8.2016601 | 68 | 43 91

F A PROJ NO S-254(2)

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION

PLAN AND PROFILE OF ~~PROPOSED~~ STATE HIGHWAY

BUNCOMBE COUNTY

BRIDGE AND APPROACHES OVER FRENCH BROAD RIVER BETWEEN SR 1634 AND US 25 & 70 ABOUT 0.7 MILES NORTH WEST OF ALEXANDER

THIS CONTRACT INCLUDES GRADING, DRAINAGE, PAVING AND STRUCTURES

INDEX OF SHEETS

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Typical Cross Section of Improvement
Estimate of Quantities
" " 1A Estimate of Quantities (Pipe)
" " 180 Std Brick Catch Basin with Grate and Frame (Std # 8201)
" " 181 Std Cone Endwall (15" 48" Pipe 30° Skew (Std # 8.61)
" " 182 Std Cone Endwall (15" 48" Pipe 30° Skew (Std # 8.62)
" " 194 Std Brick Masonry Headwall (15" 48" Pipe 30° Skew (Std # 8.72)
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" " 421 Std Method of Joint Sealing Expansion Joints (Std # 800)
" " 422 Std Underdrain and Joint Drains (Std # 470.2)
" " 4A Details of 36" Structural Plate Pipe Culvert
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" " 4D Details of Reinforced Concrete Endwall 30" Diameter 45° Skew
" " 4E Details of Reinforced Concrete Endwall 30" Diameter 45° Skew
" " 4F Details of Reinforced Concrete Endwall 30" Diameter 45° Skew
" " 4G General Notes
" " 1 Typical Cross Sections
" " 2 Summary of Earthwork
" " 3 Cross Sections

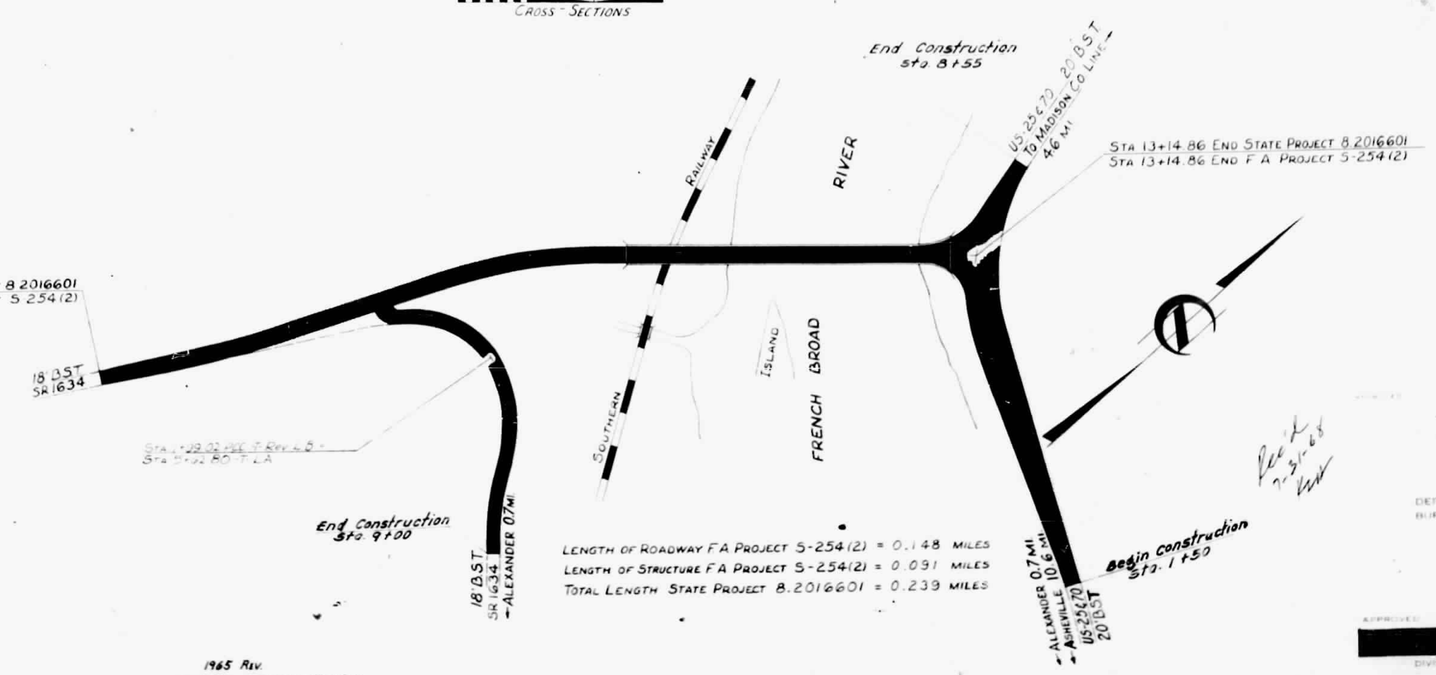
GRAPHICAL SCALES

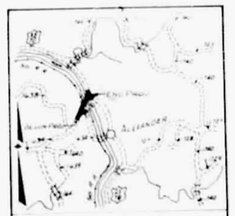
0 50 100 150' PLANS
0 50 100 150' PROFILE (HORIZONTAL)
0 10 20 30' PROFILE (VERTICAL)
0 100 200 300' LAYOUT (TITLE SHEET)
0 10 20 30' CROSS-SECTIONS

DESIGN DATA	
ADT 1966	900
ADT 1986	1600
DHV	12%
D	60%
T	7%
V	45 MPH

CONVENTIONAL SIGNS

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





SKETCH MAP SHOWING
SHIPPING POINT & LOCATION OF
STATE PROJECT 8.2016601

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

LENGTH OF ROADWAY F A PROJECT S-254(2) = 0.148 MILES
LENGTH OF STRUCTURE F A PROJECT S-254(2) = 0.091 MILES
TOTAL LENGTH STATE PROJECT 8.2016601 = 0.239 MILES

RIGHT OF WAY ON THIS PROJECT IS 100' WIDE OR AS NOTED ON PLANS

1965 REV.
State Standard Specifications.
Approved by Bureau Control.

Surveyed by G.N. SAPARILAS
Plans Prepared by C. FRIZZELL
Date JUNE 1968

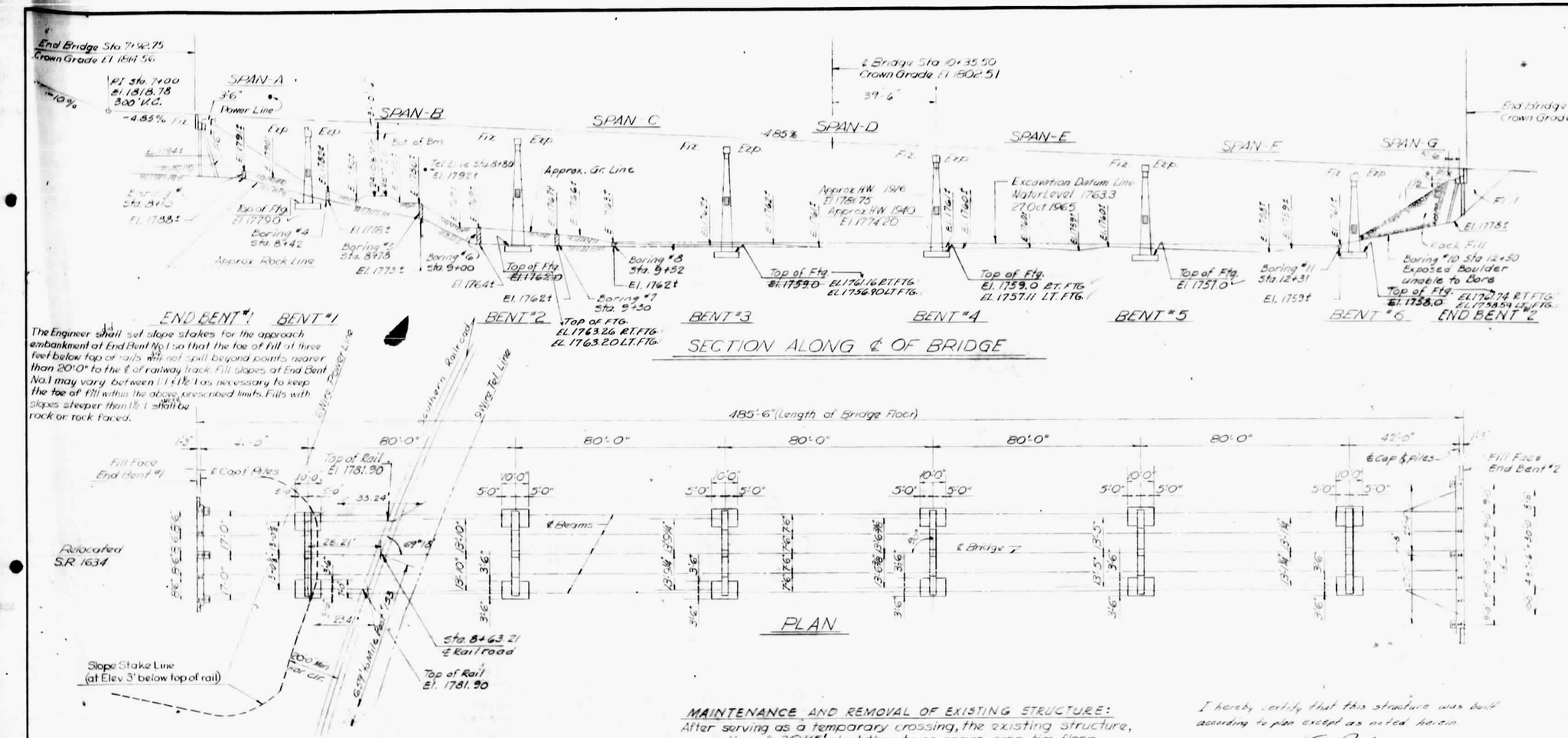
DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

APPROVED:
DIVISION ENGINEER DATE

8.2016601

FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N. C.	82016601

FA PROJECT No. S-254(3)

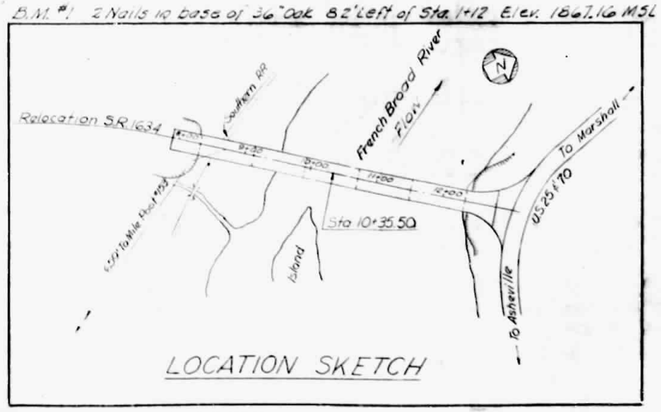


SECTION ALONG ℄ OF BRIDGE

The Engineer shall set slope stakes for the approach embankment at End Bent No.1 so that the toe of fill at three feet below top of rails will not spill beyond points nearer than 20'-0" to the ℄ of railway track. Fill slopes at End Bent No.1 may vary between 1:1 & 1½:1 as necessary to keep the toe of fill within the above prescribed limits. Fills with slopes steeper than 1½:1 ~~shall be~~ were rock or rock faced.

PLAN

B.M. #1 2 Nails in base of 36" Oak 8.2' Left of Sta. 1+12 Elev. 1867.16 MSL



LOCATION SKETCH

MAINTENANCE AND REMOVAL OF EXISTING STRUCTURE:
After serving as a temporary crossing, the existing structure, consisting of 3@115' steel thru truss spans, creo. tim. floor, rubble masonry abutments, concrete piers, 15' cl. roadway, and located 0.5 miles upstream from proposed structure, ~~shall be~~ will be removed as follows: Superstructure-completely. Substructure-in accordance with the Specifications (See Specifications and Special Provisions.)

I hereby certify that this structure was built according to plan except as noted herein

Signed [illegible] Date 9-23-70
Resident Engineer

** See Special Provisions for method of coting bridge deck and mixing and applying the linseed oil solution.

NOTES

Assumed Live Load: HS 15-44

for other Design Data and General Note, see Sheet S-N.

Computed foundation load for Bents #1, #2, #3, #4, #5, & #6 equals 4.6 tons per sq. ft.

Footings for Bents #1, #2, #3, #4, #5, & #6 ~~to be~~ were carried at least 12" into rock with thickness as shown on plans

Piles in End Bents #1 & #2 ~~are~~ were designed for bearing capacities of 36 tons per pile. These piles ~~shall be~~ were driven to rock or to practical refusal.

Fill for End Bent #2 ~~shall be~~ was rock with an earth core through which End Bent #2 piles ~~are to be~~ were driven. Before placement of fill for End Bent #2, the Contractor ~~shall~~ removed existing broken rock and boulders from the pile locations to assure piles ~~are~~ were driven to solid rock.

The Contractor ~~will be~~ was responsible for determining the correct length of piles. See Special Provisions.

Existing 6 Wire Power Line ~~will be~~ was relocated by others to clear Const.

*INCLUDES QUANTITIES IN CURVED END BLOCK

TOTAL BILL OF MATERIAL

	Reinf. Steel 110,133 Pounds	Class "A" Conc Cu. Yds.	Struct Steel (Approx Pounds	12 H 53 Steel Piles No	12 H 53 Steel Piles Lin. Ft.	Excavation WET Cu. Yds.	Excavation DRY Cu. Yds.	Conc. Hand Rail Lin. Ft.	Linseed Oil Conc. Protect. Gal.**	Maint & Removal of Exist. Struct. Lump Sum	Class "AA" Conc. Cu. Yds.
Superstructure	~~110,156~~*		466,300					~~475.5~~ 473.25	41		463.2*
End Bent #1	2,236	~~41.7~~	10,700	8	~~174~~						
Bent #1	9,508	41.7	43,930		172.5		72	55.6			
Bent #2	10,863	50.5	52,260			25	~~172~~	~~40~~	23.07		
Bent #3	10,853	49.7	53,019				~~48~~				
Bent #4	10,311	46.6	49,500				~~54~~				
Bent #5	10,291	45.2	49,960				~~64~~				
Bent #6	9,650	41.9	43,313		262.2		~~56~~	15.95			
End Bent #2	3,599	16.3		10	203						
Totals	~~167,176~~	305.9	466,300	18	~~377~~	~~240~~	~~112~~	~~475.5~~	41	Lump Sum	463.2
TOTALS FROM	177,444	318.031			3,422	240.12	112.09	97525			

SPECIAL

DESIGNED BY	R. Turner	DATE	Nov. 66
DRAWN BY	R. Blair	DATE	Nov. 66
TRACED BY		DATE	
CHECKED BY	R. Self	DATE	Nov. 66

PROJECT No. 82016601
BUNCOMBE COUNTY
STATION: 10+35.50
M.P. Sta. 153.1

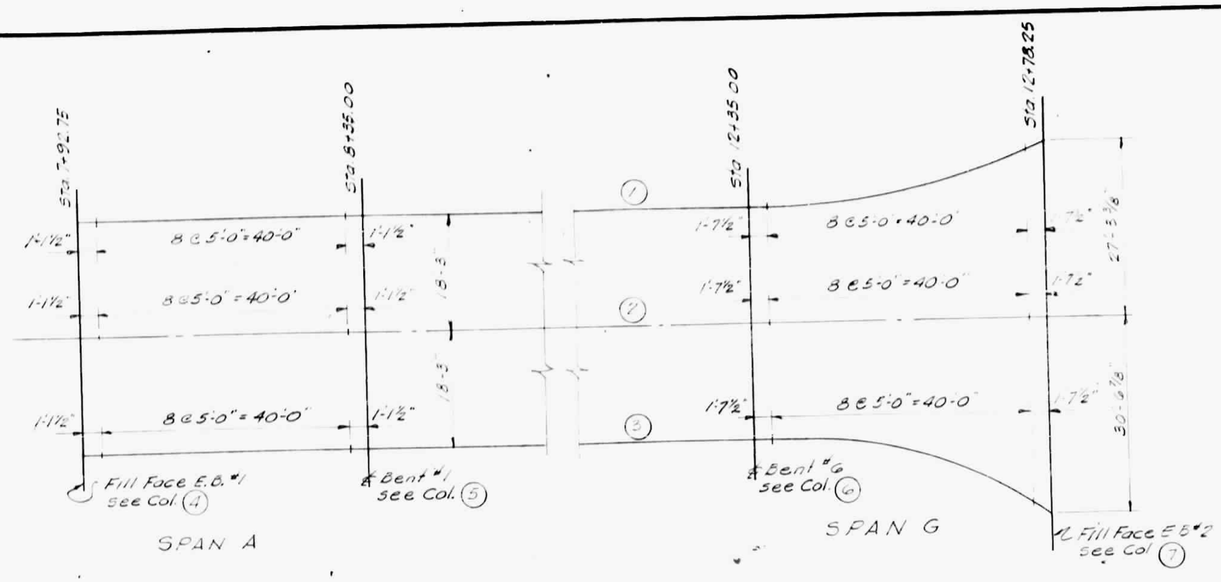
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION

GENERAL DRAWING
FOR BRIDGE OVER FRENCH
BROAD RIVER ON
S.R. 1634 RELOCATION
NOV. 1966

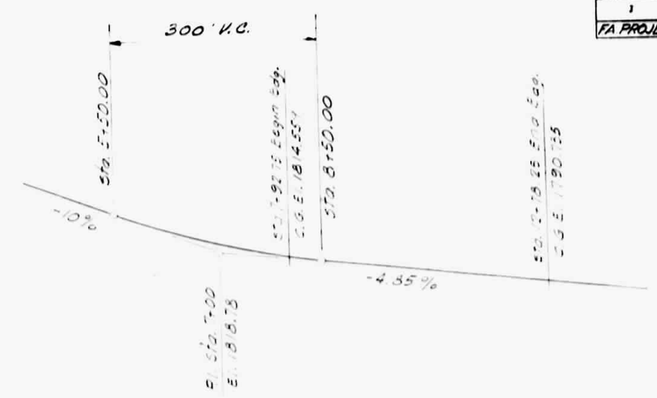
REVISIONS							
NO.	BY	DATE	NO.	BY	DATE	SHEET NO. ~~S-1~~ 69	
1			2			TOTAL SHEETS ~~15~~ 91	
2			4				

FED. ROAD DIST. NO.	STATE	PROJECT NO.
3	N. C.	B-2016601

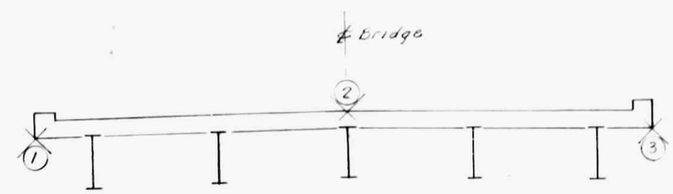
FA PROJECT No. S-254(2)



PLAN



GRADE DATA



TYPICAL SECTION

Dist.	Location	Col. 1 Elevation Bottom of Overhang	Col. 2 Elevation ℄ of Roadway	Col. 3 Elevation Bottom of Overhang
		SPAN	A	
	Fill Face	1813.606	1814.559	1813.606
1'-1½"	7+93.88	1813.540	1814.493	1813.540
8 @ 5'-0" = 40'-0"		1813.252	1814.205	1813.252
		1812.967	1813.920	1812.967
		1812.687	1813.640	1812.687
		1812.412	1813.365	1812.412
		1812.140	1813.093	1812.140
		1811.873	1812.826	1811.873
		1811.611	1812.564	1811.611
	8+33.88	1811.351	1812.304	1811.351
1'-1½"	℄ Bt. #1	1811.296	1812.249	1811.296
		SPAN	B	
	℄ Bt. #6	1791.879	1792.832	1791.879
1'-7½"	12+36.63	1791.800	1792.753	1791.800
8 @ 5'-0" = 40'-0"		1791.553	1792.511	1791.558
		1791.302	1792.268	[illegible] 308
		1791.047	1792.026	[illegible] 051
		1790.787	1791.783	1790.786
		1790.524	1791.541	1790.515
		1790.255	1791.298	1790.235
		1789.983	1791.056	1789.946
	12+78.25	1789.705	1790.813	1789.648
1'-7½"	Fill Face	1789.615	1790.735	1789.549

HEADERS

Column 4 Fill Face E.B. #1 Dist.	Elev.	Column 5 ℄ Bent #1 Dist.	Elev.	Column 6 ℄ Bent #6 Dist.	Elev.	Column 7 Fill Face E.B. #2 Dist.	Elev.
Lt. Gutter	1814.294	Lt. Gutter	1811.984	Lt. Gutter	1792.567	Lt. Gutter	1790.331
2'-0"	1814.325	2'-0"	1812.015	2'-0"	1792.598	1'-5 9/16"	1790.354
	1814.356		1812.046		1792.629	2'-0"	1790.385
	1814.387		1812.077		1792.660		1790.416
	1814.419		1812.109		1792.692		1790.447
	1814.450		1812.140		1792.723		1790.479
	1814.481		1812.171		1792.754		1790.510
	1814.512		1812.202		1792.278		1790.541
	1814.543		1812.233		1792.816		1790.572
	1814.543		1812.233		1792.816		1790.603
	1814.512		1812.202		1792.278		1790.635
	1814.481		1812.171		1792.754		1790.666
	1814.450		1812.140		1792.723		1790.697
	1814.419		1812.109		1792.692		1790.728
	1814.387		1812.077		1792.660		1790.711
	1814.356		1812.046		1792.629		1790.680
2'-0"	1814.325	2'-0"	1812.015	2'-0"	1792.598		1790.649
Rt. Gutter	1814.294	Rt. Gutter	1811.984	Rt. Gutter	1792.567		1790.617
							1790.586
							1790.555
							1790.524
							1790.493
							1790.461
							1790.430
							1790.399
							1790.368
							1790.337
						2'-0"	1790.305
						Rt. Gutter	1790.283

Elevations shown in columns 1 thru 7 are final required elevations of the completed structure. In setting up the form and screed elevations provisions must be made for deflections where required.

For columns 4 thru 7 given elevations are at 2'-0" intervals normal to ℄ of roadway from the left gutter line to the right gutter line.

