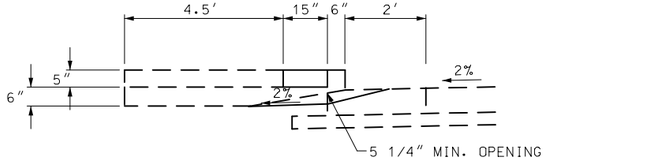
SIDEWALK TRANSITIONS
BEHIND BARRIER
DETAIL 3

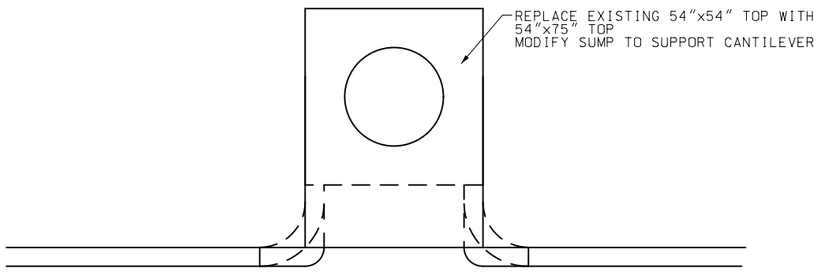


SECTION A-A

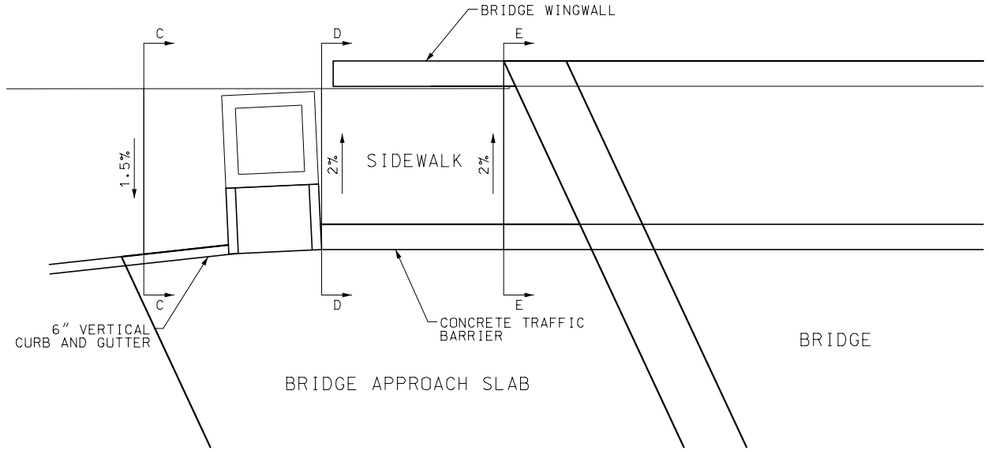


SECTION B-B

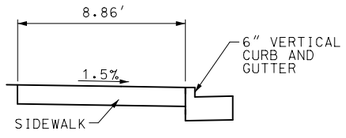




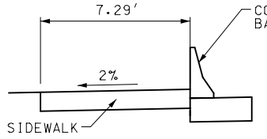
SPECIAL SUMP DETAIL 2



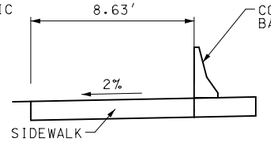
SIDEWALK TRANSITION
BEHIND BARRIER
DETAIL 4



SECTION C-C



SECTION D-D



SECTION E-E

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
BRIDGE REPLACEMENT
TYPICAL SECTIONS
SHEET 3 OF 3

HORNER & SHIFRIN, INC.

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WILLOTT ROAD BRIDGE	SHEET 5B
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

GUARDRAIL							
LOCATION	STATION	STATION	SIDE	BRIDGE ANCHOR SECTION	TRANSITION SECTION	CRASHWORTHY GUARDRAIL END TERMINAL	REMARKS
				(EACH)	(EACH)	(EACH)	
WILLOTT ROAD	107+71.44	108+28.56	RT	1	1	1	
WILLOTT ROAD	109+24.41	109+81.52	LT	1	1	1	
		TOTAL		2	2	2	
		PAY TOTAL		2	2	2	

CONCRETE PAVEMENT					
LOCATION	STATION	STATION	8" NON-REINFORCED	4" TYPE 5 AGGREGATE BASE	REMARKS
			(SY)	(SY)	
WILLOTT ROAD	107+00.00	111+00.00	787.8	922.9	
		TOTAL	787.8	922.9	
		PAY TOTAL	788	923	

CONCRETE SIDEWALK				
LOCATION	STATION	STATION	4" CONC SIDEWALK	REMARKS
			(SY)	
WILLOTT ROAD	107+00.00	111+00.00	438.5	
		TOTAL	438.5	
		PAY TOTAL	439	

CURB AND GUTTER					
LOCATION	STATION	STATION	SIDE	CURB AND GUTTER VERTICAL	REMARKS
				(LF)	
WILLOTT ROAD	107+00.00	107+97.57	LT	97.6	
WILLOTT ROAD	107+00.00	108+16.45	RT	116.1	
WILLOTT ROAD	109+36.58	111+00.00	LT	163.5	
WILLOTT ROAD	109+55.65	111+00.00	RT	144.7	
		TOTAL		521.9	
		PAY TOTAL		522	

CONCRETE APPROACH PAVEMENT				
LOCATION	STATION	STATION	8" APPROACH PAVEMENT	REMARKS
			(SY)	
WILLOTT ROAD	107+63.16	108+10.00	176.4	
	109+48.86	109+89.64	182.3	
		TOTAL	358.7	
		PAY TOTAL	359	

STORM SEWERS						
				STRUCTURE		REMARKS
LOCATION	STATION	OFFSET	SIDE	CANTILEVERED 54"X96" INLET TOP	CANTILEVERED 54"X75" INLET TOP	
				(EA)	(EA)	
WILLOTT ROAD	108+05.49	26.9	LT	1		
WILLOTT ROAD	108+07.05	14.3	RT		1	
				1	1	

ROCK BLANKET					
LOCATION	STATION	STATION	FURNISHING TYPE 2 ROCK BLANKET	PLACING TYPE 2 ROCK BLANKET	REMARKS
			(CY)	(CY)	
WILLOTT ROAD	108+38.31	108+66.14	223	223	
WILLOTT ROAD	108+99.94	109+20.55	167	167	
		TOTAL	390	390	
		PAY TOTAL	390	390	

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

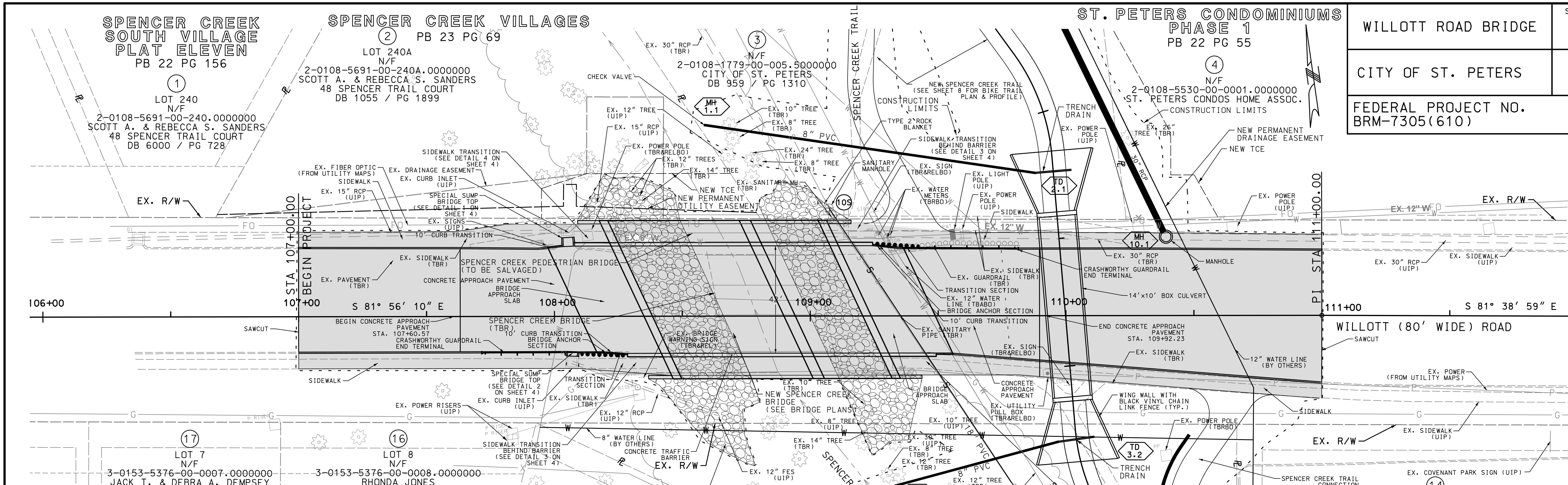
SHEET 5 QUANTITIES

HORNER & SHIFRIN, INC.

*QUANTITIES FOUND ON SHEET 5B ARE INCLUDED IN BRM-7305(610).

...\1330800 Plan Profile3-B Sheet.dgn 2:37:10 PM 3/9/2015

WILLOTT ROAD BRIDGE	SHEET 5
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



NOTES:

1) ALL SAWCUTS SHALL BE INCIDENTAL TO REMOVAL OF IMPROVEMENTS. NO DIRECT PAY FOR SAWCUTS.

2) CURB RAMPS AND DETECTABLE WARNING PANELS SHALL BE CONSTRUCTED PER ST. LOUIS COUNTY STANDARD SPECIFICATIONS AND DETAILS.

3) ALL UTILITY APPURTENANCES LOCATED WITHIN SIDEWALKS SHALL BE ADJUSTED TO MEET ADA ACCESSIBILITY GUIDELINES.

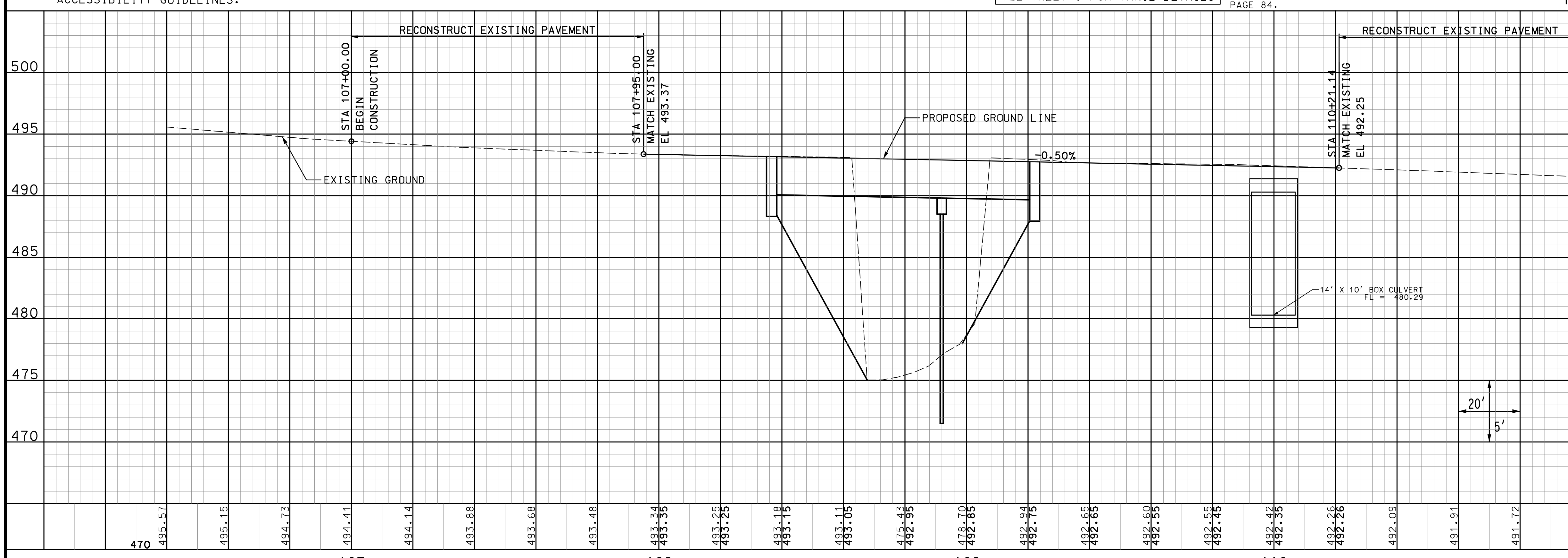
CRESCENT HILLS
PB 21 PG 61

SEE SHEET 8 FOR TRAIL DETAILS

NOTE 1: THE NEW WATER MAIN WILL BE LOCATED WITHIN A PLATTED PERMANENT UTILITY EASEMENT PER BK 22 PAGE 84.

COVENANT PARK PLAT 2
PB 20 PG 86

SCALE 0 20 40 60



JARRETT D. JASPER
NUMBER PE-2005005570
STATE OF MISSOURI PROFESSIONAL ENGINEER

WILLOTT ROAD
BRIDGE REPLACEMENT
PLAN SHEET
SHEET 1 OF 4

HORNER & SHIFRIN, INC.

...\1330800 Plan Profile3.dgn 8:53:51 AM 3/11/2015

WILLOTT ROAD BRIDGE	SHEET 6B
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

CONCRETE SIDEWALK						
LOCATION	STATION	STATION	4" CONC SIDEWALK	CONC. SIDEWALK CURB RAMP (7")	TRUNCATED DOMES	REMARKS
			(SY)	(SY)	(SF)	
WILLOTT ROAD	115+63.80	118+00.00	144.2	21.5	35.2	
		TOTAL	144.2	21.5	35.2	
		PAY TOTAL	145	22	36	

CONCRETE PAVEMENT					
LOCATION	STATION	STATION	8" NON-REINFORCED	4" TYPE 5 AGGREGATE BASE	REMARKS
			(SY)	(SY)	
WILLOTT ROAD	115+63.80	118+00.00	314.4	400.5	
		TOTAL	314.4	400.5	
		PAY TOTAL	315	401	

SEEDING				
LOCATION	STATION	STATION	AREA	REMARKS
			(ACRE)	
WILLOTT ROAD	115+63.80	118+00.00	0.07	
		TOTAL	0.07	
		PAY TOTAL	0.1	

CURB AND GUTTER				
LOCATION	STATION	STATION	CURB AND GUTTER VERTICAL	REMARKS
			(LF)	
WILLOTT ROAD	115+63.80	118+00.00	214.0	
		TOTAL	214.0	
		PAY TOTAL	214	

UTILITY ADJUSTMENTS					
LOCATION	STATION	SIDE	OFFSET	CONVERT INLET TO MANHOLE AND ATG AND CONVERT LID TO PAMREX COVER	REMARKS
				(EACH))	
WILLOTT ROAD	116+46.72	LT	29.7	1	
			TOTAL	1	
			PAY TOTAL	1	

STORM SEWERS										
									PIPING	REMARKS
LOCATION	STATION	OFFSET	SIDE	STRUCTURE NUMBER	TO STRUCTURE	PIPE OPENINGS	SINGLE CURB INLET UNTRAPPED	12" FES	CL III 12" RCP	
							(EA)	(EA)	(LF)	
WILLOTT ROAD	116+46.72	29.7	LT	MH 16.1	CI 16.2	1-12", 1-21", 1-30"			13	PAMREX COVER
WILLOTT ROAD	116+56.01	39.0	LT	CI 16.2	FES 16.3	2-12"	1	1	5	
						TOTAL	1	1	18	

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

SHEET 6 QUANTITIES

HORNER & SHIFRIN, INC.

*QUANTITIES FOUND ON SHEET 6B ARE INCLUDED IN THE ROADWAY PROJECT.

...\1330800 Plan Profile4-B Sheet.dgn 2:37:26 PM 3/9/2015

WILLOTT ROAD BRIDGE	SHEET 6
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

ST. PETERS CONDOMINIUMS
PHASE 1
PB 22 PG 55

④
N/F
2-0108-5530-00-001.0000000
ST. PETERS CONDOS HOME ASSOCIATION

ST. PETERS CONDOMINIUMS
PHASE 2
PB 55 PG 138

⑤
N/F
NEW R/W 2-0108-5594-00-001.0000000
ST. PETERS CONDOS HOME ASSOCIATION

LEGEND
SIDEWALK TO BE REPLACED -EXISTING PULL BOXES (TBR) WITHIN SIDEWALK

MATCHLINE STA 112+00

MATCHLINE STA 118+00

DELRAY DRIVE

BOCA RATON DRIVE

WILLOTT (80' WIDE) ROAD

S 81° 27' 32" E

TRAFFIC SIGNAL POST WITH MAST ARM
EX. TRAFFIC SIGNAL POST AND MAST ARM (TBR)
EX. BUSHES (UIP)
TRAFFIC SIGNAL PULL BOX
EX. 30" RCP (UIP)
EX. CURB INLET (UIP)
EX. SIDEWALK (UIP)
EX. SMALL BLOCK WALL (UIP)
TRAFFIC SIGNAL POST WITH MAST ARM
PULL BOX
EX. SIGNAL POWER SUPPLY ASSEMBLY (TBR)
EX. POWER POLE (UIP)
EX. FIBER OPTIC (FROM UTILITY MAPS)
EX. UTILITY SPLICE BOX (UIP)
EX. BUSH (UIP)
EX. TRAFFIC SIGNAL PULL BOX (TBR)
EX. CURB RAMPS WITH TRUNCATED DOMES (UIP)
EX. TRAFFIC SIGNAL POST (TBR)
EX. SIGNAL PULL BOX (TBR)
EX. 15" RCP (UIP)
EX. CURB INLET (UIP)
EX. FLAG POLE (UIP)
EX. SMALL BLOCK WALL (UIP)
EX. POWER POLE
NEW PERMANENT UTILITY EASEMENT
EX. R/W
EX. BUSHES (UIP)
EX. SIGN (UIP)
EX. UTILITY BOX (UIP)
EX. SMALL BLOCK WALL (TBR)
EX. CURB RAMP WITH TRUNCATED DOMES (UIP)
CONSTRUCTION LIMITS
NEW TCE
NEW R/W
NEW PERMANENT DRAINAGE EASEMENT
EX. 16" TREE (TBR)
EX. TREES (TBR)
EX. POWER POLE (TBR&RELBO)
CURB INLET
CI 16.2
FES 16.3
MH 16.1
EX. TELE VAULTS (UIP)
EX. CONTROL PANEL (UIP)
EX. PVC (TBR)
12" FES
EX. CURB INLET (CONVERT TO MH 24" PAMREX COVER)
EX. TELE BOX (ATGBO)
EX. POWER POLE (TBR&RELBO)
CURB RAMP TYPE 2 2.5' WIDE VERTICAL CURB & GUTTER (TBR)
EX. BUSHES AND LANDSCAPING (TBR)
BEGIN WIDENING STA. 115+63.80
EX. R/W
EX. SIDEWALK (TBR)
EX. 8" SANITARY LINE (UIP)
SEE SHEET 6
SIDEWALK SAWCUT
TRANSITION SIDEWALK FROM 4' AT STA 116+95 TO 6' AT STA 117+05
EX. 21" RCP (UIP)
TRANSITION SIDEWALK FROM 6' AT STA 116+65 TO 4' AT STA 116+75

112+00 113+00 PI STA 113+00.00 114+00 115+00 116+00 117+00

CURB RAMP TYPE 1 WITH TRUNCATED DOMES
EX. TRAFFIC SIGNAL PREFORMED PULL BOX (TBR)
CURB RAMP TYPE 1 WITH TRUNCATED DOMES
EX. POWER (FROM UTILITY MAPS)
EX. SIGNAL DOUBLE PULL BOX (TBR)
TRAFFIC SIGNAL DOUBLE PULL BOX
TRAFFIC SIGNAL POWER SUPPLY ASSEMBLY WITH BATTERY BACKUP & LIGHTING CONTROLLER
TRAFFIC SIGNAL PULL BOX
TRAFFIC SIGNAL CONTROLLER
EX. TRAFFIC SIGNAL CONTROLLER (TBR)
EX. SIGN (UIP)
EX. TRAFFIC SIGNAL POST WITH MAST ARM (TBR)
EX. TRAFFIC SIGNAL POST (TBR)
EX. TREES (UIP)
EX. LIGHT POLE (UIP)
EX. CURB RAMP (UIP)
EX. STOP SIGN (UIP)
EX. FENCE (UIP)
EX. SANITARY MH (UIP)

⑭
N/F
3-0153-5245-00-000A.0000000
CITY OF ST. PETERS
DB 831 / PG 340

COVENANT PARK
PLAT 2
PB 20 PG 86

⑬
LOT 1
N/F
3-0153-5245-00-0001.0000000
LAY DOROTHY ANN HOEKMAN
2 MONIQUE COURT
DB 4616 / PG 734

⑫
LOT 12
N/F
3-0153-5245-00-0012.0000000
WENDY M. MEIER
1 MONIQUE COURT
DB 3733 / PG 1929

⑪
LOT 13
N/F
3-0153-5245-00-0013.0000000
THOMAS E. & LINDA J. ROGERS
2 BARKWOOD TRAILS
DB 1221 / PG 957

MONIQUE COURT

NOTES:

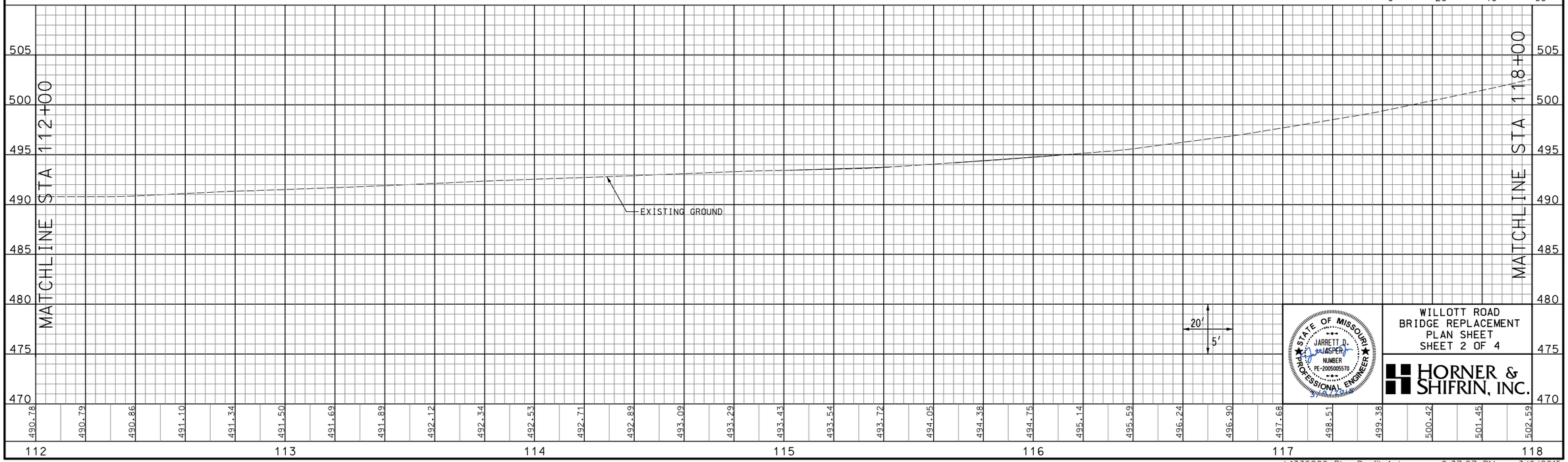
1) ALL SAWCUTS SHALL BE INCIDENTAL TO REMOVAL OF IMPROVEMENTS. NO DIRECT PAY FOR SAWCUTS.

2) CURB RAMPS AND DETECTABLE WARNING PANELS SHALL BE CONSTRUCTED PER ST. LOUIS COUNTY STANDARD SPECIFICATIONS AND DETAILS.

3) ALL UTILITY APPURTENANCES LOCATED WITHIN SIDEWALKS SHALL BE ADJUSTED TO MEET ADA ACCESSIBILITY GUIDELINES.

SEE SHEETS 23-24 FOR TRAFFIC SIGNAL DETAILS

SCALE
0 20 40 60



STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
BRIDGE REPLACEMENT
PLAN SHEET
SHEET 2 OF 4

HORNER & SHIFRIN, INC.

...\1330800 Plan Profile4.dgn 2:37:27 PM 3/9/2015

WILLOTT ROAD BRIDGE	SHEET 7B
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

CONCRETE SIDEWALK						
LOCATION	STATION	STATION	4" CONC SIDEWALK	CONC. SIDEWALK CURB RAMP (7")	TRUNCATED DOMES	REMARKS
			(SY)	(SY)	(SF)	
WILLOTT ROAD	118+00.00	120+31.68	137.8	10.2	20.0	
		TOTAL	137.8	10.2	20.0	
		PAY TOTAL	138	11	20	

CONCRETE PAVEMENT					
LOCATION	STATION	STATION	8" NON-REINFORCED	4" TYPE 5 AGGREGATE BASE	REMARKS
			(SY)	(SY)	
WILLOTT ROAD	118+00.00	120+22.07	281.5	362.1	
		TOTAL	281.5	362.1	
		PAY TOTAL	282	363	

SEEDING				
LOCATION	STATION	STATION	AREA	REMARKS
			(ACRE)	
WILLOTT ROAD	118+00.00	120+31.68	0.08	
		TOTAL	0.08	
		PAY TOTAL	0.1	

CURB AND GUTTER				
LOCATION	STATION	STATION	CURB AND GUTTER VERTICAL	REMARKS
			(LF)	
WILLOTT ROAD	118+00.00	120+31.68	208.6	
		TOTAL	208.6	
		PAY TOTAL	209	

STORM SEWERS										
							DRAINAGE STRUCTURES		PIPING	REMARKS
LOCATION	STATION	OFFSET	SIDE	STRUCTURE NUMBER	TO STRUCTURE	PIPE OPENINGS	MULTIPLE CURB INLET UNTRAPPED	PRECAST CONCRETE MANHOLE (48")	CL III 15" RCP	
							(EA)	(EA)	(LF)	
WILLOTT ROAD	118+79.22	30.1	LT	MH 18.1	MCI 18.2	1-15", 1-18", 1-21"		1	9	PAMREX COVER
WILLOTT ROAD	118+80.66	39.0	LT	MCI 18.2		1-12", 1-15"	1			
						TOTAL	1	1	9	

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

SHEET 7 QUANTITIES

HORNER & SHIFRIN, INC.

*QUANTITIES FOUND ON SHEET 7B ARE INCLUDED IN THE ROADWAY PROJECT.

...\1330800 Plan Profile5-B Sheet.dgn 2:37:40 PM 3/9/2015

NOTES:

1) ALL SAWCUTS SHALL BE INCIDENTAL TO REMOVAL OF IMPROVEMENTS. NO DIRECT PAY FOR SAWCUTS.

2) CURB RAMPS AND DETECTABLE WARNING PANELS SHALL BE CONSTRUCTED PER ST. LOUIS COUNTY STANDARD SPECIFICATIONS AND DETAILS.

3) ALL UTILITY APPURTENANCES LOCATED WITHIN SIDEWALKS SHALL BE ADJUSTED TO MEET ADA ACCESSIBILITY GUIDELINES.

SCALE
0 20 40 60

WILLOTT ROAD BRIDGE	SHEET 7
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

MATCHLINE STA 118+00

(6) LOT 13
N/F
2-0108-1779-00-005.8000000
CHURCH OF GOD AT SPENCER CREEK
2300 WILLOTT ROAD
DB 822 / PG 1377

(7) N/F
2-0108-5913-00-000A.0000000
SCHNUCK MARKETS, INC.
850 JUNGERMANN ROAD
DB 5864 / PG 2004

(8) N/F
2-0108-5913-00-000B.0000000
CITY OF ST. PETERS
890 JUNGERMANN ROAD
DB 3967 / PG 2098

NEW R/W
EX. 8" SANITARY LINE (UIP)
CONSTRUCTION LIMITS
EX. POWER WITH TRUNCATED DOMES POLE (UIP)
CURB RAMP TYPE 2
NEW TCE
EX. WATER METER (UIP)
NEW PERMANENT UTILITY EASEMENT
EX. FIBER OPTIC (FROM UTILITY MAPS)
EX. TRIPLE CURB INLET (UIP)
EX. CURB RAMP (UIP)
EX. CURB INLET
EX. 12" RCP (UIP)
MULTIPLE CURB INLET
EX. POWER POLE (TBR&RELBO)
15" RCP
EX. POWER POLE (TBR&RELBO)
EX. SIGN (TBR&REL)
EX. POWER POLE (UIP)
EX. PHONE RISER (UIP)
EX. 15" RCP
EX. 12" RCP
EX. MH
EX. GAS VALVE (UIP)
EX. R/W
MCI 18.2
MH 18.1
EX. 12" RCP (TBR)
EX. TRIPLE CURB INLET (TBR)
MANHOLE
SAWCUT
EX. 18" RCP (UIP)
END WIDENING STA. 120+22.07
PI STA 119+00.00
STA 120+33.70 END PROJECT
PI STA 121+50.00
118+00
119+00
WILLOTT ROAD (80' WIDE)
120+00
S 82° 00' 46" E
121+00
122+00
S 81° 33' 16" E
123+00

EX. CURB RAMP (UIP)
EX. CURB INLET (UIP)
EX. 10' EASEMENT
EX. R/W
EX. CURB RAMP

(10) LOT 51
N/F
3-0153-5245-00-0051.0000000
K. DEWITTE
1 BARKWOOD TRAILS
DB 3714 / PG 1872

(9) LOT 1
N/F
3-0153-5999-00-0001.0000000
ST. LOUIS CHINESE BAPTIST CHURCH
908 JUNGERMANN ROAD
DB 5003 / PG 1095

COVENANT PARK
PLAT 1
PB 25 PG 77

BARKWOOD TRAILS

JUNGERMANN ROAD

EXISTING GROUND

530 525 520 515 510 505 500
555 550 545 540 535 530 525 520

502.59 503.76 504.97 506.31 507.64 509.20 510.83 512.51 514.33 516.15 518.18 520.27 522.35 524.38 526.41 528.68 530.97 533.16 535.44 537.72 540.00 542.33 544.68 546.99 549.29 551.68 553.98 555.69 557.27

118 119 120 121 122 123

20'
5'

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
BRIDGE REPLACEMENT
PLAN SHEET
SHEET 3 OF 4

HORNER & SHIFRIN, INC.

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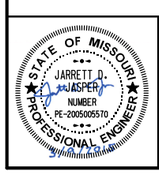
WILLOTT ROAD BRIDGE	SHEET 8B
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

SPENCER CREEK TRAIL					
LOCATION	STATION	STATION	4" ASPHALT BASE MIX	6" TYPE 5 AGGREGATE BASE	REMARKS
			(SY)	(SY)	
SPENCER CREEK TRAIL	9+91.00	12+15.67	443.2	471.6	INCLUDES CONNECTIONS
SPENCER CREEK TRAIL	13+37.68	15+06.97	407.6	434.2	INCLUDES CONNECTIONS TO WILLOTT ROAD SIDEWALK AND PARK PARKING LOT
		TOTAL	850.8	905.8	
		PAY TOTAL	851	906	

MODULAR BLOCK RETAINING WALL						
LOCATION	STATION	STATION	SIDE	MODULAR RETAINING WALL	CHAIN LINK FENCE	REMARKS
				(SF)	(LF)	
SPENCER CREEK TRAIL	13+37.69	14+52.53	LT	691.3	216.6	
SPENCER CREEK TRAIL	14+00.00	14+80.00	RT	262.5		
		TOTAL		953.8	216.6	
		PAY TOTAL		954	217	

SEEDING				
LOCATION	STATION	STATION	AREA	REMARKS
			(ACRE)	
WILLOTT ROAD	107+00.00	111+00.00	0.6	
		TOTAL	0.6	
		PAY TOTAL	0.6	

STORM SEWERS														
							DRAINAGE STRUCTURES			PIPING				REMARKS
LOCATION	STATION	OFFSET	SIDE	STRUCTURE NUMBER	TO STRUCTURE	PIPE OPENINGS	PRECAST CONCRETE MANHOLE (48")	30" FES	CHECK VALVE	8" PVC	18" PVC	CL III 30" RCP	TRENCH DRAIN WITH CATCH BASIN	
							(EA)	(EA)	(EA)	(LF)		(LF)	(LF)	
WILLOTT ROAD	109+91.21	129.5	LT	MH 9.1	FES 8.1	2-30"	1	1				158		
WILLOTT ROAD	110+39.08	30.8	LT	MH 10.1	MH 9.1	2-30"	1					110		
WILLOTT ROAD	109+07.42	42.2	LT	MH 10S	MH 269S	2-18"	1				189			
SPENCER CREEK TRAIL	12+23.64			TD 2.1	P 1.1				1	131			14	
SPENCER CREEK TRAIL	13+28.78			TD 3.2	P 3.1				1	75			14	
						TOTAL	3	1	2	206	189	268	28	



SHEET 8 QUANTITIES

HORNER & SHIFRIN, INC.

*QUANTITIES FOUND ON SHEET 8 ARE INCLUDED IN BRM-7305(610).

WILLOTT ROAD BRIDGE	SHEET 8
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

LEGEND

TRAIL/SIDEWALK REMOVAL

SPENCER CREEK TRAIL
CURVE 1
PI 10+27.33
PC 10+18.86
PT 10+35.78
Δ 6° 27' 44" (RT)
D 38° 11' 50"
L 16.92'
T 8.47'
R 150.00'

SPENCER CREEK TRAIL
CURVE 2
PI 11+21.88
PC 10+95.59
PT 11+46.39
Δ 36° 22' 47" (LT)
D 71° 37' 11"
L 50.80'
T 26.29'
R 80.00'

SPENCER CREEK TRAIL
CURVE 3
PI 11+96.37
PC 11+73.84
PT 12+17.76
Δ 31° 27' 02" (RT)
D 71° 37' 11"
L 43.91'
T 22.52'
R 80.00'

SPENCER CREEK TRAIL
CURVE 4
PI 13+42.87
PC 13+24.56
PT 13+60.56
Δ 25° 46' 53" (LT)
D 71° 37' 11"
L 36.00'
T 18.31'
R 80.00'

SPENCER CREEK TRAIL
CURVE 5
PI 14+70.26
PC 14+61.72
PT 14+78.78
Δ 6° 30' 56" (RT)
D 38° 11' 50"
L 17.06'
T 8.54'
R 150.00'

(4) N/F
2-0108-5530-00-0001.0000000
ST. PETERS CONDOS HOME ASSOC.

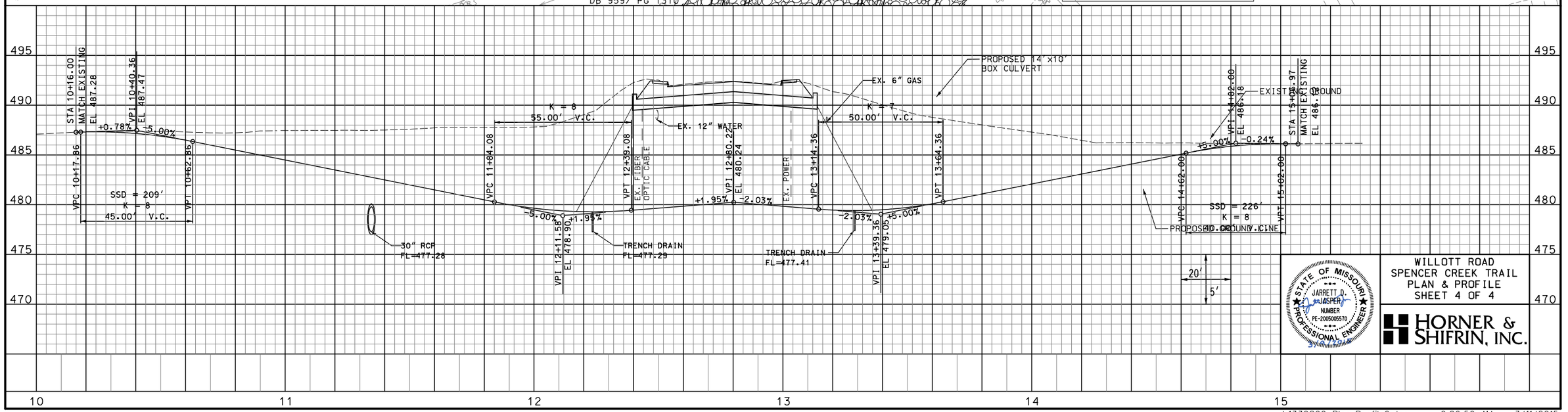
(14) N/F
3-0153-5245-00-000A.0000000
CITY OF ST. PETERS
DB 831 / PG 340

(15) N/F
CITY OF ST. PETERS
3-0153-5376-00-0083.0000000

(3) N/F
2-0108-1779-00-005.5000000
CITY OF ST. PETERS
DB 959/ PG 1310

SEE SHEET 5 FOR ROADWAY DETAILS

SCALE
0 20 40 60



STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
SPENCER CREEK TRAIL
PLAN & PROFILE
SHEET 4 OF 4

HORNER & SHIFRIN, INC.

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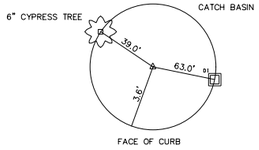
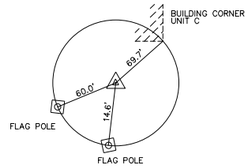
WILLOTT ROAD BRIDGE	SHEET 9
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



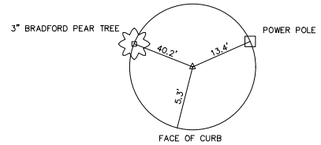
CONTROL POINT 4023

COORDINATES
NORTHING = 1071122.51
EASTING = 795161.65
STATION = 107+42.14
OFFSET = 30.24 LT
ELEVATION = 493.75



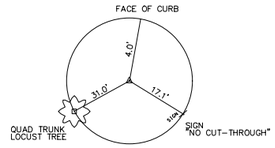
CONTROL POINT 4011

COORDINATES
NORTHING = 1071041.87
EASTING = 795884.60
STATION = 114+68.81
OFFSET = 54.22 LT
ELEVATION = 494.75



CONTROL POINT 4017

COORDINATES
NORTHING = 1070975.36
EASTING = 796173.78
STATION = 117+64.67
OFFSET = 31.41 LT
ELEVATION = 500.70



CONTROL POINT 4016

COORDINATES
NORTHING = 1070862.73
EASTING = 796518.40
STATION = 121+21.90
OFFSET = 30.95 RT
ELEVATION = 531.34

COORDINATE POINTS

PLAN SHEET	STATION	STATION	NORTHING (FEET)	EASTING (FEET)	DESCRIPTION
5	107+00.00	WILLOTT ROAD	1071098.48	795115.68	BEGIN PROJECT
5	111+00.00	WILLOTT ROAD	1071042.36	795511.73	PI STA
6	113+00.00	WILLOTT ROAD	1071013.32	795709.61	PI STA
7	119+00.00	WILLOTT ROAD	1070924.21	796302.95	PI STA
7	120+33.70	WILLOTT ROAD	1070905.63	796435.36	END PROJECT
8	9+93.01	SPENCER CREEK TRAIL	1071311.53	795393.66	BEGIN TRAIL
8	10+18.86	SPENCER CREEK TRAIL	1071310.64	795395.07	PC STA - CURVE 1
8	10+27.33	SPENCER CREEK TRAIL	1071302.17	795394.82	PI STA - CURVE 1
8	10+35.78	SPENCER CREEK TRAIL	1071293.79	795393.61	PT STA - CURVE 1
8	10+95.59	SPENCER CREEK TRAIL	1071234.59	795385.08	PC STA - CURVE 2
8	11+21.88	SPENCER CREEK TRAIL	1071208.57	795381.34	PI STA - CURVE 2
8	11+46.39	SPENCER CREEK TRAIL	1071185.40	795393.75	PT STA - CURVE 2
8	11+73.84	SPENCER CREEK TRAIL	1071161.20	795406.72	PC STA - CURVE 3
8	11+96.37	SPENCER CREEK TRAIL	1071141.34	795417.36	PI STA - CURVE 3
8	12+17.76	SPENCER CREEK TRAIL	1071118.85	795416.08	PT STA - CURVE 3
8	13+24.56	SPENCER CREEK TRAIL	1071012.22	795410.00	PC STA - CURVE 4
8	13+42.87	SPENCER CREEK TRAIL	1070993.94	795408.96	PI STA - CURVE 4
8	13+60.56	SPENCER CREEK TRAIL	1070977.03	795415.97	PT STA - CURVE 4
8	14+61.72	SPENCER CREEK TRAIL	1070883.58	795454.70	PC STA - CURVE 5
8	14+70.26	SPENCER CREEK TRAIL	1070875.70	795457.97	PI STA - CURVE 5
8	14+78.78	SPENCER CREEK TRAIL	1070867.49	795460.33	PT STA - CURVE 5
8	15+06.97	SPENCER CREEK TRAIL	1070840.39	795468.10	PI STA
8	15+36.97	SPENCER CREEK TRAIL	1070812.38	795478.85	END TRAIL

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

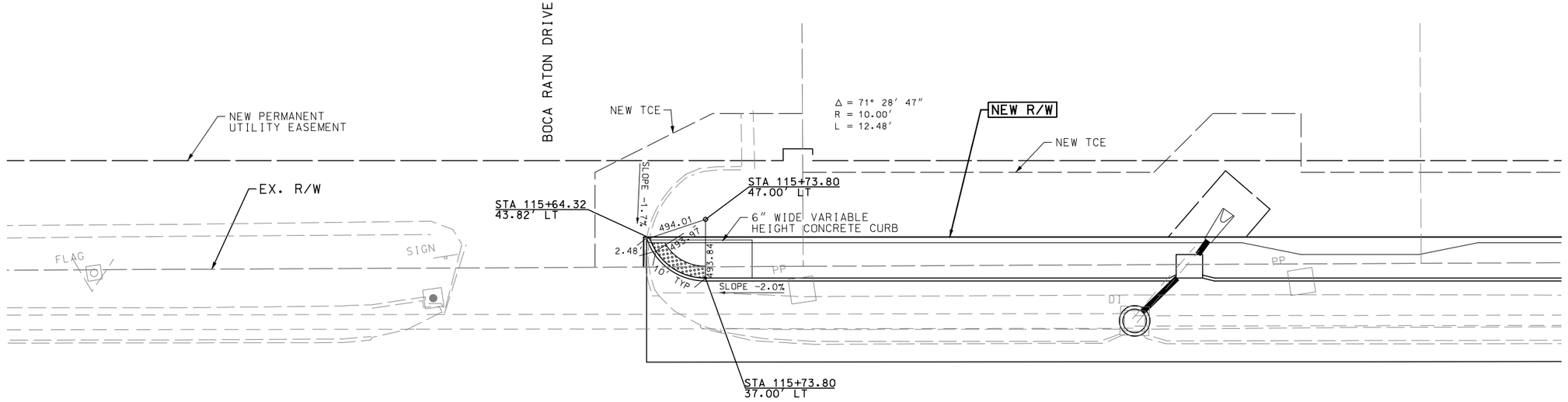
WILLOTT ROAD
BRIDGE REPLACEMENT
REFERENCE POINTS &
COORDINATE POINTS

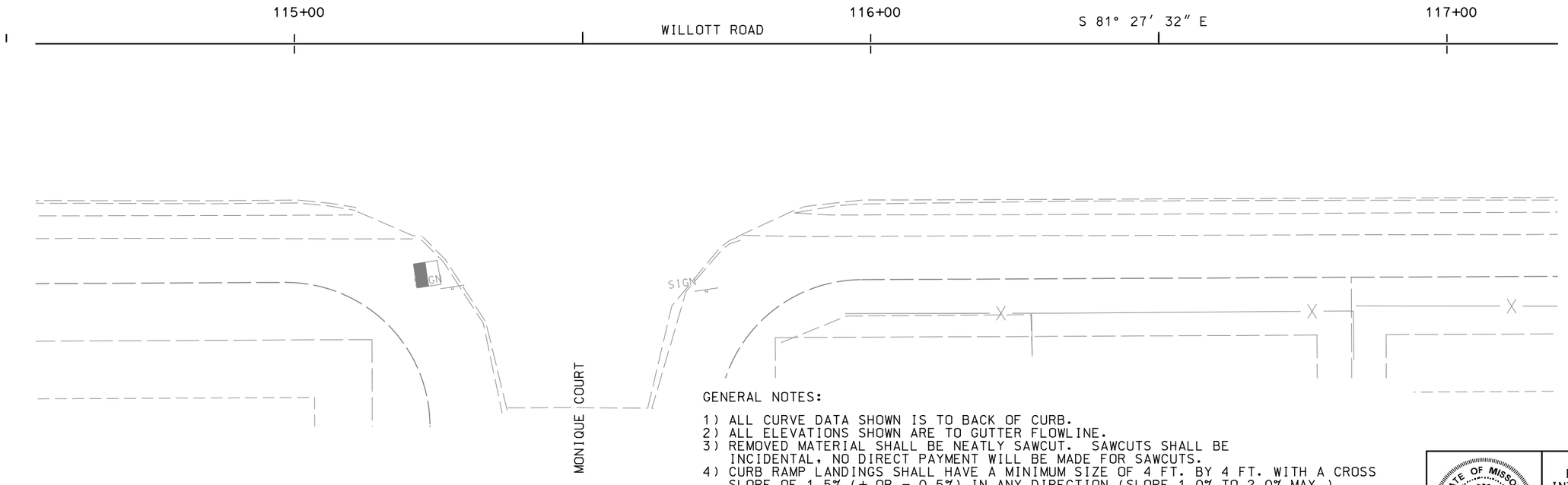
HORNER & SHIFRIN, INC.

...\008_Ref & Coord Points.dgn 2:37:54 PM 3/9/2015

WILLOTT ROAD BRIDGE	SHEET 10
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

SCALE
0 10 20 30





GENERAL NOTES:

1) ALL CURVE DATA SHOWN IS TO BACK OF CURB.
2) ALL ELEVATIONS SHOWN ARE TO GUTTER FLOWLINE.
3) REMOVED MATERIAL SHALL BE NEATLY SAWCUT. SAWCUTS SHALL BE INCIDENTAL, NO DIRECT PAYMENT WILL BE MADE FOR SAWCUTS.
4) CURB RAMP LANDINGS SHALL HAVE A MINIMUM SIZE OF 4 FT. BY 4 FT. WITH A CROSS SLOPE OF 1.5% (+ OR - 0.5%) IN ANY DIRECTION (SLOPE 1.0% TO 2.0% MAX.)
5) CURB RAMPS AND DETECTABLE WARNING PANELS SHALL BE CONSTRUCTED PER ST. LOUIS COUNTY STANDARD SPECIFICATIONS AND DETAILS.
6) ALL UTILITY APPURTENANCES LOCATED WITHIN SIDEWALKS SHALL BE ADJUSTED TO MEET ADA ACCESSIBILITY GUIDELINES.

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD – BOCA RATON DRIVE INTERSECTION DETAILS SHEET 1 OF 1

HORNER & SHIFRIN, INC.

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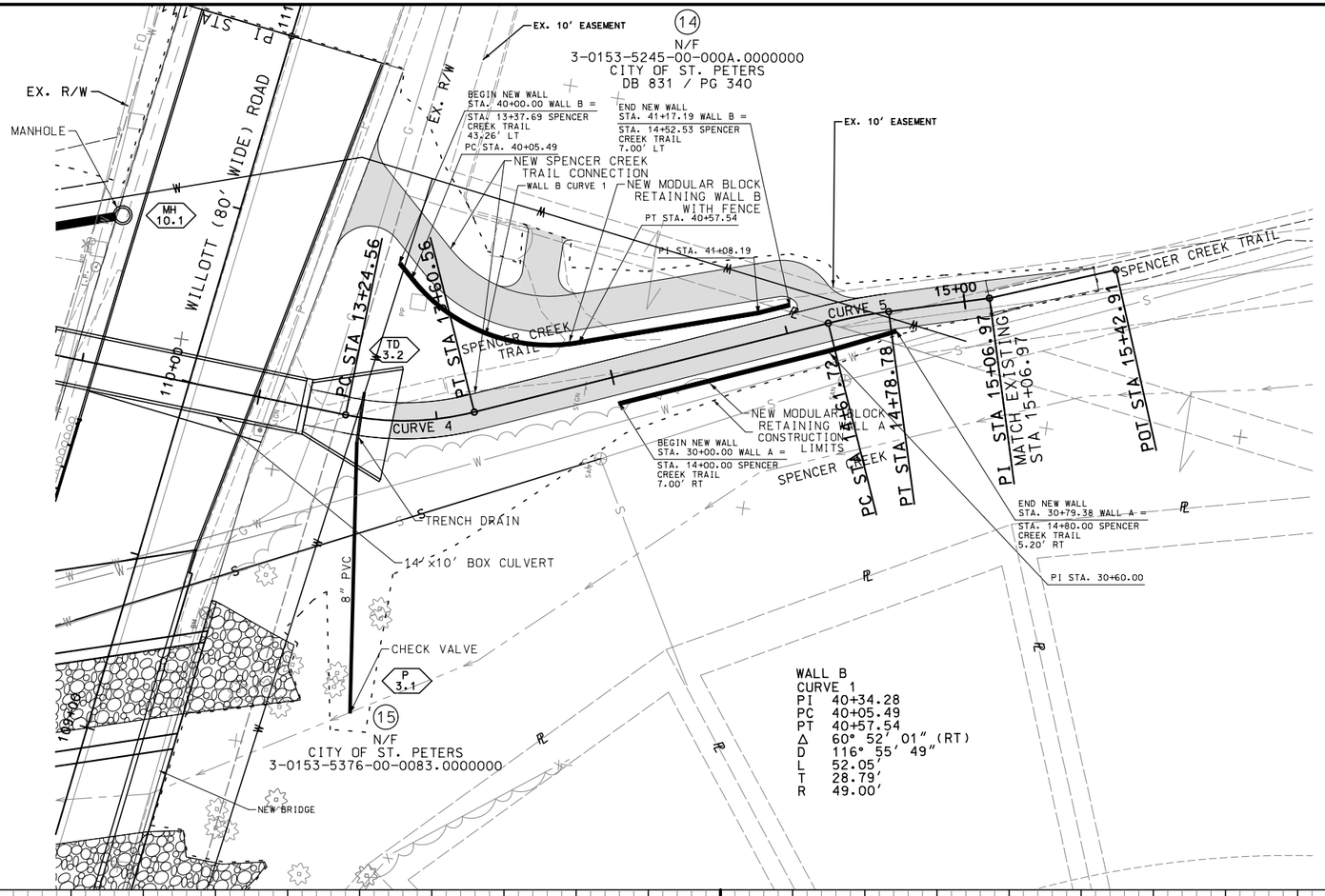
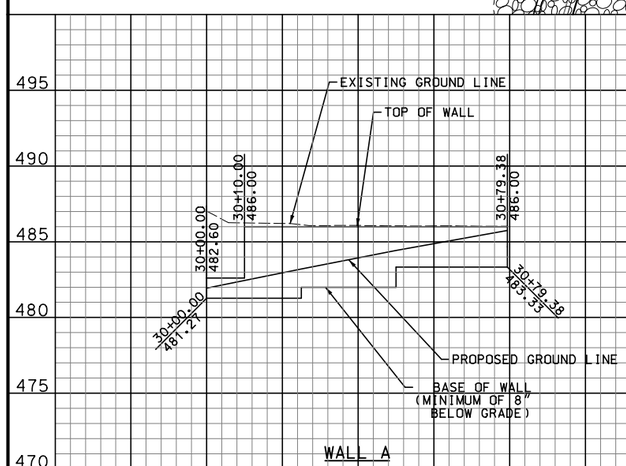
WILLOTT ROAD BRIDGE	SHEET 11
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

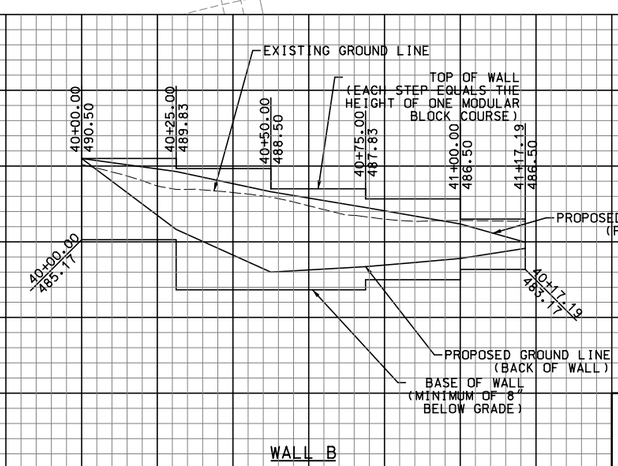


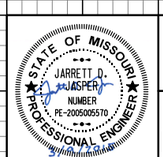
SPENCER CREEK TRAIL
CURVE 5
PI 14+70.26
PC 14+61.72
PT 14+78.78
Δ 6° 30′ 56″ (RT)
D 38° 11′ 50″
L 17.06′
T 8.54′
R 150.00′

WALL B
CURVE 1
PI 40+34.28
PC 40+05.49
PT 40+57.54
Δ 60° 52′ 01″ (RT)
D 116° 55′ 49″
L 52.05′
T 28.79′
R 49.00′

SCALE
0 20 40 60







RETAINING WALL PLAN & PROFILE SHEET 1 OF 1

HORNER & SHIFRIN, INC.

