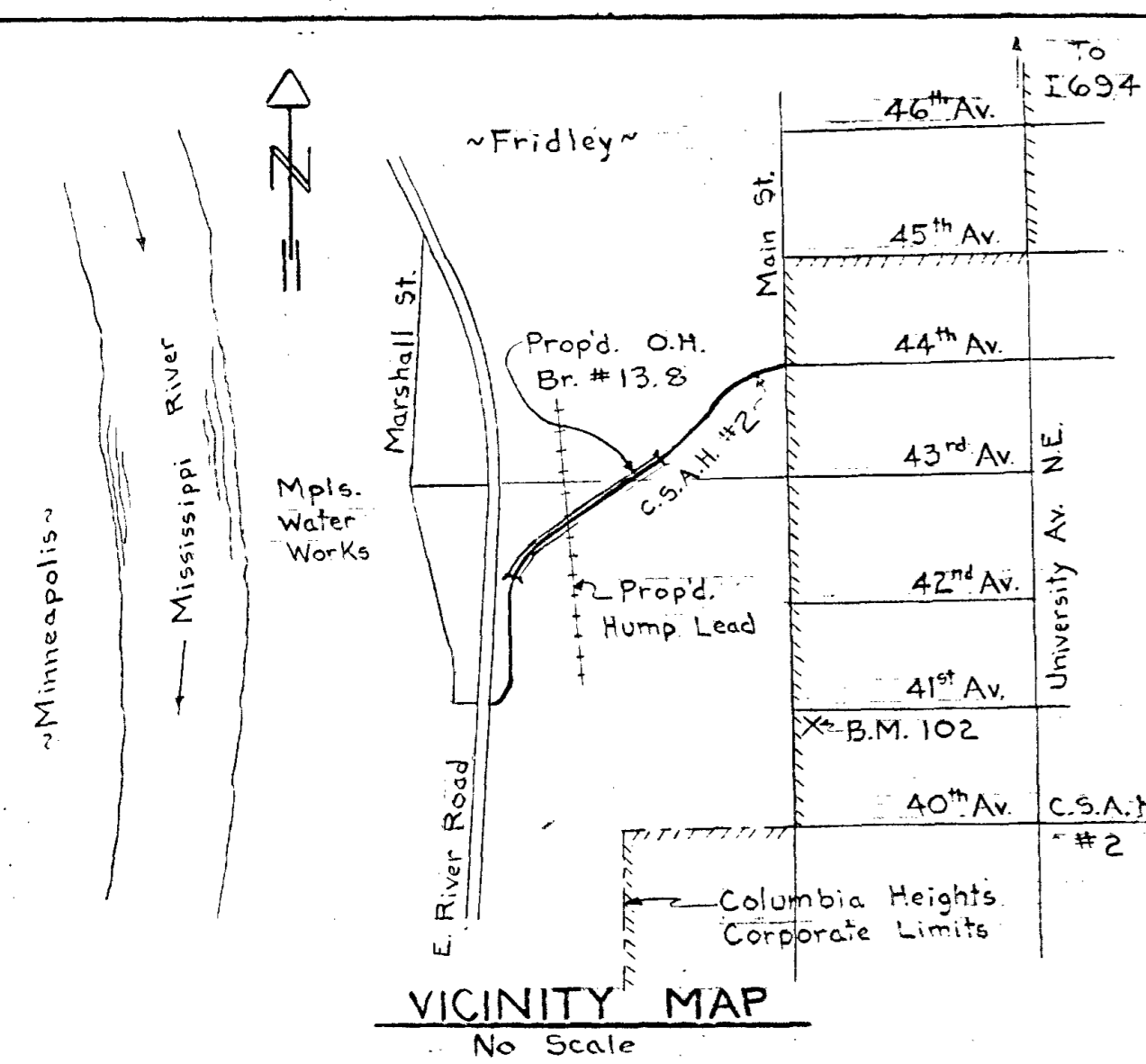


| LEGEND | |
|----------------------|---------------|
| Railroad Track/age | —+—+—+— |
| Overhead Utilities | — · — · — · — |
| Underground Conduits | — / — / — / — |
| Pipelines | — F — F — |
| Oil | — G — G — |
| Gas | — S — S — |
| Sewer | — W — W — |
| Water | — |
| Manholes | ⊙ |
| Soil Borings | ⊙ |



| SUMMARY OF QUANTITIES | | | |
|--------------------------------|----------|----------|--|
| DESCRIPTION | UNITS | QUANTITY | |
| Structure Excavation | cu. yd. | 1483 | |
| Treated Timber Test Piles | each | 9 | |
| Treated Timber Piles-Delivered | lin. ft. | 35,845 | |
| Treated Timber Piles-Driven | lin. ft. | 35,158 | |
| Concrete Mix No. 1A43 | cu. yd. | 921 | |
| Concrete Mix No. 3Y43 | cu. yd. | 880 | |
| Reinforcement Bars | lbs. | 241,000 | |
| Stain Resistant Coating | lump sum | | |
| Waterproofing & Dampproofing | lump sum | | |
| Backfill at Abutments | cu. yd. | 1050 | |

| INDEX OF DRAWINGS | |
|-------------------------|------------|
| Substructure Plan | 289-6553-1 |
| Bridge Layout | 2 |
| Soil Borings | 3 |
| Abutment 1 | 4 |
| Abutment 9 | 5 |
| Pier 2 | 6 |
| Pier 3 | 7 |
| Pier 4 | 8 |
| Pier 5 | 9 |
| Pier 6 | 10 |
| Pier 7 | 11 |
| Pier 8 | 12 |
| Reinforcing Bar Details | 13 |

DESIGN DATA
 1969 AASHO, Design Specifications with 1970 & 1971 Interim Specifications, H520 loading
 Maximum allowable design stresses:
 $f_c = 1600$ psi $n = 8$
 $f_s = 24,000$ psi reinforcement

CONSTRUCTION NOTES
 Stations & elevations are based on B.N., Inc. survey drawings NT-531T1 & NT-531T2 dated 20 July, 1971 & 19 July, 1971. B.M. No. 102 - Top of N.W. head bolt top fire hydrant @ S.E. corner 41st Av. & Main St. U.S.C. # G.S. EL. 913.57.
 The Standard Specifications for Highway Construction dated Jan. 1, 1972 and supplemented by Special Provisions shall govern.
 The stationing shown on plans is highway stationing unless otherwise noted.
 Reinforcement bars other than spiral rod stock shall be deformed billet steel bars conforming to ASTM A615 Grade 60.
 Bridge seat reinforcement shall be carefully placed to avoid interference with drilling holes for anchor bolts.
 The first digit on the first two digits of each bar mark indicates the bar size.

ANOKA COUNTY BRIDGE NO. 02523

BURLINGTON NORTHERN INC.
 MINNESOTA DIVISION
 NORTH TOWN TO STAPLES
BRIDGE NO. 13.8
 C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTH TOWN

SUBSTRUCTURE PLAN

RECOMMENDED: *[Signature]*
 Director Bridge Engineering

APPROVED: *[Signature]*
 Ass't. Vice President Engineering

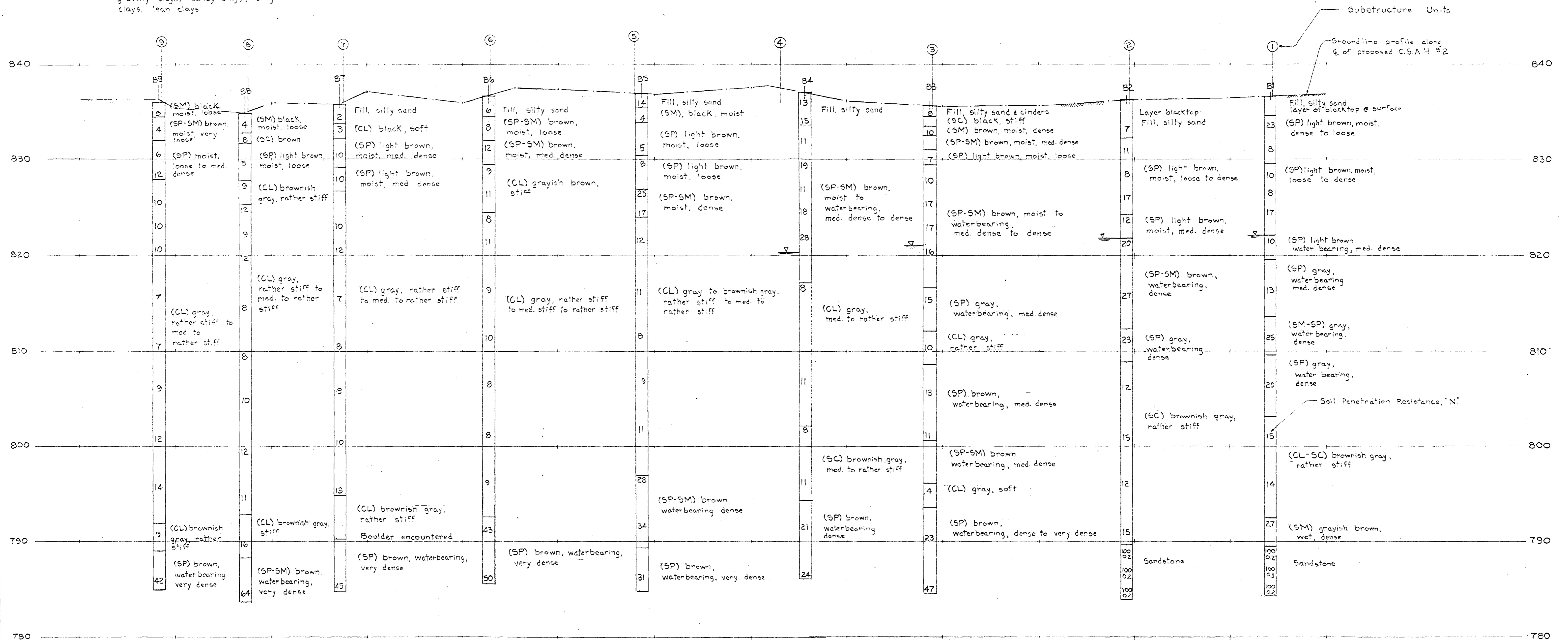
OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

| REVISIONS | DES. KEB | DR. JJM | CH. KEB |
|-----------|----------|---------|---------|
| | | | |

AUTHORITY: AFE 72-746
 DATE: June 1972
 PLAN: Sheet 6 of 18

289-6553-1

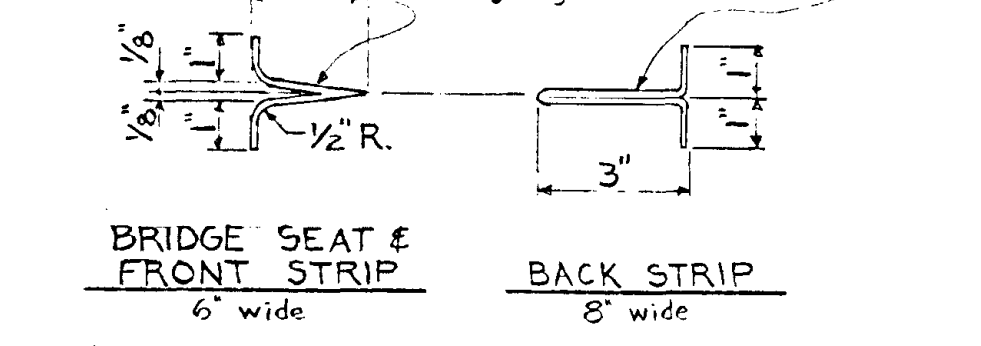
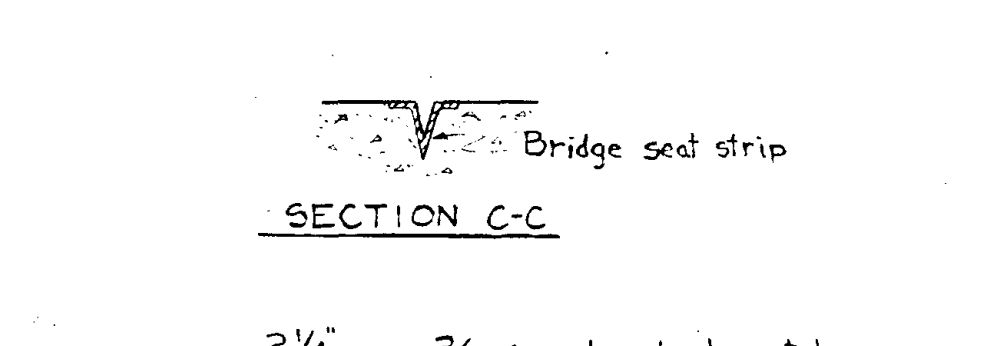
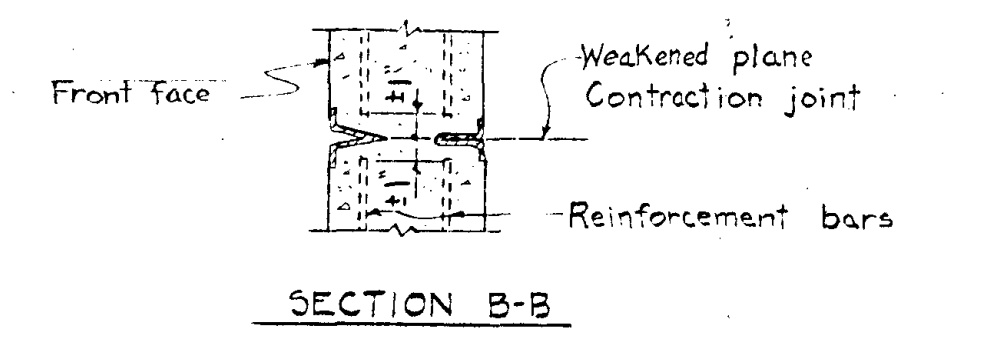
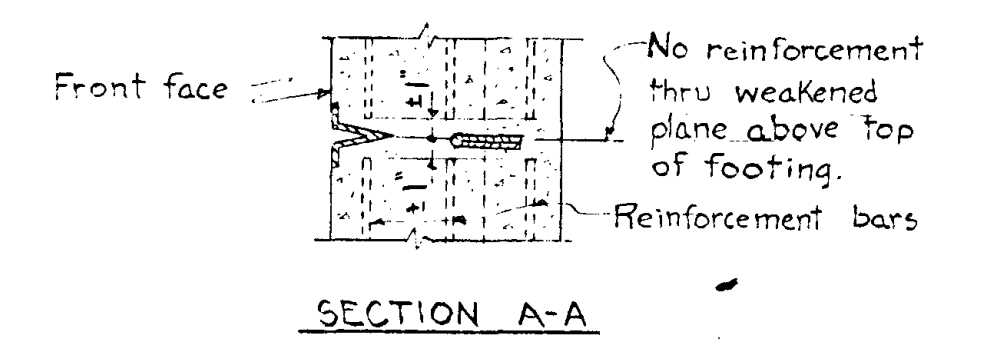
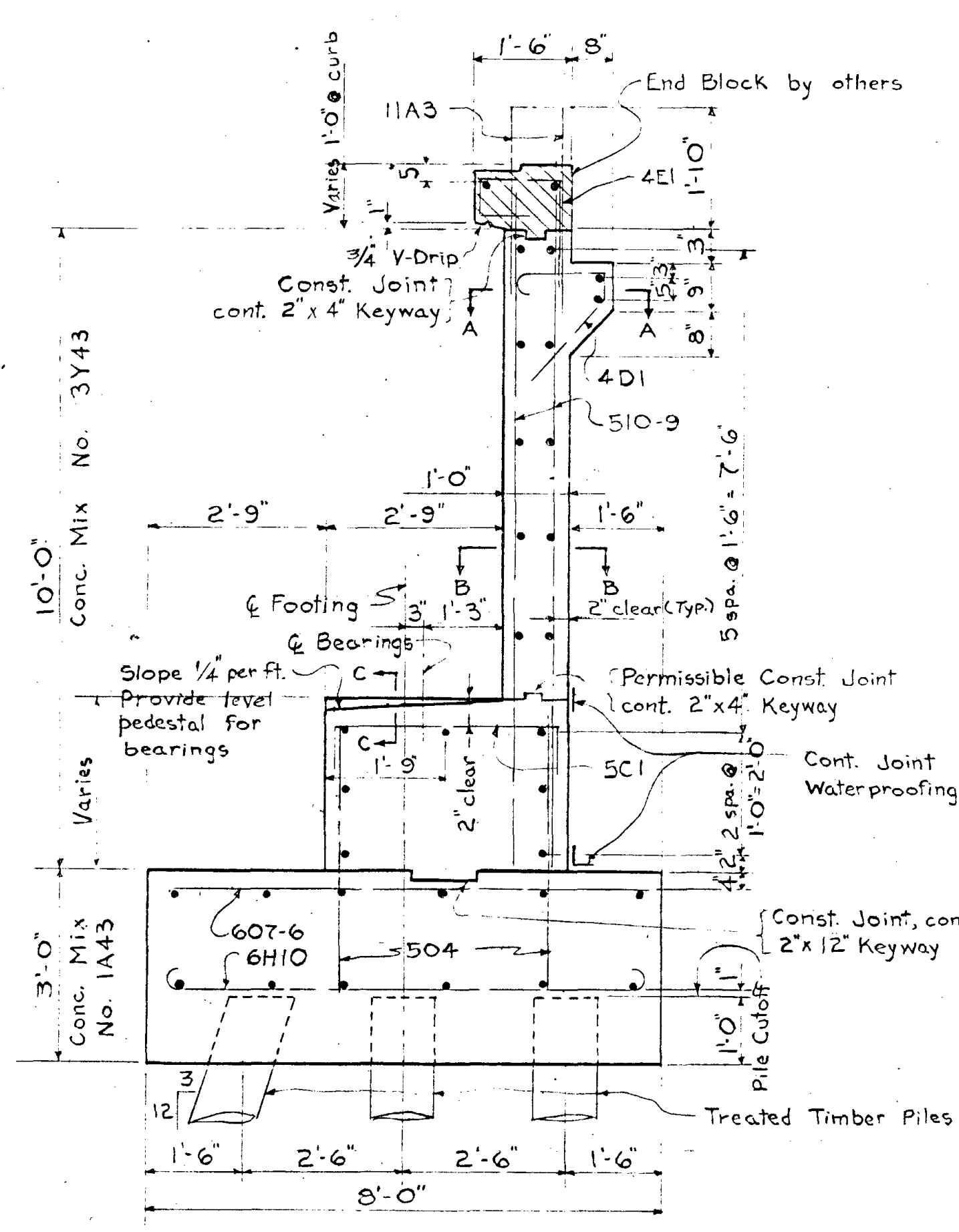
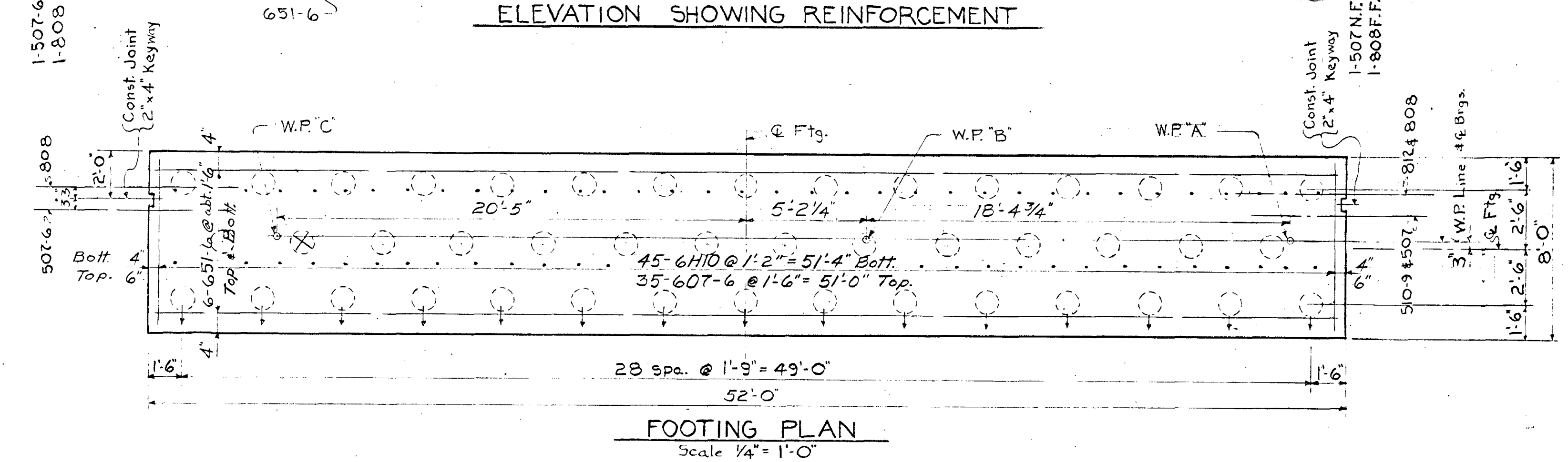
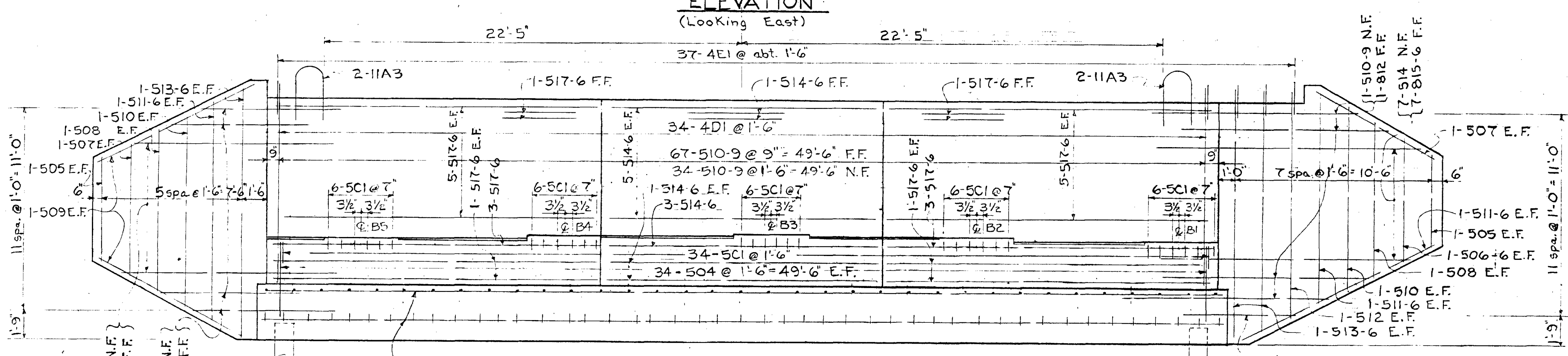
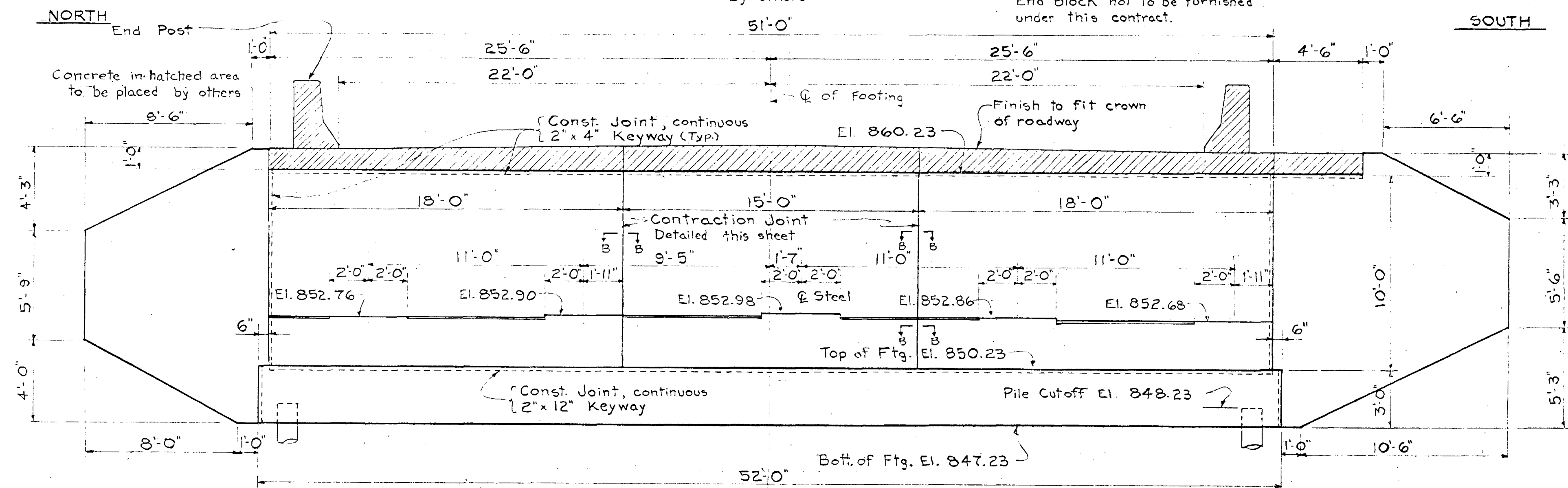
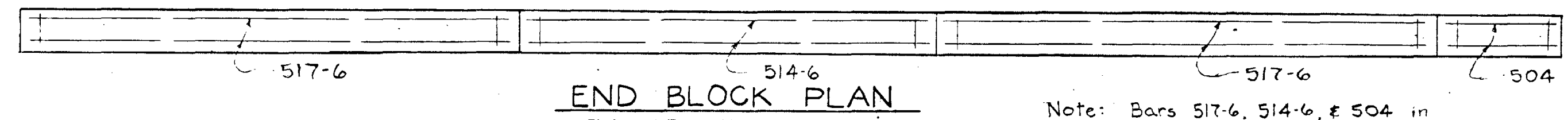
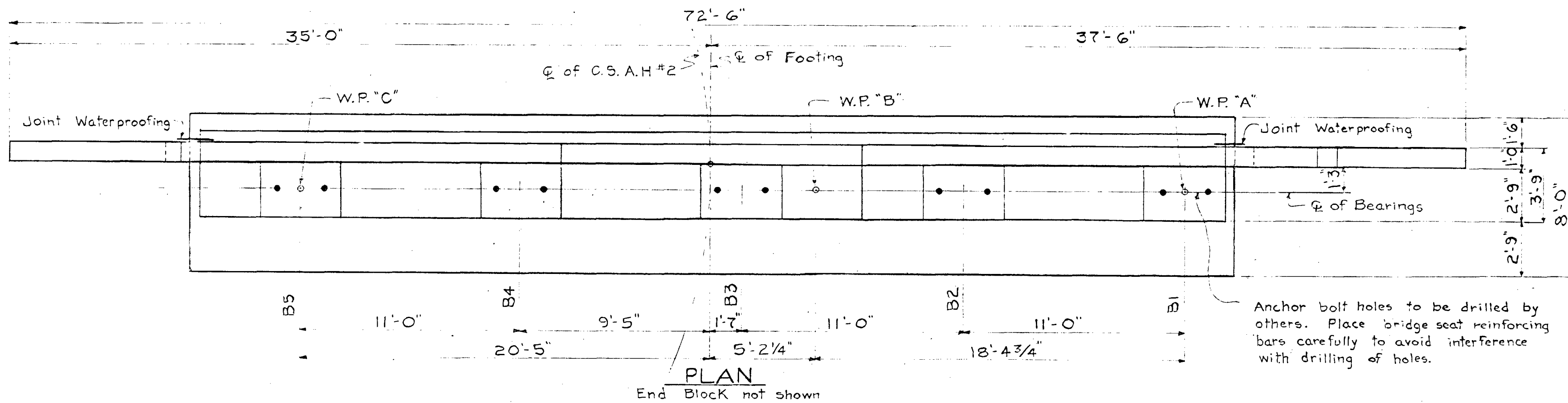
Abbreviations from Unified Soil Classification System:
 SW - Well graded sands & gravelly sands, little or no fines
 SP - Poorly graded sands & gravelly sands, little or no fines
 SM - Silty sands, sand-silt mixtures
 SC - Clayey sands, sand-clay mixtures
 ML - Inorganic silts, very fine sands, rock flour, silty or clayey fine sands
 CL - Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays



NOTES:

The soil borings shown were taken by Soil Exploration Co. of St. Paul, Minn. between July 26 to Aug. 3, 1971.
 Borings shown were taken with a 140 lb. hammer with a drop of 30" & a 2" O.D. split barrel sampler. Rock core samples were obtained by rotary core drilling.
 The numbers tabulated in the borings are "N" values, the number of blows per ft. req'd. to advance the sampler, and are a measure of the penetration resistance of the soil.

| | | |
|-------------------------------------------------------------------|---------------------------------------------------------------------|---------|
| BURLINGTON NORTHERN INC. | | |
| MINNESOTA DIVISION | | |
| NORTHTOWN TO STAPLES | | |
| BRIDGE NO. 13.8 | | |
| C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN | | |
| SOIL BORINGS | | |
| RECOMMENDED: <i>[Signature]</i> Director Bridge Engineering | APPROVED: <i>[Signature]</i> Asst. Vice President Engineering | |
| OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN. | | |
| REVISIONS | DES. JJM | DR. JJM |
| | CH. KEB | |
| | AUTHORITY: AFE 72-746 | |
| | DATE: June 1972 | |
| | PLAN: Sheet 8 of 18 | |
| | 289-6553-3 | |

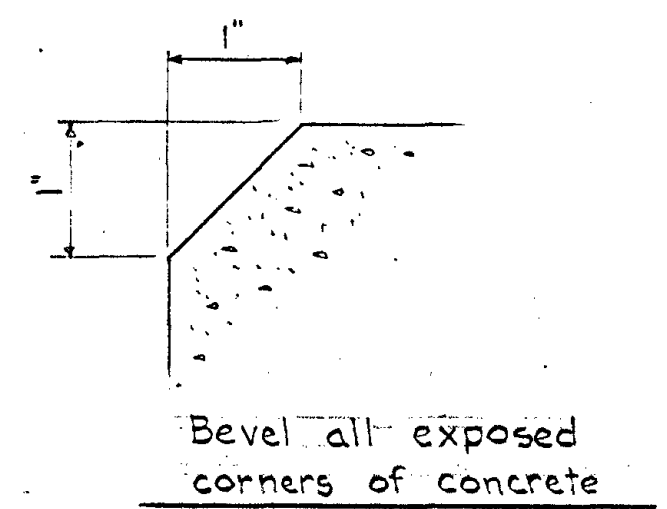


CONTRACTION JOINT DETAILS
No Scale

The methods & materials indicated under Contraction Joint Details shall be considered as suggested only. Variations will be permitted, subject to approval by the Engineer.

Front & bridge seat strips shall be removed with forms, except if a suitable plastic or other durable material satisfactory to the Engineer is used, the material may be left in place. Back strip to remain in place.

Strips to be removed shall be oiled or greased as necessary to permit removal without spalling the concrete.



General Notes

Pile spacing shown is at bottom of footing. Piles marked thus (C) to be battered 3' per ft. in direction shown.

Test pile marked thus (X).

1 Treated timber test pile 70' long.

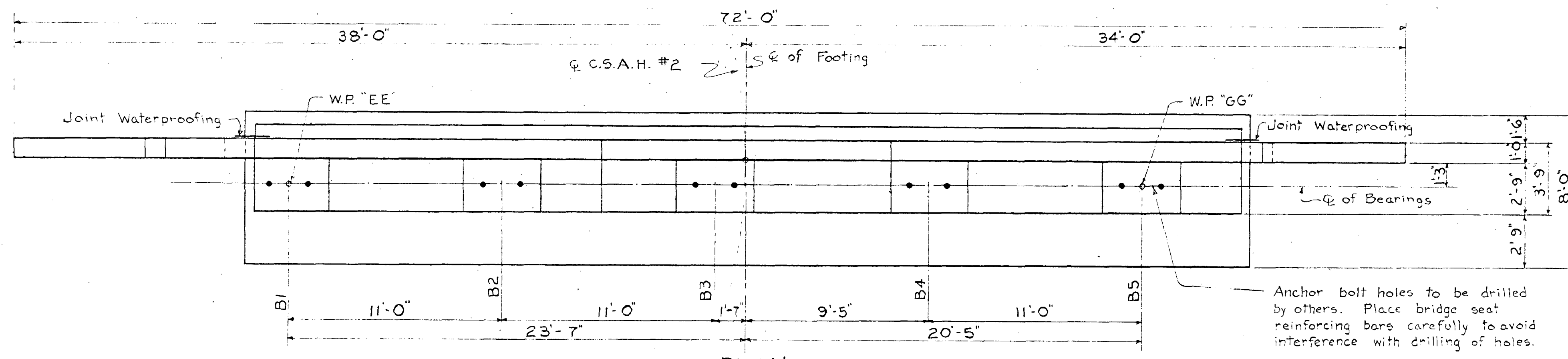
43 Treated timber piles, Est. length = 65' long.

44 Treated timber piles reqd. for Abutment 1.

E.F. denotes each face.
N.F. denotes near face.
F.F. denotes far face.

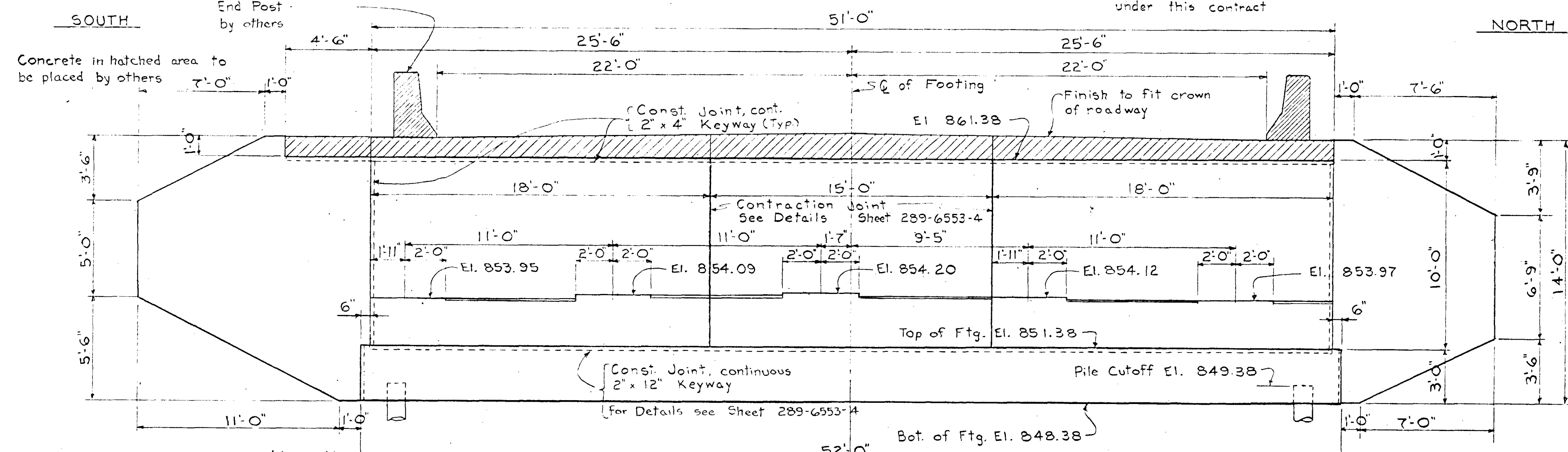
Vol. Conc. Mix No. 1A43 = 46.2 c.y.
Vol. Conc. Mix No. 3Y43 = 41.4 c.y.

| | | | |
|------------------------------------------------------------------|-----------------------------------------------------------------------|---------|---------|
| BURLINGTON NORTHERN INC. | | | |
| MINNESOTA DIVISION | | | |
| NORTHTOWN TO STAPLES | | | |
| BRIDGE NO. 13.8 | | | |
| C.S.A.H. NO. 2 OVER YARD TRACKS AT NORTHTOWN | | | |
| ABUTMENT NO. 1 | | | |
| RECOMMENDED: <i>H.E. Ekman</i> Director Bridge Engineering | APPROVED: <i>B.A. Anderson</i> Asst. Vice President Engineering | | |
| OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN. | | | |
| REVISIONS | DES. JUM | DR. JUM | CH. DRC |
| | AUTHORITY: AFE 72-746 | | |
| | DATE: June 1972 | | |
| | PLAN: Sheet 9 of 18 | | |
| 289-6553-4 | | | |

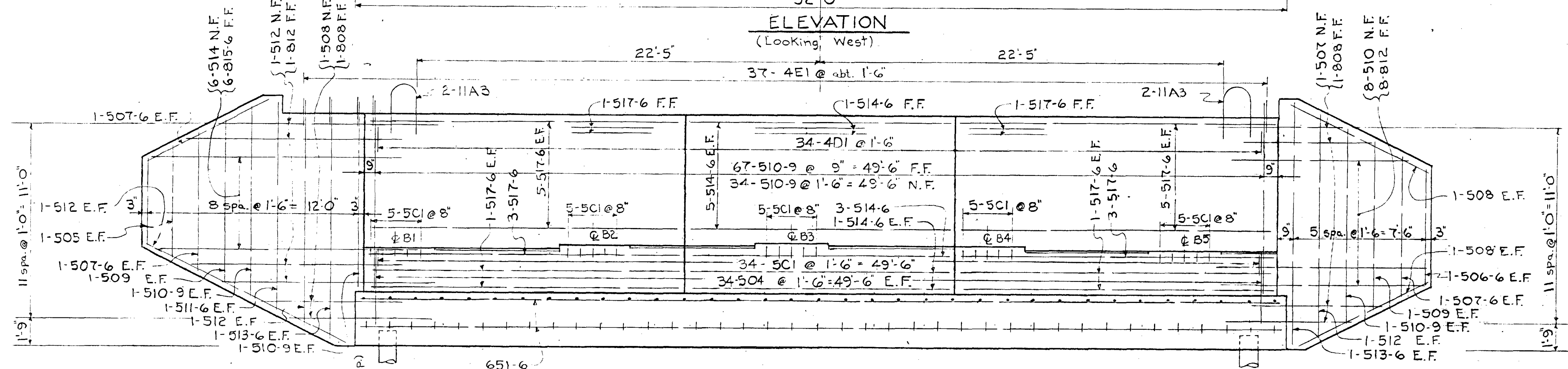


PLAN
End Block not shown
END BLOCK PLAN
By Others

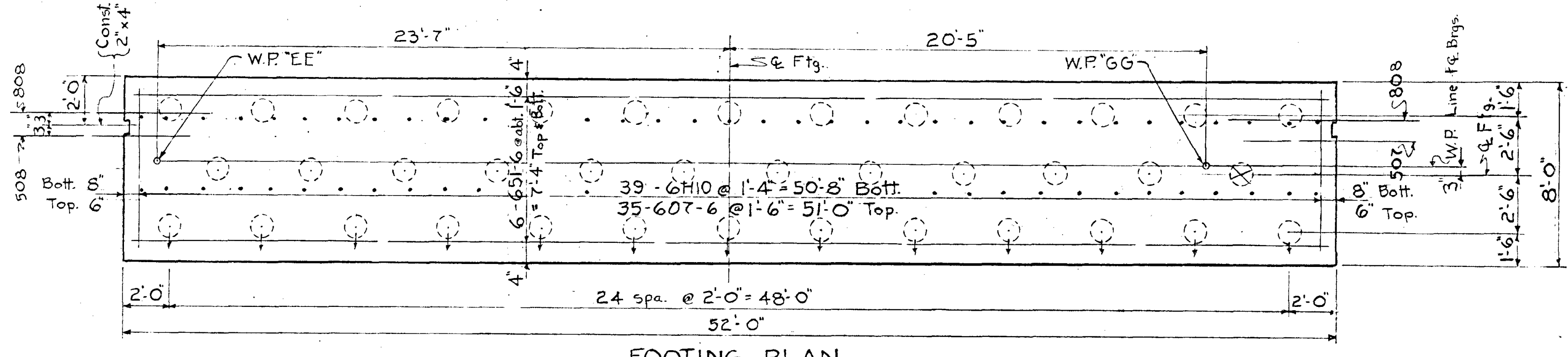
Note: Bars 517-6, 514-6, & 504 in End Block not to be furnished under this contract



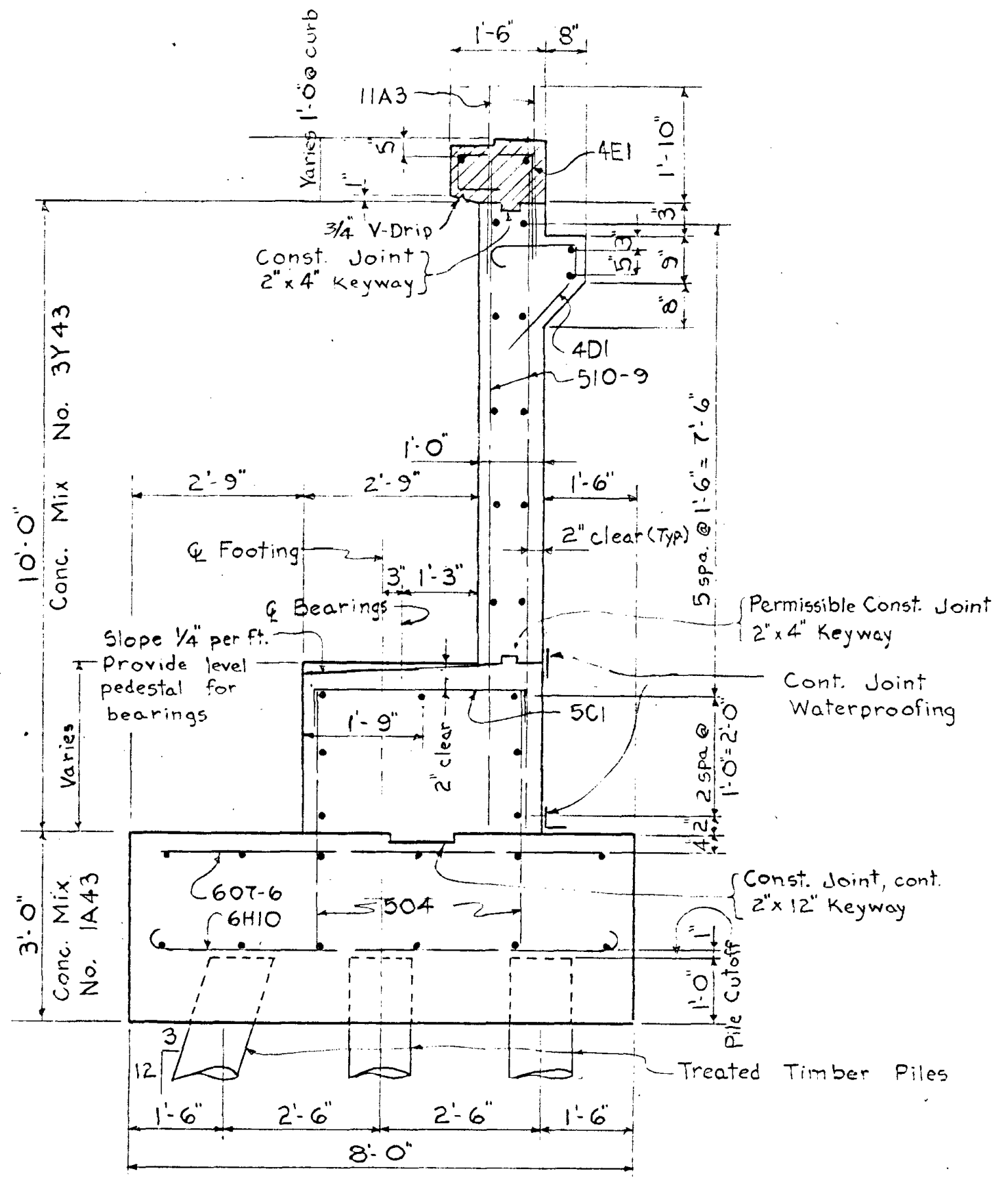
ELEVATION
(Looking West)



ELEVATION SHOWING REINFORCEMENT



FOOTING PLAN
Scale 1/4" = 1'-0"



SECTION THRU ABUTMENT 9
Scale 1/2" = 1'-0"

General Notes
 Pile spacing shown is at bottom of footing.
 Piles marked thus (⊕) to be battered 3" per ft. in the direction shown.
 Test pile marked thus (⊗).
 1 Treated timber test pile 70' long.
 37 Treated timber piles, Est. length = 65' long.
 38 Treated timber piles req'd. for Abutment 9.

Vol. Conc. Mix No. 1A43 = 46.2 c.y.
 Vol. Conc. Mix No. 3Y43 = 41.6 c.y.

BURLINGTON NORTHERN INC.
 MINNESOTA DIVISION
 NORTH TOWN TO STAPLES
BRIDGE NO. 138
 C.S.A.H. No. 2 OVER YARD TRACKS, AT NORTH TOWN
ABUTMENT NO. 9

RECOMMENDED: *(Signature)*
 Director Bridge Engineering

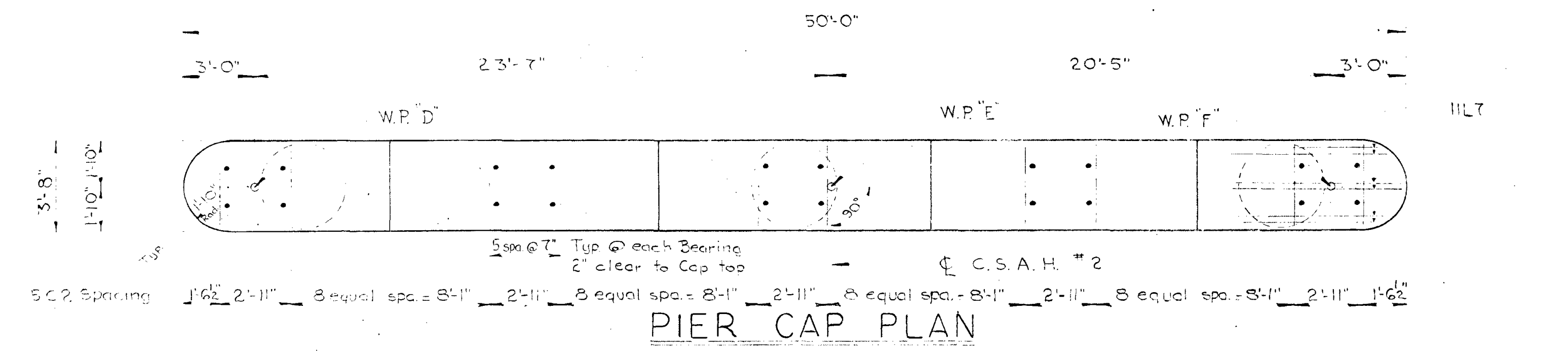
APPROVED: *(Signature)*
 Asst. Vice President Engineering

ST. PAUL, MINN.

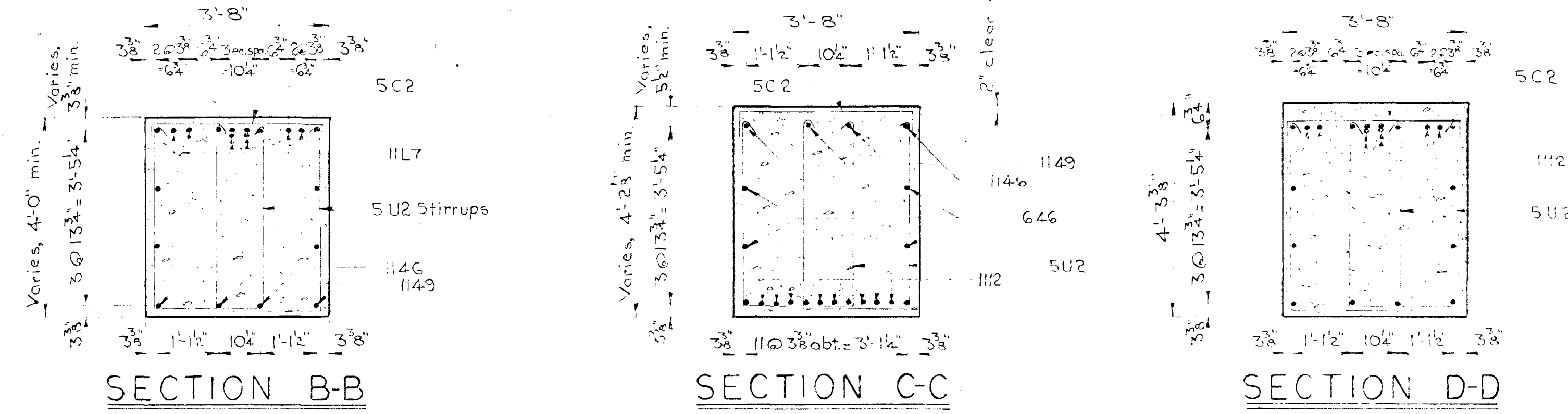
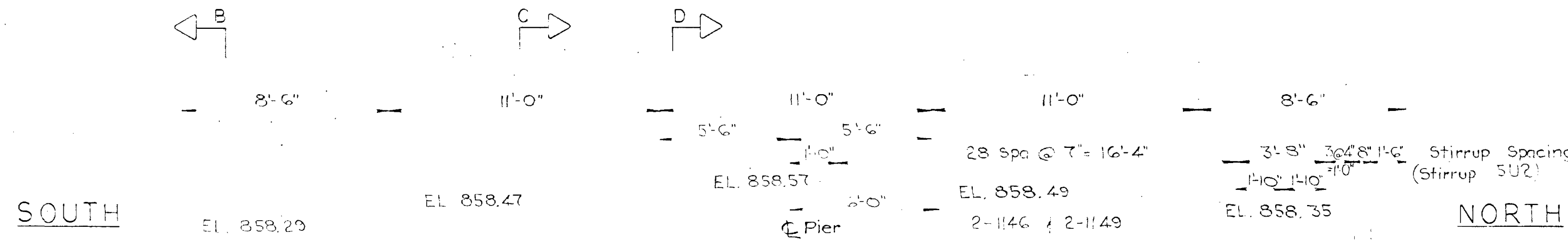
| REVISIONS | DES. JUM | DR. JUM | CH. DRC |
|-----------|----------|---------|---------|
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AUTHORITY: AFE 72-746
 DATE: June 1972
 PLAN: Sheet 10 of 18

289-6553-5



PIER CAP PLAN

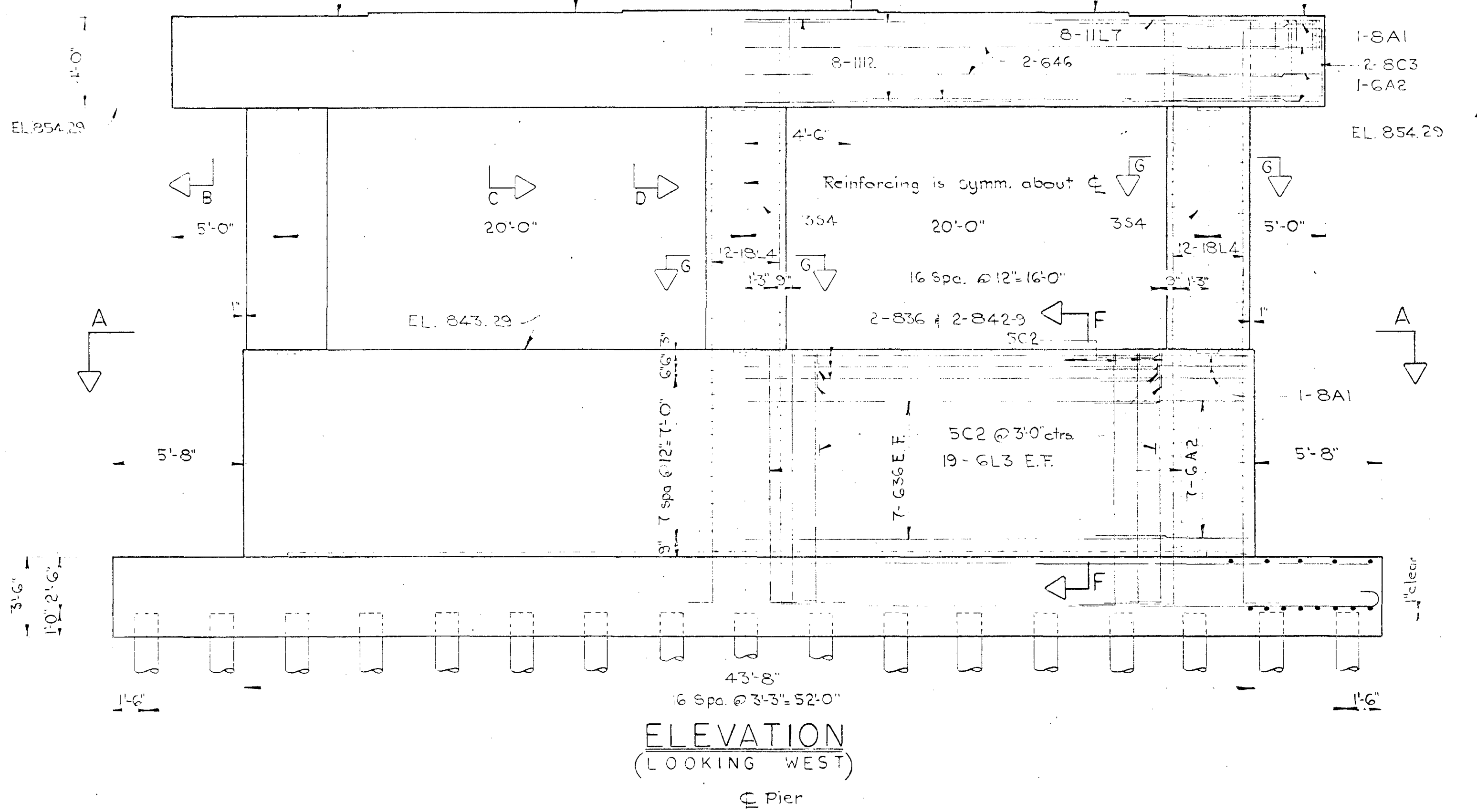


SECTION B-B

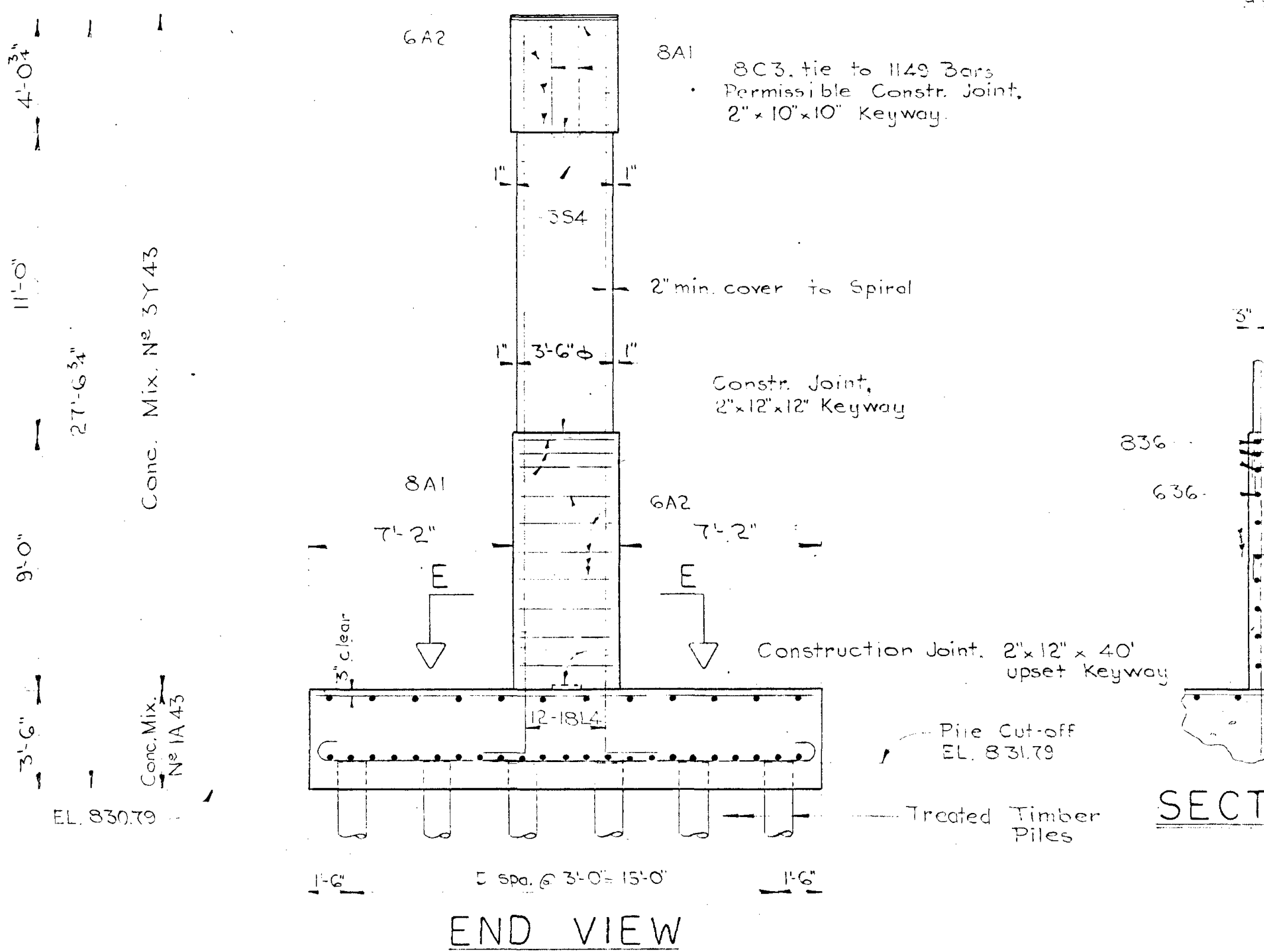
SECTION C-C

SECTION D-D

Volume Concrete Mix N^o 1A43 - 128.3 Cu. Yds.
5Y43 - 92.1



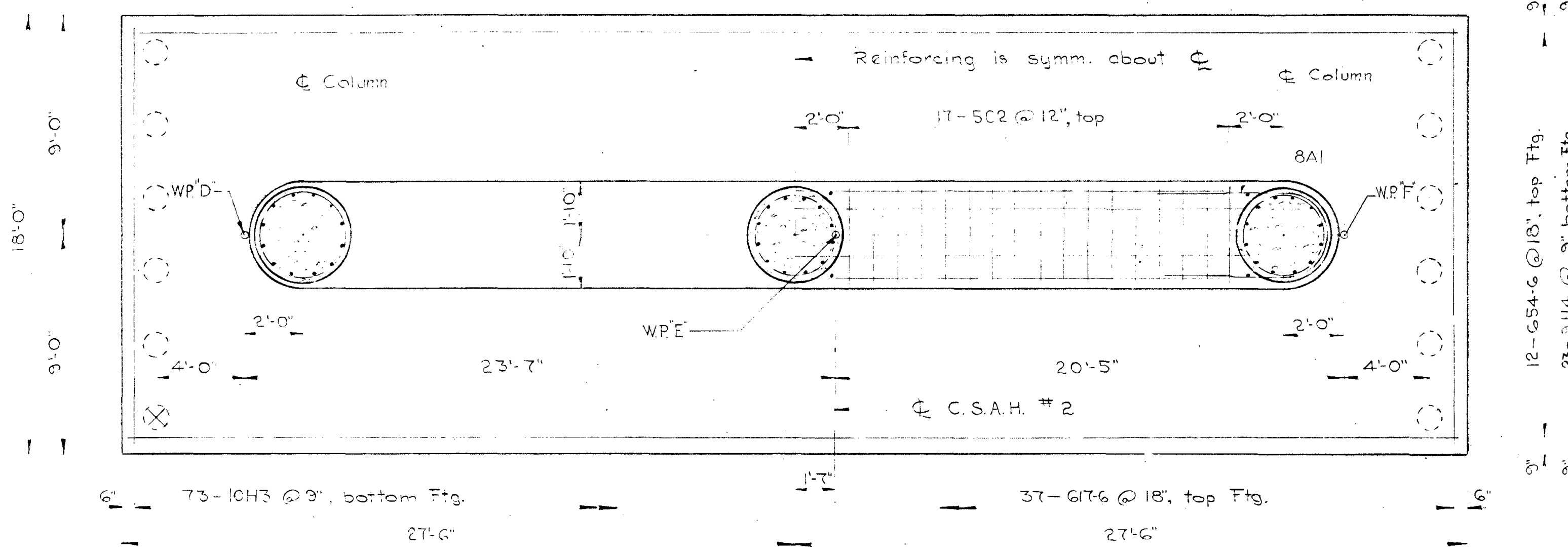
ELEVATION (LOOKING WEST)



END VIEW

SECTION F-F

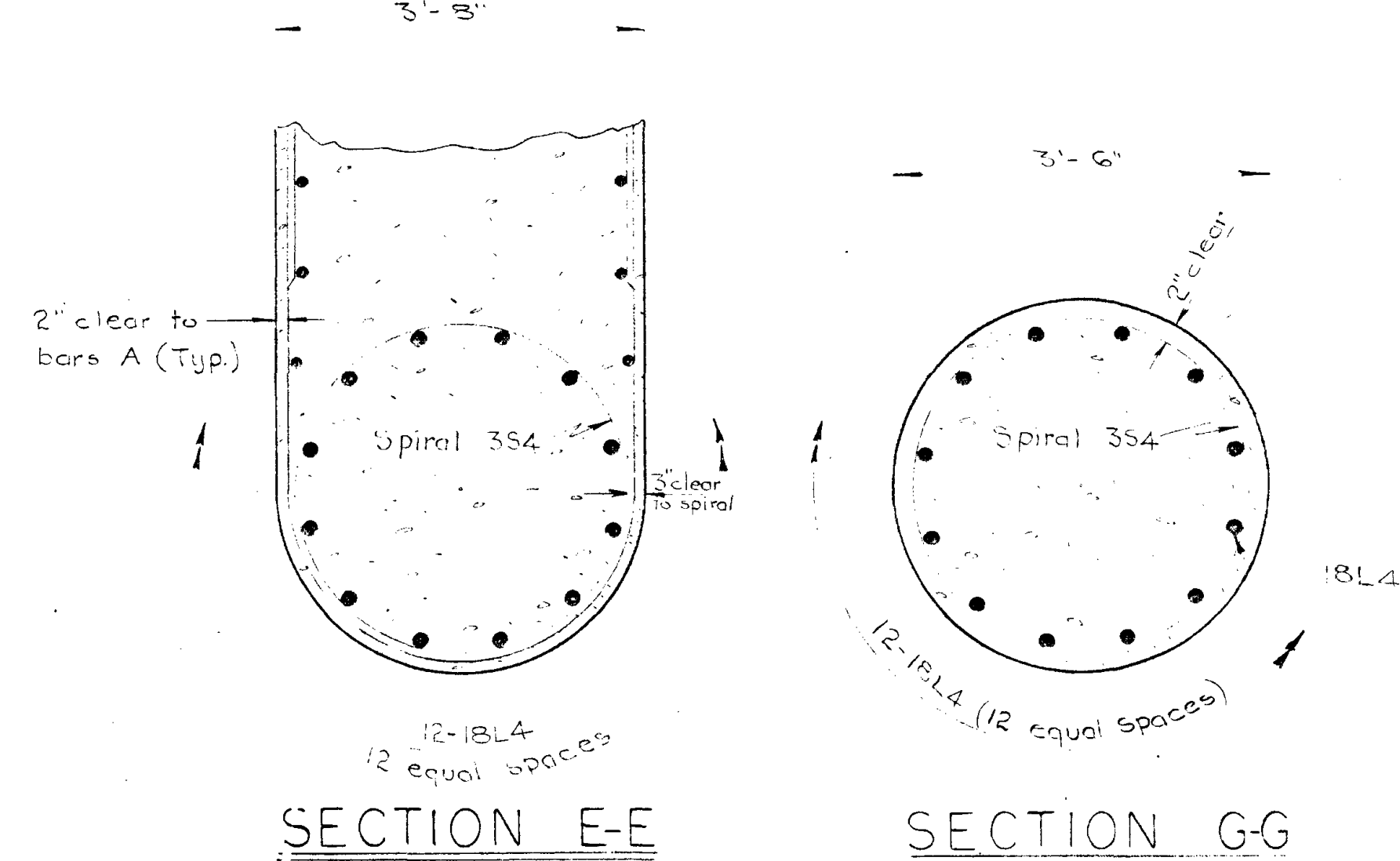
General Notes:
 1 treated test pile 50ft long.
 102 treated timber piles estimated length 45ft.
 102 treated timber piles read for Pier 2.
 Estimated penetration 1ft less than length given.
 Test Pile marked thus: ⊗



SECTION A-A

Scale: 4"=1'-0"

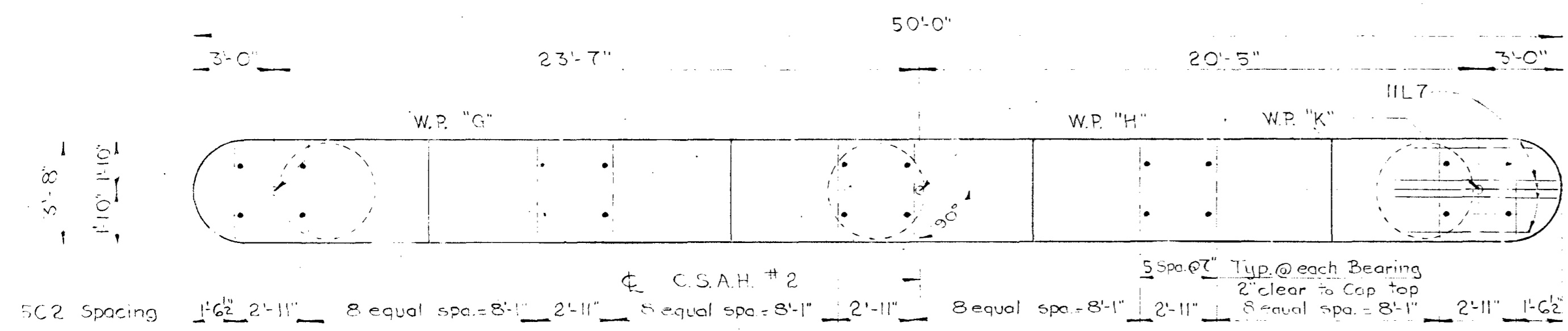
12-654-6 @ 18" top Fig.
 23-3114 @ 9" bottom Fig.
 = 16'-6"



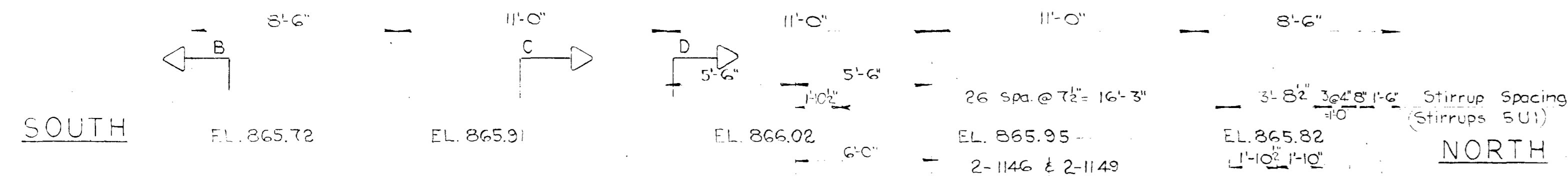
SECTION E-E

SECTION G-G

| | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------|------------|
| BURLINGTON NORTHERN INC. MINNESOTA DIVISION NORTH TOWN TO STAPLES BRIDGE NO. 13.8 <small>C.S.A.H. NO. 2 OVER YARD TRACKS AT NORTH TOWN</small> PIER NO. 2 | | | |
| RECOMMENDED: | APPROVED: | | |
| <i>J. E. Johnson</i> | <i>B. A. Anderson</i> | | |
| <small>Director Bridge Engineering</small> | <small>Asst. Vice President Engineering</small> | | |
| OFFICE OF DIRECTOR BRIDGE ENGINEERING | ST. PAUL, MINN. | | |
| REVISIONS | DES. K.E.B. | DR. O.P. | CH. D.E.B. |
| | AUTHORITY: A.F.E. 12-766 | | |
| | DATE: June 1972 | | |
| | PLAN: Sheet 11 of 18 | | |
| | 289-6553-6 | | |

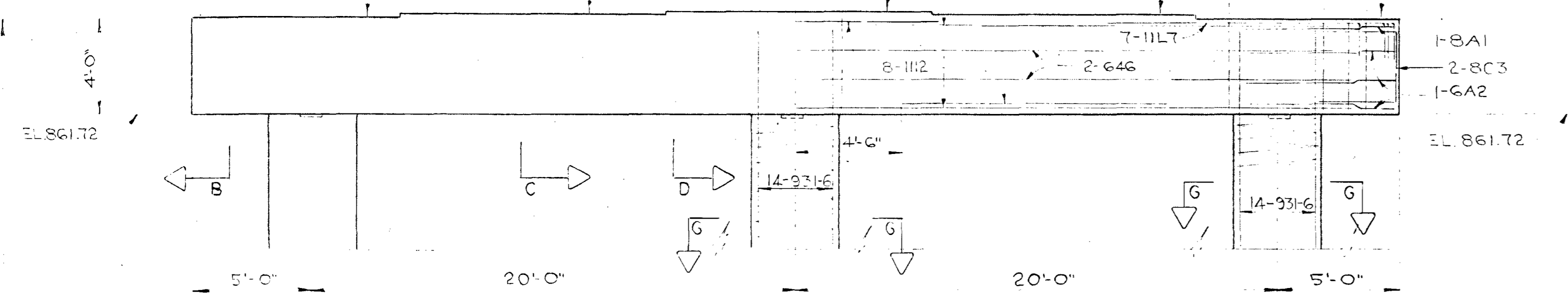


PIER CAP PLAN

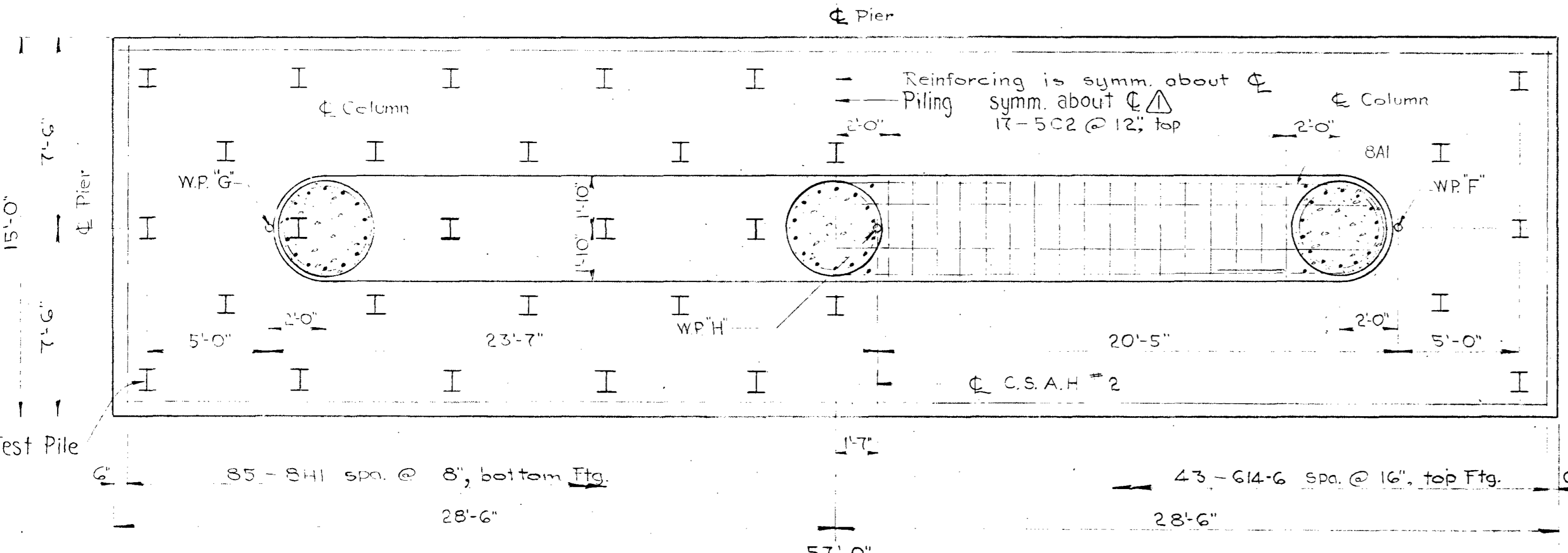


SOUTH

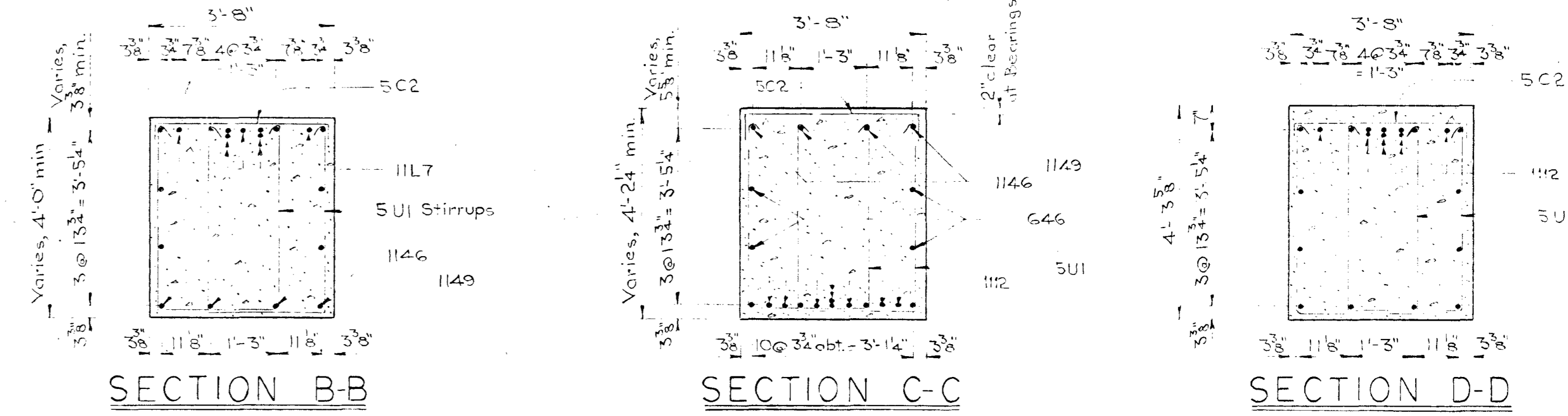
NORTH



ELEVATION (LOOKING WEST)



SECTION AA scale: 1/4" = 1'-0"



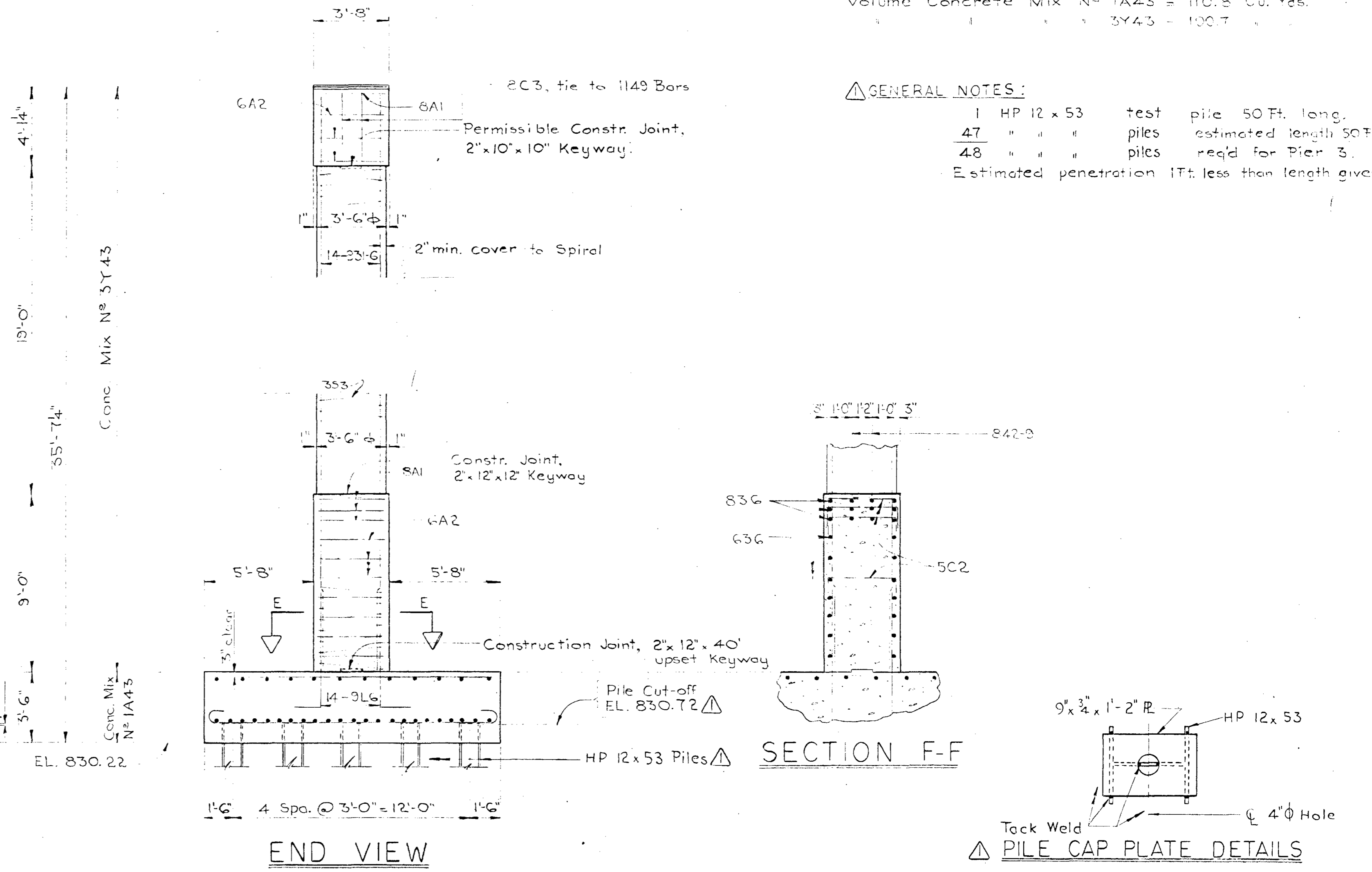
SECTION B-B

SECTION C-C

SECTION D-D

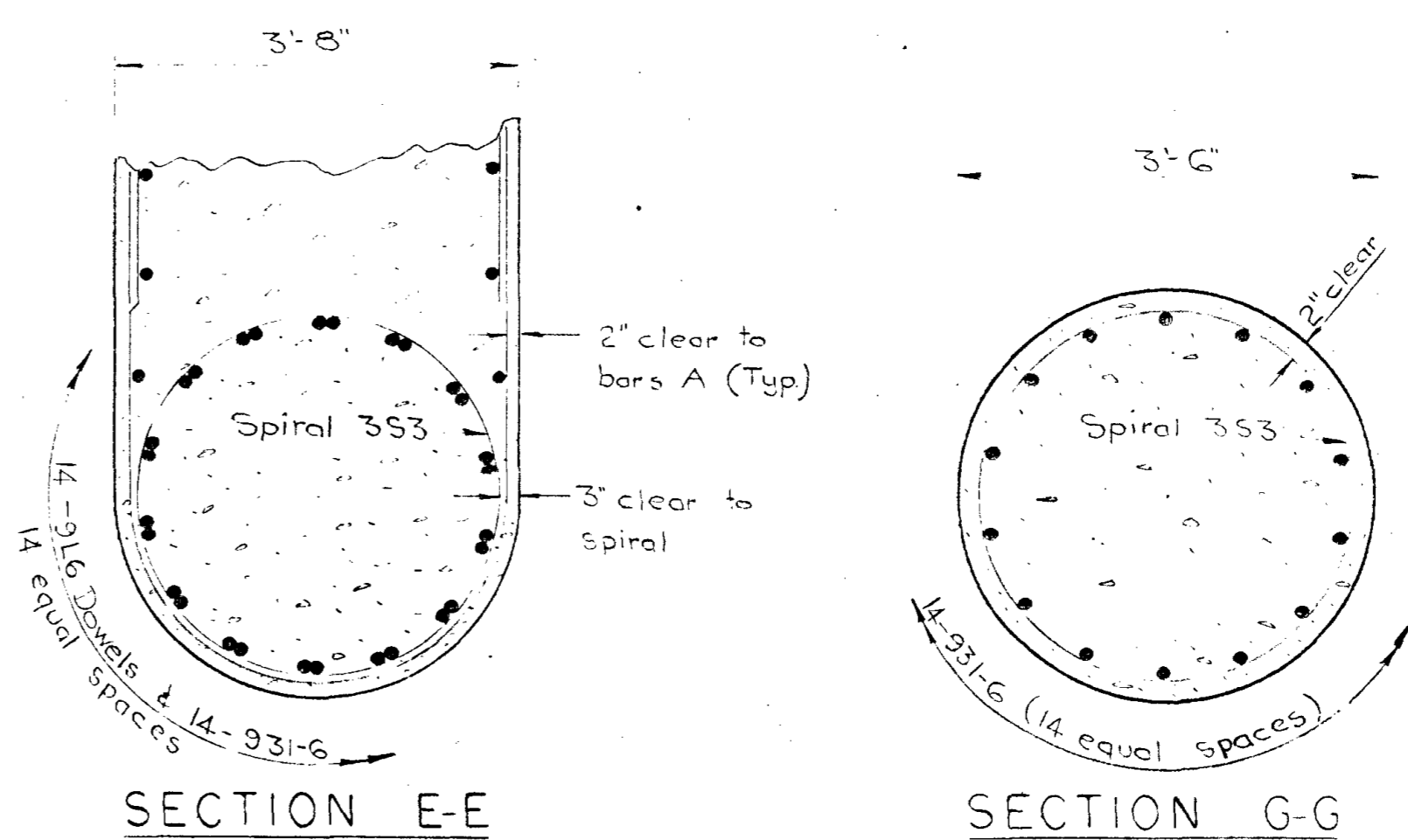
Volume Concrete Mix N° 1A43 = 110.8 Cu. Yds.
3Y43 = 100.7

GENERAL NOTES:
1 HP 12 x 53 test pile 50 Ft. long.
47 " " " piles estimated length 50 Ft.
48 " " " piles req'd for Pier 3.
Estimated penetration 1 Ft. less than length given.