SUPERIMPOSED DEAD LOAD DEFLECTION

	SPAN A	SPAN B	SPAN C	SPAN D	SPAN E	SPAN F	SPAN G
Interior	7/16"	1 9/16"	1 9/16"	1 9/16"	1 9/16"	1 5/16"	7/16"
Exterior	7/16"	2 1/8"	2 1/8"	2 1/8"	2 1/8"	2 1/8"	3/8"
Flared							3/16"

PROJECT No. B-2016601
BUNCOMBE COUNTY
STATION: 10+35.50
M.P. Sta. 1531

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

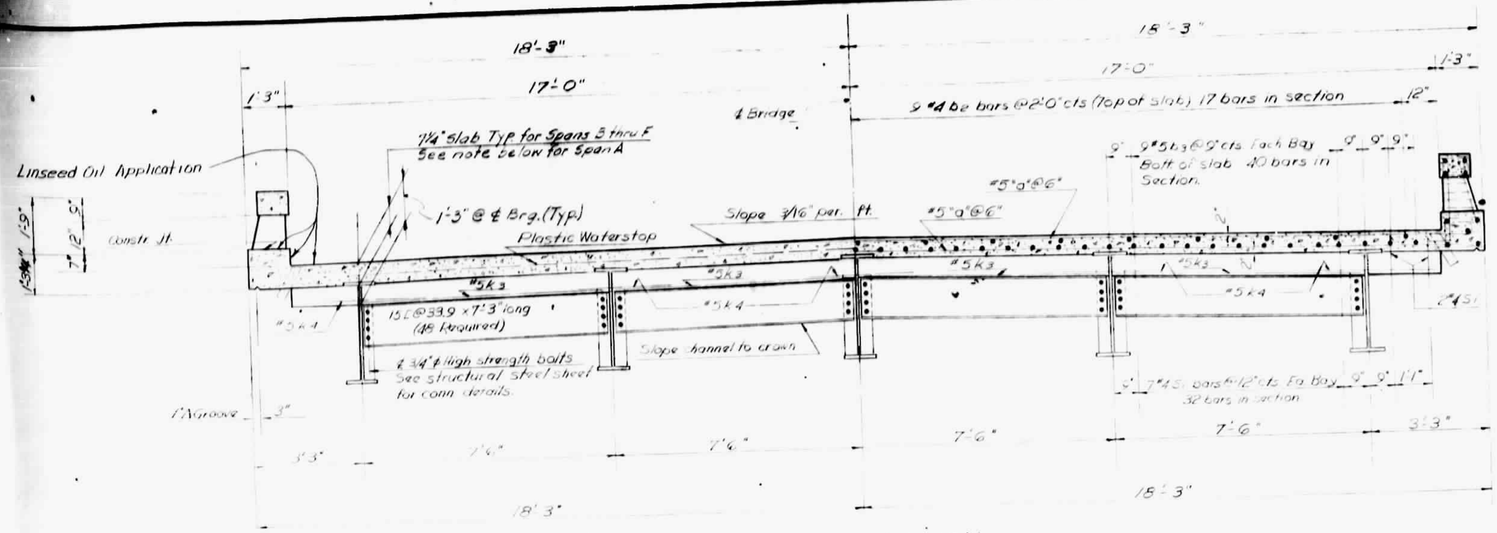
ELEVATIONS FOR SETTING UP FORMS AND SCREEDS
NOV. 1966

REVISIONS							
NO.	BY	DATE	NO.	BY	DATE	SHEET NO. 5-2	TOTAL SHEETS 18
1			3				
2			4				

SPECIAL			
	DESIGNED BY R. E. Turner	DATE Nov. 1966	
	DRAWN BY R. E. Turner	DATE Nov. 1966	
	TRACED BY	DATE	
	CHECKED BY R. Self	DATE Nov. 1966	

FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N. C.	B-2016.601

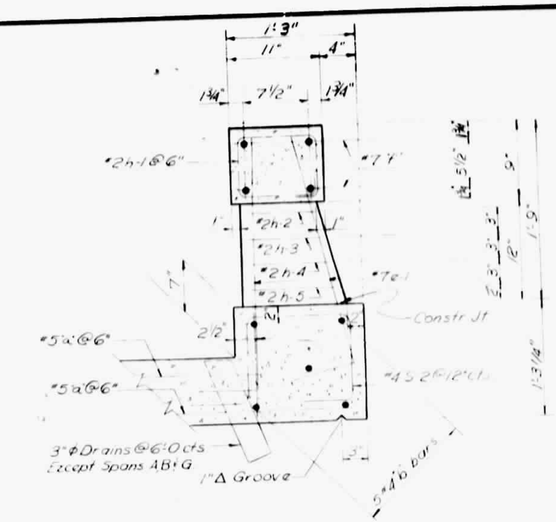
F.A. PROJECT No. S-284(7)



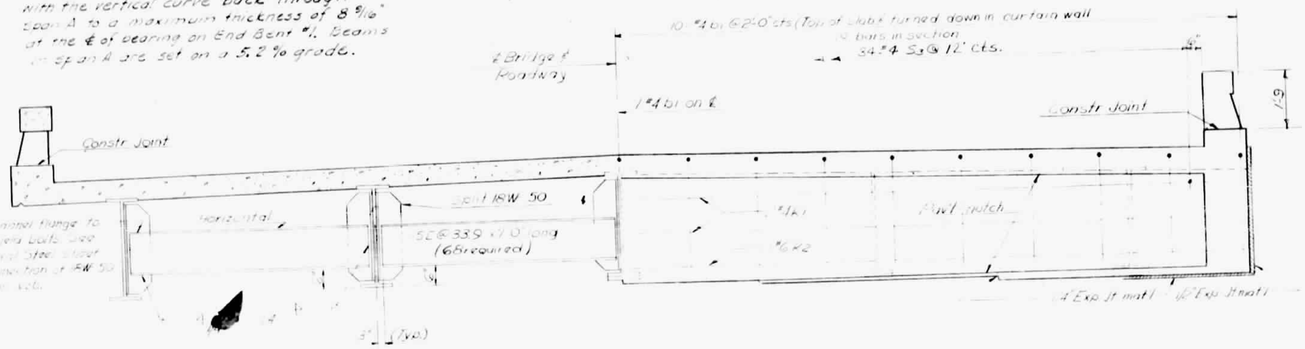
NOTE: Span A slab is 7¼" thick at ℄ of bearing on Pier #1 and varies in thickness with the vertical curve back through span A to a maximum thickness of 8 9/16" at the ℄ of bearing on End Bent #1. Beams in span A are set on a 5.2 % grade.

TYPICAL SECTION

(showing arrangement of ℄ bolts)

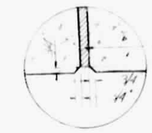


SECTION THRU CURB



TYPICAL HALF SECTION

(showing arrangement of end bent)



DETAIL "A"

NOTES

Assumed live load: HS 15-44

Concrete in roadway slab 1,000 lbs. per sq. in.
Bent steel in tension 20,000 lbs. per sq. in.
Stress, extreme fiber of struct. steel 20,000 lbs. per sq. in.

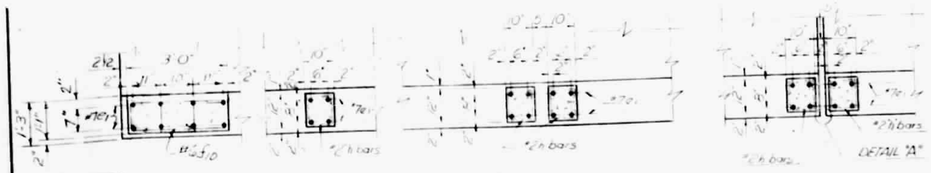
For other design data and general notes see sheet 5-N.

In lieu of the dowel and tie bars shown, see concrete slab for the different spans.

Where expansion joints are expd. tree of concrete and material. See "Special" sheet for rubber asphalt material. See "Special" sheet for revisions.

Note: Drains to be of a type meeting the minimum requirements of ASTM "D1785-64T". See sheet 5-N.

DRAIN DETAILS
104 REQUIRED

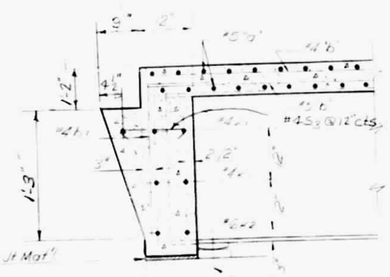


NOTE:
Vertical bars may be shifted to clear name plate / road guard rail.

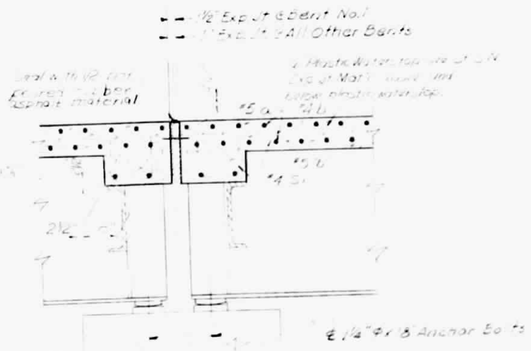
POST DETAILS

(Taken at base of posts)

HALF END VIEW



SECTION "A-A"



SECTION "B-B"

PROJECT No. B-2016.601

BUNCOMBE COUNTY

STATION: 10+35.50

M.P. Sta. 1531

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

SUPERSTRUCTURE
SECTIONS & DETAILS
FOR SPANS A THROUGH F

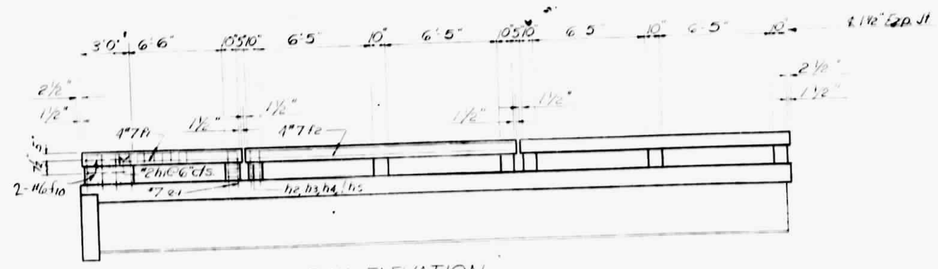
NOV. 1966

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

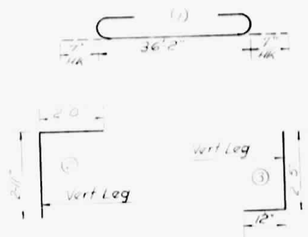
SPECIAL			
DESIGNED BY	S. Farmer	DATE	Nov. 66
DRAWN BY	R. Bair	DATE	Nov. 66
TRACED BY		DATE	
CHECKED BY	R. Self	DATE	Nov. 66

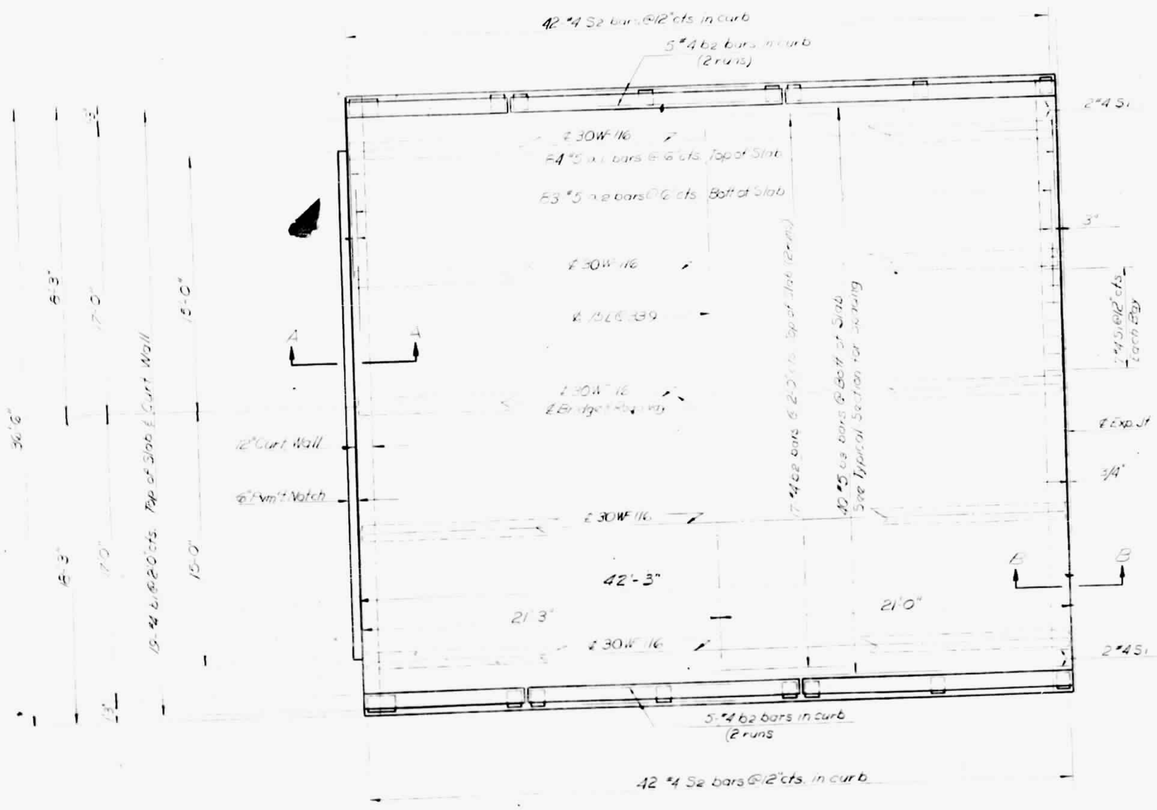
FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N. C.	8.2016601

FA PROJECT No. S-254 (2)

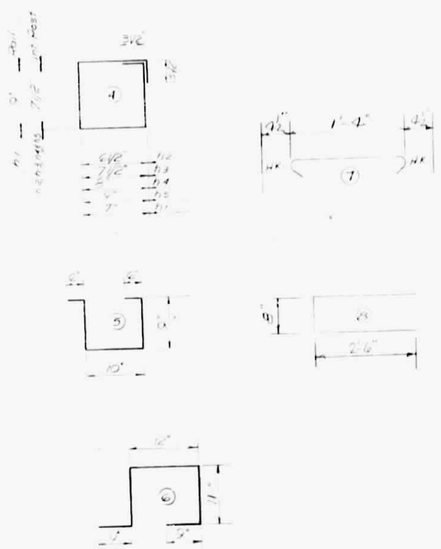


RAIL ELEVATION





PLAN OF SPAN "A"



NOTE: All dimensions in Bar Details are out to out of bar.

Note: See Sheets B, C, D, E & F for Bar Details

BILL OF MATERIAL
FOR ONE SPAN

Bar	No.	Size	Type	Length	Weight
A-1	84	#5	S	27'-4"	2872
A-2	85	#5	Str.	36'-8"	2,426
B-1	54	#4	S	3'-11"	225
B-2	54	#4	Str.	4'-11"	179
B-3	40	#5	Str.	4'-11"	412
K-1	10	#4	Str.	18'-10"	126
K-2	6	#6	Str.	36'-2"	109
K-3	8	#5	Str.	7'-5"	50
K-4	10	#5	Str.	4'-0"	42
S-1	36	#4	S	2'-4"	71
S-2	54	#4	6	4'-1"	243
S-3	54	#4	7	2'-1"	97

Reinforcing Steel, Lbs. 9,680
Class "A" Concrete, Cu. Yds. 41.2
Structural Steel (Approx.) Lbs. 27,323

BILL OF MATERIAL
FOR HANDRAIL
FOR ONE SPAN

Bar	No.	Size	Type	Length	Weight
H-1	72	#7	S	3'-5"	503
H-2	8	#7	Str.	10'-3"	55.2
H-3	16	#7	Str.	5'-4"	57.6
H-4	4	#6	S	3'-8"	34
H-5	10	#6	S	3'-9"	70
H-6	4	#6	4	2'-11"	7
H-7	14	#6	4	3'-7"	7
H-8	14	#6	4	3'-6"	8
H-9	14	#6	4	3'-4"	8
H-10	4	#6	4	3'-4"	8

Handrail Steel, Lbs. 1,307
Class "A" Conc. Cu. Yds. 27

NOTE:
For measurement and payment of Concrete Handrail see Special Provisions.

PROJECT No. 8.2016601
BUNCOMBE COUNTY
STATION: 10+35.50
MP Sta 1531

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

SUPERSTRUCTURE
SPAN A

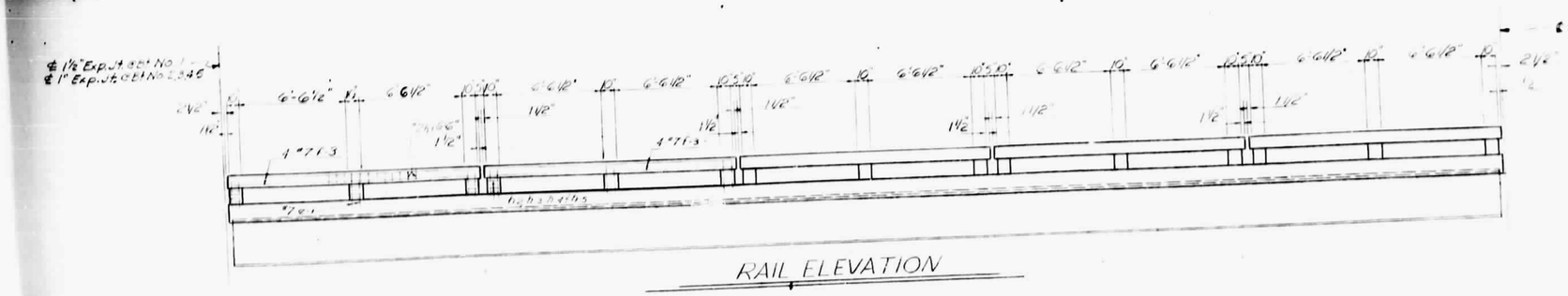
NOV. 1966

REVISIONS							
NO.	BY	DATE	NO.	BY	DATE	SHEET NO. S-4
1			3			TOTAL SHEETS 15
2			4			

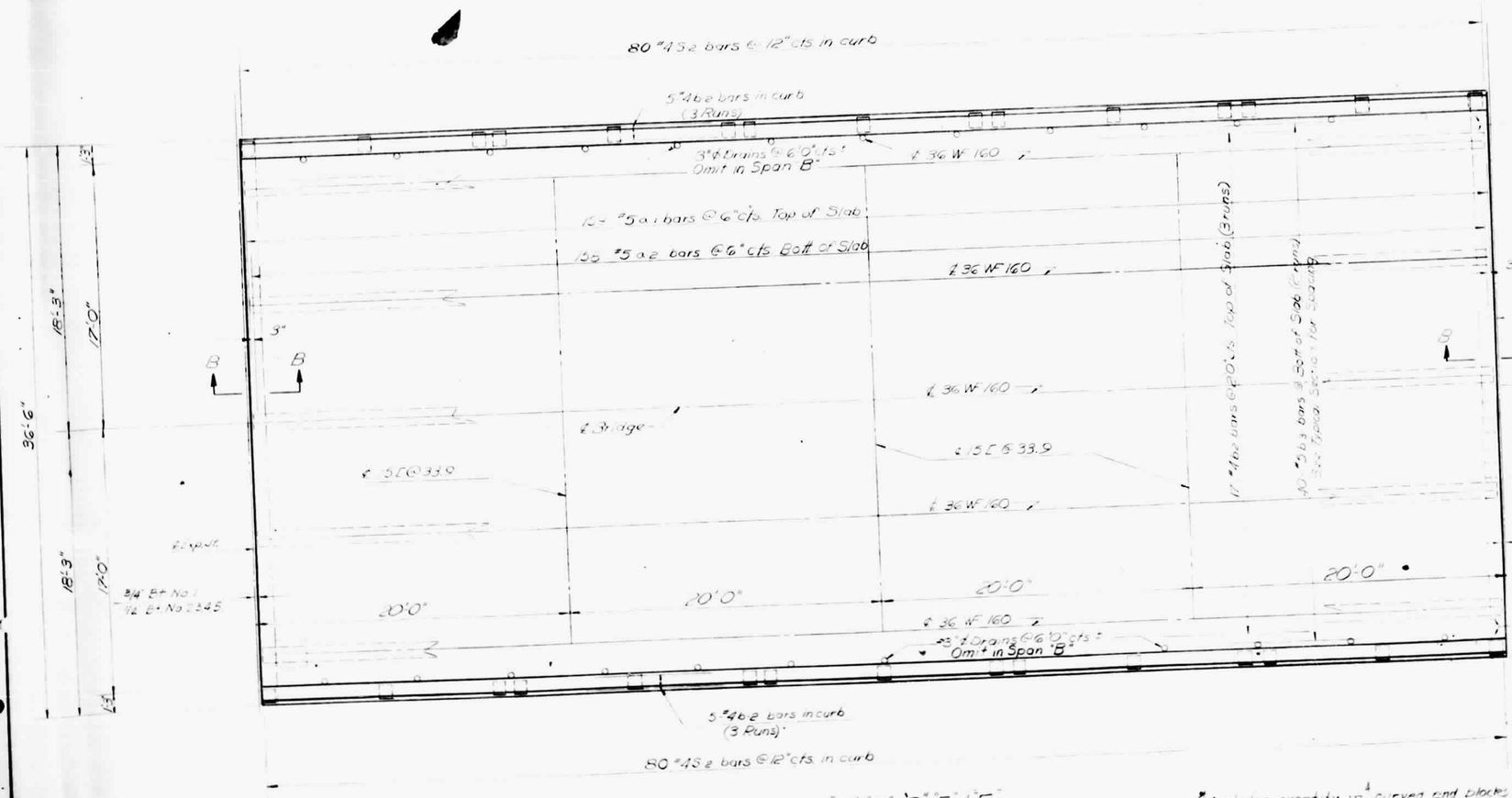
SPECIAL			
DESIGNED BY	R. Turner	DATE	Nov. 66
DRAWN BY	R. Blair	DATE	Nov. 66
TRACED BY		DATE	
CHECKED BY	R. Self	DATE	Nov. 66

FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N. C.	B-2016601

FA PROJECT No. S-254(2)

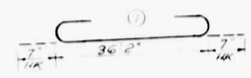


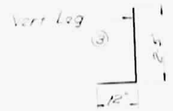
RAIL ELEVATION

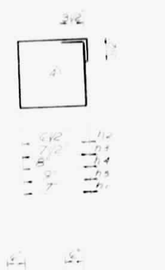


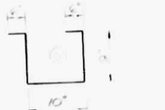
PLAN OF SPAN "B", "C", "D", "E" & "F"

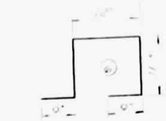
* Includes quantity in curved end blocks











NOTE: All dimensions in "Bar Details" are out to out of bar.

