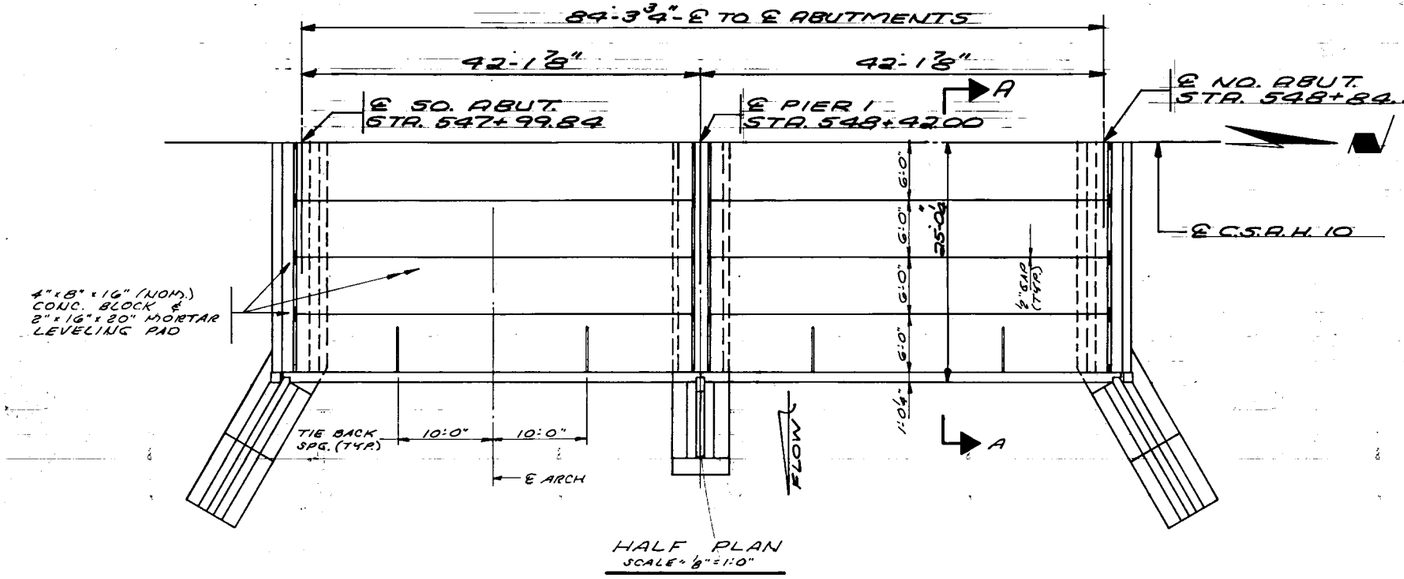
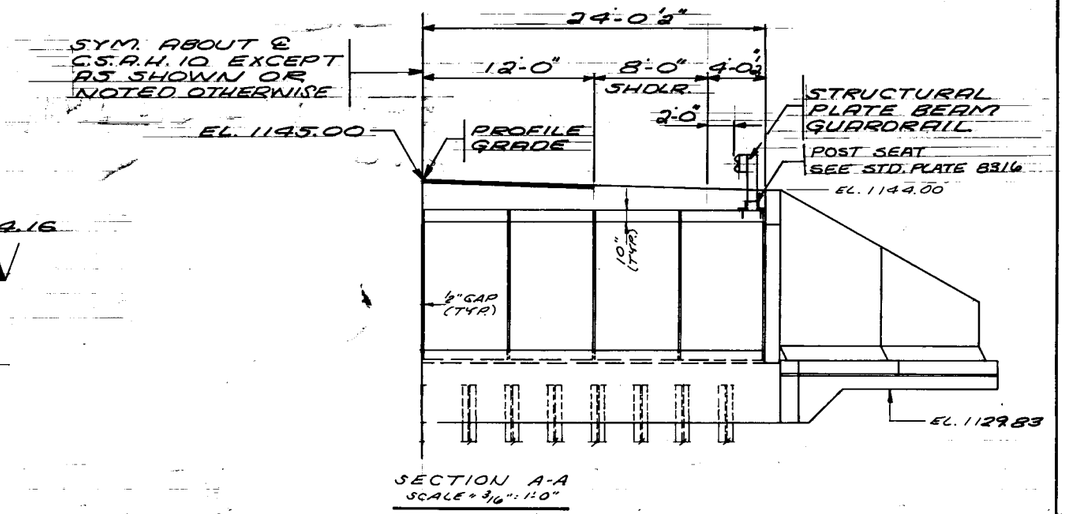
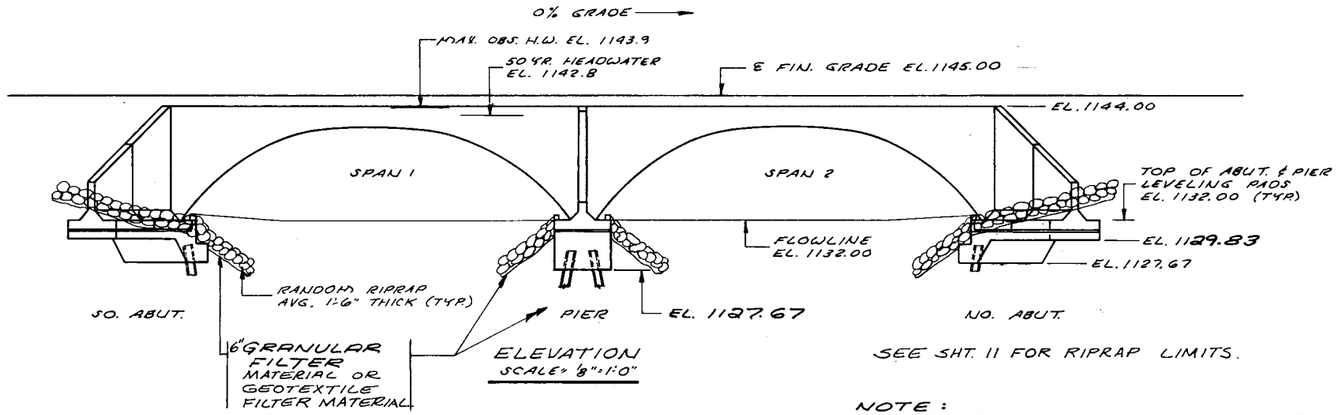



HALF PLAN
SCALE: ⅛"=1:0"




SECTION A-A
SCALE: 3/16": 1:0"




ELEVATION
SCALE: ⅛"=1:0"

SEE SHT. 11 FOR RIPRAP LIMITS.

NOTE:
STEEL HP 10x42 PILING TO BE USED AT BOTH ABUTMENTS AND PIER.

FILTER MATERIAL TO BE INCL. IN PRICE BID FOR RANDOM RIPRAP CLASS III. APPROX. QUANTITY OF GRAN. FILTER - 90 C.Y.

## DESIGN DATA

1983 & INTERIM A.A.S.H.T.O. DESIGN SPECS. WORKING STRESS DESIGN METHOD
HS-20 LOADING

MAXIMUM ALLOWABLE DESIGN STRESSES:
REINFORCED CONCRETE ARCH ELEMENTS, SPANDREL WALLS, WING & PIER WALLS.
$f'_c$ = 4000 P.S.I.
$f_y$ = 60000 P.S.I.
BACKFILL:
$\phi$ = 30° AND $\theta$ = 20°

REINFORCED CONCRETE:
$f'_c$ = 4000 P.S.I. n=8
$f_y$ = 60000 P.S.I. REINF.

~~BASIS FOR DESIGN:~~
~~FOOTING WIDTH BASED ON 8' COVER OVER ELEMENT (SOIL WT. 120#/ft³)~~
~~ELEMENT DESIGN BASED ON UP TO 9' COVER OVER ELEMENT (SOIL WT. 115.5#/ft³)~~

A.D.T. = 2075 (PROJECTED TO 2006)

## CONSTRUCTION NOTES

THE 1983 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

FABRICATION AND CONSTRUCTION OF PRECAST REINFORCED CONCRETE ARCH STRUCTURE SHALL BE IN ACCORDANCE WITH FABRICATOR'S RECOMMENDATIONS.

REINFORCEMENT BARS SHALL BE DEFORMED BILLET STEEL BARS CONFORMING TO ASTM A615, GRADE 60.

THE FIRST DIGIT OR THE FIRST TWO DIGITS OF EACH BAR MARK INDICATE THE BAR SIZE.

PLACE FILTER CLOTH OVER WEEP HOLES BEFORE BACKFILLING.

BM. ELEV. 1147.07 (M.S.L. 1929 ADJ.) BRASS PLUG AT SOUTHEAST CORNER OF BRIDGE 3746

SUMMARY OF QUANTITIES FOR THE ENTIRE BRIDGE

| ITEM NO. | ITEM | QUANT. | UNIT |
|---|---|---|---|
| 2411.541 | REINFORCEMENT BARS | 11730 (E) | POUND |
| 2411.501 | STRUCTURE CONCRETE (3Y93) | 181 (E) | CU. YD. |
| 2511.501 | RANDOM RIPRAP CLASS III | 105 | CU. YD. |
| 2554.501 | TRAFFIC BARRIER DESIGN 88307 | 475 | LIN. FT. |
| 0501.606 | SPANDREL WALLS | 4 | EACH |
| 0501.606 | PRECAST WINGWALLS | 4 | EACH |
| 0501.606 | PRECAST PIER WALLS | 2 | EACH |
| 0501.603 | PRECAST REINFORCED CONCRETE ARCH (40'x10') | 96 | LIN. FT. |
| 2452.520 | STEEL-H-TEST PILES 35 FT. LG., 10" | 6 | EACH |
| 2401.521 | STRUCTURE EXCAVATION CLASS E | 2450 (E) | CU. YD. |
| 2451.503 | GRANULAR BACKFILL (C.V.) | 1680 (E) | CU. YD. |
| 2554.523 | TWISTED END TREATMENT | 4 | EACH |
| 2452.511 | STEEL-H-PILING DELIVERED, 10" | 1275 | LIN. FT. |
| | | | |
| 2452.510 | STEEL-H-PILING DRIVEN, 10" | 1275 | LIN. FT. |

## LIST OF SHEETS

| NO. | TITLE |
|---|---|
| 1 | GENERAL PLAN & ELEVATION |
| 2 | FOUNDATION & BACKFILL DETAILS |
| 3 | ABUTMENT DETAILS |
| 4 | ABUTMENT REINFORCEMENT |
| 5 | PRECAST WALL REINF. DETAILS |
| 6 | PIER DETAILS |
| 7 | PIER REINFORCEMENT |
| 8 | SUPERSTRUCTURE DETAILS |
| 9 & 10 | DETAILS |
| 11 & 12 | SURVEY SHEETS |

