TRANSPORTATION CABINET
Frankfort, Kentucky 40622
www.transportation.ky.gov/

Steven L. Beshear
Governor

Michael W. Hancock, P.E.
Secretary

October 16, 2015

CALL NO. 100
CONTRACT ID NO. 151062
ADDENDUM # 1

Subject: Graves County, NHPP 0011 (033)
Letting October 23, 2015

(1) Revised - Plan Sheets - R2F, R3, R129, R130, & T1
Drawing #27453 - S01, S08, S13, S28, S29, S30, & S31
Drawing #27454 - S01, S08, S09, S11, S12, S25, S26, & S27
(2) Added - Notes - Pages 1-20 of 20
(3) Revised - Bid Items - Pages 168-174 of 174

Proposal revisions are available at http://transportation.ky.gov/Construction-Procurement/.

Plan revisions are available at http://www.lynnimaging.com/kytransportation/.

If you have any questions, please contact us at 502-564-3500.

Sincerely,

Rachel Mills

Rachel Mills, P.E.
Director
Division of Construction Procurement

RM:ks
Enclosures

COUNTY OF	ITEM NO.	SHEET NO.
GRAVES	1-234.20	R2F

GENERAL SUMMARY

ITEM	DESCRIPTION	UNIT	I-69	US 45	KY 80	US 45 RAMPS	KY 80 RAMPS	APPROACHES / ENTRANCES	MOT								TOTAL PROJECT
2708	CLEAN SILT TRAP TYPE C	EACH															135
2710	SCARIFYING AND RESHAPING	SQ YD	2,713		3,704		4,919	1,152									12,488
2726	STAKING	LS															1
2731	REMOVE STRUCTURE (2)	LS															1
2731	REMOVE STRUCTURE (3)	LS															1
2731	REMOVE STRUCTURE (4)	LS															1
2731	REMOVE STRUCTURE (5)	LS															1
2775	ARROW PANEL	EACH							6								6
2998	MASONRY COATING	SQ YD	12,616	1,473		601											14,690
3171	CONCRETE BARRIER WALL TYPE 9T	LF							4,382								4,382
3340	STEEL PIPE-2 1/2 IN	LF		55													55
3343	STEEL PIPE-4 IN	LF		55													55
5950	EROSION CONTROL BLANKET	SQ YD															26,311
5952	TEMP MULCH	SQ YD															434,103
5953	TEMP SEEDING AND PROTECTION	SQ YD															328,866
5963	INTIAL FERTILIZER	TON															11.0
5964	20-10-10 FERTILIZER	TON															17.3
5985	SEEDING & PROTECTION	SQ YD															441,400
5989	SPECIAL SEEDING CROWN VETCH	SQ YD															7,200
5992	AGRICULTURAL LIMESTONE	TON															408
6510	PAVE STRIPING-TEMP PAINT-4 IN	LF							32,567								32,567
6511	PAVE STRIPING-TEMP PAINT-6 IN	LF							24,536								24,536
6514	PAVE STRIPING-PERM PAINT-4 IN	LF			5,613												5,613
6515	PAVE STRIPING-PERM PAINT-6 IN	LF	54,855	5,849		14,973	9,271										84,948
6517	PAVE STRIPIING-PERM PAINT-12 IN	LF	1,516	555	266	1,320	897										4,554
6551	PAVE STRIPING-TEMP REM TAPE-Y	LF							16,661								16,661
6567	PAVE MARKING-THERMO STOP BAR-12IN	LF			56	16											72
6568	PAVE MARKING-THERMO STOP BAR-24IN	LF			90												90
6570	PAVE MARKING-PAINT CROSS-HATCH	SQ FT					4,639										4,639
6592	PAVEMENT MARKER TYPE V-B W/R	EACH	92	32		84	52										260
6593	PAVEMENT MARKER TYPE V-B Y/R	EACH		88		126	77										291
8100	CONCRETE-CLASS A	CY	7														7
8150	STEEL REINFORCEMENT	LB	326														326
10020NS	FUEL ADJUSTMENT	DOLLAR															367,320
10030NS	ASPHALT ADJUSTMENT	DOLLAR															395,910
20071EC	JOINT ADHESIVE	LF	84,772														84,772
20166ES810	TEMPORARY PIPE	LF							735								735
20209EP69	GRANULAR PILE CORE (6)	CY		517													517
20259ED	TEMPORARY MEDIAN CROSSOVER (EMS)	EACH							2								2
20411ED	LAW ENFORCEMENT OFFICER (1)	HOUR	1,000														1,000
20738NS112	TEMP CRASH CUSHION	EACH							4								4
21289ED	LONGITUDINAL EDGE KEY	LF				225											225
21799EN	BORE AND JACK PIPE-24 IN	LF	137		51		53										241
22880ED	BARRIER WALL TRANSITION	LF	1,767														1,767
23274EN11F	TURF REINFORCEMENT MAT 1	SQ YD															14,066
23791EC	PAVE STRIPING-CHEVRON MARKINGS	SQ FT				8,927	11,710										20,637
23979EC	CRASH CUSHION TY VI CLASS C TL3	EACH	1	1													2
24186EC	BORE AND JACK PIPE-36 IN	LF	342														342
24489EC	INLAID PAVEMENT MARKERS	EACH	763														763
24543EC	CLEAN	LF	1,631														1,631
24599EC	CURE IN PLACE PIPE LINER (15 IN PIPE)	LF	138														138
24599EC	CURE IN PLACE PIPE LINER (18 IN PIPE)	LF	753														753
24599EC	CURE IN PLACE PIPE LINER (24 IN PIPE)	LF	142														142
24599EC	CURE IN PLACE PIPE LINER (30 IN PIPE)	LF	178														178
24599EC	CURE IN PLACE PIPE LINER (48 IN PIPE)	LF	155														155
24599EC	CURE IN PLACE PIPE LINER (72 IN PIPE)	LF	265														265
24654ED	SINGLE SLOPE MEDIAN BARRIER	LF	10,924	1,553		585											13,062
24754ED	SETTLEMENT MONITORING	LS															1
23143ED	KPDES PERMIT AND TEMP EROSION CONTROL	LS															1
23484EC	PERFORM CIPP ACCEPTANCE TESTING	LS															1
23610NC	CORED HOLE DRAINAGE BOX CON (7)	EACH															32

NOTES:

(1) FOR ESTIMATE ONLY

(2) KY 80 OVERPASS

(3) NORTHBOUND PURCHASE PARKWAY

(4) SOUTHBOUND PURCHASE PARKWAY

(5) RCBC AT 1124+23 (152' RT)

(6) FOR BRIDGE END BENT

(7) QUANTITIES BROUGHT FORWARD FROM PERFORATED PIPE DRAINAGE SUMMARY

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4. SOUTHBOUND PURCHASE PARKWAY
5. RCBC AT 1124+23 (152' RT)
6. FOR BRIDGE END BENT
7. QUANTITIES BROUGHT FORWARD FROM PERFORATED PIPE DRAINAGE SUMMARY

COUNTY OF	ITEM NO.	SHEET NO.
GRAVES	1-234.20	R3

CONVENTIONAL SIGNS

SURVEY LINE
GRADE LINE — 400' V.C.
GROUND LINE
COUNTY LINE
CORPORATE LIMITS
EXIST. PROPERTY LINE — E
EXIST. RIGHT OF WAY & PROPERTY LINE
PROPOSED RIGHT OF WAY
RIGHT OF WAY MONUMENT
BENCH MARK — B.M. NO.4
EXISTING R/W MARKER
RIGHT OF WAY MONUMENT EXISTING/PROPOSED
UTILITY TEST HOLE — TH
EXISTING ROAD
RAILROAD
FENCE (CONTROLLED ACCESS) — XX
FENCE (EXCEPT STONE AND HEDGE) — X — X
TREE LINE
TREES
PIPE CULVERT
CULVERT
BRIDGE
BUILDINGS — 1-S FRAME, 1-S BRICK, SHED, 2-S BRICK
GUARDRAIL — END TREATMENT, GUARDRAIL, TERMINAL SECTION

	EXISTING	PROPOSED
LIGHTING POLE		
POWER POLE		
JOINT POWER & TELEPHONE POLE		
TELEPHONE & TELEGRAPH POLE		
ANCHOR, POWER OR TELEPHONE		
STUB POWER		
STUB TELEPHONE		
WATER MAIN	WM	6" WM
GAS MAIN	GM	6" GM
TELEPHONE DUCT	T	T
ELECTRIC DUCT	E	E
DIRECT BURIAL TV CABLE	TV	TV
SANITARY SEWER (WITH MANHOLE)	SAN	SAN
STORM SEWER (WITH MANHOLE)	STORM	STORM
DIRECT BURIAL ELECTRIC CABLE	E	E
DIRECT BURIAL TELEPHONE CABLE	T	T
OVERHEAD WIRE		
TRAFFIC LIGHTS		
ELECTRIC MANHOLE	EMH	EMH
TELEPHONE MANHOLE	TMH	TMH

STONE FENCE
HEDGE FENCE
SWAMP OR MARSH
SPRINGS
SINKHOLE
QUARRY SITE
BLUE LINE STREAM
INTERMITTENT STREAM OR DITCH
LAKES OR PONDS
REGULATED FLOODWAY
NORTH POINT

UTILITY OWNERS

Power
West Kentucky R.E.C.C.
P.O Box 589
Mayfield, KY 42066
Phone: 270-251-6948
Contact: Tim Vied

West Kentucky Electric and Water
301 E Broadway
Mayfield, KY 42066
Phone: 270-247-4661
Contact: Jason Weatherly
jweatherly@mewsbb.com

Telephone
West Kentucky Rural Telephone
237 N 8th Street
P.O. Box 649
Mayfield, KY 42066
Contact : Tim Merrick 270-705-1816
timmerrick@wk.net

AT&T
1200 Old Mayfield Rd.
Paducah, KY, 42001
Contact: Alan Shelby
Phone: 270-444-5048

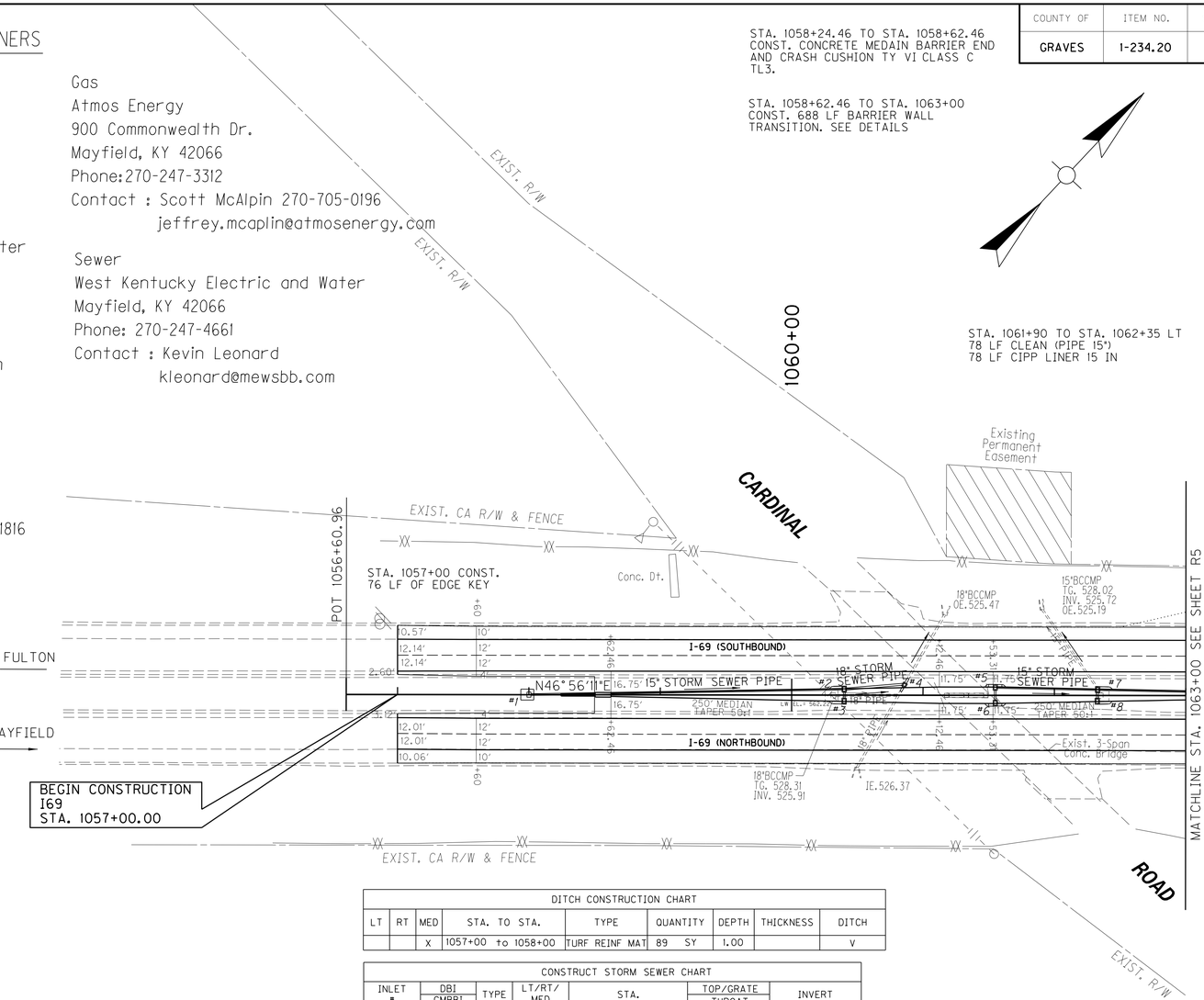
Water
Mayfield Electric and Water
301 E Broadway
Mayfield, KY 42066
Contact: Kevin Leonard
Phone: 270-247-4661

Gas
Atmos Energy
900 Commonwealth Dr.
Mayfield, KY 42066
Phone:270-247-3312
Contact : Scott McAlpin 270-705-0196
jeffrey.mcaplin@atmosenergy.com

Sewer
West Kentucky Electric and Water
Mayfield, KY 42066
Phone: 270-247-4661
Contact : Kevin Leonard
kleonard@mewsbb.com

STA. 1058+24.46 TO STA. 1058+62.46
CONST. CONCRETE MEDAIN BARRIER END AND CRASH CUSHION TY VI CLASS C TL3.

STA. 1058+62.46 TO STA. 1063+00
CONST. 688 LF BARRIER WALL TRANSITION. SEE DETAILS



STA. 1061+90 TO STA. 1062+35 LT
78 LF CLEAN (PIPE 15")
78 LF CIPP LINER 15 IN

STA. 1060+50 RT TO STA. 1061+15 LT
134 LF CLEAN (PIPE 18")
134 LF CIPP LINER 18 IN

SCALE: 1"=50'

DITCH CONSTRUCTION CHART

LT	RT	MED	STA. TO STA.	TYPE	QUANTITY	DEPTH	THICKNESS	DITCH
		X	1057+00 to 1058+00	TURF REINF MAT	89 SY	1.00		V

CONSTRUCT STORM SEWER CHART

INLET #	DBI / CMBBI	TYPE	LT/RT/ MED	STA.	TOP/GRATE / THROAT	INVERT
#1	DBI	5D	MED	1058+00	529.12	527.46
#2	CMBBI	14BI	MED	1060+40 LT	530.40	526.30
#3	CMBBI	14BI	MED	1060+40 RT	530.28	526.68
#4	JBX		LT	1060+81		525.88
#5	CMBBI	14AI	MED	1061+55 LT	530.38	526.17
#6	CMBBI	14AI	MED	1061+55 RT	530.16	526.36
#7	CMBBI	14BI	MED	1062+37 LT	530.56	525.69
#8	CMBBI	14BI	MED	1062+37 RT	530.22	526.02

BEFORE YOU DIG

The contractor is instructed to call 1-800-752-6007 to reach KY 811, the one-call system for information on the location of existing underground utilities. The call is to be placed a minimum of two (2) and no more than ten (10) business days prior to excavation. The contractor should be aware that owners of underground facilities are not required to be members of the KY 811 one-call Before-U-Dig (BUD) service. The contractor must coordinate excavation with the utility owners, including those whom do not subscribe to KY 811. It may be necessary for the contractor to contact the County Court Clerk to determine what utility companies have facilities in the area.

CARDINAL ROAD OVERPASS

CONTRACTOR SHALL MAINTAIN 16 FOOT VERTICAL CLEARANCE BETWEEN THE CARDINAL ROAD OVERPASS BRIDGE AND I-69. THE 16 FOOT VERTICAL CLEARANCE REQUIREMENT INCLUDES THE INSIDE AND OUTSIDE PAVED SHOULDERS ON I-69.

0' 50' 100' 200'

DESIGNED BY:
DATE SUBMITTED:

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS
COUNTY OF

GRAVES

PROJECT NUMBERS: I-234.20
NHPP 0011 (033), FD52 042 9003 020-022

I-69/US 45 INTERCHANGE
PLAN SHEET I-69 ML
P.O.B. TO STA. 1063+00

FILE NAME: C:\PW_WORKDIR\ANDREW-B\DMS29433\R00300PL.DGN
USER: andrew-b
DATE PLOTTED: October 8, 2015
E-SHEET NAME:
MicroStation v8.11.9.357

COUNTY OF	ITEM NO.	SHEET NO.
GRAVES	1-234.20	R3

REVISED 10-14-2015

CONVENTIONAL SIGNS

SURVEY LINE
GRADE LINE
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COUNTY LINE
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EXIST. PROPERTY LINE
EXIST. RIGHT OF WAY & PROPERTY LINE
PROPOSED RIGHT OF WAY
RIGHT OF WAY MONUMENT
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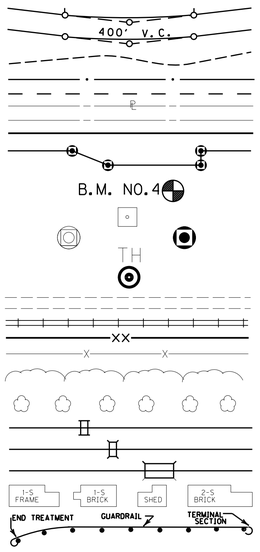
FENCE (CONTROLLED ACCESS)
FENCE (EXCEPT STONE AND HEDGE)
TREE LINE
TREES
PIPE CULVERT
CULVERT
BRIDGE
BUILDINGS
GUARDRAIL



	EXISTING	PROPOSED
LIGHTING POLE		
POWER POLE		
JOINT POWER & TELEPHONE POLE		
TELEPHONE & TELEGRAPH POLE		
ANCHOR, POWER OR TELEPHONE		
STUB POWER		
STUB TELEPHONE		
WATER MAIN	WM	6" WM
GAS MAIN	GM	6" GM
TELEPHONE DUCT	T	T
ELECTRIC DUCT	E	E
DIRECT BURIAL TV CABLE	TV	TV
SANITARY SEWER (WITH MANHOLE)	SAN	SAN
STORM SEWER (WITH MANHOLE)	STORM	STORM
DIRECT BURIAL ELECTRIC CABLE	E	E
DIRECT BURIAL TELEPHONE CABLE	T	T
OVERHEAD WIRE		
TRAFFIC LIGHTS		
ELECTRIC MANHOLE	EMH	EMH
TELEPHONE MANHOLE	TMH	TMH

STONE FENCE
HEDGE FENCE
SWAMP OR MARSH
SPRINGS
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INTERMITTENT STREAM OR DITCH
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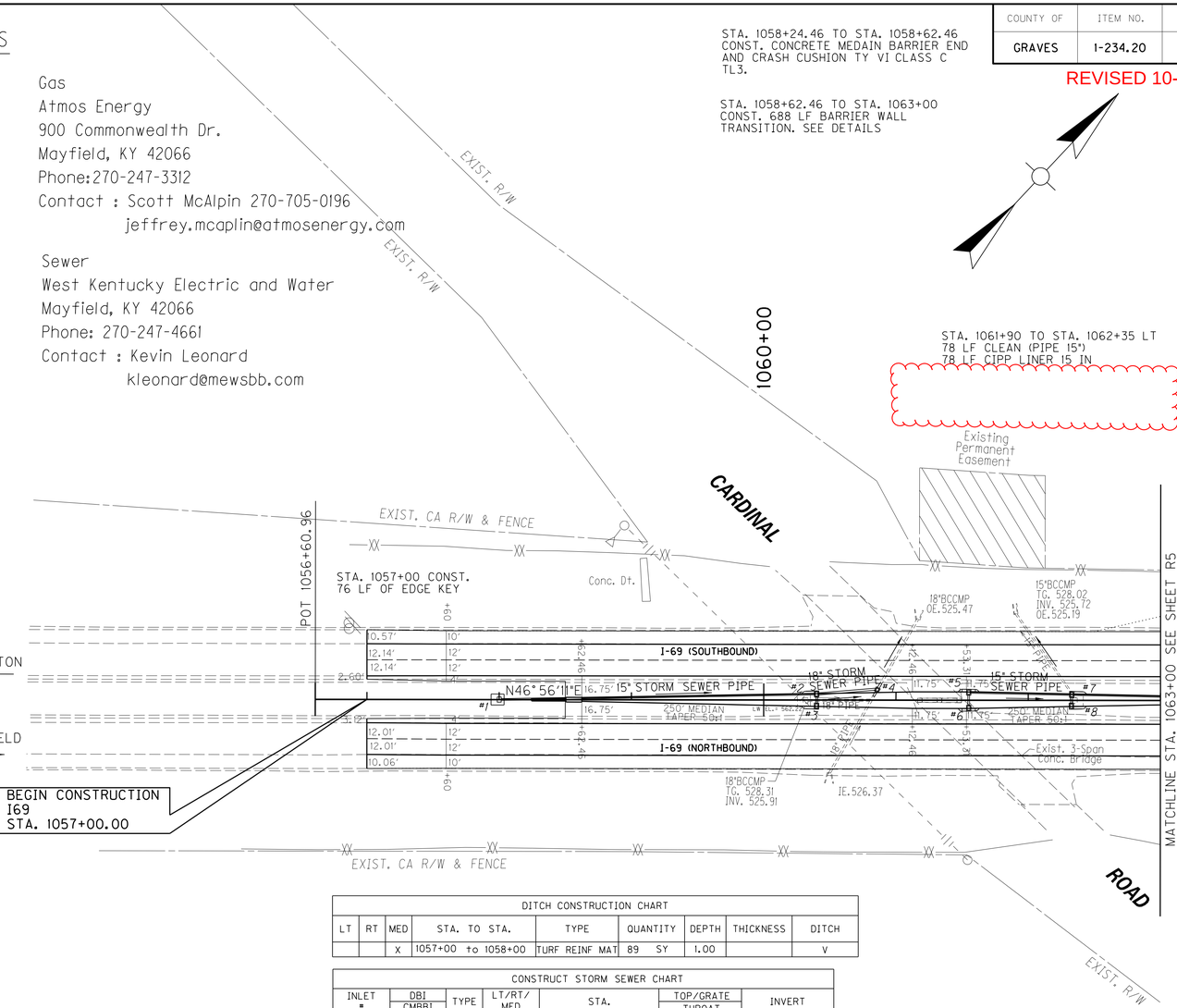

STA. 1060+50 RT TO STA. 1061+15 LT
134 LF CLEAN (PIPE 18")
134 LF CIPP LINER 18 IN

SCALE: 1"=50'

DITCH CONSTRUCTION CHART

LT	RT	MED	STA. TO STA.	TYPE	QUANTITY	DEPTH	THICKNESS	DITCH
		X	1057+00 to 1058+00	TURF REINF MAT	89 SY	1.00		V

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PIPE DRAINAGE SHEET 1 of 32

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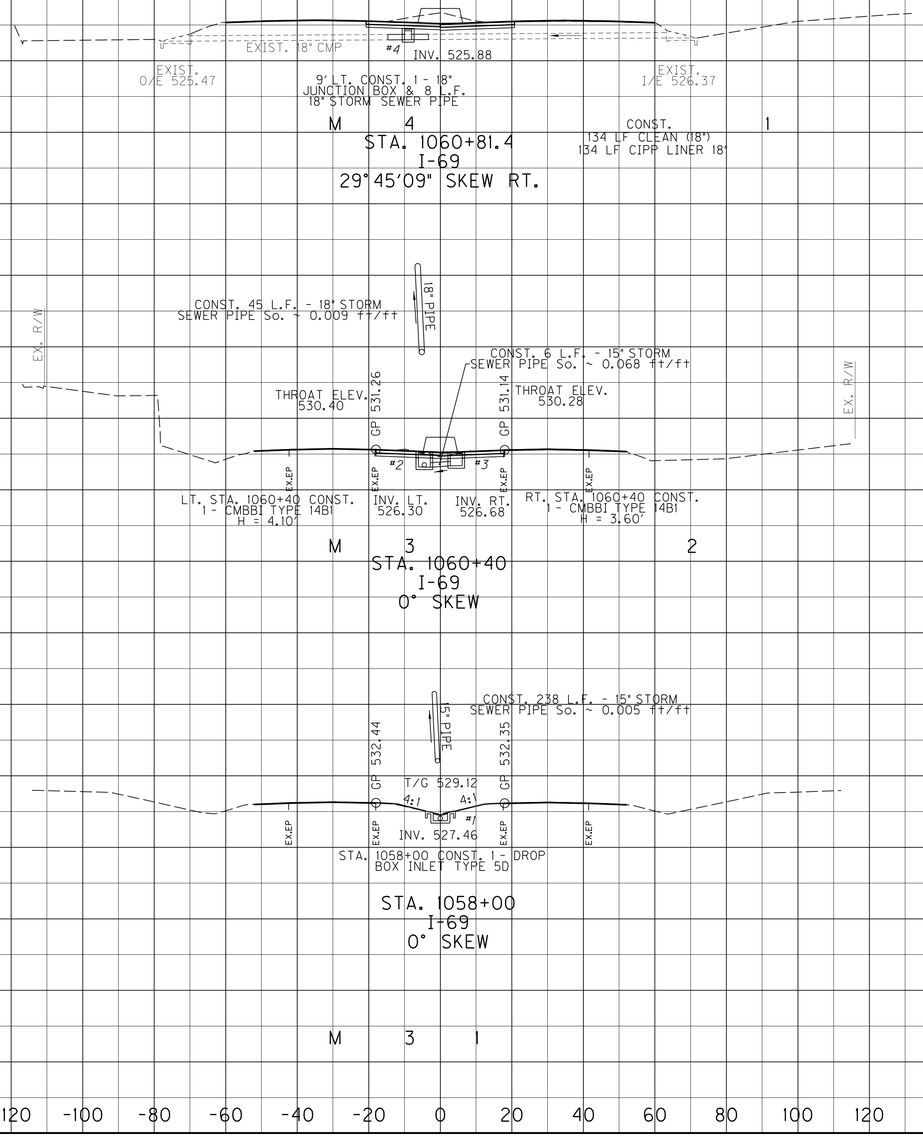
GRAVES	1-234.20	R129

STORM SEWER PIPE							CULVERT PIPE						DESIGN PH LEVEL	MAXIMUM COVER HEIGHT	DBI TYPE 5	DBI TYPE 12	DBI TYPE 15	CMBBI TYPE 14	JUNCTION BOX	24" PIPE CULVERT HEADWALL	24" S & F BOX INLET	METAL END SECTION TYPE 3-24" EQUIV.	CLASS "A" CONCRETE	STEEL REINFORCEMENT	DITCH EXCAVATION		
12"	15"	18"	24"	30"	36"	42"	15"	18"	24"	30"	36"	42"															
L I N E A R F E E T														FT	EACH	LF	EACH	EACH	EACH	EACH	EACH	EACH	CU. YD	LBS.	CU. YD		
		8											M	4													
																			1								
6	45												M	3													
																			2								
238													M	3					1								



GRAVES COUNTY
I-69 PIPE SECTIONS
STA. 1058+00 TO STA. 1060+81.4

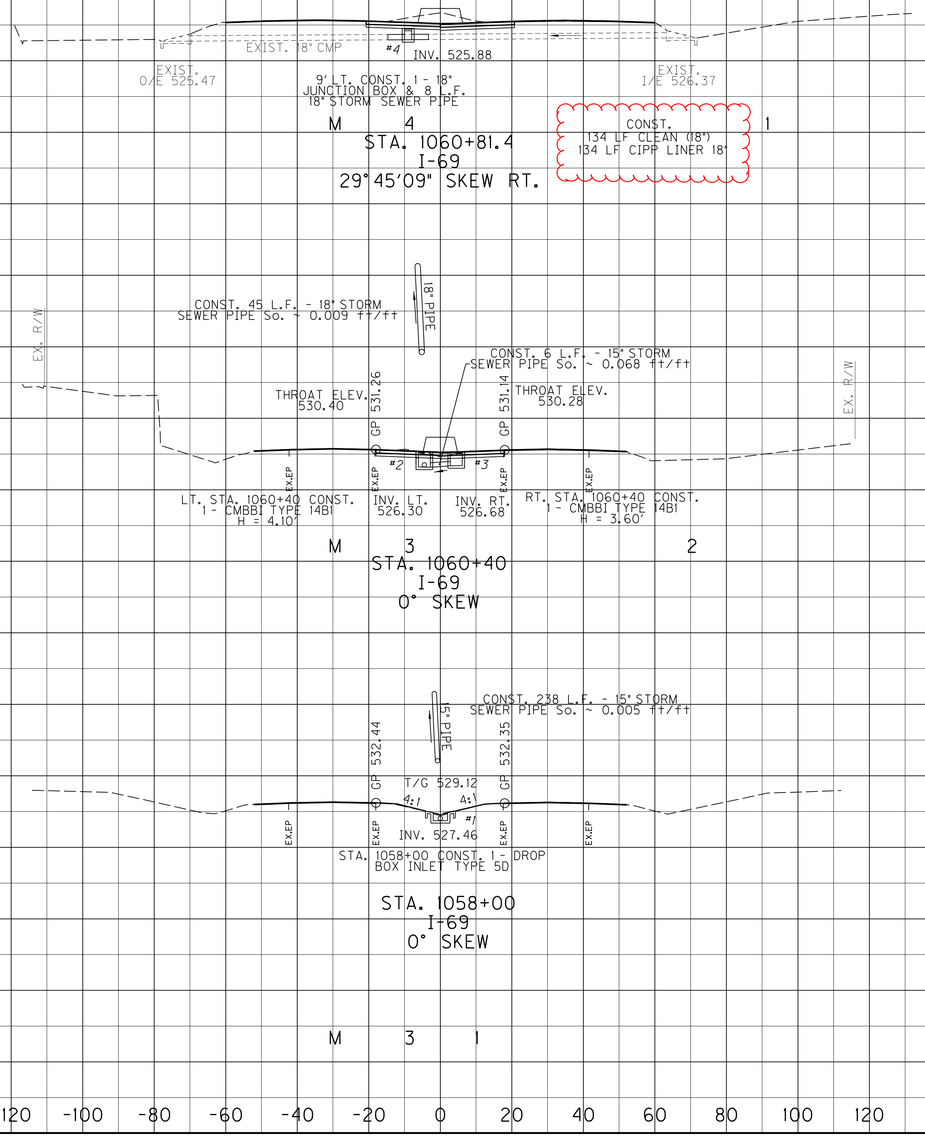
FILE NAME: C:\PW_WORKDIR\WILL\DMS29433\R12900PD.DGN
USER: will
DATE PLOTTED: August 10, 2015
E-SHEET NAME:
MicroStation v8.11.9.357

PIPE DRAINAGE SHEET 1 of 32

COUNTY OF	ITEM NO.	SHEET NO.
GRAVES	1-234.20	R129

REVISED 10-14-2015

STORM SEWER PIPE							CULVERT PIPE						DESIGN PH LEVEL	MAXIMUM COVER HEIGHT	DBI TYPE 5	DBI TYPE 12	DBI TYPE 15	CMBBI TYPE 14	JUNCTION BOX	24" PIPE CULVERT HEADWALL	24" S & F BOX INLET	METAL END SECTION TYPE 3-24" EQUIV.	CLASS "A" CONCRETE	STEEL REINFORCEMENT	DITCH EXCAVATION		
12"	15"	18"	24"	30"	36"	42"	15"	18"	24"	30"	36"	42"															
L I N E A R F E E T														FT	EACH	LF	EACH	EACH	EACH	EACH	EACH	EACH	CU. YD	LBS.	CU. YD		
		8											M	4													1
													M	3													2
6	45																										
238													M	3													1



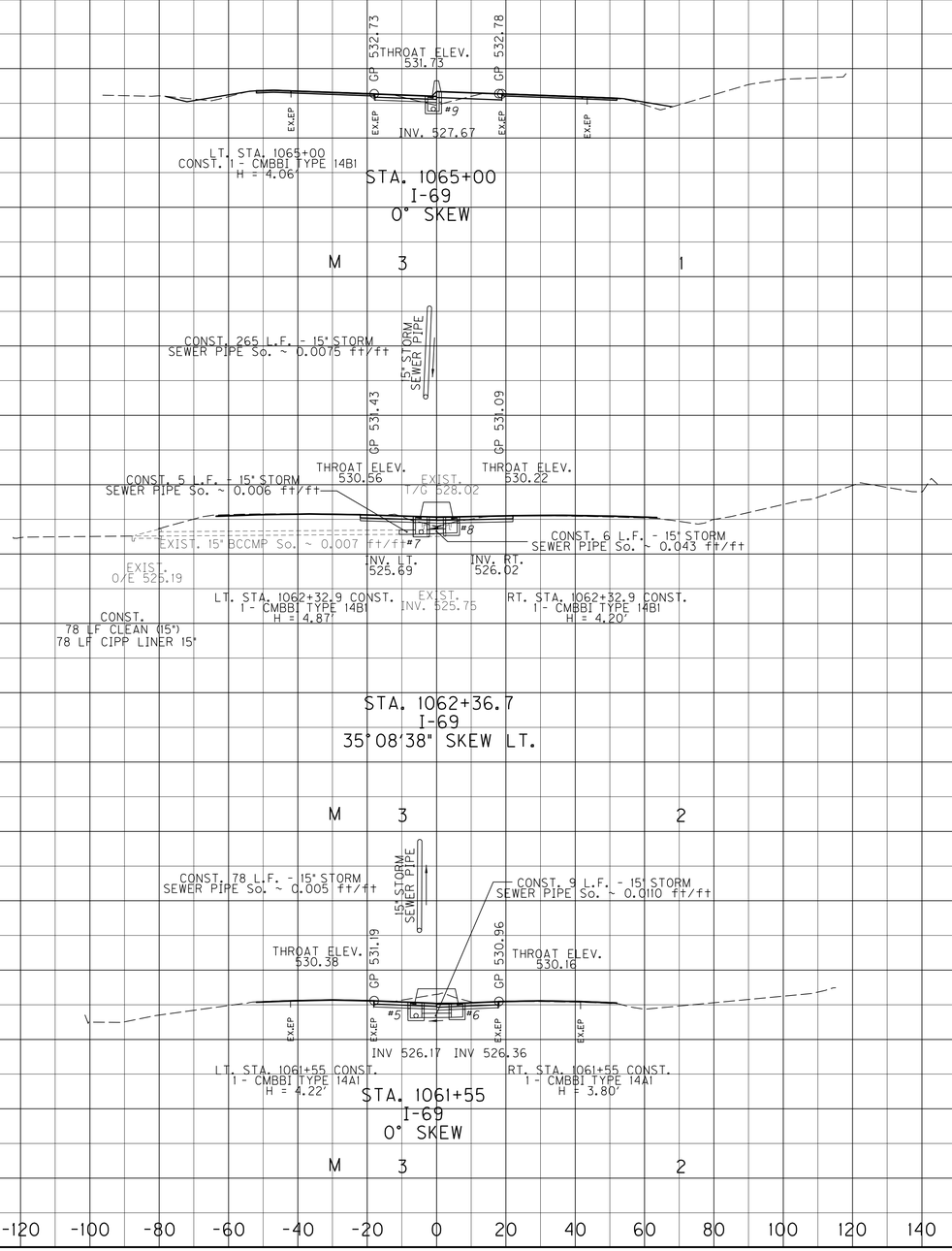
GRAVES COUNTY
I-69 PIPE SECTIONS
STA. 1058+00 TO STA. 1060+81.4

FILE NAME: C:\PW_WORKDIR\WILL\DMS29433\R12900PD.DGN
USER: will
DATE PLOTTED: August 10, 2015
E-SHEET NAME:
MicroStation v8.11.9.357

PIPE DRAINAGE SHEET 2 of 32

COUNTY OF	ITEM NO.	SHEET NO.
GRAVES	1-234.20	R130

STORM SEWER PIPE 12"	15"	18"	24"	30"	36"	42"	CULVERT PIPE 15"	18"	24"	30"	36"	42"	DESIGN PH LEVEL	MAXIMUM COVER HEIGHT	DBI TYPE I	DBI TYPE 12	DBI TYPE 15	CMBBI TYPE 14	JUNCTION BOX	24" PIPE CULVERT HEADWALL	24" S & F BOX INLET	METAL END SECTION TYPE 3-24" EQUIV.	CLASS "A" CONCRETE	STEEL REINFORCEMENT	DITCH EXCAVATION		
L I N E A R F E E T														FT	EACH	LF	EACH	EACH	EACH	EACH	EACH	EACH	CU. YD	LBS.	CU. YD		
	265												M	3				1									
														11				2									
														87													



SCALE: 1" = 20'

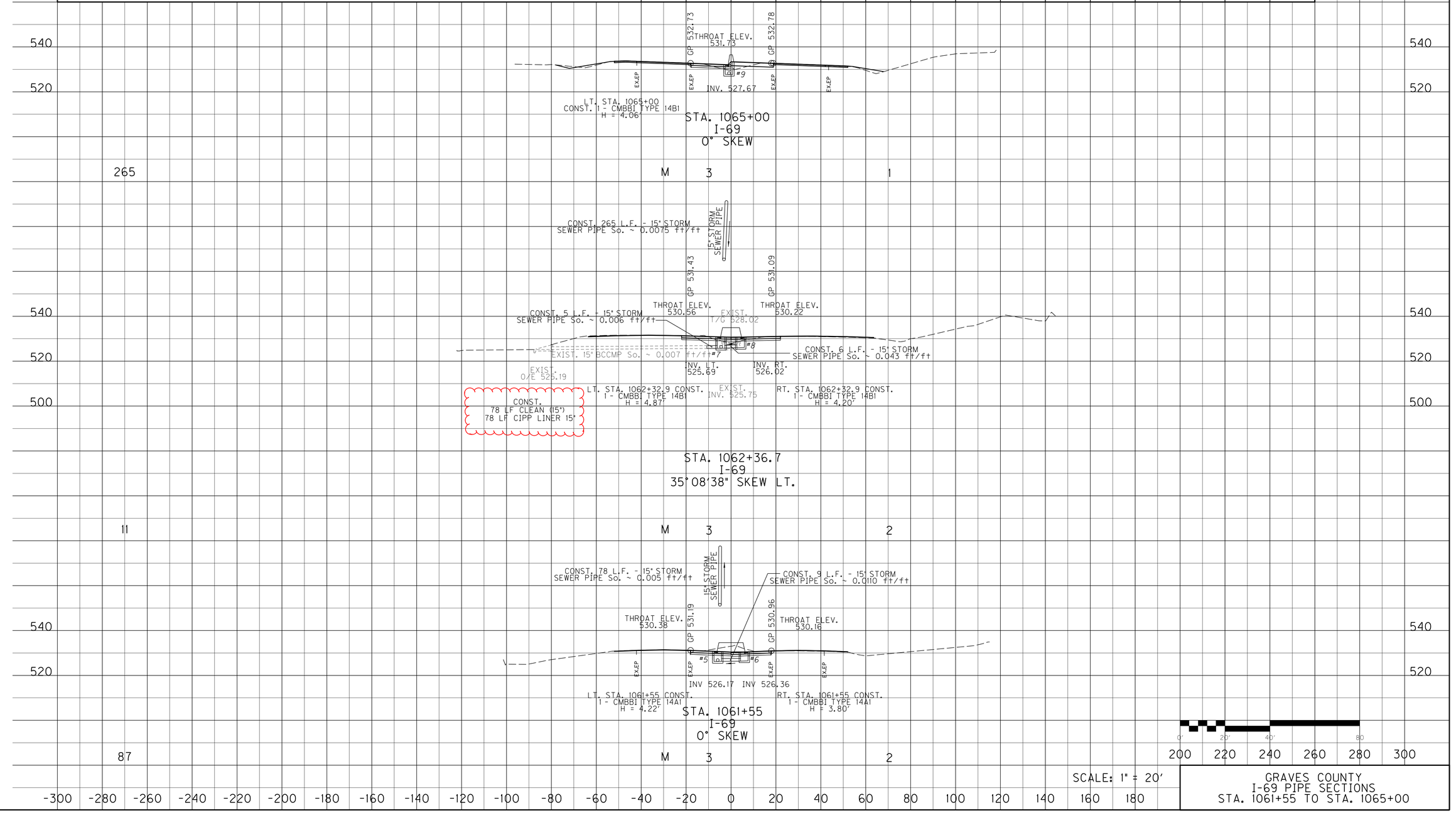
GRAVES COUNTY
I-69 PIPE SECTIONS
STA. 1061+55 TO STA. 1065+00

PIPE DRAINAGE SHEET 2 of 32

COUNTY OF	ITEM NO.	SHEET NO.
GRAVES	1-234.20	R130

REVISED 10-14-2015

STORM SEWER PIPE							CULVERT PIPE						DESIGN PH LEVEL	MAXIMUM COVER HEIGHT	DBI TYPE I	DBI TYPE 12	DBI TYPE 15	CMBBI TYPE 14	JUNCTION BOX	24" PIPE CULVERT HEADWALL	24" S & F BOX INLET	METAL END SECTION TYPE 3-24" EQUIV.	CLASS "A" CONCRETE	STEEL REINFORCEMENT	DITCH EXCAVATION		
12"	15"	18"	24"	30"	36"	42"	15"	18"	24"	30"	36"	42"															
L I N E A R F E E T														FT	EACH	LF	EACH	EACH	EACH	EACH	EACH	EACH	CU. YD	LBS.	CU. YD		



SCALE: 1" = 20'

GRAVES COUNTY
I-69 PIPE SECTIONS
STA. 1061+55 TO STA. 1065+00

FILE NAME: C:\PW_WORKDIR\will\DMS29433\R13000PD.DGN
USER: will
DATE PLOTTED: August 10, 2015
E-SHEET NAME:
MicroStation v8.11.9.357

LETTING DATE

CONSTRUCTION PROJECT NO.

