

SPANS A-B-C-D  
BILL OF MATERIAL  
FOUR SPANS

| Bar No.        | Size | Length | Weight |
|----------------|------|--------|--------|
| a <sub>1</sub> | 5/8" | 22'-6" | 1261   |
| a <sub>2</sub> | 5/8" | 22'-6" | 1253   |
| b <sub>1</sub> | 3/4" | 24'-6" | 6497   |
| b <sub>2</sub> | 1/2" | 26'-6" | 2523   |
| c              | 3/4" | 49'-4" | 8387   |
| c <sub>1</sub> | 3/4" | 45'-4" | 7707   |
| c <sub>2</sub> | 3/4" | 58'-6" | 6546   |
| c <sub>3</sub> | 3/4" | 50'-6" | 5186   |
| d              | 6/8" | 49'-4" | 6774   |
| e              | 8/8" | 6'-6"  | 382    |
| e <sub>1</sub> | 1/2" | 4'-0"  | 1735   |
| e <sub>2</sub> | 4/8" | 4'-9"  | 152    |
| e <sub>3</sub> | 2/4" | 5'-6"  | 56     |
| f              | 4/8" | 13'-6" | 433    |
| f <sub>1</sub> | 9/8" | 13'-8" | 493    |
| f <sub>2</sub> | 3/4" | 4'-0"  | 86     |
| f <sub>3</sub> | 2/8" | 7'-0"  | 131    |
| f <sub>4</sub> | 1/2" | 6'-0"  | 48     |
| g              | 1/2" | 28'-6" | 96     |
| h              | 2/8" | 4'-0"  | 524    |
| m              | 1/2" | 4'-9"  | 58     |
| s              | 1/2" | 3'-0"  | 100    |

TOTAL CLASS A CONCR. 800.2 Cu. Yds.  
Reinforcing Steel - Lbs. 403  
Plates & Bolts - Lbs. 403

Revised 4-6-36 for expansion joints with All Conc. Quantities 12-1-36 as reinforcing steel 1571

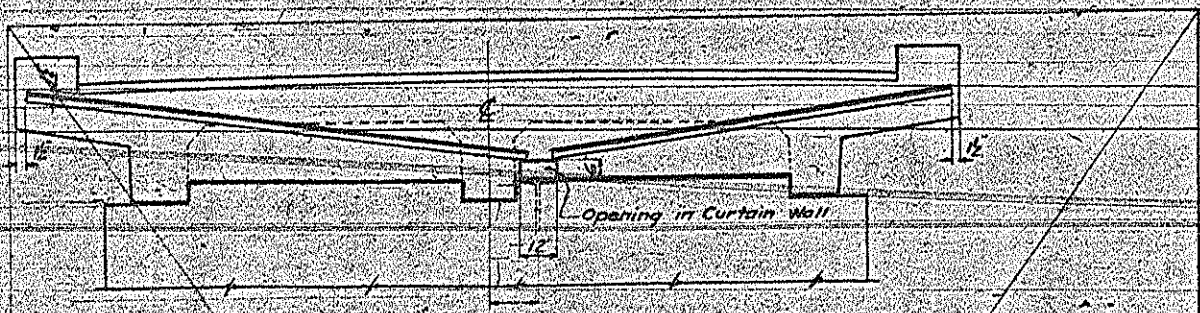
PROJECT NO. 7541  
STOKES COUNTY  
STATION 309+81.25

STATE OF NORTH CAROLINA  
STATE HIGHWAY AND  
PUBLIC WORKS COMMISSION

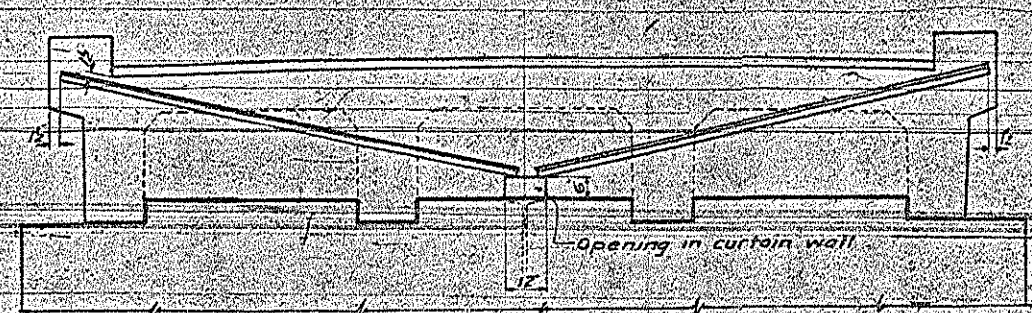
STANDARD  
REINFORCED CONCRETE  
DECK GIRDER  
SPAN=24'-0" ROADWAY  
20" CONC. L.H. SKIN

JANUARY

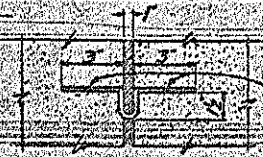
APPROVED BY: [Signature]  
CHECKED BY: [Signature]  
DESIGNED BY: [Signature]  
DRAWN BY: [Signature]  
DATE: [Date]



SECTION AT CURTAIN WALL SHOWING COPPER DRAINS THRU EXPANSION JOINT



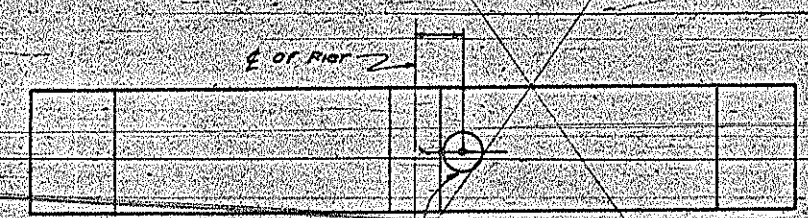
SECTION AT CURTAIN WALL SHOWING COPPER DRAINS THRU EXPANSION JOINT



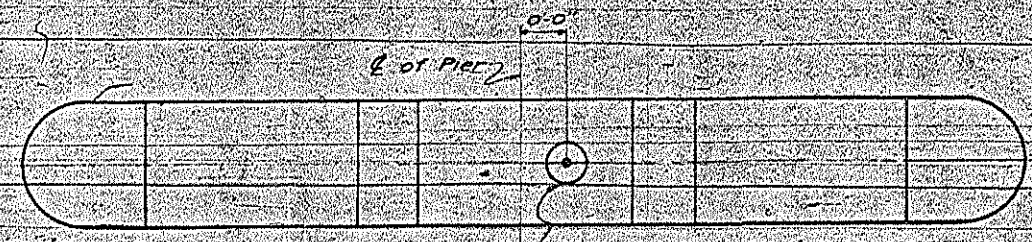
DETAIL OF COPPER DRAIN

MAKE 6 PIECES 10" x 14-3" LONG  
MAKE 4 PIECES " x " LONG

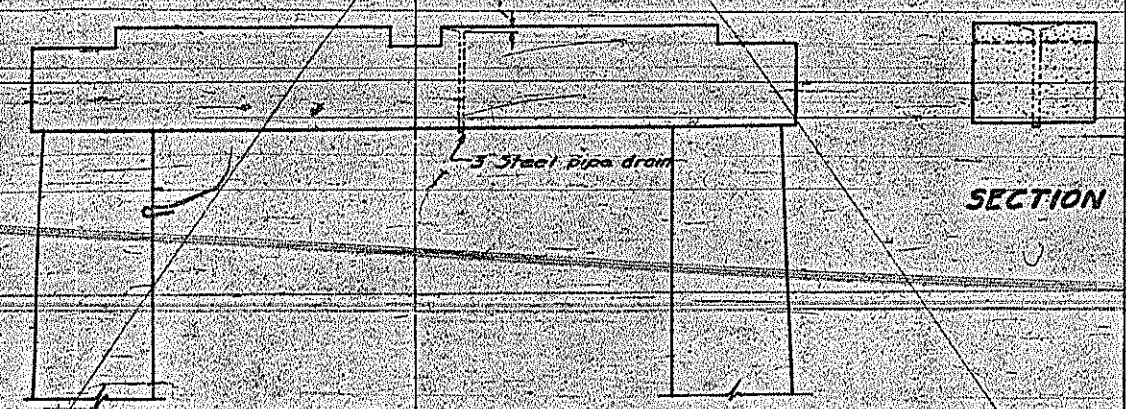
Note: Copper Flashing and steel pipe drains to be provided for Piers.