BILL OF MATERIAL
FOR ONE SPAN - 5 REQ'D

Bar	No.	Size	Type	Length	Weight
a 1	15	#5	1	21'-4"	335
a 2	120	#5	Str.	36'-8"	2570
					1404
b 1	61	#4	Str.	27'-9"	1128
b 3	30	#5	Str.	30'-8"	394
b 4	6	#5	Str.	7'-8"	120
b 4	20	#5	Str.	4'-0"	83
b 5	64	#4	5	3'-4"	142
b 5	60	#4	8	4'-4"	403
Reinforcing Steel, Lbs.					17,836
Class "A" Concrete Cu. Yds.					72.6
Structural Steel (Approx.) Lbs.					81,095

BILL OF MATERIAL FOR HANDRAILS
FOR ONE SPAN - 5 REQ'D

Bar	No.	Size	Type	Length	Weight
c 1	120	#7	3	3'-3"	232
c 3	40	#7	Str.	15'-6"	1265
h 1	360	#2	4	3'-3"	194
h 2	30	#2	4	2'-11"	15
h 3	30	#2	4	3'-1"	16
h 4	30	#2	4	3'-2"	16
h 5	30	#2	4	3'-4"	17
Reinforcing Steel Lbs.					2360
Class "A" Concrete Cu. Yds.					4.8

NOTE:
For measurement and payment of Concrete Handrails see Special Provisions.

TOTAL QUANTITIES FOR SPANS A, B, C, D, E, F & G
Paints on a Steel for
Class "A" Concrete Cu. Yds. 110,133' ~~+16,155~~ * 423.2 *
Structural Steel (Approx.) Lbs. 466,330

PROJECT No. B-2016601
BUNCOMBE COUNTY
STATION: 10+35.50
M.P. Sta 1531

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

SUPERSTRUCTURE
SPANS B, C, D, E, & F

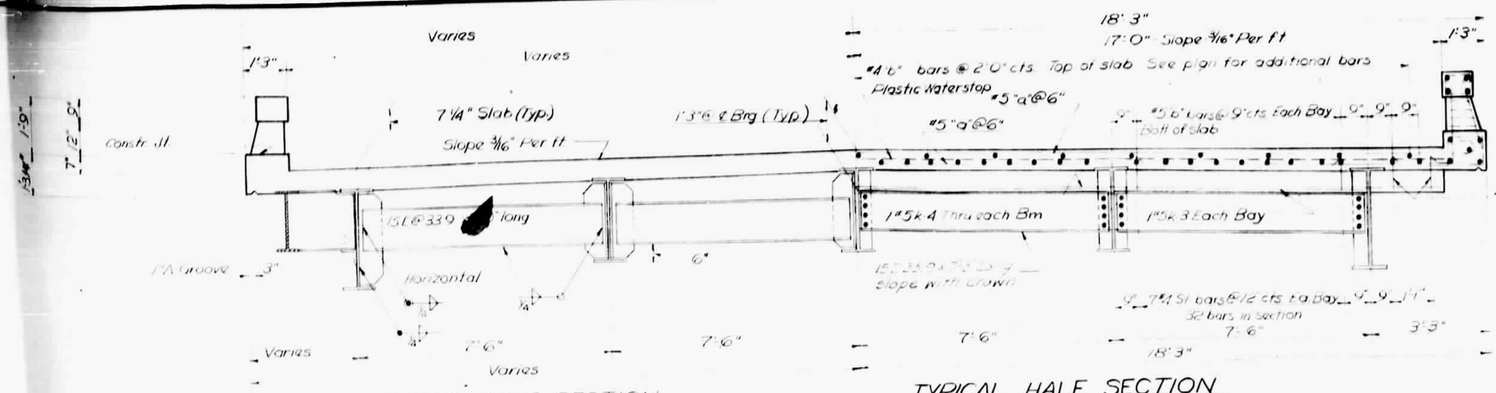
NOV 1966

REVISIONS							
NO.	BY	DATE	NO.	BY	DATE	SHEET NO. 55	TOTAL SHEETS 18
1			3				
2			4				

SPECIAL	DESIGNED BY	R. Turner	DATE Nov 66
	DRAWN BY	R. Blair	DATE Nov 66
	TRACED BY		DATE
	CHECKED BY	R. Self	DATE Nov 66

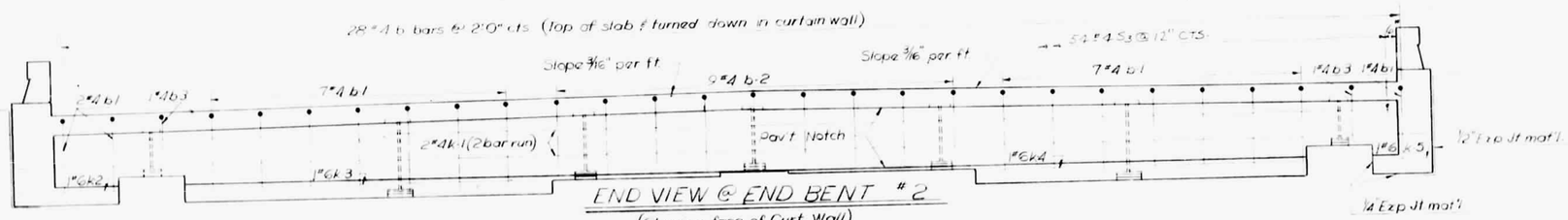
FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N. C.	B-2016601

F.A. PROJECT No. S-254(8)



TYPICAL HALF SECTION
(Showing diaphragm @ midspan)

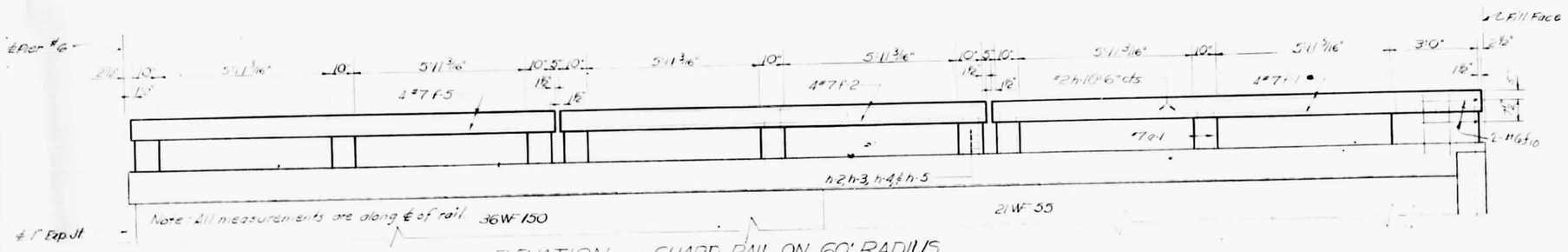
TYPICAL HALF SECTION
(Showing diaphragm @ int. bent)



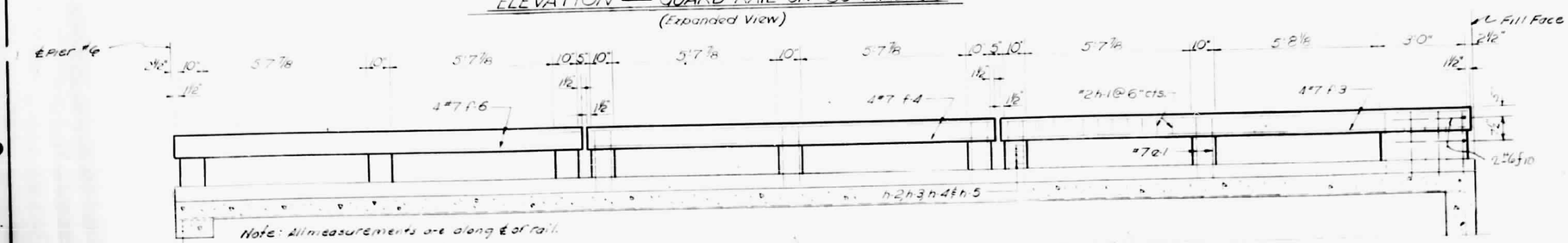
END VIEW @ END BENT #2
(Showing face of Curt. Wall)

NOTE:
For bars indicated and no bar marks shown, see concrete plan. Superstructure Span G.

For Section Thru Curb, Rail Post Details, Section A-A and Section B-B see Superstructure Sections And Details For Spans A Through F.



ELEVATION — GUARD RAIL ON 60' RADIUS
(Expanded View)



Note: All measurements are along ℄ of rail.

ELEVATION — GUARD RAIL ON 100' RADIUS
(Expanded View)

PROJECT No. 8.2016601
BUNCOMBE COUNTY
STATION: 10+35.50
M.P. Sta 1531

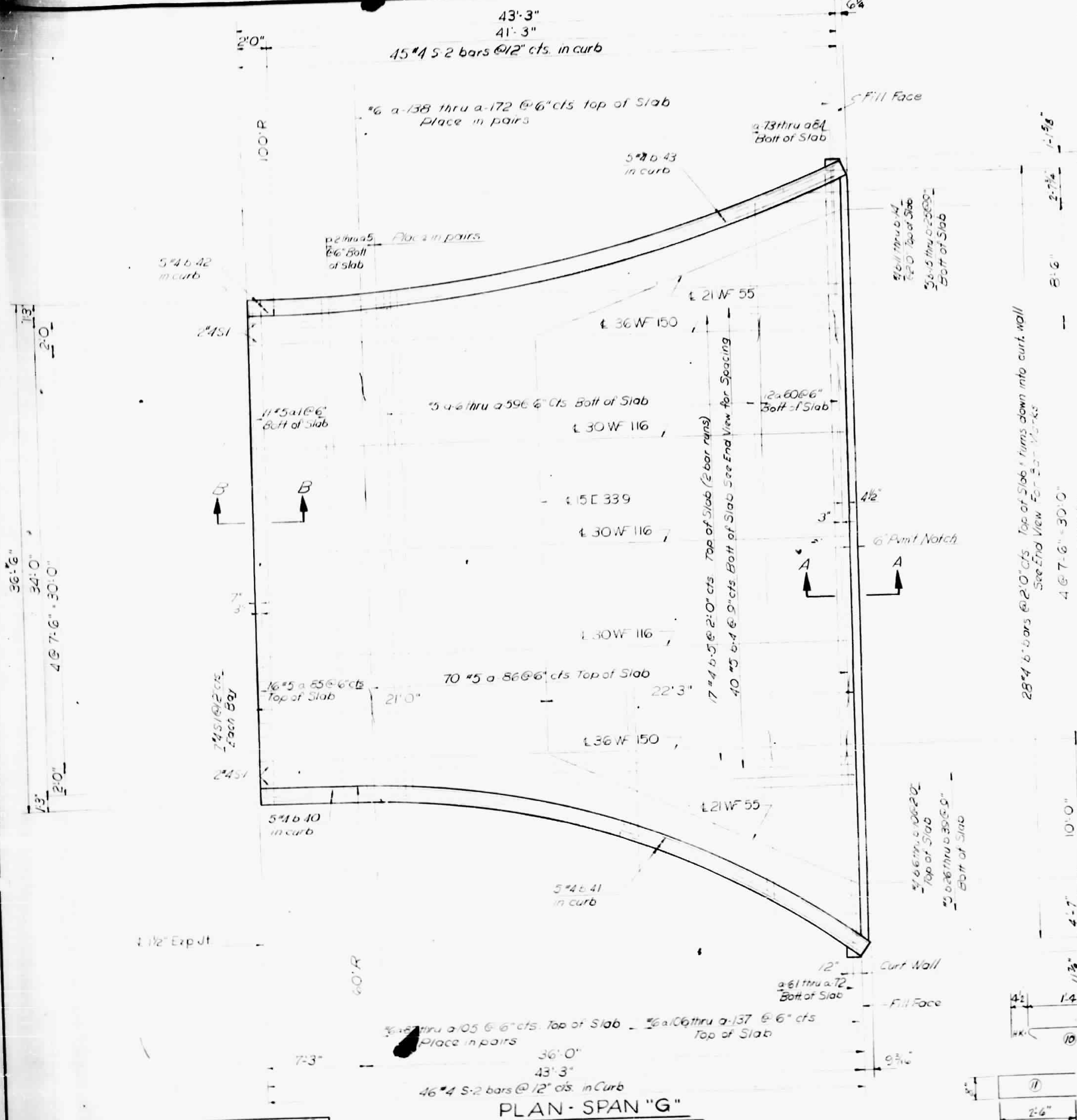
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

SUPERSTRUCTURE SECTIONS DETAILS & ELEVS. FOR SPAN G

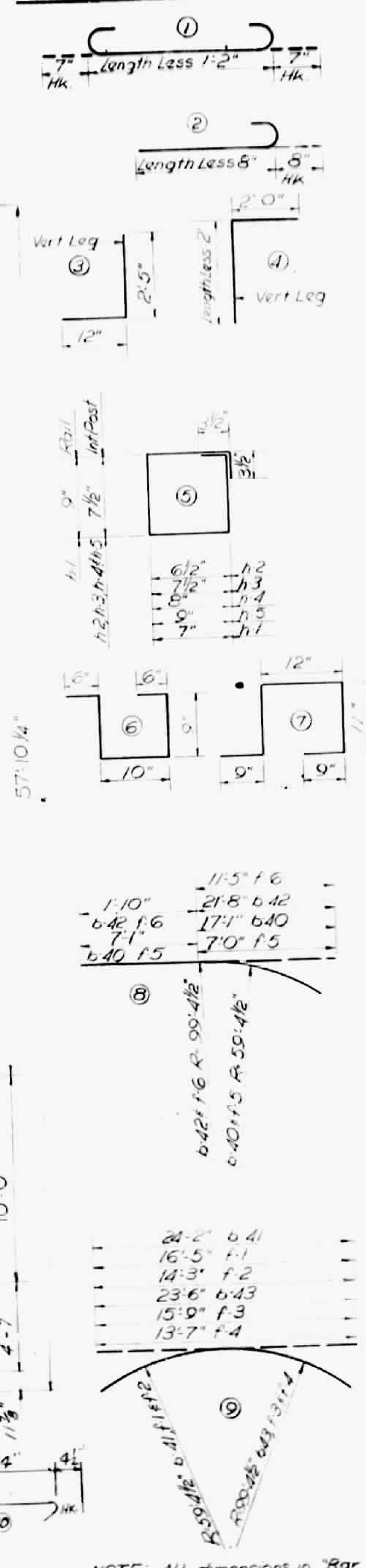
NOV 1966

REVISIONS							
NO.	BY	DATE	NO.	BY	DATE	SHEET NO. ~~S-6~~	
1			3			TOTAL SHEETS ~~13~~	
2			4				

SPECIAL			
DESIGNED BY	R. Turner	DATE	Nov. 66
DRAWN BY	R. Blair	DATE	Nov. 66
TRACED BY		DATE	
CHECKED BY	R. Self	DATE	Nov. 66



PLAN - SPAN "G"



NOTE: All dimensions in "Bar Details" are out to out of bar.

BILL OF MATERIAL
FOR SPAN "G"

BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
a-1	11	#5	str	36'-2"	415
a-2	2	#5	str	36'-3"	76
a-3	2	#5	str	36'-4"	76
a-4	2	#5	str	36'-5"	76
a-5	2	#5	str	36'-6"	76
a-6	1	#5	str	[illegible]	38
a-7	1	#5	str	[illegible]	38
a-8	1	#5	str	[illegible]	38
a-9	1	#5	str	[illegible]	38
a-10	1	#5	str	[illegible]	39
a-11	1	#5	str	[illegible]	39
a-12	1	#5	str	[illegible]	39
a-13	1	#5	str	[illegible]	39
a-14	1	#5	str	[illegible]	39
a-15	1	#5	str	[illegible]	39
a-16	1	#5	str	37'-9"	39
a-17	1	#5	str	[illegible]	40
a-18	1	#5	str	[illegible]	40
a-19	1	#5	str	[illegible]	40
a-20	1	#5	str	[illegible]	40
a-21	1	#5	str	[illegible]	40
a-22	1	#5	str	[illegible]	40
a-23	1	#5	str	[illegible]	41
a-24	1	#5	str	[illegible]	41
a-25	1	#5	str	[illegible]	41
a-26	1	#5	str	[illegible]	41
a-27	1	#5	str	[illegible]	42
a-28	1	#5	str	[illegible]	42
a-29	1	#5	str	[illegible]	42
a-30	1	#5	str	[illegible]	42
a-31	1	#5	str	[illegible]	42
a-32	1	#5	str	[illegible]	43
a-33	1	#5	str	[illegible]	43
a-34	1	#5	str	[illegible]	43
a-35	1	#5	str	[illegible]	44
a-36	1	#5	str	[illegible]	44
a-37	1	#5	str	[illegible]	44
a-38	1	#5	str	42'-8"	45
a-39	1	#5	str	43'-0"	45
a-40	1	#5	str	[illegible]	45
a-41	1	#5	str	[illegible]	46
a-42	1	#5	str	[illegible]	46
a-43	1	#5	str	[illegible]	46
a-44	1	#5	str	[illegible]	47
a-45	1	#5	str	[illegible]	47
a-46	1	#5	str	[illegible]	47
a-47	1	#5	str	[illegible]	48
a-48	1	#5	str	46'-2"	48
a-49	1	#5	str	46'-6"	49
a-50	1	#5	str	[illegible]	49
a-51	1	#5	str	46'-11"	49
a-52	1	#5	str	47'-4"	50
a-53	1	#5	str	47'-9"	50
a-54	1	#5	str	[illegible]	51
a-55	1	#5	str	[illegible]	51
a-56	1	#5	str	[illegible]	52
a-57	1	#5	str	[illegible]	52
a-58	1	#5	str	50'-0"	53
a-59	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
a-60	12	#5	str	32'-6"	401
a-61	1	#6	str	12'-6"	19
a-62	1	#6	str	12'-9"	19
a-63	1	#6	str	13'-1"	20
a-64	1	#6	str	13'-5"	20
a-65	1	#6	str	[illegible]	21
a-66	1	#6	str	[illegible]	21
a-67	1	#6	str	14'-5"	22
a-68	1	#6	str	[illegible]	22
a-69	1	#6	str	[illegible]	23
a-70	1	#6	str	[illegible]	23
a-71	1	#6	str	15'-10"	24
a-72	1	#6	str	16'-2"	24
a-73	1	#6	str	10'-5"	16
a-74	1	#6	str	10'-8"	16
a-75	1	#6	str	10'-11"	16
a-76	1	#6	str	11'-3"	17
a-77	1	#6	str	[illegible]	17
a-78	1	#6	str	11'-8"	17
a-79	1	#6	str	11'-11"	18
a-80	1	#6	str	12'-2"	18
a-81	1	#6	str	12'-4"	18
a-82	1	#6	str	12'-7"	18
a-83	1	#6	str	12'-10"	19
a-84	1	#6	str	[illegible]	19
a-85	16	#5	str	37'-4"	623
a-86	70	#5	str	24'-6"	179

BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
a-87	2	#6	[illegible]	8'-2"	25
a-88	2	#6	[illegible]	[illegible]	25
a-89	2	#6	[illegible]	[illegible]	26
a-90	2	#6	[illegible]	[illegible]	26
a-91	2	#6	[illegible]	[illegible]	26
a-92	2	#6	[illegible]	[illegible]	27
a-93	2	#6	[illegible]	[illegible]	27
a-94	2	#6	[illegible]	[illegible]	28
a-95	2	#6	[illegible]	[illegible]	28
a-96	2	#6	[illegible]	[illegible]	29
a-97	2	#6	[illegible]	[illegible]	30
a-98	2	#6	[illegible]	[illegible]	30
a-99	2	#6	[illegible]	[illegible]	31
a-100	2	#6	[illegible]	[illegible]	32
a-101	2	#6	[illegible]	[illegible]	33
a-102	2	#6	[illegible]	[illegible]	34
a-103	2	#6	[illegible]	[illegible]	35
a-104	2	#6	[illegible]	[illegible]	36
a-105	2	#6	[illegible]	[illegible]	[illegible]
a-106	2	#6	[illegible]	[illegible]	[illegible]
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a-111	2	#6	[illegible]	[illegible]	[illegible]
a-112	2	#6	[illegible]	[illegible]	[illegible]
a-113	2	#6	[illegible]	[illegible]	[illegible]
a-114	2	#6	[illegible]	[illegible]	[illegible]
a-115	2	#6	[illegible]	[illegible]	[illegible]
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a-117	2	#6	[illegible]	[illegible]	[illegible]
a-118	2	#6	[illegible]	[illegible]	[illegible]
a-119	2	#6	[illegible]	[illegible]	[illegible]
a-120	2	#6	[illegible]	[illegible]	[illegible]
a-121	2	#6	[illegible]	[illegible]	[illegible]
a-122	2	#6	[illegible]	[illegible]	[illegible]
a-123	2	#6	[illegible]	[illegible]	[illegible]
a-124	2	#6	[illegible]	[illegible]	[illegible]
a-125	2	#6	[illegible]	[illegible]	[illegible]
a-126	2	#6	[illegible]	[illegible]	[illegible]
a-127	2	#6	[illegible]	[illegible]	[illegible]
a-128	2	#6	[illegible]	[illegible]	[illegible]
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a-130	2	#6	[illegible]	[illegible]	[illegible]
a-131	2	#6	[illegible]	[illegible]	[illegible]
a-132	2	#6	[illegible]	[illegible]	[illegible]
a-133	2	#6	[illegible]	[illegible]	[illegible]
a-134	2	#6	[illegible]	[illegible]	[illegible]
a-135	2	#6	[illegible]	[illegible]	[illegible]
a-136	2	#6	[illegible]	[illegible]	[illegible]
a-137	2	#6	[illegible]	[illegible]	[illegible]
a-138	2	#6	[illegible]	[illegible]	[illegible]
a-139	2	#6	[illegible]	[illegible]	[illegible]
a-140	2	#6	[illegible]	[illegible]	26
a-141	2	#6	[illegible]	[illegible]	27
a-142	2	#6	[illegible]	[illegible]	27
a-143	2	#6	[illegible]	[illegible]	28
a-144	2	#6	[illegible]	[illegible]	28
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a-146	2	#6	[illegible]	[illegible]	29
a-147	2	#6	[illegible]	[illegible]	30
a-148	2	#6	[illegible]	[illegible]	30
a-149	2	#6	[illegible]	[illegible]	31
a-150	2	#6	[illegible]	[illegible]	32
a-151	2	#6	[illegible]	[illegible]	33
a-152	2	#6	[illegible]	[illegible]	33
a-153	2	#6	[illegible]	[illegible]	34
a-154	2	#6	[illegible]	[illegible]	34
a-155	2	#6	[illegible]	[illegible]	35
a-156	2	#6	[illegible]	[illegible]	36
a-157	2	#6	[illegible]	[illegible]	37
a-158	2	#6	[illegible]	[illegible]	38
a-159	2	#6	[illegible]	[illegible]	39
a-160	2	#6	[illegible]	[illegible]	40
a-161	2	#6	[illegible]	[illegible]	41
a-162	2	#6	[illegible]	[illegible]	42
a-163	2	#6	[illegible]	14'-4"	43
a-164	2	#6	[illegible]	[illegible]	44
a-165	2	#6	[illegible]	[illegible]	45
a-166	2	#6	[illegible]	[illegible]	46
a-167	2	#6	[illegible]	15'-4"	47
a-168	2	#6	[illegible]	[illegible]	48
a-169	2	#6	[illegible]	16'-2"	48
a-170	2	#6	[illegible]	16'-7"	50
a-171	2	#6	[illegible]	17'-1"	51
a-172	2	#6	[illegible]	[illegible]	[illegible]

BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
b-1	17	#4	4	5'-5"	62
b-2	9	#4	4	4'-11"	30
b-3	2	#4	4	4'-2"	6
b-4	40	#5	Str.	15'-11"	1791
b-5	34	#4	Str.	22'-1"	501
b-6	1	#4	str	25'-6"	17
b-7	1	#4	str	17'-6"	12
b-8	1	#4	str	12'-0"	8
b-9	1	#4	str	4'-0"	3
b-10	1	#4	str	28'-3"	19
b-11	1	#4	str	17'-4"	12
b-12	1	#4	str	10'-0"	7
b-13	1	#4	str	[illegible]	3
b-14	1	#5	str	37'-0"	38
b-15	1	#5	str	[illegible]	30
b-16	1	#5	str	[illegible]	24
b-17	1	#5	str	[illegible]	21
b-18	1	#5	str	16'-10"	17
b-19	1	#5	str	[illegible]	14
b-20	1	#5	str	[illegible]	12
b-21	1	#5	str	[illegible]	9
b-22	1	#5	str	[illegible]	7
b-23	1	#5	str	[illegible]	5
b-24	1	#5	str	[illegible]	3
b-25	1	#5	str	[illegible]	32
b-26	1	#5	str	[illegible]	26
b-27	1	#5	str	21'-6"	22
b-28	1	#5	str	[illegible]	19
b-29	1	#5	str	[illegible]	17
b-30	1	#5	str	[illegible]	15
b-31	1	#5	str	[illegible]	13
b-32	1	#5	str	[illegible]	11
b-33	1	#5	str	[illegible]	9
b-34	1	#5	str	[illegible]	8
b-35	1	#5	str	[illegible]	6
b-36	1	#5	str	[illegible]	5
b-37	1	#5	str	[illegible]	4
b-38	1	#5	str	[illegible]	3
b-39	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
b-40	5	#4	8	[illegible]	81
b-41	5	#4	9	[illegible]	81
b-42	5	#4	8	[illegible]	78
b-43	5	#4	9	[illegible]	78
k-1	10	#4	str.	28'-9"	192
k-2	2	#6	str.	3'-11"	12
k-3	2	#6	str.	14'-6"	43 ~~46~~
k-4	2	#6	str.	13'-0"	39
k-5	2	#6	str.	2'-2"	7
s-1	32	#4	6	3'-4"	71
s-2	91	#4	7	4'-4"	263
s-3	54	#4	10	2'-1"	75

Reinforcing Steel, Lbs. 11,178 ~~11,121~~
Class "AA" Concrete, Cu. Yds. 54.2
Structural Steel (Approx) Lbs. 33,549

BILL OF MATERIALS FOR HANDRAILS
FOR SPAN G

Bar	No	Size	Type	Length	Weight
e-1	80	#7	3	3'-5"	559
f-1	4	#7	9	16'-5"	134
f-2	4	#7	9	14'-3"	117
f-3	4	#7	9	15'-9"	129
f-4	4	#7	9	13'-7"	111
f-5	4	#7	8	14'-3"	117
f-6	4	#7	8	13'-7"	111
f-10	4	#6	11	5'-8"	34
h-1	172	#2	5	3'-3"	97
h-2	16	#2	5	2'-11"	8
h-3	16	#2	5	3'-1"	8
h-4	16	#2	5	3'-2"	8
h-5	16	#2	5	3'-4"	9

Reinforcing Steel, Lbs. 1442
Class "A" Concrete Cu. Yds. 2.9

NOTE: For measurement and payment of Concrete Handrails see Special Provisions.

FED. ROAD DIV. NO.	STATE	PROJECT NO.
1	N. C.	8.201660I

FA PROJECT No. S 254(1)

PROJECT No. 8.201660I
BUNCOMBE COUNTY
STATION: 10+35.50
M.P. Sta 153.1

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

SUPERSTRUCTURE
SPAN - G

NOV. 1966

REVISIONS

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

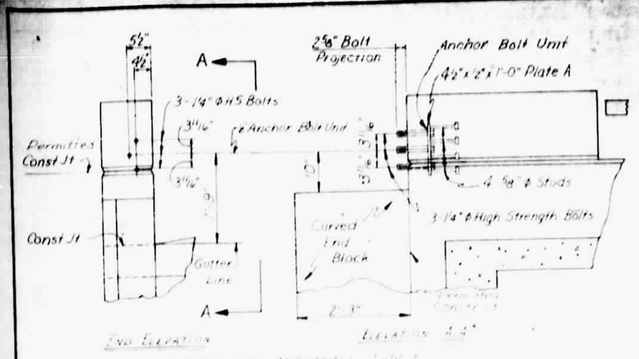
SHEET NO. S-7
TOTAL SHEETS 18

SPECIAL	DESIGNED BY	R. Turner	DATE	Nov. 66
	DRAWN BY	R. Blair	DATE	Nov. 66
	TRACED BY		DATE	
	CHECKED BY	R. Self	DATE	Nov. 66

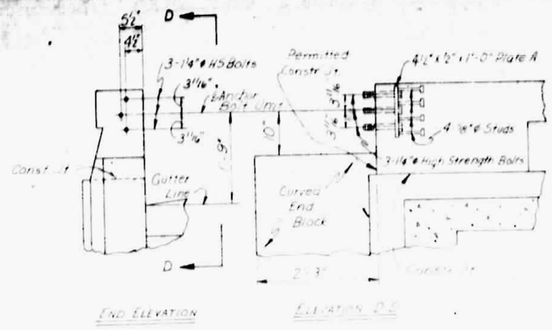
SOUTHERLAND BLUE PRINT CO. — CHARLOTTE, N. C.

FED. ROAD DIV. NO.	STATE	PROJECT NO.
8	N. C.	B-2016

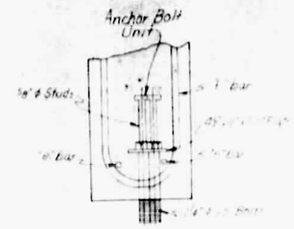
F. A. PROJECT S-284 (8)

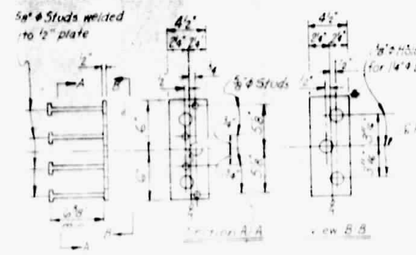


GUARD RAIL ANCHORAGE TYPE I

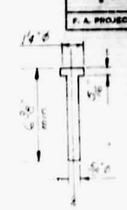


GUARD RAIL ANCHORAGE TYPE II





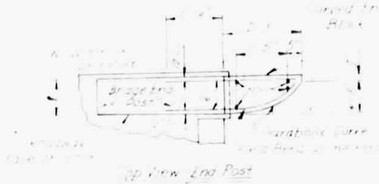
DETAIL TYPE A

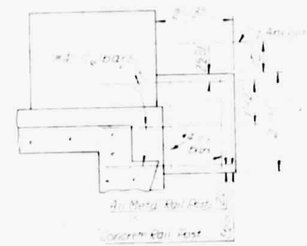


Stud Detail

See General Notes for Stud Alternate

GUARD RAIL ANCHORAGE TYPE II

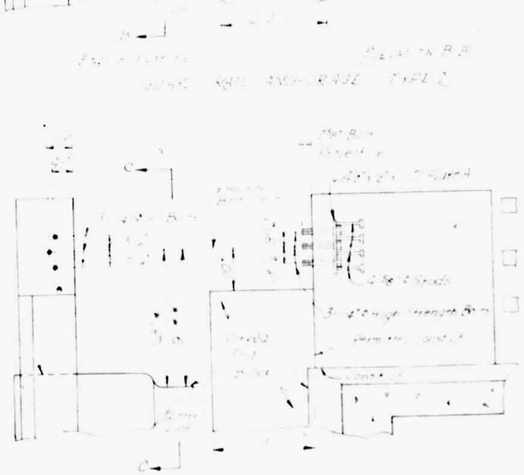




Elevation End Post Showing Anchor Bolt

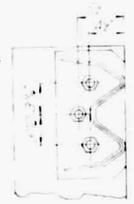
Bar	Length	Number
Anchor Bolt Unit		
Anchor Bolt Unit		
Anchor Bolt Unit		
Anchor Bolt Unit		

* NOTE: THESE QUANTITIES ARE INCLUDED IN TOTAL QUANTITIES FOR SUPERSTRUCTURE.

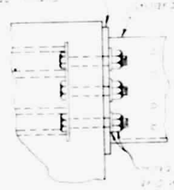


GUARD RAIL ANCHORAGE TYPE III

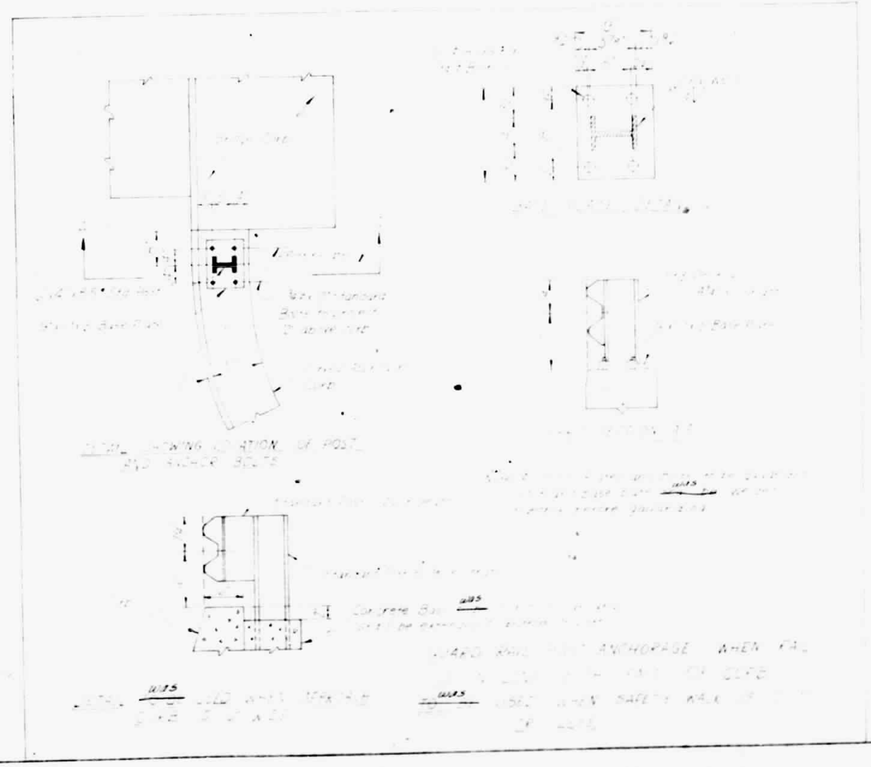
Detail-1¼" HS Bolt Hexagon Head



Left End View



End Elevation Showing Anchorage



Section Showing Location of Post and Anchor Bolts

Section A-A

Section B-B

Concrete Block

GUARD RAIL ANCHORAGE WHEN USED WITH SAFETY RAIL

* For curb and gutter conditions except

** For no curb and gutter conditions except

Project No B-2016601

BUNCOMBE County

Station 104+35.50

M.P. 153.1

STATE OF NORTH CAROLINA

STATE HIGHWAY COMMISSION

RALEIGH

STANDARD

GUARD RAIL ANCHORAGE

DRAWN BY	G.T. PHILLIPS	DATE	5-3-68		
CHECKED BY		DATE			
DRAWN BY	STANDARD				
CHECKED BY		DATE			

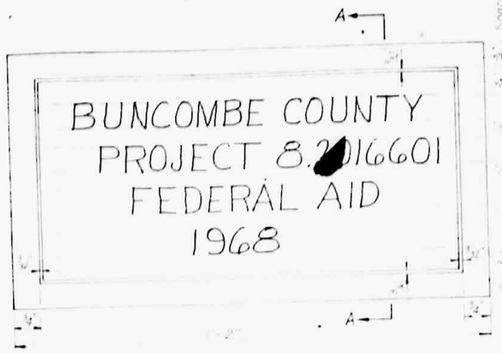
REVISIONS					
NO.	BY	DATE	NO.	BY	DATE
			1		
			2		

1968

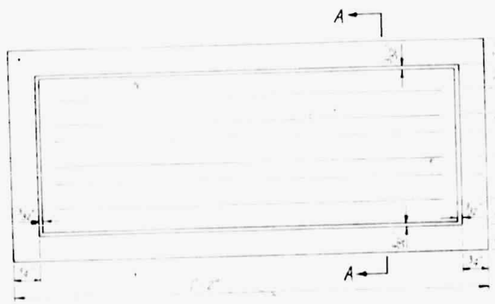
SHEET NO. 5-8

TOTAL SHEETS 12

FED. ROAD DIV. NO.	STATE	PROJECT NO.
8	N. C.	B2016601
F. A. PROJECT	S. 284 (2)	



ELEVATION SHOWING CORRECT WORDING
NAME PLATE USING FOUR LINES



ELEVATION SHOWING CORRECT WORDING
NAME PLATE USING THREE LINES

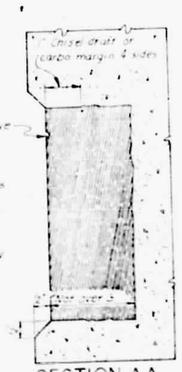
GENERAL NOTES

For bridges on which there ~~are~~ two way traffic, two name plates are required for each bridge. For bridges on which there will be one way traffic, one name plate is required for each bridge. Name plate to be placed at the right hand end post approaching the bridge as shown in the end view. See LOCATION DETAIL.

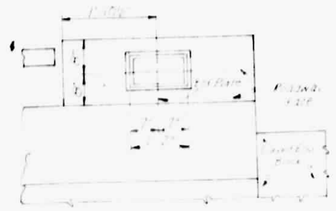
The name plates ~~are~~ were made of granite. Granite ~~was~~ light gray, fine or medium grained, sound in quality and free from defects that would mar its appearance. Exposed face of plates ~~to have~~ a fine pitched finish.

Lettering ~~was~~ sandblast sink 1/8" high, vertical, Modern Roman style. The wording shall be as shown in the ELEVATION SHOWING CORRECT WORDING.

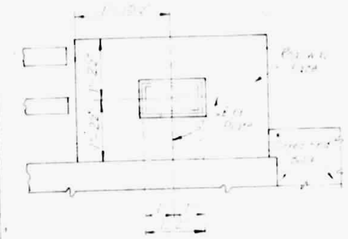
The entire cost of the name plates, complete in place, ~~was~~ included in the contract price bid for Class "AA" Concrete.



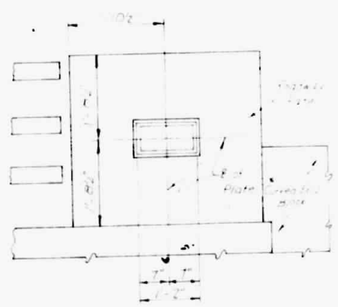
SECTION A-A



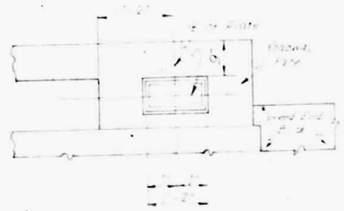
FOR ONE BAR METAL RAIL



FOR TWO BAR METAL RAIL



FOR THREE BAR METAL RAIL



FOR CONCRETE BAR TYPE RAIL

NAME PLATE
LOCATION

* Required only when guardrail is attached

SPECIAL	
ASSEMBLED BY: GEORGE PHILLIPS	DATE 5-3-68
CHECKED BY	DATE
STANDARD	
DRAWN BY: J. MCCUTCHEN	DATE FEB. 1968
CHECKED BY: [illegible]	DATE FEB. 1968

Var. No. 1 Revised to use curved end block

PROJECT NO. B.2016601
BUNCOMBE COUNTY
STATION: 101+35.50
M.P. STA. 1531

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

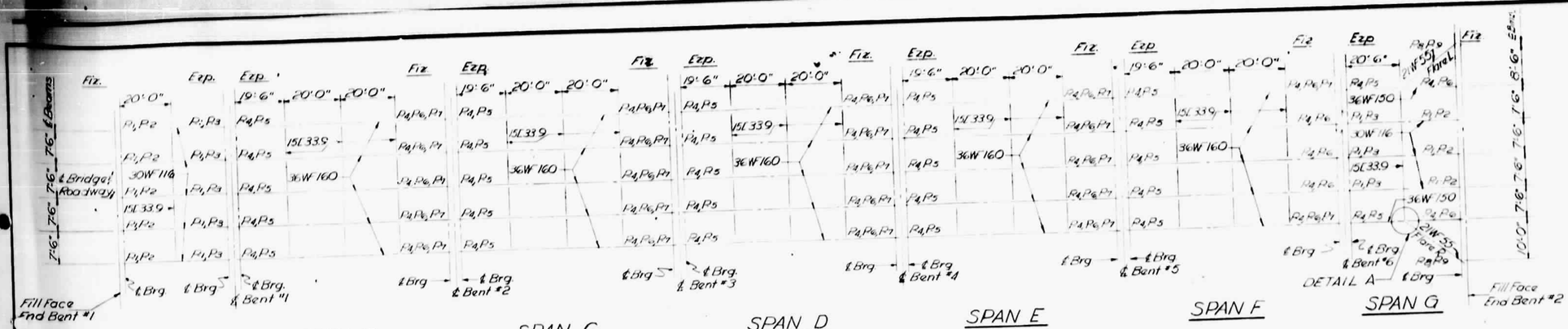
STANDARD
NAME PLATES

FEB. 1968

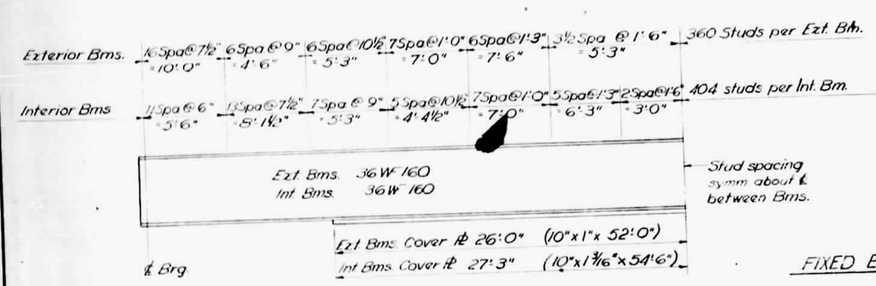
REVISIONS							
NO.	BY	DATE	NO.	BY	DATE	SHEET NO.	5-8
1	JW	4-2-68	3			TOTAL SHEETS	15
2			4				

FED. ROAD STY. NO.	STATE	PROJECT NO.
3	N. C.	B-2016601

FA PROJECT No. S-234(1)



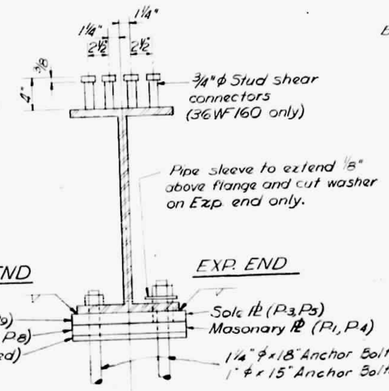
DIAPHRAGM & PLATE LAYOUT



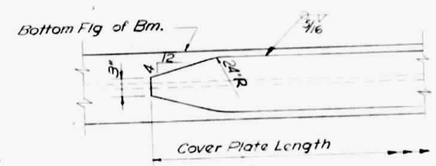
STUD SPACING & COVER PLATES

Bms. in Spans B-C-D-E & F only

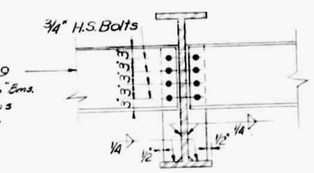
At the contractor's option, he may substitute for the cover plates designated on the plans cover plates of equivalent area provided these plates are at least 3/16" in thickness, and do not exceed a width equal to the flange width less 2" or a thickness equal to the flange thickness plus 1/8". The size of the weld for attaching these cover plates shall be in accordance with the A.W.S. Specifications.



