
Natural Ground Line
SPAN 7N
6N
5N
4N
3N
2N
-1-
2S
3S
Fix.
Exp.
Maximum Storm Tide El.+6.8
Mean Low Tide El.-0.5
Mean High Tide El.+1.6
Top of Ftg. El.-10.75
P.I. Sta 211+20
Elev. 84.8
1200' Vert. Curve
65' Vert. Clearance
El.+7.25
Top of Seal El.-15.0
Bottom of Seal El.-21.0
Bottom of Ftg. El.+3.0 (Typical)
ELEVATION
Denotes Bent Nos. North & South
Sta 211+20
℄ Bridge
℄ Channel
7 Pile Cluster (See Fender Detail)
℄ Beams
7'-6"
℄ Bridge & Roadway
90' Clearance
Fenders
80'-0"
4 SPANS @ 92' = 368'
96'-0"
66'-0"
68'-0"
℄ Cap
PLAN
SPAN 4S
5S
6S
7S
8S
9S
10S
11S
12S
8 SPANS @ 92' = 736'
24'-0"
90'-0"
MATCH LINE STA 205+00
MATCH LINE STA 213+50
MATCH LINE STA 222+00
SCALE 1"=30'

PROJECT No. 6.801563

CARTERET COUNTY

STATION: 211+20 -L-

Sheet 2 of 3

STATE OF NORTH CAROLINA

STATE HIGHWAY COMMISSION

RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER INTRACOASTAL WATERWAY BETWEEN N.C. 24 AND EMERALD ISLE

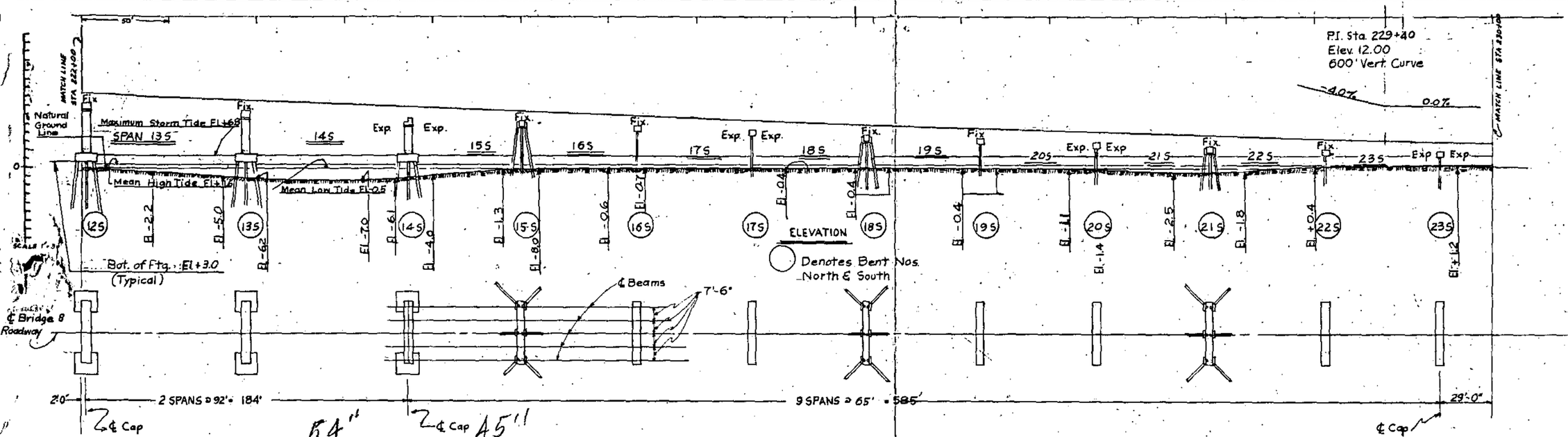
OCT. 1968

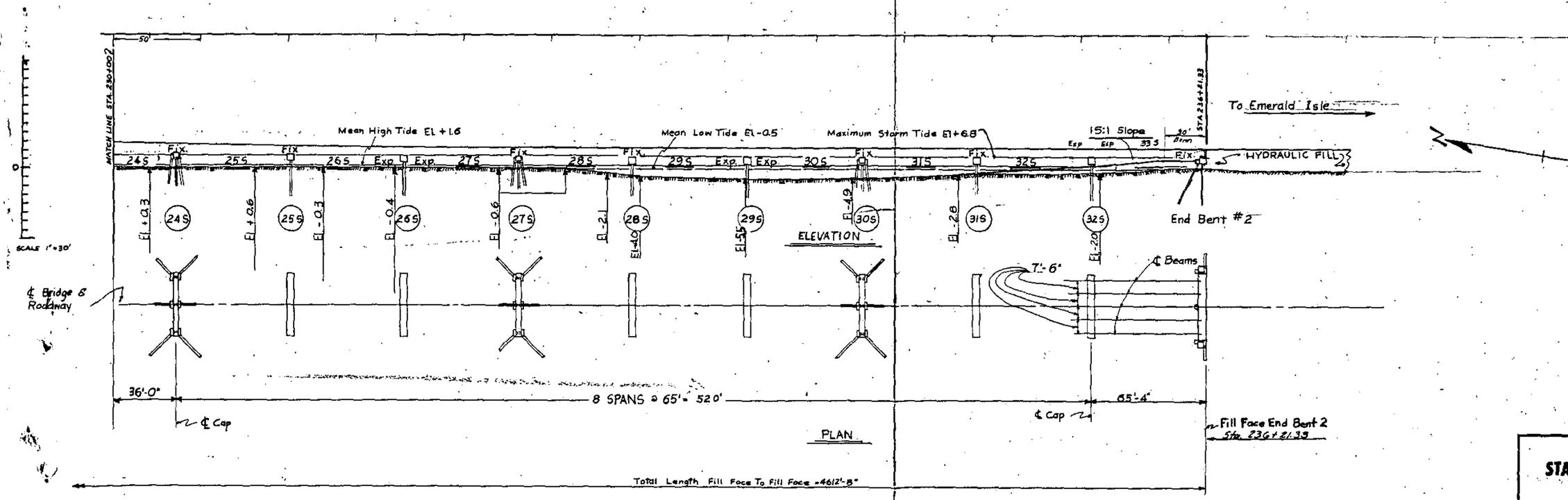
REVISIONS							
NO.	BY	DATE	NO.	BY	DATE	SHEET NO.	5-4
1			3			TOTAL SHEETS	27
2			4				

FED. ROAD DIV. NO.	STATE	PROJECT NO.
8	N.C.	6.80156

DRAWN BY D.L. WALL DATE OCT 68
CHECKED BY [illegible] DATE Oct. 1968

FED. ROAD DIV. NO.	STATE	PROJECT NO.
8	N.C.	6.801563
F. A. PROJECT		





DRAWN BY: D.J. Wall DATE: OCT 68
CHECKED BY: [illegible] DATE: Oct 1968

PROJECT NO. 6.801563
CARTERET COUNTY
STATION: 211+20 -L-
Sheet 3 of 3

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER INTRACOASTAL WATERWAY BETWEEN N.C. 24 AND EMERALD ISLE
OCT. 1968

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	3-S
1			3			TOTAL SHEETS
2			4			27

3-22-89

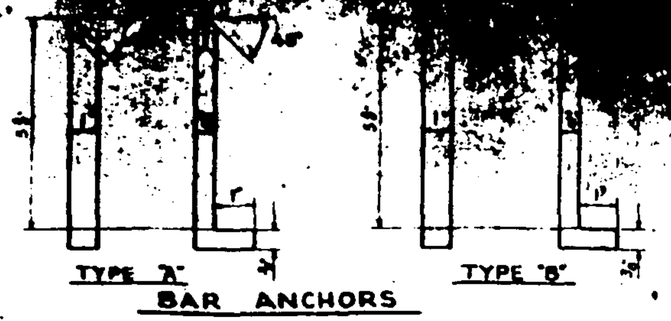
E.A. Scott

Bogue Sound Bridge
Aluminum Expansion Joints
2-5 Gal. Cans bought initially
Standard Oil Company Calumet #10X

If we can find it Scotty will send
samples also it.

Larry Brooks - Purchasing
2150
Larry is checking to see where
we can secure the above lubricant.

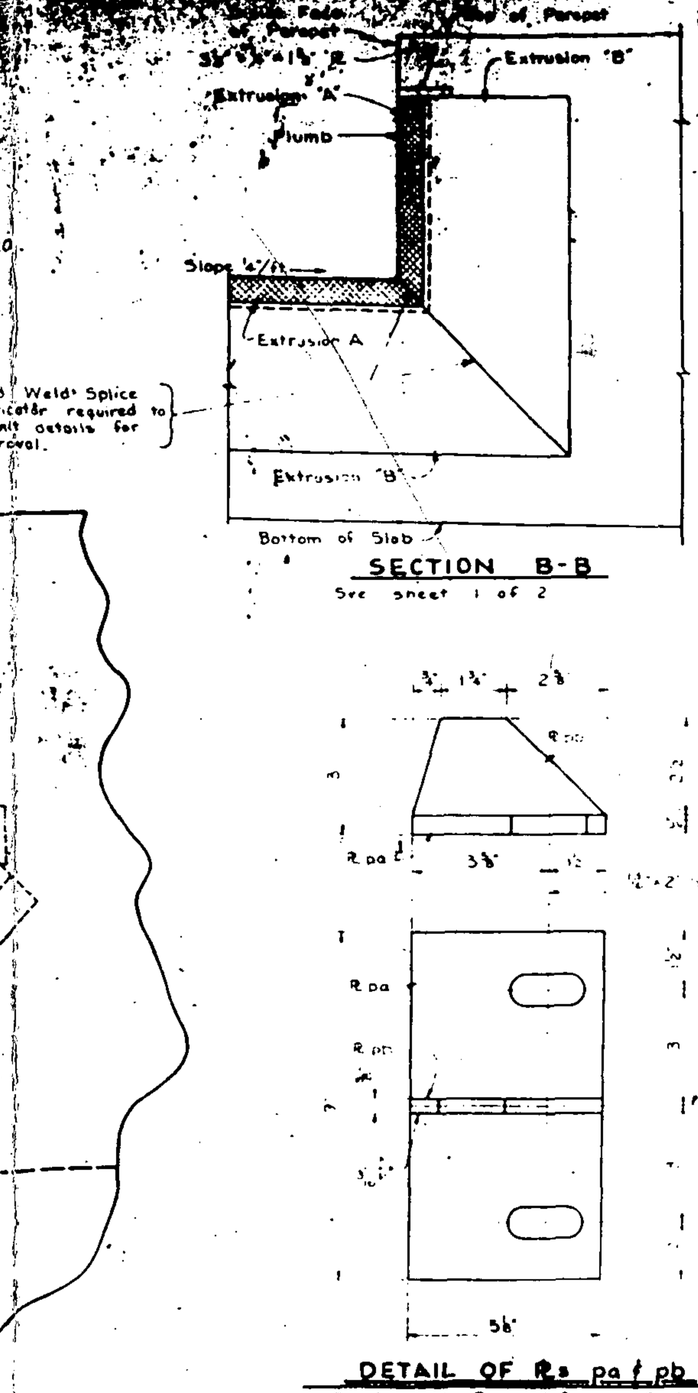
Mr. Goode
2:00 Today



BAR ANCHORS

Bent	20-N	Bent	11-S
Bent	17-N	Bent	14-S
Bent	14-N	Bent	17-S
Bent	11-N	Bent	20-S
Bent	8-N	Bent	23-S
Bent	5-N	Bent	26-S
Bent	2-N	Bent	29-S
		Bent	32-S

Total Expansion Plates required 20.

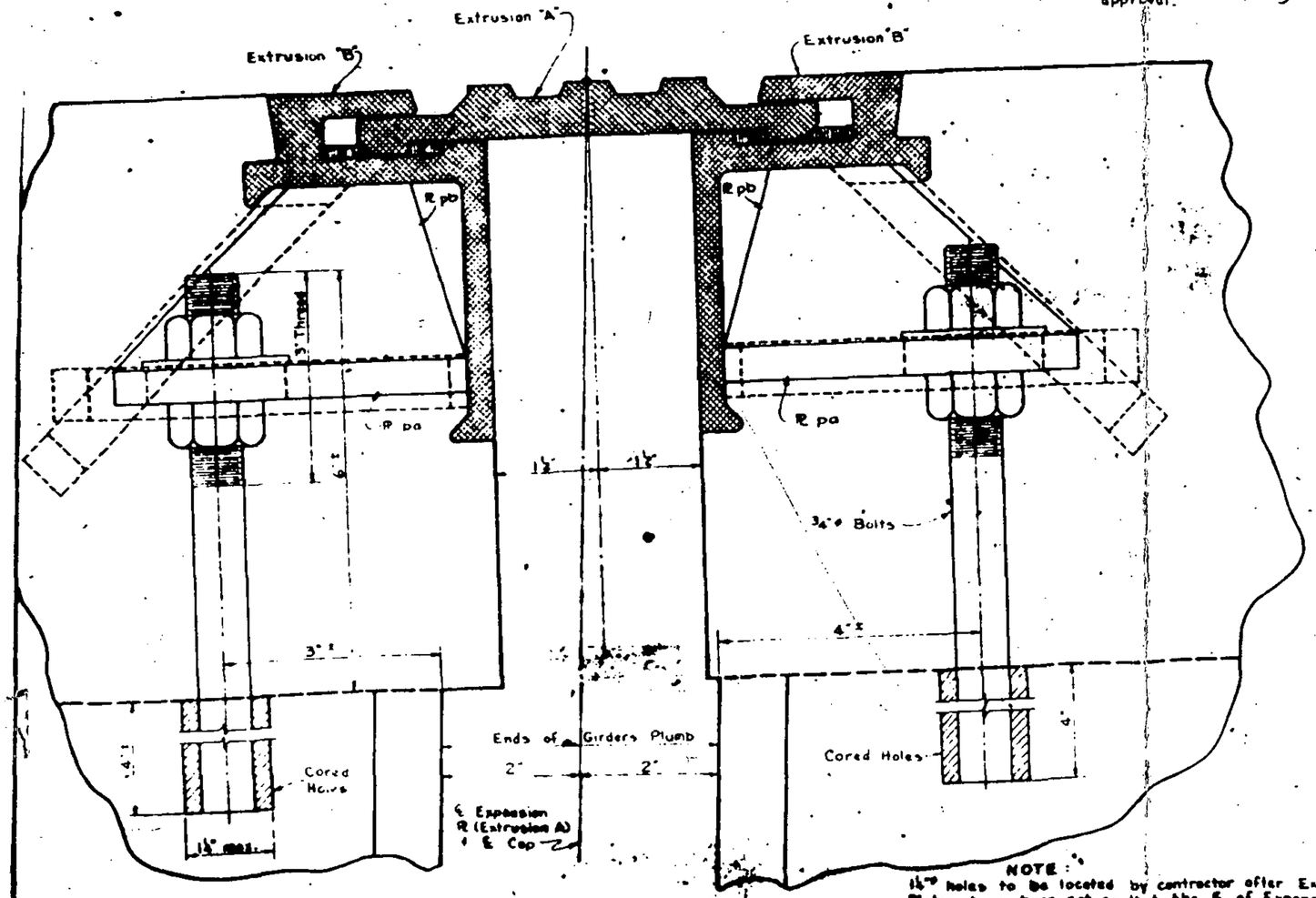


Shop Weld Splice Fabricator required to submit details for approval.

SECTION B-B

See sheet 1 of 2

For dimensions of Extrusions "A" & "B" see Sheet 1 of 2.



ALUMINUM EXPANSION

Showing Expansion

NOTE:
1½" holes to be located by contractor after Expansion Plates have been set so that the ℄ of Expansion Plate is directly above the ℄ of Cap. The contractor will be required to use a rotary type drill to core the holes. The joint in vertical face of Parapet to be perpendicular to the grade of the Bridge slab.

DETAIL OF Rs pa & pb

One Assembly Required for each Girder.

GENERAL NOTES

1. Alloy for Extrusions, Plates and [illegible] to be 6061-T 6.
2. Filler material to be Alloy 5356.
3. The expansion joints shall be shop assembled detailed with a normal 3" gap between ends. The assembly shall be adequately braced and to maintain correct alignment and spacing during
4. All aluminum surfaces in contact with concrete protected with two coats of zinc cromate paint wash coat and one prime coat) and a finish co alkali-resistant bituminous paint.
5. The expansion joint shall be field set to the grade of roadway and parallel with the roadway
6. Lubricate and seal the Aluminum Expansion in the shop before shipment with alkali-re grease (Standard Oil Company, Calumet #10% or
7. All contact surfaces for shop or field weldi be [illegible]
8. The Expansion joint shall be fabricated t the [illegible] cross section.
9. Welding to be [illegible] with the lat [illegible] specifications.

#60

PROJECT NO. 8.2215.
CARTERET Co
STATION: 211+20

Sheet 2 of 2

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSI
RALEIGH

EXPANSION PLATI

JULY, 1969

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

CONCRETE ROAD

Girder Spacings
3 lines of Girders
Gutter Line

34 Each Type "A" & "B" Bar Anchors — 33 Spaces @ 12"

Splice
See Detail

Rs pa & pb
Typ.

Gutter Line

NOTE
Spans 1, 2-N & 2-S have 7 Girders each. All other spans have 5 Girders each.

Girder Spacings
7 lines of Girders

NOTE: PLAN typical @ Bt 2-N & Bt 2-S with span on one side having 5 Girders and the other side having 7 Girders (2 required). All other Expansion Plates are located between spans having 5 Girders each (18 required). Total Aluminum Expansion Plates required 20.

PLAN

See Note at Left

Lubricant (See Note 6 Sheet 2 of 2)

Type "A" Anchor

Extrusion "A"

Extrusion "B"

Std Washer

Type "B" Anchor

2 - ⅞" Bolts 10" long each Girder with 2 Nuts each Bolt. Bolts & Nuts to be hot dipped galvanized

Top of Girder

1½" max. cored hole (2 each Girder) in top of Girder field located by contractor after Girders are in place. Grout with Epoxy.

Cored Holes

Ends of Girders Plumb

℄ Expansion ℄ (Extrusion "B") & ℄ Cap

Cut from any aluminum 6061-T6 section which satisfy dimensional requirements

Top of Girder

See Note Below

1¼" - 2" Slot

1¼" holes to be located by contractor after Expansion Plates have been set so that the ℄ of Expansion Plate is directly above the ℄ of Cap. The contractor will be required to use a rotary type drill to core the holes. The joint in vertical face of Parapet to be perpendicular to the grade of the Bridge slab.

At Span 2-N side of Bent 2-N, and at Span 2-S side of Bent 2-S core holes in ends of Girders 1½" deep due to only ¾" build-up.

ALUMINUM EXPANSION JOINT

* Slab and Parapet steel shall be pulled back so there will be no contact with Aluminum Expansion Joint.

"e" bars & Rail Post may be shifted to clear Aluminum Expansion Joint Anchors in Parapet.

Type "A" Anchor
Extrusion "B"
Type "B" Anchor
Extrusion "B"
Extrusion "A"
Top of Slab
Inside of Parapet

SECTION C-C

Aluminum Closure Plate 3½" x ¼" x 1'-8" welded to end of Extrusion "B" in vertical Parapet Section as shown.

Top of Parapet
Type "A" Anchor
Type "B" Anchor
Top of Slab
Extrusion "A"
Extrusions "B"
Type "A" Anchor
Type "B" Anchor

SECTION A-A

℄ Bridge

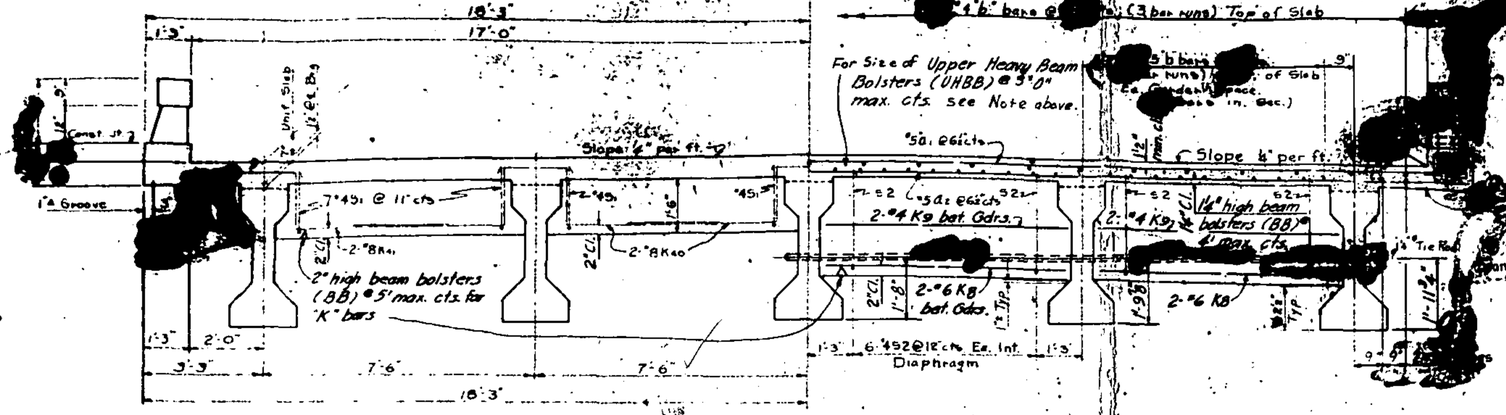
PLAN OF SPLICE

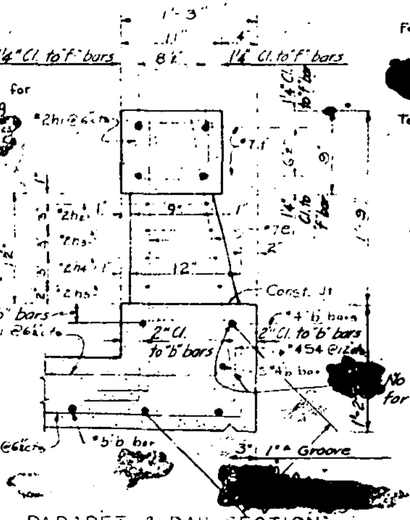
PROJECT No. 8.
CARTERET
STATION: 211 +
Sheet 1 of 2

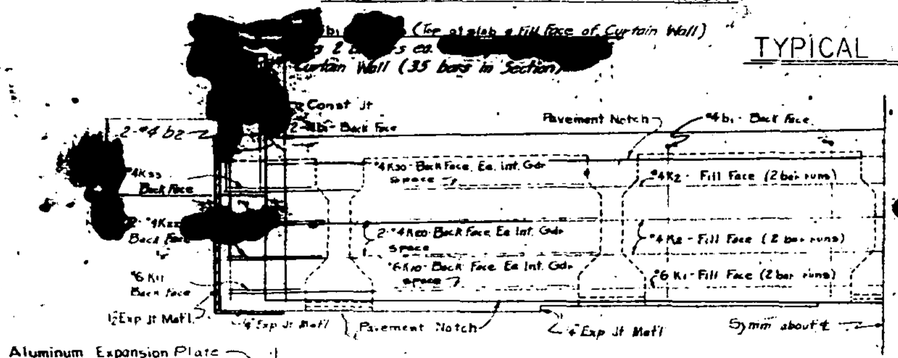
STATE OF NORTH CAROLINA
STATE HIGHWAY COM
RALEIGH

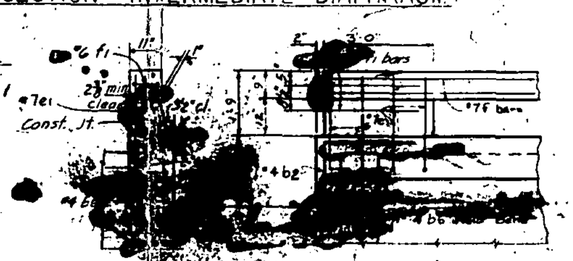
EXPANSION PL

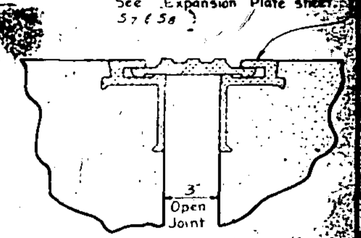
JULY, 196

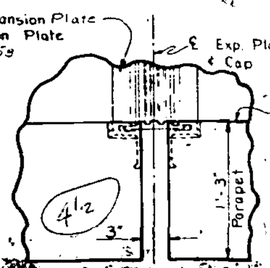


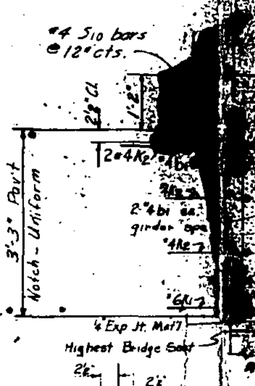


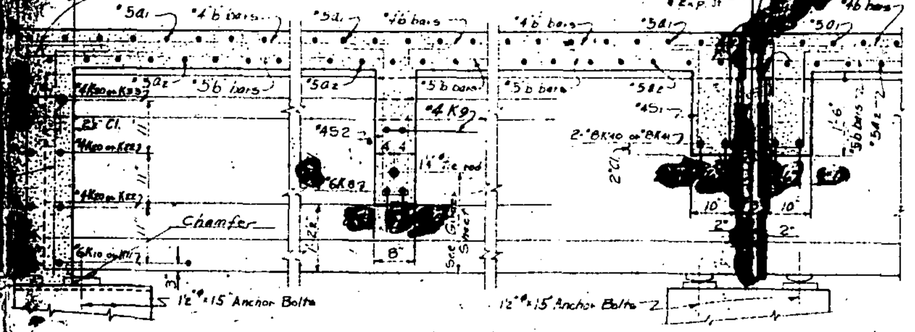












Note: When b bars in the top portion of slab are #4 use 1½" high UHBB, #6 use 1¼" high UHBB, for #8 use 1" high UHBB.

Provide one 1¼" high Beam Bolster (BB) at mid-point of each post spacing to support "f" bars - also tie "f" bars to "e" bars for support.

HALF SECTION ~ BENT DIAPHRAGM

HALF SECTION ~ INTERMEDIATE DIAPHRAGM

TYPICAL SECTION

DRAIN DETAIL

PARAPET & RAIL SECTION

Note: See Rail Sheet for reinforcing steel in Posts & Rails.

HALF END ELEVATION

END POST & BASE SECTION

DETAIL AA

DETAIL "A"

SECTION A-A

SECTION D-D

SECTION B-B

At Bent 26-N or 32-S

DETAIL "B"

*6 f1 bars may be field bent, or moved down to clear name plate.

** Clear dimensions on small posts are to e1 bars.

SKETCH SHOWING AREA OF LINSEED OIL APPLICATION

Note: See Special Provisions for method of curing bridge deck and mixing and applying the linseed oil solution.

NOTES

[illegible] Live Load : [illegible]

Concrete in Compression 1100 Lbs. [illegible]

Reinforcing Steel in [illegible]sion 20,000 Lbs. [illegible]

For other Design D[illegible] General Notes see Sheet [illegible]

For bars [illegible] mark [illegible] see co[illegible] different [illegible]

Temporary Struts shall be placed between prestressed girders adjacent to the diaphragms, and the nuts on the ¾" tie rods shall be tightened before the diaphragms are cast. Struts shall remain in place [illegible] days after concrete is placed. The tie rods shall be retightened after the struts have been removed.

~~B. #49~~ 58-16-08

PROJECT No. 8.2215302

CARTERET COUNTY

STATION: 211 + 20

65' Spans 27-N & 33-S

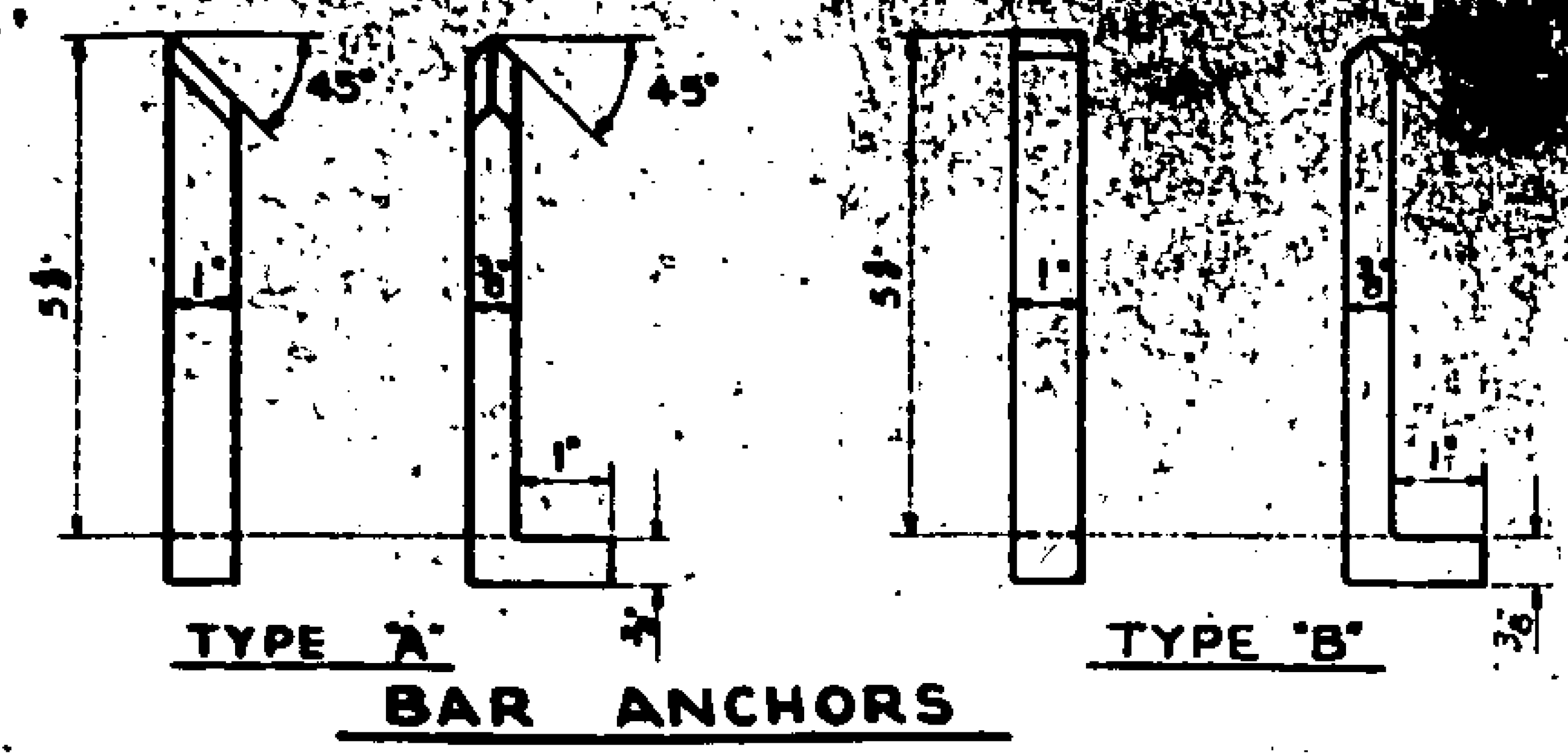
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
STANDARD TYPICAL SECTIONS
34' ROADWAY ~ 90° SKEW
5-45" PRESTR. CONC. GIRDERS
CONC. POST & RAIL

Aug. 1964

REVISIONS

[illegible]	BY	DATE	NO.	BY	DATE
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]


F.A. PROJECT 5-16 6401
8.2215302
Girder Spacings 5 lines of Girders
Gutter Line
2'-0" 7'-6" 7'-6" 7'-6" 7'-6" 2'-0"
Slab Slopes ¼"/ft.
℄ Bridge and Exp. ℄ Splice
Slab Slopes ¼"/ft.
Gutter Line
34 Each Type "A" & "B" Bar Anchors
33 spaces @ 12"
NOTE
Spans 1, 2-N & 2-S have 7 Girders each. All other spans have 5 Girders each.
Splice See Detail
℞s pa & pb Typ.
℞s pa & pb Typ.
Girder Spacings 7 lines of Girders
2'-0" 5'-0" 5'-0" 5'-0" 5'-0" 5'-0" 5'-0" 2'-0"
17'-0" 17'-0"
36'-6"
PLAN
See Note at Left
NOTE: PLAN typical @ Bt. 2-N & Bt. 2-S with span on one side having 5 Girders and the other side having 7 Girders (2 required). All other Expansion Plates are located between spans having 5 Girders each (18 required). Total Aluminum Expansion Plates required 20.
Slab and Parapet steel shall be pulled back so there will be no contact with Aluminum Expansion Joint.
"e" bars in Rail Post may be shifted to clear Aluminum Expansion Joint Anchors in Parapet.
Type "A" Anchor
Extrusion "B"
Type "B" Anchor
Extrusion "B"
Extrusion "A"
Inside vertical face of Parapet
Top of Slab
SECTION C-C
Aluminum Closure Plate 3½"×4"×1⅝" welded to end of Extrusion "B" in vertical Parapet Section as shown.
Lubricant (See Note 6 Sheet 2 of 2)
Outline of Elastomeric Exp. Jt. Assembly
Extrusion "A"
Extrusion "B"
Type "A" Anchor
Std. Washer
Cut from any aluminum 6061-T6 section which satisfy dimensional requirements.
Type "B" Anchor
Type "A" Anchor
13/16" × 2" Slot
2 - ¾" Bolts 10" long each Girder with 2 Nuts each Bolt. Bolts & Nuts to be hot dipped galvanized.
Top of Girder
Top of Girder
Ends of Girders Plumb
Cored Holes
1¼" max.
℄ Expansion ℞ (Extrusion "A") & ℄ Cap
1¼" max. cored hole (2 each Girder) in top of Girder field located by contractor after Girders are in-place. Grout with Epoxy.
ALUMINUM EXPANSION JOINT
Showing Plates on 0% Grade
Top of Parapet
3½"×4"×1⅝" ℞
Type "A" Anchor
Type "B" Anchor
Top of Slab
Extrusion "A"
Type "A" Anchor
Extrusions "B"
Type "B" Anchor
SECTION A-A
1¼" holes to be located by contractor after Expansion Plates have been set so that the ℄ of Expansion Plate is directly above the ℄ of Cap. The contractor will be required to use a rotary type drill to core the holes. The joint in vertical face of Parapet to be perpendicular to the grade of the Bridge slab.
At Span 2-N side of Bent 2-N, and at Span 2-S side of Bent 2-S core holes in ends of Girders 5" deep due to only 3/16" build-up.
℄ Bridge
PLAN OF SPLICE
PROJECT No. 8.2215302
CARTERET COUNTY
STATION: 211 + 20
Sheet 1 of 2
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
EXPANSION PLATE
JULY, 1969
REVISIONS
Robert G. Gomez July 1969

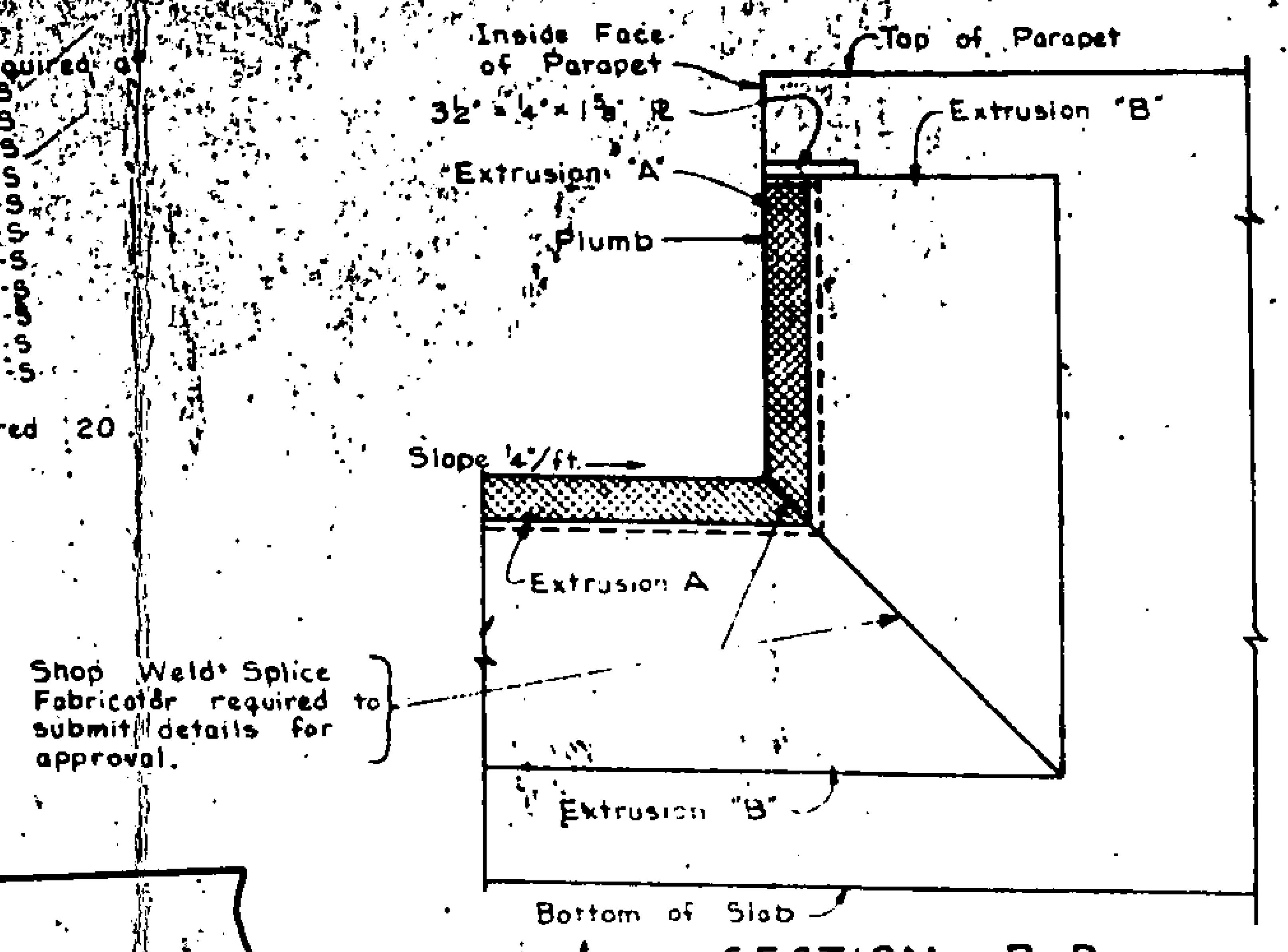


Aluminum Expansion Plates required at:

Bent 26-N	Bent 2-S
Bent 23-N	Bent 5-S
Bent 20-N	Bent 8-S
Bent 17-N	Bent 11-S
Bent 14-N	Bent 14-S
Bent 11-N	Bent 17-S
Bent 8-N	Bent 20-S
Bent 5-N	Bent 23-S
Bent 2-N	Bent 26-S
	Bent 29-S
	Bent 32-S

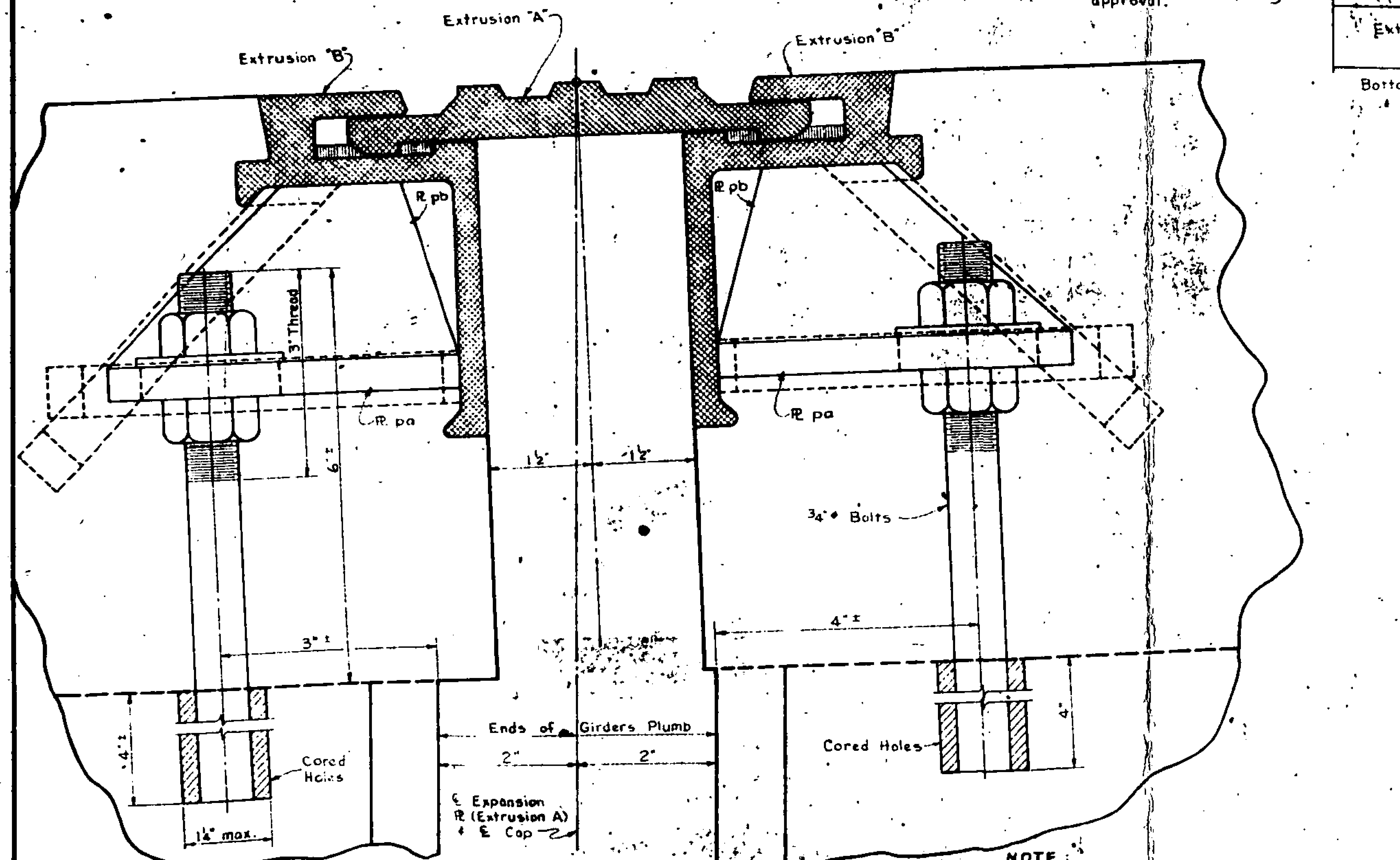
Total Expansion Plates required 20

For dimensions of Extrusions "A" & "B" see Sheet 1 of 2.



SECTION B-B

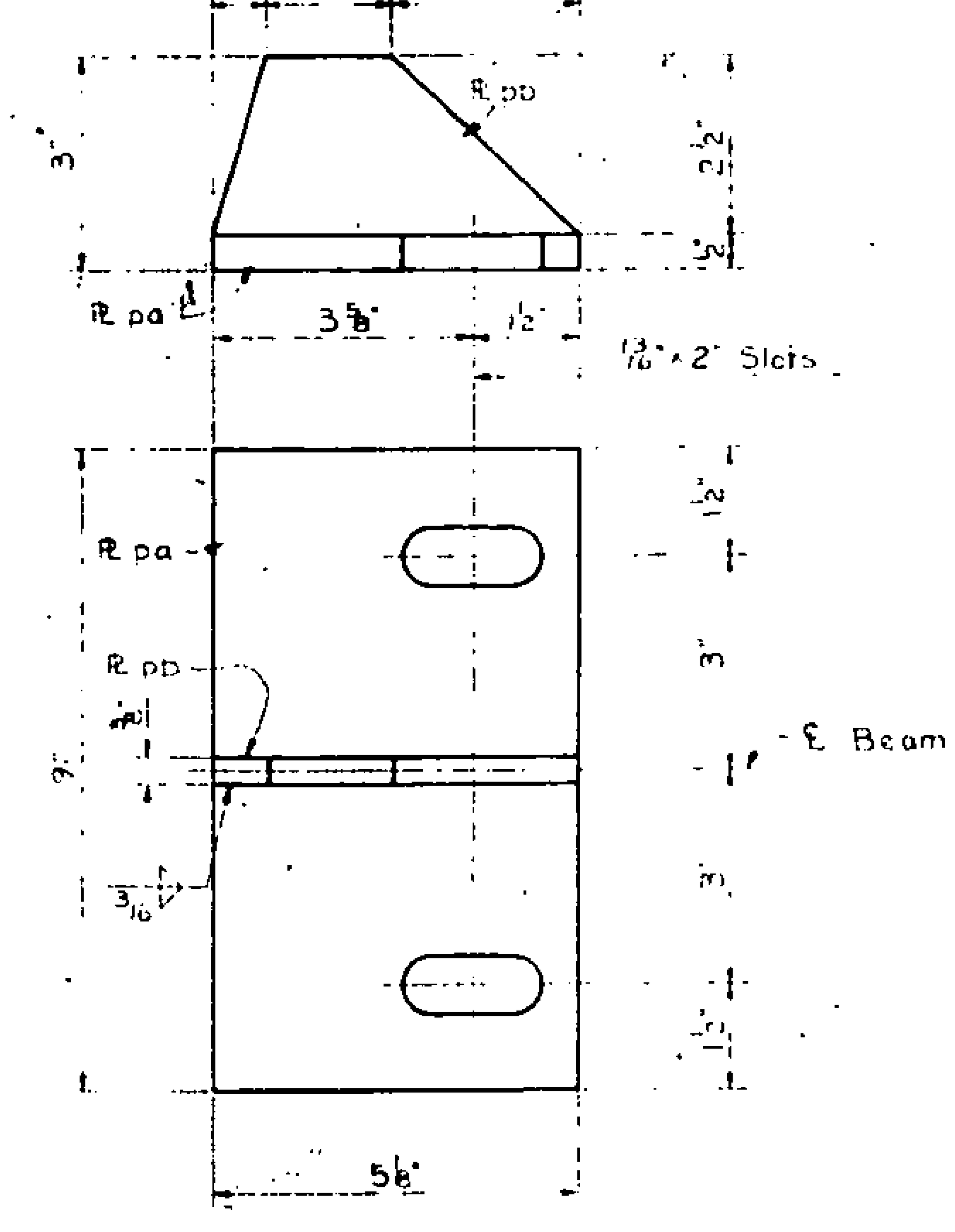
See sheet 1 of 2



NOTE: 1¼"ϕ holes to be located by contractor after Expansion Plates have been set so that the ℄ of Expansion Plate is directly above the ℄ of Cap. The contractor will be required to use a rotary type drill to core the holes. The joint in vertical face of Parapet to be perpendicular to the grade of the Bridge slab.

ALUMINUM EXPANSION JOINT

Showing Expansion Plate on ...



DETAIL OF ℞s pa & pb

One Assembly Required for each Girder.

GENERAL NOTES

1. Alloy for Extrusions, Plates and Straps to be 6061-T 6.
2. Filler material to be Alloy 5356.
3. The expansion joints shall be shop assembled as detailed with a normal 3" gap between extrusions B. The assembly shall be adequately braced and blocked to maintain correct alignment and spacing during shipment.
4. All aluminum surfaces in contact with concrete shall be protected with two coats of zinc cromate paint (one wash coat and one prime coat) and a finish coat of alkali-resistant bituminous paint.
5. The expansion joint shall be field set to the correct grade of roadway and parallel with the roadway grade.
6. Lubricate and seal the Aluminum Expansion Joint in the shop before shipment with alkali-resistant grease (Standard Oil Company, Calumet #10X or equal).
7. All contact surfaces for shop or field welding shall be milled to fit.
8. The Expansion Joint shall be fabricated to fit the roadway Cross Section.
9. Welding to be in accordance with the latest revised AWS Specifications.

#97

PROJECT NO. 8.2215302

CARTERET COUNTY

STATION 211 + 20

Sheet 2 of 2

STATE OF NORTH CAROLINA

STATE HIGHWAY COMMISSION

RALEIGH

EXPANSION PLATE

JULY, 1969

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

Drawn by Robert G. Gower date 7-29-1969
Checked by ... date ... 1969


NOTES
1. The elastomer portion of the elastomeric joint shall have the following physical properties determined by applicable A.S.T.M. tests
Property | A.S.T.M. TEST
Tensile Strength | D-412
Elongation @ Break | D-412
Hardness | D-676
Compression Set | D-395
22 hrs. @ 158°F | Method B
Low Temperature | D-746
Ozone Resistance | D-1149
Exposure to 100 pphm ozone for 70 hrs. @ 100°F Sample under 20% strain
Oil deterioration | D-471
Volume increase after immersion in A.S.T.M. oil #3 for 70 hrs. @ 212°F.
120% Max.
2. The joint will also have the following tolerances
Tolerances (@ 70°F)
Thickness
3. Joints shall be installed according to the procedures and recommendations of the manufacturer. Anchor slots to be plugged after installation. Completed (installed) assembly shall be water tight.
PLAN OF ROADWAY
℄ Joint
1'-10¾" Elastomeric Expansion Joint
9⅞"
9⅞"
℄ Bridge
B
B
1'-10¾"
1'-7⅞"
12"
6'-0"
℄ Anchor Bolts
A
A
PLAN OF ELASTOMERIC EXPANSION JOINT ASSEMBLY
1'-10¾"
9⅞"
9⅞"
℄ Joint
End of slab
TYPICAL SECTION SHOWING JOINT TROUGH SECTION B-B
34'-0"
45 Durometer Neoprene
TYPICAL SECTION SHOWING JOINT ASSEMBLY
℄ anchor bolts (TYP.)
1'-10¾"
1'-7⅞"
45 Durometer Neoprene
⅝" x 9" ℞
Seal
℄ anchor bolts
SECTION A-A
⅝" ⌀ anchor bolts
ANCHOR DETAIL
Anchor bolts to be galvanized
℄ Exp. Jt.
℄ ⅝" ⌀ anchor bolts
Roadway Surface
SECTION C-C
Polyurethane Based Sealant
PROJECT No. 8.2215302
CARTERET COUNTY
STATION: 21+20
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
ELASTOMERIC EXP. JT. DETAILS
MARCH
REVISIONS
NO. | BY | DATE
Oct. 1970

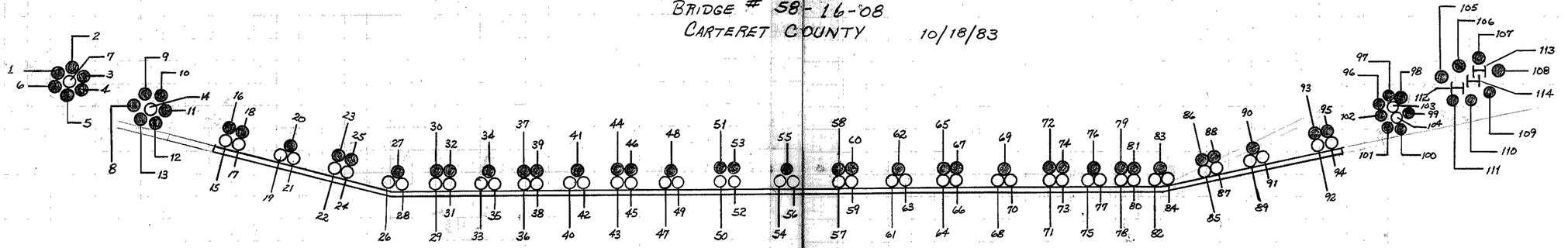
Fibi Bridge No. 6
Carteret County

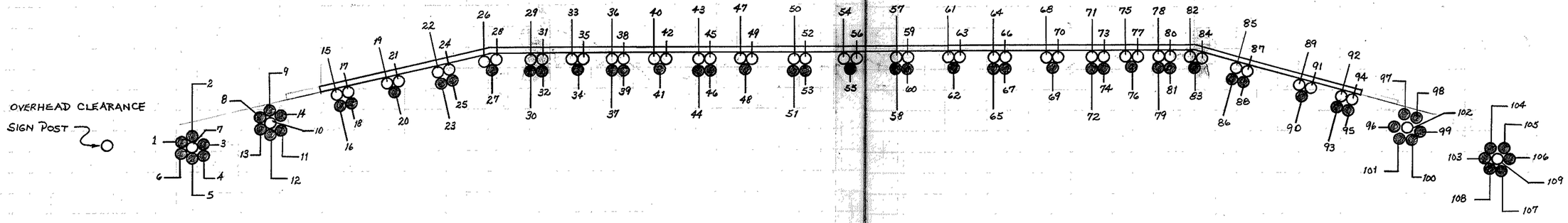
Greiner Eng

EXPANSION JOINT DETAILS

58-16-08
Bankert

BRIDGE # 58-16-08
CARTERET COUNTY 10/18/83





EMERALD ISLE HIGH RISE
FENDER SYSTEM

AVERAGE PILE SIZE → 15" ± ϕ

○ → VERTICAL OR FENDER PILE

● → BATTER PILE

N

prepared by:
D. A. Davis

FED. ROAD DIST.	STATE	STATE PROJ. REF. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
14	N.C.	8.2215302		52	

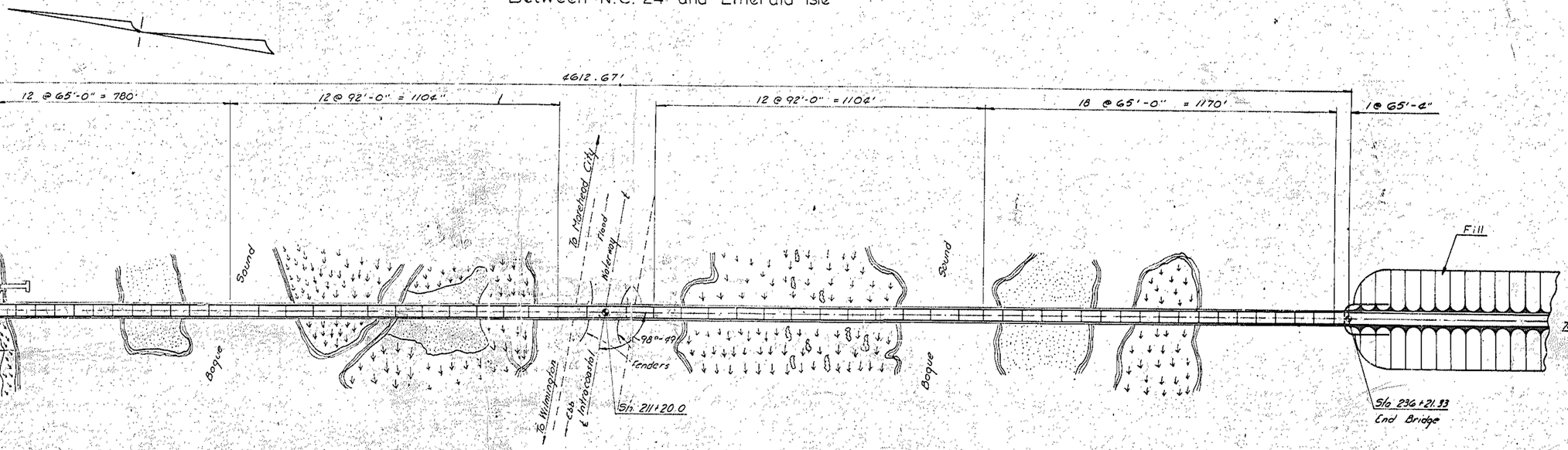
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
8.2215302	S-16 (4(2)	Const.