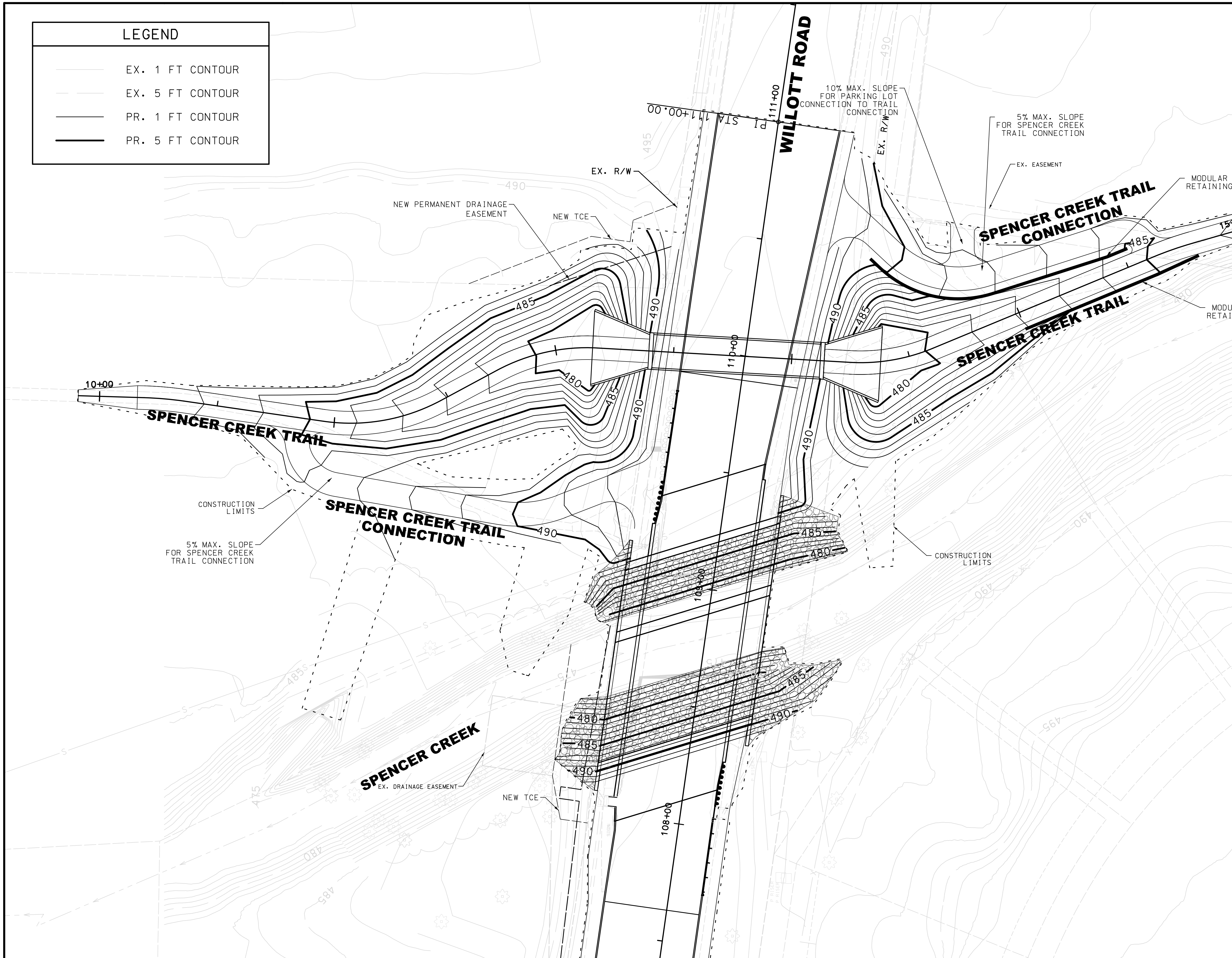
30 40 41 6

...\1330800 Retaining Wall.dgn 2:37:56 PM 3/9/2015

WILLOTT ROAD BRIDGE	SHEET 12
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

LEGEND

EX. 1 FT CONTOUR	
EX. 5 FT CONTOUR	
PR. 1 FT CONTOUR	
PR. 5 FT CONTOUR	



STATE OF MISSOURI JARRETT D. JASPER NUMBER PE-2005005570 PROFESSIONAL ENGINEER

BIKE TRAIL/CULVERT GRADING PLAN SHEET 1 OF 1

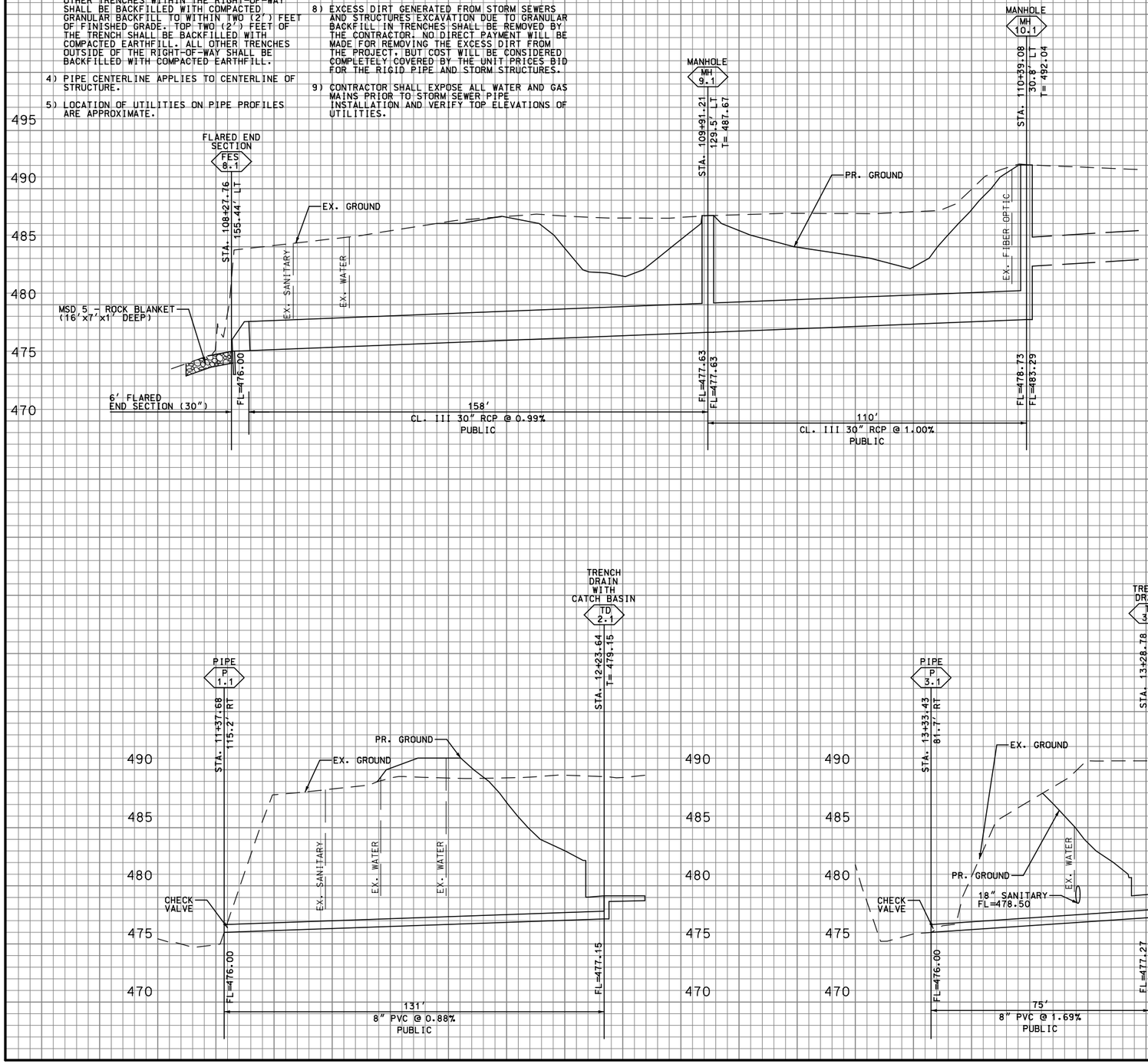
HORNER & SHIFRIN, INC.

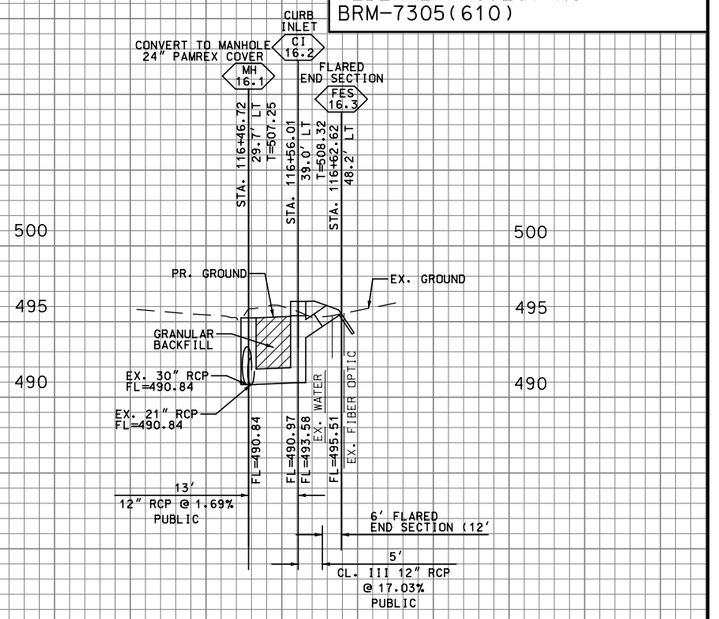
...\1330800 Grading.dgn 9:12:09 AM 3/11/2015

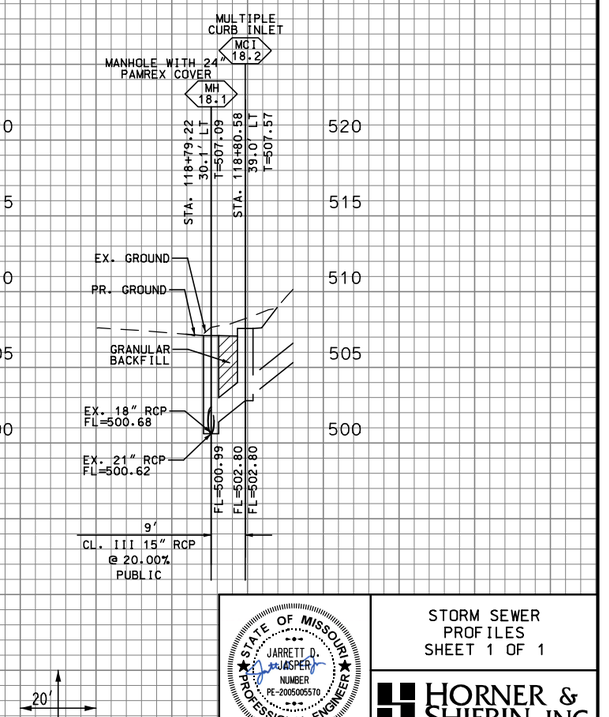
WILLOTT ROAD BRIDGE	SHEET 13
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

GENERAL NOTES:

1) T=TOP OF MANHOLE CASTING OR INLET STONE.
2) ALL STORM SEWER PIPE TO BE CLASS III, UNLESS OTHERWISE NOTED. GASKETED PIPE ("O"-RING) ASTM C-443.
3) CONTRACTOR TO PROVIDE COMPACTED GRANULAR BACKFILL TO THE SUBGRADE OF THE PAVEMENT FOR ALL TRENCHES UNDER PAVEMENT. ALL OTHER TRENCHES WITHIN THE RIGHT-OF-WAY SHALL BE BACKFILLED WITH COMPACTED GRANULAR BACKFILL TO WITHIN TWO (2') FEET OF FINISHED GRADE. TOP TWO (2') FEET OF THE TRENCH SHALL BE BACKFILLED WITH COMPACTED EARTHFILL. ALL OTHER TRENCHES OUTSIDE OF THE RIGHT-OF-WAY SHALL BE BACKFILLED WITH COMPACTED EARTHFILL.
4) PIPE CENTERLINE APPLIES TO CENTERLINE OF STRUCTURE.
5) LOCATION OF UTILITIES ON PIPE PROFILES ARE APPROXIMATE.
6) DISTANCES BETWEEN STRUCTURES ARE MEASURED TO THE CENTER OF STRUCTURES.
7) FILL MATERIAL UPON WHICH THE PROPOSED SEWERS ARE TO BE LAID SHALL BE COMPACTED TO 90% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D-15571-180 AASHTO MODIFIED COMPACTION TEST AND BE VERIFIED BY THE ENGINEER.
8) EXCESS DIRT GENERATED FROM STORM SEWERS AND STRUCTURES EXCAVATION DUE TO GRANULAR BACKFILL IN TRENCHES SHALL BE REMOVED BY THE CONTRACTOR. NO DIRECT PAYMENT WILL BE MADE FOR REMOVING THE EXCESS DIRT FROM THE PROJECT, BUT COST WILL BE CONSIDERED COMPLETELY COVERED BY THE UNIT PRICES BID FOR THE RIGID PIPE AND STORM STRUCTURES.
9) CONTRACTOR SHALL EXPOSE ALL WATER AND GAS MAINS PRIOR TO STORM SEWER PIPE INSTALLATION AND VERIFY TOP ELEVATIONS OF UTILITIES.
10) ALL SEWER CONSTRUCTION AND MATERIALS TO BE IN ACCORDANCE WITH THE METROPOLITAN ST. LOUIS SEWER DISTRICT STANDARD CONSTRUCTION SPECIFICATIONS FOR SEWERS AND DRAINAGE FACILITIES, 2009.
12) PAYMENT FOR ALL GRANULAR BACKFILL WILL BE INCIDENTAL TO THE PIPE.







STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

STORM SEWER PROFILES SHEET 1 OF 1

HORNER & SHIFRIN, INC.

...\1330800 Storm Sewer Profiles.dgn 2:37:57 PM 3/9/2015

WILLOTT ROAD BRIDGE	SHEET 14
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

GENERAL NOTES:

1) T=TOP OF MANHOLE CASTING OR INLET STONE.

2) ALL STORM SEWER PIPE TO BE CLASS III, UNLESS OTHERWISE NOTED, GASKETED PIPE ('O'-RING) ASTM C-443.

3) CONTRACTOR TO PROVIDE COMPACTED GRANULAR BACKFILL TO THE SUBGRADE OF THE PAVEMENT FOR ALL TRENCHES UNDER PAVEMENT. ALL OTHER TRENCHES WITHIN THE RIGHT-OF-WAY SHALL BE BACKFILLED WITH COMPACTED GRANULAR BACKFILL TO WITHIN TWO (2') FEET OF FINISHED GRADE. TOP TWO (2') FEET OF THE TRENCH SHALL BE BACKFILLED WITH COMPACTED EARTHFILL. ALL OTHER TRENCHES OUTSIDE OF THE RIGHT-OF-WAY SHALL BE BACKFILLED WITH COMPACTED EARTHFILL.

4) PIPE CENTERLINE APPLIES TO CENTERLINE OF STRUCTURE.

5) LOCATION OF UTILITIES ON PIPE PROFILES ARE APPROXIMATE.

6) DISTANCES BETWEEN STRUCTURES ARE MEASURED TO THE CENTER OF STRUCTURES.

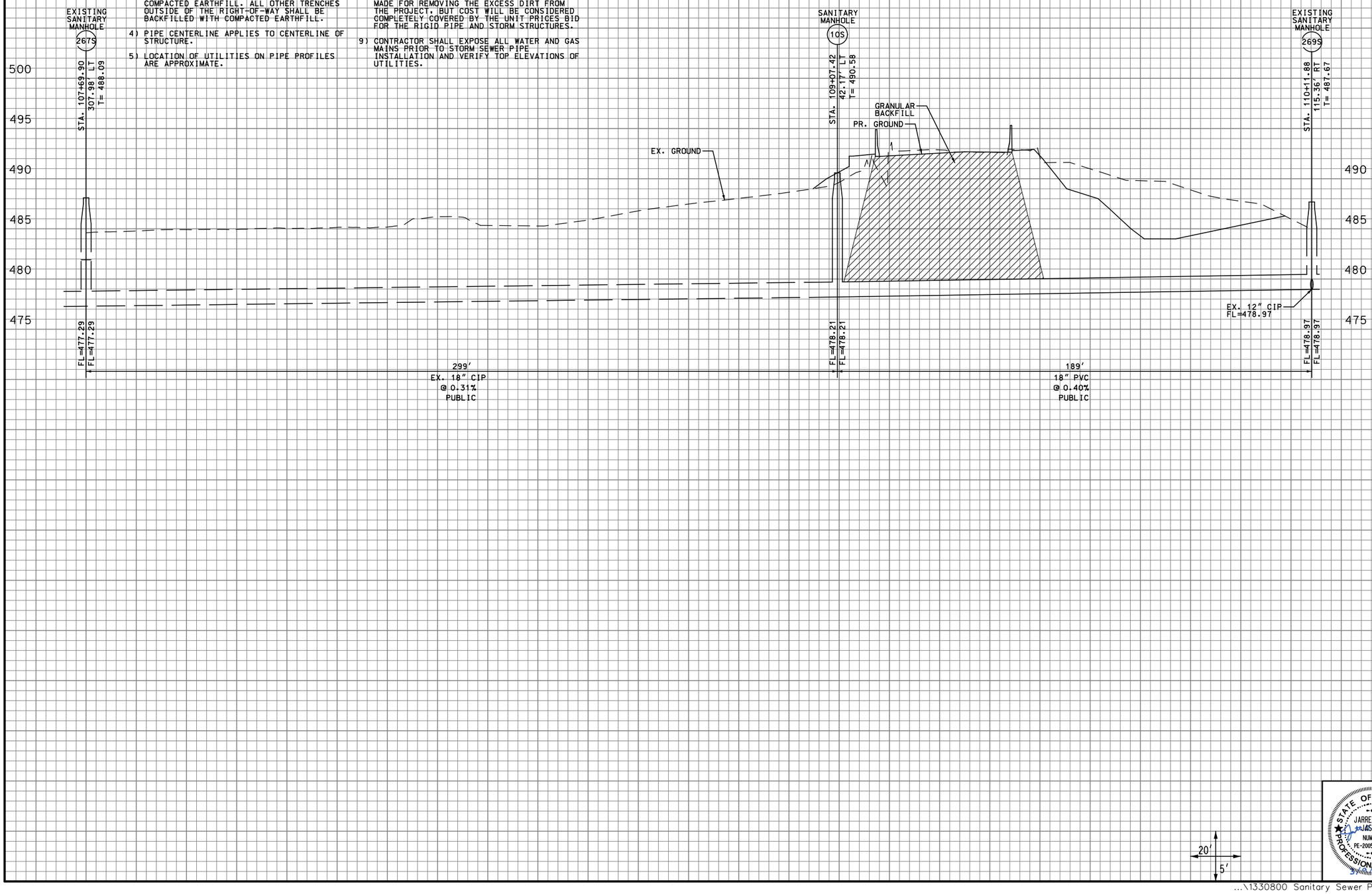
7) FILL MATERIAL UPON WHICH THE PROPOSED SEWERS ARE TO BE LAID SHALL BE COMPACTED TO 90% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D-15571-180 AASHTO MODIFIED COMPACTION TEST AND BE VERIFIED BY THE ENGINEER.

8) EXCESS DIRT GENERATED FROM STORM SEWERS AND STRUCTURES EXCAVATION DUE TO GRANULAR BACKFILL IN TRENCHES SHALL BE REMOVED BY THE CONTRACTOR. NO DIRECT PAYMENT WILL BE MADE FOR REMOVING THE EXCESS DIRT FROM THE PROJECT, BUT COST WILL BE CONSIDERED COMPLETELY COVERED BY THE UNIT PRICES BID FOR THE RIGID PIPE AND STORM STRUCTURES.

9) CONTRACTOR SHALL EXPOSE ALL WATER AND GAS MAINS PRIOR TO STORM SEWER PIPE INSTALLATION AND VERIFY TOP ELEVATIONS OF UTILITIES.

10) ALL SEWER CONSTRUCTION AND MATERIALS TO BE IN ACCORDANCE WITH THE METROPOLITAN ST. LOUIS SEWER DISTRICT STANDARD CONSTRUCTION SPECIFICATIONS FOR SEWERS AND DRAINAGE FACILITIES, 2009, EXCEPT FOR FOR THE 8'x5' BOX CULVERT EXTENSION WHICH WILL BE ACCORDANCE WITH THE CURRENT MISSOURI DEPARTMENT OF TRANSPORTATION STANDARD PLANS.

12) PAYMENT FOR ALL GRANULAR BACKFILL WILL BE INCIDENTAL TO THE PIPE.



20'
5'

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER
PE-2005005570
PROFESSIONAL ENGINEER

SANITARY SEWER PROFILES
SHEET 1 OF 1

HORNER & SHIFRIN, INC.

...\1330800 Sanitary Sewer Profiles.dgn 2:37:58 PM 3/9/2015

WILLOTT ROAD BRIDGE	SHEET 15
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

LEGEND

S.W. – SOLID WHITE
S.Y. – SOLID YELLOW
D.S.Y. – DOUBLE SOLID YELLOW
I.W. – INTERMITTENT WHITE
I.Y. – INTERMITTENT YELLOW
D.W. – DOTTED WHITE
– TURN ARROW
– TURN/THRU ARROW
– BICYCLE SYMBOL
– SILT FENCE
– INLET PROTECTION, FIBER ROLLS

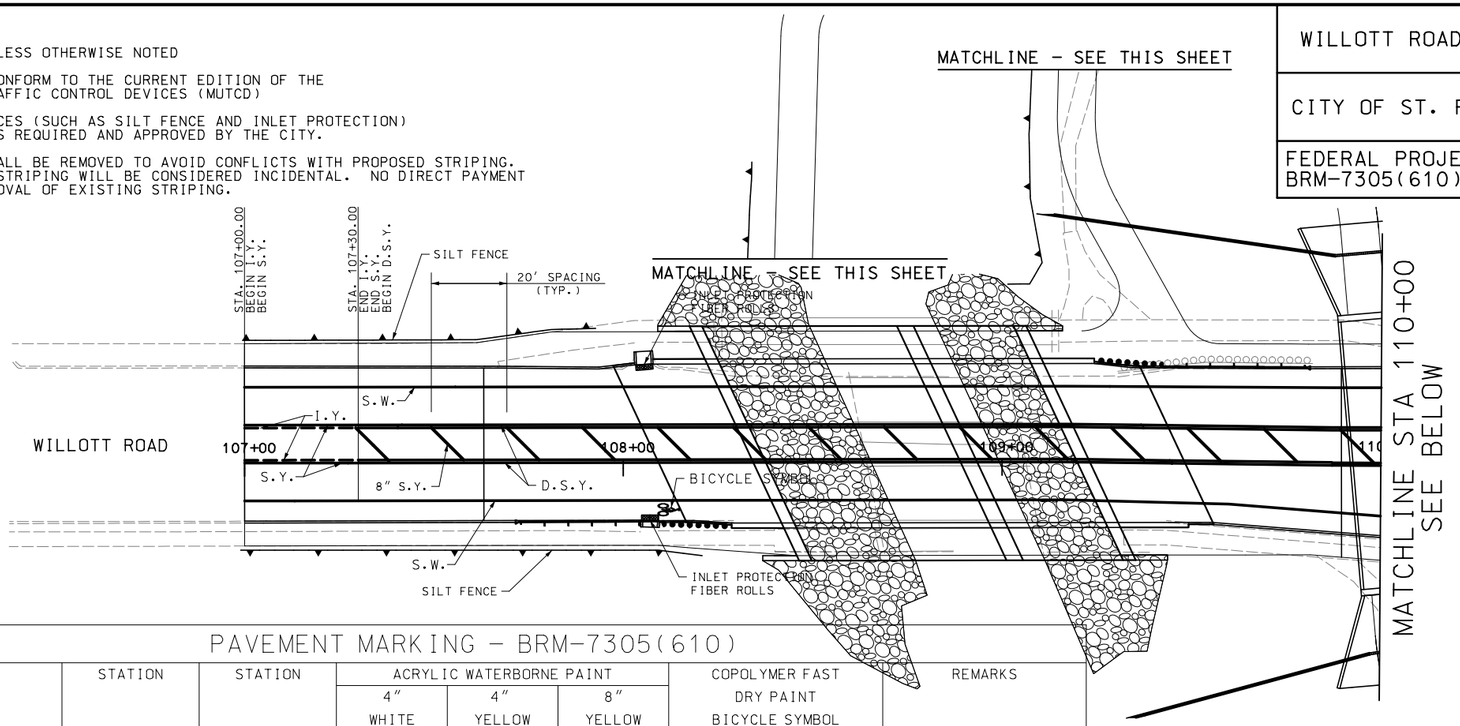
GENERAL NOTES:

1. STRIPING WIDTH 4" UNLESS OTHERWISE NOTED
2. ALL STRIPING SHALL CONFORM TO THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)
3. EROSION CONTROL DEVICES (SUCH AS SILT FENCE AND INLET PROTECTION) SHALL BE INSTALLED AS REQUIRED AND APPROVED BY THE CITY.
4. EXISTING STRIPING SHALL BE REMOVED TO AVOID CONFLICTS WITH PROPOSED STRIPING. REMOVAL OF EXISTING STRIPING WILL BE CONSIDERED INCIDENTAL. NO DIRECT PAYMENT WILL BE MADE FOR REMOVAL OF EXISTING STRIPING.

INLET PROTECTION FIBER ROLLS – BRM-7305-(610)
9 L.F.

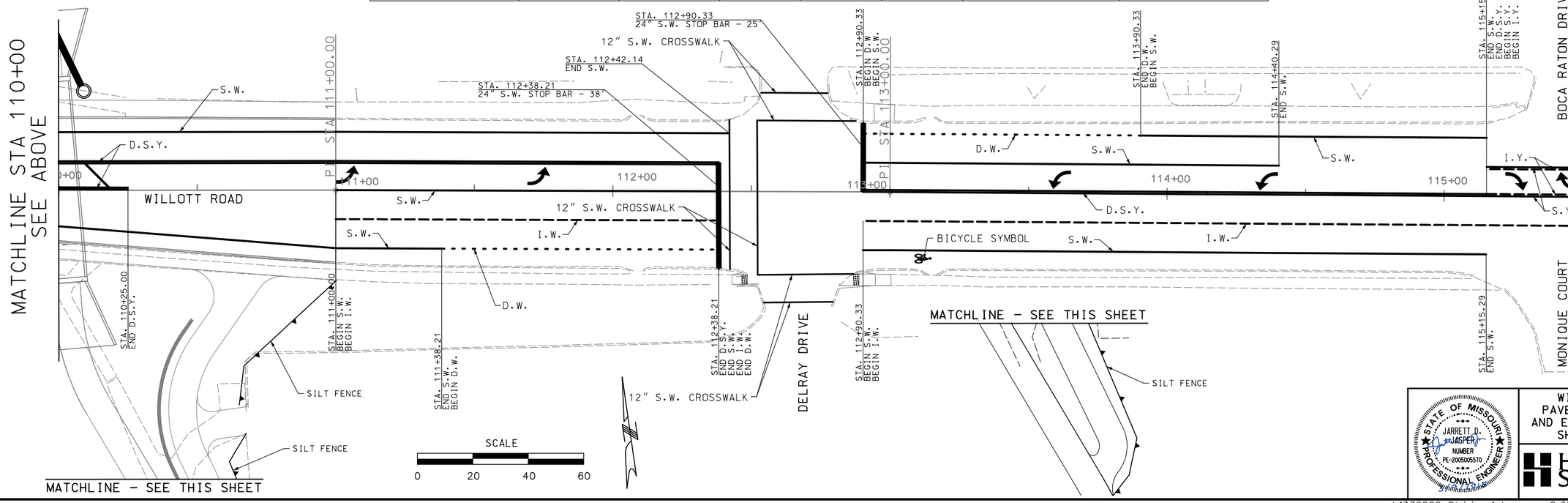
SILT FENCE
456 L.F.

SEDIMENT REMOVAL
4.1 C.Y.



PAVEMENT MARKING – BRM-7305(610)

LOCATION	STATION	STATION	ACRYLIC WATERBORNE PAINT			COPOLYMER FAST DRY PAINT	REMARKS
			4" WHITE	4" YELLOW	8" YELLOW	BICYCLE SYMBOL	
			(LF)	(LF)	(LF)	(EACH)	
WILLOTT ROAD	101+45.60	111+00.00	801	1410	182	1	
		TOTAL	801	1410	182	1	
		PAY TOTAL	800	1410	180	1	



STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD PAVEMENT MARKING AND EROSION CONTROL SHEET 1 OF 2

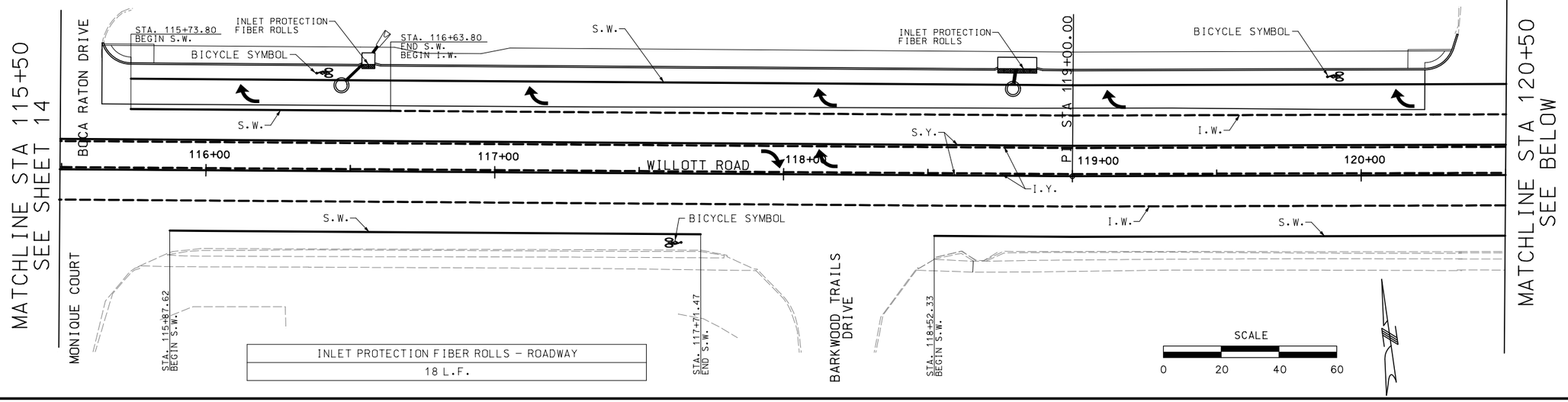
HORNER & SHIFRIN, INC.

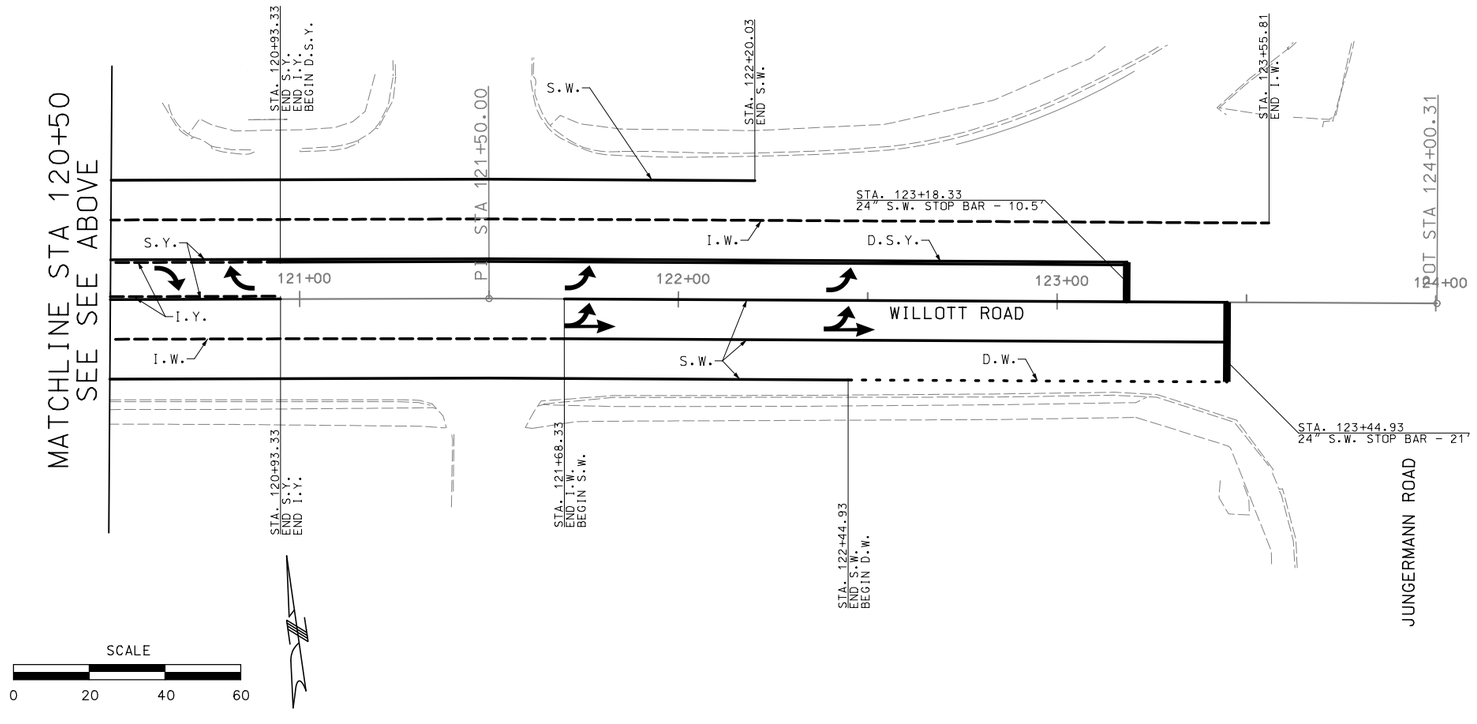
...\1330800 Striping 1.dgn 2:38:02 PM 3/9/2015

PAVEMENT MARKING – ROADWAY

LOCATION	STATION	STATION	ACRYLIC WATERBORNE PAINT 4" WHITE (LF)	4" YELLOW (LF)	12" WHITE (LF)	24" WHITE (LF)	COPOLYMER FAST DRY PAINT LT/RT ARROW WHITE (EACH)	COPOLYMER FAST DRY PAINT COMBINATION STRAIGHT-LEFT/RIGHT ARROW WHITE (EACH)	COPOLYMER FAST DRY PAINT BICYCLE SYMBOL (EACH)	REMARKS
WILLOTT ROAD	111+00.00	115+50.00	984	813	229	63	6		1	
WILLOTT ROAD	115+50.00	123+55.81	2022	1809		32	11	2	3	
		TOTAL	3006	2622	229	95	17	2	4	
		PAY TOTAL	3010	2620	230	100	17	2	4	

WILLOTT ROAD BRIDGE	SHEET 16
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	





LEGEND

- S.W. – SOLID WHITE
- S.Y. – SOLID YELLOW
- D.S.Y. – DOUBLE SOLID YELLOW
- I.W. – INTERMITTENT WHITE
- I.Y. – INTERMITTENT YELLOW
- D.W. – DOTTED WHITE
- – TURN ARROW
- – TURN/THRU ARROW
- – BICYCLE SYMBOL
- – SILT FENCE
- – INLET PROTECTION, FIBER ROLLS

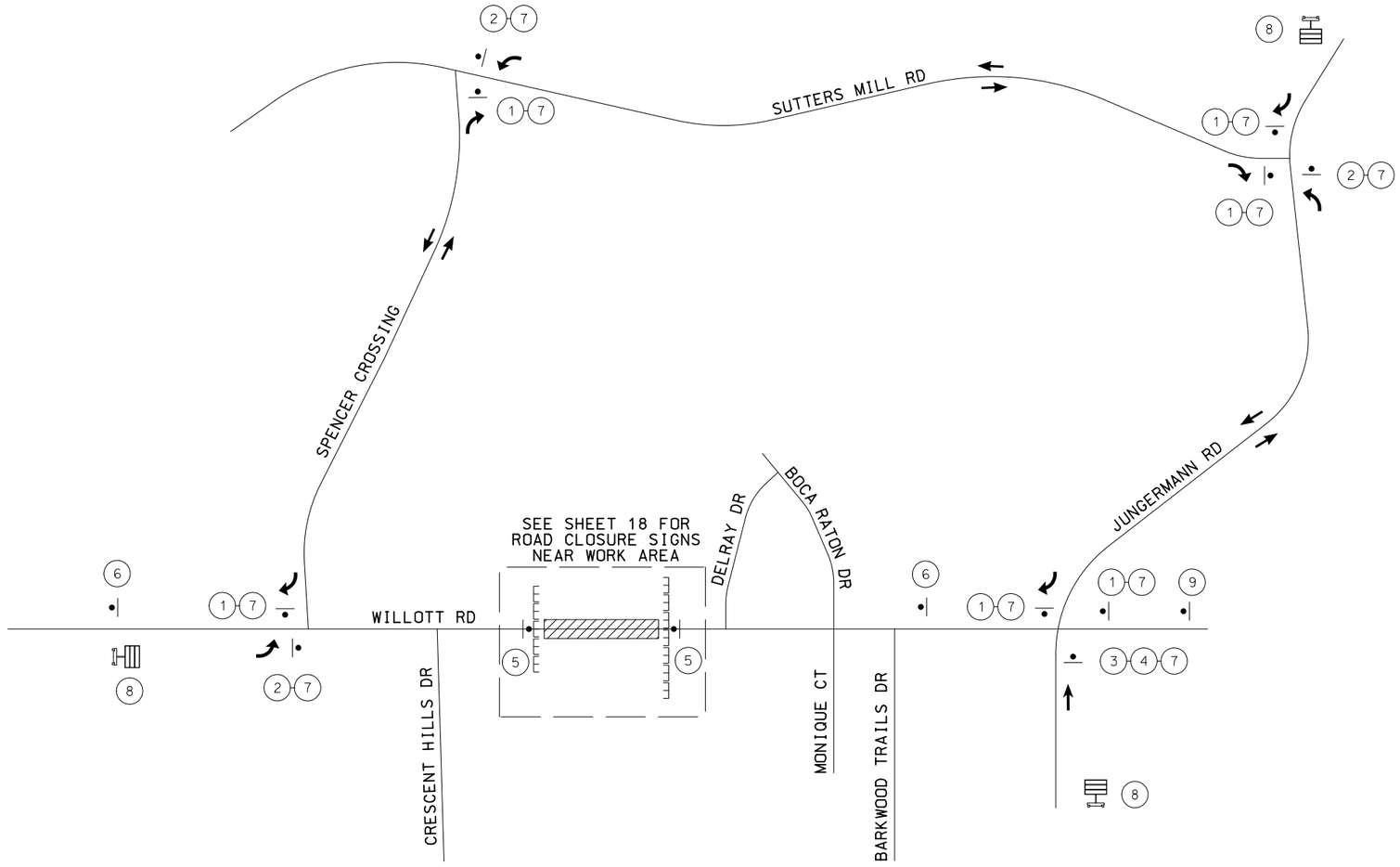
STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
PAVEMENT MARKING
AND EROSION CONTROL
SHEET 2 OF 2

HORNER & SHIFRIN, INC.

...\1330800 Striping 2.dgn 2:38:05 PM 3/9/2015

WILLOTT ROAD BRIDGE	SHEET 17
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



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GENERAL NOTES:

1) DETOUR PLAN FOR BRIDGE AND CULVERT CONSTRUCTION BETWEEN STA. 107+00 AND STA. 111+00.

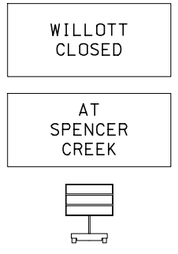
M04-9R
1

M04-9L
2

M04-8
3


M6-3
4

CHANGEABLE MESSAGE SIGN



8

R11-2
5

M04-8a
6

SPECIAL 1
7

W020-3
9

TRAFFIC CONTROL - BRM-7305(610)

LOCATION	CONSTRUCTION SIGNS					TYPE III BARRICADE	CHANGEABLE MESSAGE SIGN	REMARKS
	SIGN	SIZE	QUANTITY	QUANTITY	DESCRIPTION			
	(LF)	(IN)	(EACH)	(SF)		(EACH)		
WILLOTT ROAD	M04-9R	30 X 24	6	30	DETOUR RIGHT	23	3	
	M04-9L	30 X 24	3	15	DETOUR LEFT			
	M04-8	24 X 12	1	2	DETOUR			
	M06-3	21 X 15	1	2	ARROW			
	R11-2	48 X 30	2	20	ROAD CLOSED			
	M04-8a	24 X 18	2	6	END DETOUR			
	SPECIAL 1	24 X 30	10	50	WILLOTT ROAD			
	W020-3	36 X 36	3	27	ROAD CLOSED AHEAD			
	W020-3a	36 X 36	2	18	ROAD CLOSED 100 FT			
	R9-9	24 X 12	4	8	SIDEWALK CLOSED			
TOTAL				178		23	3	
PAY TOTAL				178		23	3	

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
TRAFFIC CONTROL
DETOUR
SHEET 1 OF 3

HORNER & SHIFRIN, INC.

...\1330800 Traffic Control - Detour.dgn 2:38:12 PM 3/9/2015

WILLOTT ROAD BRIDGE	SHEET 18
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

SCALE
0 50 100 150

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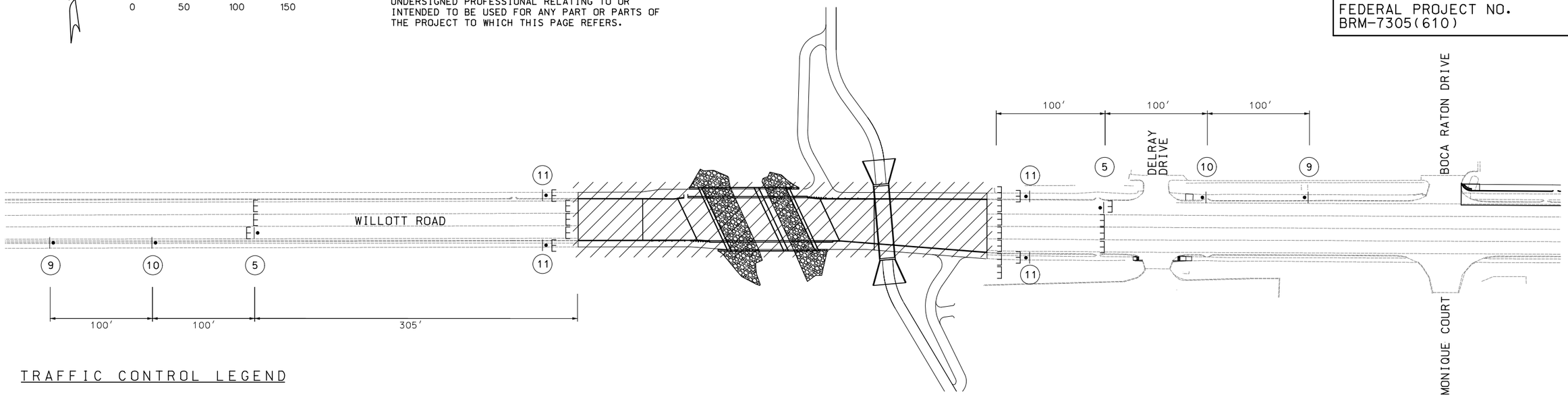


TRAFFIC CONTROL LEGEND

- SIGN (SINGLE SIDED)
- TYPE III MOVABLE BARRICADE WITH LIGHT
- CHANNELIZER (TRIM-LINE)
- WORK AREA

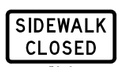
GENERAL NOTES:

1) SIGN LOCATIONS TO BE APPROVED BY ENGINEER.
2) DISTANCE MAY BE ADJUSTED ACCORDING TO FIELD CONDITIONS WITH PERMISSION OF THE ENGINEER.
3) NO DIRECT PAYMENT WILL BE MADE FOR RELOCATION OF TCP SIGNS AND DEVICES.
4) ANY EXISTING SIGNS THAT CONFLICT WITH TEMPORARY TRAFFIC CONTROL SHALL BE COVERED OR REMOVED.
5) ALL TRAFFIC CONTROL ITEMS WHICH ARE NOT INCLUDED IN THE PAY ITEMS ARE TO BE CONSIDERED INCIDENTAL.
6) MAINTAIN ACCESS TO ALL ENTRANCES AT ALL TIMES.

R11-2
(5)

W020-3
(9)

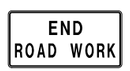
W020-3a
(10)



R9-9
(11)

W020-1
(12)

W020-5
(13)



G20-2
(14)

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER
PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
TRAFFIC CONTROL
ROAD CLOSURE
SHEET 2 OF 3

HORNER & SHIFRIN, INC.

...\1330800 Traffic Control - Bridge.dgn 2:38:13 PM 3/9/2015

TRAFFIC CONTROL – ROADWAY								
LOCATION	CHANNELIZERS (TRIM-LINE)	CONSTRUCTION SIGNS					TYPE III BARRICADE	REMARKS
		SIGN	SIZE	QUANTITY	QUANTITY	DESCRIPTION		
	(EACH)	(LF)	(IN)	(EACH)	(SF)		(EACH)	
WILLOTT ROAD	10	R9-9	24 X 12	2	4	SIDEWALK CLOSED	2	
		W020-1	36 X 36	4	36	ROAD WORK AHEAD		
		W020-5	36 X 36	1	9	RIGHT LANE CLOSED AHEAD		
		G20-2	36 X 18	2	9	END ROAD WORK		
TOTAL	10				58		2	
PAY TOTAL	10				58		2	

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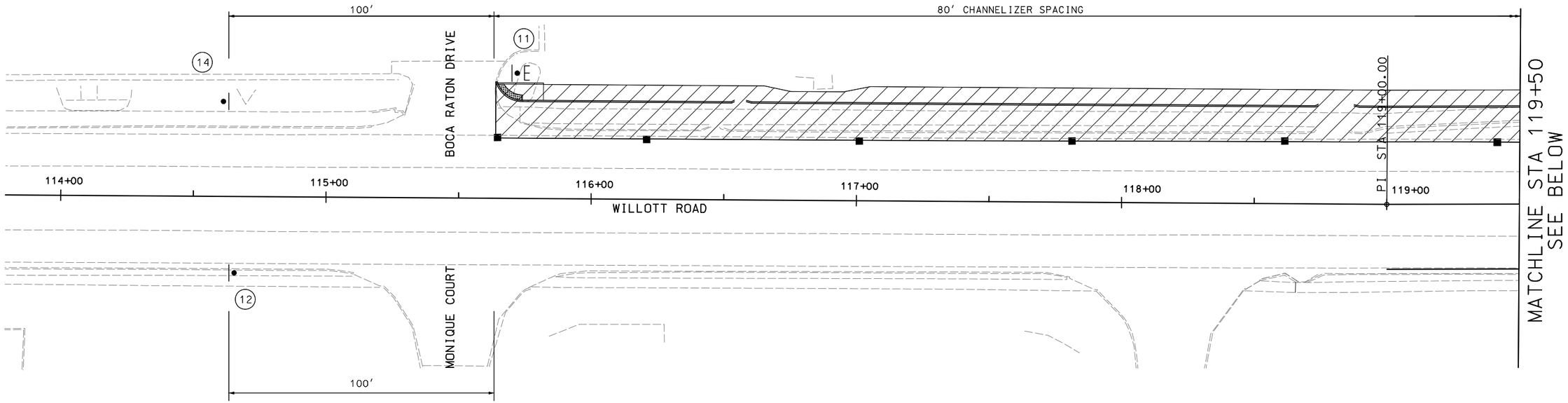
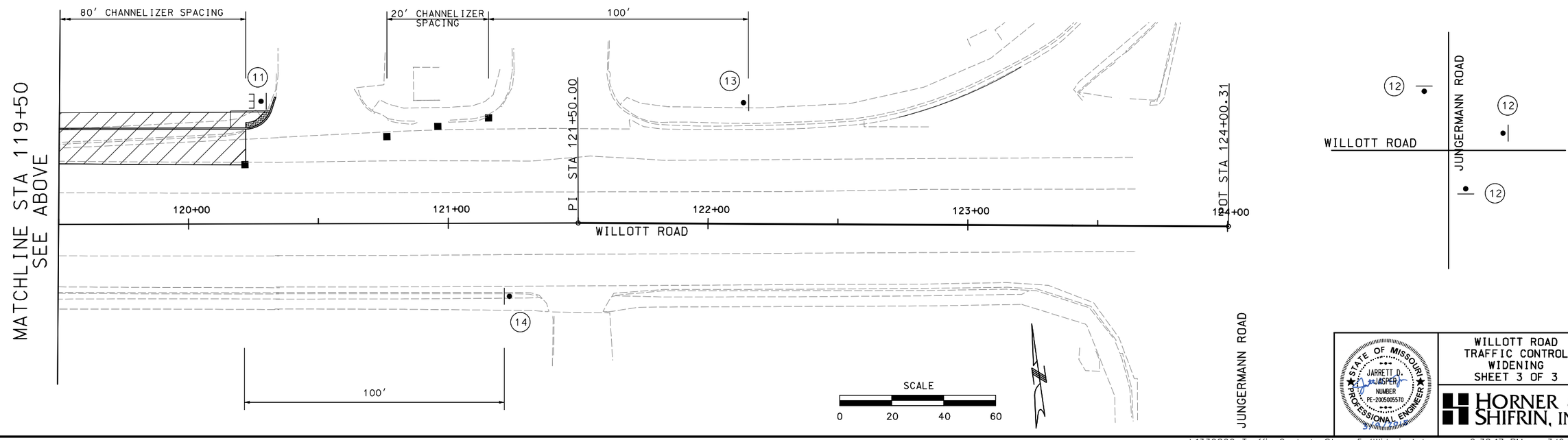
SCALE
0 20 40 60

WILLOTT ROAD BRIDGE	SHEET 19
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	





STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
TRAFFIC CONTROL
WIDENING
SHEET 3 OF 3

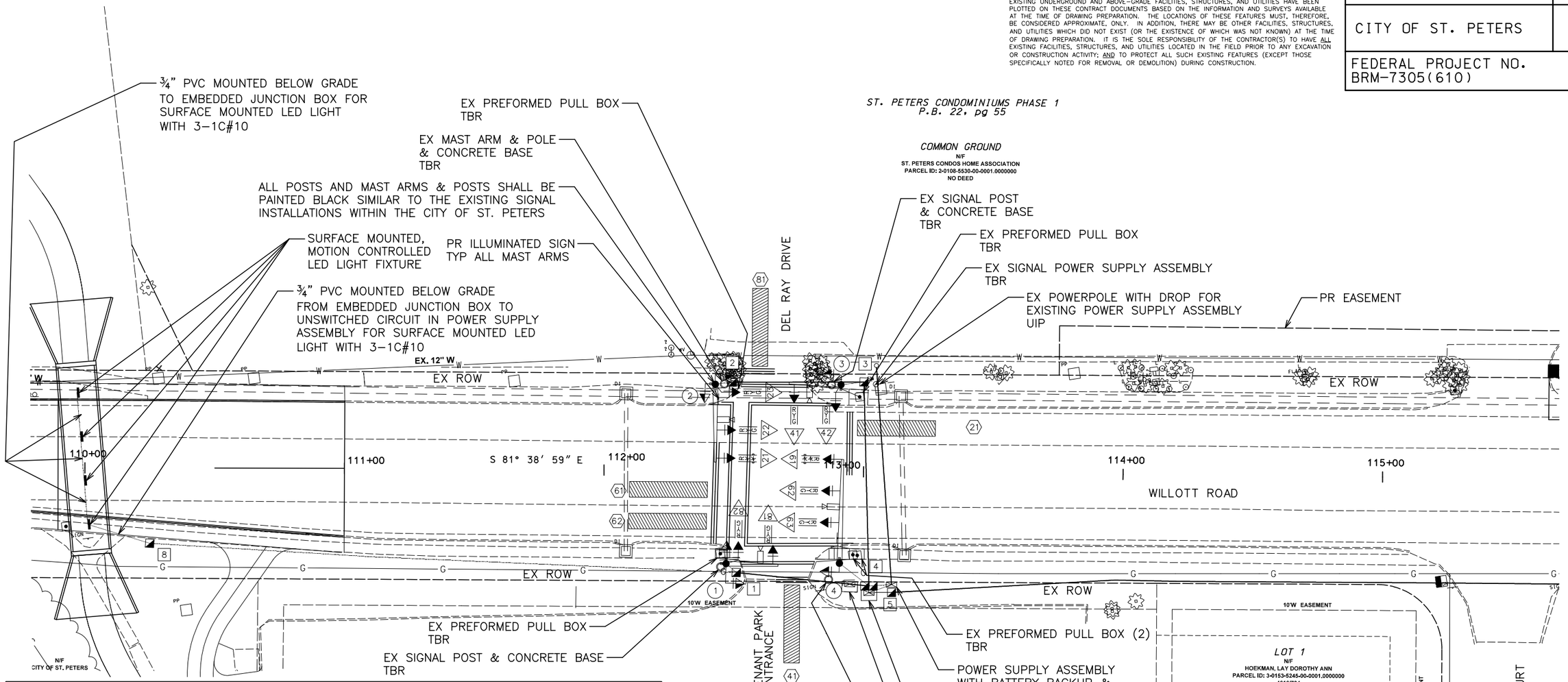
HORNER & SHIFRIN, INC.

