STATE OF MINNESOTA

# DEPARTMENT OF TRANSPORTATION

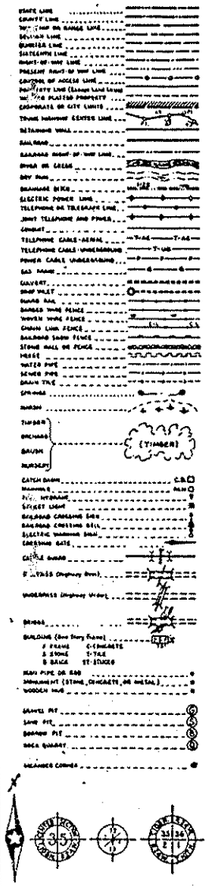
CONSTRUCTION PLAN FOR GRADING & BRIDGE

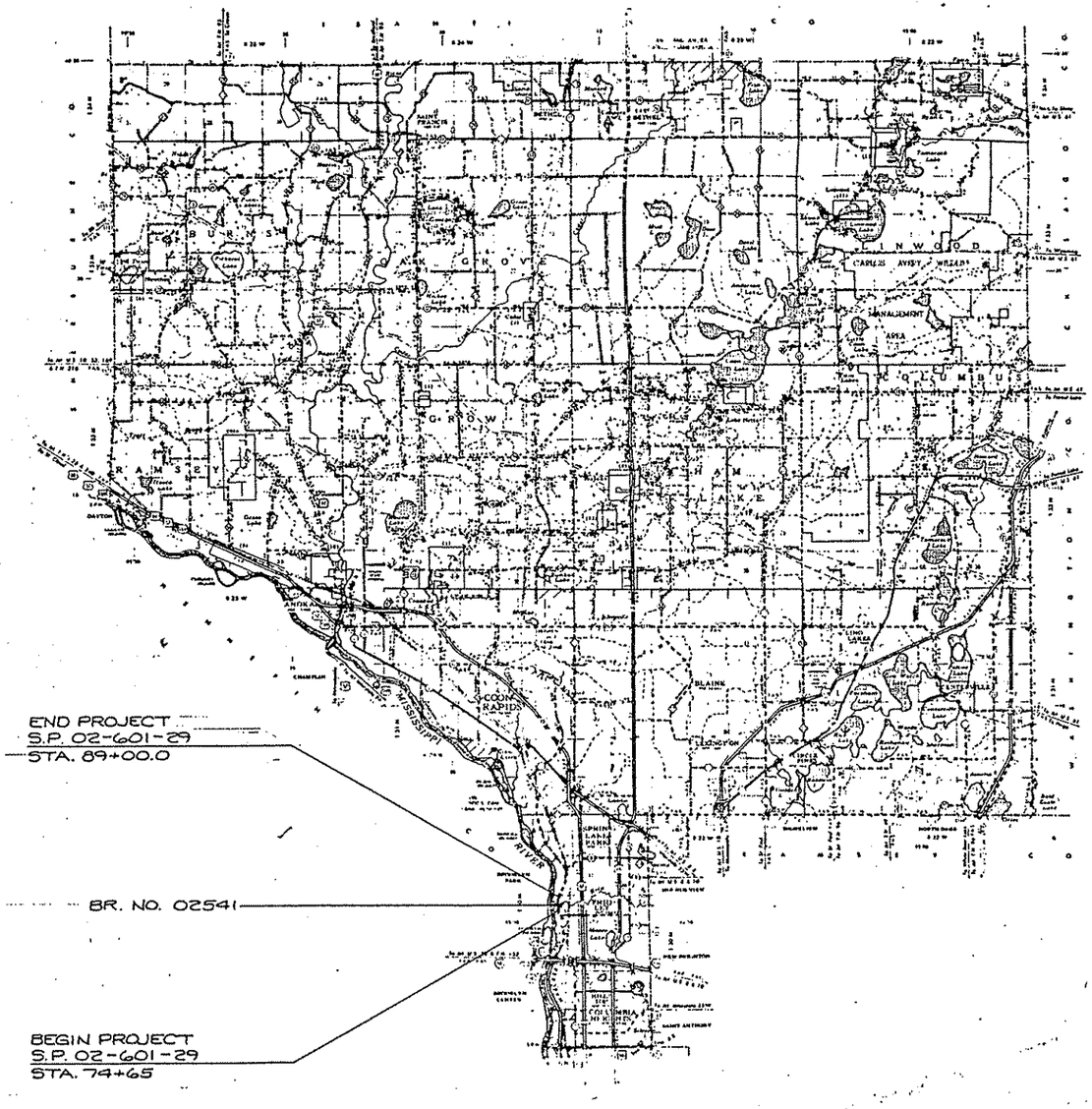
# County State Aid Highway No. 1

Between C.S.A.H. 6 And LOCKE LAKE RD.

GROSS LENGTH 1435.00 FEET 0.272 MILES
BRIDGES-LENGTH 56.07 FEET 0.011 MILES
EXCEPTIONS-LENGTH ____ FEET ____ MILES
NET LENGTH 1435.00 FEET 0.272 MILES

CONVENTIONAL SIGNS






INDEX OF SHEETS



ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND ORDINANCES WILL BE COMPLIED WITH, IN THE CONSTRUCTION OF THIS PROJECT.

RECOMMENDED FOR APPROVAL Paul K. Kind COUNTY ENGINEER DATE 1/30/87

ANOKA COUNTY

RECOMMENDED FOR APPROVAL C.C. Weichselbaum DISTRICT STATE AID ENGINEER 10/15, 19 87

RECOMMENDED FOR APPROVAL Orin D. Stallman STATE AID PLANS & SPECS. ENGR. 4/11, 19 88

APPROVED 4-11, 19 88 L. Roy Altmann STATE AID ENGINEER

SCALE

| | | |
|---|---|---|
| INDEX MAP | | 2 MI. |
| PLAN & PROFILE | HORIZ. | 50' |
| | VERT. | 5' |
| CROSS SECTIONS | | 10' |
| SIGNAL | | 30' |

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.

