



04-24-2020 LETTING ITEM 193

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED  
SURFACE TRANSPORTATION PROGRAM  
OFF SYSTEM BRIDGE

TOWNSHIP ROUTE 90 (WILDERNESS RETREAT ROAD)

COUNTY UNIT ROAD DISTRICT

SECTION 04-01179-00-BR

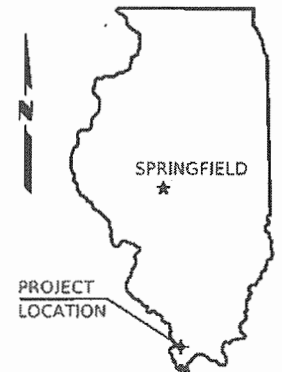
PROJECT NO. MTPX(564)

JOB NO. C-99-546-04

COOPER CREEK

UNION COUNTY

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 90	04-01179-00-BR	UNION	10	7
PROJECT NO. MTPX(564)			CONTRACT NO. 99637	



SUMMARY OF QUANTITIES

CODE NO.	PAY ITEM	UNIT	TOTAL
* X2501000	SEEDING, CLASS 2 (SPECIAL)	ACRE	0.2
Δ* X6300135	STEEL PLATE BEAM GUARDRAIL, TYPE B (SPECIAL)	FOOT	12.5
* X7010216	TRAFFIC CONTROL AND PROTECTION (SPECIAL)	L SUM	1
* Z0065000	SETTING PILES IN ROCK	EACH	8
* 20100110	TREE REMOVAL (6 TO 15 UNITS DIAMETER)	UNIT	13
* 20100500	TREE REMOVAL, ACRES	ACRE	0.1
20200100	EARTH EXCAVATION	CU YD	116
* 20300100	CHANNEL EXCAVATION	CU YD	36
20300200	ROCK EXCAVATION IN CHANNEL	CU YD	24
20400800	FURNISHED EXCAVATION	CU YD	21
* 28100809	STONE DUMPED RIPRAP, CLASS A5	TON	230
* 40200800	AGGREGATE SURFACE COURSE, TYPE B	TON	360
50100100	REMOVAL OF EXISTING STRUCTURES	EACH	1
50200100	STRUCTURE EXCAVATION	CU YD	84
50300225	CONCRETE STRUCTURES	CU YD	25.4
50300280	CONCRETE ENCASEMENT	CU YD	1.5
50400305	PRECAST PRESTRESSED CONCRETE DECK BEAMS (17" DEPTH)	SQ FT	1,104
50800105	REINFORCEMENT BARS	POUND	2,980
Δ 50900205	STEEL RAILING, TYPE S1	FOOT	94
51201300	FURNISHING STEEL PILES HP8X36	FOOT	128
51500100	NAME PLATES	EACH	1
542C5479	PIPE CULVERTS, CLASS C, TYPE 1 EQUIVALENT ROUND-SIZE 24"	FOOT	28
Δ 63000003	STEEL PLATE BEAM GUARDRAIL, TYPE A, 9 FOOT POSTS	FOOT	75
Δ 63100075	TRAFFIC BARRIER TERMINAL, TYPE 5A	EACH	2
Δ 63100167	TRAFFIC BARRIER TERMINAL, TYPE 1 (SPECIAL) TANGENT	EACH	1
67100100	MOBILIZATION	L SUM	1
Δ 72501000	TERMINAL MARKER - DIRECT APPLIED	EACH	4

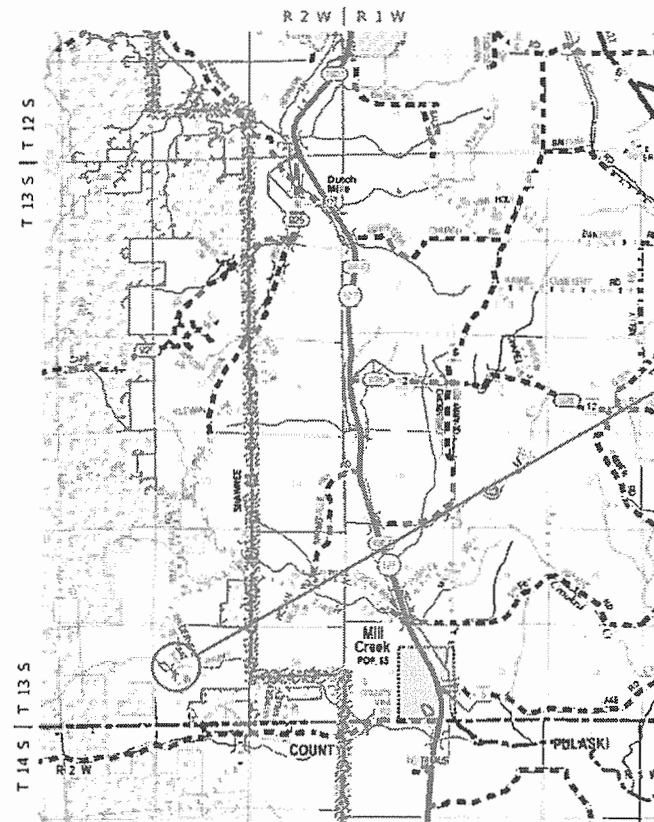
\* SEE SPECIAL PROVISIONS  
Δ SPECIALTY ITEMS

CONTRACT NO. 99637



*Kevin Phillips*  
Kevin Phillips  
PROFESSIONAL ENGINEER  
#062-047293  
EXPIRES NOV. 30, 2021

**Round Table Design, Inc.**  
PROFESSIONAL ENGINEERING - LAND SURVEYING  
1457 HIGHWAY 145 S HARRISBURG, IL (618) 253-6017



LOCATION MAP

SCALE: 1" = 2 MILES

NET LENGTH OF IMPROVEMENT = 466.00 FT. = 0.0883 MILES

INDEX OF SHEETS

- COVER SHEET
  - PLAN & PROFILE
  - GENERAL PLAN & ELEVATION
  - 17" X 48" PPC DECK BEAM
  - 17" X 48" PPC DECK BEAM DETAILS
  - ABUTMENT
  - STEEL RAILING, TYPE S-1
  - NAME PLATE
  - PILING DETAILS
  - CROSS SECTIONS
- STANDARDS
- 000001-07 STD SYMBOLS, ABBREVIATIONS & PATTERNS
  - 280001-07 TEMPORARY EROSION CONTROL SYSTEMS
  - 630001-12 STEEL PLATE BEAM GUARDRAIL
  - 630301-09 SHLDR WIDENING FOR TY 1 (SP) TERMINALS
  - 631026-06 TRAFFIC BARRIER TERMINAL TYPE 5
  - 701901-08 TRAFFIC CONTROL DEVICES
  - 725001-01 OBJECT AND TERMINAL MARKERS
  - BLR 21-9 TYP APPLICATION OF TRAF CONTR DEVICES

CLASSIFICATION : LOCAL ROAD (RURAL)

ADT : 25

DESIGN SPEED : 30 MPH

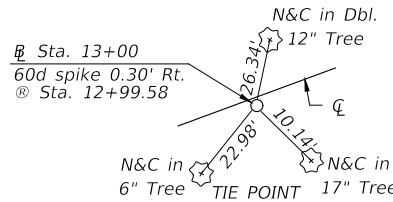
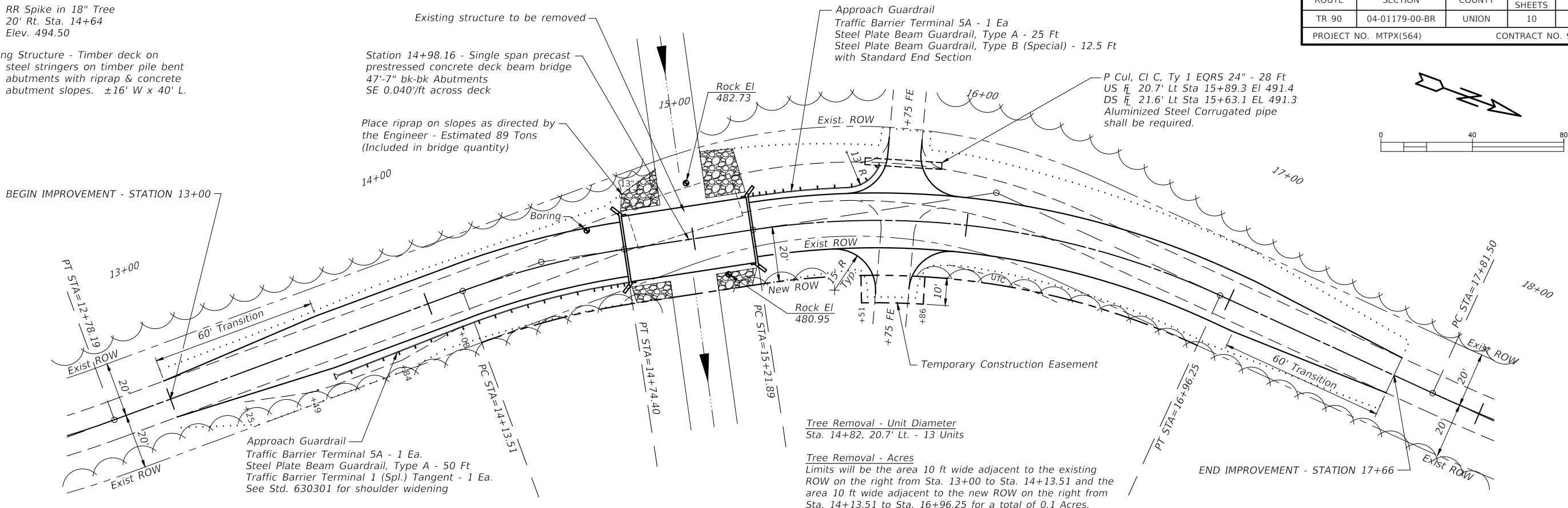
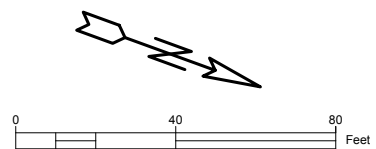
ILLINOIS DEPARTMENT OF TRANSPORTATION	
Approved	<u>2-11-2020</u> <i>Kevin Phillips</i> Union County Engineer
Passed	<u>February 19, 2020</u> <i>Joe S.</i> District 9 Engineer of Local Roads and Streets
Releasing for Bid Based on Limited Review	<u>February 19, 2020</u> <i>Keith Roberts</i> Keith Roberts, P.E. Acting Region Five Engineer

C:\Projects\631631\_Alt.dwg, 2/11/2020 9:17:48 AM

B.M. - RR Spike in 18" Tree  
 20' Rt. Sta. 14+64  
 Elev. 494.50

Existing Structure - Timber deck on steel stringers on timber pile bent abutments with riprap & concrete abutment slopes. ±16' W x 40' L.

