

**INDEX OF SHEETS**

- 1. COVER SHEET
- 2. SUMMARY OF QUANTITIES & ROADWAY DETAILS
- 3. PLAN & PROFILE
- 4. GENERAL PLAN & ELEVATION
- 5. SUPERSTRUCTURE
- 6. DECK BEAMS
- 7. DECK BEAMS
- 8. ABUTMENTS
- 9. BRIDGE RAILING
- 10. NAME PLATE
- 11. PILE DETAIL
- 12. CROSS SECTIONS

**STANDARDS IN PLANS**

- STD.000001-04 Standard Symbols, Abbreviations, and Patterns
- STD.280001-02 Temporary Erosion Control Systems
- STD.701006-02 Off Road Operations, ect
- STD.701011-01 Off Road Moving Operations, ect
- STD.701301-02 Lane Closure, 2L 2W, Short time Operations
- STD.702001-05 Traffic Control Devices
- BLR.21-6 Typical Applications of Traffic Control Devices

SCALES:  
 PLAN: N/A  
 PROFILE HOR: N/A  
 PROFILE VERT: N/A  
 CROSS SECTIONS VERT: N/A  
 CROSS SECTIONS HOR: N/A

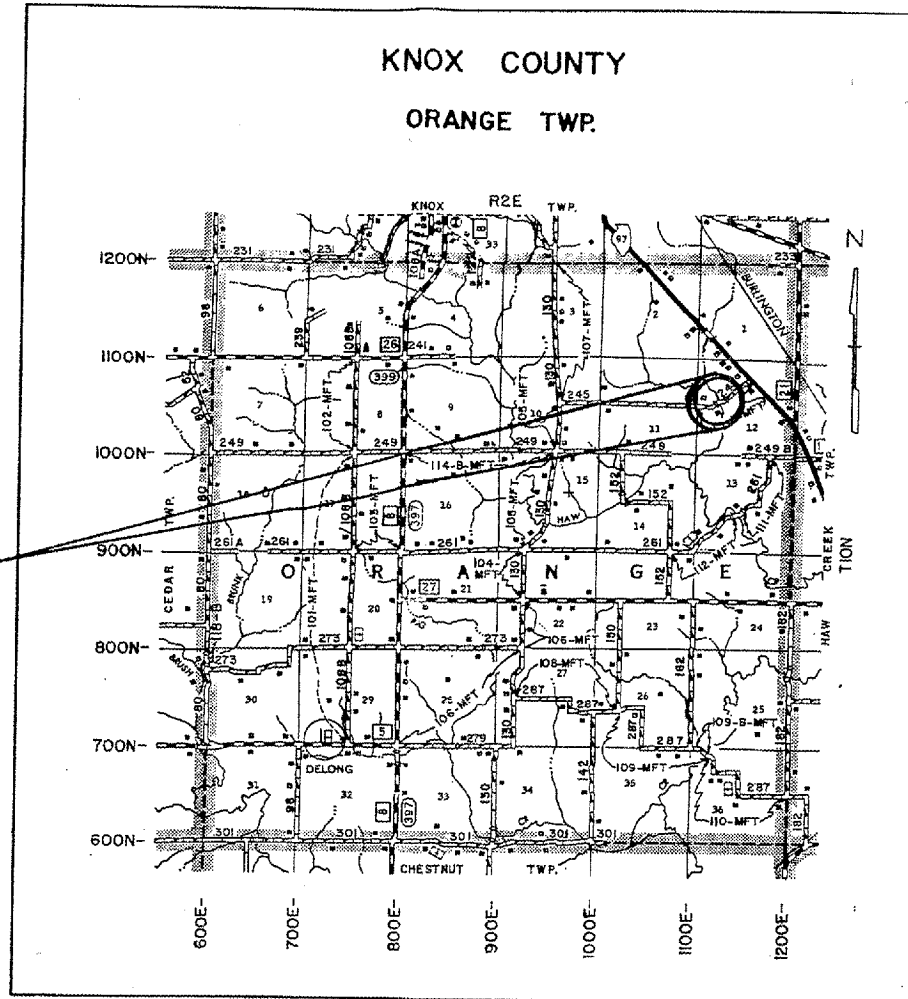
DESIGN INFORMATION  
 NET LENGTH OF SECTION: 161.50'  
 ADT=75  
 FUNCTIONAL CLASSIFICATION: LOCAL ROAD  
 DESIGN SPEED: 35MPH  
 DESIGN POLICY: RURAL  
 VARIANCES GRANTED: NONE  
 COMMITMENTS: NONE

J.U.L.I.E. 1-800-892-0123

STATE OF ILLINOIS  
 DEPARTMENT OF TRANSPORTATION  
 BUREAU OF LOCAL ROADS & STREETS  
 PLANS FOR PROPOSED COUNTY HIGHWAY IMPROVEMENTS

TR-245 OVER TRIBUTARY TO HAW CREEK  
 SECTION 05-14115-01-BR  
 PROJECT BR05-095(123)

COUNTY	RD. DIST.	ROUTE	CONTRACT	SHEET
KNOX	ORANGE	TR-245	89376	1 OF 12



END CONSTRUCTION STA. 10+80.25  
 CONSTRUCT P.P.C. DECK BEAM BRIDGE  
 CENTERLINE STA. 10+00  
 PROPOSED STRUCTURE #048-3386  
 BEGIN CONSTRUCTION STA. 9+19.75

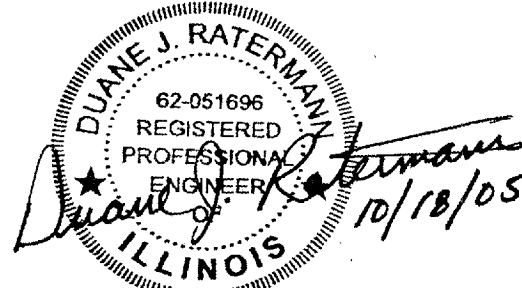
**BITUMINOUS MIXTURE REQUIREMENTS**

The following mixture requirements are applicable for this project.

Mixture Use(s):	Surface Course
AC/PG:	64-22
RAP% (Max):	15%
Design Air Voids:	3.0% Ndes=50
Mixture Composition: (Gradation Mixture)	IL 9.5 (Low Esal)
Friction Aggregate:	Mixture C

\*\*If 15% RAP is used, the Contractor may be required to use a softer grade of Asphalt as determined by the Materials Engineer

QC/QA BITUMINOUS  
 SUPERPAVE PROJECT



DUANE J. RATERMANN  
 IL PROF. ENG. #062-051696  
 EXPIRES 11/30/05

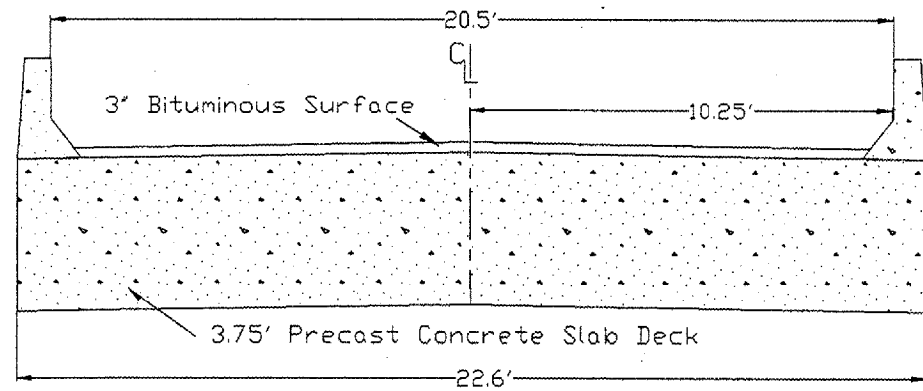
APPROVED 10/18 2005  
*Jim Smith*  
 Road Commissioner

APPROVED 10/18 2005  
*Duane J. Ratermann*  
 County Engineer

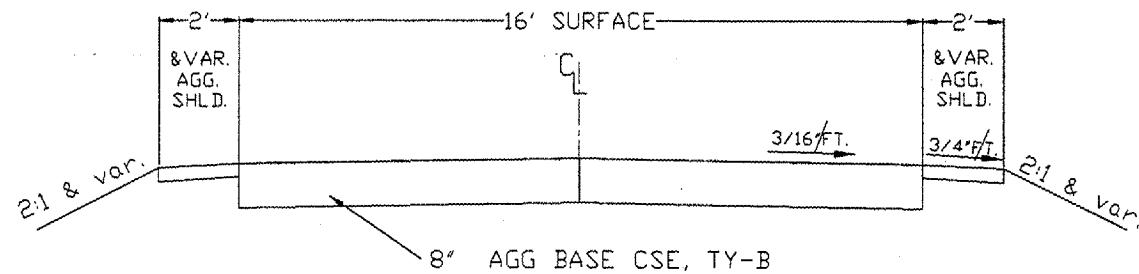
PASSED 11-14 2005  
*Leo Lalala*  
 District Four Engineer of Local Roads & Streets

Releasing For Bid Based On Limited Review  
NOV 14 2005  
*[Signature]*  
 DEPUTY DIRECTOR OF HIGHWAYS, REGION THREE ENGINEER  
 STATE OF ILLINOIS  
 DEPARTMENT OF TRANSPORTATION

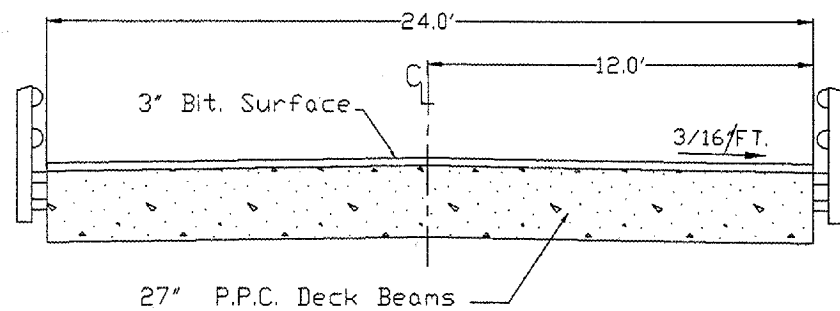
EXISTING TYPICAL SECTION  
STA. 9+87 TO STA.10+13



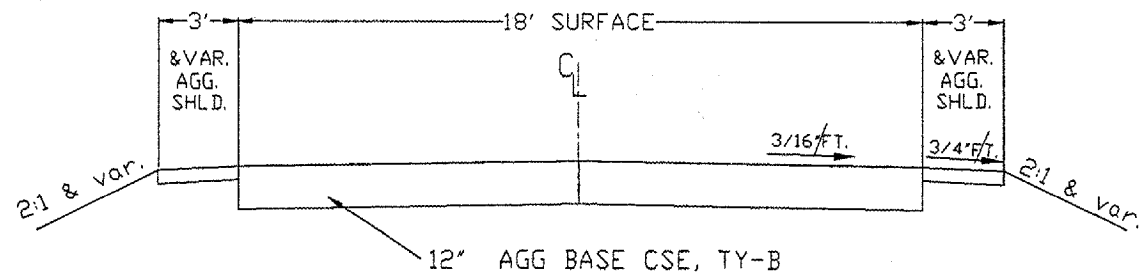
EXISTING TYPICAL SECTION  
STA. 9+19.75 TO STA.9+87  
STA. 10+13 TO STA.10+80.25