DATE: 3-30-88 Robert A. Tonegard REG. NO. 6924

RECOMMENDED FOR APPROVAL Loren H. Hayland for BRIDGE ENGINEER 4-4-88

## DESIGN DESIGNATION

ADT (CURRENT YEAR) 27261 (1987)
ADT (FUTURE YEAR) 43618 (2007) 4 TRAFFIC LANES - NO PARKING
T (HEAVY COMMERCIAL) 1300 (FUTURE) $\leq N18 = 3,600,000$
10 Ton Design SOIL FACTOR A-3.50% R-62
Design Speed 40 MPH BASED ON STOPPING SIGHT DIST., HGT. OF EYE 3.50', HGT. OF OBJECT 0.50'
Design Speed not achieved at:
STA. ____ TO STA. ____ MPH ____
STA. ____ ____ MPH ____

## GOVERNING SPECIFICATIONS

THE 1983 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" AS AMENDED BY CURRENT SUPPLEMENTAL SPECIFICATIONS SHALL GOVERN.

S.P. ____ S.A.P. 02-601-29 C.P. ____ Sheet No. 1 of 63 Sheets

## STATEMENT OF ESTIMATED QUANTITIES

| | | ITEM NO. | ITEM | UNIT | QUANTITY |
|---|---|---|---|---|---|
| BRIDGE | | 0402.606 | FIXED CURVED PLATE BRG. ASSEMBLY TYPE I | EACH | 10 |
| | | 0401.601 | FOUNDATION PREPARATION, SOUTH ABUTMENT | LUMP SUM | 1 |
| | | 2021.501 | MOBILIZATION | LUMP SUM | 1 |
| | | 2401.501 | STRUCTURE CONCRETE (1A43) | CU. YD. | 551 (P) |
| | | 2401.501 | STRUCTURE CONCRETE (3Y43) | CU. YD. | 816 (P) |
| | | 2401.512 | BRIDGE SLAB CONCRETE (3X36) | SQ. FT. | 5514 (P) |
| | | 2404.501 | CONCRETE OVERLAY (3U17A) | SQ. FT. | 3813 (P) |
| | | 2401.515 | SIDEWALK CONCRETE (3X46) | SQ. FT. | 823 (P) |
| | | 2401.513 | TYPE SPECIAL RAILING CONCRETE (3X46) | LIN. FT. | 434 (P) |
| | | 2401.541 | REINFORCEMENT BARS | POUND | 98030 (P) |
| | | 2401.541 | REINFORCEMENT BARS (EPOXY COATED) | POUND | 56710 (P) |
| | | 0402.607 | EXPANSION CURVED PLATE BRG. ASSEMBLY TYPE I | EACH | 10 |
| | | 2405.501 | PRESTRESSED CONC. BEAMS, TYPE 36-53 | EACH | 10 |
| | | 2452.519 | C.I.P. CONC. TEST PILES, 35 FT. LONG - 12" | EACH | 8 |
| | | 2452.507 | C.I.P. CONC. PILING, DELIVERED - 12" | LIN. FT. | 4855 |
| | | 2452.508 | C.I.P. CONC. PILING, DRIVEN - 12" | LIN. FT. | 4855 |
| | (11) | 2442.501 | REMOVE OLD BRIDGE | LUMP SUM | 1 |
| | | 0401.601 | STRUCTURE EXCAVATION | LUMP SUM | 1 |
| | | 2511.507 | GROUTED RIPRAP, CLASS III | CU. YD. | 185 |
| | | 2405.511 | DIAPHRAGMS FOR TYPE 36 PREST. BEAMS | LIN. FT. | 92 (P) |
| | | 2557.501 | WIRE FENCE DES S-1 | LIN. FT. | 32 (P) |
| | | 0504.601 | WATERMAIN SYSTEM | LUMP SUM | 1 |
| | | 0502.603 | DRAINAGE SYSTEM TYPE 8910 | LUMP SUM | 1 |
| | | 2402.583 | ORNAMENTAL METAL RAILING, TYPE SPECIAL | LIN. FT. | 425 (P) |
| | | 2402.544 | FLOOR DRAINS, TYPE B701 | EACH | 4 |
| | | 0401.601 | FOUNDATION PREPARATION, NORTH ABUTMENT | LUMP SUM | 1 |
| | | 2401.516 | RAISED MEDIAN CONCRETE (3X46) | SQ. FT. | 898 (P) |
| GRADING | | 2101.501 | CLEARING | ACRE | 0.3 |
| | | 2101.502 | CLEARING | TREE | 21 |
| | | 2101.506 | GRUBBING | ACRE | 0.3 |
| | | 2101.507 | GRUBBING | TREE | 22 |
| | | 2104.501 | REMOVE PIPE SEWERS (C.M.P.) | LIN. FT. | 203 |
| | | 2104.501 | REMOVE PIPE SEWERS (R.C.P.) | LIN. FT. | 454 |
| | | 2104.501 | REMOVE CURB AND GUTTER | LIN. FT. | 1372 |
| | (1) | 2104.505 | REMOVE CONCRETE PAVEMENT | SQ. YD. | 89 |
| | | 2104.521 | SALVAGE FENCE | LIN. FT. | 1436 |
| | | 0557.603 | INSTALL FENCE | LIN. FT. | 743 |
| | (2) | 2105.501 | COMMON EXCAVATION | CU. YD. | 13551 (P) |
| | (3) | 2105.522 | SELECT GRANULAR BORROW L.V. | CU. YD. | 5085 |
| | (4) | 2105.523 | COMMON BORROW L.V. | CU. YD. | 9553 |
| | (5) | 2211.503 | AGGREGATE BASE PLACED, CLASS 5 | CU. YD. | 3163 (P) |
| BITUM. | | 2331.504 | BITUMINOUS MATERIAL FOR MIXTURE | TON | 212 |
| | (6) | 2331.510 | BINDER COURSE MIXTURE | TON | 2000 |
| | (7) | 2331.514 | BASE COURSE MIXTURE | TON | 2000 |
| | (8) | 0331.601 | 2" THICK WEARING COURSE PLACED | SQ. YD. | 163 |
| | | 2341.504 | BITUMINOUS MATERIAL FOR MIXTURE | TON | 65 |
| | (9) | 2341.508 | WEARING COURSE MIXTURE | TON | 1000 |
| | | 2357.502 | BITUMINOUS MATERIAL FOR TACK COAT | GALLON | 1210 |
| | | 2105.525 | TOPSOIL BORROW | CU. YD. | 512 |
| SEWER | | 2501.515 | 24" R.C. PIPE APRON | EACH | 2 |
| | | 2503.541 | 12" R.C. PIPE SEWER DES. 3006 | LIN. FT. | 373 |
| | | 2503.541 | 15" R.C. PIPE SEWER DES. 3006 | LIN. FT. | 510 |
| | | 2503.541 | 18" R.C. PIPE SEWER DES. 3006 | LIN. FT. | 278 |
| | | 2506.507 | CONSTRUCT CATCH BASINS, DESIGN A OR F | LIN. FT. | 73.6 |
| | | 2506.507 | CONSTRUCT CATCH BASINS, DESIGN C OR G | LIN. FT. | 57.9 |
| | | 2506.511 | RECONSTRUCT MANHOLES | LIN. FT. | 5.1 |
| | | 2506.516 | CASTING ASSEMBLIES | EACH | 21 |
| | | 2506.522 | ADJUST FRAME AND RING CASTINGS | EACH | 6 |
| | | 2503.541 | 21" R.C. PIPE SEWER DES. 3006 | LIN. FT. | 102 |
| | | 2503.541 | 24" R.C. PIPE SEWER DES. 3006 | LIN. FT. | 100 |
| CONC. | (10) | 2531.501 | CONCRETE CURB AND GUTTER B612 | LIN. FT. | 2135 |
| | | 2531.501 | CONCRETE CURB AND GUTTER B618 | LIN. FT. | 2740 |
| | | 2531.507 | 6" CONCRETE DRIVEWAY PAVEMENT | SQ. YD. | 127 |
| | | 2531.507 | 8" CONCRETE DRIVEWAY PAVEMENT | SQ. YD. | 9 |
| | | 0411.604 | CONCRETE RETAINING WALL | LIN. FT. | 336 |
| | | 2564.513 | CONCRETE FOOTINGS | EACH | 20 |
| MISC. | | 0504.602 | RELOCATE HYDRANT | EACH | 3 |
| | | 0504.602 | ADJUST WATER GATE HOUSING | EACH | 6 |
| | | 0504.603 | RELOCATE SPRINKLER SYSTEM | LIN. FT. | 126 |
| | | | | | |
| | | 2021.501 | FIELD OFFICE, TYPE D | LUMP SUM | 1 |
| | | 2575.505 | SODDING | SQ. YD. | 4652 |
| | | 0563.601 | TRAFFIC CONTROL PHASE I | LUMP SUM | 1 |
| | | 0563.601 | TRAFFIC CONTROL PHASE II | LUMP SUM | 1 |
| | | 2575.531 | COMMERCIAL FERTILIZER, ANALYSIS 10-10-10 | TON | 0.25 |
| | | 0011.601 | REVISED BRIDGE PLANS | LUMP SUM | 1 |
| | (12) | 0505.601 | GAS MAIN PROVISIONS | LUMP SUM | 1 |
| | | 2531.503 | BRICK MEDIAN (BRIDGE PORTION) | SQ. YD. | 92 |
| | | 2531.503 | BRICK MEDIAN (GRADING PORTION) | SQ. YD. | 755 |
| | | 2545.509 | CONDUIT SYSTEM (TELEPHONE) | LUMP SUM | 1 |