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 90	04-01179-00-BR	UNION	10	2
PROJECT NO. MTPX(564)			CONTRACT NO. 99637	

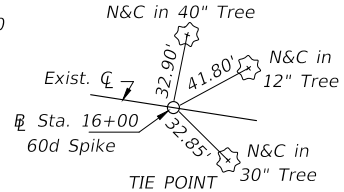
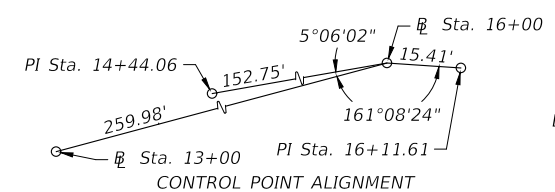


**CURVE DATA**

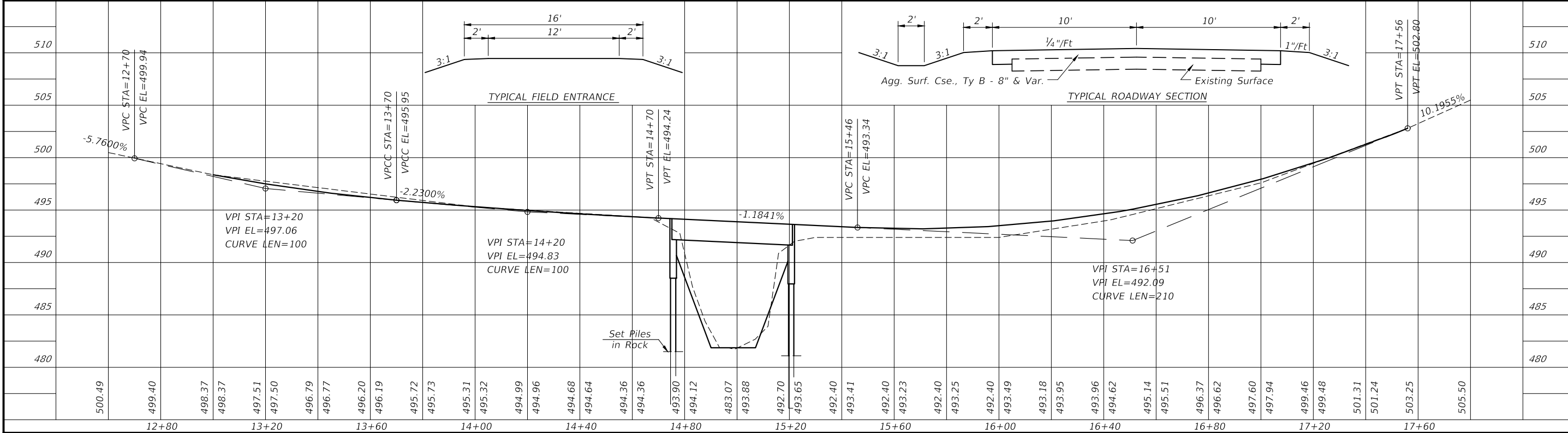
PI Sta = 14+44.06  
 $\Delta = 11^\circ 37' 46''$  T = 30.55'  
 D = 19°11'17" L = 60.89'  
 R = 300.00' E = 1.55'  
 S.E. = 0.040'/Ft.  
 Attain Sta. 13+44 to Sta. 14+37

**CURVE DATA**

PI Sta = 16+11.61  
 $\Delta = 33^\circ 18' 01''$  T = 89.72'  
 D = 19°11'17" L = 174.36'  
 R = 300.00' E = 13.13'  
 S.E. = 0.040'/Ft.  
 Remove Sta. 16+73 to Sta. 17+66

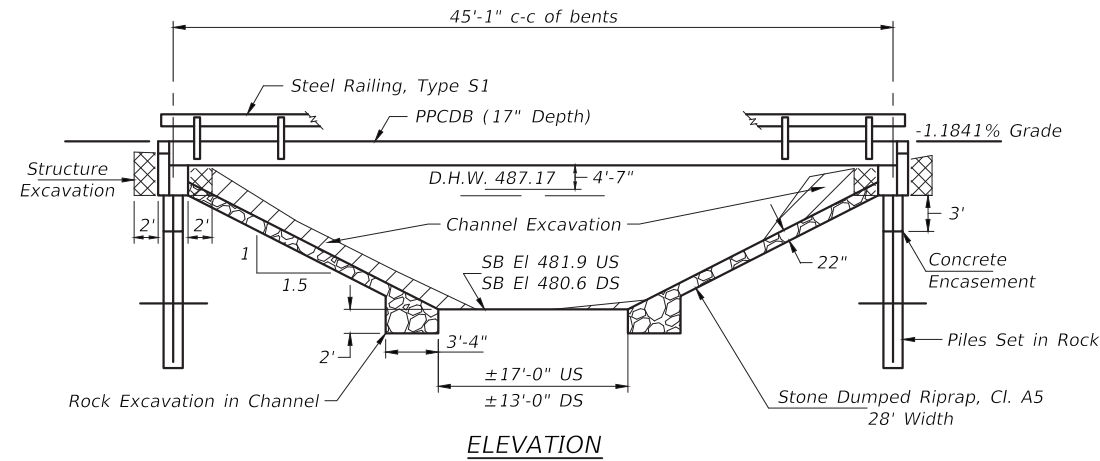


Construction Limits .....



B.M. - RR Spike in 18" Tree  
20' Rt Sta 14+64  
Elev 494.50

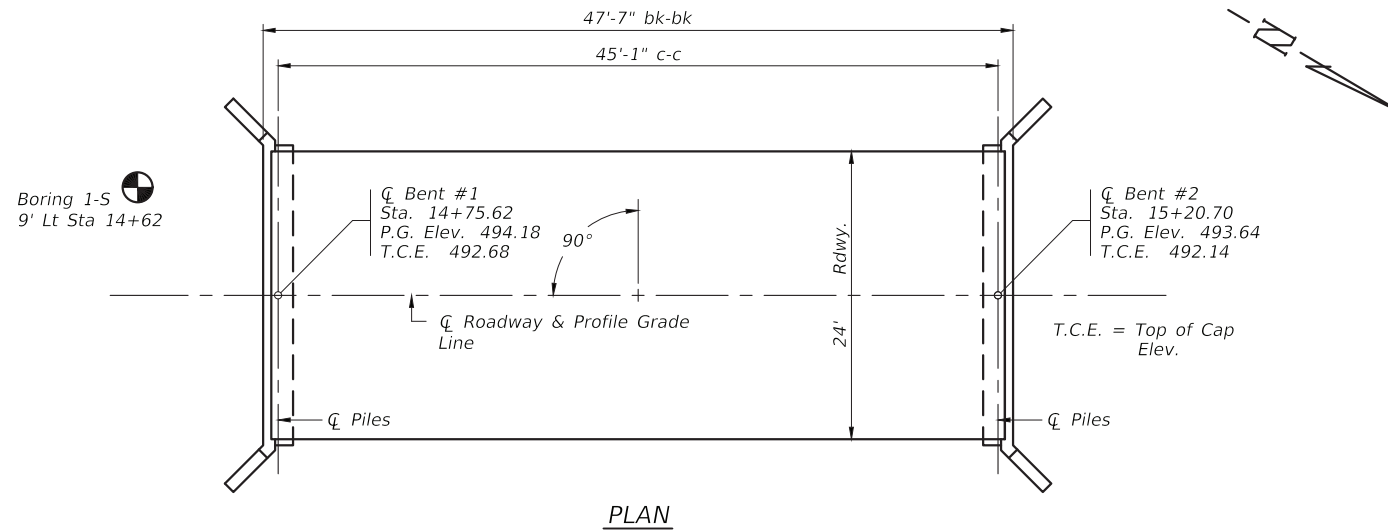
ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 90	04-01179-00-BR	UNION	10	3
PROJECT NO. MTPX(564)			CONTRACT NO. 99637	



Existing Structure - Timber deck on steel stringers on timber pile bent abutments with riprap & concrete abutment slopes. ±16' W x 40' L

**GENERAL NOTES**

- Steel H piles shall meet AASHTO M270 Grade 50 specifications.
- See special provisions for boring logs.
- A Corrosion inhibitor, as covered in the Standard Specifications, shall be used in the precast prestressed concrete deck beams.



**TOTAL BILL OF MATERIAL**

Item	Unit	Super	Sub.		Total
			Piers	Abuts.	
Channel Excavation	Cu. Yds.			36	36
Rock Excavation in Channel	Cu. Yds.			24	24
Stone Dumped Riprap, Class A5	Tons			230	230
Removal of Existing Structures	Each	1			1
Structure Excavation	Cu. Yds.			84	84
Concrete Structures	Cu. Yds.			25.4	25.4
Concrete Encasement	Cu. Yds.			1.5	1.5
P.P. Conc. Dk. Bm. 17" Dp.	Sq. Ft.	1,104			1,104
Reinforcement Bars	Pound			2,980	2,980
Steel Railing, Type S1	Foot	94			94
Furnishing Steel Piles HP8x36	Foot			128	128
Setting Piles in Rock	Foot			8	8
Name Plates	Each			1	1

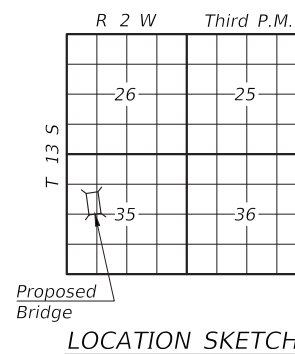
**PILE DATA (2 ABUTS.)**

Type & Size : Steel HP8x36  
Nominal Required Bearing : 242 kips  
Factored Resistance Available : Set in Rock  
Estimated Length : 16  
Number Required : 8

COOPER CREEK  
SEC. 04-01179-00-BR BUILT 20  
COUNTY UNIT ROAD DISTRICT  
UNION COUNTY  
LOADING HL-93  
STR. NO. 091-3224

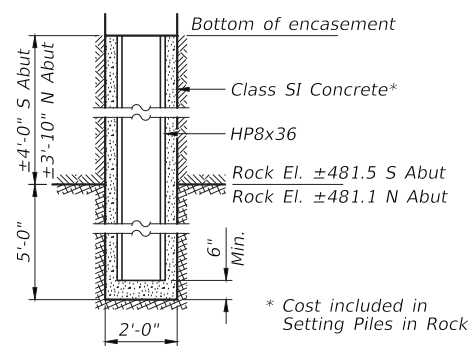
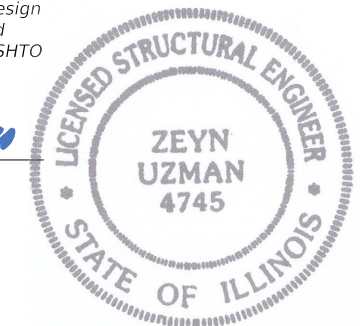
**LETTERING FOR NAME PLATE**

Locate Name Plate at southeast Corner of Bridge (See Sheet 8)



I certify that to the best of my knowledge, information and belief, this bridge design is structurally adequate for the design loading shown on the plans. The design is an economical one for the type of structure and complies with the requirements of the current AASHTO LRFD Specifications.