APPROVED:
B K Dolan
COUNTY ENGINEER
OLMSTED COUNTY
DATE: 1-2-86

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
Robert R Jorgel
REG. NO. 6994
DATE: 4-1-86

PLANS PREPARED BY:
ERICKSON ENGINEERING
3340 REPUBLIC AVENUE
ST. LOUIS PARK, MN. 55426

C.S.A.H. 10 OLMSTED COUNTY
MINNESOTA DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 95764

0.1 MILES S. OF JCT. T.H. 14 ON C.S.A.H. 10 OVER THE SOUTH FORK WHITEWATER RIVER.

2-40' SPANS PRECAST REINFORCED CONCRETE ARCH = 40' ROADWAY
SPAN IDENT. NO. 319

GENERAL PLAN & ELEVATION

SEC. 15/16 TWP 106 N R11 W
DOVER TWP. OLMSTED COUNTY

APPROVED: K V Bonthu 4-17-86
BRIDGE ENGINEER

| SHEET 1 OF 12 SHEETS | 95764 | RMT |
|---|---|---|
| S.P. 55-610-09 | | RRT |

| TABLE OF ESTIMATED QUANTITIES | |
|---|---|
| LOCATION | QTY. (C.Y.) |
| (2) | 1205 |
| (3) | 475 |

(2) All GRANULAR backfill ~~on both sides of the curved element from the outer edge of the footing on a 45° slope to the top of the curved element~~ shall be compacted to not less than 95% of maximum density as per Mn/DOT Spec. 2105.3F1 (AASHTO T-99). GRANULAR backfill shall meet or exceed Mn/DOT Specification 3149.2D FOR GRANULAR BACKFILL. All material shall be placed in 8-inch compacted lifts unless contractor can show he can obtain 95% density with greater lifts. Mn/DOT Spec. 2451.3C and 2451.3D shall apply.

The backfill material on both sides of ~~the~~ each Arch. Structure shall be placed so that the difference in elevation on one side is never greater than 2 feet higher than the other side.

(3) Hand compaction equipment is required in the area within 2 foot of the curved elements and within 1 foot adjacent to the spandrel walls and wingwalls. All backfill shall be granular backfill as per Mn/DOT Spec. 3149.2D modified to a maximum of 1 inch stone in the material. Compaction to 95% density is required per Mn/DOT Spec. 2105.3F1 (AASHTO T-99).

## GENERAL CONSTRUCTION NOTES:

1 To avoid excessive vibration in the arch, the following practice shall be followed during the compaction operation.

a) Eccentric rotating weights of vibrating rollers shall rotate at least 30 revolutions per second.

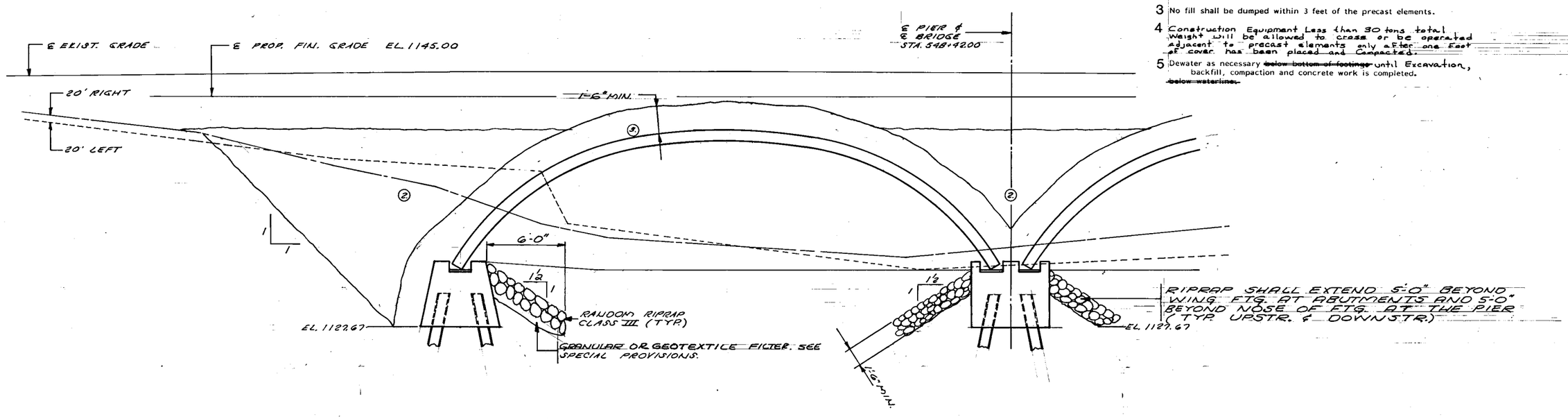
b) Vibrating rollers shall not be started or stopped within 6 feet of the structure.

2 Excavate and stockpile suitable top soils and all other organic soils encountered below proposed embankment widenings per Mn/DOT Spec. 2105.2C, for future use as slope dressing.

3 No fill shall be dumped within 3 feet of the precast elements.

4 Construction Equipment Less than 30 tons total Weight will be allowed to cross or be operated adjacent to precast elements only after one foot of cover has been placed and Compacted.

5 Dewater as necessary ~~below bottom of footings~~ until Excavation, backfill, compaction and concrete work is completed. ~~below waterline.~~




HALF ELEVATION
SCALE: ¼" = 1'-0"

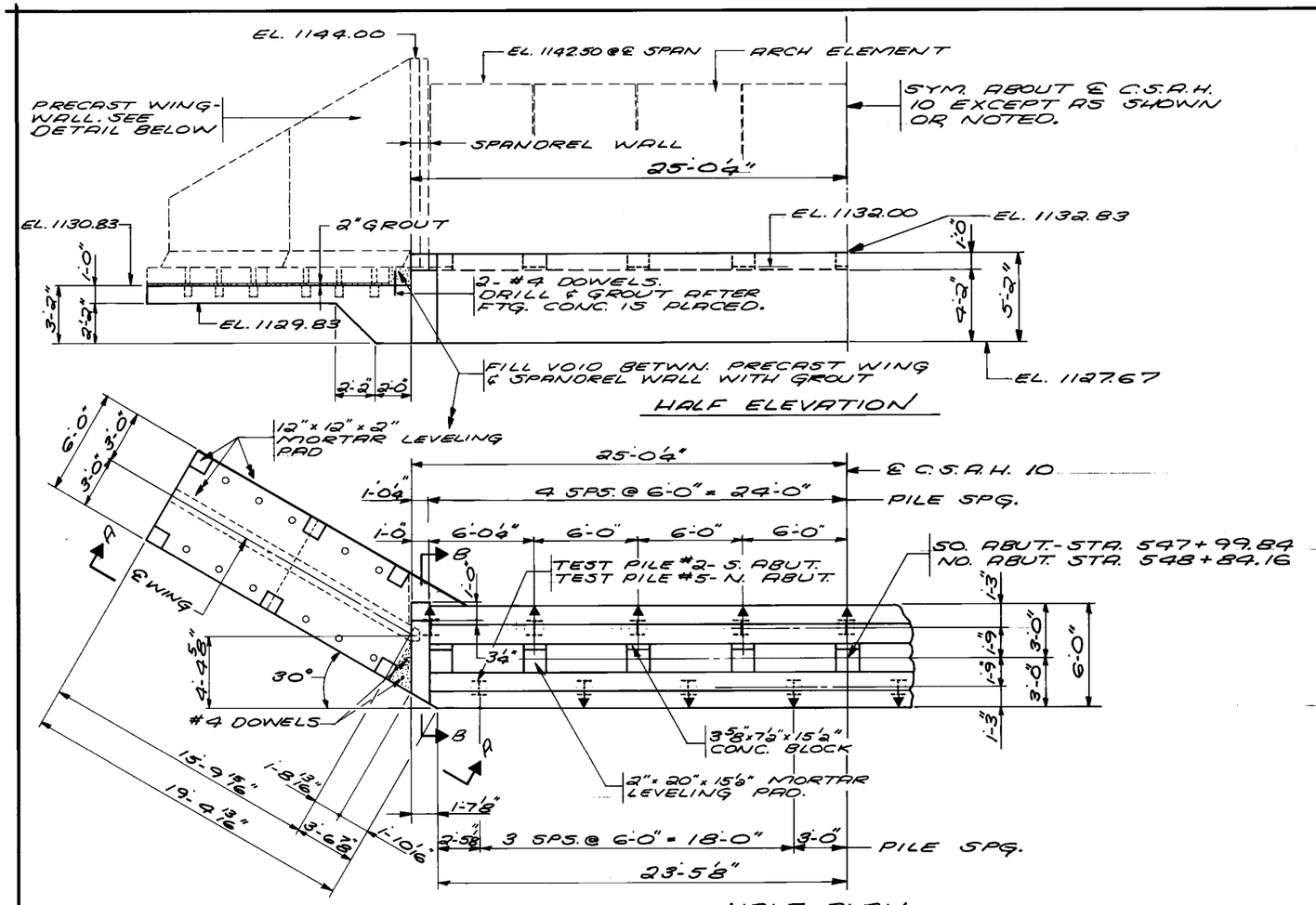
MINNESOTA DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 95764

FOUNDATION & BACKFILL DETAILS

APPROVED: 4-17-86

| SHEET 2 OF 12 SHEETS | 95764 | RMT |
|---|---|---|
| SP. 55-610-09 | | RRT |




MINNESOTA DEPARTMENT OF TRANSPORTATION

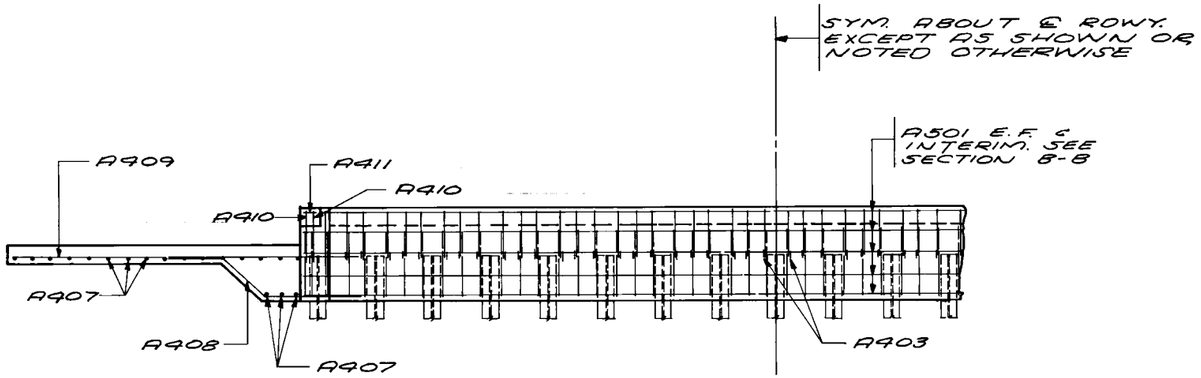
BRIDGE NO. 95764

ABUTMENT DETAILS

APPROVED: 4-17-86

| | | |
|---|---|---|
| SHT. 3 OF 12 SHTS. S.P. 55-610-09 | 95764 | O.J.V. RRT |

| BILL OF REINFORCEMENT- 2 ABUTS. | | | | |
|---|---|---|---|---|
| BAR | NO. | LEN. | SHAPE | LOCATION |
| A501 | 72 | 49'-8" | STR. | ABUT. - LONGIT. |
| A502 | 96 | 17'-8" | BENT | " STIRRUP |
| A903 | 96 | 5'-5" | " | " TIES |
| A504 | 192 | 4'-11" | " | " " |
| A505 | 4 | 17'-9" | " | " STIRRUP |
| A506 | 4 | 18'-3" | " | " " |
| A907 | 84 | 5'-6" | STR. | " WING HORZ. |
| A908 | 28 | 7'-3" | BENT | " " LONGIT. |
| A909 | 28 | 19'-0" | STR. | " " " |
| A910 | 8 | 7'-10" | BENT | " TIES |
| A911 | 8 | 0'-8" | STR. | " " |