THE FOLLOWING STANDARD PLATES AS APPROVED BY F.W.H.A. SHALL APPLY ON THIS PROJECT.

## STANDARD PLATES

| PLATE # | DESCRIPTION |
|---|---|
| 0004 A | SPEC. REFERENCE TO STANDARD PLATES |
| 3000 K | REINFORCED CONCRETE PIPE |
| 3006 D | GASKET JOINT FOR R.C. PIPE |
| 3100 F | CONC. APRON FOR R.C. PIPE |
| 3133 B | RIPRAP AT R.C.P. OUTLETS |
| 3145 C | CONCRETE PIPE TIES |
| 4000 I | MANHOLE OR CATCH BASIN |
| 4002 E | MANHOLE OR CATCH BASIN |
| 4005 K | MANHOLE OR CATCH BASIN |
| 4006 K | MANHOLE OR CATCH BASIN |
| 4010 F | CONC. SHORT CONE AND ADJUSTING RING |
| 4011 D | PRECAST CONCRETE BASE |
| 4126 E | CATCH BASIN FRAME CASTING |
| 4149 C | GRATE CASTING FOR CATCH BASIN |
| 4161 F | CURB BOX CASTING FOR CATCH BASIN |
| 4180 H | MANHOLE OR CATCH BASIN STEP |
| 7035 J | CONC. WALK AND CURB RETURNS AT ENT. |
| | |
| 7100 F | CONCRETE CURB AND GUTTER |
| 7110 E | CURB AND GUTTER CONST. AT C.B. |
| 7111 G | INSTALLATION & REINF. OF C.B. CASTINGS |
| 8000 I | STANDARD BARRICADES |
| 8003 B | BREAKAWAY SIGN SUPPORT (PLASTIC) |
| 9322 I | CHAIN LINK FENCE |