PLAN OF BEAM



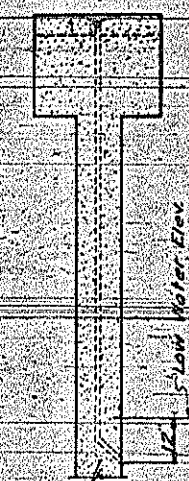
PLAN OF COPING



SECTION



ELEVATION SHOWING DRAIN PIPE POST AND WEB PIER



SECTION SHOWING DRAIN PIPE THRU WEB

GENERAL NOTE:

Copper drains shall be placed in expansion joints between spans at all piers as shown. Copper for drains to be of the best grade #20 gauge 24 oz sheet copper and shall be shop bent. The cost of same shall be included in contract unit price bid for reinforcing steel, which price shall include cost of drains complete in place and all labor tools and materials incidental thereto, including the steel pipe in piers or bents.

PROJECT NO 7541  
STOKES COUNTY  
STA 309+81.25

STATE OF NORTH CAROLINA  
STATE HIGHWAY AND  
PUBLIC WORKS COMMISSION

STANDARD  
DETAILS SHOWING COPPER DRAINS  
THRU CURTAIN WALLS  
I.C. DECK GIRDER  
AUGUST 1935

DESIGNED BY: W.P. Galloway  
CHECKED BY: W.P. Galloway  
APPROVED BY: W.P. Galloway

PLANNING NO. 11

|             |               |      |              |
|-------------|---------------|------|--------------|
| DESIGNED BY | W.P. Galloway | DATE | Aug 22, 1935 |
| CHECKED BY  | W.P. Galloway | DATE | Aug 22, 1935 |
| APPROVED BY | W.P. Galloway | DATE | Aug 22, 1935 |
| REVISIONS   |               |      |              |

Redrawn August 22, 1935 B.S.J.

# BRIDGE AT STA. 309+81.25

## END BENT NO 1

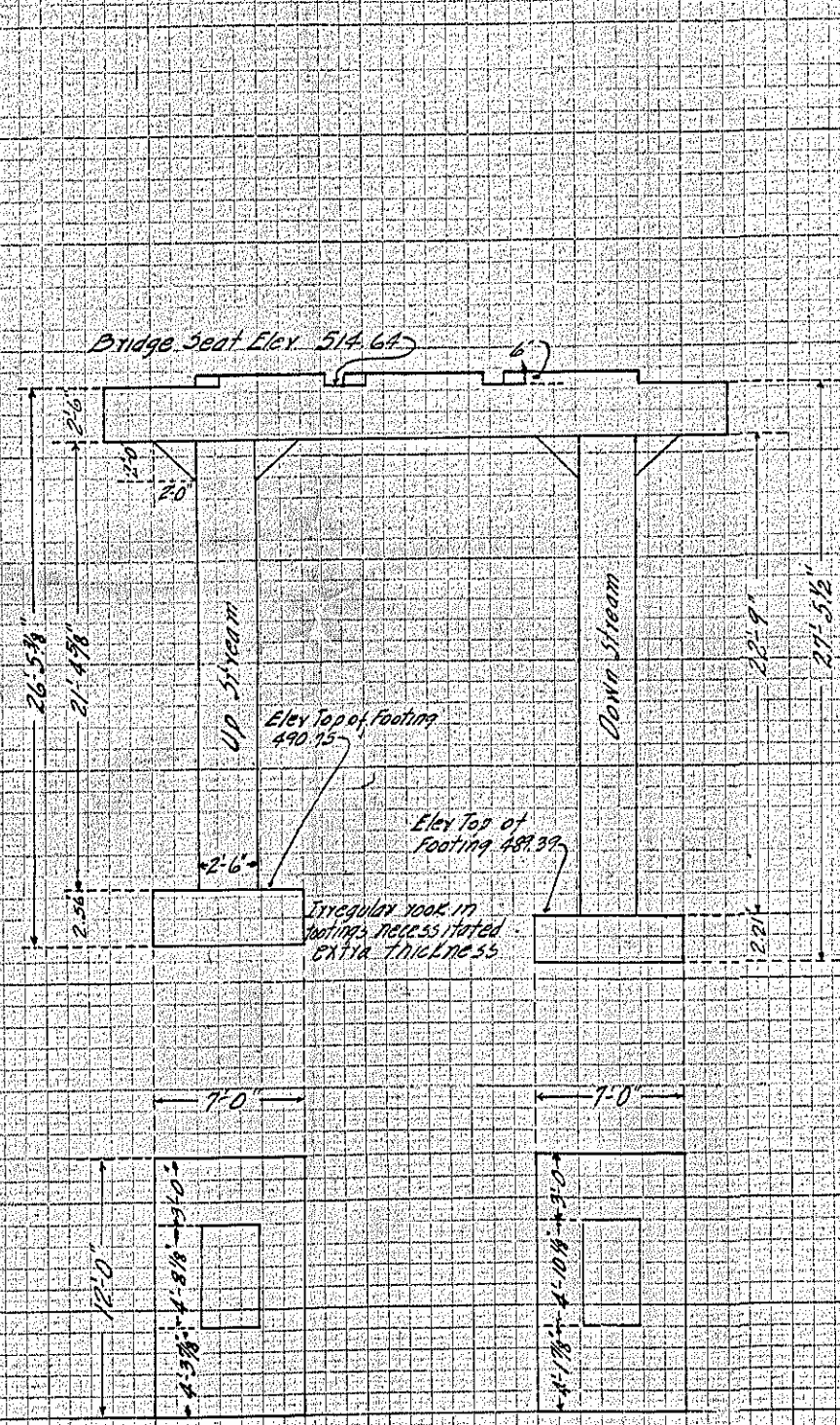
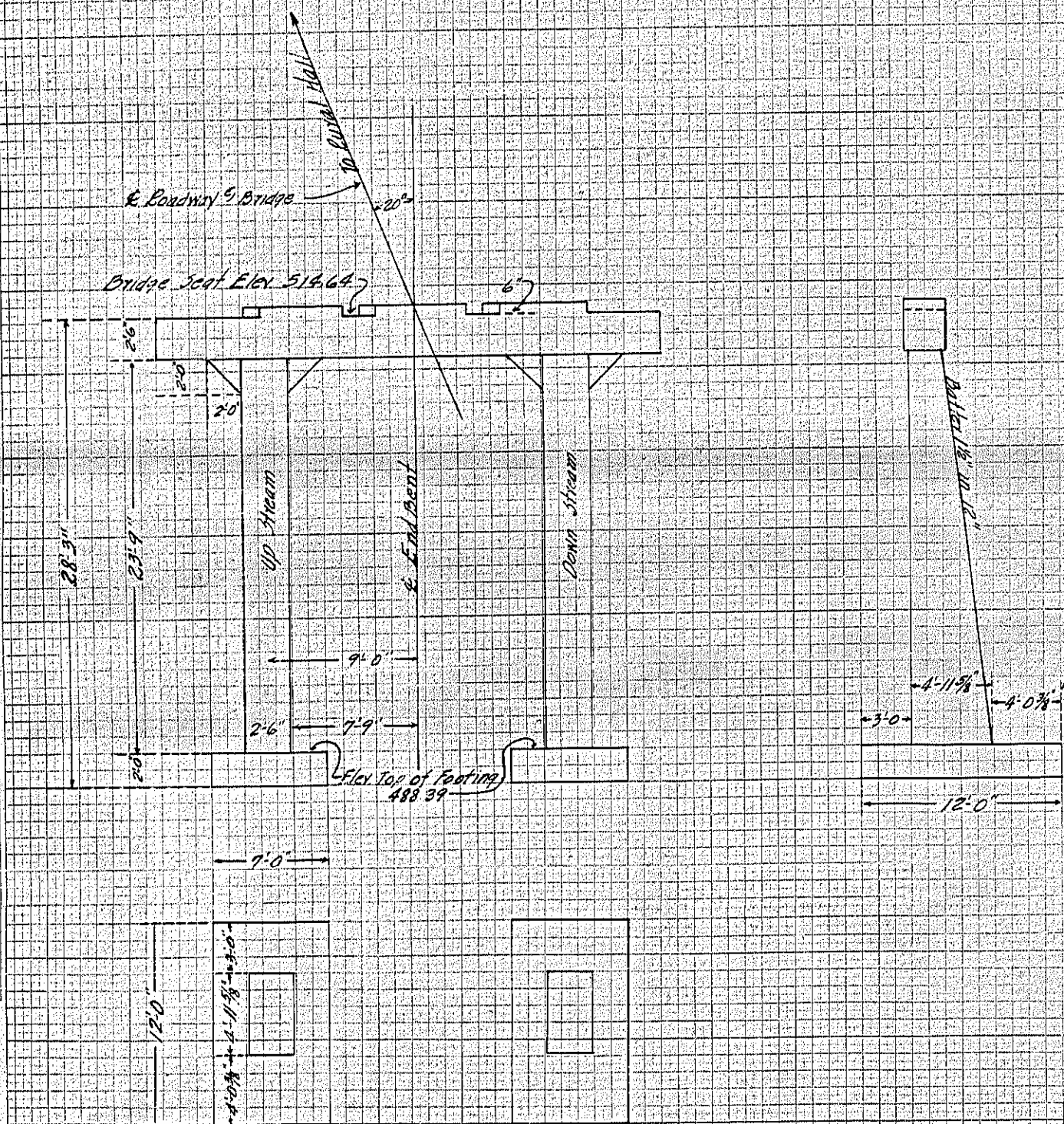
NOTE - End Bent No 1 built according to plans except footings raised and increased in thickness and legs decreased in length.