...\1330800 Traffic Control - Stage 5 (Widening).dgn 2:38:17 PM 3/9/2015

WILLOTT ROAD BRIDGE	SHEET 20
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

SPECIAL NOTE TO CONTRACTOR(S):

EXISTING UNDERGROUND AND ABOVE-GRADE FACILITIES, STRUCTURES, AND UTILITIES HAVE BEEN PLOTTED ON THESE CONTRACT DOCUMENTS BASED ON THE INFORMATION AND SURVEYS AVAILABLE AT THE TIME OF DRAWING PREPARATION. THE LOCATIONS OF THESE FEATURES MUST, THEREFORE, BE CONSIDERED APPROXIMATE, ONLY. IN ADDITION, THERE MAY BE OTHER FACILITIES, STRUCTURES, AND UTILITIES WHICH DID NOT EXIST (OR THE EXISTENCE OF WHICH WAS NOT KNOWN) AT THE TIME OF DRAWING PREPARATION. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR(S) TO HAVE ALL EXISTING FACILITIES, STRUCTURES, AND UTILITIES LOCATED IN THE FIELD PRIOR TO ANY EXCAVATION OR CONSTRUCTION ACTIVITY; AND TO PROTECT ALL SUCH EXISTING FEATURES (EXCEPT THOSE SPECIFICALLY NOTED FOR REMOVAL OR DEMOLITION) DURING CONSTRUCTION.



TRAFFIC SIGNALS LEGEND

- CONTROLLER
- CONTROLLER (EXISTING)
- JUNCTION BOX
- POWER SOURCE
- POWER SUPPLY
- WOOD POST
- SIGNAL HEAD (OPT LIM CONV)
- SIGNAL HEAD (OPT LIM)
- SIGNAL HEAD (PEDESTRIAN)
- SIGNAL HEAD (STANDARD)
- VIDEO DETECTOR
- PUSH BUTTON DETECTOR
- PREFORMED PULL BOX TYPE 1
- PREFORMED PULL BOX TYPE 2
- PULL BOX TYPE 1
- PULL BOX TYPE 2
- ITS PULL BOX TYPE 2
- ITS PULL BOX TYPE 5
- 6 X 6 LOOP DETECTOR
- 6 X 15 LOOP DETECTOR
- 30 X 6 LOOP DETECTOR
- CONDUIT MEDIAN
- CONDUIT PUSHED
- CONDUIT BRIDGE
- CONDUIT EXISTING
- CONDUIT TRENCHED
- SPAN WIRE
- TYPE C MAST ARM A BASE
- TYPE C MAST ARM B BASE

FLASHING YELLOW ARROW YIELD SIGN

SIGN BACKGROUND: WHITE
SIGN LETTERING: BLACK
YIELD: BOLD LETTERS

TYPICAL LEFT TURN LANES
WILLOTT ROAD

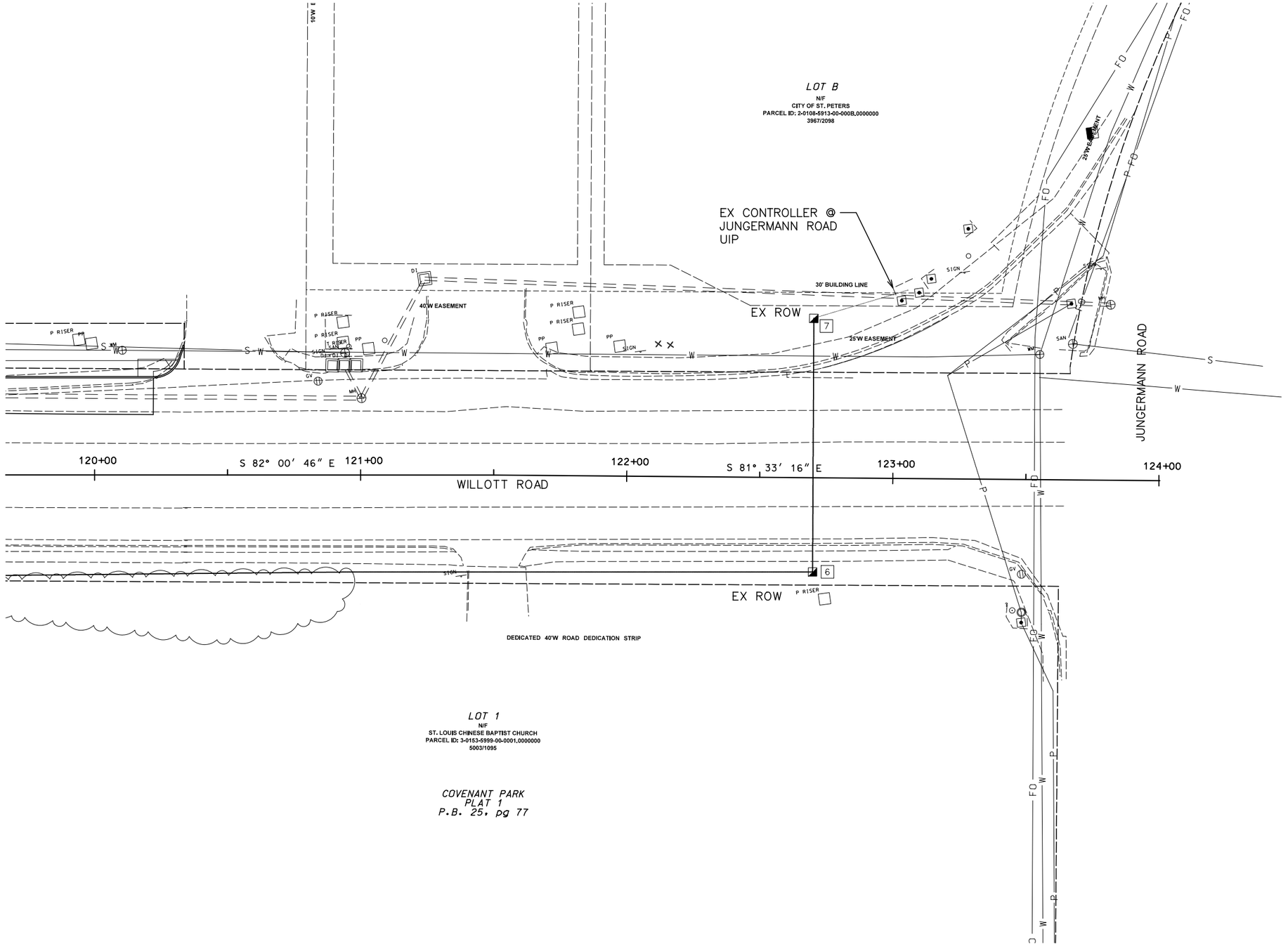
STATE OF MISSOURI BRIAN D. SCHMIDT NUMBER PE-2014007272 PROFESSIONAL ENGINEER

TRAFFIC SIGNAL AND LIGHTING PLANS SHEET 1 OF 7

HORNER & SHIFRIN, INC.

...\099_TS_Plan_1330800.dgn 9:28:39 AM 3/11/2015

WILLOTT ROAD BRIDGE	SHEET 21
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



SCALE
0 20 40 60

STATE OF MISSOURI
BRIAN D. SCHMIDT
NUMBER PE-2014007272
PROFESSIONAL ENGINEER

TRAFFIC SIGNAL AND LIGHTING PLANS
SHEET 2 OF 7

HORNER & SHIFRIN, INC.

...\099_TS_Plan_1330800.dgn 2:38:18 PM 3/9/2015

POST NUMBER	PULL BOX NUMBER	APPROACH	STATION	OFFSET	BASE A 9	A 9.5	A 10	A 10.5	A 11	A 12	F 9	F 9.5	F 10	F 10.5	F 11	F 12	C	CONCRETE ** (CU. YDS.)
			CONTROLLER	(AS REQ'D)														1.93
			POWER SUPPLY															1.31
1		WILLOTT RD	112+47.27	35.73' RT	1													2.88
2		WILLOTT RD	112+42.67	33.35' LT		1												3.01
3		WILLOTT RD	112+91.11	33.49' LT	1													2.88
4		WILLOTT RD	112+90.94	35.32' RT				1										3.27
	1	WILLOTT RD	112+51.23	39.13' RT														
	2	WILLOTT RD	112+49.26	34.19' LT														
	3	WILLOTT RD	113+00.00	34.60' LT														
	4	WILLOTT RD	113+02.38	44.00' RT														
	5	WILLOTT RD	113+11.11	46.37' RT														
	6	WILLOTT RD	122+70.00	35.00' RT														
	7	WILLOTT RD	122+70.00	60.00' LT														
	8	WILLOTT RD	110+25.00	29.00' RT														
																	SUBTOTAL	15.28
																	TOTAL	15.28

PULL BOX

PULL BOX NUMBER	PREFORMED CLASS 1	CLASS 2	CLASS 3	CLASS 5	CONCRETE STANDARD	DOUBLE, TYPE A	DOUBLE, TYPE B	DRAIN TYPE* I	II A	II B	II C
1		1							1		
2		1									1
3			1								1
4			1						1		
5				1					1		
6		1							1		
7				1					1		
8	1									1	
SUBTOTAL	1	3	2	2							
TOTAL	1	3	2	2							

POST

POST NUMBER	TOP MOUNT POST 8 FT.	15 FT.	TYPE C & CL ARM LENGTH A	A	A	A	SIGNAL SPACING B	C	D	D'	SIGN SPACING B	C	D	D'
1			20				18				3			
2				30			18	28			3	26		
3			20				18				3			
4					40		16	28	40		3	38		
SUBTOTAL			40	30	40									
TOTAL			40	30	40									

ROW	TYPE B & BL ARM LENGTH E	K	E	K	E	K	LEFT ARM E SIGNAL SPACING F	G	H	H'	SIGN SPACING F	G	H	H'	RIGHT ARM K SIGNAL SPACING L	M	N	N'	SIGN SPACING L	M	N	N'	INCLUDED ANGLE	LUMINAIRE BRACKET ARM* 4 FT.	6 FT.	8 FT.	10 FT.	12 FT.	15 FT.
POWER SUPPLY																													1
(blank)																													1
POST 1																													1
POST 2																													1

SIGNAL HEADS

SPAN NUMBER	POST NUMBER	FACE NUMBER	LUMINAIRE LED	12" LENS CONVENTIONAL R	Y	YL	YR†	FYL	FYR	G	S	L	R†	PED (hand/person symbol)	12" LENS OPTICAL LIMITING R	Y	YL	YR†	YL	YR†	G	S	L	R†	VISORS* 12" LENS	PED.
	1	65	1											1												1
	1	81		1	1					1															3	
	1	82		1	1					1															3	
	1	83												1												1
	2	21	1	1		1		1																	3	
	2	22		1	1					1															3	
	2	23		1	1					1															3	
	2	24												1												1
	2	84												1												1
	3	25	1											1												1
	3	41		1	1					1															3	
	3	42		1	1					1															3	
	4	61	1	1		1		1																	3	
	4	62		1	1					1															3	
	4	63		1	1					1															3	
	4	64												1												1
SUBTOTAL			4																							
TOTAL			4																							

FACE NUMBER	LOUVERS* A	B	C	D	E	F	BACKPLATE* LENSES 1	2	3	4	5	BRACKET* TYPE I	II	III	ONE-FACE SECTION 1- T	1- S	1- C	1- B	3- T	3- S	3- C	3- B	4- T	4- S	4- C	4- B	5- T	5- S	5- C	5- B	TWO-FACE SECTIONS 11- T	11- S	11- B	33- T	33- S	33- C	33- B	34- S	34- B	35- S	35- B	44- S	44- B	45- S	45- B
65												1				1																													
81									1			1										1																							
82									1			1								1																									
83												1				1																													
21									1			1										1																							
22									1			1										1																							
23									1			1								1																									
24												1				1																													
84												1				1																													
25												1				1																													
41									1			1										1																							
42									1			1								1																									
61									1			1										1																							
62									1			1										1																							
63									1			1										1																							
64												1				1																													

	1- T	1- S	1- C	1- B	3- T	3- S	3- C	3- B
SUBTOTAL OPTICALLY LIMITED								
SUBTOTAL CONVENTIONAL		6				3		7
SUBTOTAL COMBINATION OL & CONV		6				3		7
TOTAL OPTICALLY LIMITED								
TOTAL CONVENTIONAL		6				3		7
TOTAL COMBINATION OL & CONV		6				3		7

SIGNS

QUANTITY	MUTCD SIGN NUMBER	SIZE (INCHES)	AREA (SQ. FT.)	TOTAL AREA EACH SIGN (SQ. FT.)
	R10-10L	24 X 30	5.0	
	R10-10R	24 X 30	5.0	
	R3-5L	30 X 36	7.5	
1	R3-5R	30 X 36	7.5	7.50
	R3-5S	30 X 36	7.5	
	R3-6L	30 X 36	7.5	
	R3-6R	30 X 36	7.5	
	R3-2	24 X 24	4.0	
	R3-1	24 X 24	4.0	
	R3-3	24 X 24	4.0	
	R10-5	24 X 30	5.0	
	R10-12	24 X 30	5.0	
	D3-16***	VAR. X 16		
	D3-18***	VAR. X 18		
	R10-3B	9 X 12	0.75	
	R10-11A	24 X 30	5.0	
	R10-13	60 X 30	12.5	
3	R10-3E L	9 X 15	0.94	2.82
3	R10-3E R	9 X 15	0.94	2.82
2	FYA YIELD	30 X 36	7.5	15
SUBTOTAL AREA ITEM NO. 903-50.68				28.14
TOTAL AREA ITEM NO. 903-50.68				28.14

REMARKS

ALL LENGTHS AND SPACINGS ARE IN FEET UNLESS OTHERWISE INDICATED.

* ITEMS FOR WHICH SEPARATE PAYMENT WILL NOT BE MADE.

** SEE STANDARD PLANS 902.10 AND 902.30 FOR CONCRETE REQUIREMENTS ON BASES.

*** USE D3-16 FOR ONE LINE. USE D3-18 FOR TWO LINE.

SIGNAL STRUCTURES WHICH WILL EXCEED THE DIMENSION LIMITS SHOWN ON STANDARD PLAN SHEETS IN SECTION 902 AND ANY OTHER INSTALLATION WHERE THE DETAILS OF CONSTRUCTION ARE NOT FURNISHED IN THE CONTRACT PLANS, SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER IN ACCORDANCE WITH THE 2001 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 4TH EDITION, AND LATEST INTERIMS. THE STRUCTURE SHALL BE DESIGNED AS IMPORTANCE CATEGORY I FOR FATIGUE WITH A 50-YEAR DESIGN LIFE. THE CONTRACTOR SHALL SUBMIT A SET OF SHOP DETAIL DRAWINGS INCLUDING WELD PROCEDURE SPECIFICATIONS AND DESIGN COMPUTATIONS FOR MODOT RECORDS AND REFERENCE. THE SUBMITTED DRAWINGS AND CALCULATIONS SHALL BE SIGNED AND SEALED IN ACCORDANCE WITH THE LAWS RELATING TO ARCHITECTS AND PROFESSIONAL ENGINEERS (CHAPTER 327, RSMO.), AND SHALL INCLUDE A TITLE BLOCK OR SUMMARY SHEET WHICH LISTS AND CERTIFIES THAT THE PRODUCT MEETS ALL OF THE SPECIFIED DESIGN CRITERIA.

WILLOTT ROAD WITH DEL RAY DRIVE

INTERSECTION

LEGEND

T - TOP MOUNT
S - SIDE MOUNT
C - SPANWIRE MOUNT
B - MAST ARM MOUNT

D-37A

STATE OF MISSOURI
BRIAN D. SCHMIDT
NUMBER PE-2014007272
PROFESSIONAL ENGINEER
3/9/2015

TRAFFIC SIGNAL AND LIGHTING PLANS SHEET 3 OF 7

HORNER & SHIFRIN, INC.

CONDUIT

FROM	TO	CENTER TO CENTER DISTANCE	LOOP DET. 1"	TRENCH 2"	TRENCH 3"	TRENCH 4"	TRENCH	PUSHED 2"	PUSHED 3"	PUSHED 4"	MEDIAN 2"	MEDIAN 3"	MEDIAN 4"	ON STRUCTURE ¾"	ON STRUCTURE 3"	ON STRUCTURE	REMARKS
⌀	P.S.	84							88								
P.S.	⊠	10			18												
⊠	[4]	3			12												2 CONDUITS
[4]	(4)	15			18												
[4]	[1]	52							50								
[1]	(1)	5			8												
[4]	[3]	79							77								
[3]	(3)	9			12												
[3]	[2]	51							49								
[2]	(2)	7			10												
⊠	[5]	9		12													
[5]	[6]	960						958									
[6]	[7]	95						93									
[6]	⊠	37		40													
P.S.	[4]	9			12												
[8]	[1]	227		225													
[8]	CULV													100			CULVERT LIGHTING
SUBTOTALS				277	90			1051	264					100			
TOTALS				277	90			1051	264					100			

CABLE

FROM	TO	CENTER TO CENTER DISTANCE	POWER 1C #6	POWER	CONTROL 2c #18	CONTROL 5c #16	CONTROL 7c #16	CONTROL 3c #16	CLOSED LOOP INTERCONNECT 3 PAIR #16	LUMINAIRE - LED CONTROL 3c #14	LUMINAIRE - LED POLE & BRACKET 3c #14	SURFACE MOUNT FIXTURE - LED CONTROL 1c #10	GROUND 1c #6 GROUND	FIBER SINGLE-MODE	FIBER MULTI-MODE	REMARKS
⊠	▽65	58				88										
⊠	⊡65	58			87											
⊠	▽81	58					117									
⊠	▽82	58					91									
⊠	▽83	58				88										
⊠	⊡83	58			87											
⊠	▽21	131					207									
⊠	▽22	131					196									
⊠	▽23	131					170									
⊠	▽24	131				167										
⊠	⊡24	131			166											
⊠	▽84	131				167										
⊠	⊡84	131			166											
⊠	▽25	82				112										
⊠	⊡25	82			111											
⊠	▽41	82					141									
⊠	▽42	82					115									
⊠	▽61	13					88									
⊠	▽62	13					76									
⊠	▽63	13					64									
⊠	▽64	13				37										
⊠	⊡64	13			36											
⌀	P.S.	78	282													3 WIRES
P.S.	⊠	9	75													3 WIRES
☒	(1) LUM	58								78	45					TYPE CL - LED LUMINAIRE
☒	(1) SIGN	58								78	30					ILLUMINATED MAST ARM SIGN
☒	(2) LUM	131								157	45					TYPE CL - LED LUMINAIRE
☒	(2) SIGN	131								157	30					ILLUMINATED MAST ARM SIGN
☒	(3) LUM	82								102	45					TYPE CL - LED LUMINAIRE
☒	(3) SIGN	82								102	30					ILLUMINATED MAST ARM SIGN
☒	(4) LUM	13								27	45					TYPE CL - LED LUMINAIRE
☒	(4) SIGN	13								27	30					ILLUMINATED MAST ARM SIGN
⊠	⊠	1100												1240		FIBER TO JUNGERMANN RD
	@ JUNGERMANN															
(1)	[1]	5											11			
(2)	[2]	7											13			
(3)	[3]	9											15			
(4)	[4]	15											21			
⊠	[4]	3											14			
P.S.	CULVERT LIGHTING											1242				3 WIRES
SUBTOTALS			357		653	659	1265			728	300	1242	74	1240		
TOTALS			360		660	660	1270			730	300	1250	80	1240		
										1030						

INTERSECTION WILLOTT ROAD WITH DEL RAY DRIVE

D-37B

STATE OF MISSOURI
BRIAN D. SCHMIDT
NUMBER PE-2014007272
PROFESSIONAL ENGINEER
3/9/2015

TRAFFIC SIGNAL AND LIGHTING PLANS SHEET 4 OF 7

HORNER & SHIFRIN, INC.

WILLOTT ROAD BRIDGE	SHEET 24
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

POWER SUPPLY

LOCATION			POWER SUPPLY ASSEMBLY		CIRCUIT BREAKER TRIP RATING*				LIGHTING CONTROL * (ON POWER SUPPLY)		SERVICE POLE		CONCRETE BASE TYPE
					CONTROLLER		POWER SUPPLY DISCONNECT						
APPROACH	STATION	OFFSET	DRAWING 902.15	DRAWING	AUXILIARY BREAKER	CONT & SIGNAL LAMPS	MAIN BREAKER		120 VOLT CONTROL CABINET	MAIN BREAKER	CONTRACT FURNISH	UTILITY COMPANY	
							SIGNALS	LIGHTING					
WILLOTT ROAD	113+08.00	36.5' RT	Type	·	15 Amps	15 Amps	15 Amps	15 Amps		15 Amps	Ci. Ft.	U.I.P.	170 CABINET TYPE 332
			Type	·	15 Amps	Amps	Amps	Amps		Amps	Ci. Ft.		

CONTROLLER ASSEMBLY AND AUXILIARY EQUIPMENT

LOCATION			SYSTEM MASTER (CLOSED LOOP)		ACTUATED		ON-OFF* SWITCH		COORDINATION INTERFACE *						TIME * CLOCK	NEMA CABINET TYPE *			170 CABINET TYPE *		170 SOFTWARE *	
							TYPE		12C/7C HARDWIRE (1)		TIME BASE	CLOSED LOOP		FIBER								
APPROACH	STATION	OFFSET	NEMA	170	NEMA	170	I	II	MASTER	LOCAL		NEMA	170			E	EV	DOUBLE	332	336S	BITRAN	WAPITI
WILLOTT ROAD	113+00.00	38.6' RT			X									X			X					

DETECTOR SCHEDULE

DETECTOR NUMBER	APPROACH	TYPE				
		PUSH BUTTON	INDUCTION LOOP (2)			VIDEO
			STANDARD	DELAY/ EXTEND *	CALL UNIT *	
21, 22	W.B. WILLOTT ROAD					1
⊡ PUSH BUTTON 24	W.B. WILLOTT ROAD	1				
⊡ PUSH BUTTON 25	W.B. WILLOTT ROAD	1				
41	N.B. PARK ENTRANCE					1
61, 62	E.B. WILLOTT ROAD					1
⊡ PUSH BUTTON 64	E.B. WILLOTT ROAD	1				
⊡ PUSH BUTTON 65	E.B. WILLOTT ROAD	1				
81	S.B. DEL RAY DRIVE					1
⊡ PUSH BUTTON 83	S.B. DEL RAY DRIVE	1				
⊡ PUSH BUTTON 84	S.B. DEL RAY DRIVE	1				
	TOTAL	6				1

* ITEMS FOR WHICH SEPARATE PAYMENT WILL NOT BE MADE.

(1) MoDOT "D" PLUG SHALL BE WIRED INTO ALL NEMA CONTROLLERS WITH 7C HARDWIRE INTERCONNECT.

(2) PAYMENT IS MADE FOR THE NUMBER OF 2-CHANNEL DETECTOR CARDS AS SHOWN BELOW THE ASSIGNMENT CHART.

(3) VIDEO DETECTION SHSYTEM SHALL BE AUTOSCOPE TO BE CONSISTENT WITH OTHER CITY OWNED/MAINTAINED TRAFFIC SIGNAL SYSTEMS.

VIDEO DETECTION ASSIGNMENT

	CAMERA NUMBER							
	1	1	2	2	3	3	4	4
DETECTION ZONE	81			21	41			61 62
VEHICLE PHASE ASSOCIATION	8			2	4			6

NEMA LOAD SWITCH ASSIGNMENTS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
E.B. LT	W.B.	X	N.B.	W.B. LT	E.B.	X	S.B.	PED 2	X	PED 6	PED 8	X	X	X	X

WILLOTT ROAD WITH DEL RAY DRIVE
INTERSECTION

D-37C

STATE OF MISSOURI
BRIAN D. SCHMIDT
NUMBER PE-2014007272
PROFESSIONAL ENGINEER

TRAFFIC SIGNAL AND LIGHTING PLANS
SHEET 5 OF 7

HORNER & SHIFRIN, INC.

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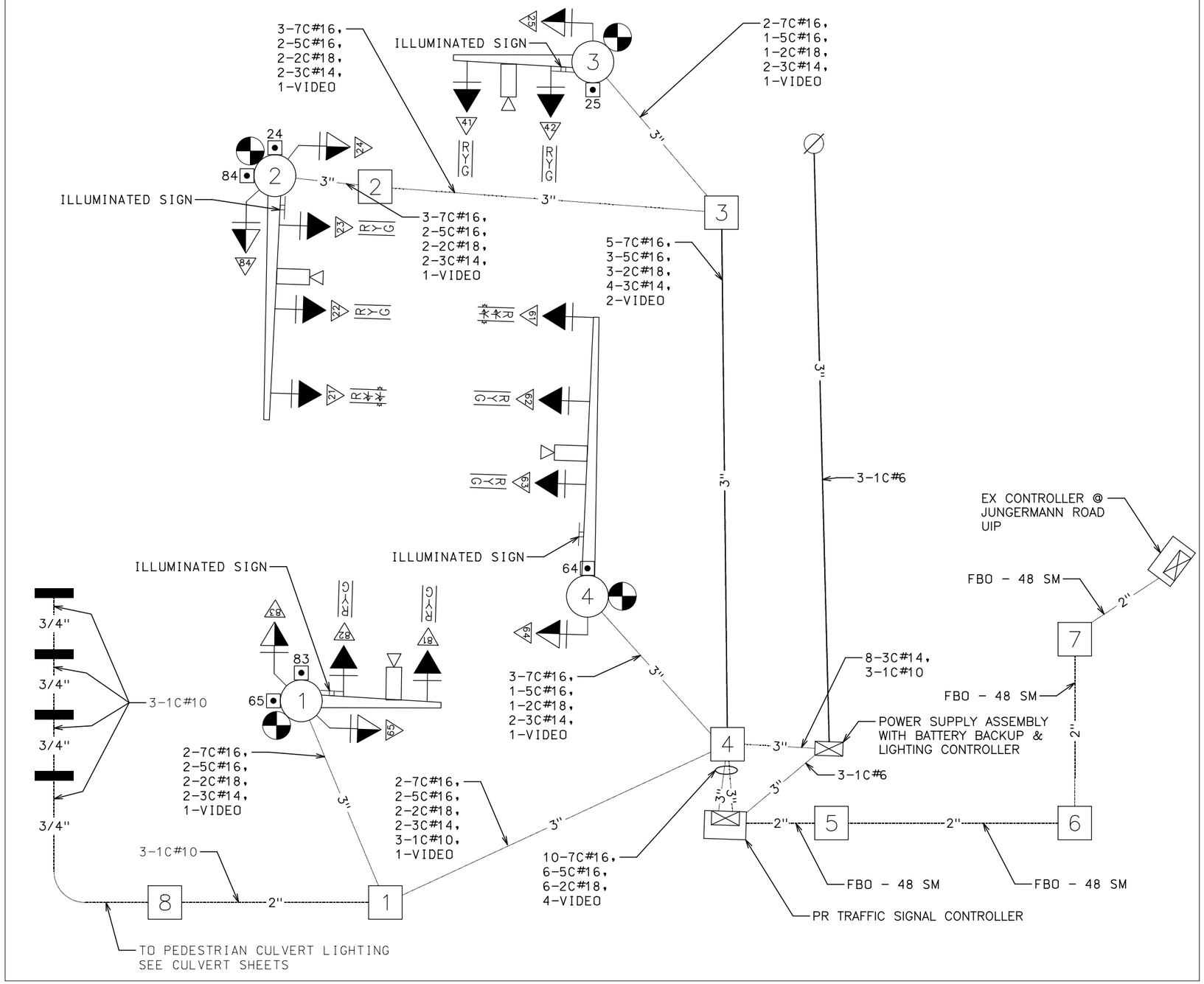
WILLOTT ROAD BRIDGE	SHEET 25
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

WIRING DIAGRAM



LEGEND

- 3" — CONDUIT CONTAINING CABLE WITH SIZE
- CABLE
- X-Xc — MULTI-CONDUCTOR CABLE #12 AWG (UNLESS OTHERWISE INDICATED)
- LIC — #14 AWG DETECTOR LEAD-IN CABLE (2C TWISTED SHIELDED)
- PULL BOX WITH NUMBER
- POST WITH NUMBER
- POST WITH MAST ARM
- POST WITH MAST ARM AND LUMINAIRE
- DETECTOR WITH NUMBER
- SIGNAL HEAD WITH NUMBER
- SIGNAL CONTROLLER
- POWER SUPPLY
- LIGHTING CONTROLLER
- MOTION ACTIVATED SURFACE MOUNTED LED LIGHT FIXTURE

WILLOTT ROAD WITH DEL RAY DRIVE

INTERSECTION

D-37D

STATE OF MISSOURI
BRIAN D. SCHMIDT
NUMBER PE-2014007272
PROFESSIONAL ENGINEER
3/9/15

TRAFFIC SIGNAL AND LIGHTING PLANS
SHEET 6 OF 7

HORNER & SHIFRIN, INC.

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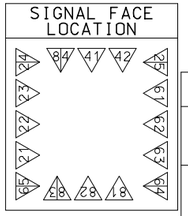
WILLOTT ROAD BRIDGE	SHEET 26
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

SIGNAL FACE LOCATION



TRAFFIC PHASING AND COLOR SEQUENCE – ACTUATED CONTROLLERS

	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 6	PHASE 7	PHASE 8	PED ⇳ 2 OVERLAP	PED ⇳ 4 OVERLAP	PED ⇳ 6 OVERLAP	PED ⇳ 8 OVERLAP					
	NOT USED		NOT USED		NOT USED		NOT USED			NOT USED			NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
FACE NUMBERS		21 22 23		41 42		61 62 63		81 82	24 25		64 65	83 84					FACE NUMBERS
SIGNAL INDICATIONS R		R R		R		R R		R	DW		DW	DW				R	SIGNAL INDICATIONS
SIGNAL INDICATIONS Y		YL Y		Y		YL Y		Y	FDW		FDW	FDW				Y	
SIGNAL INDICATIONS FYA		FYL				FYL										FYA	
SIGNAL INDICATIONS G		G		G		G		G	W		W	W				G	
DETECTOR ASSIGNMENTS																	DETECTOR ASSIGNMENTS
DETECTOR ASSIGNMENTS (PEDS. ONLY)									24 25		64 65	83 84					
OVERLAP PARENT PHASES																	

PHASE 1	PHASE 2	PHASE 3	PHASE 4
NOT USED		NOT USED	
NOT USED		NOT USED	
PHASE 5	PHASE 6	PHASE 7	PHASE 8

RING 1

RING 2

BARRIER

RING STRUCTURE

IF CALLED, ALL NON-CONFLICTING PHASES SHALL COMBINE AND TIME CONCURRENTLY. TIME TO BE DETERMINED BY THE ENGINEER AT SIGNAL TURN ON AND SET IN THE CONTROLLER BY THE CONTRACTOR.

LEGEND

- ACTUATED VEHICULAR MOVEMENT
- PARTIALLY RESTRICTED ACTUATED VEHICULAR MOVEMENT
- NON-ACTUATED VEHICULAR MOVEMENT
- PARTIALLY RESTRICTED NON-ACTUATED VEHICULAR MOVEMENT
- ACTUATED PEDESTRIAN MOVEMENT
- NON-ACTUATED PEDESTRIAN MOVEMENT
- VEHICLE STOPPED
- FDW — FLASHING DON'T WALK
- R/W — RIGHT OF WAY INTERVAL
- DW — DON'T WALK
- YR† — YELLOW RIGHT ARROW
- RT. — GREEN RIGHT ARROW
- W — WALK
- LY —YL — YELLOW LEFT ARROW
- L — GREEN LEFT ARROW
- S — GREEN STRAIGHT AHEAD ARROW
- G — CIRCULAR GREEN
- Y — CIRCULAR YELLOW
- R — CIRCULAR RED
- Ø — TRAFFIC PHASE
- AO — ALL OTHERS
- FR — FLASHING RED
- FY — FLASHING CIRCULARE YELLOW
- **FYA** — FLASHING YELLOW ARROW
- **FYL** — FLASHING YELLOW LEFT ARROW
- **FYR** — FLASHING YELLOW RIGHT ARROW

FLASHING OPERATION	
WILLIOT ROAD	FY
DEL RAY DRIVE	FR
CONTROLLER TYPE	8Φ NEMA

TRAFFIC SIGNAL CONTROL OPERATION
INTERSECTION OF
WILLOTT ROAD WITH DEL RAY DRIVE

STATE OF MISSOURI
BRIAN D. SCHMIDT
NUMBER PE-2014007272
PROFESSIONAL ENGINEER

TRAFFIC SIGNAL AND LIGHTING PLANS SHEET 7 OF 7

HORNER & SHIFRIN, INC.

D-38A

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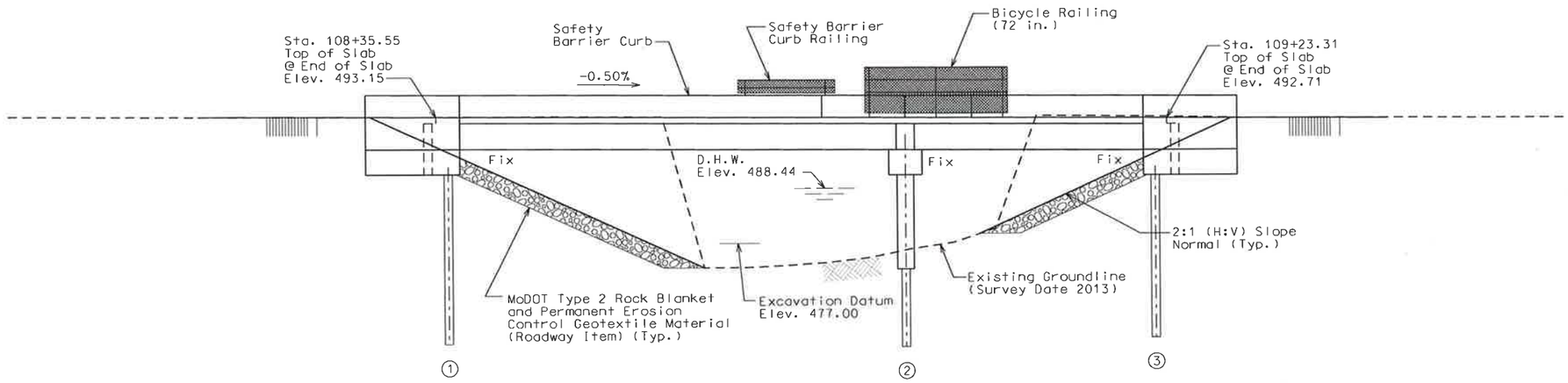
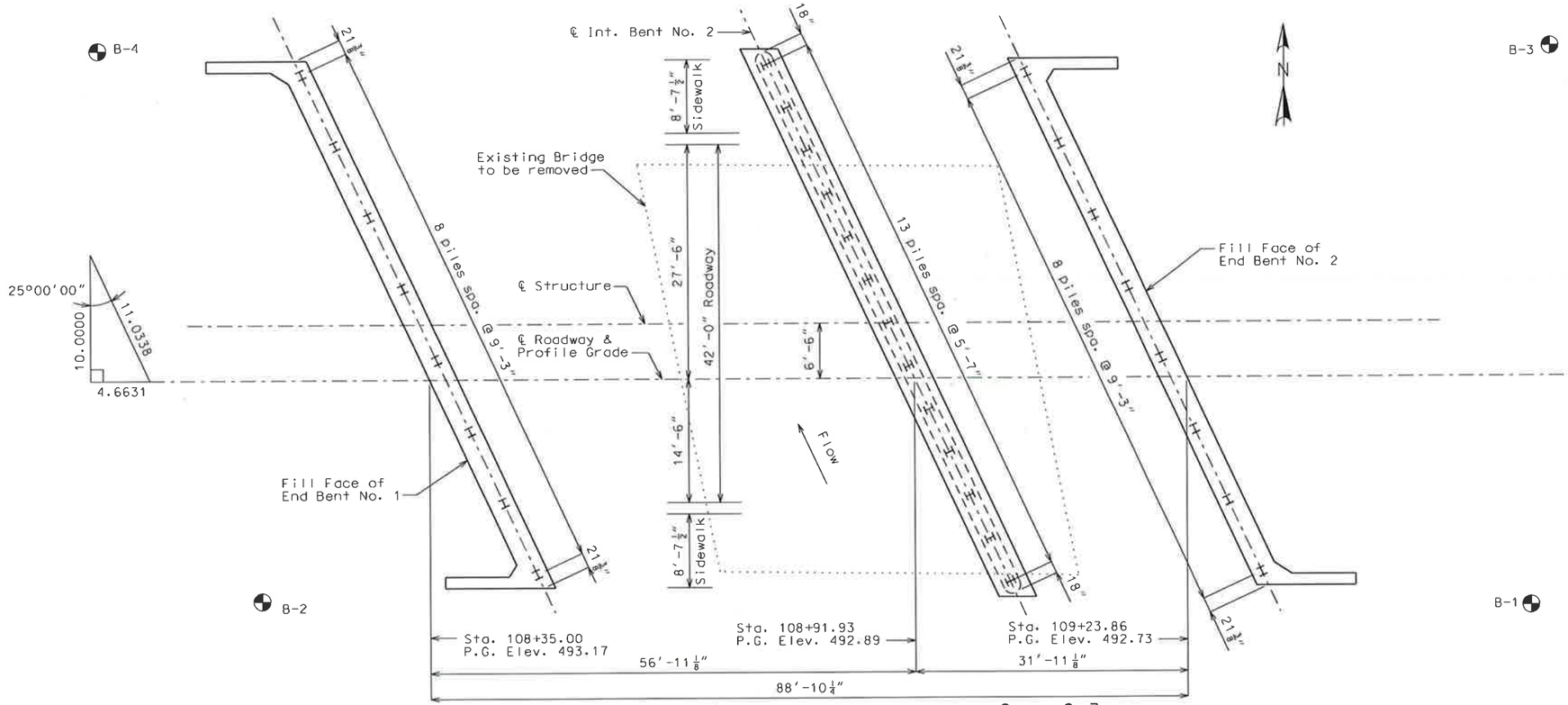
WILLOTT ROAD BRIDGE	SHEET 27
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

(56'-31') PRECAST CONCRETE BOX BEAM SPANS



GENERAL ELEVATION



PLAN

Designed: TPL
Detailed: CAB
Checked: TPL

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

● Indicates location of borings.

Notice and Disclaimer Regarding Boring Log Data

The locations of all subsurface borings for this structure are shown on the bridge plan sheet for this structure. The boring data for all locations indicated, as well as any other boring logs or other factual records of subsurface data and investigations performed by the city for the design of the project, are shown on Sheets No. 57 thru 60 or will be available from the Project Contact upon written request. No greater significance or weight should be given to the boring data depicted on the plan sheets than is given to the subsurface data available from the city or elsewhere.

The city 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 city, or on any other documentation not expressly warranted, which the contractor may obtain from the city.

STATE OF MISSOURI
TRAVIS P. LOHAR
NUMBER
PE-2009018771
PROFESSIONAL ENGINEER
3-9-15

GENERAL PLAN AND ELEVATION

HORNER & SHIFRIN, INC.

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WILLOTT ROAD BRIDGE	SHEET 28
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

Estimated Quantities

Item		Substr.	Superstr.	Total
Class 1 Excavation	cu. yard	120		120
Class 2 Excavation	cu. yard	27		27
Removal of Bridges	lump sum			1
Bridge Approach Slab (Bridge)	sq. yard		242	242
(72 in.) Bicycle Railing	linear foot		212	212
Safety Barrier Curb Railing	linear foot		235	235
Structural Steel Piles (12 in.)	linear foot	751		751
Pile Point Reinforcement	each	29		29
Class B Concrete (Substructure)	cu. yard	157.4		157.4
* Safety Barrier Curb	linear foot		237	237
Slab on Concrete Beam	sq. yard		604	604
27 in. Prestressed Concrete Spread Box Beam	linear foot		511	511
Reinforcing Steel (Bridges)	pound	12,090		12,090
Slab Drain	each	3		3
Vertical Drain at End Bents	each	2		2
Plain Neoprene Bearing Pad	each		12	12
Laminated Neoprene Bearing Pad	each		12	12

Notes:

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

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

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

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

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

Estimated Quantities for Slab on Concrete Beam

Item		Total
Class B-2 Concrete	cu. yard	185.6
Reinforcing Steel	pound	11,740
Reinforcing Steel (Epoxy Coated)	pound	39,110

Notes:

The table of Estimated Quantities for Slab on Concrete Beam represents the quantities used by the Owner 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.

The Estimated Quantities for Slab on Concrete Beam 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 Box Beam.

Foundation Data

Bent No.			1	2	3
Driven Pile	Type		Foundation	Foundation	Foundation
	Kind		HP12 X 53	HP12 X 53	HP12 X 53
	Number		8	13	8
	Approximate Length	foot	26	27	24
	Pile Driving Verification Method		DF	DF	DF
	Minimum Nominal Axial Pile Compressive Resistance	kip	400	520	290
	Hammer Energy Required	foot-pound	12,800	16,600	9,300

Manufactured pile point reinforcement shall be used on all piles.

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

DF = FHWA-modified Gates Dynamic Formula

Designed: TPL
Detailed: CAB
Checked: TPL

GENERAL NOTES:

Design Specifications:
2012 - AASHTO LRFD 6th Edition and 2013 Interims Load and Resistance Factor Design

Design Loading:
HL-93
35#/Sq. Ft. Future Wearing Surface
Equivalent Fluid Pressure 45#/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 (Superstructure, except Prestressed Box Beams 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
Steel Pile (ASTM A709 Grade 50)	fy = 50.000 psi

For prestressed concrete box beam stresses see Sheet No. 38 & 39.
For precast prestressed panel stresses see Sheet No. 41.

Neoprene Bearing Pads:
Bearings shall be 60 durometer neoprene pads.
Laminated Neoprene Bearing Pads shall be in accordance with Sec 716.

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

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

Miscellaneous:
The bridge shall be constructed in accordance with the latest edition of the MoDOT Standard Plans and Specifications except as noted.

"Sec" refers to the sections in the standard and supplemental specifications unless specified otherwise.

Structure to be closed during construction.

HYDROLOGIC DATA

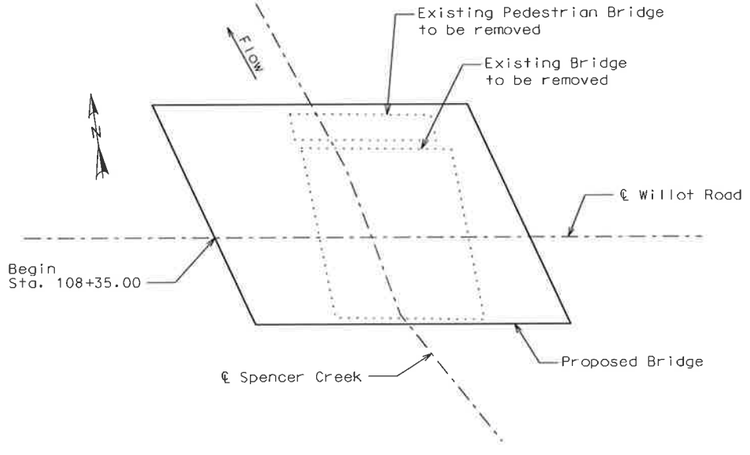
Drainage Area = 5.60 (sq. mi.)

Backwater/Base Flood Data (100 year)

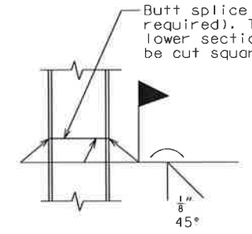
High Water Elev. = 488.44
Design Discharge = 4,374 (cfs)
Estimated Backwater = 0.0 (ft)
Freeboard = 1.2 (ft)
Average Velocity thru Opening = 8.8 (ft/sec)

Roadway Overtopping

Design Elev. (1' below shoulder) = 490.79
Design Frequency > 500 years



LOCATION SKETCH



STEEL PILE SPLICE

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

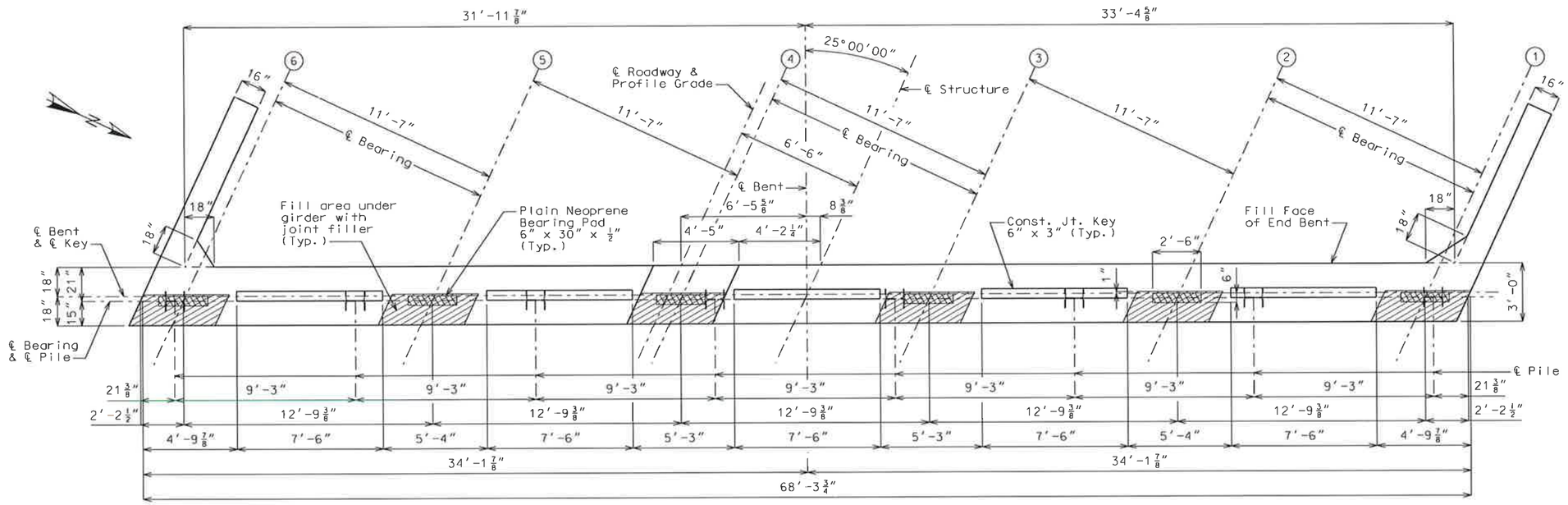
STATE OF MISSOURI THOMAS P. LEPPERT NUMBER PE-2001018771 PROFESSIONAL ENGINEER 3-9-15

QUANTITIES AND GENERAL NOTES

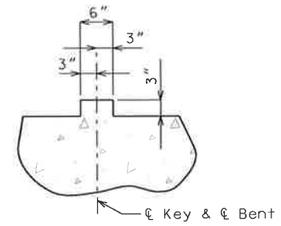
HORNER & SHIFRIN, INC.

...\28 GeneralNotes and Quantities.dgn 9:13:03 AM 12/9/2014

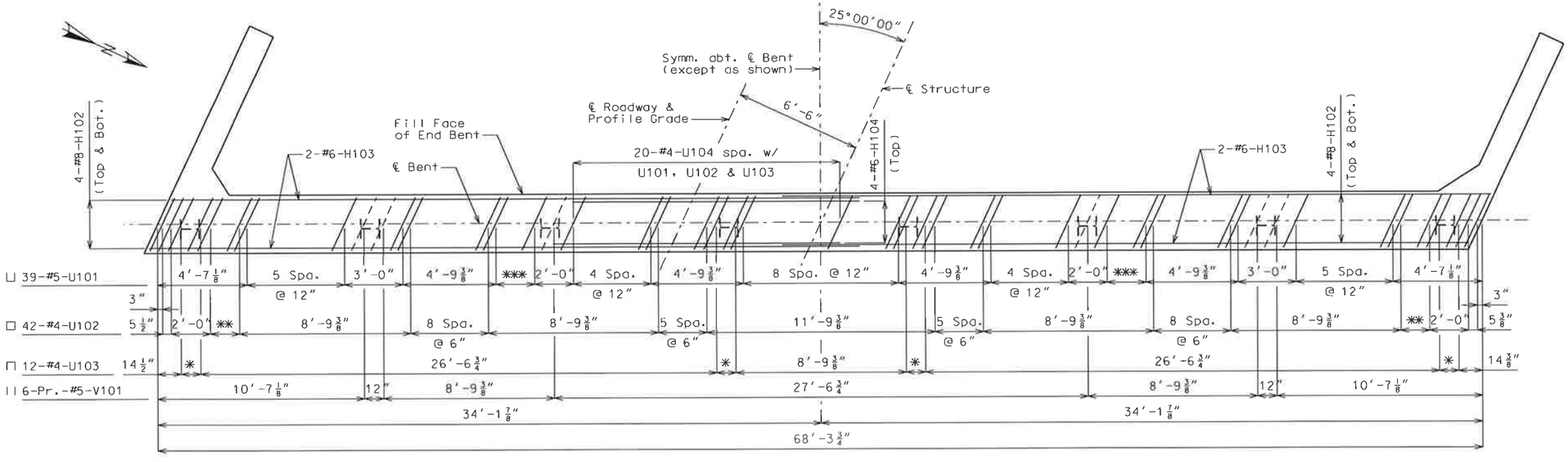
WILLOTT ROAD BRIDGE	SHEET 29
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



PLAN OF BEAM SHOWING DIMENSIONS



TYPICAL SECTION THRU KEY



* 2 Spa. @ 6"
** 3 Spa. @ 6"
*** 2 Spa. @ 12"

PLAN OF BEAM SHOWING REINFORCEMENT

Notes:

For reinforcement of safety barrier curb, see Sheets No. 46 thru 50.

