

FED. ROAD DIST. NO.	STATE	STATE PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
3	N.C.	8.1355108		1	69
F. A. PROJECT F-75-2(II)					

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION

PLANS OF
CAPE FEAR RIVER CROSSING
AT WILMINGTON
NEW HANOVER COUNTY

CONTRACT No. 3
APPROACHES ON STRUCTURE

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REFERENCE DRAWINGS - CONTRACT NO. 1:

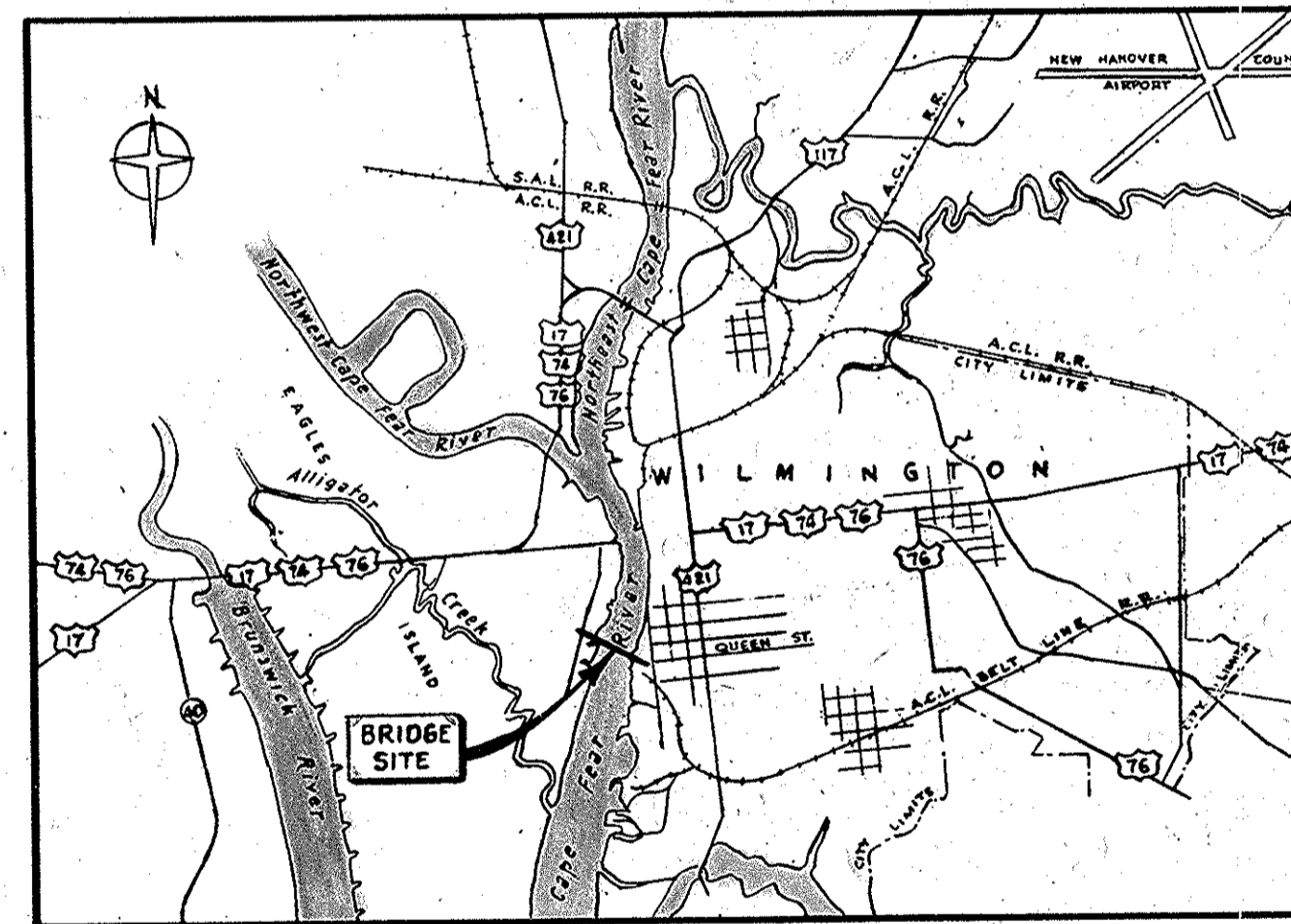
- REF. 1 PIERS 1E AND 1W - PIER TOPS AND ANCHOR BOLTS
- REF. 2 DETAILS OF PIERS 2W AND 3W
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REFERENCE DRAWINGS - CONTRACT NO. 2:

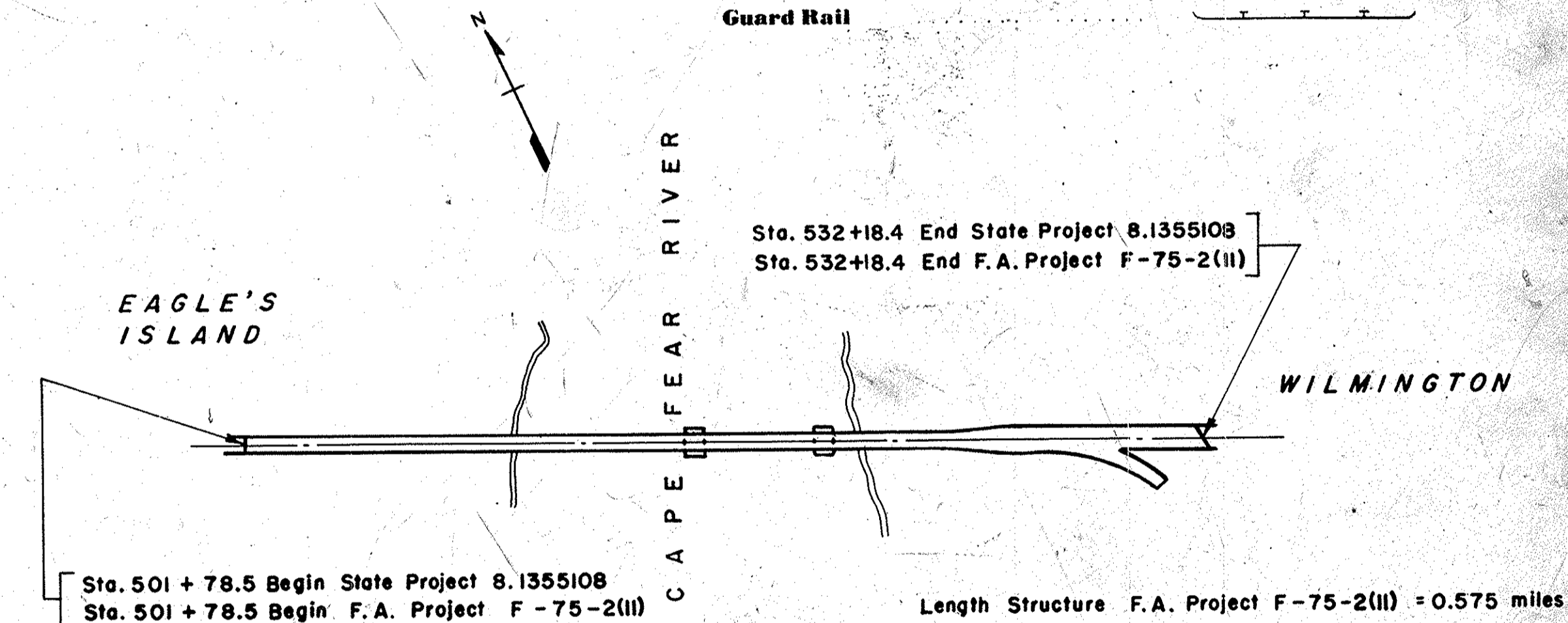
- REF. 4 ROADWAY JOINTS
- REF. 5 TOWER SPANS - FRAMING PLAN, FLOORBEAMS AND DETAILS

CONVENTIONAL SIGNS

- County Line
- Township Line
- City or Town Line
- Right of Way Line
- Survey Line
- Property or Exist. Right of Way Line
- Fence
- Proposed Road
- Existing Road
- Railroad
- Control of Access Line
- Slope Stake Line
- Bridge
- Culvert
- Woods
- Telephone or Telegraph Pole
- Tower Pole and Line
- Power Pole
- Proposed Right of Way Marker
- Existing Right of Way Marker
- Guard Rail



LOCATION PLAN
1" = 5000' ±



PLAN
Scale: 1" = 400'

APPROVED

[Signature]
CHIEF ENGINEER

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

APPROVED:

DIVISION ENGINEER DATE

Prepared in Office of
PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC.
New York, N. Y.

D-NO 24
 Inclusive 37
 New Hanover Part I
 8.1355108
 DRAINER
 8.52

CONTRACT NO. 3

FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N. C.	8.1355108
F. A. PROJECT	F-75-2 (II)	

SUMMARY OF ESTIMATED QUANTITIES

NO.	ITEM	UNIT	QUANTITY
15	Mobilization	Lump Sum	-
24A	Unclassified Structure Excavation	C. Y.	7,250
24B	Sand Backfill Under Pier Footings	C. Y.	660
207AA	45" Prestressed Concrete Stringers (Type III) (Approx. 10,039 LF)*	Lump Sum	-
207AB	54" Prestressed Concrete Stringers (Type IV) (Approx. 2,969 LF)*	Lump Sum	-
207B	Substructure Concrete - Class A	C. Y.	6,720
207C	Deck Concrete - Class AA	C. Y.	5,700
208	Reinforcing Steel	Lbs.	2,078,000
209A	Structural Steel (Approx. 4,445,000#)*	Lump Sum	-
209B	Wrought Iron Scuppers and Drain Pipe (Approx. 21,000#)*	Lump Sum	-
300A	Steel H-Piles (J2BP53)	Lin. Ft.	39,100
300B	Steel Pile Points	Each	800
300C	Loading Tests	Each	1
320A	Steel Bridge Flooring	Sq. Ft.	1,740
326	Three Bar Metal Railing	Lin. Ft.	5,240
410A	Painting Structural Steel - System A	Lump Sum	-
410B	Painting Structural Steel - System B	Lump Sum	-
501	4-Inch Concrete Slope Protection	Sq. Yd.	840
752	Linseed Oil Concrete Protection	Gal.	860
757	Electrical Work	Lump Sum	-
762	Box Beam Median Barrier	Lin. Ft.	2,630
763	Installation of Water Line	Lump Sum	-
764A	Overhead Sign Structure	Lump Sum	-
764B	Overhead Sign Panels	Sq. Ft.	383
764C	Advisory Exit Speed and Drawbridge Warning Signs	Lump Sum	-
327	Demolition	Lump Sum	-

~ GENERAL NOTES ~

- SPECIFICATIONS:**
North Carolina State Highway Commission 1965 Standard Specifications, together with the Special Provisions prepared for this contract.
- DESIGN SPECIFICATIONS:**
A. A. S. H. D. 1961 Standard Specifications for Highway Bridges, Division I, as modified by the 1961, 1962, 1963 and 1964 Interim Specifications.
- LIVE LOAD:**
HS-20-44 as defined in the A. A. S. H. D. Specifications.
- DATUM:**
All elevations shall refer to U.S. Coast and Geodetic Survey Sea Level Datum of 1929 (Adjusted).
- DESIGN STRESSES:**
 - (a) Concrete in Structures:

Ultimate Compressive Strength	{	Prestressed beams	$f'_c = 5,000$ p.s.i.
		Deck concrete	$f'_c = 3,500$ p.s.i.
		All other concrete	$f'_c = 3,000$ p.s.i.
Extreme Fiber in Compression, max.	{	Prestressed beams, before losses	$f_c = 2,400$ p.s.i.
		Prestressed beams, after losses	$f_c = 2,000$ p.s.i.
		All other concrete	$f_c = 1,200$ p.s.i.
 - (b) Reinforcement Steel, Intermediate Grade
 $f_y = 20,000$ p.s.i.
 - (c) Structural Steel: A.S.T.M. A-36
A.S.T.M. A-441
 $f_y = 20,000$ p.s.i.
 f_u varies with thickness of material. See Design Specs.
 - (d) Prestensioned Steel: $1/2$ " High Strength S_{16} strands for properties and allowable stresses, see Special Provisions.
- CONCRETE IN STRUCTURES:**
 - (a) Class AA
Bridge deck, safety walks, median, pylons, intermediate and end diaphragms on prestressed spans.
 - (b) Class A
Pier caps, columns and footings
Abutment back walls, wing walls and pile caps
 - (c) Concrete for Prestressed Beams - see Special Provisions.
- REINFORCING STEEL:**
All reinforcing steel shall be Intermediate Grade Deformed Bars. Unless otherwise provided on the Plans, all bars shall be spliced or embedded a minimum of 30 diameters. Unless otherwise noted, clear distances between reinforcing and the face of concrete shall be as follows:

Pier caps and columns, abutment backwalls	2"
wingwalls and pylons	
Pier and abutment footings	3"
Bridge deck - Top	1 3/4"
Bridge deck - Bottom	1 1/4"

 Typical bar mark in reinforcing schedules, "6SD2":
6 = bar size, SD2 = bar mark.
Reinforcing steel shall be spliced as follows:
Piers - as shown on Sheet No. 12.
Abutments - as shown on Sheets 14 through 17.
Deck - a minimum of 20 diameters.

- STEEL WORK:**
 - (a) Steel box girders to be A.S.T.M. A-441. All other steel to be A.S.T.M. A-36, unless otherwise noted.
 - (b) All stringers shall be cambered for full dead load and vertical curve. Box girders shall be cambered as shown on the Plans.
 - (c) All field connections are to be made with $3/8$ " diameter high strength bolts, unless otherwise noted.
 - (d) The location and design of all shop and field splices shall be subject to the approval of the Engineer.
 - (e) The design of members used for erection and the modification of permanent members for erection purposes shall be subject to the approval of the Engineer. See Article 209-3.2 of Special Provisions.
 - (f) No member over 90' in length shall be shipped by highway transportation.
- PRESTRESSED BEAMS:**
For General Notes for Prestressed Beams, see Sheet No. 32.

FOUNDATION DESIGN LOADS:
Steel H-Piles (J2BP53) 55 Tons

CONSTRUCTION JOINTS & CHAMFERS:
Construction joints, other than those shown, will not be permitted without written approval of the Engineer. Unless otherwise noted, all exposed concrete edges shall be chamfered thus:



PROTECTION OF RIVER TRAFFIC:
See Special Provisions for requirements for protection of river traffic.

SURFACE FINISH OF CONCRETE:
All exposed parts of the structure from and including Pier 27 through and including the East and West Abutments and between and including Piers 91K and 91L shall be given a Class 1 Surface Finish. The remainder of the structure shall be finished as required for bridges over streams, railway overhead bridges, etc., in Article 207-3.1 (p) of the Standard Specifications, except that a Class 1 Surface Finish will not be required.

REPLACEMENT OF EXISTING ROADWAYS AND STREETS:
All areas of existing roadways and streets remaining in completed work, which are required to be removed, damaged or otherwise disturbed in the execution of the work of the Contract, shall be replaced in kind or as otherwise directed by the Engineer at the Contractor's expense and at no additional cost to the Commission.

EXCAVATION FOR PILES:
The Contractor will be required to excavate completely through the fill before driving piles for Abutments. See Sheet S-N.

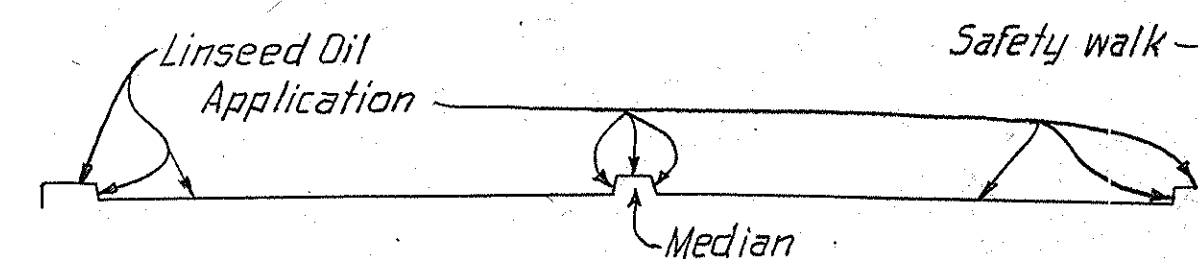
PROJECT No. 8.1355108
NEW HANOVER COUNTY

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

CAPE FEAR RIVER CROSSING
AT WILMINGTON
APPROACHES ON STRUCTURE
ESTIMATED QUANTITIES
AND GENERAL NOTES

REVISION	BY	DATE	PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. ENGINEERS NEW YORK	DATE: October 1967
Surface Finish	MCS	10-8-68		
Note 7	MCS	4-10-68		
SHEET NO. 2 OF 69				

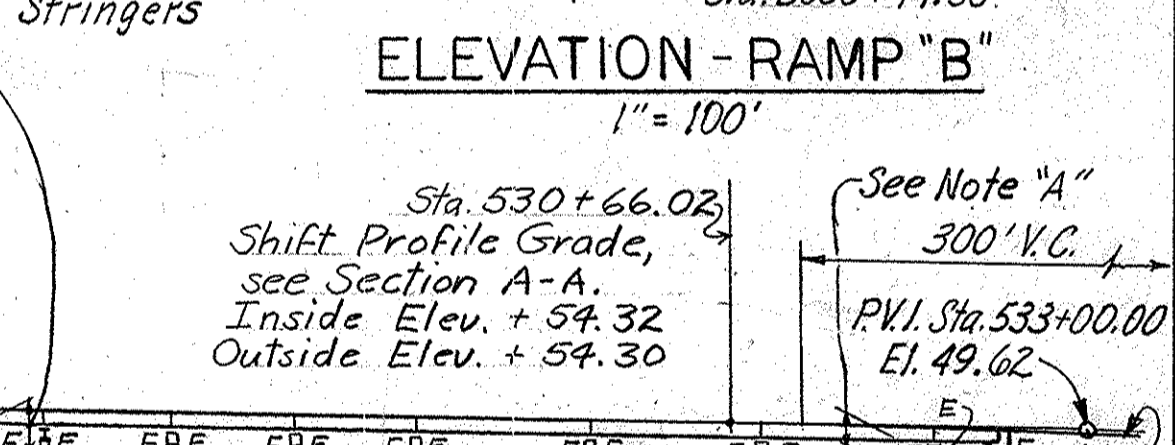
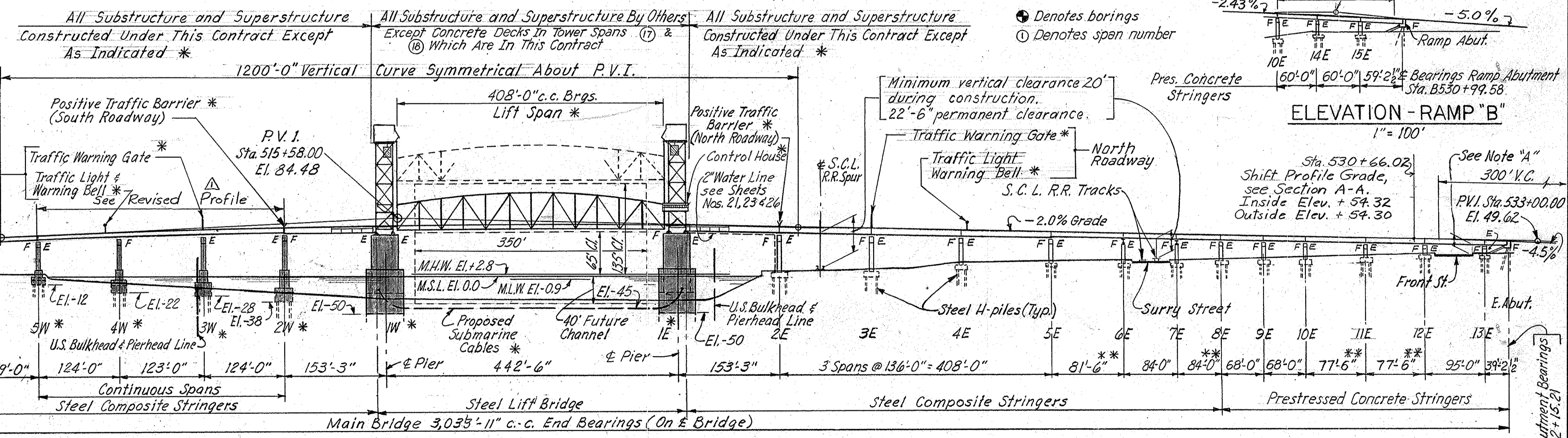
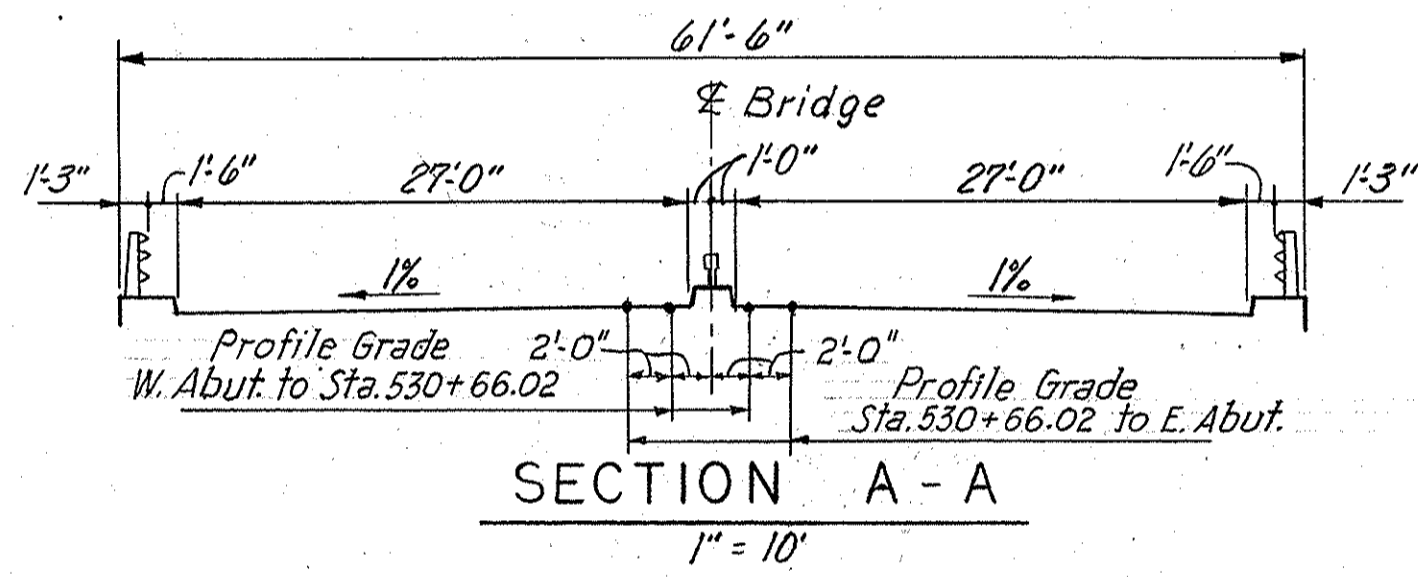
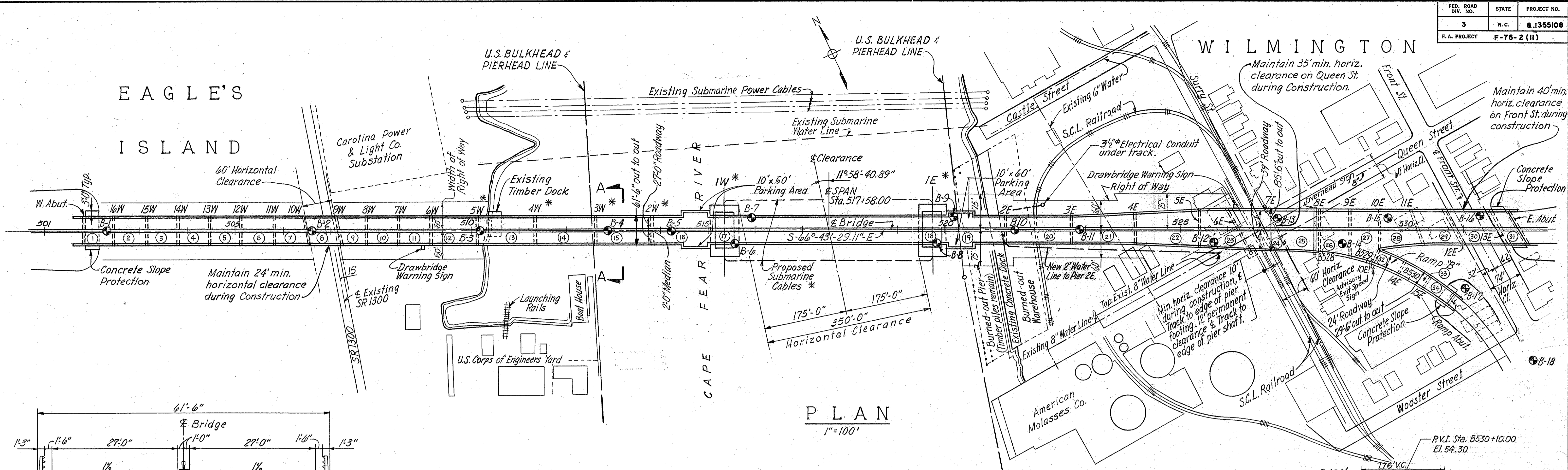
* The quantities of these items are approximate only, and it shall be the Contractor's responsibility to determine the quantities on which he bases his bid.
** Total quantity of Reinforcing Steel is not exact and is to be used for bid purposes only. The quantity of Reinforcing Steel to be paid for will be the total theoretical weight of steel as required by the Plans and accepted.



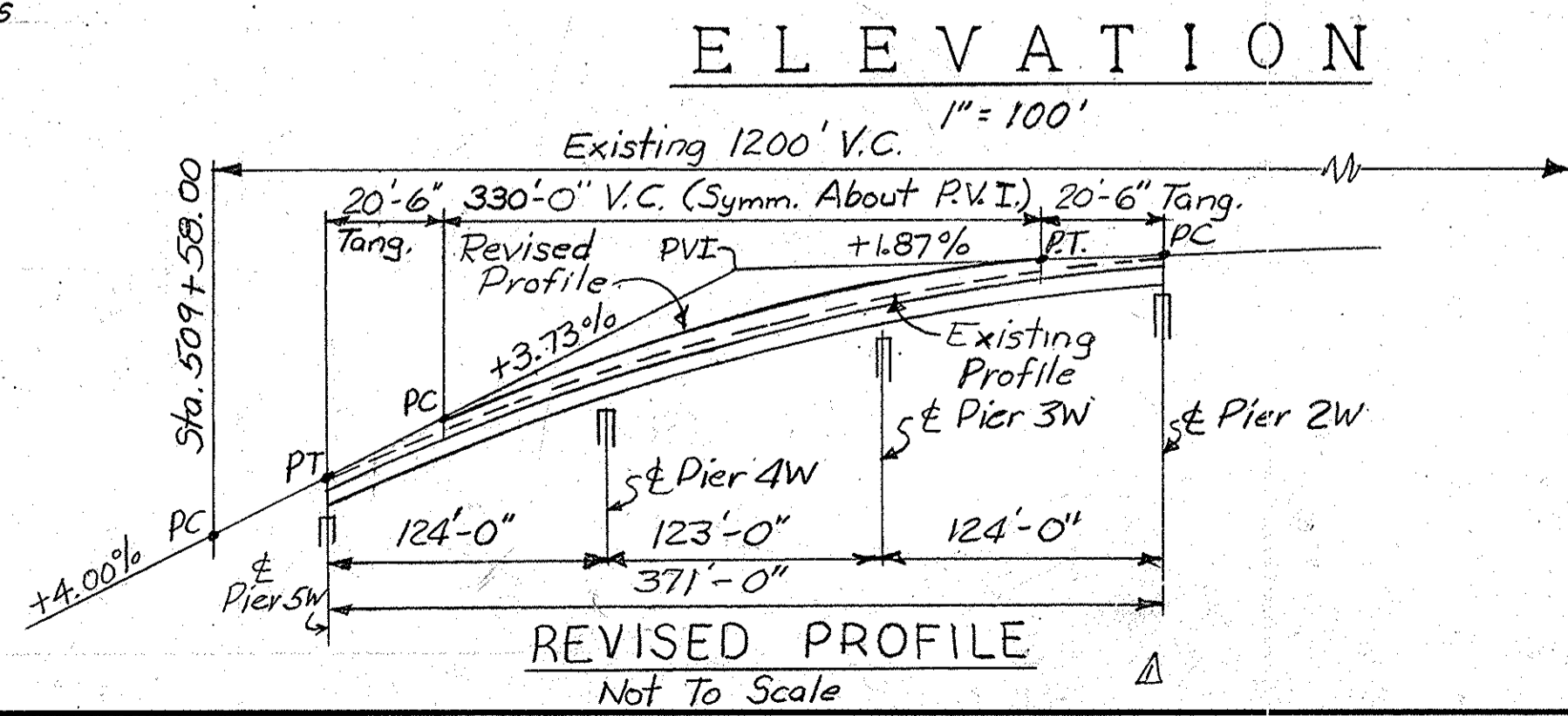
TYPICAL LINSEED OIL APPLICATION

MADE BY General Plans IN CHARGE OF M.C. PLAN CHECKED BY M.C. PLAN

FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N.C.	8.1355108
F.A. PROJECT F-75-2 (11)		



HOLE	STATION	OFFSET	APPROX. DEPTH	CASING DIAM.	HOLE	STATION	OFFSET	APPROX. DEPTH	CASING DIAM.
B-1	502+25	±	59.8'	3 1/2"	B-10	521+55	±	60'	3 1/2"
B-2	506+60	±	59.3'	2 1/2"	B-11	522+90	±	60'	2 1/2"
B-3	510+15	8' LT.	60.5'	2 1/2"	B-12	525+82	32' RT.	60'	2 1/2"
B-4	512+85	±	60'	2 1/2"	B-13	527+05	33' LT.	60'	2 1/2"
B-5	514+20	±	99.3'	3 1/2"	B-14	528+50	30' RT.	60.2'	2 1/2"
B-6	515+60	30' RT.	100'	2 1/2"	B-15	529+45	35' LT.	60'	2 1/2"
B-7	515+90	30' LT.	150'	2 1/2"	B-16	531+40	25' LT.	60'	3 1/2"
B-8	519+80	30' RT.	150'	2 1/2"	B-17	531+00	115' RT.	60'	3 1/2"
B-9	520+10	30' LT.	100.3'	2 1/2"	B-18	532+50	280' RT.	60'	3 1/2"



** Span Length at ± Bridge
Note A:
Permanent minimum vertical clearance 15'-3" at Front Street. Temporary minimum vertical clearance 14'-0" during construction.

PROJECT No. 8.1355108
NEW HANOVER COUNTY

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

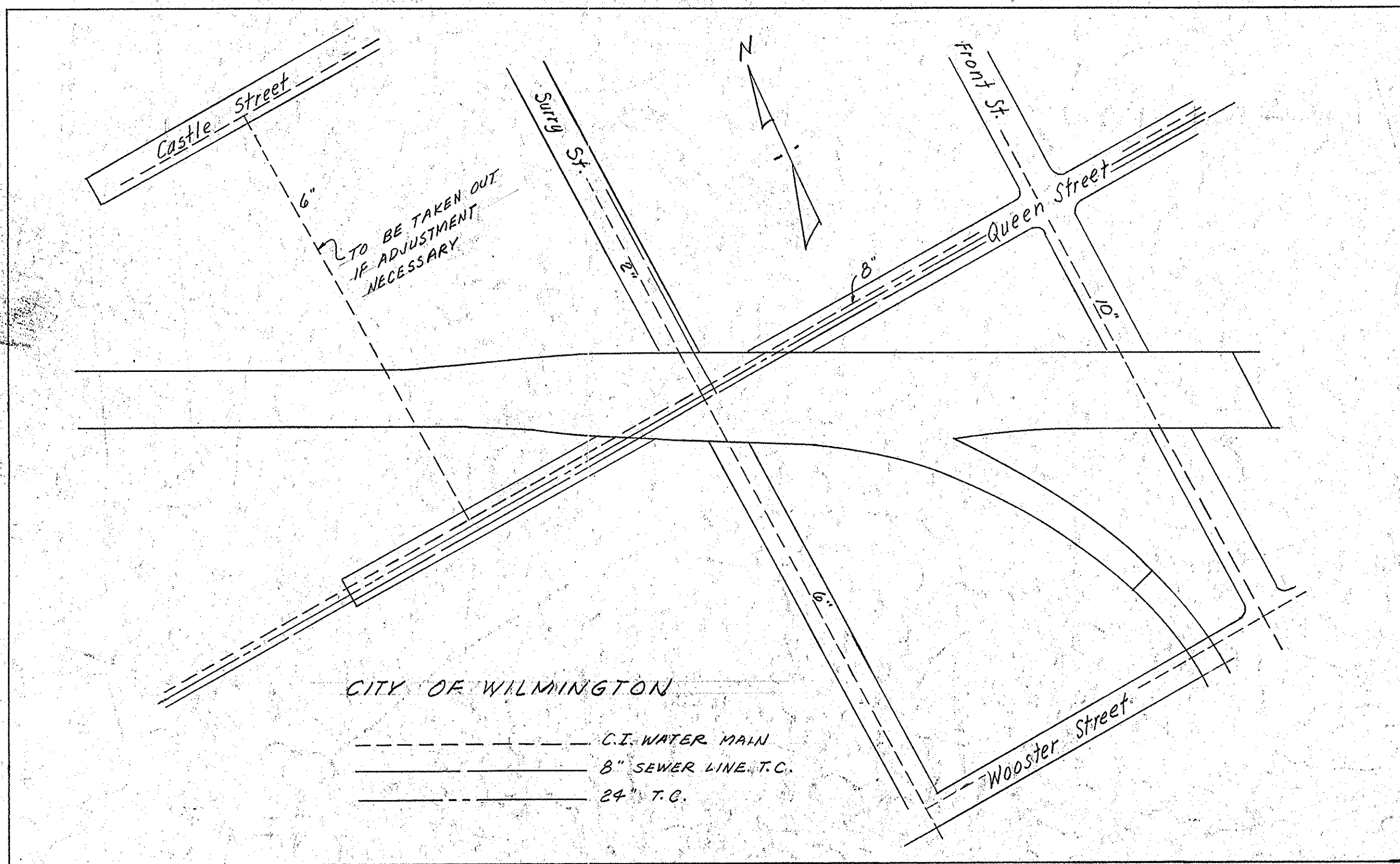
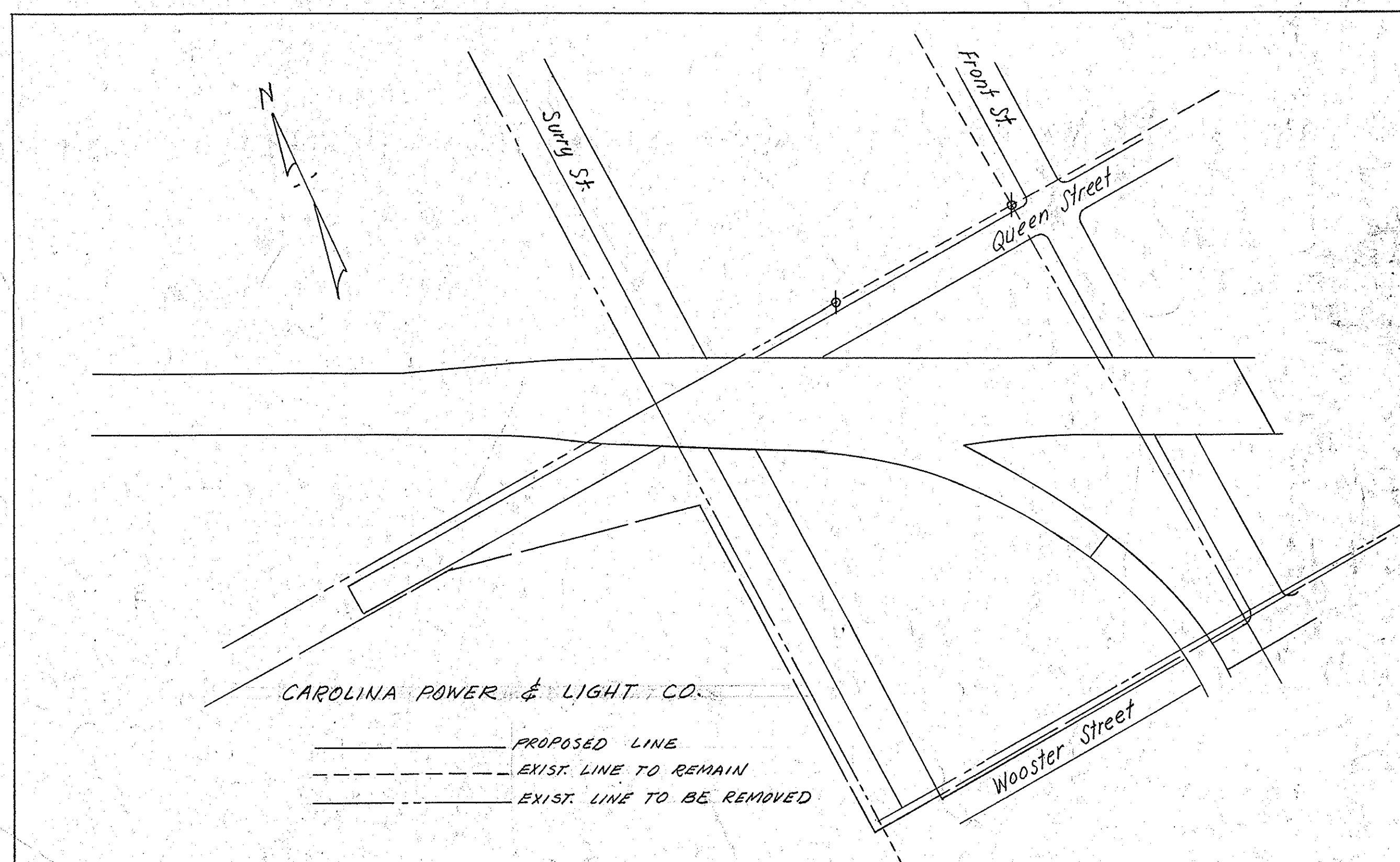
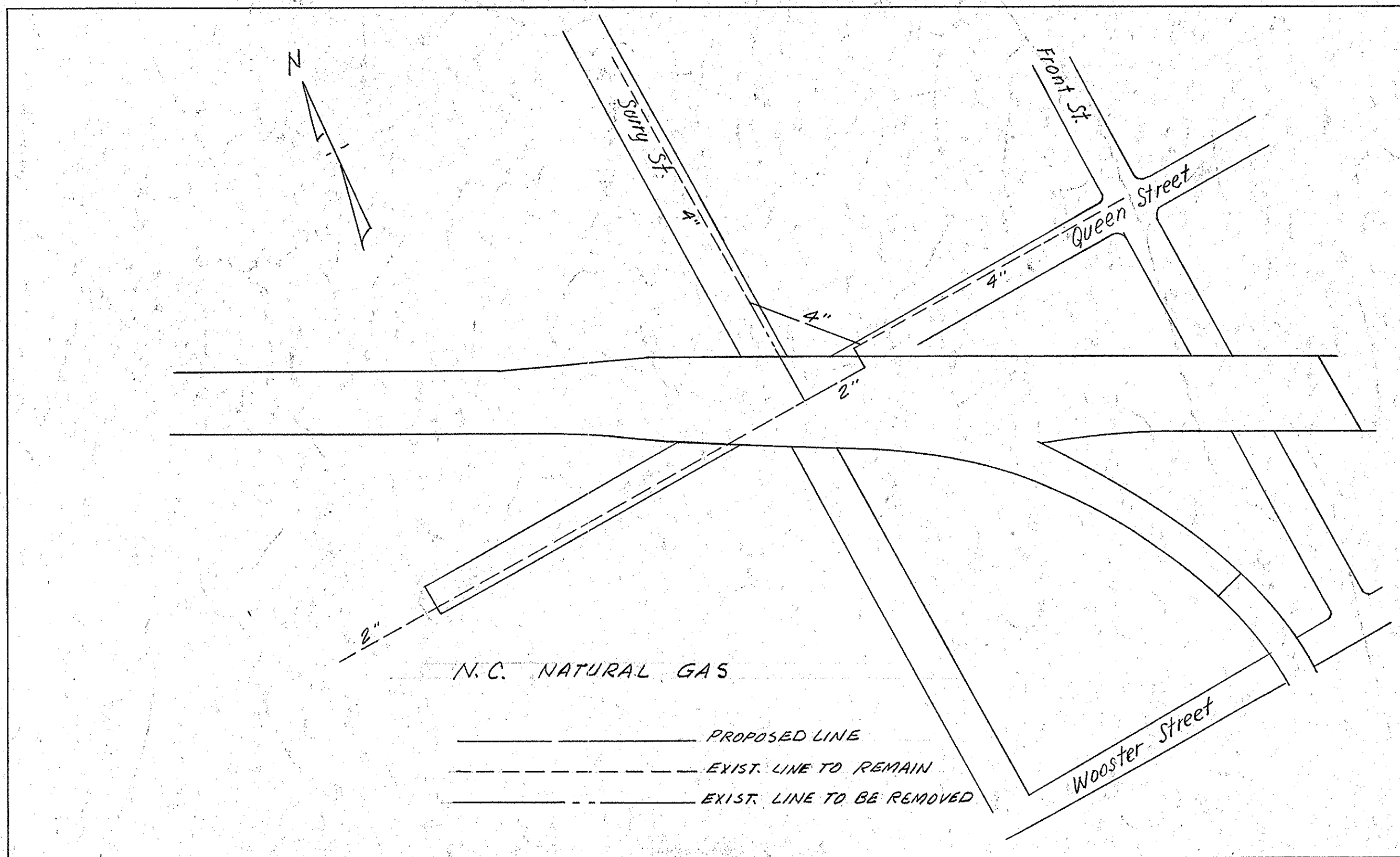
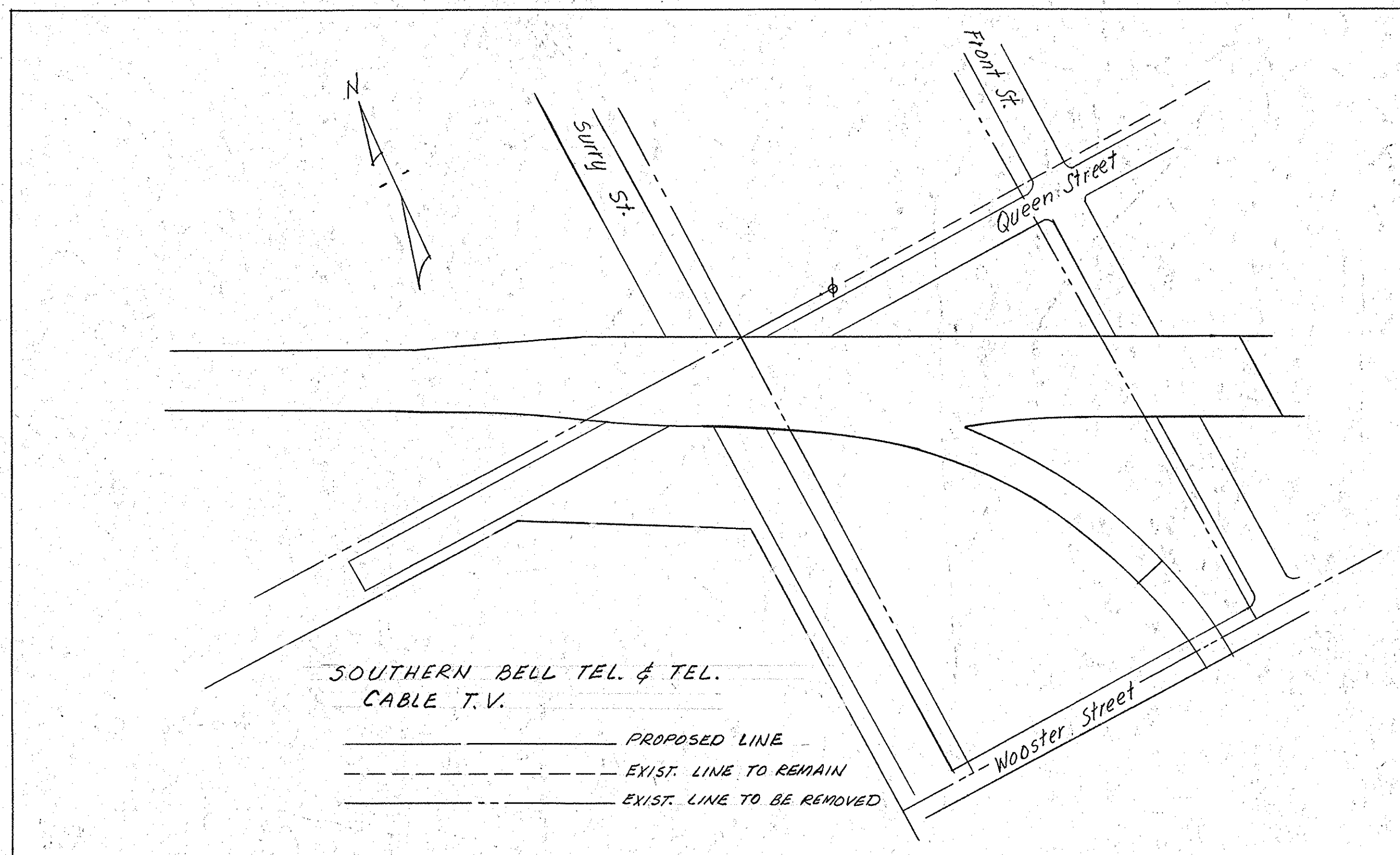
CAPE FEAR RIVER CROSSING
AT WILMINGTON

APPROACHES ON STRUCTURE

GENERAL PLAN AND ELEVATION

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. DATE: October, 1967
ENGINEERS NEW YORK SHEET NO. 3 OF 69

IN CHARGE OF: M.C. [Signature]
CHECKED BY: M.C. [Signature]



NOTE: UTILITIES SHOWN HERE ARE FOR THE INFORMATION OF THE BIDDERS. NONE OF THE WORK DESCRIBED HERE WILL BE A PART OF THIS CONTRACT. SEE SPECIAL PROVISIONS.

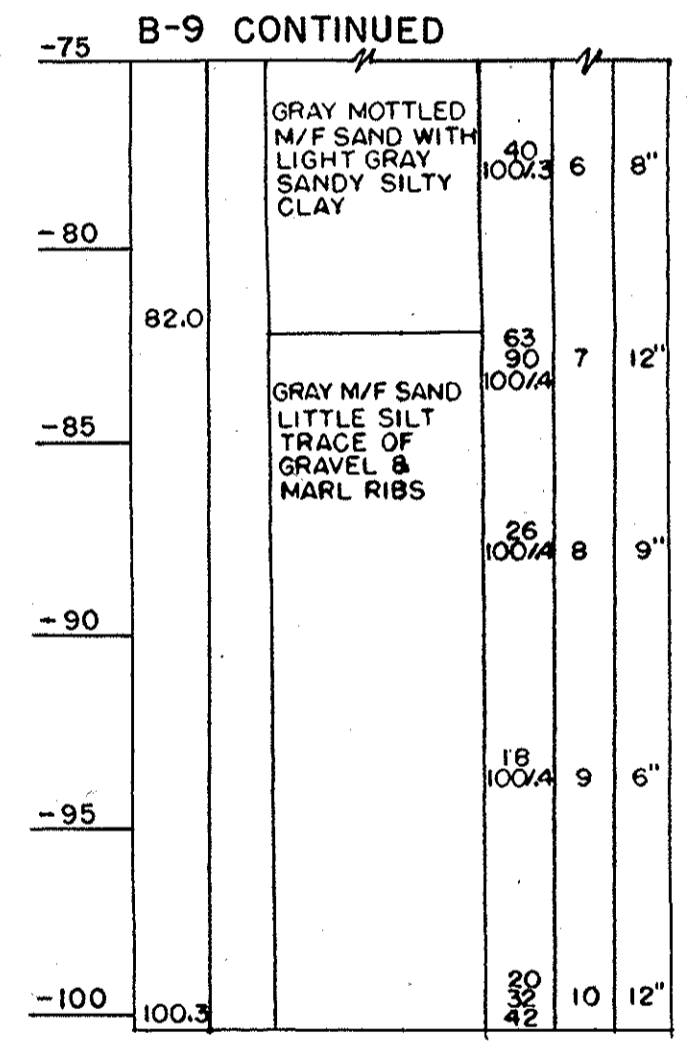
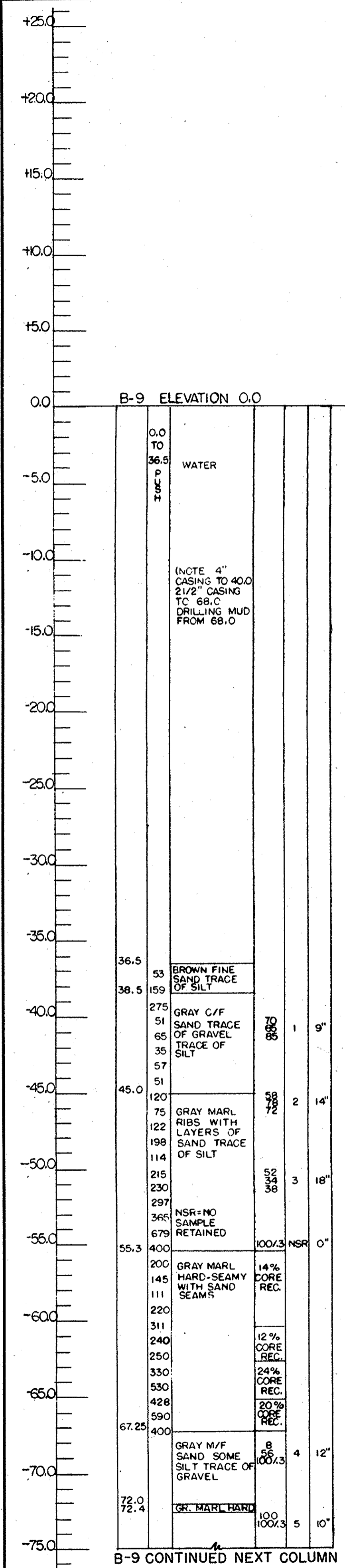
PROJECT No. 8.1355108
 NEW HANOVER COUNTY
 STATION:

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
 RALEIGH

UTILITIES IN
WILMINGTON
 OCTOBER 1967

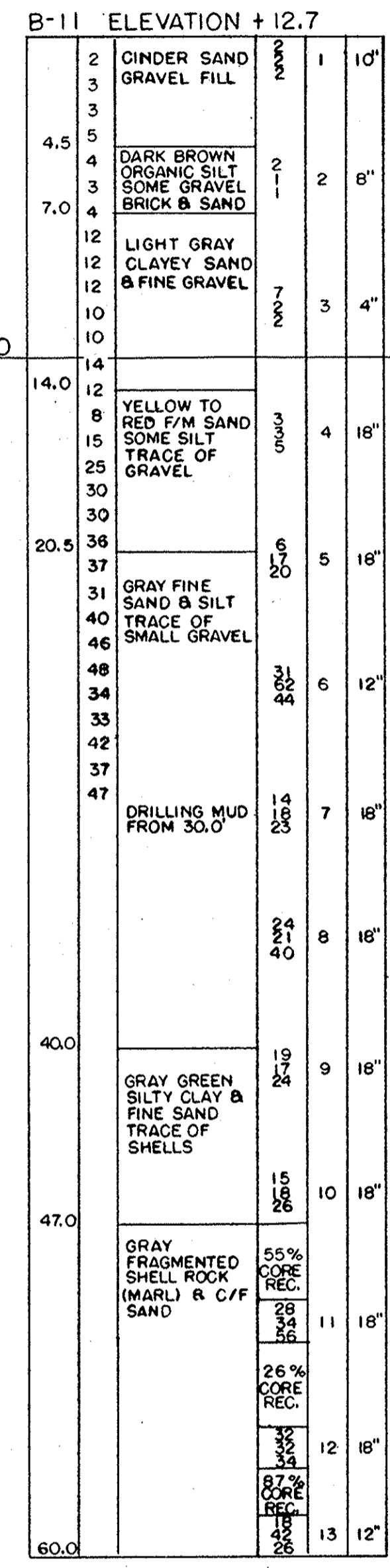
REVISIONS						SHEET NO. 3A
NO.	BY	DATE	NO.	BY	DATE	
1			3			TOTAL SHEETS 69
2						

DRAWN BY E.G.A. DATE OCT. '67
 CHECKED BY R.H. Wiggins DATE OCT. 1967

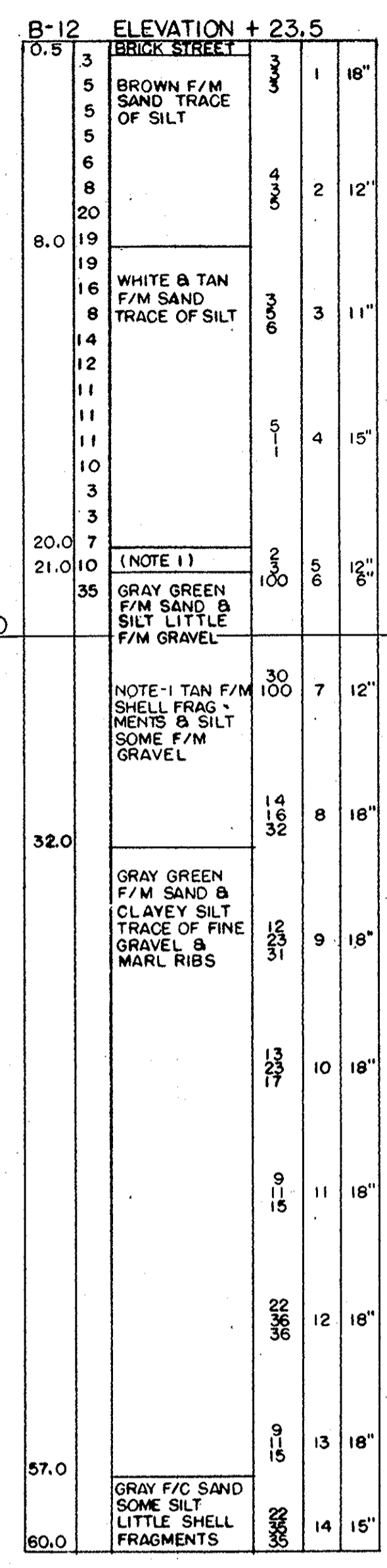


BORING TERMINATED 100.3
CORE DRILLED 55.3 TO 67.25 WITH 2" O.D. DIAMOND BIT
CORE DRILLED 72.0 TO 72.4 WITH 2" O.D. DIAMOND BIT 75% CORE REC.
DRILLER R. AYERS

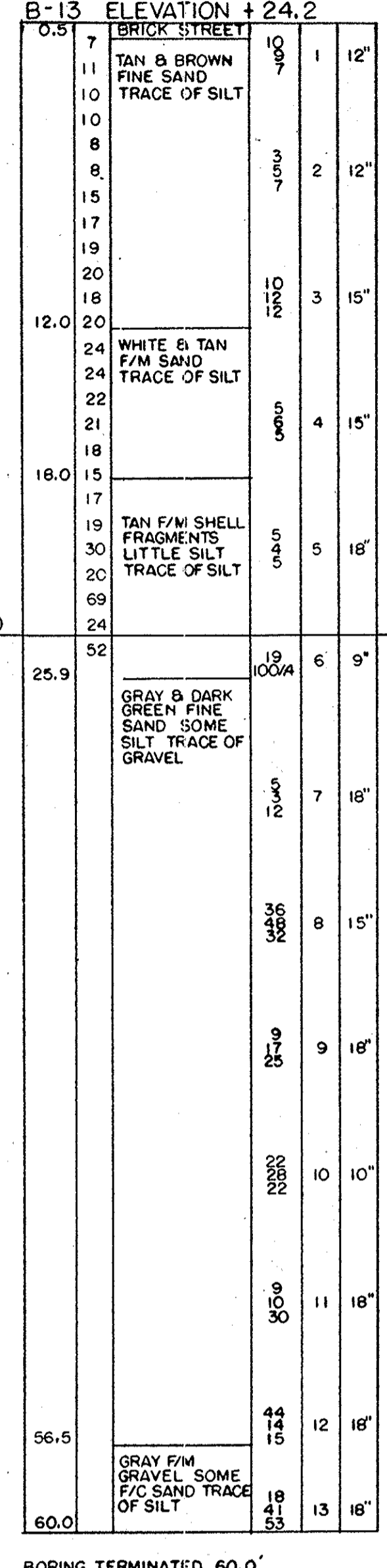
BORING TERMINATED 60.0'
WATER DATA - USED 34.5' 3 1/2" CASING
WATER STOOD 8.5' BAILED TO 12.0'
WITH 34.5' OF CASING BELOW G.S.
AFTER BAILING
WATER LEVEL 8.5' AT 0 HRS.
" " 7.2' " 24 "
" " 5.2' " 48 "
DRILLING MUD USED FROM 34.5'
NOTES ON SHELBY TUBES
SHELBY TUBE NO. 1 19.5 TO 21.5
70 LBS P.S.I. 7" RECOVERY
EM. WT. 5.42 LBS.
TUBE & SAMPLE WT. 13.87 LBS.
GROSS WT. 14.26 LBS.
ATTEMPTED SHELBY TUBE 30.5' PRESSED
TO 30.6' 5" RECOVERY 600 LBS. P.S.I.
SAMPLE IN JAR NO. 15
DRILLER H. WATTS



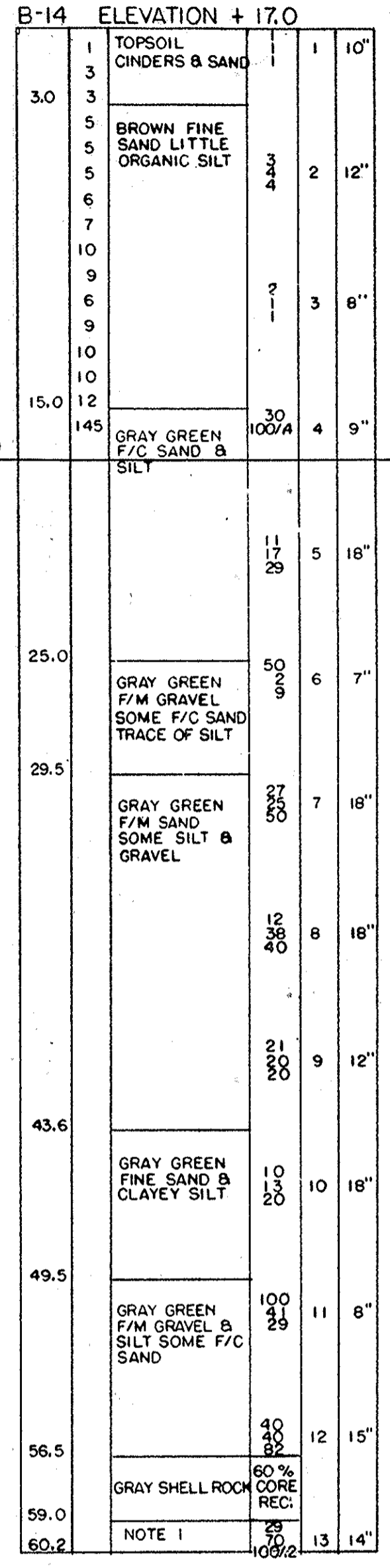
BORING TERMINATED 60.0'
WATER DATA - USED 30.0' 2 1/2" CASING
WATER STOOD 15.6' BAILED TO 18.0'
WITH 30.0' OF CASING BELOW G.S.
AFTER BAILING
WATER LEVEL 3.0' AT 0 HRS.
" " 2.0' AT 48 "
CORE DRILLED 47.0 TO 58.5 WITH 2" O.D. DIAMOND BIT
DRILLER H. WATTS



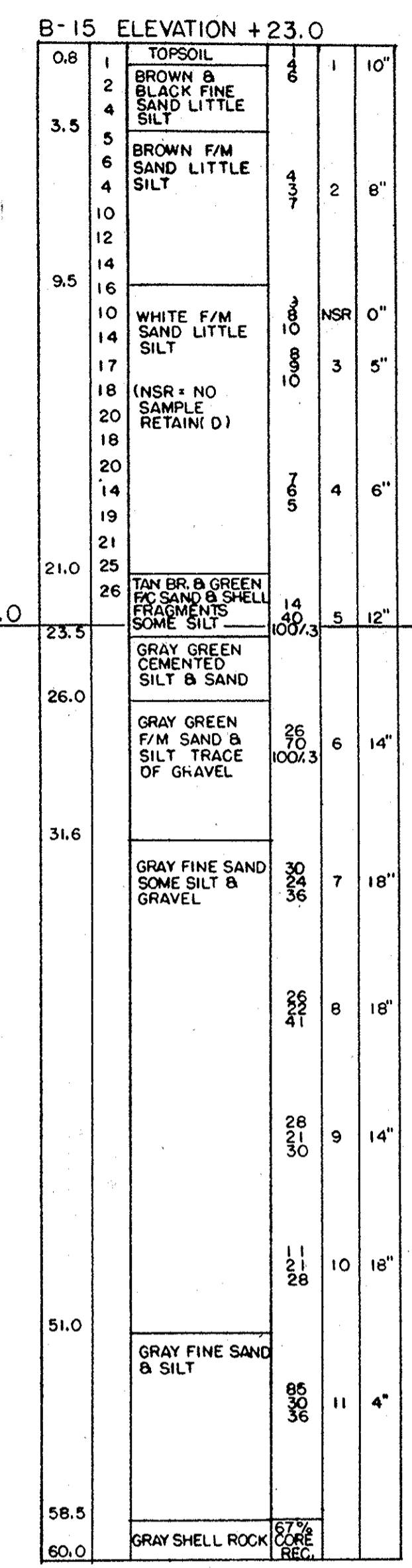
BORING TERMINATED 60.0'
WATER DATA - USED 22.0' 2 1/2" CASING
WATER STOOD 11.0' BAILED TO 14.8'
WITH 22.0' OF CASING BELOW G.S.
AFTER BAILING
WATER LEVEL 11.5' AT 0 HRS.
" " 10.8' " 24 "
" " 10.8' " 24 "
DRILLING MUD FROM 22.0'
DRILLER H. WATTS



BORING TERMINATED 60.0'
WATER DATA - USED 25.0' 2 1/2" CASING
WATER STOOD 12.7' BAILED TO 16.4'
WITH 25.0' OF CASING BELOW G.S.
AFTER BAILING
WATER LEVEL 12.7' AT 0 HRS.
" " 8.8' " 24 "
DRILLING MUD FROM 25.0'
DRILLER H. WATTS



BORING TERMINATED 60.2'
WATER DATA - USED 16.0' 2 1/2" CASING
WATER STOOD 10.0' BAILED TO 16.5'
WITH 16.0' OF CASING BELOW G.S.
AFTER BAILING
WATER LEVEL 5.2' AT 0 HRS.
" " 2.75' " 24 "
DRILLING MUD FROM 16.0'
CORE DRILLED 16.5 TO 59.0 WITH 2" O.D. DIAMOND BIT
NOTE 1 - GRAY F/M GRAVEL & F/C SAND LITTLE SILT
DRILLER H. WATTS



BORING TERMINATED 60.0'
WATER DATA - USED 22.0' 2 1/2" CASING
WATER STOOD 9.0' BAILED TO 19.5' WITH 22.0' OF CASING BELOW G.S.
AFTER BAILING
WATER LEVEL 19.5' AT 0 HRS.
" " 18.0' " 24 "
DRILLING MUD FROM 22.0'
CORE DRILLED 58.5 TO 60.0 WITH 2" O.D. DIAMOND BIT
DRILLER R. AYERS

NOTES:
1. For locations of Borings see Sheet No. 3.
2. For Legend see Sheet No. 4

PROJECT No. 8.1355108
NEW HANOVER COUNTY

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

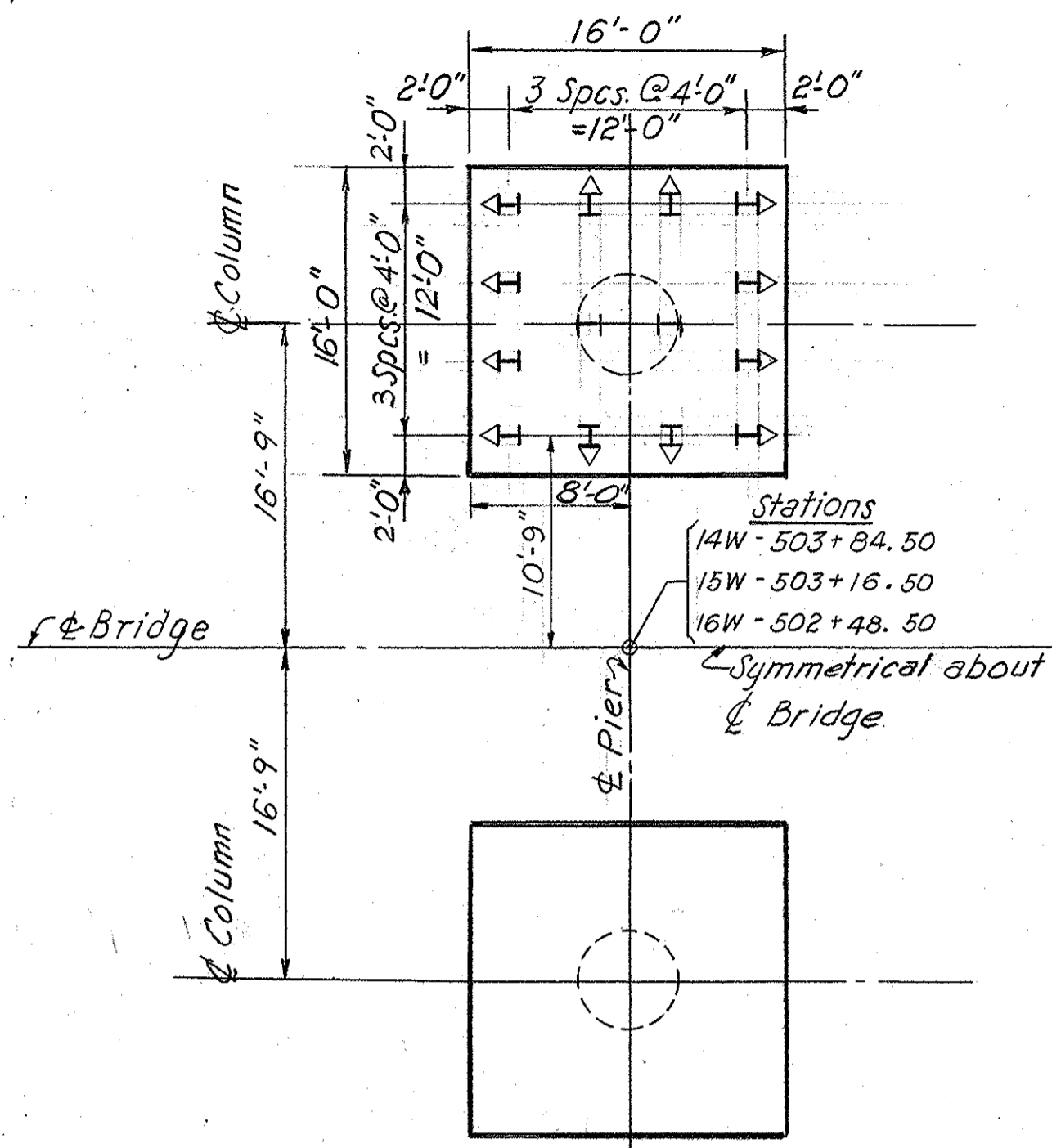
CAPE FEAR RIVER CROSSING
AT WILMINGTON

APPROACHES ON STRUCTURE
LOGS OF BORINGS B-9 THROUGH B-15

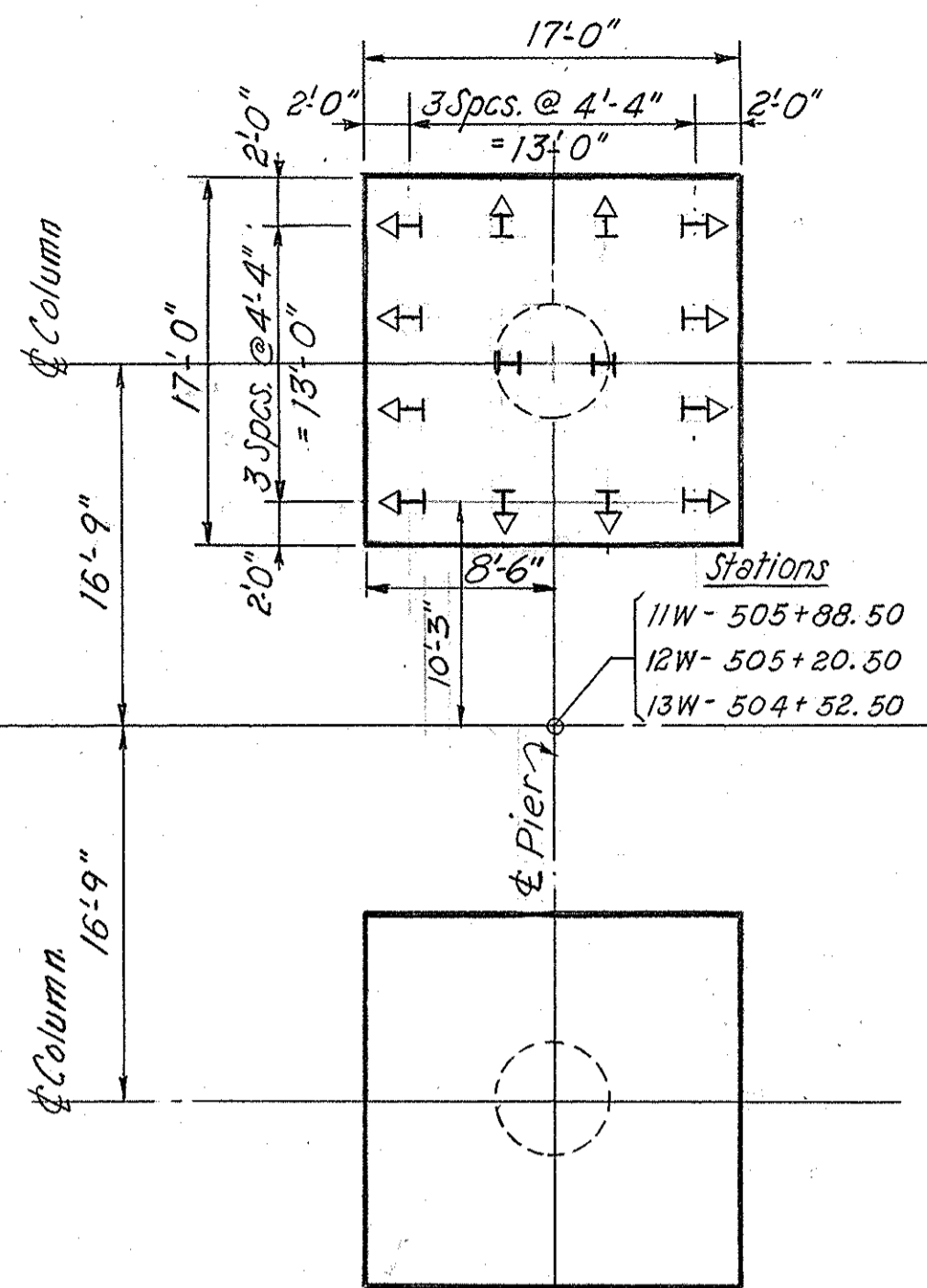
PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC.	DATE: October, 1967
ENGINEERS	SHEET NO. 5 OF 29

