

monroe

SEC. 101 BR

I&R

February 2, 1989

#96

90

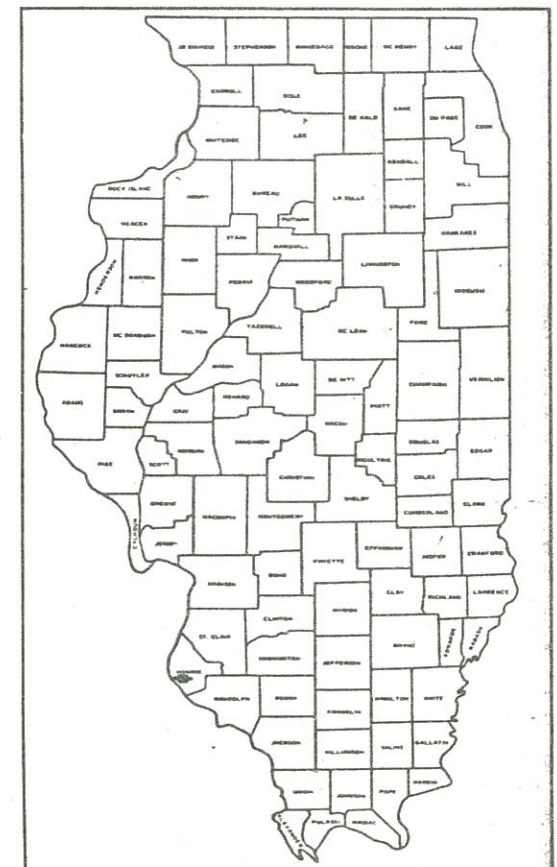
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STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLANS FOR PROPOSED
FEDERAL AID PRIMARY HIGHWAY

RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
SBI 156	101BR	MONROE	23	1

P-98-013-84



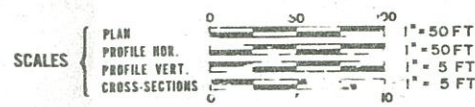
LOCATION OF SECTION INDICATED THUS: —

INDEX OF SHEETS

- 1 - TITLE SHEET
- 2 - SUMMARY OF QUANTITIES & TYPICAL SECTIONS
- 3 - ROADWAY DETAILS
- 4 - ROADWAY PLAN & PROFILE
- 5 - GENERAL PLAN & ELEVATION
- 6 - CONSTRUCTION STAGING DETAILS
- 7 - TEMPORARY BRIDGE RAIL & CONCRETE BARRIER
- 8 - TEMPORARY BRIDGE RAIL
- 9 - SUPERSTRUCTURE
- 10 - SUPERSTRUCTURE DETAILS
- 11 - DECK JOINT DETAILS
- 12 - FRAMING PLAN
- 13-13A - BEARINGS
- 14 - ABUTMENTS
- 15 - PIERS 1 & 2
- 16 - PILE DETAILS
- 17 - TOP OF SLAB ELEVATIONS
- 18 - BAR SPlicERS
- 19 - ANCHOR BOLT DETAILS FOR BEARINGS
- 20-21 - CROSS SECTIONS
- 22-23 - TRAFFIC CONTROL AND PROTECTION (SPECIAL)

- STANDARD 1686-4
- STANDARD 2113-2
- STANDARD 2298-7
- STANDARD 2299-10
- STANDARD 2230-15
- STANDARD 2300-3
- STANDARD 2381
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- STANDARD 2307-6
- STANDARD 2336-4
- STANDARD 2340-4
- STANDARD 2383-1
- STANDARD 2302-5
- STANDARD 2388-1

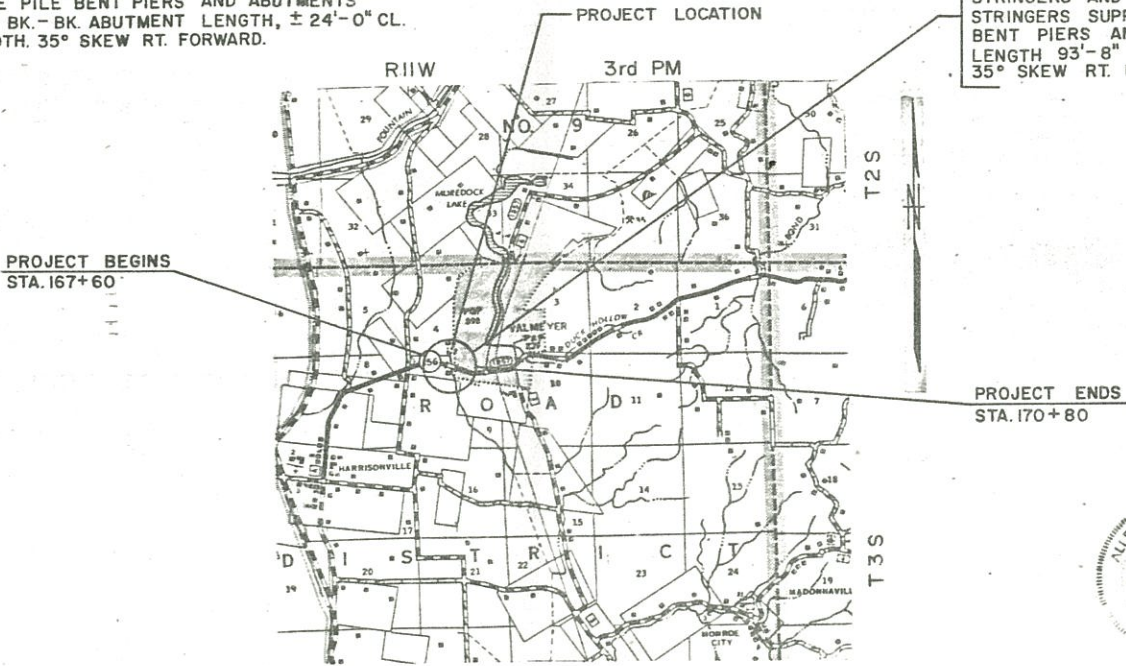
LAND SECTION - 9
LAND QUARTER SECTION - NORTHWEST



SBI 156 (ILL. RTE. 156)
SECTION 101 BR
MONROE COUNTY
C-98-007-86

EXISTING STRUCTURE: 3 SPAN REINFORCED CONCRETE DECK, STRUCTURAL STEEL STRINGERS, CONCRETE PILE BENT PIERS AND ABUTMENTS ± 93'-8" BK.-BK. ABUTMENT LENGTH, ± 24'-0" CL. DECK WIDTH. 35° SKEW RT. FORWARD.

PROPOSED STRUCTURE: 3 SPAN REINFORCED CONCRETE DECK ON EXISTING, STRENGTHENED STEEL INTERIOR STRINGERS AND NEW STRUCTURAL STEEL FASCIA STRINGERS SUPPORTED ON EXISTING CONCRETE PILE BENT PIERS AND ABUTMENTS. GROSS STRUCTURE LENGTH 93'-8" CLEAR DECK WIDTH 32'-0" 35° SKEW RT. FORWARD.



Road District No. 10

LOCATION PLAN
Length of Project - 320.00 Feet = 0.0606 Miles
Scale 1" = 1 Mile



Allen P. Henderson 11/12/86
Illinois P.E. 04097

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED August 20 1989

EXAMINED September 15 1989
District Engineer
Larry D. Gould

PASSED September 15 1989
Chief of Plans and Contracts
D. W. Wolcott

APPROVED September 15 1989
Director, Division of Highways
Karl C. Wilson

067-0013

TOLL FREE -
"JOINT UTILITY LOCATING INFORMATION FOR EXCAVATORS"
(J.U.L.I.E.) TELEPHONE NUMBER
1-800-892-0123

CONTRACT NO. 96141

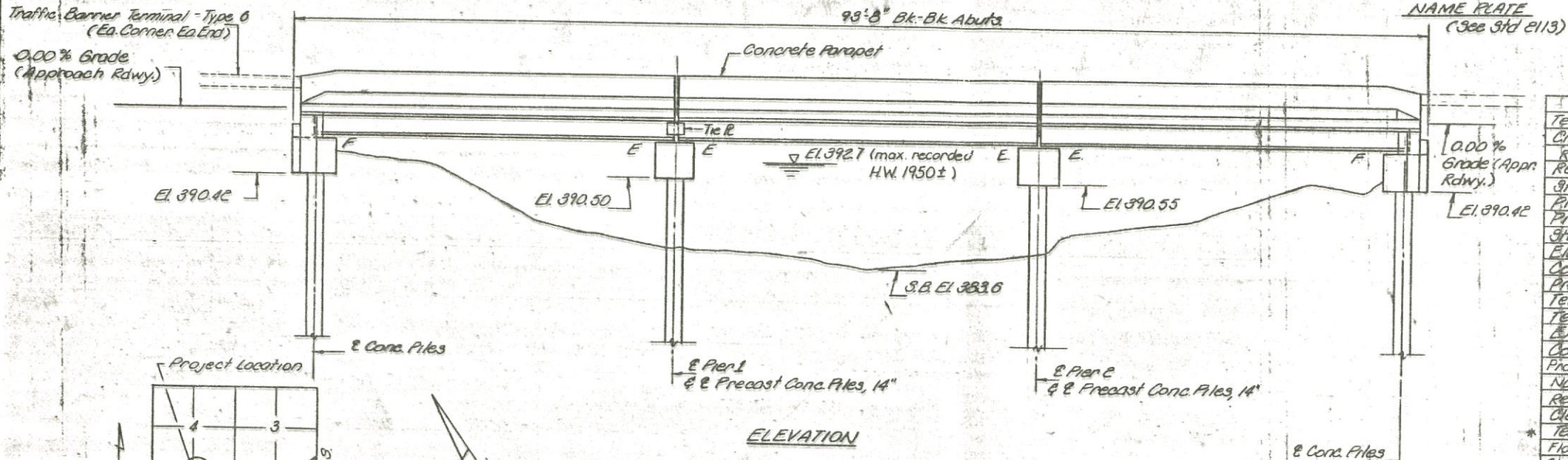
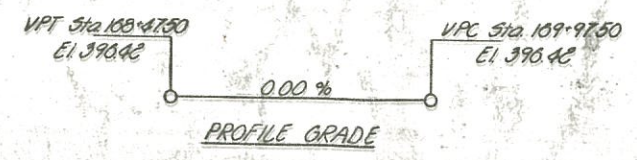
8-178

067-0013 670013

SBI 156	101 BR	MONROE	23	5
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STA 169+00
BUILT 198 BY
STATE OF ILLINOIS
FAP RT 156 SEC 101 BR
FA. PROJ. BR-589 ()
LOADING HS 20
STR. NO. 067-0013

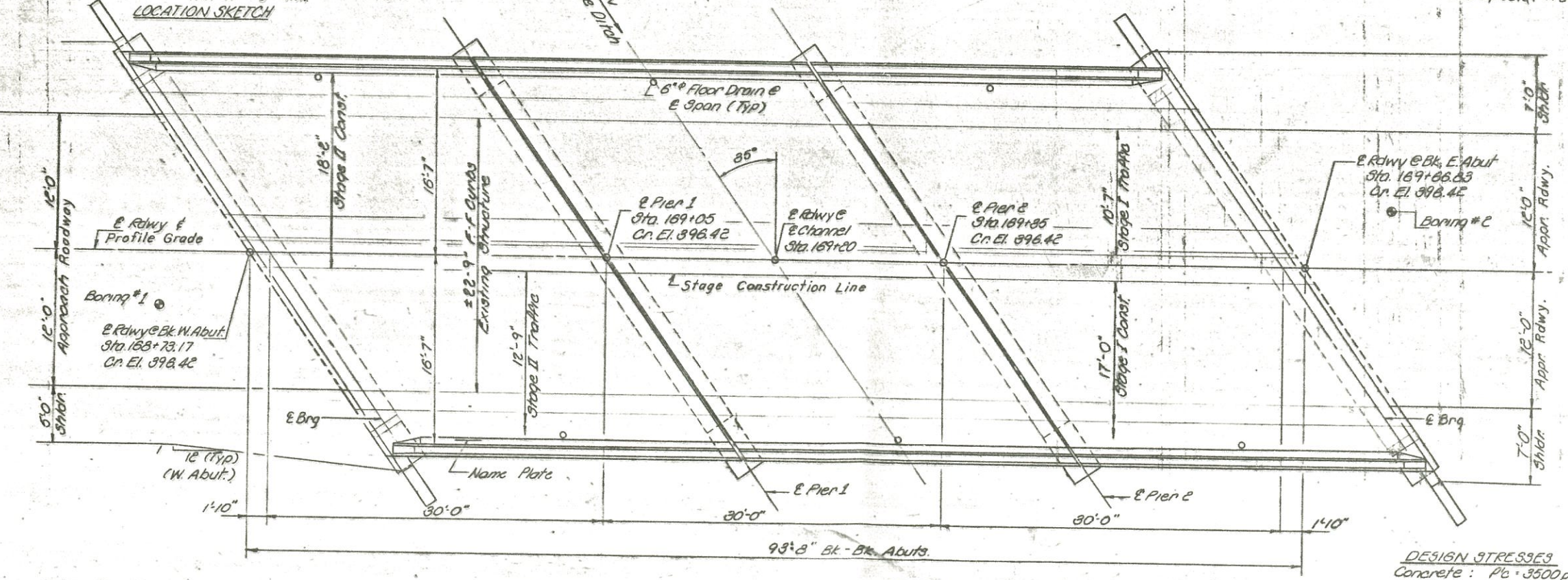
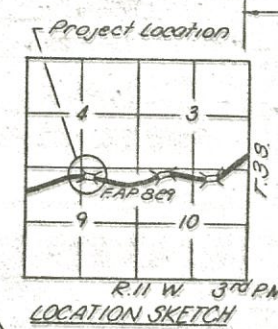
Benchmark: "X" in top of existing North-East Wingwall, El. 395.99
Existing Structure: 3-Span Concrete Deck on Steel I-Beams, 93'-8" Bk-Bk Abuts, ±24'-0" deck width, Concrete Pier Seat Piers & Abutments, 35° Skew Rt. Forward. Existing Structure built as Section 101-B-NR3 in 1986. The structure shall remain open to traffic during the construction period by Staging of the construction.



TOTAL BILL OF MATERIAL

Item	Lin. Ft.	Super.	Sub.	Total
Temporary Bridge Rail		94		94
Class X Concrete			21.6	21.6
Reinforcement Bars			2570	2,570
Reinforcement Bars (Epoxy Coated)		20,470		20,470
Structural Steel	L. Sum	1		1
Preformed Joint Seal, 4"	Lin. Ft.	43		43
Preformed Joint Seal, 1/4"	Lin. Ft.	43		43
Stud Shear Connectors	Each	1728		1728
Elastomeric Bearing Assembly, Type I	Each	32		32
Concrete Piles	Lin. Ft.		103	103
Precast Concrete Piles, 14"	Lin. Ft.		98	98
Test Pile, Concrete	Each		1	1
Test Pile, Precast Concrete 14"	Each		1	1
Expansion Bolts	Each		154	154
Concrete Removal	Cu. Yds.		8.3	8.3
Protective Coat	Sq. Yds.	76		76
Name Plates	Each		1	1
Removal of Existing Concrete Deck	Each		1	1
Cleaning and Painting Steel Bridge	L. Sum			1
Temporary Concrete Barrier	Lin. Ft.			94
Floor Drains	Each	6		6
Structural Steel Removal	L. Sum			1
Jacking & Removing Existing Bearings	L. Sum			1
Class X Concrete Superstructures	Cu. Yds.	1166		1166
End of Stringer, Structural Steel Repair	Each		8	8
Structure Excavation	Cu. Yd.		45	45

* See Special Provisions



DESIGN SPECIFICATIONS
1983 AASHTO Specifications
and applicable 1984 thru 1988 Interims
Specifications.

LOADING: HS 20-44
Allow 25#/sq. ft. for future wearing surface

DESIGN STRESSES
Concrete: $f'_c = 3500$ psi
Reinforcement: $f_y = 60$ ksi
Structural Steel: $R_s = 20$ ksi (M 183)
(Load Factor Design used for
Concrete Deck only)

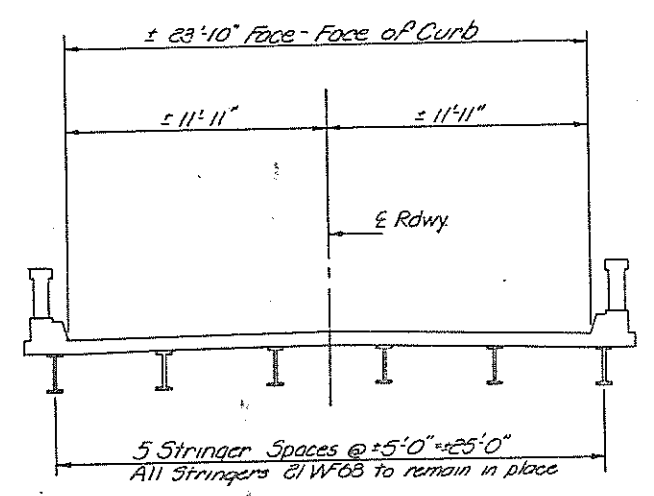


Allen Henderson
Illinois Structural 3257

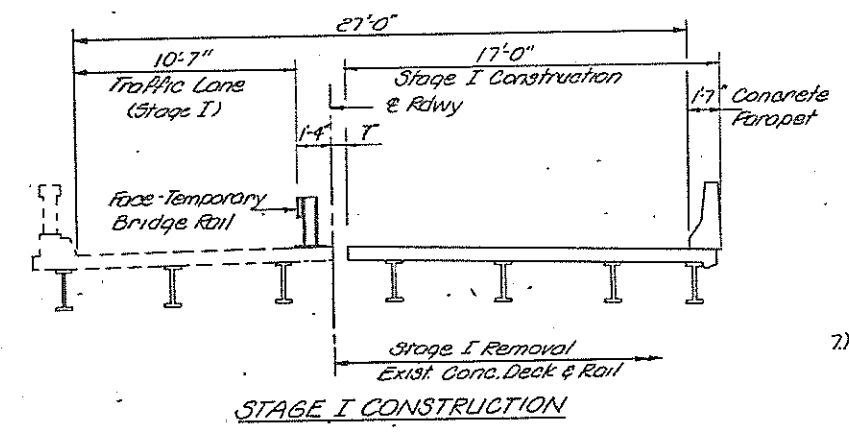
APPROVED
FOR STRUCTURAL ADEQUACY ONLY

James J. Rayburn
Engineer of Design and Structures

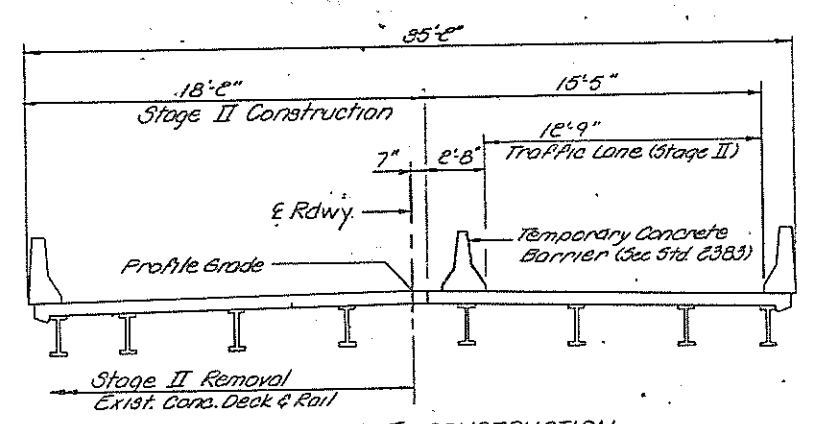
GENERAL PLAN & ELEVATION
SBI ROUTE 156 (ILL RT 156)
SECTION 101 BR
MONROE COUNTY
SN. 067-0013



EXISTING CROSS SECTION
Note: The cost of removal of existing railing is incidental to the Removal of Existing Concrete Deck.