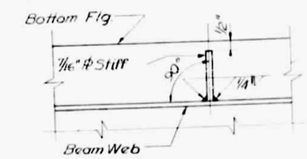
SECTION THRU BEAM



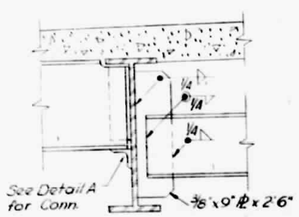
COVER PLATE WELD DETAIL



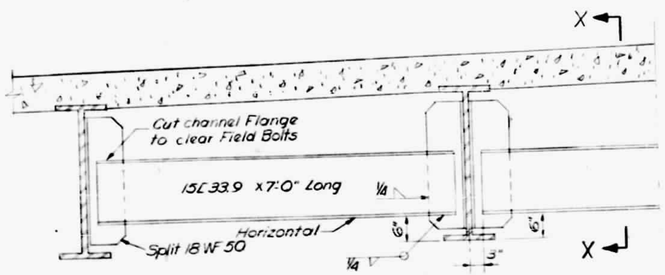
DIAPH CONN. @ INT. BENTS



STIFFENER WELD DETAIL

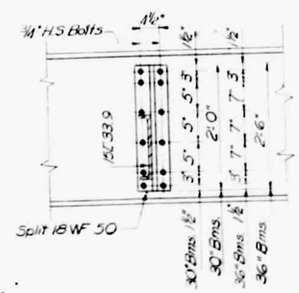


AT EXT. BM. SPAN-G



TYPICAL

DIAPHRAGM CONNECTION AT MIDSPAN



SECTION X-X

PROJECT No. 8.2016601

BUNCOMBE COUNTY

STATION: 10+35.50

M.P. Sta. 153.1

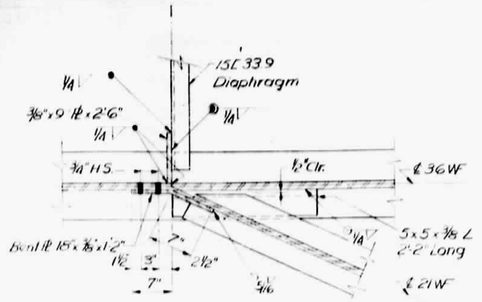
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

STRUCTURAL STEEL DETAILS

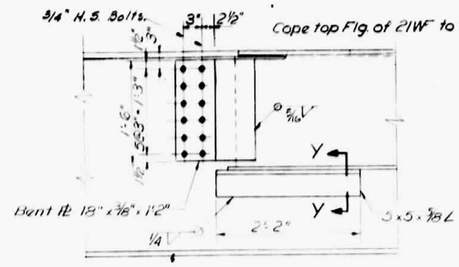
NOV. 1966

REVISIONS								SHEET NO. S-10
NO.	BY	DATE	NO.	BY	DATE			TOTAL SHEETS 16
1			3					
2			4					

SPECIAL			
	DESIGNED BY R.E. Turner	DATE Nov. 66	
	DRAWN BY	DATE Nov. 66	
	TRACED BY R.K. Blair	DATE Nov. 66	
	CHECKED BY R.E. Turner	DATE Nov. 66	



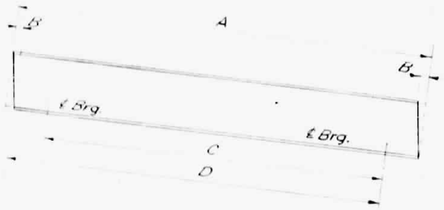
PLAN



ELEVATION

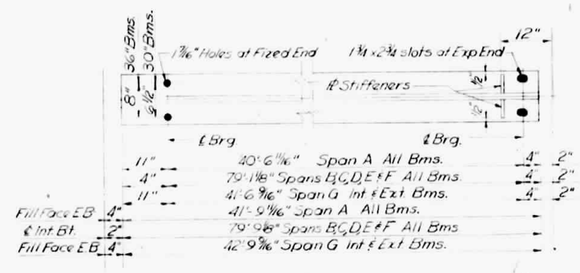
SECTION Y-Y

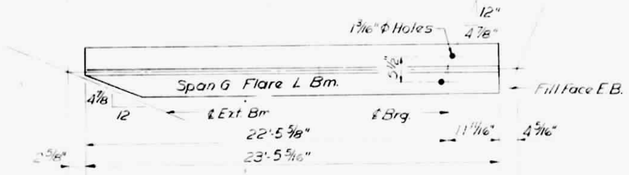
DETAIL "A"

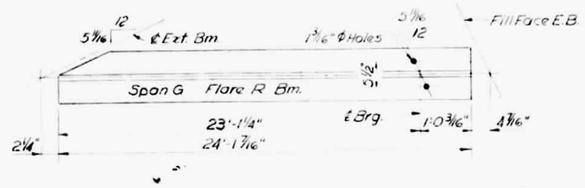


SPAN	BM.	A	B	C	D
A	All	41'-11 1/4"	1 9/16"	40'-6 9/16"	—
B,C,D,E & F	All	79'-10 7/8"	1 3/4"	79'-1 1/8"	—
G	Int.	42'-11"	1 7/16"	41'-6 9/16"	—
G	Ext.	42'-11 5/16"	1 3/4	41'-6 9/16"	—
G	Flare L	23'-6 3/8"	1 1/16"	—	22'-5 5/8"
G	Flare R	24'-2 1/2"	1 1/16"	—	23'-1 1/4"

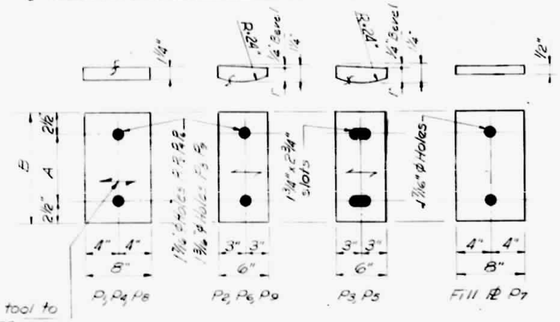
BEAM BEVEL DETAIL







BOTTOM FLANGE DETAILS



In planing cut of tool to be in this direction

No. Req'd.	16	8	8	54	27	27	22	2	2
	P1	P2	P3	P4	P5	P6	P7	P8	P9
A	6 1/2	6 1/2	6 1/2	8	8	8	8	5 1/2	5 1/2
B	11 1/2	11 1/2	11 1/2	1-1	1-1	1-1	1-1	10 1/2	10 1/2

BEARING PLATE DETAILS

STRUCTURAL STEEL SPAN	APPROX. LBS.
A	27,300
B	81,100
C	81,100
D	81,100
E	81,100
F	81,100
G	33,500
Total	406,300

NOTES

All beams and cover plates ~~shall be~~ were of A.S.T.M. A-36 grade structural steel. See S-N Sheet.

Field connections of diaphragms to beams ~~shall be~~ were bolted using 3/4" ϕ high strength bolts in accordance with the Specifications.

Tops of floor drains ~~to be~~ were set 3/8" below surface of slab.

No web stiffeners ~~are required~~ were on outside of exterior beams or at End Bents. Stiffeners ~~are to be~~ were parallel to ends of beams.

DEFLECTION TABLES

	SPAN A		SPAN B,C,D,E & F		SPAN G		
	Int. Bm.	Ext. Bm.	Int. Bm.	Ext. Bm.	Int. Bm.	Ext. Bm.	Flared Bm.
Deflection due to Beam Weight	1/16"	1/16"	1/2"	1/2"	1/16"	1/16"	0"
Deflection due to Superimposed dead load	7/16"	7/16"	1 9/16"	2 1/8"	7/16"	3/8"	3/16"
TOTAL DEFLECTION	1/2"	1/2"	2 3/16"	2 5/8"	1/2"	7/16"	3/16"
CAMBER BEAMS	*	*	2 1/16"	2 5/8"	*	*	*

* No camber other than natural mill camber required.

PROJECT No. 82016601
BUNCOMBE COUNTY
STATION: 10+35.50
M.P. Sta. 153.1

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

STRUCTURAL STEEL DETAILS

NOV. 1966

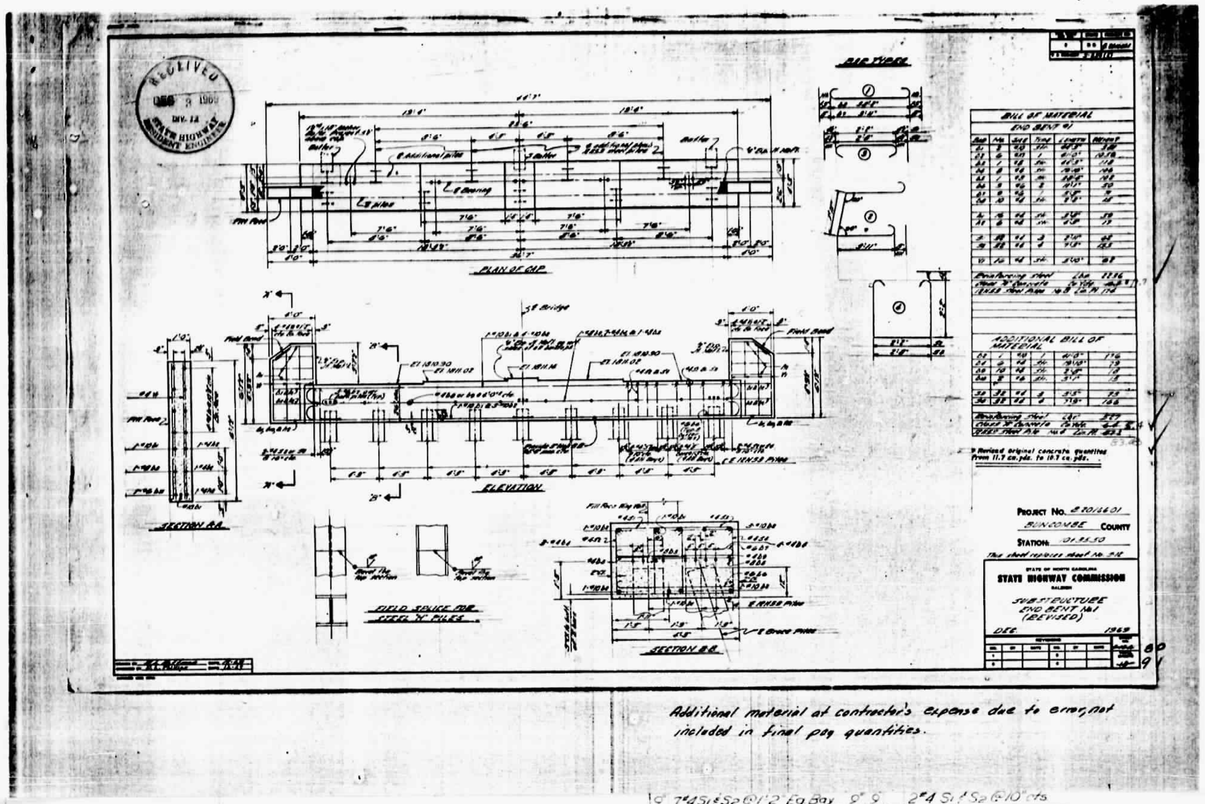
REVISIONS						
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			

SHEET NO. S-11 79
TOTAL SHEETS 18 91

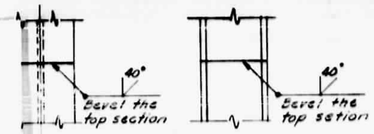
SPECIAL

DESIGNED BY	R.E. Turner	DATE NOV. 66
DRAWN BY	R.E. Blair	DATE NOV. 66
TRACED BY		DATE NOV. 66
CHECKED BY	R.E. Turner	DATE NOV. 66

F.A. PROJECT No. S-
N.C.

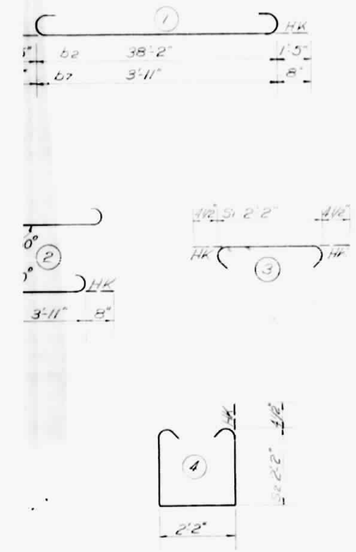


Additional material at contractor's expense due to error, not included in final pay quantities.



FIELD SPLICE FOR STEEL H PILES

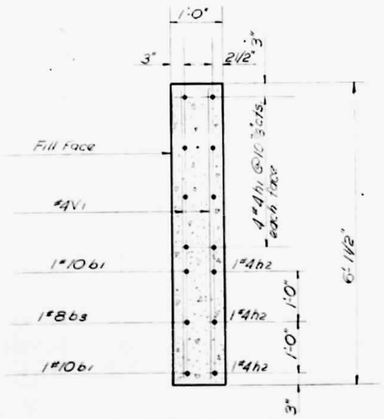
BAR DETAILS



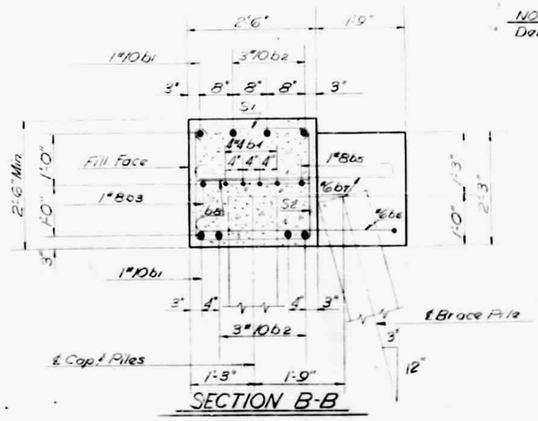
BILL OF MATERIAL

Bar	No	Size	Type	Length	Weight
b-1	2	#10	Str	43'-3"	387
b-2	8	#10	1	41'-0"	1058
b-3	4	#8	Str	44'-3"	118
b-4	8	#4	Str	13'-10"	106
b-5	1	#8	Str	35'-4"	102
b-6	1	#6	2	11'-1"	30
b-7	4	#4	1	25'-3"	71
b-8	10	#4	Str	2'-2"	12
h-1	16	#4	Str	3'-8"	39
h-2	6	#4	Str	4'-3"	17
b-1	30	#4	3	21'-1"	63
b-2	32	#4	4	17'-3"	185
v-1	16	#4	Str	3'-10"	62
Reinforcing Steel, Lbs				2236	11.7
Class "A" Concrete, Cu. Yds.					
12 HP53 Steel Piles				176 Lin. Ft.	No. 5
				179 Lin. Ft.	

See note revised sheet



SECTION A-A



SECTION B-B

NOTE: All dimensions in Bar Details are out to out of bar.

PROJECT NO. 8.2016601
BUNCOMBE COUNTY
STATION: 10+35.50
M.P. 153.1

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

SUBSTRUCTURE
END BENT NO.1

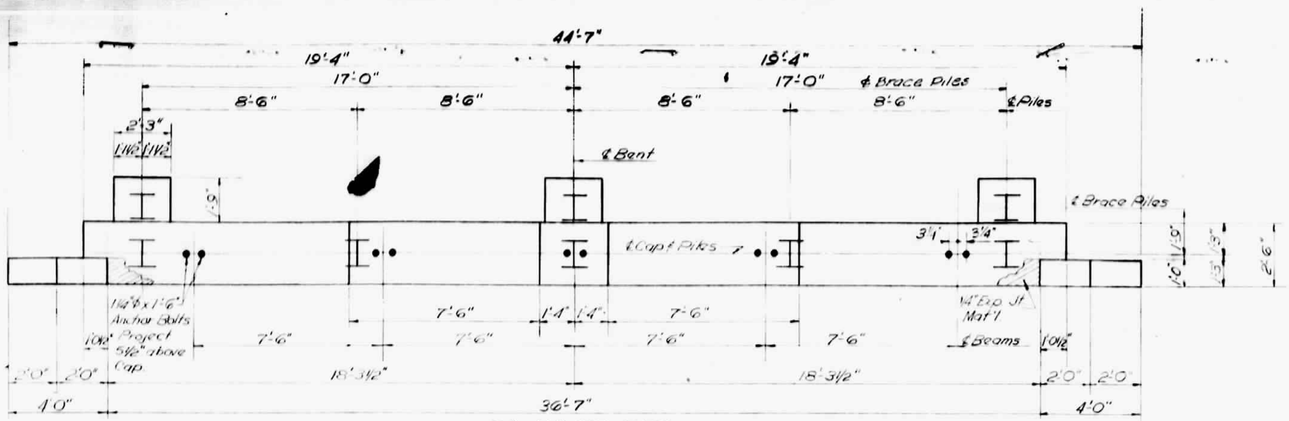
NOV. 1966

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

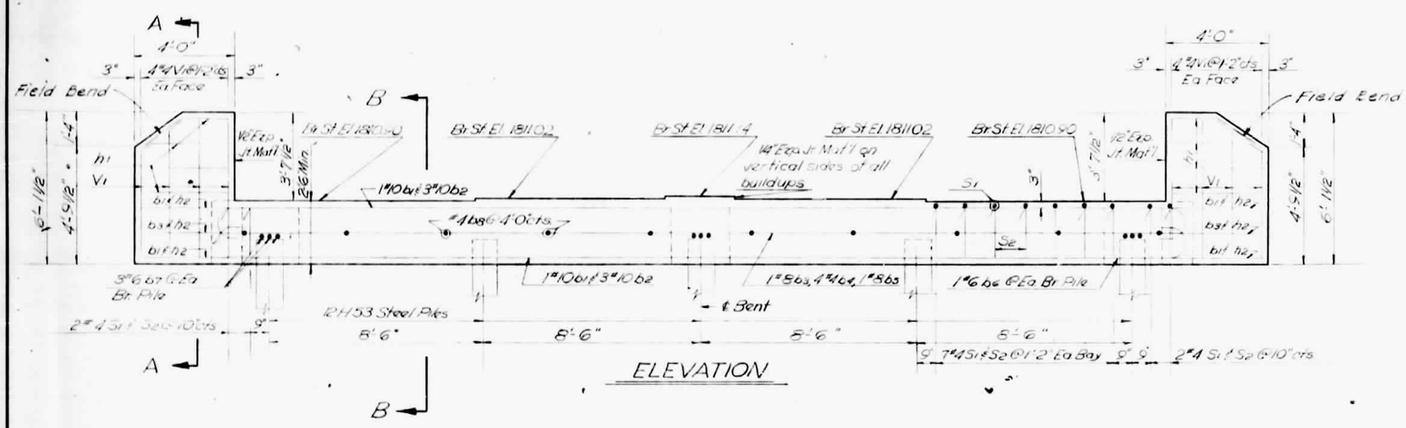
SHEET NO. 5-12 — TOTAL SHEETS 18

SPECIAL			
	DESIGNED BY R. Turner	DATE Nov. 66	
	DRAWN BY R. Blair	DATE Nov. 66	
	TRACED BY	DATE	
	CHECKED BY R. Self	DATE Nov. 66	

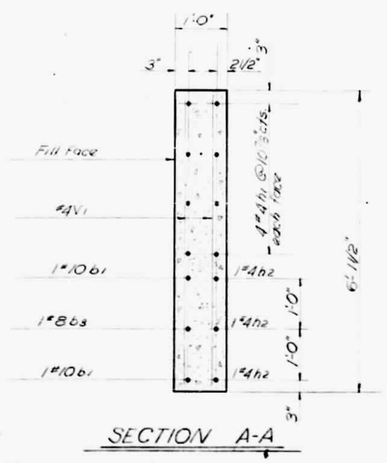
90
91



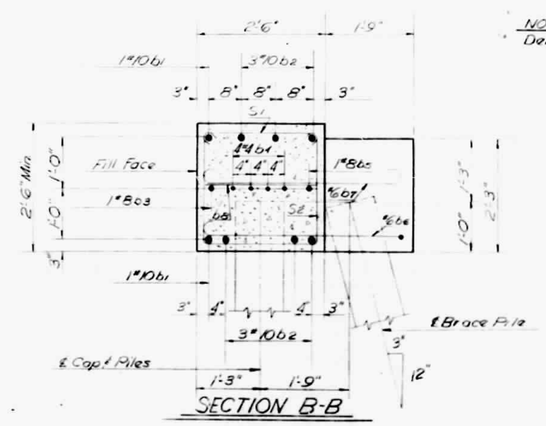
PLAN OF CAP



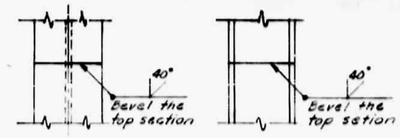
ELEVATION



SECTION A-A

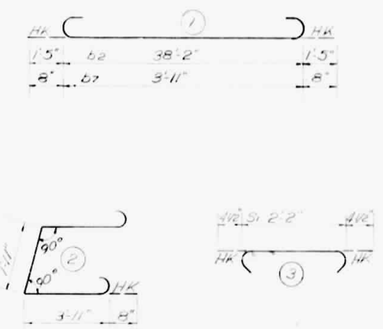


SECTION B-B



FIELD SPLICE FOR STEEL H PILES

BAR DETAILS



NOTE: All dimensions in "Bar Details" are out to out of bar.

BILL OF MATERIAL

Bar	No.	Size	Type	Length	Weight
b-1	2	#10	Str.	3'-3"	3.91
b-2	54	#10	Str.	41'-0"	1058
b-3	7	#8	Str.	44'-3"	118
b-4	8	#4	Str.	13'-10"	106
b-5	7	#8	Str.	38'-4"	102
b-6	1	#8	Str.	11'-0"	5.9
b-7	4	#6	1	5'-3"	11
b-8	10	#4	Str.	2'-2"	13
h-1	16	#4	Str.	3'-8"	39
h-2	6	#4	Str.	4'-3"	17
s-1	10	#4	3	21'-1"	62
s-2	10	#4	4	27'-3"	155
V-1	16	#4	Str.	5'-10"	62
Reinforcing Steel, Lbs				2236	~~11.7~~ 10.79
Class "A" Concrete, Cu. Yds.					
12 HP53 Steel Piles				~~174~~ Lin. Ft.	No. 5

See note revised sheet

PROJECT NO. B-2016601
BUNCOMBE COUNTY
STATION: 10+35.50
M.P. 153.1

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

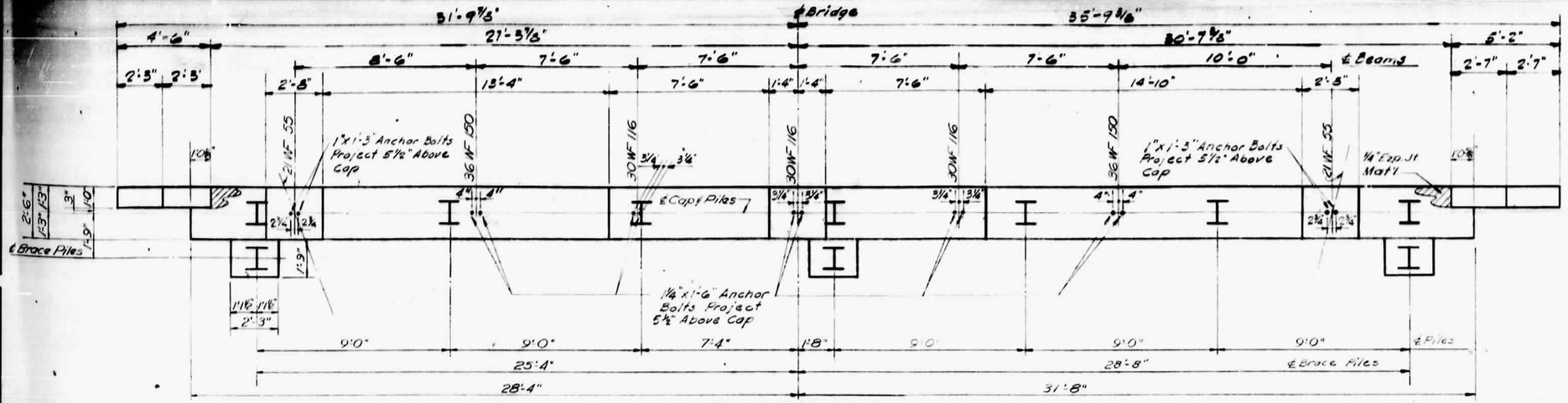
SUBSTRUCTURE
END BENT NO. 1

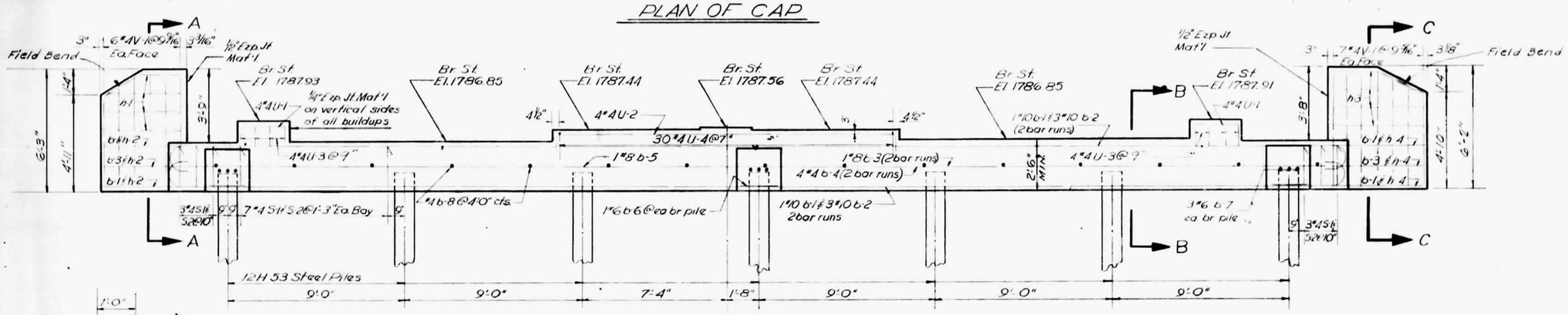
NOV. 1966

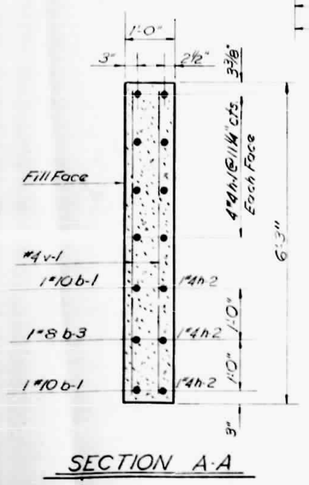
REVISIONS						
NO.	BY	DATE	NO.	BY	DATE	
1			3			
2			4			

