076-0024

076-0024

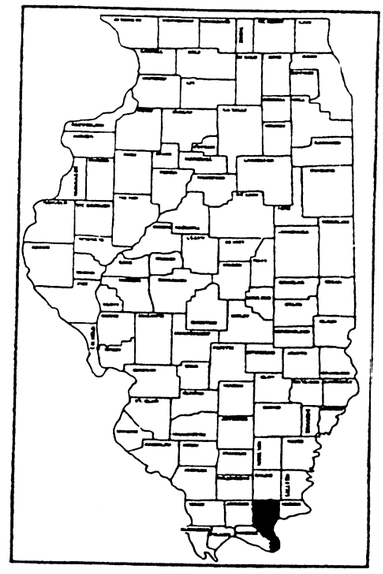
ROUTE: F.A.P. 132
SECTION BSMART FY 2001-
COUNTY: POPE
SHEET 1 OF 17

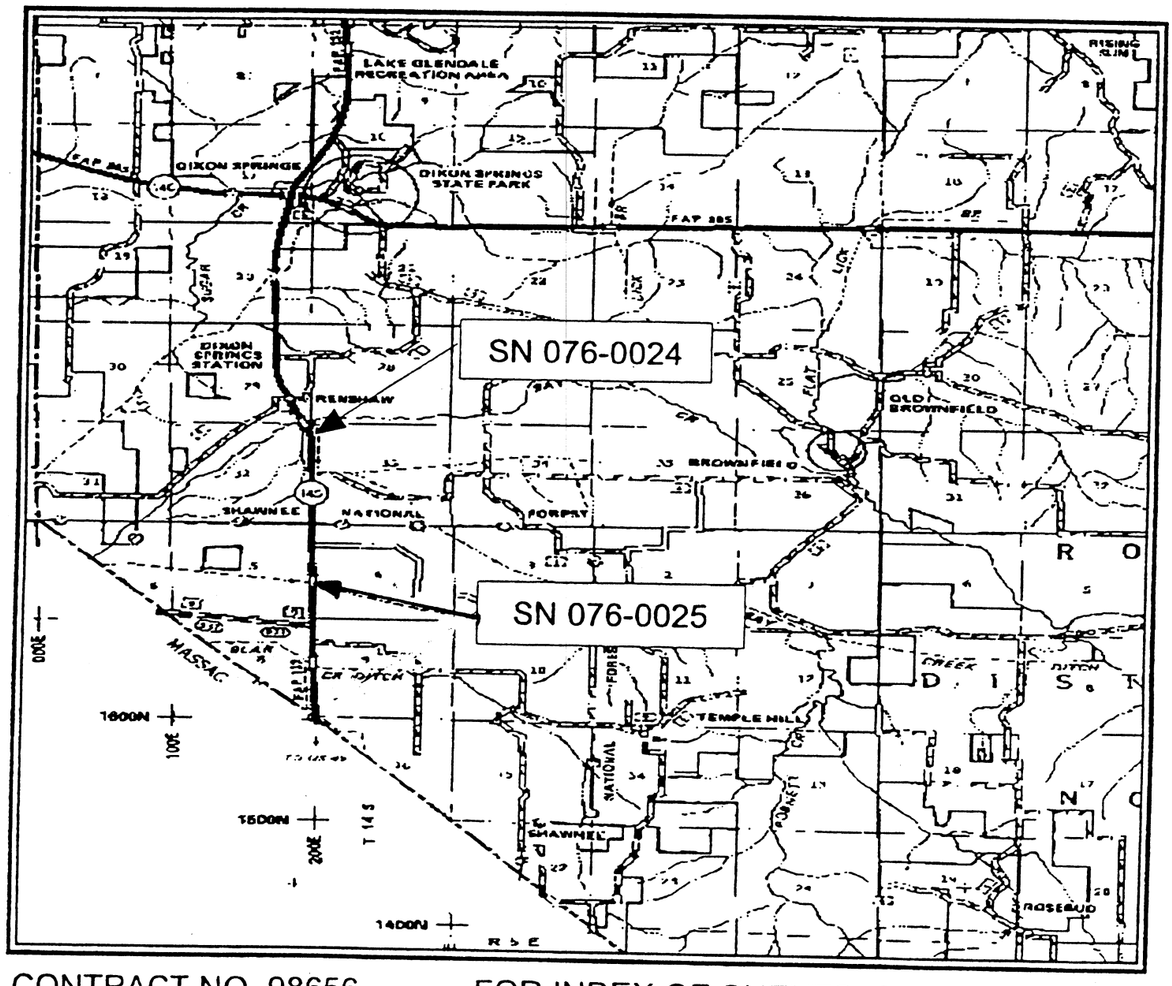
100%
11-30-2000

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLANS FOR PROPOSED HIGHWAY DISTRICT 9

F.A.P. ROUTE 132 (IL. 145)
SECTION BSMART FY 2001-1
POPE COUNTY
C-99-049-00





PROJECT ENGINEER: DAVID PICHE 618-549-2171

CONTRACT NO. 98656

JULIE 1-800-892-0123

ADT = 2250 (1999)

FOR INDEX OF SHEETS, SEE SHEET NO. 3

FOR SUMMARY OF QUANTITIES, SEE SHEET NO. 4

GENERAL NOTES

IT SHALL BE THE CONTRACTOR'S RESPONSIBILTY TO VERIFY PLAN DIMENSIONS AND DETAILS RELATIVE TO THE EXISTING STRUCTURE. NOMINAL CONSTRUCTION VARIATIONS AND PLAN DETAILS WILL NOT BE CAUSE FOR ADDITIONAL COMPENSATION. EXISTING PLANS ARE AVAILABE FOR INSPECTION AT THE DISTRICT OFFICE.

TEMPORARY PAVEMENT MARKING CONSISTS OF 100 mm SOLID WHITE AND SOLID YELLOW LINES. REFER TO STANDARD 780001 FOR DETAILS.

TEMPORARY PAVEMENT MARKING SHALL BE TYPE III TAPE.

FACTORS USED FOR QUANTITY CALCULATIONS ARE AS FOLLOWS:
ALL BITUMINOUS CONCRETE 2.016 TONS/CU YD

COMMITMENTS: NONE

BITUMINOUS MIXTURE REQUIREMENTS

MIXTURE: BITUMINOUS CONCRETE SURFACE COURSE, SUPERPAVE, N-90, MIXTURE C

MIXTURE USE:	BIT. CONC. S.C. SUPER "C" N90
AC/PG:	PG 64-22
RAP % (MAX):	10
MIXTURE COMPOSITION: (GRADATION MIXTURE)	IL-12.5 MM
DESIGN AIR VOIDS	4.0%, 90 GYRATION SUPERPAVE DESIGN
FRICTION AGGREGATE:	MIXTURE C

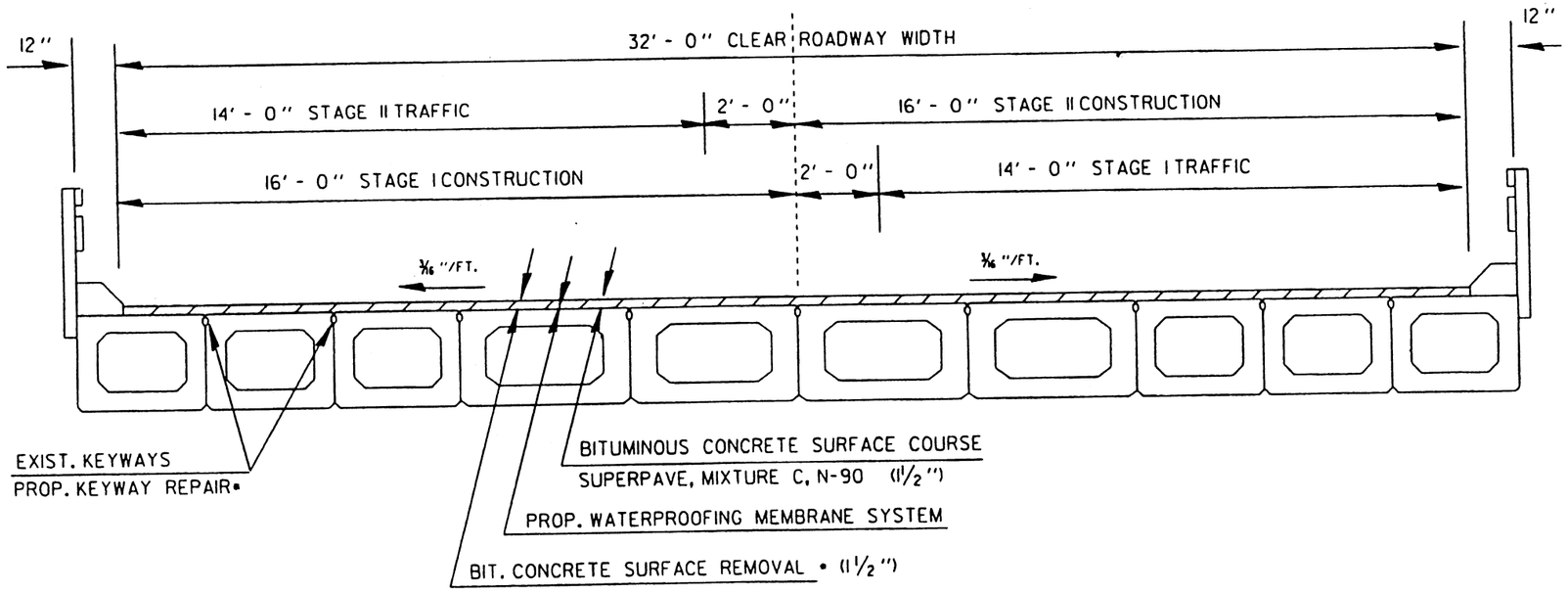
QC/QA BITUMINOUS

PAY ITEM	SN 076-0024	SN 076-0025
	TON	TON
BITUMINOUS CONCRETE SURFACE COURSE, SUPERPAVE, N-90, MIXTURE C	96	97
TOTAL	**173**	

TYPICAL CROSS SECTION

S.N. 076-0024

℄
FAP 132
(IL 145)

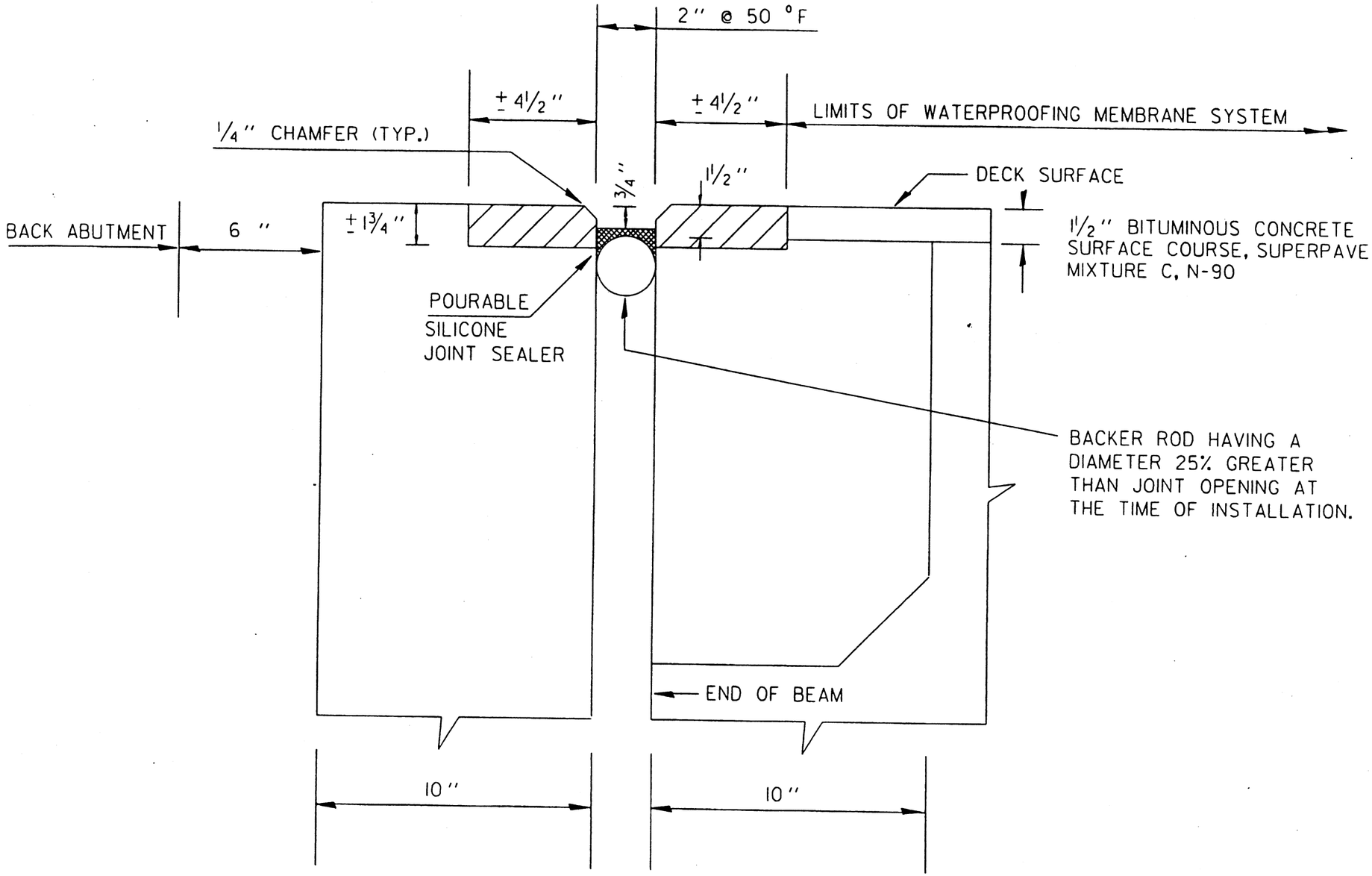


•SEE SPECIAL PROVISIONS

TOTAL BILL OF MATERIAL
(SN 076-0024)

BITUMINOUS CONCRETE SURFACE REMOVAL	SQ YD	1139
KEYWAY REPAIR	FT	730
WATERPROOFING MEMBRANE SYSTEM	SQ YD	1157
BIT. CONC. S.C. SUPER "C" N90	TON	96
POLYMER CONCRETE	CU FT	8
SILICONE JOINT SEALER	FT	64

ROUTE: F.A.P. 132
SECTION BSMART FY 200
COUNTY: POPE
SHEET 6 OF 17

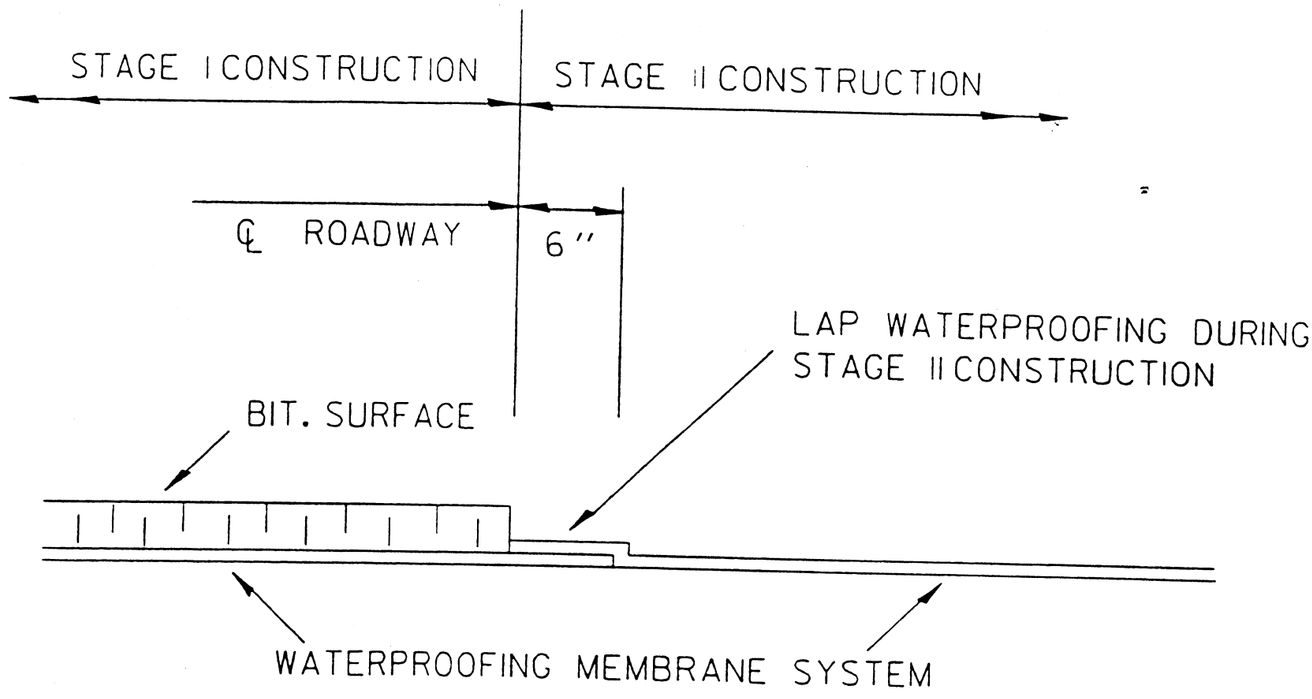


SECTION THROUGH EXPANSION JOINT (TYPICAL EACH ABUTMENT)

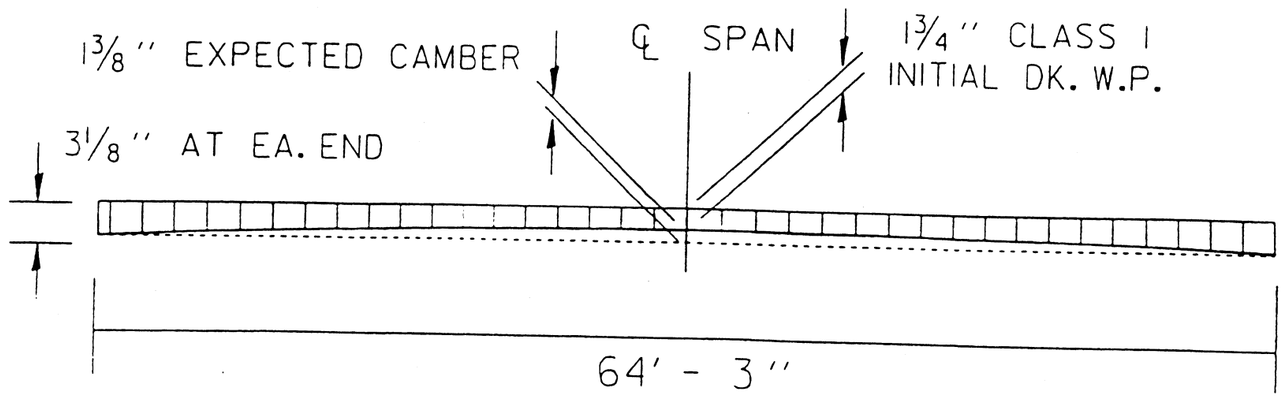
NOTE: HATCHED AREAS INDICATE REMOVAL OF EXISTING NEOPRENE EXPANSION JOINT AND REPLACED WITH POLYMER CONCRETE. COST INCLUDED IN POLYMER CONCRETE.