As PER PLANS  
see sheet # 6

As CONSTRUCTED  
see sheet # 1, page # 3

DATE  
BY  
FINAL SURVEY PLOTTED  
NOTE BOOK NO.  
NO.

DATE  
BY  
ORIGINAL SURVEY PLOTTED  
NOTE BOOK NO.  
NO.



### EXTRA CONCRETE IN END BENT NO 1

See sheet # 1, page # 3

UP STREAM FOOTING  

$$\frac{12.0 \times 7.0 \times 0.56}{27} = 1.74 \text{ Cu. Yds.}$$

DOWN STREAM FOOTING  

$$\frac{12.0 \times 7.0 \times 0.21}{27} = 0.65 \text{ " "}$$

EXTRA CONCRETE IN END BENT NO 1 2.39 Cu. Yds.

### DEDUCTIONS

UP STREAM LEG  

$$\frac{(1/6 \times 2.36) \times [(4'-11 3/8" \times 2'-6") + (4'-8 3/8" \times 2'-6") + 4(4'-9 7/8" \times 2'-6")]}{27} = 1.06 \text{ Cu. Yds.}$$

DOWN STREAM LEG  

$$\frac{(1/6 \times 1.0) \times [(4'-11 3/8" \times 2'-6") + (4'-10 3/8" \times 2'-6") + 4(4'-10 7/8" \times 2'-6")]}{27} = 0.45 \text{ " "}$$

TOTAL DEDUCTIONS 1.51 Cu. Yds.

EXTRA CONCRETE + 2.39 Cu. Yds.

DEDUCTIONS - 1.51 " "

TOTAL EXTRA CONCRETE IN END BENT NO 1 + 0.88 Cu. Yds.

CONCRETE AS SHOWN ON PLANS (See sheet # 6) 35.90 " "

TOTAL CONCRETE ALLOWED 36.78 Cu. Yds.  
see sheet # 2



# BRIDGE AT STA. 309+81.25

## END BENT NO 2

NOTE - End Bent No 2 built according to plans except footings increased in thickness.

AS PER PLANS  
See Sheet # 8

AS CONSTRUCTED  
See Book # 1, Page # 5

### EXTRA CONCRETE IN END BENT NO 2 See Book # 1, Page # 5

UP STREAM FOOTING

$$\frac{7.0 \times 5.0 \times 0.17}{27} = 0.22 \text{ Cu. Yds.}$$

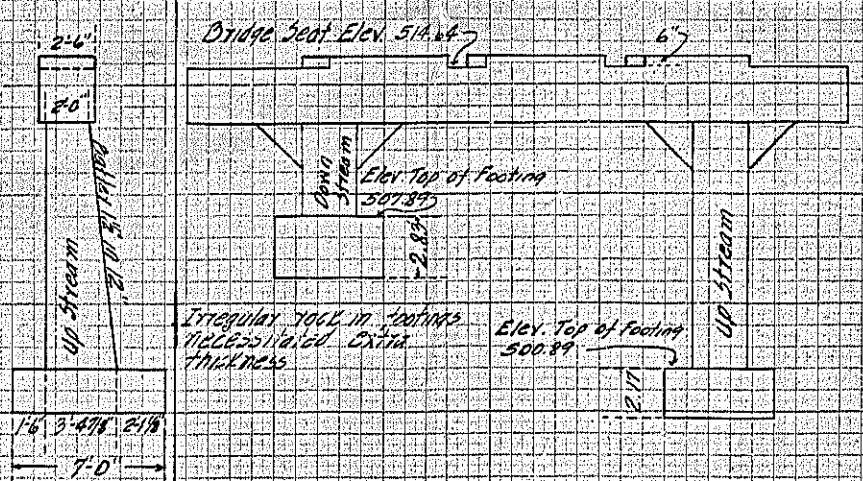
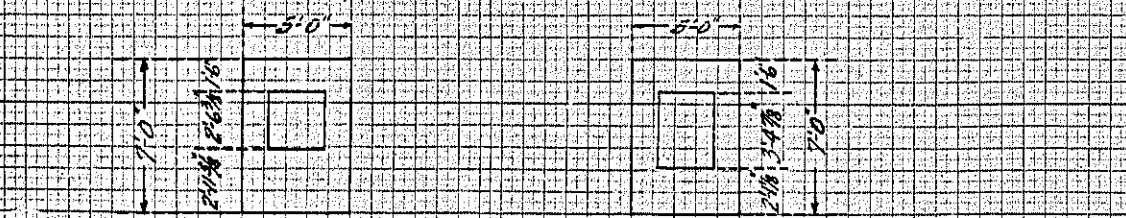
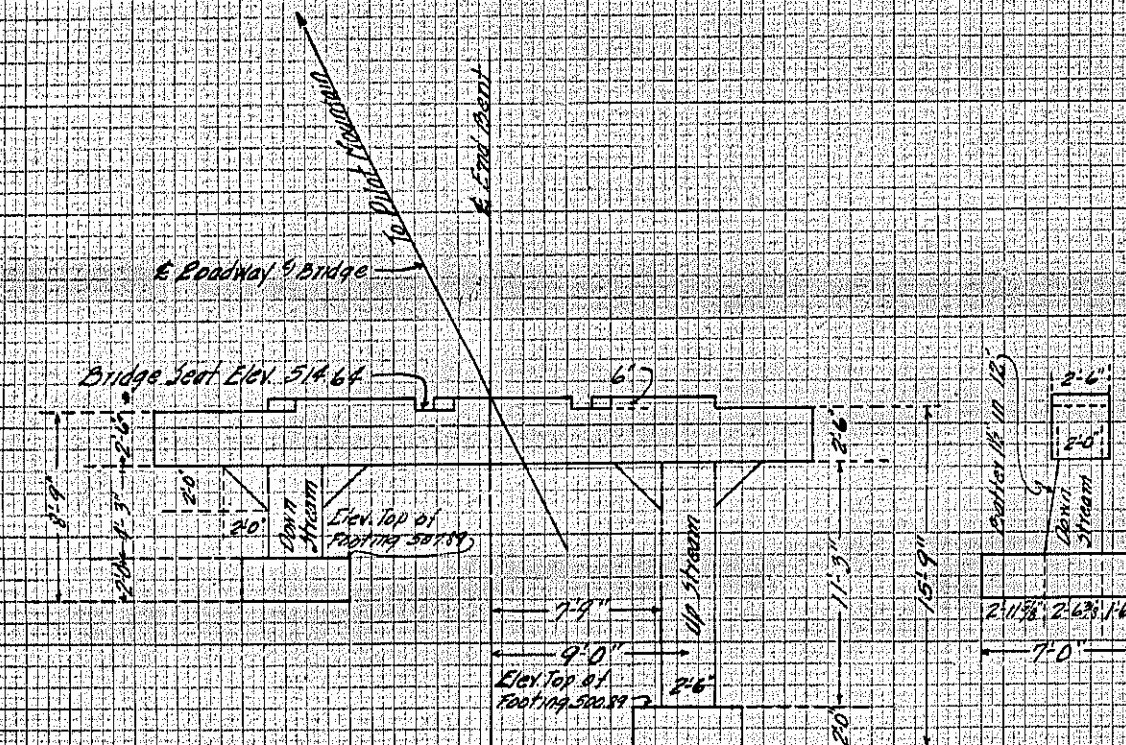
DOWN STREAM FOOTING

$$\frac{7.0 \times 5.0 \times 0.83}{27} = 1.08 \text{ " "}$$

TOTAL EXTRA CONCRETE END BENT NO 1 1.30 Cu. Yds.