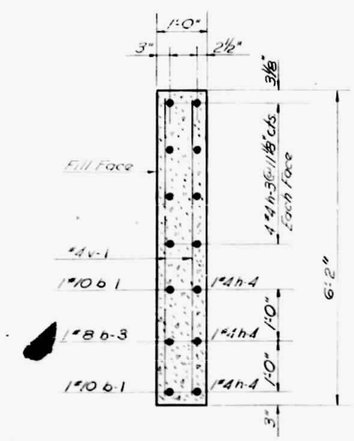
SHEET NO. ~~512~~ 90
TOTAL SHEETS ~~13~~ 91

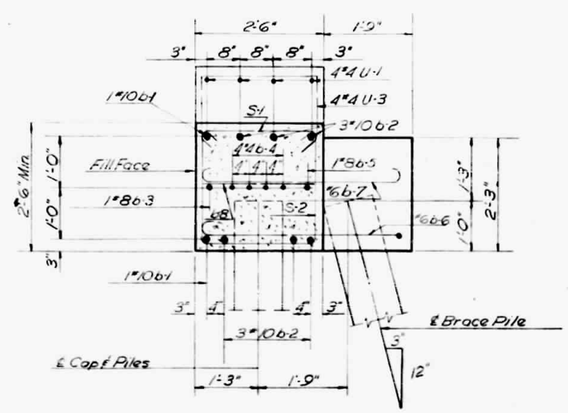
SPECIAL			
	DESIGNED BY	R. Garner	DATE Nov. 66
	DRAWN BY	R. Blair	DATE Nov. 66
	TRACED BY		DATE
	CHECKED BY	R. Self	DATE Nov. 66

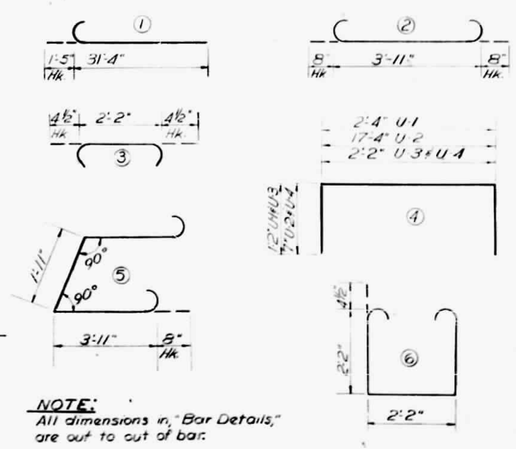












NOTE: All dimensions in "Bar Details," are out to out of bar.

BILL OF MATERIAL
FOR END BENT NO. 2

Bar	No.	Size	Type	Length	Weight
b-1	4	#10	str.	35'-2"	605
b-2	12	#10	str.	33'-9"	1,351
b-3	5	#8	str.	34'-10"	726
b-4	4	#4	str.	30'-0"	120
b-5	1	#8	str.	39'-6"	148
b-6	3	#6	s.	17'-1"	30
b-7	3	#6	s.	5'-9"	17
b-8	15	#4	str.	2'-3"	22
h-1	18	#4	str.	4'-9"	21
h-2	12	#4	str.	4'-9"	9
h-3	24	#4	str.	4'-8"	23
h-4	3	#4	str.	3'-3"	11
S-1	48	#4	3	2'-11"	94
S-2	48	#4	6	7'-3"	232
U-1	8	#4	4	4'-8"	25
U-2	4	#4	4	18'-6"	49
U-3	8	#4	4	4'-9"	24
U-4	30	#4	4	3'-4"	67
V-1	26	#4	str.	5'-8"	98

No. forms Steel Lbs. 3599
Class A Conc. cu. yds. 18.3
12 H 53 Steel Piles No. 10
Lin. Ft. of Piles 203
202.9A

SPECIAL			
	DESIGNED BY	P. Turner	DATE Nov. 66
	DRAWN BY	R. Blair	DATE Nov. 66
	TRACED BY		DATE
	CHECKED BY	R. Self	DATE Nov. 66

PROJECT NO. 8.2016601
BUNCOMBE COUNTY
STATION: 10+35.50

M.P. 153.1

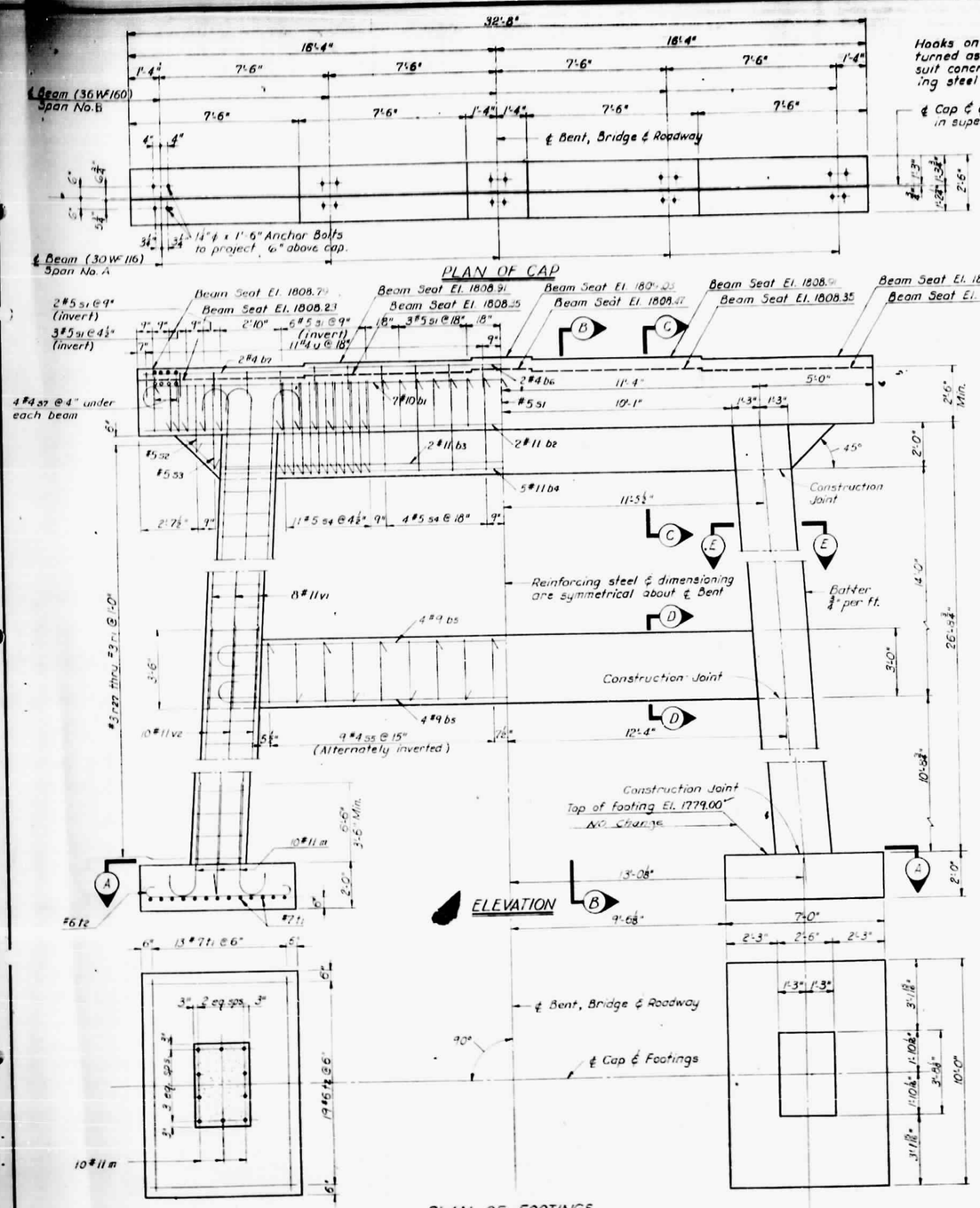
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

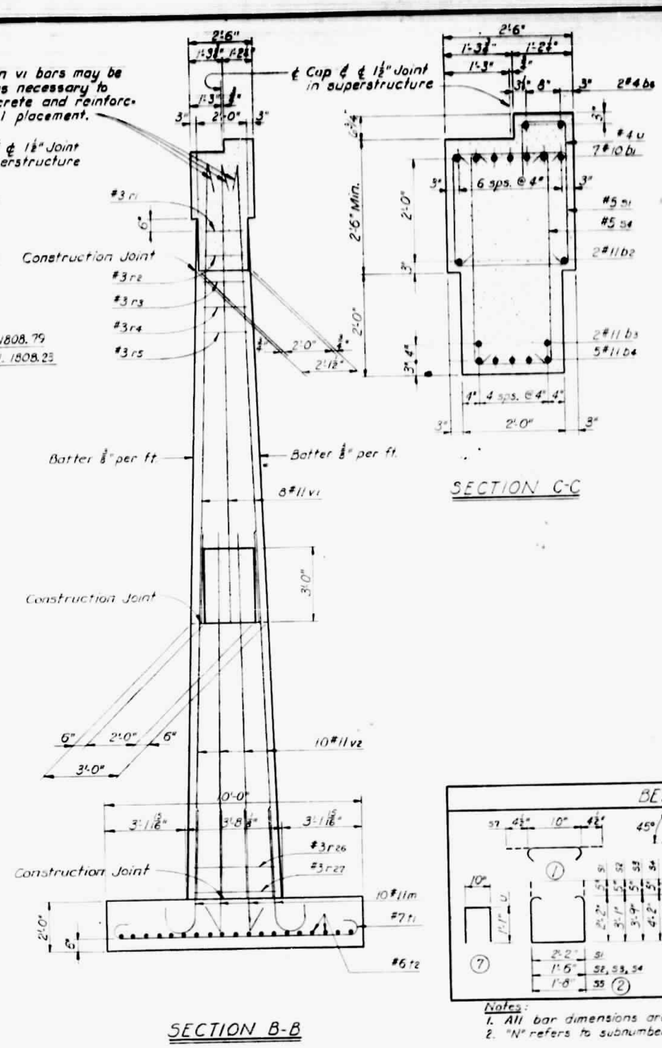
SUBSTRUCTURE
END BENT NO. 2

NOV. 1966

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

SHEET NO. 5-13 B1
TOTAL SHEETS 18 91

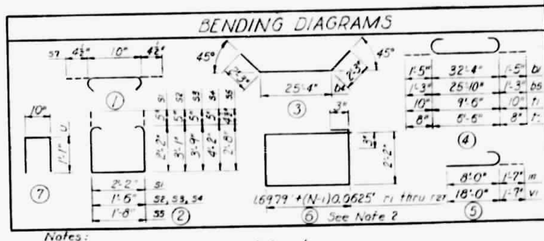




REINFORCING BAR SCHEDULE

BAR	SIZE	TYPE	LENGTH	NO.	WEIGHT
b1	10	4	35'-2"	7	1,059
b2	11	Str.	32'-4"	2	344
b3	11	Str.	25'-4"	2	269
b4	11	3	29'-10"	5	793
b5	9	4	28'-4"	8	771
b6	4	Str.	17'-4"	2	23
b7	4	Str.	8'-6"	4	23
m	11	5	9'-7"	20	1,018
s1	5	2	7'-4"	31	237
s2	5	2	8'-6"	2	18
s3	5	2	9'-10"	2	21
s4	5	2	10'-8"	30	334
s5	4	2	7'-9"	18	93
s7	4	1	1'-7"	40	42
r1-r27	3	6	8.2292'+(N-1)0.1250'	2 ea.	200
t1	7	4	11'-2"	26	593
t2	6	4	7'-10"	38	447
u	4	7	3'-0"	22	44
v1	11	5	19'-7"	16	1,685
v2	11	Str.	14'-3"	20	1,514

BENDING DIAGRAMS



Notes:
1. All bar dimensions are out to out.
2. "N" refers to subnumber of bar mark.

CONCRETE VOLUMES BY POURS

POUR NO.	LOCATION	CU. YDS.
4	Cap	12.5
3	Stems & Struts	11.5
2	Stems	6.7
1	Footings	10.4 13.23

BILL OF MATERIAL

LOCATION	CLASS A CONCRETE CU. YDS.	REINFORCING STEEL LBS.
Bent No. 1	~~41.7~~ 43.930	9,508

DEVELOPED EXCAVATION (CU. YDS.) = 83.46
No WET EXCAV.

PROJECT NO. B 2016601
BUNCOMBE COUNTY
STATION: 10+35.50

MP1531

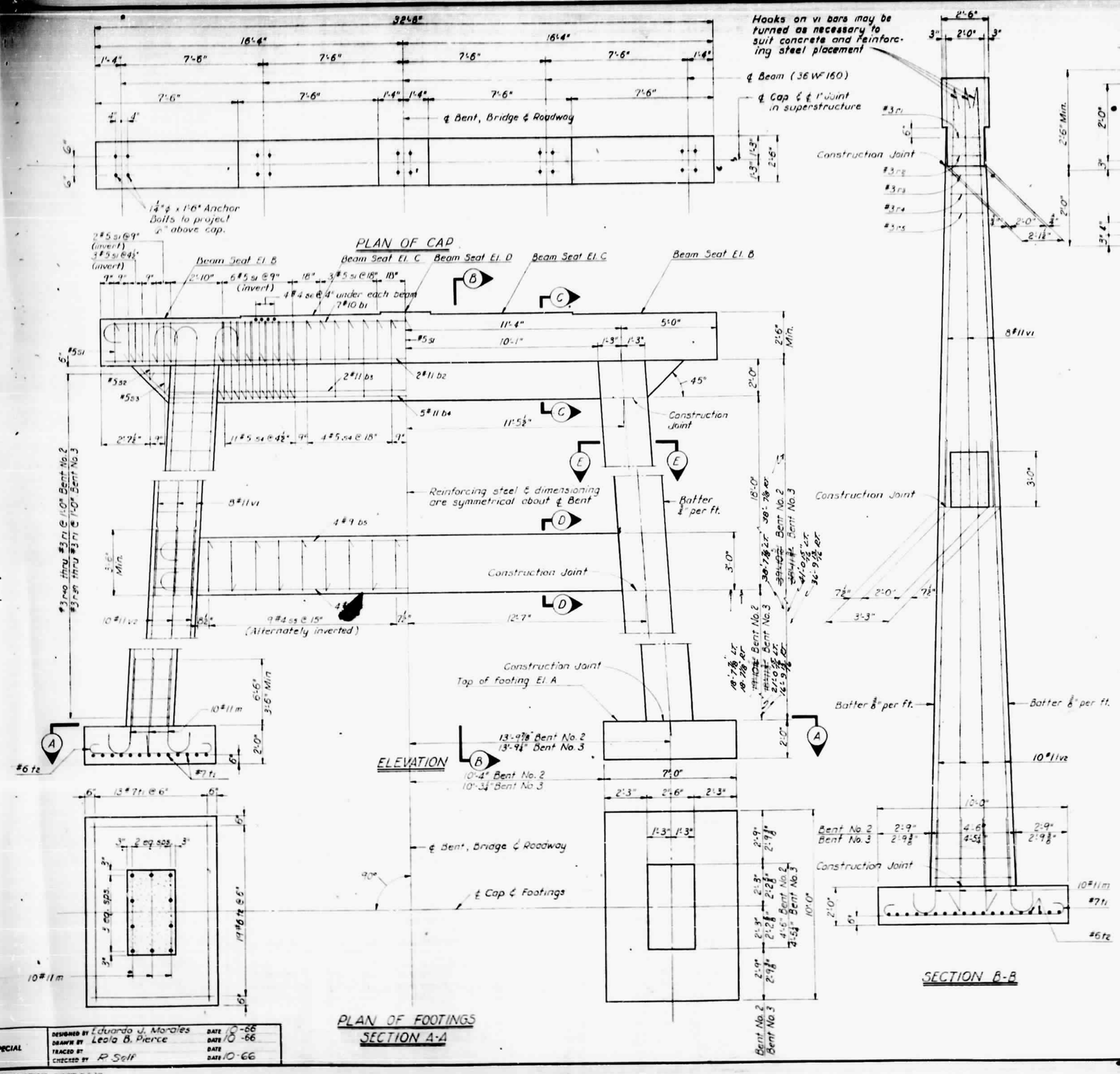
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

SUBSTRUCTURE
BENT NO. 1
NOV. 1966

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

SHEET NO. ~~5-14~~ 82
TOTAL SHEETS ~~13~~ 91

SPECIAL	DESIGNED BY	Eduardo J. Morales	DATE 10-66
	DRAWN BY	Leola B. Pierce	DATE 10-66
	TRACED BY		DATE
	CHECKED BY		DATE 10-66



REINFORCING BAR SCHEDULE FOR ONE BENT					
BAR	SIZE	TYPE	LENGTH	NO.	WEIGHT
b1	10	4	35'- 2"	7	1,059
b2	11	Str.	32'- 4"	2	344
b3	11	Str.	25'- 4"	2	269
b4	11	3	29'-10"	5	793
b5	9	4	28'-10"	8	784
m	11	5	9'- 7"	20	1,018
s1	5	2	7'- 4"	31	237
s2	5	2	8'- 6"	2	18
s3	5	2	9'-10"	2	21
s4	5	2	10'- 8"	30	334
s5	4	2	7'- 9"	18	93
s6	4	1	2'-11"	20	39
* r1-r40	3	6	6.2292' + (N-1)0.1250'	2 ea.	321
t1	7	4	11'- 2"	26	593
t2	6	4	7'-10"	38	447
v1	11	5	23'- 7"	16	2,009
v2	11	Str.	23'- 5"	20	2,488

CONCRETE VOLUMES BY POURS			
POUR NO.	LOCATION	CU. YDS. BENT 2	CU. YDS. BENT 3
4	Cap	11.8	11.8
3	Stems & Strut	14.0	14.0
2	Stems	13.2	13.5
1	Footings	10.4	10.4

BILL OF MATERIAL		
LOCATION	CLASS A CONCRETE CU. YDS.	REINFORCING STEEL LBS.
Bent No. 2	50.5	10,863
Bent No. 3	49.7	10,853

DRY EXCAV. (CU. YDS.) = 43.97 BENT 2
WET EXCAV. (CU. YDS.) = 25.13
DRY EXCAV. (CU. YDS.) = 0.00 BENT 3
WET EXCAV. (CU. YDS.) = 60.49

BENDING DIAGRAMS

Notes:
1. All bar dimensions are out to out.
2. "N" refers to subnumber of bar mark.
* Omit bar r40 in Bent No. 3.

ELEVATIONS OF FOOTINGS (BUILT)		
MARK	BENT NO. 2	BENT NO. 3
A	1763.20 Lt.	1756.70 Lt.
A	1763.26 Rt.	1761.76 Rt.