For details of End Bent No. 1 not shown, see Sheets No. 30 & 31.

For details of approach slab, see Sheet No. 52.

For details of Vertical Drain at End Bents, see Sheet No. 32.

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

All U-bars and Pr. V-bars in end bent are to be placed parallel to ℄ Roadway.

Designed: TPL
Detailed: CAB
Checked: MAC

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

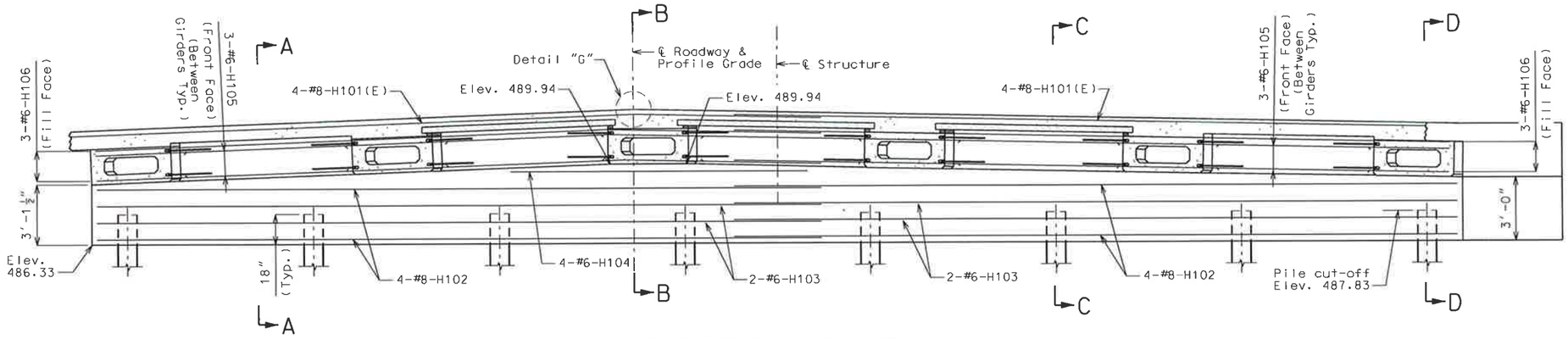
STATE OF MISSOURI THOMAS P. LOHMAR NUMBER PE-2001018771 PROFESSIONAL ENGINEER

END BENT NO. 1 DETAILS

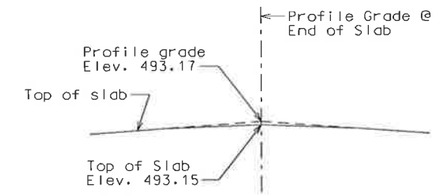
HORNER & SHIFRIN, INC.

S:\29 End Bent 1 Details.dgn 9:13:04 AM 12/9/2014

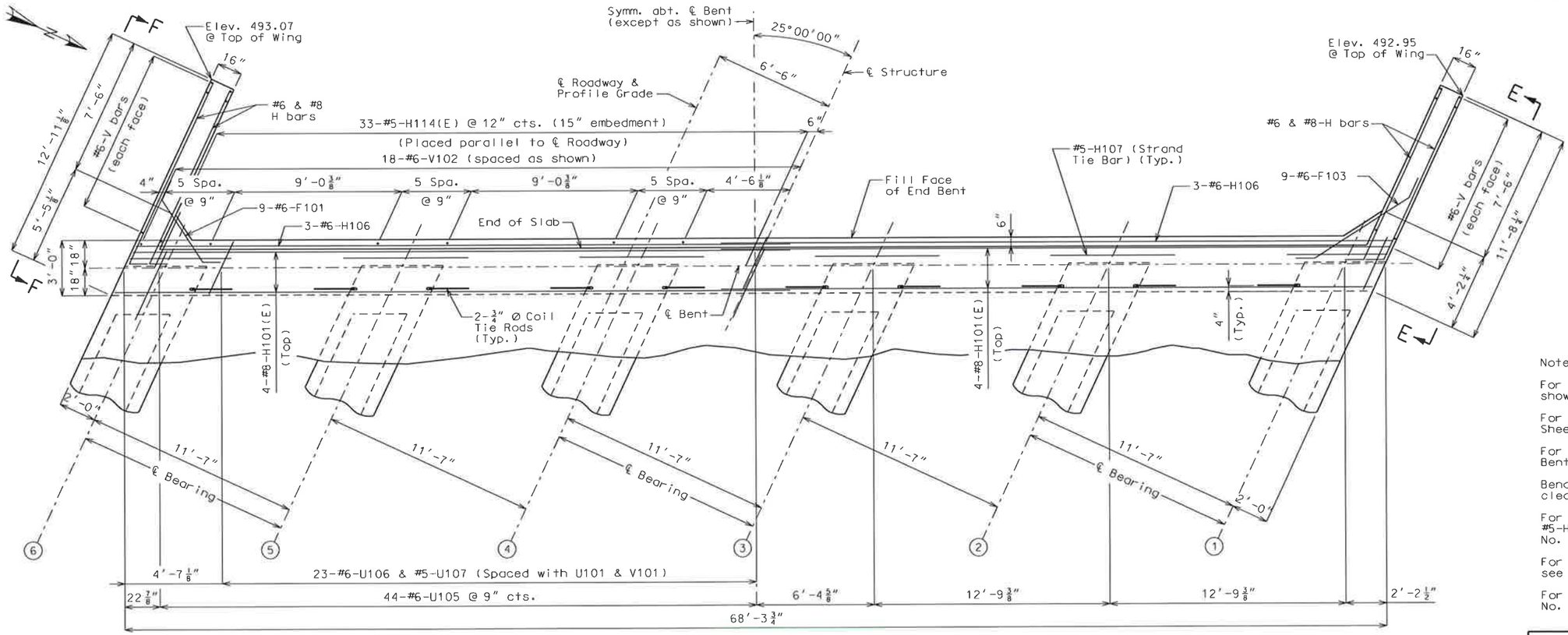
WILLOTT ROAD BRIDGE	SHEET 30
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



SECTION NEAR END BENT



DETAIL "G"



PLAN OF BEAM SHOWING DIMENSIONS

Notes:

For details of End Bent No. 1 not shown, see Sheets No. 29 & 31.

For details of approach slab, see Sheet No. 52.

For details of Vertical Drain at End Bents, see Sheet No. 32.

Bend F101 & F103 bars in field to clear girders.

For location of Coil Tie Rods and #5-H107 (Strand Tie Bar), see Sheet No. 38.

For Sections A-A, B-B, C-C & D-D, see Sheet No. 31.

For Elevations E-E & F-F, see Sheet No. 31.

Designed: TPL
Detailed: CAB
Checked: MAC

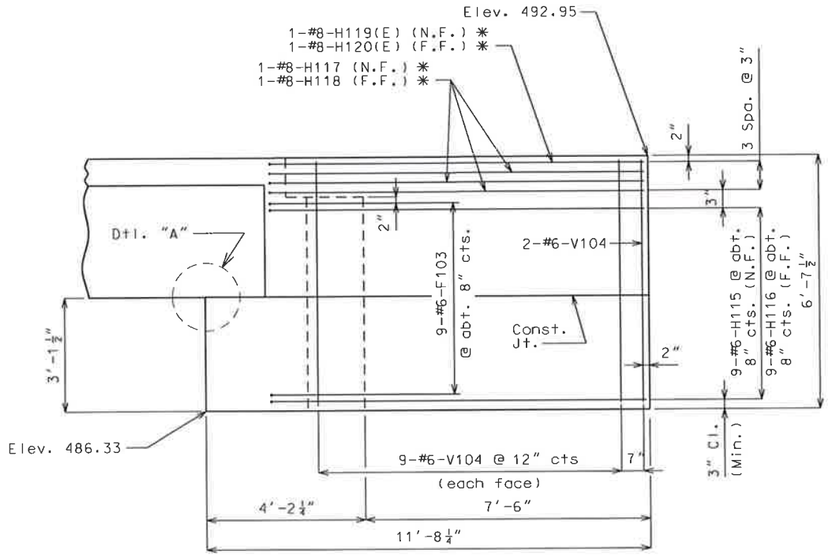
Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI THOMAS P. LOMAX NUMBER PE-2001018771 PROFESSIONAL ENGINEER 3-4-15

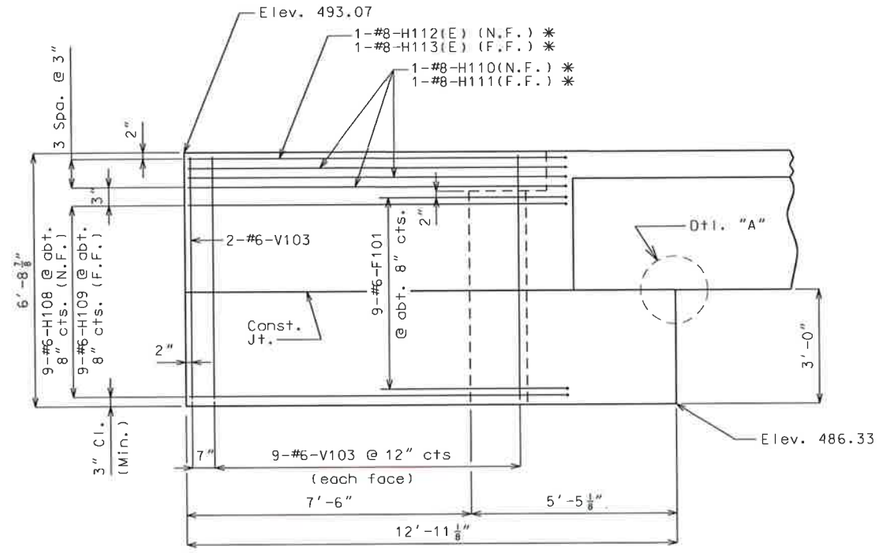
END BENT NO. 1 DETAILS

HORNER & SHIFRIN, INC.

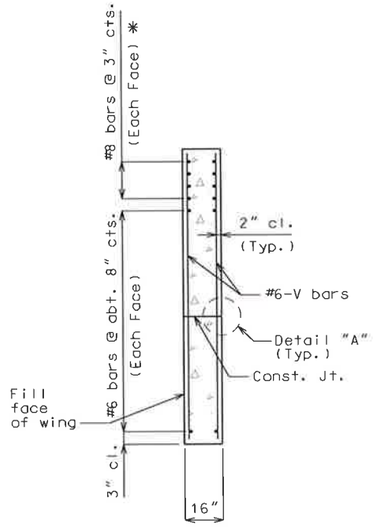
WILLOTT ROAD BRIDGE	SHEET 31
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



ELEVATION E-E

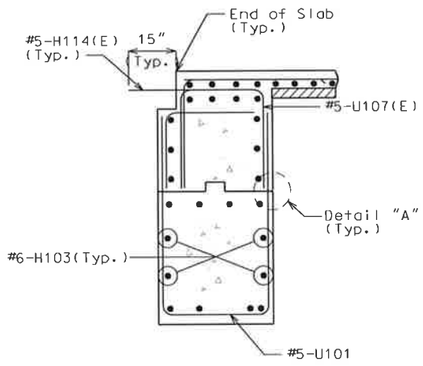


ELEVATION F-F

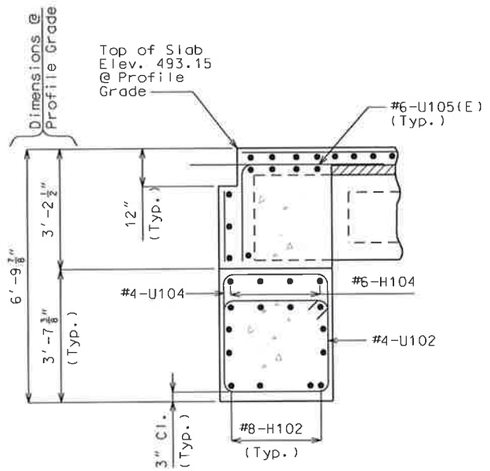


TYPICAL SECTION THRU WING

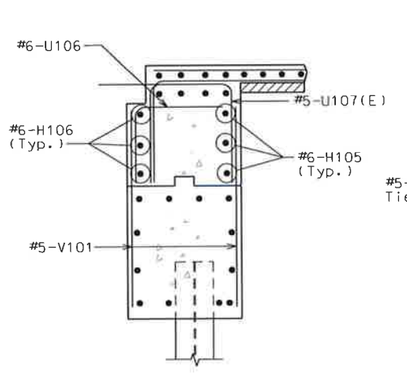
* Placed with grade



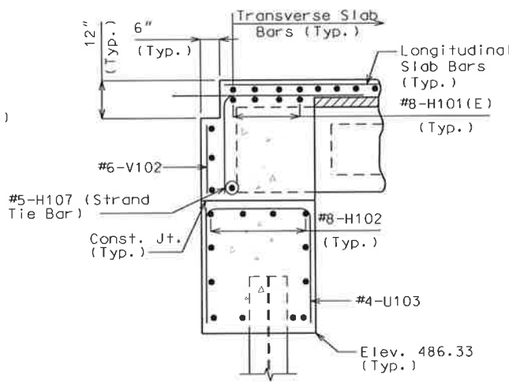
SECTION A-A



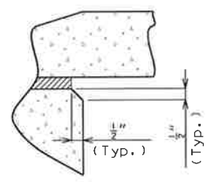
SECTION B-B



SECTION C-C



SECTION D-D



DETAIL "A"

Substructure Quantity Table for Bent No. 1		
Item		Quantity
Class 1 Excavation	cu. yard	60
Structural Steel Piles (12 in.)	linear foot	208
Pile Point Reinforcement	each	8
Class B Concrete (Substructure)	cu. yard	28.5

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

Notes:

For details of End Bent No. 1 not shown, see Sheets No. 29 and 30.

For location of Sections A-A, B-B, C-C, & D-D, see Sheet No. 30.

For location of Elevations E-E and F-F, see Sheet No. 30.

Designed: TPL
Detailed: CAB
Checked: MAC

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

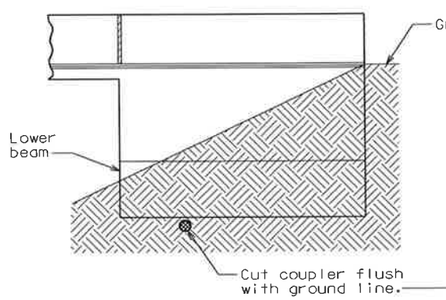
STATE OF MISSOURI THOMAS P. LOHMAR NUMBER PE-2009018771 PROFESSIONAL ENGINEER

END BENT NO. 1 DETAILS

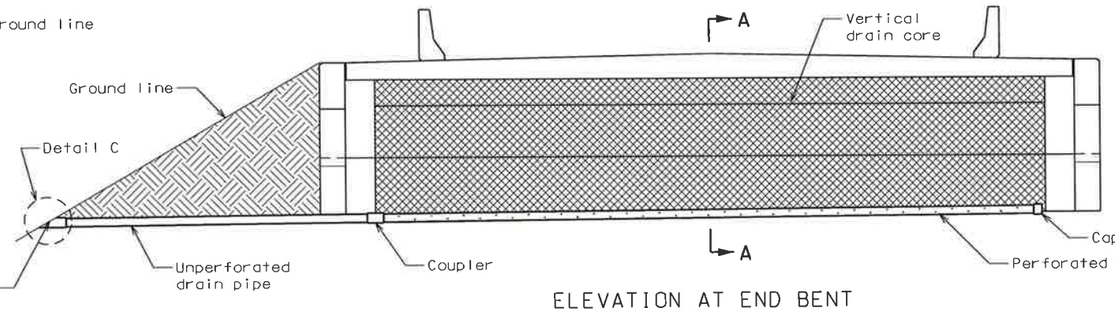
HORNER & SHIFRIN, INC.

...\S\31 End Bent 1 Details.dgn 9:15:05 AM 12/9/2014

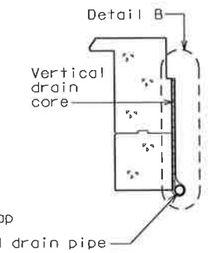
WILLOTT ROAD BRIDGE	SHEET 32
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



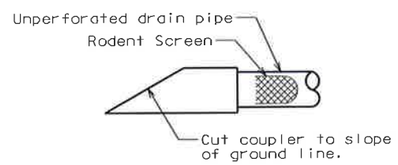
ELEVATION OF WING



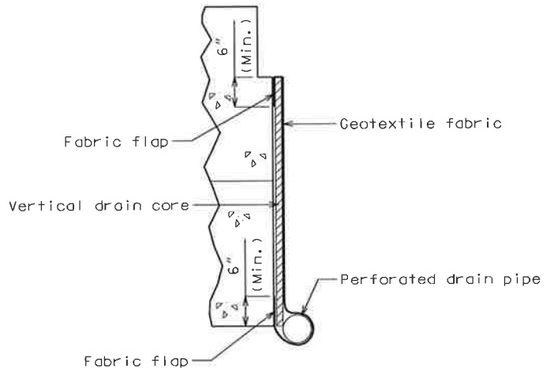
ELEVATION AT END BENT



SECTION A-A



DETAIL C



DETAIL B

Note:
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.

Designed: TPL
Detailed: CAB
Checked: CBW

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

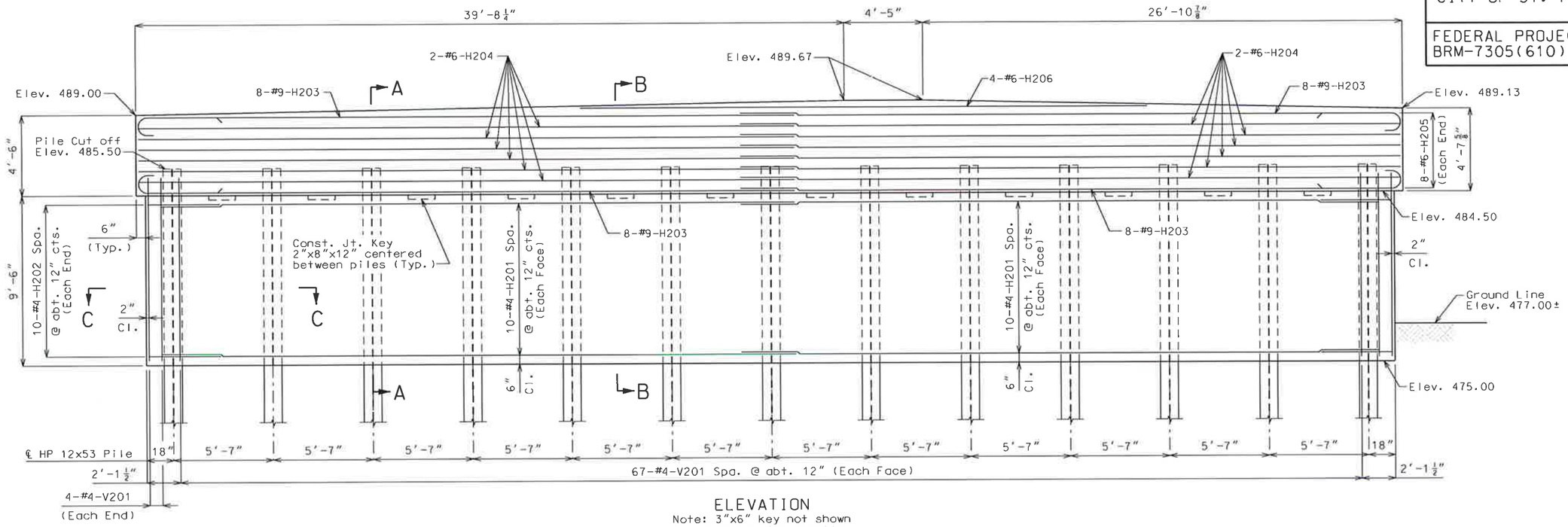
STATE OF MISSOURI THOMAS P. LOFANO NUMBER PE-2009018771 PROFESSIONAL ENGINEER

VERTICAL DRAIN DETAILS

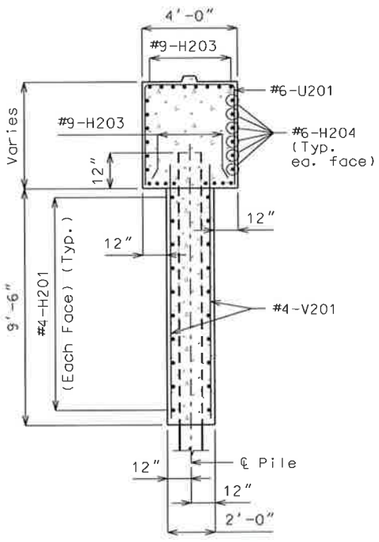
HORNER & SHIFRIN, INC.

...\Cad\S\32 VerticalDrain.dgn 9:13:06 AM 12/9/2014

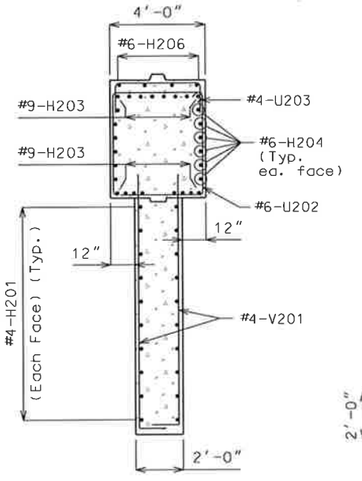
WILLOTT ROAD BRIDGE	SHEET 33
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



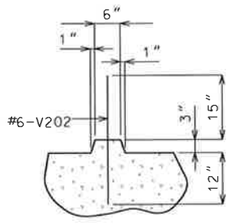
ELEVATION
Note: 3"x6" key not shown in elevation for clarity.



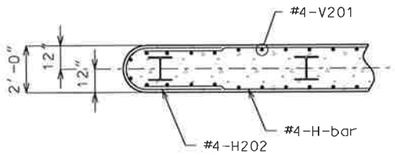
SECTION A-A



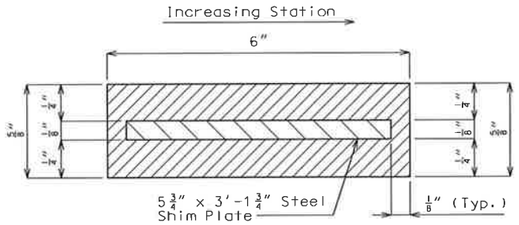
SECTION B-B



DETAIL OF KEY



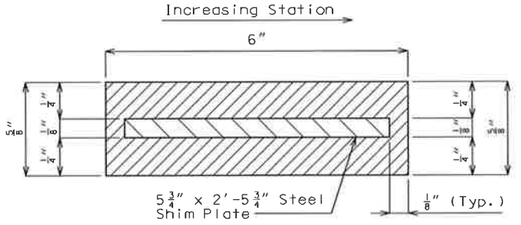
PART SECTION C-C



TYPICAL SECTION THRU 6" x 3'-2" LAMINATED NEOPRENE BEARING PAD

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

(6 required)



TYPICAL SECTION THRU 6" x 2'-6" LAMINATED NEOPRENE BEARING PAD

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

(6 required)

Substructure Quantity Table for Bent No. 2

Item		Quantity
Class 2 Excavation	cu. yard	27
Structural Steel Piles (12 in.)	linear foot	351
Pile Point Reinforcement	each	13
Class B Concrete (Substructure)	cu. yard	100.5
Reinforcing Steel (Bridges)	pound	12,090

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

Note:

Work this sheet with Sheet No. 34.

STATE OF MISSOURI THOMAS P. LOHR NUMBER PE-2009018771 PROFESSIONAL ENGINEER

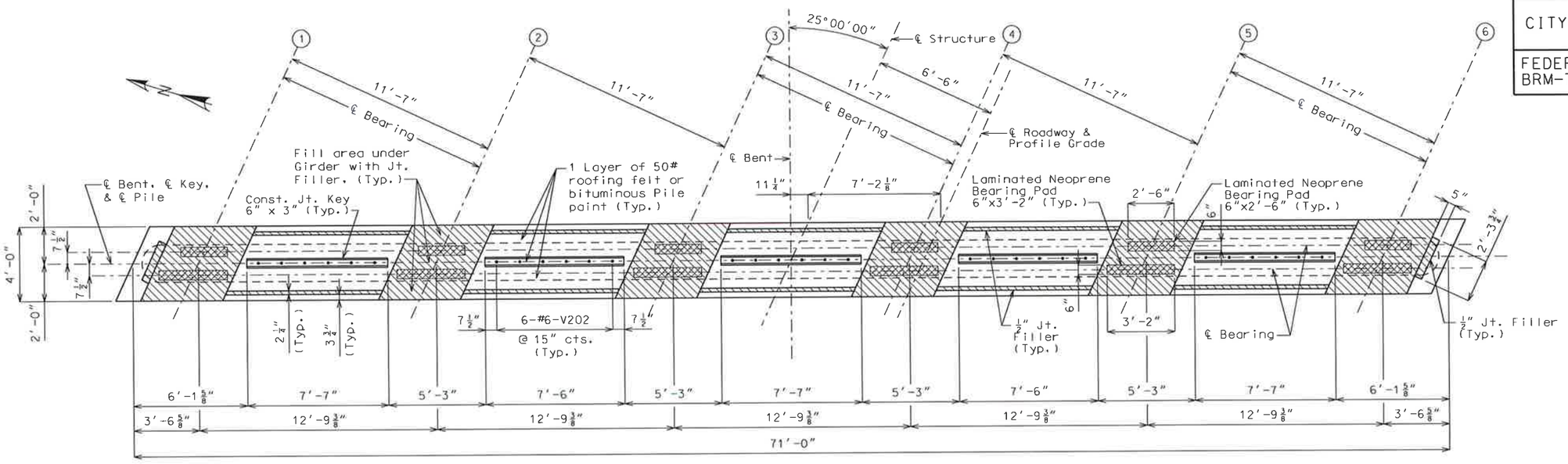
INT. BENT NO. 2 DETAILS

HORNER & SHIFRIN, INC.

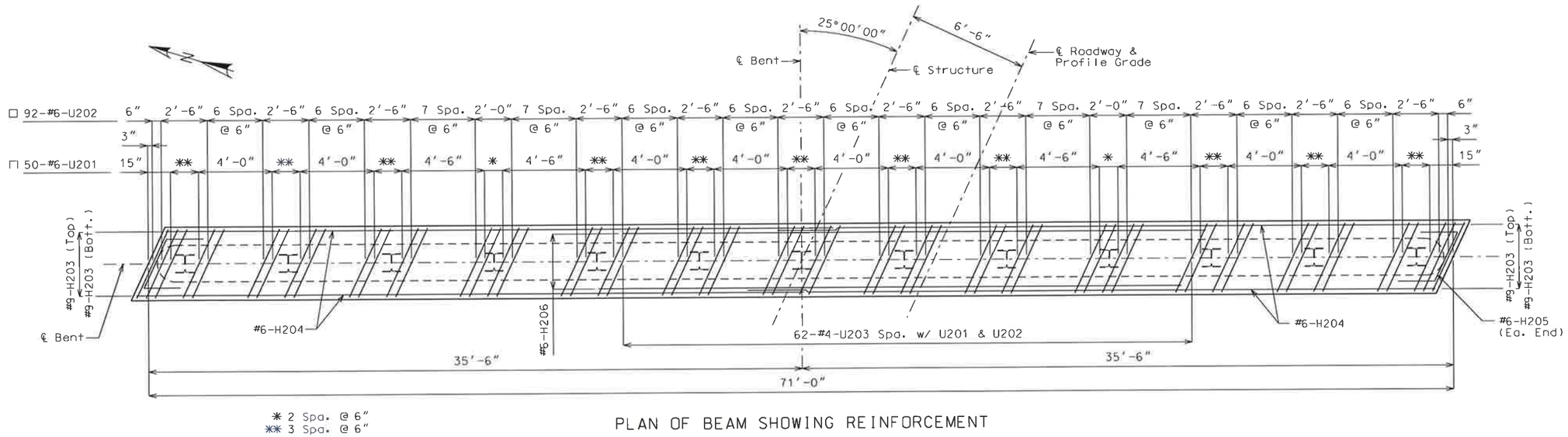
Designed: KAK
Detailed: CAB
Checked: TPL

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

WILLOTT ROAD BRIDGE	SHEET 34
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



PLAN OF BEAM
(Symmetrical except as shown.
Piles omitted for clarity.)



✱ 2 Spa. @ 6"
✱✱ 3 Spa. @ 6"

PLAN OF BEAM SHOWING REINFORCEMENT

Notes:
Reinforcement in wall omitted for clarity.
All U-bars shall be placed parallel to ℄ Roadway.

Note:
Work this sheet with Sheet No. 33.

Designed: KAK
Detailed: CAB
Checked: TPL

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

STATE OF MISSOURI
THOMAS P. LOHMAN
PE-2003018771
PROFESSIONAL ENGINEER
12-9-15

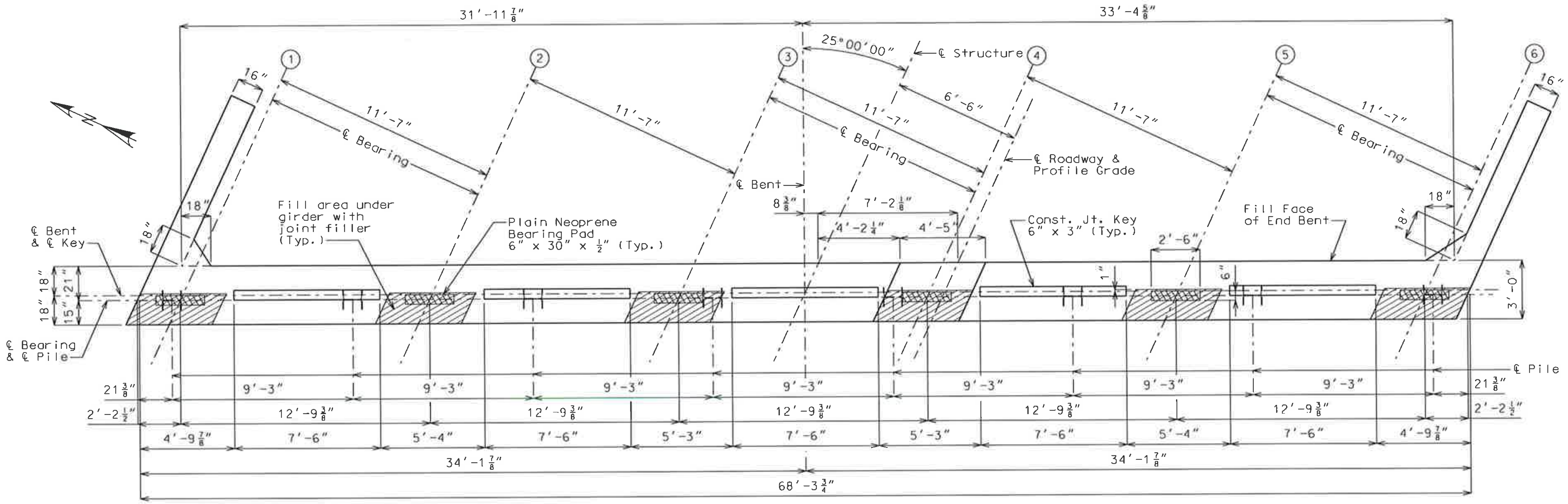
INT. BENT NO. 2 DETAILS

HORNER & SHIFRIN, INC.

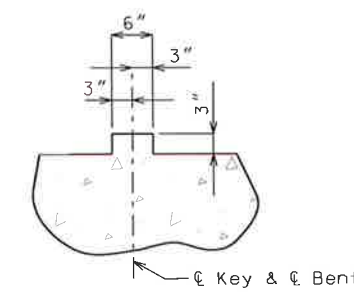
...\S534 Int Bent 2 Details.dgn 9:15:07 AM 12/9/2015

WILLOTT ROAD BRIDGE	SHEET 35
CITY OF ST. PETERS	OF 70

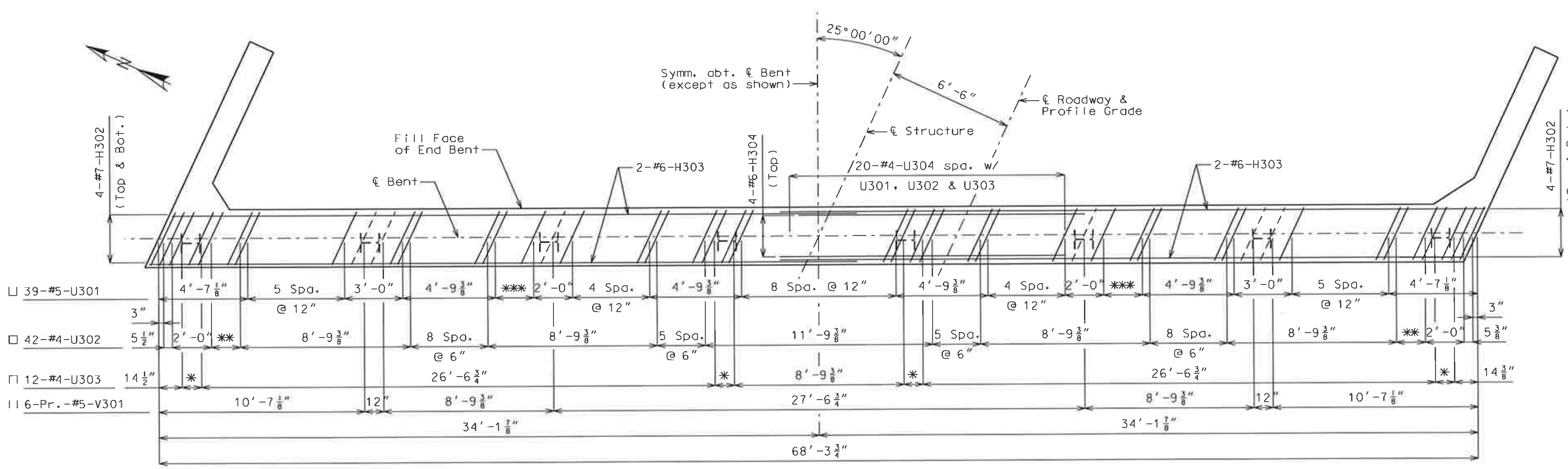
FEDERAL PROJECT NO.
BRM-7305(610)



PLAN OF BEAM SHOWING DIMENSIONS



TYPICAL SECTION THRU KEY



* 2 Spa. @ 6"
** 3 Spa. @ 6"
*** 2 Spa. @ 12"

PLAN OF BEAM SHOWING REINFORCEMENT

Notes:

For reinforcement of safety barrier curb, see Sheets No. 46 thru 50.

For details of End Bent No. 3 not shown, see Sheets No. 35 & 36.

For details of approach slab, see Sheet No. 52.

For details of Vertical Drain at End Bents, see Sheet No. 32.

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

All U-bars and Pr. V-bars in end bent are to be placed parallel to ℄ Roadway.

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

Designed: TPL
Detailed: CAB
Checked: TPL

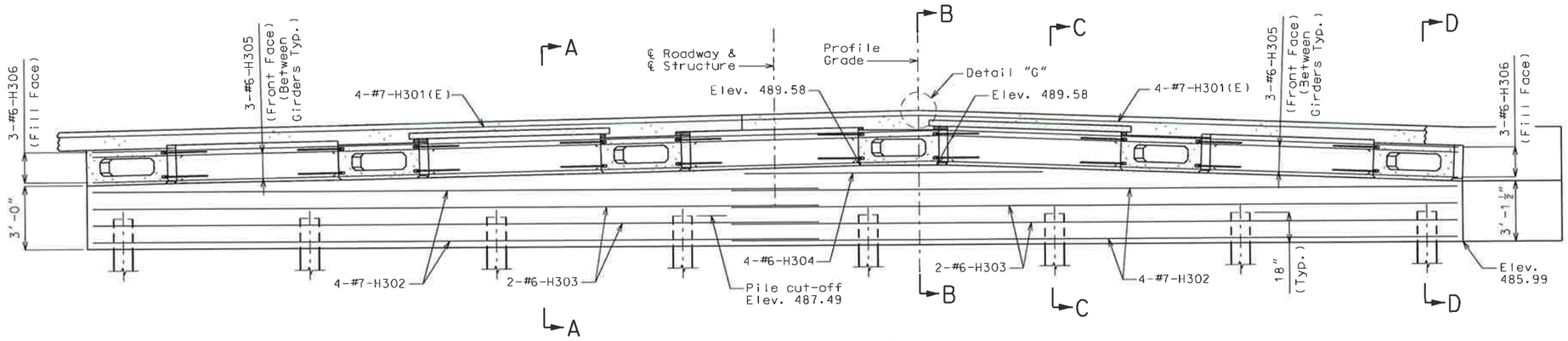
STATE OF MISSOURI — THOMAS P. LUDWIG — NUMBER PE-2001018771 — PROFESSIONAL ENGINEER — 3-9-15

END BENT NO. 3 DETAILS

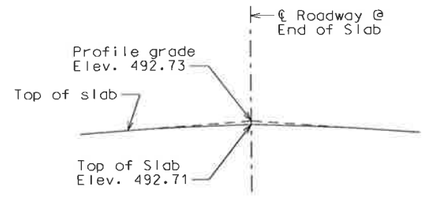
HORNER & SHIFRIN, INC.

...\S\35 End Bent 3 Details.dgn 9:13:08 AM 12/9/2014

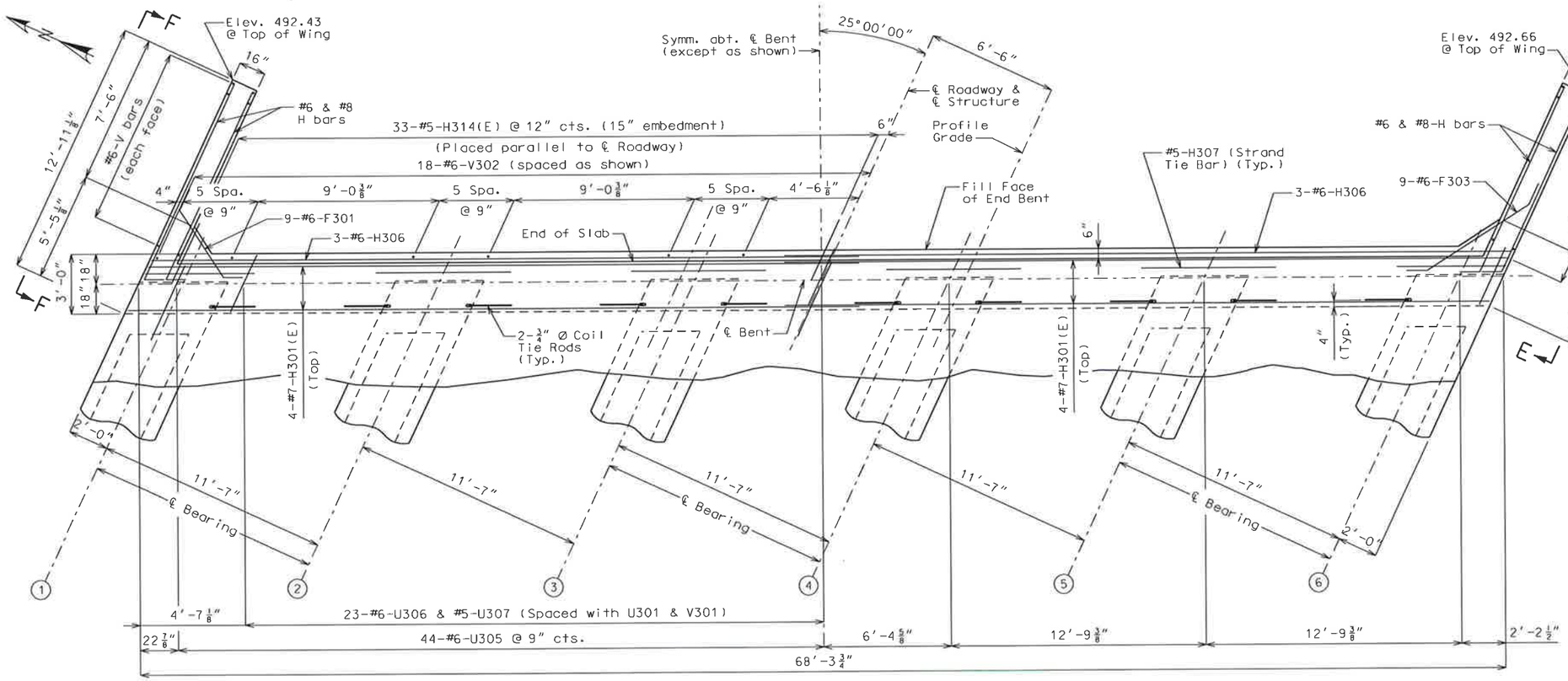
WILLOTT ROAD BRIDGE	SHEET 36
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



SECTION NEAR END BENT



DETAIL "G"



PLAN OF BEAM SHOWING DIMENSIONS

Notes:

For details of End Bent No. 3 not shown, see Sheets No. 35 & 37.

For details of approach slab, see Sheet No. 52.

For details of Vertical Drain at End Bents, see Sheet No. 32.

Bend F301 & F303 bars in field to clear girders.

For location of Coil Tie Rods and #5-H307 (Strand Tie Bar), see Sheet No. 39.

For Sections A-A, B-B, C-C & D-D, see Sheet No. 37.

For Elevations E-E & F-F, see Sheet No. 37.

STATE OF MISSOURI THOMAS P. CRAWFORD NUMBER PE-2001018771 PROFESSIONAL ENGINEER
3-9-15

END BENT NO. 3 DETAILS

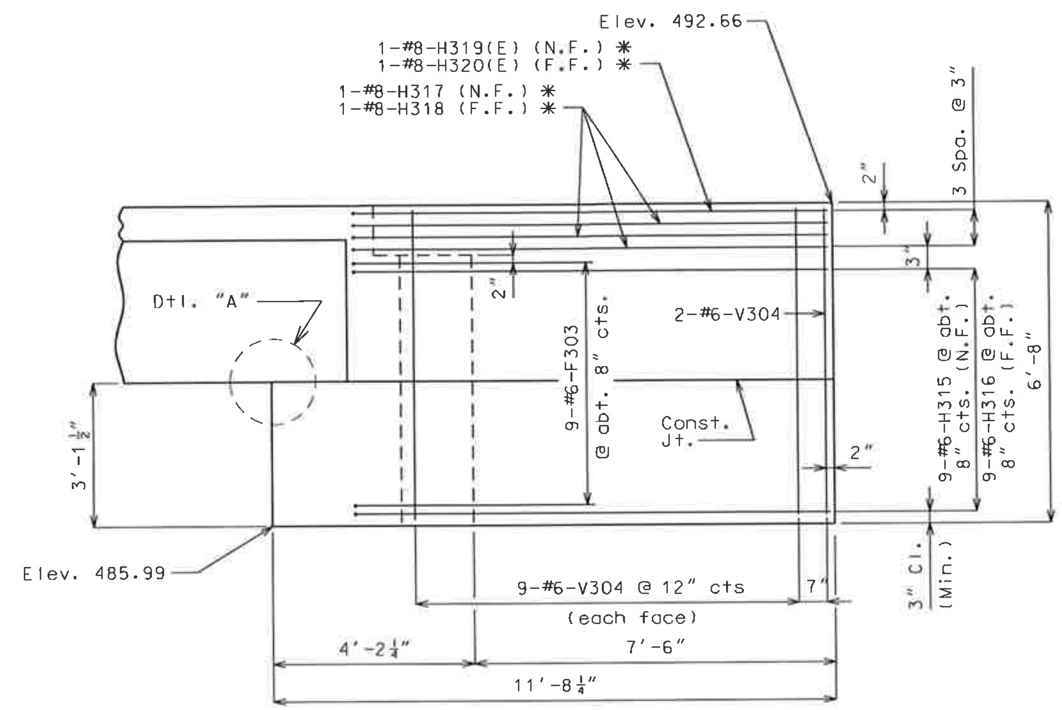
HORNER & SHIFRIN, INC.

Designed: TPL
Detailed: CAB
Checked: TPL

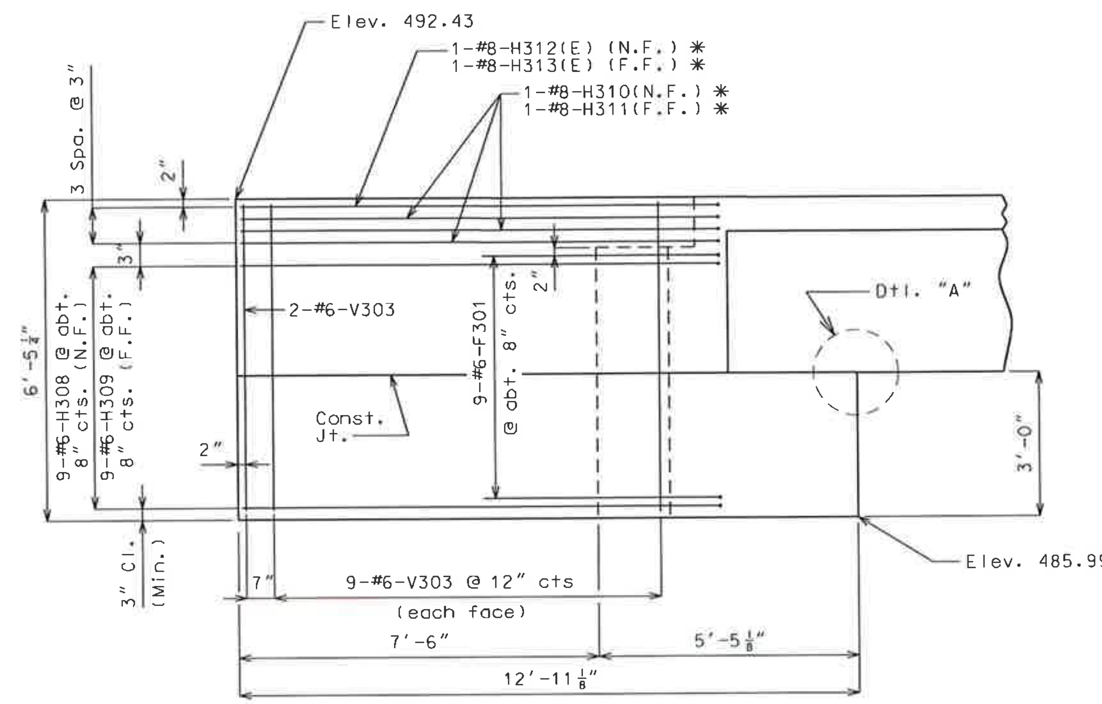
Note: This drawing is not to scale. Follow dimensions.

...\S\36 End Bent 3 Details.dgn 9:13:09 AM 12/9/2014

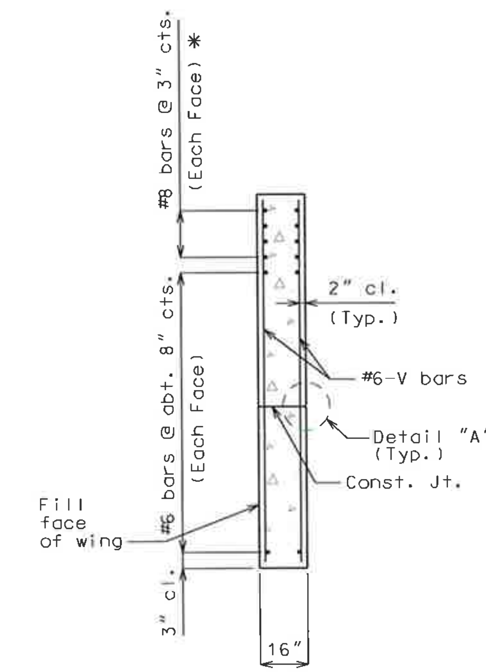
WILLOTT ROAD BRIDGE	SHEET	37
CITY OF ST. PETERS	OF	70
FEDERAL PROJECT NO. BRM-7305(610)		



ELEVATION E-E

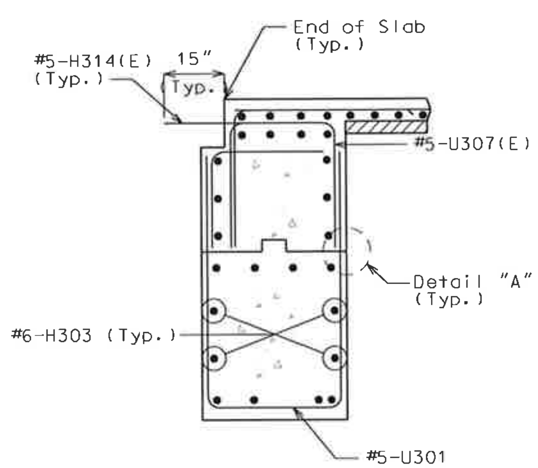


ELEVATION F-F

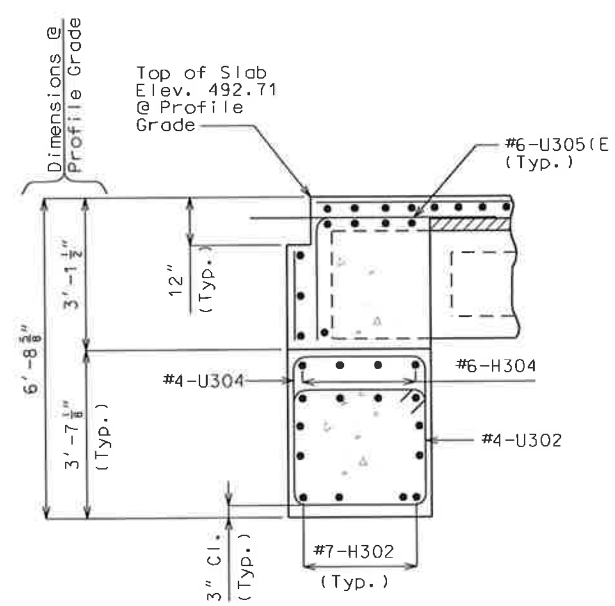


TYPICAL SECTION THRU WING

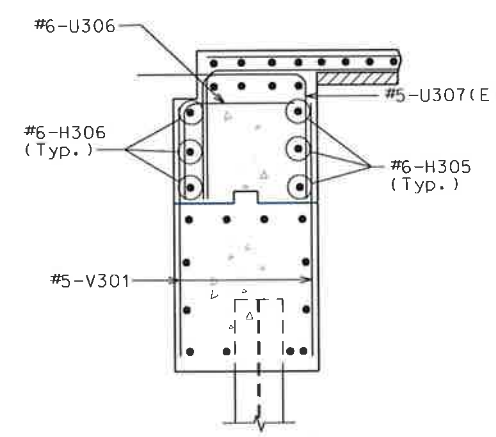
* Placed with grade



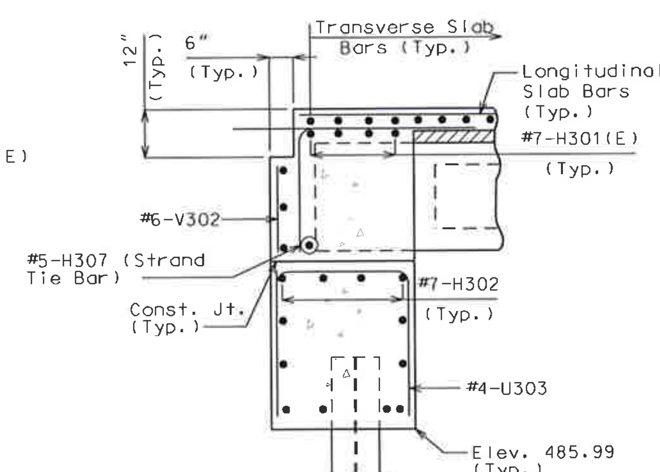
SECTION A-A



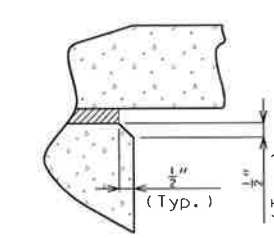
SECTION B-B



SECTION C-C



SECTION D-D



DETAIL "A"

Notes:

For details of End Bent No. 3 not shown, see Sheets No. 35 & 36.

