

# STATE OF ILLINOIS

## DEPARTMENT OF TRANSPORTATION

### PLANS FOR PROPOSED LOCAL AGENCY IMPROVEMENT FEDERAL AID BRRP PROJECT HENRY COUNTY

SECTION 04-01119-00-BR/04-04126-00-BR  
PROJECT BR05-0073(49) JOB C-92-073-04  
ALBA/ATKINSON TOWNSHIP TR 384  
CONTRACT 85352

FAS RTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 384	04-01119-00-BR 04-04126-00-BR	HENRY	13	1
F.H.W.A. REG.		ILLINOIS PROJECT	BR-05-073(49)	

85352

#### INDEX OF SHEETS

- Sheet No. 1 Cover Sheet
- Sheet No. 2 Plan & Profile
- Sheet No. 3 Cross Sections
- Sheet No. 4 Cross Sections
- Sheet No. 5 General Plan & Elevation
- Sheet No. 6 P.P.C. Deck Beam Superstructure
- Sheet No. 7 P.P.C. Deck Beam Superstructure
- Sheet No. 8 P.P.C. Deck Beam Details
- Sheet No. 9 P.P.C. Deck Beam Pile Bent Abutment
- Sheet No. 10 P.P.C. Deck Beam Pile Bent Pier
- Sheet No. 11 Type S-1 Railing
- Sheet No. 12 Name Plate
- Sheet No. 13 Pile Details

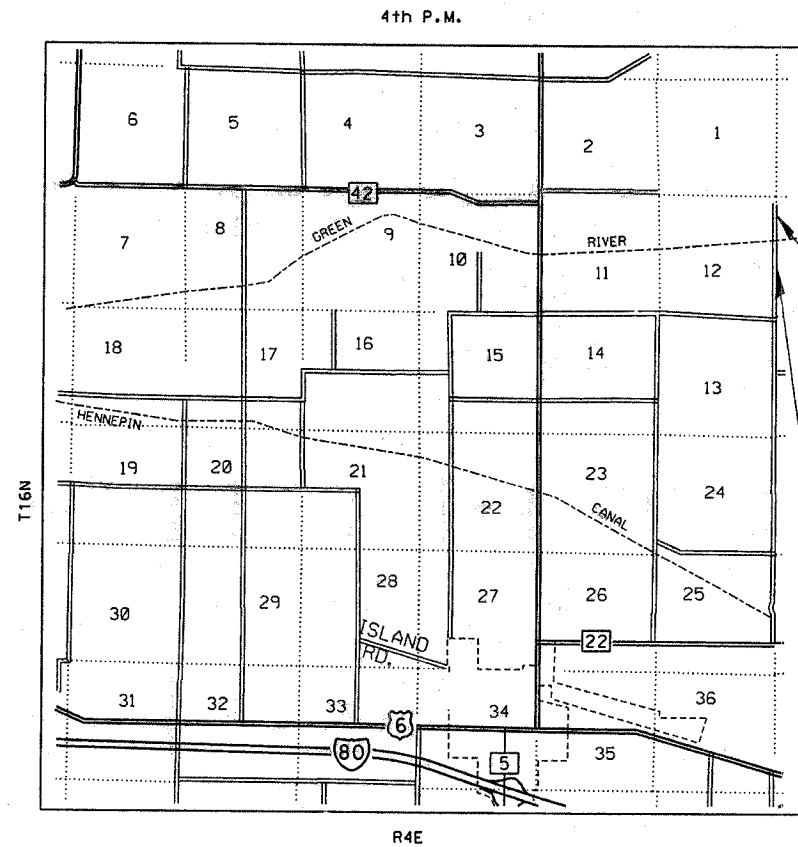
#### STANDARDS

702001-05 280001-02  
BLR 21-6

CONSTRUCTION TYPE CODE X080-2A  
SCHEDULE OF QUANTITIES

#### CODE QUANTITY UNIT DESCRIPTION

20200100	156	Cu Yd	Earth Excavation
20400800	1740	Cu Yd	Furnished Excav
25000330	0.73	Acre	Seeding C1 6
25000400	66	Pound	Nitrogen Fert Nutr
25000500	66	Pound	Phosphorus Fert Nutr
25000600	66	Pound	Potassium Fert Nutr
25100120	1.4	Ton	Mulch Method 2
28000300	6	Each	Temp Ditch Checks
28100707	262	Sq Yd	Stone Dump Rip CL A4
35101400	654	Ton	Agg Base Cse B
50100100	1	Each	Rem Exist Struct
50200100	81.8	Cu Yd	Structure Excavation
50300225	92	Cu Yd	Conc Struct
50400605	3834	Sq Ft	P P Conc Dk Bm 33 Dp
50800105	7360	Pound	Reinforcement Bars
50900205	320	Foot	Steel Railing Ty S1
51201000	1730	Foot	Fur Met Pile Shell 12
51202600	1730	Foot	Driv & Filling Shells
51203200	2	Each	Test Pile Met Shells
51500100	1	Each	Name Plates
542D1060	30	Foot	P Cul CI D 2 15
542D1069	98	Foot	P Cul CI D 2 24
X5020501	1	Each	Unwat Str Ex Prot L1
X5020502	1	Each	Unwat Str Ex Prot L2



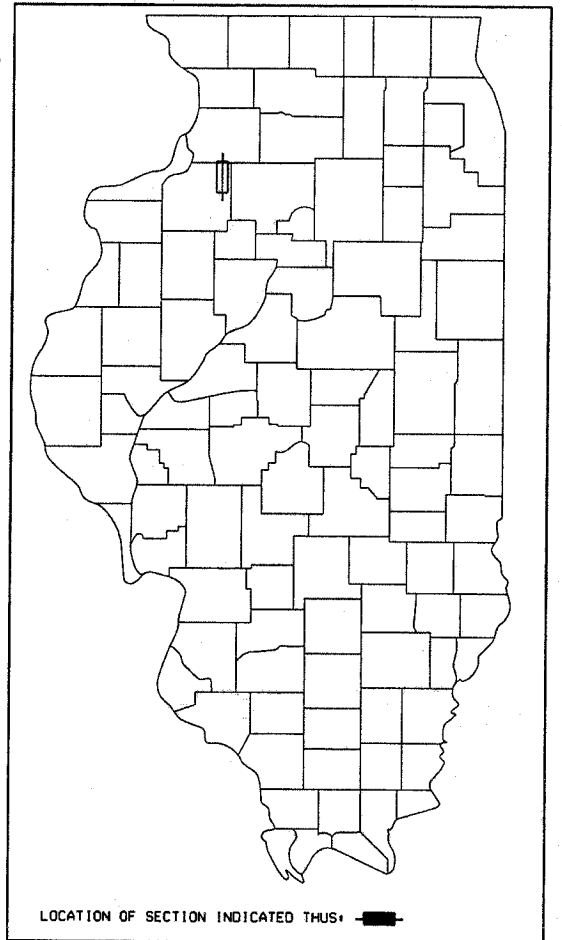
#### LOCATION MAP

NET LENGTH OF SECTION = 825 FEET = 0.16 MILES

Section 04-01119-00-BR/04-04126-00-BR  
Ends at Station 111+25.

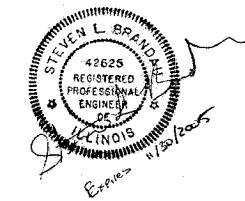
Section includes a three span bridge  
(40'.80'.40') with precast prestressed  
concrete deck beams (33" deep) on pile  
bent concrete abutments. Also included  
are aggregate surface approach roadways.

SECTION 04-01119-00-BR/04-04126-00-BR  
Begins at Station 103+00.



THESE PLANS WERE PREPARED BY ME OR  
BY THE FULL TIME MEMBERS OF MY STAFF.

*Steven L. Brandau*  
STEVEN L. BRANDAU  
P.E. 42625



STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS	
APPROVED <i>[Signature]</i> 20	COUNTY ENGINEER
PASSED FEB 23 2005 20	DISTRICT ENGINEER OF LOCAL ROADS & STREETS
APPROVED FEB 23 2005 20	<i>[Signature]</i> DISTRICT ENGINEER

CALL J.U.L.I.E.  
BEFORE YOU DIG  
800-892-0123

RURAL LOCAL ROAD (ADT 0-250)

FAS RTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 384	04-01119-00-BR 04-04126-00-BR	HENRY	13	2
F.H.W.A. REG.	ILLINOIS	PROJECT	BR-OS-073(49)	

B.M. 1 - 60p Nail in Power Pole  
Sta. 106 + 96 13' Left  
Elev. 201.50

B.M. 2 - 60p Nail in Power Pole  
Sta. 109 + 79 53' Right  
Elev. 202.16

**PROPOSED STRUCTURE:** A Three Span (40-80-40)  
Precast Prestressed Concrete Deck Beam (33")  
Bridge on Pile Bent Abutments and Concrete Encased  
Pile Bent Piers

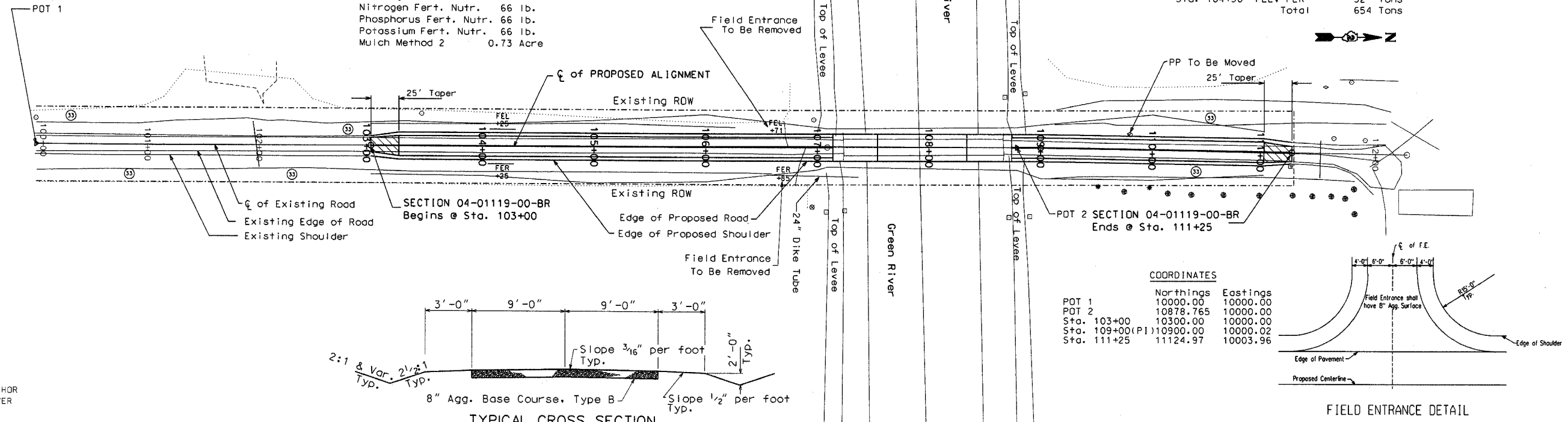
**EXISTING STRUCTURE:** A Single Span Steel Throug  
Truss (140') on Closed Concrete Abutments

**SEEDING QUANTITIES**

Seeding Class 6 0.73Acre  
Nitrogen Fert. Nutr. 66 lb.  
Phosphorus Fert. Nutr. 66 lb.  
Potassium Fert. Nutr. 66 lb.  
Mulch Method 2 0.73 Acre

**AGGREGATE BASE COURSE, TYPE B**

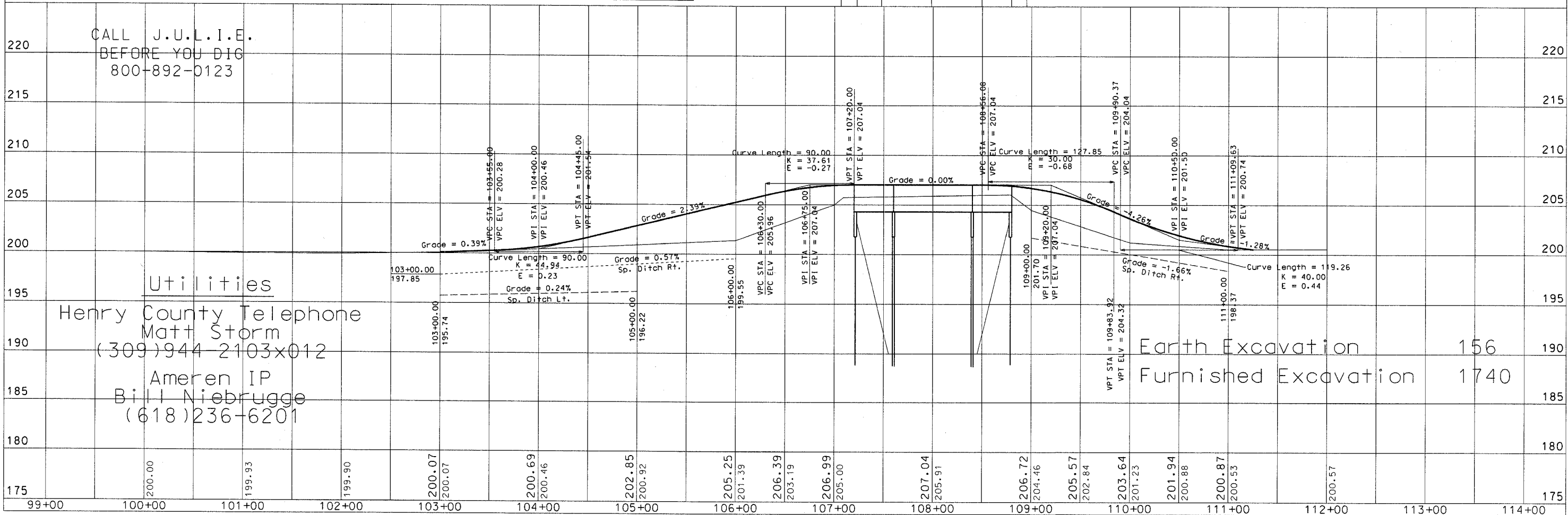
Sta. 103+00 To 107+19.25 381 Tons  
Sta. 108+80.75 To 111+25 221 Tons  
Sta. 104+50 FEL, FER 52 Tons  
Total 654 Tons