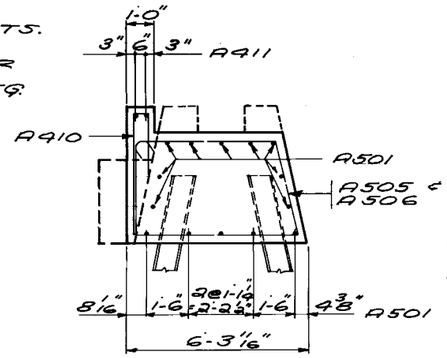



HALF ELEVATION
SCALE: 1/4"=1'-0"

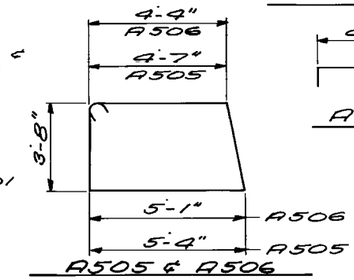
## PILE NOTES

4 - STEEL-H-TEST PILES 35 FT. LONG
32 - STEEL-H-PILES EST. LENGTH 25 FT.
36 - STEEL-H-PILES REQ'D FOR 2 ABUTMENTS.

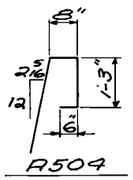
ALL PILES TO BE HP10x42
PILES MARKED |► TO BE BATTERED 3" PER FOOT IN THE DIRECTION SHOWN.
PILE SPACING SHOWN IS AT BOTTOM OF FTG.
FOR SPLICE DETAILS SEE DETAIL B202.
COMPUTED LOAD IS 56.0 TONS PER PILE.



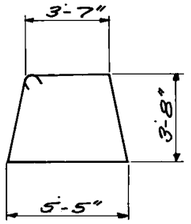

SECTION A-A
SCALE: 3/8"=1'-0"



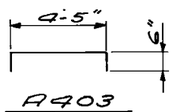

A505 & A506



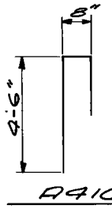

A504



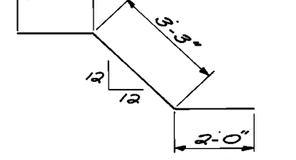

A502




A403



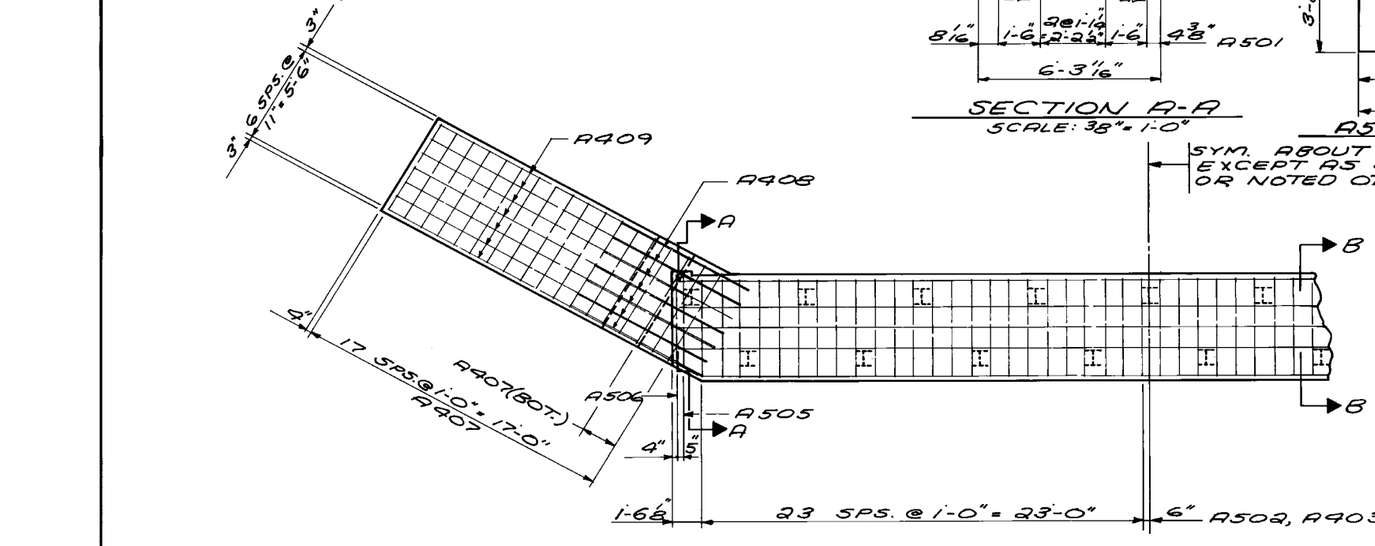

A410




A408

| SUMMARY OF QUANTITIES- 2 ABUTS. | | |
|---|---|---|
| STRUCTURE CONCRETE (3Y43) | 112 | CU. YD. |
| REINFORCEMENT BARS | 7830 | POUND |
| (2) PRECAST WINGWALLS | 4 | EACH |
| (2)(1) CONC. BLOCKS 3 5/8" x 7 5/8" x 15 1/2" | | |
| (1) MORTAR | | |
| (1) GROUT | | |
| (2)(1) 1"x 20" DOWELS | 44 | EACH |
| STEEL-H-TEST PILES 35 FT. LONG. | 4 | EACH |
| (3) STEEL-H-PILING DELIVERED | 800 | LIN. FT. |
| (3) STEEL-H-PILING DRIVEN | 800 | LIN. FT. |
| (2) 12" x 16" DOWELS | 8 | EACH |

(1) INCLUDED IN PRICE BID FOR OTHER ITEMS.
(2) FURNISHED BY WALL FABRICATOR.
(3) DOES NOT INCLUDE TEST PILES



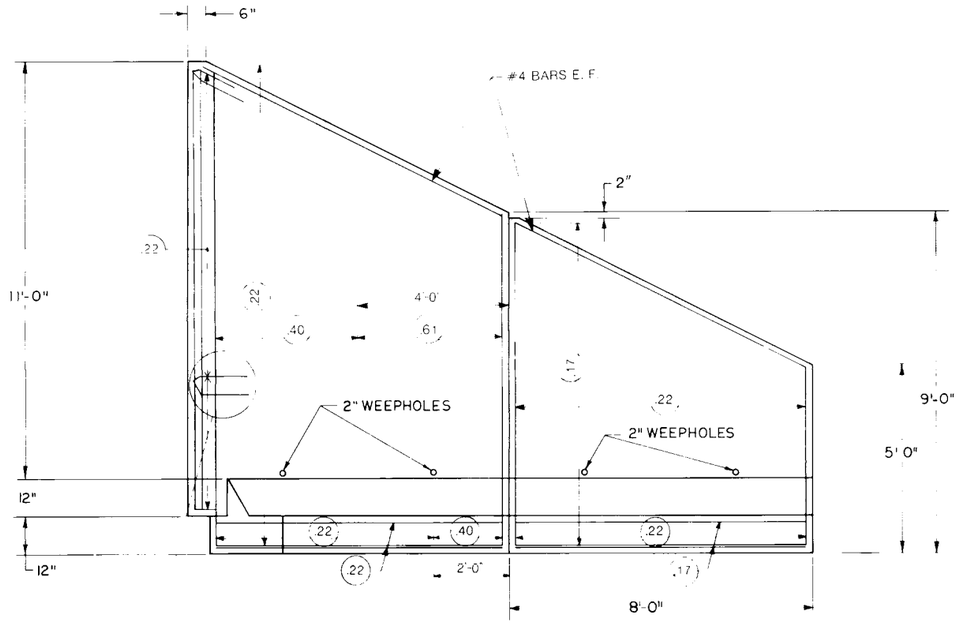

HALF FOOTING PLAN
SCALE: 1/4"=1'-0"

SYM. ABOUT ℄ ROWY. EXCEPT AS SHOWN OR NOTED OTHERWISE



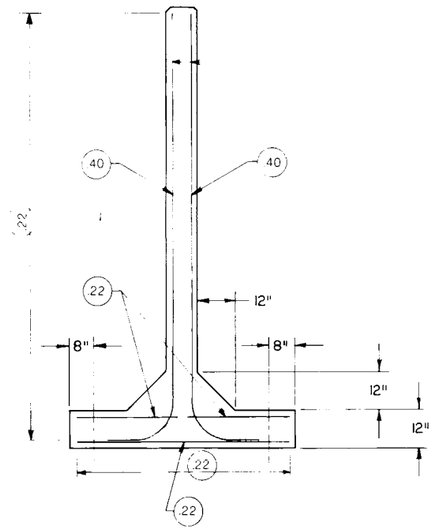

SECTION B-B

| ABUTMENT REINFORCEMENT | DRAWN: D.J.V. | CHECKED: R.R.T. | APPROVED: 4-17-86 | BRIDGE NUMBER 95764 |
|---|---|---|---|---|
| | SHEET 4 OF 12 SHEETS | | | |




ELEVATION: WINGWALL SECTIONS 1 AND 2

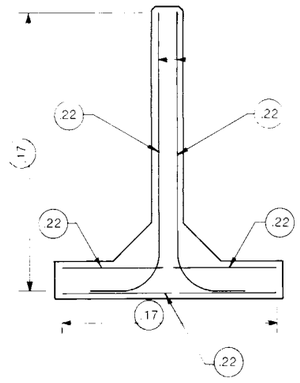
2' 0' 1'