REVISION	BY	DATE

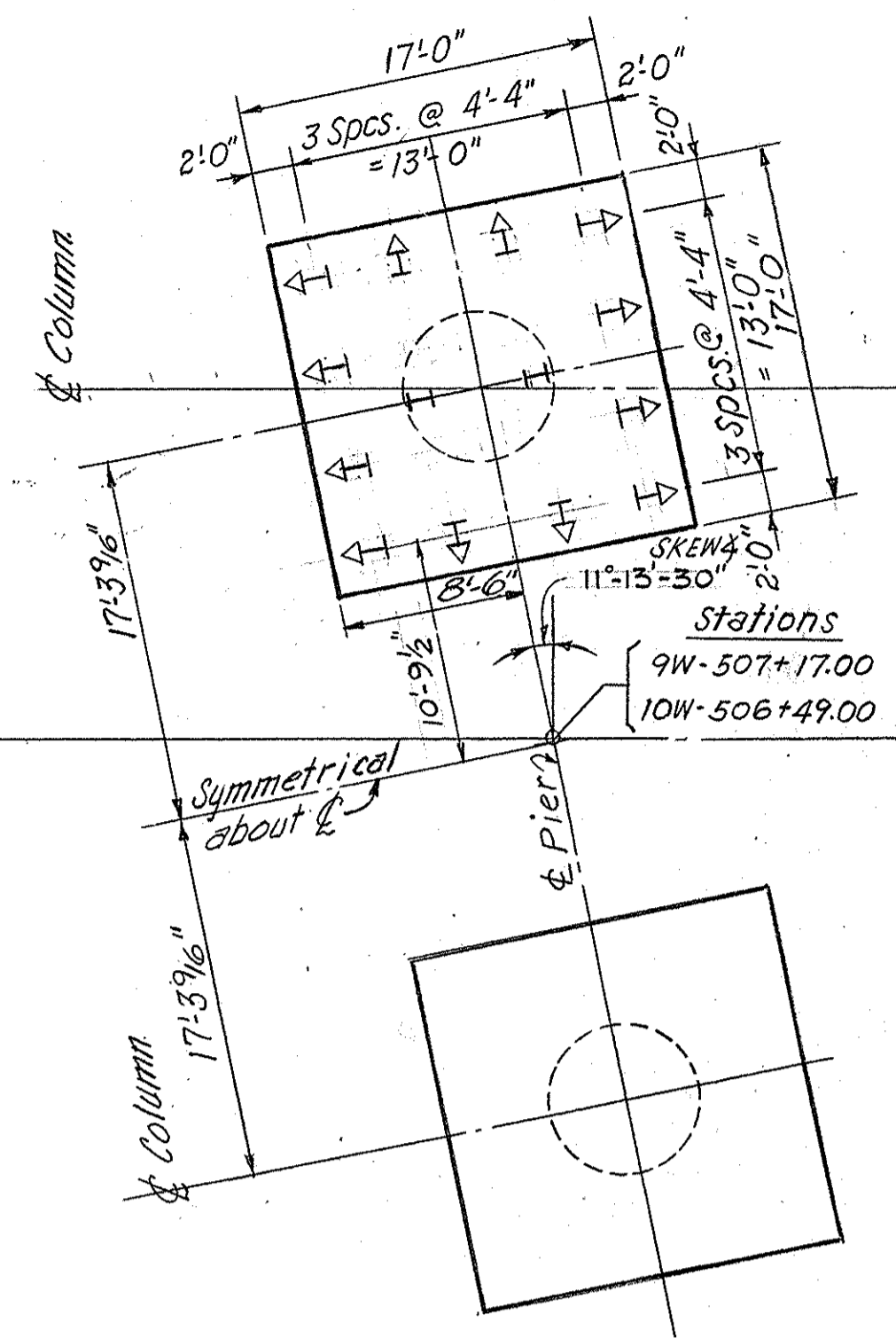
MADE BY: IN CHARGE OF:



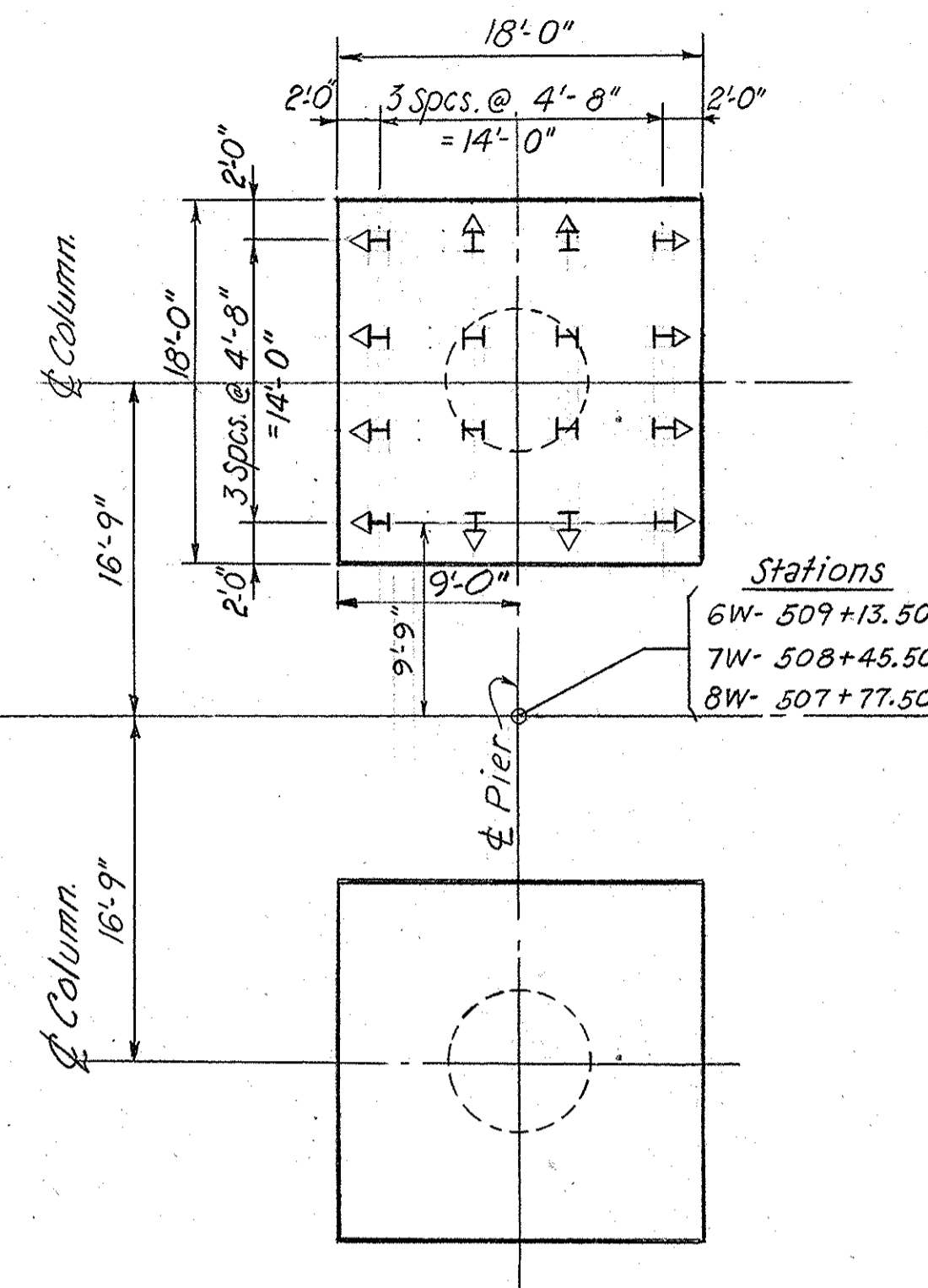
PIERS 14W 15W & 16W
28 Piles Required Each Pier



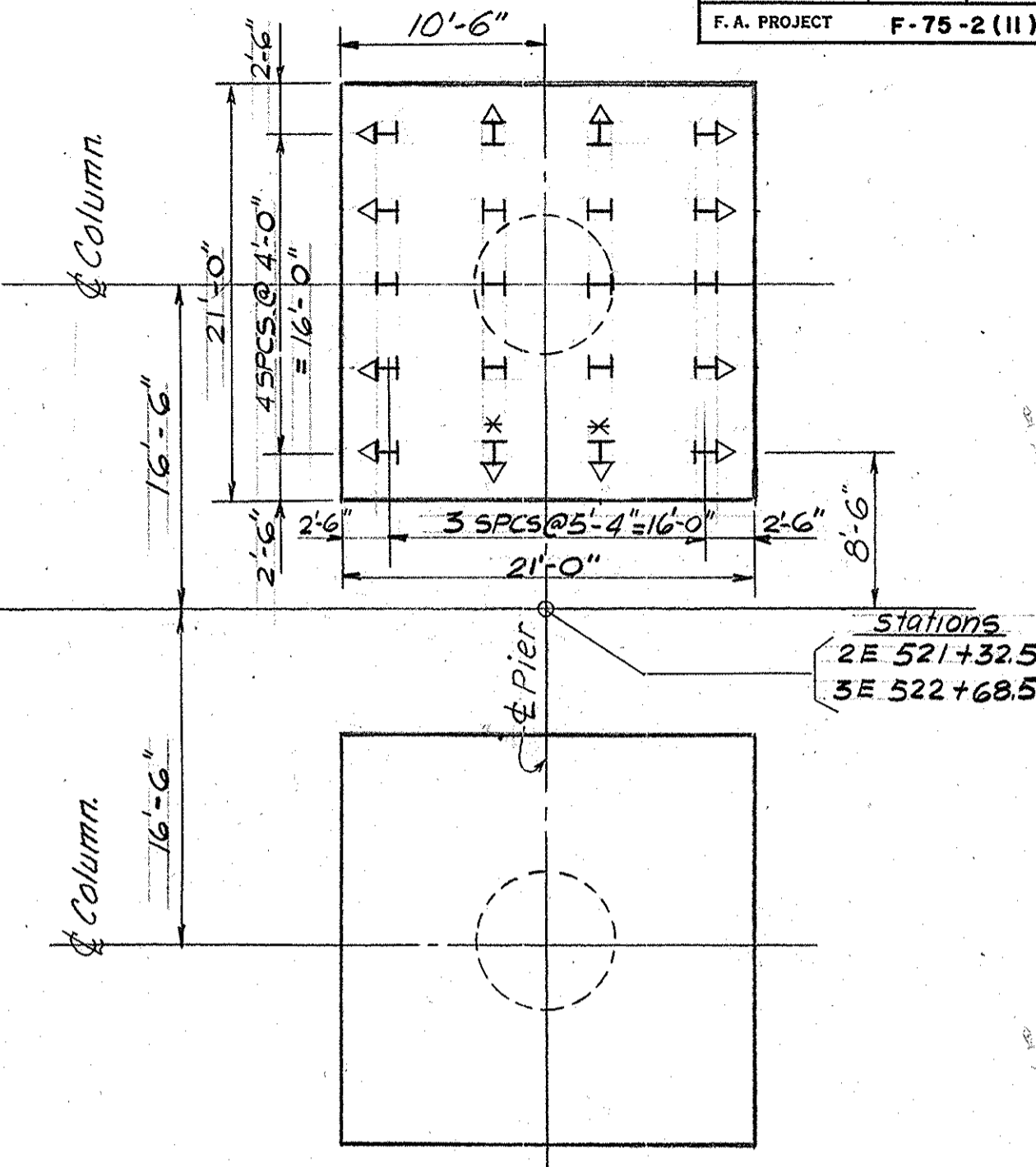
PIERS 11W 12W & 13W
28 Piles Required Each Pier



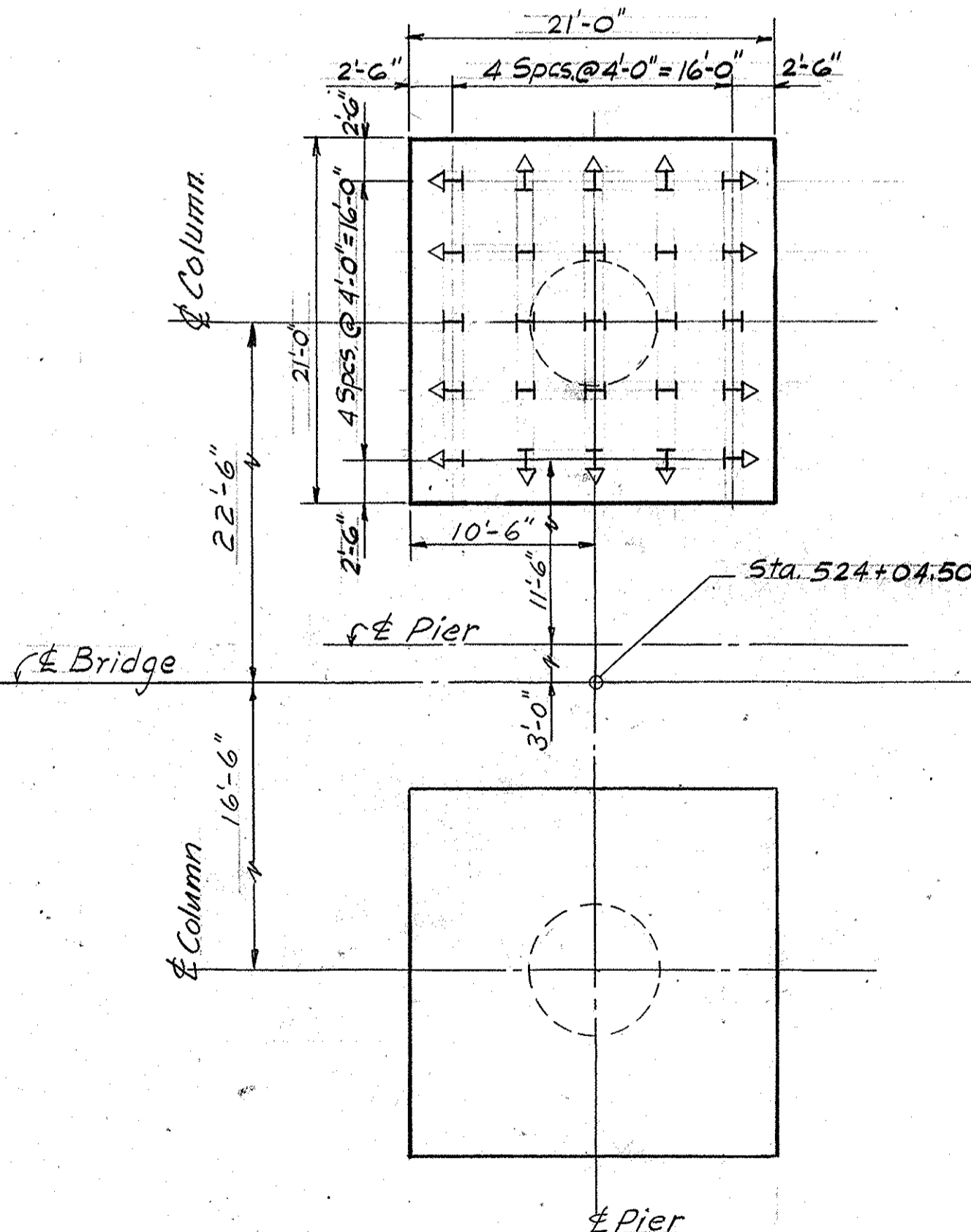
PIERS 9W & 10W
28 Piles Required Each Pier



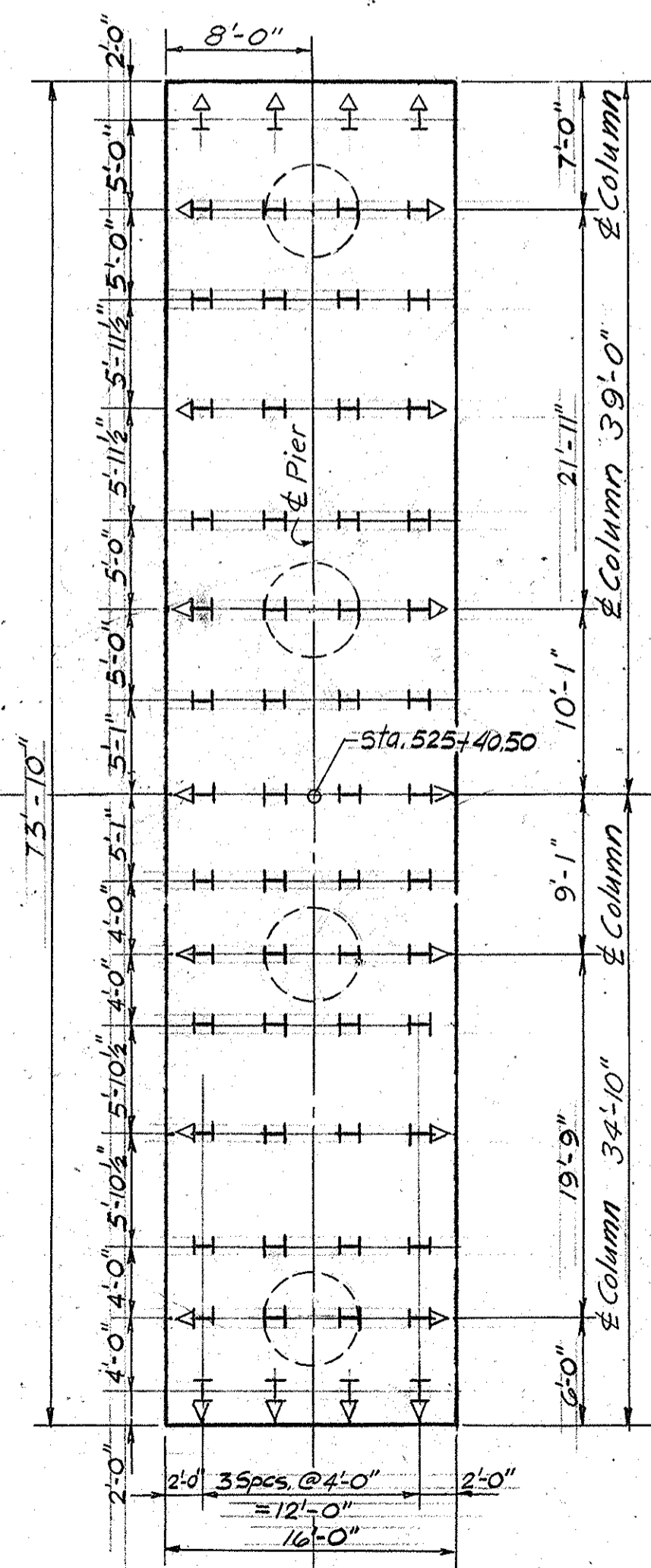
PIERS 6W 7W & 8W
32 Piles Required Each Pier



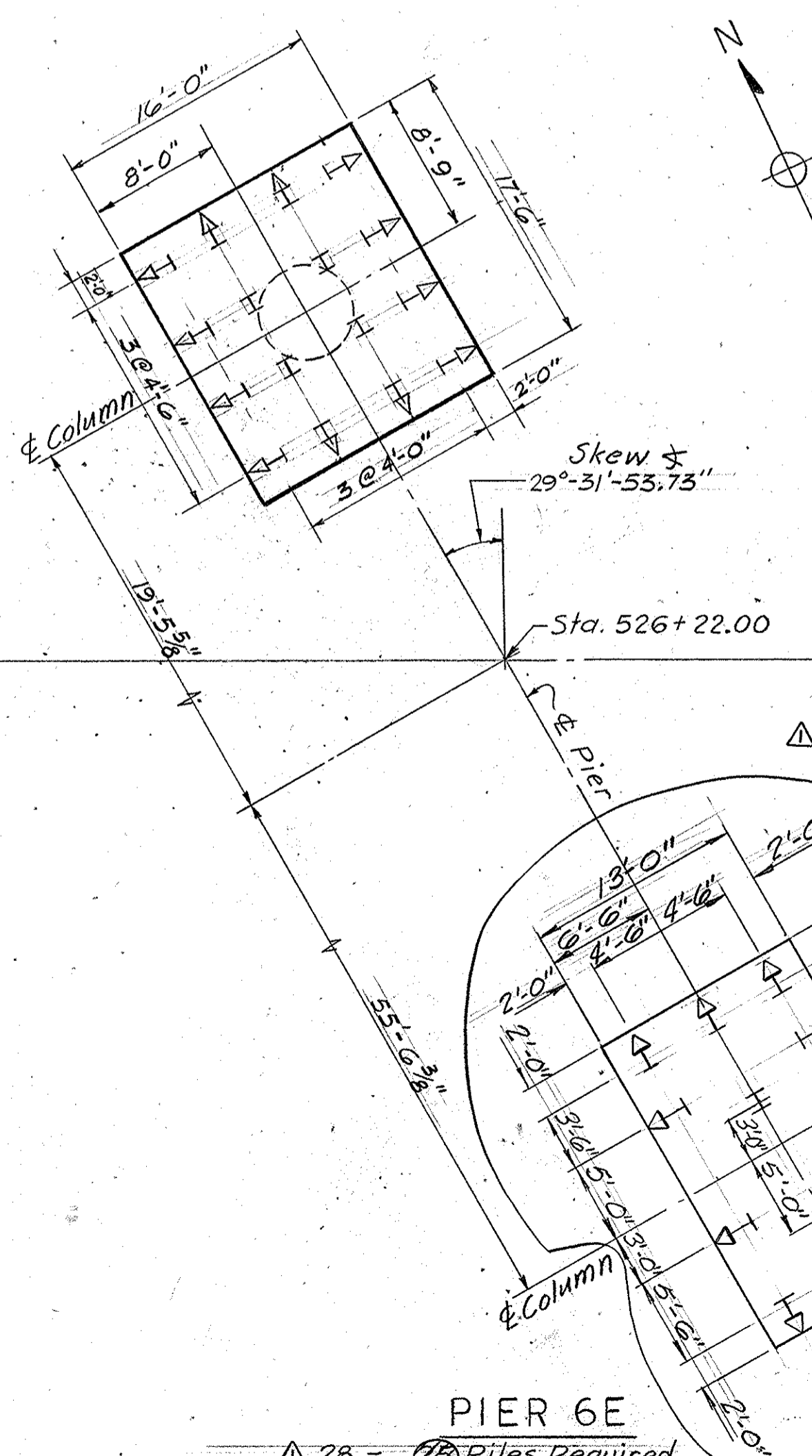
PIERS 2E & 3E
40 Piles Required Each Pier
* 4-1:8 Batter Piles at Pier 2E only.
Batter 1:6 at Pier 3E.



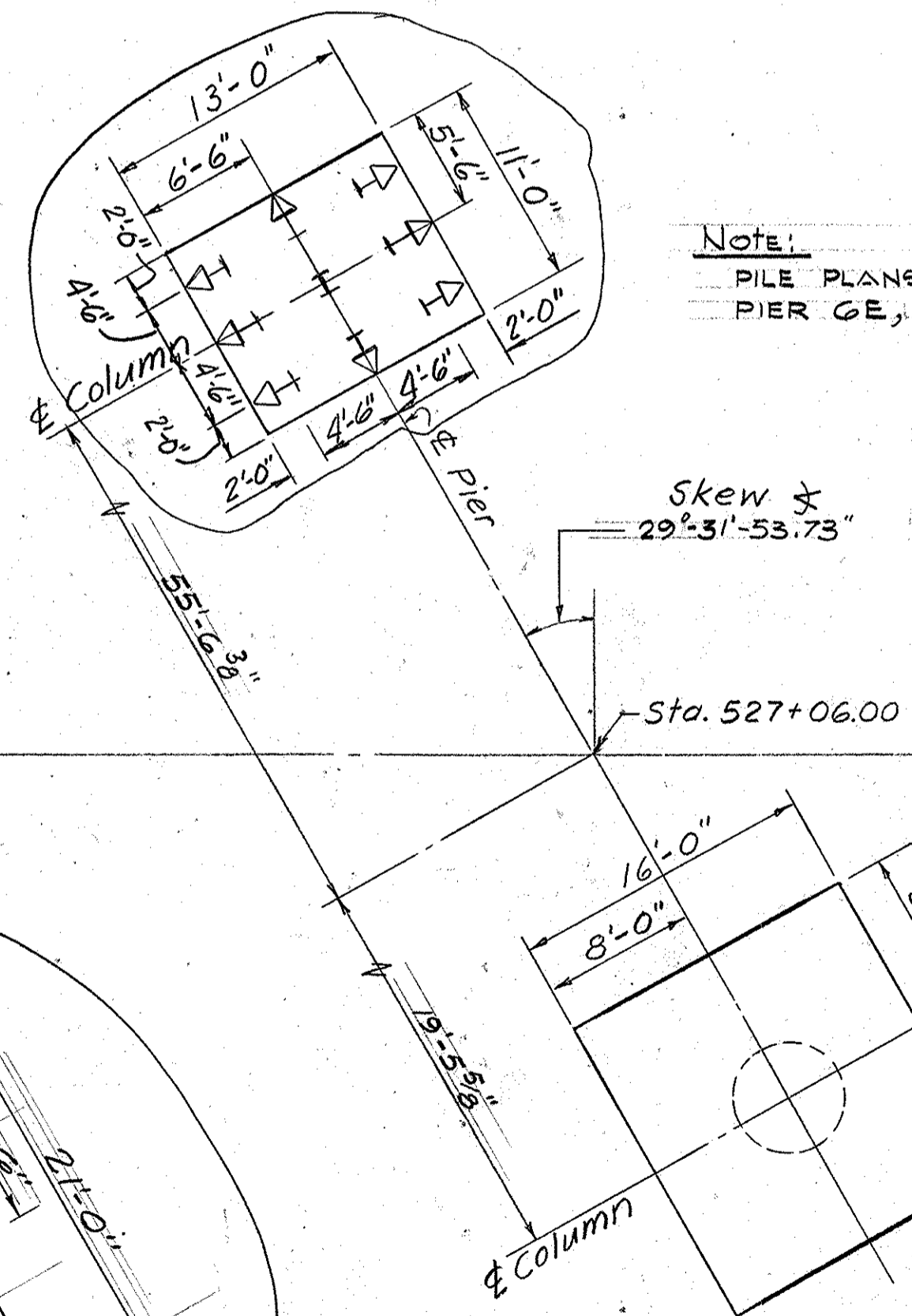
PIER 4E
50 Piles Required



PIER 5E
60 Piles Required



PIER 6E
28 Piles Required



PIER 7E
25 Piles Required

Note:
- PILE PLANS SAME AS AT PIER 6E, UNLESS NOTED

- NOTES:
1. For General Notes see Sheet No. 2.
 2. All piles to be steel 12BP53.
 3. For detail of pilepoint, see Sheet No. 8.
 4. ▴ Denotes 1:6 Batter Piles unless noted.

PROJECT No. 8.1355108
NEW HANOVER COUNTY

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

CAPE FEAR RIVER CROSSING
AT WILMINGTON

APPROACHES ON STRUCTURE
FOOTING AND PILE PLANS
PIERS 16W THROUGH 7E

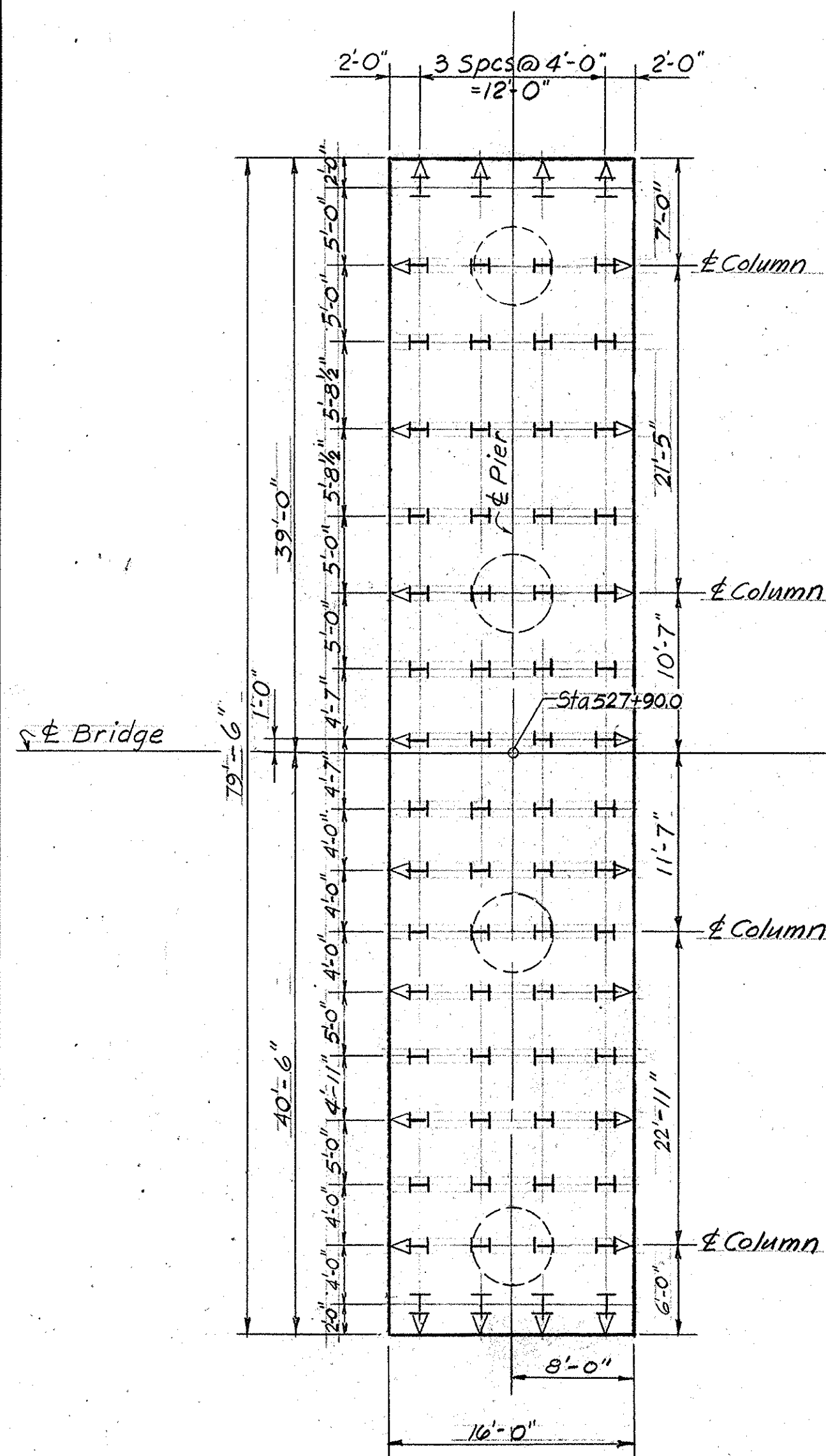
PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. DATE: October, 1967
ENGINEERS NEW YORK SHEET NO. 7 OF 69

Scale: 1/8" = 1'-0"

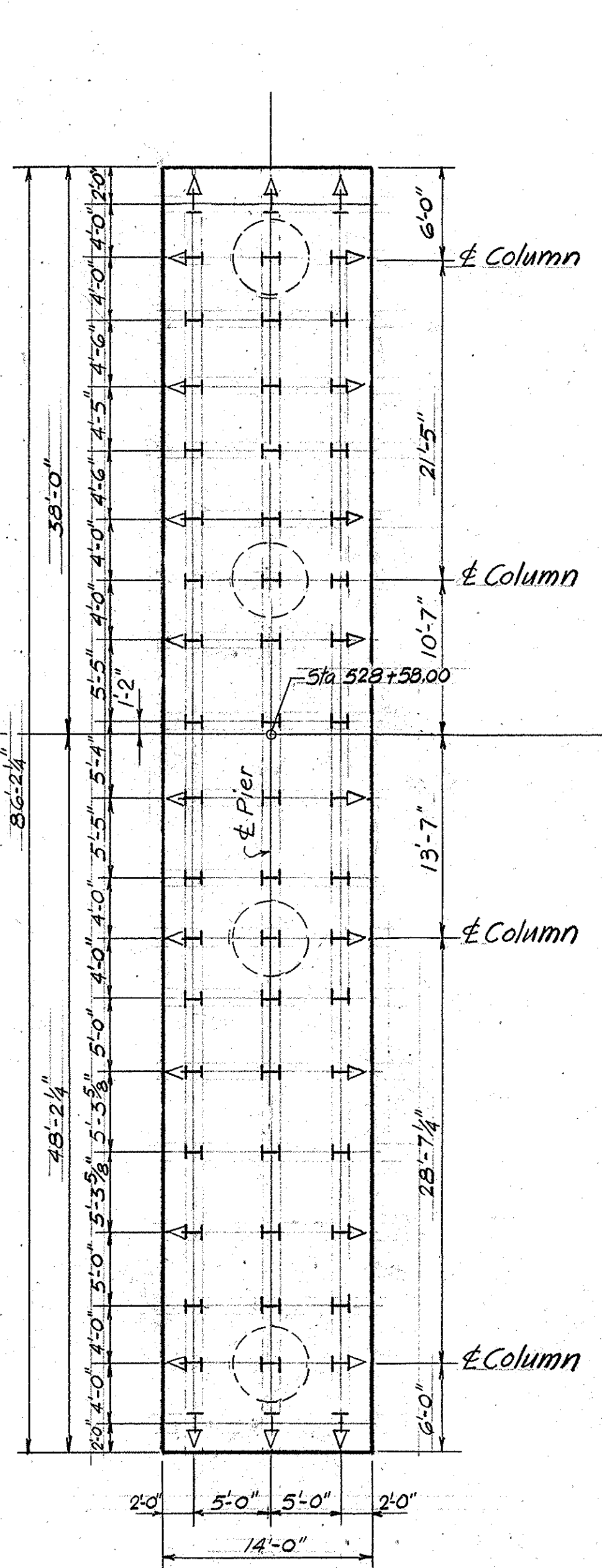
REVISION	BY	DATE
△ PILE PLANS	GES	9-13-68

MADE BY: C. Young
CHECKED BY: M.C. D...
IN CHARGE OF: M.C. D...

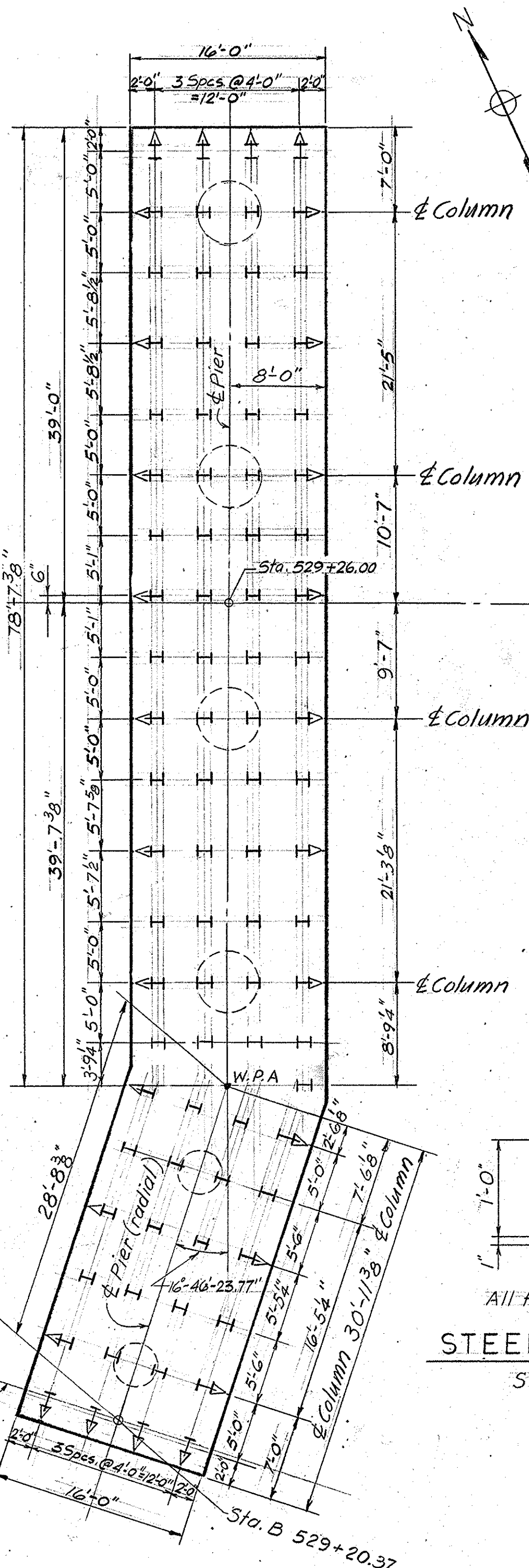
FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N.C.	8.1355108
F. A. PROJECT		F-75-2 (II)



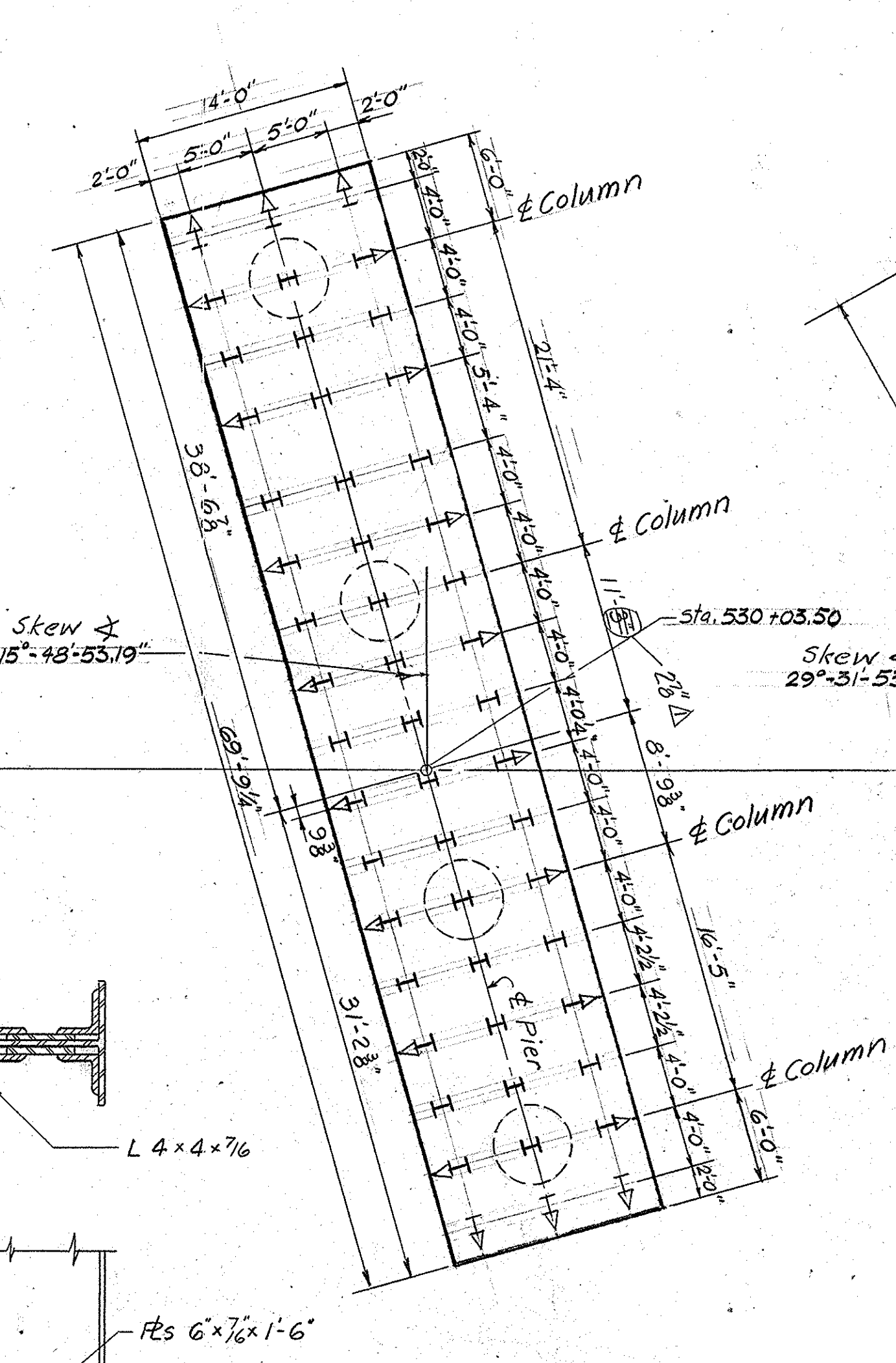
PIER 8E
Scale: 1/8" = 1'-0"
68 Piles Required



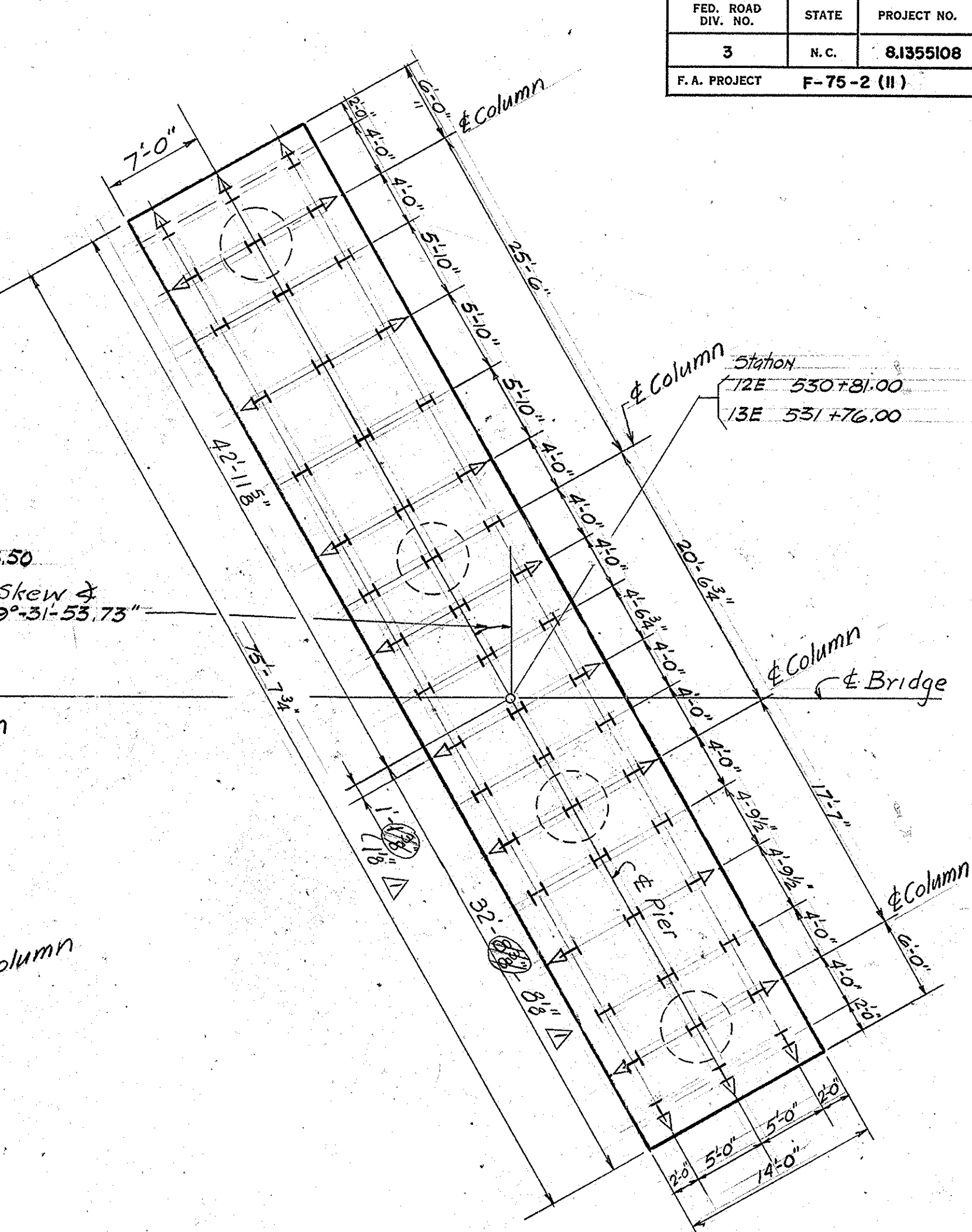
PIER 9E
Scale: 1/8" = 1'-0"
57 Piles Required



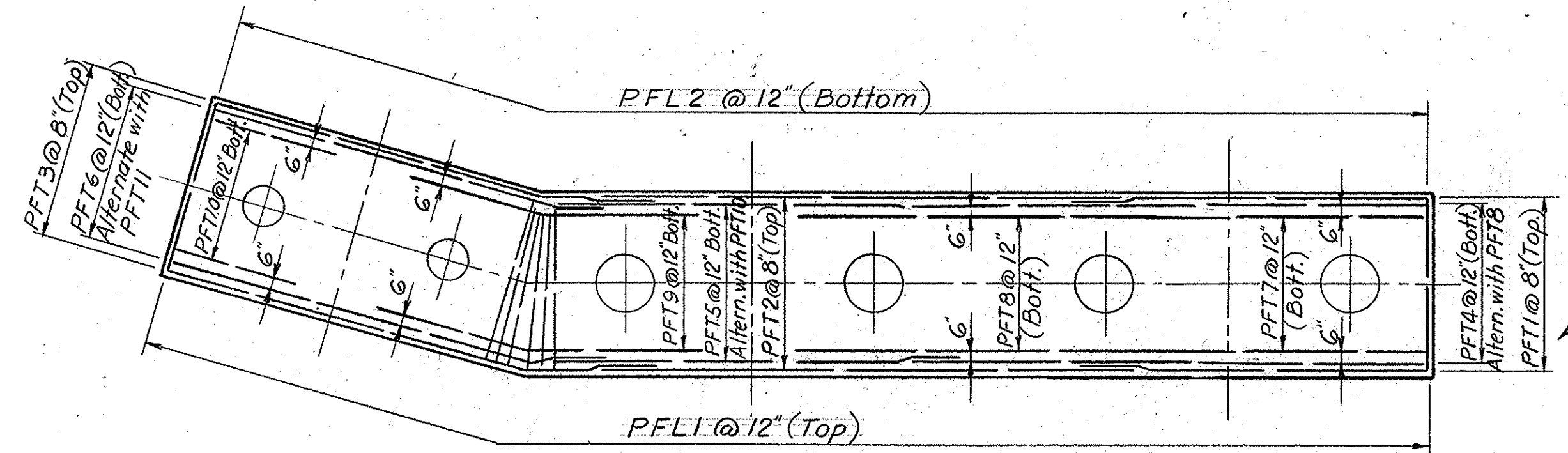
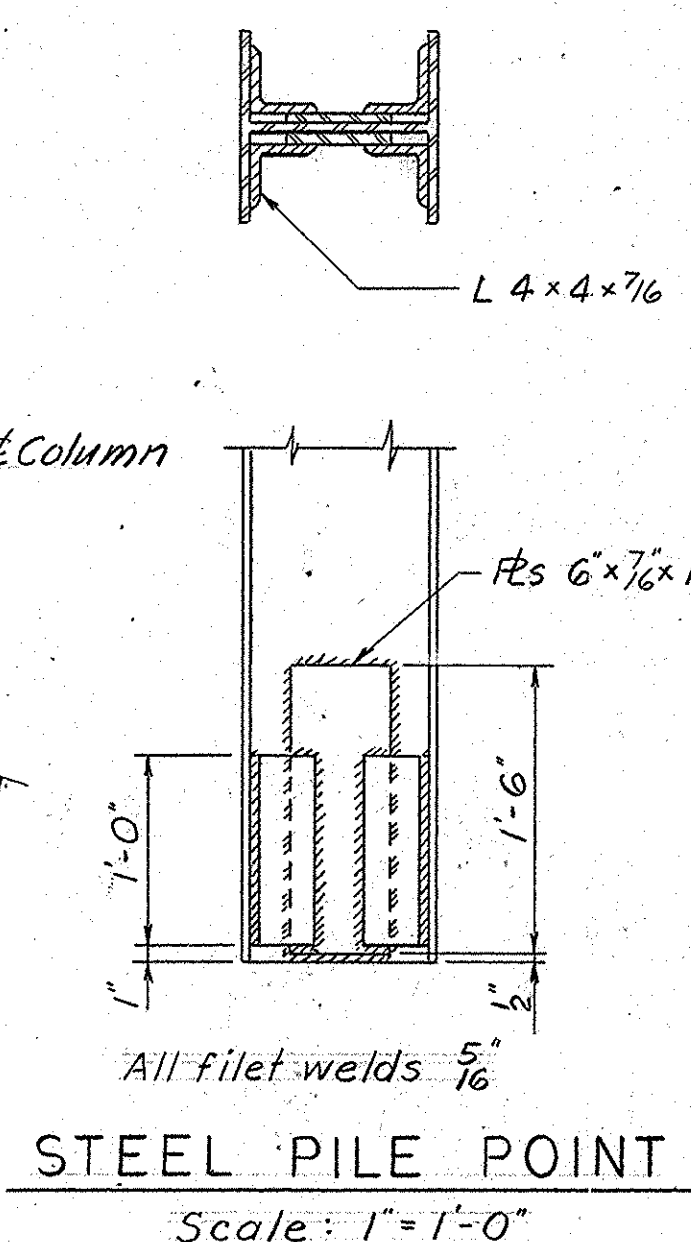
PIER 10E
Scale: 1/8" = 1'-0"
85 Piles Required



PIER 11E
Scale: 1/8" = 1'-0"
51 Piles Required



PIERS 12E & 13E
Scale: 1/8" = 1'-0"
51 Piles Required Each Pier



FOOTING REINFORCEMENT - PIER 10E
Scale: 3/32" = 1'-0"

- NOTES:**
1. For General Notes see Sheet No. 2.
 2. All piles to be steel 12BP53.
 3. ▽ Denotes 1:6 Batter Piles.

PROJECT No. 8.1355108
 NEW HANOVER COUNTY
 STATE OF NORTH CAROLINA
 STATE HIGHWAY COMMISSION
 RALEIGH

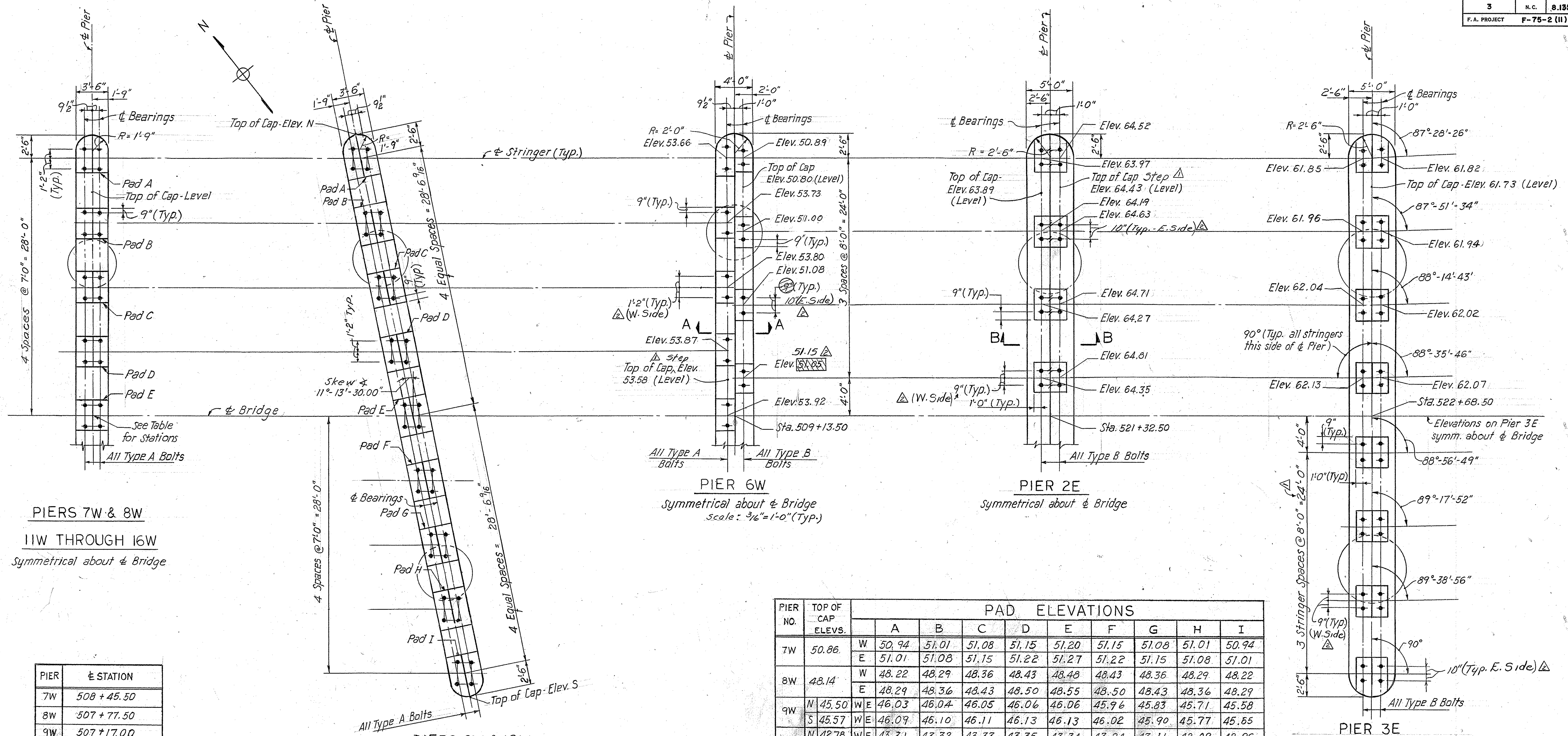
CAPE FEAR RIVER CROSSING
 AT WILMINGTON

APPROACHES ON STRUCTURE
 FOOTING AND PILE PLANS
 PIERS 8E THROUGH 15E

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. DATE: October, 1967
 ENGINEERS NEW YORK SHEET NO. 8 OF 69

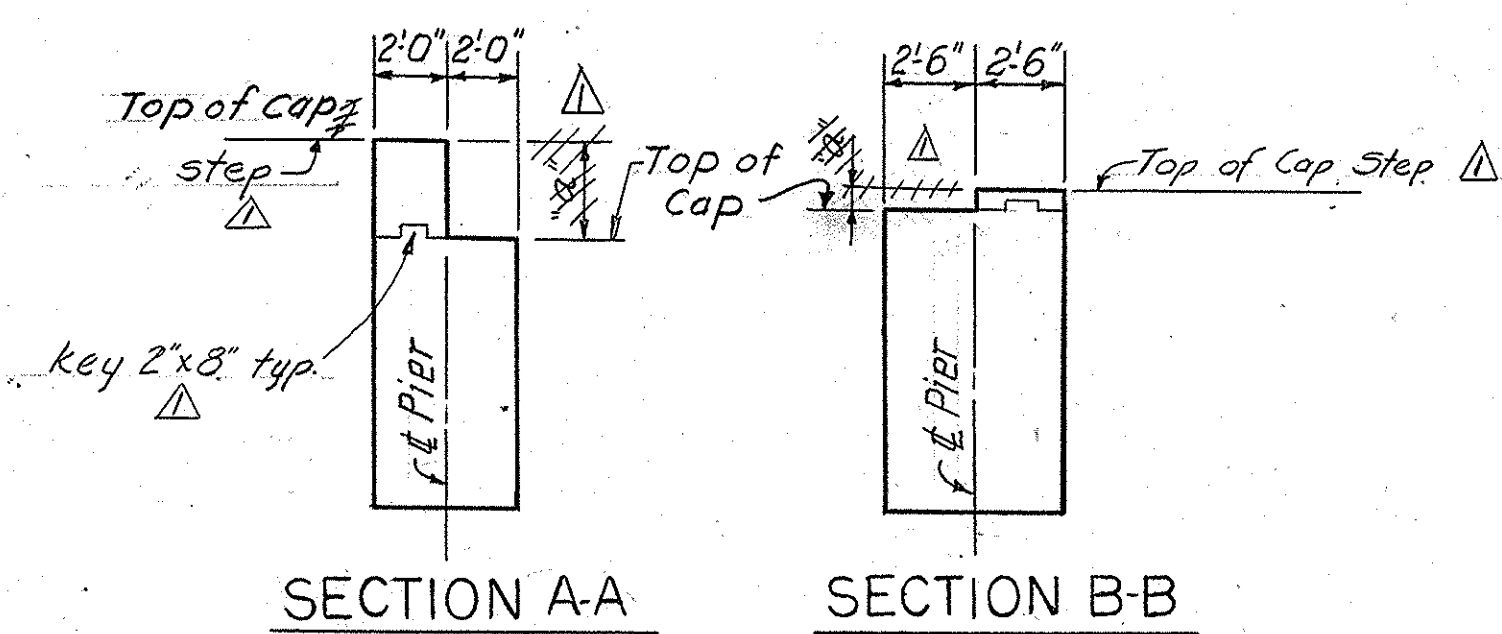
REVISION	BY	DATE
Δ Footing Dims. MC5		12-7-67

MADE BY: C. Yung
 CHECKED BY: E. Allen
 IN CHARGE OF: H. C. Allen



PIERS 7W & 8W
11W THROUGH 16W
Symmetrical about & Bridge

PIER	± STATION
7W	508 + 45.50
8W	507 + 77.50
9W	507 + 17.00
10W	506 + 49.00
11W	505 + 88.50
12W	505 + 20.50
13W	504 + 52.50
14W	503 + 48.50
15W	503 + 16.50
16W	502 + 48.50



Note: Provide construction joint and extra reinforcement when "a" is > "d" (see detail on sheet No. 18)

For details of extra reinforcement in stepped caps, see sheet No. 13

PIER NO.	TOP OF CAP ELEV.	PAD ELEVATIONS										
		A	B	C	D	E	F	G	H	I		
7W	50.86	W	50.94	51.01	51.08	51.15	51.20	51.15	51.08	51.01	50.94	
		E	51.01	51.08	51.15	51.22	51.27	51.22	51.15	51.08	51.01	
8W	48.14	W	48.22	48.29	48.36	48.43	48.48	48.43	48.36	48.29	48.22	
		E	48.29	48.36	48.43	48.50	48.55	48.50	48.43	48.36	48.29	
9W	45.50	N	45.50	46.03	46.04	46.05	46.06	45.96	45.83	45.71	45.58	
		S	45.57	46.09	46.10	46.11	46.13	46.13	46.02	45.90	45.77	45.65
10W	42.85	N	42.85	43.31	43.32	43.33	43.35	43.34	43.24	43.11	42.99	42.86
		S	42.85	43.37	43.38	43.40	43.41	43.41	43.30	43.18	43.05	42.93
11W	40.58	W	40.66	40.73	40.80	40.86	40.92	40.86	40.80	40.73	40.66	
		E	40.73	40.80	40.87	40.94	40.99	40.94	40.87	40.80	40.73	
12W	37.86	W	37.94	38.13	38.07	38.15	38.20	38.15	38.07	38.13	37.94	
		E	38.01	38.08	38.15	38.22	38.27	38.22	38.15	38.08	38.01	
13W	35.14	W	35.22	35.29	35.36	35.43	35.48	35.43	35.36	35.29	35.22	
		E	35.29	35.36	35.43	35.50	35.55	35.50	35.43	35.36	35.29	
14W	32.42	W	32.50	32.57	32.64	32.71	32.76	32.71	32.64	32.57	32.50	
		E	32.57	32.64	32.71	32.78	32.83	32.78	32.71	32.64	32.57	
15W	29.70	W	29.78	29.85	29.92	29.99	30.04	29.99	29.92	29.85	29.78	
		E	29.85	29.92	29.99	30.06	30.11	30.06	29.99	29.92	29.85	
16W	26.98	W	27.06	27.13	27.20	27.27	27.32	27.27	27.20	27.13	27.06	
		E	27.13	27.20	27.27	27.34	27.39	27.34	27.27	27.20	27.13	

Scale: 3/16" = 1'-0"

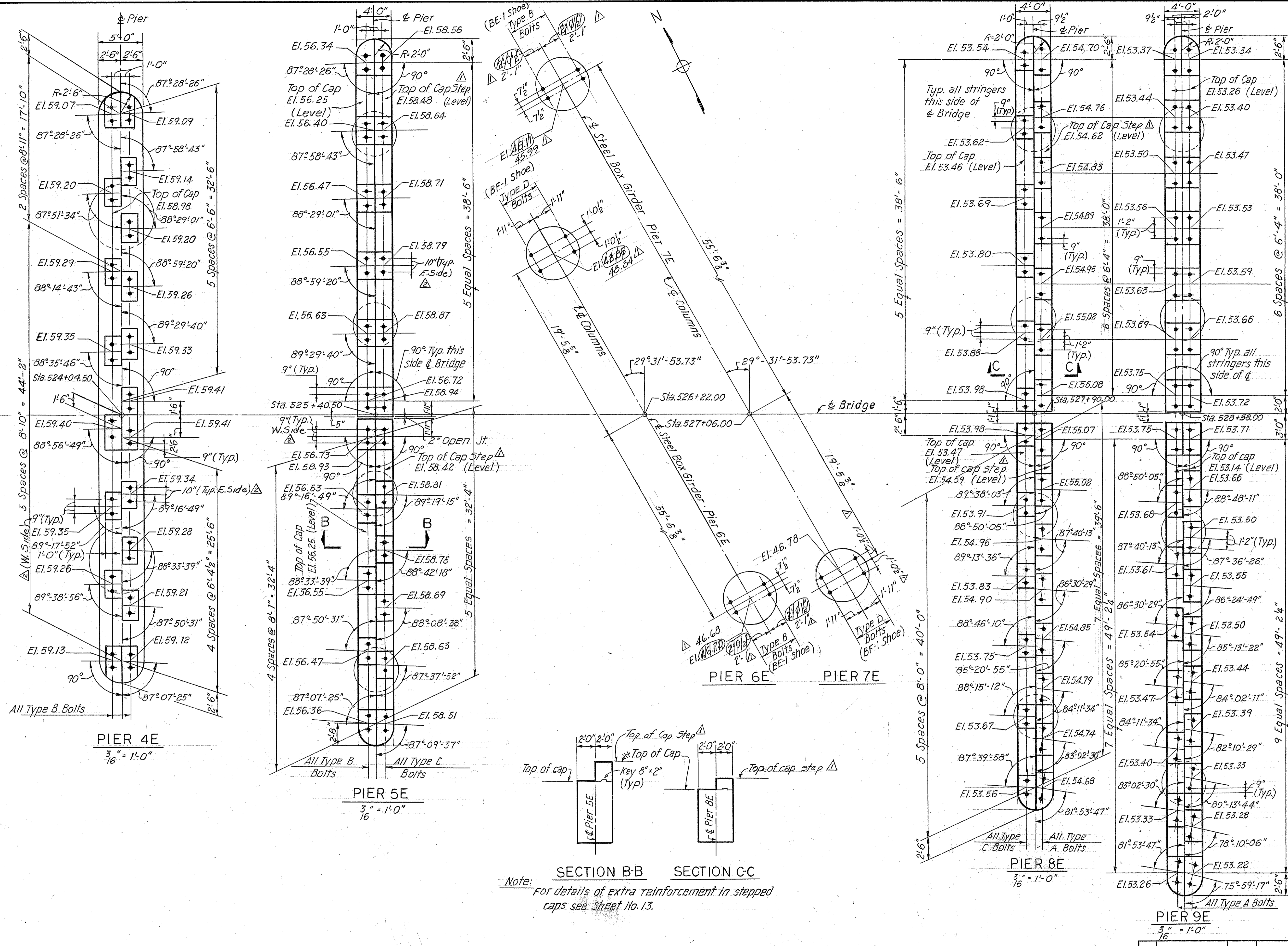
REVISION	BY	DATE
1. Bolt Spacing	MCS	1-25-68
2. Cap Steps	MCS	12-7-67

NOTES:
1. For General Notes see Sheet No. 2
2. Anchor Bolts are placed normal to & Stringer.
3. For details of anchor bolts, see Sheet No. 13

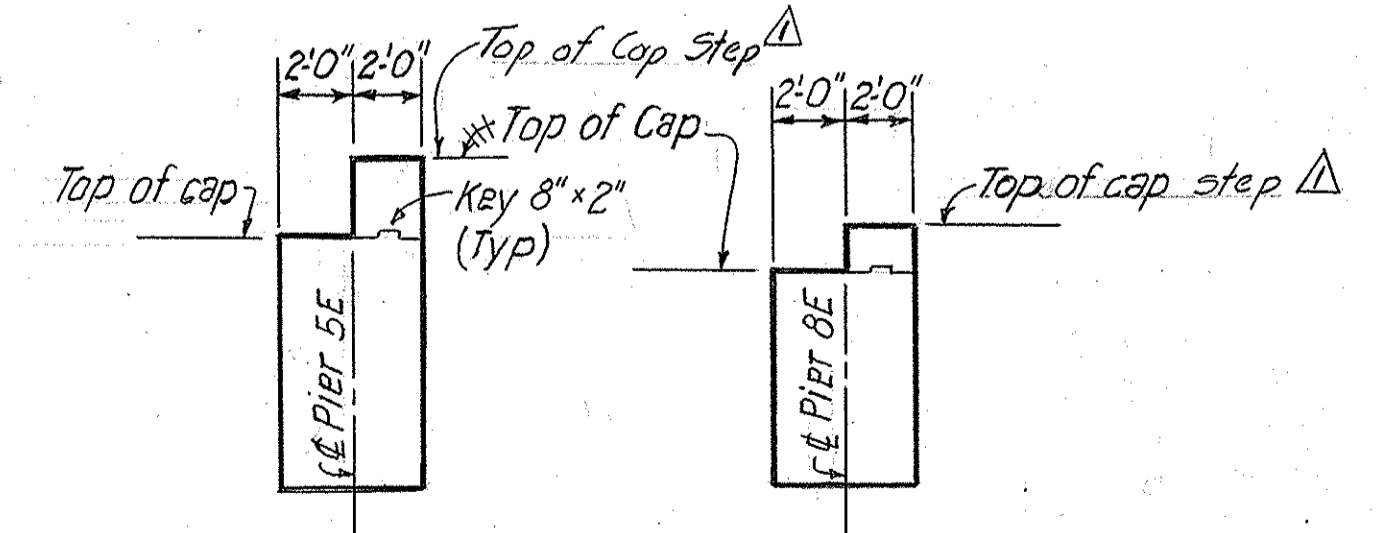
PROJECT No. 8.1355108
NEW HANOVER COUNTY
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
CAPE FEAR RIVER CROSSING
AT WILMINGTON
APPROACHES ON STRUCTURE
PIER CAP PLANS
PIERS 16W THROUGH 3E

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. ENGINEERS
NEW YORK
DATE: October 1967
SHEET NO. 9 OF 69

MADE BY: S. P. ...
CHECKED BY: M. C. ...



- NOTES:**
1. For General Notes, see Sheet No. 2.
 2. Anchor bolts are placed normal to stringer.
 3. For detail of anchor bolts see Sheet No. 13.

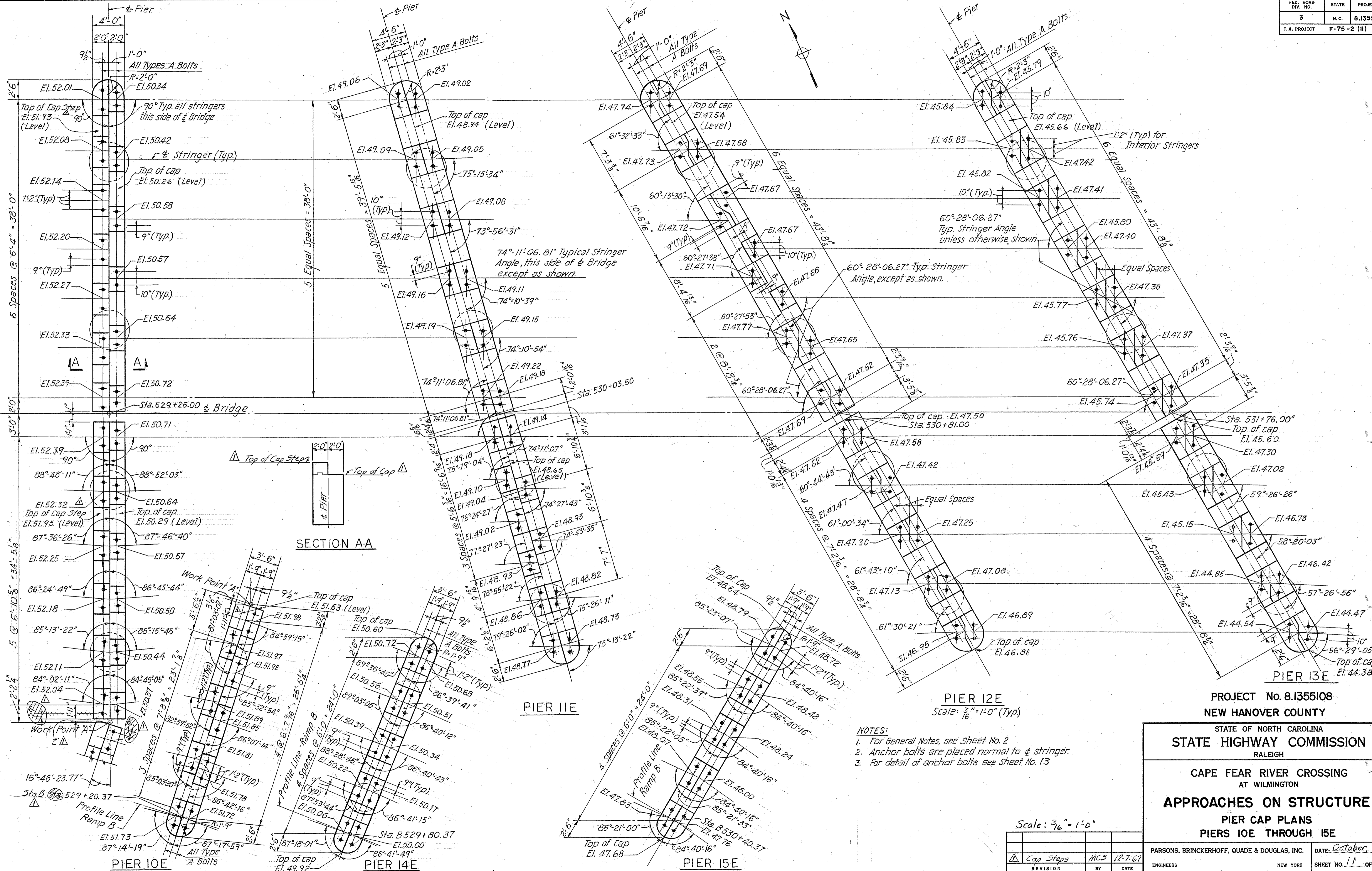


Note: For details of extra reinforcement in stepped caps see Sheet No. 13.