CONCRETE AS SHOWN ON PLANS (See Sheet # 8) 17.10 " "

TOTAL CONCRETE ALLOWED 18.40 Cu. Yds.  
See Sheet # 2



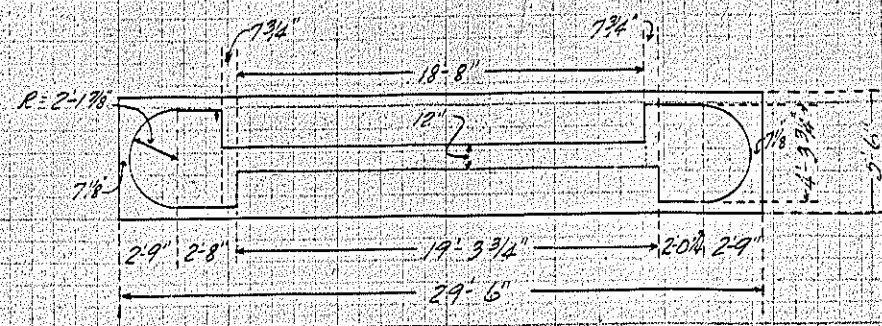
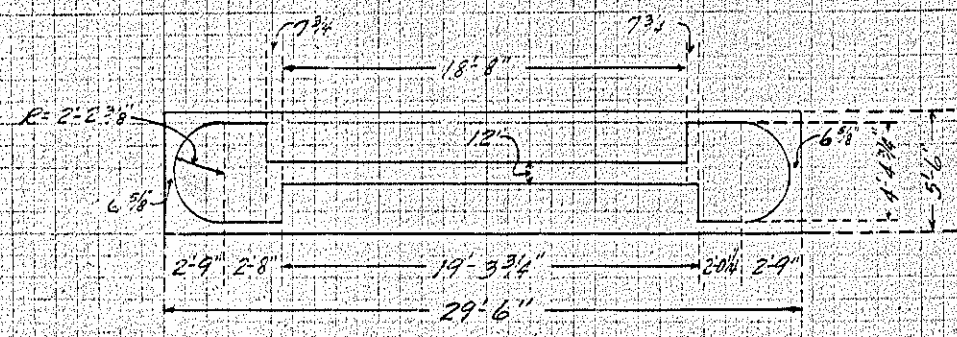
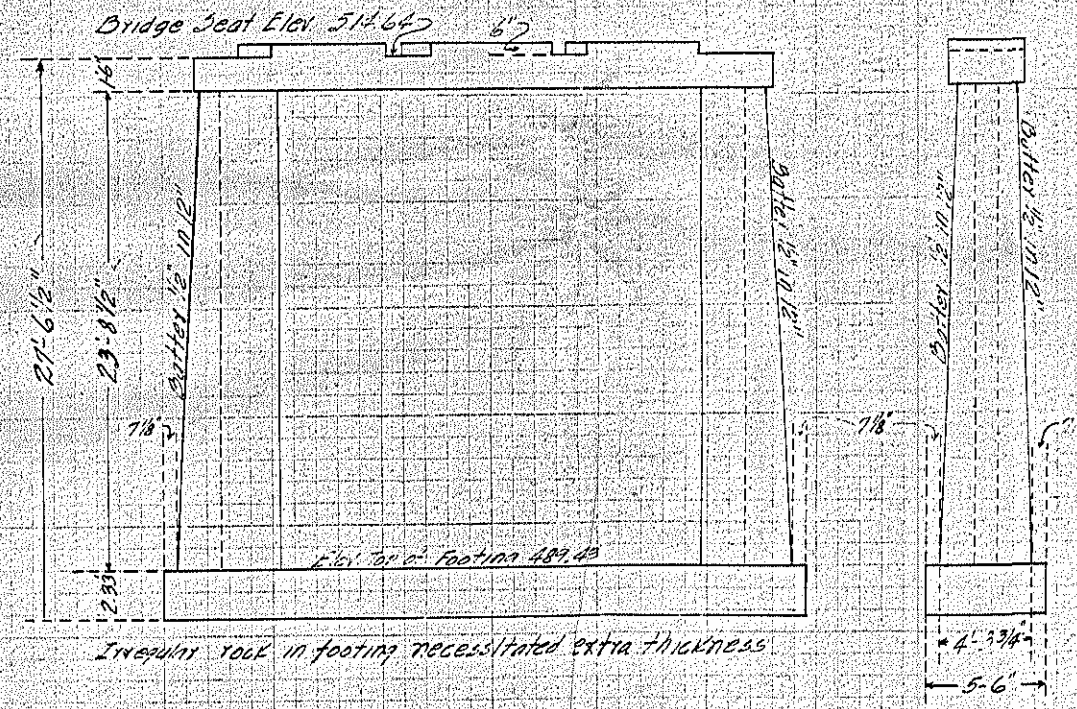
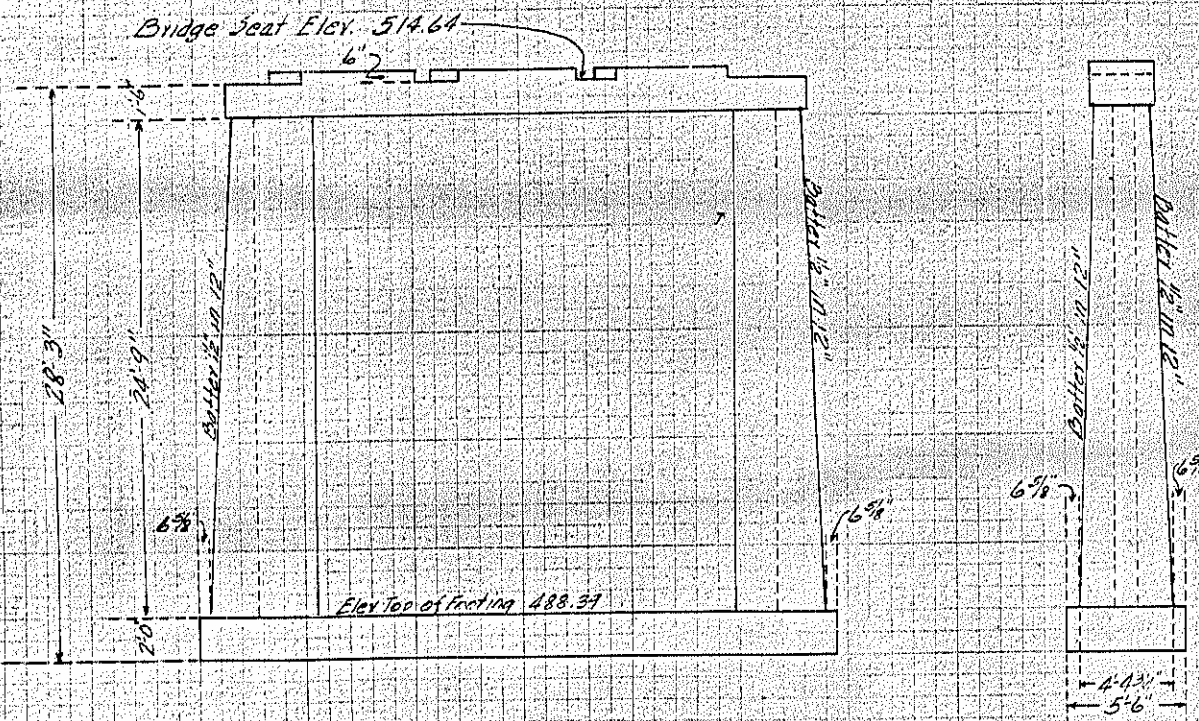


# BRIDGE AT STA. 309+81.25 PIER NO 1

NOTE - Pier No 1 built according to plans except footing raised and increased in thickness.

As PER PLANS  
See Sheet # 10

As CONSTRUCTED  
See Book # 1, Page # 7



## EXTRA CONCRETE IN PIER NO 1

See Book # 1, Page # 7

FOOTING

$$\frac{29.5 \times 5.5 \times 0.33}{27} = 1.98 \text{ CU Yds}$$

EXTRA CONCRETE IN PIER NO 1 1.98 CU Yds.