SECTION A-A

WINGWALL SECTION 1

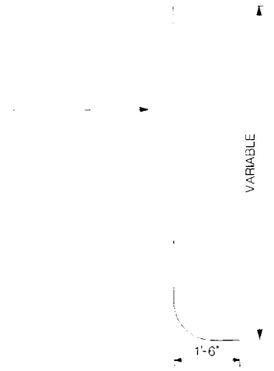
2' 0' 1'




SECTION B-B

WINGWALL SECTION 2

2' 0' 1'



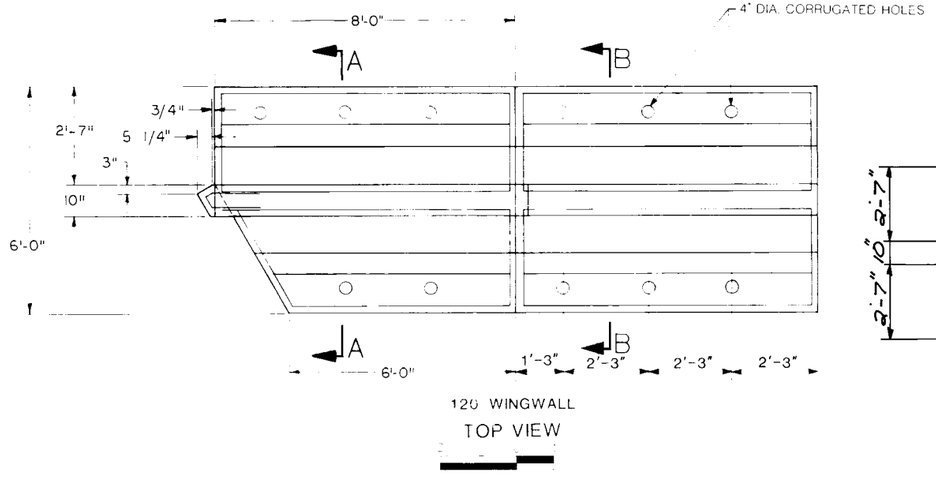




NOTES

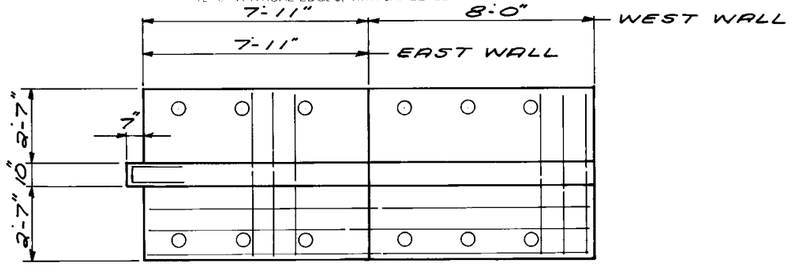
1. THE NUMBERS IN THE ( )'S ARE STEEL AREA REQUIREMENTS IN SQUARE INCHES PER FOOT.
2. REINFORCEMENT BARS AND STEEL FABRIC PER STD SPEC. FOR CONST. 3301 AND 3303 RESPECTIVELY.
3. STEEL FABRIC SHALL HAVE A MINIMUM LAP OF THE SPACING OF THE CROSS WIRES PLUS 2".
4. MAXIMUM SPACING FOR REINFORCEMENT BARS IS 18". MAXIMUM SPACING FOR STEEL FABRIC IS 8".
5. PRECAST CONCRETE SECTIONS SHALL BE MIX NO. 3W46 WITH NO CALCIUM ALLOWED.
6. CONCRETE COVER TO REINFORCEMENT IS 2" ± 1/2".
7. FINISH ALL EDGES, EXCEPT ON BASE SECTION, AND 12'-0" VERTICAL EDGES, WITH 3/4" BEVEL.

NOTE:
PIER WALL REINF. SHOWN IS FOR INFORMATIONAL PURPOSES ONLY. BAR PLACEMENT & SIZES ARE TO BE SIMILAR TO THAT SHOWN FOR ABUTMENT WINGWALLS.

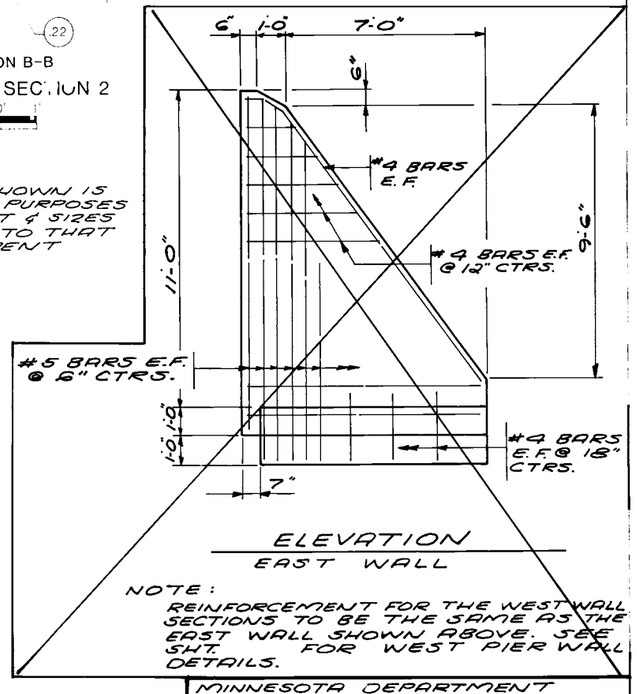



120 WINGWALL

TOP VIEW




LAYOUT & REINFORCEMENT DETAILS - PIER WALLS




ELEVATION

EAST WALL

NOTE:
REINFORCEMENT FOR THE WEST WALL SECTIONS TO BE THE SAME AS THE EAST WALL SHOWN ABOVE. SEE SHT. FOR WEST PIER WALL DETAILS.

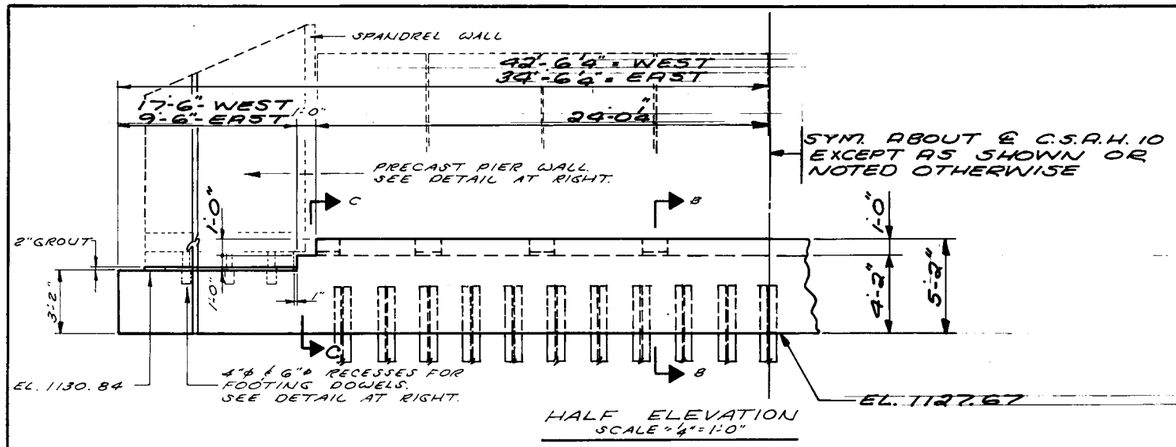
MINNESOTA DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 95764

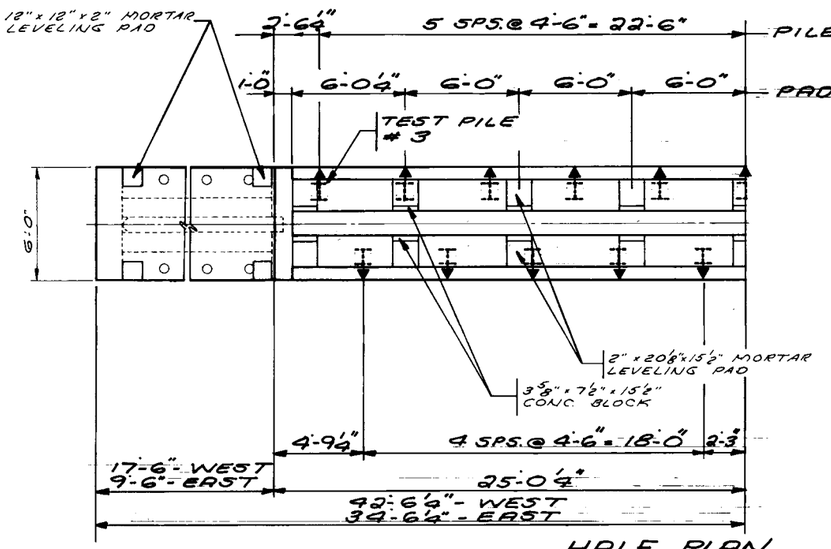
PRECAST WALL REINFORCEMENT DETAILS

APPROVED: 4-17-86

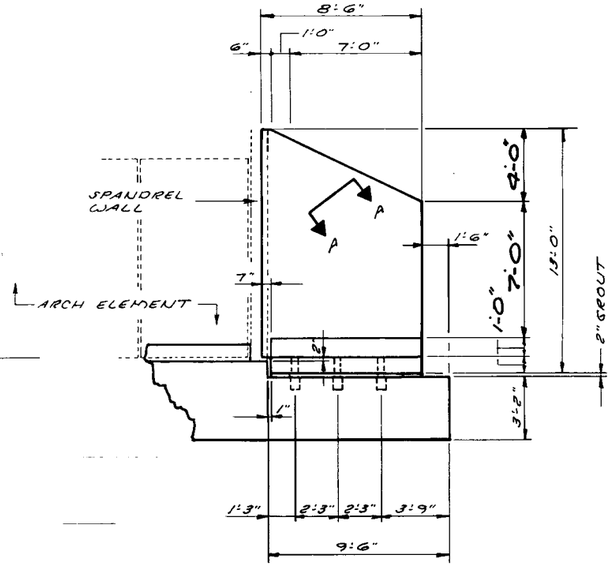
| | | |
|---|---|---|
| SHT. 5 OF 12 SHTS. | 95764 | D.J.V. |
| S.P. 55-610-09 | | R.B.T. |



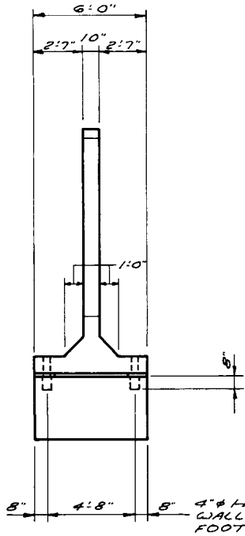

HALF ELEVATION
SCALE: 1/4" = 1'-0"