## BASIS OF PLANNED QUANTITIES

2331 PLANT MIXED BASE COURSE
BITUMINOUS MIXTURE 110#/S.Y. PER 1" THICKNESS.
MATERIAL FOR MIXTURE 5.3 % BY WT.

2331 PLANT MIXED BINDER COURSE
BITUMINOUS MIXTURE 110#/S.Y. PER 1" THICKNESS.
MATERIAL FOR MIXTURE 5.3 % BY WT.

2341 PLANT MIXED WEARING COURSE
BITUMINOUS MIXTURE 110#/S.Y. PER 1" THICKNESS.
MATERIAL FOR MIXTURE 6.5 % BY WT.

2357 BITUMINOUS MATERIAL FOR TACK COAT 0.05 GALLON PER S.Y.

2575 COMMERCIAL FERTILIZER
ANALYSIS 10-10-10, 500#/ACRE. ON ALL SOD AREAS AND SEED AREAS.

(1) INCLUDES 15 SQ. YD. FOR ISLAND NOSE, STA. 76+03.
(2) COMMON EXCAVATION QUANTITY INCLUDES ALL BITMINOUS PAVEMENT MATERIAL TO BE REMOVED AND 387 CU. YD. FOR STREET APPROACHES.
(3) INCLUDES 1317 CU. YD. FOR SOUTH RETAINING WALL AND 2100 CU. YD. BEHIND ABUTS. AND BRIDGE WINGS.
(4) INCLUDES 186 CU. YD. FOR STREET APPROACHES.
(5) INCLUDES 108 CU. YD. FOR STREET APPROACHES.
(6) INCLUDES 122 TONS FOR STREET APPROACHES.
(7) INCLUDES 122 TONS FOR STREET APPROACHES.
(8) PROVIDED FOR DRIVEWAY RESTORATION. PAYMENT BY SQ. YD. INCLUDES BITUMINOUS MATERIAL AND 3" CL.-5 AGG. BASE.
(9) INCLUDES 61 TONS FOR STREET APPROACHES.
(10) FOR MEDIAN CONSTRUCTION.
(11) STA. 81+00, SEE SPECIAL PROVISIONS.
(12) NON-PARTICIPATING ITEMS
~~(13) PAY ITEMS APPLY ONLY TO ALTERNATE # 1, STEEL BM. ALTERNATE. SEE SHEET NO. 14 FOR ITEMS WHICH ARE INCLUDED ONLY IN ALTERNATE # 2, PRESTRESSED CONCRETE BEAM ALTERNATE. ALL OTHER ITEMS APPLY TO BOTH ALTERNATES.~~
~~(14) REVISED BRIDGE PLANS PAY ITEM~~

## CONSTRUCTION NOTES

INPLACE TOPSOIL SHALL BE SALVAGED AND USED TO THE FULLEST EXTENT POSSIBLE PRIOR TO THE USE OF TOPSOIL BORROW ON AREAS DISTURBED BY CONSTRUCTION OPERATIONS. SALVAGE OF INPLACE TOPSOIL FOR USE IN TURF ESTABLISHMENT SHALL BE CONSIDERED TO BE INCIDENTAL TO COMMON EXCAVATION AND NO DIRECT COMPENSATION WILL BE MADE THEREFORE.

ALL BITUMINOUS PAVEMENT SCHEDULED TO BE REMOVED IS INCLUDED IN COMMON EXCAVATION QUANTITIES. DISPOSAL WILL NOT BE ALLOWED WITHIN RIGHT OF WAY.

DISPOSAL OF ANY EXCESS EXCAVATED MATERIAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE DISPOSED OF IN ACCORDANCE WITH THE PROVISIONS OF 2104. DISPOSAL WILL NOT BE ALLOWED WITHIN RIGHT OF WAY.

SLOPES WITHIN PROJECT LIMITS SHALL BE COVERED WITH NOT LESS THAN 3" OF TOPSOIL.

FILLS BEHIND THE RETAINING WALLS AND ABUTMENTS SHALL BE COMPACTED TO 98% OF STANDARD PROCTOR DENSITY.

CONTRACTOR SHALL CONTACT PUBLIC UTILITIES FOR LOCATION OF ALL UNDERGROUND WIRES, CABLES, OR OTHER BURIED STRUCTURES BEFORE GRADING OPERATIONS BEGIN.

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. Tronsgard
REG. NO. [illegible]

