

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED
HIGHWAY BRIDGE PROGRAM

TOWNSHIP ROUTE 265 (LINGLE CREEK ROAD)

COUNTY UNIT ROAD DISTRICT

SECTION 04-01181-00-BR

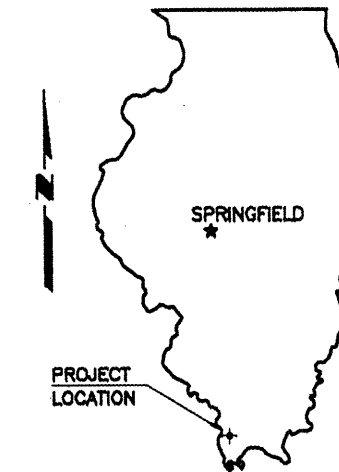
PROJECT NO. BROS-181(25)

JOB NO. C-99-548-04

LINGLE CREEK

UNION COUNTY

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 265	04-01181-00-BR	UNION	10	1
PROJECT NO. BROS-181(25)		CONTRACT NO. 99316		

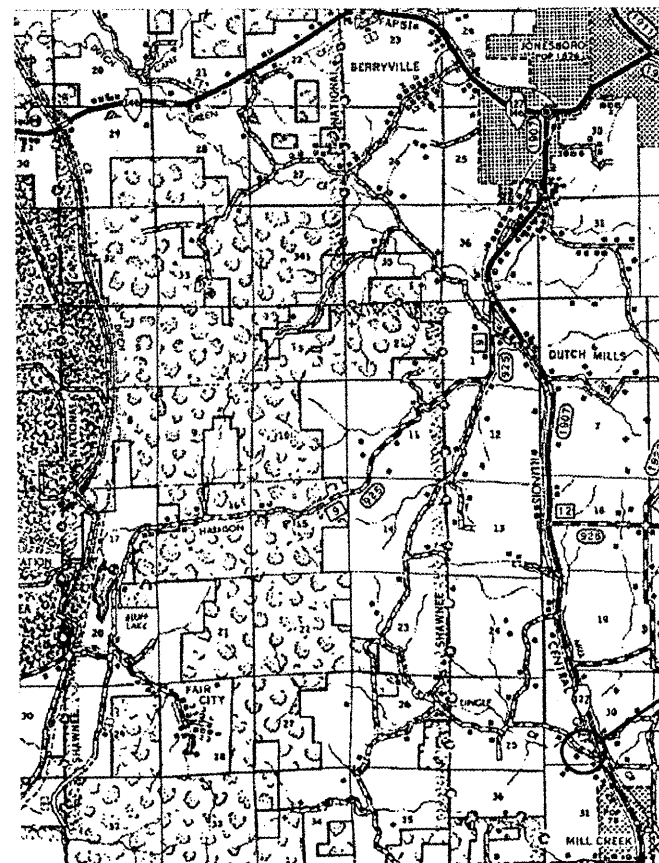
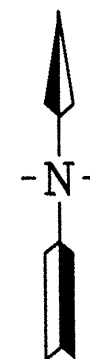


SUMMARY OF QUANTITIES

CODE NO.	PAY ITEM	UNIT	TOTAL
20100500	TREE REMOVAL, ACRES	ACRE	0.4
20200100	EARTH EXCAVATION	CU YD	348
20300100	CHANNEL EXCAVATION	CU YD	324
20400100	BORROW EXCAVATION	CU YD	1,518
25000200	SEEDING, CLASS 2	ACRE	0.5
25000400	NITROGEN FERTILIZER NUTRIENT	POUND	45
25000500	PHOSPHORUS FERTILIZER NUTRIENT	POUND	45
25000600	POTASSIUM FERTILIZER NUTRIENT	POUND	45
25000700	AGRICULTURAL GROUND LIMESTONE	TON	1
25100120	MULCH, METHOD 2	TON	1
28100807	STONE DUMPED RIPRAP, CLASS A4	TON	260
40200800	AGGREGATE SURFACE COURSE, TYPE B	TON	397
50100100	REMOVAL OF EXISTING STRUCTURES	EACH	1
50200100	STRUCTURE EXCAVATION	CU YD	19
50300225	CONCRETE STRUCTURES	CU YD	20.4
50300280	CONCRETE ENCASEMENT	CU YD	2.1
50400505	PRECAST PRESTRESSED CONCRETE DECK DECK BEAMS (27" DEPTH)	SQ FT	1,582
50800105	REINFORCEMENT BARS	POUND	2,580
50900205	STEEL RAILING, TYPE S1	FOOT	132
51201400	FURNISHING STEEL PILES HP10X42	FOOT	303
51202305	DRIVING PILES	FOOT	303
51203400	TEST PILE STEEL HP10X42	EACH	1
51204650	PILE SHOES	EACH	8
51500100	NAME PLATES	EACH	1
54200223	PIPE CULVERTS, CLASS D, TYPE 1 18"	FOOT	32
67100100	MOBILIZATION	L SUM	1

INDEX OF SHEETS

- COVER SHEET
 - PLAN AND PROFILE
 - GENERAL PLAN AND PROFILE
 - DECK BEAMS 27" X 36"
 - DECK BEAMS 27" X 48"
 - ABUTMENTS
 - STEEL RAILING
 - NAME PLATE
 - PILING DETAILS
 - CROSS SECTIONS
- STANDARDS 280001-04 TEMPORARY EROSION CONTROL
701901 TRAFFIC CONTROL DEVICES
BLR-21-7 TRAFFIC CONTROL



LOCATION MAP

SCALE: 1" = 2 MILES

NET LENGTH OF IMPROVEMENT = 500.00 FT. = 0.0947 MILES

CLASSIFICATION : LOCAL ROAD
ADT : 100
DESIGN SPEED : 30 MPH

JOINT UTILITY LOCATION INFORMATION
FOR EXCAVATION
J.U.L.I.E. 1-800-892-0123
CONTACT 48 HOURS BEFORE EXCAVATING

CONTRACT NO. 99316

E. MILLER ENGINEERING, INC.
CONSULTING ENGINEERS
HARRISBURG, ILLINOIS



Edward W. Miller
Edward W. Miller
PROFESSIONAL ENGINEER
#062-025277
EXPIRES NOV. 30, 2009

ILLINOIS DEPARTMENT OF TRANSPORTATION	
Approved	<i>February 25, 2008</i> <i>Brian L. Boyd</i> Union County Engineer
Passed	<i>April 10, 2008</i> <i>Dennis W. Hill</i> District 9 Engineer of Local Roads and Streets
Releasing for Bid Based on Limited Review	<i>April 14, 2008</i> <i>Mary C. Lewis</i> Deputy Director of Highways, Region 5 Engineer

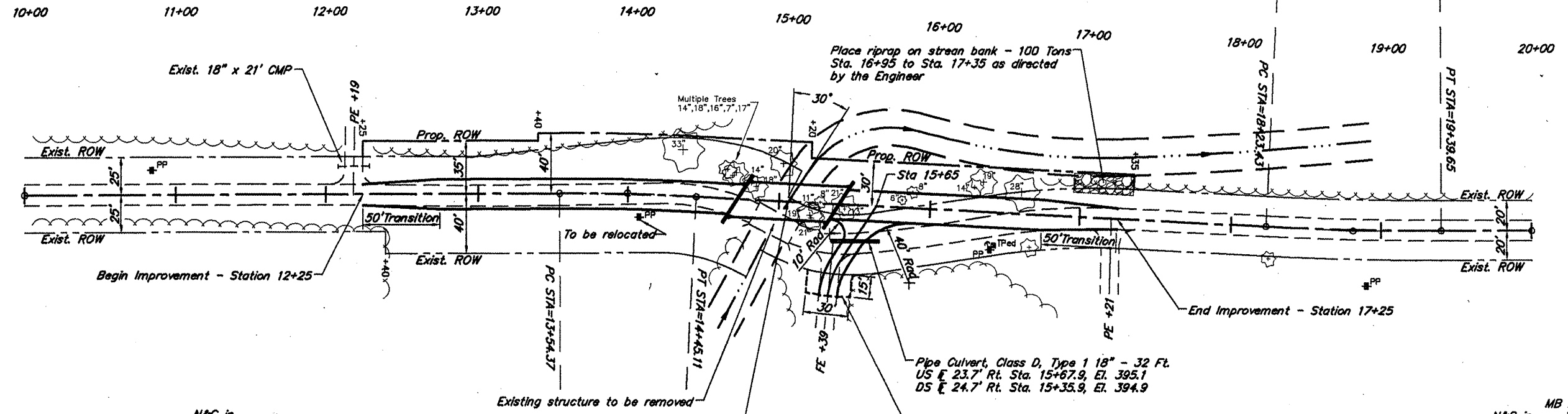
B.M. - RR Spike in Power Pole
15' Rt. Sta. 14+08
Assumed Elev. 395.00

Existing Structure - Timber deck on steel stringers with closed concrete abutments. ±16' W x 30' L
Deck Elev. 395.32

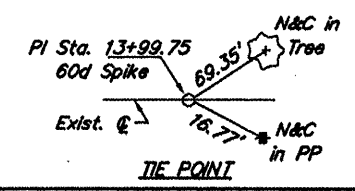
CURVE DATA
PI Sta = 13+99.75
 $\Delta = 3^{\circ}10'47''$ $T = 45.38'$
 $D = 3^{\circ}30'15''$ $L = 90.74'$
 $R = 1,635.06'$ $E = 0.63'$
 $S.E. = 0.025'/ft.$
Attain Sta. 13+09.7 to Sta. 13+76.7
Remove Sta. 14+04.6 to Sta. 14+71.6

Tree Removal Acres: The limits of the tree removal shall be between a line 10 feet left or right of the existing centerline of the roadway and the proposed ROW on the left and the existing ROW on the right between the following Stations.
Lt. Sta. 12+25 to Sta. 17+25 0.37 Ac.
Rt. Sta. 14+45 to Sta. 14+80 0.03 Ac.
Total 0.40 Ac.