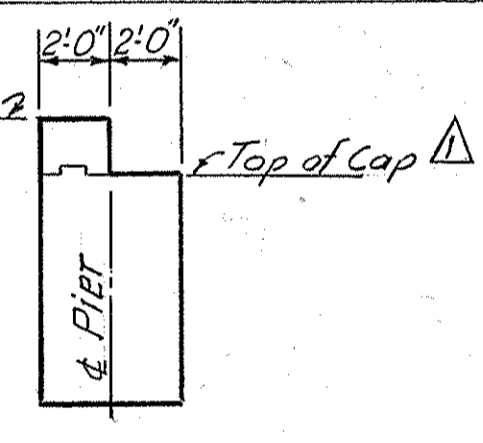
PROJECT No. 8.1355108
 NEW HANOVER COUNTY
 STATE OF NORTH CAROLINA
 STATE HIGHWAY COMMISSION
 RALEIGH
 CAPE FEAR RIVER CROSSING
 AT WILMINGTON
APPROACHES ON STRUCTURE
 PIER CAP PLANS
 PIERS 4E THROUGH 9E

REVISION	BY	DATE	PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC.	DATE: October, 1967
1	MCS	1-25-68	ENGINEERS	NEW YORK
2	MCS	12-7-67		SHEET No. 10 OF 69

IN CHARGE OF: M.C. [Signature]
 CHECKED BY: S.P. [Signature]



SECTION AA



- NOTES:
1. For General Notes, see Sheet No. 2
 2. Anchor bolts are placed normal to & stringer.
 3. For detail of anchor bolts see Sheet No. 13

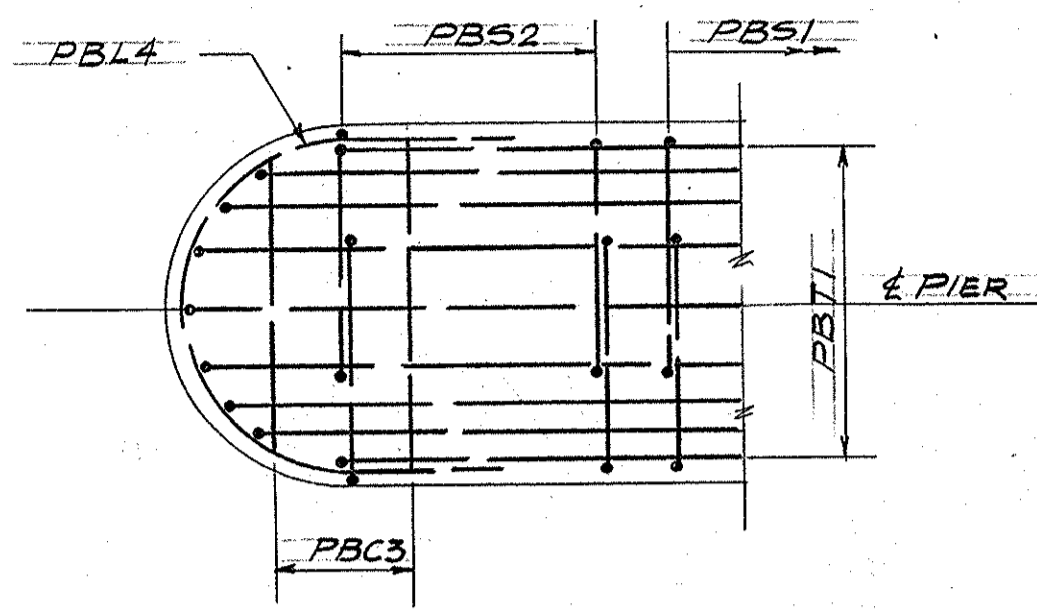
Scale: 3/16" = 1'-0"

REVISION	BY	DATE
Cap Steps	MCS	12-7-67

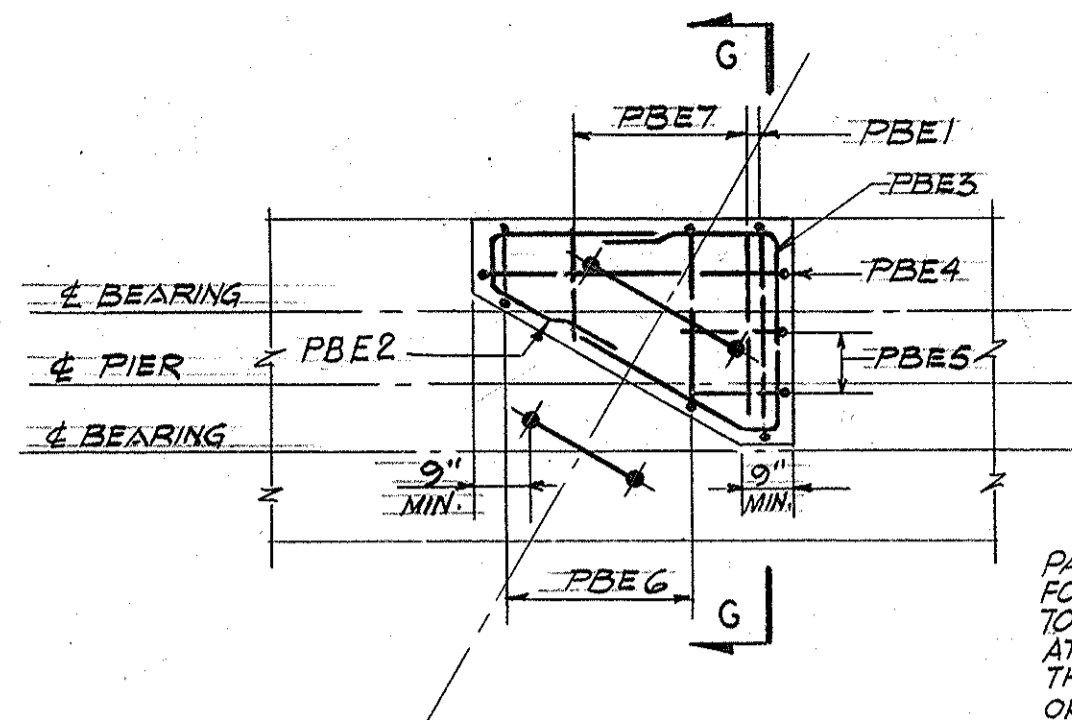
PROJECT No. 8.1355108
 NEW HANOVER COUNTY
 STATE OF NORTH CAROLINA
 STATE HIGHWAY COMMISSION
 RALEIGH
 CAPE FEAR RIVER CROSSING
 AT WILMINGTON
 APPROACHES ON STRUCTURE
 PIER CAP PLANS
 PIERS IOE THROUGH I3E

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. DATE: October, 1967
 ENGINEERS NEW YORK SHEET No. 11 OF 69

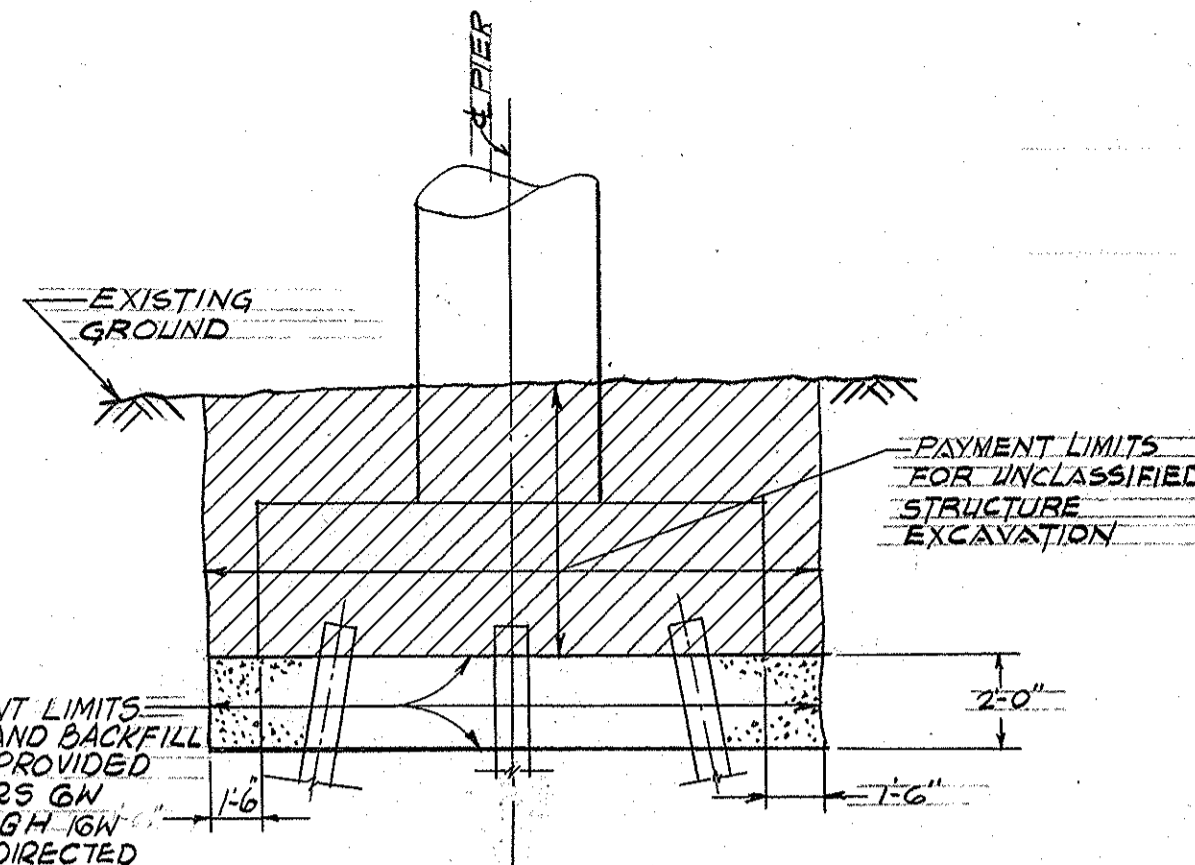
MADE BY: S. P. ...
 CHECKED BY: E. ...
 IN CHARGE OF: M. C. ...



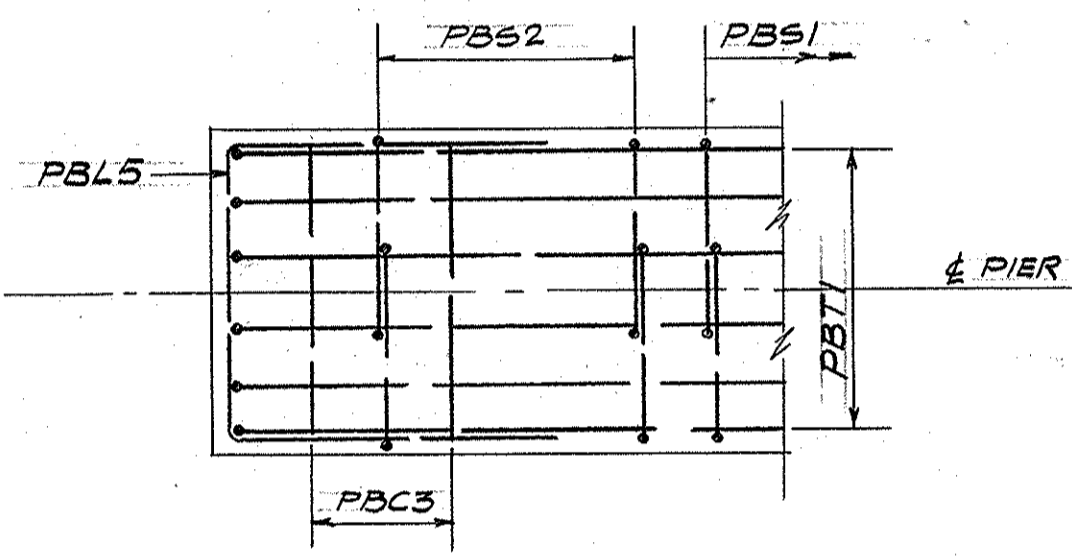
SECTION F-F
(FOR ROUND END)



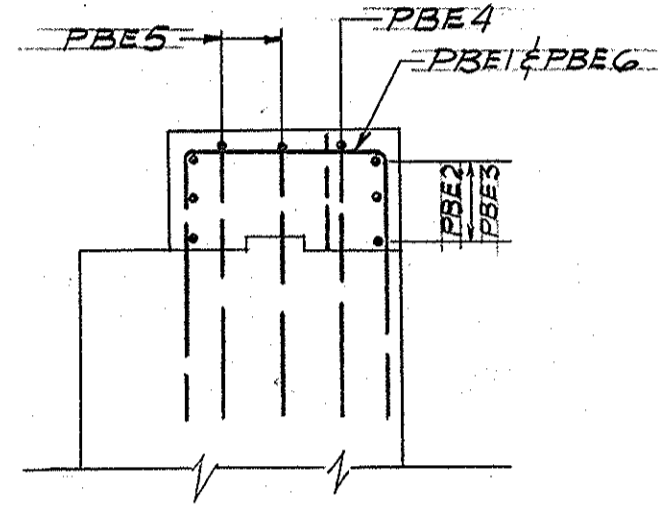
DETAIL OF PEDESTAL REINF. IN PIER 13E



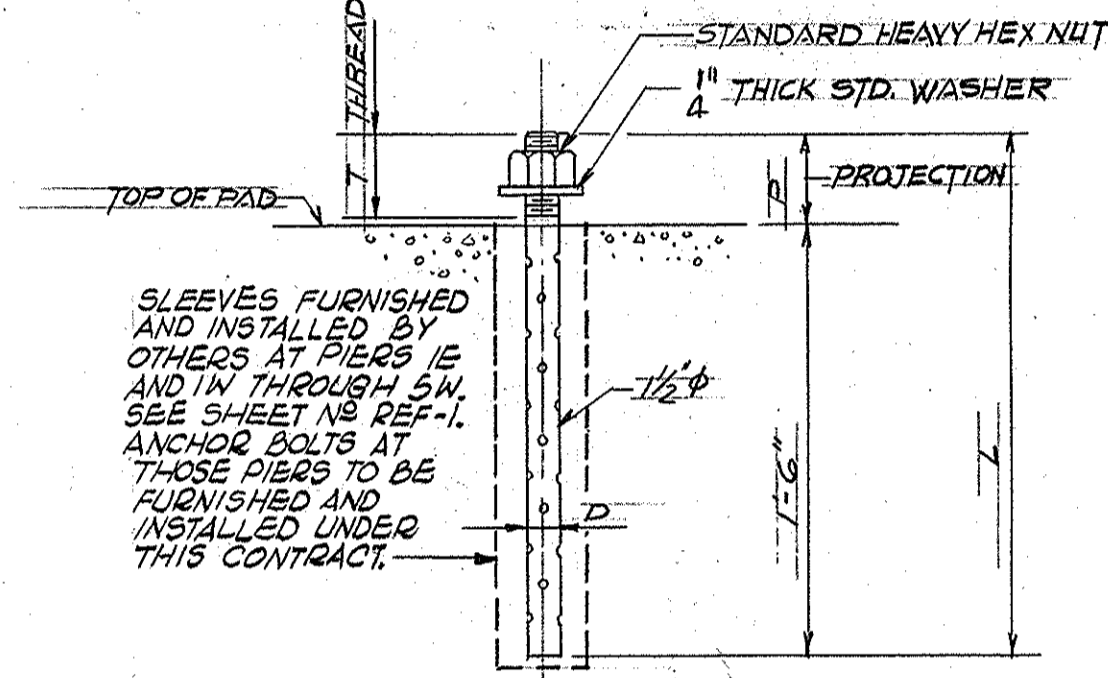
PAYMENT LIMITS FOR FOUNDATION EXCAVATION FOR ALL PIERS



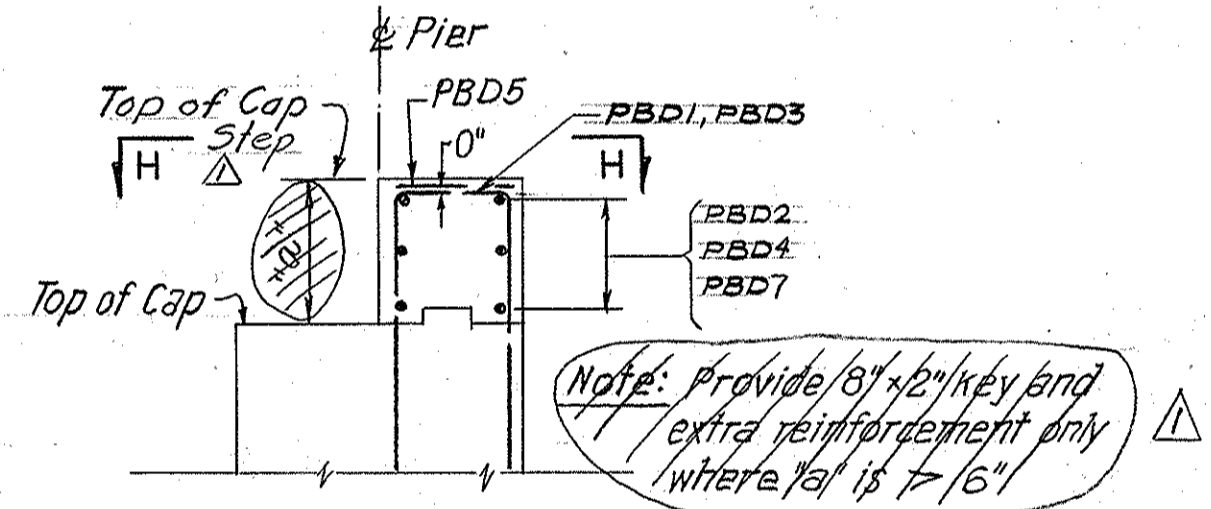
SECTION F-F
(FOR SQUARE END)



SECTION G-G



TYPICAL ANCHOR BOLT DETAIL



DETAIL OF EXTRA REINF. IN STEPPED CAPS

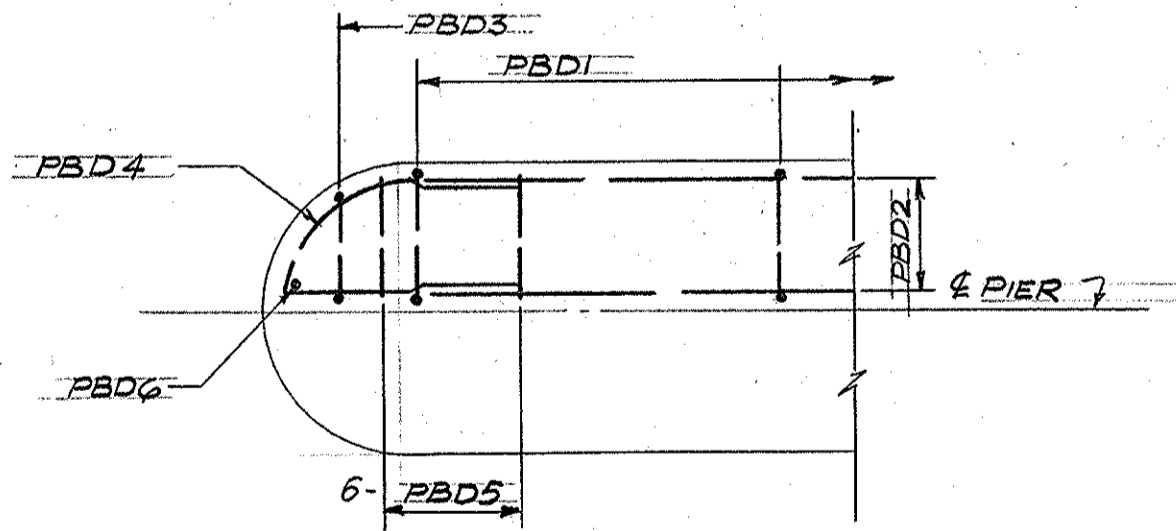
NOTE:
Holes for all anchor bolts except those on Piers 1E and 1W through 5W shall be formed by the insertion in the fresh concrete of oiled wooden plugs or metal pipe sleeves in accordance with Article 203-3.2 (g) of the Standard Specifications. The bolts shall be set accurately and fixed with portland cement grout completely filling the holes.

ANCHOR BOLT SCHEDULE						
TYPE	TYPE OF BEARING SHOE	D	T	P	L	NO REQ'D FOR EACH SHOE
A	TYPE III - E & F	1 1/2"	3 1/2"	4 1/2"	1'-10 1/2"	2
	TYPE IV - E & F	"	"	5"	1'-11"	
B	E1, E4A, E4B, F3A, BE-1, F3B	"	"	7 1/4"	2'-1 1/4"	4 (FOR E3A, F3B, E4A, E4B & BE-1)
	E2A, E2B, E2C, E3A, E3B, F1, E2A, F2B, F2C, F2D,	"	"	6 1/4"	2'-0 1/4"	2 (FOR OTHERS)
C	E5, F4	"	"	5 1/4"	1'-11 1/4"	2
D	BF-1	"	"	9 1/4"	2'-3 1/4"	4

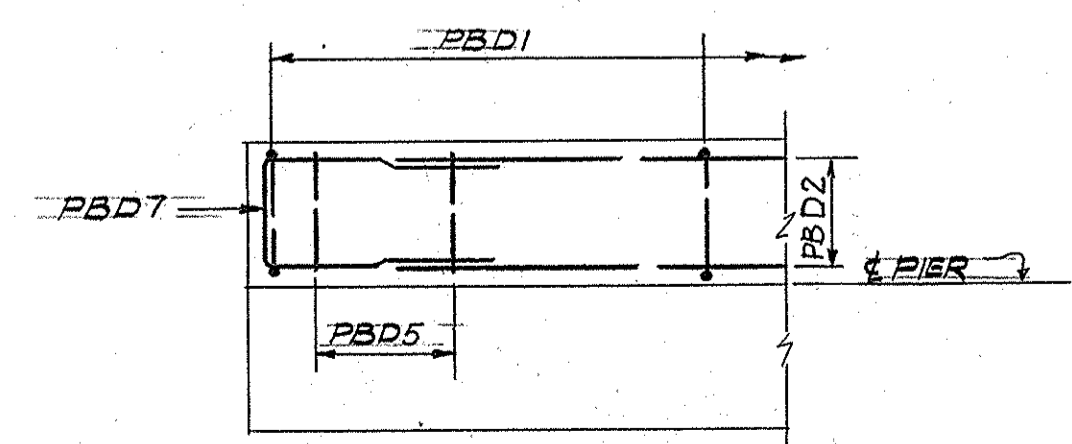
E = EXPANSION
F = FIXED

PIER NO.	POSITION RELATIVE TO BRIDGE	ELEV. U	DIMENSIONS (SEE SHEET NO. 12)										
			E	K	M	R	W	X	Y	T	I	D	L
16W	Symm.	-3.0	28'-6"	5'-0"	11'-3"	102'-0"	7'-0"	8'-0"	4'-0"	4'-6"	—	3'-6"	61'-0"
15W	"	-3.0	28'-6"	5'-0"	11'-3"	102'-0"	7'-0"	8'-0"	4'-0"	4'-6"	—	—	—
14W	"	-1.0	28'-6"	5'-0"	11'-3"	102'-0"	7'-0"	8'-0"	4'-0"	4'-6"	—	—	—
13W	"	-1.0	28'-6"	5'-0"	11'-3"	102'-0"	7'-0"	8'-0"	4'-0"	4'-6"	—	—	—
12W	"	-1.0	28'-6"	5'-0"	11'-3"	102'-0"	7'-0"	8'-0"	4'-0"	4'-6"	+	—	—
11W	"	-1.0	28'-6"	5'-0"	11'-3"	102'-0"	7'-0"	8'-0"	4'-0"	4'-6"	+	—	61'-0"
10W	"	-1.0	28'-7 1/8"	6'-0"	10'-9"	102'-8"	7'-0"	8'-0"	4'-0"	4'-6"	+	—	62'-1 1/8"
9W	"	-1.0	28'-7 1/8"	6'-0"	10'-9"	102'-8"	7'-0"	8'-0"	4'-0"	4'-6"	+	—	62'-1 1/8"
8W	"	-2.0	27'-6"	6'-0"	10'-9"	95'-0"	7'-0"	8'-0"	4'-0"	4'-6"	+	—	61'-0"
7W	"	-3.0	27'-6"	6'-0"	10'-9"	95'-0"	7'-0"	8'-0"	4'-0"	4'-6"	20'-0"	3'-6"	—
6W	"	-3.0	27'-6"	6'-0"	10'-9"	95'-0"	7'-0"	8'-0"	4'-0"	4'-6"	20'-0"	4'-0"	—
2E	"	-1.0	26'-0"	7'-0"	10'-6"	85'-0"	8'-0"	9'-0"	5'-0"	5'-6"	25'-0"	5'-0"	—
3E	"	1.0	26'-0"	7'-0"	10'-6"	85'-0"	8'-0"	9'-0"	5'-0"	5'-6"	23'-0"	5'-0"	61'-0"
4E	See Note A	5.0	32'-0"	7'-0"	10'-6"	128'-6"	8'-0"	9'-0"	5'-0"	5'-6"	—	5'-0"	67'-0"
5E	Left	15.0	16'-11"	5'-0"	8'-0"	36'-3"	6'-0"	7'-0"	4'-0"	4'-6"	—	4'-0"	42'-11"
	Right	15.0	14'-9"	5'-0"	6'-0"	27'-8"	6'-0"	7'-0"	4'-0"	4'-6"	—	4'-0"	36'-9"
6E & 7E	—	SEE SHEET No. 14											
8E	Left	11.0	16'-5"	5'-0"	8'-0"	34'-3"	6'-0"	7'-0"	4'-0"	4'-6"	+	4'-0"	42'-5"
	Right	11.0	17'-11"	5'-0"	8'-0"	40'-6"	6'-0"	7'-0"	4'-0"	4'-6"	+	—	43'-11"
9E	Left	10.0	16'-5"	5'-0"	8'-0"	34'-3"	6'-0"	7'-0"	4'-0"	5'-0"	—	—	42'-5"
	Right	10.0	23'-7 1/4"	5'-0"	10'-0"	70'-2"	6'-0"	7'-0"	4'-0"	5'-0"	+	—	53'-7 1/4"
10E	Left	16.0	16'-5"	5'-0"	8'-0"	34'-2"	6'-0"	7'-0"	4'-0"	4'-6"	—	—	42'-5"
	Right	16.0	16'-3 3/8"	5'-0"	6'-0"	33'-7"	6'-0"	7'-0"	4'-0"	4'-6"	—	4'-0"	38'-3 1/8"
11E	Ramp B	16.0	12'-11 1/4"	3'-6"	5'-6"	22'-0"	4'-0"	5'-0"	3'-0"	4'-6"	—	3'-6"	30'-11 1/4"
	Left	19.0	16'-4"	5'-0"	9'-0"	33'-9"	6'-0"	7'-0"	4'-0"	4'-6"	—	4'-6"	44'-4"
12E	Right	19.0	11'-5"	5'-0"	5'-6"	16'-10"	6'-0"	7'-0"	4'-0"	4'-6"	—	—	32'-5"
	Left	23.0	20'-6"	5'-0"	9'-0"	53'-0"	6'-0"	7'-0"	4'-0"	4'-6"	—	—	48'-6"
13E	Right	23.0	12'-7"	5'-0"	5'-6"	20'-3"	6'-0"	7'-0"	4'-0"	4'-6"	—	—	33'-7"
	Left	23.0	20'-6"	5'-0"	9'-0"	53'-0"	6'-0"	7'-0"	4'-0"	4'-6"	—	—	48'-6"
14E	Right	23.0	12'-7"	5'-0"	5'-6"	20'-3"	6'-0"	7'-0"	4'-0"	4'-6"	—	—	33'-7"
	Left	23.0	20'-6"	5'-0"	9'-0"	53'-0"	6'-0"	7'-0"	4'-0"	4'-6"	—	—	48'-6"
14E	Ramp B	27.0	11'-0"	3'-6"	5'-6"	15'-8"	4'-0"	5'-0"	3'-0"	4'-0"	—	3'-6"	29'-0"
15E	Ramp B	31.0	11'-0"	3'-6"	5'-6"	15'-8"	4'-0"	5'-0"	3'-0"	4'-0"	—	3'-6"	29'-0"

* - Looking up stations ("Left" is north side of \pm , "Right" is south side of \pm)
 Note A - Double-shafted pier not symm. about \pm Bridge. See Footing and Cap Plans.
 + Construction joints optional at mid-height of columns.
 - No construction joints required in columns.
 All details shown on this sheet are not to scale.



SECTION H-H



SECTION H-H
(FOR SQUARE END)

PROJECT No. 8.1355108
 NEW HANOVER COUNTY
 STATE OF NORTH CAROLINA
 STATE HIGHWAY COMMISSION
 RALEIGH
 CAPE FEAR RIVER CROSSING
 AT WILMINGTON
 APPROACHES ON STRUCTURE
 PIER GEOMETRY & TYPICAL DETAILS

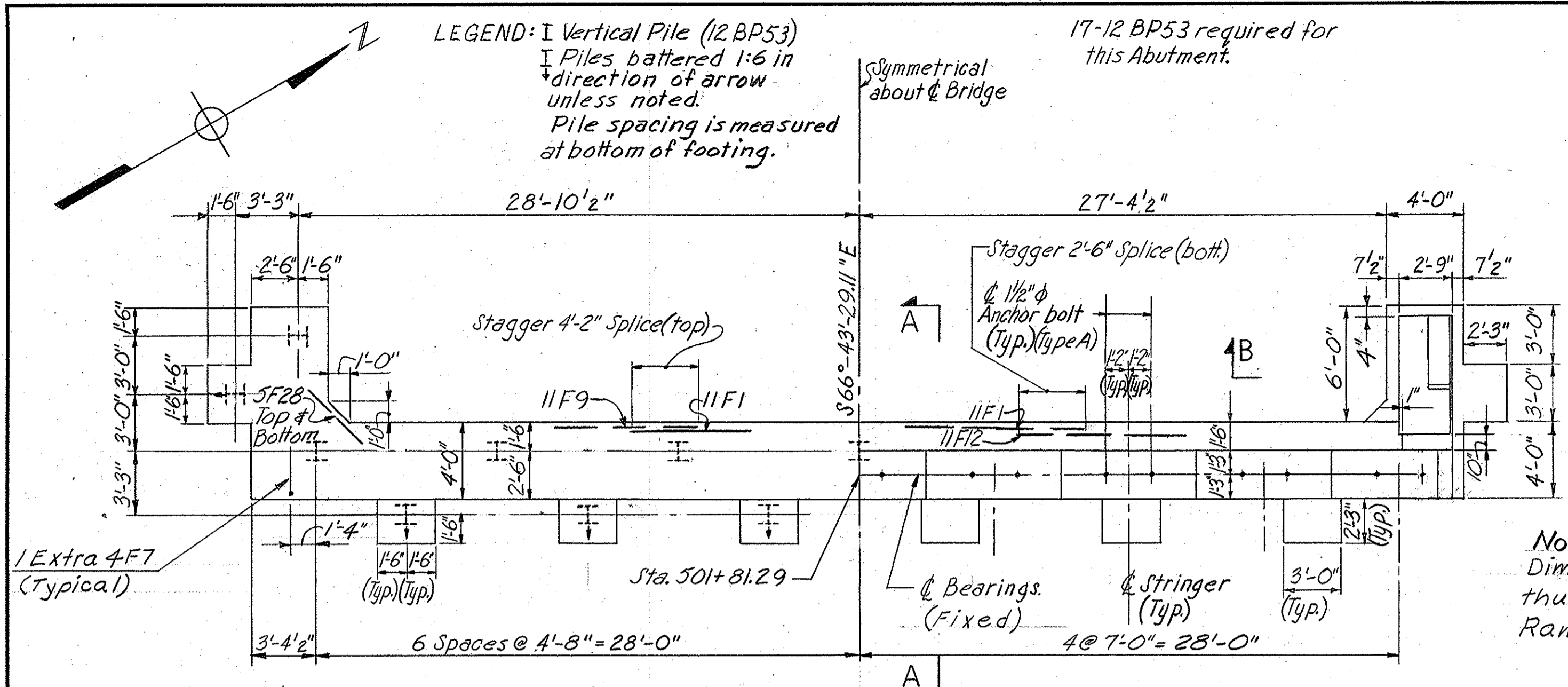
PARSONS, BRINCKERHOFF, QUAE & DOUGLAS, INC. DATE: October 1967
 ENGINEERS NEW YORK SHEET No. 13 OF 69

REVISION	BY	DATE
Cap Step Notes	MCS	12-7-67

MADE BY W. T.ovich
 CHECKED BY E. J. plan
 IN CHARGE OF M. C. plan

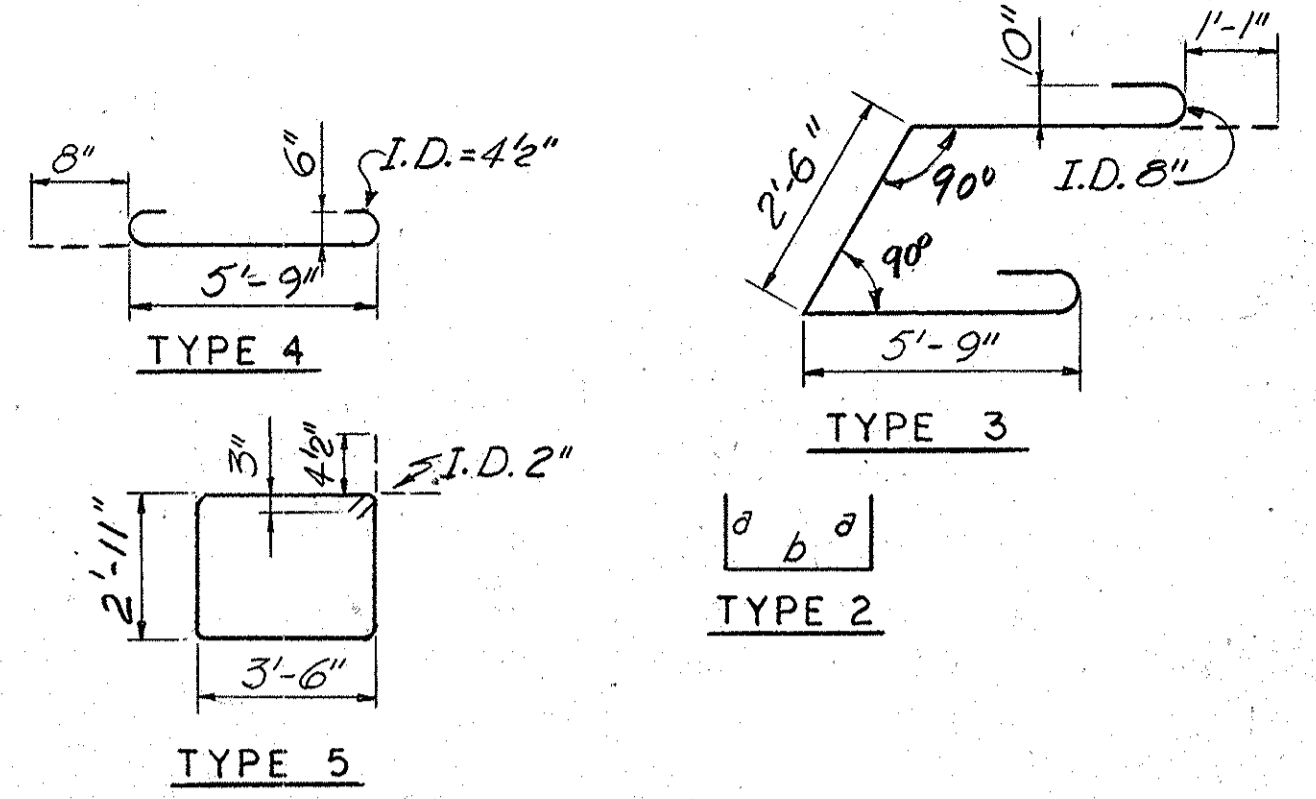
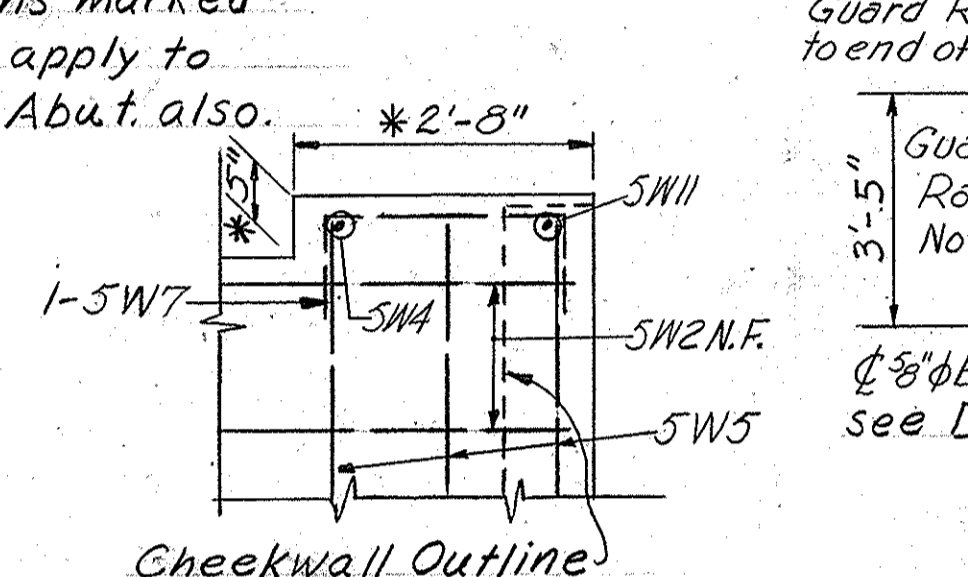
LEGEND: I Vertical Pile (2 BP53)
 I Piles battered 1:6 in direction of arrow unless noted.
 Pile spacing is measured at bottom of footing.

17-12 BP53 required for this Abutment.



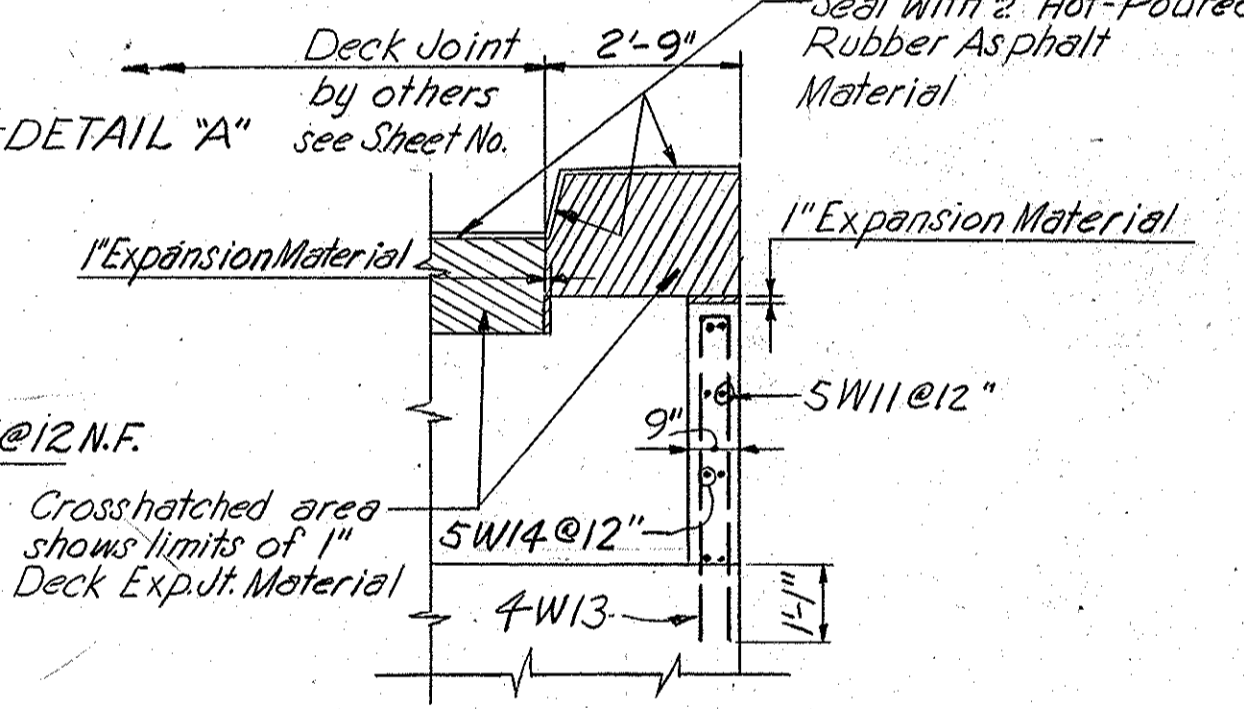
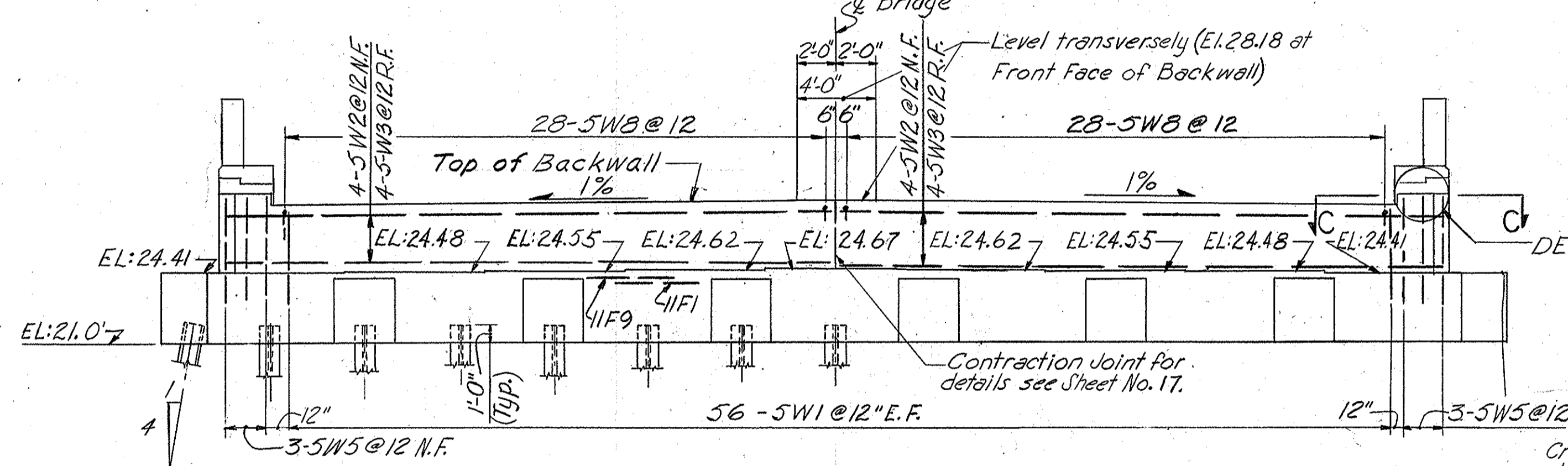
Note:
 Dimensions marked thus (*) apply to Ramp 'B' Abut. also.

SECTION C-C
 Scale: 3/4" = 1'-0"

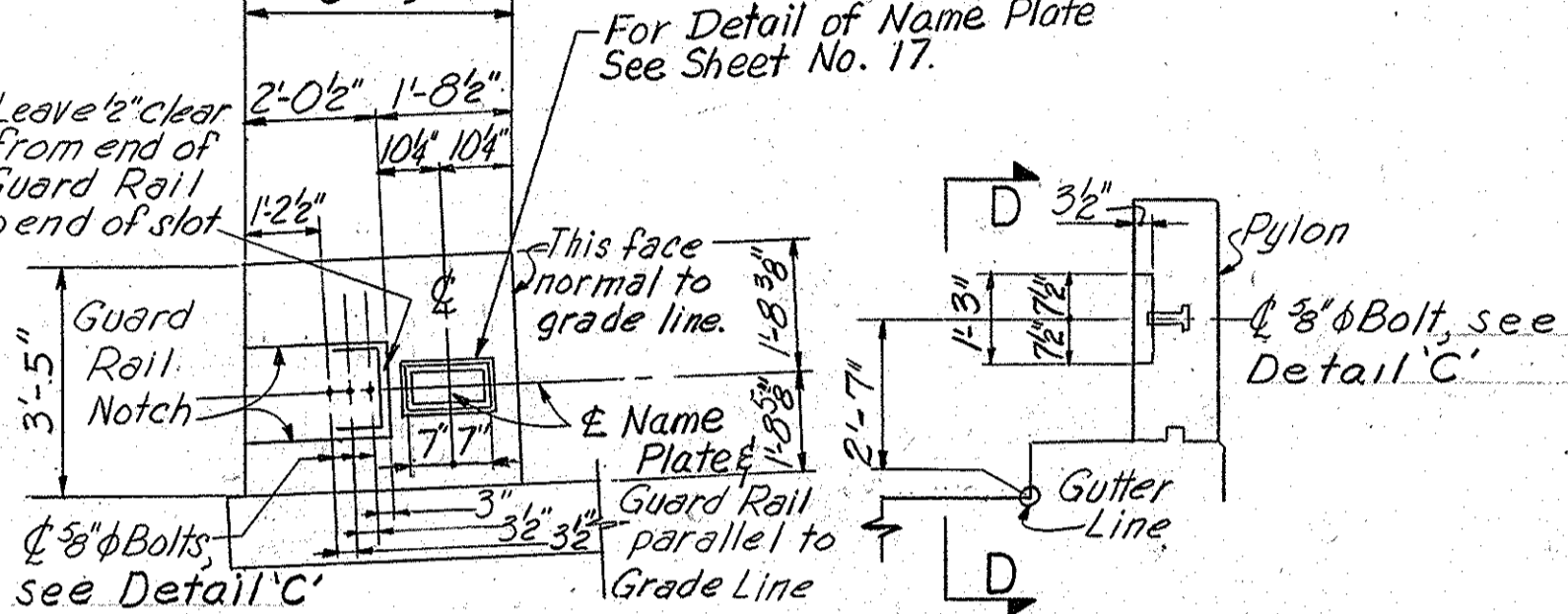


BAR SCHEDULE				
MARK	TOTAL LENGTH	TYPE	NO. REQ'D	REMARKS
5W1	5'-0"	Str.	112	
5W2	30'-5"	Str.	8	
5W3	29'-0"	Str.	8	
5W4	6'-10"	Str.	8	
5W5	5'-4"	Str.	6	
5W7	4'-6"	#2	2	a=14", b=2'-4"
5W8	3'-4"	#2	56	a=1'-1", b=1'-2"
5W9	6'-11"	Str.	28	
5W10	4'-6"	#2	14	a=14", b=2'-4"
5W11	9'-4"	Str.	8	
5W12	6'-0"	Str.	10	
4W13	10'-3"	#2	6	a=4'-11", b=5"
5W14	4'-0"	Str.	8	
8P1	14'-6"	#2	8	a=7'-0", b=6'-6"
5P2	3'-5"	Str.	16	
11F1	45'-0"	Str.	20	
6F2	32'-4"	Str.	8	
8F3	16'-2"	#3	8	
6F4	7'-1"	#4	40	
4F5	3'-6"	Str.	36	
4F6	3'-8"	Str.	8	
4F7	13'-7"	#5	60	
5F8	9'-6"	Str.	24	
11F9	2'-5"	Str.	8	
4F10	6'-6"	Str.	8	
5F28	4'-0"	Str.	4	
4F32	6'-2"	#2	13	a=1'-4", b=3'-6"
11F12	19'-9"	Str.	12	

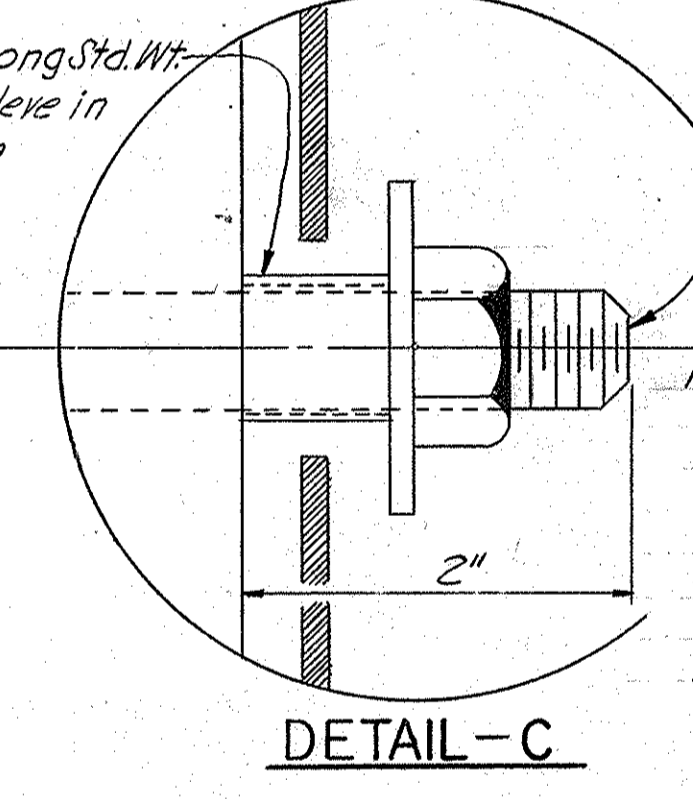
LEGEND:
 5W1; 5-Bar Size W1-Bar Mark
 All dimensions are out to out of bar.
 R.F. = Rear Face. N.F. = Near Face.
 E.F. = Each Face.



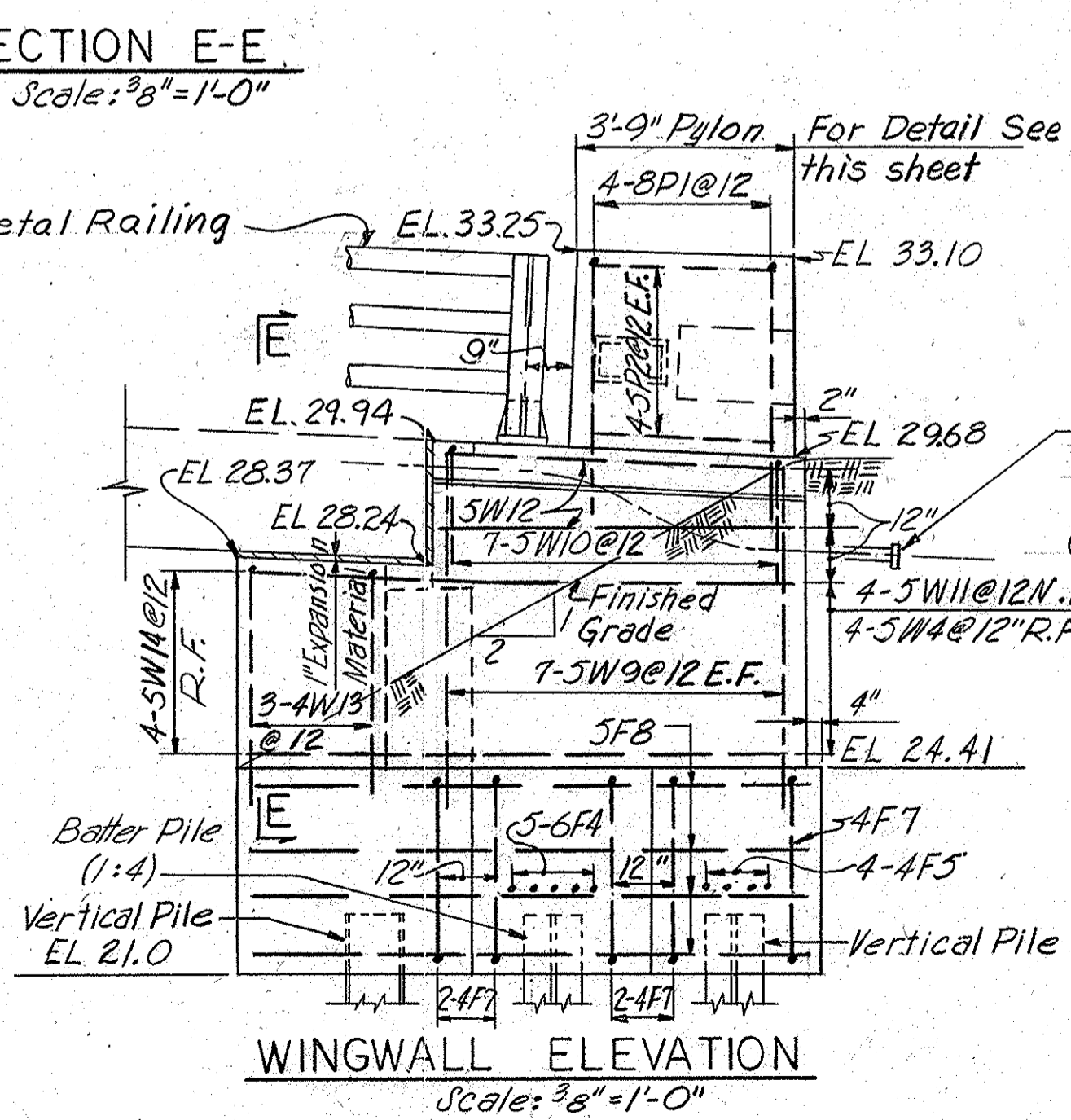
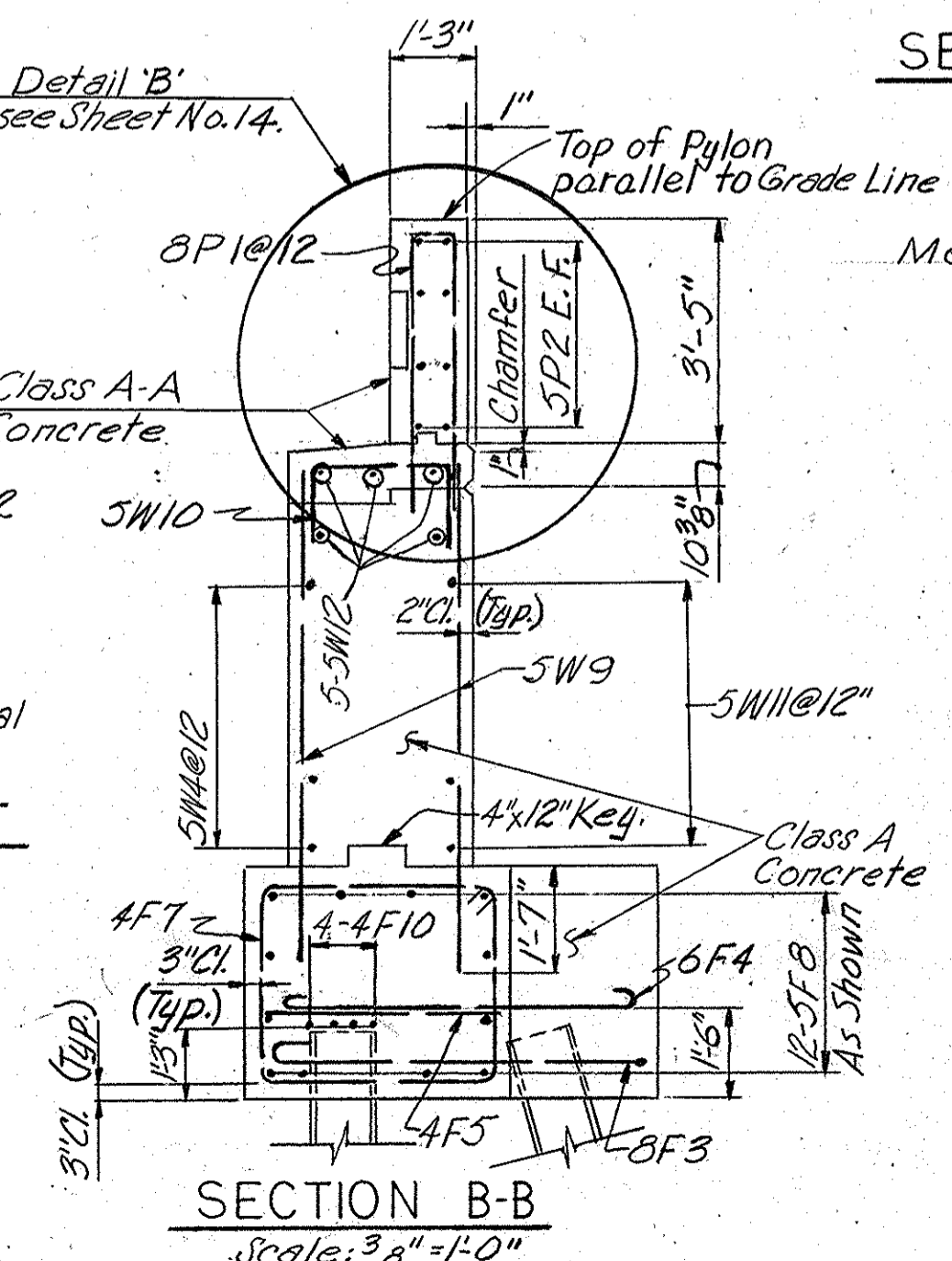
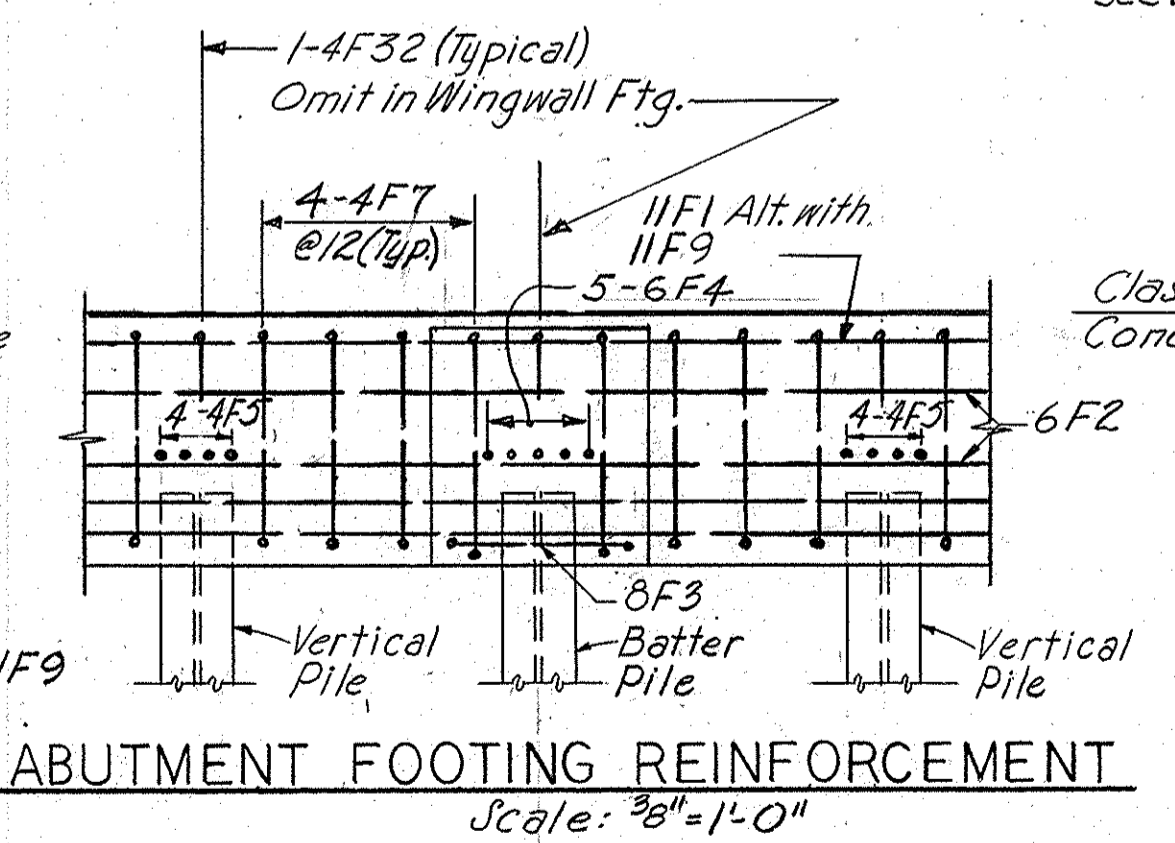
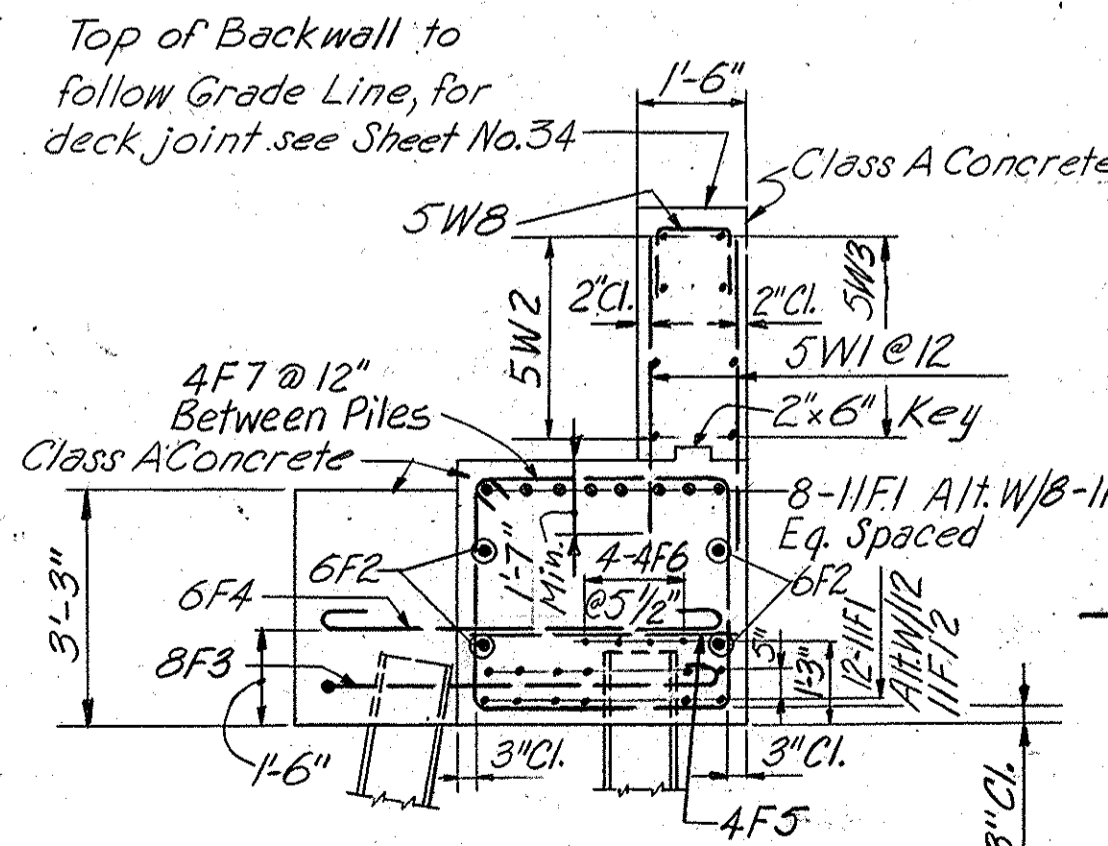
ELEVATION D-D
 Scale: 3/8" = 1'-0"



END ELEVATION
 Scale: 3/8" = 1'-0"



Note:
 Cost of Guard Rail Anchor Bolts complete in place shall be included in the unit contract price bid for Class A-A Concrete.
 Nuts, Bolts & Washers are to conform to the requirements of A.S.T.M. A-307 and are to be galvanized to conform to the requirements of A.S.T.M. A-153.



- NOTES:
- For General Notes See Sheet No. 2
 - For Metal Railing Details see Sh. No. 40, for Metal Railing Post Spacing see Sh. No. 18.
 - For Pile Point Details See Sheet No. 8.
 - Contractor will be required to excavate through the fill to bottom of the footing before driving piles.

PROJECT No. 8.1355108
 NEW HANOVER COUNTY
 STATE OF NORTH CAROLINA
 STATE HIGHWAY COMMISSION
 RALEIGH
 CAPE FEAR RIVER CROSSING
 AT WILMINGTON
 APPROACHES ON STRUCTURE
 WEST ABUTMENT

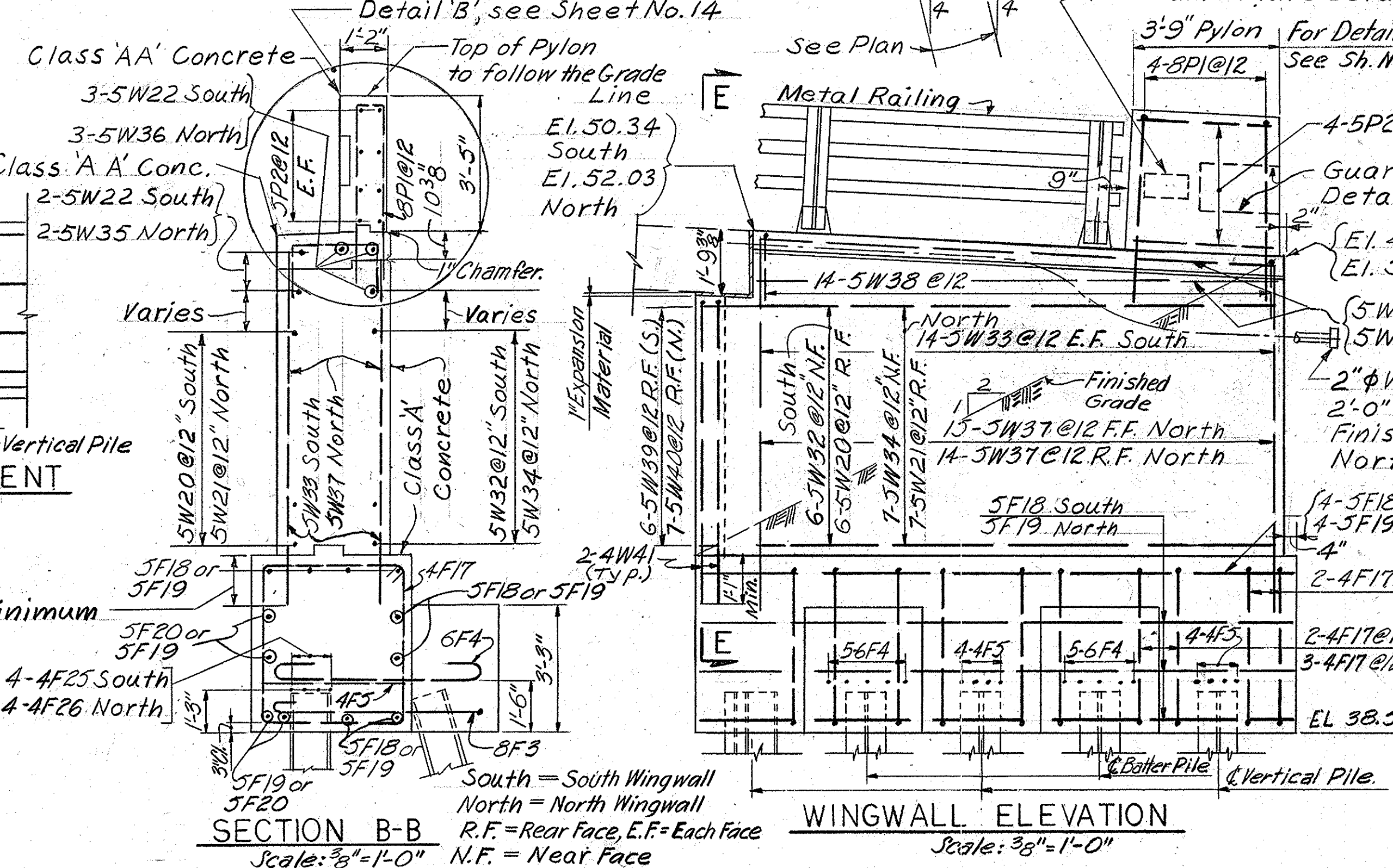
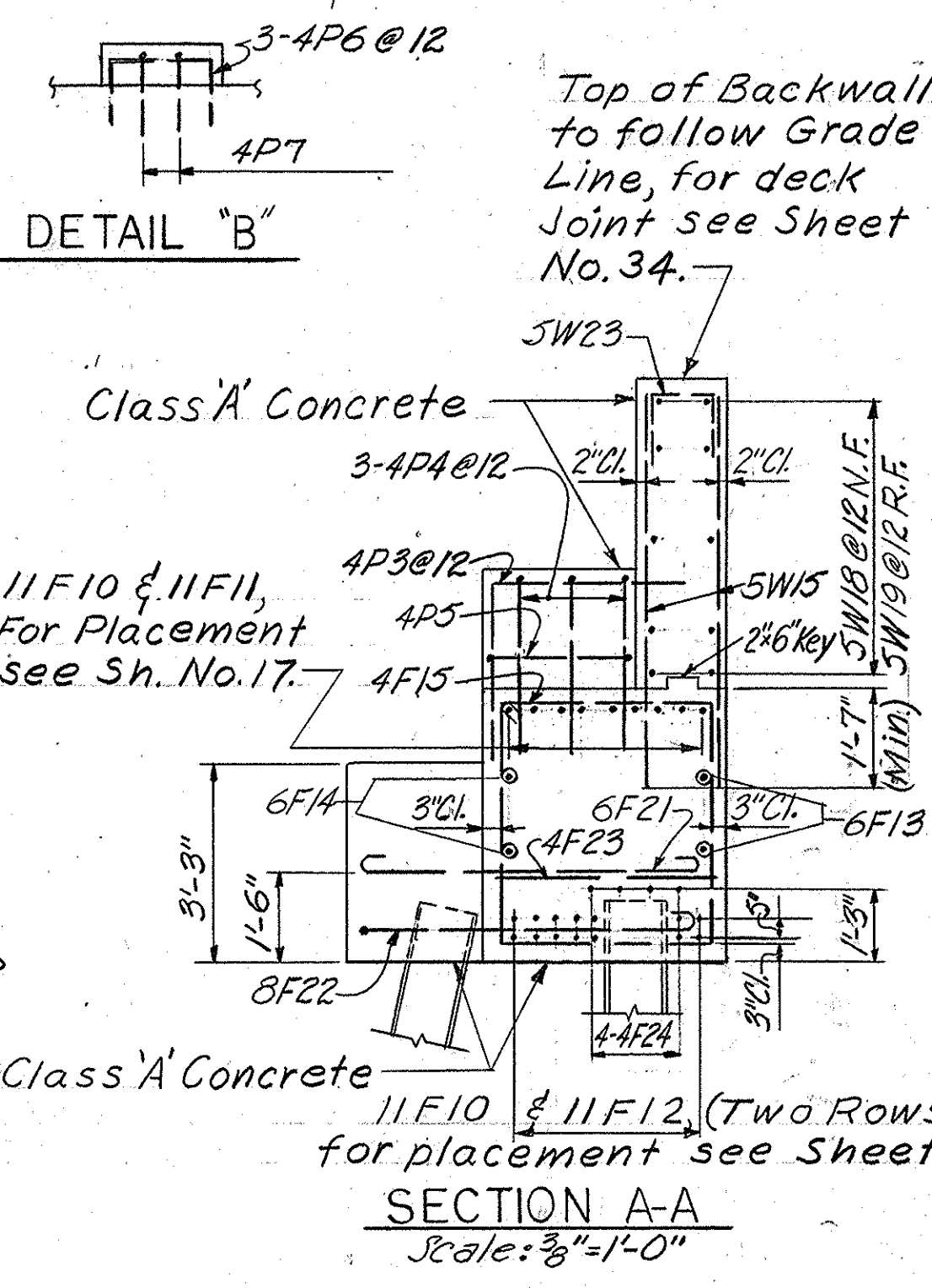
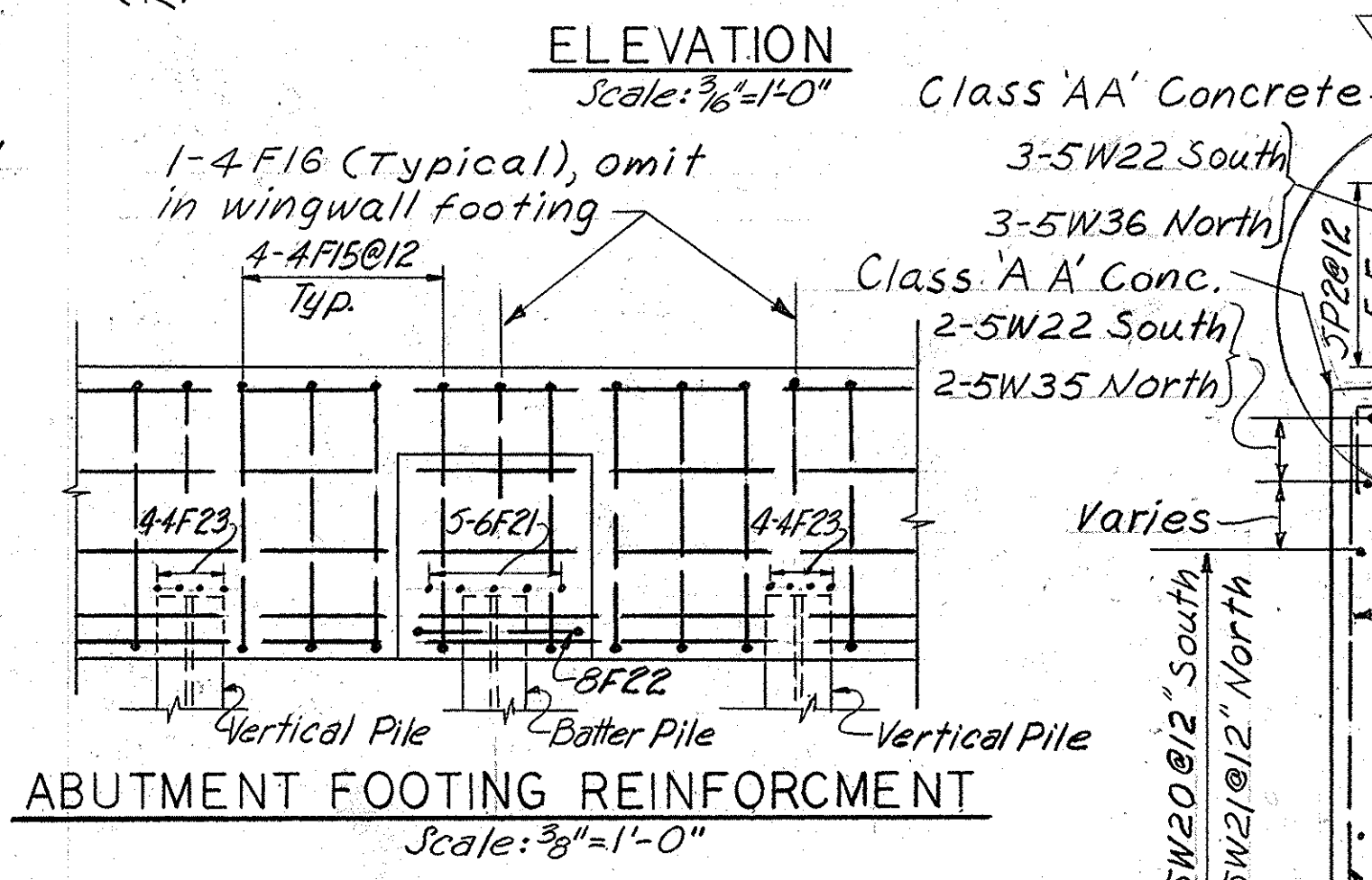
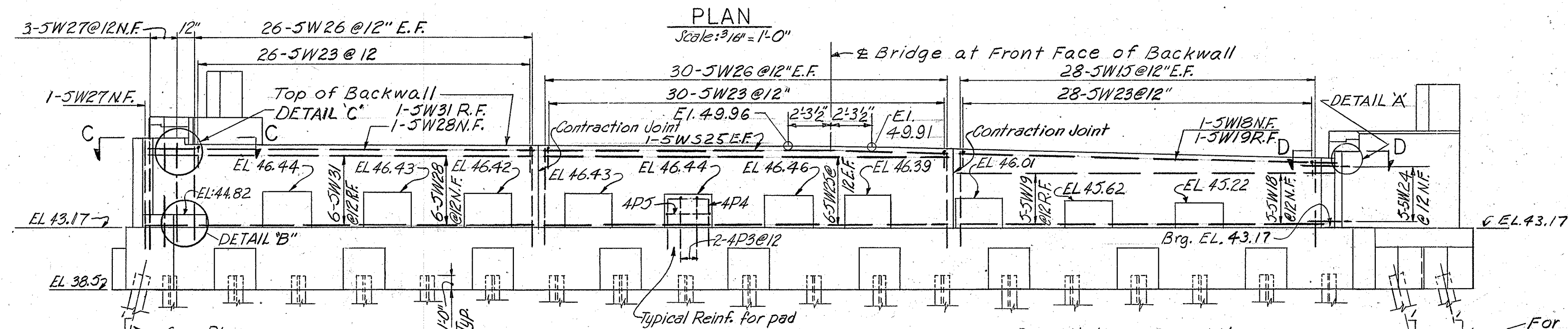
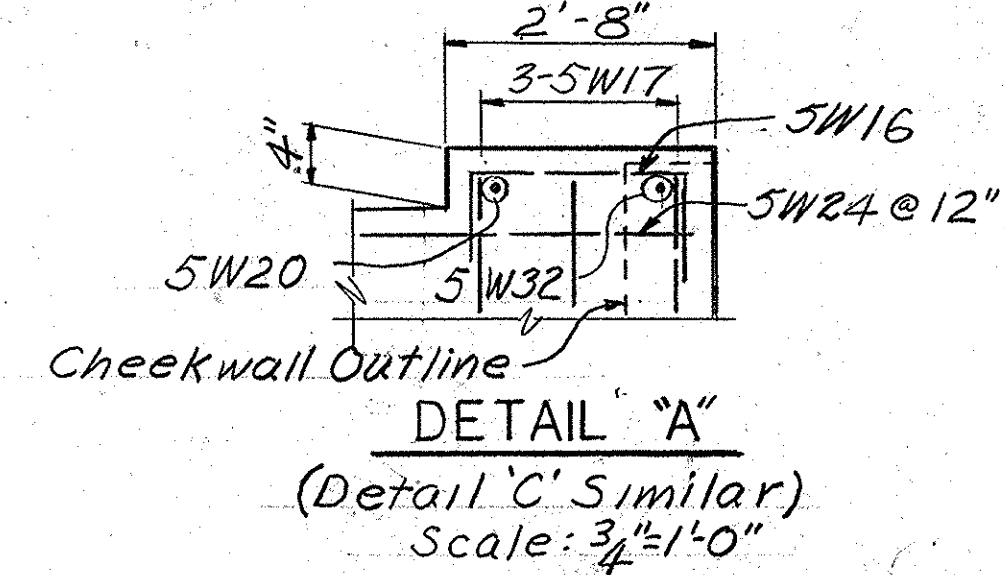
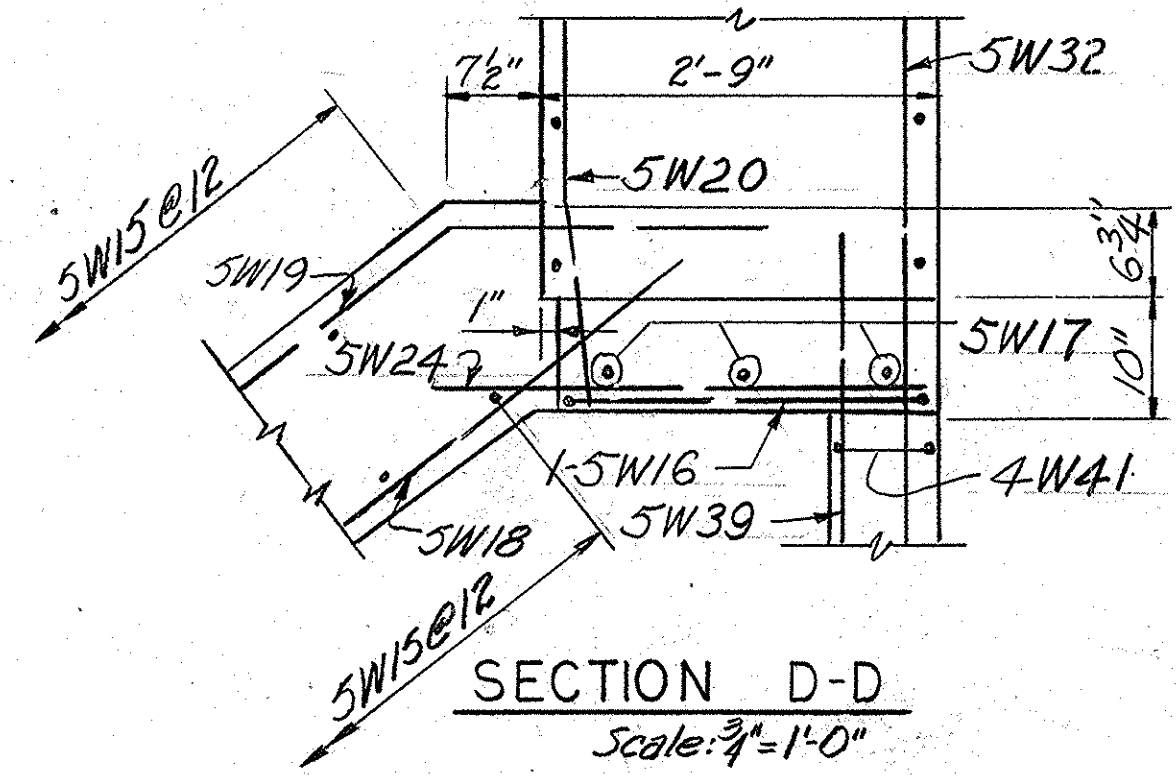
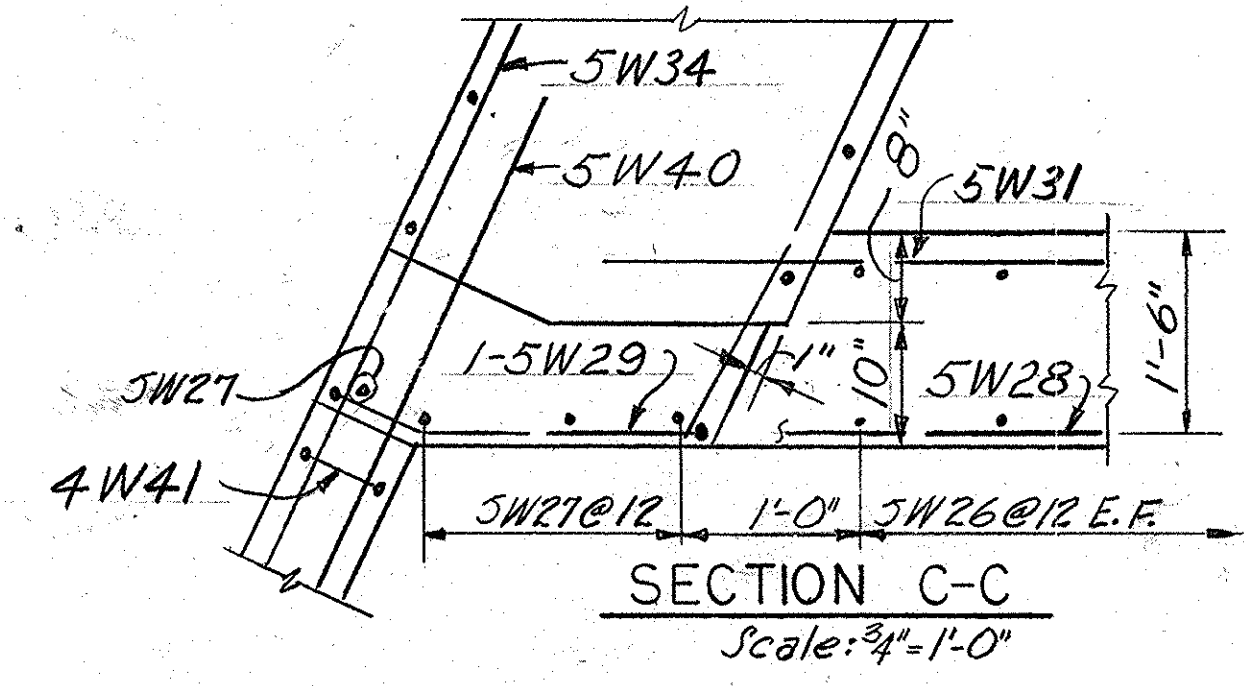
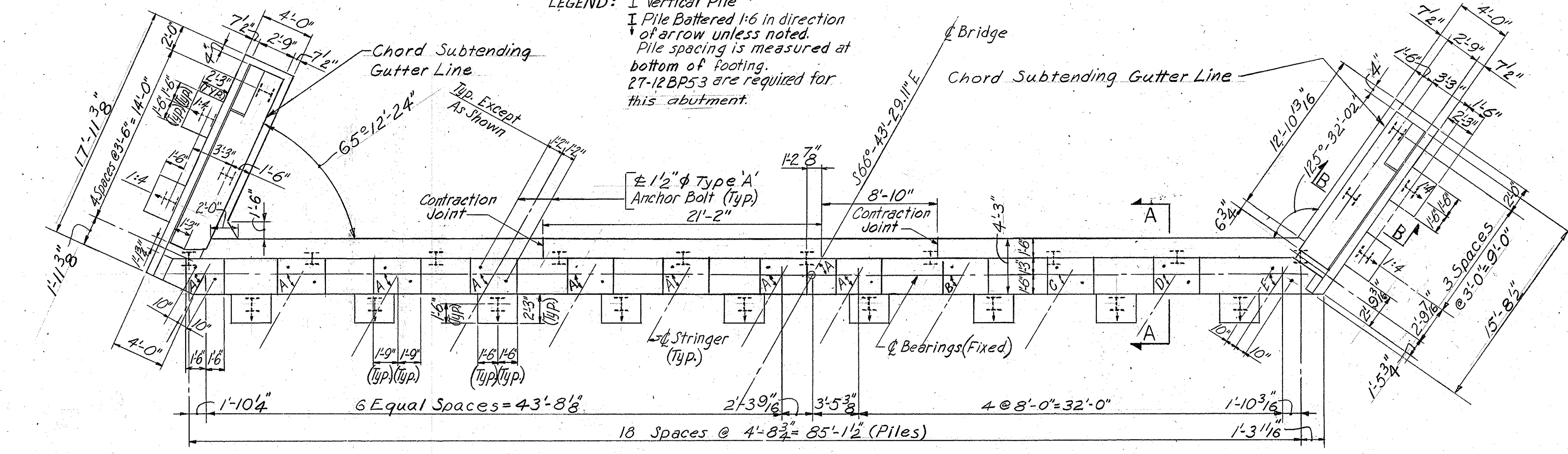
PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. DATE: October, 1967
 ENGINEERS NEW YORK SHEET No. 15 OF 69