## DEDUCTIONS

PIER

$$\left[ \frac{1}{27} H \right] (B + b + 4M)$$

$$H = 1.04$$

$$B = 2 \left[ (2'-0\frac{1}{4}" \times 4'-4\frac{1}{4}") + (0'-7\frac{3}{4}" \times 2'-8\frac{3}{8}") + \left( \frac{3.1416 \times 2'-2\frac{3}{8}"^2}{2} \right) + (10 \times 18'-8") \right] = 55.0943$$

$$b = 2 \left[ (2'-0\frac{1}{4}" \times 4'-3\frac{3}{4}") + (0'-7\frac{3}{4}" \times 2'-7\frac{3}{8}") + \left( \frac{3.1416 \times 2'-1\frac{7}{8}"^2}{2} \right) + (10 \times 18'-8") \right] = 54.1341$$

$$M = 2 \left[ (2'-0\frac{1}{4}" \times 4'-4\frac{1}{4}") + (0'-7\frac{3}{4}" \times 2'-8\frac{3}{8}") + \left( \frac{3.1416 \times 2'-2\frac{3}{8}"^2}{2} \right) + (10 \times 18'-8") \right] = 54.6131$$

$$\left[ \frac{1}{27} \times 1.04 \right] (55.0943 + 54.1341) + (4 \times 54.6131) = 2.10 \text{ CU Yds}$$

DEDUCTIONS PIER NO 1 2.10 CU Yds.

EXTRA CONCRETE + 1.98 CU Yds.

DEDUCTIONS - 2.10 " "

TOTAL DEDUCTIONS CONCRETE PIER NO 1 - 0.12 " "

CONCRETE AS SHOWN ON PLANS (See Sheet No 10) 57.60 " "

TOTAL CONCRETE ALLOWED 57.48 CU Yds.  
See Sheet # 8





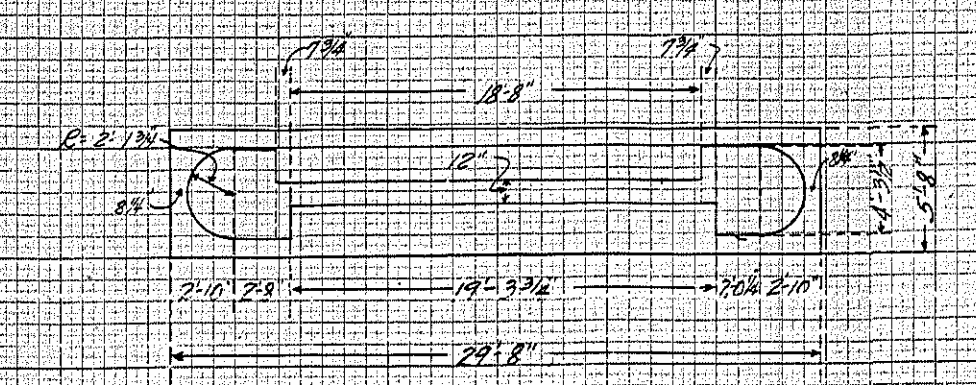
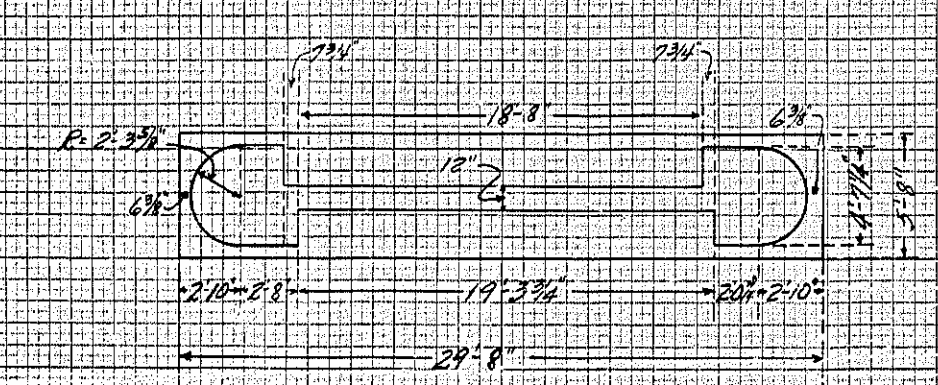
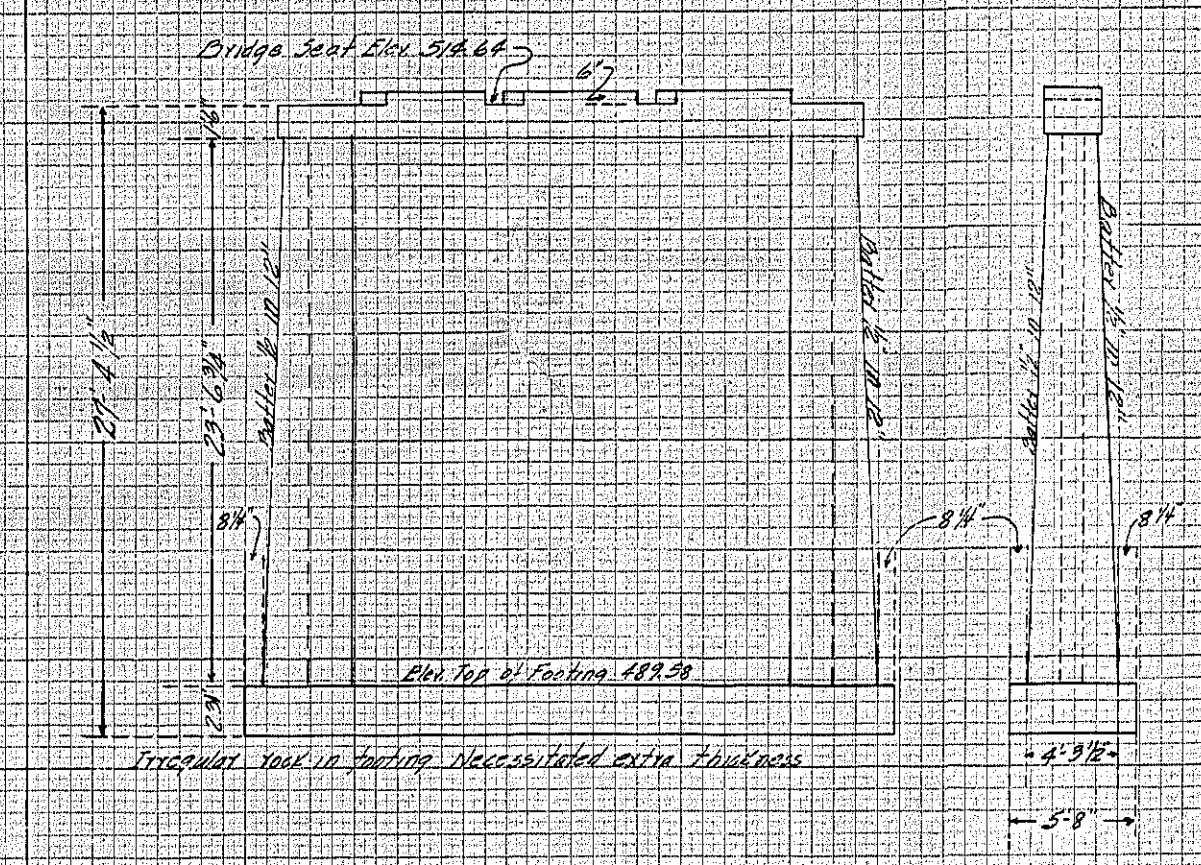
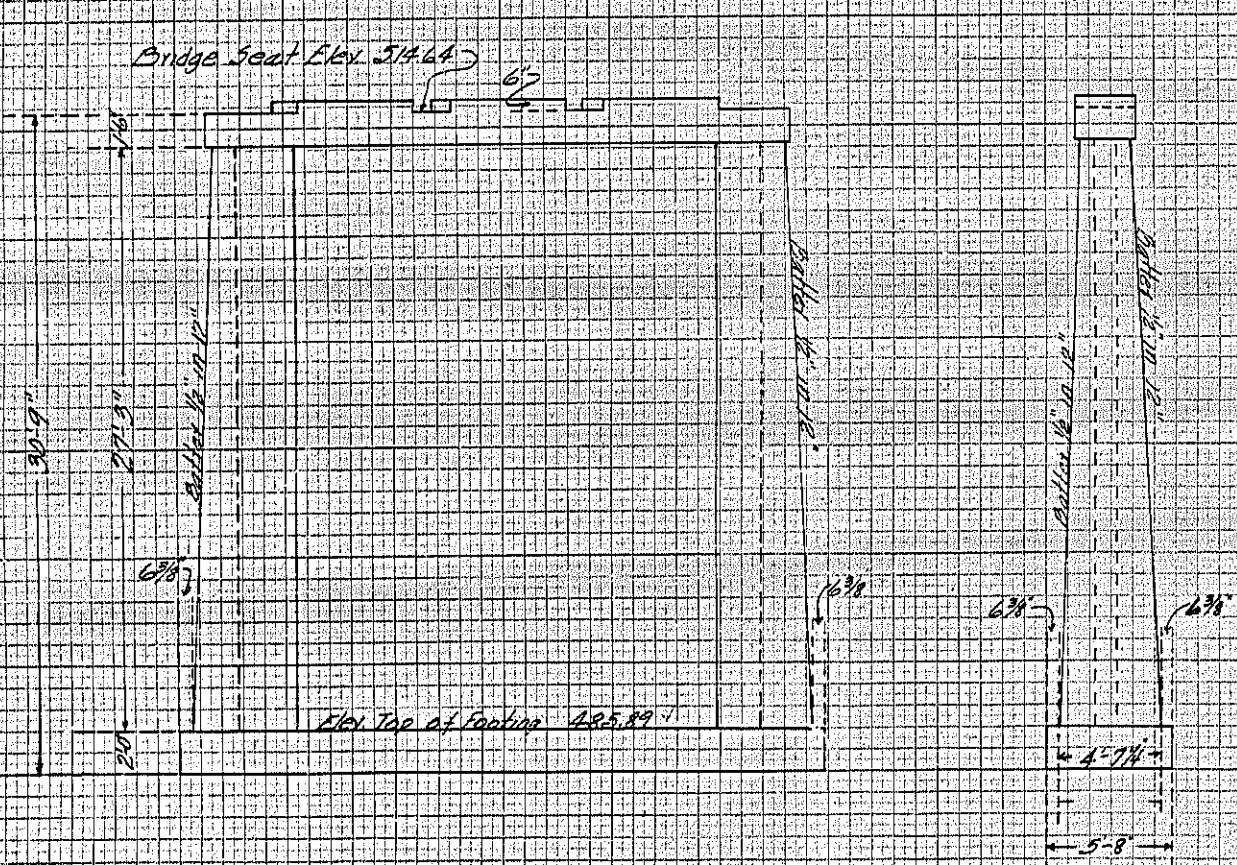
# BRIDGE AT STA. 309+81.25