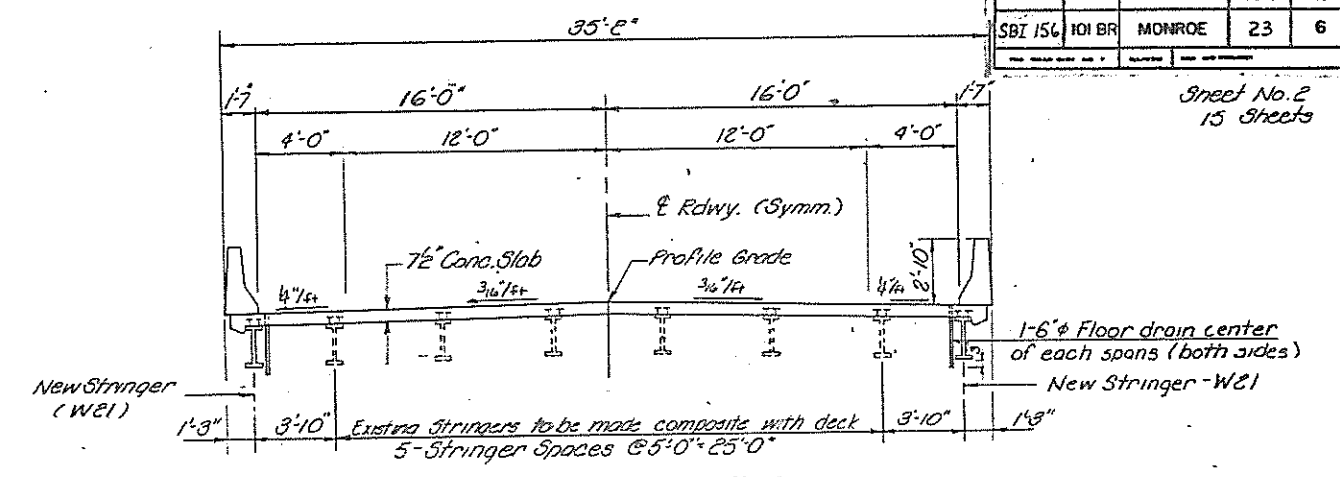


STAGE I CONSTRUCTION



STAGE II CONSTRUCTION

Note: The Temporary Bridge Rail placed during Stage I construction shall not be removed until after the Temporary Concrete Barrier has been erected and traffic routed through Stage II traffic lane.



PROPOSED CROSS SECTION
(Composite Construction)

GENERAL NOTES
See Proposal for Boring Data
Fasteners shall be High Strength Bolts - 3/4" φ, Holes 13/16" unless otherwise noted.
Anchor bolts shall be set before bolting diaphragms over support.
Field welding of construction accessories will not be permitted to the bottom flange of beams. Fixing welding of construction accessories in other areas will be permitted when approved by the Engineer.
The main load carrying components subject to tensile stress shall conform to the supplemental requirements for Notch Toughness - Zone E. These components are the new Wide Flange Beams and new tie plates.
The existing structural steel beams for a distance of 5' from the end of the beams, and the tie plates at Pier 1, shall be cleaned by Method I. The remainder of existing structural steel to be re-used shall be cleaned by Method II and spot painted.
The three coat lead and chromate free alkyd paint system shall be used for field painting of Existing Structural Steel. The color of the final finish coat shall be munsel standard 7.56 4/8 Interstate Green.
The three coat lead and chromate free alkyd paint system shall be used for shop and field painting of New Structural Steel. The color of the final finish coat shall be munsel standard 7.56 4/8 Interstate Green.

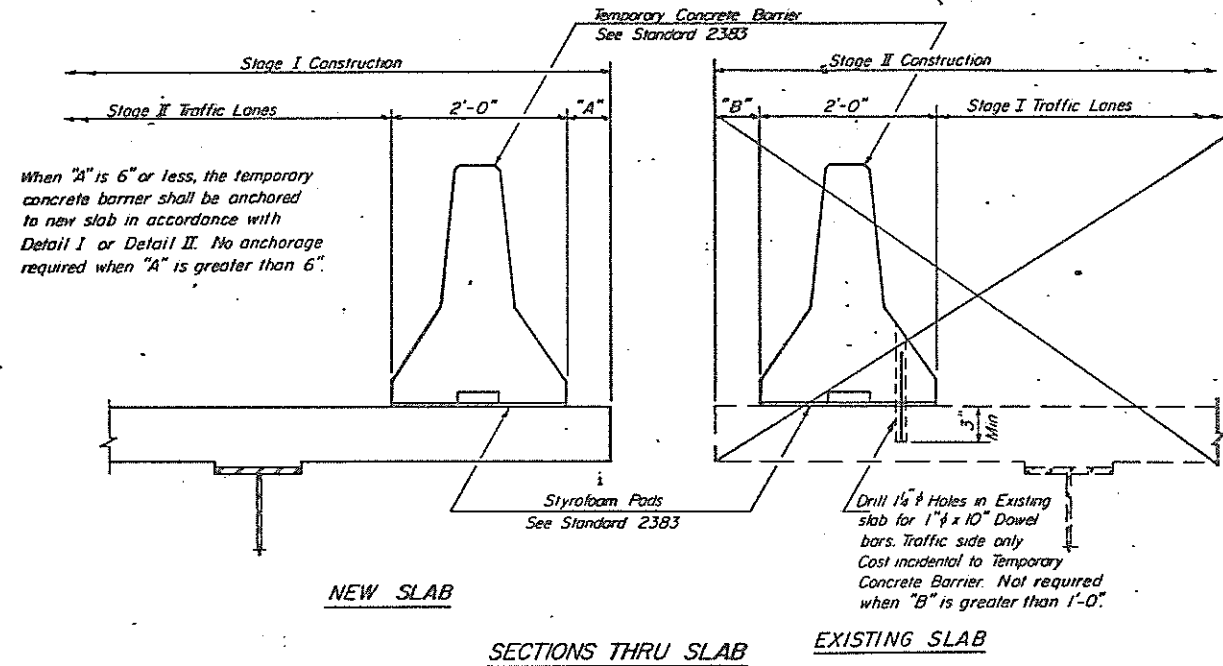
- SUGGESTED CONSTRUCTION SEQUENCE**
- Stage I:**
- 1) Erect temporary bridge rail
 - 2) Remove existing concrete deck of Stage I Construction.
 - 3) Loosen existing diaphragms between stringers 4&5.
 - 4) Repair designated pier piles that support beams and cap of the east bound traffic lane.
 - 5) Extend substructure units to accommodate Stage I Construction and place the new beam.
 - 6) Jack beams, remove and replace existing bearings. (Jack stringers 5 thru 7 at one bearing line simultaneously) (Max 4")
 - 7) Clean top of existing beams & place shear studs on existing beams. Place shear studs on new stringer beams.
 - 8) Place Concrete Deck on prepared Stage I framing.
- Stage II:**
- 1) With Stage I Construction complete, erect a temporary concrete barrier on Stage I Construction to provide for Stage II Traffic Lanes.
 - 2) Remove existing concrete deck of Stage II Construction.
 - 3) Repair designated pier piles that support beams and cap of the west bound traffic lane.
 - 4) Extend substructure units to accommodate Stage I Construction and place the new beam.
 - 5) Jack beams, remove and replace existing bearings. (Jack stringers 2 thru 4 at one bearing line simultaneously) (Max 4")
 - 6) Clean top of existing beams and place shear studs on existing beams. Place shear studs on new stringer beams.
 - 7) Tighten existing diaphragms between stringers 4&5 (new diaphragms at Piers)
 - 8) Place Concrete deck for Stage II Construction.

All contact surface areas of new and existing structural shall be free of paint or lacquer.
Reinforcement bars shall conform to the requirements of AASHTO M-31, M-42 or M-53, Grade 60.
Plan dimensions and details relative to the existing structure have been taken from existing plans and are subject to nominal construction variations. It shall be the contractor's responsibility to verify such dimensions and details in the field and make necessary approved adjustments prior to construction or ordering of materials. Such variations shall not be cause for additional compensation for a change in the scope of the work, however the contractor will be paid for the quantity actually furnished at the unit price bid for the work.
Expansion Bolts shall consist of approved expansion anchors, providing a minimum certified proof load = 4060 lbs., and 3/4" φ x 12" hooked bolts.
For Type I Elastomeric Bearings, shims of the dimensions of the top plate shall be provided and placed as detailed.
The contractor shall drive two (2) test piles in permanent locations; one 14" precast concrete test pile at Pier 2, and one concrete test pile at the East Abutment, as directed by the Engineer before ordering the remainder of piles.
Calculated weight of structural steel = 24490 lbs

CONSTRUCTION STAGING DETAILS
SBI ROUTE 156 (ILL 156)
SECTION 101-BR
MONROE COUNTY

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PROJECT NO.	SECTION	QUANTITY	TOTAL SHEETS	SHEET NO.	SHEET NO. 3
SBI 156	101 BR	MONROE	23	7	15 SHEETS
FOR ROAD DIST. USE ONLY					

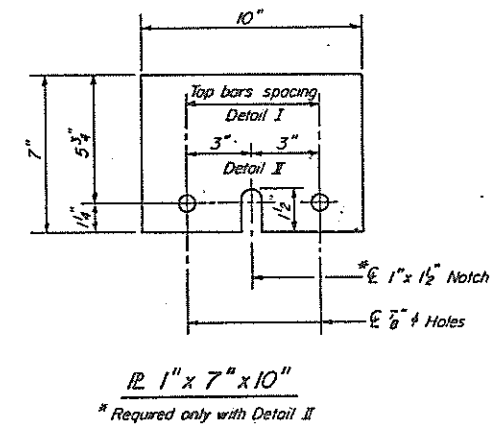
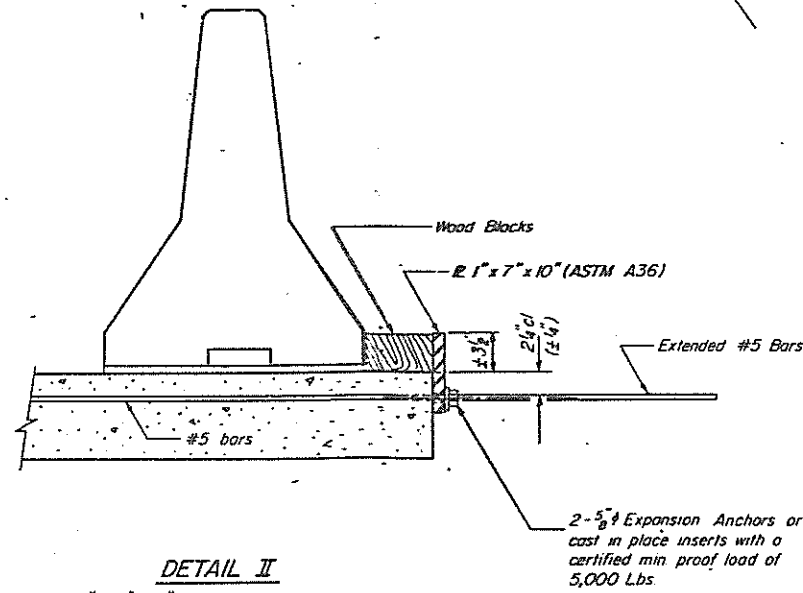
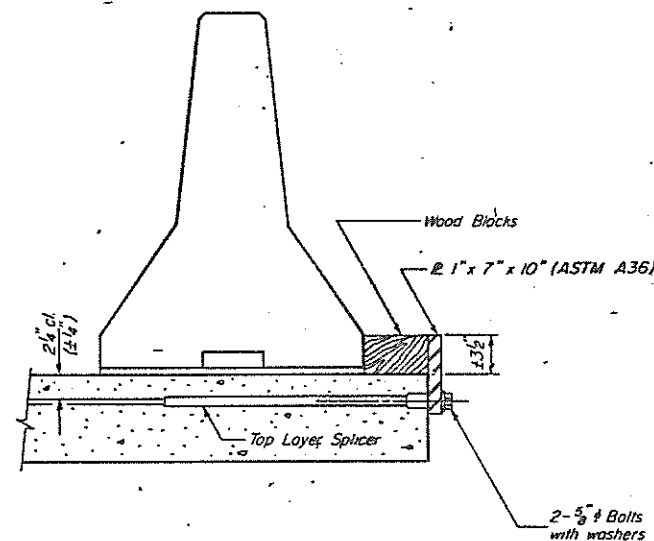
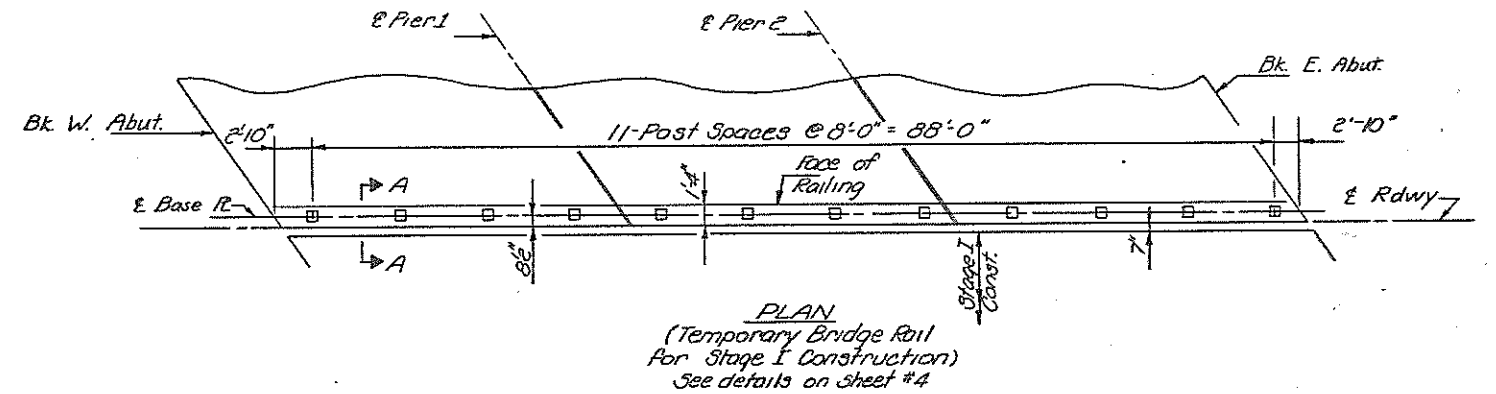


NOTES

Detail I - With Bar Splicer or Couplers:
Connect one (1) 1" \times 7" \times 10" steel PL to the top layer of couplers with 2- $\frac{5}{8}$ " ϕ bolts screwed to coupler at approximate $\frac{1}{2}$ " of each 10'-0" barrier panel.

Detail II - With Extended Reinforcement Bars:
Connect one (1) 1" \times 7" \times 10" steel PL to the concrete slab with 2- $\frac{5}{8}$ " ϕ Expansion Anchors or cast in place inserts spaced between the top layer of reinforcement at approximate $\frac{1}{2}$ " of each 10'-0" barrier panel.

Cost of anchorage is incidental to Temporary Concrete Barrier.



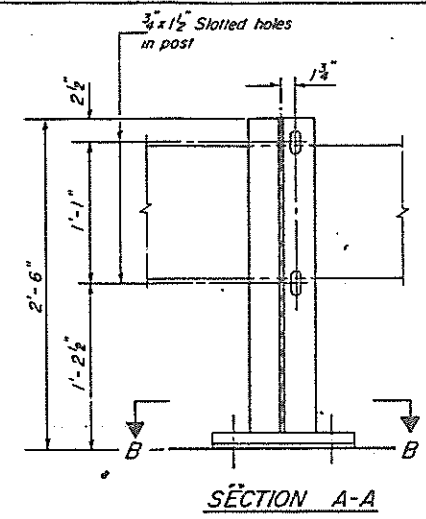
TEMPORARY BRIDGE RAIL &
TEMPORARY CONCRETE BARRIER FOR
STAGE CONSTRUCTION

SBI ROUTE 156 (ILL 156)
SECTION 101 BR
MONROE COUNTY

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

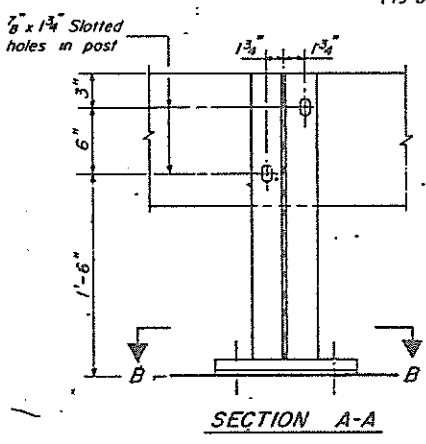
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SBT 156	101 BR	MONROE	23	8
FOR FIELD LIST NO. 7				

SHEET NO. 4
15 SHEETS

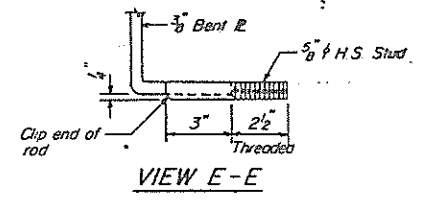
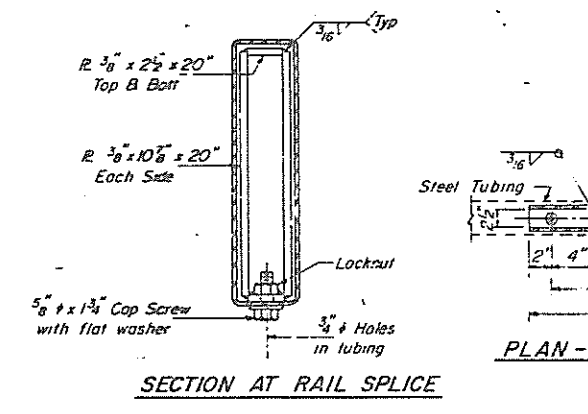
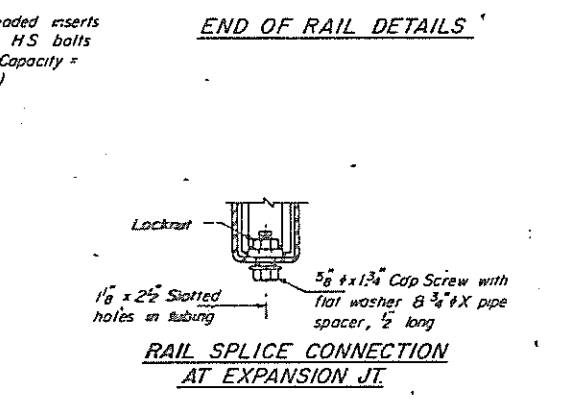
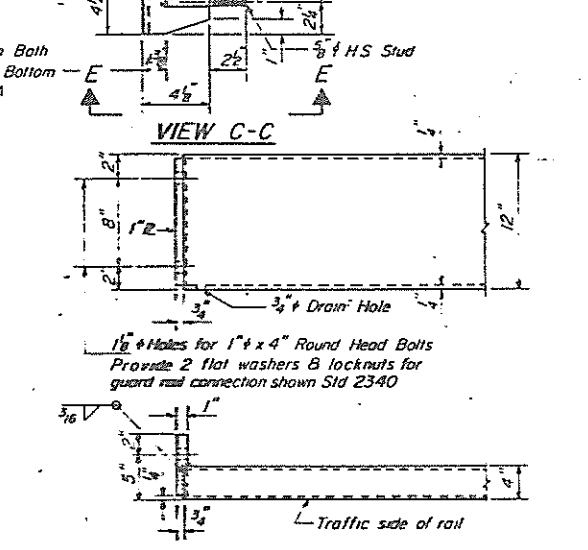
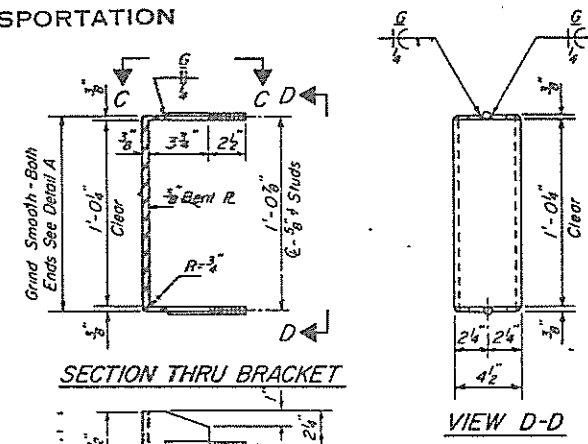
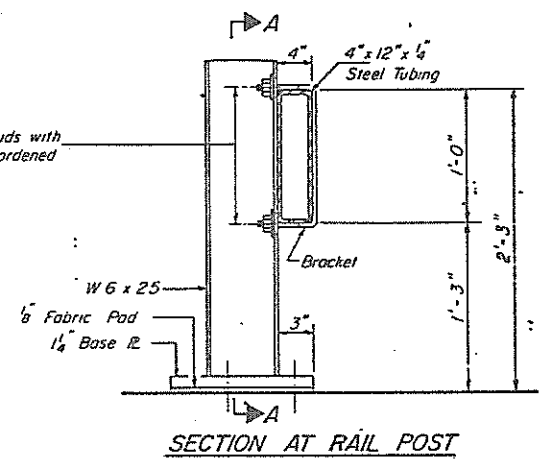
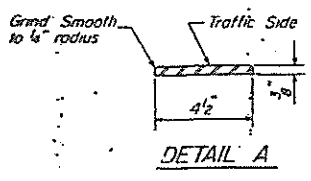
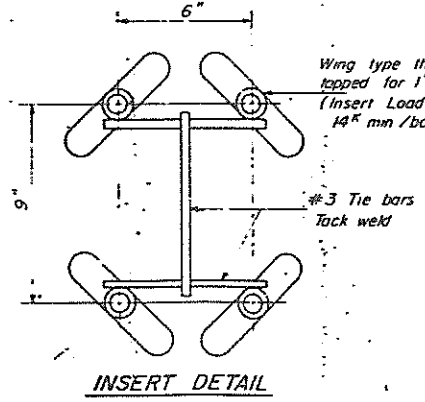
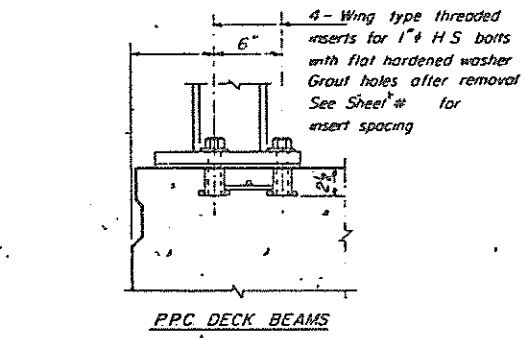
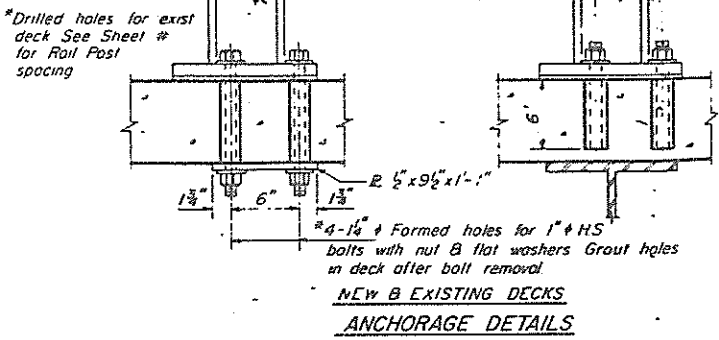
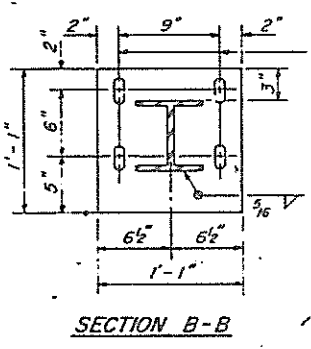