REVISION	BY	DATE

IN CHARGE OF: M.C. [Signature]
 CHECKED BY: [Signature]

ANGLE	A	B	C	D	E
	60°28'-06.3"	59°26'-26.2"	58°26'-02.8"	57°26'-56.1"	56°29'-05.4"

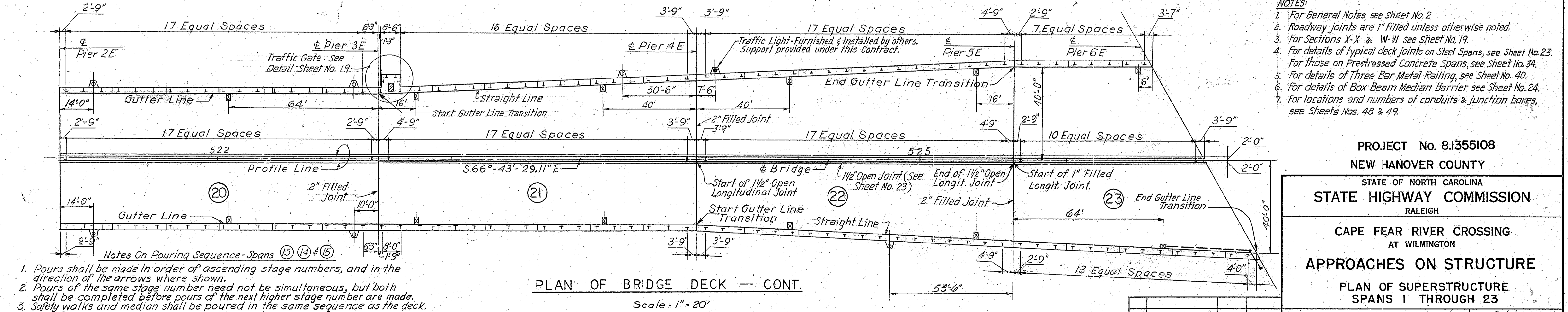
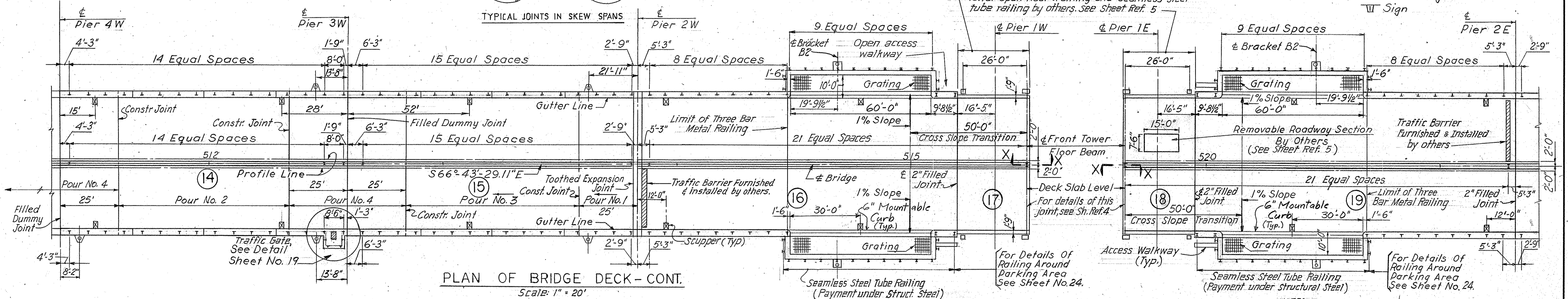
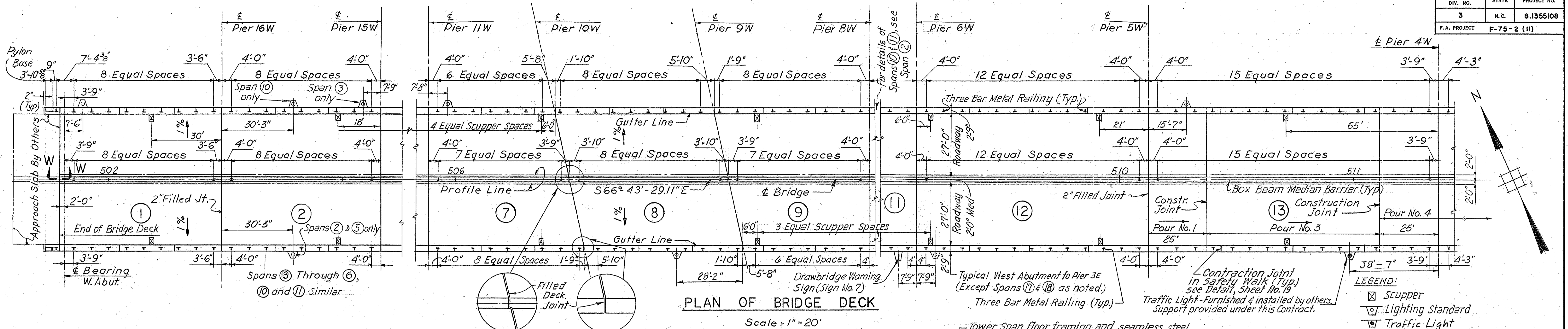
LEGEND: I Vertical Pile
 I Pile Battered 1:6 in direction of arrow unless noted.
 Pile spacing is measured at bottom of footing.
 27-12BP53 are required for this abutment.



- NOTES:
1. For General Notes see Sh. No. 2
 2. For Section E-E see Sh. No. 15
 3. For Metal Railing Details see Sh. No. 4.0, for Metal Railing Post Spacing see Sh. No. 19.
 4. For Pile Point Details see Sh. No. 3.
 5. For Reinforcement Detail in Footing Corners see Sh. No. 17
 6. For Anchor Bolt Details see Sh. No. 13.
 7. Contractor will be required to excavate through the fill to bottom of the footing before driving piles.

PROJECT No. 8.1355108
 NEW HANOVER COUNTY
 STATE OF NORTH CAROLINA
 STATE HIGHWAY COMMISSION
 RALEIGH
 CAPE FEAR RIVER CROSSING
 AT WILMINGTON
 APPROACHES ON STRUCTURE
 EAST ABUTMENT
 PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. DATE: October 1967
 ENGINEERS NEW YORK SHEET NO. 16 OF 69

MADE BY: [Signature]
 CHECKED BY: [Signature]
 IN CHARGE OF: M.C. [Signature]



- LEGEND:**
- ☒ Scupper
 - ☐ Lighting Standard
 - ☐ Traffic Light
 - ☐ Sign

- NOTES:**
1. For General Notes see Sheet No. 2
 2. Roadway joints are 1" filled unless otherwise noted.
 3. For Sections X-X & W-W see Sheet No. 19.
 4. For details of typical deck joints on Steel Spans, see Sheet No. 23. For those on Prestressed Concrete Spans, see Sheet No. 34.
 5. For details of Three Bar Metal Railing, see Sheet No. 40.
 6. For details of Box Beam Median Barrier see Sheet No. 24.
 7. For locations and numbers of conduits & junction boxes, see Sheets Nos. 48 & 49.

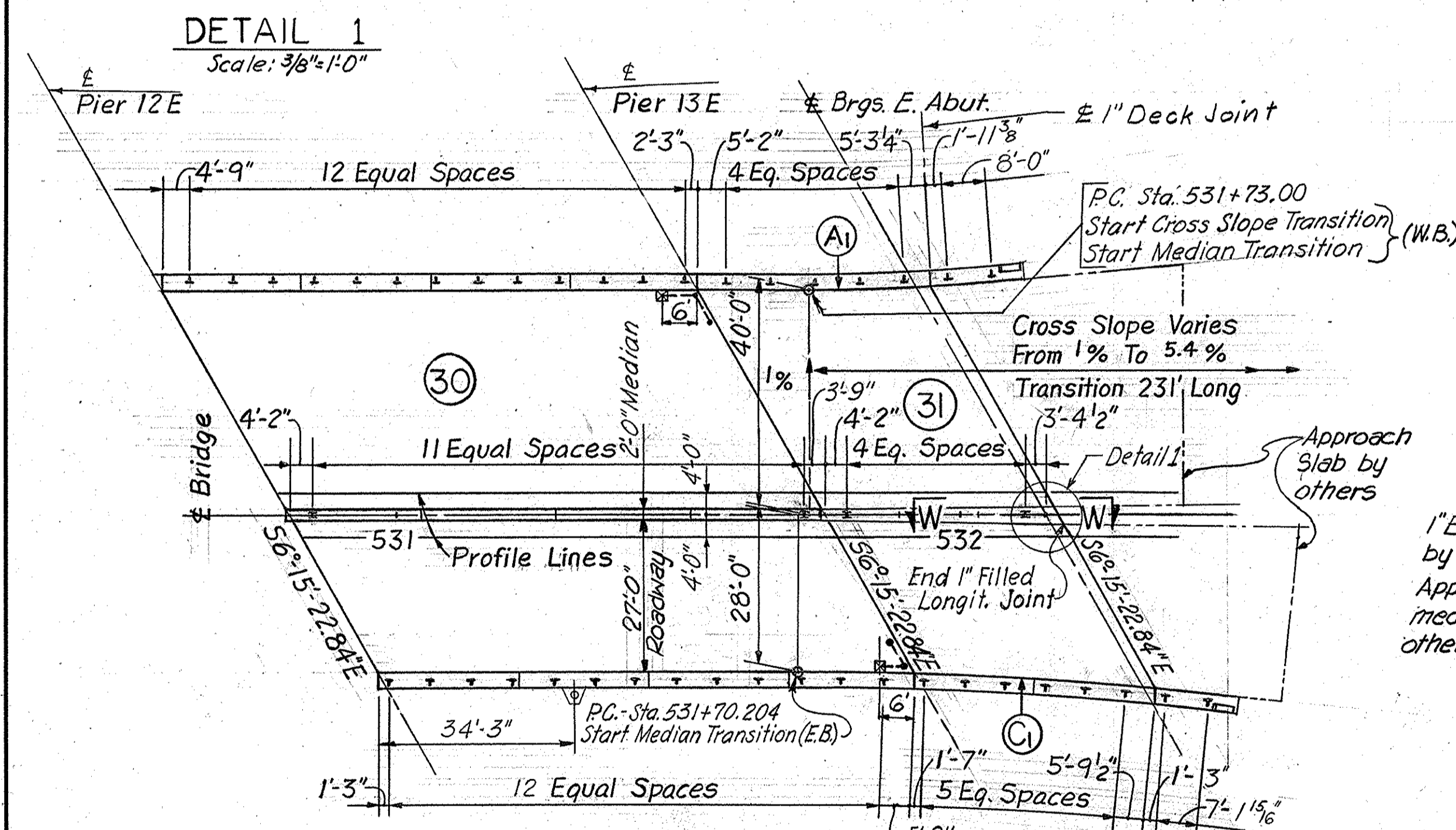
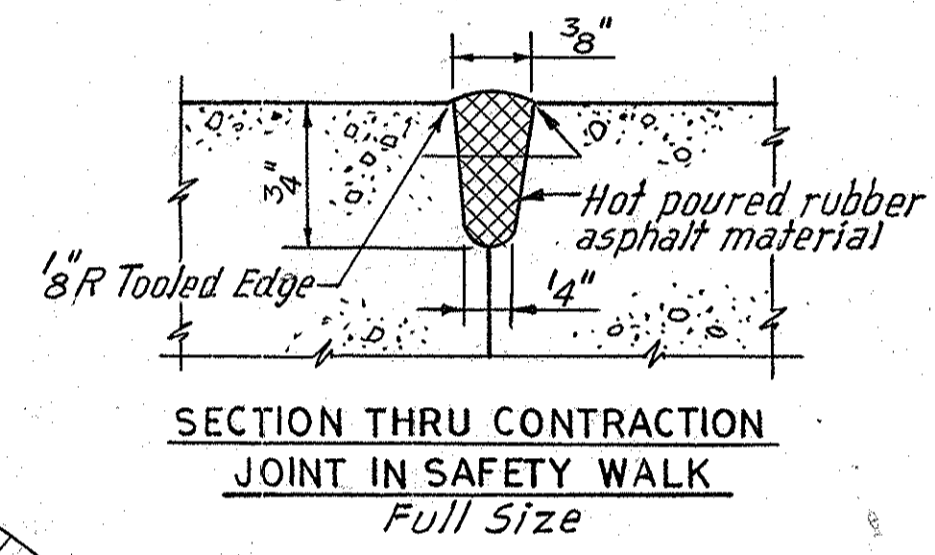
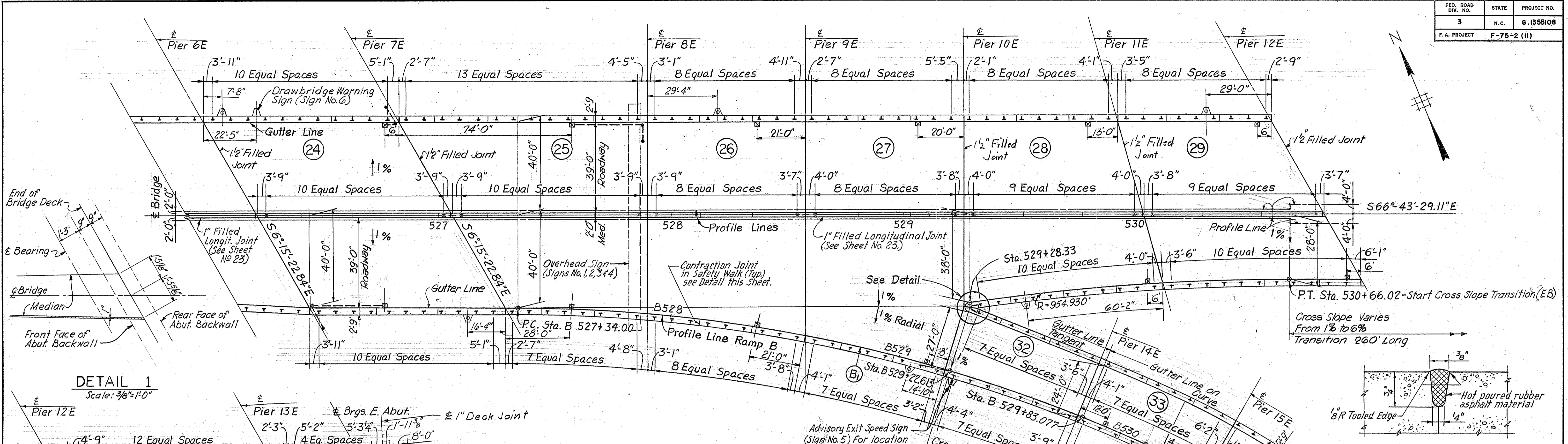
- Notes On Pouring Sequence - Spans (13), (14) & (15)**
1. Pours shall be made in order of ascending stage numbers, and in the direction of the arrows where shown.
 2. Pours of the same stage number need not be simultaneous, but both shall be completed before pours of the next higher stage number are made.
 3. Safety walks and median shall be poured in the same sequence as the deck.

PROJECT No. 8.1355108
NEW HANOVER COUNTY
 STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
 RALEIGH
CAPE FEAR RIVER CROSSING
 AT WILMINGTON
APPROACHES ON STRUCTURE
PLAN OF SUPERSTRUCTURE
SPANS 1 THROUGH 23

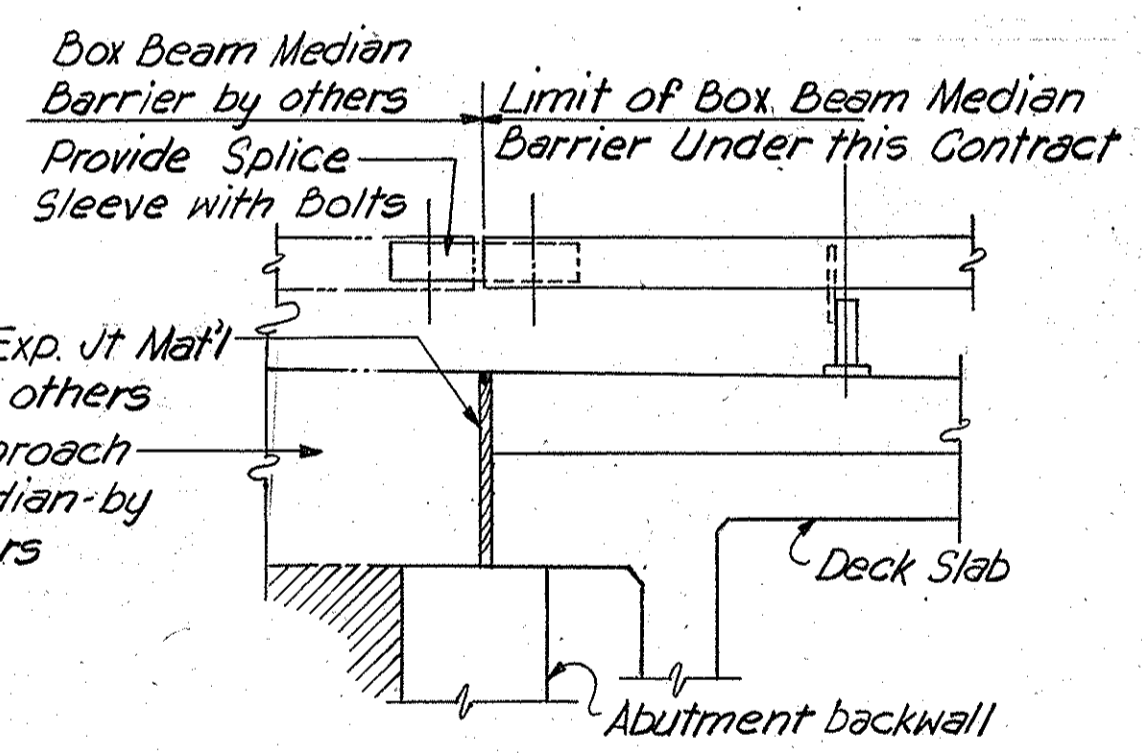
PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. DATE: October 1967
 ENGINEERS NEW YORK SHEET NO. 18 OF 69

REVISION	BY	DATE

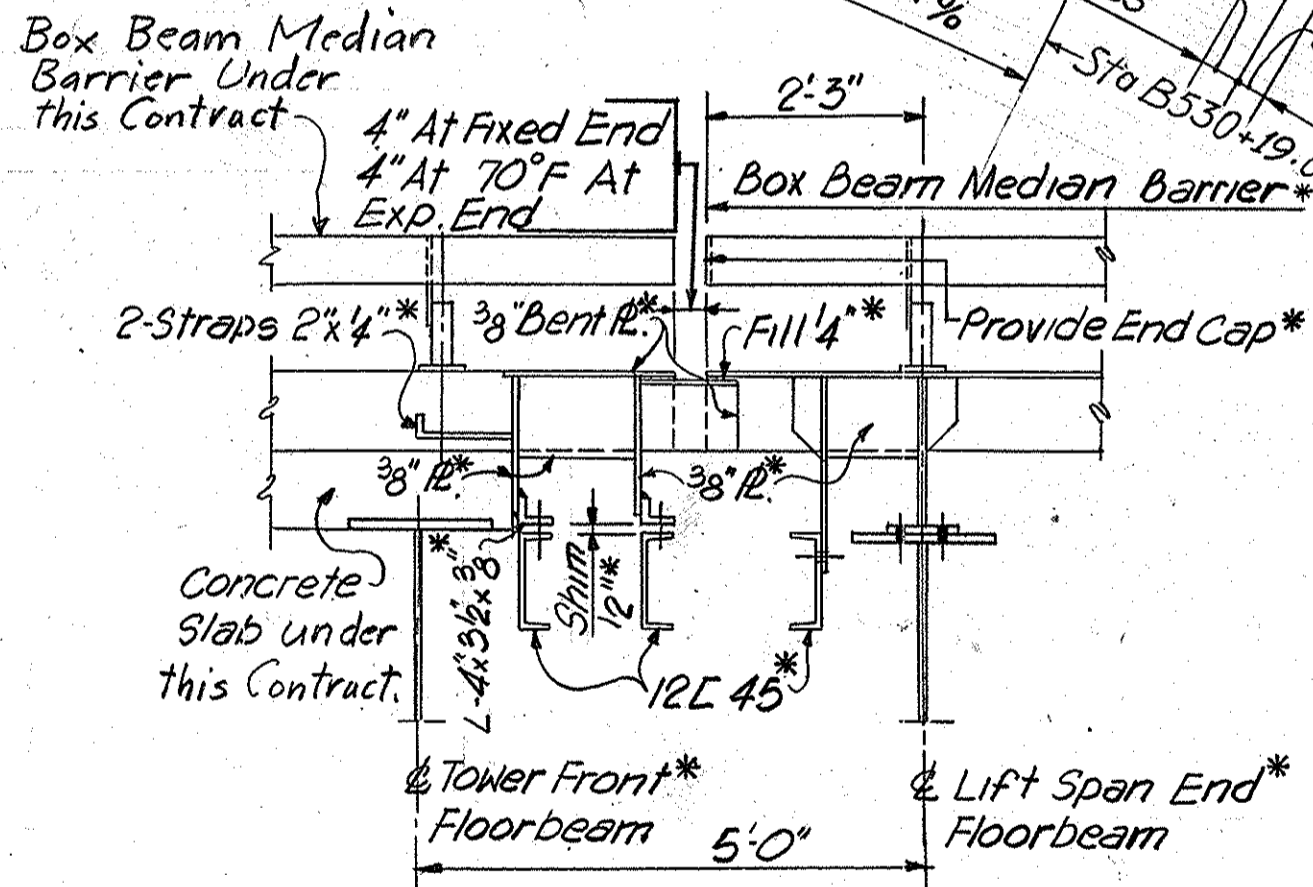
MADE BY: J. Starnes
 CHECKED BY: Robert B. Long



PLAN OF BRIDGE DECK
Scale: 1" = 20"

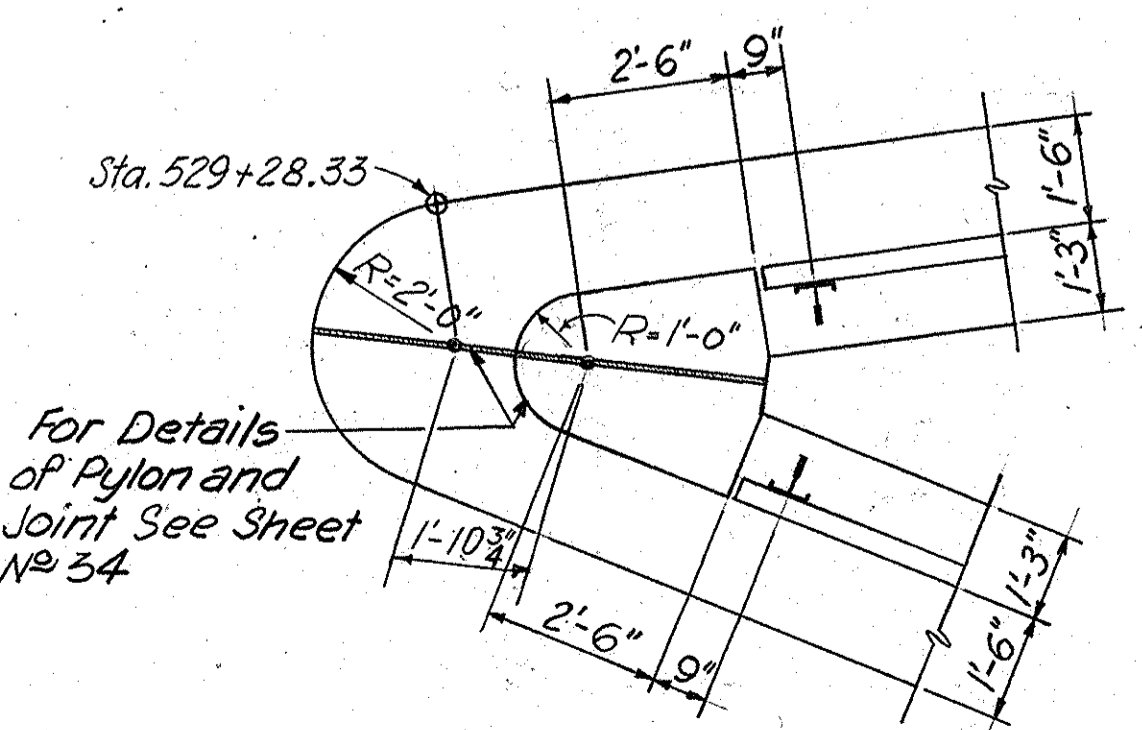


SECTION W-W
Scale: 1/2" = 1'-0"

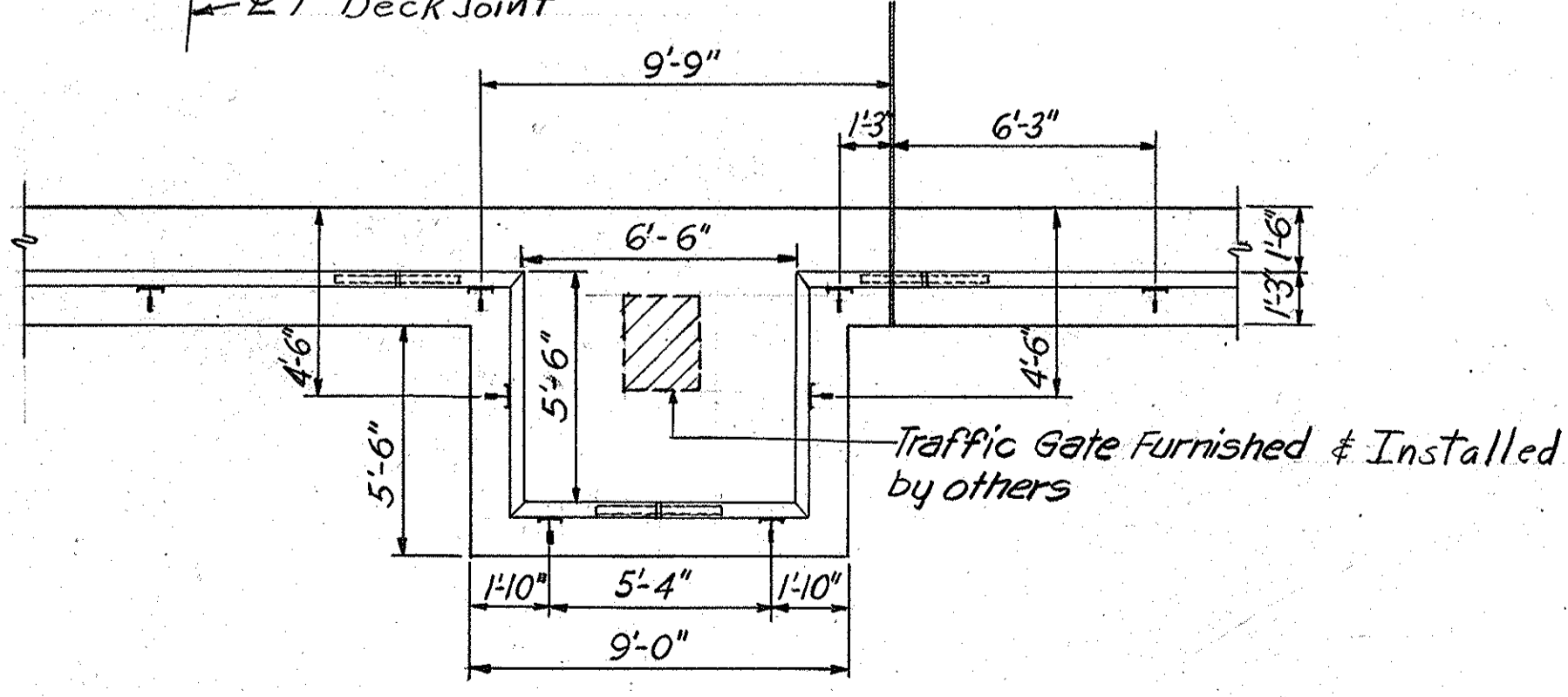


SECTION X-X
*By Others

- NOTES:
1. For General Notes, See Sheet No. 2
 2. For Location of Section X-X See Sheet No. 18
 3. For Additional Notes See Sheet No. 18
 4. Railpost spacing on curved sections, measured at intersection of ϵ Post and ϵ Front Anchor Bolts, see Sheet No. 40.



DETAIL AT RAMP B NOSE
Scale: 3/8" = 1'-0"



DETAIL AT TRAFFIC GATE
Scale: 1/4" = 1'-0"

CURVE DATA					
CURVE	D	R	Δ	L	T
A1	14°-23'-32.19"	398.101'	15°-00'-00"	104.222'	52.411'
B1	9°-00'-00"	636.620'	25°-01'-12.12"	278.000'	141.252'
B2	18°-00'-00"	318.310'	29°-58'-47.88"	166.555'	85.231'
C1	8°-30'-00"	674.068'	41°-43'-50.65"	490.950'	256.935'

PROJECT No. 8.1355108
NEW HANOVER COUNTY

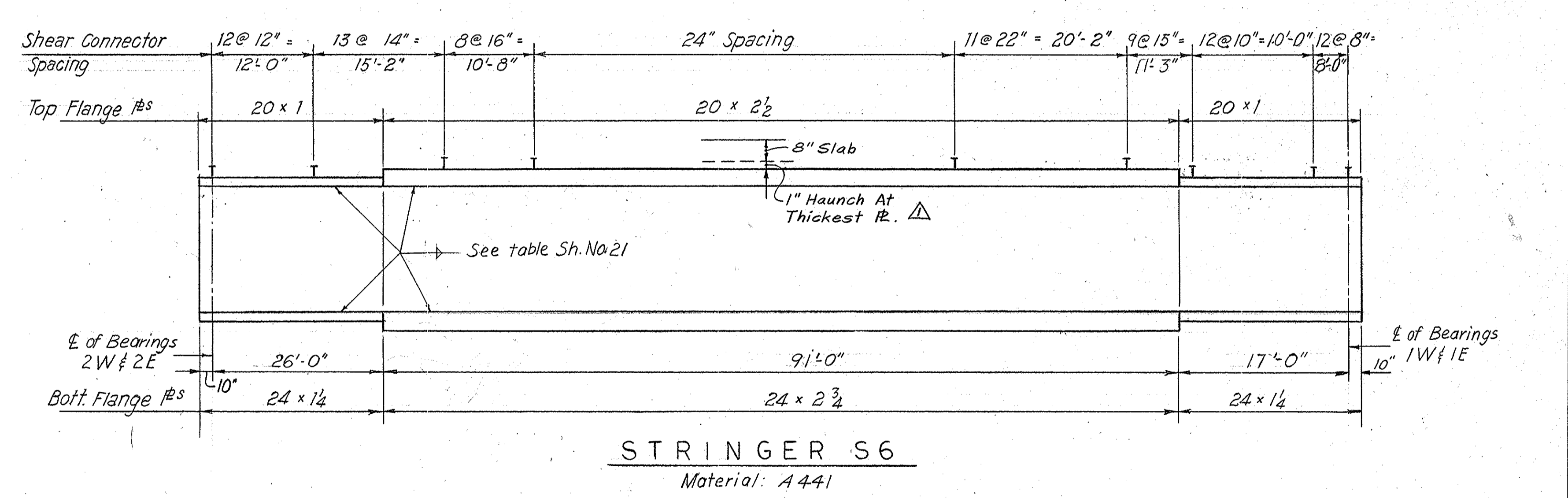
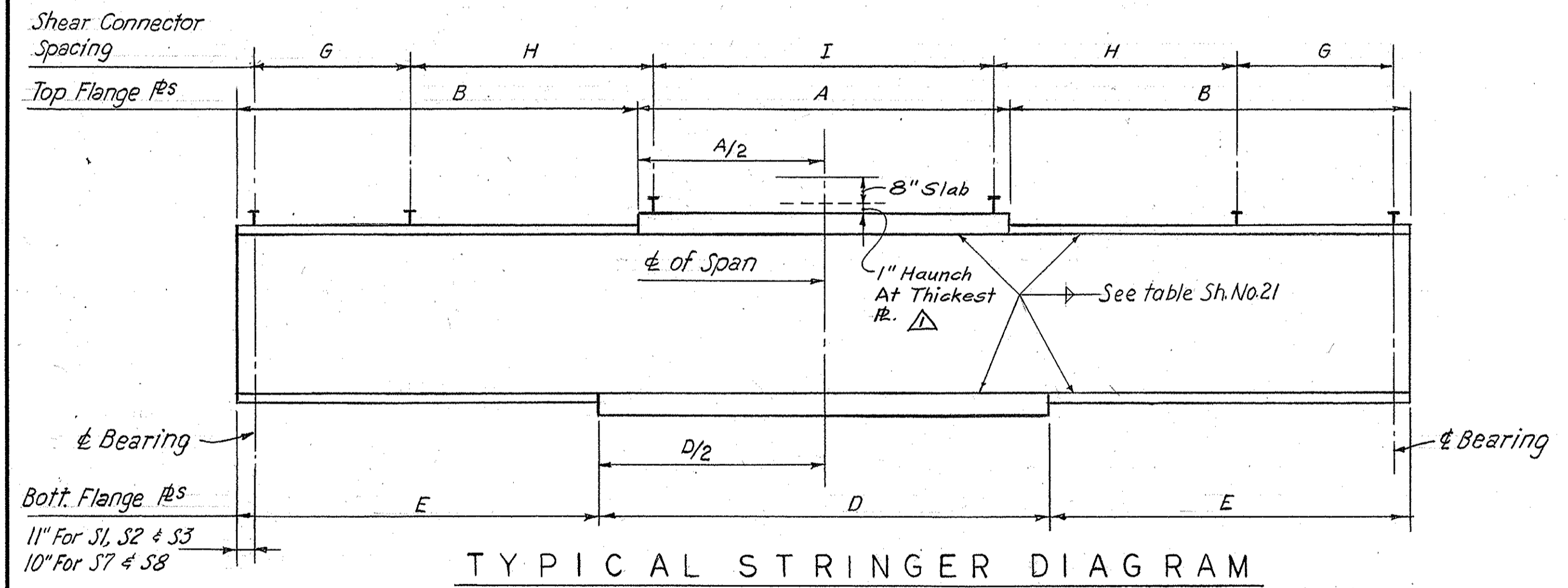
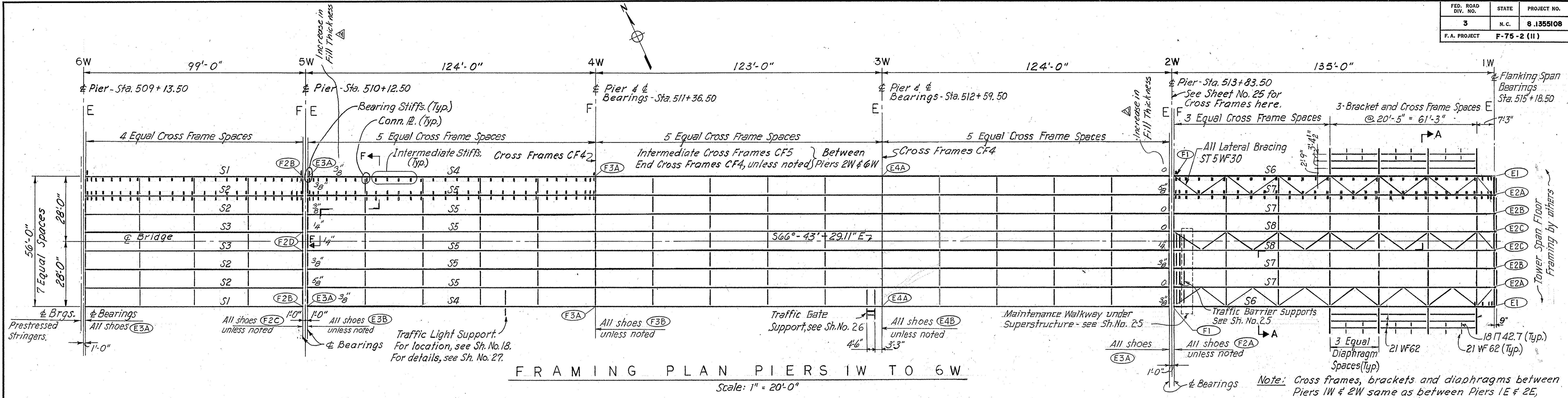
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

CAPE FEAR RIVER CROSSING
AT WILMINGTON

APPROACHES ON STRUCTURE
PLAN OF SUPERSTRUCTURE
SPANS 24 THROUGH 34

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. DATE: October, 1967
ENGINEERS NEW YORK SHEET NO. 19 OF 69

MADE BY: F. Ho
 CHECKED BY: D. W. Rogers
 IN CHARGE OF: H. C. Sloan



~ WELDED STRINGER SCHEDULE ~

MARK	DESIGN LENGTH	WEB #	TOP FLANGE #S		BOTTOM FLANGE #S		STIFFENERS		DEFLECTIONS				SHEAR CONNECTOR SPACING		
			A	B	D	E	BRG.	INTERM. OR CONN. #	STEEL	CONC.	V.C. ORD.	TOTAL CAMBER	G	H	I
S1	97.00'	60 x 3/8	14 x 3/8 - Full	—	16 x 1 1/8 - 61'-0"	16 x 3/8 As Reg'd.	6 3/4 x 3/4	5 x 3/8	7/16	1 1/8	—	2 1/4	19@13"=20'-7"	10@18"=15'-0"	@24"
S2	97.00'	60 x 3/8	14 x 3/8	—	16 x 1 1/8 - 59'-0"	16 x 3/4	6 3/4 x 3/4	5 x 3/8	1/2	1 3/4	—	2 1/4	18@15"=22'-6"	10@21"=17'-0"	@24"
S3	97.00'	60 x 3/8	14 x 3/8	—	16 x 1 1/8 - 63'-0"	16 x 3/4	6 3/4 x 3/4	5 x 3/8	1/2	1 3/8	—	2 5/8	21@13"=22'-9"	10@20"=16'-6"	@24"
S6	134.00'	72 x 1/2	See Diagram		20 x 1 1/2 - 82'-0"	20 x 3/8 As Reg'd.	9 3/4 x 1	6 x 3/8	1 1/2	1 1/8	1 1/8	4 9/16	See Diagram		
S7	134.00'	72 x 1/2	18 x 1 1/8 - 43'-0"	18 x 3/8 As Reg'd.	20 x 1 1/2 - 82'-0"	20 x 3/8 As Reg'd.	8 x 3/4	6 x 3/8	1 1/4	2 5/8	1 1/8	5 3/8	18@19"=28'-6"	@24"	@24"
S8	134.00'	72 x 1/2	18 x 1 1/8 - 47'-0"	18 x 3/8	20 x 1 1/2 - 85'-0"	20 x 3/8	8 x 3/4	6 x 3/8	1 1/8	2 15/16	1 1/8	5 1/4	19@17"=26'-11"	@24"	@24"

Note:
For details of Stringers S4 & S5, see Sheet No. 22.

- Notes:
- For General Notes, see Sheet No. 2.
 - Shoe types indicated thus: (E1), (F1), etc. For shoe details, see Sheet No. 30.
 - For notes for Welded Stringers, see Sheet No. 21.
 - For Sect. F-F, see Sheet No. 23.
 - For typical arrangement of stiffeners, see Sheet No. 21.
 - For cross frame, bracket and diaphragm details, see Sheet No. 23.

PROJECT No. 8.1355108
NEW HANOVER COUNTY

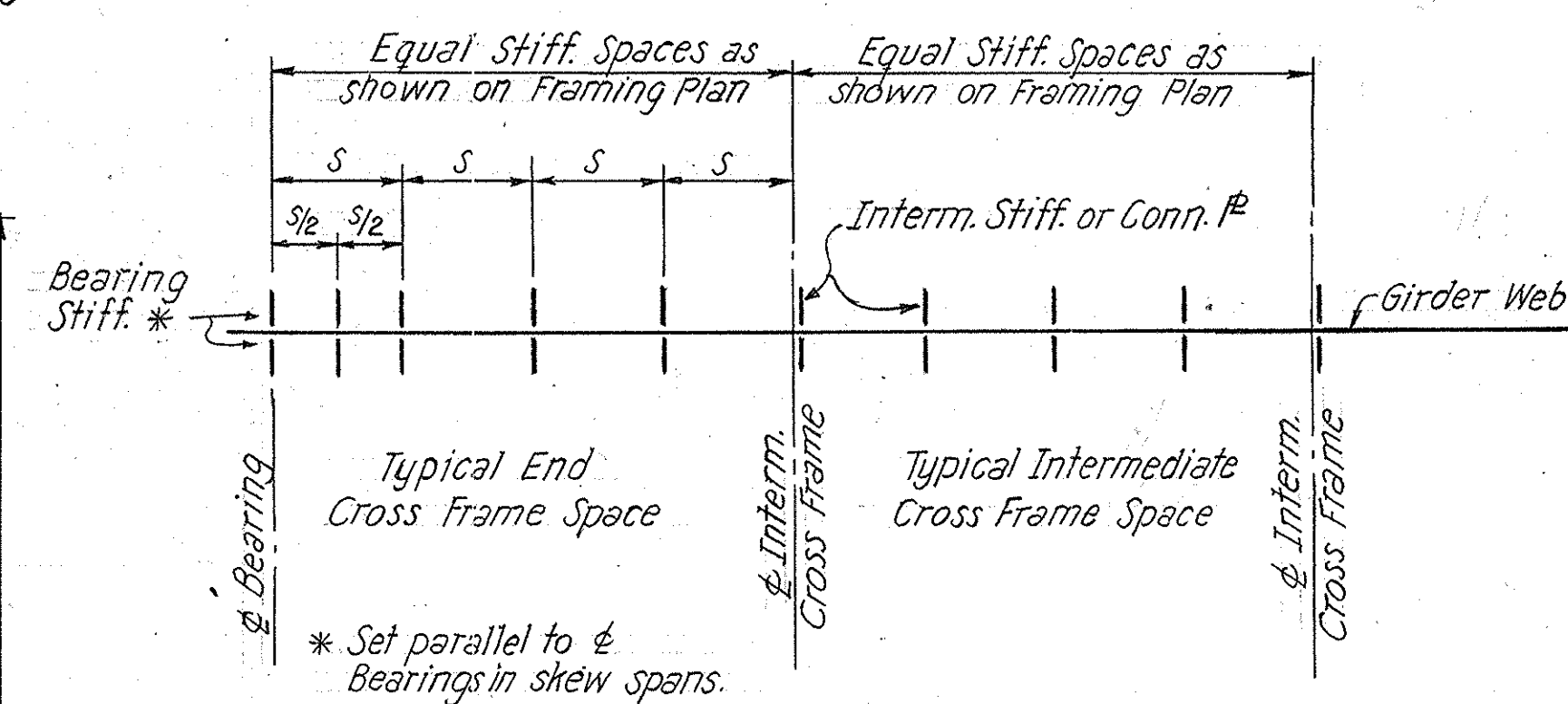
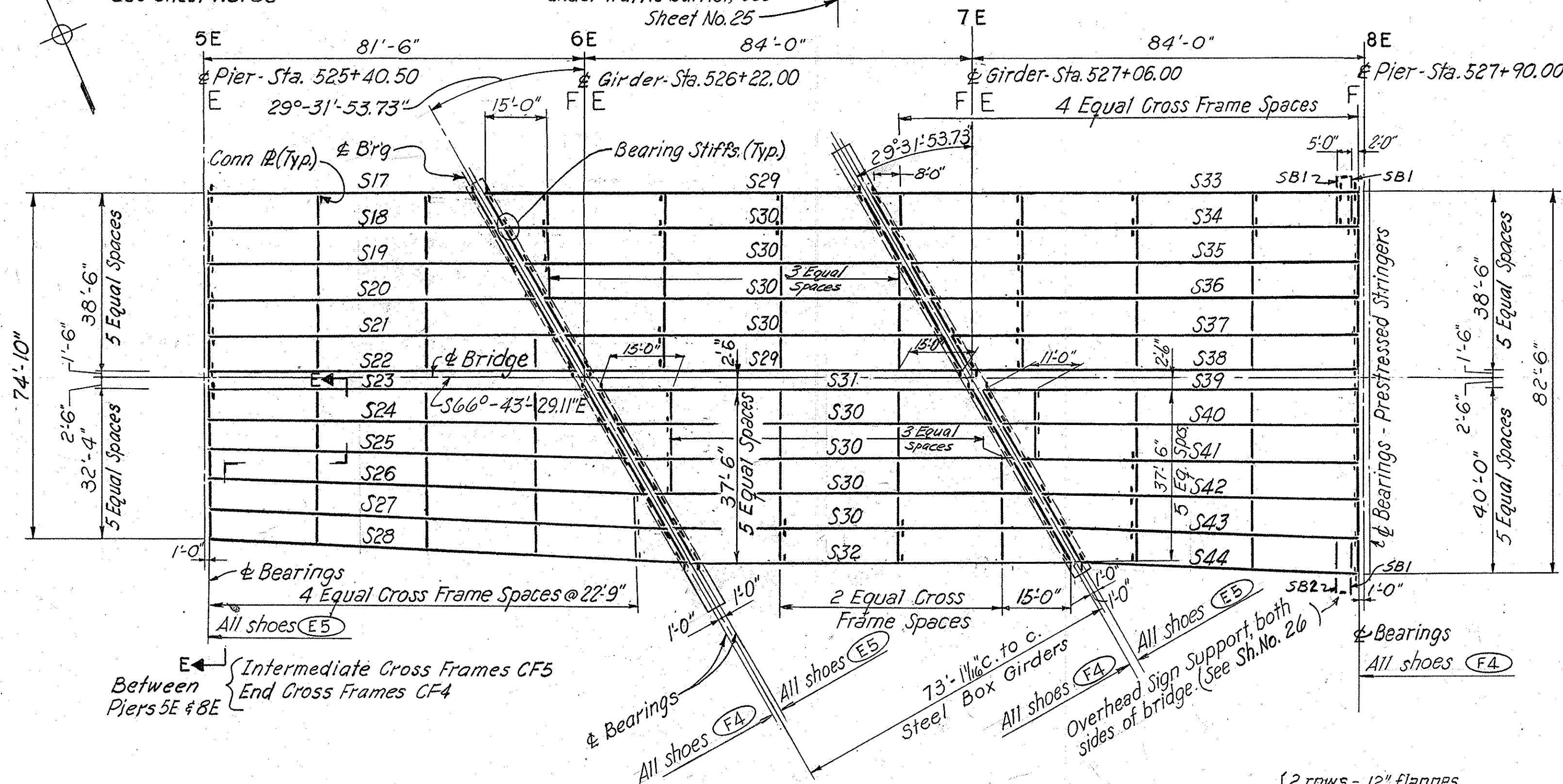
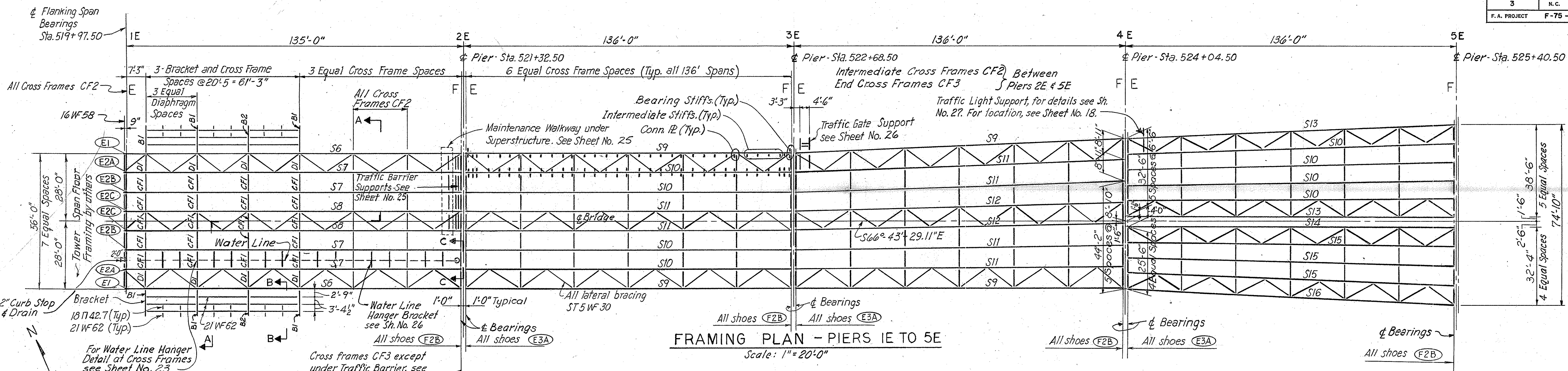
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

CAPE FEAR RIVER CROSSING
AT WILMINGTON

APPROACHES ON STRUCTURE
FRAMING PLAN - STEEL STRINGERS
WEST APPROACH

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. DATE: October 1967
ENGINEERS NEW YORK SHEET NO. 20 OF 69

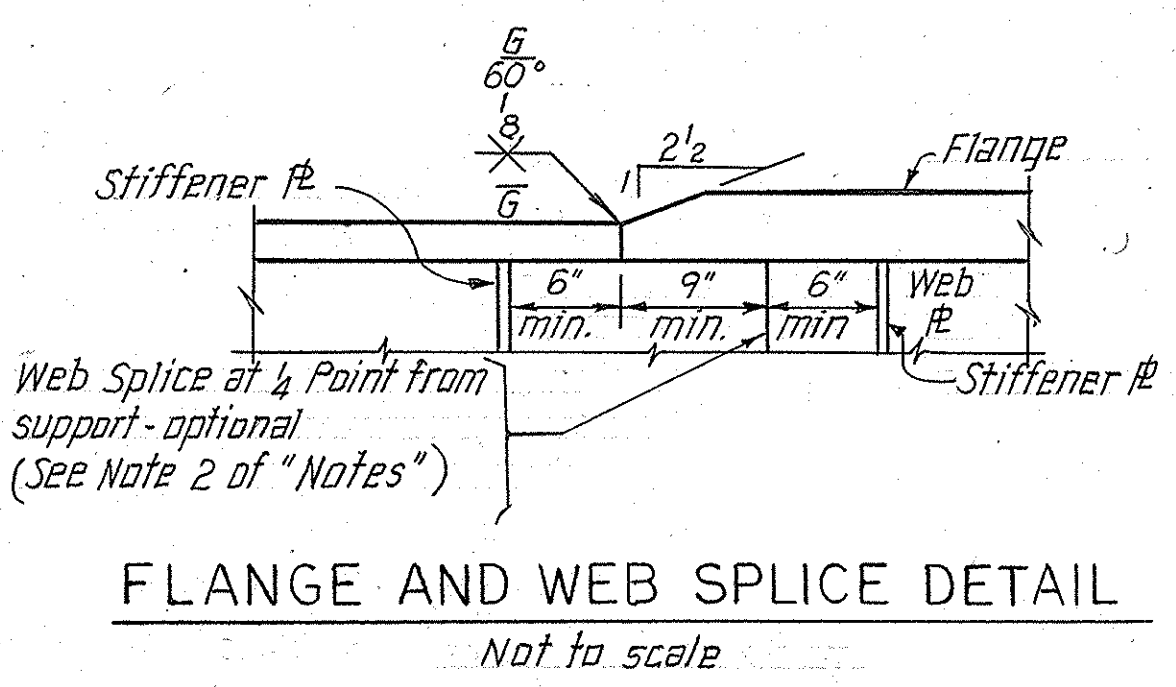
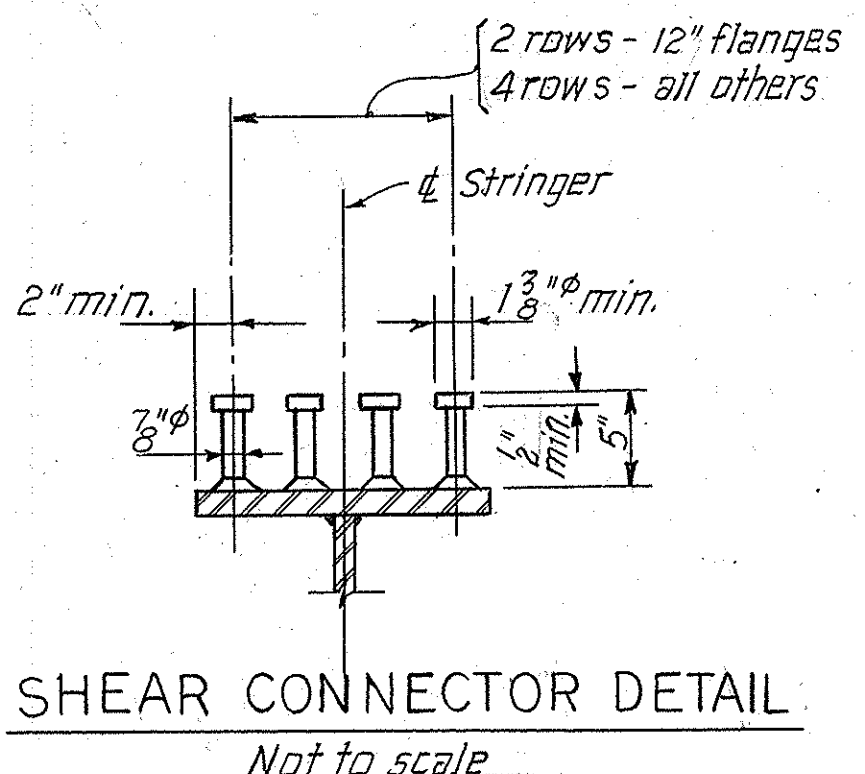
REVISION	BY	DATE
△ Increase Fills 5W, 2W	RHW	7-30-68
△ Haunches	MCS	4-11-68



- NOTES FOR WELDED STRINGERS:**
1. Location of web splices and flange splices not indicated on design drawings to be approved by the Engineer.
 2. Web splices to be full penetration butt weld, grind to a flush surface on outside face of exterior stringers only.
 3. Flange splices must be completed before flanges are welded to webs.
 4. Each stringer shall be so fabricated that the specified camber shall remain in the stringer after all shop welding has been completed.
 5. Intermediate stiffeners, all cross frame connection plates and bearing stiffeners are to be set vertical under full dead load. Place intermediate stiffeners and connection plates tight against bottom flange, do not weld. Mill bearing stiffeners to bear against bottom flange, do not weld. Back-to-back pairs of stiffeners or connection plates are not to be welded to top flange. Stiffeners or connection plates which are on one side of web only are to be welded to top flange. On continuous stringers, do not weld on tension flange.

- NOTES:**
1. For General Notes, see Sheet No. 2
 2. Shoe Types indicated thus: (E1), (F1), etc.
 3. For Sections A-A, B-B, C-C & E-E, see Sheet No. 23
 4. For cross frame, diaphragm and bracket details, see Sheet No. 23.