DATE: 1-30-87

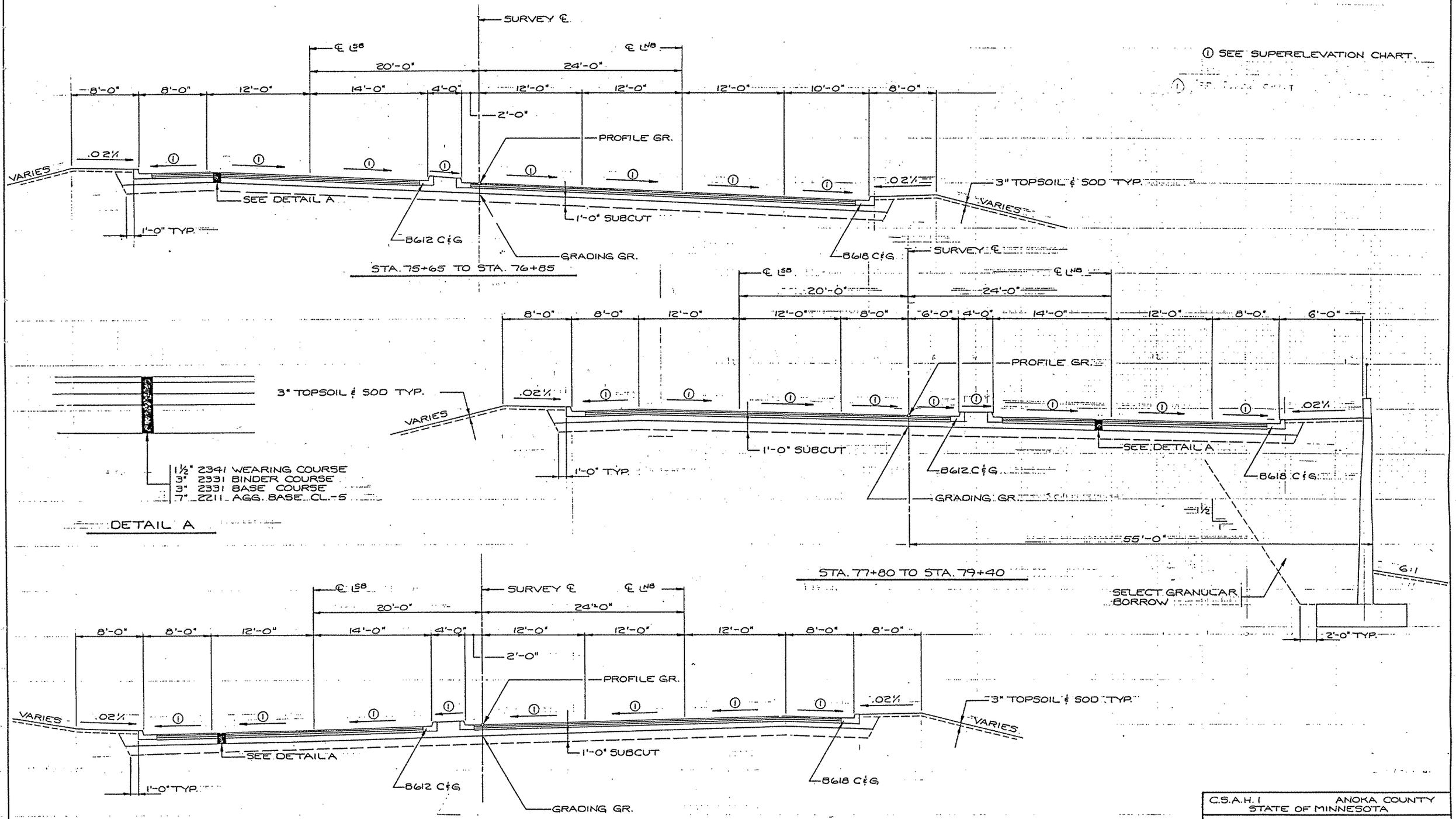
PLANS PREPARED BY:

ERICKSON ENGINEERING
3340 REPUBLIC AVE.
ST. LOUIS PARK, MN. 55426

C.S.A.H. 1 ANOKA COUNTY
STATE OF MINNESOTA

ESTIMATED QUANTITIES
CONSTRUCTION NOTES

S.A.P. 02-601-29 L.H.C.
SHEET 61 OF 619 SHEETS F.M.J.

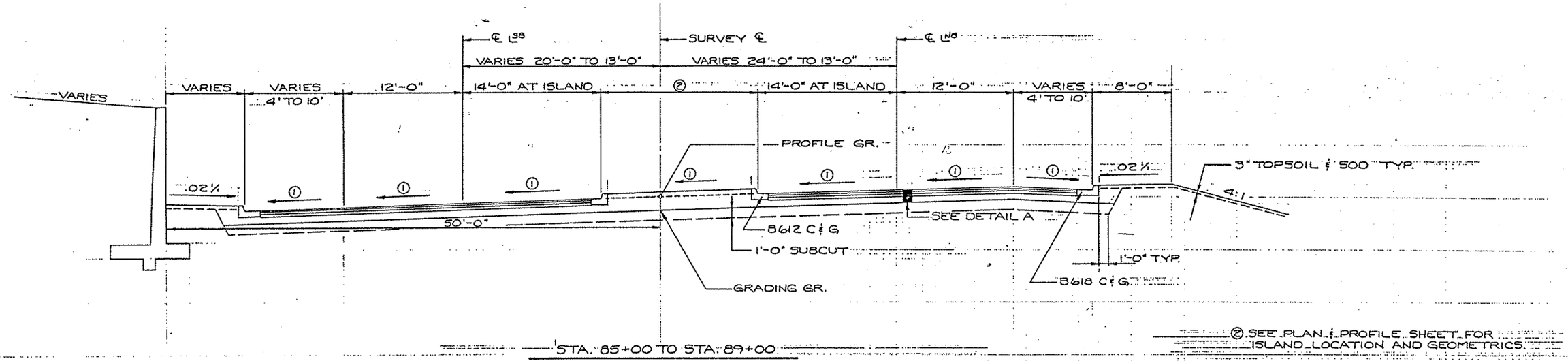



C.S.A.H. 1 ANOKA COUNTY
STATE OF MINNESOTA

# TYPICAL SECTIONS

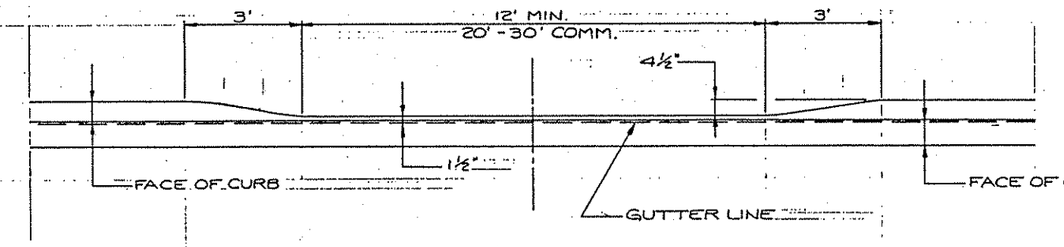
APPROVED: _____

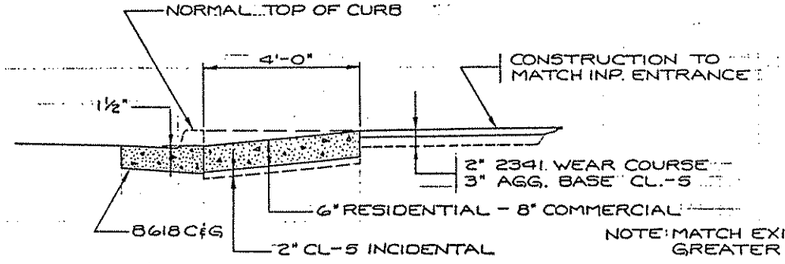
| | |
|---|---|
| S.A.P. 02-601-29 | L.H.C. |
| SHEET 62 OF 615 SHEETS | F.M.J. |




STA. 85+00 TO STA. 89+00

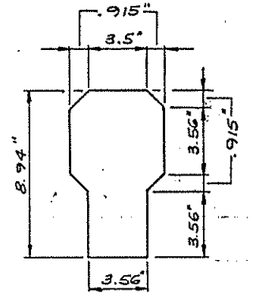
② SEE PLAN & PROFILE SHEET FOR ISLAND LOCATION AND GEOMETRICS.