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 265	04-01181-00-BR	UNION	10	2
PROJECT NO. BROS-181(25)			CONTRACT NO. 99316	

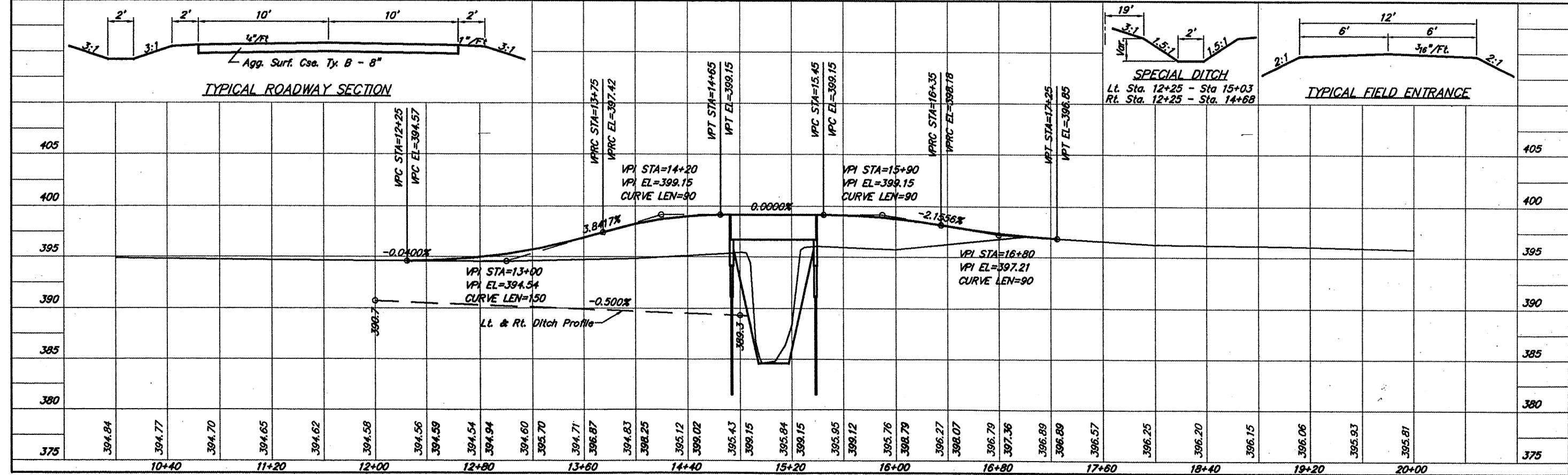
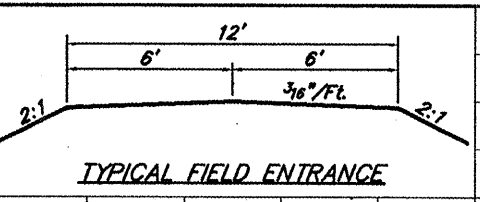
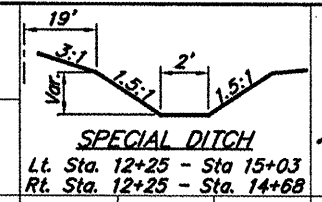
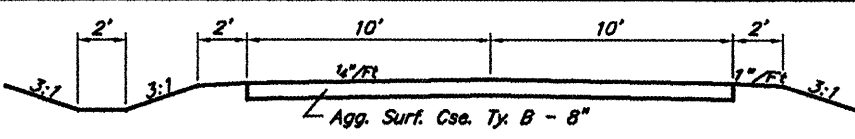
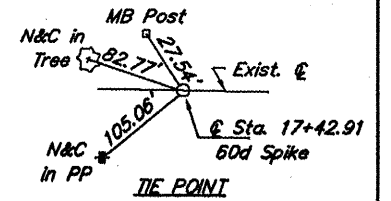


SCALES:
1" = 80' HOR
1" = 10' VER



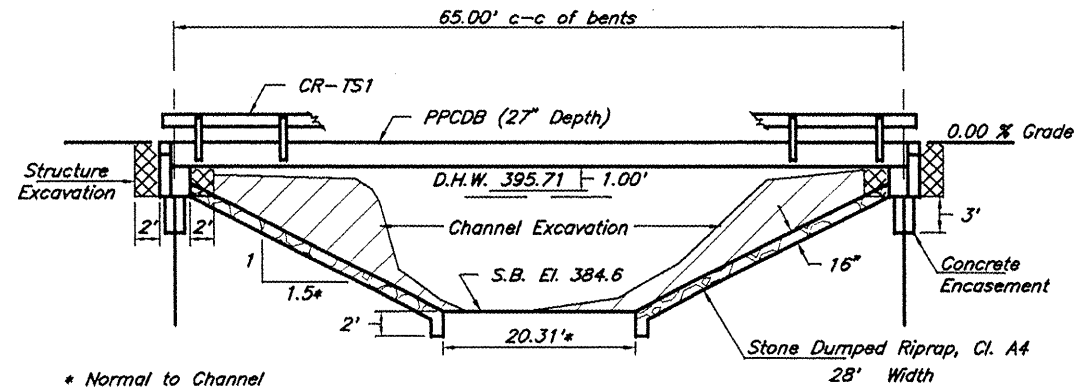
Station 15+06 - Single span precast prestressed concrete deck beam bridge 68.88' bk-bk Abutments, Skewed 30° Lt. Forward

CURVE DATA
PI Sta = 18+81.55
 $\Delta = 3^{\circ}00'16''$ $T = 58.12'$
 $D = 2^{\circ}35'07''$ $L = 116.22'$
 $R = 2,216.32'$ $E = 0.76'$



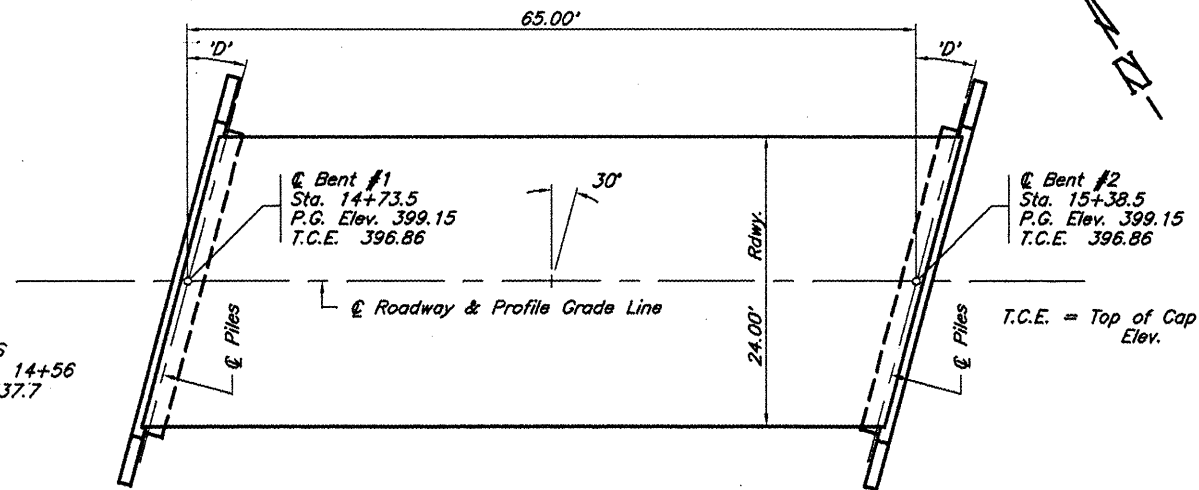
B.M. - PP spike in Power Pole
15' Rt. Station 14+08
Assumed Elev. 395.00

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 265	04-01181-00-BR	UNION	10	3
PROJECT NO. BROS-181(25)			CONTRACT NO. 99316	



ELEVATION

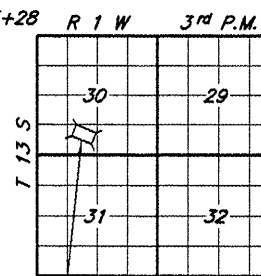
Existing Structure - Timber deck on steel stringers with closed concrete abutments
16'W x 30'L Deck El. 395.32



PLAN

Skew Angle "D" = 30° Left Forward

⊙ Boring 2-S
34' Rt. Sta. 15+28
Rock El. 371.7



LOCATION SKETCH

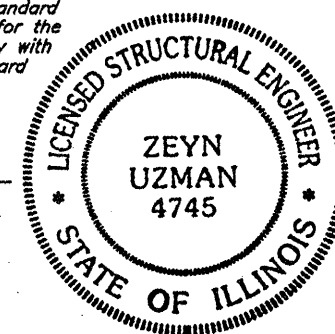
LINGLE CREEK
SEC. 04-01181-00-BR BUILT 20
COUNTY UNIT ROAD DISTRICT
UNION COUNTY
LOADING HS20
STR. NO. 091-3226

LETTERING FOR NAME PLATE

Locate Name Plate at southwest Corner of Bridge (See Std. CN)

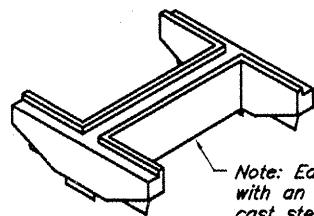
I certify that to the best of my knowledge, information and belief, the revised standard detail sheets and/or special component sheets included with the standard bridge detail sheets are structurally adequate for the design loading shown on the plans and comply with the requirements of the current AASHTO Standard Specifications for Highway Bridges.

Zeyn B. Uzman
S.E. #81-4745
Expires Nov. 30, 2008



PILE DATA (2-ABUTS.)

Type & Size : HP10X42
Nominal Required Bearing : 335 kips
Allowable Resistance Available : 112 kips
Estimated Length : 54 Feet Bent #1, 29 Feet Bent #2
Number Required : 8 (Includes 1 Test Pile located in Bent #2)



Note: Each pile shall be provided with an "APF HardBite" point or cast steel alternate, of the proper size, subject to approval of the Engineer.

PILE SHOES

DESIGN SPECIFICATIONS

2002 AASHTO Standard Specifications - 17th ed.

LOADING HS20-44

Allow 25#/sq. ft. for future wearing surface

SEISMIC DATA

Seismic Performance Category (SPC) = B
Bedrock Acceleration Coefficient (A) = 16.4%
Site Coefficient (S) = 1.0

WATERWAY INFORMATION

Drainage Area = 6.140 Sq. Mi. Low Grade Elev. = 394.57 At Sta. 12+25									
Flood	Freq. Yr.	Q C.F.S.	Opening Sq. Ft.		Natural H.W.E.	Head-Ft.		Headwater El.	
			Exist.	Prop.		Exist.	Prop.	Exist.	Prop.
Design	15	2,555	198.9*	410.8	395.71	1.41	0.00	397.12	395.71
Base	100	4,097	198.9*	464.6	397.57	0.09	0.98	397.86	398.55
Overtopping	±119	4,264		464.6	397.69		1.46		399.15
Max. Calc.	500								

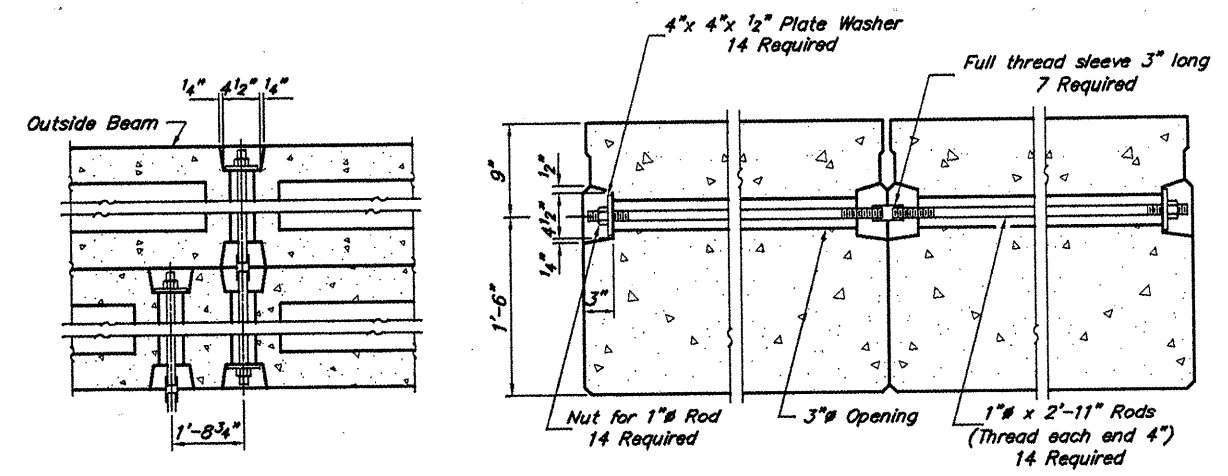
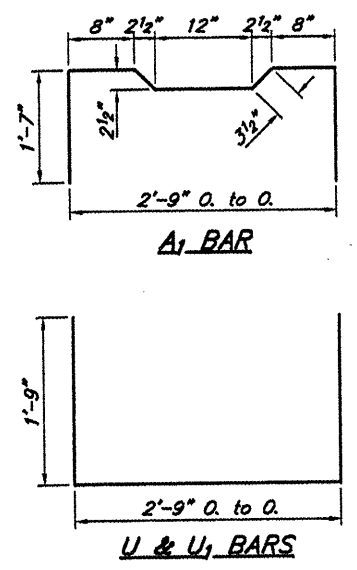
* Over road flow area Exist. 539.0 902.6
Proposed deck elevation used for overtopping calculations.