ALTERNATE I

(To be used only for Roadway width $\geq 12'$)



ALTERNATE II



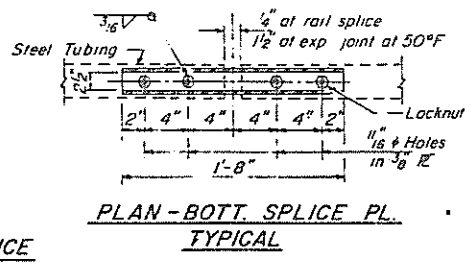
NOTES

Hollow structural steel tubing shall conform to the requirements of ASTM designation A-500 Grade B Structural Steel Tubing
All other steel shapes and plates shall conform to the requirements of AASHTO M-183 except posts and brackets shall conform to AASHTO M-223 Grade 50
Bolts, cap screws, and nuts shall conform to the requirement of ASTM designation A-307 except for high strength bolts, threaded rods, studs, nuts and washers noted which shall conform to AASHTO M-164
The bridge rail shall receive one shop coat of a steel prime paint.
The 1" high strength bolts or threaded rods used to connect the railposts shall be tightened in accordance with Article 50704(g)(3) of the Standard Specification
See Special Provisions for Temporary Bridge Rail
See sheet #3 for Rail Post spacing
The contact surfaces between post flange, rail and inside face of bracket or Alternate J shall be free of all lubricants
The nut for 5/8" high strength studs used in Alternate I to connect bracket to post shall be tightened in a snug fit and given an additional one half turn

Note: See Sheet No. 3 for Rail Plan

BILL OF MATERIAL

Item	Unit	Quantity
Temporary Bridge Rail	Lin Ft	94

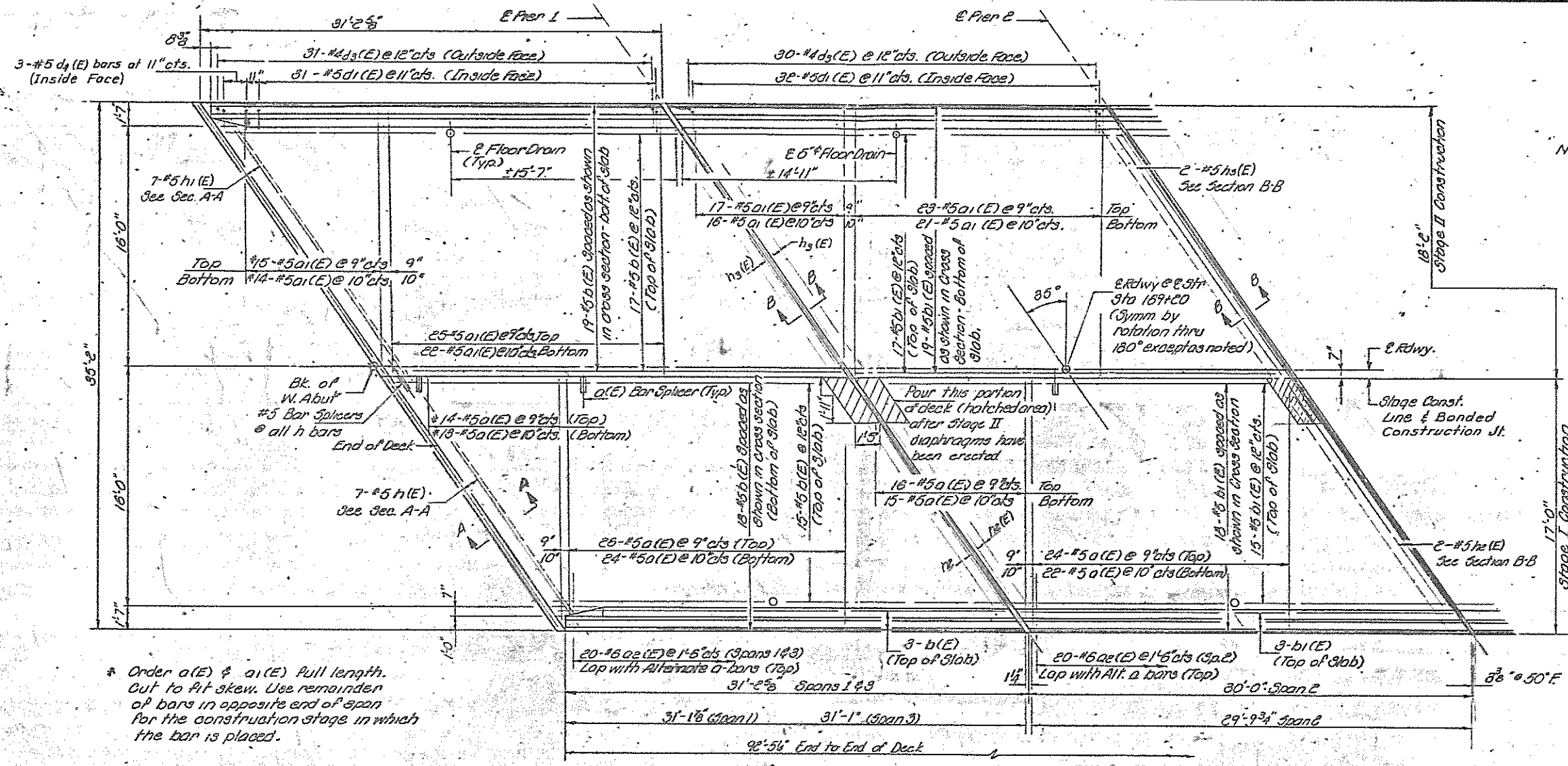


TEMPORARY BRIDGE RAIL
SBT ROUTE 156 (ILL 156)
SECTION 101 BR
MONROE COUNTY

DATE	BY	CHECKED	SCALE	NO.
SBI 156	IOI BR	MONROE	23	9

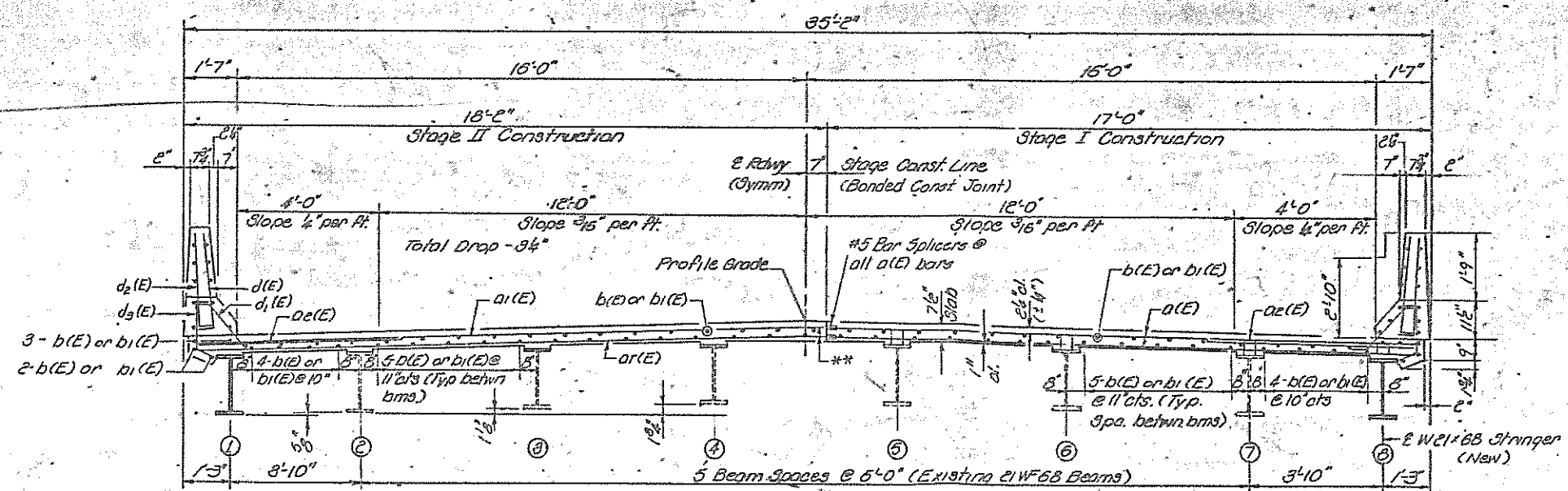
Sheet No. 5
15 Sheets

Notes: See Sheet No. 6 for superstructure details and Bill of Material. Reinforcement bars designated (E) shall be epoxy coated. See Sheet 14 for Bar Splicer Details.



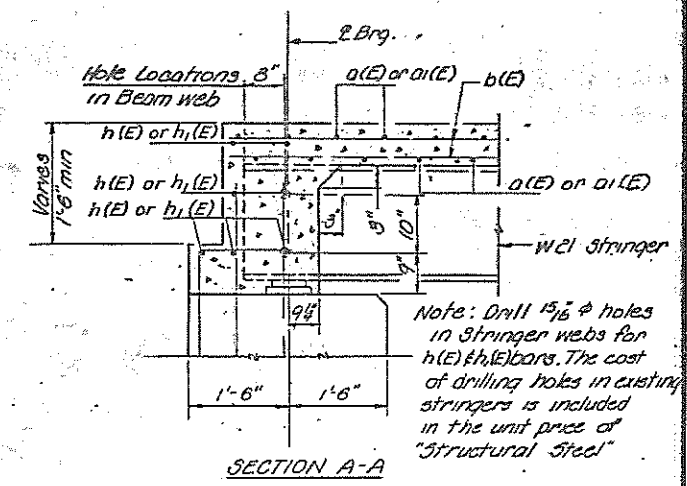
* Order a(E) & a1(E) Full length. Cut to fit skew. Use remainder of bars in opposite end of span for the construction stage in which the bar is placed.

PLAN



CROSS SECTION

** Lapped bars at this location shall be tied with double the number of ties normally used.



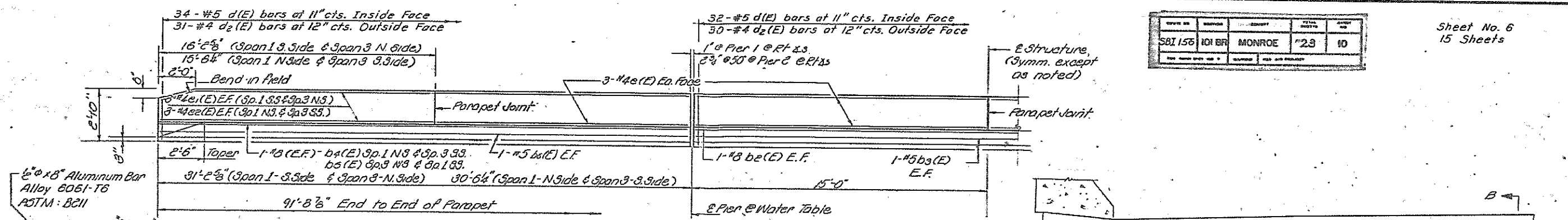
SECTION A-A

Note: Drill 1 5/16" holes in stringer webs for h(E) & h1(E) bars. The cost of drilling holes in existing stringers is included in the unit price of "Structural Steel".

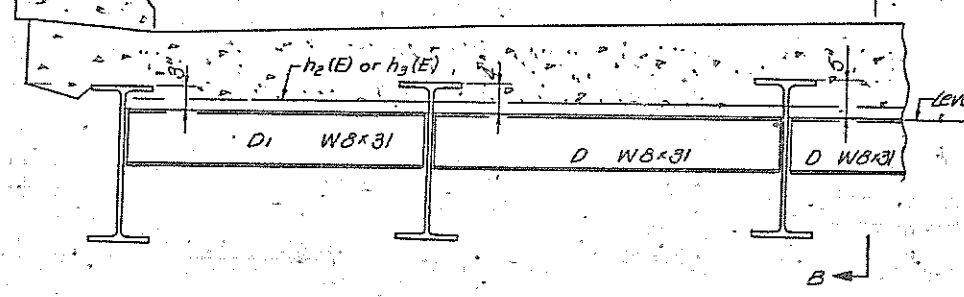
SUPERSTRUCTURE
SBP ROUTE 156
ILL. RTE 156
SECTION 101-BR
MONROE COUNTY

DATE	BY	CHECKED	SCALE	SHEET NO.
S&T 156	IOI BR	MONROE	"2.3	10

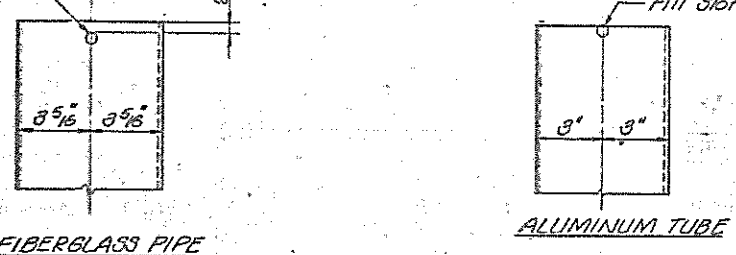
Sheet No. 6
15 Sheets



HALF ELEVATION
(Showing Inside Face of Parapet)

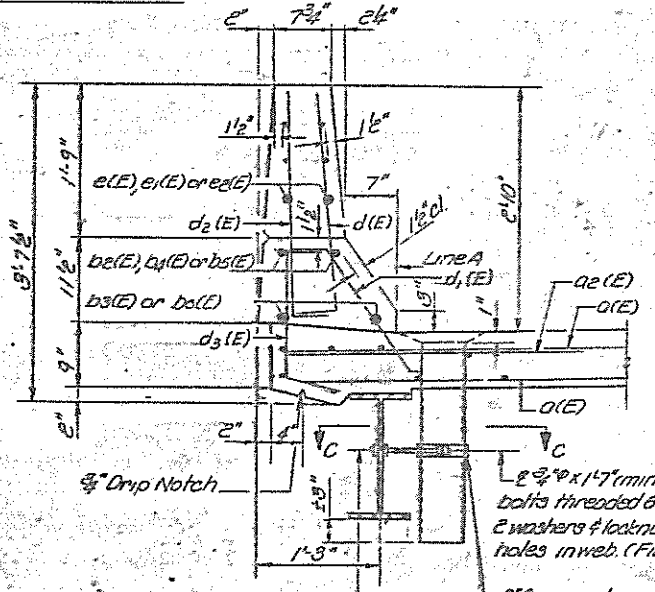


PARTIAL ELEVATION @ PIERS
(Showing Diaphragms)



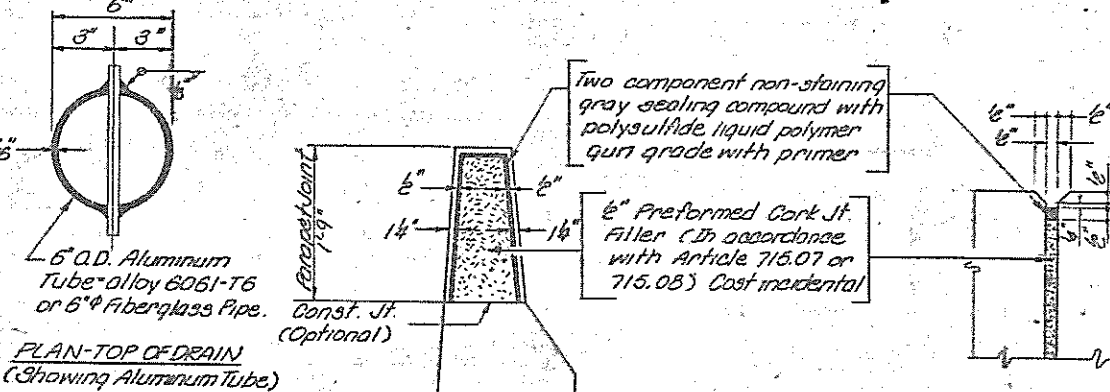
FIBERGLASS PIPE

ALUMINUM TUBE



SECTION THRU PARAPET

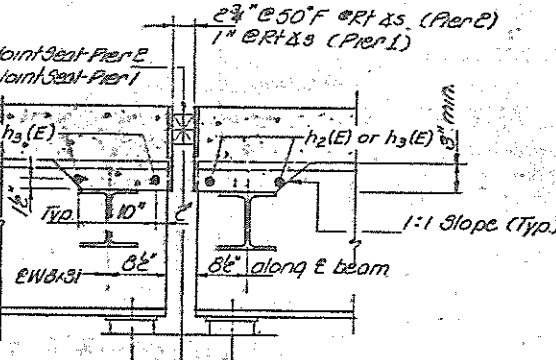
The surface of the fiberglass pipe shall be free of bond inhibiting agents



PLAN-TOP OF DRAIN
(Showing Aluminum Tube)

PARAPET JOINT DETAILS

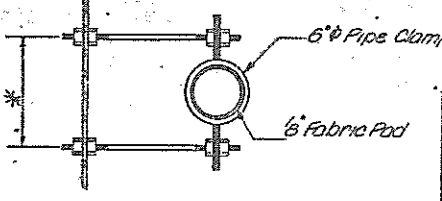
*- Drill 1/8 inch holes in existing stringer webs for placement of h2(E) and h3(E) bars.