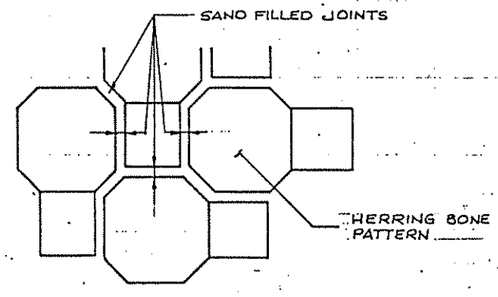


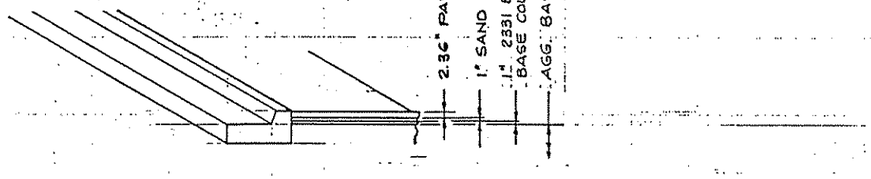

NOTE: ALSO SEE STANDARD PLATE NO. 7035 J.

CONCRETE APRON DETAIL




PAVING STONE DETAIL



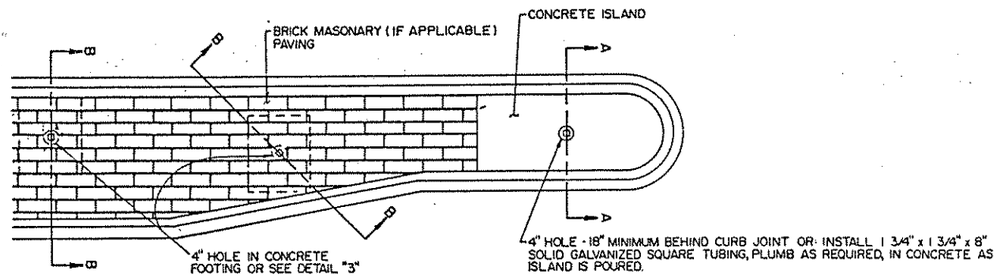

C.S.A.H. 1 ANOKA COUNTY
STATE OF MINNESOTA

# TYPICAL SECTION AND DETAILS

S.A.P. 02-601-29 L.H.C.
SHEET G3 OF G15 SHEETS F.M.J.

## DETAIL "1"

ISLAND MOUNT BREAK-AWAY SIGN POST INSTALLATION



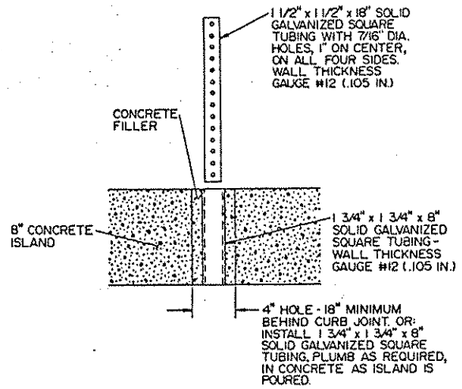

NOTES: DASHED LINES REPRESENT THE APPROX. LIMITS OF CONCRETE FOOTINGS TO BE POURED FOR EACH ISLAND MOUNT SIGN POST INSTALLATION WITHIN AREAS OF BRICK MASONARY PAVING. (36" LENGTH x 48" WIDTH x 5" HEIGHT) IF THE ISLAND IS LESS THAN 48" WIDE, THE WIDTH OF THE CONCRETE FOOTING WILL EQUAL THE WIDTH OF THE ISLAND. IF MORE THAN ONE POST IS REQUIRED FOR AN INSTALLATION, SEE DETAIL "4."

SECTION B-B: THE SOLID GALVANIZED SQUARE TUBING FOR THE DO NOT ENTER SIGNS SHALL BE SET AT THE PROPER ANGLE. REFER TO THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

FOR PAYMENT OF CONCRETE FOOTINGS, REFER TO THE STATEMENT OF ESTIMATED QUANTITIES, ITEM 2564.513 CONCRETE FOOTINGS.

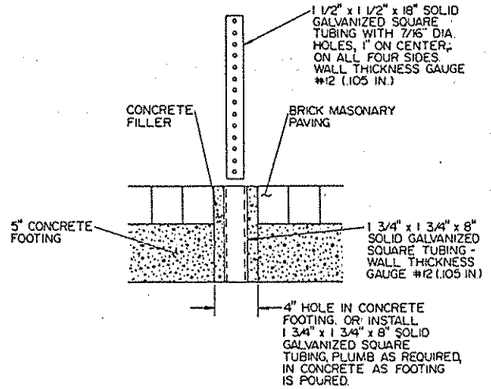
## DETAIL "2"