For location of Sections A-A, B-B, C-C, & D-D, see Sheet No. 36.

For location of Elevations E-E and F-F, see Sheet No. 36.

Substructure Quantity Table for Bent No. 3

Item		Quantity
Class 1 Excavation	cu. yard	60
Structural Steel Piles (12 in.)	linear foot	192
Pile Point Reinforcement	each	8
Class B Concrete (Substructure)	cu. yard	28.4

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

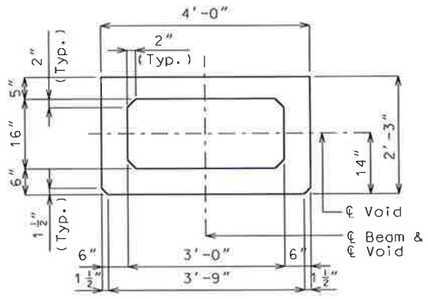
END BENT NO. 3 DETAILS

HORNER & SHIFRIN, INC.

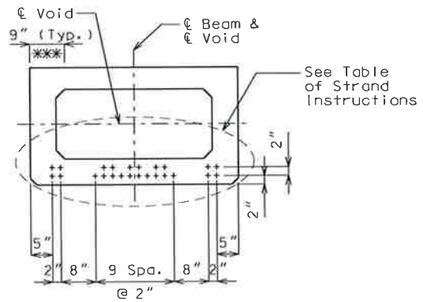
Designed: TPL
Detailed: CAB
Checked: TPL

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

WILLOTT ROAD BRIDGE	SHEET 38
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



DIMENSIONS

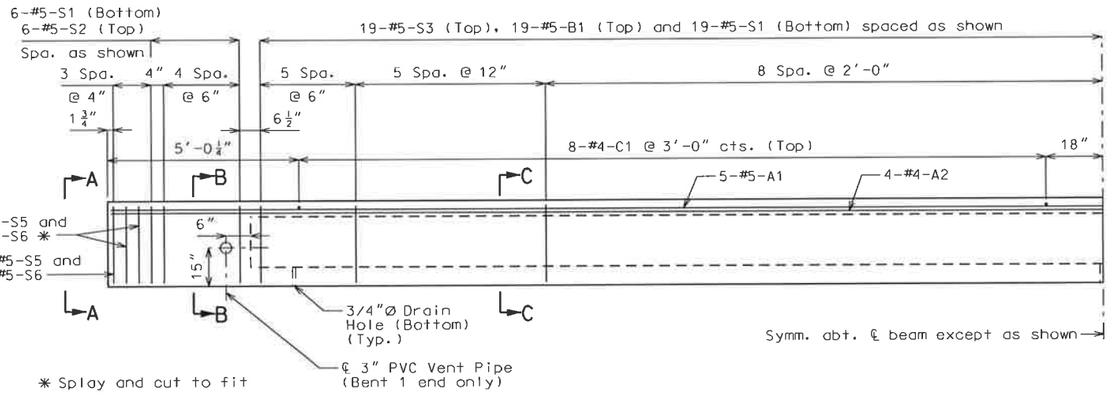


STRAND ARRANGEMENT

(+) Indicates prestressing strand.

Use 24 strands with an initial prestress force of 744 kips.

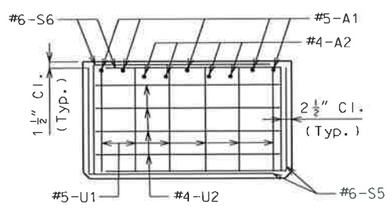
*** Beam top flange shall be steel troweled to a smooth finish for 9" at the edges, as shown. Apply two layers of 30-lb. roofing felt as a bond breaker to this region only excluding where joint filler is applied. The center portion shall be rough finished by scarifying the surface transversely with a wire brush, and no laitance shall remain on the surface.



✳ Splay and cut to fit

HALF ELEVATION OF BOX BEAM ALONG ℄ BEAM

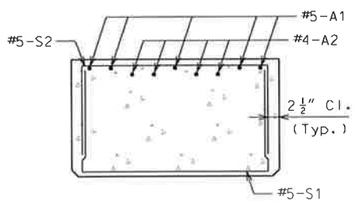
Exterior and interior box beams are the same, except for coil ties. See Sheet No. 40 for spacing of U1 and U2 bars.



ELEVATION A-A

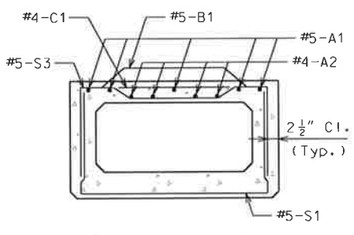
Note: U1 and U2 bars shall be equally spaced.

(Strands not shown for clarity)



SECTION B-B

(Strands not shown for clarity)



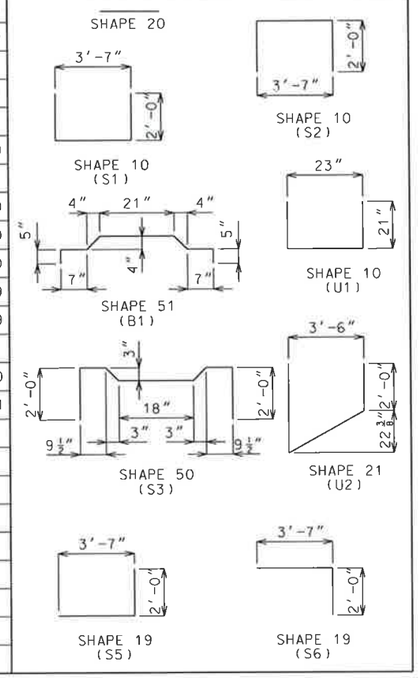
SECTION C-C

(Strands not shown for clarity)

BILL OF REINFORCING STEEL - EACH BEAM

NO.	SIZE & MARK	ACTUAL LENGTH	SHAPE
5	5 A1	54'-9½"	20
4	4 A2	54'-9½"	20
37	5 B1	4'-7"	51
16	4 C1	3'-7"	20
49	5 S1	7'-4"	10
12	5 S2	7'-4"	10
37	5 S3	7'-4"	50
8	6 S5	5'-5"	19
8	6 S6	5'-5"	19
12	5 U1	5'-3"	10
8	4 U2	9'-7"	21

BENDING DIAGRAM



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", unless otherwise shown.

All reinforcement shall be Grade 60.

All B1 bars shall be epoxy coated.

Table of Strand Instructions

⊕+ ⊕+⊕⊕⊕⊕+⊕ +⊕	
+	Denotes fully bonded strands
⊕	Cut and shop bend with 2'-0" projection. Cut any remaining bottom strands within 1" of end of beam. **

** 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.

General Notes

Concrete for prestressed beams shall be Class A-1 with f'c = 7,000 psi and f'ci = 5,000 psi.

Prestressing tendons shall be uncoated, seven-wire, low-relaxation strands, 0.5 inch diameter conforming to AASHTO M203, Grade 270. Pretensioned members shall be in accordance with Sec 1029.

For Beam Camber Diagram, see Sheet No. 42.

3/4"Ø drain holes shall be provided at each end of each void, and shall be kept open at all times.

Beams shall be kept upright at all times. Support shall be within 12 inches of the ends only.

Void filler shall be non-absorptive cellular polystyrene, according to ASTM C 578, designed to withstand the forces imposed upon them during fabrication without substantial deformation such as bulging, sagging, or collapsing. Cardboard void filler will not be allowed. The outside dimensions of void filler shall be as shown on the plans. When two or more sections of void filler are used to make up a required length, they shall be effectively taped or spliced together.

Beams shall be finished similarly in accordance with Sec 1029, except as noted.

Designed: TPL
Detailed: CAB
Checked: TPL

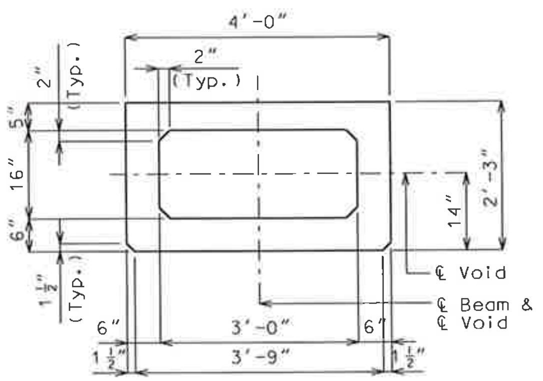
Note: Work this sheet with Sheet No. 40.

STATE OF MISSOURI THOMAS P. LOWRY NUMBER PE-2009018771 PROFESSIONAL ENGINEER 3.9.15

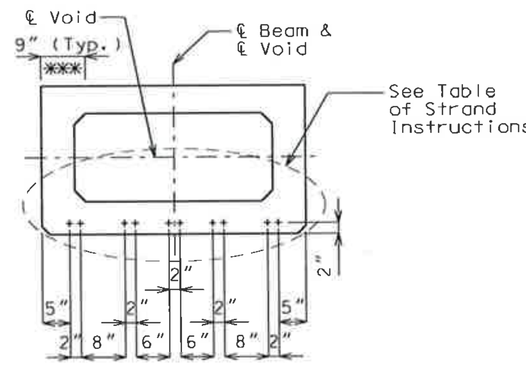
SPREAD BOX BEAM DETAILS SPAN (1-2)

HORNER & SHIFRIN, INC.

WILLOTT ROAD BRIDGE	SHEET 39
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



DIMENSIONS

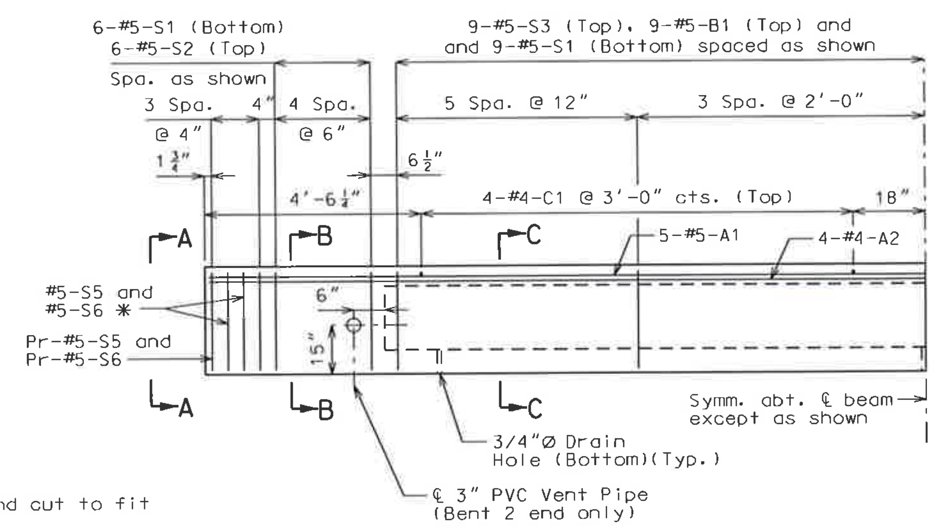


STRAND ARRANGEMENT

(+) Indicates prestressing strand.

Use 10 strands with an initial prestress force of 310 kips.

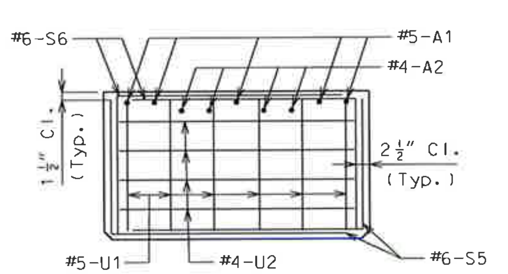
*** Beam top flange shall be steel troweled to a smooth finish for 9" at the edges, as shown. Apply two layers of 30-lb. roofing felt as a bond breaker to this region only excluding where joint filler is applied. The center portion shall be rough finished by scarifying the surface transversely with a wire brush, and no laitance shall remain on the surface.



* Splay and cut to fit

HALF ELEVATION OF BOX BEAM ALONG ℄ BEAM

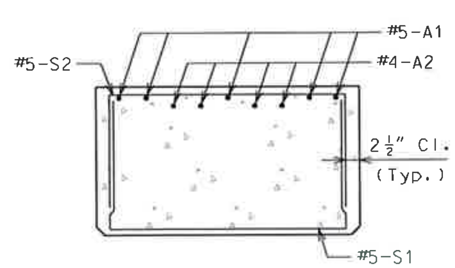
Exterior and interior box beams are the same, except for coil ties and coil inserts for slab drains. See Sheet No. 40 for spacing of U1 and U2 bars.



ELEVATION A-A

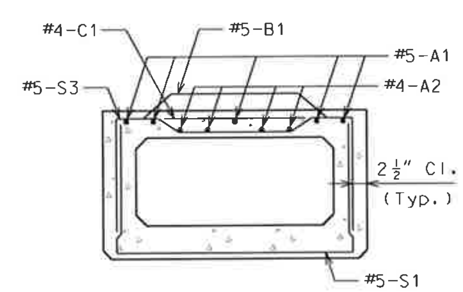
Note: U1 and U2 bars shall be equally spaced.

(Strands not shown for clarity)



SECTION B-B

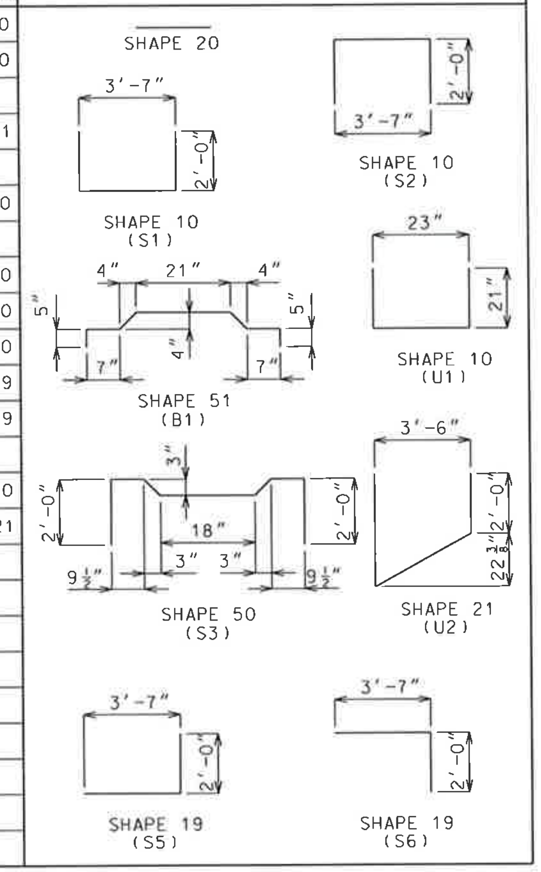
(Strands not shown for clarity)



SECTION C-C

(Strands not shown for clarity)

BILL OF REINFORCING STEEL - EACH BEAM

NO.	SIZE & MARK	ACTUAL LENGTH	SHAPE	BENDING DIAGRAM
5	5 A1	29'-9½"	20	
4	4 A2	29'-9½"	20	
17	5 B1	4'-7"	51	
8	4 C1	3'-7"	20	
29	5 S1	7'-4"	10	
12	5 S2	7'-4"	10	
17	5 S3	7'-4"	50	
8	6 S5	5'-5"	19	
8	6 S6	5'-5"	19	
12	5 U1	5'-3"	10	
8	4 U2	9'-7"	21	

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", unless otherwise shown.

All reinforcement shall be Grade 60.

All B1 bars shall be epoxy coated.

Table of Strand Instructions	
⊕+ ⊕⊕ ⊕⊕ ⊕⊕ +⊕	
+	Denotes fully bonded strands
⊕	Cut and shop bend with 2'-0" projection. Cut any remaining bottom strands within 1" of end of beam. **

** 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.

General Notes

Concrete for prestressed beams shall be Class A-1 with f'c = 7,000 psi and f'ci = 5,000 psi.

Prestressing tendons shall be uncoated, seven-wire, low-relaxation strands, 0.5 inch diameter conforming to AASHTO M203, Grade 270. Pretensioned members shall be in accordance with Sec 1029.

For Beam Camber Diagram, see Sheet No. 42.

For location of coil inserts at slab drains, see Sheet No. 40.

3/4"Ø drain holes shall be provided at each end of each void, and shall be kept open at all times.

Beams shall be kept upright at all times. Support shall be within 12 inches of the ends only.

Void filler shall be non-absorptive cellular polystyrene, according to ASTM C 578, designed to withstand the forces imposed upon them during fabrication without substantial deformation such as bulging, sagging, or collapsing. Cardboard void filler will not be allowed. The outside dimensions of void filler shall be as shown on the plans. When two or more sections of void filler are used to make up a required length, they shall be effectively taped or spliced together.

Beams shall be finished similarly in accordance with Sec 1029, except as noted.

Note: Work this sheet with Sheet No. 40.

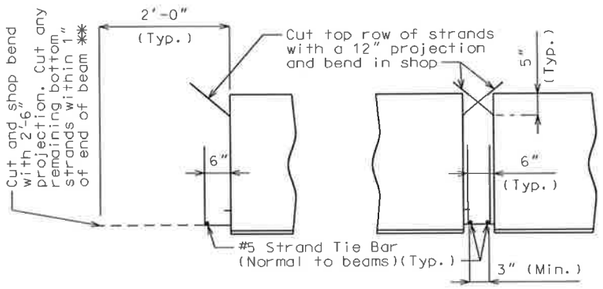
SPREAD BOX BEAM DETAILS SPAN (2-3)

HORNER & SHIFRIN, INC.

Designed: TPL
Detailed: CAB
Checked: TPL

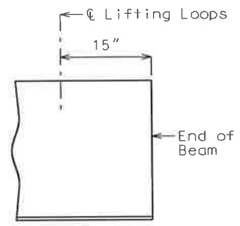
WILLOTT ROAD BRIDGE	SHEET 40
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

** 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.

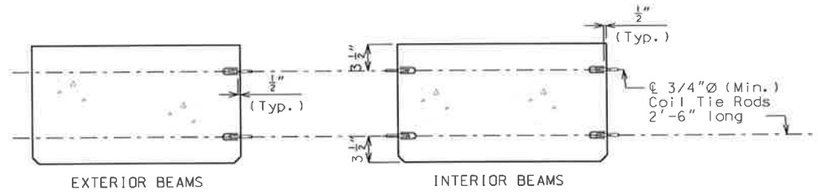


END BENT NO. 1 INTERMEDIATE BENT

STRAND DETAILS AT BEAM ENDS



LOCATION OF LIFTING LOOPS



EXTERIOR BEAMS INTERIOR BEAMS

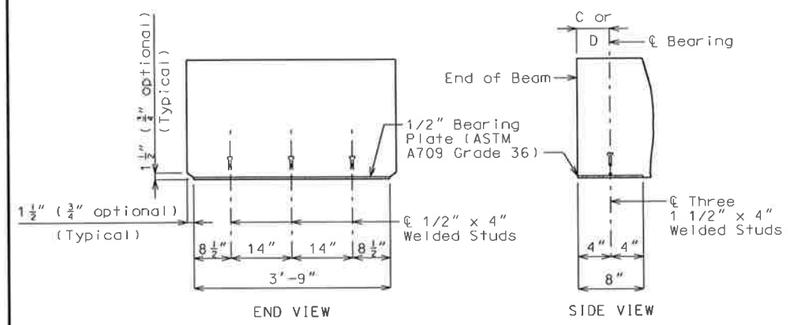
DETAILS OF COIL TIES

(Strands and reinforcement not shown for clarity)

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

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

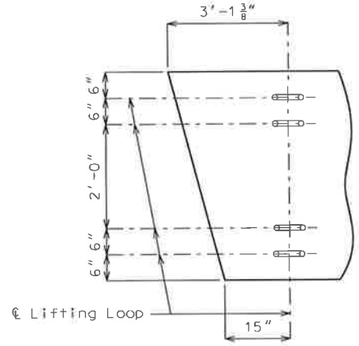
For location of coil ties, see Sheets No. 30, 36 & 43.



BEARING PLATE DETAILS

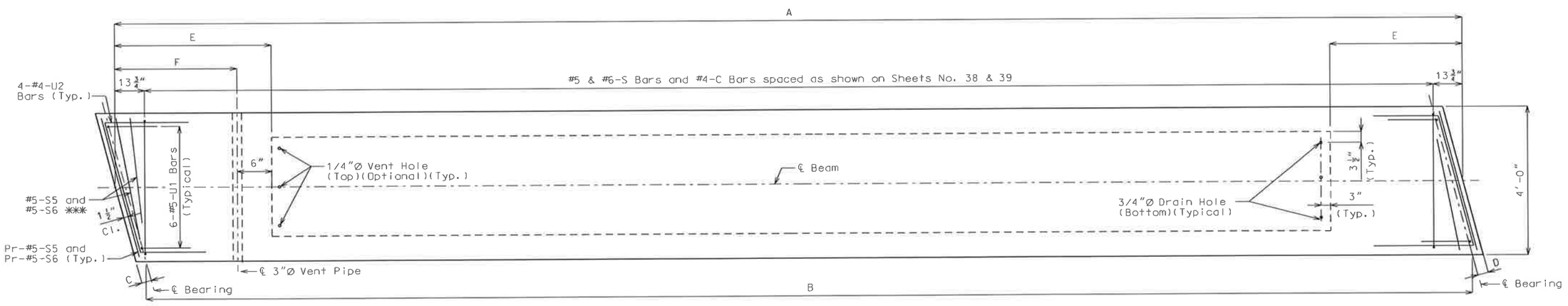
Galvanize the 1/2" bearing plate (ASTM A709 Grade 36) in accordance with ASTM A123.

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



PART PLAN SHOWING LOCATION OF LIFTING LOOPS

Table of Dimensions for Plan of Beam						
Span	Beam Length A	℄ Brg. to ℄ Brg. B	Left ℄ Brg. C	Right ℄ Brg. D	End Length E	Vent Pipe F
(1-2)	55'-0 1/2"	54'-3 3/4"	4"	4"	3'-9"	3'-0 3/4"
(2-3)	30'-0 1/2"	29'-3 3/4"	4"	4"	3'-9"	3'-0 3/4"



*** Splay and cut to fit.

PLAN OF BEAM

(S bars, C bars and strands not shown for clarity)

Note: Work this sheet with Sheets No. 38 & 39.

STATE OF MISSOURI THOMAS P. JORDAN NUMBER PE-2009018771 PROFESSIONAL ENGINEER

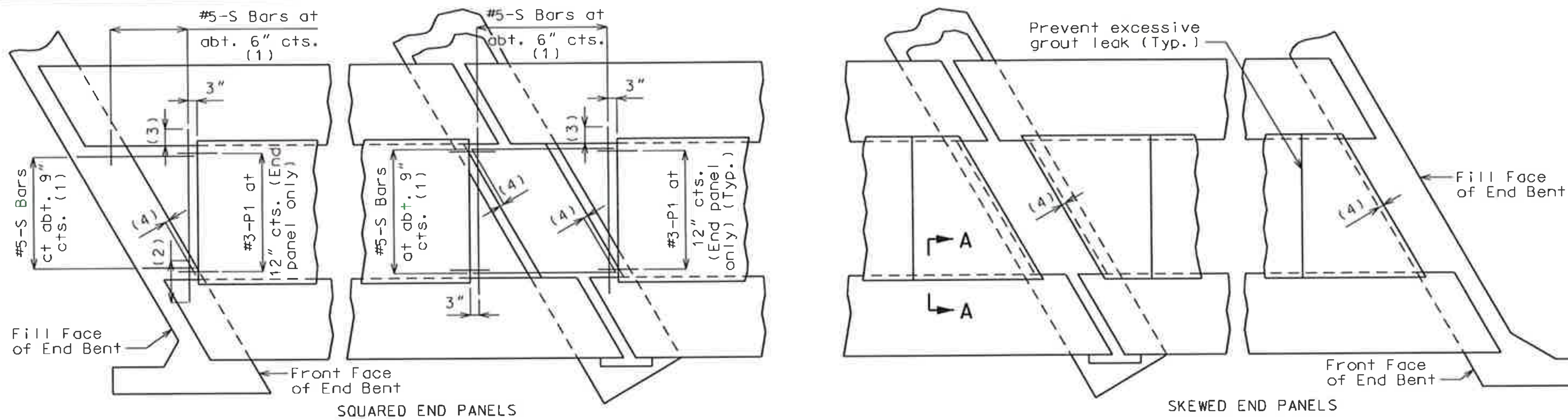
SPREAD BOX BEAM DETAILS

HORNER & SHIFRIN, INC.

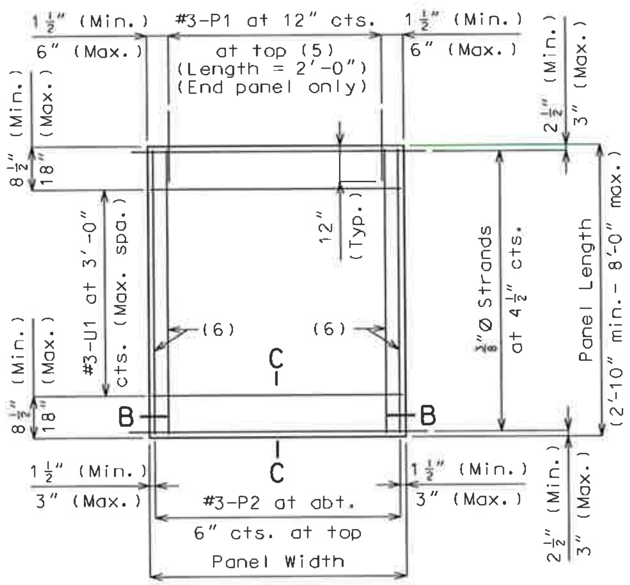
Designed: TPL
Detailed: CAB
Checked: TPL

...\Cad\S\40-Box Beam Details.dgn 9:15:11 AM 12/9/2014

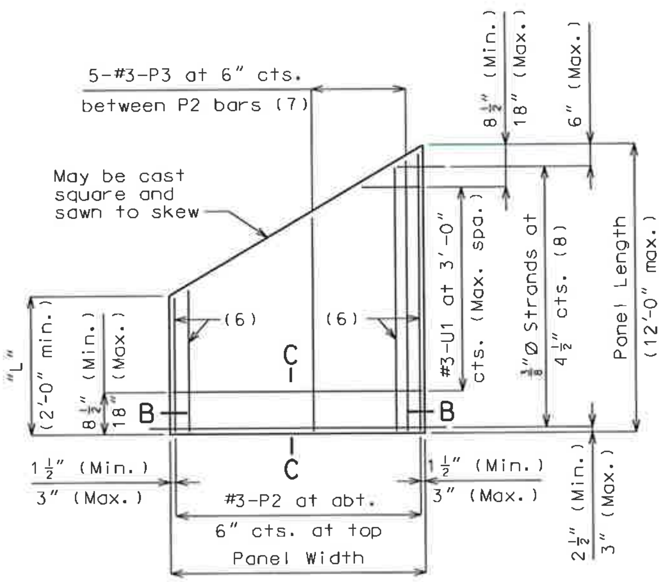
WILLOTT ROAD BRIDGE	SHEET 41	
CITY OF ST. PETERS	OF 70	
FEDERAL PROJECT NO. BRM-7305(610)		



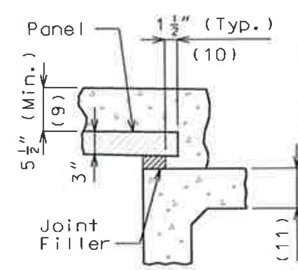
PLAN SHOWING PANEL PLACEMENT



PLAN OF SQUARED PANEL

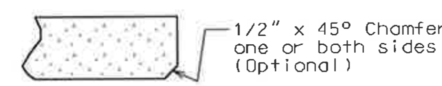


PLAN OF OPTIONAL SKEWED END PANEL

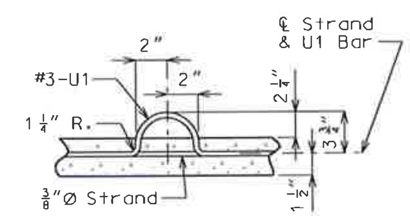


SECTION A-A

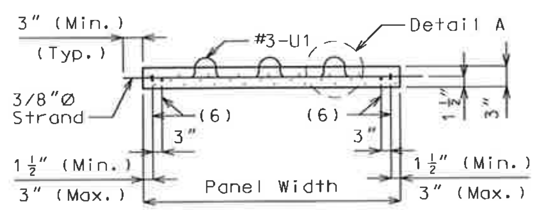
Joint Filler Dimensions		
Width	Height	
	Min.	Max.
3"	1"	4"



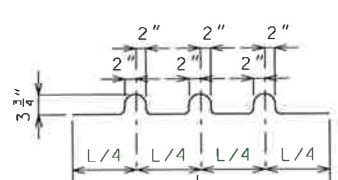
SECTION C-C



DETAIL A



SECTION B-B



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.

Reference Notes:

Plan of Panel Placement:

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

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

(3) Extend S-bars 9 inches beyond edge of beam.

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

Plans of Panel:

(5) P1 bars not required for square integral end bents.

(6) #3-P2 bars near edge of panel at bottom (under strands).

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

(8) Any strand 2'-0" or shorter shall have a #4 reinforcing bar on each side of it, centered between strands. Strands 2'-0" or shorter may then be debonded at the fabricator's option.

Section A-A:

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

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

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

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

General Notes:

Prestressed Panels:

Concrete for prestressed panels shall be Class A-1 with f'c = 6,000 psi, f'ci = 4,000 psi.

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

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

Initial prestressing force = 17.2 kips/strand.

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

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

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

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

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

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

Reinforcing Steel:

All dimensions are out to out.

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

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

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

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

The reinforcing steel shall be tied securely to the 3/8"Ø strands with the following maximum spacing in each direction:
- #3-P2 bars at 16 inches.
- Welded wire fabric or welded deformed bar mats at 2'-0".

Tie the #3-U1 bars to the #3-P2 bars, to the welded wire fabric or the welded deformed bar mats at about 3'-0" centers.

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

All reinforcement other than prestressing strands shall be epoxy coated.

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

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

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

Joint Filler:

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

Use Slab Haunching Diagram on Sheet No. 42 for determining thickness of joint filler within the limits noted in the table of Joint Filler Dimensions.

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

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

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

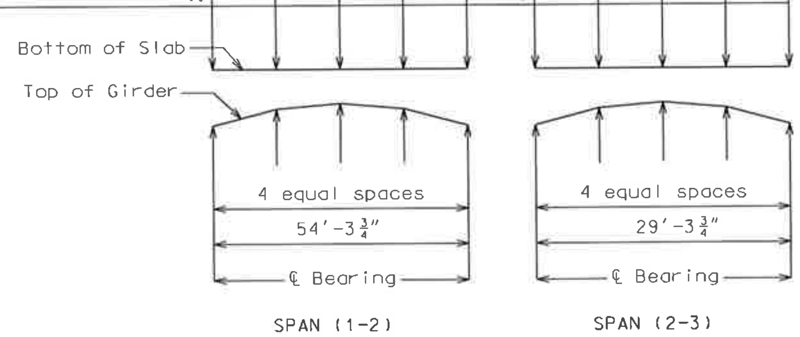
Edges of panels shall be uniformly seated on the joint filler before slab reinforcement is placed.

Designed: TPL
Detailed: CAB
Checked: CBW

PRECAST PRESTRESSED PANEL DETAILS

HORNER & SHIFRIN, INC.

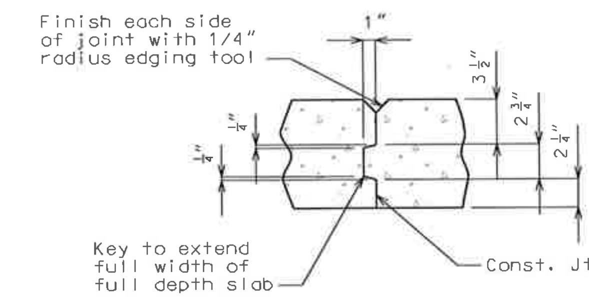
Girder No. 1	2 1/8"	1 3/8"	1 1/8"	1 1/2"	2 1/4"	2 1/4"	1 3/4"	1 3/8"	1 1/8"	1"
Girder No. 2	2"	1 1/2"	1 1/4"	1 5/8"	2 1/4"	2 1/8"	1 3/4"	1 1/2"	1 1/8"	1 1/8"
Girder No. 3	2"	1 1/2"	1 1/4"	1 1/2"	2"	2"	1 5/8"	1 3/8"	1 1/4"	1 1/4"
Girder No. 4	2 3/8"	1 3/4"	1 1/2"	1 3/4"	2 1/4"	2 1/8"	1 3/4"	1 3/4"	1 1/2"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



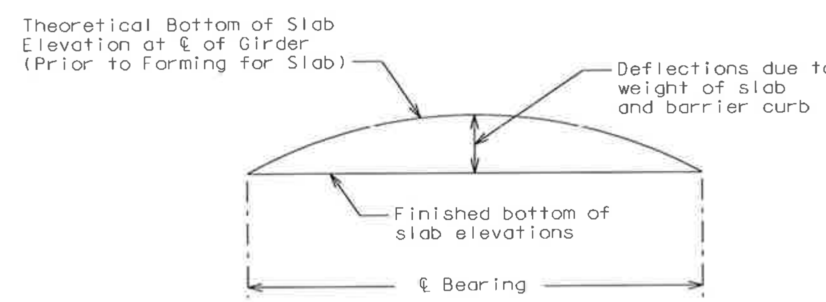
THEORETICAL SLAB HAUNCHING DIAGRAM

Theoretical Bottom of Slab Elevations at ℄ of Girder (Prior to Forming for Slab) **	Span (1-2) (54'-3 3/4" ℄ brg - ℄ brg.)					Span (2-3) (29'-3 3/4" ℄ brg - ℄ brg.)				
	℄ brg.	.25	.50	.75	℄ brg.	℄ brg.	.25	.50	.75	℄ brg.
Girder No. 1	491.83	491.79	491.73	491.65	491.55	491.55	491.51	491.47	491.44	491.40
Girder No. 2	492.03	492.01	491.95	491.88	491.76	491.75	491.72	491.69	491.64	491.61
Girder No. 3	492.23	492.22	492.16	492.08	491.96	491.96	491.92	491.89	491.85	491.81
Girder No. 4	492.43	492.41	492.35	492.28	492.16	492.15	492.11	492.09	492.04	492.00
Girder No. 5	492.21	492.19	492.13	492.06	491.94	491.93	491.89	491.87	491.82	491.78
Girder No. 6	491.95	491.91	491.85	491.78	491.68	491.67	491.64	491.60	491.56	491.53

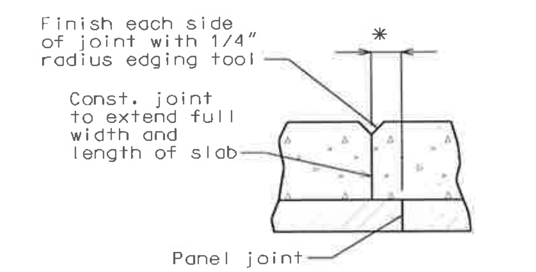
** Elevations are based on a constant slab thickness of 8 1/2" and include allowance for theoretical dead load deflections due to weight of slab (including precast panel) and barrier curb.



FULL DEPTH SLAB



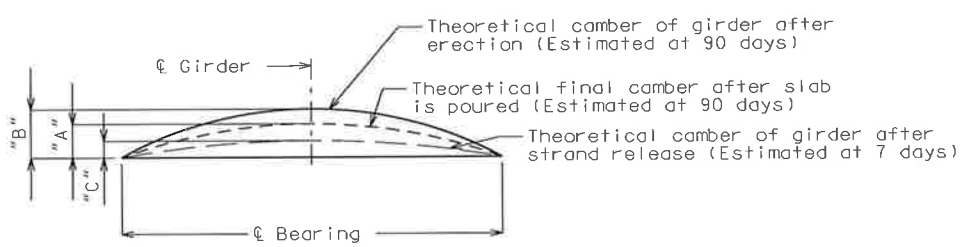
TYPICAL SLAB ELEVATIONS DIAGRAM



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

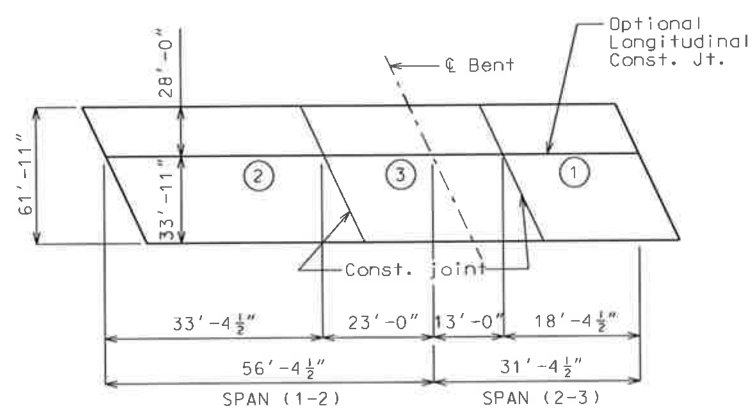
SLAB ON PANELS

SLAB CONSTRUCTION JOINT DETAILS



	Span (1-2)			Span (2-3)		
	"A"	"B"	"C"	"A"	"B"	"C"
Ext. girder	1"	1 5/8"	7/8"	1/4"	1/4"	1/8"
Int. girder	7/8"			1/4"		

GIRDER CAMBER DIAGRAM



SLAB POURING SEQUENCE

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

Notes:

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

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

The longitudinal construction joint may be omitted with the approval of the engineer. When the longitudinal construction joint is omitted, the minimum rate of pour for alternate pouring sequences shall be increased to 36 Cu. Yds./Hr.

CAMBER, HAUNCHING AND SLAB POURING

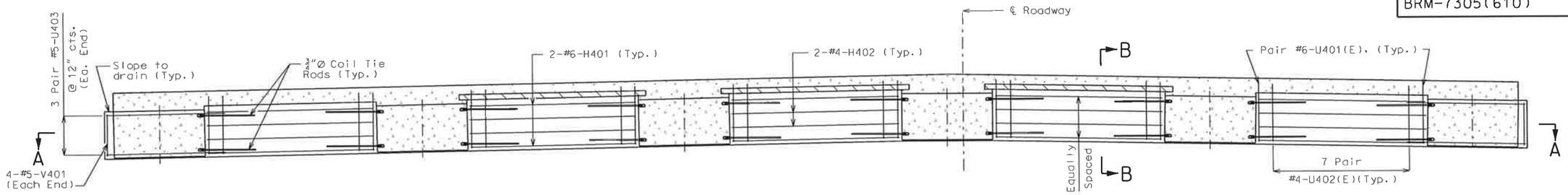
HORNER & SHIFRIN, INC.

STATE OF MISSOURI — THOMAS P. LEHMAN — PROFESSIONAL ENGINEER — PE-2008018771 — 3.9.15

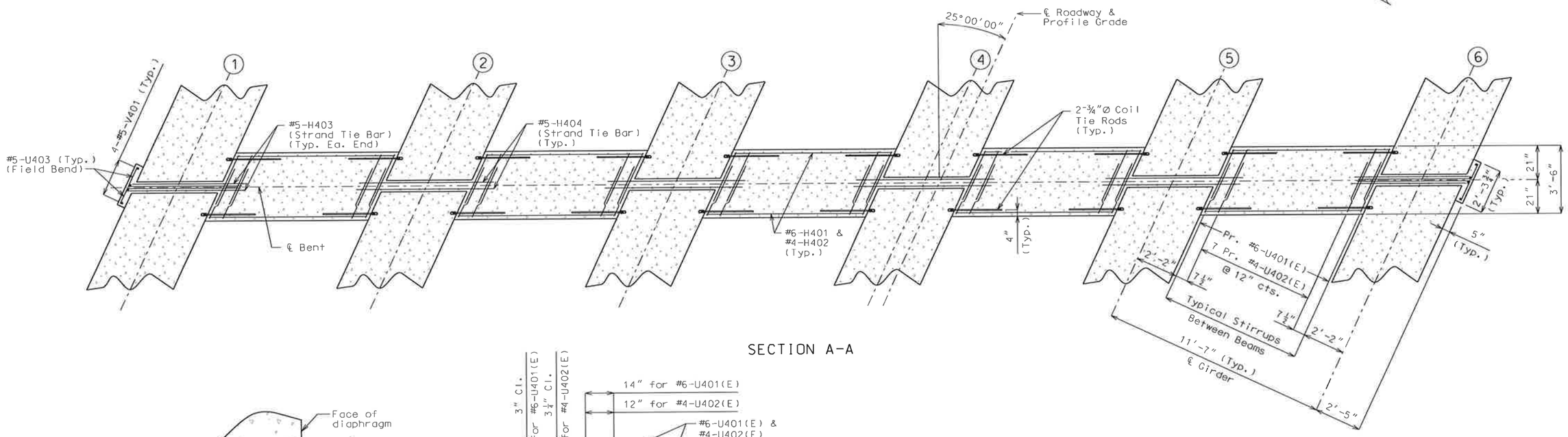
Designed: TPL
Detailed: CAB
Checked: TPL

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

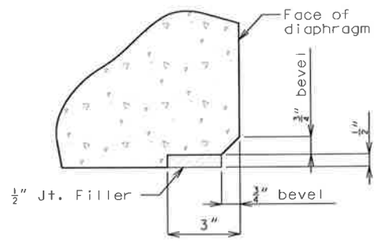
WILLOTT ROAD BRIDGE	SHEET 43
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



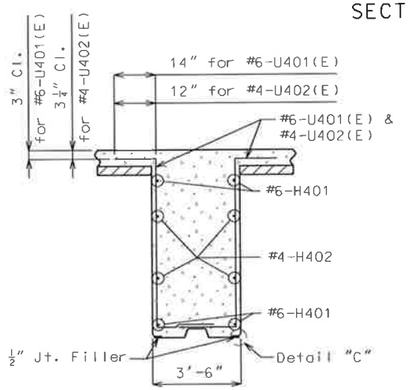
SECTION NEAR INTERMEDIATE BENT NO. 2



SECTION A-A



DETAIL "C"



SECTION B-B

Notes:

Diaphragm at Intermediate Bent shall be built vertical.

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

For location of #5-H403 & #5-H404 (Strand Tie Bars) and Coil Tie Rods, see Sheets No. 38 & 39.

Designed: TPL
Detailed: KAK
Checked: TPL

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

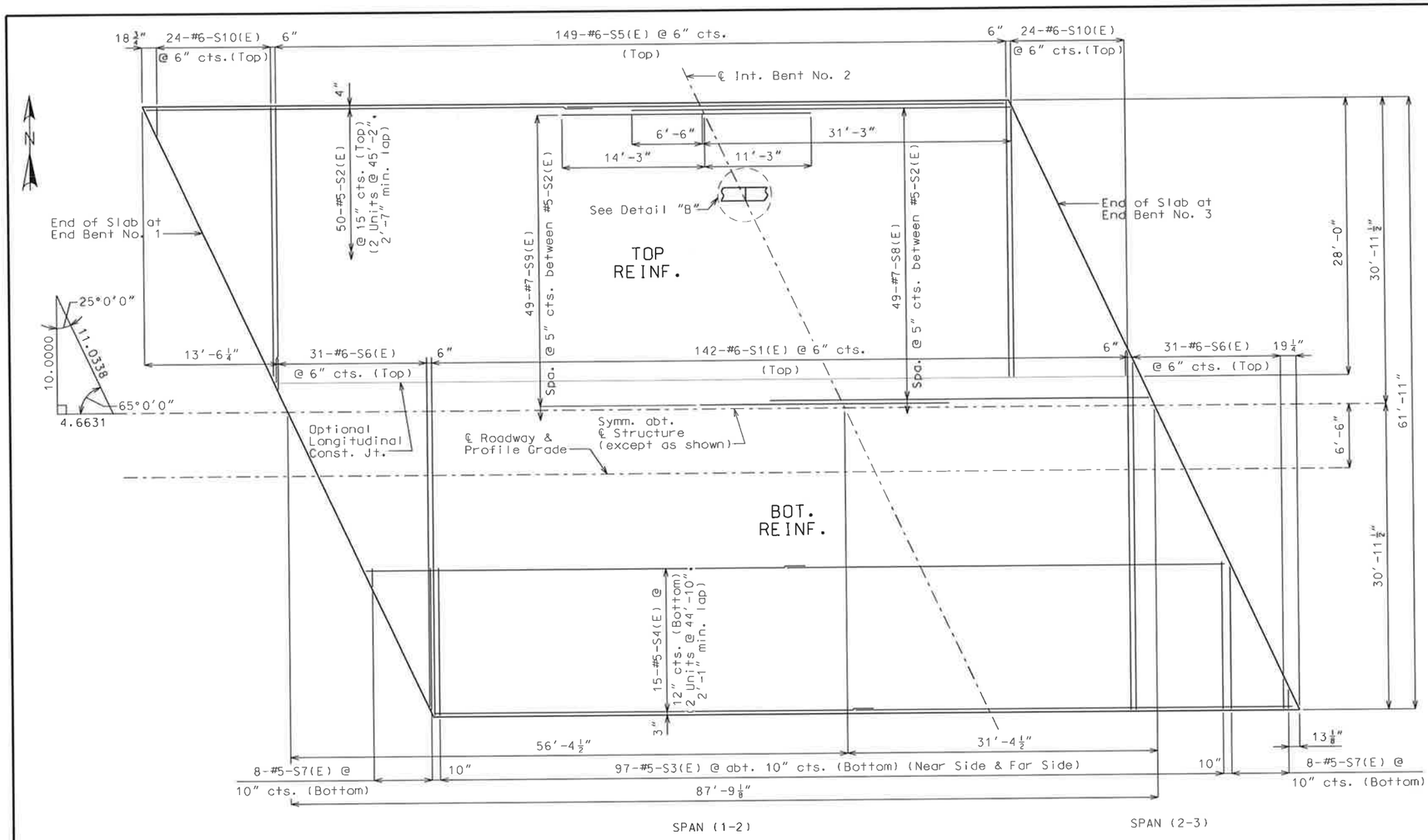
STATE OF MISSOURI THOMAS P. LORDAN NUMBER PE-2009018771 PROFESSIONAL ENGINEER

INT. BENT DIAPH. DETAILS

HORNER & SHIFRIN, INC.

...\Cad\S43 Int Diaphragm.dgn 9:15:13 AM 12/9/2014

WILLOTT ROAD BRIDGE	SHEET 44
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



PLAN OF SLAB SHOWING REINFORCEMENT

Notes:

For details of precast panels, see Sheet No. 41.

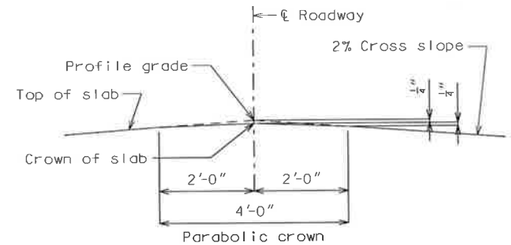
For Theoretical Bottom of Slab Elevations, Slab Haunching Diagram, and Girder Camber, see Sheet No. 42.

For details of safety barrier curb not shown, see Sheets No. 46 thru 50.

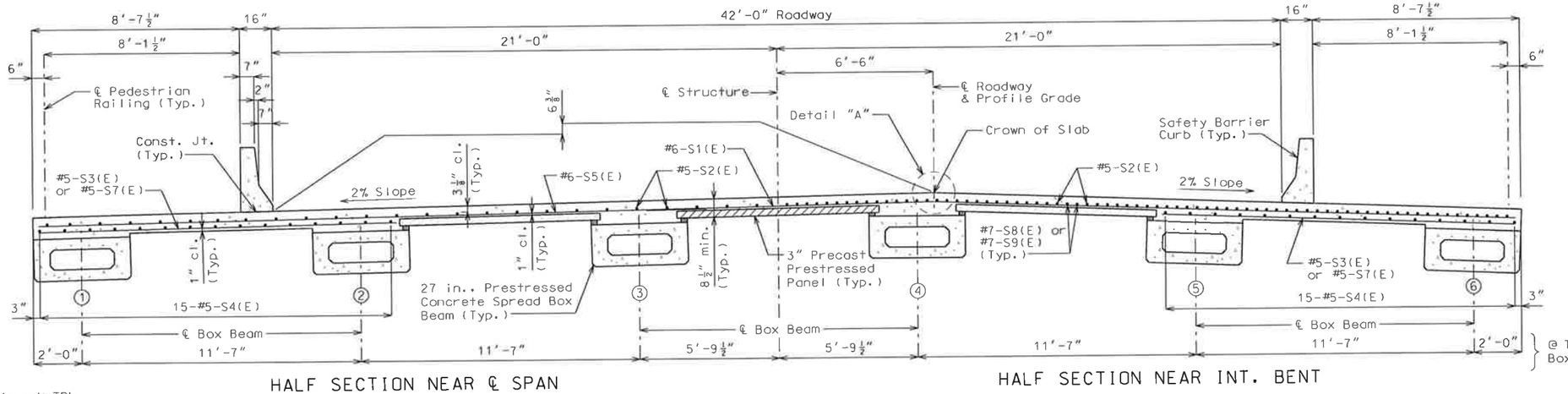
Longitudinal dimensions are horizontal.

For Slab Pouring Sequence and Slab Construction Joint Details, see Sheet No. 42.

Minimum splice for #6 Top Transverse bars = 2'-6".

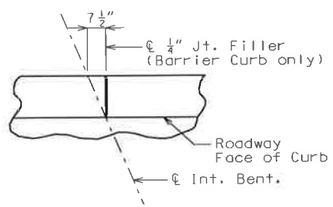


DETAIL "A"



HALF SECTION NEAR ℄ SPAN

HALF SECTION NEAR INT. BENT



DETAIL "B"

Designed: TPL
Detailed: CAB
Checked: CBW

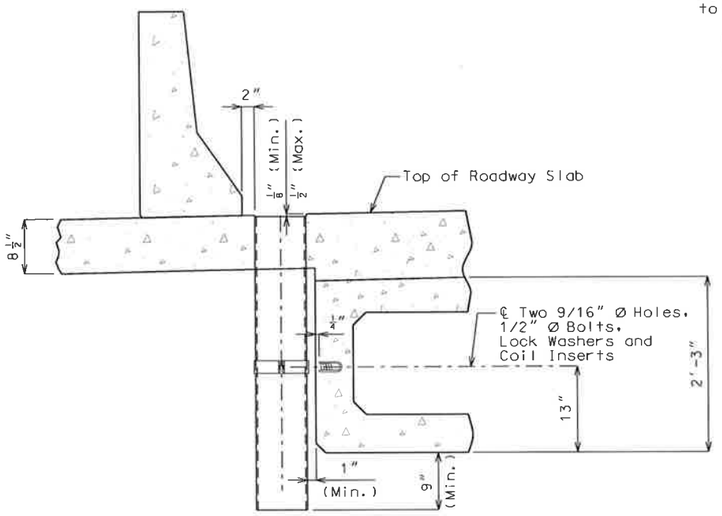
Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI THOMAS P. LOMAN PE-2009018771 PROFESSIONAL ENGINEER

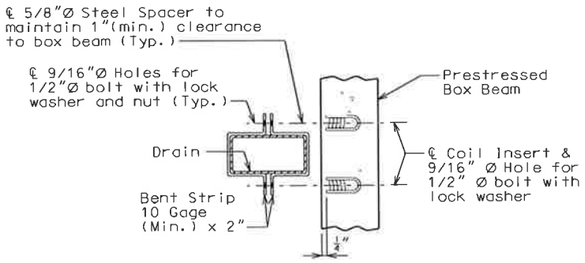
SLAB DETAILS

HORNER & SHIFRIN, INC.