SCHEDULE OF ELEVATIONS		
MARK	BENT NO. 2	BENT NO. 3
A	~~1762.00~~	~~1759.00~~
B	1804.36	1800.48
C	1804.48	1800.60
D	1804.60	1800.72

PROJECT No. 8.2016601
BUNCOMBE COUNTY
STATION: 10+35.50
M.P. 153.1

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

SUBSTRUCTURE
BENT NO. 2 & 3

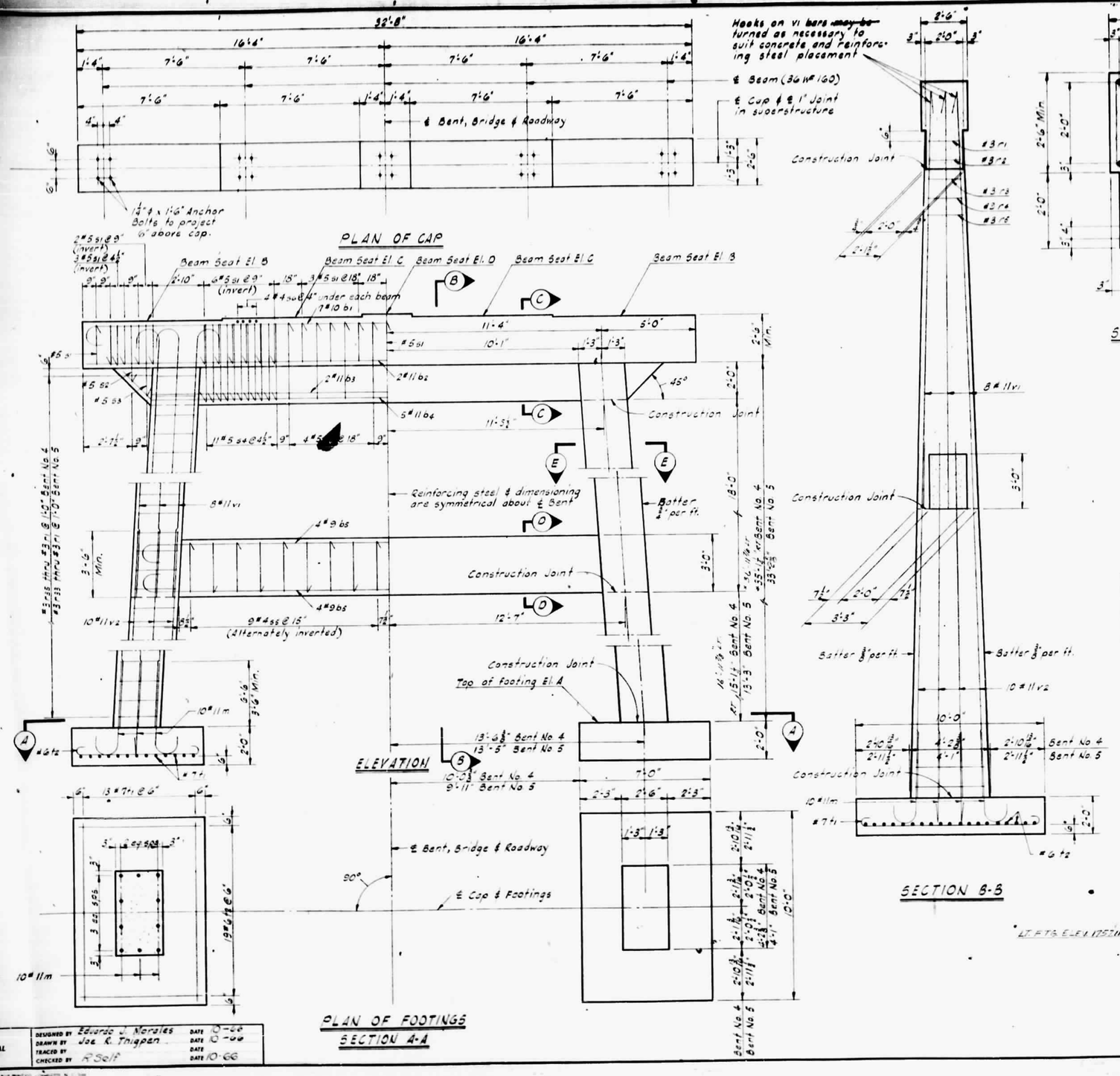
NOV 1966

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

SHEET NO. 5-15
TOTAL SHEETS 18

SPECIAL
DESIGNED BY Eduardo J. Morales DATE 10-66
DRAWN BY Leola B. Pierce DATE 10-66
TRACED BY DATE
CHECKED BY R. Self DATE 10-66

63
91



FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	N.C.	B-2016601

F.A. PROJECT No. S-1-2(2)

REINFORCING BAR SCHEDULE FOR ONE BENT

BAR	SIZE	TYPE	LENGTH	NO.	WEIGHT
b1	10	4	35'-2"	7	1,059
b2	11	Str	32'-4"	2	344
b3	11	Str	25'-4"	2	269
b4	11	3	29'-10"	5	793
b5	9	4	28'-10"	8	784
m	11	5	9'-7"	20	1,018
s1	5	2	7'-4"	31	237
s2	5	2	8'-6"	2	18
s3	5	2	9'-10"	2	21
s4	5	2	10'-8"	30	334
s5	4	2	7'-9"	18	93
s6	4	1	2'-11"	20	39
r1-rss	3	6	8.2292' (N-1)0.1250'	28a	273
t1	7	4	11'-2"	26	593
t2	6	4	7'-10"	38	447
v1	11	5	23'-7"	16	2,005
v2	11	Str	18'-8"	20	1,864

CONCRETE VOLUME BY POURS

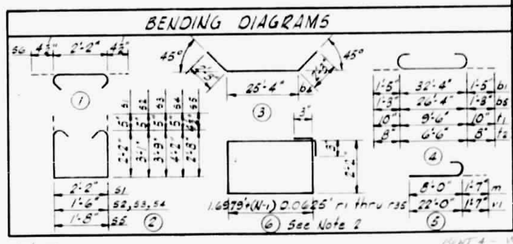
POUR NO.	LOCATION	CU. YDS. BENT 4	CU. YDS. BENT 5
4	Cap	11.8	11.8
3	Stems & Struts	14.0	14.0
2	Stems	10.4	9.0
1	Footings	10.4	10.4

BILL OF MATERIAL

LOCATION	CLASS A CONCRETE CU. YDS.	REINFORCING STEEL LBS.
Bent No. 4	46.6	10,311
Bent No. 5	45.2	10,281

BENT 4 — NET EXCAV. (COMM. YARDS) = 66.1
BENT 5 — NET EXCAV. (COMM. YARDS) = 47.46
INCIDENTAL EXCAV. FOR REMOVAL FOR BENT 5

BENDING DIAGRAMS



Notes:
1. All bar dimensions are out to out.
2. "N" refers to subnumber of bar mark.
* Omit bars rss4 & rss5 in Bent No. 4.

SCHEDULE OF ELEVATIONS

MARK	BENT NO. 4	BENT NO. 5
A	1759.00 (LT. FTG. ELEV. 1755.11)	1757.00
B	1796.60	1792.72
C	1796.72	1792.84
D	1796.84	1792.96

PROJECT No. 8.2016601
BUNCOMBE COUNTY
STATION: 10+35.50
M.P. Sta. 153.1

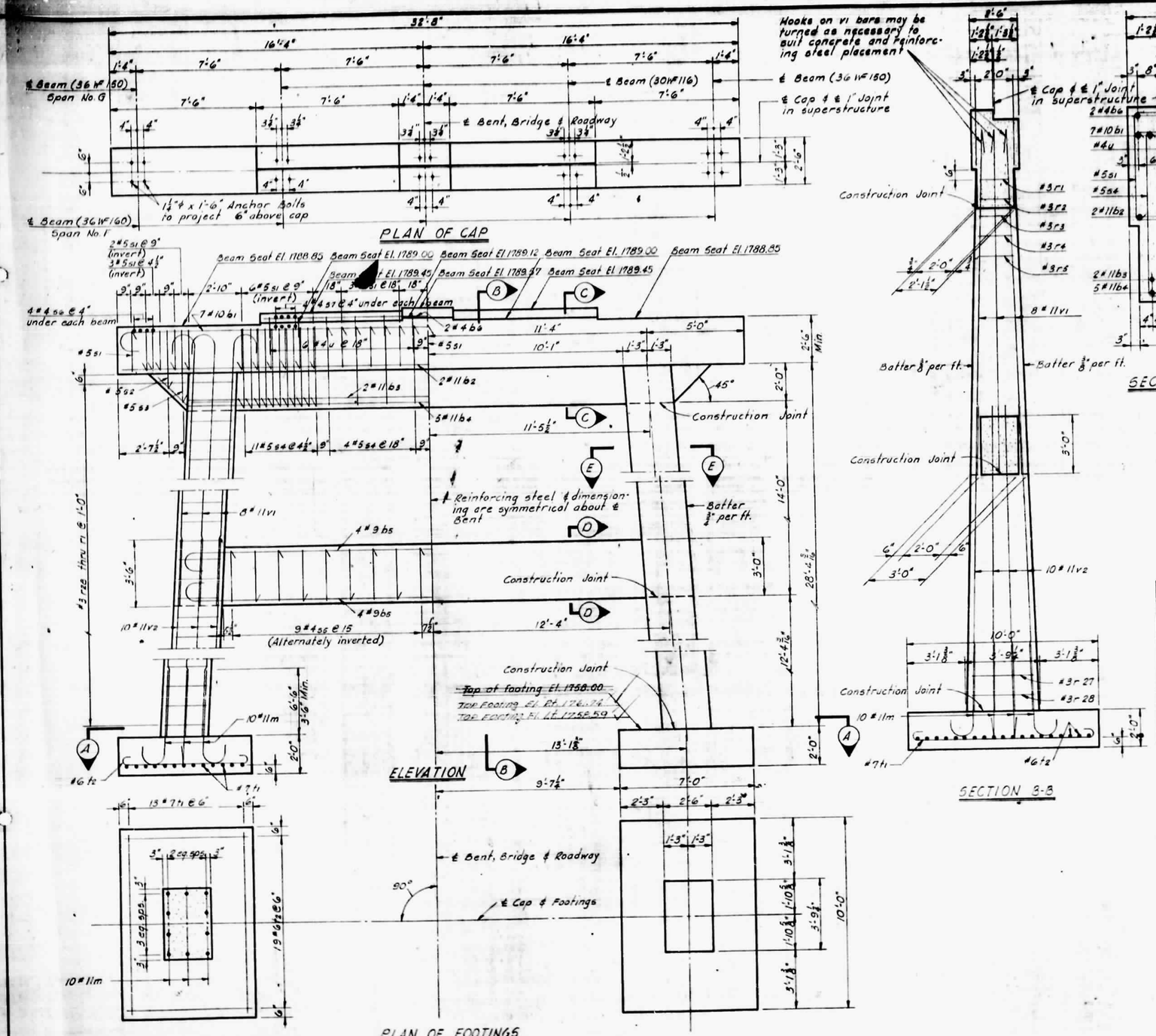
STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

SUBSTRUCTURE
BENT NO. 4 & 5

NOV 1966

REVISIONS							
NO.	BY	DATE	NO.	BY	DATE	SHEET NO. ~~S-16~~	84
1			3			TOTAL SHEETS ~~18~~	91
2			4				

SPECIAL			
DESIGNED BY	Eduardo J. Morales	DATE	10-66
DRAWN BY	Joe R. Thigpen	DATE	10-66
TRACED BY		DATE	
CHECKED BY	R. Self	DATE	10-66



REVISION NO.	DATE	PROJECT NO.
3	N.C.	B-2016(01)

FA PROJECT No. S-236(17)

REINFORCING BAR SCHEDULE

BAR	SIZE	TYPE	LENGTH	NO.	WEIGHT
b1	10	4	35'-2"	7	1,059
b2	11	Str	32'-4"	2	344
b3	11	Str	25'-4"	2	269
b4	11	3	29'-10"	5	793
b5	9	4	28'-4"	8	771
b6	6	Str	17'-4"	2	25
m	11	5	9'-7"	20	1,018
s1	5	2	7'-4"	31	237
s2	5	2	8'-0"	2	18
s3	5	2	9'-10"	2	21
s4	5	2	10'-8"	30	334
s5	4	2	7'-5"	18	93
s6	4	1	2'-11"	8	16
s7	4	1	1'-9"	24	25
r1 thru r28	3	6	8.2292' + (N-1) 0.1250'	2 Ea	209
t1	7	4	11'-2"	26	593
t2	6	4	7'-10"	38	447
u	4	7	3'-0"	12	24
v1	11	5	19'-9"	16	1,665
v2	11	Str.	15'-11"	20	1,691

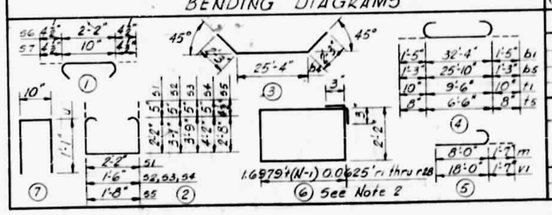
CONCRETE VOLUMES BY POURS

POUR NO.	LOCATION	CU. YDS.
4	Cap	12.2
3	Stems & Strut	11.5
2	Stems	7.8
1	Footings	10.4

BILL OF MATERIAL

LOCATION	CLASS A CONCRETE CU. YDS.	REINFORCING STEEL LBS.
Bent No. 6	41.9	9,650

BENDING DIAGRAMS



Notes:
1. All bar dimensions are out to out.
2. "N" refers to subnumber of bar mark.

PROJECT No. B-2016(01)
BUNCOMBE COUNTY
STATION: 10+35.50
M.P. Sta 153.1

STATE OF NORTH CAROLINA
STATE HIGHWAY COMMISSION
RALEIGH

SUBSTRUCTURE
BENT NO. 6

NOV. 1966

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

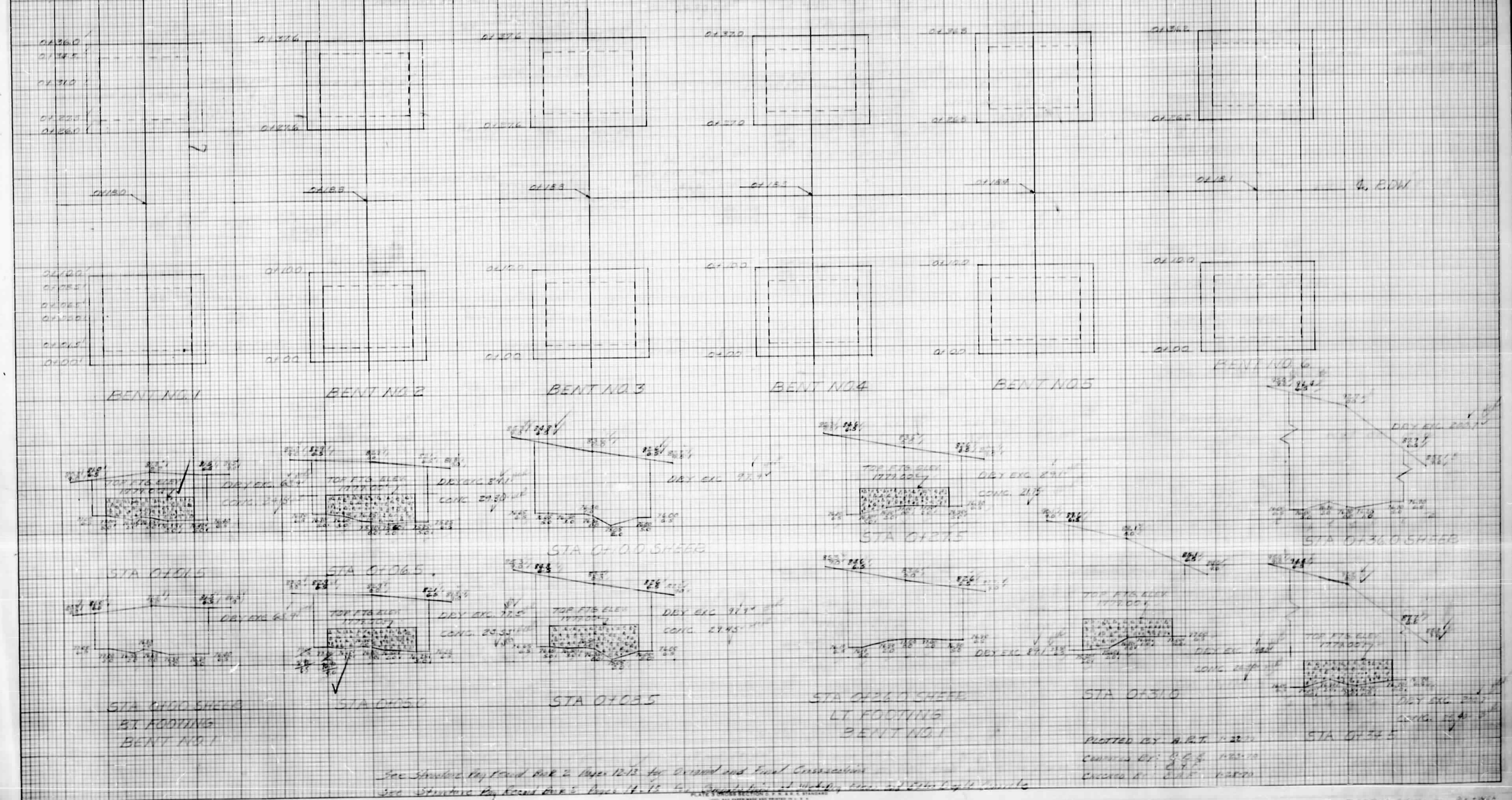
SHEET NO. ~~5-17~~ 85
TOTAL SHEETS ~~18~~ 91

SPECIAL			
DESIGNED BY	Eduardo J. Morales	DATE	10-66
DRAWN BY	Joe R. Thigpen	DATE	10-66
TRACED BY		DATE	
CHECKED BY	R. Self	DATE	10-66

STATE	PROJECT NO.	SHEET NO.
N. C.	B-2101(6)	18
F.A. PROJ. NO.	S-258(2)	

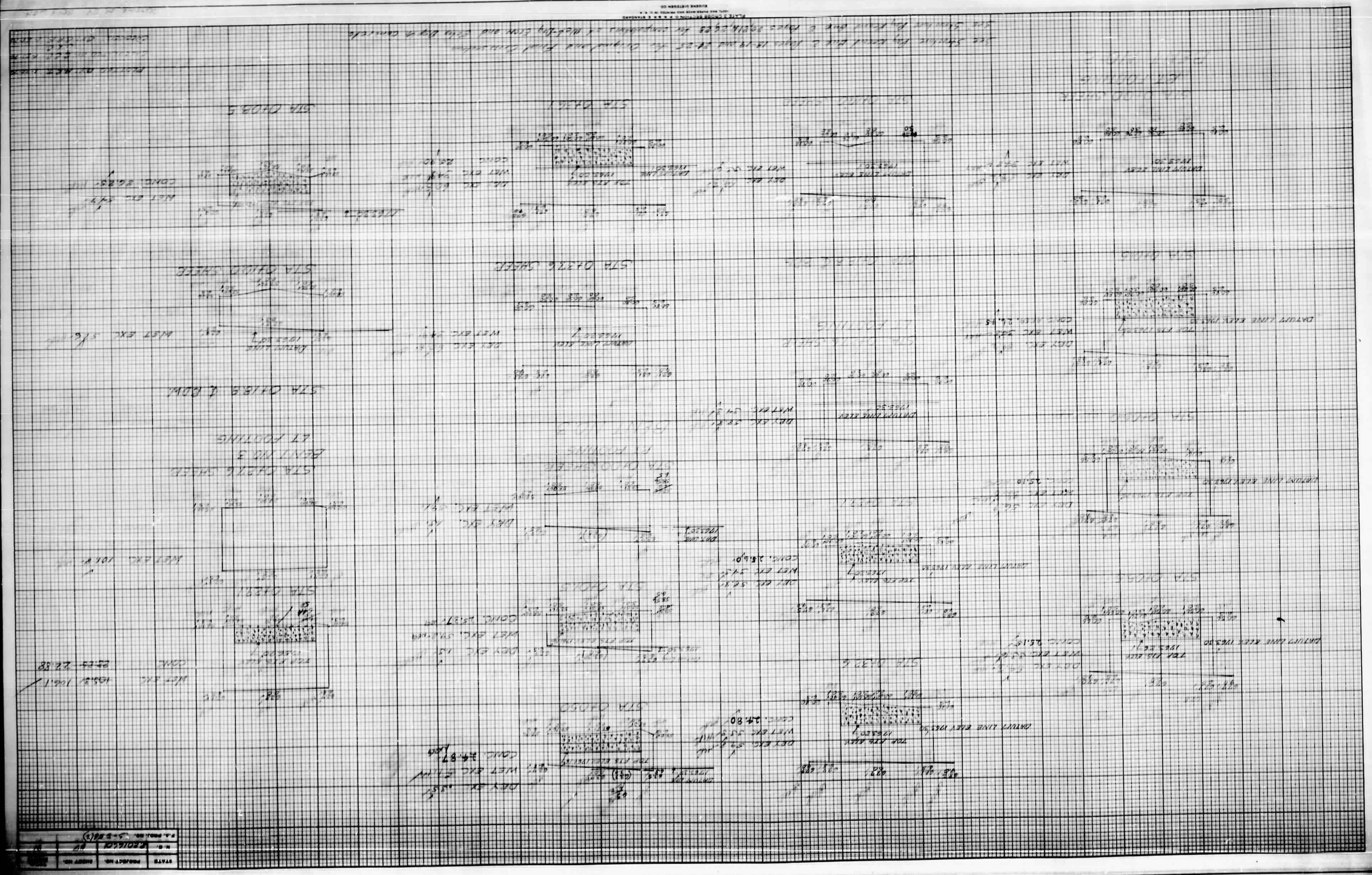
BRIDGE STA 101+35.50

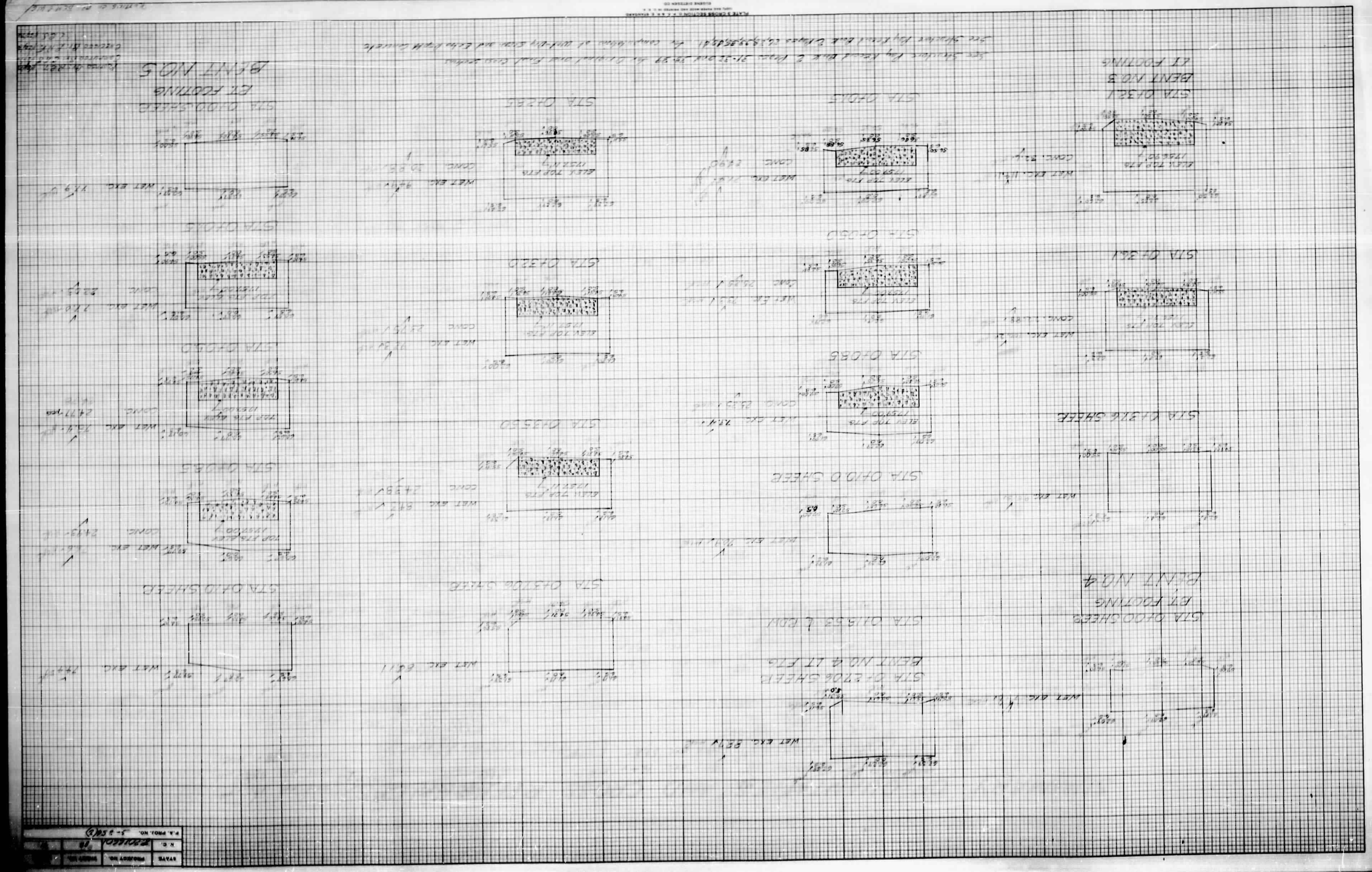
DRY AND WET EXCAVATION PLAN ALSO EXTRA DEPTH CONCRETE IN FOOTINGS



See Structure Rep. Found. Rec. 2 Pages 12-13 for Drilled and Final Construction

See Structure Rep. Found. Rec. 2 Pages 14-15 for Construction of Working Pier and Drilled Piles