PROPOSED TYPICAL SECTION  
STA. 9+69.75 TO STA.10+30.25



PROPOSED TYPICAL SECTION  
STA. 9+19.75 TO STA.9+69.75  
STA. 10+30.25 TO STA.10+80.25



COUNTY	RD.DIST	ROUTE	CONTRACT	SHEET
KNOX -	ORANGE	TR-245	89376	2 OF 12

SEC.05-14115-01-BR

SUMMARY OF QUANTITIES

X081-2A

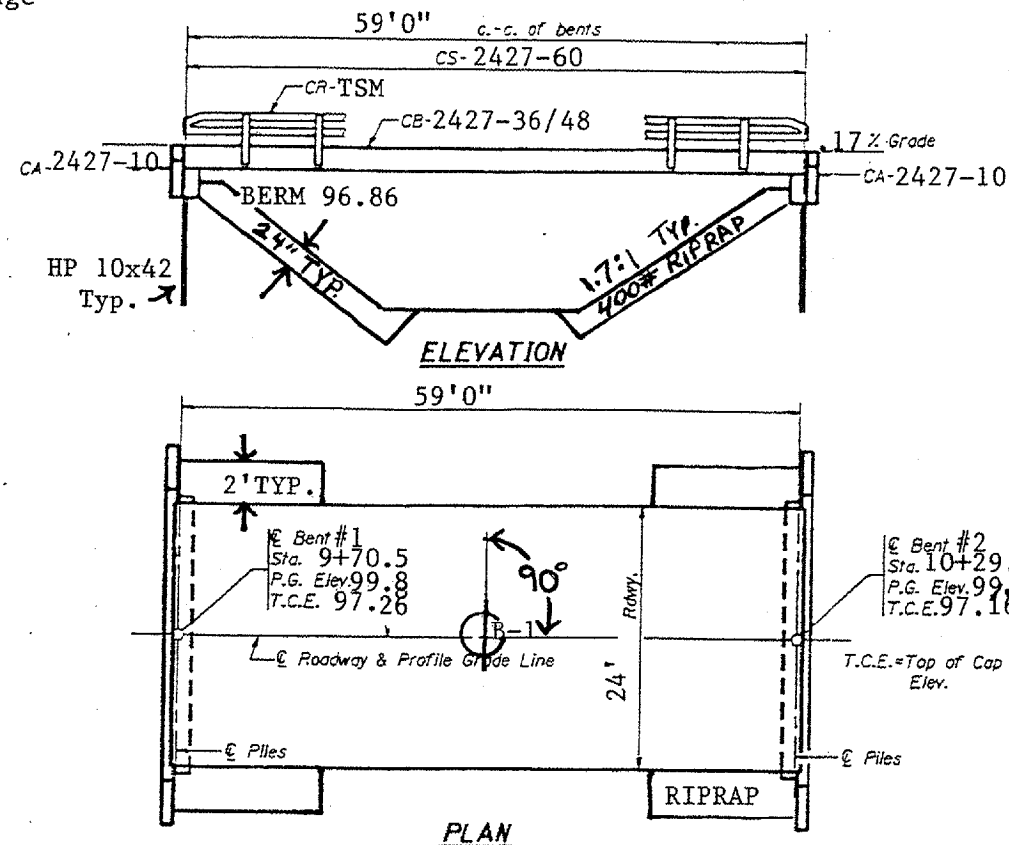
QUANT.	UNIT	ITEMS	CODE NUMBER
150.0	TON	STONE DUMP RIPRAP	XX000295
28.0	TON	BCSC SUPER IL 9.5L LE	X4066490
1.0	L.SUM	REM EXIST STRUCT	50100200
18.2	CU.YD	CONC STRUCT	50300225
1440.0	SQ.FT.	P P CONC DK BM 27 DP	50400505
1980.0	POUND	REINFORCEMENT BARS	50800105
120.0	FOOT	STEEL BR RAIL TYPE SM	50901005
210.0	FOOT	FUR STL PILE HP10X42	51201400
210.0	FOOT	DRIVE STL PILE	51202700
1.0	EACH	TEST PILE ST HP10X42	51203400
2.1	CU.YD	CONC ENCASE	51204315
1.0	EACH	NAME PLATES	51500100
160.0	SQ.YD.	WATERPRF MEMBRANE SYS	58100200
420.0	FOOT	PC MORTAR FAIRING CSE	58300100
2.0	L.SUM	MOBILIZATION	07100100



B.M. #1-STA.9+55LT., Spike in Tree  
 Elev.100.0'  
 Existing Structure-  
 Pre-cast concrete slab Bridge  
 with Timber Pile, Backing,  
 and Caps  
 Salvage-  
 NONE

*	**	KNOX	4	12
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\*TR-245  
 \*\*05-14115-01-BR



**GENERAL NOTES**

1. The Contractor shall drive 1 test piles, 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.

**TOTAL BILL OF MATERIAL**

Item	Unit	Super	Sub.		Total
			Piers	Abuts.	
Removal of Existing Structures	Each				1
Bituminous Concrete Surface Course, Class I	Ton	28.0			18.8
Waterproofing Membrane System	Sq. Yd.	160.0			160.0
Concrete Structures	Cu. Yd.			18.2	18.2
Precast Prestressed Concrete Deck Beams (2' Depth)	Sq. Ft.	1440			1440
Steel Bridge Rail, Type SW	Foot	120			120
Steel Railings, Type S-1	Foot				
Reinforcement Bars	Pound			1980	1980
Furnishing steel pile	Foot			210	210
Driving HP10x42	Foot			210	210
Test Piles	Each			1	1
Name Plates	Each			1	1
Class SI Concrete Encasement	Cu. Yd.			2.1	2.1
PC mortar fairing cse	foot	420			420
stone dumped riprap	ton			150	150

NOTE:  
 The Article or Section numbers referencing the Standard Specifications for Road and Bridge Construction as shown on the standard bridge plan sheets included with the contract plans should be interpreted as referring to the current edition of the Standard Specifications (Adopted January 1, 2002) as shown in the "Article/Section No. Reference Table".

**ARTICLE/SECTION NO. REFERENCE TABLE**

Previous No.	Current No.
504.06	504.06
505.04	505.04
706.05	1006.05
706.32	1006.32
760.07	1060.07

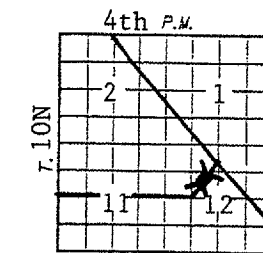
**PILE DATA (2-ABUTS.)**

Type HP 10X42  
 Capacity Refusal Tons  
 Estimated Length 30 Feet  
 Number Required 8 (Includes 1 Test Pile located in Bent #1)

\*05-14115-01-BR  
 STATION 10+00  
 Trib. Haw CREEK  
 SEC. \* BUILT 2006  
 Orange ROAD DIST.  
 KNOX COUNTY  
 LOADING HS20-44  
 STR. NO. 048-3386

**LETTERING FOR NAME PLATE**

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



PROPOSED R2E BRIDGE  
**LOCATION SKETCH**

**INDEX OF SHEETS**

1. General Plan & Elevation
2. Standard CS-2427-60
3. Standard CB-2427-36
4. Standard CB-2427-48
5. Standard CA-2427-10
6. Standard CR-TSM
7. Standard CN
8. Standard CX-1
9. Standard

**WATERWAY INFORMATION**

Drainage Area = 5.47sqmi Low Grade Elev. = 99.5 @ Sta. 10+00

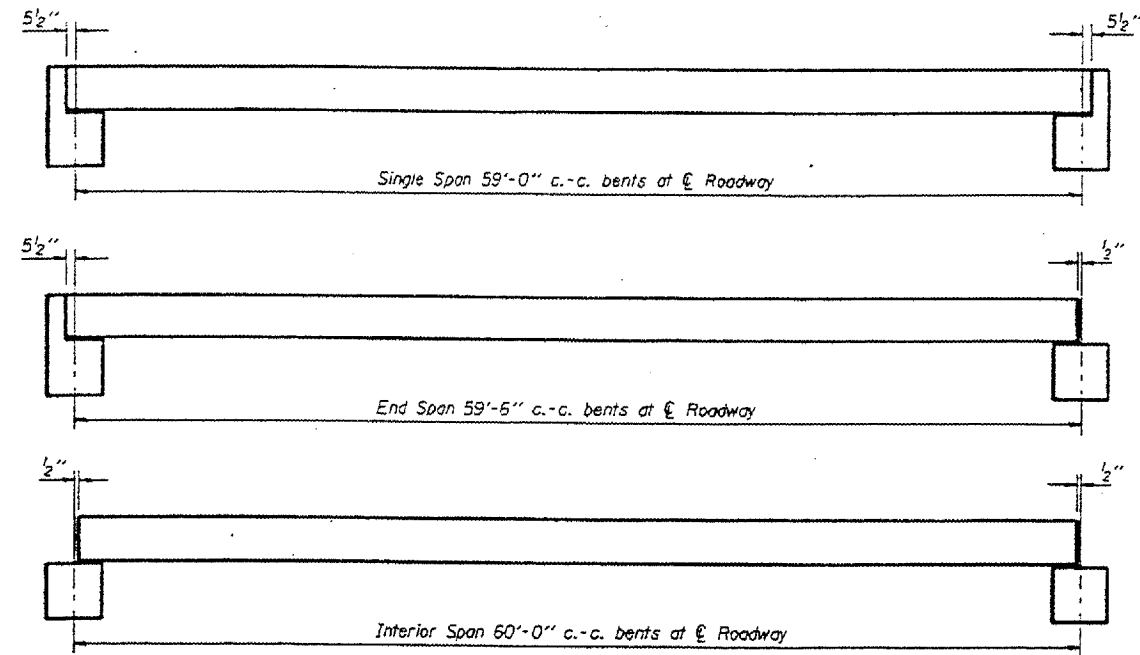
Flood Yr.	Freq.	Opening Sq. Ft.		Nat. H.W.E.	Head - Ft.		Headwater El.	
		Exist.	Prop.		Exist.	Prop.	Exist.	Prop.
Design	15	1362	180	192	92.2			
Base	100	2289	263	280	94.1			
Overtopping								
Max. Calc.	500	3102	332	349				

**DESIGN SPECIFICATIONS**

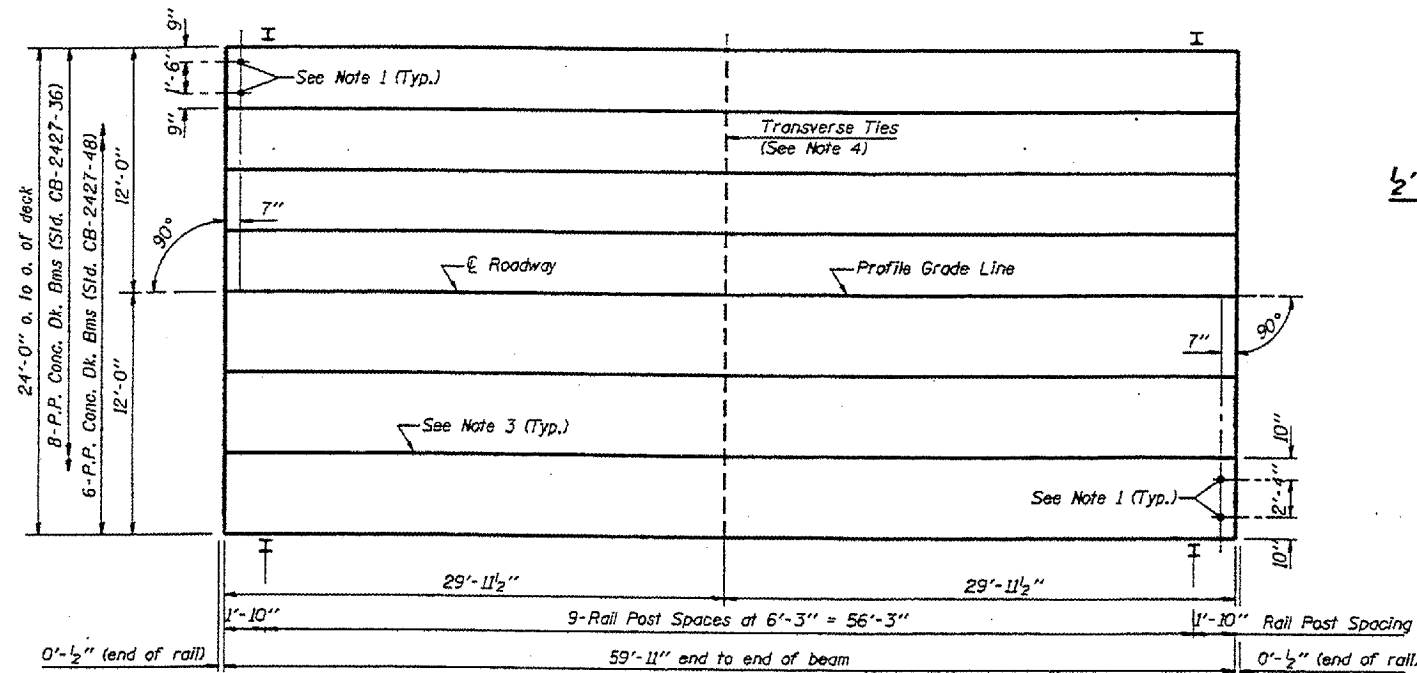
1996 AASHTO and Interims  
 HS20-44 Loading Load Factor Design