TOTAL BILL OF MATERIAL

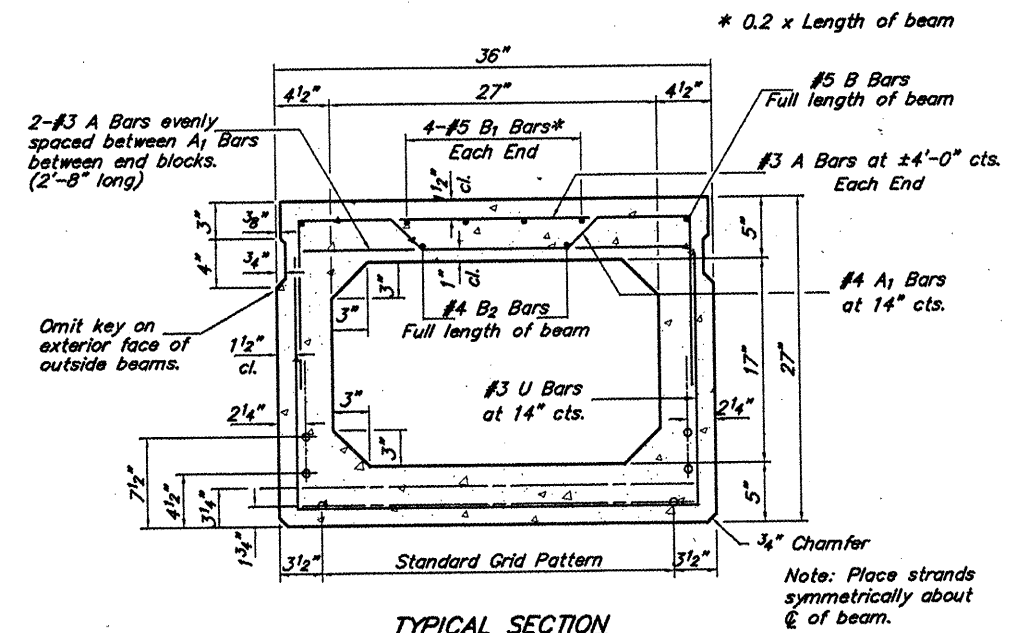
Item	Unit	Super	Sub.		Total
			Piers	Abuts.	
Removal of Existing Structures	Each				1
Concrete Structures	Cu. Yds.			20.4	20.4
P.P. Conc. Dk. Bm. 27" Dp.	Sq. Ft.	1582			1582
Steel Railing, Type S1	Foot	132			132
Reinforcement Bars	Pound			2580	2580
Furnishing Steel Piles HP10X42	Foot			303	303
Driving Piles	Foot			303	303
Test Pile Steel HP10X42	Each			1	1
Concrete Encasement	Cu. Yds.			2.1	2.1
Name Plates	Each			1	1
Structure Excavation	Cu. Yds.			19	19
Channel Excavation	Cu. Yds.			324	324
Stone Dumped Riprap, Class A4	Tons			160	160
Pile Shoes	Each			8	8

GENERAL PLAN & ELEVATION
TOWNSHIP ROUTE 265
LINGLE CREEK
SECTION 04-01181-00-BR
UNION COUNTY
STATION 15+06

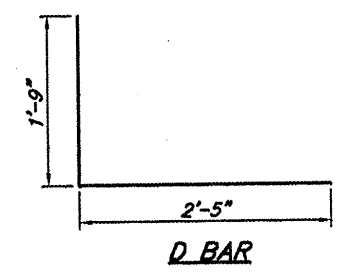
ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 265	04-01181-00-BR	UNION	10	4
PROJECT NO. BROS-181(25)		CONTRACT NO. 99316		



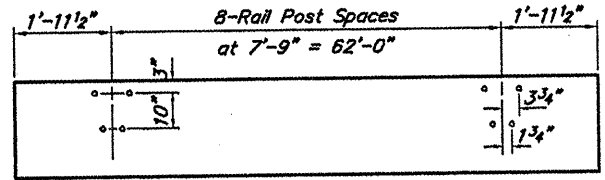
TYPICAL TRANSVERSE TIE ASSEMBLY



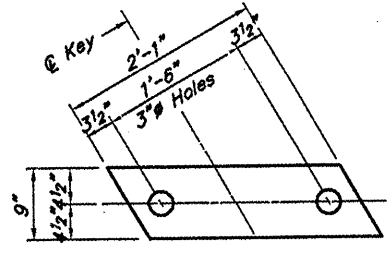
TYPICAL SECTION
19-1/2# Strands Each Strand Stressed to 28,900 lbs.
8-Strands 1 1/4" up, 7-Strands 3/4" up,
2-Strands 4 1/2" up, 2-Strands 7 1/2" up.



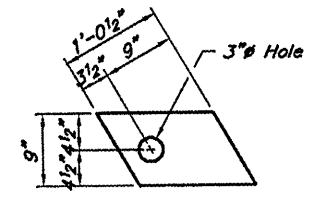
D BAR



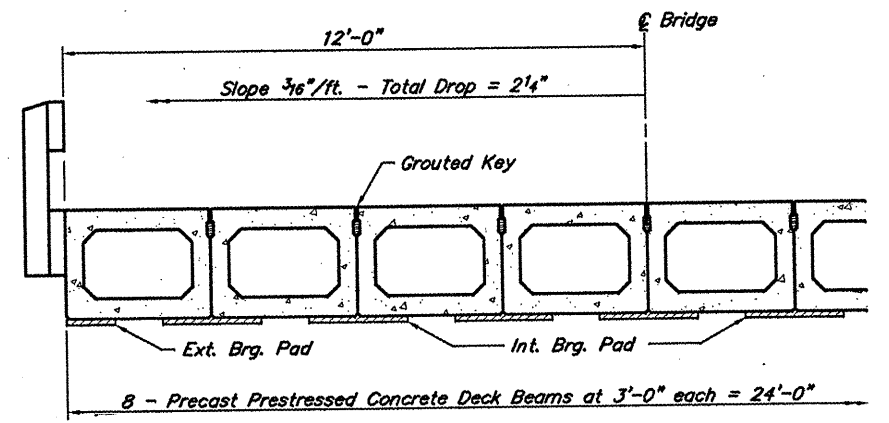
RAIL POST SPACING



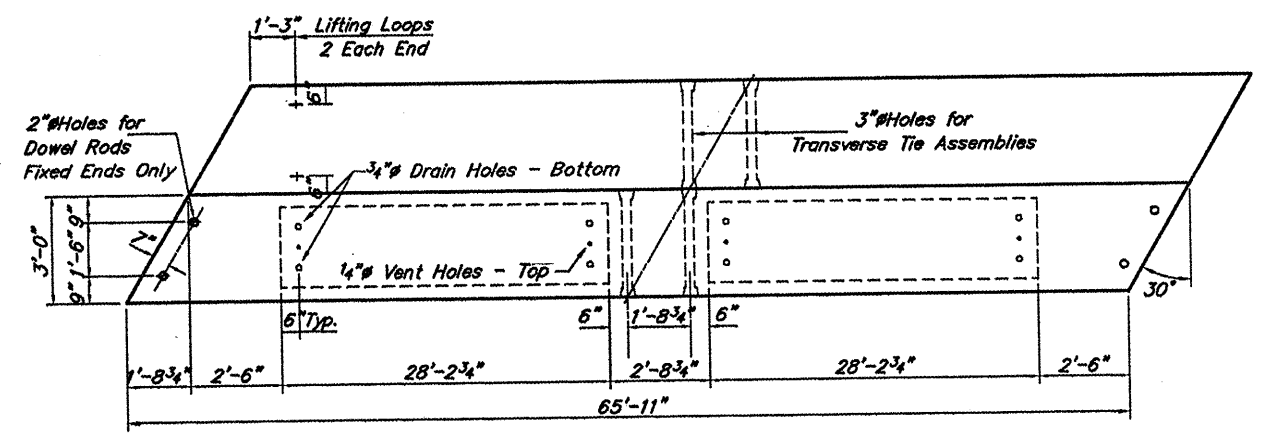
FABRIC BEARING PAD (Interior)



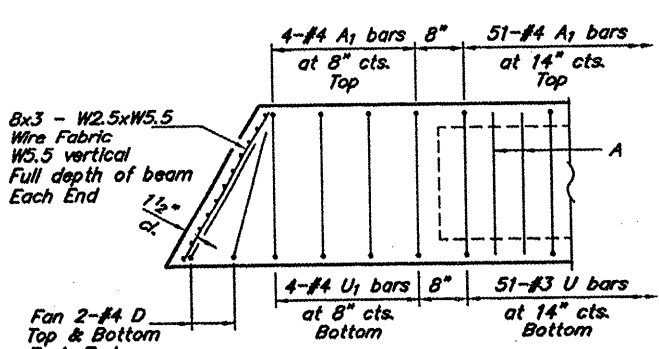
FABRIC BEARING PAD (Exterior)



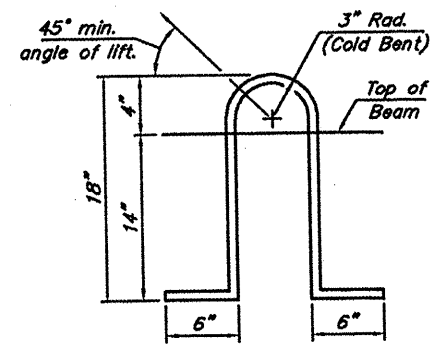
HALF CROSS SECTION



PLAN



END PLAN



LIFTING LOOP DETAIL

NOTES

Reinforcement bars shall conform to AASHTO M-31 or M-322, Grade 60. Prestressing steel shall be uncoated high strength, stress-relieved 7-wire strand, Grade 270. The nominal diameter shall be 1/2" and the nominal cross-sectional area shall be 0.153 sq. in. Required release strength, f_{ci} , shall be 4,950 p.s.i. An equal substitution of the low-relaxation strands for the stress-relieved strands will be permitted.