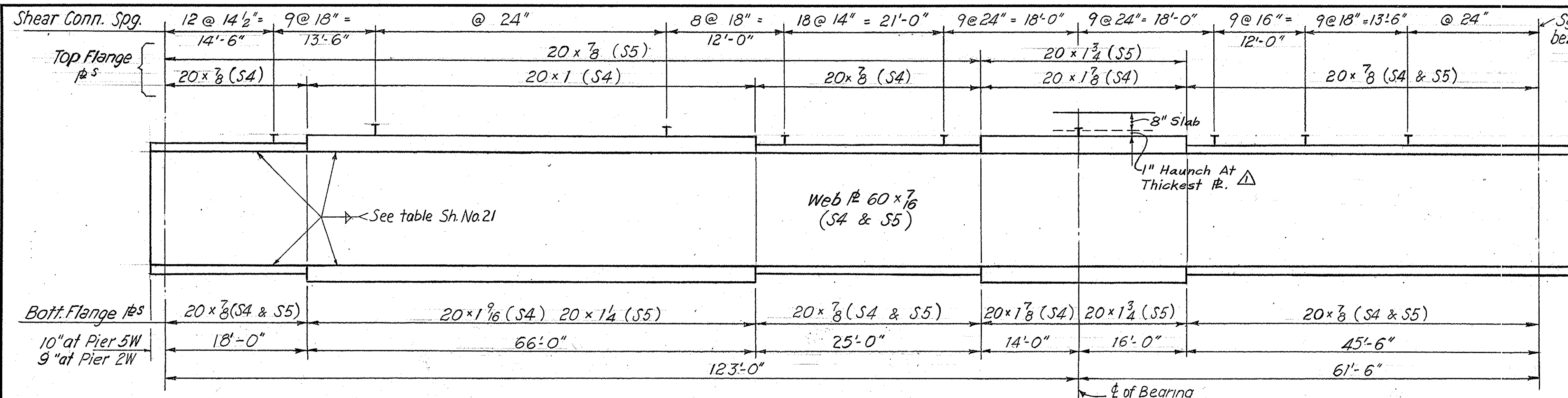
FILLET WELD SIZES	
THICKER MATERIAL THICKNESS - INS.	WELD SIZE - INS.
≤ 3/4	1/4
> 3/4 to 1 1/2 incl.	3/16
> 1 1/2 to 2 1/4 incl.	3/8
> 2 1/4	1/2



PROJECT No. 8.1355108
NEW HANOVER COUNTY
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
CAPE FEAR RIVER CROSSING
AT WILMINGTON
APPROACHES ON STRUCTURE
FRAMING PLAN - STEEL STRINGERS
EAST APPROACH

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. DATE: October 1967
ENGINEERS NEW YORK SHEET NO. 21 OF 69

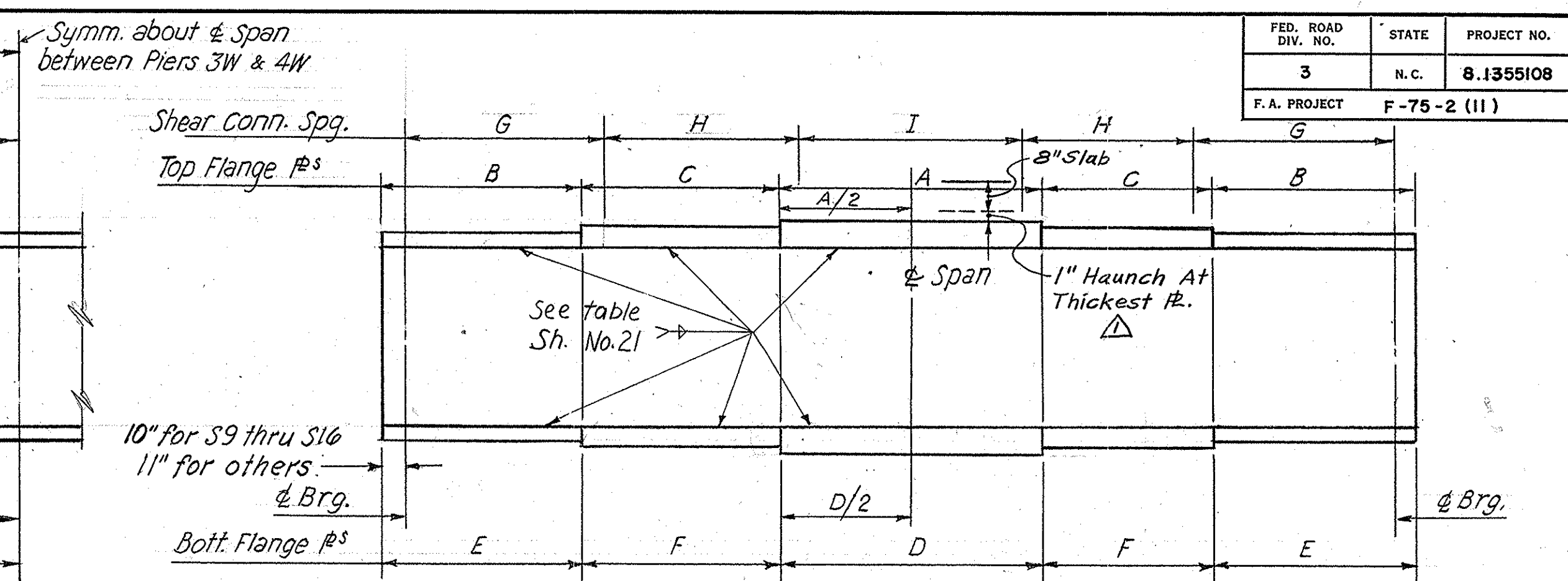
REVISION	BY	DATE



STRINGER S4 AND S5

Not to Scale

Bearing Stiffeners = #5 9/2 x 1 1/8
Intermediate Stiffs & Conn. #5 = #5 6 x 3/8
For spacing of Stiffeners, see Sheet No. 20

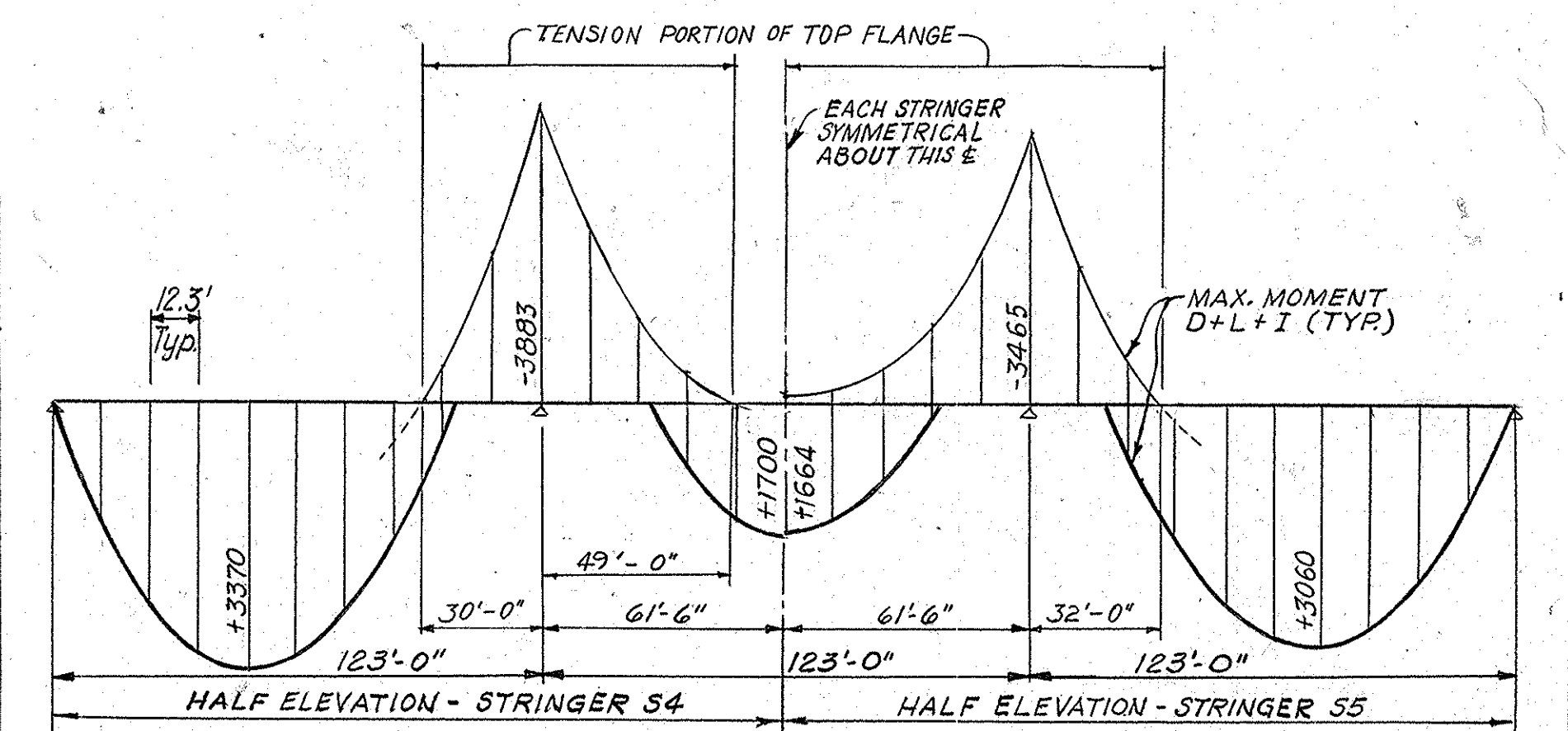


TYPICAL DIAGRAM STRINGERS S9 THROUGH S44

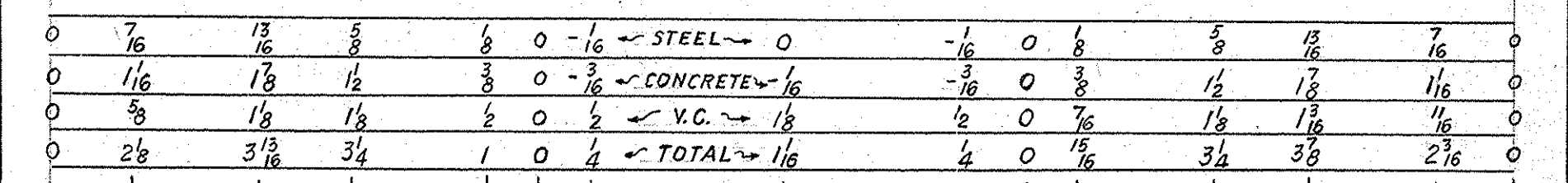
Not to Scale

~ WELDED STRINGER SCHEDULE ~

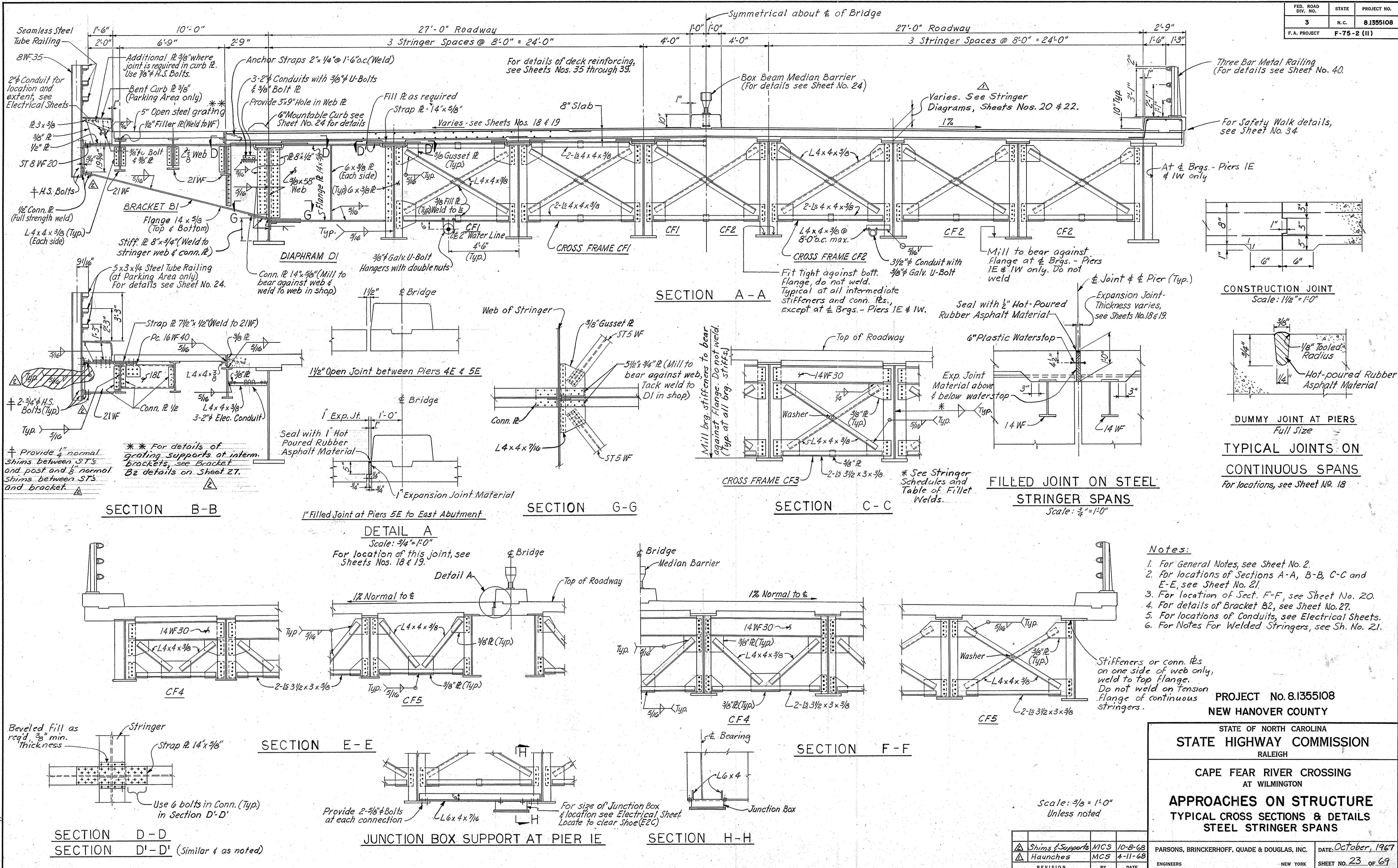
MARK	DESIGN LENGTH	WEB #	TOP FLANGE #5			BOTTOM FLANGE #5			STIFFENERS		DEFLECTIONS - INS.				SHEAR CONNECTOR SPACING		
			A	B	C	D	E	F	BRG.	INTERM. OR CONN. #	STEEL	CONC.	V.C. OR D.	TOTAL CAMBER	G	H	I
S9	134.0'	66 x 7/16	18 x 1 1/8 - 57'-0"	18 x 7/8 - As Req'd.	18 x 1 1/4 - 10'-6"	20 x 2 1/4 - 84'-0"	20 x 7/8 - As Req'd.	20 x 1 3/8 - 9'-0"	8 x 3/4	6 x 3/8	1 1/2	3 1/2	—	4 3/8	18 @ 13 1/2 = 19'-6"	9 @ 18" = 13'-6"	@ 24"
S10	134.0'	"	18 x 1 1/8 - 65'-0"	"	"	20 x 1 1/8 - 87'-0"	20 x 1 - As Req'd.	"	"	1 3/8	2 1/4	—	4 1/2	12 @ 17" = 17'-0"	6 @ 20" = 10'-0"	"	
S11	134.0'	"	18 x 1 1/8 - 66'-0"	"	"	20 x 2 1/8 - 79'-0"	20 x 7/8 - As Req'd.	20 x 1 1/4 - 16'-0"	"	1 1/2	3	—	4 1/4	14 @ 15" = 17'-6"	11 @ 18" = 16'-6"	"	
S12	134.0'	"	18 x 1 1/4 - 75'-0"	"	"	20 x 2 1/8 - 80'-0"	"	20 x 1 3/8 - 9'-6"	"	1 1/2	2 1/8	—	4 3/8	18 @ 14" = 21'-0"	8 @ 18" = 12'-0"	"	
S13	134.0'	"	18 x 1 1/4 - 57'-0"	"	"	20 x 1 1/8 - 88'-0"	"	"	"	1 3/8	2 1/8	—	4 1/8	16 @ 19" = 25'-4"	@ 24"	"	
S14	134.0'	"	18 x 1 1/8 - 24'-0"	"	"	20 x 1 1/8 - 76'-0"	"	"	"	1 1/2	2 3/8	—	3 7/8	12 @ 21" = 21'-0"	"	"	
S15	134.0'	"	18 x 1 1/4 - 54'-0"	"	"	20 x 1 1/8 - 86'-0"	"	"	"	1 1/6	2 1/8	—	4 1/4	16 @ 19" = 25'-4"	"	"	
S16	134.0'	66 x 7/16	18 x 1 1/8 - 77'-0"	"	"	20 x 2 1/8 - 69'-0"	20 x 7/8 - As Req'd.	20 x 1 1/2 - 15'-0"	8 x 3/4	6 x 3/8	1 1/6	3 1/8	—	4 1/2	18 @ 14" = 21'-0"	6 @ 20" = 10'-0"	"
S17	56.7'	45 x 7/16	12 x 5/8 - Full	"	"	14 x 5/8 - Full	"	"	5 1/2 x 5/8	5 x 3/8	1/8	7/16	—	1 1/6	20 @ 6" = 10'-0"	16 @ 7 1/2" = 10'-0"	@ 10"
S18	61.0'	"	"	"	"	14 x 1 1/8 - 33'-6"	14 x 3/8 - As Req'd.	"	"	3/16	5/8	—	1 3/16	24 @ 5" = 10'-0"	25 @ 6" = 12'-6"	"	
S19	65.4'	"	"	"	"	14 x 1 1/8 - 36'-0"	"	"	"	3/16	1/2	—	1	24 @ 5" = 10'-0"	25 @ 6" = 12'-6"	"	
S20	69.8'	"	"	"	"	14 x 1 1/8 - 48'-0"	"	"	"	1/4	1 1/8	—	1 1/8	36 @ 5" = 15'-0"	24 @ 7" = 14'-0"	"	
S21	74.1'	"	"	"	"	14 x 1 1/8 - 51'-0"	"	"	"	5/16	1 1/8	—	1 3/8	36 @ 5" = 15'-0"	24 @ 7" = 14'-0"	"	
S22	78.5'	"	12 x 5/8 - Full	"	"	14 x 1 1/8 - 55'-0"	"	"	"	3/8	1 1/8	—	1 1/2	33 @ 6" = 16'-6"	21 @ 8" = 14'-0"	@ 12"	
S23	80.8'	45 x 7/16	12 x 3/4 - Full	"	"	14 x 1 1/4 - 54'-0"	14 x 5/8 - As Req'd.	"	"	3/8	1 1/8	—	1 1/2	33 @ 6" = 16'-6"	21 @ 8" = 14'-0"	"	
S24	85.0'	45 x 1/2	12 x 1 - 40'-0"	12 x 3/8 - As Req'd.	"	14 x 1 1/4 - 55'-6"	14 x 1 - As Req'd.	"	"	1/2	1 1/2	—	2	40 @ 5 1/2" = 18'-4"	25 @ 8" = 16'-8"	"	
S25	89.3'	"	12 x 1 - 42'-0"	12 x 5/8 - As Req'd.	"	14 x 1 1/4 - 58'-0"	14 x 1 - As Req'd.	"	5 1/2 x 5/8	"	1 1/8	—	2 1/8	40 @ 5 1/2" = 18'-4"	25 @ 8" = 16'-8"	"	
S26	93.6'	"	14 x 1 - 49'-0"	14 x 5/8 - As Req'd.	"	16 x 1 1/4 - 65'-0"	16 x 3/8 - "	"	6 3/4 x 3/4	"	5/8	—	2 1/8	18 @ 13" = 19'-6"	10 @ 18" = 15'-0"	@ 24"	
S27	97.8'	"	14 x 1 - 51'-0"	14 x 5/8 - As Req'd.	"	16 x 1 1/4 - 67'-0"	16 x 3/8 - "	"	6 3/4 x 3/4	"	3/4	—	2 1/8	18 @ 13" = 19'-6"	10 @ 18" = 15'-0"	"	
S28	102.0'	"	16 x 1 1/8 - 58'-0"	16 x 3/4 - As Req'd.	"	18 x 2 1/8 - 70'-0"	18 x 1 1/2 - "	"	7 1/2 x 3/4	"	2 1/8	—	3 3/8	21 @ 11" = 19'-3"	12 @ 15" = 15'-0"	"	
S29	81.7'	"	12 x 7/8 - Full	"	"	14 x 1 1/8 - 56'-0"	14 x 3/8 - "	"	5 1/2 x 5/8	"	3/8	—	1 1/6	30 @ 6" = 15'-0"	24 @ 8" = 16'-0"	@ 12"	
S30	81.7'	"	12 x 7/8 - Full	"	"	14 x 1 1/8 - 57'-0"	14 x 3/8 - "	"	"	7/16	1 1/8	—	2	36 @ 5" = 15'-0"	27 @ 7" = 15'-9"	@ 10"	
S31	81.7'	"	12 x 3/4 - Full	"	"	14 x 1 1/4 - 55'-0"	14 x 3/8 - "	"	"	3/8	1 1/8	—	1 7/8	34 @ 6" = 17'-0"	21 @ 8" = 14'-0"	@ 12"	
S32	81.7'	"	12 x 7/8 - 33'-0"	12 x 5/8 - As Req'd.	"	14 x 1 1/8 - 54'-0"	14 x 1 - "	"	5 1/2 x 5/8	"	3/8	—	2 1/8	48 @ 5" = 20'-0"	18 @ 8" = 12'-0"	"	
S33	104.5'	"	16 x 1 1/4 - 57'-0"	16 x 3/4 - As Req'd.	"	18 x 1 1/8 - 54'-0"	18 x 3/8 - "	18 x 1 1/8 - 13'-0"	7 1/2 x 3/4	"	7/8	—	2 1/2	18 @ 13" = 19'-6"	12 @ 16" = 16'-0"	@ 24"	
S34	100.2'	"	16 x 1 1/8 - 51'-0"	"	"	18 x 1 1/8 - 68'-0"	18 x 1 - "	"	"	1 3/16	2 1/4	—	3 1/8	20 @ 12" = 20'-0"	15 @ 16" = 20'-0"	"	
S35	95.8'	"	16 x 1 1/8 - 49'-0"	"	"	18 x 1 1/8 - 66'-0"	18 x 1 - "	"	"	5/8	2	—	2 3/8	20 @ 12" = 20'-0"	15 @ 16" = 20'-0"	"	
S36	91.4'	"	16 x 7/8 - Full	"	"	18 x 1 1/8 - 59'-0"	18 x 3/8 - "	"	"	9/16	1 1/8	—	2 3/8	20 @ 12" = 20'-0"	13 @ 16" = 17'-4"	"	
S37	87.0'	"	16 x 3/8 - "	"	"	18 x 1 1/8 - 57'-0"	18 x 3/8 - "	"	7 1/2 x 3/4	"	1 1/2	—	2	20 @ 12" = 20'-0"	13 @ 16" = 17'-4"	"	
S38	82.7'	45 x 1/2	14 x 3/4 - "	"	"	16 x 1 1/2 - 56'-0"	16 x 3/8 - "	"	6 1/2 x 3/4	"	1 1/8	—	2	20 @ 12" = 20'-0"	8 @ 18" = 12'-0"	"	
S39	80.4'	45 x 1/6	12 x 3/4 - "	"	"	14 x 1 1/4 - 54'-0"	14 x 3/8 - "	"	5 1/2 x 5/8	"	3/8	—	1 7/8	34 @ 6" = 17'-0"	21 @ 8" = 14'-0"	@ 12"	
S40	76.2'	"	12 x 3/4 - "	"	"	14 x 1 1/8 - 54'-0"	14 x 3/8 - "	"	"	3/8	1 1/8	—	1 13/16	30 @ 5 1/2" = 13'-9"	24 @ 7 1/2" = 15'-0"	@ 10 1/2"	
S41	71.9'	"	12 x 5/8 - "	"	"	14 x 1 1/8 - 51'-0"	14 x 3/8 - "	"	"	5/16	1 1/4	—	1 7/8	30 @ 5 1/2" = 13'-9"	24 @ 7 1/2" = 15'-0"	"	
S42	67.7'	"	12 x 5/8 - "	"	"	14 x 1 1/8 - 41'-0"	14 x 3/8 - "	"	"	1/4	1 1/8	—	1 3/8	34 @ 5 1/2" = 15'-7"	16 @ 7 1/2" = 10'-0"	@ 11"	
S43	63.4'	"	12 x 5/8 - "	"	"	14 x 1 1/8 - 39'-0"	14 x 3/8 - As Req'd.	"	"	3/16	3/4	—	1 5/16	34 @ 5 1/2" = 15'-7"	16 @ 7 1/2" = 10'-0"	"	
S44	59.2'	45 x 7/16	12 x 3/4 - "	"	"	14 x 3/8 - Full	"	"	5 1/2 x 5/8	5 x 3/8	1/2	—	3/8	34 @ 5 1/2" = 15'-7"	11 @ 8" = 7'-4"	@ 10 1/2"	



ENVELOPES OF MAX. MOMENTS



FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N.C.	8.1355108
F.A. PROJECT	F-75-2 (11)	



- Notes:**
1. For General Notes, see Sheet No. 2.
 2. For locations of Sections A-A, B-B, C-C and E-E, see Sheet No. 21.
 3. For location of Sect. F-F, see Sheet No. 20.
 4. For details of Bracket B2, see Sheet No. 27.
 5. For locations of Conduits, see Electrical Sheets.
 6. For Notes For Welded Stringers, see Sh. No. 21.

PROJECT No. 8.1355108
 NEW HANOVER COUNTY

STATE OF NORTH CAROLINA
 STATE HIGHWAY COMMISSION
 RALEIGH

CAPE FEAR RIVER CROSSING
 AT WILMINGTON

APPROACHES ON STRUCTURE
 TYPICAL CROSS SECTIONS & DETAILS
 STEEL STRINGER SPANS

Scale: 3/8" = 1'-0"
 Unless noted

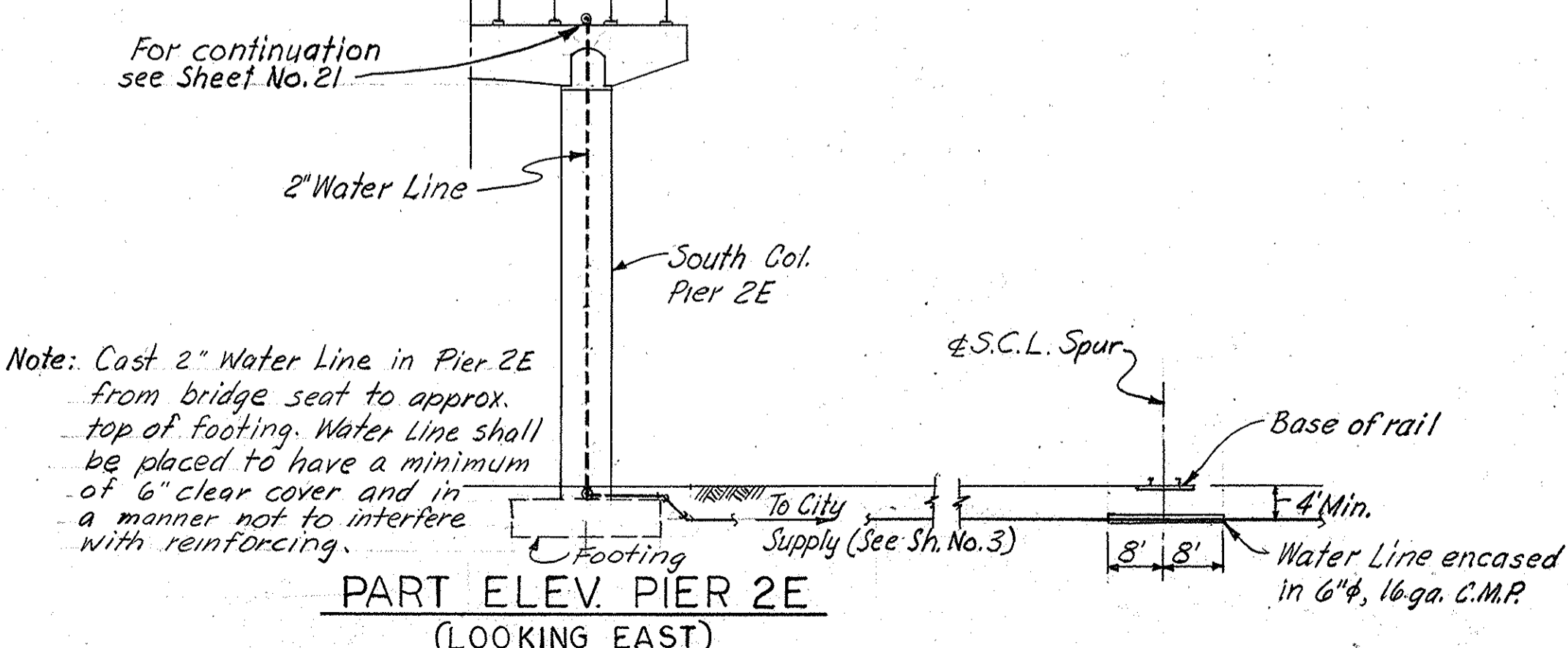
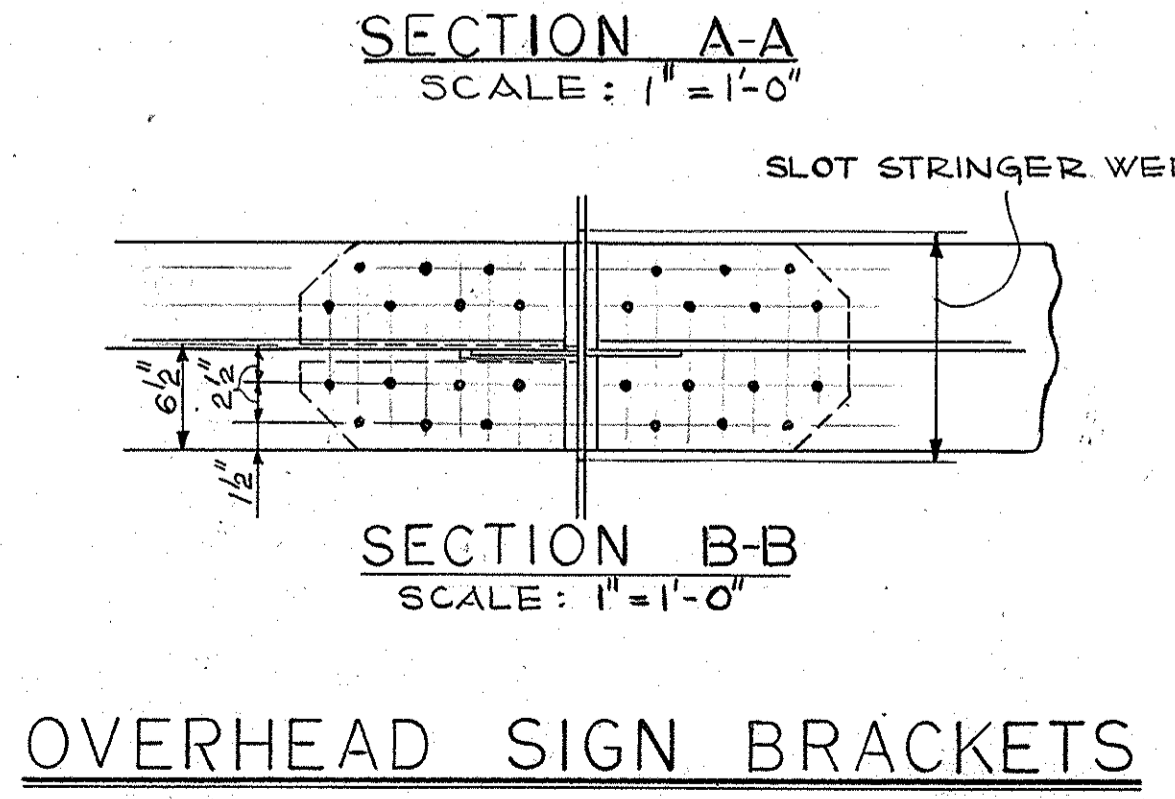
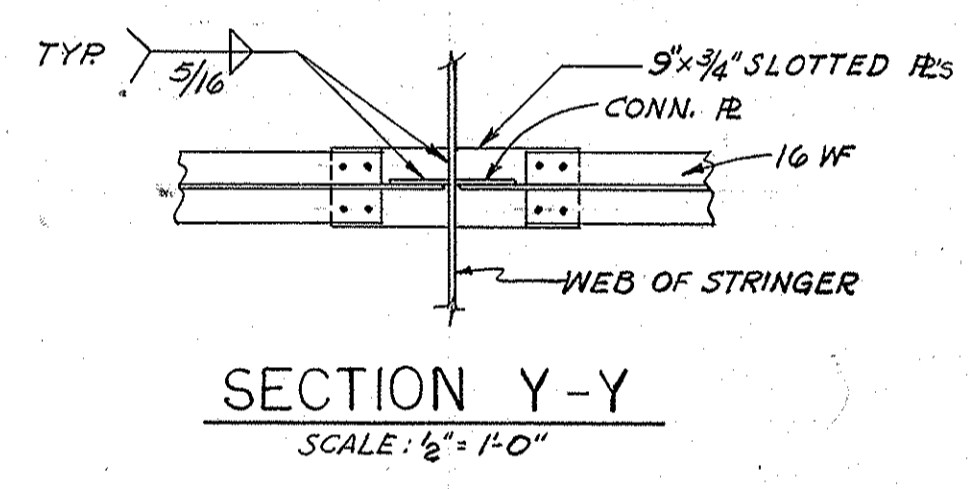
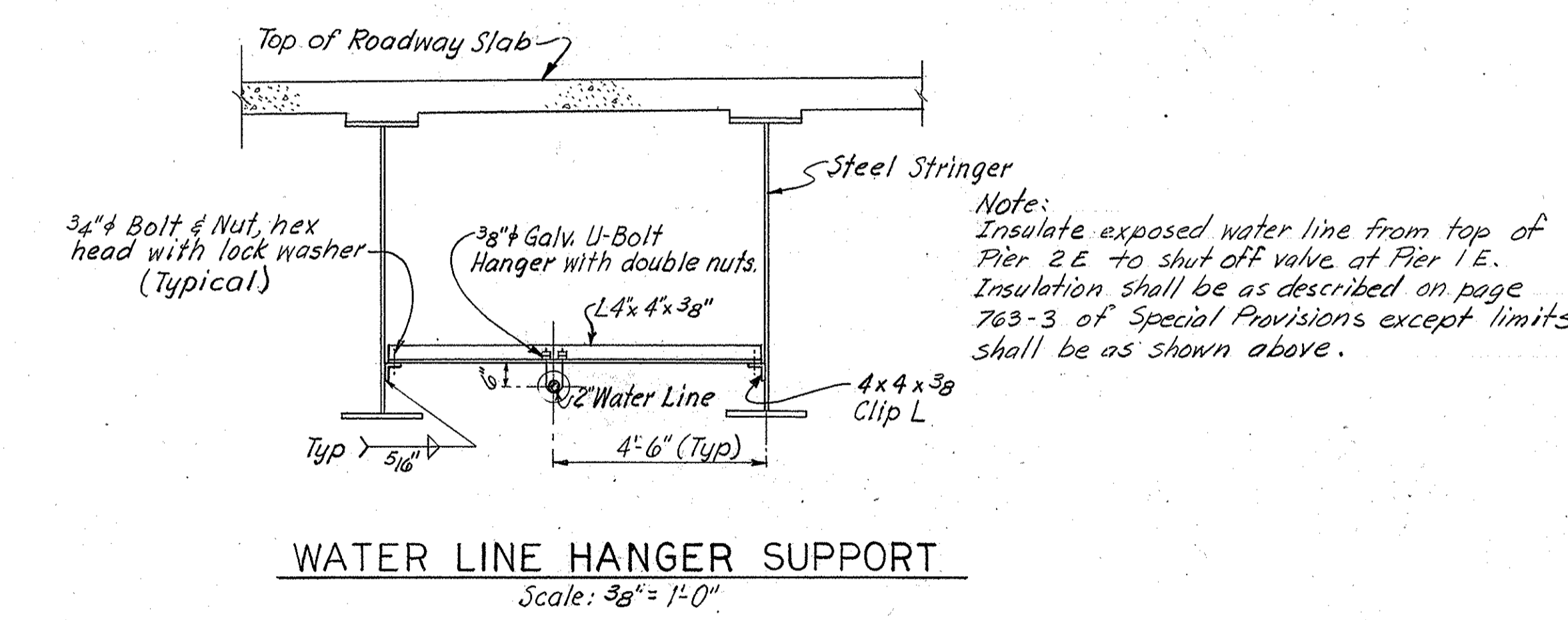
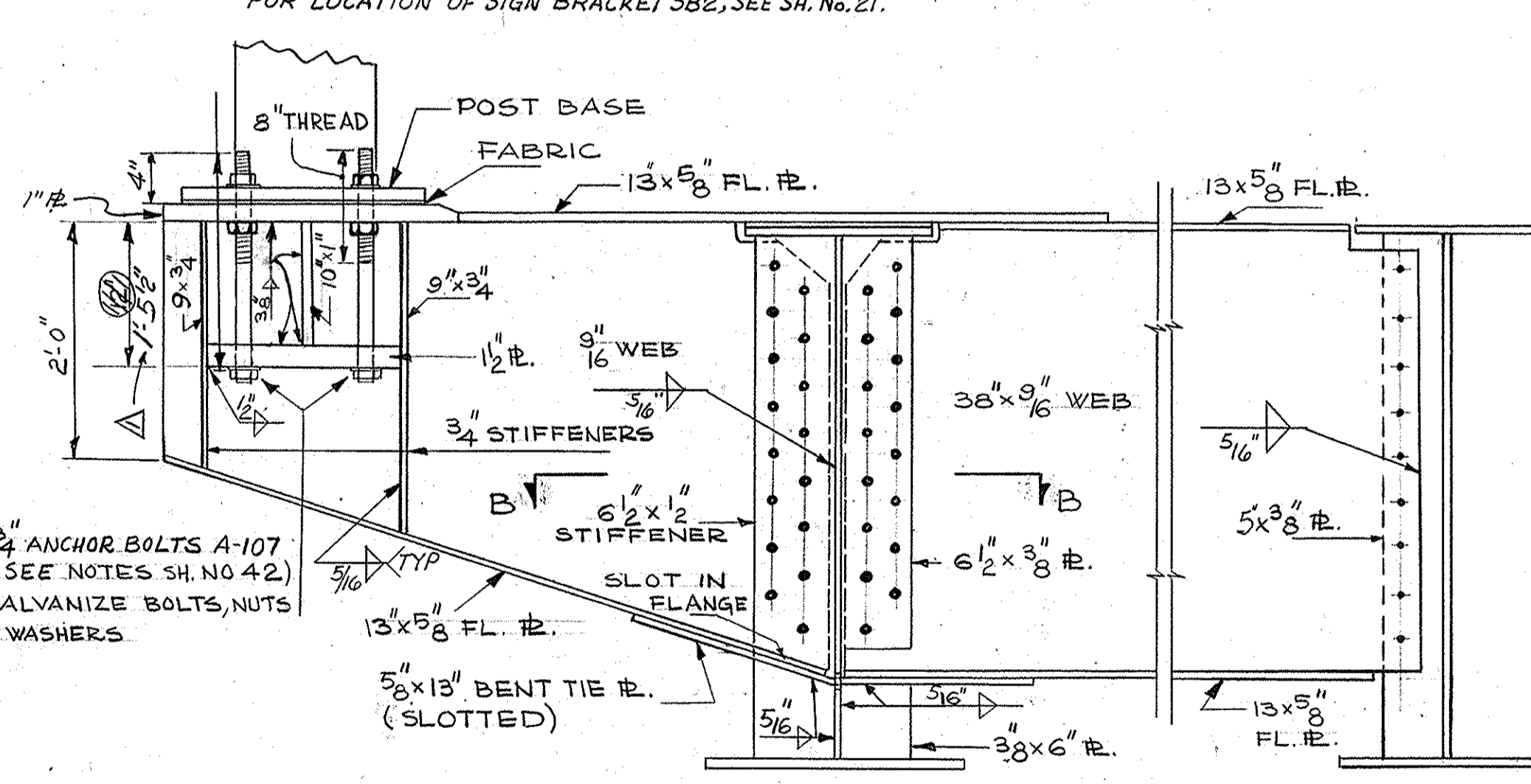
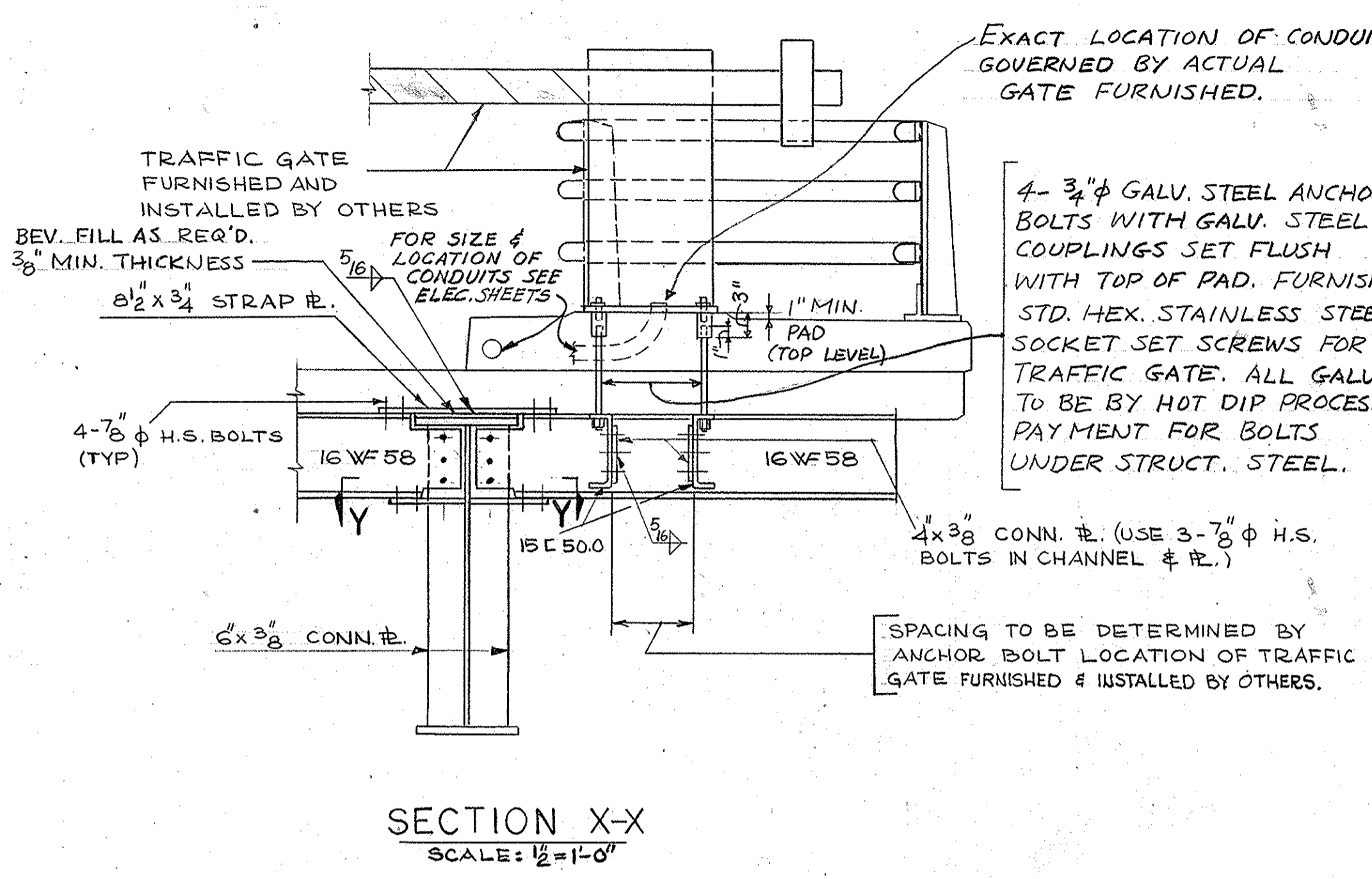
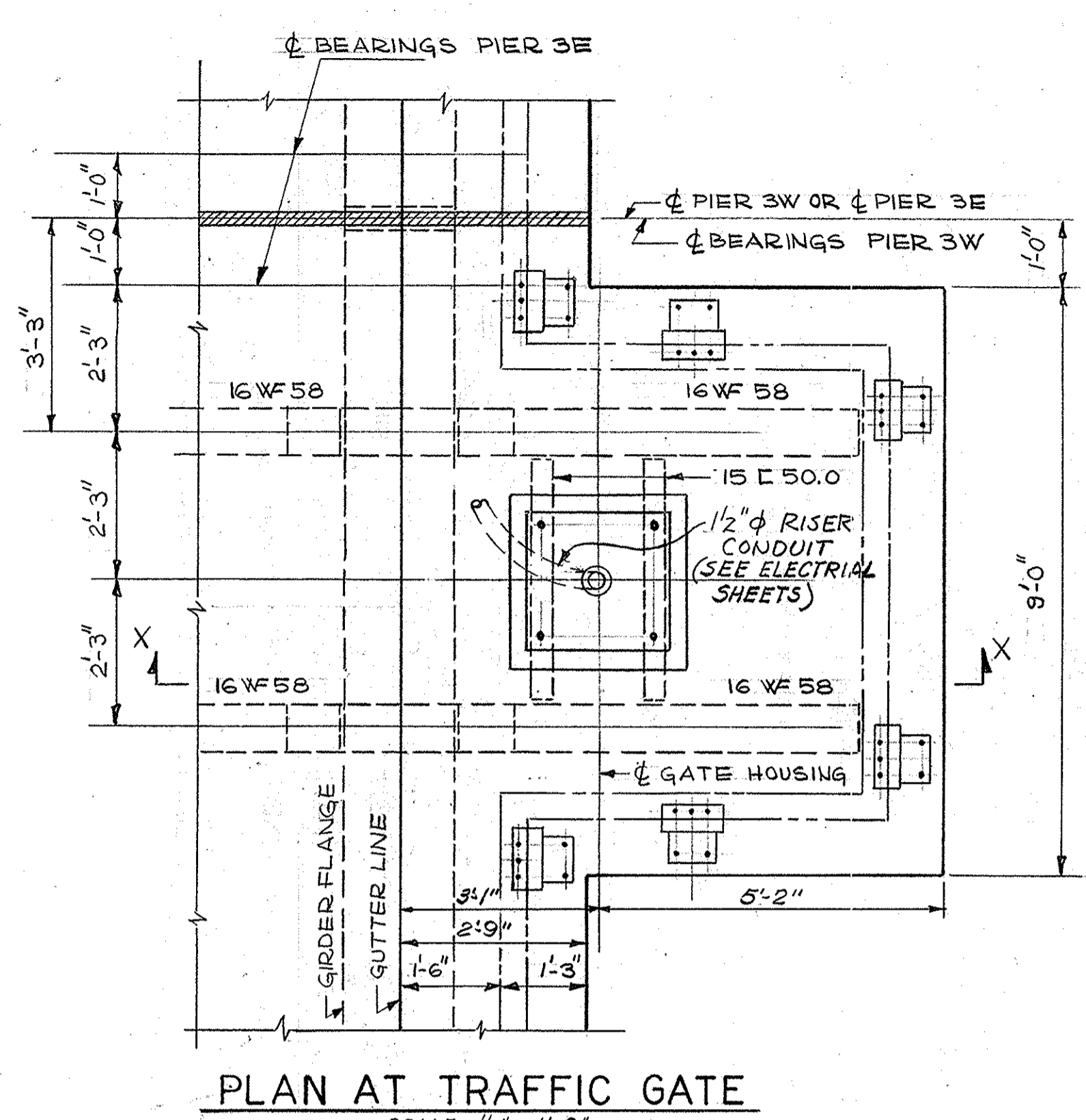
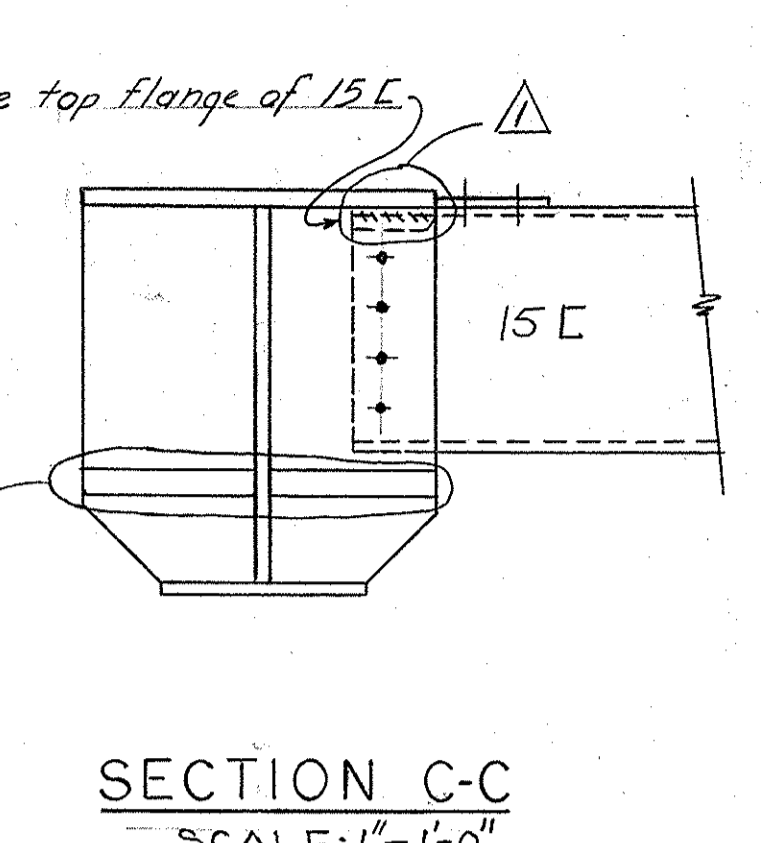
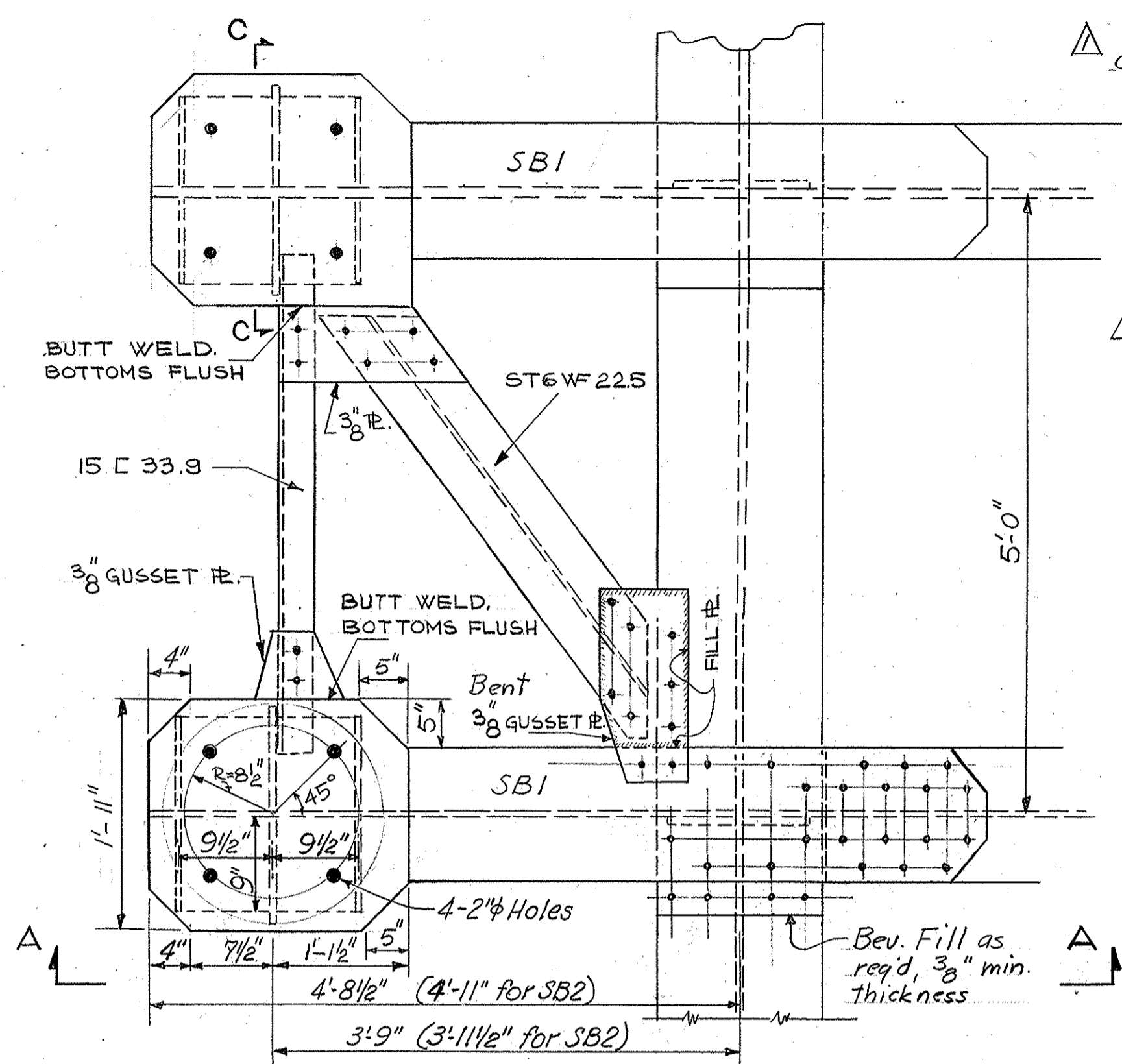
Shims & Supports	MCS	10-8-68
Haunches	MCS	4-11-68

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC.
 ENGINEERS
 NEW YORK

DATE: October 1967
 SHEET NO. 23 OF 69

MADE BY: [Signature]
 CHECKED BY: [Signature]

FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N.C.	8.1355108
F.A. PROJECT		F-75-2 (11)



- Notes:**
1. For locations of Sign Brackets, see Sheet No. 21.
 2. For details of Overhead Sign, see Sheet Nos. 43 & 44.
 3. For locations of Traffic Lights, see Sheet No. 18.
 4. For locations of Water Line Hanger Brackets, see Sheet No. 21.

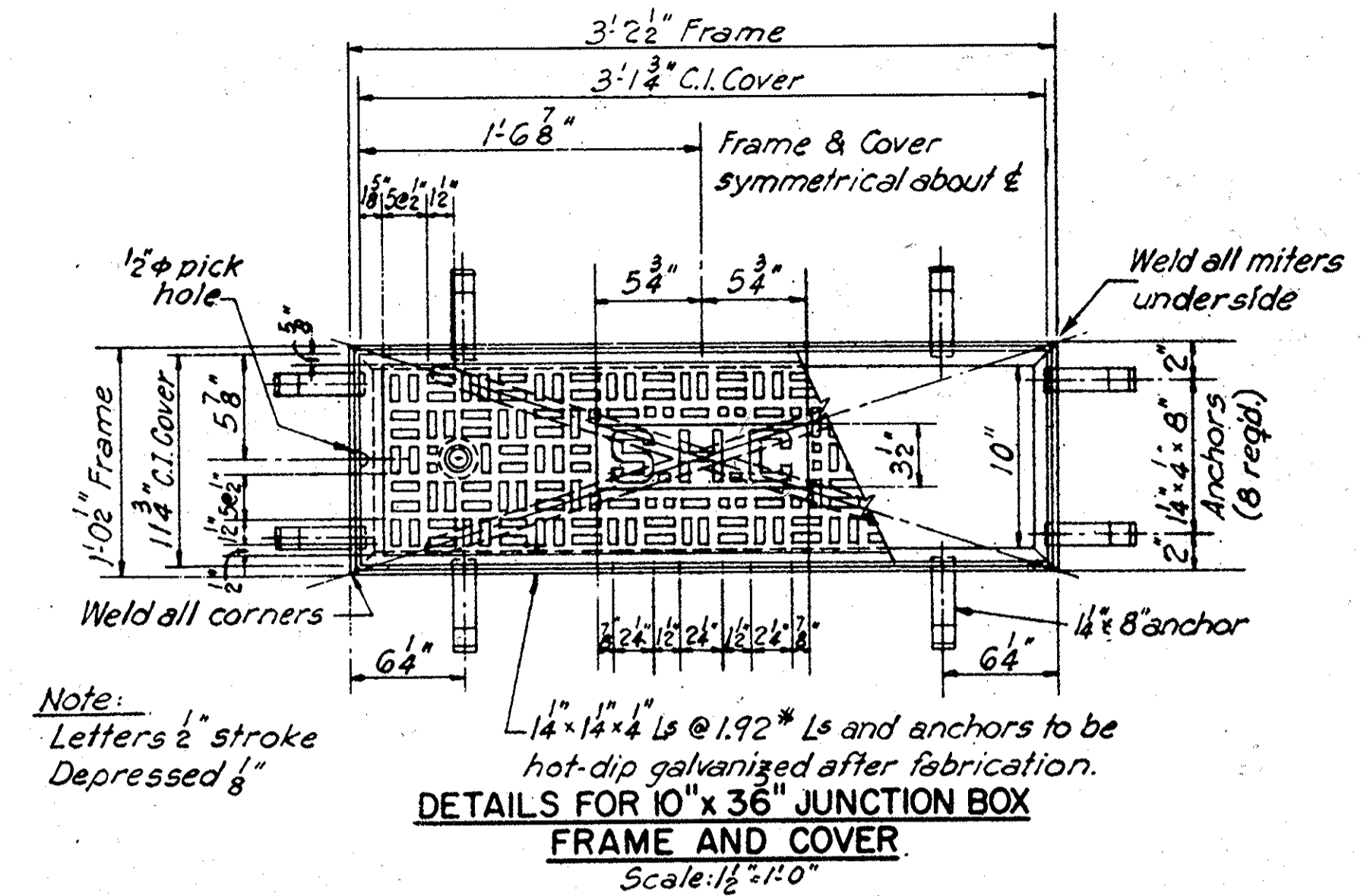
PROJECT No. 8.1355108
NEW HANOVER COUNTY
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
CAPE FEAR RIVER CROSSING
AT WILMINGTON
APPROACHES ON STRUCTURE
SIGN BRACKETS & TRAFFIC GATE SUPPORTS
WATER LINE DETAILS

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC.	DATE: October 1967
ENGINEERS	NEW YORK
REVISION	BY DATE
1. Revised Anchorage	MCS 2.13.68
2.	

SHEET No. 26 OF 69

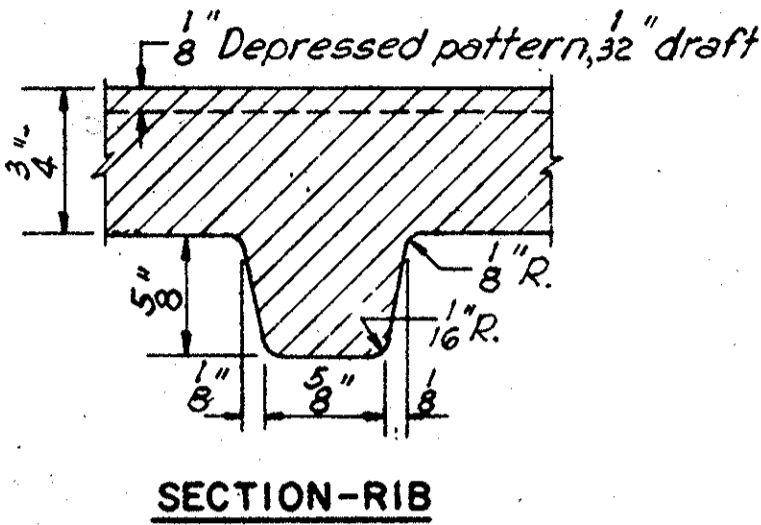
MADE BY E. E. MAGS
CHECKED BY M. C. SLOTT
IN CHARGE OF M. C. SLOTT

FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N.C.	8.1355108
F.A. PROJECT	F-75-2 (11)	

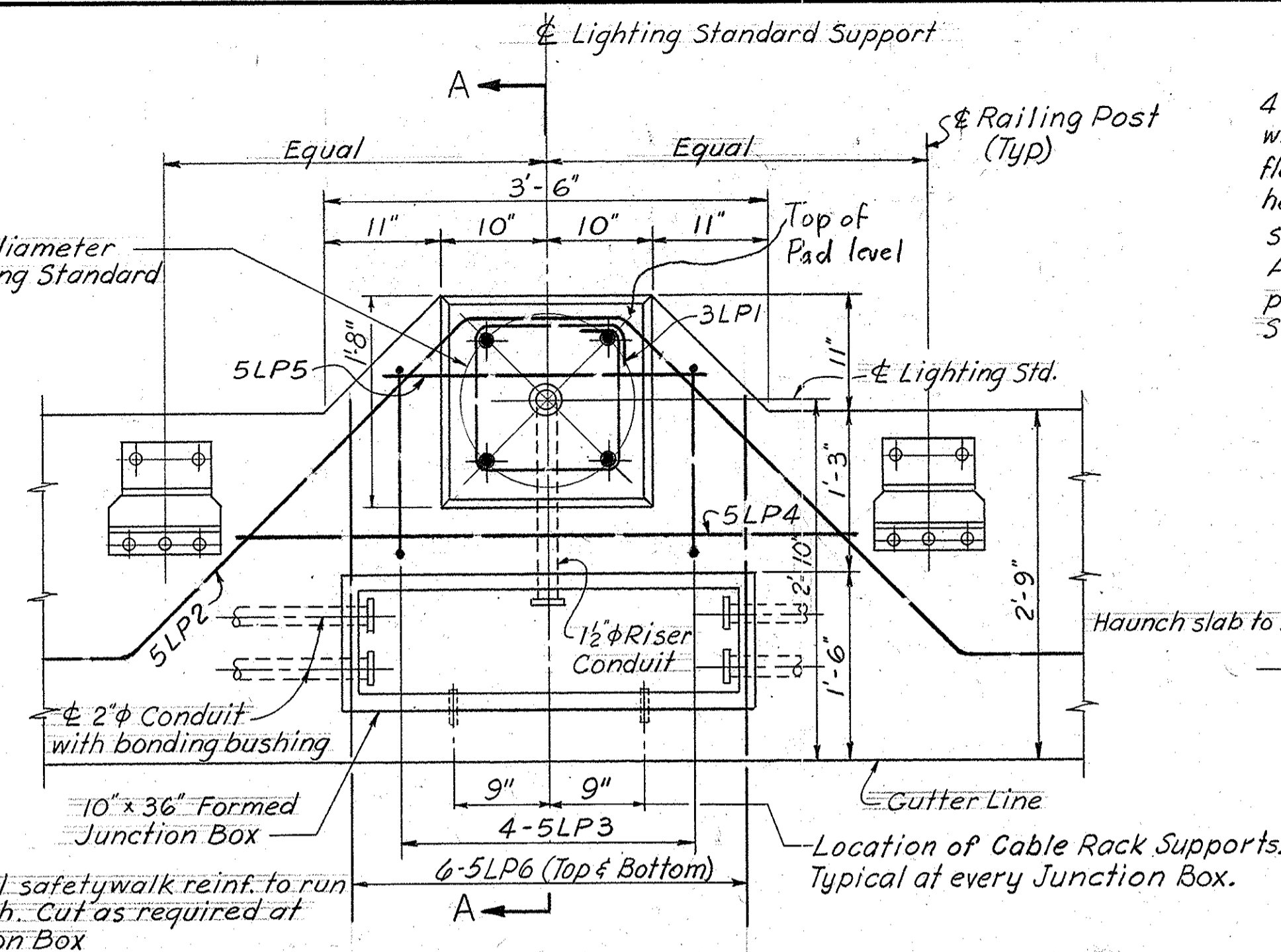


DETAILS FOR 10" x 36" JUNCTION BOX FRAME AND COVER
Scale: 1/2" = 1'-0"

Cover and exposed portions of frame to receive one shop coat of red lead and 2 field coats of paint as per specifications. Color to match adjacent concrete.

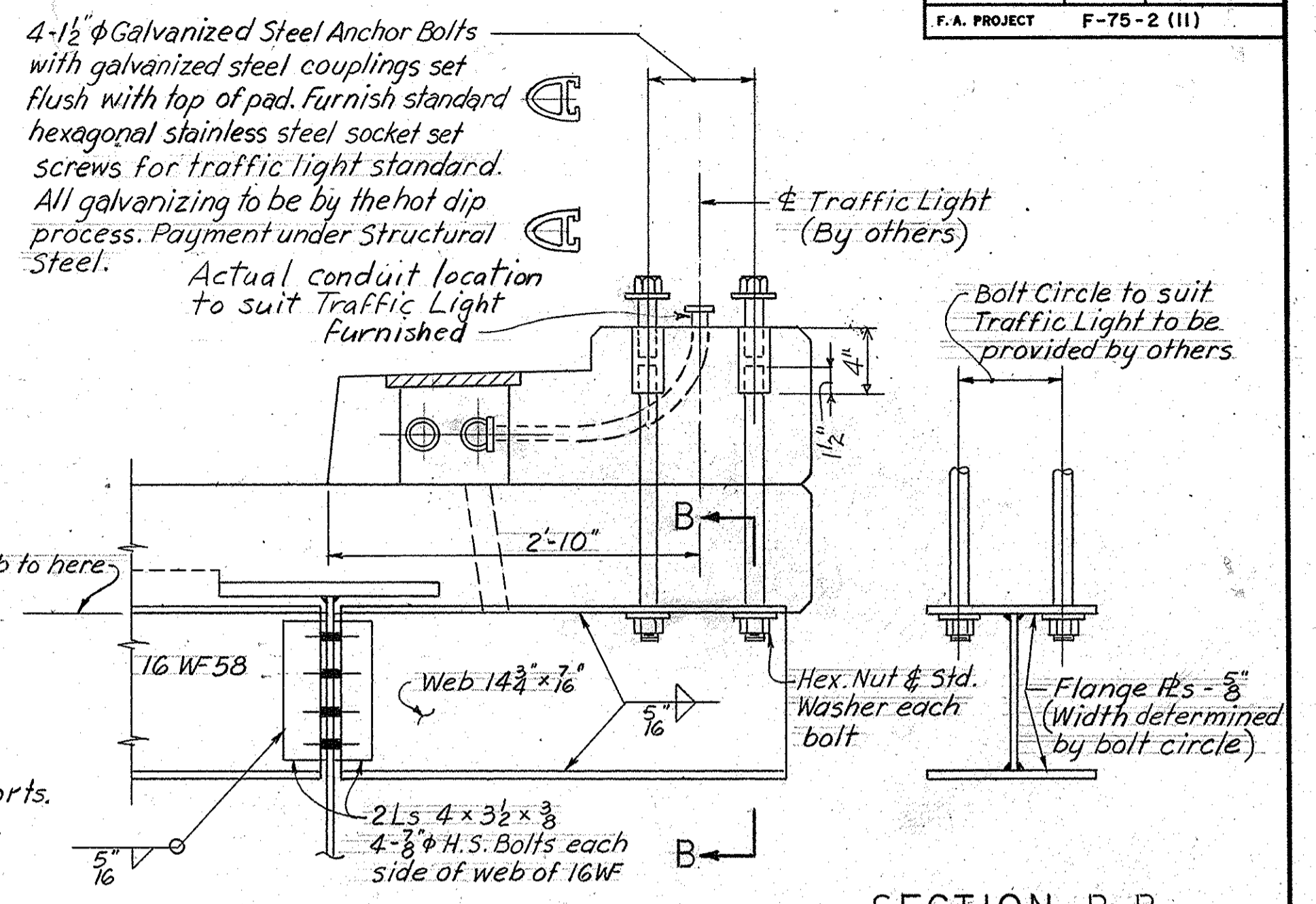


SECTION-RIB



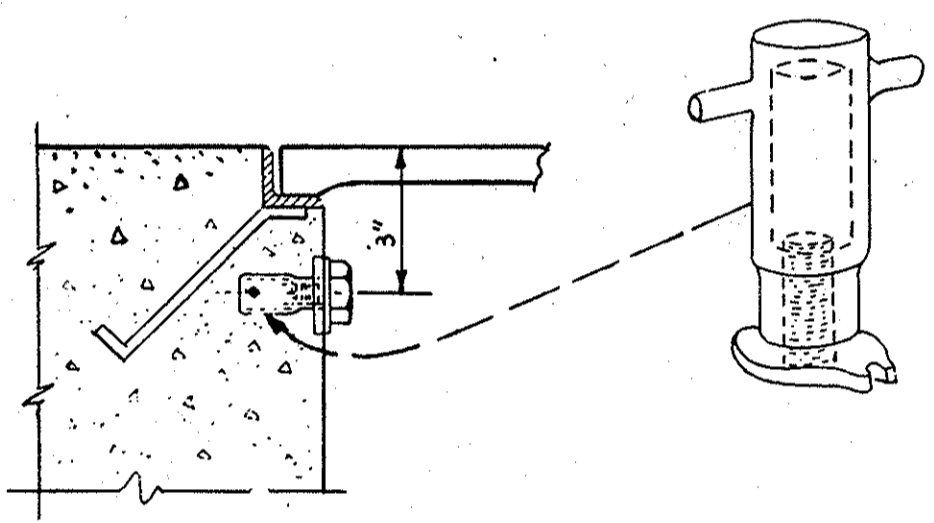
PLAN AT LIGHTING STANDARD SUPPORT
Scale: 1" = 1'-0"

For number and location of Lighting Standards see Sheets No. 18 & 19. For number and location of Conduits and Junction Boxes, see Electrical Sheets.

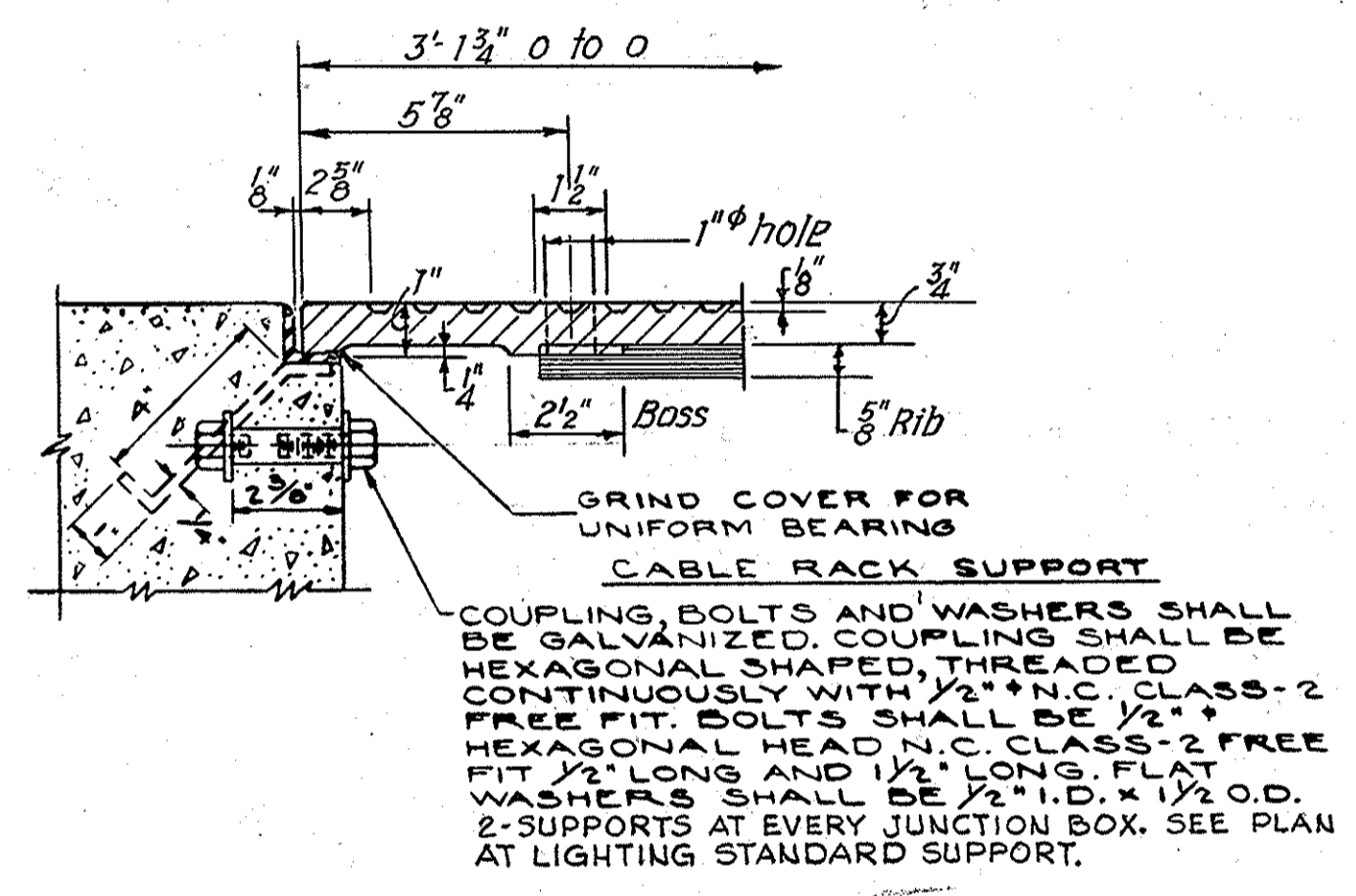


SECTION AT TRAFFIC LIGHT
Scale: 1" = 1'-0"

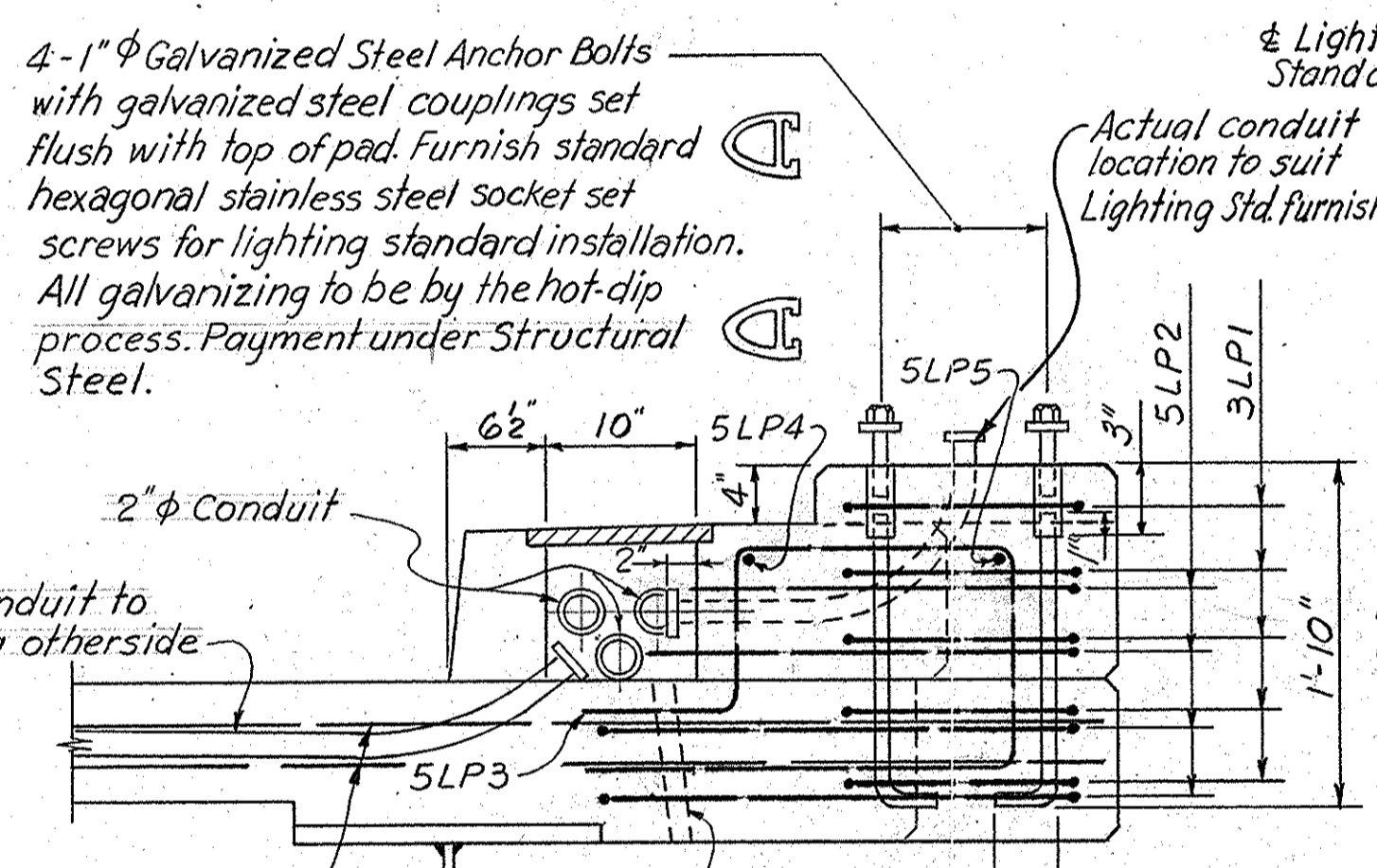
Details, dimensions and reinforcing not shown are same as at Lighting Standard Support.



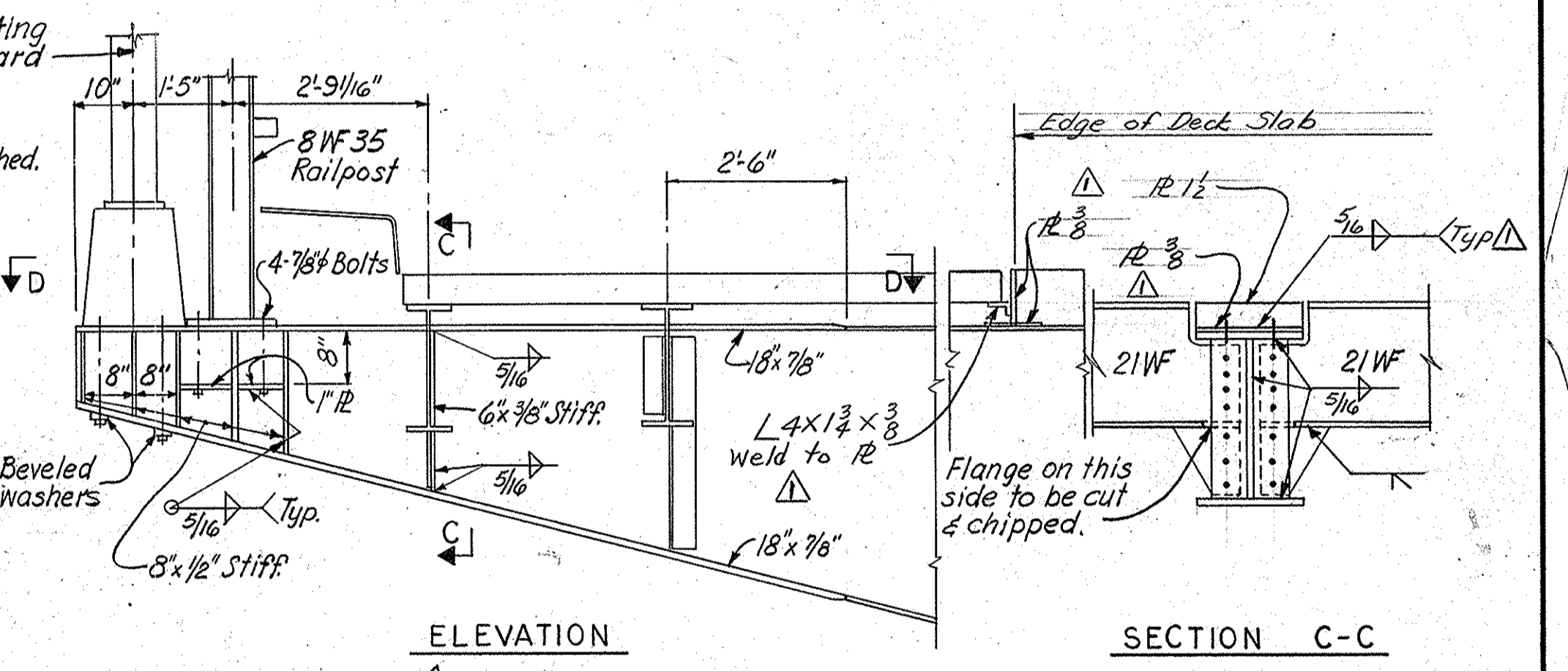
ALTERNATE CABLE RACK SUPPORT



SECTION THRU JUNCTION BOX COVER
See alternate cable rack support.
Scale: 3" = 1'-0"

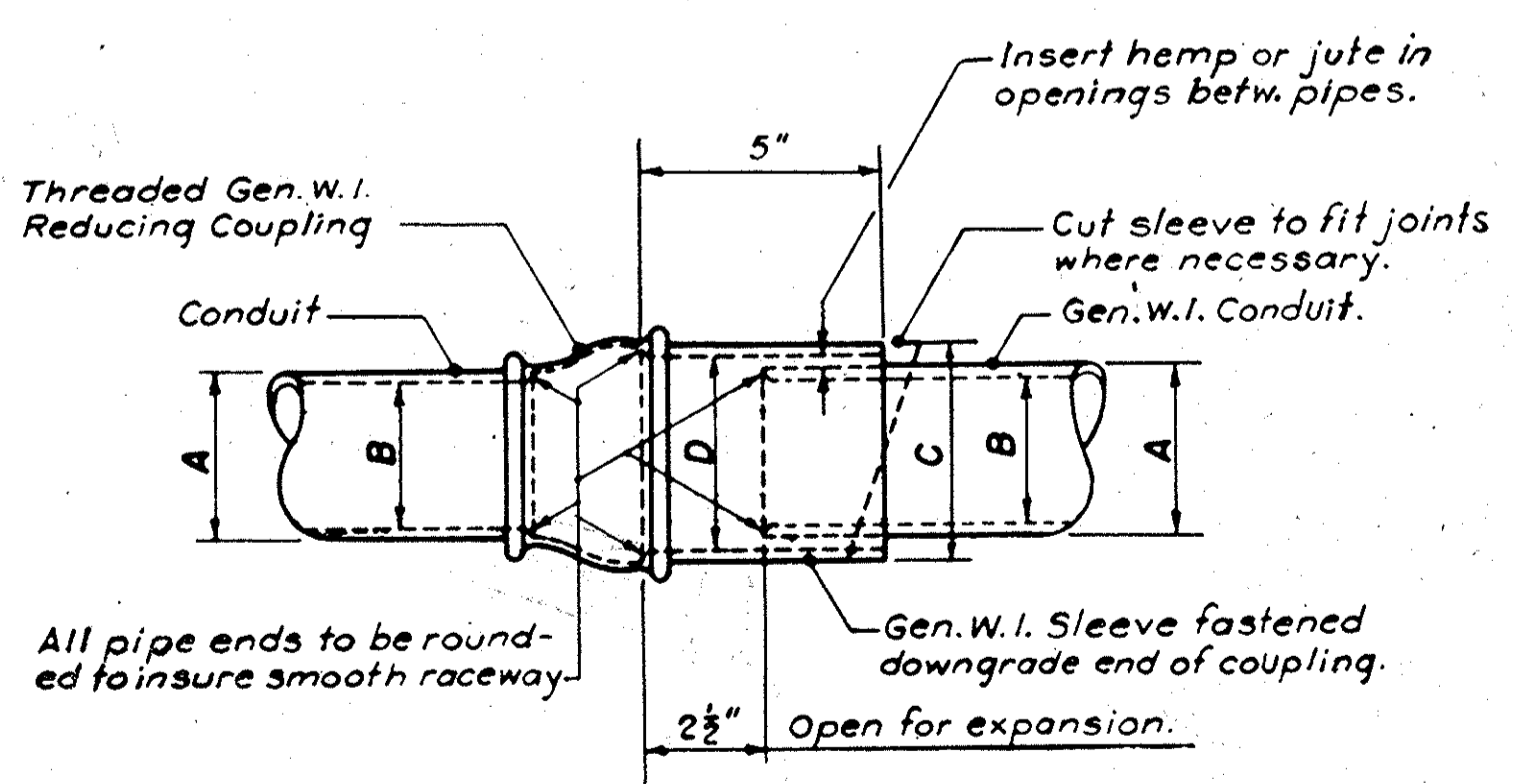


SECTION A-A
Scale: 1" = 1'-0"



ELEVATION

SECTION C-C



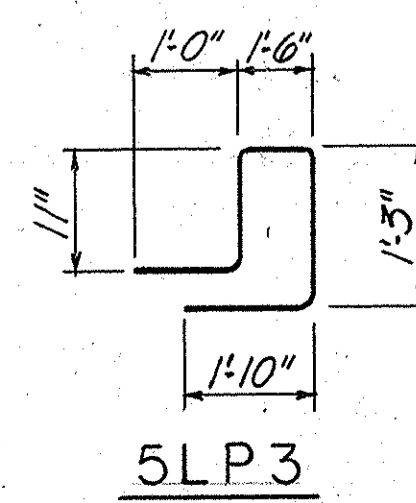
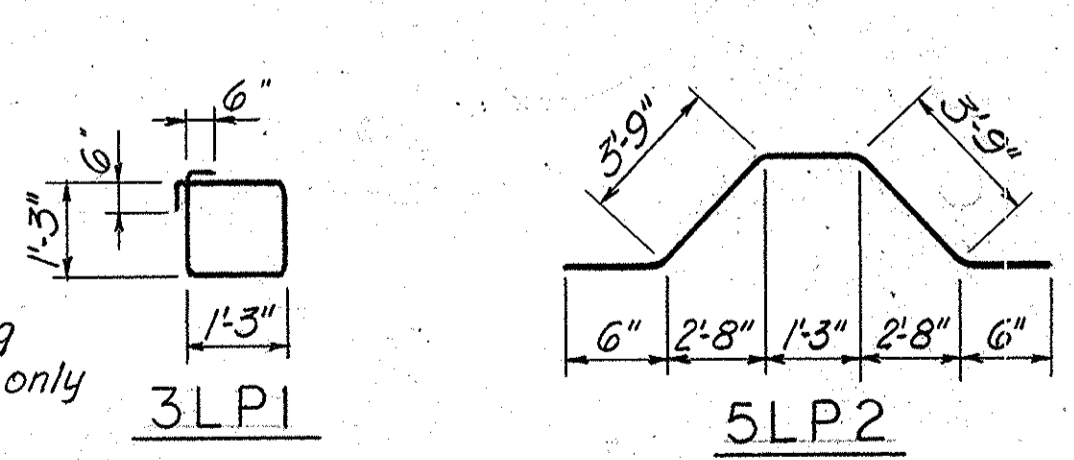
DETAIL OF CONDUIT EXPANSION SLEEVE

Expansion sleeves shall be installed at all expansion joints and elsewhere as shown or ordered. All expansion sleeves shall include clamp type conduit bonding jumpers. Conduits and fittings shall be hot-dip galvanized.