**GENERAL PLAN & ELEVATION**

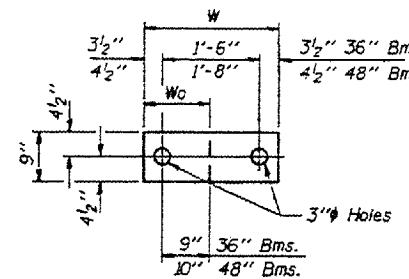
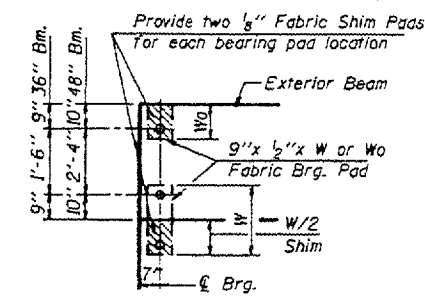
TR ROUTE 245  
 OVER Trib. to Haw Creek  
 SECTION 05-14115-01-BR  
 KNOX COUNTY  
 STATION 10+00



TYPICAL ELEVATIONS

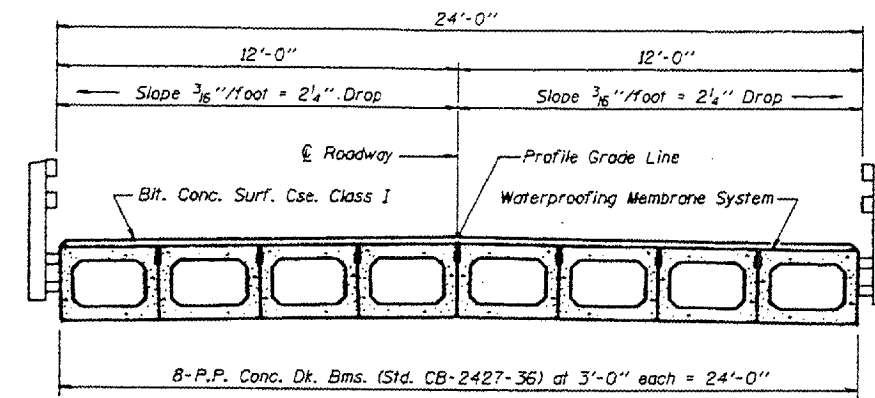


PLAN

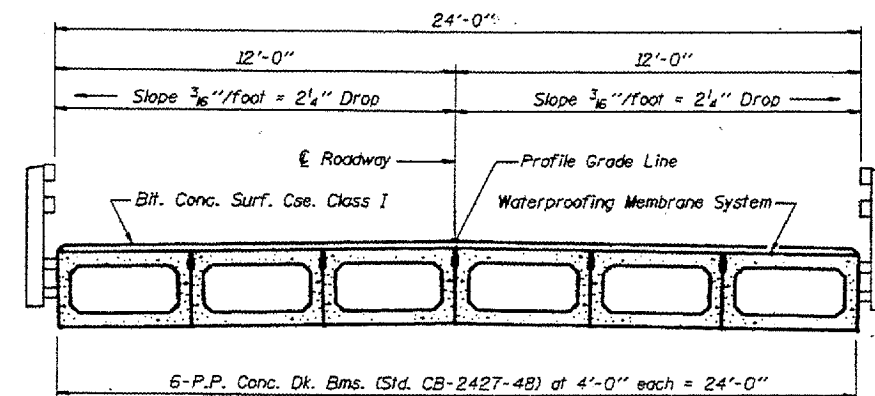


Beam	W	W <sub>o</sub>
36"	2'-1"	1'-0"
48"	2'-5"	1'-2"

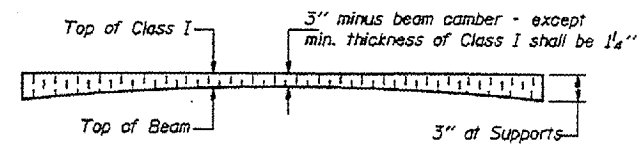
1/2" FABRIC BRG. PAD DETAILS



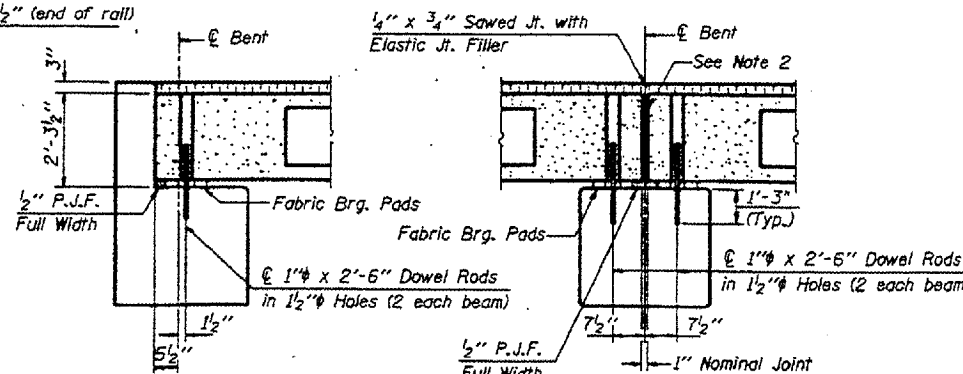
CROSS SECTION



CROSS SECTION



PROFILE OF OVERLAY



SECTION AT ABUTS.  
(Along E Beams)

SECTION AT PIERS  
(Along E Beams)

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 E Pier shall be filled with non-shrink grout.
- Longitudinal keys shall be grouted.
- 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 outside shall be filled with grout after transverse tie assembly is in place.

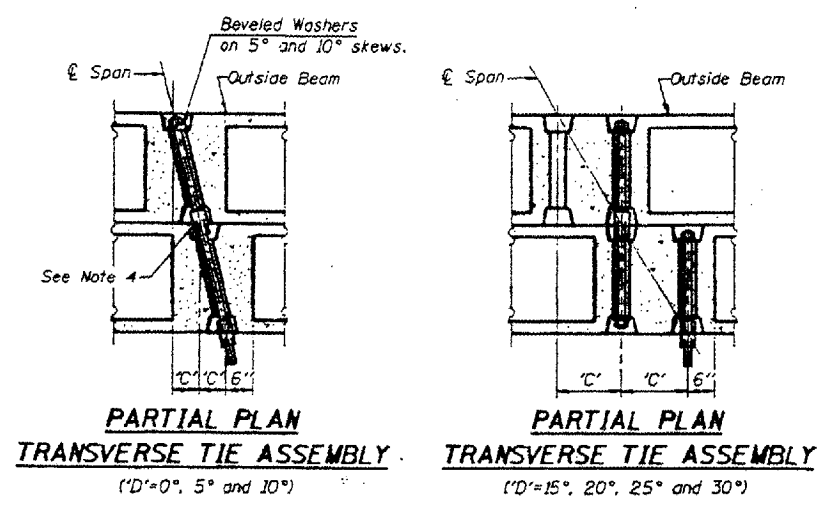
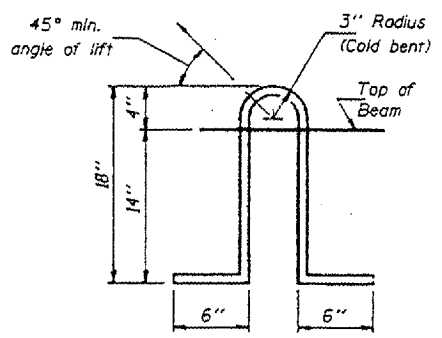
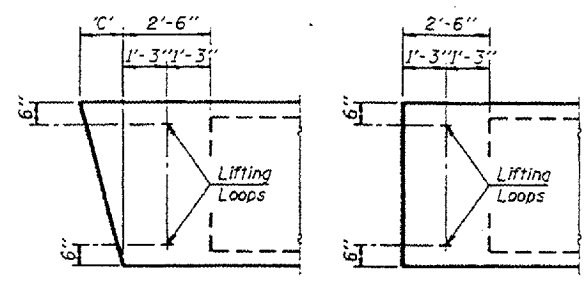
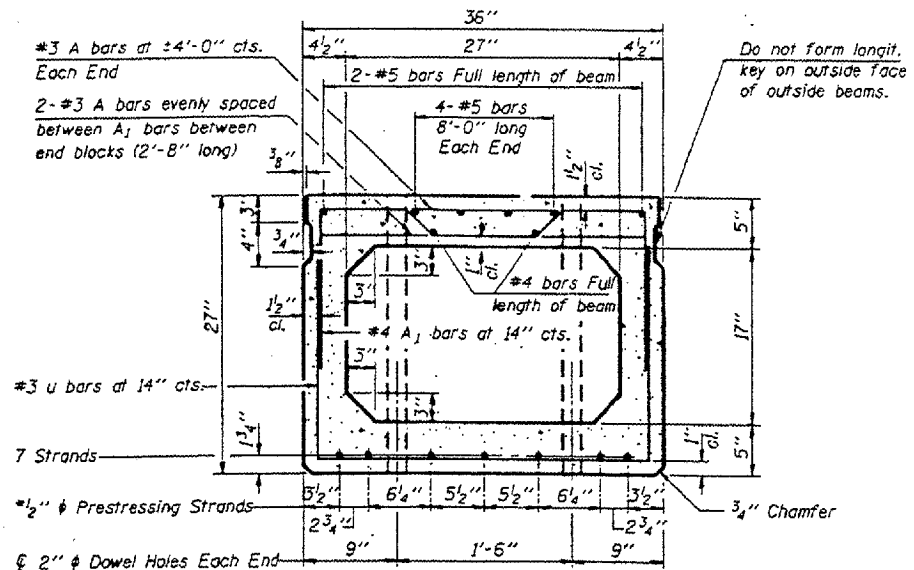
QUANTITIES FOR ONE SPAN

P.P. Conc. Dk. Bm. 27" Dp.	1440 Sq. Ft.
Steel Railing	120 Ft.
Bit. Conc. Surf. Cse. Class I	18.8 Tons
Waterproofing Membrane System	160.0 Sq. Yds.