*Zeyn B. Uzman*  
Zeyn B. Uzman  
S.E. #81-4745  
Expires Nov. 30, 2020



\* Cost included in Setting Piles in Rock

**DESIGN SPECIFICATIONS**

2014 AASHTO LRFD Bridge Design Specifications and all applicable interims.

**LOADING HL-93**

Allow 50#/sq. ft. for future wearing surface

**SEISMIC DATA**

Seismic Performance Zone (SPZ) = 4  
Design Spectral Acceleration at 1.0 sec. ( $S_{D1}$ ) = 0.577  
Design Spectral Acceleration at 0.2 sec. ( $S_{D5}$ ) = 1.274  
Soil Site Class = D

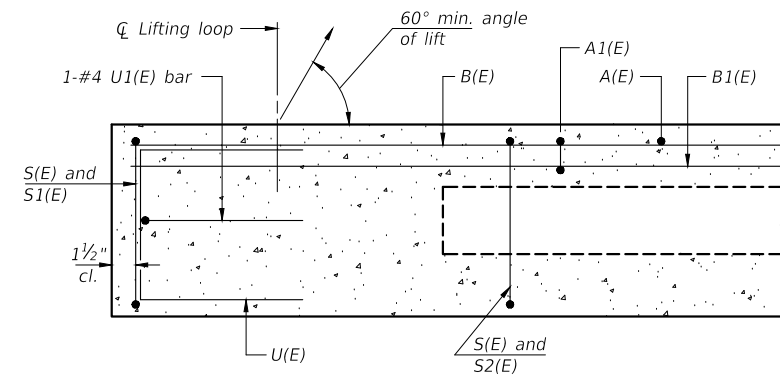
**WATERWAY INFORMATION**

Drainage Area = 0.79 s.m.		Low Grade Elev. = 493.21		At Sta. 15+70		
Flood	Freq. Yr.	Q C.F.S.	Opening Sq. Ft. Exist. Prop.	Natural H.W.E.	Head-Ft. Exist. Prop.	Headwater El. Exist. Prop.
Design	20	872	53.5 132.1	487.17	3.20 0.08	490.42 487.25
Base	100	1290	74.5 169.8	488.26	4.98 0.09	493.29 488.35
Max. Calc.	500	1770	97.2 209.4	489.31	4.65 0.09	494.01 489.40

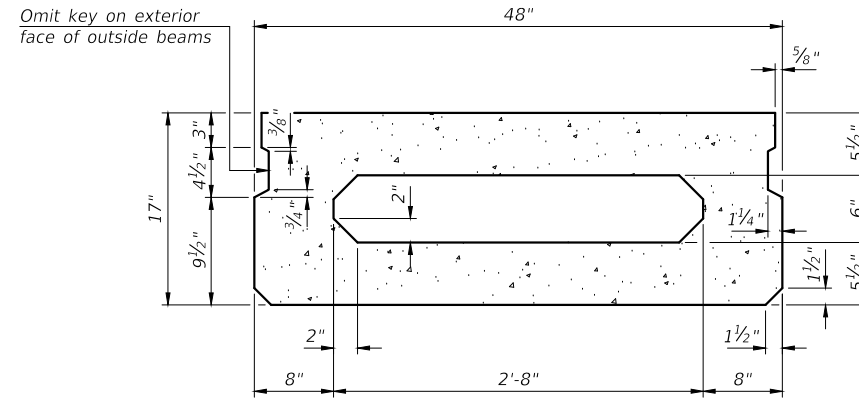
Over Road Flow (Sq. Ft.): Existing  $Q_{(100)}$   $Q_{(500)}$   
40.0 120.9

GENERAL PLAN & ELEVATION  
TR 90 (WILDERNESS RETREAT ROAD)  
COOPER CREEK  
SECTION 04-01179-00-BR  
UNION COUNTY  
STRUCTURE NO. 091-3224

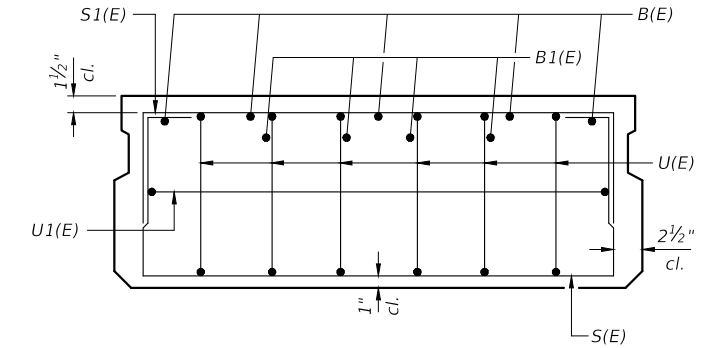
ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 90	04-01179-00-BR	UNION	10	4
PROJECT NO. MTPX(564)			CONTRACT NO. 99637	



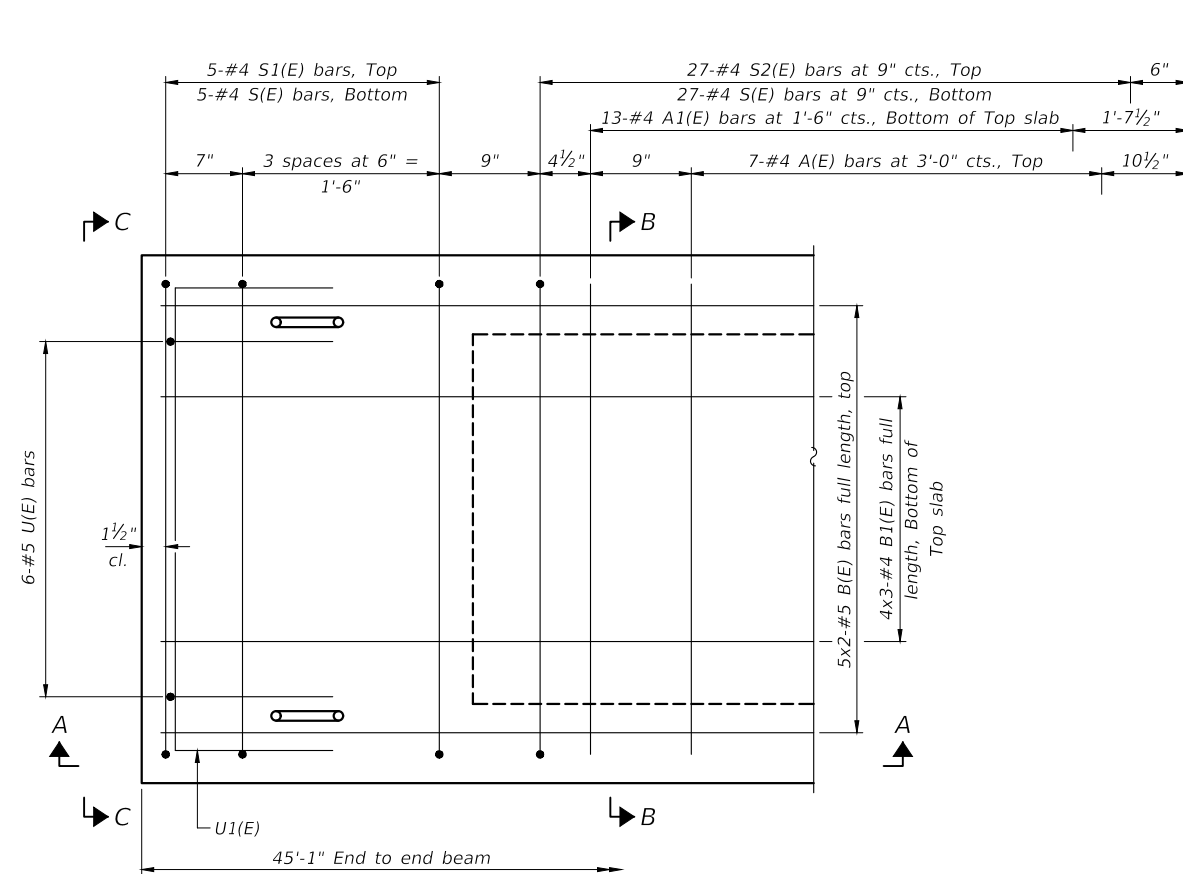
SECTION A-A



SECTION B-B  
(Showing dimensions)

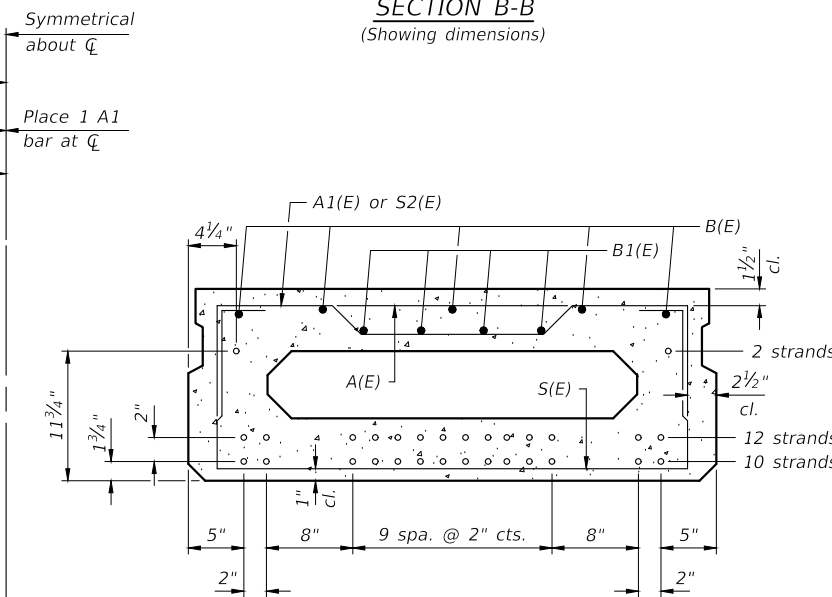


VIEW C-C



PLAN VIEW

Note: Spacing of S(E) and S2(E) bars may be adjusted up to 4" in the immediate area of the transverse tie diaphragms to miss the block outs for the transverse ties.



SECTION B-B  
(Showing reinforcement and permissible strand locations)

Note: Place the number of strands specified in each row symmetrically about the centerline of beam in the permissible strand locations shown.