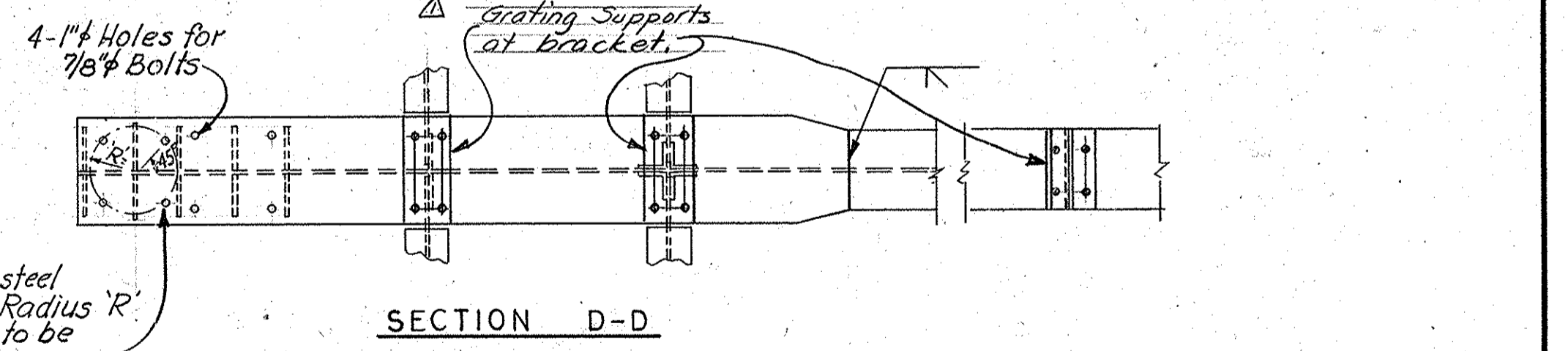
REINFORCEMENT FOR ONE LIGHTING STANDARD SUPPORT *			
MARK	No.	LENGTH	REMARKS
3LP1	5	6'-0"	
5LP2	4	9'-9"	
5LP3	4	6'-6"	
5LP4	1	5'-0"	Straight
5LP5	1	2'-6"	"
5LP6	12	5'-4"	"

* Reinforcement same for One Traffic Light Support, except as noted.

CONDUIT SIZE	DIAMETERS			
	A	B	C	D
1"	1.315	1.043	1.900	1.604
2"	2.375	2.060	3.500	3.059
3 1/2"	4.000	3.538	5.563	5.036



5LP3

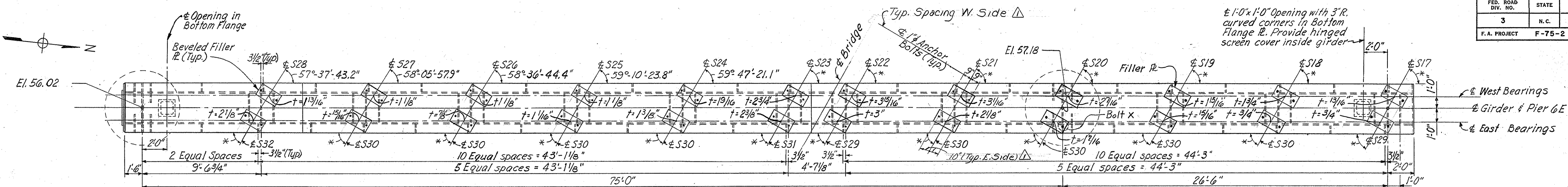


DETAILS AT LIGHTING STANDARD OF BRACKET B2
Scale: 1/2" = 1'-0"

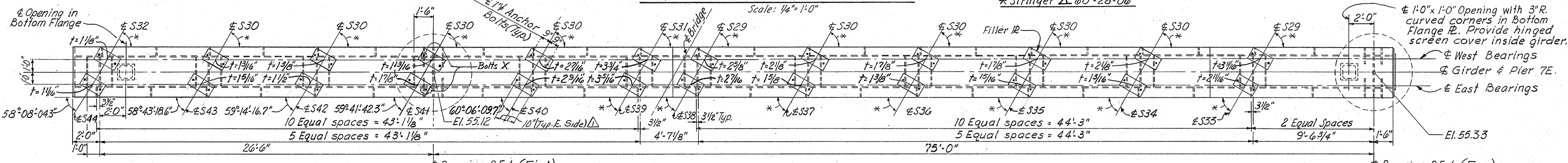
For details not shown, see Bracket B1, Sheet No. 23.

REVISION	BY	DATE
Grating Supports	MCS	10-8-68

PROJECT No. 8.1355108
NEW HANOVER COUNTY
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
CAPE FEAR RIVER CROSSING
AT WILMINGTON
APPROACHES ON STRUCTURE
JUNCTION BOXES - LIGHTING STANDARD
AND TRAFFIC LIGHT SUPPORTS
PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. DATE: October, 1967
NEW YORK SHEET NO. 27 OF 69

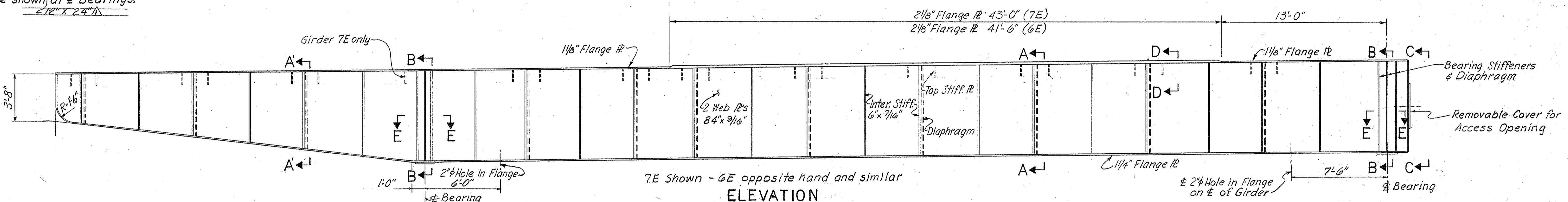


PLAN OF TOP FLANGE - PIER 6E

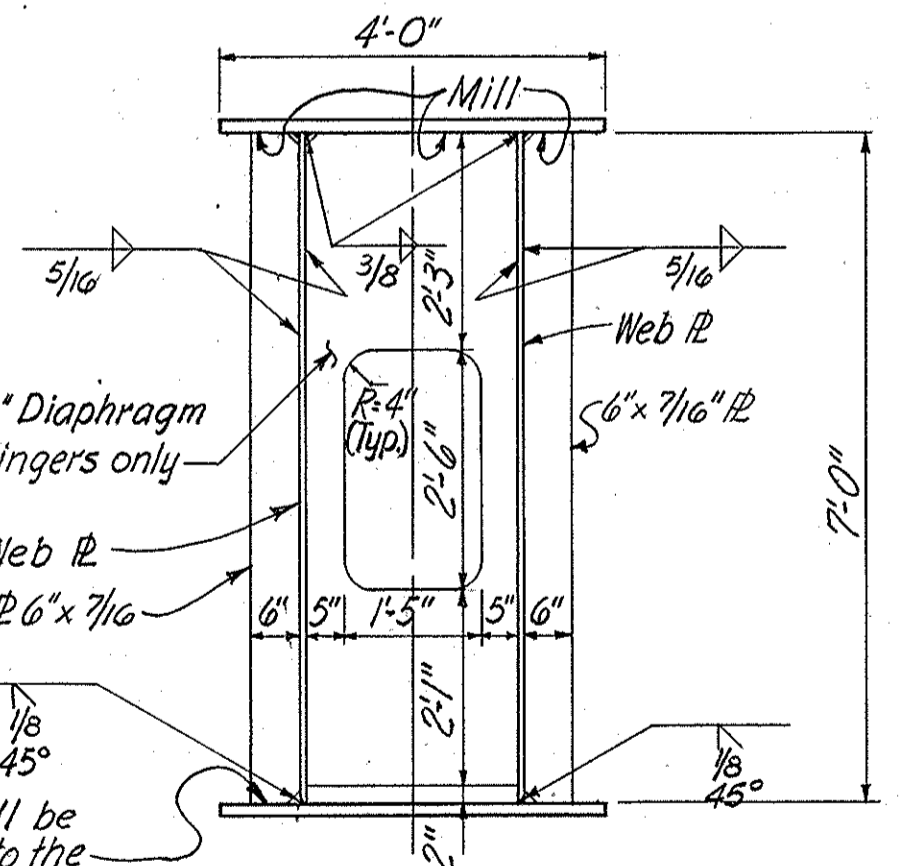


PLAN OF TOP FLANGE - PIER 7E

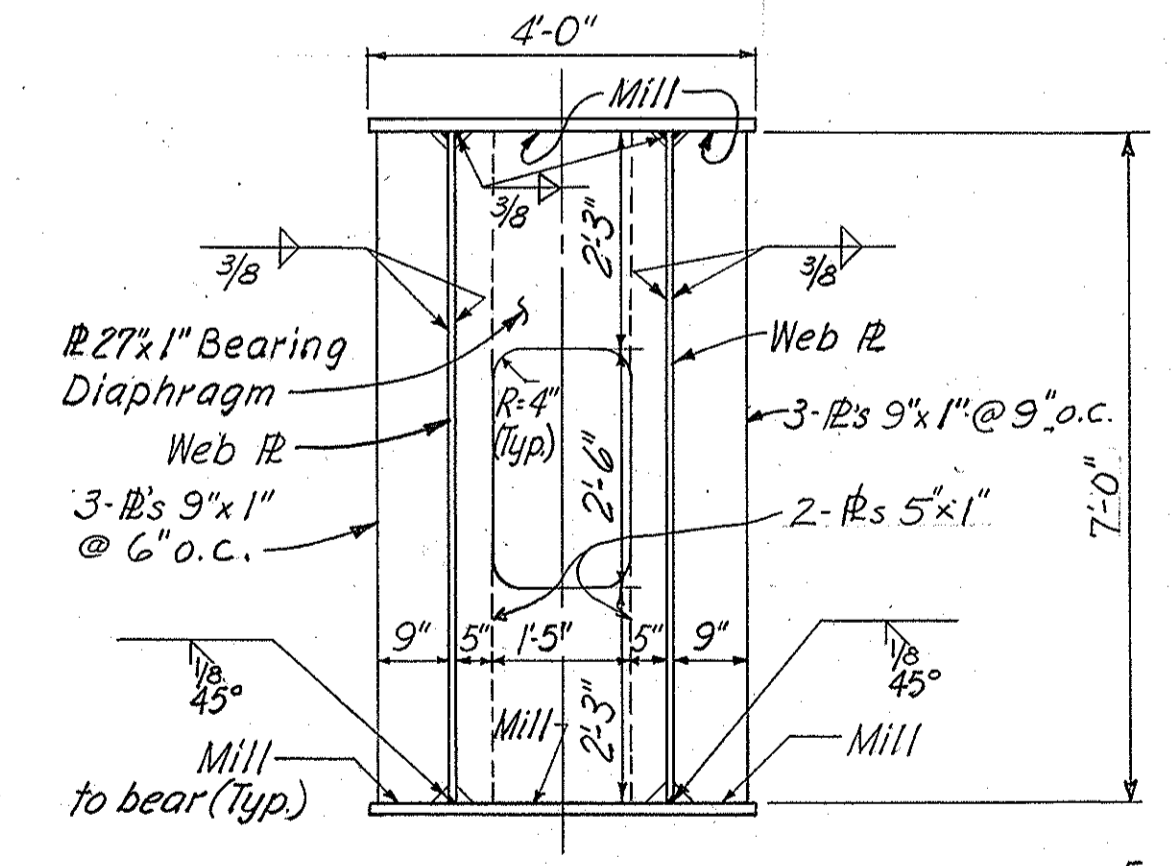
Note:
All filler R's on top of Box Girders are to be $\frac{1}{8}$ " x $\frac{3}{4}$ " beveled. Thicknesses "t" are shown at & Bearings.
 $\frac{1}{2}$ " x $2\frac{1}{4}$ "



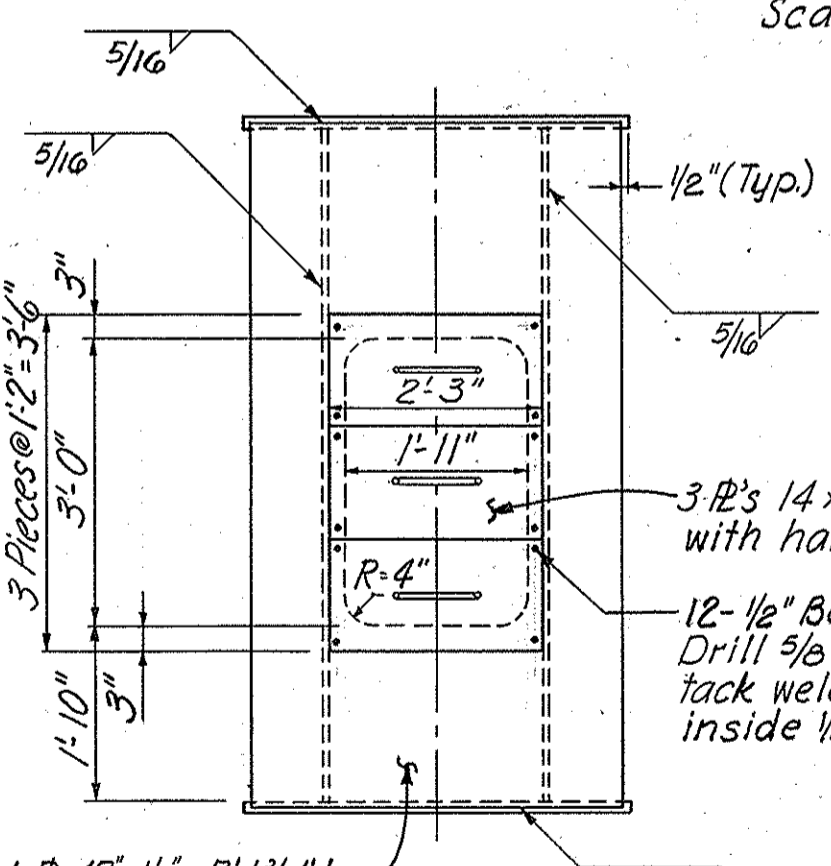
ELEVATION



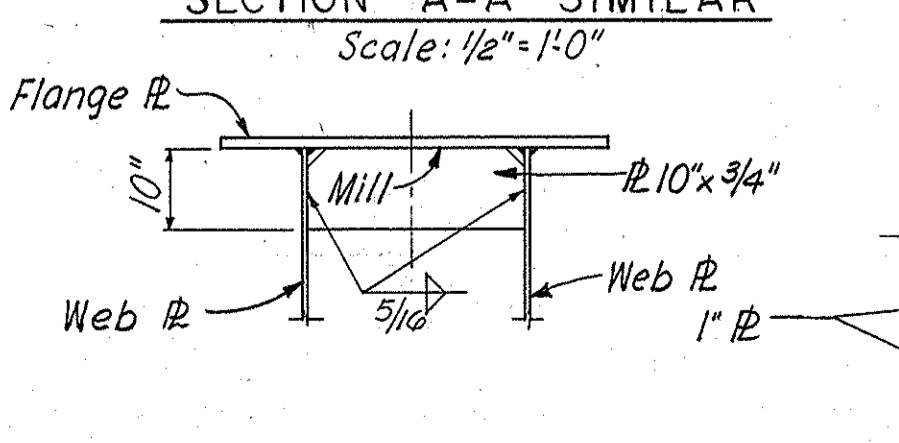
SECTION A-A



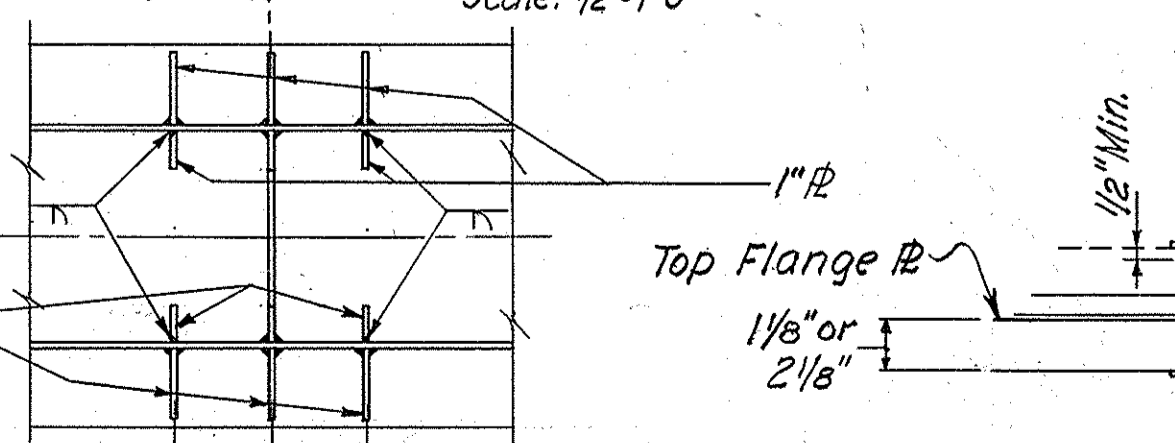
SECTION B-B



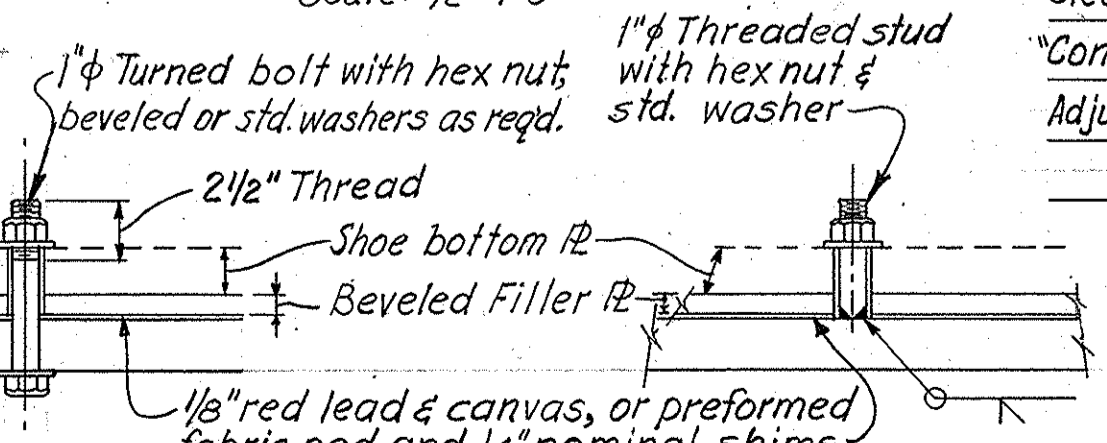
SECTION C-C



SECTION D-D



SECTION E-E



ANCHOR BOLT DETAIL

BOLT X

GIRDER 6E

	9.56'	18.18'	26.80'	35.42'	44.04'	52.66'	61.28'	69.90'	78.52'	87.14'	95.76'	104.38'	113.00'
"Steel" Deflection	0	1/16	1/8	1/8	3/16	1/8	1/8	1/8	1/8	0	-1/16	-1/16	-1/16
"Concrete" Deflection	0	3/16	5/16	3/8	3/8	5/8	1/4	1/8	0	-1/16	-1/16	-1/16	
Adjustment for Cross Slope	0	15/16	1 1/2	1 7/8	2	2	1 1/4	1 1/2	7/8	0	-1 1/16	-2 3/8	-3 7/8
Total Camber	0	-1 3/16	-1 5/16	2 3/8	2 9/16	2 1/2	2 1/8	1 7/8	1 1/16	0	-1 3/16	-2 1/2	-4

GIRDER 7E

	8.62'	17.24'	25.86'	34.48'	43.10'	51.72'	60.34'	68.96'	77.58'	86.20'	94.82'	103.44'	112.06'
"Steel" Deflection	-1/16	-1/16	-1/16	0	0	1/8	1/8	1/8	1/8	1/8	1/8	1/16	0
"Concrete" Deflection	-1/16	-1/16	-1/16	0	1/8	1/4	5/16	3/8	7/16	3/8	5/16	3/16	0
Adjustment for Cross Slope	-4/8	-2 3/4	-1 5/8	0	7/8	1 5/8	2 1/4	2 5/16	2 1/8	1 3/4	1 1/16	0	
Total Camber	-4 7/8	-2 7/8	-1 7/16	0	1	2	2 9/16	2 3/4	2 7/8	2 5/8	2 3/16	1 3/16	0

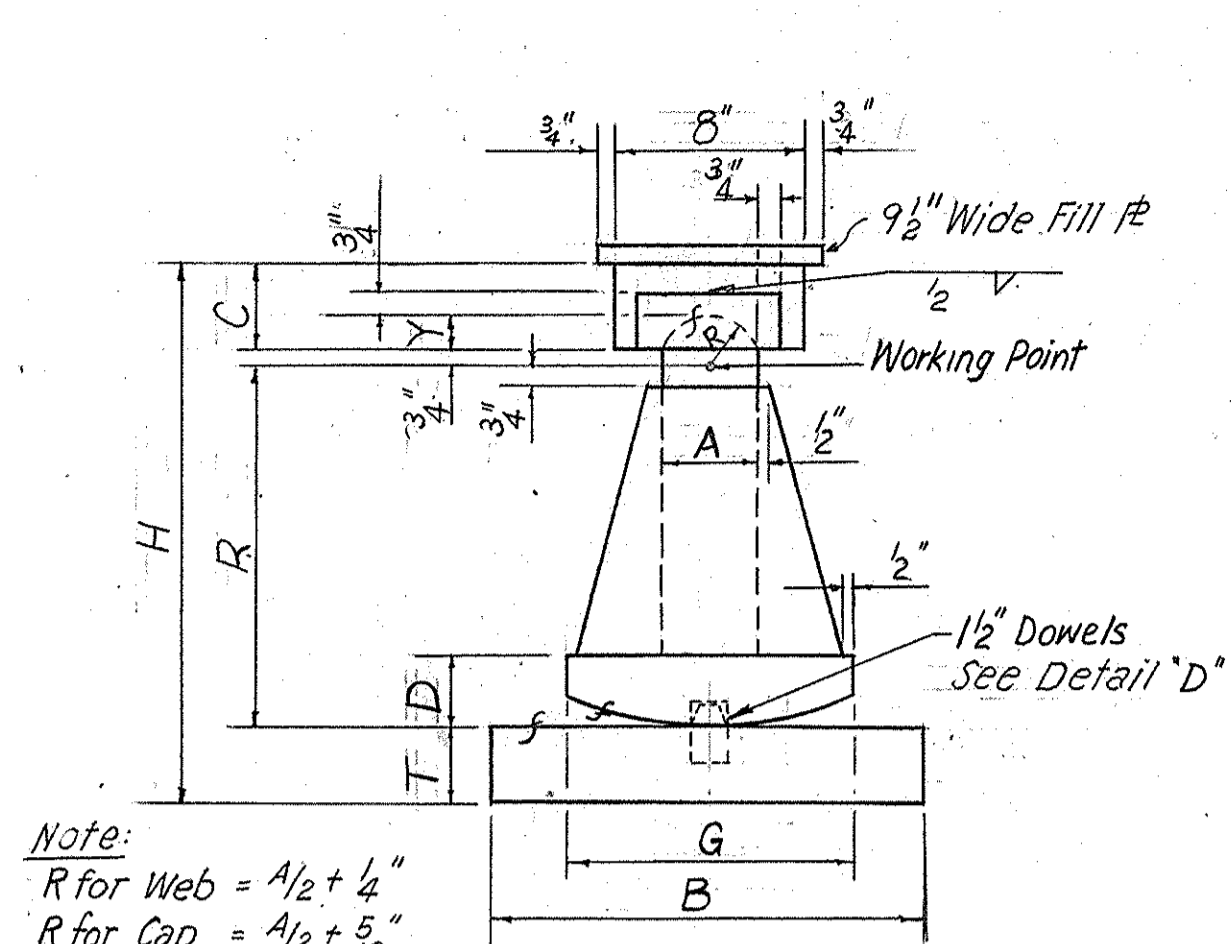
GIRDER 7E DEFLECTION & CAMBER

Notes:
1. For General Notes, see Sheet No. 2
2. Webs, flanges & bearing stiffeners of box girders are to be A441 Steel. All other steel A36.
3. For shoe types, see Sheet No. 21.
For shoe details, see Sheet No. 30.

PROJECT No. 8.1355108
NEW HANOVER COUNTY
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
CAPE FEAR RIVER CROSSING
AT WILMINGTON
APPROACHES ON STRUCTURE
STEEL BOX GIRDER DETAILS

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC.	DATE: October 1967
ENGINEERS	NEW YORK
REVISION	BY DATE
1	Fills & Bolt Spacing MCS 1-25-68

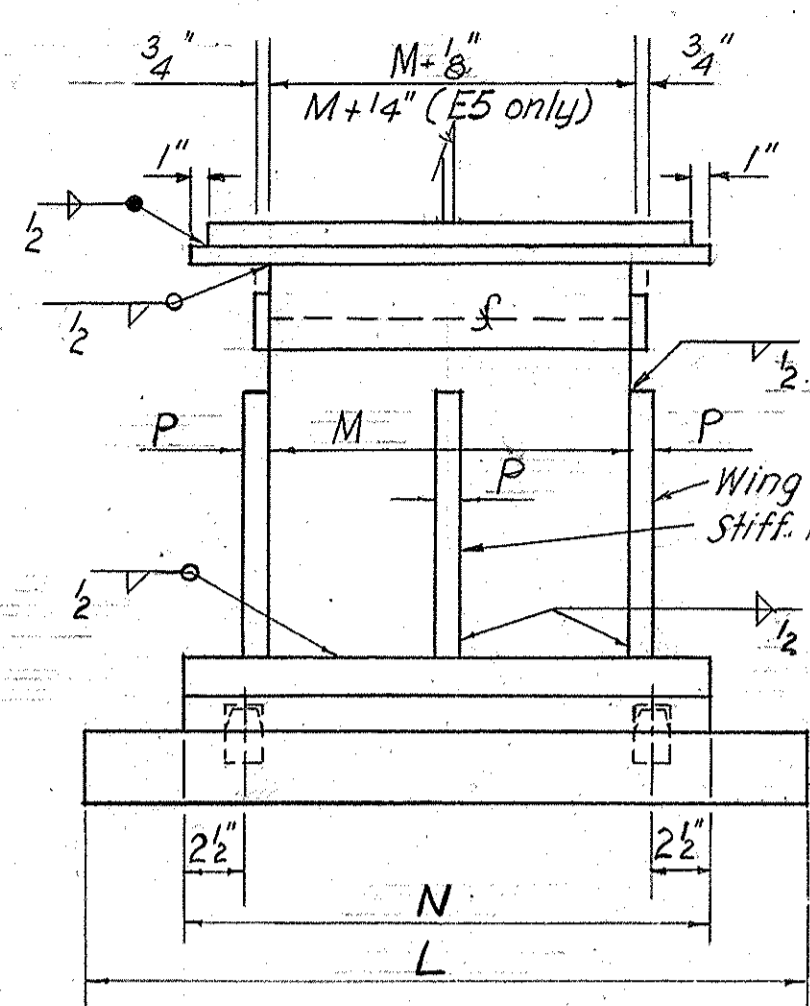
SHEET NO. 29 OF 69



Note:
R for Web = $A/2 + 1/4"$
R for Cap = $A/2 + 5/16"$

EXPANSION BEARING SHOE-"E" TYPES

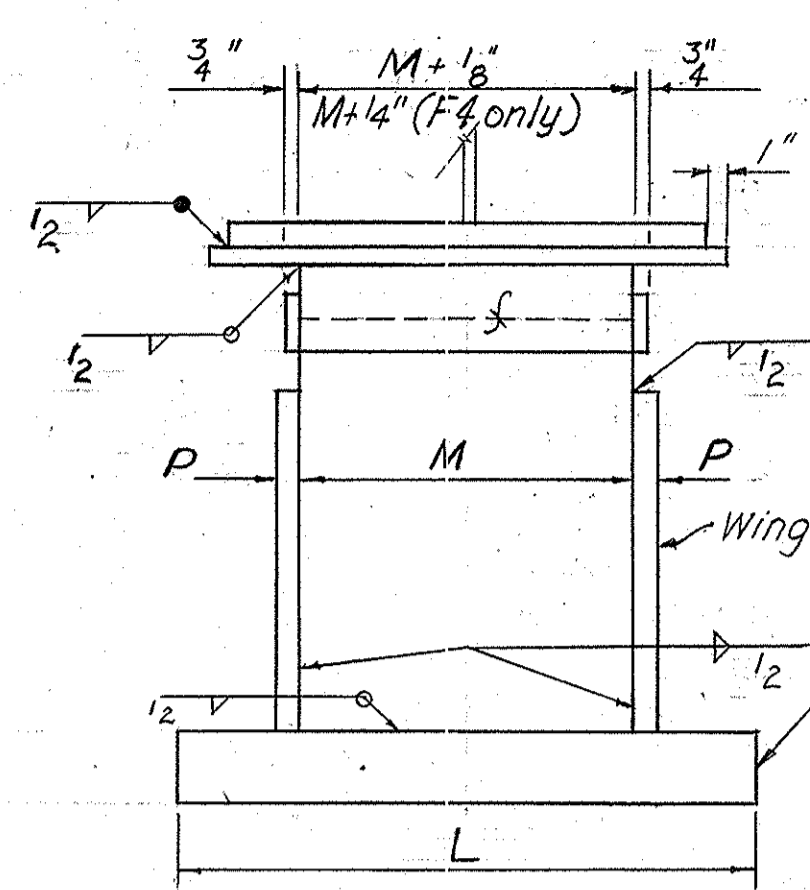
Not to Scale



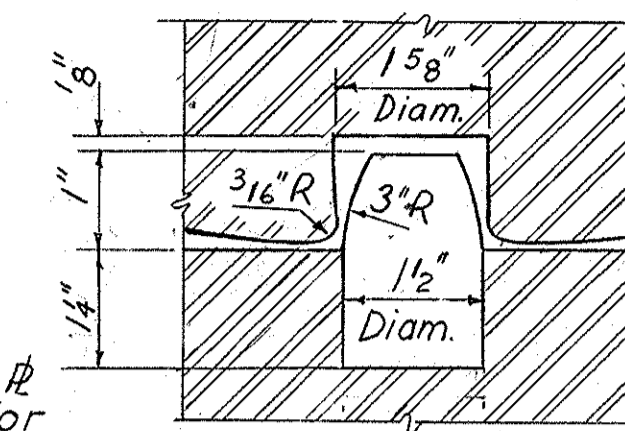
Masonry R. See Plan for location of anchor bolts

FIXED BEARING SHOE-"F" TYPES

Not to Scale

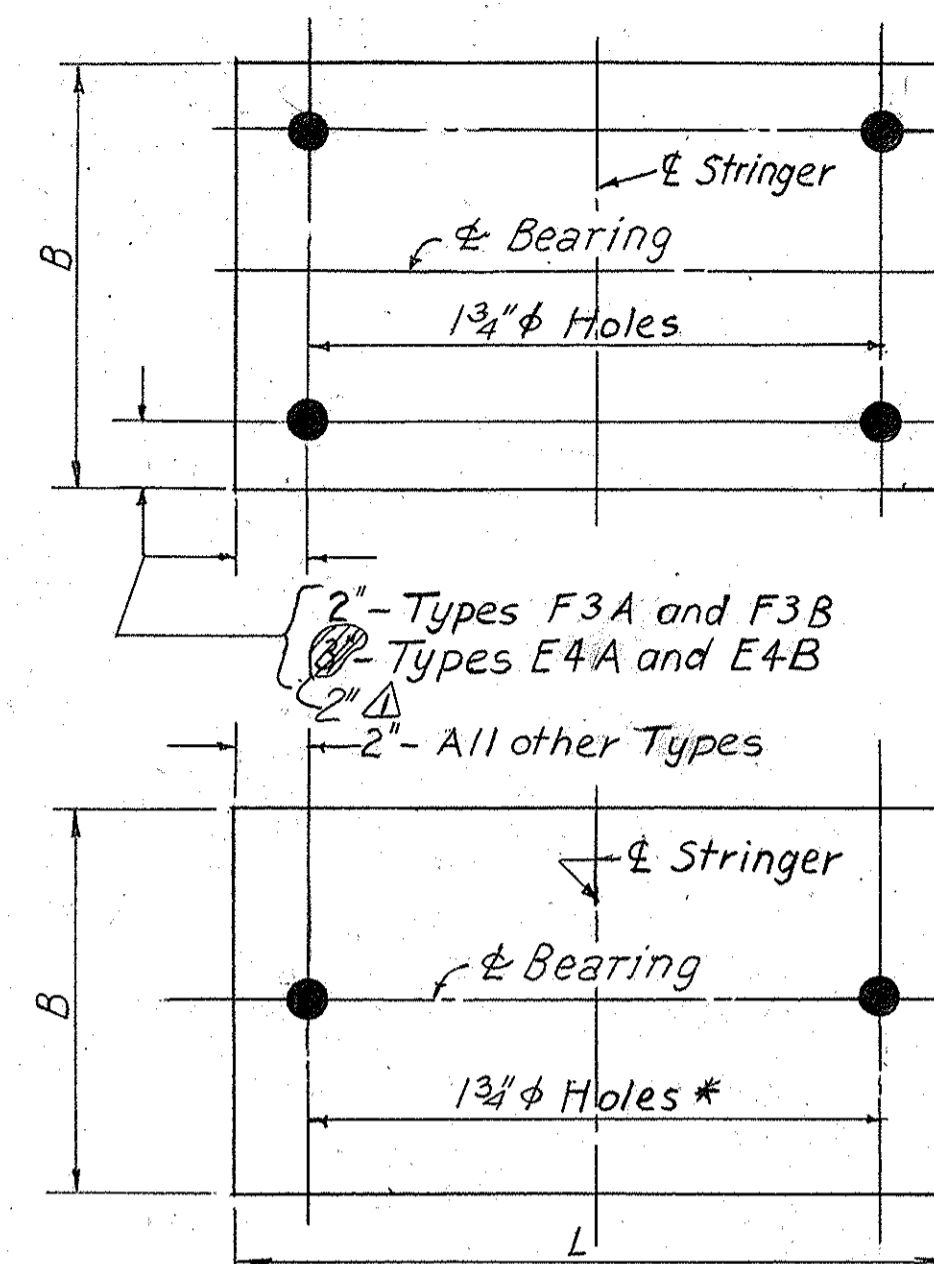


EXPANSION BEARING SHOE BE-1



DETAIL D
Half Size

*Except for shoes used on top flanges of box girders. See Sheet 29.

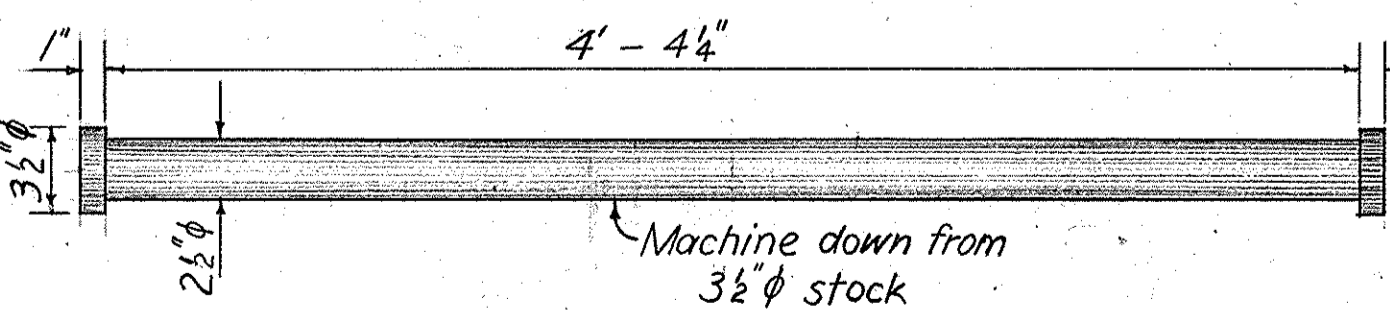


PLAN-MASONRY PLATES

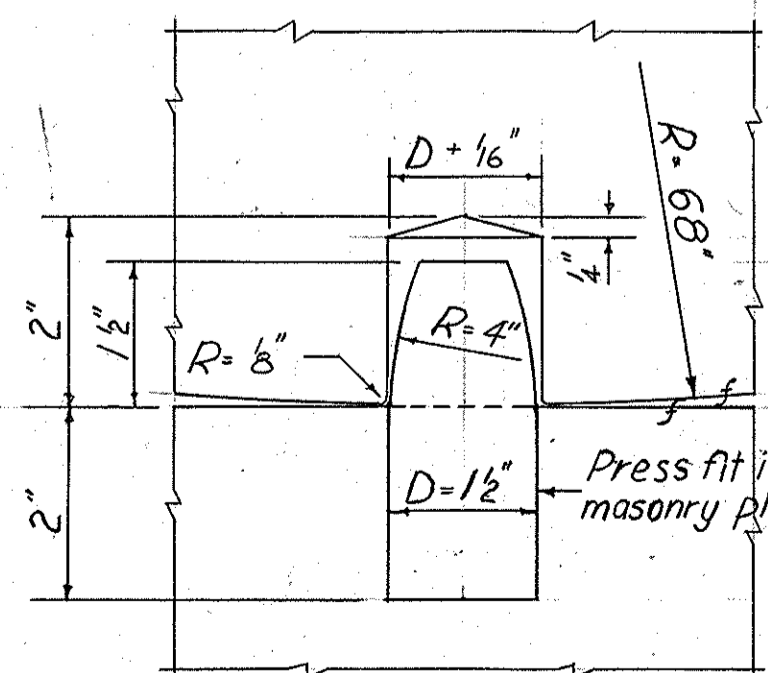
Not to Scale

TYPE	B	L	T	H	R	C	N	G	D	M	A	P	Y	TOP FILL R THICKNESS
E1	20	34	3 1/2	25 1/2	17 3/4	3 1/2	24	16	4	18	4	1	1 1/2	3/4
E2A	16	24	3	18 3/4	12	3	16	12	3	11	3 1/2	3/4	1 1/4	19/16
E2B		24				Same	as	E2A						1 3/16
E2C						"	"	"						13/16
E3A	16	24	3	19 3/8	12 5/8	3	16	12	3	11	3 1/2	3/4	1 1/4	3/4
E3B		24				Same	as	E3A						7/8
E4A	18	34	3 1/2	19 1/4	11 1/2	3 1/2	26	12	4	20	4	1	1 1/2	3/4
E4B						Same	as	E4A						11/16
E5	12	24	2	14 1/4	9	2 1/2	15	8	2 1/4	11	3	3/4	1	3/4
F1	16	22	2	18 3/8	12 5/8	3	-	-	-	11	3 1/2	3/4	1 1/4	3/4
F2A	16	22	2	19 1/2	13 1/2	3	-	-	-	11	3 1/2	3/4	1 1/4	1 3/8
F2B						Same	as	F2A						3/4
F2C						Same	as	F2A						1/8
F2D						Same	as	F2A						1
F3A	16	28	3	19 3/8	12 5/8	3 1/2	-	-	-	18	4	1	1 1/2	3/4
F3B						Same	as	F3A						1
F4	12	22	2	14 1/4	9	2 1/2	-	-	-	11	3	3/4	1	3/4

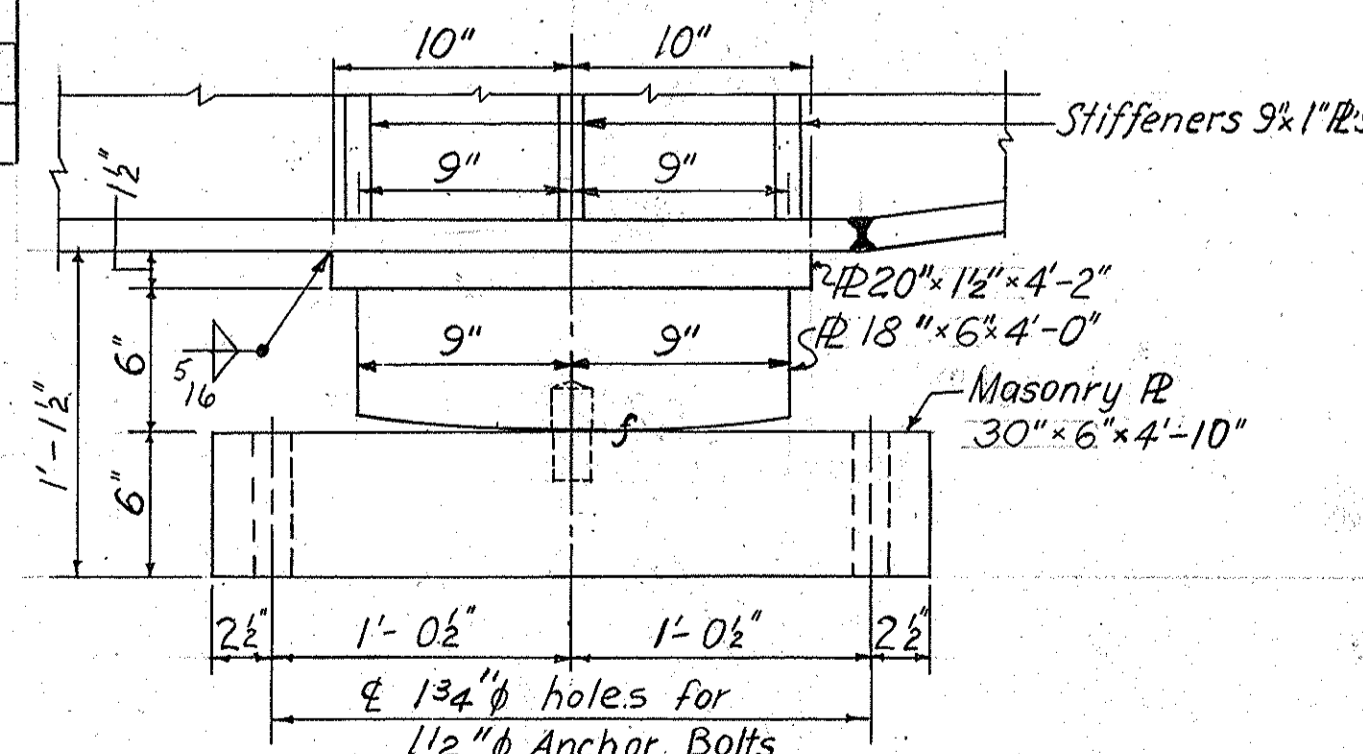
Note:
All dimensions are in inches



PIN DETAIL
Scale: 1 1/2" x 1'-0"

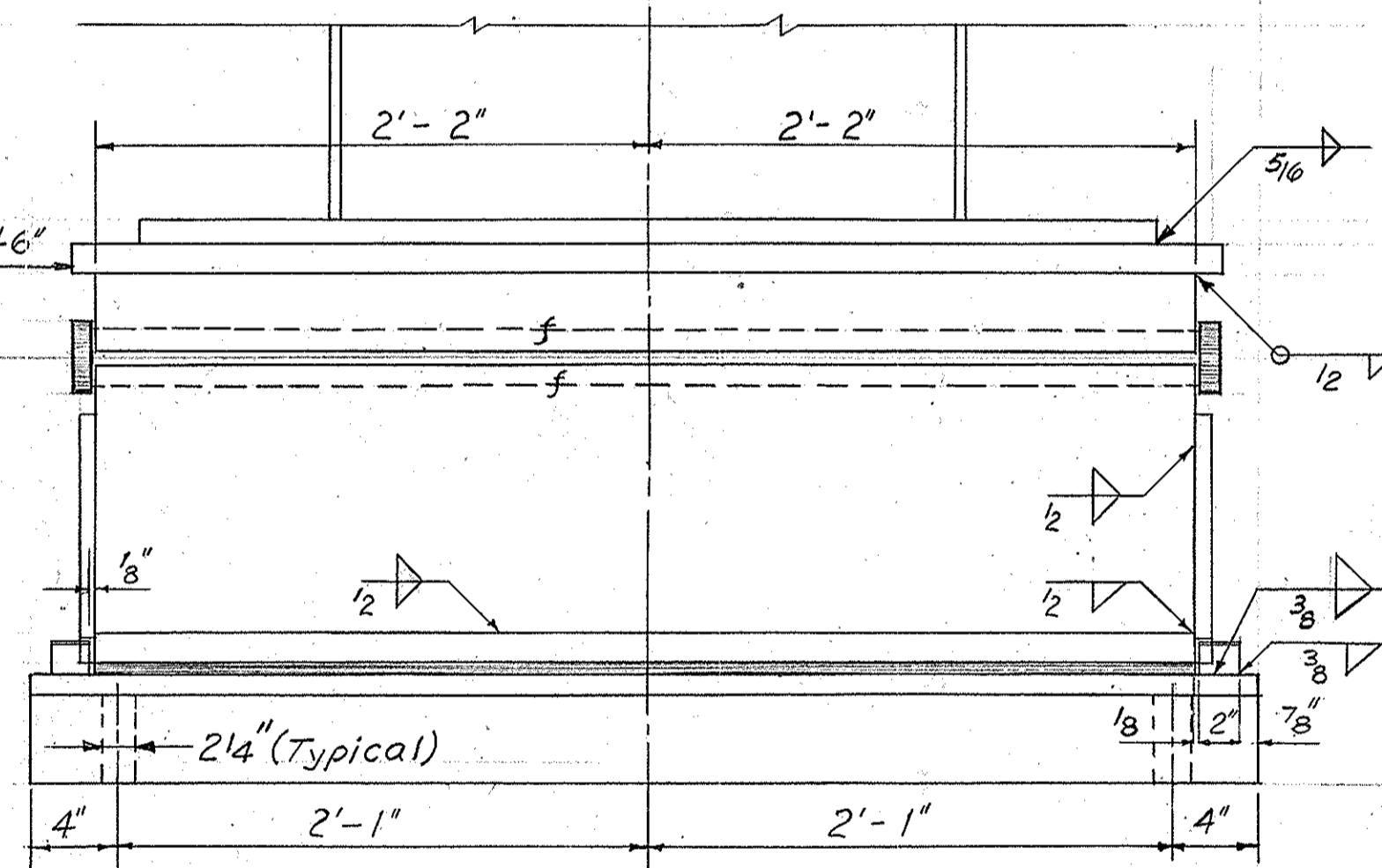


DOWEL DETAIL
Half Scale

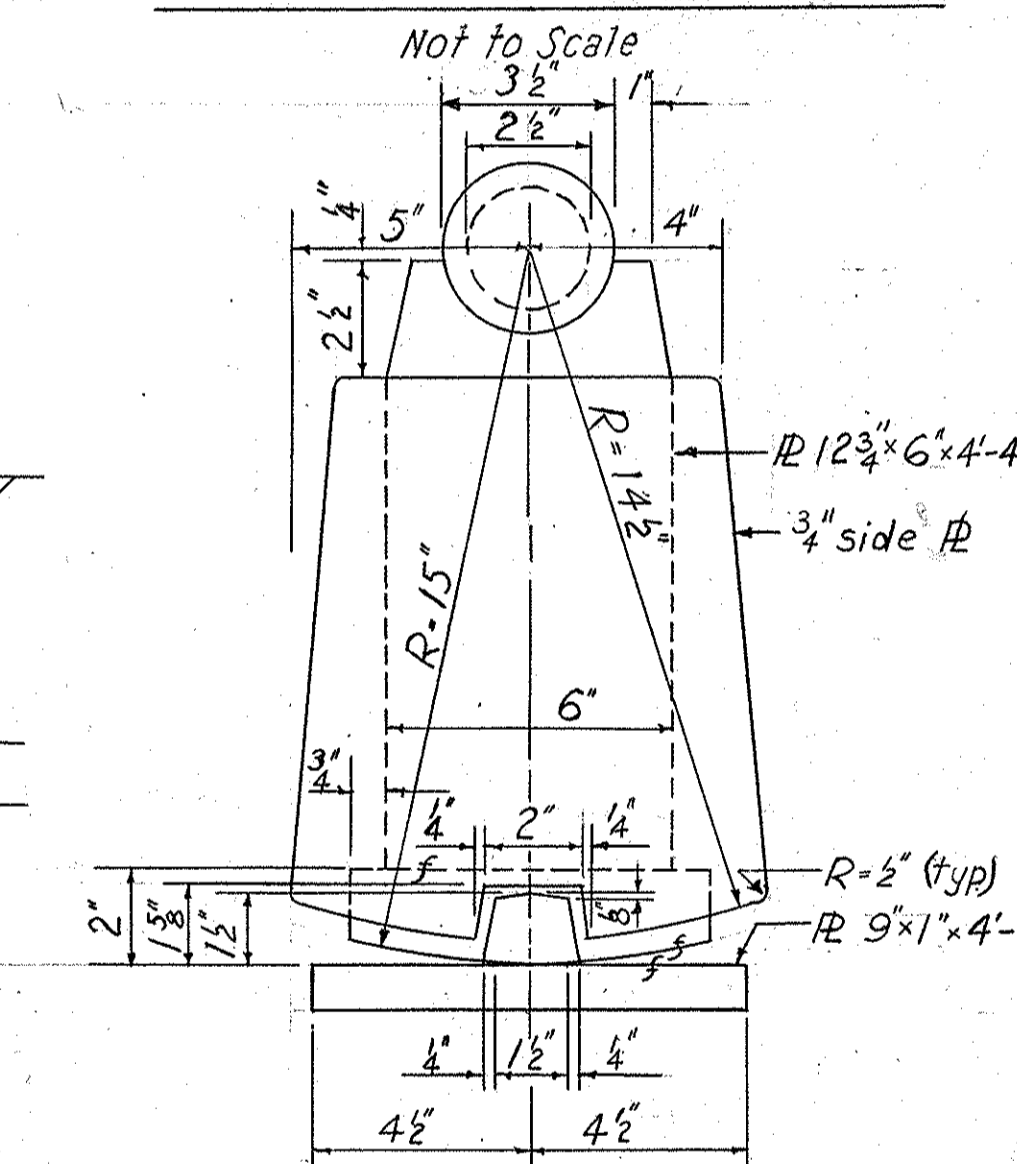


FIXED BEARING SHOE BF-1

BOX GIRDER SHOES
Scale: 1 1/2" x 1'-0"



EXPANSION BEARING SHOE BE-1



DETAIL R
Scale: 3" x 1'-0"

Note:
1. For General Notes see Sheet No. 2.
2. All welded shoes are to be stress-relieved.

PROJECT No. 8.1355108
NEW HANOVER COUNTY

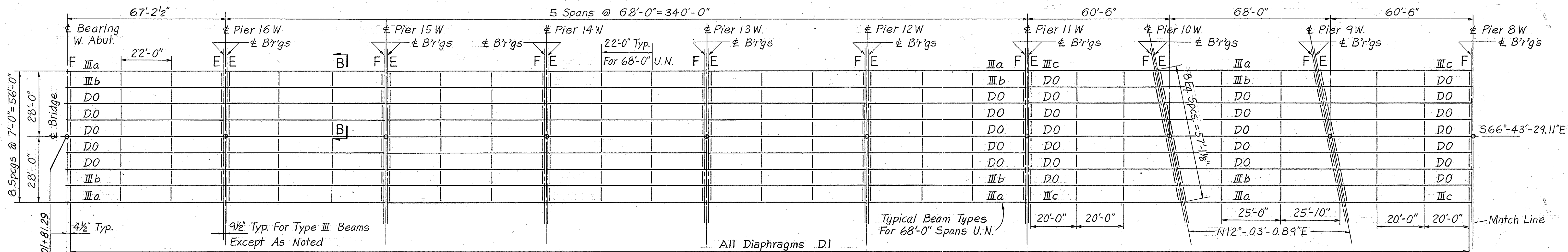
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

CAPE FEAR RIVER CROSSING
AT WILMINGTON
APPROACHES ON STRUCTURE
SHOE DETAILS - STEEL SPANS

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. DATE: October 1967
ENGINEERS NEW YORK SHEET NO. 30 OF 69

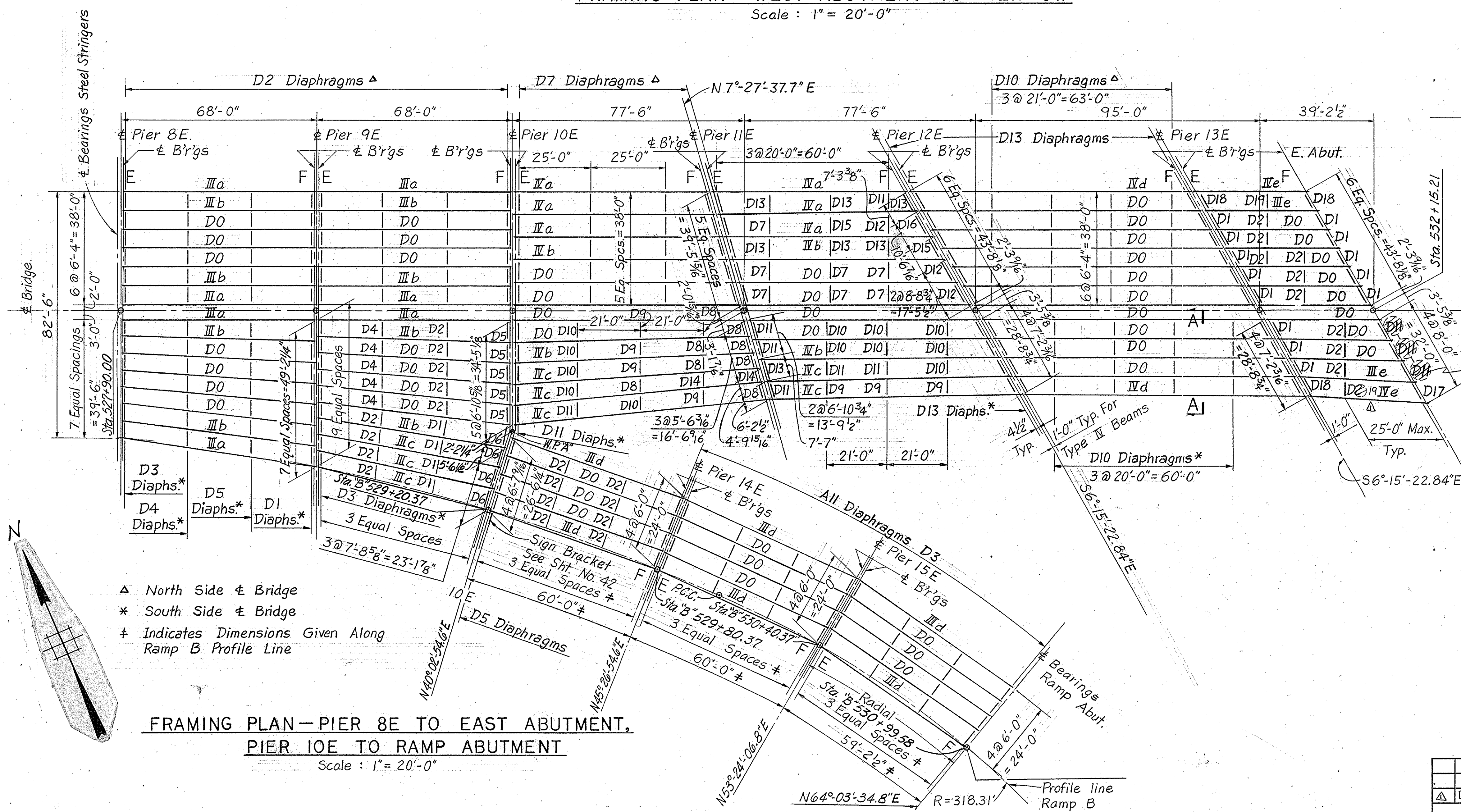
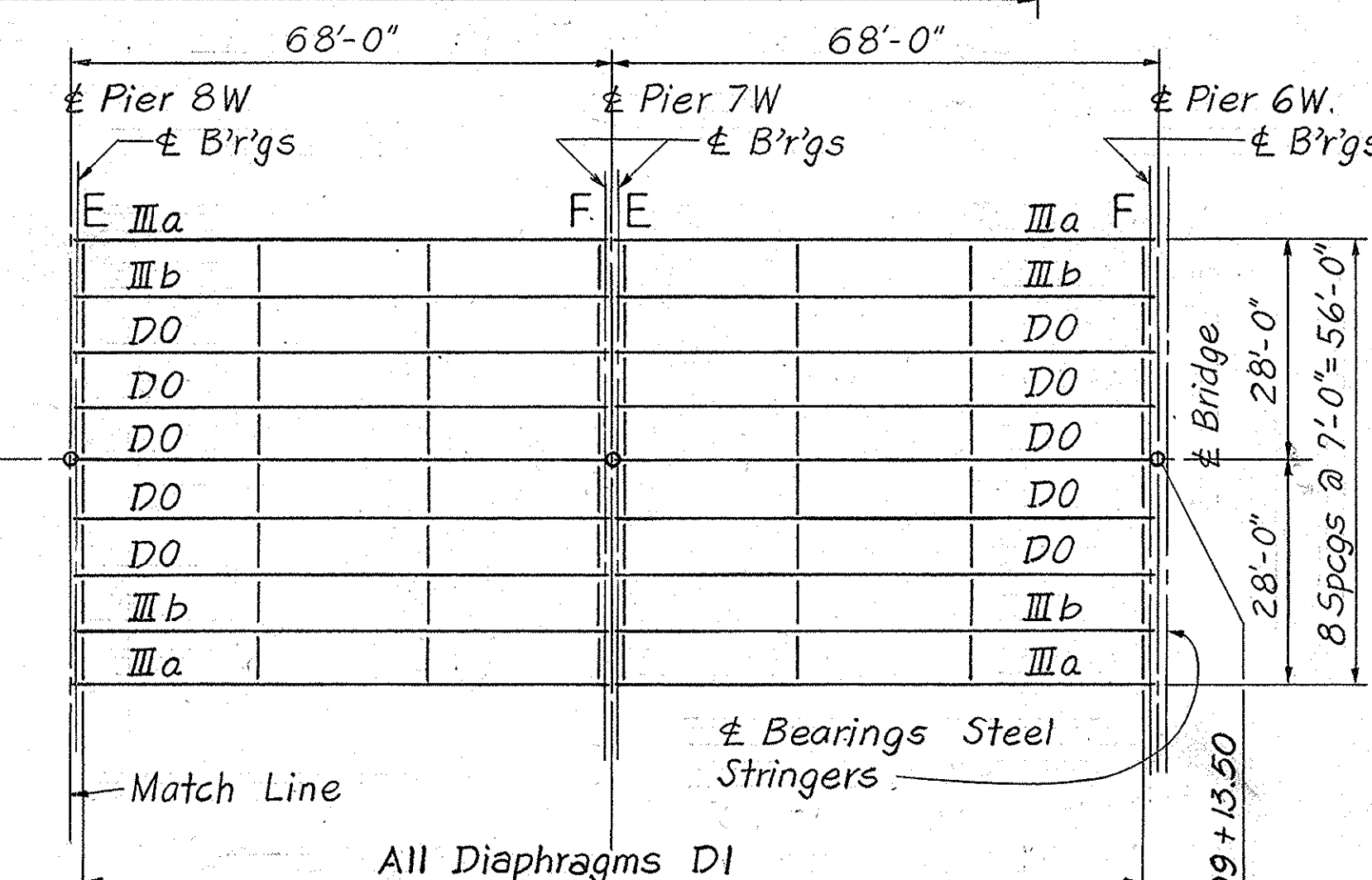
REVISION	BY	DATE
Masonry R's	MCS	1-25-68

MADE BY Parsons Brinckerhoff, Quade & Douglas
CHECKED BY M.C. Slas
IN CHARGE OF M.C. Slas



FRAMING PLAN - WEST ABUTMENT TO PIER 6W

Scale: 1" = 20'-0"

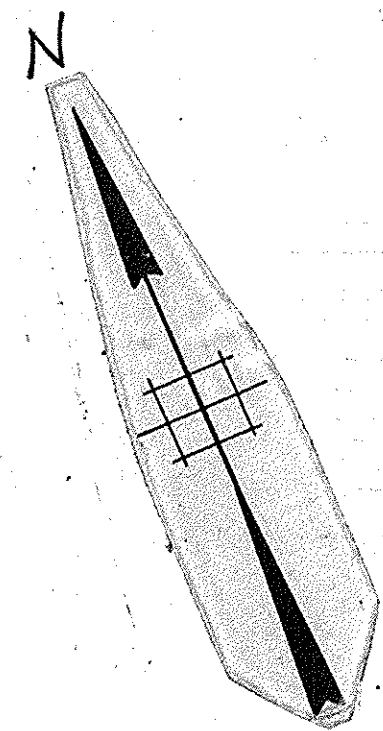


FRAMING PLAN - PIER 8E TO EAST ABUTMENT, PIER 10E TO RAMP ABUTMENT

Scale: 1" = 20'-0"

- NOTES:
1. For General Notes See Sheet No. 32
 2. For General Plan & Elevation See Sheet No. 3
 3. For Sections A-A & B-B See Sheet No. 34

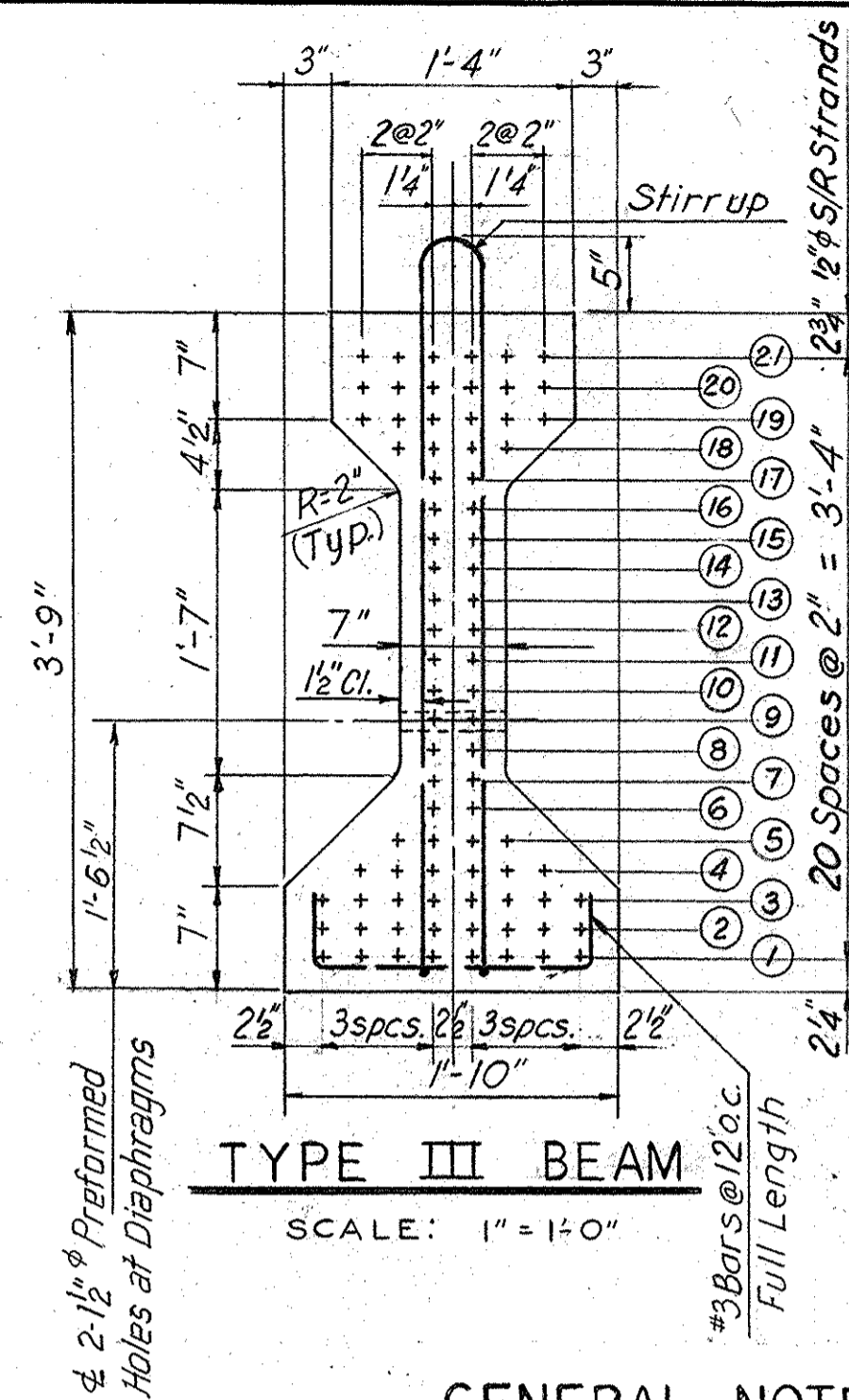
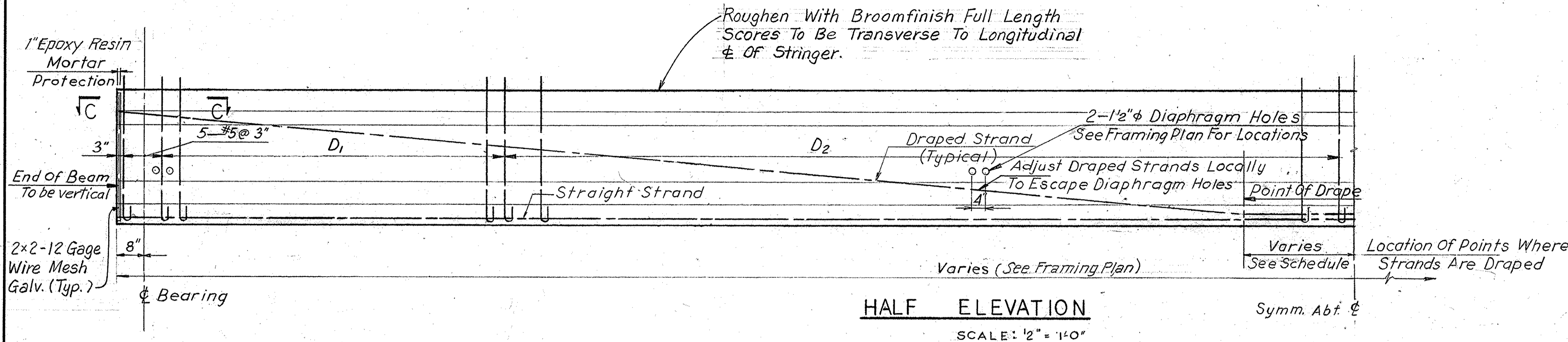
- △ North Side of Bridge
- * South Side of Bridge
- ‡ Indicates Dimensions Given Along Ramp B Profile Line



PROJECT No. 8.1355108
 NEW HANOVER COUNTY
 STATE OF NORTH CAROLINA
 STATE HIGHWAY COMMISSION
 RALEIGH
 CAPE FEAR RIVER CROSSING
 AT WILMINGTON
 APPROACHES ON STRUCTURE
 FRAMING PLANS - PRESTRESSED STRINGERS

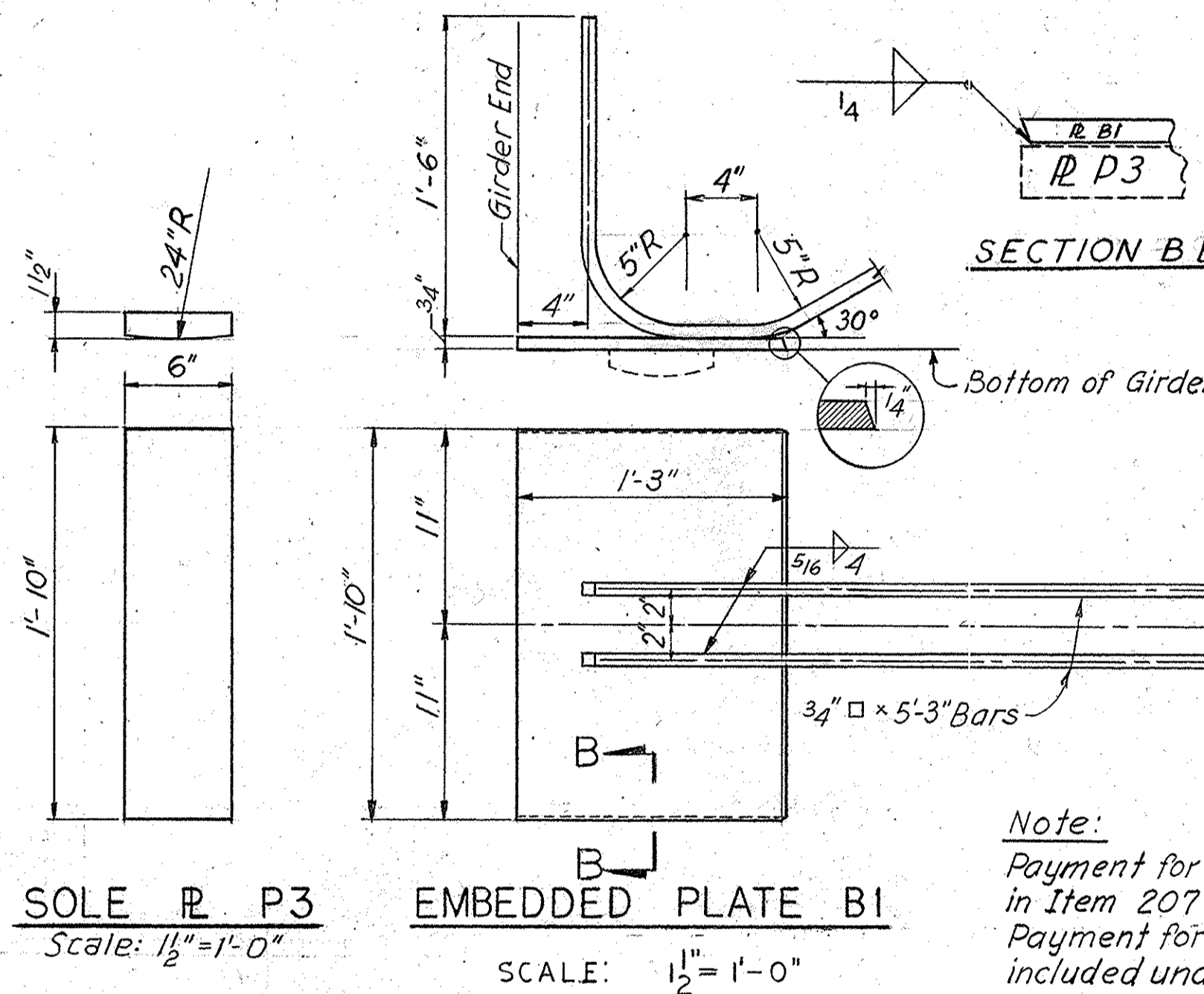
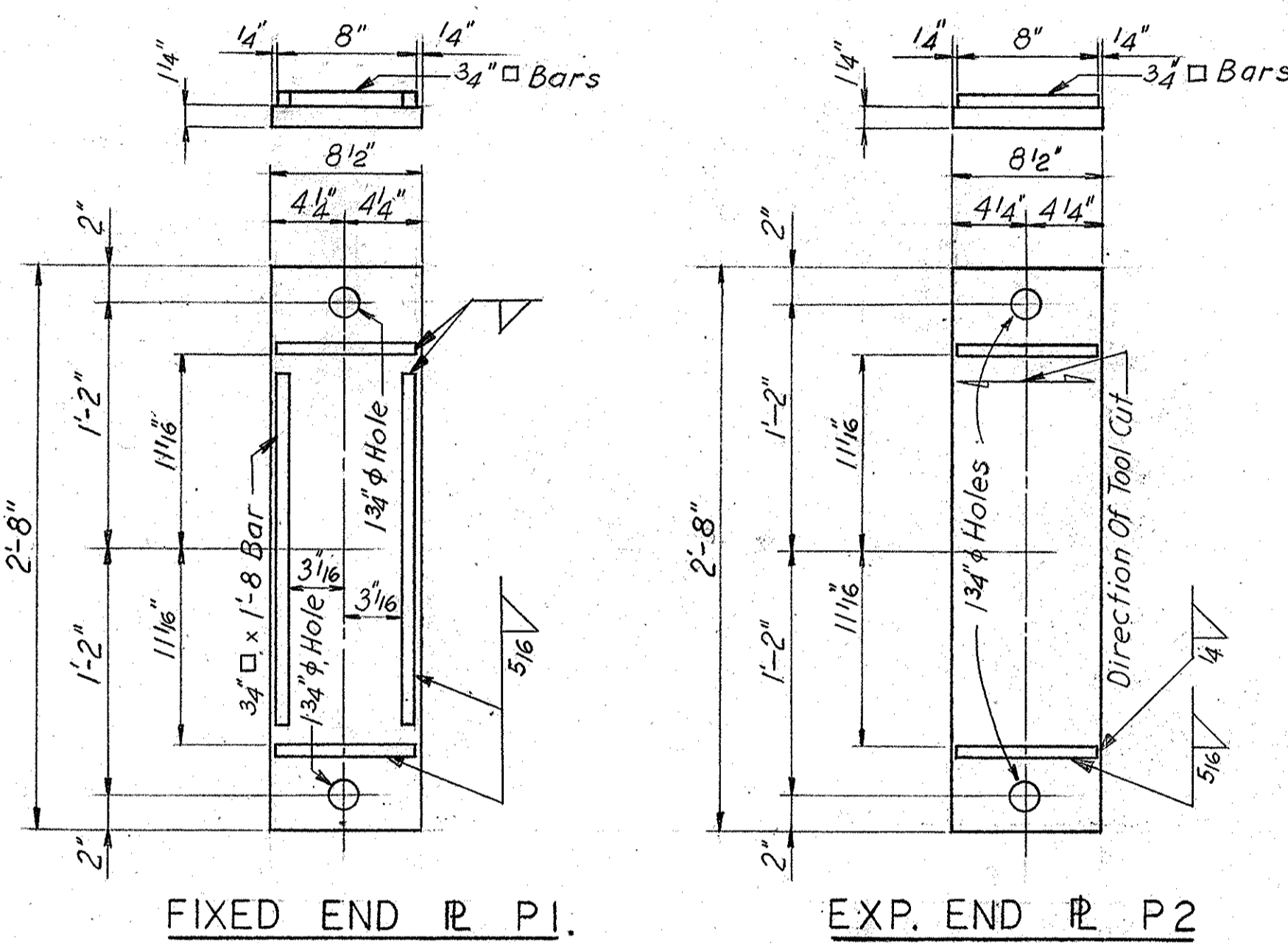
PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC.	DATE: October 1967
ENGINEERS	NEW YORK
REVISION	BY DATE
△ Diaph. Marks	MCS 8-5-68
SHEET NO. 31 OF 69	

MADE BY: F. Ho
 CHECKED BY: J. Barzanych
 IN CHARGE OF: M. C. Alatt



GENERAL NOTES

- DESIGN REQUIREMENTS: All prestressed concrete beams are designed to meet the requirements of the 1961 Standard Specifications for Highway Bridges and also the Interim Specifications prepared by A.A.S.H.O. "Committee on Bridges and Structures."
- STEEL STRESSES: All pretensioned strands shall be high strength, 1/2" dia. 7-wire 1/4" r strands. For properties of prestressing steel see specifications. Maximum initial stress in strand for all beams equal to 188,800 p.s.i.
- CONCRETE STRESSES: The ultimate 28-day cylinder strength of concrete equal to 5,000 p.s.i. The prestressed force shall not be released until the minimum ultimate strength at time of release as shown on plans is reached.
- Lifting devices shall be placed close to the centerline of bearing of the beam. Details and locations of lifting devices shall be submitted to the Engineer for approval. Approval of lifting device does not relieve the Contractor of his responsibility if there is damage due to failure of the lifting device.
- The Contractor shall submit for approval the type of diaphragm insert to be used on the beam.
- Cut strands 6" from end of beam and apply 1" epoxy resin mortar protection to end of beam.