P.P.C. DECK BEAM  
SUPERSTRUCTURE

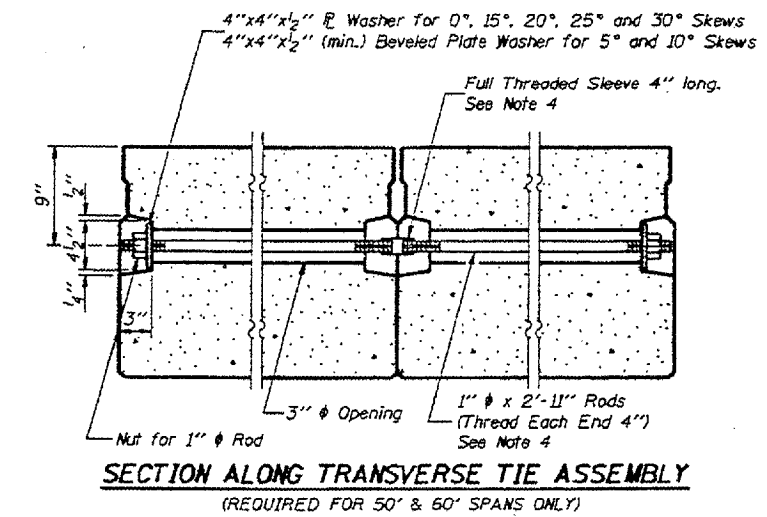
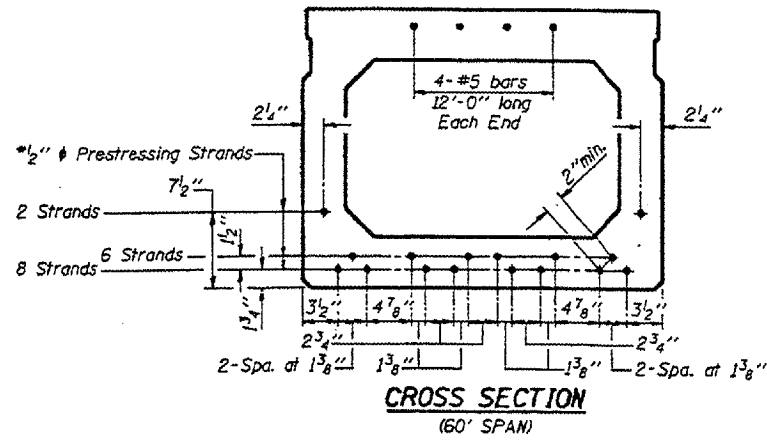
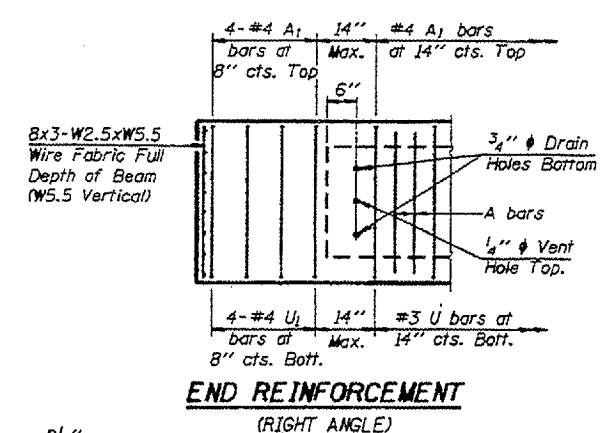
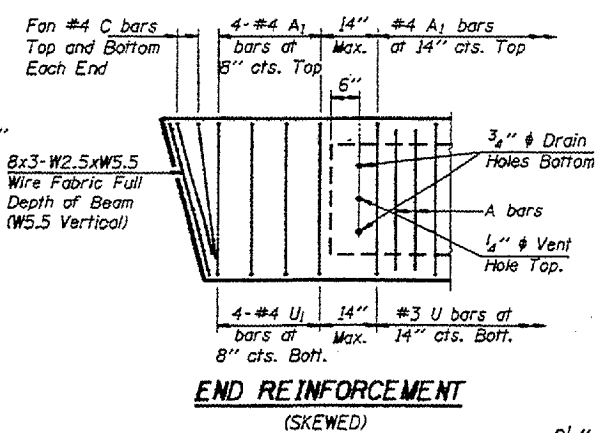
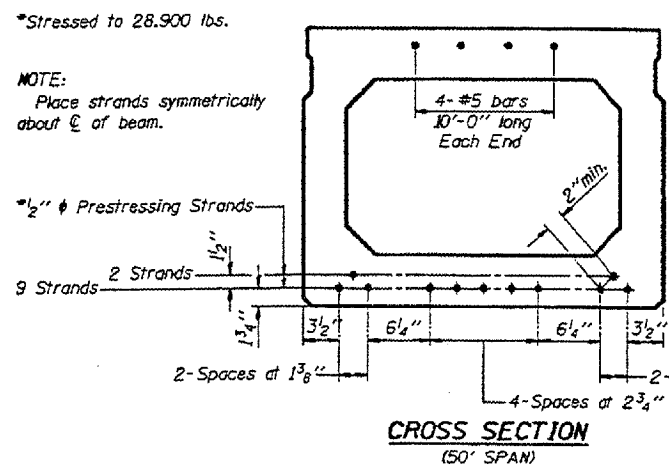
24' RDWY.	27" BMS.	60' SPAN	0° SKEW
STANDARD CS-2427-60			

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

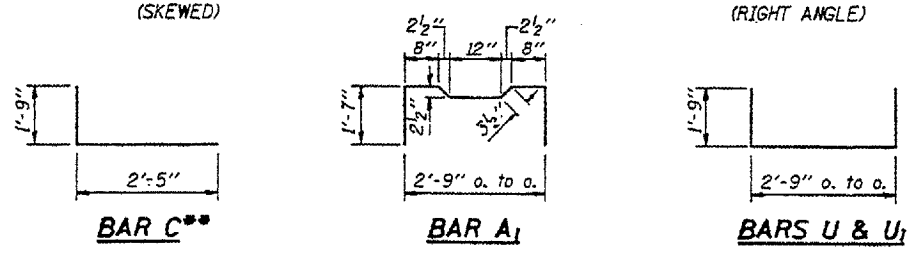


**DIMENSION 'C'**

Skew Angle $\theta$	0°	5°	10°	15°	20°	25°	30°
Dimension 'C' (Inches)	0	3 3/8	6 3/8	9 3/8	13 3/8	16 3/4	20 3/4



- 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.
  - On 0°, 5° and 10° skew, alternate approved transverse tie rods of increased segmental length are acceptable.
  - Rail Post anchor devices shall be cast into outside beam as elsewhere specified.
  - When Waterproofing Membrane System is specified, the top surface of the beams shall be finished in accordance with Article 504.05 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 minimum of 1/4".
  - Low relaxation strands may be substituted for the stress relieved strands. The initial prestressing force applied to each strand shall be the same as for the stress relieved strands (28,900 lbs.).
  - 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.



**DESIGN STRESSES**

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

**REQUIRED RELEASE STRENGTH**

Span	$f'_a$ (psi)
40'	4,000
50'	4,000
60'	4,000

Illinois Department of Transportation  
PASSED NOVEMBER 1, 1995  
Engineer of Bridge Design  
APPROVED NOVEMBER 1, 1995  
Engineer of Bridges and Structures

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

\*\*NOTE:  
The following number of C bars shall be used:

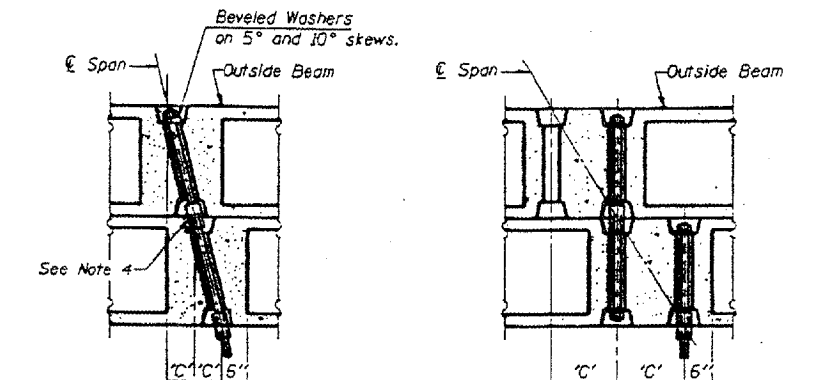
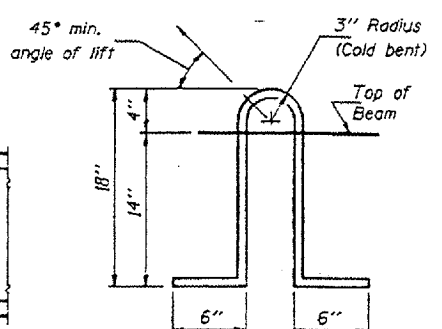
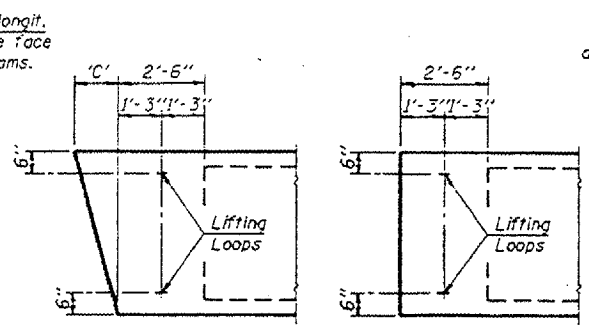
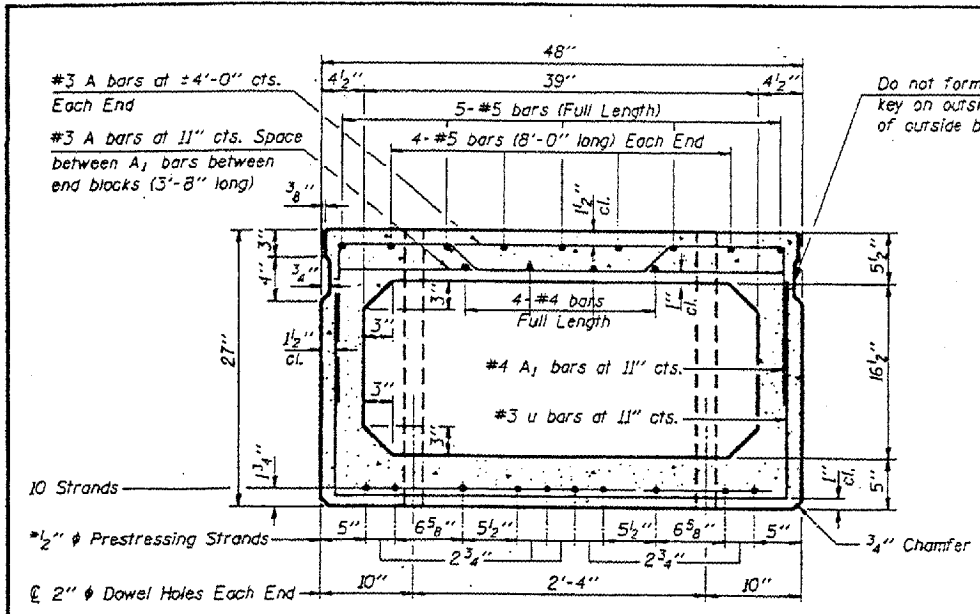
Skew	No.
5° and 10°	1
15° and 20°	2
25° and 30°	3