ROUTE: F.A.P. 132
SECTION BSMART FY 2001-
COUNTY: POPE
SHEET 7 OF 17

ROUTE: F.A.P. 132
SECTION BSMART FY 2001-1
COUNTY: POPE
SHEET 8 OF 17



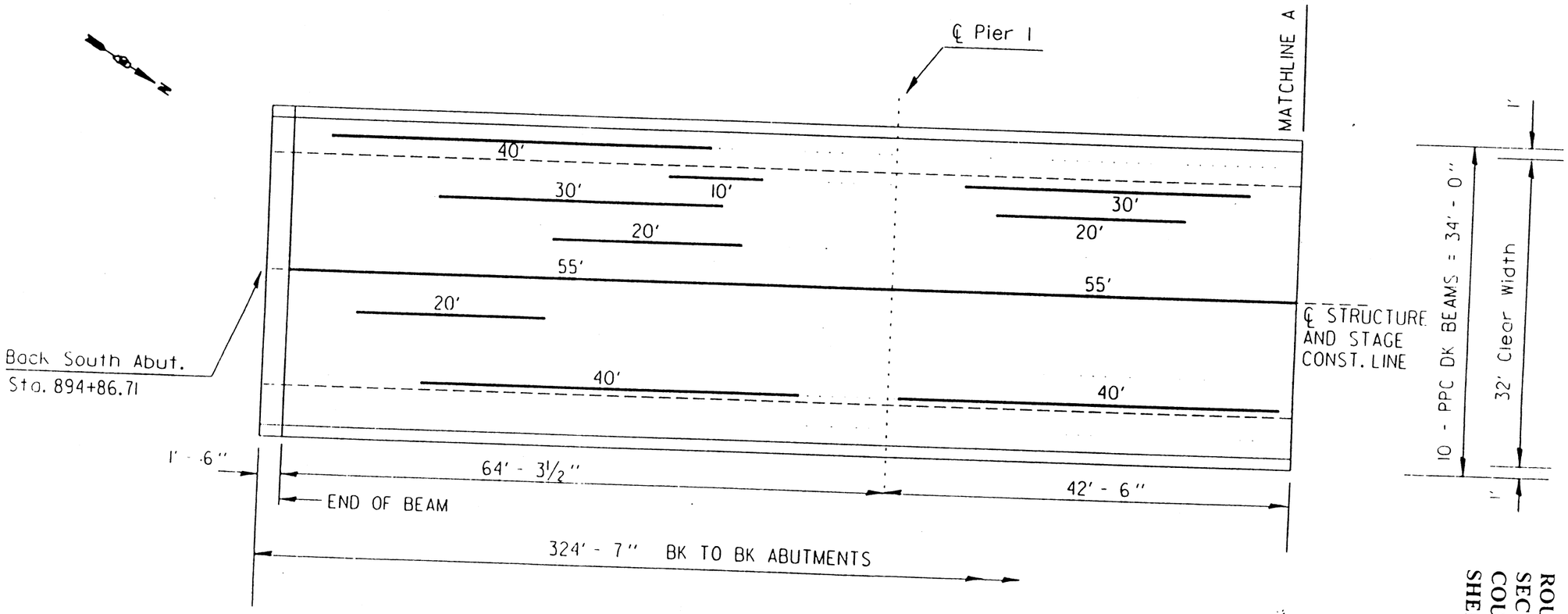
WATERPROOFING TREATMENT AT STAGE CONSTRUCTION



EXISTING BITUMINOUS SURFACE PROFILE

KEYWAY REPAIR PLAN FOR SN 076-0024

(SHEET 1 OF 3)



NOTE: QUANTITIES SHOWN IN THE PLANS FOR KEYWAY REPAIR ARE ESTIMATES.
THE ACTUAL AMOUNT OF REPAIR REQUIRED SHALL BE DETERMINED BY THE ENGINEER.

ROUTE: F.A.P. 132
SECTION BSMART FY 2001-1
COUNTY: POPE
SHEET 9 OF 17

KEYWAY REPAIR PLAN FOR SN 076-0024

(SHEET 2 OF 3)

ROUTE: F.A.P. 132
SECTION: BSMART FY 20
COUNTY: POPE
SHEET 10 OF 17

KEYWAY REPAIR PLAN FOR SN 076-0024

(SHEET 3 OF 3)

ROUTE: F.A.P. 132
SECTION: BSMART FY 20
COUNTY: POPE
SHEET 11 OF 17

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHT. NO.
132	103A-B	POPE	25	1

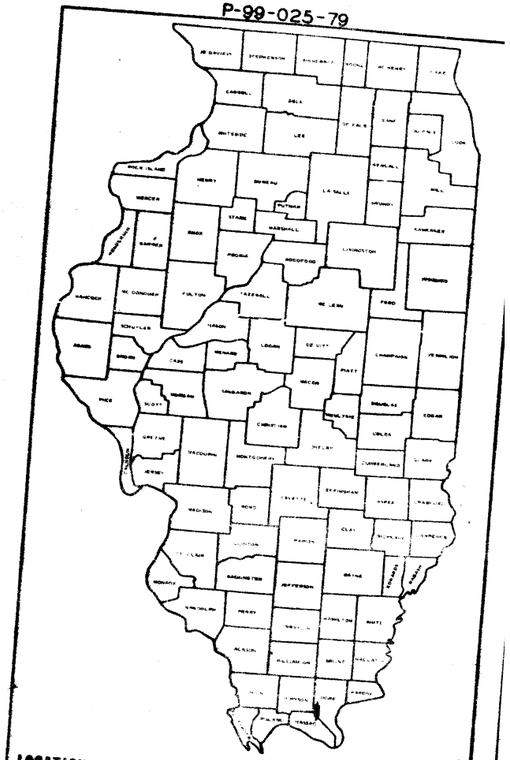
F.A.P. RTE. 148 | ILLINOIS | PROJECT BR-F-132(49)

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLANS FOR PROPOSED FEDERAL AID HIGHWAY

F.A. ROUTE 132 (ILL. ROUTE 145)
PROJECT BR-F-132(49)
SECTION 103A-B
POPE COUNTY

P-99-025-79

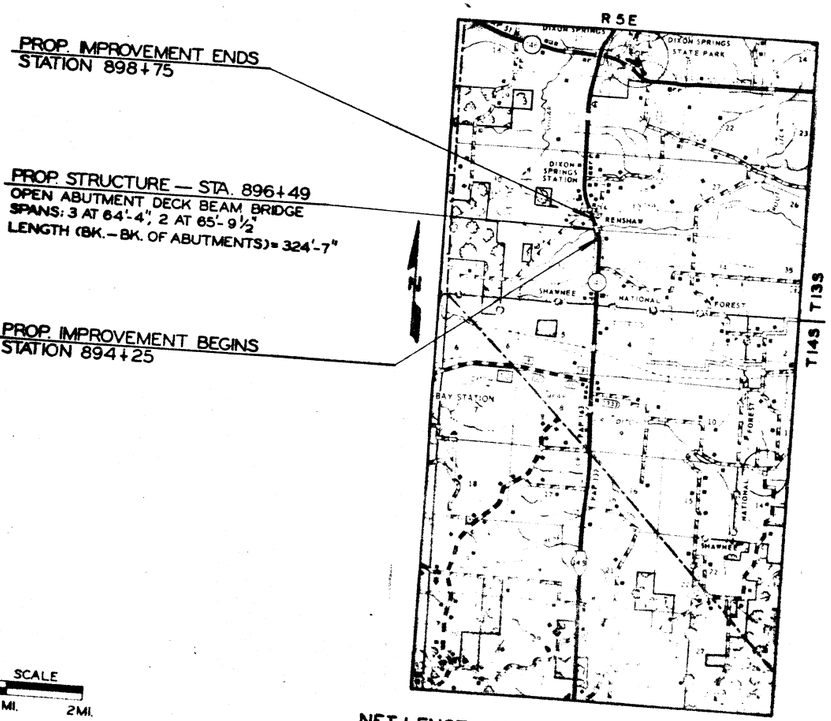


LOCATION OF SECTION INDICATED THUS: —

INDEX OF SHEETS	- SHEET NO. 2
SUMMARY OF QUANTITIES	- SHEET NO. 2

FILE COPY
5-29-81

C-99-069-80



NET LENGTH STRUCTURE = 324.58 FT. = 0.061 MI.
NET LENGTH ROADWAY = 125.42 FT. = 0.024 MI.
NET LENGTH PROJECT = 450.00 FT. = 0.085 MI.

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED March 20, 19 81
J. Newton
DISTRICT ENGINEER

EXAMINED April 6, 19 81
P. Wilson
ENGINEER OF PLANS AND CONTRACTS

PASSED April 6, 19 81
Thomas R. Bruget
ENGINEER OF DESIGN

APPROVED April 6, 19 81
DIRECTOR DIVISION OF HIGHWAYS

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR DATE

CONTRACT NO. 34993 BAY CREEK

9-109

ROUTE	SECTION	COUNTY	TOTAL
FA 132	103A-B	POPE	25
STA.		TO STA.	
F.H.W.A. REG. NO. 4	ILLINOIS	FED. AID PROJECT-	

GENERAL NOTES

See Proposal for Boring Data.

The top surface of the beams shall be finished in accordance with Article 505.06 of the Standard Specification except that the surface shall not be roughened by brooming. The finished surface shall be free of depressions or high spots with sharp corners.

Protective Coat shall not be applied to surfaces to which Waterproofing Membrane System is applied.

Reinforcement bars shall conform to the requirements of AASHTO M-31 or M-53 Grade 60, unless otherwise indicated.

The Contractor shall drive one precast concrete test pile in a permanent location at Pier 2 and at Pier 4 as directed by the Engineer.

Bars designated "Grade 40" shall have a minimum yield strength of 33,000 psi and maximum yield strength of 45,000 psi.

Elev. 347.25 — Elev. 346.90 — Metal guardrail & posts — ±2'-4" Vert. cl. — Elev. 344.53 — 10% — Slope to drain — Elev. 336.5 — Str. Exc. — Design H.W. Elev. 345.4 — 27" P.P.C. Deck Bms. — 340.0 Toe of Slope — Natural Ground — Elev. 326.5 — Streambed Elev. 330.2 — Earth Excavation — Elev. 326.0 — Slope to drain — Elev. 336.5 — 340.0 Toe of Slope — Elev. 344.24 — Concrete Piles — Conc. Piles — Cofferdam Excavation — Conc. Piles — Conc. Piles — Conc. Piles

ELEVATION

NOTE: Hatched Area shows Earth Excavation which is included in the Earth work balances in the road plans.

10' 11'-0" — 13-4" X 8" Deck Drains — Boring #2 spaced at ±25'-0" cts. Typ. Ea. Curb. Do not place drains closer than 4'-0" to Edge of bents — 11'-0" 10' — 5' Shldr. — 2:1 — Boring #1 — ℄ Pier 1 Sta. 895+52.50 Elev. 350.78 — ℄ Pier 2 Sta. 896+16.83 Elev. 350.71 — Flow — Stage Constr. Line — Limits of Exist Structure — ℄ Pier 3 Sta. 896+81.17 Elev. 350.64 — ℄ Pier 4 Sta. 897+45.50 Elev. 350.57 — Std. 2324 — Bk. Sa. Abut Sta. 894+86.71 Elev. 350.86 — 34'-0" O. to O. — 16' — 4' — 90° — ℄ F.A. Rte. 132 — Boring #3 Bk. No. Abut Sta. 898+11.29 Elev. 350.50 — 24'-0" — 12' — 12' — 5' Shldr. to Shldr. — 2:1 — 65'-9½" — 64'-4" — 1' — 64'-4" — 64'-4" — 65'-9½" — Std. 2324 No Drains Req'd. — 20' Appr. Std. 2382 — 324'-7" Bk. to Bk. Abut. — 20' Appr. Std. 2382

PLAN

Riprap — 6'-0" — Bedding — 3'-0"

RIPRAP ANCHOR DETAIL

-0.11% — Sta. 894+64.21 Elev. 350.88 — Sta. 898+33.79 Elev. 350.47

PROFILE GRADE

℄ ROADWAY

WATERWAY INFORMATION

Drainage Area 16466 sq. mi. Low Grade Elev 349.16' at Sta. 890+00

Flood	Freq. Yr.	Q. C.F.S.	Opening Sq. Ft. Exist.	Opening Sq. Ft. Prop.	Nat. H.W.E.	Head-Ft. Exist	Head-Ft. Prop.	Headwater Exist.	Headwater Prop.
Design	50	9900	1398	2360	345.4	2.0	0.47	347.4	345.9
Base	100	11700	1478	2528	346.0	2.5	0.60	348.5	346.6
Overtopping	—	—	—	—	—	—	—	—	—
Max. Calc.	500	15515	1627	2842	347.12	3.0	0.75	350.1	347.9

NAME PLATE

STATION 896+49
BUILT 198 BY
STATE OF ILLINOIS
F.A. RT. 132 SEC. 103A-B
F.A. PROJECT BRF-132(49)
LOADING HS20
*STR. NO.

See Std. 213
*Structure Number to be supplied by District.

DESIGN STRESSES

FIELD UNITS
f'c = 3,500 psi
fy = 60,000 psi
Reinforcement

PRECAST PRESTRESSED UNITS
f'c = 5,000 psi
f'ci = 4,000 psi
fs = 270,000 psi (½" ø Strands)
fs = 189,000 psi (½" ø Strands)

Design Specifications 1977 AASHTO & 1978, 1979 & 1980 Interims as applicable

Allow for 25 #/sq. ft. Future Wearing Surface

LOADING HS20-44

APPROVED
FOR STRUCTURAL ADEQUACY ONLY
Engineer of Bridge & Traffic Structures

TOTAL BILL OF MATERIAL

ITEM	UNIT	SUPER	SUB	TOTAL
Structure Excavation	Cu. Yd.		195	195
Portland Cement Mortar Fairing Course	Lin. Ft.	2890		2890
Waterproofing Membrane System	Sq. Yd.	1145		1145
Protective Coat	Sq. Yd.	110		110
Bituminous Conc. Surf. Crse. Mixture D Class I	Ton	134		134
Concrete Piles	Lin. Ft.	1078		1078
Precast Concrete Piles, 14"				
Test Pile, Precast Concrete	Lin. Ft.		2357	2357
Neoprene Expansion Jt. 2"	Ea.		2	2
Precast Prestressed Concrete Deck Beams (27" Depth)	Lin. Ft.	64		64
Steel Railing, Type T	Sq. Ft.	10,923		10,923
Untreated Timber	Lin. Ft.	644		644
Hardware	FBM		624	624
Name Plates	Pound		105	105
Stone Riprap	Ea.	1		1
Removal of Existing Structures	Sq. Yd.		330	330
Class X Concrete	Ea.			1
Reinforcement Bars	Cu. Yd.	18.2	181.0	199.2
Temporary Bridge Rail	Pound	1250	18,580	19,830
Steel Sheet Piling, Temporary	Lin. Ft.	365		365
Cofferdam (Pier 2)	Sq. Ft.		4750	4750
Cofferdam (Pier 3)	Ea.		1	1
Cofferdam Excavation	Ea.		1	1
	Cu. Yds.		105	105

N — Range 5 E. 3rd. P.M. — ILL. 145 — 29 — 28 — I.C.R.R. — Bay — Creek — 32 — 33 — F.A. Rte. 132 — Twp. 13 S. — Bridge Reconstruction

LOCATION SKETCH

STATE OF ILLINOIS — ROBERT BRADFORD — STRUCTURAL ENGINEER

GENERAL PLAN AND ELEVATION

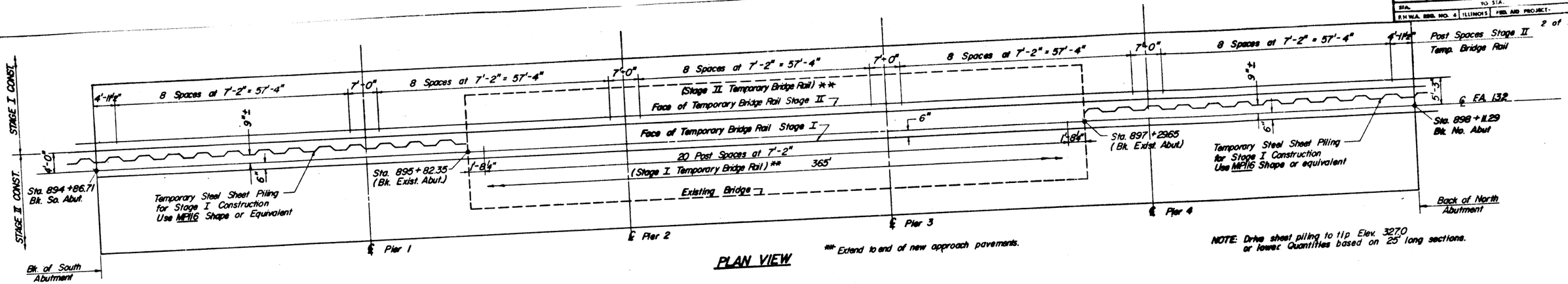
F.A. Rte. 132 (ILL. 145) Over BAY CREEK
F.A. Rte 132 SECTION 103A-B
POPE COUNTY Sta. 896+49.00

GREENE & ELLIOTT, Ltd.
CONSULTING ENGINEERS
1819 STEVENSON DR · 217/529-6681 · SPRINGFIELD, ILL.

DRAWN L.V.R.	REVISED	DATE	PROJECT
CHECKED R.B.		OCT. 1980	

ROUTE	SECTION	COUNTY	SHEET NO.	SHEET NO.
FA 132	103 A-B	POPE	25	14
STA.	TO STA.			
F.A.P. RTE. NO. 4	ILLINOIS	FED. AID PROJECT -		

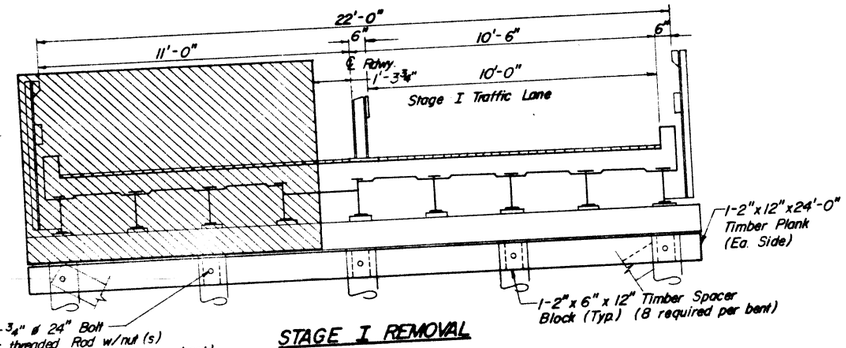
2 of 13



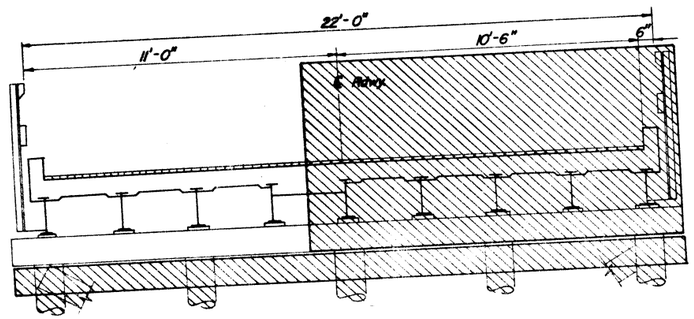
PLAN VIEW

*** Extend to end of new approach pavements.

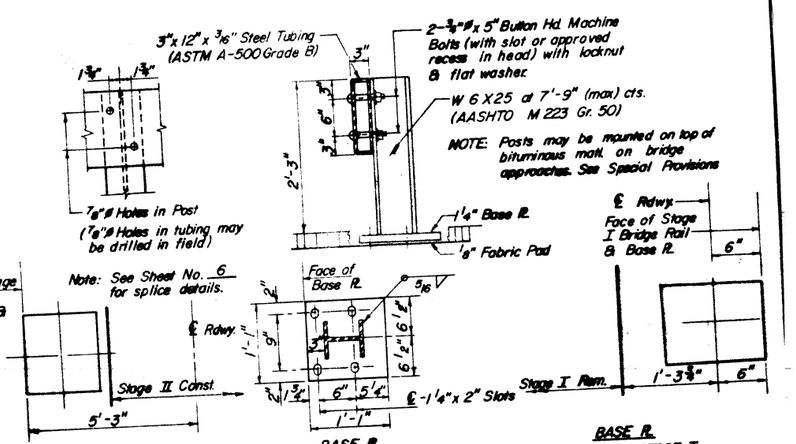
NOTE: Drive sheet piling to tip Elev. 327.0 or lower. Quantities based on 25' long sections.