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION

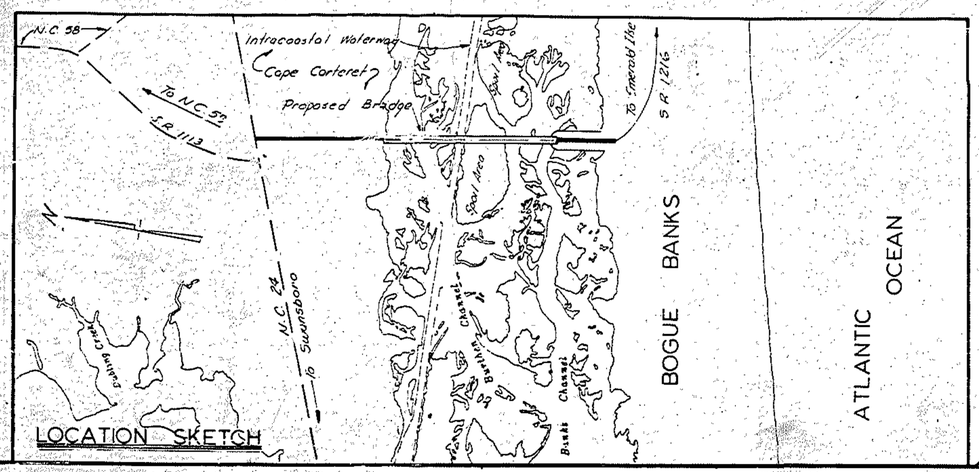
PLAN AND PROFILE OF PROPOSED STATE HIGHWAY

CARTERET COUNTY

Bridge over Intracoastal Waterway
Between N.C. 24 and Emerald Isle



PLAN



LOCATION SKETCH

Prepared in Office of
STATE HIGHWAY COMMISSION
RALEIGH, N. C.

Nearest Shipping Point - Newport

Surveyed by Bridge Location Dept.
Plans Compiled by Bridge Design Dept.
Date November 1968

REEL 953
POS 1

Br. No. 58+16-08

APPROVED:

ORIENTATION - 5 to N

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

APPROVED

DIVISION ENGINEER DAT

BUILT ACCORDING TO PLANS

FED. ROAD DIV. NO.	STATE	P
2	N. C.	8
F. A. PROJECT	S-16	

TOTAL BILL OF MATERIAL FOR SUPERSTRUCTURE, ONE INT. BENT, ONE END BENT & CONCRETE SHEET PILE BULKHEAD

	"Class "A" Concrete Cu. Yds	Class "AA" Concrete Cu. Yds	Concrete Handrail Lin. Ft.	45" Prestr. Conc. Girder Lin. Ft.	54" Prestr. Conc. Girder Lin. Ft.	Reinforcing Steel Lbs.	12"ø Prestr. Conc. Piles No.	12"ø Prestr. Conc. Piles Lin. Ft.	22" Oct. Prestr. Conc. Piles No.	22" Oct. Prestr. Conc. Piles Lin. Ft.	8"x24" Prestr. Conc. Sheet Piles No.	8"x24" Prestr. Conc. Sheet Piles Lin. Ft.	Method "D" Dampproofing Sq. Yds.	Linseed Oil Conc. Protection Gal.	Navigation Lighting System Lump Sum	Expansion Plates Lump Sum		
End Span 27 N		68.7				15,223												
Spans 26 N - 25 N - 24 N		197.7				52,109												
Spans 23 N - 22 N - 21 N		197.7				52,109												
Spans 20 N - 19 N - 18 N		197.7				52,109												
Spans 17 N - 16 N - 15 N		198.9				52,109												
Spans 14 N - 13 N - 12 N		273.9				76,714												
Spans 11 N - 10 N - 9 N		273.9				76,714												
Spans 8 N - 7 N - 6 N		275.3				76,714												
Spans 5 N - 4 N - 3 N		278.1				76,714												
Span 2 N		108.9				21,262												
Span 1		106.6				20,144												
Span 2 S		108.9				21,262												
Spans 3 S - 4 S - 5 S		278.1				76,714												
Spans 6 S - 7 S - 8 S		275.3				76,714												
Spans 9 S - 10 S - 11 S		273.9				76,714												
Spans 12 S - 13 S - 14 S		273.9				76,714												
Spans 15 S - 16 S - 17 S		198.9				52,109												
Spans 18 S - 19 S - 20 S		197.7				52,109												
Spans 21 S - 22 S - 23 S		197.7				52,109												
Spans 24 S - 25 S - 26 S		197.7				52,109												
Spans 27 S - 28 S - 29 S		198.5				52,109												
Spans 30 S - 31 S - 32 S		198.9				52,109												
End Span 33 S		68.7				15,223												
End Post Blocks		0.8				85 ✓												
Bent No 32 South	10.0 ✓					20701 ✓			7 ✓	350 ✓			71 ✓					
End Bent No 2	16.0 ✓					29231 ✓	11 ✓	~~495~~ 528	7 ✓	~~350~~			71 ✓					
Bulkhead	44.3 ✓					7383 ✓	31 ✓	930 ✓			190 ✓	4750 ✓	~~1404~~ 1366.4 ✓					
*Reinf. Steel (Sample Bars) ✓						338 ✓												
Totals	70.3 ✓	4,646.4 ✓	9,228.33 ✓	10,353.54 ✓	13,313.60 ✓	~~1,240,377~~ 1,240,715 ✓	42 ✓	~~1425~~ 1458 ✓	7 ✓	350 ✓	190 ✓	4750 ✓	~~1475~~ 1427.4 ✓	~~386~~ 385.41 385.50 ✓	Lump Sum ✓	~~20%~~ Lump Sum		

* See Str. Pay Record Book, Page 98

GENERAL NOTES

1. Assumed Live Load H.S. 15-44
2. For other Design Data and General Note see sheet S-N.
3. The contractor shall be required to maintain water traffic in a manner satisfactory to both the Engineer and the U.S. Coast Guard and in accordance with the Special Provisions.
4. For protection of material from salt water see Special Provisions.
5. Construction Elevations for setting the forms and screeds will be furnished to the Resident Engineer by the Bridge Design Dept. upon request before construction of deck is begun.
6. See Special Provisions for method of curing bridge deck and mixing and applying the linseed oil solution.
7. Piles for End Bent #2 to be driven through the roadway fill.
8. The contractor will be responsible for determining lengths of piles required for Bent 32-S and End Bent No. 2. See Special Provisions.
9. All 1½"ø x 18" anchor bolts and hex nuts are to be hot dipped galvanized after fabrication. Galvanizing shall be at a uniform rate of 2 oz. per sq. ft. of surface in accordance with A.S.T.M. specifications A-123. Anchor bolts, hex nuts, and galvanizing will not be paid for as a separate item; the entire cost of same to be included in the unit prices bid for the several pay items.
10. For sheet showing location of supports for utility lines see Sheet 9-39

Revision 2 To correct Reinforcing Steel Weight.
Revision 1 To correct Lin. Ft. of 54" Girders

BUILT ACCORDING TO PLANS

DRAWN BY Robert A. Gower DATE Feb. 1969
CHECKED BY [illegible] DATE Aug 1969

PROJECT NO. 8.2215301
CARTERET Co
STATION: 211+20

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
GENERAL NOTES AND TOTAL BILL OF MATERIAL
FEBRUARY, 1969

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	R.O.G.	11-20-69	3		
2	R.O.G.	4-2-70	4		

FED. ROAD DIV. NO.	STATE
3	N.C.
P. A. PROJECT	S-

PI Sta. 193+00
Elevation 12.00
600' Vert Curve
0.0% +4.0%

To N.C. 24.

STA 190+50

STA 190+08.67

SPAN 27N 26N 25N 24N 23N 22N 21N 20N 19N 18N 17N 16N

Natural Ground Line

0.0%

Maximum Storm Tide El. +6.8'

3@65'

Fix. Exp. Exp. Fix. Fix. Exp. Exp. Fix. Fix. Exp. Exp. Fix. Exp. Exp. Fix.

Mean Low Tide El. -0.5'

Mean High Tide El. +1.6

El. +8.4

El. +10.2

End Bent #1
See Enlarged Sketch

26N 25N 24N 23N 22N 21N 20N 19N 18N 17N 16N

El. -0.9 El. -0.7 El. -4.3 El. -5.9 El. -6.1 El. -6.8 El. -5.2 El. -4.6 El. -3.4 El. -1.9 El. -1.7 El. -0.4 El. -0.8 El. -0.9 El. -1.2 El. -3.3

SCALE 1"=30FT.

ELEVATION

Denotes Bent Nos. North & South

Natural Ground Line

1:6

Shaded Areas to be Excavated by the Structure Contractor 30' each side of ℄. See Spec. Provisions.

END BENT 1

℄ Beams 7'-6"

℄ Bridge & Roadway

65'-4"

Fill Face End Bent 1 Sta. 190+08.67

℄ Cap

10 SPANS @ 65' = 650'

PLAN

℄ Beams 7'-6"

26'-0"

℄ Cap

Total Length Fill Face To Fill Face = 4612'-8"

MATCH LINE STA. 197+50

16N SPAN 15N 14N 13N 12N 11N 10N 9N 8N

3@92'

3@65'

Fix. Exp. Exp. Fix. Fix. Exp. Exp. Fix. Fix. Exp. Exp. Fix.

Mean Low Tide El -0.5

Mean High Tide El +1.6

Maximum Storm Tide El +6.8

Elev Bot of Ftg. -3.0 (Typical)

MATCH LINE STA. 205+10

15N 14N 13N 12N 11N 10N 9N 8N 7N

El. -4.9 El. -5.9 El. -7.2 El. -7.9 El. -8.8 El. -7.8 El. -7.7 El. -6.3 El. -4.3 El. -0.9 El. +1.1 El. +1.0 El. +1.1 El. +1.0 El. -1.4 El. -0.9 El. 0.0 El. -0.2 El. -0.3

SCALE 1"=30'

ELEVATION

℄ Bridge & Roadway

℄ Beams 7'-6"

39'-0"

65'-0"

℄ Cap

℄ Cap

7 SPANS @ 92' = 644'

PLAN

℄ Beams 7'-6"

12'-6"

℄ Cap

Datum - Mean Sea Level

B.M. #8 - 1 Nail in base of 15" pine 66' Lt. of Sta. 187+70. Elev. 13.24

B.M. #7 - 1 Nail in base of 20" pine 56' Lt. of Sta 177+77. Elev. 27.48

B.M. #6 - 1 Nail in base of 10" pine 54' Rt. of Sta 169+45. Elev. 25.13

Note: For sheet showing location of Supports for Utility lines see Sheet S-39

BUILT ACCORDING TO PLANS

DRAWN BY D.L. WALL DATE OCT. 68
CHECKED BY J.T. Pardue DATE Oct 1968

PROJECT NO. 8.2215302
CARTERET COUNTY

STATION: 211+20 -L-

Sheet 1 of 3

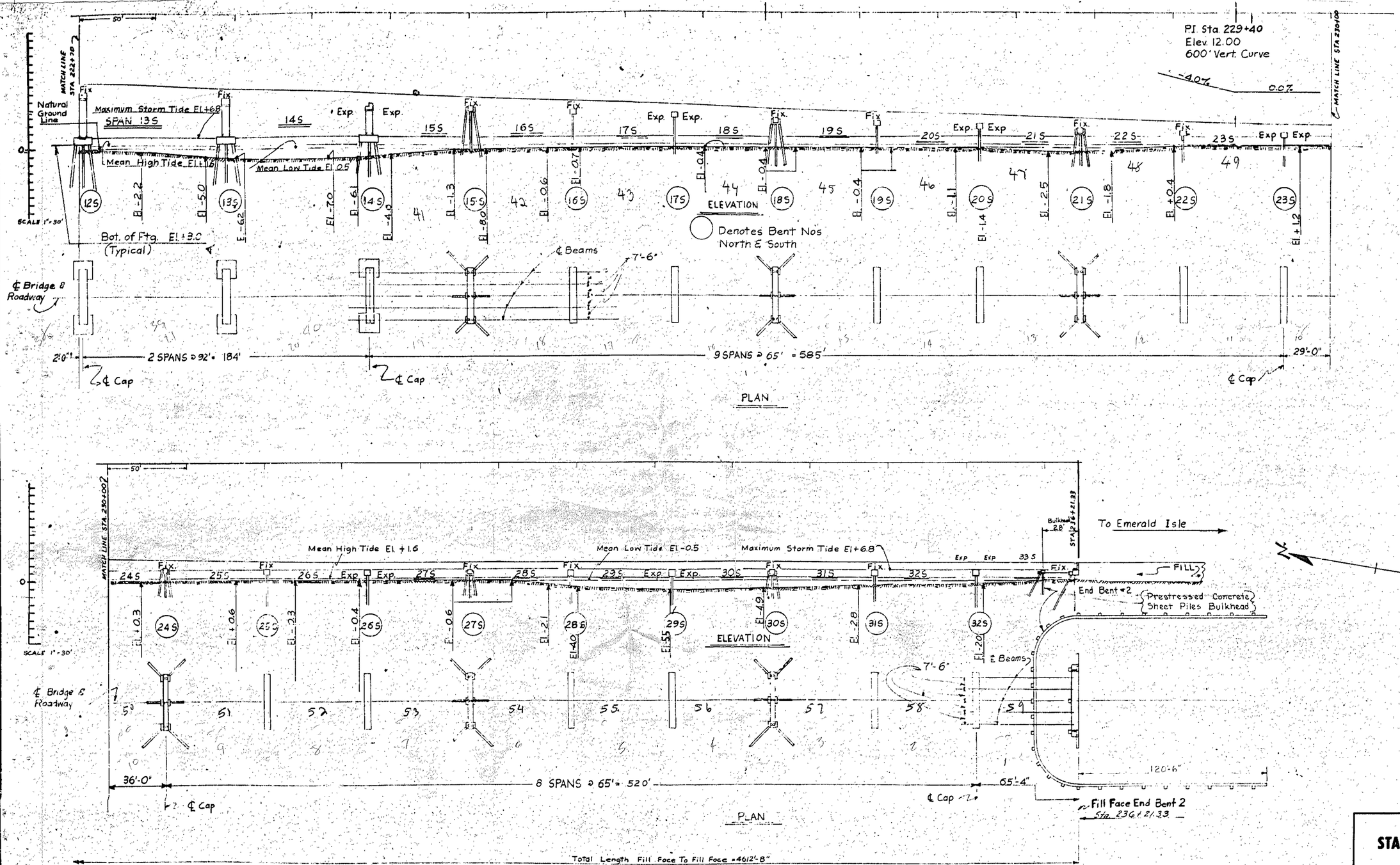
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER INTRACCASTAL WATERWAY BETWEEN N.C. 24 AND EMERALD ISLE

OCT 1968

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			
2			4			

SPAN 7N
6N
5N
4N
3N
2N
-1-
2S
3S
Fix.
Exp.
Exp
Maximum Storm Tide El +6.8
Mean Low Tide El -0.5
Mean High Tide El +1.6
P.I. Sta 211+20
Elev. 84.8
1200' Vert Curve
65' Vert. Clearance
Top of Ftg. El. -10.75
El +7.25
Natural Ground Line
ELEVATION
Denotes Bent Nos. North & South
Top of Seal El. -15.0
Bottom of Seal El -21.0
El -4.3
El -10.3
Bottom of Ftg. El+3.0 (Typical)
Sta 211+20
℄ Bridge
℄ Channel
7 Pile Cluster (See Fender Detail)
℄ Beams
7'-6"
90' Clearance
Fenders
80'-0"
4 SPANS @ 92' = 368'
96'-0"
66'-0"
68'-0"
℄ Cap
PLAN
SPAN 4S
5S
6S
7S
8S
9S
10S
11S
12S
Maximum Storm Tide El +6.8'
Mean High Tide El +1.6
Bottom of Ftg. El+3.0 (Typical)
24'-0"
8 SPANS @ 92' = 736'
90'-0"
MATCH LINE STA 205+00
MATCH LINE STA 213+50
MATCH LINE STA 222+00
Note: For sheet showing location of supports for utility lines see Sheet S-39
PROJECT No 8.2215302
CARTERET COUNTY
STATION: 211+20 -L-
Sheet 2 of 3
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
GENERAL DRAWING
FOR BRIDGE OVER INTRACOASTAL WATERWAY BETWEEN
N.C. 24 AND EMERALD ISLE
OCT. 1968
REVISIONS
NO. BY DATE NO. BY DATE
SHEET NO.
TOTAL SHEETS
35
BUILT ACCORDING TO PLANS
DATE OCT. 1968



DRAWN BY: [illegible] DATE: [illegible]
CHECKED BY: [illegible] DATE: Oct 1968

Note: For sheet showing location of supports for utility lines, see sheet S-39

BUILT ACCORDING TO PLANS

PROJECT NO. 8.22153
CARTERET Co.
STATION: 211+20 -L-
Sheet 3 of 3

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER INTRACOASTAL WATERWAY BETWEEN N.C. 24 AND EMERALD ISLE
OCT. 1968

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

Note: When "b" bars in the top portion of slab are: #4 - use 1½" high UHBB; #6 - use 1¾" high UHBB; or #5 - use 1" high UHBB
No Drains Req'd for Spans 27N & 33S
HALF END ELEVATION
END POST & RAIL SECTION
PARAPET & RAIL SECTION
Note: See Rail Sheet for reinforcing steel in Posts & Rails.
No support req'd for these bars
3" × 1" Groove
Aluminum Expansion Plate See Expansion Plate sheet
DETAIL "AA"
(Showing Joint in Parapet)
DETAIL "A"
#6 f1 bars may be shifted to clear name plate.
12" high UHBB @ 3'-0" max. cts.
Chamfer
SECTION B-B
At Bent 26N or 32S
POST DETAIL
(Taken at base of posts)
** Clear dimensions on small posts are to e1 bars.
#6 f1 bars may be field bent or moved down to clear name plate.
Detail "A"
Detail "AA"
Linseed Oil Application
SKETCH SHOWING AREA OF LINSEED OIL APPLICATION
Note: See Special Provisions for method of curing bridge deck and mixing and applying the linseed oil solution.
BUILT ACCORDING TO PLANS
NOTES
Assumed live load HS15-44
Temporary struts shall be placed between the outermost girders adjacent to the diaphragms and the nuts on the 1¼" tie rods shall be tightened before the diaphragms are cast. Struts shall remain in place 3 days after concrete is poured. The tie rods shall be retightened after the struts have been removed.
DETAIL "B"
Open Joint

PROJECT No. 8.2215302

CARTERET COUNTY

STATION: 211 + 20

65' Spans 27N & 33S

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

STANDARD TYPICAL SECTIONS
34' ROADWAY ~ 90° SKEW
5-45" PRESTR. CONC. GIRDERS
CONC. POST & RAIL

Aug. 1966

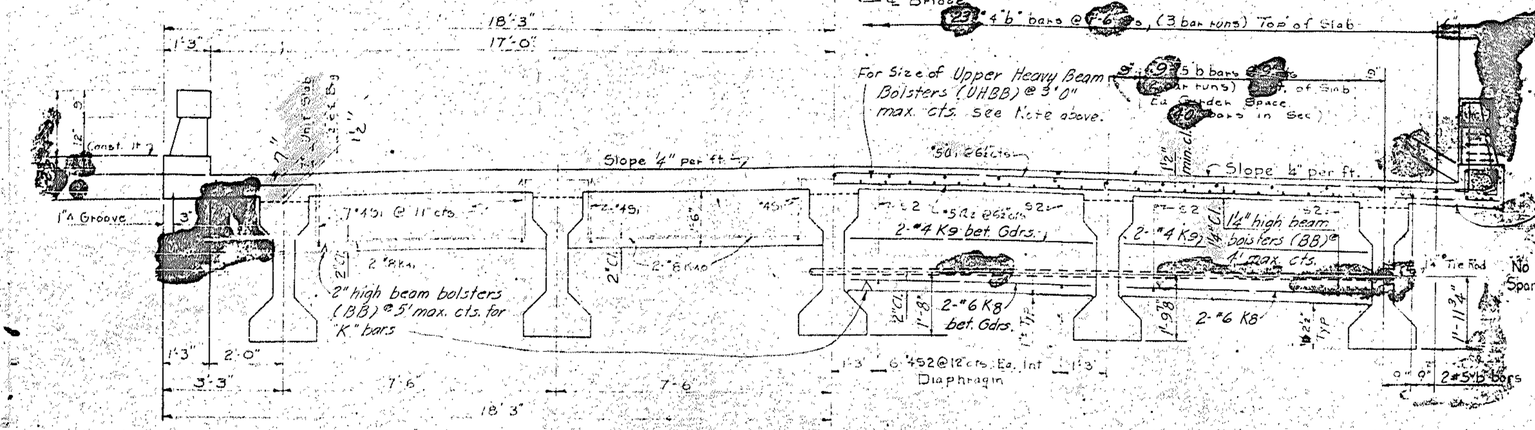
37

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

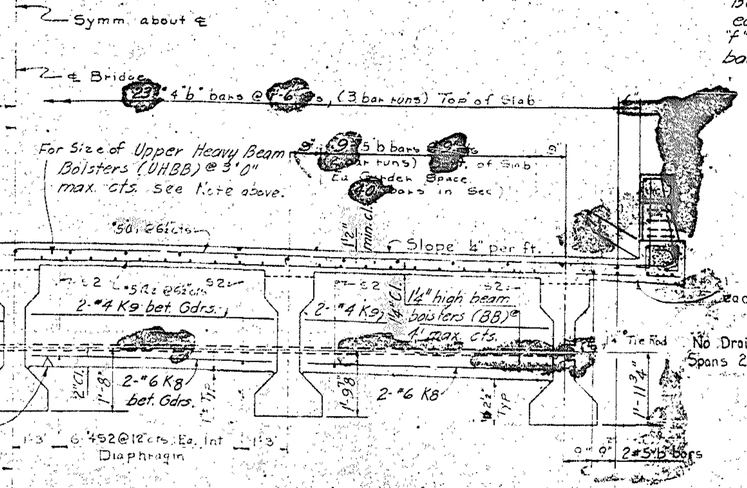
SHEET NO. S-6

TOTAL SHEETS

Note: When "b" bars in the top portion of slab are: #4 - use 1½" high UHBB; #6 - use 1¼" high UHBB; or #8 - use 1" high UHBB



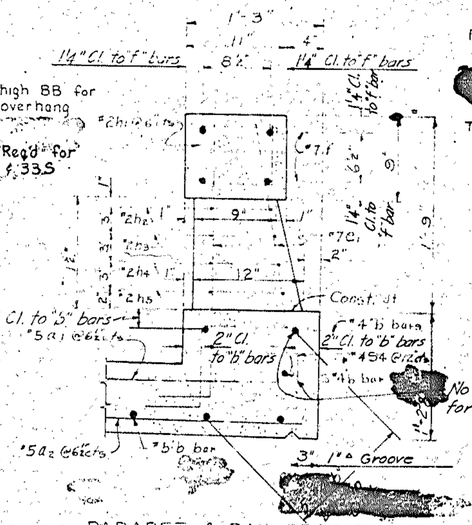
HALF SECTION ~ BENT DIAPHRAGM



HALF SECTION ~ INTERMEDIATE DIAPHRAGM

Provide one - 1¼" high Beam Bolster (BB) at mid-point of each post spacing to support "f" bars - also tie "f" bars to "e" bars for support.

DRAIN DETAIL



PARAPET & RAIL SECTION

Note: See Rail Sheet for reinforcing steel in Posts & Rails.

NOTES

Assumed Live Load HS15

Concrete in Compression 1100 Lbs

Reinforcing Steel in Tension 20000 Lbs

For other Design Data see Sheet ... General Notes

For bars in ... see ... bar mark ... different

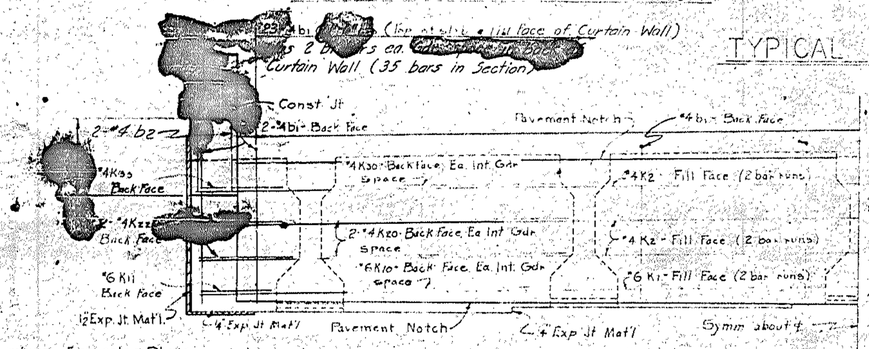
Temporary Struts shall be placed between prestressed girders adjacent to the diaphragms and the nuts on the 1¼" rods shall be tightened before the deck slab are cast. Struts shall remain in place 7 days after concrete is placed. The rods shall be retightened after the struts have been removed.

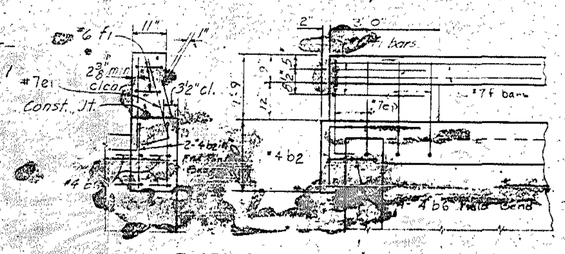
109# EACH POST

103# LF/RAIL

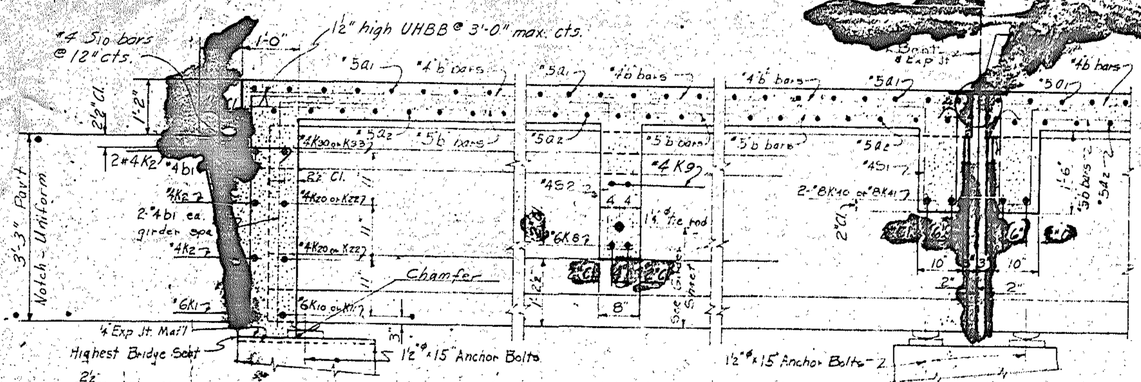
No support req'd for these bars

TYPICAL SECTION

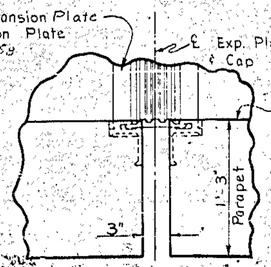




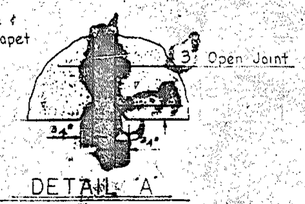
END POST & BASE SECTION



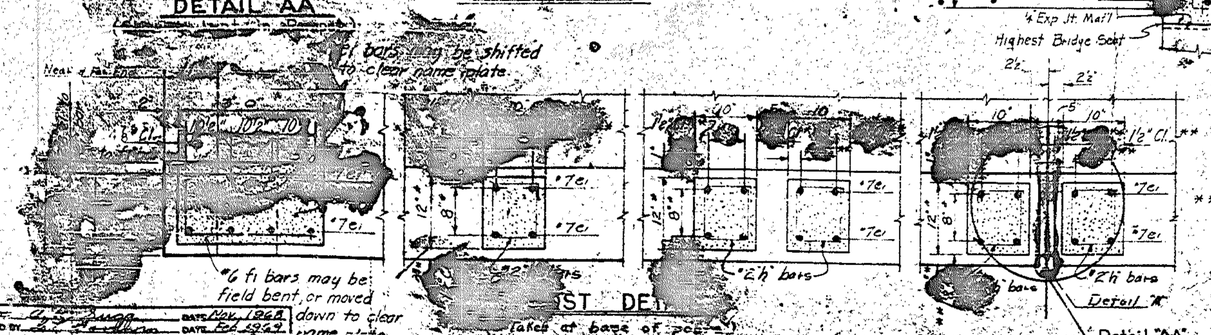
HALF END ELEVATION



DETAIL "AA"



DETAIL "A"



"6 f1 bars may be field bent, or moved down to clear name plate.

** Clear dimensions on small posts are to e1 bars.

SECTION A-A

SECTION D-D

SECTION B-B

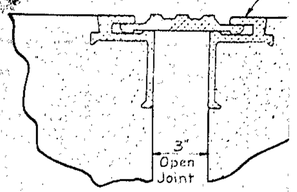
At Bent 26N or 32S

Linseed Oil Application

SKETCH SHOWING AREA OF LINSEED OIL APPLICATION

Note: See Special Provisions for method of curing bridge deck and mixing and applying the linseed oil solution.

Aluminum Expansion Plate See Expansion Plate sheet 57 & 58



DETAIL "B"

FED. ROAD DIV. NO.	STATE	P.
3	N.C.	8.
F. A. PROJECT	5-16	

PROJECT No. 8.22153

CARTERET Cou

STATION: 211 + 20

65' Spans 27-N & 33-S

STATE OF NORTH CAROLINA

STATE HIGHWAY COMMISSIO

RALEIGH

STANDARD TYPICAL SECTIO

34' ROADWAY ~ 90° SKEW

5-45' PRESTR. CONC GIRDE

CONC. POST & RAIL

Aug. 1966

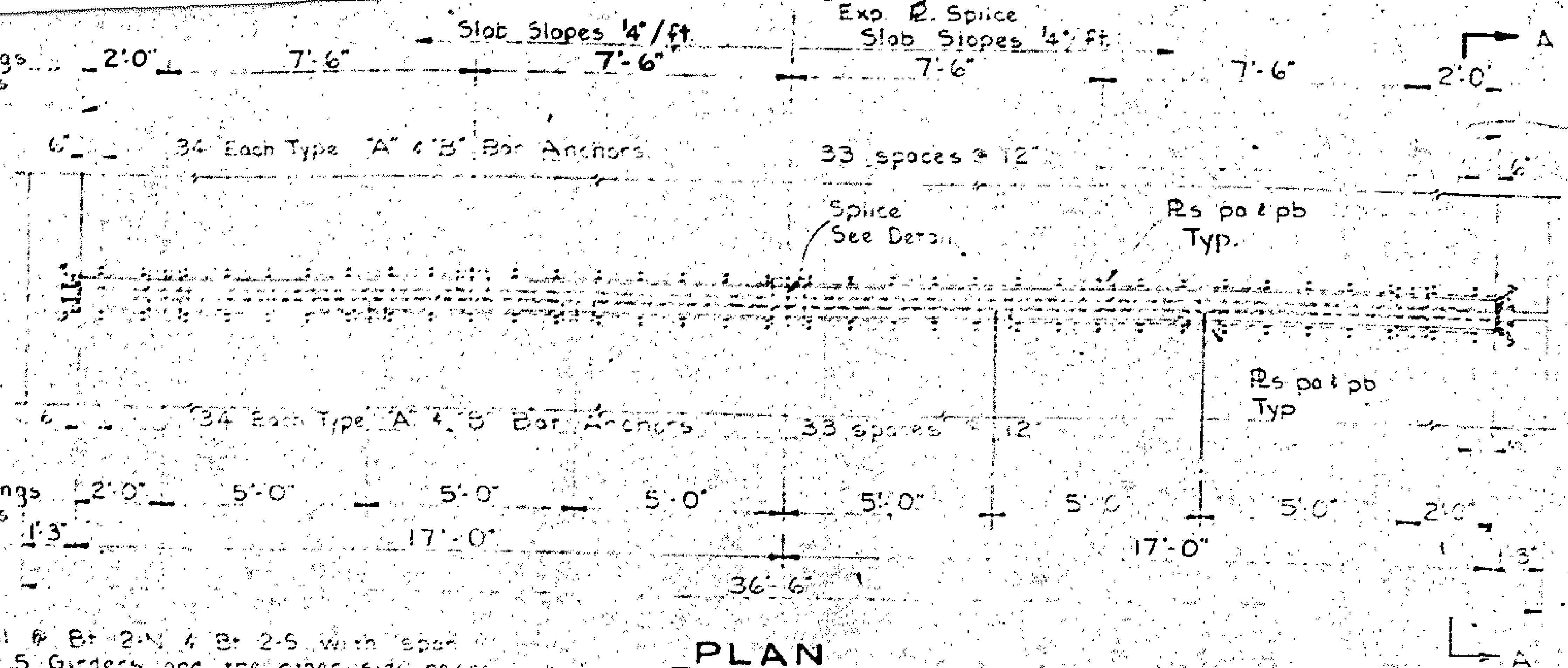
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

DRAWN BY: [illegible] DATE: Nov. 1964

CHECKED BY: [illegible] DATE: Feb. 1965

BUILT ACCORDING TO PLANS

NOTE
Spans 1, 2-N & 2-S have 7 Girders each. All other spans have 5 Girders each.

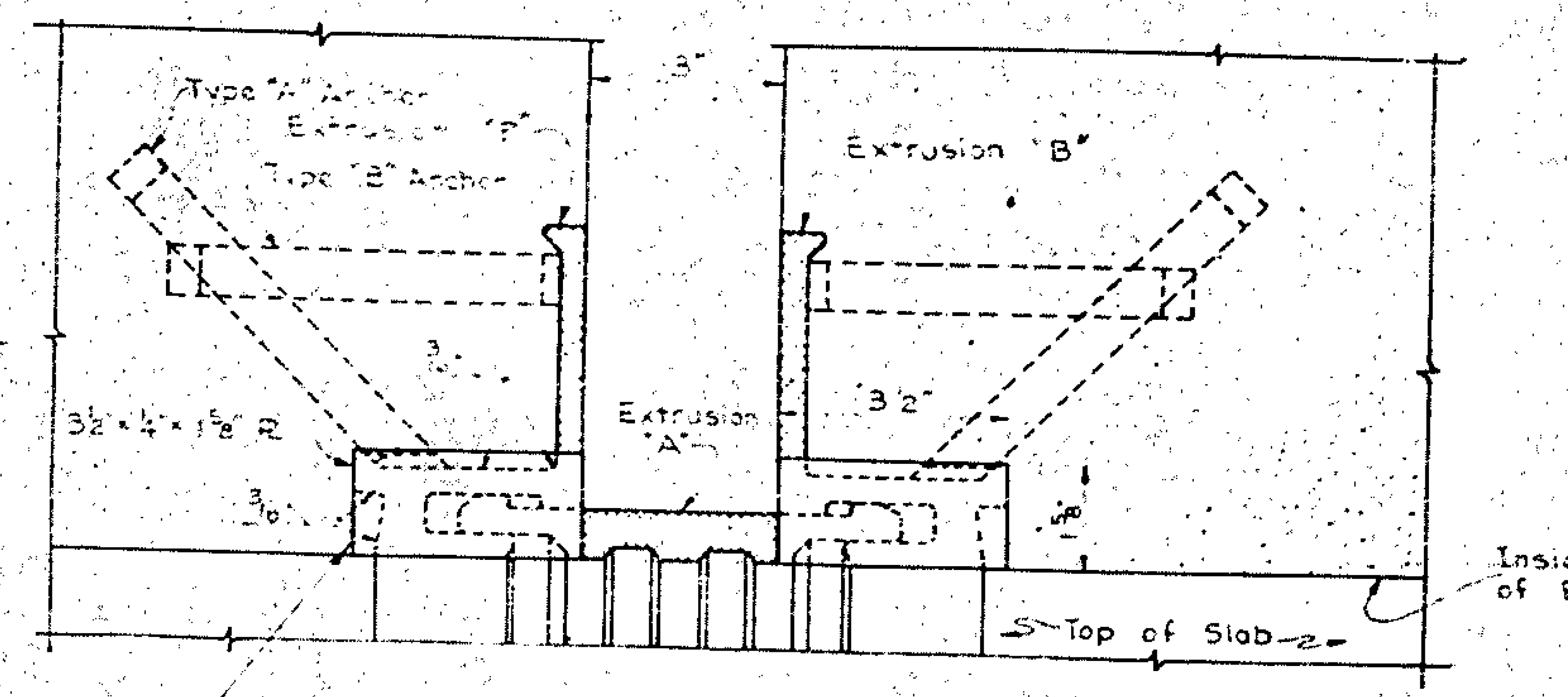


PLAN
(See Note at Left)

NOTE: PLAN typical @ Bt 2-N & Bt 2-S with span on one side having 5 Girders and the other side having 7 Girders (2 required). All other Expansion Plates are located between spans having 5 Girders each (18 required). Total Aluminum Expansion Plates required 20.

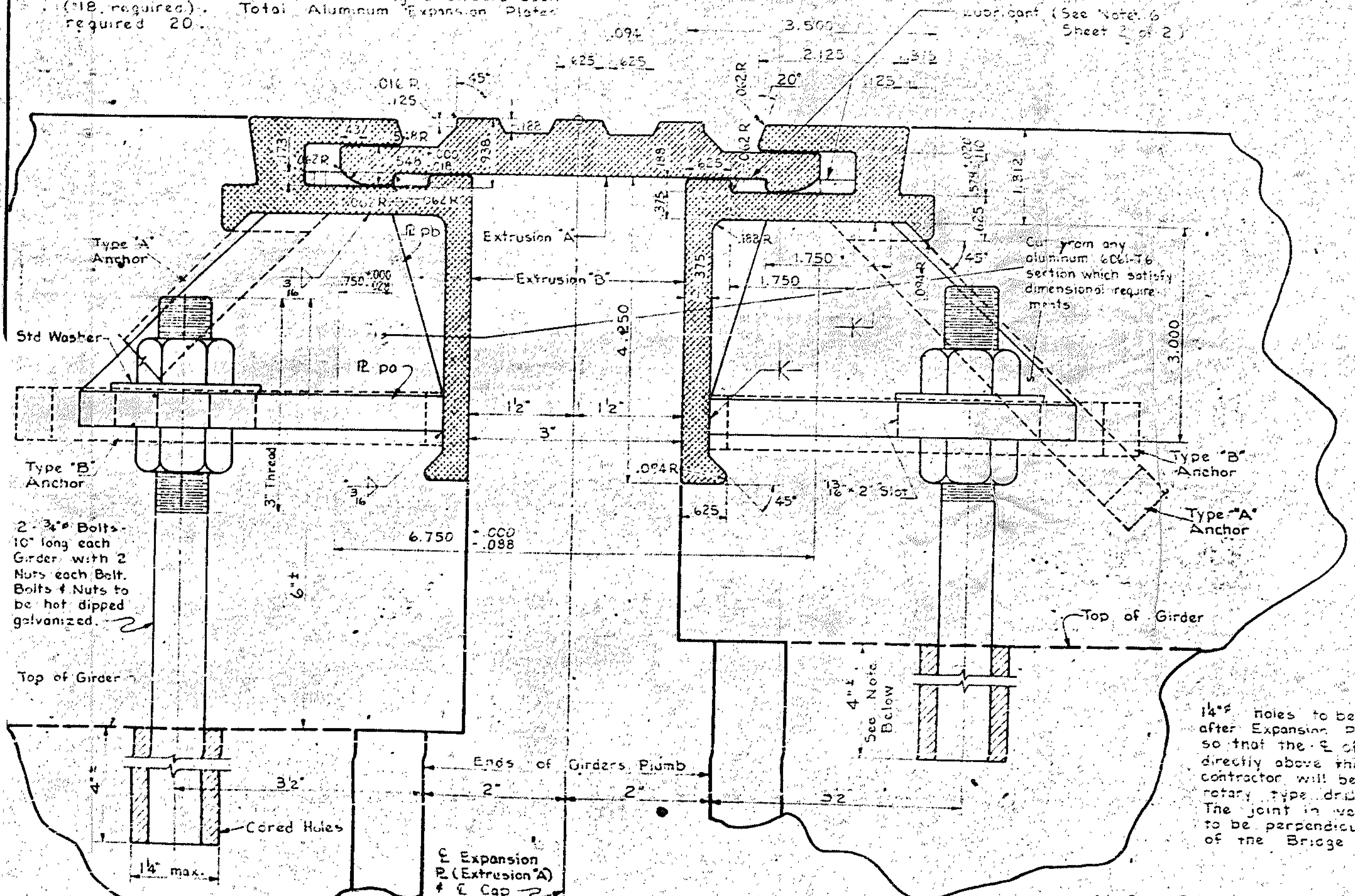
Slab and Parapet steel shall be bent as shown so there will be no contact with Aluminum Expansion Joint.

Tie bars in Rail Post may be shifted to clear Aluminum Expansion Joint or Anchors in Parapet.



SECTION C-C

Aluminum Closure Plate 3 1/2" x 4" x 1 5/8" welded to end of Extrusion "B" in vertical Parapet Section as shown.



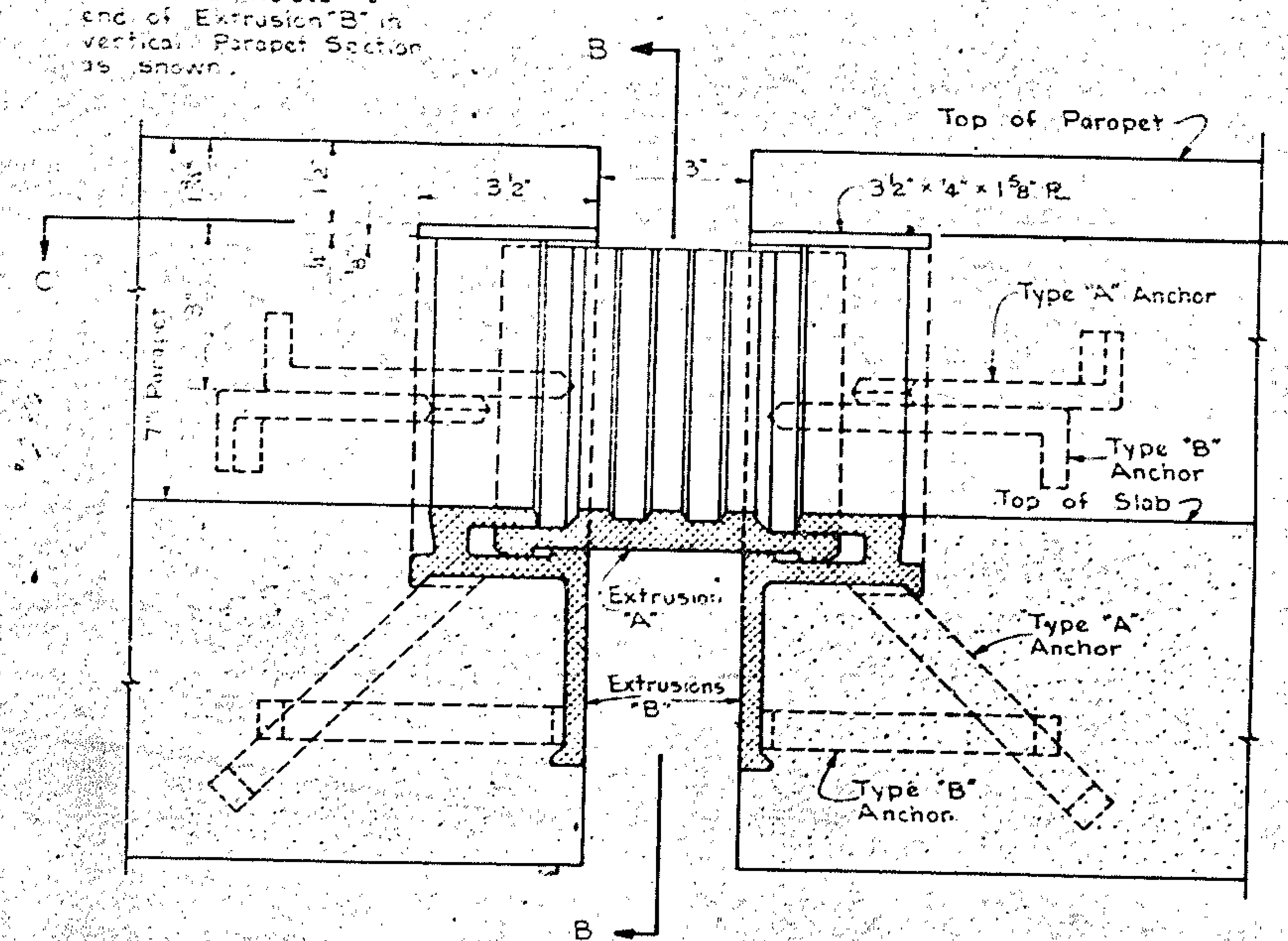
1 1/4"φ max. cored hole (2 each Girder) in top of Girder field located by contractor after Girders are in-place. Grout with Epoxy.

1 1/4"φ holes to be located by contractor after Expansion Plates have been set so that the ℄ of Expansion Plate is directly above the ℄ of Cap. The contractor will be required to use a rotary type drill to core the holes. The joint in vertical face of Parapet to be perpendicular to the grade of the Bridge slab.

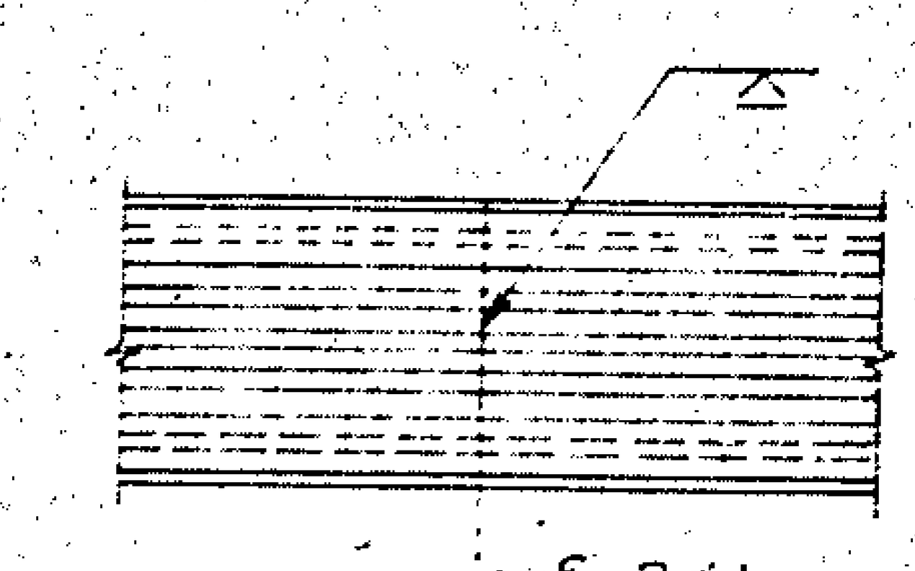
At Span 2-N side of Bent 2-N, and at Span 2-S side of Bent 2-S core holes in ends of Girders 5" deep due to only 3/16" build-up.