**P.P.C. DECK BEAM DETAILS**

24' ROADWAY | 27" x 36" BEAMS

STANDARD CB-2427-36



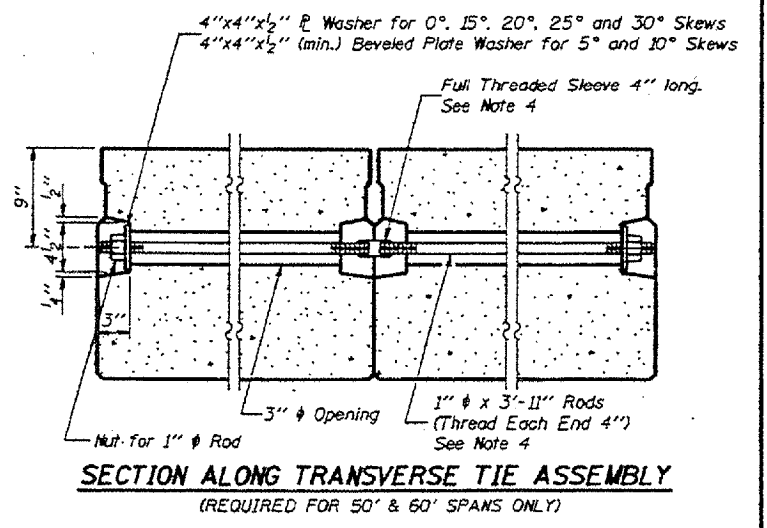
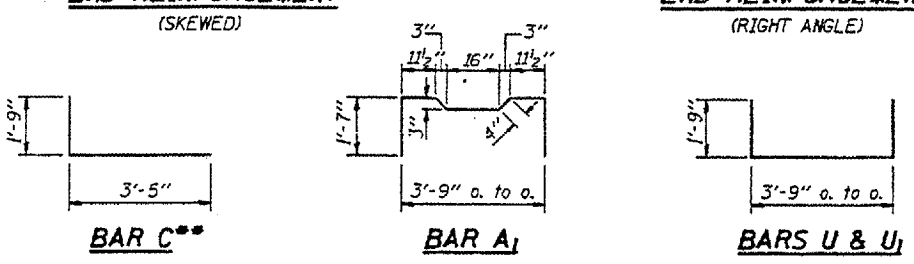
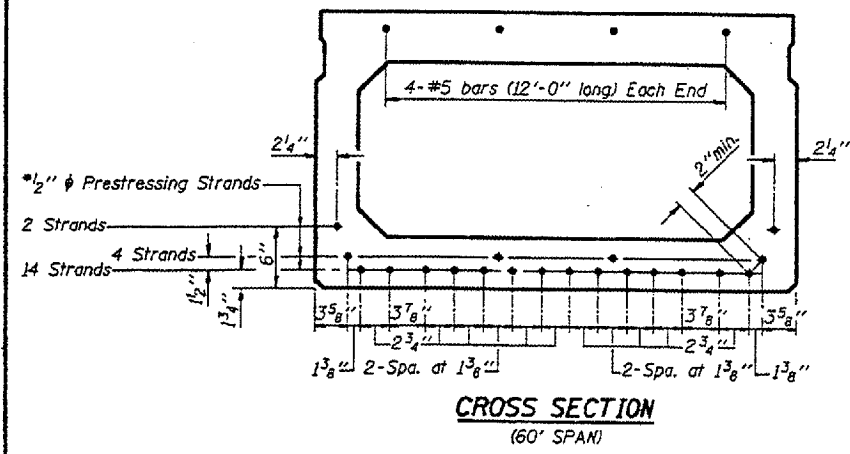
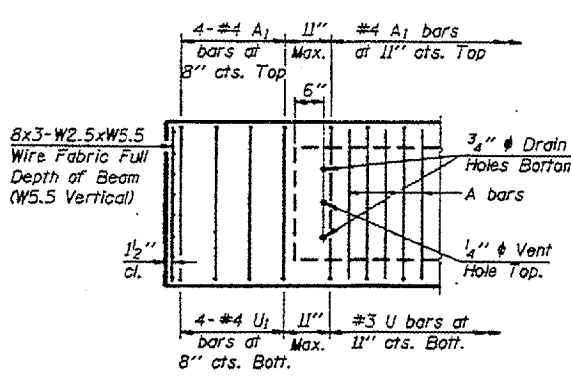
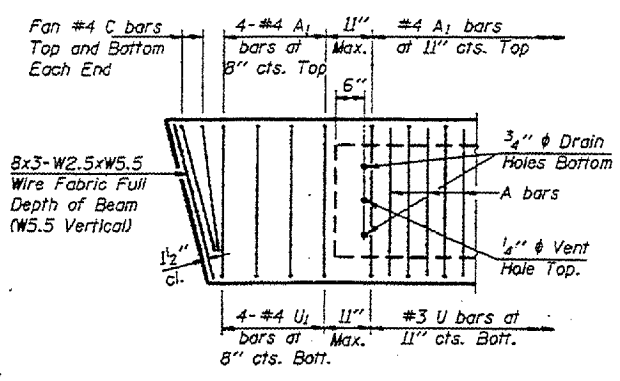
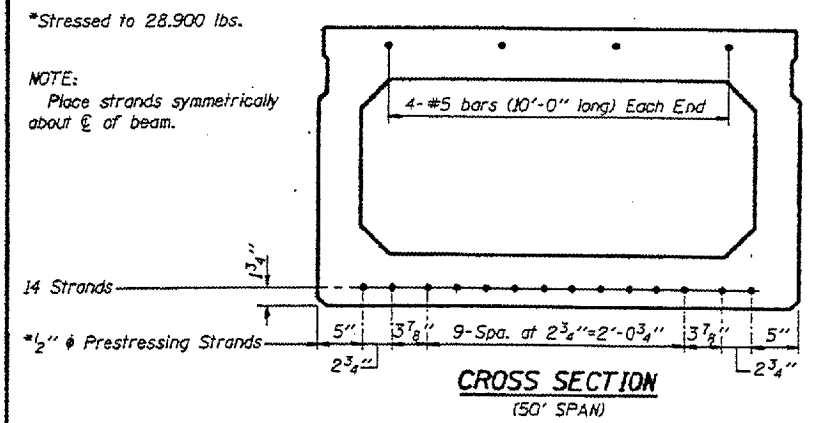


**END BLOCK DETAILS**  
Each beam shall have four Lifting Loops, two at each end of beam cast in locations shown above. Loops shall be burned off after beams have been erected.

**LIFTING LOOP DETAIL**  
Lifting loops shall be 3/2" φ-270 ksi strands, as shown. Alternate approved lifting devices are also acceptable.

**DIMENSION 'C'**

Skew Angle 'D'	0°	5°	10°	15°	20°	25°	30°
Dimension 'C' (Inches)	0	4 1/4	8 1/2	12 1/8	17 1/2	22 3/8	27 3/4



- 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.
  - On 0°, 5° and 10° skews, alternate approved transverse tie rods of increased segmental length are acceptable.
  - Rail Post anchor devices shall be cast into outside beam as elsewhere specified.
  - 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 minimum of 1/4".
  - Low relaxation strands may be substituted for the stress relieved strands. The initial prestressing force applied to each strand shall be the same as for the stress relieved strands (28,900 lbs.).
  - 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.

Illinois Department of Transportation  
PASSED NOVEMBER 1, 1995  
Engineer of Bridge Design  
APPROVED NOVEMBER 1, 1995  
Engineer of Bridges and Structures

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

**\*\*NOTE:**  
The following number of C bars shall be used:

Skew	No.
5° and 10°	1
15° and 20°	2
25° and 30°	3

**DESIGN STRESSES**

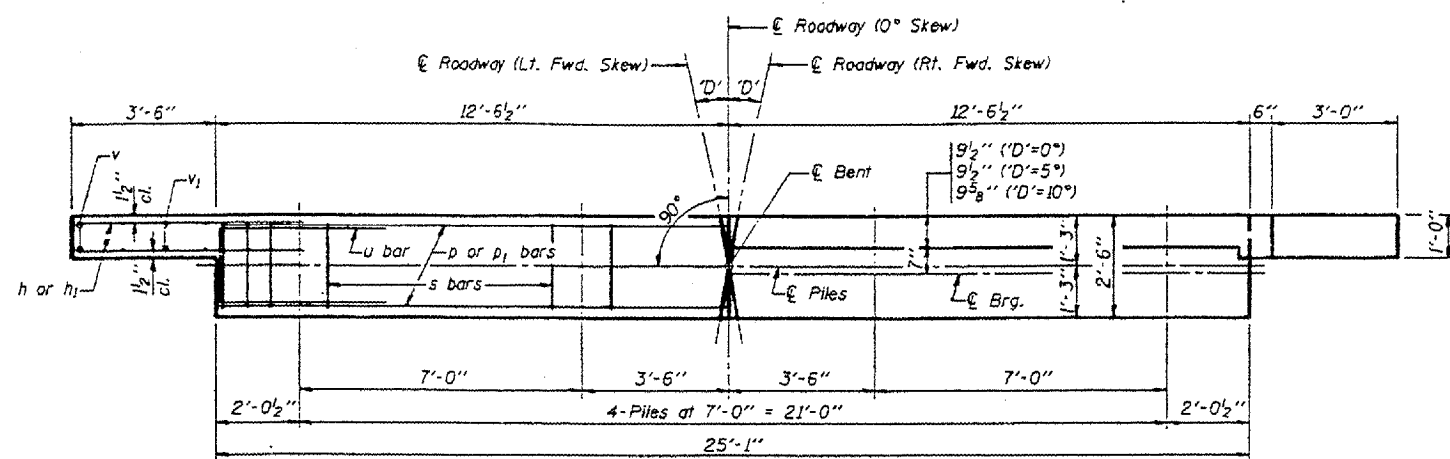
$f_c = 5,000$  p.s.i.  
 $f_w =$  (See Required Release Strength Table)  
 $f_s = 270,000$  p.s.i. (1/2" φ Strand)  
 $f_u = 189,000$  p.s.i. (1/2" φ Strand)  
 $f_y = 60,000$  p.s.i.