FILE NAME: 27453_S01_Title.dgn

USERNAME: $$$$plotted$by$$$$

DATE: 10/13/2015

SHEET LOCATION: TIT

TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS

GRAVES COUNTY
U.S. 45
OVER INTERSTATE 69
STA. 515+53.70

ESTIMATE OF QUANTITIES

BID ITEM CODE	08100	08104	08150	08151	08001	02231	02998	03299	08020	08033	08500	23826EC	23825EC	23233EC	21532ED	24098EC	08160	08134	08135								
BID ITEM	Concrete Class "A"	Concrete Class "AA" ①	Steel Reinforcement	Steel Reinforcement, Epoxy Coated	Structure Excavation, Common	Structure Granular Backfill ②	Masonry Coating	Armored Edge for Concrete	Crushed Aggregate Slope Protection	Test Piles	Approach Slab	Pipe Pile 16 Inch	Inside Fit Snubnose Conical Point-16 Inch	Dynamic Pile Testing	Rail System Type III	PPC I-Beam HN 66 49	Structural Steel ③	Mechanical Reinforced Coupler-No. 9	Mechanical Reinforced Coupler-No. 10								
UNIT	C.Y.	C.Y.	LBS.	LBS.	C.Y.	C.Y.	S.Y.	L.F.	Tons	L.F.	S.Y.	L.F.	Each	Each	L.F.	L.F.	L.S.	Each	Each								
Substructure: Integral End Bent #1	71	41	7372	4950		268	106		164	62	138	930	16	2													
Substructure: Pier #1	139	44	31724	319	59		220			77		1309	18	2				54	15								
Substructure: Integral End Bent #2	73	41	7217	4807		276	94		254	62	135	930	16	2													
Superstructure		450		163933			1322	115							491	1448	1										
BRIDGE TOTALS	283	576	46313	174009	59	544	1742	115	418	201	273	3169	50	6	491	1448	1	54	15								

① Pipe sleeves are incidental to pier diaphragm concrete. Refer to the pier details sheet for anchor dowel details.
Concrete for the non-standard median barrier is included here.

② Fabric Geotextile Type 4 is incidental to Structure Granular Backfill.

③ Estimated weight of structural steel - 1820 Lbs. (deck drains)

INDEX OF SHEETS

SPECIAL NOTES

Special Note for Dynamic Pile Testing

SPECIAL PROVISIONS

69(12) Embankment at Bridge End Bent Structures

STANDARD DRAWINGS

BGX-006-09	Stencils for Structures
BGX-012-02	Geotechnical Legend
BJE-001-12	Neoprene Expansion Dams and Armored Edges
BBP-002-04	Bearing Details
RGX-100-05	Treatment of Embankment at End Bents
RGX-105-07	Treatment of Embankment at End Bents

SPECIFICATIONS

2012 Standard Specifications for Road and Bridge Construction.

7th Edition AASHTO LRFD Bridge Design Specifications (2014) with Interims thru 2015.

STATE OF KENTUCKY
LEE A. CARLISLE
25709
LICENSED PROFESSIONAL ENGINEER

Lee A. Carlisle
Lee A. Carlisle
P.E. 25709
10/14/2015
DATE

UPDATED QUANTITIES	10/14/2015
REVISION	DATE

DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: L.M. SALLEE	L.A. CARLISLE
DETAILED BY: J. ROSE	L.A. CARLISLE

ITEM NUMBER
1-234.20

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
GRAVES

ROUTE
US 45

CROSSING
OVER I-69

TITLE SHEET

PREPARED BY
PALMER ENGINEERING CO.

SHEET NO.
S01

DRAWING NO.
27453

LETTING DATE

CONSTRUCTION PROJECT NO.

FILE NAME: 27453_S01_Title.dgn

USERNAME: $$$$plotted$by$$$$

DATE: 10/13/2015

SHEET LOCATION: TIT

TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS

GRAVES COUNTY
U.S. 45
OVER INTERSTATE 69
STA. 515+53.70

ESTIMATE OF QUANTITIES

BID ITEM CODE		08100	08104	08150	08151	08001	02231	02998	03299	08020	08033	08500	23826EC	23825EC	23233EC	21532ED	24098EC	08160	08134	08135
BID ITEM		Concrete Class "A"	Concrete Class "AA" ①	Steel Reinforcement	Steel Reinforcement, Epoxy Coated	Structure Excavation, Common	Structure Granular Backfill ②	Masonry Coating	Armored Edge for Concrete	Crushed Aggregate Slope Protection	Test Piles	Approach Slab	Pipe Pile 16 Inch	Inside Fit Snubnose Conical Point-16 Inch	Dynamic Pile Testing	Rail System Type III	PPC I-Beam HN 66 49	Structural Steel ③	Mechanical Reinforced Coupler-No. 9	Mechanical Reinforced Coupler-No. 10
UNIT		C.Y.	C.Y.	LBS.	LBS.	C.Y.	C.Y.	S.Y.	L.F.	Tons	L.F.	S.Y.	L.F.	Each	Each	L.F.	L.F.	L.S.	Each	Each
Substructure	Integral End Bent #1	71	41	7372	4950		268	106		164	62	138	930	16	2					
	Pier #1	139	44	31724	319	59		220			77		1309	18	2				54	15
	Integral End Bent #2	73	41	7217	4807		276	94		254	62	135	930	16	2					
Superstructure			450		163933			1322	115							491	1448	1		
BRIDGE TOTALS		283	576	46313	174009	59	544	1742	115	418	201	273	3169	50	6	491	1448	1	54	15

① Pipe sleeves are incidental to pier diaphragm concrete. Refer to the pier details sheet for anchor dowel details.
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SPECIFICATIONS

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7th Edition AASHTO LRFD Bridge Design Specifications (2014) with Interims thru 2015.

UPDATED QUANTITIES	10/14/2015
REVISION	DATE

DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: L.M. SALLEE	L.A. CARLISLE
DETAILED BY: J. ROSE	L.A. CARLISLE

STATE OF KENTUCKY
LEE A. CARLISLE
25709
LICENSED PROFESSIONAL ENGINEER

Lee A. Carlisle
Lee A. Carlisle
P.E. 25709
10/14/2015
DATE

ITEM NUMBER
1-234.20

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
GRAVES

ROUTE
US 45

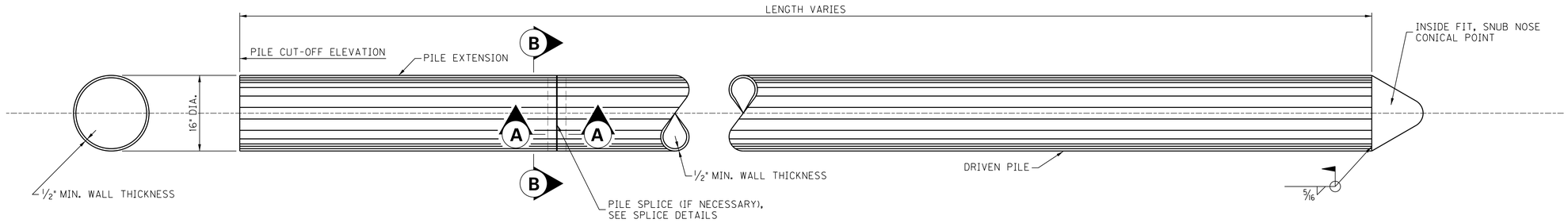
CROSSING
OVER I-69

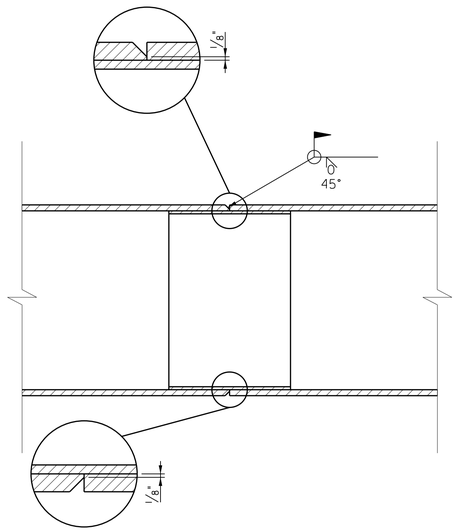
TITLE SHEET

PREPARED BY
PALMER ENGINEERING CO.

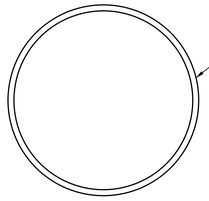
SHEET NO.
S01

DRAWING NO.
27453





SECTION A–A



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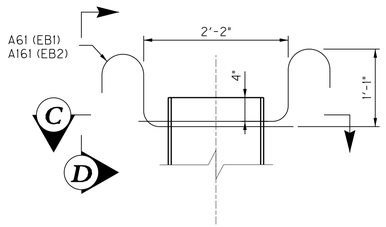
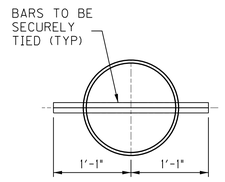


END BENT
PILE ANCHORAGE DETAIL



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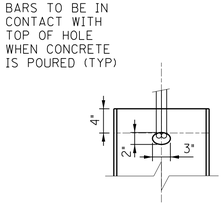


VIEW "D"

NOTE: AT END BENT PILES DRILL OR TORCH 2"x3" (+/-) HOLE AND THREAD A61 OR A161 BARS THROUGH AS SHOWN. WELDING SHALL NOT BE PERMITTED.

GENERAL NOTES

SPECIFICATIONS: KENTUCKY DEPARTMENT OF HIGHWAY STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION,

PIPE PILE MATERIAL: THE STEEL FOR THE PIPE PILING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A252, GRADE 3 (MINIMUM YIELD STRENGTH OF 45 ksi), FOR WELDED OR SEAMLESS STEEL PIPE PILES.

PAINT: NO PAINT SHALL BE REQUIRED ON THE STEEL PILE SHELL.

PILE POINTS: INSIDE FIT, SNUB NOSE CONICAL POINTS SHALL CONFORM TO ASTM A148 OR AASHTO M103 GRADE 65/35 MINIMUM. PILE POINTS SHALL BE ATTACHED USING MINIMUM 5/16" FILLET WELD AROUND CIRCUMFERENCE.

SPLICES: SPLICES SHALL BE WELDED AS DETAILED ON THIS SHEET, EMPLOYING THE USE OF A BACK-UP RING OR SLEEVE TO ALIGN THE PILE SECTIONS. WHEN SPLICING IS NECESSARY, USE A LENGTH THAT WILL REASONABLE ASSURE THAT CAPACITY WILL BE ATTAINED WITHOUT ADDITIONAL SPLICING.

FIELD WELDS: ENSURE FIELDS WELDING MATERIAL AND WORKMANSHIP FOR ALL PILING CONFORMS TO THE CURRENT JOINT SPECIFICATIONS ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE. SPLICE PILES AS INDICATED ABOVE ONLY WHEN DRIVEN BELOW CUT-OFF ELEVATION.

PAYMENT: PAYMENT FOR THE PILES IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS WILL BE MADE AT THE CONTRACT PRICE PER LINEAR FOOT.

PIPE PILE THICKNESS: CONTRACTOR SHALL SELECT WALL THICKNESS SUFFICIENT TO WITHSTAND DRIVING WITHOUT INJURY AND RESIST HARMFUL DISTORTION AND/OR BUCKLING DUE TO SOIL PRESSURES AFTER DRIVING. SELECTED WALL THICKNESS SHALL NOT BE LESS THAN THAT INDICATED ABOVE.

MIL TEST REPORTS: FURNISH NOTARIZED MILL TEST REPORTS IN TRIPLICATE TO THE DEPARTMENT SHOWING THAT ALL MATERIALS FURNISHED CONFORM TO THE SPECIFICATIONS.

CONCRETE: THE PIPE PILES SHALL BE FILLED WITH CLASS "A" CONCRETE. THE COST OF THE FILL CONCRETE BELOW BOTTOM OF CAP/FOOTING IS INCIDENTAL TO THE PRICE BID PER LINEAR FOOT OF 16" PIPE PILE.

REVISION	DATE
ADDED PILE ANCHORAGE DETAILS	10/14/2015

DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: L.M. SALLEE	L.A. CARLISLE
DETAILED BY: M.D. SIMPSON	L.A. CARLISLE

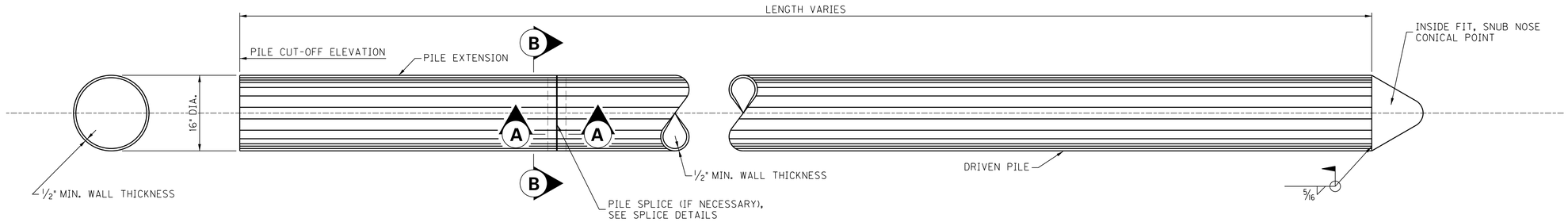
Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

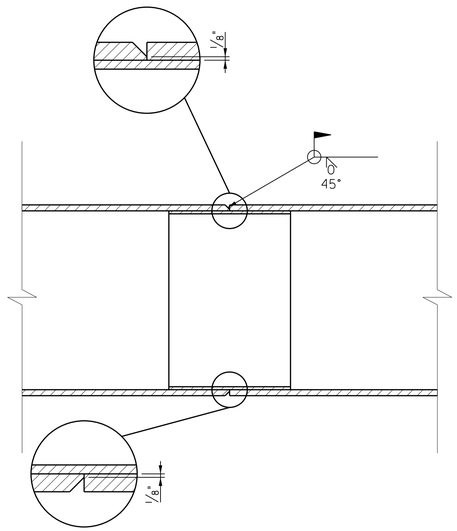
COUNTY
GRAVES

ROUTE	CROSSING
US 45	I-69

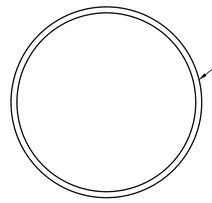
16" PIPE PILE DETAILS

ITEM NUMBER	PREPARED BY	SHEET NO.
1-234.20	PALMER ENGINEERING CO.	S08
		DRAWING NO. 27453





SECTION A–A



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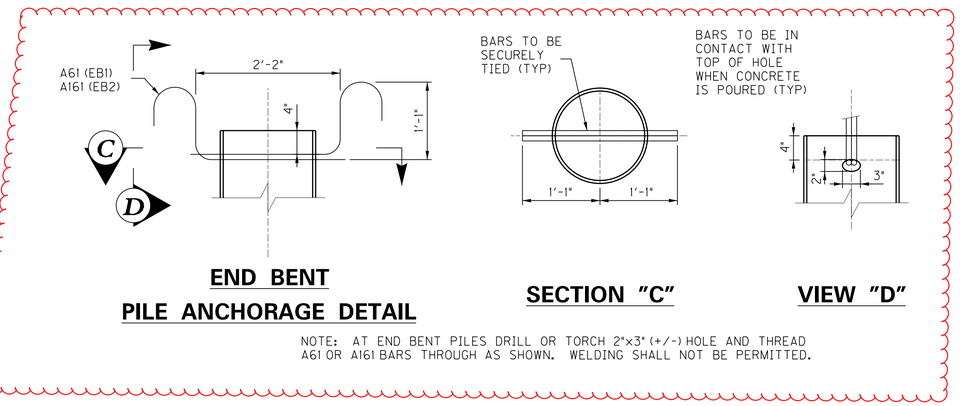


END BENT
PILE ANCHORAGE DETAIL

SECTION "C"

VIEW "D"

NOTE: AT END BENT PILES DRILL OR TORCH 2"x3" (+/-) HOLE AND THREAD A61 OR A161 BARS THROUGH AS SHOWN. WELDING SHALL NOT BE PERMITTED.

CONCRETE: THE PIPE PILES SHALL BE FILLED WITH CLASS "A" CONCRETE. THE COST OF THE FILL CONCRETE BELOW BOTTOM OF CAP/FOOTING IS INCIDENTAL TO THE PRICE BID PER LINEAR FOOT OF 16" PIPE PILE.

GENERAL NOTES

SPECIFICATIONS: KENTUCKY DEPARTMENT OF HIGHWAY STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION,

PIPE PILE MATERIAL: THE STEEL FOR THE PIPE PILING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A252, GRADE 3 (MINIMUM YIELD STRENGTH OF 45 ksi), FOR WELDED OR SEAMLESS STEEL PIPE PILES.

PAINT: NO PAINT SHALL BE REQUIRED ON THE STEEL PILE SHELL.

PILE POINTS: INSIDE FIT, SNUB NOSE CONICAL POINTS SHALL CONFORM TO ASTM A148 OR AASHTO M103 GRADE 65/35 MINIMUM. PILE POINTS SHALL BE ATTACHED USING MINIMUM 5/16" FILLET WELD AROUND CIRCUMFERENCE.

SPLICES: SPLICES SHALL BE WELDED AS DETAILED ON THIS SHEET, EMPLOYING THE USE OF A BACK-UP RING OR SLEEVE TO ALIGN THE PILE SECTIONS. WHEN SPLICING IS NECESSARY, USE A LENGTH THAT WILL REASONABLE ASSURE THAT CAPACITY WILL BE ATTAINED WITHOUT ADDITIONAL SPLICING.

FIELD WELDS: ENSURE FIELDS WELDING MATERIAL AND WORKMANSHIP FOR ALL PILING CONFORMS TO THE CURRENT JOINT SPECIFICATIONS ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE. SPLICE PILES AS INDICATED ABOVE ONLY WHEN DRIVEN BELOW CUT-OFF ELEVATION.

PAYMENT: PAYMENT FOR THE PILES IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS WILL BE MADE AT THE CONTRACT PRICE PER LINEAR FOOT.

PIPE PILE THICKNESS: CONTRACTOR SHALL SELECT WALL THICKNESS SUFFICIENT TO WITHSTAND DRIVING WITHOUT INJURY AND RESIST HARMFUL DISTORTION AND/OR BUCKLING DUE TO SOIL PRESSURES AFTER DRIVING. SELECTED WALL THICKNESS SHALL NOT BE LESS THAN THAT INDICATED ABOVE.

MIL TEST REPORTS: FURNISH NOTARIZED MILL TEST REPORTS IN TRIPLICATE TO THE DEPARTMENT SHOWING THAT ALL MATERIALS FURNISHED CONFORM TO THE SPECIFICATIONS.

REVISION	DATE
ADDED PILE ANCHORAGE DETAILS	10/14/2015

DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: L.M. SALLEE	L.A. CARLISLE
DETAILED BY: M.D. SIMPSON	L.A. CARLISLE

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: GRAVES

ROUTE: US 45 | CROSSING: I-69

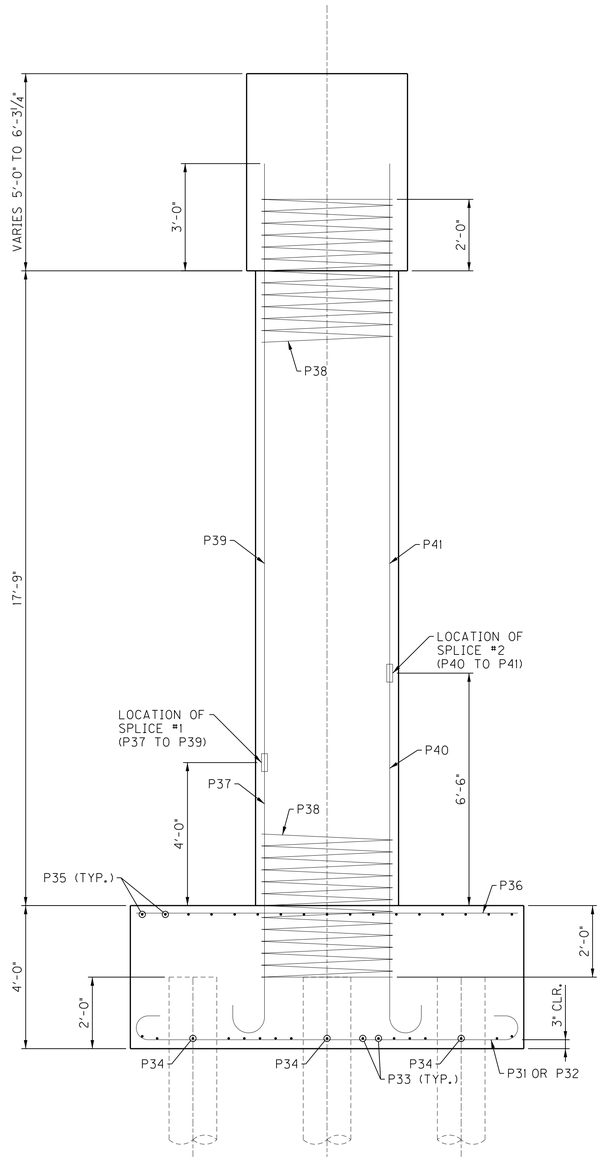
16" PIPE PILE DETAILS

ITEM NUMBER: 1-234.20

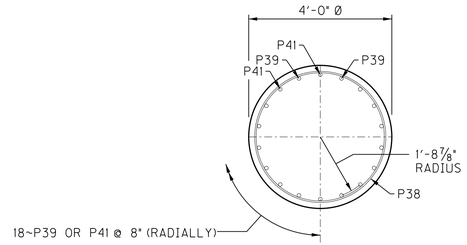
PREPARED BY: PALMER ENGINEERING CO.

SHEET NO. S08

DRAWING NO. 27453



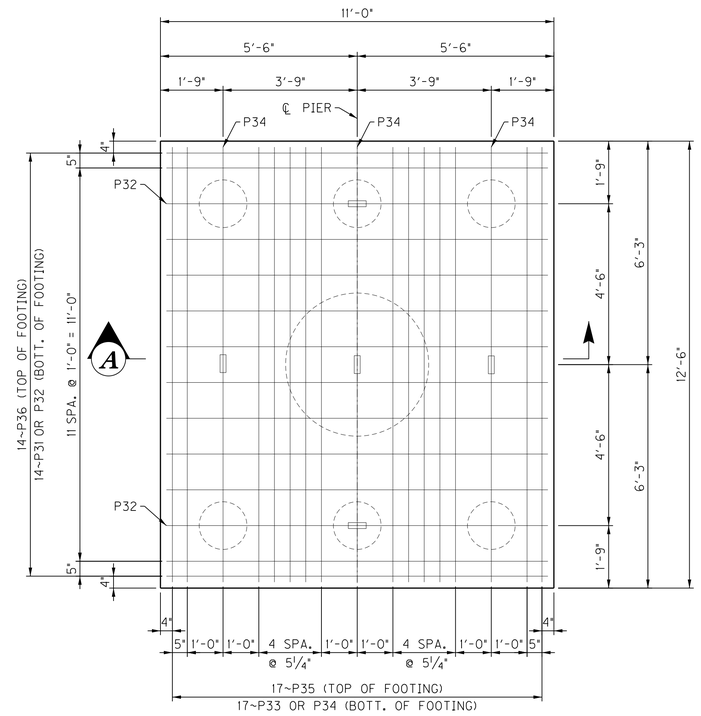
SECTION A–A



COLUMN SECTION

NOTE:
USE A MECHANICAL COUPLER TO SPLICE P37 DOWEL TO P39 BAR AND P40 DOWEL TO P41 BAR, LAP SPLICES SHALL NOT BE USED.

NOTE:
DRILL OR TORCH 1½" Ø (+/-) HOLES IN PILES AND THREAD P32 OR P34 BARS THROUGH. ATTACH MATCHING BARS WITH MECHANICAL COUPLER, WELDING SHALL NOT BE PERMITTED.



PLAN OF FOOTING

(TYPICAL EACH FOOTING)

ADDED NORTH ARROW, CHANGED NOTE	10/14/2015
REVISION	DATE
DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: L.M. SALLEE	L.A. CARLISLE
DETAILED BY: D.L. HORTON	L.M. SALLEE

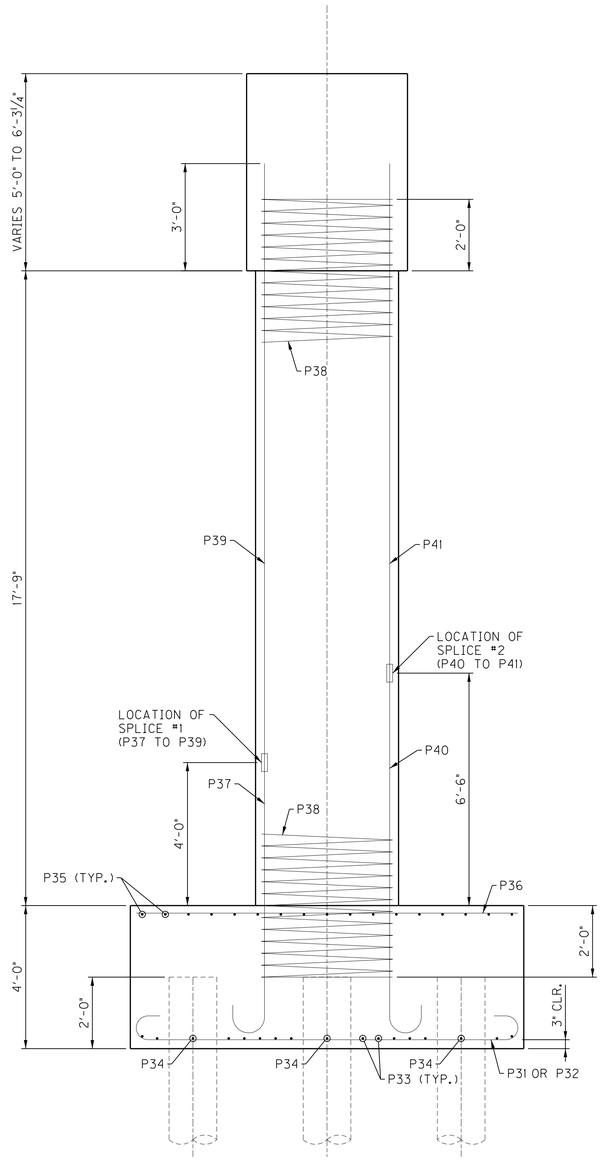
Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: **GRAVES**

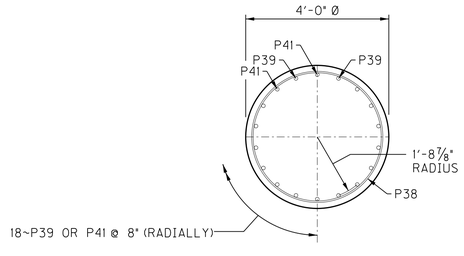
ROUTE: **US 45** | CROSSING: **I–69**

PIER REINFORCING DETAILS

ITEM NUMBER	PREPARED BY	SHEET NO.
1–234.20	*PALMER ENGINEERING CO.*	S13
		DRAWING NO. 27453



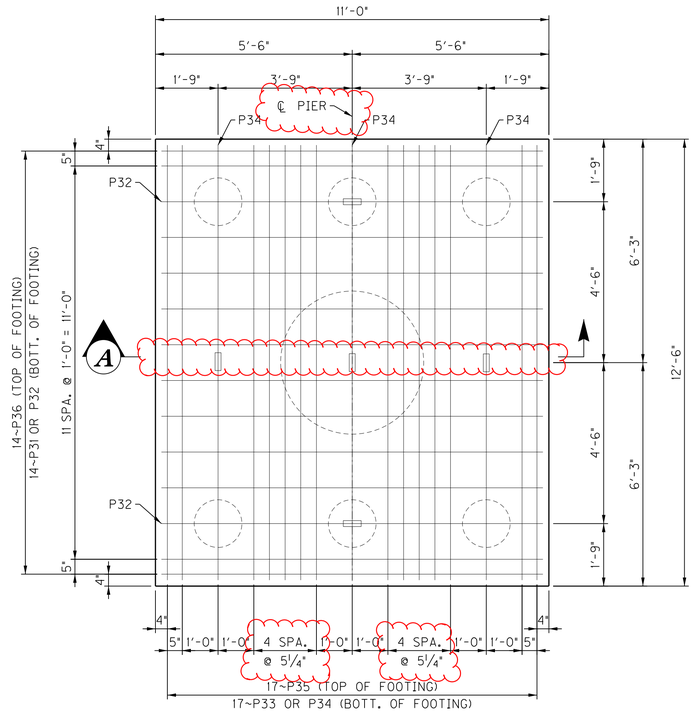
SECTION A–A



COLUMN SECTION

NOTE:
USE A MECHANICAL COUPLER TO SPLICE P37 DOWEL TO P39 BAR AND P40 DOWEL TO P41 BAR, LAP SPLICES SHALL NOT BE USED.

NOTE:
DRILL OR TORCH 1½" Ø (+/-) HOLES IN PILES AND THREAD P32 OR P34 BARS THROUGH. ATTACH MATCHING BARS WITH MECHANICAL COUPLER, WELDING SHALL NOT BE PERMITTED.



PLAN OF FOOTING

(TYPICAL EACH FOOTING)

ADDED NORTH ARROW, CHANGED NOTE	10/14/2015
REVISION	DATE
DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: L.M. SALLEE	L.A. CARLISLE
DETAILED BY: D.L. HORTON	L.M. SALLEE

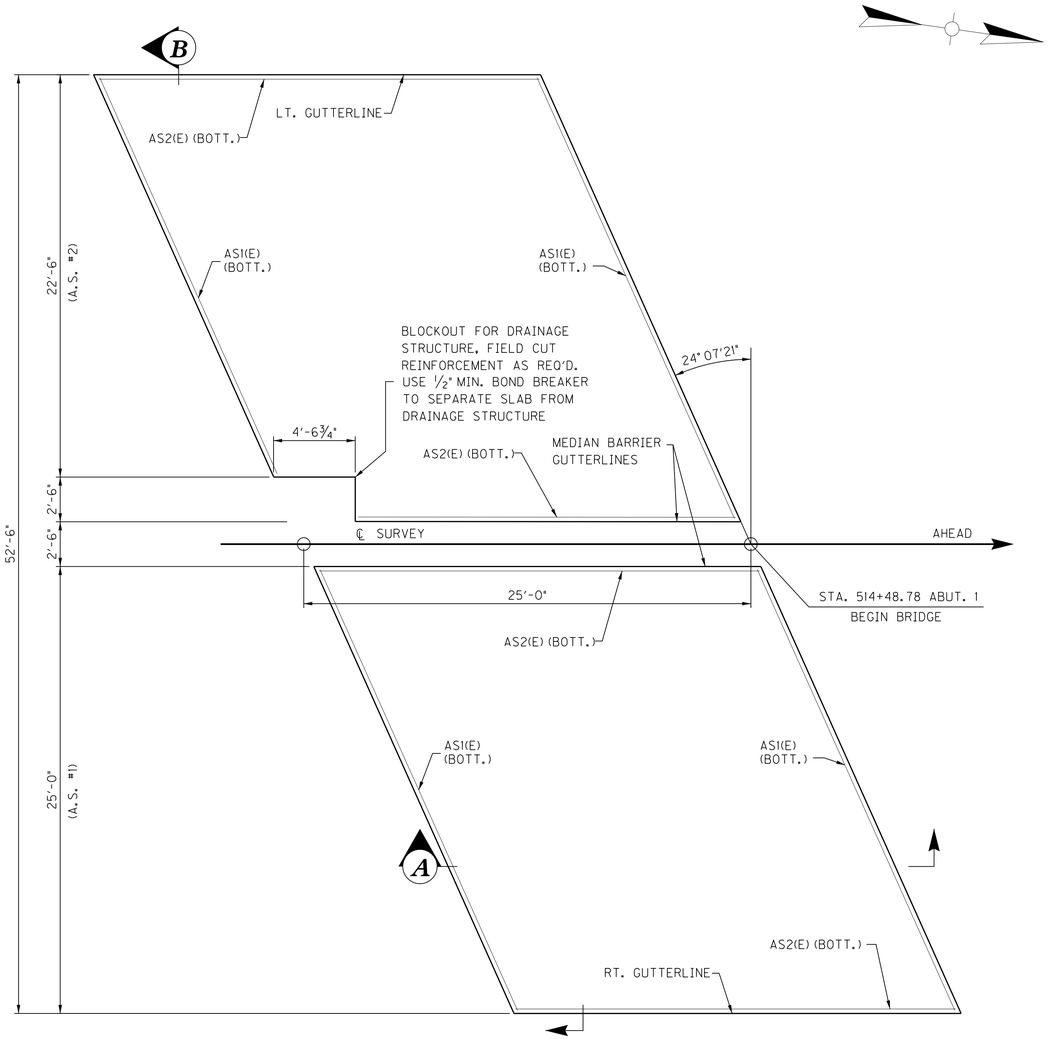
Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: **GRAVES**

ROUTE: **US 45** | CROSSING: **I–69**

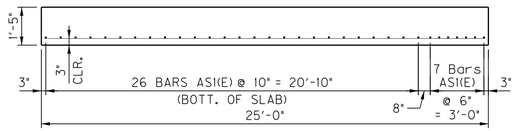
PIER REINFORCING DETAILS

ITEM NUMBER	PREPARED BY	SHEET NO.
1–234.20	*PALMER ENGINEERING CO.*	S13
		DRAWING NO. 27453

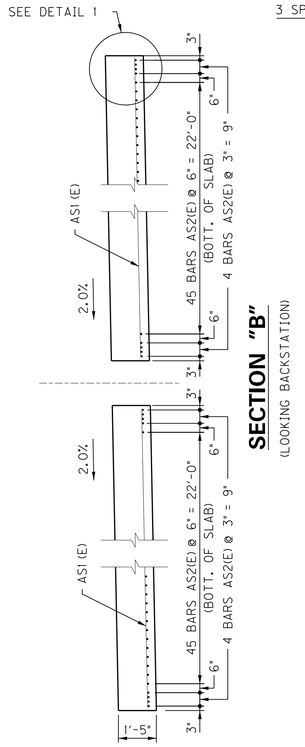


PLAN

APPROACH SLAB AT ABUTMENT 1

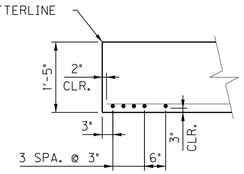


SECTION "A"

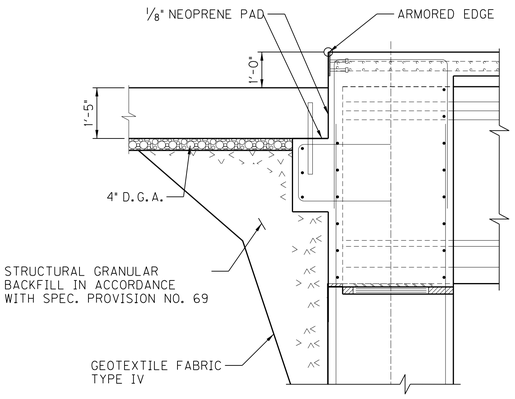


SECTION "B"

(LOOKING BACKSTATION)



DETAIL 1



TYPICAL SECTION SHOWING JUNCTION OF APPROACH SLAB WITH BRIDGE BACKWALL

APPROACH SLAB REINFORCEMENT

MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d
ASI(E)	STR.	66	#5	27'-0"	SLAB				
AS2(E)	STR.	106	#8	24'-8"	SLAB				

ESTIMATE OF QUANTITIES

	A.S. #1	A.S. #2	UNIT
CLASS "AA" CONCRETE	33	33	YD^3
EPOXY COATED REINFORCEMENT	4420	4420	lbs.

NOTE : ESTIMATE OF QUANTITIES IS FOR INFORMATION ONLY.

GENERAL NOTES

CONCRETE

CONCRETE SHALL BE CLASS "AA"

REINFORCEMENT

ALL STEEL REINFORCEMENT SHALL BE GRADE 60 AND EPOXY COATED.

APPROACH CURB TREATMENT

⅛" NEOPRENE PAD SHALL BE PLACED BETWEEN APPROACH SLAB AND ANY APPROACH CURB OR BARRIER.

MIN. LAP SPLICE

#5 BARS - 3'-0"

REVISION	DATE
UPDATED QUANTITY, ADDED NOTE	10/14/2015

DATE: SEPTEMBER, 2015 — CHECKED BY

DESIGNED BY: L.M. SALLEE — L.A. CARLISLE

DETAILED BY: J.A. ROSE — L.M. SALLEE

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: GRAVES

ROUTE: US 45 — CROSSING: I-69

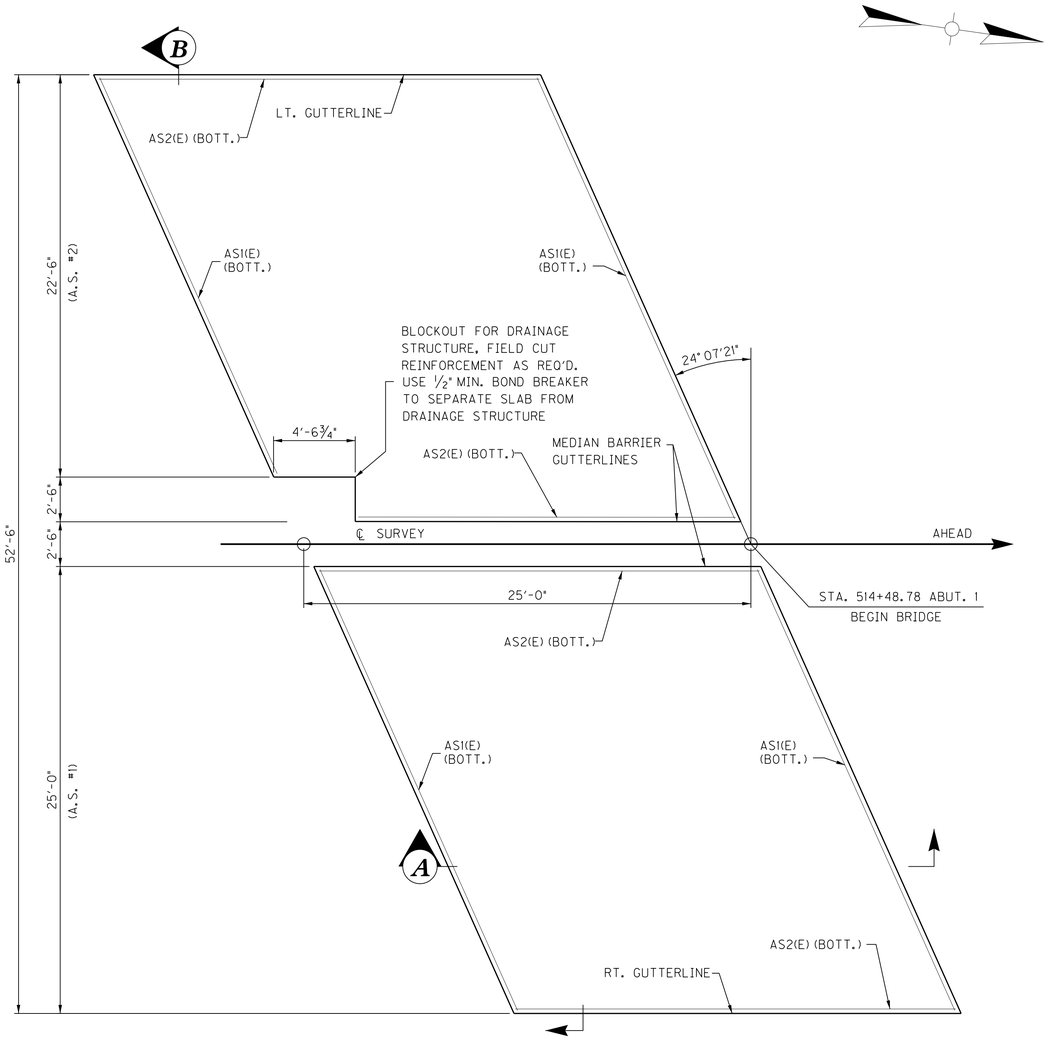
APPROACH SLAB

ITEM NUMBER: 1–234.20

PREPARED BY: PALMER ENGINEERING CO.