ALUMINUM EXPANSION JOINT

Showing Plates on 0% Grade



SECTION A-A



PLAN OF SPLICE

FED. ROAD DIV. NO.	STATE	
3	N.C.	82
F. A. PROJECT	S-16	

PROJECT No. 8.2215302
CARTERET COUNTY
STATION: 211 + 20
Sheet 1 of 2

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

EXPANSION PLATE

JULY, 1969

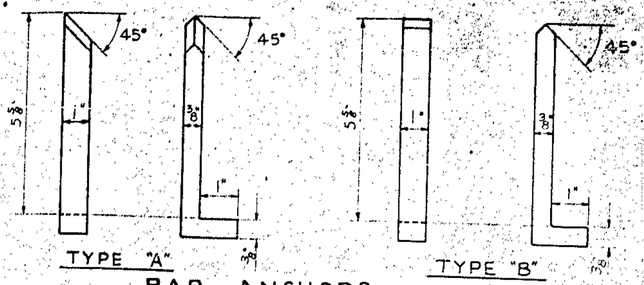
DRAWN BY Robert G. Gower DATE July 1969
CHECKED BY DATE

BUILT ACCORDING TO PLANS

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. S-7
TOTAL SHEETS 41

FED. ROAD DIV. NO.	STATE
8	N.C.
F. A. PROJECT	5-16



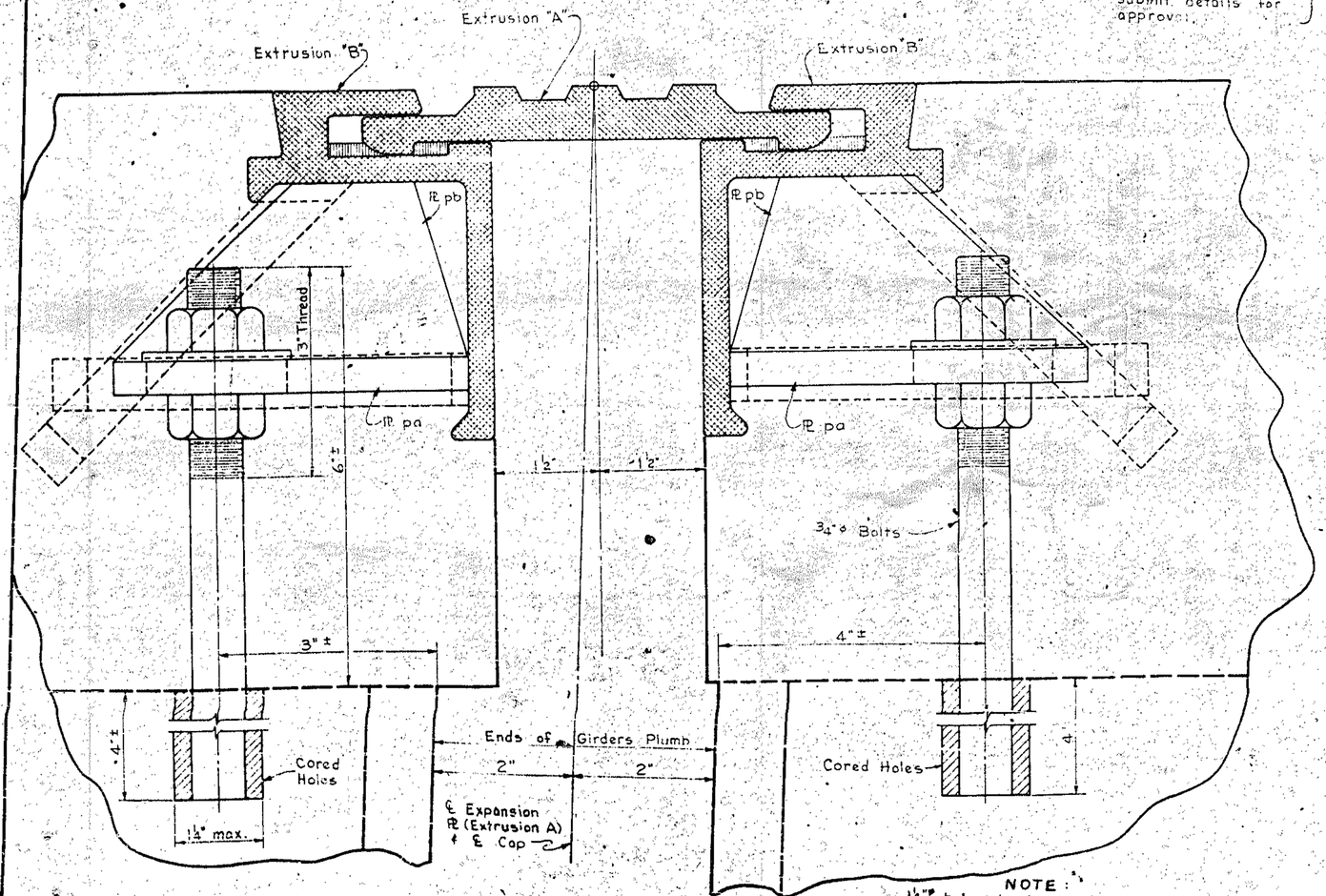
BAR ANCHORS

Aluminum Expansion Plates required at

Bent	26-N	Bent	2-S
Bent	23-N	Bent	5-S
Bent	20-N	Bent	8-S
Bent	17-N	Bent	11-S
Bent	14-N	Bent	14-S
Bent	11-N	Bent	17-S
Bent	8-N	Bent	20-S
Bent	5-N	Bent	23-S
Bent	2-N	Bent	26-S
		Bent	29-S
		Bent	32-S

Total Expansion Plates required 20

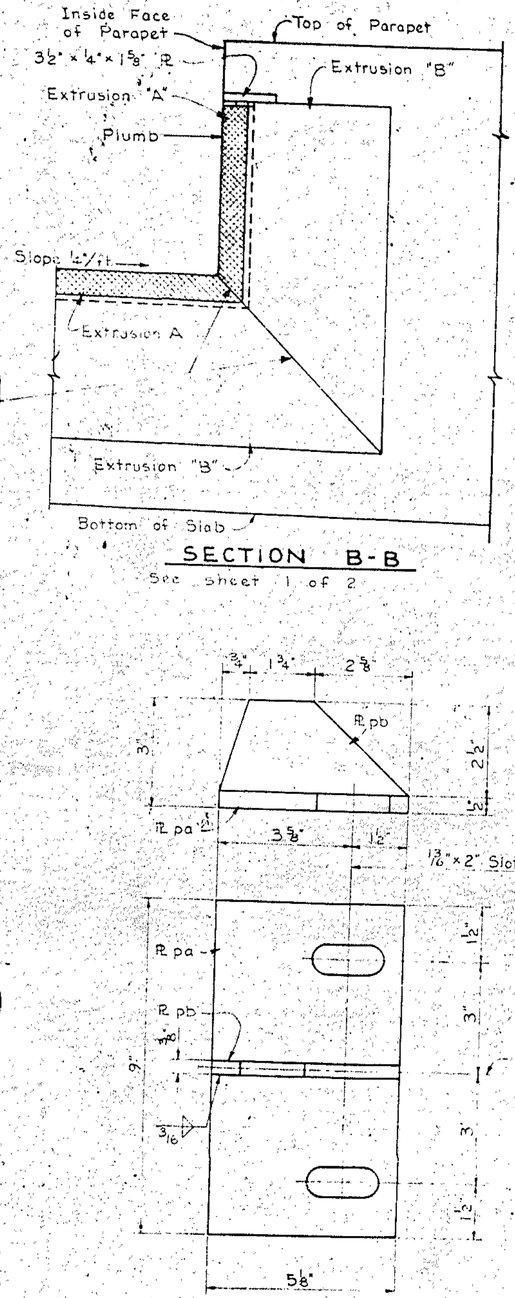
For dimensions of Extrusions "A" & "B" see Sheet 1 of 2.



ALUMINUM EXPANSION JOINT

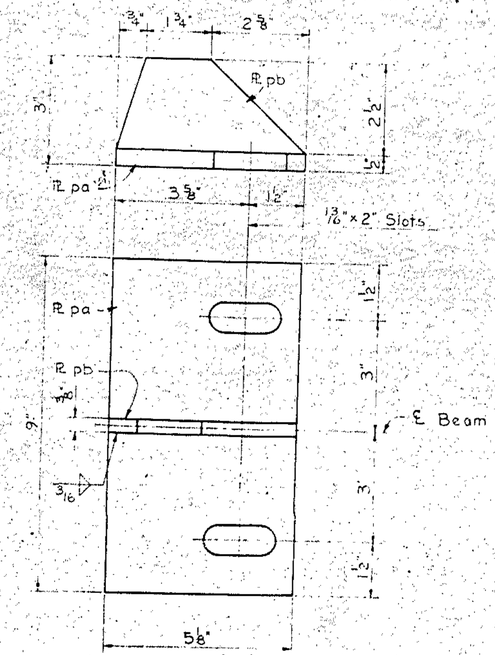
Showing Expansion Plate on Grade

Shop Weld: Splice Fabricator required to submit details for approval.



SECTION B-B

See sheet 1 of 2



DETAIL OF ℄s pa & pb

One Assembly Required for each Girder.

NOTE:

¼" holes to be located by contractor after Expansion Plates have been set so that the ℄ of Expansion Plate is directly above the ℄ of Cap. The contractor will be required to use a rotary type drill to core the holes. The joint in vertical face of Parapet to be perpendicular to the grade of the Bridge slab.

GENERAL NOTES

1. Alloy for Extrusions, Plates and Straps to be 6061-T 6.
2. Filler material to be Alloy 5356.
3. The expansion joints shall be shop assemb detailed with a normal 3" gap between extru The assembly shall be adequately braced and to maintain correct alignment and spacing during s
4. All aluminum surfaces in contact with concrete protected with two coats of zinc cromate paint wash coat and one prime coat) and a finish co alkaliresistant bituminous paint.
5. The expansion joint shall be field set to the grade of roadway and parallel with the roadway
6. Lubricate and seal the Aluminum Expansion in the shop before shipment with alkali-re grease (Standard Oil Company, Calumet #10X or
7. All contact surfaces for shop or field welding be milled to fit.
8. The Expansion Joint shall be fabricated to the roadway Cross Section.
9. Welding to be in accordance with the late revised AWS Specifications.

DRAWN BY Robert G. Gower DATE 7-29-1969
CHECKED BY DATE

BUILT ACCORDING TO PLANS

PROJECT NO. 8.221536
CARTERET COUN
STATION: 211+20
Sheet 2 of 2

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

EXPANSION PLATE

JULY, 1969

REVISIONS						SHE NO.
NO.	BY	DATE	NO.	BY	DATE	5
1			3			TOT SHE
2			4			4

F.A. Proj # S-16 64(2

NOTES

1. The elastomer [illegible] of the [illegible] expan[illegible] [illegible] properties as [illegible]

		Requirem
Tensile strength	D-412	1,800 psi
Elongation @ break	[illegible]	400% Mi
Hardness	[illegible]	55±5 pts
Compression set	[illegible]	[illegible]
22 hrs. @ [illegible] F	[illegible]	[illegible] Max
Low temperature	[illegible]	Not brittle
Ozone resistance	[illegible]	no cracks
Oil [illegible]	[illegible]	[illegible] Max

2. [illegible] procedures [illegible] manufacturer [illegible] in [illegible] to water tight

BUILT ACCORDING TO PLANS

DRAWN BY B.V. Bennett DATE Oct. '70
CHECKED BY DATE Oct. 1970

PROJECT No. 8.2215302

CARTERET COU

STATION: 211+20

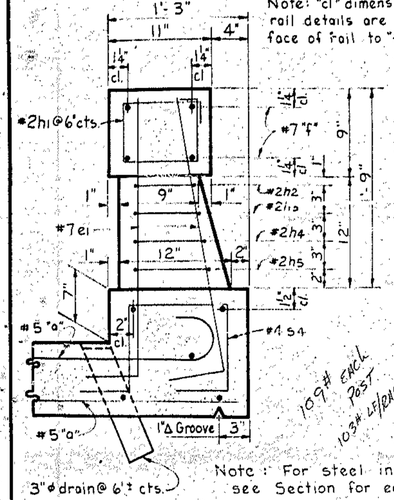
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSIO
RALEIGH
ELASTOMERIC EXP
DETAILS

197

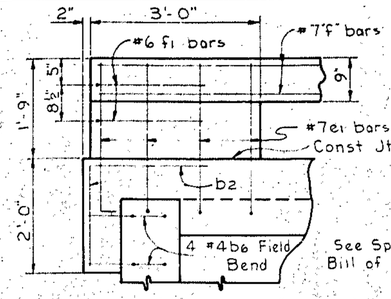
REVISIONS					
NO	BY	DATE	NO	BY	DATE
1			3		
2			4		

FED. ROAD DIV. NO.	STATE
3	N. C.
F. A. PROJECT	S-1

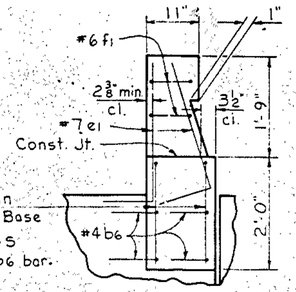
Provide - one 1¼ high beam bolster (BB) at midpoint of each post spacing to support "f" bars. Also tie "e" bars to "f" bars for support.



Note: "cl" dimensions in rail details are from face of rail to "f" bar.



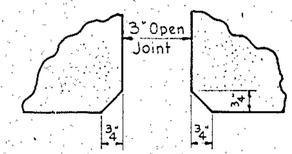
See Span 27-N & 33-S Bill of Material for b6 bar.



2 #4 b2 in End Post Base

Note: e1 bars may be shifted to clear name plate and f1 bars may be field bent or lowered to clear name plate.

** Note: Reinforcing Steel to be hot dipped galvanized after fabrication. Galvanizing shall be at a uniform rate of 2 oz. per sq ft. of surface in accordance with ASTM Specification A 123. Galvanizing will not be paid for as a separate item: the entire cost of same to be included in the unit price bid for Lin. Ft. of Concrete Handrail.



DETAIL "A"

BILL OF MATERIAL
FOR ONE END SPAN 2 REQ'D

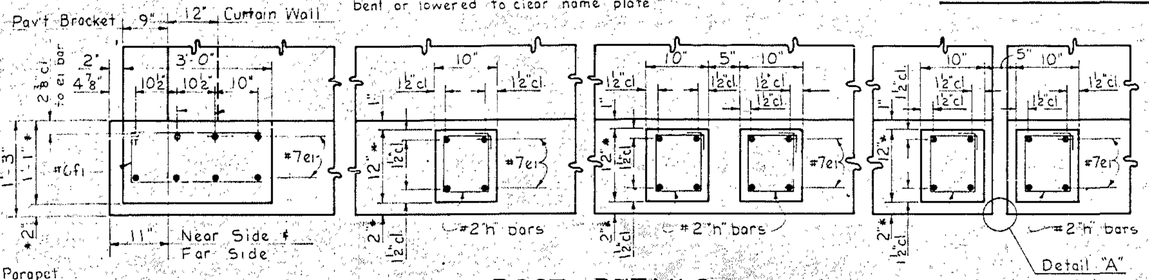
BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
e1	104	#7	1	3'-6"	744
f1	4	#6	2	5'-8"	34
f2	8	#7	Str.	17'-6"	286
f3	24	#7	Str.	15'-6"	760
h1	264	#2	3	3'-3"	143
h2	22	#2	3	2'-11"	11
h3	22	#2	3	3'-1"	11
h4	22	#2	3	3'-2"	12
h5	22	#2	3	3'-4"	12
Reinforcing Steel Lbs.				**	2,013
Class "AA" Concrete Cu. Yds.					4.1

BILL OF MATERIAL
FOR ONE 65' SPAN 30 REQ'D

BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
e1	96	#7	1	3'-6"	687
f4	32	#7	Str	15'-9"	1,030
h1	260	#2	3	3'-3"	141
h2	24	#2	3	2'-11"	12
h3	24	#2	3	3'-1"	12
h4	24	#2	3	3'-2"	13
h5	24	#2	3	3'-4"	13
Reinforcing Steel Lbs				**	1,908
Class "AA" Concrete Cu. Yds.					3.9

BILL OF MATE
FOR ONE 92' SPAN 24

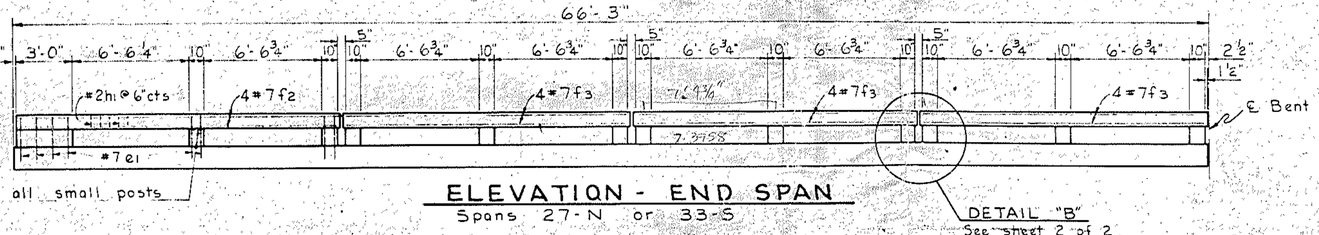
BAR	NO	SIZE	TYPE	LENG
e1	120	#7	1	3'-
f5	40	#7	Str.	17'-
h1	368	#2	3	3'-
h2	30	#2	3	2'-
h3	30	#2	3	3'-
h4	30	#2	3	3'-
h5	30	#2	3	3'-
Reinforcing Steel Lbs.				
Class "AA" Concrete Cu. Y				



POST DETAILS

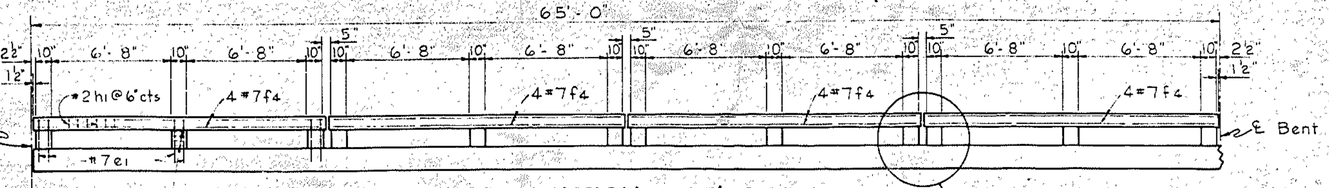
* Taken at Base of Posts

Clear dimensions on small posts are to e1 bars.



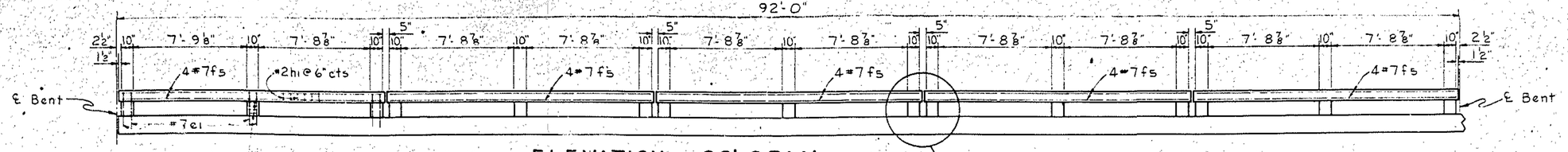
ELEVATION - END SPAN

Spans 27-N or 33-S



ELEVATION - 65' SPAN

Spans 26-N thru 15-N and 15-S thru 32-S

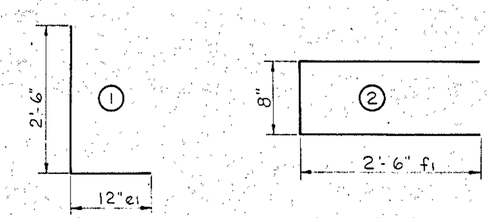


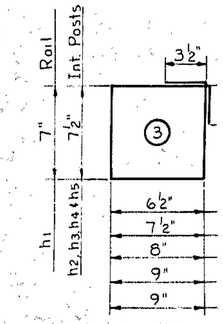
ELEVATION - 92' SPAN

Spans 14-N thru 3-N and 3-S thru 14-S

BAR DETAILS

All bar dimensions are out to out.





TOTAL BILL OF MATERIAL FOR HANDRAIL

Type Span	No. Spans	Reinf. Steel Lbs. 1-Span	Reinf. Steel Lbs. Total	Class "AA" Conc. Cu. Yds. 1-Span	Class "AA" Conc. Cu. Yds. Total
End Span	2	2,013	4,026	4.1	8.2
65'-Span	30	1,908	57,240	3.9	117.0
92'-Span	24	2,579	61,896	5.5	132.0
96'-Span plus 13'-Cantilever	2	2,962	5,924	6.4	12.8
106'-Drop-In Span	1	3,067	3,067	6.5	6.5
Totals	59		132,153		276.5
Total Concrete Handrail		*** Lin. Ft.		9,228.33	

*** Length of handrail is measured continuous from end to end of rail without deductions for spaces between rail sections. See Special Provisions.

PROJECT NO. 8.2215

CARTERET Co

STATION: 211+20

SHEET 1 OF 2

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSI
RALEIGH

RAIL POST SPACIN
& DETAILS

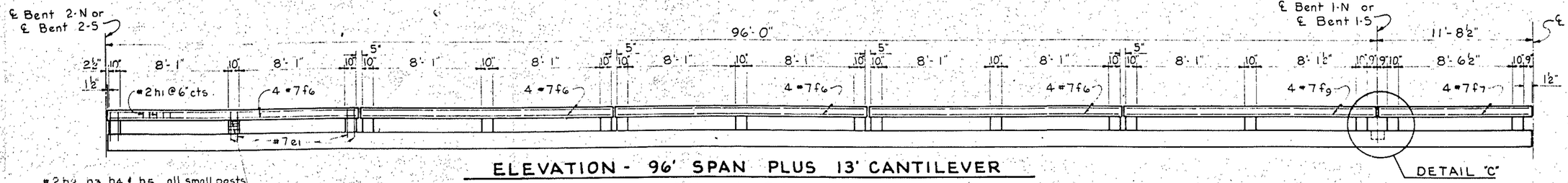
NOVEMBER

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

DRAWN BY Robert G. Gower DATE Nov. 1968
CHECKED BY [illegible] DATE Feb. 1969

BUILT ACCORDING TO PLANS

3	N.C.
F. A. PROJECT	S-1(

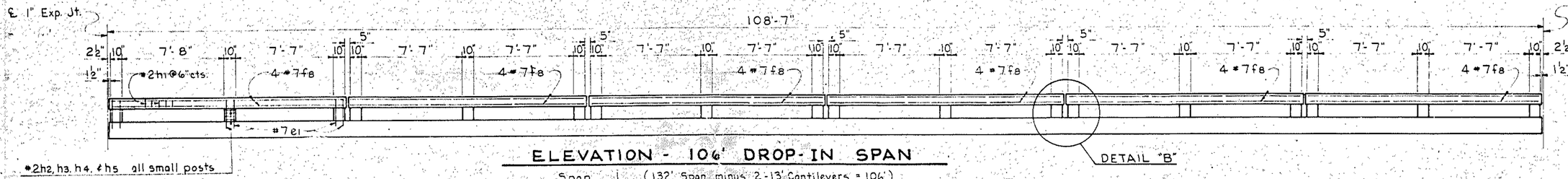


#2h2, h3, h4 & h5 all small posts

ELEVATION - 96' SPAN PLUS 13' CANTILEVER

Spans 2-N and 2-S

DETAIL "C"

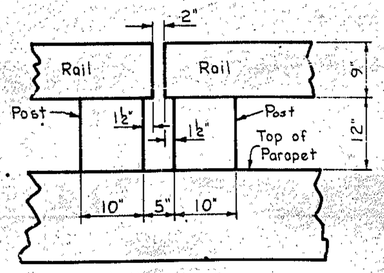


#2h2, h3, h4, & h5 all small posts

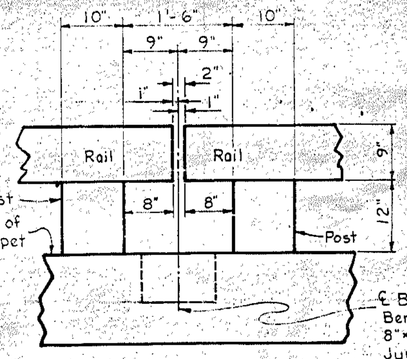
ELEVATION - 106' DROP-IN SPAN

Span 1 (132' Span minus 2-13' Cantilevers = 106')

DETAIL "B"



DETAIL "B"

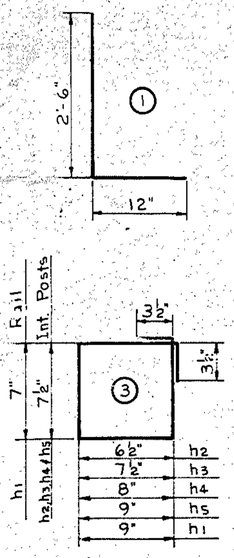


DETAIL "C"

℄ Bent 1-N or Bent 1-S & ℄ 8"×8"×12" Electrical Junction Box (Note: Junct. Boxes to be installed in east parapet only).

BAR DETAILS

All bar dimensions are out to out.



* See Note Sheet 1 of 2

BILL OF MATERIAL
FOR ONE 96' SPAN 2 REQ'D

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
e1	136	#7	1	3'-6"	973
f6	32	#7	Str.	18'-8"	1,221
f7	8	#7	Str.	11'-2"	183
f9	8	#7	Str.	19'-3"	315
h1	384	#2	3	3'-3"	208
h2	34	#2	3	2'-11"	17
h3	34	#2	3	3'-1"	18
h4	34	#2	3	3'-2"	18
h5	34	#2	3	3'-4"	19

Reinforcing Steel Lbs. * 2,972
Class "AA" Concrete Cu. Yds. 6.4

BILL OF MATERIAL
FOR ONE 106' DROP-IN SPAN

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
e1	144	#7	1	3'-6"	1,030
f8	48	#7	Str.	17'-7"	1,725
h1	434	#2	3	3'-3"	236
h2	36	#2	3	2'-11"	18
h3	36	#2	3	3'-1"	19
h4	36	#2	3	3'-2"	19
h5	36	#2	3	3'-4"	20

Reinforcing Steel Lbs. * 3,067
Class "AA" Concrete Cu. Yds. 6.5

BUILT ACCORDING TO PLANS

PROJECT No. 8.2215
CARTERET Co
STATION: 211+20
SHEET 2 OF 2

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSI
RALEIGH

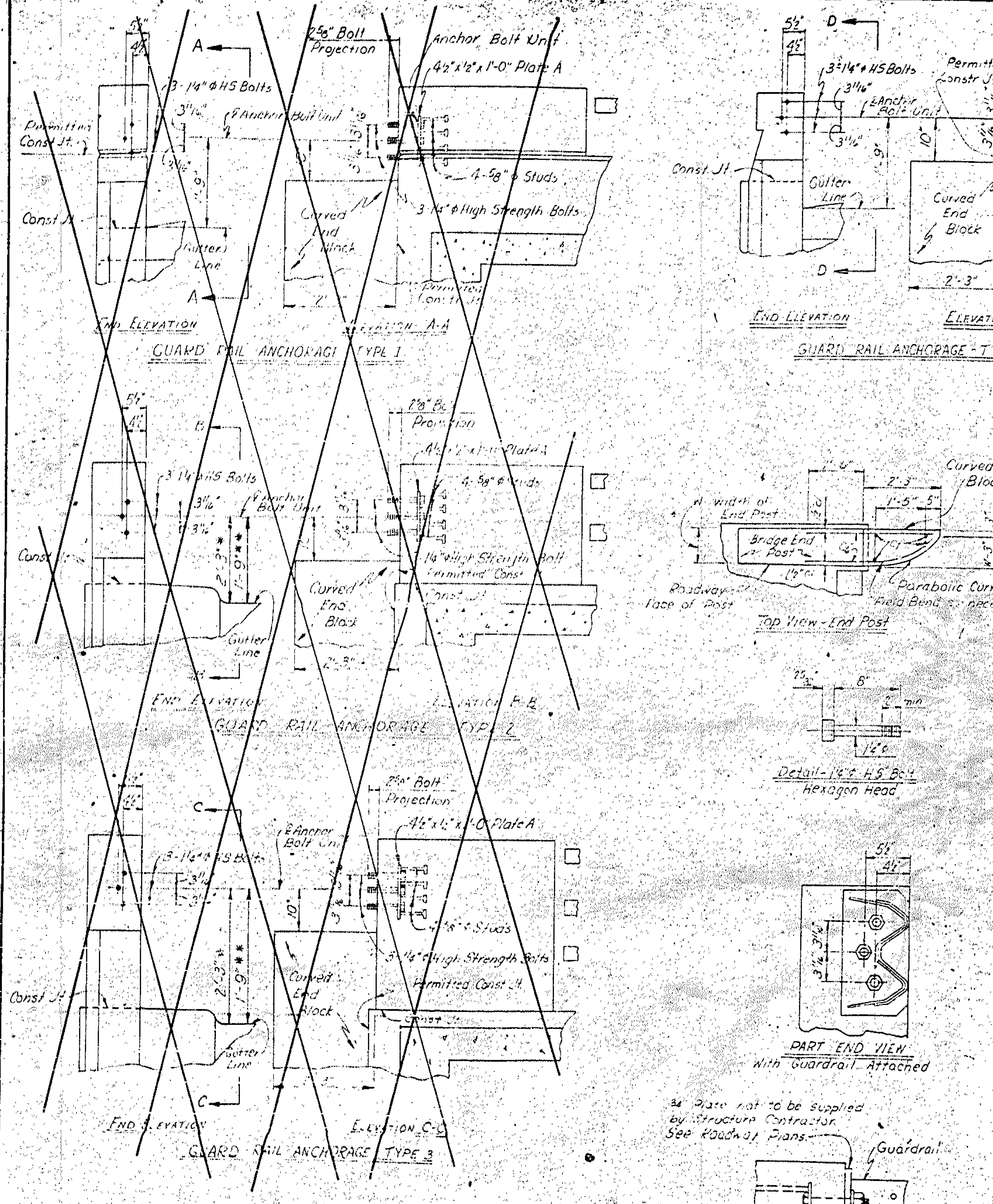
RAIL POST SPACI
& DETAILS

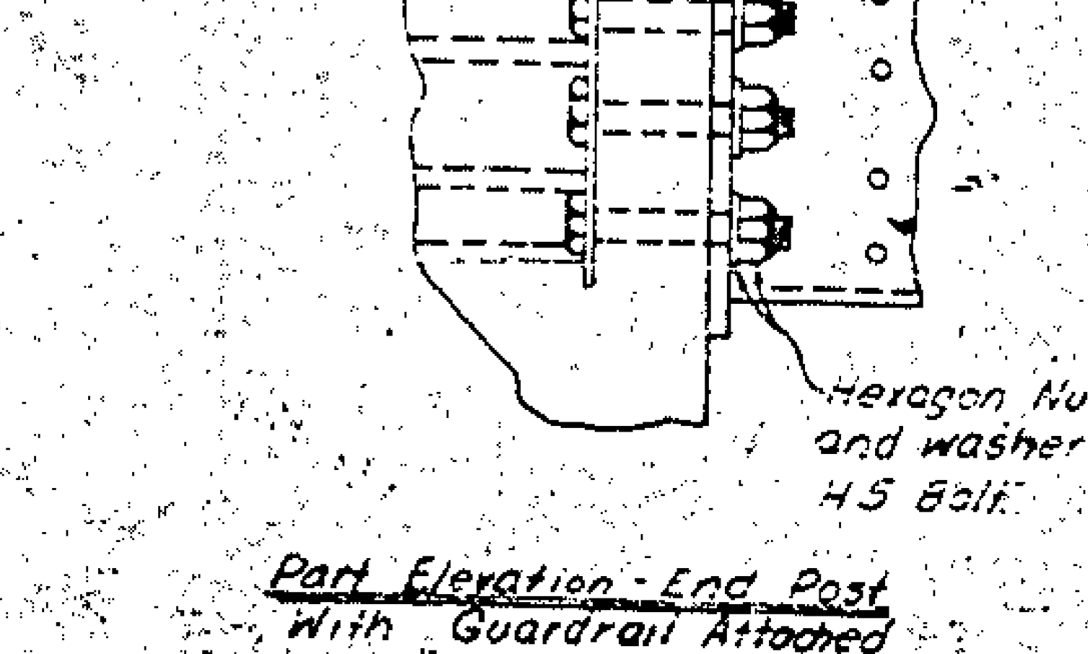
NOVEMBER

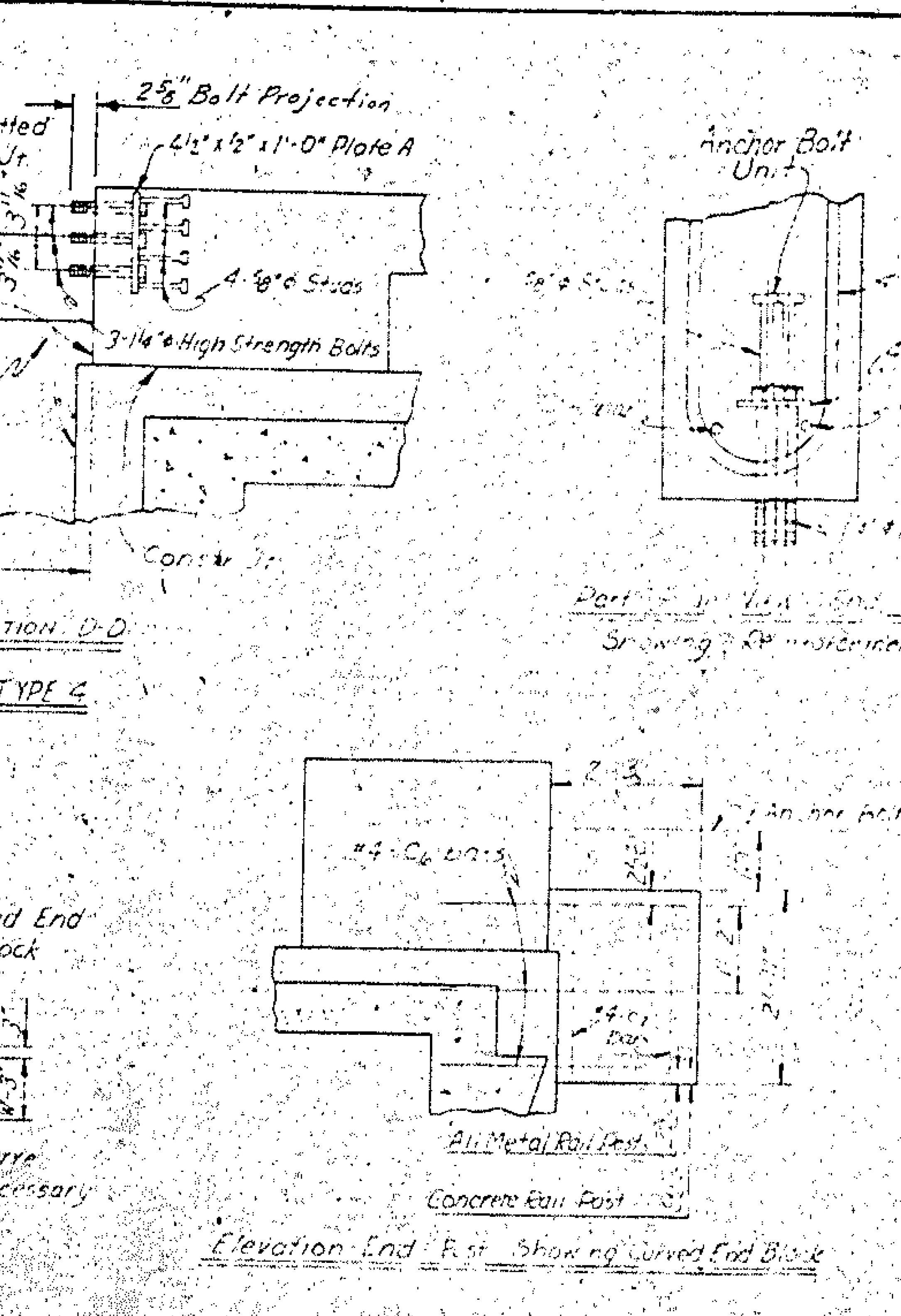
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

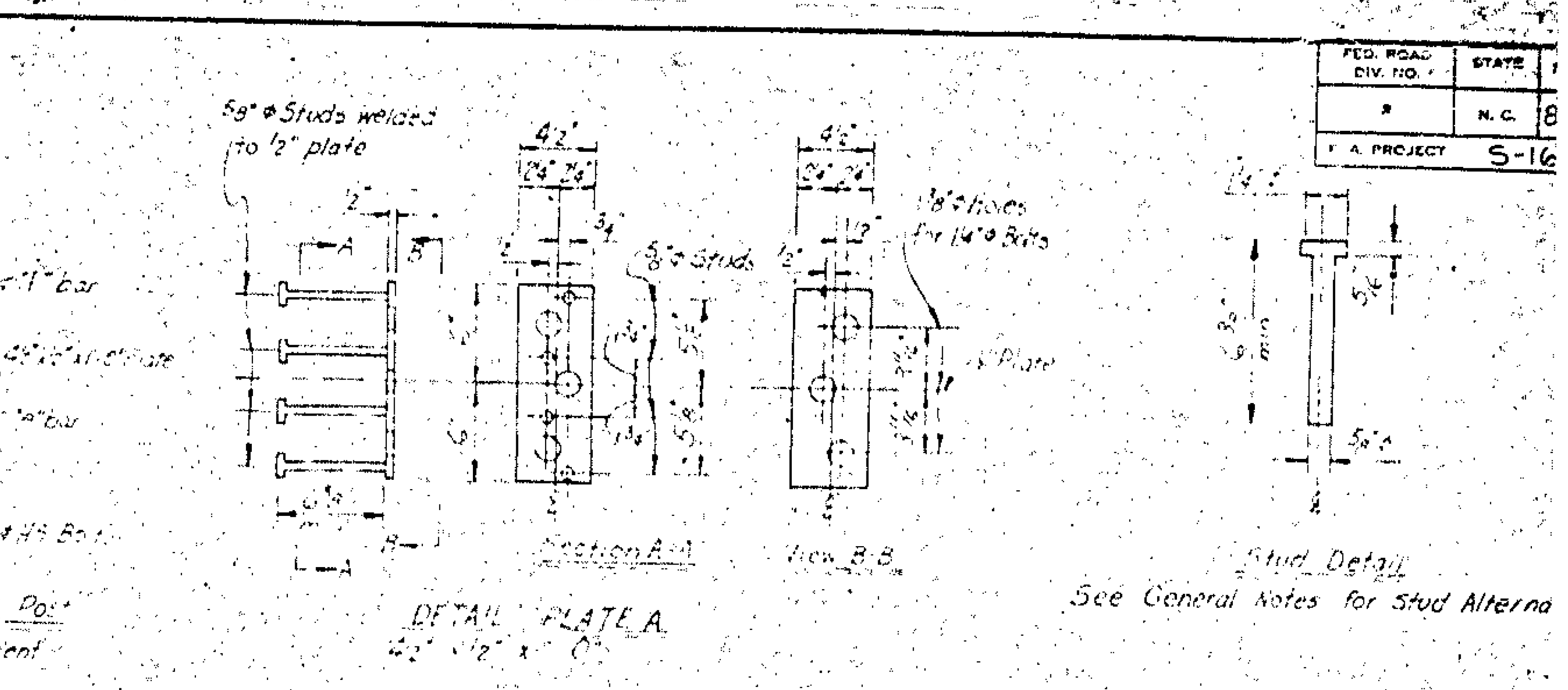
DRAWN BY Robert S. Gower DATE Nov. 1968
CHECKED BY [illegible] DATE Feb. 1969

SOUTHERLAND BLUE PRINT CO., ASHEVILLE, N. C.









BILL OF MATERIAL FOR 1 CURVED END BLOCK					
	Bar	No.	Size	Length	Weight
	[illegible]	[illegible]	#4	[illegible]	14
	[illegible]	4	#4	2' [illegible]	7
	Reinforcing Steel			21	Lbs.
	Class "AA" Concrete			[illegible]	C.Y.
Quantities for 2 Curved End Blocks	Reinforcing Steel			43	Lbs.
	Class "AA" Concrete			4	C.Y.
Quantities for 3 Curved End Blocks	Reinforcing Steel			64	Lbs.
	Class "AA" Concrete			6	C.Y.
Quantities for 4 Curved End Blocks	Reinforcing Steel			85	Lbs.
	Class "AA" Concrete			8	C.Y.

GENERAL NOTES

Cost of Guardrail Anchor Bolt unit, consisting of 3 - 1/4"⌀ High Strength bolts, nuts, washers, 5/8"⌀ Studs and 4 1/2"x1/2"x1'-0" plate complete in place, shall be included in the unit contract price bid for Class "AA" Concrete.

The 1/4"⌀ High Strength bolts, nuts, and washers are to conform to the requirements of A.S.T.M. A-325 and are to be galvanized to conform to the requirements of A.S.T.M. A-153.

The 5/8"⌀ Studs are to conform to the requirements of A.S.T.M. A-108. See Special Provisions.

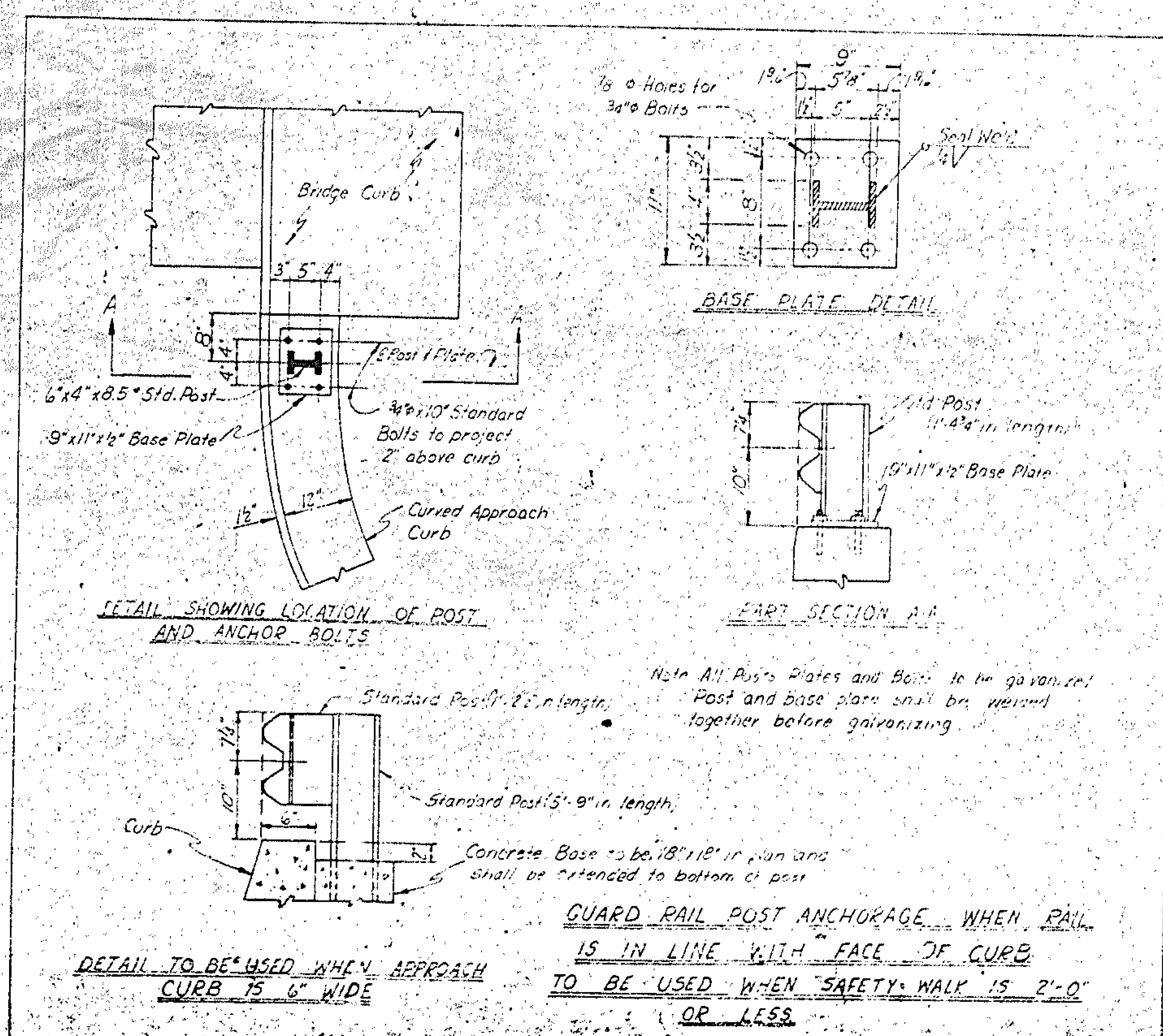
The 4 1/2"x1/2"x1'-0" Plate is to conform to the requirements of A.S.T.M. A-36.

The contractor may substitute, for the stud shown, two 5/8"⌀ studs of shorter length welded one on to the head of the other. The total length of these two studs shall not be less than the 6" required in the Stud Detail.

The standard requirements for High Strength bolts will be followed with the exception of the procedure for nut tightening. Nuts for the 1/4" bolts will be given one half turn with the wrench from a finger tight position. A torque wrench is not required.

The excavation for curbs will not be measured or paid for as a separate item. The entire cost is to be included in the unit price bid for Class "AA" Concrete.

Guard Rail Anchorage to be placed on all 4 End Post.



* For 6" curb and gutter approaching bridge.

** For no curb and gutter approaching bridge.

BUILT ACCORDING TO PLANS

SPECIAL	
DRAWN BY Robert G. Gower	DATE Feb. 1969
CHECKED BY [illegible]	DATE Sept. 1969
STANDARD	
DRAWN BY [illegible]	DATE April 1968
CHECKED BY [illegible]	DATE April 1968

FED. ROAD DIV. NO.	STATE	
8	N.C.	8
F. A. PROJECT	S-16	

PROJECT No. 8.221530

CARTERET COUN[TY]

STATION: 211 + 20

STATE OF NORTH CAROLINA

STATE HIGHWAY COMMISSION

RALEIGH

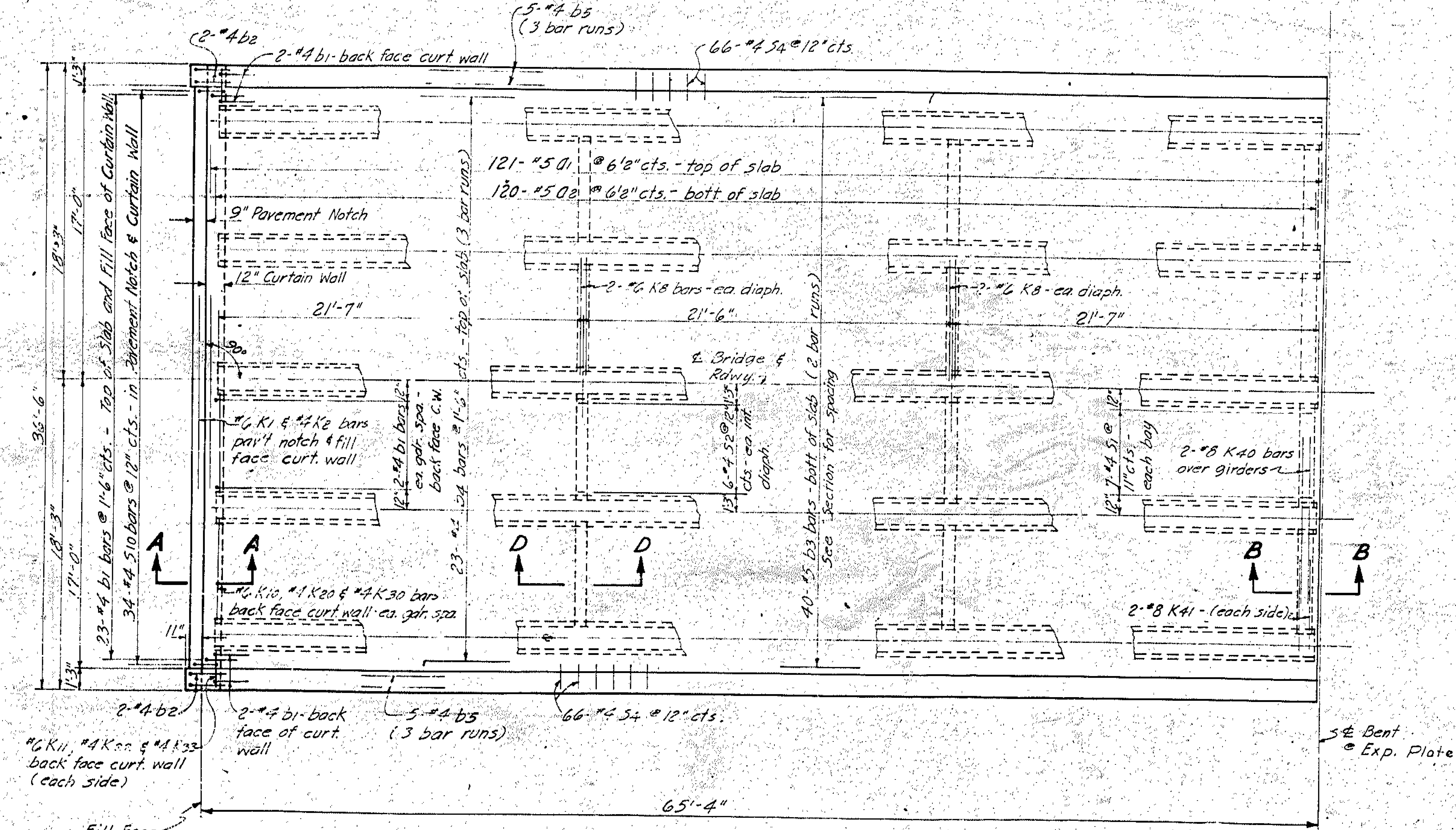
STANDARD

GUARD RAIL ANCHORAGE

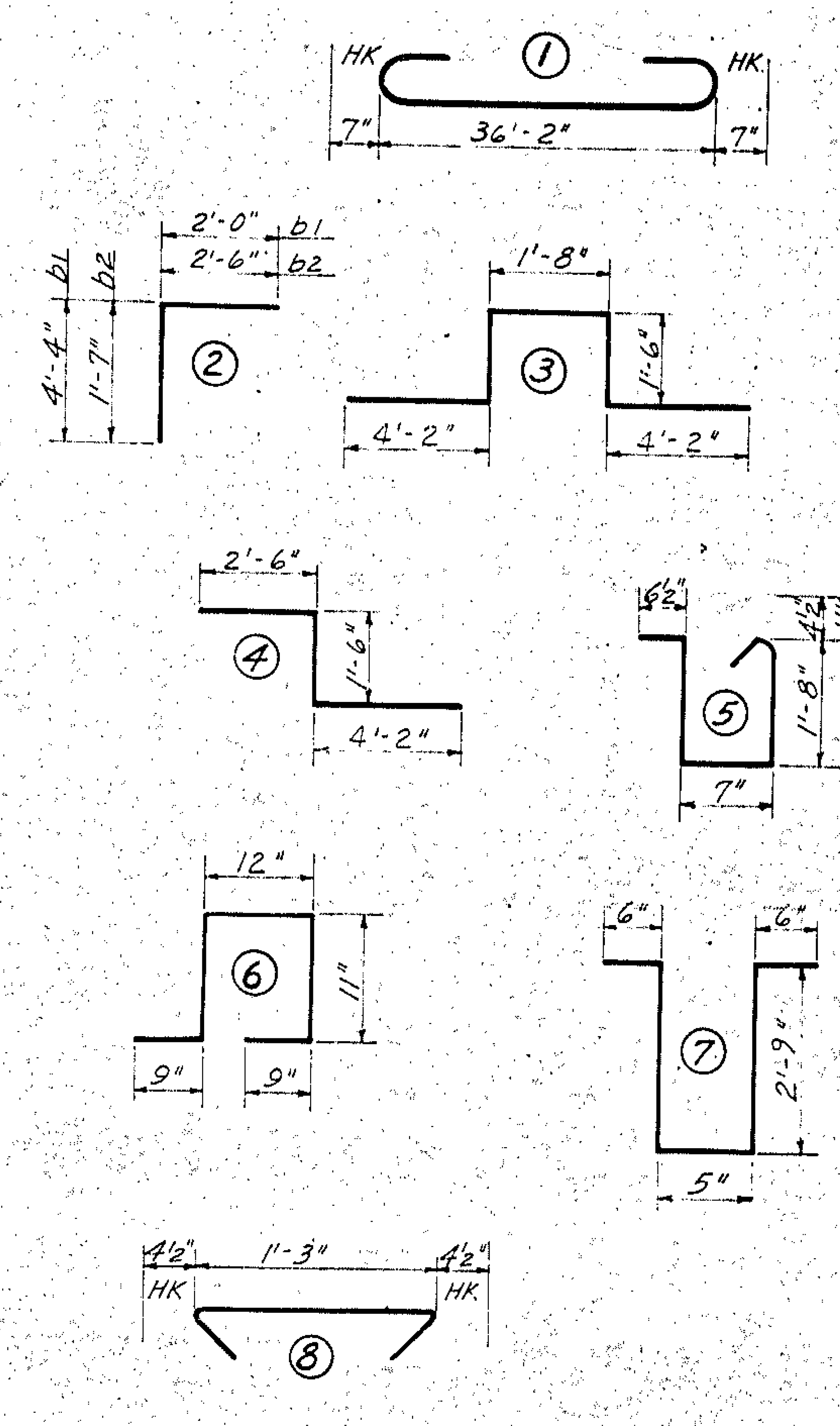
April 19[illegible]

REVISIONS

FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N.C.	8.2215302
F. A. PROJECT	S-16 64(2)	



PLAN OF SPAN NO. 27 NORTH, OR NO. 33 SOUTH



BAR DETAILS

(Dimensions are out to out of bar)

* For location of "b6" bar see End Post & Base Section.