STAGE I REMOVAL



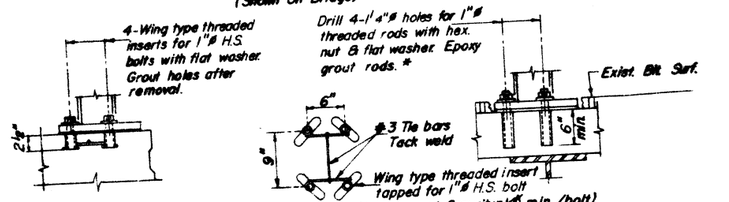
STAGE II REMOVAL



BASE PL. LOCATION STAGE II

POST DETAIL (Shown On Bridge)

BASE PL. LOCATION STAGE I



INSERT DETAIL (Stage II)

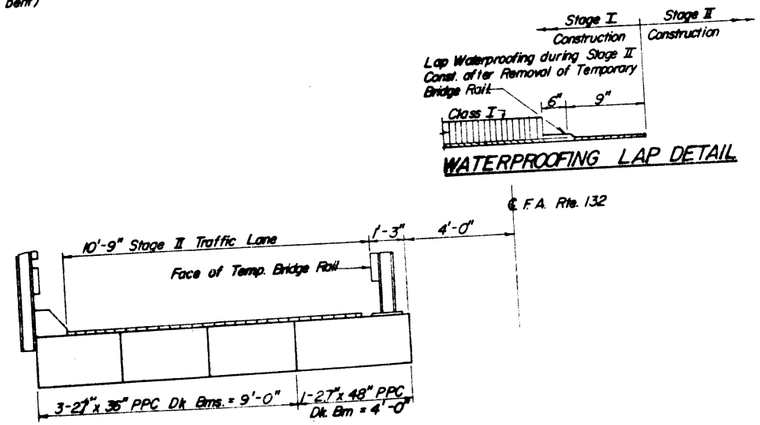
STAGE II RAIL (See Plan View above for spacing)

STAGE I RAIL (See Sheet No 5 for spacing)

ANCHORAGE DETAIL

* Threaded Rods shall extend 6" into concrete deck or approach pavements.

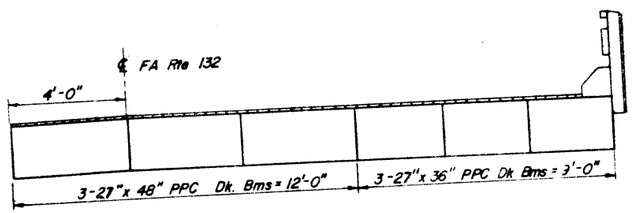
TEMPORARY BRIDGE RAIL DETAILS (See Special Provisions)



WATERPROOFING LAP DETAIL

STAGE I CONSTRUCTION

NOTE: "TEMPORARY PIER BENT SUPPORTS" Prior to the Stage I removal of existing timber pile cap, as shown, the Contractor shall fasten one (1) 2" x 12" timber plank alongside each side of existing piles. Work shall be in accordance with the applicable portions of Sec. 510 of the Standard Specifications.



STAGE II CONSTRUCTION

BILL OF MATERIALS

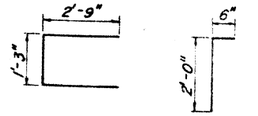
TEMPORARY PIER BENT SUPPORTS

ITEM	UNIT	QTY.
Untreated Timber	FBM	624
Hardware	Pound	105

STAGING DETAILS
FA. RTE. 132 SEC. 103A-B
POPE COUNTY
STATION 896+49

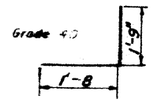
GREENE & ELLIOTT, LI
CONSULTING ENGINEERS

ROUTE	SECTION	COUNTY		SHEET
FA 132	103A B	POPE	25	15
STA.		TO STA.		
F.A.P. RTE. NO.	ILLINOIS	FED. AID PROJECT		



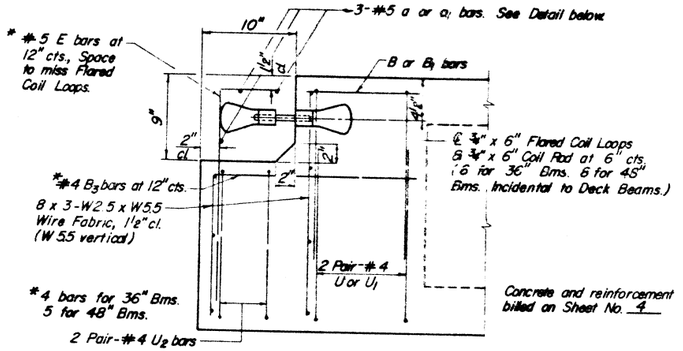
BAR U_2

BAR E

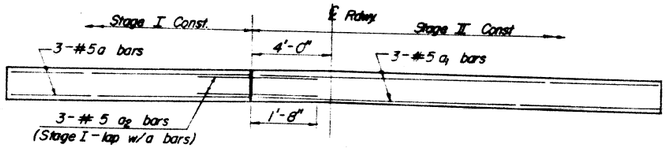


BAR a_2

Straighten before Stage II Construction

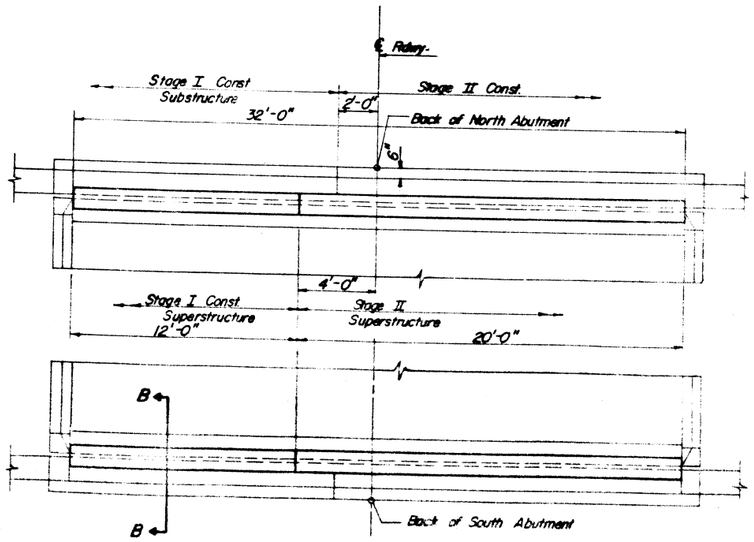


END OF BEAM AT ABUTMENTS



ELEVATION – BEAM BLOCKOUT

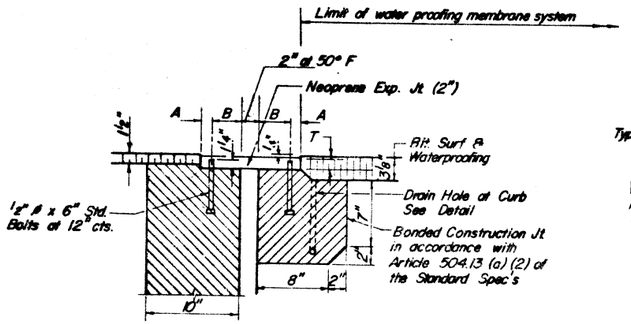
NOTE: See end of Beam Detail for placement of a and a_1 bars.



PLAN VIEW – EXPANSION DEVICE

NOTE: *Ends of beams shall be aligned at the expansion joints. Any lineal variation in the beam lengths shall be placed at the fixed joint.*

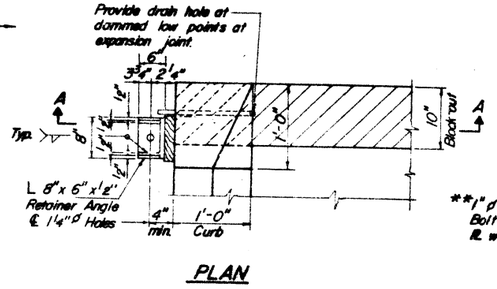
Hatched areas to be poured after beams have been erected and joints grouted. See End of Beam Detail and Abutment sheet for reinforcement.



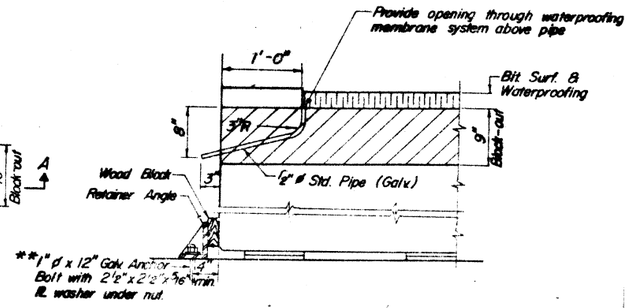
SEC. B-B

** Anchor bolts may be cast into the masonry or placed in drilled holes and grouted in place. Cost including Retainer Angle and Accessories incidental to Beams.

NOTE: After block-outs are poured and cured the retainer angles shall be removed. Anchor bolts may be left in place.



PLAN



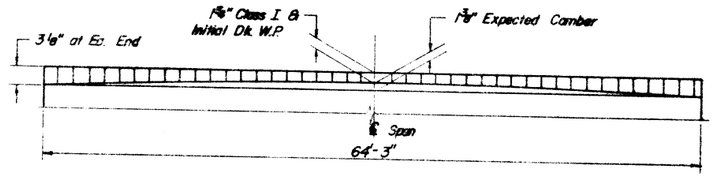
SEC. A-A

DRAIN HOLES & RETAINER ANGLE AT ABUTMENTS

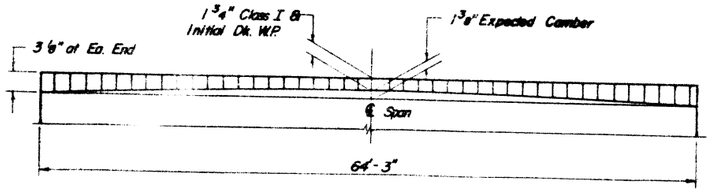
ALTERNATE NEOPRENE EXPANSION JOINTS (2")

(See Special Provisions)

Model	Supplier	Blockout Dimensions
TRANSFLEX, MODEL 200A	General Tire Company	$T=1\frac{9}{16}$", $A=1\frac{1}{8}$", $B=3\frac{3}{16}$"
~~WABOFLEX, MODEL 200~~	~~Watson Bowman Associates, Inc.~~	~~$T=1\frac{9}{16}$", $A=1\frac{1}{8}$", $B=3\frac{3}{16}$"~~
FEL-SPAN, MODEL T-30 Set joint seal ⅝" at 50° F	Fel-Pro Building Products, Inc.	$T=1\frac{3}{4}$", $A=2\frac{1}{4}$", $B=2\frac{3}{16}$"
WABO ELASTODAM, TYPE 300 Set joint seal ⅝" at 50° F	Watson Bowman Associates, Inc.	$T=1\frac{3}{4}$", $A=2\frac{1}{4}$", $B=2\frac{13}{16}$"
WABO ALU-STRIP, TYPE III S300 Set joint seal 1½" at 50° F Permitted for up 50° skew.	Watson Bowman Associates, Inc.	$T=1\frac{3}{4}$", $A=1\frac{5}{8}$", $B=2\frac{3}{4}$"
LOW PROFILE ONFLEX Set joint seal 1½" at 50° F Roadway bolt channel shall be filled with approved grout. Permitted for up to 50° skew.	Structural Accessories, Inc.	$T=1\frac{3}{4}$", $A=1\frac{5}{8}$", $B=2\frac{3}{8}$"



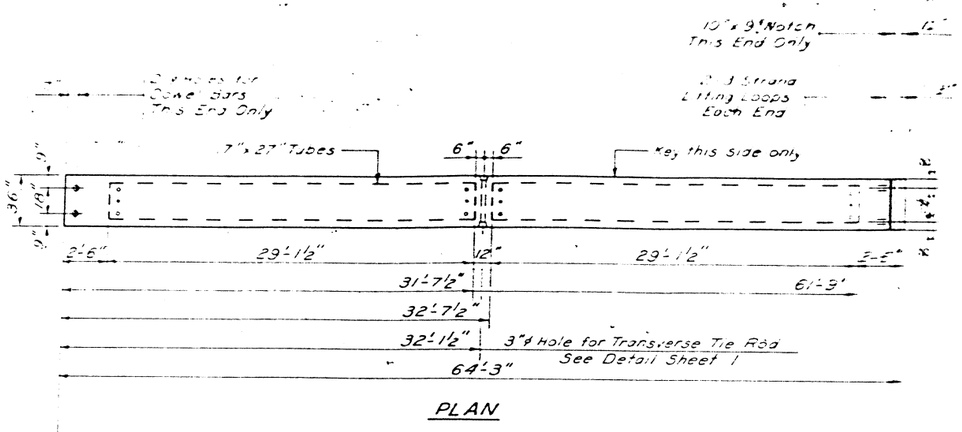
CAMBER DIAGRAM – 36" BEAMS



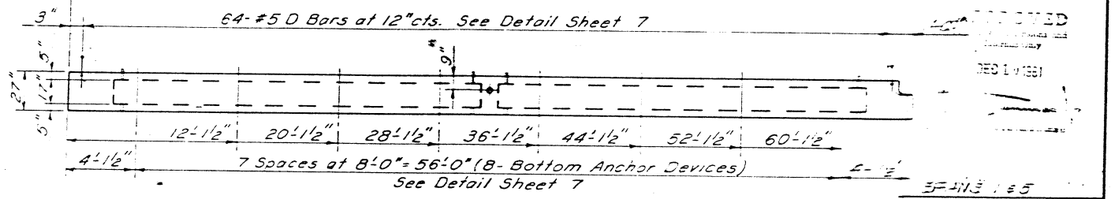
CAMBER DIAGRAM – 48" BEAMS

SUPERSTRUCTURE DETAILS
FA. RTE. 132 SEC. 103A-B
POPE COUNTY
STATION 896+49

GREENE & ELLIOTT, Ltd.
CONSULTING ENGINEERS



PLAN



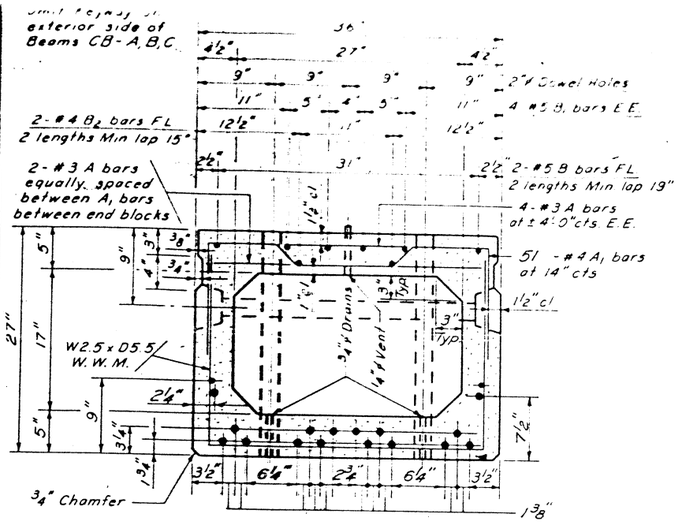
ELEVATION

Bars Spaced	
1	
2	

SHOP No. 176-81

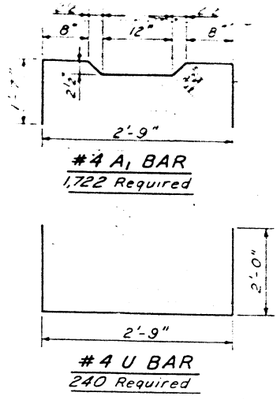
SHEET 6 OF 13

SCALE 3/4" = 1'-0" BEAM CB-C 2 REQUIRED



TYPICAL SECTION THRU BEAM

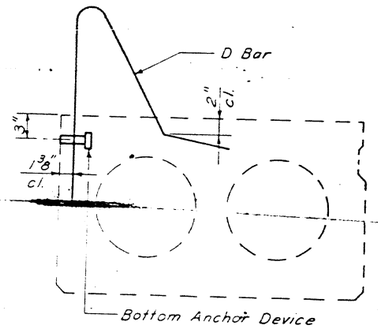
2 - 3 wire - 5/16" ø strands tensioned to 4,000# 9" up
16 - Strands 1/2" ø 270 K @ 1 3/4" 6 Up 3 1/4" 2 Up 7 1/2"



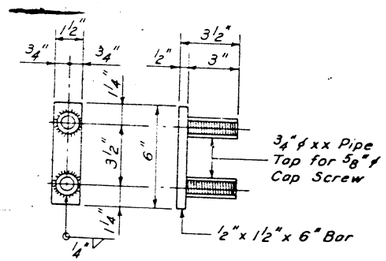
1 = CB-A, C 1B-A
2 = CB-B 1B-B
3 = CB-A, C
4 = CB-B
5 = CB-A, B, C

SHOP BILL OF MATERIAL

	Bar	Size	Length	Shape	Cre Beam	Job Total	Remarks
	A	#3	2'-8"		108	3,240	
1	A1	4	6'-1"		55	660	1,722
2					59	1,062	
	B	5	32'-10"		4	120	
	B1	5	13'-0"		8	240	
	B2	4	32'-8"		4	120	
1	B3	4	2'-3"		4	48	
3	D	5	3'-9"		64	256	646
4					65	390	
1	E	5	2'-6"		4	48	
	U	4	6'-9"		3	240	
1	U1	4	6'-9"		4	48	
	Reinforcement Bars			Lbs.	25,761		
	MESH End	24"	2'-9"		2	60	
1	MESH E.End	15"	2'-9"		1	12	
	MESH 8x3-W2.5xW5.5			Sq. Ft.	372		
	MESH Bott	78"	58'-4"		1	30	
	W2.5 x D5.5			Sq. Ft.	11,375		
	Concrete			C. Y.	9.3	279	
	Lifting Loops			Each	4	120	
	Tubes 17"x27"x29'-1 1/2"				2	60	1,748 L.F.
1	Tubes 2" I.D. x 2'-3"				2	24	216 L.F.
2					4	72	
	Tubes 3" I.D. x 2'-6"				1	30	68 L.F.
	Void Drains 3/4" I.D. x 5"				8	240	
	Void Vents 1/4" I.D. x 6"				4	120	
1	Flared Coil Loops 3/4"ø x 6"				6	72	
R&B	Rail Post Anchor Devices				8	80	



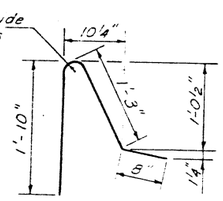
LOCATION OF D BAR & BOTTOM ANCHOR DEVICE



BOTTOM ANCHOR DEVICE

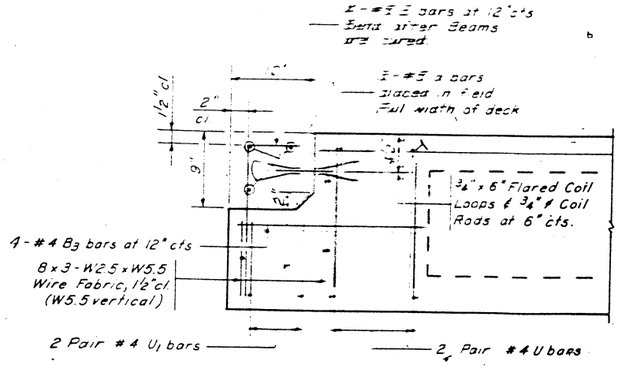
80 Required

Galvanize in accordance with AASHTO: M-111 and A.S.T.M: A-385.