BAR LIST  
ONE BEAM ONLY  
(For information only)

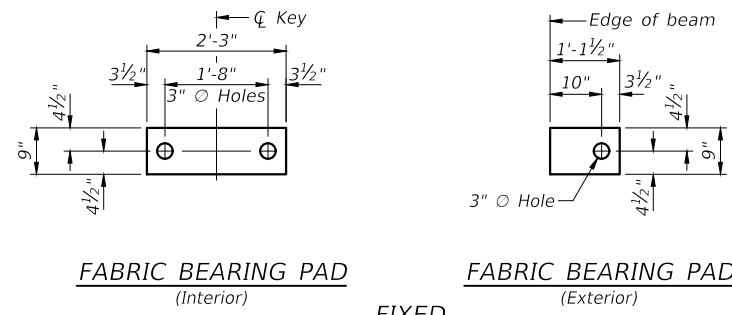
Bar	No.	Size	Length	Shape
A(E)	14	#4	3'-7"	—
A1(E)	27	#4	3'-10"	~
B(E)	10	#5	24'-2"	—
B1(E)	12	#4	16'-7"	—
S(E)	64	#4	6'-9"	□
S1(E)	10	#4	5'-3"	□
S2(E)	54	#4	5'-6"	□
U(E)	12	#5	3'-8"	□
U1(E)	2	#4	6'-0"	□

Notes:  
See sheet 5 of 10 for additional details and Bill of Materials.  
Bars noted thus 4x2-#5 etc. indicates 4 lines of bars with 2 lengths per line.

MINIMUM BAR LAP  
#4 bar = 1'-11"  
#5 bar = 2'-6"

17" X 48" PPC DECK BEAM  
TR 90 (WILDERNESS RETREAT ROAD)  
COOPER CREEK  
SECTION 04-01179-00-BR  
UNION COUNTY  
STRUCTURE NO. 091-3224

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 90	04-01179-00-BR	UNION	10	5
PROJECT NO. MTPX(564)			CONTRACT NO. 99637	

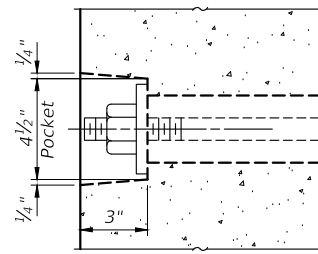


**FABRIC BEARING PAD**  
(Interior)

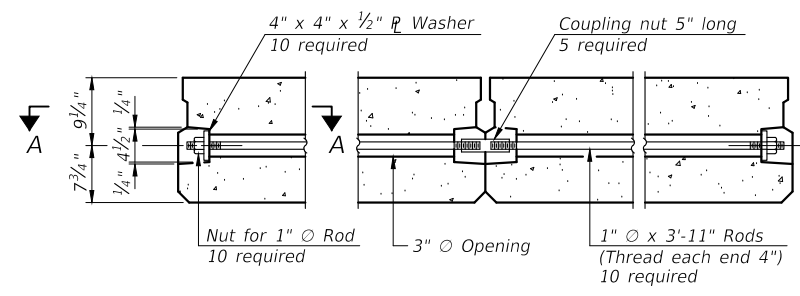
**FABRIC BEARING PAD**  
(Exterior)

**FIXED**

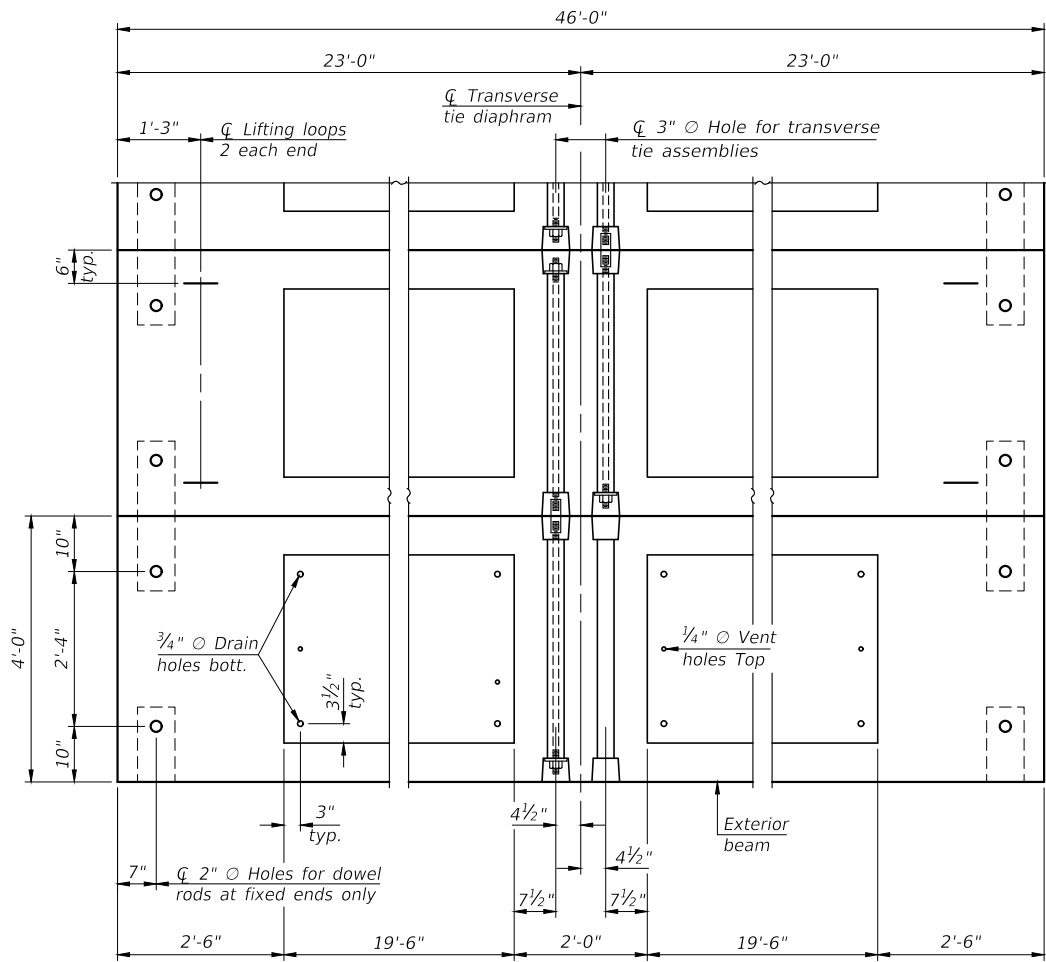
Notes:  
All bearing pads shall be 1" thick.  
Omit holes when using expansion bearings.  
Expansion bearing pads shall be bonded to the substructure.



**SECTION A-A**

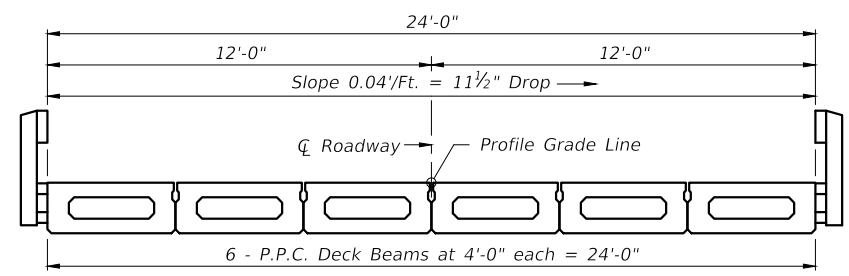


**TYPICAL TRANSVERSE TIE ASSEMBLY**



**PLAN VIEW**

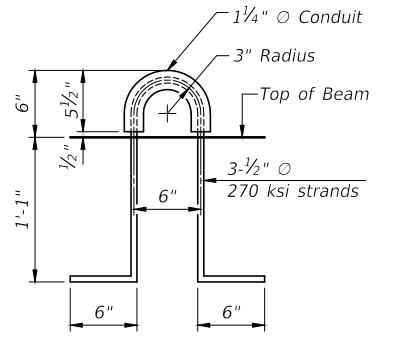
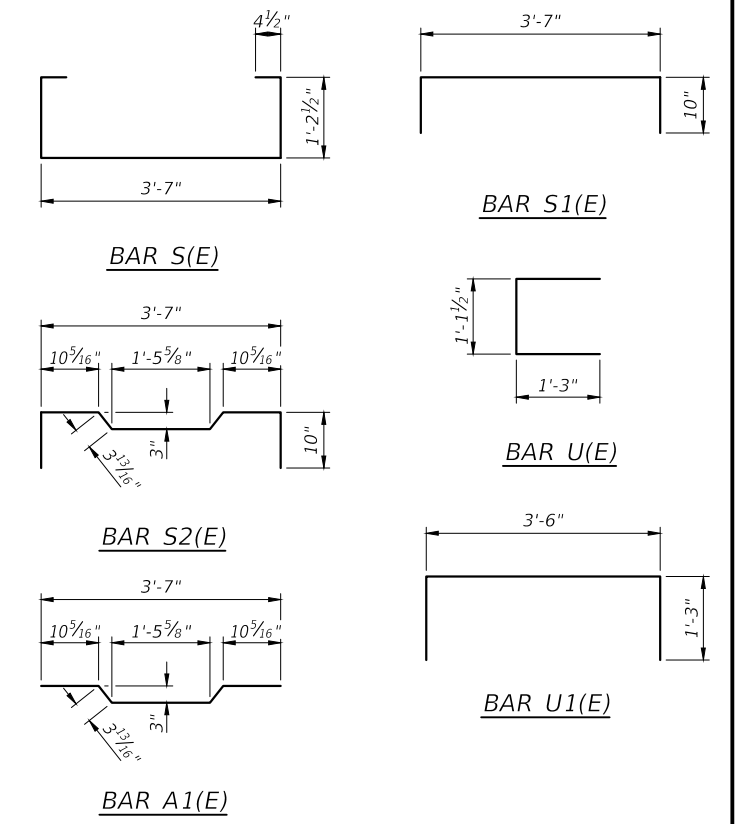
Note: Connect beams in pairs with the transverse tie configuration shown.



**CROSS SECTION**

**NOTES**

Prestressing steel shall be uncoated high strength, low relaxation 7-wire strand, Grade 270. The nominal diameter shall be 1/2" and the nominal cross-sectional area shall be 0.153 sq. in.  
The 1" diameter rods in the transverse tie assembly shall be tightened to a snug fit and the threads set. Pockets on exterior faces of bridge shall be filled with grout after transverse tie assembly is in place.  
Two 1/8" fabric adjusting shims of the dimensions of the exterior bearing pad shall be provided for each bearing pad location.  
A minimum 2 1/2" diameter lifting pin shall be used to engage the lifting loops during handling.  
Corrosion Inhibitor, per Article 1020.05(b)(10) and 1021.07 of the Standard Specifications, shall be used in the concrete for precast prestressed concrete deck beams.  
Compressive strength of prestressed concrete, f'c, shall be 6000 psi.  
Compressive strength of prestressed concrete at release, f'ci, shall be 5000 psi.