SHEET NO. S28

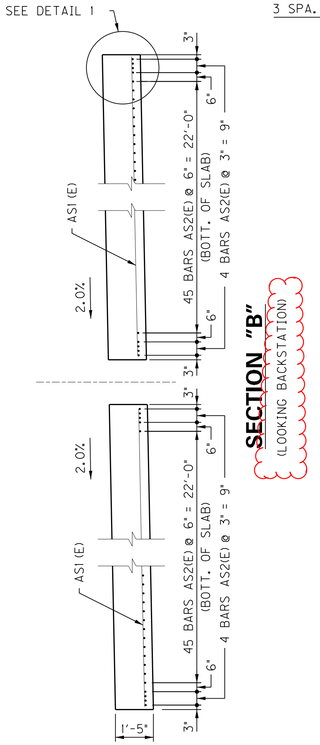
DRAWING NO. 27453



PLAN

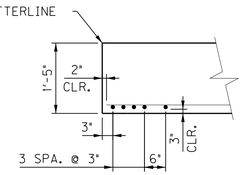
APPROACH SLAB AT ABUTMENT 1

SECTION "A"

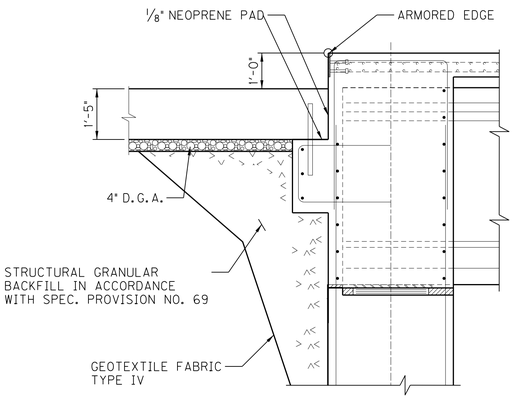


SECTION "B"

(LOOKING BACKSTATION)



DETAIL 1



TYPICAL SECTION SHOWING JUNCTION OF APPROACH SLAB WITH BRIDGE BACKWALL

APPROACH SLAB REINFORCEMENT

MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d
ASI(E)	STR.	66	#5	27'-0"	SLAB				
AS2(E)	STR.	106	#8	24'-8"	SLAB				

ESTIMATE OF QUANTITIES

	A.S. #1	A.S. #2	UNIT
CLASS "AA" CONCRETE	33	33	YD^3
EPOXY COATED REINFORCEMENT	4420	4420	lbs.

NOTE : ESTIMATE OF QUANTITIES IS FOR INFORMATION ONLY.

GENERAL NOTES

CONCRETE

CONCRETE SHALL BE CLASS "AA"

REINFORCEMENT

ALL STEEL REINFORCEMENT SHALL BE GRADE 60 AND EPOXY COATED.

APPROACH CURB TREATMENT

⅛" NEOPRENE PAD SHALL BE PLACED BETWEEN APPROACH SLAB AND ANY APPROACH CURB OR BARRIER.

MIN. LAP SPLICE

#5 BARS - 3'-0"

REVISION	DATE
UPDATED QUANTITY, ADDED NOTE	10/14/2015

DATE: SEPTEMBER, 2015 — CHECKED BY

DESIGNED BY: L.M. SALLEE — L.A. CARLISLE

DETAILED BY: J.A. ROSE — L.M. SALLEE

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: GRAVES

ROUTE: US 45 — CROSSING: I-69

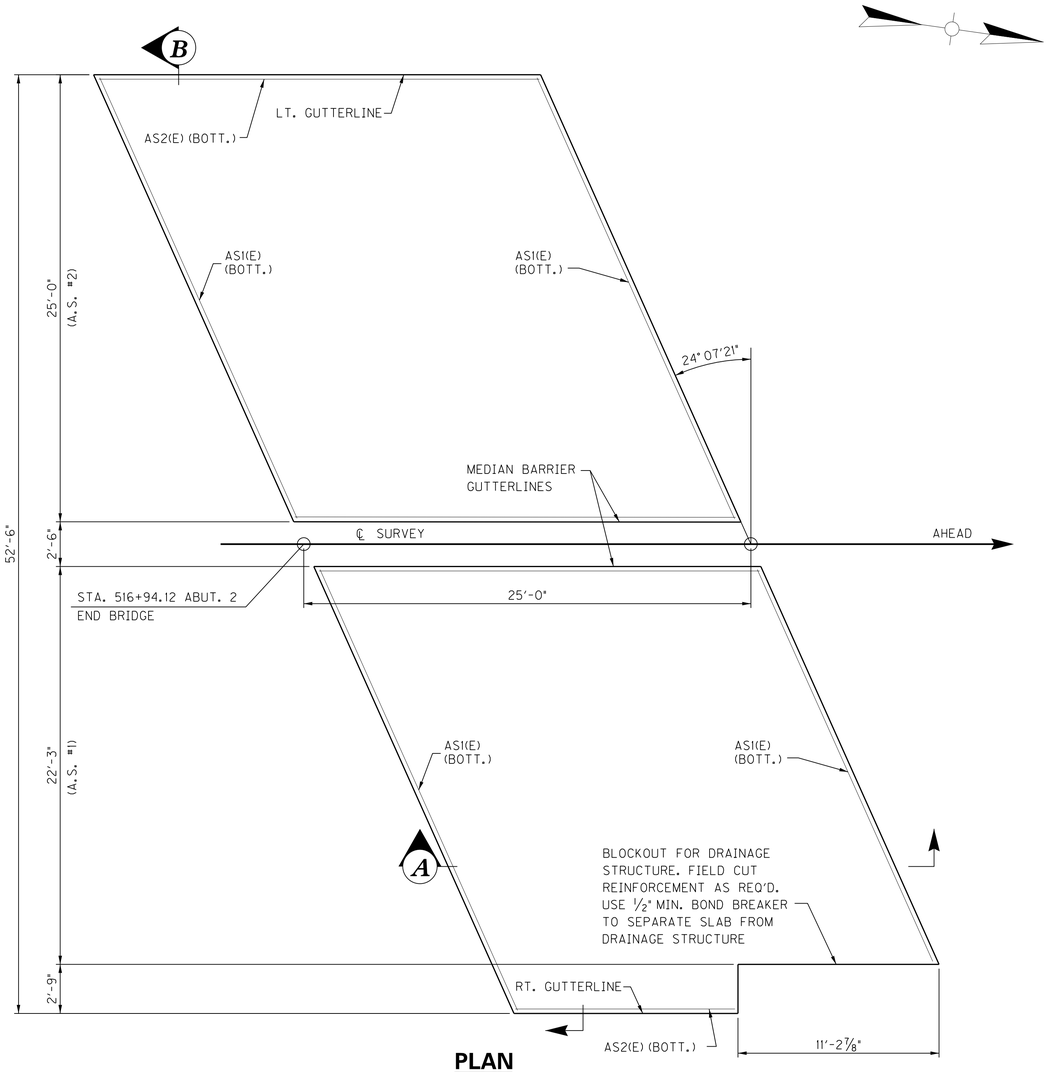
APPROACH SLAB

ITEM NUMBER: 1-234.20

PREPARED BY: PALMER ENGINEERING CO.

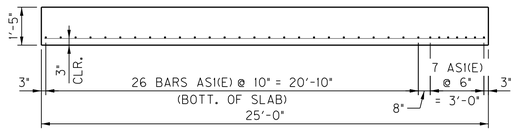
SHEET NO. S28

DRAWING NO. 27453

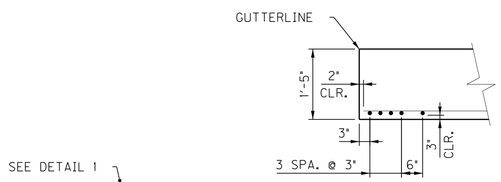


PLAN

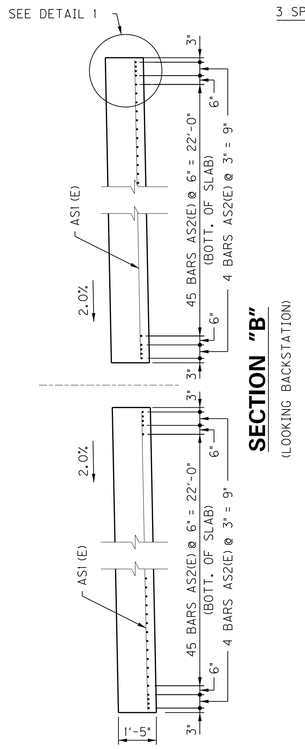
APPROACH SLAB AT ABUTMENT 2



SECTION "A"

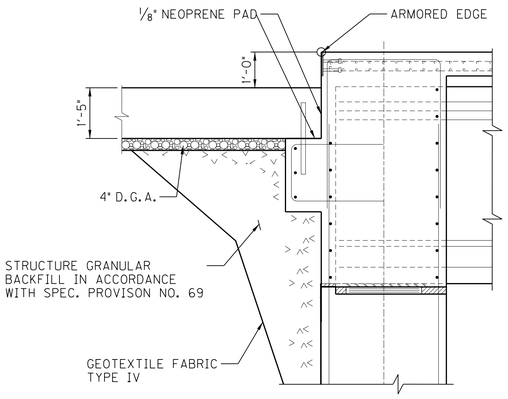


DETAIL 1



SECTION "B"

(LOOKING BACKSTATION)



TYPICAL SECTION SHOWING JUNCTION OF APPROACH SLAB WITH BRIDGE BACKWALL

APPROACH SLAB REINFORCEMENT

MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d
AS1(E)	STR.	66	#5	27'-0"	SLAB				
AS2(E)	STR.	106	#8	24'-8"	SLAB				

ESTIMATE OF QUANTITIES

	A.S. #1	A.S. #2	UNIT
CLASS "AA" CONCRETE	33	33	YD^3
EPOXY COATED REINFORCEMENT	4420	4420	lbs.

NOTE : ESTIMATE OF QUANTITIES IS FOR INFORMATION ONLY.

GENERAL NOTES

CONCRETE

CONCRETE SHALL BE CLASS "AA"

REINFORCEMENT

ALL STEEL REINFORCEMENT SHALL BE GRADE 60 AND EPOXY COATED.

APPROACH CURB TREATMENT

1/8" NEOPRENE PAD SHALL BE PLACED BETWEEN APPROACH SLAB AND ANY APPROACH CURB OR BARRIER.

MIN. LAP SPLICE

#5 BARS - 3'-0"

REVISION	DATE
UPDATED QUANTITY.REVISED NOTE	10/14/2015

DATE: SEPTEMBER, 2015 | CHECKED BY

DESIGNED BY: L.M. SALLEE | L.A. CARLISLE

DETAILED BY: J.A. ROSE | L.M. SALLEE

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
GRAVES

ROUTE: US 45 | CROSSING: I-69

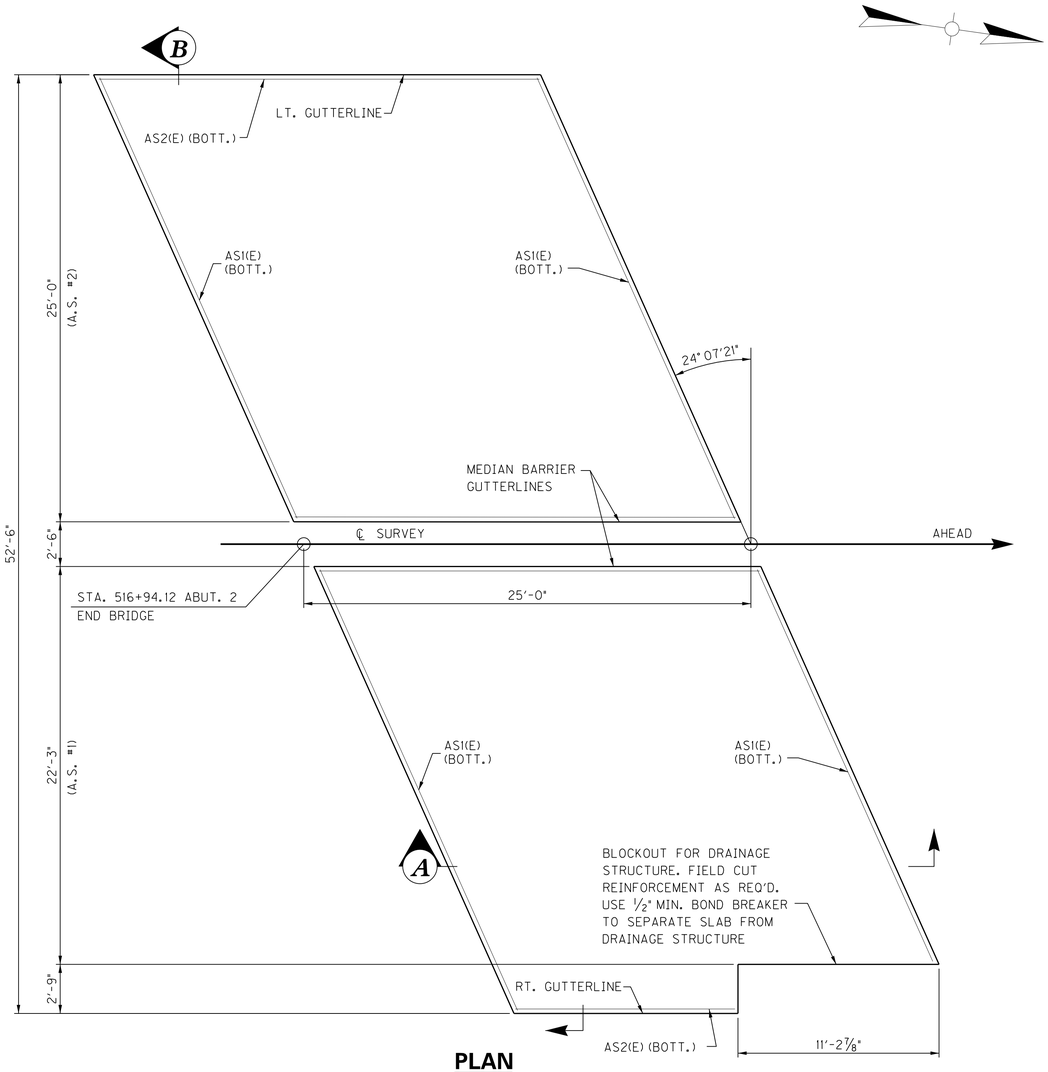
APPROACH SLAB

ITEM NUMBER
1-234.20

PREPARED BY
PALMER ENGINEERING CO.

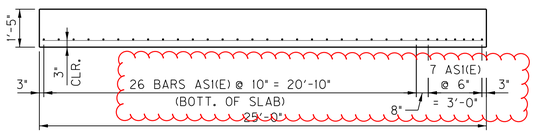
SHEET NO. S29

DRAWING NO. 27453

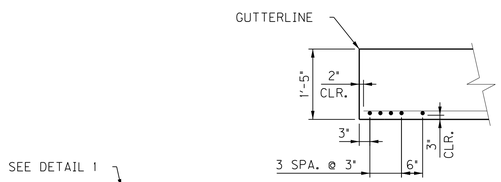


PLAN

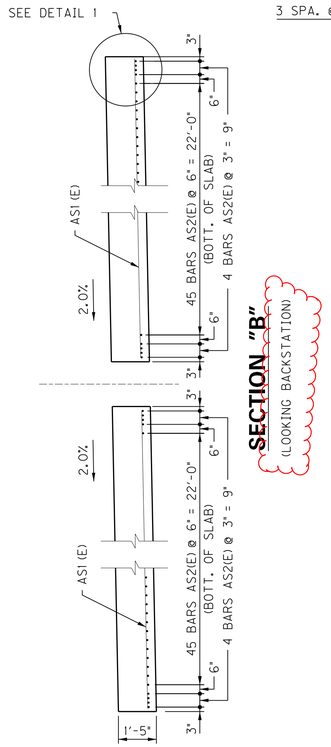
APPROACH SLAB AT ABUTMENT 2



SECTION "A"

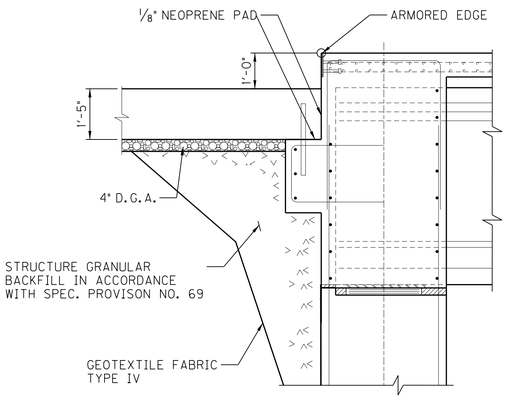


DETAIL 1



SECTION "B"

(LOOKING BACKSTATION)



TYPICAL SECTION SHOWING JUNCTION OF APPROACH SLAB WITH BRIDGE BACKWALL

APPROACH SLAB REINFORCEMENT

MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d
AS1(E)	STR.	66	#5	27'-0"	SLAB				
AS2(E)	STR.	106	#8	24'-8"	SLAB				

ESTIMATE OF QUANTITIES

	A.S. #1	A.S. #2	UNIT
CLASS "AA" CONCRETE	33	33	YD^3
EPOXY COATED REINFORCEMENT	4420	4420	lbs.

NOTE : ESTIMATE OF QUANTITIES IS FOR INFORMATION ONLY.

GENERAL NOTES

CONCRETE

CONCRETE SHALL BE CLASS "AA"

REINFORCEMENT

ALL STEEL REINFORCEMENT SHALL BE GRADE 60 AND EPOXY COATED.

APPROACH CURB TREATMENT

⅛" NEOPRENE PAD SHALL BE PLACED BETWEEN APPROACH SLAB AND ANY APPROACH CURB OR BARRIER.

MIN. LAP SPLICE

#5 BARS - 3'-0"

REVISION	DATE
UPDATED QUANTITY, REVISED NOTE	10/14/2015

DATE: SEPTEMBER, 2015 — CHECKED BY

DESIGNED BY: L.M. SALLEE — L.A. CARLISLE

DETAILED BY: J.A. ROSE — L.M. SALLEE

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: GRAVES

ROUTE: US 45 — CROSSING: I-69

APPROACH SLAB

ITEM NUMBER: 1-234.20

PREPARED BY: PALMER ENGINEERING CO.

SHEET NO. S29

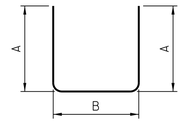
DRAWING NO. 27453

BILL OF REINFORCEMENT – END BENT 1

MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d	e
A01(S)	14	23	# 5	16'-6"	CAP	4'-7"	3'-2"			
A02(S)	14	9	# 5	16'-11"	CAP	4'-9 3/8"	3'-2"			
A03(S)	14	8	# 5	17'-4"	CAP	4'-11 1/8"	3'-2"			
A04(S)	14	9	# 5	17'-9"	CAP	5'-2 1/4"	3'-2"			
A05(S)	14	9	# 5	18'-1"	CAP	5'-4 5/8"	3'-2"			
A06(S)	14	25	# 5	18'-6"	CAP	5'-7"	3'-2"			
A07	STR.	8	# 9	60'-0"	CAP					
A08	STR.	8	# 9	46'-8"	CAP					
A09	STR.	20	# 5	60'-0"	CAP					
A10	STR.	24	# 5	42'-5"	CAP					
A11	STR.	16	# 5	14'-2"	CAP					
A12	STR.	4	# 5	29'-10"	CAP					
A13(E)	STR.	166	# 5	3'-6"	CAP/DIAPH.					
A14(E)	2	8	# 5	9'-8"	CAP/DIAPH.	3'-3"	3'-2"			
A15(E) SER.	2	1 12 BARS	# 5	137'-0"	WING	1'-10" TO 6'-5"	3'-2"			
A16(E)	2	2	# 5	16'-2"	WING	6'-6"	3'-2"			
A17(E)	2	2	# 5	16'-3"	WING	6'-6"	3'-3"			
A18(E)	2	1	# 5	15'-3"	DIAPHRAGM	6'-0"	3'-3"			
A19(E)	2	33	# 5	15'-2"	DIAPHRAGM	6'-0"	3'-2"			
A20(E)	2	3	# 5	16'-6"	DIAPHRAGM	6'-8"	3'-2"			
A21(E) SER.	2	1 15 BARS	# 5	170'-0"	DIAPHRAGM	1'-8" TO 6'-6"	3'-2"			
A22(E)	STR.	1	# 5	2'-8"	WING					
A23(E)	STR.	1	# 5	7'-8"	DIAPHRAGM					
A24(E)	STR.	1	# 5	11'-8"	DIAPHRAGM					
A25(E)	STR.	1	# 5	13'-11"	DIAPHRAGM					
A26(E)	STR.	1	# 5	16'-1"	DIAPHRAGM					
A27(E)	STR.	1	# 5	18'-4"	DIAPHRAGM					
A28(E)	STR.	1	# 5	19'-1"	DIAPHRAGM					
A29(E)	STR.	1	# 9	4'-3"	WING					
A30(E)	STR.	1	# 9	18'-3"	WING					
A31(E)	STR.	1	# 9	20'-8"	WING					
A32(E)	STR.	1	# 9	22'-10"	WING					
A33(E)	STR.	1	# 9	25'-2"	WING					
A34(E)	STR.	1	# 9	27'-6"	WING					
A35(E)	STR.	1	# 9	29'-8"	WING					
A36(E)	8	1	# 6	17'-9"	WING	15'-8"	2'-0"	9 5/8"	1'-10"	
A37(E)	8	1	# 6	19'-2"	WING	15'-8"	3'-5"	1'-4 1/4"	3'-0 3/4"	
A38(E)	STR.	10	# 5	5'-10"	DIAPHRAGM					
A39(E)	STR.	20	# 5	9'-3"	DIAPHRAGM					
A40(E)	STR.	6	# 5	45'-6"	DIAPHRAGM					
A41(E)	STR.	1	# 9	3'-4"	WING					
A42(E)	STR.	1	# 9	19'-3"	WING					
A43(E)	STR.	1	# 9	22'-0"	WING					
A44(E)	STR.	1	# 9	24'-8"	WING					
A45(E)	STR.	1	# 9	27'-4"	WING					
A46(E)	STR.	1	# 9	30'-0"	WING					
A47(E)	STR.	1	# 9	32'-9"	WING					
A48(E)	STR.	1	# 5	4'-10"	DIAPHRAGM					
A49(E)	STR.	1	# 5	8'-6"	DIAPHRAGM					
A50(E)	STR.	1	# 5	12'-0"	DIAPHRAGM					
A51(E)	STR.	1	# 5	15'-8"	DIAPHRAGM					
A52(E)	STR.	1	# 5	18'-5"	DIAPHRAGM					
A53(E)	STR.	1	# 5	21'-0"	DIAPHRAGM					
A54(E)	STR.	1	# 5	22'-2"	DIAPHRAGM					
A55(E)	8	1	# 6	20'-6"	DIAPHRAGM	18'-6"	2'-0"	8 3/8"	1'-10 1/2"	
A56(E)	8	1	# 6	21'-11"	DIAPHRAGM	18'-6"	3'-5"	1'-2 1/4"	3'-2 1/2"	
A57(E)	STR.	29	# 5	6'-0"	DIAPHRAGM					
A58(E)	2	58	# 5	6'-8"	APP. SLAB BLOCK	2'-6"	1'-8"			
A59(E)	STR.	3	# 5	57'-8"	APP. SLAB BLOCK					
A60(E)	STR.	58	# 11	2'-0"	APP. SLAB BLOCK					
A61	29	32	# 7	4'-3"	PILE ANCHOR	1'-1"	1'-3"	7"	2'-2"	

BILL OF REINFORCEMENT – END BENT 2

MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d	e
A101(S)	14	23	# 5	19'-9"	CAP	6'-2 3/8"	3'-2"			
A102(S)	14	9	# 5	19'-2"	CAP	5'-10 5/8"	3'-2"			
A103(S)	14	8	# 5	18'-6"	CAP	5'-6 3/4"	3'-2"			
A104(S)	14	9	# 5	17'-10"	CAP	5'-3"	3'-2"			
A105(S)	14	9	# 5	17'-2"	CAP	4'-11"	3'-2"			
A106(S)	14	23	# 5	16'-6"	CAP	4'-7"	3'-2"			
A107	STR.	8	# 9	60'-0"	CAP					
A108	STR.	8	# 9	43'-8"	CAP					
A109	STR.	20	# 5	60'-0"	CAP					
A110	STR.	24	# 5	39'-5"	CAP					
A111	STR.	16	# 5	14'-2"	CAP					
A112	STR.	4	# 5	26'-10"	CAP					
A113(E)	STR.	157	# 5	3'-6"	CAP/DIAPH.					
A114(E)	2	8	# 5	9'-8"	CAP/DIAPH.	3'-2"	3'-2"			
A115(E) SER.	2	1 12 BARS	# 5	141'-0"	WING	1'-11" TO 6'-8"	3'-2"			
A116(E)	2	2	# 5	16'-8"	WING	6'-9"	3'-2"			
A117(E)	2	2	# 5	16'-3"	WING	6'-6"	3'-3"			
A118(E)	2	1	# 5	15'-5"	WING	6'-1"	3'-3"			
A119(E)	2	33	# 5	15'-2"	DIAPHRAGM	6'-0"	3'-2"			
A120(E)	2	3	# 5	16'-4"	WING	6'-7"	3'-2"			
A121(E) SER.	2	1 12 BARS	# 5	138'-0"	WING	1'-10" TO 6'-6"	3'-2"			
A122(E)	STR.	1	# 5	3'-2"	DIAPHRAGM					
A123(E)	STR.	1	# 5	7'-9"	DIAPHRAGM					
A124(E)	STR.	1	# 5	11'-9"	DIAPHRAGM					
A125(E)	STR.	1	# 5	13'-11"	DIAPHRAGM					
A126(E)	STR.	1	# 5	16'-2"	DIAPHRAGM					
A127(E)	STR.	1	# 5	18'-4"	DIAPHRAGM					
A128 (E)	STR.	1	# 5	19'-1"	DIAPHRAGM					
A129(E)	STR.	1	# 9	4'-8"	WING					
A130(E)	STR.	1	# 9	17'-11"	WING					
A131(E)	STR.	1	# 9	20'-2"	WING					
A132(E)	STR.	1	# 9	22'-4"	WING					
A133(E)	STR.	1	# 9	24'-7"	WING					
A134(E)	STR.	1	# 9	26'-10"	WING					
A135(E)	STR.	1	# 9	28'-11"	WING					
A136(E)	8	1	# 6	17'-9"	WING	15'-9"	2'-0"	9 7/8"	1'-9 7/8"	
A137(E)	8	1	# 6	19'-1"	WING	15'-9"	3'-5"	1'-4 7/8"	3'-1 3/8"	
A138(E)	STR.	10	# 5	5'-10"	DIAPHRAGM					
A139(E)	STR.	20	# 5	9'-3"	DIAPHRAGM					
A140(E)	STR.	6	# 5	45'-5"	DIAPHRAGM					
A141(E)	STR.	1	# 9	2'-11"	WING					
A142(E)	STR.	1	# 9	17'-9"	WING					
A143(E)	STR.	1	# 9	20'-0"	WING					
A144(E)	STR.	1	# 9	22'-3"	WING					
A145(E)	STR.	1	# 9	24'-6"	WING					
A146(E)	STR.	1	# 9	26'-9"	WING					
A147(E)	STR.	1	# 9	28'-11"	WING					
A148(E)	STR.	1	# 5	4'-4"	DIAPHRAGM					
A149(E)	STR.	1	# 5	8'-4"	DIAPHRAGM					
A150(E)	STR.	1	# 5	12'-4"	DIAPHRAGM					
A151(E)	STR.	1	# 5	14'-7"	DIAPHRAGM					
A152(E)	STR.	1	# 5	16'-11"	DIAPHRAGM					
A153(E)	STR.	1	# 5	19'-2"	DIAPHRAGM					
A154(E)	STR.	1	# 5	19'-11"	DIAPHRAGM					
A155(E)	8	1	# 6	17'-8"	WING	15'-8"	2'-0"	9 5/8"	1'-10"	
A156(E)	8	1	# 6	19'-1"	WING	15'-8"	3'-5"	1'-4 1/2"	3'-1 1/2"	
A157(E)	STR.	29	# 5	6'-0"	DIAPHRAGM					
A158(E)	2	58	# 5	6'-8"	APP. SLAB BLOCK	2'-6"	1'-8"			
A159(E)	STR.	3	# 5	57'-8"	APP. SLAB BLOCK					
A160(E)	STR.	58	# 11	2'-0"	APP. SLAB BLOCK					
A161	29	32	# 7	4'-3"	PILE ANCHOR	1'-1"	1'-3"	7"	2'-2"	



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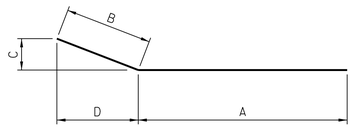

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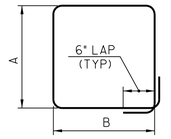

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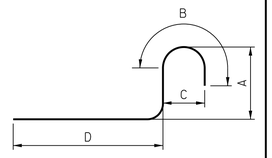


TYPE (29)

NOTE : REINFORCING BARS DESIGNATED WITH SUFFIX (E) IN PLANS SHALL BE EPOXY COATED IN ACCORDANCE WITH THE SPECIFICATIONS.

REINFORCING BARS DESIGNATED WITH THE SUFFIX (S) IN PLANS ARE STIRRUP BARS.

REVISION	DATE
UPDATED REBAR	10/14/2015

DATE: SEPTEMBER, 2015 | CHECKED BY
DESIGNED BY: L.M. SALLEE | R.L. COLBERT
DETAILED BY: D.L. HORTON | L.M. SALLEE

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: GRAVES

ROUTE: US 45 | CROSSING: I-69

BILL OF REINFORCEMENT-SUBSTRUCTURE

ITEM NUMBER: 1-234.20

PREPARED BY: PALMER ENGINEERING CO.

SHEET NO.: S30

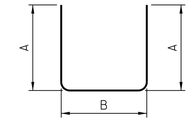
DRAWING NO.: 27453

BILL OF REINFORCEMENT – END BENT 1

MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d	e
A01(S)	14	23	# 5	16'-6"	CAP	4'-7"	3'-2"			
A02(S)	14	9	# 5	16'-11"	CAP	4'-9 3/8"	3'-2"			
A03(S)	14	8	# 5	17'-4"	CAP	4'-11 1/8"	3'-2"			
A04(S)	14	9	# 5	17'-9"	CAP	5'-2 1/4"	3'-2"			
A05(S)	14	9	# 5	18'-1"	CAP	5'-4 5/8"	3'-2"			
A06(S)	14	25	# 5	18'-6"	CAP	5'-7"	3'-2"			
A07	STR.	8	# 9	60'-0"	CAP					
A08	STR.	8	# 9	46'-8"	CAP					
A09	STR.	20	# 5	60'-0"	CAP					
A10	STR.	24	# 5	42'-5"	CAP					
A11	STR.	16	# 5	14'-2"	CAP					
A12	STR.	4	# 5	29'-10"	CAP					
A13(E)	STR.	166	# 5	3'-6"	CAP/DIAPH.					
A14(E)	2	8	# 5	9'-8"	CAP/DIAPH.	3'-3"	3'-2"			
A15(E) SER.	2	1 12 BARS	# 5	137'-0"	WING	1'-10" TO 6'-5"	3'-2"			
A16(E)	2	2	# 5	16'-2"	WING	6'-6"	3'-2"			
A17(E)	2	2	# 5	16'-3"	WING	6'-6"	3'-3"			
A18(E)	2	1	# 5	15'-3"	DIAPHRAGM	6'-0"	3'-3"			
A19(E)	2	33	# 5	15'-2"	DIAPHRAGM	6'-0"	3'-2"			
A20(E)	2	3	# 5	16'-6"	DIAPHRAGM	6'-8"	3'-2"			
A21(E) SER.	2	1 15 BARS	# 5	170'-0"	DIAPHRAGM	1'-8" TO 6'-6"	3'-2"			
A22(E)	STR.	1	# 5	2'-8"	WING					
A23(E)	STR.	1	# 5	7'-8"	DIAPHRAGM					
A24(E)	STR.	1	# 5	11'-8"	DIAPHRAGM					
A25(E)	STR.	1	# 5	13'-11"	DIAPHRAGM					
A26(E)	STR.	1	# 5	16'-1"	DIAPHRAGM					
A27(E)	STR.	1	# 5	18'-4"	DIAPHRAGM					
A28(E)	STR.	1	# 5	19'-1"	DIAPHRAGM					
A29(E)	STR.	1	# 9	4'-3"	WING					
A30(E)	STR.	1	# 9	18'-3"	WING					
A31(E)	STR.	1	# 9	20'-8"	WING					
A32(E)	STR.	1	# 9	22'-10"	WING					
A33(E)	STR.	1	# 9	25'-2"	WING					
A34(E)	STR.	1	# 9	27'-6"	WING					
A35(E)	STR.	1	# 9	29'-8"	WING					
A36(E)	8	1	# 6	17'-9"	WING	15'-8"	2'-0"	9 5/8"	1'-10"	
A37(E)	8	1	# 6	19'-2"	WING	15'-8"	3'-5"	1'-4 1/4"	3'-0 3/4"	
A38(E)	STR.	10	# 5	5'-10"	DIAPHRAGM					
A39(E)	STR.	20	# 5	9'-3"	DIAPHRAGM					
A40(E)	STR.	6	# 5	45'-6"	DIAPHRAGM					
A41(E)	STR.	1	# 9	3'-4"	WING					
A42(E)	STR.	1	# 9	19'-3"	WING					
A43(E)	STR.	1	# 9	22'-0"	WING					
A44(E)	STR.	1	# 9	24'-8"	WING					
A45(E)	STR.	1	# 9	27'-4"	WING					
A46(E)	STR.	1	# 9	30'-0"	WING					
A47(E)	STR.	1	# 9	32'-9"	WING					
A48(E)	STR.	1	# 5	4'-10"	DIAPHRAGM					
A49(E)	STR.	1	# 5	8'-6"	DIAPHRAGM					
A50(E)	STR.	1	# 5	12'-0"	DIAPHRAGM					
A51(E)	STR.	1	# 5	15'-8"	DIAPHRAGM					
A52(E)	STR.	1	# 5	18'-5"	DIAPHRAGM					
A53(E)	STR.	1	# 5	21'-0"	DIAPHRAGM					
A54(E)	STR.	1	# 5	22'-2"	DIAPHRAGM					
A55(E)	8	1	# 6	20'-6"	DIAPHRAGM	18'-6"	2'-0"	8 3/8"	1'-10 1/2"	
A56(E)	8	1	# 6	21'-11"	DIAPHRAGM	18'-6"	3'-5"	1'-2 1/4"	3'-2 1/2"	
A57(E)	STR.	29	# 5	6'-0"	DIAPHRAGM					
A58(E)	2	58	# 5	6'-8"	APP. SLAB BLOCK	2'-6"	1'-8"			
A59(E)	STR.	3	# 5	57'-8"	APP. SLAB BLOCK					
A60(E)	STR.	58	# 11	2'-0"	APP. SLAB BLOCK					
A61	29	32	# 7	4'-3"	PILE ANCHOR	1'-1"	1'-3"	7"	2'-2"	

BILL OF REINFORCEMENT – END BENT 2

MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d	e
A101(S)	14	23	# 5	19'-9"	CAP	6'-2 3/8"	3'-2"			
A102(S)	14	9	# 5	19'-2"	CAP	5'-10 5/8"	3'-2"			
A103(S)	14	8	# 5	18'-6"	CAP	5'-6 3/4"	3'-2"			
A104(S)	14	9	# 5	17'-10"	CAP	5'-3"	3'-2"			
A105(S)	14	9	# 5	17'-2"	CAP	4'-11"	3'-2"			
A106(S)	14	23	# 5	16'-6"	CAP	4'-7"	3'-2"			
A107	STR.	8	# 9	60'-0"	CAP					
A108	STR.	8	# 9	43'-8"	CAP					
A109	STR.	20	# 5	60'-0"	CAP					
A110	STR.	24	# 5	39'-5"	CAP					
A111	STR.	16	# 5	14'-2"	CAP					
A112	STR.	4	# 5	26'-10"	CAP					
A113(E)	STR.	157	# 5	3'-6"	CAP/DIAPH.					
A114(E)	2	8	# 5	9'-8"	CAP/DIAPH.	3'-2"	3'-2"			
A115(E) SER.	2	1 12 BARS	# 5	141'-0"	WING	1'-11" TO 6'-8"	3'-2"			
A116(E)	2	2	# 5	16'-8"	WING	6'-9"	3'-2"			
A117(E)	2	2	# 5	16'-3"	WING	6'-6"	3'-3"			
A118(E)	2	1	# 5	15'-5"	WING	6'-1"	3'-3"			
A119(E)	2	33	# 5	15'-2"	DIAPHRAGM	6'-0"	3'-2"			
A120(E)	2	3	# 5	16'-4"	WING	6'-7"	3'-2"			
A121(E) SER.	2	1 12 BARS	# 5	138'-0"	WING	1'-10" TO 6'-6"	3'-2"			
A122(E)	STR.	1	# 5	3'-2"	DIAPHRAGM					
A123(E)	STR.	1	# 5	7'-9"	DIAPHRAGM					
A124(E)	STR.	1	# 5	11'-9"	DIAPHRAGM					
A125(E)	STR.	1	# 5	13'-11"	DIAPHRAGM					
A126(E)	STR.	1	# 5	16'-2"	DIAPHRAGM					
A127(E)	STR.	1	# 5	18'-4"	DIAPHRAGM					
A128 (E)	STR.	1	# 5	19'-1"	DIAPHRAGM					
A129(E)	STR.	1	# 9	4'-8"	WING					
A130(E)	STR.	1	# 9	17'-11"	WING					
A131(E)	STR.	1	# 9	20'-2"	WING					
A132(E)	STR.	1	# 9	22'-4"	WING					
A133(E)	STR.	1	# 9	24'-7"	WING					
A134(E)	STR.	1	# 9	26'-10"	WING					
A135(E)	STR.	1	# 9	28'-11"	WING					
A136(E)	8	1	# 6	17'-9"	WING	15'-9"	2'-0"	9 7/8"	1'-9 7/8"	
A137(E)	8	1	# 6	19'-1"	WING	15'-9"	3'-5"	1'-4 7/8"	3'-1 7/8"	
A138(E)	STR.	10	# 5	5'-10"	DIAPHRAGM					
A139(E)	STR.	20	# 5	9'-3"	DIAPHRAGM					
A140(E)	STR.	6	# 5	45'-5"	DIAPHRAGM					
A141(E)	STR.	1	# 9	2'-11"	WING					
A142(E)	STR.	1	# 9	17'-9"	WING					
A143(E)	STR.	1	# 9	20'-0"	WING					
A144(E)	STR.	1	# 9	22'-3"	WING					
A145(E)	STR.	1	# 9	24'-6"	WING					
A146(E)	STR.	1	# 9	26'-9"	WING					
A147(E)	STR.	1	# 9	28'-11"	WING					
A148(E)	STR.	1	# 5	4'-4"	DIAPHRAGM					
A149(E)	STR.	1	# 5	8'-4"	DIAPHRAGM					
A150(E)	STR.	1	# 5	12'-4"	DIAPHRAGM					
A151(E)	STR.	1	# 5	14'-7"	DIAPHRAGM					
A152(E)	STR.	1	# 5	16'-11"	DIAPHRAGM					
A153(E)	STR.	1	# 5	19'-2"	DIAPHRAGM					
A154(E)	STR.	1	# 5	19'-11"	DIAPHRAGM					
A155(E)	8	1	# 6	17'-8"	WING	15'-8"	2'-0"	9 5/8"	1'-10"	
A156(E)	8	1	# 6	19'-1"	WING	15'-8"	3'-5"	1'-4 1/2"	3'-1 1/2"	
A157(E)	STR.	29	# 5	6'-0"	DIAPHRAGM					
A158(E)	2	58	# 5	6'-8"	APP. SLAB BLOCK	2'-6"	1'-8"			
A159(E)	STR.	3	# 5	57'-8"	APP. SLAB BLOCK					
A160(E)	STR.	58	# 11	2'-0"	APP. SLAB BLOCK					
A161	29	32	# 7	4'-3"	PILE ANCHOR	1'-1"	1'-3"	7"	2'-2"	



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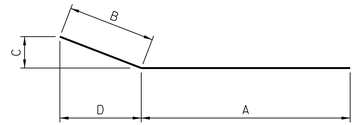

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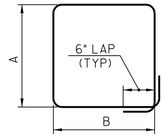

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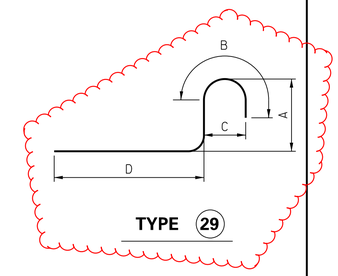


TYPE (29)

NOTE : REINFORCING BARS DESIGNATED WITH SUFFIX (E) IN PLANS SHALL BE EPOXY COATED IN ACCORDANCE WITH THE SPECIFICATIONS.