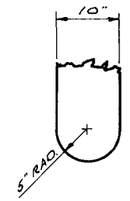

HALF PLAN
SCALE: 1/4" = 1'-0"




EAST WALL ELEVATION

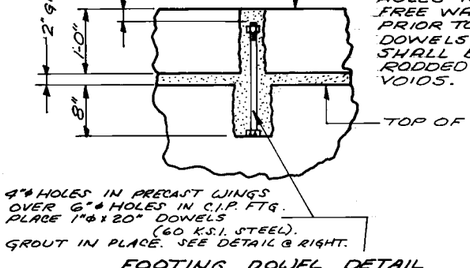



END VIEW

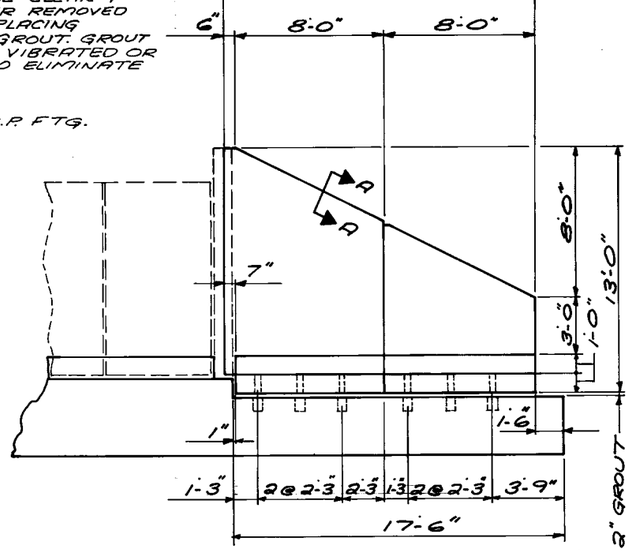



SECTION A-A
SCALE: 1" = 1'-0"

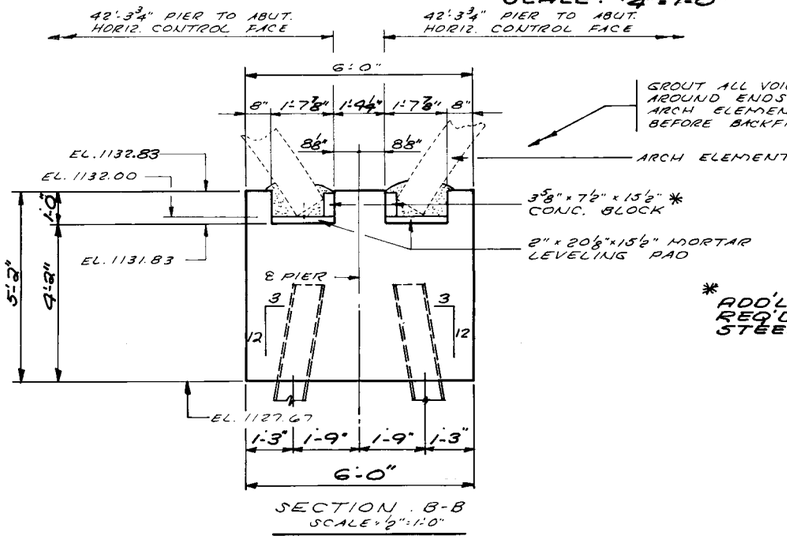
PRECAST PIER WALL DETAILS
SCALE: 1/4" = 1'-0"




FOOTING DOWEL DETAIL
SCALE: 1" = 1'-0"

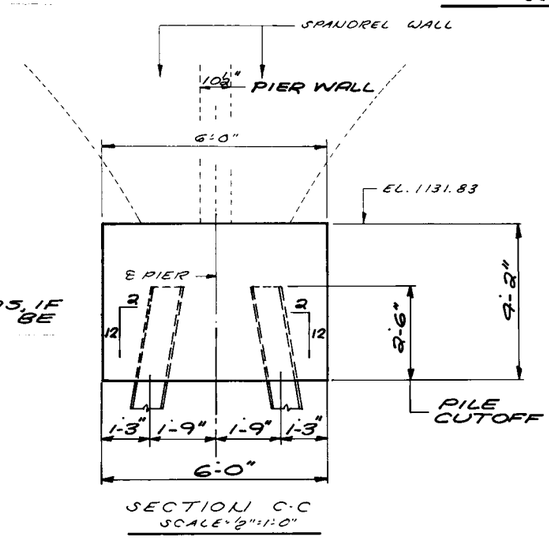



WEST WALL ELEVATION

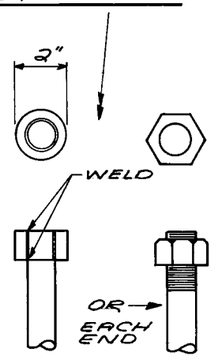



SECTION B-B
SCALE: 1/2" = 1'-0"

* ADD'L SHIMS, IF REQ'D., TO BE STEEL.




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




MINNESOTA DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 95764

PIER DETAILS

APPROVED: 4-17-86

| | | |
|---|---|---|
| SHEET 6 OF 12 SHEETS | 95764 | RMT |
| S.P. 55-610-09 | | RRT |

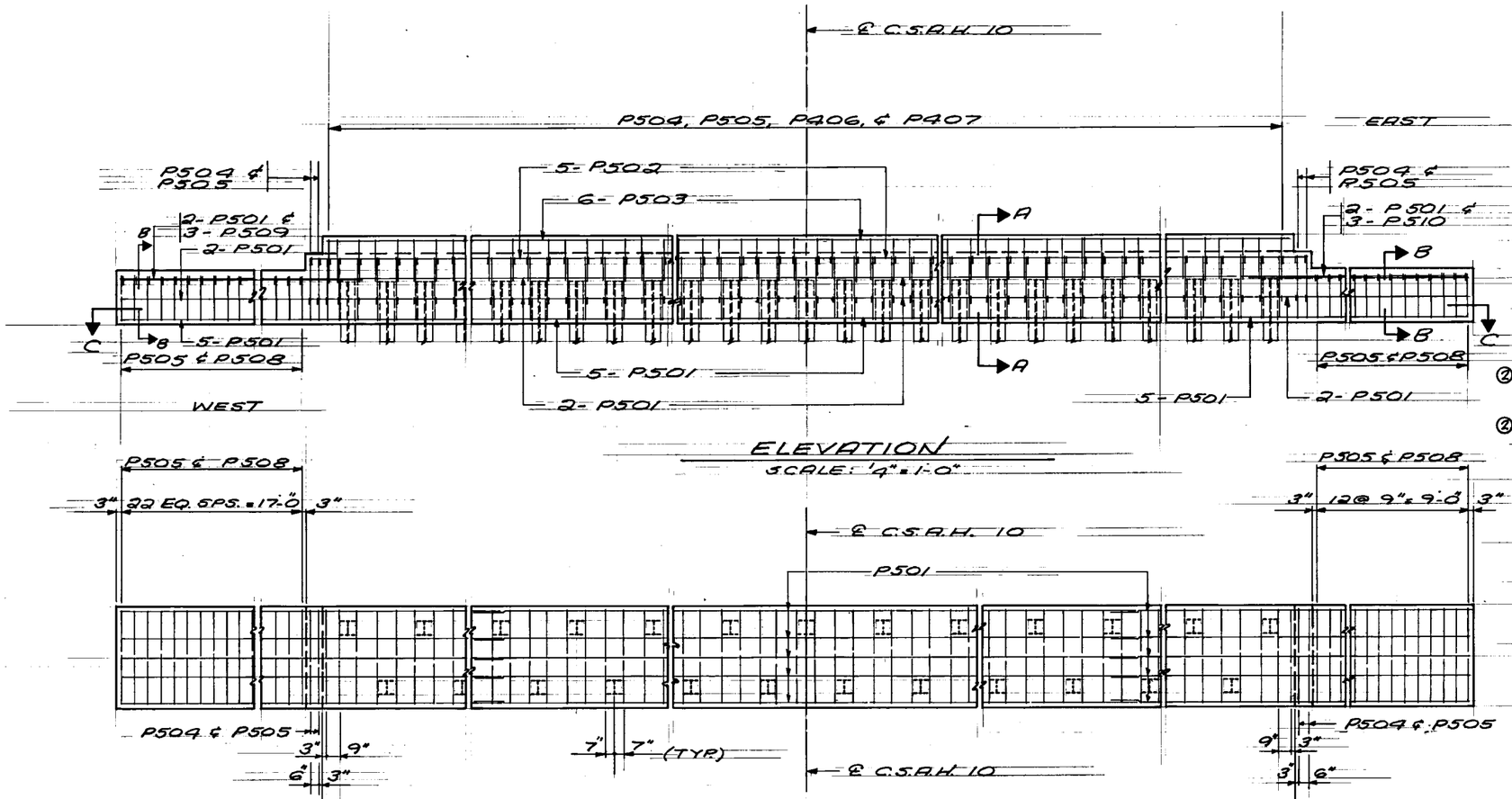
## BILL OF REINFORCEMENT - PIER

| BAR | NO. | LEN. | SHAPE | LOCATION |
|---|---|---|---|---|
| P501 | 18 | 39'-6" | STR. | LONGIT. |
| P502 | 5 | 49'-8" | " | " |
| P503 | 6 | 47'-8" | " | " |
| P504 | 98 | 14'-3" | BENT | STIRRUPS |
| P505 | 137 | 6'-8" | " | " |
| P406 | 88 | 9'-4" | " | TIES |
| P407 | 44 | 9'-11" | " | " |
| P508 | 36 | 12'-3" | " | STIRRUPS |
| P509 | 3 | 21'-0" | STR | WING FTG. |
| P510 | 3 | 13'-0" | " | " " |

## SUMMARY OF QUANTITIES - 1 PIER

| | | |
|---|---|---|
| | STRUCTURE CONCRETE (3Y43) | 69 CU. YD. |
| | REINFORCEMENT BARS | 3900 POUND |
| ② | PRECAST PIER WALL | 2 EACH |
| ②① | CONCRETE BLOCKS 3⅝"x7½"x15½" | 30 EACH |
| ① | MORTAR | |
| ① | GROUT | |
| ②① | 1"ø x 20" DOWELS | 18 EACH |
| | STEEL-H-TEST PILES 35 FT. LONG | 2 EACH |
| ③ | STEEL-H-PILING EST. LENGTH 25 FT. | 475 L.F. |
| ③ | STEEL-H-PILING EST. LENGTH 25 FT. | 475 L.F. |

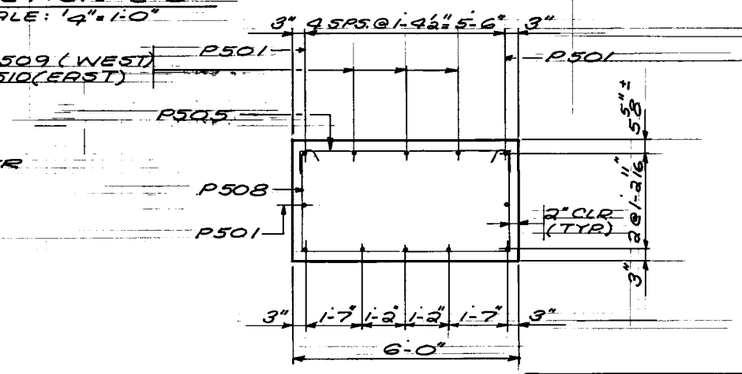
① INCLUDED IN PRICE BID FOR OTHER ITEMS.
② FURNISHED BY WALL FABRICATOR
③ DOES NOT INCLUDE TEST PILES.