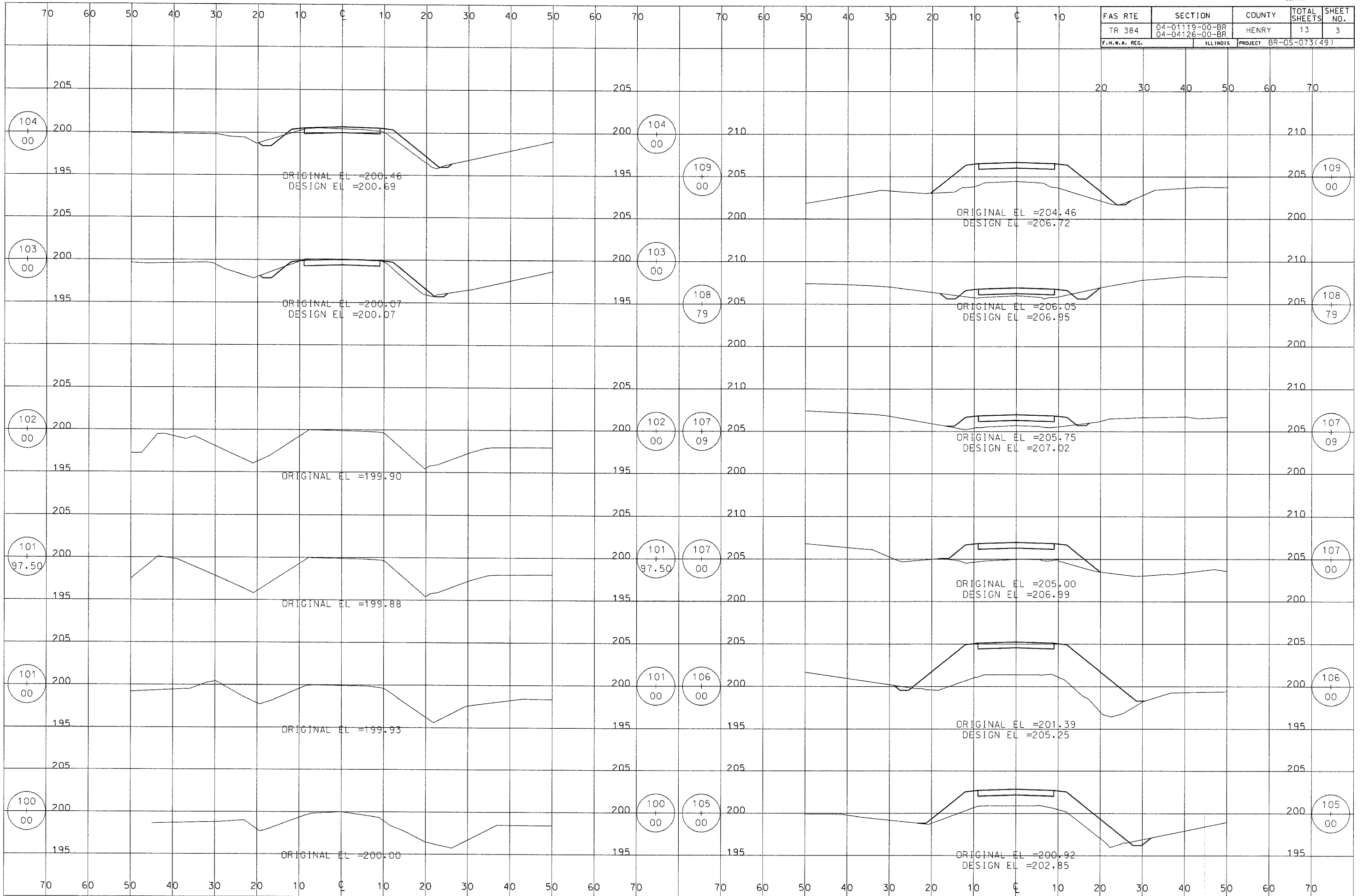
**COORDINATES**

	Northings	Eastings
POT 1	10000.00	10000.00
POT 2	10878.765	10000.00
Sta. 103+00	10300.00	10000.00
Sta. 109+00 (PI)	10900.00	10000.02
Sta. 111+25	11124.97	10003.96

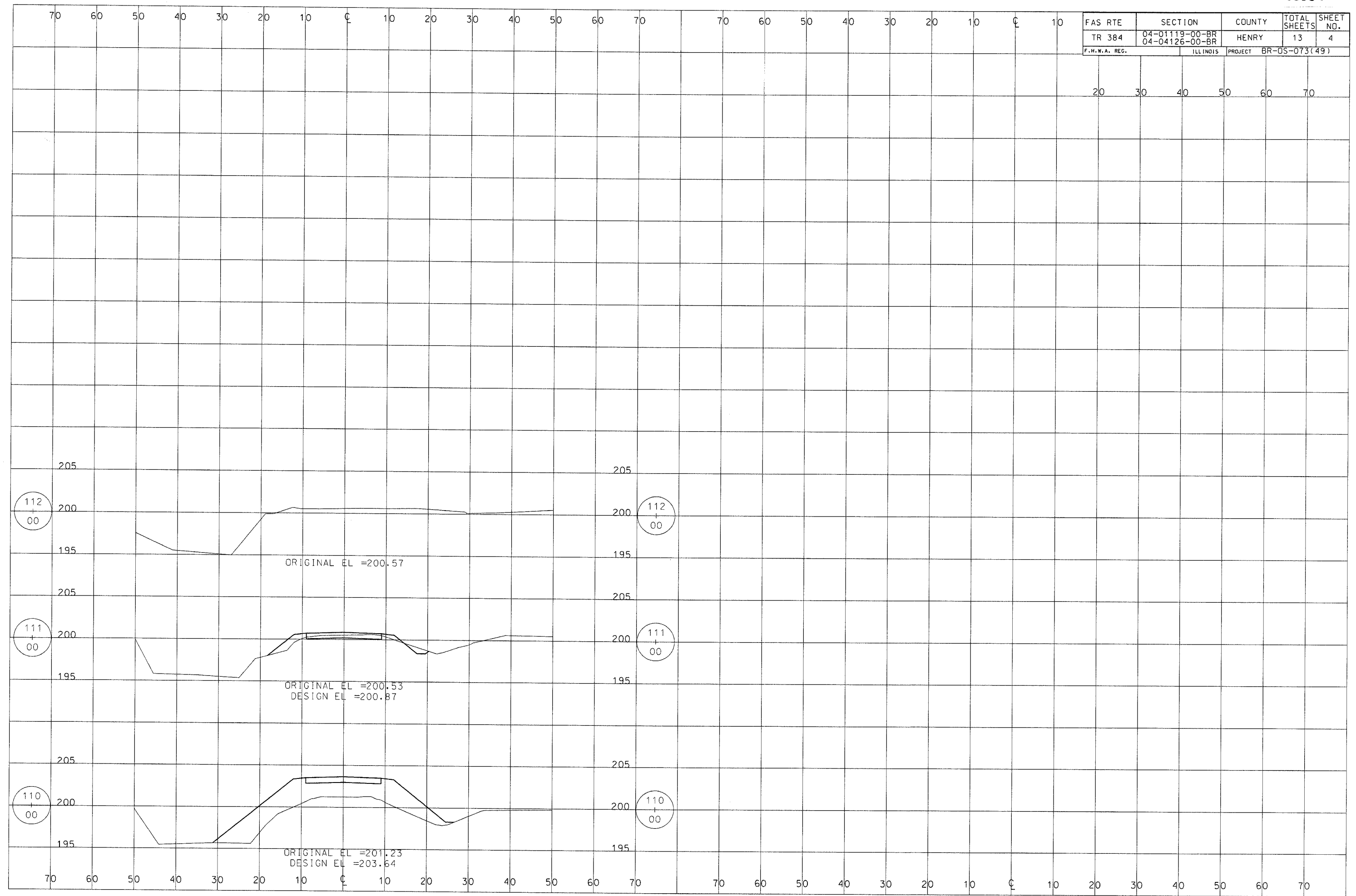
SCALES:  
1" = 50' HOR  
1" = 5' VER



CALL J.U.L.I.E.  
BEFORE YOU DIG  
800-892-0123



FAS RTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 384	04-01119-00-BR 04-04126-00-BR	HENRY	13	4
F.H.W.A. REG.	ILLINOIS	PROJECT	BR-OS-073(49)	



112  
+  
00

112  
+  
00

111  
+  
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111  
+  
00

110  
+  
00

110  
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00

ORIGINAL EL =200.57

ORIGINAL EL =200.53  
DESIGN EL =200.87

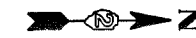
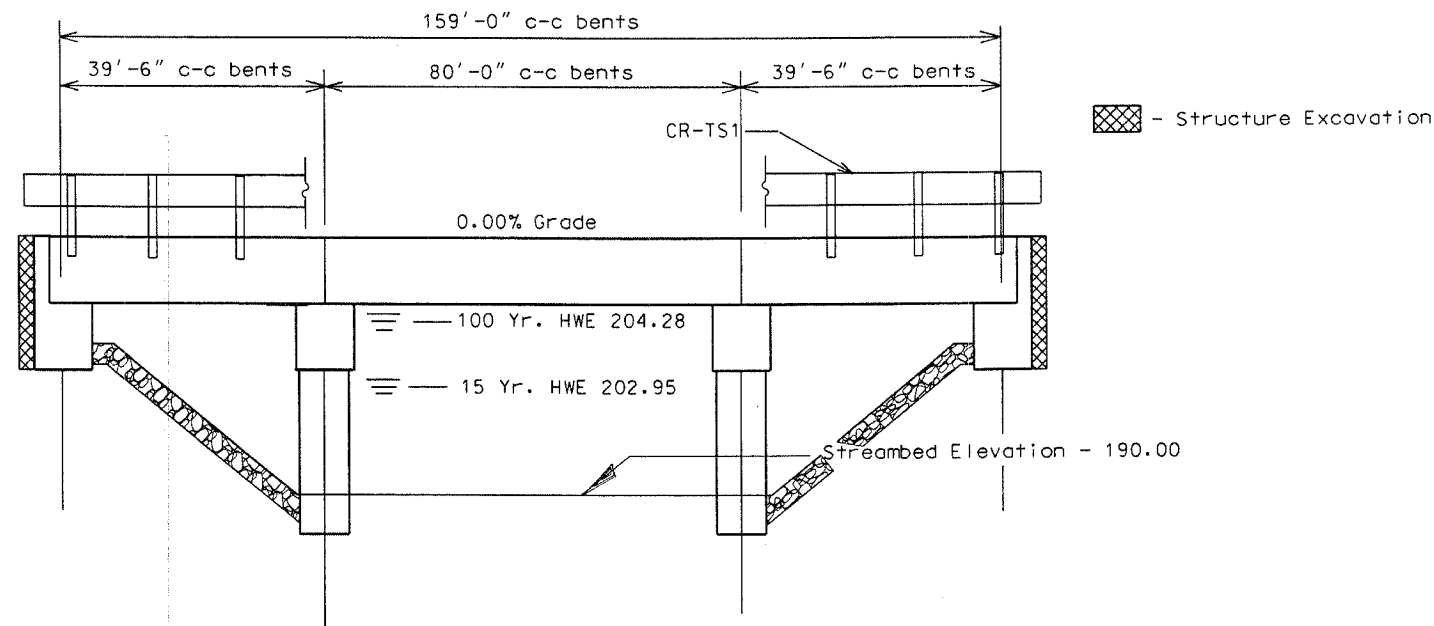
ORIGINAL EL =201.23  
DESIGN EL =203.64

B.M. 1 60p Nail in Power Pole  
Sta. 106+96, 13' Lt.  
Elev. 201.50

B.M. 2 60p Nail in Power Pole  
Sta. 109+79, 53' Rt.  
Elev. = 202.16

Existing Structure is a single span (140') through truss bridge on closed concrete abutments.