SECTION B-B

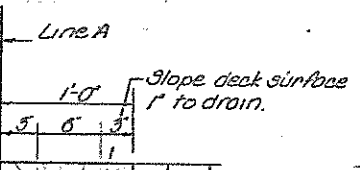
SUPERSTRUCTURE
BILL OF MATERIAL

Bar	No	Size	Length	Shape
a(E)	281	#5	16'-7"	—
a1(E)	229	#5	17'-2"	—
a2(E)	120	#6	4'-0"	—
b(E)	150	#5	30'-10"	—
b1(E)	75	#5	29'-1"	—
b2(E)	4	#8	29'-6"	—
b3(E)	2	#5	29'-5"	—
b4(E)	4	#3	30'-2"	—
b5(E)	4	#8	30'-10"	—
b6(E)	3	#5	30'-2"	—
d(E)	200	#5	3'-0"	—
d1(E)	188	#5	2'-7"	—
d2(E)	184	#4	3'-0"	—
d3(E)	184	#4	2'-5"	—
d4(E)	12	#5	2'-5"	—
e(E)	48	#4	14'-9"	—
e1(E)	12	#4	15'-10"	—
e2(E)	12	#4	15'-2"	—
h1(E)	14	#5	20'-6"	—
h2(E)	8	#5	21'-11"	—
h3(E)	8	#5	18'-2"	—
h4(E)	8	#5	22'-6"	—
Reinforcement Bars (Epoxy Coated) Lbs. 20,470				
Class X Concrete Superstructures Cu Yds 116.6				

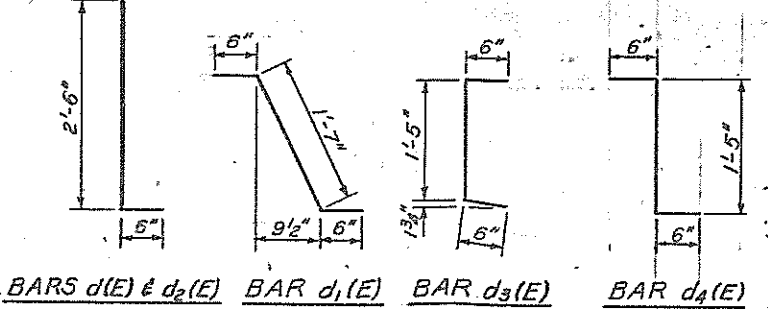


SECTION C-C
* Dimension to match that required for clamp

Note: Fiberglass pipe shall conform to ASTM D2990, with short-time rupture strength hoop tensile stress of 30,000 psi minimum.



PLAN
(Drain Placement)



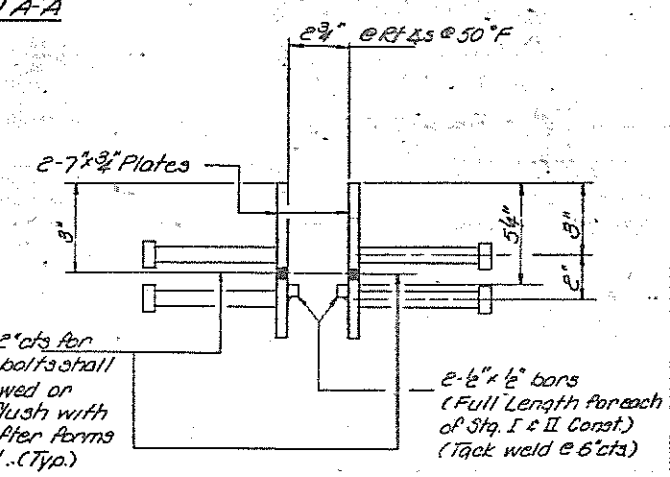
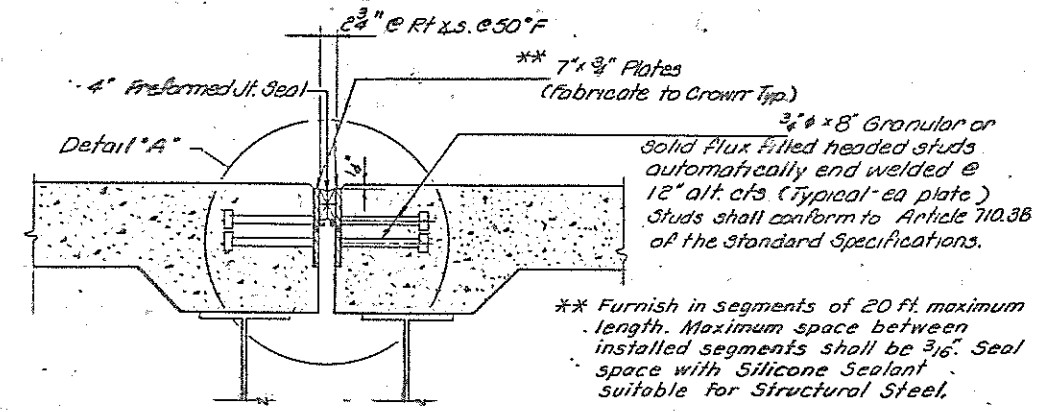
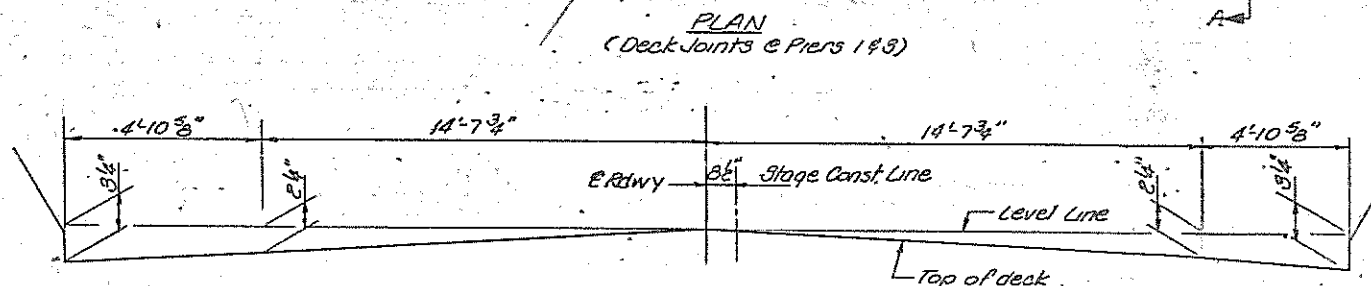
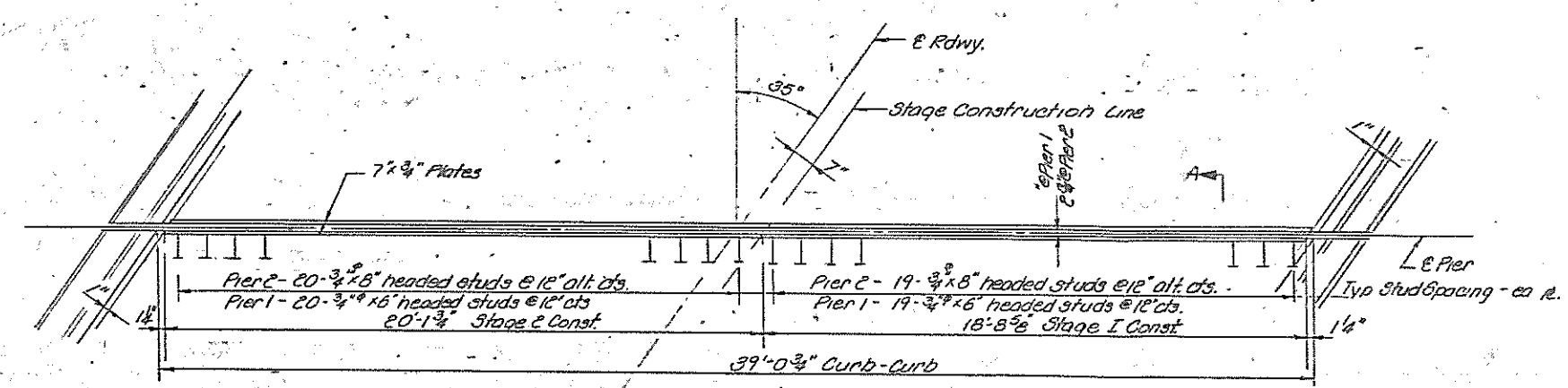
BARS d(E) & d2(E) BAR d1(E) BAR d3(E) BAR d4(E)

Note: The exterior surfaces of the Floor Drain shall be painted with the lead and chromate free alkyl paint system specified for structural steel. The exterior surfaces of the Aluminum tube shall be cleaned and given a washcoat pretreatment in accordance with Steel Structures Painting Council's Spec. 53PC-5P1 & 53PC-5P2-5P3-5P4-5P5-5P6-5P7 prior to painting.

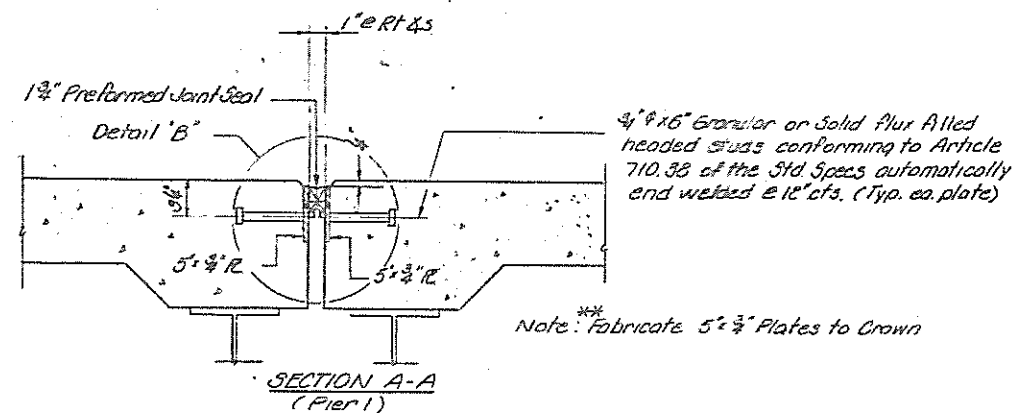
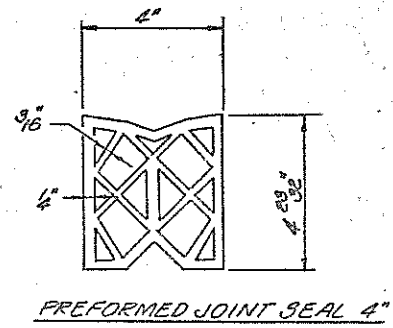
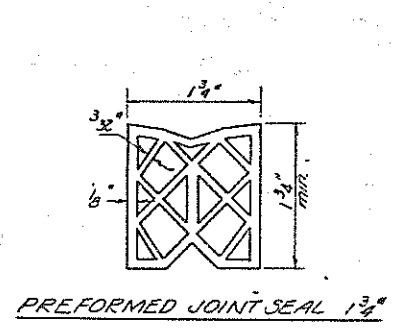
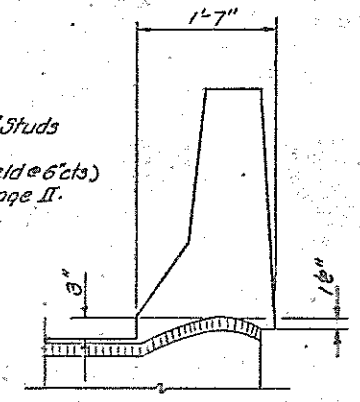
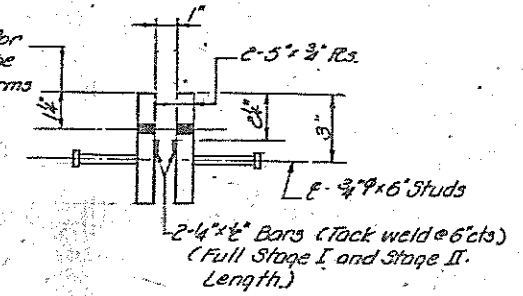
SUPERSTRUCTURE DETAILS
S&T ROUTE 156
(ILL. ROUTE 156)
SECTION IOI BR
MONROE COUNTY

PROJECT NO.	DATE	DESIGNER	CHECKED	DATE
SBT 156	10/1 BR	MONROE	28	11

Sheet No. 7
15 Sheets



7/16" Holes @ 12" cts for 3/8" bolts. Bolts shall be cut off flush when forms are removed.



BILL OF MATERIAL

Item	Quantity
Preformed Joint Seal 4" Lin.Ft	43
Preformed Joint Seal 1 3/4" Lin.Ft	43

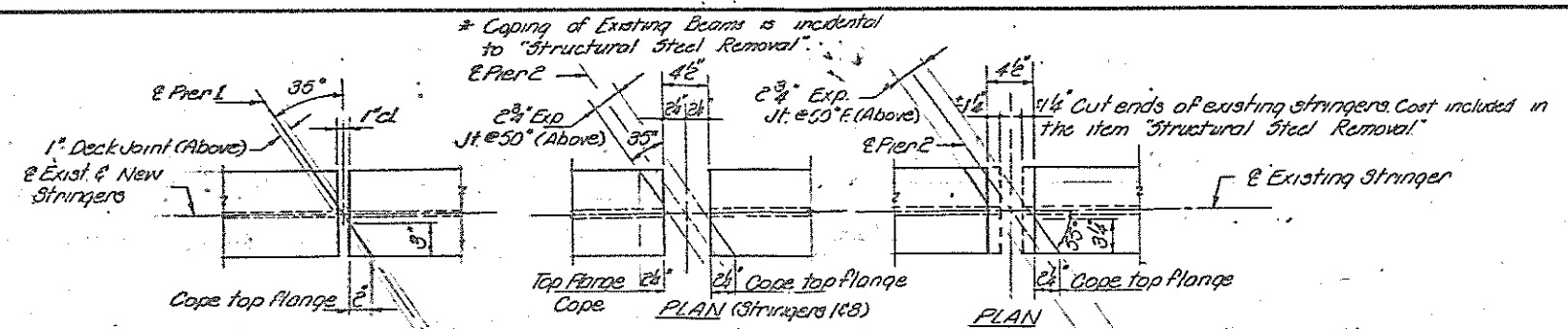
DECK JOINT DETAILS
SBT ROUTE 156
(ILL RTE 156)
SECTION 101 BR
MONROE COUNTY

SBI 156	101 BR	MONROE	2.3	12
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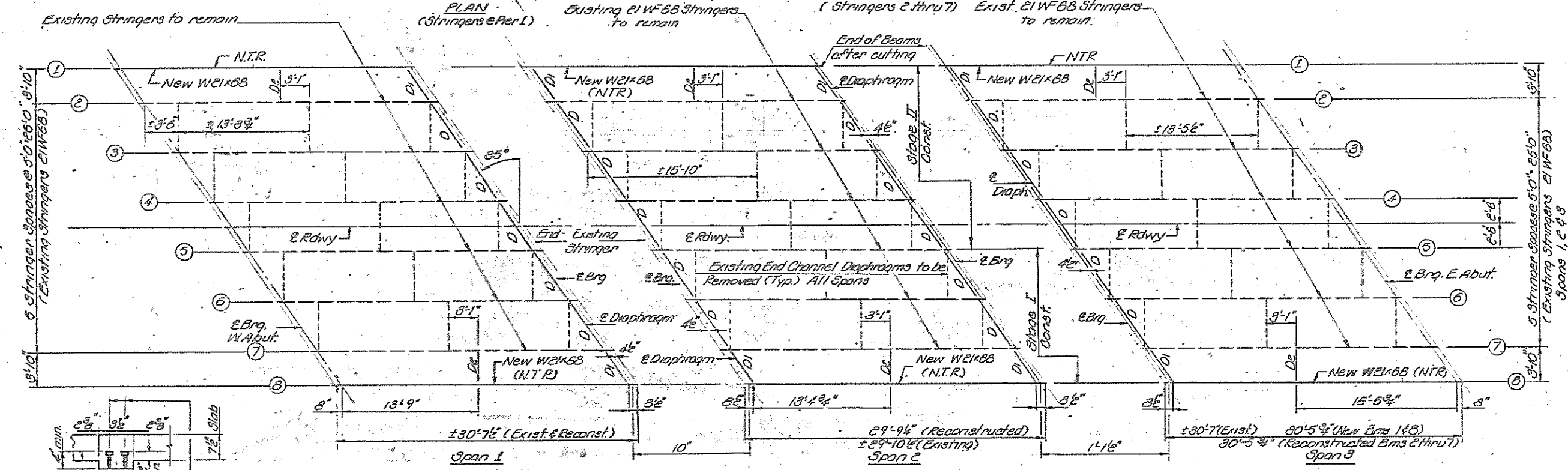
TOP OF BEAM ELEVATIONS

Location	New Bms	Existing Beams		
	148	247	328	445
E. Brdg	395.48	395.55	395.64	395.71
W. Abut.	395.48	395.55	395.64	395.71
Pier 1 Sp1	395.48	395.55	395.64	395.71
Pier 2 Sp2	395.48	395.55	395.64	395.71
Pier 2 Sp3	395.48	395.55	395.64	395.71
E. Abut.	395.48	395.55	395.64	395.71

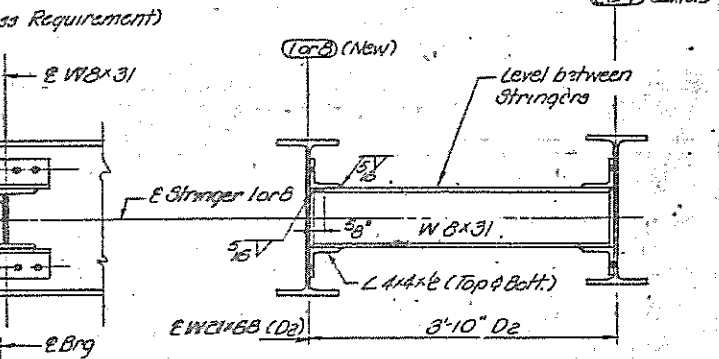
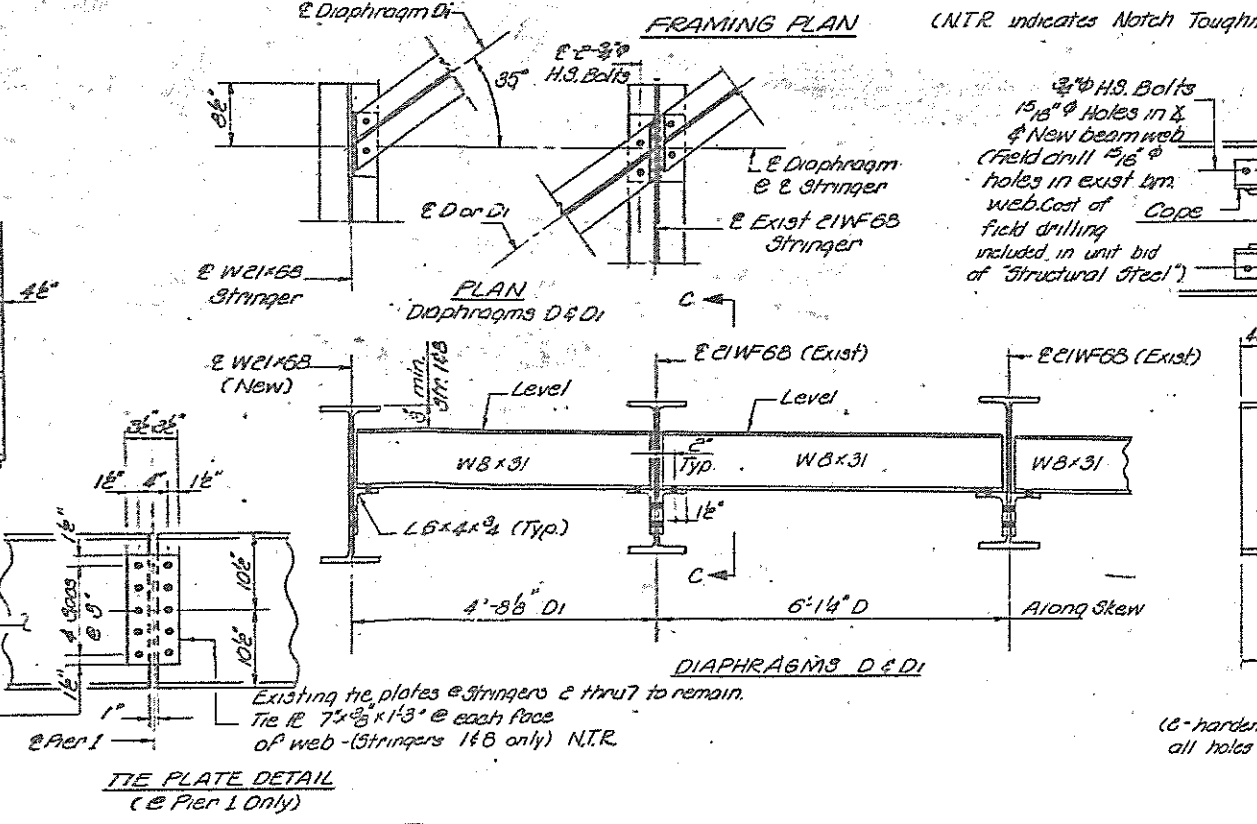
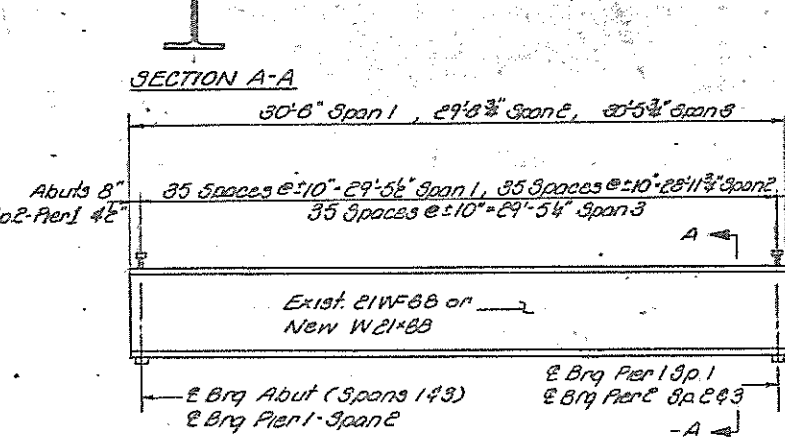
* Elevations shown are for existing stringers in jacked position for acceptance of new concrete deck.