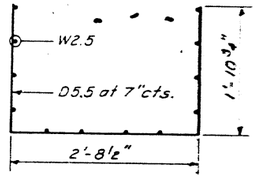


#5 D BAR

646 Required

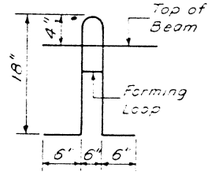


NOTCH DETAIL



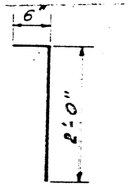
BOTTOM MESH

W2.5 x D5.5
78" x 58'-4"
30 Required



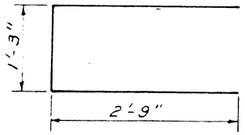
LIFTING LOOP

Use 3 - 1/2" Strands
120 Required



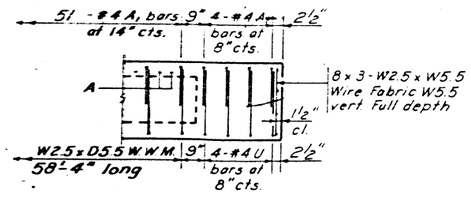
#5 E BAR

48 Required



#4 U1 BAR

41 Required



END ELEVATION

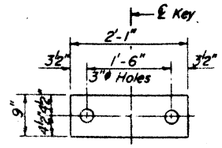
FABR. NOTES

Seal Drains before concrete placement and open before shipment. Vents to be open during curing period but removed and sealed before shipment.

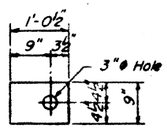
SHOP No. 176-81

SHEET 7 OF 13

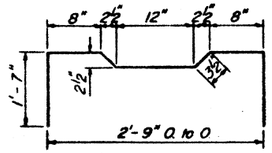
27" x 36" SHOP DETAILS



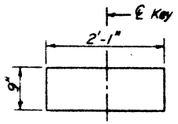
FABRIC BEARING PAD
(Interior)



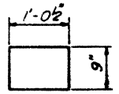
FABRIC BEARING PAD
(Exterior)



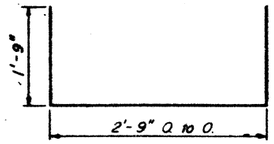
A1 BAR



GRAPHITED ASBESTOS
BEARING PAD
(Interior)

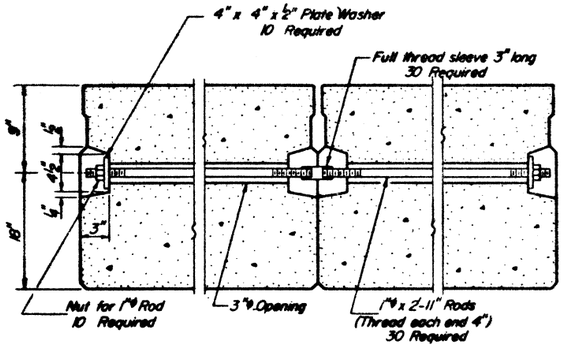


GRAPHITED ASBESTOS
BEARING PAD
(Exterior)

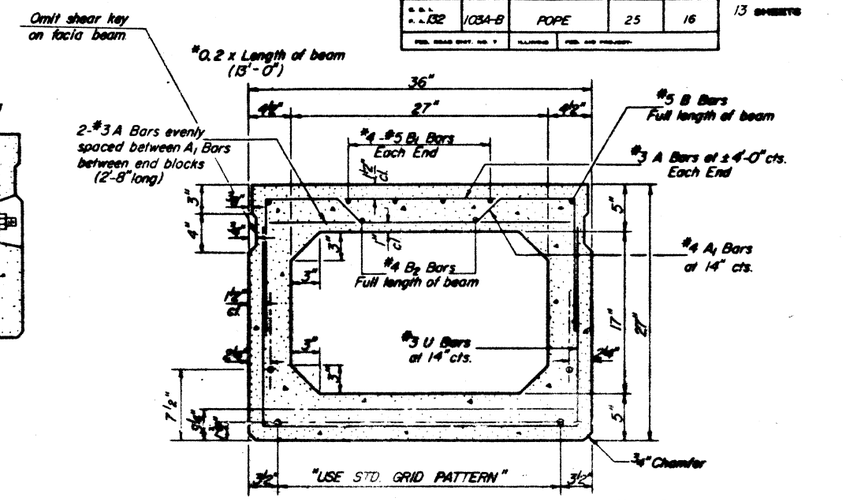


U & U1 BARS

NOTE: Use combination bearing pads between 36" & 48" beams.
See sheet # 5 for details.



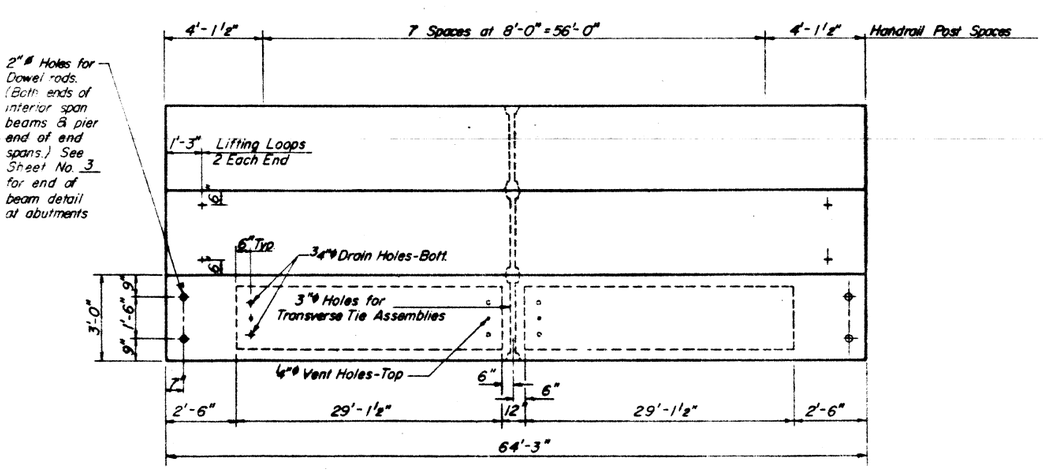
TYPICAL TRANSVERSE TIE ASSEMBLY



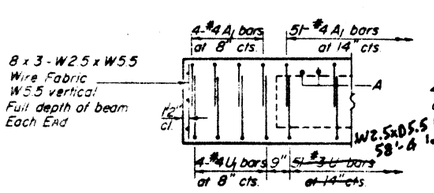
Note: Place strands symmetrically about ℄ beam.

TYPICAL SECTION

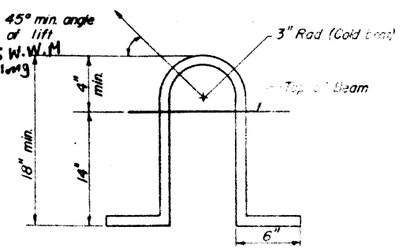
16 - ½"ϕ Strands Each Strand Stressed to 28,900 Lbs.
8 - Strands 1¾" up, 6 - Strands 3¼" up, 2 - Strands 7½" up



PLAN

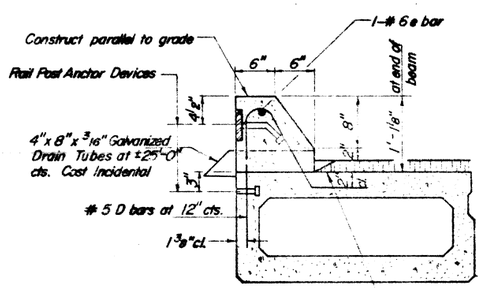


END ELEVATION
AT PIERS



Lifting Loops shall be 7 wire stress relieved ½" ϕ 270 ksi strands.

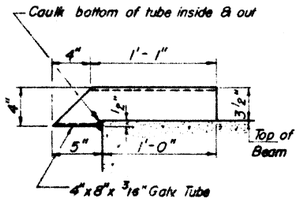
LIFTING LOOP DETAIL



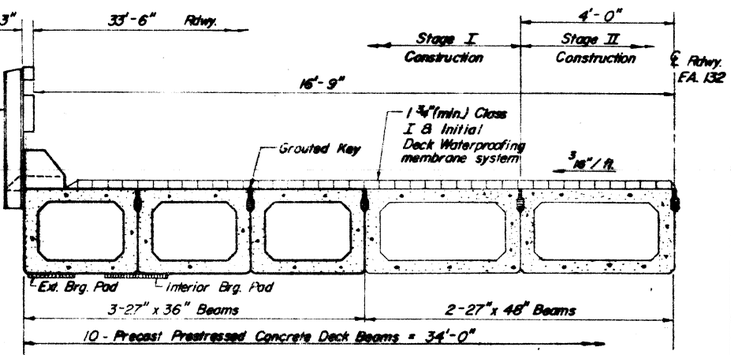
Slope Class I 2:1 at drains (Ext. end deck waterproofing 2" inside drain.

SECTION THRU CURB

Curbs shall be poured in the field
Class X and Reinforcement for Curb billed on Sheet No. 6

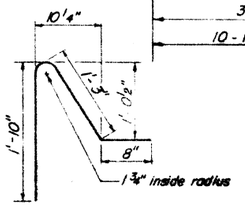


DRAIN DETAIL



PARTIAL CROSS SECTION

(Looking Up Station)



BAR D

NOTES

Prestressing steel shall be non-galvanized high strength, stress-relieved 7-wire strand, Grade 270. The nominal diameter shall be ½" and the nominal cross-sectional area shall be 0.153 sq in.

Lifting loops shall be ⅝" diameter, 6 x 25 class wire rope with fiber core and shall have a minimum ultimate tensile strength of 33,000 lbs. or 2 - ½" ϕ - 270 ksi strands.

The 1"ϕ 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.

Reinforcement bars shall conform to AASHTO: M-31 or M-53, Grade 60.

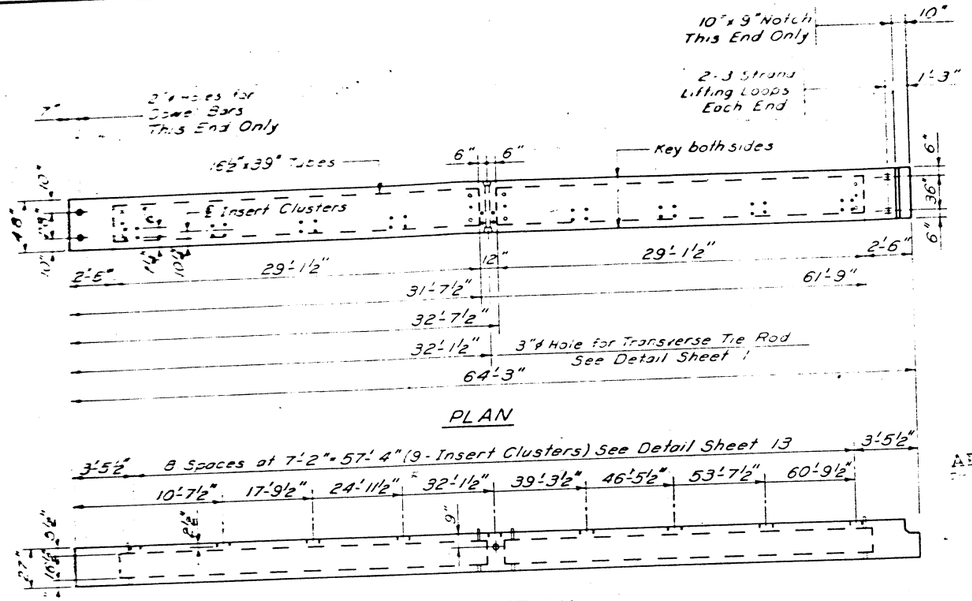
The bearing seat surfaces shall be adjusted by shimming to assure firm and even bearing. Two ⅛" fabric adjusting shims of the dimensions of the Exterior Bearing Pad shall be provided for each bearing.

BILL OF MATERIAL

Bar	No.	Size	Length	Shape
a	6	#5	12'-9"	——
a1	6	#5	20'-9"	——
a2	6	#5	3'-5"	⌐—
Precast Prestressed Concrete Deck Beams (27" Depth)			Sq. Ft.	5783
Reinforcement Bars			Lbs.	230
Class X Concrete			Cu. Yd.	1.5

SUPERSTRUCTURE (3'-0" BMS)
FA. RTE. 132 SEC. 103A-B
POPE COUNTY
STATION 896+49

GREENE & ELLIOTT, Ltd.
CONSULTING ENGINEERS



Date Figured

APPROVED

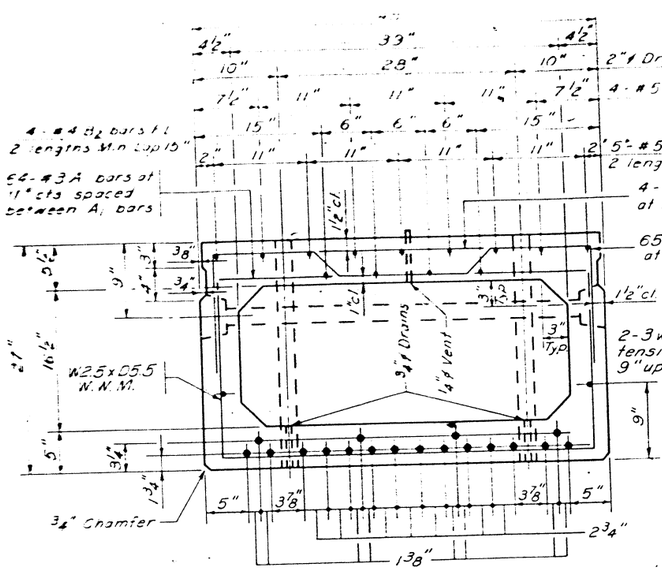
DEC 1 1981

SPAN 5

SHOP No. 176-81

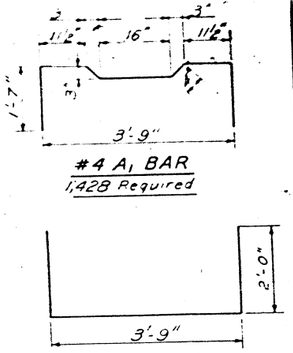
SHEET 12 OF 13

27"x48" BEAM 18-G 1 REQUIRED



TYPICAL SECTION THRU BEAM

18-Strands ½"ø 270 K 14 Up 1¾" 4 Up 3¼"



#4 A, BAR

1,428 Required

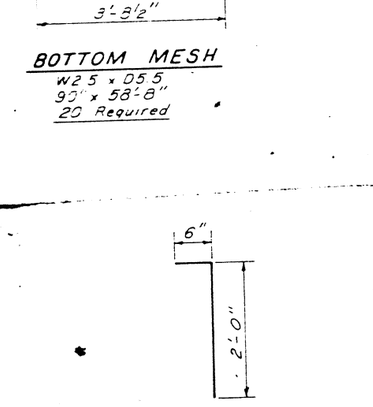
#4 U BAR

160 Required

1 = 18-C, D, G
2 = 18-E, F
3 = 18-C, E, G

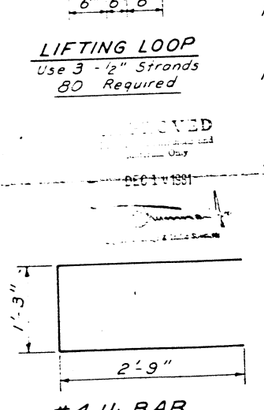
SHOP BILL OF MATERIAL

	Bar	Size	Length	Shape	One Beam	Job Total	Remarks
	A	#3	3'-8"	——	72	1,440	
1	A1	4	7'-1"		69	552	1,428
2					73	876	
	B	5	32'-10"	——	10	200	
	B1	5	13'-0"	——	8	160	
	B2	4	32'-8"	——	8	160	
1	B3	4	2'-3"	——	5	40	
1	E	5	2'-6"	⌐	5	40	
	U	4	7'-9"	⌐⌐	8	160	
1	U1	4	6'-9"	⌐⌐	4	32	
	Reinforcement Bars			Lbs.	22,285		
	MESH End 24"		3'-9"	——	2	40	
	MESH E.End 15"		3'-9"	——	1	8	
	8 x 3 - W2.5 x W5.5			Sq. Ft.	338		
1	Bolt 90°		58'-8	⌐	1	20	
	W2.5 x D5.5			Sq. Ft.	8,800		
	Concrete			C.Y.	11.4	228	
	Lifting Loops				4	80	
	Tubes 16½"x39"x29'-1½"				2	40	1,165 L.F.
1	Tubes 2" I.D. x 2'-3"			Each	2	16	144 L.F.
2					4	48	
	Tubes 3" I.D. x 3'-6"				1	20	70 L.F.
3	Insert Clusters				9	45	
	Void Drains ¾" I.D. x 5"				8	160	
	Void Vents ¼" I.D. x 6½"				4	80	
1	Flared Coil Loops ¾"x 6"				8	64	



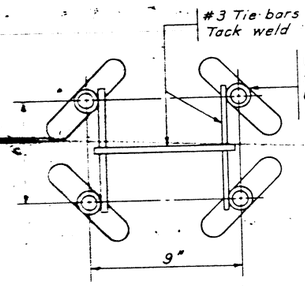
BOTTOM MESH

W2.5 x D5.5
90° x 58'-8"
20 Required



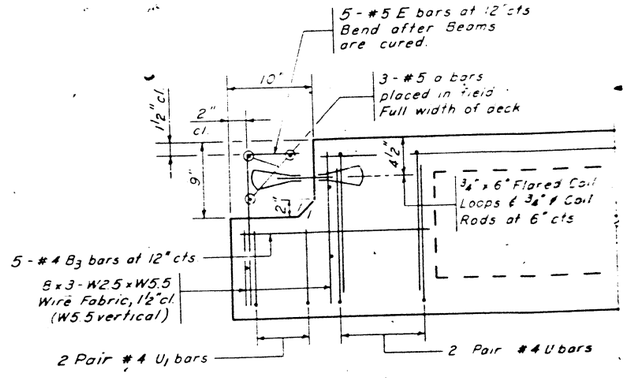
LIFTING LOOP

Use 3 - ½" Strands
80 Required



INSERT CLUSTER DETAIL

45 Required



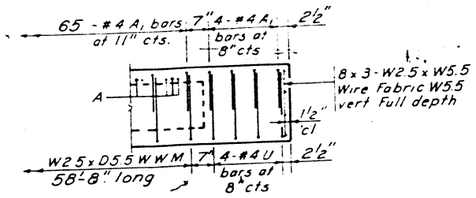
NOTCH DETAIL

#5 E BAR

40 Required

#4 U1 BAR

32 Required



END ELEVATION

FABR. NOTES

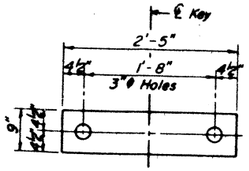
Seal Drains before concrete placement and open before shipment. Vents to be open during curing period but removed and sealed before shipment.