TWO REQUIRED

BILL OF MATERIAL

FOR ONE END SPAN

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
a1	121	#5	1	37'-4"	4712
a2	120	#5	Str.	36'-2"	4527
b1	35	#4	2	6'-4"	148
b2	4	#4	2	4'-1"	11
b3	80	#5	Str.	33'-5"	2788
b4	69	#4	Str.	22'-6"	1037
b5	30	#4	Str.	22'-10"	458
* b6	8	#4	Str.	3'-5"	18
K1	2	#6	Str.	19'-3"	58
K2	8	#4	Str.	18'-9"	100
K8	16	#6	Str.	6'-8"	160
K10	4	#6	Str.	5'-5"	33
K11	2	#6	Str.	2'-1"	6
K20	8	#4	Str.	6'-8"	36
K22	4	#4	Str.	2'-8"	7
K30	4	#4	Str.	5'-11"	16
K33	2	#4	Str.	2'-3"	3
K40	6	#8	3	13'-0"	208
K41	4	#8	4	8'-2"	87
K9	16	#4	Str.	6'-8"	71
S1	28	#4	5	4'-10"	90
S4	132	#4	6	4'-4"	382
S2	48	#4	7	6'-11"	222
S10	34	#4	8	2'-0"	45

Reinforcing Steel, Lbs. 15,223
Class "AA" Conc., Cu. Yds. 68.7
45" Prestressed Girder
No. 5
Lin. Ft. 323.33

PROJECT NO. 8.2215302
CARTERET **COUNTY**
STATION: 211+20
65'-4" END SPAN

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

SUPERSTRUCTURE

SPAN 27 NORTH &
SPAN 33 SOUTH

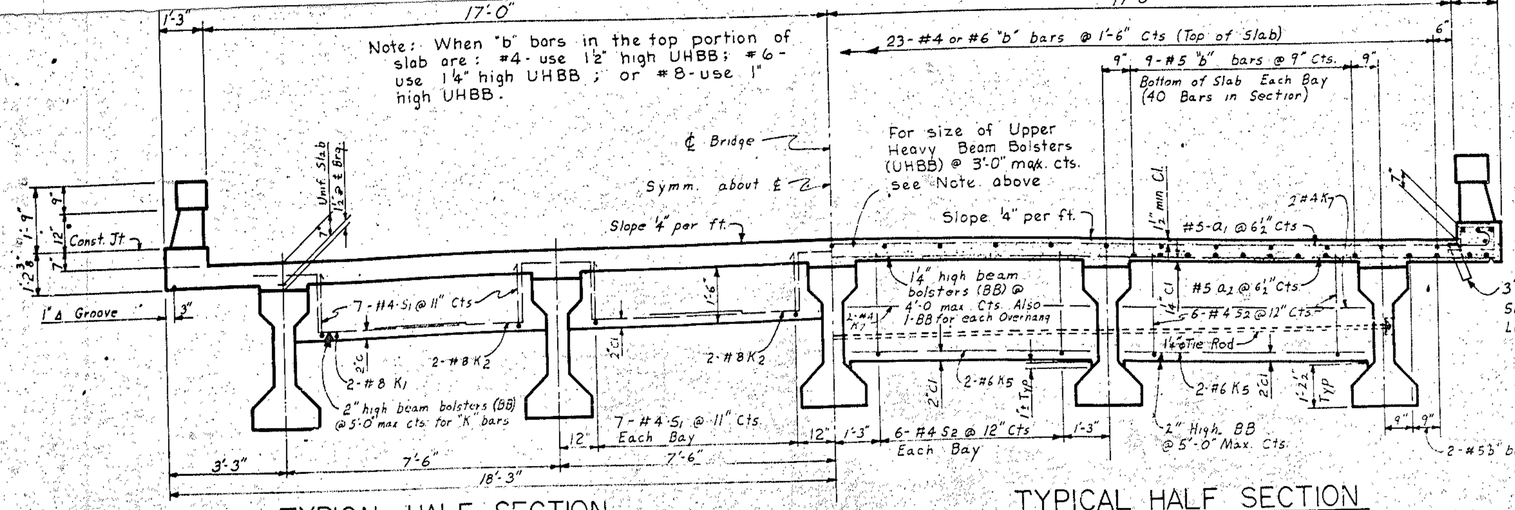
NOV., 1968

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

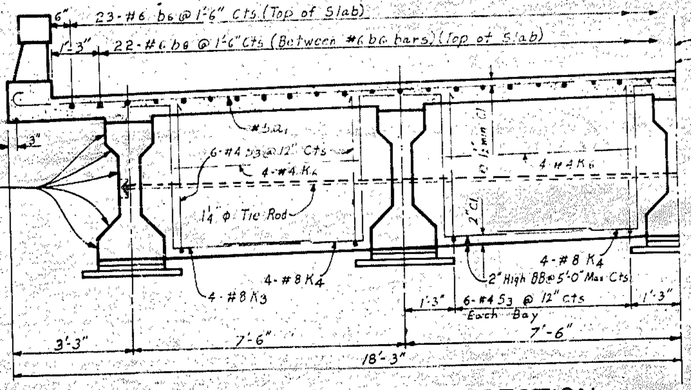
SHEET NO. 44 ~~S-13~~
TOTAL SHEETS ~~41~~ 256

BY ___ DATE Nov. 1968
CHECKED BY ___ DATE Feb. 1968

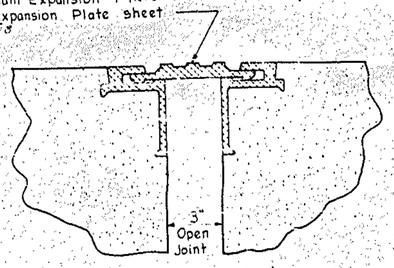
BUILT ACCORDING TO PLANS



TYPICAL HALF SECTION
(SHOWING BENT DIAPHRAGM AT EXPANSION JOINT)



TYPICAL HALF SECTION
(SHOWING BENT DIAPHRAGM AT FIXED END OF GIRDERS)



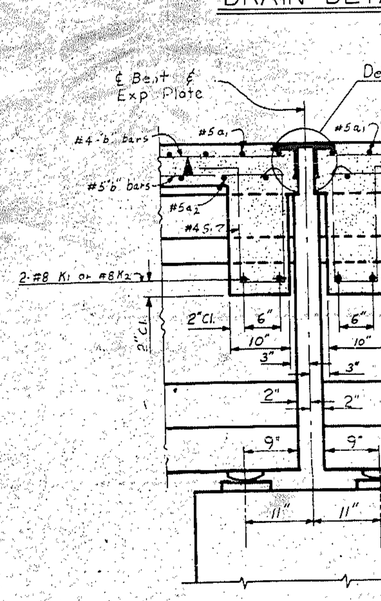
DETAIL "B"

DRAIN DETAIL

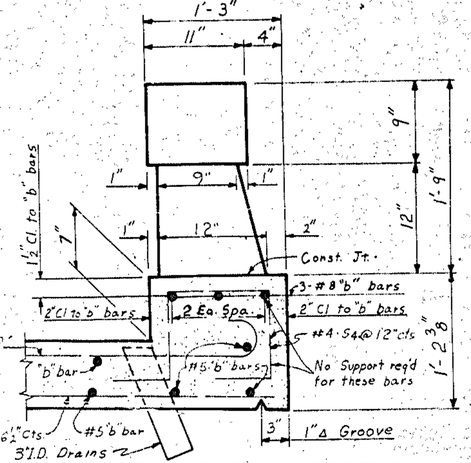
NOTE: Drains shall be of PVC plastic pipe. See Sheet S-N. Top of Drains shall be set ⅜" below surface of slab.

No. Required 600 (65' spans)

TYPICAL HALF SECTION
(SHOWING INTERMEDIATE DIAPHRAGM)



SECTION B-B SECTION D-D SECTION C-C



PARAPET AND RAIL SECTION

NOTES

Assumed Live Load HS 15-44

For other Design Data and General Notes, see Sheet S-N.

For bars indicated and no bar mar shown, see concrete plan for different spans.

Temporary struts shall be place between prestressed girders adjacent to the diaphragms, and the nuts on the 1¼"ϕ tie rods shall be tightened befo the diaphragms are cast. Struts shall remain in plac 3 days after concrete is placed. The tie rods shall retightened after the struts have been removed.

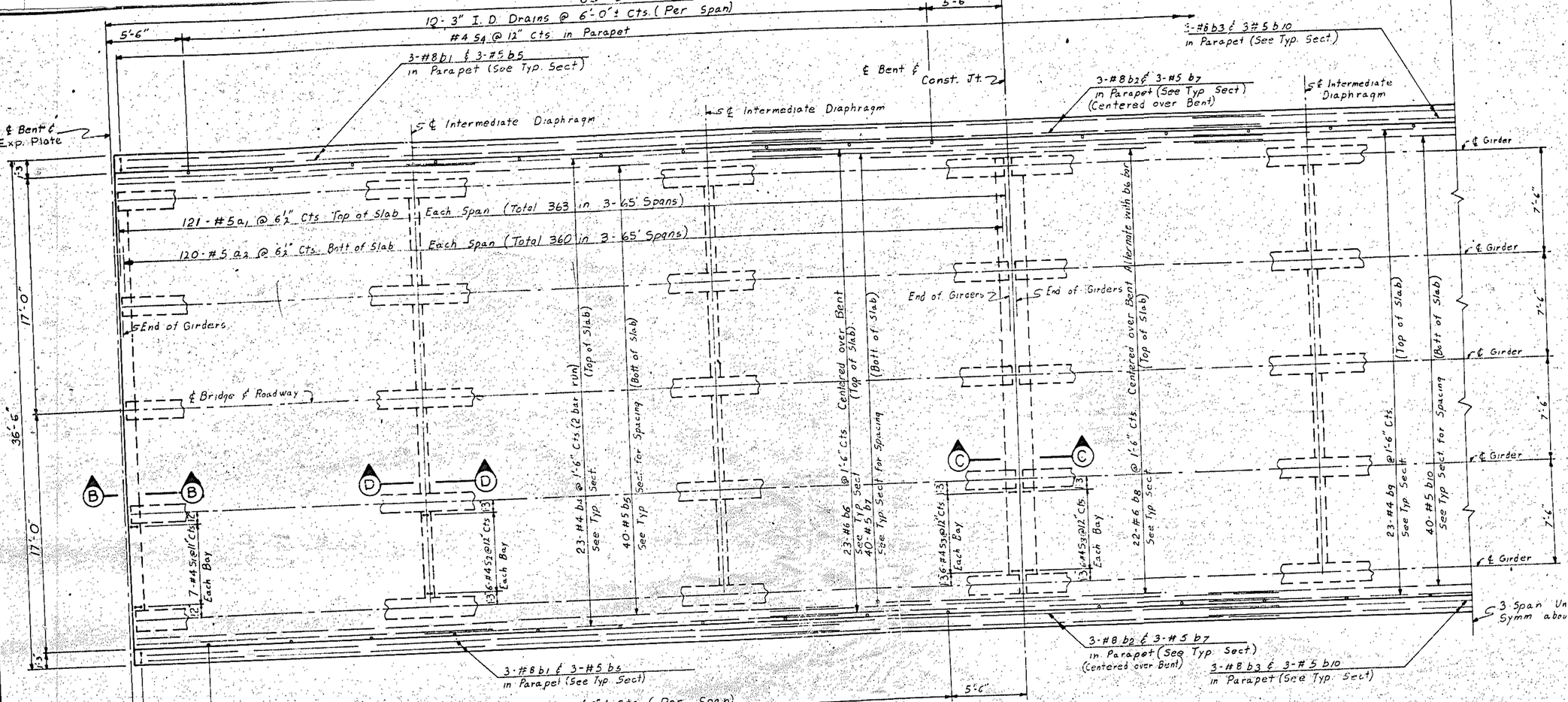
PROJECT NO. 8.2215302
CARTERET COUNT
STATION: 211+20
SHEET 1 OF 3

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
SUPERSTRUCTURE
TYPICAL SECTIONS
3 SPAN CONTINUOUS UNITS
65' SPANS - 45" GIRDERS
NOVEMBER 1966

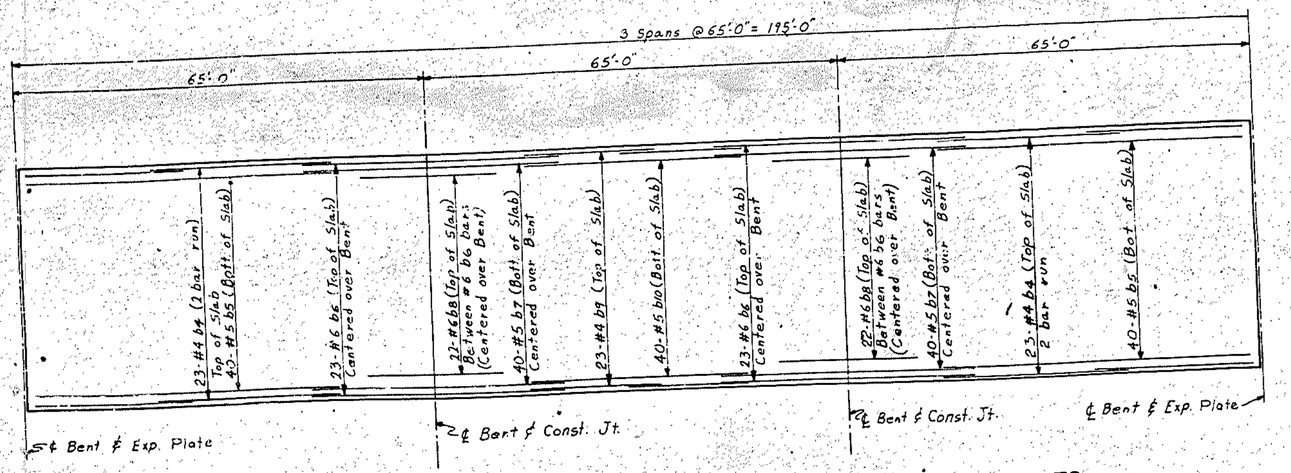
REVISIONS						SHEET NO. S-1
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS 11
1			3			22
2			4			

DRAWN BY D.R. Tidd DATE Dec. 1966
CHECKED BY Ray Gordon DATE Feb. 1967

BUILT ACCORDING TO PLANS

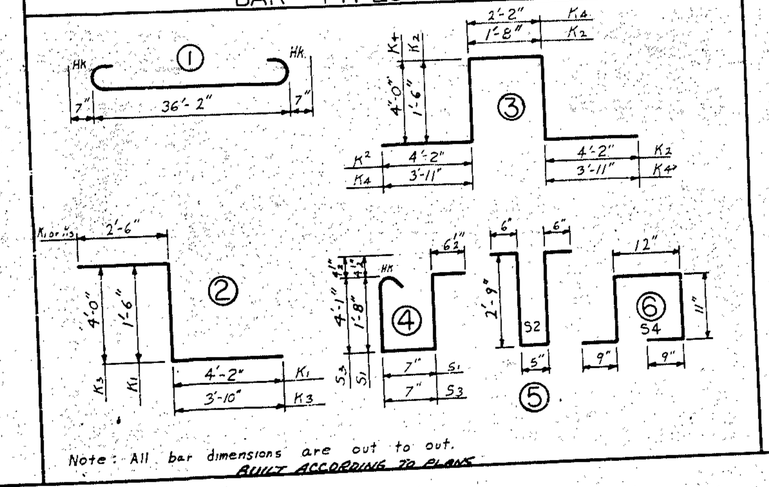


PLAN



LAYOUT OF "b" BARS IN SLAB – 3 SPAN CONTINUOUS UNITS

BAR TYPES



Note: All bar dimensions are out to out.
BUILT ACCORDING TO PLANS

BILL OF MATERIAL

FOR ONE 3 SPAN CONTINUOUS UNIT
10 REQUIRED

BAR	NO.	SIZE	TYPE	LENGTH	WEIGH
a1	363	#5	1	37'-4"	14,1
a2	360	#5	Str.	36'-2"	13,5
b1	12	#8	Str	49'-0"	1,5
b2	12	#8	Str	37'-0"	1,1
b3	6	#8	Str	33'-0"	5
b4	92	#4	Str	24'-6"	1,5
b5	92	#5	Str	48'-3"	4,6
b6	46	#6	Str	37'-0"	2,5
b7	92	#5	Str	37'-0"	3,5
b8	44	#6	Str	20'-0"	1,3
b9	23	#4	Str	30'-6"	4
b10	46	#5	Str	31'-6"	1,5
K1	8	#8	2	8'-2"	1
K2	12	#8	3	13'-0"	4
K3	16	#8	2	10'-4"	4
K4	24	#8	3	18'-0"	1,1
K5	48	#6	Str.	6'-7"	4
K6	32	#4	Str	4'-8"	1
K7	48	#4	Str	6'-7"	2
S1	56	#4	4	4'-10"	1
S2	144	#4	5	6'-11"	6
S3	96	#4	4	9'-8"	6
S4	390	#4	6	4'-4"	1,1

Reinforcing Steel (lbs.) 52,1
Class 'AA' Concrete (See sheet 3 of 3)

PROJECT NO. 8.2215302
CARTERET COUN
STATION: 211+20
SHEET 2 OF 3

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSIO
RALEIGH
SUPERSTRUCTURE
3 SPAN CONTINUOUS UNITS
65' SPANS - 45° GIRDERS
NOVEMBER 19

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

DRAWN BY D.R. Isley DATE Dec. 1968
CHECKED BY [illegible] DATE Feb. 1968

SOUTHERLAND PRINTING CO., CHARLOTTE, N. CAROLINA

CLASS "AA" CONCRETE BREAKDOWN

	SPAN	cu. yds.
3 SPAN CONTINUOUS UNIT	30 S	65.4
	31 S	68.1
	32 S	[illegible]
TOTAL (For 3 Span Continuous Unit)		[illegible]

	SPAN	cu. yds.
3 SPAN CONTINUOUS UNIT	27 S	[illegible]
	28 S	[illegible]
	29 S	[illegible]
TOTAL (For 3 Span Continuous Unit)		[illegible]

	SPAN	SPAN	SPAN	cu. yds.
3 SPAN CONTINUOUS UNIT	24 N & S	21 N & S	18 N & S	65.0
	25 N & S	22 N & S	19 N & S	67.7
	26 N & S	23 N & S	20 N & S	65.0
TOTAL (For 3 Span Continuous Unit)				197.7

	SPAN	cu. yds.
3 SPAN CONTINUOUS UNIT	15 N & S	65.4
	16 N & S	68.1
	17 N & S	65.4
TOTAL (For 3 Span Continuous Unit)		[illegible]

PROJECT NO. 8.22153
CARTERET Co
STATION: 211 + 20
SHEET 3 OF 3

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISS
RALEIGH
SUPERSTRUCTURE
3 SPAN CONTINUOUS UN
65′ SPANS – 45″ GIRDERS
DECEMBER

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

DRAWN BY D.R. [illegible] DATE Dec. 1968
CHECKED BY [illegible] DATE Feb. 1969

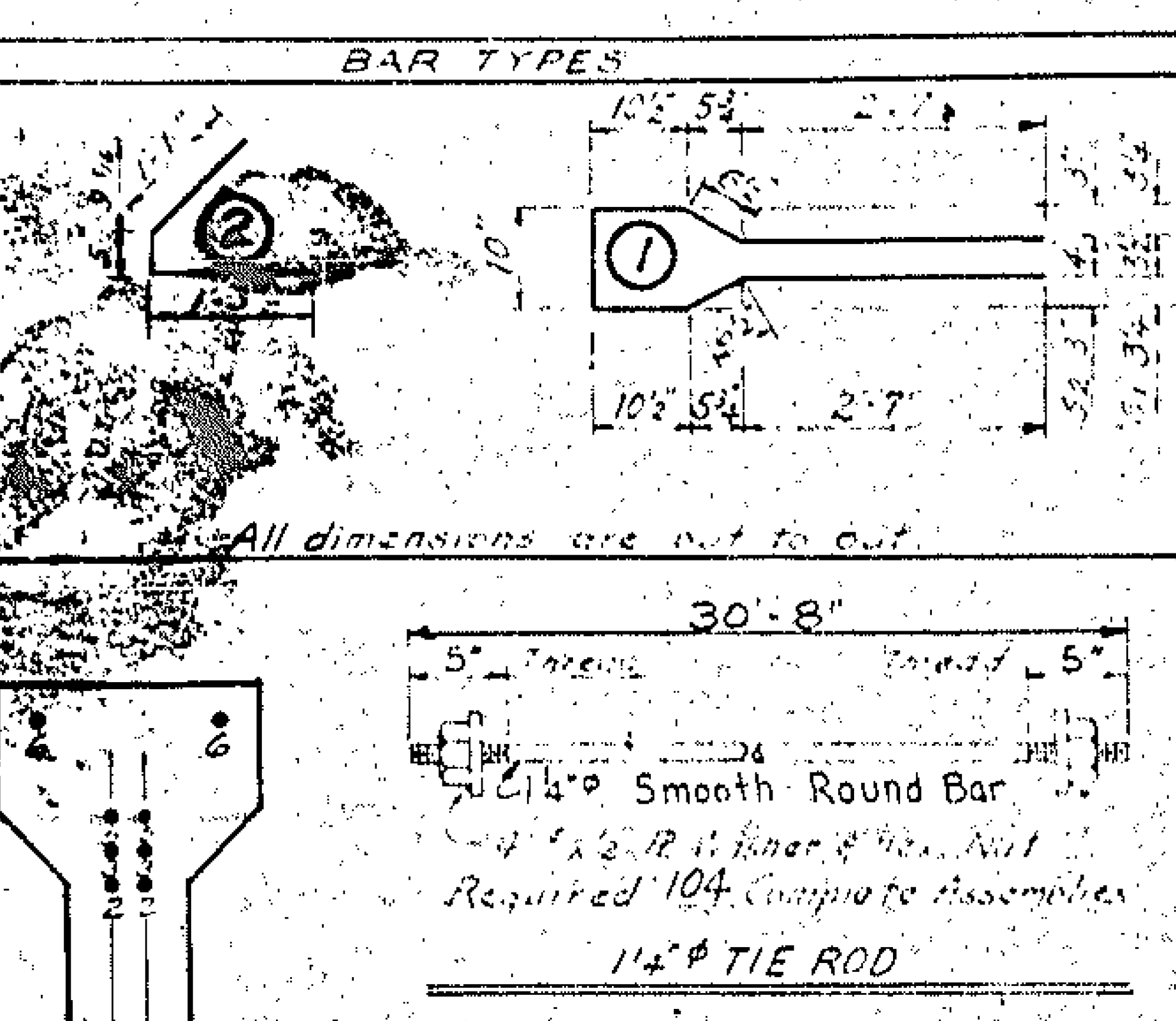
BUILT ACCORDING TO PLANS

BUILT ACCORDING TO PLANS

FED. ROAD DIV. NO.	STATE	PROJECT
3	N.C.	8.2215
F.A. PROJECT	S-16	64

REINFORCING STEEL FOR ONE GIRDER

Bar	No.	Size	Type	Length	Weight
Interior Girder S1	47	#4	1	8'-10"	277
Exterior Girder B1	39	#4	1	8'-10"	230
S2	12	#6	[illegible]	4'-10"	59
S3	[illegible]				
S4	20	#4	2	[illegible]	[illegible]
GRID	2	#3	See Diagram	5'-4"	4
"	3	#3		5'-4"	6
"	4	#3		5'-4"	8



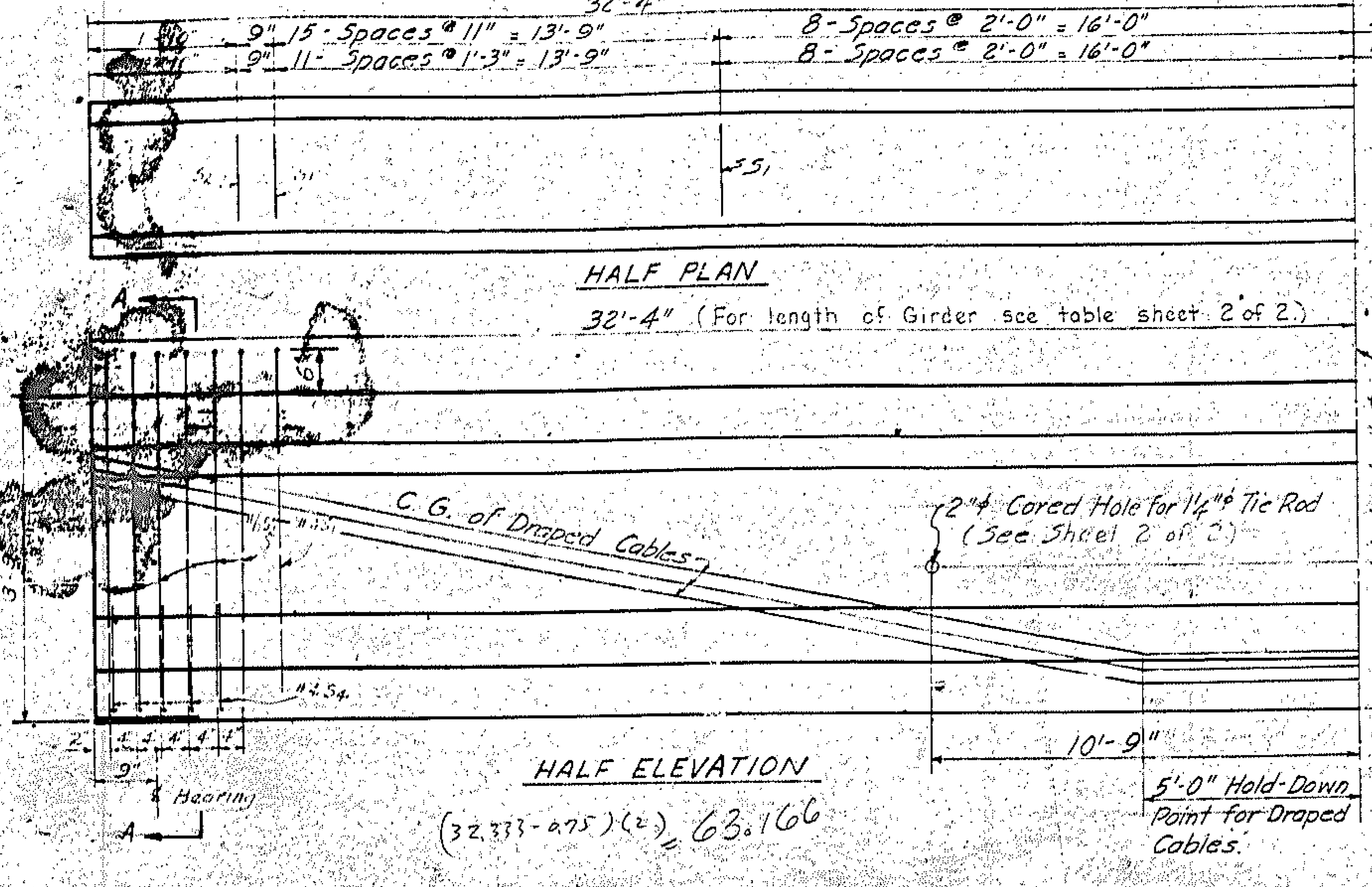
NOTES

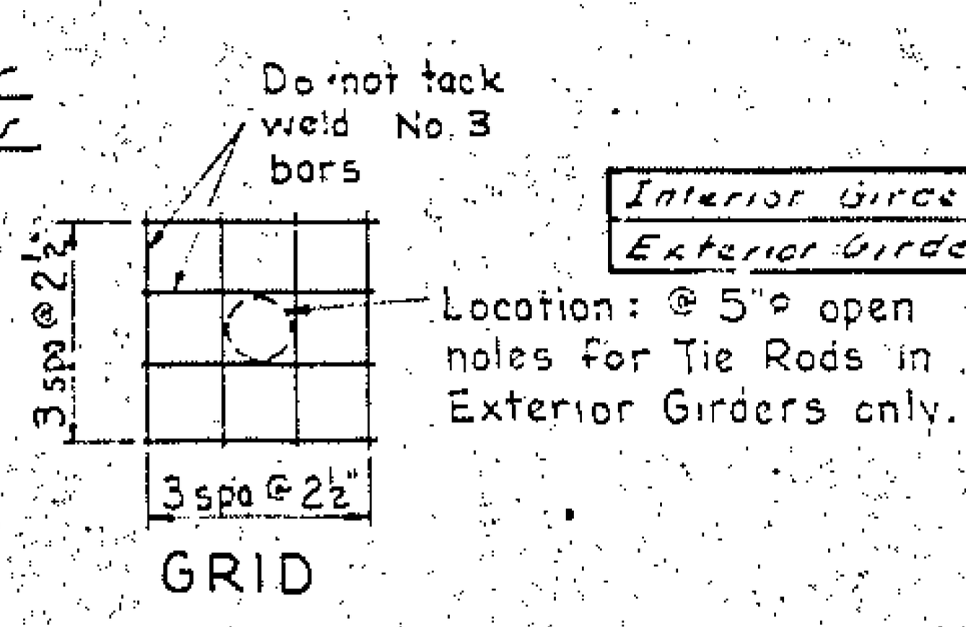
All prestressing strand shall meet the requirements of A.S.T.M.-A416.

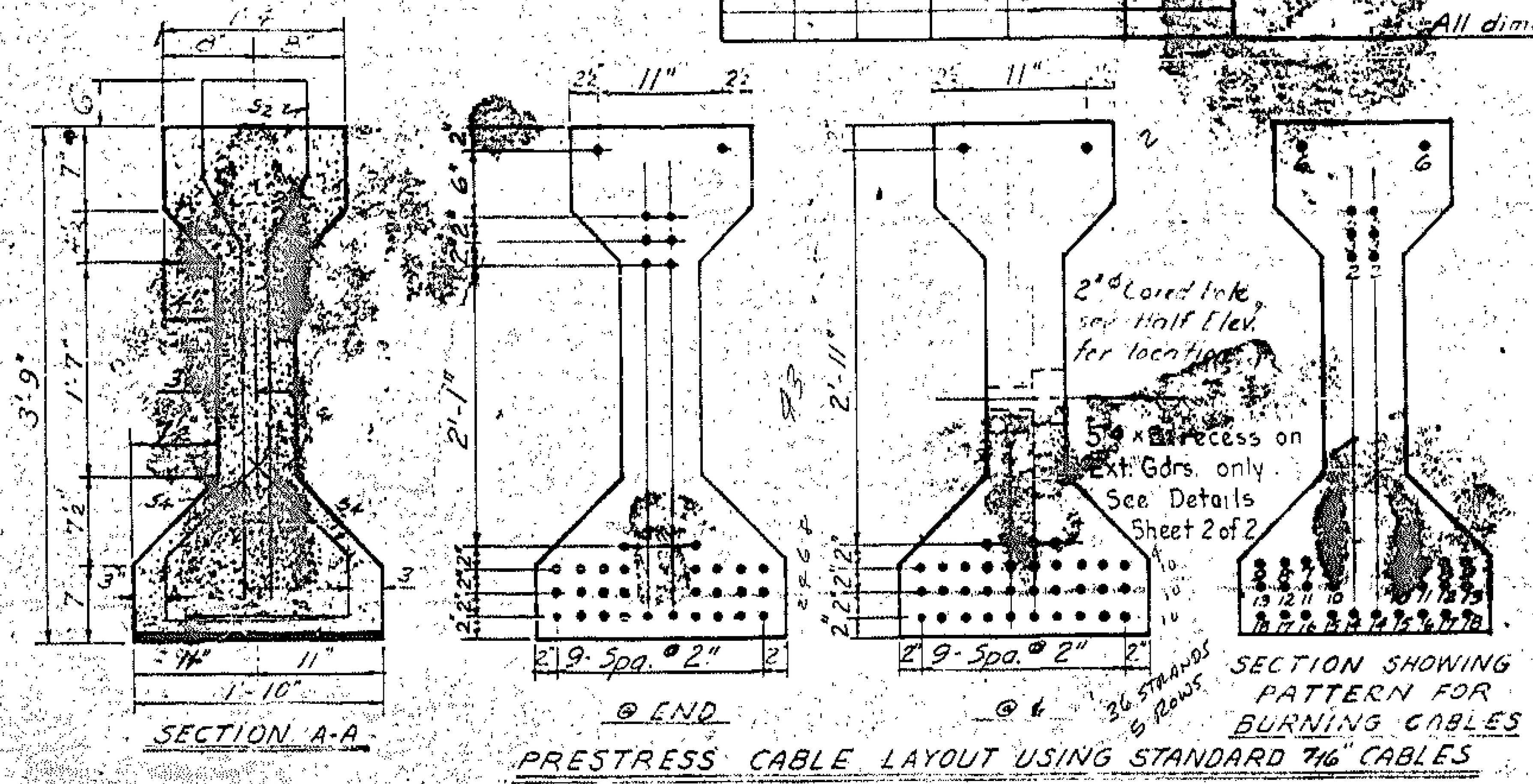
No surface finish will be required for prestressed concrete girders. However the outside face of exterior girders shall be carefully cleaned of drippings and other discolorations. See Specifications.

All prestressing strands shall be 7/16" 7 wire stress relieved cables in accordance with the specifications. At the contractor's option he may use either of the two types of cables listed below; however, all cables within a girder shall be of the same type.

TYPE	AREA	ULTIMATE STR.	APPLIED PRESTRESS
7/16 Std.	0.1089 ☐"	27,000 Lbs per cable	18,900 Lbs per cable
7/16 High Str.	0.1152 ☐"	31,000 Lbs per cable	21,700 Lbs per cable



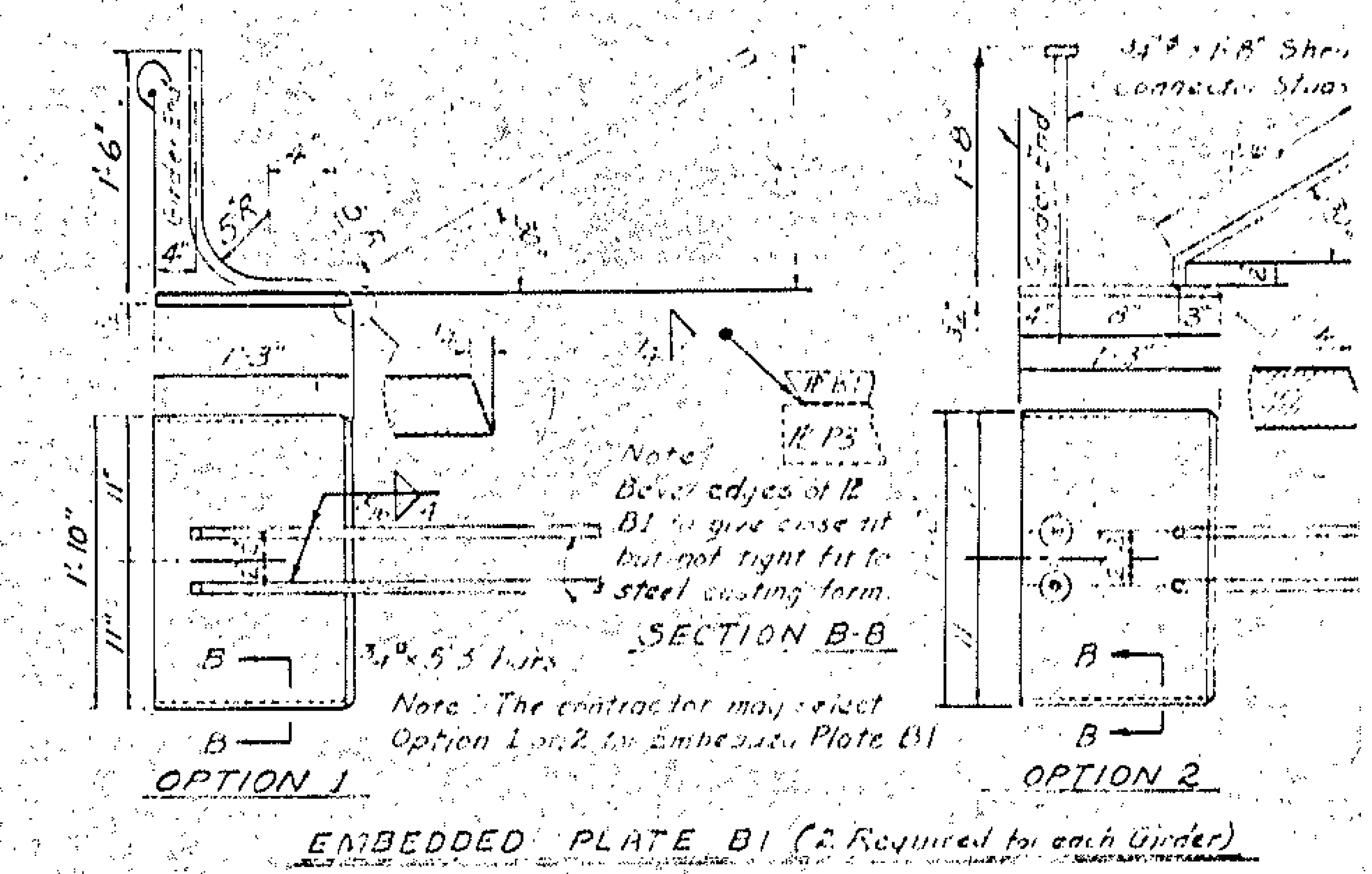


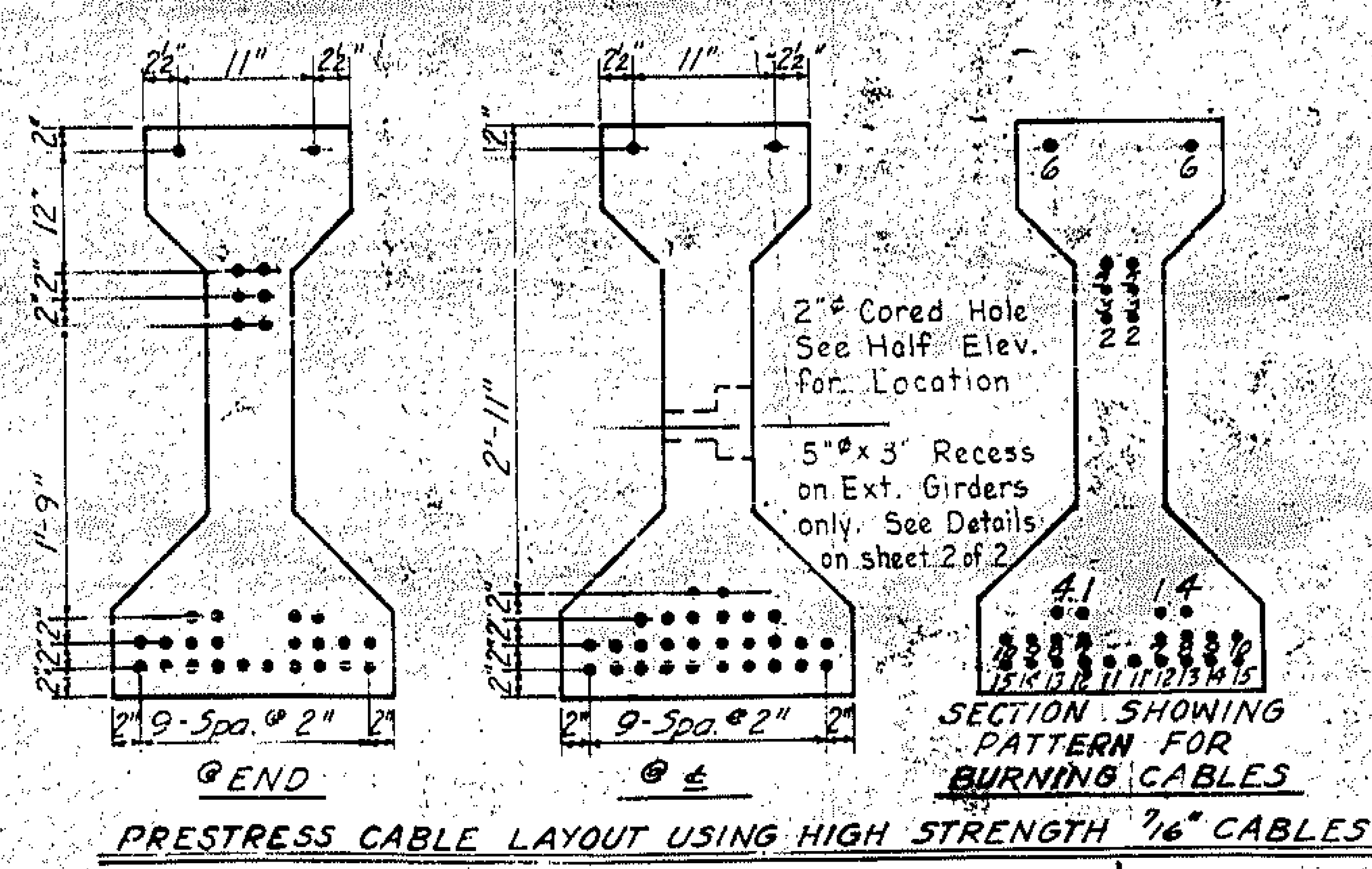


1. All cables must be cut off flush with end of girder and painted as noted below.
2. Ends of cables and field welds on prestressed girder bearings shall be painted with zinc rich paint conforming to federal specification MIL-P-26915 (U.S.A.F.) Type I.
3. Embedded Plates are to be hot dipped galvanized after fabrication. Galvanizing shall be at a uniform rate of 2 oz. per sq. ft. of surface in accordance with A.S.T.M. specifications A-123.
4. The cost of bearing assemblies, 1¼"ø tie rod assembly, galvanizing of bearing assemblies and painting of cable ends and field welds on bearing assemblies shall be included in the unit price bid for lin. ft. of Prestressed Concrete Girder.

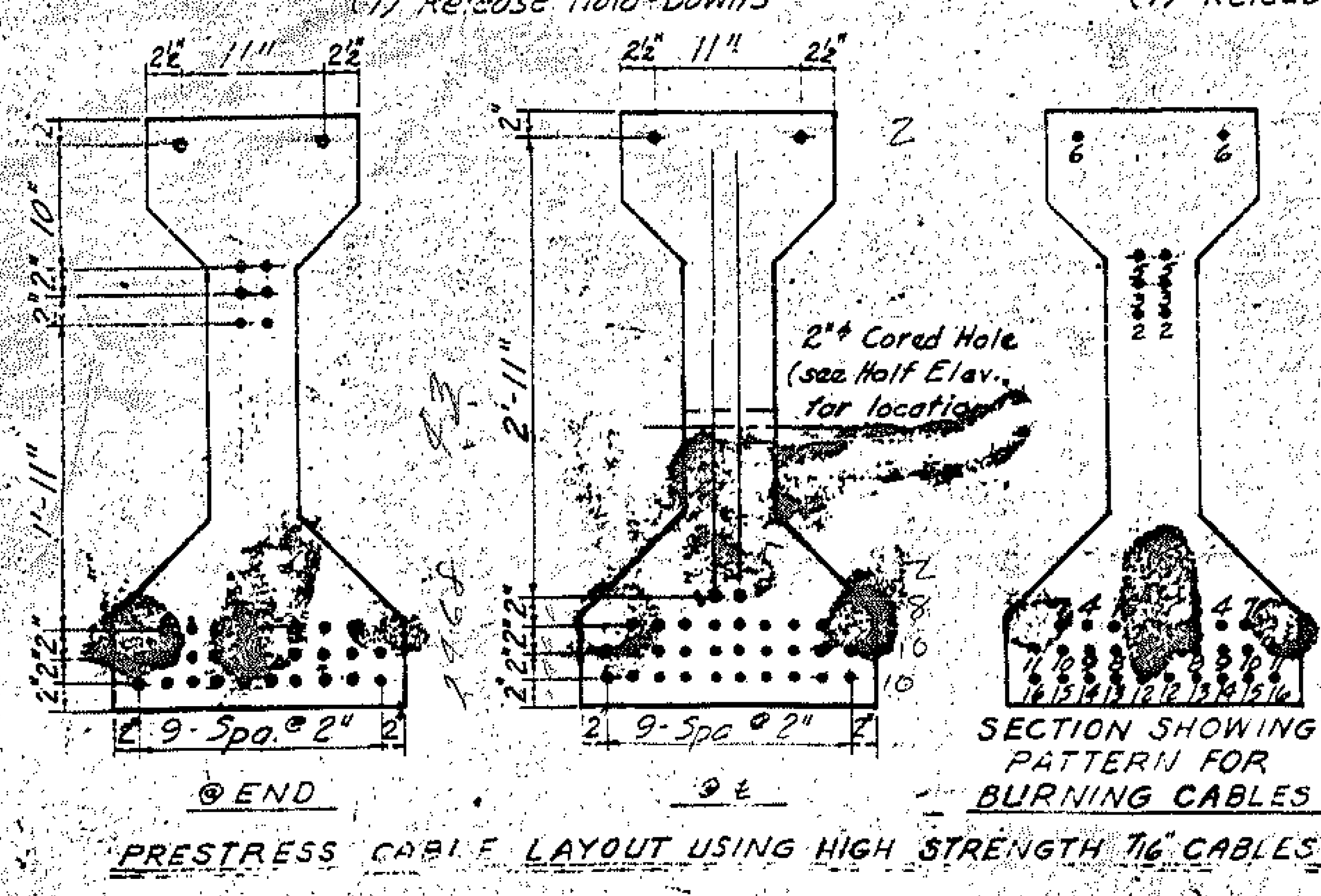
Note: If cable stress is relieved by burning each pair of cables shall be burned at ends of bed and between all girders before burning any of the next pair of cables. The following order of burning shall be strictly adhered to:

For Standard 7/16" Cables		For High Strength 7/16" Cables	
(1) Bottom Cables	1-1	(1) Bottom Cables	1-1
(2) Draped Cables	2-2	(2) Draped Cables	2-2
(3) Draped Cables	3-3	(3) Draped Cables	3-3
(4) Bottom Cables	4-4	(4) Bottom Cables	4-4
(5) Draped Cables	5-5	(5) Draped Cables	5-5
(6) Top Cables	6-6	(6) Top Cables	6-6
(7) Release Hold-Downs		(7) Release Hold-Downs	



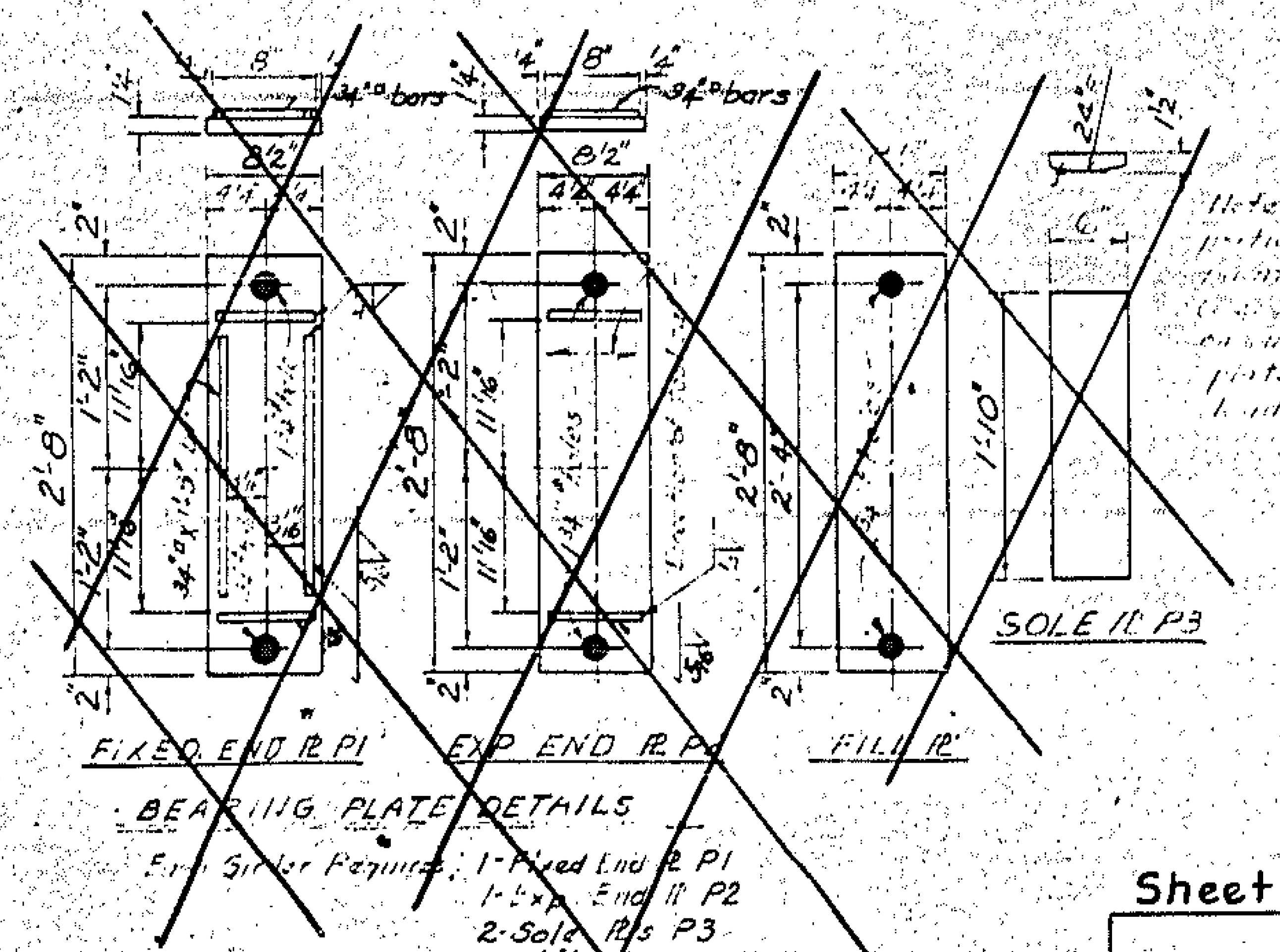


EXTERIOR GIRDER



INTERIOR GIRDER

32 STRANDS 6 ROWS



Note: For Bearing Plate Details see Bearing Plate Detail Sheet 18

* Does not include weight of Grid steel
** See table on Sheet 2 of 2

QUANTITIES FOR ONE GIRDER

	Reinforcing Steel	5,000 psi Concrete Cu. Yds.	Standard 7/16 S.R. Cables	High Strength Cables
Interior	473	9.3	36	32
Exterior	* 426	9.3	36	30

GIRDERS REQUIRED

No.	Length	Total Length
96	**	6,212'-1½"
64	**	4,141'-5"

Total Lin. Ft. 45" Girders = 10,353.54

BUILT ACCORDING TO PLANS

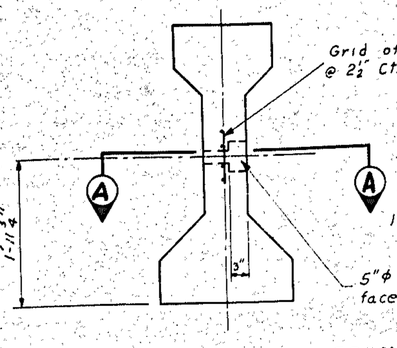
PROJECT No. 8.2215302
CARTERET COUNTY
STATION 211+20
Sheet 1 of 2

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

STANDARD
45" PRESTRESSED
CONCRETE GIRDER
65' SPANS
FEBRUARY, 1965

SPECIAL
Assembled by A.R. [illegible] Dec. 1968
Checked by [illegible] Feb. 1969
STANDARD

48

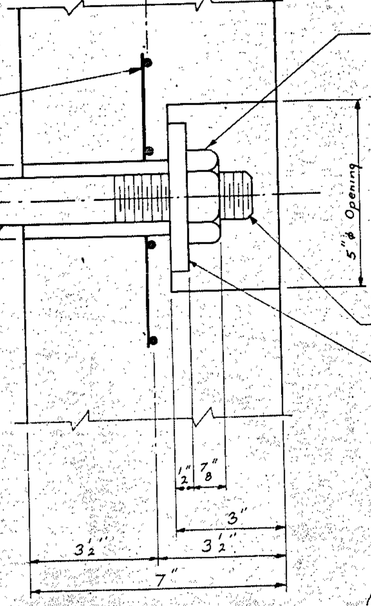


Grid of #3 bars @ 2½" Cts. Each Way

1¼"ϕ Tie Rod

5"ϕ Opening on Outside face of Exterior Girders

TYPICAL DETAIL OF OPENING FOR TIE ROD AT EXTERIOR GIRDER ONLY

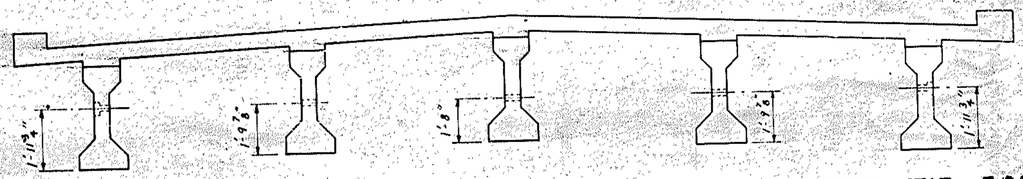


NOTE: Tighten nut firmly after concrete in diaphragm is 3 days old.