## ELEVATION
SCALE: 1/4" = 1'-0"




## SECTION C-C
SCALE: 1/4" = 1'-0"

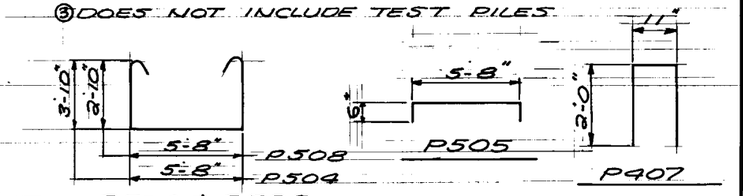


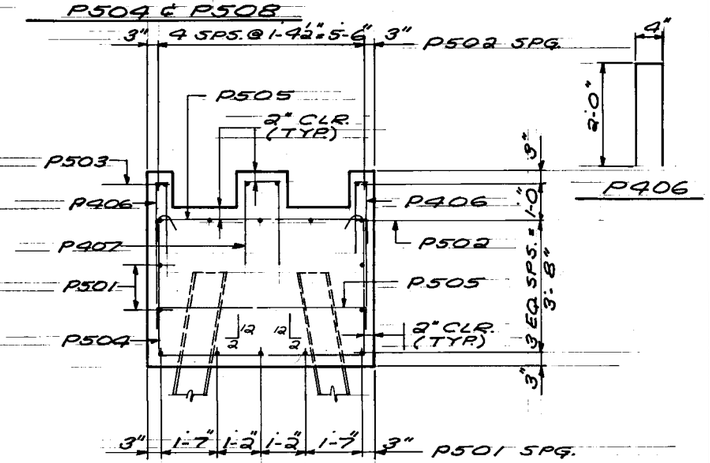

## SECTION B-B
SCALE: 1/2" = 1'-0"

## PILE NOTES

2- STEEL-H-TEST PILES 35 FT. LONG.
19- STEEL-H PILES EST LENGTH 25 FT.
21- STEEL-H-PILES REQ'D FOR 1 PIER.

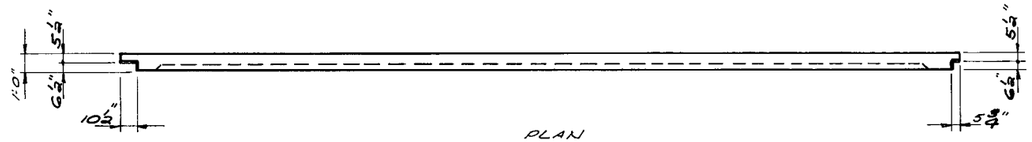
ALL PILES TO BE HP 10 x 42
PILES MARKED THUS ⊢→ TO BE BATTERED 2" PER FT. IN THE DIRECTION SHOWN.
PILE SPG. SHOWN IS AT BOTTOM OF FOOTING.
FOR SPLICES SEE DETAIL 8202.
COMPUTED PILE LOAD IS 55.0 TONS PER PILE.

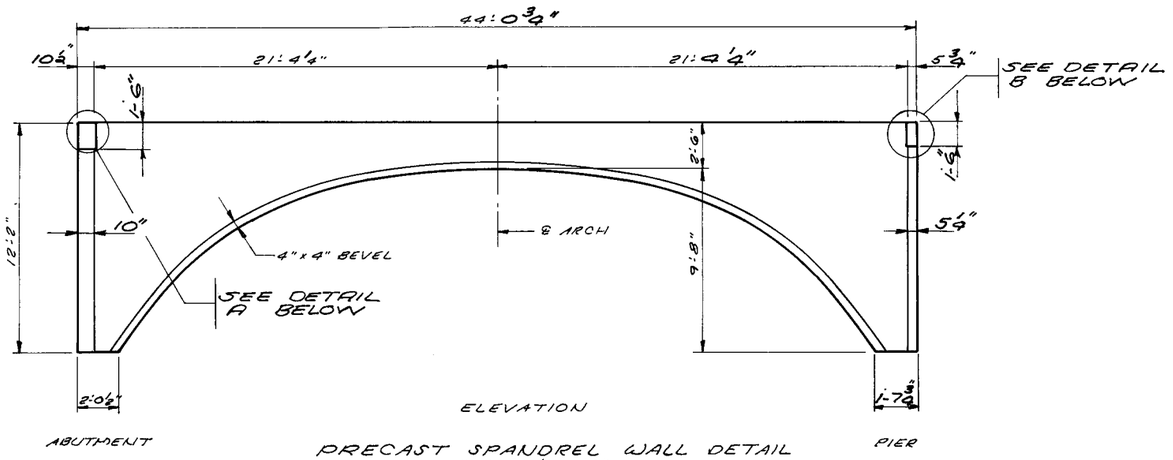


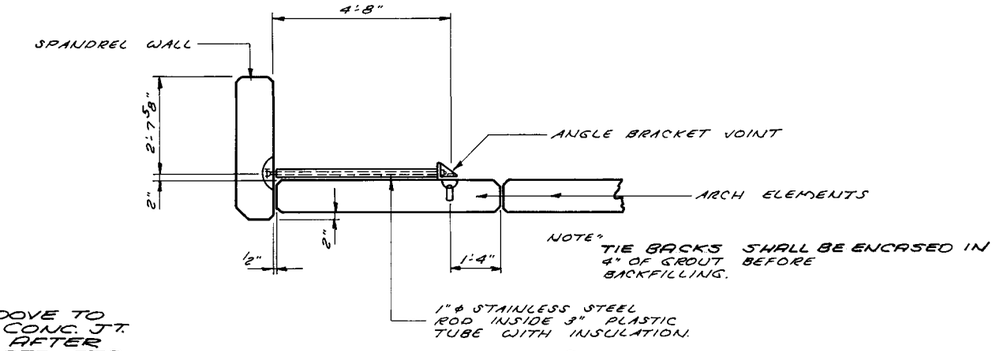

## SECTION A-A
SCALE: 1/2" = 1'-0"

| PIER REINFORCEMENT | DRAWN: O.J.V. | CHECKED: R.R.T. | APPROVED: 4-17-86 | BRIDGE NUMBER 95764 |
|---|---|---|---|---|
| | SHEET 7 OF 12 SHEETS | | | |



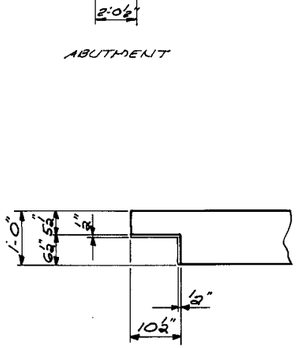

## PRECAST SPANDREL WALL DETAIL
SCALE: ¼"=1'-0"



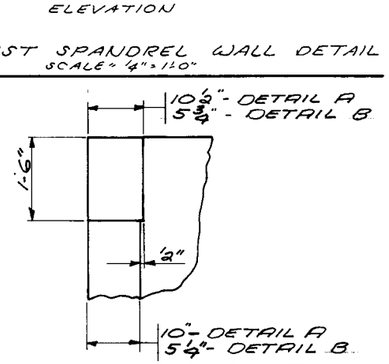

NOTE: TIE BACKS SHALL BE ENCASED IN 4" OF GROUT BEFORE BACKFILLING.

## SPANDREL WALL TIE BACK ①
SCALE: ½"=1'-0"

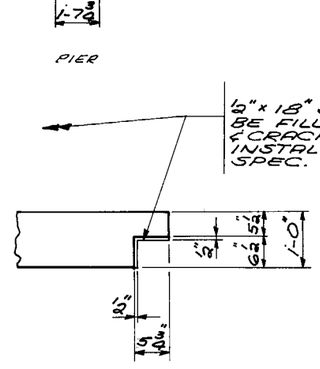
① INCLUDED IN PRICE BID FOR OTHER ITEMS.



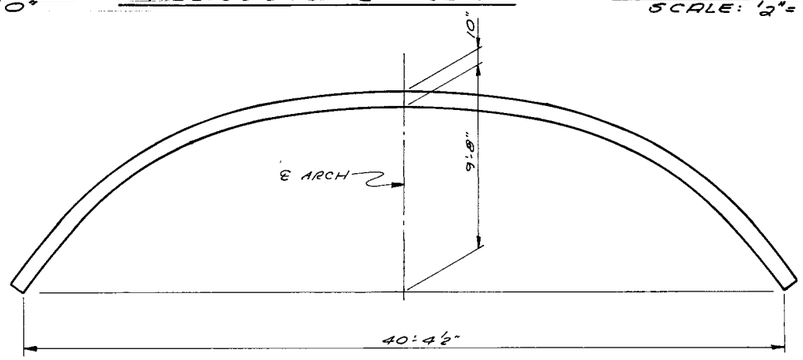

## DETAIL A
SCALE: ½"=1'-0"



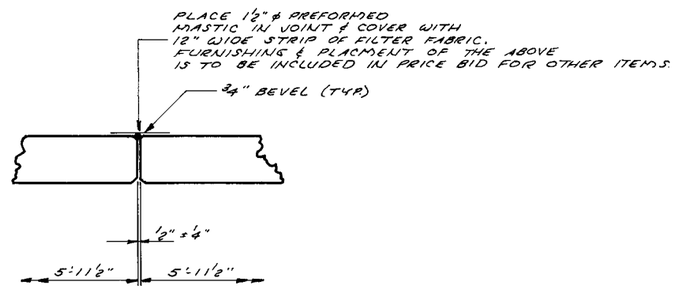

## RECESS @ TOP CORNER




## DETAIL B
SCALE: ½"=1'-0"




## PRECAST ARCH ELEMENT
SCALE: ¼"=1'-0"




## JOINT BETWEEN ARCH ELEMENTS
SCALE: ¾"=1'-0"

### LIST OF WEIGHTS

| | | |
|---|---|---|
| ARCH ELEMENT | | 37100 LBS. |
| SPANDREL WALL | | 35410 LBS. |
| WINGWALLS: | INNER | 19790 LBS. |
| | OUTER | 14880 LBS. |
| PIER WALL: | INNER | 19790 LBS. |
| | OUTER | 14880 LBS. |