Note: Existing interior diaphragm connection between stringers 445 shall be replaced by high strength bolts and then loosened during Stage I Const. removal operations. All new diaphragms D between stringers 445 shall be erected and tightened during Stage II Construction.



3/4" Granular or Solid Flux Filled headed studs, automatically end welded. 2 Lines (2 studs per line) (72" Required per Stringer)



BILL OF MATERIAL

Item	Quantity
Stud Shear Connectors	Each 1728
3/4" H.S. Bolts (1 1/2" holes)	Field drill - Exist Bms

MOMENT TABLE (Int. Stringers)

Is	1480 in ⁴	Total	1674 in ⁴
Ic	4440 in ⁴	Ic (total)	10,374 in ⁴
Is	140 in ⁴	Ic (total)	15,488 in ⁴
Is	2175 in ⁴	VR	31 E
Ic	0.553 ft		
MR	60 ft		
Rc (net)	5.14 ft		
Re	0.235 ft		
MR (net)	26.5 ft		
MR	124.5 ft		
MI	37.2 ft		

STRINGER ELEVATION
(Stud Shear Connector Spacing)

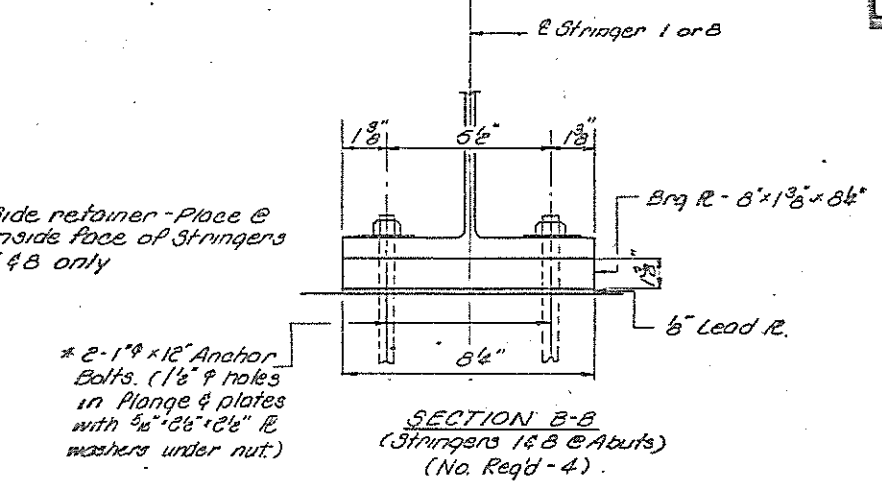
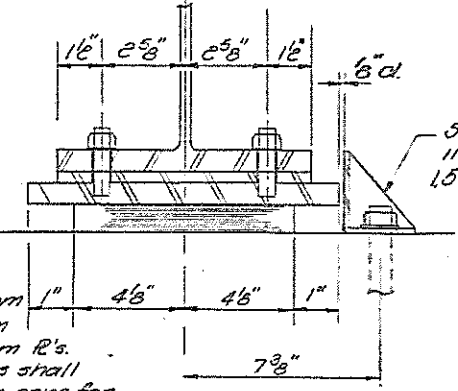
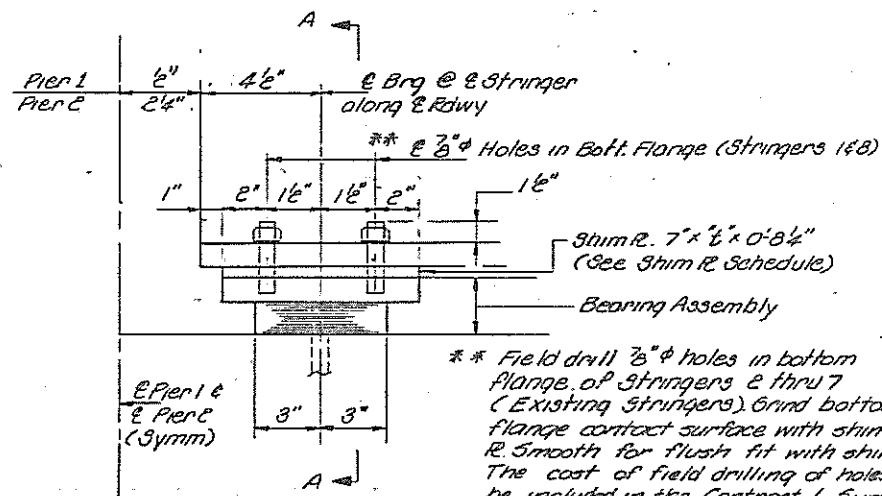
Exist 21WF68 or New W21x68

3/4" H.S. Bolts
1 1/2" holes

Existing tie plates @ stringers 2 thru 7 to remain.

Tie @ 7x3/8 x 1'3" @ each face of web - (Stringers 1 & 8 only) N.T.R.

FRAMING PLAN
SBI ROUTE 156
CELL ROUTE 156
SECTION 101 BR
MONROE COUNTY



SHIM R. SCHEDULE
(*1" - Dimension)

Location	Stringer Designation							
	1	2	3	4	5	6	7	8
E Brq W Abut	—	2'6"	4"	4'6"	4'6"	4"	2'6"	—
E Brq Pier 1 Sp 1	1'4"	1'6"	1'6"	2"	2"	1'6"	1'4"	—
E Brq Pier 2 Sp 2	—	—	7'8"	1'3"	1'3"	1'6"	—	—
E Brq Pier 2 Sp 3	—	—	7'8"	1'3"	1'3"	1'6"	—	—
E Brq E. Abut	—	2'6"	4"	4'6"	4'6"	4"	2'6"	—

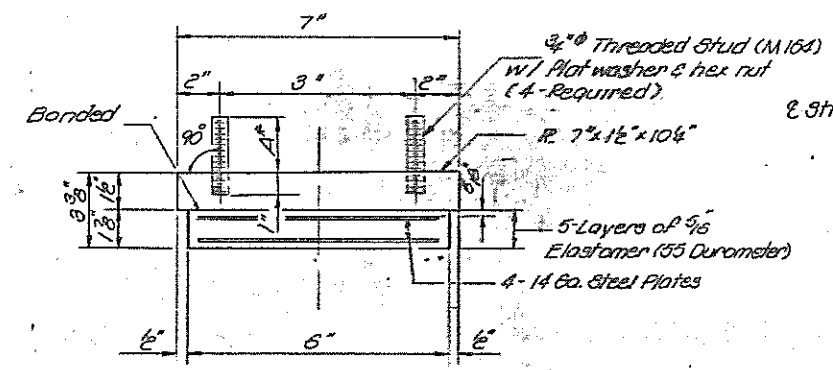
** Field drill 7/8" φ holes in bottom flange of stringers & thru 7 (Existing stringers) Grind bottom flange contact surface with shim R's. Smooth for flush fit with shim R's. The cost of field drilling of holes shall be included in the Contract L. Sum price for "Structural Steel". The cost of grinding bottom flanges shall be included in the Contract Unit Price Each for End of Stringer, Structural Steel Repair.

* 2-1" φ x 12" Anchor Bolts (1 1/8" φ holes in Plange & plates with 5/16" x 2 1/2" x 2 1/2" R washers under nut.)

** See Sheet 15 of 15 For Anchor Bolt installation.

PARTIAL ELEVATION @ PIERS
Note: Provide over-size washers at threaded studs nearest existing anchor bolt hole in bottom flange to completely cover existing holes. Cost shall be incidental to Elastomeric Bearing Assembly, Type I.

TYPE I ELASTOMERIC EXP BRG
(@ Piers - New & Exst Stringers)

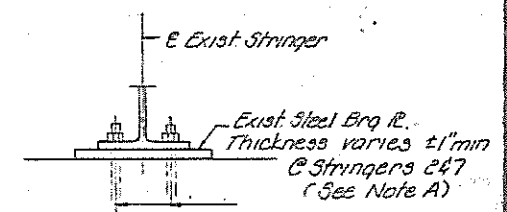
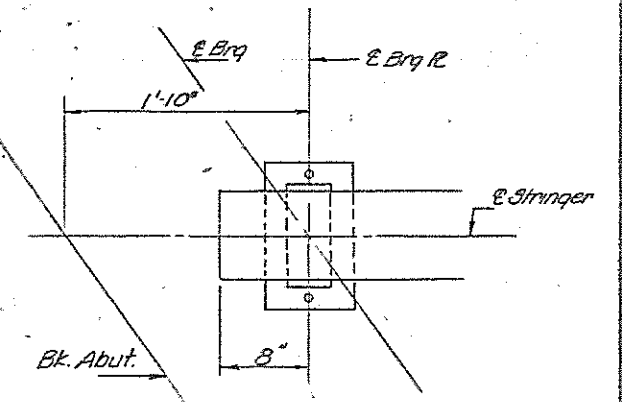
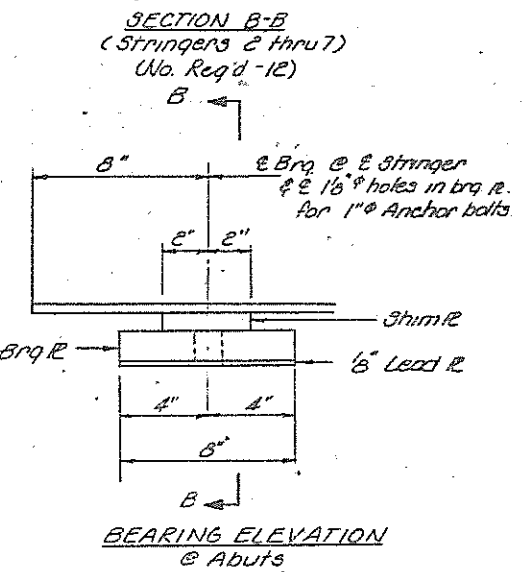
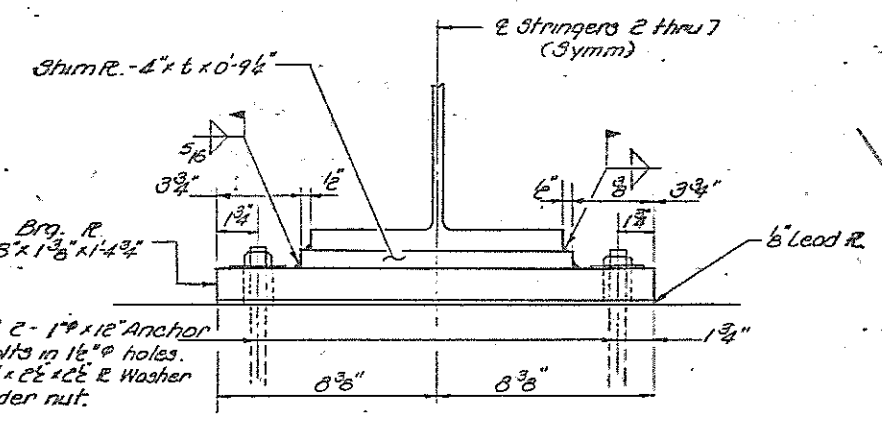
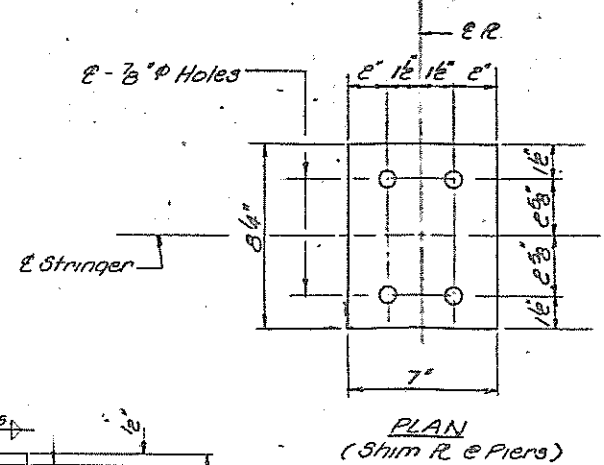
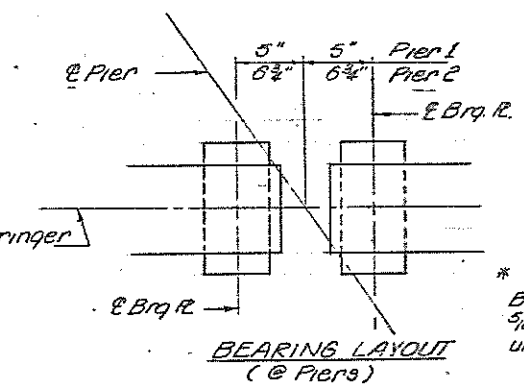
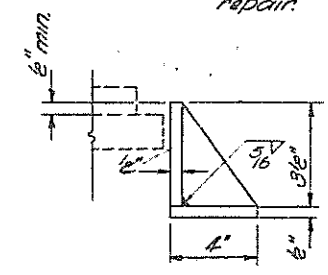


Note: Shim plates shall not be placed under bearing assembly.

* Dimension "A" Table

Stringer No.	1 & 8	2 & 7	3 & 6	4 & 5
Pier 1	3"	3"	4'6"	4'6"
Pier 2	2'6"	2'6"	3'6"	4'6"

Note: Add 1/4" to tabulated dimensions for locations requiring stringer repair.



Note: Existing Anchor bolts shall be burned, sawed or chipped off flush with top of Pier or Abut (Cost incidental to Jacking and Removing Bearings)

BILL OF MATERIAL

Item	Unit	Quantity
Elastomeric Bearing Assembly, Type I	Each	32
Structural Steel	L. Sum	1
Jacking and Removing Bearings	L. Sum	1

Note: Work this Sheet with Sheet 9.1

Note A: Jack existing stringers of each construction stage to the Top of Beam Elevation shown on Sheet No. 8. Remove existing bearing plates and the projecting segments of existing anchor bolts. Provide smooth and even surface for acceptance of new stringer bearings. Beams of spans 1 & 2 shall be jacked at all bearing lines simultaneously. Existing beams of span 3 shall be jacked simultaneously at each support, one end at a time. Min Jack Capacity - 5 Tons per bearing line @ Abuts - 12 Tons (@ bearing lines @ each Pier)

BEARINGS
SBT ROUTE 156
CILL RTE 156
SECTION 101 BR
MONROE COUNTY

FAP 829	*	MONROE	21	13A
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Sheet No. 9.A
15 Sheets

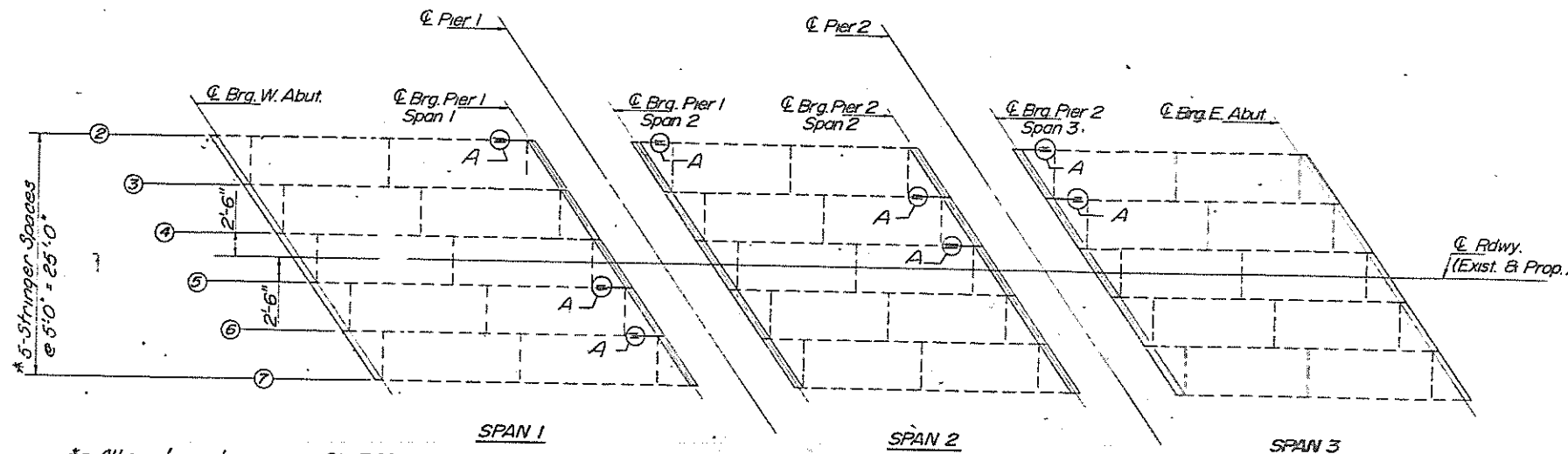
NOTES

The contractor shall adjust all existing beams to the plan elevations prior to the removal of beam ends designated as A on this sheet. Grind surfaces at cut ends of existing beams, which are to be reused, for flush fit with splice plates.

Remove all paint from the surfaces of the existing beam segments to remain for reuse. All contact surfaces of the existing and new beams with the splice plates shall not be painted.

Quantities shown on this sheet may be increased by the Engineer in the field if in his opinion the loss of section for any stringer as determined by the flange thickness is excessive and exceeds that resulting from the use of a splice.

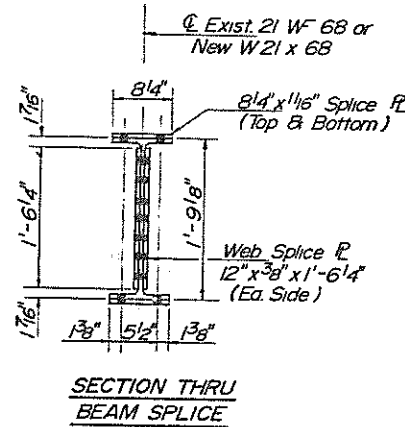
Estimated Steel weight per splice, (including bolt, nuts and washers) = 206 lbs.



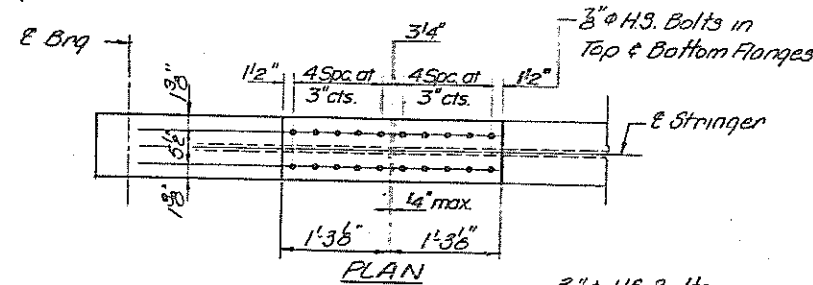
* - All existing stringers - 21 WF 68

**EXISTING STRINGER LAYOUT
REFERENCE PLAN**

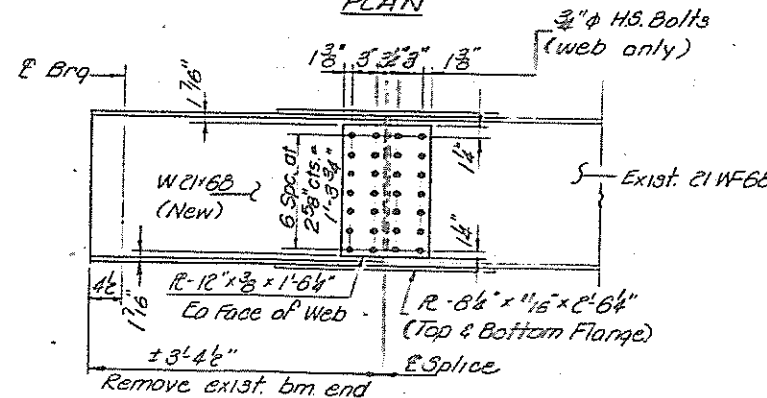
"End of Stringer, Structural Steel Repair" Locations designated A



**SECTION THRU
BEAM SPLICE**



PLAN



ELEVATION

DETAIL
"End of Stringer, Structural Steel Repair"
for Locations designated A.