REINFORCING BARS DESIGNATED WITH THE SUFFIX (S) IN PLANS ARE STIRRUP BARS.

REVISION	DATE
UPDATED REBAR	10/14/2015

DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: L.M. SALLEE	R.L. COLBERT
DETAILED BY: D.L. HORTON	L.M. SALLEE

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
GRAVES

ROUTE	CROSSING
US 45	I-69

BILL OF REINFORCEMENT-SUBSTRUCTURE

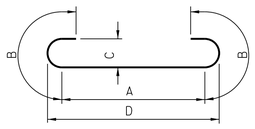
ITEM NUMBER	PREPARED BY	SHEET NO.
1-234.20	*PALMER ENGINEERING CO.*	S30
		DRAWING NO. 27453

BILL OF REINFORCEMENT – PIER

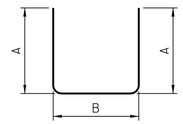
MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d	e
P1	8	20	# 9	26'-5"	CAP	22'-6"	3'-11"	10 7/8"	3'-10"	
P2	8	20	# 9	38'-5"	CAP	34'-6"	3'-11"	10 7/8"	3'-10"	
P3	STR.	4	# 5	56'-8"	CAP					
P4	STR.	16	# 5	44'-0"	CAP					
P5(S)	2	16	# 7	21'-5"	CAP	9'-4"	2'-9"			
P6	4	10	# 9	24'-0"	CAP	22'-0 1/8"	1'-11"	11 3/4"	22'-6"	
P7	4	10	# 9	43'-8"	CAP	41'-8 1/8"	1'-11"	11 3/4"	42'-2"	
P8	5	10	# 9	26'-2"	CAP	22'-6"	3'-8"			
P9	5	10	# 9	45'-11"	CAP	42'-3"	3'-8"			
P10(S)	14	4	# 6	14'-4"	CAP	3'-9 1/4"	2'-10 1/2"			
P11(S)	14	4	# 6	14'-9"	CAP	4'-0"	2'-10 1/2"			
P12(S)	14	4	# 6	15'-2"	CAP	4'-2 1/4"	2'-10 1/2"			
P13(S)	14	4	# 6	15'-4"	CAP	4'-3 1/4"	2'-10 1/2"			
P14(S)	14	4	# 6	15'-6"	CAP	4'-4 1/4"	2'-10 1/2"			
P15(S)	14	4	# 6	15'-8"	CAP	4'-5 3/8"	2'-10 1/2"			
P16(S)	14	4	# 6	15'-10"	CAP	4'-6 1/2"	2'-10 1/2"			
P17(S)	14	4	# 6	16'-0"	CAP	4'-7 1/2"	2'-10 1/2"			
P18(S)	14	176	# 6	16'-1"	CAP	4'-8"	2'-10 1/2"			
P19(S)	2	49	# 5	9'-6"	CAP	2'-8"	4'-2"			
P20	STR.	30	# 5	11'-0"	CAP					
P21	STR.	10	# 5	38'-6"	CAP					
P22	STR.	10	# 5	7'-4"	CAP					
P23(E)	STR.	20	# 11	3'-0"	ANCHOR DOWEL					
P31	1	36	# 10	13'-11"	FOOTING	9'-6 3/4"	2'-2"	1'-1 1/4"	10'-8"	
P32	4	12	# 10	7'-0"	FOOTING	4'-9 3/8"	2'-2"	1'-1 1/4"	5'-4"	
P33	1	42	# 10	15'-5"	FOOTING	11'-0 3/4"	2'-2"	1'-1 1/4"	12'-2"	
P34	4	18	# 10	7'-9"	FOOTING	5'-6 3/8"	2'-2"	1'-1 1/4"	6'-1"	
P35	STR.	51	# 6	12'-2"	FOOTING					
P36	STR.	42	# 6	10'-8"	FOOTING					
P37	4	27	# 9	9'-0"	FOOTING/COLUMN	7'-11 1/8"	1'-11"	11 3/4"	7'-7"	
P38	18	3	# 5	751'-11"	FOOTING/COLUMN/CAP	21'-9"	0'-4"	3'-8"		
P39	STR.	27	# 9	16'-9"	COLUMN/CAP					
P40	4	27	# 9	11'-7"	FOOTING/COLUMN	9'-7 1/8"	1'-11"	11 3/4"	10'-1"	
P41	STR.	27	# 9	14'-3"	COLUMN/CAP					

NOTE : REINFORCING BARS DESIGNATED WITH SUFFIX (E) IN PLANS SHALL BE EPOXY COATED IN ACCORDANCE WITH THE SPECIFICATIONS.

REINFORCING BARS DESIGNATED WITH THE SUFFIX (S) IN PLANS ARE STIRRUP BARS.



TYPE (1)



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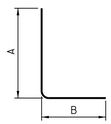

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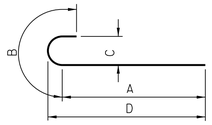

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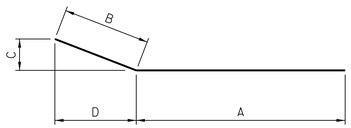

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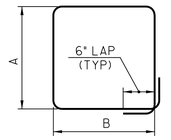

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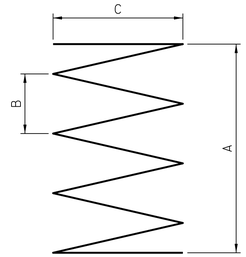


TYPE (18)

UPDATED REBAR	10/14/2015
REVISION	DATE
DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: L.M. SALLEE	R.L. COLBERT
DETAILED BY: D.L. HORTON	L.M. SALLEE

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
GRAVES

ROUTE	CROSSING
US 45	I–69

BILL OF REINFORCEMENT–SUBSTRUCTURE

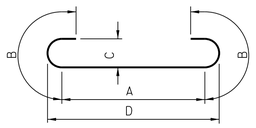
ITEM NUMBER	PREPARED BY	SHEET NO.
1–234.20	*PALMER ENGINEERING CO.*	S31
		DRAWING NO. 27453

BILL OF REINFORCEMENT – PIER

MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d	e
P1	8	20	# 9	26'-5"	CAP	22'-6"	3'-11"	10⅞"	3'-10"	
P2	8	20	# 9	38'-5"	CAP	34'-6"	3'-11"	10⅞"	3'-10"	
P3	STR.	4	# 5	56'-8"	CAP					
P4	STR.	16	# 5	44'-0"	CAP					
P5(S)	2	16	# 7	21'-5"	CAP	9'-4"	2'-9"			
P6	4	10	# 9	24'-0"	CAP	22'-0⅛"	1'-11"	11¾"	22'-6"	
P7	4	10	# 9	43'-8"	CAP	41'-8⅛"	1'-11"	11¾"	42'-2"	
P8	5	10	# 9	26'-2"	CAP	22'-6"	3'-8"			
P9	5	10	# 9	45'-11"	CAP	42'-3"	3'-8"			
P10(S)	14	4	# 6	14'-4"	CAP	3'-9¼"	2'-10½"			
P11(S)	14	4	# 6	14'-9"	CAP	4'-0"	2'-10½"			
P12(S)	14	4	# 6	15'-2"	CAP	4'-2¼"	2'-10½"			
P13(S)	14	4	# 6	15'-4"	CAP	4'-3¼"	2'-10½"			
P14(S)	14	4	# 6	15'-6"	CAP	4'-4¼"	2'-10½"			
P15(S)	14	4	# 6	15'-8"	CAP	4'-5⅜"	2'-10½"			
P16(S)	14	4	# 6	15'-10"	CAP	4'-6½"	2'-10½"			
P17(S)	14	4	# 6	16'-0"	CAP	4'-7½"	2'-10½"			
P18(S)	14	176	# 6	16'-1"	CAP	4'-8"	2'-10½"			
P19(S)	2	49	# 5	9'-6"	CAP	2'-8"	4'-2"			
P20	STR.	30	# 5	11'-0"	CAP					
P21	STR.	10	# 5	38'-6"	CAP					
P22	STR.	10	# 5	7'-4"	CAP					
P23(E)	STR.	20	# 11	3'-0"	ANCHOR DOWEL					
P31	1	36	# 10	13'-11"	FOOTING	9'-6¾"	2'-2"	1'-1¼"	10'-8"	
P32	4	12	# 10	7'-0"	FOOTING	4'-9⅜"	2'-2"	1'-1¼"	5'-4"	
P33	1	42	# 10	15'-5"	FOOTING	11'-0¾"	2'-2"	1'-1¼"	12'-2"	
P34	4	18	# 10	7'-9"	FOOTING	5'-6⅜"	2'-2"	1'-1¼"	6'-1"	
P35	STR.	51	# 6	12'-2"	FOOTING					
P36	STR.	42	# 6	10'-8"	FOOTING					
P37	4	27	# 9	9'-0"	FOOTING/COLUMN	7'-1⅛"	1'-11"	11¾"	7'-7"	
P38	18	3	# 5	751'-11"	FOOTING/COLUMN/CAP	21'-9"	0'-4"	3'-8"		
P39	STR.	27	# 9	16'-9"	COLUMN/CAP					
P40	4	27	# 9	11'-7"	FOOTING/COLUMN	9'-7⅛"	1'-11"	11¾"	10'-1"	
P41	STR.	27	# 9	14'-3"	COLUMN/CAP					

NOTE : REINFORCING BARS DESIGNATED WITH SUFFIX (E) IN PLANS SHALL BE EPOXY COATED IN ACCORDANCE WITH THE SPECIFICATIONS.

REINFORCING BARS DESIGNATED WITH THE SUFFIX (S) IN PLANS ARE STIRRUP BARS.



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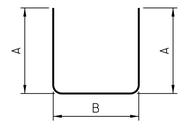

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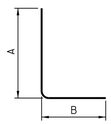

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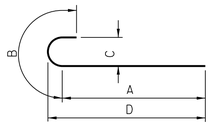

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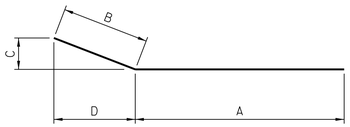

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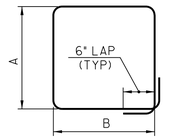

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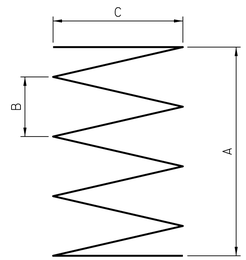

TYPE (18)

UPDATED REBAR	10/14/2015
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DETAILED BY: D.L. HORTON	L.M. SALLEE

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
GRAVES

ROUTE	CROSSING
US 45	I–69

BILL OF REINFORCEMENT–SUBSTRUCTURE

ITEM NUMBER	PREPARED BY	SHEET NO.
1–234.20	*PALMER ENGINEERING CO.*	S31
		DRAWING NO. 27453

LETTING DATE

CONSTRUCTION PROJECT NO.

SHEET LOCATION: TIT DATE: 10/13/2015 USERNAME: $$$$plotted$by$$$$ FILE NAME: 27454_S01_Title.dgn

TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS

GRAVES COUNTY
KY 80
OVER INTERSTATE 69
STA. 50+15.62

ESTIMATE OF QUANTITIES

BID ITEM CODE		08100	08104	08150	08151	08001	02231	02998	03299	08020	08033	08500	23826EC	23825EC	23233EC	21532ED	23981EC	08134	08135
BID ITEM		Concrete Class "A"	Concrete Class "AA" ①	Steel Reinforcement	Steel Reinforcement, Epoxy Coated	Structure Excavation, Common	Structure Granular Backfill ②	Masonry Coating	Armored Edge for Concrete	Crushed Aggregate Slope Protection	Test Piles	Approach Slab	Pipe Pile 16 Inch	Inside Fit Snubnose Conical Point-16 Inch	Dynamic Pile Testing	Rail System Type III	PPC I-Beam HN 42 49	Mechanical Reinforced Coupler-No. 9	Mechanical Reinforced Coupler-No. 10
UNIT		C.Y.	C.Y.	LBS.	LBS.	C.Y.	C.Y.	S.Y.	L.F.	Tons	L.F.	S.Y.	L.F.	Each	Each	L.F.	L.F.	Each	Each
Substructure	Integral End Bent #1	52	39	5642	3183		134	52		156	72	128	792	12	2				
	Pier #1	126	29	27329	319	181		161			62		1054	18	2			54	15
	Integral End Bent #2	52	38	5642	3188	133	134	52		157	72	118	792	12	2				
Superstructure			311		112590			835	97							432	1271		
BRIDGE TOTALS		230	417	38613	119280	314	268	1100	97	313	206	246	2638	42	6	432	1271	54	15

① Pipe sleeves are incidental to pier diaphragm concrete. Refer to the pier details sheet for anchor dowel details.

② Fabric Geotextile Type 4 is incidental to Structure Granular Backfill.

INDEX OF SHEETS

SPECIAL NOTES

Special Note for Dynamic Pile Testing

SPECIAL PROVISIONS

69(12) Embankment at Bridge End Bent Structures

STANDARD DRAWINGS

BGX-006-09	Stencils for Structures
BGX-012-02	Geotechnical Legend
BJE-001-12	Neoprene Expansion Dams and Armored Edges
BBP-002-04	Bearing Details
RGX-100-05	Treatment of Embankment at End Bents
RGX-105-07	Treatment of Embankment at End Bents

SPECIFICATIONS

2012 Standard Specifications for Road and Bridge Construction.

7th Edition AASHTO LRFD Bridge Design Specifications (2014) with interims thru 2015.

QUANTITY REVISIONS	10/14/2015
REVISION	DATE

DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: R.L. COLBERT	L.A. CARLISLE
DETAILED BY: J.A. ROSE	L.A. CARLISLE

STATE OF KENTUCKY
LEE A. CARLISLE
25709
LICENSED PROFESSIONAL ENGINEER

Lee A. Carlisle
P.E. 25709
10/14/2015
DATE

ITEM NUMBER
1-234.20

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
GRAVES

ROUTE
KY 80

CROSSING
I-69

TITLE SHEET

PREPARED BY
PALMER ENGINEERING CO.

SHEET NO.
S01

DRAWING NO.
27454

LETTING DATE

CONSTRUCTION PROJECT NO.

SHEET LOCATION: TIT DATE: 10/13/2015 USERNAME: $$$$plotted$by$$$$ FILE NAME: 27454_S01_Title.dgn

TRANSPORTATION CABINET
DEPARTMENT OF HIGHWAYS

GRAVES COUNTY
KY 80
OVER INTERSTATE 69
STA. 50+15.62

ESTIMATE OF QUANTITIES

BID ITEM CODE	08100	08104	08150	08151	08001	02231	02998	03299	08020	08033	08500	23826EC	23825EC	23233EC	21532ED	23981EC	08134	08135
BID ITEM	Concrete Class "A"	Concrete Class "AA" ①	Steel Reinforcement	Steel Reinforcement, Epoxy Coated	Structure Excavation, Common	Structure Granular Backfill ②	Masonry Coating	Armored Edge for Concrete	Crushed Aggregate Slope Protection	Test Piles	Approach Slab	Pipe Pile 16 Inch	Inside Fit Snubnose Conical Point-16 Inch	Dynamic Pile Testing	Rail System Type III	PPC I-Beam HN 42 49	Mechanical Reinforced Coupler-No. 9	Mechanical Reinforced Coupler-No. 10
UNIT	C.Y.	C.Y.	LBS.	LBS.	C.Y.	C.Y.	S.Y.	L.F.	Tons	L.F.	S.Y.	L.F.	Each	Each	L.F.	L.F.	Each	Each
Substructure: Integral End Bent #1	52	39	5642	3183		134	52		156	72	128	792	12	2				
Substructure: Pier #1	126	29	27329	319	181		161			62		1054	18	2			54	15
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Superstructure		311		112590			835	97							432	1271		
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STATE OF KENTUCKY
LEE A. CARLISLE
25709
LICENSED PROFESSIONAL ENGINEER

Lee A. Carlisle
Lee A. Carlisle
P.E. 25709
10/14/2015
DATE

QUANTITY REVISIONS	10/14/2015
REVISION	DATE

DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: R.L. COLBERT	L.A. CARLISLE
DETAILED BY: J.A. ROSE	L.A. CARLISLE

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: **GRAVES**

ROUTE: **KY 80** | CROSSING: **I-69**

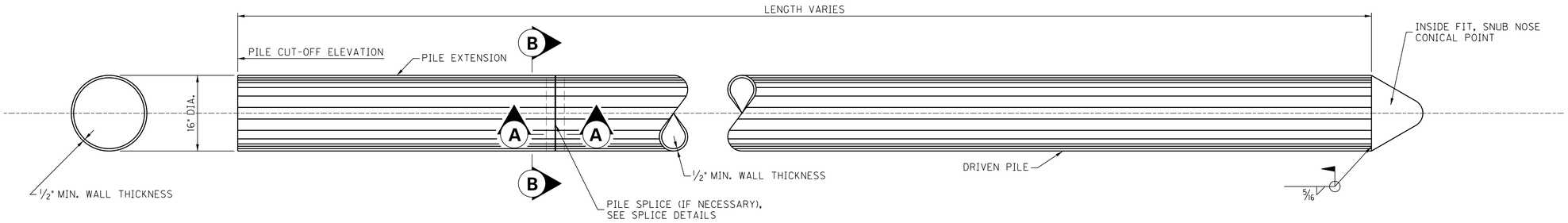
TITLE SHEET

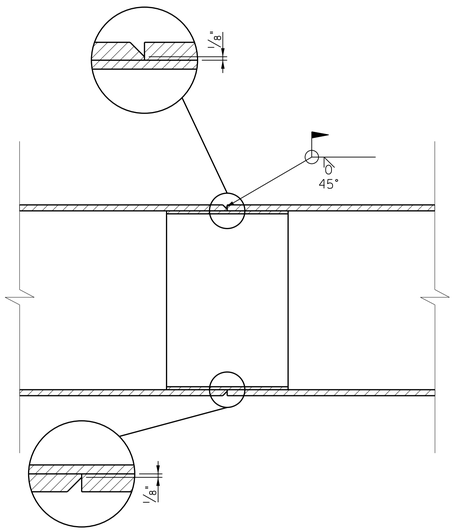
ITEM NUMBER: **1-234.20**

PREPARED BY: *PALMER ENGINEERING CO.*

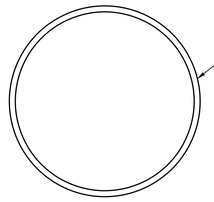
SHEET NO. S01

DRAWING NO. 27454





SECTION A–A



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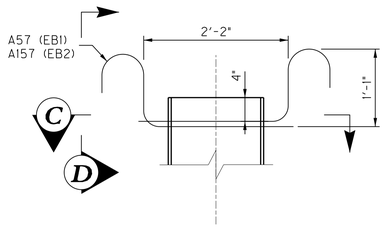
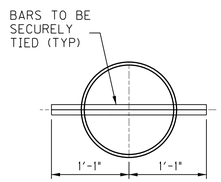


END BENT
PILE ANCHORAGE DETAIL



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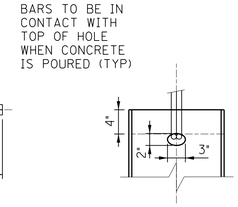


VIEW "D"

NOTE: AT END BENT PILES DRILL OR TORCH 2"x3" (+/-) HOLE AND THREAD A57 OR A157 BARS THROUGH AS SHOWN. WELDING SHALL NOT BE PERMITTED.

GENERAL NOTES

SPECIFICATIONS: KENTUCKY DEPARTMENT OF HIGHWAY STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.

PIPE PILE MATERIAL: THE STEEL FOR THE PIPE PILING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A252, GRADE 3 (MINIMUM YIELD STRENGTH OF 45 ksi), FOR WELDED OR SEAMLESS STEEL PIPE PILES.

PAINT: NO PAINT SHALL BE REQUIRED ON THE STEEL PILE SHELL.

PILE POINTS: INSIDE FIT, SNUB NOSE CONICAL POINTS SHALL CONFORM TO ASTM A148 OR AASHTO M103 GRADE 65/35 MINIMUM. PILE POINTS SHALL BE ATTACHED USING MINIMUM 5/16" FILLET WELD AROUND CIRCUMFERENCE.

SPLICES: SPLICES SHALL BE WELDED AS DETAILED ON THIS SHEET, EMPLOYING THE USE OF A BACK-UP RING OR SLEEVE TO ALIGN THE PILE SECTIONS. WHEN SPLICING IS NECESSARY, USE A LENGTH THAT WILL REASONABLE ASSURE THAT CAPACITY WILL BE ATTAINED WITHOUT ADDITIONAL SPLICING.

FIELD WELDS: ENSURE FIELDS WELDING MATERIAL AND WORKMANSHIP FOR ALL PILING CONFORMS TO THE CURRENT JOINT SPECIFICATIONS ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE. SPLICE PILES AS INDICATED ABOVE ONLY WHEN DRIVEN BELOW CUT-OFF ELEVATION.

PAYMENT: PAYMENT FOR THE PILES IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS WILL BE MADE AT THE CONTRACT PRICE PER LINEAR FOOT.

PIPE PILE THICKNESS: CONTRACTOR SHALL SELECT WALL THICKNESS SUFFICIENT TO WITHSTAND DRIVING WITHOUT INJURY AND RESIST HARMFUL DISTORTION AND/OR BUCKLING DUE TO SOIL PRESSURES AFTER DRIVING. SELECTED WALL THICKNESS SHALL NOT BE LESS THAN THAT INDICATED ABOVE.

MIL TEST REPORTS: FURNISH NOTARIZED MILL TEST REPORTS IN TRIPLICATE TO THE DEPARTMENT SHOWING THAT ALL MATERIALS FURNISHED CONFORM TO THE SPECIFICATIONS.

CONCRETE: THE PIPE PILES SHALL BE FILLED WITH CLASS "A" CONCRETE. THE COST OF THE FILL CONCRETE BELOW BOTTOM OF CAP/FOOTING IS INCIDENTAL TO THE PRICE BID PER LINEAR FOOT OF 16" PIPE PILE.

REVISION	DATE
ADDED PILE ANCHORAGE DETAILS	10/14/2015

DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: R.L. COLBERT	G.S. WILSON
DETAILED BY: M.D. SIMPSON	R.L. COLBERT

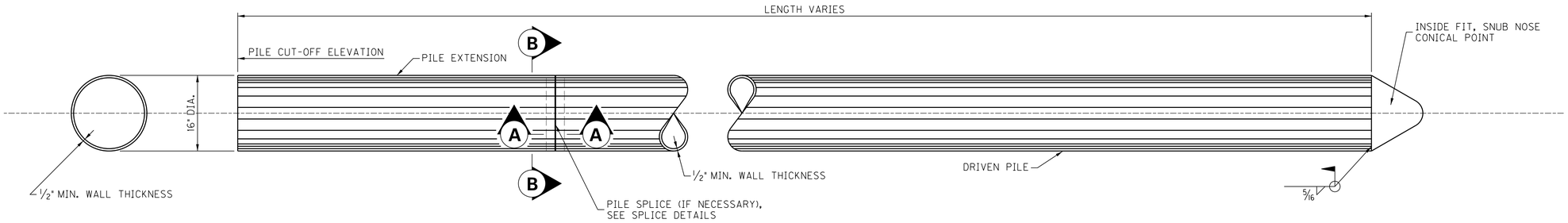
Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

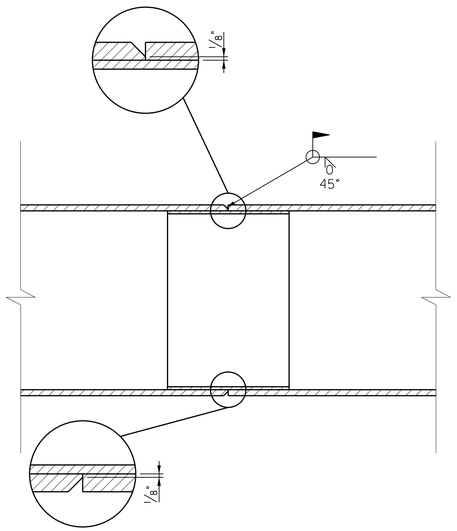
COUNTY
GRAVES

ROUTE	CROSSING
KY 80	I-69

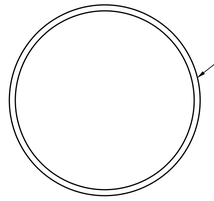
16" PIPE PILE DETAILS

ITEM NUMBER	PREPARED BY	SHEET NO.
1–234.20	PALMER ENGINEERING CO.	S08
		DRAWING NO. 27454

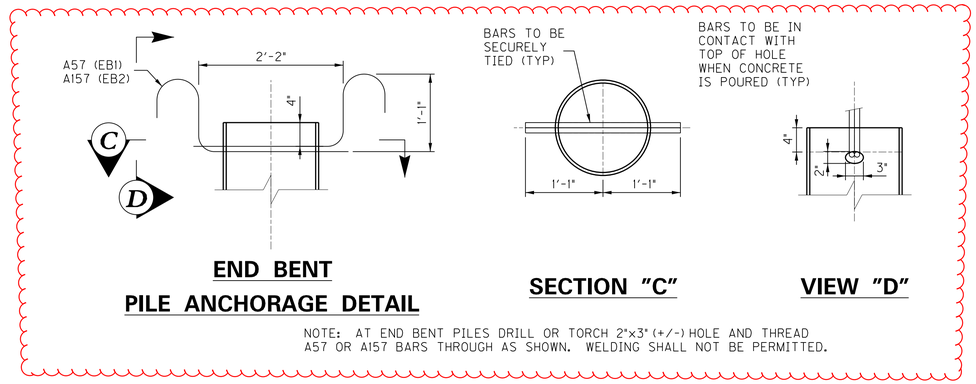




SECTION A–A



SECTION B–B



END BENT
PILE ANCHORAGE DETAIL

SECTION "C"

VIEW "D"

NOTE: AT END BENT PILES DRILL OR TORCH 2"x3" (+/-) HOLE AND THREAD A57 OR A157 BARS THROUGH AS SHOWN. WELDING SHALL NOT BE PERMITTED.

GENERAL NOTES

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SPLICES: SPLICES SHALL BE WELDED AS DETAILED ON THIS SHEET, EMPLOYING THE USE OF A BACK-UP RING OR SLEEVE TO ALIGN THE PILE SECTIONS. WHEN SPLICING IS NECESSARY, USE A LENGTH THAT WILL REASONABLE ASSURE THAT CAPACITY WILL BE ATTAINED WITHOUT ADDITIONAL SPLICING.

FIELD WELDS: ENSURE FIELDS WELDING MATERIAL AND WORKMANSHIP FOR ALL PILING CONFORMS TO THE CURRENT JOINT SPECIFICATIONS ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE. SPLICE PILES AS INDICATED ABOVE ONLY WHEN DRIVEN BELOW CUT-OFF ELEVATION.

PAYMENT: PAYMENT FOR THE PILES IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS WILL BE MADE AT THE CONTRACT PRICE PER LINEAR FOOT.

PIPE PILE THICKNESS: CONTRACTOR SHALL SELECT WALL THICKNESS SUFFICIENT TO WITHSTAND DRIVING WITHOUT INJURY AND RESIST HARMFUL DISTORTION AND/OR BUCKLING DUE TO SOIL PRESSURES AFTER DRIVING. SELECTED WALL THICKNESS SHALL NOT BE LESS THAN THAT INDICATED ABOVE.

MIL TEST REPORTS: FURNISH NOTARIZED MILL TEST REPORTS IN TRIPLICATE TO THE DEPARTMENT SHOWING THAT ALL MATERIALS FURNISHED CONFORM TO THE SPECIFICATIONS.

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ADDED PILE ANCHORAGE DETAILS	10/14/2015
REVISION	DATE
DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: R.L. COLBERT	G.S. WILSON
DETAILED BY: M.D. SIMPSON	R.L. COLBERT

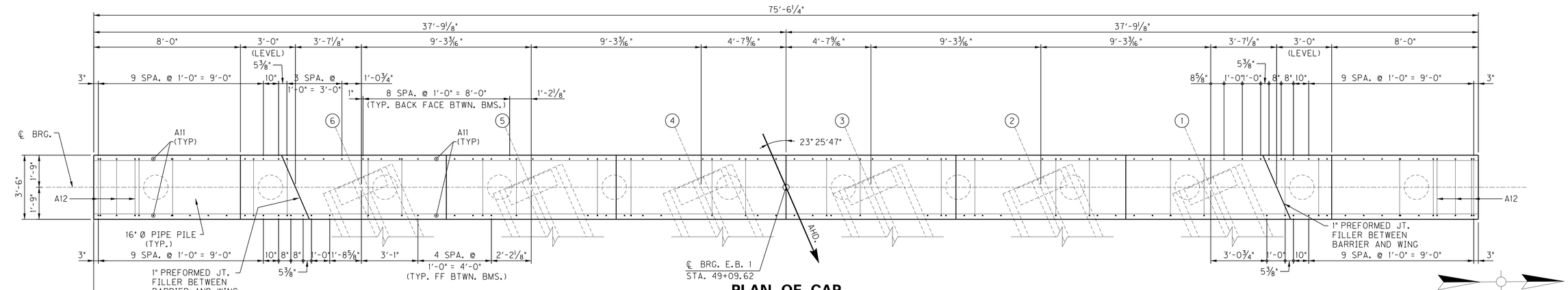
Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
GRAVES

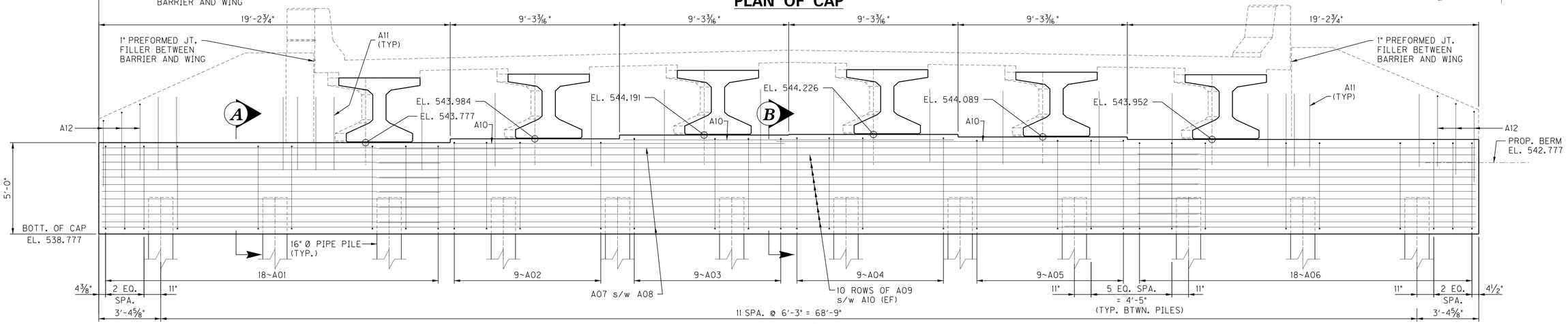
ROUTE	CROSSING
KY 80	I-69

16" PIPE PILE DETAILS

ITEM NUMBER	PREPARED BY	SHEET NO.
1–234.20	PALMER ENGINEERING CO.	S08
		DRAWING NO. 27454

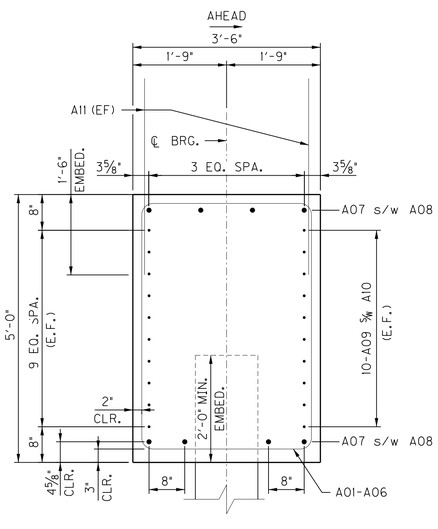


PLAN OF CAP

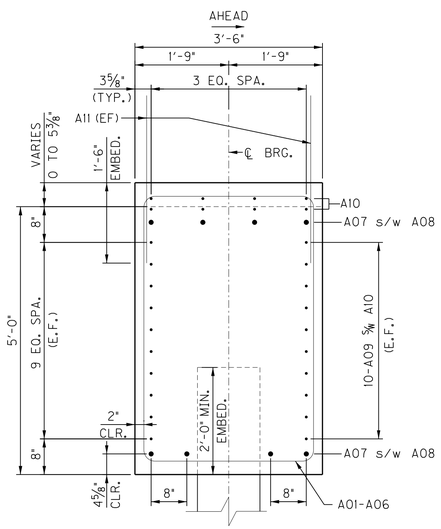


ELEVATION

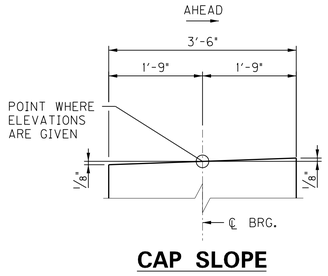
(LOOKING BACK STATION)



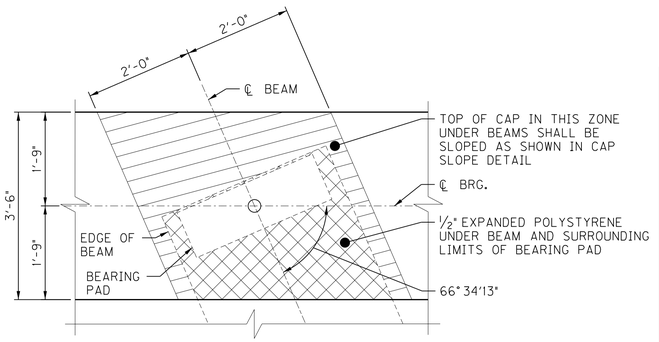
SECTION "A"



SECTION "B"



CAP SLOPE



BEAM BEARING

(TYPICAL EACH BEAM)

MINIMUM LAP SPLICES
#5 BAR - 3'-9"
#9 BAR - 8'-0"

REVISION	DATE
REVISED BAR GRAPHICS.REMOVED BAR MARK	10/14/2015

DATE: SEPTEMBER, 2015 — CHECKED BY
DESIGNED BY: R.L. COLBERT — L.M. SALLEE
DETAILED BY: J.A. ROSE — R.L. COLBERT

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: **GRAVES**

ROUTE: **KY 80** — CROSSING: **I-69**

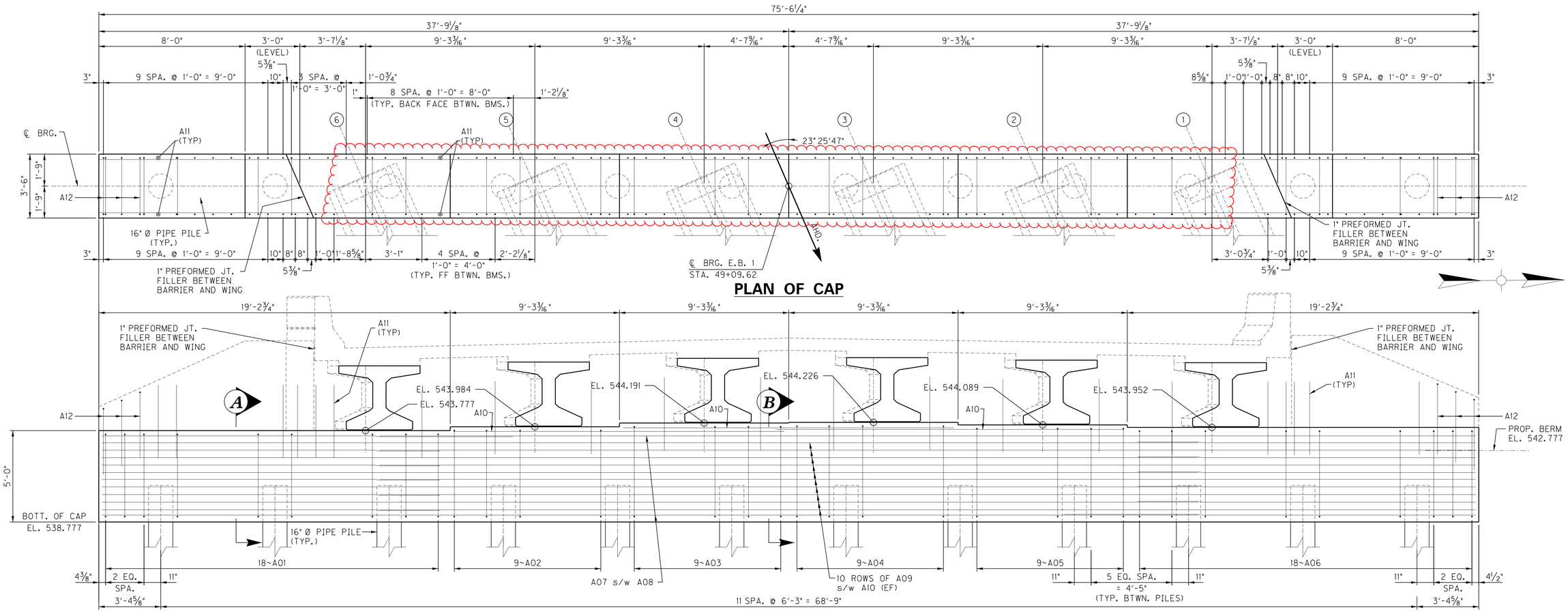
INTEGRAL END BENT 1

ITEM NUMBER: **1-234.20**

PREPARED BY: *PALMER ENGINEERING CO.*

SHEET NO. S09

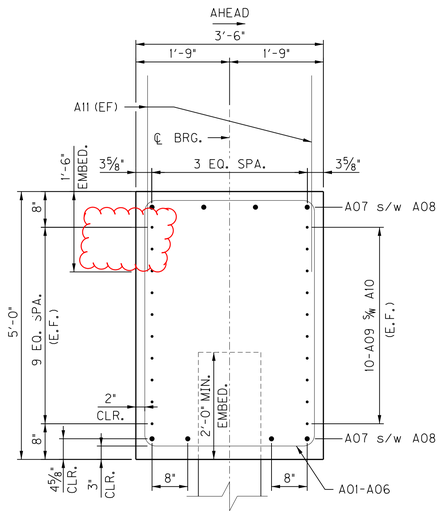
DRAWING NO. 27454



PLAN OF CAP

ELEVATION

(LOOKING BACK STATION)



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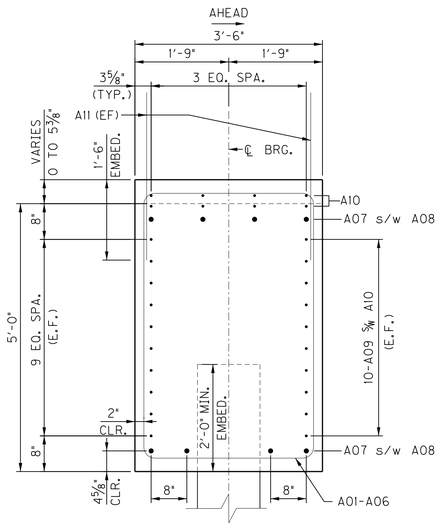

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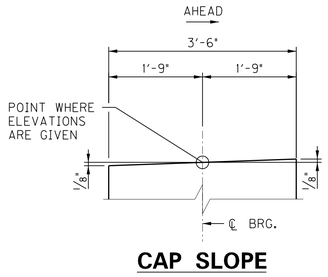
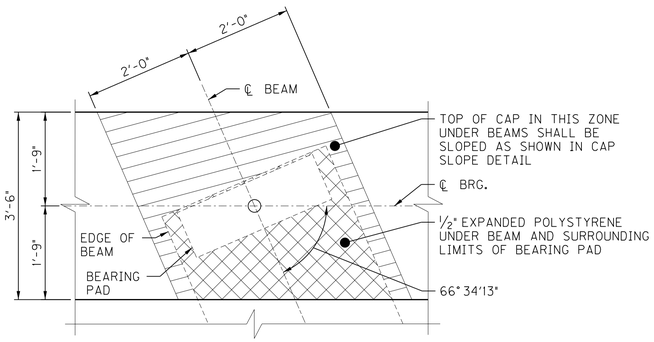


CAP SLOPE



BEAM BEARING

(TYPICAL EACH BEAM)

MINIMUM LAP SPLICES
#5 BAR - 3'-9"
#9 BAR - 8'-0"

REVISION	DATE
REVISED BAR GRAPHICS.REMOVED BAR MARK	10/14/2015

DATE: SEPTEMBER, 2015 — CHECKED BY
DESIGNED BY: R.L. COLBERT — L.M. SALLEE
DETAILED BY: J.A. ROSE — R.L. COLBERT

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: GRAVES

ROUTE: KY 80 — CROSSING: I-69

INTEGRAL END BENT 1

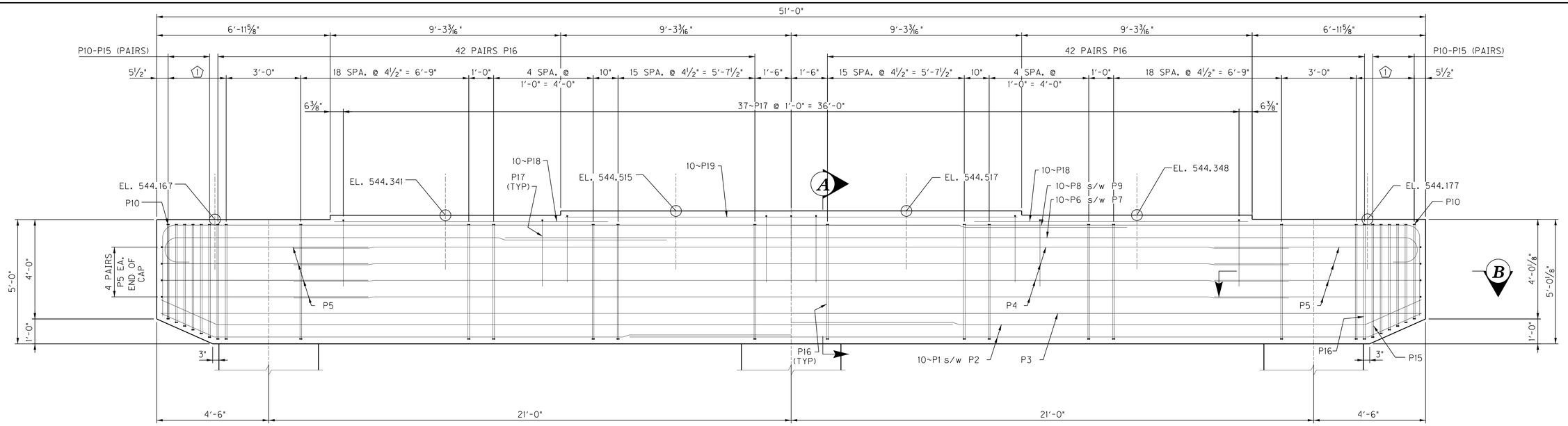
ITEM NUMBER: 1-234.20

PREPARED BY: PALMER ENGINEERING CO.