END VIEW

SECTION F-F



SECTION E-E

SECTION G-G

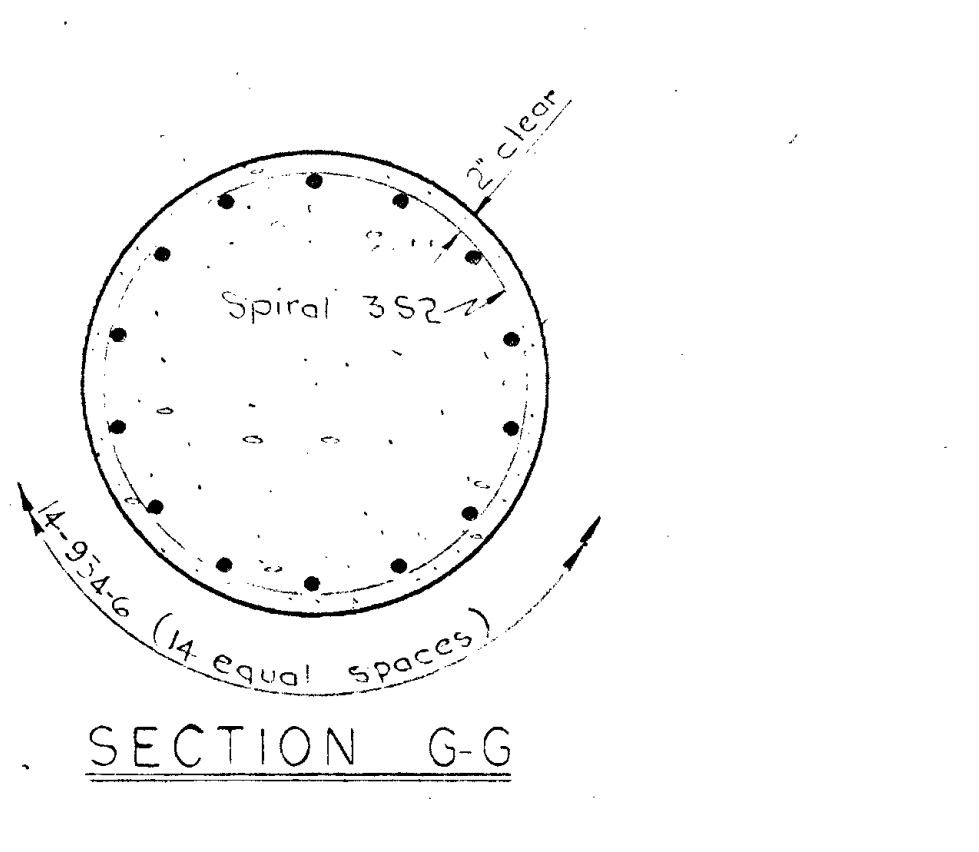
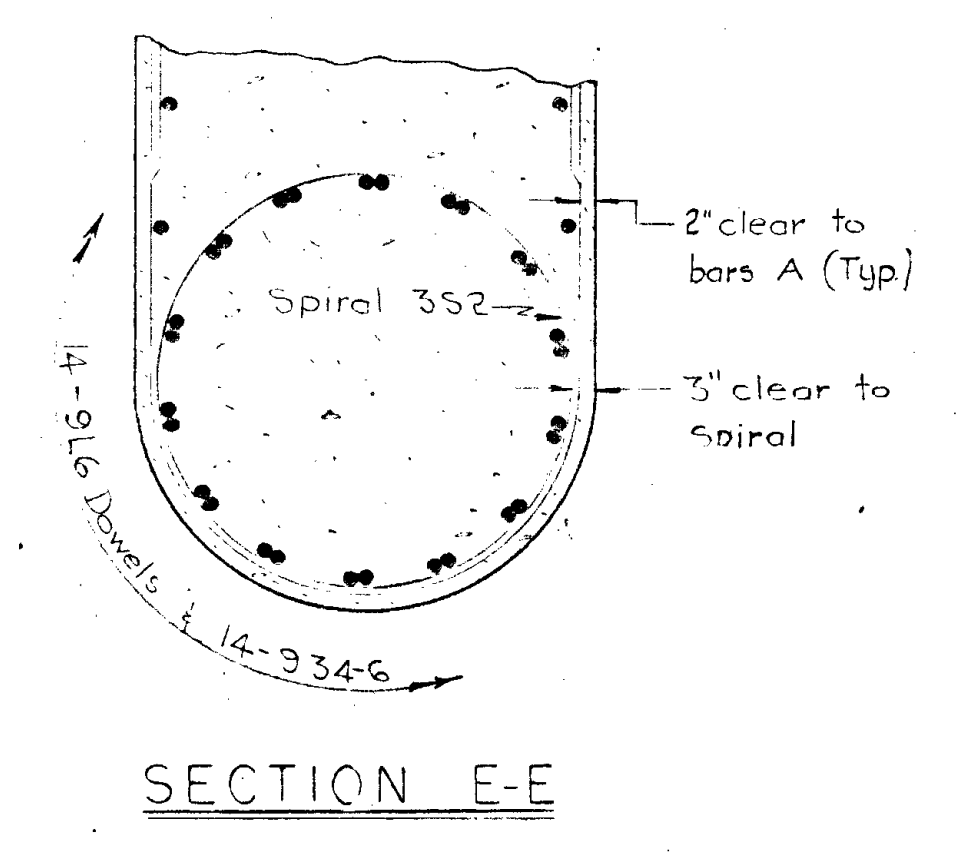
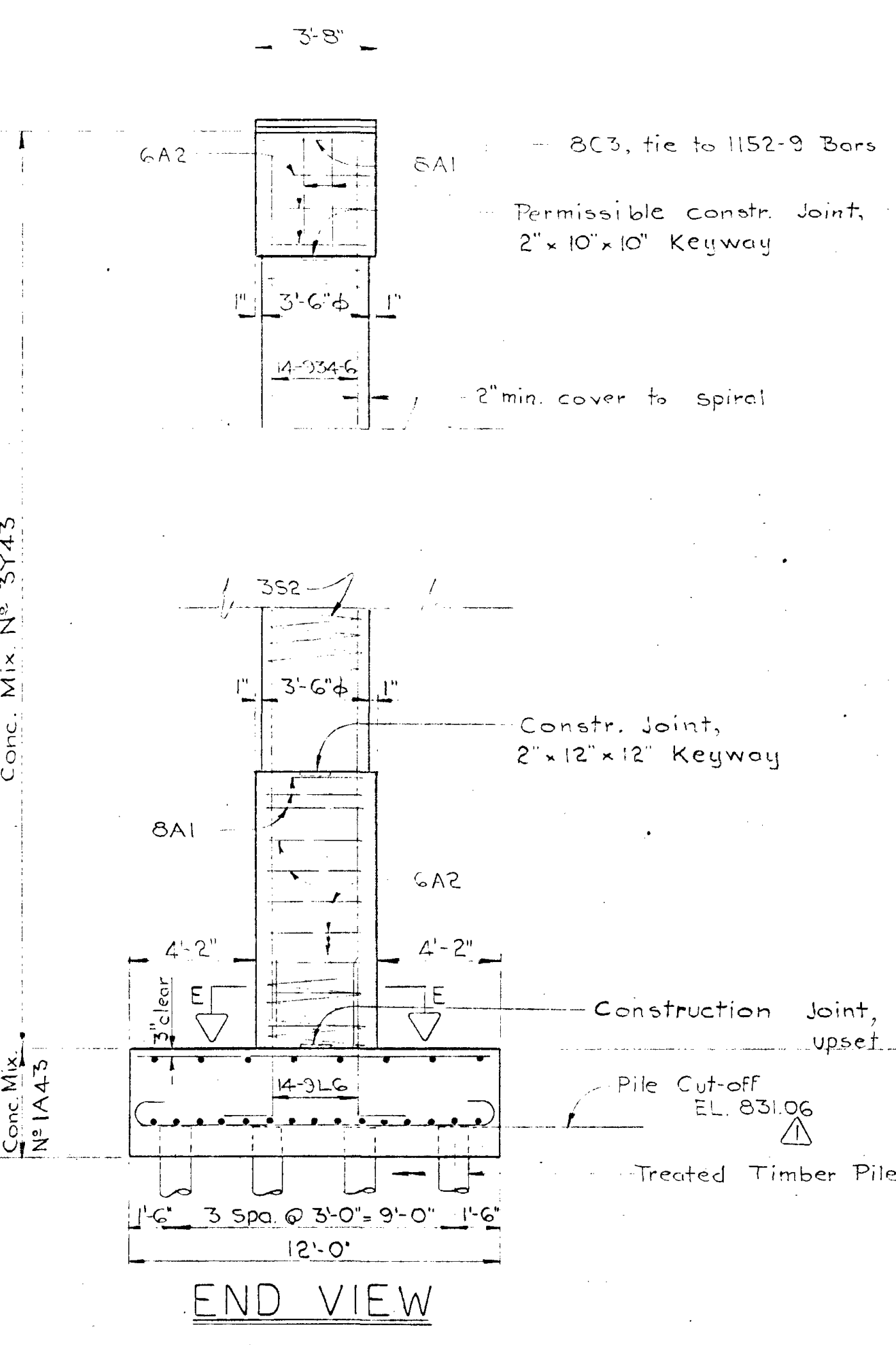
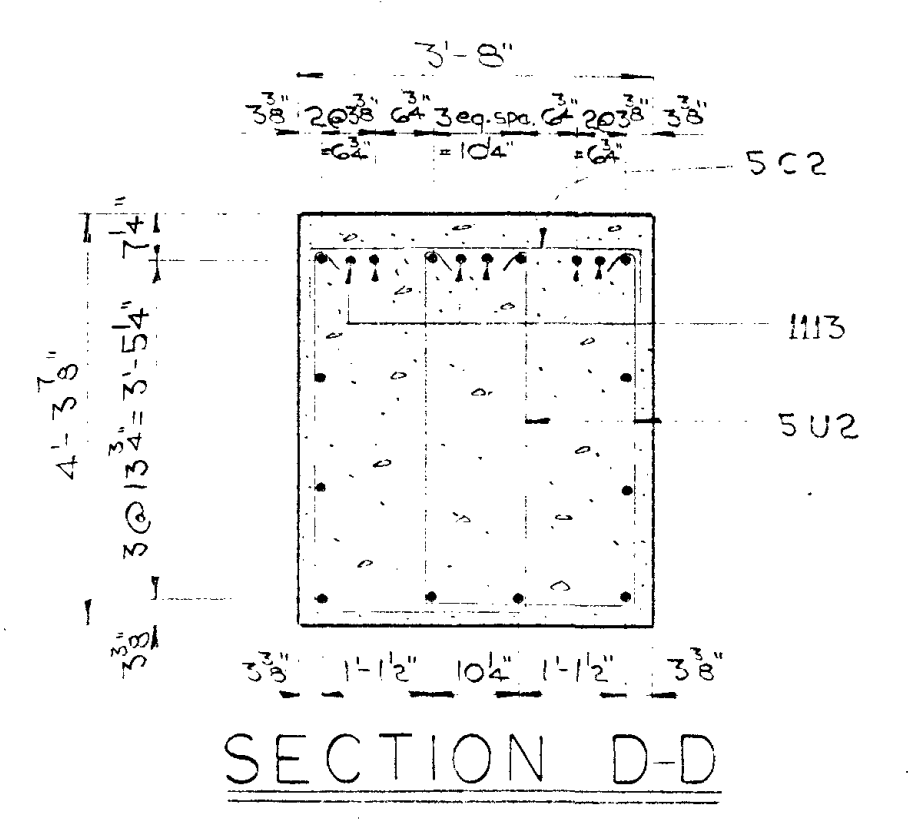
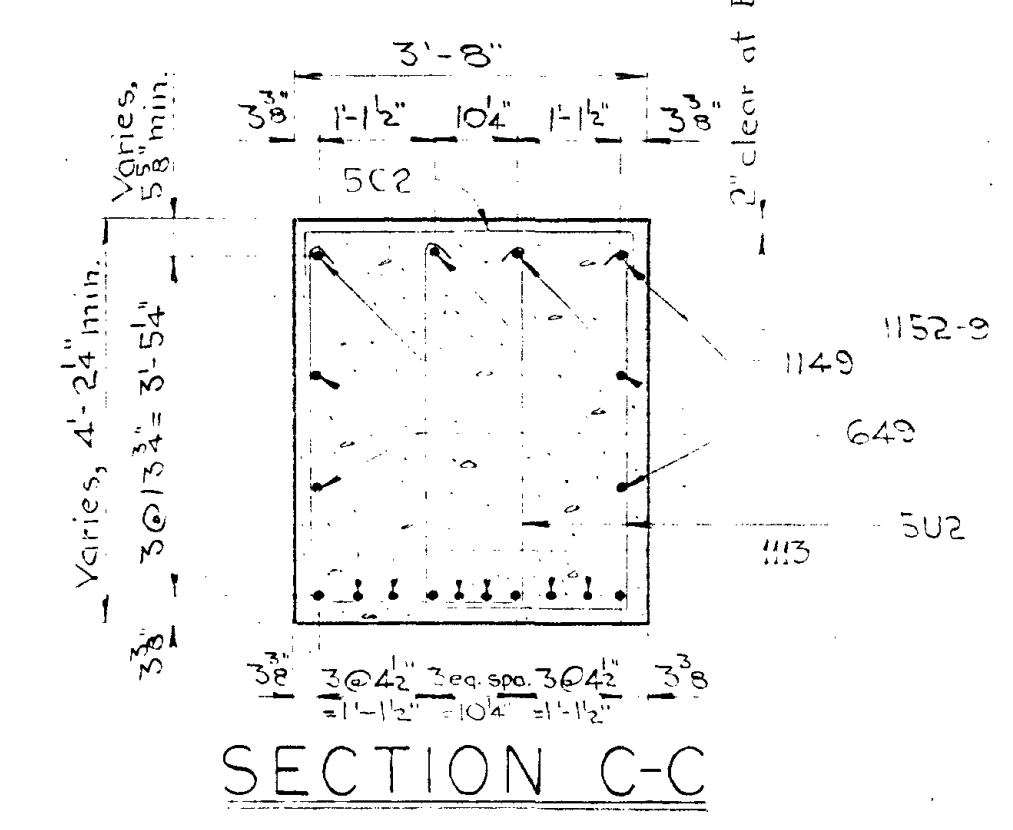
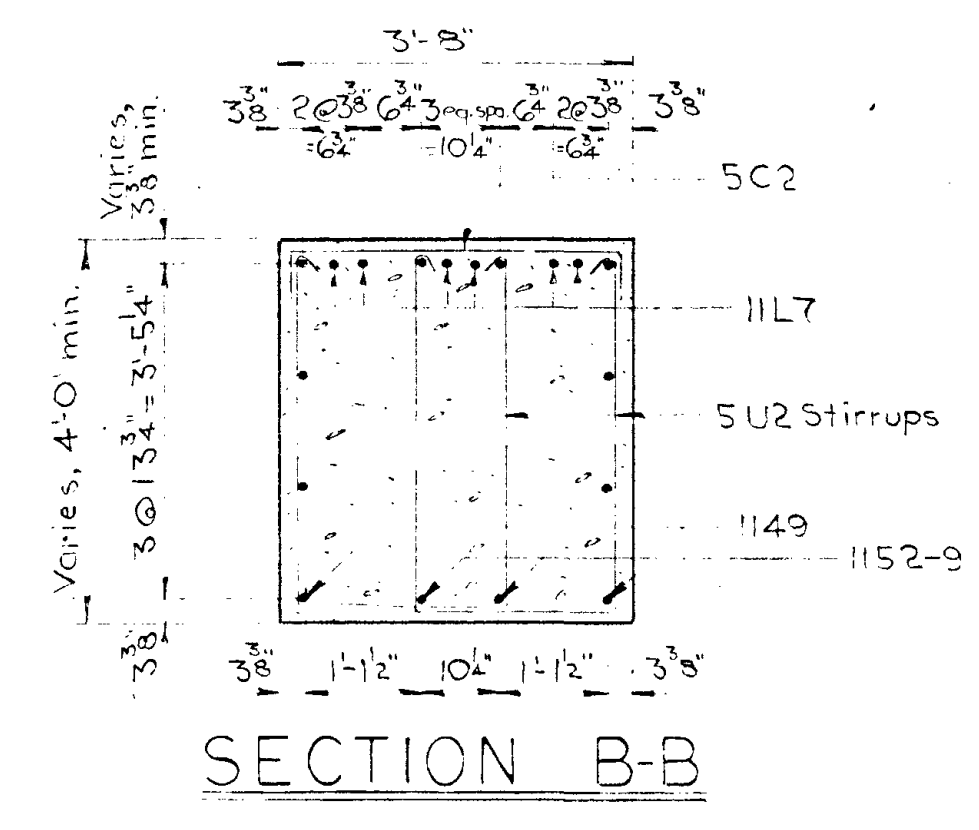
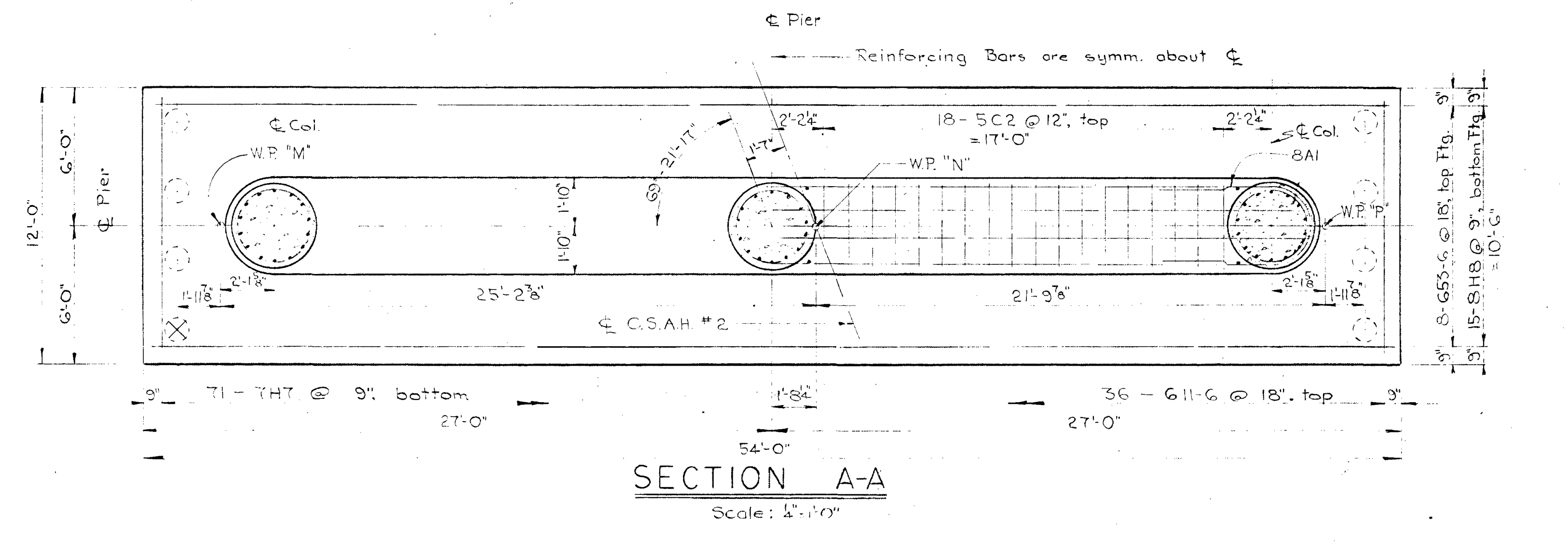
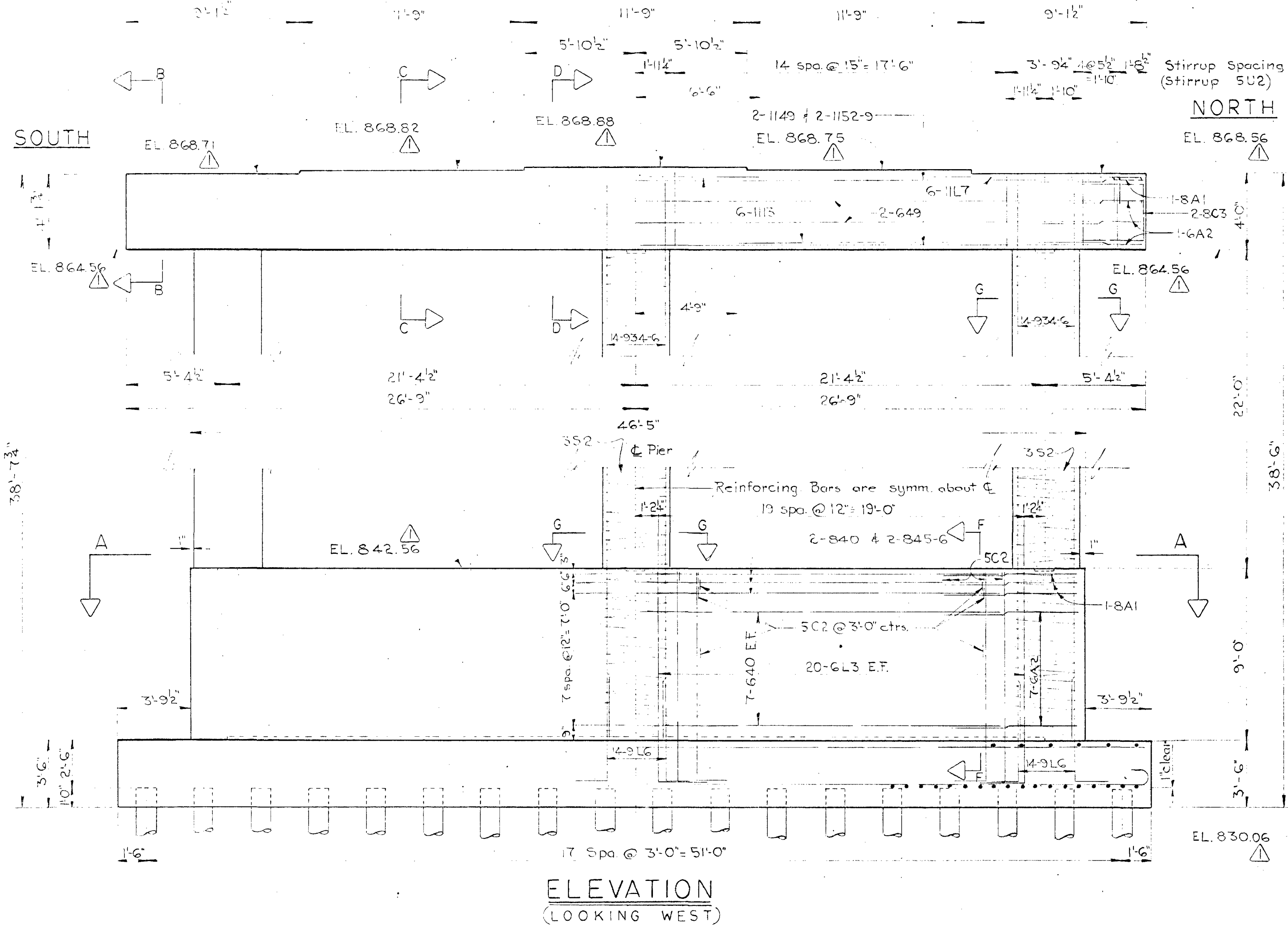
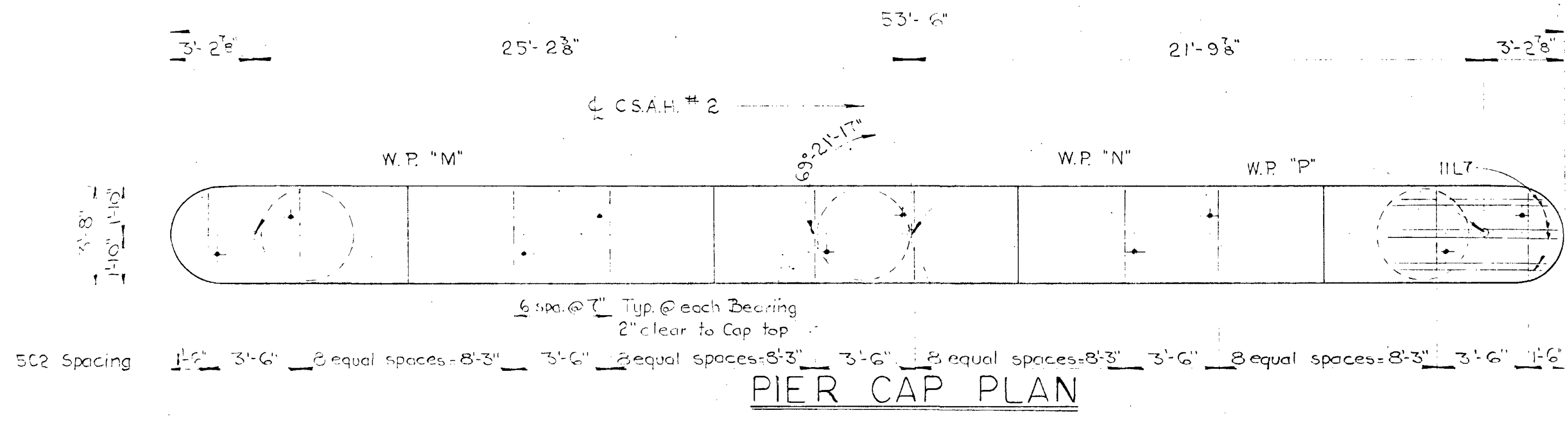
BURLINGTON NORTHERN INC.
MINNESOTA DIVISION
NORTHTOWN TO STAPLES
BRIDGE NO. 13.8
C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN
PIER NO. 3

RECOMMENDED: *W.B. Ekstrom* Director Bridge Engineering
APPROVED: *B.H. Anderson* Asst. Vice President Engineering

OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

| REVISIONS | DES. K.E.B. | DR. O.P. | CH. D.E.B. |
|-------------------|-------------|----------|------------|
| △ Piling 11-13-72 | | | |

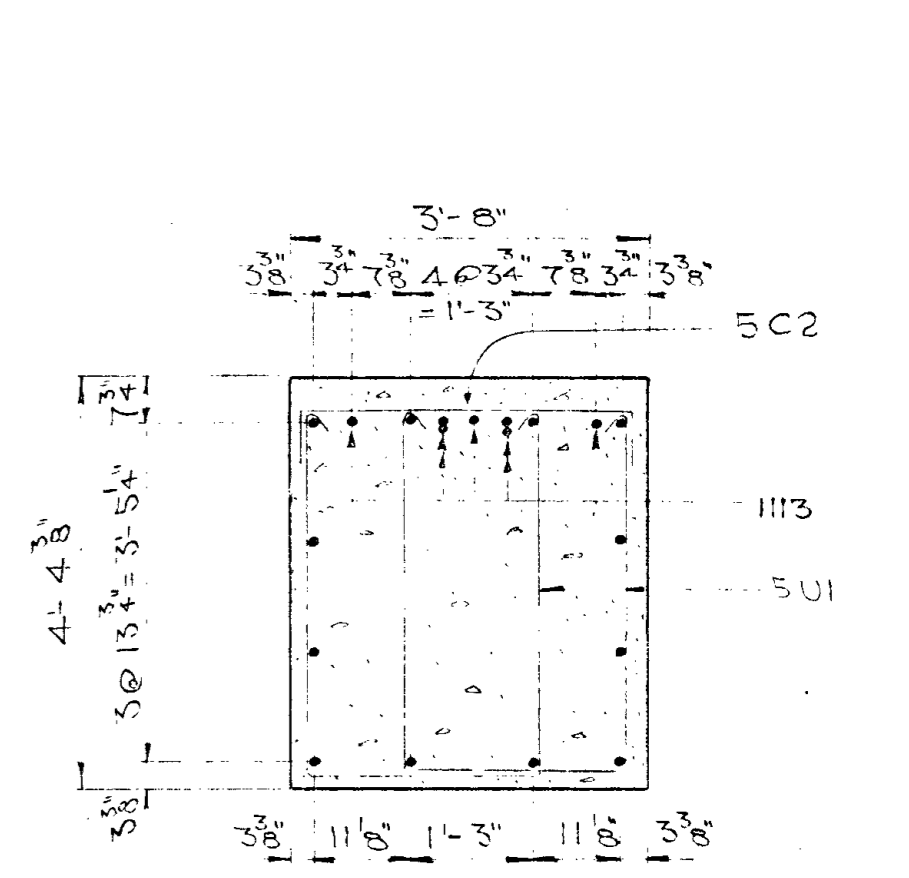
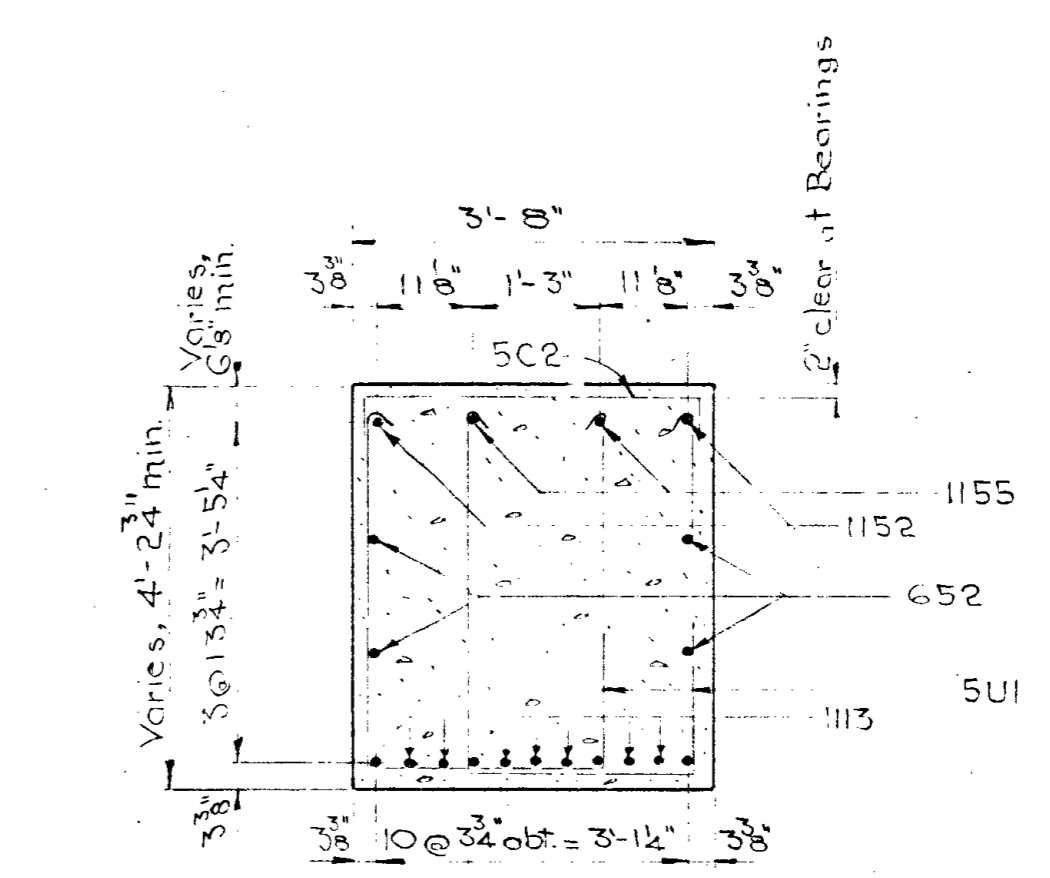
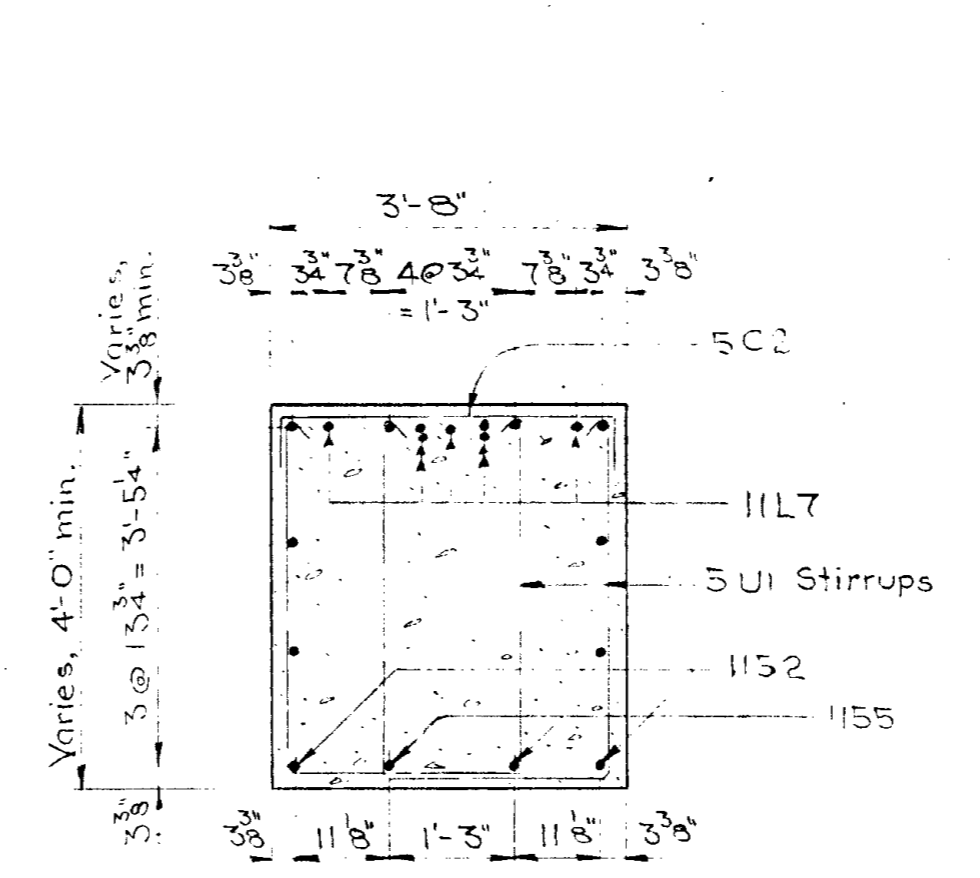
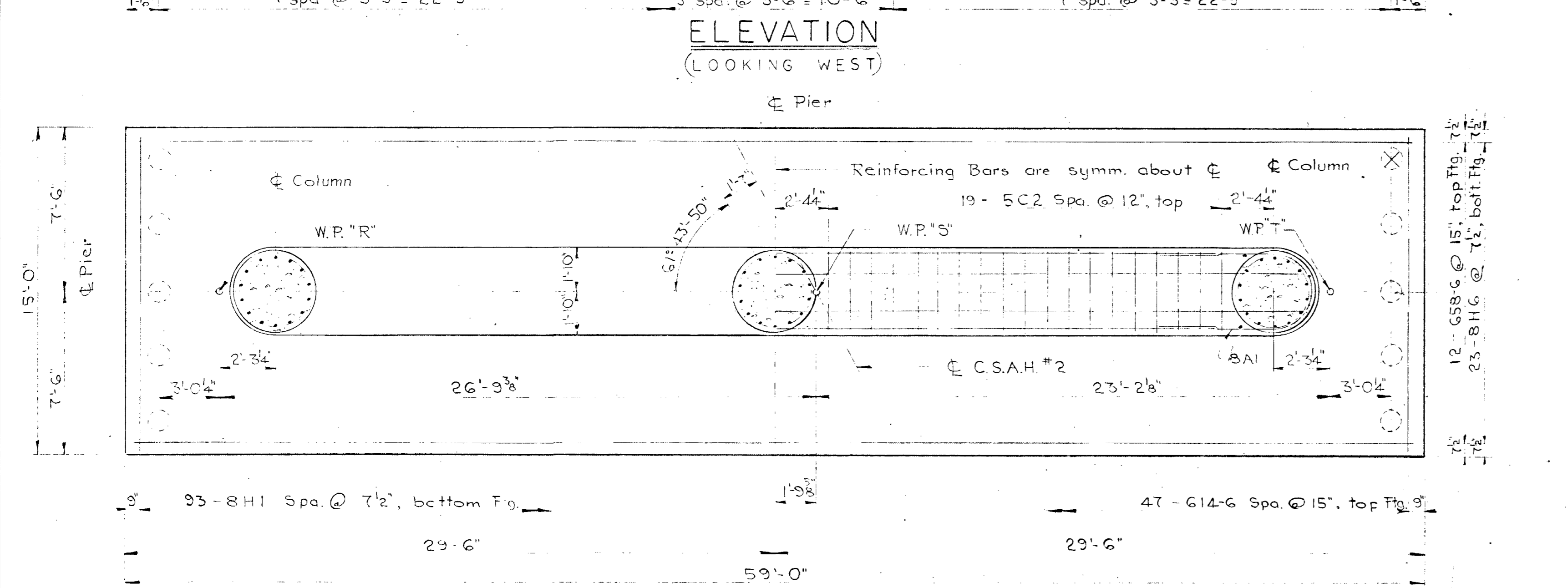
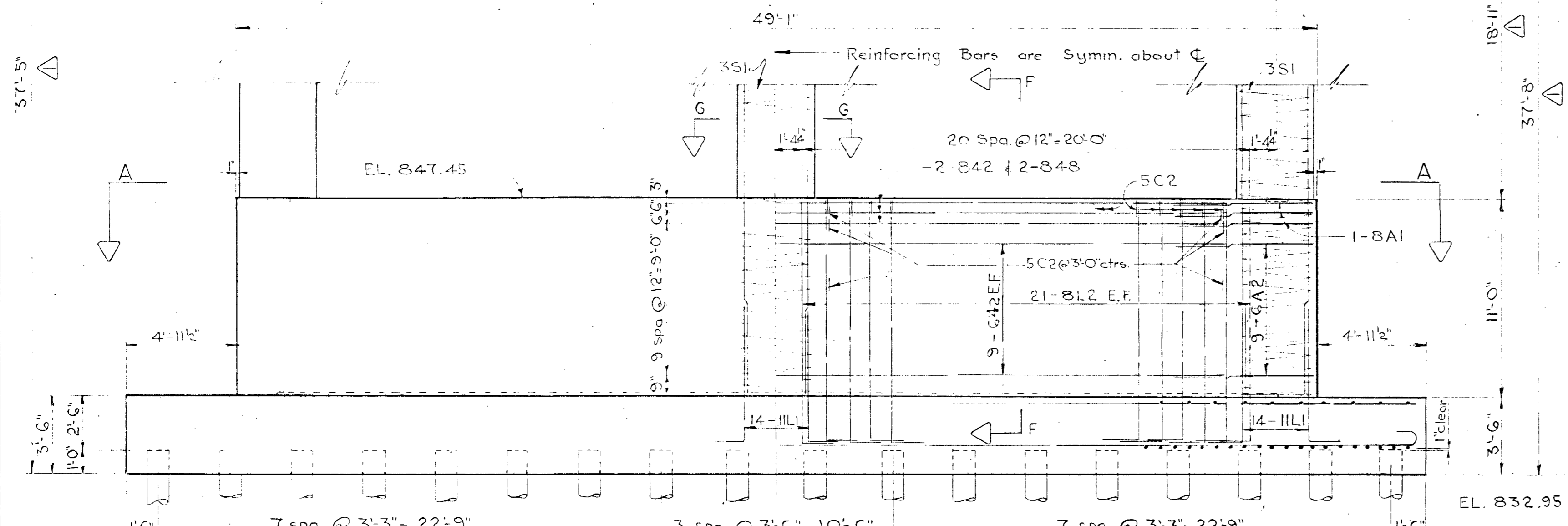
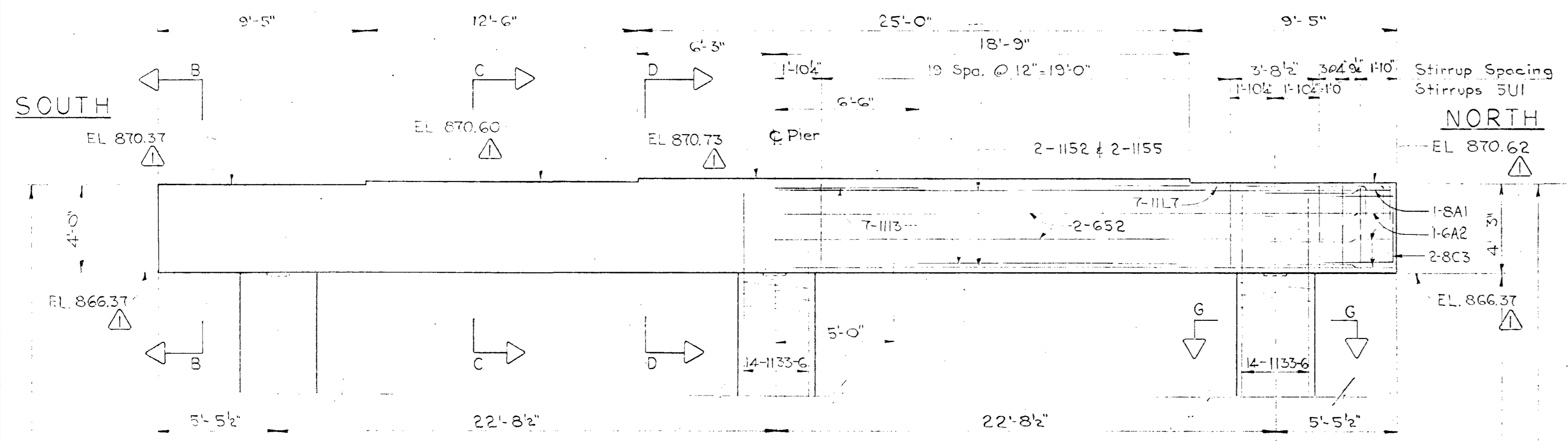
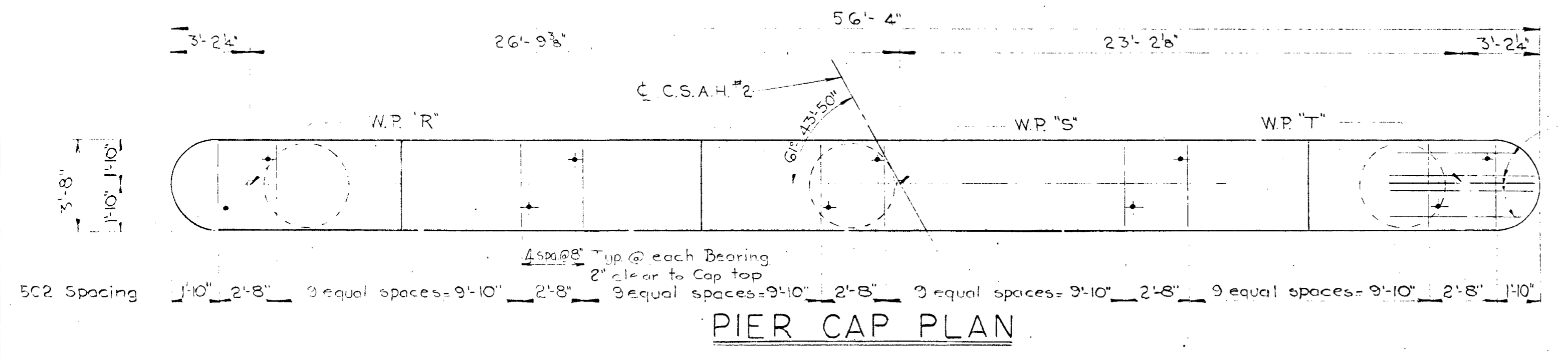
AUTHORITY: A.F.E. 72-746
DATE: June 1972
PLAN: Sheet 12 of 18
289 - 6553 - 7



Volume Concrete Mix No. 1A43 = 84.0 Cu. Yds.
 3Y43 = 109.3

General Notes:
 1. treated test pile 60 Ft. long.
 2. treated timber piles estimated length 55 Ft.
 3. 72 treated timber piles req'd for Pier 4.
 4. Estimated penetration 1 Ft. less than length given.
 5. Test Pile marked thus ⊗

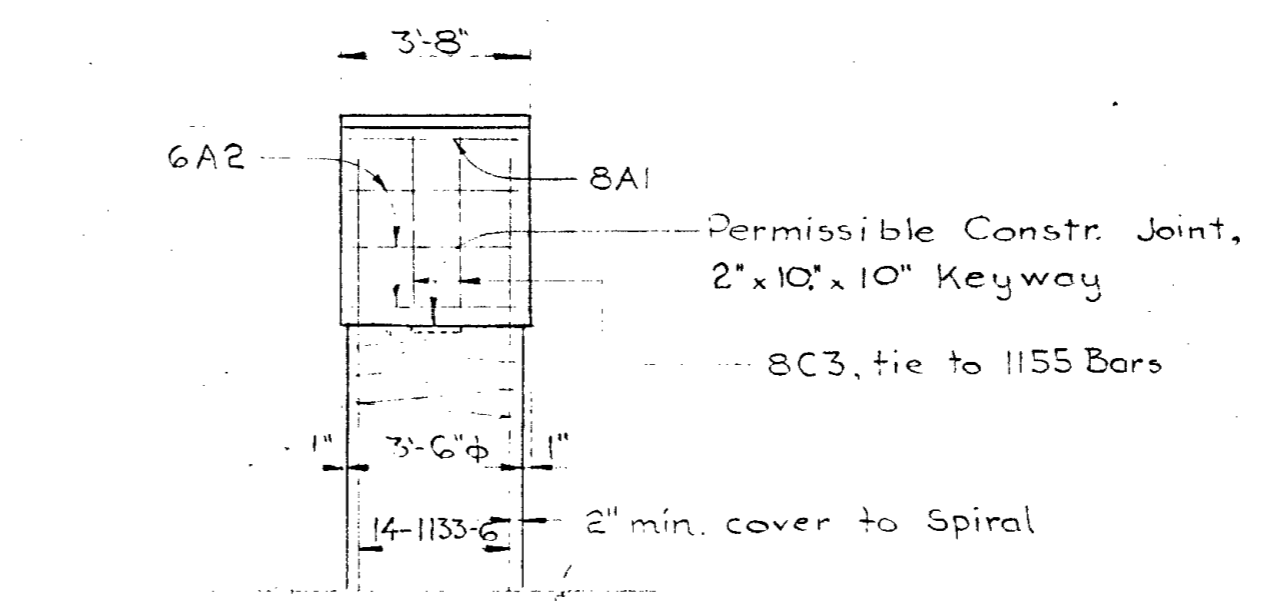
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|------------------------------------------------------------------|------------------------------------------------------------------------|-----------------|----------|
| BURLINGTON NORTHERN INC. | | | |
| MINNESOTA DIVISION | | | |
| NORTHTOWN TO STAPLES | | | |
| BRIDGE NO. 13.8 | | | |
| C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN | | | |
| PIER NO. 4 | | | |
| RECOMMENDED: Director Bridge Engineering <i>T. G. Egan</i> | APPROVED: Asst. Vice President Engineering <i>B. H. Anderson</i> | ST. PAUL, MINN. | |
| REVISIONS | | DES. KEYB | DR. O.P. |
| Elevations 10-G-72 | | CH. D.E.B. | |
| AUTHORITY: A.F.E. 72-74G | | DATE: June 1972 | |
| PLAN: | | Sheet 13 of 18 | |
| 289-6553-8 | | | |



SECTION B-B

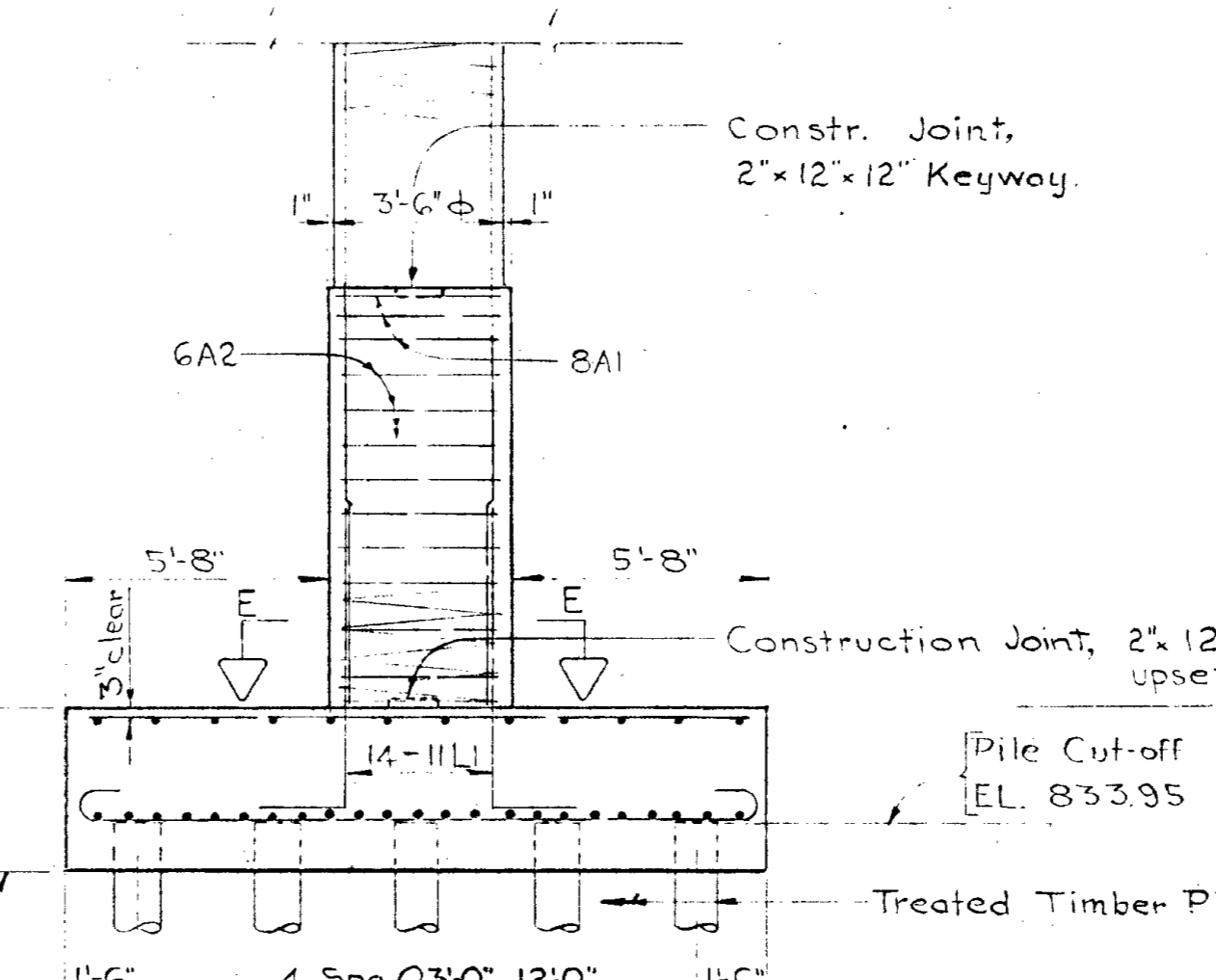
SECTION C-C

SECTION D-D



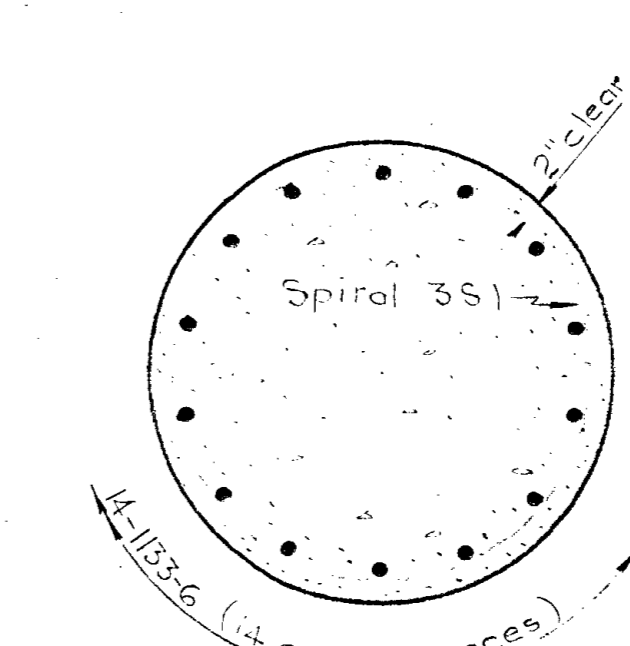
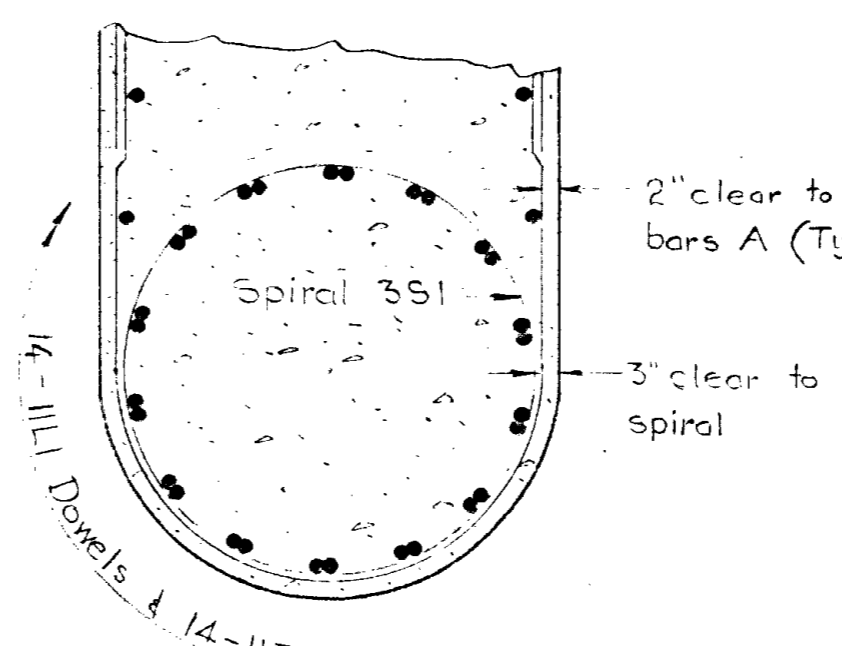
Volume Concrete Mix N^o 1A43 = 114.7 Cu. Yds.
3Y43 = 124.6

General Notes:
1 treated test pile 60 Ft. long.
29 treated timber piles estimated length 55 Ft.
90 treated timber piles req'd for Pier 5.
Estimated penetration 1 Ft. less than length given.
Test Pile marked thus X



END VIEW

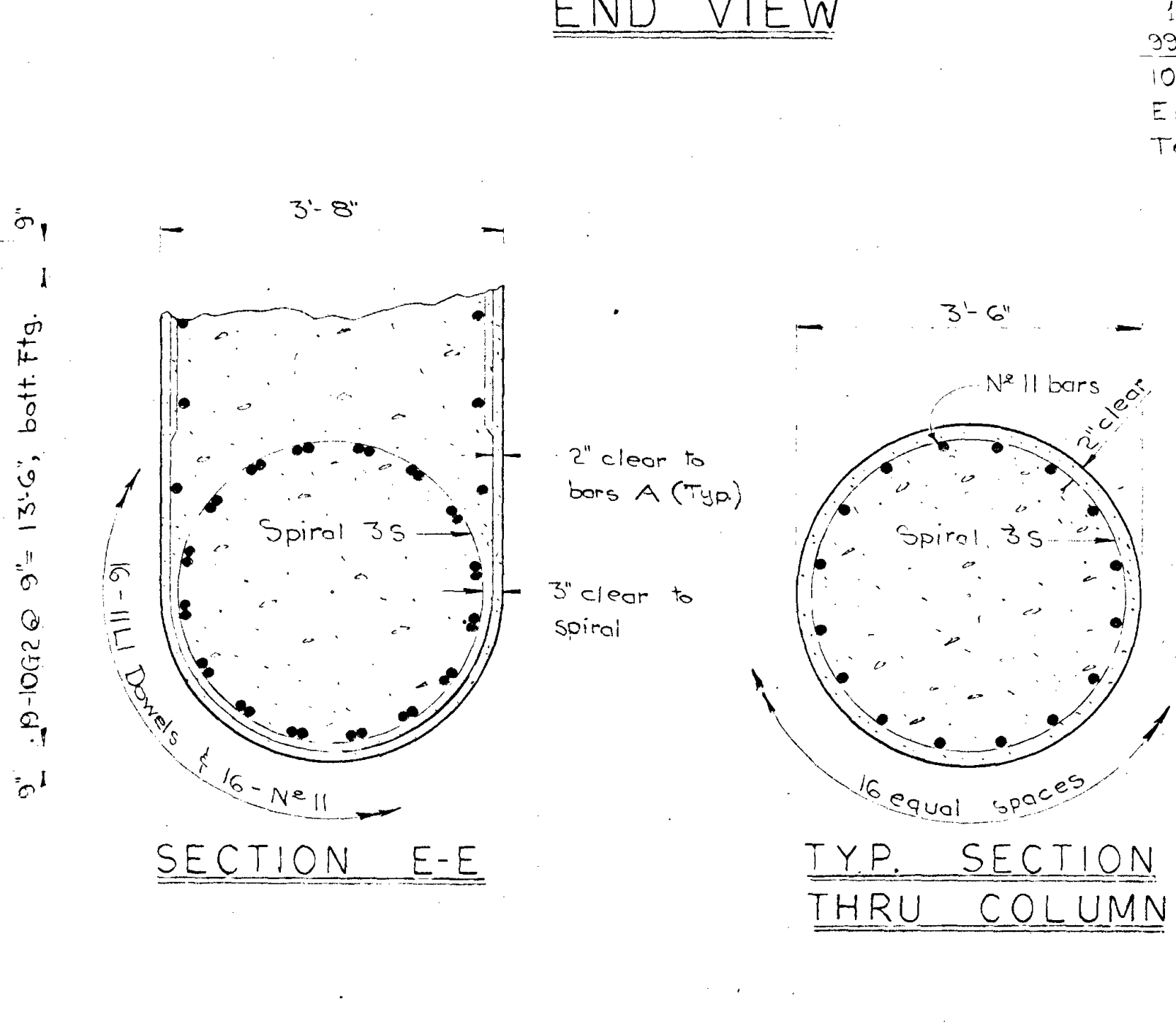
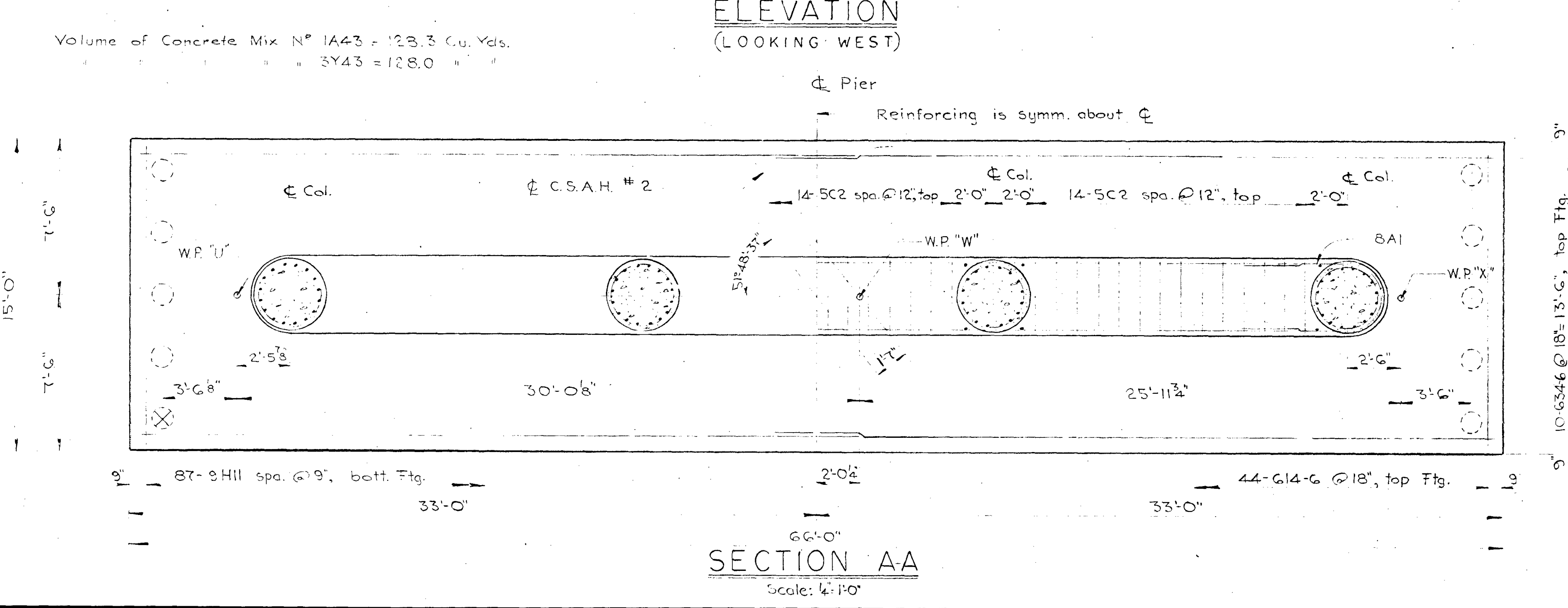
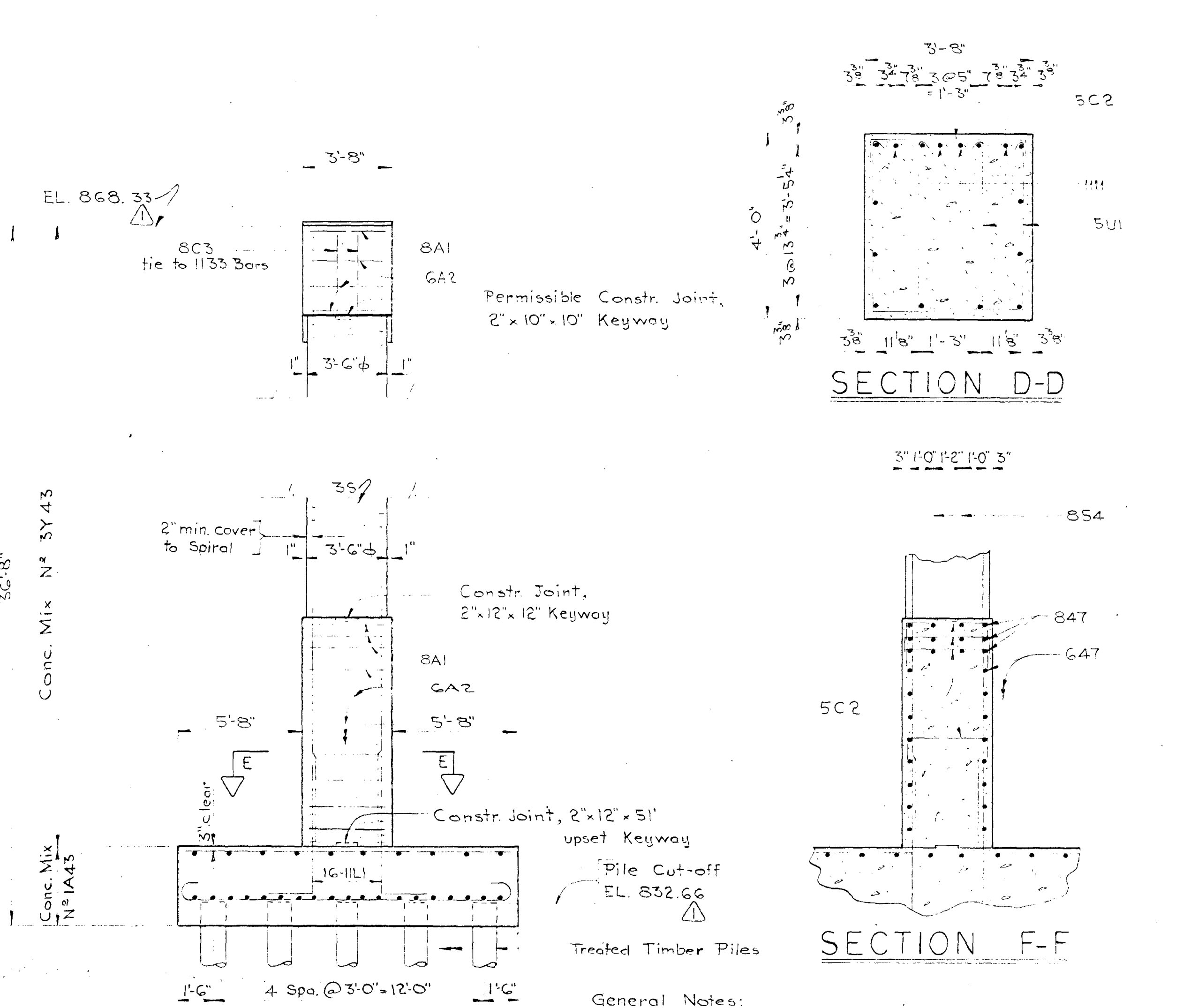
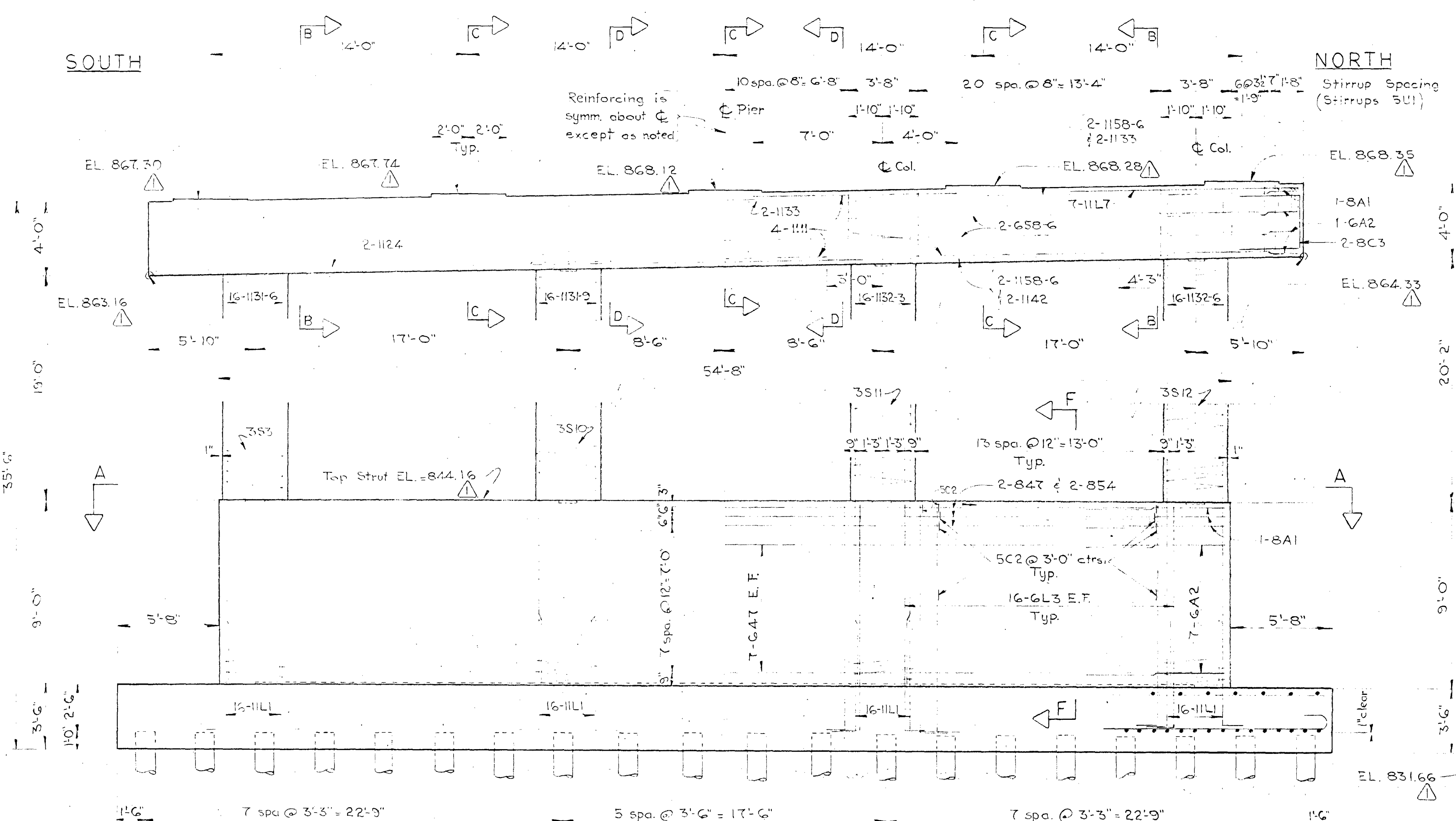
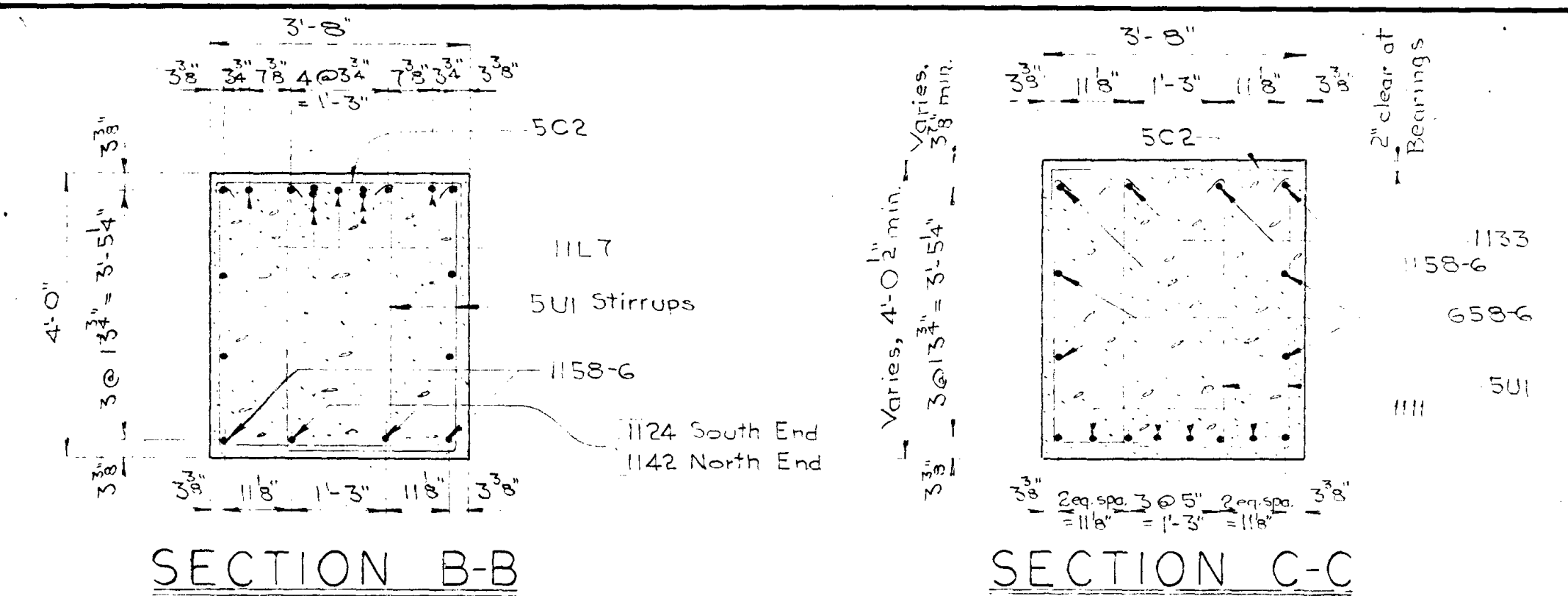
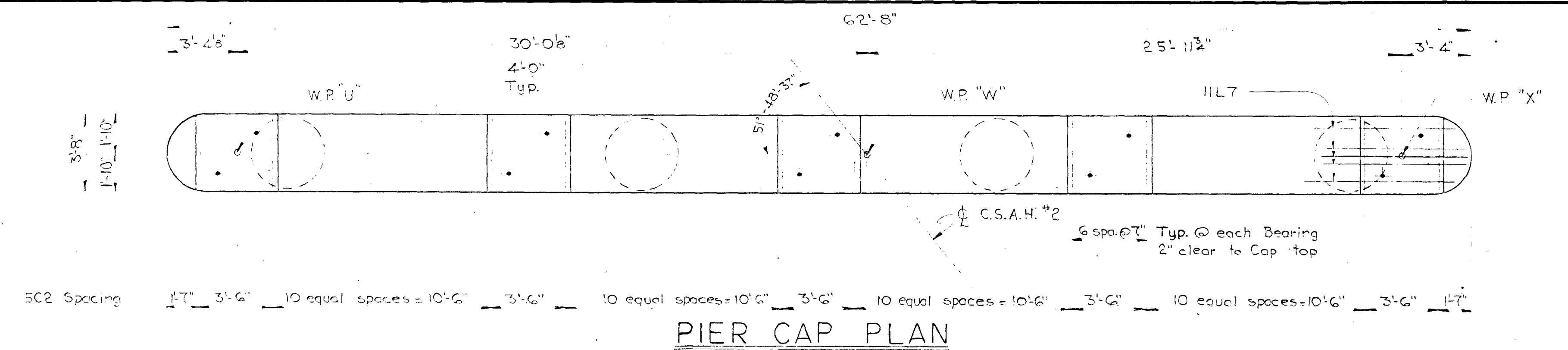
SECTION F-F