**REQUIRED RELEASE STRENGTH**

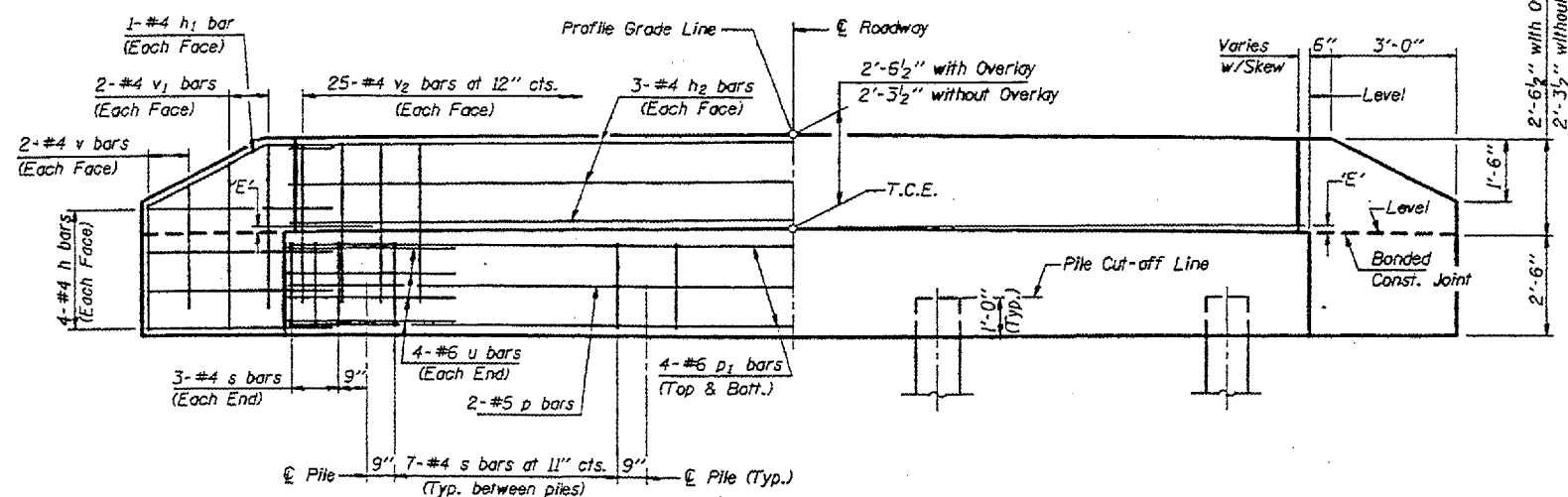
Span	$f_{rd}$ (psi)
40'	4,000
50'	4,000
60'	4,000

**P.P.C. DECK BEAM DETAILS**

24' ROADWAY	27" x 48" BEAMS
STANDARD CB-2427-48	



**PLAN**  
(D = Designated Skew Angle)



**ELEVATION**

**DIMENSION 'E'**

GRADE	D=0°		D=5°		D=10°	
	UPGRADE END	DOWNGRADE END	UPGRADE END	DOWNGRADE END	UPGRADE END	DOWNGRADE END
0%	2 3/8"	2 3/8"	2 3/8"	2 3/8"	2 3/8"	2 3/8"
Over 0% to 1%	2 3/8"	2 3/8"	2 1/4"	2 3/8"	2 1/8"	2 1/2"
Over 1% to 2%	2 3/8"	2 3/8"	2 1/8"	2 1/2"	1 7/8"	2 3/4"
Over 2% to 3%	2 3/8"	2 3/8"	2"	2 5/8"	1 5/8"	3"
Over 3% to 4%	2 3/8"	2 3/8"	1 7/8"	2 3/4"	1 3/8"	3 1/4"

**NOTES**

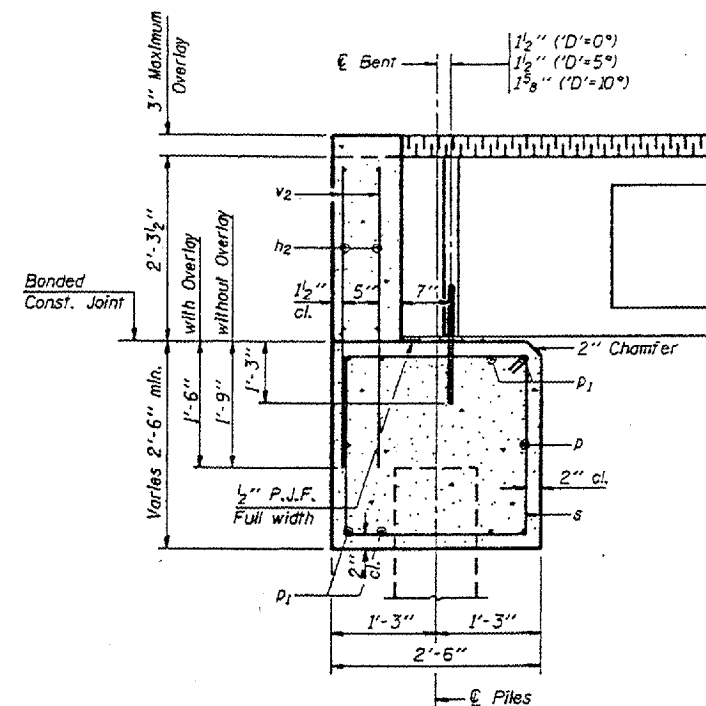
- The Backwall and the portion of the Wingwalls above the bonded construction joint shall be cast against the in-place beam.
- Reinforcement bars shall conform to A.A.S.H.T.O. M-31, M-42 or M-53, Grade 60.

**MAXIMUM PILE LOADS**

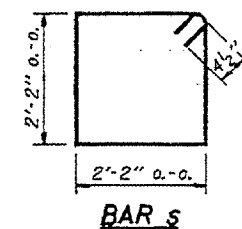
SPAN	TONS
40'	34
50'	38
60'	43

**DESIGN STRESSES**

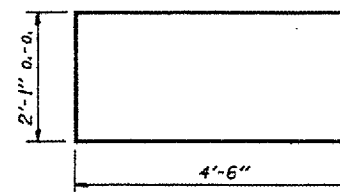
f'c = 3,500 psi  
fy = 60,000 psi



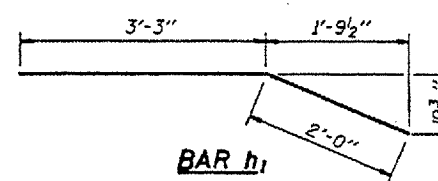
**SECTION THRU ABUTMENT**  
(At Right Angles)



**BAR s**



**BAR u**



**BAR h1**

**BILL OF MATERIAL FOR ONE ABUTMENT**

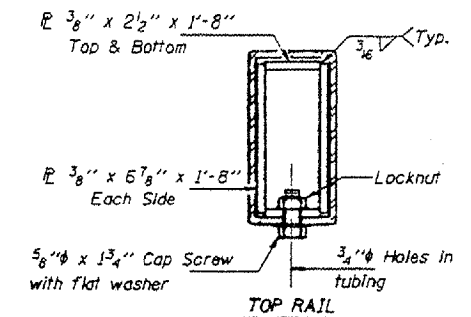
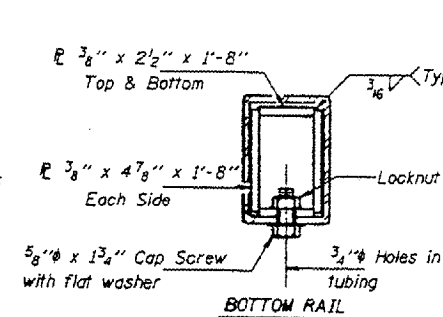
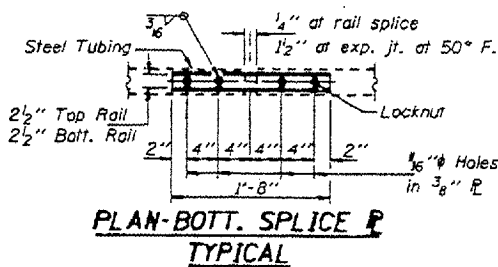
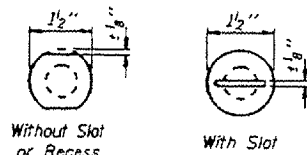
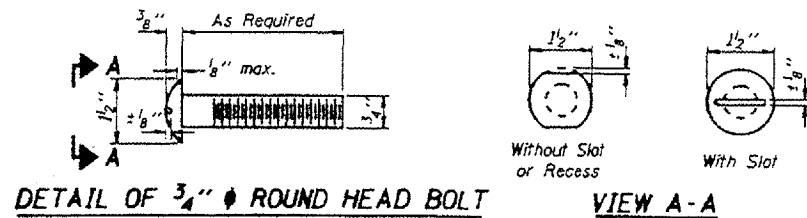
Bar	No.	Size	Length	Shape
h	16	#4	5'-0"	—
h1	4	#4	5'-3"	—
h2	6	#4	24'-9"	—
p	2	#5	24'-9"	—
p1	8	#6	24'-9"	—
s	27	#4	9'-5"	□
u	8	#6	11'-1"	—
v	8	#4	3'-2"	—
v1	8	#4	4'-2"	—
v2	50	#4	3'-11"	—
Concrete Structures				9.1 Cu. Yds.
Reinforcement Bars				990 Lbs.

**P.P.C. DECK BEAMS  
PILE BENT ABUTMENT**

24' RDWY.	27" BMS.	D=0°, 5° OR 10°
STANDARD CA-2427-10		

Wisconsin Department of Transportation  
PASSED November 1, 1995  
Approved November 1, 1995  
Engineer of Bridges and Structures

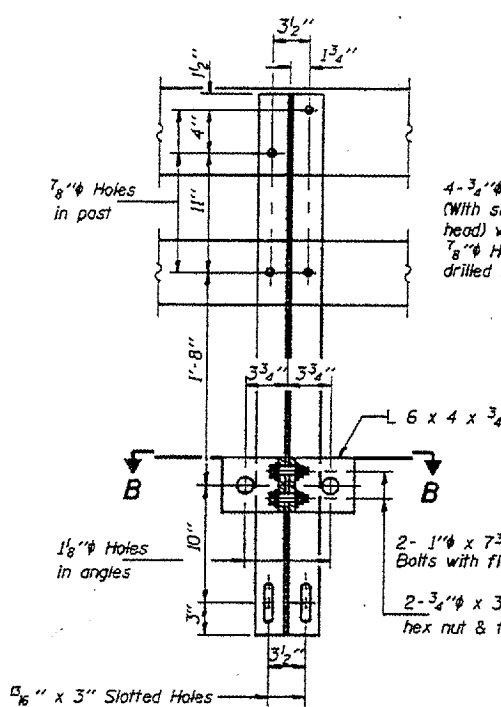




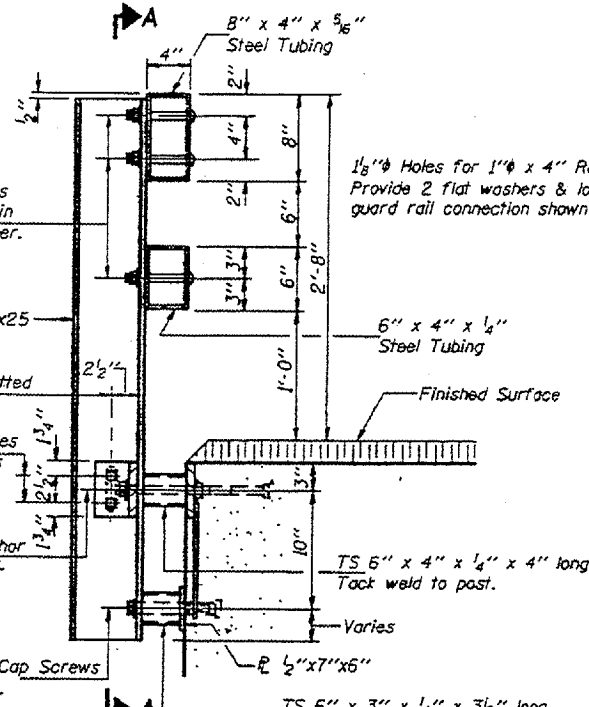
SECTIONS AT RAIL SPLICE

NOTES

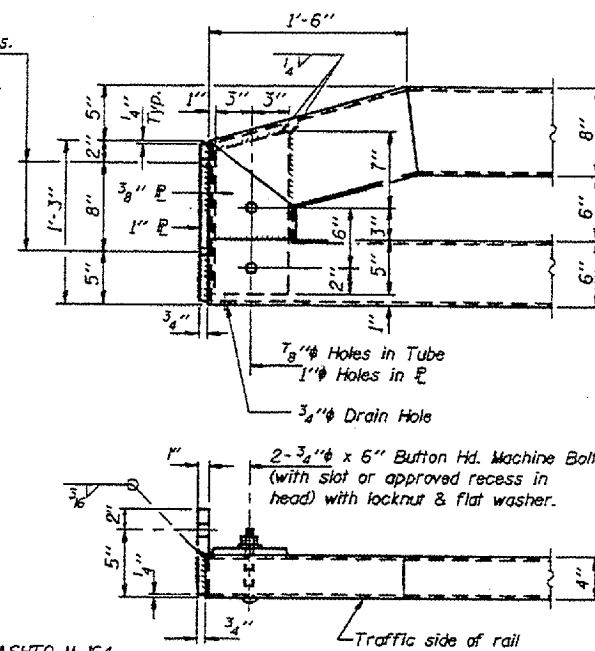
Hollow structural steel tubing shall conform to the requirements of ASTM designation A-500 Grade B Structural Steel Tubing and shall meet the longitudinal CVN requirements of 15 ft-lbs at 0° F.  
 All other steel shapes and plates shall conform to the requirements of AASHTO M-270 Grade 36 except posts and angles shall conform to AASHTO M-270, Grade 50.  
 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-154.  
 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.  
 All field drilled holes shall be coated with an approved zinc rich paint before erection.  
 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 BRIDGE RAIL, TYPE SM.  
 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(FX3) 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 5/8" cap screws in bottom of posts shall be tightened to a snug fit only.  
 The 1/2" x 7" x 6" plates that come in contact with concrete shall receive two coats of asphalt paint conforming to Section 760.07 Type II or place 1/2" fabric bearing pads between the plates and concrete.  
 The maximum allowable rail post spacing shall be 6'-3".