SHEET NO. S09

DRAWING NO. 27454

...\Dgn\27454_S09_EB1_01.dgn
MicroStation v8.11.9.357 | E-SHEET NAME: | USER: jeff-r | DATE PLOTTED: September 11, 2015 | FILE NAME: C:\PW_WORKDIR\JEFF-R\DMS2563A\27454_S09_EB1_01.DGN | 10/13/2015 11:40:54 AM

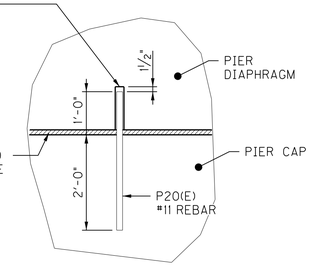


① 7 SPA. @ 4" = 2'-4"

CAP ELEVATION

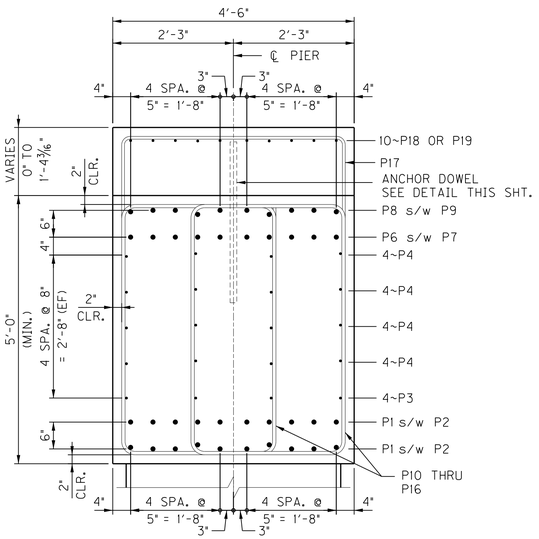
(LOOKING AHEAD STA.)

STANDARD WEIGHT 5" COMMERCIAL PIPE SLEEVE CLOSED AT ONE END & 1'-1" LONG. SECURE PIPE SLEEVE TO PREVENT FLOATING WHILE PLACING CONCRETE. PIPE SLEEVE IS TO SIT ON EXPANDED POLYSTYRENE AND IS TO BE INCIDENTAL TO DIAPHRAGM CONCRETE. WRAP ANCHOR DOWEL SYMMETRICALLY IN POLYSTYRENE SO THAT IT REMAINS CENTERED WITHIN THE PIPE SLEEVE.

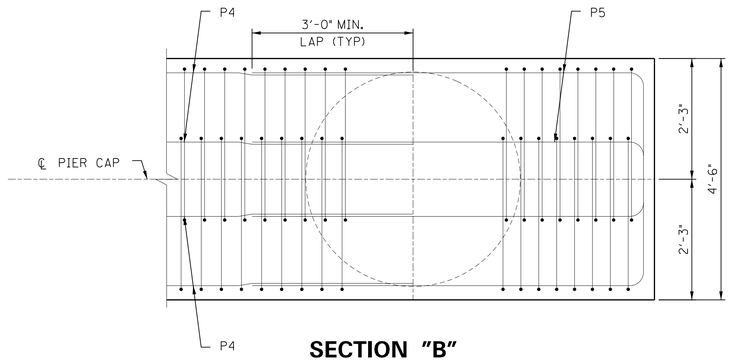


ANCHOR DOWEL DETAIL

ANCHOR DOWEL LOCATIONS MAY BE SHIFTED SLIGHTLY TO AVOID INTERFERENCE WITH CAP STIRRUPS.



SECTION "A"



SECTION "B"

MINIMUM LAP SPLICES

#5 BAR - 3'-0"
#8 BAR - 6'-6"

REVISED CAP STIRRUP SPACING	10/14/15
REVISION	DATE
DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: R.L. COLBERT	L.M. SALLEE
DETAILED BY: J.A. ROSE	R.L. COLBERT

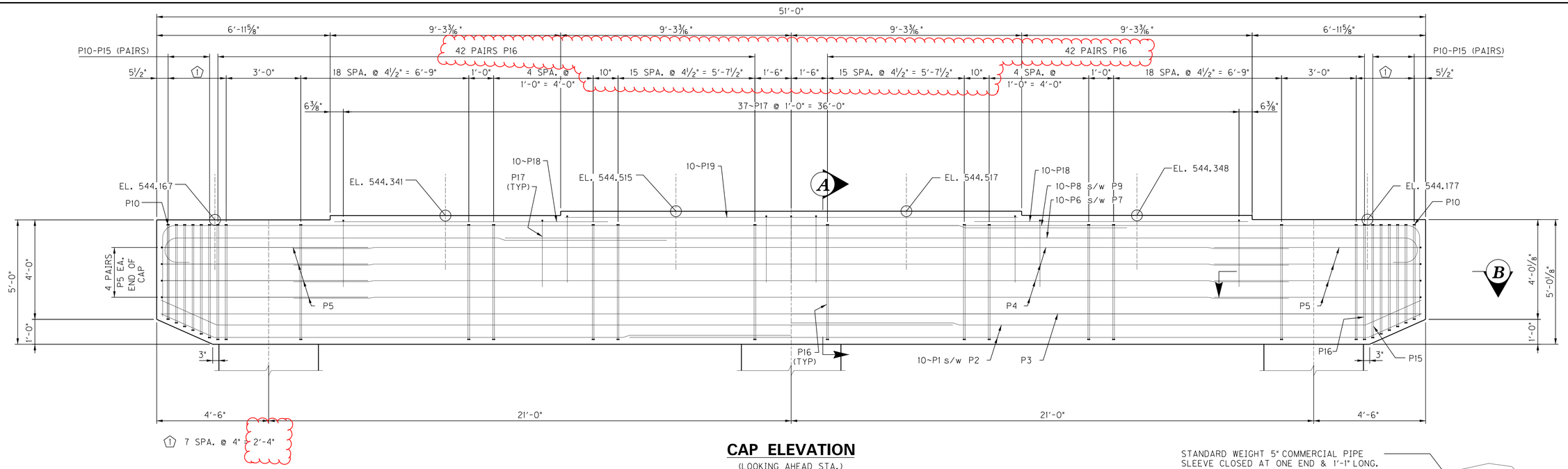
Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: GRAVES

ROUTE: KY 80 | CROSSING: I-69

PIER CAP DETAILS

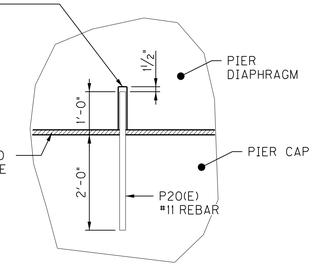
ITEM NUMBER	PREPARED BY	SHEET NO.
1-234.20	PALMER ENGINEERING CO.	S11
		DRAWING NO. 27454



CAP ELEVATION

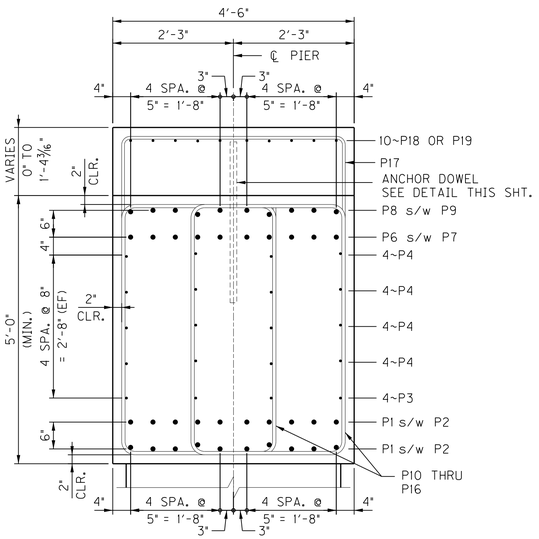
(LOOKING AHEAD STA.)

STANDARD WEIGHT 5" COMMERCIAL PIPE SLEEVE CLOSED AT ONE END & 1'-1" LONG. SECURE PIPE SLEEVE TO PREVENT FLOATING WHILE PLACING CONCRETE. PIPE SLEEVE IS TO SIT ON EXPANDED POLYSTYRENE AND IS TO BE INCIDENTAL TO DIAPHRAGM CONCRETE. WRAP ANCHOR DOWEL SYMMETRICALLY IN POLYSTYRENE SO THAT IT REMAINS CENTERED WITHIN THE PIPE SLEEVE.

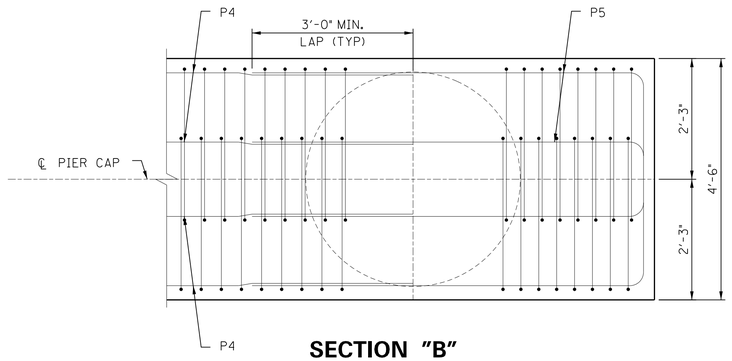


ANCHOR DOWEL DETAIL

ANCHOR DOWEL LOCATIONS MAY BE SHIFTED SLIGHTLY TO AVOID INTERFERENCE WITH CAP STIRRUPS.



SECTION "A"



SECTION "B"

MINIMUM LAP SPLICES

#5 BAR - 3'-0"
#8 BAR - 6'-6"

REVISED CAP STIRRUP SPACING	10/14/15
REVISION	DATE
DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: R.L. COLBERT	L.M. SALLEE
DETAILED BY: J.A. ROSE	R.L. COLBERT

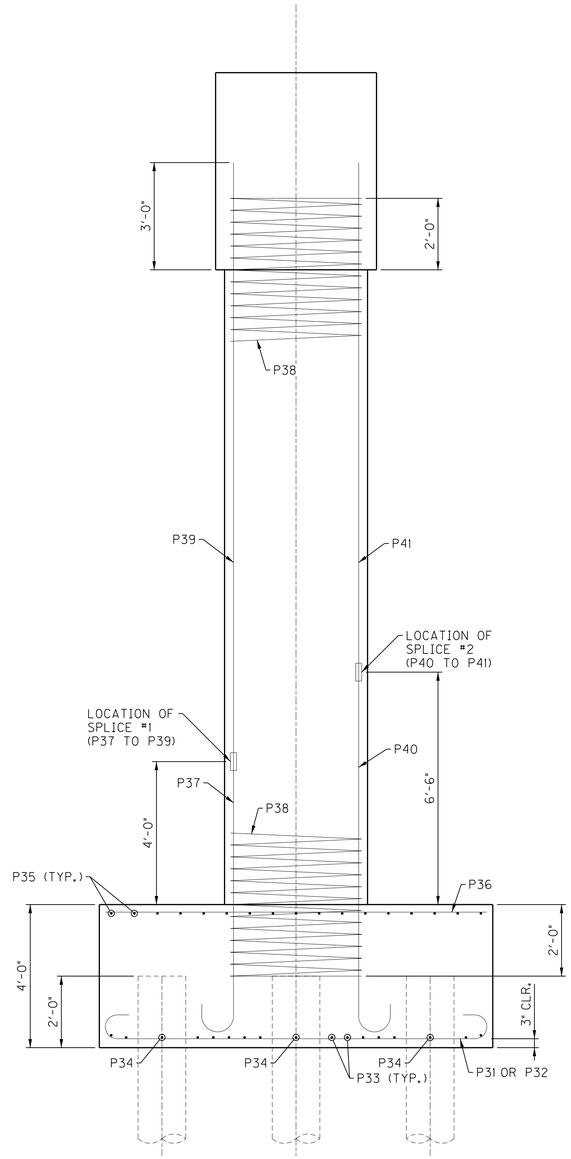
Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: GRAVES

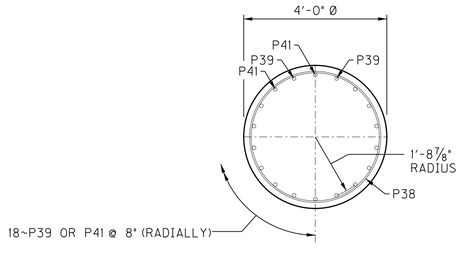
ROUTE: KY 80 | CROSSING: I-69

PIER CAP DETAILS

ITEM NUMBER	PREPARED BY	SHEET NO.
1-234.20	PALMER ENGINEERING CO.	S11
		DRAWING NO. 27454



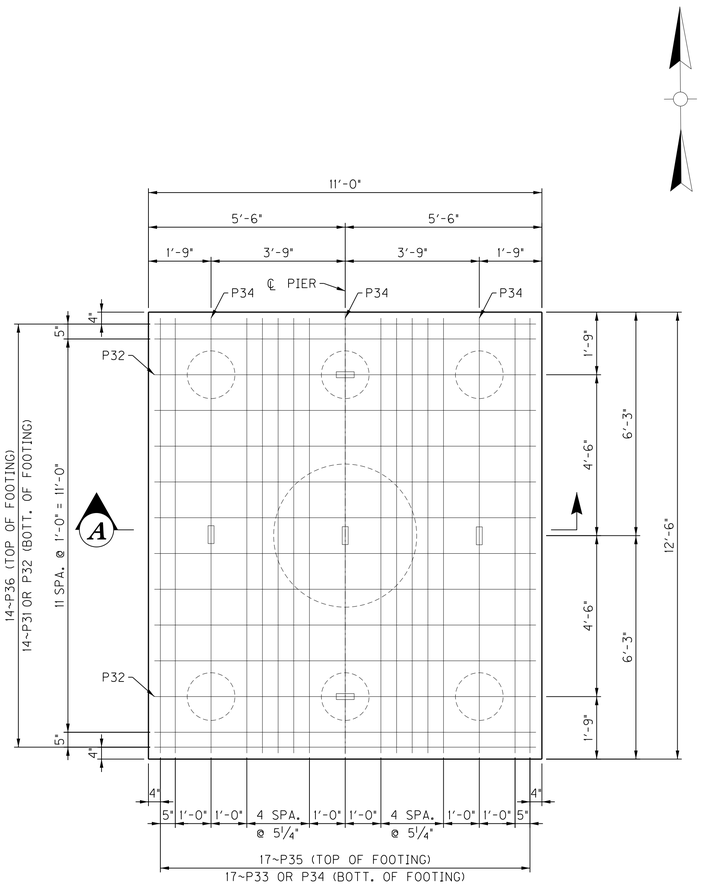
SECTION A–A



COLUMN SECTION

NOTE:
USE A MECHANICAL COUPLER TO SPLICE P37 DOWEL TO P39 BAR AND P40 DOWEL TO P41 BAR, LAP SPLICES SHALL NOT BE USED.

NOTE:
DRILL OR TORCH 1½" Ø (+/-) HOLES IN PILES AND THREAD P32 OR P34 BARS THROUGH. ATTACH MATCHING BARS WITH MECHANICAL COUPLER, WELDING SHALL NOT BE PERMITTED.



PLAN OF FOOTING

(TYPICAL EACH FOOTING)

ADDED NORTH ARROW, CHANGED NOTE	10/14/2015
REVISION	DATE
DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: L.M. SALLEE	L.A. CARLISLE
DETAILED BY: D.L. HORTON	L.M. SALLEE

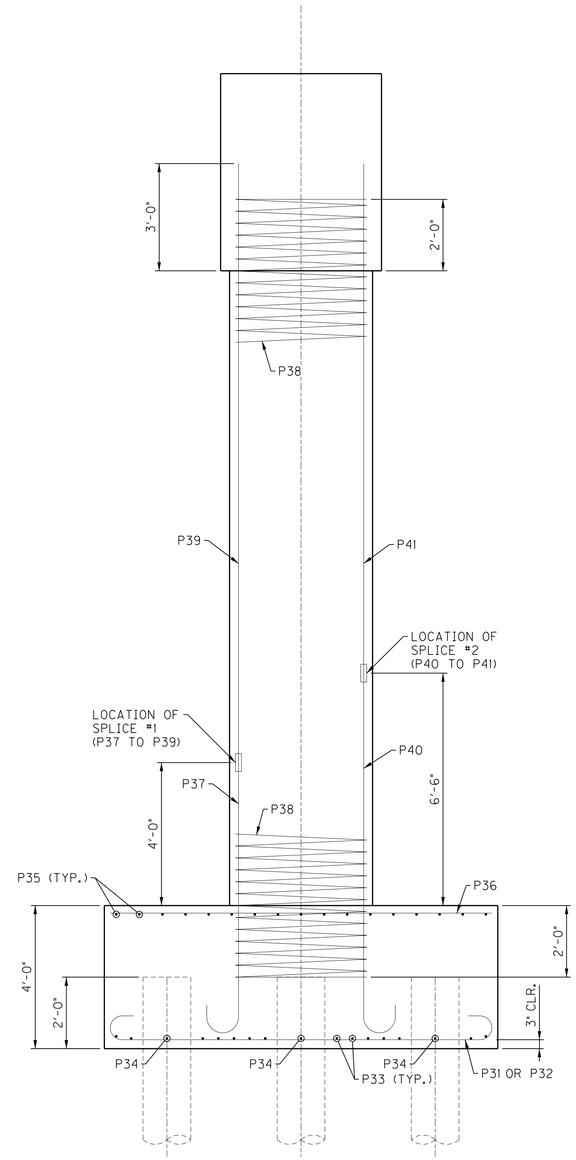
Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: **GRAVES**

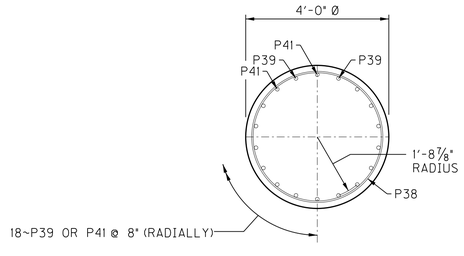
ROUTE: **KY 80** | CROSSING: **I–69**

PIER REINFORCING DETAILS

ITEM NUMBER	PREPARED BY	SHEET NO.
1–234.20	*PALMER ENGINEERING CO.*	S12
		DRAWING NO. 27454



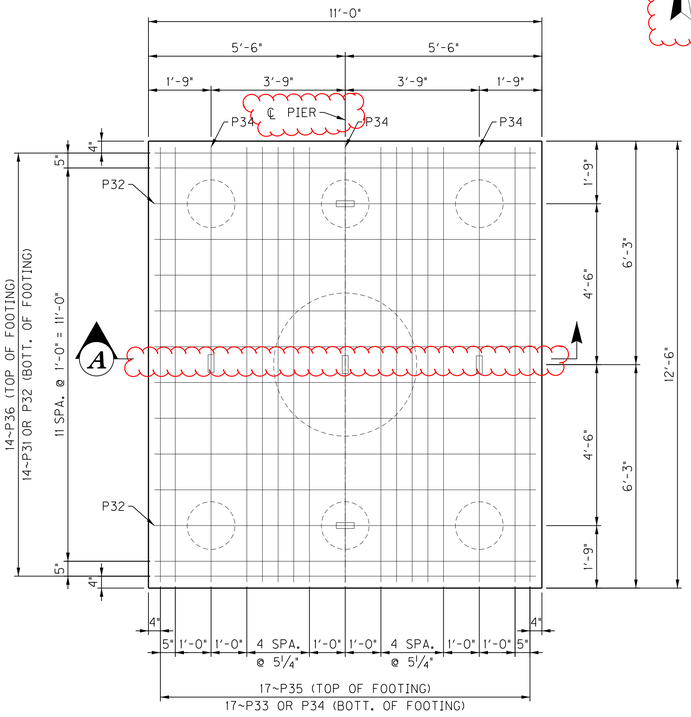
SECTION A–A



COLUMN SECTION

NOTE:
USE A MECHANICAL COUPLER TO SPLICE P37 DOWEL TO P39 BAR AND P40 DOWEL TO P41 BAR, LAP SPLICES SHALL NOT BE USED.

NOTE:
DRILL OR TORCH 1½" Ø (+/-) HOLES IN PILES AND THREAD P32 OR P34 BARS THROUGH. ATTACH MATCHING BARS WITH MECHANICAL COUPLER, WELDING SHALL NOT BE PERMITTED.



PLAN OF FOOTING

(TYPICAL EACH FOOTING)

ADDED NORTH ARROW, CHANGED NOTE	10/14/2015
REVISION	DATE
DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: L.M. SALLEE	L.A. CARLISLE
DETAILED BY: D.L. HORTON	L.M. SALLEE

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
GRAVES

ROUTE	CROSSING
KY 80	I–69

PIER REINFORCING DETAILS

ITEM NUMBER	PREPARED BY	SHEET NO.
1–234.20	*PALMER ENGINEERING CO.*	S12
		DRAWING NO. 27454

TABLE OF ELEVATIONS

LINE	LEFT GUTTER LINE	GIRDER #1			GIRDER #2			GIRDER #3			PROFILE GRADE	GIRDER #4			GIRDER #5			GIRDER #6			RIGHT GUTTER LINE
		CONSTR. ELEV.	TOP OF GIRDER	DIM. "X"	CONSTR. ELEV.	TOP OF GIRDER	DIM. "X"	CONSTR. ELEV.	TOP OF GIRDER	DIM. "X"		CONSTR. ELEV.	TOP OF GIRDER	DIM. "X"	CONSTR. ELEV.	TOP OF GIRDER	DIM. "X"	CONSTR. ELEV.	TOP OF GIRDER	DIM. "X"	
A	548.365	548.393			548.530			548.666			548.702	548.630			548.423			548.215			548.172
B	548.381	548.410			548.547			548.684			548.720	548.649			548.443			548.235			548.192
C	548.757	548.793			548.967			549.140			549.195	549.142			548.973			548.802			548.767
D	548.072	548.115			548.327			548.537			548.610	548.576			548.443			548.309			548.282
E	548.050	548.093			548.305			548.516			548.590	548.556			548.424			548.291			548.263
01	548.466	548.495			548.639			548.777			548.815	548.744			548.540			548.331			548.288
02	548.572	548.601			548.753			548.894			548.933	548.864			548.662			548.451			548.409
03	548.666	548.696			548.855			548.999			549.039	548.972			548.773			548.560			548.519
04	548.748	548.778			548.943			549.090			549.132	549.065			548.870			548.656			548.615
05	548.814	548.845			549.016			549.165			549.208	549.144			548.951			548.737			548.697
06	548.865	548.896			549.071			549.224			549.268	549.205			549.014			548.802			548.762
07	548.899	548.931			549.109			549.264			549.310	549.248			549.060			548.850			548.811
08	548.916	548.949			549.128			549.286			549.334	549.273			549.088			548.882			548.843
09	548.916	548.950			549.130			549.291			549.340	549.281			549.099			548.897			548.859
10	548.901	548.935			549.116			549.279			549.329	549.271			549.092			548.896			548.859
11	548.872	548.907			549.086			549.252			549.304	549.247			549.071			548.882			548.845
12	548.831	548.866			549.043			549.212			549.265	549.210			549.036			548.855			548.818
13	548.779	548.815			548.990			549.162			549.216	549.162			548.991			548.817			548.782
14	548.767	548.804			548.981			549.156			549.212	549.159			548.991			548.820			548.785
15	548.795	548.832			549.018			549.195			549.252	549.202			549.036			548.863			548.828
16	548.814	548.851			549.044			549.224			549.283	549.233			549.071			548.896			548.862
17	548.820	548.858			549.057			549.240			549.300	549.252			549.092			548.916			548.883
18	548.811	548.850			549.055			549.241			549.302	549.256			549.099			548.922			548.889
19	548.787	548.826			549.037			549.225			549.288	549.242			549.088			548.912			548.880
20	548.747	548.786			549.000			549.192			549.256	549.212			549.060			548.886			548.855
21	548.689	548.730			548.946			549.140			549.206	549.163			549.015			548.844			548.813
22	548.615	548.656			548.874			549.071			549.138	549.097			548.951			548.784			548.754
23	548.526	548.567			548.785			548.985			549.053	549.013			548.870			548.709			548.679
24	548.421	548.463			548.680			548.882			548.952	548.913			548.773			548.618			548.589
25	548.303	548.346			548.561			548.766			548.837	548.800			548.663			548.515			548.486
26	548.174	548.217			548.430			548.638			548.711	548.675			548.540			548.401			548.373

NOTES FOR ELEVATIONS TAKEN ON PRESTRESSED CONCRETE BEAMS

TAKE ELEVATIONS ON TOP OF BEAM AT POINTS INDICATED BY THE GRID LAYOUT. THE BEAM ELEVATIONS ARE TO BE READ TO THREE DECIMALS, AND ENTERED IN TABLES UNDER "TOP OF BEAM ELEVATIONS".

COMPUTE DIMENSION "X" AS FOLLOWS:

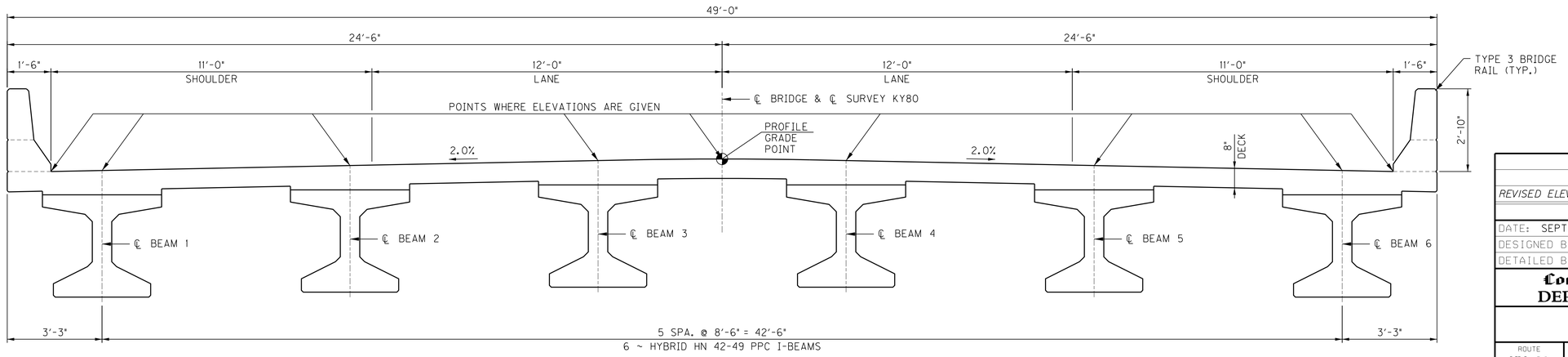
"CONSTRUCTION ELEVATION" MINUS "TOP OF BEAM" ELEVATION EQUALS DIMENSION "X". CONSTRUCTION ELEVATIONS INCLUDE CAMBER DUE TO WEIGHT OF CONCRETE SLAB AND BARRIER. MEASURING OF DIMENSION "X" GIVES THE FINAL CHECK ON BEAM TOLERANCES FOR CAMBER, BEAM DAMAGE, AND ERRORS IN ERECTION THAT PRODUCE REVERSE CAMBERS, SAGS, AND UNSIGHTLY FASCIA BEAMS.

FOR SETTING TEMPLATES, MEASURE DIMENSION "X" ABOVE TOP OF BEAMS FOR TOP OF TEMPLATE. DO NOT SET TEMPLATE BY ELEVATIONS.

TEMPORARY SUPPORTS OR SHORING WILL NOT BE PERMITTED UNDER THE GIRDERS WHEN POURING THE CONCRETE FLOOR SLAB OR WHEN TAKING "TOP OF BEAM" ELEVATIONS.

CONSTRUCT BARRIER TO ROADWAY GRADE. DO NOT ADD CAMBER TO BARRIER.

NOTE TO RESIDENT: THE "MAXIMUM ALLOWABLE CAMBER" SHOWN ON THE BEAM SHEET IS THE AMOUNT OF CAMBER, MEASURED PRIOR TO CASTING THE DECK, ABOVE WHICH THE BEAM WILL BEGIN TO ENCROACH INTO THE SLAB.



TYPICAL DECK SECTION

(LOOKING AHEAD, KY 80)

REVISION	DATE
REVISED ELEVATIONS	10/14/2015

DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: R.L. COLBERT	H.H. NEAL
DETAILED BY: J.A. ROSE	H.H. NEAL

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: GRAVES

ROUTE: KY 80 | CROSSING: I-69

CONSTRUCTION ELEVATIONS

ITEM NUMBER: 1-234.20

PREPARED BY: PALMER ENGINEERING CO.

SHEET NO.: S25

DRAWING NO.: 27454

TABLE OF ELEVATIONS

LINE	LEFT GUTTER LINE	GIRDER #1			GIRDER #2			GIRDER #3			PROFILE GRADE	GIRDER #4			GIRDER #5			GIRDER #6			RIGHT GUTTER LINE
		CONSTR. ELEV.	TOP OF GIRDER	DIM. "X"	CONSTR. ELEV.	TOP OF GIRDER	DIM. "X"	CONSTR. ELEV.	TOP OF GIRDER	DIM. "X"		CONSTR. ELEV.	TOP OF GIRDER	DIM. "X"	CONSTR. ELEV.	TOP OF GIRDER	DIM. "X"	CONSTR. ELEV.	TOP OF GIRDER	DIM. "X"	
A	548.365	548.393			548.530			548.666			548.702	548.630			548.423			548.215			548.172
B	548.381	548.410			548.547			548.684			548.720	548.649			548.443			548.235			548.192
C	548.757	548.793			548.967			549.140			549.195	549.142			548.973			548.802			548.767
D	548.072	548.115			548.327			548.537			548.610	548.576			548.443			548.309			548.282
E	548.050	548.093			548.305			548.516			548.590	548.556			548.424			548.291			548.263
01	548.466	548.495			548.639			548.777			548.815	548.744			548.540			548.331			548.288
02	548.572	548.601			548.753			548.894			548.933	548.864			548.662			548.451			548.409
03	548.666	548.696			548.855			548.999			549.039	548.972			548.773			548.560			548.519
04	548.748	548.778			548.943			549.090			549.132	549.065			548.870			548.656			548.615
05	548.814	548.845			549.016			549.165			549.208	549.144			548.951			548.737			548.697
06	548.865	548.896			549.071			549.224			549.268	549.205			549.014			548.802			548.762
07	548.899	548.931			549.109			549.264			549.310	549.248			549.060			548.850			548.811
08	548.916	548.949			549.128			549.286			549.334	549.273			549.088			548.882			548.843
09	548.916	548.950			549.130			549.291			549.340	549.281			549.099			548.897			548.859
10	548.901	548.935			549.116			549.279			549.329	549.271			549.092			548.896			548.859
11	548.872	548.907			549.086			549.252			549.304	549.247			549.071			548.882			548.845
12	548.831	548.866			549.043			549.212			549.265	549.210			549.036			548.855			548.818
13	548.779	548.815			548.990			549.162			549.216	549.162			548.991			548.817			548.782
14	548.767	548.804			548.981			549.156			549.212	549.159			548.991			548.820			548.785
15	548.795	548.832			549.018			549.195			549.252	549.202			549.036			548.863			548.828
16	548.814	548.851			549.044			549.224			549.283	549.233			549.071			548.896			548.862
17	548.820	548.858			549.057			549.240			549.300	549.252			549.092			548.916			548.883
18	548.811	548.850			549.055			549.241			549.302	549.256			549.099			548.922			548.889
19	548.787	548.826			549.037			549.225			549.288	549.242			549.088			548.912			548.880
20	548.747	548.786			549.000			549.192			549.256	549.212			549.060			548.886			548.855
21	548.689	548.730			548.946			549.140			549.206	549.163			549.015			548.844			548.813
22	548.615	548.656			548.874			549.071			549.138	549.097			548.951			548.784			548.754
23	548.526	548.567			548.785			548.985			549.053	549.013			548.870			548.709			548.679
24	548.421	548.463			548.680			548.882			548.952	548.913			548.773			548.618			548.589
25	548.303	548.346			548.561			548.766			548.837	548.800			548.663			548.515			548.486
26	548.174	548.217			548.430			548.638			548.711	548.675			548.540			548.401			548.373

NOTES FOR ELEVATIONS TAKEN ON PRESTRESSED CONCRETE BEAMS

TAKE ELEVATIONS ON TOP OF BEAM AT POINTS INDICATED BY THE GRID LAYOUT. THE BEAM ELEVATIONS ARE TO BE READ TO THREE DECIMALS, AND ENTERED IN TABLES UNDER "TOP OF BEAM ELEVATIONS".

COMPUTE DIMENSION "X" AS FOLLOWS:

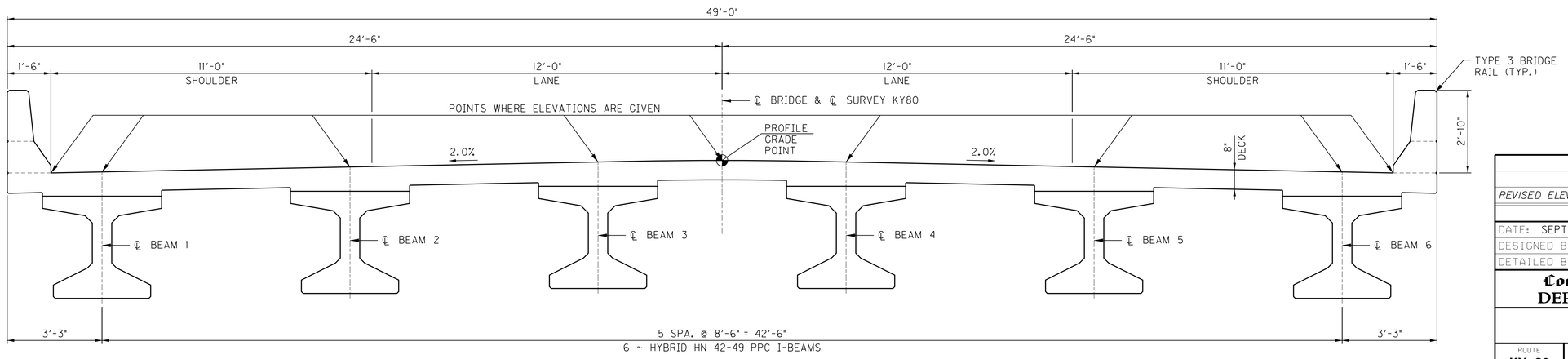
"CONSTRUCTION ELEVATION" MINUS "TOP OF BEAM" ELEVATION EQUALS DIMENSION "X". CONSTRUCTION ELEVATIONS INCLUDE CAMBER DUE TO WEIGHT OF CONCRETE SLAB AND BARRIER. MEASURING OF DIMENSION "X" GIVES THE FINAL CHECK ON BEAM TOLERANCES FOR CAMBER, BEAM DAMAGE, AND ERRORS IN ERECTION THAT PRODUCE REVERSE CAMBERS, SAGS, AND UNSIGHTLY FASCIA BEAMS.

FOR SETTING TEMPLATES, MEASURE DIMENSION "X" ABOVE TOP OF BEAMS FOR TOP OF TEMPLATE. DO NOT SET TEMPLATE BY ELEVATIONS.

TEMPORARY SUPPORTS OR SHORING WILL NOT BE PERMITTED UNDER THE GIRDERS WHEN POURING THE CONCRETE FLOOR SLAB OR WHEN TAKING "TOP OF BEAM" ELEVATIONS.

CONSTRUCT BARRIER TO ROADWAY GRADE. DO NOT ADD CAMBER TO BARRIER.

NOTE TO RESIDENT: THE "MAXIMUM ALLOWABLE CAMBER" SHOWN ON THE BEAM SHEET IS THE AMOUNT OF CAMBER, MEASURED PRIOR TO CASTING THE DECK, ABOVE WHICH THE BEAM WILL BEGIN TO ENCROACH INTO THE SLAB.