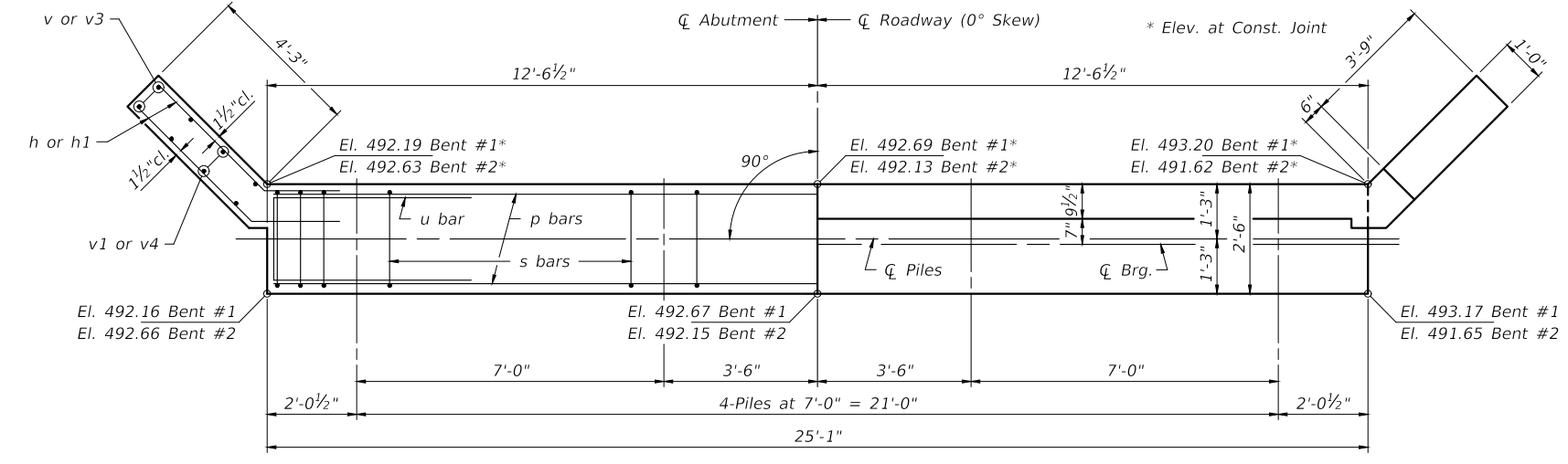
**LIFTING LOOP DETAIL**

**BILL OF MATERIAL**

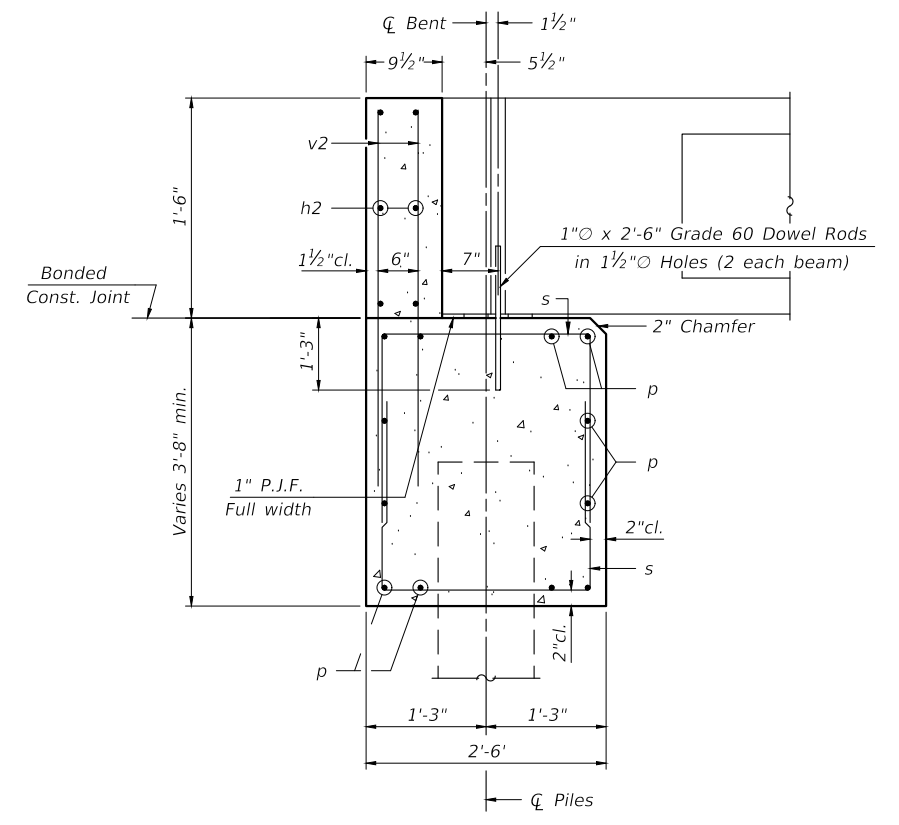
Precast Prestressed Concrete Deck Beams (17" depth)	Sq. Ft.	1,104
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17" X 48" PPC DECK BEAM DETAILS  
TR 90 (WILDERNESS RETREAT ROAD)  
COOPER CREEK  
SECTION 04-01179-00-BR  
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STRUCTURE NO. 091-3224

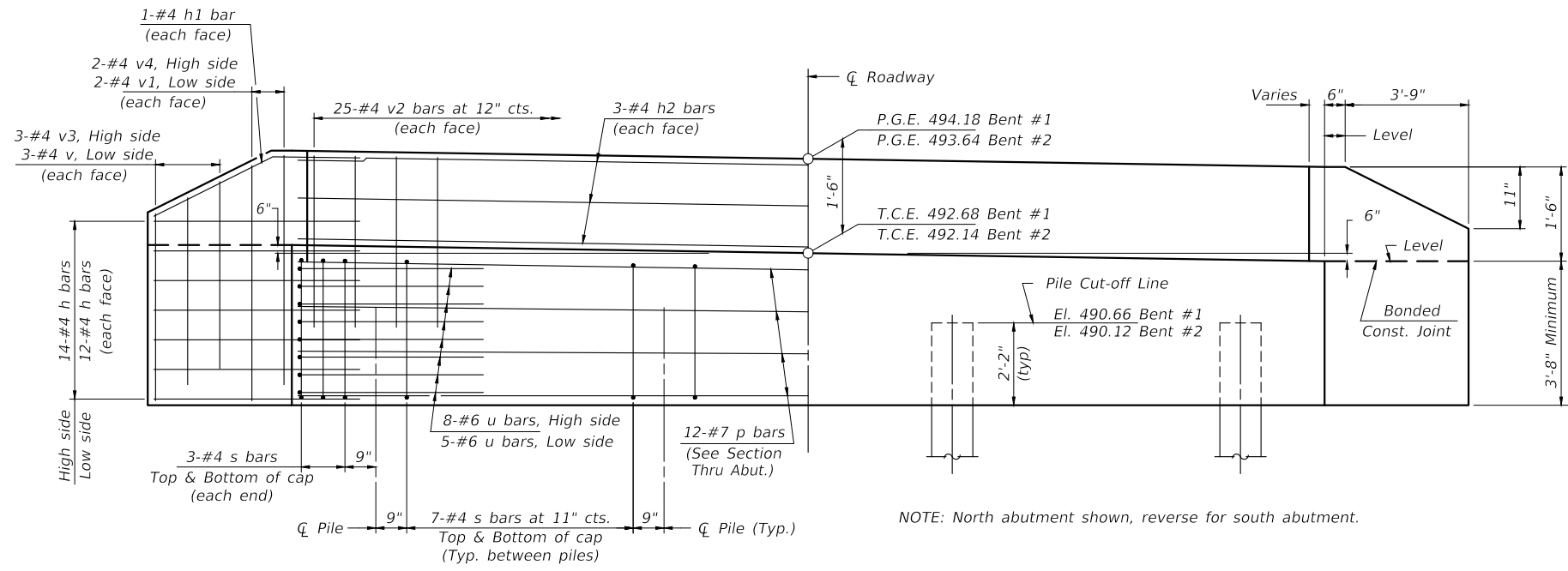
ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 90	04-01179-00-BR	UNION	10	6
PROJECT NO. MTPX(564)			CONTRACT NO. 99637	



PLAN



SECTION THRU ABUT.  
(At Right Angles)

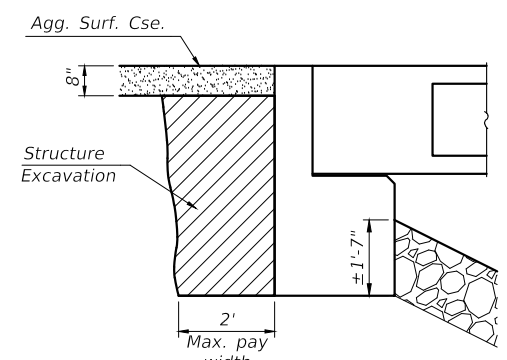


ELEVATION

NOTE: North abutment shown, reverse for south abutment.

BILL OF MATERIAL FOR ONE ABUTMENT

Bar	No.	Size	Length	Shape
h	26	#4	6'-3"	—
h1	4	#4	6'-4"	—
h2	6	#4	24'-9"	—
p	12	#7	24'-9"	—
s	54	#4	8'-0"	⊏
u	13	#6	11'-1"	⊏
v	6	#4	4'-1"	—
v1	4	#4	4'-11"	—
v2	50	#4	3'-1"	—
v3	6	#4	5'-1"	—
v4	4	#4	5'-11"	—
Concrete Structures			12.7	Cu. Yds.
Reinforcement Bars			1,490	Lbs.



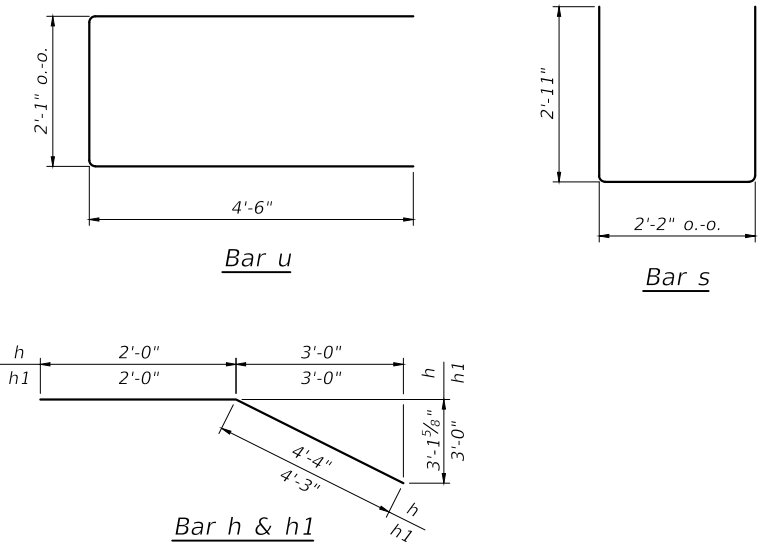
BACKFILL & BERM DETAIL  
(At Right Angles to Abut.)

NOTES

- The Backwall and the portion of the Wingwalls above the bonded construction joint shall be cast against the in-place beam.
- Reinforcement bars shall be according to ASTM A 706, Grade 60.