SHOP No. 176-81

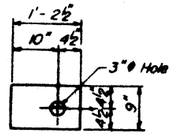
SHEET 13 OF 13

27"x36" SHOP DETAILS

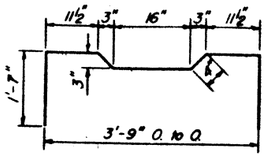
5 of 5



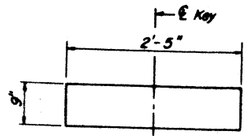
FABRIC BEARING PAD
(Interior)



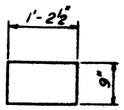
FABRIC BEARING PAD**
(Exterior)



A_1 BAR

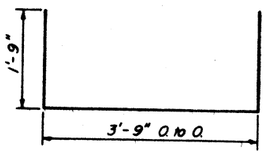


GRAPHITED ASBESTOS BEARING PAD
(Interior)

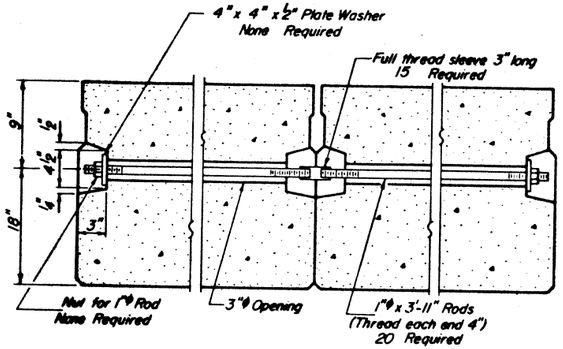


GRAPHITED ASBESTOS BEARING PAD**
(Exterior)

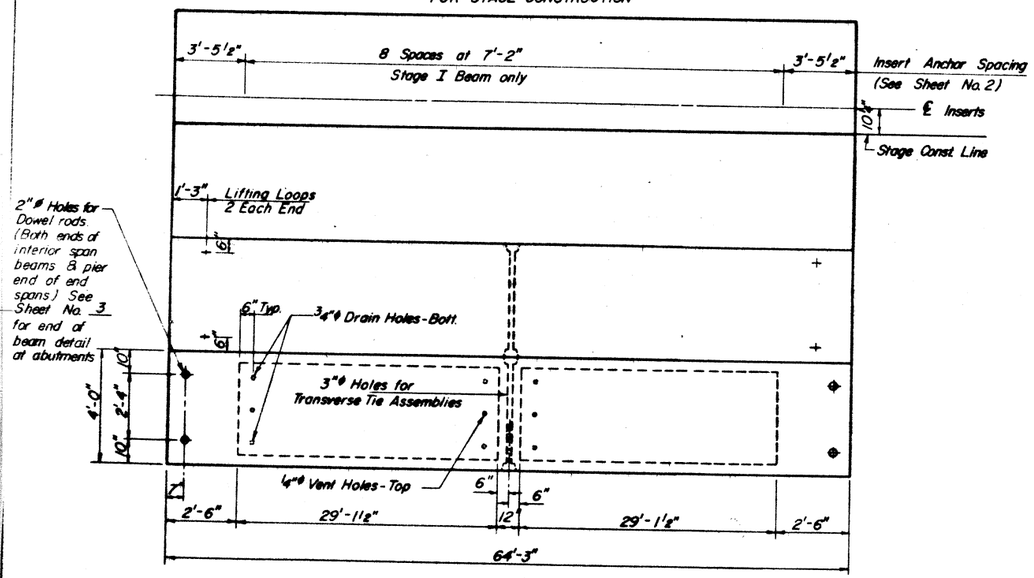
** FOR STAGE CONSTRUCTION



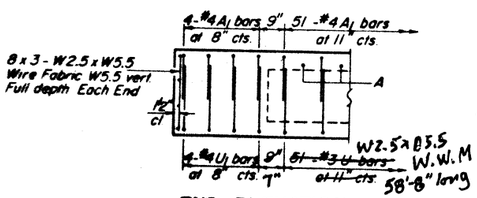
U & U_1 BARS



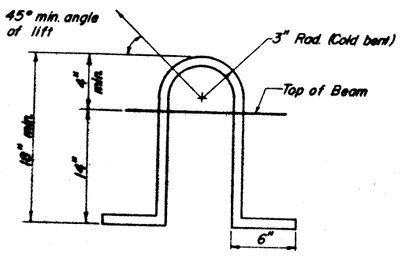
TYPICAL TRANSVERSE TIE ASSEMBLY



PLAN

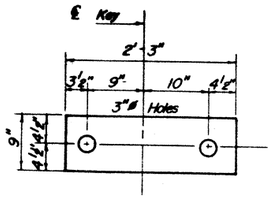


END ELEVATION AT PIERS

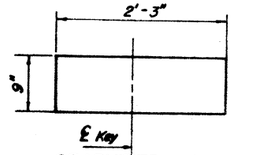


Lifting Loops shall be 7 wire stress relieved ½"ϕ -270 ksi strands.

LIFTING LOOP DETAIL



FABRIC BEARING PAD
(Interior Combination)*

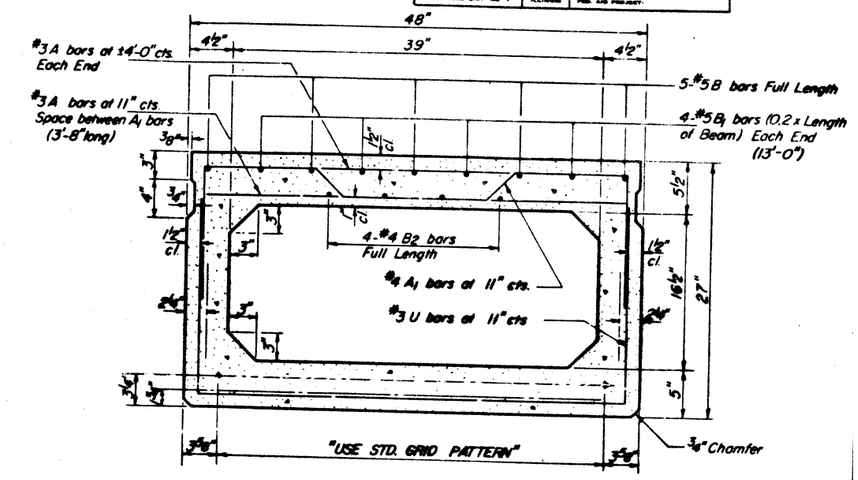


GRAPHITED ASBESTOS BEARING PAD
(Interior Combination)*

* Use between 36" & 48" beams

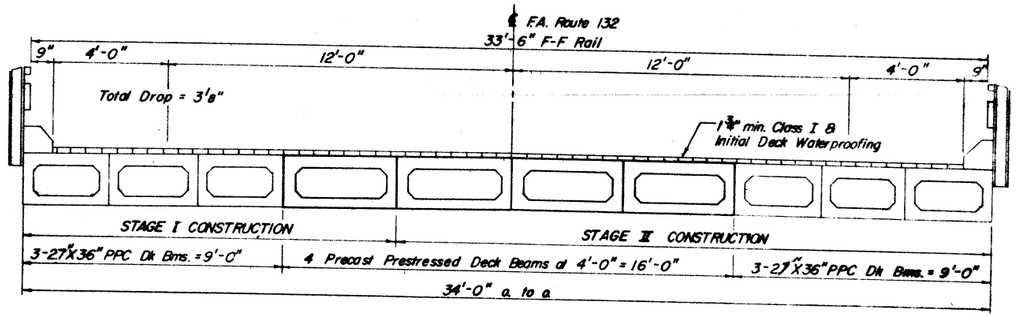
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
U.S. F.A. 132	103A-B	POPE	25	17
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT.		

SHEET NO. 5
13 SHEETS



TYPICAL SECTION
48 - ½"ϕ Strands Each Strand Stressed to 28,900 Lbs.
14 - Strands 1¾" up, 4 - Strands ¾" up,

Note:
Place strands symmetrically about ℄ beam



CROSS SECTION
(Looking Up Station)

NOTES

Prestressing steel shall be non-galvanized high strength, stress-relieved 7-wire strand, Grade 270. The nominal diameter shall be ½" and the nominal cross-sectional area shall be 0.153 sq. in.

Lifting loops shall be ¾" diameter, 6 x 25 class wire rope with fiber core and shall have a minimum ultimate tensile strength of 46,000 lbs. or 3 - ½" ϕ - 270 ksi strands.

The 1"ϕ 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.

Reinforcement bars shall conform to AASHTO M-31 or M-53, Grade 60.

The bearing seat surfaces shall be adjusted by shimming to assure firm and even bearing. Two ⅛" fabric adjusting shims of the dimensions of the Exterior Bearing Pad shall be provided for each bearing.

BILL OF MATERIAL

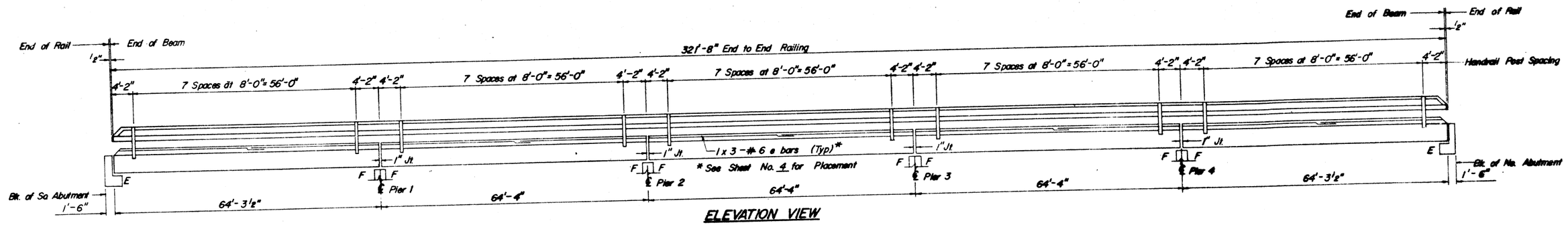
Bar	No.	Size	Length	Shape
Precast Prestressed Concrete Deck Beams (27" Depth)			Sq. Ft.	5140

SUPERSTRUCTURE (4'-0" BMS.)
F.A. RTE. 132 SEC. 103 A-B
POPE COUNTY
STATION 896 + 49

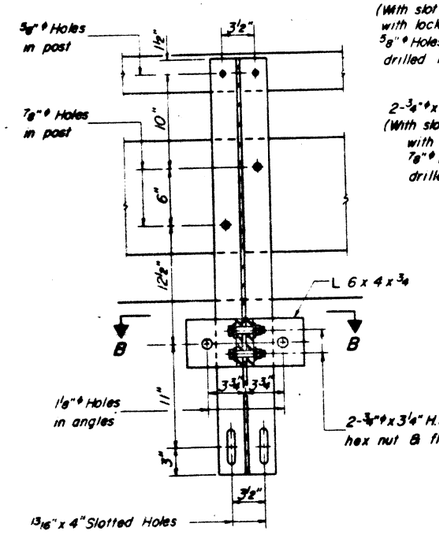
GREENE & ELLIOTT, Ltd.
CONSULTING ENGINEERS

			TOTAL SHEETS	SHEET NO.
132	103A-B	POPE	25	18

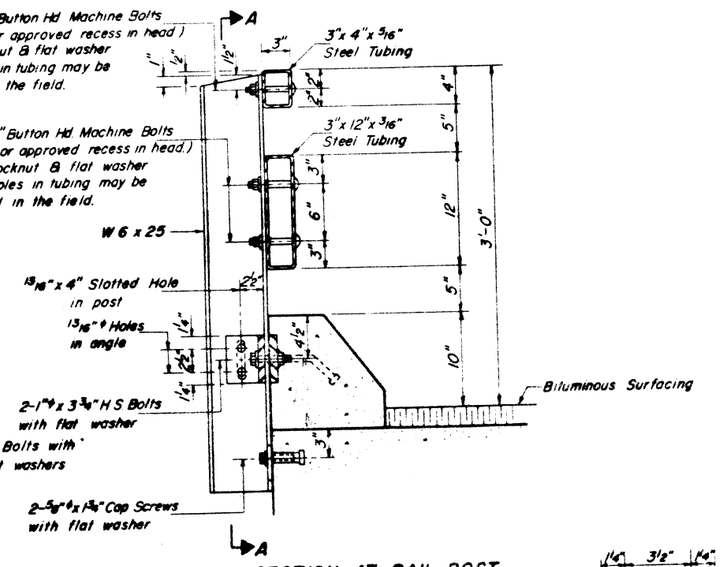
SHEET NO. 6
13 SHEETS



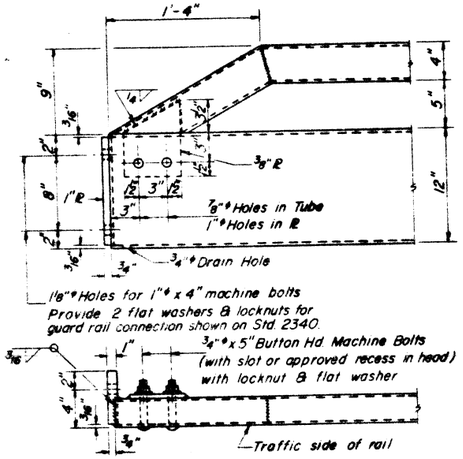
ELEVATION VIEW



SECTION A-A



SECTION AT RAIL POST



END OF RAIL DETAILS

NOTES

Hollow structural steel tubing shall conform to the requirements of A.S.T.M. designation A-500 Grade B Structural Steel Tubing.

All other steel shapes and plates shall conform to the requirements of A.A.S.H.T.O. M-183 except posts and angles shall conform to A.A.S.H.T.O. M-223, Grade 50.

Bolts, cap screws, and nuts shall conform to the requirement of A.S.T.M. designation A-307 except for high strength bolts, nuts and washers noted which shall conform to A.A.S.H.T.O. M-164.

All bolts, nuts, cap screws, washers and lock washers shall be galvanized in accordance with A.A.S.H.T.O. M-232.

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

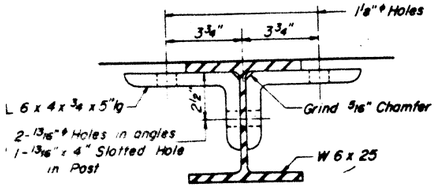
Railing shall be in accordance with Section 508 of the Standard Specifications, except as noted, and shall be paid for at the contract unit price per lineal foot for STEEL RAILING, TYPE T.

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

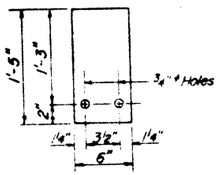
The lower portion of the post flange in contact with concrete shall receive two coats of asphalt paint conforming to Section 714.08 Type B or place 1/8" fabric bearing pad between the post and concrete.

The 3/4" ϕ high strength bolts used to connect the 6 x 4 x 3/8 angles to the post shall be tightened in accordance with Article 507.04(g)(3) of the Standard Specifications. The 1" ϕ high strength bolts connecting the angles to the concrete shall be tightened to a snug fit and given an additional 1/3 turn. The 5/8" ϕ cap screws in bottom of posts shall be tightened to a snug fit only.

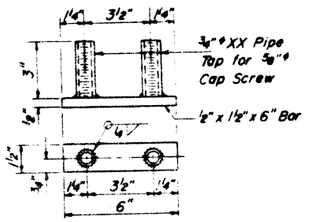
For multi-span bridges, sufficient 1/4" x 6" x 1'-5" galvanized steel shims shall be provided to align rail between adjacent spans. Cost incidental to Steel Railing.



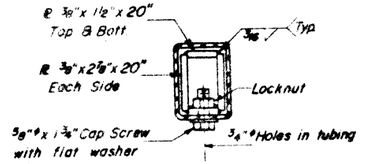
SECTION B-B



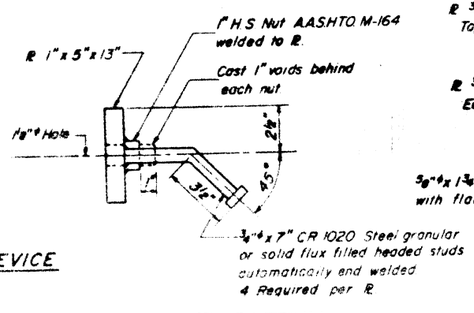
1/4" SHIM PLATE



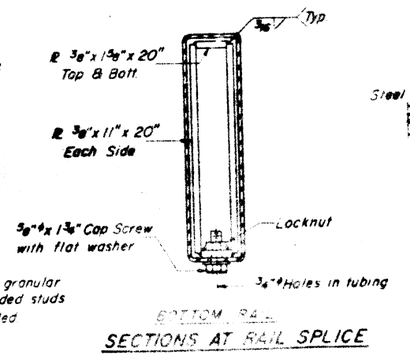
BOTTOM ANCHOR DEVICE



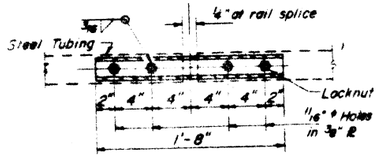
TOP ANCHOR DEVICE



TOP RAIL



SECTIONS AT RAIL SPLICE



PLAN - BOTT SPLICE ℝ TYPICAL

CURB & RAIL BILL OF MATERIAL

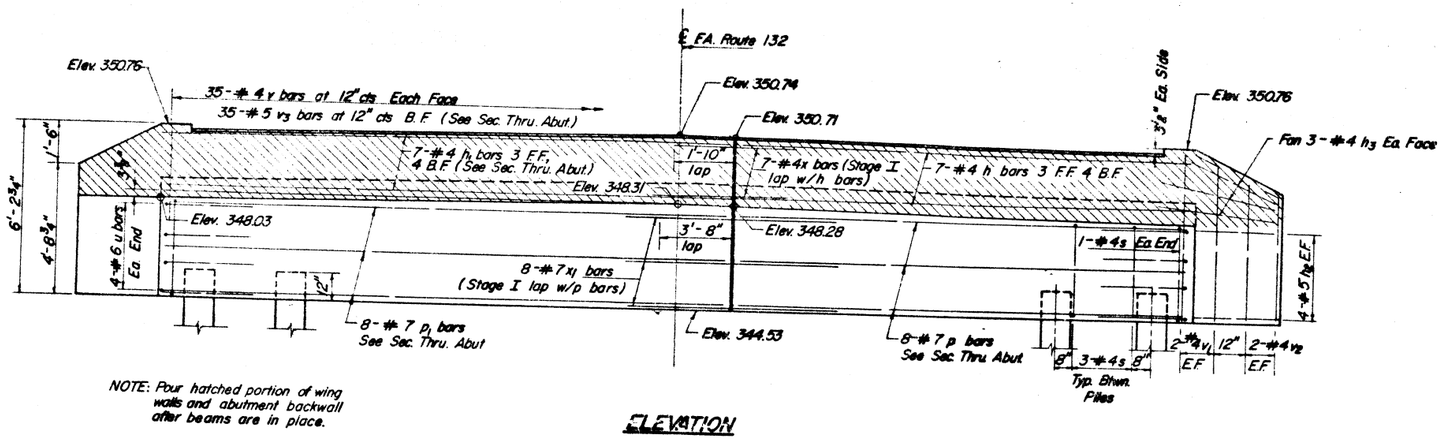
Bar	No.	Size	Length	Shape
e	30	#6	22'-6"	——
Reinforcement Bars			Lbs.	1020
Class X Concrete			Cu. Yds.	167
Steel Railing, Type T			Lin. Ft.	644

TYPE T STEEL RAILING

F.A. RTE. 132 SEC. 103A-B
POPE COUNTY
STATION 896+49

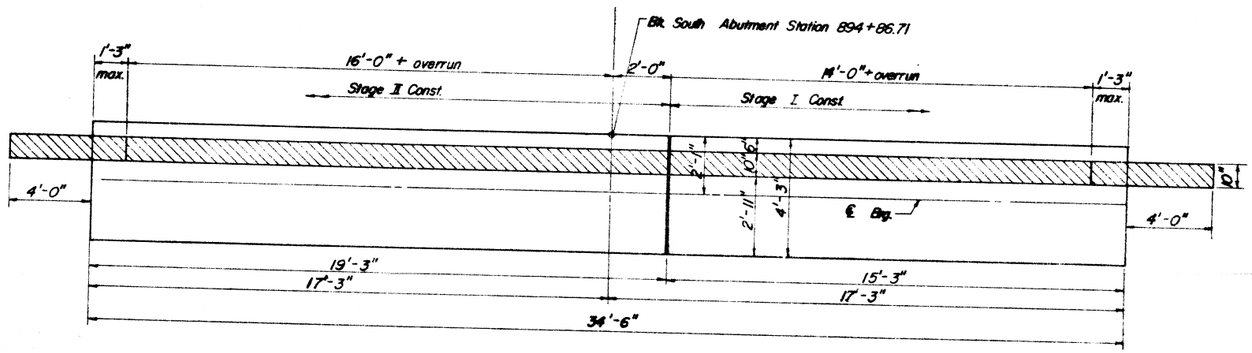
GREENE & ELLIOTT, Ltd.
CONSULTING ENGINEERS
1915 STEVENSON DR. 317-329-0600 SPRINGFIELD, ILL.