Note: Field drill 1 3/16" holes in web of existing beam for 3/4" H.S. Bolts and 1 1/16" holes in flanges of existing beam for 1 1/16" H.S. Bolts. Cost shall be incidental to the contract unit price each for END OF STRINGER, STRUCTURAL STEEL REPAIR.

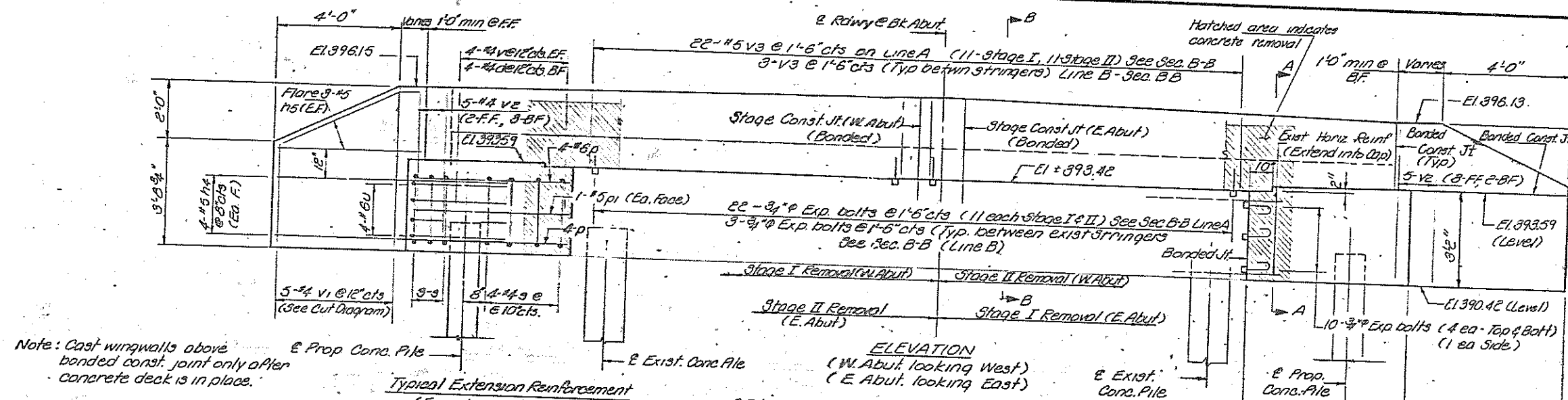
BILL OF MATERIAL

End of Stringer, Structural Steel Repair	Each	8
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Note: Work this sheet with Sheet No. 9

BEARINGS
F.A.P. ROUTE 829
(IL. ROUTE 156)
SECTION 101 BR
MONROE COUNTY

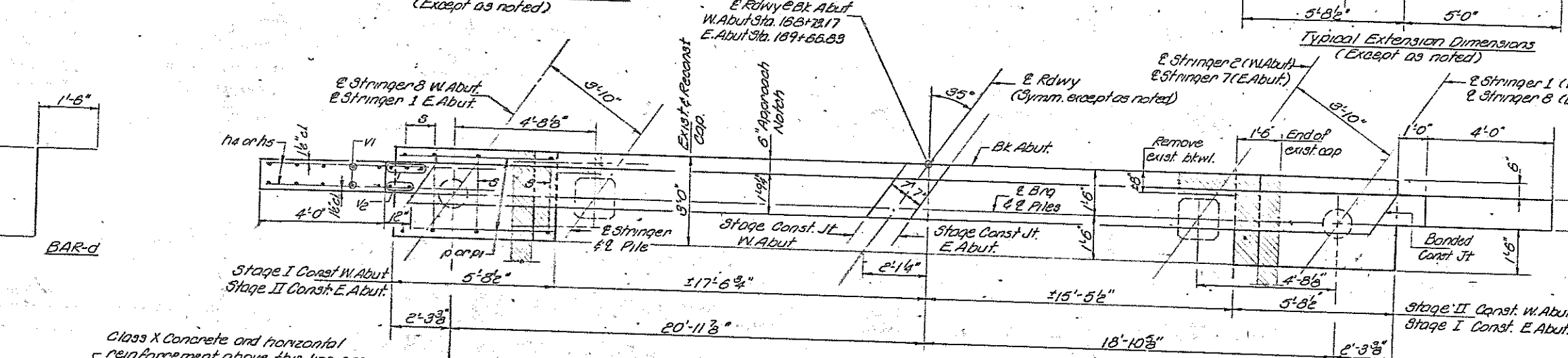
SBI 156	101 BR	MONROE	23	14
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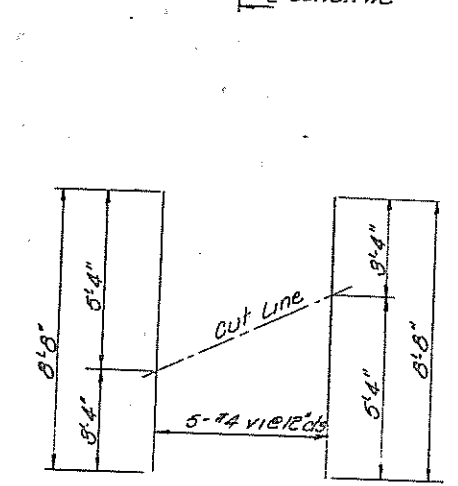
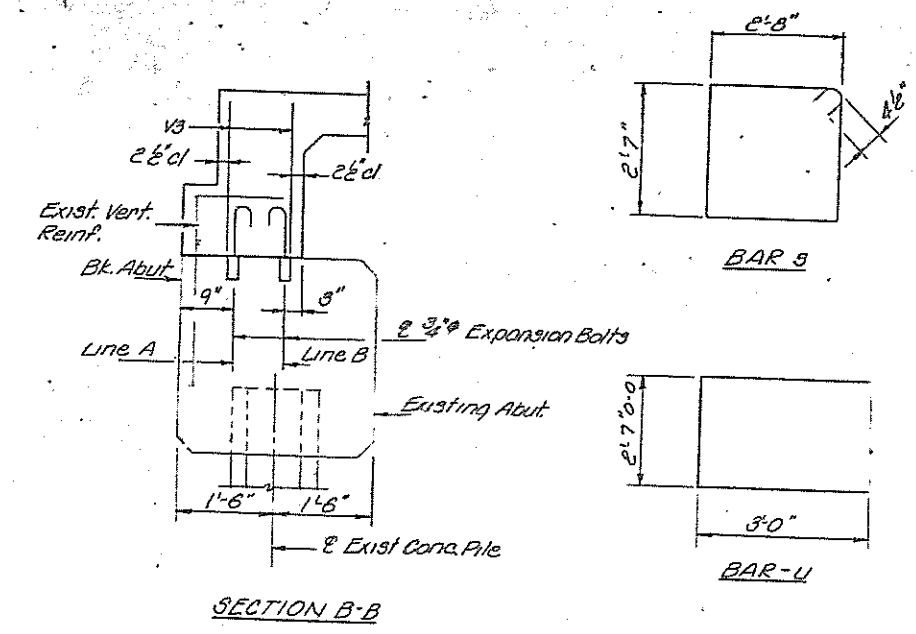
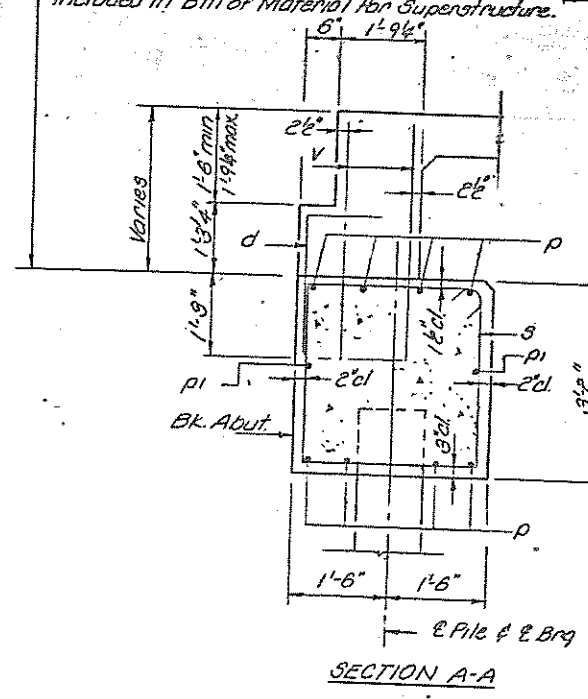
NOTES
All exposed concrete edges shall have standard 3/4" chamfer. Existing reinforcement shall be thoroughly cleaned of mortar, rust and other debris prior to incorporating into new construction.

FILE DATA

Type	W. Abut	E. Abut
Capacity	30 Tons	30 Tons
Est. Length	86 Ft	86 Ft
No. Reqd	2	1 + 1 Test Pile



Class X Concrete and horizontal reinforcement above this line are included in Bill of Material for Superstructure.



**TWO ABUTMENTS
BILL OF MATERIAL**

Bar	No	Size	Length	Shape
d	16	#5	3'-8"	┌
na	32	#5	8'-0"	—
ns	24	#5	4'-9"	—
p	32	#6	5'-5"	—
pi	8	#5	3'-5"	—
s	28	#4	11'-3"	□
u	16	#6	8'-7"	└
v	32	#4	2'-7"	—
vi	20	#4	3'-8"	—
ve	20	#4	5'-3"	—
v3	74	#5	2'-9"	—

Class X Concrete	Cu Yds	11.7
Reinforcement Bars	Lbs	1580
Concrete Piles	Ln Ft	106
Concrete Test Pile	Each	1
Expansion Bolts	Each	114
Concrete Removal	Cu Yds	6.7

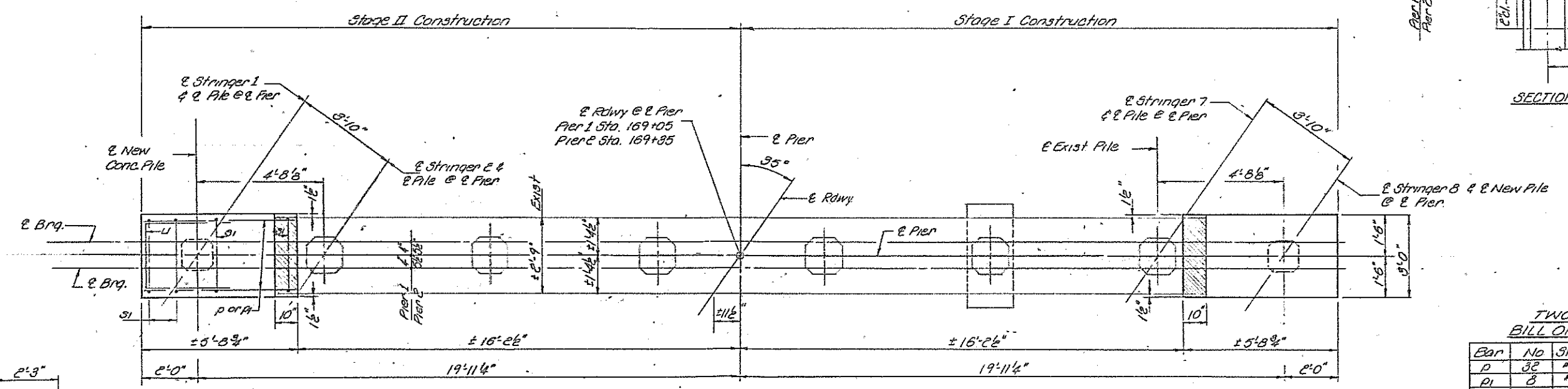
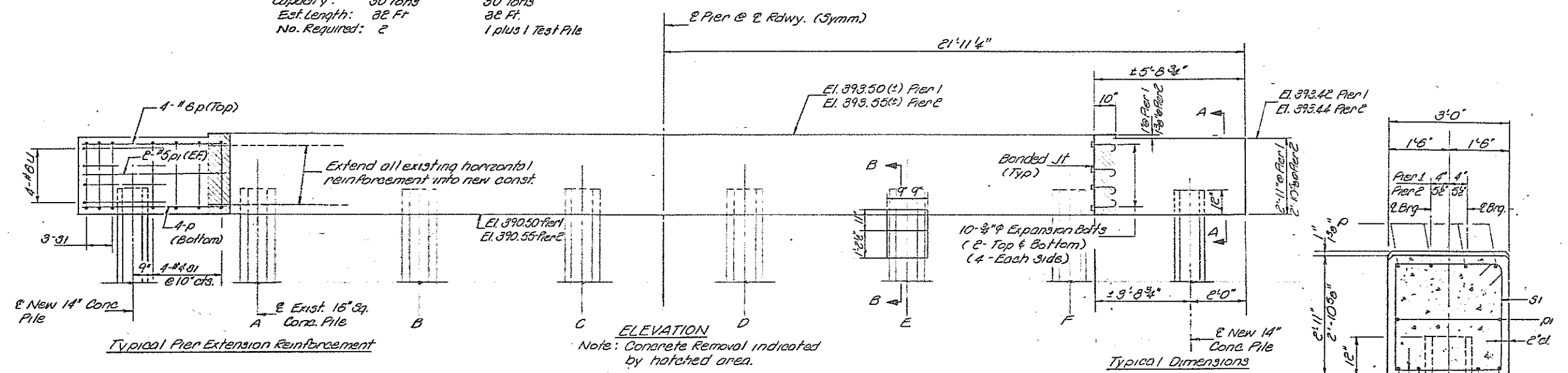
ABUTMENTS
SBI ROUTE 156
BILL RTE 156
SECTION 101 BR

SBI 156	101 BR	MONROE	23	15
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Sheet No. 11
15 Sheets

PILE DATA

	<u>Pier 1</u>	<u>Pier 2</u>
Type :	14" Precast Conc.	14" Precast Conc.
Capacity :	30 Tons	30 Tons
Est. Length :	32 Ft	32 Ft.
No. Required :	2	1 plus 1 Test Pile



TWO PIERS BILL OF MATERIAL

Bar	No	Size	Length	Shape
p	32	#6	5'-5"	—
pi	8	#5	5'-5"	—
31	28	#2	11'-2"	□
32	36	#2	5'-9"	□
u	16	#6	8'-7"	□
v4	36	#5	3'-2"	U
Expansion Bolts	Each	40		
Class X Concrete	Cu Yds	99		
Reinforcement Bars	Lbs	970		
Precast Conc Piles	14" LinFt	96		
Test Pile Precast Conc.	Each	1		
Concrete Removal	Cu Yds	1.6		

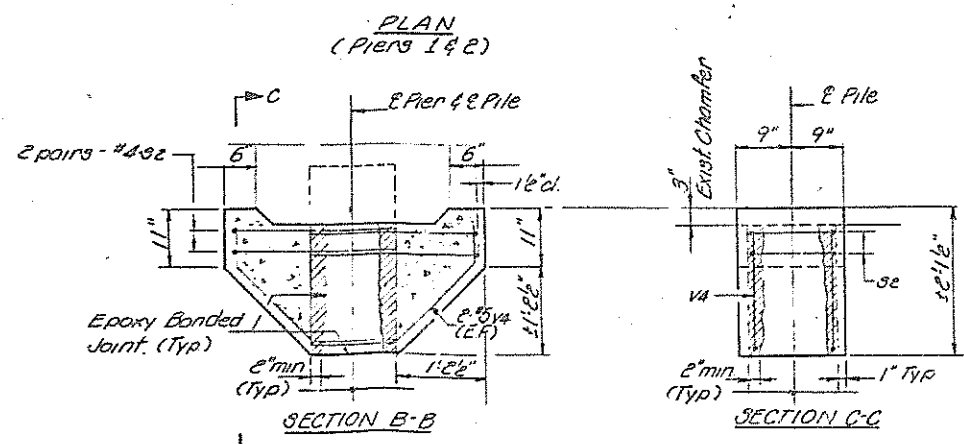
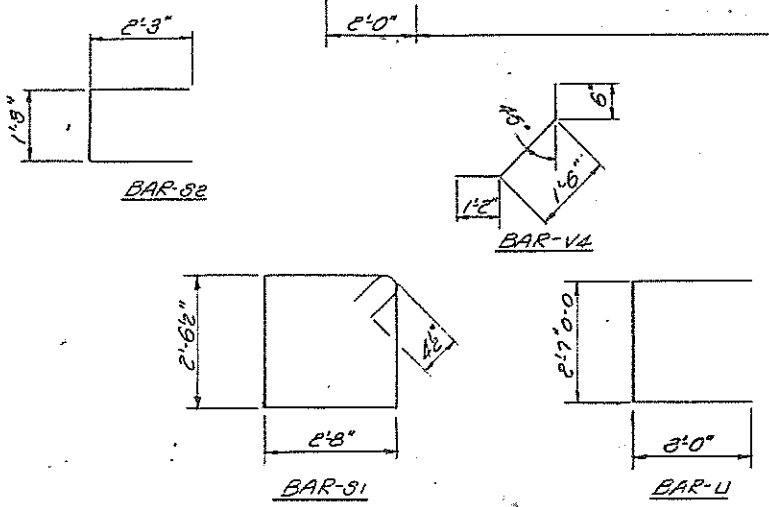
* Includes quantities for pile repair.

NOTES

All exposed edges shall have standard 3/4" Chamfer.

The contractor shall carefully remove all unsound concrete from the existing piles, all rust from existing pile reinforcement, and all other loose aggregate, prior to casting of the concrete encasement at piles designated for repair.