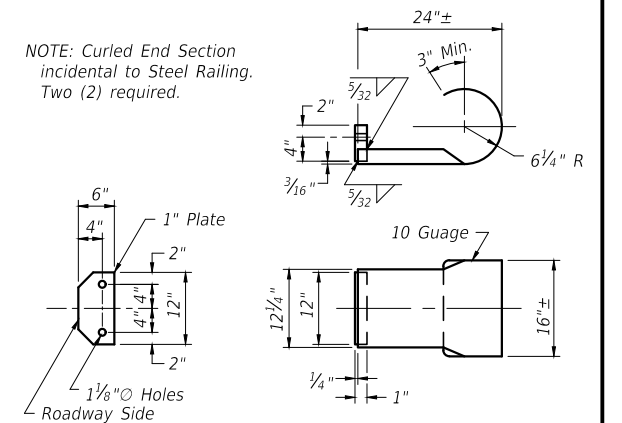
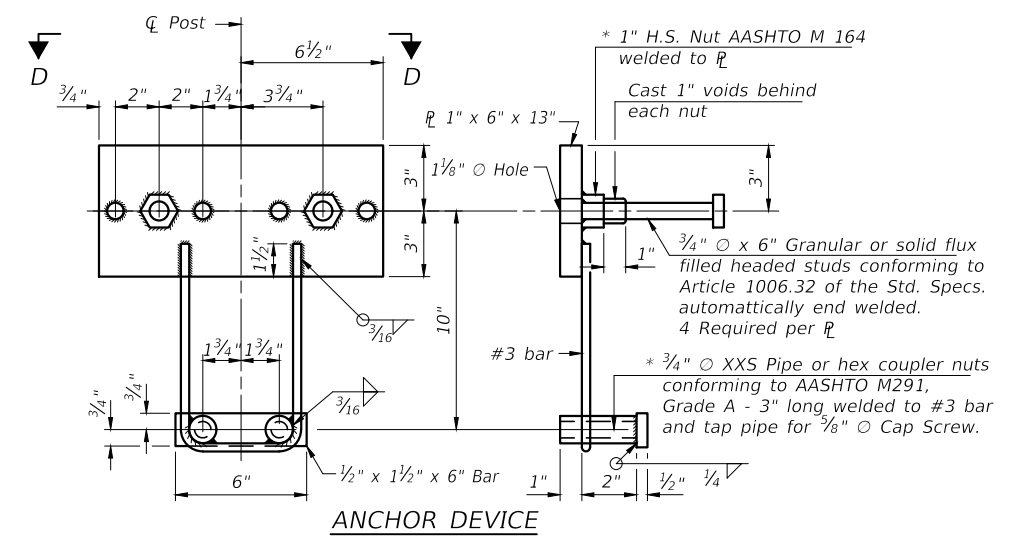
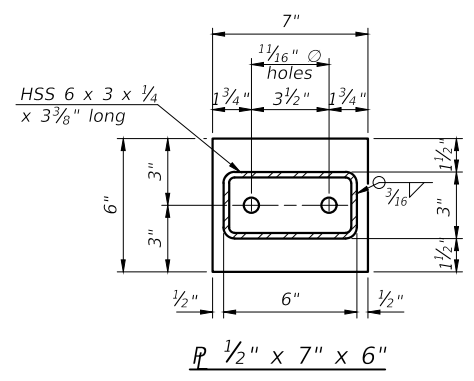
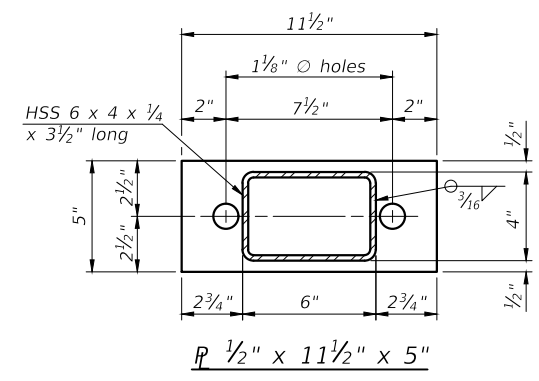
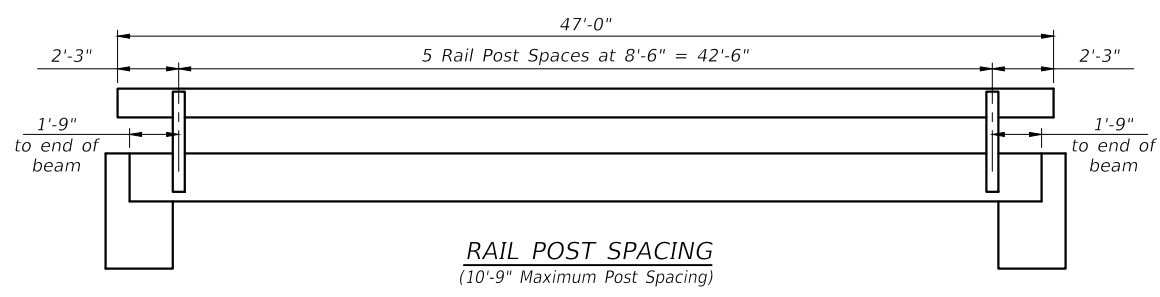
DESIGN STRESSES

$f_c = 3,500$  psi  
 $f_y = 60,000$  psi



ABUTMENT  
TR 90 (WILDERNESS RETREAT ROAD)  
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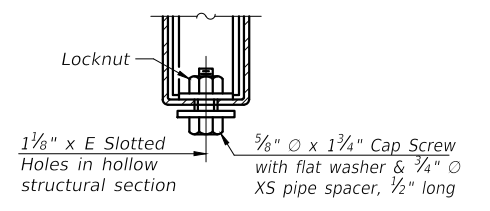
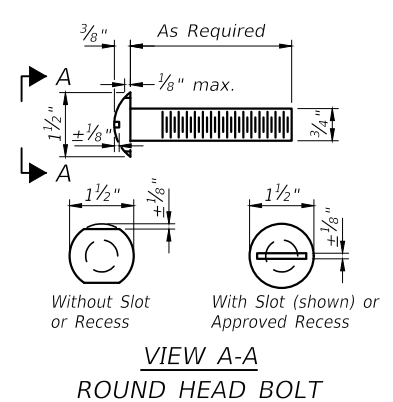
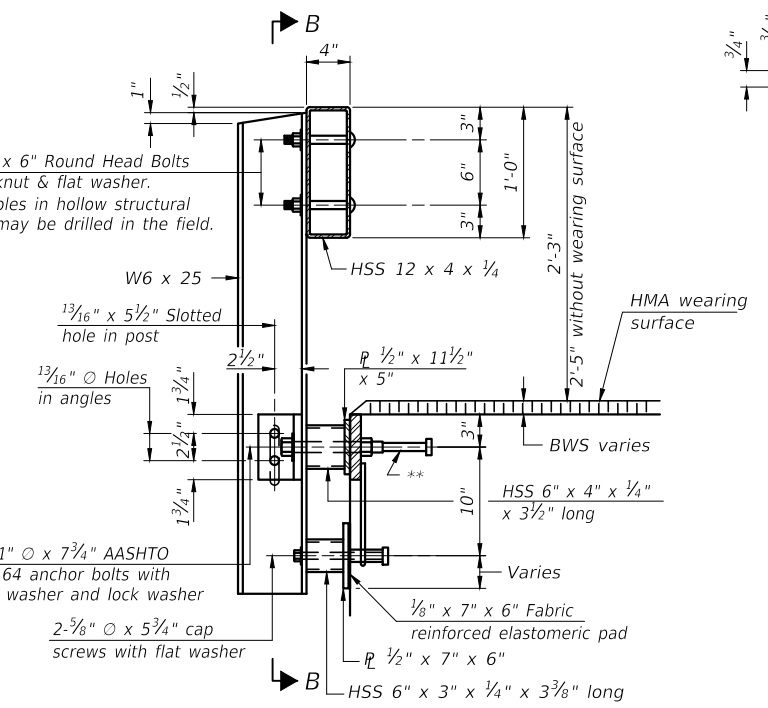
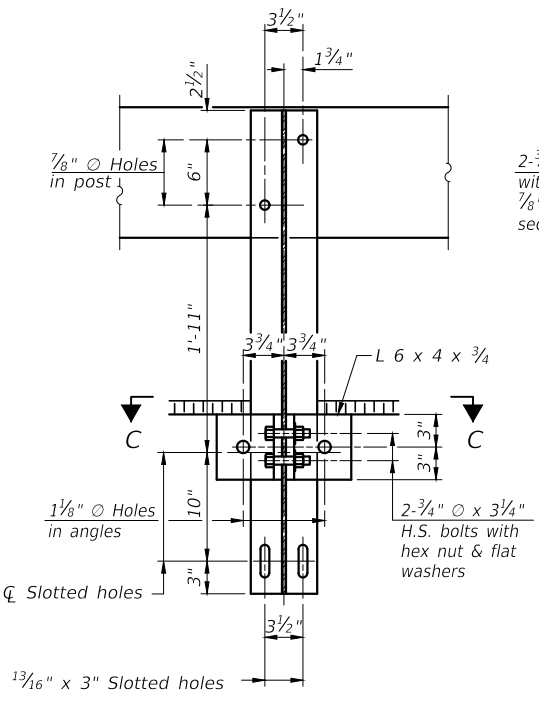
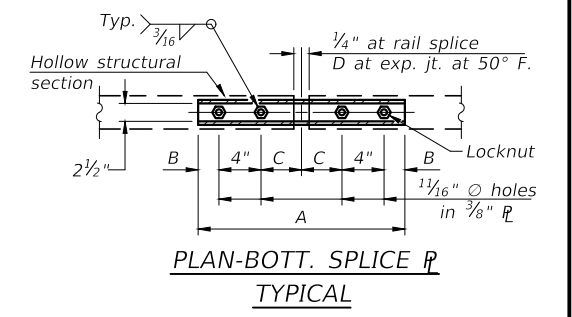
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**SPLICE DIMENSIONS**

T	D	A	B	C	E
Up to 4"	2 1/2"	1'-8"	2"	4"	2 1/2"
>4" to 6 1/2"	3 3/4"	2'-0"	2 1/2"	5 1/2"	3 1/2"
>6 1/2" to 9"	5"	2'-4"	3 1/2"	6 1/2"	9"
>9" to 13"	7"	2'-10"	4 1/2"	8 1/2"	11"
Rail Splice	1/4"	1'-8"	2"	4"	—

T = Total movement at expansion joint as shown on the design plans.