TYPICAL DECK SECTION

(LOOKING AHEAD, KY 80)

REVISION	DATE
REVISED ELEVATIONS	10/14/2015

DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: R.L. COLBERT	H.H. NEAL
DETAILED BY: J.A. ROSE	H.H. NEAL

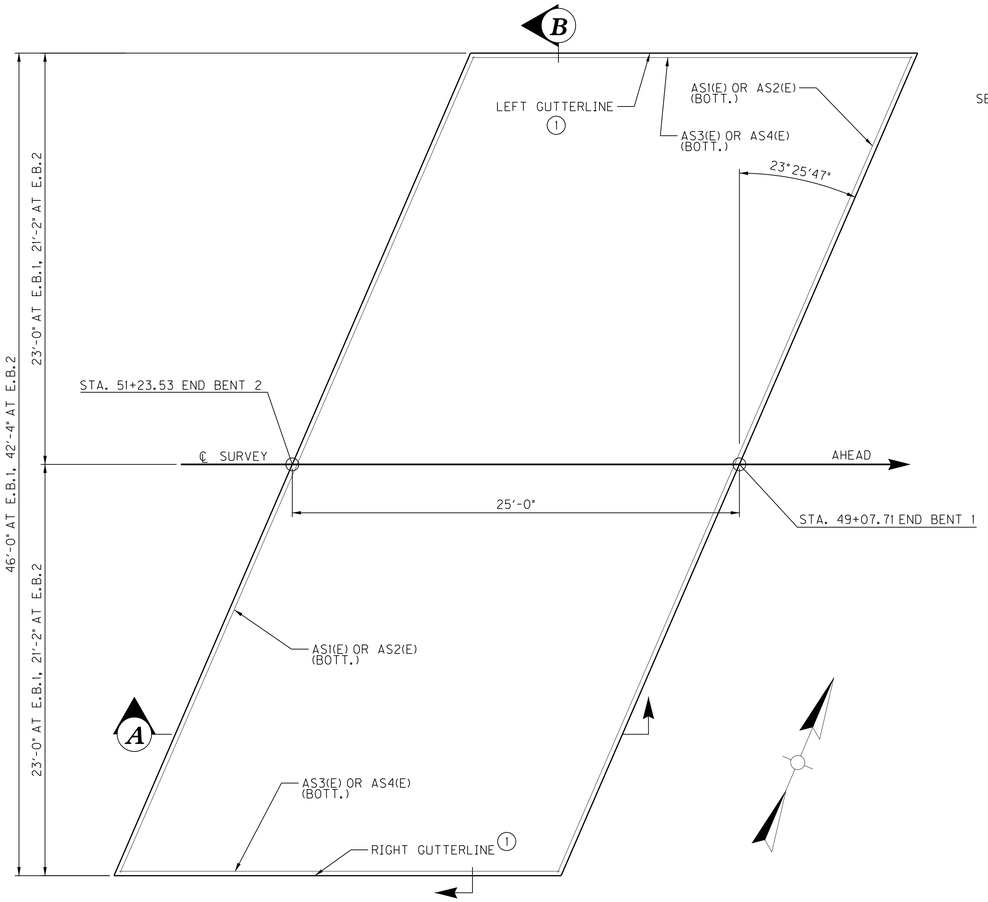
Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: **GRAVES**

ROUTE: **KY 80** | CROSSING: **I-69**

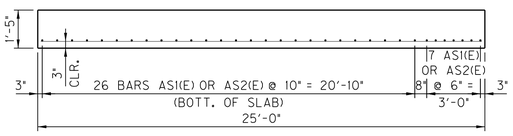
CONSTRUCTION ELEVATIONS

ITEM NUMBER	PREPARED BY	SHEET NO.
1-234.20	*PALMER ENGINEERING CO.*	S25
		DRAWING NO. 27454

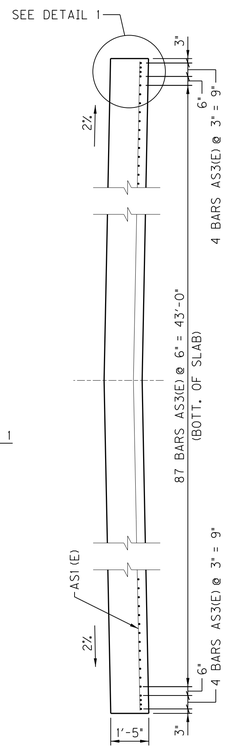


PLAN

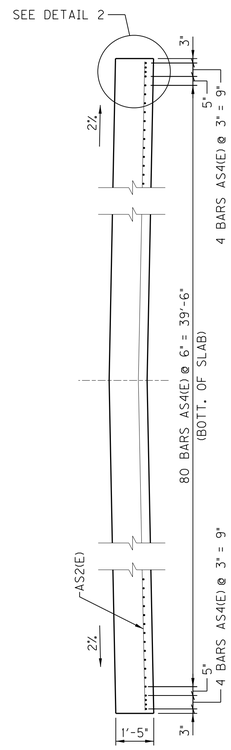
(1) INFORMATION FOR BOTH SLABS IS SHOWN.
APPROACH SLAB AT END BENT 2 IS INSIDE GUTTER LINES BY 1'-10"



SECTION "A"



SECTION "B", END BENT 1



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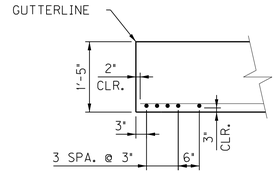
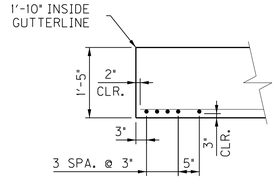
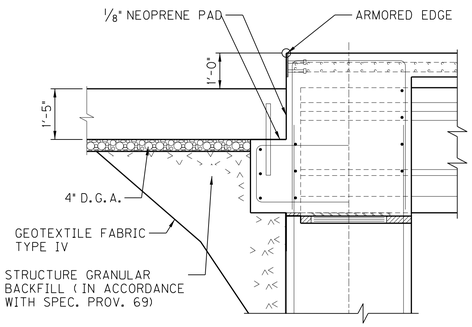


DETAIL 1, END BENT 1



DETAIL 2, END BENT 2



TYPICAL SECTION SHOWING JUNCTION OF APPROACH SLAB WITH BRIDGE BACKWALL

APPROACH SLAB REINFORCEMENT

MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d
AS1(E)	STR.	33	#5	49'-9"	E.B.1 APPCH. SLAB				
AS2(E)	STR.	33	#5	45'-9"	E.B.2 APPCH. SLAB				
AS3(E)	STR.	95	#8	24'-8"	E.B.1 APPCH. SLAB				
AS4(E)	STR.	88	#8	24'-8"	E.B.2 APPCH. SLAB				

ESTIMATE OF QUANTITIES

	A.S. #1	A.S. #2	UNIT
CLASS "AA" CONCRETE	61	56	YD^3
EPOXY COATED REINFORCEMENT	7970	7371	lbs.

NOTE : ESTIMATE OF QUANTITIES IS FOR INFORMATION ONLY.

GENERAL NOTES

CONCRETE

CONCRETE SHALL BE CLASS "AA"

REINFORCEMENT

ALL STEEL REINFORCEMENT SHALL BE GRADE 60 AND EPOXY COATED.

APPROACH CURB TREATMENT

⅛" NEOPRENE PAD SHALL BE PLACED BETWEEN APPROACH SLAB AND ANY APPROACH CURB OR BARRIER.

MIN. LAP SPLICE

#5 BARS - 3'-0"

REVISION	DATE
VARIOUS REVISIONS	10/14/2015

DATE: SEPTEMBER, 2015 — CHECKED BY

DESIGNED BY: R.L. COLBERT — L.A. CARLISLE

DETAILED BY: M. SIMPSON — R.L. COLBERT

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: **GRAVES**

ROUTE: **KY 80** — CROSSING: **I-69**

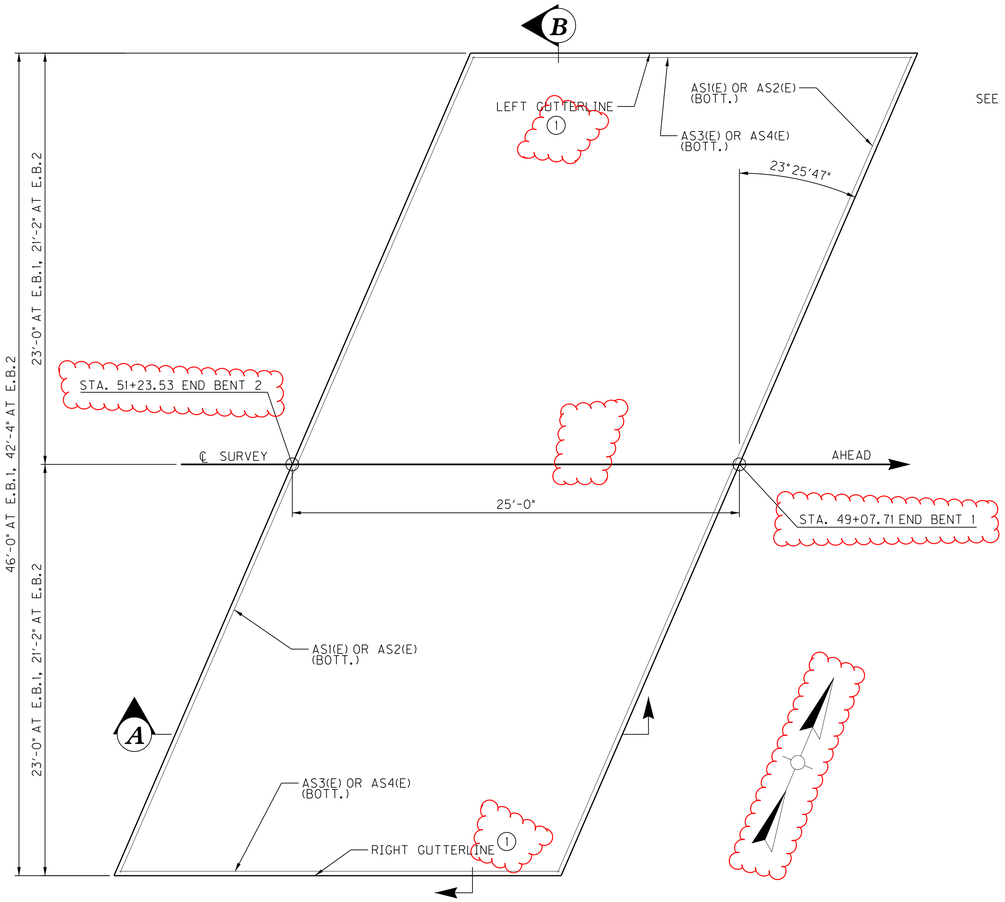
APPROACH SLAB

ITEM NUMBER: **1-234.20**

PREPARED BY: *PALMER ENGINEERING CO.*

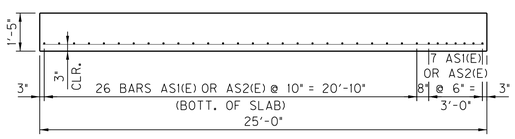
SHEET NO. S26

DRAWING NO. 27454

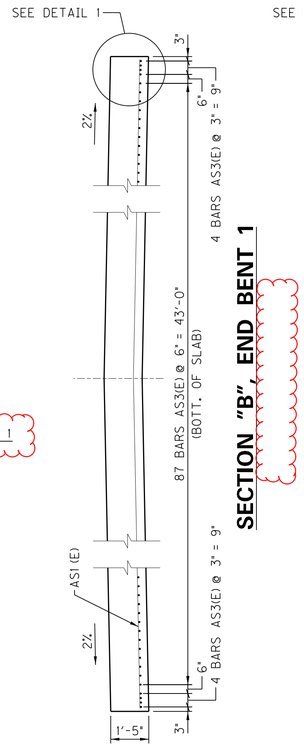


PLAN

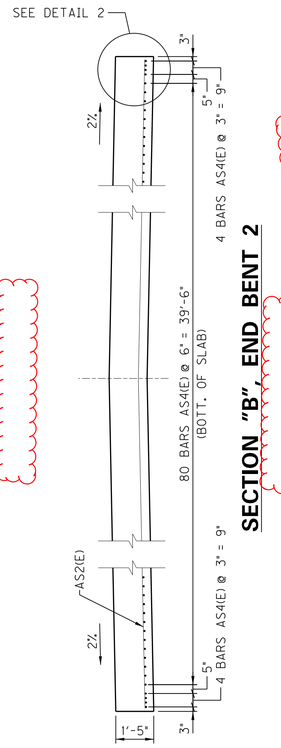
(1) INFORMATION FOR BOTH SLABS IS SHOWN.
APPROACH SLAB AT END BENT 2 IS INSIDE GUTTER LINES BY 1'-10"



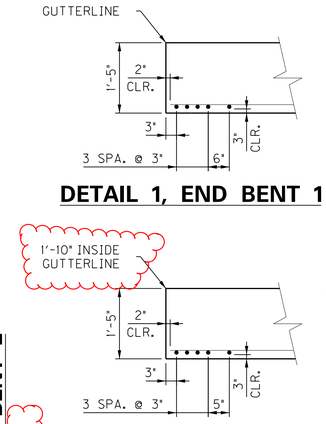
SECTION "A"



SECTION "B", END BENT 1

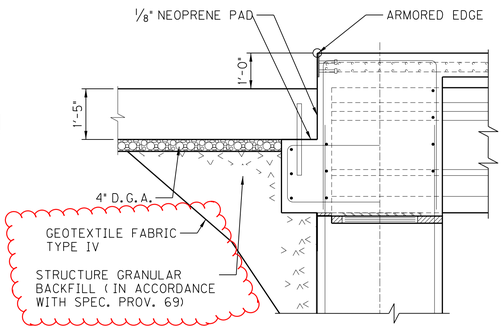


SECTION "B", END BENT 2



DETAIL 1, END BENT 1

DETAIL 2, END BENT 2



TYPICAL SECTION SHOWING JUNCTION OF APPROACH SLAB WITH BRIDGE BACKWALL

APPROACH SLAB REINFORCEMENT

MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d
AS1(E)	STR.	33	#5	49'-9"	E.B.1 APPCH. SLAB				
AS2(E)	STR.	33	#5	45'-9"	E.B.2 APPCH. SLAB				
AS3(E)	STR.	95	#8	24'-8"	E.B.1 APPCH. SLAB				
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ESTIMATE OF QUANTITIES

	A.S. #1	A.S. #2	UNIT
CLASS "AA" CONCRETE	61	56	YD^3
EPOXY COATED REINFORCEMENT	7970	7371	lbs.

NOTE : ESTIMATE OF QUANTITIES IS FOR INFORMATION ONLY.

GENERAL NOTES

CONCRETE

CONCRETE SHALL BE CLASS "AA"

REINFORCEMENT

ALL STEEL REINFORCEMENT SHALL BE GRADE 60 AND EPOXY COATED.

APPROACH CURB TREATMENT

⅛" NEOPRENE PAD SHALL BE PLACED BETWEEN APPROACH SLAB AND ANY APPROACH CURB OR BARRIER.

MIN. LAP SPLICE

#5 BARS - 3'-0"

REVISION	DATE
VARIOUS REVISIONS	10/14/2015

DATE: SEPTEMBER, 2015 — CHECKED BY

DESIGNED BY: R.L. COLBERT — L.A. CARLISLE

DETAILED BY: M. SIMPSON — R.L. COLBERT

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: **GRAVES**

ROUTE: **KY 80** — CROSSING: **I-69**

APPROACH SLAB

ITEM NUMBER: **1-234.20**

PREPARED BY: *PALMER ENGINEERING CO.*

SHEET NO. S26

DRAWING NO. 27454

BILL OF REINFORCEMENT – END BENT 1

MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d	e
A01(S)	14	18	# 5	16'-6"	CAP	4'-7"	3'-2"			
A02(S)	14	9	# 5	16'-11"	CAP	4'-9½"	3'-2"			
A03(S)	14	9	# 5	17'-4"	CAP	5'-0"	3'-2"			
A04(S)	14	9	# 5	17'-5"	CAP	5'-0⅜"	3'-2"			
A05(S)	14	9	# 5	17'-2"	CAP	4'-10¾"	3'-2"			
A06(S)	14	18	# 5	16'-11"	CAP	4'-9⅛"	3'-2"			
A07	STR.	8	# 9	60'-0"	CAP					
A08	STR.	8	# 9	23'-5"	CAP					
A09	STR.	20	# 5	60'-0"	CAP					
A10	STR.	32	# 5	19'-2"	CAP					
A11(E)	STR.	118	# 5	3'-6"	CAP/DIAPHRAGM					
A12(S)(E)	2	6	# 5	10'-8"	WINGS	3'-9"	3'-2"			
A13(E)	STR.	23	# 5	4'-2"	DIAPHRAGM					
A14(S)(E)	2	25	# 5	11'-6"	DIAPHRAGM	4'-2"	3'-2"			
A15(S)(E)	2	4	# 5	11'-10"	DIAPHRAGM	4'-2"	3'-5⅜"			
A16(S)(E)	2	2	# 5	12'-8"	WINGS	4'-7"	3'-5⅜"			
A17(S)(E)	2	6	# 5	12'-4"	WINGS	4'-7"	3'-2"			
A18(S)(E)	2	1	# 5	8'-0"	RT. WING	2'-5"	3'-2"			
A19(S)(E)	2	1	# 5	8'-10"	RT. WING	2'-10"	3'-2"			
A20(S)(E)	2	1	# 5	9'-10"	RT. WING	3'-4"	3'-2"			
A21(S)(E)	2	1	# 5	10'-10"	RT. WING	3'-10"	3'-2"			
A22(S)(E)	2	1	# 5	11'-8"	RT. WING	4'-3"	3'-2"			
A23(S)(E)	2	1	# 5	8'-6"	LT. WING	2'-8"	3'-2"			
A24(S)(E)	2	1	# 5	9'-4"	LT. WING	3'-1"	3'-2"			
A25(S)(E)	2	1	# 5	10'-2"	LT. WING	3'-6"	3'-2"			
A26(S)(E)	2	1	# 5	11'-2"	LT. WING	4'-0"	3'-2"			
A27(S)(E)	2	1	# 5	11'-10"	LT. WING	4'-4"	3'-2"			
A28(E)	STR.	5	# 5	5'-4"	DIAPHRAGM					
A29(E)	STR.	15	# 5	7'-10"	DIAPHRAGM					
A30(E)	STR.	5	# 5	4'-6"	DIAPHRAGM					
A31(E)	STR.	5	# 5	40'-6"	DIAPHRAGM					
A32(E)	STR.	1	# 6	12'-9"	RT. WING					
A33(E)	STR.	1	# 6	14'-5"	RT. WING					
A34(E)	STR.	1	# 6	12'-10"	RT. WING					
A35(E)	STR.	1	# 6	11'-2"	RT. WING					
A36(E)	STR.	1	# 6	7'-10"	RT. WING					
A37(E)	STR.	1	# 6	6'-2"	RT. WING					
A38(E)	8	1	# 6	12'-0"	RT. WING	3'-4"	8'-8"	3'-6⅝"	7'-10⅝"	
A39(E)	STR.	1	# 6	11'-3"	LT. WING					
A40(E)	STR.	1	# 6	12'-6"	LT. WING					
A41(E)	STR.	1	# 6	12'-0"	LT. WING					
A42(E)	STR.	1	# 6	10'-3"	LT. WING					
A43(E)	STR.	1	# 6	7'-3"	LT. WING					
A44(E)	STR.	1	# 6	5'-6"	LT. WING					
A45(E)	8	1	# 6	10'-8"	LT. WING	2'-1"	8'-7"	3'-4¼"	7'-10⅝"	
A46(E)	STR.	2	# 6	21'-0"	WINGS/DIAPHRAGM					
A47(E)	STR.	2	# 6	21'-0"	WINGS/DIAPHRAGM					
A48(E)	STR.	2	# 6	19'-5"	WINGS/DIAPHRAGM					
A49(E)	STR.	2	# 6	17'-9"	WINGS/DIAPHRAGM					
A50(E)	STR.	2	# 6	16'-1"	WINGS/DIAPHRAGM					
A51(E)	STR.	2	# 6	14'-5"	WINGS/DIAPHRAGM					
A52(E)	8	1	# 6	10'-9"	RT. WING	2'-1"	8'-8"	3'-6⅝"	7'-10⅝"	
A53(E)	8	1	# 6	11'-11"	LT. WING	3'-4"	8'-7"	3'-4¼"	7'-10⅝"	
A54(E)	STR.	51	# 11	2'-0"	ROADWAY NOTCH					
A55(S)(E)	2	51	# 5	6'-9"	ROADWAY NOTCH	2'-7"	1'-7"			
A56(E)	STR.	3	# 5	50'-8"	ROADWAY NOTCH					
A57	29	24	# 7	4'-3"	PILE ANCHOR	1'-1"	1'-3"	7"	2'-2"	

BILL OF REINFORCEMENT – END BENT 2

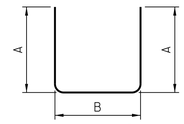
MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d	e
A101(S)	14	18	# 5	16'-6"	CAP	4'-7"	3'-2"			
A102(S)	14	9	# 5	16'-11"	CAP	4'-9½"	3'-2"			
A103(S)	14	9	# 5	17'-4"	CAP	5'-0"	3'-2"			
A104(S)	14	9	# 5	17'-5"	CAP	5'-0½"	3'-2"			
A105(S)	14	9	# 5	17'-2"	CAP	4'-10¾"	3'-2"			
A106(S)	14	18	# 5	16'-11"	CAP	4'-9¼"	3'-2"			
A107	STR.	8	# 9	60'-0"	CAP					
A108	STR.	8	# 9	23'-5"	CAP					
A109	STR.	20	# 5	60'-0"	CAP					
A110	STR.	32	# 5	19'-2"	CAP					
A111(E)	STR.	118	# 5	3'-6"	CAP/DIAPHRAGM					
A112(S)(E)	2	6	# 5	11'-2"	WINGS	4'-0"	3'-2"			
A113(E)	STR.	23	# 5	4'-2"	DIAPHRAGM					
A114(S)(E)	2	25	# 5	11'-6"	DIAPHRAGM	4'-2"	3'-2"			
A115(S)(E)	2	4	# 5	11'-10"	DIAPHRAGM	4'-2"	3'-5⅜"			
A116(S)(E)	2	2	# 5	12'-9"	WINGS	4'-8"	3'-5⅜"			
A117(S)(E)	2	6	# 5	12'-6"	WINGS	4'-8"	3'-2"			
A118(S)(E)	2	1	# 5	8'-8"	LT. WING	2'-9"	3'-2"			
A119(S)(E)	2	1	# 5	9'-6"	LT. WING	3'-2"	3'-2"			

BILL OF REINFORCEMENT – END BENT 2 (CONT.)

MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d	e
A120(S)(E)	2	1	# 5	10'-2"	LT. WING	3'-6"	3'-2"			
A121(S)(E)	2	1	# 5	11'-2"	LT. WING	4'-0"	3'-2"			
A122(S)(E)	2	1	# 5	11'-10"	LT. WING	4'-4"	3'-2"			
A123(S)(E)	2	1	# 5	7'-6"	RT. WING	2'-2"	3'-2"			
A124(S)(E)	2	1	# 5	8'-6"	RT. WING	2'-8"	3'-2"			
A125(S)(E)	2	1	# 5	9'-8"	RT. WING	3'-3"	3'-2"			
A126(S)(E)	2	1	# 5	10'-8"	RT. WING	3'-9"	3'-2"			
A127(S)(E)	2	1	# 5	11'-10"	RT. WING	4'-4"	3'-2"			
A128(E)	STR.	5	# 5	5'-4"	DIAPHRAGM					
A129(E)	STR.	15	# 5	7'-10"	DIAPHRAGM					
A130(E)	STR.	5	# 5	4'-6"	DIAPHRAGM					
A131(E)	STR.	5	# 5	40'-6"	DIAPHRAGM					
A132(E)	STR.	1	# 6	12'-9"	LT. WING					
A133(E)	STR.	1	# 6	14'-5"	LT. WING					
A134(E)	STR.	1	# 6	13'-6"	LT. WING					
A135(E)	STR.	1	# 6	11'-8"	LT. WING					
A136(E)	STR.	1	# 6	8'-2"	LT. WING					
A137(E)	STR.	1	# 6	6'-4"	LT. WING					
A138(E)	8	1	# 6	11'-10"	LT. WING	3'-4"	8'-6"	3'-2¼"	7'-10⅝"	
A139(E)	STR.	1	# 6	11'-3"	RT. WING					
A140(E)	STR.	1	# 6	11'-10"	RT. WING					
A141(E)	STR.	1	# 6	10'-5"	RT. WING					
A142(E)	STR.	1	# 6	9'-1"	RT. WING					
A143(E)	STR.	1	# 6	6'-5"	RT. WING					
A144(E)	STR.	1	# 6	5'-1"	RT. WING					
A145(E)	8	1	# 6	11'-0"	RT. WING	2'-1"	8'-11"	4'-3"	7'-10¾"	
A146(E)	STR.	2	# 6	21'-0"	WINGS/DIAPHRAGM					
A147(E)	STR.	2	# 6	21'-0"	WINGS/DIAPHRAGM					
A148(E)	STR.	2	# 6	20'-2"	WINGS/DIAPHRAGM					
A149(E)	STR.	2	# 6	18'-4"	WINGS/DIAPHRAGM					
A150(E)	STR.	2	# 6	16'-5"	WINGS/DIAPHRAGM					
A151(E)	STR.	2	# 6	14'-7"	WINGS/DIAPHRAGM					
A152(E)	8	1	# 6	10'-7"	LT. WING	2'-1"	8'-6"	3'-2¼"	7'-10⅝"	
A153(E)	8	1	# 6	12'-1"	RT. WING					
A154(E)	STR.	51	# 11	2'-0"	ROADWAY NOTCH					
A155(S)(E)	2	51	# 5	6'-9"	ROADWAY NOTCH	2'-7"	1'-7"			
A156(E)	STR.	3	# 5	50'-8"	ROADWAY NOTCH					
A157	29	24	# 7	4'-3"	PILE ANCHOR	1'-1"	1'-3"	7"	2'-2"	

BILL OF REINFORCEMENT – PIER

MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d	e
P1	8	20	# 8	25'-7"	CAP	23'-3"	2'-4"	11⅜"	2'-1¾"	
P2	8	20	# 8	32'-1"	CAP	29'-9"	2'-4"	11⅜"	2'-1¾"	
P3	STR.	4	# 5	50'-8"	CAP					
P4	STR.	16	# 5	42'-0"	CAP					
P5(S)	2	16	# 7	19'-5"	CAP	8'-4"	2'-9"			
P6	4	10	# 8	21'-3"	CAP	19'-10"	1'-5"	8"	20'-2"	
P7	4	10	# 8	37'-9"	CAP	36'-4"	1'-5"	8"	36'-8"	
P8	5	10	# 8	22'-0"	CAP	18'-4"	3'-8"			
P9	5	10	# 8	42'-6"	CAP	38'-10"	3'-8"			
P10(S)	14	4	# 6	14'-6"	CAP	3'-10⅛"	2'-10½"			
P11(S)	14	4	# 6	14'-9"	CAP	3'-11⅞"	2'-10½"			
P12(S)	14	4	# 6	15'-1"	CAP	4'-1⅝"	2'-10½"			
P13(S)	14	4	# 6	15'-4"	CAP	4'-3⅜"	2'-10½"			
P14(S)	14	4	# 6	15'-8"	CAP	4'-5¼"	2'-10½"			
P15(S)	14	4	# 6	15'-11"	CAP	4'-7"	2'-10½"			
P16(S)	14	168	# 6	16'-1"	CAP	4'-8"	2'-10½"			
P17(S)	2	37	# 5	9'-6"	CAP	2'-8"	4'-2"			
P18	STR.	20	# 5	11'-0"	CAP					
P19	STR.	10	# 5	18'-2"	CAP					
P20(E)	STR.	20	# 11	3'-0"	ANCHOR DOWEL					
P31	1	36	# 10	13'-11"	FOOTING	9'-6¾"	2'-2"	1'-1¼"	10'-8"	
P32	4	12	# 10	7'-0"	FOOTING	4'-9⅜"	2'-2"	1'-1¼"	5'-4"	
P33	1	42	# 10	15'-5"	FOOTING	11'-0¾"	2'-2"	1'-1¼"	12'-2"	
P34	4	18	# 10	7'-9"	FOOTING	5'-6⅜"	2'-2"	1'-1¼"	6'-1"	
P35	STR.	51	# 6	12'-2"	FOOTING					
P36	STR.	42	# 6	10'-8"	FOOTING					
P37	4	27	# 9	9'-0"	FOOTING/COLUMN	7'-1⅛"	1'-11"	11¾"	7'-7"	
P38	18	3	# 5	682'-7"	FOOTING/COLUMN/CAP	19'-9"	0'-4"	3'-8"		
P39	STR.	27	# 9	14'-9"	COLUMN/CAP					
P40	4	27	# 9	11'-7"	FOOTING/COLUMN	9'-7⅛"	1'-11"	11¾"	10'-1"	
P41	STR.	27	# 9	12'-3"	COLUMN/CAP					



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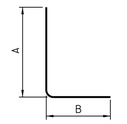

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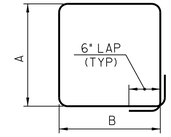

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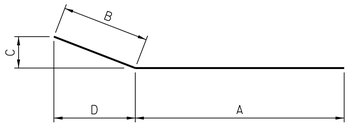

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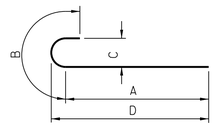

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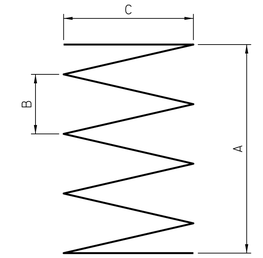

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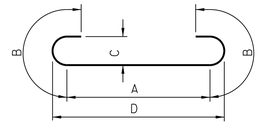

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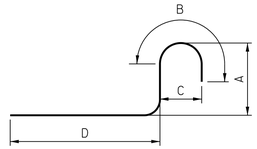


TYPE (29)

NOTE : REINFORCING BARS DESIGNATED WITH SUFFIX (E) IN PLANS SHALL BE EPOXY COATED IN ACCORDANCE WITH THE SPECIFICATIONS.

REINFORCING BARS DESIGNATED WITH THE SUFFIX (S) IN PLANS ARE STIRRUP BARS.

REVISION	DATE
REBAR CORRECTIONS	10/14/2015
DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: R.L. COLBERT	L.M. SALLEE
DETAILED BY: J.A. ROSE	R.L. COLBERT

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY
GRAVES

ROUTE: KY 80
CROSSING: I-69

BILL OF REINFORCEMENT – SUBSTRUCTURE

ITEM NUMBER
1–234.20

PREPARED BY
PALMER ENGINEERING CO.

SHEET NO. S27
DRAWING NO. 27454

BILL OF REINFORCEMENT – END BENT 1

MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d	e
A01(S)	14	18	# 5	16'-6"	CAP	4'-7"	3'-2"			
A02(S)	14	9	# 5	16'-11"	CAP	4'-9½"	3'-2"			
A03(S)	14	9	# 5	17'-4"	CAP	5'-0"	3'-2"			
A04(S)	14	9	# 5	17'-5"	CAP	5'-0⅜"	3'-2"			
A05(S)	14	9	# 5	17'-2"	CAP	4'-10¾"	3'-2"			
A06(S)	14	18	# 5	16'-11"	CAP	4'-9⅛"	3'-2"			
A07	STR.	8	# 9	60'-0"	CAP					
A08	STR.	8	# 9	23'-5"	CAP					
A09	STR.	20	# 5	60'-0"	CAP					
A10	STR.	32	# 5	19'-2"	CAP					
A11(E)	STR.	118	# 5	3'-6"	CAP/DIAPHRAGM					
A12(S)(E)	2	6	# 5	10'-8"	WINGS	3'-9"	3'-2"			
A13(E)	STR.	23	# 5	4'-2"	DIAPHRAGM					
A14(S)(E)	2	25	# 5	11'-6"	DIAPHRAGM	4'-2"	3'-2"			
A15(S)(E)	2	4	# 5	11'-10"	DIAPHRAGM	4'-2"	3'-5⅜"			
A16(S)(E)	2	2	# 5	12'-8"	WINGS	4'-7"	3'-5⅜"			
A17(S)(E)	2	6	# 5	12'-4"	WINGS	4'-7"	3'-2"			
A18(S)(E)	2	1	# 5	8'-0"	RT. WING	2'-5"	3'-2"			
A19(S)(E)	2	1	# 5	8'-10"	RT. WING	2'-10"	3'-2"			
A20(S)(E)	2	1	# 5	9'-10"	RT. WING	3'-4"	3'-2"			
A21(S)(E)	2	1	# 5	10'-10"	RT. WING	3'-10"	3'-2"			
A22(S)(E)	2	1	# 5	11'-8"	RT. WING	4'-3"	3'-2"			
A23(S)(E)	2	1	# 5	8'-6"	LT. WING	2'-8"	3'-2"			
A24(S)(E)	2	1	# 5	9'-4"	LT. WING	3'-1"	3'-2"			
A25(S)(E)	2	1	# 5	10'-2"	LT. WING	3'-6"	3'-2"			
A26(S)(E)	2	1	# 5	11'-2"	LT. WING	4'-0"	3'-2"			
A27(S)(E)	2	1	# 5	11'-10"	LT. WING	4'-4"	3'-2"			
A28(E)	STR.	5	# 5	5'-4"	DIAPHRAGM					
A29(E)	STR.	15	# 5	7'-10"	DIAPHRAGM					
A30(E)	STR.	5	# 5	4'-6"	DIAPHRAGM					
A31(E)	STR.	5	# 5	40'-6"	DIAPHRAGM					
A32(E)	STR.	1	# 6	12'-9"	RT. WING					
A33(E)	STR.	1	# 6	14'-5"	RT. WING					
A34(E)	STR.	1	# 6	12'-10"	RT. WING					
A35(E)	STR.	1	# 6	11'-2"	RT. WING					
A36(E)	STR.	1	# 6	7'-10"	RT. WING					
A37(E)	STR.	1	# 6	6'-2"	RT. WING					
A38(E)	8	1	# 6	12'-0"	RT. WING	3'-4"	8'-8"	3'-6⅝"	7'-10⅝"	
A39(E)	STR.	1	# 6	11'-3"	LT. WING					
A40(E)	STR.	1	# 6	12'-6"	LT. WING					
A41(E)	STR.	1	# 6	12'-0"	LT. WING					
A42(E)	STR.	1	# 6	10'-3"	LT. WING					
A43(E)	STR.	1	# 6	7'-3"	LT. WING					
A44(E)	STR.	1	# 6	5'-6"	LT. WING					
A45(E)	8	1	# 6	10'-8"	LT. WING	2'-1"	8'-7"	3'-4¼"	7'-10⅝"	
A46(E)	STR.	2	# 6	21'-0"	WINGS/DIAPHRAGM					
A47(E)	STR.	2	# 6	21'-0"	WINGS/DIAPHRAGM					
A48(E)	STR.	2	# 6	19'-5"	WINGS/DIAPHRAGM					
A49(E)	STR.	2	# 6	17'-9"	WINGS/DIAPHRAGM					
A50(E)	STR.	2	# 6	16'-1"	WINGS/DIAPHRAGM					
A51(E)	STR.	2	# 6	14'-5"	WINGS/DIAPHRAGM					
A52(E)	8	1	# 6	10'-9"	RT. WING	2'-1"	8'-8"	3'-6⅝"	7'-10⅝"	
A53(E)	8	1	# 6	11'-11"	LT. WING	3'-4"	8'-7"	3'-4¼"	7'-10⅝"	
A54(E)	STR.	51	# 11	2'-0"	ROADWAY NOTCH					
A55(S)(E)	2	51	# 5	6'-9"	ROADWAY NOTCH	2'-7"	1'-7"			
A56(E)	STR.	3	# 5	50'-8"	ROADWAY NOTCH					
A57	29	24	# 7	4'-3"	PILE ANCHOR	1'-1"	1'-3"	7"	2'-2"	

BILL OF REINFORCEMENT – END BENT 2

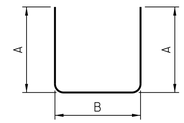
MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d	e
A101(S)	14	18	# 5	16'-6"	CAP	4'-7"	3'-2"			
A102(S)	14	9	# 5	16'-11"	CAP	4'-9½"	3'-2"			
A103(S)	14	9	# 5	17'-4"	CAP	5'-0"	3'-2"			
A104(S)	14	9	# 5	17'-5"	CAP	5'-0½"	3'-2"			
A105(S)	14	9	# 5	17'-2"	CAP	4'-10¾"	3'-2"			
A106(S)	14	18	# 5	16'-11"	CAP	4'-9¼"	3'-2"			
A107	STR.	8	# 9	60'-0"	CAP					
A108	STR.	8	# 9	23'-5"	CAP					
A109	STR.	20	# 5	60'-0"	CAP					
A110	STR.	32	# 5	19'-2"	CAP					
A111(E)	STR.	118	# 5	3'-6"	CAP/DIAPHRAGM					
A112(S)(E)	2	6	# 5	11'-2"	WINGS	4'-0"	3'-2"			
A113(E)	STR.	23	# 5	4'-2"	DIAPHRAGM					
A114(S)(E)	2	25	# 5	11'-6"	DIAPHRAGM	4'-2"	3'-2"			
A115(S)(E)	2	4	# 5	11'-10"	DIAPHRAGM	4'-2"	3'-5⅜"			
A116(S)(E)	2	2	# 5	12'-9"	WINGS	4'-8"	3'-5⅜"			
A117(S)(E)	2	6	# 5	12'-6"	WINGS	4'-8"	3'-2"			
A118(S)(E)	2	1	# 5	8'-8"	LT. WING	2'-9"	3'-2"			
A119(S)(E)	2	1	# 5	9'-6"	LT. WING	3'-2"	3'-2"			

BILL OF REINFORCEMENT – END BENT 2 (CONT.)

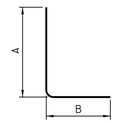
MARK	TYPE	NUMBER	SIZE	LENGTH	LOCATION	a	b	c	d	e
A120(S)(E)	2	1	# 5	10'-2"	LT. WING	3'-6"	3'-2"			
A121(S)(E)	2	1	# 5	11'-2"	LT. WING	4'-0"	3'-2"			
A122(S)(E)	2	1	# 5	11'-10"	LT. WING	4'-4"	3'-2"			
A123(S)(E)	2	1	# 5	7'-6"	RT. WING	2'-2"	3'-2"			
A124(S)(E)	2	1	# 5	8'-6"	RT. WING	2'-8"	3'-2"			
A125(S)(E)	2	1	# 5	9'-8"	RT. WING	3'-3"	3'-2"			
A126(S)(E)	2	1	# 5	10'-8"	RT. WING	3'-9"	3'-2"			
A127(S)(E)	2	1	# 5	11'-10"	RT. WING	4'-4"	3'-2"			
A128(E)	STR.	5	# 5	5'-4"	DIAPHRAGM					
A129(E)	STR.	15	# 5	7'-10"	DIAPHRAGM					
A130(E)	STR.	5	# 5	4'-6"	DIAPHRAGM					
A131(E)	STR.	5	# 5	40'-6"	DIAPHRAGM					
A132(E)	STR.	1	# 6	12'-9"	LT. WING					
A133(E)	STR.	1	# 6	14'-5"	LT. WING					
A134(E)	STR.	1	# 6	13'-6"	LT. WING					
A135(E)	STR.	1	# 6	11'-8"	LT. WING					
A136(E)	STR.	1	# 6	8'-2"	LT. WING					
A137(E)	STR.	1	# 6	6'-4"	LT. WING					
A138(E)	8	1	# 6	11'-10"	LT. WING	3'-4"	8'-6"	3'-2¼"	7'-10⅝"	
A139(E)	STR.	1	# 6	11'-3"	RT. WING					
A140(E)	STR.	1	# 6	11'-10"	RT. WING					
A141(E)	STR.	1	# 6	10'-5"	RT. WING					
A142(E)	STR.	1	# 6	9'-1"	RT. WING					
A143(E)	STR.	1	# 6	6'-5"	RT. WING					
A144(E)	STR.	1	# 6	5'-1"	RT. WING					
A145(E)	8	1	# 6	11'-0"	RT. WING	2'-1"	8'-11"	4'-3"	7'-10¾"	
A146(E)	STR.	2	# 6	21'-0"	WINGS/DIAPHRAGM					
A147(E)	STR.	2	# 6	21'-0"	WINGS/DIAPHRAGM					
A148(E)	STR.	2	# 6	20'-2"	WINGS/DIAPHRAGM					
A149(E)	STR.	2	# 6	18'-4"	WINGS/DIAPHRAGM					
A150(E)	STR.	2	# 6	16'-5"	WINGS/DIAPHRAGM					
A151(E)	STR.	2	# 6	14'-7"	WINGS/DIAPHRAGM					
A152(E)	8	1	# 6	10'-7"	LT. WING	2'-1"	8'-6"	3'-2¼"	7'-10⅝"	
A153(E)	8	1	# 6	12'-1"	RT. WING					
A154(E)	STR.	51	# 11	2'-0"	ROADWAY NOTCH					
A155(S)(E)	2	51	# 5	6'-9"	ROADWAY NOTCH	2'-7"	1'-7"			
A156(E)	STR.	3	# 5	50'-8"	ROADWAY NOTCH					
A157	29	24	# 7	4'-3"	PILE ANCHOR	1'-1"	1'-3"	7"	2'-2"	

BILL OF REINFORCEMENT – PIER

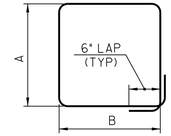
P1	8	20	# 8	25'-7"	CAP	23'-3"	2'-4"	11⅜"	2'-1¾"	
P2	8	20	# 8	32'-1"	CAP	29'-9"	2'-4"	11⅜"	2'-1¾"	
P3	STR.	4	# 5	50'-8"	CAP					
P4	STR.	16	# 5	42'-0"	CAP					
P5(S)	2	16	# 7	19'-5"	CAP	8'-4"	2'-9"			
P6	4	10	# 8	21'-3"	CAP	19'-10"	1'-5"	8"	20'-2"	
P7	4	10	# 8	37'-9"	CAP	36'-4"	1'-5"	8"	36'-8"	
P8	5	10	# 8	22'-0"	CAP	18'-4"	3'-8"			
P9	5	10	# 8	42'-6"	CAP	38'-10"	3'-8"			
P10(S)	14	4	# 6	14'-6"	CAP	3'-10⅛"	2'-10½"			
P11(S)	14	4	# 6	14'-9"	CAP	3'-11⅞"	2'-10½"			
P12(S)	14	4	# 6	15'-1"	CAP	4'-1⅝"	2'-10½"			
P13(S)	14	4	# 6	15'-4"	CAP	4'-3⅜"	2'-10½"			
P14(S)	14	4	# 6	15'-8"	CAP	4'-5¼"	2'-10½"			
P15(S)	14	4	# 6	15'-11"	CAP	4'-7"	2'-10½"			
P16(S)	14	168	# 6	16'-1"	CAP	4'-8"	2'-10½"			
P17(S)	2	37	# 5	9'-6"	CAP	2'-8"	4'-2"			
P18	STR.	20	# 5	11'-0"	CAP					
P19	STR.	10	# 5	18'-2"	CAP					
P20(E)	STR.	20	# 11	3'-0"	ANCHOR DOWEL					
P31	1	36	# 10	13'-11"	FOOTING	9'-6¾"	2'-2"	1'-1¼"	10'-8"	
P32	4	12	# 10	7'-0"	FOOTING	4'-9⅜"	2'-2"	1'-1¼"	5'-4"	
P33	1	42	# 10	15'-5"	FOOTING	11'-0¾"	2'-2"	1'-1¼"	12'-2"	
P34	4	18	# 10	7'-9"	FOOTING	5'-6⅜"	2'-2"	1'-1¼"	6'-1"	
P35	STR.	51	# 6	12'-2"	FOOTING					
P36	STR.	42	# 6	10'-8"	FOOTING					
P37	4	27	# 9	9'-0"	FOOTING/COLUMN	7'-1⅛"	1'-11"	11¾"	7'-7"	
P38	18	3	# 5	682'-7"	FOOTING/COLUMN/CAP	19'-9"	0'-4"	3'-8"		
P39	STR.	27	# 9	14'-9"	COLUMN/CAP					
P40	4	27	# 9	11'-7"	FOOTING/COLUMN	9'-7⅛"	1'-11"	11¾"	10'-1"	
P41	STR.	27	# 9	12'-3"	COLUMN/CAP					



TYPE (2)



TYPE (5)



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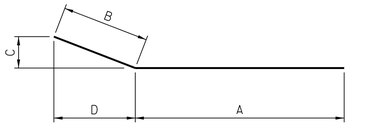

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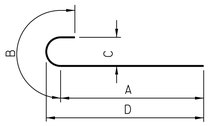

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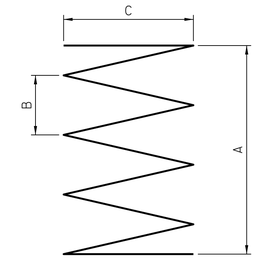

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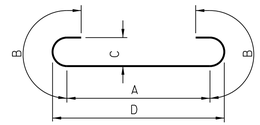

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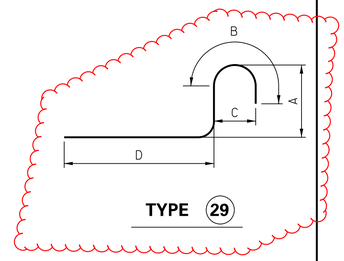

TYPE (29)

NOTE : REINFORCING BARS DESIGNATED WITH SUFFIX (E) IN PLANS SHALL BE EPOXY COATED IN ACCORDANCE WITH THE SPECIFICATIONS.