SECTION E-E

SECTION G-G

| | | |
|-------------------------------------------------------------------|-----------------------------------------------------------------------|------------|
| BURLINGTON NORTHERN INC. | | |
| MINNESOTA DIVISION NORTHTOWN TO STAPLES | | |
| BRIDGE NO. 13.8 | | |
| C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN | | |
| PIER NO. 5 | | |
| RECOMMENDED: <i>T. G. Flynn</i> Director Bridge Engineering | APPROVED: <i>Boh. Anderson</i> Asst. Vice President Engineering | |
| OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN. | | |
| REVISIONS | | |
| DES. KEYB | DR. O P | CH. D.E.B. |
| AUTHORITY: A.F.E. 72-74G | | |
| DATE: June 1972 | | |
| PLAN: Sheet 14 of 18 | | |
| 289-6553-9 | | |



General Notes:
 1 treated test pile 50 Ft. long.
 99 treated timber piles estimated length 50 Ft.
 100 treated timber piles req'd for Pier 6.
 Estimated penetration 1 ft less than length given.
 Test Pile marked thus ⊗

BURLINGTON NORTHERN INC.
 MINNESOTA DIVISION
 NORTHTOWN TO STAPLES
 BRIDGE NO. 13.8
 C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN
 PIER NO. 6

RECOMMENDED: *E. Ekstrom*
 Director Bridge Engineering

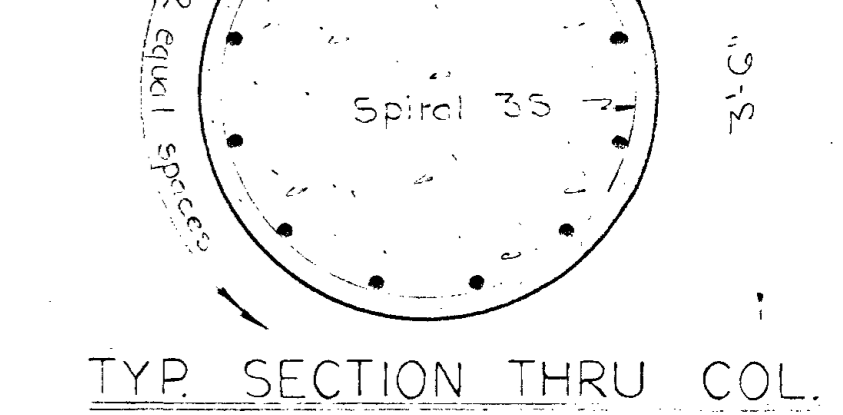
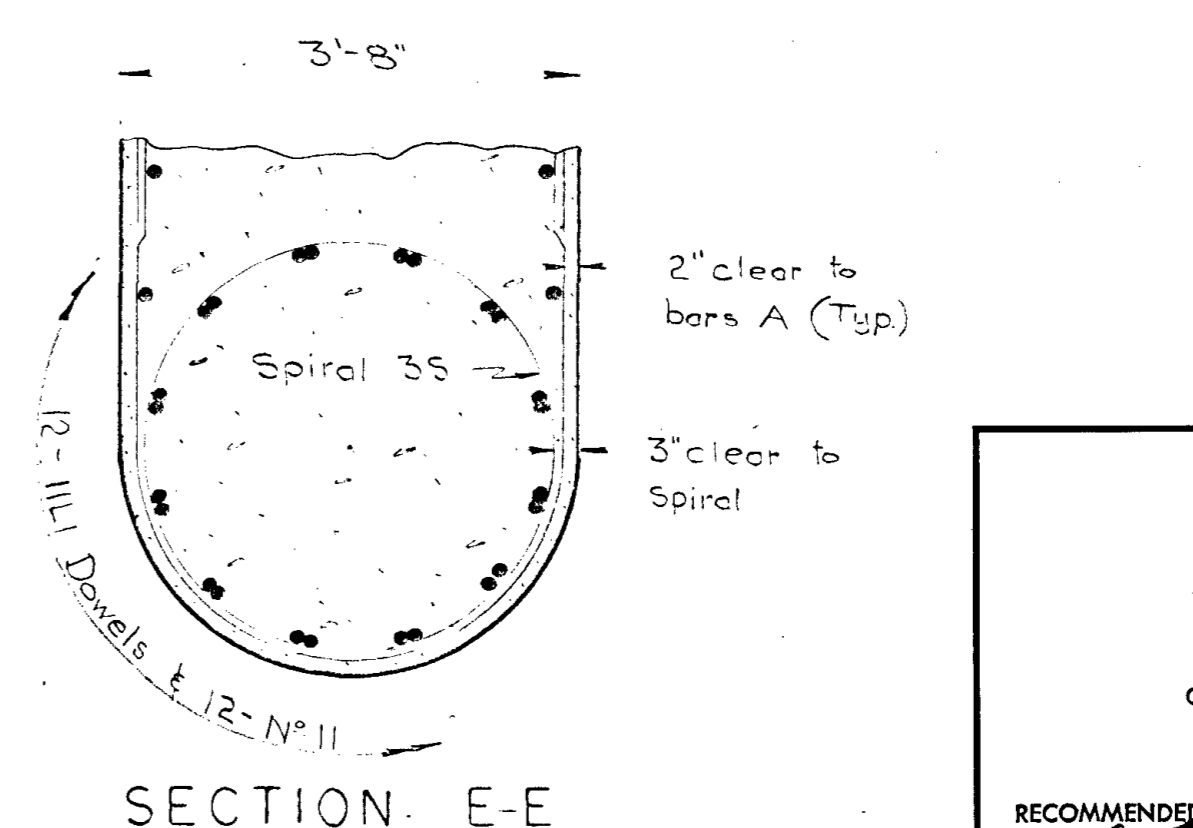
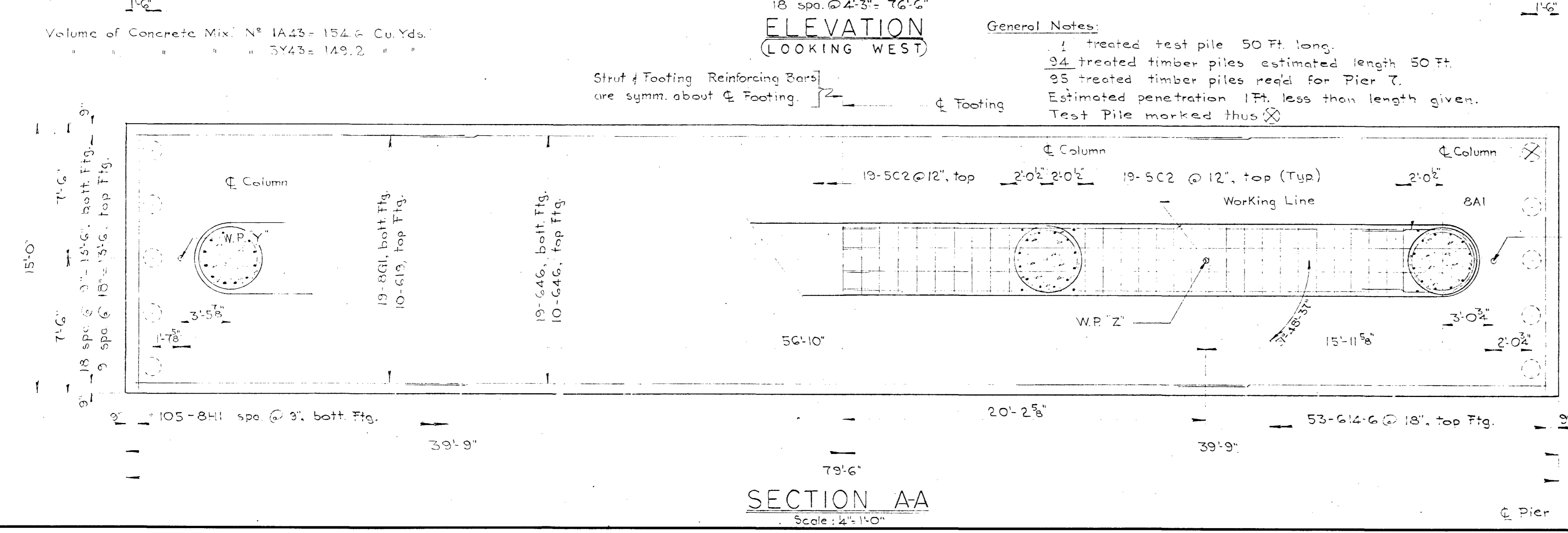
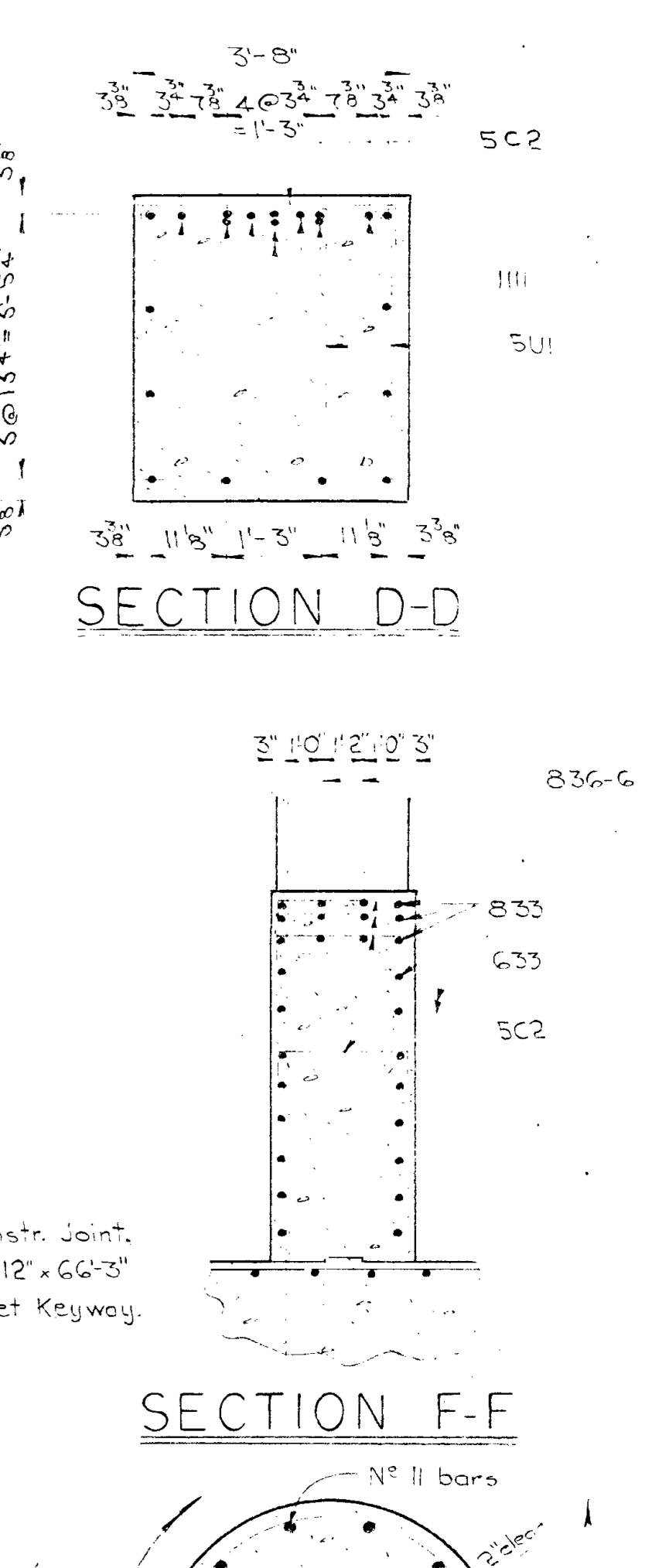
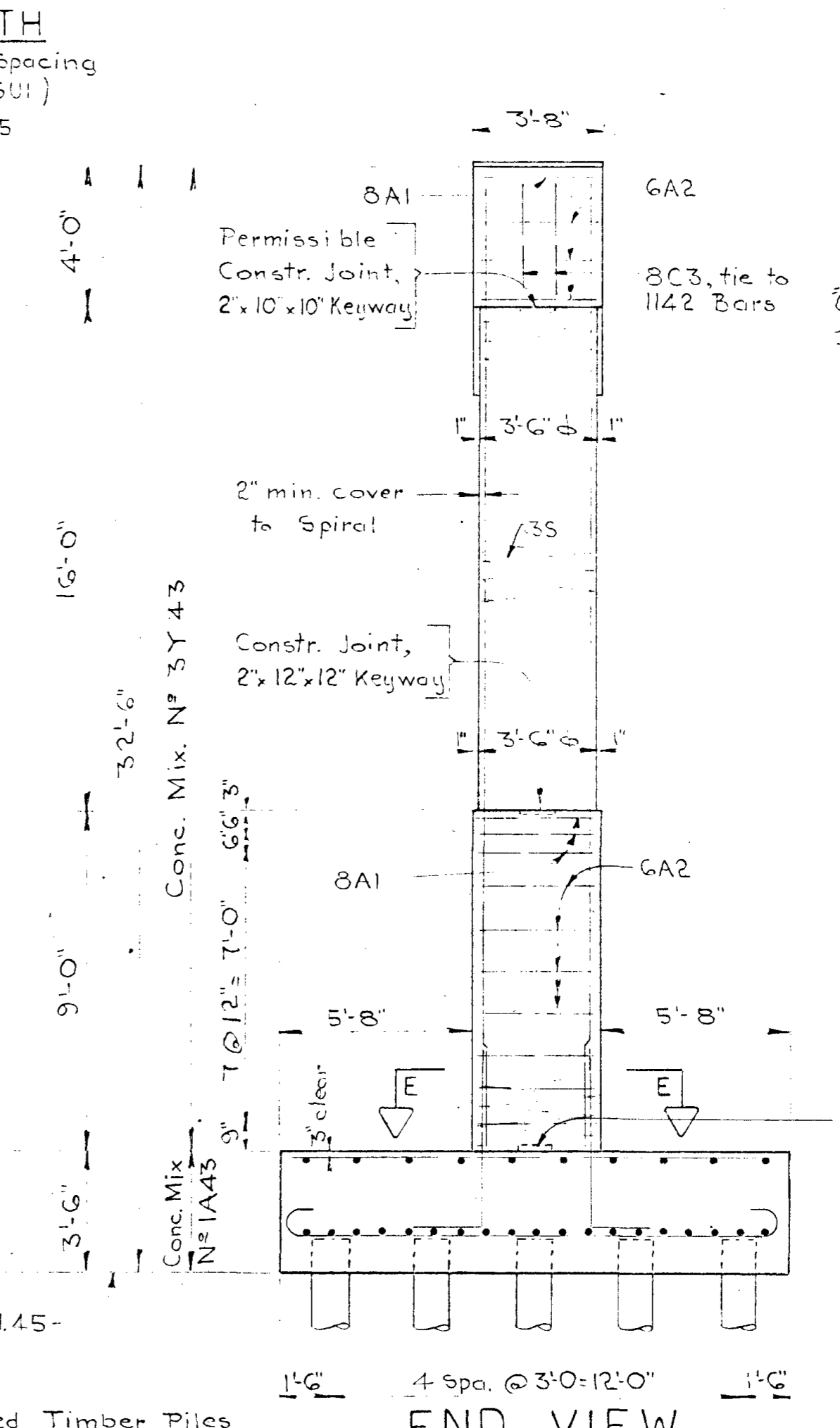
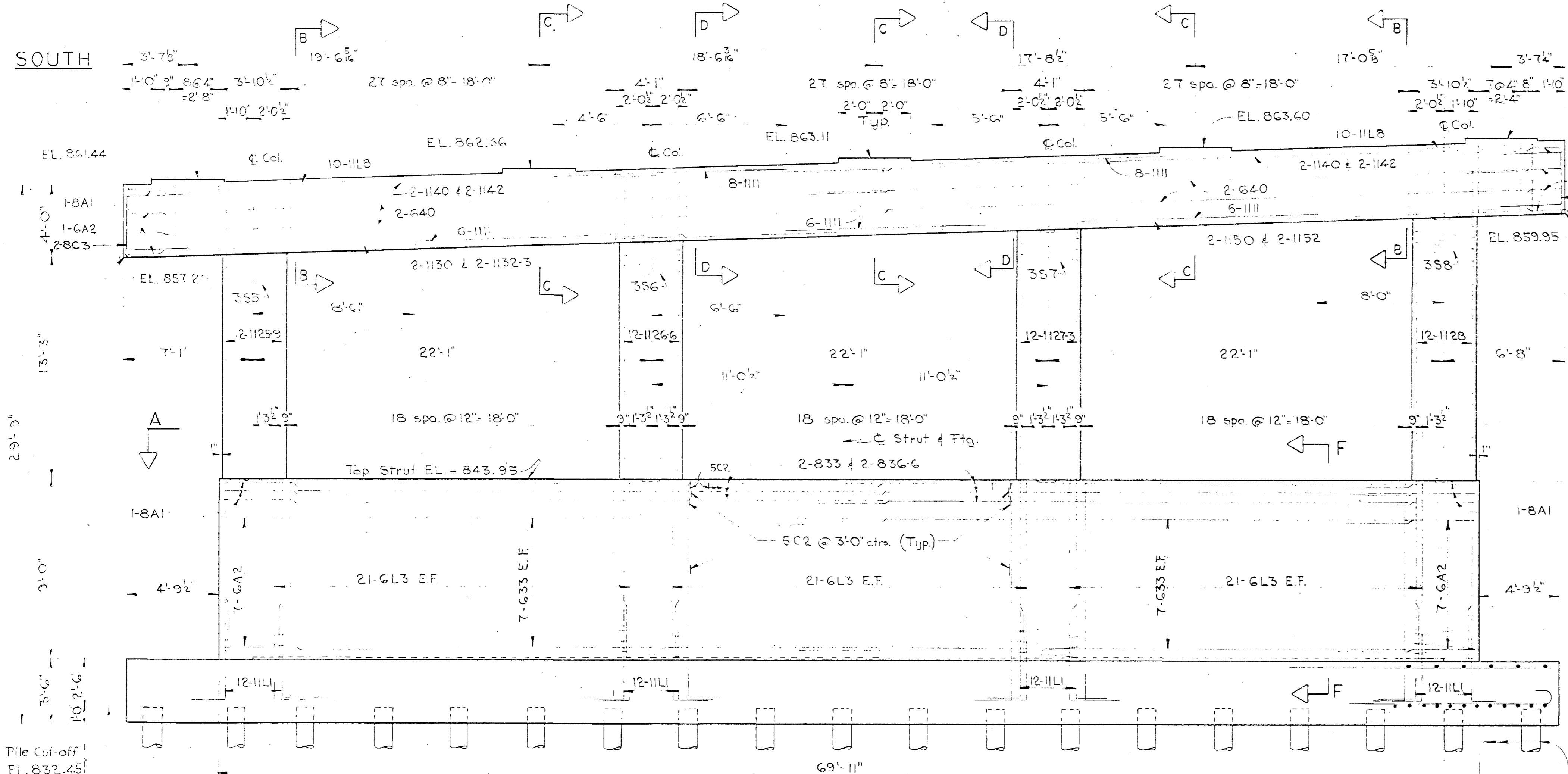
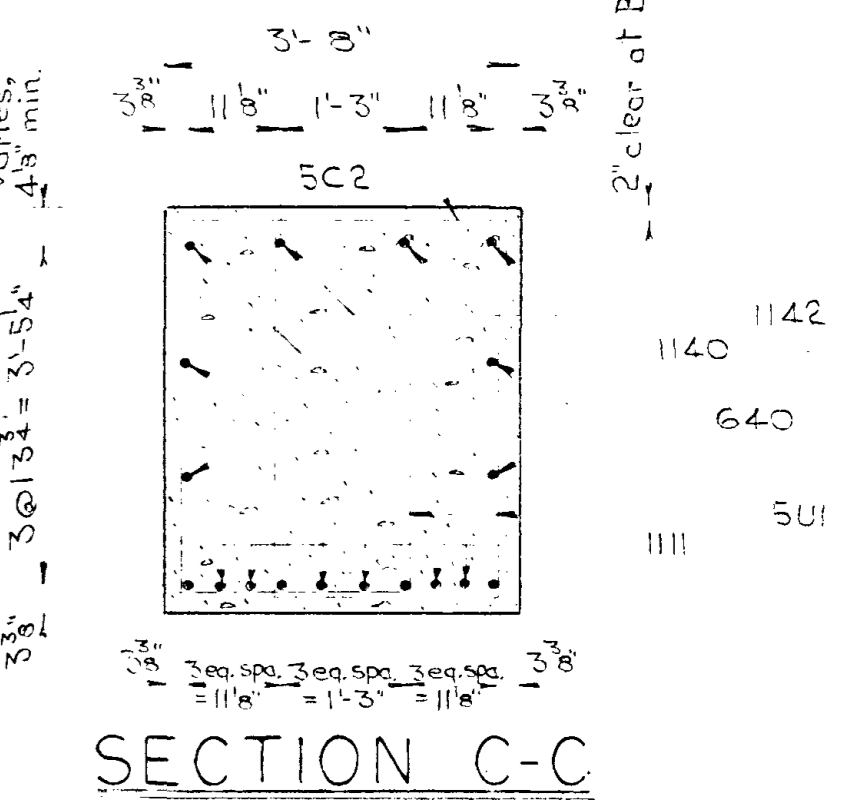
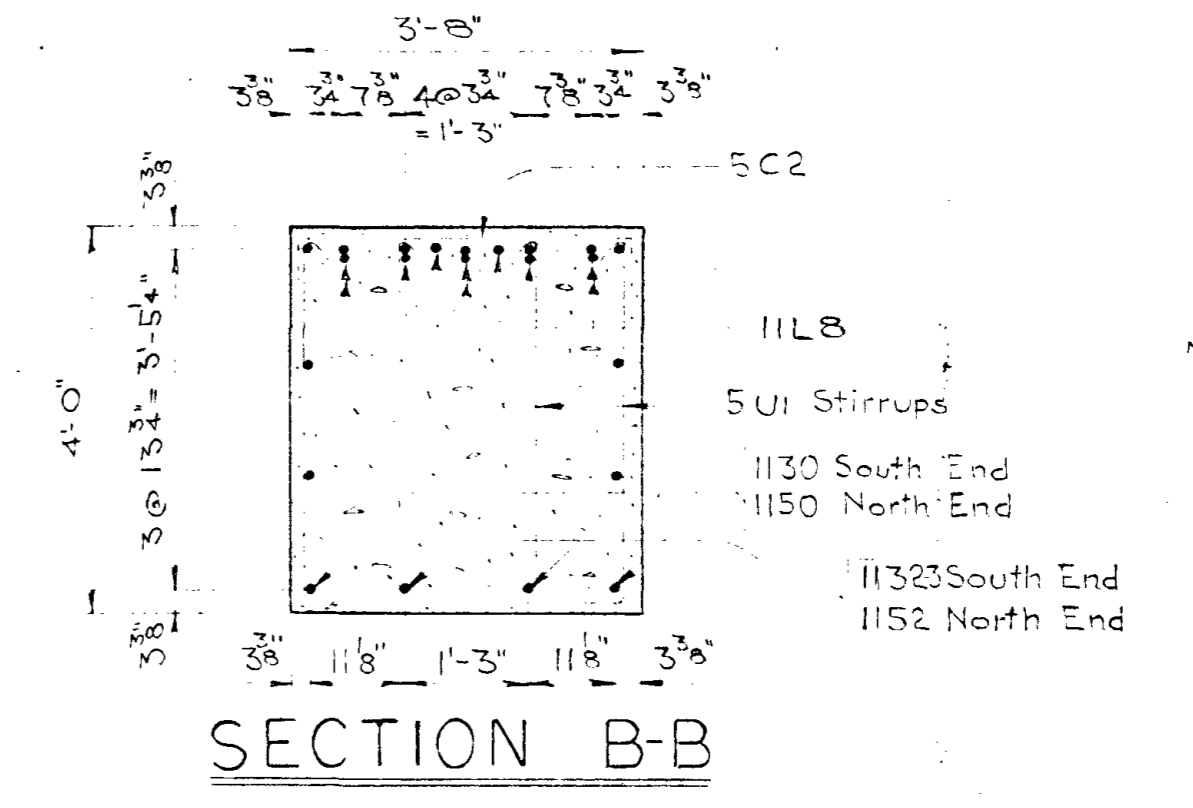
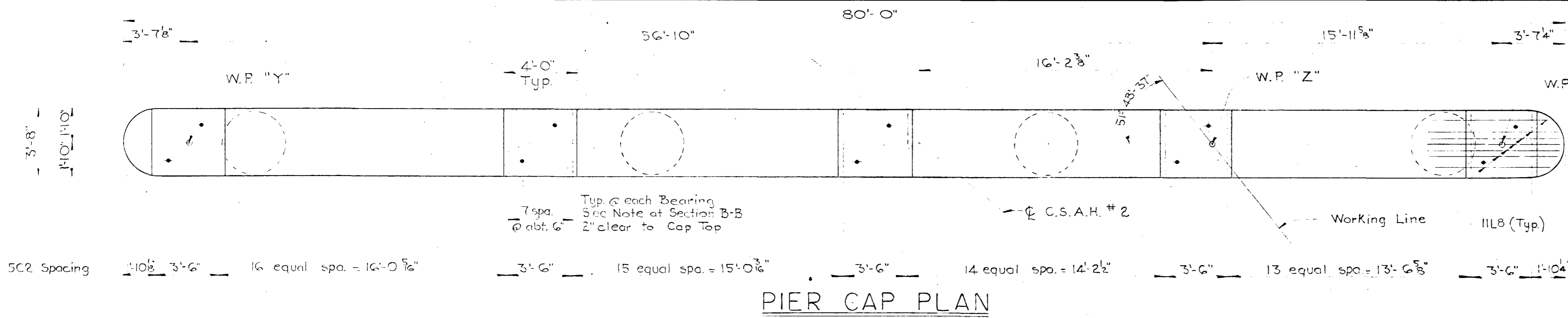
APPROVED: *B.A. Anderson*
 Asst. Vice President Engineering

OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

| REVISIONS | DES. KEY | DR. O.P. | CH. D.E.B. |
|----------------------|----------|----------|------------|
| Δ Elevations 10-6-72 | | | |

AUTHORITY: A.F.E. 72-746
 DATE: June 1972
 PLAN: Sheet 15 of 18
 289-6553-10

NOTE: Dimensions to top bars are approximate, reinforcing steel is to be 2" min. clear of 1/2" Anchor Bolts. See Table of Anchor Bolt Locations below.



| ANCHOR BOLT LOCATIONS | | | | |
|-----------------------|-------------|----------|----------|--|
| BEAM | ANGLE | X | Y | |
| 1 W.P. Y | 33° 8' 39" | 10' 8" | 12" | |
| 2 | 35° 25' 9" | 11' 6" | 11' 8" | |
| 3 | 37° 27' 51" | 11' 3" | 11' 3" | |
| 4 | 39° 19' 16" | 12' 1/2" | 10' 1/2" | |
| 5 W.P. AA | 41° 1' 13" | 12' 9" | 10' 1/2" | |

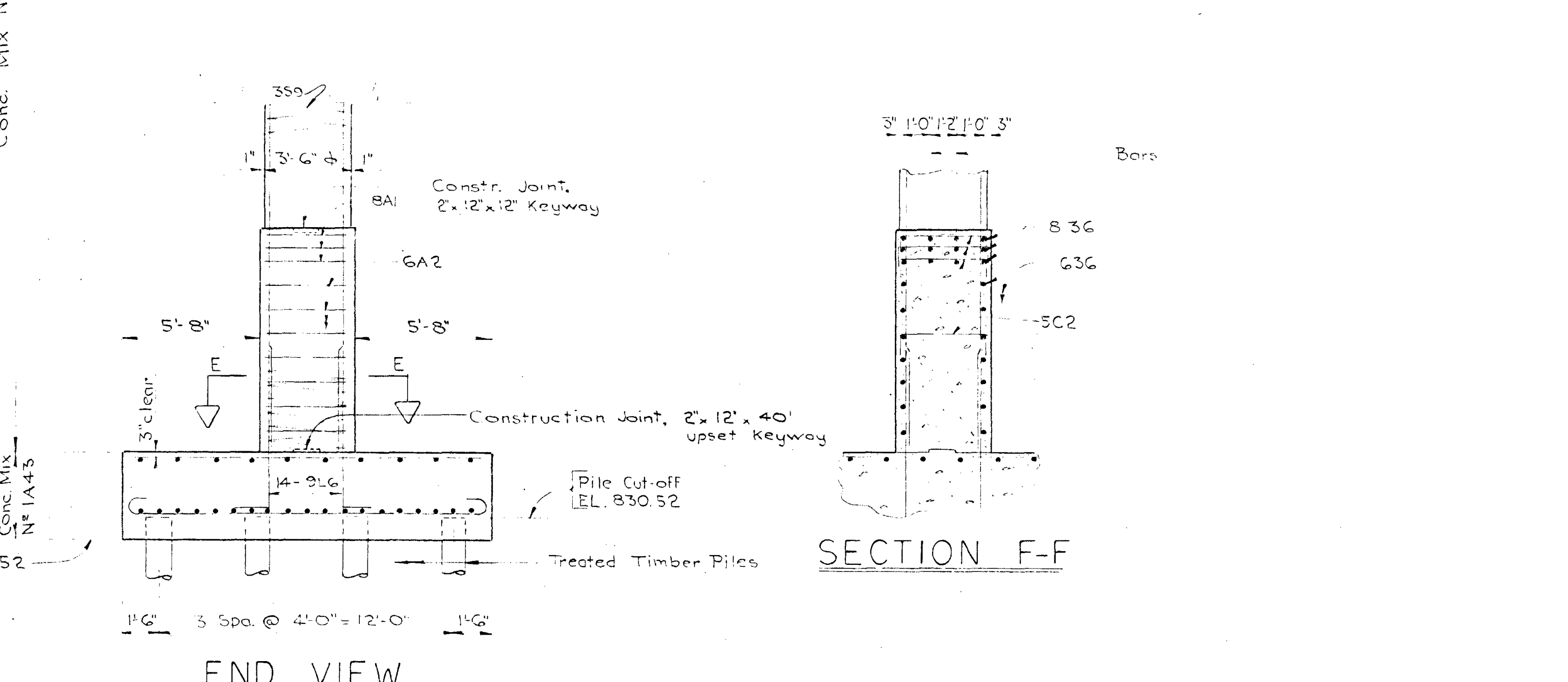
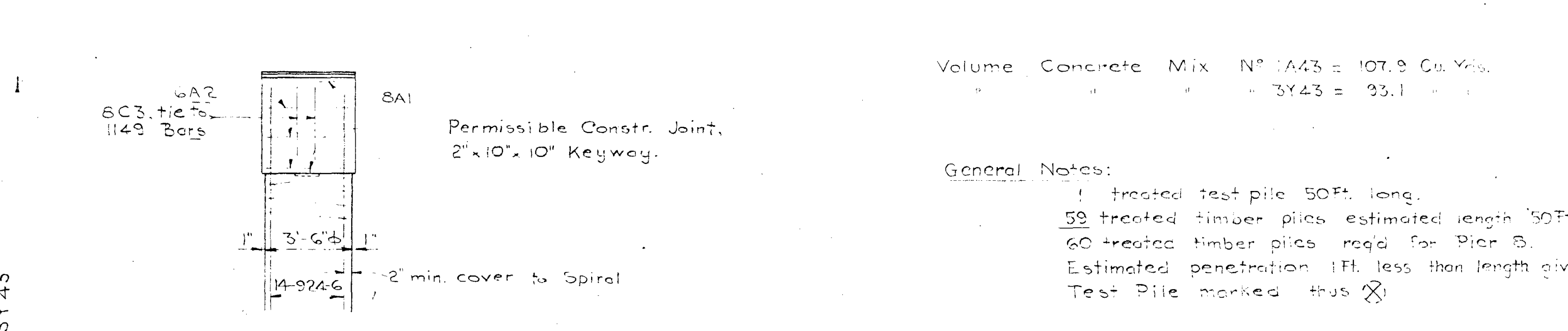
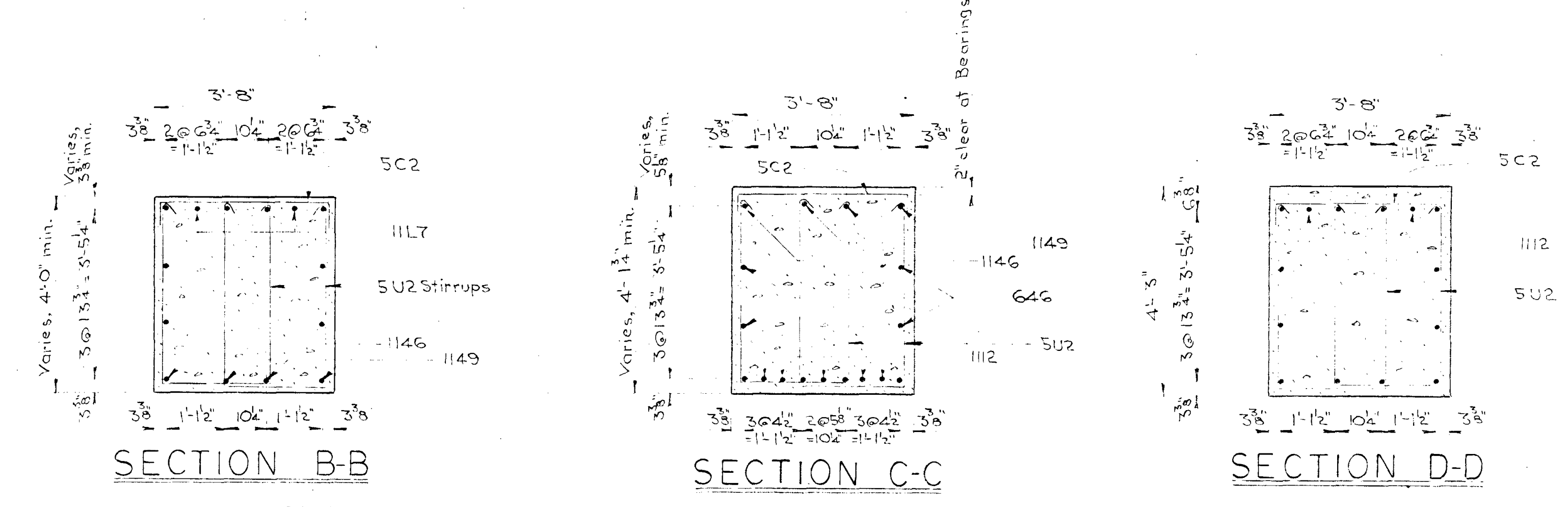
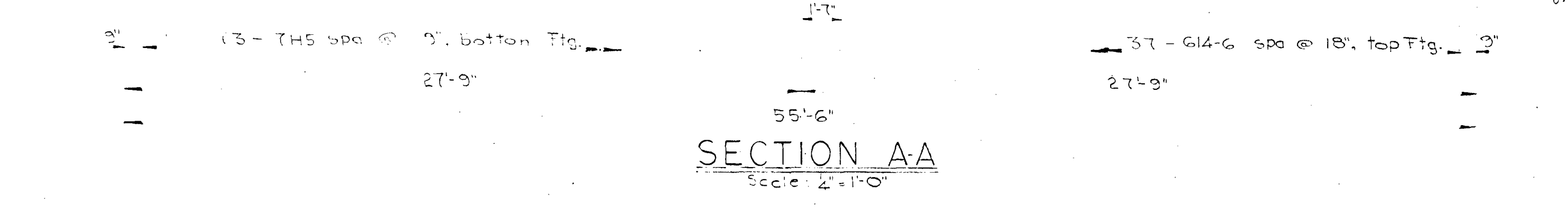
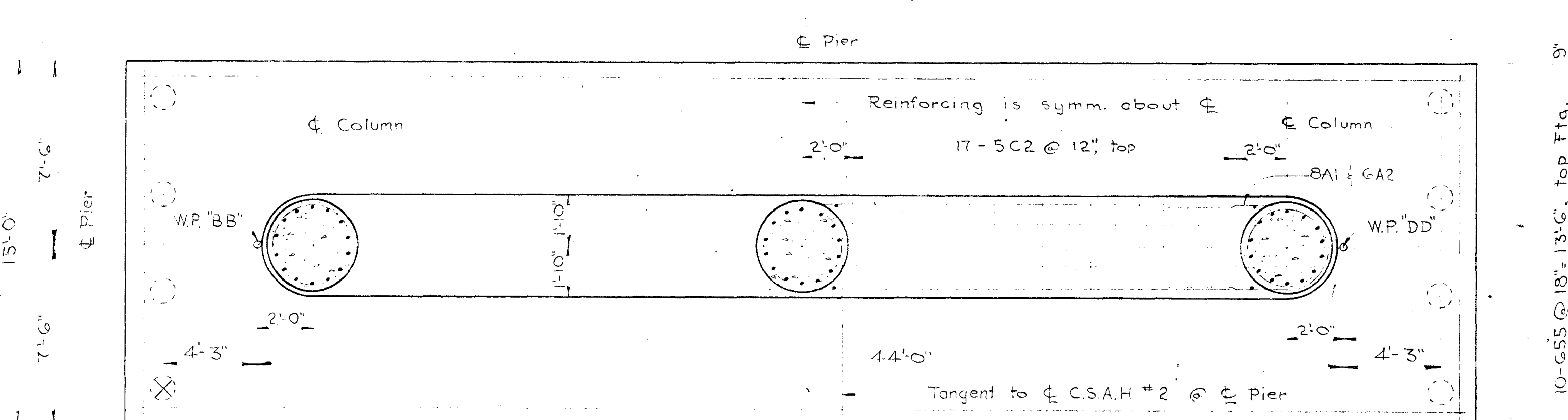
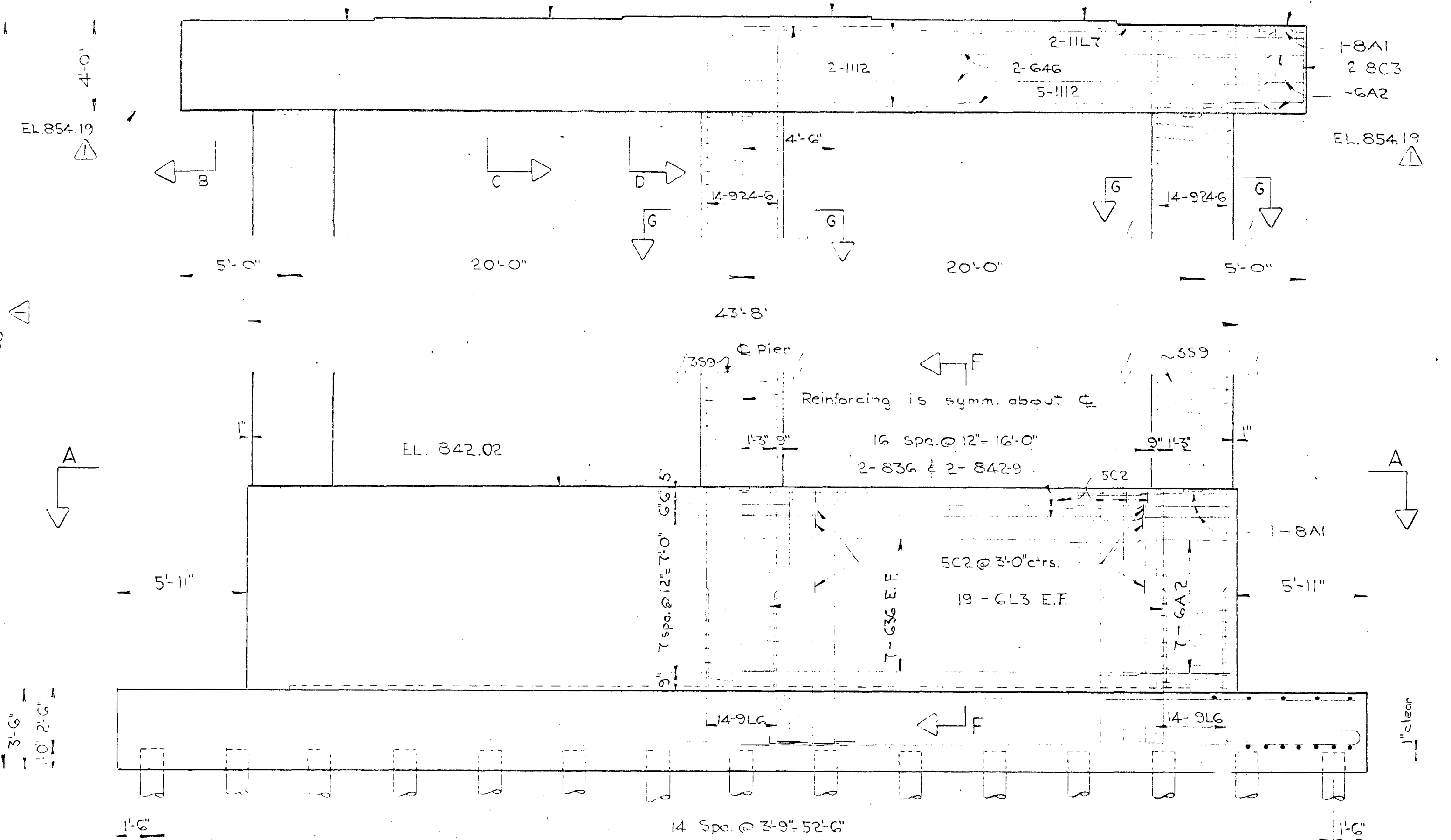
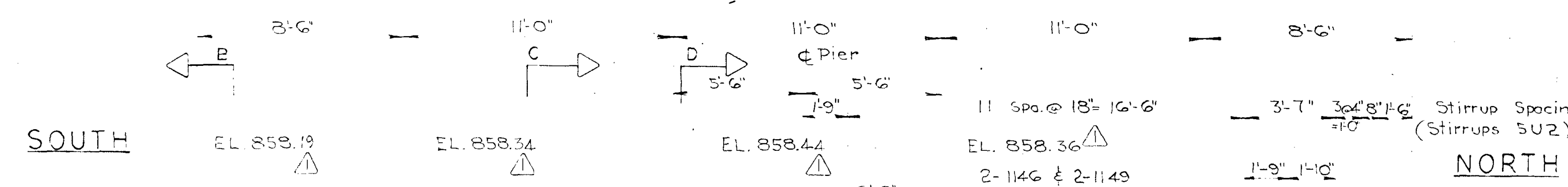
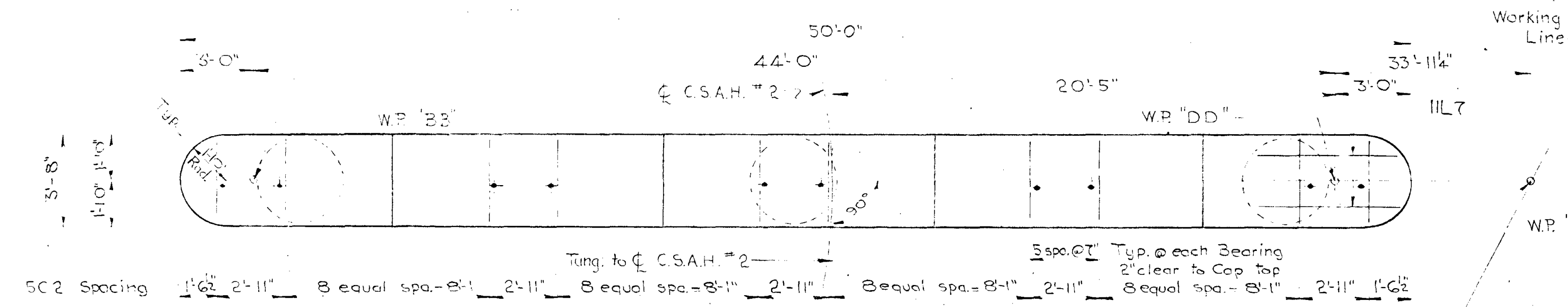
BURLINGTON NORTHERN INC.
MINNESOTA DIVISION
NORTHTOWN TO STAPLES
BRIDGE NO. 13.8
C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN
PIER NO. 7

RECOMMENDED: *H. C. Eberlein*
Director Bridge Engineering

APPROVED: *W. A. Anderson*
Asst. Vice President Engineering

OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

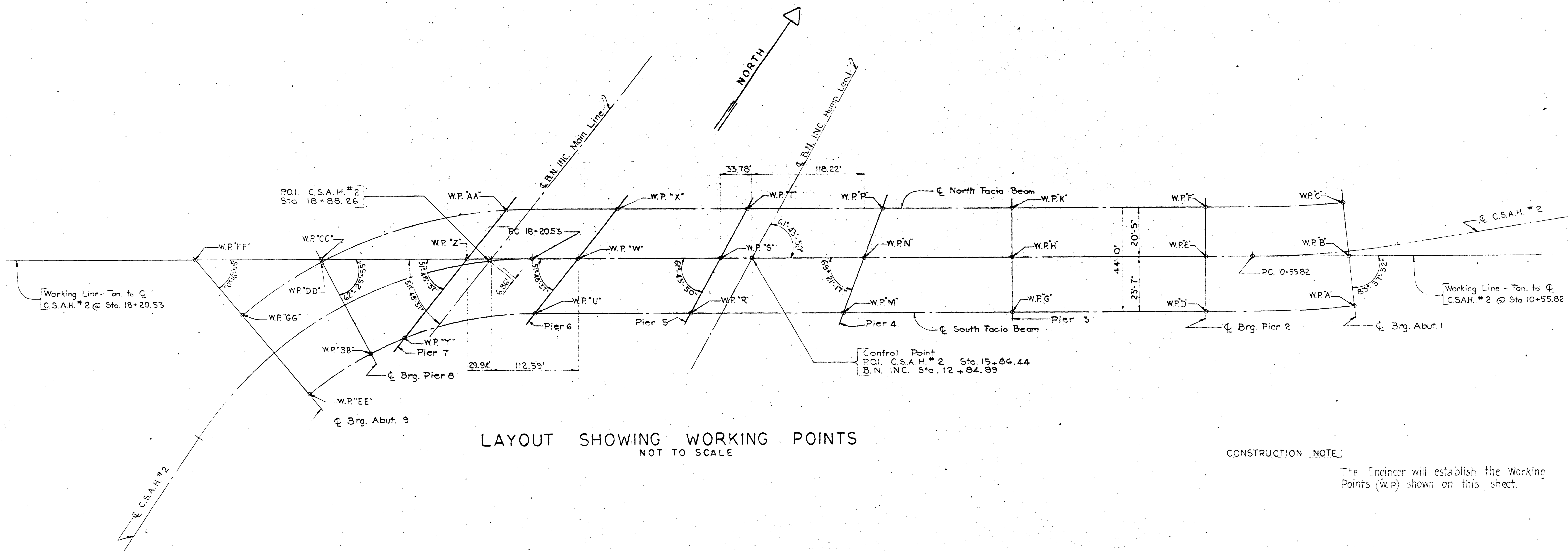
| REVISIONS | DES. KEB | DR. O.P. | CH. D.E., B. |
|--------------------------|----------|----------|--------------|
| AUTHORITY: A.F.E. 72-726 | | | |
| DATE: June 1972 | | | |
| PLAN: Sheet 16 of 18 | | | |
| 289-6553-11 | | | |



Volume Concrete Mix No. 1A43 = 107.9 Cu. Yds.
 3Y43 = 93.1

General Notes:
 1 treated test pile 50 Ft. long.
 59 treated timber piles estimated length 50 Ft.
 60 treated timber piles req'd for Pier B.
 Estimated penetration 1 Ft. less than length given.
 Test Pile marked thus ⊗

| | | |
|--------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------|
| BURLINGTON NORTHERN INC. | | |
| MINNESOTA DIVISION | | |
| NORTHTOWN TO STAPLES | | |
| BRIDGE NO. 13.8 | | |
| C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN | | |
| PIER NO. 8 | | |
| RECOMMENDED: <i>M. E. Eklund</i> Director Bridge Engineering | APPROVED: <i>Bob O'Connell</i> Asst. Vice President Engineering | |
| OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN. | | |
| REVISIONS | DES. DRC | DR. O.P. |
| | CH. KEB | |
| △ Elevations 10'-6"-72 | AUTHORITY: A.F.E. 72-746 | |
| | DATE: June 1972 | |
| | PLAN: Sheet 17 of 18 | |
| | 289-6553-12 | |



LAYOUT SHOWING WORKING POINTS
NOT TO SCALE

CONSTRUCTION NOTE:

The Engineer will establish the Working Points (W.P.) shown on this sheet.

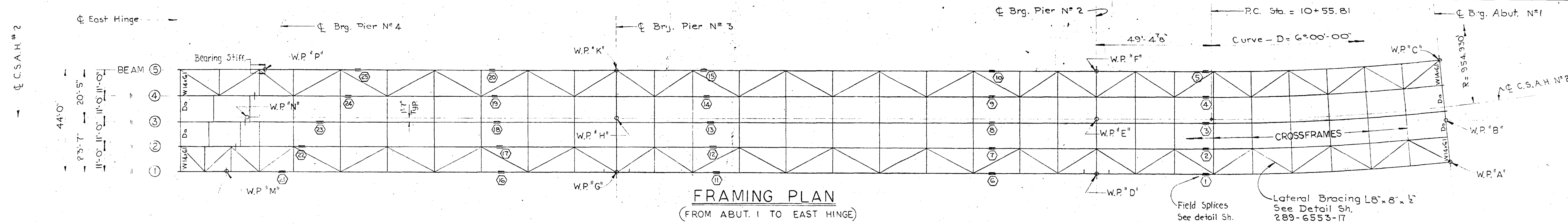
| POINT | STATION | DIMENSIONS BETWEEN WORKING POINTS | | | | | | | | | | | | | | | | | ELEVATIONS | | | POINT | | | | | | | | | | | | | | | | | | | | | |
|-------|----------|-----------------------------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|---|---|---|------------|---|---|-------|----|----|----|----|----|----|----|----|----|----|-------------|-------------------------|-------------|--------|--------|--------|--------|--------|--------|--------|----|
| | | A | B | C | D | E | F | G | H | K | M | N | P | R | S | T | U | W | X | Y | Z | | AA | BB | CC | DD | EE | FF | GG | HH | KK | MM | TOP OF SLAB | TOP OF SLAB TO BR. SEAT | BRIDGE SEAT | | | | | | | | |
| A | 9+56.44 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 861.32 | 8.64 | 852.68 | A | | | | | |
| B | 9+56.46 | 18.39 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 861.34 | 8.58 | 852.76 | B | | | | |
| C | 9+56.50 | 44.00 | 25.61 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 868.75 | 10.46 | 858.29 | C | | | | |
| D | 11+05.22 | 151.14 | 150.97 | 154.42 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 868.75 | 10.46 | 858.29 | D | | | |
| E | 11+05.22 | 152.15 | 149.12 | 148.62 | 23.58 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 868.77 | 10.42 | 858.35 | E | | | |
| F | 11+05.22 | 155.93 | 150.51 | 146.51 | 44.00 | 20.42 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 876.47 | 10.75 | 865.72 | F | | | |
| G | 13+10.22 | 356.09 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 876.50 | 10.68 | 865.82 | G | | | |
| H | 13+10.22 | | 354.12 | | 206.35 | 205.00 | 206.01 | 23.58 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 879.31 | 10.60 | 868.71 | H | | | |
| K | 13+10.22 | | | | 209.67 | 206.01 | 205.00 | 44.00 | 20.42 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 879.31 | 10.60 | 868.71 | K | | |
| M | 14+77.11 | 522.96 | | | | | | 166.89 | 168.54 | 172.59 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 879.39 | 8.77 | 870.62 | M | | |
| N | 14+68.22 | | 512.12 | | | | | 159.75 | 158.00 | 159.31 | 25.20 | | | | | | | | | | | | | | | | | | | | | | | | | | | 879.19 | 10.63 | 868.56 | N | | |
| P | 14+60.53 | | | | | | | 156.62 | 151.69 | 150.31 | 47.02 | 21.82 | | | | | | | | | | | | | | | | | | | | | | | | | | 879.17 | 8.80 | 870.37 | P | | |
| R | 16+32.90 | 678.75 | | | | | | | | | 155.80 | 166.36 | 177.90 | | | | | | | | | | | | | | | | | | | | | | | | | | 879.17 | 8.80 | 870.37 | R | |
| S | 16+20.22 | | 664.12 | | | | | | | | 145.04 | 152.00 | 160.99 | 26.78 | | | | | | | | | | | | | | | | | | | | | | | | | 879.39 | 8.77 | 870.62 | S | |
| T | 16+09.24 | | | | | | | | | | 139.27 | 142.49 | 148.71 | 49.96 | 23.18 | | | | | | | | | | | | | | | | | | | | | | | | 879.39 | 8.77 | 870.62 | T | |
| U | 17+89.69 | 835.54 | | | | | | | | | 156.79 | 171.10 | 185.74 | | | | | | | | | | | | | | | | | | | | | | | | | | 876.30 | 9.00 | 867.30 | U | |
| W | 17+71.14 | | 815.04 | | | | | | | | 140.24 | 150.92 | 165.18 | 30.01 | | | | | | | | | | | | | | | | | | | | | | | | | 877.19 | 8.84 | 868.35 | W | |
| X | 17+55.08 | | | | | | | | | | 129.86 | 136.40 | 145.84 | 55.98 | 25.98 | | | | | | | | | | | | | | | | | | | | | | | 870.15 | 8.71 | 861.44 | X | | |
| Y | 19+58.79 | 994.99 | | | | | | | | | 160.51 | 183.20 | 204.37 | | | | | | | | | | | | | | | | | | | | | | | | | | 870.15 | 8.71 | 861.44 | Y | |
| Z | 19+12.22 | | 957.57 | | | | | | | | 126.20 | 142.53 | 159.90 | 56.83 | | | | | | | | | | | | | | | | | | | | | | | | | 872.65 | 8.70 | 863.95 | Z | |
| AA | 19+00.45 | | | | | | | | | | 119.69 | 133.25 | 148.93 | 72.80 | 15.97 | | | | | | | | | | | | | | | | | | | | | | | | 872.65 | 8.70 | 863.95 | AA | |
| BB | 20+24.73 | 1053.08 | | | | | | | | | 62.21 | 115.34 | 130.83 | | | | | | | | | | | | | | | | | | | | | | | | | | 866.93 | 8.74 | 858.19 | BB | |
| CC | 20+24.73 | | 1086.00 | | | | | | | | 103.43 | 128.43 | 138.87 | 77.94 | | | | | | | | | | | | | | | | | | | | | | | | | 866.95 | 8.76 | 858.19 | CC | |
| DD | 20+24.73 | | | | | | | | | | 78.94 | 116.66 | 129.80 | 44.00 | 33.94 | | | | | | | | | | | | | | | | | | | | | | | | 862.50 | 8.55 | 853.95 | DD | |
| EE | 21+13.41 | 1125.71 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 862.51 | 8.54 | 853.97 | EE |
| FF | 21+13.77 | | 1215.37 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 862.51 | 8.54 | 853.97 | FF |
| GG | 21+13.54 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 862.51 | 8.54 | 853.97 | GG |
| HH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 862.51 | 8.54 | 853.97 | HH |
| KK | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 862.51 | 8.54 | 853.97 | KK |
| MM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 862.51 | 8.54 | 853.97 | MM |

BURLINGTON NORTHERN INC.
MINNESOTA DIVISION
NORTHTOWN TO STAPLES
BRIDGE NO. 13.8
C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN
BRIDGE LAYOUT

RECOMMENDED: *[Signature]* APPROVED: *[Signature]*
DIRECTOR BRIDGE ENGINEERING ASST. VICE PRESIDENT ENGINEERING
OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

| REVISIONS | DES. D.E.B. | DR. O.P. | CH. KEB |
|-----------|-------------|----------|---------|
| | | | |

AUTHORITY: A.F.E. 72-746
DATE: November 1972
PLAN: 289-6553-15

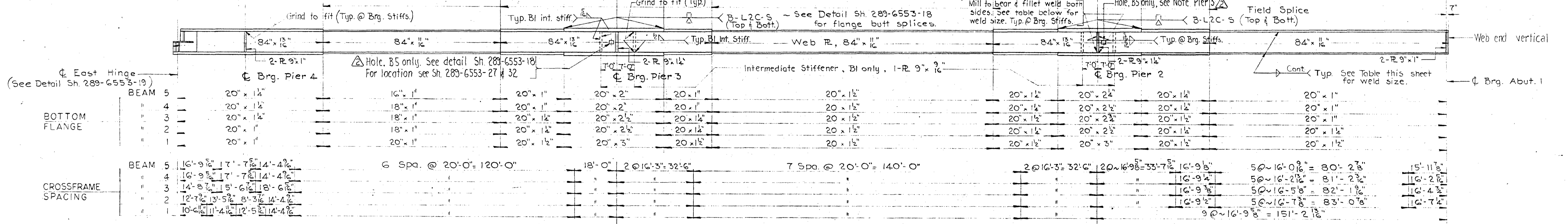


| | | |
|-------------|--------|-------------|
| BEAM LENGTH | BEAM 5 | 540'-2 3/4" |
| | " 4 | 541'-4 1/4" |
| | " 3 | 542'-6 1/8" |
| | " 2 | 543'-8 1/4" |
| | " 1 | 544'-10" |
| SPAN LENGTH | BEAM 5 | 38'-3 1/2" |
| | " 4 | 34'-1 3/4" |
| | " 3 | 30'-0" |
| | " 2 | 25'-10 1/4" |
| | " 1 | 21'-8 3/8" |

| | | | | | | | | | | | | | | | |
|--------------------|--------|-------------|------------|--------|---------------------|--------|-------------|--------|--------|----------------------|--------|--------|------------|--------|---------------------|
| SHEAR STUD SPACING | BEAM 5 | 38'-3 1/2" | 42'-3 1/8" | 6 @ 6" | 32 @ 1'-6" = 48'-0" | 6 @ 6" | 54'-0" | 35'-9" | 7 @ 6" | 68 @ 1'-9" = 119'-0" | 7 @ 6" | 43'-3" | 50'-4 1/2" | 6 @ 6" | 53 @ 1'-9" = 92'-9" |
| | " 4 | 34'-1 3/4" | 36'-6" | " | 40 @ 1'-6" = 60'-0" | " | 51'-11 1/2" | 38'-3" | 6 @ 6" | 92 @ 1'-3" = 115'-0" | 6 @ 6" | 45'-9" | 52'-3 1/2" | 7 @ 6" | 61 @ 1'-6" = 91'-6" |
| | " 3 | 30'-0" | 32'-6" | " | 45 @ 1'-6" = 67'-6" | " | 52'-7 1/2" | 42'-0" | " | 88 @ 1'-3" = 110'-0" | " | 47'-0" | 52'-11" | 7 @ 6" | 62 @ 1'-6" = 93'-0" |
| | " 2 | 25'-10 1/4" | 27'-6" | " | 52 @ 1'-6" = 78'-0" | " | 51'-2 3/8" | 43'-6" | " | 88 @ 1'-3" = 110'-0" | " | 45'-6" | 49'-0 1/2" | 6 @ 6" | 65 @ 1'-6" = 97'-6" |
| | " 1 | 21'-8 3/8" | 23'-0" | " | 49 @ 1'-9" = 85'-9" | 7 @ 6" | 51'-7 3/8" | 46'-6" | " | 70 @ 1'-6" = 105'-0" | " | 47'-6" | 49'-8 1/2" | 7 @ 6" | 65 @ 1'-6" = 97'-6" |

| | | | | | | | | | | | |
|------------|--------|--------------|----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| TOP FLANGE | BEAM 5 | 20" x 1 1/2" | 16" x 1" | 20" x 1" | 20" x 2" | 20" x 1" | 16" x 1" | 20" x 1 1/2" | 20" x 2 1/2" | 20" x 1 1/2" | 16" x 1" |
| | " 4 | 20" x 1 1/2" | 18" x 1" | 20" x 1" | 20" x 2" | 20" x 1" | 20" x 1 1/2" | 20" x 1 1/2" | 20" x 2 1/2" | 20" x 1 1/2" | 20" x 1 1/2" |
| | " 3 | 20" x 1 1/2" | 18" x 1" | 20" x 1 1/2" | 20" x 2 1/2" | 20" x 1 1/2" | 20" x 1 1/2" | 20" x 1 1/2" | 20" x 2 1/2" | 20" x 1 1/2" | 20" x 1 1/2" |
| | " 2 | 20" x 1 1/2" | 18" x 1" | 20" x 1 1/2" | 20" x 2 1/2" | 20" x 1 1/2" | 20" x 1 1/2" | 20" x 1 1/2" | 20" x 2 1/2" | 20" x 1 1/2" | 20" x 1 1/2" |
| | " 1 | 20" x 1 1/2" | 16" x 1" | 20" x 1 1/2" | 20" x 3" | 20" x 1 1/2" | 20" x 1 1/2" | 20" x 1 1/2" | 20" x 3" | 20" x 1 1/2" | 20" x 1 1/2" |

| | | | | | | | | | | | | | | |
|--------------|--------|-------------|--------|-------------|--------|--------|--------|--------|---------|--------|--------|--------|--------|-------------|
| PLATE LENGTH | BEAM 5 | 38'-3 1/2" | 40'-0" | 57'-3 1/2" | 28'-0" | 25'-0" | 19'-0" | 18'-0" | 123'-3" | 23'-9" | 21'-0" | 23'-0" | 23'-9" | 99'-10 1/2" |
| | " 4 | 34'-1 3/4" | 40'-0" | 62'-5 1/2" | 27'-6" | 24'-6" | 20'-0" | 18'-6" | 121'-9" | " | " | " | " | 101'-0 1/2" |
| | " 3 | 30'-0" | 32'-0" | 75'-7 1/2" | 27'-0" | 24'-0" | 21'-0" | 19'-0" | 120'-3" | " | " | " | " | 102'-2" |
| | " 2 | 25'-10 1/4" | 28'-0" | 84'-8 3/8" | 26'-6" | 23'-6" | 22'-0" | 19'-6" | 118'-9" | " | " | " | " | 103'-3 1/2" |
| | " 1 | 21'-8 3/8" | 24'-0" | 93'-10 5/8" | 26'-0" | 23'-0" | 20'-0" | 17'-3" | 117'-3" | " | " | " | " | 104'-5 1/2" |



STRUCTURAL STEEL NOTES:

All girder lengths, stud spacings, etc are horizontally projected dimensions @ 45°.

All steel for structural items shall comply with M.H.D. 3309 unless otherwise noted.

Welding shall conform to latest AWS. Specifications for Welded Highway and Railway Bridges, and all weld metal must be equivalent to the base material in strength, corrosion resistance, and weathered appearance.

Field connections shall be made with High Strength Bolts, except as noted. Bolts shall comply with A.S.T.M. A 325-70a, type 3, and shall have one hardened washer under the turned element.

Open holes shall be 1/4" unless noted.

Cast Steel shall be A.S.T.M. A27 Grade 70-36, fully annealed.

Full assembly raming will be required as per M.H.D. 2471. 3E1d

Web and Flange Plates shall be furnished in available mill lengths. Location of additional splices is subject to approval of the engineer, but shall be a minimum of 1'-0" from stiffeners or other splices. Splices shall be full butt welds using low hydrogen process or equal and shall be ground flush.

Flange Plates for girders shall be cut to the proper curvature before welding.

Radiographic inspection of full penetration welds req'd per M.H.D. 2471.3J.

BEAM ELEVATION

All lengths & spacings are horizontally projected dimensions. Crossframe Stiffeners not shown.

FILLET WELD SIZE TABLE OF CONT. FLANGE TO WEB AND STIFF. TO FLANGE

| FLANGE THICKNESS | MIN. FILLET WELD SIZE |
|------------------|-----------------------|
| 3/4" to 1 1/2" | 5/16" |
| 1 1/2" to 2 1/2" | 3/8" |
| 2 1/2" to 6" | 1/2" |

NOTES:

~ Indicates approximate dimension.

See Sh. 289-6553-18 for Stud Details & Note.

See Sh. 289-6553-21, 35 & 36 for Bearing Sole Plates.

All Bearing Stiffeners shall be vertical except @ hinges. All intermediate stiffeners to be perpendicular to flange.