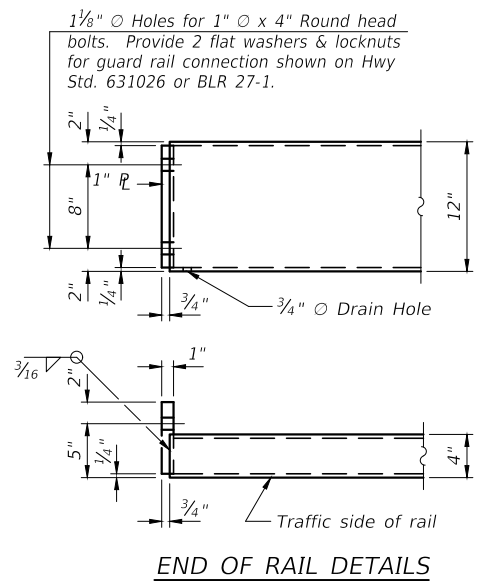
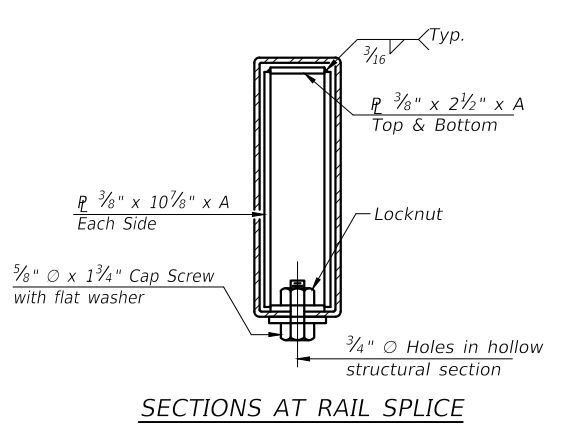
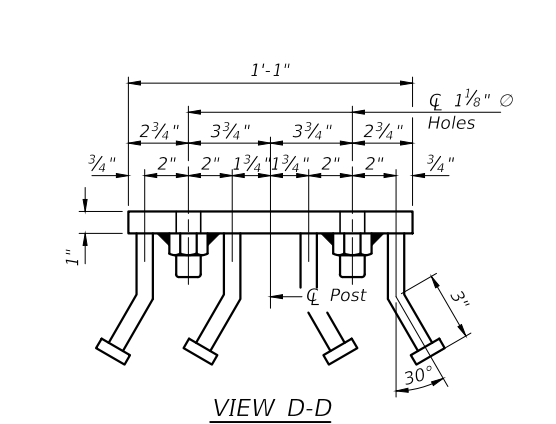
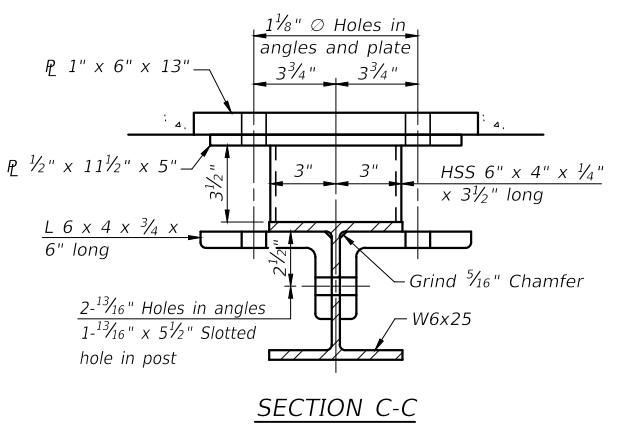


**Notes:**  
For multi-span bridges, sufficient 1/4 x 6 x 1-2" galvanized steel shims shall be provided to align rail between adjacent spans. Cost included with Steel Railing, Type S-1.  
All steel rail elements shall be galvanized according to Article 509.05 of the Standard Specifications.

\*\* The studs of the anchor devices shall be placed below the top reinforcement bars and the outermost longitudinal reinforcement bar shall be placed directly above the studs of the rail post anchor device. The anchorage studs may be bent down 1/2" to accommodate the top reinforcement bar placement.

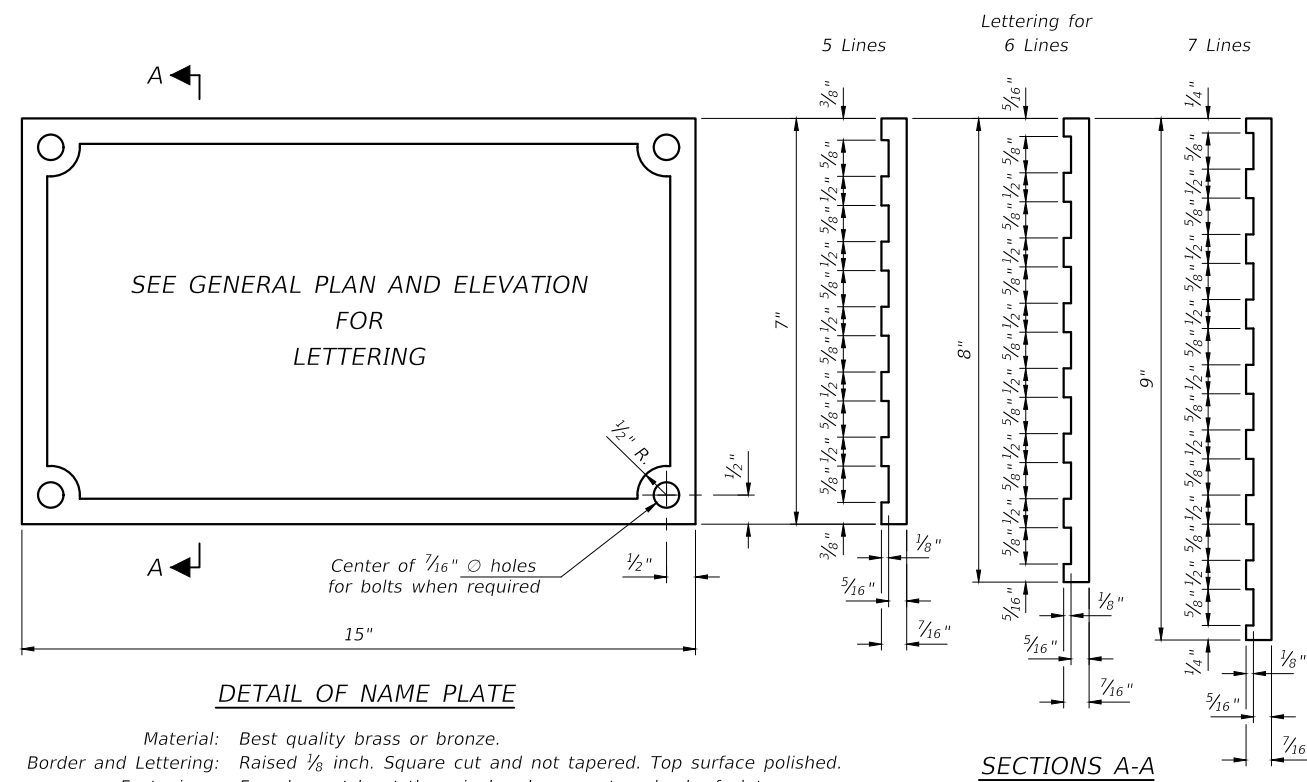
**BILL OF MATERIAL**

Item	Unit	Quantity
Steel Railing, Type S-1	Foot	94

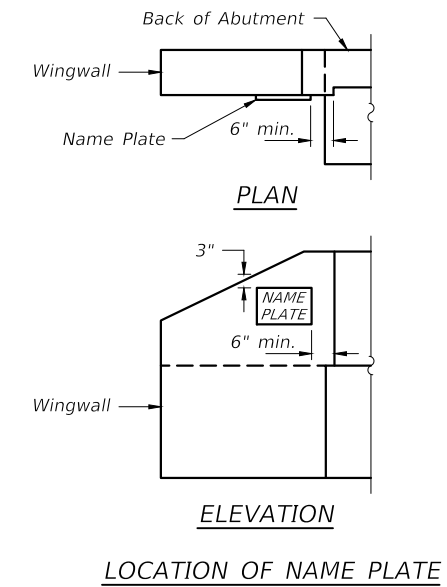


**STEEL RAILING, TYPE S-1**  
TR 90 (WILDERNESS RETREAT ROAD)  
COOPER CREEK  
SECTION 04-01179-00-BR  
UNION COUNTY  
STRUCTURE NO. 091-3224

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 90	04-01179-00-BR	UNION	10	8
PROJECT NO. MTPX(564)			CONTRACT NO. 99637	



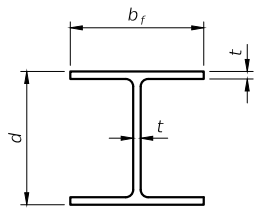
Material: Best quality brass or bronze.  
 Border and Lettering: Raised  $\frac{1}{8}$  inch. Square cut and not tapered. Top surface polished.  
 Fastenings: Four lugs at least three inches long, cast on back of plate.



NAME PLATE  
 TR 90 (WILDERNESS RETREAT ROAD)  
 COOPER CREEK  
 SECTION 04-01179-00-BR  
 UNION COUNTY  
 STRUCTURE NO. 091-3224



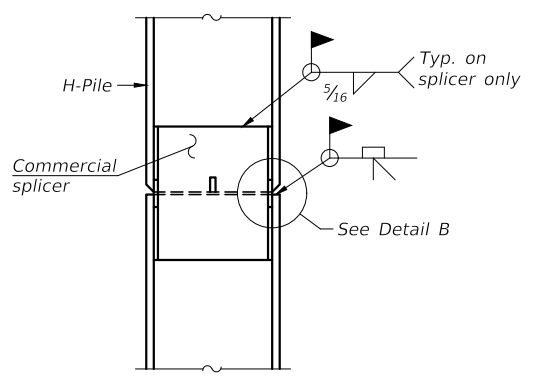
ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 90	04-01179-00-BR	UNION	10	9
PROJECT NO. MTPX(564)			CONTRACT NO. 99637	



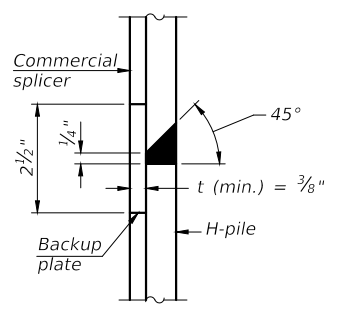
STEEL PILE TABLE

Designation	Depth d	Flange width b <sub>f</sub>	Web and Flange thickness t	Encasement diameter A	Encasement Quantity/Ft. C.Y.
HP 14x117	14 1/4"	14 7/8"	1 3/16"	30"	0.173
x102	14"	14 3/4"	1 1/16"	30"	0.174
x89	13 7/8"	14 3/4"	5/8"	30"	0.175
x73	13 3/8"	14 3/8"	1/2"	30"	0.176
HP 12x84	12 1/4"	12 1/4"	1 1/16"	24"	0.110
x74	12 1/8"	12 1/4"	5/8"	24"	0.111
x63	12"	12 1/8"	1/2"	24"	0.112
x53	11 3/4"	12"	7/16"	24"	0.112
HP 10x57	10"	10 1/4"	9/16"	24"	0.112
x42	9 3/4"	10 1/8"	7/16"	24"	0.113
HP 8x36	8"	8 1/8"	7/16"	18"	0.063

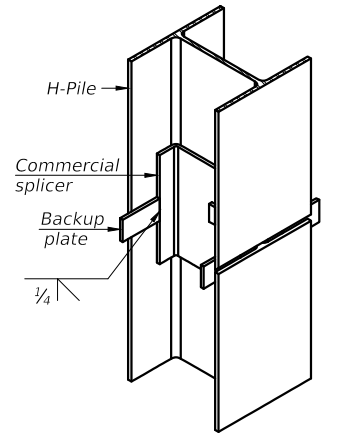
Note: The steel H-piles shall be according to AASHTO M270 Grade 50.