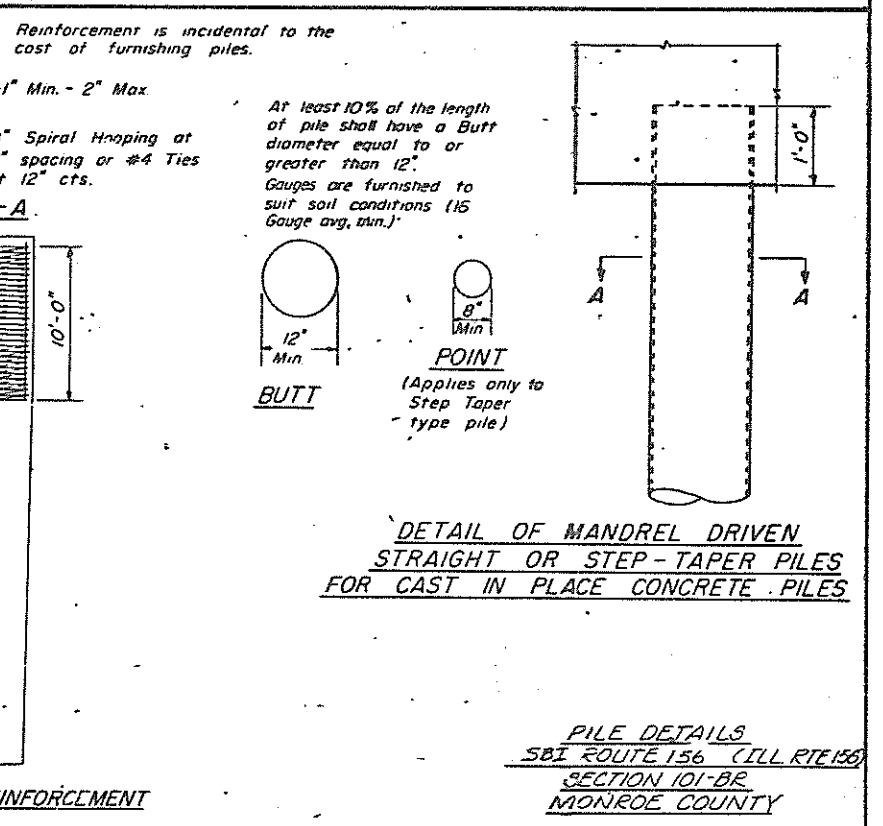
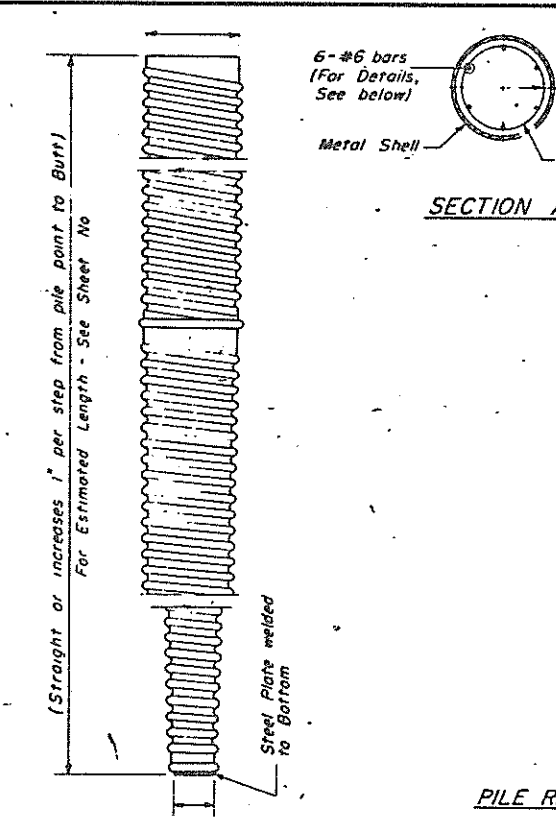
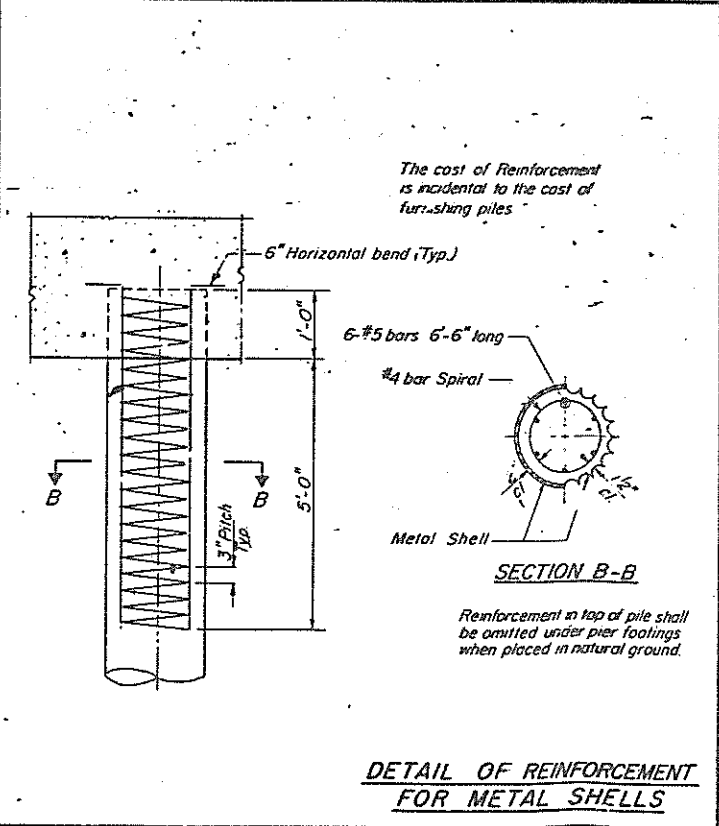
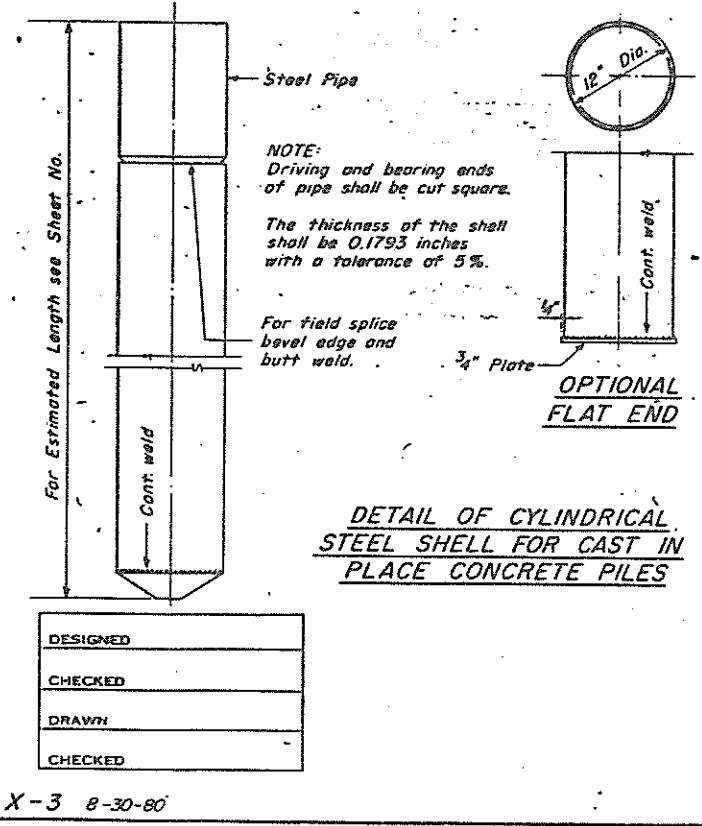
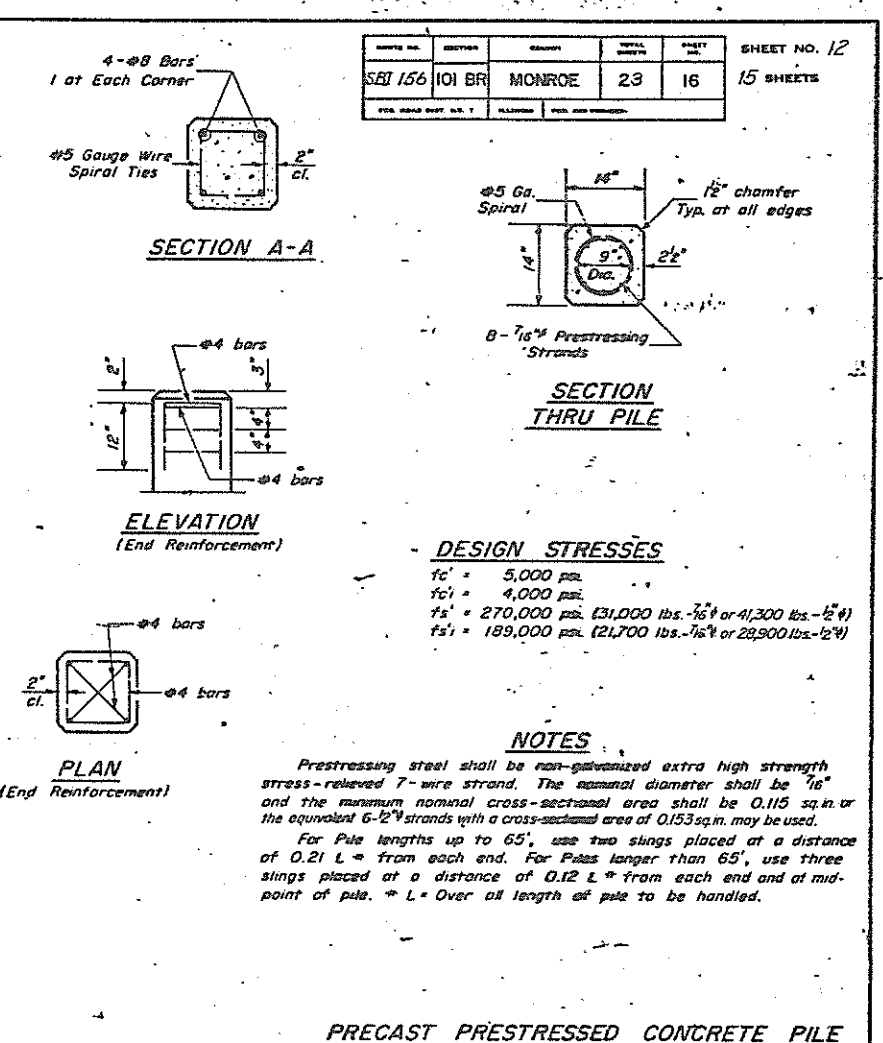
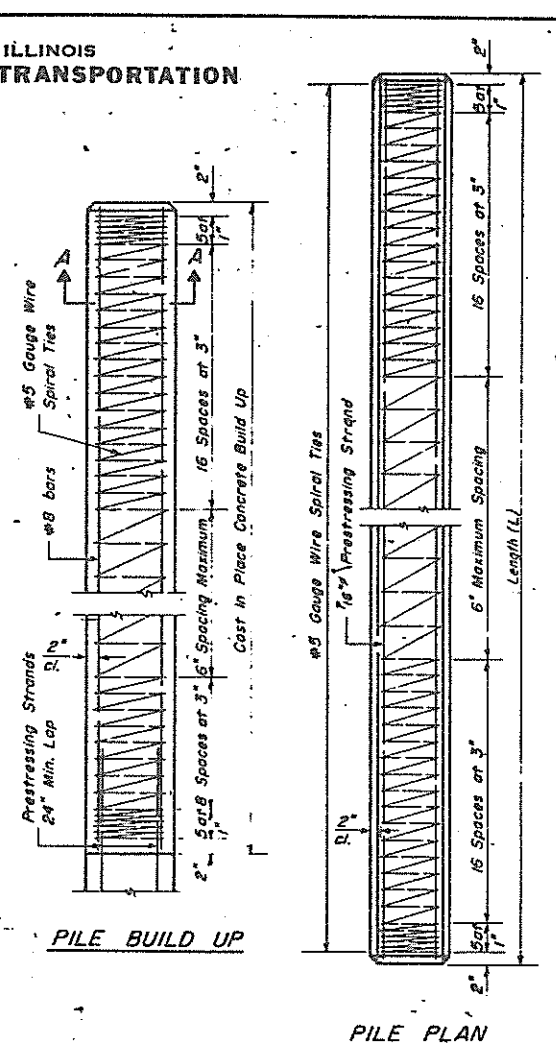
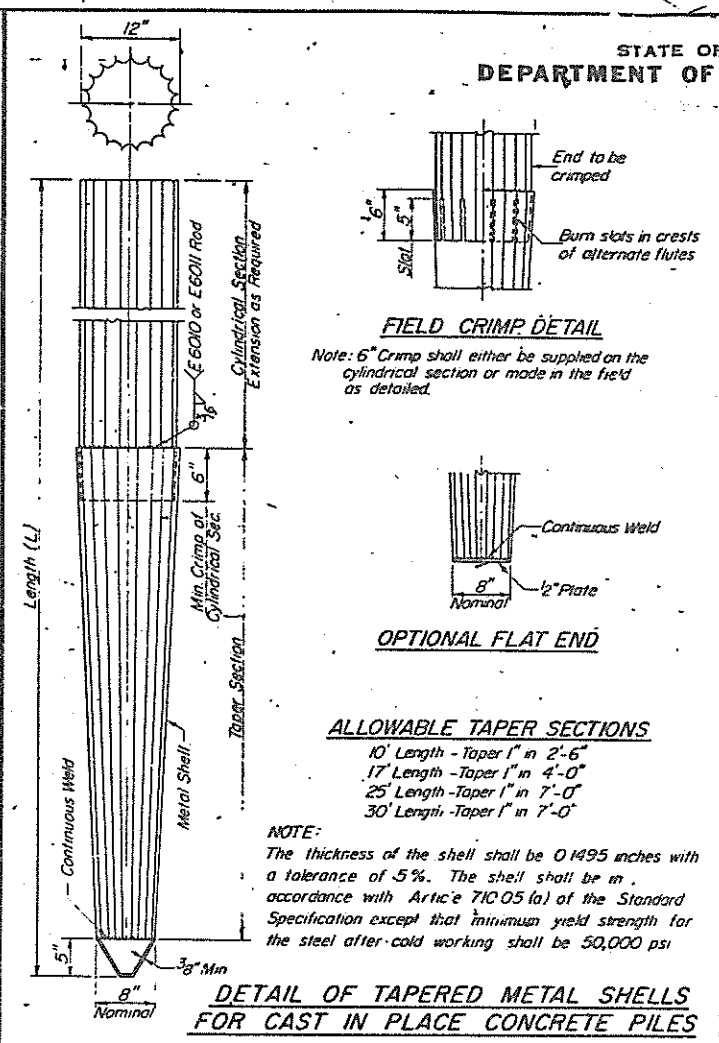
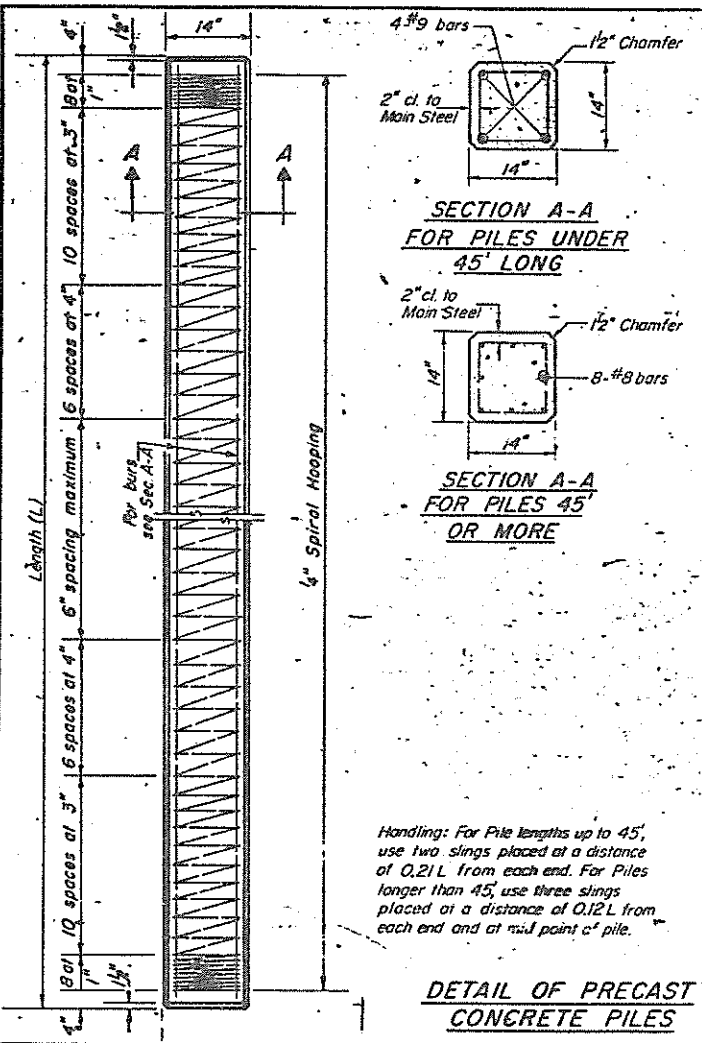
All existing reinforcement shall be cleaned of mortar, rust & other debris prior to incorporating into new construction.

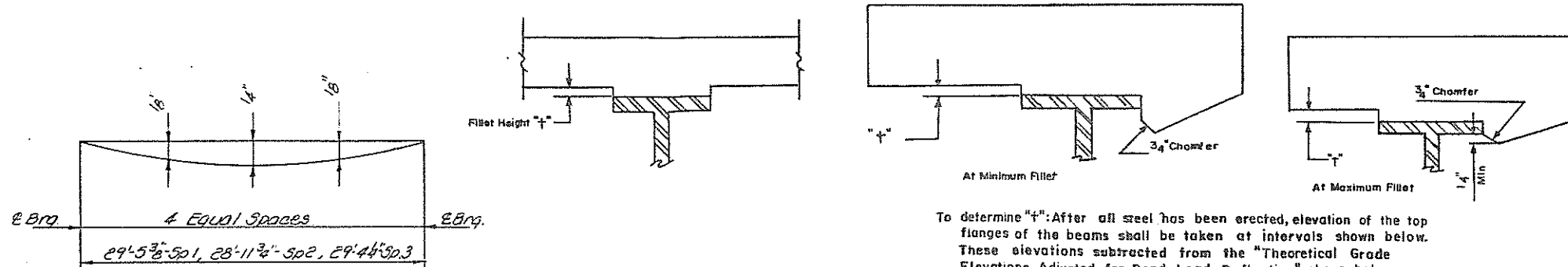


PIERS 1 & 2
SBI ROUTE 156
(ILL RTE 156)
SECTION 101 BR
MONROE COUNTY

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PROJECT NO.	SECTION	COUNT	SHEET NO.	TOTAL SHEETS
SBI 156	101 BR	MONROE	23	16
SHEET NO. 12 15 SHEETS				



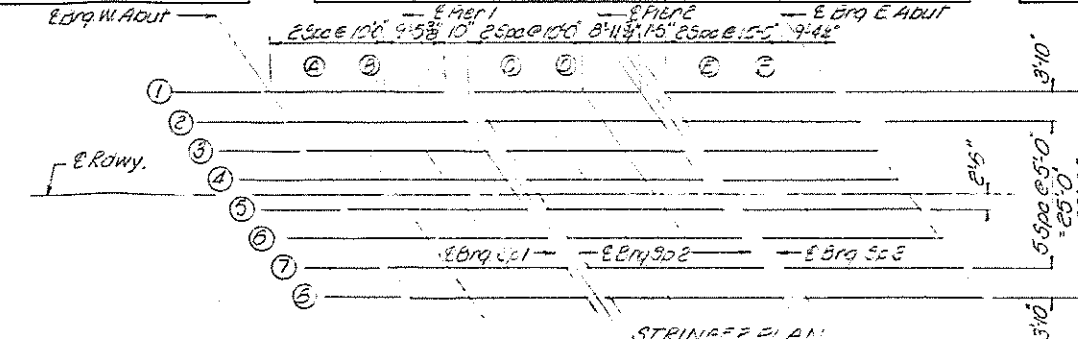


To determine "t": After all steel has been erected, elevation of the top flanges of the beams shall be taken at intervals shown below. These elevations subtracted from the "Theoretical Grade Elevations Adjusted for Dead Load Deflection" shown below, minus slab thickness, equals the fillet heights "t" above top flange of beams.