NOTES FOR PRESTRESSED CONCRETE BEAMS:

- Values of deflection based upon $E_c = 3,500,000$ p.s.i.
- The calculated camber includes the combined effect of the prestress force and the weight of the beam.
- The dead load deflection includes the combined effect of the weight of slab, haunch and diaphragm and the superimposed dead loads.
- Positive sign indicates downward deflection.

Note: For details of Anchor Bolts see Sheet No. 13.

BEARING PLATE DETAILS

SCALE: 1/2" = 1'-0"

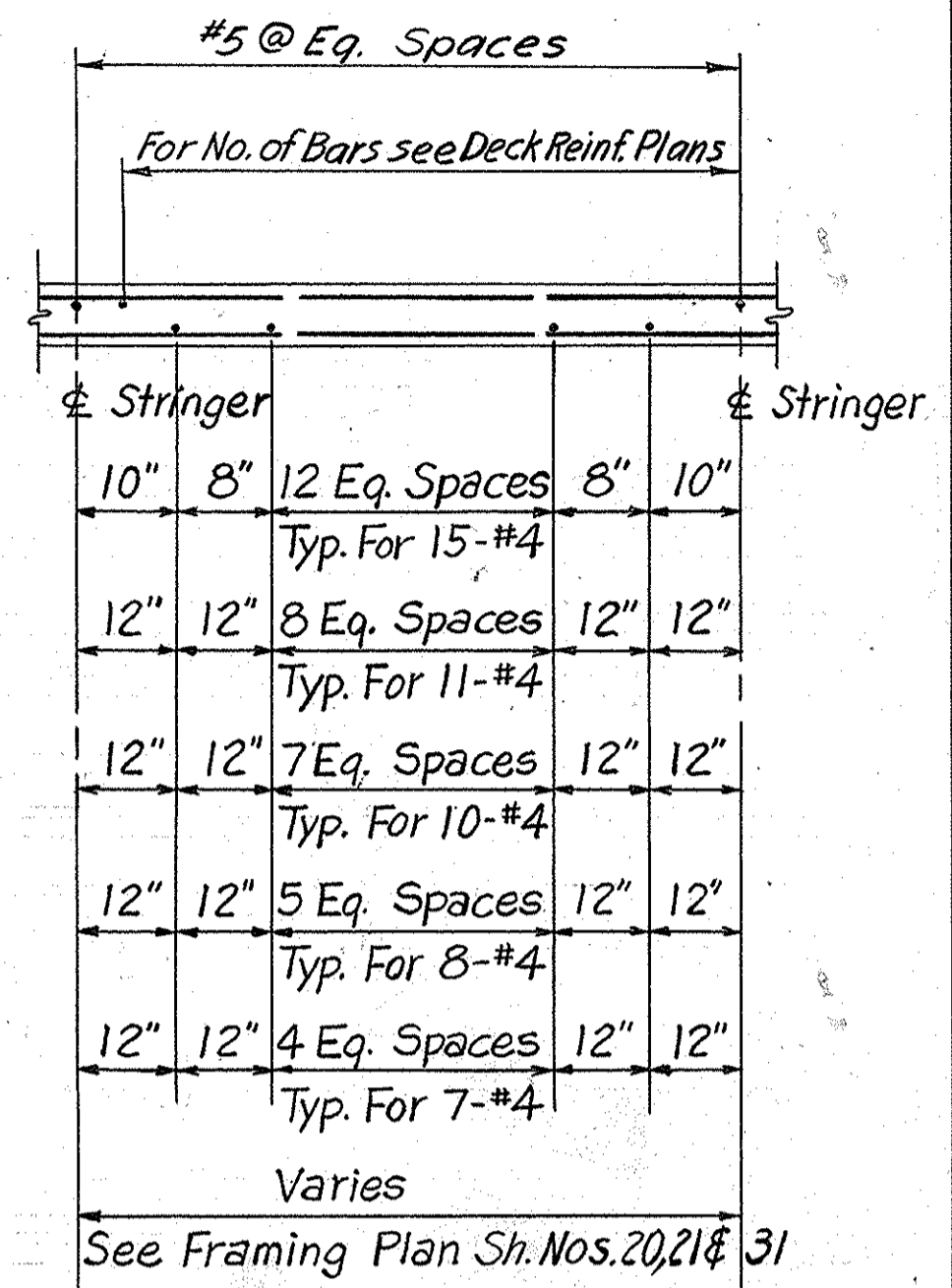
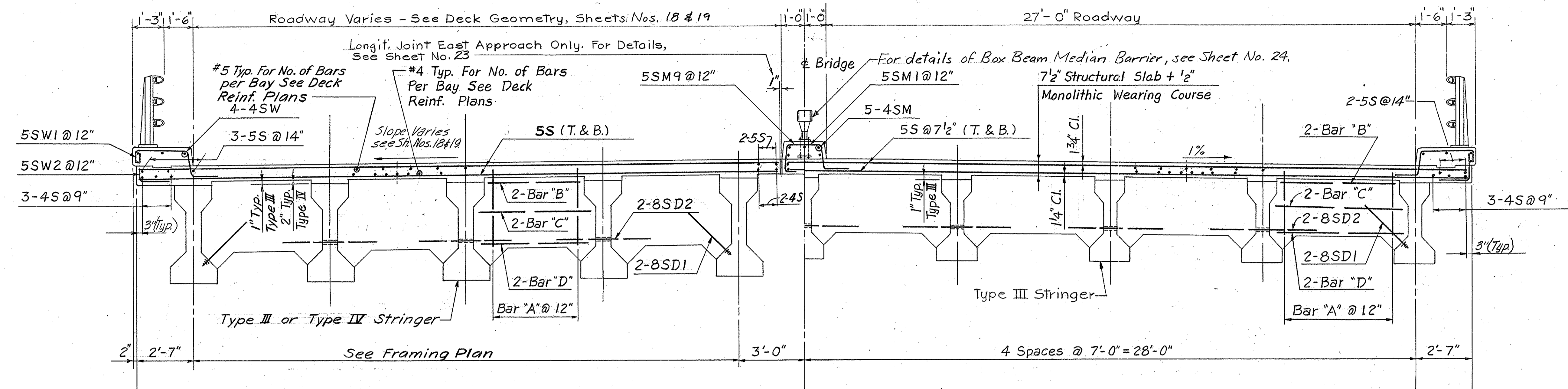
BEAM SCHEDULE

BEAM TYPE	TOTAL NO. OF STRANDS	NUMBER OF STRANDS PER LINE AT ϕ SPAN																									DISTANCE ϕ SPAN TO POINT OF DRAPE	DRAPED STRANDS										STIRRUPS		CALCULATED CAMBER INDUCED BY PRESTRESS FORCE (in)	DEAD LOAD DEFLECTIONS (in)	LENGTH C.T.O.C. OF BEARING	REQD. MINIMUM STRENGTH BEFORE RELEASE OF STRANDS						
		LINE NUMBER																										NO. OF STRANDS	UNIT 1	UNIT 2	UNIT 3	UNIT 4	UNIT 5	SIZE	NO. OF STIRRUPS AT ϕ SPAN	SPACING ϕ 2													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25											NO. OF STRANDS AT POINT OF DRAPE	NO. OF STRANDS AT END OF BEAM	NO. OF STRANDS AT POINT OF DRAPE					NO. OF STRANDS AT END OF BEAM	NO. OF STRANDS AT POINT OF DRAPE	NO. OF STRANDS AT END OF BEAM	NO. OF STRANDS AT POINT OF DRAPE	NO. OF STRANDS AT END OF BEAM	
III a	20	6	6	2	2	2	2																				12'-0"	2	2	5	2	3	9	2	4	13	2	5	17	2	7	21	#3	12" Full Length	- 1/2	2	Varies	4000 psi.	
III b	26	8	6	4	2	2	2																				12'-0"	2	3	10	2	4	13	2	5	16	2	6	19	2	13	21	#3	40 @ 7" 12"	- 3/4	3/4	Varies	4000 psi.	
III c	26	8	8	2	2	2	2																				9'-0"	2	2	6	2	3	9	2	4	12	2	6	15	2	8	18	#3	12" Full Length	- 1/2	1/2	Varies	4000 psi.	
III d	22	8	6	2	2	2																					9'-0"	2	2	5	2	3	10	2	4	14	2	5	18	2	16	21	#3	24 @ 9" 12"	- 1/2	1/2	Varies	4000 psi.	
III e	16	6	2	2		2																																						#3	11" Full Length	- 1/8	1/8	Varies	4000 psi.
IV a	31	11	8	3		3	3																				5'-0"	3	3	12	3	6	17	3	8	20	3	11	23	2	12	25	#3	38 @ 7" 11"	- 5/8	5/8	Varies	4000 psi.	
IV b	33	11	8	3		3	3																				13'-0"	3	3	12	3	6	17	3	8	20	3	11	23	2	12	25	#3	44 @ 7" 11"	- 5/8	5/8	Varies	4000 psi.	
IV c	33	11	11	3	3	3																					13'-0"	3	2	12	3	3	17	3	4	20	3	5	23	2	9	25	#3	38 @ 8" 11"	- 3/4	3/4	Varies	4000 psi.	
IV d	38	11	11	7	3	3	3																				15'-0"	3	2	12	3	3	17	3	4	20	3	5	23	3	6	25	#3	68 @ 6" 11"	- 1/2	1/2	92' 8 3/4"	4200 psi.	
IV e	16	6	2		2	2	2																				9'-0"	2	3	8	2	6	12	2	8	16	2	9	20	2	12	25	#3	11" Full Length	- 1/2	1/2	Varies	4000 psi.	

PROJECT No. 8.1355108
NEW HANOVER COUNTY

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
CAPE FEAR RIVER CROSSING
AT WILMINGTON
APPROACHES ON STRUCTURE
45" PRESTRESSED STRINGERS
TYPE III
PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. DATE: October, 1967
ENGINEERS NEW YORK SHEET No. 32 OF 69

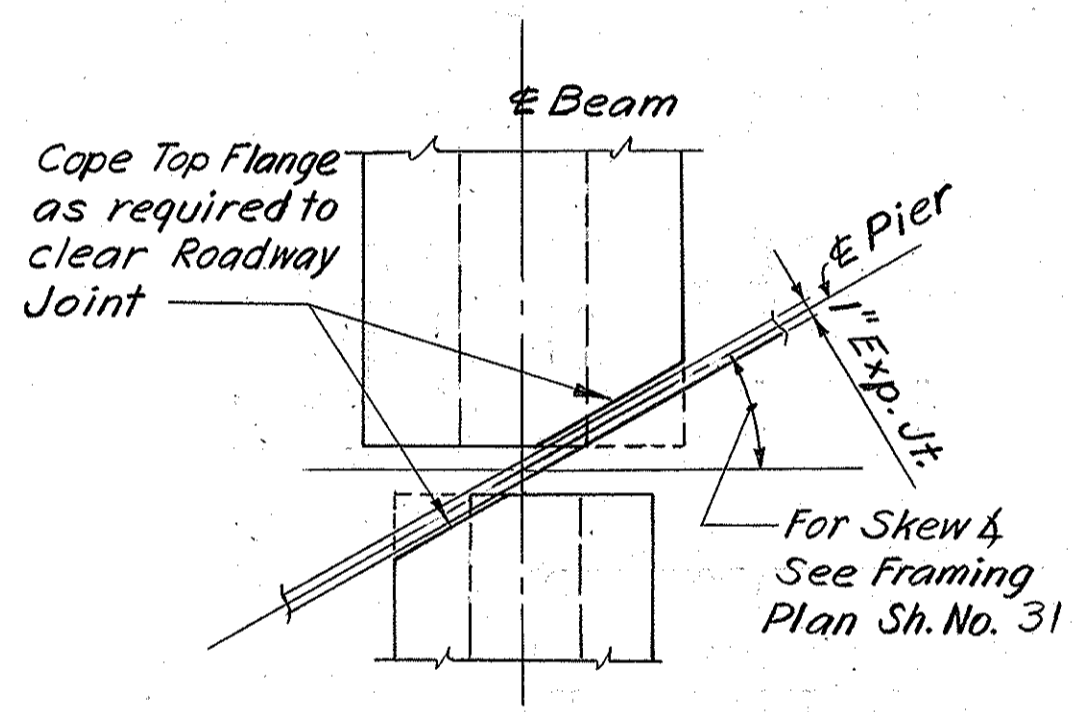
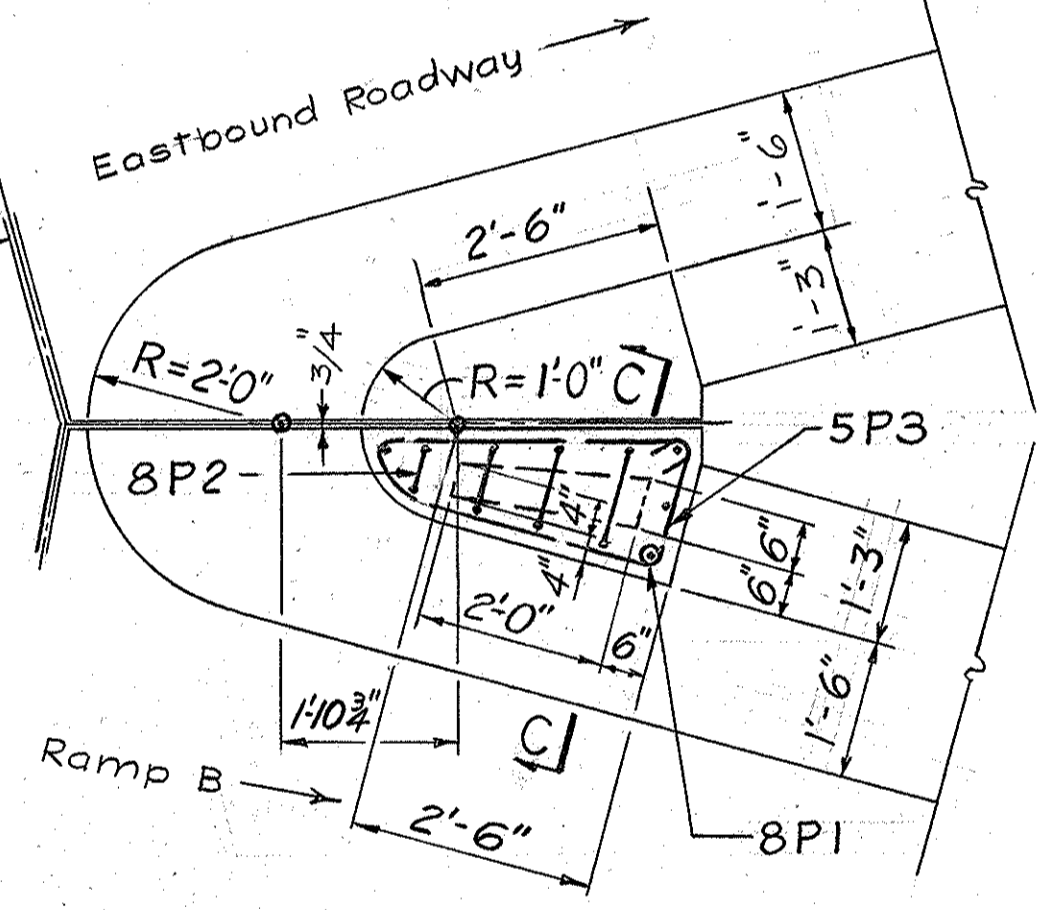
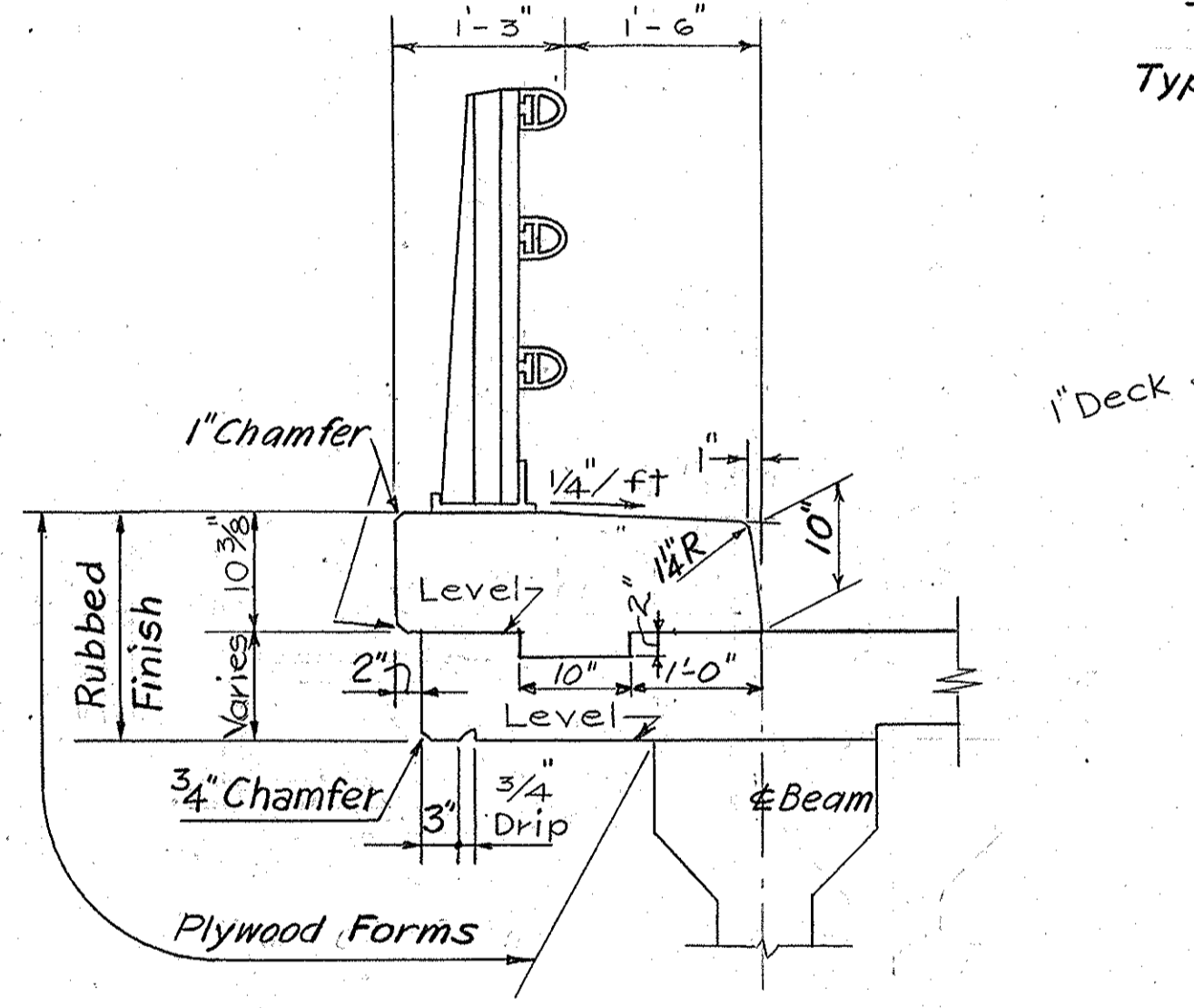
MADE BY: F. Ho
CHECKED BY: J. Benzoph



SECTION A-A
Scale: 3/8" = 1'-0"
Typical on East Approach

SECTION B-B
Scale: 3/8" = 1'-0"
Typical on West Approach

ARRANGEMENT OF TOP & BOTTOM BARS
Not to Scale



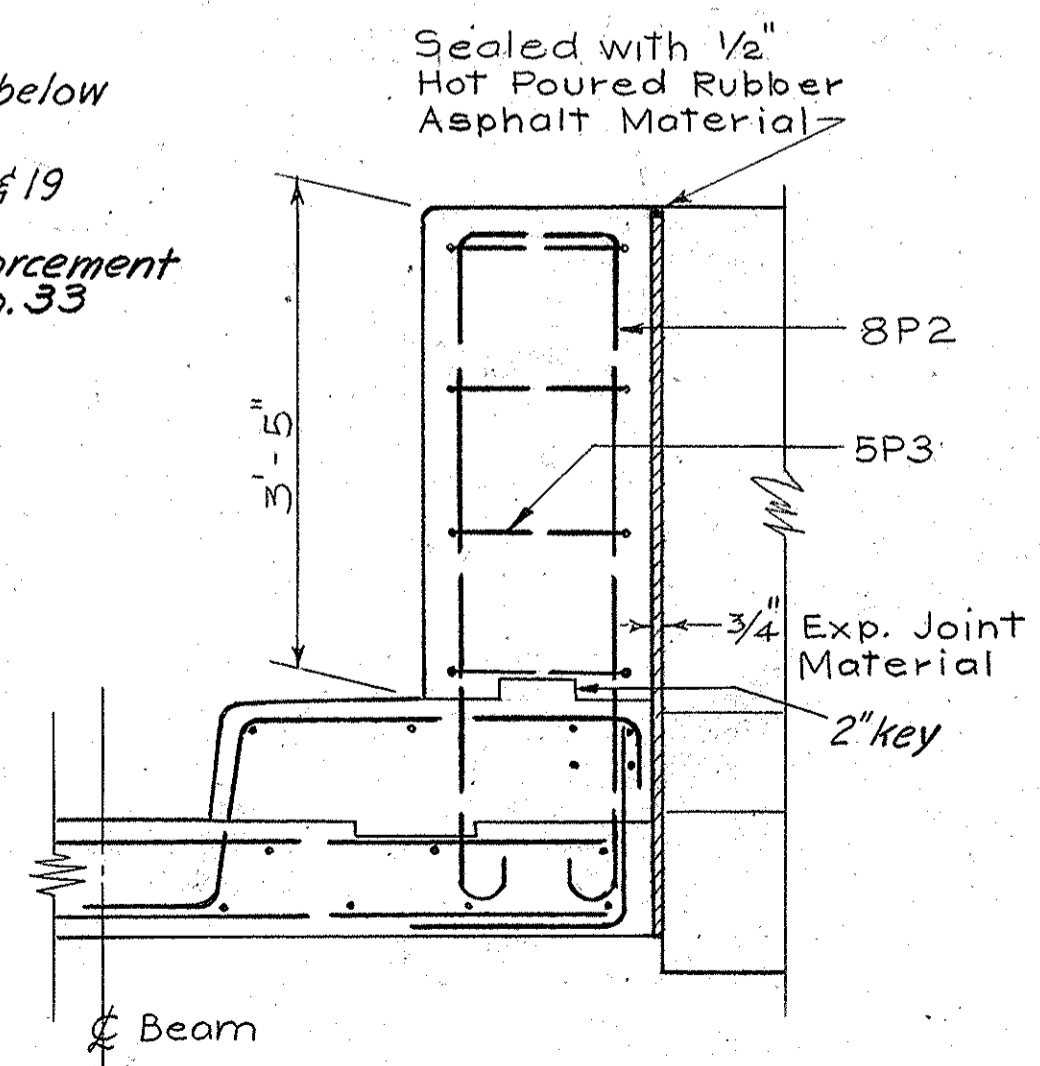
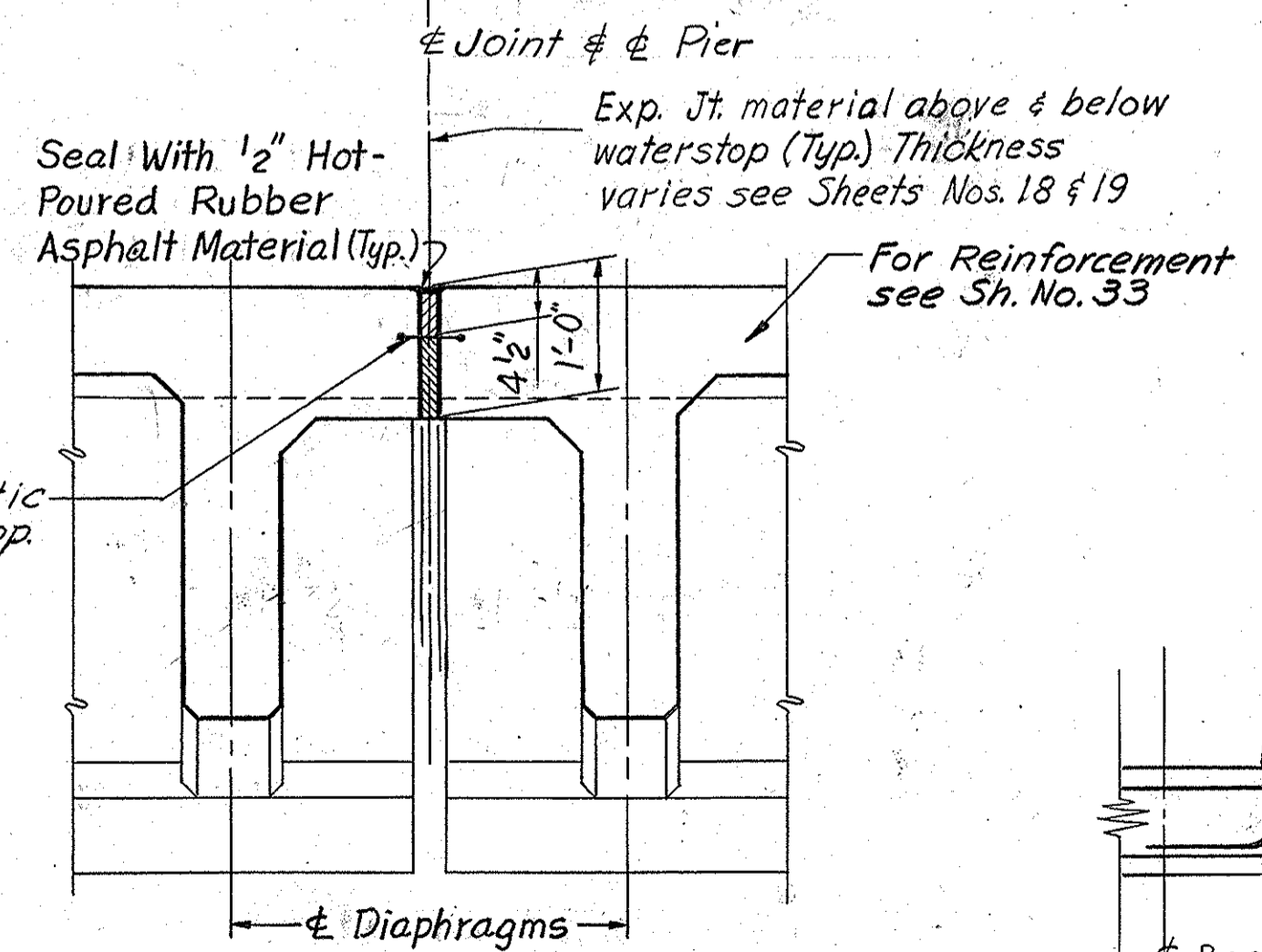
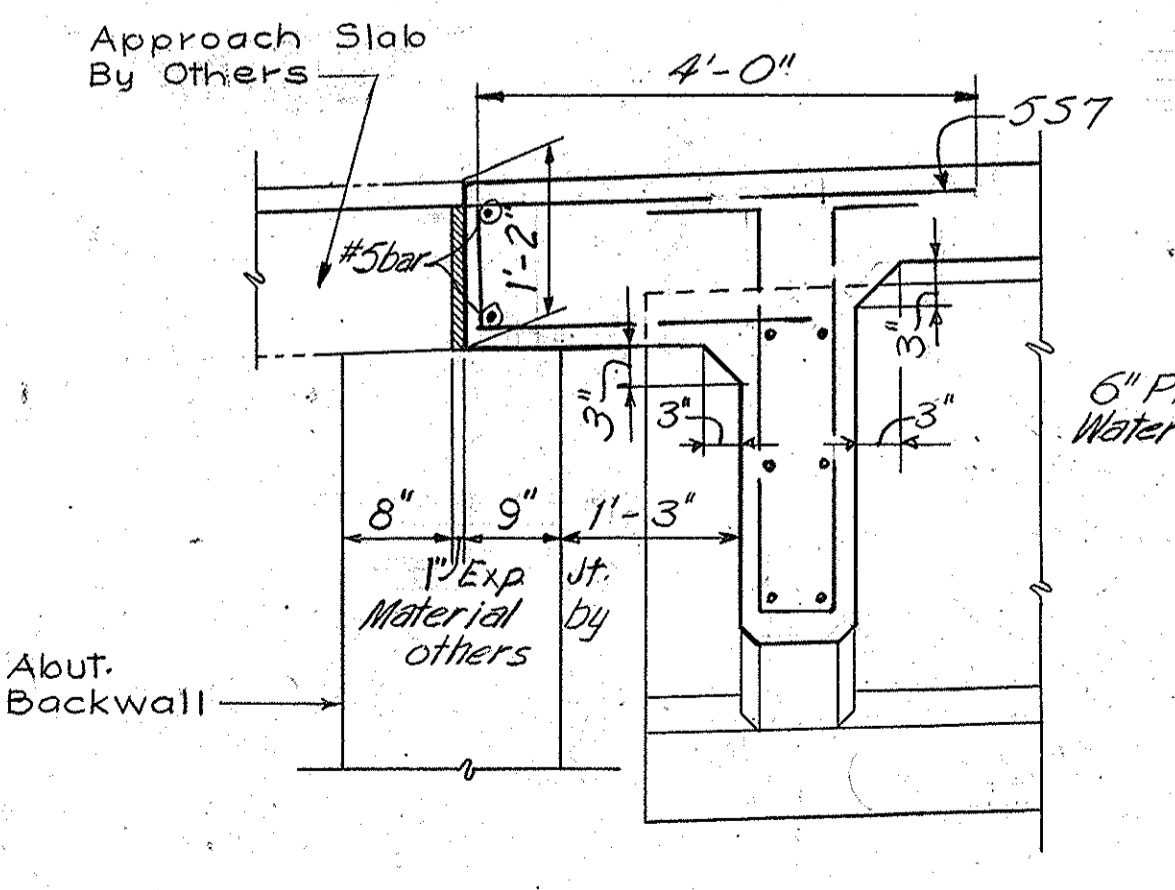
TYPICAL SECTION THROUGH SAFETY WALK
Scale: 3/4" = 1'-0"

PYLON AT NOSE OF RAMP B
Scale: 1/2" = 1'-0"

COPING OF TOP FLANGE
Scale: 1" = 1'-0"

DIAPHRAGM REINFORCEMENT							
Diaph. Type	Bar	Mark	No. Per Diaph.	Diaph. Type	Bar	Mark	No. Per Diaph.
D1	A	3SD1	6	D11	A	3SD2	6
	B	6SD1	2		B	6SD15	2
	C	6SD2	2		C	6SD8	2
	D	8SD3	2		D	8SD7	2
D2	A	3SD1	5	D12	A	3SD2	7
	B	6SD3	2		B	6SD10	2
	C	6SD4	2		C	6SD16	2
	D	8SD4	2		D	8SD15	2
D3	A	3SD1	4	D13	A	3SD2	6
	B	6SD5	2		B	6SD17	2
	C	6SD3	2		C	6SD18	2
	D	8SD5	2		D	8SD9	2
D4	A	3SD1	5	D14	A	3SD2	3
	B	6SD6	2		B	6SD19	2
	C	6SD7	2		C	6SD5	2
	D	8SD6	2		D	8SD10	2
D5	A	3SD1	6	D15	A	3SD2	7
	B	6SD7	2		B	6SD18	2
	C	6SD8	2		C	6SD20	2
	D	8SD7	2		D	8SD11	2
D6	A	3SD1	7	D16	A	3SD2	9
	B	6SD9	2		B	6SD21	2
	C	6SD10	2		C	6SD14	2
	D	8SD8	2		D	8SD12	2
D7	A	3SD2	6	D17	A	3SD3	7
	B	6SD11	2		B	6SD2	2
	C	6SD10	2		C	6SD4	2
	D	8SD8	2		D	8SD13	2
D8	A	3SD2	4	D18	A	3SD3	6
	B	6SD12	2		B	6SD11	2
	C	6SD3	2		C	6SD2	2
	D	8SD5	2		D	8SD3	2
D9	A	3SD2	5	D19	A	3SD3	5
	B	6SD13	2		B	6SD6	2
	C	6SD7	2		C	6SD17	2
	D	8SD6	2		D	8SD14	2
D10	A	3SD2	5				
	B	6SD6	2				
	C	6SD4	2				
	D	8SD4	2				

- Notes:
- For General Notes, See Sheet No. 2
 - For Locations of sections A-A and B-B, See Sheet No. 31
 - For Deck Reinforcing Plans, See Sheets Nos. 35 Through 39.



AT ABUTMENTS

AT PIERS

SECTION C-C
Scale: 3/4" = 1'-0"

FILLED JOINTS ON PRESTRESSED SPANS
Scale: 3/4" = 1'-0"

Δ	Diaph Bars	MCS	8-5-68
	REVISION	BY	DATE

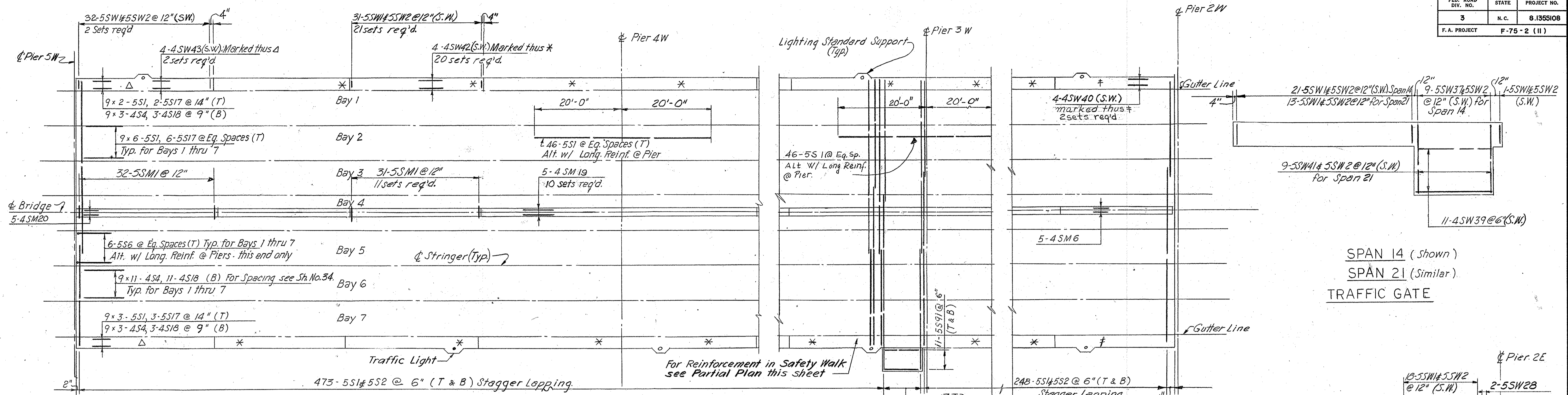
PROJECT No. 8.1355108
NEW HANOVER COUNTY
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
CAPE FEAR RIVER CROSSING
AT WILMINGTON
APPROACHES ON STRUCTURE
TYPICAL CROSS SECTION & DETAILS
PRESTRESSED STRINGER SPANS

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. DATE: October, 1967
ENGINEERS NEW YORK SHEET NO. 34 OF 69

MADE BY: F. Ho
CHECKED BY: C. K.
IN CHARGE OF: M. C. Slay

B4013036

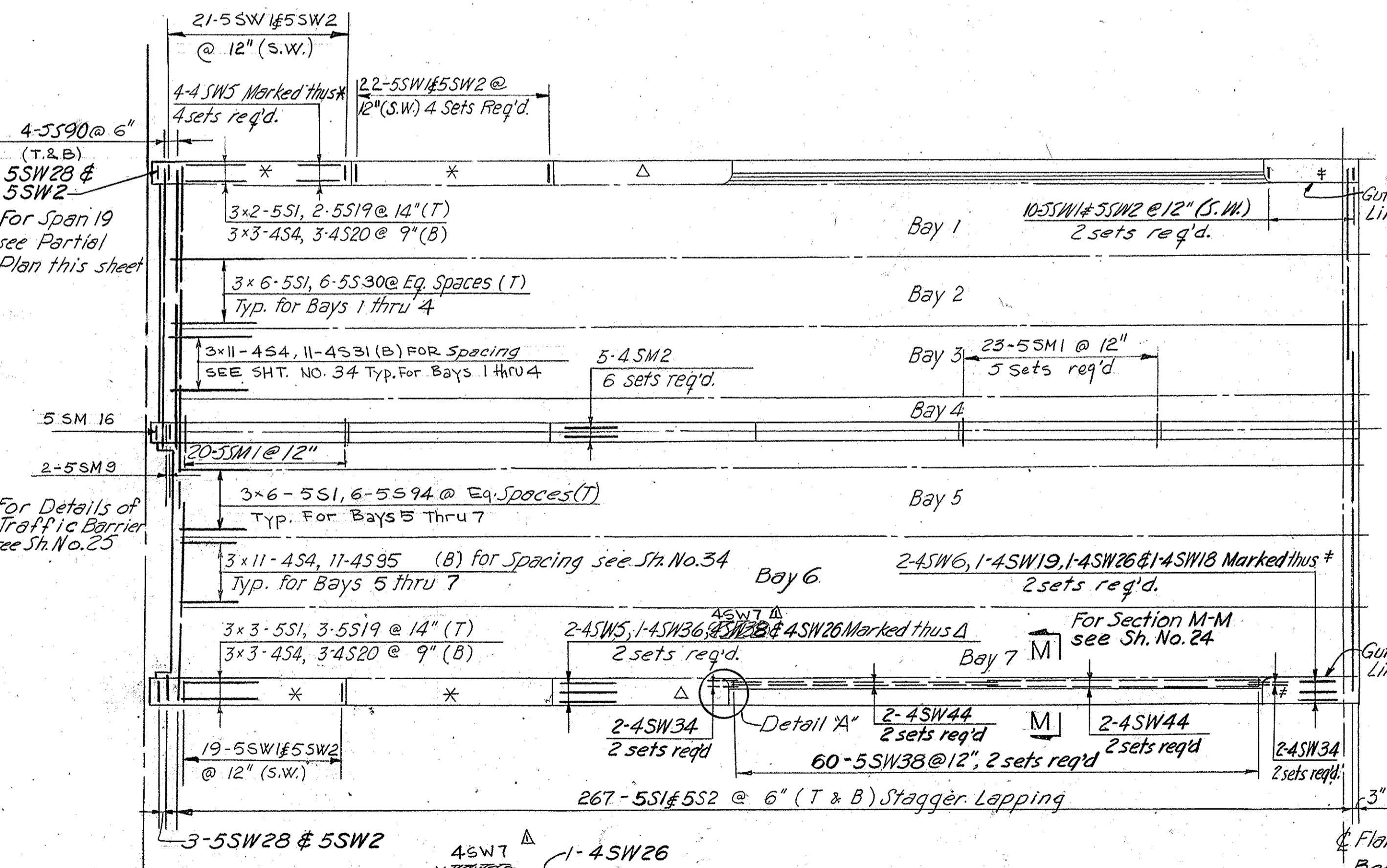
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3	N.C.	8.1355108
F.A. PROJECT		F-75-2 (II)



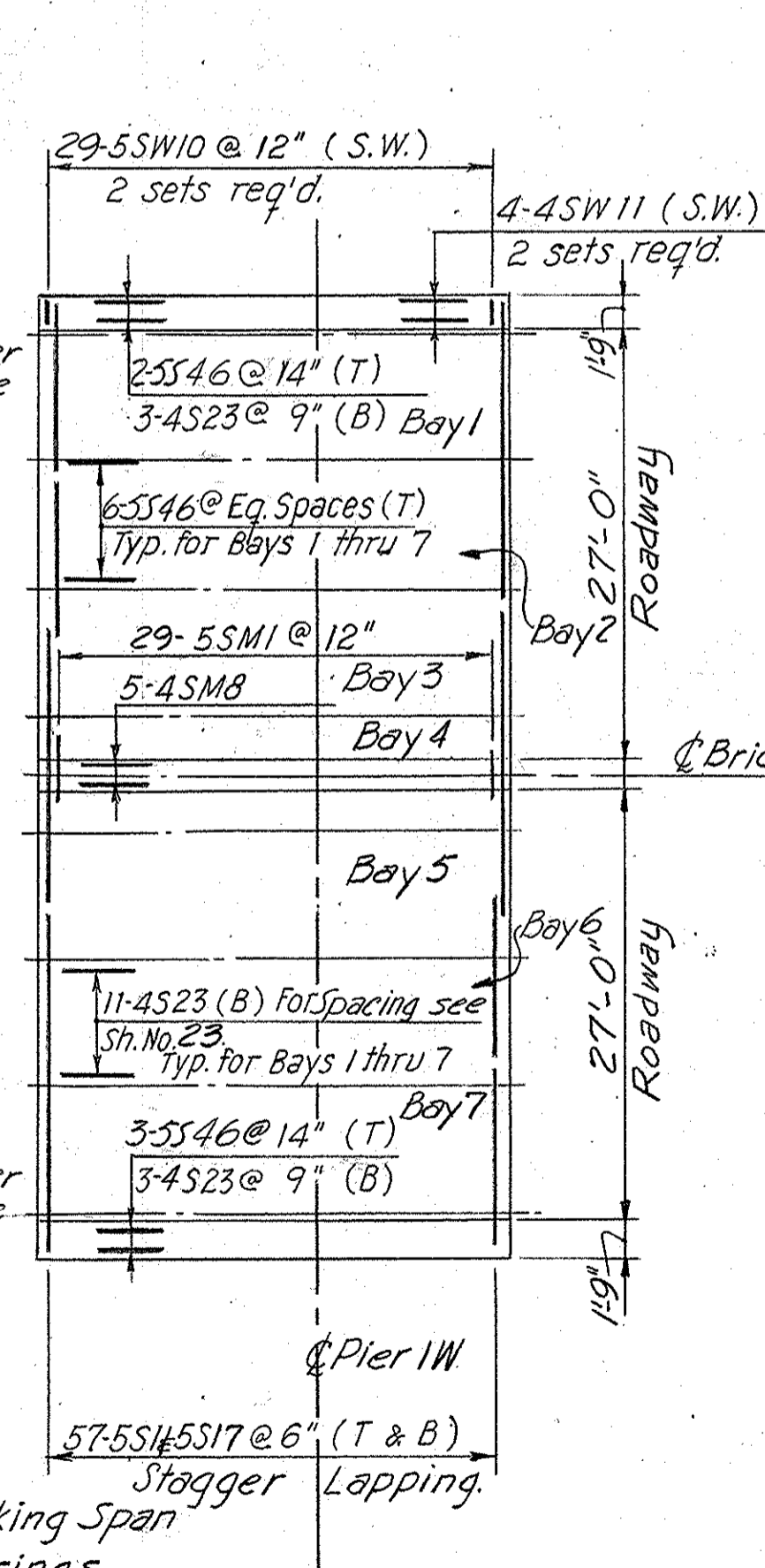
SPAN 13

SPAN 14

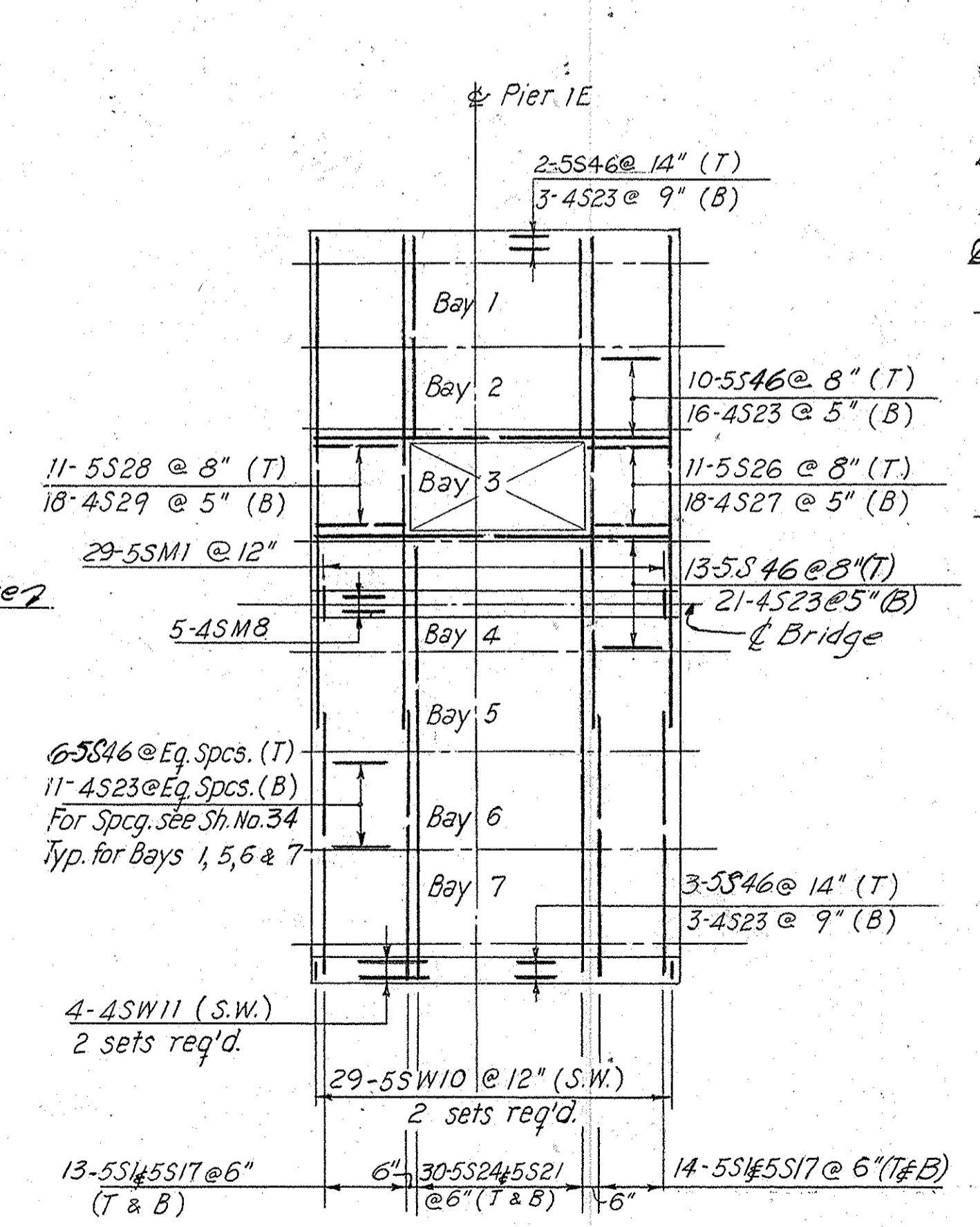
SPAN 15



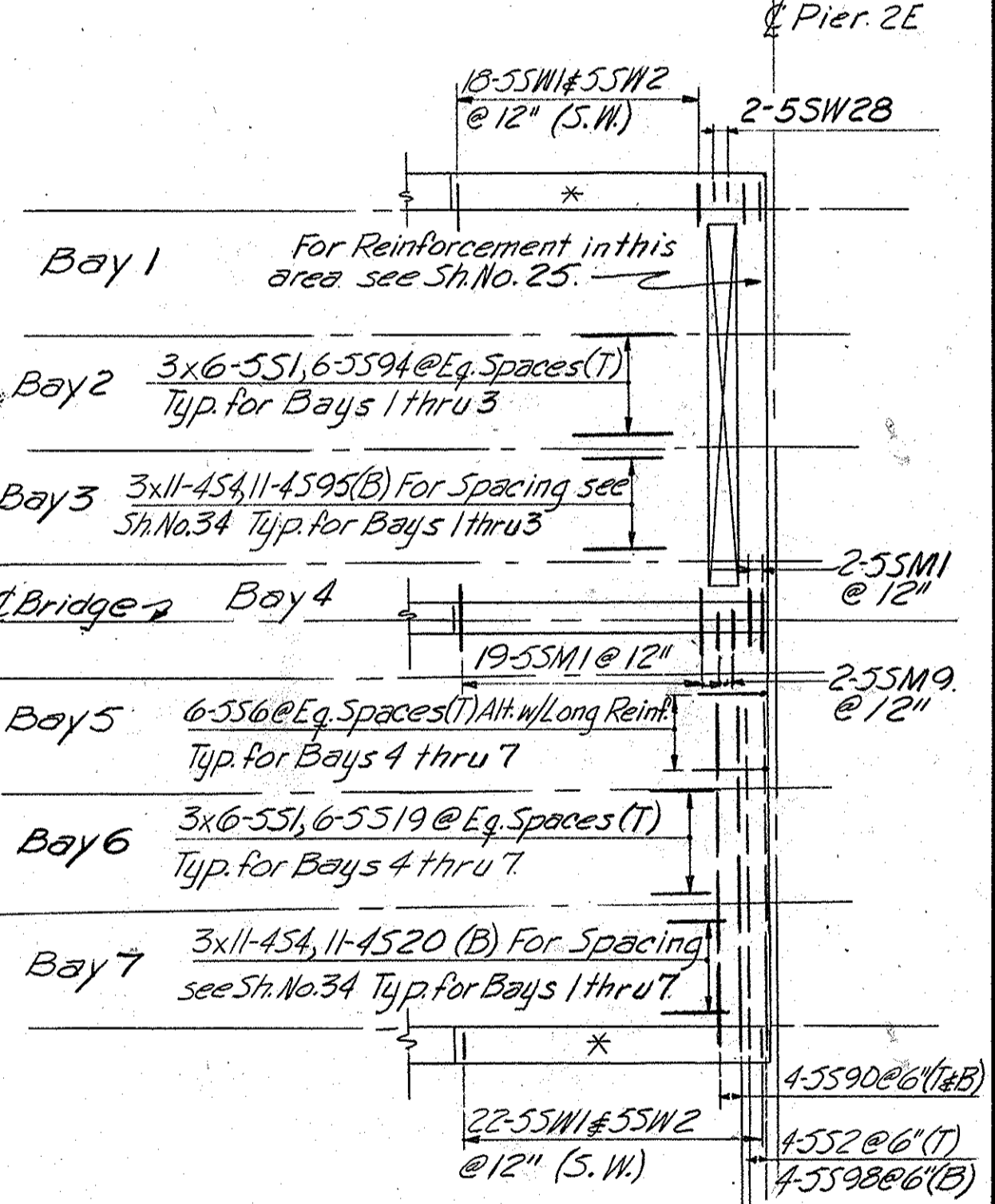
SPAN 16 (As Shown)
SPAN 19 (Opposit Hand Unless Otherwise Noted)



SPAN 17



SPAN 18



SPAN 19

1. For Reinforcement and Details of Lighting Standard Support see Sh. No. 27.

PROJECT No. 8.1355108
NEW HANOVER COUNTY

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

CAPE FEAR RIVER CROSSING
AT WILMINGTON

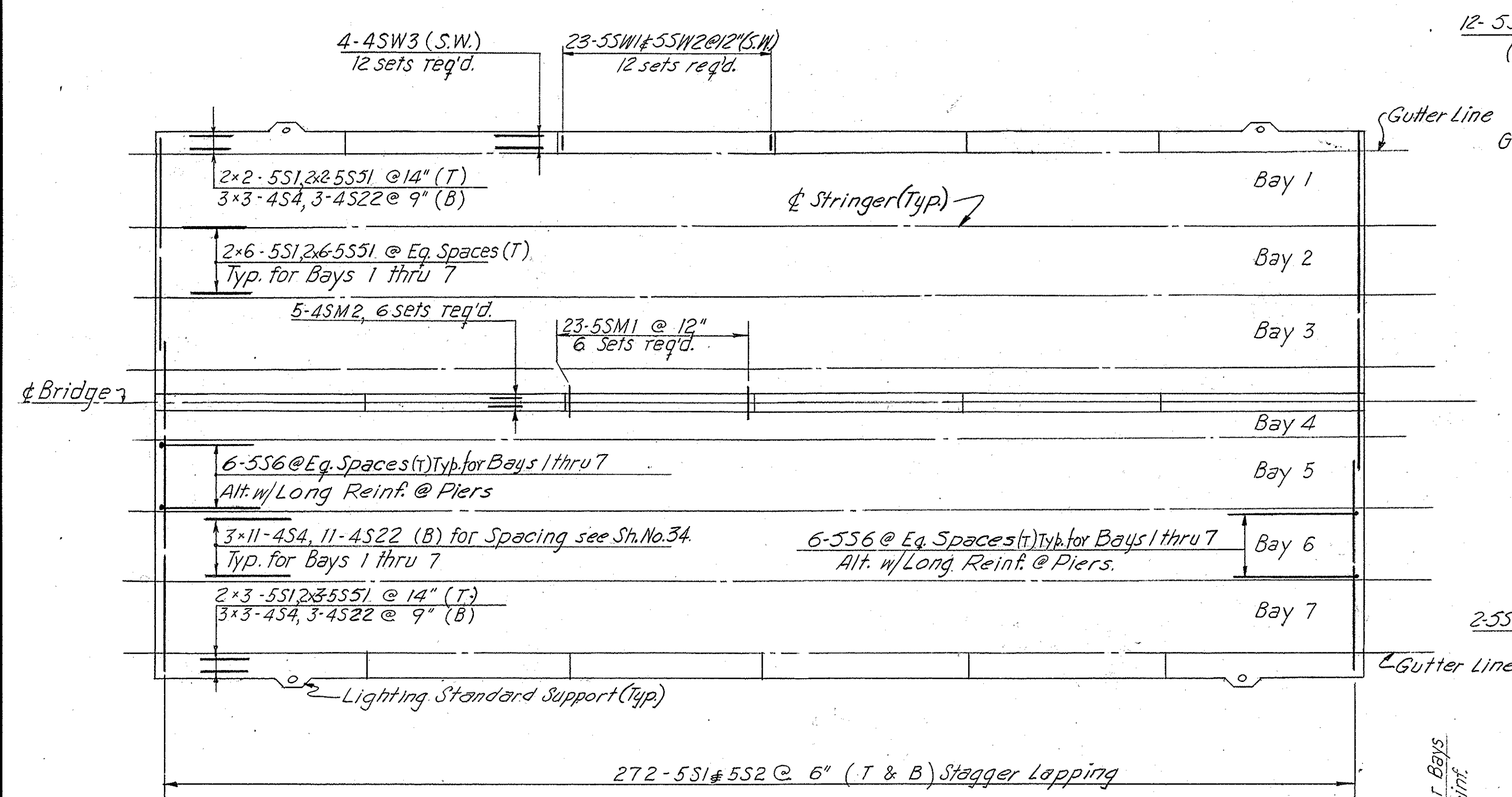
APPROACHES ON STRUCTURE
DECK REINFORCING PLANS
SPANS 13 THROUGH 19

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC.	DATE: October, 1967
ENGINEERS	NEW YORK
SHEET NO. 36	OF 69

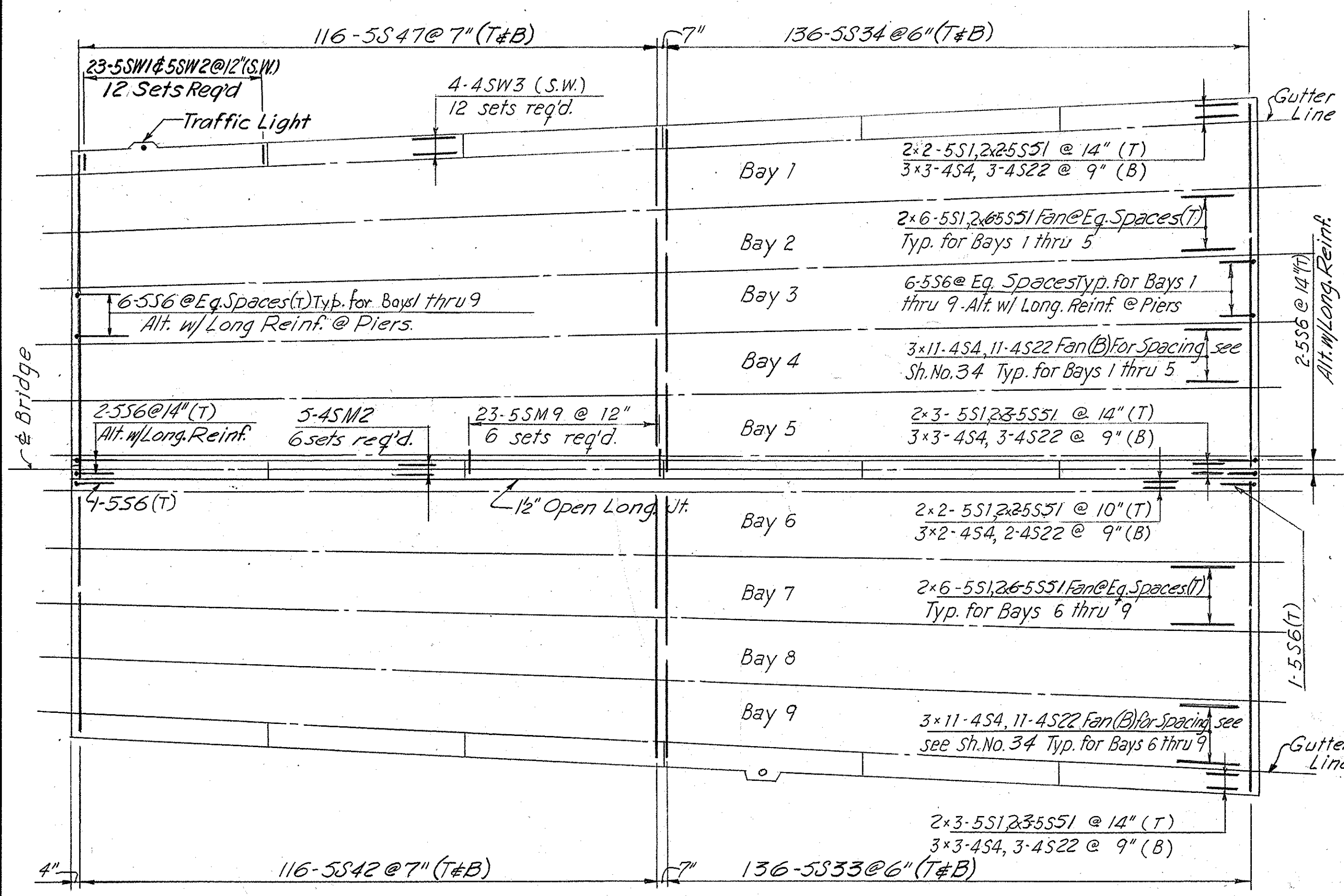
REVISION	BY	DATE
Δ Bar Marks	MCS	8-5-68

IN CHARGE OF: M.C. [Signature]
CHECKED BY: F. Ho [Signature]
MADE BY: C.C. [Signature]

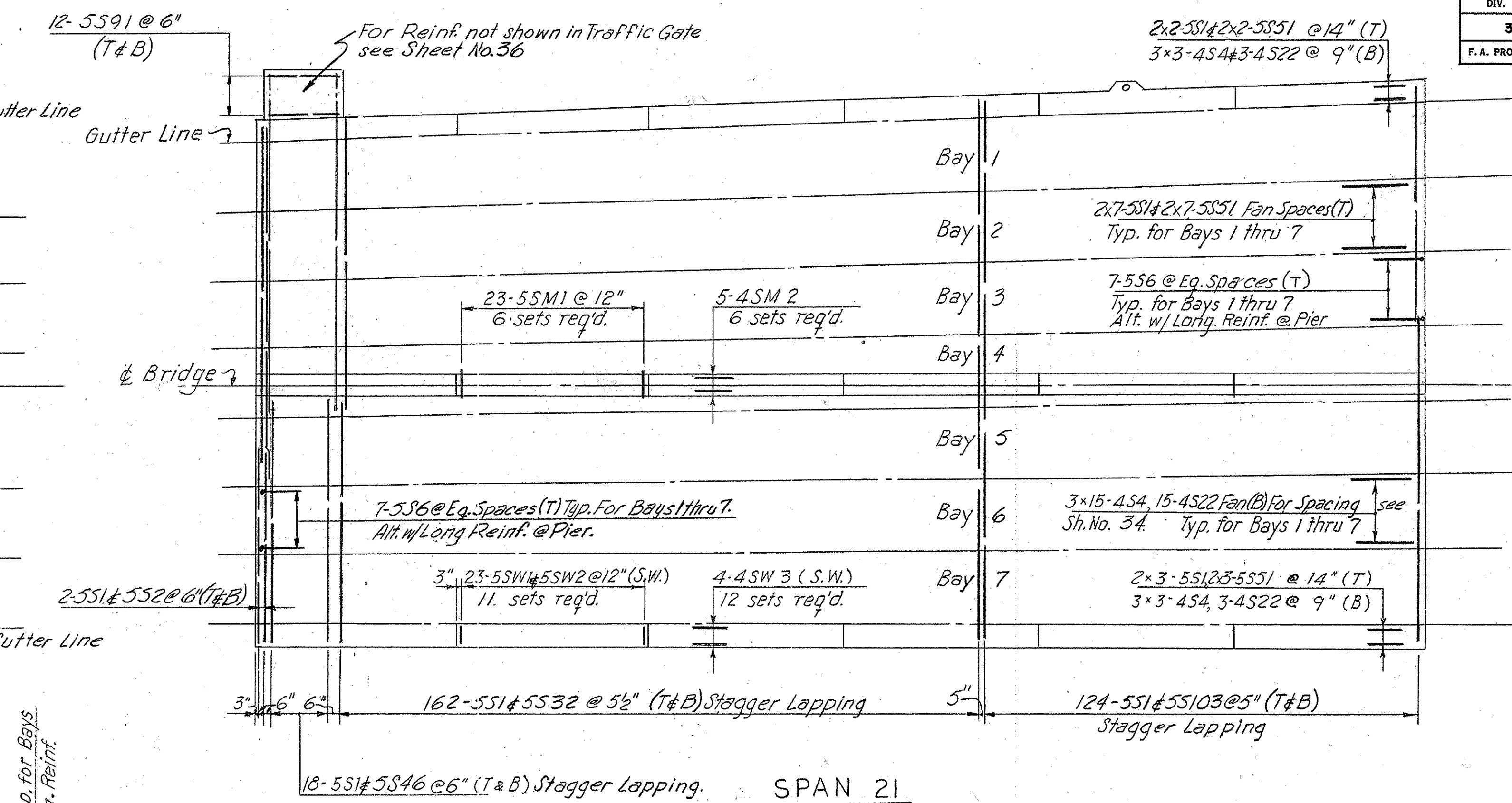
FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N.C.	8.1355108
F.A. PROJECT		F-75-2 (11)



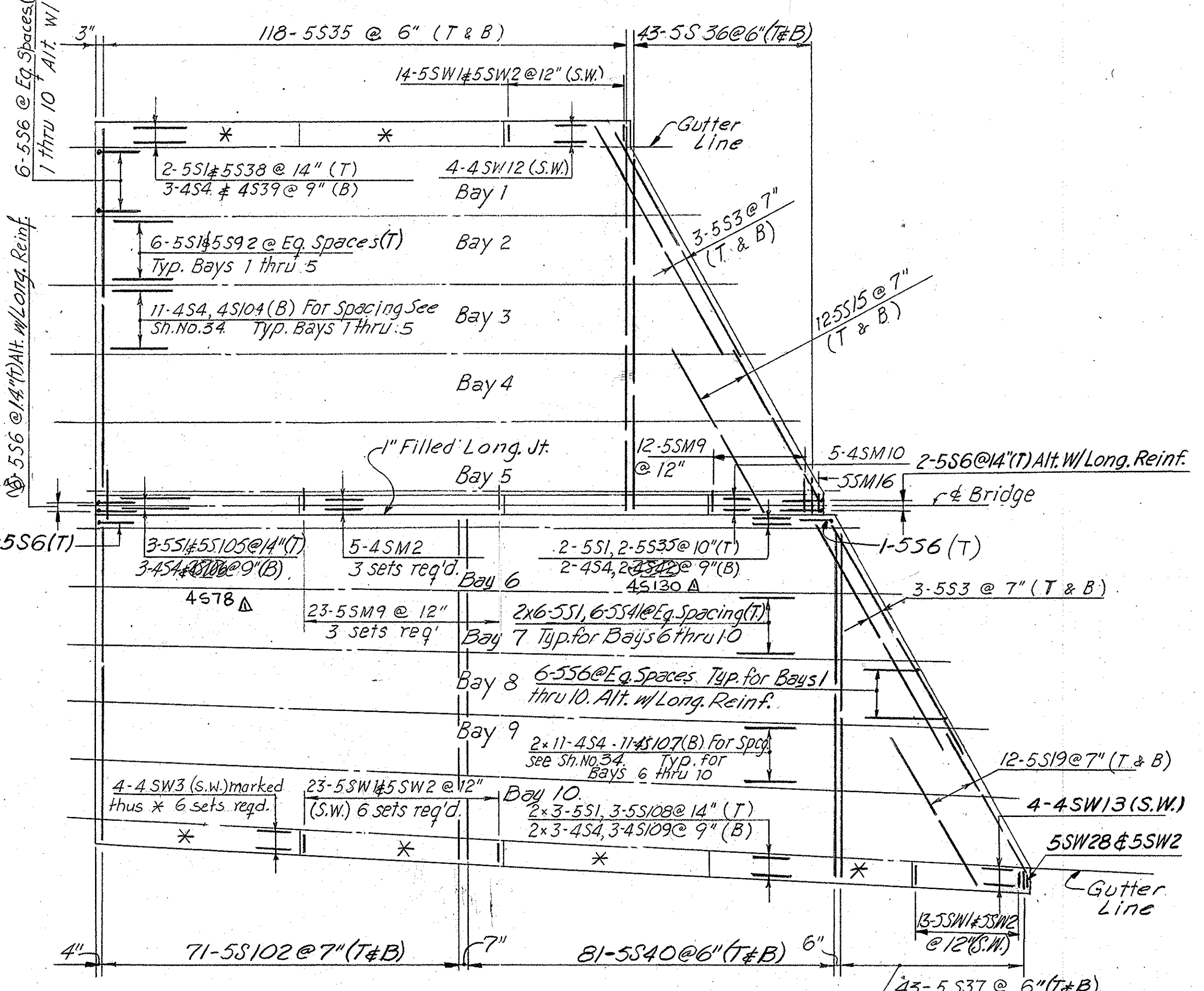
SPAN 20



SPAN 22



SPAN 21



SPAN 23

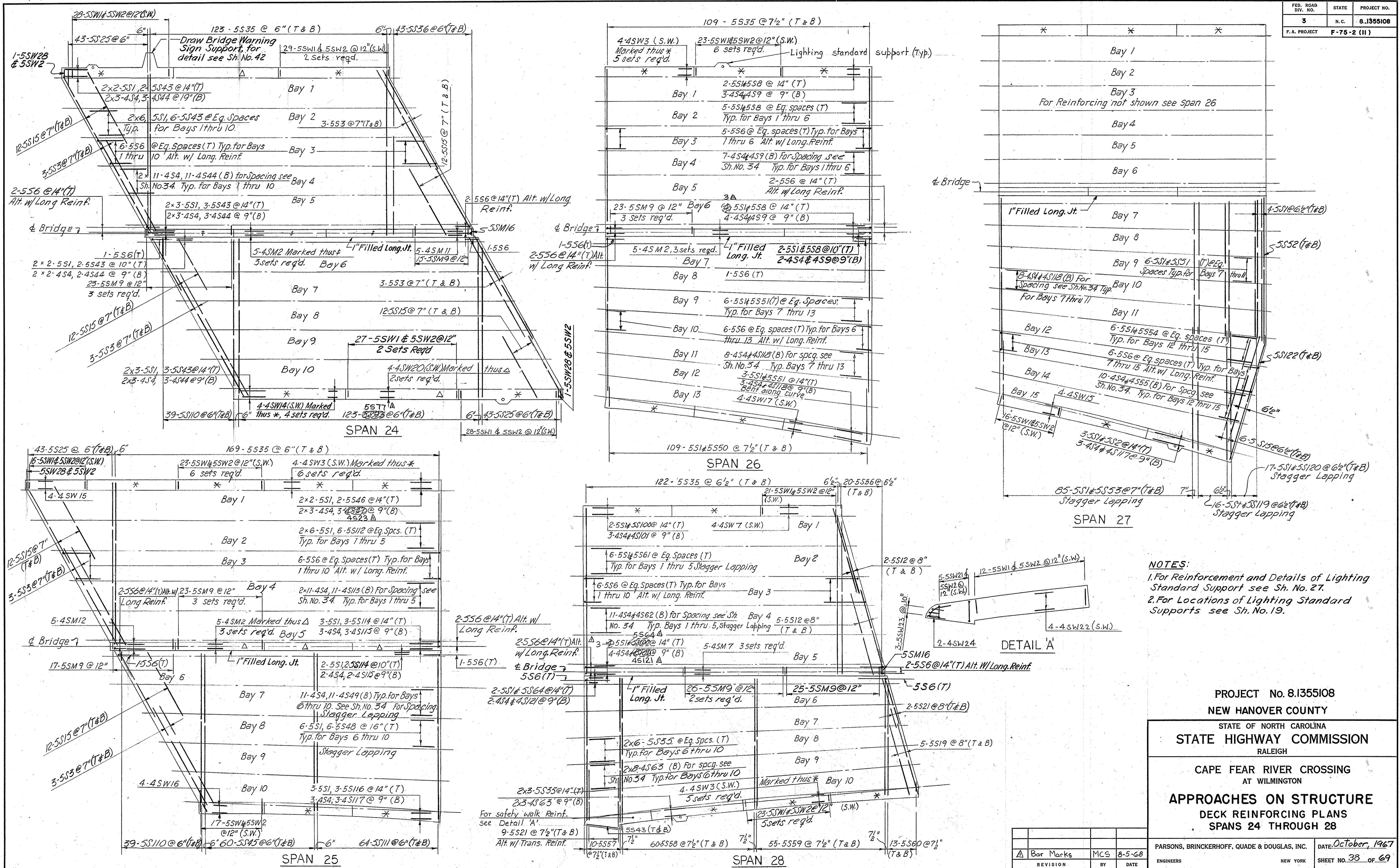
- NOTES:
1. For Reinforcement and Details of Lighting Standard Support see Sh.No. 27.
 2. For Locations of Lighting Standard Supports see Sh.No.18.