ENLARGED SECTION A-A



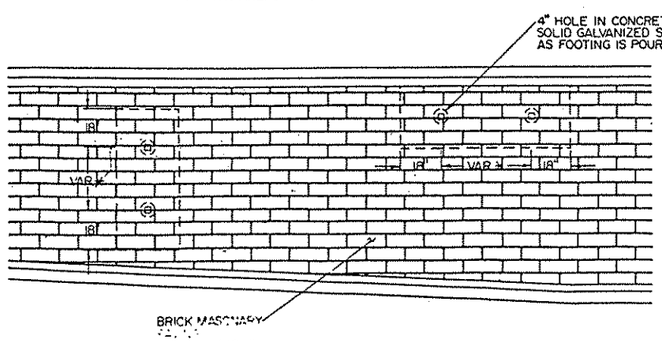

## DETAIL "3"

ENLARGED SECTION B-B




## DETAIL "4"

ISLAND MOUNT BREAK AWAY SIGN POST INSTALLATIONS REQUIRING MORE THAN ONE POST (WITHIN AREAS OF BRICK MASONARY PAVING)




NOTES:

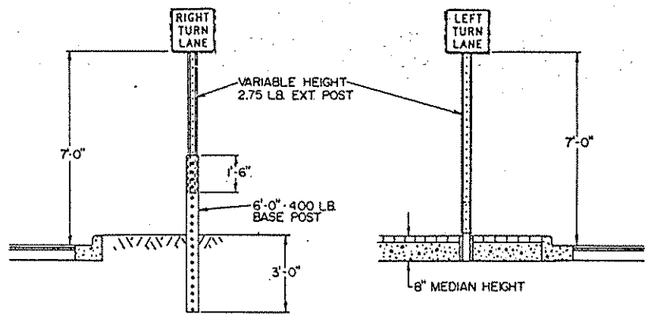
* THE DISTANCE BETWEEN SIGN POSTS VARIES. REFER TO THE STANDARD SIGNS MANUAL FOR THE SPACING CHART THAT RELATES TO THE SIZE AND SHAPE OF THE INSTALLATION.

1. IF THE WIDTH OF THE ISLAND IS LESS THAN THE CONCRETE FOOTING MEASUREMENTS REQUIRED BY THIS DETAIL AND THE SPACING CHART IN THE STANDARD SIGNS MANUAL, THE LENGTH OF THE CONCRETE FOOTING WILL EQUAL THE WIDTH OF THE ISLAND.
2. THE DIMENSIONS OF THE CONCRETE FOOTINGS FOR ANY ISLAND MOUNT SIGN INSTALLATION REQUIRING MORE THAN ONE POST WITHIN AREAS OF BRICK MASONARY PAVING WILL BE 36" WIDTH x VARIABLE X LENGTH x 5" HEIGHT
3. DASHED LINES REPREST THE APPROX. LIMITS OF CONCRETE FOOTINGS TO BE POURED FOR ISLAND MOUNT BREAK-AWAY SIGN POST INSTALLATIONS REQUIRING MORE THAN ONE POST WITHIN AREAS OF BRICK MASONARY PAVING.

## DETAIL "5"

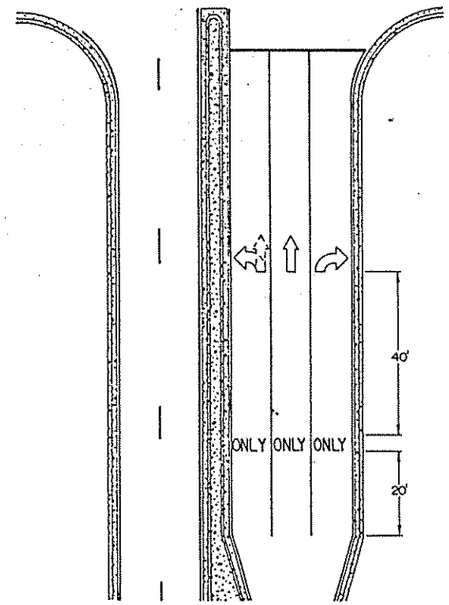
GROUND POST MOUNT SIGN INSTALLATION TYPICAL

ISLAND MOUNT BREAK-AWAY SIGN POST INSTALLATION TYPICAL




## DETAIL "6"

PAVEMENT MESSAGES - LANE DESIGNATION DETAILS




ARROWS: 6'-11" HIGH
WORDS: 8'-0" HIGH

NOTE: SEE SHEETS 34-36 FOR INDIVIDUAL PAVEMENT MESSAGE TYPES AND LOCATIONS. REFER TO THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR LAYOUT SPECIFICATIONS.