Lifting loops shall be 3/4" diameter, 6x25 class wire rope with fiber core and shall have a minimum ultimate tensile strength of 46,000 lbs. or 2-1/2#-270 ksi strands, as shown.

Keyway surfaces shall be cleaned to remove form oil or other bond breaking material prior to shipment of the beams. Cleaning shall be done by sandblasting the keyway areas between the top of the beam and the bottom edge of the key.

The 1" rods in the transverse tie assembly shall be tightened to a snug fit and the threads set. Pockets that receive transverse tie bar on outside shall be filled with grout after transverse tie assembly is in place.

The bearing seat surfaces shall be adjusted by shimming to assure firm and even bearing. Two 1/8" fabric adjusting shims of the dimensions of the Exterior Bearing Pad shall be provided for each bearing.

After beams have been erected, holes shall be drilled into substructures and anchor dowels placed. Dowel holes shall be filled with non-shrink grout to top of beam and allowed to cure a minimum of 24 hours prior to grouting the shear keys.

Nominal 1" joint at @ Pier shall be filled with non-shrink grout.

Rail Post Anchor Devices shall be cast into exterior face of outside beams as elsewhere specified.

Cost of reinforcement and accessories cast into the beam, of bearing pads, and of grouting longitudinal shear keys is incidental to Precast Prestressed Concrete Deck Beams.

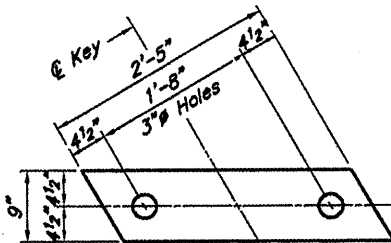
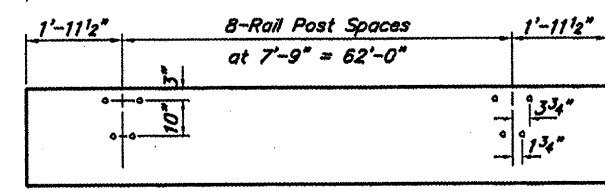
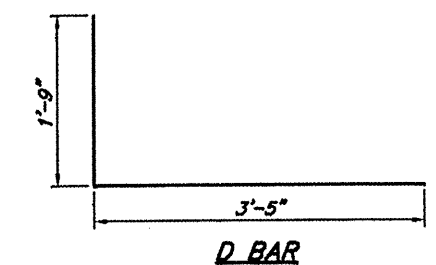
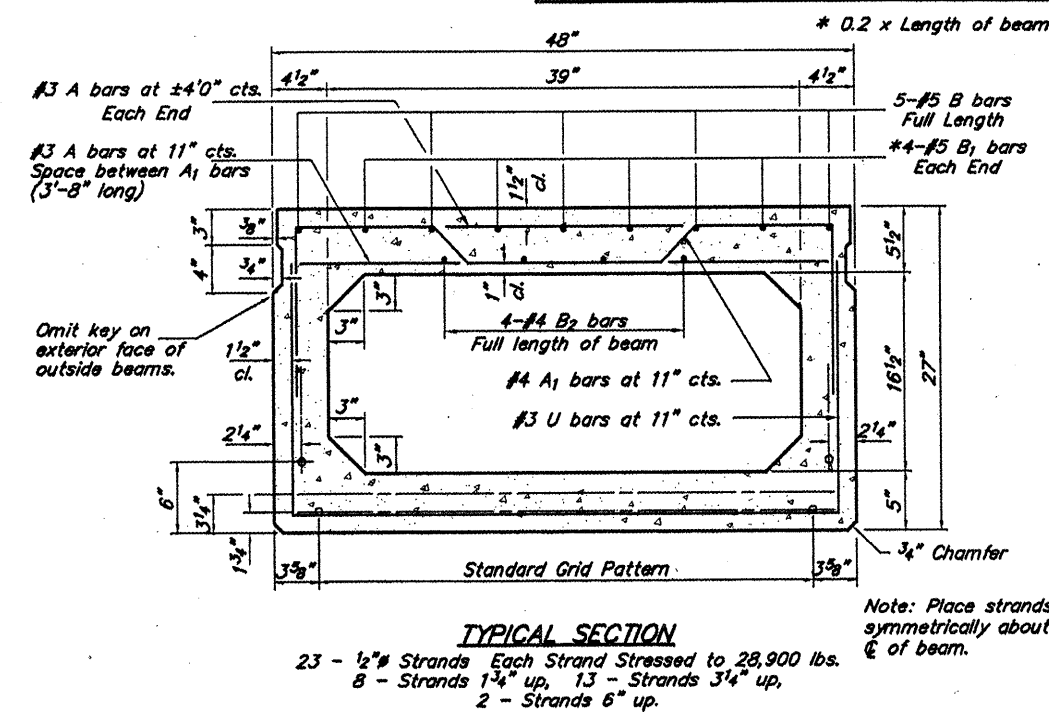
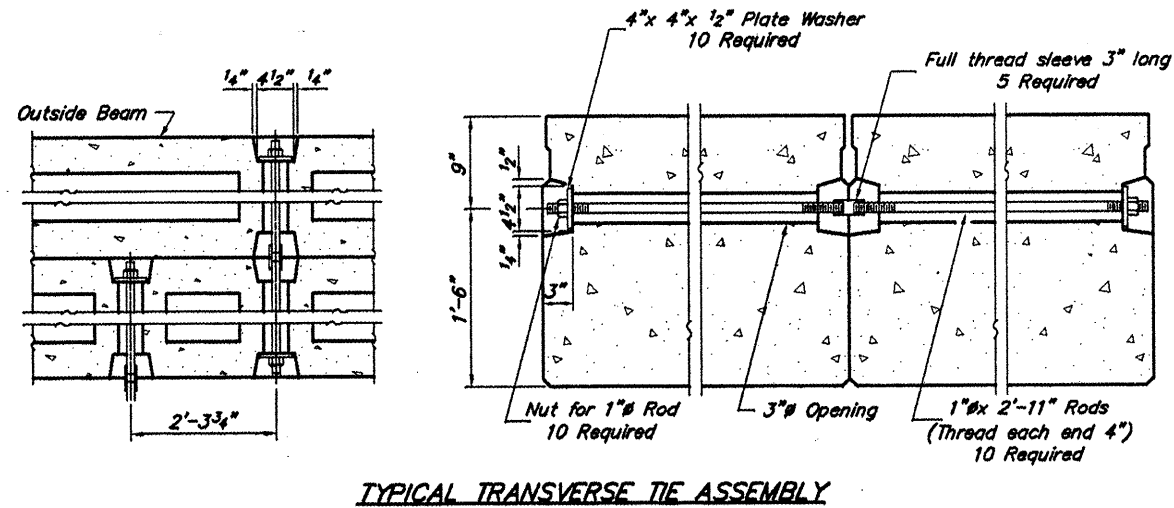
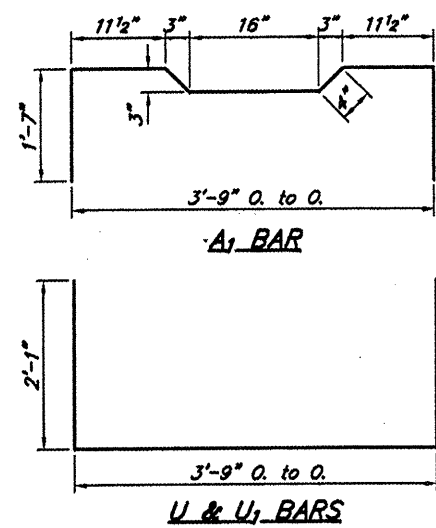
When Waterproofing Membrane System is specified, the top surface of the beams shall be finished in accordance with Article 504.06 of the Standard Specifications except that the surface shall not be roughened by brooming. The finished surface shall be free of depressions or high spots with sharp corners, and the top edge of keys shall be rounded or chamfered a min. of 1/4".

BILL OF MATERIAL

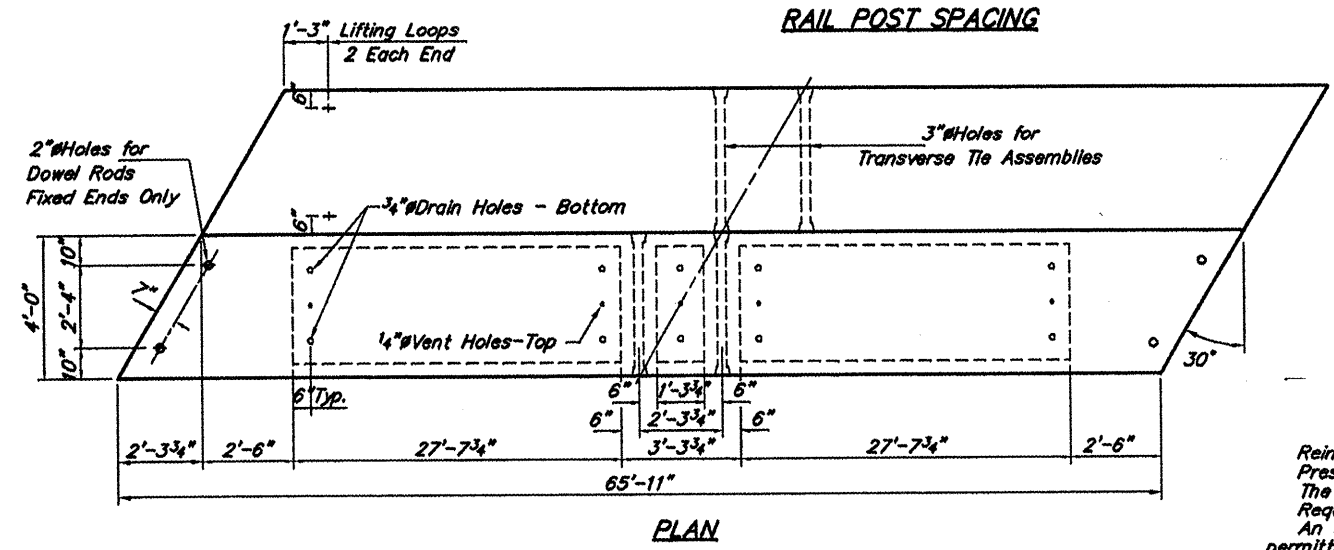
Bar	No.	Size	Length	Shape
A	108	#3	2'-8"	—
A1	59	#4	6'-1"	U
B	4	#5	33'-8"	—
B1	8	#5	13'-0"	—
B2	4	#4	33'-6"	—
D	8	#4	4'-2"	—
U	51	#3	6'-3"	—
U1	8	#4	6'-3"	—
Precast Prestressed Concrete Deck Beams		Sq. Ft.	1582	

DECK BEAMS 27" X 36"
LINGLE CREEK
SECTION 04-01181-00-BR
UNION COUNTY

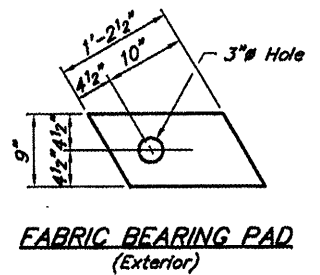
ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 265	04-01181-00-BR	UNION	10	5
PROJECT NO. BROS-181(25)		CONTRACT NO. 99316		



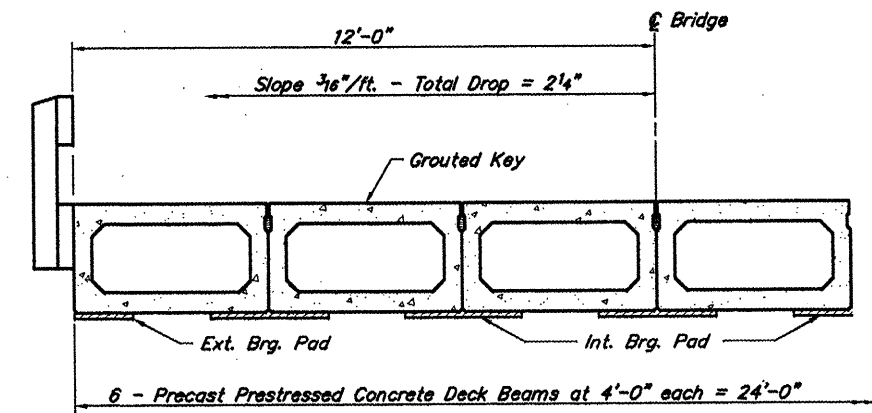
FABRIC BEARING PAD (Interior)



PLAN



FABRIC BEARING PAD (Exterior)



HALF CROSS SECTION

NOTES

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Nominal 1" joint at @ Pier shall be filled with non-shrink grout.