ROUTE	SECTION	COUNTY		SHEET
FA 132	103A-B	POPE	25	19
STA.		TO S.A.		
F.H.W.A. PROJ. NO. 4	ILLINOIS	FED. AND PROJECT		

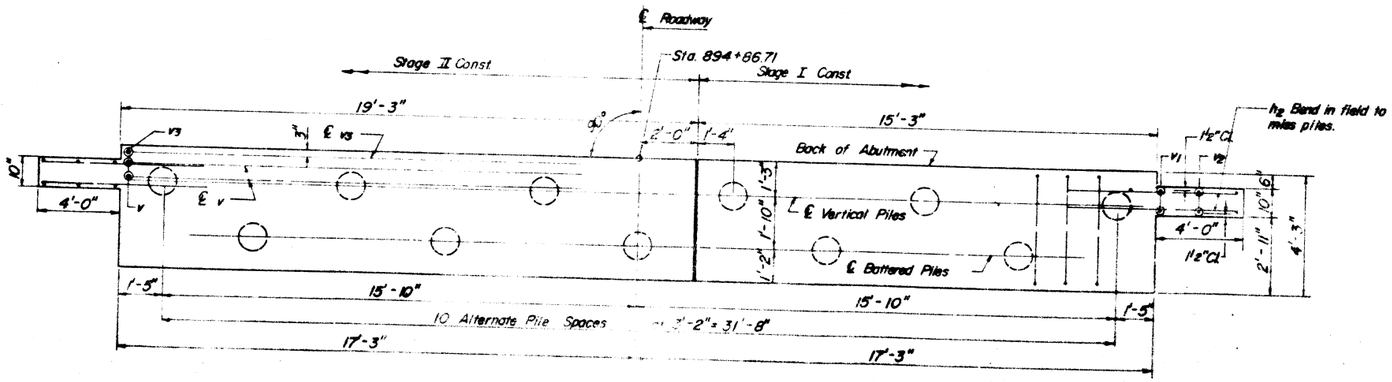


NOTE: Pour hatched portion of wing walls and abutment backwall after beams are in place.

ELEVATION



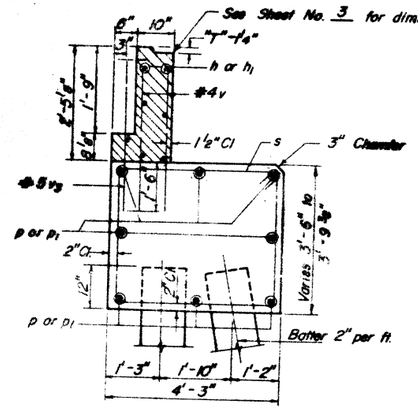
TOP VIEW



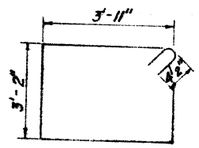
PLAN-PILE CAP

PILE DATA

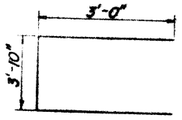
Type: Concrete
Capacity: 35 T
Est. Length: 54'
No. Required: 11



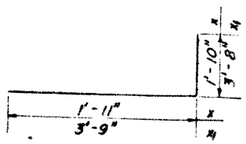
SEC. THRU ABUT



BAR s



BAR u



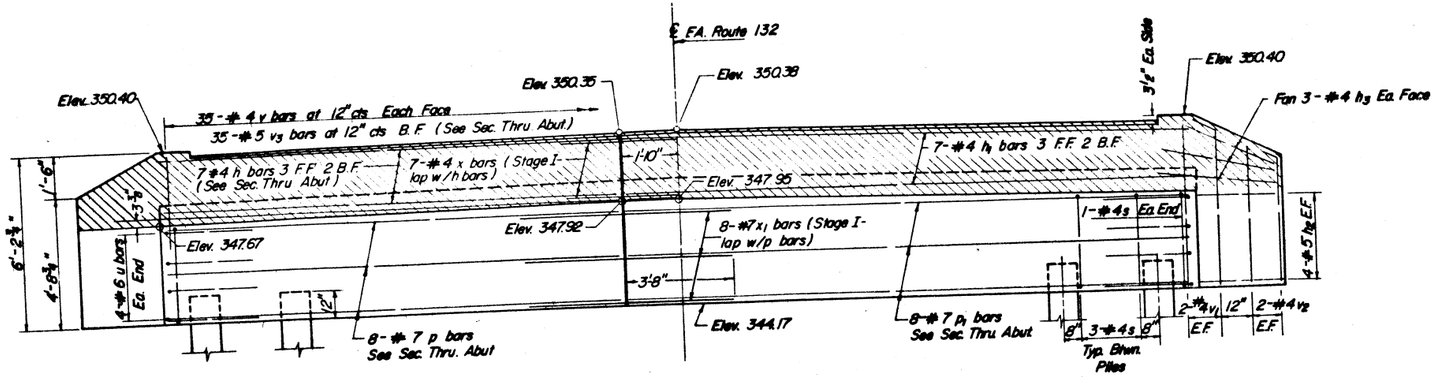
BARS x & x1
(Grade 40)

ONE ABUTMENT
BILL OF MATERIALS

Bar	No.	Size	Length	Shape
h	7	#4	17'-6"	——
h1	7	#4	19'-10"	——
h2	16	#5	7'-0"	——
h3	12	#4	5'-0"	
p	8	#7	15'-3"	——
p1	8	#7	19'-1"	——
s	32	#4	14'-11"	
u	8	#6	9'-10"	
v	70	#4	3'-9"	——
v1	8	#4	5'-9"	——
v2	8	#4	5'-0"	——
v3	35	#5	3'-9"	——
x	8	#4	3'-9"	
x1	8	#7	7'-5"	
Reinforcement Bars			Lbs.	1840
Concrete Piles			Lin. Ft.	594
Class X Concrete			Cu. Yd.	23.8

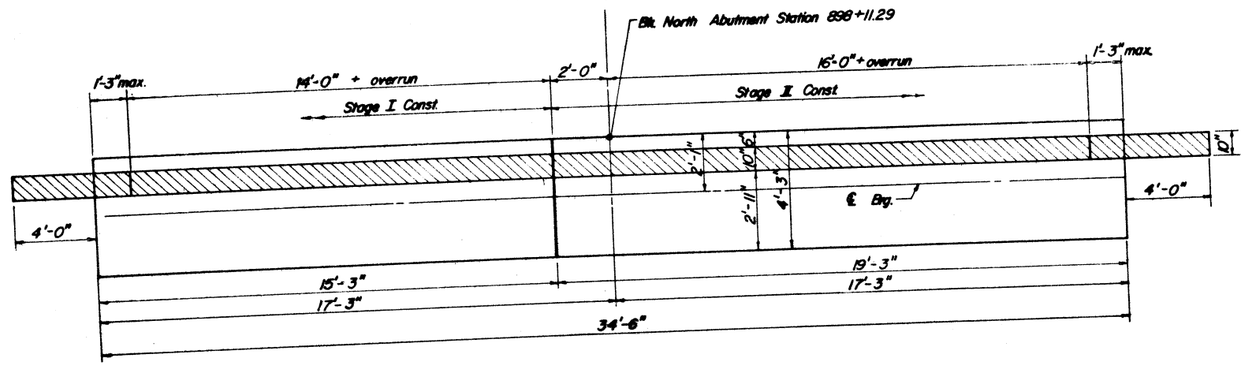
SOUTH ABUTMENT
F.A. RTE. 132 SEC. 103 A-B
POPE COUNTY
STATION 896+49

GREENE & ELLIOTT, Ltd.
CONSULTING ENGINEERS

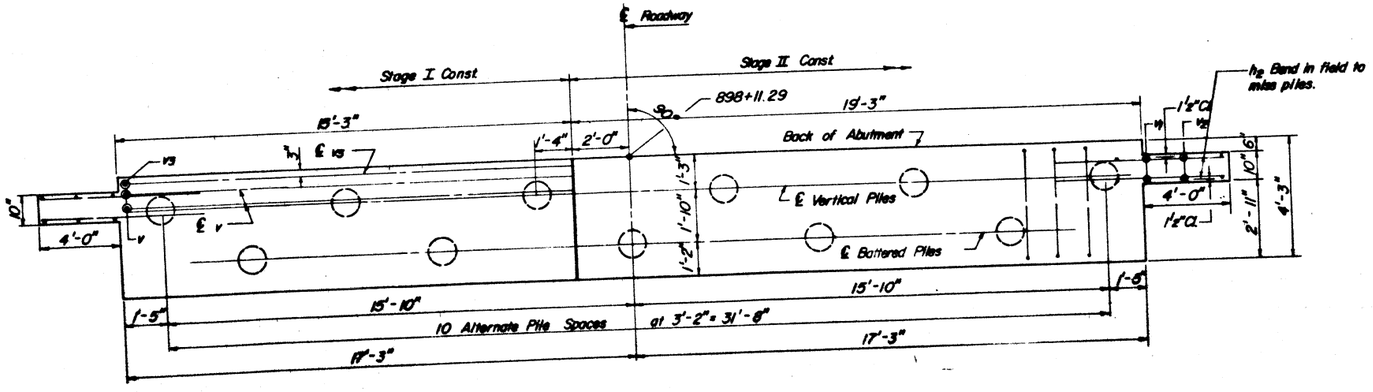


NOTE: Pour hatched portion of wing walls and abutment backwall after beams are in place.

ELEVATION



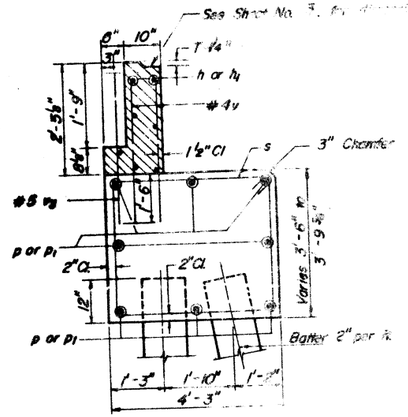
TOP VIEW



PLAN-PILE CAP

PILE DATA

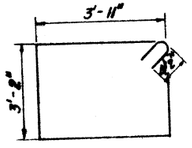
Type: Concrete
Capacity: 35 T.
Est. Length: 44'
No. Required: 11



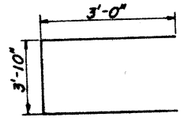
SEC. THRU ABUT.

ONE ABUTMENT BILL OF MATERIALS

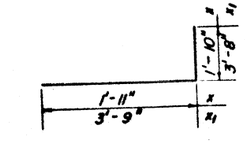
Bar	No.	Size	Length	Shape
h	7	#4	17'-5"	
h1	7	#4	19'-10"	
h2	16	#5	4'-0"	
h3	12	#4	5'-0"	
p	8	#7	15'-3"	
p1	8	#7	19'-1"	
s	32	#4	14'-11"	
u	8	#6	9'-10"	
v	70	#4	3'-3"	
v1	8	#4	5'-9"	
v2	8	#4	5'-0"	
v3	35	#5	3'-9"	
x	8	#4	3'-9"	
x1	8	#7	7'-5"	
Reinforcement Bars			Lbs.	1840
Concrete Piles			Lin. Ft.	484
Class X Concrete			Cu. Yd.	23.8



BAR s



BAR u

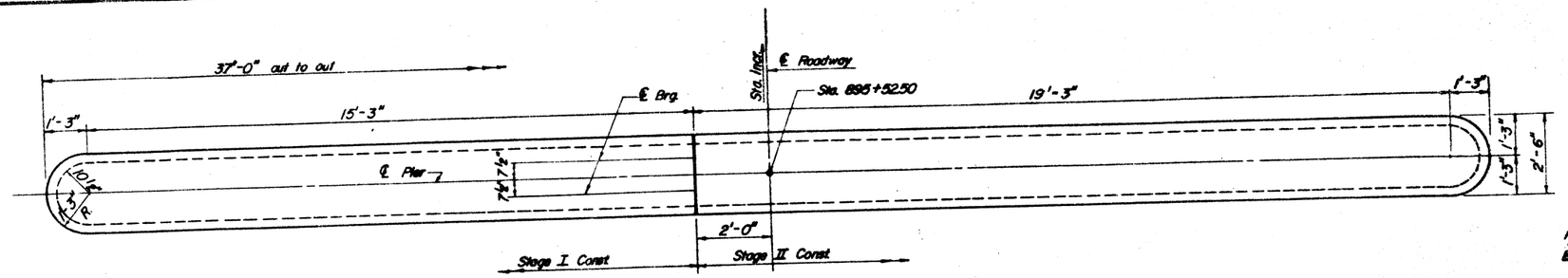


BARS x & x1
(Grade 40)

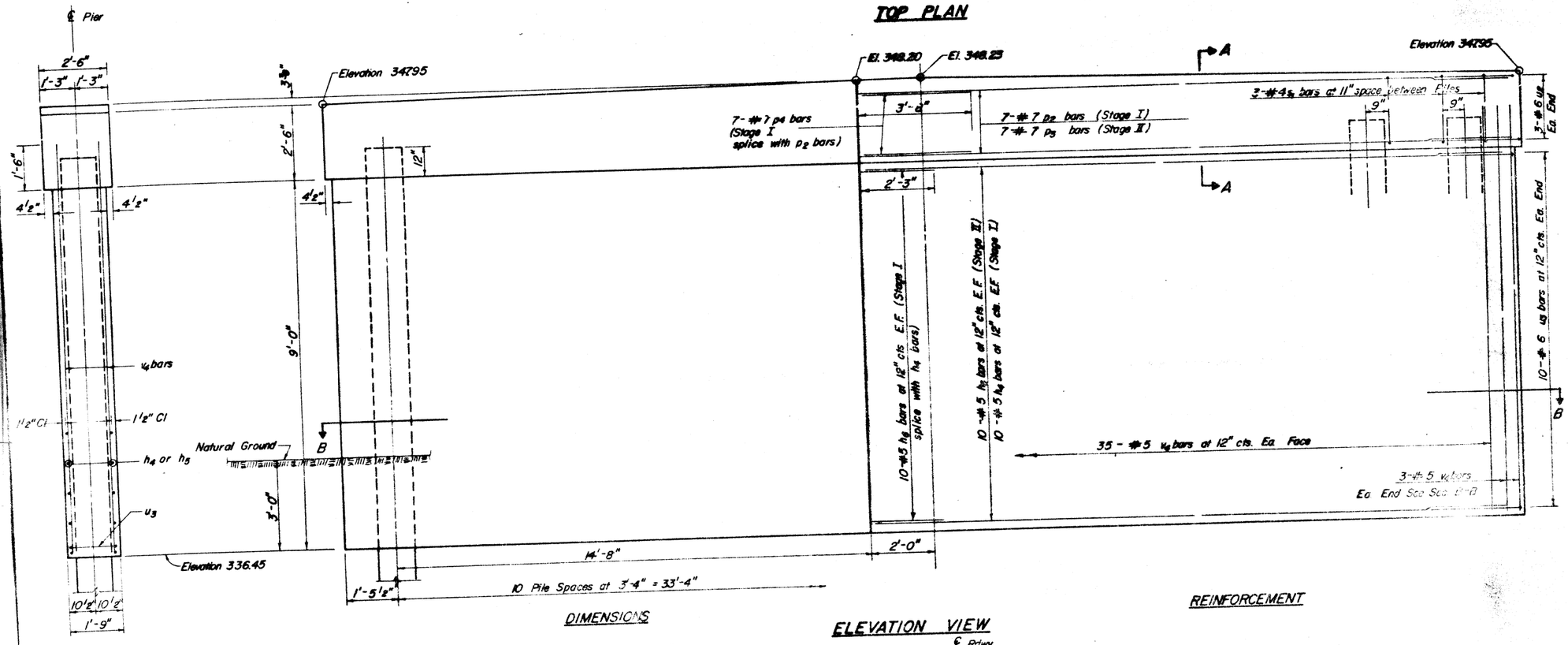
NORTH ABUTMENT
EA. RTE. 132 SEC. 103 A-B
POPE COUNTY
STATION 896+49

GREENE & ELLIOTT, Ltd.
CONSULTING ENGINEERS

FA RTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FA 132	103A-B	POPE	25	21
STA.		TO STA.		
F.H.W.A. REG. NO. 4	ILLINOIS	FED. AID PROJECT-		



TOP PLAN

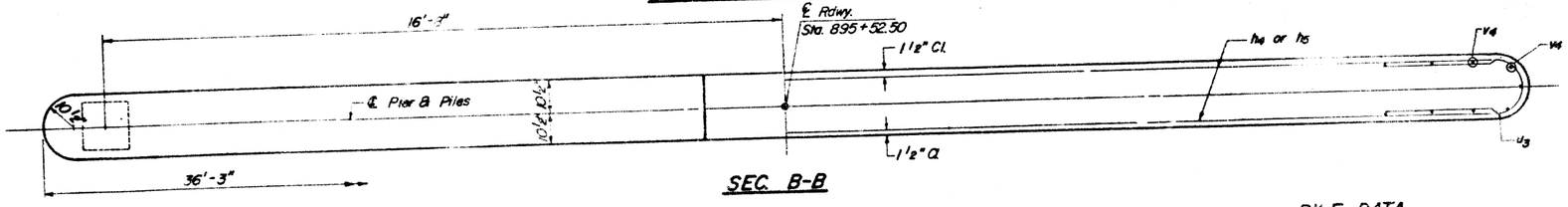


END VIEW

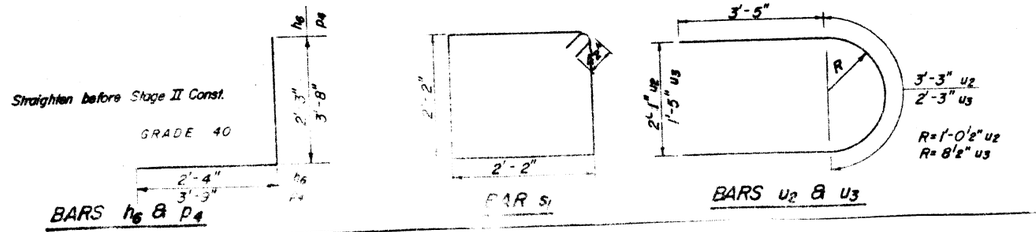
DIMENSIONS

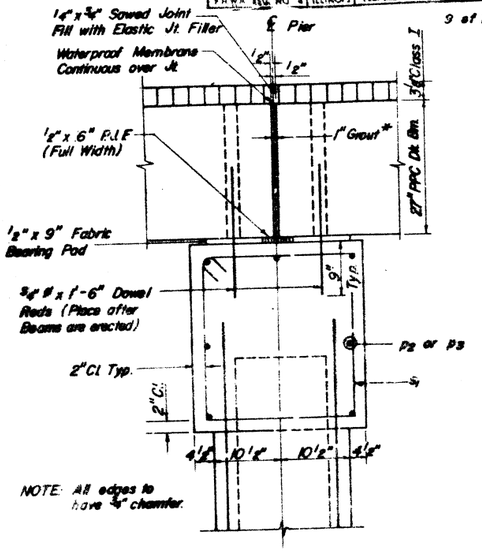
REINFORCEMENT

ELEVATION VIEW



SEC. B-B





SEC. A-A

* 1" joint shall be packed with a very dry mix of 2:1 sand & P.C. Mortar. 1" dimension may vary plus or minus to accommodate tolerance in beam lengths.