BURLINGTON NORTHERN INC.
MINNESOTA DIVISION
NORTHTOWN TO STAPLES
BRIDGE NO. 13.8
C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN

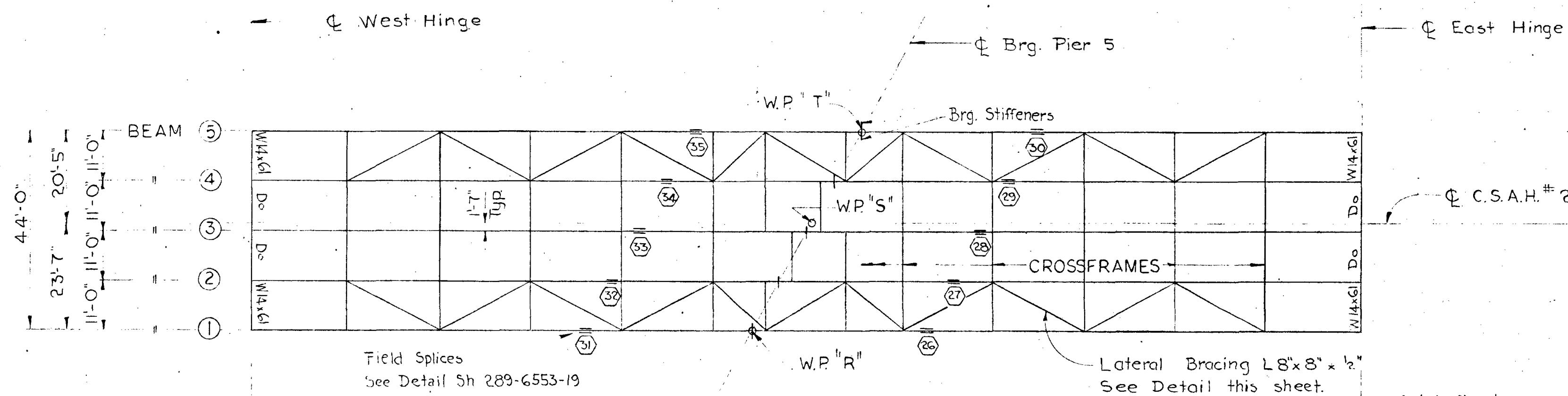
FRAMING PLAN & BEAM DETAILS

RECOMMENDED: *M.E. Ebbm* Director Bridge Engineering
APPROVED: *R.A. Anderson* Asst. Vice President Engineering

OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

| REVISIONS | DES. KEB | DR. O.P. | CH. D.E.B. |
|-------------------------------------------|----------|----------|------------|
| Δ 12-5-72 Casting Spec. | | | |
| Δ 1-17-73 Stiffener notes & BS Web Reinf. | | | |

AUTHORITY: 72-746
DATE: November 1972
PLAN:
289-6553-16



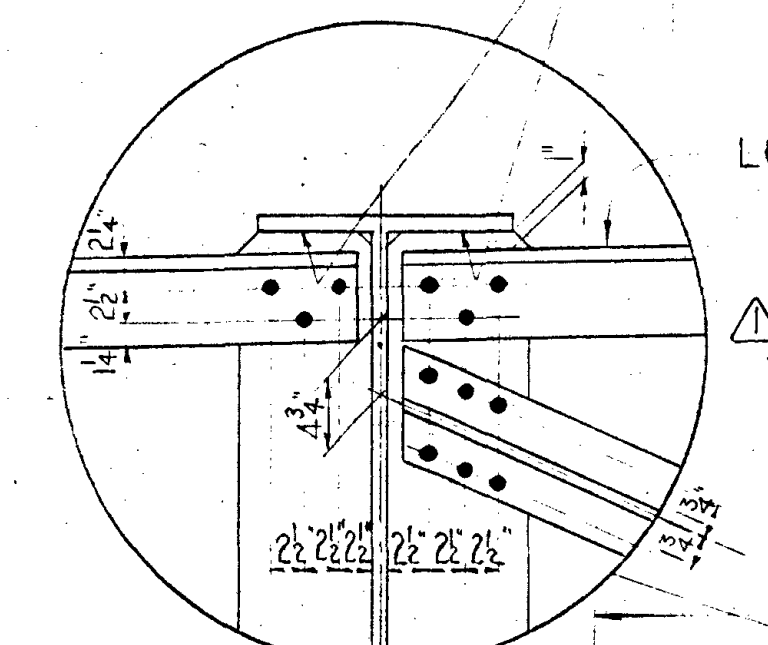
FRAMING PLAN
(FROM EAST TO WEST HINGE)

| | | | | | | | | | | | |
|--------------------|--------|--------------------------|---------------------|--------------|------------|-------------|--------------------------|---------------------|--------|--|--|
| BEAM LENGTH | BEAM 5 | 243'-6 1/2" | | | | | | | | | |
| | 4 | | | | | | | | | | |
| | 3 | | | | | | | | | | |
| | 2 | | | | | | | | | | |
| | 1 | | | | | | | | | | |
| SPAN LENGTH | BEAM 5 | 133'-1 1/2" | | | | | 110'-5 1/2" | | | | |
| | 4 | 127'-2 3/4" | | | | | 116'-4 1/2" | | | | |
| | 3 | 121'-3 3/4" | | | | | 122'-3 1/2" | | | | |
| | 2 | 115'-4 1/2" | | | | | 128'-2" | | | | |
| | 1 | 109'-5 1/2" | | | | | 134'-1" | | | | |
| SHEAR STUD SPACING | BEAM 5 | 6 @ 6" | 46 @ 2'-0" = 92'-0" | 6 @ 6" | 35'-1 1/2" | 41'-11 1/2" | 7 @ 6" | 31 @ 2'-0" = 62'-0" | 6 @ 6" | | |
| | 4 | 7 @ 6" | 56 @ 1'-6" = 84'-0" | 7 @ 6" | 36'-2 3/4" | 38'-7 1/2" | 6 @ 6" | 41 @ 1'-9" = 71'-9" | 6 @ 6" | | |
| | 3 | 6 @ 6" | 52 @ 1'-6" = 78'-0" | 6 @ 6" | 37'-3 3/4" | 35'-3 1/2" | 6 @ 6" | 54 @ 1'-6" = 81'-0" | 6 @ 6" | | |
| | 2 | 5 @ 6" | 47 @ 1'-6" = 70'-6" | 6 @ 6" | 39'-4 1/2" | 34'-2" | 7 @ 6" | 58 @ 1'-6" = 87'-0" | 7 @ 6" | | |
| | 1 | 6 @ 6" | 34 @ 1'-9" = 59'-6" | 7 @ 6" | 43'-5 1/2" | 34'-4" | 7 @ 6" | 53 @ 1'-9" = 92'-9" | 7 @ 6" | | |
| TOP FLANGE | BEAM 5 | 14" x 3" | 18" x 1" | 20" x 1 1/2" | 18" x 1" | 14" x 3" | | | | | |
| | 4 | | 16" x 1" | | 16" x 1" | | | | | | |
| | 3 | | 16" x 1" | | 16" x 1" | | | | | | |
| | 2 | | 18" x 1" | | 18" x 1" | | | | | | |
| | 1 | | 20" x 1" | 20" x 1 1/2" | 20" x 1" | | | | | | |
| PLATE LENGTH | BEAM 5 | 95'-9 1/2" | 20'-4" | 17'-0" | 17'-0" | 21'-3 1/2" | 72'-11 3/4" | | | | |
| | 4 | 89'-10 1/2" | | | | | 78'-0 1/2" | | | | |
| | 3 | 85'-11 1/2" | | | | | 83'-11 1/2" | | | | |
| | 2 | 78'-0 1/2" | | | | | 89'-10 1/2" | | | | |
| | 1 | 72'-1 1/2" | | | | | 95'-9 1/2" | | | | |
| BOTTOM FLANGE | BEAM 5 | 16" x 7 1/2" | 18" x 1" | 20" x 1 1/2" | 18" x 1" | 14" x 3" | | | | | |
| | 4 | 16" x 7 1/2" | 16" x 1" | | 16" x 1" | | | | | | |
| | 3 | 14" x 3" | 16" x 1" | | 16" x 1" | | | | | | |
| | 2 | 14" x 3" | 18" x 1" | | 18" x 1" | | | | | | |
| | 1 | 14" x 3" | 20" x 1" | 20" x 1 1/2" | 20" x 1" | 18" x 1" | | | | | |
| CROSSFRAME SPACING | BEAM 5 | 5 Spa @ 20'-0" = 100'-0" | | 12'-5 1/2" | 17'-8 1/2" | 13'-4 1/2" | 5 Spa @ 20'-0" = 100'-0" | | | | |
| | 4 | | | 12'-5 1/2" | 17'-8 1/2" | 13'-4 1/2" | | | | | |
| | 3 | | | 12'-5 1/2" | 17'-8 1/2" | 13'-4 1/2" | | | | | |
| | 2 | | | 18'-4 1/2" | 11'-9 1/2" | 13'-4 1/2" | | | | | |
| | 1 | | | 12'-5 1/2" | 17'-8 1/2" | 13'-4 1/2" | | | | | |

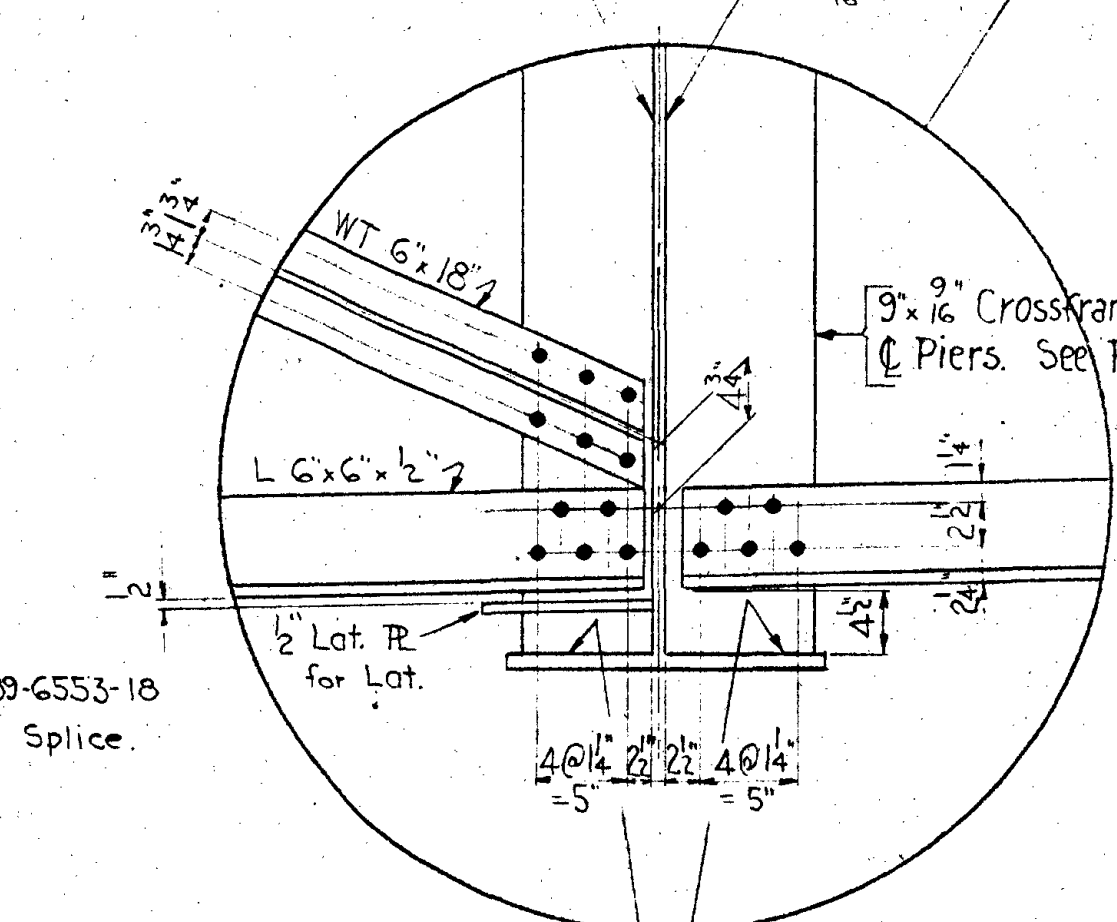
BEAM ELEVATION

(All lengths & spacings are horizontally projected dimensions. Crossframe stiffeners not shown.)

Grind to fit where beams are continuous over Piers (Area 'A') Fillet weld both sides at other points. See table Sh. 289-6553-16 for weld size.



Use outside stiff only at C of all bearings. See Framing Plans for size & locations.

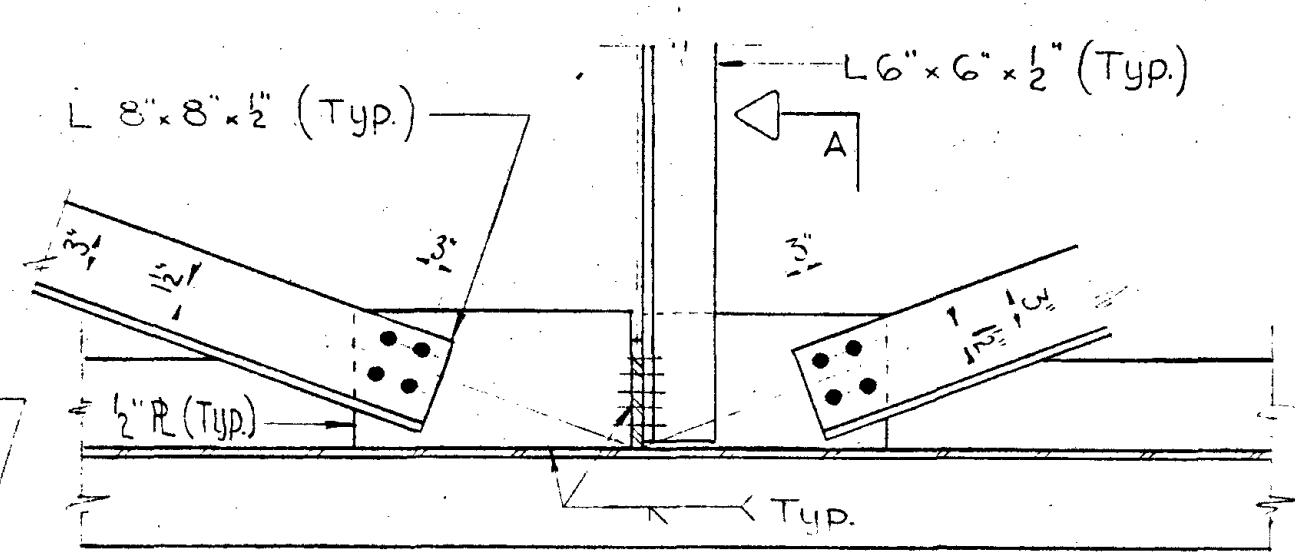


STEEL DETAILS

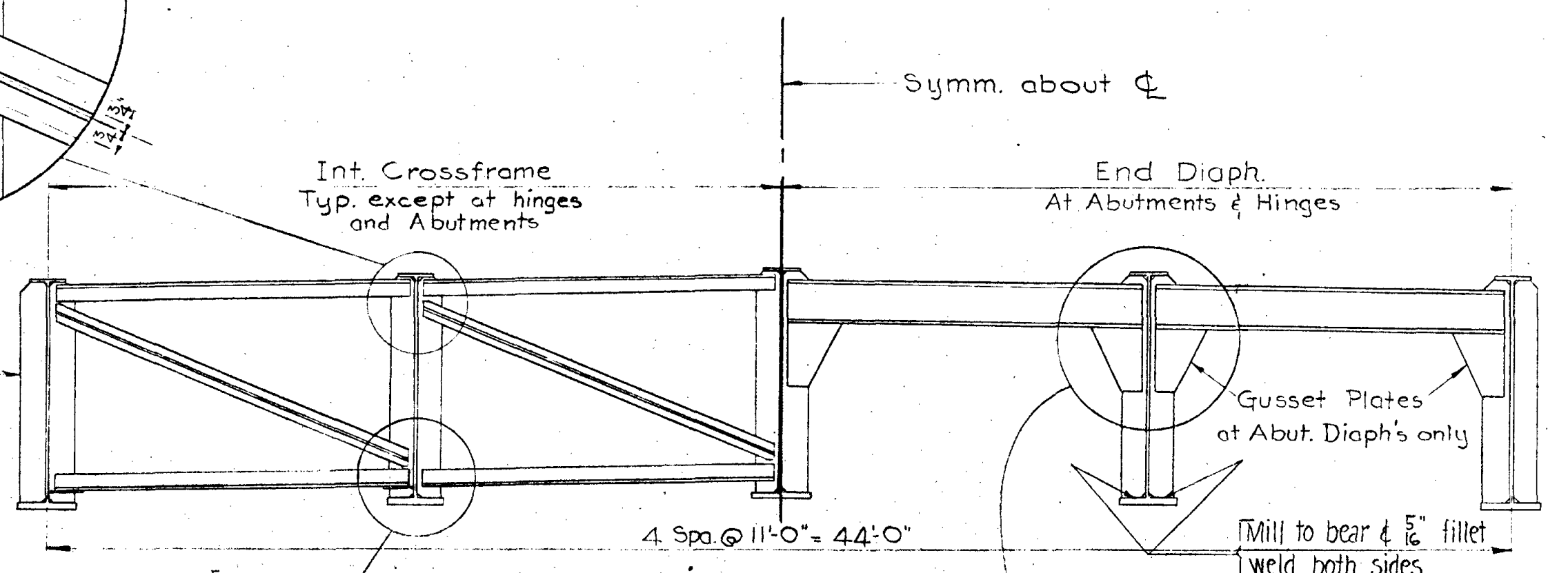
Mill to bear and fillet weld both sides when @ C of Bearing. Fillet weld both sides other points (Area 'A'). See table Sh. 289-6553-16 for weld size. Grind to fit all other points.

NOTES:

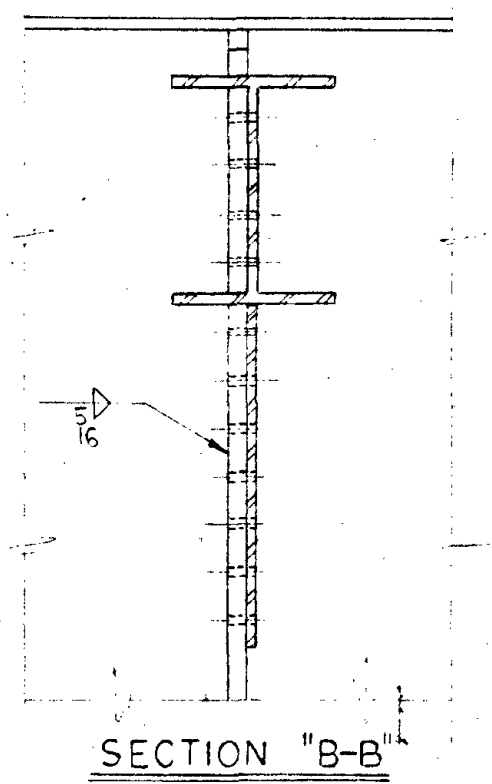
- ~ Indicates approximate dimension.
- See Sh. 289-6553-18 for Stud Details & Note.
- See Sh. 289-6553-21, 35 & 36 for bearing Sole Plates.
- See Sh. 289-6553-16 for Steel Notes.
- △ All Bearing Stiffeners shall be vertical, except @ hinges. All intermediate Stiffeners to be perpendicular to flange.



TYPICAL LATERAL BRACING △



SECTION 'A-A'



SECTION 'B-B'

See Hinge Details Sh. 289-6553-19 for Diaphragm of hinges.

BURLINGTON NORTHERN INC.
MINNESOTA DIVISION
NORTHTOWN TO STAPLES
BRIDGE NO. 13.8
C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN

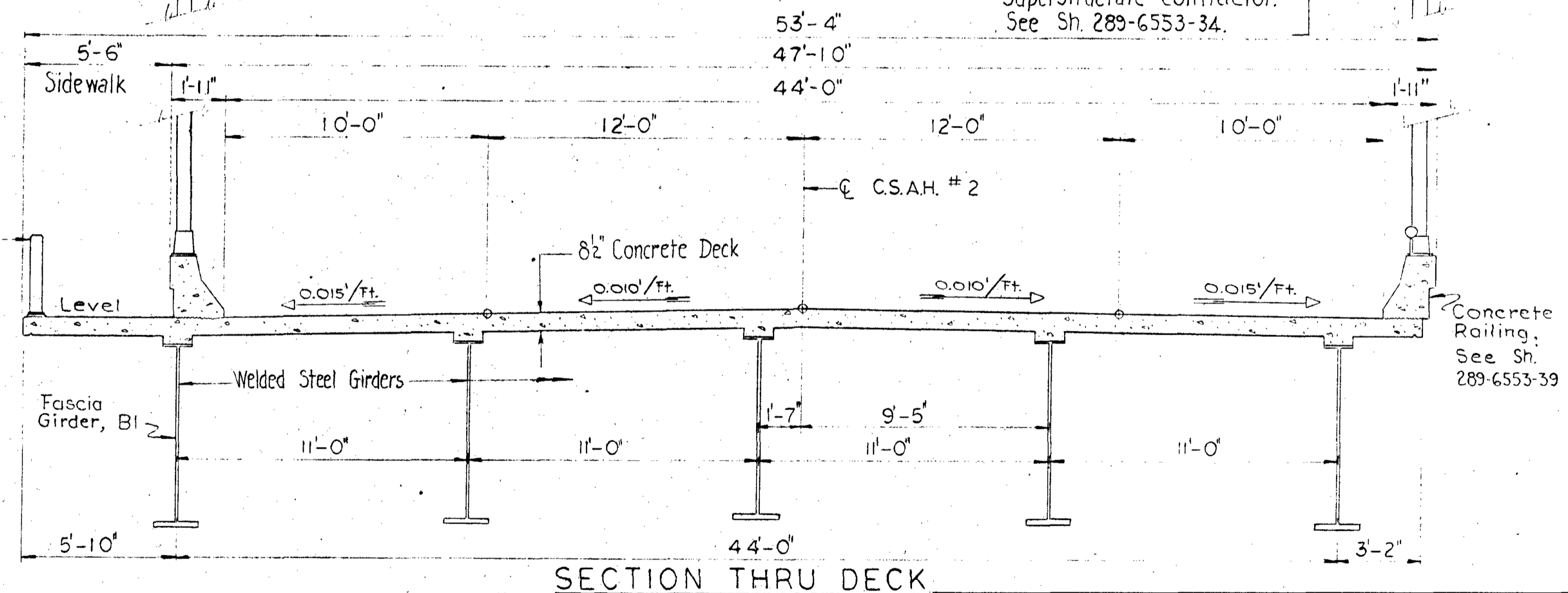
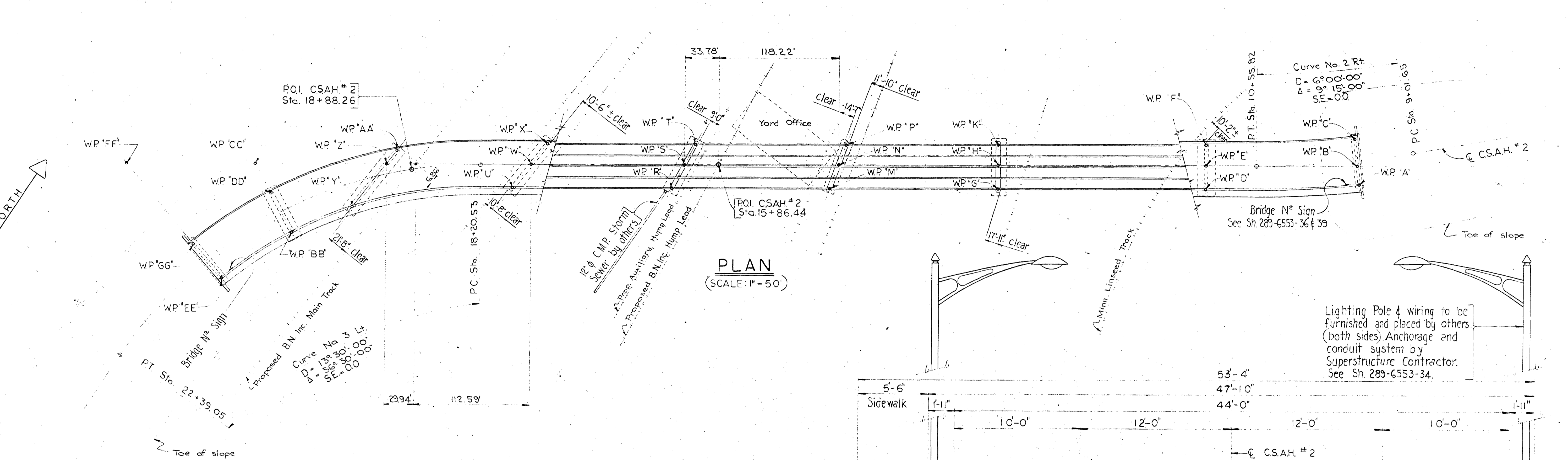
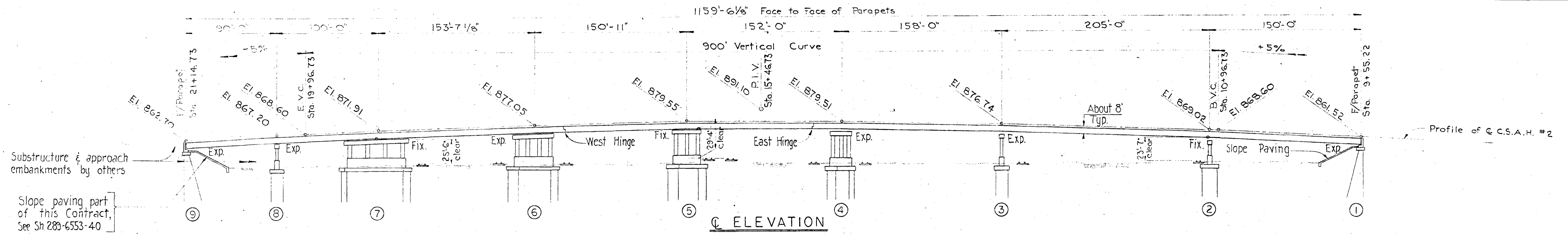
FRAMING PLAN & BEAM DETAILS

APPROVED: *[Signature]*
Director Bridge Engineering

APPROVED: *[Signature]*
Asst. Vice President Engineering

OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

| REVISIONS | DES. KEY | DR. O.P. | CH. D. E. B. |
|-------------------------------------------|---------------------|----------|--------------|
| △ 1-17-1973 Bracing conn. & Web holes. | | | |
| | AUTHORITY: 72-746 | | |
| | DATE: November 1972 | | |
| | PLAN: | | |
| | | | 289-6553-17 |

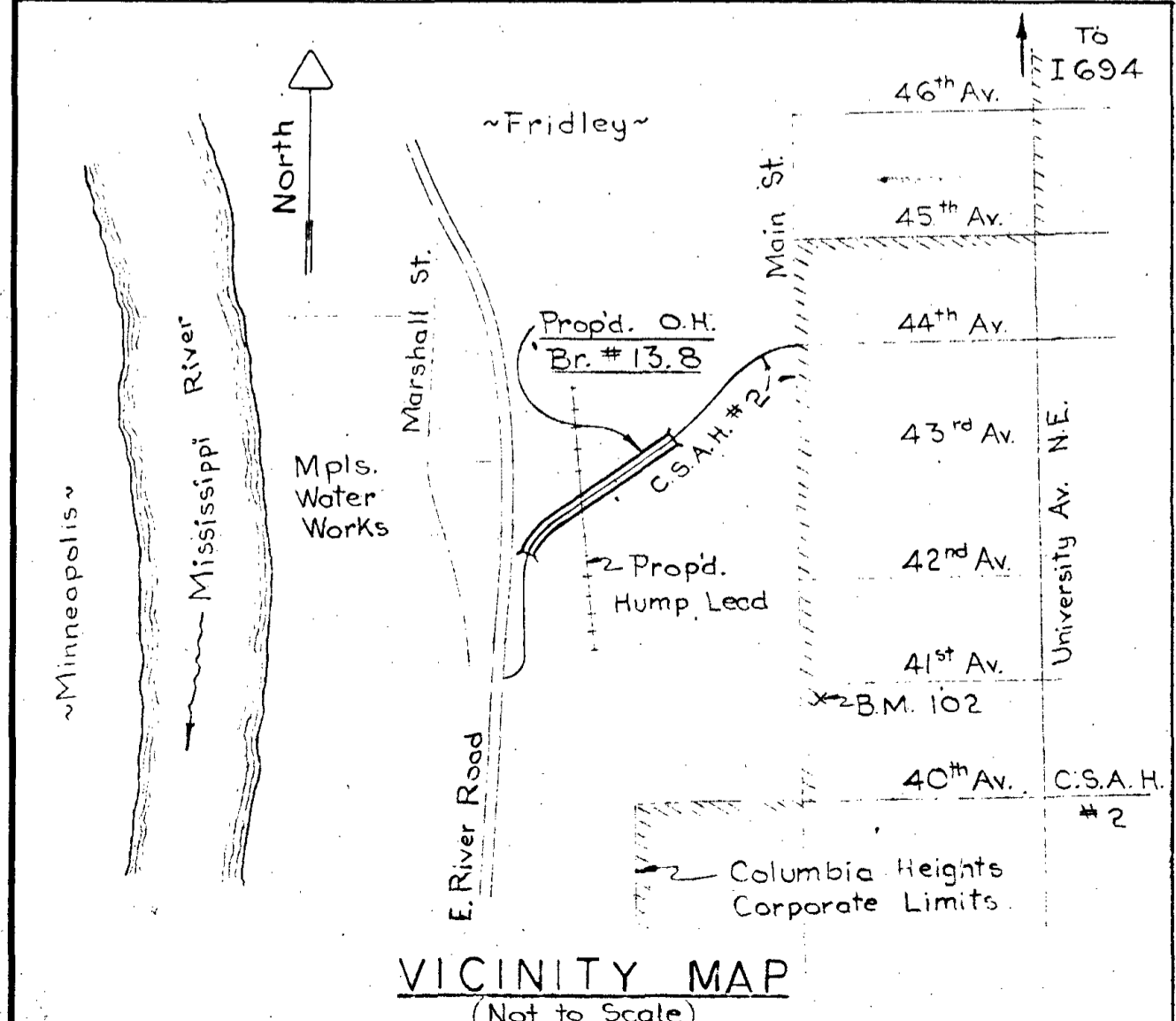


| SUMMARY OF QUANTITIES | | |
|------------------------------|----------|-----------|
| DESCRIPTION | UNITS | QUAN. |
| Structural Steel - A588 | Pound | 2,550,000 |
| Roadway Expansion Assemblies | Lump Sum | |
| Fixed Bearing Assembly FB-1 | Each | 5 |
| " " FB-2 | " | 5 |
| " " FB-3 | " | 5 |
| Exp. Bearing Assembly EB-1 | " | 5 |
| " " EB-2 | " | 3 Δ |
| " " EB-3 | " | 2 Δ |
| " " EB-4 | " | 3 Δ |
| " " EB-5 | " | 2 Δ |
| " " EB-6 | " | 5 |
| " " EB-7 | " | 5 |
| " " EB-7A | " | 5 |
| " " EB-8 | " | 10 |
| Reinforcement Bars | Pound | 495,220 |
| Concrete, Mix 3Y43 | Cu. Yd. | 1,660 |
| " " 3Y46A | " | 268 |
| Slope Paving | Sq. Yd. | 560 |
| Metal Railing, Type S | Lin. Ft. | 1,145 |
| " " G | " | 1,173 |
| Deck Drainage System | Lump Sum | |
| Electrical Work | " | |

| INDEX OF DRAWINGS: | |
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DESIGN DATA:
 1969 AASHTO Design Specifications w/ 1970 & 1971 Interim Specifications - HS20 loading. (D.L. includes future 3" bituminous wearing surface.)
 Max. allowable design stresses — $f_c = 1600 \text{ psi}, n=8$
 $f_s = 24,000 \text{ psi}$ for reinforcement
 $f_s = 27,000 \text{ psi}$ for structural steel, M.H.D. 3309.

CONSTRUCTION NOTES:
 The M.H.D. Standard Specifications for Highway Construction dated Jan. 1, 1972 and supplemented by Special Provisions shall govern.
 The stationing shown on Plans is highway sta. unless otherwise noted.
 Stations and elevations are based on B.N. Inc. survey drawings NT-531T1 and NT-531T2 dated July 20, 1971 and July 19, 1971.
 B.M. 102 - Top of N.W. head bolt top fire hydrant @ S.E. corner 41st Ave. and Main St. U.S.C. & G.S. El. 913.57.
 All horizontal dimensions are horizontally projected distances @ 45° F.



ANOKA COUNTY BRIDGE NO. 02523

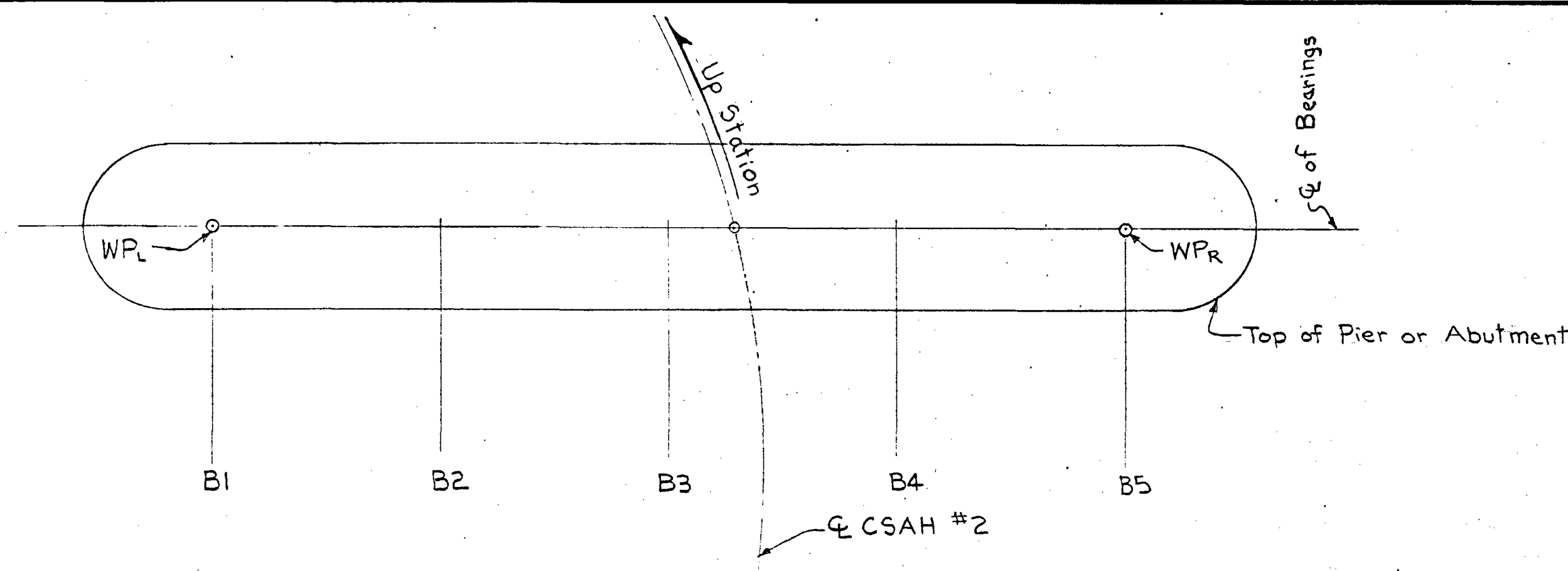
BURLINGTON NORTHERN INC.
 MINNESOTA DIVISION
 NORTHROW TO STAPLES
 BRIDGE NO. 13.8
 C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN

SUPERSTRUCTURE PLAN

RECOMMENDED: *M.H. Edman* Director Bridge Engineering No. 2228
 APPROVED: *B.A. Anderson* Asst. Vice President Engineering No. 2437
 OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

| REVISIONS | DES. KEB | DR. O.P. | CH. D.E.B. |
|------------------------------|----------|----------|------------|
| Δ 12-5-72 Revised Quantities | | | |

AUTHORITY: A.F.E. 72-746
 DATE: November 1972
 PLAN:
 289-6553-14

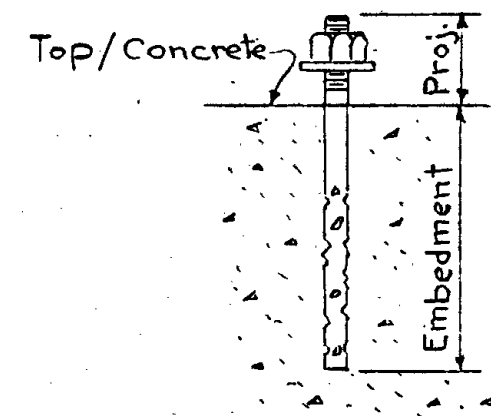


| Substructure Unit | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|-------------------|--------|--------|--------|-------------|------------|--------------|-------------|--------|--------|
| * Distance | | | | | | | | | |
| WPL - B2 | 11'-0" | 11'-0" | 11'-0" | 11'-9 1/16" | 12'-5 7/8" | 13'-11 5/16" | 19'-6 3/16" | 11'-0" | 11'-0" |
| B2 - B3 | " | " | " | " | " | " | 18'-6 3/16" | " | " |
| B3 - B4 | " | " | " | " | " | " | 17'-8 1/2" | " | " |
| B4 - WPR | " | " | " | " | " | " | 17'-0 3/8" | " | " |

* Distance measured is along C of Pier

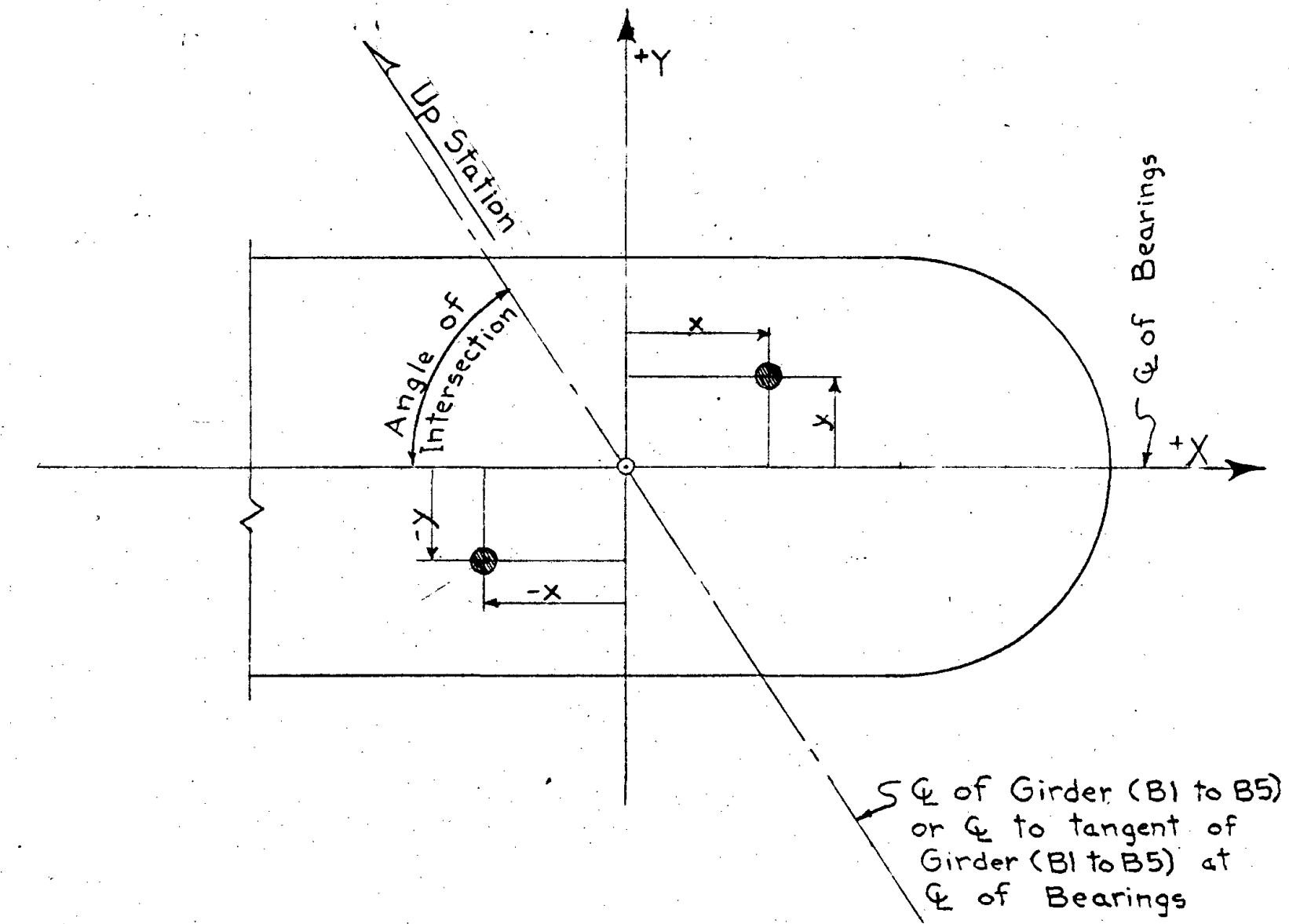
BEARING SPACING
No Scale

| Substructure Unit | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|-------------------|--------|-----------|-----------|-----------|-------|-------|-------|--------|-----------|
| Anchor Bolt | A2 | A3 | A3 | A3 | A4 | A4 | A4 | A1 | A1 |
| Embedment | 1'-3" | 1'-3 3/4" | 1'-3 3/4" | 1'-3 3/4" | 1'-6" | 1'-6" | 1'-6" | 1'-0" | 1'-0 1/2" |
| Projection | 3 1/2" | 5 1/4" | 4 3/4" | 4 3/4" | 4" | 4" | 4" | 3 1/2" | 3" |



ANCHOR BOLT PLACEMENT

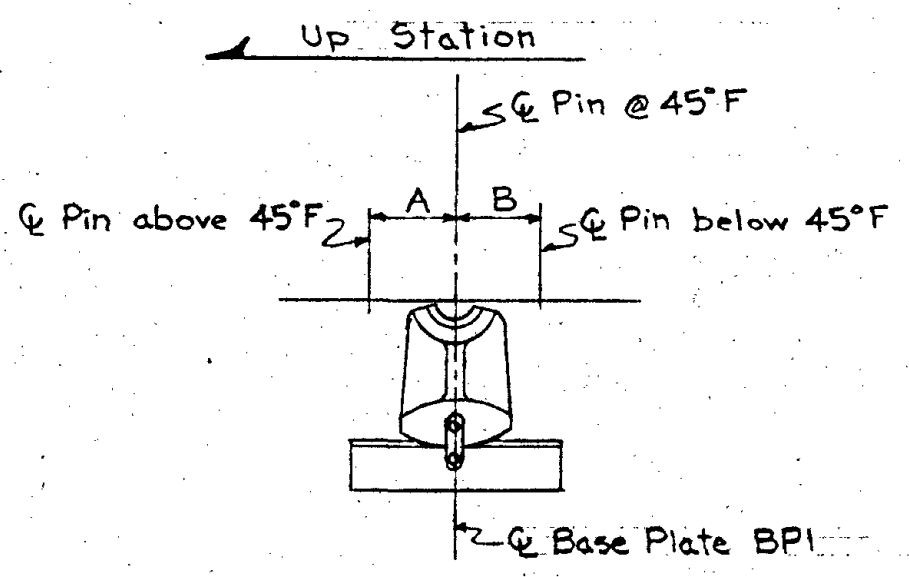
Note: Anchor Bolts detailed Sh. 289-6553-21



ANCHOR BOLT LOCATION

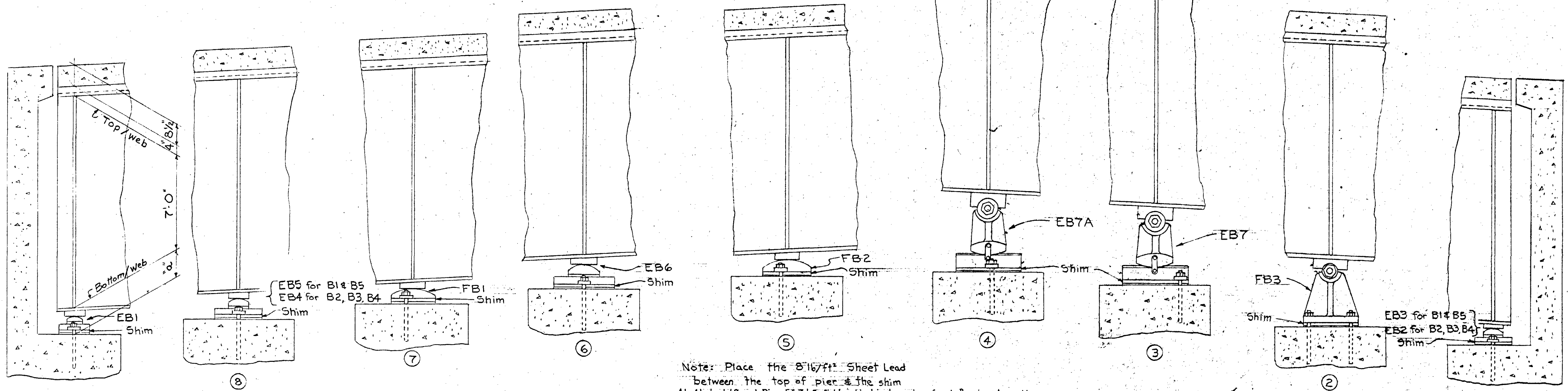
No Scale
Co-ordinates tabulated on right hand side this sheet

| Temp. °F | Pier 3 | | Pier 4 | |
|----------|---------|---------|--------|---------|
| | A | B | A | B |
| 90° | 1 1/16" | | 1 1/4" | |
| 80° | 9/16" | | 1" | |
| 70° | 7/16" | | 7/16" | |
| 60° | 1/4" | | 7/16" | |
| 50° | 1/16" | | 1/8" | |
| 45° | 0 | 0 | 0 | 0 |
| 40° | | 1/16" | | 1/8" |
| 30° | | 1/4" | | 7/16" |
| 20° | | 7/16" | | 1 1/16" |
| 10° | | 3/16" | | 1" |
| 0° | | 1/16" | | 1 1/4" |
| -10° | | 13/16" | | 1 9/16" |
| -20° | | 1 1/16" | | 1 7/8" |



EXP. BRG. @ PIERS 3 & 4

Expansion Bearing to be vertical under dead load at 45°F.



Note: Place the 5/16" x 12" Sheet Lead between the top of pier & the shim. At Abuts. 1 & 9 and Piers 3, 4 & field weld shim to ends of each Bearing Assembly base plate after girders are assembled. Restore burned paint film.

| Girder | "a" | Shim |
|--------|--------|------|
| B1 | 6" | S23 |
| B2 | 6" | --- |
| B3 | 6" | S23 |
| B4 | 6 1/8" | S23 |
| B5 | 6" | S23 |

| Girder | "a" | Shim |
|--------|--------|------|
| B1 | 8 3/8" | S20 |
| B2 | 8 1/4" | S19 |
| B3 | 8 3/8" | S20 |
| B4 | 8 1/2" | S21 |
| B5 | 8 3/8" | S22 |

| Girder | "a" | Shim |
|--------|--------|------|
| B1 | 8" | S17 |
| B2 | 7 3/4" | S15 |
| B3 | 7 1/8" | S18 |
| B4 | 7 1/8" | S18 |
| B5 | 7 1/8" | S16 |

| Girder | "a" | Shim |
|--------|---------|------|
| B1 | 11 1/2" | S14 |
| B2 | 10 3/4" | S14 |
| B3 | 10 3/4" | S13 |
| B4 | 9 7/8" | S13 |
| B5 | 9 3/8" | --- |

| Girder | "a" | Shim |
|--------|--------|------|
| B1 | 9 1/8" | S11 |
| B2 | 8 3/8" | S9 |
| B3 | 9 1/8" | S12 |
| B4 | 8 3/4" | S10 |
| B5 | 8 3/4" | S10 |

| Girder | "a" | Shim |
|--------|-----------|------|
| B1 | 2'-6 3/4" | S7 |
| B2 | 2'-6 3/4" | S7 |
| B3 | 2'-6 3/4" | S6 |
| B4 | 2'-7 1/8" | S8 |
| B5 | 2'-7 1/8" | S8 |

| Girder | "a" | Shim |
|--------|-----------|------|
| B1 | 2'-8 1/2" | S5 |
| B2 | 2'-8" | S5 |
| B3 | 2'-8" | S5 |
| B4 | 2'-7 7/8" | S8 |
| B5 | 2'-7 7/8" | S6 |

| Girder | "a" | Shim |
|--------|-----------|------|
| B1 | 2'-5" | --- |
| B2 | 2'-4 1/2" | --- |
| B3 | 2'-4 3/4" | --- |
| B4 | 2'-4 3/4" | S1 |
| B5 | 2'-4 1/2" | S2 |

| Girder | "a" | Shim |
|--------|--------|------|
| B1 | 7 1/8" | S4 |
| B2 | 6 3/8" | --- |
| B3 | 6 3/8" | S4 |
| B4 | 6 3/8" | S4 |
| B5 | 6 1/2" | S3 |

BEARING LAYOUT
No Scale

| ANCHORAGE CO-ORDINATES | | | | |
|------------------------|------------|-----------------------|-------------|-----------|
| Unit | Girder | Angle of Intersection | X | Y |
| 1 | B1 | 89° 55' 37" | 1'-1 1/2" | 0 |
| | B2 | 89° 55' 34" | -1'-1 1/2" | 0 |
| | B3 | 89° 55' 30" | -1'-1 1/2" | 0 |
| | B4 | 89° 55' 27" | -1'-1 1/2" | 0 |
| | B5 | 89° 55' 24" | -1'-1 1/2" | 0 |
| 2 | B1 thru B5 | 90° | 1'-1 1/2" | 8 1/2" |
| | | | -1'-1 1/2" | -8 1/2" |
| 3 | B1 thru B5 | 90° | 1'-10" | 10 1/2" |
| | | | -1'-10" | -10 1/2" |
| 4 | B1 thru B5 | 69° 21' 17" | 1'-8 1/4" | 8 1/16" |
| | | | -1'-8 1/4" | -8 1/16" |
| 5 | B1 thru B5 | 61° 43' 50" | 1'-0 3/16" | 9 9/16" |
| | | | -1'-0 3/16" | -9 9/16" |
| 6 | B1 thru B5 | 51° 48' 37" | 1'-1" | 10 3/16" |
| | | | -1'-1" | -10 3/16" |
| 7 | B1 | 33° 08' 39" | 10 13/16" | 1'-0" |
| | B2 | 35° 25' 09" | 11 5/16" | 11 3/16" |
| | B3 | 37° 27' 51" | -11 3/16" | -11 3/16" |
| | B4 | 39° 19' 16" | -1'-0 1/16" | 10 13/16" |
| | B5 | 41° 01' 13" | 1'-0 3/8" | 10 7/16" |
| 8 | B1 thru B5 | 90° | 1'-2 1/2" | 0 |
| | | | -1'-2 1/2" | 0 |
| 9 | B1 | 89° 49' 17" | 1'-0" | -1/16" |
| | B2 | 89° 49' 34" | -1'-0" | -1/16" |
| | B3 | 89° 49' 50" | -1'-0" | 1/16" |
| | B4 | 89° 50' 06" | 1'-0" | -1/16" |
| | B5 | 89° 50' 20" | 1'-0" | -1/16" |

Note: For Bearing Assemblies see Sh. 289-6553-21, 35, & 36.

BURLINGTON NORTHERN INC.
MINNESOTA DIVISION
NORTHTOWN TO STAPLES
BRIDGE NO. 13.8
C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN

ANCHORAGE PLAN

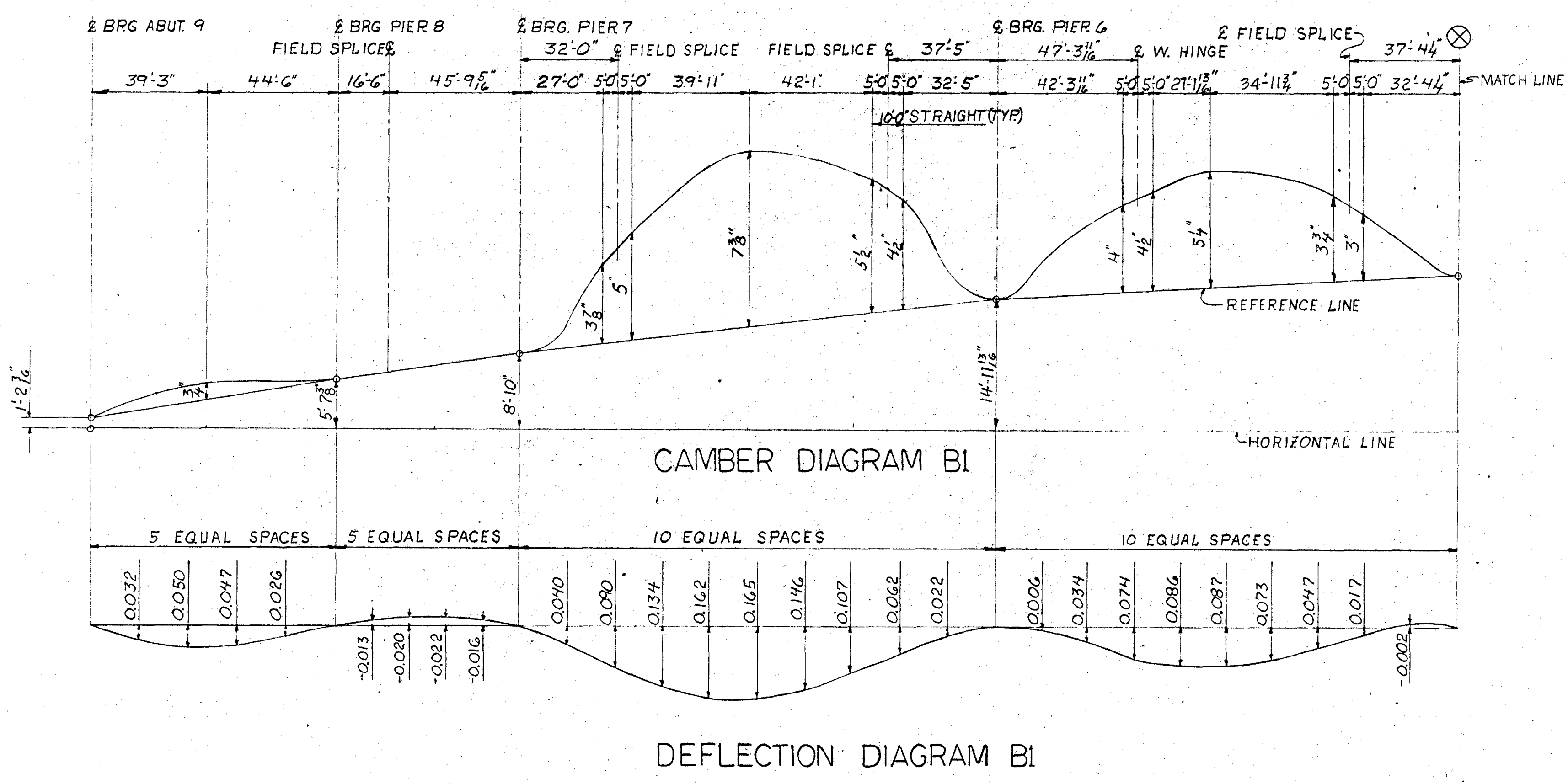
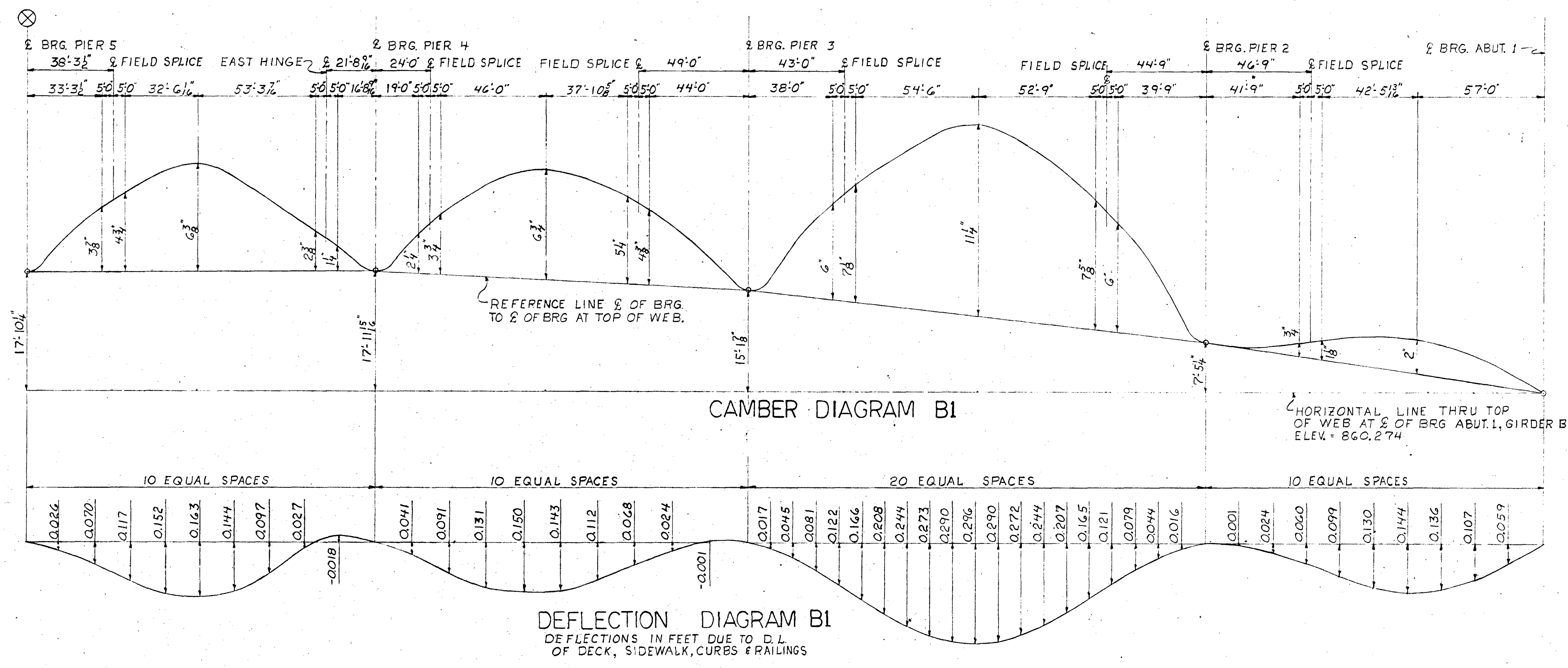
RECOMMENDED: *T.E. Eshel*
Director Bridge Engineering

APPROVED: *B.A. Anderson*
Asst. Vice President Engineering

OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

| REVISIONS | DES. JJM | DR. JJM | CH. DRC |
|------------------|----------|---------|---------|
| 1-4-73 Dimn. "a" | | | |

AUTHORITY: AFE 72-746
DATE: November 1972
PLAN:
289-6553-20



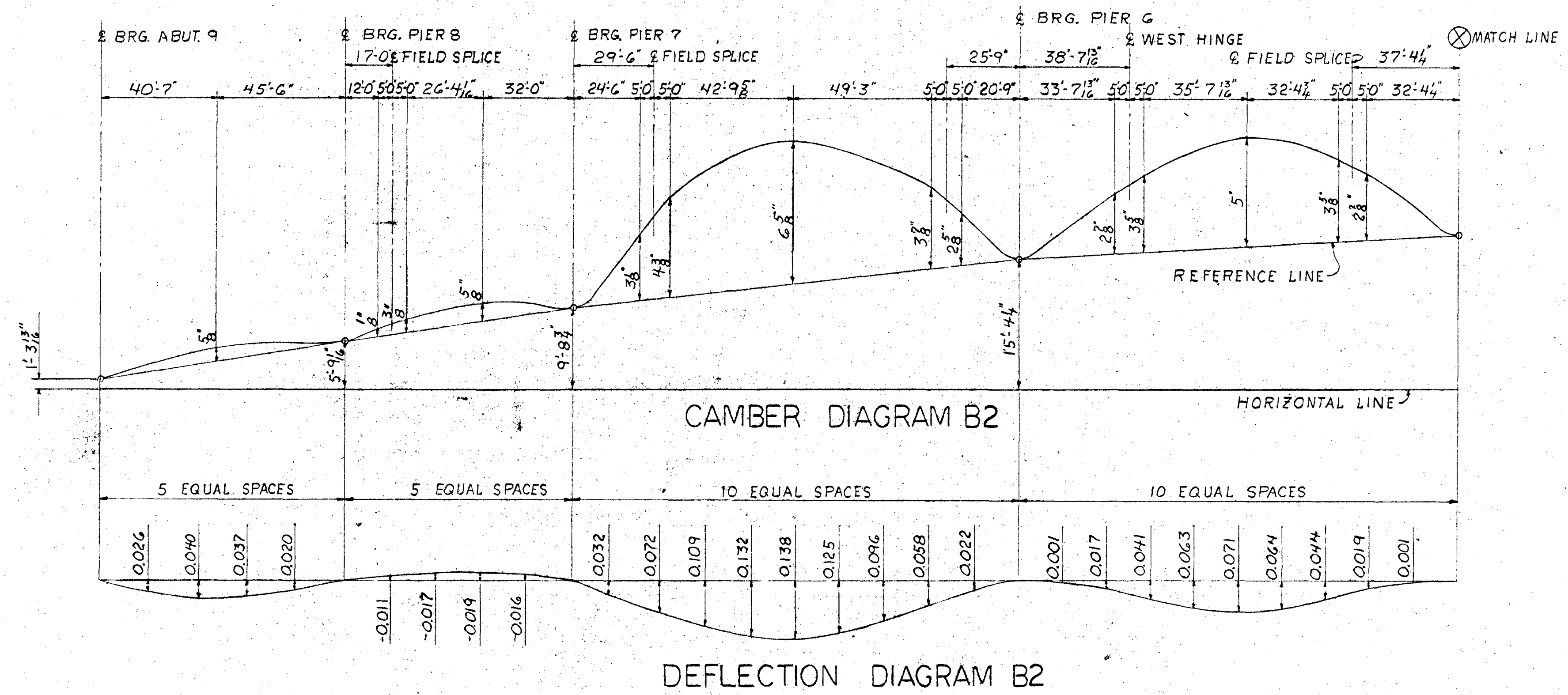
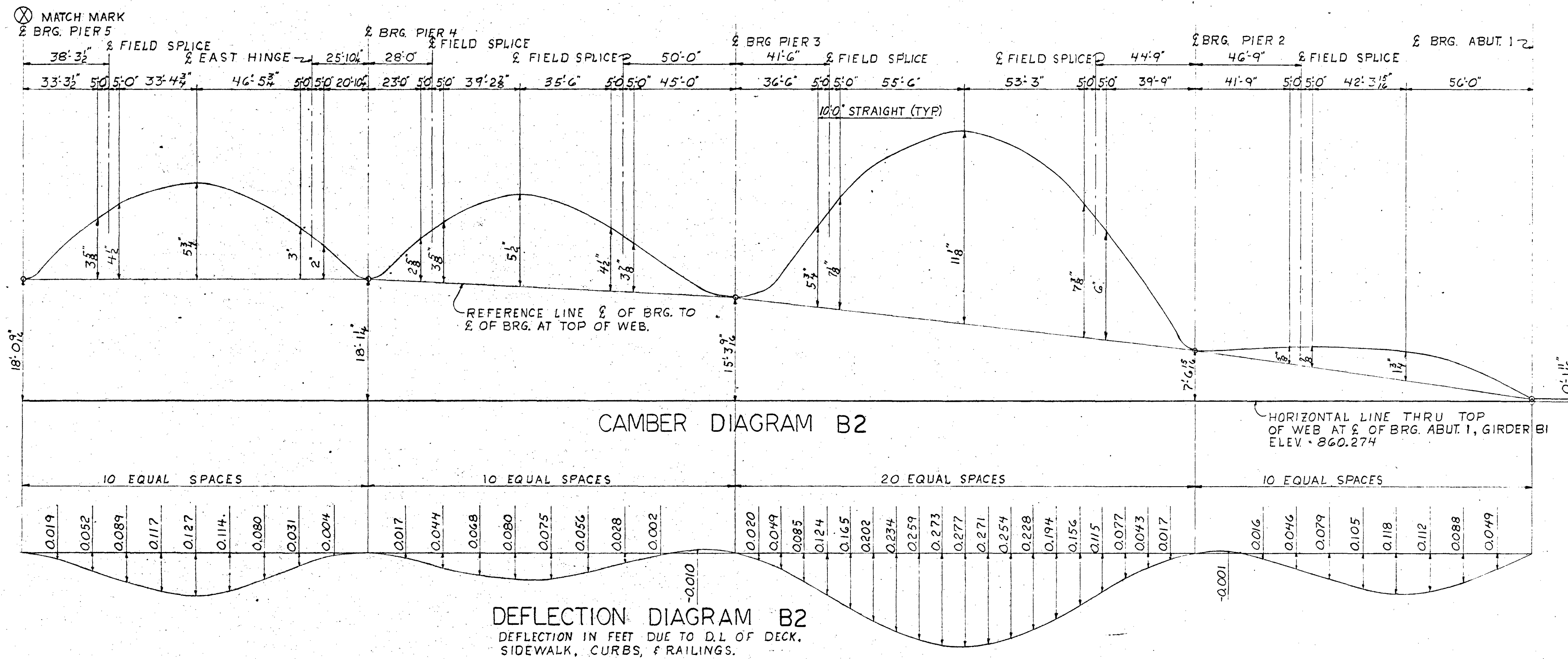
BURLINGTON NORTHERN INC.
MINNESOTA DIVISION
NORTHTOWN TO STAPLES
BRIDGE NO. 13.8
C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN

CAMBER, DEFLECTION DIAGRAMS B1

RECOMMENDED: *M. E. Johnson* APPROVED: *B. H. Anderson*
Director Bridge Engineering Ass't. Vice President Engineering

OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

| REVISIONS | DES. DRC | DR. DRC | CH. KEB |
|-----------|--------------------------|---------|---------|
| | AUTHORITY: AFE 72-746 | | |
| | DATE: NOVEMBER, 1972 | | |
| | PLAN: 289 - 6553 - 22 | | |



BURLINGTON NORTHERN INC.
 MINNESOTA DIVISION
 NORTHTOWN TO STAPLES

BRIDGE NO. 138
 C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN

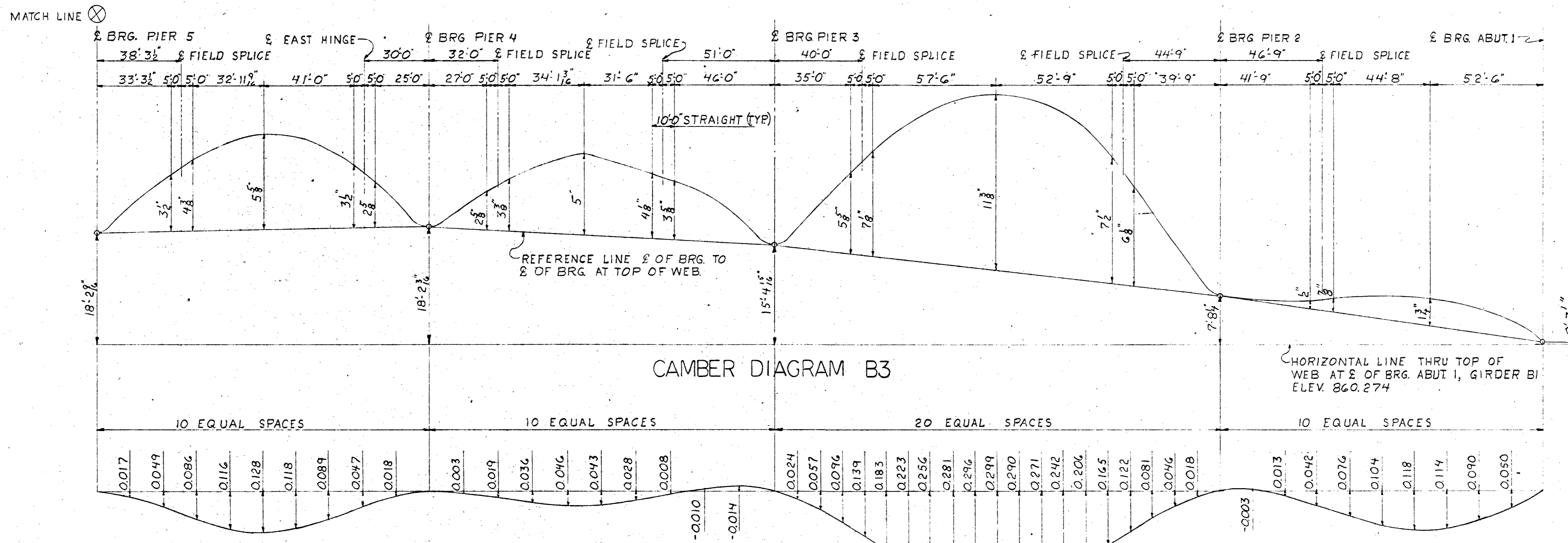
CAMBER, DEFLECTION DIAGRAMS B2

RECOMMENDED: *H. E. Johnson* APPROVED: *B. H. Anderson*
Director Bridge Engineering Asst. Vice President Engineering

OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

| REVISIONS | DES. DRC | DR. DRC | CH. KEB |
|-----------|----------|---------|---------|
| | | | |

AUTHORITY: AFE 72-746
 DATE: NOVEMBER, 1972
 PLAN:
 289 - 6553 - 23

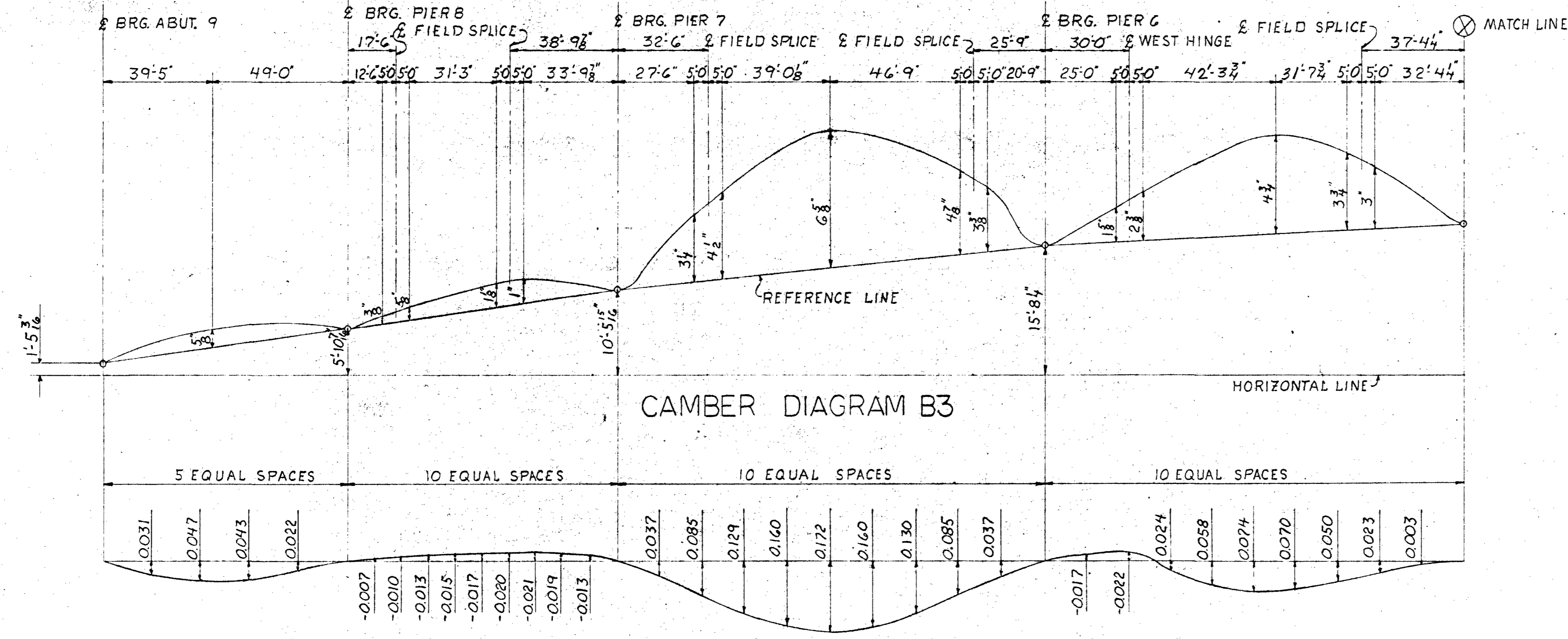


CAMBER DIAGRAM B3

DEFLECTION DIAGRAM B3

DEFLECTION IN FEET DUE TO DL OF DECK SIDEWALK, CURBS, & RAILINGS.

NOTE: ALL GIRDER LENGTHS ARE HORIZONTALLY PROJECTED DIMENSIONS.



CAMBER DIAGRAM B3

DEFLECTION DIAGRAM B3

BURLINGTON NORTHERN INC.
MINNESOTA DIVISION
NORTHTOWN TO STAPLES
BRIDGE NO. 13.8
C.S.A.H. NO. 2 OVER YARD TRACKS AT NORTHTOWN

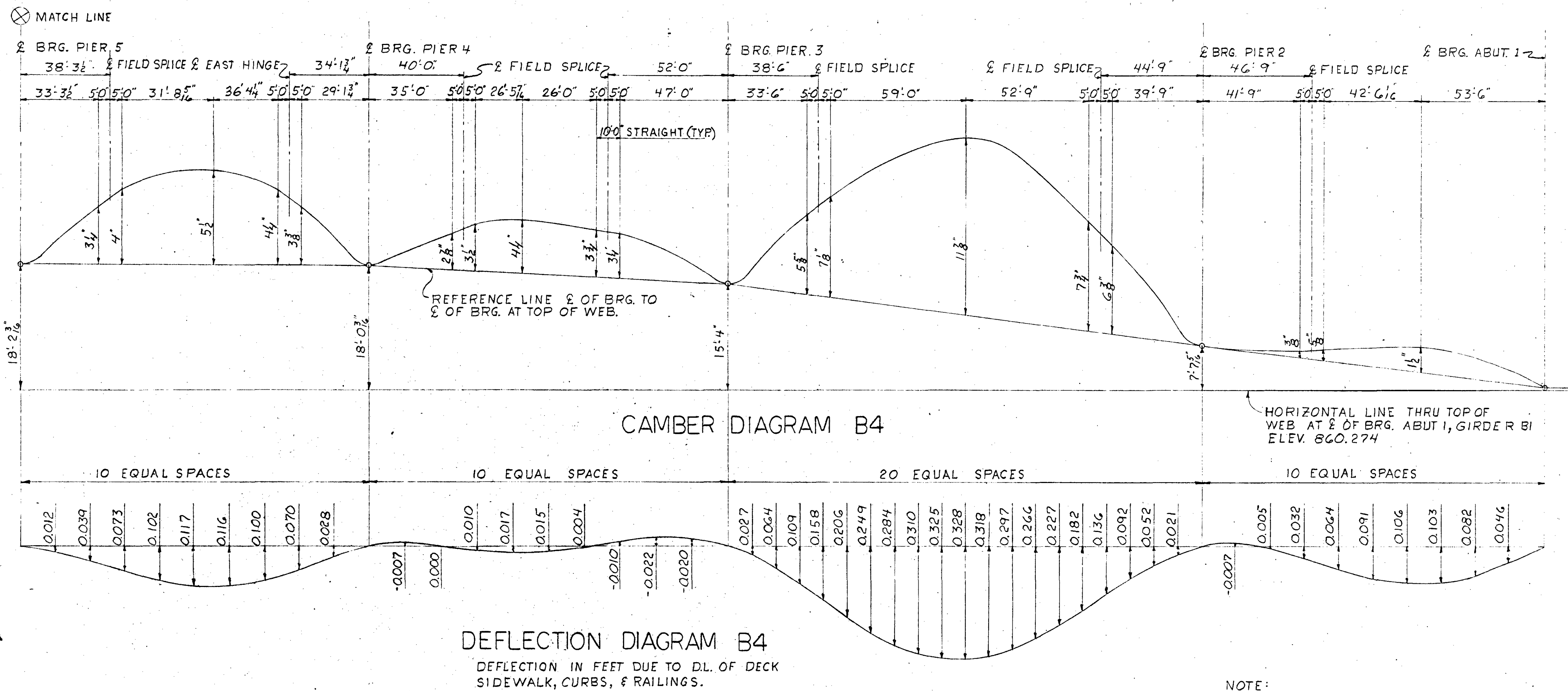
CAMBER, DEFLECTION DIAGRAMS B3

RECOMMENDED: *W. E. Johnson* Director Bridge Engineering
APPROVED: *B. A. Anderson* Ass't. Vice President Engineering

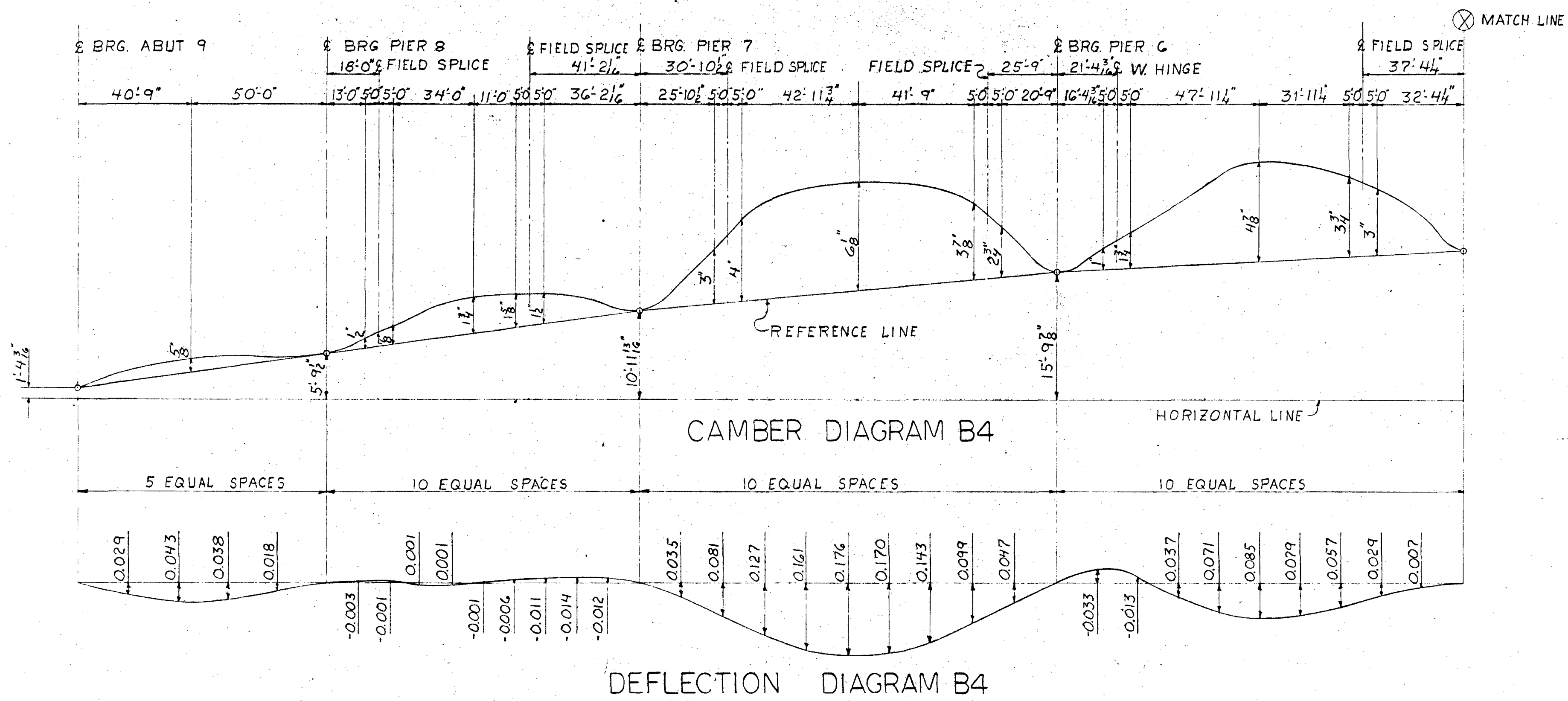
OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

| REVISIONS | DES. DRC | DR. DRC | CH. KEB |
|-----------|----------|---------|---------|
| | | | |

AUTHORITY: AFE 72-746
DATE: NOVEMBER, 1972
PLAN:
289 - 6553 - 24



NOTE:
ALL GIRDER LENGTHS ARE
HORIZONTALLY PROJECTED DIMENSIONS.