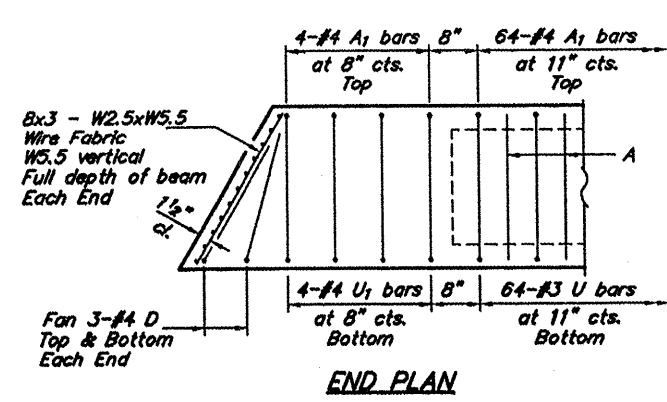
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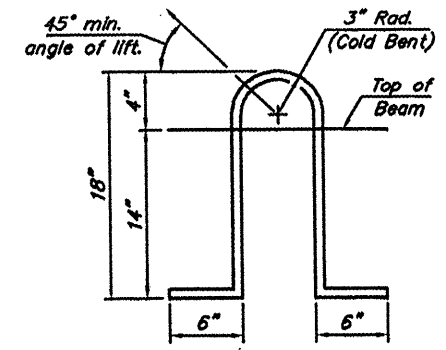
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BILL OF MATERIAL

Bar	No.	Size	Length	Shape
A	71	#3	3'-8"	—
A ₁	72	#4	7'-1"	—
B	10	#5	33'-8"	—
B ₁	8	#5	13'-0"	—
B ₂	8	#4	33'-6"	—
D	12	#4	5'-2"	—
U	64	#3	7'-3"	—
U ₁	8	#4	7'-3"	—
Precast Prestressed Concrete Deck Beams		Sq. Ft.	1582	



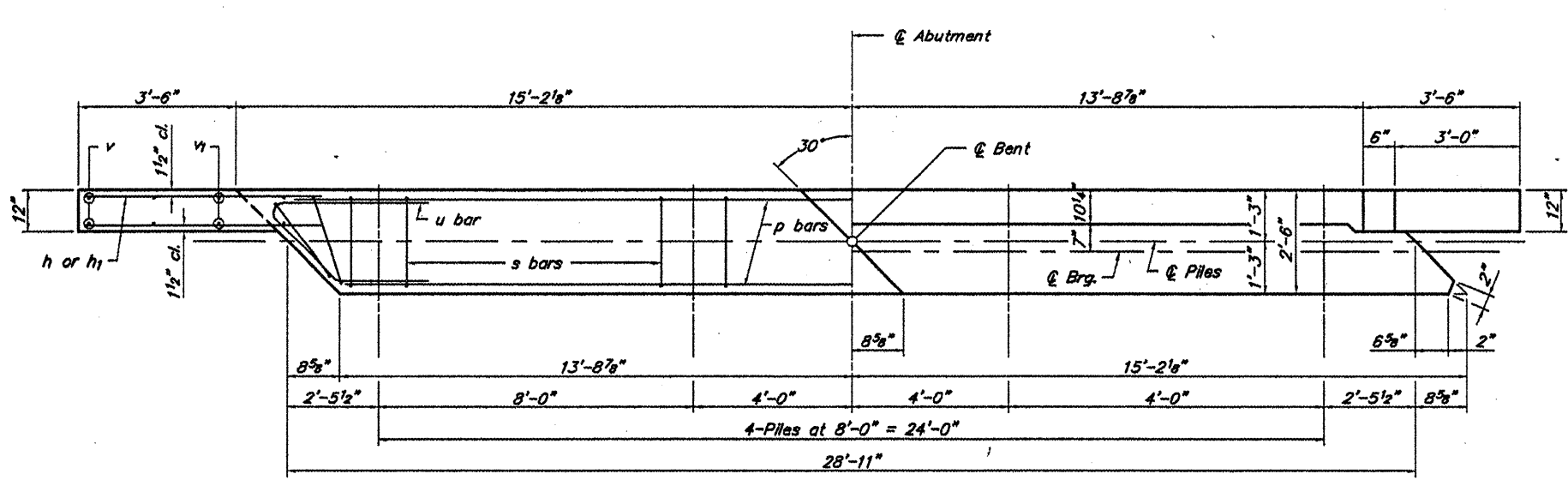
END PLAN



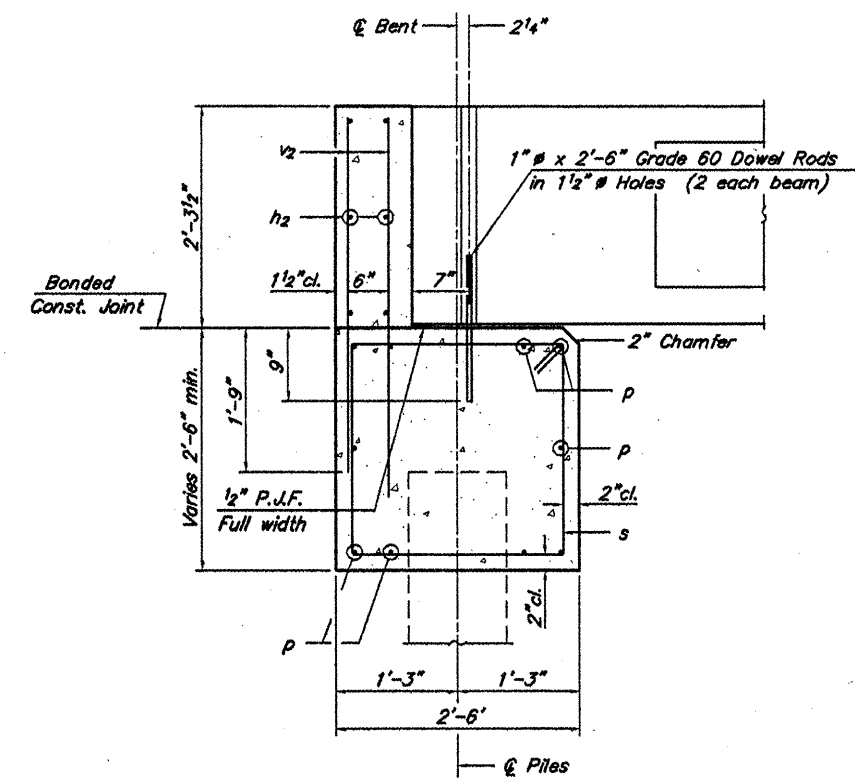
LIFTING LOOP DETAIL

DECK BEAMS 27" X 48"
LINGLE CREEK
SECTION 04-01181-00-BR
UNION COUNTY

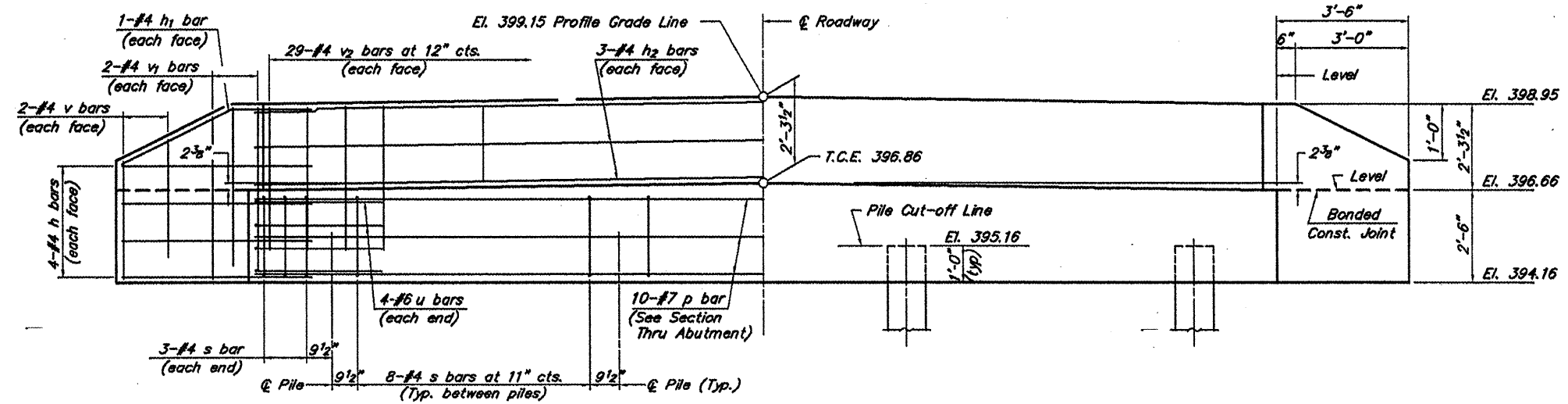
ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 265	04-01181-00-BR	UNION	10	6
PROJECT NO. BROS-181(25)		CONTRACT NO. 99316		



PLAN



SECTION THRU ABUT.
(At Right Angles)



ELEVATION

BAR LIST FOR ONE ABUTMENT

Bar	No.	Size	Length	Shape
h	16	#4	5'-6"	—
h1	4	#4	5'-6"	—
h2	8	#4	28'-7"	—
p	10	#7	28'-7"	—
s	30	#4	9'-5"	□
u	8	#6	11'-4"	—
v	8	#4	3'-2"	—
v1	8	#4	4'-2"	—
v2	58	#4	3'-11"	—

QUANTITIES FOR ONE ABUTMENT

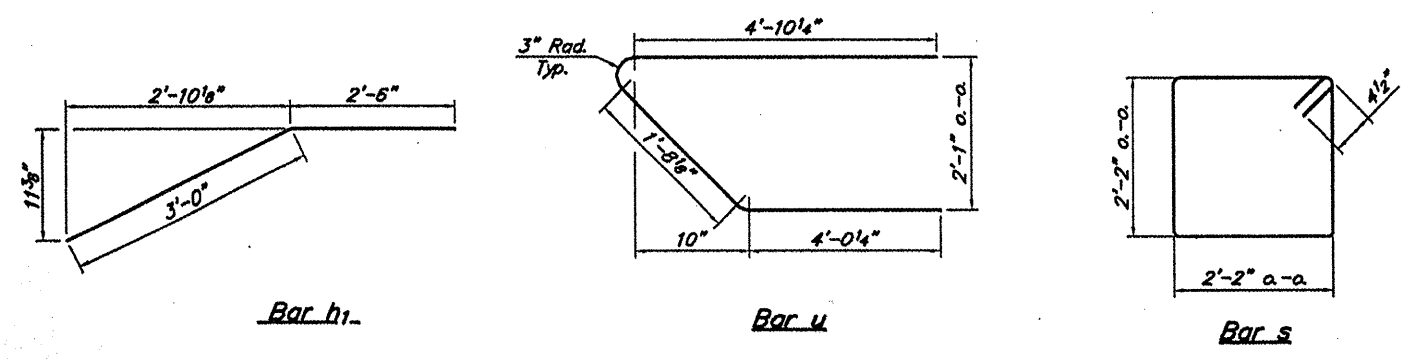
Concrete Structures	10.2 Cu. Yds.
Reinforcement Bars	1290 Lbs.