Cut off rod ℄ grout hole

4"ϕ x ½" ℔ Washer

SECTION A-A



SECTION SHOWING LOCATION OF HOLES IN GIRDERS FOR TIE RODS (FOR INTERMEDIATE DIAPH. & FIXED ENDS OF GIRDERS)

Exp. P_2P_3	Fix P_1P_2	Fix P_2P_3	Fix P_1P_3	Fix P_1P_3	Exp. P_3P_3
P_2P_3	P_1P_3	P_1P_3	P_1P_3	P_1P_3	P_3P_3
P_2P_3	P_1P_3	P_1P_3	P_1P_3	P_1P_3	P_2P_3
P_2P_3	P_1P_2	P_1P_3	P_1P_3	P_1P_3	P_2P_3
P_2P_3	P_1P_3	P_1P_3	P_1P_3	P_1P_3	P_2P_3

BEARING PLATE LAYOUT 3 SPAN CONTINUOUS UNIT -65' SPANS

End Bent 1 or 2 — Fix P_1P_3

Bent 26N or 32S — Exp. P_1P_3

P_1P_3	P_3P_3
P_1P_3	P_2P_3
P_1P_3	P_2P_3
P_1P_3	P_2P_3

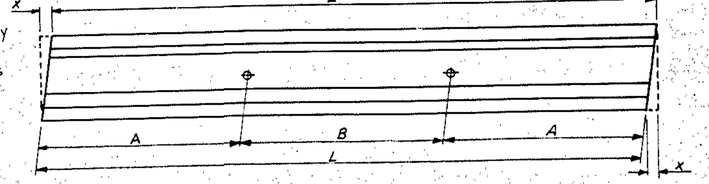
BEARING PLATES REQUIRED FOR SPAN 27N or 33S
Each Girder Requires
1- Fixed End ℔ P_1
1- Exp. End ℔ P_2
2- Sole ℔'s P_3

BEARING PLATE LAYOUT FOR SPAN 27N or 33S

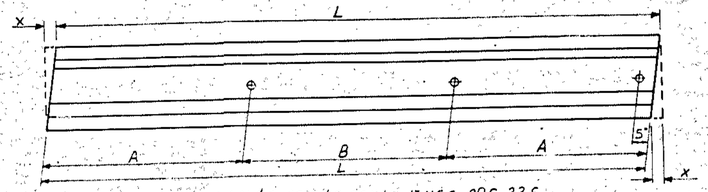
BEARING PLATES REQUIRED FOR ONE - 3 SPAN CONTINUOUS UNIT (10 Units Req'd)

20 - Fixed End ℔ P_1
10 - Exp. End ℔ P_2
30 - Sole ℔'s P_3
Tie ℔'s } (See Bearing ℔ Detail Sheet)
Fill ℔'s }

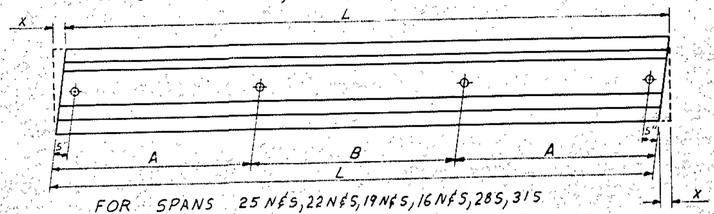
DEAD LOAD DEFLECTION	EXTERIOR GIRDER		INTERIOR GIRDER	
	Reg.	H.S.	Reg.	H.S.
Camber (Girder alone in place)	9/16" ↑	9/16" ↑	9/16" ↑	5/8" ↑
Superimposed Dead Load Deflection	5/8" ↓	11/16" ↓	5/8" ↓	5/8" ↓
Final Deflection	1/16" ↓	1/8" ↓	1/16" ↓	0" ↓



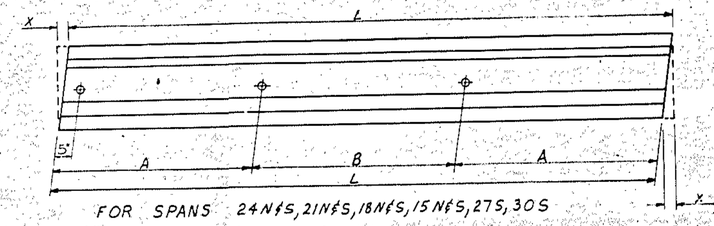
FOR SPANS 27N & 33S



FOR SPANS 26N'S, 23N'S, 20N'S, 17N'S, 29S, 32S



FOR SPANS 25N'S, 22N'S, 19N'S, 16N'S, 28S, 31S



FOR SPANS 24N'S, 21N'S, 18N'S, 15N'S, 27S, 30S

ELEVATION OF GIRDER SHOWING LOCATION OF HOLES FOR TIE RODS

GIRDER LENGTHS FOR 65' SPANS				
SPAN	L	A	B	X
33S, 32S, 31S, 30S, 29S, 28S	64'-8¼"	21'-7⅞"	21'-6"	—
27N'S	64'-8¼"	21'-7⅞"	21'-6"	⅛"
26 N'S	64'-8¼"	21'-7⅞"	21'-6"	⅜"
25 N'S	64'-8¼"	21'-7⅞"	21'-6"	⅞"
24 N'S	64'-8⅜"	21'-7 3/16"	21'-6"	1⅜"
23 N'S	64'-8⅜"	21'-7 3/16"	21'-6"	⅞"
22 N'S	64'-8½"	21'-7¼"	21'-6"	1⅛"
21 N'S	64'-8 5/8"	21'-7 5/16"	21'-6"	1¼"
20 N'S	64'-8 5/8"	21'-7 5/16"	21'-6"	1½"
19 N'S	64'-8¾"	21'-7⅜"	21'-6"	1 5/8"
15 thru 18 N'S	64'-8⅞"	21'-7 7/16"	21'-6"	1¾"

GIRDERS REQUIRED		
	No.	Total Length
	160	10,353.54 Lin Ft

NOTE: Girder lengths shown include the following amount to compensate for elastic shortening: ¼"

NOTE: Spans 27N thru 18N and 18S thru 27S are in a sag vertical curve with a vertical curve ordinate of 7/16". BUILT ACCORDING TO PLANS

PROJECT No. 8.221530
CARTERET COUN
STATION: 211+20
SHEET 2 OF 2

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
45" PRESTRESSED CONCRETE GIRDER DETAILS
65' SPANS

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

DRAWN BY: D.B. Tidd DATE Dec. 1968
CHECKED BY: [illegible] DATE Feb 1969

SOUTHERLAND BLUE PRINT CO., CHARLOTTE, N. C.

See "Prestressed Concrete Girder Sheets" for Plates B1 or B2 or B3 or B4.

	E.B. 1	Bt. 26-N	Bt. 25-N	Bt. 24-N	Bt. 23-N	Bt. 22-N	Bt. 21-N	Bt. 20-N	Bt. 19-N	Bt. 18-N	Bt. 17-N	Bt. 16-N	Bt. 15-N	Bt. 14-N	Bt. 13-N	Bt. 12-N	Bt. 11-N	Bt. 10-N	Bt. 9-N	Bt. 8-N	Bt. 7-N	Bt. 6-N	Bt. 5-N	Bt. 4-N	Bt. 3-N
Tie Plates	—	—	3/4"	3/4"	—	3/4"	3/4"	—	3/4"	3/4"	—	3/4"	3/4"	—	1"	1"	—	1"	1"	—	1"	1"	—	1"	1"
	℄	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS
Fill Plates G1	—	- 1/8"	- 3/16"	- 5/16"	- 3/8"	- 1/2"	- 9/16"	- 11/16"	- 3/4"	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- —	- —	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- 3/4"	- 5/8"	- 1/2"	- 3/8"
Fill Plates G2	—	- 1/8"	- 3/16"	- 5/16"	- 3/8"	- 1/2"	- 9/16"	- 11/16"	- 3/4"	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- —	- —	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- 3/4"	- 5/8"	- 1/2"	- 3/8"
Fill Plates G3	—	- 1/8"	- 3/16"	- 5/16"	- 3/8"	- 1/2"	- 9/16"	- 11/16"	- 3/4"	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- —	- —	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- 3/4"	- 5/8"	- 1/2"	- 3/8"
Fill Plates G4	—	- 1/8"	- 3/16"	- 5/16"	- 3/8"	- 1/2"	- 9/16"	- 11/16"	- 3/4"	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- —	- —	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- 3/4"	- 5/8"	- 1/2"	- 3/8"
Fill Plates G5	—	- 1/8"	- 3/16"	- 5/16"	- 3/8"	- 1/2"	- 9/16"	- 11/16"	- 3/4"	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- —	- —	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- 7/8"	- 3/4"	- 5/8"	- 1/2"	- 3/8"
Girder Size	45" Girders													54" Girders											

1. Field welds on prestressed girder bearing plates shall be painted with zinc rich paint conforming to federal Specifications MIL-P 26915 (U.S.A.F.) Type I.
2. All bearing plates are to be hot dipped galvanized after fabrication. Galvanizing sha be at a uniform rate of 2 oz. per sq.ft. of surface in accordance with ASTM specificatior A-123.
3. The cost of bearing assemblies, galvanizing o bearing assemblies and painting of field weld on bearing assemblies shall be included in th unit price bid for Lin. Ft. of Prestressed Concrete Girder.

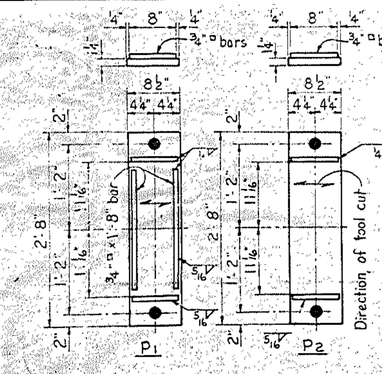
No fill plates required at Piers 1-N & S or Piers 2-N & S.

	Bt. 3-S	Bt. 4-S	Bt. 5-S	Bt. 6-S	Bt. 7-S	Bt. 8-S	Bt. 9-S	Bt 10-S	Bt. 11-S	Bt. 12-S	Bt. 13-S	Bt. 14-S	Bt. 15-S	Bt. 16-S	Bt. 17-S	Bt. 18-S	Bt. 19-S	Bt 20-S	Bt. 21-S	Bt. 22-S	Bt. 23-S	Bt. 24-S	Bt. 25-S	Bt. 26-S	Bt. 27-S	Bt. 28-S	Bt. 29-S	Bt. 30-S	Bt. 31-S	Bt. 32-S	E.B. 2
Tie Plates	—	—	—	—	—	—	—	—	—	—	—	—	3/4"	3/4"	—	3/4"	3/4"	—	3/4"	3/4"	—	3/4"	3/4"	—	3/4"	3/4"	—	3/4"	3/4"	—	—
	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	N6 FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	NS FS	℄
Fill Plates G1	3/8" -	1/2" -	5/8" -	3/4" -	7/8" -	7/8" -	7/8" -	7/8" -	7/8" -	7/8" -	7/8" -	— —	— —	7/8" -	7/8" -	7/8" -	3/4" -	1/16" -	9/16" -	1/2" -	3/8" -	5/16" -	3/16" -	1/8" -	— —	— —	— —	— —	— —	— —	—
Fill Plates G2	3/8" -	1/2" -	5/8" -	3/4" -	7/8" -	7/8" -	7/8" -	7/8" -	7/8" -	7/8" -	7/8" -	— —	— —	7/8" -	7/8" -	7/8" -	3/4" -	1/16" -	9/16" -	1/2" -	3/8" -	5/16" -	3/16" -	1/8" -	— —	— —	— —	— —	— —	— —	—
Fill Plates G3	3/8" -	1/2" -	5/8" -	3/4" -	7/8" -	7/8" -	7/8" -	7/8" -	7/8" -	7/8" -	7/8" -	— —	— —	7/8" -	7/8" -	7/8" -	3/4" -	1/16" -	9/16" -	1/2" -	3/8" -	5/16" -	3/16" -	1/8" -	— —	— —	— —	— —	— —	— —	—
Fill Plates G4	3/8" -	1/2" -	5/8" -	3/4" -	7/8" -	7/8" -	7/8" -	7/8" -	7/8" -	7/8" -	7/8" -	— —	— —	7/8" -	7/8" -	7/8" -	3/4" -	1/16" -	9/16" -	1/2" -	3/8" -	5/16" -	3/16" -	1/8" -	— —	— —	— —	— —	— —	— —	—
Fill Plates G5	3/8" -	1/2" -	5/8" -	3/4" -	7/8" -	7/8" -	7/8" -	7/8" -	7/8" -	7/8" -	7/8" -	— —	— —	7/8" -	7/8" -	7/8" -	3/4" -	1/16" -	9/16" -	1/2" -	3/8" -	5/16" -	3/16" -	1/8" -	— —	— —	— —	— —	— —	— —	—
Girder Size	54" Girders												45" Girders																	

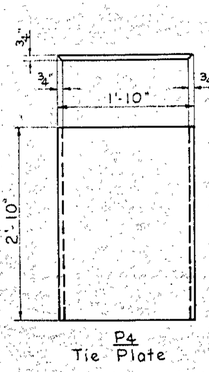
PLATES REQUIRED

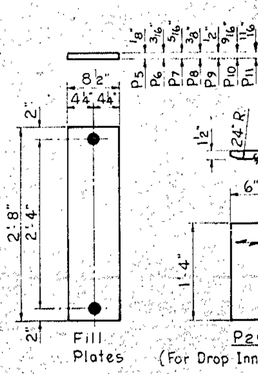
3 SPAN UNITS	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	
* 27 N	5	5	10																							
26-25-24 N	20	10	30	10	5	5	5																			45' Girders
23-22-21 N	20	10	30	10				5	5	5																
20-19-18 N	20	10	30	10							5	5	5													
17-16-15 N	20	10	30	10									15													
14-13-12 N														20	10	30	10	10								
11-10-9 N														20	10	30	10	15								
8-7-6 N														20	10	30	10	10	5							
5-4-3 N														20	10	30	10			5	5	5				
2N-1-2S															14	14							14	14	14	54' Girders
3-4-5S														20	10	30	10			5	5	5				
6-7-8S														20	10	30	10	10	5							
9-10-11S														20	10	30	10	15								
12-13-14S														20	10	30	10	10								
15-16-17S	20	10	30	10								1	15													
18-19-20S	20	10	30	10						5	5	5														
21-22-23S	20	10	30	10				5	5	5																
24-25-26S	20	10	30	10	5	5	5																			
27-28-29S	20	10	30	10																						
30-31-32S	20	10	30	10																						
* 33-S	5	5	10																							45' Girders
Totals	210	110	320	100	10	10	10	10	10	10	10	10	40	160	94	254	80	70	10	10	10	10	14	14	14	

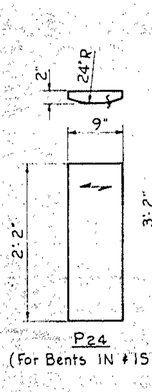
* Simple Span

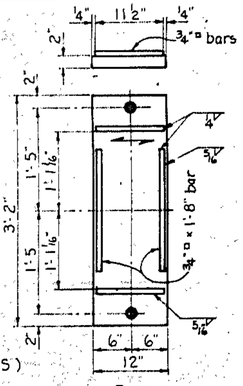


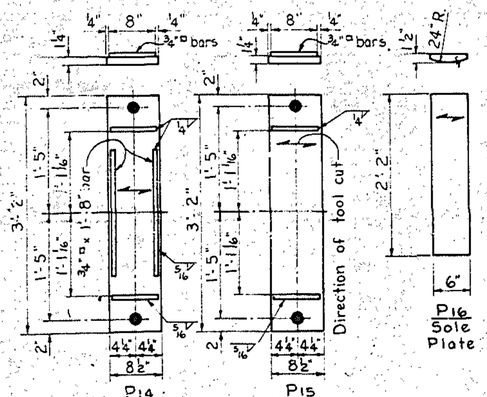
Note: All holes to be 1 3/4" ø

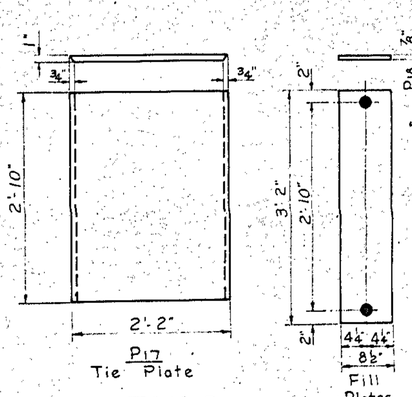


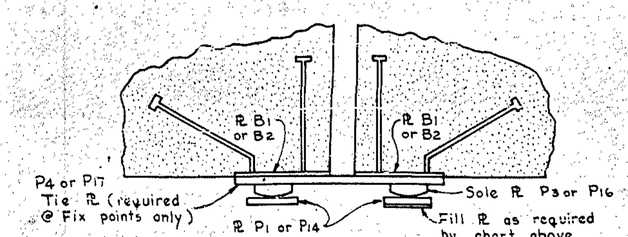


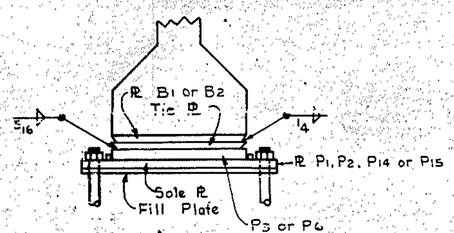












DRAWN BY Robert G. Gower DATE Nov. 1968
CHECKED BY [illegible] DATE Feb 1969

PROJECT NO. 8.2215302
CARTERET COUNTY
STATION: 211+20

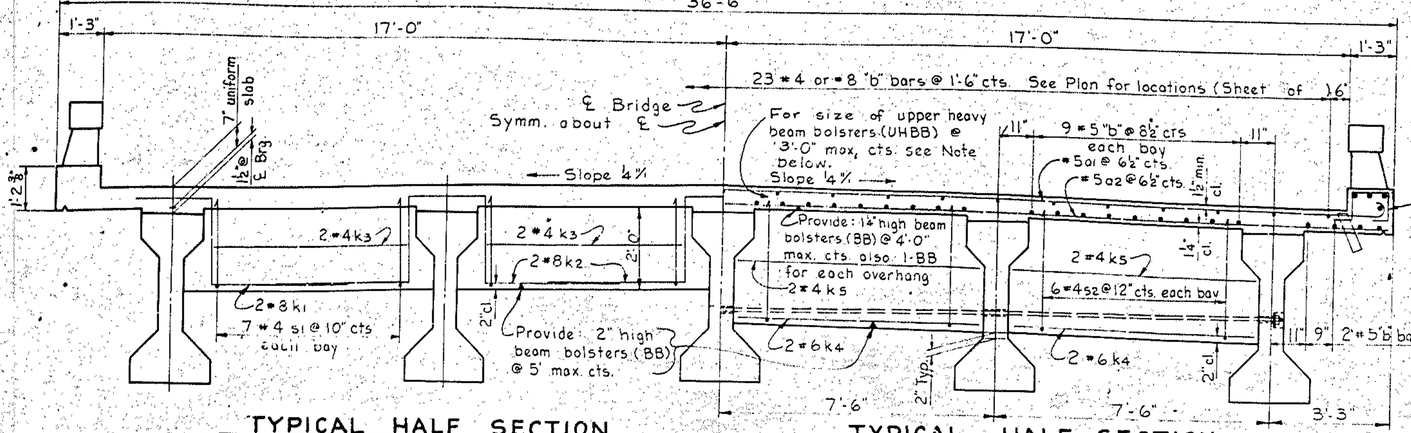
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

BEARING PLATE DETAILS

NOVEMBER 1968

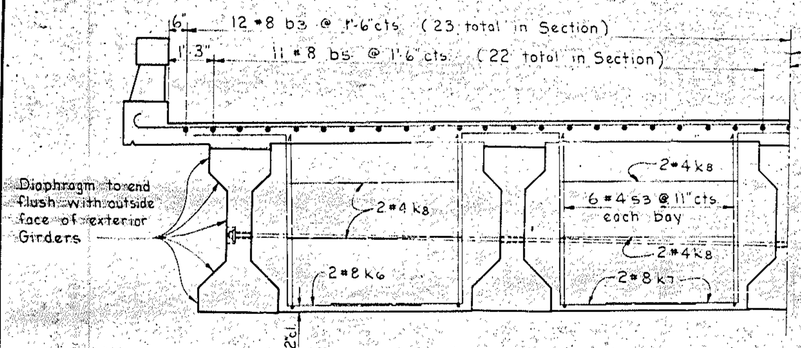
REVISIONS						SHEET NO. S-4
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS 41 256
1			3			
2			4			

BUILT ACCORDING TO PLANS



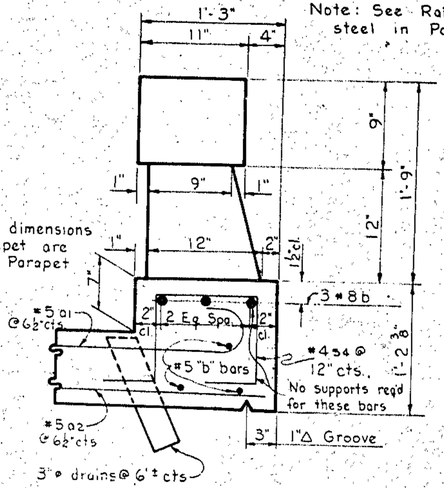
TYPICAL HALF SECTION
SHOWING BENT DIAPHRAGM @ EXPANSION JOINT

TYPICAL HALF SECTION
SHOWING INTERMEDIATE DIAPHRAGM



TYPICAL HALF SECTION
SHOWING BENT DIAPHRAGM @ FIXED END OF GIRDERS

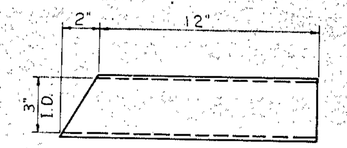
Note: When 'b' bars in top portion of slab are: #4 - use 1½" high UHBB; #6 - use 1¼" high UHBB; or #8 - use 1" high UHBB.



Note: See Rail Sheet for reinforcing steel in Posts and Rails.

Note: All clear dimensions shown in Parapet are from face of Parapet to 'b' bars.

SECTION THRU PARAPET



DRAIN DETAILS
No. Required : 720
Note: Drains shall be of PVC Plastic Pipe. See sheet S-N.
Top of Drains shall be set ⅜" below surface of slab.

NOTES

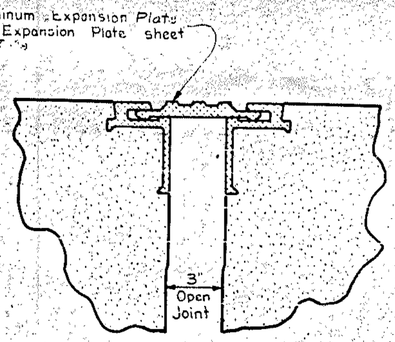
Assumed Live Load HS 15-44

For other Design Data and General Note, see sheet S-N.

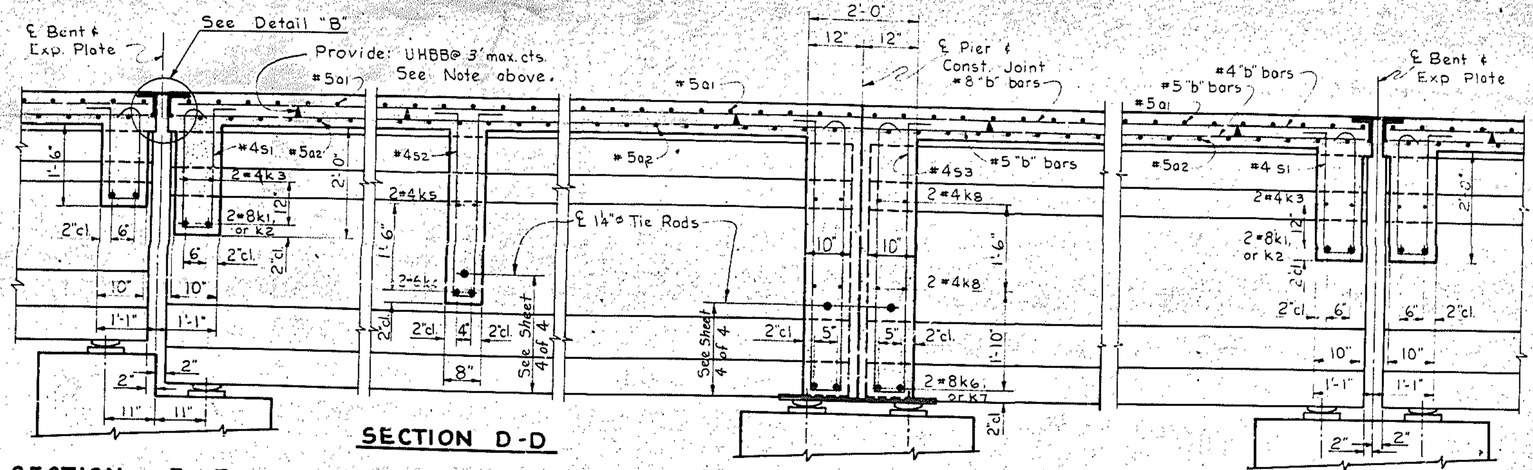
For bars indicated and no bar mark shown, see concrete plan for the different spans.

Temporary struts shall be placed between prestressed girders adjacent to the diaphragms, and the nuts on the 1¼"ø tie rods shall be tightened before the diaphragms are cast. Struts shall remain in place 3 days after concrete is placed. The tie rods shall be retightened after the struts have been removed.

FED. ROAD DIV. NO.	STATE	PROJ.
3	N.C.	8.221
F. A. PROJECT	S-16	64



DETAIL "B"



SECTION D-D

SECTION E-E
For Bent 14-N or 14-S

SECTION C-C

SECTION F-F

PROJECT NO. 8.2215302
CARTERET COUNTY
STATION: 211+20
Sheet 1 of 4

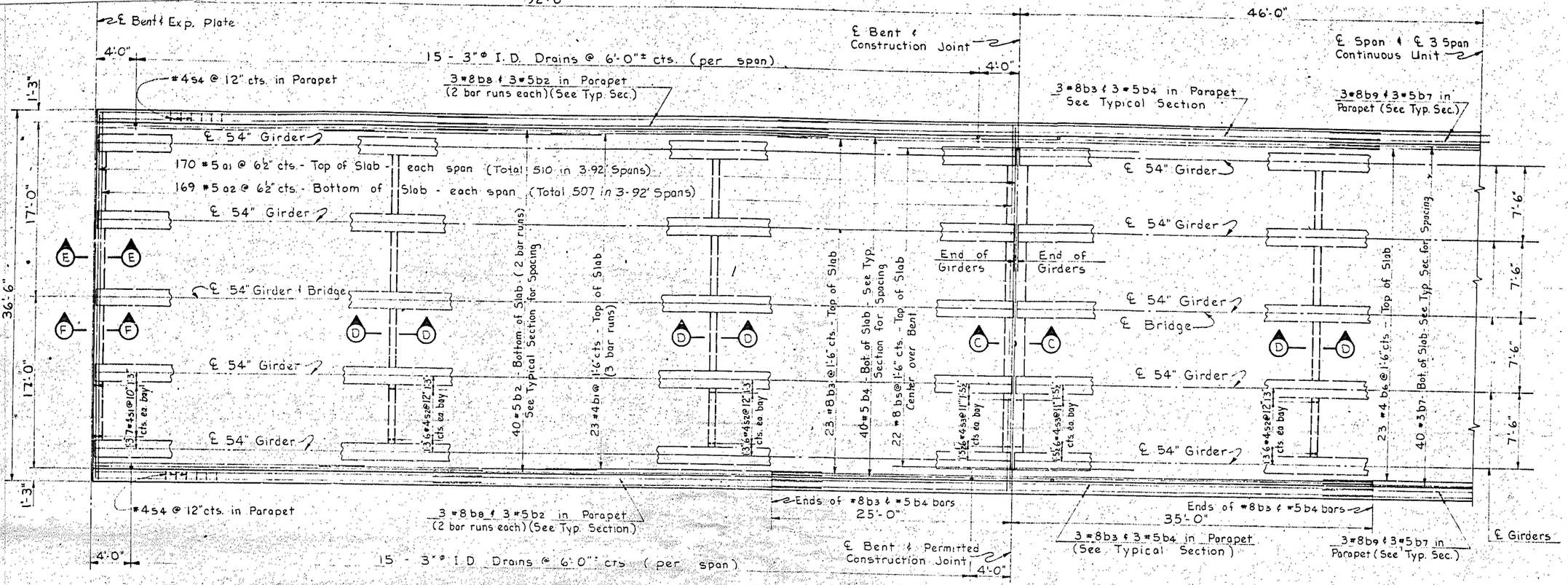
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
SUPERSTRUCTURE
TYPICAL SECTIONS
3 SPAN CONTINUOUS UNIT
92' SPANS - 54" GIRDERS
DECEMBER 1968

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S 19
1			3			TOTAL SHEETS
2			4			41 256

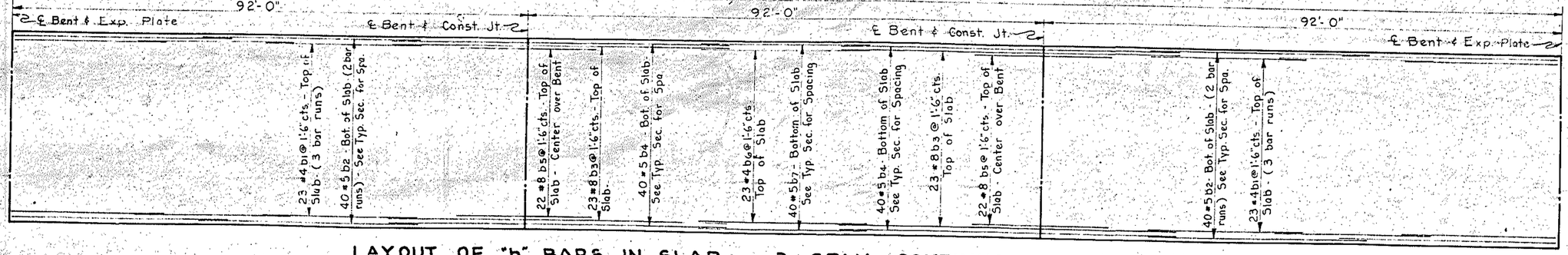
DRAWN BY Robert G. Gower DATE Dec. 1968
CHECKED BY [illegible] DATE Feb 1969

BUILT ACCORDING TO PLANS

SHEETS 41 256



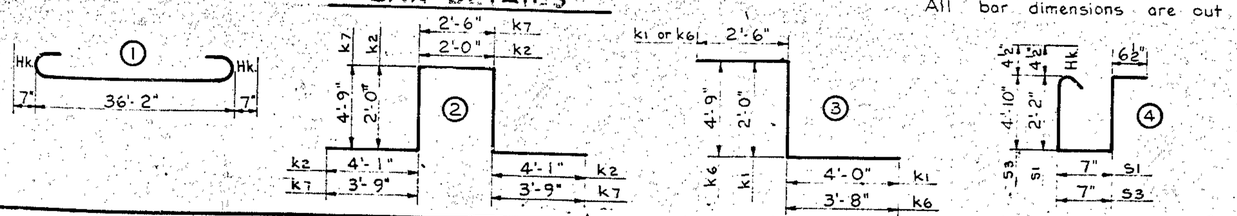
PLAN



LAYOUT OF "b" BARS IN SLAB — 3 SPAN CONTINUOUS UNIT

BAR DETAILS

All bar dimensions are out to out.



BUILT ACCORDING TO PLANS

DRAWN BY Robert G. Gower DATE Dec. 1968
CHECKED BY [illegible] DATE Feb 1969

BILL OF MATERI

For 3 SPAN CONTINUOU
8 REQUIRED

BAR	NO.	SIZE	TYPE	LENGTH
a1	510	#5	1	37'-4"
a2	507	#5	Str.	36'-2"
b1	138	#4	Str.	23'-7"
b2	184	#5	1	35'-3"
b3	58	#8		60'-0"
b4	92	#5		60'-0"
b5	44	#8		24'-0"
b6	23	#4		24'-6"
b7	46	#5		25'-6"
b8	24	#8	1	36'-0"
b9	6	#8	Str.	27'-0"
k1	8	#8	3	8'-6"
k2	12	#8	2	14'-2"
k3	16	#4	Str.	5'-3"
k4	48	#6	Str.	6'-8"
k5	48	#4	Str.	6'-8"
k6	16	#8	3	10'-11"
k7	24	#8	2	19'-6"
k8	64	#4	Str.	4'-9"
s1	56	#4	4	5'-10"
s2	144	#4	5	7'-9"
s3	96	#4	4	11'-2"
s4	552	#4	6	4'-4"

Reinforcing Steel Lbs.
Class "AA" Concrete Cu. Yds.
Table Below

CLASS "AA" CONCRETE

Span 3 N&S	Span 4 N&S	Span 5
91.7 Cu. Yds	94.7 Cu. Yds	91.7 C
Total One 3 Span Unit 278.1 C		
Span 6 N&S	Span 7 N&S	Span 8
91.7 Cu. Yds	93.3 Cu Yds	90.3 C
Total One 3 Span Unit 275.3 C		
Span 9 N&S	Span 10 N&S	Span 11
90.3 Cu Yds	93.3 Cu Yds.	90.3 C
Total One 3 Span Unit 273.9 C		
Span 12 N&S	Span 13 N&S	Span 14
90.3 Cu Yds	93.3 Cu Yds.	90.3 C
Total One 3 Span Unit 273.9 C		

F. A. PROJECT S-16

PROJECT No. 8.221530
CARTERET COUN
STATION: 211+20
Sheet 2 of 4

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSIO
RALEIGH
SUPERSTRUCTURE - PLA
3 SPAN CONTINUOUS UNI
92' SPANS - 54" GIRDE

DECEMBER 19

REVISIONS						SH
NO.	BY	DATE	NO.	BY	DATE	TO CH
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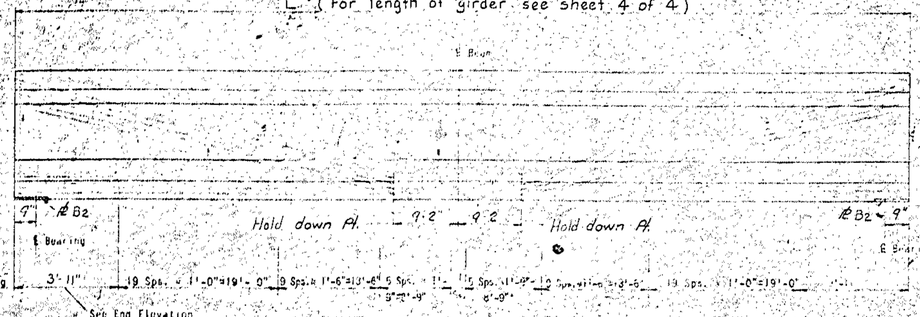
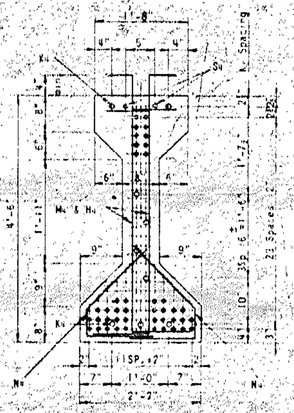




3	N.C.	8.2215
F.A. PROJECT	S-16 64	

... must be cut off flush with end of girder and painted as noted below.

2. Ends of cables and field welds on prestressed girder bearings shall be painted with zinc rich paint conforming to federal specifications MIL-P. 26915 (U.S.A.F.) Type I.
3. Embeded plates are to be hot dipped galvanized after fabrication. Galvanizing shall be at a uniform rate of 2 oz per sq. ft. of surface in accordance with A.S.T.M. Specification's A-123.
4. The cost of bearing assemblies, 1¼"⌀ tie rod assembly, galvanizing of bearing assemblies and painting of cable ends and field welds on bearing assemblies shall be included in the unit price bid for lin. ft. of Prestressed Concrete Girder.

ELEVATION OF PRESTRESSED BEAM

NOTE: For Bearing Plate Details see Bearing Plate Details Sheet. S-18

BILL OF REINFORCING STEEL FOR ONE BEAM

MARK	No. Req.	SIZE	LENGTH	BENDING	WEIGHT
H4	16	6	5'-11"	See Diagram	142
L4	136	4	5'-11"	"	538
K4	18	4	4'-6"	Straight	54
V4	20	6	8'-7"	See Diagram	179
N3	40	3	3'-8"		55
S4	4	5	46'-9"	Straight	195
GRID	1*	3	5'-4"	See Diagram	2

BENDING DIAGRAMS

Location: @ 5"⌀ open hole for Tie Rods in Exterior Girders only.

* At Exterior Beams only

Note: All bar dimensions are out to out.

1¼"⌀ TIE ROD (Required: 80 Complete Assemblies)

END VIEW

(38-10) ½"⌀ S.R. Strands 25,200 lbs.

END ELEVATION

Note: Construct end of beam as indicated. See table for x dimension Sheet 4 of 4

END PLAN

(42-10) ½"⌀ S.R. Strands 25,200 lbs.

42 STRANDS 5 ROWS

MID SPAN SECTION

NOTES:

1. All reinforcing steel shall be included in the contract unit price for prestressed beams.
2. All prestressing strand shall meet the requirements of A.S.T.M.-A-416.
3. Cables must be cut off flush with end of girder.
4. No surface finish will be required for prestressed concrete girders. However the outside face of the exterior girders shall be carefully cleaned of drippings and other discolorations. See Specifications.
5. SHOP DRAWINGS: Contractor shall submit Shop Drawings showing complete details of beams including reinforcing steel.
6. BEAM LENGTHS: Beam lengths shown include the following amount to compensate for elastic shortening: 1/2"
7. FORMS & PALLETS: All beams shall be cast on concrete floored pallets and metal forms.
8. CYLINDER STRENGTH: At transfer of tensioning load, the cylinder strength of concrete shall be 4,000 p.s.i., at 28 days 5000 p.s.i.
9. HANDLING: In the handling of beams, they must be maintained in an upright position at all times and must be picked from points located at maximum distance of 3'- 6" from end of beam. Disregard of this requirement may lead to collapse of the member.
10. Concrete fins or projections shall be removed to produce a vertical face at the top edge of the beam.

12. All prestressed strands shall be ½" 7-wire stress relieved cables and shall have the following properties: Ultimate strength 36,000 lbs per cable; applied prestress 25,200 lbs. per cable. The cables shall meet all requirements listed under section 207-A of the standard specification.
13. Shop plans for Prestressed Conc. Girders shall show a complete detensioning schedule (burning patern and when to release hold down points) such as to minimize tension in the concrete during release of the strands. Detailed concrete stresses during each operation of detensioning shall be submitted with shop plans.

BEAM DEFLECTION TABLE

	Ext. Beams	Int. Beams
A	1⅜" ↑	1⅜" ↑
B	15/16" ↓	13/16" ↓
C	7/16" ↑	9/16" ↑

A = Expected camber due to prestress and dead load of beam
B = Expected deflection due to dead load slabs, diaph., curbs and handrails
C = Final camber

Note: Spans 3, 4, 5, 6 & 7 have an up Vertical Curve Ordinate of ⅞".

NOTE: Break bond with non-corrosive material on the following strands at each end of the beam. Unbonded length shall be 12" on half of the strands listed and 24" on other strands listed. Row number begin at bottom of beam. Unbonding shall be symmetrical about ℄ of beam.

6 Strands in row No.1
4 Strands in row No.2
4 Strands in row No.3
2 Strands in row No.4

TYPICAL DETAIL OPENING FOR DIAPHRAGM BAR AT EXTERIOR BEAM ONLY

NOTE: Tighten nut firmly after concrete in diaphragm is 48 hours old.

SECTION (A)

BUILD-UP OVER BEAM

BUILT ACCORDING TO PLANS

* Does not include weight of Grid Steel
** See table on Sheet 4 of 4

QUANTITIES FOR ONE GIRDER			GIRDERS REQUIRED		
Reinf. Steel	5000 psi Concrete	½" S.R. Strands No.	No.	Length	Total Length
1,176 lbs	21.62 Cu. Yds.	[illegible]	120	[illegible]	11,012.0 Lin. Ft.

PROJECT NO. 8.2215302

CARTERET COUNTY

STATION: 211+20

Sheet 3 of 4

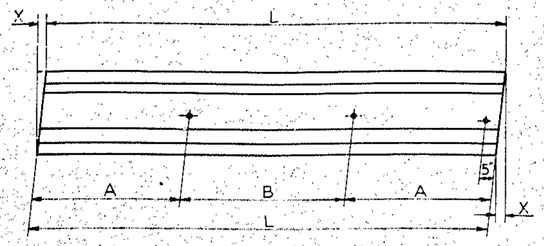
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

PRESTRESSED GIRDER SPANS
THRU NO. 14 NORTH & SOUTH
92' SPANS 54" GIRDERS

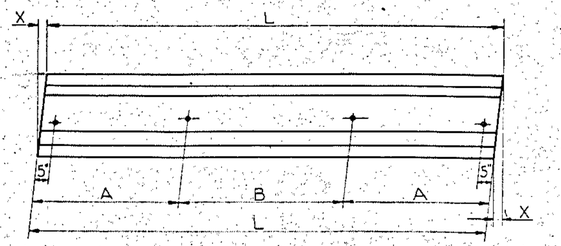
SHEET NO. 53
TOTAL SHEETS 256

SHEET NO. ~~S-22~~ 54
TOTAL SHEETS ~~4~~ 256

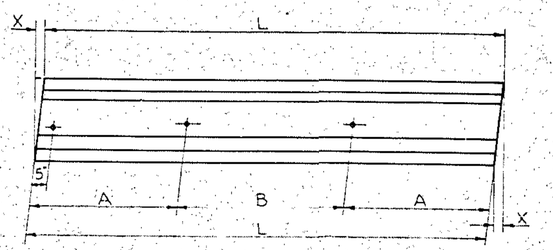
F.A.D. ROAD DIV. NO.	STATE	PROJ.
3	N. C.	8.221
F. A. PROJECT	S-16 64	



SPANS: 5, 8, 11, & 14 N & S



SPANS: 4, 7, 10, & 13 N & S

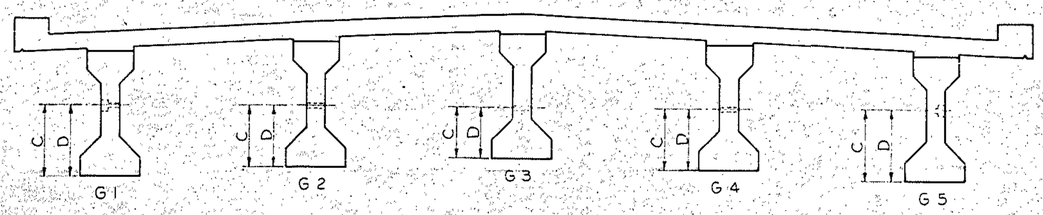


SPANS: 3, 6, 9 & 12 N & S

91.781-1.5 = 90.281

SPAN	"L"	"A"	"B"	"X"
7 thru 14 N & S	91'-9 3/8"	29'-10 1/16"	32'-0"	2 1/8"
6 N & S	91'-9 1/8"	29'-10 9/16"	32'-0"	1 3/4"
5 N & S	91'-8 7/8"	29'-10 7/16"	32'-0"	1 5/8"
4 N & S	91'-8 3/4"	29'-10 3/8"	32'-0"	1 1/8"
3 N & S	91'-8 5/8"	29'-10 5/16"	32'-0"	3/4"

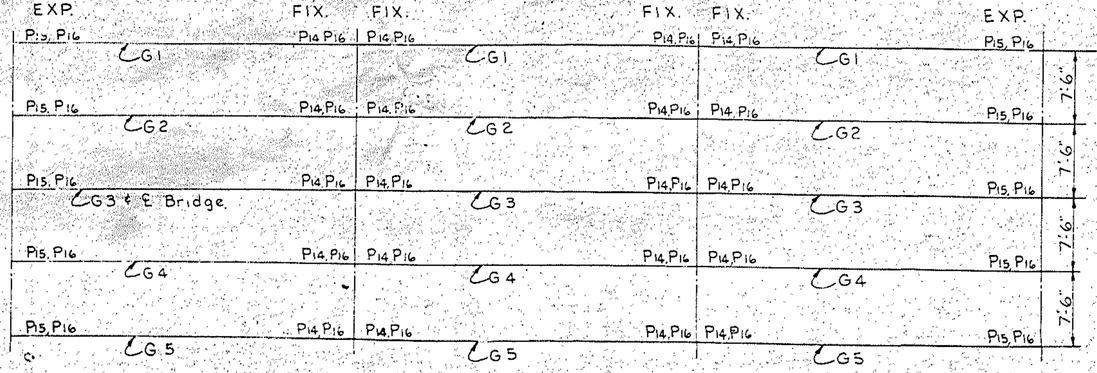
GIRDER	"C" DIMENSION	"D" DIMENSION
G1 & G5	2'-4 1/4"	2'-0 1/8"
G2 & G4	2'-2 3/8"	1'-11"
G3	2'-0 1/2"	1'-9 1/8"



ELEVATION AND SECTION OF GIRDERS SHOWING LOCATION OF HOLES FOR TIE RODS AT INTERMEDIATE DIAPHRAGMS AND FIXED END OF GIRDERS

"C" Dimension is at Intermediate Diaphragm
"D" Dimension is at Fixed End of Girder

90.2396 Back to Back



SPANS: 5, 8, 11, & 14 N & S SPANS: 4, 7, 10 & 13 N & S SPANS: 3, 6, 9 & 12 N & S

BEARING PLATE LAYOUT FOR 3 SPAN CONTINUOUS UNIT - 92' SPANS

PROJECT NO. 8.2215302
CARTERET COUNTY
STATION: 211+20
Sheet 4 of 4

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

PRESTRESSED BEAMS SPANS NO. 3 THRU NO. 14 N & S 92' SPANS - 54" GIRDERS

DECEMBER 1968

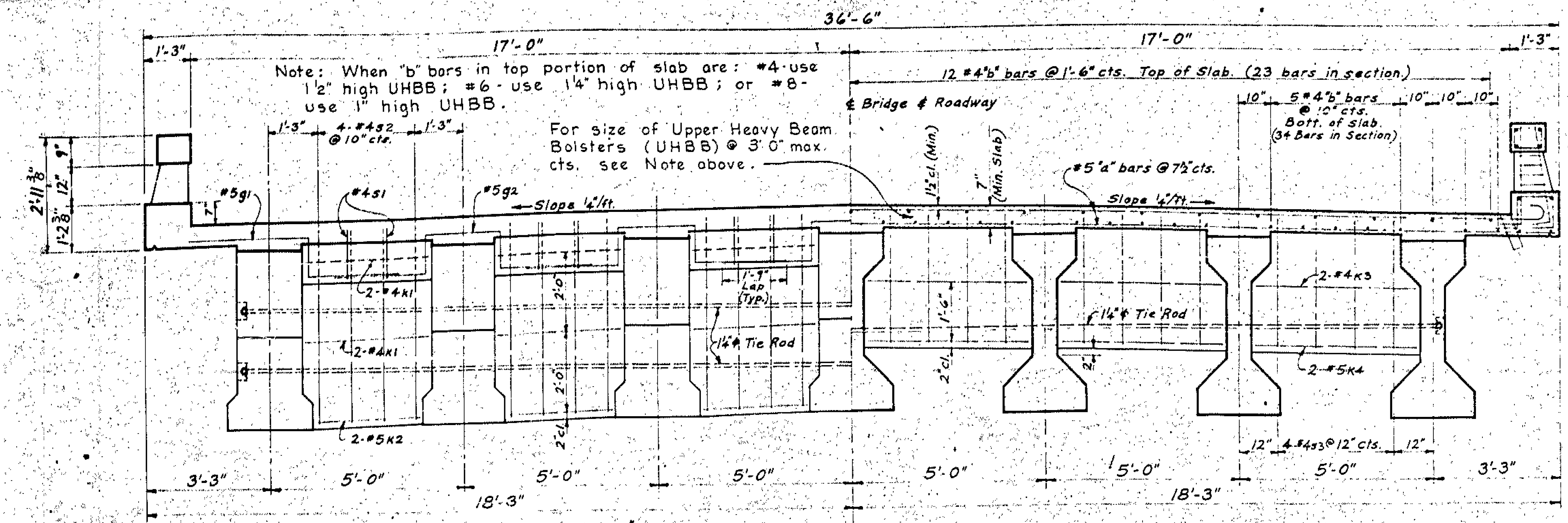
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-22
1			3			TOTAL SHEETS
2			4			44
						236

DRAWN BY: Robert G Gower DATE: Dec. 1968
CHECKED BY: [illegible] DATE: Feb 1969

SOUTHLAND BLUE PRINT CO., CHARLOTTE, N. C.

BUILT ACCORDING TO PLANS

8	N.C.	8.221530	
F.A. PROJECT	S-16	64(2)	



HALF END ELEVATION OF DROP-IN SPAN

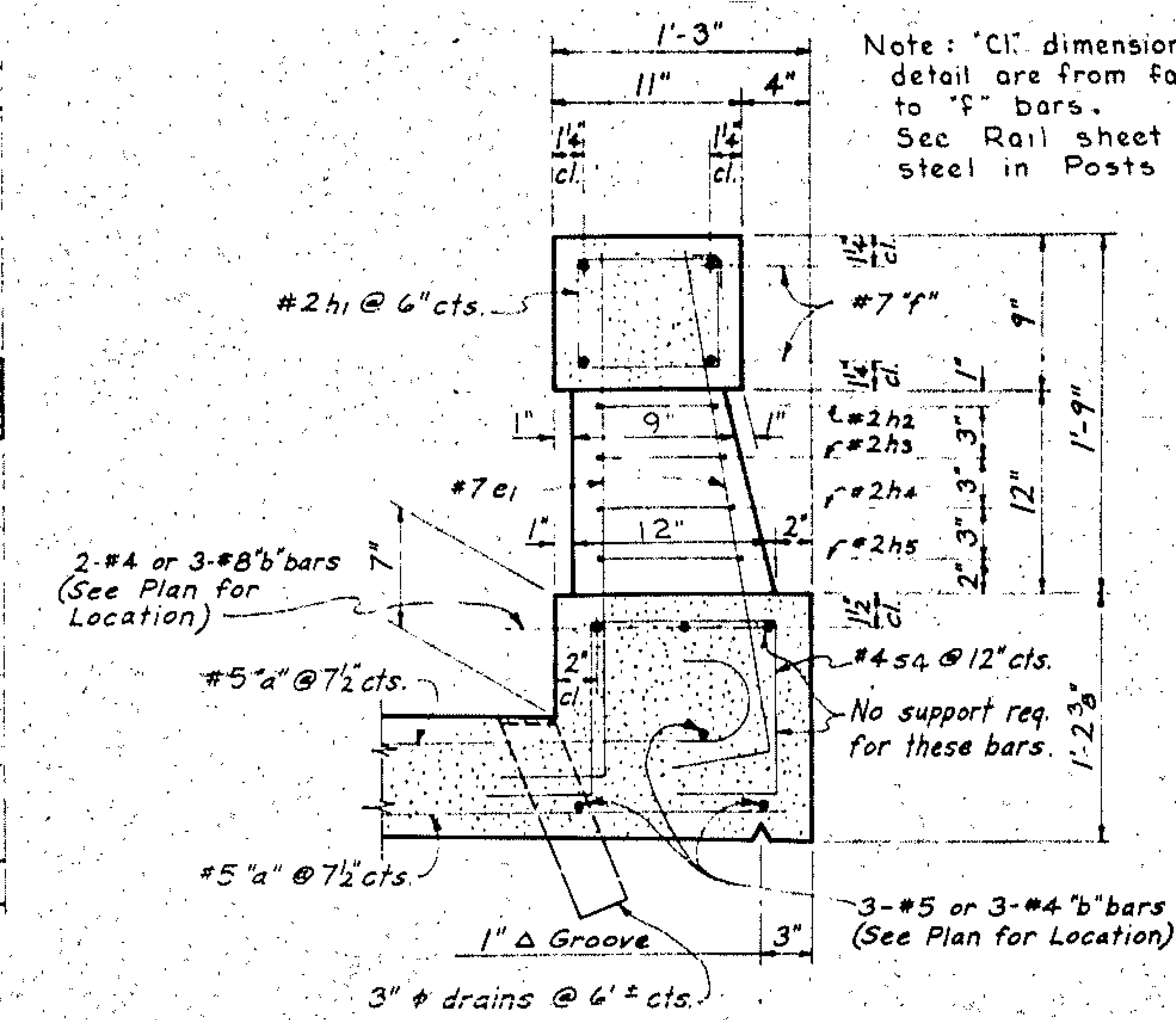
@ DIAPHRAGM NO. 1

(SEE VIEW D-D SHEET 2 OF 6)

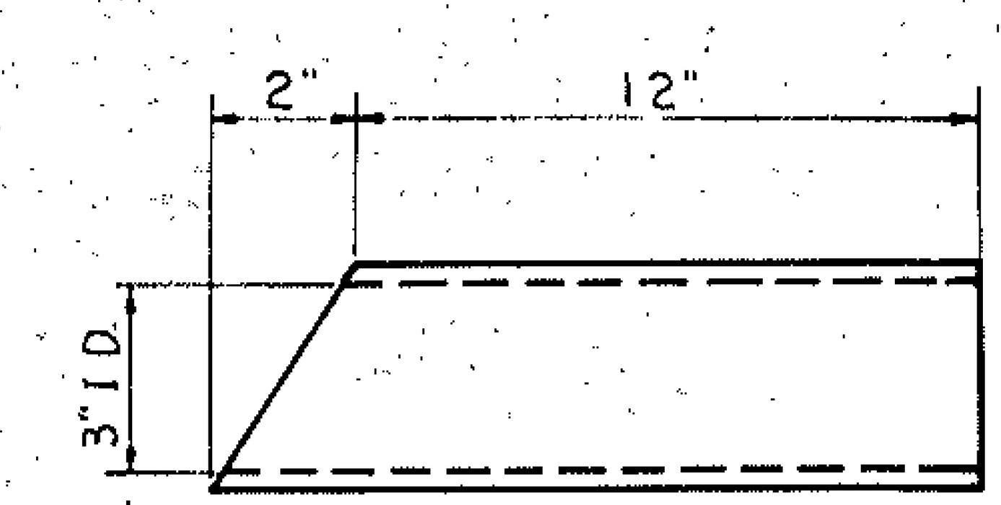
HALF SECTION @ DIAPH. No. 2 & 4

(SEE VIEW E-E SHEET 2 OF 6 & 3 OF 6)

Note: "Cl." dimensions in rail detail are from face of rail to "f" bars.
See Rail sheet for reinforcing steel in Posts and Rail.