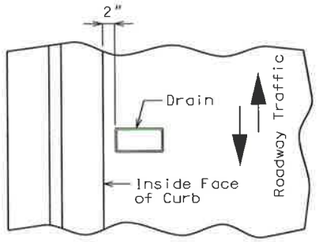
WILLOTT ROAD BRIDGE	SHEET 45
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



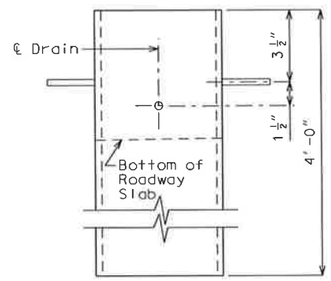
PART SECTION NEAR DRAIN



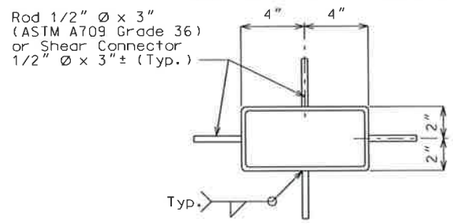
PART SECTION SHOWING BRACKET ASSEMBLY



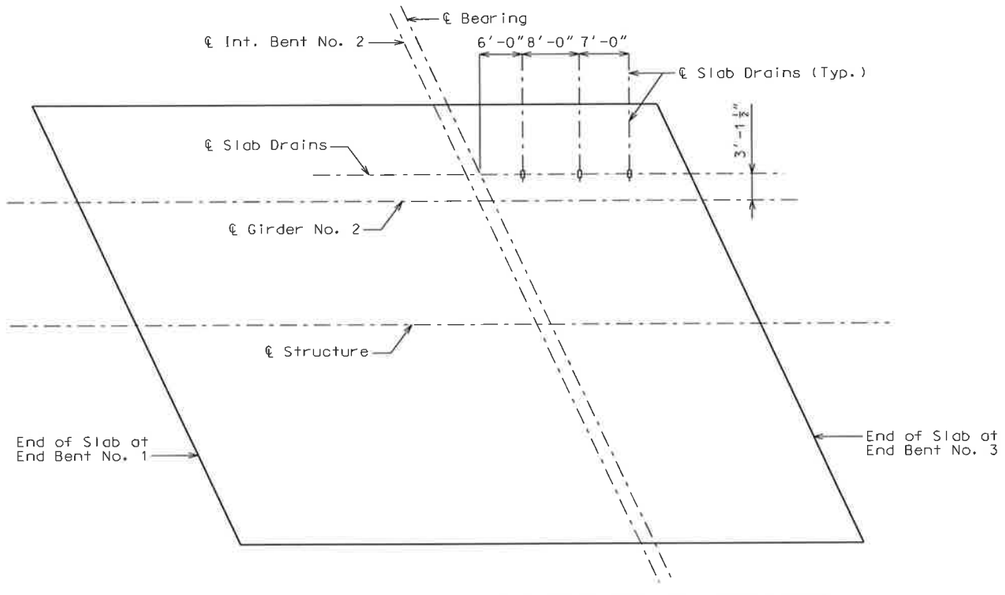
PART PLAN OF SLAB AT DRAIN



ELEVATION OF DRAIN



PLAN OF DRAIN



PLAN OF SLAB SHOWING SLAB DRAIN LOCATIONS
Note: Longitudinal dimensions are horizontal.

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.

Reinforcing steel shall be shifted to clear drains.

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

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

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

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

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

The bolts required to attach the slab drain bracket assembly to the prestresssed concrete box beam shall be supplied by the prestressed box beam fabricator.

Designed: TPL
Detailed: CAB
Checked: TPL

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

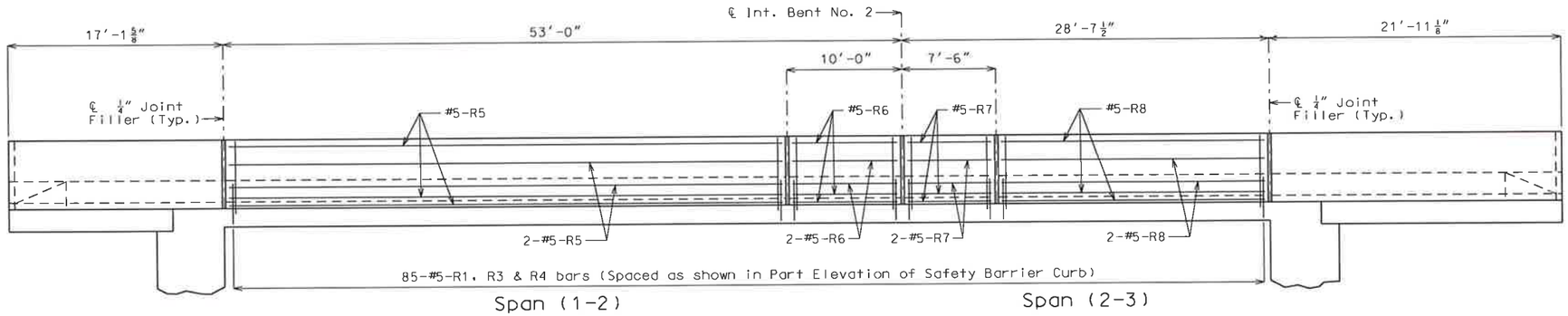
STATE OF MISSOURI THOMAS P. LOHMAN PE-2009018771 PROFESSIONAL ENGINEER 3-0-15

SLAB DRAIN DETAILS

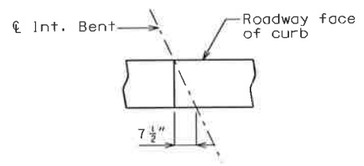
HORNER & SHIFRIN, INC.

...\Cad\S\45 Slab Drains.dgn 9:13:15 AM 12/9/2014

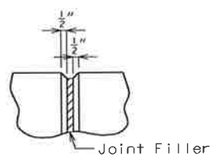
WILLOTT ROAD BRIDGE	SHEET 46
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



ELEVATION OF RIGHT SAFETY BARRIER CURB
Longitudinal dimensions are horizontal.



SKEWED JOINT DETAIL



FILLED JOINT DETAIL

General Notes

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

All exposed edges of safety barrier curb shall have either a 1/2-inch radius or a 3/8-inch bevel, unless otherwise noted.

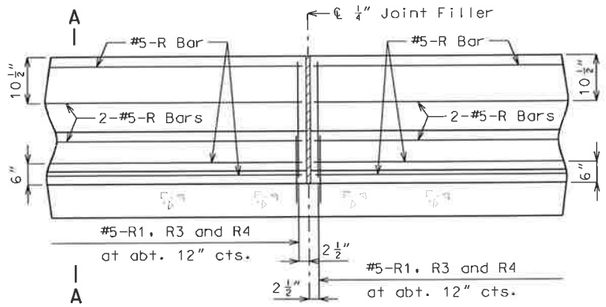
Payment for all concrete and reinforcement, complete in place, will be considered completely covered by the contract unit price for Safety Barrier Curb per linear foot.

Concrete in the safety barrier curb shall be Class B-1.

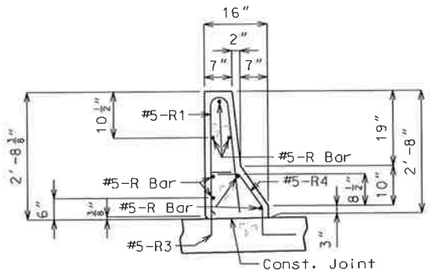
Measurement of safety barrier curb is to the nearest linear foot for each structure, measured along the outside top of barrier from end of safety barrier curb to end of safety barrier curb.

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

For Safety Barrier Curb Railing details, see Sheet 51.



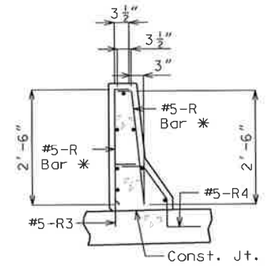
PART ELEVATION OF SAFETY BARRIER CURB
(CAST-IN-PLACE CONVENTIONAL FORMING)



SECTION A-A

Use a minimum lap of 2′-11″ for #5 horizontal safety barrier curb bars.

The cross-sectional area above the slab = 2.27 sq. ft.



R-BAR PERMISSIBLE ALTERNATE SHAPE

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

Designed: TPL
Detailed: CAB
Checked: CBW

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

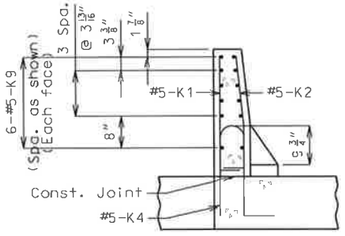
STATE OF MISSOURI THOMAS P. LOEHMAN NUMBER PE-2001018771 PROFESSIONAL ENGINEER 2-9-15

RIGHT SAFETY BARRIER CURB

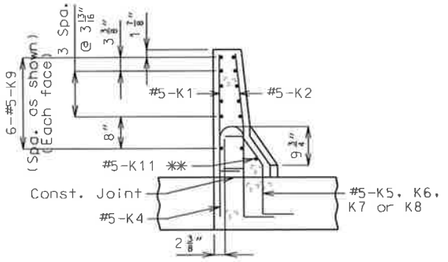
HORNER & SHIFRIN, INC.

J:\Cad\S\146 SBC Right.dgn 9:13:15 AM 02/9/2015

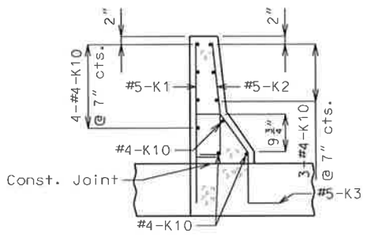
WILLOTT ROAD BRIDGE	SHEET 47
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



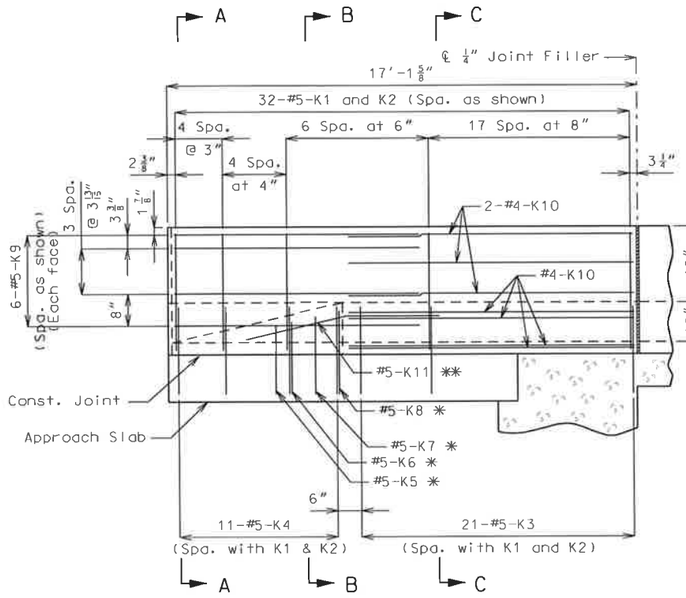
SECTION A-A



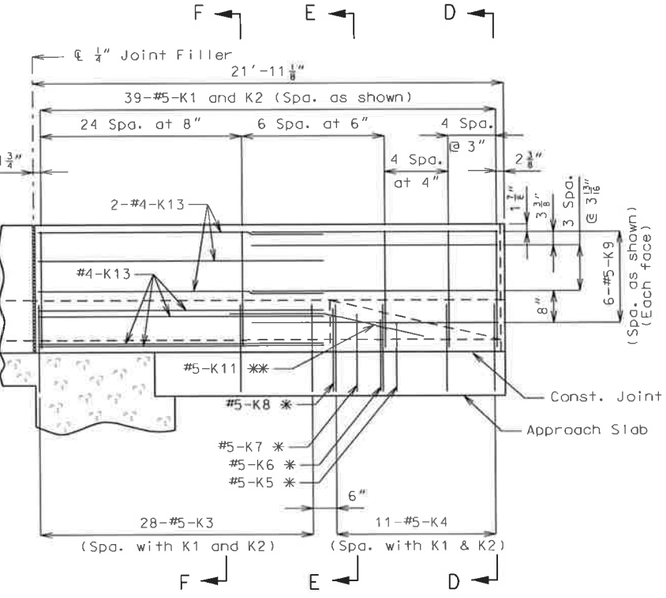
SECTION B-B



SECTION C-C



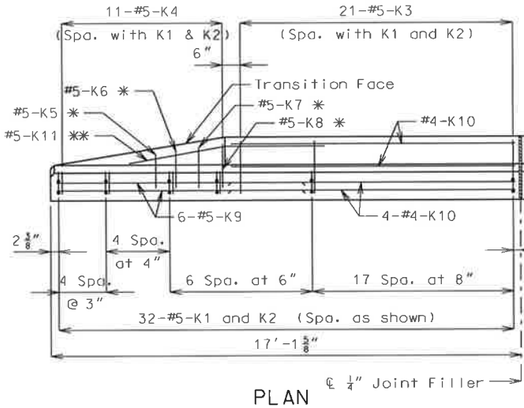
ELEVATION



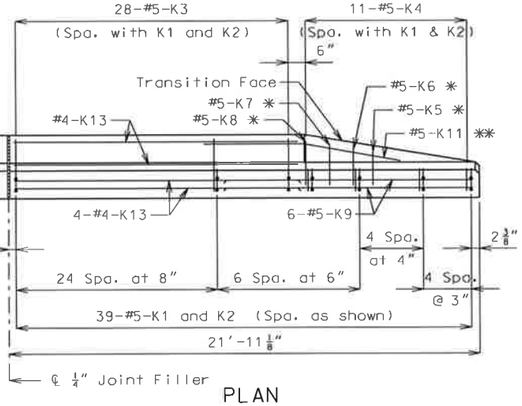
ELEVATION

* Spaced with #5-K4 bars.

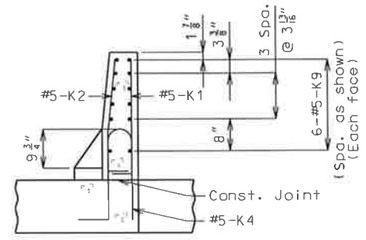
** Fit bar to follow transition face of curb.



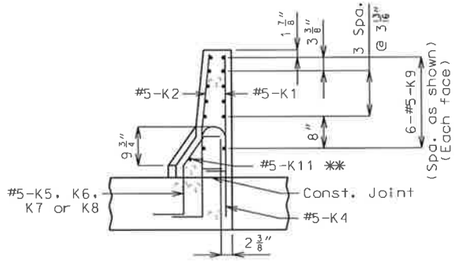
PLAN



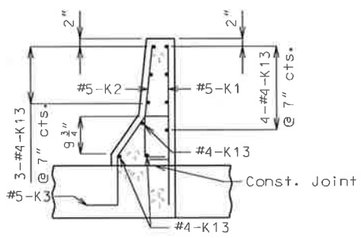
PLAN



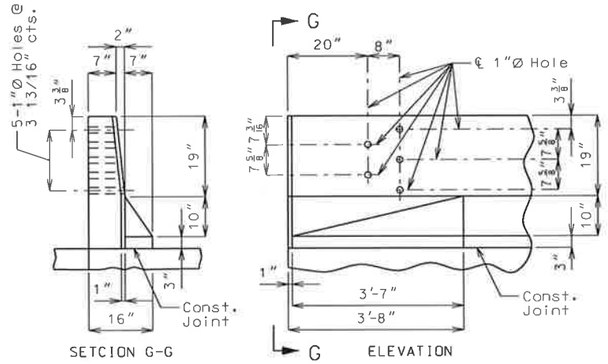
SECTION D-D



SECTION E-E



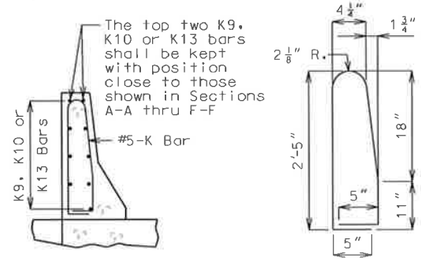
SECTION F-F



DETAILS OF GUARD RAIL ATTACHMENT

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

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



K1-K2 BAR PERMISSIBLE ALTERNATE SHAPE

(K3 or K4 thru K8 bars not shown for clarity)

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

Designed: TPL
Detailed: CAB
Checked: CBW

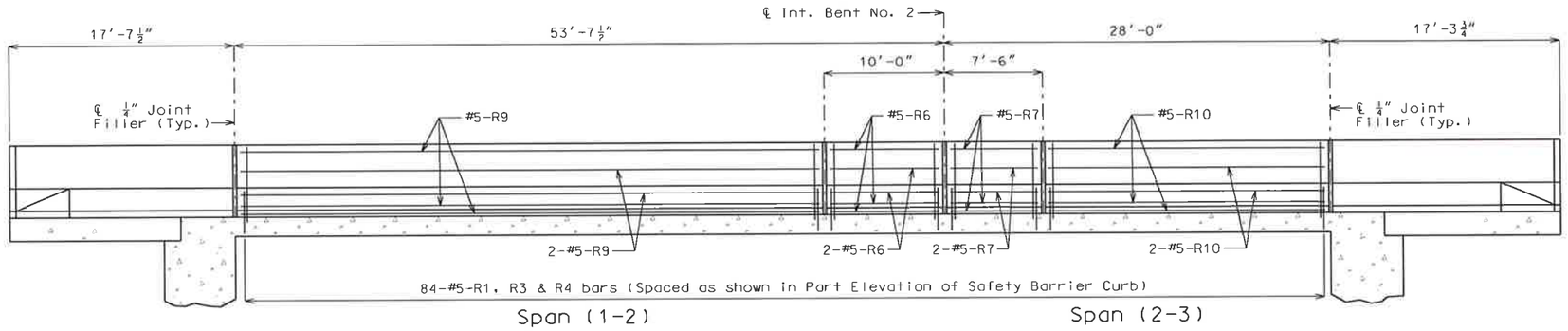
Note: This drawing is not to scale. Follow dimensions.

STATE OF MISSOURI THOMAS P. LOHMAN PE-2001018771 PROFESSIONAL ENGINEER

RIGHT SBC AT END BENTS

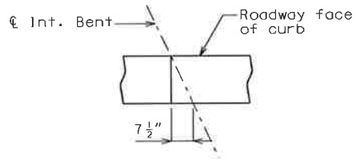
HORNER & SHIFRIN, INC.

WILLOTT ROAD BRIDGE	SHEET 48
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

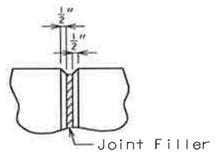


SECTION NEAR LEFT SAFETY BARRIER CURB

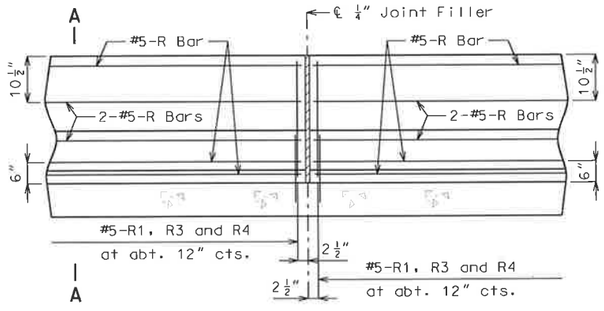
Longitudinal dimensions are horizontal.



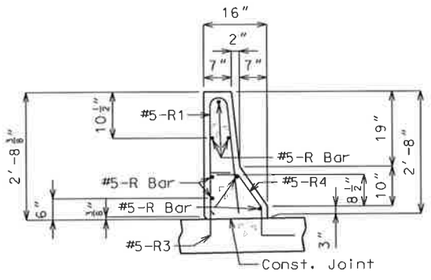
SKEWED JOINT DETAIL



FILLED JOINT DETAIL



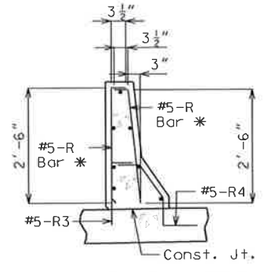
PART ELEVATION OF SAFETY BARRIER CURB (CAST-IN-PLACE CONVENTIONAL FORMING)



SECTION A-A

Use a minimum lap of 2'-11" for #5 horizontal safety barrier curb bars.

The cross-sectional area above the slab = 2.27 sq. ft.



R-BAR PERMISSIBLE ALTERNATE SHAPE

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

General Notes

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

All exposed edges of safety barrier curb shall have either a 1/2-inch radius or a 3/8-inch bevel, unless otherwise noted.

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

Concrete in the safety barrier curb shall be Class B-1.

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

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

For Safety Barrier Curb Railing details, see Sheet 51.

Designed: TPL
Detailed: CAB
Checked: CBW

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

STATE OF MISSOURI THOMAS P. LOHMAR NUMBER PE-2009018771 PROFESSIONAL ENGINEER 5-9-13

LEFT SAFETY BARRIER CURB

HORNER & SHIFRIN, INC.

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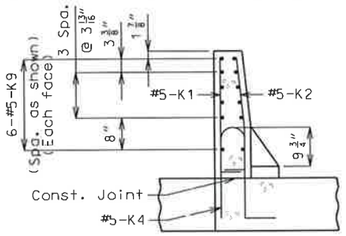
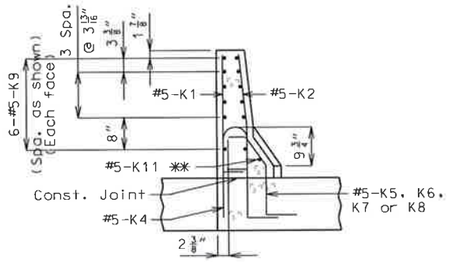
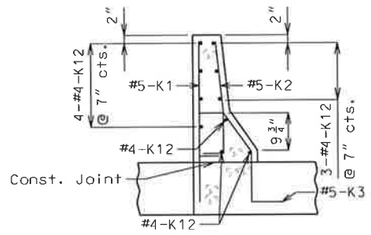
WILLOTT ROAD BRIDGE	SHEET 49
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



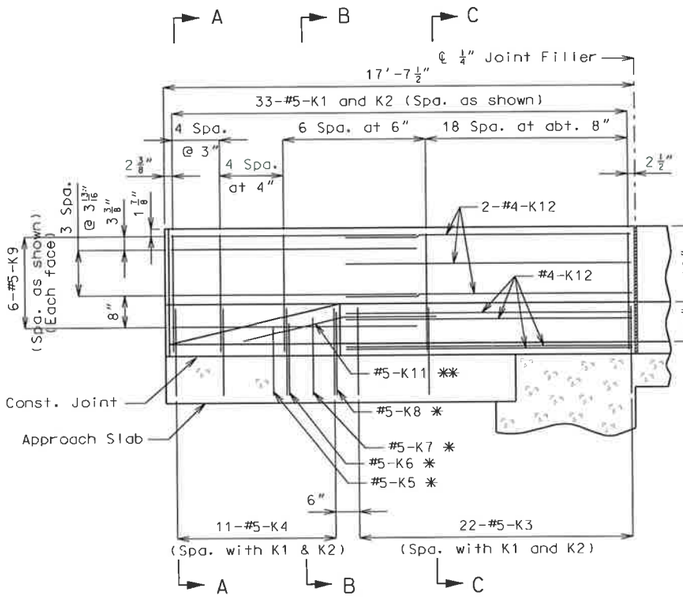
SECTION A-A



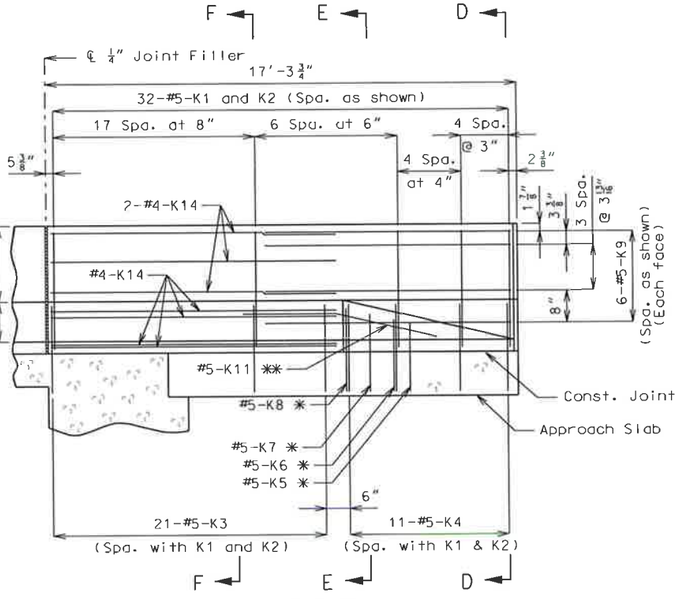
SECTION B-B



SECTION C-C



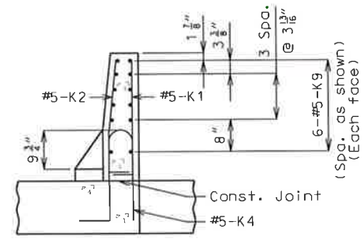
ELEVATION



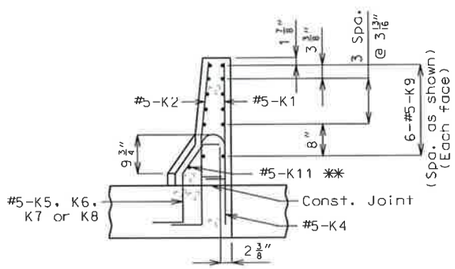
ELEVATION

* Spaced with #5-K4 bars.

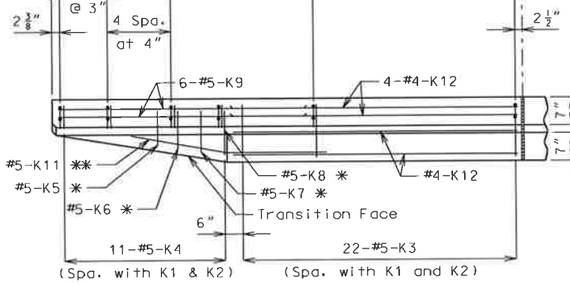
** Fit bar to follow transition face of curb.



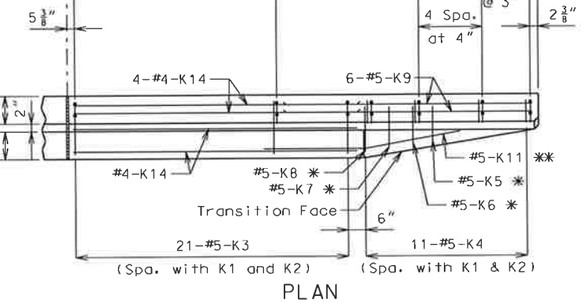
SECTION D-D



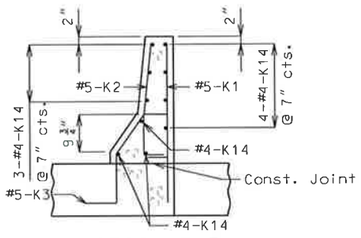
SECTION E-E



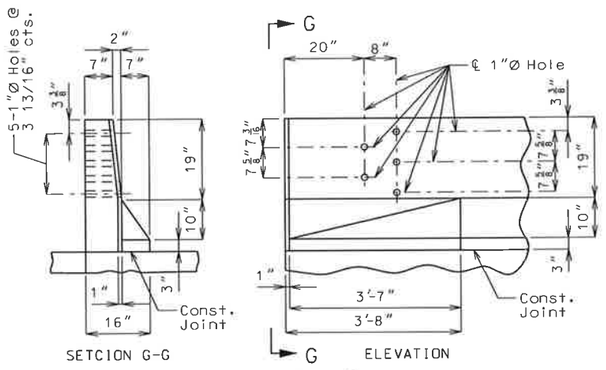
PLAN



PLAN



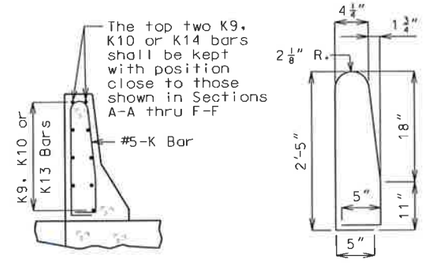
SECTION F-F



DETAILS OF GUARD RAIL ATTACHMENT

Note: Use a minimum lap of 2'-0" between K9 and K12 or K14 bars.

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



K1-K2 BAR PERMISSIBLE ALTERNATE SHAPE

(K3 or K4 thru K8 bars not shown for clarity)

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

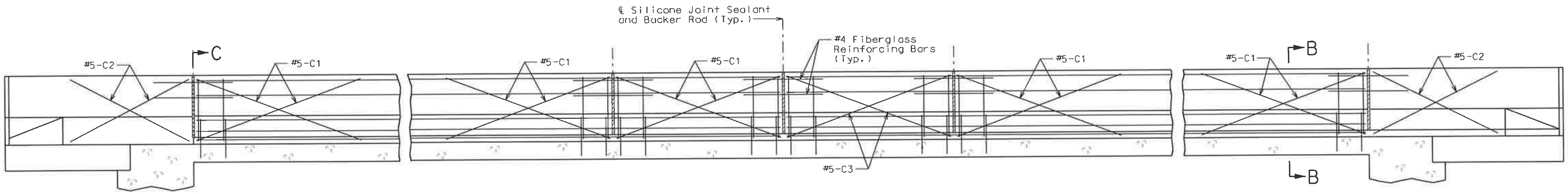
Designed: TPL
Detailed: CAB
Checked: CBW

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

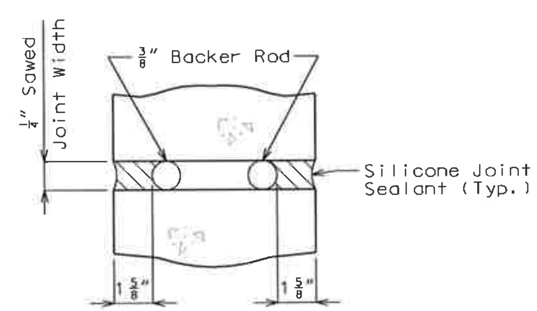
STATE OF MISSOURI THOMAS P. LEWIS NUMBER PE-2009019771 PROFESSIONAL ENGINEER 12/9/2014

LEFT SBC AT END BENTS

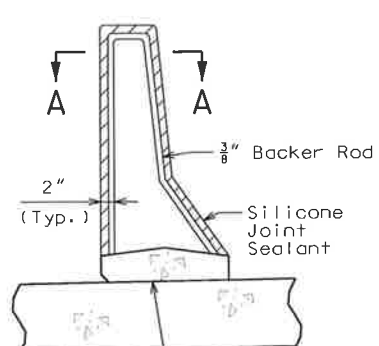
HORNER & SHIFRIN, INC.



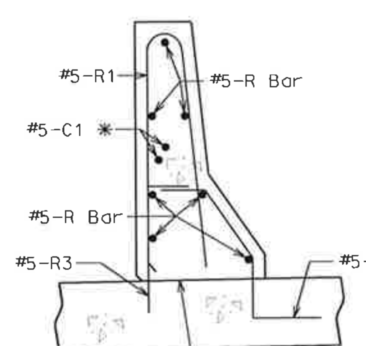
TYPICAL ELEVATION OF SAFETY BARRIER CURB AT SUPPORT LOCATIONS
(left safety barrier curb shown, right safety barrier curb similar)



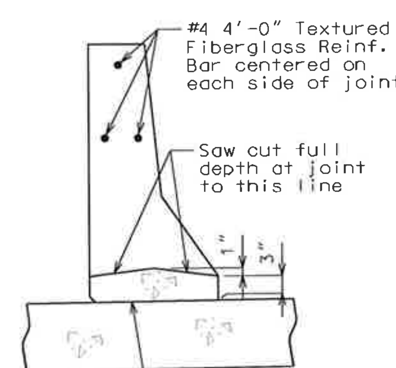
SECTION A-A



SECTION THRU JOINT



SECTION B-B
✳ Each side of joint location.



SECTION C-C

General Notes:

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

All exposed edges of safety barrier curb shall have either a 1/2-inch radius or a 3/8-inch bevel, unless otherwise noted.

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

Concrete in the safety barrier curb shall be Class B-1.

Measurement of safety barrier curb is to the nearest linear foot for each structure, measured along the outside edge of barrier from end of safety barrier curb to end of safety barrier curb.

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

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

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

For slip-form option, all sides of the safety barrier curb shall have a vertically broomed finish and the curb top shall have a transversely broomed finish.

C bars (slip-form option only) shall be used in addition to cast-in-place conventional forming reinforcement for bridge safety barrier curb.

Cost of silicone joint sealant and backer rod, complete in place, will be considered completely covered by the contract unit price for Safety Barrier Curb.

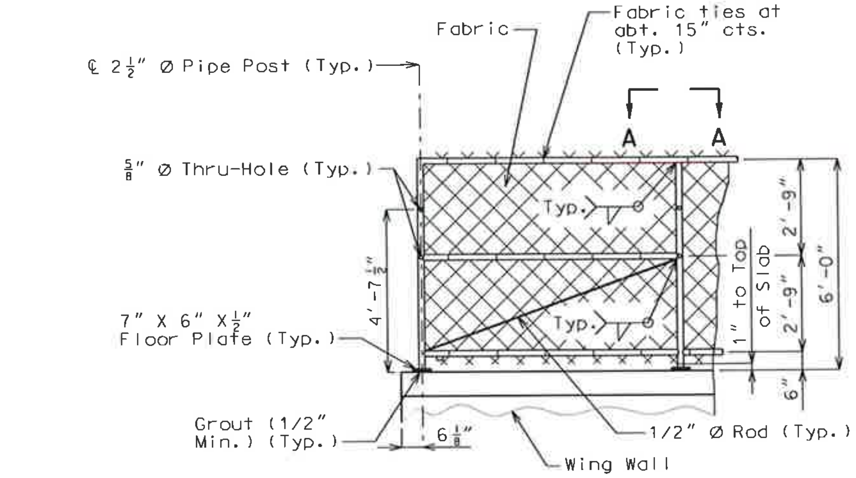
Note: This drawing is not to scale. Follow dimensions.

Designed: TPL
Detailed: CAB
Checked: CBW

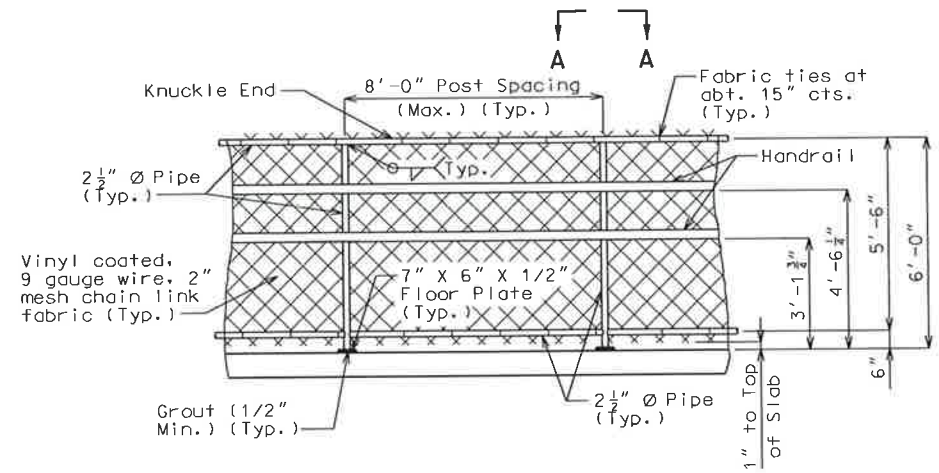
DETAILS OF SBC SLIP FORM OPTION

HORNER & SHIFRIN, INC.

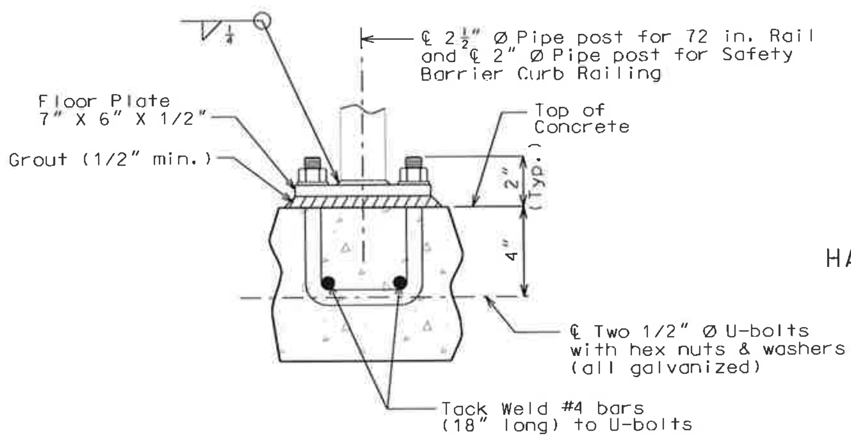
WILLOTT ROAD BRIDGE	SHEET 51
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



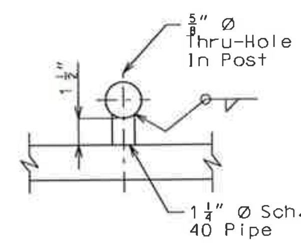
DETAIL OF (72 IN.) BICYCLE RAIL
(Handrail not shown)



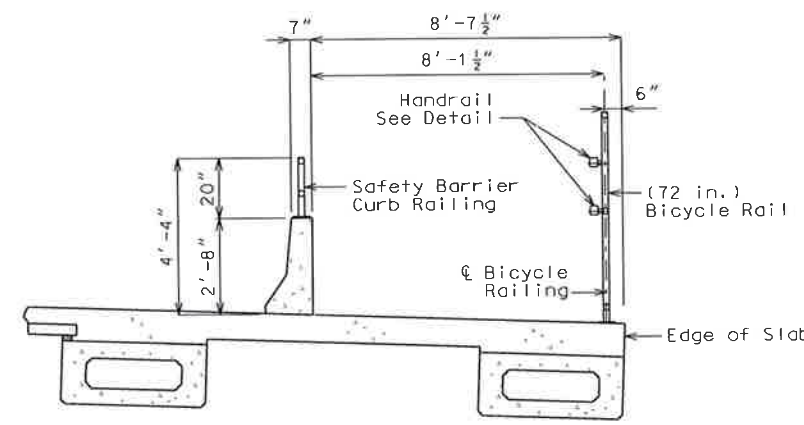
(72 IN.) BICYCLE RAIL ELEVATION



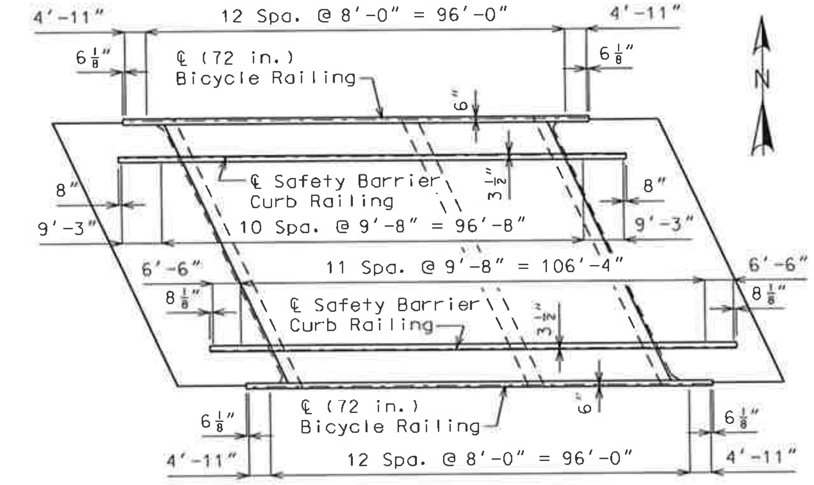
POST CONNECTION
(TYPICAL)



SECTION A-A
HANDRAIL ATTACHMENT



SECTION THRU SLAB



PLAN SHOWING POST SPACING OF RAILINGS

Notes:

All fabricated structural steel shall be ASTM A36.

All steel pipe shall be ASTM A500, Grade B.

(72 in.) Bicycle Rail and Safety Barrier Curb Rail shall be in accordance with Sec 1043 except all fabric shall have the top edges knuckled.

All rail post shall be vertical. Grout of ½" minimum thickness shall be placed under floor plates to provide for vertical alignment of rail posts.

Payment for furnishing, galvanizing and erecting the fence and frame complete with handrails, anchor bolts and washers will be considered completely covered by the contract unit price for (72 in.) Bicycle Rail and Safety Barrier Curb Railing per linear foot.

Dimensions are measured horizontally.

The maximum spacing allowed for the braced panels (Pull posts) is 100 ft.

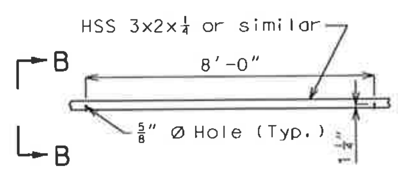
Connect the lower end of the ½" Ø rod to the end of the braced panel to which the stretcher bar is attached.

(72 in.) Bicycle Railing will be measured to the nearest linear foot.

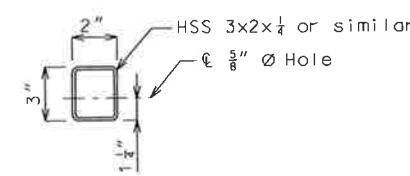
Safety Barrier Curb Railing will be measured to the nearest linear foot.

The (72 in.) Bicycle Railing and Safety Barrier Curb Railing, including chain link fabric, shall be black vinyl coated.

Provide splice in rails with ¼" gap @ 30'-0" max spacing.

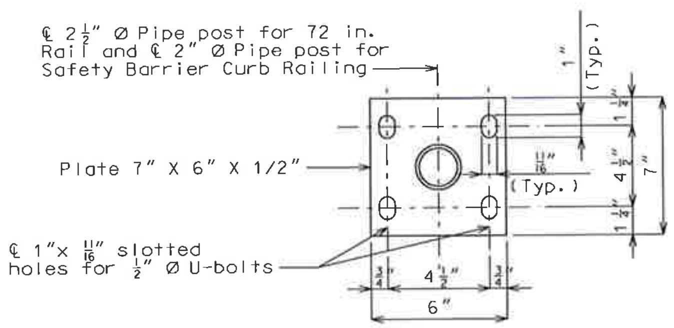


ELEVATION OF HANDRAIL

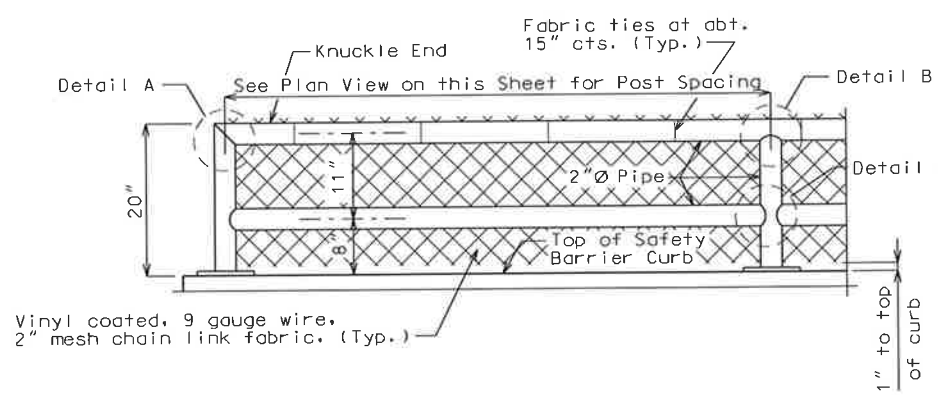


SECTION B-B

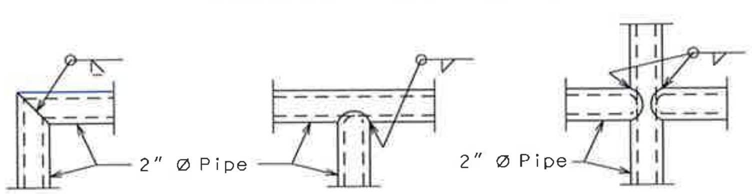
Note: Connect handrail to posts with ½" Ø ASTM A307 galvanized carriage bolt with nut and washer.



PLAN OF FLOOR PLATE



SAFETY BARRIER CURB RAILING ELEVATION
(Inside Face of Two Element Rail)



DETAIL A DETAIL B DETAIL C

Designed: TPL
Detailed: CAB
Checked: TPL

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

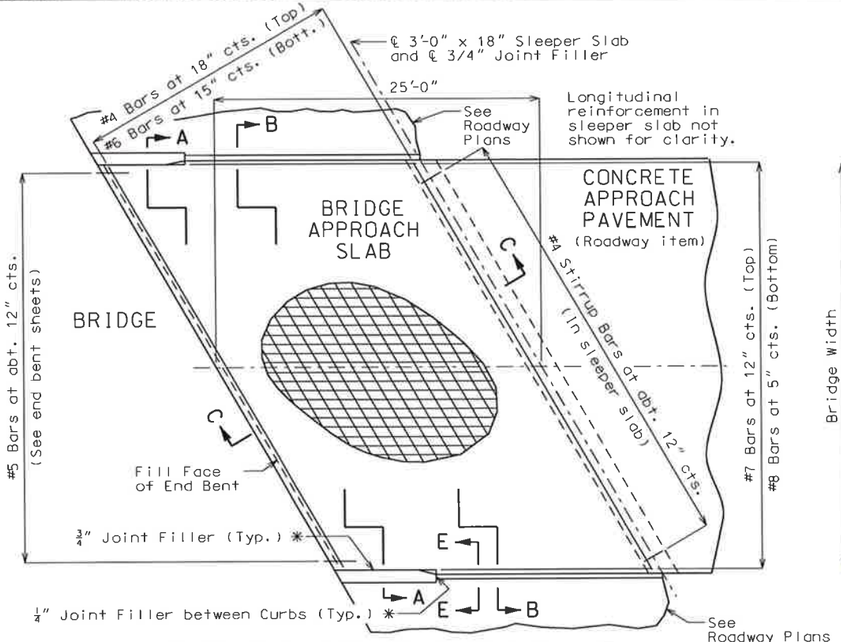
STATE OF MISSOURI THOMAS P. LOEHR NUMBER PE-2001811171 PROFESSIONAL ENGINEER

PEDESTRIAN RAILING DETAILS

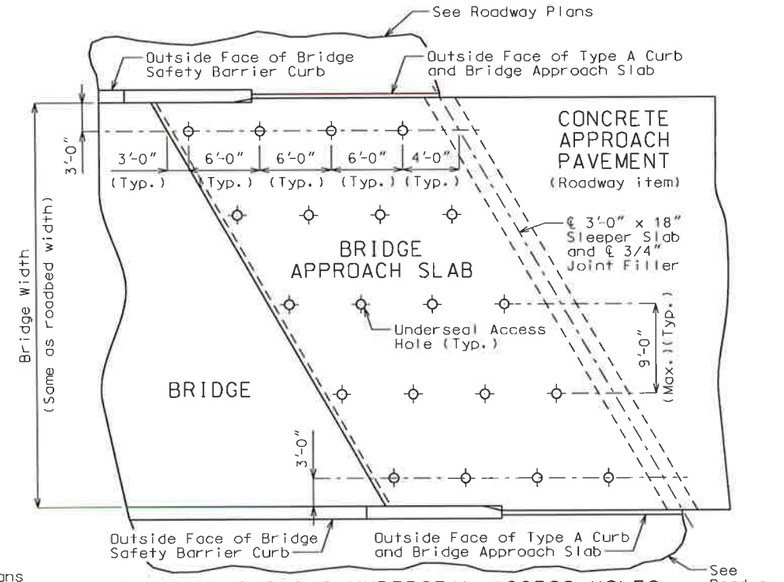
HORNER & SHIFRIN, INC.

...\S\51Pedestrian Railing.dgn 9:13:19 AM 12/9/2014

WILLOTT ROAD BRIDGE	SHEET 52
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



PART PLAN SHOWING REINFORCEMENT



PART PLAN SHOWING UNDERSEAL ACCESS HOLES

NOTE:
SEE ROADWAY PLANS FOR ADDITIONAL BRIDGE APPROACH SLAB GEOMETRY. ADJUST REINFORCEMENT ACCORDINGLY.

General Notes:

All concrete for the bridge approach slab and sleeper slab shall be in accordance with Sec 503 (f'c = 4,000 psi).

All joint filler shall be in accordance with Sec 1057 for preformed fiber expansion joint filler, except as noted.

The reinforcing steel in the bridge approach slab and the sleeper slab shall be epoxy coated Grade 60 with Fy = 60,000 psi.

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

The reinforcing steel in the bridge approach slab and the sleeper slab shall be continuous. The transverse reinforcing steel may be made continuous by lap splicing the #4 & #6 bars 18" and 2'-2", respectively.

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

The contractor shall pour and satisfactorily finish the bridge or semi-deep slab before pouring the bridge approach slabs.

Longitudinal construction joints in approach slab and sleeper slab shall be aligned with longitudinal construction joints in bridge or semi-deep slab.

Payment for furnishing all materials, labor and excavation necessary to construct the approach slab, including the timber header, sleeper slab, underdrain, Type 5 aggregate base, joint filler and all other appurtenances and incidental work as shown on this sheet, complete in place, will be considered completely covered by the contract unit price for Bridge Approach Slab (Bridge) per square yard.

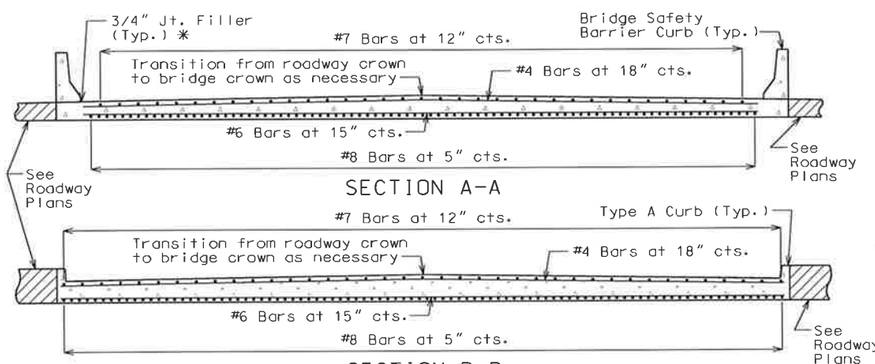
For Concrete Approach Pavement details, see roadway plans.

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

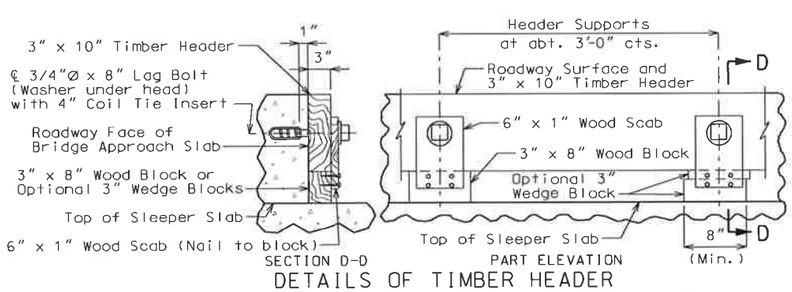
At the contractor's option, Grade 40 reinforcement may be substituted for the Grade 60 #5 dowel bars connecting the bridge approach slab to the bridge abutment. No additional payment will be made for this substitution.