Any salvageable material shall become the property of the Henry County Highway Department



FAS RTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 384	04-01119-00-BR 04-04126-00-BR	HENRY	13	5
F.H.W.A. REG.		ILLINOIS	PROJECT	

**GENERAL NOTES**

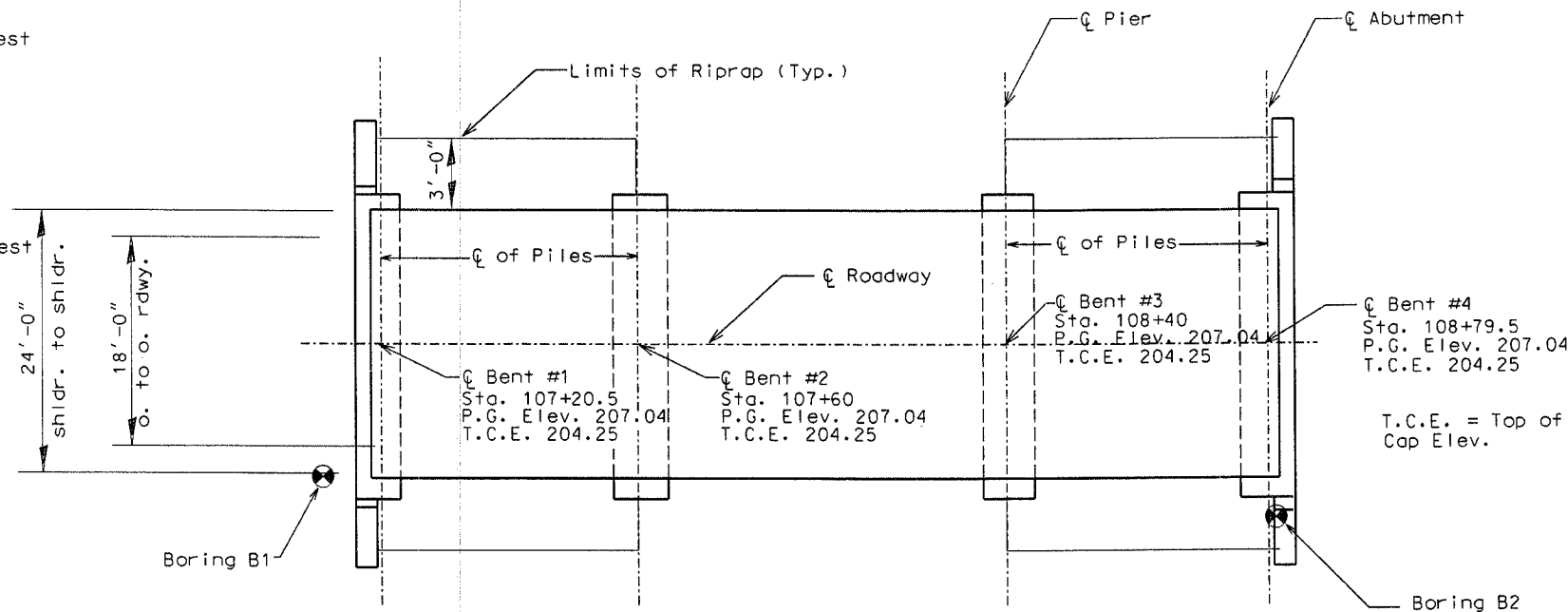
1. The Contractor shall drive 2 test pile @ Bent #1 and Bent #2, as specified in a permanent location as directed by the Engineer before ordering the remaining piles.
2. See Special Provisions for boring logs.
3. A Calcium Nitrite Corrosion inhibitor, as covered in the Special Provisions, shall be used in the concrete for precast prestressed concrete deck beams.
4. The abutments shall not be backfilled until the deck beams are in place and dowel pins have been grouted and cured.
5. Reinforcement bars shall conform to AASHTO M-31, M-42 or M-53, Grade 60.
6. Underwater Structure Excavation protection shall be applied to bent #2 and bent #3.

**PILE DATA - (2 ABUTS)**

Type Metal Shell, 12"  
Capacity 33 Ton  
Est. Length 65 Feet  
Number Req. 8 (Includes 1 Test Pile Located in Bent # 1)

**PILE DATA - (2 PIERS)**

Type Metal Shell, 12"  
Capacity 38 Ton  
Est. Length 85 Feet  
Number Req. 16 (Includes 1 Test Pile Located in Bent # 2)



**TOTAL BILL OF MATERIAL**

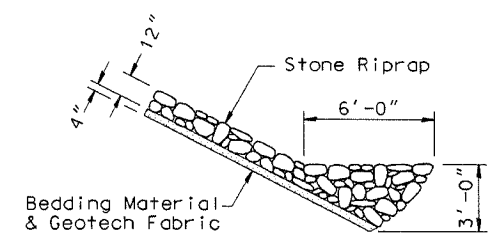
ITEM	UNIT	SUPER	SUB	TOTAL
Removal of Existing Structure	Each			1
Stone Dumped Riprap, Class C4	Sq. Yd		262	262
P.P. Conc. Deck Beam 33"	Sq. Ft	3834		3834
Furnishing Metal Shell Pile, 12"	Foot		1730	1730
Driving and Filling Shells	Foot		1730	1730
Test Piles Metal Shell	Each		2	2
Concrete Structures	Cu. Yd		92.0	92.0
Reinforcement Bars	Pound		7360	7360
Structure Excavation	Cu. Yd		81.8	81.8
Name Plate	Each		1	1
Steel Railing, Type S-1	Foot	320		320
Underwater Str Ex Protection L1	Each		1	1
Underwater Str Ex Protection L2	Each		1	1

STATION 108+00 GREEN RIVER  
BUILT 2005  
SEC. 04-01119-00-BR/04-01126-00-BR  
ALBA/ATKINSON ROAD DISTRICT  
HENRY COUNTY  
LOADING HS20-44  
STR. NO. 037-3356

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 this style of structure and complies with the requirements of the current AASHTO Standard Specifications for highway bridges.



*Keith E. Brandau*  
Keith E. Brandau Date  
Illinois Structural No. 4905  
License Expires 11/30/2006



**STONE RIPRAP ANCHOR DETAIL**

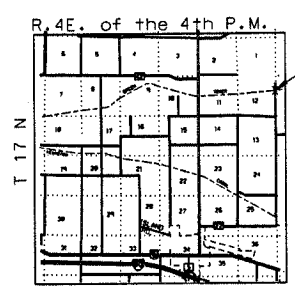
**DESIGN SPECIFICATIONS**

2002 AASHTO, W/ Applicable Interims  
HS20-44 Loading Load Factor Design

**WATERWAY INFORMATION**

Drainage Area = 645 Sq. Miles Low Grade Elev. 199.90 @ Sta. 102+00

Flood	Freq. Yr.	Q C.F.S.	Opening Sq. Ft.		Natural H.W.E.		Head - Ft.		Headwater El.	
			Exist.	Prop.	Exist.	Prop.	Exist.	Prop.	Exist.	Prop.
Design	15	8377	1500	1561	202.81		0.05	0.14	202.86	202.95
Base	100	10699	1500	1561	204.12		0.18	0.16	204.30	



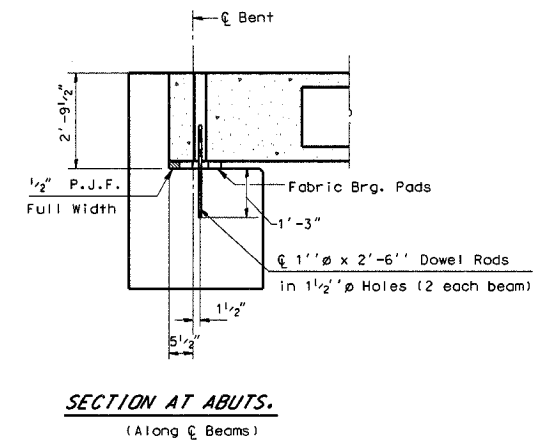
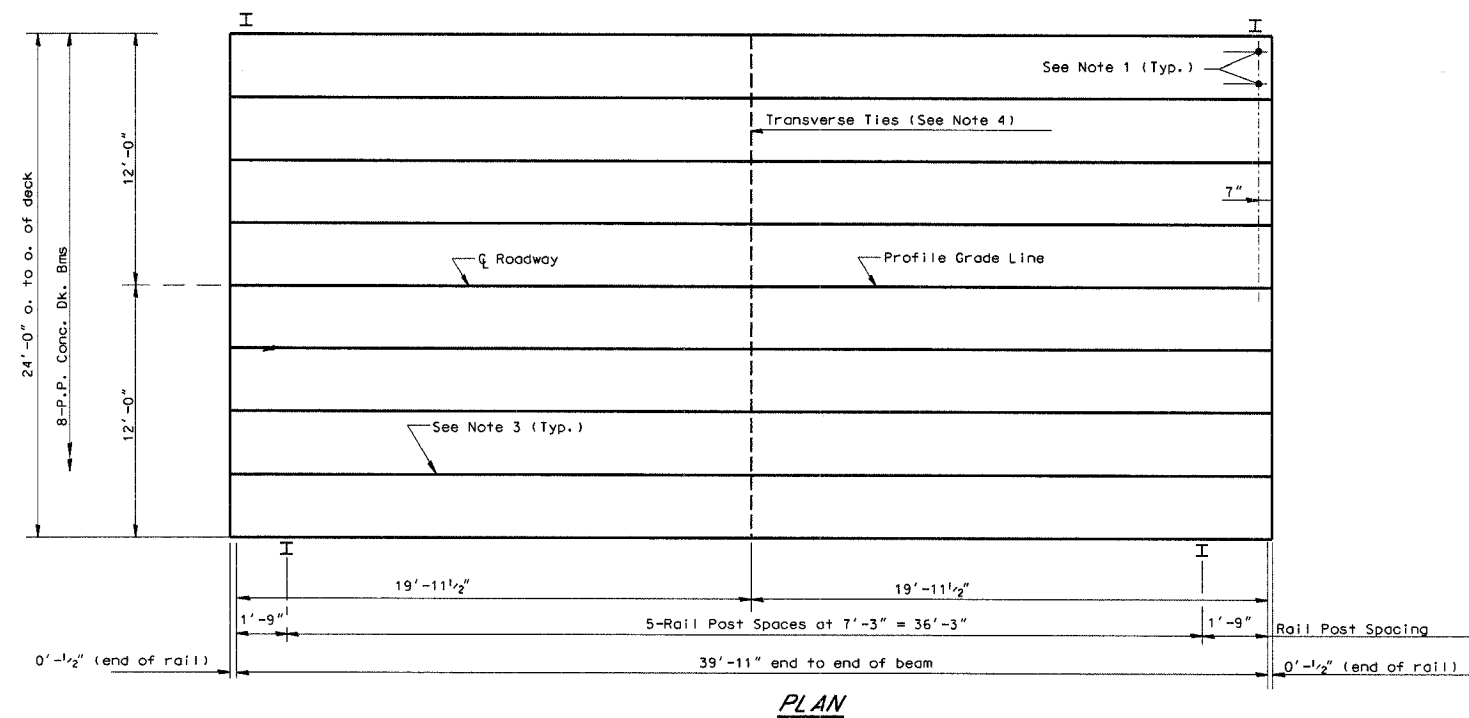
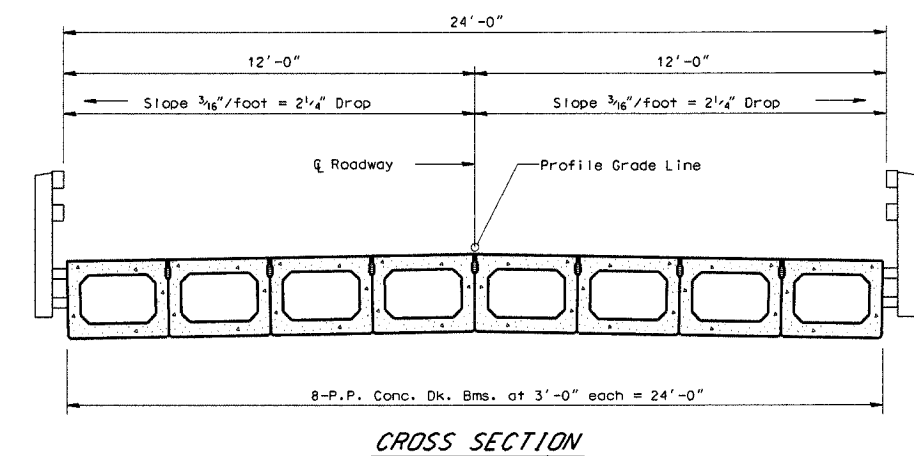
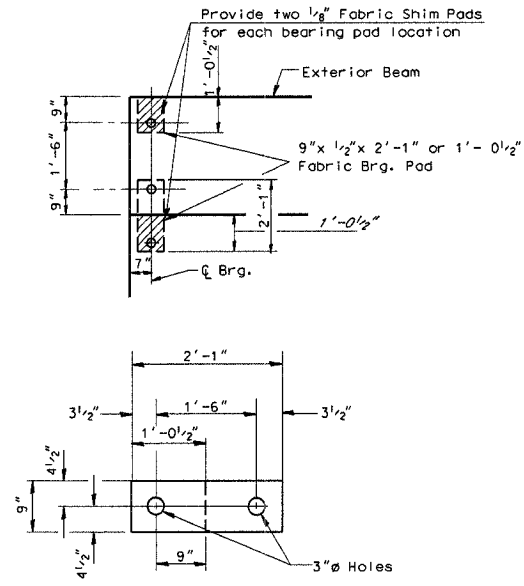
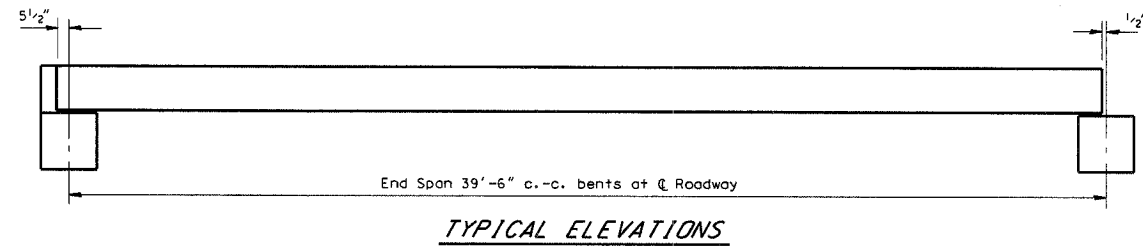
**LOCATION SKETCH**

**GENERAL PLAN & ELEVATION**

TR 384  
SECTION 04-01119-00-BR  
04-04126-00-BR

HENRY COUNTY  
ALBA/ATKINSON ROAD DISTRICT  
STR. NO. 037-3356

FAS RTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 384	04-01119-00-BR 04-04126-00-BR	HENRY	13	6
F.W.W.A. REG.	ILLINOIS	PROJECT	BR-OS-073(49)	