BILL OF MATERIAL
PIER NO. 1

BAR	NO.	SIZE	LENGTH	SHAPE
h_4	20	#5	15'-0"	—
h_5	20	#5	19'-0"	—
h_6	20	#5	4'-7"	⌊
p_2	7	#7	15'-0"	—
p_3	7	#7	19'-0"	—
p_4	7	#7	7'-5"	⌊
s_1	30	#4	3'-5"	□
u_2	6	#6	10'-1"	⊃
u_3	20	#6	5'-1"	⊃
v_4	76	#5	10'-6"	—
Class X Concrete			Cu. Yds.	24.3
Reinforcement Bars			Lbs.	2780
Precast Conc. Pile, 14"			Lin. Ft.	638

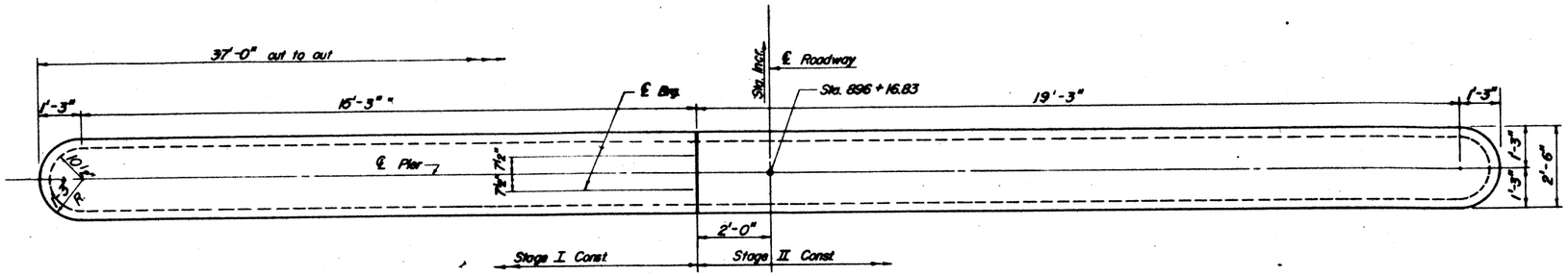
PILE DATA

Type Precast Concrete, 14"
Capacity 40 Ton
Est. Length 58'
No. Required 11

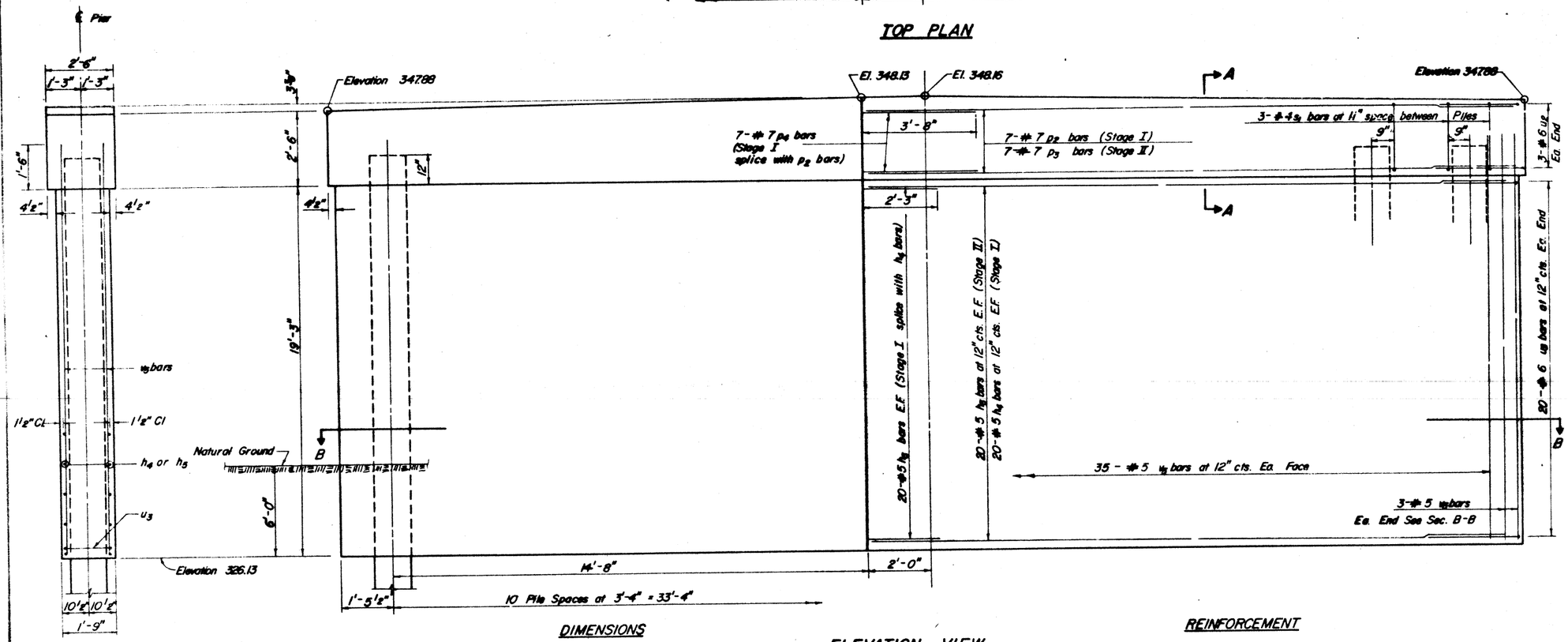
PIER NO. 1
FA. RTE. 132 SEC. 103A-B
POPE COUNTY
STATION 896+49

GREENE & ELLIOTT, Ltd.
CONSULTING ENGINEERS

ROUTE	SECTION	COUNTY	SHEET	TOTAL SHEETS
FA132	103A-B	POPE	25	22
STA.		TO STA.		
F.H.W.A. REG. NO. 4	ILLINOIS	REG. AID PROJECT-		



TOP PLAN

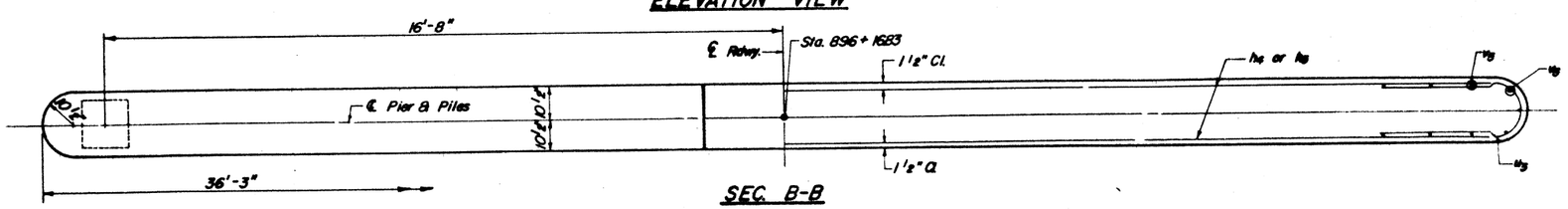


END VIEW

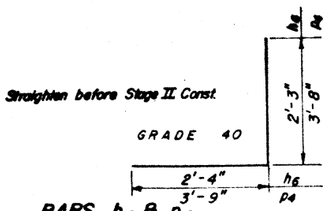
DIMENSIONS

REINFORCEMENT

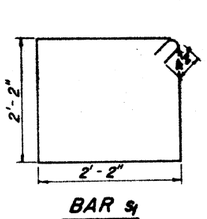
ELEVATION VIEW



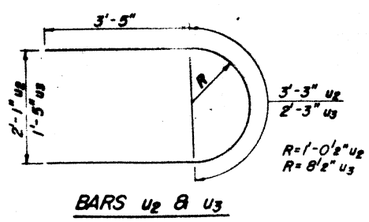
SEC. B-B



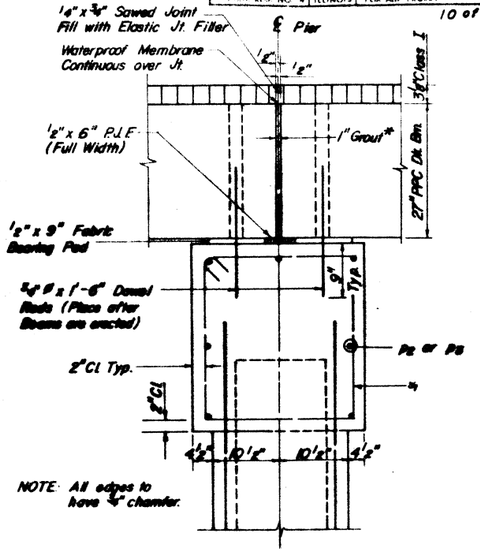
BARS h_6 & p_4



BAR s_4



BARS u_2 & u_3



NOTE: All edges to have ¾" chamfer.

SEC. A-A

* 1" joint shall be packed with a very dry mix of 2:1 sand & P.C. Mortar. 1" dimension may vary plus or minus to accommodate tolerance in beam lengths.

BILL OF MATERIAL
PIER NO. 2

BAR	NO.	SIZE	LENGTH	SHAPE
h_4	40	#5	15'-0"	——
h_5	40	#5	19'-0"	——
h_6	40	#5	4'-7"	⌐—
p_2	7	#7	15'-0"	——
p_3	7	#7	19'-0"	——
p_4	7	#7	7'-5"	⌐—
s_4	30	#4	9'-5"	□
u_2	6	#6	10'-1"	⊃
u_3	40	#6	9'-1"	⊃
v_3	76	#5	20'-9"	——
Class X Concrete			Cu. Yds.	42.4
Reinforcement Bars			Lbs.	4670
Precast Conc. Pile, 14"			Lin. Ft.	590
Test Pile, Precast Conc.			Ea.	1

PILE DATA

Type Precast Concrete, 14"
Capacity 40 Ton
Est. Length 59'
No. Required 10+1 Test Pile

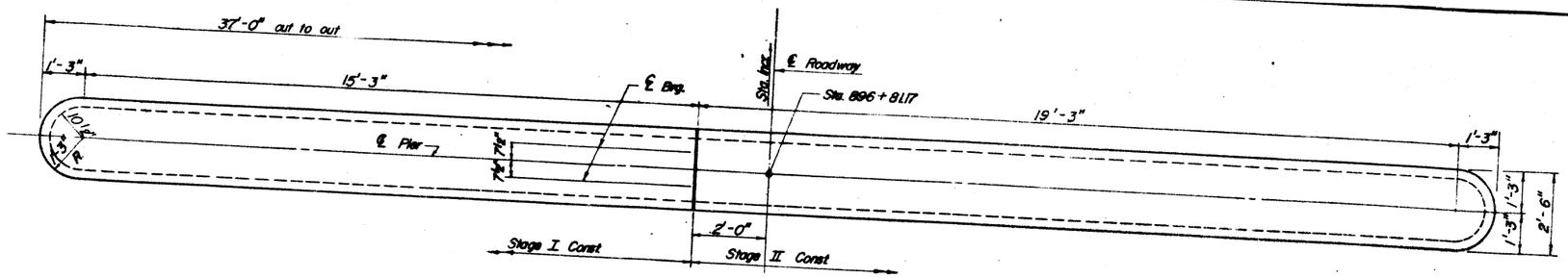
PIER NO. 2

FA. RTE. 132 SEC. 103A-B
POPE COUNTY
STATION 896+49

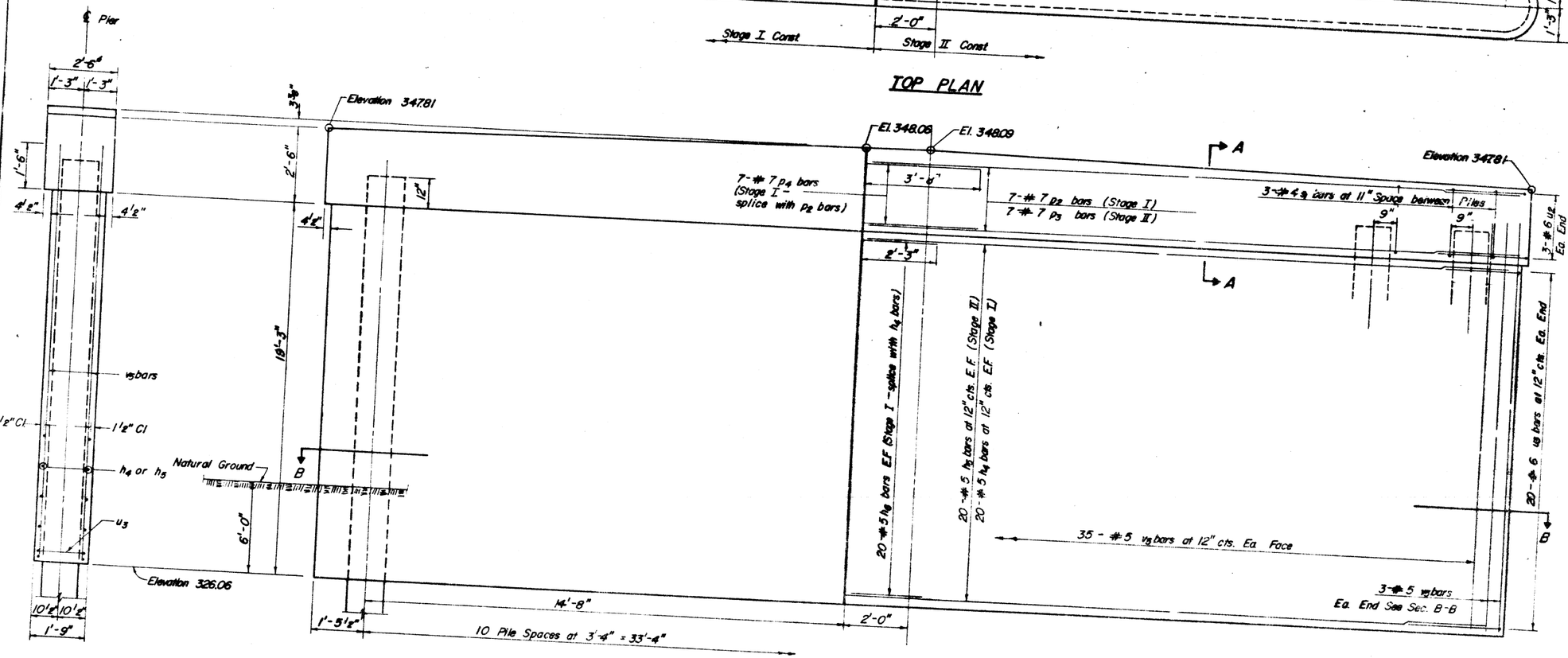
GREENE & ELLIOTT, Ltd.
CONSULTING ENGINEERS

ROUTE	SECTION	COUNTY
FAI 132	103A-B	POPE
STA.		TO STA.
FHWA REG. NO. 4	ILLINOIS	FED. AID PROJECT:

11 of 11

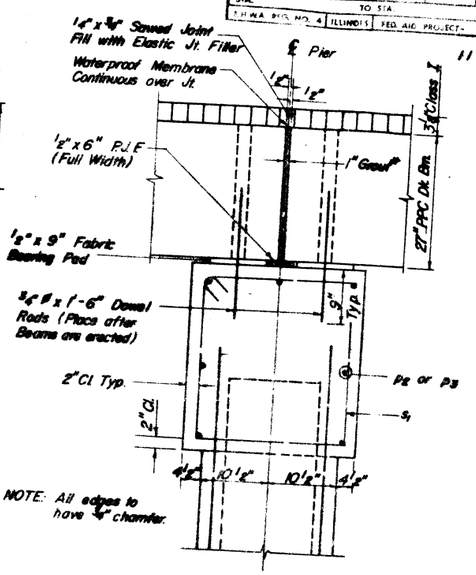


TOP PLAN



END VIEW

DIMENSIONS

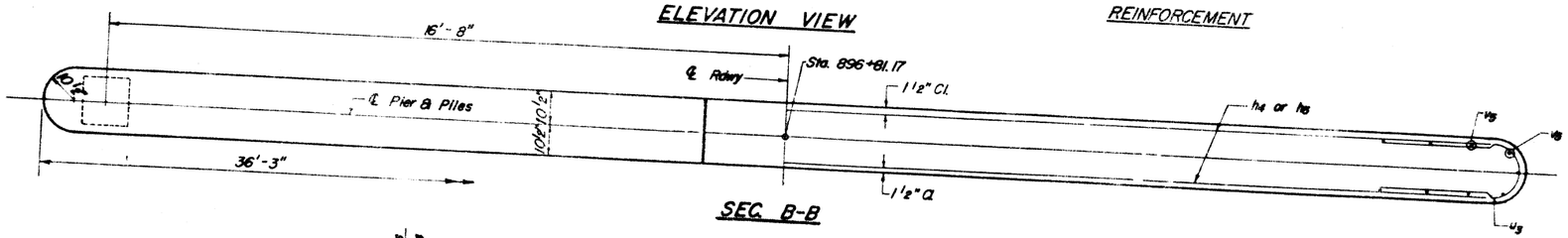


NOTE: All edges to have ¾" chamfer.

SEC. A-A

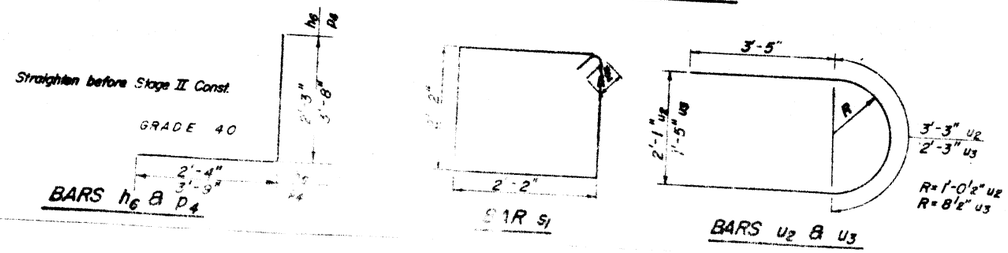
*"1" Joint shall be packed with a very dry mix of 2:1 sand & P.C. Mortar. 1" dimension may vary plus or minus to accommodate tolerance in beam lengths.