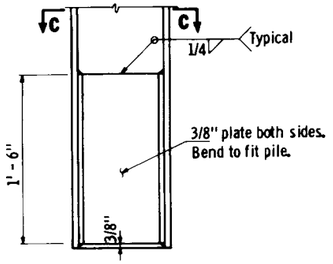
MINNESOTA DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 95764

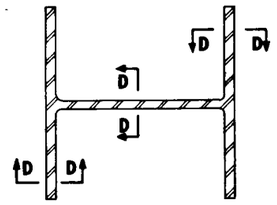
SUPERSTRUCTURE DETAILS

APPROVED: 4-17-86

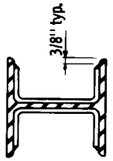
| | | |
|---|---|---|
| SHEET 8 OF 12 SHEETS | 95764 | RHT |
| S.P. 55-610-09 | | RRT |




ELEVATION




SECTION AT JOINT

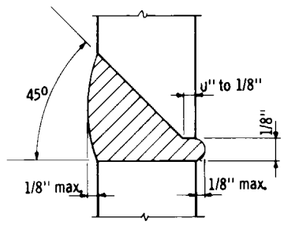



Each pile tip reinforced, will be paid for in amount equal to 5 linear feet of piling delivered.

Pile tips shall be reinforced only when directed by the Engineer.

SECTION C - C

**DETAIL OF PILE TIP REINFORCEMENT**




SECTION D - D

**100% BUTT WELDED PILE SPLICE**

**NOTES:**

A. W. S. Type E7010 or E7018 (low-hydrogen) electrodes shall be used for 100% butt welded splices.

A. W. S. Type E6010, E6011 electrodes, or E7010 or E7018 (low-hydrogen) electrodes, shall be used for the alternate plate type pile splice.

Low-hydrogen electrodes shall be supplied in hermetically (air-tight) sealed containers.

Low-hydrogen electrodes shall be stored in holding ovens at a temperature of not less than 250° F.

Low-hydrogen electrodes shall be placed in a holding oven for at least 8 hours, after having been exposed to the atmosphere for more than 2 hours.

Any type electrode which has become wet, soiled, or damaged shall not be used.

Welding shall not be done when the ambient temperature is lower than 0° F. or when the pile is wet or exposed to falling rain or snow. When the pile metal temperature is below 32° F., the pile metal in the area of the weld shall be heated to a minimum temperature of 70° F. and maintained at this temperature during welding.

APPROVED: November 5, 1979

Developed by: BRIDGE STANDARDS & BRIDGE AND STRUCTURES SECTION

Issued by: ENGINEERING STANDARDS SECTION

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

**PILE SPLICE and TIP REINFORCEMENT**
**STEEL H BEARING PILES 10" TO 14"**

DETAIL NO.

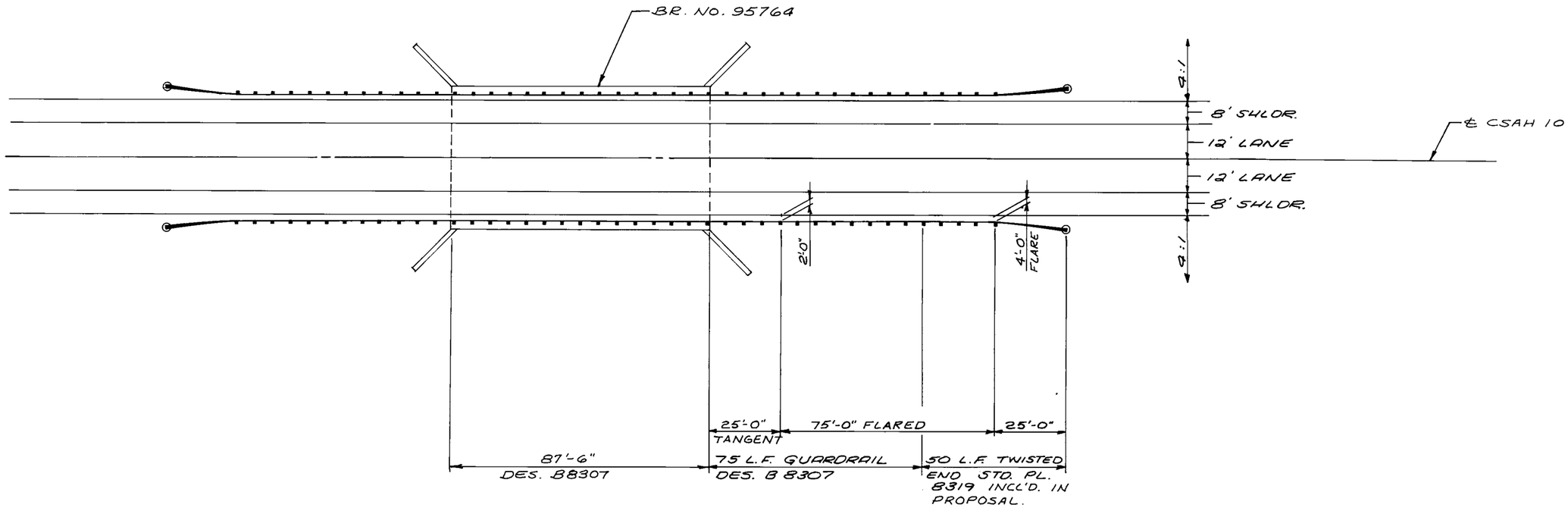
**B202**

S.P. 55-610-09

PILE SPLICE DETAIL

| DRAWN | CHECKED: | APPROVED: | BRIDGE NUMBER |
|---|---|---|---|
| D.J.V. | R.R.T. | 4-17-86 | 95764 |

SHEET 9 OF 12 SHEETS




TYPICAL ALL FOUR CORNERS

## GUARDRAIL INSTALLATION FOR PRECAST REINFORCED CONC. ARCH

### GENERAL NOTES

ALL GUARDRAIL POSTS SHALL BE 6'-3" O.C.

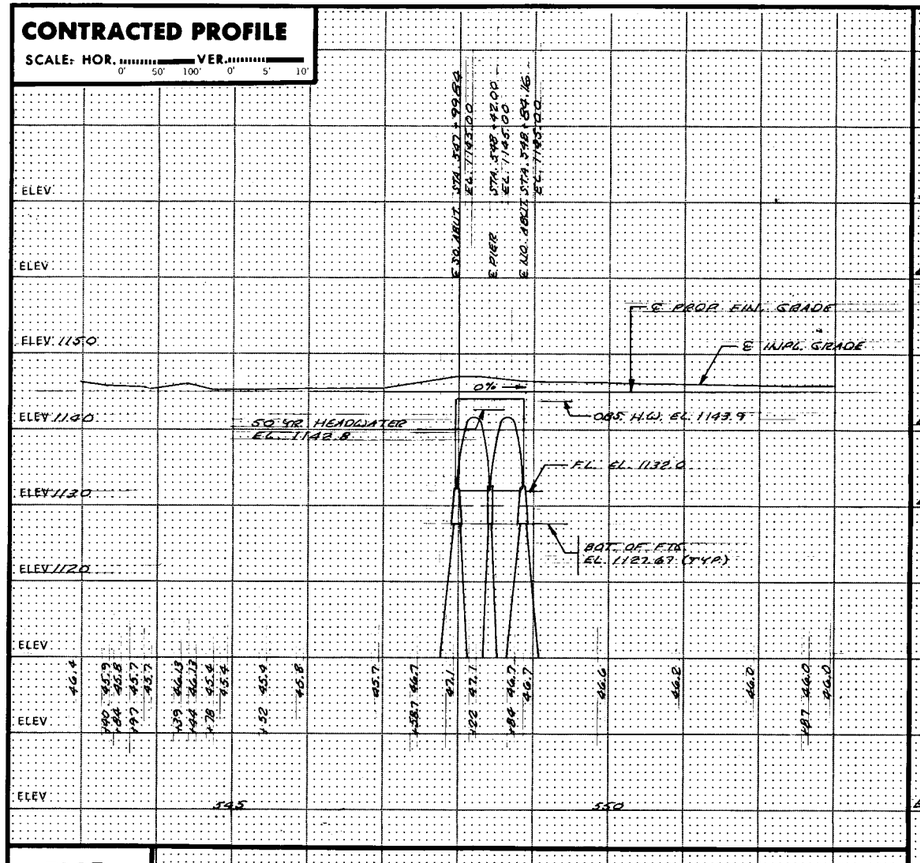
THE REQUIRED L LENGTH & W OFFSET SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.

S.P. 55-610-09

| GUARDRAIL DETAILS | DRAWN: D.J.V. | CHECKED R.R.T. | APPROVED: 4-17-86 | BRIDGE NUMBER 95764 |
|---|---|---|---|---|
| | SHEET 10 OF 12 SHEETS | | | |

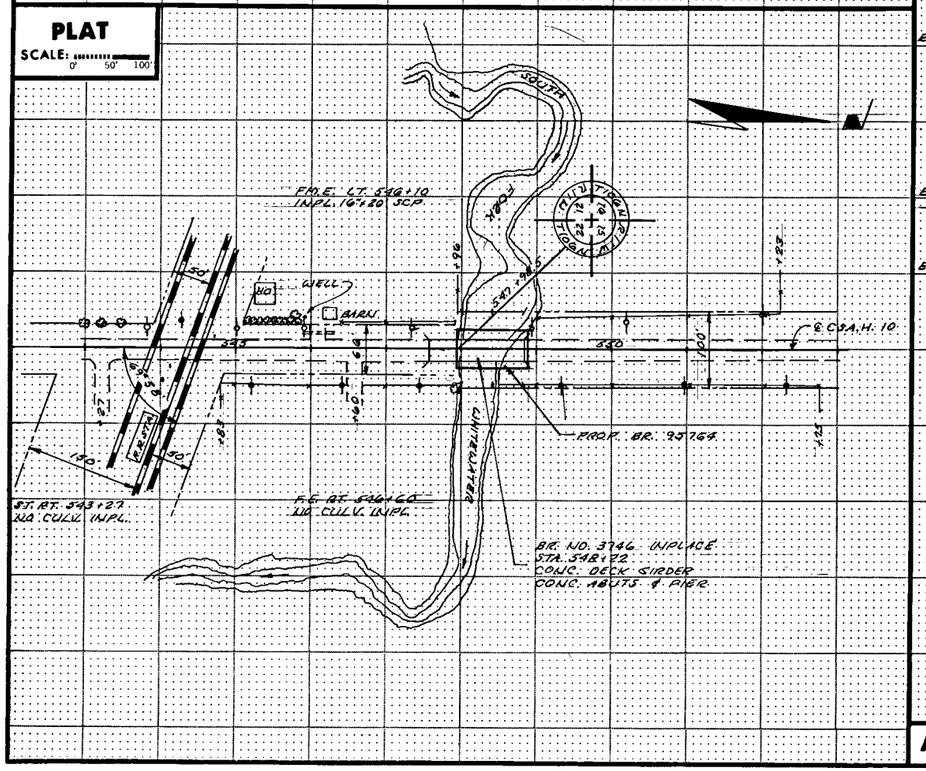
## CONTRACTED PROFILE

SCALE: HOR. 0' 50' 100' VER. 0' 5' 10'