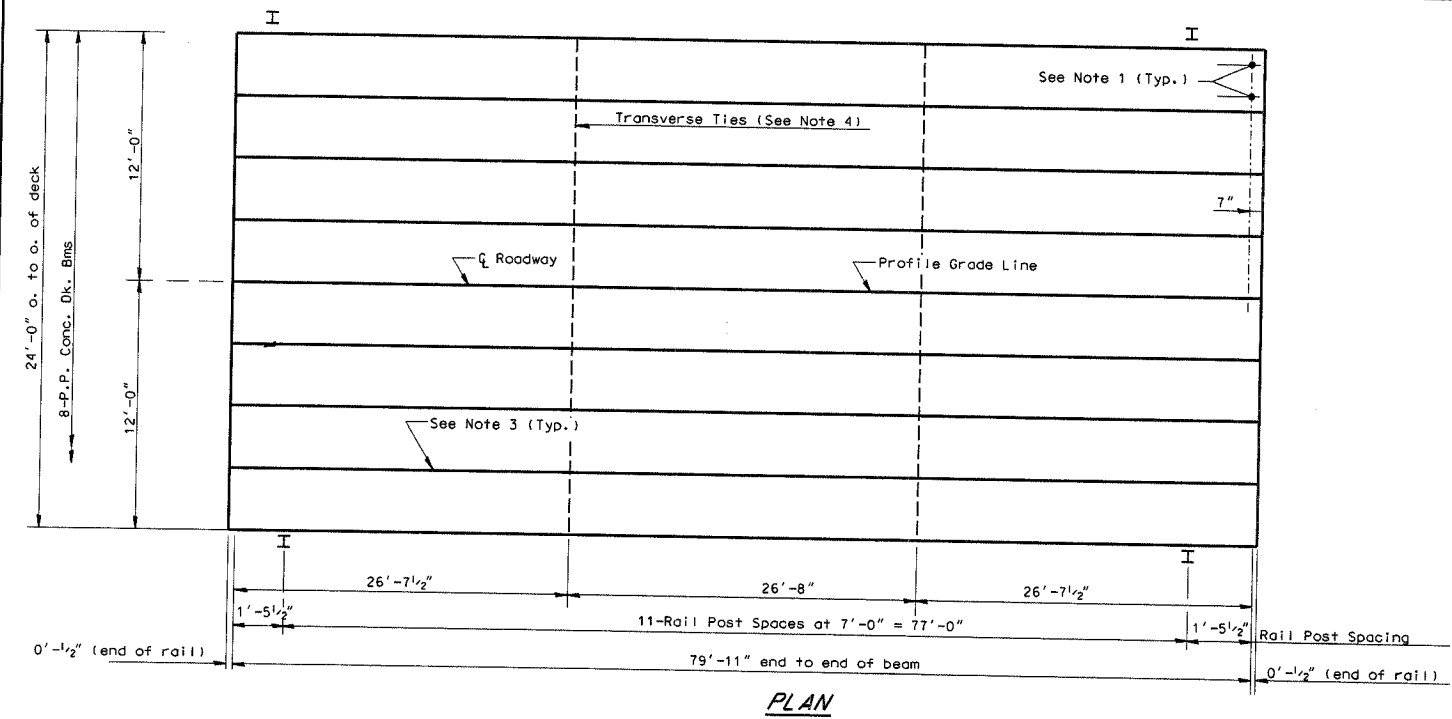
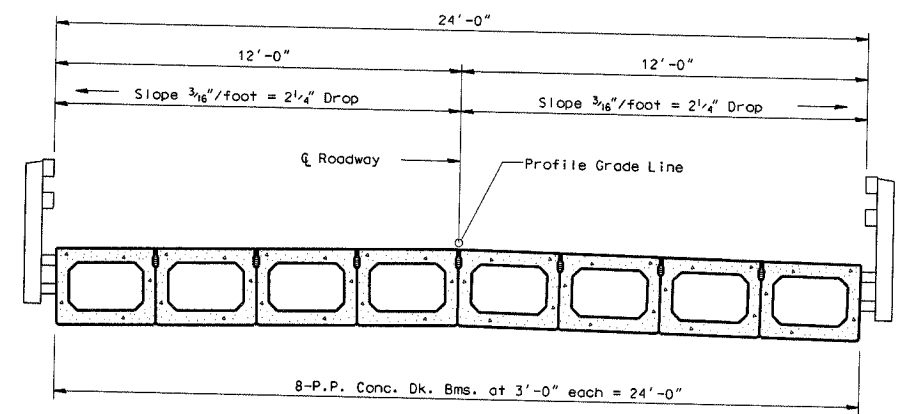
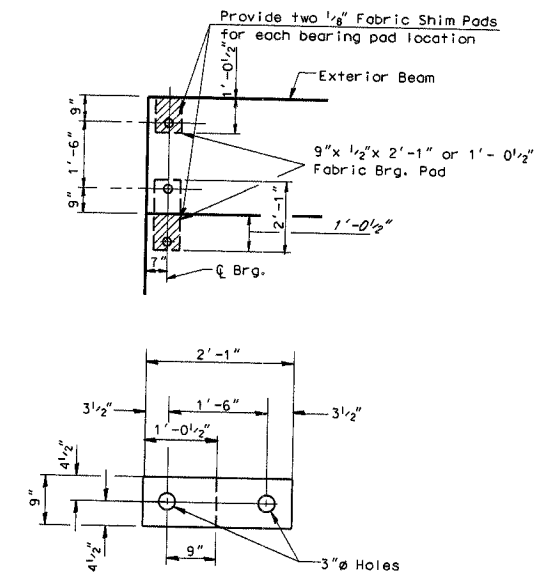
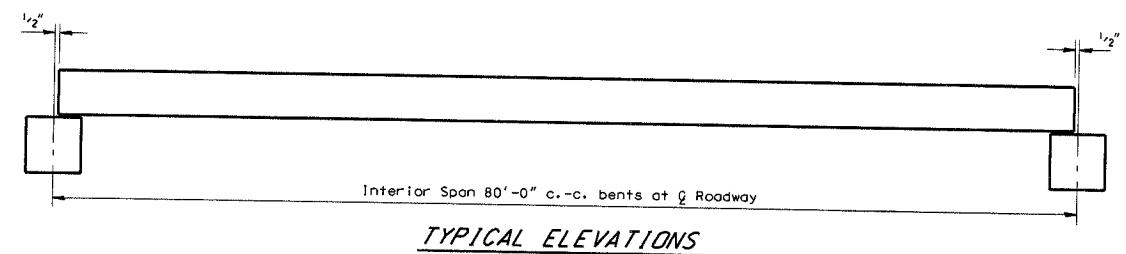
**QUANTITIES FOR ONE SPAN**

P.P. Conc. Dk. Bm. 33" Dp.	958 Sq. Ft.
Steel Railing	80 Ft.

- NOTES**
- After beams have been erected, holes shall be drilled into substructure and anchor dowels placed. Dowel holes shall be filled with non-shrink grout to top of beam and allowed to cure min. 24 hrs. prior to grouting the shear keys.
  - Nominal 1" joint at  $\bar{C}$  Pier shall be filled with non-shrink grout.
  - Longitudinal keys shall be grouted.
  - The 1"  $\bar{\phi}$  rods in the transverse tie assembly shall be tightened to a snug fit and the threads set. Pockets that receive transverse tie bar outside shall be filled with grout after transverse tie assembly is in place.

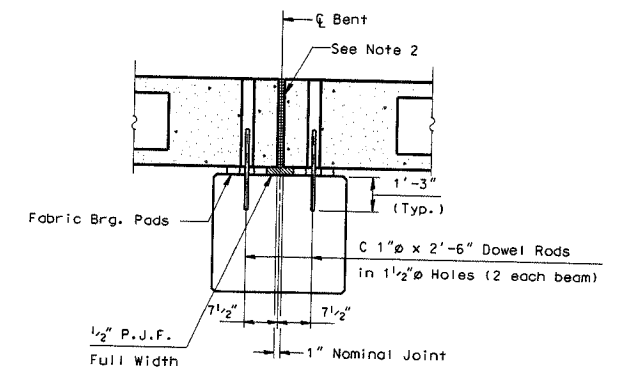
P.P.C. DECK BEAM SUPERSTRUCTURE			
24' RDWY.	33' BMS.	40' SPAN	0° SKEW

FAS RTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 384	04-01119-00-BR 04-04126-00-BR	HENRY	13	7
F.H.W.A. REG.	ILLINOIS PROJECT	BR-OS-073(49)		



**NOTES**

1. After beams have been erected, holes shall be drilled into substructure and anchor dowels placed. Dowel holes shall be filled with non-shrink grout to top of beam and allowed to cure min. 24 hrs. prior to grouting the shear keys.
2. Nominal 1" joint at  $\bar{Q}$  Pier shall be filled with non-shrink grout.
3. Longitudinal keys shall be grouted.
4. The 1"  $\bar{\phi}$  rods in the transverse tie assembly shall be tightened to a snug fit and the threads set. Pockets that receive transverse tie bar outside shall be filled with grout after transverse tie assembly is in place.

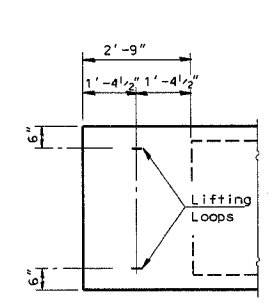
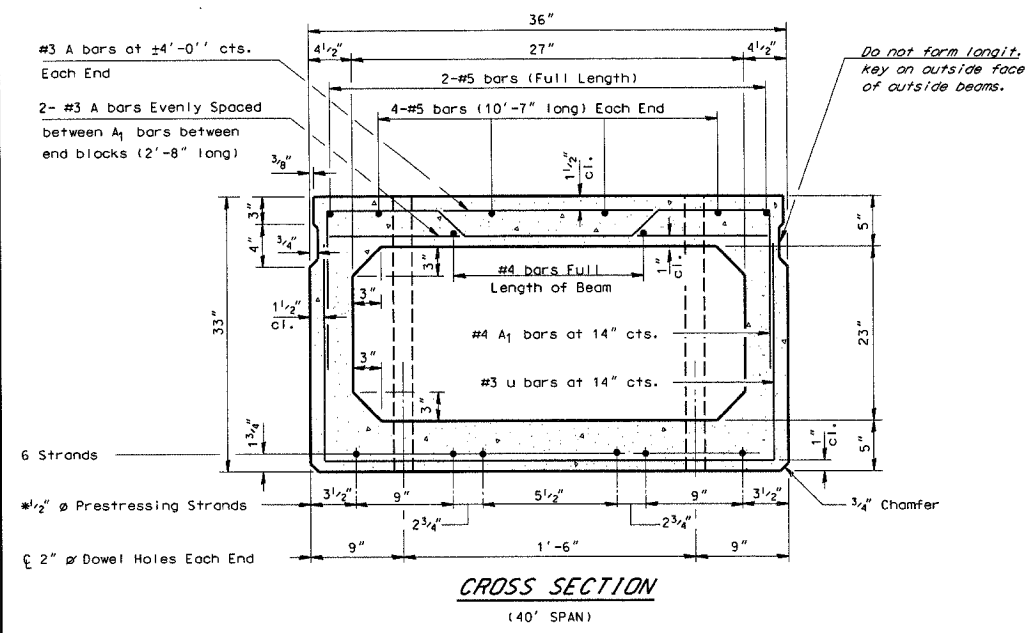


**QUANTITIES FOR ONE SPAN**

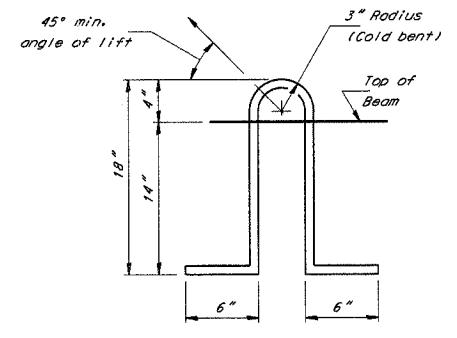
P.P. Conc. Dk. Bm. 33" Op.	1918 Sq. Ft.
Steel Railing	160 Ft.

<b>P.P.C. DECK BEAM SUPERSTRUCTURE</b>			
24' RDWY.	33' BMS.	80' SPAN	0° SKEW

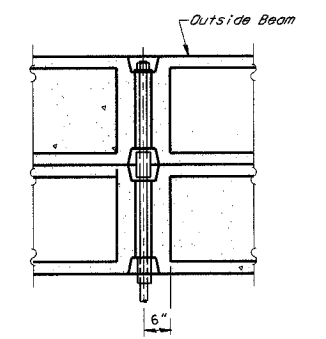
FAS RTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 384	04-01119-00-BR 04-04126-00-BR	HENRY	13	8
F.W.W.A. REG.	ILLINOIS	PROJECT BR-OS-073(49)		



Each beam shall have four Lifting Loops, two at each end of beam cast in locations shown above. Loops shall be burned off after beams have been erected.

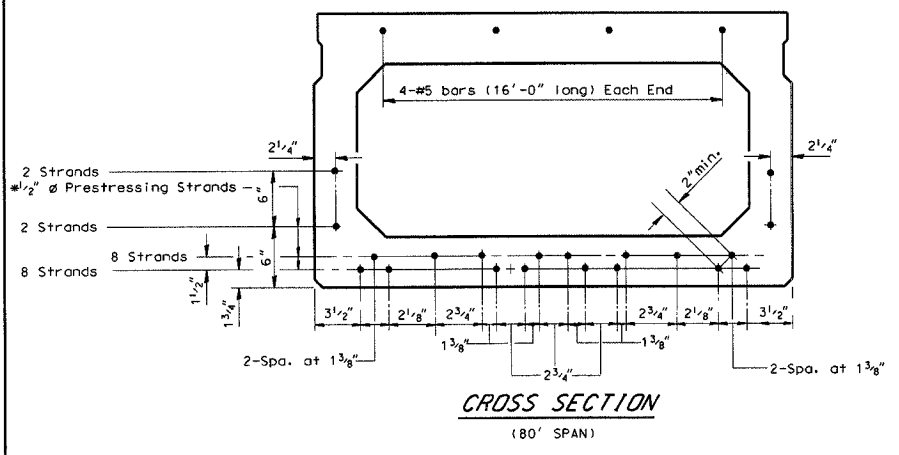


Lifting loops shall be 3, 1/2"  $\phi$ -270 ksi strands, as shown. Alternate approved lifting devices are also acceptable.