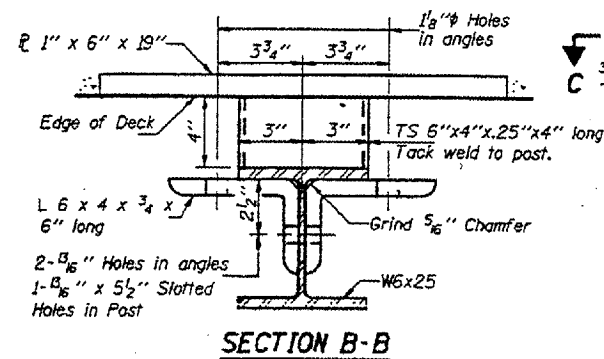
SECTION A-A



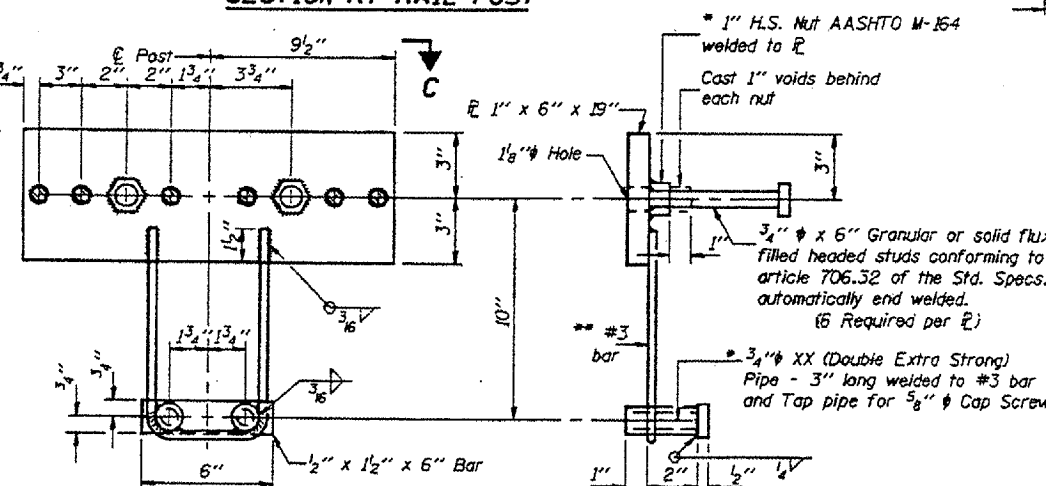
SECTION AT RAIL POST



END OF RAIL DETAILS

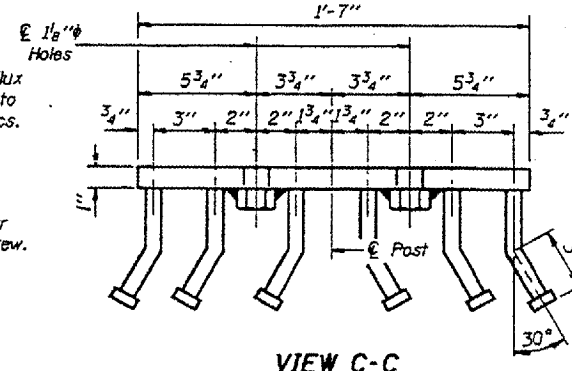


SECTION B-B



ANCHOR DEVICE

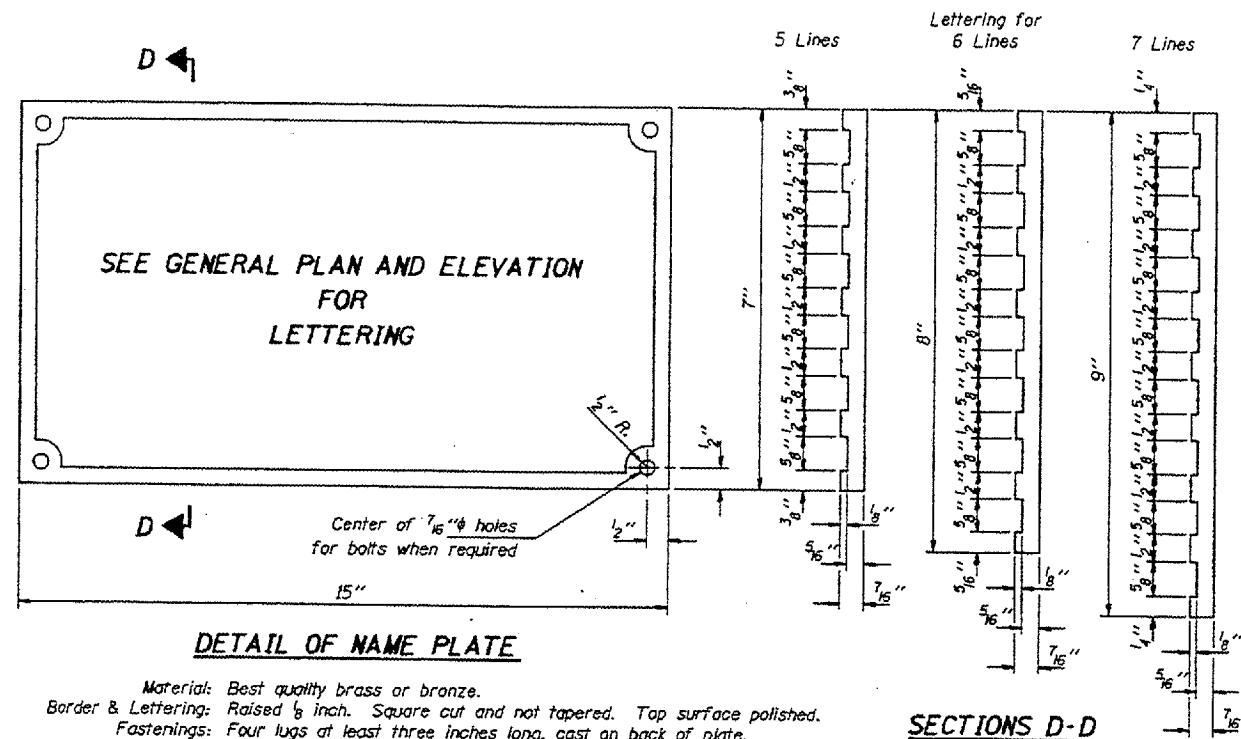
\* Threaded areas shall be plugged or blocked off during casting of beam. Galvanized after fabrication.  
 \*\* Whenever the lower insert assemblies interfere with strand locations, the #3 bars shall be cut and adjusted in order to allow raising or lowering of the lower inserts. Maximum adjustment not to exceed 1/2".



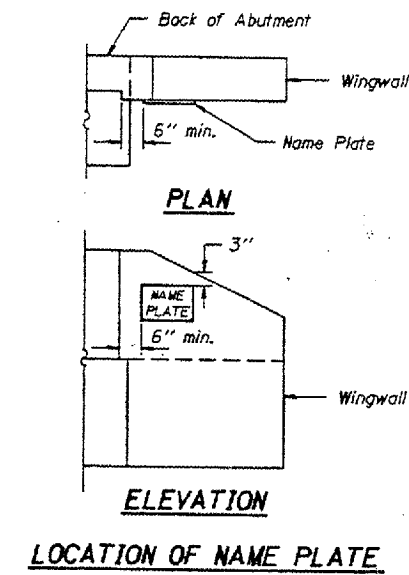
VIEW C-C

Illinois Department of Transportation  
 PASSED November 1, 1995  
 APPROVED November 1, 1995  
 Engineer of Bridges and Structures

STEEL BRIDGE RAIL, TYPE SM  
 STANDARD CR-TSM



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 November 1, 1995

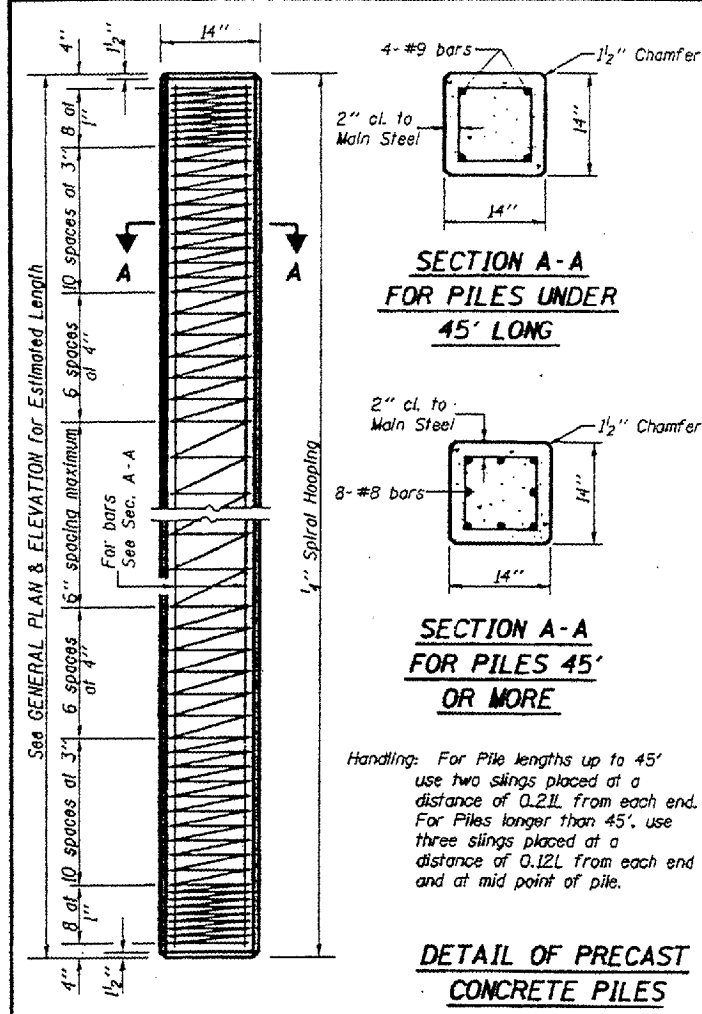
*Gregory J. Kaspar*  
 Engineer of Bridge Design