When Grade 40 reinforcement is substituted for the Grade 60 #5 dowel bars connecting the bridge approach slab to the bridge abutment, the reinforcement may be bent up to 90 degrees with a 2" minimum radius near the abutment to allow compaction of the backfill material near the abutment. Damage to epoxy coating shall be repaired in accordance with Sec 710.

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

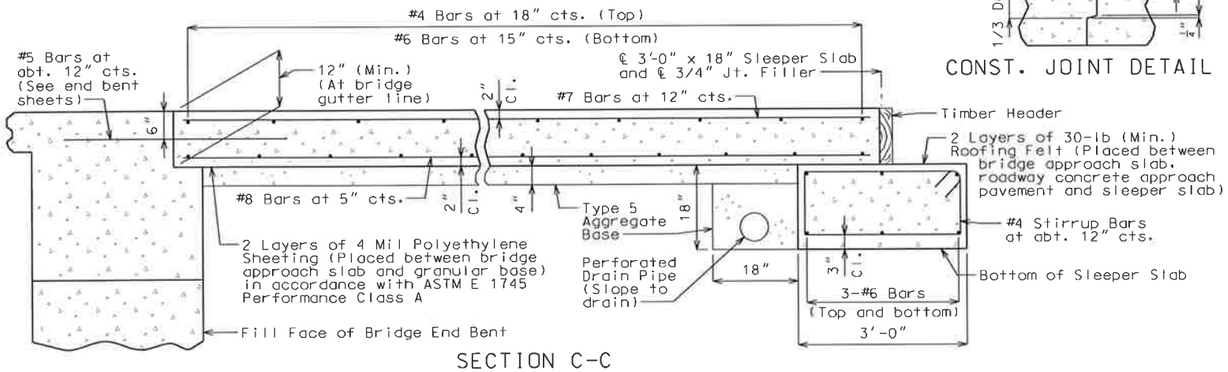


With the approval of the engineer, the contractor may crown the bottom of the approach slab to match the crown of the roadway surface.

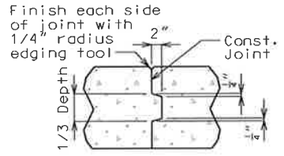


DETAILS OF TIMBER HEADER

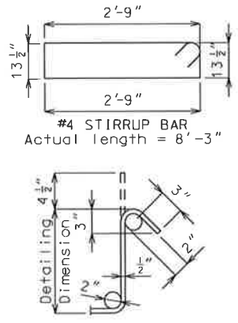
Remove timber header when concrete pavement is placed.



SECTION C-C

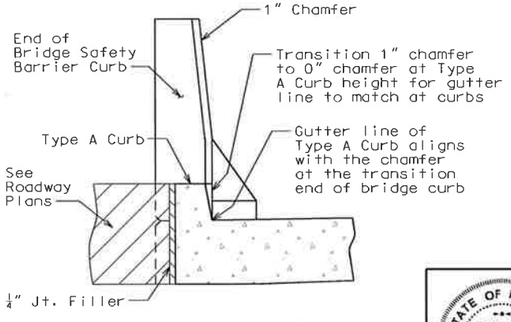


CONST. JOINT DETAIL

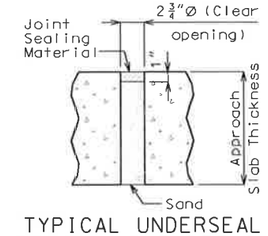


BENDING DIAGRAMS

Nominal lengths are based on out to out dimensions shown in bending diagram and are listed for fabricators use (nearest inch).



SECTION E-E
(Between curbs)
(See Roadway Plans for location of Type A curb)



TYPICAL UNDERSEAL ACCESS HOLE DETAIL

Designed: TPL
Detailed: CAB
Checked: CBW

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

THOMAS P. LORAN NUMBER PE-2009017711 PROFESSIONAL ENGINEER STATE OF MISSOURI
3-9-15

APPROACH SLAB DETIALS

HORNER & SHIFRIN, INC.

WILLOTT ROAD BRIDGE

SHEET 53 OF 70

CITY OF ST. PETERS

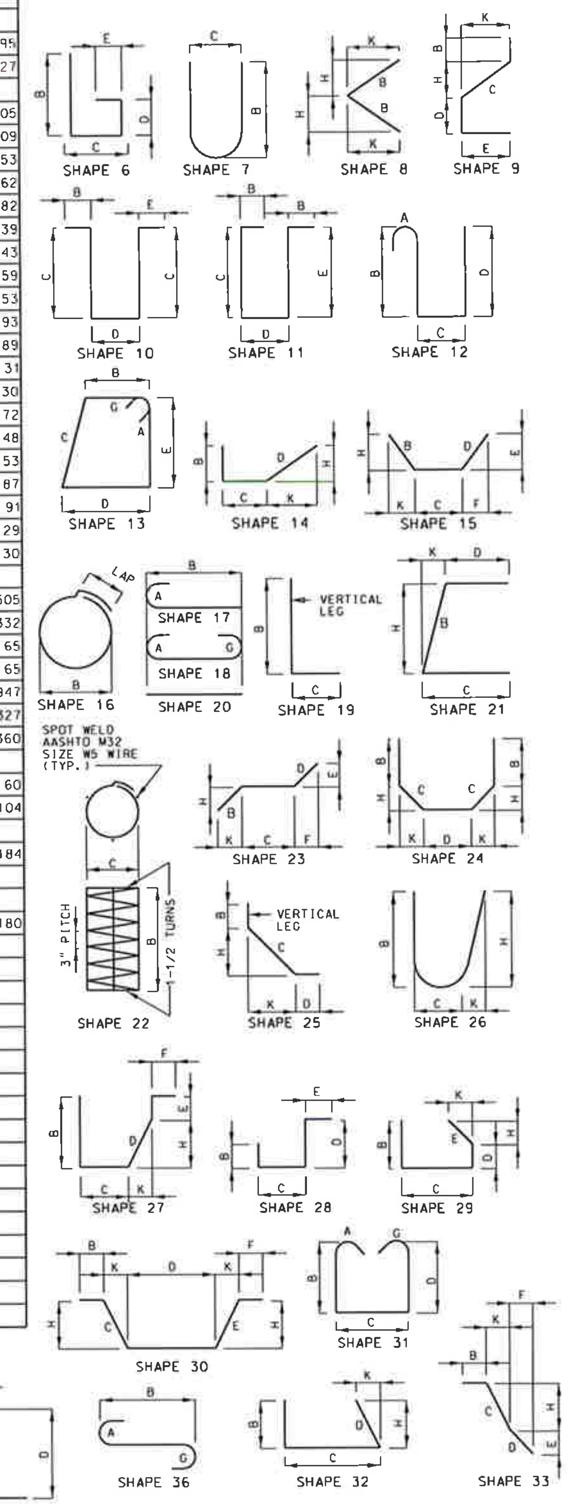
FEDERAL PROJECT NO. BRM-7305(610)

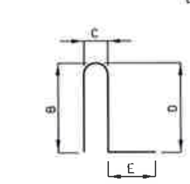
BILL OF REINFORCING STEEL

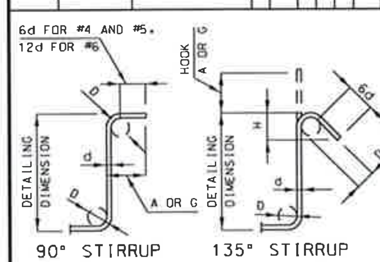
NO. REQ'D.	SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			SUBSTRUCTURE																									
			INT. BENT NO. 2																									
40	4	H201	WALL		20		X			35	3.000													35	3	35	3	942
20	4	H202	WALL		7		X			3	9.000	1	8.000											8	5	8	5	112
32	9	H203	BEAM		17		X			39	5.000													40	8	40	8	4425
24	6	H204	BEAM		20		X			37	2.000													37	2	37	2	1340
16	6	H205	BEAM		21		X			3	11.375	1	10.000	1	10.000					3	7.000	1	8.000	7	7	7	2	172
4	6	H206	BEAM		20		X			31	0.000													31	0	31	0	186
50	6	U201	BEAM		10	S	X					4	3.000	4	1.625									12	8	12	4	926
92	6	U202	BEAM		13	S	X			4	1.625	4	3.000	4	1.625	4	3.000							18	1	17	8	2441
62	4	U203	BEAM		10	S	X					1	0.000	4	1.625									6	2	6	0	248
142	4	V201	WALL		19		X			10	10.000	1	9.000											12	7	12	6	1186
30	6	V202	KEY		20		X			2	6.000													2	6	2	6	113

BILL OF REINFORCING STEEL

NO. REQ'D.	SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			SUPERSTRUCTURE																									
			END BENT NO. 1																									
9	6	F101	DIAPHRAGM		15	S				1	2.000	4	1.250	1	9.875	1	6.500	0	11.750	0	11.750	0	7.500	7	1	7	0	95
9	6	F103	DIAPHRAGM		15	S				1	2.000	6	2.250	2	0.750	1	1.375	1	8.875	0	7.500	0	11.750	9	5	9	5	127
8	8	H101	DIAPHRAGM	E	20					37	8.000													37	8	37	8	805
16	8	H102	BEAM		20					37	8.000													37	8	37	8	1609
8	6	H103	BEAM		20					37	8.000													37	8	37	8	453
4	6	H104	BEAM		20					27	0.000													27	0	27	0	162
15	6	H105	DIAPHRAGM		20					8	1.000													8	1	8	1	182
6	6	H106	DIAPHRAGM		20					37	8.000													37	8	37	8	339
6	5	H107	STRAND TIE BAR		20					6	11.000													6	11	6	11	43
9	6	H108	WING		21					1	4.000	10	8.625							1	2.500	0	6.750	12	1	11	9	159
9	6	H109	WING		21					1	4.000	10	3.750							1	2.500	0	6.750	11	8	11	4	153
3	8	H110	WING		21					1	4.000	10	8.625							1	2.500	0	6.750	12	1	11	7	93
3	8	H111	WING		21					1	4.000	10	3.750							1	2.500	0	6.750	11	8	11	2	89
1	8	H112	WING	E	21					1	4.000	10	8.625							1	2.500	0	6.750	12	1	11	7	31
1	8	H113	WING	E	21					1	4.000	10	3.750							1	2.500	0	6.750	11	8	11	2	30
66	5	H114	APPR. SLAB	E	20					2	6.000													2	6	2	6	172
9	6	H115	WING		14							9	8.250	1	4.000					1	2.500	0	6.750	11	0	10	11	148
9	6	H116	WING		14							10	1.250	1	4.000					1	2.500	0	6.750	11	5	11	4	153
3	8	H117	WING		14							9	8.250	1	4.000					1	2.500	0	6.750	11	0	10	11	87
3	8	H118	WING		14							10	1.250	1	4.000					1	2.500	0	6.750	11	5	11	4	91
1	8	H119	WING	E	14							9	8.250	1	4.000					1	2.500	0	6.750	11	0	10	11	29
1	8	H120	WING	E	14							10	1.250	1	4.000					1	2.500	0	6.750	11	5	11	4	30
39	5	U101	BEAM		10	S						4	9.500	3	0.375									12	7	12	5	505
42	4	U102	BEAM		13	S				3	0.375	2	7.500	3	0.375	2	7.500							12	1	11	10	332
12	4	U103	BEAM		10	S						2	7.500	3	0.375									8	3	8	1	65
20	4	U104	BEAM		10	S						1	0.000	3	0.375									5	0	4	10	65
87	6	U105	DIAPHRAGM	E	19	S				2	8.250	4	9.000											7	5	7	3	947
45	6	U106	DIAPHRAGM		19	S				1	11.000	3	0.375											4	11	4	10	327
45	5	U107	DIAPHRAGM	E	10	S						2	8.250	2	5.750									7	10	7	8	360
12	5	V101	BEAM		20					4	9.500													4	10	4	10	60
36	6	V102	DIAPHRAGM		20					1	11.000													1	11	1	11	104
20	6	V103	WING		20			V	2	6	3.500													6	4	6	4	
			INCREMENT =							5	11.000													5	11	5	11	184
			0.500 INCH																									
20	6	V104	WING		20			V	2	6	2.000													6	2	6	2	
			INCREMENT =							5	9.500													5	10	5	10	180
			0.500 INCH																									

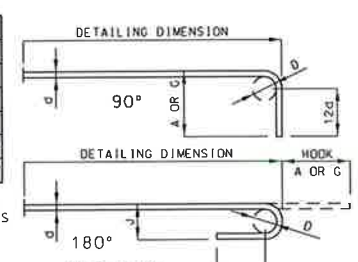






STIRRUP HOOK DIMENSIONS				
GRADES 40 - 50 - 60 KSI				
BAR SIZE	D (IN.)	90° HOOK	135° HOOK	
		HOOK A OR G	HOOK A OR G	APPROX. H
#4	2"	4 1/2"	4 1/2"	3"
#5	2 1/2"	6"	5 1/2"	3 3/4"
#6	4 1/2"	12"	8"	4 1/2"

NOTE: UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR.



END HOOK DIMENSIONS				
		ALL GRADES		
BAR SIZE	D (IN.)	180° HOOKS		90° HOOKS
		A OR G	J	A OR G
#3	2 1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	12"
#7	5 1/4"	10"	7"	14"
#8	6"	11"	8"	16"
#9	9 1/2"	15"	11 3/4"	19"
#10	10 3/4"	17"	13 1/4"	22"
#11	12"	19"	14 3/4"	2'-0"
#14	18 1/4"	2'-3"	21 3/4"	2'-7"

NOTE:
ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEGREE STANDARD HOOKS.
HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.
E = EPOXY COATED REINFORCEMENT.
S = STIRRUP.
X = BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES.
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.
NOMINAL LENGTHS ARE BASED ON OUT TO OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)
ACTUAL LENGTHS ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.
PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.
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.

Designed: MAC
Detailed: MAC
Checked: TPL

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

BILL OF REINFORCING

HORNER & SHIFRIN, INC.

STATE OF MISSOURI THOMAS P. ... PROFESSIONAL ENGINEER

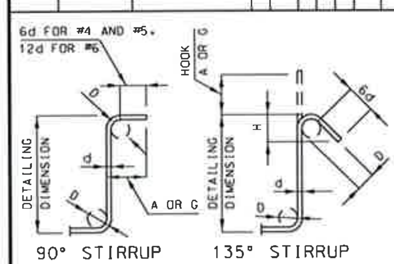
WILLOTT ROAD BRIDGE	SHEET 54 OF 70
CITY OF ST. PETERS	
FEDERAL PROJECT NO. BRM-7305(610)	

BILL OF REINFORCING STEEL

No. Req'd	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 NO. 3																
9	6	F301	DIAPHRAGM		15	S				1 2.000	4 1.250	1 9.875	1 6.500	0 11.750	0 11.750	0 7.500	7 1	7 0	95
9	6	F303	DIAPHRAGM		15	S				1 2.000	6 2.250	2 0.750	1 1.375	1 8.875	0 7.500	0 11.750	9 5	9 5	127
8	7	H301	DIAPHRAGM	E	20					37 8.000							37 8	37 8	616
16	7	H302	BEAM		20					37 8.000							37 8	37 8	1232
8	6	H303	BEAM		20					37 8.000							37 8	37 8	453
4	6	H304	BEAM		20					27 0.000							27 0	27 0	162
15	6	H305	DIAPHRAGM		20					8 1.000							8 1	8 1	182
6	6	H306	DIAPHRAGM		20					37 8.000							37 8	37 8	339
6	5	H307	STRAND TIE BAR		20					6 11.000							6 11	6 11	43
9	6	H308	WING		21					1 4.000	10 8.625				1 2.500	0 6.750	12 1	11 9	159
9	6	H309	WING		21					1 4.000	10 3.750				1 2.500	0 6.750	11 8	11 4	153
3	8	H310	WING		21					1 4.000	10 8.625				1 2.500	0 6.750	12 1	11 7	93
3	8	H311	WING		21					1 4.000	10 3.750				1 2.500	0 6.750	11 8	11 2	89
1	8	H312	WING	E	21					1 4.000	10 8.625				1 2.500	0 6.750	12 1	11 7	31
1	8	H313	WING	E	21					1 4.000	10 3.750				1 2.500	0 6.750	11 8	11 2	30
66	5	H314	APPR. SLAB	E	20					2 6.000							2 6	2 6	172
9	6	H315	WING		14						9 8.250	1 4.000			1 2.500	0 6.750	11 0	10 11	148
9	6	H316	WING		14						10 1.250	1 4.000			1 2.500	0 6.750	11 5	11 4	153
3	8	H317	WING		14						9 8.250	1 4.000			1 2.500	0 6.750	11 0	10 11	87
3	8	H318	WING		14						10 1.250	1 4.000			1 2.500	0 6.750	11 5	11 4	91
1	8	H319	WING	E	14						9 8.250	1 4.000			1 2.500	0 6.750	11 0	10 11	29
1	8	H320	WING	E	14						10 1.250	1 4.000			1 2.500	0 6.750	11 5	11 4	30
39	5	U301	BEAM		10	S					4 8.500	3 0.375					12 5	12 3	498
42	4	U302	BEAM		13	S				3 0.375	2 7.500	3 0.375	2 7.500				12 1	11 10	332
12	4	U303	BEAM		10	S					2 7.500	3 0.375					8 3	8 1	65
20	4	U304	BEAM		10	S					1 0.000	3 0.375					5 0	4 10	65
87	6	U305	DIAPHRAGM	E	19	S				2 7.250	4 9.000						7 4	7 2	936
45	6	U306	DIAPHRAGM		19	S				1 10.000	3 0.375						4 10	4 9	321
45	5	U307	DIAPHRAGM	E	10	S					2 7.250	2 5.750					7 8	7 6	352
12	5	V301	BEAM		20					4 8.500							4 9	4 9	59
36	6	V302	DIAPHRAGM		20					1 10.000							1 10	1 10	99
20	6	V303	WING		20			V	2	6 0.500							6 1	6 1	
			INCREMENT =							5 8.000							5 8	5 8	176
			0.500 INCH																
20	6	V304	WING		20			V	2	6 2.000							6 2	6 2	
			INCREMENT =							5 9.500							5 10	5 10	180
			0.500 INCH																
			INT. DIAPH.																
20	6	H401	INT. DIAPH.		20					8 1.000							8 1	8 1	243
20	4	H402	INT. DIAPH.		20					8 1.000							8 1	8 1	108
4	5	H403	INT. DIAPH.		20					5 11.000							5 11	5 11	25
8	5	H404	INT. DIAPH.		20					7 1.000							7 1	7 1	59
20	6	U401	INT. DIAPH.	E	28	S					3 7.000	2 6.500	1 2.000				7 4	7 0	210
70	4	U402	INT. DIAPH.	E	28	S					3 7.000	2 6.250	1 0.000				7 1	6 11	323
12	5	U403	INT. DIAPH.		19	S				5 10.000	1 1.250						6 11	6 10	86
8	5	V401	INT. DIAPH.		20					2 0.000							2 0	2 0	17

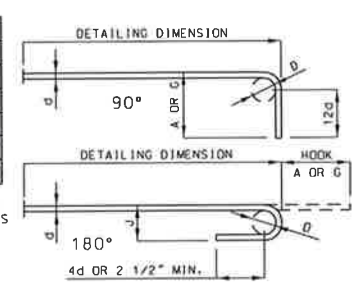
BILL OF REINFORCING STEEL

No. Req'd	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.)
			SLAB																
142	6	S1	SLAB	E	20					36 5.000							36 5	36 5	7767
100	5	S2	SLAB	E	20					45 2.000							45 2	45 2	4711
194	5	S3	SLAB	E	20					14 11.000							14 11	14 11	3018
60	5	S4	SLAB	E	20					44 10.000							44 10	44 10	2806
149	6	S5	SLAB	E	20					27 9.000							27 9	27 9	6210
62	6	S6	SLAB	E	20			V	2	35 2.750							35 3	35 3	
			INCREMENT =							3 0.500							3 1	3 1	1785
			12.875 INCH																
32	5	S7	SLAB	E	20			V	4	14 4.625							14 5	14 5	
			INCREMENT =							1 11.000							1 11	1 11	273
			21.375 INCH																
49	7	S8	SLAB	E	20					37 9.000							37 9	37 9	3781
49	7	S9	SLAB	E	20					25 6.000							25 6	25 6	2554
48	6	S10	SLAB	E	20			V	2	27 2.125							27 2	27 2	
			INCREMENT =							2 6.000							2 6	2 6	1069
			12.875 INCH																
			SAFETY																
			BARRIER CURB																
136	5	K1	BARRIER CURB	E	19	S				2 5.000	0 5.125						2 10	2 9	390
136	5	K2	BARRIER CURB	E	14	S				0 5.125	0 11.125	1 6.000			0 2.000	1 5.875	2 10	2 9	390
92	5	K3	BARRIER CURB	E	27	S				1 11.250	0 5.125	1 0.000	1 1.375	1 0.000	0 9.875	0 6.875	5 6	5 3	504
44	5	K4	BARRIER CURB	E	50					1 11.250	0 6.000	1 11.250	1 0.000				5 5	5 0	229
4	5	K5	BARRIER CURB	E	27	S					0 4.375	0 6.750	1 5.750	1 0.000	0 5.500	0 4.000	3 5	3 3	14
4	5	K6	BARRIER CURB	E	27	S					0 4.375	0 7.875	1 4.750	1 0.000	0 6.500	0 4.500	3 5	3 3	14
4	5	K7	BARRIER CURB	E	27	S					0 4.375	0 9.625	1 3.375	1 0.000	0 7.875	0 5.500	3 5	3 3	14
4	5	K8	BARRIER CURB	E	27	S					0 4.375	0 11.250	1 2.000	1 0.000	0 9.250	0 6.500	3 6	3 4	14
48	5	K9	BARRIER CURB	E	20					5 7.000							5 7	5 7	280
10	4	K10	BARRIER CURB	E	20					13 4.000							13 4	13 4	89
4	5	K11	BARRIER CURB	E	8					2 2.125					2 2.000	0 2.375	4 4	4 4	18
10	4	K12	BARRIER CURB	E	20					13 10.000							13 10	13 10	92
10	4	K13	BARRIER CURB	E	20					18 2.000							18 2	18 2	121
10	4	K14	BARRIER CURB	E	20					13 6.000							13 6	13 6	90
169	5	R1	BARRIER CURB	E	26					2 6.000	0 4.250				2 6.000	0 3.000	5 3	5 2	911
169	5	R3	BARRIER CURB	E	19	S				1 5.000	0 6.000						1 11	1 10	323
169	5	R4	BARRIER CURB	E	27	S					0 6.000	0 11.250	0 7.000	1 0.000	0 9.250	0 6.375	3 0	2 10	499
7	5	R5	BARRIER CURB	E	20					42 9.000							42 9	42 9	312
14	5	R6	BARRIER CURB	E	20					9 9.000							9 9	9 9	142
14	5	R7	BARRIER CURB	E	20					7 3.000							7 3	7 3	106
7	5	R8	BARRIER CURB	E	20					20 10.000							20 10	20 10	152
7	5	R9	BARRIER CURB	E	20					43 4.000							43 4	43 4	316
7	5	R10	BARRIER CURB	E	20					20 3.000							20 3	20 3	148
			SLIP FORM																
			OPTION																
20	5	C1	SLIP FORM	E	20					10 0.000							10 0	10 0	209
8	5	C2	SLIP FORM	E	20					13 4.000							13 4	13 4	111
4	5	C3	SLIP FORM	E	20					7 6.000							7 6	7 6	31



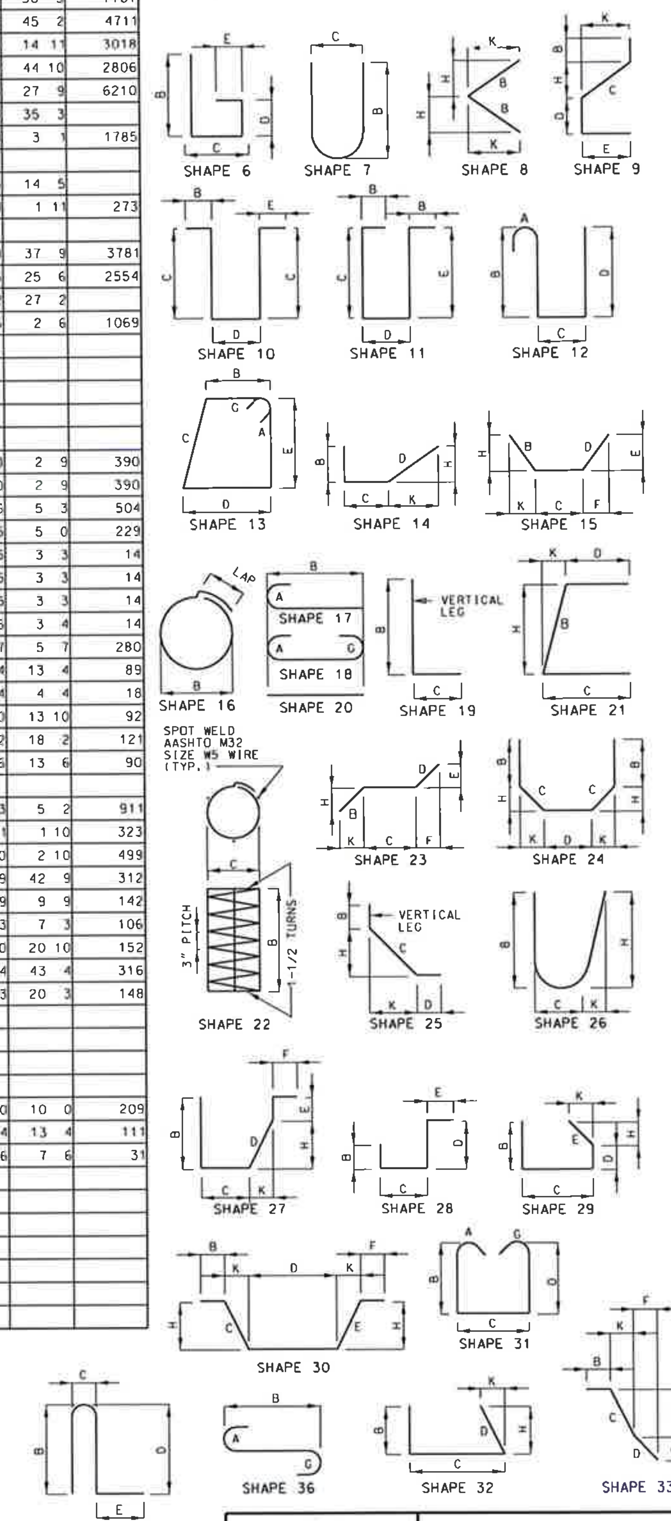
STIRRUP HOOK DIMENSIONS				
GRADES 40 - 50 - 60 KSI				
BAR SIZE	D (IN.)	90° HOOK: HOOK A OR G	135° HOOK: HOOK A OR G	135° HOOK: APPROX. H
#4	2"	4 1/2"	4 1/2"	3"
#5	2 1/2"	6"	5 1/2"	3 3/4"
#6	4 1/2"	12"	8"	4 1/2"

NOTE: UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR.



END HOOK DIMENSIONS				
		ALL GRADES		
BAR SIZE	D (IN.)	180° HOOKS: A OR G	180° HOOKS: J	90° HOOKS: A OR G
#3	2 1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	12"
#7	5 1/4"	10"	7"	14"
#8	6"	11"	8"	16"
#9	9 1/2"	15"	11 3/4"	19"
#10	10 3/4"	17"	13 1/4"	22"
#11	12"	19"	14 3/4"	2'-0"
#14	18 1/4"	2'-3"	21 3/4"	2'-7"

NOTE:
ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEGREE STANDARD HOOKS.
HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.
E = EPOXY COATED REINFORCEMENT.
S = STIRRUP.
X = BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES.
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.
NOMINAL LENGTHS ARE BASED ON OUT TO OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)
ACTUAL LENGTHS ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.
PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.
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.



BILL OF REINFORCING

HORNER & SHIFRIN, INC.

Designed: MAC
Detailed: MAC
Checked: TPL

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

barbill_1 Effective: Aug. 2008 Supercedes: Feb. 2006

BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. SIZE	MARK	LOCATION	(E) EPOXY	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.
			TOTALS																							
	4																									3520
	4			E																						715
	5																									1395
	5			E																						16991
	6																									10934
	6			E																						18924
	7																									1232
	7			E																						6951
	8																									2329
	8			E																						1045
	9																									4425
			Total																							23835
			Total	E																						44626
			Slab on Girder																							
	4																									1032
	4			E																						323
	5																									1395
	5			E																						11864
	6																									5756
	6			E																						18924
	7																									1232
	7			E																						6951
	8																									2329
	8			E																						1045
			Total																							11744
			Total	E																						39107
			Reinforcing Steel (Bridges)																							
	4																									2488
	6																									5178
	9																									4425
			Total																							12091
			Safety Barrier Curb																							
	4			E																						392
	5			E																						4776
			Total	E																						5168
			Slip Form Option																							
	5			E																						351
			Total	E																						351

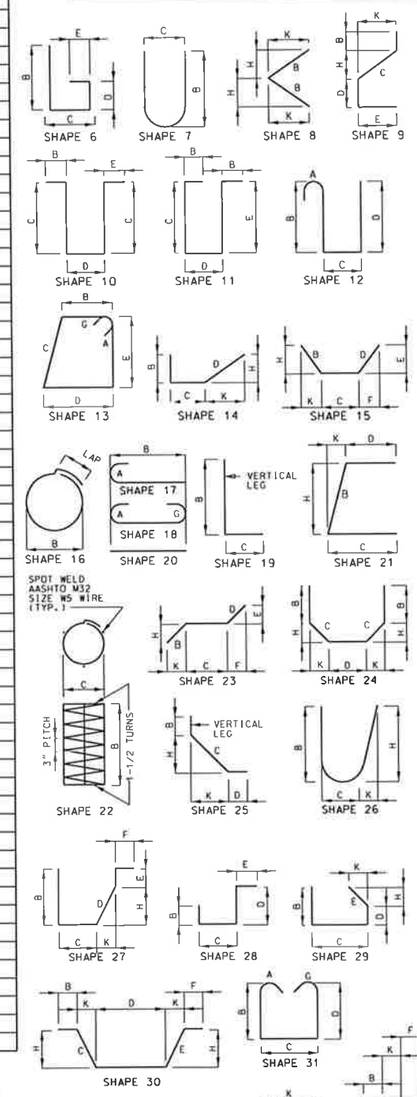
BILL OF REINFORCING STEEL

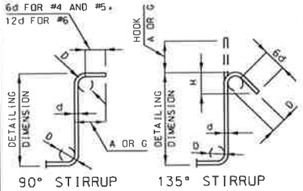
NO. REQ'D.	MARK NO. SIZE	MARK	LOCATION	(E) EPOXY	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.

WILLOTT ROAD BRIDGE — SHEET 55

CITY OF ST. PETERS — OF 70

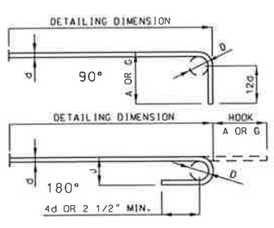
FEDERAL PROJECT NO. BRM-7305(610)





STIRRUP HOOK DIMENSIONS			
GRADES 40 - 50 - 60 KSI			
BAR SIZE	D (IN.)	90° HOOK A OR G	135° HOOK A OR G	135° HOOK APPROX. H
#4	2"	4 1/2"	4 1/2"	3"
#5	2 1/2"	6"	5 1/2"	3 3/4"
#6	4 1/2"	12"	8"	4 1/2"

NOTE: UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR.



END HOOK DIMENSIONS				
		ALL GRADES		
BAR SIZE	D (IN.)	180° HOOKS A OR G	180° HOOKS J	90° HOOKS A OR G
#3	2 1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	12"
#7	5 1/4"	10"	7"	14"
#8	6"	11"	8"	16"
#9	9 1/2"	15"	11 3/4"	19"
#10	10 3/4"	17"	13 1/4"	22"
#11	12"	19"	14 3/4"	2'-0"
#14	18 1/4"	2'-3"	21 3/4"	2'-7"

NOTE:
ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEGREE STANDARD HOOKS.
HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.
E = EPOXY COATED REINFORCEMENT.
S = STIRRUP.
X = BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES.
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.
NOMINAL LENGTHS ARE BASED ON OUT TO OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)
ACTUAL LENGTHS ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.
PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.
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.

STATE OF MISSOURI THOMAS R. LOMAN ENGINEER PE-2001018771 PROFESSIONAL ENGINEER 3/4/15

BILL OF REINFORCING

HORNER & SHIFRIN, INC.

Designed: MAC
Detailed: MAC
Checked: TPL

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

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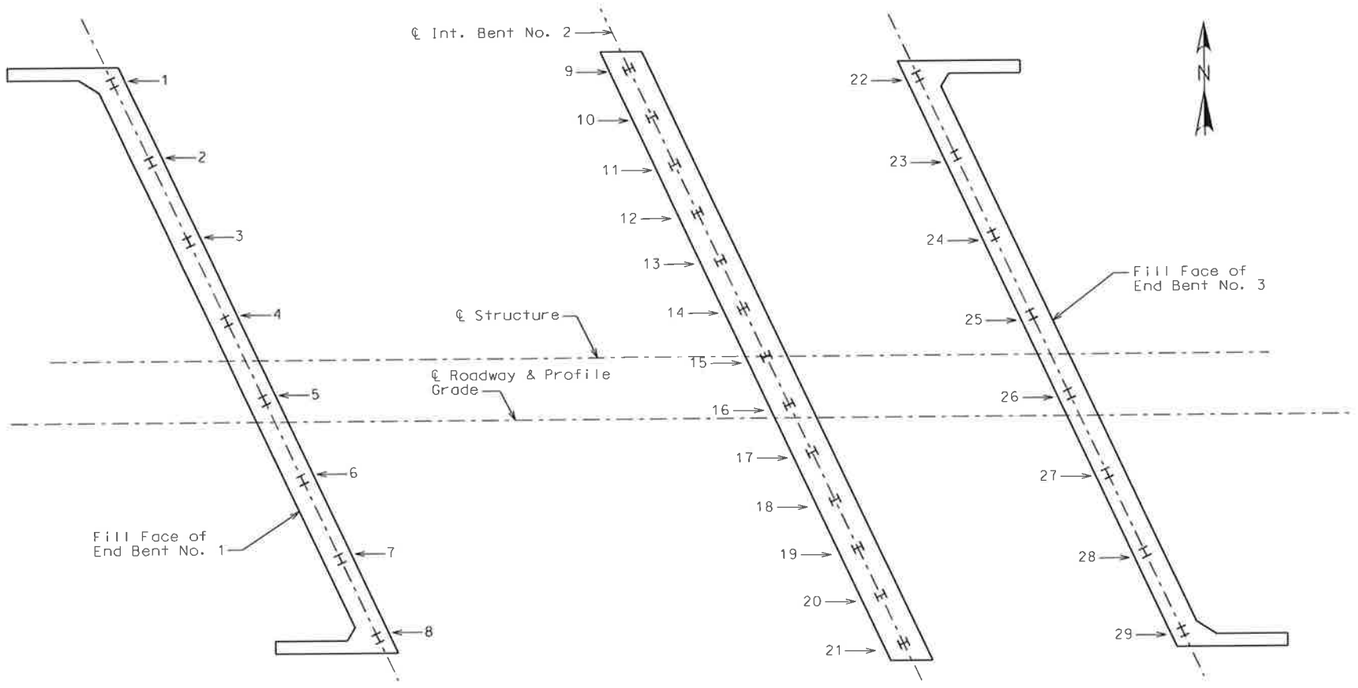
WILLOTT ROAD BRIDGE	SHEET 56
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



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

"AS BUILT PILE" DATA			
PILE NO.	LENGTH IN PLACE (FT.)	COMPUTED AXIAL COMPRESSIVE RESISTANCE (KIPS)	REMARKS
			End Bent No. 1
1			
2			
3			
4			
5			
6			
7			
8			

"AS BUILT PILE" DATA			
PILE NO.	LENGTH IN PLACE (FT.)	COMPUTED AXIAL COMPRESSIVE RESISTANCE (KIPS)	REMARKS
			Int. Bent No. 2
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

"AS BUILT PILE" DATA			
PILE NO.	LENGTH IN PLACE (FT.)	COMPUTED AXIAL COMPRESSIVE RESISTANCE (KIPS)	REMARKS
			End Bent No. 3
22			
23			
24			
25			
26			
27			
28			
29			

NOTE: INDICATE IN REMARKS 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
CITY OF ST. PETERS CONSTRUCTION PERSONNEL.

Designed: TPL
Detailed: CAB
Checked: TPL

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

STATE OF MISSOURI
THOMAS P. LOMAN
PE-2009018771
PROFESSIONAL ENGINEER
3-9-15

AS-BUILT PILE DATA

HORNER & SHIFRIN, INC.

...\S\56 As-Built Pile Data.dgn 9:03:22 AM 12/9/2014

LOG OF BORING NO. B-1

Project Description: **New Willott Road Bridge over Spencer Creek**
St. Peters, Missouri

TSI Engineering Inc.
5850 Arsenal Street
St. Louis, Missouri 63139
(314) 644-3134 (314) 644-3135 FAX

Surface El.: **Approx. 492.5**
Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, lean CLAY (CL), with grass and roots										
				Dark brown, lean CLAY (CL), trace limestone pieces (FILL)										
5		SS-1			50		4 4 5				21			
		SS-2		Brown, lean CLAY (CL) (FILL) - gray, trace limestone pieces below 6.3 ft.	100		7 11 13	>4.50			17			
		ST-3		Gray, lean CLAY (CL)	96			2.00	0.55	95	26	39	24	15
10		SS-4			100		3 4 4	1.25			24			
15		SS-5			100		2 2 3	1.25			16			
		ST-6			92			<0.25	0.30	98	26			
20														
		SS-7		Brown, clayey GRAVEL (GC), with sand	50		11 17 14				21			
25														

Completion Depth: 27.2
Date Boring Started: 12/11/13
Date Boring Completed: 12/11/13
Engineer/Geologist: KKH
Project No.: 20131365.00

Remarks: Boring drilled with CME 550 using HSA and auto SPT. Groundwater encountered at 24.0 ft. during drilling. Delayed groundwater level at 24.5 ft. after 0.25 hrs. Auger refusal at 27.2 ft.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

LOG WITH LAB WILLOTT ROAD BRIDGE.GPJ 1/29/14

LOG OF BORING NO. B-1

Project Description: **New Willott Road Bridge over Spencer Creek**
St. Peters, Missouri

TSI Engineering Inc.
5850 Arsenal Street
St. Louis, Missouri 63139
(314) 644-3134 (314) 644-3135 FAX

Surface El.: **Approx. 492.5**
Location: **See Site and Boring Location Plan**

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, clayey GRAVEL (GC), with sand *(continued)*										
				Gray, weathered LIMESTONE										
				Boring terminated at 27.2 ft.										
30														
35														
40														
45														
50														

Completion Depth: 27.2
Date Boring Started: 12/11/13
Date Boring Completed: 12/11/13
Engineer/Geologist: KKH
Project No.: 20131365.00

Remarks: Boring drilled with CME 550 using HSA and auto SPT. Groundwater encountered at 24.0 ft. during drilling. Delayed groundwater level at 24.5 ft. after 0.25 hrs. Auger refusal at 27.2 ft.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

LOG WITH LAB WILLOTT ROAD BRIDGE.GPJ 1/29/14

Note: For locations of borings, see Sheet No. 27.

Designed: TPL
Detailed: CAB
Checked: MAB

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

STATE OF MISSOURI — THOMAS P. LOHMAN — PROFESSIONAL ENGINEER

BORING DATA

HORNER & SHIFRIN, INC.

WILLOTT ROAD BRIDGE	SHEET 58
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

LOG OF BORING NO. B-2

Project Description: **New Willott Road Bridge over Spencer Creek St. Peters, Missouri**

TSi Engineering Inc.
5850 Arsenal Street
St. Louis, Missouri 63139
(314) 644-3134 (314) 644-3135 FAX

Surface El.: **Approx. 493.5**
Location: **See Site and Boring Location Plan**

Depth, feet	Sample #	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown, lean CLAY (CL), with grass and roots										
		Brown, lean CLAY (CL), trace fine roots										
5	SS-1		50		4 4 4				20			
	SS-2	Gray, lean CLAY (CL)	89		3 5 5	2.25			25			
		- with silt layers from 6.0 to 8.0 ft.										
10	SS-3		83		2 4 3	1.00			26			
	SS-4	- with decayed wood pieces from 11.0 to 15.0 ft.	67		2 4 3				31			
15	SS-5		67		8 13 13							
20	SS-6		67		4 2 2	0.50			27			
		Brown, clayey GRAVEL (GC), trace sand										
25	SS-7	(23% passing No. 200 sieve)	44		11 16 12				18			

Completion Depth: 38.5
Date Boring Started: 12/12/13
Date Boring Completed: 12/12/13
Engineer/Geologist: KKH
Project No.: 20131365.00

Remarks: Boring drilled with CME 550 using HSA and auto SPT. Groundwater encountered at 23.0 ft. during drilling. Delayed groundwater level at 27.0 ft. after 0.25 hrs. ST-5 refusal at 13.5 ft.; drove SS-5 from 13.5 to 15.0 ft. ST-7 refusal at 23.0 ft.; drove SS-7 from 23.0 to 24.5 ft. Auger refusal at 28.5 ft.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

LOG WITH LAB WILLOTT ROAD BRIDGE.GPJ 1/29/14

Continued Next Page

LOG OF BORING NO. B-2

Project Description: **New Willott Road Bridge over Spencer Creek St. Peters, Missouri**

TSi Engineering Inc.
5850 Arsenal Street
St. Louis, Missouri 63139
(314) 644-3134 (314) 644-3135 FAX

Surface El.: **Approx. 493.5**
Location: **See Site and Boring Location Plan**

Depth, feet	Sample #	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown, clayey GRAVEL (GC), trace sand *(continued)*										
30	RUN1	LIMESTONE, gray, moderately hard, slightly weathered, finely crystalline, thin to medium bedded - chert nodule at 29.2 ft.	100	43								
	RUN2	- with chert nodules below 31.8 ft.	97	57								
		- 0.5" soft, brown clay seam at 33.2 ft.										
35	RUN3		98	41								
		Boring terminated at 38.5 ft.										
40												
45												
50												

Completion Depth: 38.5
Date Boring Started: 12/12/13
Date Boring Completed: 12/12/13
Engineer/Geologist: KKH
Project No.: 20131365.00

Remarks: Boring drilled with CME 550 using HSA and auto SPT. Groundwater encountered at 23.0 ft. during drilling. Delayed groundwater level at 27.0 ft. after 0.25 hrs. ST-5 refusal at 13.5 ft.; drove SS-5 from 13.5 to 15.0 ft. ST-7 refusal at 23.0 ft.; drove SS-7 from 23.0 to 24.5 ft. Auger refusal at 28.5 ft.

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

LOG WITH LAB WILLOTT ROAD BRIDGE.GPJ 1/29/14

Note: For locations of borings, see Sheet No. 27.

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

STATE OF MISSOURI
THOMAS P. LOGAN
PROFESSIONAL ENGINEER

BORING DATA

HORNER & SHIFRIN, INC.

Designed: TPL
Detailed: CAB
Checked: MAB

LOG OF BORING NO. B-3

Project Description: **New Willott Road Bridge over Spencer Creek**
St. Peters, Missouri

TSi Engineering Inc.
5850 Arsenal Street
St. Louis, Missouri 63139
(314) 644-3134 (314) 644-3135 FAX

Surface El.: **Approx. 492.0**
Location: **See Site and Boring Location Plan**

Sample #	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
	Brown, lean CLAY (CL), with grass and roots										
	Brown, lean CLAY (CL), trace fine roots and limestone pieces (FILL)										
SS-1		61		4 5 4				17			
ST-2		92			2.25	0.63	100	25			
SS-3	Brown, lean CLAY (CL), trace metal pieces (FILL)	78		18 16 7				23			
	Brown and gray, lean CLAY (CL)										
ST-4		25						26	33	23	10
SS-5	- trace fine sand from 13.5 to 15.0 ft.	100		2 2 4	<0.25			25			
SS-6		100		1 2 2	<0.25			26			
	Brown, clayey GRAVEL (GC), with sand and cherty limestone pieces										
SS-7		44		13 9 10				18			

Depth, feet: 5, 10, 15, 20, 25

Completion Depth: 39.0
Date Boring Started: 12/11/13
Date Boring Completed: 12/11/13
Engineer/Geologist: KKH
Project No.: 20131365.00

Remarks: Boring drilled with CME 550 using HSA and auto SPT. Groundwater encountered at 18.0 ft. during drilling. Auger refusal at 29.0 ft.

LOG WITH LAB WILLOTT ROAD BRIDGE.GPJ 1/29/14

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Continued Next Page

LOG OF BORING NO. B-3

Project Description: **New Willott Road Bridge over Spencer Creek**
St. Peters, Missouri

TSi Engineering Inc.
5850 Arsenal Street
St. Louis, Missouri 63139
(314) 644-3134 (314) 644-3135 FAX

Surface El.: **Approx. 492.0**
Location: **See Site and Boring Location Plan**

Sample #	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
	Brown, clayey GRAVEL (GC), with sand and cherty limestone pieces *(continued)*										
SS-8	- with weathered limestone pieces below 28.5 ft.	100		50/3"				9			
	LIMESTONE, gray, moderately hard, slightly weathered, finely to medium crystalline, thin to medium bedded										
RUN1	- with chert nodules below 30.0 ft.	97	48								
	- possible clay seam from 35.0 to 35.2 ft.										
RUN2	- cherty from 35.0 to 37.0 ft.	92	48								
	Boring terminated at 39.0 ft.										

Depth, feet: 30, 35, 40, 45, 50

Completion Depth: 39.0
Date Boring Started: 12/11/13
Date Boring Completed: 12/11/13
Engineer/Geologist: KKH
Project No.: 20131365.00

Remarks: Boring drilled with CME 550 using HSA and auto SPT. Groundwater encountered at 18.0 ft. during drilling. Auger refusal at 29.0 ft.

LOG WITH LAB WILLOTT ROAD BRIDGE.GPJ 1/29/14

The stratification lines represent approximate strata boundaries. In situations, the transition may be gradual.

Note: For locations of borings, see Sheet No. 27.

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

Designed: TPL
Detailed: CAB
Checked: MAB

STATE OF MISSOURI — THOMAS P. ... NUMBER PE-2008018771 — PROFESSIONAL ENGINEER

BORING DATA

HORNER & SHIFRIN, INC.

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LOG OF BORING NO. B-4

Project Description: **New Willott Road Bridge over Spencer Creek**
St. Peters, Missouri

TSI Engineering Inc.
5850 Arsenal Street
St. Louis, Missouri 63139
(314) 644-3134 (314) 644-3135 FAX

Surface El.: **Approx. 493.0**
Location: **See Site and Boring Location Plan**
Sewer Invert Depth:

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, lean CLAY (CL), with grass and roots										
				Brown, lean CLAY (CL), with limestone pieces (FILL)										
5		SS-1			61		11 10 7				14			
		ST-2		Brown, lean CLAY (CL) (FILL)	94			>4.50		100	17			
10		SS-3			50		3 5 5				22			
		SS-4		Brown, lean CLAY (CL) - trace sand from 11.0 to 12.5 ft.	89		2 1 1				21			
		ST-5		- sandy from 13.0 to 15.0 ft. (56% passing No. 200 sieve)	63					95	19			
15														
		SS-6		- brown and gray below 18.5 ft.	100		1 2 2	<0.25			30			
				Brown, lean CLAY (CL), with gravel and cherty limestone pieces										
20		SS-7			56		11 13 12				18			
25														

Completion Depth:	31.1
Date Boring Started:	12/11/13
Date Boring Completed:	12/11/13
Engineer/Geologist:	KKH
Project No.:	20131365.00

Remarks: Boring drilled with CME 550 using HSA and auto SPT.
Groundwater encountered at 24.0 ft. during drilling.
ST-2 refusal at 7.5 ft.
Auger refusal at 31.0 ft.

The stratification lines represent approximate strata boundaries.
In situations, the transition may be gradual.

Continued Next Page

MSD LOGS WITH LAB WILLOTT ROAD BRIDGE.GPJ 1/30/14

LOG OF BORING NO. B-4

Project Description: **New Willott Road Bridge over Spencer Creek**
St. Peters, Missouri

TSI Engineering Inc.
5850 Arsenal Street
St. Louis, Missouri 63139
(314) 644-3134 (314) 644-3135 FAX

Surface El.: **Approx. 493.0**
Location: **See Site and Boring Location Plan**
Sewer Invert Depth:

Depth, feet	Samples	Sample #	Graphic Log	MATERIAL DESCRIPTION	Recovery %	RQD	Penetration Blows Per 6 inches	Hand Penetrometer TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
				Brown, lean CLAY (CL), with gravel and cherty limestone pieces *(continued)*										
30		SS-8		Brownish red, fat CLAY (CH), with limestone pieces	50		5 7 8				21			
		SS-9		Gray, weathered LIMESTONE	100		50/1"				4			
				Boring terminated at 31.1 ft.										
35														
40														
45														
50														

Completion Depth:	31.1
Date Boring Started:	12/11/13
Date Boring Completed:	12/11/13
Engineer/Geologist:	KKH
Project No.:	20131365.00

Remarks: Boring drilled with CME 550 using HSA and auto SPT.
Groundwater encountered at 24.0 ft. during drilling.
ST-2 refusal at 7.5 ft.
Auger refusal at 31.0 ft.

The stratification lines represent approximate strata boundaries.
In situations, the transition may be gradual.

MSD LOGS WITH LAB WILLOTT ROAD BRIDGE.GPJ 1/30/14

Note: For locations of borings, see Sheet No. 27.

Designed: TPL
Detailed: CAB
Checked: MAB

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

STATE OF MISSOURI
THOMAS P. LOHMAR
NUMBER 2006017
PROFESSIONAL ENGINEER
3-9-15

BORING DATA

HORNER & SHIFRIN, INC.

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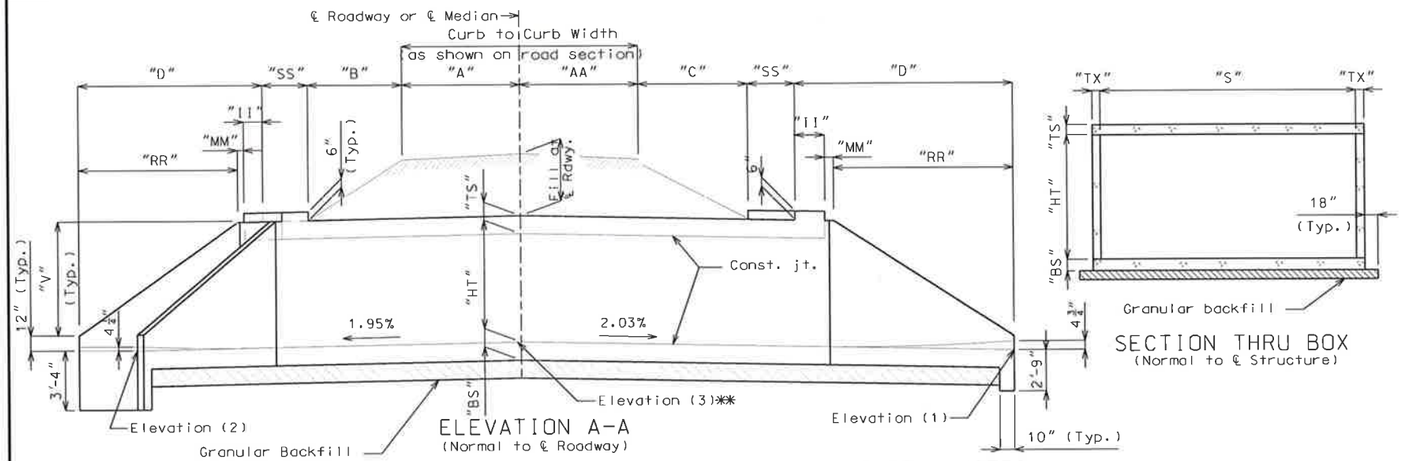
SEC/SUR TWP 46N RGE 4E

WILLOTT ROAD BRIDGE	SHEET 61
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



Note: If unsuitable material is encountered, excavation of unsuitable material and furnishing and placing of granular backfill shall be in accordance with Sec 206.