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 conform to A.A.S.H.T.O. M-31, M-42 or M-53, Grade 60.
- Space reinforcement in cap to miss dowel rods.

DESIGN STRESSES

$f'_c = 3,500$ psi
 $f_y = 60,000$ psi



ABUTMENTS
LINGLE CREEK
SECTION 04-01181-00-BR
UNION COUNTY

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 265	04-01181-00-BR	UNION	10	7
PROJECT NO. BROS-181(25)			CONTRACT NO. 99318	

NOTES

Hollow structural steel tubing shall conform to the requirements of ASTM designation A500 Grade B Structural Steel Tubing and shall meet the longitudinal CVN requirements of 15 ft.-lbs. at 0° F.

All other steel shapes and plates shall conform to the requirements of AASHTO M 270 Grade 36 except posts and angles shall conform to AASHTO M 270 Grade 50.

Boils, cap screws, and nuts shall conform to the requirement of ASTM designation A307 except for high strength bolts, nuts and washers noted which shall conform to AASHTO M 164.

All bolts, nuts, cap screws, washers and lock washers shall be galvanized according to AASHTO M 232.

All posts, railing, rail splices, anchor devices and angles shall be galvanized after shop fabrication according to AASHTO M-111 and ASTM A 385. Galvanized rail shall not be painted.

Railing shall be according to Section 509 of the Standard Specifications, except as noted, and will be paid for at the contract unit price per foot for STEEL RAILING, TYPE S-1.

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.

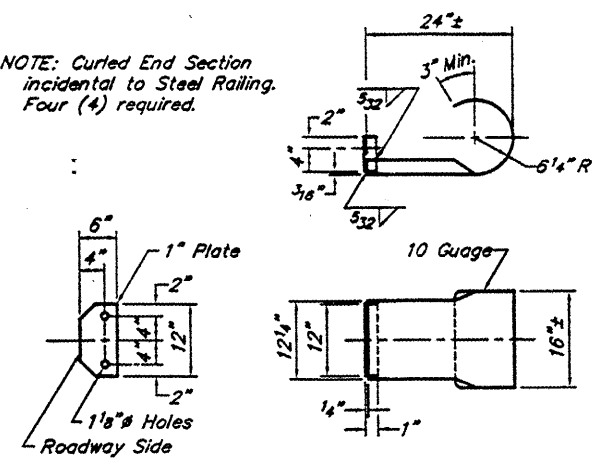
All field drilled holes shall be coated with an approved zinc rich paint before erection.

The 1/2" x 7" x 6" plates that come in contact with concrete shall either receive two coats of asphalt paint conforming to Section 1060.07 Type II, or 1/8" fabric bearing pads shall be placed between the plates and concrete.

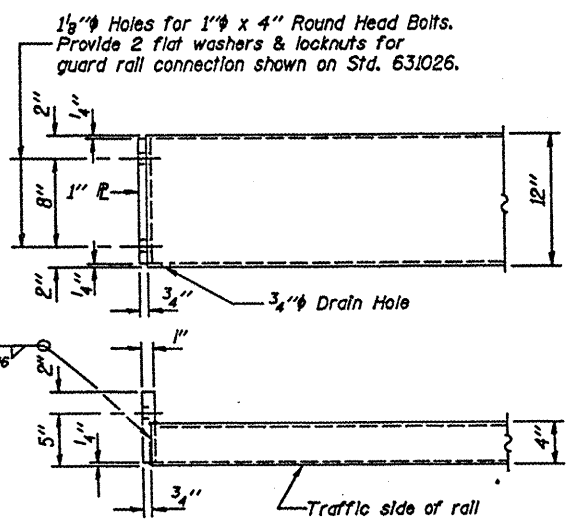
The 3/4" high strength bolts used to connect the 6 x 4 x 3/4 angles to the post shall be tightened according to Article 505.04 (f)(2) of the Standard Specifications. The 1" high strength bolts connecting the angles to the concrete shall be tightened to a snug fit and given an additional 1/8 turn. The 5/8" cap screws in bottom of posts shall be tightened to a snug fit only.

The maximum allowable rail post spacing shall be 10'-6". The rail post spacing shown elsewhere in the plans is based on the allowable spacing for another type of rail. When this type of rail is used, the number of posts may be decreased and the post spacing increased to provide equal post spaces of 10'-6" or less.

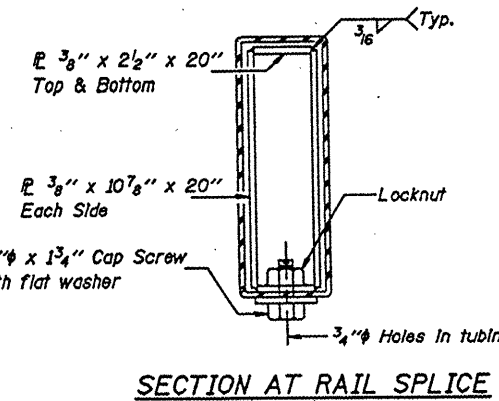
NOTE: Curled End Section incidental to Steel Railing. Four (4) required.