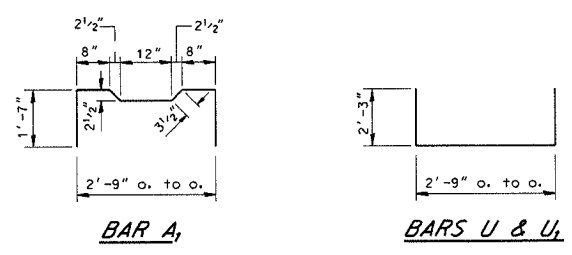
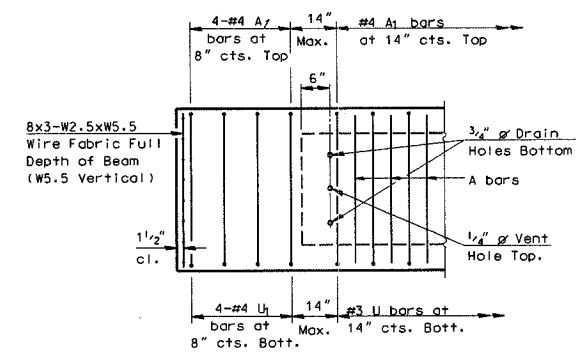


\*Stressed to 28,900 lbs.

NOTE:  
Place strands symmetrically about  $\bar{C}$  of beam.



NOTE  
The std. reinf. shown on the 40' span cross section is typical for all spans, except as shown.

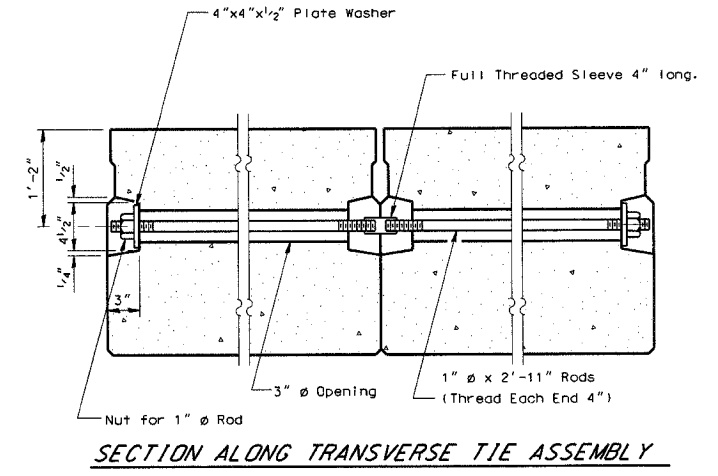


**DESIGN STRESSES**

- $f'_c = 5,000$  p.s.i.
- $f'_ci =$  (See Required Release Strength Table)
- $f'_s = 270,000$  p.s.i. (1/2"  $\phi$  Strand)
- $f_{si} = 189,000$  p.s.i. (1/2"  $\phi$  Strand)
- $f_y = 60,000$  p.s.i.

**REQUIRED RELEASE STRENGTH**

Span	$f'_ci$ (psi)
40'	4,000
80'	4,100



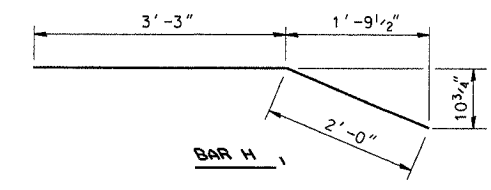
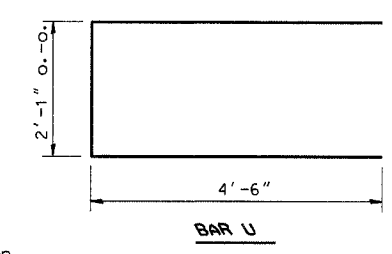
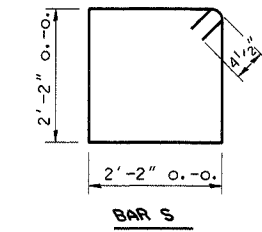
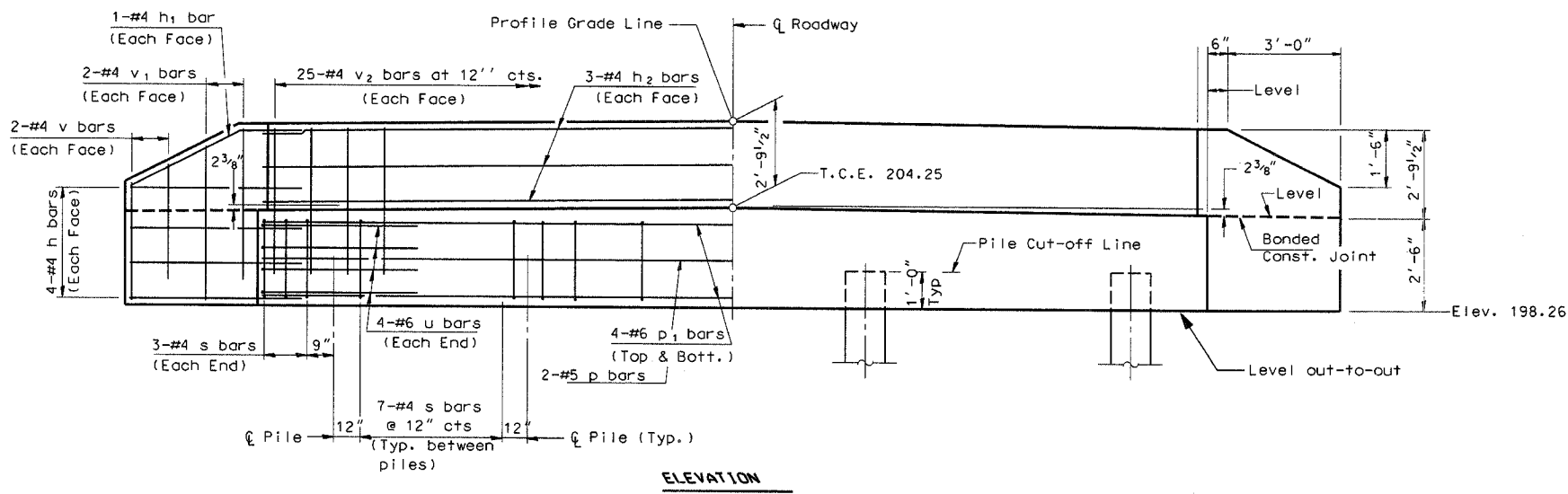
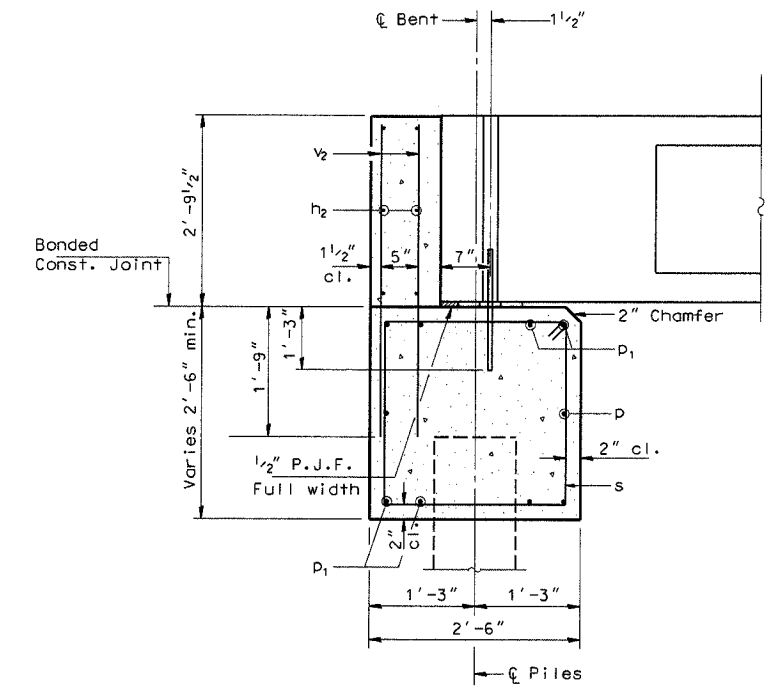
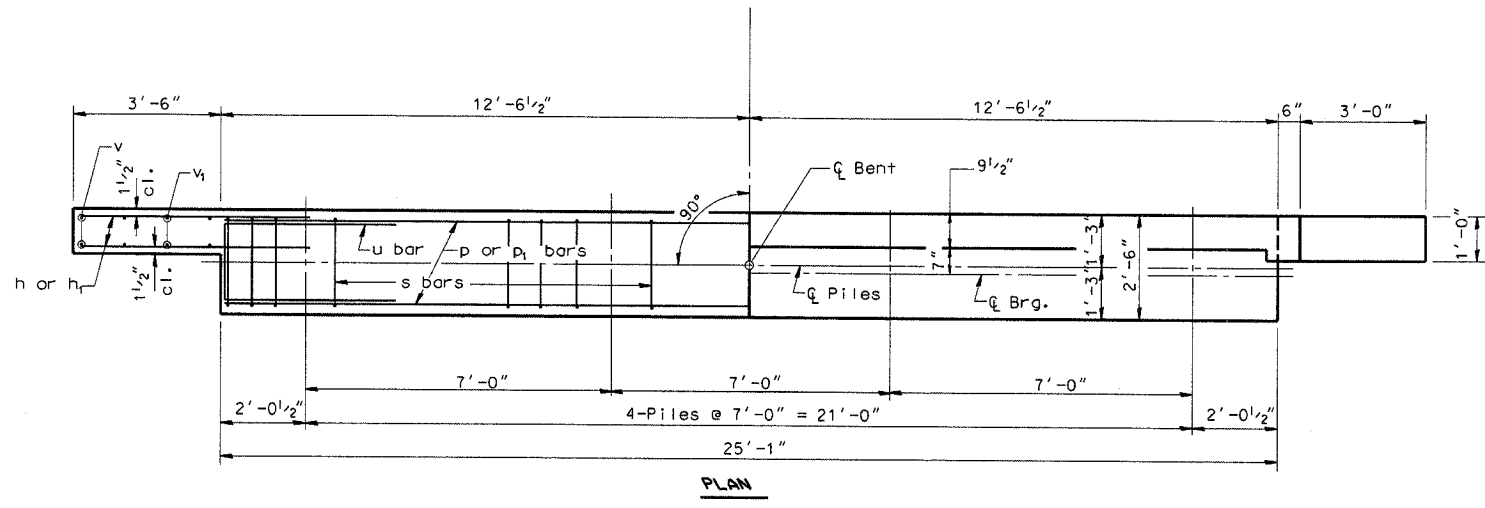
**NOTES**

- 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 square inches.
- Reinforcement bars shall conform to AASHTO M-31, M-42 or M-53, Grade 60.
- Rail Post anchor devices shall be cast into outside beam as elsewhere specified.
- The top surface of the beams shall be finished in accordance with Article 504.06 of the Standard Specifications. The finished surface shall be free of depressions or high spots with sharp corners, and the top edge of the keys shall be rounded or chamfered a minimum of 1/4".
- 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.

<b>P.P.C. DECK BEAM DETAILS</b>	
24' ROADWAY	33" x 36" BEAMS



FAS RTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 384	04-01119-00-BR 04-04126-00-BR	HENRY	13	9
F.H.W.A. REG.	ILLINOIS	PROJECT	BR-OS-073(49)	



**BILL OF MATERIAL FOR ONE ABUTMENT**

Bar	No.	Size	Length	Shape
h	16	#4	5'-0"	—
h1	4	#4	5'-3"	—
h2	6	#4	24'-9"	—
p	2	#5	24'-9"	—
p1	8	#6	24'-9"	—
s	27	#4	9'-5"	□
u	8	#6	11'-1"	□
v	8	#4	3'-2"	—
v1	8	#4	4'-2"	—
v2	50	#4	4'-3"	—
Concrete Structures			Cu. Yd.	9.4
Reinforcement Bars			Pound	1000
Structure Excavation			Cu. Yd.	14.4