BURLINGTON NORTHERN INC.
MINNESOTA DIVISION
NORTHTOWN TO STAPLES
BRIDGE NO. 13.8
C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN
CAMBER, DEFLECTION DIAGRAMS B4

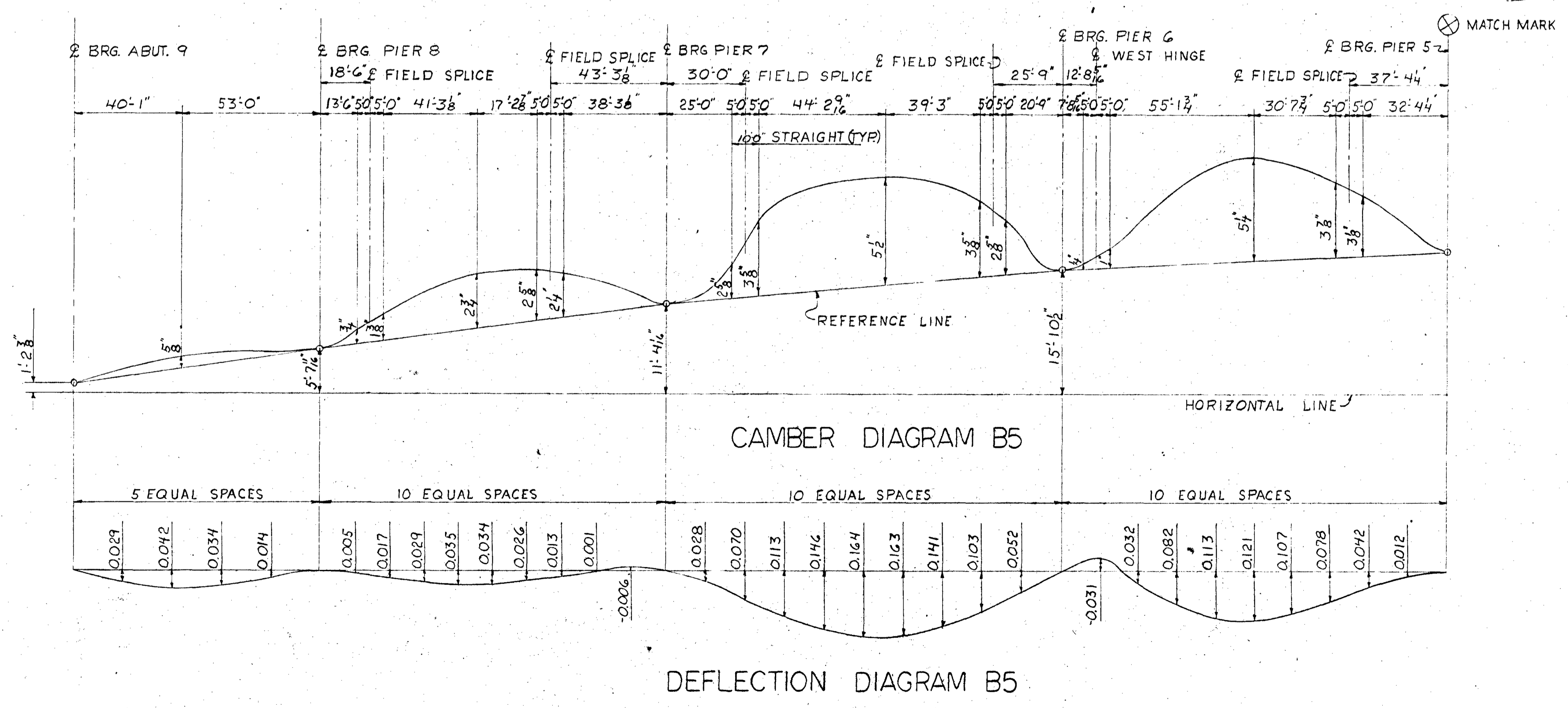
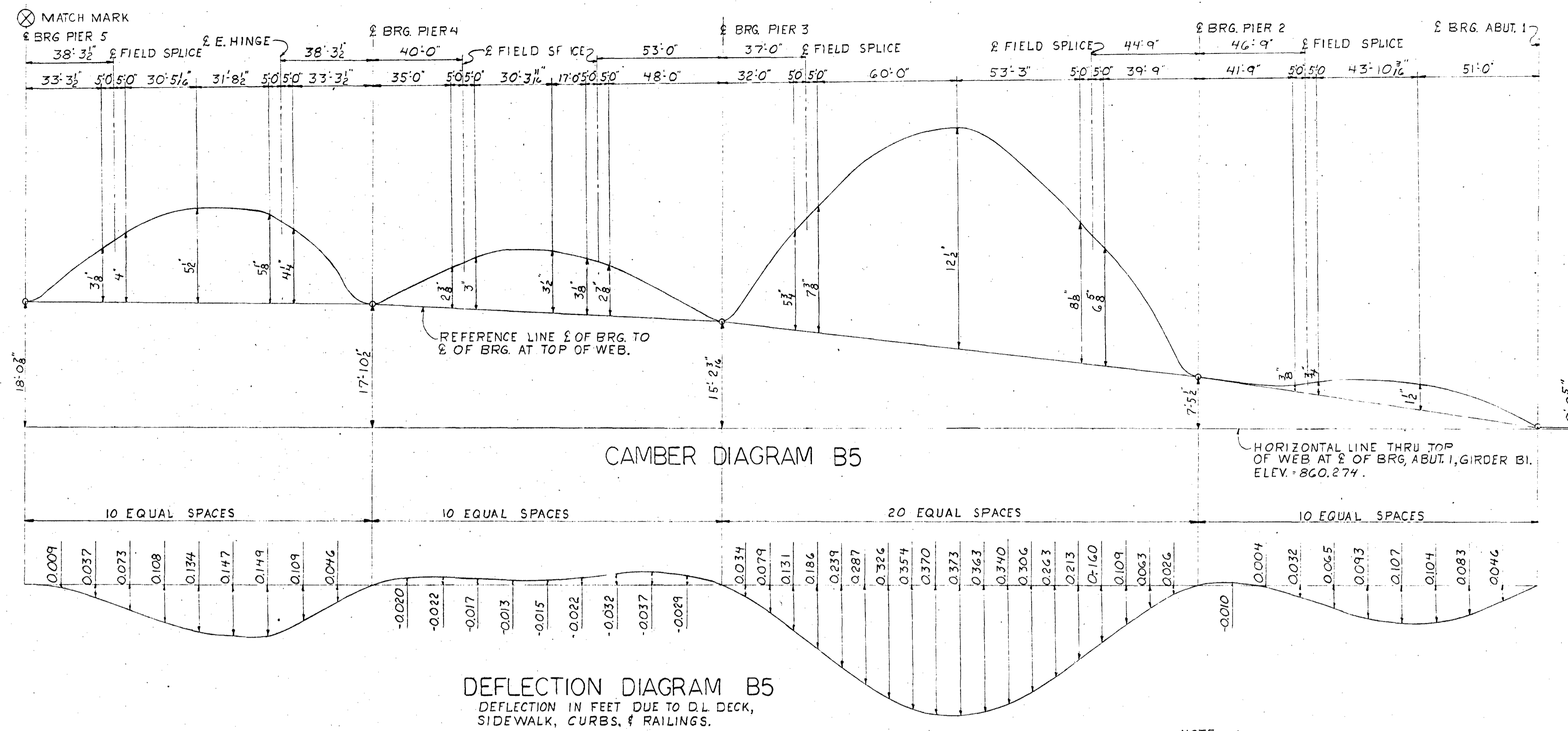
RECOMMENDED: *M. E. Skelton*
Director Bridge Engineering

APPROVED: *B. A. Anderson*
Ass't. Vice President Engineering

OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

| REVISIONS | DES. DRC | DR. DRC | CH. KEB |
|-----------|----------|---------|---------|
| | | | |

AUTHORITY: AFE 72-746
DATE: NOVEMBER, 1972
PLAN:
289-6553 - 25

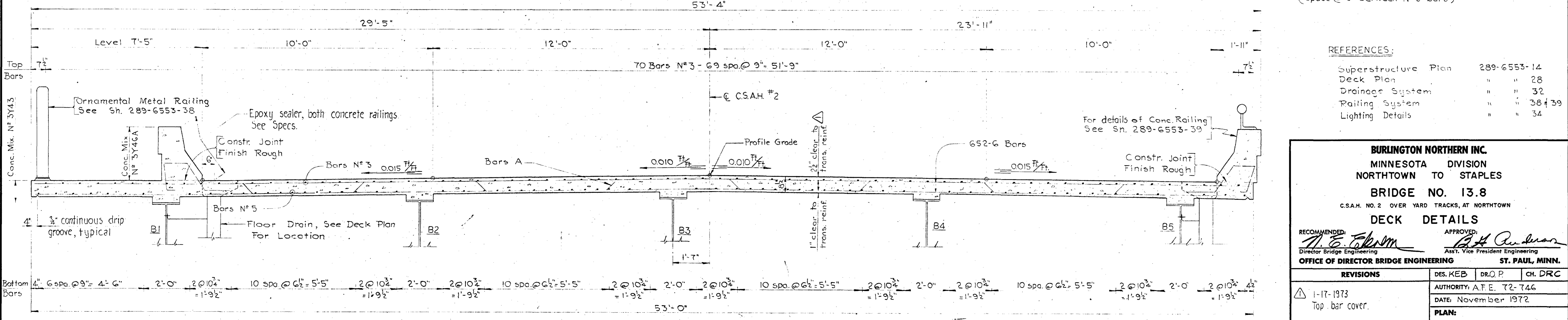
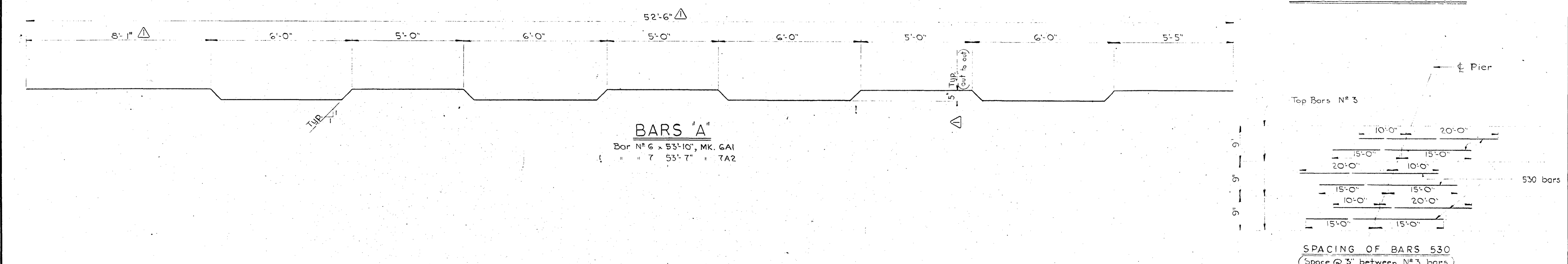
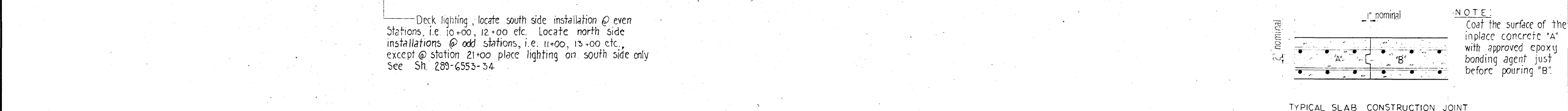
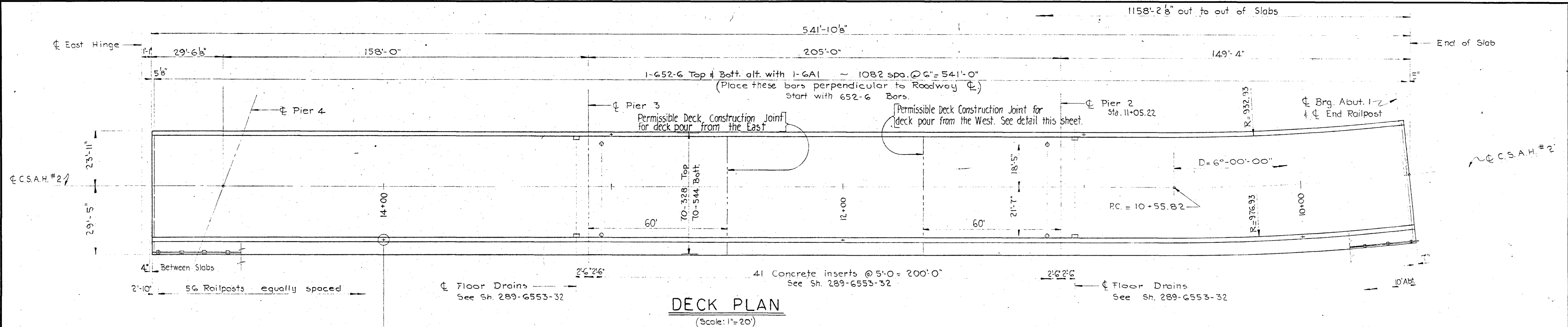


BURLINGTON NORTHERN INC.
MINNESOTA DIVISION
NORTHTOWN TO STAPLES
BRIDGE NO. 13.8
C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN
CAMBER, DEFLECTION DIAGRAMS B5

RECOMMENDED: *M.E. Johnson* APPROVED: *B.H. Anderson*
Director Bridge Engineering Asst. Vice President Engineering
OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

| REVISIONS | DES. DRC | DR. DRC | CH. KEB |
|-----------|----------|---------|---------|
| | | | |

AUTHORITY: AFE 72-746
DATE: NOVEMBER, 1972
PLAN:
289-6553-26



REFERENCES:

| | |
|---------------------|-------------|
| Superstructure Plan | 289-6553-14 |
| Deck Plan | " " 28 |
| Drainage System | " " 32 |
| Railing System | " " 38 & 39 |
| Lighting Details | " " 34 |

BURLINGTON NORTHERN INC.
MINNESOTA DIVISION
NORTHTOWN TO STAPLES
BRIDGE NO. 13.8
C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN

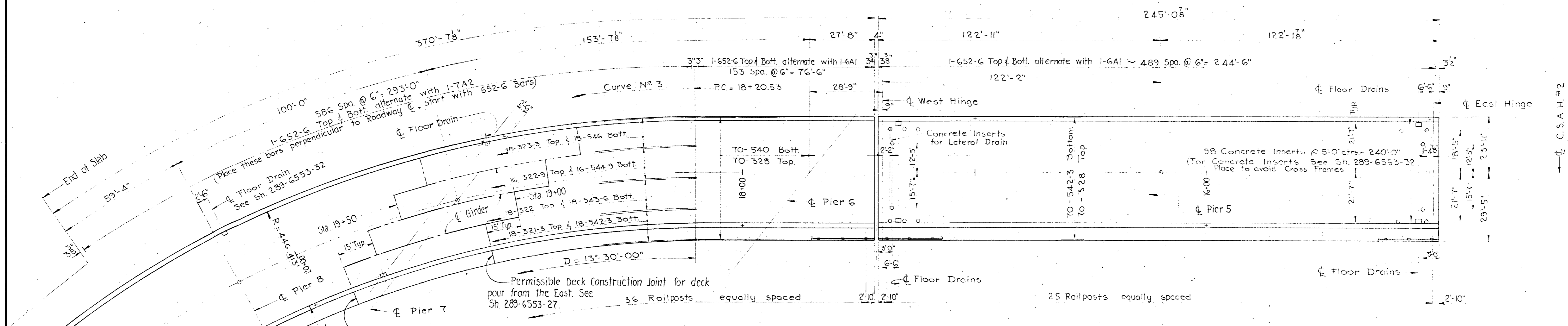
DECK DETAILS

RECOMMENDED: *A. E. Johnson* APPROVED: *B. H. Anderson*
Director Bridge Engineering Asst. Vice President Engineering

OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

| REVISIONS | DES. KEB | DR. Q.P. | CH. DRC |
|-----------------------------|----------|----------|---------|
| 1-17-1973 Top bar cover. | | | |

AUTHORITY: A.F.E. 72-746
DATE: November 1972
PLAN:
289-6553-27



DECK PLAN
(Scale: 1"=20')

REFERENCES:

| | |
|------------------|-------------|
| Deck Details | 289-6553-27 |
| Drainage Details | " " - 32 |
| Abut. End Blocks | 29 & 30 |
| Concrete Railing | 39 |
| Lighting Details | 34 |

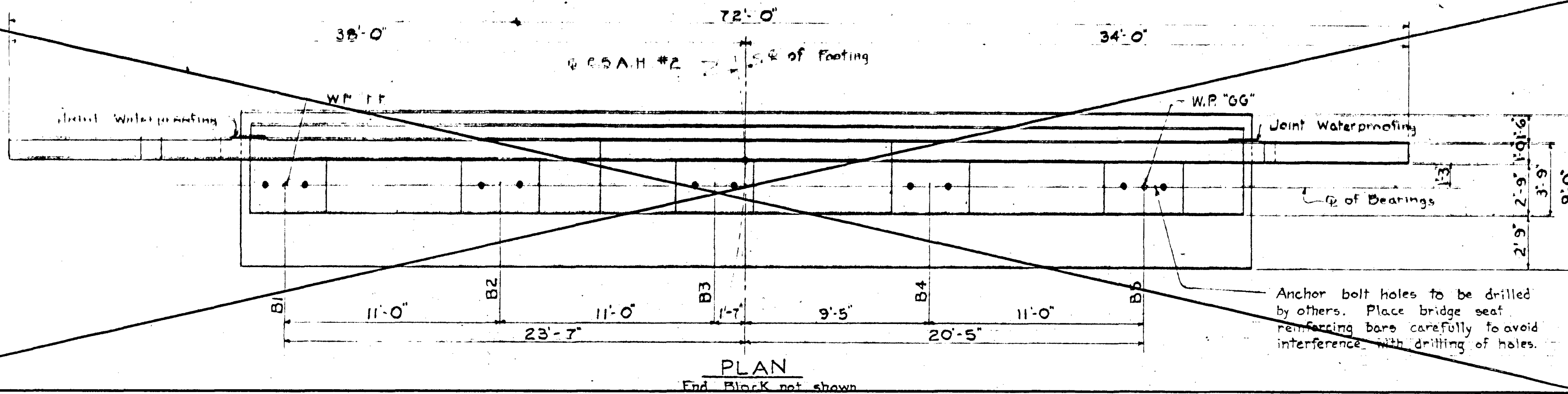
NOTE:
The volume of deck concrete for payment shall be computed using an average stool height of 2" and an average stool width of 18".

Volume of Concrete Mix N° 3Y43 = 1,660 Cu.Yds.
Volume of Concrete Mix N° 3Y46/ = 268 Cu.Yds.

| LIST OF REINFORCING BARS (BARS IN CONCRETE RAILING ARE INCLUDED) | | | | | |
|---------------------------------------------------------------------|---------------------------------------------|----------|---------|---------|----------------------------------------|
| QUAN. | MARK | SHAPE | SIZE | LENGTH | LOCATION |
| 863 | 6A1 | Bent | N°6 | 53'-10" | Trans. bars out of Curve N°3 |
| 293 | 7A2 | | N°7 | 53'-7" | in |
| 252 | 321-3 | Straight | N°3 | 21'-3" | Top long. bars in Curve N°3 |
| 252 | 322 | " | " | 22'-0" | " " " " " " " " |
| 224 | 322-9 | " | " | 22'-9" | " " " " " " " " |
| 252 | 323-3 | " | " | 23'-3" | " " " " " " " " |
| 2,240 | 328 | " | " | 28'-0" | " " " out of " " " |
| 966 | 530 | Straight | N°5 | 30'-0" | Top long. bars over Piers |
| 140 | 540 | " | " | 40'-0" | Bott. long. bars just out of Curve N°3 |
| 546 | 542-3 | " | " | 42'-3" | in Curve N°3 & between Hinges |
| 126 | 543-6 | " | " | 43'-6" | " " " in Curve N°3 |
| 980 | 544 | " | " | 44'-0" | " " " from Abut. 1 to E. Hinge |
| 112 | 544-9 | " | " | 44'-9" | " " " in Curve N°3 |
| 126 | 546 | " | " | 46'-0" | " " " " " " " " |
| 2,316 | 652-6 | Straight | N°6 | 52'-6" | Trans. bars throughout Bridge |
| 8 | 517-6 | Straight | N°5 | 17'-6" | } Abutment end blocks |
| 4 | 514-6 | " | " | 14'-6" | |
| 4 | 504 | " | " | 4'-0" | |
| 54,610 lbs. | Various bars as detailed on Sh. 289-6553-39 | | | | Concrete Railings & End Posts. |
| Total Wt. of Bars = | | | 495,220 | | |

Note:
See Sh. 289-6553-27 for cross section & for location of 530 bars.
Min. Splice = 1'-0" lap for N°3 bars
" " 1'-8" " " 5 "

| | | |
|--------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------|
| BURLINGTON NORTHERN INC. | | |
| MINNESOTA DIVISION | | |
| NORTHTOWN TO STAPLES | | |
| BRIDGE NO. 13.8 | | |
| C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN | | |
| DECK | | PLAN |
| RECOMMENDED: <i>H. E. Ekholm</i> Director Bridge Engineering | APPROVED: <i>R. H. Anderson</i> Asst. Vice President Engineering | |
| OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN. | | |
| REVISIONS | DES. <i>KEB</i> | DR. O. P. <i>CH. DRC</i> |
| | AUTHORITY: A.F.E. 72-746 | |
| | DATE: November 1972 | |
| | PLAN: | |
| | 289-6553-28 | |

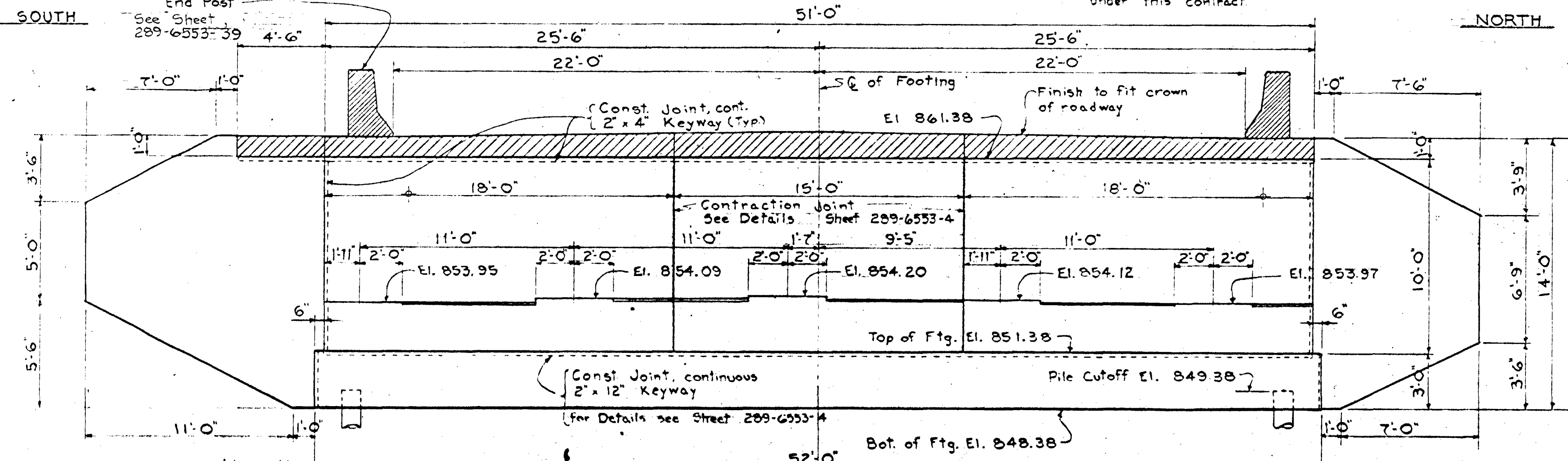


PLAN
End Block not shown

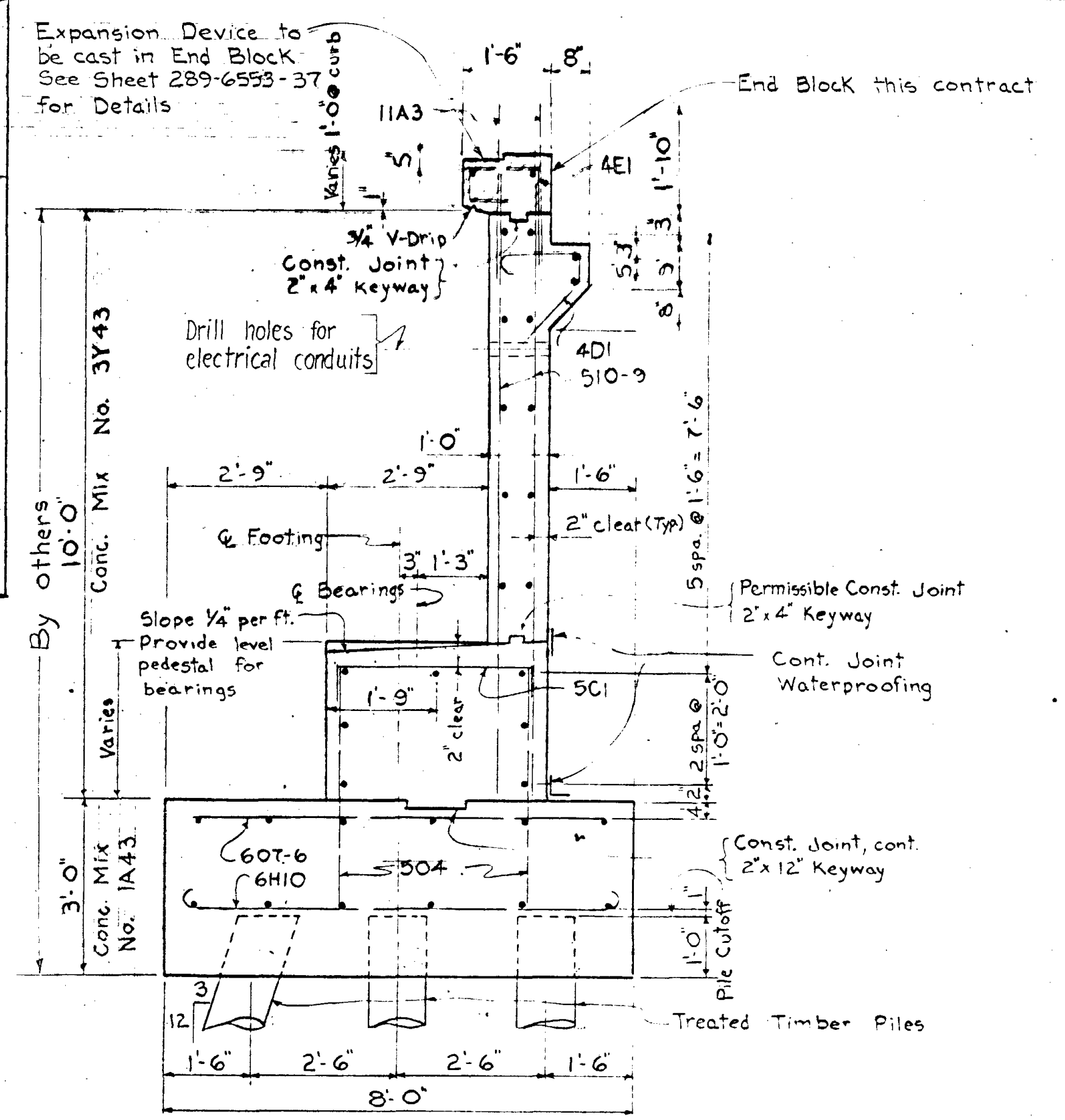
END BLOCK PLAN

Concrete in hatched area to be placed under this contract after superstructure roadway slab & expansion device are in place.

Note: Bars 517-6, 514-6 & 504 in End Block to be furnished under this contract



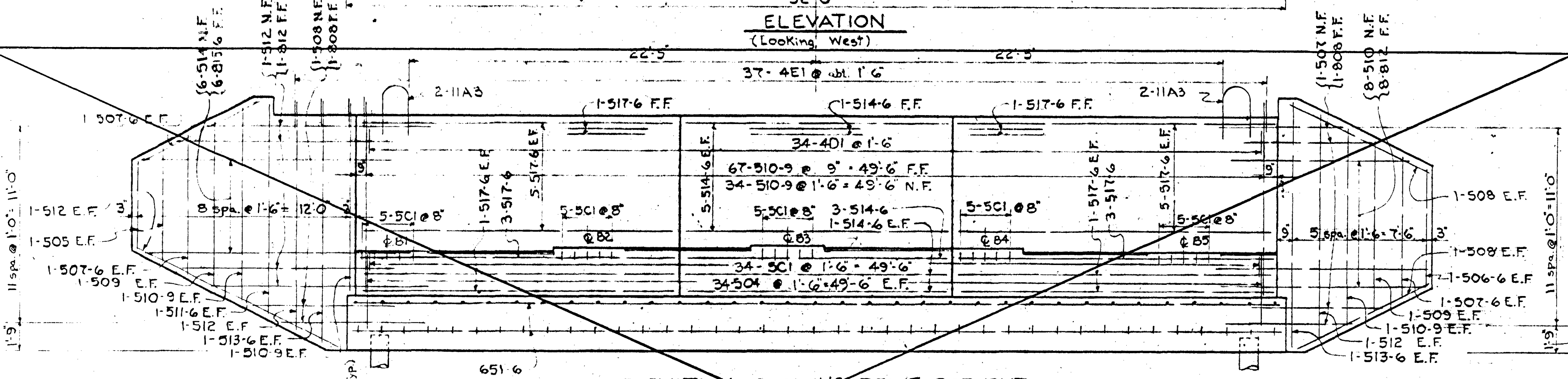
ELEVATION
(Looking West)



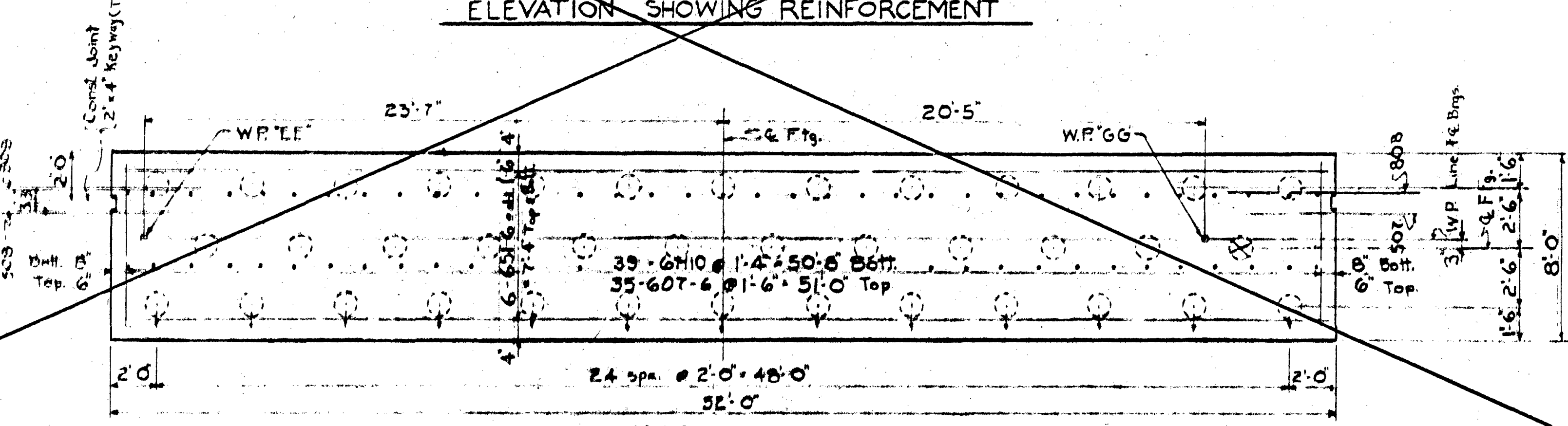
SECTION THRU ABUTMENT 9
Scale 1/2" = 1'-0"

Volume of 3Y46A Concrete in End Block = 3.2 c.y.

Note: Details of work by others shown for reference only.



ELEVATION SHOWING REINFORCEMENT



FOOTING PLAN
Scale 1/4" = 1'-0"

General Notes
Pile spacing shown is at bottom of footing. Piles marked thus (X) to be battered 3' per ft. in the direction shown.
Test pile marked thus (T).
1 Treated timber test pile, 70' long.
37 Treated timber piles, Est. length = 65' long.
38 Treated timber piles, req'd. for Abutment 9.

Vol. Conc. Mix No. 1A43 = 46.2 c.y.
Vol. Conc. Mix No. 3Y43 = 41.6 c.y.

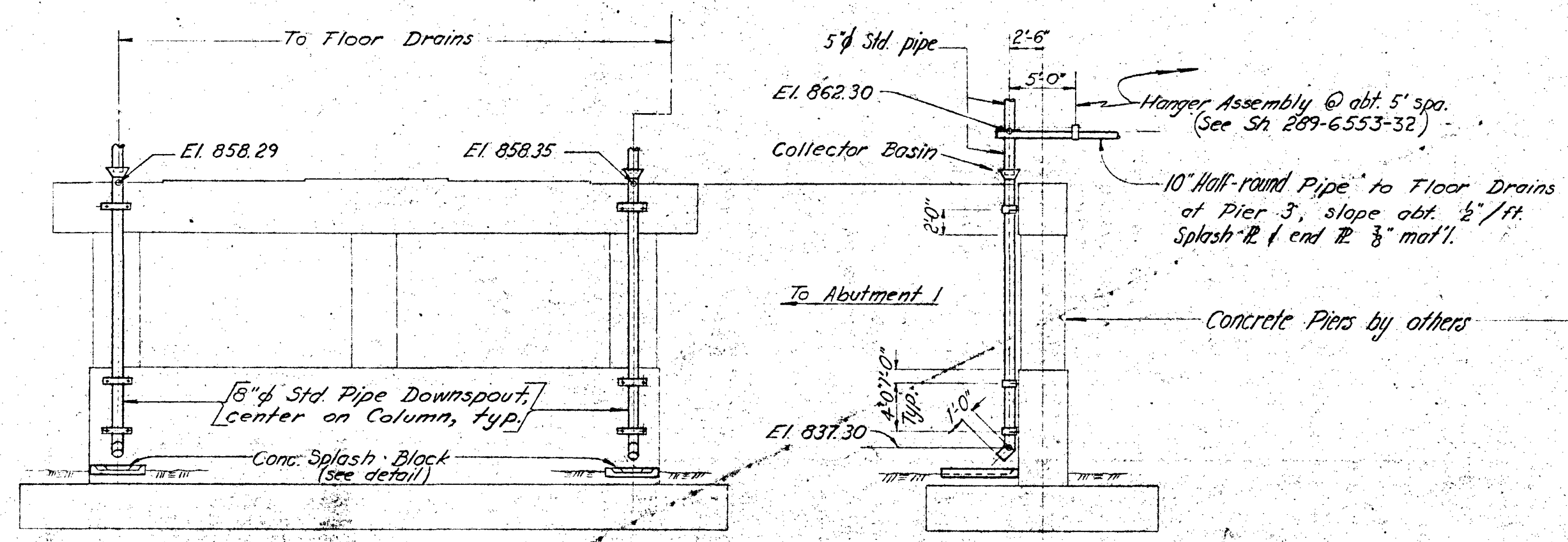
BURLINGTON NORTHERN INC.
MINNESOTA DIVISION
NORTHTOWN TO STAPLES
BRIDGE NO. 138
C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN
ABUTMENT NO. 9 - END BLOCK

RECOMMENDED: *[Signature]*
Director, Bridge Engineering

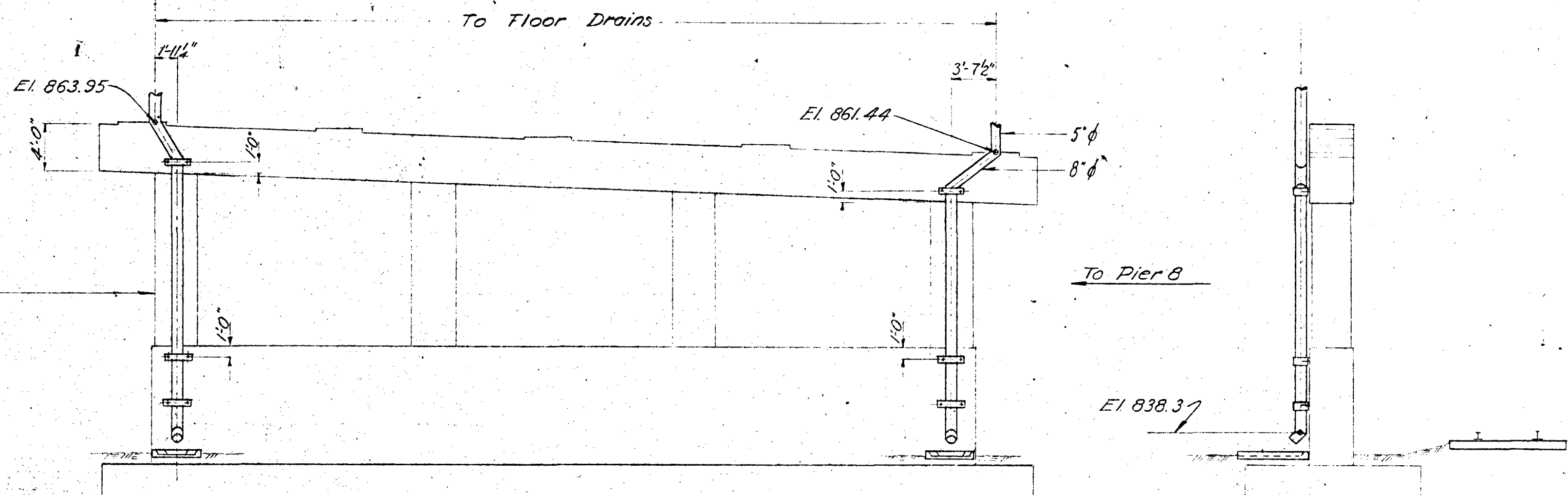
APPROVED: *[Signature]*
Asst. Vice President Engineering

OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

| REVISIONS | DES. JJM | DR. JJM | CH. DRC |
|-------------|-----------------------|---------|---------|
| | AUTHORITY: AFE 72-746 | | |
| | DATE: November 1972 | | |
| PLAN: | | | |
| 289-6553-30 | | | |

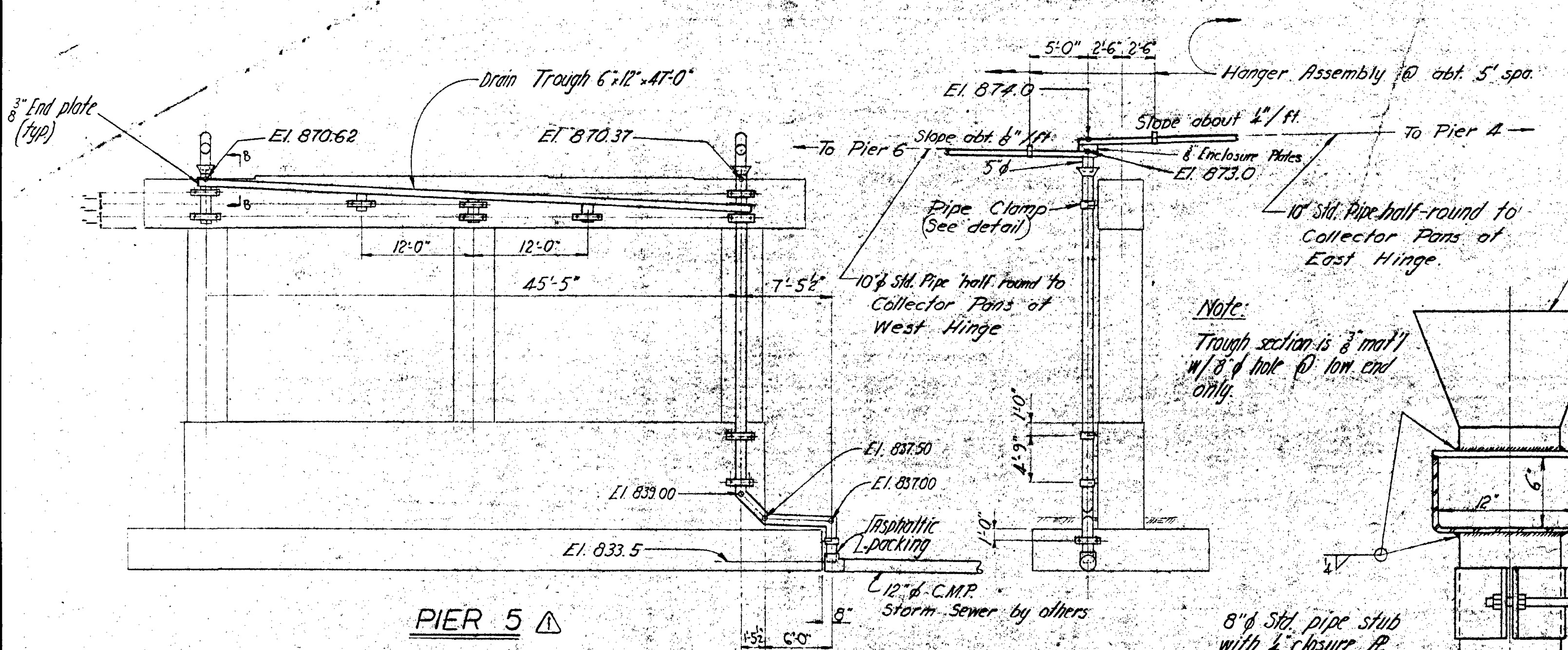


PIER 2

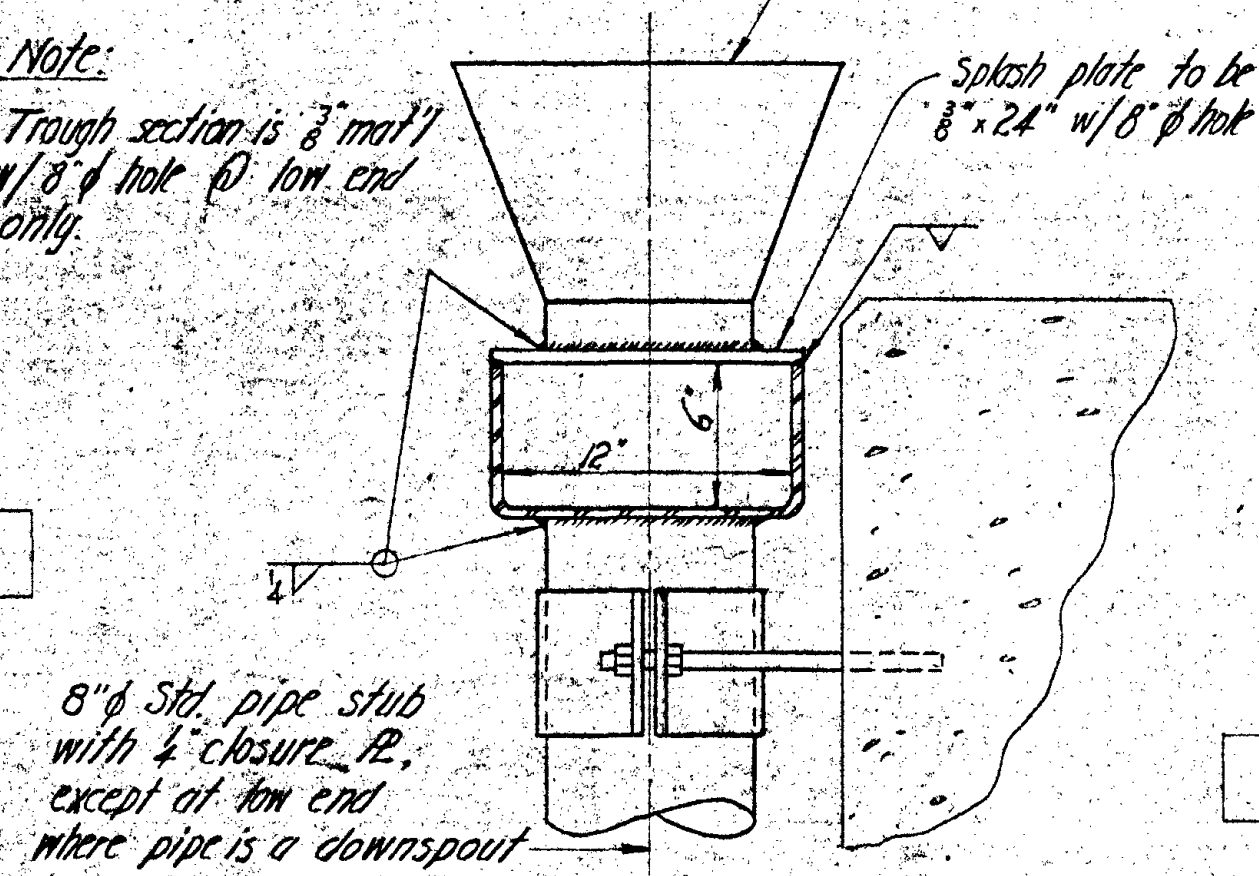


PIER 7

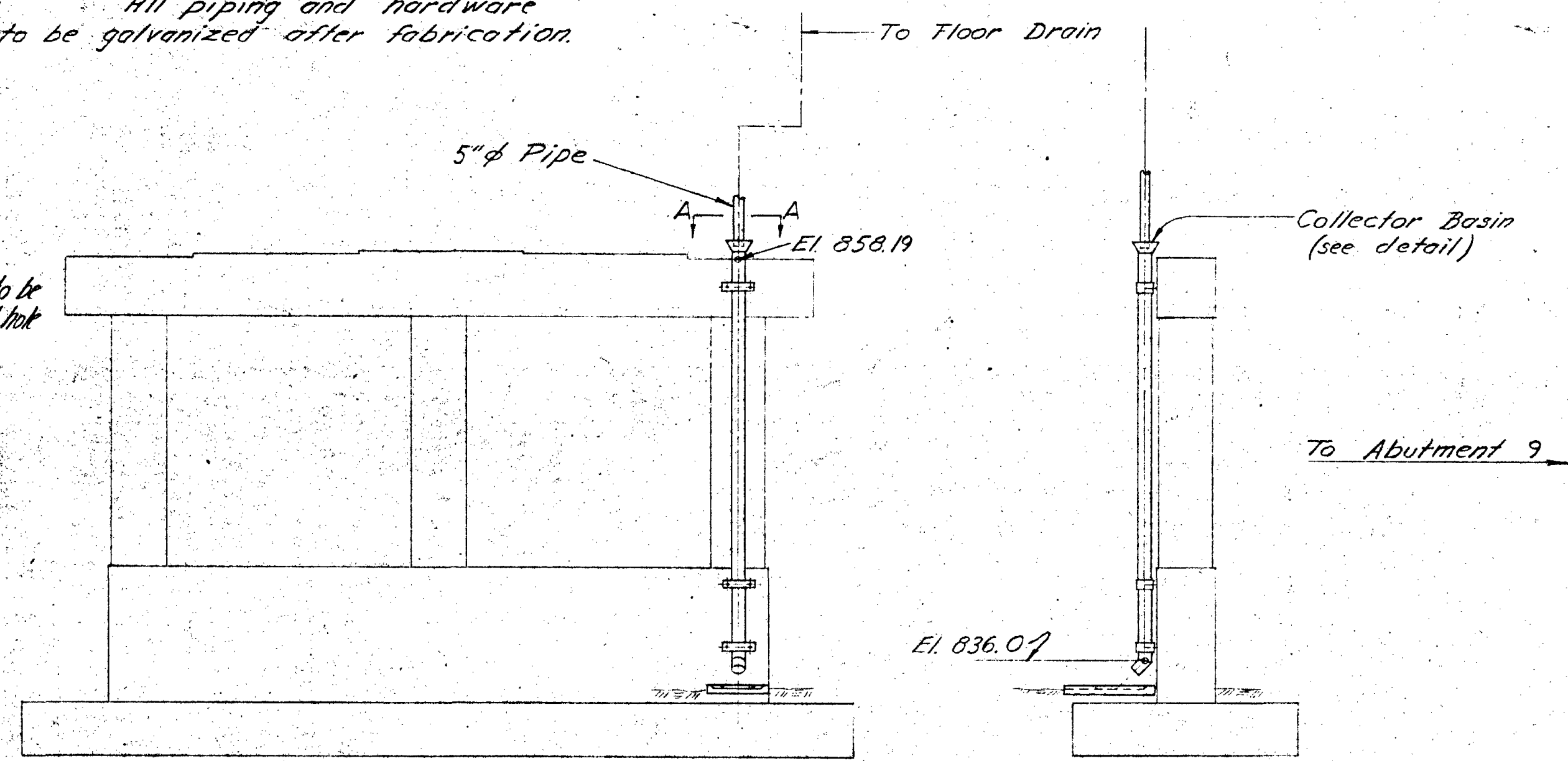
Notes:
 For Piping details to Floor Drains
 See Section B-B Sh 289-6553-32
 For Piping details to Collector Pans
 at Hinges see Section A-A Sh 289-6553-32
 All piping and hardware
 to be galvanized after fabrication.



PIER 5

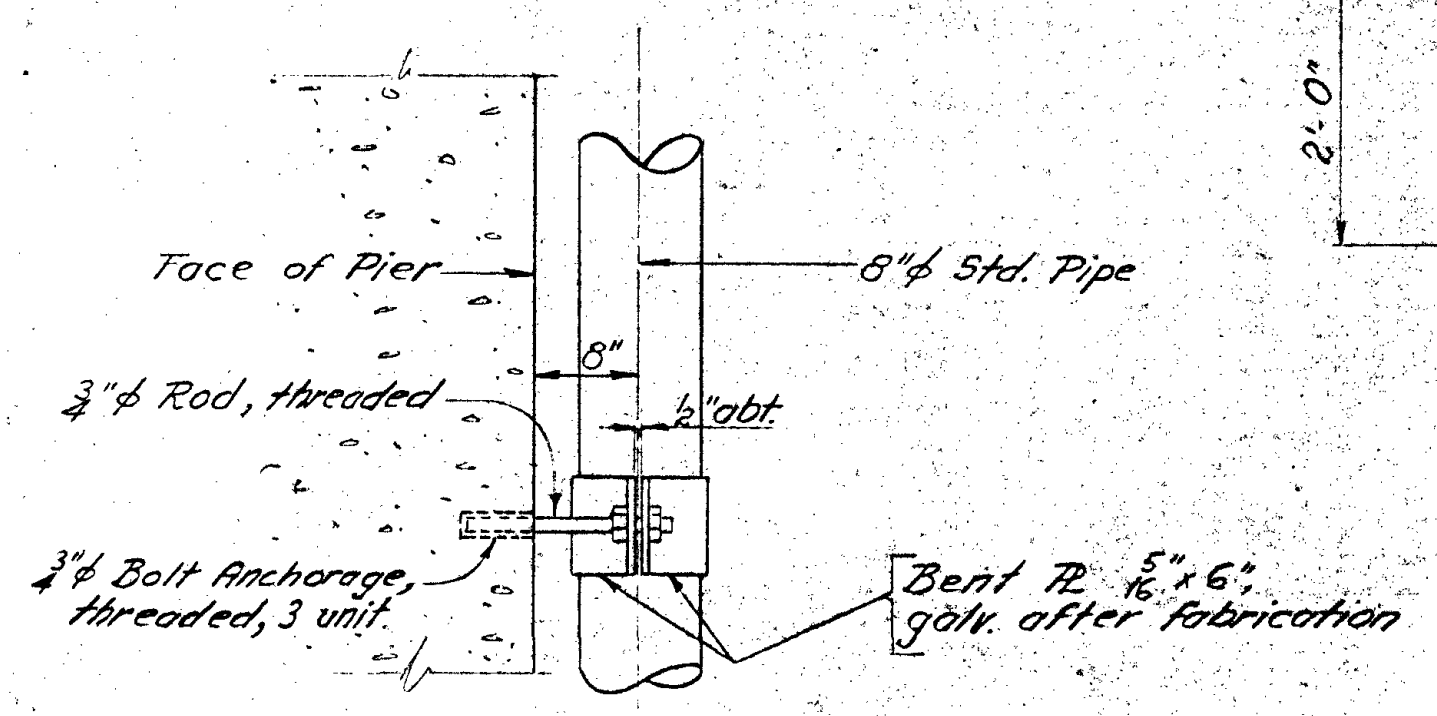


SECTION 'B-B'

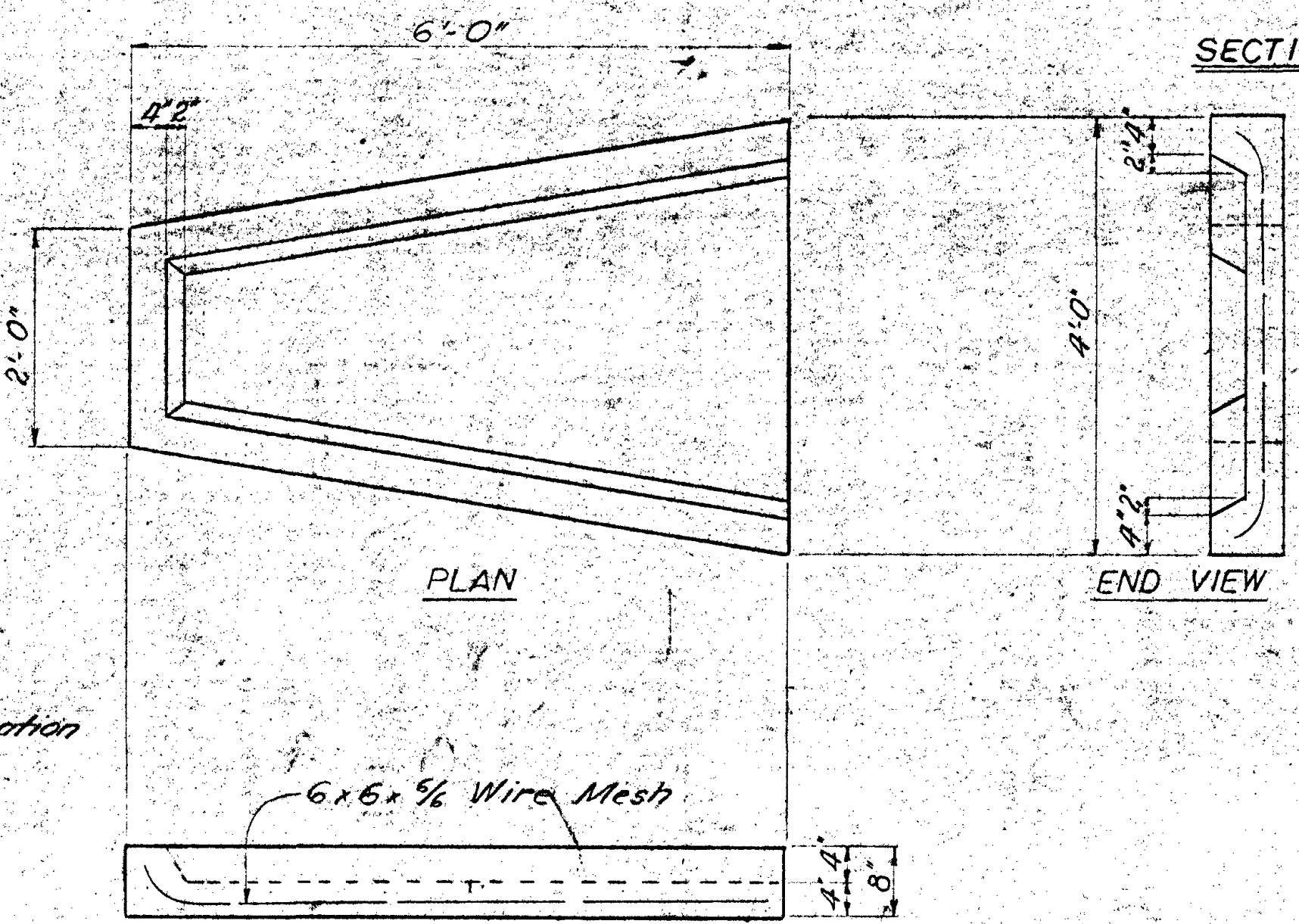


PIER 8

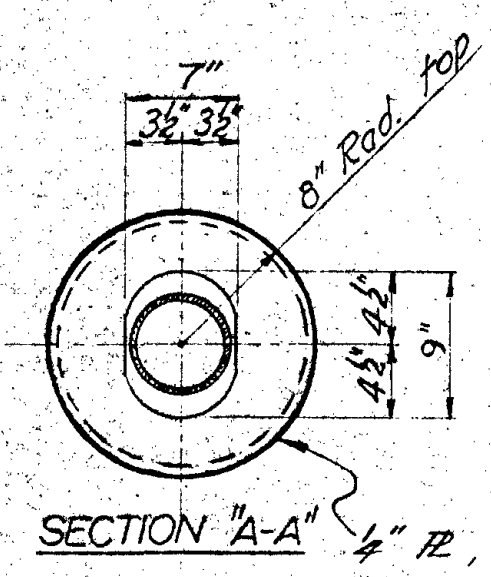
NOTE:
 Drainage System to be paid
 as lump sum, including splash blocks.



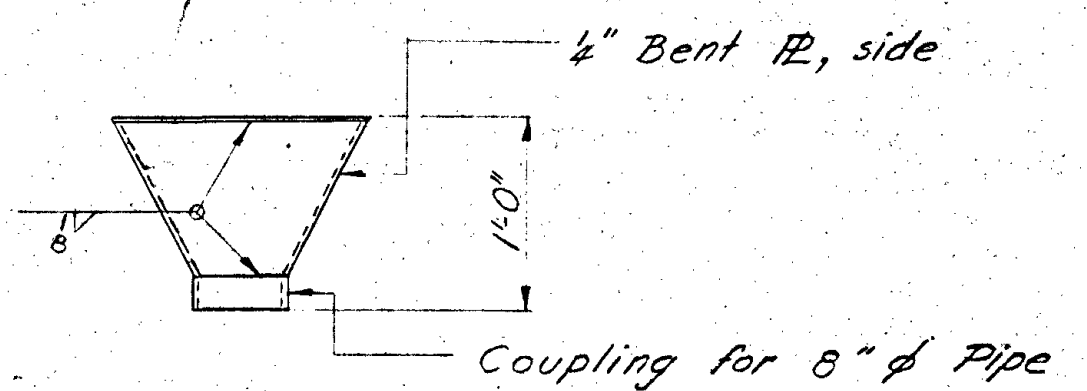
PIPE CLAMP DETAIL



ELEVATION
 SPLASH BLOCK
 (5 Req'd as shown)
 Use Concrete 3Y46A

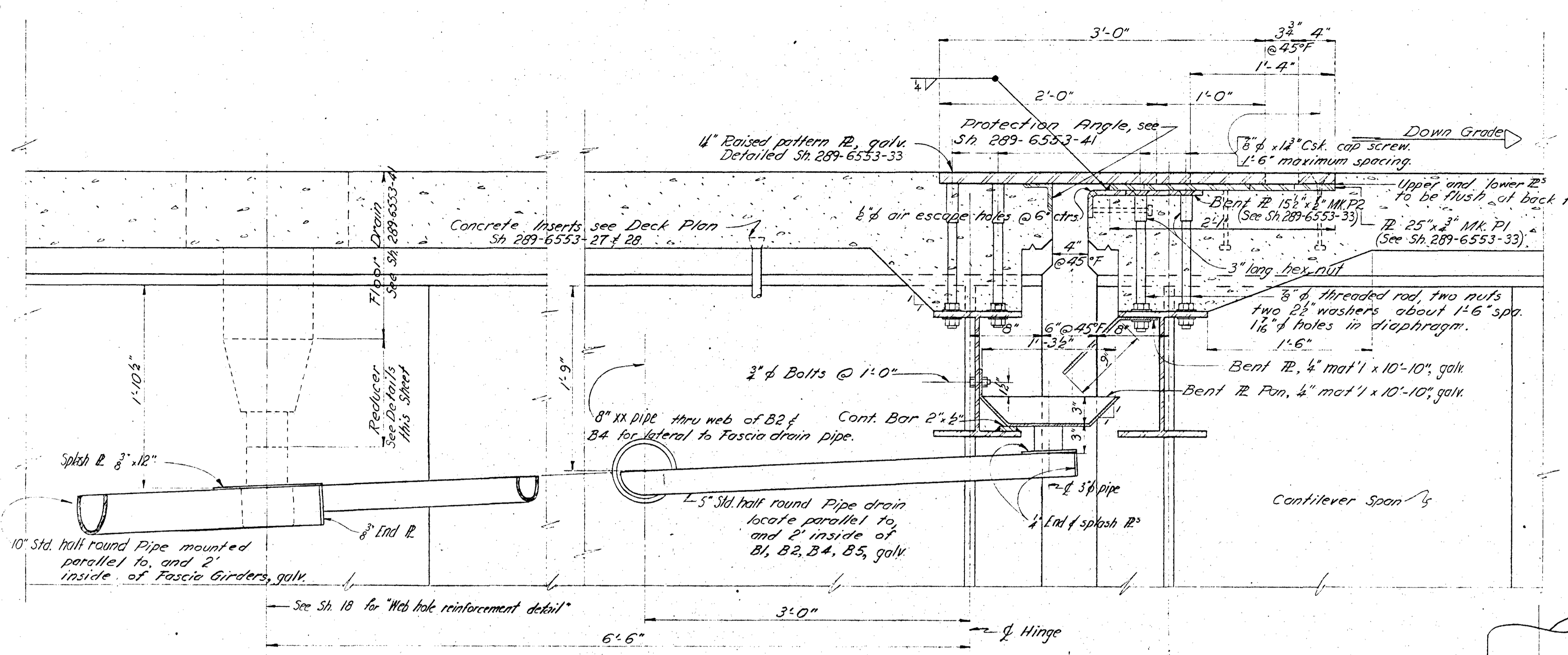


SECTION 'A-A'

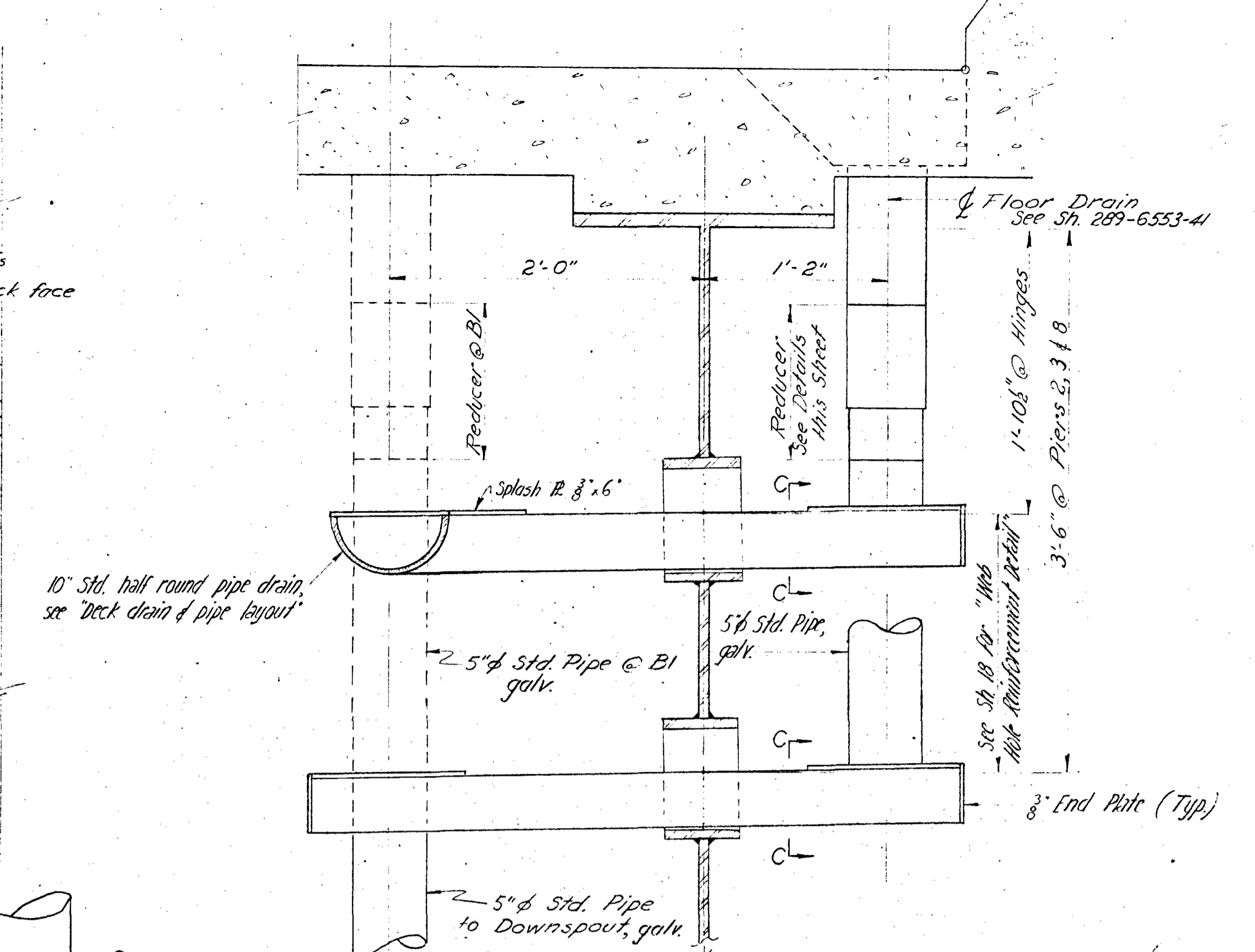


COLLECTOR BASIN
 (Galv. after fabrication)

| | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------|
| BURLINGTON NORTHERN INC. MINNESOTA DIVISION NORTH TOWN TO STAPLES BRIDGE NO. 13.8 C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTH TOWN DRAINAGE DETAILS | | | |
| RECOMMENDED <i>M.E. Fildrum</i> Director Bridge Engineering OFFICE OF DIRECTOR BRIDGE ENGINEERING | | APPROVED <i>R.H. Anderson</i> Asst. Vice President Engineering ST. PAUL, MINN. | |
| REVISIONS 1-17-1973 Horiz. run pipe details. | DES. <i>KEB</i> , DR. <i>OP</i> , CH. <i>JUM</i> | AUTHORITY: AFE. 72-746 DATE: November 1972 PLAN: | 289 - 6553 - 31 |

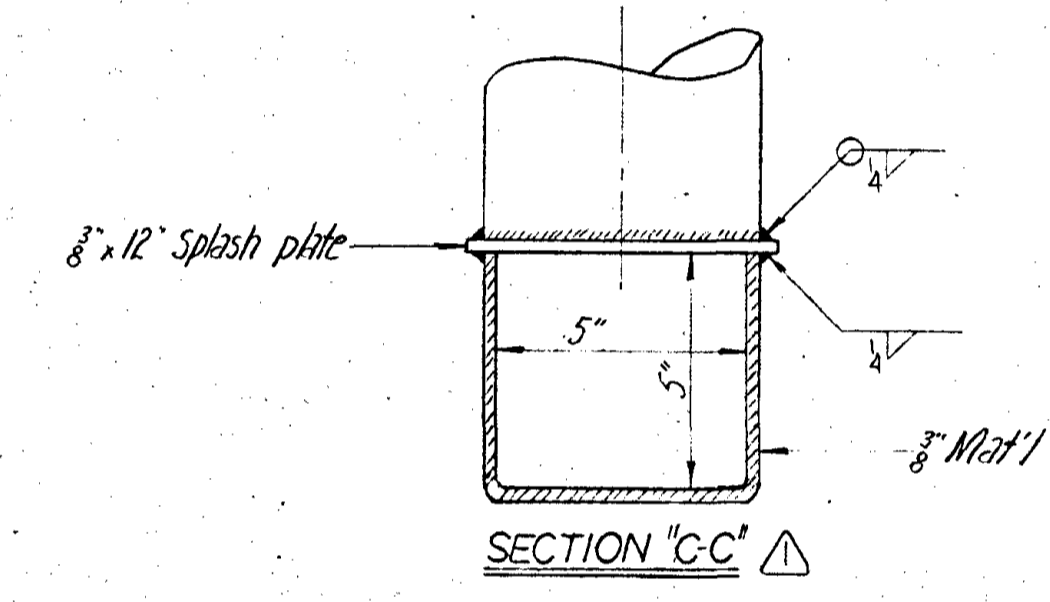


SECTION "A-A" Δ

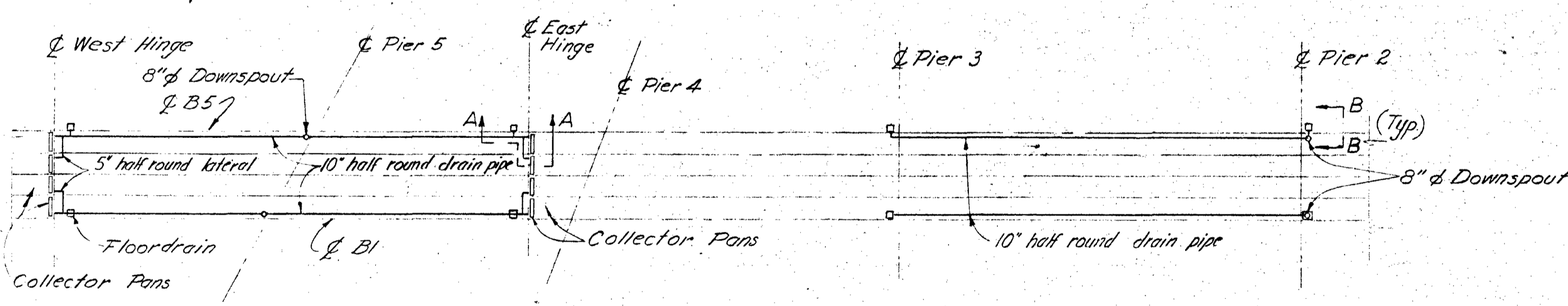


SECTION "B-B" Δ

Drain Pipes near Girder B5 shown in solid lines
 " " " " B1 " " dotted "
 Repair Galv. coating after field welding per M.H.D. 2471.3L3.

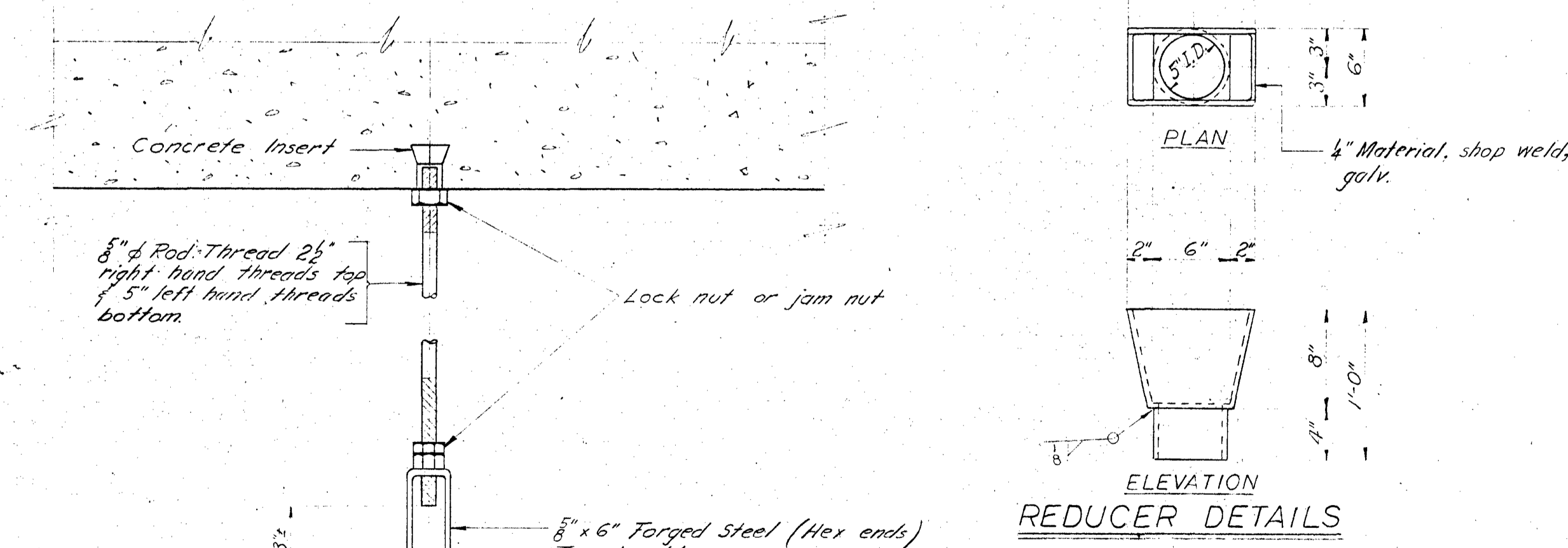


SECTION "C-C" Δ

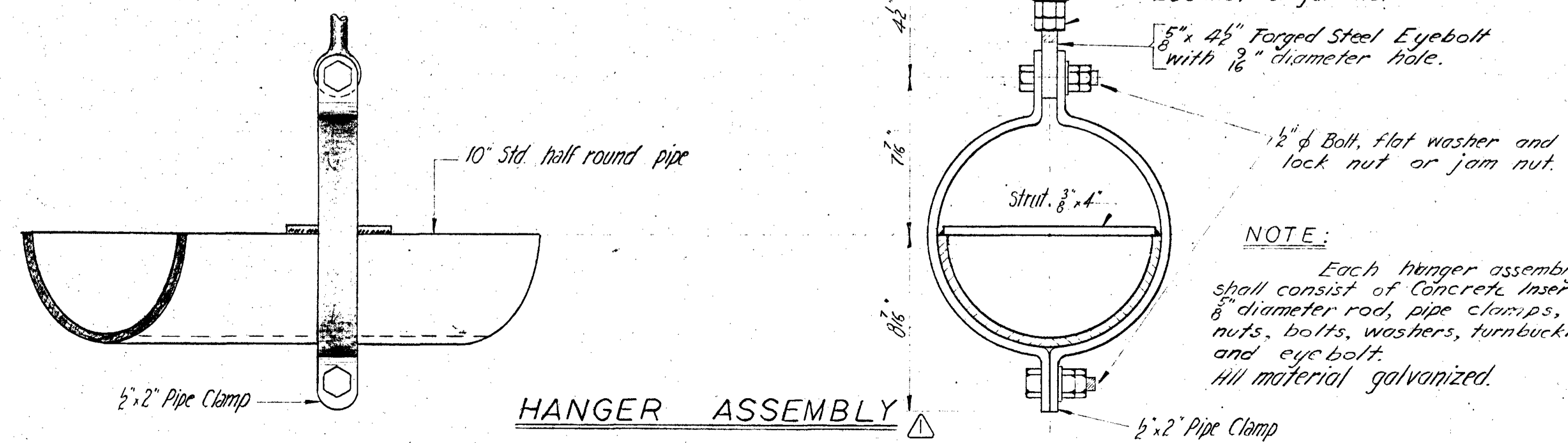


DECK DRAIN PIPE LAYOUT Δ

Note: Drainage pans, pipes, floor drains (Sh. 4), hanger assemblies, reducers, pipe clamps, splash blocks, collector basins, etc. to be bid as a lump sum "Drainage System."