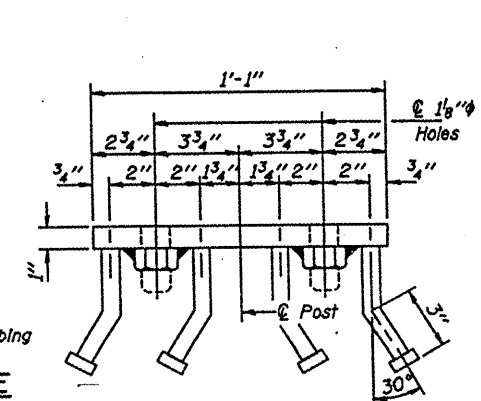
CURLLED END SECTION DETAILS



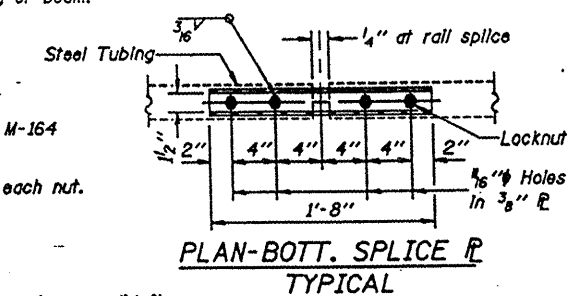
END OF RAIL DETAILS



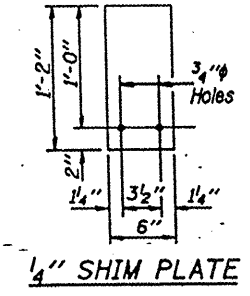
SECTION AT RAIL SPLICE



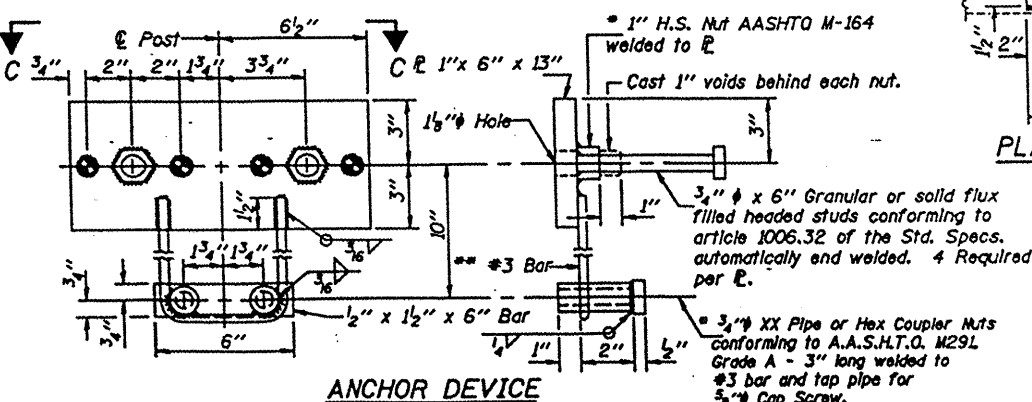
VIEW C-C



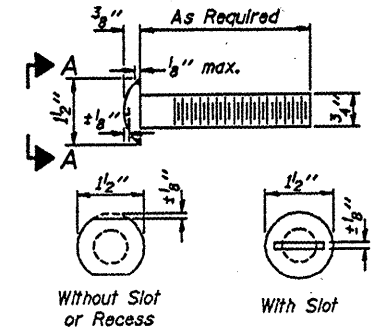
PLAN-BOTT. SPLICE R TYPICAL



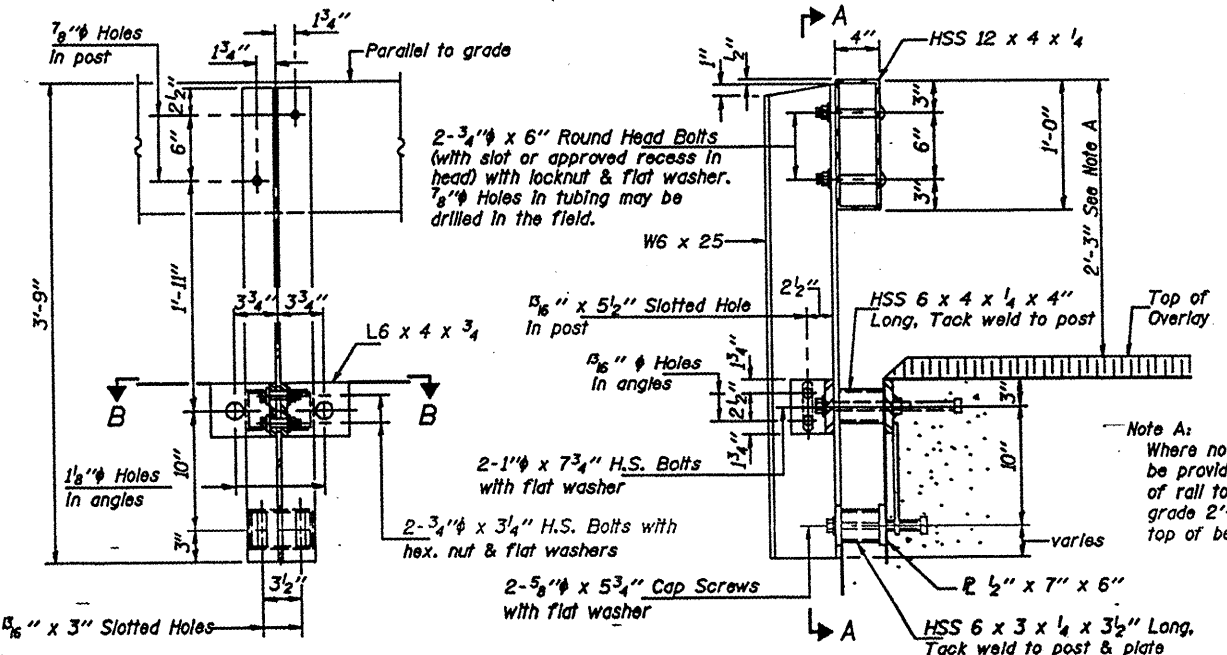
1/4 SHIM PLATE



ANCHOR DEVICE

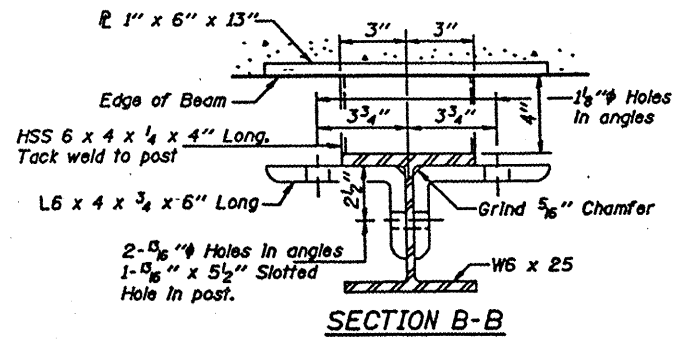


VIEW A-A ROUND HEAD BOLT



SECTION A-A

SECTION AT RAIL POST

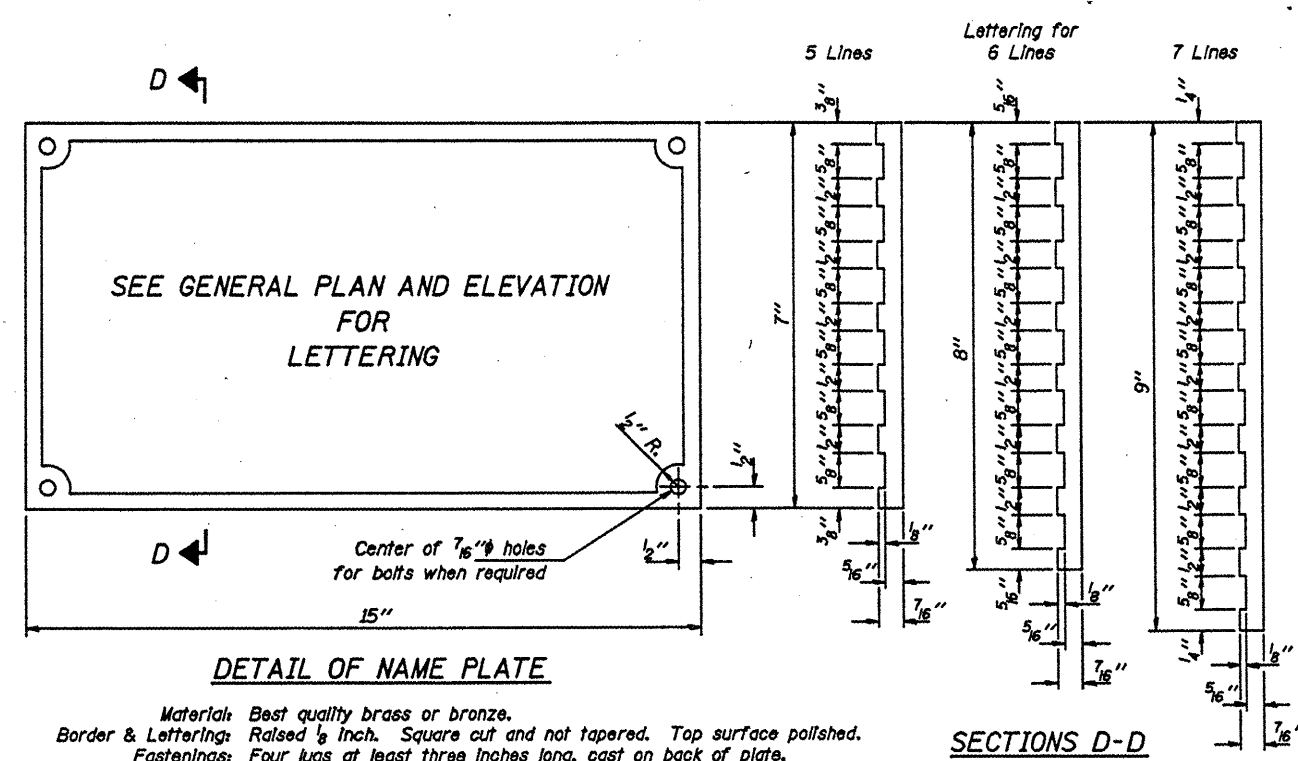


SECTION B-B

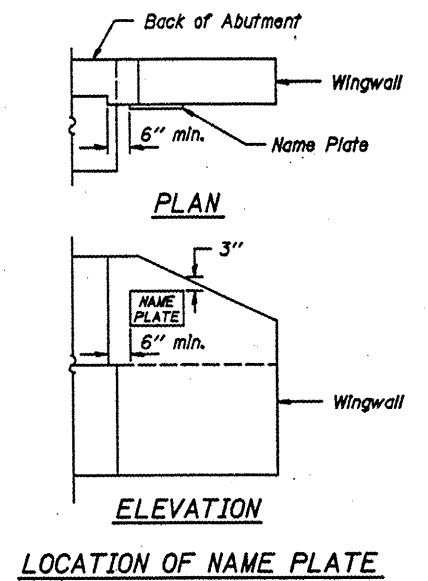
Illinois Department of Transportation
 PASSED APRIL 4, 2005
 Thomas J. Nema (Seal)
 Engineer of Bridge Design
 APPROVED APRIL 4, 2005
 Robert E. (Seal)
 Engineer of Bridges and Structures

**STEEL RAILING, TYPE S-1
 STANDARD CR-TS1**

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 265	04-01181-00-BR	UNION	10	8
PROJECT NO. BROS-181(25)			CONTRACT NO. 99316	



Material: Best quality brass or bronze.
 Border & 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.



Illinois Department of Transportation

PASSED APRIL 4, 2005

Thomas S. Hanna (Signature)

Engineer of Bridge Design

APPROVED APRIL 4, 2005

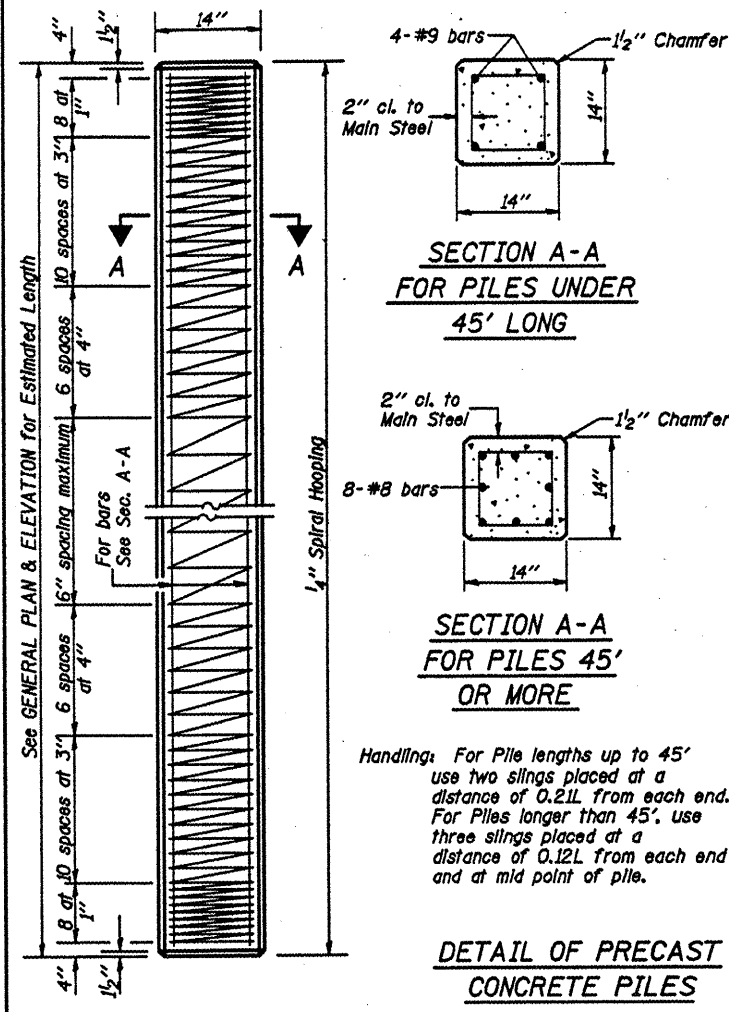
Ralph E. Anderson (Signature)