**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.

**MAXIMUM PILE LOADS**

SPAN	TONS
40'	34
50'	38
60'	43

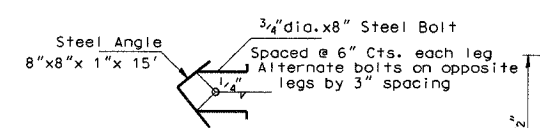
**DESIGN STRESSES**

f'c = 3,500 psi  
fy = 60,000 psi

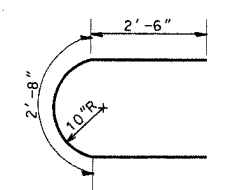
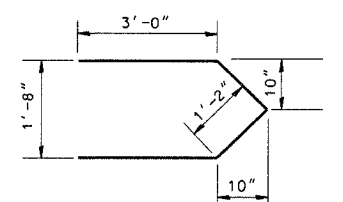
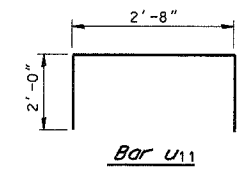
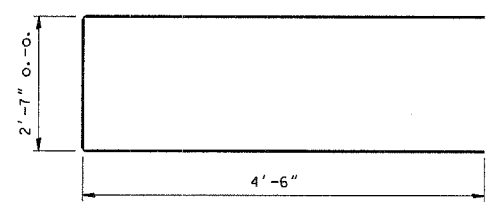
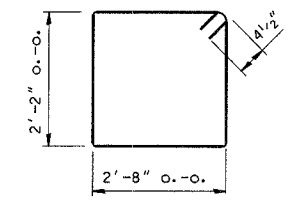
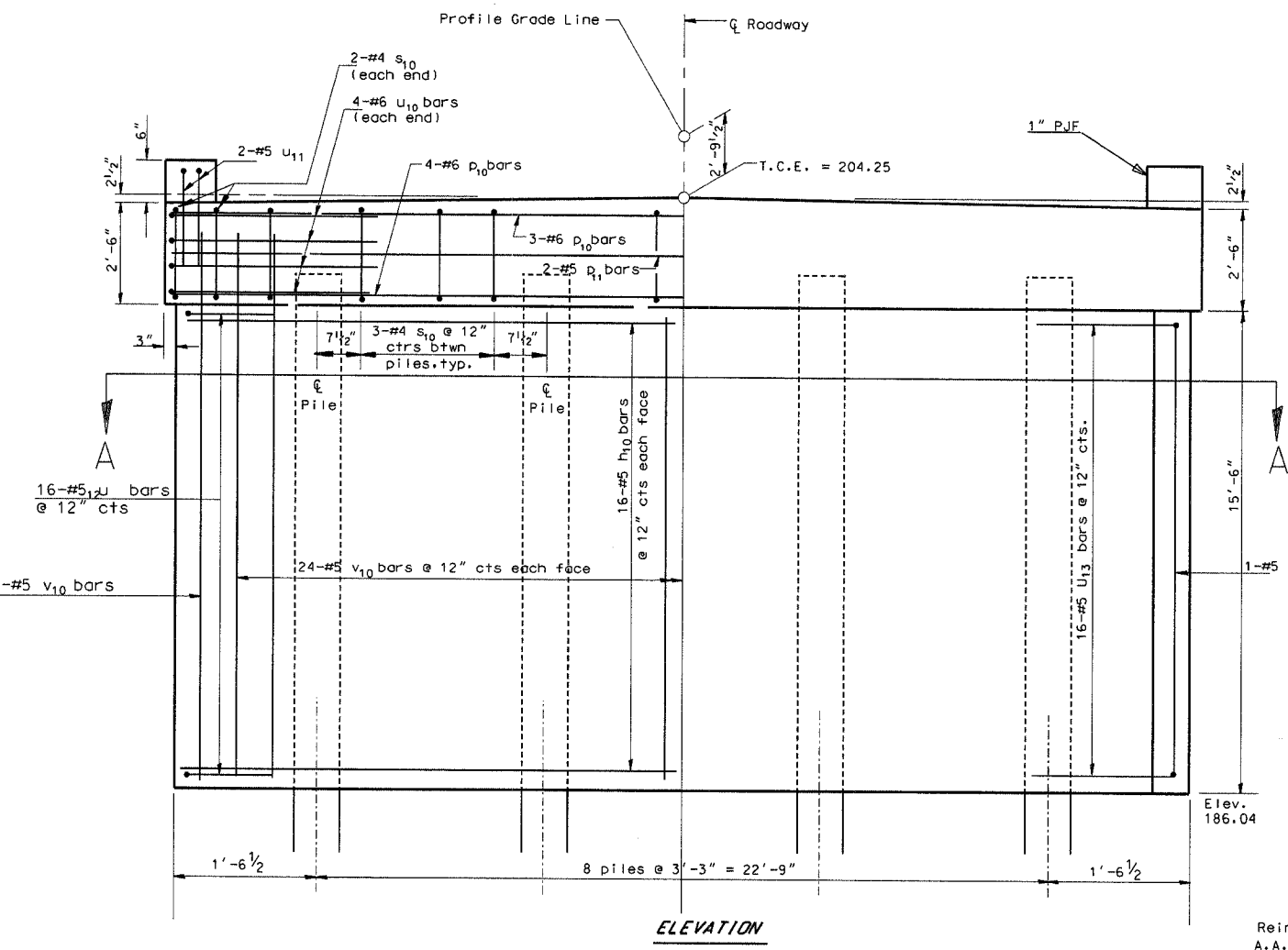
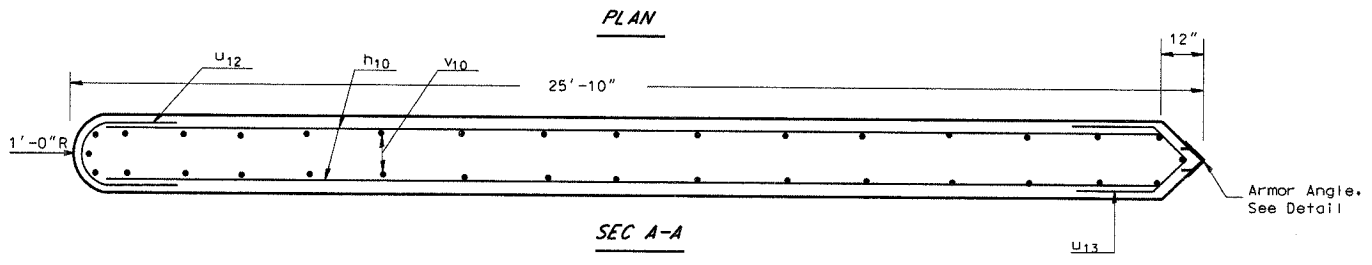
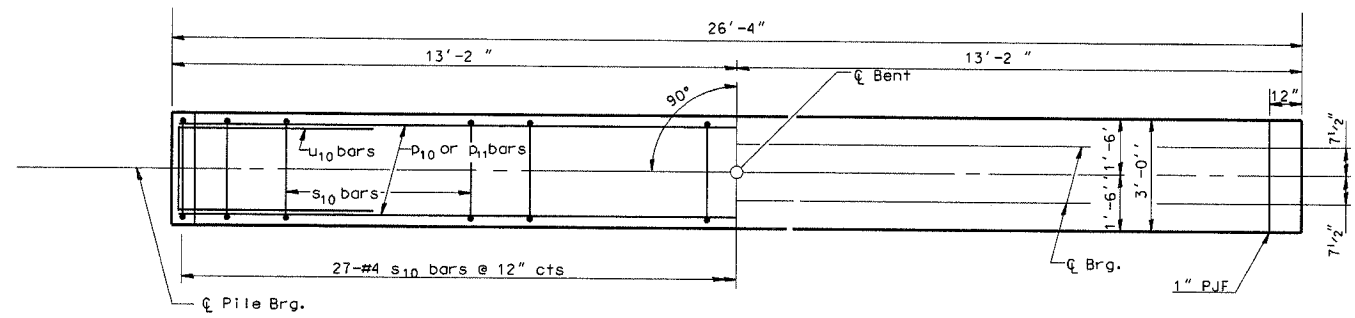
P.P.C. DECK BEAMS		
PILE BENT ABUTMENT		
24' RDWY	33" BMS	0° SKEW

FAS RTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 384	04-01119-00-BR 04-04126-00-BR	HENRY	13	10
F.H.W.A. REG.	ILLINOIS	PROJECT	BR-OS-073(49)	

**DETAIL A  
DETAIL OF ARMOR ANGLE**



Place Armor Angle on Upstream End of Piers Only. Cast assembly with piers. Maintain a minimum of 2" clearance between armor angle and reinforcement. The Armor Angle shall be galvanized in accordance with AASHTO M-111 and ASTM A-385. Cost of Armor Angle shall be included in concrete structures. Total Furnished Weight is Approx. 1690 lbs. total, both piers.



**BILL OF MATERIAL  
FOR ONE PIER**

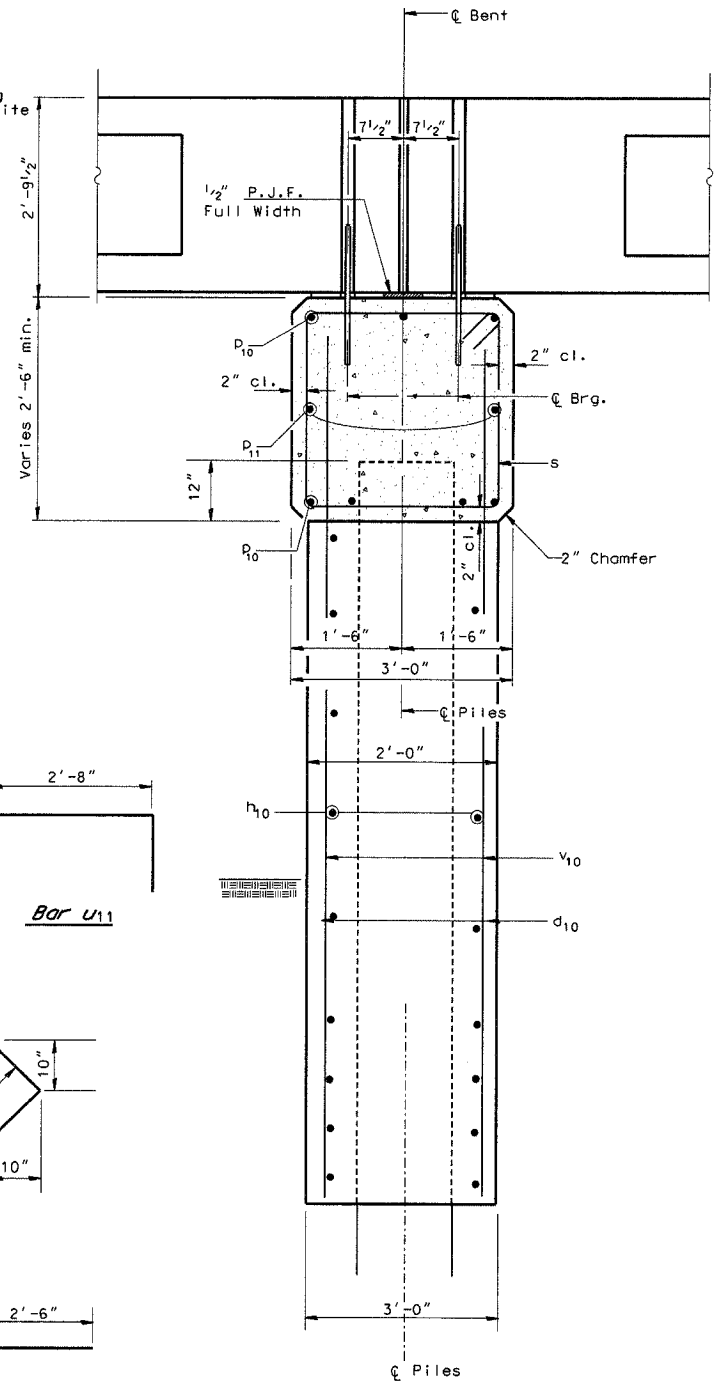
Bar	No.	Size	Length	Shape
n <sub>10</sub>	32	#5	23'-10"	—
p <sub>10</sub>	7	#5	26'-0"	—
p <sub>11</sub>	2	#5	26'-0"	—
s <sub>10</sub>	25	#4	10'-5"	□
u <sub>10</sub>	8	#6	11'-7"	—
u <sub>11</sub>	4	#5	6'-8"	—
u <sub>12</sub>	16	#5	7'-8"	—
u <sub>13</sub>	16	#5	8'-4"	—
v <sub>10</sub>	52	#5	17'-6"	—
Concrete Structures			Cu. Yds.	36.6
Reinforcement Bars			Pound	2680
Structure Excavation			Cu. Yds.	26.5

**NOTE**

Reinforcement bars shall conform to A.A.S.H.T.O. M-31, M-42 or M-53, Grade 60.

**DESIGN STRESSES**

f'c = 3,500 psi  
fy = 60,000 psi



P.P.C. DECK BEAMS PILE BENT PIER		
24' RDWY.	33' BMS.	

FAS RTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 384	04-01119-00-BR 04-04126-00-BR	HENRY	13	11
F.H.W.A. REG.	ILLINOIS	PROJECT BR-05-073(49)		

**NOTES**

Hollow structural steel tubing shall conform to the requirements of ASTM designation A-500 Grade B Structural Steel Tubing and shall meet the longitudinal CWN 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.

Bolts, cap screws, and nuts shall conform to the requirement of ASTM designation A-307 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 in accordance with AASHTO M-232.

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

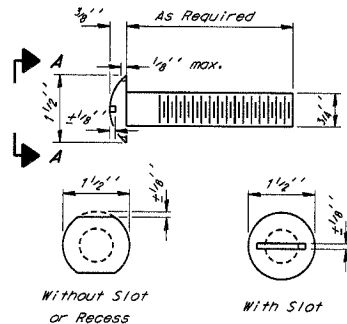
For multi-span bridges, sufficient 1/4" x 6" x 1'-2" galvanized steel shims shall be provided to align rail between adjacent spans. Cost incidental to Steel Railing, Type S-1.

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

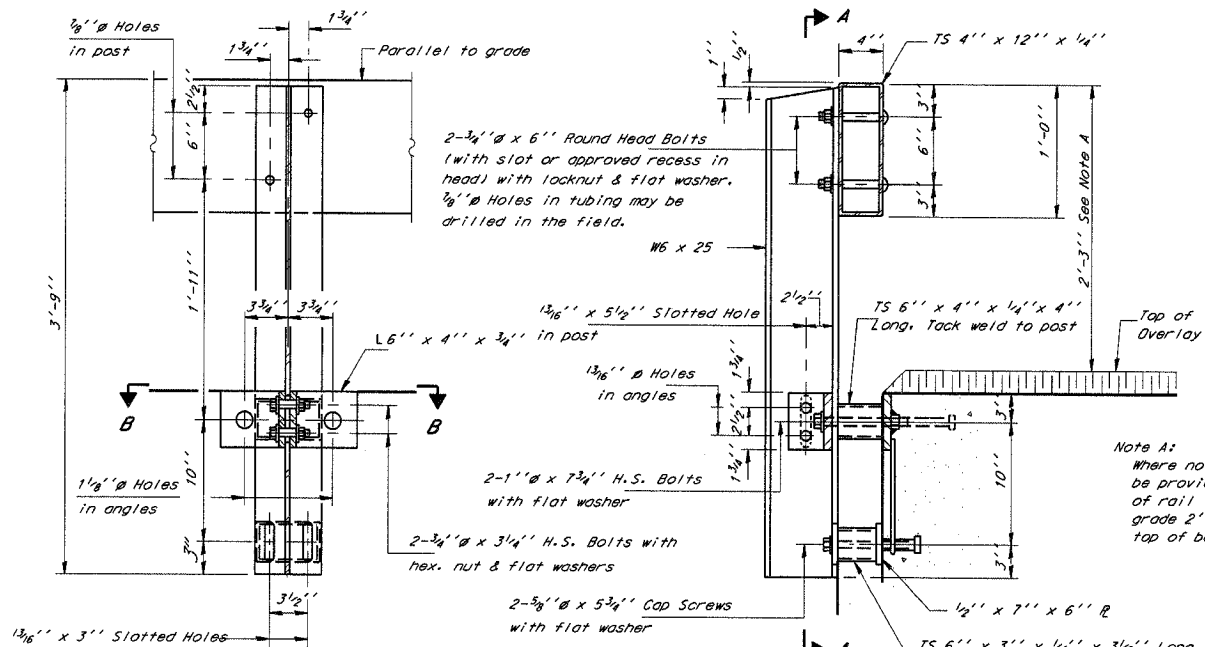
The 1/2" x 7" x 6" plates that come in contact with concrete shall receive two coats of asphalt paint conforming to Section 1060.07 Type II or place 1/2" fabric bearing pads between the plates and concrete.