ELEVATION

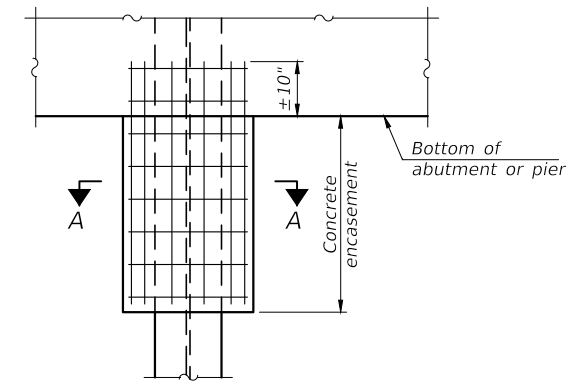


DETAIL "B"



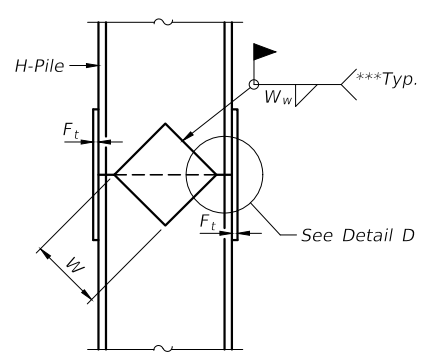
ISOMETRIC VIEW

WELDED COMMERCIAL SPLICE

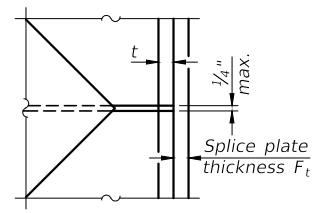


ELEVATION

PILE ENCASEMENT

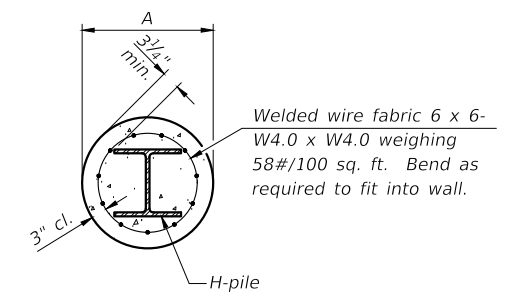


ELEVATION



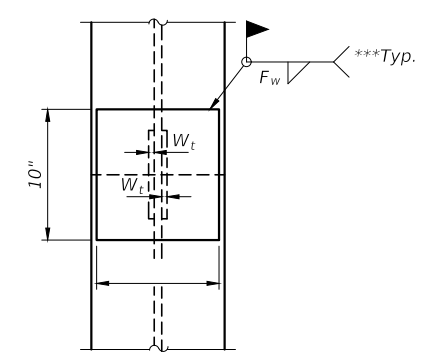
DETAIL D

WELDED PLATE FIELD SPLICE

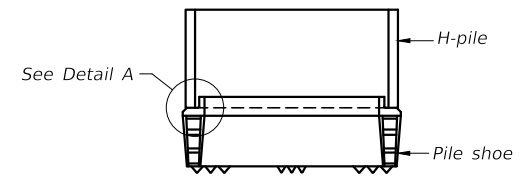


Note: Forms for encasement may be omitted when soil conditions permit.

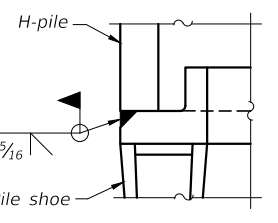
SECTION A-A



END VIEW

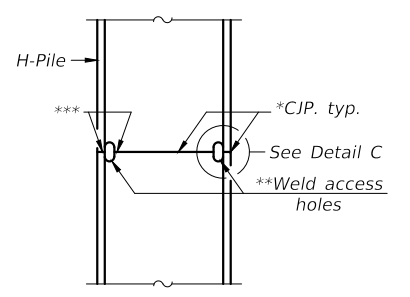


ELEVATION



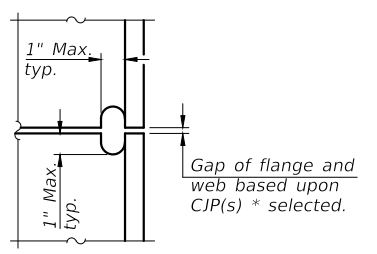
DETAIL A

H-PILE SHOE ATTACHMENT



ELEVATION

COMPLETE PENETRATION WELD SPLICE

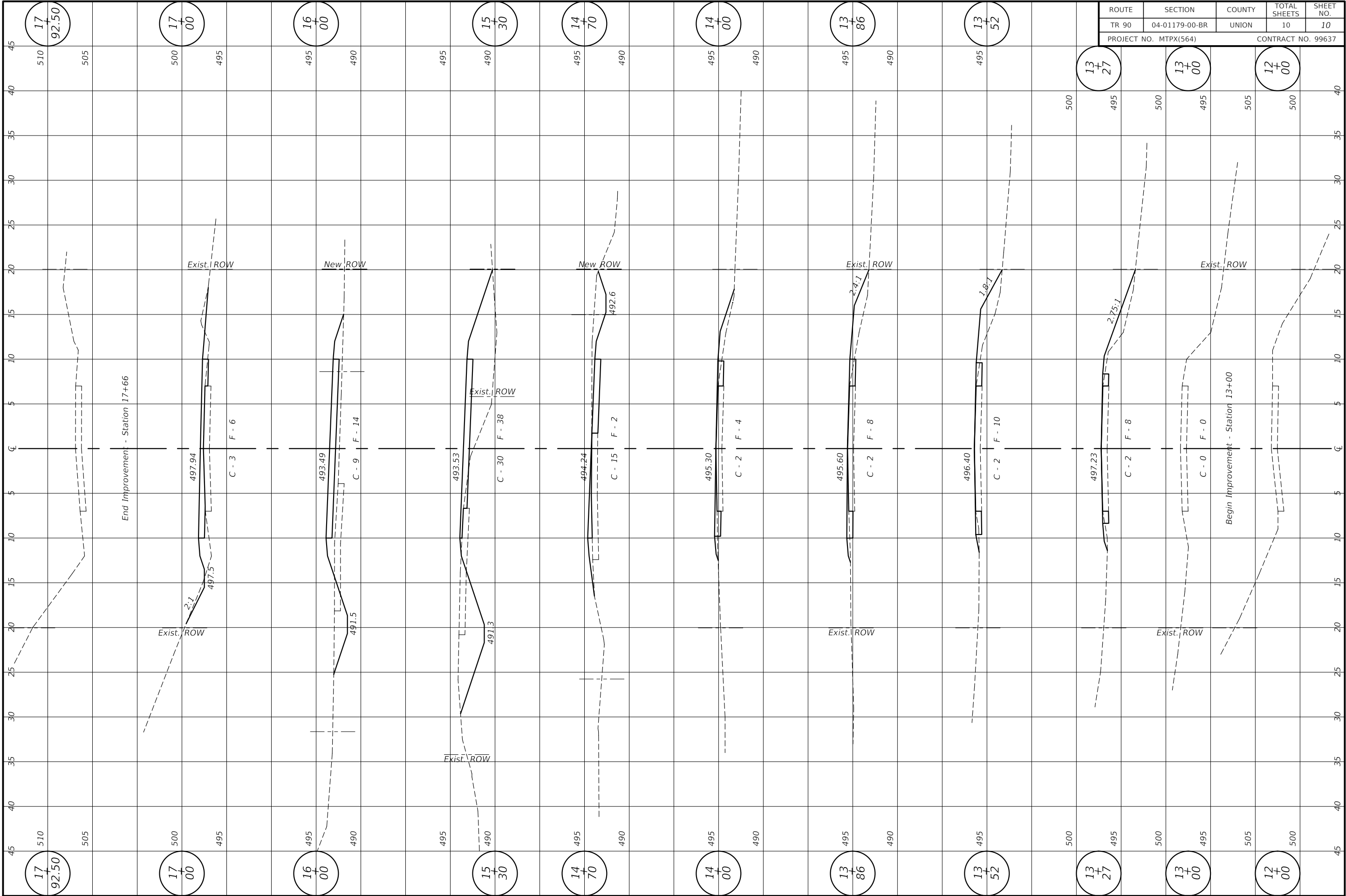


DETAIL C

\* Use joint conforming to Fig. 3.4 in AWS D1.1. Structure Welding Code - Steel.  
 \*\* Preparation per Fig. 5.2 in AWS D1.1. Structure Welding Code - Steel.  
 \*\*\* Interrupt welds 1/4" from end of each pile.

Designation	F	F <sub>t</sub>	F <sub>w</sub>	W	W <sub>t</sub>	W <sub>w</sub>
HP 14x117	12 1/2"	1"	7/8"	7 3/4"	5/8"	1/2"
x102	12 1/2"	7/8"	3/4"	7 3/4"	5/8"	1/2"
x89	12 1/2"	3/4"	11/16"	7 3/4"	5/8"	1/2"
x73	12 1/2"	5/8"	9/16"	7 3/4"	5/8"	1/2"
HP 12x84	10"	7/8"	1 1/16"	6 1/2"	5/8"	1/2"
x74	10"	7/8"	1 1/16"	6 1/2"	5/8"	1/2"
x63	10"	5/8"	1/2"	6 1/2"	1/2"	3/8"
x53	10"	5/8"	1/2"	6 1/2"	1/2"	3/8"
HP 10x57	8"	3/4"	9/16"	5 1/4"	1/2"	3/8"
x42	8"	5/8"	9/16"	5 1/4"	1/2"	3/8"
HP 8x36	7"	5/8"	7/16"	4 1/4"	1/2"	3/8"

PILING DETAILS  
 TR 90 (WILDERNESS RETREAT ROAD)  
 COOPER CREEK  
 SECTION 04-01179-00-BR  
 UNION COUNTY  
 STRUCTURE NO. 091-3224



ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 90	04-01179-00-BR	UNION	10	10
PROJECT NO. MTPX(564)			CONTRACT NO. 99637	

17  
92.50

17  
00

16  
00

15  
30

14  
70

14  
00

13  
86

13  
52

13  
27

13  
00

12  
00

17  
92.50

17  
00

16  
00

15  
30

14  
70

14  
00

13  
86

13  
52

13  
27

13  
00

12  
00