ELEVATION VIEW



SEC. B-B

REINFORCEMENT



PILE DATA

Type Precast Concrete, 14"
Capacity 40 Ton
Est. Length 55'
No. Required 11

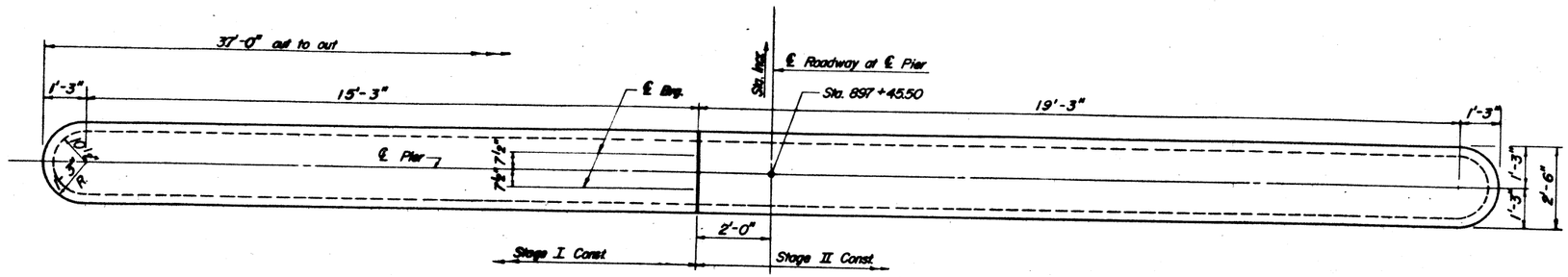
BILL OF MATERIAL
PIER NO. 3

BAR	NO.	SIZE	LENGTH	SHAPE
h_4	40	#5	15'-0"	—
h_5	40	#5	19'-0"	—
h_6	40	#5	4'-7"	L
P_2	7	#7	15'-0"	—
P_3	7	#7	19'-0"	—
P_4	7	#7	7'-5"	L
s_1	30	#4	9'-5"	□
u_2	6	#6	10'-1"	⊃
u_3	40	#6	9'-1"	⊃
v_5	76	#5	20'-9"	—
Class X Concrete			Cu. Yds.	42.4
Reinforcement Bars			Lbs.	4670
Precast Conc. Pile, 14"			Lin. Ft.	649

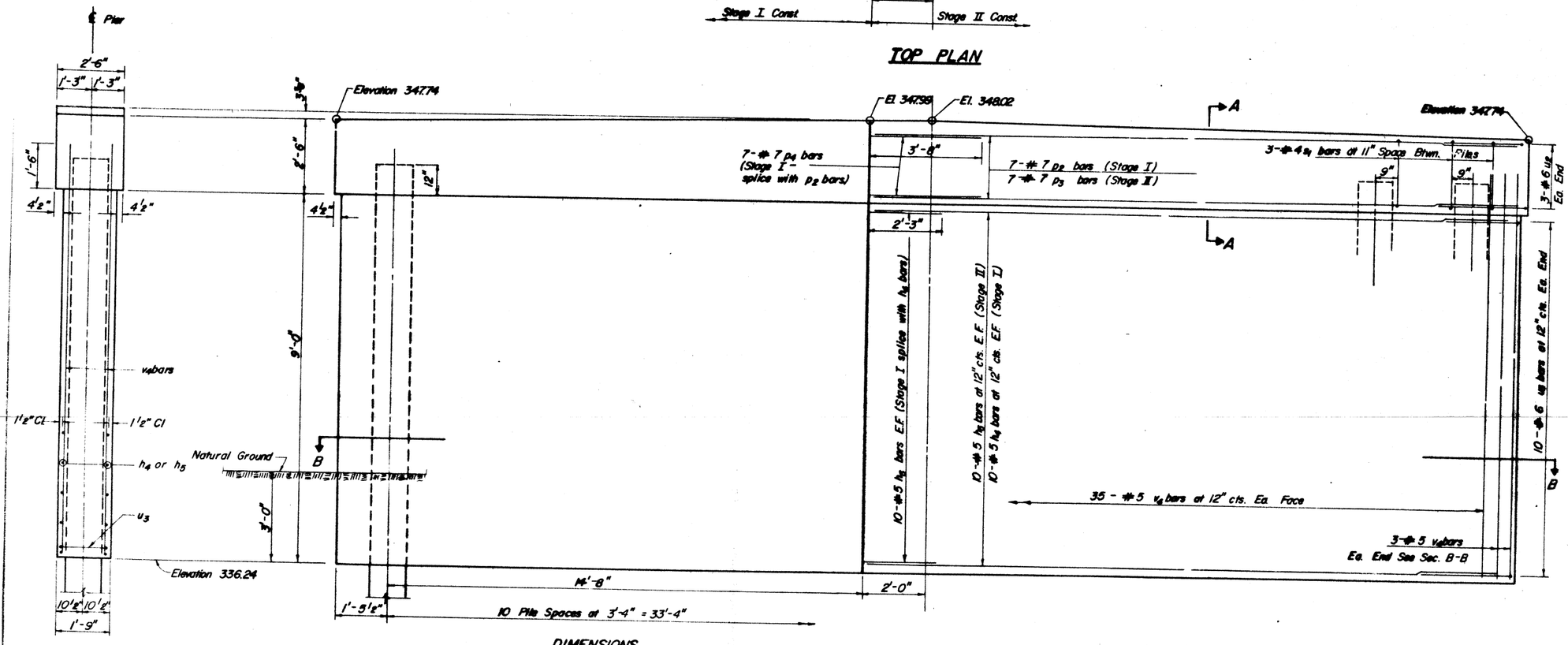
PIER NO. 3
FA. RTE. 132 SEC. 103A-B
POPE COUNTY
STATION 896+49

GREENE & ELLIOTT, Ltd.
CONSULTING ENGINEERS

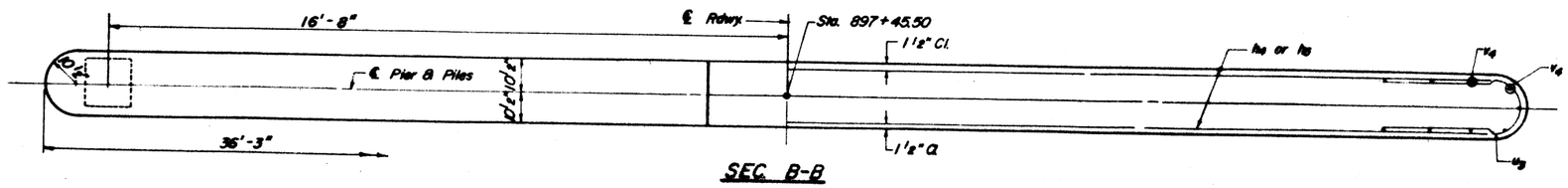
ROUTE	SECTION		
FA 132	103A-B	POPE	25 24
STA.	AREWA REG. NO. 4	ILLINOIS	FED. AID PROJECT



TOP PLAN

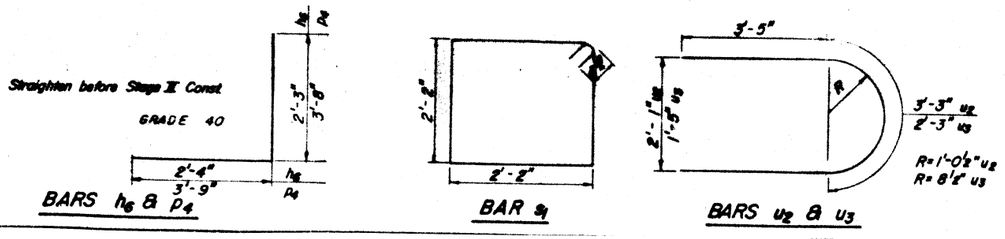


END VIEW — DIMENSIONS — REINFORCEMENT

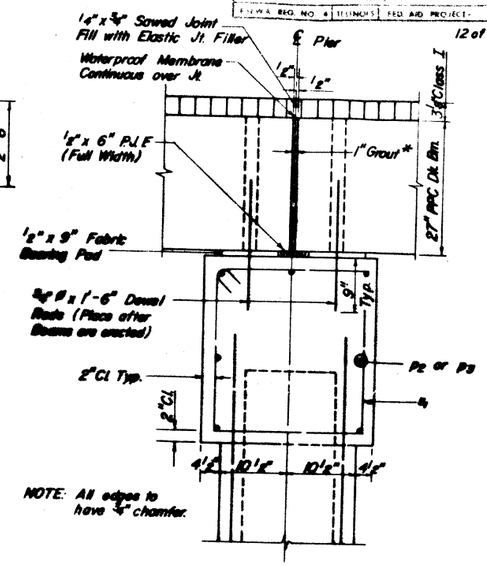


ELEVATION VIEW

SEC. B-B



BARS h_6 & p_4 — BAR s_1 — BARS u_2 & u_3



NOTE: All edges to have ¾" chamfer.

SEC. A-A

* 1" joint shall be packed with a very dry mix of 2:1 sand & P.C. Mortar. 1" dimension may vary plus or minus to accommodate tolerance in beam lengths.

BILL OF MATERIAL
PIER NO. 4

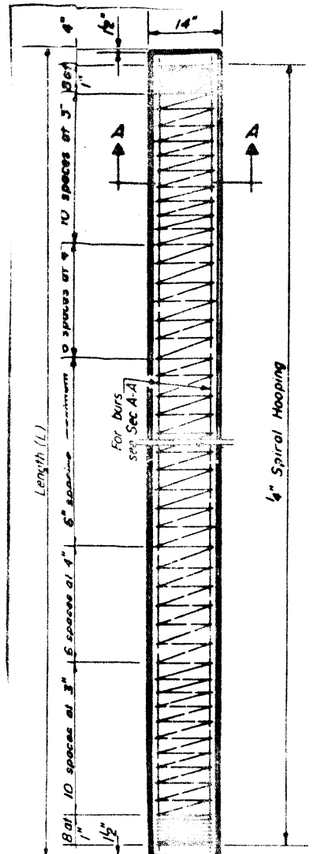
BAR	NO.	SIZE	LENGTH	SHAPE
h_4	20	#5	15'-0"	——
h_5	20	#5	19'-0"	——
h_6	20	#5	4'-7"	⌊
p_2	7	#7	15'-0"	——
p_3	7	#7	19'-0"	——
p_4	7	#7	7'-5"	⌊
s_1	30	#4	9'-5"	□
u_2	6	#6	10'-1"	⊃
u_3	20	#6	9'-1"	⊃
v_4	76	#5	10'-6"	——
Class X Concrete			Cu. Yds.	24.3
Reinforcement Bars			Lbs.	2780
Precast Conc. Pile, 14"			Lin. Ft.	480
Test Pile, Precast Conc.			Ea.	1

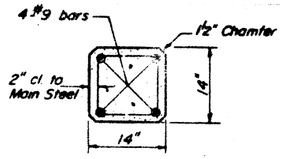
PILE DATA

Type — Precast Concrete, 14"
Capacity — 40 Ton
Est. Length — 48'
No. Required — 10+1 Test Pile

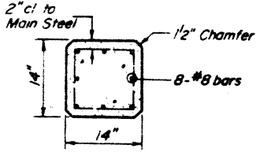
PIER NO. 4
FA. RTE. 132 SEC. 103A-B
POPE COUNTY
STATION 896+49

GREENE & ELLIOTT, Ltd.
CONSULTING ENGINEERS





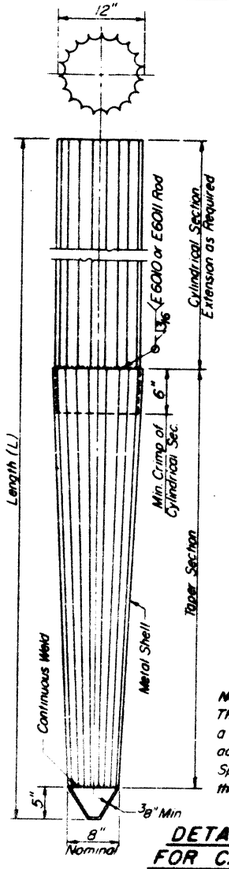
SECTION A-A FOR PILES UNDER 45' LONG



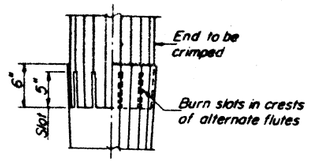
SECTION A-A FOR PILES 45' OR MORE

Handling: For Pile lengths up to 45', use two slings placed at a distance of 0.21 L from each end. For Piles longer than 45' use three slings placed at a distance of 0.12 L from each end and at mid point of pile.

DETAIL OF PRECAST CONCRETE PILES

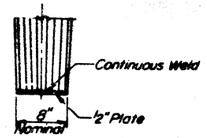


DETAIL OF TAPERED METAL SHELLS FOR CAST IN PLACE CONCRETE PILES



FIELD CRIMP DETAIL

Note: 6" Crimp shall either be supplied on the cylindrical section or made in the field as detailed.

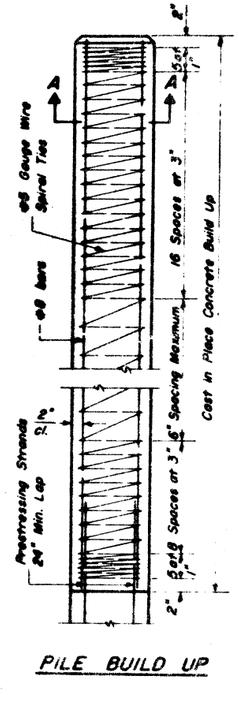


OPTIONAL FLAT END

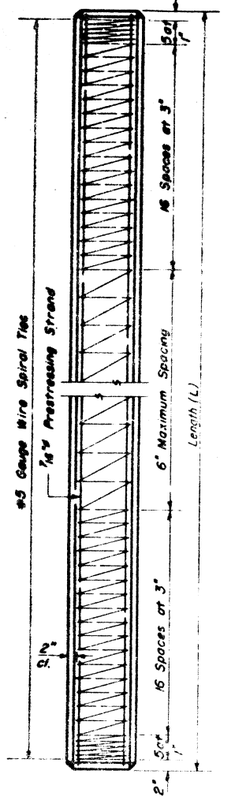
ALLOWABLE TAPER SECTIONS

10' Length - Taper 1" in 2'-6"
17' Length - Taper 1" in 4'-0"
25' Length - Taper 1" in 7'-0"
30' Length - Taper 1" in 7'-0"

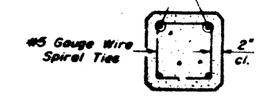
NOTE:
The thickness of the shell shall be 0.1495 inches with a tolerance of 5%. The shell shall be in accordance with Article 710.05 (a) of the Standard Specification except that minimum yield strength for the steel after cold working shall be 50,000 psi.



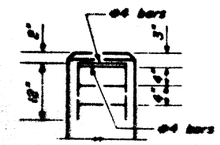
PILE BUILD UP



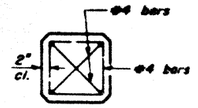
PILE PLAN



SECTION A-A



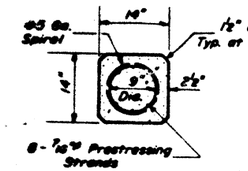
ELEVATION (End Reinforcement)



PLAN (End Reinforcement)

DRAWING NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
132	103A-B	POPE	25	25
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT		

SHEET NO. 13
13 SHEETS



SECTION THRU PILE

DESIGN STRESSES

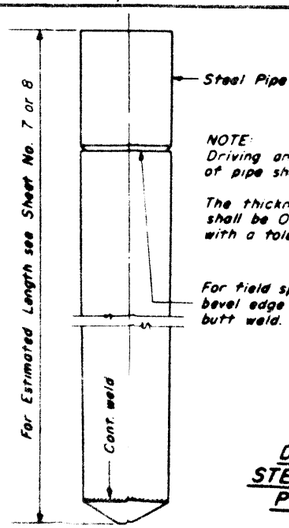
f'c = 5,000 psi.
f'ci = 4,000 psi.
fs = 270,000 psi. (31,000 lbs.)
fsi = 189,000 psi. (21,700 lbs. - 7/16" ø or 28,900 lbs. - ½" ø)

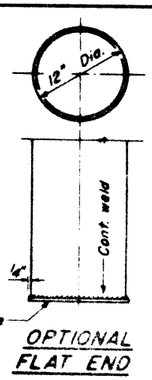
NOTES

Prestressing steel shall be non-galvanized extra high strength stress-relieved 7-wire strand. The nominal diameter shall be 7/16" and the minimum nominal cross-sectional area shall be 0.115 sq in or the equivalent 6-½" ø strands with a cross-sectional area of 0.153 sq in may be used.

For Pile lengths up to 65', use two slings placed at a distance of 0.21 L = from each end. For Piles longer than 65', use three slings placed at a distance of 0.12 L = from each end and at mid-point of pile. = L = Over all length of pile to be handled.

PRECAST PRESTRESSED CONCRETE PILE

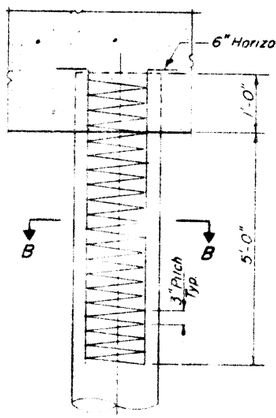


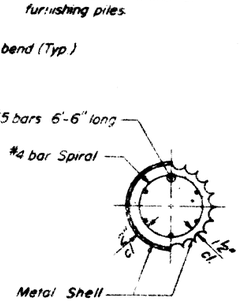


OPTIONAL FLAT END

DETAIL OF CYLINDRICAL STEEL SHELL FOR CAST IN PLACE CONCRETE PILES

The cost of Reinforcement is incidental to the cost of furnishing piles.

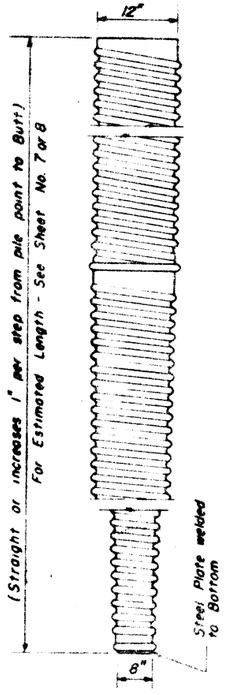


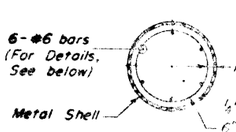


SECTION B-B

Reinforcement in top of pile shall be omitted under pier footings when placed in natural ground

DETAIL OF REINFORCEMENT FOR METAL SHELLS



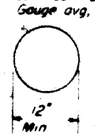


SECTION A-A

PILE REINFORCEMENT

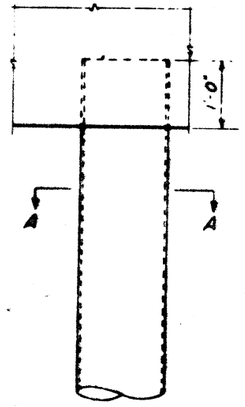
Reinforcement is incidental to the cost of furnishing piles.

At least 10% of the length of pile shall have a Butt diameter equal to or greater than 12" Gauges are furnished to suit soil conditions (16 Gauge avg. min.)



BUTT

POINT (Applies only to Step Taper type pile)



DETAIL OF MANDREL DRIVEN STRAIGHT OR STEP-TAPER PILES FOR CAST IN PLACE CONCRETE PILES

CONCRETE PILES
FA RTE 132 SEC 103A-B
POPE COUNTY
STATION 896+49

GREENE & ELLIOTT, Ltd.
CONSULTING ENGINEERS