REDUCER DETAILS



HANGER ASSEMBLY Δ

NOTE: Each hanger assembly shall consist of Concrete insert, 3/8 diameter rod, pipe clamps, nuts, bolts, washers, turnbuckle and eye bolt. All material galvanized.

BURLINGTON NORTHERN INC.
 MINNESOTA DIVISION
 NORTH TOWN TO STAPLES
 BRIDGE NO. 13.8
 C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTH TOWN

DRAINAGE & EXPANSION DETAILS

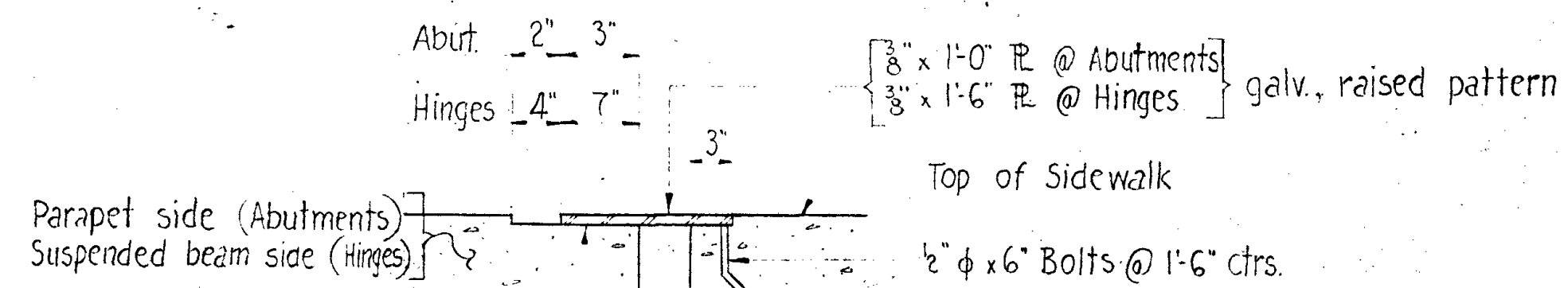
RECOMMENDED: *M. G. Ebram* Director Bridge Engineering
 APPROVED: *A. H. Anderson* Asst. Vice President Engineering

OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

| REVISIONS | DES. KEB | DR. OP | CH. JUM |
|-----------|----------|--------|---------|
| 1-17-1973 | | | |

Authority: A.F.E. 72-746
 Date: November 1972
 PLAN: Horiz. run pipe details

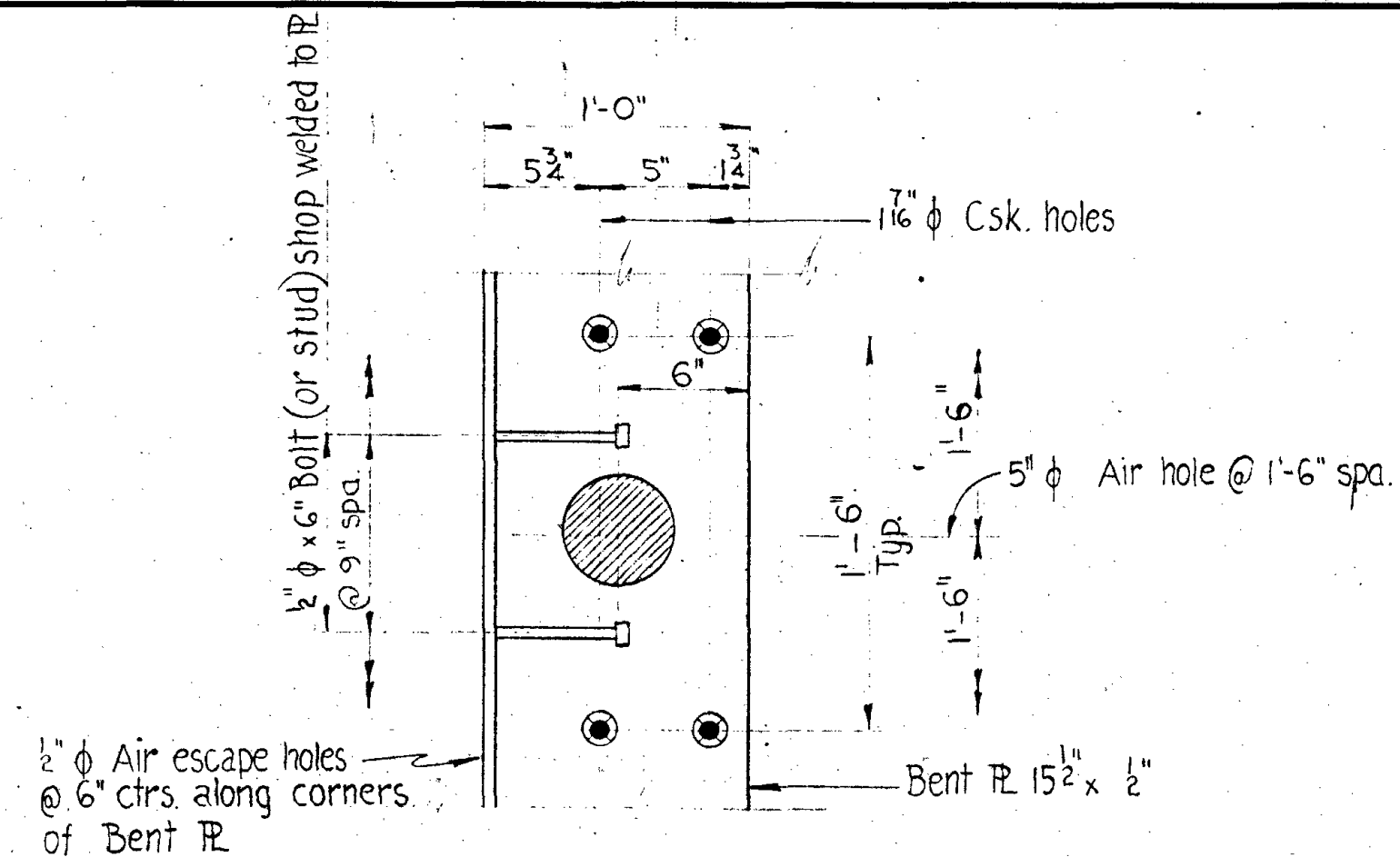
289-6553-32



Coat with paraffin to prevent bond

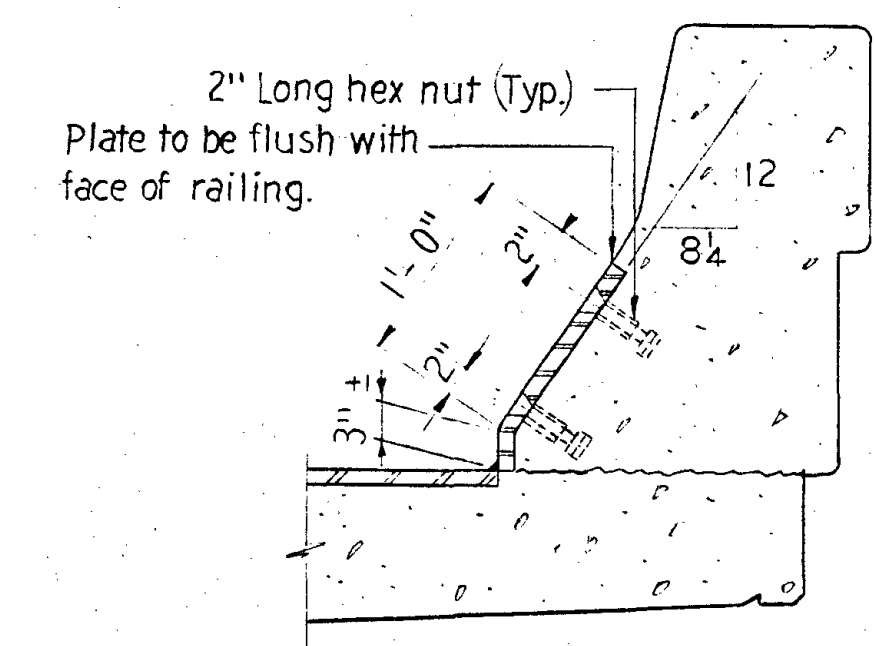
EXPANSION PLATE DETAIL FOR SIDEWALK

To be bid with Roadway Expansion Assemblies.
Bend 3/8" R up 6" @ concrete railing.

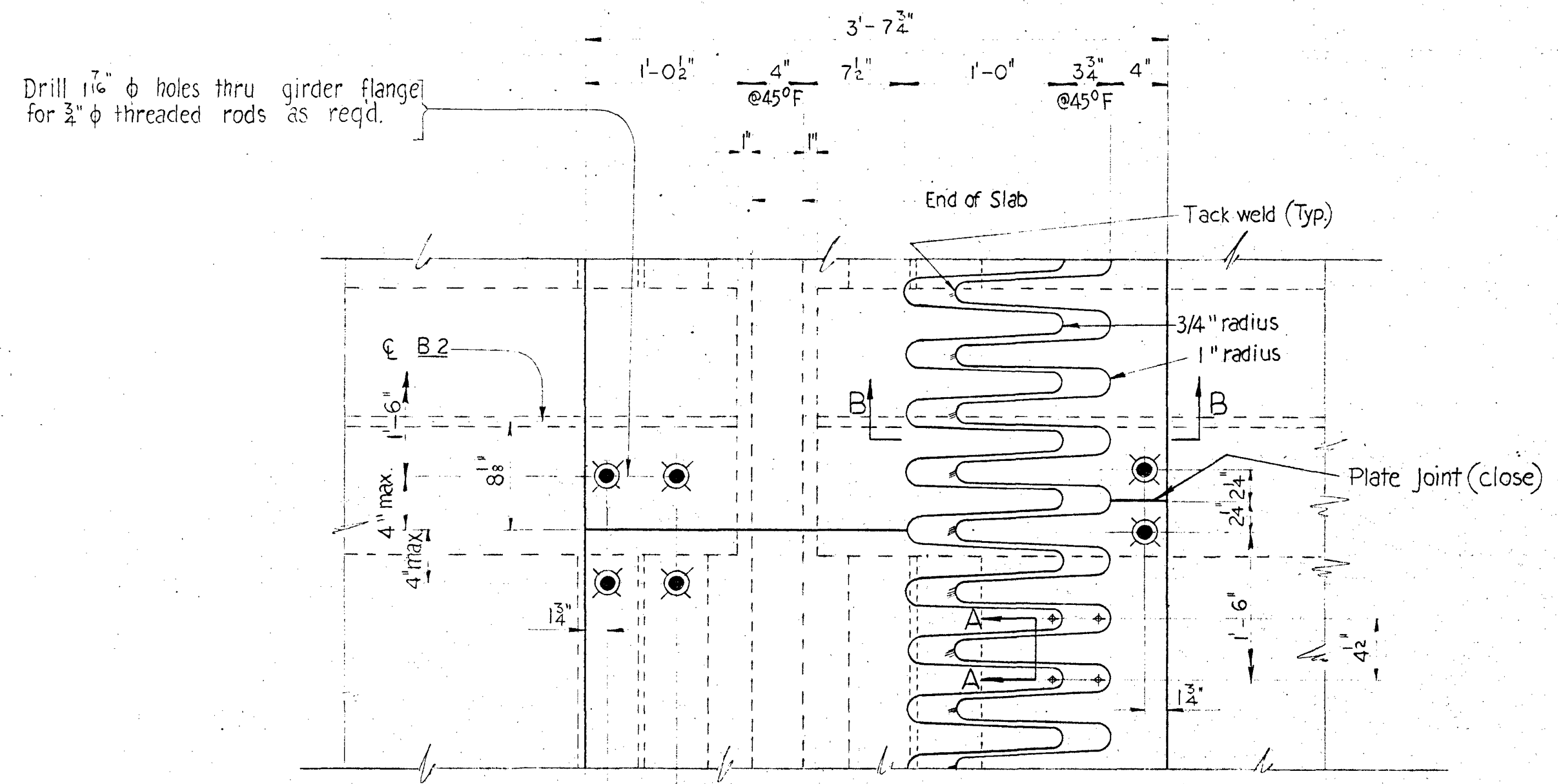


DETAIL R "P2"

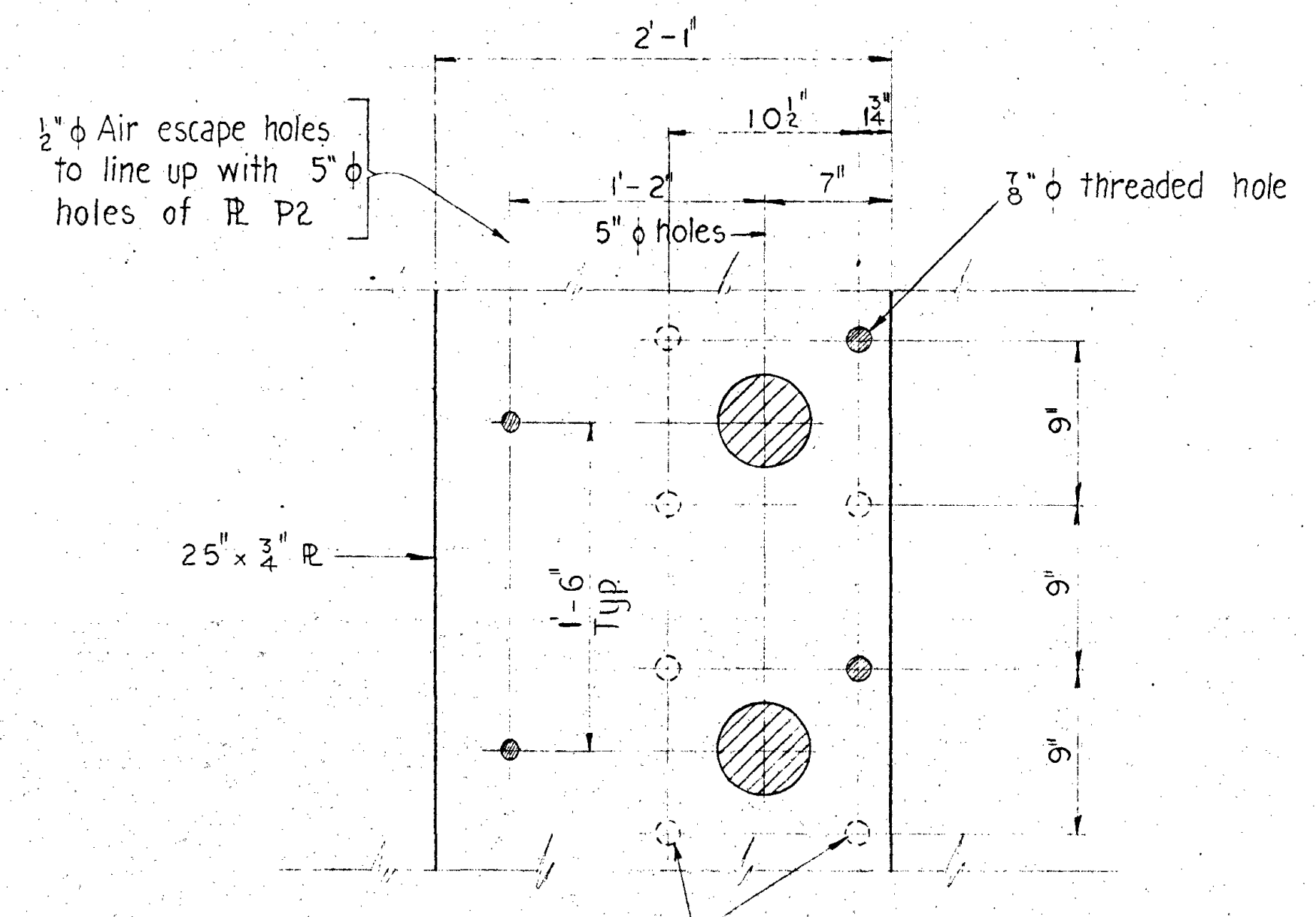
(See Sh. 289-6553-32 for location)



RAILING SECTION

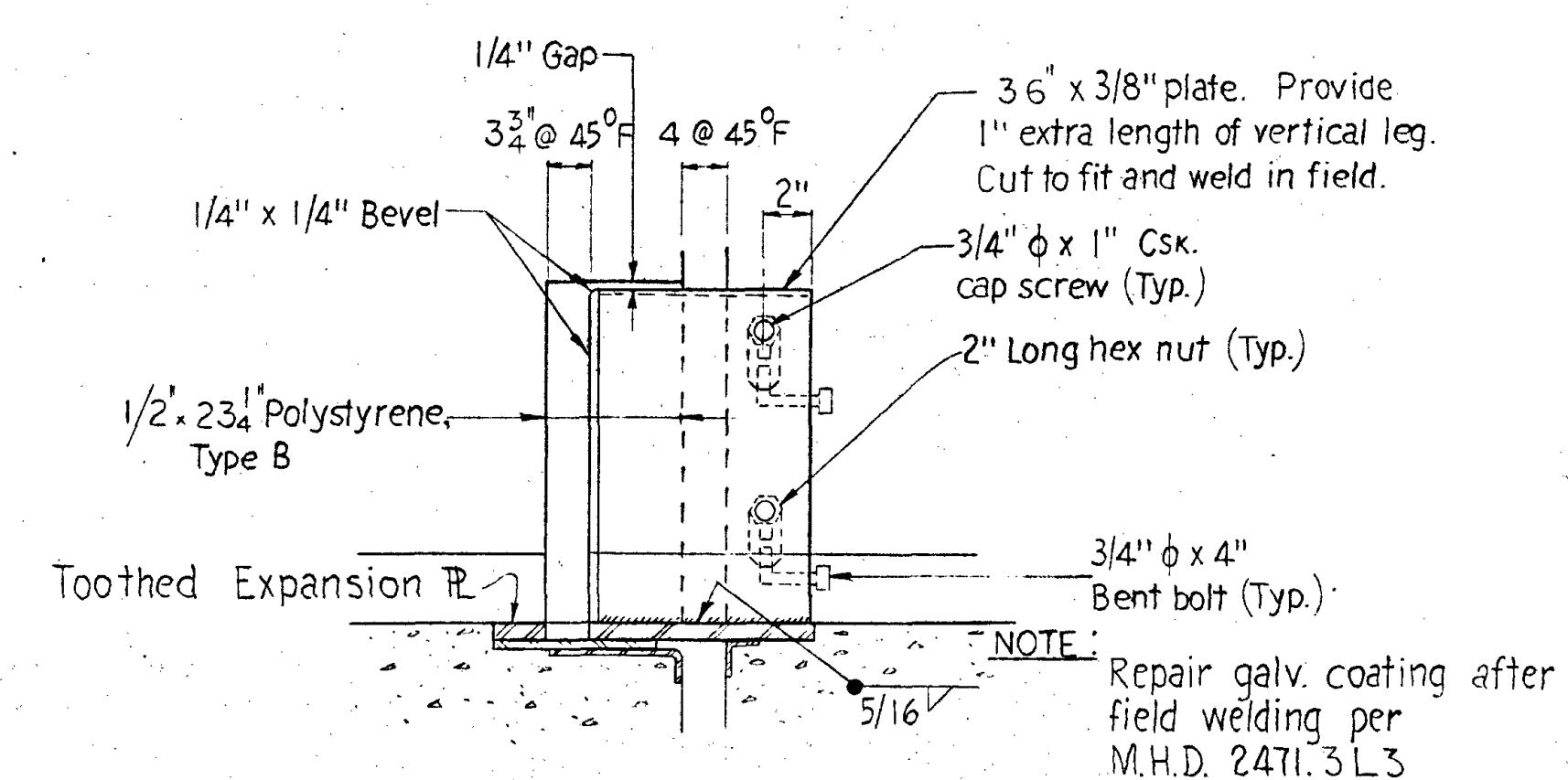


**PART PLAN
JOINT NEAR BEAM B2**

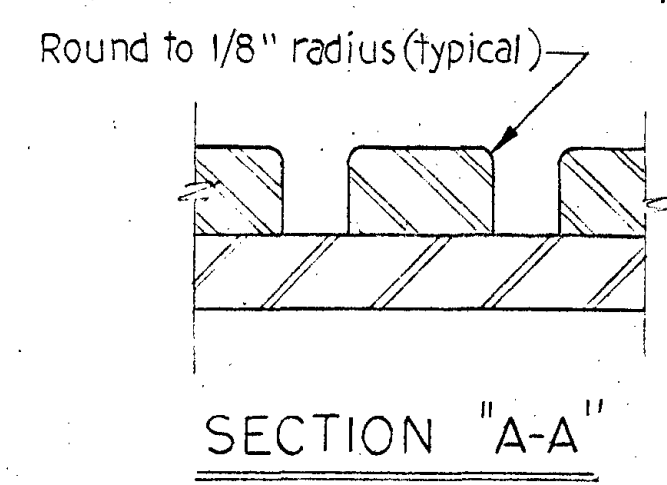


DETAIL R "P1"

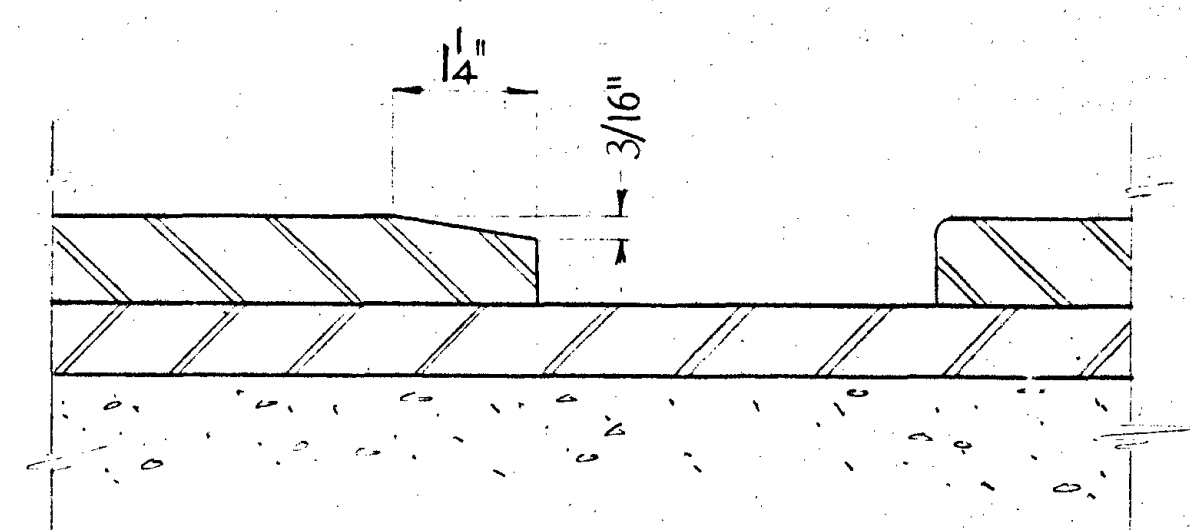
(See Sh. 289-6553-32 for location)



RAILING PLATE ELEVATION



SECTION "A-A"



SECTION "B-B"

NOTES:

- Roadway plate shall be raised pattern: Inland Steel Co., large pattern; U. S. Steel Co., section S400; or Allan Wood Co., super diamond.
- Structural steel shall comply with M. H. D. 3306.
- Galvanize all 1 1/4" roadway plates and 3/8" curb plates per M. H. D. 3394.
- Galvanize cap screws, 2" and 3" long hex. nuts per M. H. D. 3392.
- Galvanizing not required on bent plates, 3/4" and 7/8" bolts, rods and washers.
- Joints in roadway plate shall be located at breaks in transverse profile and as otherwise required. Joints shall be close fit and not welded. Locate cap screws and rod or bolt assemblies not more than 4" from joint on each side of joint.
- Bolt and washer included in anchorages - to be included in price bid for other items.
- All material this sheet to be bid as "Roadway Expansion Assemblies."

References:
Drainage & Expansion details 289-6553-32
Abutment Expansion Device 37

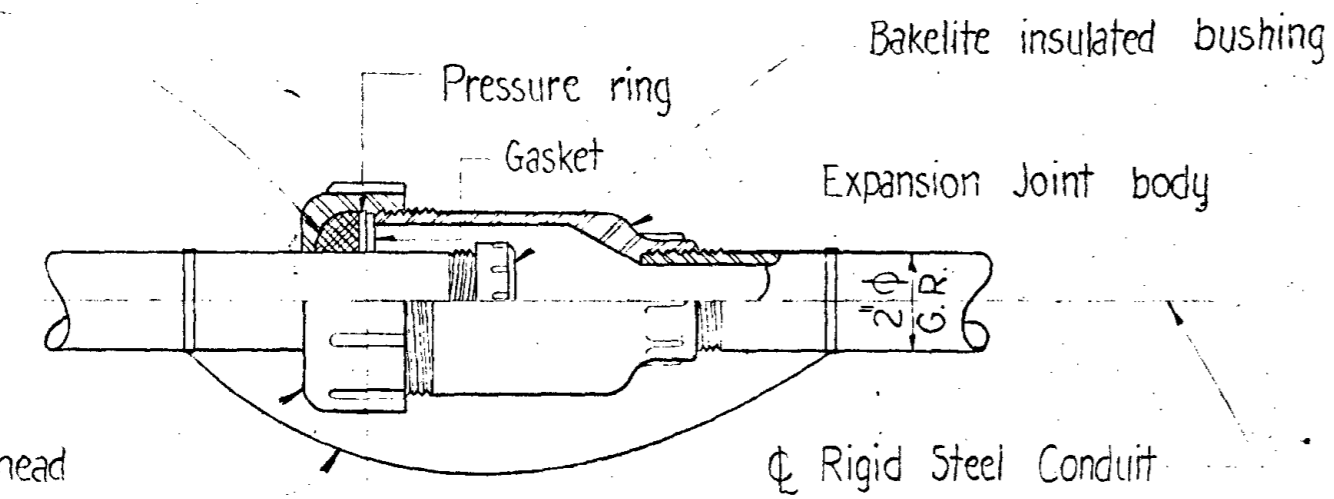
BURLINGTON NORTHERN INC.
MINNESOTA DIVISION
NORTHTOWN TO STAPLES
BRIDGE NO. 13.8
C.S.A.H. NO. 2 OVER YARD TRACKS, AT NORTHTOWN
HINGE EXPANSION DETAILS

RECOMMENDED: *[Signature]* Director, Bridge Engineering
APPROVED: *[Signature]* Asst. Vice President Engineering

OFFICE OF DIRECTOR BRIDGE ENGINEERING ST. PAUL, MINN.

| REVISIONS | DES. KEY | DR. O. P. | CH. JJM |
|-----------|---------------------------|-----------|---------|
| | AUTHORITY: A.F.E. 72-74 6 | | |
| | DATE: November 1972 | | |
| | PLAN: | | |
| | 289-6553-33 | | |

Watertight packing backed with a tinned copper wire mesh for grounding.



Bonding Jumper for continuity of electrical ground.

1/4" @ 30" E
2" @ 60" E
2 3/8" @ 90" E
4" Free Length Expansion Chamber

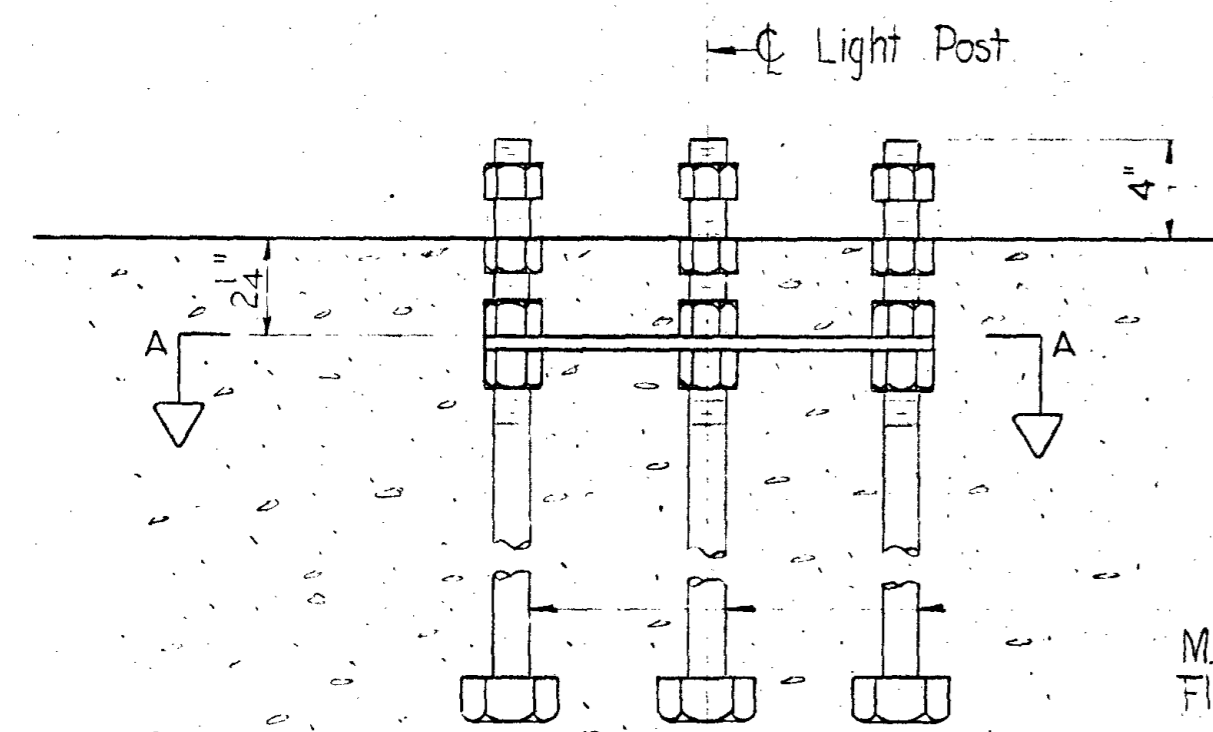
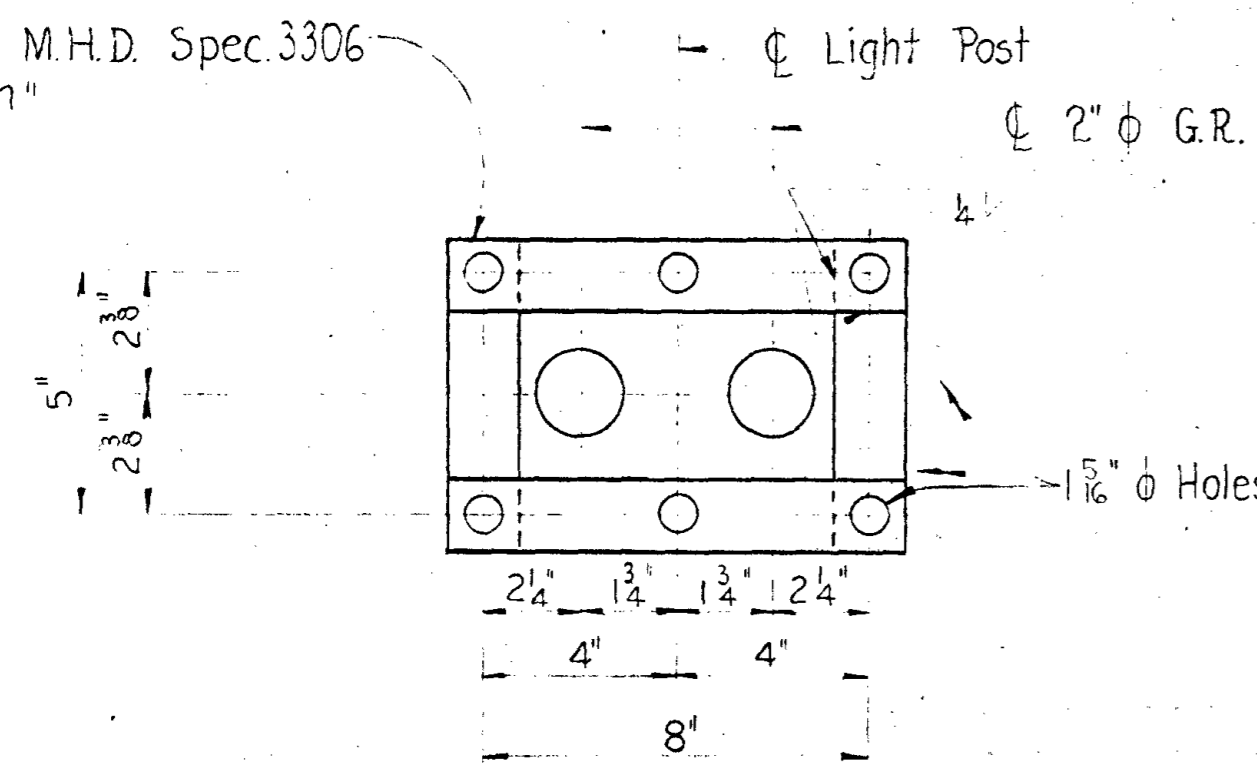
EXPANSION JOINT FITTING DETAIL

Scale: 3" = 1'-0"

(Place 2 Joint Fittings in series @ East Hinge)

10 Fittings Req'd.

2" x 1/2" Steel bar, M.H.D. Spec. 3306 "Black Iron"



LIGHT ANCHOR BOLT ASSEMBLY

Scale: 3" = 1'-0"

Adjust bolts to accommodate the thickness of lamp base, plate & shims.

1" φ x 24" Bolts, 4 Hvy. Hex. nuts as shown, M.H.D. 3391, galvanized. Flat face of bolt heads to be parallel to railing.

NOTES:

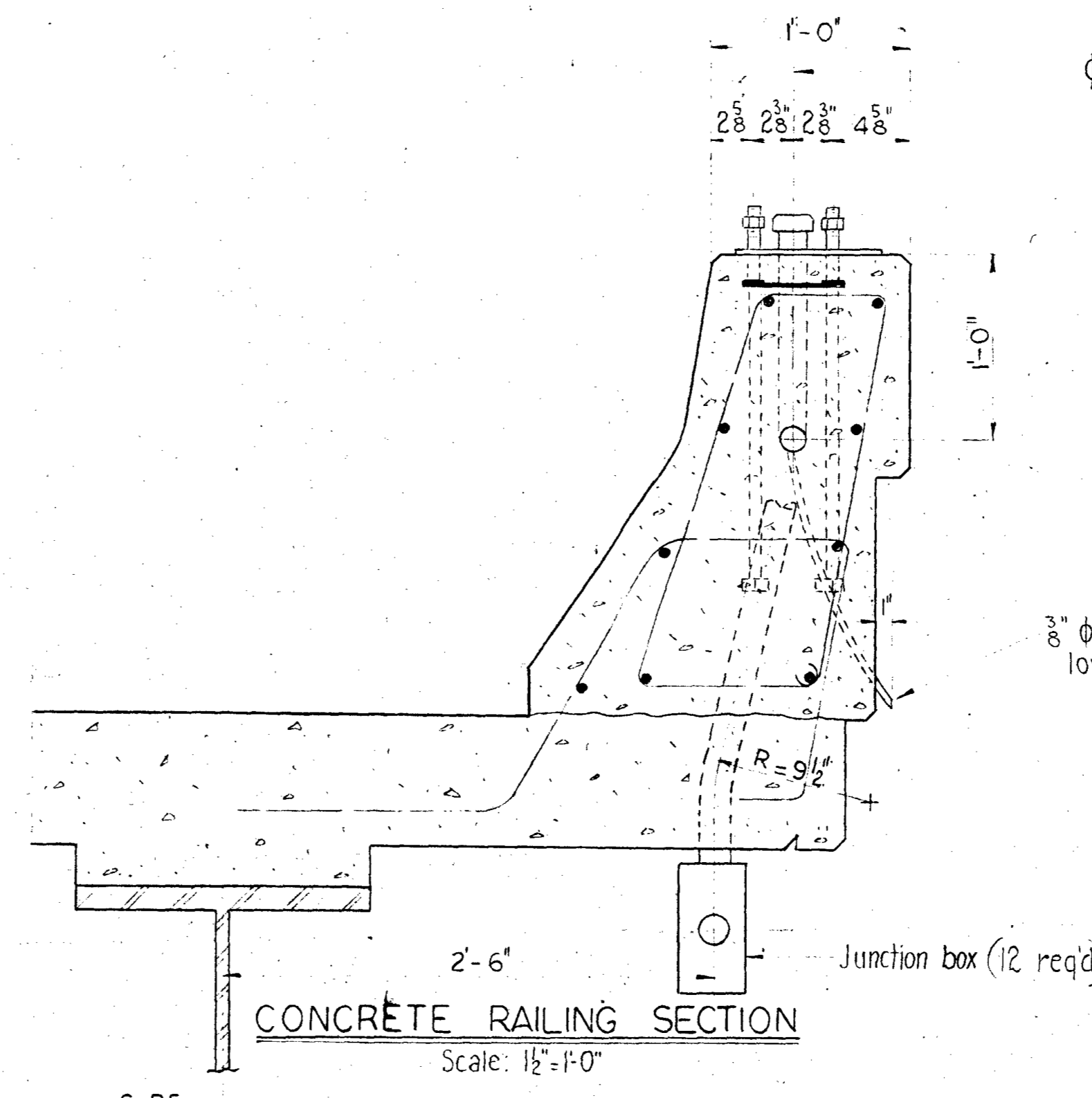
All material detailed in this sheet to be included in price bid for Electrical Work.

Anchor Bolts are to be set according to manufacturer's recommendations.

35 aluminum alloy, davit arm, transformer base type, ornamental light standard to be furnished and placed by others.

Electrical wiring to be furnished and placed by others.

Junction box shall be cast-iron (N.E.M.A. class 4) galvanize after fabrication per M.H.D. 3394. Galvanize nuts, bolts and washers per M.H.D. 3392.

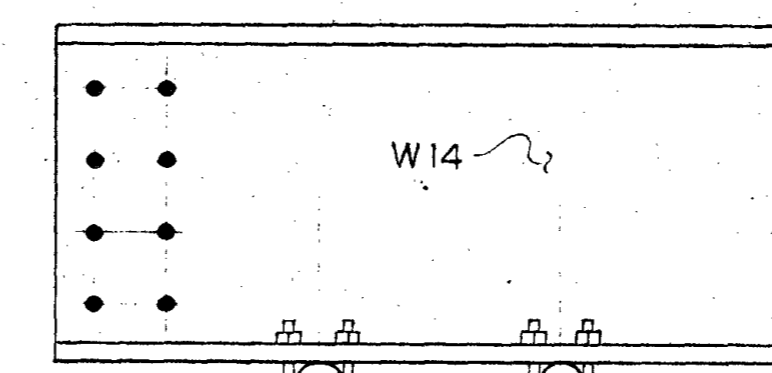


CONCRETE RAILING SECTION

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

CONCRETE RAILING SECTION SIDEWALK SIDE

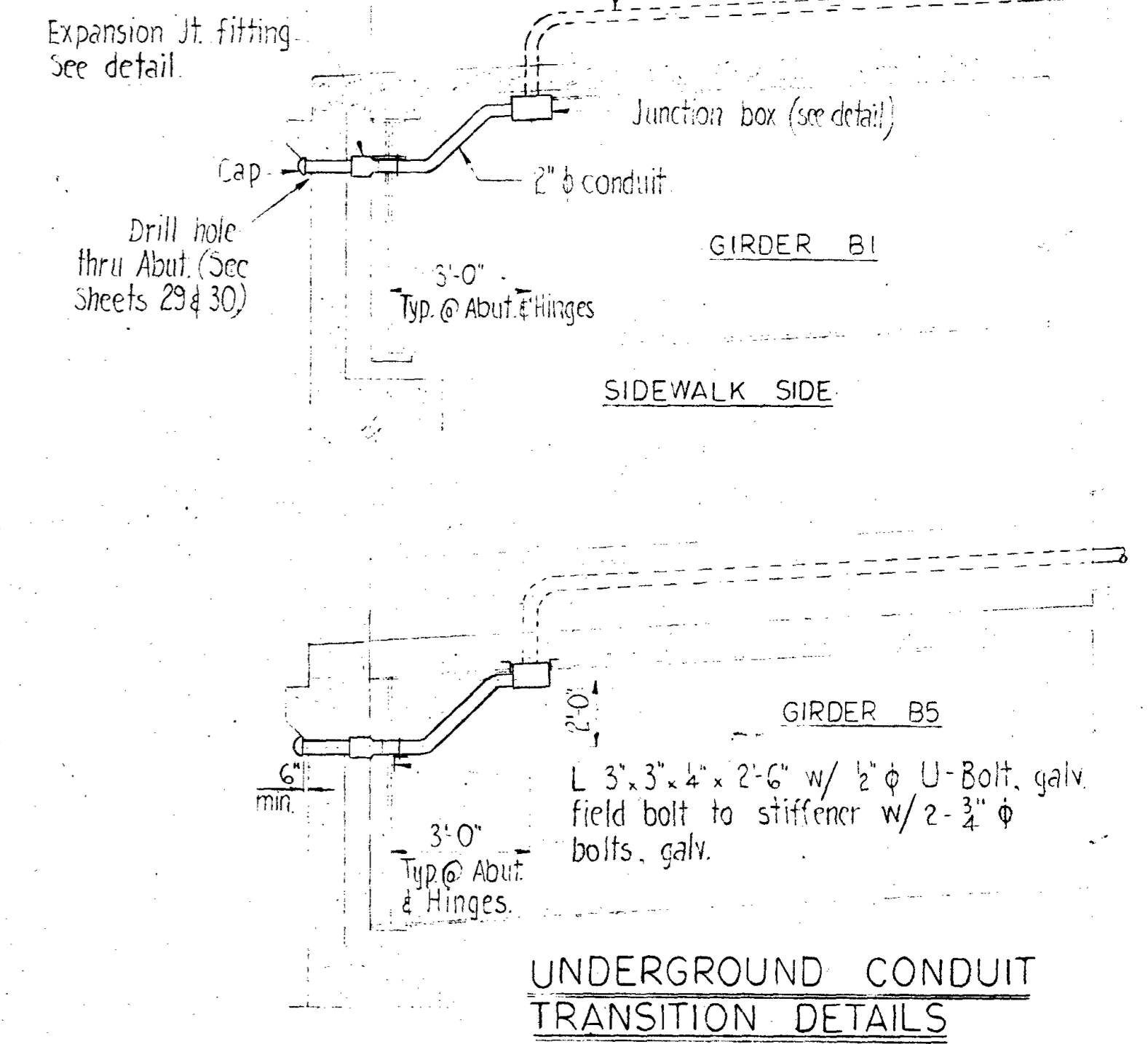
Scale: 1 1/2" = 1'-0"



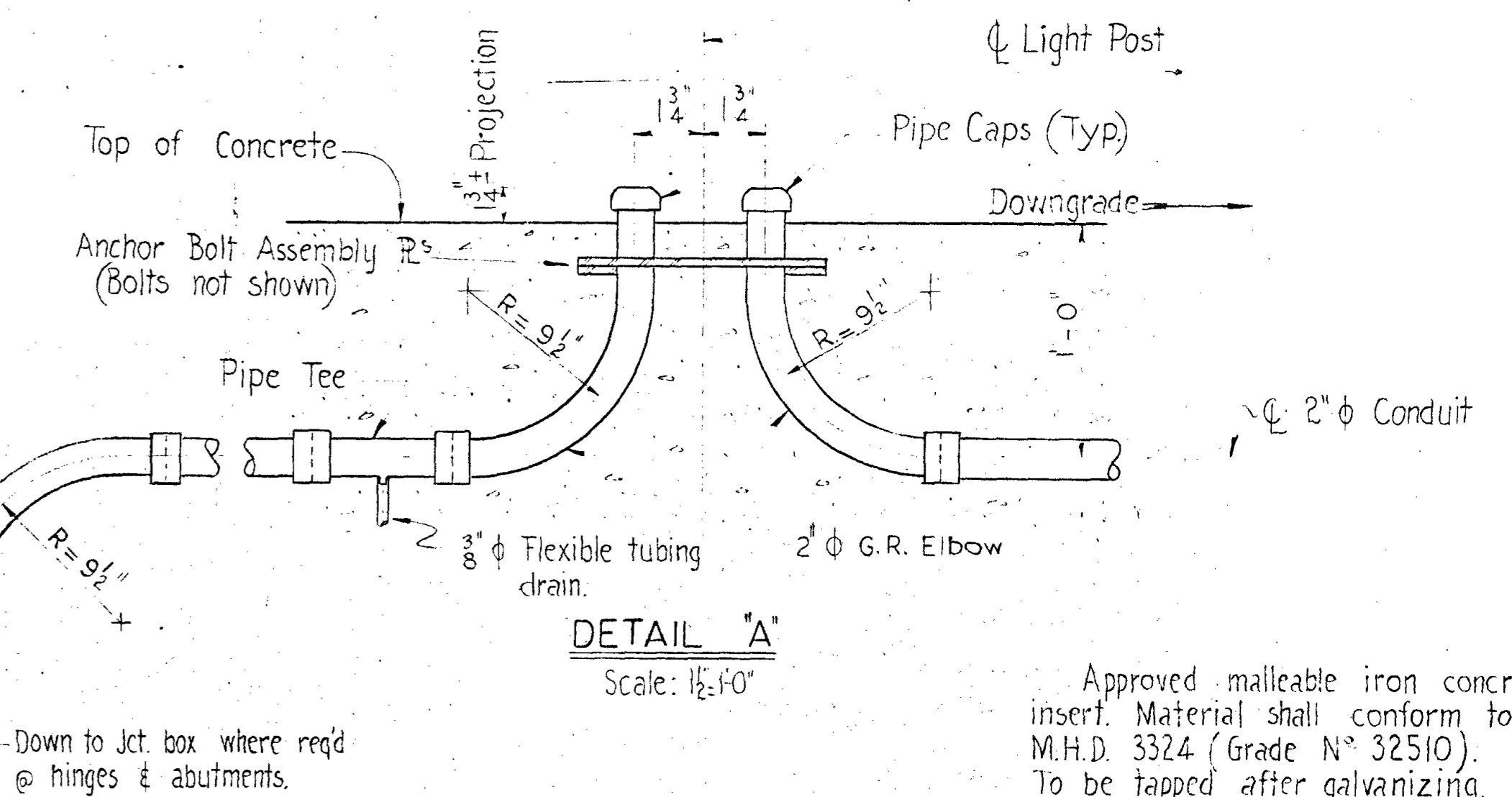
1'-2" @ Hinges
2'-6" @ Abutments
1/2" φ U-Bolt, galv. (Fasten 2" φ conduit)

2" φ G.R.

3/8" φ Flexible tubing, drain at low points. See Detail "A".



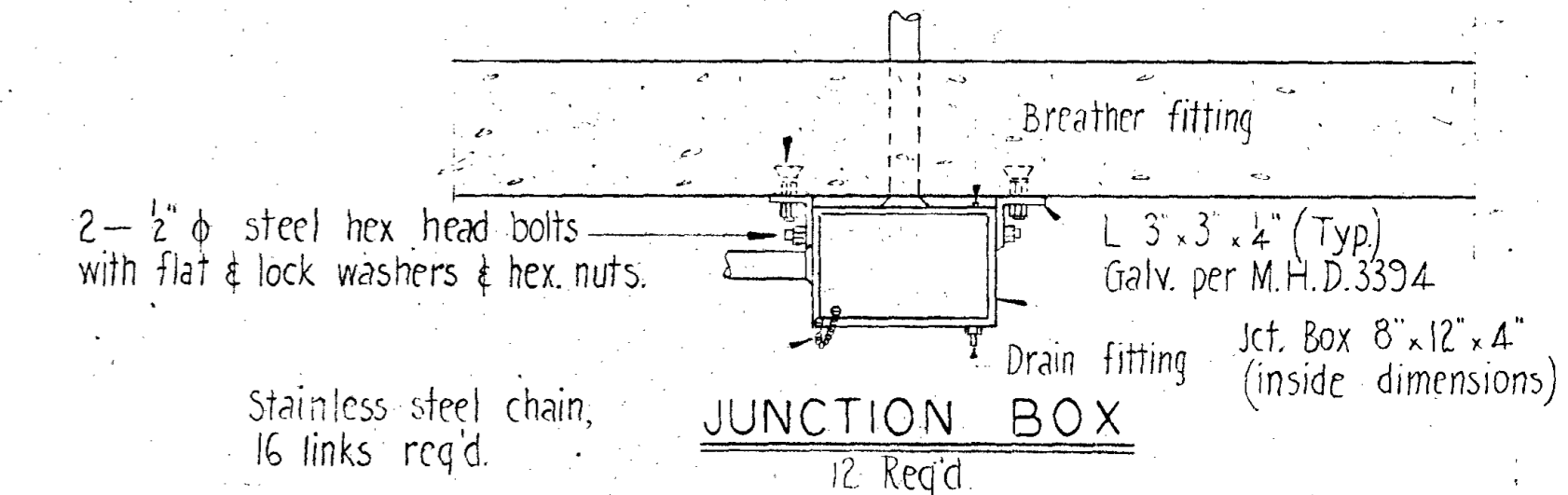
UNDERGROUND CONDUIT TRANSITION DETAILS



DETAIL "A"

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

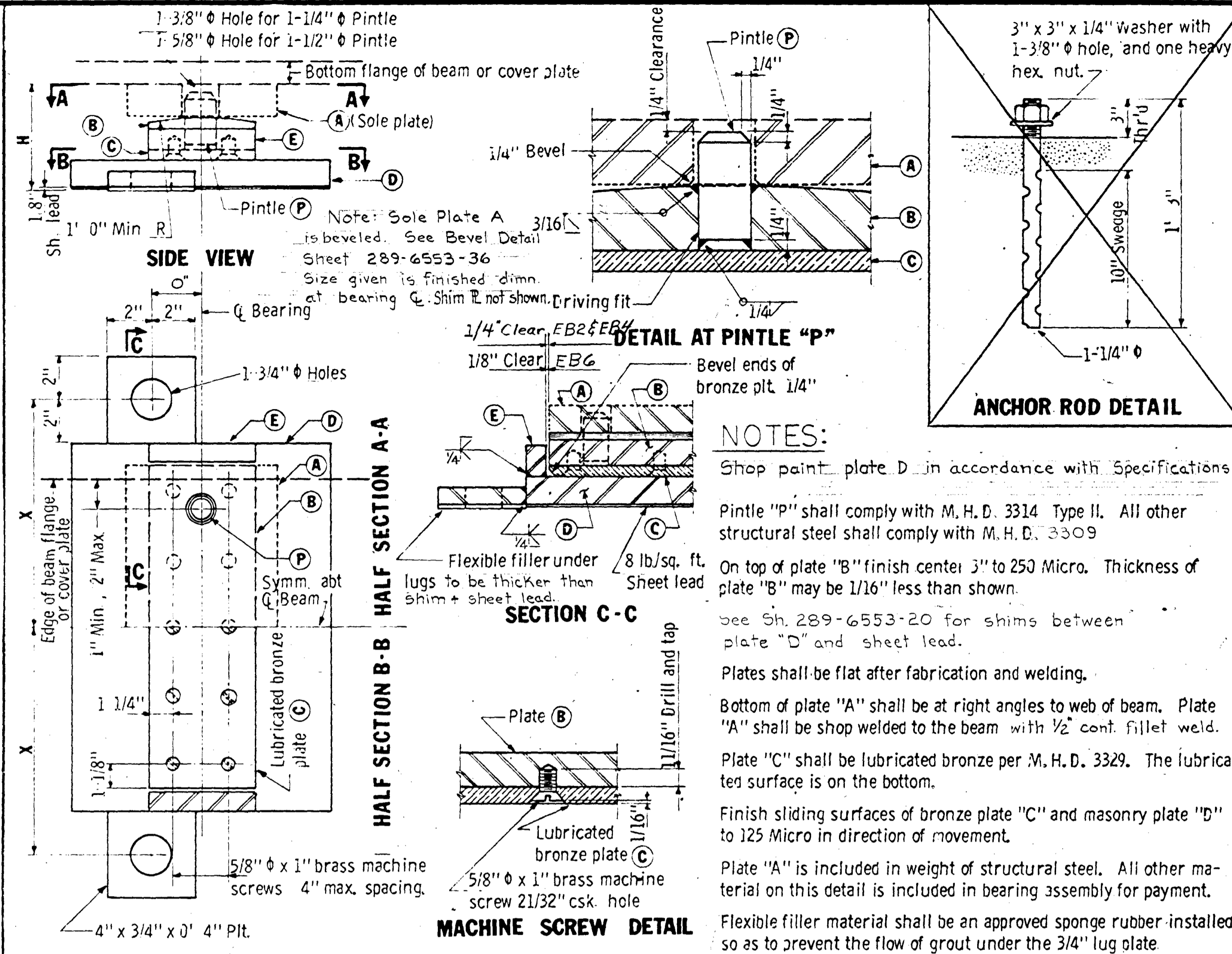
Approved malleable iron concrete insert. Material shall conform to M.H.D. 3324 (Grade N° 32510). To be tapped after galvanizing.



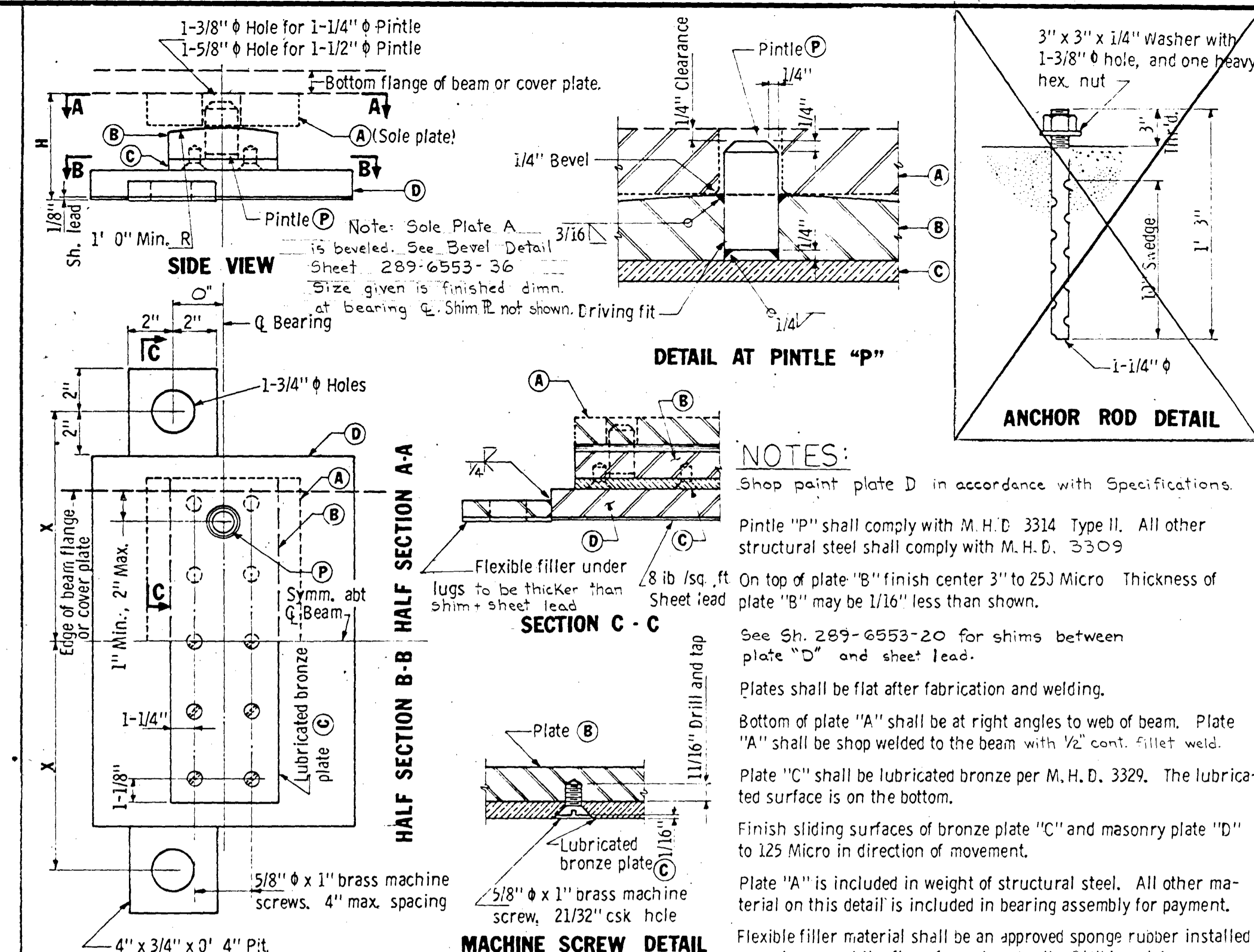
JUNCTION BOX

12 Req'd.

| | | | |
|-----------------------------------------------|----------------------------------|-----------------|---------|
| BURLINGTON NORTHERN INC. | | | |
| MINNESOTA DIVISION | | | |
| NORTHTOWN TO STAPLES | | | |
| BRIDGE NO. 13.8 | | | |
| C.S.A.M. NO. 2 OVER YARD TRACKS, AT NORTHTOWN | | | |
| LIGHTING DETAILS | | | |
| RECOMMENDED: | APPROVED: | | |
| <i>H.E. Ekstrom</i> | <i>B.H. Anderson</i> | | |
| Director Bridge Engineering | Asst. Vice President Engineering | | |
| OFFICE OF DIRECTOR BRIDGE ENGINEERING | | ST. PAUL, MINN. | |
| REVISIONS | DES. KEB | DR. O.P. | CH. KEB |
| | AUTHORITY: A.F.E. 72-746 | | |
| | DATE: November 1972 | | |
| | PLAN: | | |
| | 289-6553-34 | | |



NOTES:
 Shop paint plate D in accordance with Specifications.
 Pintle "P" shall comply with M. H. D. 3314 Type II. All other structural steel shall comply with M. H. D. 3309
 On top of plate "B" finish center 3" to 25J Micro. Thickness of plate "B" may be 1/16" less than shown.
 See Sh. 289-6553-20 for shims between plate "D" and sheet lead.
 Plates shall be flat after fabrication and welding.
 Bottom of plate "A" shall be at right angles to web of beam. Plate "A" shall be shop welded to the beam with 1/2 cont. fillet weld.
 Plate "C" shall be lubricated bronze per M. H. D. 3329. The lubricated surface is on the bottom.
 Finish sliding surfaces of bronze plate "C" and masonry plate "D" to 125 Micro in direction of movement.
 Plate "A" is included in weight of structural steel. All other material on this detail is included in bearing assembly for payment.
 Flexible filler material shall be an approved sponge rubber installed so as to prevent the flow of grout under the 3/4" lug plate.



NOTES:
 Shop paint plate D in accordance with Specifications.
 Pintle "P" shall comply with M. H. D. 3314 Type II. All other structural steel shall comply with M. H. D. 3309
 On top of plate "B" finish center 3" to 25J Micro. Thickness of plate "B" may be 1/16" less than shown.
 See Sh. 289-6553-20 for shims between plate "D" and sheet lead.
 Plates shall be flat after fabrication and welding.
 Bottom of plate "A" shall be at right angles to web of beam. Plate "A" shall be shop welded to the beam with 1/2 cont. fillet weld.
 Plate "C" shall be lubricated bronze per M. H. D. 3329. The lubricated surface is on the bottom.
 Finish sliding surfaces of bronze plate "C" and masonry plate "D" to 125 Micro in direction of movement.
 Plate "A" is included in weight of structural steel. All other material on this detail is included in bearing assembly for payment.
 Flexible filler material shall be an approved sponge rubber installed so as to prevent the flow of grout under the 3/4" lug plate.

| REQD. MK. | LOAD (KIPS) | PLATE A | PLATE B | PLATE C | PLATE D | BAR E | PINTLE P | DIM. H | DIM. X | TOTAL MOV. |
|-----------|-------------|-----------------|-----------------|---------------|------------------|-------------------|-----------------|--------|---------|------------|
| | 105 | 5"x1-1/2"x1' 0" | 5"x1-1/2"x1' 0" | 5"x1/2"x1' 0" | 12"x1-1/4"x1' 2" | 7/8"x1-1/2"x0' 8" | 1-1/4" x 2-1/2" | 4-7/8" | 9" | 2-1/2" |
| | 130 | 7"x1-1/2"x1' 3" | 5"x1-1/2"x1' 3" | 5"x1/2"x1' 3" | 12"x1-1/4"x1' 5" | 7/8"x1-1/2"x0' 8" | 1-1/4" x 2-1/2" | 4-7/8" | 10-1/2" | 2-1/2" |
| | 165 | 8"x1-1/2"x1' 3" | 6"x1-3/4"x1' 3" | 6"x1/2"x1' 3" | 15"x1-1/2"x1' 5" | 7/8"x1-1/2"x0' 9" | 1-1/4" x 2-3/4" | 5-3/8" | 10-1/2" | 2-1/2" |
| | 200 | 8"x1-1/2"x1' 3" | 7"x2-1/4"x1' 3" | 7"x1/2"x1' 3" | 16"x1-1/2"x1' 5" | 7/8"x1-1/2"x0' 9" | 1-1/4" x 3-1/4" | 5-7/8" | 10-1/2" | 2" |

| REQD. MK. | LOAD (KIPS) | PLATE A | PLATE B | PLATE C | PLATE D | PINTLE P | DIM. H | DIM. X | TOTAL MOV. |
|-----------|-------------|-----------------|-----------------|---------------|------------------|-----------------|--------|---------|------------|
| | 105 | 5"x1-1/2"x1' 0" | 5"x1-1/2"x1' 0" | 5"x1/2"x1' 0" | 12"x1-1/4"x1' 2" | 1-1/4" x 2-1/2" | 4-7/8" | 9" | 2 1/2" |
| | 130 | 7"x1-1/2"x1' 3" | 5"x1-1/2"x1' 3" | 5"x1/2"x1' 3" | 12"x1-1/4"x1' 5" | 1-1/4" x 2-1/2" | 4-7/8" | 10-1/2" | 2-1/2" |
| | 165 | 8"x1-1/2"x1' 3" | 6"x1-3/4"x1' 3" | 6"x1/2"x1' 3" | 15"x1-1/2"x1' 5" | 1-1/4" x 2-3/4" | 5-3/8" | 10-1/2" | 2-1/2" |
| | 200 | 8"x1-1/2"x1' 3" | 7"x2-1/4"x1' 3" | 7"x1/2"x1' 3" | 16"x1-1/2"x1' 5" | 1-1/4" x 3-1/4" | 5-7/8" | 10-1/2" | 2" |

| REQD. MK. | LOAD (KIPS) | PLATE A | PLATE B | PLATE C | PLATE D | BAR E | PINTLE P | DIM. H | DIM. X | TOTAL MOV. |
|-----------|-------------|-----------------|-----------------|---------------|------------------|-------------------|-----------------|--------|--------|------------|
| | 125 | 5"x1-1/2"x1' 2" | 5"x1-1/2"x1' 2" | 5"x1/2"x1' 2" | 12"x1-1/4"x1' 4" | 7/8"x1-1/2"x0' 8" | 1-1/4" x 2-1/2" | 4-7/8" | 10" | 2-1/2" |
| | 155 | 7"x1-1/2"x1' 6" | 5"x1-1/2"x1' 6" | 5"x1/2"x1' 6" | 12"x1-1/2"x1' 8" | 7/8"x1-1/2"x0' 8" | 1-1/4" x 2-1/2" | 5-1/8" | 12" | 2-1/2" |
| | 195 | 8"x1-1/2"x1' 6" | 6"x1-3/4"x1' 6" | 6"x1/2"x1' 6" | 15"x1-1/2"x1' 8" | 7/8"x1-1/2"x0' 9" | 1-1/4" x 2-3/4" | 5-3/8" | 12" | 2-1/2" |
| | 235 | 8"x1-1/2"x1' 6" | 7"x2-1/4"x1' 6" | 7"x1/2"x1' 6" | 16"x1-1/2"x1' 8" | 7/8"x1-1/2"x0' 9" | 1-1/2" x 3-1/4" | 5-7/8" | 12" | 2" |

| REQD. MK. | LOAD (KIPS) | PLATE A | PLATE B | PLATE C | PLATE D | PINTLE P | DIM. H | DIM. X | TOTAL MOV. |
|-----------|-------------|-----------------|-----------------|---------------|------------------|-----------------|--------|--------|------------|
| | 125 | 5"x1-1/2"x1' 2" | 5"x1-1/2"x1' 2" | 5"x1/2"x1' 2" | 12"x1-1/4"x1' 4" | 1-1/4" x 2-1/2" | 4-7/8" | 10" | 2-1/2" |
| 5 EBI | 155 | 7"x1-1/2"x1' 6" | 5"x1-1/2"x1' 6" | 5"x1/2"x1' 6" | 12"x1-1/2"x1' 8" | 1-1/4" x 2 1/2" | 5-1/8" | 12" | 2-1/2" |
| | 195 | 8"x1-1/2"x1' 6" | 6"x1-3/4"x1' 6" | 6"x1/2"x1' 6" | 15"x1-1/2"x1' 8" | 1-1/4" x 2-3/4" | 5-3/8" | 12" | 2-1/2" |
| | 235 | 8"x1-1/2"x1' 6" | 7"x2-1/4"x1' 6" | 7"x1/2"x1' 6" | 16"x1-1/2"x1' 8" | 1-1/2" x 3-1/4" | 5-7/8" | 12" | 2" |

| REQD. MK. | LOAD (KIPS) | PLATE A | PLATE B | PLATE C | PLATE D | BAR E | PINTLE P | DIM. H | DIM. X | TOTAL MOV. |
|-----------|-------------|------------------|----------------------|--------------------|------------------|--------------------|-----------------|--------|-----------|------------|
| | 145 | 5"x1-1/2"x1' 5" | 5"x1-1/2"x1' 5" | 5"x1/2"x1' 5" | 13"x1-1/4"x1' 7" | 7/8"x1-1/2"x0' 8" | 1-1/4" x 2-1/2" | 4-7/8" | 11-1/2" | 3" |
| | 185 | 8"x1-1/2"x1' 10" | 5"x1-1/2"x1' 10" | 5"x1/2"x1' 10" | 13"x1-1/2"x2' 0" | 7/8"x1-1/2"x0' 8" | 1-1/4" x 2-1/2" | 5-1/8" | 1' 2" | 3" |
| | 235 | 8"x1-1/2"x1' 10" | 6"x1-3/4"x1' 10" | 6"x1/2"x1' 10" | 15"x1-1/2"x2' 0" | 7/8"x1-1/2"x0' 9" | 1-1/2" x 2-3/4" | 5-3/8" | 1' 2" | 3" |
| | 280 | 8"x1-3/4"x1' 10" | 7"x2-1/4"x1' 10" | 7"x1/2"x1' 10" | 17"x1-3/4"x2' 0" | 7/8"x1-1/2"x0' 10" | 1-1/2" x 3-1/2" | 6-3/8" | 1' 2" | 2-1/2" |
| | 320 | 8"x2"x1' 11" | 7-1/2"x2-1/4"x1' 11" | 7-1/2"x1/2"x1' 11" | 19"x2"x2' 1" | 7/8"x1-1/2"x0' 10" | 1-1/2" x 3-3/4" | 6-7/8" | 1' 2-1/2" | 2-1/2" |

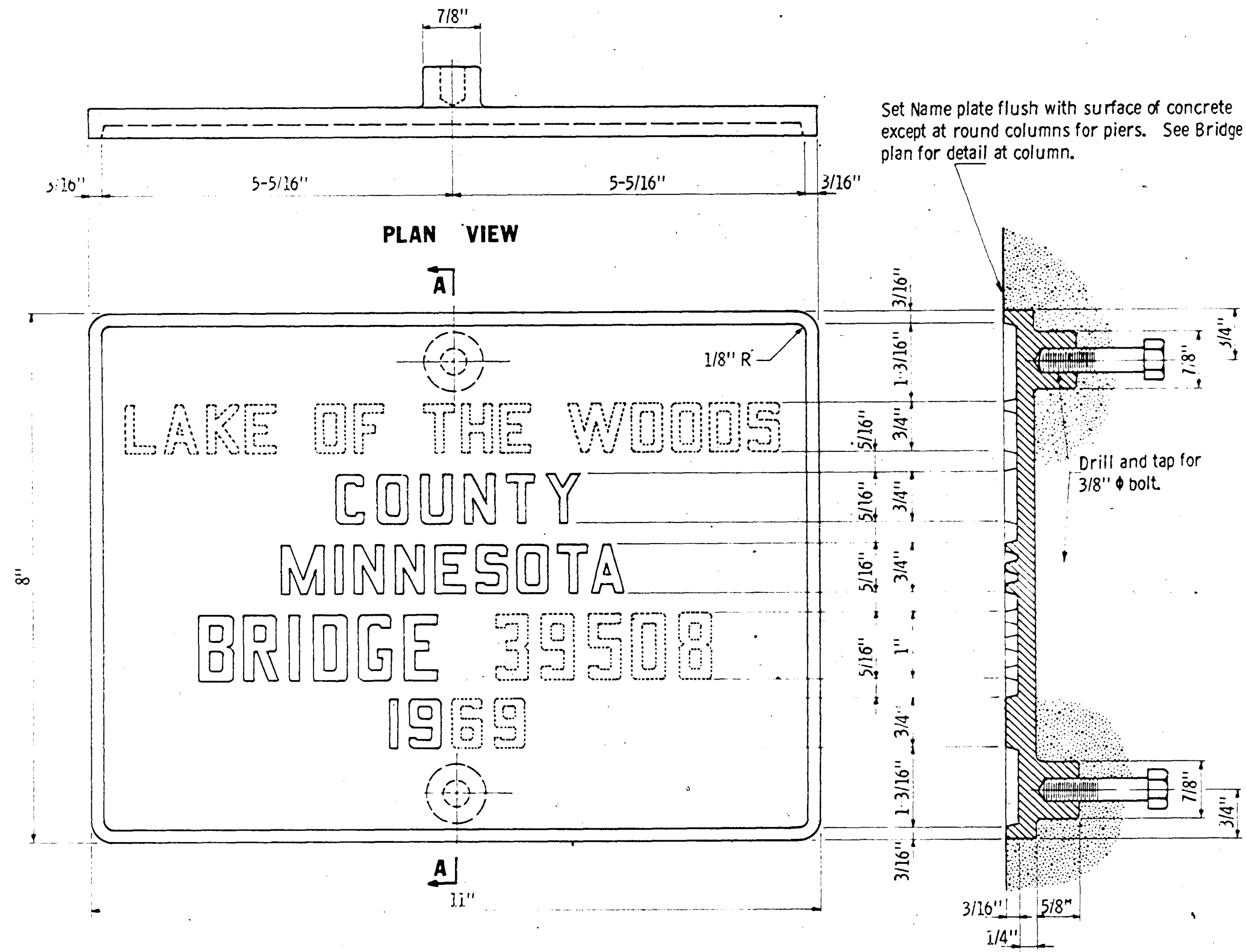
| REQD. MK. | LOAD (KIPS) | PLATE A | PLATE B | PLATE C | PLATE D | BAR E | PINTLE P | DIM. H | DIM. X | TOTAL MOV. |
|-----------|-------------|------------------|----------------------|--------------------|------------------|-----------------|----------|-----------|--------|------------|
| | 145 | 5"x1-1/2"x1' 5" | 5"x1-1/2"x1' 5" | 5"x1/2"x1' 5" | 13"x1-1/4"x1' 7" | 1-1/4" x 2-1/2" | 4-7/8" | 11-1/2" | 3" | |
| | 185 | 8"x1-1/2"x1' 10" | 5"x1-1/2"x1' 10" | 5"x1/2"x1' 10" | 13"x1-1/2"x2' 0" | 1-1/4" x 2-1/2" | 5-1/8" | 1' 2" | 3" | |
| | 235 | 8"x1-1/2"x1' 10" | 6"x1-3/4"x1' 10" | 6"x1/2"x1' 10" | 15"x1-1/2"x2' 0" | 1-1/2" x 2-3/4" | 5-3/8" | 1' 2" | 3" | |
| | 280 | 8"x1-3/4"x1' 10" | 7"x2-1/4"x1' 10" | 7"x1/2"x1' 10" | 17"x1-3/4"x2' 0" | 1-1/2" x 3-1/2" | 6-3/8" | 1' 2" | 2-1/2" | |
| | 320 | 8"x2"x1' 11" | 7-1/2"x2-1/4"x1' 11" | 7-1/2"x1/2"x1' 11" | 19"x2"x2' 1" | 1-1/2" x 3-3/4" | 6-7/8" | 1' 2-1/2" | 2-1/2" | |

| REQD. MK. | LOAD (KIPS) | PLATE A | PLATE B | PLATE C | PLATE D | BAR E | PINTLE P | DIM. H | DIM. X | TOTAL MOV. |
|-----------|-------------|----------------------|----------------------|--------------------|----------------------|------------------------|-----------------|--------|-----------|------------|
| 3 EB2 | 200 | 8"x1 1/2" x 1'-9" | 6"x1 3/4" x 1'-9" | 6"x 1/2" x 1'-9" | 15"x1 1/2" x 1'-11" | 3/4" x 1 1/2" x 0'-9" | 1 1/2" x 2-3/4" | 5 3/8" | 1'-1 1/2" | 3" |
| 3 EB4 | 340 | 8" x 2" x 1'-11" | 8" x 2 1/4" x 1'-11" | 8" x 1/2" x 1'-11" | 19" x 2" x 2'-1" | 3/4" x 1 1/2" x 0'-10" | 1 1/2" x 3-3/4" | 6 7/8" | 1'-2 1/2" | 2" |
| 5 EB6 | 565 | 10" x 2 1/2" x 2'-3" | 12" x 3 1/4" x 2'-3" | 12" x 1/2" x 2'-3" | 24" x 2 1/4" x 2'-5" | 7/8" x 1 1/2" x 1'-2" | 1 1/2" x 5 1/4" | 8 3/8" | 1'-4 1/2" | 2" |

| REQD. MK. | LOAD (KIPS) | PLATE A | PLATE B | PLATE C | PLATE D | BAR E | PINTLE P | DIM. H | DIM. X | TOTAL MOV. |
|-----------|-------------|---------------------|----------------------|--------------------|-----------------------|------------------------|-----------------|--------|-----------|------------|
| 2 EB3 | 200 | 8" x 1 1/2" x 1'-9" | 6" x 1 3/4" x 1'-9" | 6" x 1/2" x 1'-9" | 15" x 1 1/2" x 1'-11" | 3/4" x 1 1/2" x 0'-9" | 1 1/2" x 2-3/4" | 5 3/8" | 1'-1 1/2" | 3" |
| 2 EB5 | 340 | 8" x 2" x 1'-11" | 8" x 2 1/4" x 1'-11" | 8" x 1/2" x 1'-11" | 19" x 2" x 2'-1" | 3/4" x 1 1/2" x 0'-10" | 1 1/2" x 3-3/4" | 6 7/8" | 1'-2 1/2" | 2" |

APPROVED *May 20, 1972*
 STATE OF MINNESOTA
 DEPARTMENT OF HIGHWAYS
BEARING ASSEMBLIES
STEEL BEAMS
(EXPANSION W/GUIDE BARS)
 DETAIL NO. **B352**
 MODIFIED

APPROVED *May 20, 1972*
 STATE OF MINNESOTA
 DEPARTMENT OF HIGHWAYS
BEARING ASSEMBLIES
STEEL BEAMS
(EXPANSION W/O GUIDE BARS)
 REVISION
 DETAIL NO. **B353**
 MODIFIED



PLAN VIEW
ELEVATION
SECTION A - A

LAKE OF THE WOODS
COUNTY
MINNESOTA
BRIDGE 39508
1969

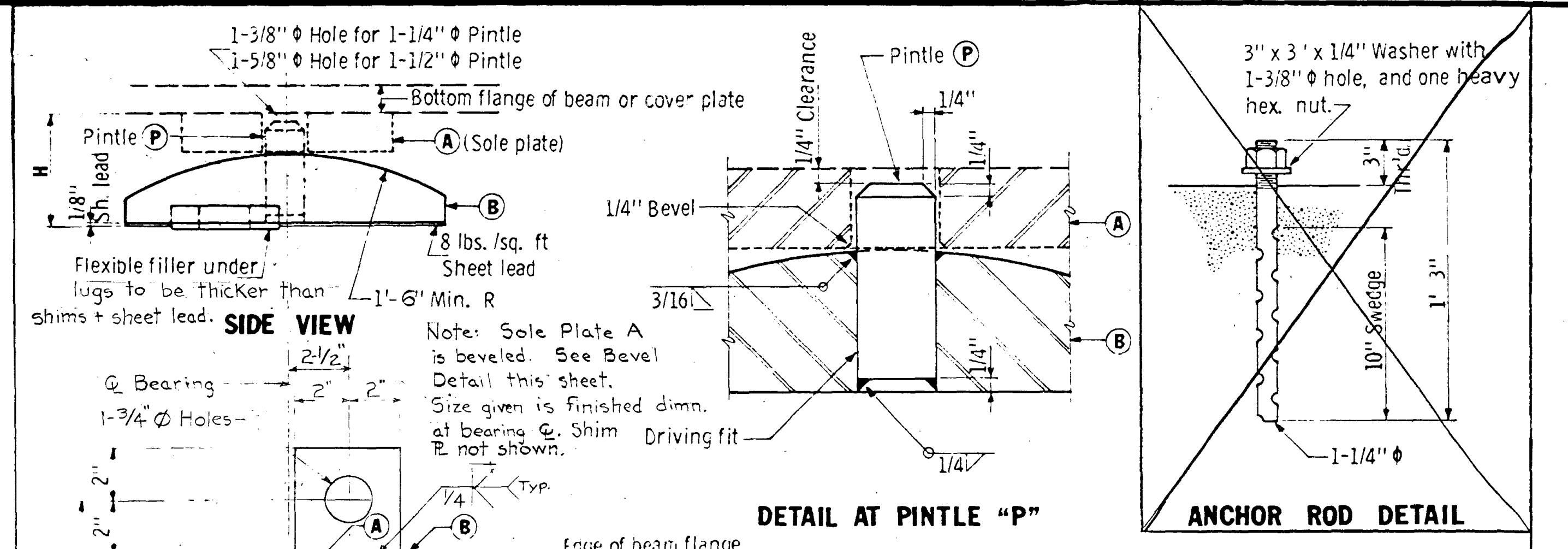
ABCDEF GHIJKLMN
OPQRST UVWXYZ
1234567890

LETTERS FOR NAME PLATES

NOTES:
Numbers and letters shall conform to those shown.
Draft on letters shall not be more than 3" in 12"
Horizontal spacing of letters shall produce a balanced layout in proportion to spacing shown.
Top surface of letters and frames shall be burnished.
Background of plate shall have a deep brown oxidized finish.
Furnish 2 steel bolts 3/8" ϕ x 3" long with each plate.
Plates ordered in pairs shall be cast from the same heat.
Numbers and letters shown dotted are to be obtained from Bridge plans.
All dimensions for 3/4" high letters and numbers shall be in direct proportion to those shown for the 1" high letters and numbers.