## PIER NO. 2

NOTE - Pier No. 2 built according to plans except footing raised and increased in thickness.

As PER PLANS  
See Sheet # 12

As CONSTRUCTED  
See Sheet # 1, Page # 9



EXTRA CONCRETE IN PIER NO. 2  
See Sheet # 1, Page # 9

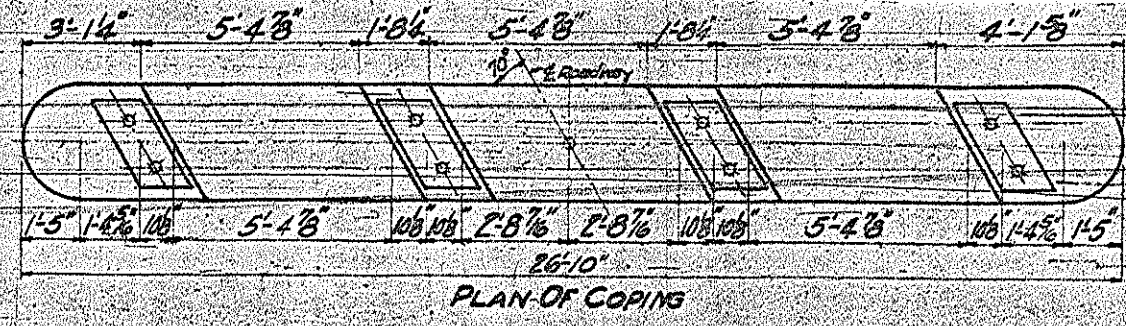
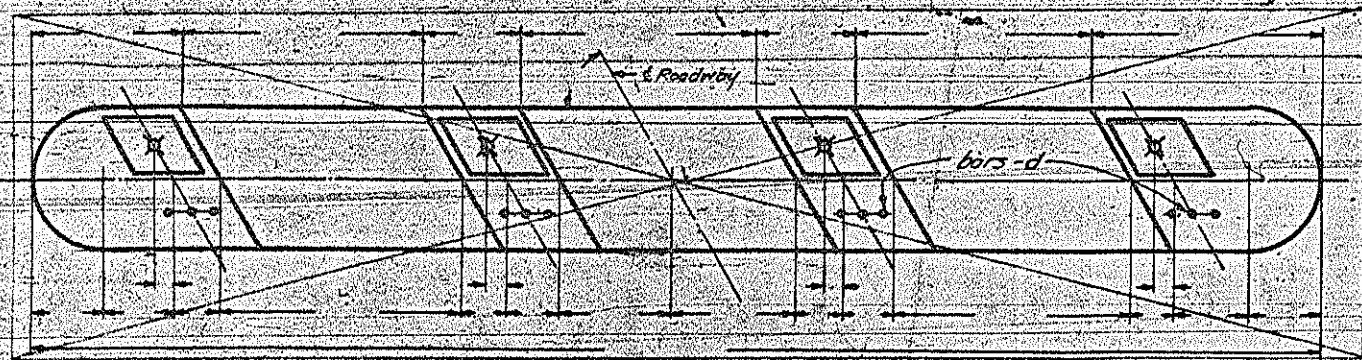
FOOTING  
 $\frac{27'-9'' \times 5'-8'' \times 0.31}{27} = 1.93 \text{ Cu. Yds.}$

EXTRA CONCRETE IN PIER NO. 2 1.93 Cu. Yds.

DEDUCTIONS

PIER  
 $\left(\frac{16H}{27}\right) (B+b+4M)$   
 $H = 3.69$   
 $B = 2 \left[ \frac{2'-0 1/4'' \times 4'-7 1/4''}{2} + (0'-7 3/4'' \times 2'-9 7/8'') + \frac{(3'-14 1/2'' \times 2'-3 3/8'')^2}{2} \right] + (10' \times 18'-8'') = 57.5439$   
 $b = 2 \left[ \frac{2'-0 1/4'' \times 4'-3 1/2''}{2} + (0'-7 3/4'' \times 2'-7 3/4'') + \frac{(3'-14 1/2'' \times 2'-1 3/8'')^2}{2} \right] + (10' \times 18'-8'') = 53.8949$   
 $M = 2 \left[ \frac{2'-0 1/4'' \times 5'-7 7/8''}{2} + (0'-7 3/4'' \times 2'-8 1/2'') + \frac{(3'-14 1/2'' \times 2'-2 1/2'')^2}{2} \right] + (10' \times 18'-8'') = 55.7007$   
 $\left[ \frac{16 \times 3.69}{27} \right] (57.5439 + 53.8949) + (4 \times 55.7007) = 7.61 \text{ Cu. Yds.}$

|   |                 |
|---|-----------------|
| DEDUCTIONS PIER NO. 2 =                     | 7.61 Cu. Yds.   |
| EXTRA CONCRETE                              | + 1.93 Cu. Yds. |
| DEDUCTIONS                                  | - 7.61 " "      |
| TOTAL DEDUCTIONS CONCRETE PIER NO. 2        | - 5.68 " "      |
| CONCRETE AS SHOWN ON PLANS (see sheet # 12) | 63.20 " "       |
| TOTAL CONCRETE ALLOWED                      | 57.52 Cu. Yds.  |