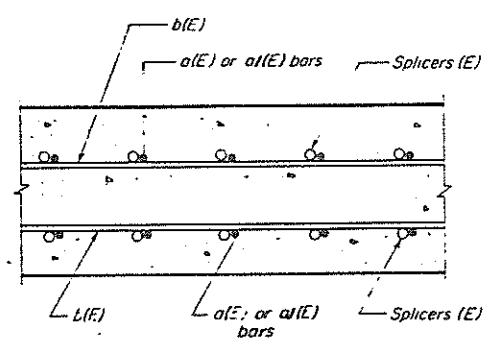
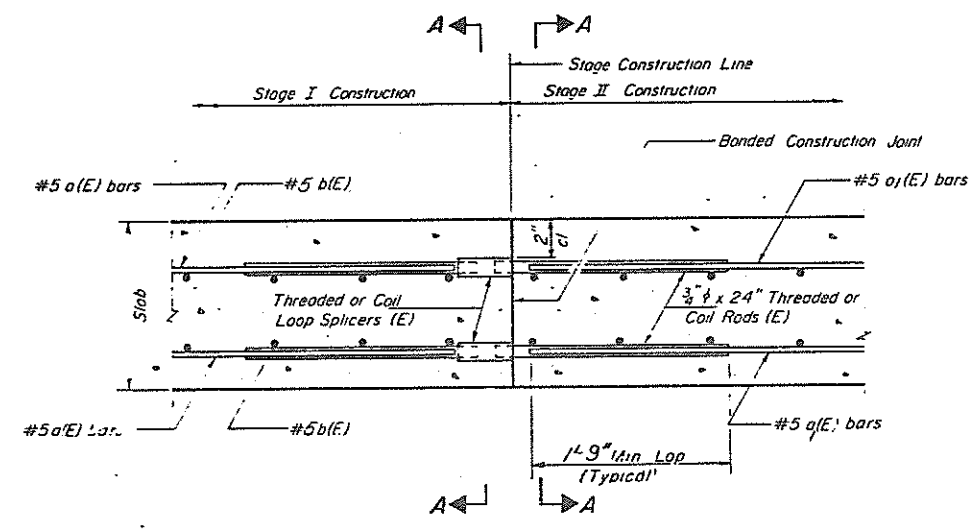
FILLET HEIGHTS

DEAD LOAD DEFLECTION DIAGRAM
(Not to be used if contractor is working from tabulated "Theoretical Grade Elevations Adjusted for Dead Load Deflection")

LOCATION	STATION	OFFSET	THEORETICAL GRADE ELEVATION	THEORETICAL GRADE ELEVATIONS ADJUSTED FOR DEAD LOAD DEFLECTION
SPAN 1				
€ BRG W. ABUT				
BM 1	168+63.57	16.33'	396.14	396.14
BM 2	168+66.25	12.5'	396.22	396.22
BM 3	168+69.75	7.5'	396.30	396.30
BM 4	168+73.25	2.5'	396.38	396.38
€ RDWY	168+75.00	0	396.42	396.42
BM 5	168+76.75	2.5'	396.38	396.38
BM 6	168+80.25	7.5'	396.30	396.30
BM 7	168+83.75	12.5'	396.22	396.22
BM 8	168+86.43	16.33'	396.14	396.14
LINE A				
BM 1	168+73.57	16.33'	396.14	396.15
BM 2	168+76.25	12.5'	396.22	396.23
BM 3	168+79.75	7.5'	396.30	396.31
BM 4	168+83.25	2.5'	396.38	396.39
€ RDWY	168+85.00	0	396.42	396.43
BM 5	168+86.75	2.5'	396.38	396.39
BM 6	168+90.25	7.5'	396.30	396.31
BM 7	168+93.75	12.5'	396.22	396.23
BM 8	168+96.43	16.33'	396.14	396.15
LINE B				
BM 1	168+83.57	16.33'	396.14	396.15
BM 2	168+86.25	12.5'	396.22	396.23
BM 3	168+89.75	7.5'	396.30	396.31
BM 4	168+93.25	2.5'	396.38	396.39
€ RDWY	168+95.00	0	396.42	396.43
BM 5	168+96.75	2.5'	396.38	396.39
BM 6	169+00.25	7.5'	396.30	396.31
BM 7	169+03.75	12.5'	396.22	396.23
BM 8	169+06.43	16.33'	396.14	396.15
PIER 1 € BRG SP. 1				
BM 1	168+93.15	16.33'	396.14	396.14
BM 2	168+95.93	12.5'	396.22	396.22
BM 3	168+99.33	7.5'	396.30	396.30
BM 4	169+02.83	2.5'	396.38	396.38
€ RDWY	169+04.58	0	396.42	396.42
BM 5	169+06.33	2.5'	396.38	396.38
BM 6	169+09.83	7.5'	396.30	396.30
BM 7	169+13.33	12.5'	396.22	396.22
BM 8	169+16.01	16.33'	396.14	396.14
SPAN 2				
PIER 1 € BRG SP 2				
BM 1	168+93.99	16.33'	396.14	396.14
BM 2	169+96.67	12.5'	396.22	396.22
BM 3	169+00.17	7.5'	396.30	396.30
BM 4	169+03.67	2.5'	396.38	396.38
€ RDWY	169+05.42	0	396.42	396.42
BM 5	169+07.17	2.5'	396.38	396.38
BM 6	169+10.67	7.5'	396.30	396.30
BM 7	169+14.17	12.5'	396.22	396.22
BM 8	169+16.85	16.33'	396.14	396.14
LINE C				
BM 1	169+03.99	16.33'	396.14	396.15
BM 2	169+06.67	12.5'	396.22	396.23
BM 3	169+10.17	7.5'	396.30	396.31
BM 4	169+13.67	2.5'	396.38	396.39
€ RDWY	169+15.42	0	396.42	396.43
BM 5	169+17.17	2.5'	396.38	396.39
BM 6	169+20.67	7.5'	396.30	396.31
BM 7	169+24.17	12.5'	396.22	396.23
BM 8	169+26.85	16.33'	396.14	396.15
LINE D				
BM 1	169+13.99	16.99'	396.14	396.15
BM 2	169+16.67	12.5'	396.22	396.23
BM 3	169+20.17	7.5'	396.30	396.31
BM 4	169+23.67	2.5'	396.38	396.39
€ RDWY	169+25.42	0	396.42	396.43
BM 5	169+27.17	2.5'	396.38	396.39
BM 6	169+30.67	7.5'	396.30	396.31
BM 7	169+34.17	12.5'	396.22	396.23
BM 8	169+36.85	16.33'	396.14	396.15
PIER 2 € BRG SP 3				
BM 1	169+23.01	16.33'	396.14	396.14
BM 2	169+25.69	12.5'	396.22	396.22
BM 3	169+29.19	7.5'	396.30	396.30
BM 4	169+32.69	2.5'	396.38	396.38
€ RDWY	169+34.44	0	396.42	396.42
BM 5	169+36.19	2.5'	396.38	396.38
BM 6	169+39.69	7.5'	396.30	396.30
BM 7	169+43.19	12.5'	396.22	396.22
BM 8	169+45.87	16.33'	396.14	396.14
SPAN 3				
PIER 2 € BRG SP 3				
BM 1	169+24.14	16.33'	396.14	396.14
BM 2	169+26.82	12.5'	396.22	396.22
BM 3	169+30.32	7.5'	396.30	396.30
BM 4	169+33.82	2.5'	396.38	396.38
€ RDWY	169+35.57	0	396.42	396.42
BM 5	169+37.32	2.5'	396.38	396.38
BM 6	169+40.82	7.5'	396.30	396.30
BM 7	169+44.32	12.3'	396.22	396.22
BM 8	169+47.00	16.33'	396.14	396.14
LINE E				
BM 1	169+34.14	16.33'	396.14	396.15
BM 2	169+36.82	12.5'	396.22	396.23
BM 3	169+40.32	7.5'	396.30	396.31
BM 4	169+43.82	2.5'	396.38	396.39
€ RDWY	169+45.57	0	396.42	396.43
BM 5	169+47.32	2.5'	396.38	396.39
BM 6	169+50.82	7.5'	396.30	396.31
BM 7	169+54.32	12.5'	396.22	396.23
BM 8	169+57.00	16.33'	396.14	396.15
LINE F				
BM 1	169+44.14	16.33'	396.14	396.15
BM 2	169+46.82	12.5'	396.22	396.23
BM 3	169+50.32	7.5'	396.30	396.31
BM 4	169+53.83	2.5'	396.38	396.39
€ RDWY	169+55.57	0	396.42	396.43
BM 5	169+57.32	2.5'	396.38	396.39
BM 6	169+60.82	7.5'	396.30	396.31
BM 7	169+64.32	12.5'	396.22	396.23
BM 8	169+67.00	16.33'	396.14	396.15
€ BRG E. ABUT				
BM 1	169+53.57	16.33'	396.14	396.14
BM 2	169+56.25	12.5'	396.22	396.22
BM 3	169+59.75	7.5'	396.30	396.30
BM 4	169+63.25	2.5'	396.38	396.38
€ RDWY	169+65.00	0	396.42	396.42
BM 5	169+66.75	2.5'	396.38	396.38
BM 6	169+70.25	7.5'	396.30	396.30
BM 7	169+73.75	12.5'	396.22	396.22
BM 8	169+76.43	16.33'	396.14	396.14



TOP OF SLAB ELEVATIONS
SBI ROUTE 156 (ILL. RTE 156)
SECTION 101-BR
MONROE COUNTY

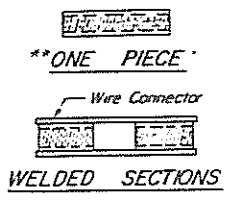
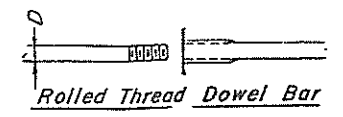


SPLICER DETAILS
(No Req'd 255) *

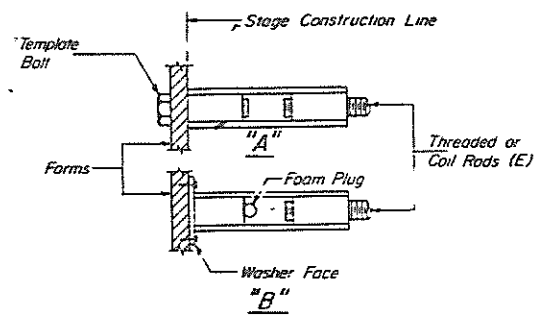
* Includes Splicers for h-bars of Abutts and the bars at Piers

Cost incidental to reinforcement bars (Epoxy Coated)

Note: D = Same diameter as that of bar being spliced.



SPLICER ALTERNATIVES
** Heavy Hex Nuts conforming to ASTM A 563, Grade C, D or E-1 may be used



NOTES

Steel Splicer (Coupler) assembly shall be of an approved type and shall develop in tension at least 125 percent of the yield strength of the lapped reinforcement bars.

Steel Splicer rods shall be of minimum 60 ksi yield strength, threaded or coiled full length and have effective tensile stress area equal or greater than that of the lapped reinforcement bars.

All reinforcement bars shall be lapped and tied to the splicer rods.

Splicer (coupler) assembly in the slab shall be epoxy coated in accordance with the requirements for reinforcement bars.

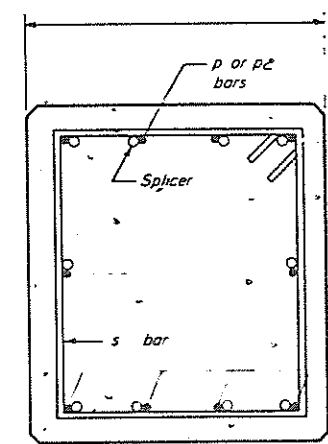
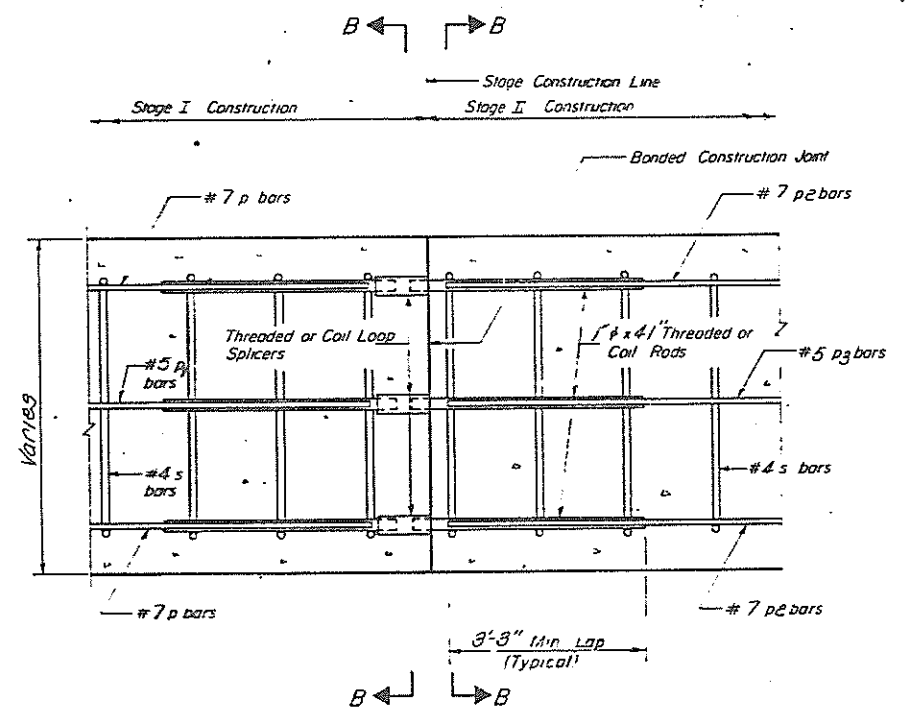
Other systems of similar design may be submitted to the Engineer for approval. Approval shall be based on certified test results from an approved testing laboratory that the proposed splicer (coupler) assembly satisfies the following requirements:

- Minimum Capacity = $1.25 \times f_y \times A_1$
(Tension in kips)
- Minimum * Pull-out Strength = $1.25 \times f_{allow} \times A_1$
(Tension in kips)

Where f_y = Yield strength of lapped reinforcement bars in k.s.i.
 f_{allow} = Allowable tensile stress in lapped reinforcement bars in k.s.i. (Service Load)
 A_1 = Tensile stress area of lapped reinforcement bars
 * 28 day concrete

Typical Splicer (Coupler) Assembly Sizes

In Slabs	#5 bar lap with 3/8" Splicer (Coupler) x 2'-0" Splicer Rods	Minimum Capacity = 230 kips-tension
		Minimum Pull-out Strength = 92 kips-tension
In Sub-structures	#7 bar lap with 1" Splicer (Coupler) x 3'-5" Splicer Rods	Minimum Capacity = 451 kips-tension
		Minimum Pull-out Strength = 180 kips-tension
	#8 bar lap with 1 1/4" Splicer (Coupler) x 4'-6" Splicer Rods	Minimum Capacity = 589 kips-tension
		Minimum Pull-out Strength = 236 kips-tension



SPLICER DETAILS
(No Req'd)

Cost incidental to reinforcement bars

BAR SPLICER (COUPLER) DETAILS AT STAGE CONSTRUCTION

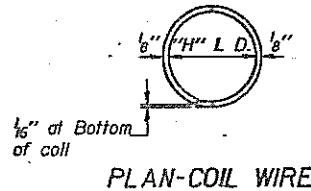
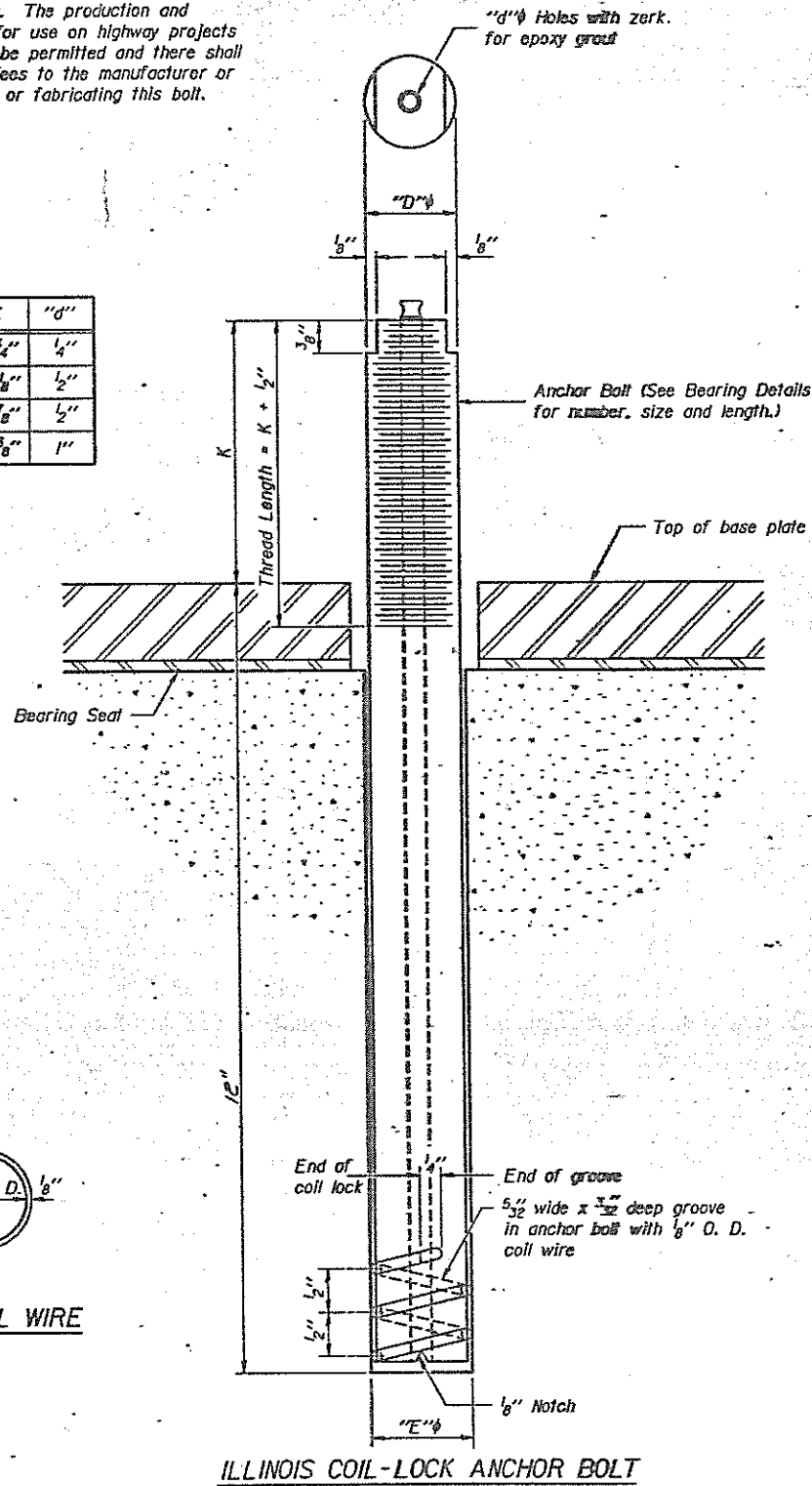
SBI ROUTE 156 (ILL. RT. 156)
SECTION 101 BR
MONROE COUNTY

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SECTION	DATE	BY	NO.	SHEET NO.
SBI 156 101 BR	MONROE	23	19	15 SHEETS

The Illinois Coil-Lock Anchor Bolt is a proprietary item which is the property of the Illinois Department of Transportation. Use, reproduction or disclosure without express written permission is prohibited and protected under Federal copyright laws. The production and the fabrication of this bolt for use on highway projects in the State of Illinois shall be permitted and there shall be no incurred charges or fees to the manufacturer or the fabricator for producing or fabricating this bolt.

D	E	H	K	"d"
1"	1 1/8"	3 1/8"	1 3/4"	1/4"
1 1/2"	1 5/8"	1 5/8"	2 1/8"	1/2"
2"	2 1/8"	1 5/8"	2 7/8"	1/2"
2 1/2"	2 5/8"	2 5/8"	3 3/8"	1"



MATERIALS FOR ILLINOIS COIL-LOCK ANCHOR BOLT

The anchor bolt shall be fabricated from cold drawn or hot finished seamless carbon steel mechanical tubing conforming to ASTM A519, Grade 1026 and supplied with hexagonal nuts and cut washers.
The coil wire shall be made of any suitable soft steel wire.
The finished anchor bolt shall be cleaned of rust and other foreign materials and wrapped or packaged to prevent contamination until they are installed.
The epoxy grout shall be a two-component, epoxy resin bonding system conforming to ASTM C881, Type I, Grade I and of a Class suitable for the temperature at installation.

INSTALLATION PROCEDURE for the ILLINOIS COIL-LOCK ANCHOR BOLT

1. With the coil wire in place, the bolt shall be inserted into the hole and turned clockwise to a snug fit in the hole. Nut and washer shall be placed on the bolt. The nut shall be tensioned until the steel base plates are held securely to the concrete bearing seat.
2. Epoxy grout shall be pumped through the zerk fitting with a pressure gun. Pumping shall continue until the epoxy overflows the hole around the bolt shank. After pumping is discontinued, excess epoxy shall be immediately wiped off.

ALTERNATE ANCHOR BOLTS

The Contractor may use, at his option, the capsule or the adhesive cartridge type anchor rods that have been previously tested and given a prior approval by the Department. The Contractor shall install these anchor rods in pre-drilled holes in accordance with the manufacturer's recommendations and procedures.
The capsule or the adhesive cartridge type anchor rods shall be a two part system composed of:
1. A threaded rod stud with nut and washer conforming to ASTM A307.
2. A sealed glass capsule or a sealed glass adhesive cartridge containing premeasured amounts of the adhesive chemical.

GENERAL NOTES

Holes in the masonry for anchor bolts shall be drilled through the base plates to the diameter and depth shown or in accordance with the manufacturer's recommendation after beams or girders have been erected and adjusted.
Prior to setting the bolts, the holes shall be dry and all dust and loose particles shall be removed by the use of compressed air or vacuuming.
The anchor bolts, furnished and installed and including the epoxy grout or capsules shall not be paid for separately but shall be included in the unit bid price for "Furnishing and Erecting Structural Steel".
Anchor bolts, nuts and washers shall be completely coated by either the hot-dipped process conforming to AASHTO M 292 or the mechanical plating method conforming to ASTM B695, Class 50. Zinc coated nuts shall be tapered oversize in accordance with the requirements of AASHTO M 291 and shall meet the supplementary requirements S1.1 thru S1.2.1 of the same specifications for lubricant and testing.

DESIGNED
CHECKED
DRAWN
CHECKED

ABB-1 12-1-83

ANCHOR BOLT DETAILS FOR BEARINGS
SBI ROUTE 156 (ILL RTE 156)
SECTION 101 BR
MONROE COUNTY