STA 0+00.5
STA 0+17.6 SHEET
STA 0+17.6 SHEET
STA 0+17.6 SHEET


STA 0+32.4
BENT NO 3
FT FOOTING
STA 0+32.4
STA 0+00.5
STA 0+00.5 SHEET
STA 0+00.5 SHEET
FT FOOTING
BENT NO 4
STA 0+00.5 SHEET
STA 0+00.5 SHEET
STA 0+00.5 SHEET
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STA 0+00.5 SHEET
STA 0+00.5 SHEET
FT FOOTING
BENT NO 5
STA 0+00.5 SHEET
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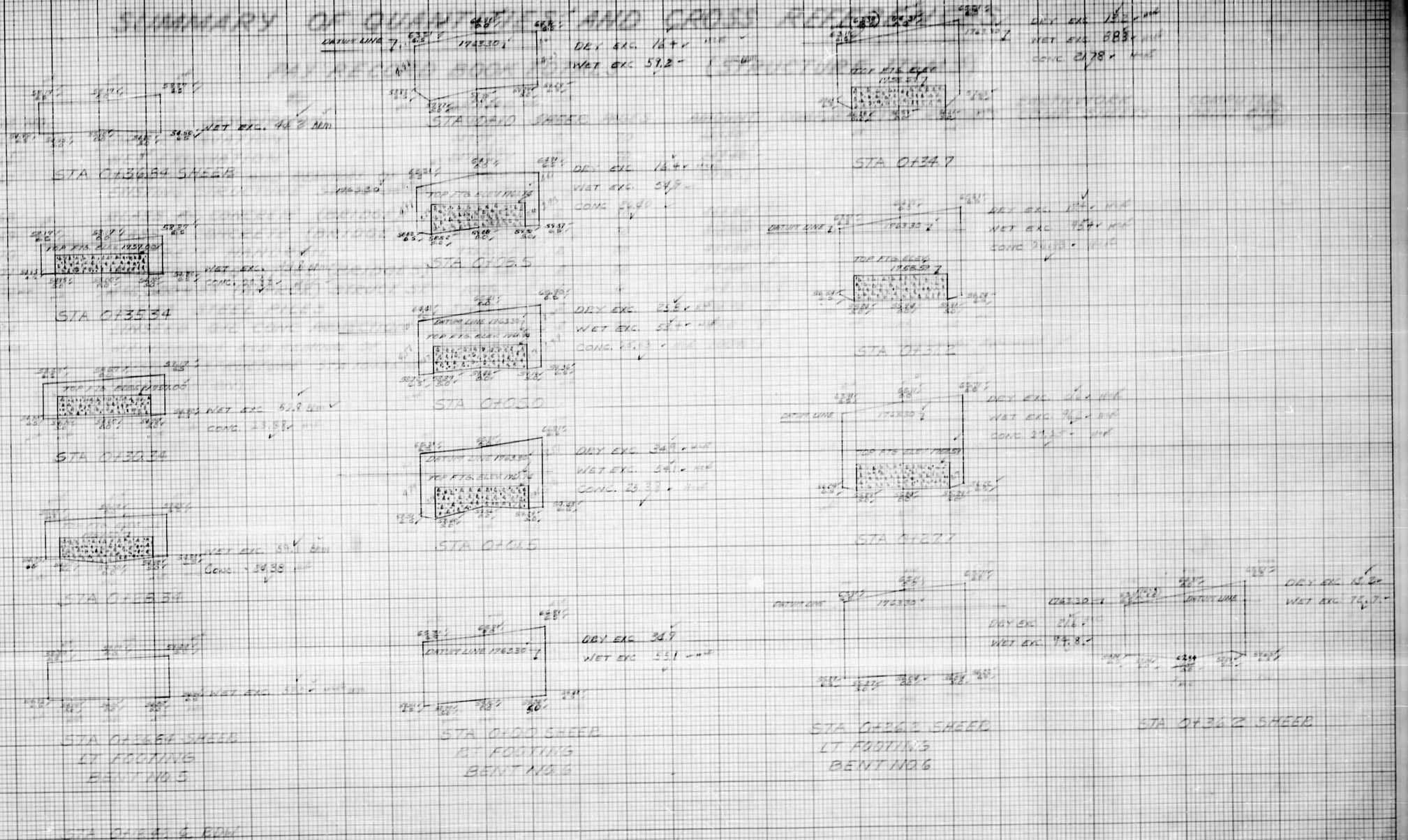
STATE	PROJECT NO.	SHEET NO.
N. C.	R-2014001	69
F.A. PROJ. NO.	STE 56(8)	

SUMMARY OF QUANTITIES AND CROSS SECTIONS

AS REQUIRED FOR PLACING PLANS



See Structure Pay Record Book 2 Pages 33-34 and 45-46 for Original and Final Quantities.
See Structure Pay Record Book 2 Pages 40, 41, 47, 48 for completions of West Dry Stream and Entire Depth Concrete

PLOTTED BY: H.R.T.
CHECKED BY:
CHECKED BY:

PLATE 3 CROSS SECTION C. P. K. & R. E. STANDARD
100% RAG PAPER MADE AND PRINTED IN U. S. A.
EUGENE DIETZGEN CO.

STATE	PROJECT NO.	SHEET NO.	TOTAL
N.C.	B-0040001	10	11
F.A. PROJ. NO.	3-2541(1)		

SUMMARY OF QUANTITIES AND CROSS REFERENCES

PAY RECORD BOOK TOTALS (STRUCTURE ITEMS)

ITEM NO.	DESCRIPTION	GRAND TOTAL	BOOK	PAGES	AMOUNT	COMP. SHEETS	REPORTS	EARTHWORK COMP. SHEETS	COMPUTER PRINT OUT
65	DRY EXCAVATION	143.09 C.Y.	2	70	143.09				
66	WET EXCAVATION	247.42 C.Y.	2	70	247.42				
67	MAINTENANCE AND REMOVAL OF EXISTING STRUCTURE STA. 10+35.50	0%			0%				
68	CLASS AA CONCRETE (BRIDGE)	463.20 C.Y.	2	70	463.20				
69	CLASS A CONCRETE (BRIDGE)	318.039 C.Y.	2	70	318.039				
70	CONCRETE HANDRAIL	975.25 L.F.	2	70	975.25				
71	REINFORCING STEEL (BRIDGES)	177,444 Lbs.	2	70	177,444				
72	466,300 LBS. (APPROX.) STRUCT. ST.	100%	1	6	4.5 100%				
73	12 HS3 STEEL PILES	374.92 L.F.	2	70	374.92				
74	LINSEED OIL CONC. PROTECTION	41.0 Gal.	2	74	41.0				
13-192	MAINTENANCE AND REMOVAL OF EXISTING STRUCTURE STA 10+35.50 (MODIFICATION)	100%			100%		Supplemental Agreement		

STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
N. C.	8.2016601	91	91
F.A. PROJ. NO.	S-254 (2)		

THE FINAL ESTIMATE
N.C. PROJECT Nº 8.2016601
F.A. PROJECT Nº S-254(2)

(STRUCTURE ITEMS AND PROJECT TOTALS CONTINUED FROM SHEET 67)

ITEM NO.	ITEM	UNIT	QUANTITY	CONTRACT PRICE	AMOUNT
65	DRY EXCAVATION	CU. YD.	~~143.09~~	10.00	~~1,430.90~~
66	WET EXCAVATION	CU. YD.	~~244.42~~	60.00	~~14,665.20~~
67	MAINTENANCE AND REMOVAL OF EXISTING STRUCTURE @ STA. 10+35.50	LUMP SUM	0 %	8,500.00	0.00
68	CLASS AA CONCRETE (BRIDGE)	CU. YD.	463.20	110.00	50,952.00
69	CLASS A CONCRETE (BRIDGE)	CU. YD.	~~318.09~~	110.00	~~34,990.27~~
70	CONCRETE HANDRAIL	LIN. FT.	975.25	16.00	15,604.00
71	REINFORCING STEEL (BRIDGE)	LBS.	177,444	.14	24,842.16
72	466,300 LBS. (APPROX.) STRUCTURAL STEEL	LUMP SUM	100%	75,000.00	75,000.00
73	12 H 53 STEEL PILES	LIN. FT.	374.92	12.00	4,499.04
74	LINSEED OIL CONCRETE PROTECTION	GAL.	41.0	15.00	615.00
13-192	MAINTENANCE AND REMOVAL OF EXISTING STRUCTURE @ STA 10+35.50 (MODIFICATION)	LUMP SUM	100%	8,300.00	8,300.00

TOTAL STRUCTURE ITEMS: ~~231,072.59~~ 231,165.54

ROADWAY ITEMS (Carried Forward) : ~~227,590.41~~ 229,469.82

TOTAL CONTRACT: ~~458,663.00~~ 460,635.36

LESS PREVIOUS PAYMENTS (1-~~19~~ 33) ~~427,047.07~~ 445,723.91

BALANCE DUE $ ~~28,507.75~~ 14,911.84

$ ~~31,715.76~~

$ ~~33,195.37~~

I hereby certify that this structure was built according to plan except as noted herein.

Signed [illegible] Date 7-23-70
Resident Engineer

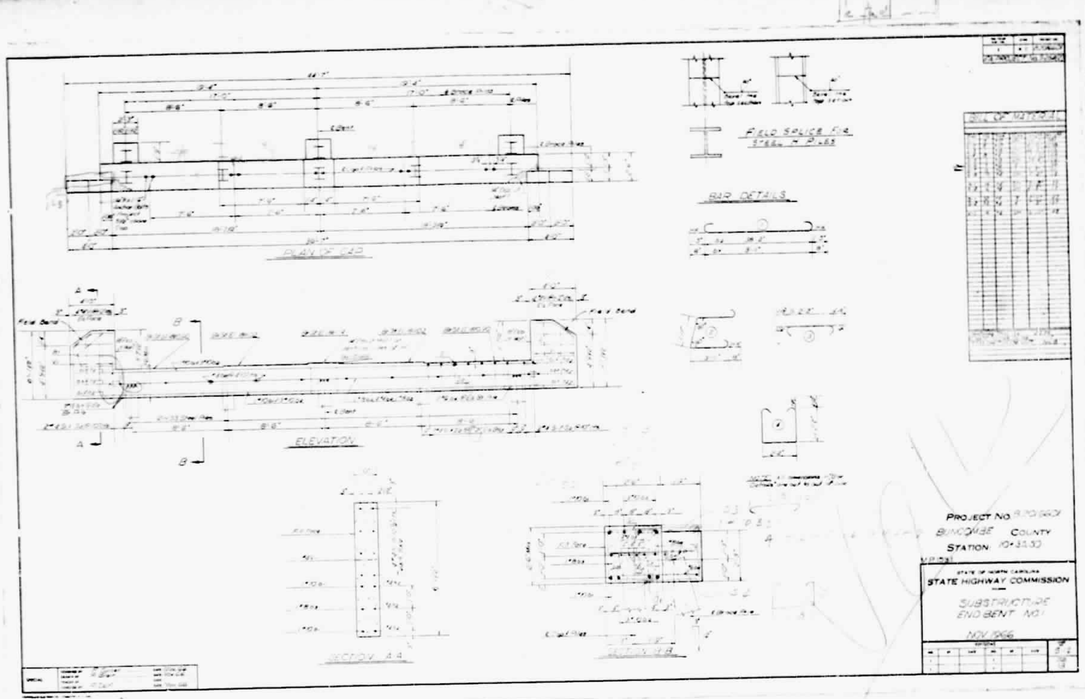
I hereby certify that I have checked this estimate and that it is true and correct according to my best knowledge and belief.

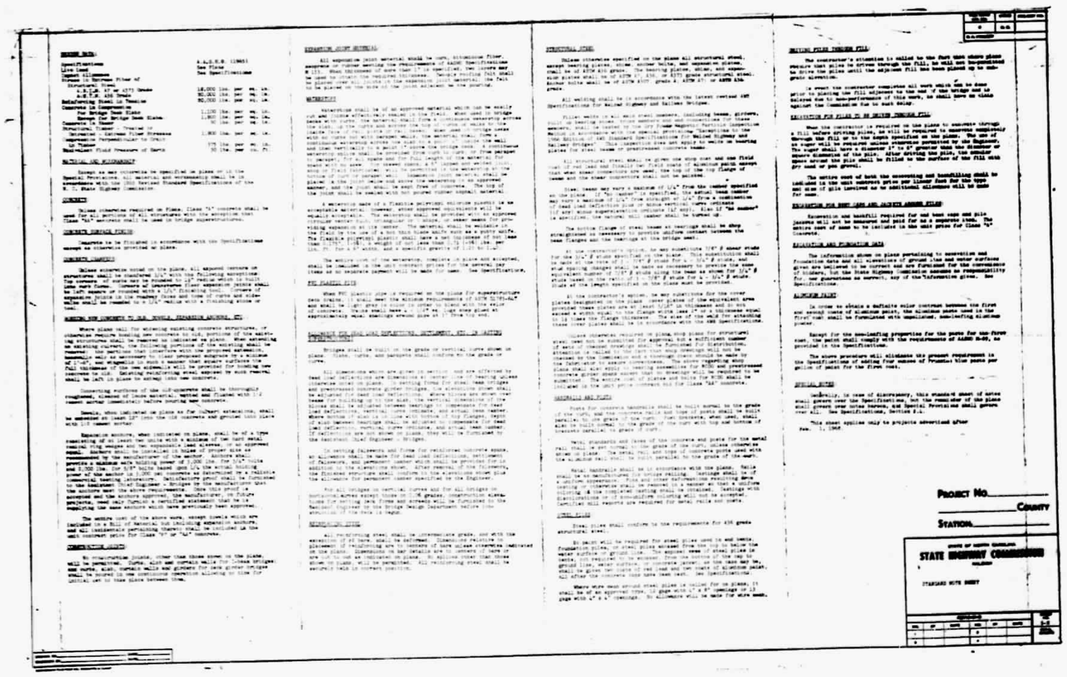
Signed [illegible] Date 7-23-70
Resident Engineer

I hereby certify that I have examined this estimate in detail and that it is true and correct according to my best knowledge and belief.

Signed [illegible] Date 8-24-70
Division Engineer

PLATE 3 CROSS SECTION U. P. A. B. R. E. STANDARD
100% RAG PAPER MADE AND PRINTED IN U. S. A.
EUGENE DIETZGEN CO.





GENERAL NOTES

Specifications A.A.S.H.O. (1961)
Live Load HS20-44
Impact Allowance See Specifications
Unit Stresses in Pounds Per Square Inch
Structural Steel
A.S.T.M. A7 or A373 Grade 18,000 lbs. per sq. in.
A.S.T.M. A36 Grade 20,000 lbs. per sq. in.
Reinforcing Bars Conforming to Specifications for Deformed Billet-Steel Bars 20,000 lbs. per sq. in.
Concrete in Compression
For Bridge Deck Slabs 1,250 lbs. per sq. in.
Except for Bridge Deck Slabs. 1,350 lbs. per sq. in.
Concrete in Shear
Structural Timber (Fiber Stresses
Compression Perpendicular to Grain 400 lbs. per sq. in.
Shear 175 lbs. per sq. in.
Soil Bearing Pressure of Piers 4,000 lbs. per sq. ft.

MATERIAL AND WORKMANSHIP

Except as not otherwise specified on plans or in the Special Provisions, all material and workmanship shall be in accordance with the Current Standard Specifications of the N. C. State Highway Commission.

CONCRETE

Unless otherwise required on Plans, Class "A" concrete shall be used for all portions of all structures with the exception that Class "AA" concrete shall be used in bridge superstructure.

CONCRETE CURING COVER

Concrete to be finished in accordance with the Specifications except as otherwise provided on plans.

CONCRETE CHAMFERS

Unless otherwise noted on the plans, all exposed corners on structures shall be chamfered 3/4" with the following exceptions: Top corners of deck may be rounded to 1/2" radius which is built into deck forms. Corners of exposed floor expansion joints shall be left sharp. Corners of exposed curbs, railing, and other concrete members shall be rounded to a 3/4" radius. Corners of piers, footings and slabs below ground or hidden by fills shall be rounded to a 3/4" radius with a finishing stroke of trowel.

REMOVING NEW CONCRETE TO ALL WHICH PROVISION ADDERED, ETC.

Where plans call for widening existing concrete structures, or otherwise require bonding new concrete to old concrete, the existing structure shall be removed to the extent shown on plans. When widening existing structures, the existing concrete shall be removed to the extent that concrete with the proposed extension, especially only as necessary to clear proposed subgrade or a minimum of 1'-0", and 6" from the outside face of the existing wing walls. Concrete shall be removed by hand, or by a method that will not damage the remaining concrete. Bonding reinforcing steel exposed by such removal shall be left in place to extend into new concrete.

Connecting surfaces of the old concrete shall be thoroughly roughened, cleaned of loose material, wetted and flushed with 1:2 cement mortar immediately before pouring new concrete.

Dowels, when indicated on plans as for culvert extensions, shall be embedded at least 12" into the old concrete and grouted into place with 1:2 cement mortar.

Expansion anchors, when indicated on plans, shall be of a type consisting of at least two units with a minimum of two bolt metal, resilient lead, and expansion shell. Anchors shall be installed in drilled holes of a diameter in holes of proper size as recommended by the manufacturer of the anchor. Anchors shall provide a minimum safe holding power of 7,000 lbs. for 3/4" hole and 5,000 lbs. for 5/8" holes based upon 1/4 the actual holding power of the anchors. Anchors shall be installed in holes in reliable place of the supporting structure. Installation shall be subject to the approval Chief Engineer - Bridges to the satisfaction that the anchors meet the above requirements. Upon completion of a accepted and the anchors approved, the manufacturer, or fabricator shall furnish a certificate of compliance with the above specifications, and specifications which have previously been approved.

The entire cost of the above work, except items which are included in a bill of material but including expansion anchors, and all incidental materials therewith, shall be included in the unit contract price for Class "A" or "AA" concrete.

EXPANSION JOINTS (GENERAL)

Bridge floors shall be built to the grade or vertical curve shown on plans. Slabs, curbs, and parapets shall conform to the grade or curve.

All dimensions which are given in metric, and are affected by temperature, shall be based on a setting temperature of 68°F. Unless otherwise noted on plans, setting times for steel beam bridges shall be adjusted for heat loss reflections, where floors are poured in place, and for heat loss reflections, where floors are poured in place and for heat loss reflections, vertical curve offsets, and actual heat loss reflections, vertical curve offsets, and actual heat loss reflections, for all other bridges shall be adjusted in accordance to heat loss reflections, vertical curve offsets, and actual heat loss reflections, vertical curve offsets, and actual heat loss reflections, for all other bridges shall be adjusted in accordance to heat loss reflections, vertical curve offsets, and actual heat loss reflections, for all other bridges shall be adjusted in accordance to the maximum Chief Engineer - Bridges.

In setting falsework and forms for reinforced concrete spans, no allowance shall be made for heat loss reflections, settlement of falsework or other causes which may cause the span to deflect in addition to the elevations shown. After removal of the falsework, the span shall be adjusted to the elevations shown on the plans by the use of jacks, or other methods approved by the Chief Engineer - Bridges.

For all bridges on vertical curves and for all bridges on horizontal curves except those on 1.0% grades, construction elevations for bridges on the bridge seats will be furnished to the contractor by the Chief Engineer - Bridges (approximately before the commencement of the work is begun.

REINFORCING STEEL

All reinforcing steel shall be intermediate grade, and with the exception of as here shall be defined. Dimensions relative to placement of reinforcing are to centers of bars unless otherwise indicated on the plans. Dimensions on bar details are to centers of bars or to outside of bars, as indicated. In addition, bend lengths are given outside of bars. All reinforcing steel shall be bended hooks in current practice.

STRUCTURAL STEEL

Unless otherwise specified on the plans all structural steel, except bearing plates, rollers, anchor bolts, and expansion plates, shall be of ASTM A36 grade. The bearing plates, rollers, and expansion plates shall be of ASTM A7, A36, or A373 grade structural steel. Anchor bolts shall be of ASTM A307 grade A, ASTM A7, or AASHO M34 grade.

All welding shall be in accordance with the latest revised AWS Specifications for Welded Highway and Railway Bridges.

Pilot holes in all steel members, including beams, girders, stringers, and floor beams, and connections for these members, shall be reamed and bolted together. Holes in accordance with the special provisions "Specifications for Punching and Reaming Holes in Steel Bridges." Pilot holes in connections for floor beams, stringers, and girders shall be in a working Railway Bridges. Pilot holes in connections shall be reamed.

All structural steel shall be given one shop coat and one field coat of red lead and linseed oil paint. Contact surfaces except those of high tensile bolts, the top of the top flange of stringers and the bottom of the bottom flange shall not be painted.

Steel beams may have a maximum of 1/4" from the camber specified on the plans. If the camber is specified, the steel beam manufacturer's method of fabrication shall be subject to approval of the Chief Engineer - Bridges. Camber shall be measured in the shop and adjusted as necessary to provide uniform contact between the beam flanges and the floor beams.

At the contractor's option, he may substitute 1/2" A steel plate for the 3/4" A plate specified on the plans. This substitution shall be made only if the 1/2" A plate for the 3/4" A plate, and the equivalent number of 1/2" A plate using the base as stated for 3/4" A plate. The substitution of 1/2" A plate with 3/4" A plate shall be made at the length specified on the plans and be provided.

At the contractor's option, he may substitute for the cover plates designated on the plans, cover plates of the equivalent area provided these plates are at least 1/2" thick and 14" in a thickness steel exceed a width equal to the flange. The area of the weld for attaching these cover plates shall be in accordance with the specifications.

Cover channels required in plate shop plans for structural steel shall not be substituted for angles, but a sufficient number of cover plates shall be furnished for distribution. Attention is called to the fact that cover channels will not be shown on the connection and a coverage chart should be made to the fabrication to assure proper coverage. Cover plates shall be made to the fabrication to assure proper coverage. Cover plates shall be made to the fabrication to assure proper coverage. Cover plates shall