The 3/4" high strength bolts used to connect the 6" x 4" x 3/4" angles to the post shall be tightened in accordance with Article 505.04 (f) (3) 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 1/2 turn. The 3/8" cap screws in bottom of posts shall be tightened to a snug fit only.

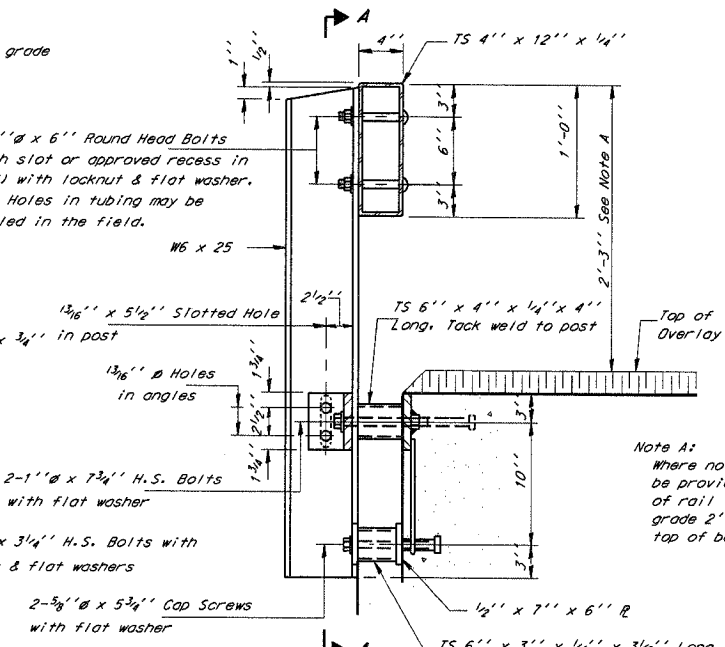
The maximum allowable rail post spacing shall be 10'-6". The rail post spacing shown elsewhere in the plans is based on the allowable spacing for another type of rail. When this type of rail is used, the number of posts may be decreased and the post spacing increased to provide equal post spaces of 10'-6"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



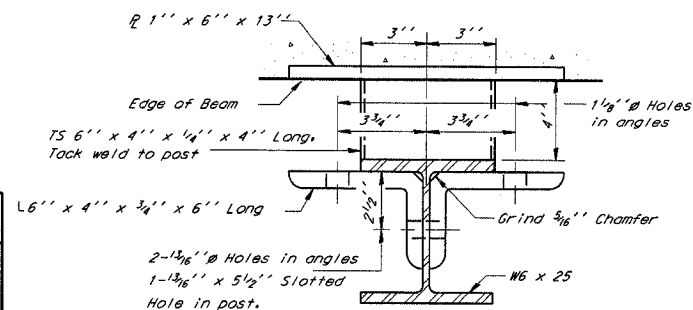
**VIEW A-A**  
**ROUND HEAD BOLT**



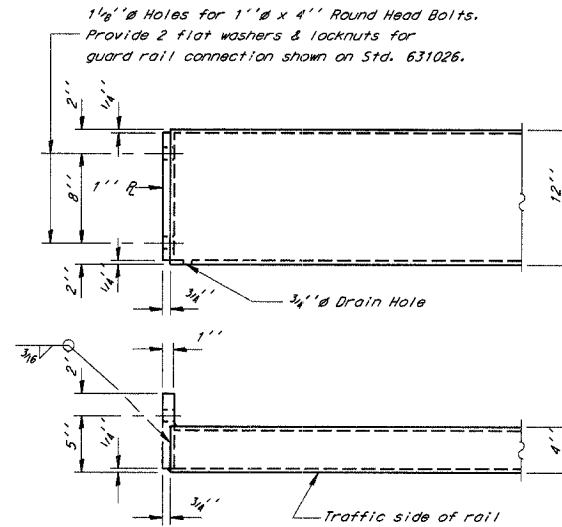
**SECTION A-A**



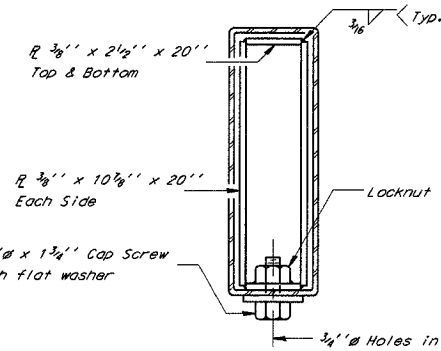
**SECTION AT RAIL POST**



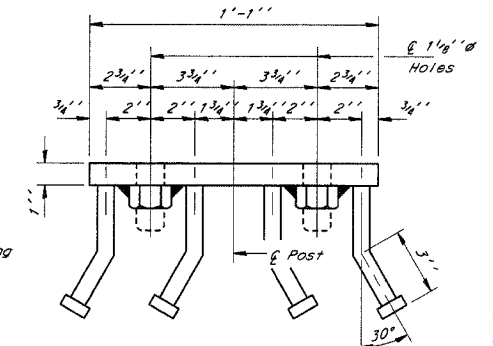
**SECTION B-B**



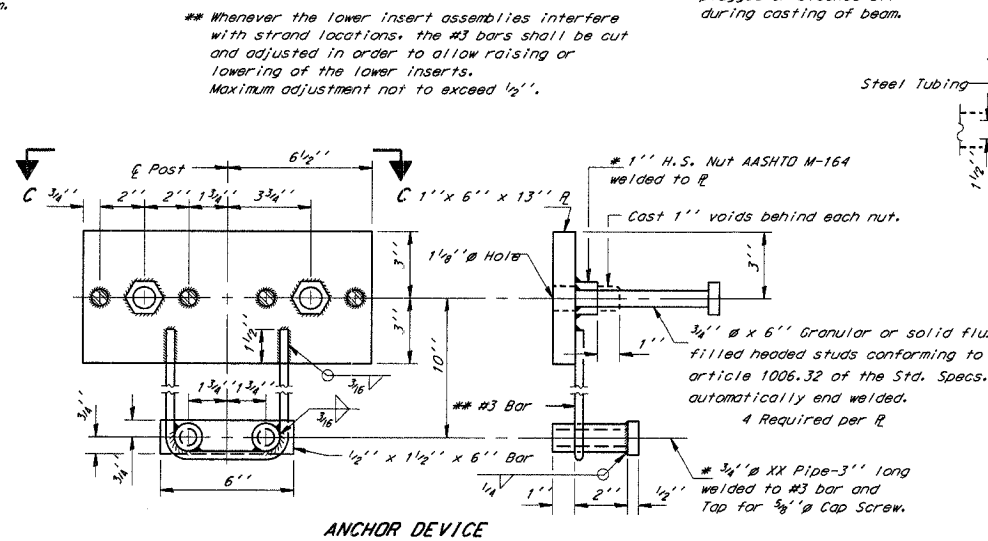
**END OF RAIL DETAILS**



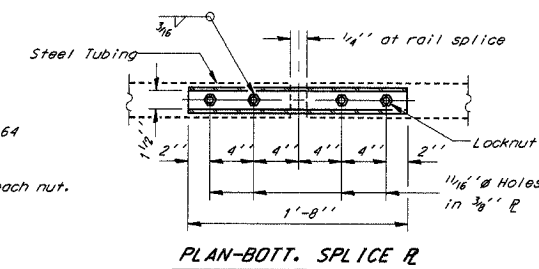
**SECTION AT RAIL SPLICE**



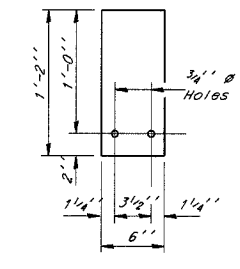
**VIEW C-C**



**ANCHOR DEVICE**



**PLAN-BOTT. SPLICE R**  
**TYPICAL**



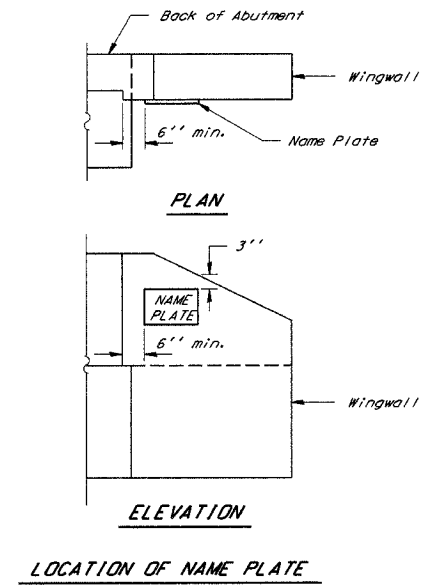
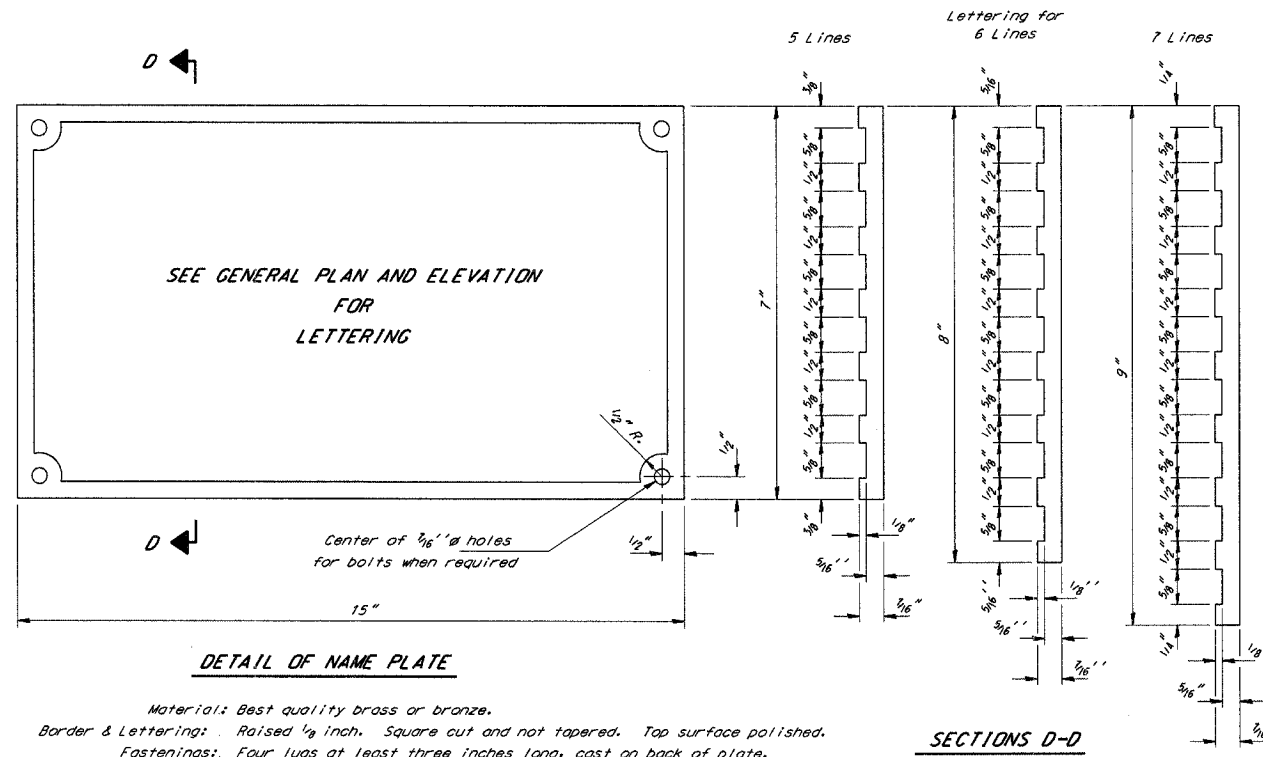
**1/4 SHIM PLATE**

Illinois Department of Transportation  
 PASSED November 1, 1995  
 Prof. J. Kauper  
 Engineer of Bridge Design  
 APPROVED November 1, 1995  
 Ralph E. Anderson  
 Engineer of Bridges and Structures

18-1-1 02/95/51

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

FAS RTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 384	04-01119-00-BR 04-04126-00-BR	HENRY	13	12
F.H.W.A. REG.	ILLINOIS	PROJECT	BR-OS-073(49)	



Illinois Department of Transportation

PASSED November 1, 1995  
*Dr. J. Kaapa*  
 Engineer of Bridge Design

APPROVED November 1, 1995  
*Ralph E. Anderson*  
 Engineer of Bridges and Structures