PROJECT No.8.1355108
NEW HANOVER COUNTY
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
CAPE FEAR RIVER CROSSING
AT WILMINGTON
APPROACHES ON STRUCTURE
DECK REINFORCING PLANS
SPANS 20 THROUGH 23

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. DATE: October 1967
ENGINEERS NEW YORK SHEET NO. 37 OF 69

Bar Marks	MCS	8-5-68
REVISION	BY	DATE

MADE BY: F. Ho
 CHECKED BY: C. K.
 IN CHARGE OF: M. C.

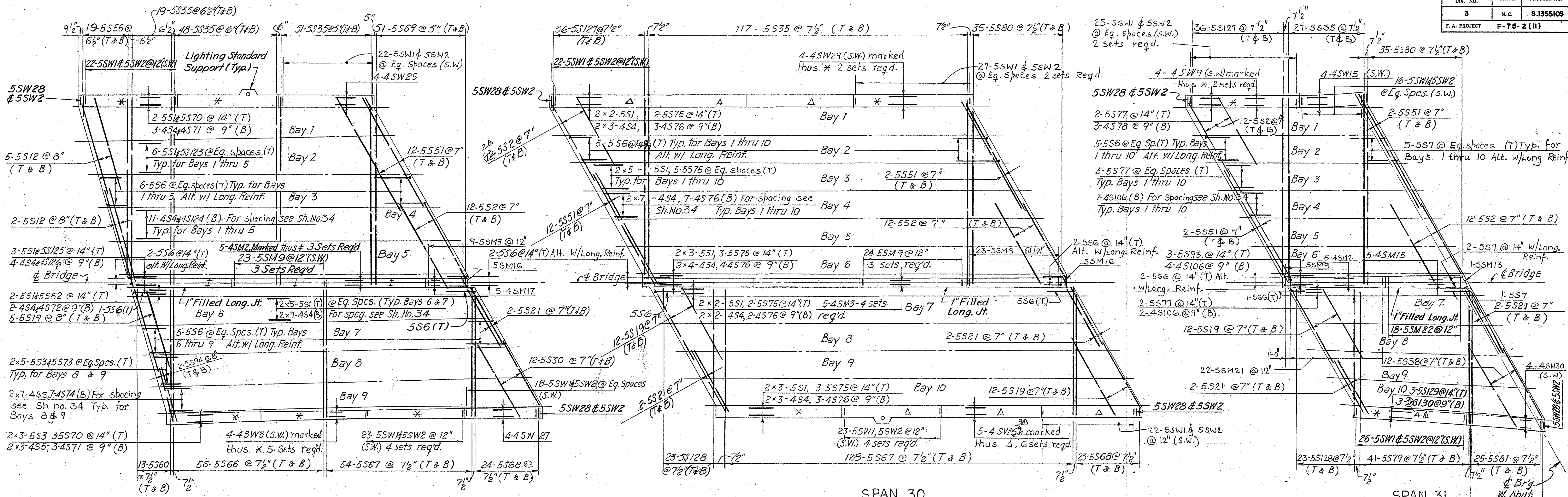


NOTES:
 1. For Reinforcement and Details of Lighting Standard Support see Sh. No. 27.
 2. For Locations of Lighting Standard Supports see Sh. No. 19.

PROJECT No. 8.1355108
 NEW HANOVER COUNTY
 STATE OF NORTH CAROLINA
 STATE HIGHWAY COMMISSION
 RALEIGH
 CAPE FEAR RIVER CROSSING
 AT WILMINGTON
 APPROACHES ON STRUCTURE
 DECK REINFORCING PLANS
 SPANS 24 THROUGH 28

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC. DATE: October, 1967
 ENGINEERS NEW YORK SHEET NO. 38 OF 69

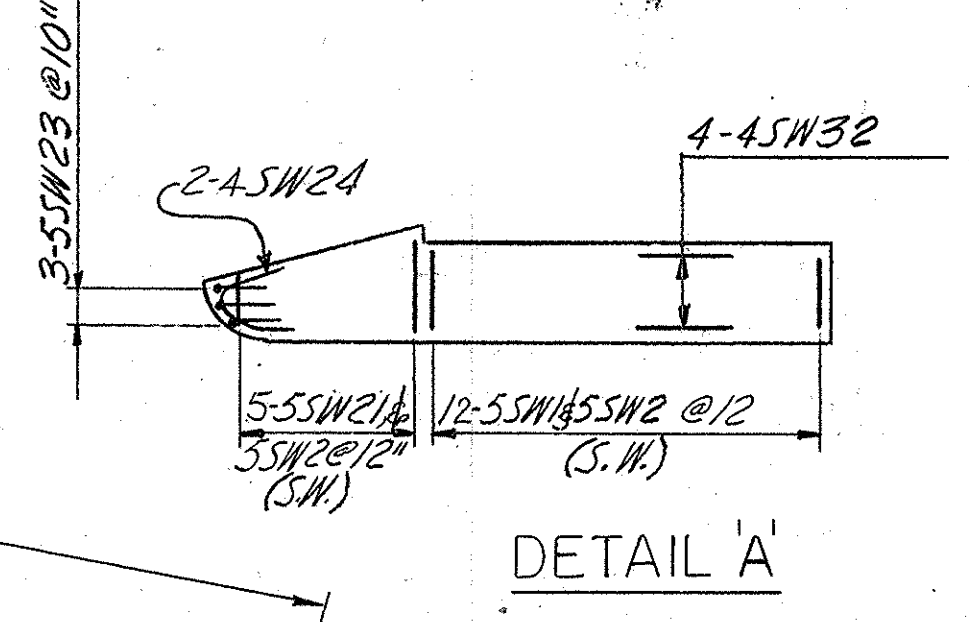
IN CHARGE OF: M.C. Flay
 CHECKED BY: C.C. K...
 MADE BY: F.H.



SPAN 29

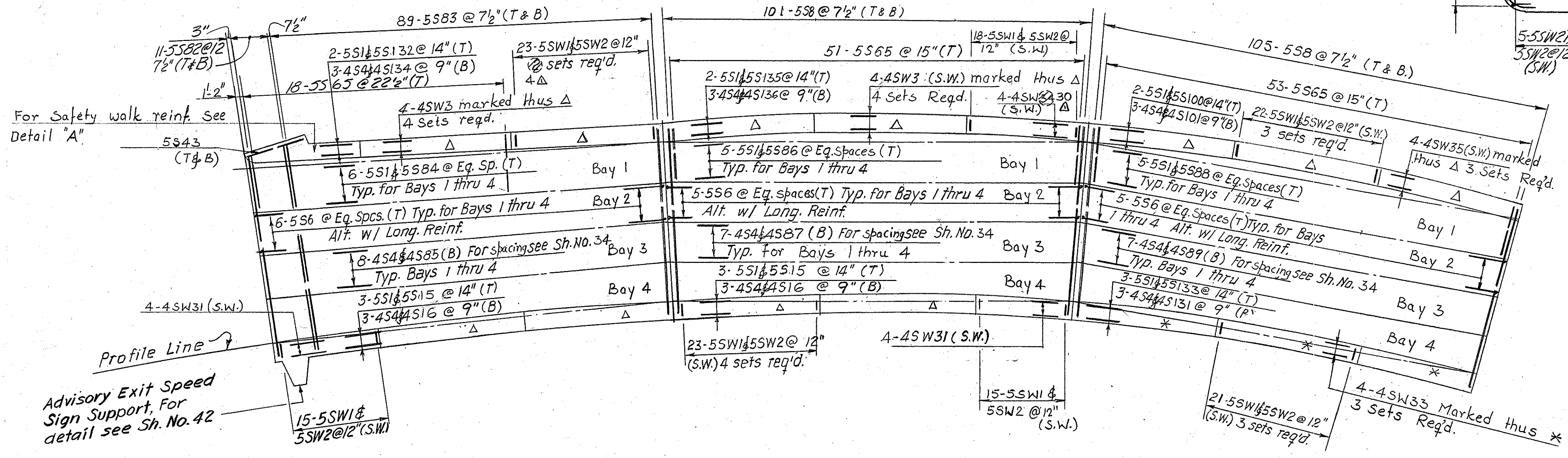
SPAN 30

SPAN 31



DETAIL 'A'

NOTES:
 1. For Reinforcement and Details of Lighting Standard Support see Sh. No. 27.
 2. For Locations of Lighting Standard Supports see Sh. No. 19.



SPAN 32

SPAN 33

SPAN 34

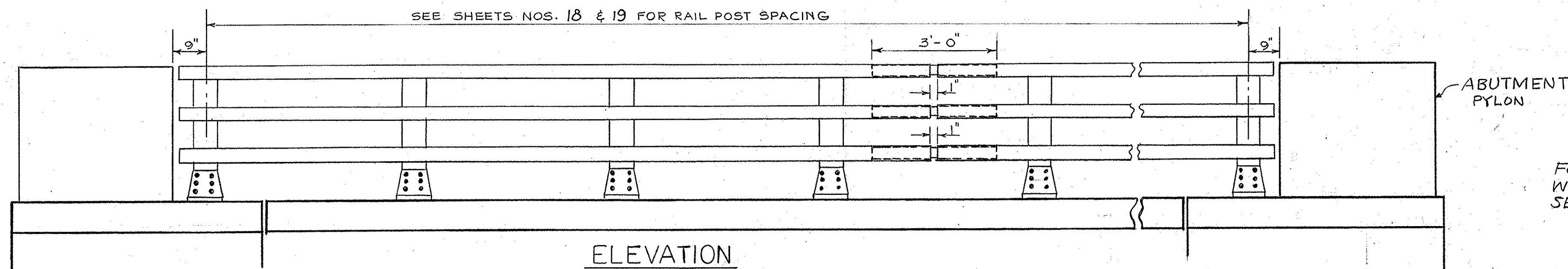
PROJECT No. 8.1355108
 NEW HANOVER COUNTY
 STATE OF NORTH CAROLINA
 STATE HIGHWAY COMMISSION
 RALEIGH
 CAPE FEAR RIVER CROSSING
 AT WILMINGTON
 APPROACHES ON STRUCTURE
 DECK REINFORCING PLANS
 SPANS 29 THROUGH 34

REVISION	BY	DATE	ENGINEERS	NEW YORK	DATE: October 1967	SHEET NO. 39 OF 69
1	MCS	8-5-68	PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC.	NEW YORK		

MADE BY: F. Ho
 CHECKED BY: C. C. K.
 IN CHARGE OF: H. C. FLAHERTY

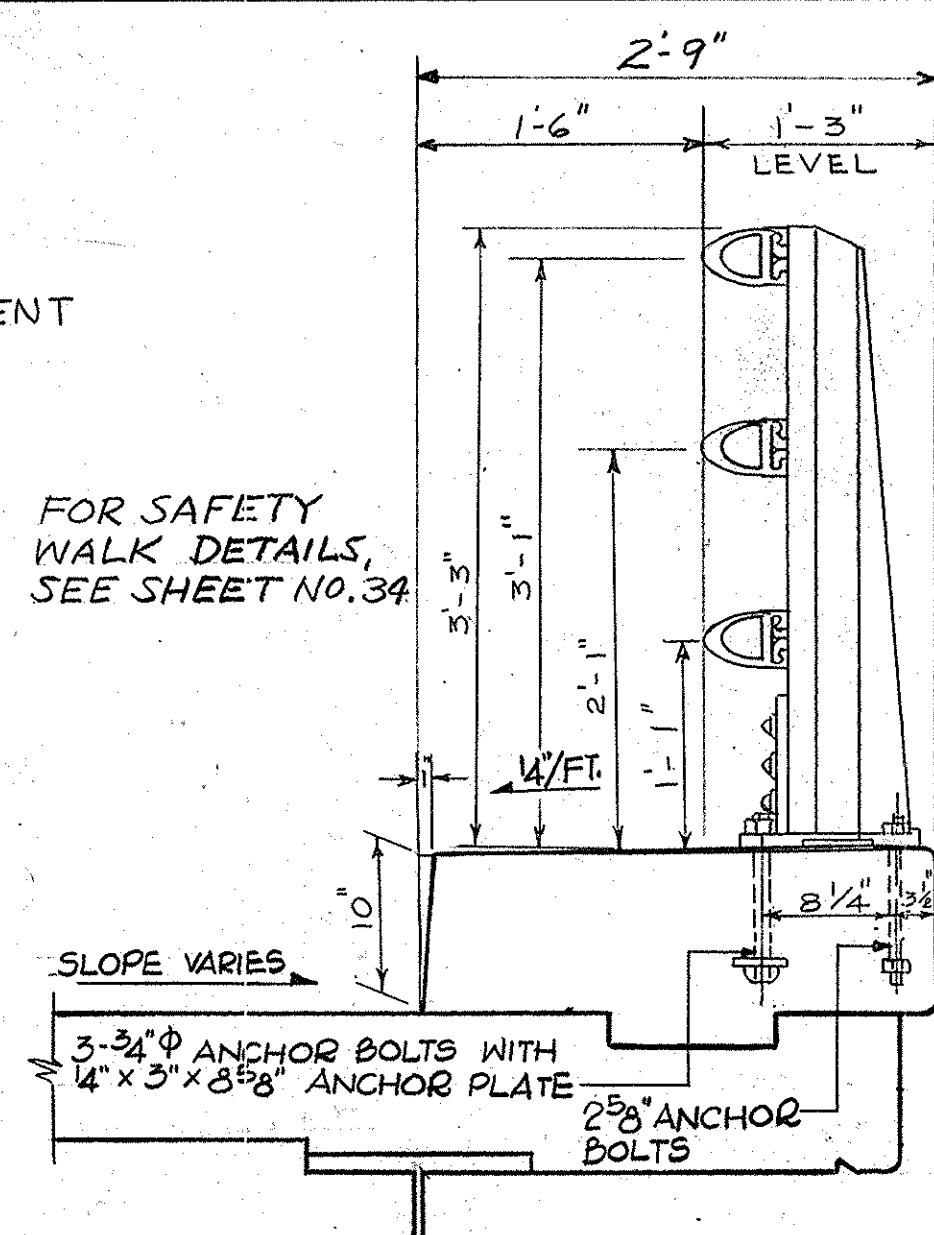
FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N.C.	81355108
F.A. PROJECT		F-75-2(11)

SEE SHEETS NOS. 18 & 19 FOR RAIL POST SPACING



FOR SAFETY WALK DETAILS, SEE SHEET NO. 34

SECTION THRU CURB & RAIL



AT THE CONTRACTOR'S OPTION METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES & RAILS, EXPANSION BARS & CLAMP BARS SHALL BE A.S.T.M. B-221 ALLOY 6061

MATERIAL FOR ALUMINUM WASHER SHALL BE A.S.T.M. B-209 ALLOY ALCLAD 2024-T3.

MATERIAL FOR RIVETS SHALL BE A.S.T.M. B-316, ALLOY 6061.

RIVETS SHALL BE STD. BUTTON HEAD & CONE POINT COLD DRIVEN AS PER DRAWING.

MATERIAL FOR ALUMINUM NUTS SHALL BE A.S.T.M. B211 ALLOY 6061 OR 6062-T6. THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

GENERAL NOTES

- 1- RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF FOUR POSTS.
- 2- END OF RAIL TO CLEAR FACE OF CONCRETE END POST BY 1 1/2".
- 3- MATERIAL FOR ANCHOR STUDS SHALL BE TYPE 430 STAINLESS STEEL WITH MINIMUM 70,000 P.S.I. ULTIMATE STRENGTH. THREADS TO BE ROLLED & NOT CUT. STUDS TO BE EMBEDDED 7" IN CONCRETE. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK NUTS, CLASS 2 B THREAD. ANCHOR PLATES SHALL BE A.S.T.M. A7 OR A-36 MACHINE SCREWS FOR RAIL ATTACHMENT SHALL BE STAINLESS STEEL.
- 4- CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS & POSTS. SHOP INSPECTION IS NOT REQUIRED.
- 5- METAL RAIL POSTS TO BE SET NORMAL TO CURB GRADE.
- 6- METHOD OF MEASUREMENT FOR METAL RAILS: UNLESS OTHERWISE STATED THE LENGTH OF METAL RAILS TO BE PAID FOR SHALL BE THE CONTINUOUS HORIZONTAL LENGTH MEASURED FROM INSIDE TO INSIDE OF CONCRETE POSTS.
- 7- CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY AT HIS OPTION HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

GALVANIZED STEEL RAILS

MATERIALS AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS.

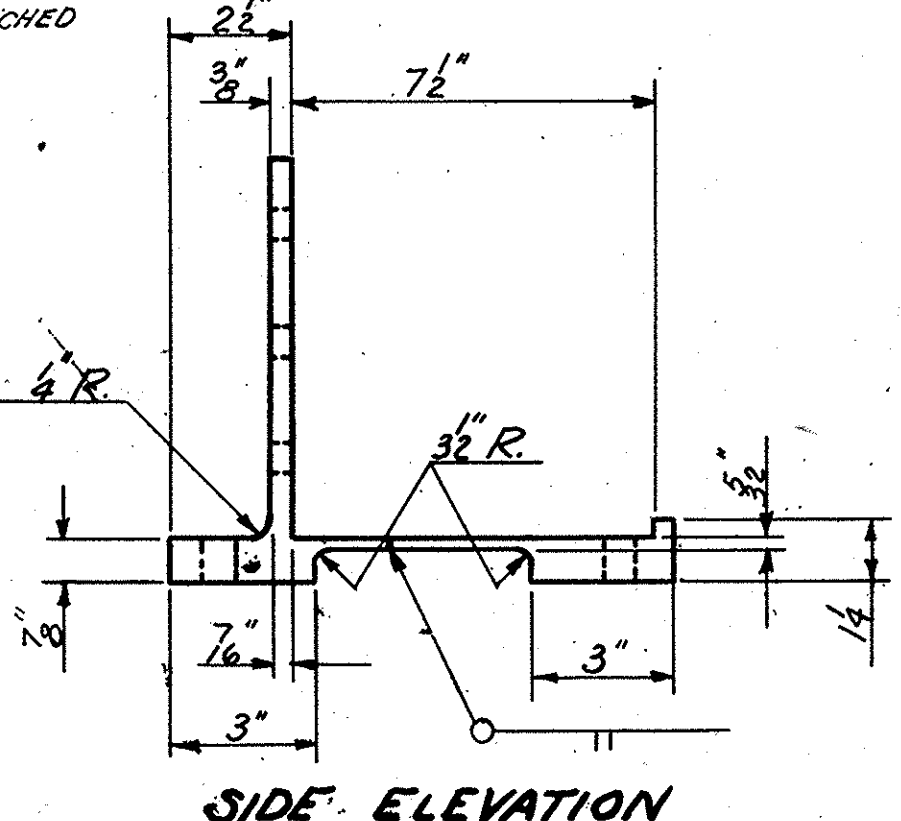
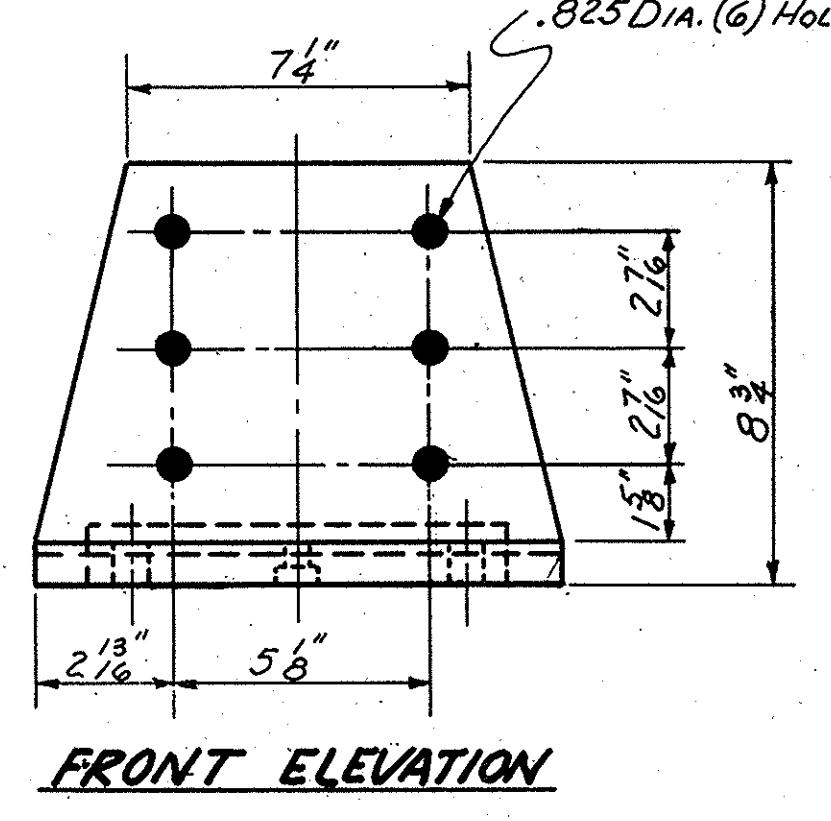
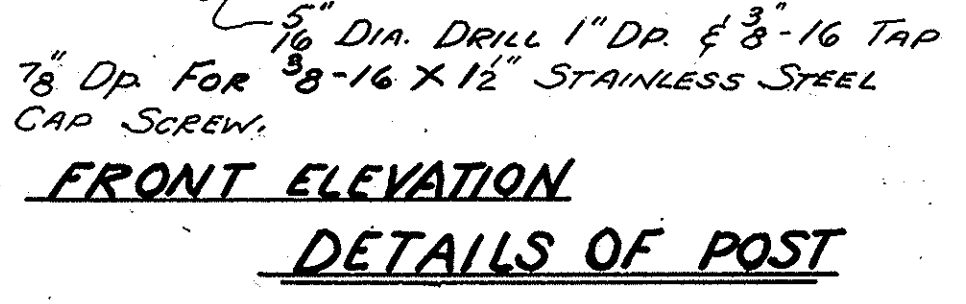
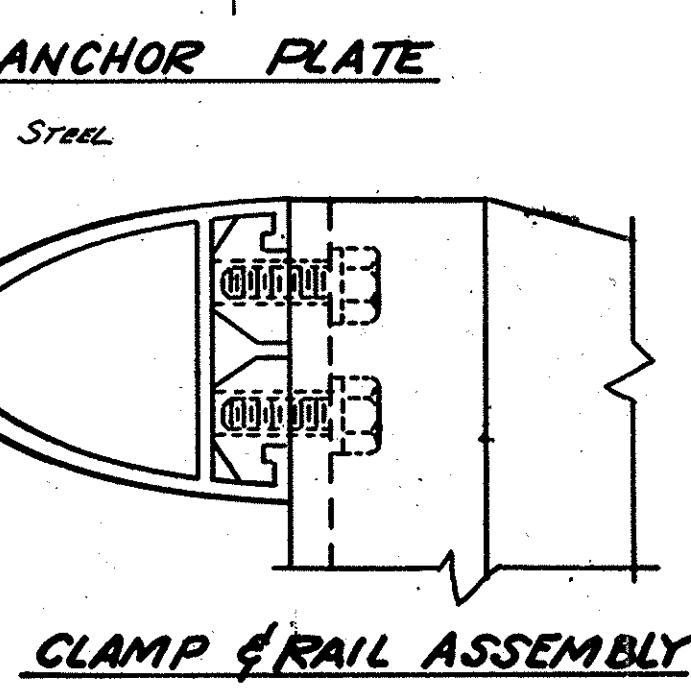
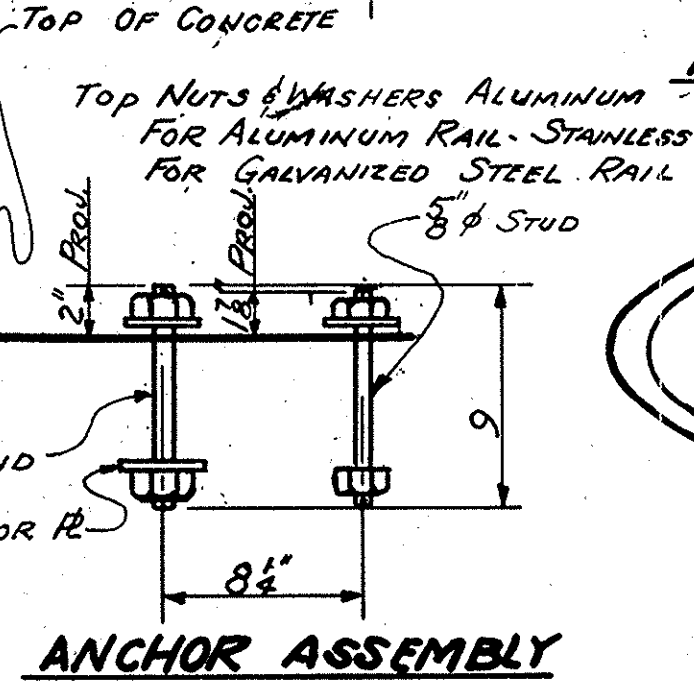
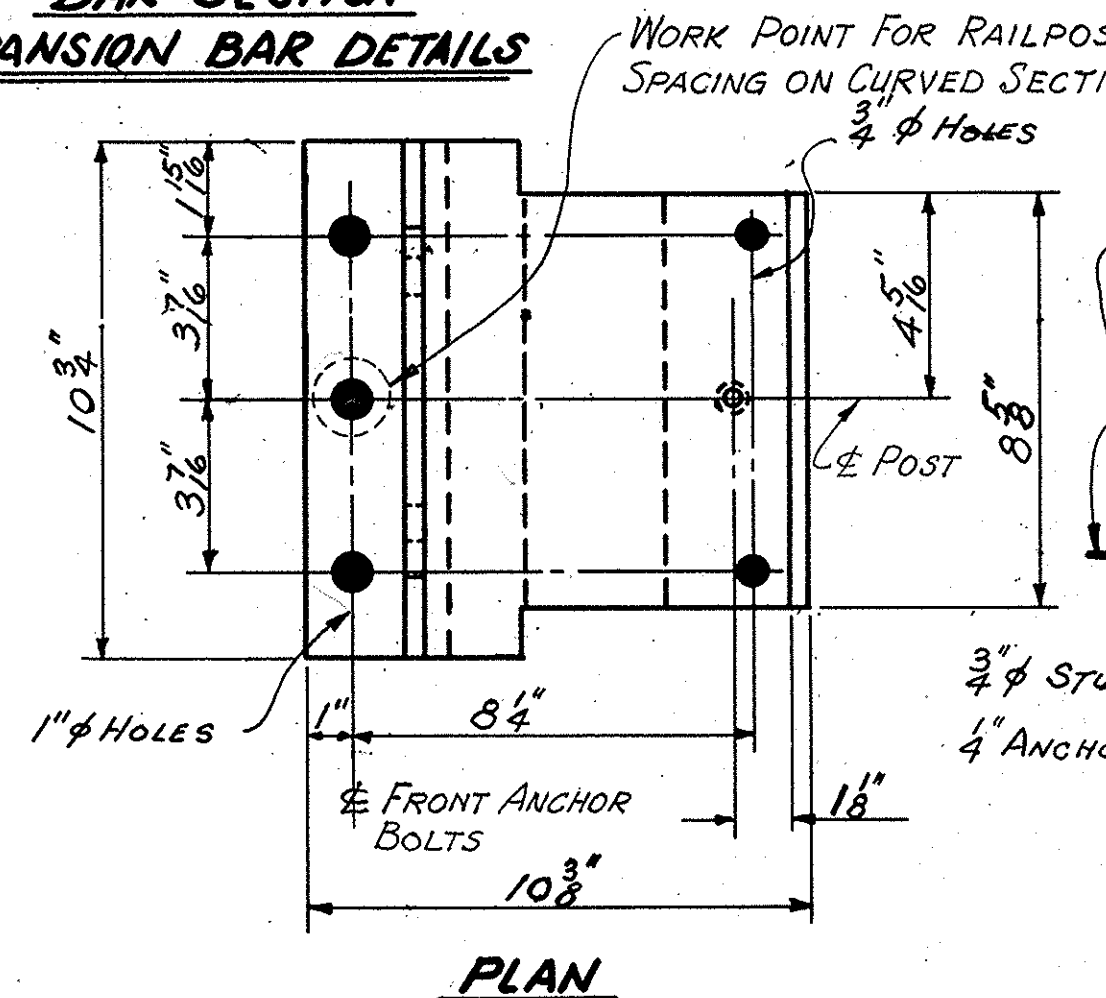
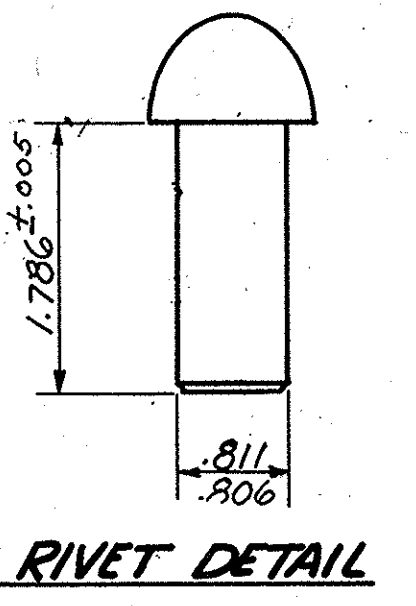
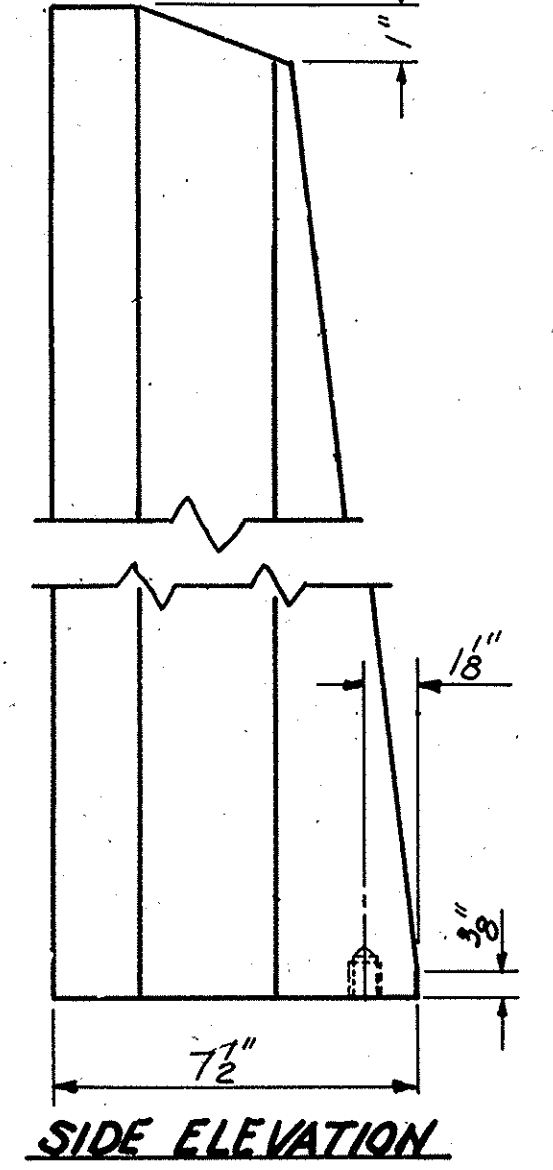
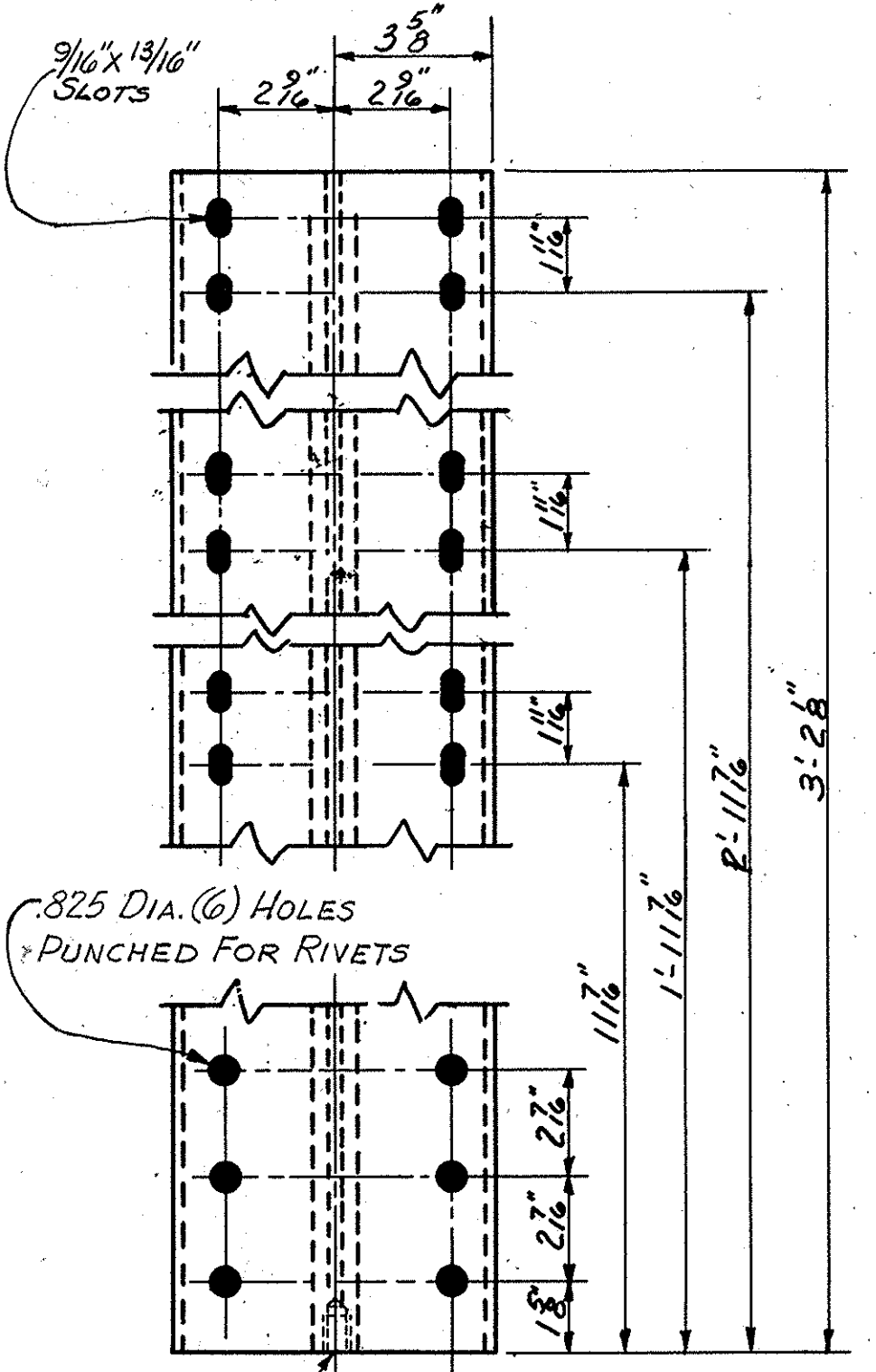
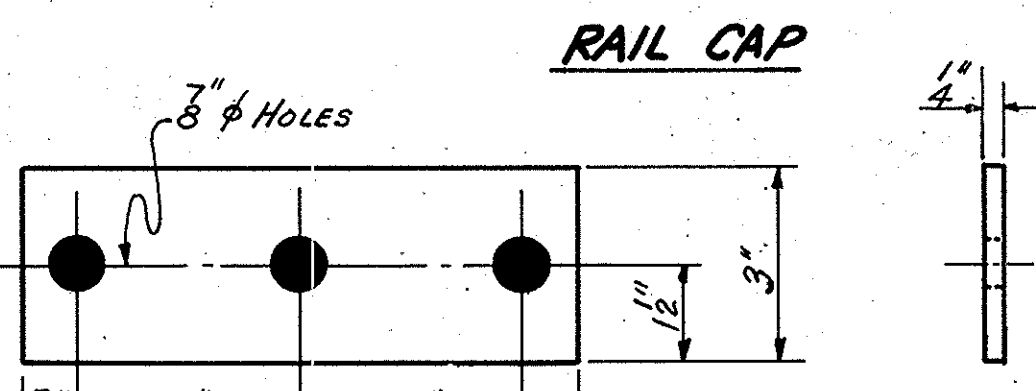
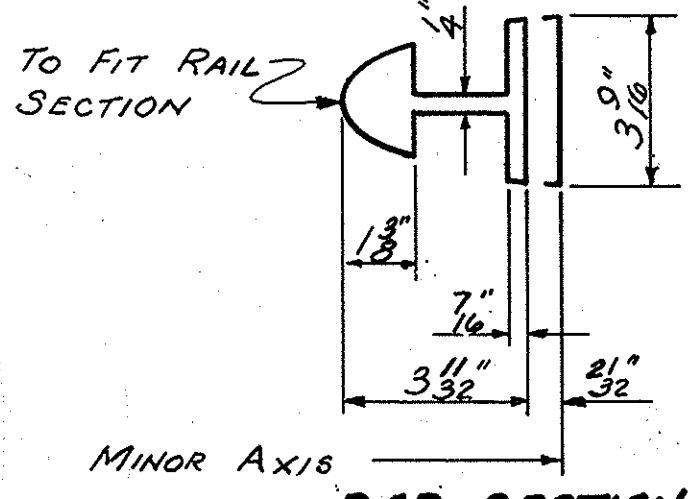
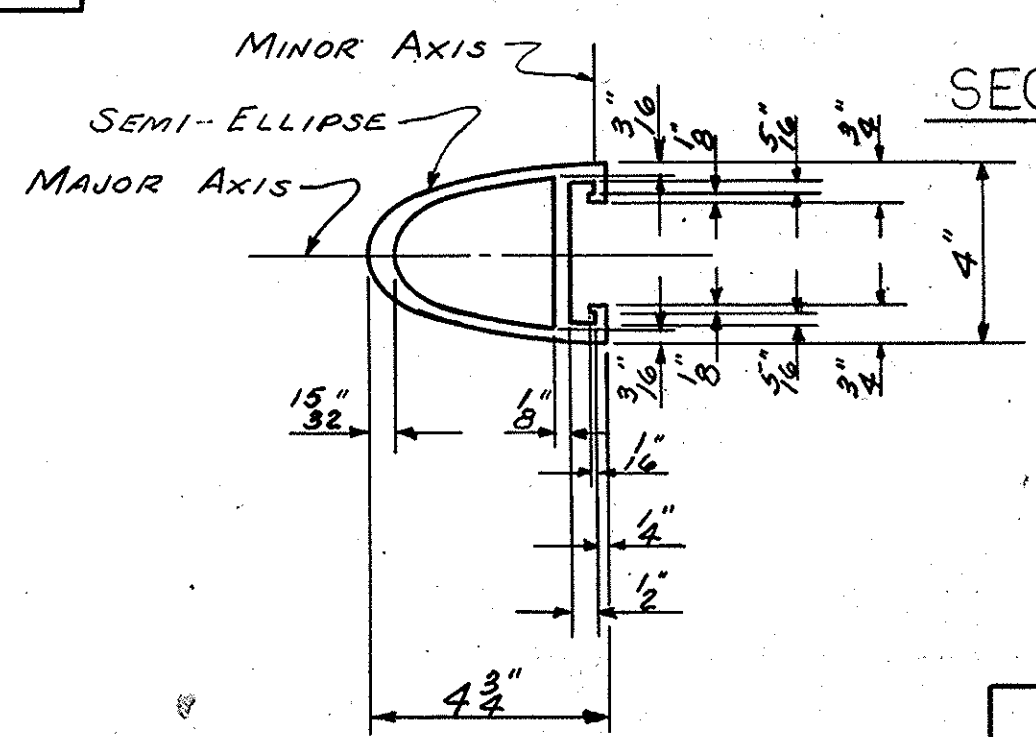
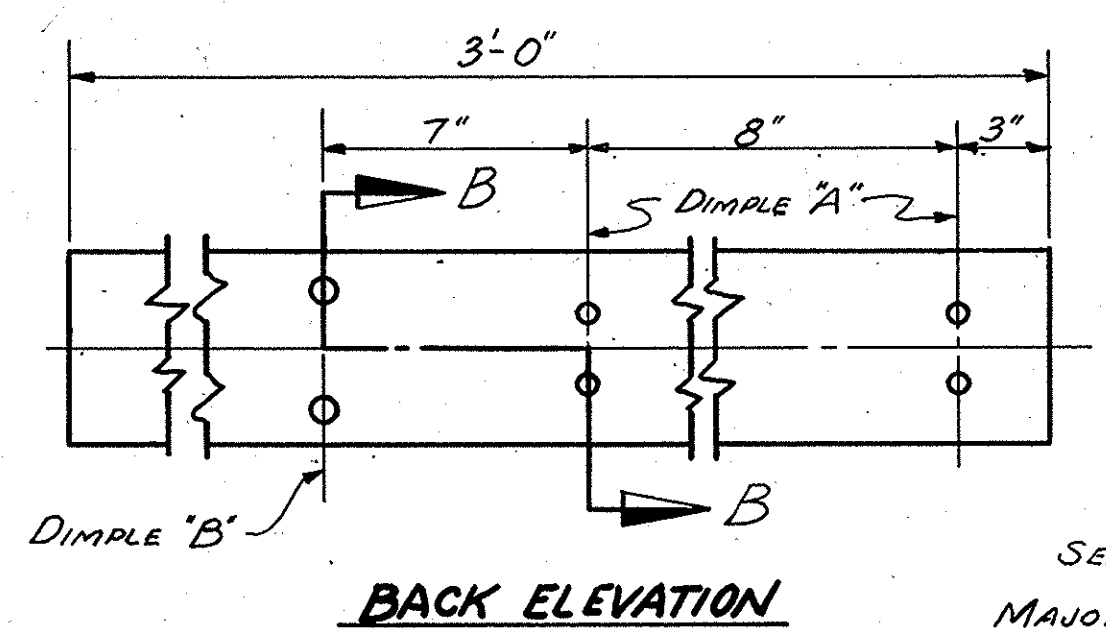
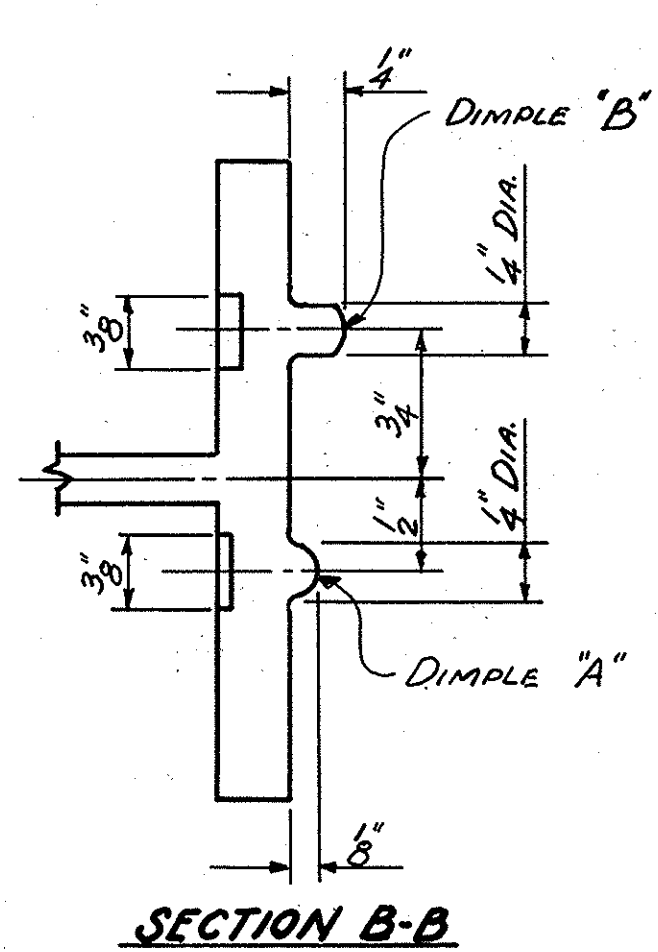
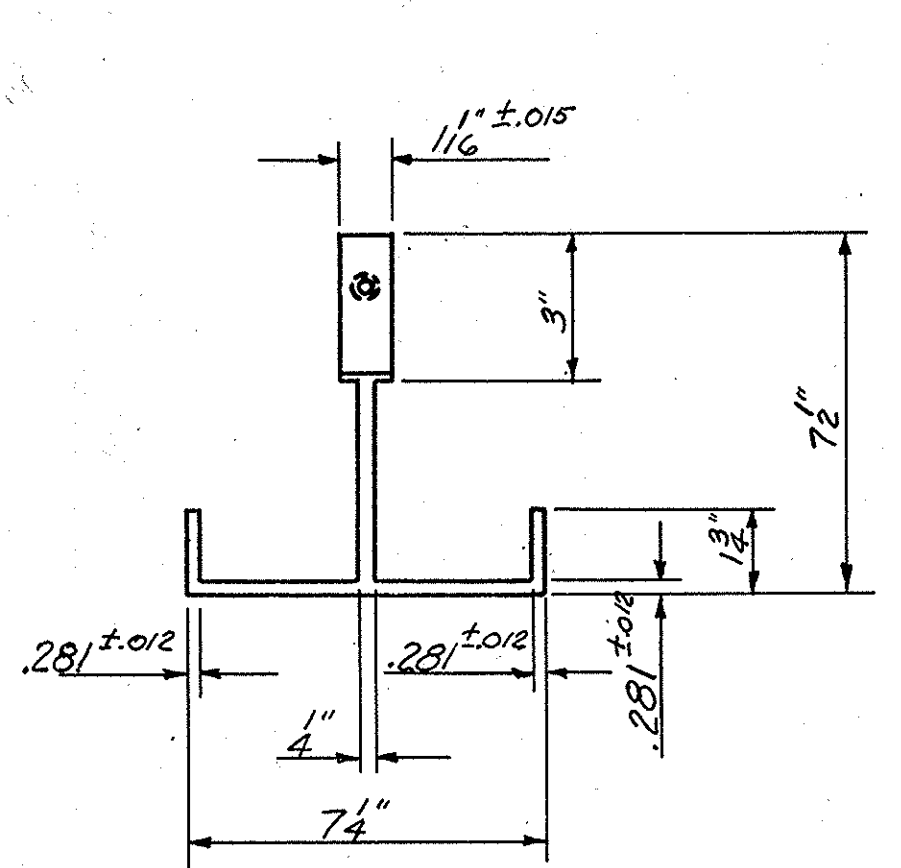
RAIL POST & POST BASE: A.S.T.M. A36 GRADE STRUCTURAL STEEL - GALVANIZED TO A.S.T.M. A123

RAIL & EXPANSION BAR: A.S.T.M. A36 GRADE STRUCTURAL STEEL - GALVANIZED TO A.S.T.M. A123

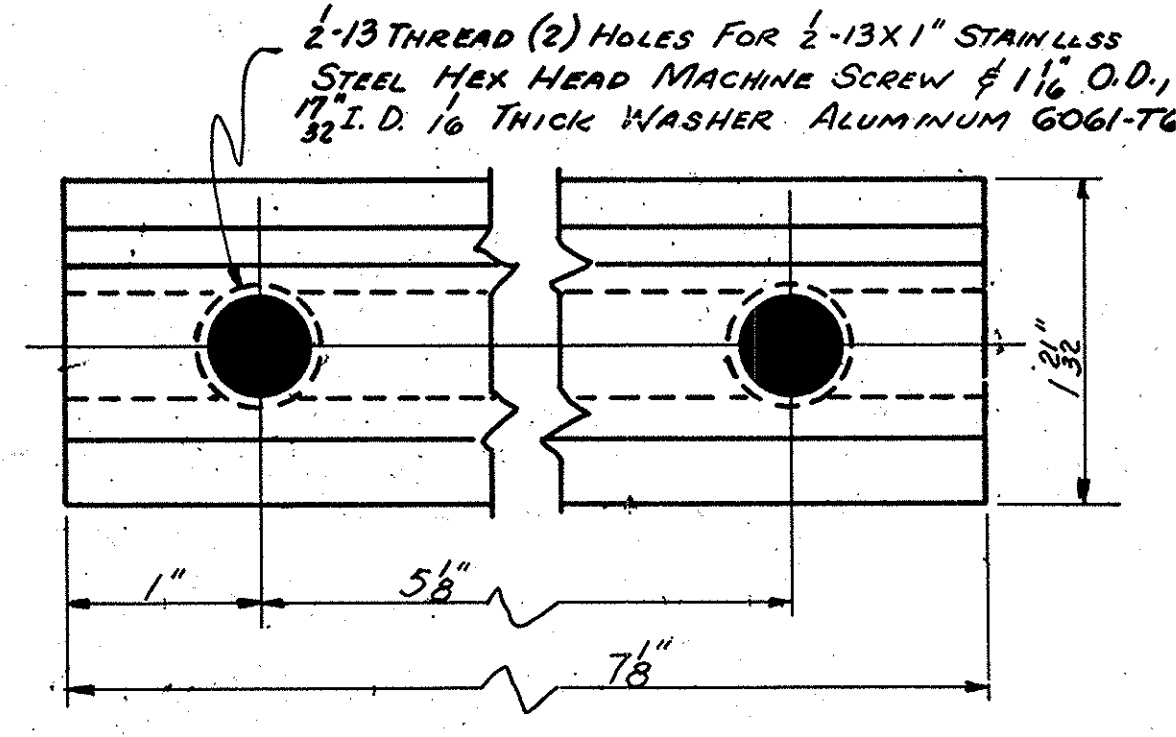
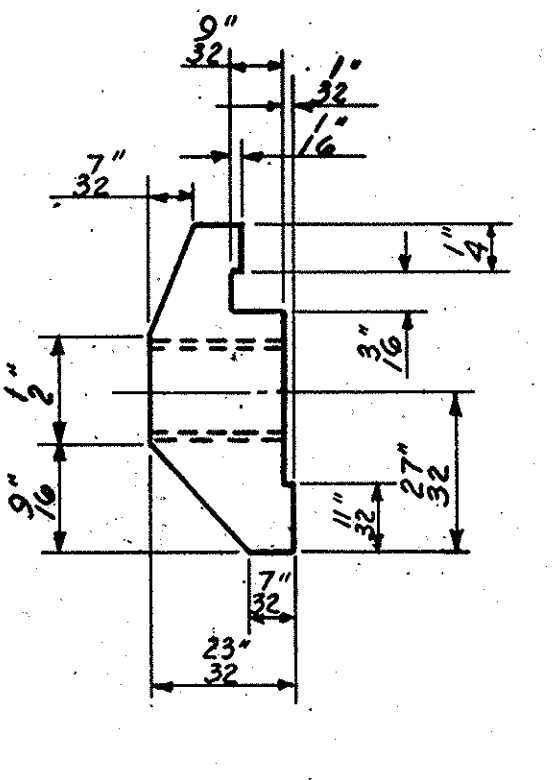
CLOSURE PLATES & SHIMS: A.S.T.M. A245 GRADE C - GALVANIZED TO A.S.T.M. A123

NUTS & WASHERS FOR TOP END OF ANCHOR ASSEMBLY FOR STEEL RAIL SHALL BE TYPE 430 STAINLESS STEEL.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1.



POST BASE DETAILS



MADE BY: NCHC STD. CHECKED BY: M.C. SLASH

PROJECT No. 8.1355108
NEW HANOVER COUNTY

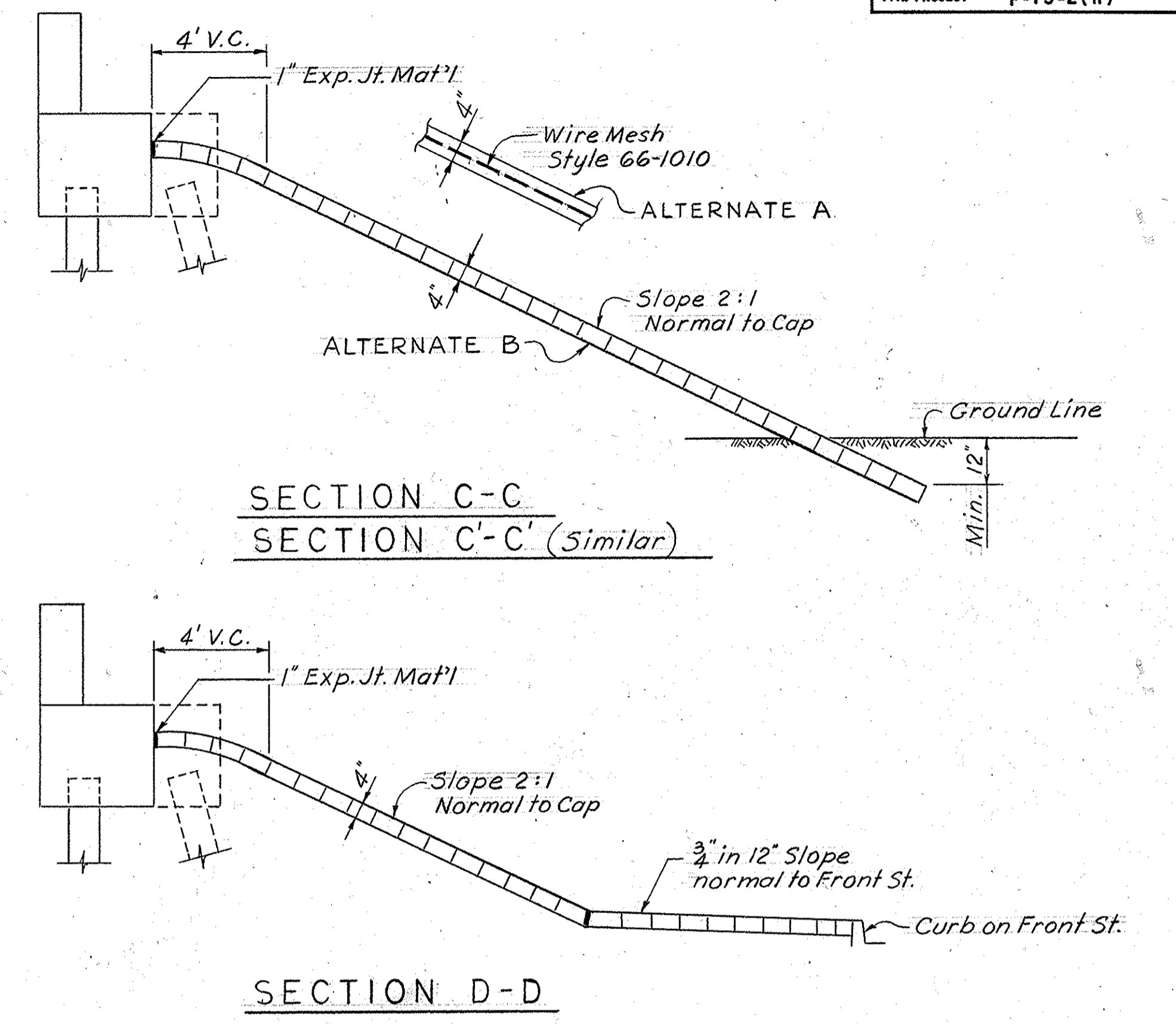
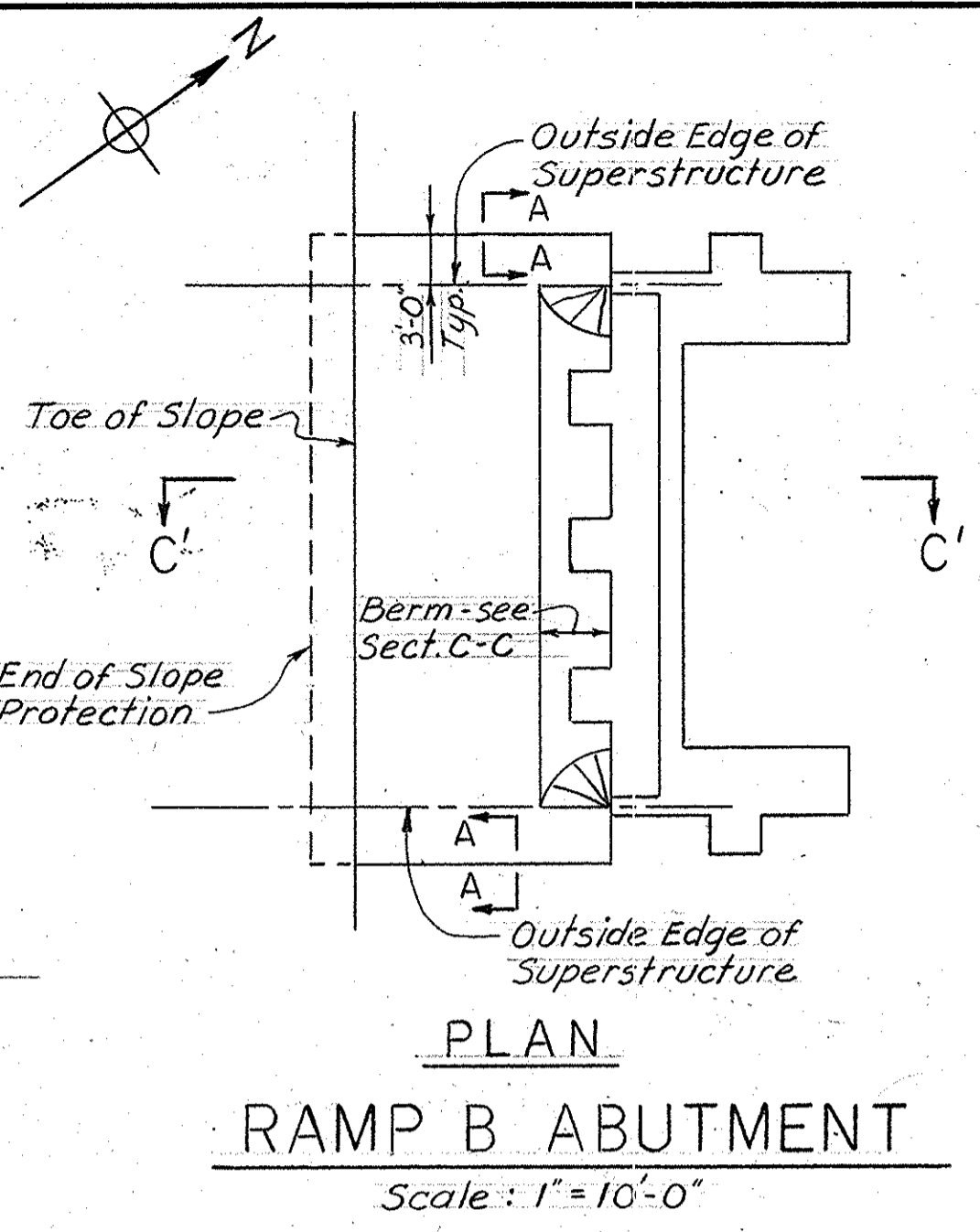
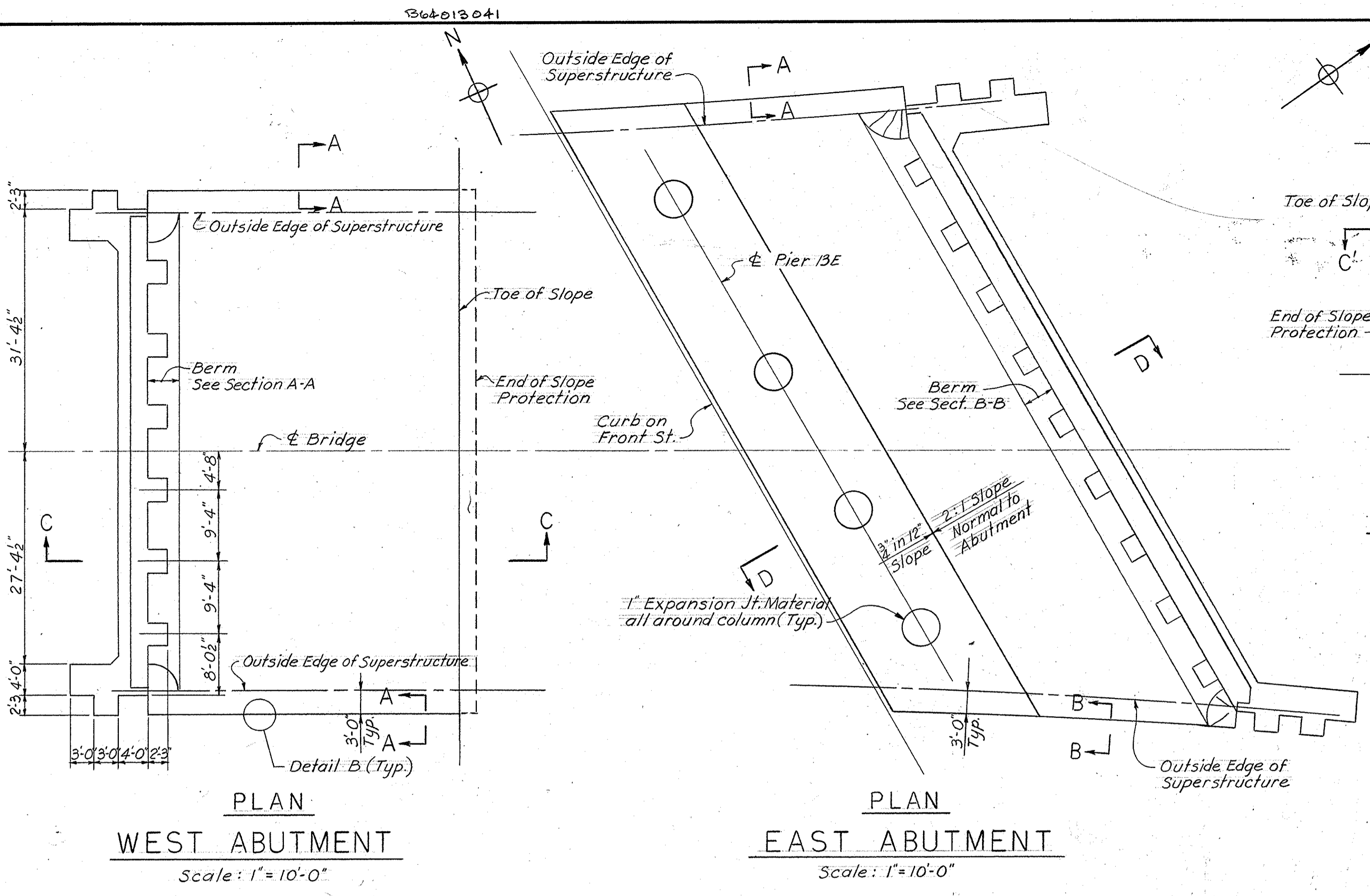
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

CAPE FEAR RIVER CROSSING
AT WILMINGTON
APPROACHES ON STRUCTURE
THREE BAR METAL RAILING

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC.	DATE: October, 1967
ENGINEERS	NEW YORK
REVISION	BY DATE

Sheet 01

FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N.C.	8.135510B
F.A. PROJECT		F-75-2 (11)



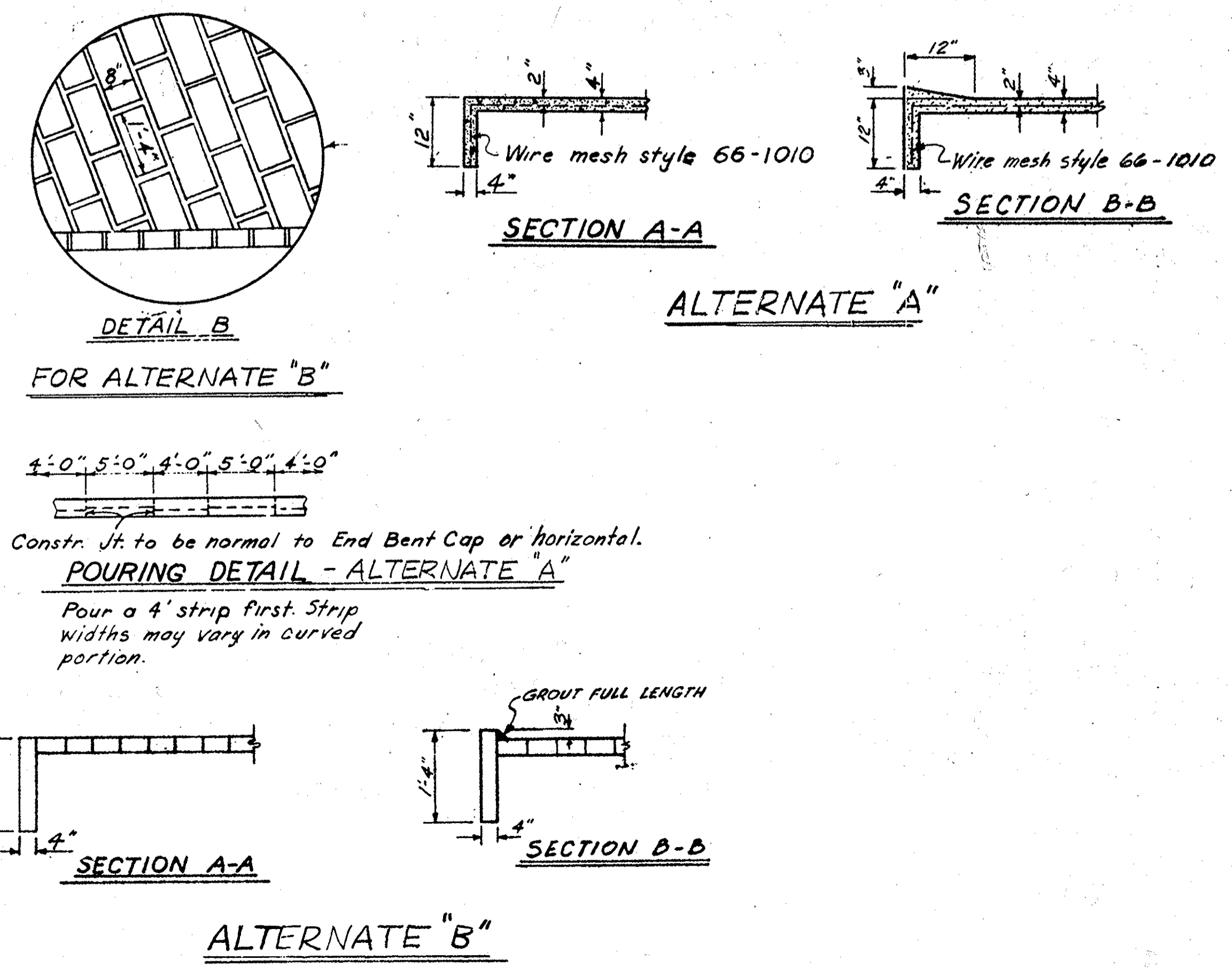
NOTES:

A 4" concrete slope protection paving shall be placed under the ends of the bridge. Limits of the protection shall be as shown in the details. The contractor, at his option, may place either type, Alternate "A" or "B" as described below. Immediately before placing the paving, the slope shall be properly shaped and firmly compacted so that it conforms to the lines and grades shown. The finished surface shall be reasonably smooth and uniform and shall not vary from lines, grades, and sections shown by more than 1/2" along a 10' straight edge.

ALTERNATE "A"
 Alternate "A" shall consist of 4" poured in place concrete paving as shown in details on this sheet. Concrete shall be Class B. The concrete surface shall be floated with a wooden float and finished.
 The quantity to be paid for under this item shall be the number of square yards of slope protection measured in place complete and accepted, including the area of the toe walls below 4" thickness of protection. (For example 8" pay area for toe wall 1'-0" deep.)
 The quantity measured as provided for above, shall be paid for at the contract unit price per square yard for mesh excavation, backfilling, preparation of slopes, and all materials, labor, equipment, tools and incidentals necessary to complete the work.

ALTERNATE "B"
 Alternate "B" shall consist of solid concrete blocks 4"x8"x16" laid in horizontal courses such that those in successive courses will break joints with units in the preceding one. Blocks are to be laid with their long axis parallel to the end bent cap with grouted joints preferably 3/4" but not less than 1/2" nor more than 1 1/4" wide between successive courses and ends of blocks. Joints shall be grouted by pouring a mixture of one part Portland cement to three parts sand mixed with sufficient water to enable the mixture to be poured through a spout.
 The concrete blocks shall be cast to accurate dimensions, shall have uniform surface color and texture, and shall be manufactured of materials to produce a compressive strength of not less than 3,000 p.s.i. at age of 28 days. No broken blocks shall be used except in constructing a straight line along each side of the paving down the slope. Care shall be taken to break the blocks so as to give a uniform workmanlike joint and surface.
 Method of measurement and basis of payment shall be as prescribed above under Alternate "A".

ALTERNATE "A" wire mesh reinforcing to be style 66-1010 60" wide. Adjacent runs of wire mesh to lap at least 6". Slope Protection to be poured in alternate 4" & 5" strips as shown in Pouring Detail. The cost of wire mesh to be included in the contract unit price bid per square yard for 4" concrete slope protection.
 The same type of slope protection shall be used under both ends of any one bridge.



PROJECT No. 8.135510B	
NEW HANOVER COUNTY	
STATE OF NORTH CAROLINA	
STATE HIGHWAY COMMISSION	
RALEIGH	
CAPE FEAR RIVER CROSSING	
AT WILMINGTON	
APPROACHES ON STRUCTURE	
SLOPE PROTECTION	
PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, INC.	DATE: October, 1967
ENGINEERS	NEW YORK
REVISION	BY DATE

MADE BY Joseph A. ...
 CHECKED BY M. C. ...
 IN CHARGE OF M. C. ...

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