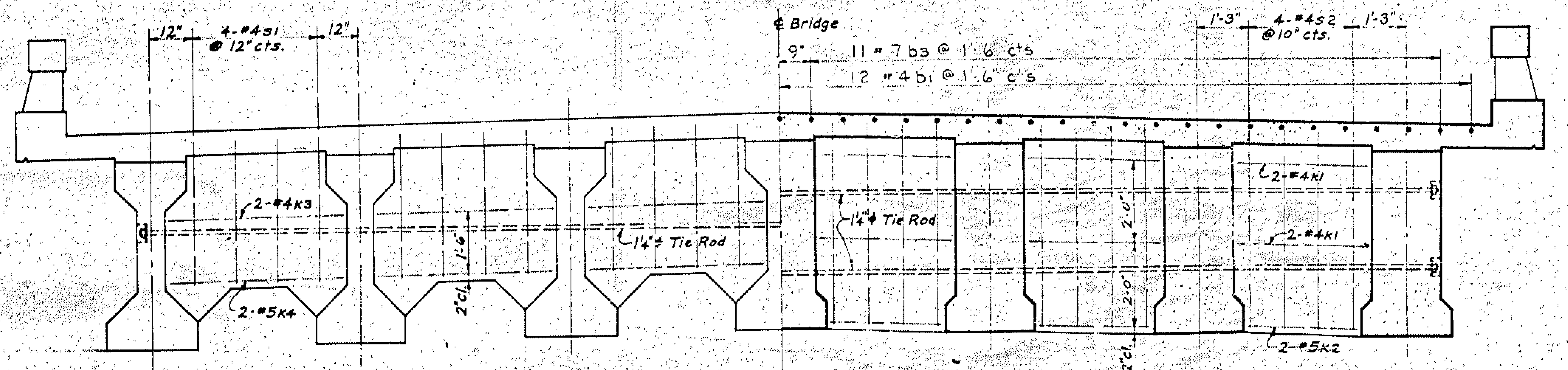


SECTION THRU RAIL & PARAPET



No. Reqd: 108

Note: Drains shall be of PVC Plastic Pipe. See S-N Sheet.
Top of Drains shall be set ⅜" below surface of slab.

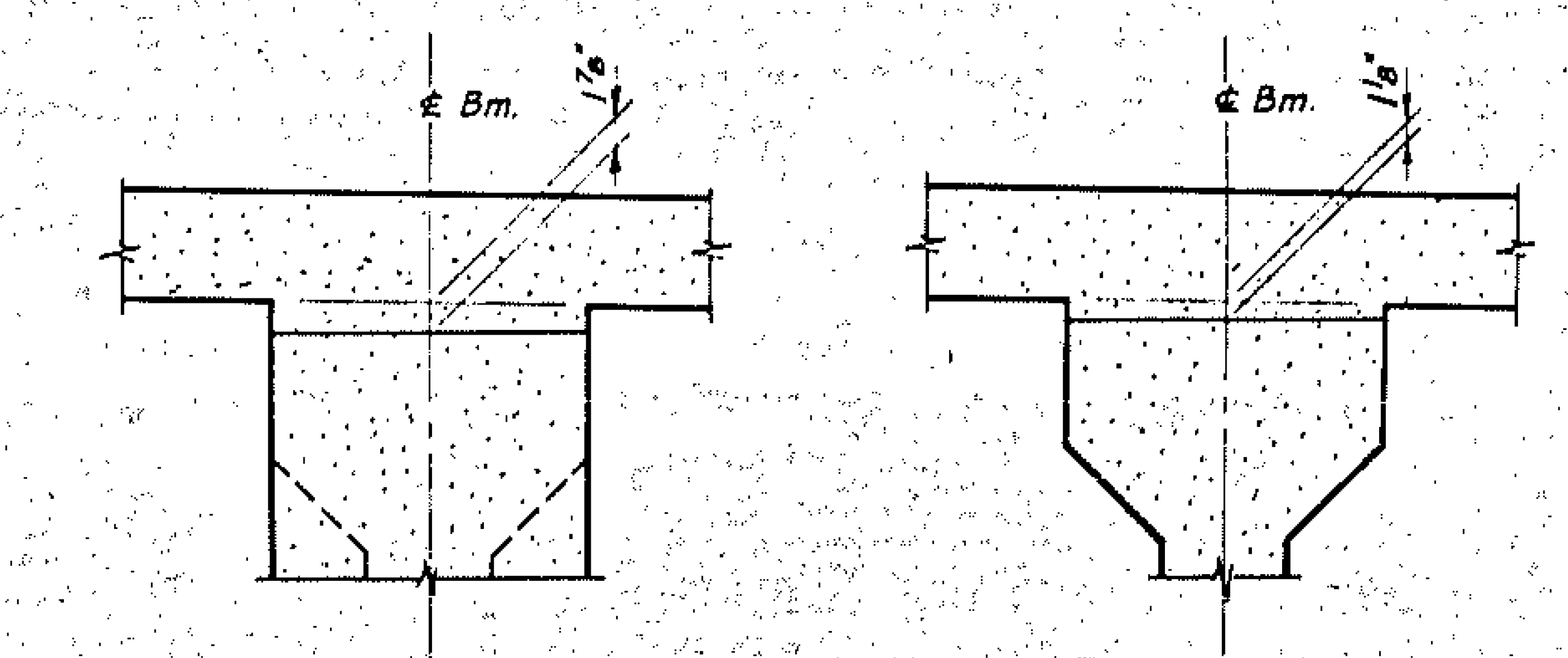


HALF END ELEVATION @ DIAPH. No. 3

(SEE VIEW C-C SHEET 3 OF 6)

HALF SECTION @ DIAPH. No. 5

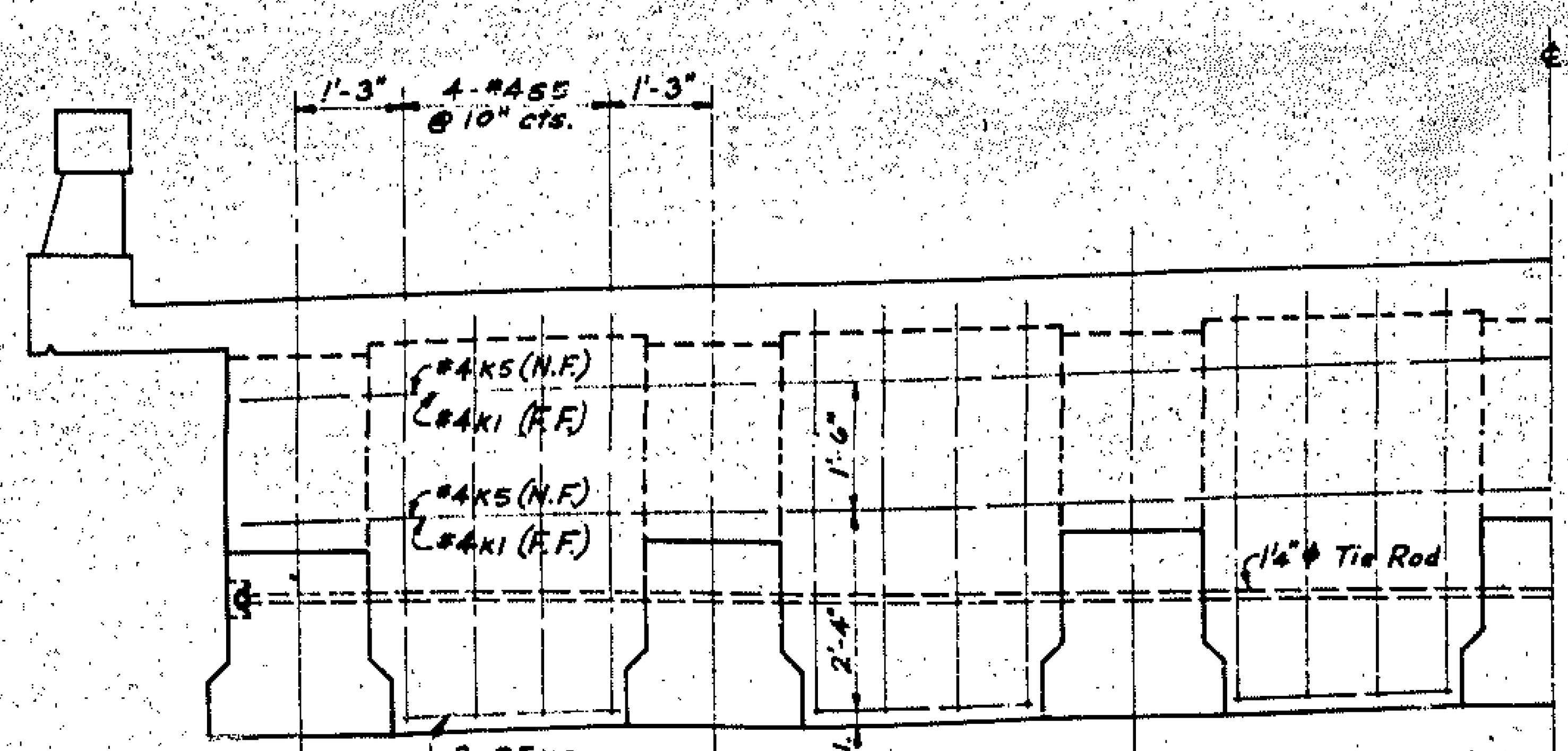
(SEE VIEW B-B SHEET 3 OF 6)



SECTION @ ℄ BEARING

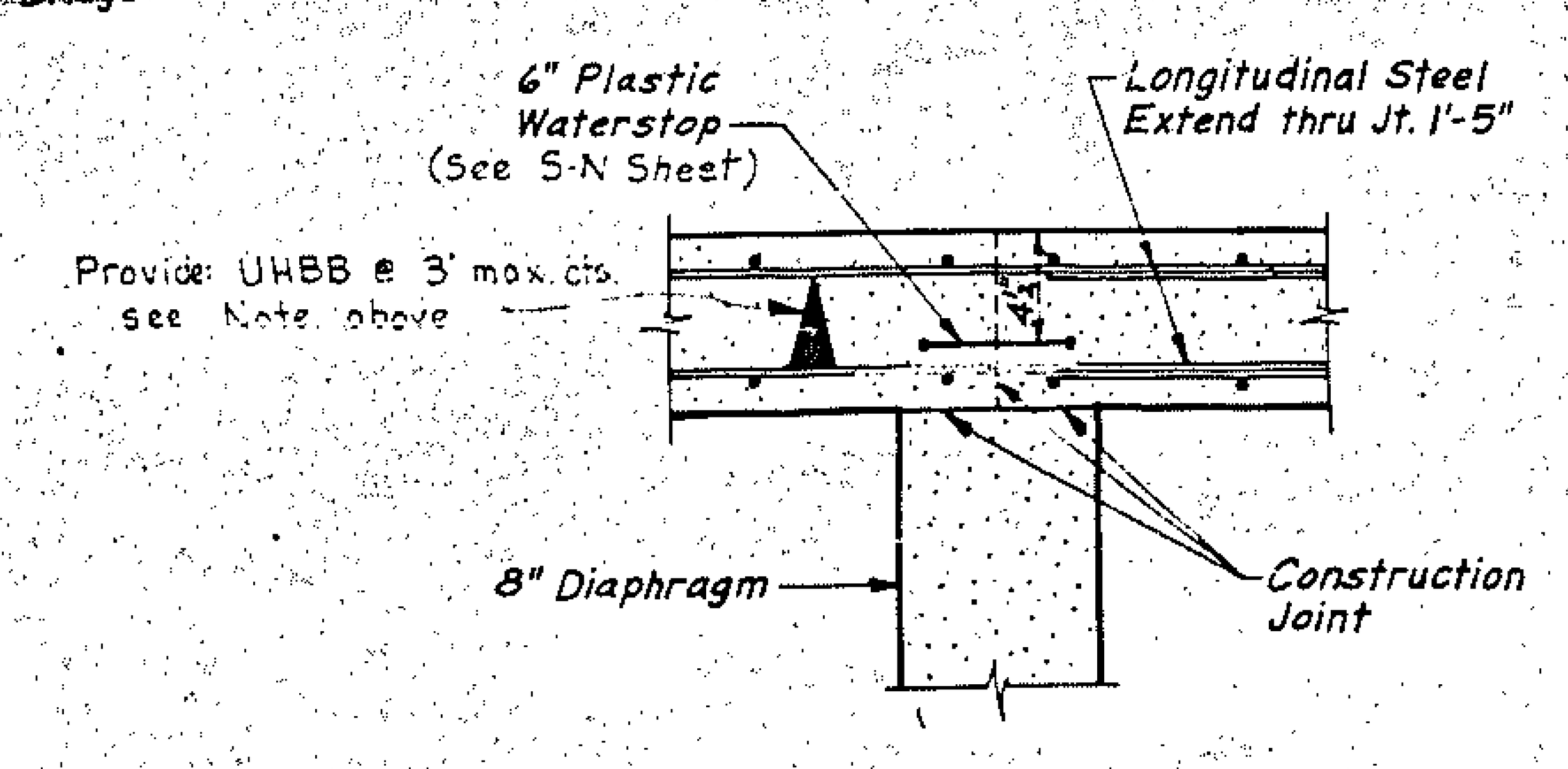
SECTION @ MID-SPAN

ESTIMATED BUILD-UPS FOR DROP-IN SPAN



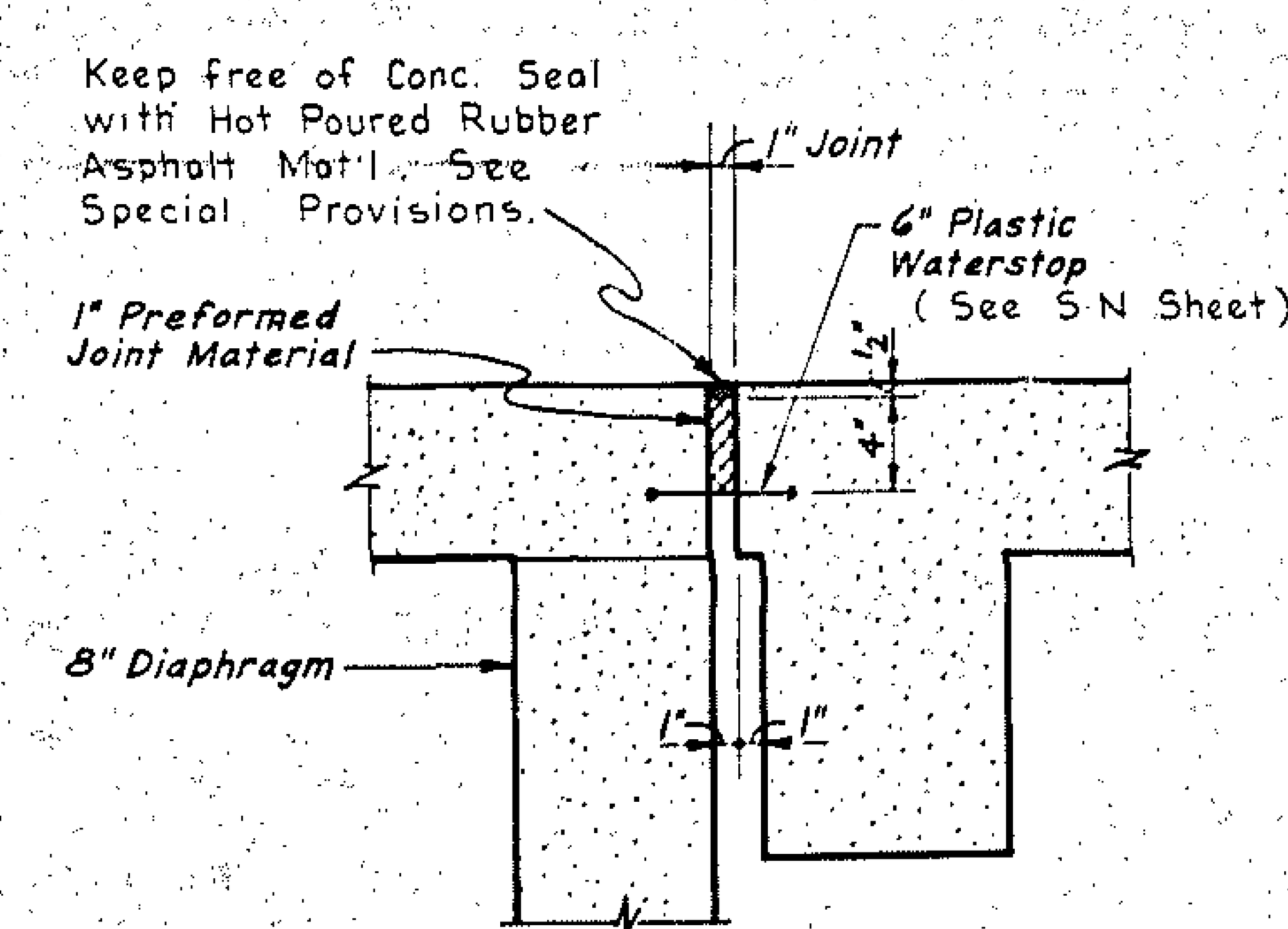
HALF END ELEVATION @ DIAPH. No. 6

(SEE VIEW A-A SHEET 3 OF 6)



DETAIL "A-A"

Construction Joint Detail.
@ Section C-C



DETAIL "B-B"

PROJECT No. 8.2215302

CARTERET COUNTY

STATION: 211+20

Sheet 1 of 6

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

TYPICAL SECTIONS
& DETAILS
FOR SPANS No. 1 & 2

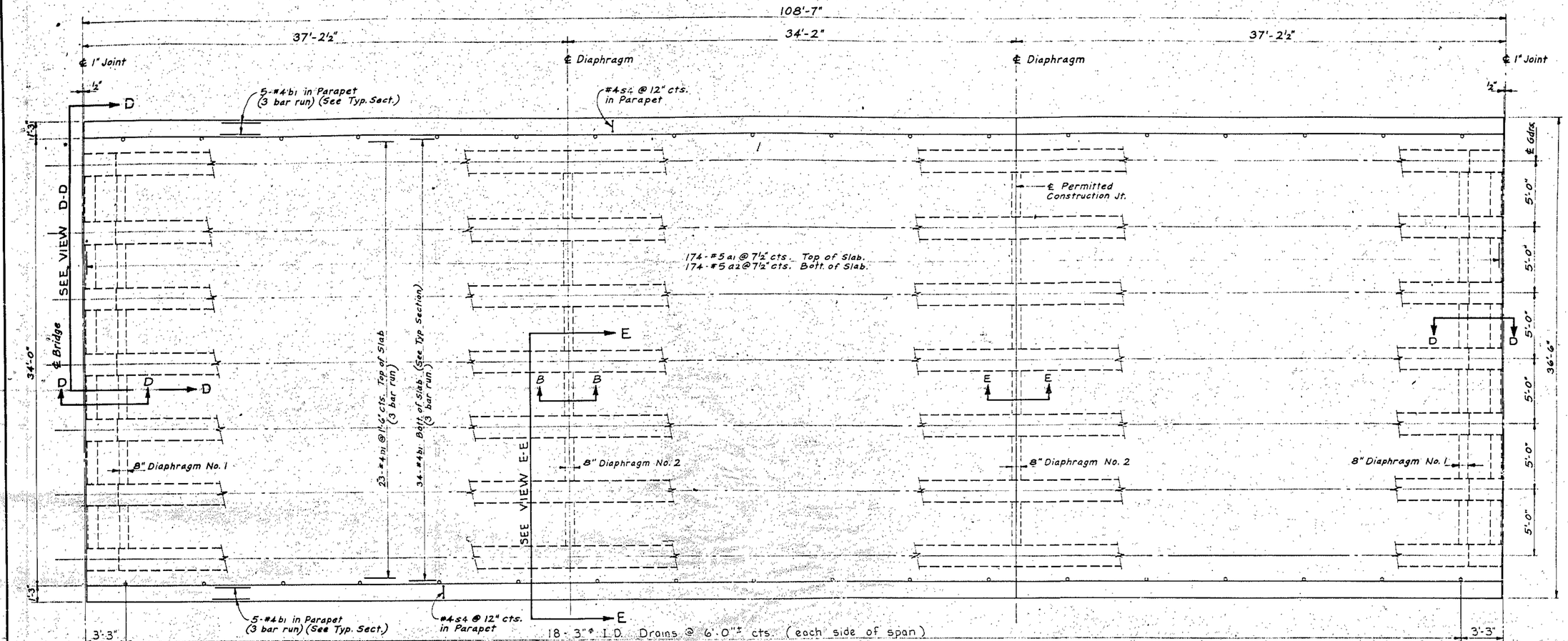
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. 55 ~~S-23~~
TOTAL SHEETS ~~41~~ ~~236~~ ~~236~~ 256

DRAWN BY Dewey Phillips DATE Nov. 1968
CHECKED BY [illegible] DATE Feb. 1969

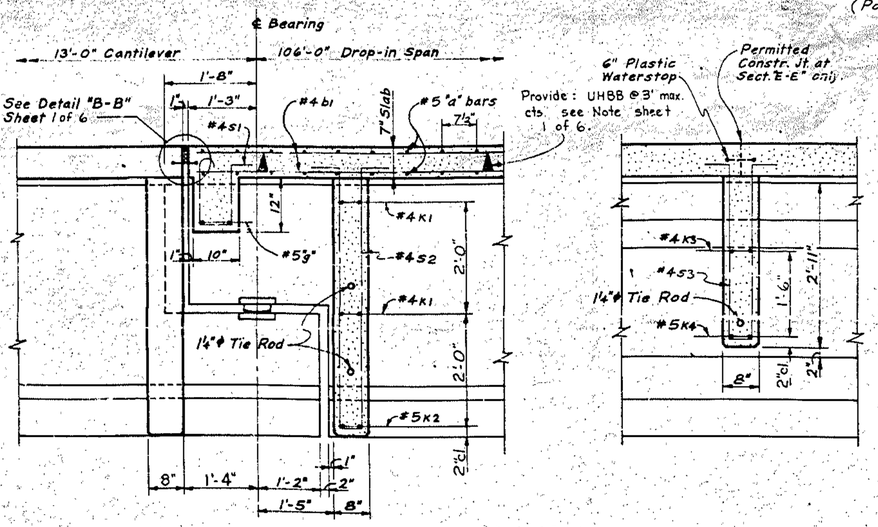
BUILT ACCORDING TO PLANS

FED. ROAD DIV. NO.	STATE
3	N. C.
F. A. PROJECT	S-16



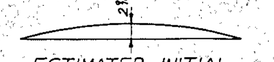
PLAN - DROP-IN SPAN

(Post & Rail not shown)

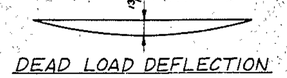


SECTION D-D

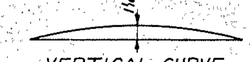
SECTION B-B & E-E



ESTIMATED INITIAL BEAM CAMBER

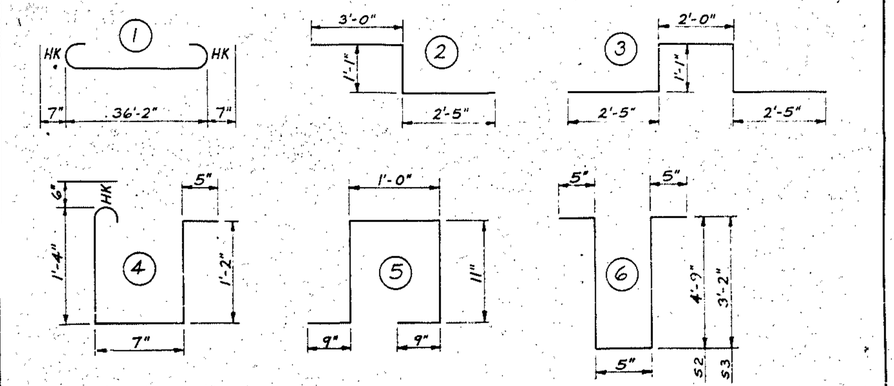


DEAD LOAD DEFLECTION FROM SLAB POUR



VERTICAL CURVE CORRECTION

BAR DETAILS



All bar dimensions are out to out. BUILT ACCORDING TO PLANS

BILL OF MATERI

DROP-IN SPAN

BAR	NO.	SIZE	TYPE	LENGT
a1	174	#5	1	37'-
a2	174	#5	Str.	36'-
b1	201	#4	Str.	36'-1
g1	8	#5	2	6'-6
g2	20	#5	3	9'-0
k1	48	#4	Str.	3'-0
k2	24	#5	Str.	2'-6
k3	24	#4	Str.	4'-0
k4	24	#5	Str.	4'-0
s1	24	#4	4	4'-0
s4	218	#4	5	4'-4
s3	48	#4	6	7'-7
s2	48	#4	6	10'-9

Reinforcing Steel, Lbs.
Class "AA" Concrete, Cu. Yds.
54" Prestressed Conc. Gdrs.,

PROJECT No. 8.22153

CARTERET Co

STATION: 211+20

Sheet 2 of 6

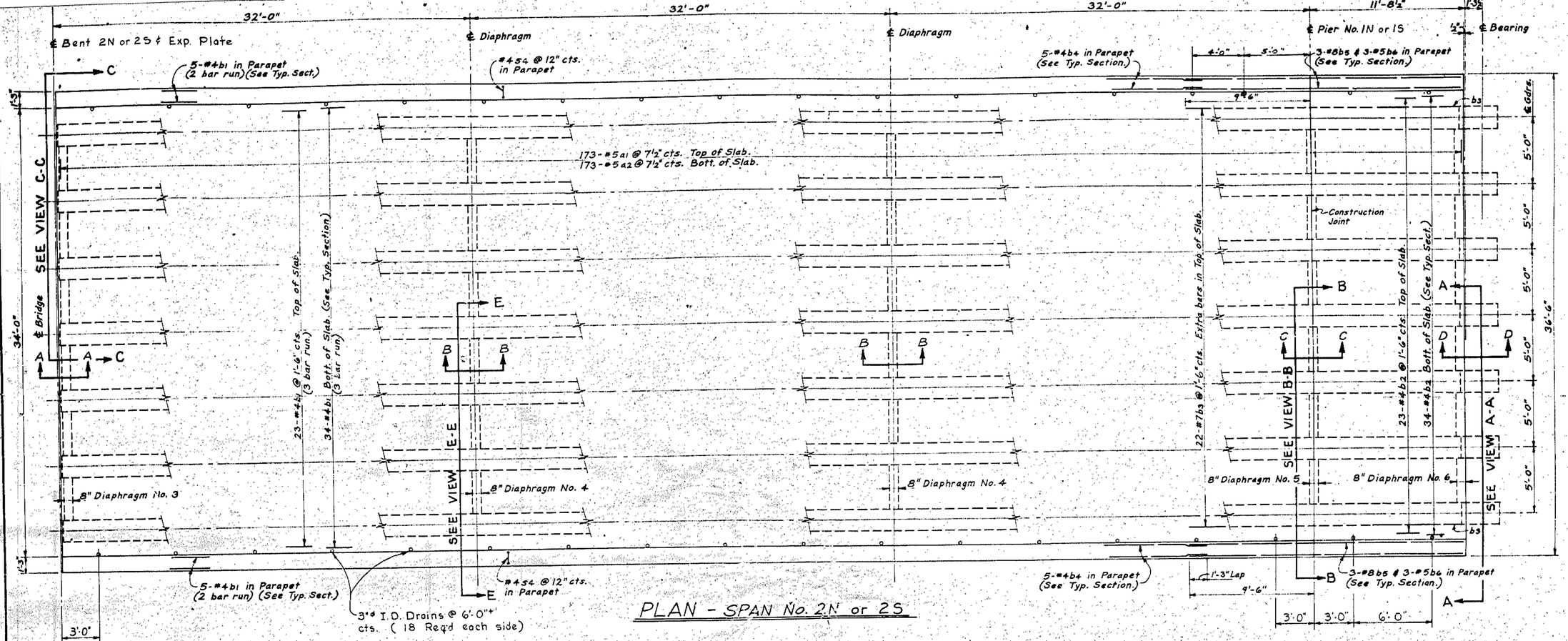
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSI
RALEIGH

SUPERSTRUCTURE
SPAN No. 1

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

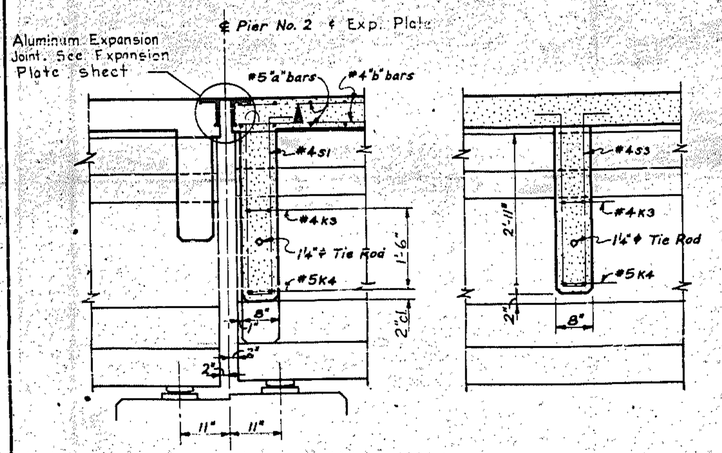
DRAWN BY Dewey Phillips DATE Nov. 1968
CHECKED BY [illegible] DATE Feb. 1969

SOUTHERLAND BLUE PRINT CO. CHARLOTTE, N. C.



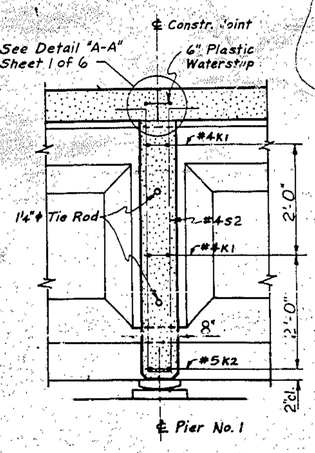
PLAN - SPAN No. 2N or 2S

Provide: UHBB @ 3' max. cts. see sheet 1 of 6 Note.

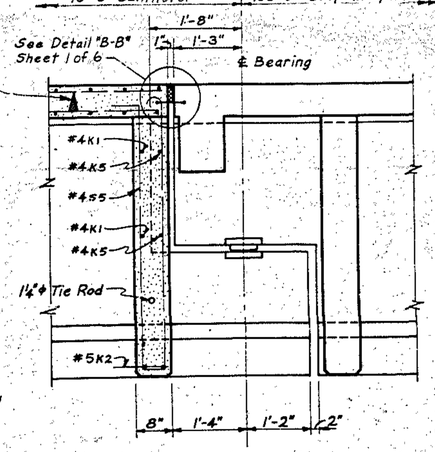


SECTION A-A

SECTION B-B



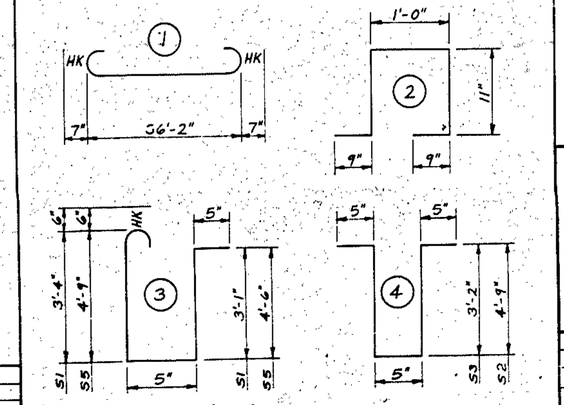
SECTION C-C



SECTION D-D

BAR DETAILS

All bar dimensions are out to out.



BUILT ACCORDING TO PLANS

BILL OF MATERIAL FOR ONE SPAN (

BAR	NO.	SIZE	TYPE	LEN.
a1	173	#5	I	37
a2	173	#5	Str.	36
b1	191	#4	Str.	33
b2	57	#4	Str.	11'
b3	22	#7	Str.	21'
b4	10	#4	Str.	23
b5	6	#8	Str.	21'
b6	6	#5	Str.	21'
k1	36	#4	Str.	3'
k2	24	#5	Str.	2'
k3	36	#4	Str.	4'
k4	36	#5	Str.	4'
k5	2	#4	Str.	31'
s1	24	#4	3	7'
s4	216	#4	2	4'
s3	48	#4	4	7'
s2	24	#4	4	10'
s5	24	#4	3	10'

Reinforcing Steel, Lbs.
Class "AA" Concrete, Cu. Yd.
54" Prestr. Conc. Girders,

PROJECT NO. 8.2215
CARTERET C
STATION: 211+20
Sheet 3 of 6

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
SUPERSTRUCTURE
SPANS No. 2
NORTH & SOUTH

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	R.G.G.	4-2-70	3		
2			4		

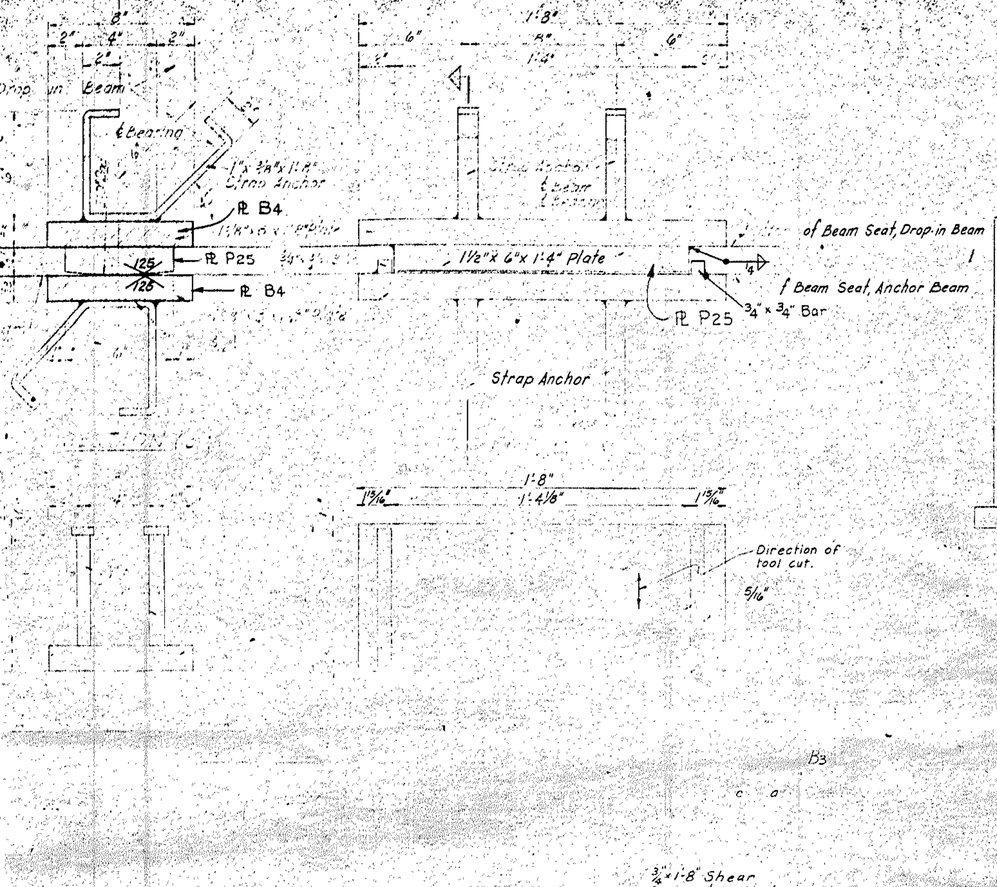
DRAWN BY Dewey Phillips DATE Nov. 1968
CHECKED BY [illegible] DATE Feb 1969

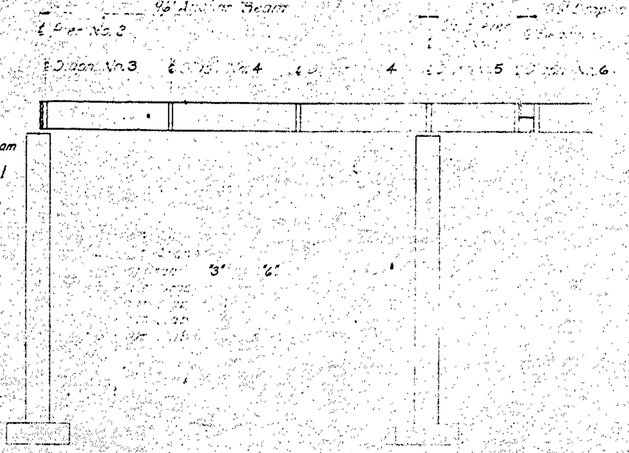
Revision 1 : To show K5 bars

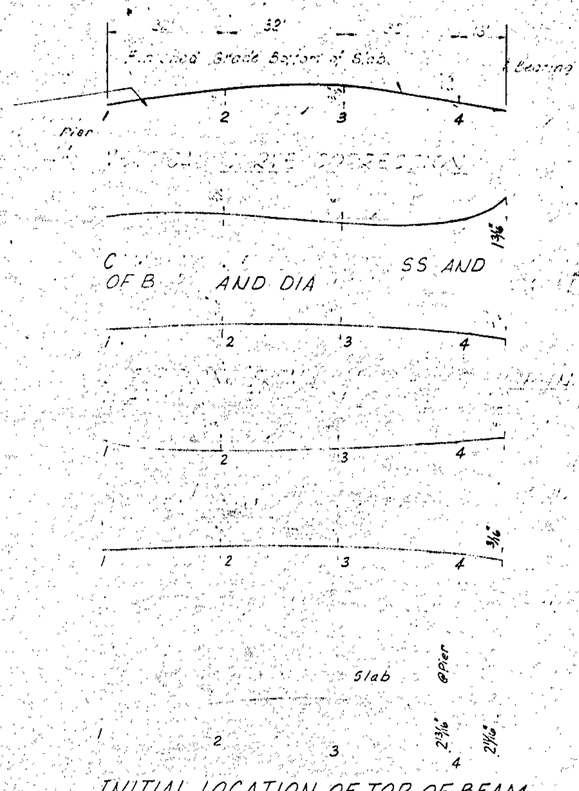
DATE Feb. 1969

BUILT ACCORDING TO PLANS

NO.	ROAD	STATE	PROJECT NO.
REGION			
3		N.C.	8.2215302
F. A. PROJECT		5-16 64(2)	







INITIAL LOCATION OF TOP OF BEAM TO PROVIDE REQUIRED BUILD-UP AT END OF DROP IN SPAN

CAMBER AND DEFLECTION DIAGRAMS IN FLANKING SPANS

8.2215302

CARTERET

Sheet 4 of 6

COMMISSION

SPAN NO. 1

SOUTH

58

S 26

41

256

Contractor may select Alternate or 2 for Embedded Plate.

For total P23, P24, & P25 Plates required See Bearing Plate Detail Sheet.

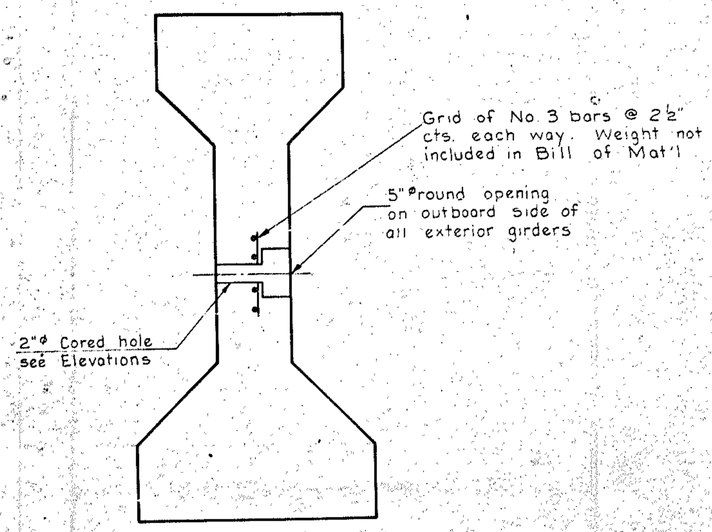
Date Nov. 1968

Date Feb. 1969

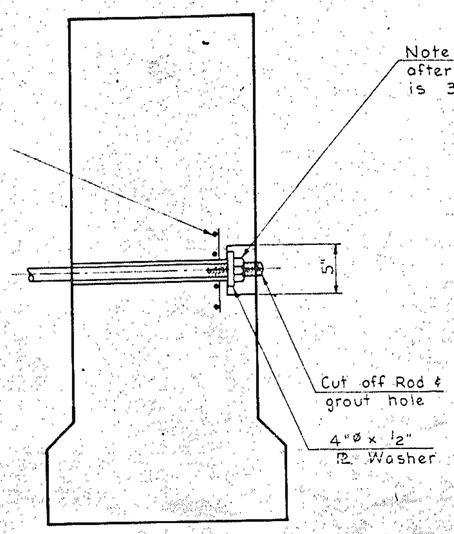
BUILT ACCORDING TO PLANS

F.A. PROJECT
Note:
For steel in this end of girder see girder sheet for 92' Span.
5'-10½"
31'-10⅛"
32'-0⅛"
Pick up point
2" Hole
2" Hole
For Dim See Table 1
54'-10¼"
4 of 6
for drop in beam sheet 4 of 6)
Below
Below
Notes continued on sheet 6 of 6.
DROP-IN BEAM
QUANTITIES REQUIRED FOR ONE GIRDER
5000 P.S.I.
1945
22.01
46
QUANTITIES FOR ONE G
6000 P.S.I.
1858
22.70
7
7598 Lin. ft.
14
15418 Lin.
TIE ROD
1¼" ø Smooth Round Rod
29
42
45
46
2N and 25.
80'-11"
No. 13
17
20
24
22'-2"
1, 2, 3, 10, 11
12
17'-2"
PROJECT No. 8.2215
CARTERET COUNTY
NOTE:
25,200
6 of 6
Bridge
Tie Bar
Sheet 5 of 6
STATE HIGHWAY COMMIS
54" PRESTRESSED GIRDERS SPAN
VIEW
VIEW
SECTION
SECTION AT ℄ BEAM
KEY TO
DRAWN BY McKay Phillips DATE Nov. 1968
CHECKED BY L. T. Goodson DATE Feb. 1969
BUILT ACCORDING TO PLANS

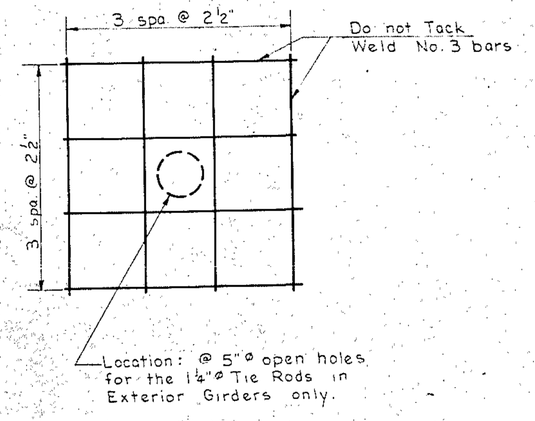
SPAN	[illegible]	[illegible]	[illegible]	"D"
1	1'-5¾"	1'-4½"	1'-3¼"	1'-2"
2	2'-3¾"	2'-2½"	2'-1¼"	2'-0"
3 & 4	2'-9¾"	2'-8½"	2'-7¼"	2'-6"
5 & 6	1'-7¾"	1'-6½"	1'-5¼"	1'-4"



EXTERIOR GIRDER



EXTERIOR GIRDER



NOTES

4. All reinforcing steel shall be included in the contract unit price for prestressed girders.
5. All prestressing strand shall meet the requirements of A.S.T.M.-A-
6. No surface finish will be required for prestressed concrete girder However the outside face of the exterior girders shall be carefully cleaned of drippings and other discolorations, See Specifications.
7. SHOP DRAWINGS: Contractor shall submit Shop Drawings showing complete details of beams including reinforcing steel.
8. FORMS & PALLETS: All girders shall be cast on concrete floored pallets and metal forms.
9. HANDLING: In the handling of girders, they must be maintained in upright position at all times and must be picked up from points located maximum distance of 3'-6" from end of beam. Disregard of this requireme may lead to collapse of the member.
10. Concrete fins or projections shall be removed to produce a vertical face at the top edge of the girder.
11. All prestressed strands shall be ½" 7-wire stress relieved cables and sha have the following properties: ultimate strength 36,000 lbs. per cable; of prestress 25,200 lbs. per cable. The cables shall meet all requirements listed under section 207-A of the standard specification.
12. Shop plans for Prestressed Conc. Girders shall show a complete detensi schedule (burning patern and when to release hold-down points) such to minimize tension in the concrete during release of the strands. De concrete stresses during each operation of detensioning shall be submitte with shop plans.
13. All cables must be cut off flush with end of girder and painted as noted below.
14. Ends of cables and field welds on prestressed girder bearings shall l painted with zinc rich paint conforming to federal specifications MIL-P 2691 (U.S.A.F.) Type I.
15. Embeded plates are to be hot dipped galvanized after fabrication. Galvanizi shall be at a uniform rate of 2 oz. per sq. ft. of surface in accorda with A.S.T.M. Specifications A-123.
16. The cost of bearing assemblies, 1¼"ø tie rod assemblies, galvanizir of bearing assemblies and painting of cable ends and field welds on bearing assemblies shall be included in the unit price bid fo lin. ft. of Prestressed Concrete Girder.

PROJECT No. 8.221530
CARTERET COUN
STATION: 211 + 20
Sheet 6 of 6

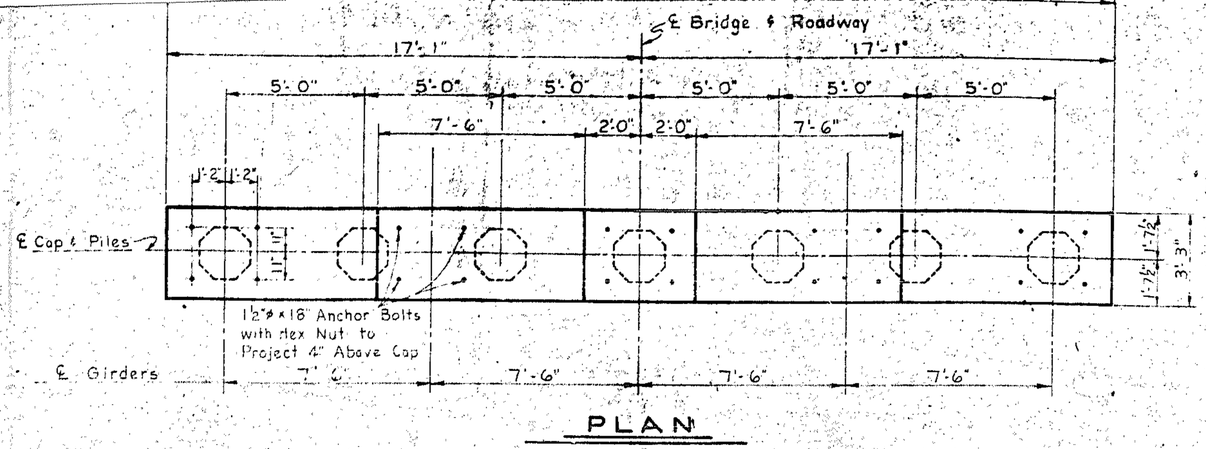
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
GIRDER DETAILS
ANCHOR & DROP-IN SPA

FEBRUARY, 1969

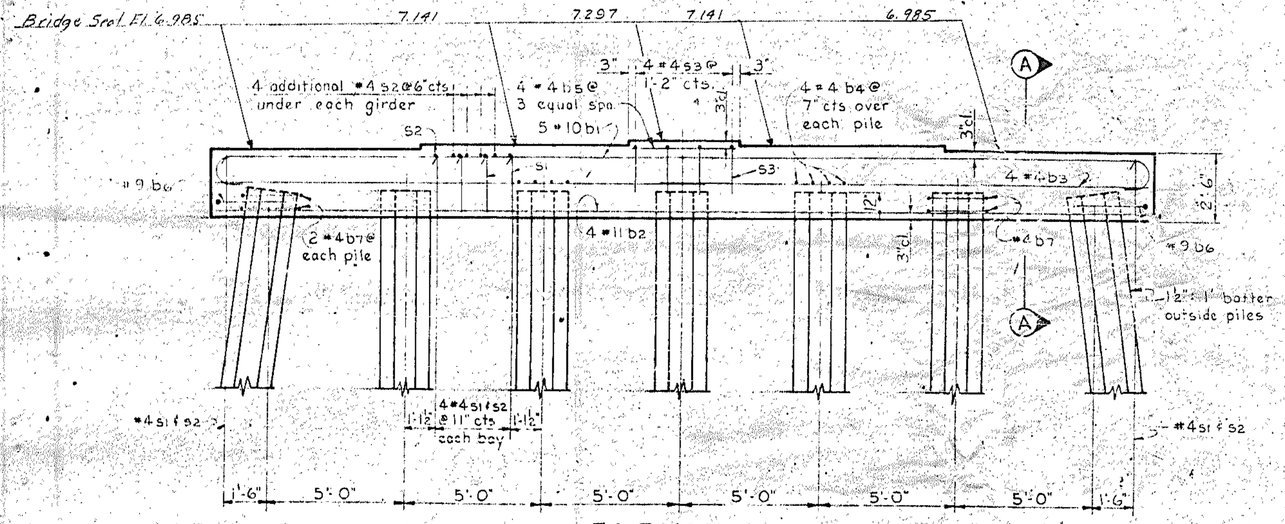
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

DRAWN BY Robert G. Gower DATE Feb. 1969
CHECKED BY H.F. Gardner DATE Aug 1969

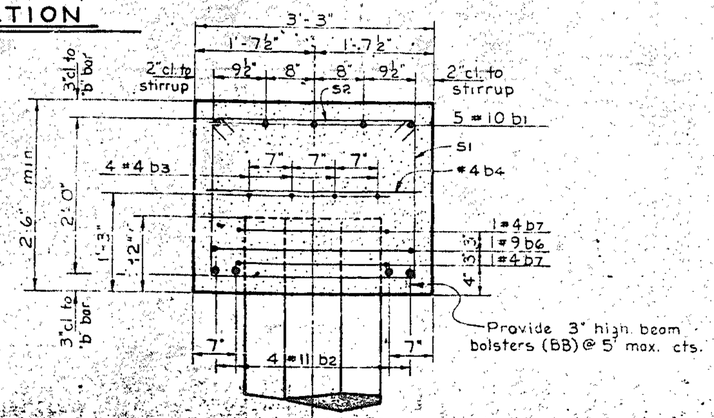
BUILT ACCORDING TO PLANS



PLAN



ELEVATION



SECTION A-A

BILL OF MAT

FOR ONE BENT

BAR	NO.	SIZE	TYPE	L
b1	5	#10	1	
b2	4	#11	Str	
b3	8	#4	Str	
b4	28	#4	Str	
b5	4	#4	Str	
b6	2	#9	5	
b7	14	#4	6	
s1	26	#4	2	
s2	46	#4	3	
s3	4	#4	4	

Reinforcing Steel Lbs.
Class 'A' Concrete Cu.

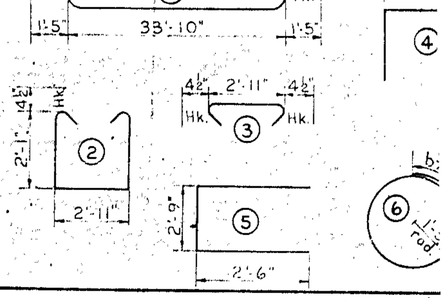
22" Oct. Prestr. Conc. Pile
Lin. F

Conc displaced by pile heads has been

Drive 22" Oct. Prestr. Conc. Piles to a m
bearing capacity of 50 tons each.

BAR DETAILS

All bar dimensions are out to out.