REINFORCING BARS DESIGNATED WITH THE SUFFIX (S) IN PLANS ARE STIRRUP BARS.

REBAR CORRECTIONS	10/14/2015
REVISION	DATE
DATE: SEPTEMBER, 2015	CHECKED BY
DESIGNED BY: R.L. COLBERT	L.M. SALLEE
DETAILED BY: J.A. ROSE	R.L. COLBERT

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY: **GRAVES**

ROUTE: **KY 80** | CROSSING: **I-69**

BILL OF REINFORCEMENT – SUBSTRUCTURE

ITEM NUMBER: **1–234.20**

PREPARED BY: *PALMER ENGINEERING CO.*

SHEET NO.: S27

DRAWING NO.: **27454**

COUNTY OF	ITEM NO.	SHEET NO.
GRAVES	1-234.20	T1

ROADWAY LIGHTING ESTIMATE OF QUANTITIES

TOTAL	UNITS	CODE	ITEM DESCRIPTION
18	EACH	4714	POLE 120' MTG HT HIGH MAST
2	EACH	4761	LIGHTING CONTROL EQUIPMENT
2,710	LIN FT	4797	CONDUIT 3 INCH
35	EACH	4800	MARKER
13,350	LIN FT	4820	TRENCHING AND BACKFILLING
32,605	LIN FT	4860	CABLE - NO. 8/3C DUCTED
16	EACH	20391NS835	ELECTRICAL JUNCTION BOX TYPE A
8	EACH	20392NS835	ELECTRICAL JUNCTION BOX TYPE C
2,710	LIN FT	21543EN	BORE AND JACK CONDUIT
158	CU YD	23161EN	POLE BASE - HIGH MAST
83	EACH	24749EC	HIGH MAST LED LUMINAIRE

THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION, AND OTHER SPECIAL NOTES AND SPECIFICATIONS WILL APPLY ON THIS PROJECT. SEE SECTION 716 FOR MEASUREMENT AND OTHER DETAILS. SEE SECTION 602 FOR SPIRAL REINFORCEMENT SPLICING

THE CONTRACTOR SHALL MAKE AN INSPECTION OF THE PROJECT SITE PRIOR TO SUBMITTING A BID AND SHALL BE THOROUGHLY FAMILIARIZED WITH EXISTING CONDITIONS. SUBMISSIONS OF A BID WILL BE CONSIDERED AN AFFIRMATION OF THIS INSPECTION HAVING BEEN COMPLETED.

ADD SENTENCE TO SECTION 834.06: ALL WIRE SHALL HAVE WORDING ADDED TO THE OUTER JACKET THAT STATES : "PROPERTY OF KENTUCKY TRANSPORTATION CABINET 502 564 0501".

ADD SENTENCE TO SECTION 834.09: ALL WIRE SHALL HAVE WORDING ADDED TO THE OUTER JACKET THAT STATES: "PROPERTY OF KENTUCKY TRANSPORTATION CABINET 502 564 0501".

CONSTRUCTION AND MEASUREMENT NOTES THAT ARE CONTRARY TO SECTION 716

SUBSECTION: 03.04 CONDUIT INSTALLATION.
REVISION: ADD THE FOLLOWING TO THE PART TO THE SUBSECTION:
G) BORE AND JACK. CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH SUBSECTIONS 706.03.02, PARAGRAPHS 1, 2 AND 4.

SUBSECTION: 03.10 JUNCTION BOXES.
REVISION: REPLACE SUBSECTION TITLE WITH THE FOLLOWING:
ELECTRICAL JUNCTION BOX AND
REPLACE THE LAST SENTENCE OF THE PARAGRAPH WITH THE FOLLOWING:
ANY ADDITIONAL JUNCTION BOXES SHALL BE APPROVED BY THE ENGINEER.

SUBSECTION: 04.02 HIGH MAST POLE.
REVISION: REPLACE THE SECOND SENTENCE WITH THE FOLLOWING:
THE DEPARTMENT WILL NOT MEASURE THE LOWERING DEVICE, ANCHOR BOLTS, HEAD FRAME ASSEMBLY, CABLES, WINCH UNIT, POWER CABLES, WIRING, CONNECTORS, CIRCUIT BREAKERS, GROUNDING LUGS, GROUND WIRE, GROUND RODS, CONDUITS, TEST PLUGS, ADJUSTMENT AND CALIBRATION OF THE UNIT TO PROVIDE THE DESIRED OPERATION, AND ANY ASSOCIATED HARDWARE FOR PAYMENT AND WILL CONSIDER THEM INCIDENTAL TO THIS ITEM OF WORK.

SUBSECTION: 04.04 POLE BASE.
REVISION: CHANGE THE SUBSECTION HEADING TO 716.04.04 POLE BASES AND DELETE THE PARAGRAPH.
A. POLE BASE.
THE DEPARTMENT WILL MEASURE THE QUANTITY AS EACH INDIVIDUAL UNIT FURNISHED AND INSTALLED. THE DEPARTMENT WILL NOT MEASURE EXCAVATION, CONCRETE, CONDUITS, FITTINGS, GROUND RODS, GROUND WIRES, GROUND LUGS, REINFORCING STEEL, RESTORING DISTURBED AREAS TO THE SATISFACTION OF THE ENGINEER, AND ANY ASSOCIATED HARDWARE FOR PAYMENT AND WILL CONSIDER THEM INCIDENTAL TO THIS ITEM OF WORK.
B. POLE BASE HIGH MAST.
THE DEPARTMENT WILL MEASURE THE QUANTITY IN CUBIC YARDS FURNISHED AND INSTALLED. THE DEPARTMENT WILL NOT MEASURE EXCAVATION, CONCRETE, CONDUITS, FITTINGS, GROUND RODS, GROUND WIRES, GROUND LUGS, REINFORCING STEEL, RESTORING DISTURBED AREAS TO THE SATISFACTION OF THE ENGINEER, AND ANY ASSOCIATED HARDWARE FOR PAYMENT AND WILL CONSIDER THEM INCIDENTAL TO THIS ITEM OF WORK.

8-5-2015

CONSTRUCTION AND MEASUREMENT NOTES THAT ARE CONTRARY TO SECTION 716 (CONTINUED)

SUBSECTION: 04.08 LIGHTING CONTROL EQUIPMENT.
REVISION: REPLACE THE PARAGRAPH WITH THE FOLLOWING:
THE DEPARTMENT WILL MEASURE THE QUANTITY AS EACH INDIVIDUAL UNIT FURNISHED AND INSTALLED. THE DEPARTMENT WILL NOT MEASURE THE CONCRETE BASE, EXCAVATION, BACKFILLING, RESTORATION, ANY NECESSARY ANCHORS, ELECTRICAL INSPECTION FEES, AND REQUIRED BUILDING FEES INVOLVING UTILITY SECONDARY/ PRIMARY SERVICE FOR PAYMENT AND WILL CONSIDER THEM INCIDENTAL TO THIS ITEM OF WORK. THE DEPARTMENT WILL ALSO NOT MEASURE/ FURNISHING AND INSTALLING ELECTRICAL SERVICE CONDUCTORS, SPECIFIED CONDUITS, METER BASE, TRANSFORMER, SERVICE PANEL, FUSED CUTOUT, FUSES, LIGHTING ARRESTORS, PHOTOELECTRICAL CONTROL, CIRCUIT BREAKERS, CONTACTOR, MANUAL SWITCH, GROUND RODS, GROUND LUGS, AND GROUND WIRES FOR PAYMENT AND WILL CONSIDER THEM INCIDENTAL TO THIS ITEM OF WORK. THE DEPARTMENT WILL NOT MEASURE THE FILLING OF ANY UNUSED HOLES WITH AND WILL CONSIDER THEM INCIDENTAL TO THIS ITEM OF WORK.

SUBSECTION: 04.09 LUMINAIRE.
REVISION: REPLACE THE PARAGRAPH WITH THE FOLLOWING:
THE DEPARTMENT WILL MEASURE THE QUANTITY AS EACH INDIVIDUAL UNIT FURNISHED AND INSTALLED. THE DEPARTMENT WILL NOT MEASURE LAMPS, STARTERS, BALLASTS, DRIVERS, SURGE PROTECTION, DIMMING MODULES, PHOTO-CONTROL RECEPTACLE, SPECIFIED SHIELDING (IF REQUIRED), AND ANY ADJUSTMENTS NECESSARY TO PROVIDE THE DESIRED LIGHTING PATTERN FOR PAYMENT AND WILL CONSIDER THEM INCIDENTAL TO THIS ITEM OF WORK.

SUBSECTION: 04.11 CONDUITS.
REVISION: REPLACE THE SECOND SENTENCE WITH THE FOLLOWING:
THE DEPARTMENT WILL NOT MEASURE INSTALLATION IN GROUND OR ON STRUCTURES, CONDUIT FITTINGS, TEST PLUGS, EXPANSION JOINTS WITH BONDING STRAPS, GROUNDING LUGS, DRILL ANCHORS, CLAMPS, AND ANY ADDITIONAL HARDWARE REQUIRED FOR PAYMENT AND WILL CONSIDER THEM INCIDENTAL TO THIS ITEM OF WORK.

SUBSECTION: 04.12 MARKERS.
REVISION: REPLACE THE SECTION WITH THE FOLLOWING:
THE DEPARTMENT WILL MEASURE THE QUANTITY AS EACH INDIVIDUAL UNIT FURNISHED AND INSTALLED.

SUBSECTION: 04.13 ELECTRICAL JUNCTION BOX TYPE VARIOUS.
REVISION: REPLACE THE SECTION WITH THE FOLLOWING:
THE DEPARTMENT WILL MEASURE THE QUANTITY AS EACH INDIVIDUAL UNIT FURNISHED AND INSTALLED. THE DEPARTMENT WILL NOT MEASURE ADDITIONAL JUNCTION BOXES FOR GREATER DEPTHS THAN THOSE IDENTIFIED IN PLANS, #57 AGGREGATE, BACKFILLING, RESTORATION OF DISTURBED AREAS TO THE SATISFACTION OF THE ENGINEER, GEOTEXTILE FILTER FABRIC, CONCRETE, HOT DIPPED GALVANIZED COVER, STAINLESS STEEL SCREWS, RUBBER GASKET, AND ANY ASSOCIATED HARDWARE FOR PAYMENT , AND WILL CONSIDER THEM INCIDENTAL TO THIS ITEM OF WORK.

SUBSECTION: 04.13 PART A JUNCTION ELECTRICAL. DELETE PART A.

SUBSECTION: 04.14 TRENCHING AND BACKFILLING.
REVISION: REPLACE THE SECTION WITH THE FOLLOWING:
THE DEPARTMENT WILL MEASURE THE QUANTITY IN LINEAR FEET. THE DEPARTMENT WILL NOT MEASURE EXCAVATION, BACKFILLING, UNDERGROUND UTILITY WARNING TAPE (IF REQUIRED), AND THE RESTORATION OF DISTURBED AREAS TO ORIGINAL CONDITION FOR PAYMENT AND WILL CONSIDER THEM INCIDENTAL TO THIS ITEM OF WORK.

SUBSECTION: 04.16 DUCTED CABLE.
REVISION: REPLACE THE SECOND SENTENCE OF THE PARAGRAPH WITH THE FOLLOWING:
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SUBSECTION: 04.20 BORE AND JACK CONDUIT.
REVISION: RENUMBER SUBSECTION TO 716.04.19 BORE AND JACK CONDUIT.
REPLACE THE PARAGRAPH WITH THE FOLLOWING: THE DEPARTMENT WILL MEASURE THE QUANTITY IN LINEAR FEET. THIS ITEM SHALL INCLUDE ALL WORK NECESSARY FOR BORING AND INSTALLING CONDUIT UNDER AN EXISTING ROADWAY.

STATE OF KENTUCKY
BRENDA K. BOOKER
LICENSED PROFESSIONAL ENGINEER
9/14/15

DESIGNED BY: BOOKER ENG., INC.
DATE SUBMITTED: 09-14-15

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS
COUNTY OF

GRAVES

PROJECT NUMBERS: NHPP 0011 (033)
FD52 042 9003 020-022

ROADWAY LIGHTING ESTIMATES OF QUANTITIES

COUNTY OF	ITEM NO.	SHEET NO.
GRAVES	1-234.20	T1

REVISED 10-14-15

ROADWAY LIGHTING ESTIMATE OF QUANTITIES

TOTAL	UNITS	CODE	ITEM DESCRIPTION
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CONSTRUCTION AND MEASUREMENT NOTES THAT ARE CONTRARY TO SECTION 716 (CONTINUED)

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SUBSECTION: 04.20 BORE AND JACK CONDUIT.
REVISION: RENUMBER SUBSECTION TO 716.04.19 BORE AND JACK CONDUIT.
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8-5-2015

STATE OF KENTUCKY
BRENDA K. BOOKER
LICENSED PROFESSIONAL ENGINEER
10/14/15

DESIGNED BY: BOOKER ENG., INC.
DATE SUBMITTED: 09-14-15

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS
COUNTY OF

GRAVES

PROJECT NUMBERS: NHPP 0011 (033)
FD52 042 9003 020-022

ROADWAY LIGHTING ESTIMATES OF QUANTITIES

SPECIAL NOTE FOR PIPE CLEANING

PART 1 -- GENERAL

1.01 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required to clean all pipes, as specified herein.

B. Cleaning shall include the proper high pressure water jetting, rodding, snaking, bucketing, brushing and flushing of pipes prior to inspection by closed circuit television, pipeline rehabilitation, and testing operations.

C. Cleaning shall dislodge, transport and remove all sludge, mud, sand, gravel, rocks, bricks, grease, roots, sticks, and all other debris from the interior of the sewer pipe and structures as required for pipeline rehabilitation.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Hydraulically propelled Sewer Cleaning Equipment

1. Hydraulically propelled sewer cleaning equipment shall be the movable dam type constructed such that a portion of the dam may be collapsed during cleaning to prevent flooding of the sewer.

2. The movable dam shall be the same diameter as the pipe being cleaned and shall provide a flexible scraper around the outer periphery to ensure total removal of grease.

3. Contractor shall take precautions against flooding prior to using sewer cleaning balls or other such equipment that cannot be collapsed instantly.

B. High Velocity Hydro-Cleaning Equipment shall have the following:

1. A minimum of 500-ft of high pressure hose.

2. Two or more high velocity nozzles capable of producing a scouring action from 15 to 45 degrees in all size lines to be cleaned.

3. A high velocity gun for washing and scouring manhole walls and floor.

4. Capability of producing flows from a fine spray to a long distance solid stream.

5. A water tank, auxiliary engines and pumps and a hydraulically driven hose reel.

6. Equipment operating controls located above ground.

C. Mechanical cleaning equipment for sewer mains shall be either power buckets or power rodders by the Sewer Equipment Company of America or equal.

1. Bucket machines
   a. Be furnished with buckets in pairs
   b. Use V-belts for power transmission or have an overload device. No direct drive machines will be permitted.

   c. Be equipped with a take up drum and a minimum of 500-ft of cable.
   d. Have sufficient dragging power to perform the work efficiently.

2. Power rodding machine
   a. Either sectional or continuous.
   b. Hold a minimum of 750-ft of rod.
   c. The machine shall have a positive rod drive to produce 2000 pounds of rod pull.

PART 3 -- EXECUTION

3.01 PERFORMANCE

A. Selection of cleaning equipment shall be based on the conditions of the structures and lines at the time the work commences based on the pre-construction CCTV inspection to be conducted by the Contractor under this Contract.

B. Use properly selected equipment to remove all dirt, grease, rock and other deleterious materials and obstructions.

C. Protect existing sewer lines from damage caused by improper use of cleaning equipment.

D. Take precautions to avoid damage or flooding to public or private property being served by the line being cleaned.

F. Removal of Materials

1. Remove all solids and semi-solids at the downstream manhole of the section being cleaned.

2. Passing material from one section of a line to another will not be permitted; unless access to any one section of line cannot be achieved.

G. Remove from the site and properly dispose of all solids or semi-solids recovered during the cleaning operation.

H. No sewer cleaning shall take place in a particular sewer segment until all upstream pipe segments have been cleaned. If cleaning is done in a downstream pipe segment in order to facilitate overall cleaning operations, the segment shall be re-cleaned at no additional cost, after all pipes upstream of that segment have been cleaned.

3.02 FIELD QUALITY CONTROL

A. Acceptance of this portion of the work shall be dependent upon the results of the television inspection. Lines not acceptably clean as to permit television inspection and rehabilitation shall be re-cleaned and re-inspected at no additional cost to the Owner

B. Following cleaning, the Contractor shall inspect each section in accordance with the Special Note for CIPP Acceptance Testing.

C. Upon the Engineer's final structure to structure inspection of the system, if any foreign matter is still present in the system, clean the sections and portions of the lines as required.

PART 4 – PAYMENT

Payment for cleaning of the pipes as detailed in the Pipe Drainage Summary will be made per linear foot as the price bid for CLEAN. The CLEAN bid item will be paid for the cleaning of all pipe sizes. Payment for CLEAN will be considered full compensation for all work, equipment, and incidentals necessary to clean the pipe in accordance with this note.

END OF SECTION

SPECIAL NOTE FOR CURED-IN-PLACE PIPE LINING

PART 1 -- GENERAL

1.01 REQUIREMENTS

A. It is the intent of this specification to provide for the reconstruction of pipelines by the installation of a resin-impregnated flexible tube which is formed to the original conduit and cured to produce a continuous and tight fitting Cured-In-Place Pipe (CIPP). Cured-In-Place Pipe shall be designed for storm water application.

B. The work specified in this Section includes all labor, materials, accessories, equipment and tools necessary to install and test cured-in-place (CIPP) pipe lining as shown on the Drawings and as specified herein.

1.02 SUBMITTALS

A. The CONTRACTOR shall submit shop drawings and other information to the ENGINEER for review.

B. With the bid, the following submittals are required:

Documentation as outlined herein under paragraph 1.06 A, including installation references of projects that are similar in size and scope to this project. The submittal shall include, at a minimum, the client contact name, phone number, and the diameter and footage of pipe rehabilitated. Documentation for product and installation experience must be satisfactory to the ENGINEER.

C. After contract award, the following submittals are required.

1. The CONTRACTOR shall submit design data and specification data sheets listing all parameters used in the CIPP design and thickness calculations based on ASTM F1216 or F2019 and D2412 for “fully deteriorated gravity pipe conditions.” All CIPP liner design calculations shall be sealed and signed by a registered professional Engineer in the Commonwealth of Kentucky. Submit P.E. certification form for all CIPP design data. Submit detailed installation procedures, lining production schedule and location, testing procedures and schedule, quality control procedures, liner curing procedures including heat-up and cool-down rates, curing temperature and duration, and shipping and storage requirements, schedule and procedures. Detailed design calculations as specified herein under paragraph 2.01 Q.

2. Various test results as specified herein under Section 2.03.

3. Documentation as specified herein for the Cure Report under Paragraph 3.08 A.

4. Documentation as specified herein for the Television Survey under Paragraph Section 3.10 Television Survey.

D. Curing log, including temperatures, pressures, and times during the curing process to document that a proper cure has been achieved. Curing log is to be submitted immediately after the curing is complete for each line segment that is rehabilitated.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Special Note for Pipe Cleaning

B. Special Note for CIPP Acceptance Testing

1.04 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

1. ASTM D638 – Standard Test Methods for Tensile Properties of Plastics.

2. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

3. ASTM D2412- Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.

4. ASTM D2990 – Standard Test Methods for Tensile, Compressive and Flexural Creep and Creep-Rupture of Plastics.

5. ASTM F1216 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.

6. ASTM F1743 – Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP).

7. ASTM F2019 – Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP)

8. ASTM E1252 - Standard Practice for General Techniques for Obtaining Infrared Spectra for Qualitative Analysis

B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALIFICATIONS

A. The CONTRACTOR performing the CIPP lining work shall be fully qualified, experienced and equipped to complete this work expeditiously and in a satisfactory manner and shall be certified and/or licensed as an installer by the CIPP manufacturer. Only commercially proven products and installers with substantial track records will be approved. In addition the Contractor shall meet the following requirements:

1. The CONTRACTOR shall have minimum of 10,000 LF of CIPP successfully installed of similar diameter and using the specific method of installation and curing being used.

2. The CONTRACTOR shall submit a certified statement from the manufacturer that he/she is a certified and/or licensed installer of the CIPP lining.

3. A minimum of three clients that the CONTRACTOR has performed this type of work for, including names, phone numbers, linear footage, and a description of the actual work performed.

4. The CONTRACTOR'S superintendent who will perform the work under this section must have at least 3 years of experience and have successfully installed at least 5,000 linear feet 24-inch diameter or greater of the proposed product and curing method.

B. The CONTRACTOR shall also be capable of providing crews as needed to complete the work without undue delay.

C. The ENGINEER shall approve or disapprove the CONTRACTOR and/or manufacturer based on the submitted information and a follow up interview, if warranted.

D. Inspection of the liner may be made by the representative of the ENGINEER after delivery. The liner shall be subject to rejection at any time on account of failure to meet any of the requirements specified, even though sample liner may have been accepted as satisfactory at the place of manufacture. Liner rejected after delivery shall be marked for identification and shall be removed from the job site at once.

1.06 GUARANTEE

A. All CIPP lining placed shall be guaranteed by the CONTRACTOR and manufacturer for a period of one year from the date of final acceptance. During this period, defects discovered in the CIPP lining, as determined by the ENGINEER, shall be removed and replaced in a satisfactory manner by the CONTRACTOR at no cost to the ENGINEER. The ENGINEER may conduct an independent television inspection, at his own expense, of the lining work prior to the completion of the one year guarantee period.

1.07 DELIVERY, STORAGE AND HANDLING

A. Care shall be taken in shipping, handling and storage to avoid damaging the liner. Extra care shall be taken during cold weather construction. Any liner damaged in shipment shall be replaced as directed by the ENGINEER.

B. Any liner showing a split or tear, or which has otherwise received damage shall be marked as rejected and removed at once from the job site.

C. The liner shall be maintained at a proper temperature in refrigerated facilities to prevent premature curing at all times prior to installation. The liner shall be protected from UV light prior to installation. Any liner showing evidence of premature curing will be rejected for use and will be removed from the site immediately.

PART 2 -- PRODUCTS

2.01 CIPP LINING

A. CIPP lining shall be Insituform by Insituform Technologies, Inliner by Inliner Technologies, Premier Pipe, Blue-Tek by Reline America, or approved equal.

B. The tube shall consist of one or more layers of absorbent non-woven felt fabric and meet the requirements of ASTM F1216 or ASTM F1743, Section 5. The tube shall be constructed to withstand installation pressures, have sufficient strength to bridge breaks and missing sections of the existing pipe, and stretch to fit irregular pipe sections. The new jointless pipe-within-a-pipe must fit tightly against the old pipe wall and consolidate all disconnected sections into a single continuous conduit, substantially reducing or eliminating infiltration or exfiltration.

C. The wetout tube shall have a uniform thickness that when compressed at installation pressures will meet or exceed the Design thickness.

D. The tube shall be fabricated to a size that when installed will tightly fit the internal circumference and length of the original pipe with minimal shrinkage, in such a way as to minimize water migration (tracking) between the liner and the host pipe. Allowance should be made for circumferential stretching during inversion, and longitudinal stretching during pull in.

Overlapped layers of felt in longitudinal seams that cause lumps in the final product shall not be utilized.

E. The minimum tube length shall be that deemed necessary by the Contractor to effectively span the distance between the access points and to facilitate a good, "non-tracking" seal. The Contractor shall verify the lengths in the field before cutting liner to length and otherwise preparing it for installation.

F. The outside layer of the tube (before wetout) shall be coated with an impermeable, flexible membrane that will contain the resin and facilitate monitoring of resin saturation during the resin impregnation (wetout) procedure.

G. The tube shall be homogeneous across the entire wall thickness containing no intermediate or encapsulated elastomeric layers. No material shall be included in the tube that may cause delamination in the cured CIPP. No dry or unsaturated layers shall be evident.

H. The wall color of the interior pipe surface of CIPP after installation shall be a light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made.

I. Seams in the tube shall be stronger than the unseamed felt.

J. The outside of the tube shall be marked for distance at regular intervals along its entire length, not to exceed 5 ft. Such markings shall include the Manufacturers name or identifying symbol. The tubes shall be manufactured in the USA.

K. The resin system shall be a corrosion resistant polyester, vinyl ester, or epoxy and catalyst system that when properly cured within the tube composite meets the requirements of ASTM F1216 and ASTM F1743, the physical properties herein, and those which are to be utilized in the Design of the CIPP for this project. The resin shall produce CIPP which will comply with the structural and chemical resistance requirements of this specification.

L. The finished pipe in place shall be fabricated from materials which when cured will be chemically resistant to withstand internal exposure to domestic sewage. All constituent materials will be suitable for service in the environment intended. The final product will not deteriorate, corrode or lose structural strength that will reduce the projected product life. In industrial areas a liner system using epoxy vinyl ester resin shall be utilized and a polyester resin shall be used in non-industrial areas. The ENGINEER shall determine the type of appropriate resin to be utilized for each line segment.

M. The CIPP shall be designed as per ASTM F1216, Appendix X1. The CIPP design shall assume no bonding to the original pipe wall. The structural performance of the finished pipe must be adequate to accommodate all anticipated loads throughout its design life.

N. The CIPP must have a minimum design life of fifty (50) years. The minimum design life may be documented by submitting life estimates by national and/or international authorities or specifying agencies. Otherwise, long-term testing and long-term in-service results (minimum ten (10) years) may be used, with the results extrapolated to fifty (50) years.

O. The CONTRACTOR must have performed long-term testing for flexural creep of the CIPP pipe material installed by his company. Such testing results are to be used to determine the long-term, time dependent flexural modulus to be utilized in the product design. This is a performance test of the materials (tube and resin) and general workmanship of the installation and curing. A percentage of the instantaneous flexural modulus value (as measured by ASTM D-790 testing) will be used in design calculations for external buckling. The percentage, or the long-term creep retention value utilized, will be verified by this testing. Values in excess of 50% will not be applied unless substantiated by qualified third party test data. The materials utilized for the contracted project shall be of a quality equal to or better

than the materials used in the long-term test with respect to the initial flexural modulus used in design.

P. The minimum required structural CIPP wall thickness shall be based on the physical and structural properties described herein and in accordance with the design equations in the appendix of ASTM F 1216 or F 2019, and the following design parameters:

Design Safety Factor	2.0
Retention Factor for Long-Term Flexural Modulus to be used in Design *(as determined by Long-Term tests described in paragraph 2.03)*	50 %
Ovality*	2 %
Soil Depth (above crown)*	Refer to Contract Plans
Design Condition	Fully deteriorated
**Denotes information which can be provided here or in inspection video tapes or project construction plans. Multiple line segments may require a table of values.*	

Q. The lining manufacturer shall submit to the ENGINEER for review complete design calculations for the liner, signed and sealed by a Professional Engineer registered in the Commonwealth of Kentucky and certified by the manufacturer as to the compliance of his materials to the values used in the calculations. The buckling analysis shall account for the combination of dead load, live load, hydrostatic pressure and grout pressure (if any). The liner side support shall be considered as if provided by soil pressure against the liner. The existing pipe shall not be considered as providing any structural support. Modulus of soil reaction shall be 1000, corresponding to a moderate degree of compaction of bedding and a fine-grained soil as shown in AWWA Manual M45, Fiberglass Pipe Design.

R. The layers of the cured CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate cleanly or the probe or knife blade moves freely between the layers. If separation of the layers occurs during testing of field samples, new samples will be cut from the work. Any reoccurrence may cause rejection of the work.

S. Any layers of the tube that are not saturated with resin prior to insertion into the existing pipe shall not be included in the structural CIPP wall thickness computation.

2.02 END SEALS

A. A watertight seal shall be made at every manhole entrance and exit and all other terminus of the liner. End seals shall be made by using a hydrophilic seal such as Insignia or equal.

2.02 STRUCTURAL REQUIREMENTS FOR MAIN LINES

A. Resin shall be impregnated by vacuum application or approved equal. If reinforcing materials (fiberglass, etc.) are used, the reinforcing material must be fully encapsulated within the resin to assure that the reinforcement is not exposed, either to the inside of the pipe or at the interface of the CIPP and the existing pipe.

B. The design for the CIPP wall thickness will be based on the following strengths, unless otherwise submitted to and approved by the ENGINEER.

Property	Test Method	Cured Composite per ASTM F1216
Flexural Modulus of Elasticity	ASTM D-790	250,000 psi
Flexural Stress	ASTM D-790	4,500 psi

2.03 TESTING REQUIREMENTS

A. Chemical Resistance - The CIPP shall meet the chemical resistance requirements of ASTM F1216 or F2019. CIPP samples for testing shall be of tube and resin system similar to that proposed for actual construction. It is required that CIPP samples with and without plastic coating meet these chemical testing requirements.

B. Prior to any liner installation, the CONTRACTOR shall submit technical data sheets showing the physical and chemical properties and infrared spectrum analysis per ASTM E1252 (chemical fingerprint) of the proposed resin system as modified for the cured-in-place process. Additionally, copies of the certificates of analysis for resin used on the project must be made available to the ENGINEER.

C. The CONTRACTOR shall provide resin samples as directed by the ENGINEER during the duration of the project and infrared spectrography chemical fingerprints shall be run and compared to the submitted fingerprint to verify the resin used is the resin submitted for use on this project. These analyses shall be conducted at the ENGINEER's expense.

D. In the case of liner installation performed under this contract, CIPP samples shall be prepared and physical properties tested in accordance with ASTM F1216, F2019, or ASTM F1743, Section 8, using either method proposed.

1. Where the diameter is less than or equal to 15-inches, the samples shall be restrained type samples made by extending the liner through a form with a diameter as close as possible to the existing pipeline. The formed sample shall be provided with insulation to contain cure heat as well as a heat sink such as sand bags for cool down.

2. Where the diameter is greater than 15-inches, a plate sample shall be prepared. The test sample shall be fabricated from the material taken from the liner and cured in a clamped mold with the resin used in the liner construction placed in the down tube.

3. Each sample shall be large enough to provide at least five total specimens for testing. One thickness, flexural strength, and flexural modulus shall be conducted in accordance with ASTM F1216, ASTM D790, and ASTM D2290 for each segment. The material must meet the initial strength requirements of ASTM F1216, Table 1.

4. These samples will be tested to verify compliance with the installed material specifications and shall be paid for through the testing allowance on the bid form. The CONTRACTOR shall produce these test samples for each pipe segment installed, defined as a contiguous length of insertion. Liners which do not pass these material tests will be rejected. The cost for sample collection shall be included in the bid price for the cured in place pipe.

5. Test specimens shall be marked in indelible ink with the appropriate lateral or main section, work order number, date of installation, and orientation to the top of the pipe (direction of up) so the results can be correlated to the field work performed. All test results shall use this designated labeling as a reference.

6. The extraction and labeling of test specimens shall be done in the presence of the ENGINEER. The ENGINEER and CONTRACTOR shall, upon completion of sample extraction and labeling, both sign a chain-of-custody form that shall subsequently accompany the sample at all times and shall ultimately be received and signed at the testing laboratory. Test reports shall include a copy of the chain-of-custody form with all signatures to ensure that reported test results are for the correct sample.

7. The flexural properties must meet or exceed the values specified herein.

8. Wall thickness of samples shall be determined as described in paragraph 8.1.6 of ASTM F1743.

9. Visual inspection of the CIPP shall be by closed-circuit television.

PART 3 -- EXECUTION

3.01 CLEANING/SURFACE PREPARATION

A. It shall be the responsibility of the CONTRACTOR to clean the pipeline and to remove all internal debris out of the pipeline in accordance with the Special Note for Pipe Cleaning.

3.02 JOINT, CRACK, ANNULAR SPACE, AND LINER END CHEMICAL SEALING

A. Prior to cured-in-place liner installation, all active leaks of a magnitude to compromise the integrity of the liner shall be stopped using chemical grout, at no additional cost to the ENGINEER.

B. Materials used on this Project shall have the following properties: react quickly to form a permanent watertight seal; resultant seal shall be flexible and immune to the effects of wet/dry cycles; non-biodegradable and immune to the effects of acids, and alkalis; component packaging and mixing compatible with field conditions and worker safety; extraneous sealant left inside pipe shall be readily removable; and shall be compatible with the CIPP liner resin system utilized. The chemical sealing materials shall be acrylic resin type and shall be furnished with activators, initiators, inhibitors and any other materials recommended by the manufacturer for a complete grout system. Sealing grout shall be furnished in liquid form in standard manufacturer's containers. Sealing grout shall be AV-100 manufactured by Avanti International or approved equal.

C. The Contractor shall modify his equipment as necessary to seal the leaks, however both his equipment and sealing method must meet the approval of the ENGINEER prior to use. Extreme caution shall be utilized during leak sealing (pressure) operations in order to avoid damaging the already weakened sewer pipe. If any damage occurs, it shall be repaired at the CONTRACTOR’s cost and to the satisfaction of the ENGINEER. Excessive pumping of grout which might plug a service lateral shall be avoided. Any service laterals blocked by the grouting operation shall be cleared immediately by the Contractor.

3.03 FLOW CONTROL

A. Flow control shall be exercised as required to ensure that no flowing water comes into contact with sections of pipe under repair.

3.04 LINER INSTALLATION FOR MAIN LINES AND LATERALS

A. In presence of ENGINEER, perform a pre-lining CCTV inspection immediately prior to CIPP lining to demonstrate that the pipe is clean and free of roots, grease, sand, rocks, sludge,

PACP runners or gushers, pockets of water, or structural impediments that would affect long-term viability of the pipe liner. Obtain ENGINEER's approval of the acceptability of the existing pipe condition prior to installation of CIPP.

B. The CONTRACTOR shall present to the ENGINEER, for review, a description of his methods for avoiding liner stoppage due to conflict and friction with such points as the manhole entrance and the bend into the pipe entrance. He shall also present plans for dealing with a liner stopped by snagging within the pipe. This information shall be rendered to the ENGINEER in a timely fashion prior to the preconstruction conference.

C. The CONTRACTOR shall immediately notify the ENGINEER of any construction delays taking place during the insertion operation. Such delays shall possibly require sampling and testing by an independent laboratory of portions of the cured liner at the ENGINEER's discretion. The cost of such test shall be born by the CONTRACTOR and no extra compensation will be allowed. Any failure of sample tests or a lack of immediate notification of delay shall be automatic cause for rejection of that part of the work at the ENGINEER's discretion.

D. On site wet out (if applicable) - The CONTRACTOR shall designate a location where the tube will be impregnated with resin prior to installation. The CONTRACTOR shall allow the ENGINEER and/or ENGINEER to inspect the materials and the "wet-out" procedure.

E. The materials and processes must be reasonably available for pre-installation, installation and post-installation inspections. Areas which require inspection include, but are not limited to, the following:

1. Product materials should exhibit sufficient transparency to visually verify the quality of resin impregnation.

2. Temperature sensing devices, such as thermocouples, shall be located between the existing pipe and the CIPP to ensure the quality of the cure of the wall laminate.

3.05 LINER INSTALLATION FOR MAIN LINES

A. (Heat cured) After the inversion is complete, the CONTRACTOR shall supply a suitable heat source throughout the pipeline. The equipment shall be capable of delivering hot water or steam throughout the pipeline to uniformly raise the temperature to a level required to effectively cure the resin. The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing water supply or steam. Another such gage shall be placed between the tube and the host pipe at the termination end at or near the bottom to determine the temperatures during cure. Water temperature or steam in the pipe during the cure period shall be as recommended by the resin manufacturer.

B. Initial cure shall be deemed complete when the exposed portions of the tube appear to be hard and sound and the temperature sensor indicates that the temperature is of a magnitude to realize an exotherm. The cure period shall be of a duration recommended by the resin manufacturer and may require continuous recirculation of the water to maintain the temperature. The CONTRACTOR shall have on hand at all times, for use by his personnel and the ENGINEER, a digital thermometer or other means of accurately and quickly checking the temperature of exposed portions of the liner.

C. CIPP installation shall be in accordance with ASTM F1216, Section 7, ASTM F1743, Section 6 or ASTM F2019, with modifications as listed herein.

D. Resin Impregnation: The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the loss of resin through cracks and irregularities in the original pipe wall. A vacuum impregnation or approved equal process shall be used. To insure thorough resin saturation throughout the length of the felt tube, the point of vacuum shall be no further than 25 feet

from the point of initial resin introduction. After vacuum in the tube is established, a vacuum point shall be no further than 75 feet from the leading edge of the resin. The leading edge of the resin slug shall be as near to perpendicular as possible. A roller system shall be used to uniformly distribute the resin throughout the tube. If the Installer uses an alternate method of resin impregnation, the method must produce the same results. Any alternate resin impregnation method must be proven.

E. Tube Insertion: The wetout tube shall be positioned in the pipeline using either inversion or a pull-in method. If pulled into place, a power winch should be utilized and care should be exercised not to damage the tube as a result of pull-in friction. The tube should be pulled-in or inverted through an existing manhole or approved access point and fully extend to the next designated manhole or termination point.

F. Temperature gauges shall be placed inside the tube at the invert level of each end to monitor the temperatures during the cure cycle.

G. Curing shall be in accordance with the manufacturer's recommended cure schedule.

H. Cooldown: The CONTRACTOR shall cool the hardened pipe to a temperature below 100 F before relieving the hydrostatic head. Cooldown may be accomplished by the introduction of cool water into the inversion standpipe to replace water being pumped out of the manhole. Care should be taken in release of static head so that vacuum will not be developed that could damage the newly installed liner.

I. Finish: The new pipe shall be cut off in the manhole at a suitable location. The finished product shall be continuous over the length of pipe reconstructed and be free from dry spots, delamination and lifts. Pipe entries and exits shall be smooth, free of irregularities, and watertight. No visible leaks shall be present and the CONTRACTOR shall be responsible for grouting to remove leaks or fill voids between the host pipe and the liner. During the warranty period, any defects which will affect the integrity or strength of the product shall be repaired at the CONTRACTOR's expense, in a manner mutually agreed upon by the ENGINEER and the CONTRACTOR.

3.06 FIELD QUALITY CONTROL

A. Field acceptance of the liner shall be based on the ENGINEER’s evaluation of the installation including TV video and a review of certified test data for the installed pipe samples.

1. Groundwater infiltration of the liner shall be zero.
2. There shall be no evidence of splits, cracks, breaks, lifts, kinks, delaminations or crazing in the liner.
3. If any defective liner is discovered after it has been installed, it shall be removed and replaced with either a sound liner or a new pipe at no additional cost to the ENGINEER.

3.07 ACCEPTANCE

A. The finished liner shall be continuous over the entire length of the installation. The liner shall be free from visual defects, damage, deflection, holes, delamination, uncured resin, and the like. No pinholes, cracks, thin spots, dry spots, or other defects in the liner will be permitted. There shall be no visible infiltration through the liner or from behind the liner at manholes and service connections. Cut-ins and attachments at service connections shall be neat and smooth.