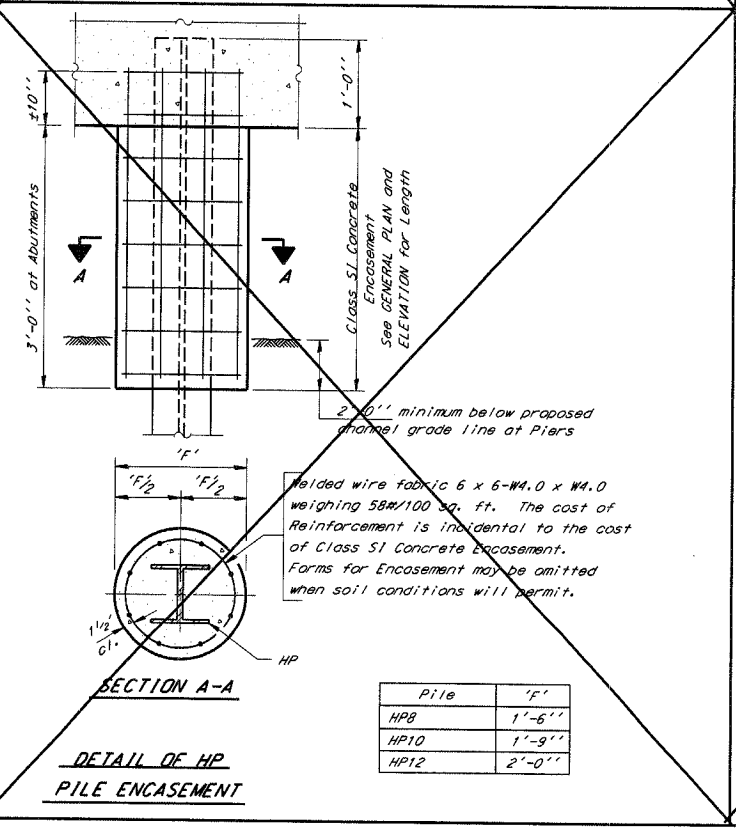
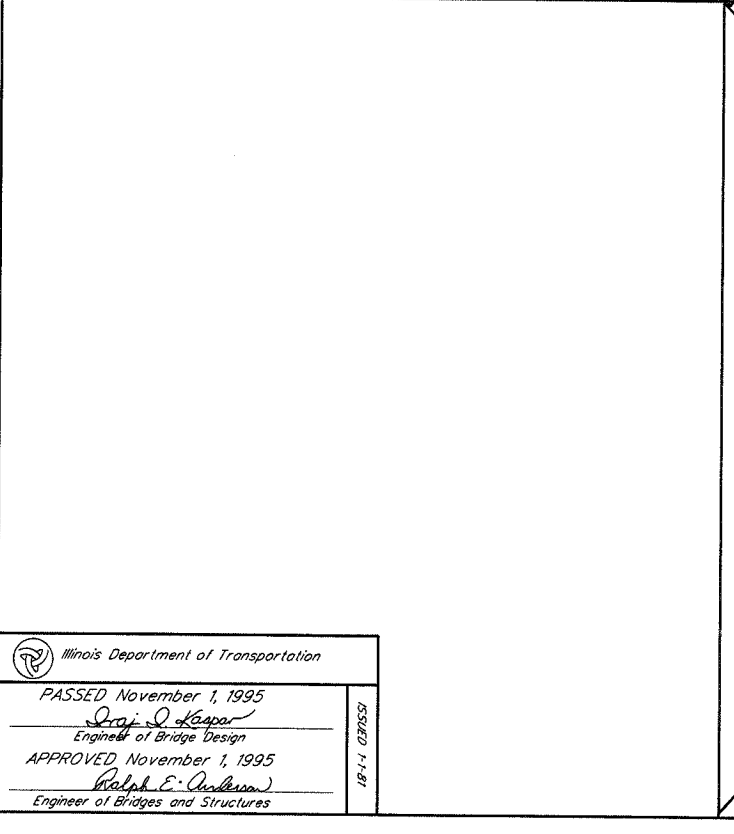
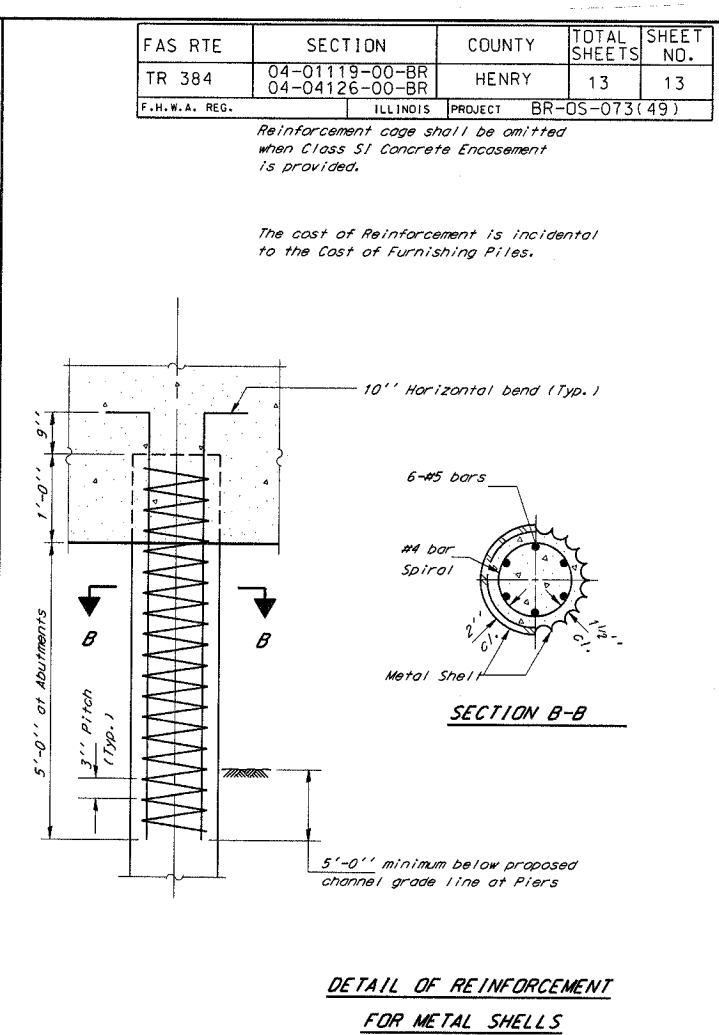
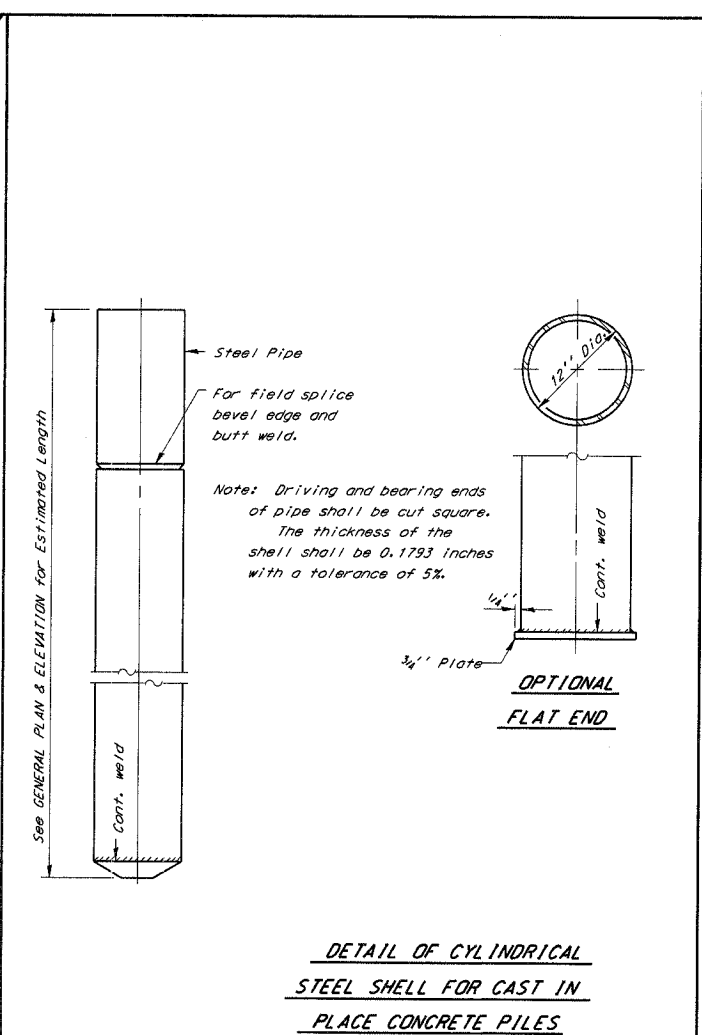
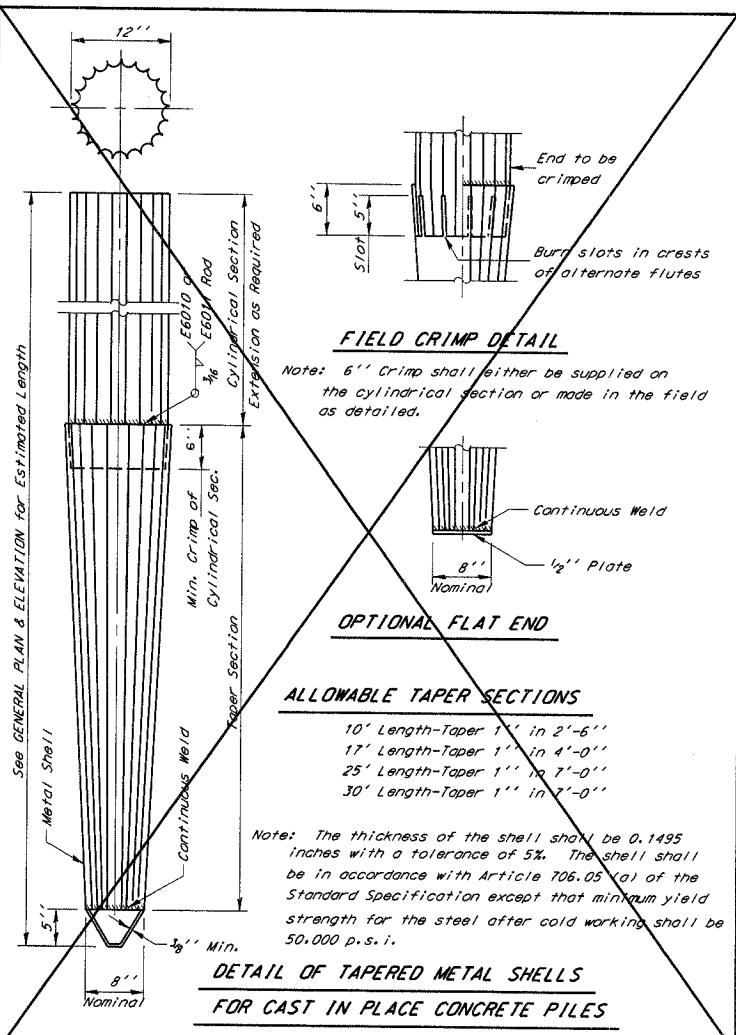
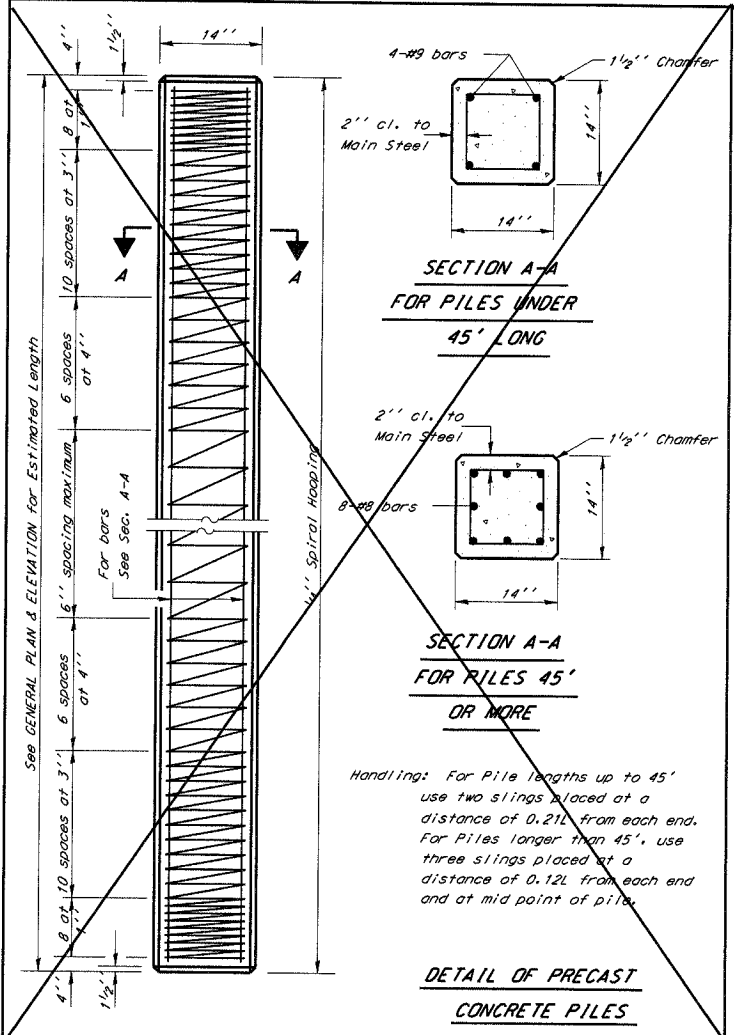
56-1-1-02/MSY

NAME PLATE
STANDARD CN

FAS RTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR 384	04-01119-00-BR 04-04126-00-BR	HENRY	13	13
F.H.W.A. REG.	ILLINOIS PROJECT	BR-05-073(49)		

Reinforcement cage shall be omitted when Class S1 Concrete Encasement is provided.

The cost of Reinforcement is incidental to the Cost of Furnishing Piles.



**QUANTITIES/LIN. FT. OF ENCASEMENT**

(STEEL PILES)

Pile Size	Item	Quantity
HP8	Class S1 Concrete Encasement	0.063 C.Y.
HP10	Class S1 Concrete Encasement	0.086 C.Y.
HP12	Class S1 Concrete Encasement	0.112 C.Y.

(METAL SHELL PILES)

Pile Size	Item	Quantity
12" Dia.	Class S1 Concrete Encasement	0.087 C.Y.

**PILE DETAILS**

**STANDARD CX-1**

Illinois Department of Transportation  
PASSED November 1, 1995  
Approved by: [Signature]  
Engineer of Bridge Design  
APPROVED November 1, 1995  
Approved by: [Signature]  
Engineer of Bridges and Structures