Specification reference:
2471 3H, 3327 (Bronze castings)

| | | | |
|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------|---------------------------|
| APPROVED July 1, 1969 Design Standards Engineer ENGINEERING STANDARDS DIVISION | STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS BRIDGE NAME PLATE COUNTY BRIDGES (STATE AID) | REVISION | DETAIL NO. B103 |
|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------|---------------------------|



NOTES:
Shop paint plate B in accordance with Specifications.
Pintle "P" shall comply with M. H. D. 3314, Type II. All other structural steel shall comply with M. H. D. 3309
On top of plate "B" finish center 3" to 250 Micro. Thickness of plate "B" may be 1/16" less than shown.
See Sh. 289-6553-20 for shims between Plate "B" and sheet lead.
Plates shall be flat after fabrication and welding.
Bottom of plate "A" shall be at right angles to web of beam. Plate "A" shall be shop welded to the beam with 1/2" cont. fillet weld.
Plate "A" is included in weight of structural steel. All other material on this detail is included in bearing assembly for payment.
Flexible filler material shall be an approved sponge rubber installed so as to prevent the flow of grout under the 3/4" lug plate.

PLAN VIEW

| REQD. MK. | FOR LOAD (KIPS) | BEAMS WITH PLATE A | 9" TO 10 1/2" PLATE B | PINTLE P | TO 10 1/2" DIM. H | FLANGES DIM. X |
|-----------|-----------------|---------------------|-----------------------|------------------------|-------------------|----------------|
| | 105 | 5" x 1-1/2" x 1' 0" | 8" x 1-3/4" x 1' 2" | 1-1/4" ϕ x 2-3/4" | 3-3/8" | 9" |
| | 130 | 7" x 1-1/2" x 1' 3" | 8" x 1-3/4" x 1' 5" | 1-1/4" ϕ x 2-3/4" | 3-3/8" | 10-1/2" |
| | 165 | 8" x 1-1/2" x 1' 3" | 10" x 2-1/4" x 1' 5" | 1-1/4" ϕ x 3-1/4" | 3-7/8" | 10-1/2" |
| | 200 | 8" x 1-1/2" x 1' 3" | 12" x 2-3/4" x 1' 5" | 1-1/4" ϕ x 3-3/4" | 4-3/8" | 10-1/2" |

| REQD. MK. | FOR LOAD (KIPS) | BEAMS WITH PLATE A | 11 1/2" TO 12" PLATE B | PINTLE P | TO 12" DIM. H | FLANGES DIM. X |
|-----------|-----------------|---------------------|------------------------|------------------------|---------------|----------------|
| | 125 | 5" x 1-1/2" x 1' 2" | 8" x 1-3/4" x 1' 4" | 1-1/4" ϕ x 2-3/4" | 3-3/8" | 10" |
| | 155 | 7" x 1-1/2" x 1' 6" | 8" x 1-3/4" x 1' 8" | 1-1/4" ϕ x 2-3/4" | 3-3/8" | 1' 0" |
| | 195 | 8" x 1-1/2" x 1' 6" | 10" x 2-1/4" x 1' 8" | 1-1/4" ϕ x 3-1/4" | 3-7/8" | 1' 0" |
| | 235 | 8" x 1-1/2" x 1' 6" | 12" x 2-3/4" x 1' 8" | 1-1/2" ϕ x 3-3/4" | 4-3/8" | 1' 0" |

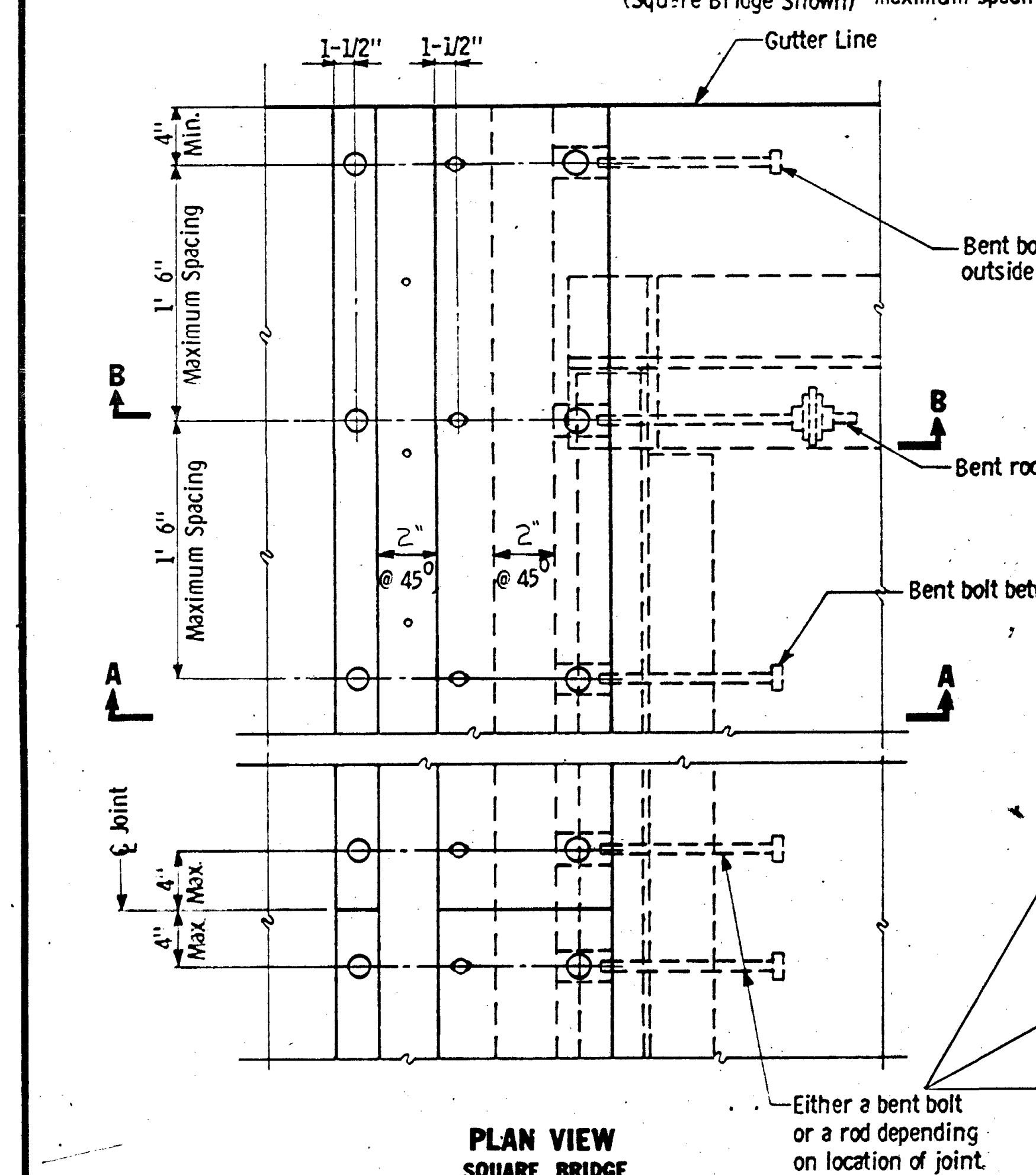
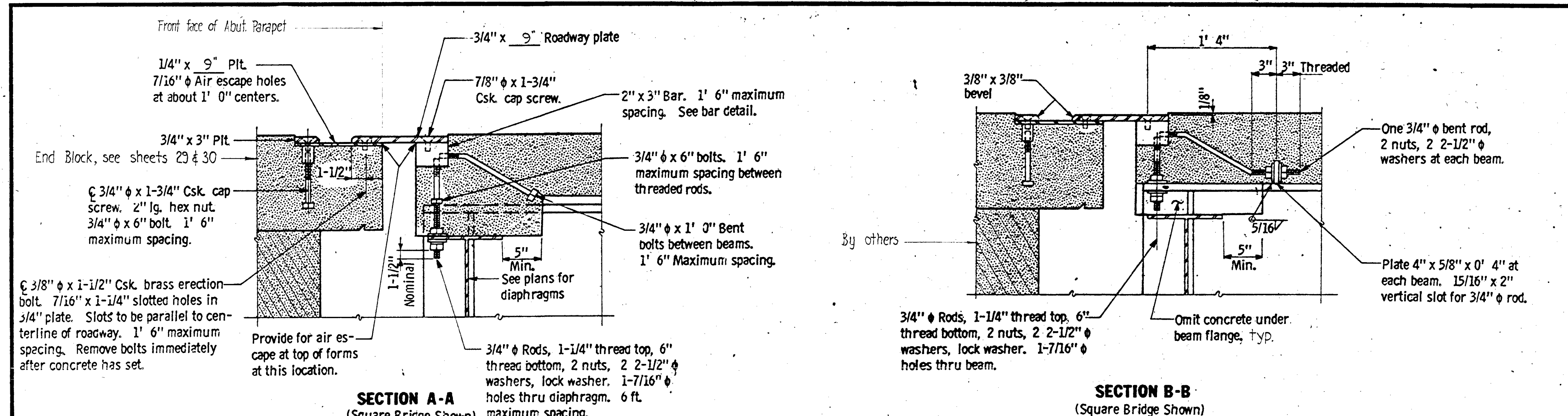
| REQD. MK. | FOR LOAD (KIPS) | BEAMS WITH PLATE A | 15" TO 16" PLATE B | PINTLE P | TO 16" DIM. H | FLANGES DIM. X |
|-----------|-----------------|----------------------|----------------------|------------------------|---------------|----------------|
| | 145 | 5" x 1-1/2" x 1' 5" | 8" x 1-3/4" x 1' 7" | 1-1/4" ϕ x 2-3/4" | 3-3/8" | 11-1/2" |
| | 185 | 8" x 1-1/2" x 1' 10" | 8" x 1-3/4" x 2' 0" | 1-1/4" ϕ x 2-3/4" | 3-3/8" | 1' 2" |
| | 235 | 8" x 1-1/2" x 1' 10" | 10" x 2-1/4" x 2' 0" | 1-1/2" ϕ x 3-1/4" | 3-7/8" | 1' 2" |
| | 280 | 8" x 1-3/4" x 1' 10" | 12" x 2-3/4" x 2' 0" | 1-1/2" ϕ x 4" | 4-5/8" | 1' 2" |
| | 320 | 8" x 2" x 1' 11" | 13" x 2-3/4" x 2' 1" | 1-1/2" ϕ x 4-1/4" | 4-7/8" | 1' 2-1/2" |

| REQD. MK. | FOR LOAD (KIPS) | BEAMS WITH PLATE A | TO PLATE B | PINTLE P | TO DIM. H | FLANGES DIM. X |
|-----------|-----------------|--------------------|-----------------------|----------------------|------------------------|------------------|
| 5 | FB1 | 460 | 10" x 2 1/4" x 2' 2" | 17" x 3 1/2" x 2' 4" | 1 1/2" ϕ x 5 1/4" | 5 7/8" 1' 4" |
| 5 | FB2 | 520 | 10" x 2 1/2" x 1' 11" | 19" x 4" x 2' 3" | 1 1/2" ϕ x 6" | 6 3/8" 1' 3 1/2" |

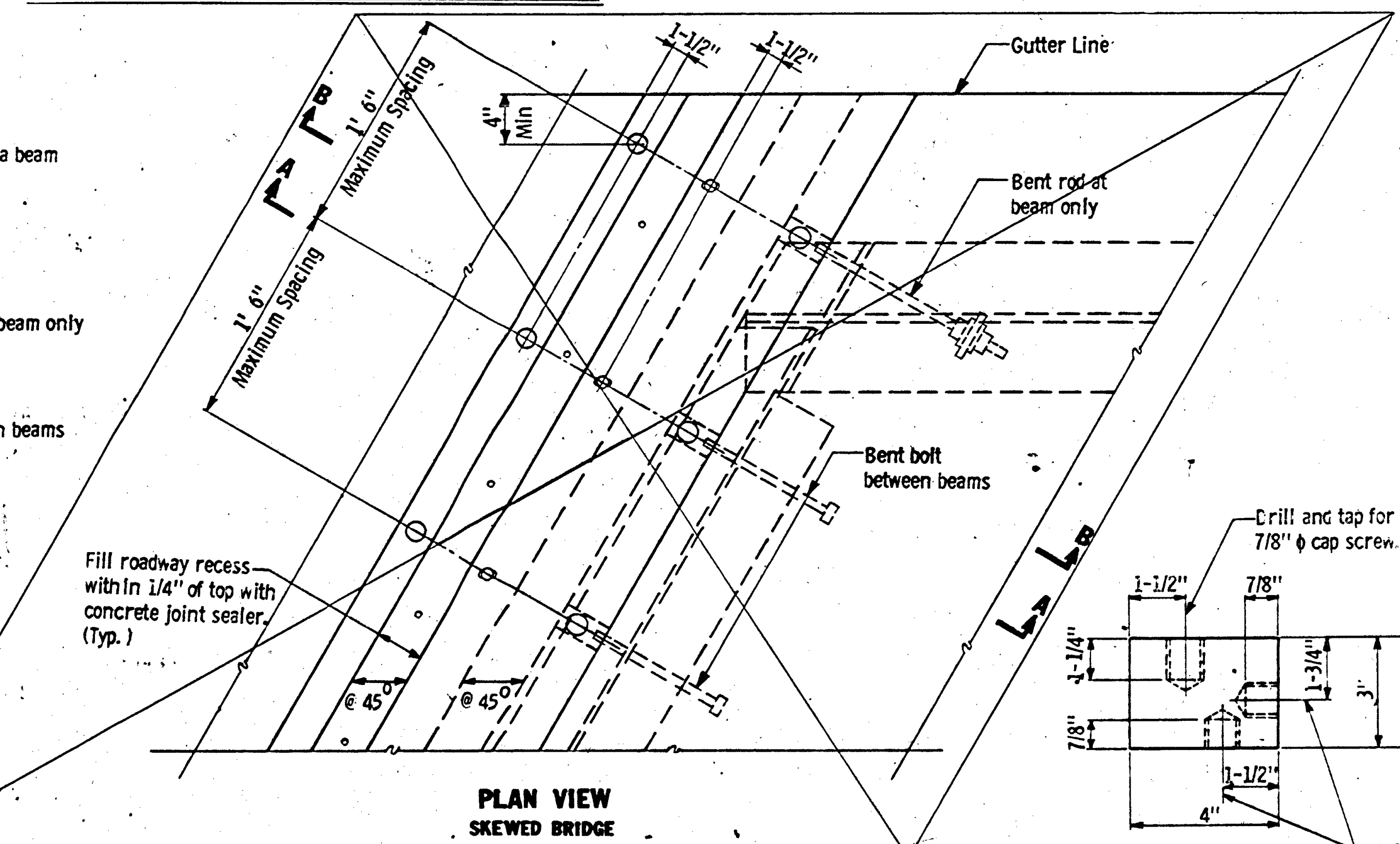
| Bearing | Bevel | h |
|---------|-------|--------|
| EB1 | 3/8" | 1 1/2" |
| EB2 | 3/8" | 1 1/2" |
| EB3 | 3/8" | 1 1/2" |
| EB4 | 3/8" | 2" |
| EB5 | 3/8" | 2" |
| EB6 | 1/4" | 2 1/2" |
| FB1 | 3/8" | 2 1/4" |
| FB2 | 1/8" | 2 1/2" |

BEVEL OF SOLE PLATE "A"
See Sh. 289-6553-20 for direction of slope.

| | | | |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------|----------------------------------------|
| APPROVED May 26, 1972 <i>Stephen Duffell</i> Engineering Standards Engineer RESEARCH AND STANDARDS DIVISION | STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS BEARING ASSEMBLIES STEEL BEAMS (FIXED) | REVISION | DETAIL NO. B351 MODIFIED |
|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------|----------------------------------------|



2 EXPANSION JOINTS THUS



NOTES

Joints in roadway plate shall be located at breaks in transverse profile and as otherwise required. Joints shall be close fit and not welded except as noted. Locate one cap screw and rod assembly or bent bolt not more than 4\"

Roadway plate shall be raised pattern Inland Steel Co., large pattern; U. S. Steel Co., section S-400; or Alan Wood Co., super diamond.

Plates shall be flat after galvanizing.

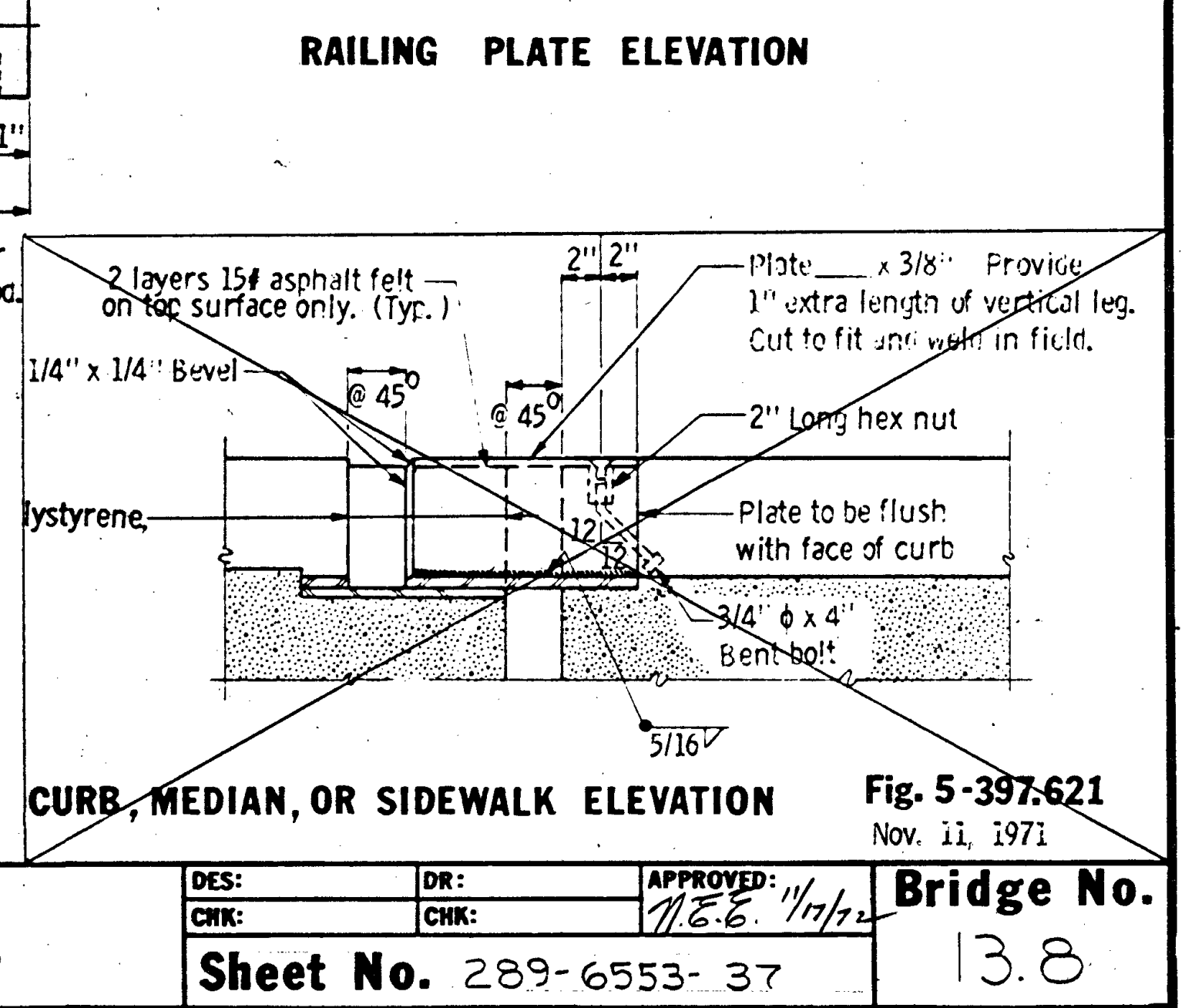
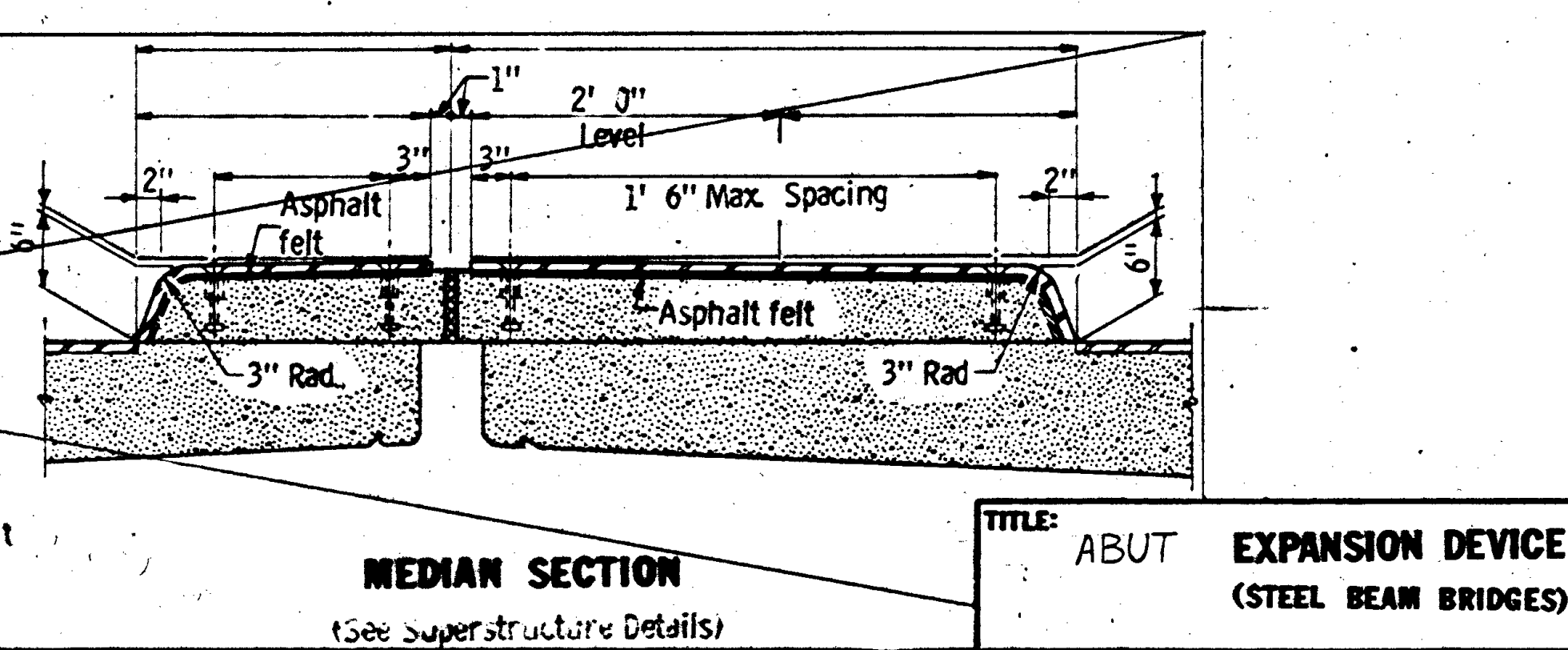
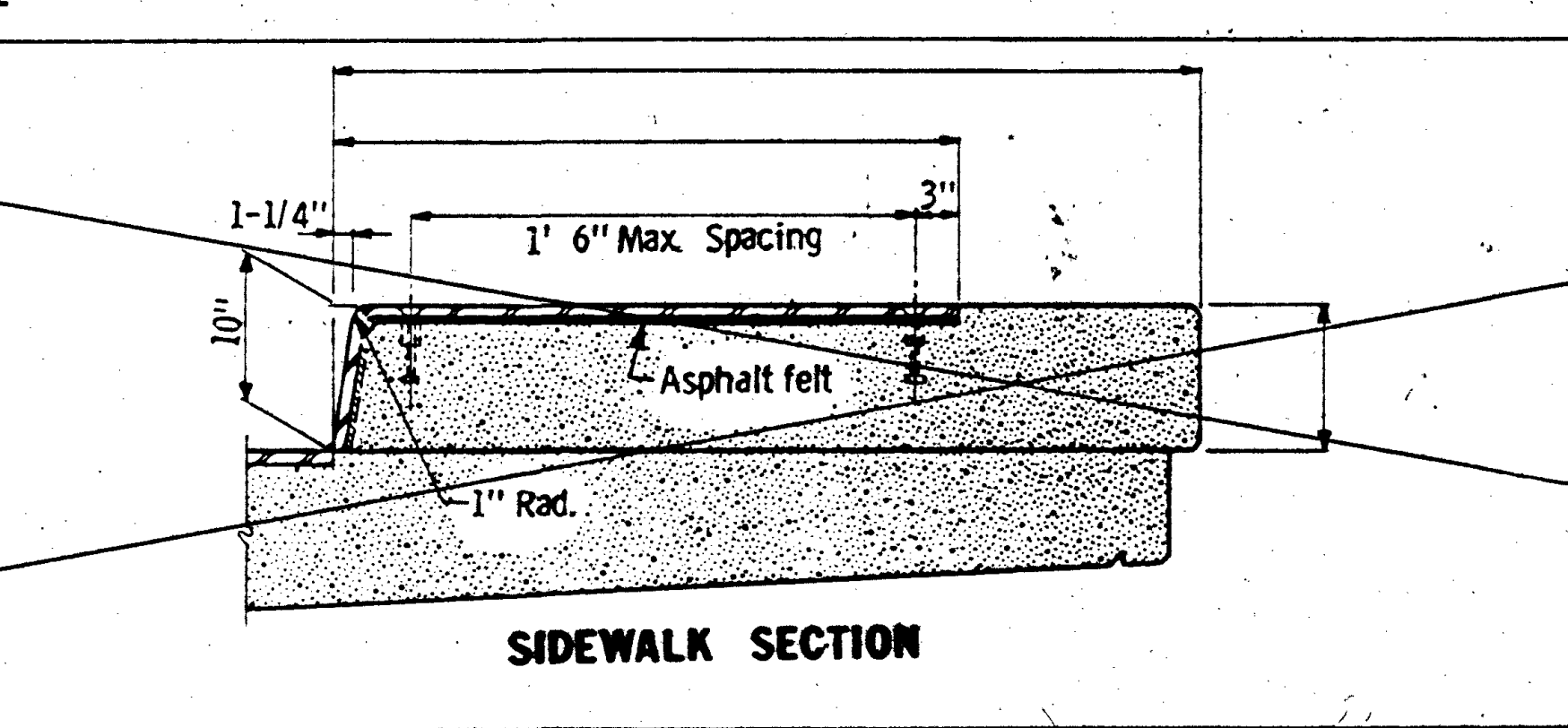
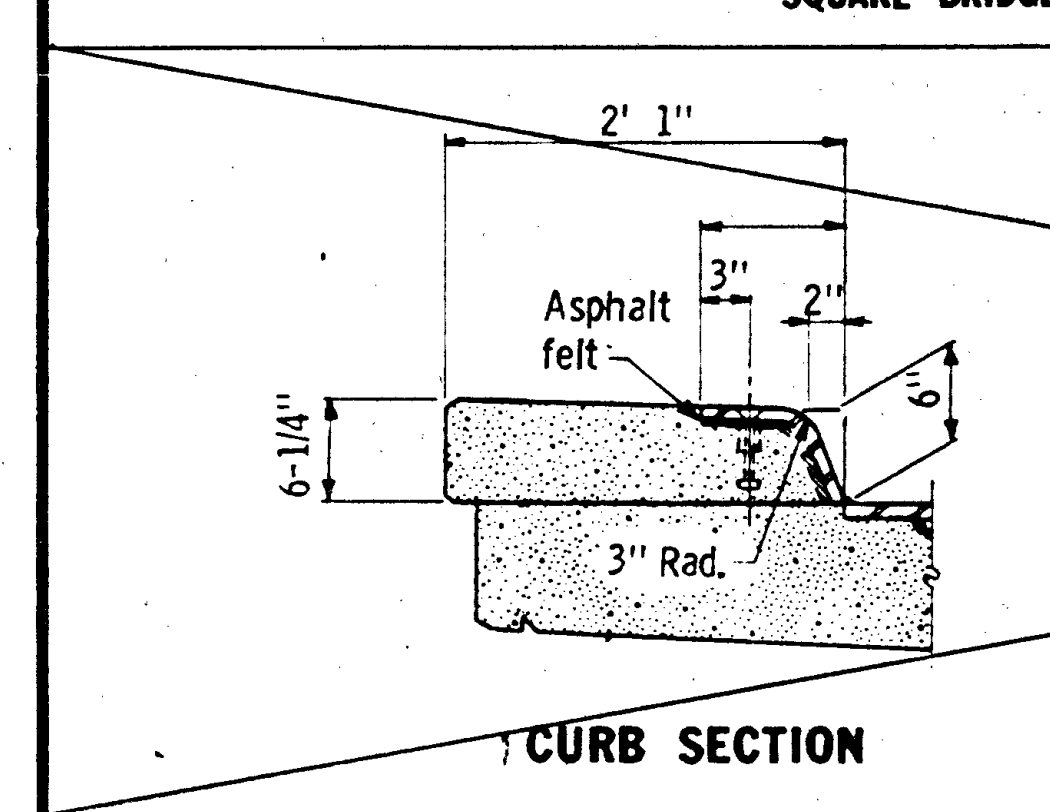
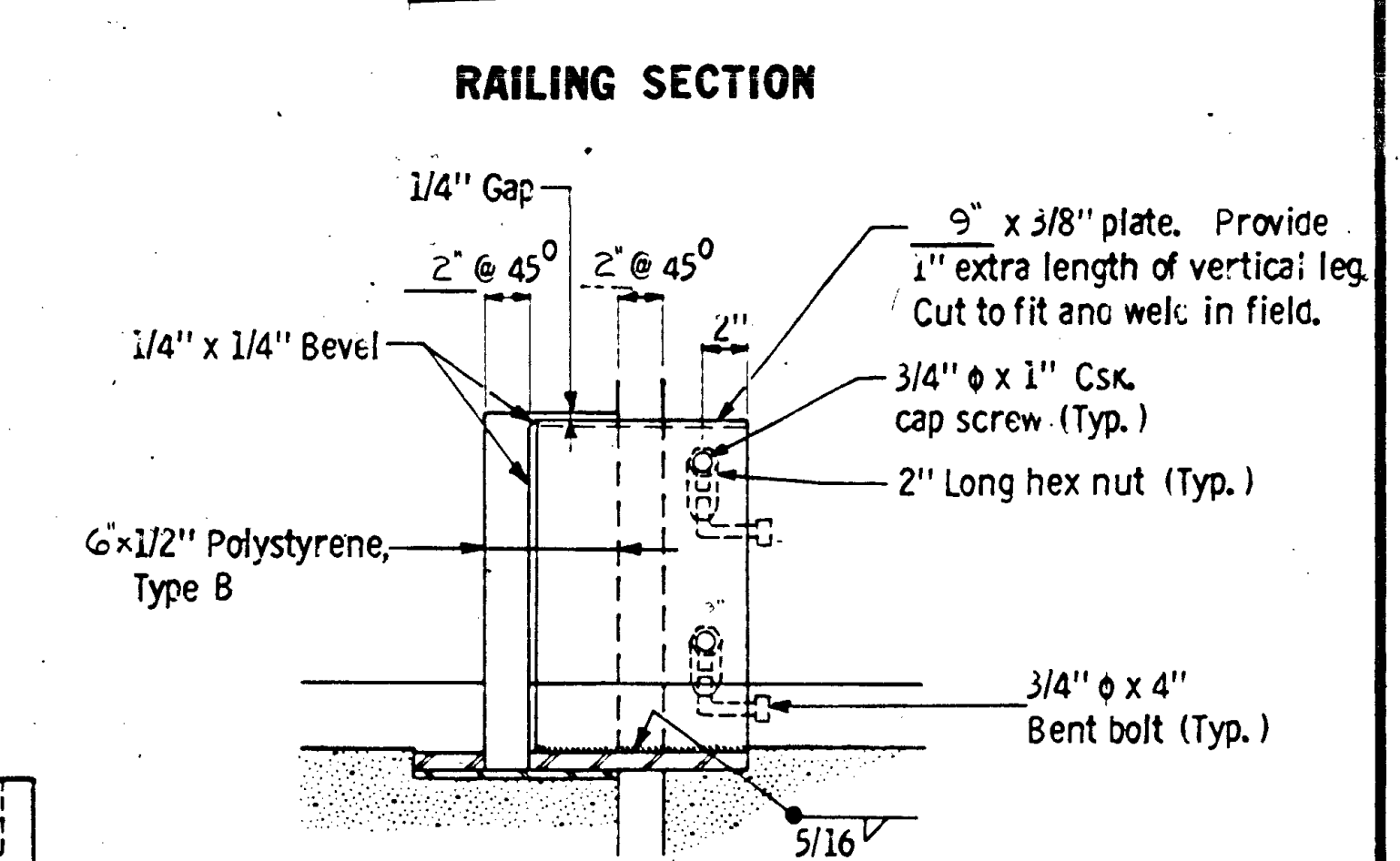
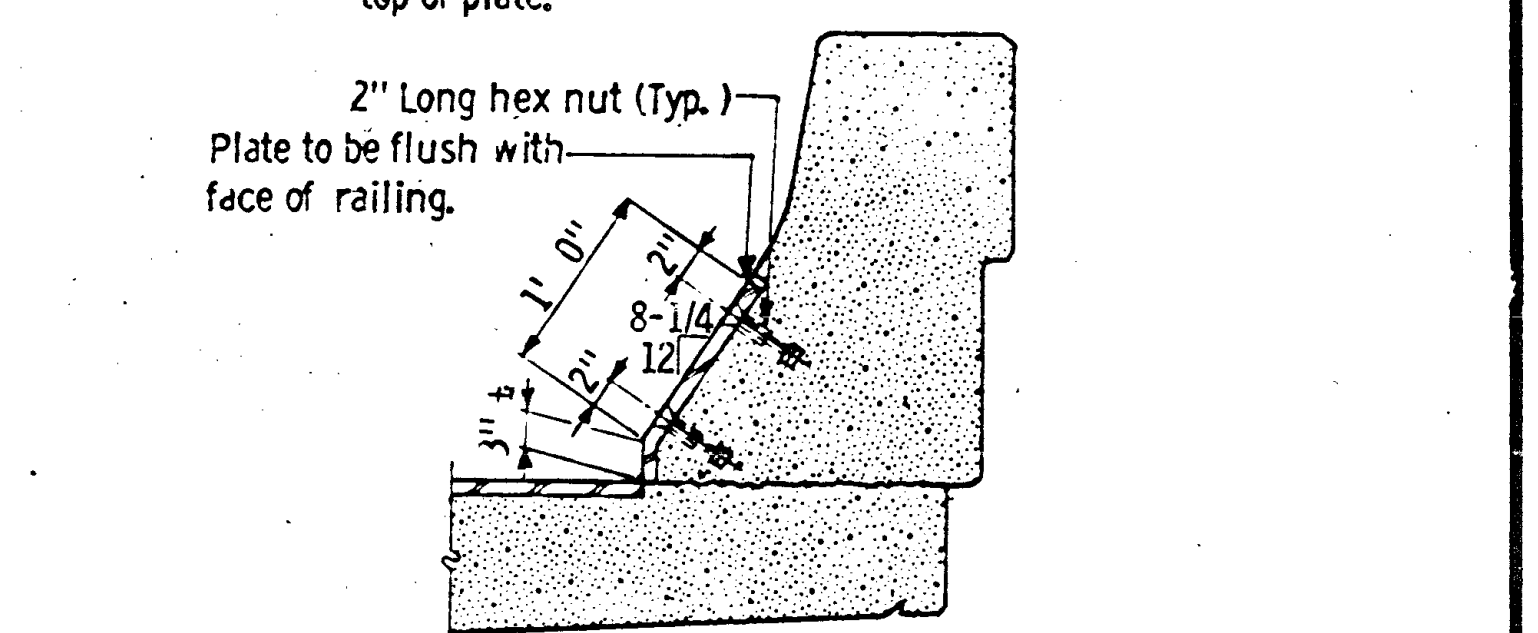
Steel Plates shall comply with M. H. D. 3306.

Galvanize all plates and bars except 2\" x 3\" bars per M. H. D. 3394 after fabrication.

Galvanize 2\" x 3\" bar, cap screws, and 2\" long hex. nuts per M. H. D. 3392.

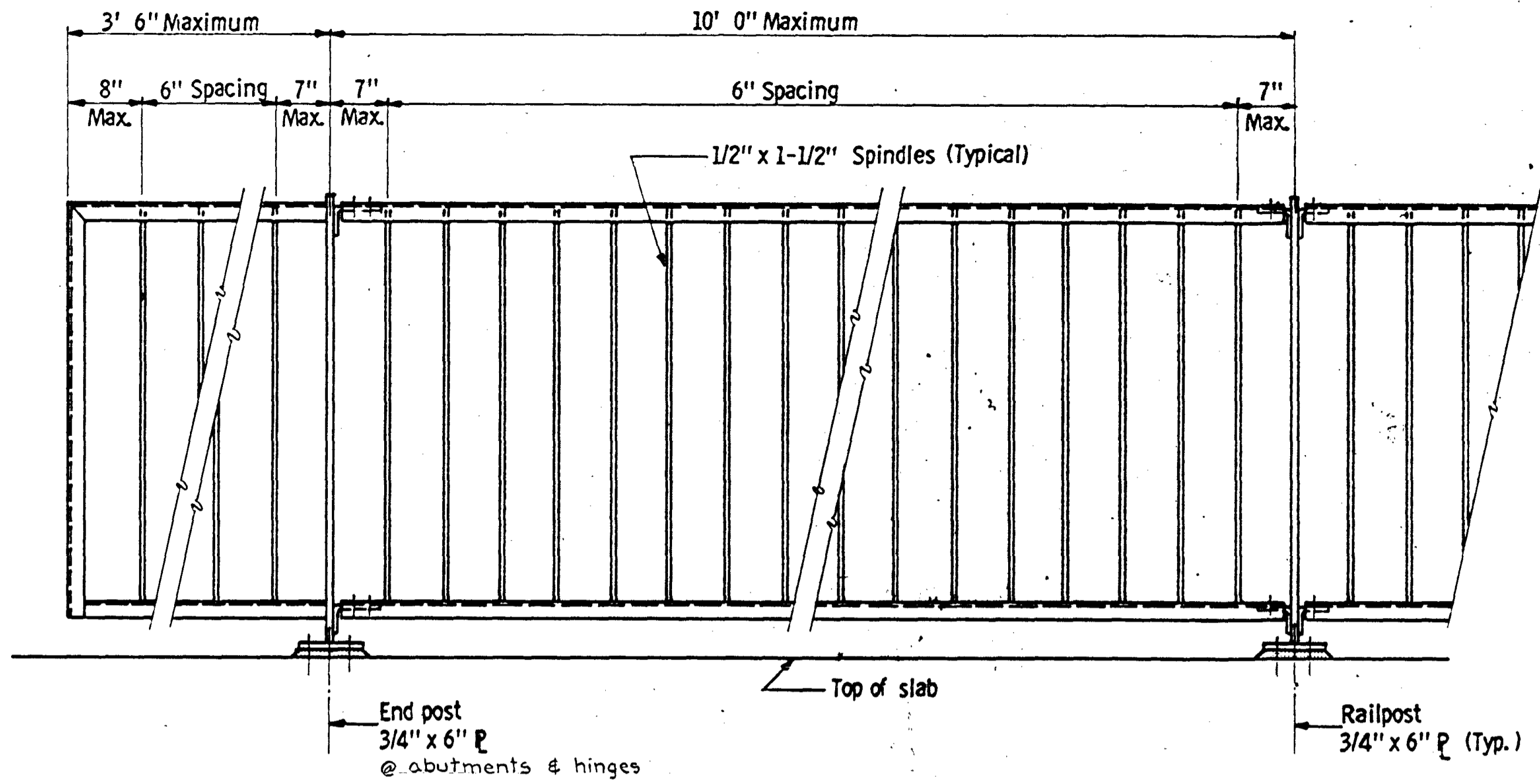
2\" x 3\" Bars may be drilled and tapped after galvanizing. All material this sheet to be bid as "Roadway Expansion Assemblies". Repair galvanizing after field welding per M. H. D. 247L, 3L.

3/4\" ϕ and 7/8\" ϕ cap screws shall be countersunk 1/16\" below top of plate.

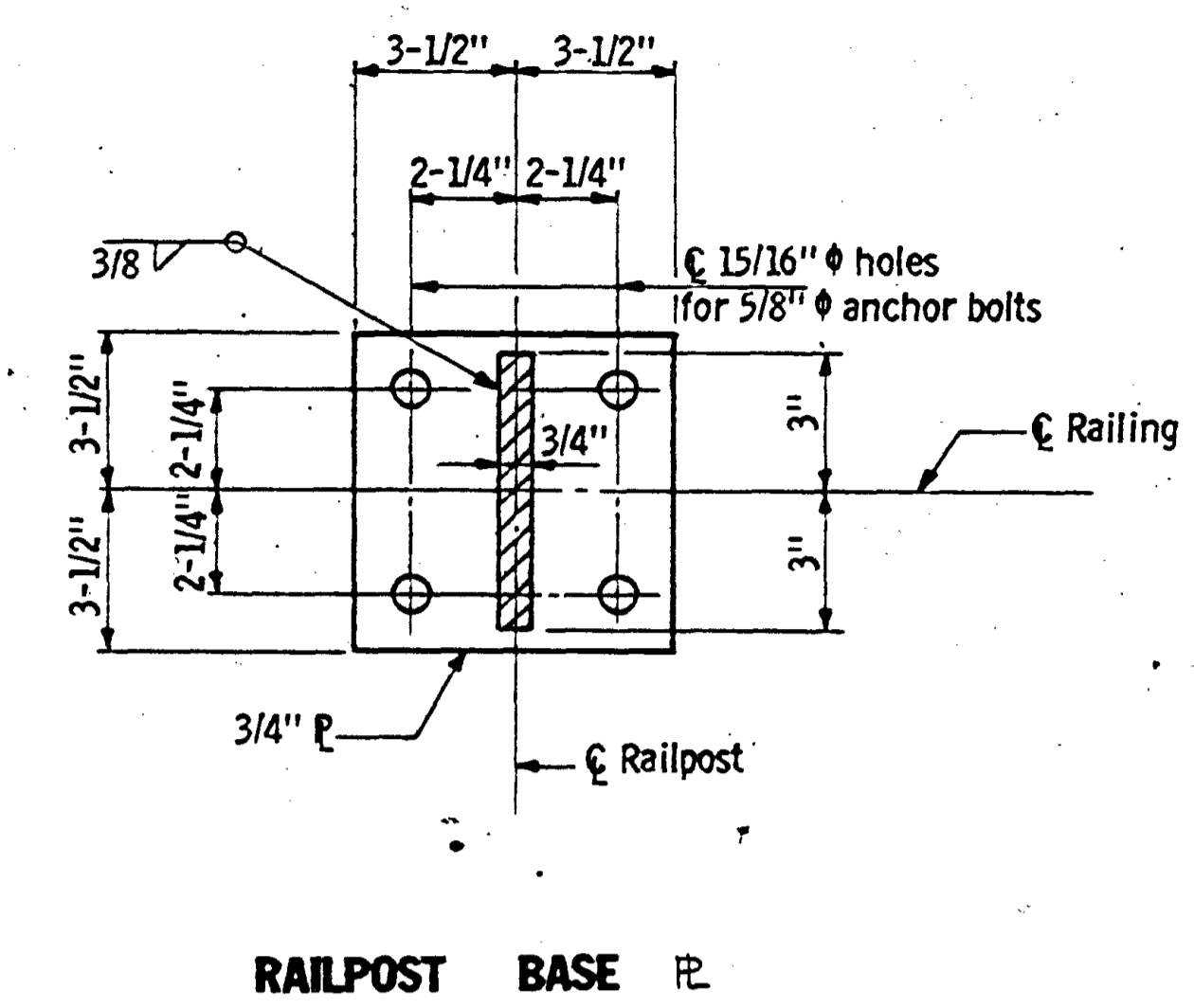


| | | | | | |
|---------------------------------------------------|--|----------|----------|---------------|-----------------|
| TITLE: ABUT EXPANSION DEVICE (STEEL BEAM BRIDGES) | | DES: [] | DR: [] | APPROVED: [] | Bridge No. 13.8 |
| Sheet No. 289-6553-37 | | CHK: [] | CHK: [] | 11/26/72 | |

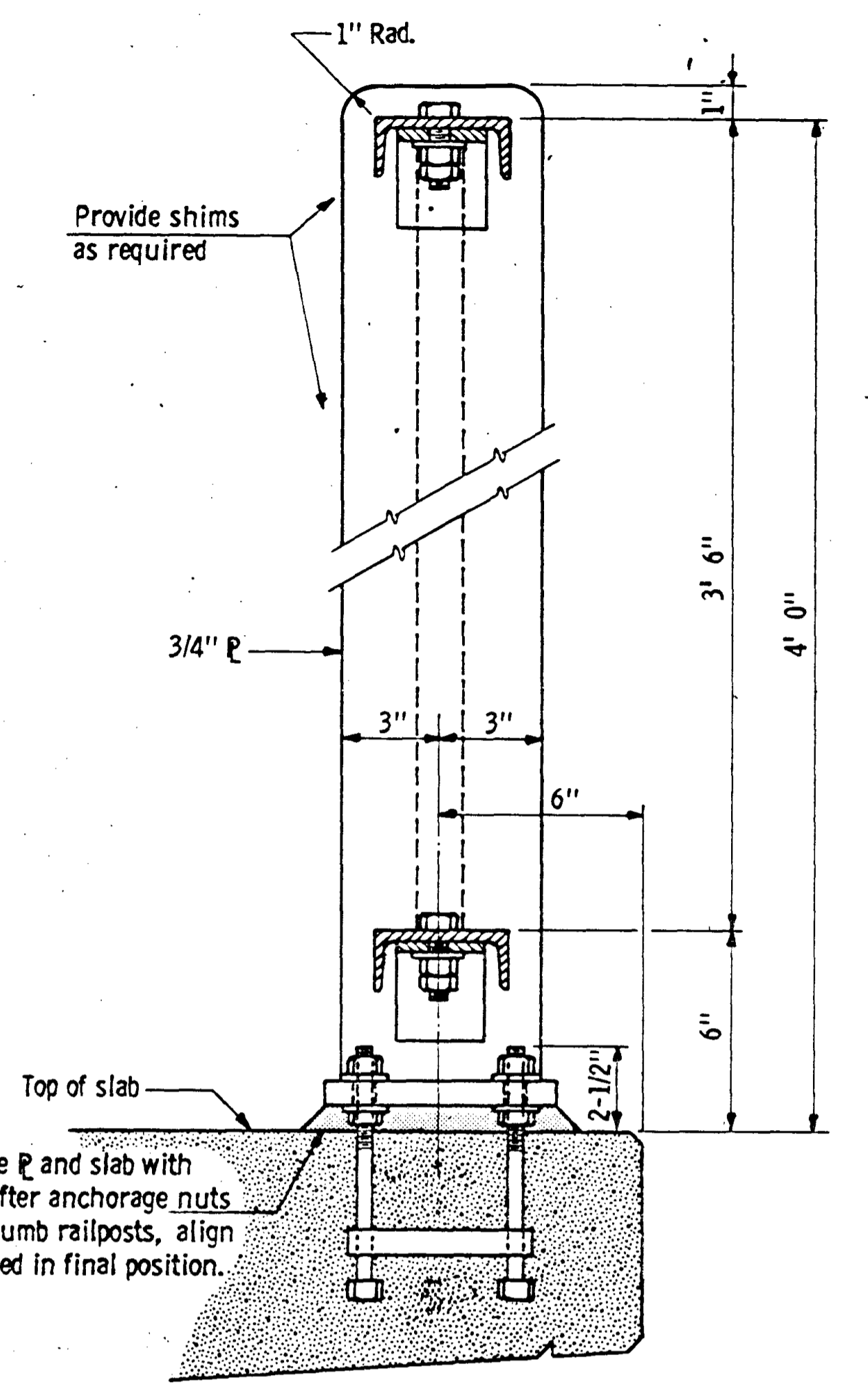
Fig. 5-397.621
Nov. 11, 1971



GENERAL RAILING ELEVATION

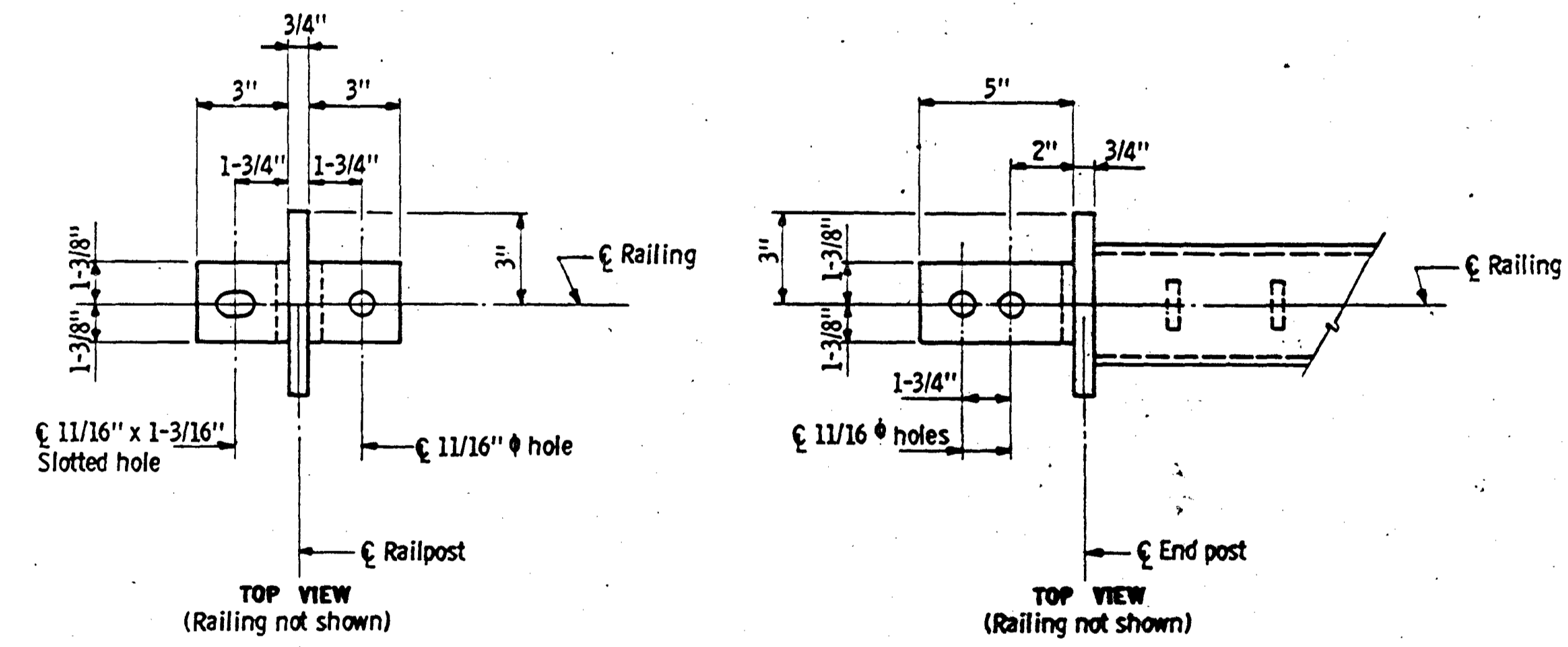


RAILPOST BASE P



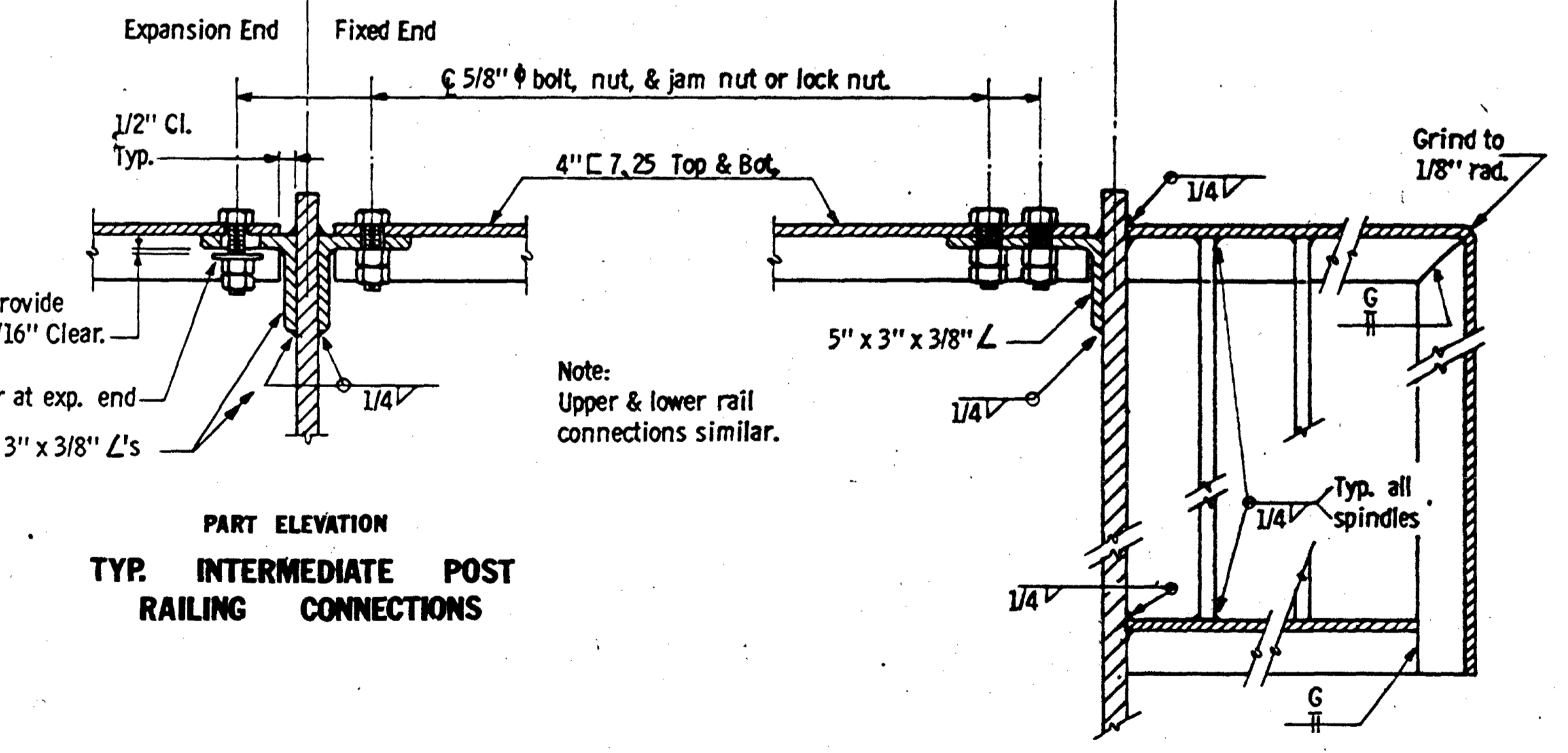
TYPICAL RAILPOST

Pack space between base P and slab with approved epoxy mortar after anchorage nuts have been adjusted to plumb railposts, align railing, and are tightened in final position.



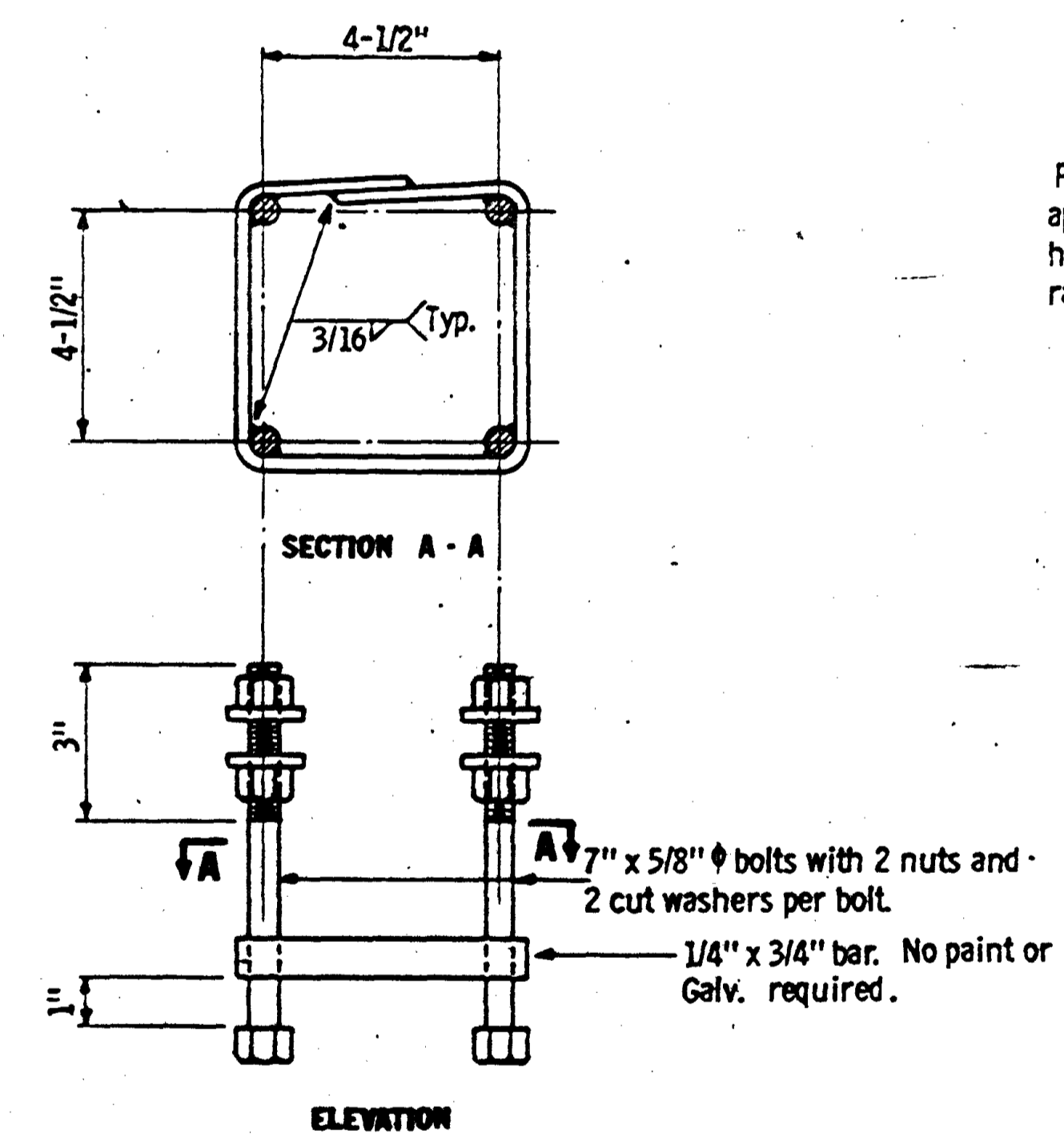
TOP VIEW (Railing not shown)

TOP VIEW (Railing not shown)