B. Defects, which, in the opinion of the Engineer, will affect the liner's structural integrity, strength, hydraulic performance, future maintenance access, and overall line performance, shall be repaired or the sewer replaced at the Contractor's expense. Any lined section of segment (from manhole to manhole) exhibiting these defects will be rejected for payment until such time repairs have been made to the defective liner to the satisfaction of the Engineer. The following methods of repair shall be implemented by the Contractor to resolve defects unless otherwise approved by the Engineer:

Defects	**Repair Method**
Annular space or infiltration at lateral opening	Re-seal with structural grout or point repair
Damaged lateral caused by overly ground tap	Repair with structural grout or point repair
Annular space or infiltration at manhole wall and liner termination	Re-grout liner termination
Cracked, missing pipe or voids caused by the cleaning operation	Repair with structural grout, thicken liner, or point repair
Dropped pipe or shape loss caused by the cleaning operation	Point repair
Wrinkles or ridges in liner greater than 5% of the pipe diameter	Grinding allowed if not part of structural component of liner. If grinding would require removal of structural component, then Contractor must make point repair
Re-installed bulkheaded tap or inactive service connection	Re-seal with structural grout or point repair
Lined over debris	Point repair
Soft spots or lifts in the liner	Point repair
Final liner thickness less than required thickness bid	Replace inadequate liner

3.08 WET-OUT AND CURE REPORT

A. The CONTRACTOR shall submit "wet out" and "cure" reports documenting the specific details of the liner's vacuum impregnation and saturation with resin and the CIPP installation of the liner. A report shall be generated for each liner installation. A copy of all "wet out" and "cure" records shall be made available to the ENGINEER upon request, and shall be turned over to the ENGINEER on a weekly basis and prior to request for payment. If the "wet out" and "cure" reports are not presented prior to a payment request for a repair work order, payment for the work will not be made and the request will be rejected. At a minimum, this report shall include, in addition to CONTRACTOR and Contract identification:

1. Line identification and location
2. Wet-out date
3. Sample identification(s) and technician
4. Installation (in sewer) date
5. Host sewer pipe inside diameter
6. Liner thickness
7. Liner length

8. Liner and resin batch numbers
9. Resin type
10. Wet out length
11. Roller spacing
12. Vacuum setting
13. Quantity of resin and catalyst utilized
14. Wet out technicians
15. Time wet out started and completed
16. Applicable remarks
17. (Heat cure) Boiler and liner heating fluid pressure and temperature versus time log during cure period
18. (UV cure) Pressure and temperature versus time log and light train speed during cure period.
19. Cool down report

3.09 CLEANUP

A. After the liner installation has been completed and accepted, the CONTRACTOR shall cleanup the entire project area and return the ground cover to the original or better condition. All excess material and debris not incorporated into the permanent installation shall be disposed of by the CONTRACTOR.

3.10 TELEVISION SURVEY

A. Television survey, including Preconstruction Survey, Post Construction Survey, and Warranty Survey, shall be in accordance with Special Note for CIPP Acceptance Testing. Television survey shall be done for all cured-in-place lining, and shall be completed within 2 weeks of liner installation.

PART 4 – PAYMENT

Payment for Cured-in-Place Pipe Liners will be made per linear foot as CURE IN PLACE PIPE LINER 15 IN, CURE IN PLACE PIPE LINER 18 IN, AND CURE IN PLACE PIPE LINER". Lined storm sewer pipes 15 inch will be paid as CURE IN PLACE PIPE LINER 15 IN. Lined storm sewer pipes 18 inch will be paid as CURE IN PLACE PIPE LINER 18 IN. All other pipes required to be lined will be paid the price bid per linear foot for CURE IN PLACE PIPE LINER. Payment for CURE IN PLACE PIPE LINER 15 IN, CURE IN PLACE PIPE LINER 18 IN, and CURE IN PLACE PIPE LINER will be considered full compensation for all work, equipment, and incidentals necessary to install the pipe liners in accordance with this note.

END OF SECTION

SPECIAL NOTE FOR CIPP ACCEPTANCE TESTING

PART 1 -- GENERAL

1.01 SCOPE OF WORK

A. Furnish all necessary labor, materials, equipment, services and incidentals required to visually inspect by means of closed-circuit television (CCTV) designated pipe sections including, but not limited to, recording and playback equipment, materials and supplies.

B. The inspection shall be performed on one section (i.e. curb box inlet to curb box inlet) at a time. The section being inspected shall be suitably isolated from the remainder of the sewer system.

C. Video recordings shall be made of the television inspections and copies of both the recordings and printed inspection logs shall be supplied to the ENGINEER.

D. Contractor may have to perform point repairs, remove obstructions or remove protruding service connections to complete pre-rehabilitation TV inspection.

PART 2 -- PRODUCTS

2.01 EQUIPMENT

A. The television camera used for inspection shall be one specifically designed and constructed for such inspection. Lighting for the camera shall be suitable to allow a clear picture for the entire periphery of the pipe. The camera shall be operative in 100 percent humidity conditions. The camera, television monitor and other components of the video system shall be capable of producing a minimum 500-line resolution color video picture. Picture quality and definition shall be to the satisfaction of the Engineer and if unsatisfactory, inspection shall be performed again with the appropriate changes made as designated by the Engineer at no additional cost to the ENGINEER. The television inspection equipment shall have an accurate footage counter that shall display on the monitor, the exact distance of the camera from the centerline of the starting manhole.

PART 3 -- EXECUTION

3.01 PROCEDURE

A. The camera shall be moved through the sewer main in either direction at a uniform rate, stopping when necessary to ensure proper documentation of the sewer's condition but in no case will the television camera be pulled at a speed greater than 30 fpm. Manual winches, power winches, TV cable and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the pipe conditions shall be used to move the camera through the line. If, during the inspection operation, the television camera will not pass through the entire section, the equipment shall be removed and repositioned in a manner so that the inspection can be performed from the opposite manhole. All set-up costs for the inspection shall be included in the unit prices bid. If, again, the camera fails to pass through the entire section, the Contractor shall perform point repairs as required on the Drawings, remove or cut protruding service connections, or re-clean or further remove blockage at no additional cost to the ENGINEER.

B. Whenever non-remote powered and controlled winches are used to pull the television camera through the line, telephones, radios, or other suitable means of communication shall be set up between the two manholes of the sewer line being inspected to ensure that good communications exist between members of the crew.

The camera height shall be adjusted such that the camera lens is always centered (1/2 □I.D. or higher) in the pipe being televised. Flow shall be controlled such that depth of flow shall not exceed 20% of pipe's diameter.

Lighting system shall be adequate for quality pictures.

3.02 RECORDING OF FIELD OBSERVATIONS

A. Television Inspection logs

1. Printed location records shall be kept which shall clearly show the location, in relation to adjacent manholes, of each source of infiltration discovered. In addition, other data of significance including joints, unusual conditions, roots, storm sewer connections, cracked or collapsed sections, presence of scale and corrosion, sewer line sections that the camera failed to pass through and reasons for the failure and other discernible features shall be recorded and annotated using the PACP system and a copy of such records shall be supplied to both the ENGINEER and the Engineer.

B. Digital Recordings

1. The purpose of digital recording shall be to supply a visual and audio record of areas of interests of the pipe segments that may be replayed by the ENGINEER. Digital recording playback shall be at the same speed that it was recorded and shall be made in color. The Contractor shall be required to have all digital media and necessary playback equipment readily accessible for review by the ENGINEER/Engineer during the project.

2. The Contractor shall perform CCTV inspection of each newly installed or rehabilitated pipe segment (manhole to manhole) after testing and before re-introducing any flow into the pipe. Each test shall be witnessed by the Engineer and/or ENGINEER.

3. The Contractor shall record each CCTV inspection on a DVD and submit such recordings to the Engineer as a prerequisite for Partial Utilization/Substantial Completion.

4. CCTV inspections shall be performed by a PACP certified and trained person.

5. Inspections shall include narration that notes the location and type of defects, if any.

6. At the completion of the project, the Contractor shall furnish all of the original digital recordings to the ENGINEER. Each disc shall be labeled as to its contents. Labels shall include the disc number, date televised, sewer segment reach designation, street location, and structure numbers on the disc. The Contractor shall keep a copy of the discs for 30 days after the final payment for the project, at which time the discs may be erased at the Contractor's option.

PART 4 – PAYMENT

Payment for both the video inspection prior to and after the Cured-in-Place Pipe Liners have been installed will be made as one lump sum payment as CIPP ACCEPTANCE TESTING. Payment for CIPP ACCEPTANCE TESTING will be considered full compensation for all work, equipment, and incidentals necessary to perform the video inspection in accordance with this note.

END OF SECTION

SPECIAL NOTE FOR PIPELINE INSPECTION

1.0 DESCRIPTION. The Department will perform visual inspections on all pipe on the project. A video inspection will be required on projects having more than 250 linear feet of storm sewer and/or culvert pipe and on routes with an ADT of greater than 1,000 vehicles. Conduct video inspections on all pipe located under the roadway and 50 percent of the remaining pipe not under the roadway. Storm sewer runs and outfall pipes not under the roadway take precedence over rural entrance pipes. Contractors performing this item of work must be prequalified with the Department in the work type J51 (Video Pipe Inspection and Cleaning). Deflection testing shall be completed using a mandrel in accordance with the procedure outlined below or by physical measurement for pipes greater than 36inches in diameter. Mandrel testing for deflection must be completed prior to the video inspection testing. Unless otherwise noted, Section references herein are to the Department's 2012 Standard Specifications for Road and Bridge Construction.

2.0 VIDEO INSPECTION. Ensure pipe is clear of water, debris or obstructions. Complete the video inspection and any necessary measurement prior to placing the final surface over any pipe. When paving will not be delayed, take measurements 30 days or more after the completion of earthwork to within 1 foot of the finished subgrade. Notify the Engineer a minimum of 24 hours in advance of inspection and notify the Engineer immediately if distresses or locations of improper installation are logged.

2.1 INSPECTION FOR DEFECTS AND DISTRESSES

A) Begin at the outlet end and proceed through to the inlet at a speed less than or equal to 30 ft/minute. Remove blockages that will prohibit a continuous operation.

B) Document locations of all observed defects and distresses including but not limited to: cracking, spalling, slabbing, exposed reinforcing steel, sags, joint offsets, joint separations, deflections, improper joints/connections, blockages, leaks, rips, tears, buckling, deviation from line and grade, damaged coatings/paved inverts, and other anomalies not consistent with a properly installed pipe.

C) During the video inspection provide a continuous 360 degree pan of every pipe joint.

D) Identify and measure all cracks greater than 0.1" and joint separations greater than 0.5".

E) Video Inspections are conducted from junction to junction which defines a pipe run. A junction is defined as a headwall, drop box inlet, curb box inlet, manhole, buried junction, or other structure that disturbs the continuity of the pipe. Multiple pipe inspections may be conducted from a single set up location, but each pipe run must be on a separate video file and all locations are to be referenced from nearest junction relative to that pipe run.

F) Record and submit all data on the TC 64-765 and TC 64-766 forms.

3.0 MANDREL TESTING. Mandrel testing will be used for deflection testing. For use on Corrugated Metal Pipe, High Density Polyethylene Pipe, and Polyvinyl Chloride Pipe,

use a mandrel device with an odd number of legs (9 minimum) having a length not less than the outside diameter of the mandrel. The diameter of the mandrel at any point shall not be less than the diameter specified in Section 3.6. Mandrels can be a fixed size or a variable size.

3.1 Use a proving ring or other method recommended by the mandrel manufacturer to verify mandrel diameter prior to inspection. Provide verification documentation for each size mandrel to the Engineer.

3.2 All deflection measurements are to be based off of the AASHTO Nominal Diameters. Refer to the chart in section 3.6.

3.3 Begin by using a mandrel set to the 5.0% deflection limit. Place the mandrel in the inlet end of the pipe and pull through to the outlet end. If resistance is met prior to completing the entire run, record the maximum distance achieved from the inlet side, then remove the mandrel and continue the inspection from the outlet end of the pipe toward the inlet end. Record the maximum distance achieved from the outlet side.

3.4 If no resistance is met at 5.0% then the inspection is complete. If resistance occurred at 5.0% then repeat 3.1 and 3.2 with the mandrel set to the 10.0% deflection limit. If the deflection of entire pipe run cannot be verified with the mandrel then immediately notify the Engineer.

3.5 Care must be taken when using a mandrel in all pipe material types and lining/coating scenarios. Pipe damaged during the mandrel inspection will be video inspected to determine the extent of the damage. If the damaged pipe was video inspected prior to mandrel inspection then a new video inspection is warranted and supersedes the first video inspection. Immediately notify the Engineer of any damages incurred during the mandrel inspection and submit a revised video inspection report.

3.6 AASHTO Nominal Diameters and Maximum Deflection Limits.

Base Pipe Diameter	AASHTO Nominal Diameter	Max. Deflection Limit	
		5.0%	10.0%
(inches)	(inches)	(inches)	
15	14.76	14.02	13.28
18	17.72	16.83	15.95
24	23.62	22.44	21.26
30	29.53	28.05	26.58
36	35.43	33.66	31.89
42	41.34	39.27	37.21
48	47.24	44.88	42.52
54	53.15	50.49	47.84
60	59.06	56.11	53.15

4.0 PHYSICAL MEASUREMENT OF PIPE DEFLECTION. Alternate method for deflection testing when there is available access or the pipe is greater than 36 inches in diameter, as per 4.1. Use a contact or non-contact distance instrument. A leveling device is recommended for establishing or verifying vertical and horizontal control.

4.1 Physical measurements may be taken after installation and compared to the AASHTO Nominal Diameter of the pipe as per Section 3.6. When this method is used, determine the smallest interior diameter of the pipe as measured through the center point of the pipe (D2). All measurements are to be taken from the inside crest of the corrugation. Take the D2 measurements at the most deflected portion of the pipe run in question and at intervals no greater than ten (10) feet through the run. Calculate the deflection as follows:

% Deflection = [(AASHTO Nominal Diameter - D2) / AASHTO Nominal Diameter] x 100%

Note: The Engineer may require that preset monitoring points be established in the culvert prior to backfilling. For these points the pre-installation measured diameter (D1) is measured and recorded. Deflection may then be calculated from the following formula:

$$\% \text{ Deflection} = [(D1 - D2) / D1] (100\%)$$

4.2 Record and submit all data.

5.0 DEDUCTION SCHEDULE. All pipe deductions shall be handled in accordance with the tables shown below.

FLEXIBLE PIPE DEFLECTION	
Amount of Deflection (%)	Payment
0.0 to 5.0	100% of the Unit Bid Price
5.1 to 9.9	50% of the Unit Bid Price [(1)]
10 or greater	Remove and Replace [(2)]

[(1)] Provide Structural Analysis for HDPE and metal pipe. Based on the structural analysis, pipe may be allowed to remain in place at the reduced unit price. [(2)] The Department may allow the pipe to remain in place with no pay to the Contractor in instances where it is in the best interest to the public and where the structural analysis demonstrates that the pipe should function adequately.

RIGID PIPE REMEDIATION TABLE PIPE	
Crack Width (inches)	Payment
≤ 0.1	100% of the Unit Bid Price
Greater than 0.1	Remediate or Replace [(1)]

[(1)] Provide the Department in writing a method for repairing the observed cracking. Do not begin work until the method has been approved.

6.0 PAYMENT. The Department will measure the quantity in linear feet of pipe to inspect. The Department will make payment for the completed and accepted quantities under the following:

Code	Pay Item	Pay Unit
24814EC	Pipeline Inspection	Linear Foot
10065NS	Pipe Deflection Deduction	Dollars

Special Note for
Erosion Prevention and Sediment Control

The Contractor shall be responsible for filing the Kentucky Pollution Discharge Elimination System (KPDES) KYR10 permit Notice of Intent (NOI) with the Kentucky Division of Water (DOW) and any KPDES local Municipal Separate Storm Sewer System (MS4) program that has jurisdiction. The NOI shall name the contractor as the Facility Operator and include the KYTC Contract ID Number (CID) for reference.

The Contractor shall perform all temporary erosion/sediment control functions including: providing a Best Management Practice (BMP) Plan, conducting required inspections, modifying the BMP plan documents as construction progresses and documenting the installation and maintenance of BMPs in conformance with the KPDES KYR10 permit effective on _____ or a permit re-issued to replace that KYR10 permit. This work shall be conducted in conformance with the requirements of Section 213 of KYTC 2012 Department of Highways, Standard Specifications for Road and Bridge Construction.

Contrary to Section 213.03.03, paragraph 2, the Engineer shall conduct inspections as needed to verify compliance with Section 213 of KYTC 2012 Department of Highways, Standard Specifications for Road and Bridge Construction. The Engineer's inspections shall be performed a minimum of once per month and within seven days after a storm of 1/2 inch or greater. Copies of the Engineer's inspections shall not be provided to the contractor unless improvements to the BMP's are required. The contractor shall initiate corrective action within 24 hours of any reported deficiency and complete the work within 5 days. The Engineer shall use Form TC 63-61 A for this report. Inspections performed by the Engineer do not relieve the Contractor of any responsibility for compliance with the KPDES permit.

Contrary to Section 213.05, bid items for temporary BMPs will not be listed and will be replaced with one lump sum item for the services. Payment will be pro-rated based on the Project Schedule as submitted by the Contractor and as agreed to by the Engineer.

The contractor shall be responsible for applying "good engineering practices" as required by the KPDES permit. The contractor may use any temporary BMPs with the approval of the KYTC Engineer.

The contractor shall provide the Engineer copies of all documents required by the KPDES permit at the time they are prepared.

The contractor shall be responsible for the examination of the soils to be encountered and make his own independent determination of the temporary BMPs that will be required to accomplish effective erosion prevention and sediment control.

The Contractor shall be responsible for filing the KPDES permit Notice of Termination (NOT) with the Kentucky DOW and any local MS4 program that has jurisdiction. The NOT shall be filed after the Engineer agrees that the project is stabilized or the project has been formally accepted.

Payment: Payment will be at the contract unit price for K.P.D.E.S Permit & Temporary Erosion Control: Lump Sum.

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PROPOSAL BID ITEMS

Report Date 10/16/15

Section: 0001 - PAVING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00001		DGA BASE	99,992.00	TON		$	
0020	00018		DRAINAGE BLANKET-TYPE II-ASPH	56,952.00	TON		$	
0030	00100		ASPHALT SEAL AGGREGATE	448.00	TON		$	
0040	00103		ASPHALT SEAL COAT	54.00	TON		$	
0050	00194		LEVELING & WEDGING PG76-22	616.00	TON		$	
0060	00212		CL2 ASPH BASE 1.00D PG64-22	28,346.00	TON		$	
0070	00214		CL3 ASPH BASE 1.00D PG64-22	34,676.00	TON		$	
0080	00216		CL3 ASPH BASE 1.00D PG76-22	17,300.00	TON		$	
0090	00309		CL2 ASPH SURF 0.50D PG64-22	5,789.00	TON		$	
0100	00332		CL3 ASPH SURF 0.50A PG76-22	9,537.00	TON		$	
0110	00358		ASPHALT CURING SEAL	165.00	TON		$	
0120	02677		ASPHALT PAVE MILLING & TEXTURING	2,620.00	TON		$	
0130	23362ES403		CL2 ASPH SURF 0.5B PG64-22	581.00	TON		$	

Section: 0002 - ROADWAY

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0160	00071		CRUSHED AGGREGATE SIZE NO 57	691.00	TON		$	
0170	00078		CRUSHED AGGREGATE SIZE NO 2	11,092.00	TON		$	
0180	01000		PERFORATED PIPE-4 IN	22,883.00	LF		$	
0190	01001		PERFORATED PIPE-6 IN	8,463.00	LF		$	
0200	01010		NON-PERFORATED PIPE-4 IN	1,877.00	LF		$	
0210	01011		NON-PERFORATED PIPE-6 IN	1,527.00	LF		$	
0220	01015		INSPECT & CERTIFY EDGE DRAIN SYSTEM	1.00	LS		$	
0230	01020		PERF PIPE HEADWALL TY 1-4 IN	7.00	EACH		$	
0240	01021		PERF PIPE HEADWALL TY 1-6 IN	1.00	EACH		$	
0250	01024		PERF PIPE HEADWALL TY 2-4 IN	6.00	EACH		$	
0260	01028		PERF PIPE HEADWALL TY 3-4 IN	63.00	EACH		$	
0270	01029		PERF PIPE HEADWALL TY 3-6 IN	1.00	EACH		$	
0280	01032		PERF PIPE HEADWALL TY 4-4 IN	14.00	EACH		$	
0290	01310		REMOVE PIPE	448.00	LF		$	
0300	01787		REMOVE MANHOLE	4.00	EACH		$	
0310	01891		ISLAND HEADER CURB TYPE 2	140.00	LF		$	
0320	01895		VALLEY GUTTER	359.00	LF		$	
0330	01904		REMOVE CURB	3,501.00	LF		$	
0340	01982		DELINEATOR FOR GUARDRAIL MONO DIRECTIONAL WHITE	121.00	EACH		$	
0350	01985		DELINEATOR FOR BARRIER - YELLOW	514.00	EACH		$	
0360	02014		BARRICADE-TYPE III	8.00	EACH		$	
0370	02091		REMOVE PAVEMENT	25,523.00	SQYD		$	
0380	02159		TEMP DITCH	15,220.00	LF		$	
0390	02160		CLEAN TEMP DITCH	7,610.00	LF		$	
0400	02165		REMOVE PAVED DITCH	1,515.00	SQYD		$	
0410	02200		ROADWAY EXCAVATION	295,245.00	CUYD		$	
0420	02262		FENCE-WOVEN WIRE TYPE 1	8,240.00	LF		$	
0430	02265		REMOVE FENCE	3,650.00	LF		$	
0440	02351		GUARDRAIL-STEEL W BEAM-S FACE	8,556.00	LF		$	

PROPOSAL BID ITEMS

Report Date 10/16/15

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0450	02360		GUARDRAIL TERMINAL SECTION NO 1	2.00	EACH		$	
0460	02363		GUARDRAIL CONNECTOR TO BRIDGE END TY A	4.00	EACH		$	
0470	02367		GUARDRAIL END TREATMENT TYPE 1	15.00	EACH		$	
0480	02369		GUARDRAIL END TREATMENT TYPE 2A	15.00	EACH		$	
0490	02381		REMOVE GUARDRAIL	4,985.00	LF		$	
0500	02387		GUARDRAIL CONNECTOR TO BRIDGE END TY A-1	4.00	EACH		$	
0510	02429		RIGHT-OF-WAY MONUMENT TYPE 1	20.00	EACH		$	
0520	02432		WITNESS POST	3.00	EACH		$	
0530	02483		CHANNEL LINING CLASS II	803.00	TON		$	
0540	02484		CHANNEL LINING CLASS III	220.00	TON		$	
0550	02545		CLEARING AND GRUBBING 30.5 ACRES	1.00	LS		$	
0560	02562		TEMPORARY SIGNS	1,852.00	SQFT		$	
0570	02585		EDGE KEY	304.00	LF		$	
0580	02599		FABRIC-GEOTEXTILE TYPE IV	16,000.00	SQYD		$	
0590	02600		FABRIC GEOTEXTILE TY IV FOR PIPE	23,937.00	SQYD	$2.00	$	$47,874.00
0600	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		$	
0610	02651		DIVERSIONS (BY-PASS DETOURS)	1.00	LS		$	
0620	02653		LANE CLOSURE	5.00	EACH		$	
0630	02655		CROSSOVER	1.00	LS		$	
0640	02671		PORTABLE CHANGEABLE MESSAGE SIGN	6.00	EACH		$	
0650	02690		SAFELOADING	88.00	CUYD		$	
0660	02692		SETTLEMENT PLATFORM	2.00	EACH		$	
0670	02696		SHOULDER RUMBLE STRIPS-SAWED	70,863.00	LF		$	
0680	02701		TEMP SILT FENCE	15,288.00	LF		$	
0690	02703		SILT TRAP TYPE A	135.00	EACH		$	
0700	02704		SILT TRAP TYPE B	135.00	EACH		$	
0710	02705		SILT TRAP TYPE C	135.00	EACH		$	
0720	02706		CLEAN SILT TRAP TYPE A	135.00	EACH		$	
0730	02707		CLEAN SILT TRAP TYPE B	135.00	EACH		$	
0740	02708		CLEAN SILT TRAP TYPE C	135.00	EACH		$	
0750	02710		SCARIFYING AND RESHAPING	12,488.00	SQYD		$	
0760	02726		STAKING	1.00	LS		$	
0770	02731		REMOVE STRUCTURE KY 80 OVERPASS	1.00	LS		$	
0780	02731		REMOVE STRUCTURE NB PURCHASE PARKWAY	1.00	LS		$	
0790	02731		REMOVE STRUCTURE SB PURCHASE PARKWAY	1.00	LS		$	
0800	02731		REMOVE STRUCTURE RCBC	1.00	LS		$	
0810	02775		ARROW PANEL	6.00	EACH		$	
0820	02998		MASONRY COATING	14,690.00	SQYD		$	
0830	03171		CONCRETE BARRIER WALL TYPE 9T	4,382.00	LF		$	
0840	03340		STEEL PIPE-2 1/2 IN	55.00	LF		$	
0850	03343		STEEL PIPE-4 IN	55.00	LF		$	
0860	05950		EROSION CONTROL BLANKET	26,311.00	SQYD		$	
0870	05952		TEMP MULCH	434,103.00	SQYD		$	
0880	05953		TEMP SEEDING AND PROTECTION	328,866.00	SQYD		$	
0890	05963		INITIAL FERTILIZER	11.00	TON		$	

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PROPOSAL BID ITEMS

Report Date 10/16/15

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0900	05964		20-10-10 FERTILIZER	17.30	TON		$	
0910	05985		SEEDING AND PROTECTION	441,400.00	SQYD		$	
0920	05989		SPECIAL SEEDING CROWN VETCH	7,200.00	SQYD		$	
0930	05992		AGRICULTURAL LIMESTONE	408.00	TON		$	
0940	06510		PAVE STRIPING-TEMP PAINT-4 IN	32,567.00	LF		$	
0950	06511		PAVE STRIPING-TEMP PAINT-6 IN	24,536.00	LF		$	
0960	06514		PAVE STRIPING-PERM PAINT-4 IN	5,613.00	LF		$	
0970	06515		PAVE STRIPING-PERM PAINT-6 IN	84,948.00	LF		$	
0980	06517		PAVE STRIPING-PERM PAINT-12 IN	4,554.00	LF		$	
0990	06551		PAVE STRIPING-TEMP REM TAPE-Y	16,661.00	LF		$	
1000	06567		PAVE MARKING-THERMO STOP BAR-12IN	72.00	LF		$	
1010	06568		PAVE MARKING-THERMO STOP BAR-24IN	90.00	LF		$	
1020	06570		PAVE MARKING-PAINT CROSS-HATCH	4,639.00	SQFT		$	
1030	06592		PAVEMENT MARKER TYPE V-B W/R	260.00	EACH		$	
1040	06593		PAVEMENT MARKER TYPE V-B Y/R	291.00	EACH		$	
1050	08100		CONCRETE-CLASS A	7.00	CUYD		$	
1060	08150		STEEL REINFORCEMENT	326.00	LB		$	
1070	10020NS		FUEL ADJUSTMENT	367,320.00	DOLL	$1.00	$	$367,320.00
1080	10030NS		ASPHALT ADJUSTMENT	395,910.00	DOLL	$1.00	$	$395,910.00
1090	20071EC		JOINT ADHESIVE	84,772.00	LF		$	
1100	20166ES810		TEMPORARY PIPE	735.00	LF		$	
1110	20209EP69		GRANULAR PILE CORE	517.00	CUYD		$	
1120	20259ED		TEMPORARY MEDIAN CROSSOVER	2.00	EACH		$	
1130	20411ED		LAW ENFORCEMENT OFFICER	1,000.00	HOUR		$	
1140	20738NS112		TEMP CRASH CUSHION	4.00	EACH		$	
1150	21289ED		LONGITUDINAL EDGE KEY	225.00	LF		$	
1160	21799EN		BORE AND JACK PIPE-24 IN	241.00	LF		$	
1170	22880ED		BARRIER WALL TRANSITION	1,767.00	LF		$	
1180	23143ED		KPDES PERMIT AND TEMP EROSION CONTROL	1.00	LS		$	
1190	23274EN11F		TURF REINFORCEMENT MAT 1	14,066.00	SQYD		$	
1200	23484EC		PERFORM CIPP ACCEPTANCE TESTING	1.00	LS		$	
1210	23610NC		CORED HOLE DRAINAGE BOX CON	32.00	EACH		$	
1220	23791EC		PAVE STRIPING-CHEVRON MARKINGS	20,637.00	SQFT		$	
1230	23979EC		CRASH CUSHION TY VI CLASS C TL3	2.00	EACH		$	
1240	24186EC		BORE AND JACK PIPE-36 IN	342.00	LF		$	
1250	24489EC		INLAID PAVEMENT MARKER	763.00	EACH		$	
1260	24543EC		CLEAN PIPE (REVISED: 10-16-15)	1,631.00	LF		$	
1270	24599EC		CURE IN PLACE PIPE LINER 15 IN (REVISED: 10-16-15)	138.00	LF		$	
1280	24599EC		CURE IN PLACE PIPE LINER 18 IN (REVISED: 10-16-15)	753.00	LF		$	
1290	24599EC		CURE IN PLACE PIPE LINER 24 IN	142.00	LF		$	
1300	24599EC		CURE IN PLACE PIPE LINER 30 IN	178.00	LF		$	
1310	24599EC		CURE IN PLACE PIPE LINER 48 IN	155.00	LF		$	

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1320	24599EC		CURE IN PLACE PIPE LINER 72 IN	265.00	LF		$	
1330	24654ED		SINGLE SLOPE MEDIAN BARRIER	13,062.00	LF		$	
1340	24754ED		SETTLEMENT MONITORING	1.00	LS		$	

Section: 0003 - DRAINAGE

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1350	00440		ENTRANCE PIPE-15 IN	194.00	LF		$	
1360	00441		ENTRANCE PIPE-18 IN	55.00	LF		$	
1370	00461		CULVERT PIPE-15 IN	46.00	LF		$	
1380	00462		CULVERT PIPE-18 IN	364.00	LF		$	
1390	00464		CULVERT PIPE-24 IN	896.00	LF		$	
1400	00466		CULVERT PIPE-30 IN	195.00	LF		$	
1410	00468		CULVERT PIPE-36 IN	616.00	LF		$	
1420	00470		CULVERT PIPE-48 IN	64.00	LF		$	
1430	00471		CULVERT PIPE-54 IN	142.00	LF		$	
1440	00478		CULVERT PIPE-96 IN	154.00	LF		$	
1450	00521		STORM SEWER PIPE-15 IN	2,013.00	LF		$	
1460	00522		STORM SEWER PIPE-18 IN	1,916.00	LF		$	
1470	00524		STORM SEWER PIPE-24 IN	448.00	LF		$	
1480	00526		STORM SEWER PIPE-30 IN	132.00	LF		$	
1490	00528		STORM SEWER PIPE-36 IN	176.00	LF		$	
1500	01204		PIPE CULVERT HEADWALL-18 IN	5.00	EACH		$	
1510	01208		PIPE CULVERT HEADWALL-24 IN	4.00	EACH		$	
1520	01210		PIPE CULVERT HEADWALL-30 IN	1.00	EACH		$	
1530	01212		PIPE CULVERT HEADWALL-36 IN	6.00	EACH		$	
1540	01216		PIPE CULVERT HEADWALL-48 IN	2.00	EACH		$	
1550	01373		METAL END SECTION TY 1-24 IN	2.00	EACH		$	
1560	01432		SLOPED BOX OUTLET TYPE 1-15 IN	1.00	EACH		$	
1570	01433		SLOPED BOX OUTLET TYPE 1-18 IN	2.00	EACH		$	
1580	01450		S & F BOX INLET-OUTLET-18 IN	3.00	EACH		$	
1590	01451		S & F BOX INLET-OUTLET-24 IN	11.00	EACH		$	
1600	01452		S & F BOX INLET-OUTLET-30 IN	5.00	EACH		$	
1610	01453		S & F BOX INLET-OUTLET-36 IN	1.00	EACH		$	
1620	01480		CURB BOX INLET TYPE B	2.00	EACH		$	
1630	01490		DROP BOX INLET TYPE 1	2.00	EACH		$	
1640	01493		DROP BOX INLET TYPE 2	1.00	EACH		$	
1650	01505		DROP BOX INLET TYPE 5B	1.00	EACH		$	
1660	01511		DROP BOX INLET TYPE 5D	3.00	EACH		$	
1670	01544		DROP BOX INLET TYPE 11	1.00	EACH		$	
1680	01616		CONC MED BARR BOX INLET TY 14B1	36.00	EACH		$	
1690	01642		JUNCTION BOX-18 IN	1.00	EACH		$	
1700	01691		FLUME INLET TYPE 2	4.00	EACH		$	
1710	20932ND		CONC MEDIAN BARRIER BOX INLET TY 14A1	4.00	EACH		$	
1720	24026EC		PIPE CULVERT HEADWALL-54 IN	1.00	EACH		$	
1730	24575ES610		HEADWALL PIPE CULVERT HEADWALL-96 IN	1.00	EACH		$	
1740	24814EC		PIPELINE INSPECTION	8,610.00	LF		$	

PROPOSAL BID ITEMS

Report Date 10/16/15

Section: 0004 - BRIDGE-27454

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1750	02231		STRUCTURE GRANULAR BACKFILL	268.00	CUYD		$	
1760	02998		MASONRY COATING	1,100.00	SQYD		$	
1770	03299		ARMORED EDGE FOR CONCRETE	97.00	LF		$	
1780	08001		STRUCTURE EXCAVATION-COMMON	314.00	CUYD		$	
1790	08020		CRUSHED AGGREGATE SLOPE PROT	313.00	TON		$	
1800	08033		TEST PILES	206.00	LF		$	
1810	08100		CONCRETE-CLASS A	230.00	CUYD		$	
1820	08104		CONCRETE-CLASS AA	417.00	CUYD		$	
1830	08133		MECHANICAL REINF COUPLER #8	9.00	EACH		$	
1840	08134		MECHANICAL REINF COUPLER #9	54.00	EACH		$	
1850	08135		MECHANICAL REINF COUPLER #10	15.00	EACH		$	
1860	08150		STEEL REINFORCEMENT (REVISED: 10-16-15)	38,613.00	LB		$	
1870	08151		STEEL REINFORCEMENT-EPOXY COATED (REVISED: 10-16-15)	119,280.00	LB		$	
1880	08500		APPROACH SLAB	246.00	SQYD		$	
1890	21532ED		RAIL SYSTEM TYPE III	432.00	LF		$	
1900	23233EC		DYNAMIC PILE TESTING	6.00	EACH		$	
1910	23825EC		INSIDE FIT SNUB NOSE CONICAL POINT-16 IN	42.00	EACH		$	
1920	23826EC		PIPE PILE-16 IN	2,638.00	LF		$	
1930	23981EC		PPC I-BEAM TYPE HN42-49 (REVISED: 10-16-15)	1,271.00	LF		$	

Section: 0005 - BRIDGE-27453

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
1940	02231		STRUCTURE GRANULAR BACKFILL	544.00	CUYD		$	
1950	02998		MASONRY COATING	1,742.00	SQYD		$	
1960	03299		ARMORED EDGE FOR CONCRETE	115.00	LF		$	
1970	08001		STRUCTURE EXCAVATION-COMMON	59.00	CUYD		$	
1980	08020		CRUSHED AGGREGATE SLOPE PROT	418.00	TON		$	
1990	08033		TEST PILES	201.00	LF		$	
2000	08100		CONCRETE-CLASS A	283.00	CUYD		$	
2010	08104		CONCRETE-CLASS AA	576.00	CUYD		$	
2020	08133		MECHANICAL REINF COUPLER #8	9.00	EACH		$	
2030	08134		MECHANICAL REINF COUPLER #9	54.00	EACH		$	
2040	08135		MECHANICAL REINF COUPLER #10	15.00	EACH		$	
2050	08150		STEEL REINFORCEMENT (REVISED: 10-16-15)	46,313.00	LB		$	
2060	08151		STEEL REINFORCEMENT-EPOXY COATED (REVISED: 10-16-15)	174,009.00	LB		$	
2070	08160		STRUCTURAL STEEL 1820 LBS.	1.00	LS		$	
2080	08500		APPROACH SLAB	273.00	SQYD		$	
2090	21532ED		RAIL SYSTEM TYPE III	491.00	LF		$	
2100	23233EC		DYNAMIC PILE TESTING	6.00	EACH		$	

PROPOSAL BID ITEMS

Report Date 10/16/15

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2110	23825EC		INSIDE FIT SNUB NOSE CONICAL POINT-16 IN	50.00	EACH		$	
2120	23826EC		PIPE PILE-16 IN	3,169.00	LF		$	
2130	24098EC		PPC I-BEAM TYPE HN66-49	1,448.00	LF		$	

Section: 0006 - BRIDGE-27455

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2140	08001		STRUCTURE EXCAVATION-COMMON	1,466.00	CUYD		$	
2150	08100		CONCRETE-CLASS A	406.00	CUYD		$	
2160	08150		STEEL REINFORCEMENT	46,350.00	LB		$	

Section: 0007 - SIGNING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2170	04904		BARRIER MOUNTING BRACKET	14.00	EACH		$	
2180	06400		GMSS GALV STEEL TYPE A	9,607.00	LB		$	
2190	06401		FLEXIBLE DELINEATOR POST-M/W	480.00	EACH		$	
2200	06404		FLEXIBLE DELINEATOR POST-M/Y	135.00	EACH		$	
2210	06405		SBM ALUMINUM PANEL SIGNS	3,806.00	SQFT		$	
2220	06406		SBM ALUM SHEET SIGNS .080 IN	949.00	SQFT		$	
2230	06407		SBM ALUM SHEET SIGNS .125 IN	823.00	SQFT		$	
2240	06410		STEEL POST TYPE 1	2,977.00	LF		$	
2250	06412		STEEL POST MILE MARKERS	2.00	EACH		$	
2260	06415		OSS GALV STEEL CANTILEVER	4.00	EACH		$	
2270	06419		OSS ALUMINUM 50 FT TRUSS	1.00	EACH		$	
2280	06420		OSS ALUMINUM 55 FT TRUSS	1.00	EACH		$	
2290	06422		OSS ALUMINUM 60 FT TRUSS	1.00	EACH		$	
2300	06441		GMSS GALV STEEL TYPE C	2,669.00	LB		$	
2310	06449		REM OVERHEAD SIGN SUPPORT STR	3.00	EACH		$	
2320	06450		REM OVERHEAD STRUC CONC BASE	3.00	EACH		$	
2330	06451		REMOVE SIGN SUPPORT BEAM	3.00	EACH		$	
2340	06490		CLASS A CONCRETE FOR SIGNS	37.00	CUYD		$	
2350	06491		STEEL REINFORCEMENT FOR SIGNS	730.00	LB		$	
2360	20418ED		REMOVE & RELOCATE SIGNS	2.00	EACH		$	
2370	20419ND		ROADWAY CROSS SECTION	18.00	EACH		$	
2380	20912ND		BARRIER WALL POST	14.00	EACH		$	
2390	21373ND		REMOVE SIGN	2.00	EACH		$	
2400	21596ND		GMSS TYPE D	16.00	EACH		$	
2410	24631EC		BARCODE SIGN INVENTORY	150.00	EACH		$	

Section: 0008 - LIGHTING

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2420	04714		POLE 120 FT MTG HT HIGH MAST	18.00	EACH		$	
2430	04761		LIGHTING CONTROL EQUIPMENT	2.00	EACH		$	

PROPOSAL BID ITEMS

Report Date 10/16/15

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2440	04797		CONDUIT-3 IN (REVISED: 10-16-15)	2,710.00	LF		$	
2450	04800		MARKER	35.00	EACH		$	
2460	04820		TRENCHING AND BACKFILLING (REVISED: 10-16-15)	15,350.00	LF		$	
2470	04860		CABLE-NO. 8/3C DUCTED (REVISED: 10-16-15)	32,605.00	LF		$	
2480	20391NS835		ELECTRICAL JUNCTION BOX TYPE A	16.00	EACH		$	
2490	20392NS835		ELECTRICAL JUNCTION BOX TYPE C	8.00	EACH		$	
2500	21543EN		BORE AND JACK CONDUIT	2,710.00	LF		$	
2510	23161EN		POLE BASE-HIGH MAST	158.00	CUYD		$	
2520	24749EC		HIGH MAST LED LUMINAIRE	83.00	EACH		$	

Section: 0009 - TRAINEES

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
2530	02742		TRAINEE PAYMENT REIMBURSEMENT 1 GROUP 1 OPERATOR	1,600.00	HOUR		$	
2540	02742		TRAINEE PAYMENT REIMBURSEMENT 1 GROUP 2, 3 ,4 OPERATOR	1,400.00	HOUR		$	
2550	02742		TRAINEE PAYMENT REIMBURSEMENT 1 GROUP 2, 3 OR 4 OPERATOR	1,400.00	HOUR		$	

Section: 0010 - DEMOBILIZATION AND/OR MOBILIZATION

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0140	02568		MOBILIZATION	1.00	LS		$	
0150	02569		DEMOBILIZATION	1.00	LS		$	