PROJECT NO. 8.2215
CARTERET Co
STATION: 211+20

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISS
RALEIGH
SUBSTRUCTURE
PILE BENT
No. 32 SOUTH

OCTOBER, 1968

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

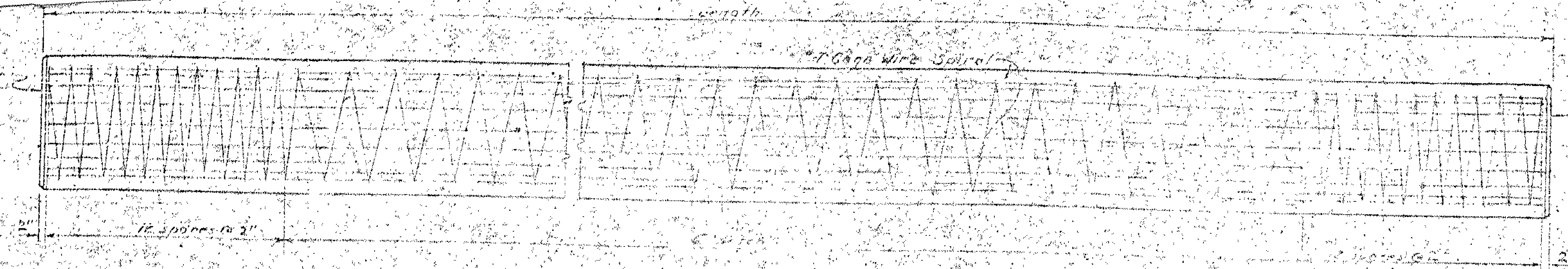
DRAWN BY: Robert G. Gower DATE: Oct. 1968
CHECKED BY: [illegible] DATE: Oct. 1968

BUILT ACCORDING TO PLANS

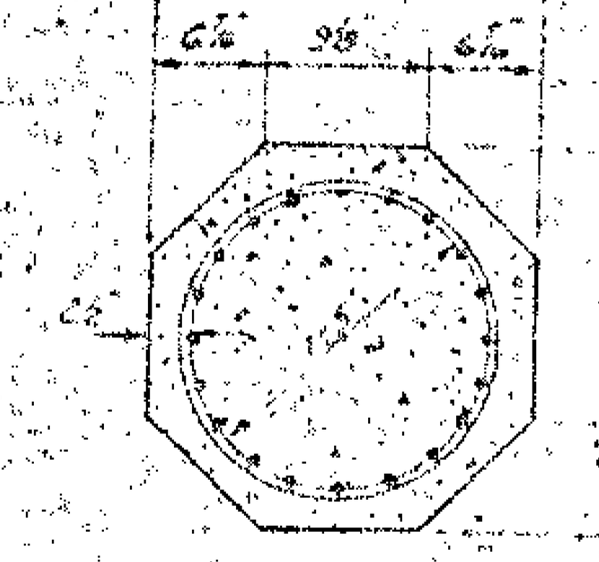
SECTION B-B

SECTION C-C

1	R.G.G.	1-20-71	3		
2			4		



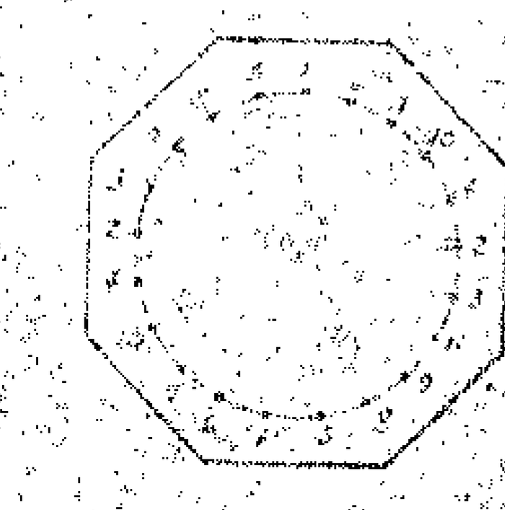
Piles



Typical Section
Showing 20 Prestressing Cables

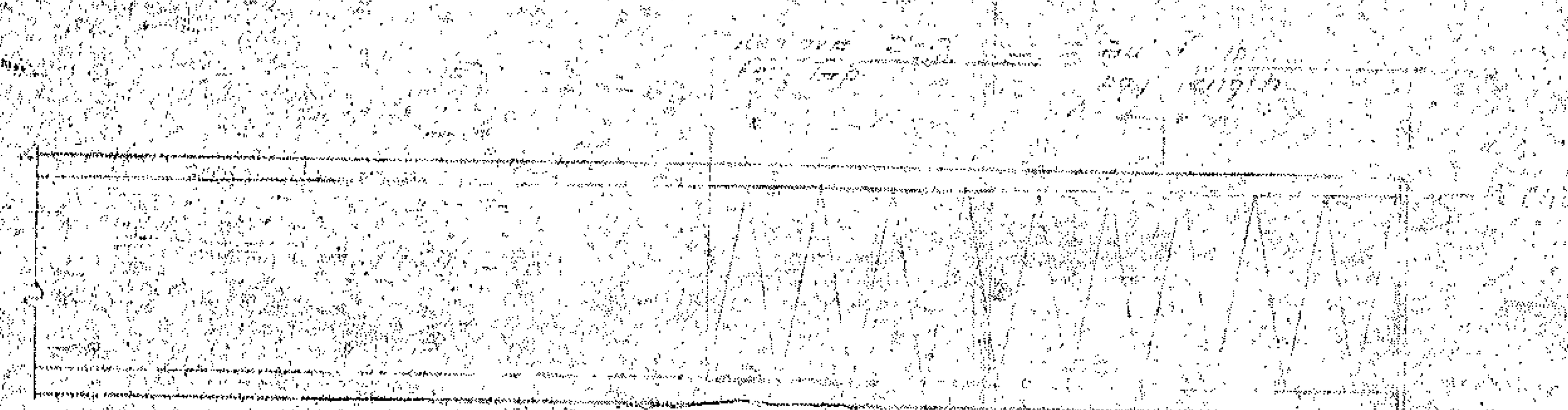
Note: Dampproofing
The length of Pile to be dampproofed may be changed as required by the Engineer. The contractor shall have no claim resulting from any changes in the length of dampproofing required, but he will be paid for the area of dampproofing actually applied at the unit price bid per square yard of Method D Dampproofing. The dampproofing shall be applied before the pile is driven. Because of the coating, support of forms for supporting the Concrete Cap by means of applying Clamps to the piles will not be permitted. Method D Dampproofing shall be applied to the piles over the length shown in Column B in table below. No Dampproofing shall be applied to ... of piles.

Design Data:
Concrete:
f'c = 5000 Lbs per Sq. Inch.
fc = 2000 Lbs per Sq. Inch.

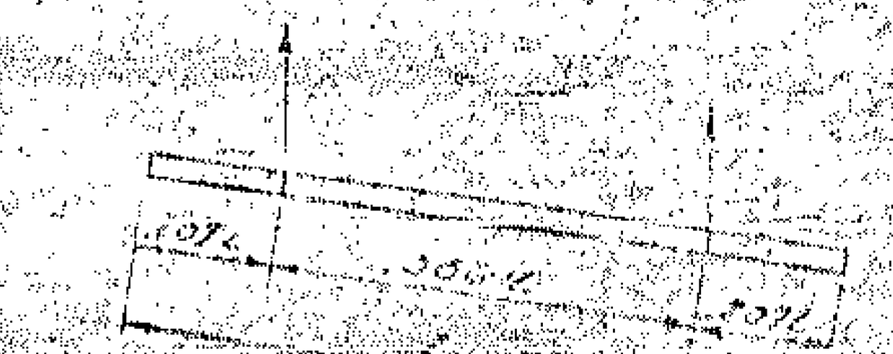


Typical Pattern for Burning Cables.

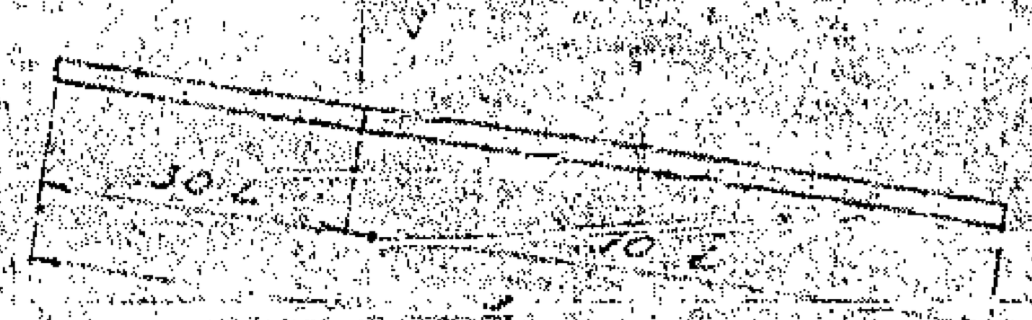
If cable stress is relieved by burning, the cables shall be burned in opposite pairs as ... the typical pattern shown. For any number of cables, burn in opposite pairs and symmetrical about both vertical and horizontal axes. Cables ... shall be burned ... Not more than 4 cables, say 3a and 3b, may be burned at any one section before these same pairs of cables are burned at both ends of the bed and between each pair of piles in the bed.



Pile Building



Method of picking up Piles 62' thru 90'
2 pick up points



Method of picking up Piles ...
1 pick up point

Impact in handling = 30%

General Notes:
In driving piles a method approved by the engineer shall be used ... the head of the pile is not damaged.

Build-up, where necessary, shall be done in accordance with the specifications except that the reinforcing steel required in the build-up shall be included in the contract unit price per foot for the pile and not be paid for as reinforcing steel.

All material and workmanship as per the specifications of the N. Carolina State Highway Commission.

Devices for lifting the piles from the casting beds shall be approved by the Engineer. These devices shall consist of inserts set in the piles to receive threaded eye-bolts, or similar approved devices. The use of loops of cable cast in the piles for use as lifting devices will not be permitted. The use of satisfactory clamps or slings will be permitted where this is practicable without the use of lifting devices cast in the piles. After eye-bolts or other attachments have been removed, the openings shall be repaired in a satisfactory manner before delivery to the bridge site in order to obtain a uniform appearance.

Because of the resulting surface finish, slip-form method of casting piles will not be permitted.

All prestressing strands shall be 7 wire Stress Relieved Cables in accordance with the Specifications. The contractor may at his option use any one of the strand sizes and types shown below, but all cables used in a pile shall be of the same size & type.

Size	Type	No. Cables Req'd.	Area	Ultimate Strength	Applied Prestressing
3/8"	High Str.	23	0.0840"	23,000# per cable	16,100# per cable
7/16"	Standard	20	0.1080"	27,000# per cable	18,900# per cable
7/16"	High Str.	17	0.1152"	31,000# per cable	21,700# per cable

Cables shall be equally spaced around a circle of the diameter shown in the "Typical Section".

All prestressing strand shall meet the requirements of ASTM-A416.

Required Dampproofing		
Bent No.	A	B
32 South	1'-0"	15'-0"

BUILT ACCORDING TO PLANS

Piles Required			
No.	Size	Length	Lin. Ft.
7	22"	50'-0"	350

Quantities for One 22" Octagonal Pile

Length	Concrete Cu. Yds.	Weight Tons	One Pickup Point 30% L	One Pickup Point 70% L	Two Pickup Points 20% L	Two Pickup Points 60% L
25'-0"	[illegible]	[illegible]	[illegible]	17'-6"		
30'-0"	[illegible]	[illegible]	9'-0"	21'-0"		
35'-0"	3.61	7.31	10'-6"	24'-6"		
40'-0"	4.12	8.36	12'-0"	28'-0"		
45'-0"	4.64	9.40	13'-6"	31'-6"		
50'-0"	5.16	10.45	15'-0"	35'-0"		
55'-0"	5.67	11.49	16'-6"	38'-6"		
60'-0"	6.19	12.53	18'-0"	42'-0"		
65'-0"	6.71	13.58			13'-...	38'-1"
70'-0"	7.22	14.62			14'-6"	41'-0"
75'-0"	7.74	15.67			15'-6"	43'-11"
80'-0"	8.25	16.71			16'-6"	46'-11"
85'-0"	8.77	17.76			[illegible]	49'-10"
90'-0"	[illegible]	18.80			18'-...	52'-9"

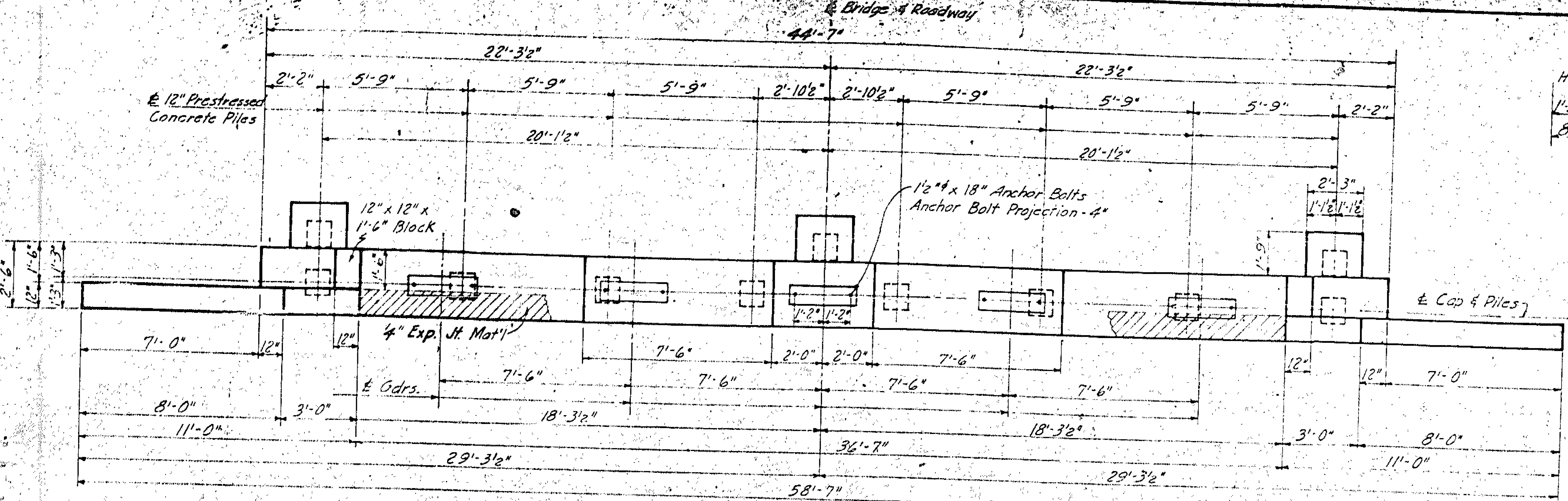
PROJECT No. 8.22153
CARTERET COUNTY
STATION: 211+20

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH
STANDARD
22" PRESTRESSED
OCTAGONAL CONCRETE PILES
JULY 1959
S-3

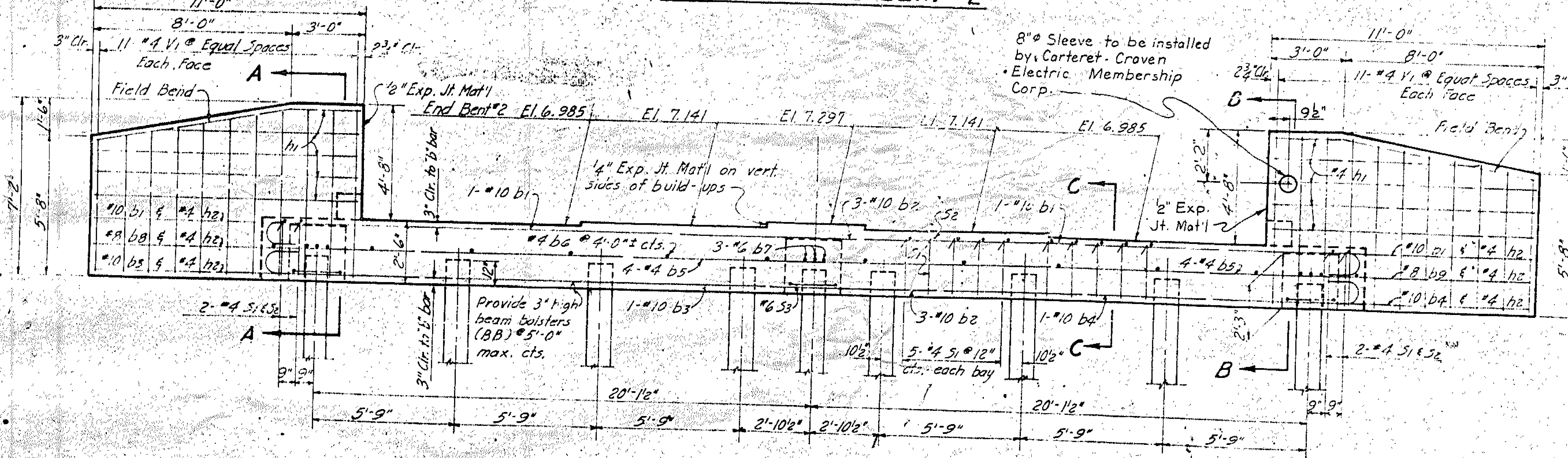
SPECIAL	ASSIGNED BY	DATE Aug. 1969
STANDARD	DRAWN BY	DATE July 1959

Rev. Sept. 24, 1963 to show prestressing strand to meet requirements of ASTM-A416 by ... V.B.
Revised to add notes regarding Cables 4-5-62 JLB ...
Revised to clarify buildup detail 3/8/60 M.S.D. ...
Revised to add notes and sketch regarding burning of cables. Jan. 5, 1960 ...

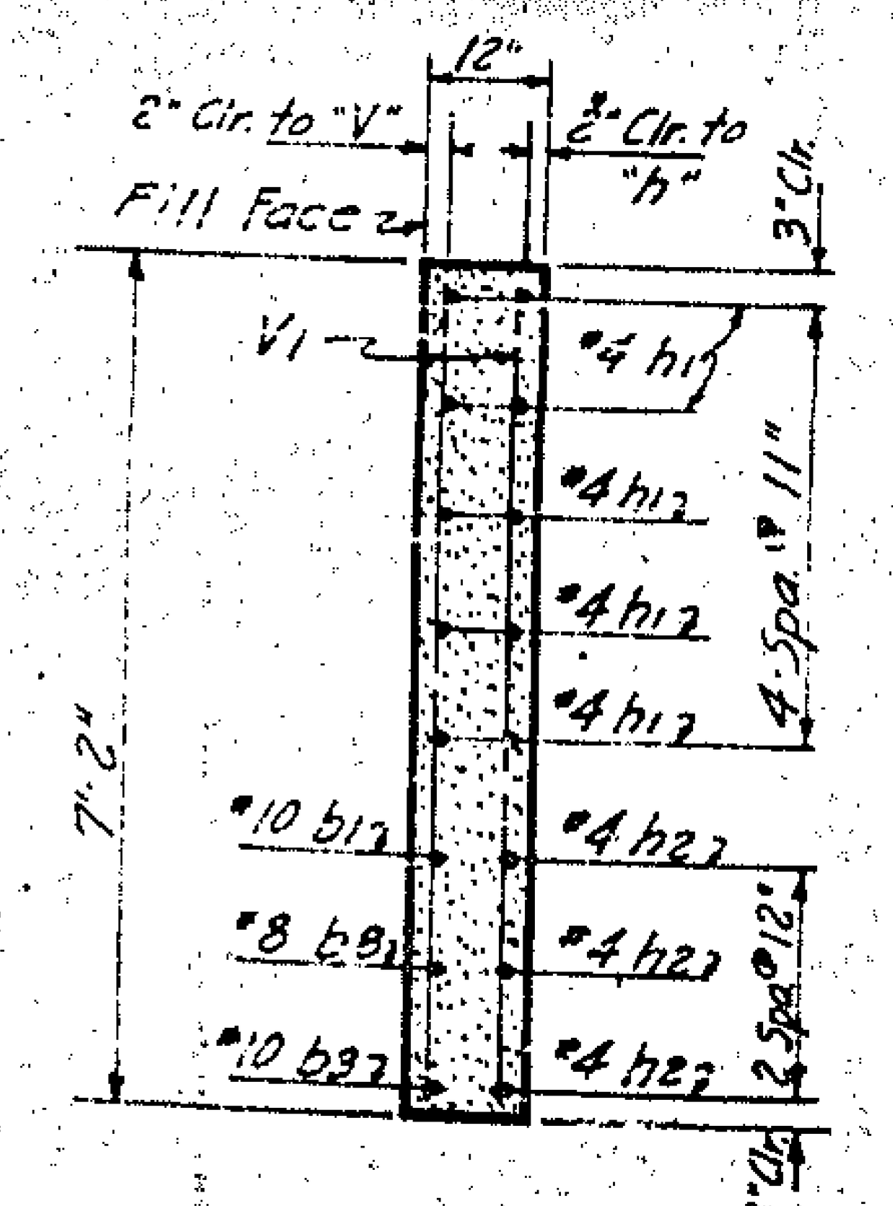
SECTION A-A
SECTION B-B
SECTION C-C



PLAN OF END BENT #2



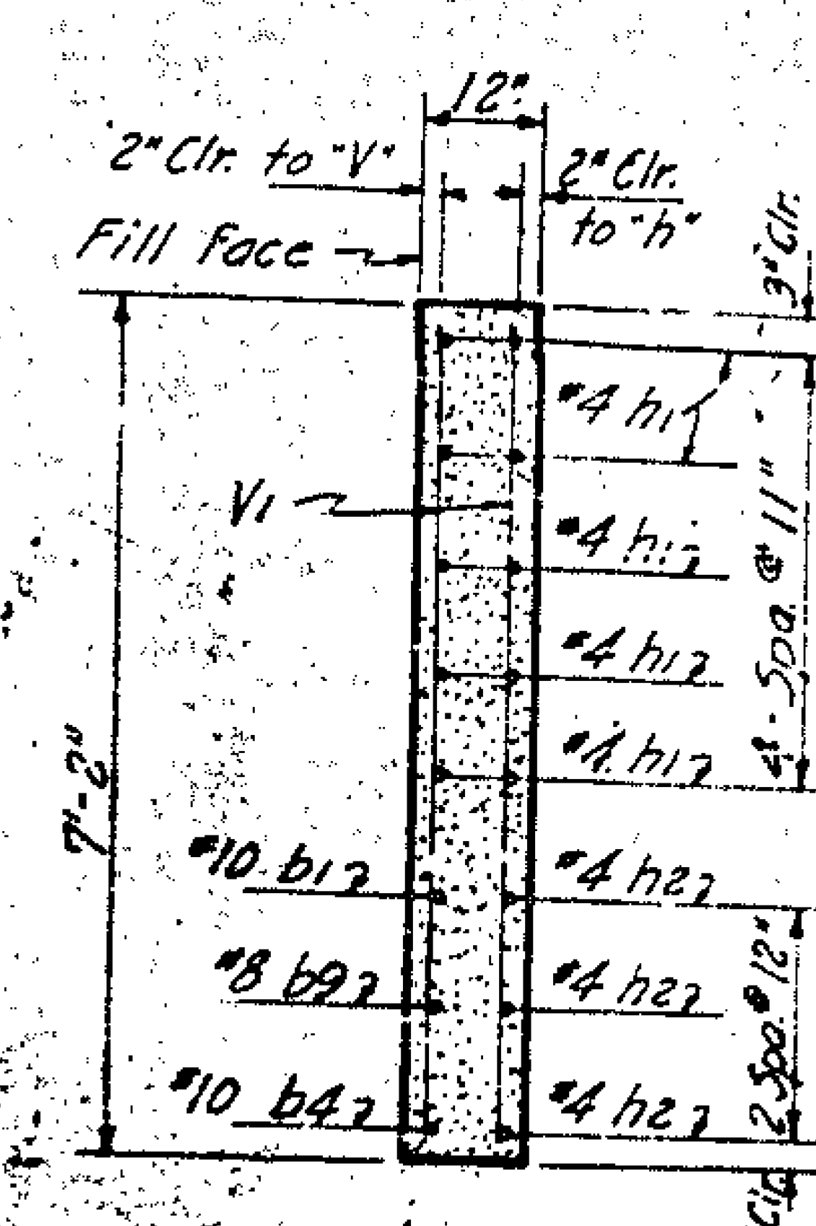
ELEVATION



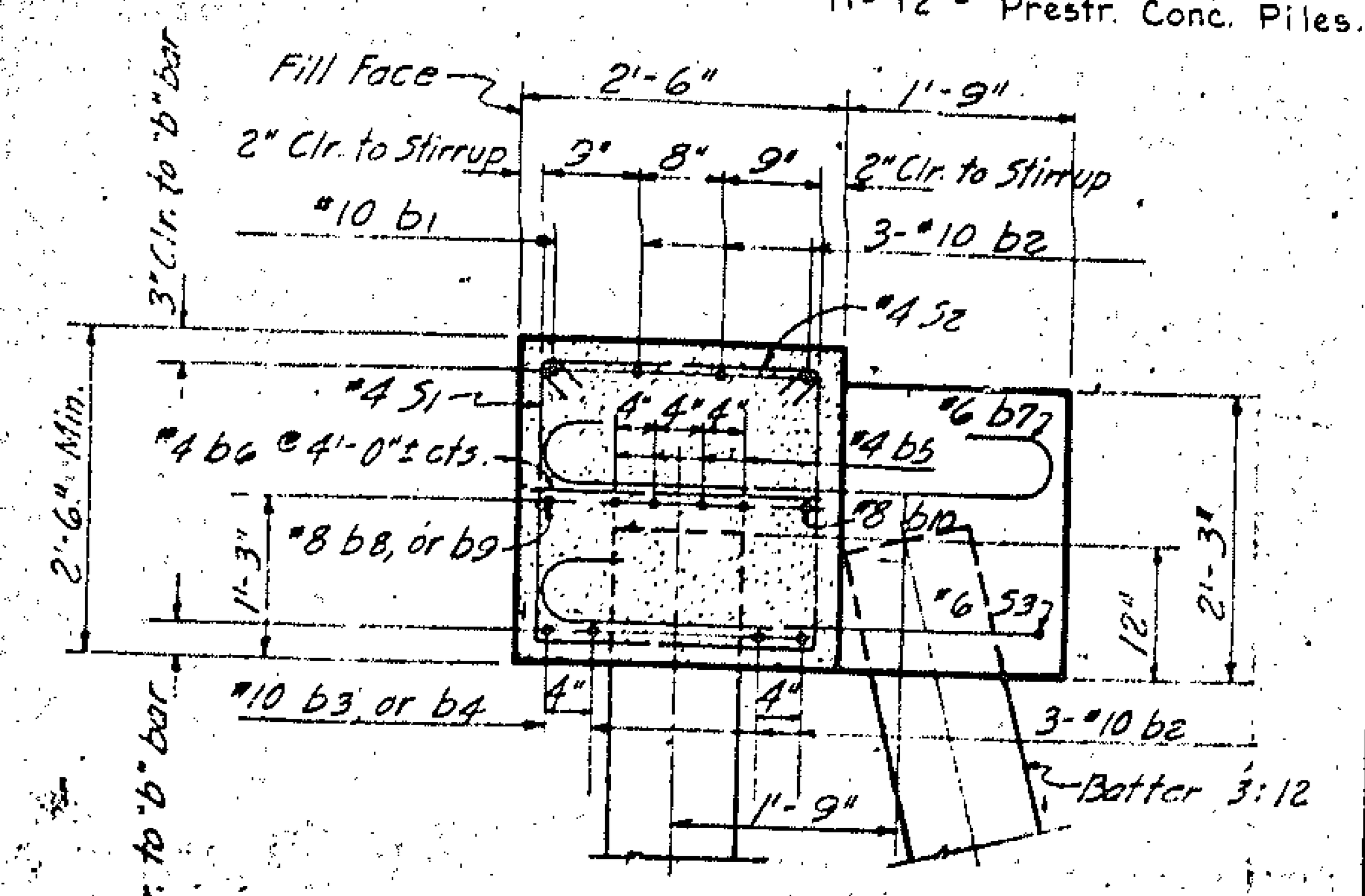
SECTION A-A

Note : The opening drilled through the earwall shall be the minimum required to install the 8"φ sleeve. The excess area around the sleeve shall be packed with an epoxy grout with the surfaces on each face of the earwall neatly finished to the satisfaction of the Engineer.

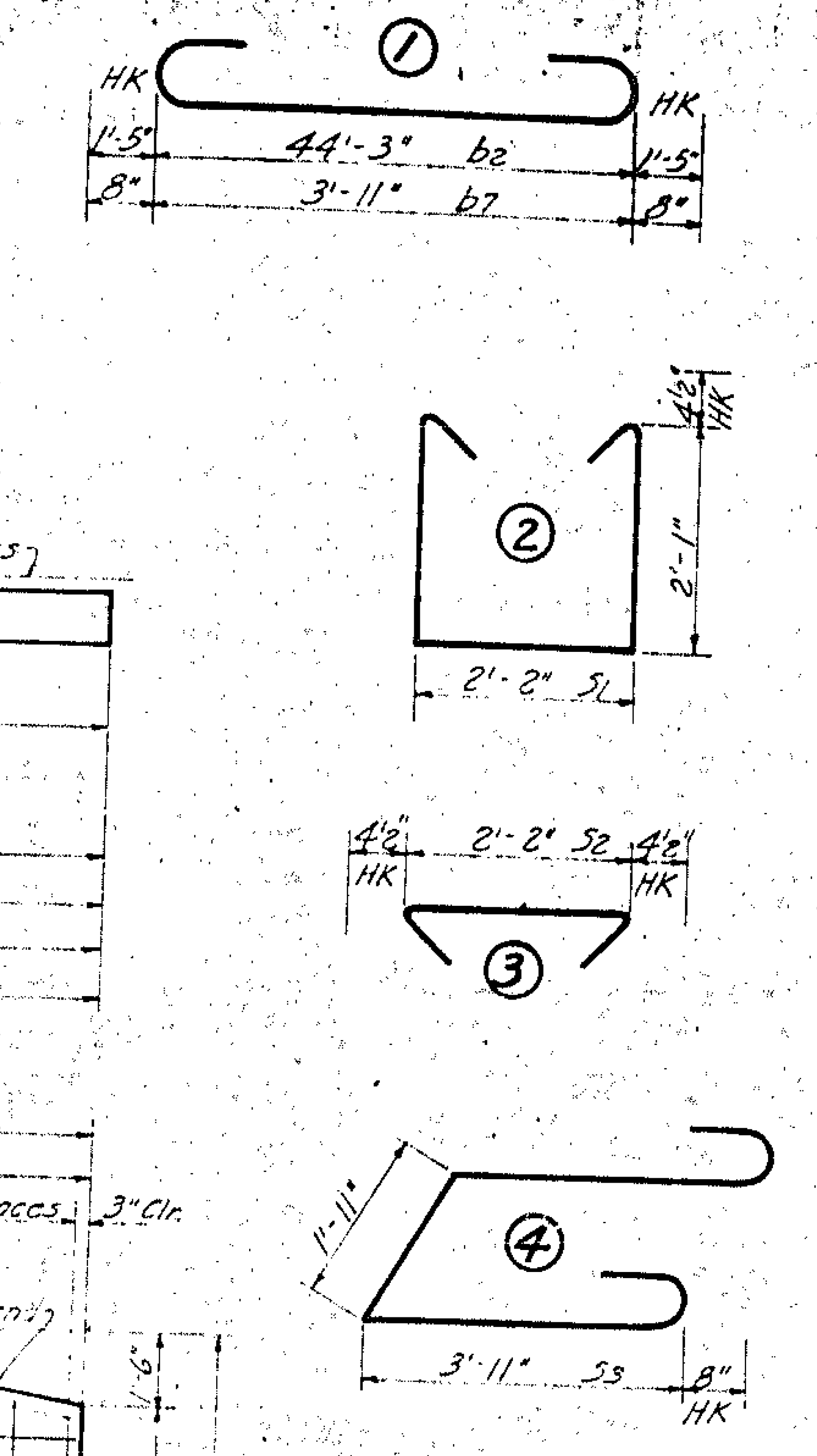
Revision #1 : 1-20-71 R.G.G. Revised to show 8"φ sleeve to be installed in earwall and Note: ✓ by: [illegible]



SECTION B-B



SECTION C-C



BAR TYPES

(All dimensions are out to out)

BAR	NO.	SIZE	TYPE	LENGTH
b1	2	#10	Str.	30'-8"
b2	6	#10	1	47'-1"
b3	1	#10	Str.	28'-0"
b4	1	#10	Str.	33'-8"
b5	8	#4	Str.	22'-10"
b6	12	#4	Str.	2'-2"
b7	9	#6	1	5'-3"
b8	1	#8	Str.	20'-5"
b9	1	#8	Str.	40'-6"
b10	1	#8	Str.	44'-3"
h1	20	#4	Str.	10'-8"
h2	6	#4	Str.	8'-1"
S1	39	#4	2	7'-1"
S2	39	#4	3	2'-11"
S3	3	#6	4	11'-1"
V1	44	#4	Str.	6'-10"

BILL OF MATERIAL FOR END BENT No.

Reinforcing Steel, Lbs. . 2,9
Class "A" Concrete, Cu. Yds. . 16.
12" Prestressed Conc. Piles:
No. 11
Lin. Ft. 495 528

* Concrete displaced by piles has been deducted.

Note:
Piles for End Bent No 2 to be driven to a minimum bearing capacity of 30 tons each.

No dampproofing required on these 11 - 12"φ Prestr. Conc. Piles.

PROJECT No. 8.2215302
CARTERET COUNTY
STATION: 211 + 20 -L-

BUILT ACCORDING TO PLANS

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

OCT. 1968

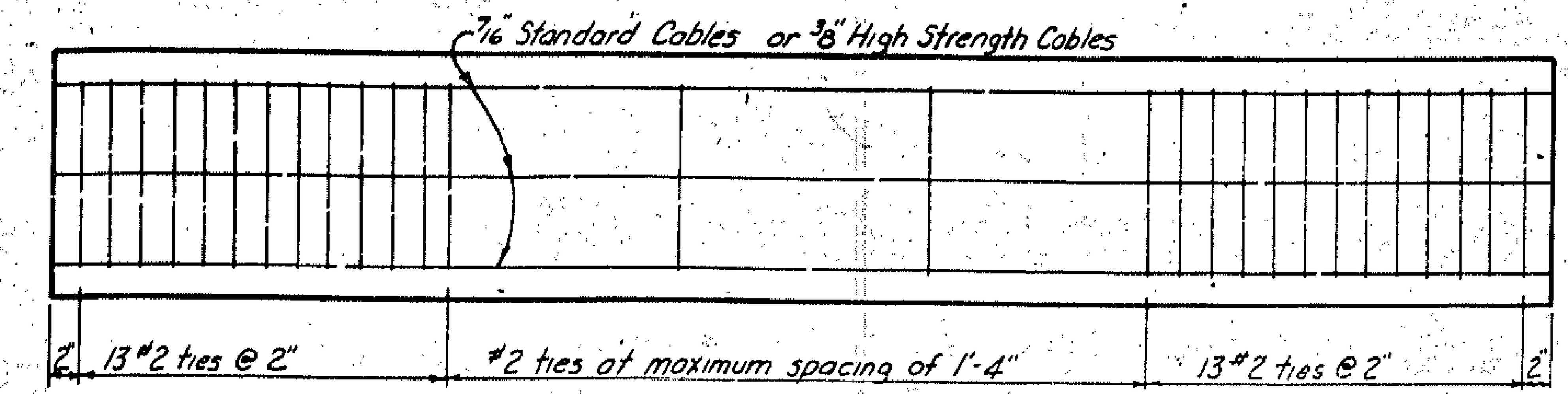
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1	R.G.G.	1-20-71	3		
2			4		

SHEET NO. 3-37

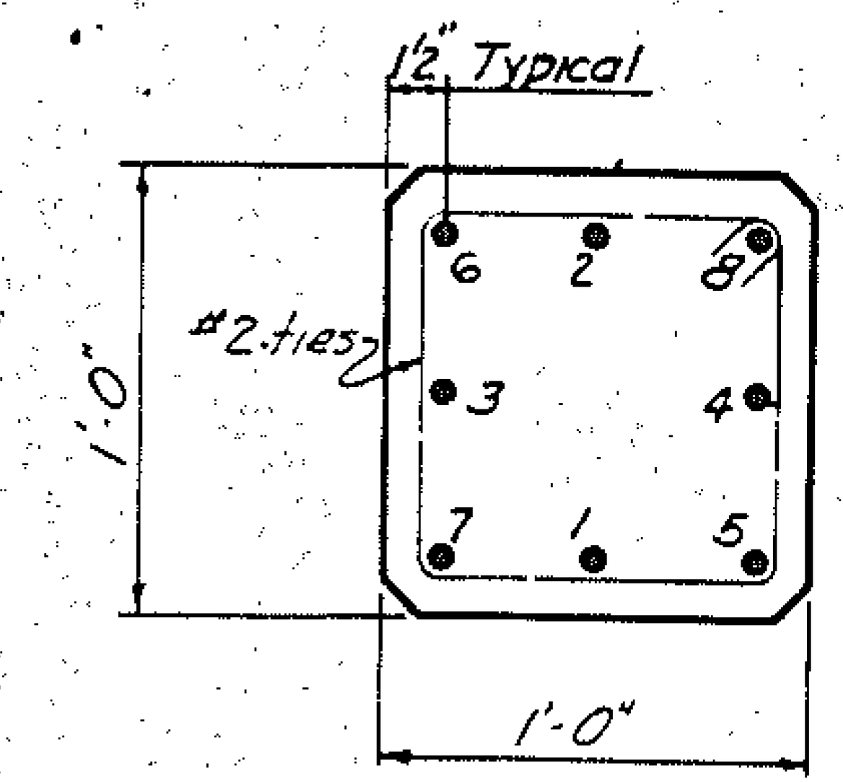
DRAWN BY [illegible] DATE Oct. 1968
CHECKED BY [illegible] DATE Oct. 1968

FED. ROAD DIV. NO. 3 | STATE N.C. | F. A. PROJECT S-16 6[illegible]

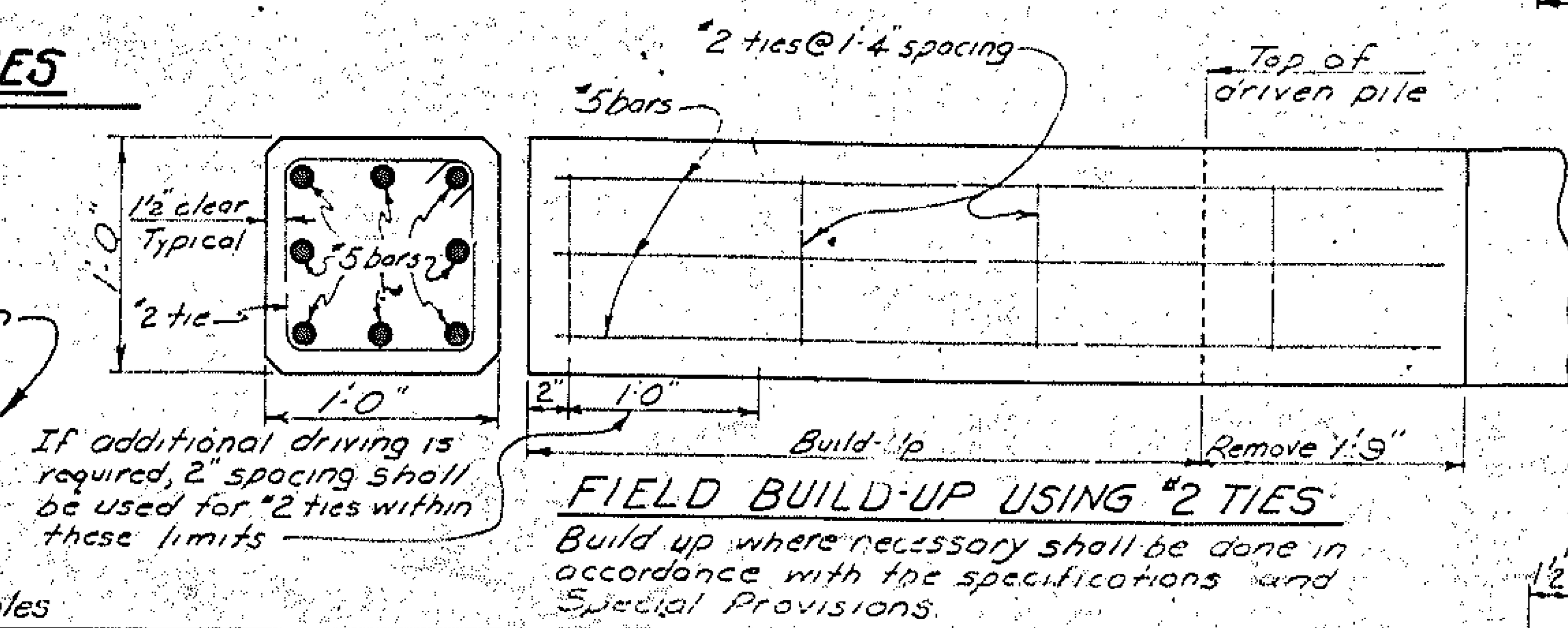
FED. ROAD DIV. NO.	STATE	PROJECT NO.
*	N.C.	8.2215302
F.A. PROJECT	5-16	64(2)



12"□ PRESTRESSED CONCRETE PILES USING #2 TIES

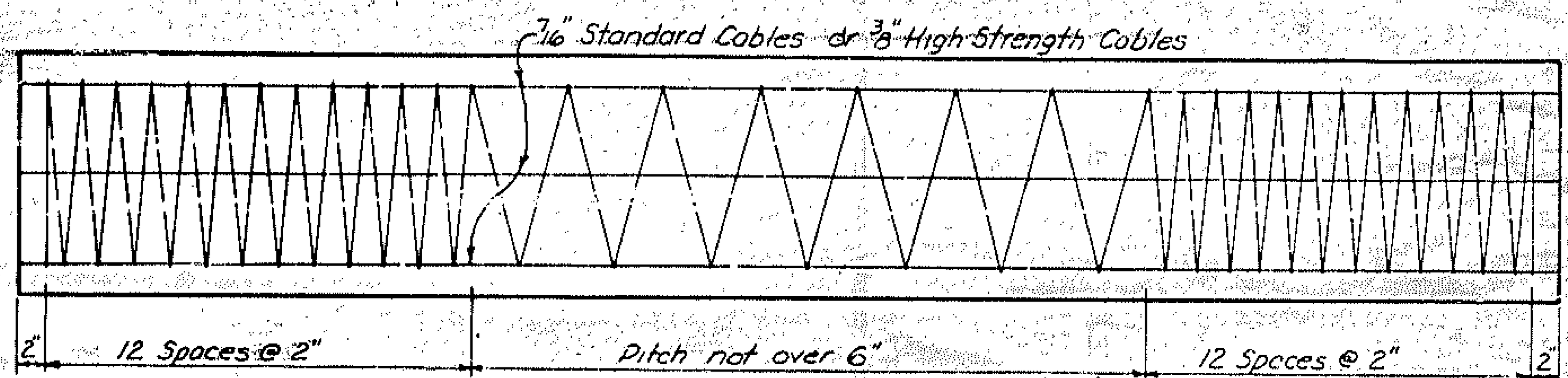


The contractor may use either #2 ties or #7 gage wire spiral as shown

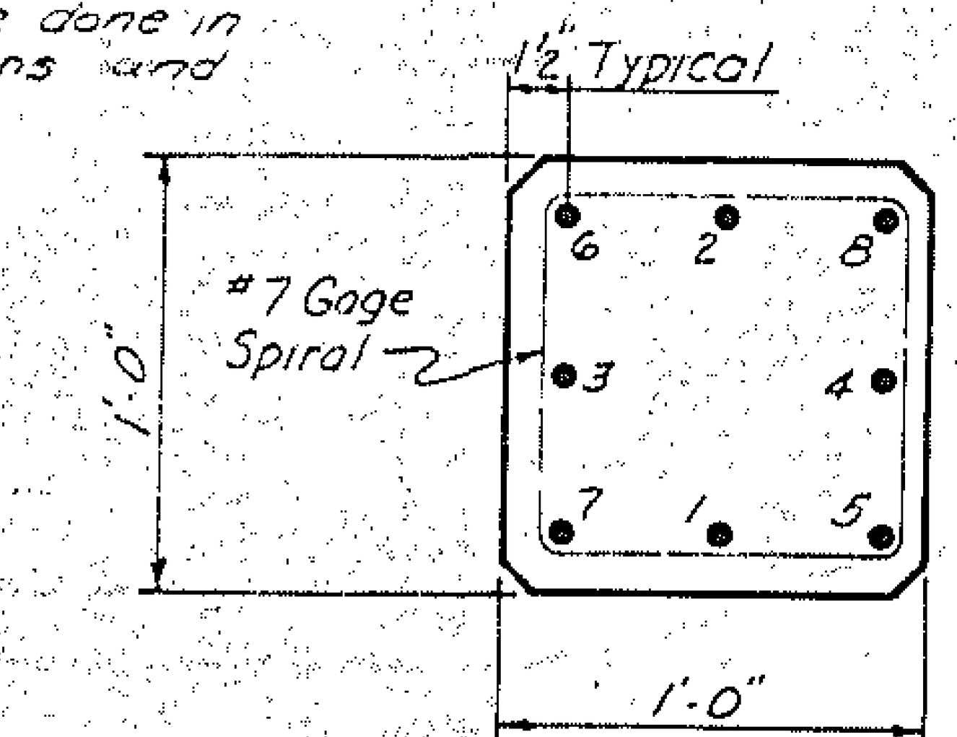


FIELD BUILD-UP USING #2 TIES

Build up where necessary shall be done in accordance with the specifications and Special Provisions.



12"□ PRESTRESSED CONCRETE PILES USING #7 GAGE SPIRAL



If cable stress is to be relieved by burning, the cables shall be burned in pairs in the order shown above. Not more than 4 cables may be burned at any one section before the same cables are burned at both ends of the bed and between each pair of piles in the bed.

TYPICAL PATTERN FOR BURNING CABLES

Design Data:
Concrete: f'c = 5,000 p.s.i. ; fc = 2,000 p.s.i.
Impact in handling = 50%
In driving piles, a method approved by the Engineer shall be used, whereby the head of the pile is not damaged.
All prestressing strand shall be 7-wire stress relieved cables in accordance with the Specifications. The contractor may, at his option, use either of the two types of cable listed below; however, all cables in a pile shall be of the same type:

TYPE	AREA	ULTIMATE STRENGTH	APPLIED PRESTRESSING
3/8" High Strength	0.0840 □"	23,000# per cable	16,100# per cable
7/16" Standard	0.1089 □"	27,000# per cable	18,900# per cable

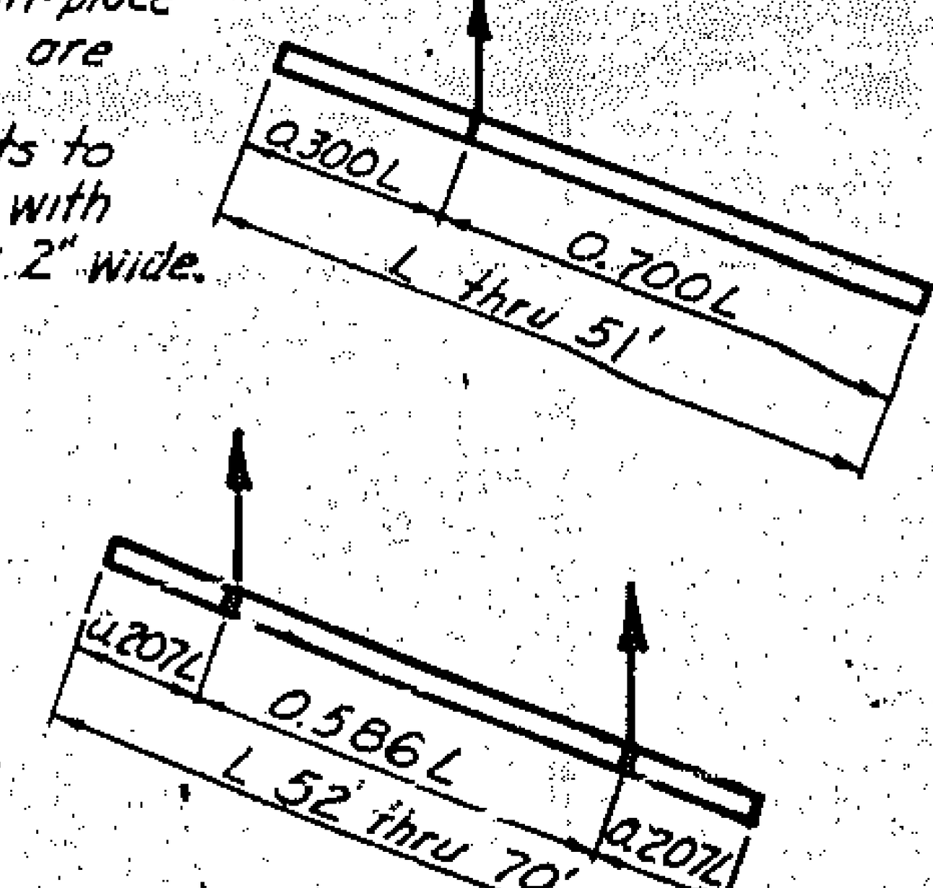
Devices for lifting the piles from the casting beds shall be approved by the Engineer. Where piles will be exposed to view in the structure, inserts set in the piles to receive threaded eye-bolts or similar approved devices shall be used. Loops of cable cast in the pile will not be permitted.

The use of satisfactory clamps or slings will be permitted where this is practicable without the use of lifting devices cast in the piles. After eye bolts or other attachments have been removed, the openings shall be repaired in a satisfactory manner before delivery to the bridge site in order to obtain a uniform appearance. It will not be necessary to remove loops of cable or other lifting devices in piles for End Bents and foundations which will not be exposed to view.

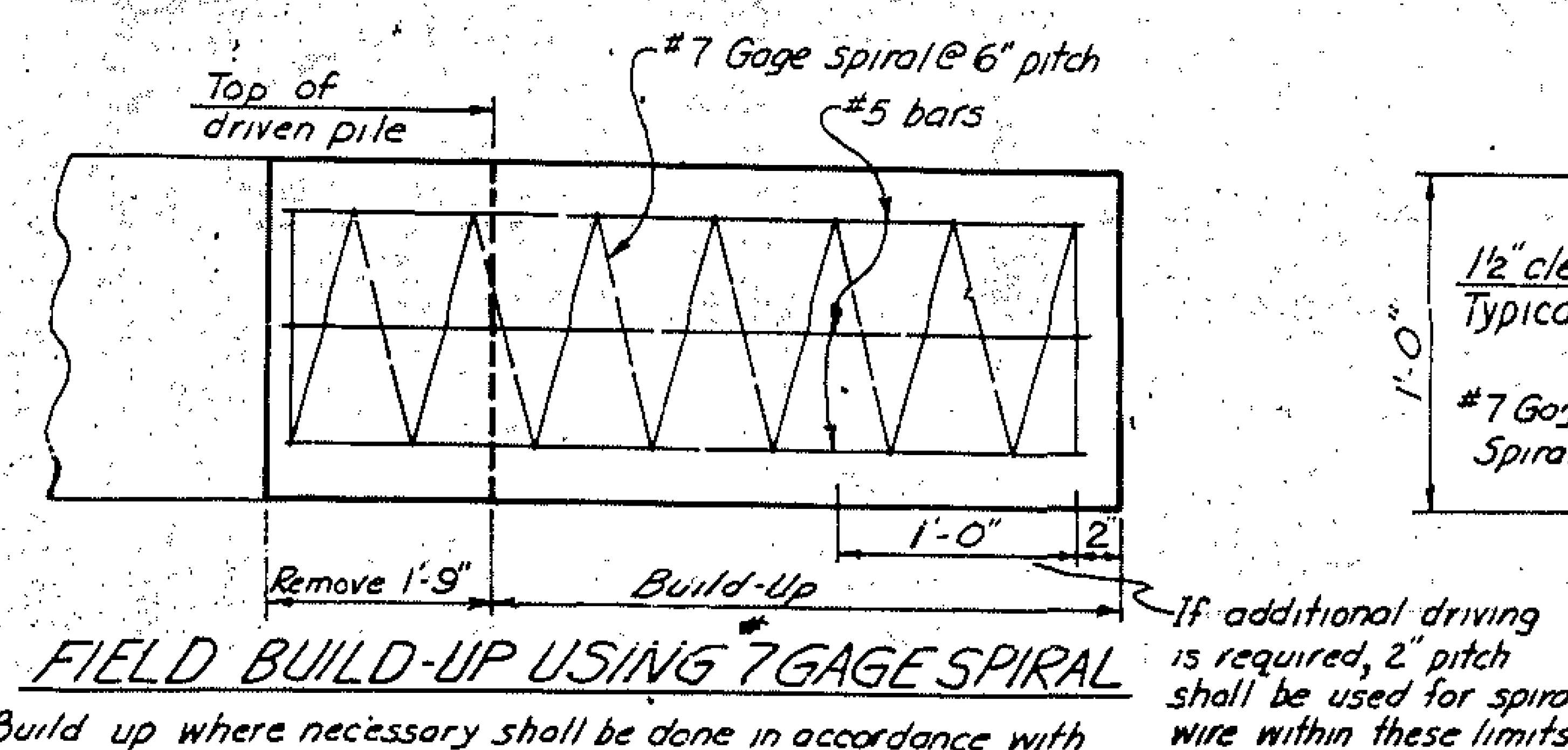
All corners to be chamfered 3/4".