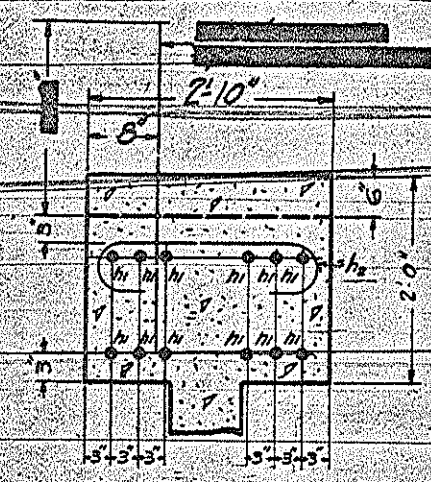
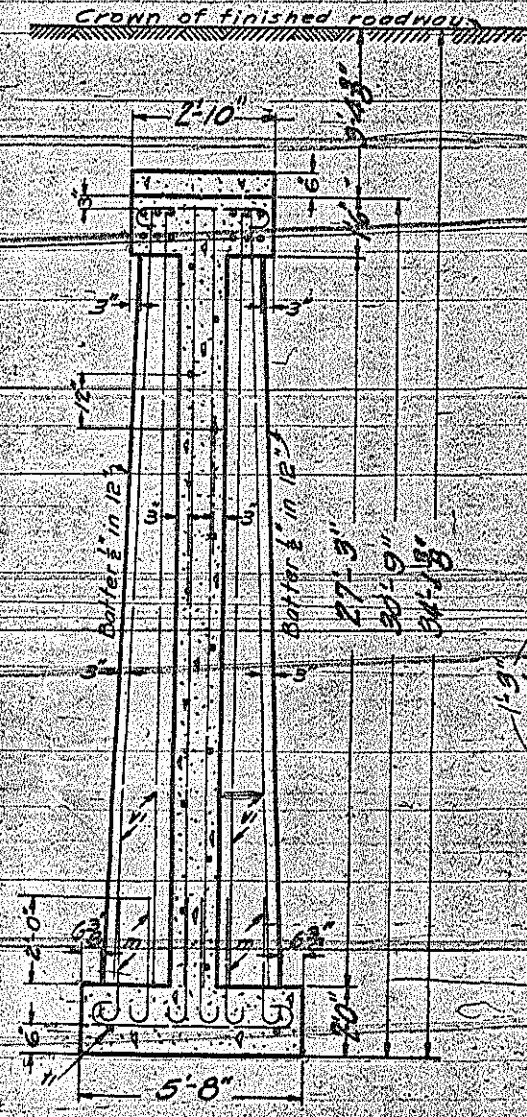
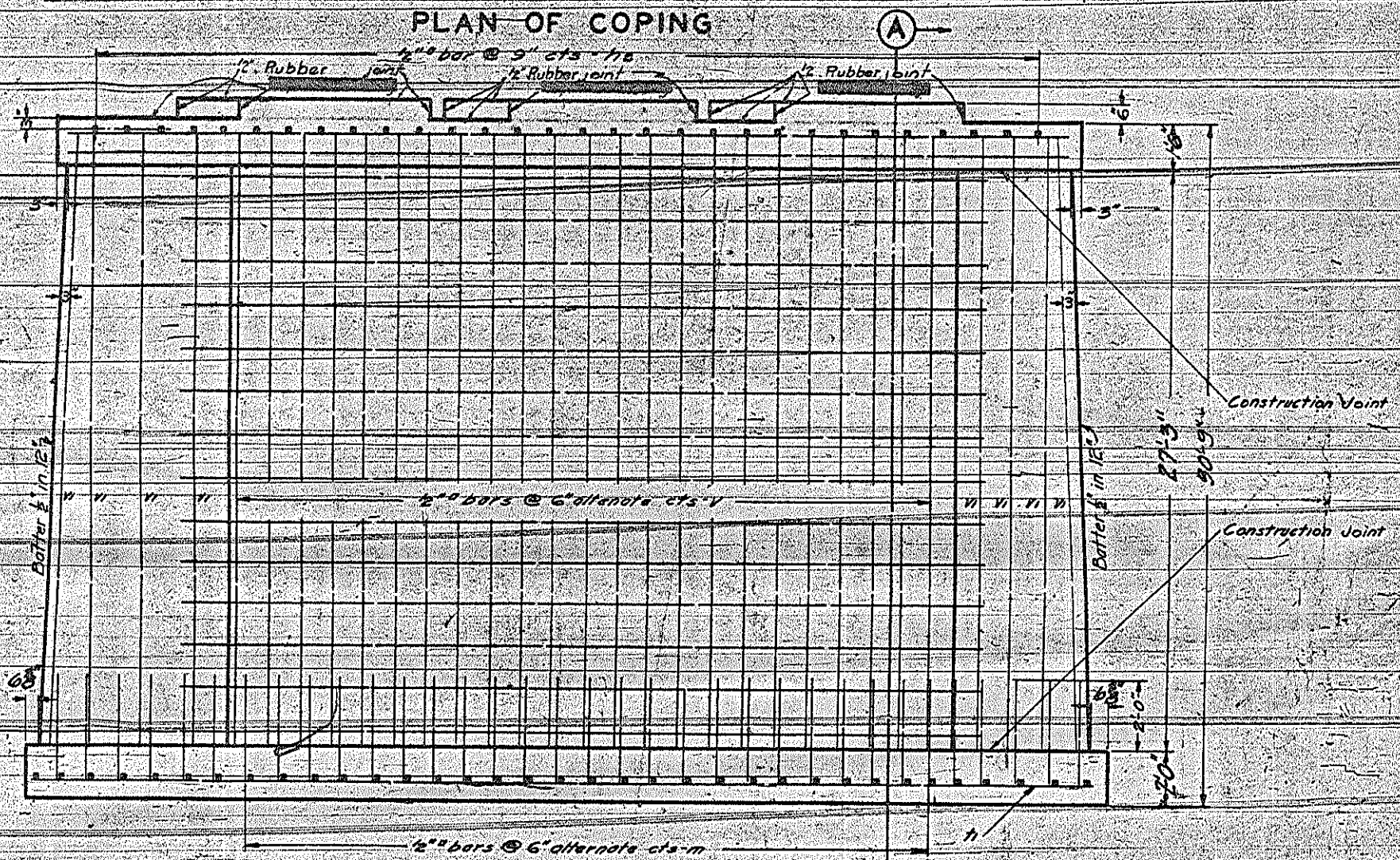


**DESIGN DATA:**  
 Specifications A.A.S.H.O.  
 Assumed Live Load H.15  
 Steel in Tension 16000 lbs. per sq. in.  
 Concrete in compression 900 lbs. per sq. in.  
 Shear Class A Concrete 60 lbs. per sq. in.

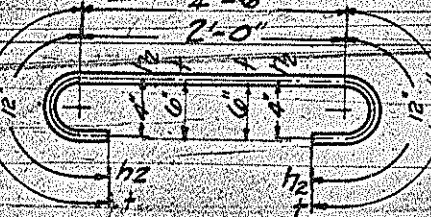
**GENERAL NOTE:**  
 Class A concrete to be used throughout. Maximum size of coarse aggregate to be 1 1/2". All reinforcing steel shall be deformed bars. All dimensions relative to reinforcement are to centers of bars. No splice of bars other than those shown on plans will be permitted. All reinforcing steel shall be securely held in correct position. All exposed corners to be chamfered 1". All materials and workmanship, as per the specifications of the N. C. State Highway and Public Works Commission. The following extra bars are provided for holding the reinforcing steel in correct position:

PLAN OF COPING

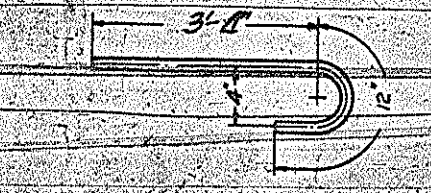
PLAN OF COPING



DETAIL OF COPING



DETAIL OF BAR-h2-t

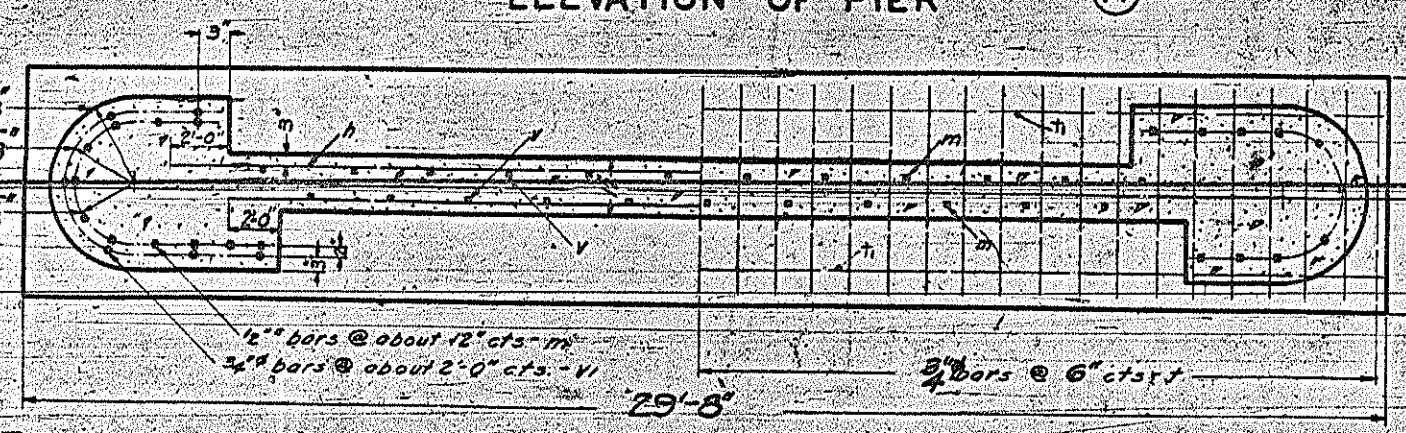


DETAIL OF BAR-m

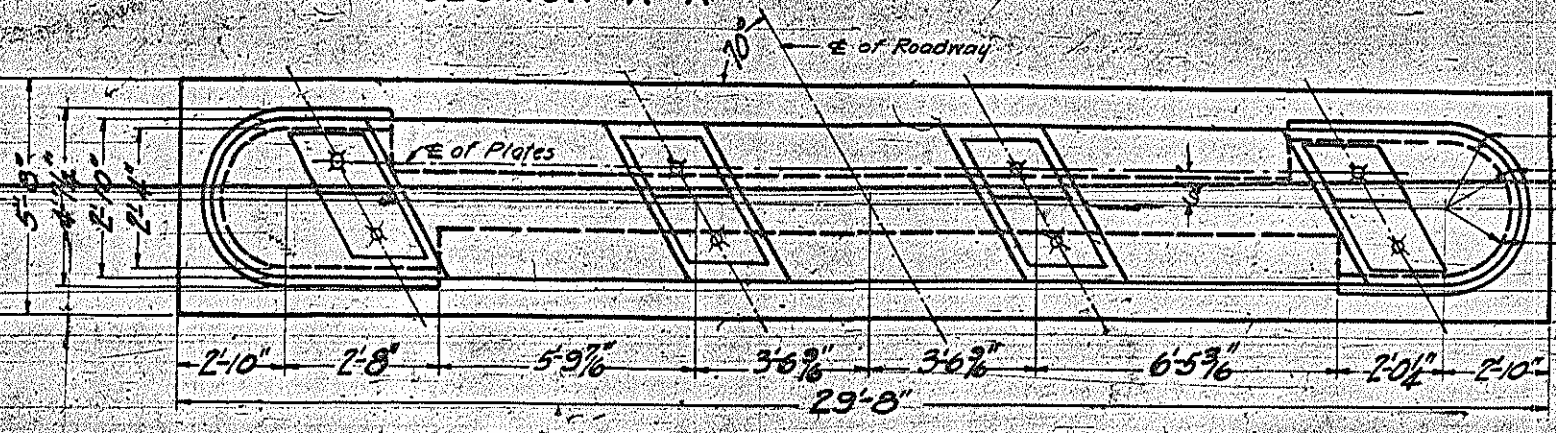
ELEVATION OF PIER

SECTION A-A

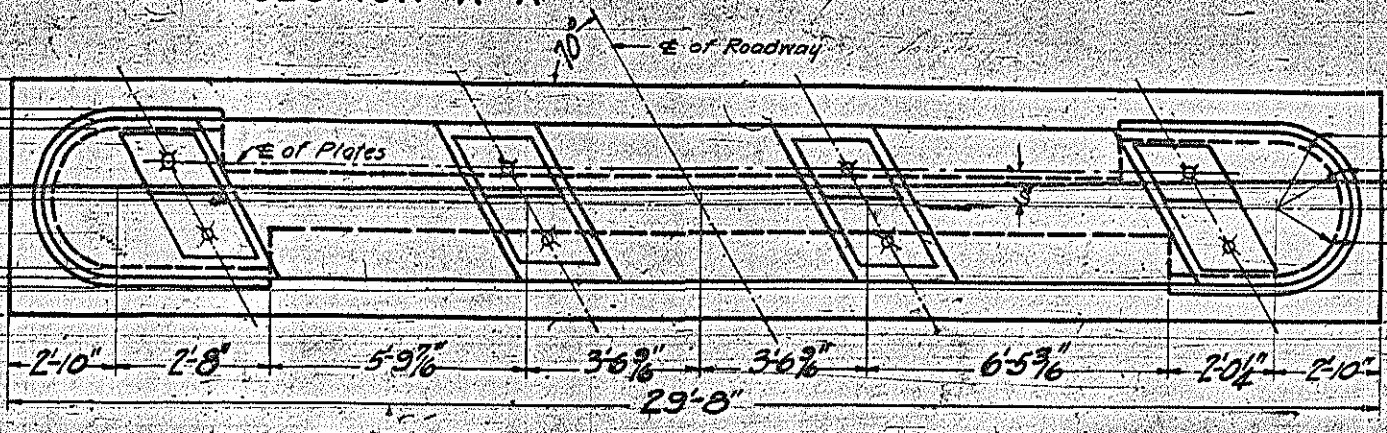
| BILL OF MATERIAL<br>PIER No. 2          |     |      |        |        |
|---|-----|------|--------|--------|
| Bars                                    | No. | Size | Length | Weight |
| h                                       | 77  | 1/2" | 29'-3" | 534    |
| h1                                      | 12  | 7/8" | 24'-6" | 60     |
| h2                                      | 39  | 1/2" | 4'-0"  | 112    |
| v                                       | 39  | 1/2" | 28'-6" | 969    |
| v1                                      | 12  | 3/4" | 28'-6" | 514    |
| m                                       | 61  | 1/2" | 4'-0"  | 273    |
| t                                       | 59  | 3/4" | 7'-0"  | 620    |
| ti                                      | 2   | 1/2" | 29'-3" | 50     |
| d                                       | 12  | 1"   | -      | -      |
| Reinforcing Steel, lbs                  |     |      |        | 3600   |
| Conc. Class A Cu. Yds.                  |     |      |        | 63.2   |
| Plates and bolts, lbs.                  |     |      |        | 215    |
| Conc. per ft depth of footing, Cu. Yds. |     |      |        | 6.29   |
| Piles, No.                              |     |      |        | -      |



PLAN OF PIER SHOWING POST & WEB REINFORCEMENT



PLAN OF PIER SHOWING FOOTING REINFORCEMENT



PLAN OF PIER SHOWING OUTLINES

Notes: Footings are to be carried down at least 6" into rock with a minimum depth of footing as shown on plans.

PROJECT No. 7541  
 STOKES COUNTY  
 STATION 309+02.5  
 PIER No. 2

STATE OF NORTH CAROLINA  
 STATE HIGHWAY & PUBLIC WORKS COMM.  
 STANDARD  
 R. C. PIER DETAILS  
 FOR  
 R. C. DECK GIRDERS  
 20° L.H. SKEW  
 MARCH 1933

|              |      |
|--------------|------|
| ASSEMBLED BY | DATE |
| CHECKED BY   | DATE |
| DESIGNED BY  | DATE |
| TRACED BY    | DATE |
| CHECKED BY   | DATE |

Revised Bituminous Fall changed to Rubber  
 Jan. 11, 1936 (course aggregate changed to 1 1/2") by J.W.H. & M.J.

Rev. 51536 for d'bars by R.R.H. 1/15



# BRIDGE AT STA. 309+81.25

## PIER NO 3

NOTE - Pier No 3 built according to plans  
except footing raised and increased in thickness

### EXTRA CONCRETE IN PIER NO 3

See Book #1, Page #11

FOOTING

$$29'4" \times 5'4" \times 0.5 = 290 \text{ Cu Yds}$$

EXTRA CONCRETE IN PIER NO 3 290 Cu Yds.

### DEDUCTIONS

PIER

$$H = 0.79 \frac{(16.4)(D + b + 4M)}{27}$$

$$D = 2 \left[ \frac{(2'0\frac{1}{4}" \times 4'3\frac{3}{4}") + (0'7\frac{3}{4}" \times 2'7\frac{1}{2}") + (3.1416 \times 2'17\frac{1}{2}^2)}{2} \right] + (10 \times 18'8") = 54.1341$$

$$b = 2 \left[ \frac{(2'0\frac{1}{4}" \times 4'3") + (0'7\frac{3}{4}" \times 2'7\frac{1}{2}") + (3.1416 \times 2'17\frac{1}{2}^2)}{2} \right] + (10 \times 18'8") = 53.4201$$

$$M = 2 \left[ \frac{(2'0\frac{1}{4}" \times 4'3\frac{3}{4}") + (0'7\frac{3}{4}" \times 2'7\frac{1}{2}") + (3.1416 \times 2'17\frac{1}{2}^2)}{2} \right] + (10 \times 18'8") = 53.7761$$

$$\left[ \frac{(16 \times 0.79)}{27} (54.1341 + 53.4201) + (4 \times 53.7761) \right] = 1.58 \text{ Cu Yds}$$

DEDUCTIONS PIER NO 3 = 1.58 Cu Yds.

EXTRA CONCRETE + 290 Cu Yds.

DEDUCTIONS - 1.58 " "

TOTAL EXTRA CONCRETE PIER NO 3 + 132 " "

CONCRETE AS SHOWN ON PLANS (See Sheet #12) 55.40 " "

TOTAL CONCRETE ALLOWED 56.72 Cu Yds.  
See Sheet #12

AS PER PLANS  
See Sheet #12

AS CONSTRUCTED  
See Book #1, Page #11