Engineer of Bridge and Structures

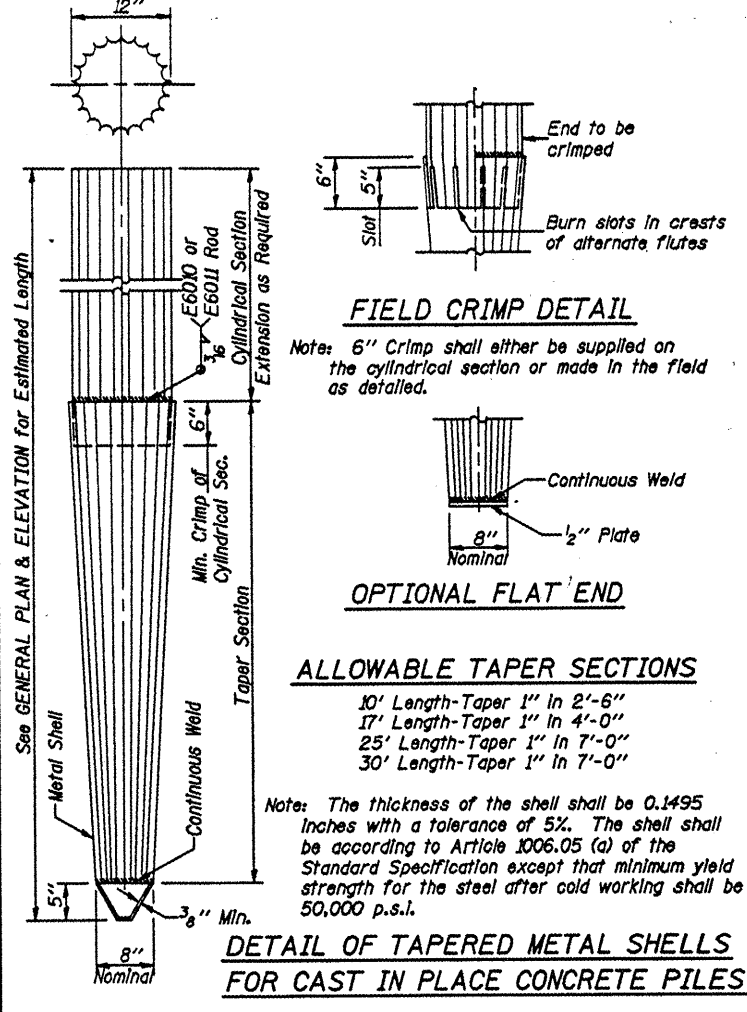
NAME PLATE

STANDARD CN

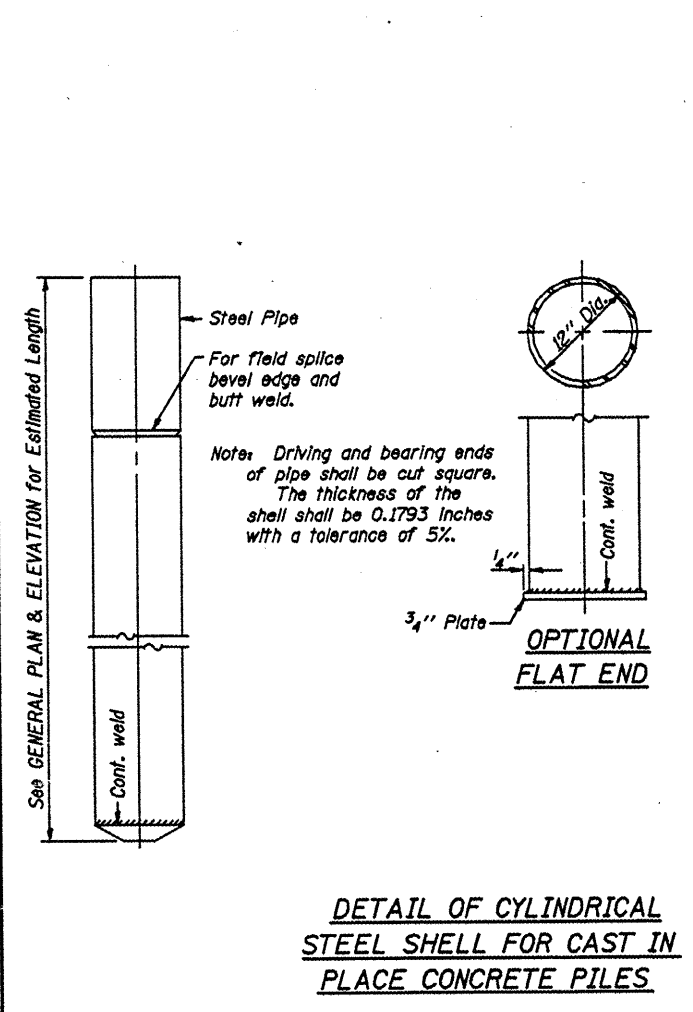
ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 265	04-01181-00-BR	UNION	10	9
PROJECT NO. BROS-181(25)		CONTRACT NO. 99316		



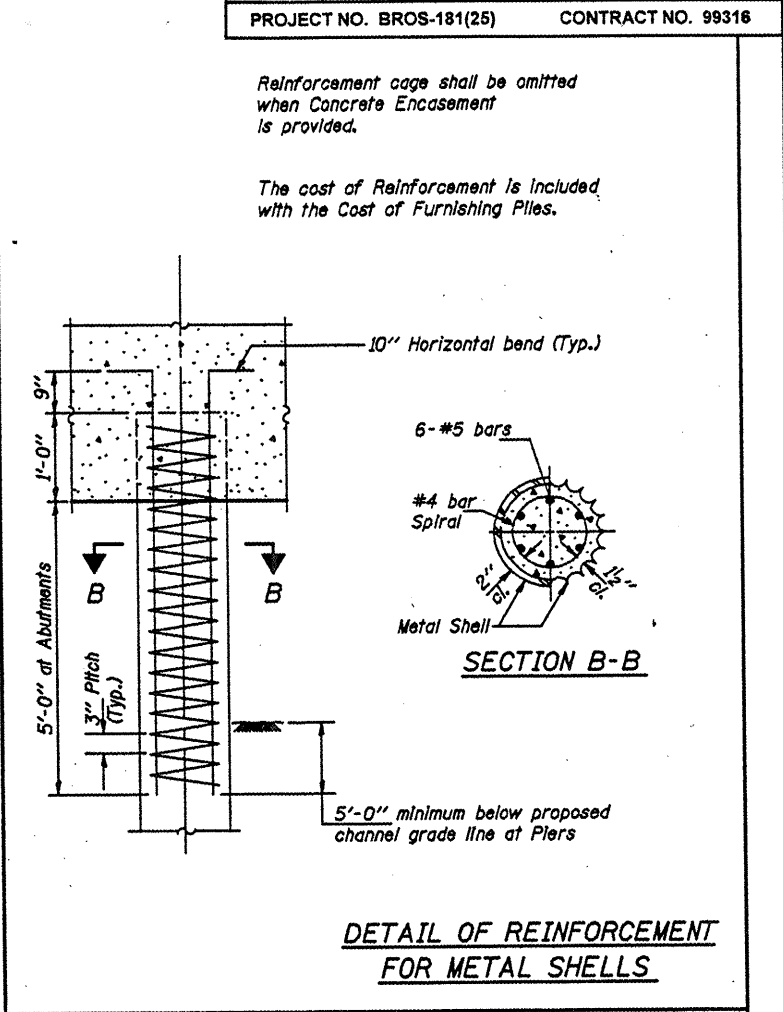
DETAIL OF PRECAST CONCRETE PILES



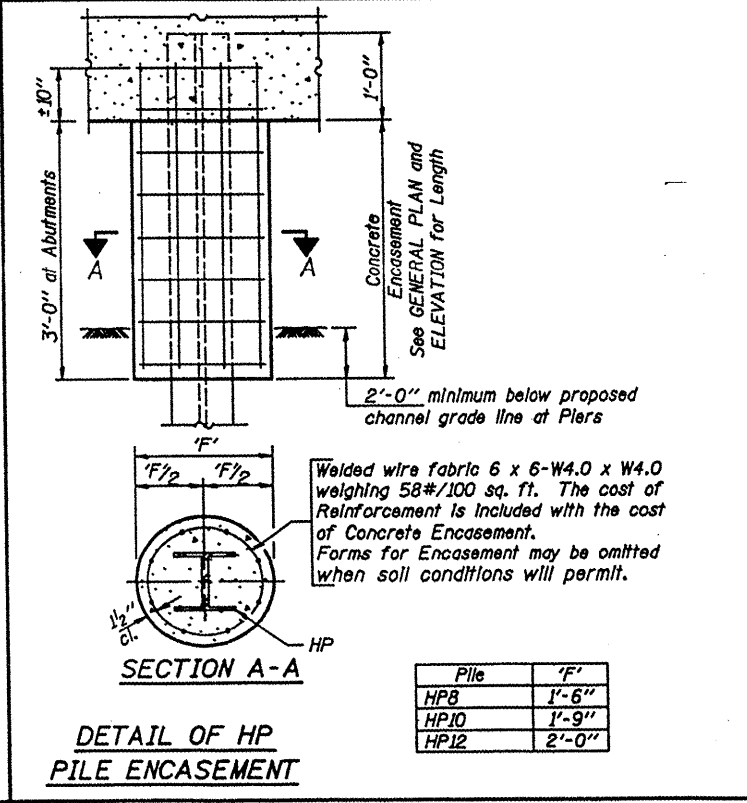
DETAIL OF TAPERED METAL SHELLS FOR CAST IN PLACE CONCRETE PILES



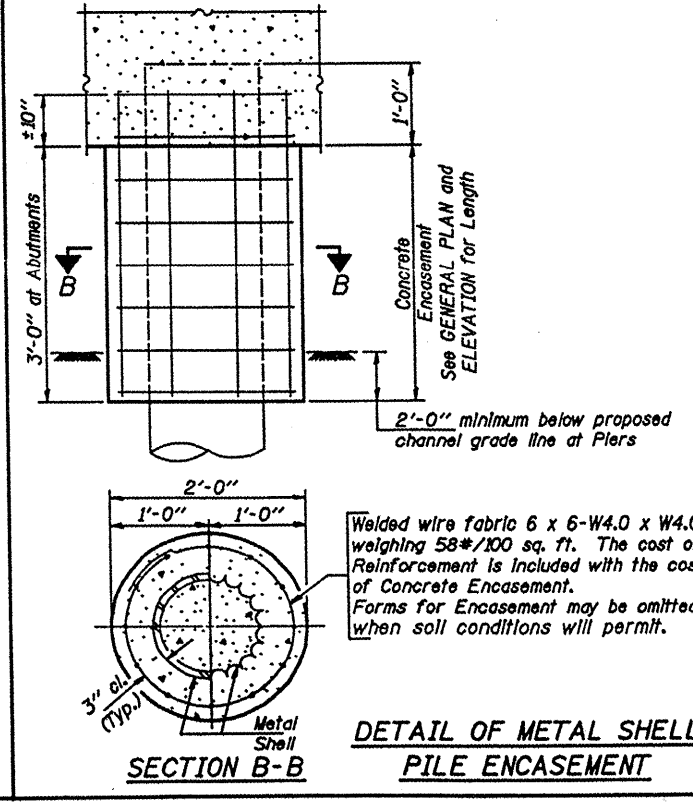
DETAIL OF CYLINDRICAL STEEL SHELL FOR CAST IN PLACE CONCRETE PILES



DETAIL OF REINFORCEMENT FOR METAL SHELLS



DETAIL OF HP PILE ENCASEMENT



DETAIL OF METAL SHELL PILE ENCASEMENT

QUANTITIES/FT. OF ENCASEMENT (STEEL PILES)

Pile Size	Item	Quantity
HP8	Concrete Encasement	0.063 C.Y.
HP10	Concrete Encasement	0.086 C.Y.
HP12	Concrete Encasement	0.112 C.Y.

(METAL SHELL PILES)

Pile Size	Item	Quantity
12" Dia.	Concrete Encasement	0.087 C.Y.

PILE DETAILS	
STANDARD CX-1	

Illinois Department of Transportation
 PASSED FEBRUARY 1, 2000
 Approved by: [Signature]
 Engineer of Bridge Design
 APPROVED FEBRUARY 1, 2000
 Approved by: [Signature]
 Engineer of Bridges and Structures