** Elevation is NOT at centerline of roadway.

GENERAL DATA TABLE

VARIABLE	EQUATION	DIM.	VARIABLE	EQUATION	DIM.
"S"	- - -	14'-0"	"O"	TX(cos 20°)	8½"
"HT"	- - -	10-'0"	"R"	P(cos 20°)	23'-1½"
"TS"	- - -	13"			
"BS"	- - -	12"	"U"	(R + M)(tan 20°)	8'-6⅜"
"TX"	- - -	9"	"V"	HT + TS - 12"	10-'1"
"A"	- - -	26'-6¼"	"W"	A + AA + B + C + 2D + 2SS + 2YY	124'-1⅝"
"AA"	- - -	19'-2⅜"			
"B"	- - -	11'-9⅜"	"Y"	TX(sin 20°)	3⅛"
"C"	- - -	11'-10⅛"	"Z"	Skew Angle	4°47'57"
"D"	II + MM + RR	25'-10⅝"			
			"BB"	(A + B)(sec Z)	38'-5¼"
"F"	S + 2TX	15'-6"	"CC"	(AA + C)(sec Z)	31'-1⅞"
			"DD"	R + M + N + 20"	25'-6⅜"
"H"	(EE/2 + CC + DD)(sin Z)	4'-9⅝"	"EE"	F(tan Z)	15⅝"
"J"	(EE/2 + BB + DD)(sin Z)	5'-4⅛"	"II"	20"(cos Z)	19⅞"
			"KK"	S/2 + U	15'-6⅝"
"L"	2DD + BB + CC + EE	121'-11½"	"LL"	(EE/2 + BB + DD)(cos Z)	64'-4¾"
"M"	N(cos 20°)	4¼"	"MM"	3"[cos Z + cos(Z - 20°)]	5⅛"
"N"	3" + TX(tan 10°)	4⅝"	"RR"	P[cos (Z - 20°)]	23'-9"
			"SS"	F(sin Z)	15½"
"P"	- - -	24'-7⅜"	"YY"	TX(sin 20° - Z)	2⅜"

℄ Rdwy Sta.109+99.80=℄ Trail Sta.12+80.29	
Rdwy Pr. Gr. Elev. at ℄ Sta.= 492.35	
Fill at ℄ Rdwy. at ℄ Station =	1'-0"
Design Fill (*)	1'-0"

Elev. (1) 479.07 feet	Trail Sta. 13+37.69
Elev. (2) 478.98 feet	Trail Sta. 12+15.67
Elev. (3) 480.24 feet	Trail Sta. 12+80.22

* Design fill height is the distance from top of earth fill or roadway to the top of the top slab.

ESTIMATED QUANTITIES

			FINAL QUANTITIES
Class 4 Excavation	cu. yard	630	
Class B-1 Concrete (Culverts)	cu. yard	200.4	
Reinforcing Steel (Culverts)	pound	36,260	
Form Liners	sq. yard	66	

GENERAL NOTES:

Design Specifications:
2010 - AASHTO Bridge Design Specifications and 2010 Interim Revisions

Design Unit Stresses:
Class B-1 concrete f'c = 4,000 psi
Reinforcing steel (Grade 60), fy = 60,000 psi

Design Loading:
Vehicular = HL-93 minus lane load

Earth 120 #/ft.³
Equivalent fluid pressure
30 #/ft.³ (Min.) - 60 #/ft.³ (Max.)

All elevations shown are in feet unless otherwise noted. Dimensions are horizontal.

Box Culvert must be cast-in-place. Use of Precast Box is not allowed.

Utilize Square Headwall both ends.
No chamfer required.

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

Culvert to be constructed with high point in middle of culvert at Elevation (3) location provided.

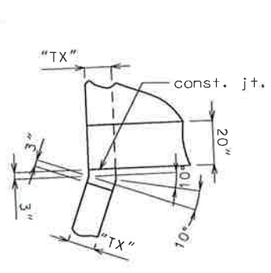
Invert slab thickness varies outside of barrel section. See Willott Road Trail Profile for vertical curve data.

Locate A-Bars in top mat of Wing Sections to maintain 1½" clearance.

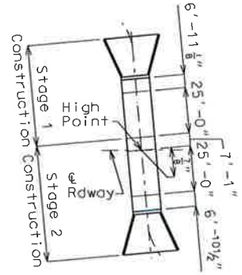
Bend top mat of longitudinal #4-F bars in bottom slab so tied to transverse A-Bars.

Interior exposed faces of wingwalls and exterior faces of headwalls shall feature an Ashlar Stone or other approved Form Liner. See Special Provisions.

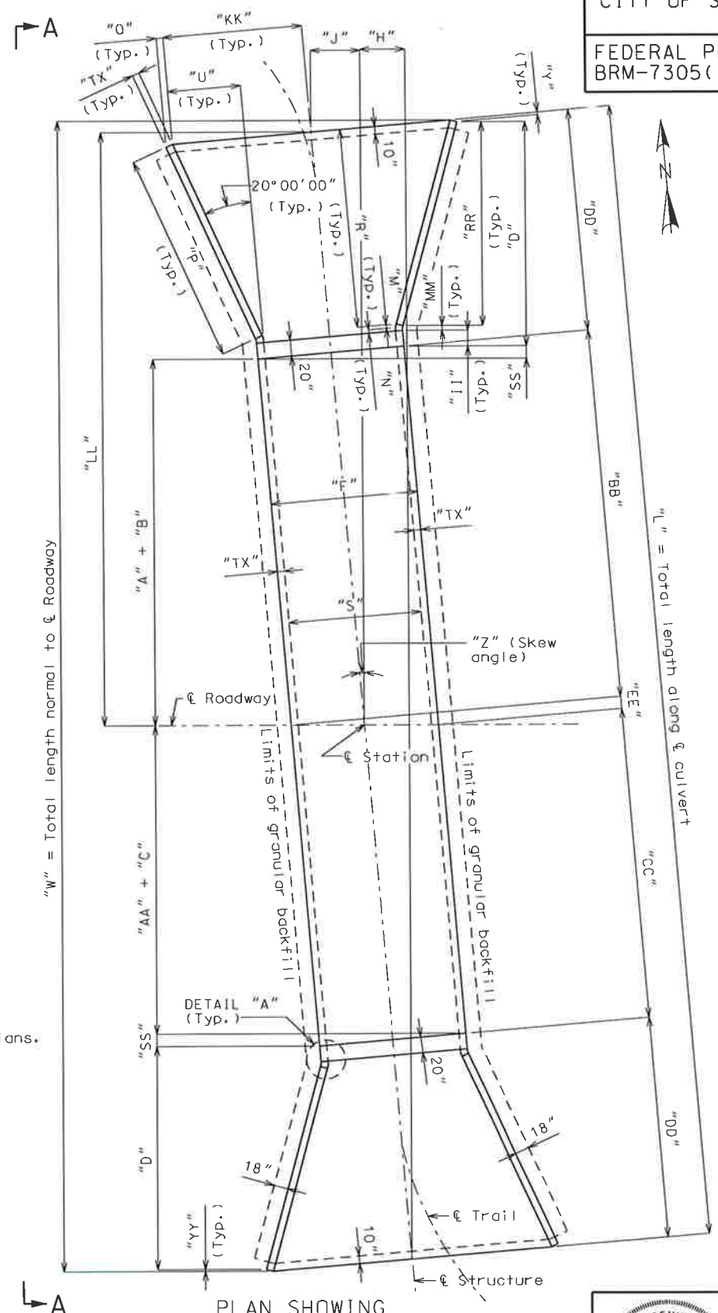
For details of Chain Link Fence on Wingwalls, see Roadway Plans.



DETAIL "A"



PLAN SHOWING TRANSVERSE JOINTS



PLAN SHOWING LAYOUT DIMENSIONS

STD. 703.15	
STD. 703.16	
STD. 703.17	
STD. 703.37	
STD. 706.35	

STATE OF MISSOURI MICHAEL A. BOUCK NUMBER E-26839 REGISTERED PROFESSIONAL ENGINEER
5/9/15

CULVERT PLAN AND ELEVATION

HORNER & SHIFRIN, INC.

Designed: CBW
Detailed: CBW
Checked: MAB

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

BILL OF REINFORCING STEEL

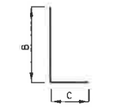
NO. REQ'D.	MARK NO. SIZE	MARK	LOCATION	SHAPE NO.	STIRRUP (S)	EPOXY (E)	VARIES (V)	NO. EACH	DIMENSIONS B FT.	C FT.	D or F FT.	E FT.	H FT.	K FT.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.
-	-		Barrel Section	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			Cut Section 1														
51	6	A1	Top Slab	20				1	15.167						15'-2"	15'-2"	1163
51	6	A2	Bottom Slab	20				1	15.167						15'-2"	15'-2"	1163
94	5	J3	Top Corner	19				1	2.800	8.550					11'-4"	11'-3"	1101
102	6	J4	Bottom Corner	19				1	10.667	8.858					19'-6"	19'-4"	2970
68	5	B2	Exterior Wall	10				1		1.000	11.667				13'-8"	13'-5"	951
62	4	F1	Temp. Steel	20				1	24.750						24'-9"	24'-9"	1025
			Cut Section 2														
15	6	A1	Top Slab	20				1	15.167						15'-2"	15'-2"	342
15	6	A2	Bottom Slab	20				1	15.167						15'-2"	15'-2"	342
28	5	J3	Top Corner	19				1	2.800	8.550					11'-4"	11'-3"	328
30	6	J4	Bottom Corner	19				1	10.667	8.858					19'-6"	19'-4"	874
20	5	B2	Exterior Wall	10				1		1.000	11.667				13'-8"	13'-5"	280
62	4	F1	Temp. Steel	20				1	6.830						6'-10"	6'-10"	283
			Cut Section 3														
51	6	A1	Top Slab	20				1	15.167						15'-2"	15'-2"	1163
51	6	A2	Bottom Slab	20				1	15.167						15'-2"	15'-2"	1163
94	5	J3	Top Corner	19				1	2.800	8.550					11'-4"	11'-3"	1101
102	6	J4	Bottom Corner	19				1	10.667	8.858					19'-6"	19'-4"	2970
68	5	B2	Exterior Wall	10				1		1.000	11.667				13'-8"	13'-5"	951
62	4	F1	Temp. Steel	20				1	24.750						24'-9"	24'-9"	1025
			Upper End Section														
17	6	A1	Top Slab	20				1	15.167						15'-2"	15'-2"	388
18	6	A2	Bottom Slab	20				1	15.167						15'-2"	15'-2"	410
34	5	J3	Top Corner	19				1	2.800	8.550					11'-4"	11'-3"	398
38	6	J4	Bottom Corner	19				1	10.667	8.858					19'-6"	19'-4"	1106
26	5	B2	Exterior Walls	10				1		1.000	11.667				13'-8"	13'-5"	364
62	4	F10	Temp. Steel	20				1	8.287						8'-3"	8'-3"	343
			Lower End Section														
17	6	A1	Top Slab	20				1	15.167						15'-2"	15'-2"	388
18	6	A2	Bottom Slab	20				1	15.167						15'-2"	15'-2"	410
34	5	J3	Top Corner	19				1	2.800	8.550					11'-4"	11'-3"	398
38	6	J4	Bottom Corner	19				1	10.667	8.858					19'-6"	19'-4"	1106
26	5	B2	Exterior Walls	10				1		1.000	11.667				13'-8"	13'-5"	364
62	4	F60	Temp. Steel	20				1	8.287						8'-3"	8'-3"	343
			Upper Wings and Headwall														
49	6	A10	Bottom Slab	20			V	1	31.631			Incr =	4.116	inches	31'-8"	31'-8"	1723
									15.167						15'-2"	15'-2"	
2	8	D1	Headwall	20				1	15.250						15'-3"	15'-3"	82
8	5	E1	Toe	20				1	4.000						4'-0"	4'-0"	33
14	4	F50	Flared Wings	15			V	2		20.763	Incr =	34.176	1.052	2.889	23'-10"	23'-10"	143
										3.675			1.052	2.889	6'-9"	6'-9"	
14	4	F51	Bottom Slab	20			V	2	21.822			Incr =	38.465	inches	21'-10"	21'-10"	114
									2.589						2'-7"	2'-7"	
6	4	F53	Bottom Slab	20			FB	1	26.809						26'-10"	26'-10"	108
13	4	F55	Bottom Slab	20				1	25.450						25'-5"	25'-5"	221
64	5	G2	Exterior Wings	20			V	2	11.568			Incr =	3.683	inches	11'-7"	11'-7"	456
									2.053						2'-1"	2'-1"	
8	7	J6	Flared Wings	20				1	29.849						29'-10"	29'-10"	488
92	6	J5	Exterior Wings	19			V	2	11.450	8.858		Incr =	2.506	inches	20'-4"	20'-2"	2136
									2.053	8.858					10'-11"	10'-9"	
17	5	R3	Headwall	10	S			1		1.417	1.333				4'-2"	3'-12"	70
			Lower Wings and Headwall														
49	6	A10	Bottom Slab	20			V	1	31.631			Incr =	4.116	inches	31'-8"	31'-8"	1723
									15.167						15'-2"	15'-2"	
2	8	D1	Headwall	20				1	15.250						15'-3"	15'-3"	82
8	5	E1	Toe	20				1	4.000						4'-0"	4'-0"	33
14	4	F50	Flared Wings	15			V	2		20.763	Incr =	34.176	1.052	2.889	23'-10"	23'-10"	143
										3.675			1.052	2.889	6'-9"	6'-9"	
14	4	F51	Bottom Slab	20			V	2	21.822			Incr =	38.465	inches	21'-10"	21'-10"	114
									2.589						2'-7"	2'-7"	
6	4	F53	Bottom Slab	20			FB	1	26.809						26'-10"	26'-10"	108
13	4	F55	Bottom Slab	20				1	25.450						25'-5"	25'-5"	221
64	5	G2	Exterior Wings	20			V	2	11.568			Incr =	3.683	inches	11'-7"	11'-7"	456
									2.053						2'-1"	2'-1"	
8	7	J6	Flared Wings	20				1	29.849						29'-10"	29'-10"	488
92	6	J5	Exterior Wings	19			V	2	11.450	8.858		Incr =	2.506	inches	20'-4"	20'-2"	2136
									2.053	8.858					10'-11"	10'-9"	
17	5	R3	Headwall	10	S			1		1.417	1.333				4'-2"	3'-12"	70

BILL OF REINFORCING STEEL

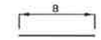
NO. REQ'D.	MARK NO. SIZE	MARK	LOCATION	SHAPE NO.	STIRRUP (S)	EPOXY (E)	VARIES (V)	NO. EACH	DIMENSIONS B FT.	C FT.	D or F FT.	E FT.	H FT.	K FT.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.
			Totals														
		4															4041
		5															7354
		6															23676
		7															976
		8															164
		9															0
		10															0
		11															0
			TOTALS														36261.0

SHAPE 10

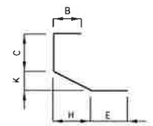
SHAPE 15



SHAPE 19



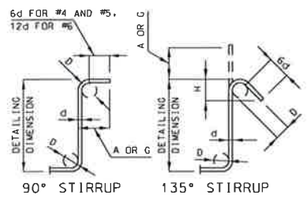
SHAPE 20



SHAPE 27

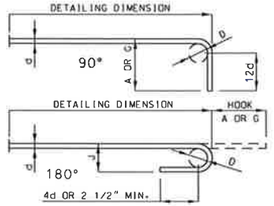
SPLICE LENGTH	
BAR SIZE	NON-EPOXY
#4	21 IN.
#5	26 IN.
#6	31 IN.
#7	39 IN.
#8	51 IN.
#9	65 IN.
#10	82 IN.
#11	101 IN.

MAX BAR LENGTH	
BAR SIZE	NON-EPOXY
#4	60 FT.
#5	60 FT.
#6	60 FT.
#7	60 FT.
#8	60 FT.
#9	60 FT.
#10	60 FT.
#11	101 IN.



STIRRUP HOOK DIMENSIONS				
BAR SIZE	D (IN.)	90° HOOK HOOK A OR G	135° HOOK HOOK A OR G	135° HOOK APPROX. H
#4	2"	4 1/2"	4 1/2"	3"
#5	2 1/2"	6"	5 1/2"	3 3/4"
#6	4 1/2"	12"	8"	4 1/2"

NOTE: UNLESS OTHERWISE NOTED DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR.



END HOOK DIMENSIONS				
BAR SIZE	D (IN.)	GRADE 60 180° HOOKS A OR G	180° HOOKS J	90° HOOKS A OR G
#4	3"	6"	4"	8"
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	12"
#7	5 1/4"	10"	7"	14"
#8	6"	11"	8"	16"
#9	9 1/2"	15"	11 3/4"	19"
#10	10 3/4"	17"	13 1/4"	22"
#11	12"	19"	14 3/4"	24"

NOTE:
ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEGREE STANDARD HOOKS.
HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.
FB = BARS MAY BE BENT IN FIELD TO FIT.
E = EPOXY COATED REINFORCEMENT.
S = STIRRUP.
V = BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE. A BLANK IN THE SECOND LINE REPRESENTS THE SAME BAR DIMENSION AS THAT IN THE FIRST LINE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ADD A SPLICE LENGTH TO A BAR LENGTH WHICH EXCEEDS ITS MAXIMUM ALLOWABLE LENGTH.
NO. EA. = NUMBER OF BARS OF EACH LENGTH.
NOMINAL LENGTHS ARE BASED ON OUT TO OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)
ACTUAL LENGTHS ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.
PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.
REINFORCING STEEL (GRADE 60) FY = 60,000 PSI.

NOTE:
THE BAR LIST IS BASED ON THE MISSOURI STANDARD PLANS.
THIS BAR LIST IS FOR QUANTITY ESTIMATION PURPOSE ONLY AND SHALL BE VERIFIED OR MODIFIED BY THE CONTRACTOR.

Detailed MAB
Checked MAC

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

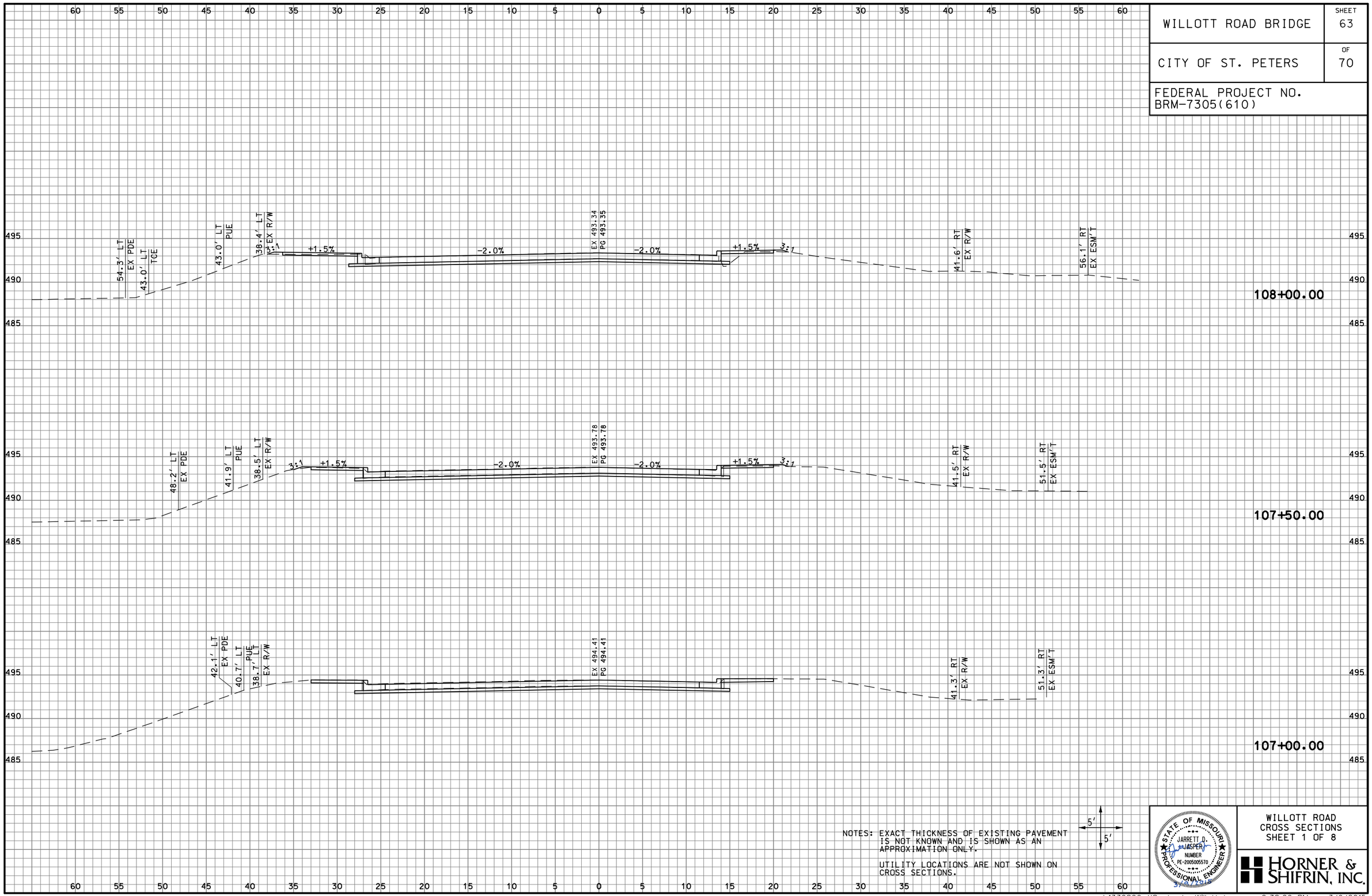
WILLOTT ROAD BRIDGE	SHEET 62
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	

STATE OF MISSOURI
MICHAEL A. BANAUCH
NUMBER E-26839
REGISTERED PROFESSIONAL ENGINEER
3/9/15

CULVERT BILL OF REINFORCING

HORNER & SHIFRIN, INC.

WILLOTT ROAD BRIDGE	SHEET 63
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



NOTES: EXACT THICKNESS OF EXISTING PAVEMENT IS NOT KNOWN AND IS SHOWN AS AN APPROXIMATION ONLY.

UTILITY LOCATIONS ARE NOT SHOWN ON CROSS SECTIONS.

5'
5'

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
CROSS SECTIONS
SHEET 1 OF 8

HORNER & SHIFRIN, INC.

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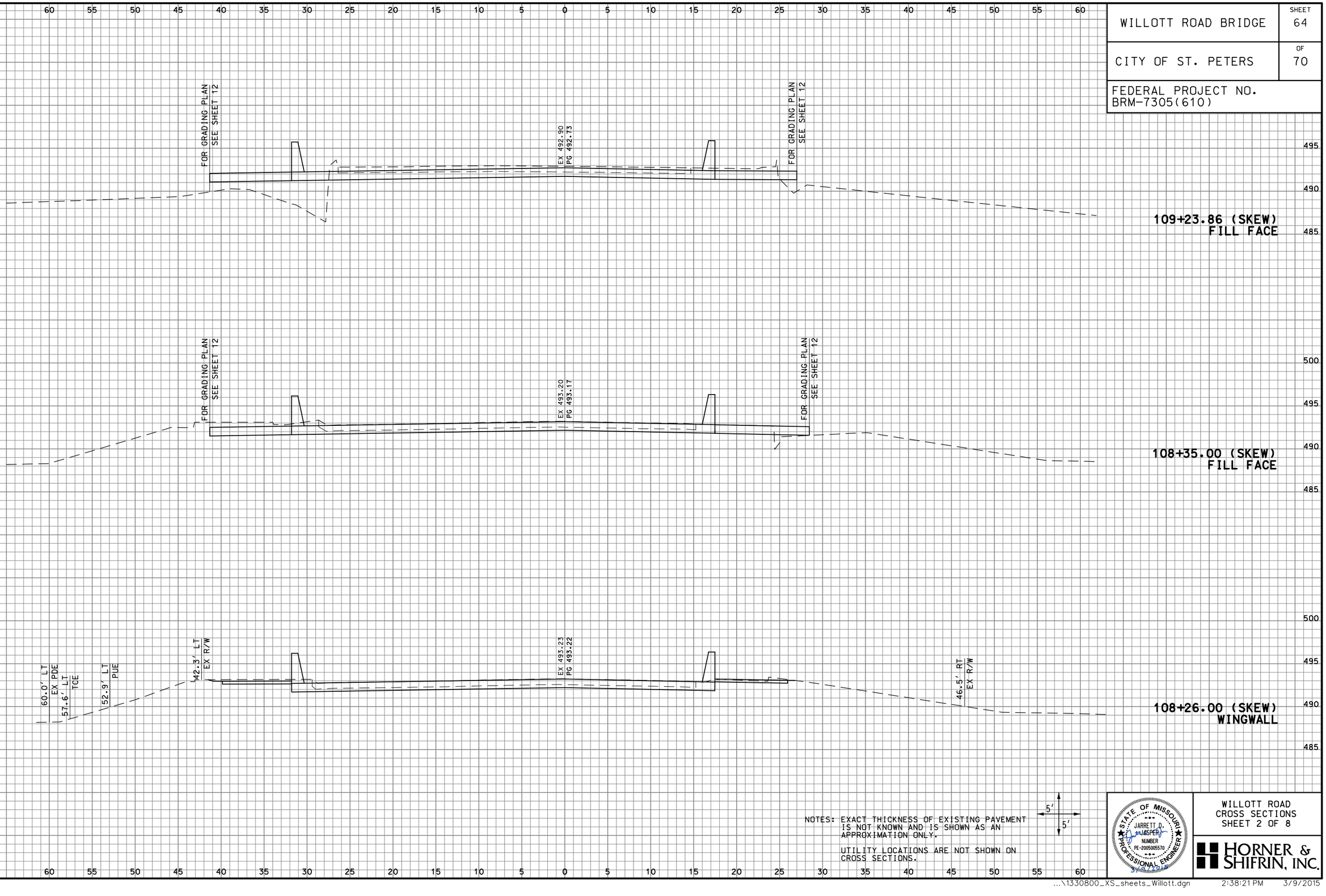
WILLOTT ROAD BRIDGE	SHEET 64
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



NOTES: EXACT THICKNESS OF EXISTING PAVEMENT IS NOT KNOWN AND IS SHOWN AS AN APPROXIMATION ONLY.

UTILITY LOCATIONS ARE NOT SHOWN ON CROSS SECTIONS.

5'
5'

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
CROSS SECTIONS
SHEET 2 OF 8

HORNER & SHIFRIN, INC.

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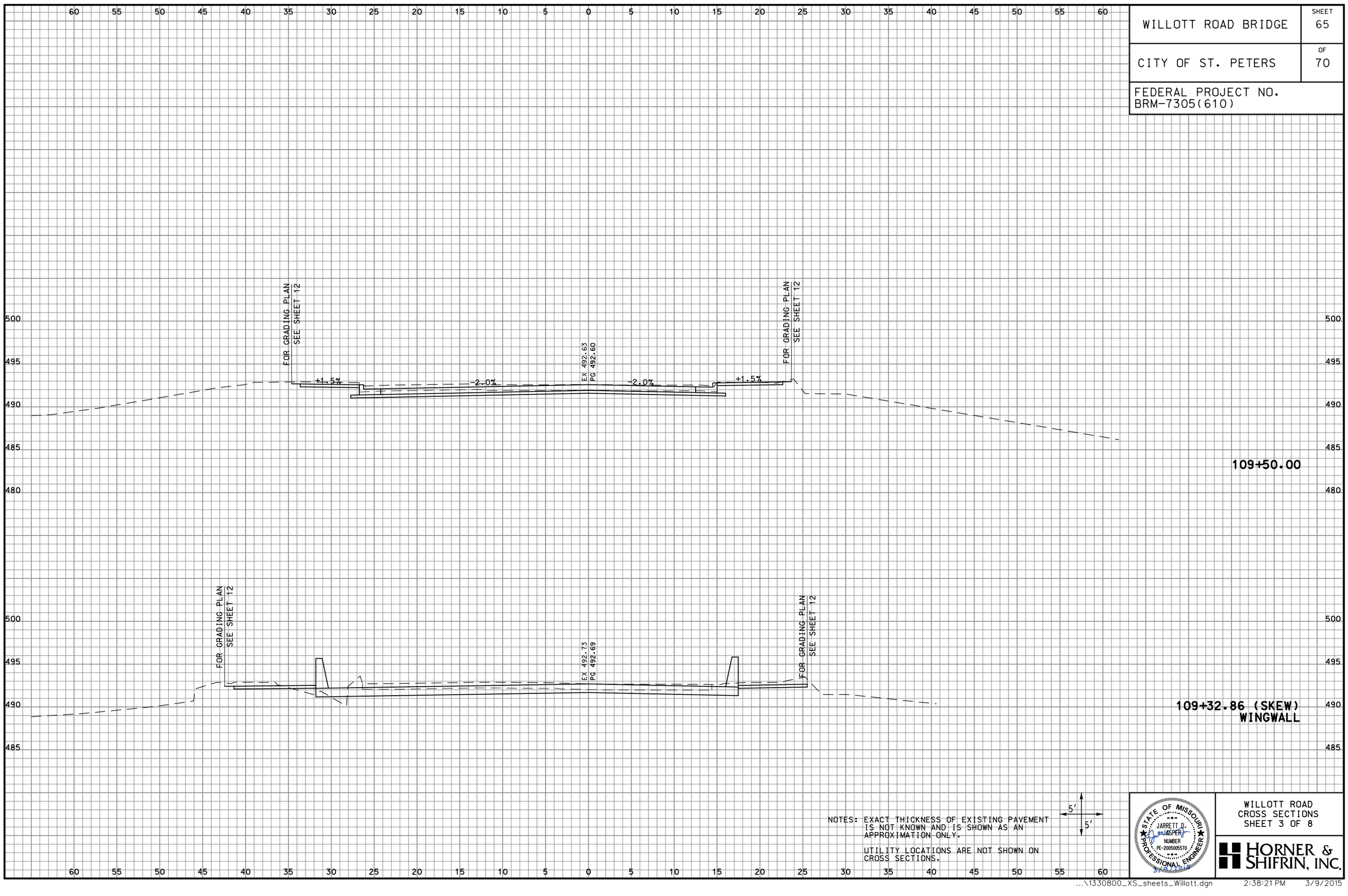
WILLOTT ROAD BRIDGE	SHEET 65
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



NOTES: EXACT THICKNESS OF EXISTING PAVEMENT IS NOT KNOWN AND IS SHOWN AS AN APPROXIMATION ONLY.

UTILITY LOCATIONS ARE NOT SHOWN ON CROSS SECTIONS.

5'
5'

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
CROSS SECTIONS
SHEET 3 OF 8

HORNER & SHIFRIN, INC.

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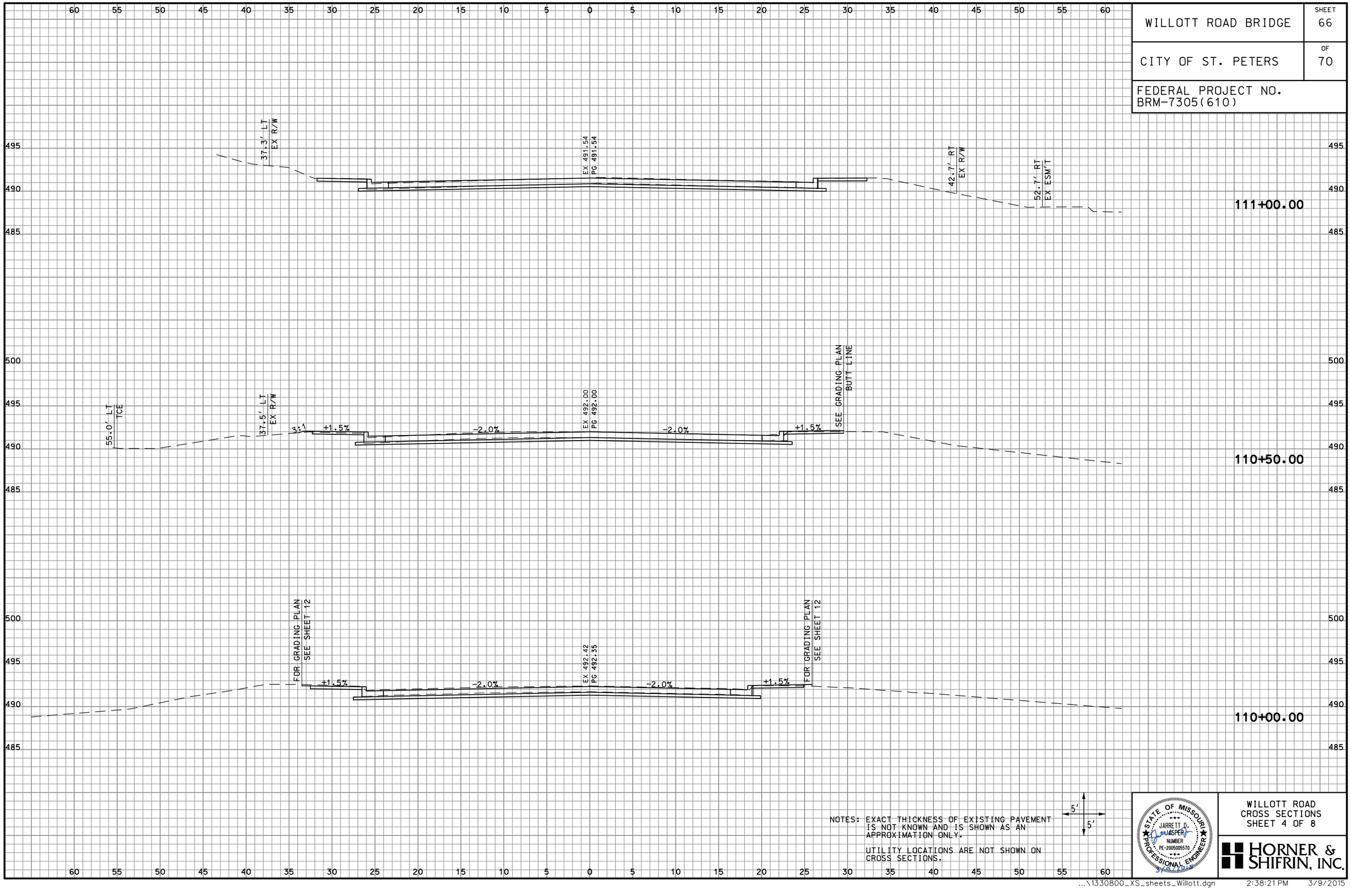
WILLOTT ROAD BRIDGE	SHEET 66
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



NOTES: EXACT THICKNESS OF EXISTING PAVEMENT IS NOT KNOWN AND IS SHOWN AS AN APPROXIMATION ONLY.

UTILITY LOCATIONS ARE NOT SHOWN ON CROSS SECTIONS.

5'
5'

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
CROSS SECTIONS
SHEET 4 OF 8

HORNER & SHIFRIN, INC.

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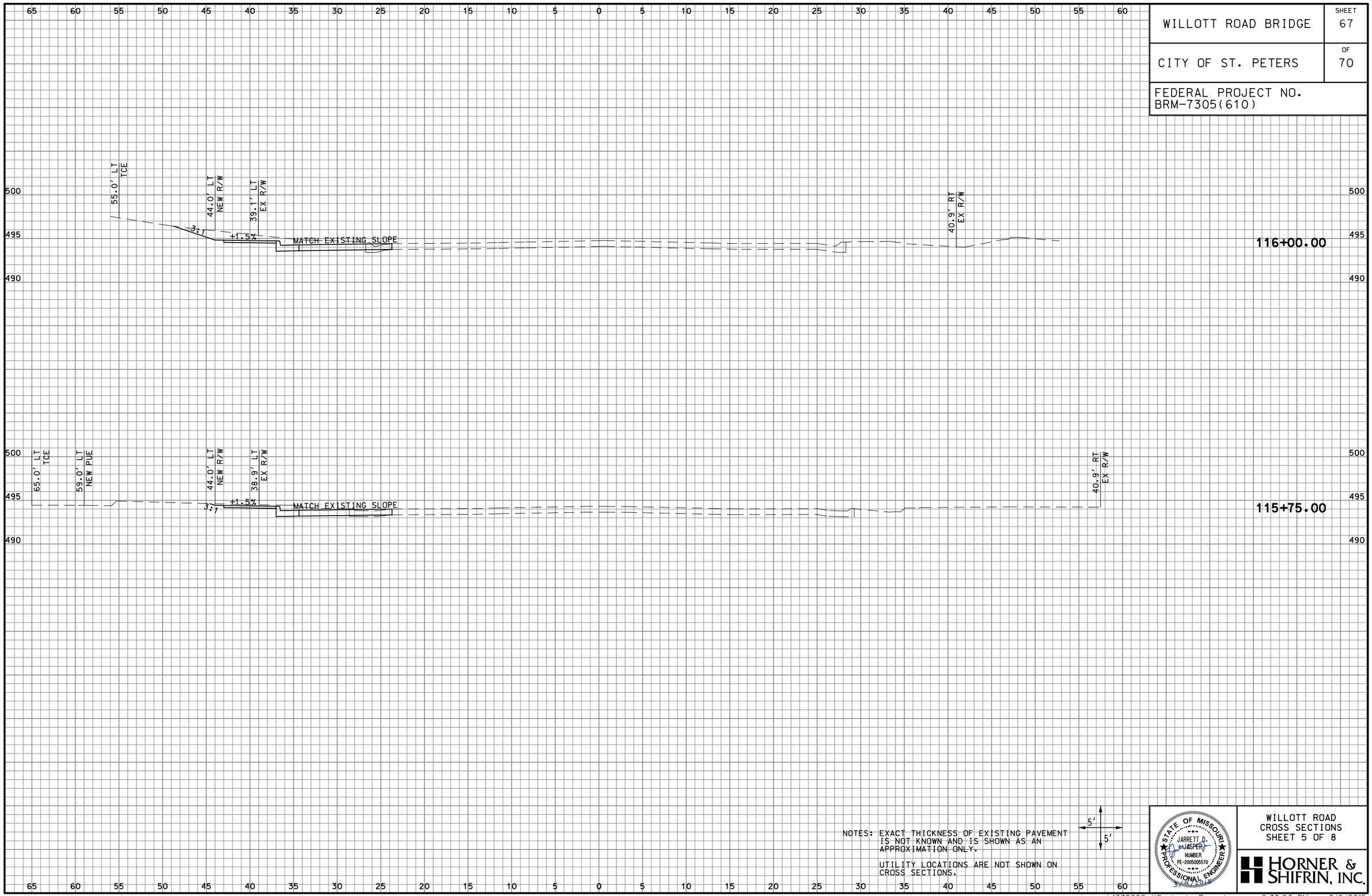
WILLOTT ROAD BRIDGE	SHEET 67
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



NOTES: EXACT THICKNESS OF EXISTING PAVEMENT IS NOT KNOWN AND IS SHOWN AS AN APPROXIMATION ONLY.

UTILITY LOCATIONS ARE NOT SHOWN ON CROSS SECTIONS.

5'
5'

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
CROSS SECTIONS
SHEET 5 OF 8

HORNER & SHIFRIN, INC.

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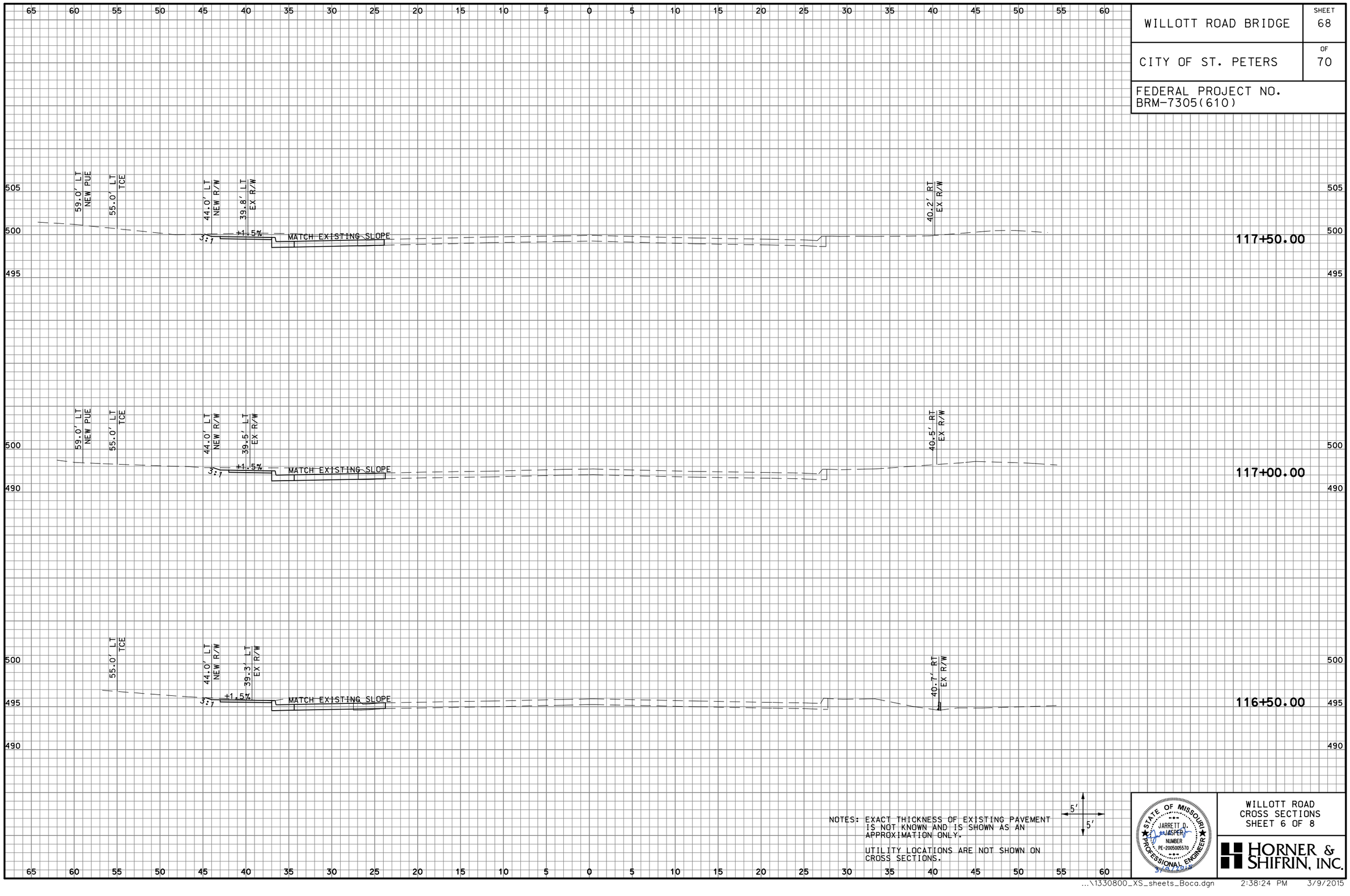
WILLOTT ROAD BRIDGE	SHEET 68
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



NOTES: EXACT THICKNESS OF EXISTING PAVEMENT IS NOT KNOWN AND IS SHOWN AS AN APPROXIMATION ONLY.

UTILITY LOCATIONS ARE NOT SHOWN ON CROSS SECTIONS.

5'
5'

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
CROSS SECTIONS
SHEET 6 OF 8

HORNER & SHIFRIN, INC.

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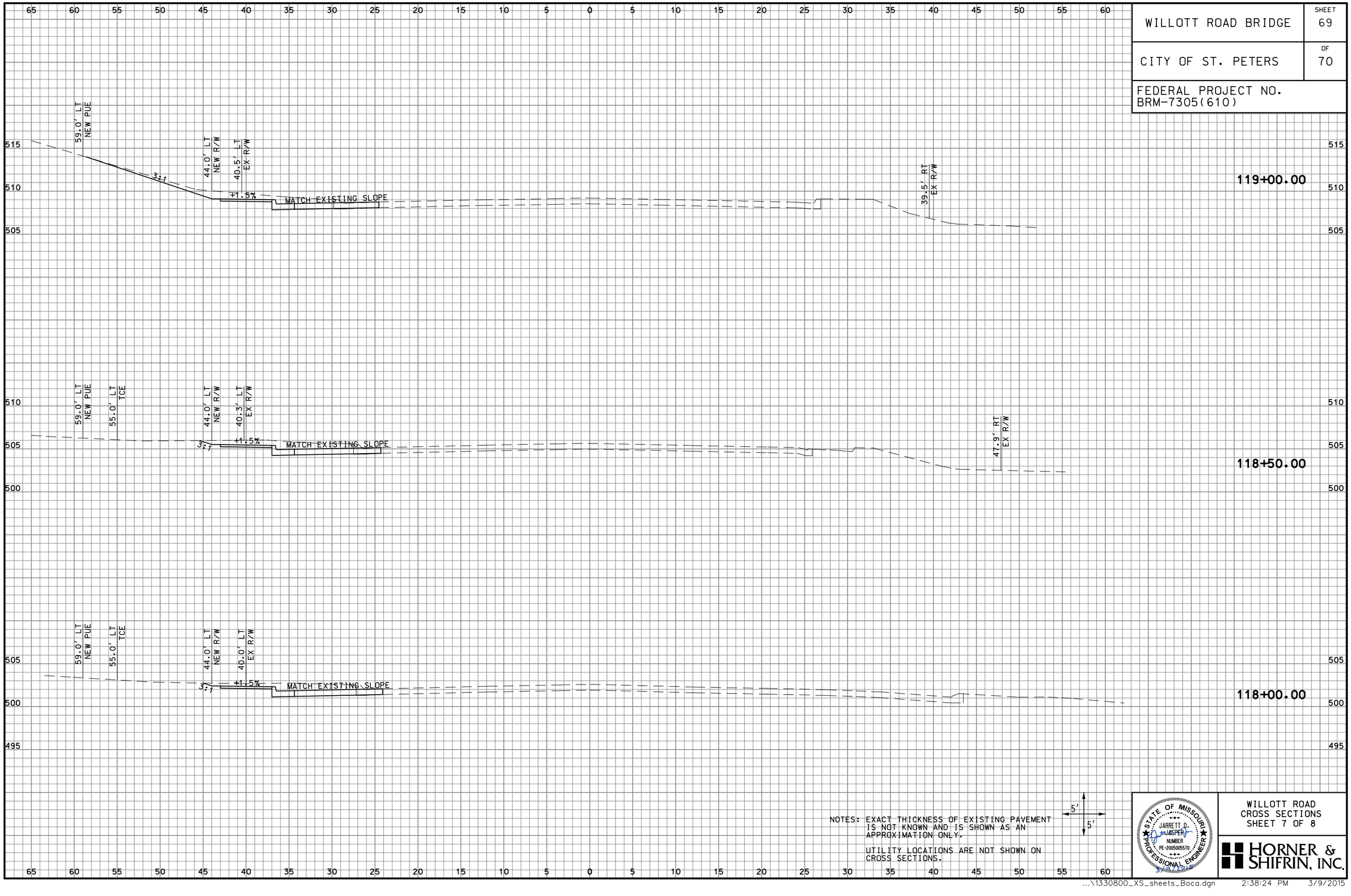
WILLOTT ROAD BRIDGE	SHEET 69
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



NOTES: EXACT THICKNESS OF EXISTING PAVEMENT IS NOT KNOWN AND IS SHOWN AS AN APPROXIMATION ONLY.

UTILITY LOCATIONS ARE NOT SHOWN ON CROSS SECTIONS.

STATE OF MISSOURI
JARRETT D. JASPER
NUMBER PE-2005005570
PROFESSIONAL ENGINEER

WILLOTT ROAD
CROSS SECTIONS
SHEET 7 OF 8

HORNER & SHIFRIN, INC.

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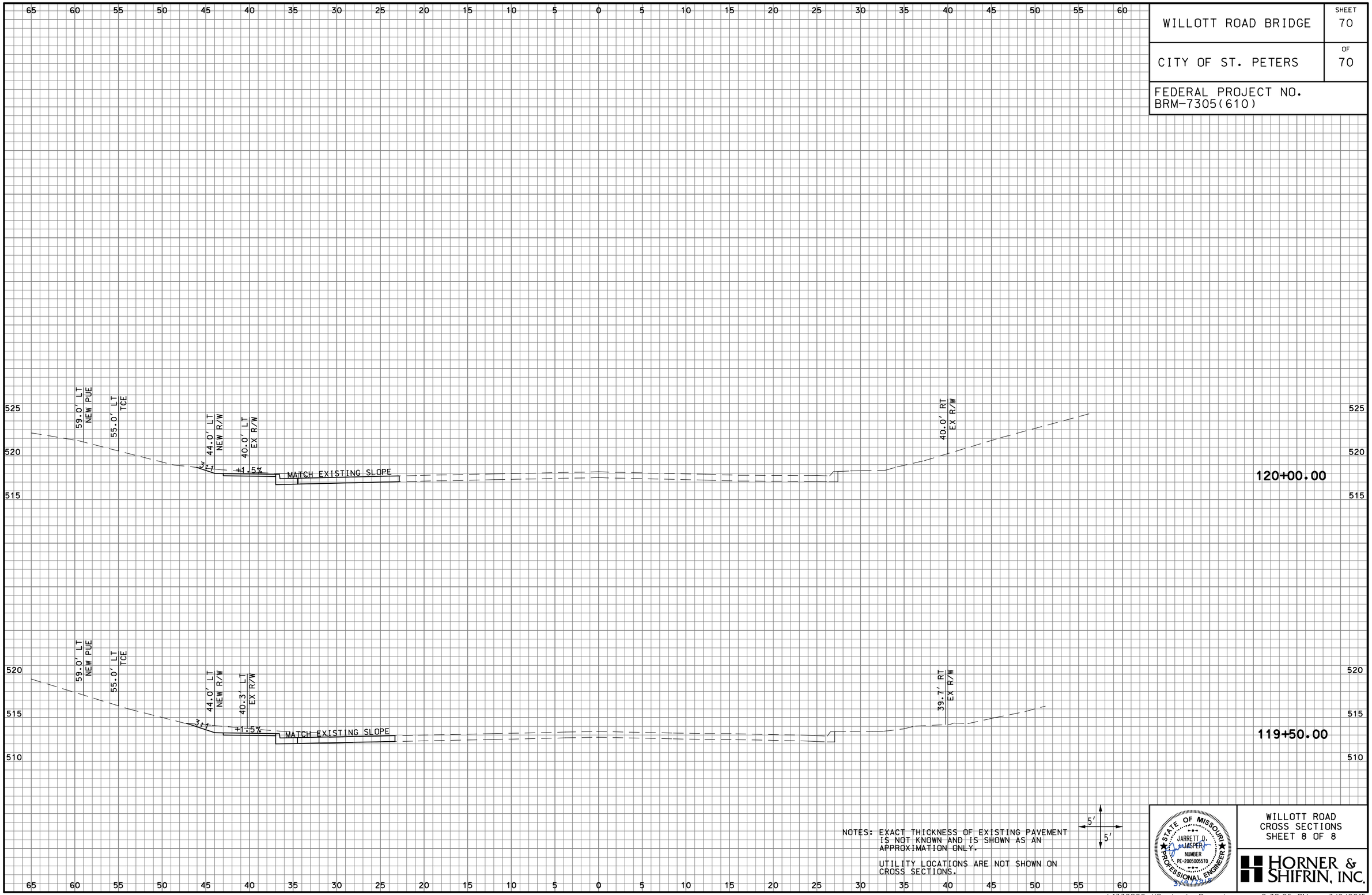
WILLOTT ROAD BRIDGE	SHEET 70
CITY OF ST. PETERS	OF 70
FEDERAL PROJECT NO. BRM-7305(610)	



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SHEET 8 OF 8

HORNER & SHIFRIN, INC.

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