APPROVED November 1, 1995

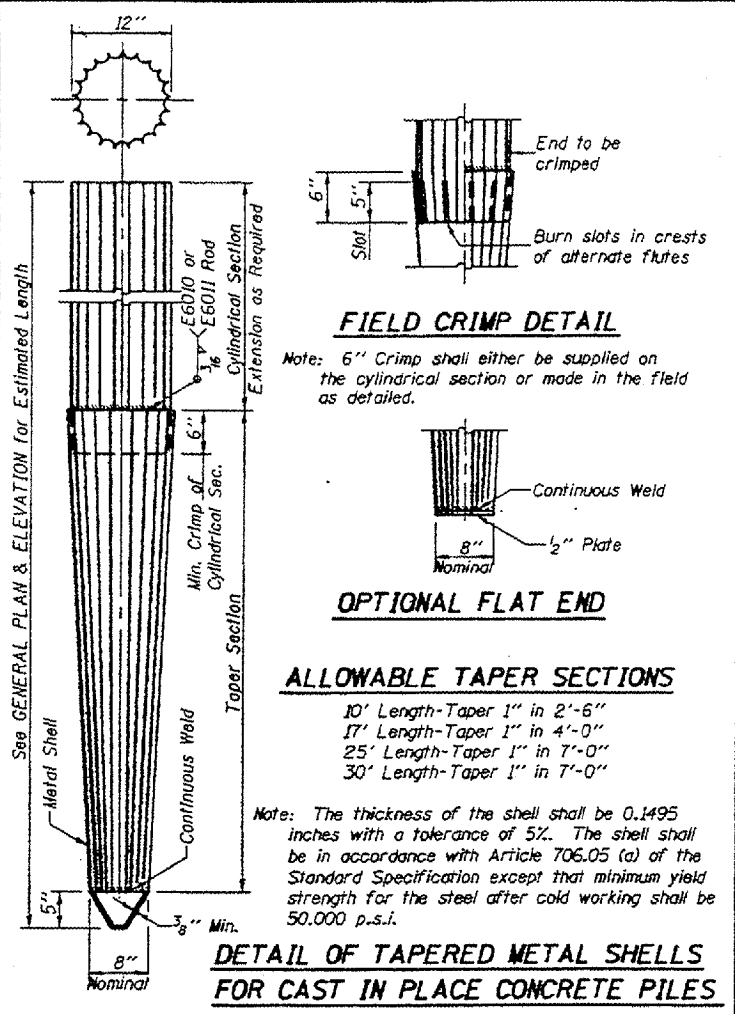
*Ralph E. Anderson*  
 Engineer of Bridges and Structures

STANDARD 74-315

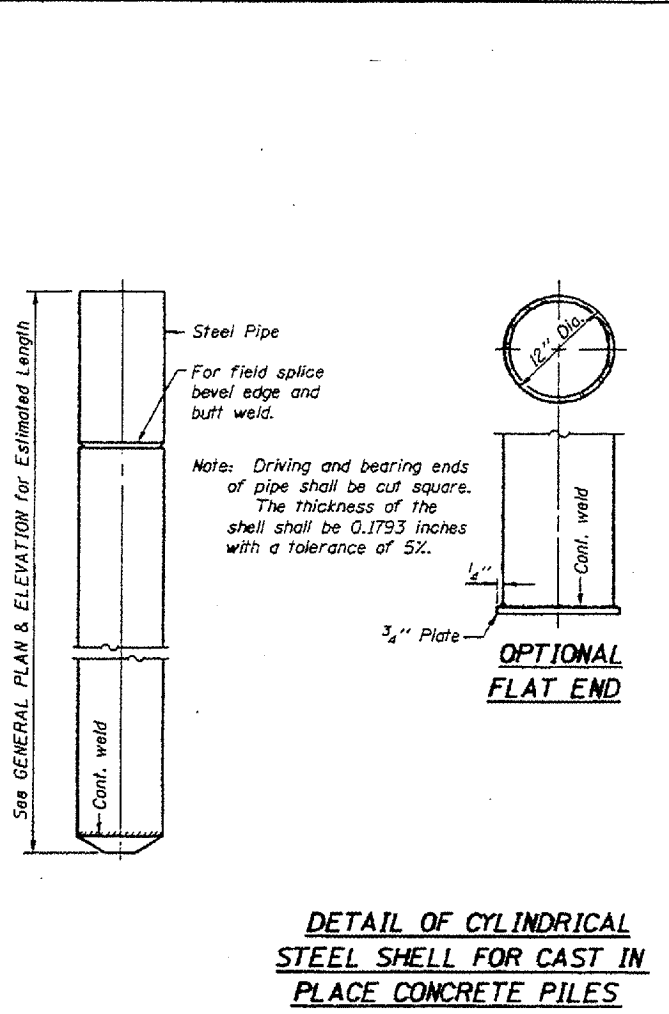
NAME PLATE  
 STANDARD CN



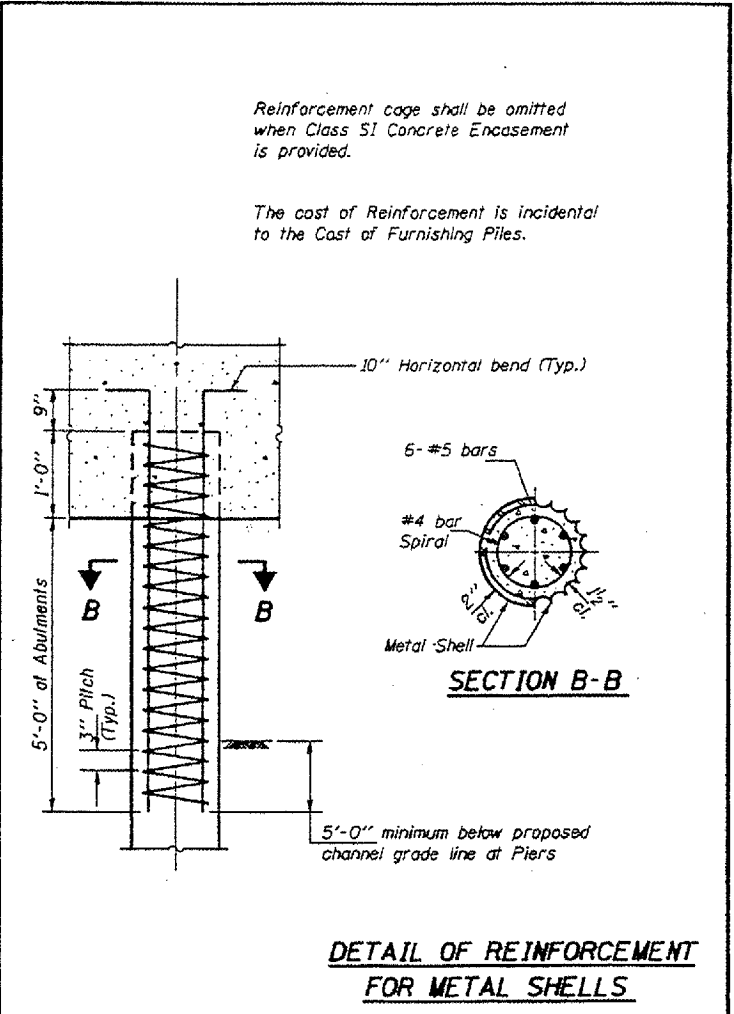
**DETAIL OF PRECAST CONCRETE PILES**



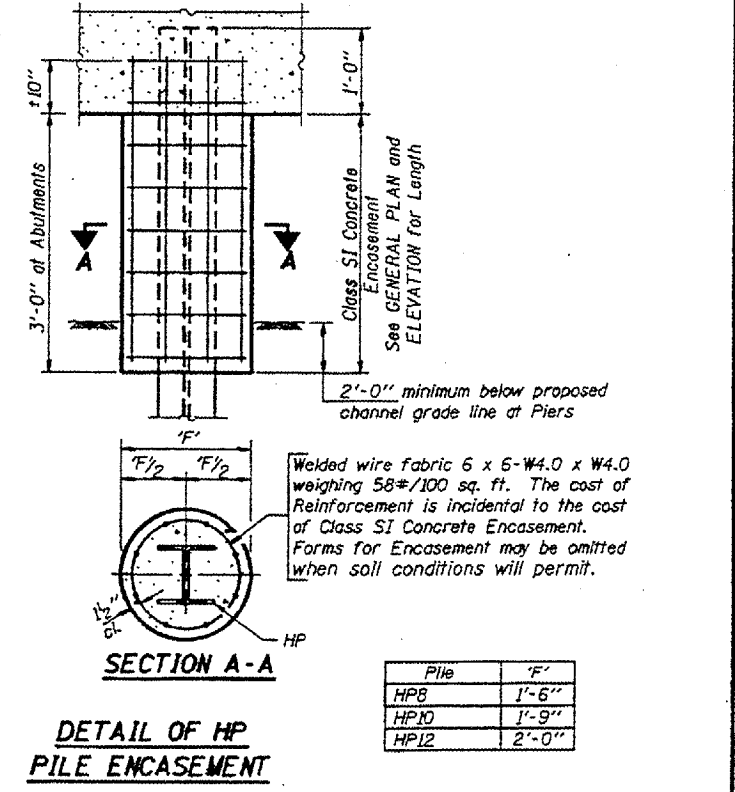
**DETAIL OF TAPERED METAL SHELLS FOR CAST IN PLACE CONCRETE PILES**



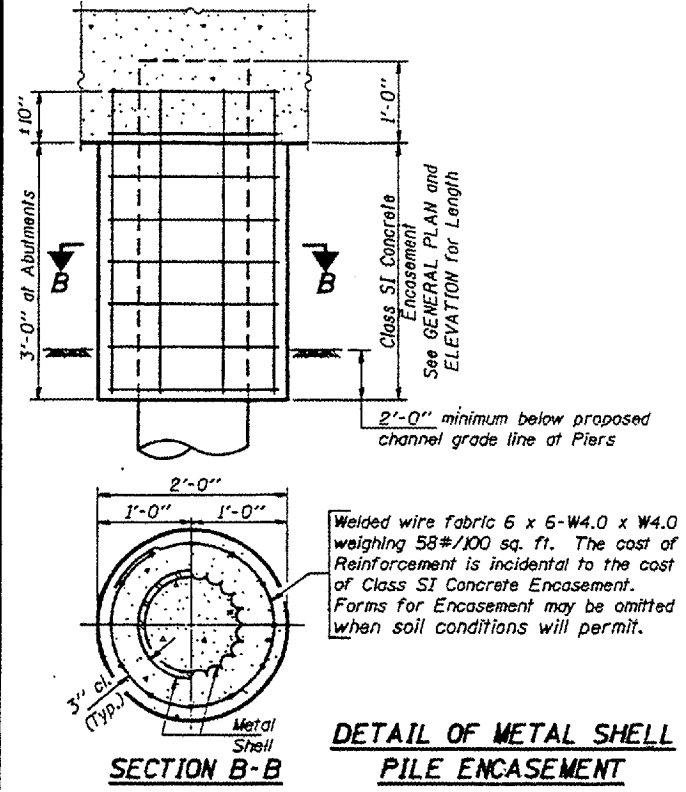
**DETAIL OF CYLINDRICAL STEEL SHELL FOR CAST IN PLACE CONCRETE PILES**



**DETAIL OF REINFORCEMENT FOR METAL SHELLS**



**DETAIL OF HP PILE ENCASEMENT**



**DETAIL OF METAL SHELL PILE ENCASEMENT**

**QUANTITIES/LIN. FT. OF ENCASEMENT (STEEL PILES)**

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

**(METAL SHELL PILES)**

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

PILE DETAILS	
STANDARD CX-1	

Illinois Department of Transportation

PASSED November 4, 1995

APPROVED November 4, 1995

Engineer of Bridges and Structures

COUNTY	RD.DIST.	ROUTE	CONTRACT	SHEET
KNOX	ORANGE	TR-245	89376	12 of 12