PROJECT No. 8.2215302
CARTERET COUNTY
STATION: 211+20

Where cast-in-place lifting devices are not used, pick-up points to be indicated with a block mark 2" wide.

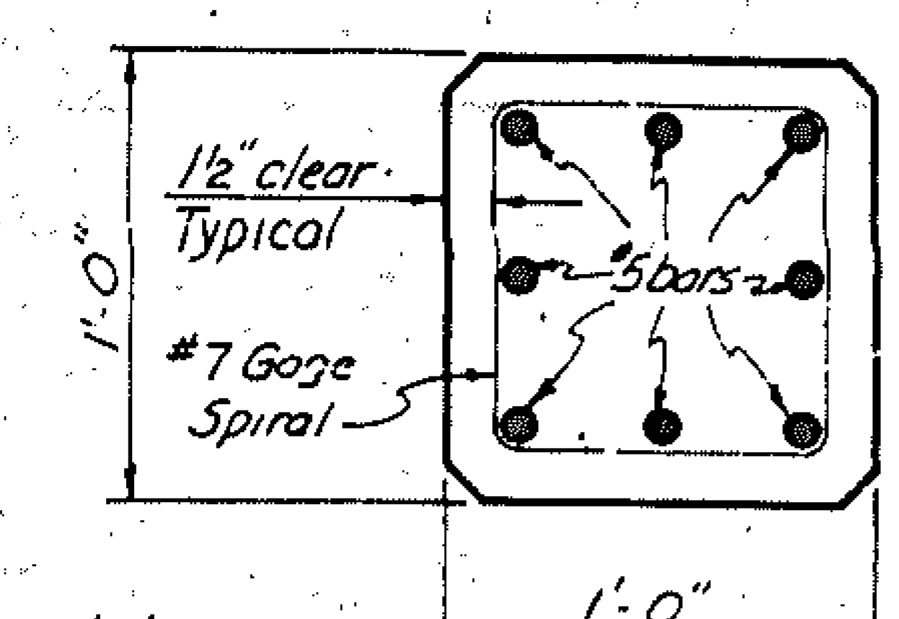


METHOD OF PICKING UP PILES



FIELD BUILD-UP USING #7 GAGE SPIRAL

Build up where necessary shall be done in accordance with the specifications and Special Provisions.



12"□ PRESTRESSED CONCRETE PILES

Revised to add Field Build-Up Using #2 Ties 10-3-66 by C.J.K. ✓ by O.W.R.
Revised for note concerning Field Build-Up. 8/17/66 by C.J.K. ✓ by O.W.R.
Revised for note concerning loops of cable. 5/13/66 by J.M.T. ✓ O.W.R.

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

STANDARD
12" PRESTRESSED CONCRETE PILES

MARCH 1966 — 64

REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. S-32
TOTAL SHEETS 47

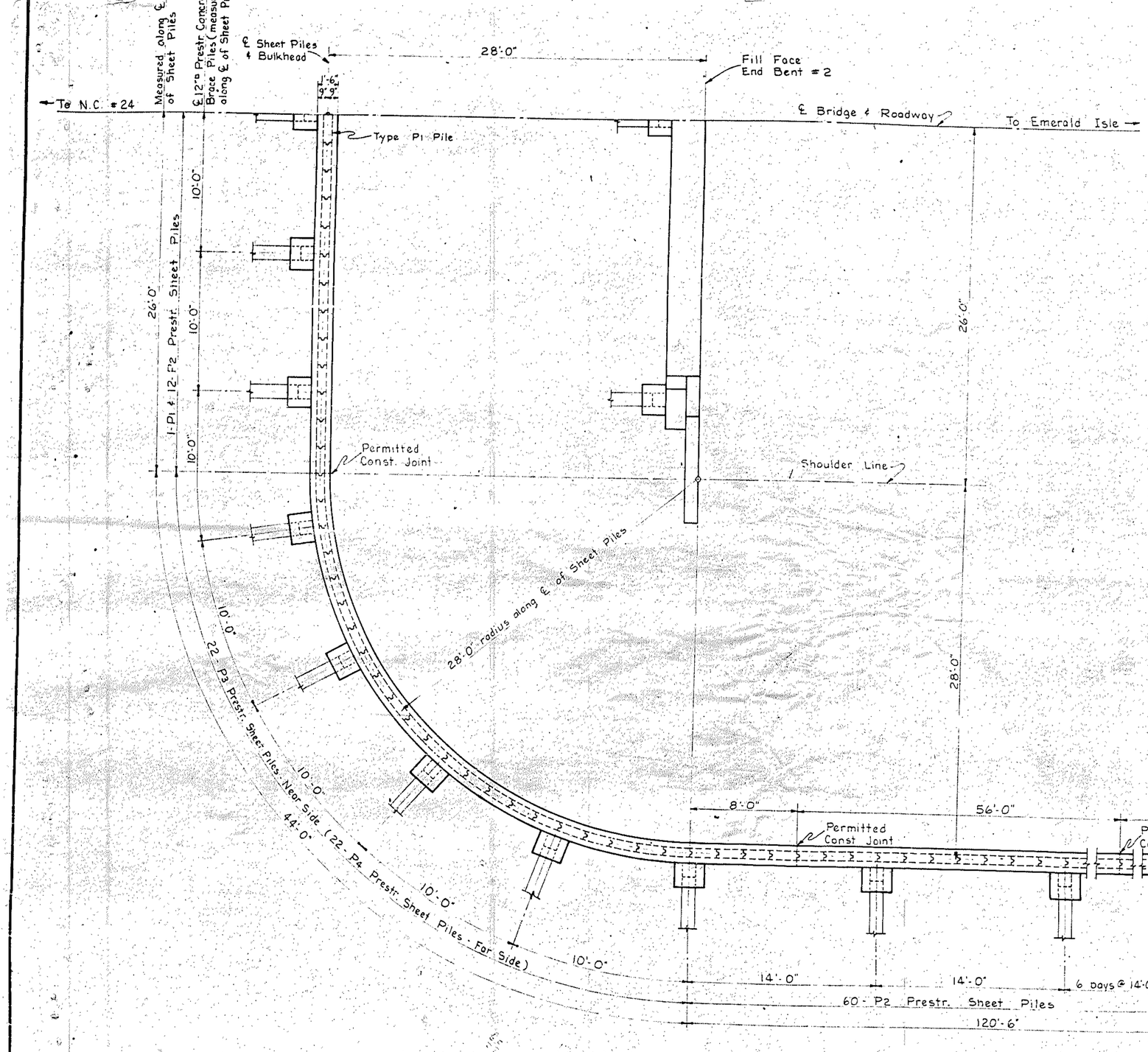
Assembled By: L. T. Goodwin Date: Aug 1969	SPECIAL
Checked By: Robert T. Moore Date: Sept. 1969	
DRAWN BY: Carl J. Krone DATE: March 18, 1966	STANDARD
CHECKED BY: [illegible] DATE: March, 1966	

BUILT ACCORDING TO PLANS

DRAWN BY Robert G. Gower DATE Sept. 1969
CHECKED BY L. T. Goodwin DATE Sept. 1969

BUILT ACCORDING TO PLANS

FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N.C.	8.2215302
F. A. PROJECT		S-16 64(2)



HALF PLAN

Symmetrical about ℄ of Bridge & Roadway

NOTE

1. Prestressed Concrete Sheet Piles to be driven from the ℄ Roadway out. Pile P1 to be driven first.
2. 12"□ Prestressed Concrete Brace Piles to be driven to grade.
3. Any excavation required for Bulkhead will not be measured and paid for as a separate item. The entire cost of same to be included in the unit price for Class "A" Concrete.

DRAWN BY Robert G. Gower DATE Sept. 1969
CHECKED BY [illegible] DATE Sept. 1969

DRAWN BY Robert G. Gower DATE Sept. 1969
CHECKED BY [illegible] DATE Sept. 1969

BUILT ACCORDING TO PLANS

PROJECT NO. 8.2215302
CARTERET COUNTY
STATION: 211+20
Sheet 1 of 3

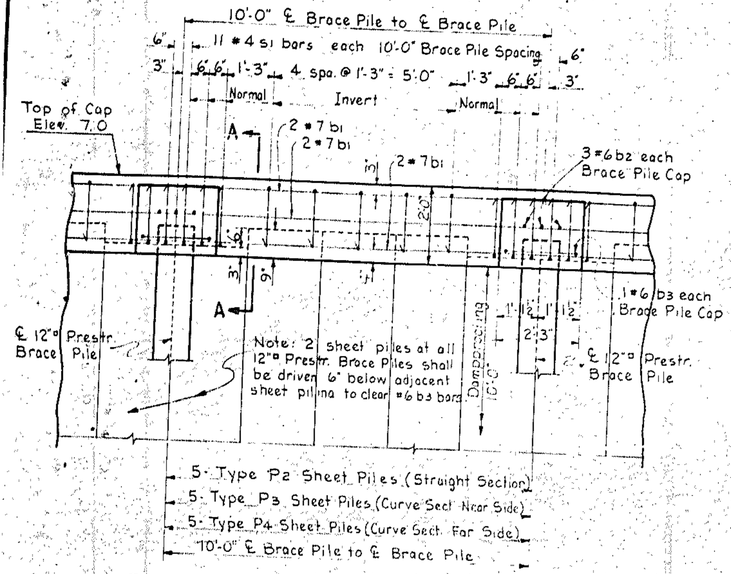
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

BULKHEAD

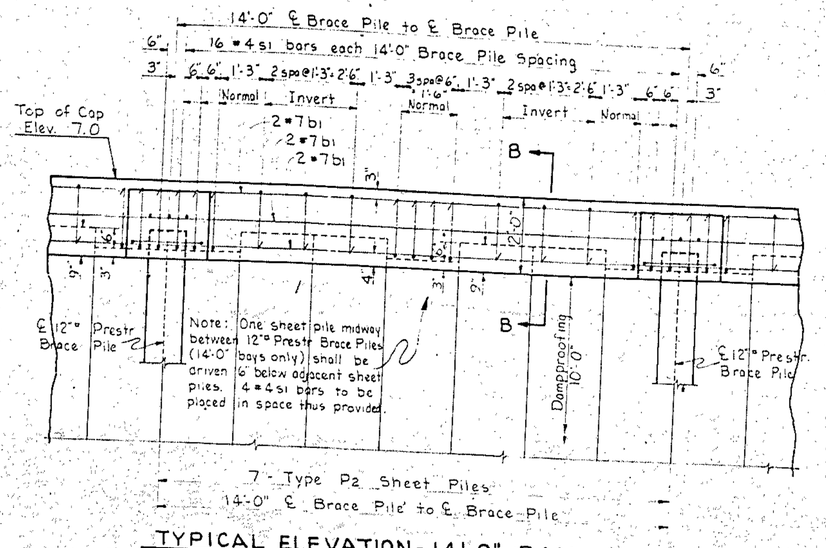
SEPTEMBER, 1969 65

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-33
1			3			TOTAL SHEETS
2			4			A1 256

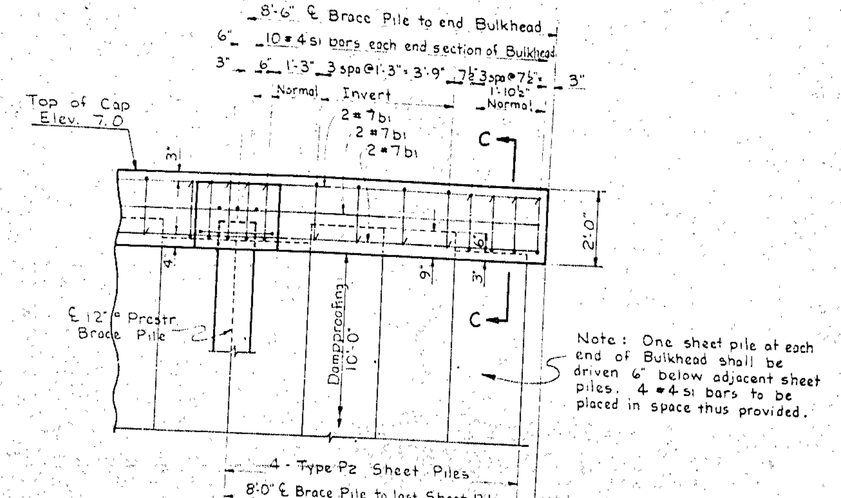
FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N. C.	8.2215302
F. A. PROJECT		S-16 64(2)



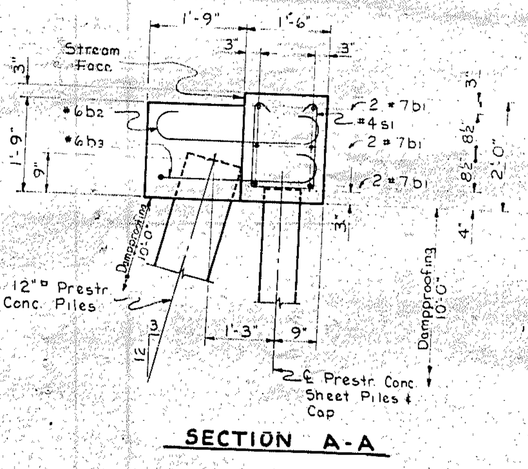
TYPICAL ELEVATION - 10'-0" BAY



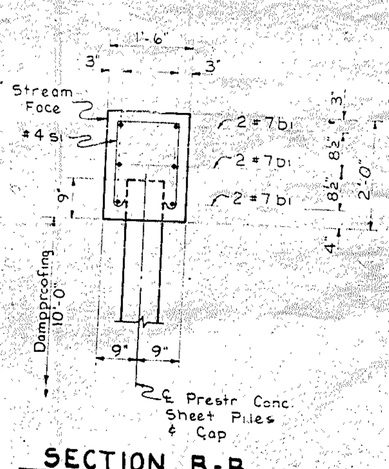
TYPICAL ELEVATION - 14'-0" BAY



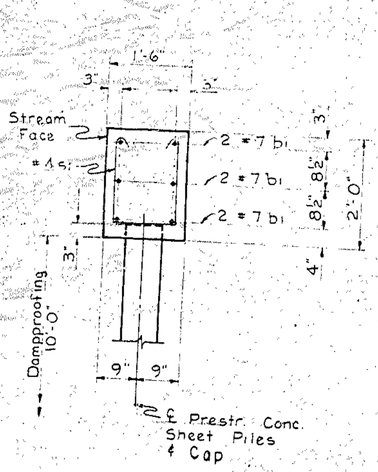
TYPICAL ELEVATION AT END OF BULKHEAD



SECTION A-A



SECTION B-B



SECTION C-C

BILL OF MATERIAL FOR CAP

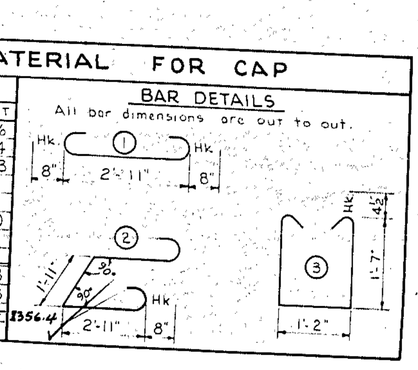
REINFORCING STEEL

BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
b1	48	#7	Str.	50'-0"	4,906
b2	93	#6	1	4'-3"	594
b3	31	#6	2	9'-1"	423
s1	430	#4	3	5'-1"	1,460

Reinforcing Steel lbs.	7,383
* Class "A" Concrete cu. yds.	44.3
** Method "D" Dampproofing sq yds. ~~1404~~ 1356.4	
12"ø Prestr Conc Piles: No-31; Lin Ft 930	

BAR DETAILS

All bar dimensions are out to out.



* Concrete displaced by Pile heads has been deducted.

** Includes Prestr. Conc. Sheet Piles & 12"ø Prestr. Conc. Piles.

PROJECT No. 8.2215302
CARTERET COUNTY
STATION: 211+20
Sheet 2 of 3

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

BULKHEAD

SEPTEMBER, 1969

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-34
1			3			TOTAL SHEETS
2			4			41

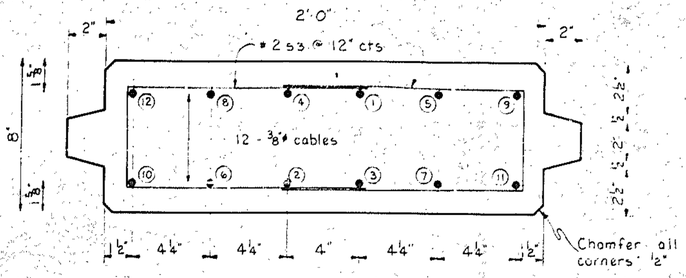
DRAWN BY Robert G. Gower DATE Sept. 1969
CHECKED BY [illegible] DATE Sept. 1969

BUILT ACCORDING TO PLANS

BUILT ACCORDING TO PLANS

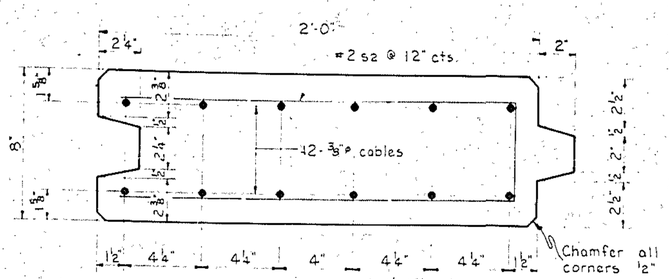
1		3	SHEETS
2		4	2241

FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N. C.	8.2215302
F. A. PROJECT		S-16 64(2)



TYPE P1

○ Denotes order of burning cables - cables for all sheet piles (P1, P2, P3 & P4) to be released by a similar pattern.



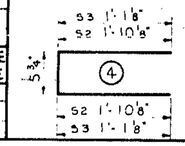
TYPE P2

REINFORCING STEEL FOR ONE TYPE P1 SHEET PILE					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S3	50	#2	4	2'-8"	22

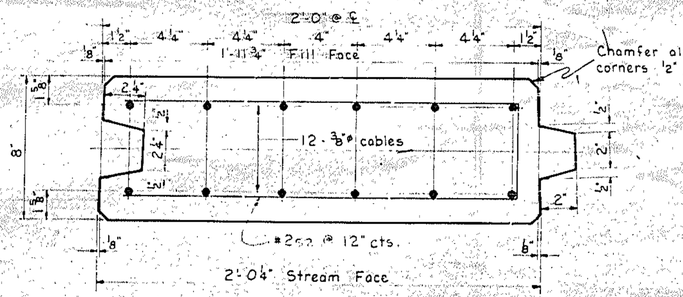
REINFORCING STEEL FOR ONE TYPE P2, P3, or P4 SHEET PILE					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S2	25	#2	4	4'-2"	17

BAR DETAILS

All bar dimensions are out to out.

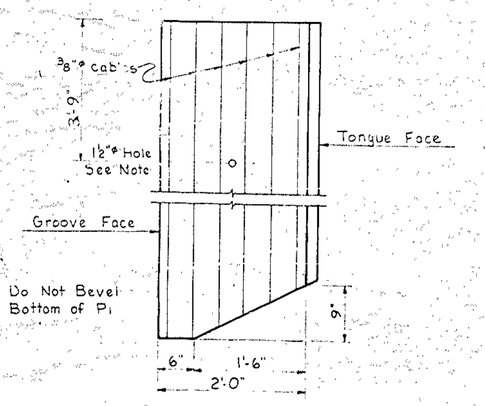


SUMMARY OF PRESTR. CONCRETE SHEET PILES				
MARK	NO.	SIZE	LENGTH	LIN. FT.
P1	1	8"×2'-0"	25'-0"	25
P2	145	8"×2'-0"	25'-0"	3,625
P3	22	8"×2'-0"	25'-0"	550
P4	22	8"×2'-0"	25'-0"	550
Total	190			4,750



TYPE P3

(TYPE P4 OPPOSITE HAND TO P3)



ELEVATION - SHEET PILE

Note: For convenience in handling the sheet piles the contractor will be required to form a hole not to exceed 1 1/2"ø 3'-9" down from the top of the sheet pile. The holes shall be formed by wood plugs. Remove plugs before concrete has reached final set or by the use of some non-corrosive material. These holes to serve as drains.

NOTES

1. All prestress strands to be 3/8"ø Stress Relieved Cables. Each cable to be prestressed at 14,000 lbs.
2. Concrete: f'c = 5,000 lbs. per square inch.
3. Method "D" Dampproofing to be applied from bottom of cap for 10'-0" each pile.
4. Prestressed Concrete Sheet Piles shall be manufactured, driven and paid for in accordance with the requirements for prestressed concrete piles in Section 207-A of the Specifications.

PROJECT NO. 8.2215302
CARTERET COUNTY
STATION: 211+20
Sheet 3 of 3

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

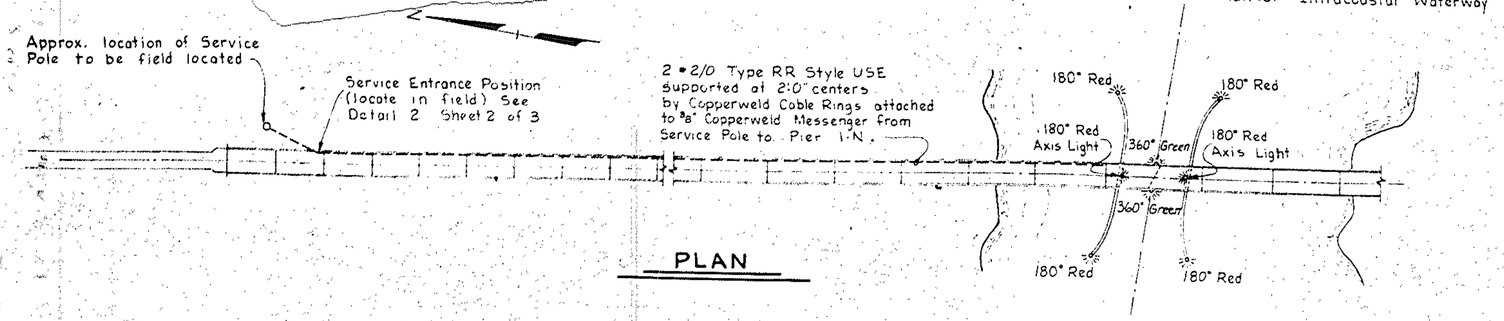
BULKHEAD

SEPTEMBER, 1969 67

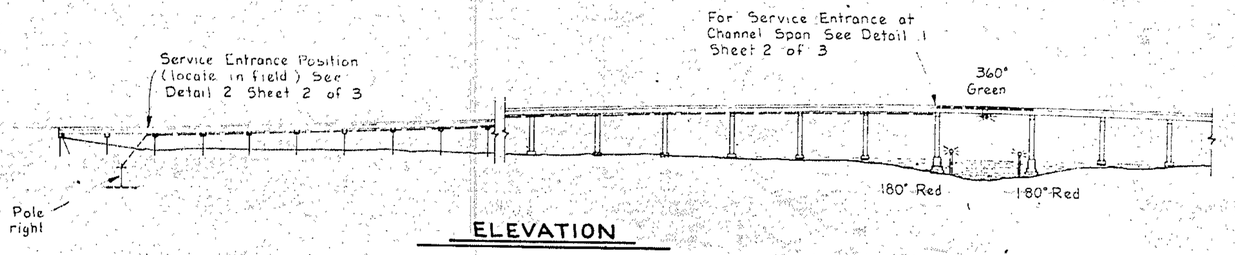
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-35
1			3			TOTAL SHEETS
2			4			2641

DRAWN BY Robert G. Gower DATE Sept. 1969
CHECKED BY [illegible] DATE Sept. 1969

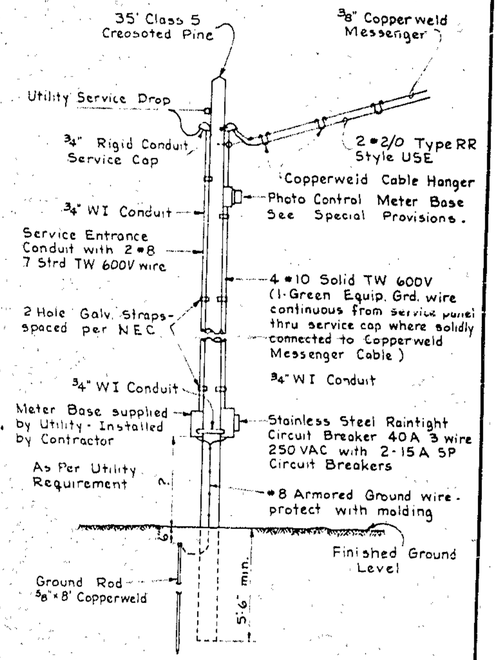
BUILT ACCORDING TO PLANS



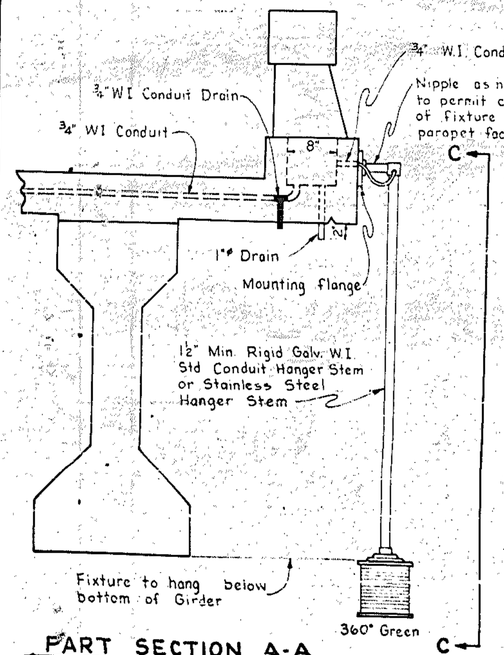
PLAN



ELEVATION

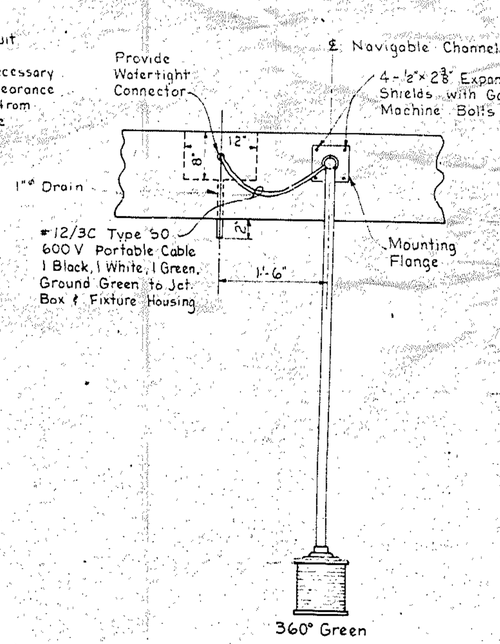


SERVICE & METER POLE



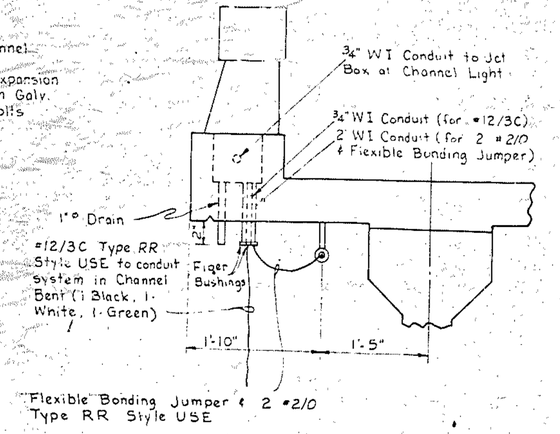
PART SECTION A-A

(See Sheet 2 of 3)



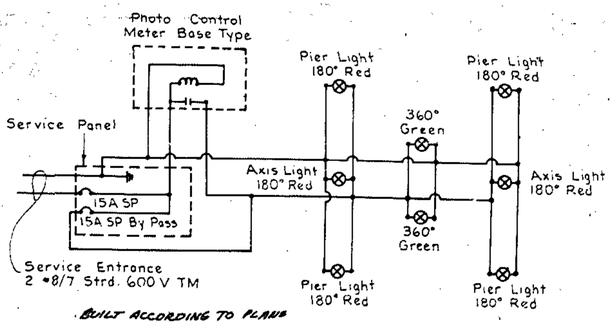
VIEW C-C

Showing 360° Green Channel Center Light



SECTION B-B

(See also Detail 1 Sheet 2 of 3)



BUILT ACCORDING TO PLANS

SCHEMATIC WIRING DIAGRAM

PROJECT No. 8.2215302

CARTERET COUNTY

STATION: 211 + 20

Sheet 1 of 3

STATE OF NORTH CAROLINA

STATE HIGHWAY COMMISSION

RALEIGH

NAVIGATION LIGHTING PLAN

AUGUST, 1969

FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N. C.	8.2215302
F. A. PROJECT	S-16 64(2)	

REVISIONS

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

SHEET NO. S-36

TOTAL SHEETS 41

SHEETS 41

DRAWN BY Robert G. Gower DATE B-27-1969

CHECKED BY [illegible] DATE Aug 1969

SOUTHERLAND BLUE PRINT CO. CHARLOTTE, N. C.

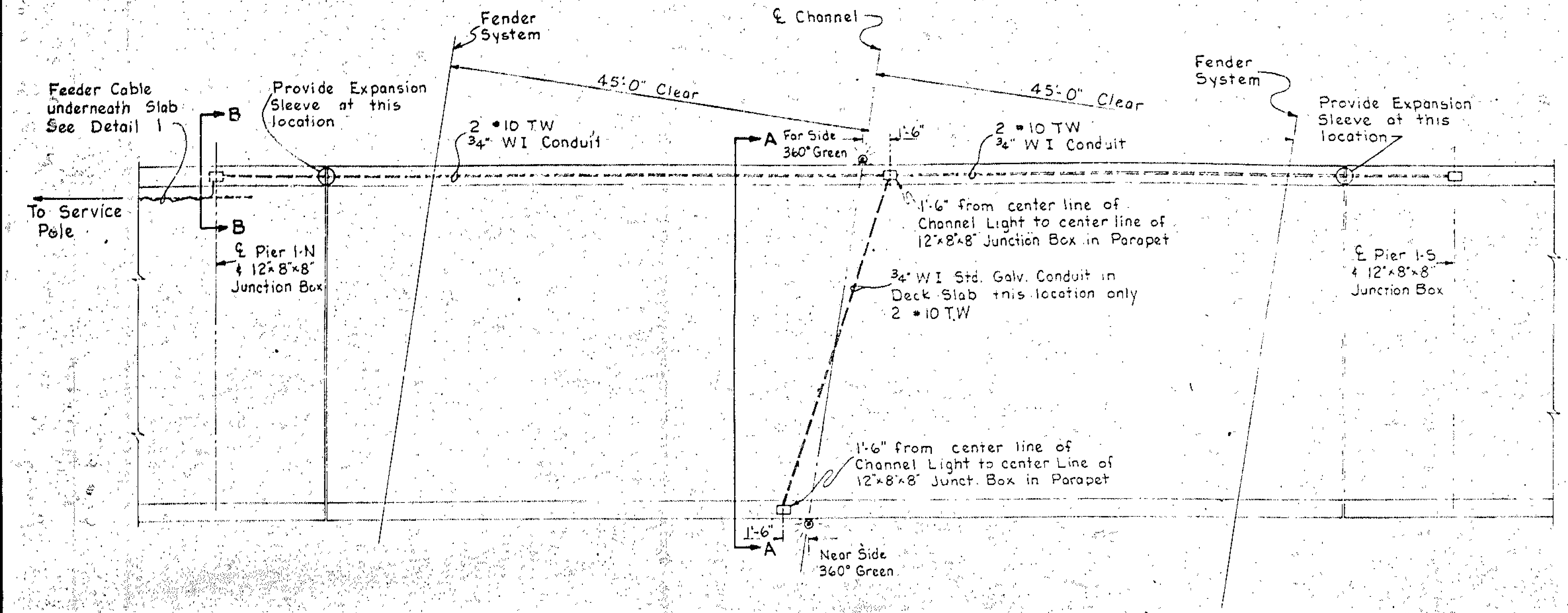
DRAWN BY Robert G. Gower DATE B-27-1969

CHECKED BY [illegible] DATE Aug 1969

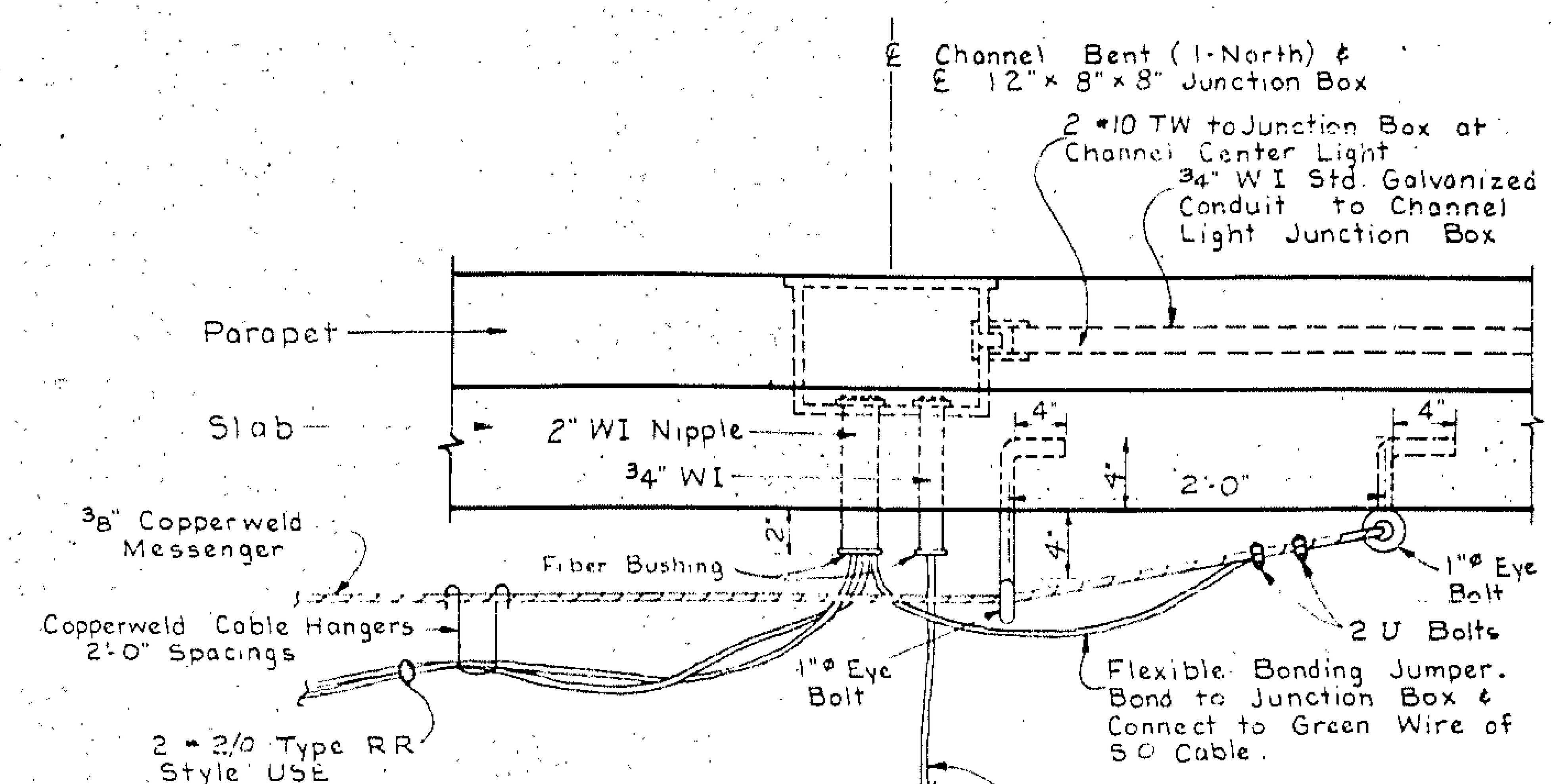
SOUTHERLAND BLUE PRINT CO. CHARLOTTE, N. C.

BUILT ACCORDING TO PLANS

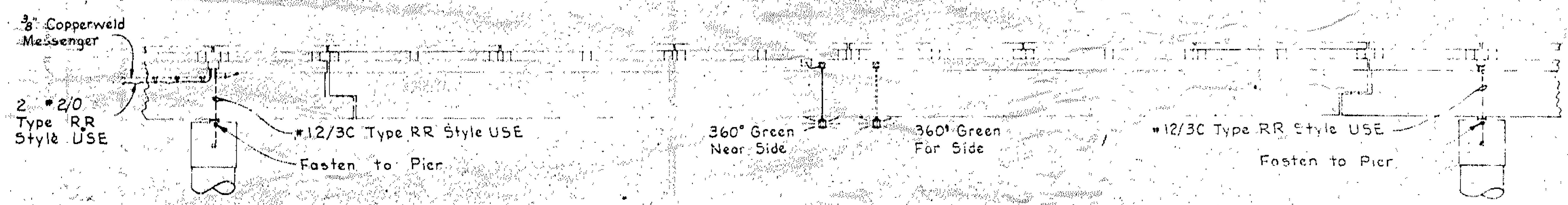
FED. ROAD DIV. NO.	STATE	PROJECT NO.
2	N.C.	8.2215302
F. A. PROJECT	S-16	6 ½ (2)



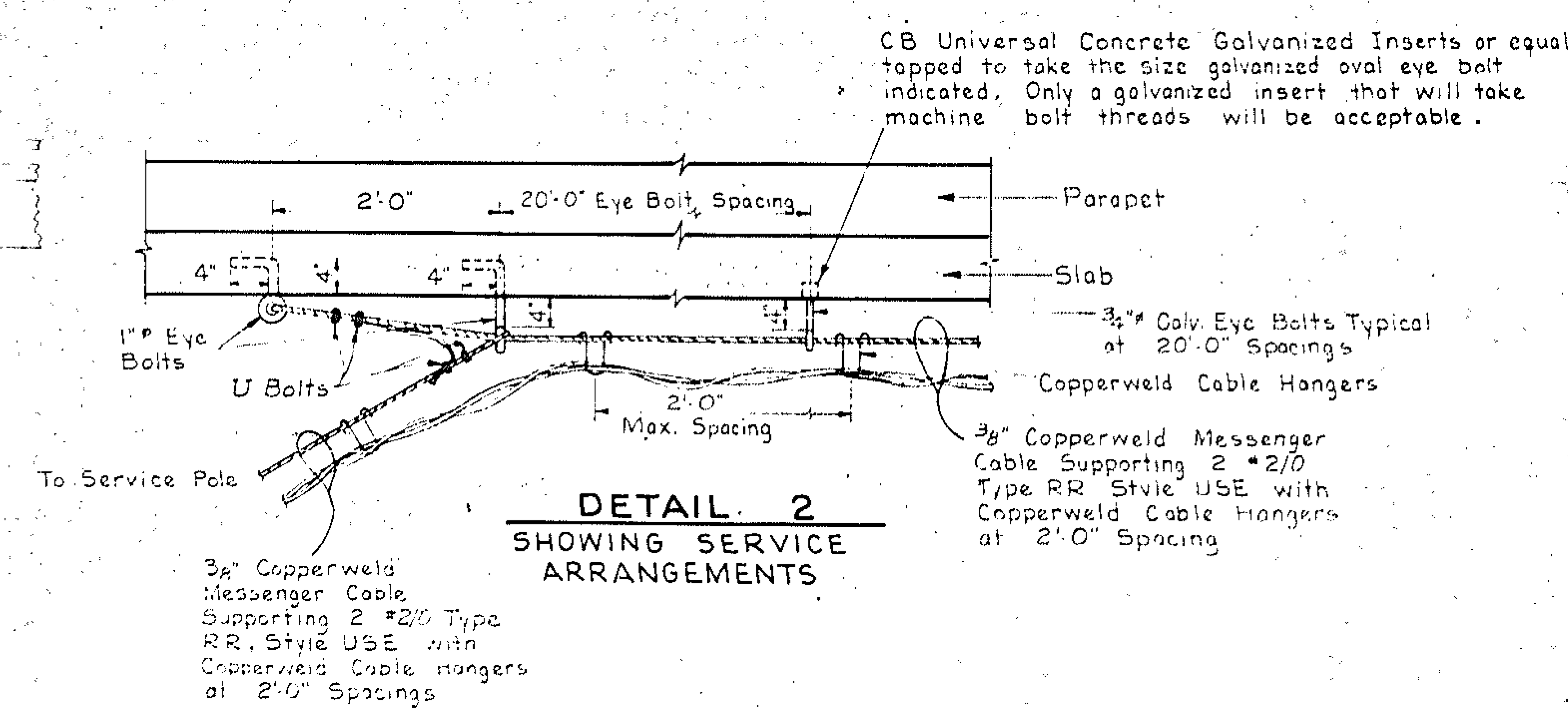
NAVIGATION LIGHTING PLAN AT CHANNEL SPAN



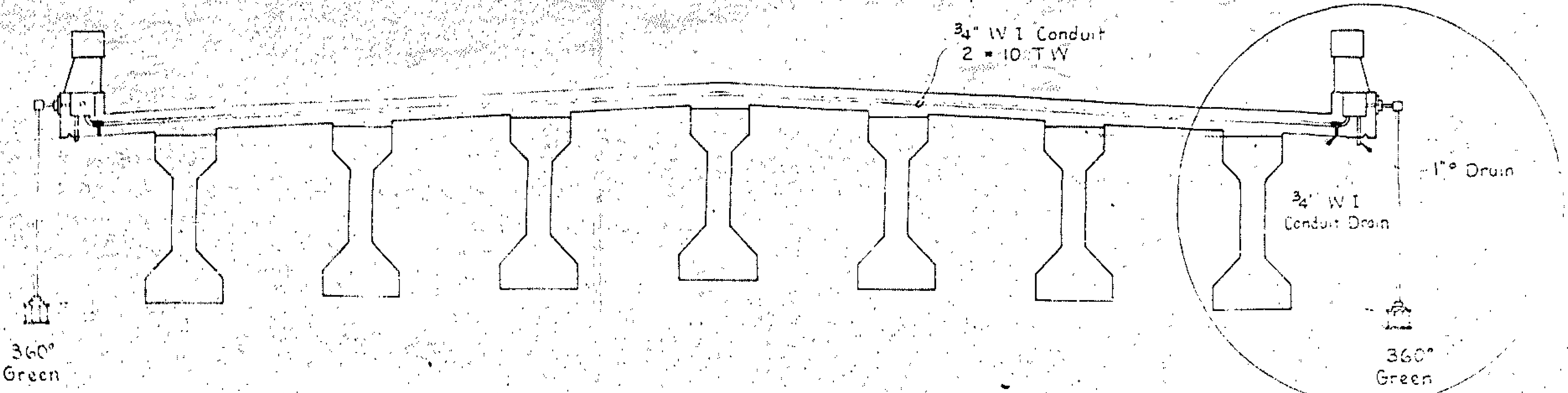
DETAIL 1
SHOWING SERVICE ENTRANCE
(See also Section B-B, Sheet 1 of 3)



ELEVATION
SHOWING LIGHTS IN PLACE



DETAIL 2
SHOWING SERVICE ARRANGEMENTS



SECTION A-A
SHOWING LIGHTS IN PLACE

NOTES:

1. The Navigation Lighting System shall be installed to, and conform with the requirements of the following: (a) Standard Specifications For Road & Bridge Construction, N.C. State Highway Commission, (b) N.F.P.A. No 70, National Electric Code 1965, (c) Aids to Navigation Regulations, United States Coast Guard, CG-208, Jan 1, 1953.

2. The Electrical Contractor shall contact the Power Company and Engineer as to location of service point.

3. The neutral conductor and all non-current carrying parts of the Navigation Lighting System shall be interconnected by a ground wire, (as specified on the plans) & grounded at the equipment pole. The grounding point at the equipment pole shall be the only interconnection between the equipment ground wire and the system ground wire.

4. All conduit to be galvanized.

BUILT ACCORDING TO PLANS

PROJECT No. 8.2215302
CARTERET COUNTY
STATION: 211 + 20
Sheet 2 of 3

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

NAVIGATION LIGHTING PLAN

AUGUST, 1969

NO.	BY	DATE	NO.	BY	DATE
1			3		
2			4		

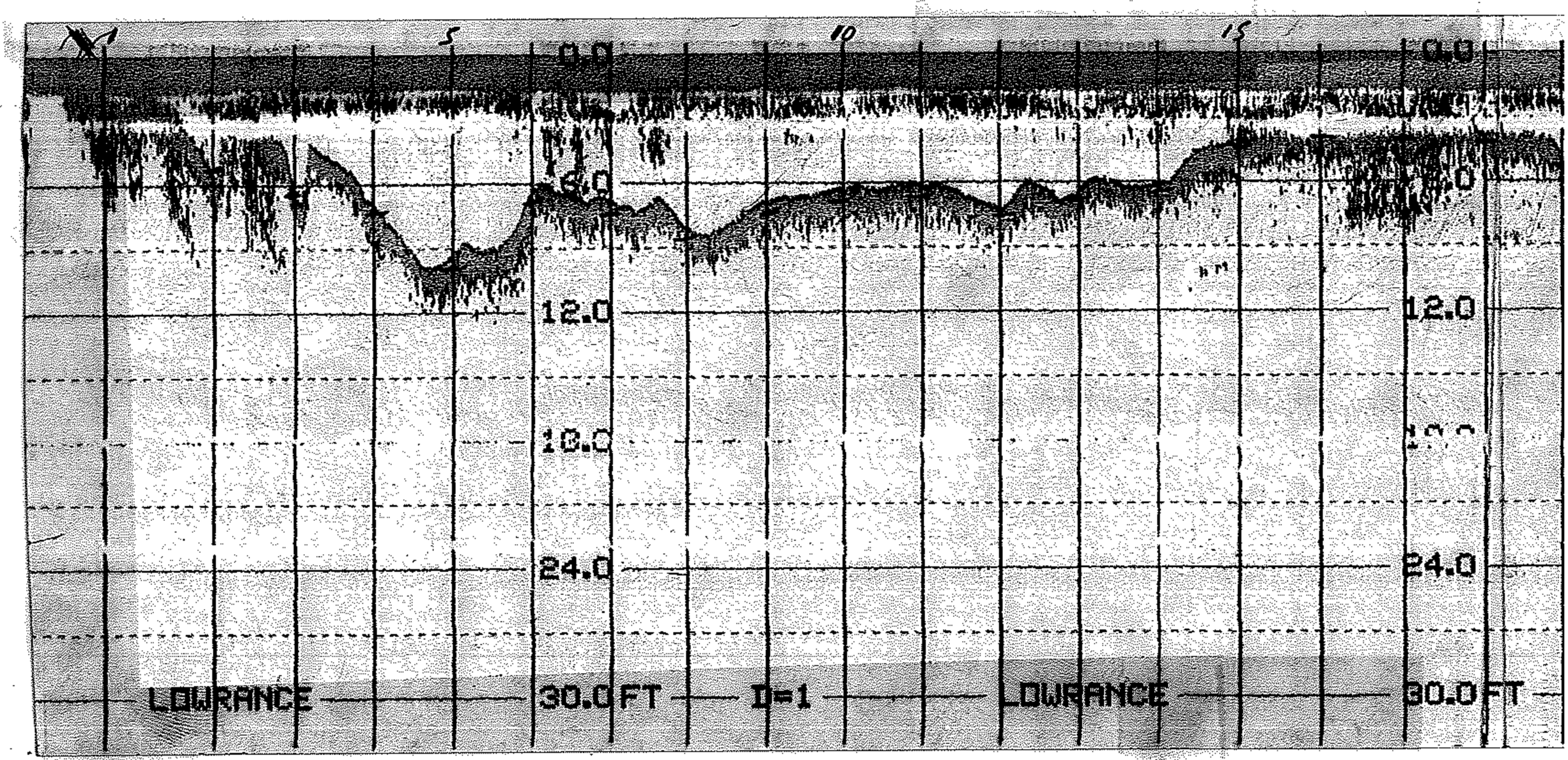
SHEET NO. S-37
TOTAL SHEETS 41

DRAWN BY Robert C. Gower DATE 8-27-69
CHECKED BY [illegible] DATE [illegible]

SOUTHERLAND BLUE PRINT CO. CHARLOTTE N. C.

COUNTY CARTERET BR. # 150006 DATE 6/19/01 BY: W.H. LOTZ

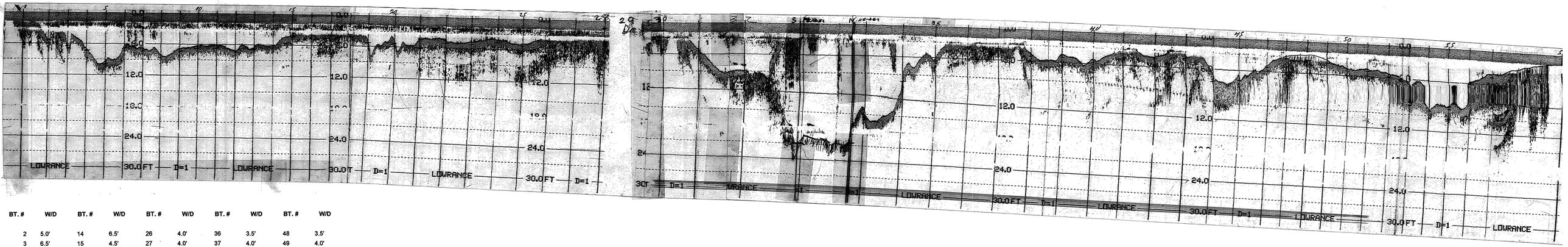
WEST SIDE RUN TAKEN S-N +/- 10' FROM BENTS 1-58 W/S TO TOP OF FOOTING AT BT.# 19 = 6.1'



BT. #	W/D	BT. #	W/D	BT. #	W/D	BT. #	W/D	BT. #	W/D
2	5.0'	14	6.5'	26	4.0'	36	3.5'	48	3.5'
3	6.5'	15	4.5'	27	4.0'	37	4.0'	49	4.0'
4	7.5'	16	4.0'	28	1.5'	38	5.0'	50	5.0'
5	10.0'	17	4.5'	29	DRY	39	5.0'	51	5.0'
6	6.5'	18	4.5'	30	1.5'	40	5.5'	52	6.0'
7	7.5'	19	5.0'	31	5.0'	41	4.0'	53	7.5'
8	8.5'	20	5.0'	32	9.5'	42	4.5'	54	8.0'
9	7.5'	21	4.5'	S. FEN.	21	43	4.5'	55	7.5'
10	7.0'	22	5.0'	N. FEN	20.5'	44	7.5'	56	5.0'
11	6.5'	23	5.0'	33	16.0'	45	7.5'	57	5
12	7.5'	24	4.5'	34	10.0'	46	5.0'	58	1.5'
13	7.0'	25	5.0'	35	6.5'	47	3.5'		

COUNTY **CARTERET** BR. # **150006** DATE **6/19/01** BY: **W.H. LOTZ**

WEST SIDE RUN TAKEN S-N +/- 10' FROM BENTS 1-58 W/S TO TOP OF FOOTING AT BT.# 19 = 6.1'



BT. #	W/D	BT. #	W/D	BT. #	W/D	BT. #	W/D	BT. #	W/D
2	5.0'	14	6.5'	26	4.0'	36	3.5'	48	3.5'
3	6.5'	15	4.5'	27	4.0'	37	4.0'	49	4.0'
4	7.5'	16	4.0'	28	1.5'	38	5.0'	50	5.0'
5	10.0'	17	4.5'	29	DRY	39	5.0'	51	5.0'
6	6.5'	18	4.5'	30	1.5'	40	5.5'	52	6.0'
7	7.5'	19	5.0'	31	5.0'	41	4.0'	53	7.5'
8	8.5'	20	5.0'	32	9.5'	42	4.5'	54	8.0'
9	7.5'	21	4.5'	S. FEN.	21	43	4.5'	55	7.5'
10	7.0'	22	5.0'	N. FEN	20.5'	44	7.5'	56	5.0'
11	6.5'	23	5.0'	33	16.0'	45	7.5'	57	5
12	7.5'	24	4.5'	34	10.0'	46	5.0'	58	1.5'
13	7.0'	25	5.0'	35	6.5'	47	3.5'		