PART ELEVATION TYP. INTERMEDIATE POST RAILING CONNECTIONS

PART ELEVATION END POST DETAILS



RAILPOST ANCHORAGE

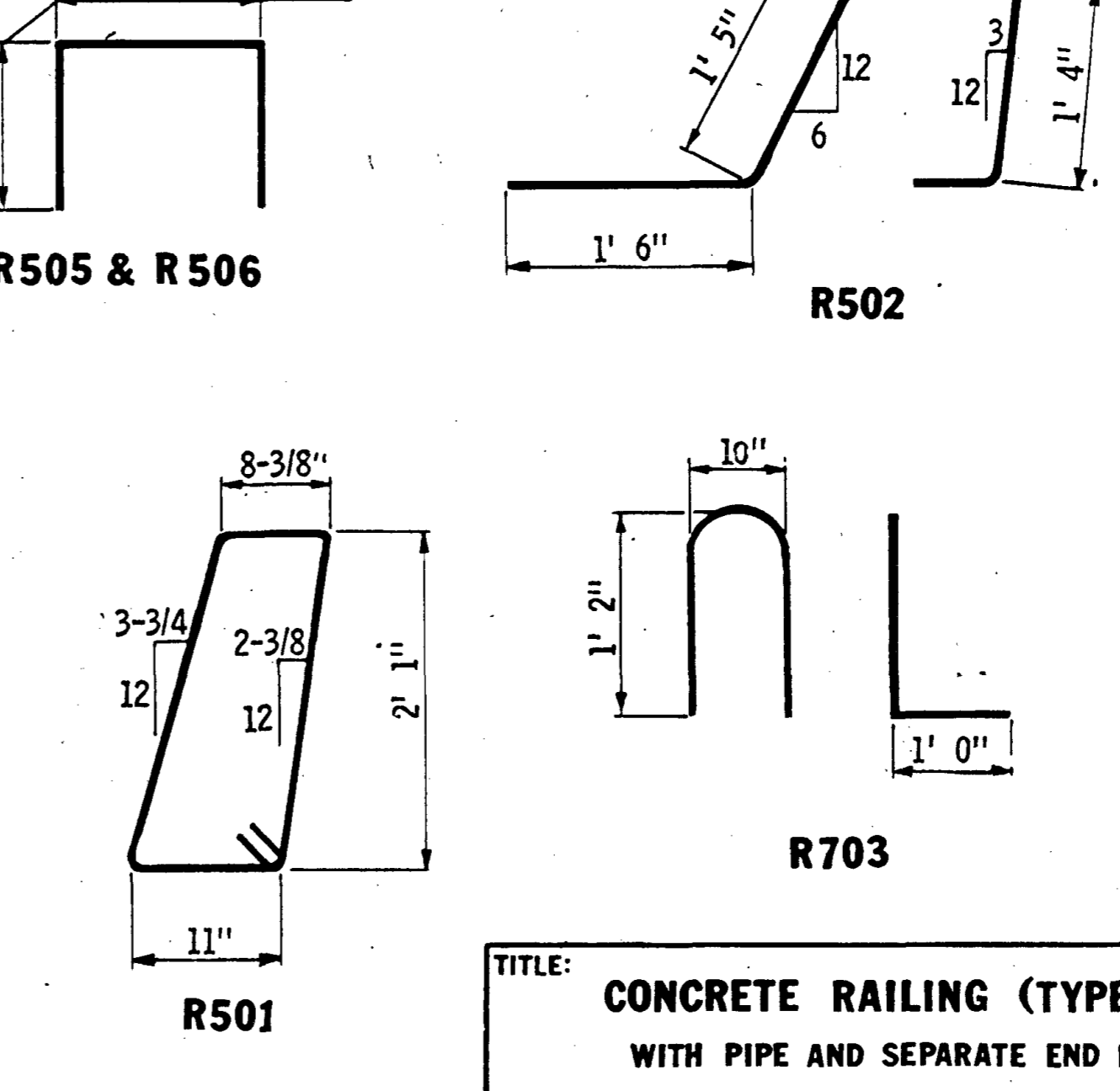
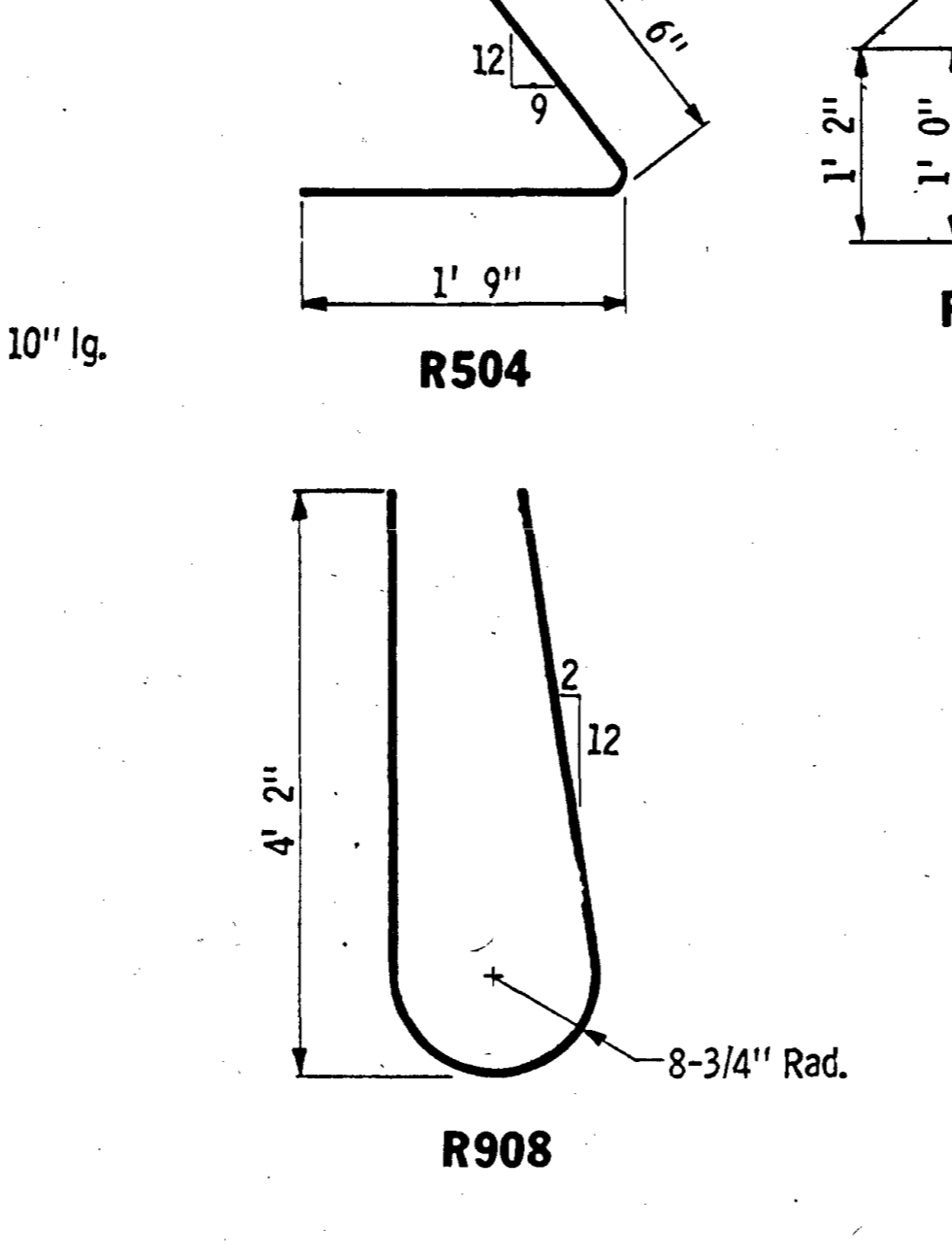
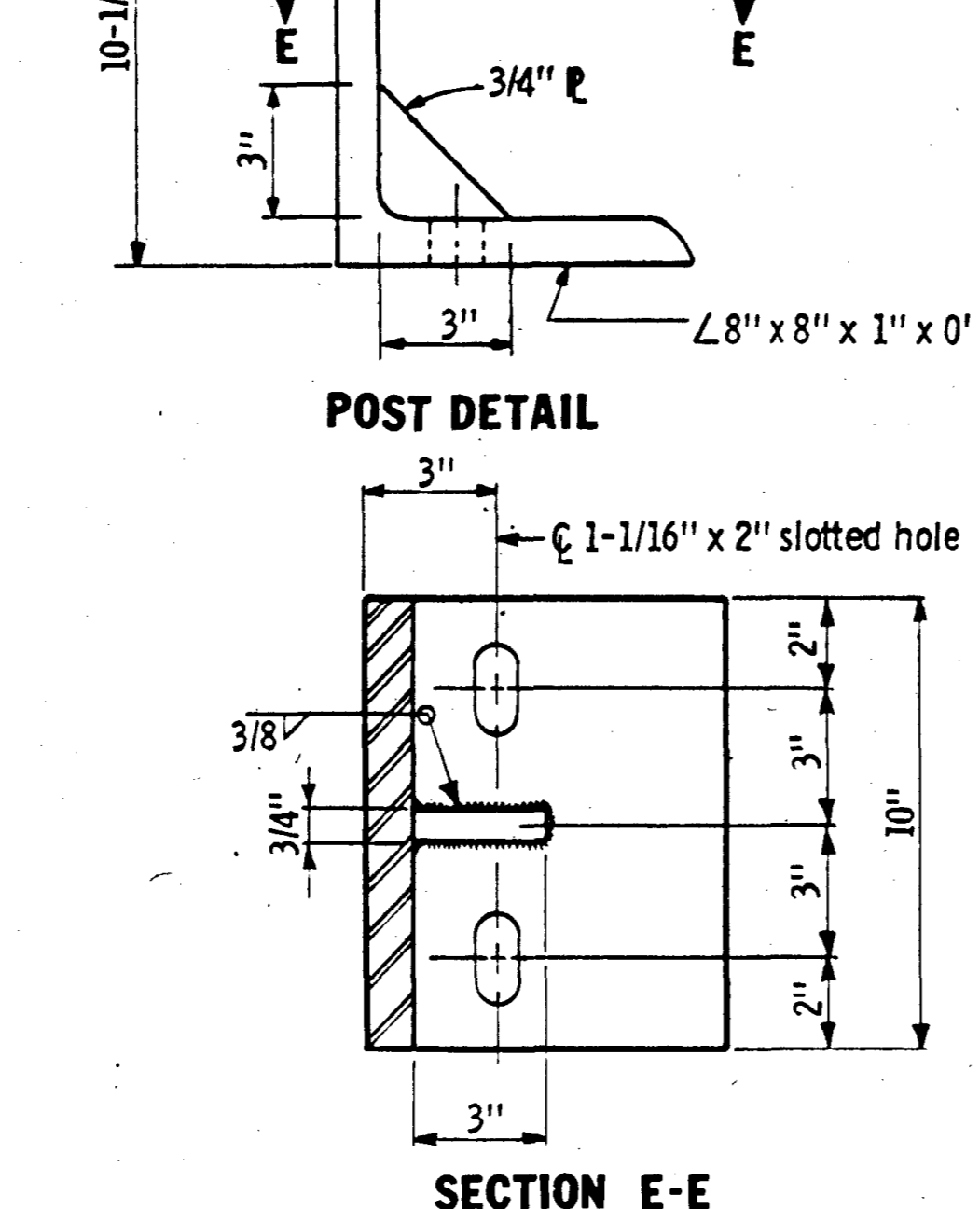
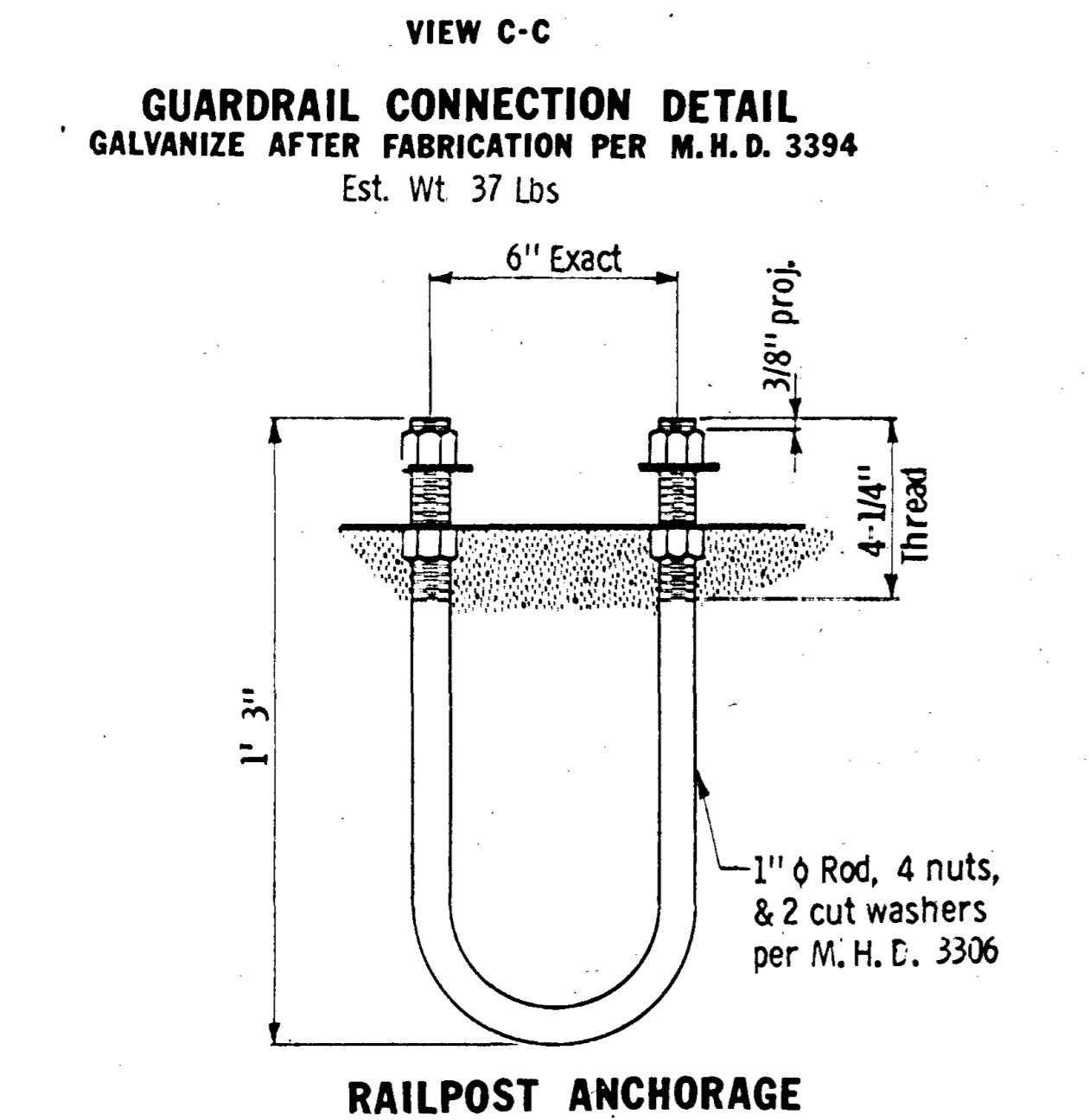
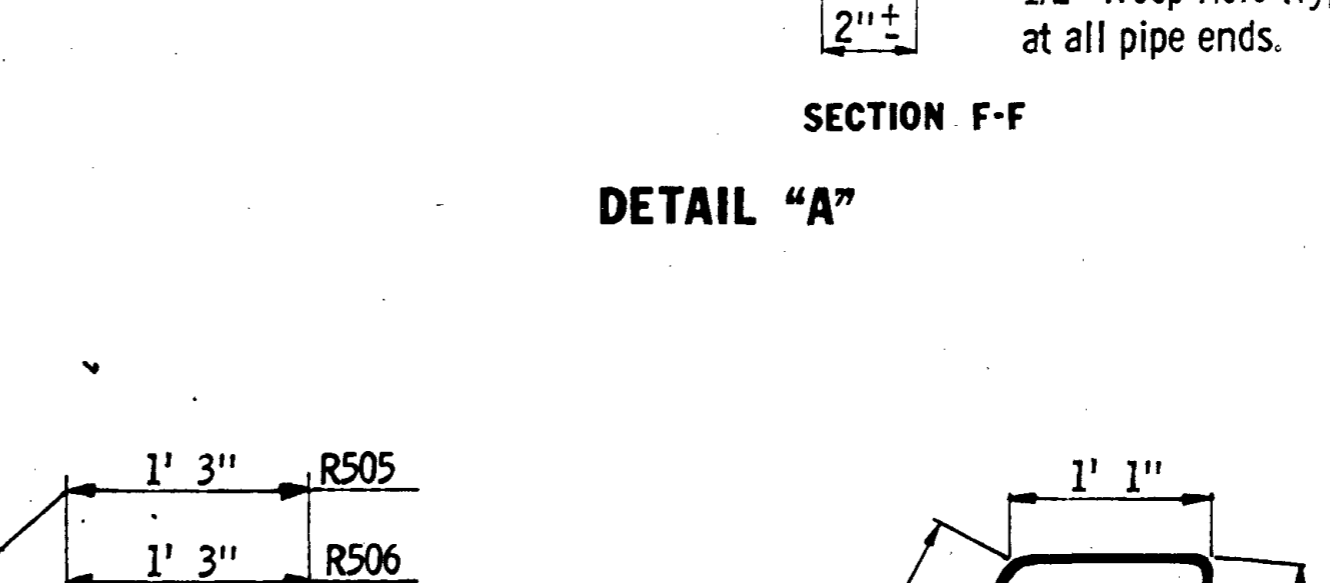
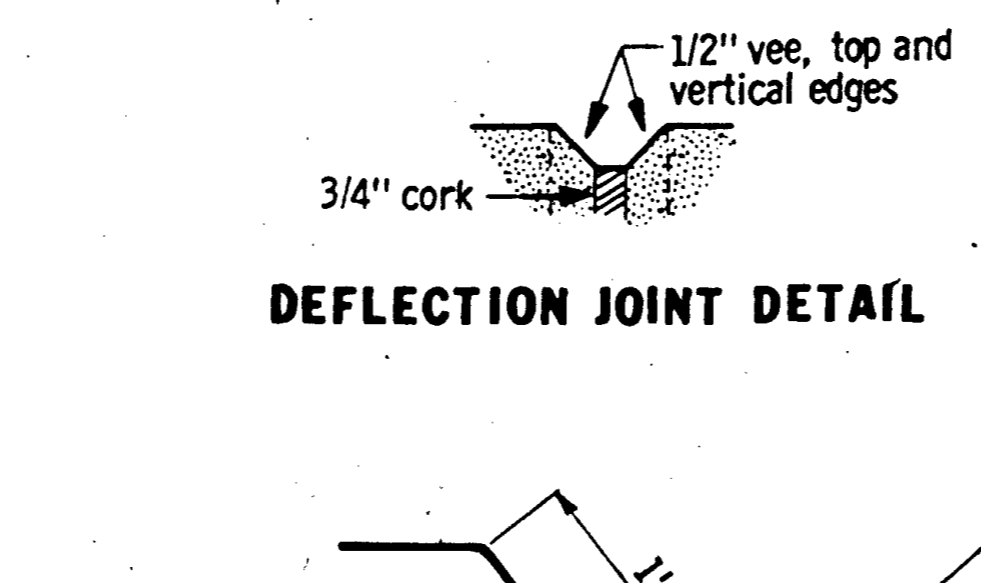
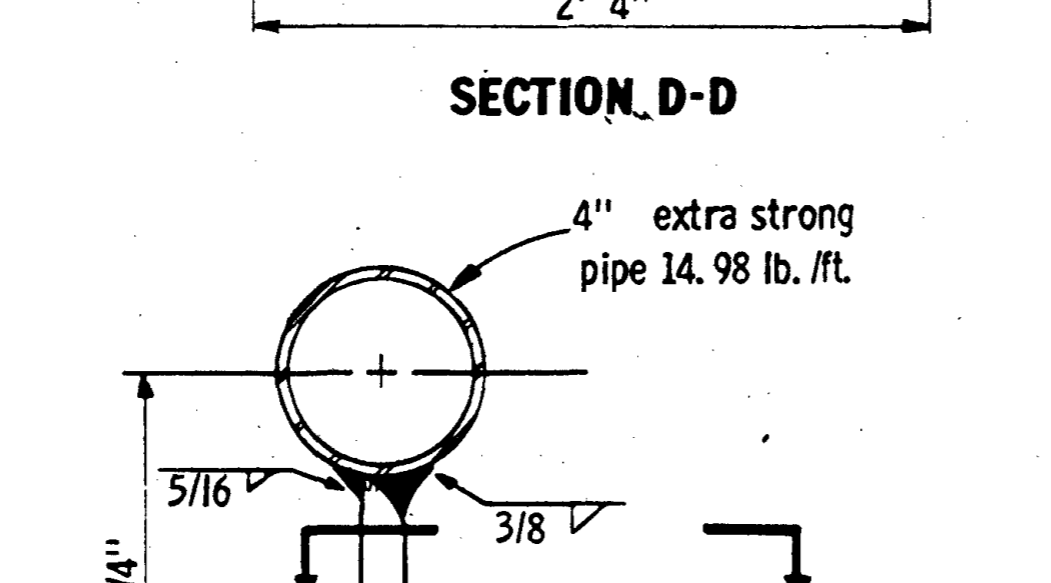
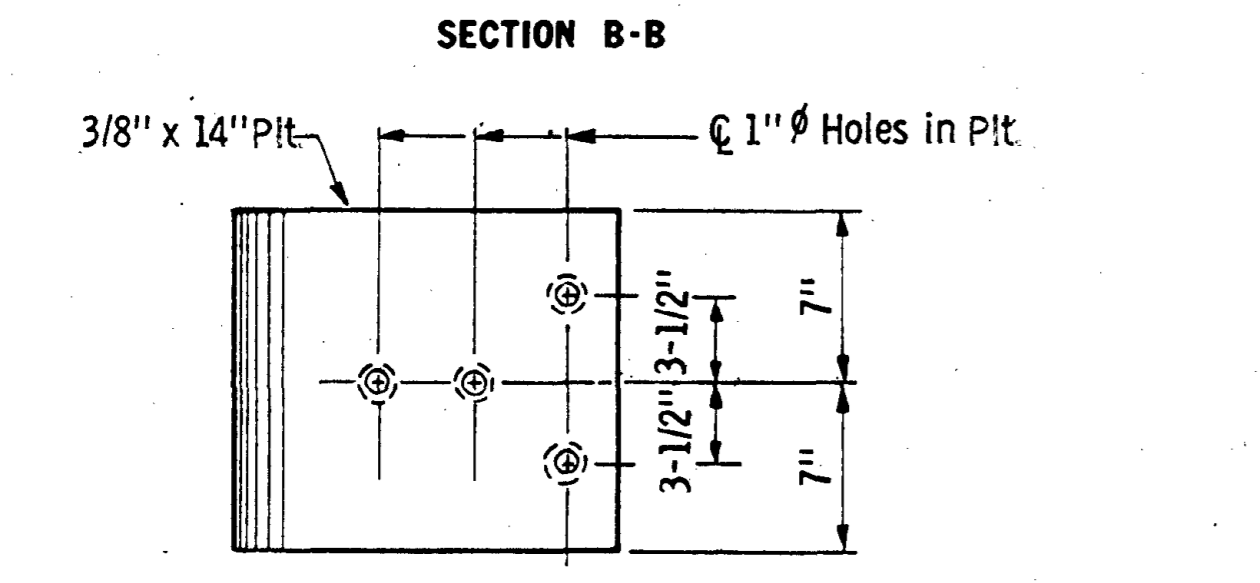
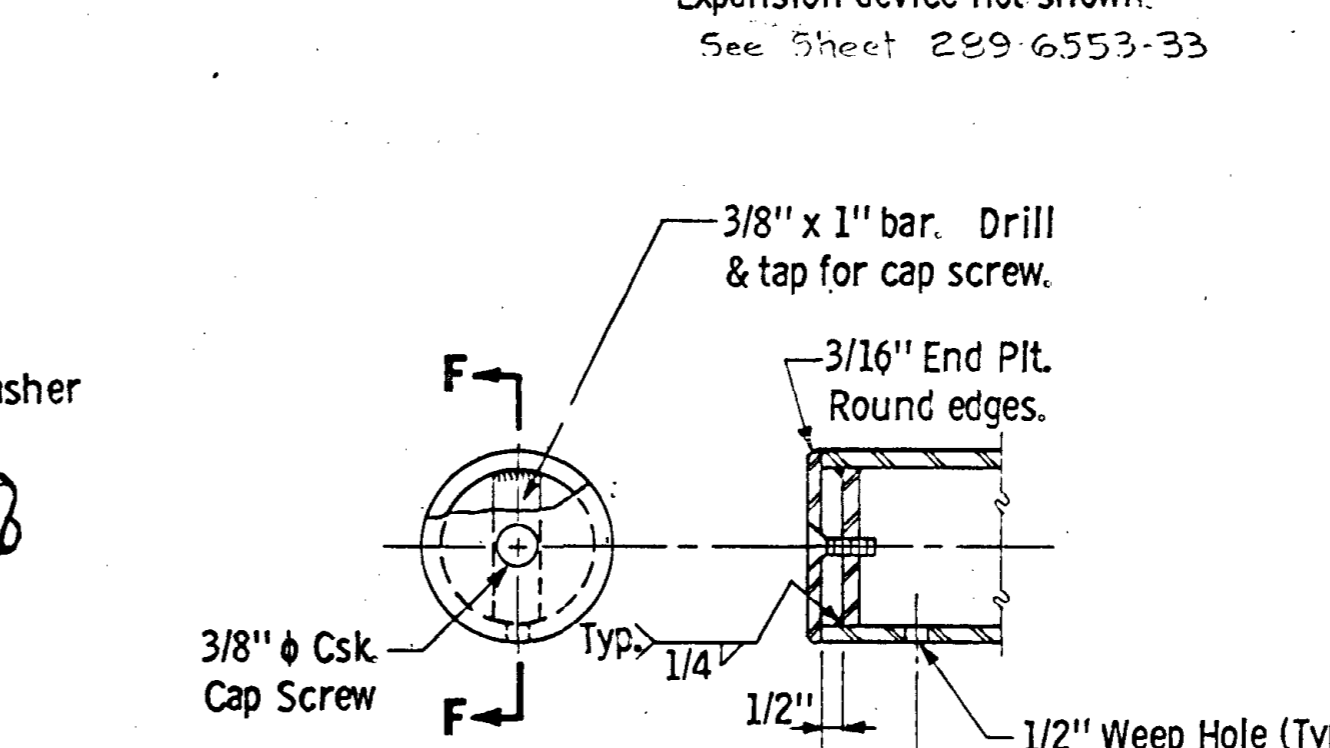
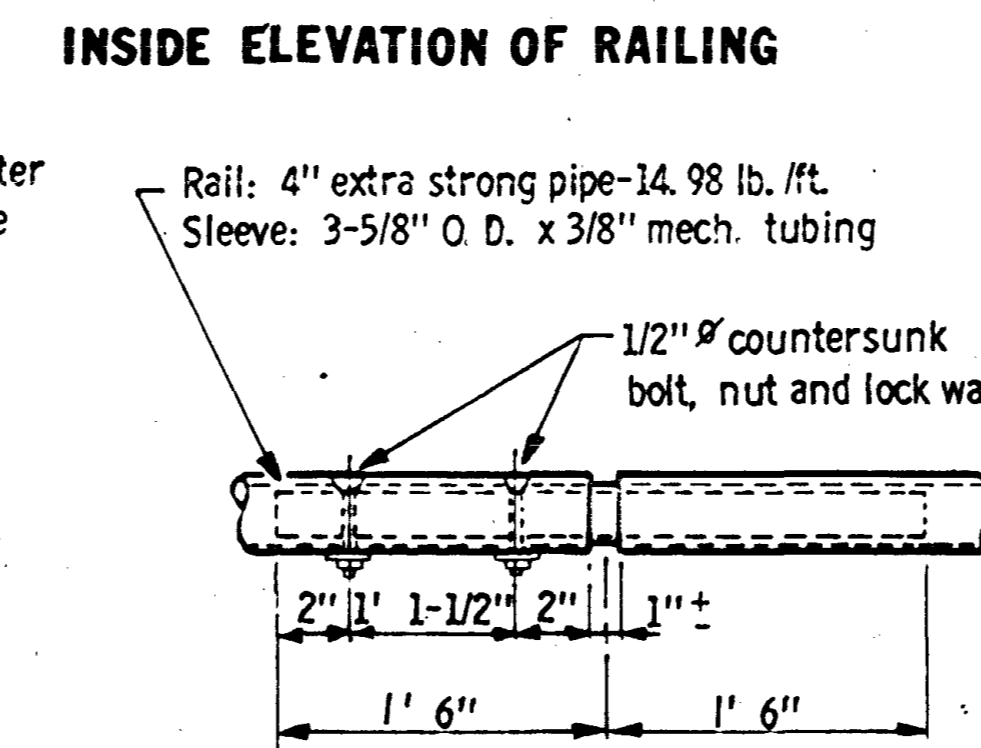
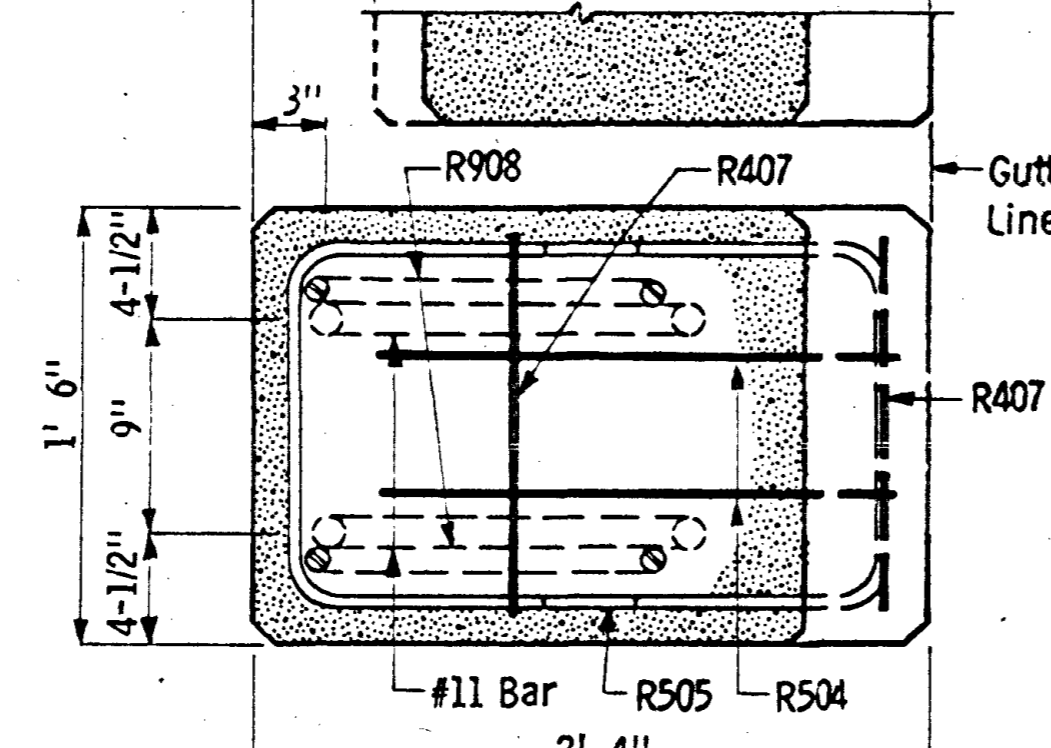
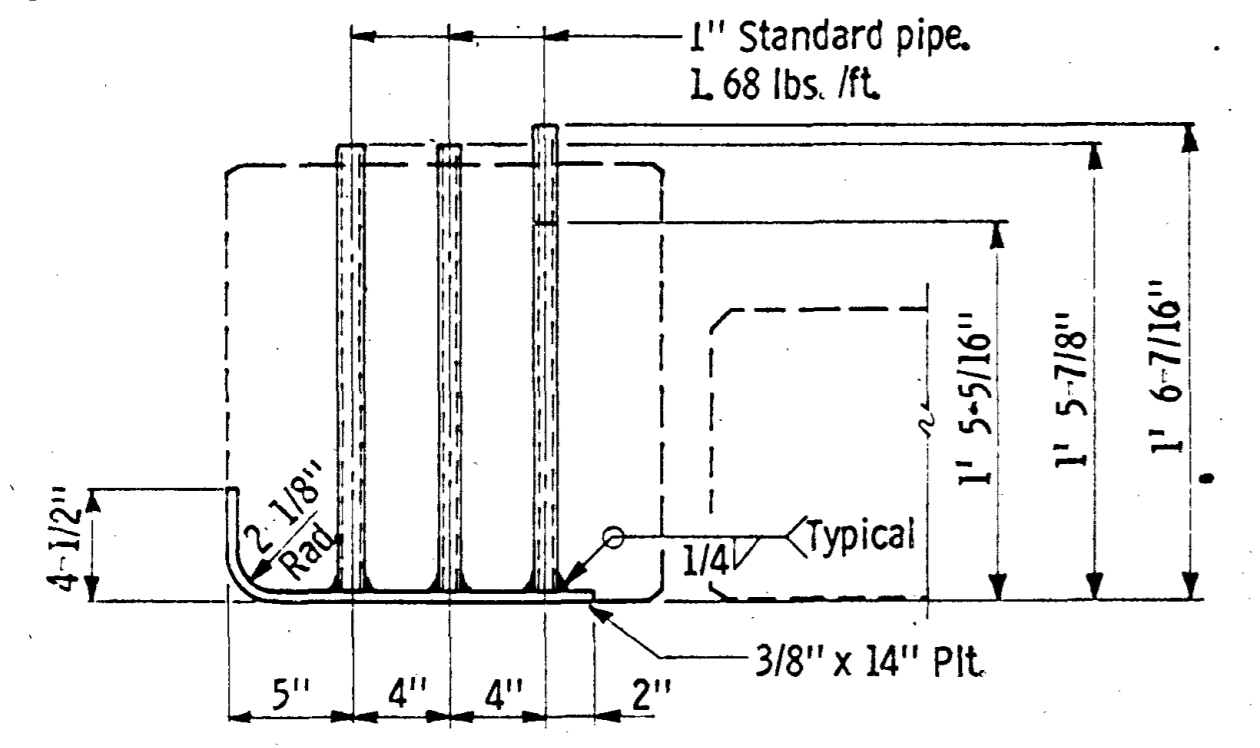
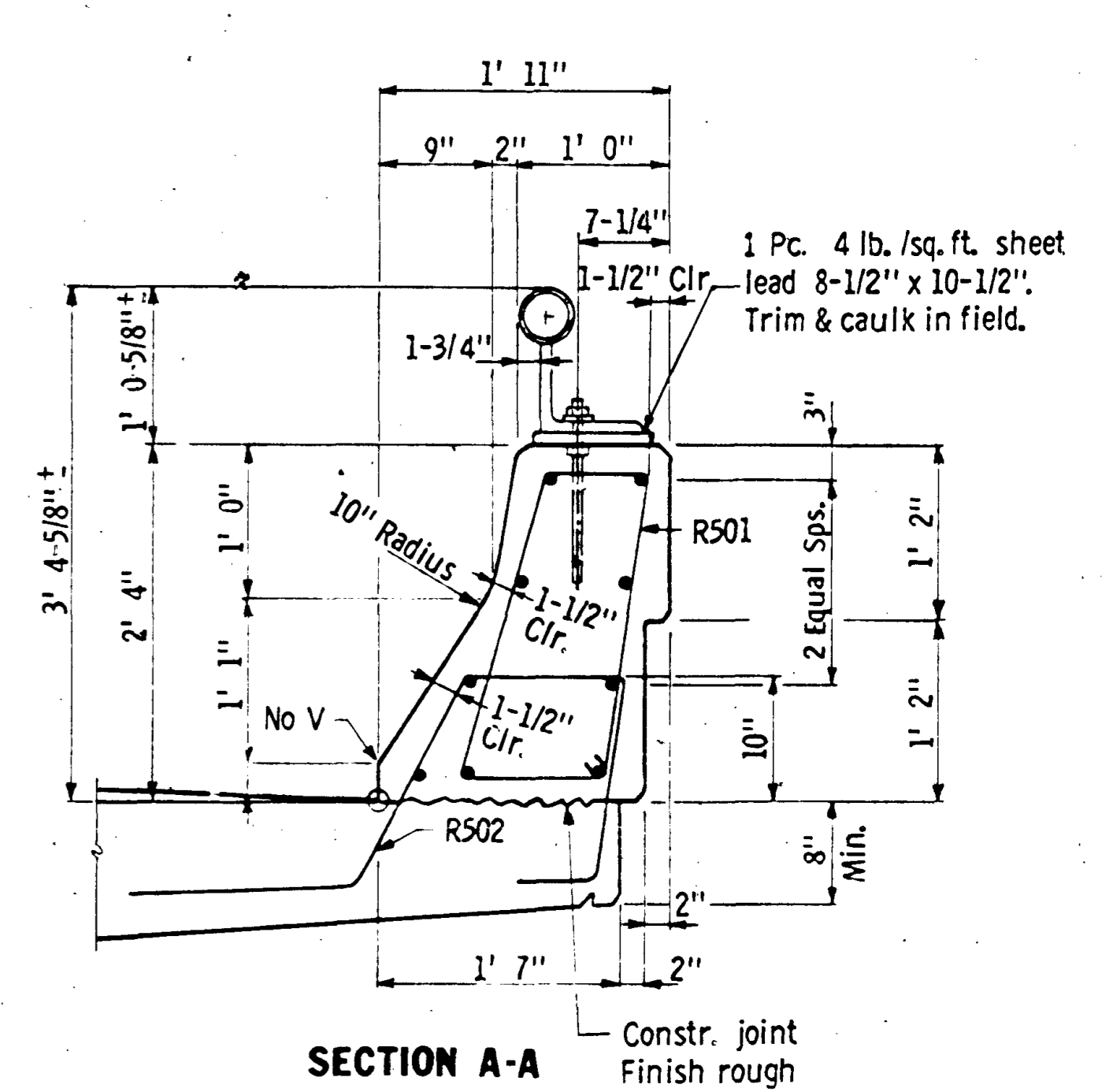
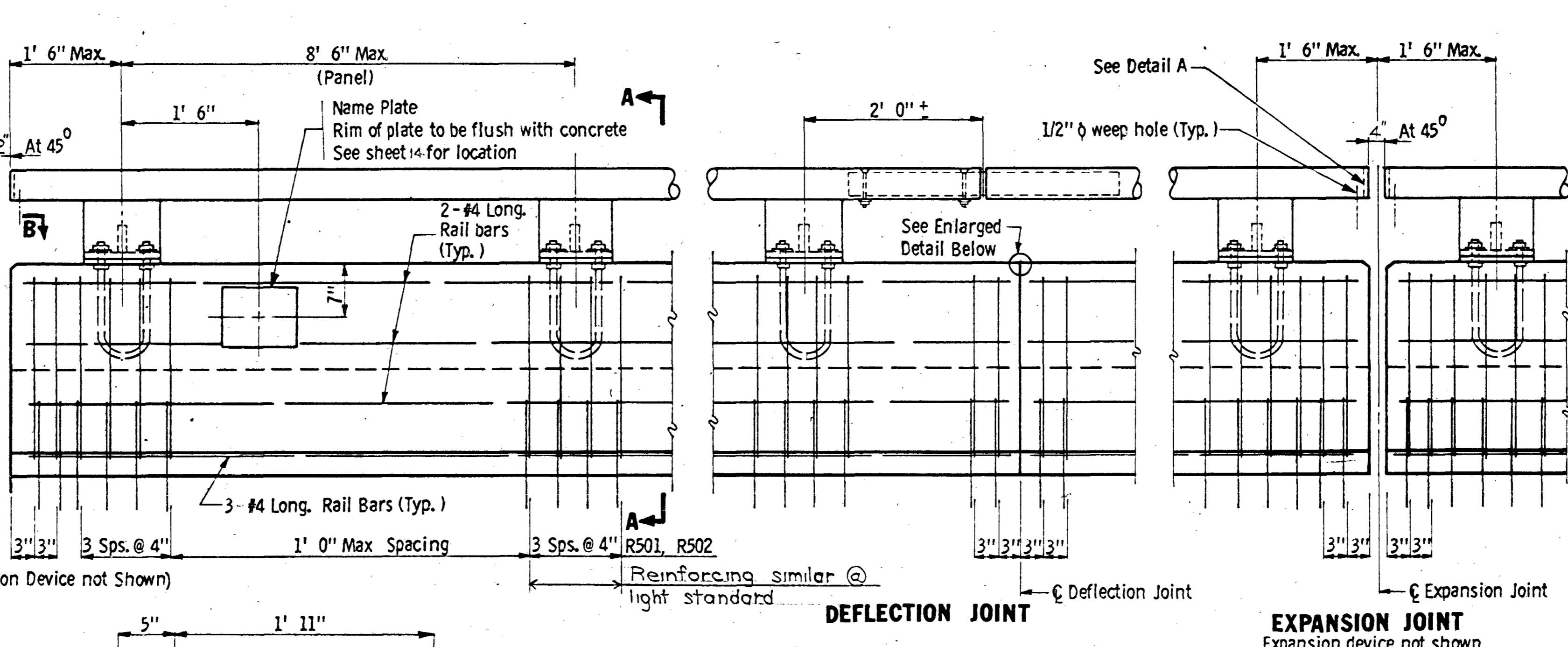
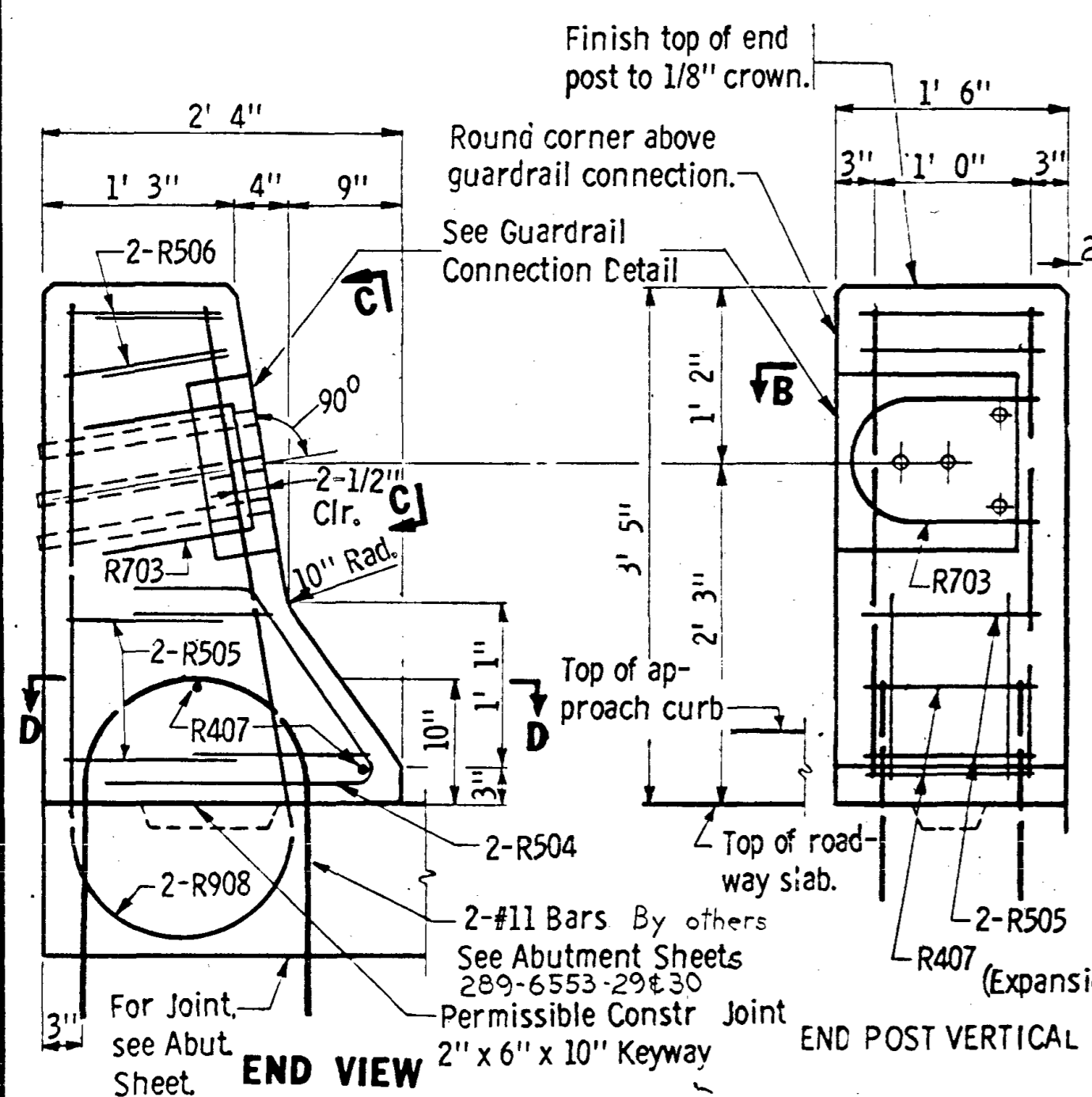
This railing will be used only when there is a barrier between the sidewalk and the roadway.

GENERAL NOTES:

- All railposts normal to grade.
- Anchorage shall be accurately placed to provide correct alignment of railing. Set normal to grade.
- All material shall comply with M. H. D. 3306.
- Galvanize bolts, nuts, and washers per M. H. D. 3392.
- Galvanize all other structural steel per M. H. D. 3394 after fabrication.
- Price bid for ornamental metal railing includes all material shown on this sheet.
- Length of "ornamental metal railing" for payment will be measured from end to end of channel with no deduction for open joint.

Fig. 5-397.108
Feb. 23, 1970

| | | | | |
|-----------------------------------|------|------|-----------|--------------------|
| TITLE: | DES: | DR: | APPROVED: | Bridge No. 13.8 |
| ORNAMENTAL METAL RAILING (TYPE S) | CHK: | CHK: | 1/17/72 | |
| Sheet No. 289-6559-38 | | | | |



| BILL OF REINFORCEMENT FOR RAILING | | | | | |
|-----------------------------------|-------|----------|-------|---------------|-------|
| BAR | NO. | LENGTH | SHAPE | LOCATION | SIZE |
| R501 | 3000 | 6' 11" | Bent | Rail Vertical | No. 5 |
| R502 | 3000 | 5' 10" | Bent | Rail Vertical | " 5 |
| R703 | 4 | 4' 10" | Bent | End Post | " 7 |
| R504 | 8 | 4' 0" | Bent | End Post | " 5 |
| R505 | 16 | 3' 7" | Bent | " " | " 5 |
| R506 | 16 | 3' 3" | Bent | " " | " 5 |
| R407 | 8 | 1' 3" | Str't | " " | " 4 |
| R908 | 8 | 8' 4" | Bent | " " | " 9 |
| R409 | 21400 | lin. ft. | Str't | Rail Long. | " 4 |

GENERAL NOTES

Rail base and end post to be Concrete Mix No. 3Y46A.

Pipe shall comply with M. H. D. 3362. The 4" pipe shall have a minimum yield point of 35000 P. S. I.

Structural steel shall comply with M. H. D. 3306.

Finish all edges of railbase and end post with 1/4" bevel except where otherwise noted.

Anchorage shall be accurately placed to provide correct alignment of railing. Set normal to grade.

Galvanize pipe and guardrail conn. per M. H. D. 3394 after fabrication. Galvanize bolts and anchorages per M. H. D. 3392.

Maximum spacing of concrete deflection joints shall be 30' 0". Railpipe deflection joints shall be placed in same panel as concrete deflection joints.

Price bid for ornamental metal railing includes the post anchorages and all material above railbase. Guardrail connection to be included in bid price for metal railing type G. No pipe on sidewalk side.

Length of ornamental metal railing for payment is measured end to end of pipe. Railing quantities are included in summary of quantities for superstructure.

CONSTRUCTION NOTES

The slope paving shall be constructed of cast-in-place concrete, in accordance with the applicable sections of MHD 2401, and the following:

1. The concrete shall be Mix 3A34. The concrete slump may be adjusted, subject to approval of the Engineer, as may be necessary to obtain the desired results.
2. Metal reinforcement shall conform to ASTM A615 grade 60. Lap 36 diameters at splices.
3. The slopes shall conform to the section shown on the General Plan and Elevation sheet in these Plans, except as otherwise provided for below. In the event the Engineer determines that a deficiency in material exists on the approach embankments constructed by others, he may order that the dimensions shown for the berm (see upper left of Section A-A) be revised to the extent necessary to construct the slope without hauling additional material. Such revision should, however, be limited to a decrease of not more than three inches, as applied to the height and/or width of the berm. In the event additional fill is required in order to conform to the slope lines staked by the Engineer, on approach embankments completed by others, the cost of furnishing, hauling, placing and compacting additional material ordered by the Engineer will be paid for as Extra Work. In the event the Engineer determines that an excess of material is present on approach embankments completed by others, he may order that the width of the berm be increased to the extent necessary to utilize such material, but not more than 1' 6". Excess material, beyond that which is required to dress the slope to true lines and to the grades staked by the Engineer, shall be used as directed by the Engineer for purposes such as widening the shoulders adjacent to the sidewalls, flaring out these shoulders, and shaping up adjacent side slopes. The disposal of excess material, except material deposited by the Contractor during excavation for substructure units or related work, which can not be incorporated into the slopes as hereinbefore defined, and which the Engineer directs to be hauled from the site, will be paid for as Extra Work. Any revision in berm grades and dimensions should be applied uniformly for the full length of the berm. Compaction will be required.
4. Toe and side walls shall be in place before casting remainder of slope paving.
5. Slope paving shall, in general, be poured in equal alternate vertical strips with a maximum width of 6 ft. The strips shall be cut into sections by grooves spaced at equal distances not exceeding 6 ft. and shall be at right angles to the strips. Other patterns for strips and grooves will be considered if requested by the Contractor. Subgrade shall be moist when concrete is placed.
6. The forms shall be set to accurate grade and alignment, and shall be rigidly supported. Deviations of greater than 1/4" from a ten-foot straight edge shall be corrected.
7. Care shall be taken in placement of concrete so as not to disturb the grade on which it is placed, or to contaminate the concrete.
8. Sufficient hand spading and/or tamping shall be done to secure a dense paving relatively free of voids and honeycomb.
9. The top surface shall be struck off immediately after placing the concrete. When the concrete has set sufficiently to hold its shape, it shall be struck off again, after which it shall be given a final finish by hand floating with a cork or wooden float. The finished appearance shall be reasonably smooth and uniform. The finished concrete shall not vary more than 3/8" from a ten-foot straight edge.
10. All edges shall be finished with an edger or 1/2" V strip. Grooves shall be cut using a sidewalk grooving tool. The trails left by the flanges of these tools shall be removed by floating.
11. The concrete shall be cured in accordance with MHD 2401.3G, until a strength gain of 30% has been attained.
12. Reinforcement shall be supported on concrete bricks or mortar blocks or other support satisfactory to the Engineer.

13. Slope paving will be measured by area of the top surface bounded by the outside edges of the toewall and sidewalls and the front face of the abutment.
14. Payment for furnishing and placing the slope paving will be made at the Contract price per square yard.

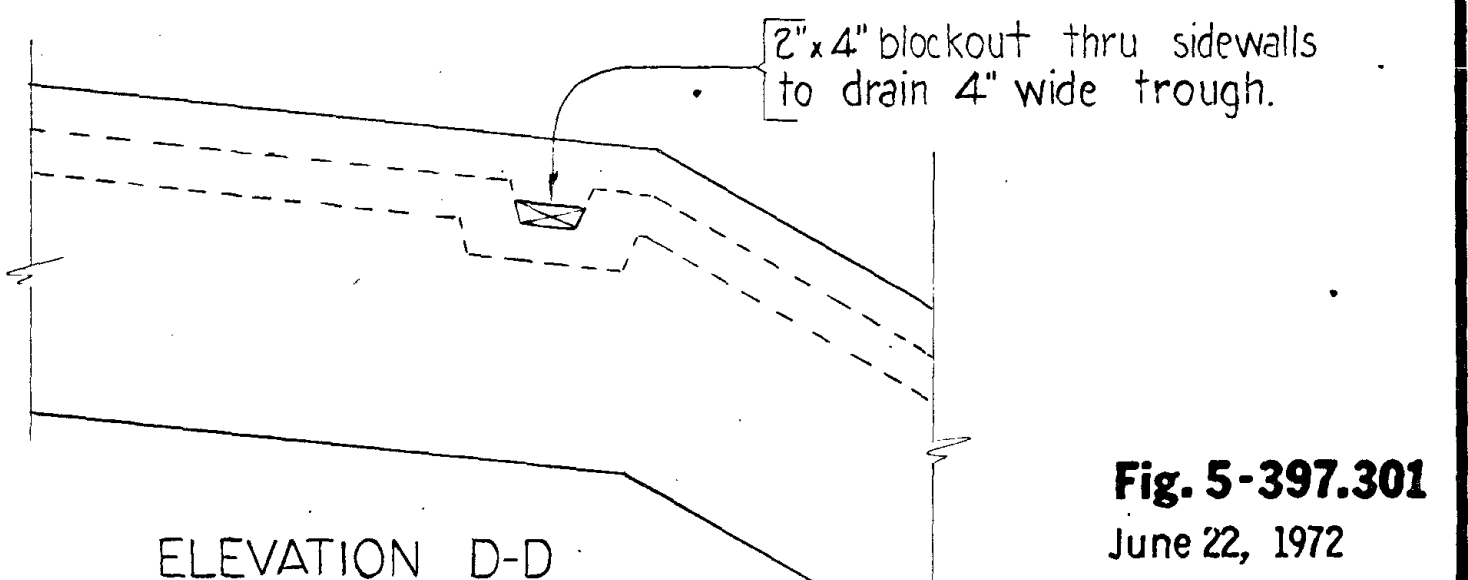
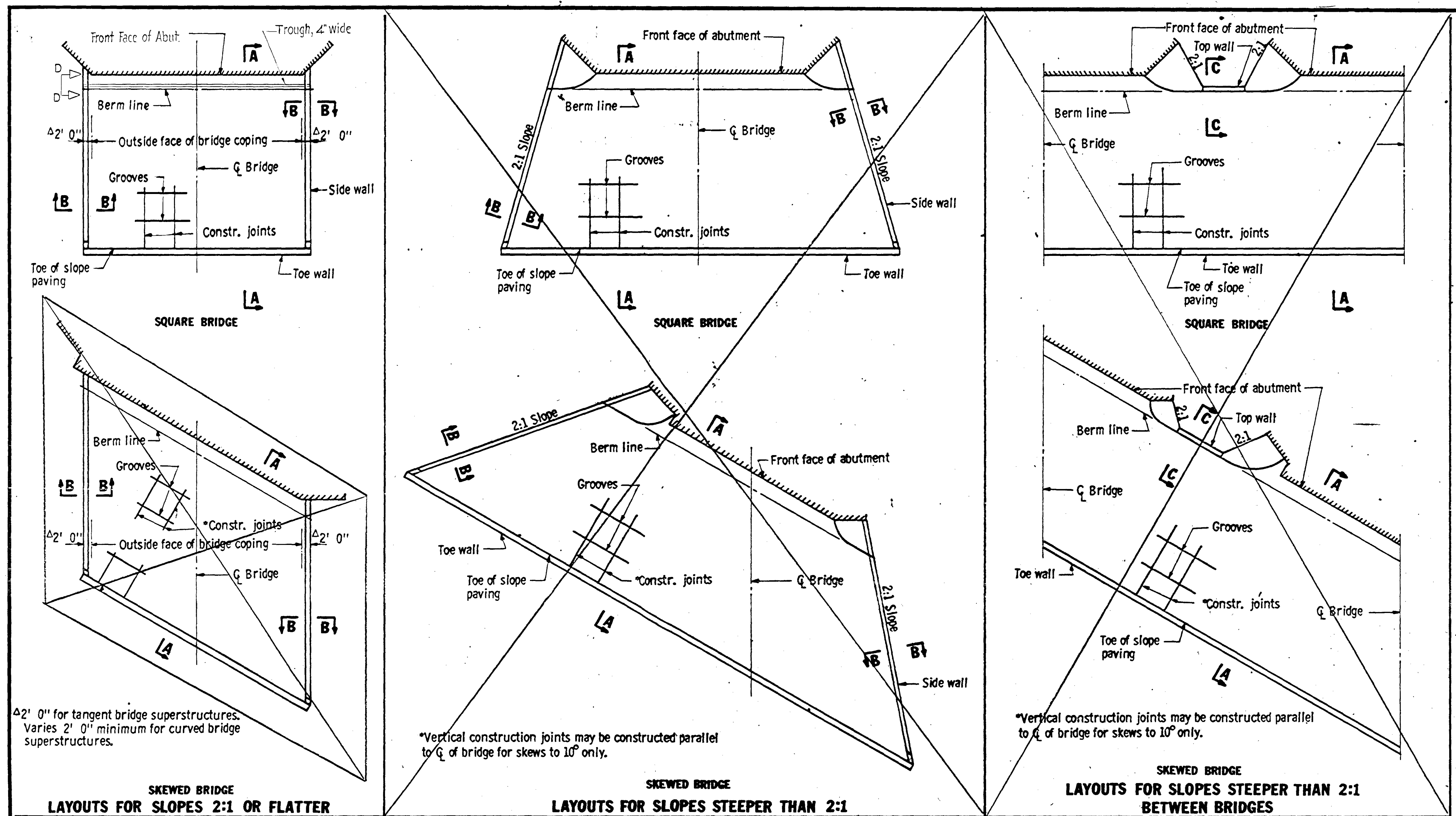


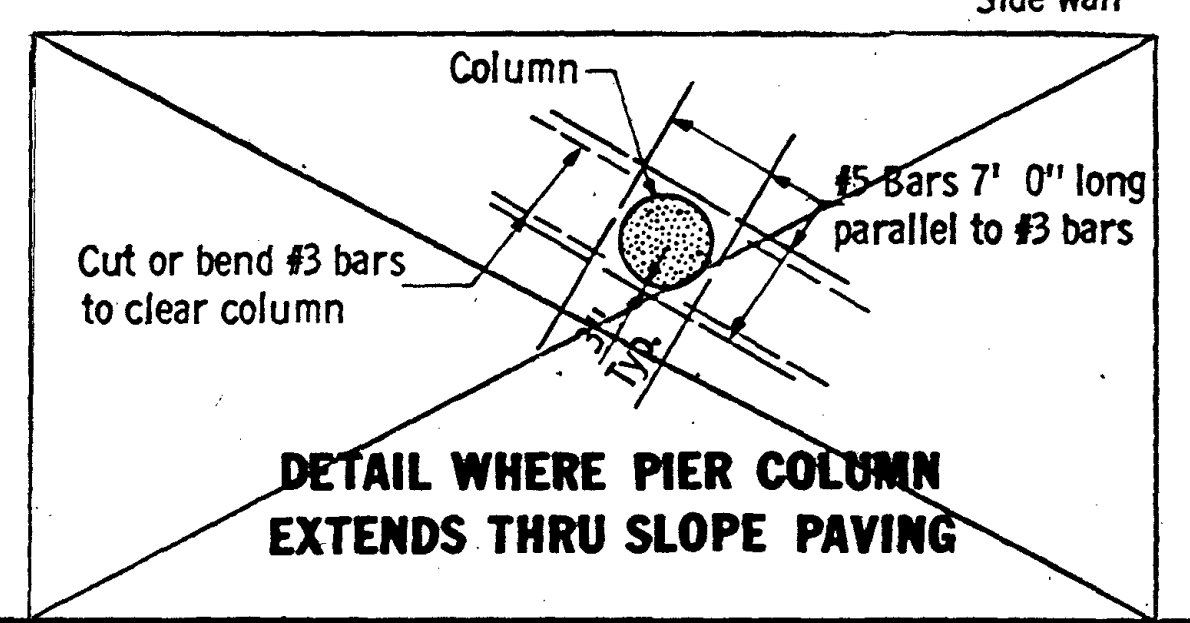
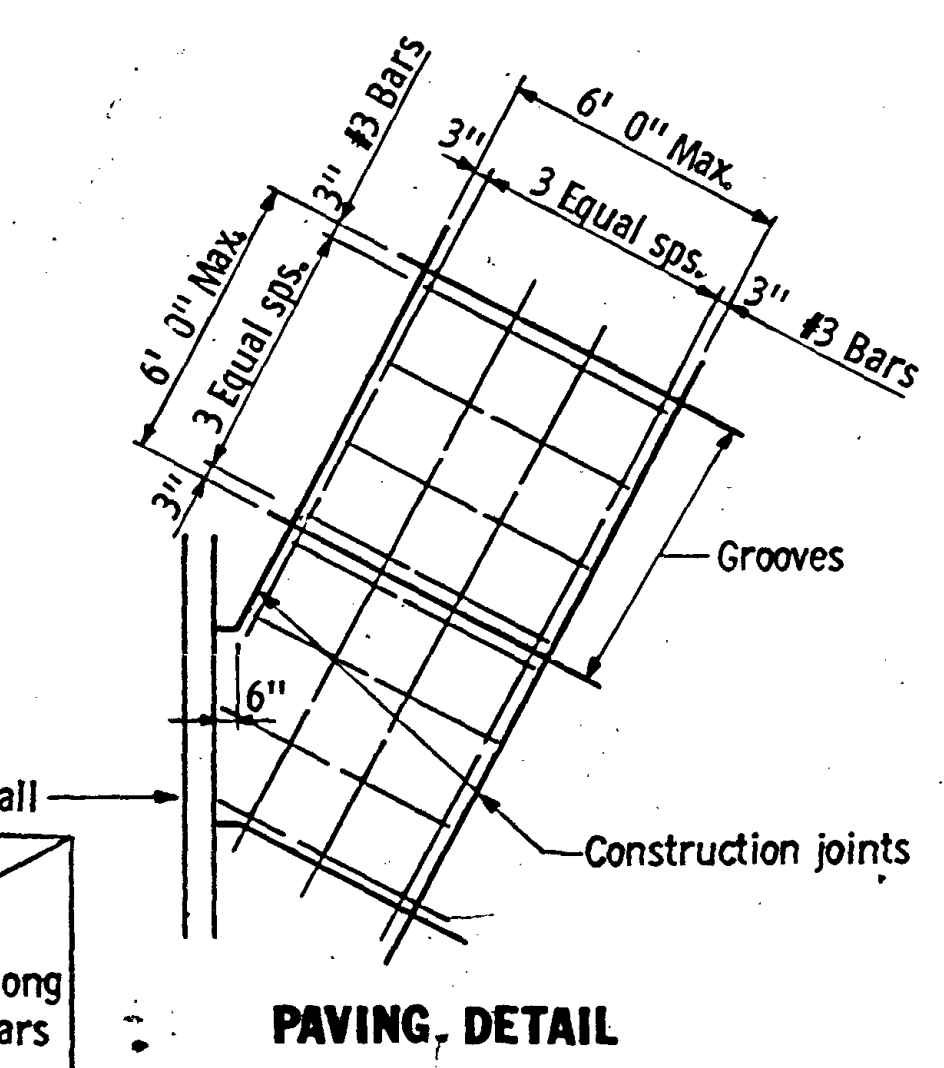
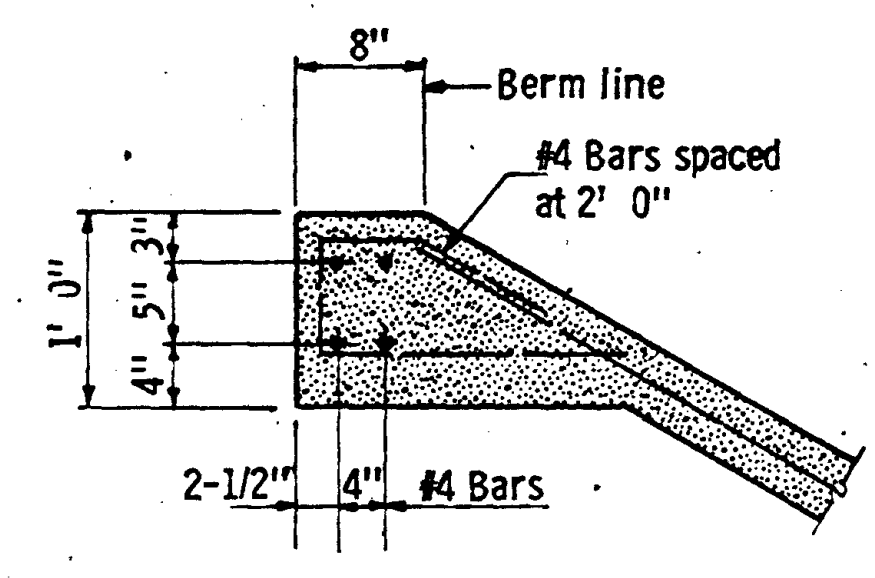
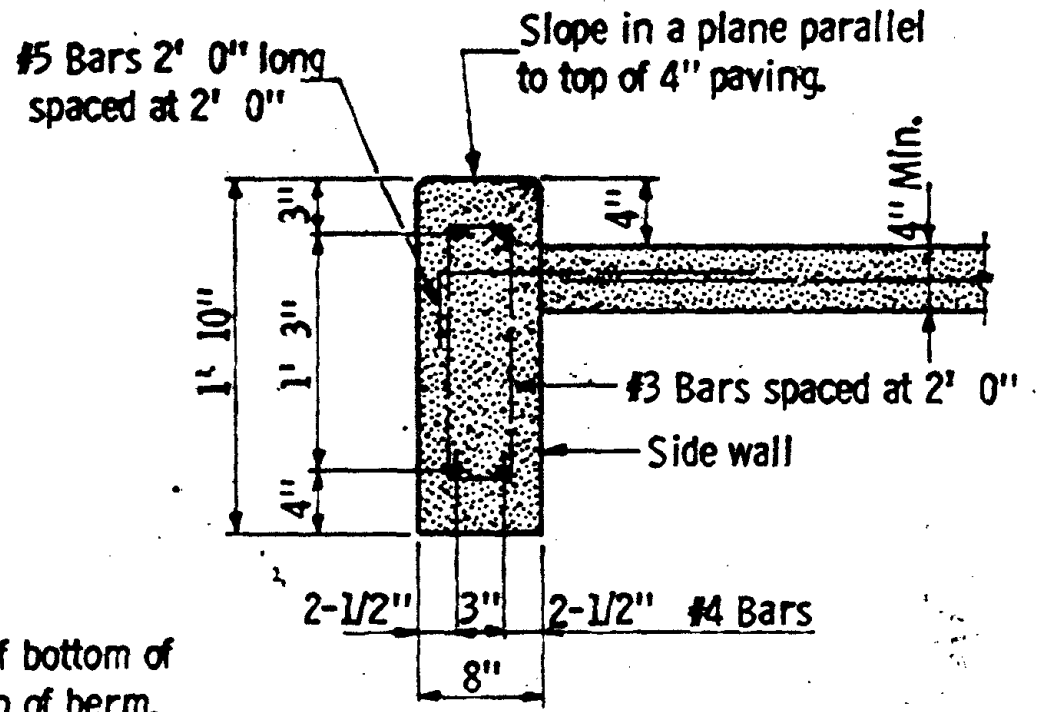
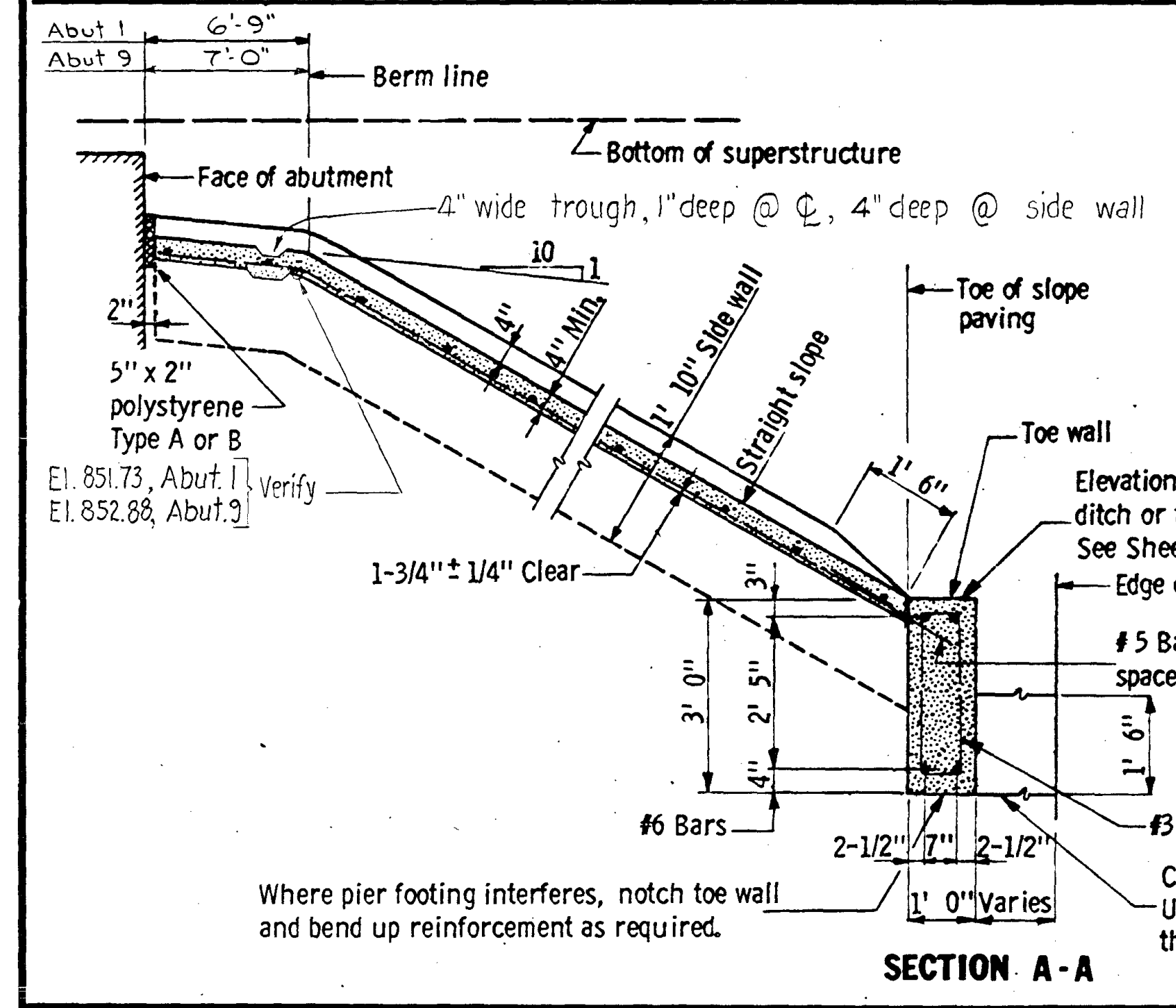
Fig. 5-397.301
June 22, 1972



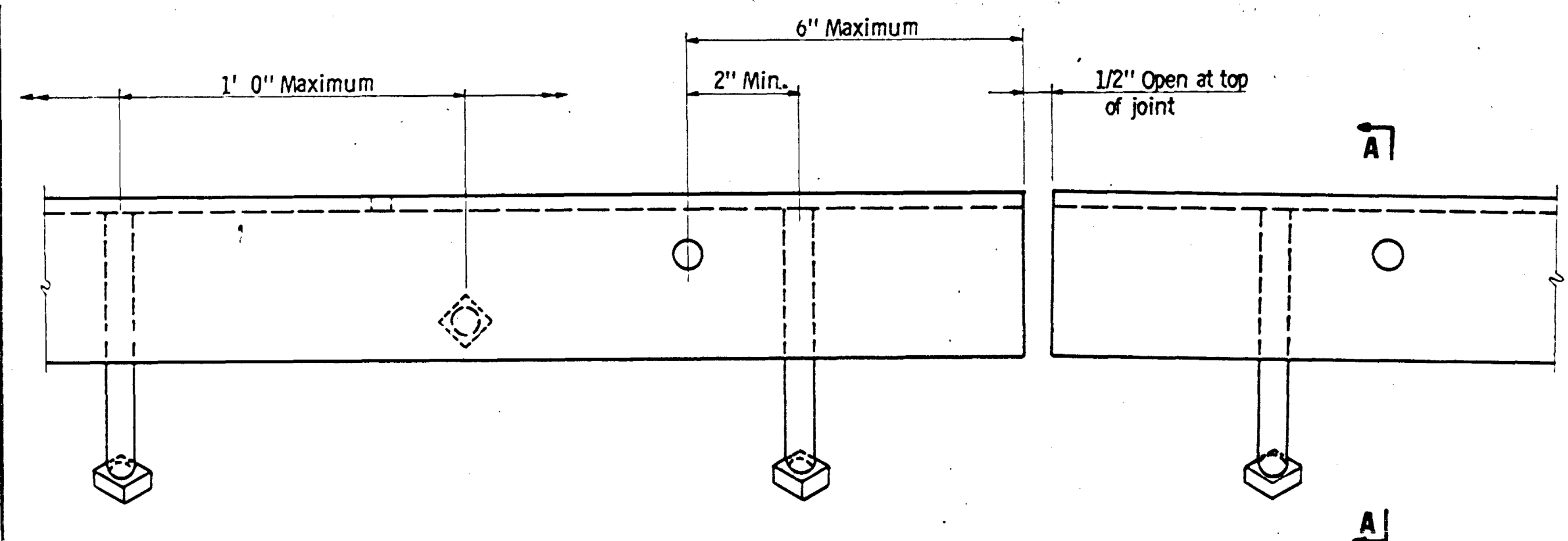
Δ2' 0" for tangent bridge superstructures. Varies 2' 0" minimum for curved bridge superstructures.

*Vertical construction joints may be constructed parallel to Q of bridge for skew to 10° only.

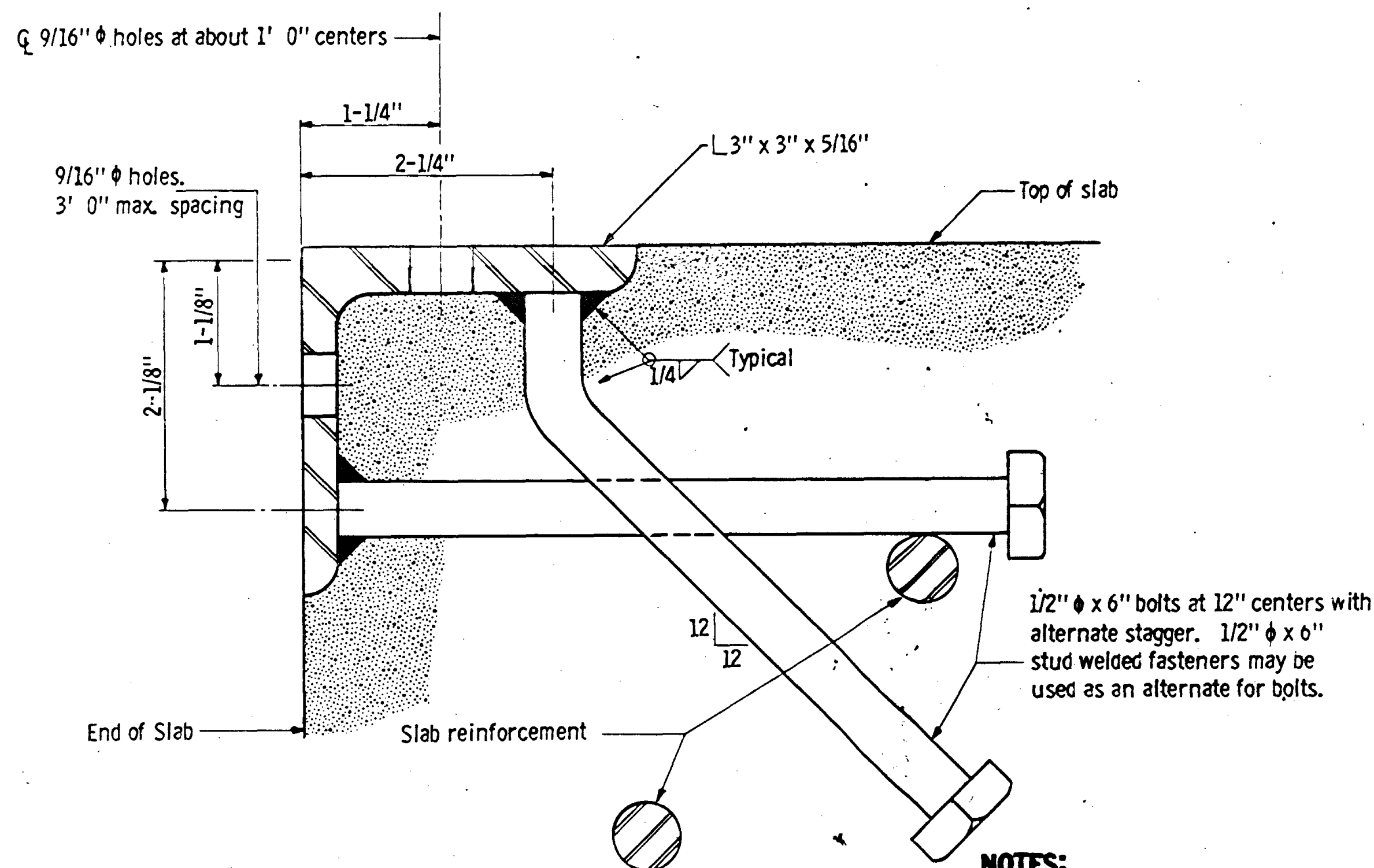
*Vertical construction joints may be constructed parallel to Q of bridge for skew to 10° only.



| | | | | | |
|-------------------------------------------|--|------------|------------|---------------------------------|-----------------|
| TITLE: CLASS B SLOPE PAVING UNDER BRIDGES | | DES: _____ | DR: _____ | APPROVED: <i>7/6 E. 11/7/72</i> | Bridge No. 13.8 |
| Sheet No. 289-6553-40 | | CHK: _____ | CHK: _____ | | |



ELEVATION
(Concrete not shown)



SECTION A - A

NOTES:
 Angles shall extend full width of roadway between curbs with a 1/2" open joint at each break in crown profile. Maximum length 22 feet.
 Angles shall be straightened to a tolerance of 1/16" in 10 feet after galvanizing.
 Material: Structural steel per M. H. D. 3306. Galvanize after fabrication per M. H. D. 3394.
 Set angle to proper grade and crown.
 All material will be paid for as roadway expansion assemblies.

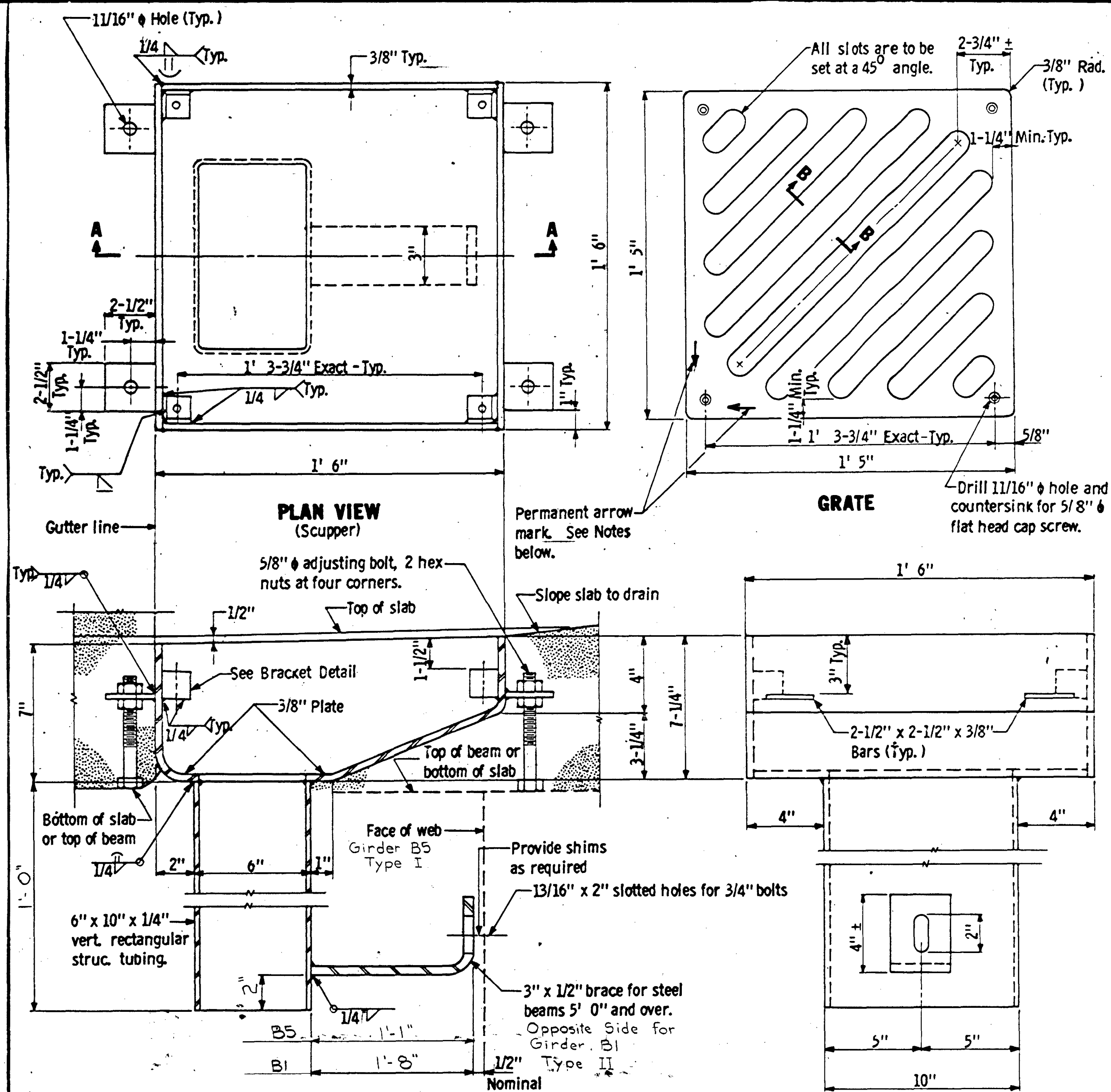
APPROVED May 26, 1972

Douglas Duffert
 Engineering Standards Engineer
 RESEARCH AND STANDARDS
 DIVISION

STATE OF MINNESOTA
 DEPARTMENT OF HIGHWAYS
**PROTECTION ANGLE
 FOR END OF SLAB**

DETAIL NO.

B551



PLAN VIEW
(Scupper)

GRATE

SECTION A - A

FRONT VIEW

SECTION B - B

BRACKET DETAIL

NOTES

All steel plates per M. H. D. 3306. Fabricate grate using automatically controlled cutting torch.
 Malleable iron grate alternate per M. H. D. 3324 Grade 35018.
 Workmanship and fabrication per M. H. D. 2471.
 Blast clean scupper and grate after fabrication.
 Galvanize scupper and grate per M. H. D. 3394.
 Galvanize hardware per M. H. D. 3392.
 Install grate with arrow on curb side and in direction of flow.
 Payment for Floor Drain, Type I & II shall include all material shown on this detail.
 Grate opening area 110 sq. in.

APPROVED July 24, 1972

Douglas Duffert
 Engineering Standards Engineer
 RESEARCH AND STANDARDS
 DIVISION

STATE OF MINNESOTA
 DEPARTMENT OF HIGHWAYS

**BRIDGE FLOOR DRAIN
 WELDED BOX**

DETAIL NO.

B701

TITLE: MISCELLANEOUS DETAILS

DES: _____ DR: _____ APPROVED: *7/26/72*
 CHK: _____ CHK: _____
 Sheet No. 289-6553741

Bridge No. 13.8