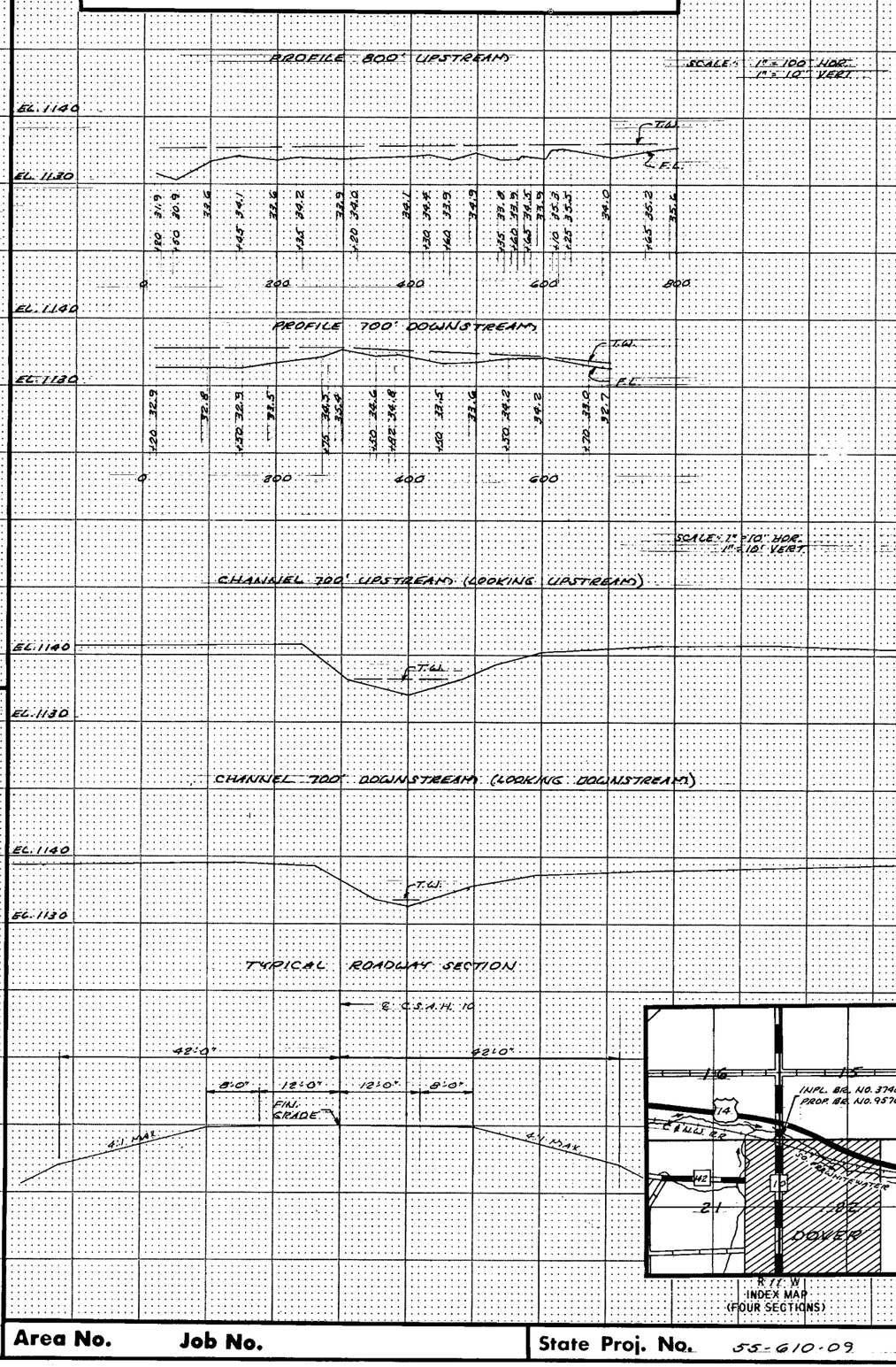

## PLAT

SCALE: 0' 50' 100'




## TYPICAL SECTIONS & PERTINENT DATA

SCALES AS SHOWN







INDEX MAP (FOUR SECTIONS)

**Fed. Proj. No.**

### LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

1. Special Features: Waterfalls, dams, floods, ice, debris, sliding banks, recreational boating.

2. Other bridges or culverts over the same stream (particularly structures which carry high water without overflow of roadway) :Given location, type, length, height above high water, cross-sectional area etc.

3. Apparent highwater elevation..... Obtained from.....

4. Other data: Approx. velocity of water at time of survey.....

### HYDRAULIC ENGINEERS RECOMMENDATION

DATE NOV. 3, 1982

Stream or ditch designation SO. FORK WHITEWATER RIVER
Drainage area 20.8 SQ. MILES
Max. flood on record UNK. Design flood ( 50 yr. freq.) 3120 C.F.S.
Max. observed highwater elevation 1143.9 Design highwater elevation 1142.8
Design mean velocity through structure 5.4 F.P.S.
Low superstructure at or above elevation 1141.7
Flowline elevation 1132.0 Skew angle NONE
Waterway area req'd. below elevation ..... = .....Sq. Ft. at Rt. angles to channel

In the interest of flood plain zoning the regional flood (100 yr. freq.) is 3760 C.F.S. at stage 1143.4 and mean velocity of 6.5 F.P.S. with 1.1 Ft. swellhead.
The above recommendation will provide a structure of adequate waterway to pass the regional flood within criteria established by the Dept. of Natural Resources.

### FOUNDATION ENGINEERS RECOMMENDATION

DATE NOV. 3, 1982

DOUBLE LINE A41/50 BEBO

Bridge survey sheets made from: BRIDGE SURVEY CONDUCTED BY OLMSTED CO.

Bench mark elevation 1147.07 (M.S.L. 1929 Adj.)
Location BRASS PLUG S.E. CORNER BR. 3746

MINNESOTA
DEPARTMENT OF TRANSPORTATION

## BRIDGE SURVEY

AT MILE POINT 11.02 ON C.S.A.H. 10 (T.H., C.S.A.H., C.R. etc.)
PROPOSED BRIDGE LOCATED 0.1 MILES S. OF JCT. T.H. 14
SEC. 15/16 TWP 106 N R 11 W
TOWNSHIP DOVER COUNTY OLMSTED
BRIDGE NO. 95764

APP'D. 4-17-86

**Area No.** **Job No.** **State Proj. No.** 55-610-09 **Sheet No. 11 of 12 Sheets**

Fed. Proj. No.

TEST PILE # 1

TEST PILE #3

TEST PILE #5

FLOW

18'-0" (TYP.)

18'-0" (TYP.)

℄ SO. ABUT. STA. 547+99.84

90° (TYP.)

℄ PIER STA. 548+42.00

℄ NO. ABUT. STA. 548+84.16

548

549

550

℄ C.S.A.H. 10

LIMITS OF RANDOM RIPRAP AVG. 1'-6" THICK - ABUTS & PIERS AT WINGWALLS.

6'-0" TYP.

TEST PILE #2

TEST PILE # 4

TEST PILE #6

PIER

SO. ABUT.

NO. ABUT.

0% GRADE

97'-1 7/8"

42'-1 7/8"

50 YR. HEADWATER EL. 1148.8

MAR. OBS. W.S. EL. 1142.9

20' RIGHT

20' LEFT

℄ INPLACE GRADE

℄ PROP. FIN. GRADE

EL. 1150

EL. 1140

EL. 1130

EL. 1120

| | | | |
|---|---|---|---|
| 18 | | | Gravelly Sand, fine to med., dk brn., moist |
| 6 | WL | | Silty Sandy Clay, dk brn., moist, med. |
| 11 | | | Sand, slightly silty, fine to med., some fine gravel, loose, wet, brown |
| 18 | | | |
| 7 | | | Silty Clay, trace of gravel, gray, wet, stiff, medium, small boulders @ 17' depth |
| 19 | | | Silty Clay, gray, moist, very stiff |
| 21 | | | Gravelly Silt, large pc. of silty clay, gray, moist, very stiff |
| 18 | | | Sand, slightly silty, fine to med., trace fine gravel & gravel, trace of silty clay, yellowish brn., moist, med. dense |

ST-1

RANDOM RIPRAP CLASS III (TYP.)

F.F. EL. 1132.00

FILTER (TYP.)

10" STEEL H-PILE TEST PILE 35 FT. LONG

| | | | |
|---|---|---|---|
| 6 | | | Silty Clay & Sandy Silt, fine to med., trace fine gravel, moist |
| 4 | WL | | Silty Sandy Clay, traces of silty sand, dk brn., moist, cohesive |
| 6 | | | Sand & Gravel, silty, fine to med., some fine gravel, brown & gray, waterbearing, med dense |
| 26 | | | Silty Sand, fine to med., trace fine to med. gravel, gray, waterbearing, med dense |
| 7 | | | Silty Clay, trace gravel, gray, wet, med. |
| 7 | | | |
| 86 | | | Silty Clay, gray, moist, med to very stiff |
| 27 | | | |
| 110 | | | Silty Sand, fine to med., trace fine gravel, reddish brn., seams of silty sandy clay, moist, very dense |

ST-2

550+00

BORINGS SHOWN (ST-) TAKEN WITH STD 140 LB HAMMER 30 INCH DROP 2 INCH O.D. SAMPLER

150

548+00

150

549+00

150

| | | | | |
|---|---|---|---|---|
| BRIDGE SURVEY PLAN AND PROFILE | DES: | DR: | APPROVED: 4-17-86 | Bridge No. 95764 |
| State Proj. No. 55-610-09 | CHK: | CHK: | Sheet No. 12 of 12 Sheets | |

TRC-1 9/76