## STORM SEWER

| NO. | STA. | LOC. | REMARKS | DESIGN | LIN. FT. | REMOVE PIPE | ① FURN. & INSTALL CASTING ASSEMBLY | TOP | OUTLET | FURNISH & INSTALL 12" LIN.FT. | 15" LIN.FT. | 18" LIN.FT. | 20" LIN.FT. | 24" LIN.FT. | 24" APRON | DRAINS TO NO. | % | INCET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 75+50 | 38.87' LT. | | A OR F | 6.5 | 12"x34' R.C.P. | 1 | 833.89 | 827.18 | 31 | | | | | | 8 | 1.0 | 826.87 |
| B | 75+50 | 8.13' LT. | | A OR F | 6.7 | 12"x125' R.C.P. | 1 | 833.68 | 826.83 | | 127 | | | | | 3 | 1.0 | 825.56 |
| 1 | 76+65 | 38.87' LT. | | A OR F | 5.8 | | 1 | 833.35 | 827.35 | 32 | | | | | | 2 | 1.5 | 826.87 |
| 2 | 76+65 | 7.13' LT. | | C OR G | 5.3 | | 1 | 832.31 | 826.80 | 52 | | | | | | 3 | 2.0 | 825.76 |
| 3 | 76+65 | 44.87' RT. | | C OR G | 4.4 | 12"x100' R.C.P. | 1 | 829.90 | 825.36 | | 135 | | | | | 4 | 1.9 | 822.80 |
| 4 | 78+00 | 42.87' RT. | | C OR G | 4.2 | 15"x93' R.C.P. | 1 | 827.07 | 822.72 | | 100 | | | | | 5 | 1.8 | 820.92 |
| 5 | 79+00 | 42.87' RT. | | C OR G | 4.3 | 15"x102' R.C.P. | 1 | 825.28 | 820.86 | | | 70 | | | | 8 | 1.1 | 820.09 |
| 6 | 79+00 | 38.87' LT. | | A OR F | 6.9 | | 1 | 829.16 | 822.12 | 44 | | | | | | 7 | 1.0 | 821.68 |
| 7 | 79+00 | 4.87' RT. | | C OR G | 5.2 | | 1 | 827.03 | 821.64 | 38 | | | | | | 5 | 1.0 | 821.26 |
| 8 | 79+70 | 42.87' RT. | | C OR G | 5.0 | | 1 | 824.86 | 819.69 | | | | 52 | | | 9 | 0.6 | 819.38 |
| 9 | 80+00 | 1.07' RT. | | A OR F | 7.3 | | 1 | 826.78 | 819.34 | | | | 50 | | | 10 | 0.6 | 819.04 |
| 10 | 80+30 | 38.87' LT. | TIE LAST 3 R.C.P. SECTIONS @ OUTLET | A OR F | 15.9 | | 1 | 828.22 | 812.18 | | | | | 53 | 1 | ② | 2.0 | 811.00 |
| 11 | 82+00 | 42.87' RT. | | C OR G | 4.3 | | 1 | 829.19 | 824.69 | 37 | | | | | | 12 | 1.0 | 824.32 |
| 12 | 82+00 | 4.13' RT. | | C OR G | 5.0 | | 1 | 829.43 | 824.28 | 13 | | | | | | 13 | 1.0 | 824.15 |
| 13 | 82+00 | 7.13' LT. | | C OR G | 5.2 | | 1 | 829.42 | 824.09 | 32 | | | | | | 14 | 2.0 | 823.46 |
| 14 | 82+00 | 38.87' LT. | TIE LAST 3 R.C.P. SECTIONS @ OUTLET | A OR F | 12.2 | | 1 | 829.42 | 817.06 | | | | | 47 | 1 | ② | 2.0 | 816.00 |
| 15 | 83+70 | 38.87' LT. | | C OR G | 5.4 | | 1 | 833.43 | 827.90 | | | 170 | | | | 14 | 2.0 | 824.50 |
| 16 | 83+70 | 0.87' LT. | | C OR G | 4.8 | | 1 | 834.73 | 829.37 | | | 38 | | | | 15 | 0.55 | 829.16 |
| 17 | 83+90 | 42.87' RT. | | A OR F | 6.0 | | 1 | 836.38 | 830.24 | 47 | | | | | | 16 | 1.0 | 829.77 |
| 18 | 85+18 | 1.40' RT. | | A OR F | 6.3 | | 1 | 839.34 | 832.83 | | 148 | | | | | 16 | 1.7 | 830.31 |
| 19 | 85+40 | 39.87' LT. | | C OR G | 4.8 | | 1 | 838.40 | 833.40 | 47 | | | | | | 18 | 1.0 | 832.93 |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | TOTALS | | 454 | | 21 | | | 373 | 510 | 278 | 102 | 100 | 2 | | | |

① CASTING 801
GRATE 810
CURB BOX 821 B

② OUTLET

## CLEARING & GRUBBING

| STA | LOC. | DESCR. | CLR. | GRUB | REMARKS |
|---|---|---|---|---|---|
| 75+88 | 38' LT. | TREE | 1 | 1 | |
| 75+91 | 45' LT. | TREE | 1 | 1 | |
| 75+96 | 38' LT. | TREE | 1 | 1 | |
| 76+60 | 40' LT. | BUSH | | | REMOVE |
| 76+68 | 50' LT. | TREE | | | SAVE |
| 76+88 | 37' LT. | TREE | 1 | 1 | |
| 76+91 | 43' LT. | TREE | 1 | 1 | |
| 76+93 | 37' LT. | TREE | 1 | 1 | |
| 77+65 | 45' LT. | BUSH | | | REMOVE |
| 77+97 | 59' RT. | TREE | | | SAVE |
| 78+00 | 55' LT. | BUSH | | | SAVE |
| 79+06 | 73' RT. | TREE | | | SAVE |
| 79+22 | 68' RT. | TREE | | | SAVE |
| 79+78 | 68' RT. | TREE | 1 | 1 | |
| 79+86 | 68' RT. | TREE | 1 | 1 | |
| 80+23 | 65' RT. | TREE | 1 | 1 | |
| 80+27 | 62' RT. | TREE | 1 | 1 | |
| 80+32 | 65' RT. | TREE | 1 | 1 | |
| 80+38 | 65' RT. | TREE | 1 | 1 | |
| 82+01 | 57' RT. | TREE | | | SAVE |
| 82+05 | 53' RT. | TREE | 1 | 1 | |
| 82+39 | 41' RT. | TREE | 1 | 1 | |
| 82+92 | 57' RT. | TREE | | | SAVE |
| 82+94 | 47' RT. | TREE | 1 | 1 | |
| 82+99 | 54' RT. | TREE | | | SAVE |
| 83+46 | 52' RT. | TREE | 1 | 1 | |
| 84+44 | 55' RT. | TREE | | | SAVE |
| 84+74 | 55' RT. | TREE | | | SAVE |
| 85+10 | 58' RT. | TREE | | | SAVE |
| 85+12 | 64' LT. | TREE | 1 | 1 | |
| 85+56 | 34' RT. | TREE | 1 | 1 | |
| 85+65 | 34' RT. | TREE | 1 | 1 | |
| 86+37 | 37' LT. | BUSH | | 1 | REMOVE |
| 86+37 | 40' LT. | TREE | 1 | 1 | |
| 86+83 | 59' LT. | TREE | | | SAVE |
| 87+26 | 55' LT. | TREE | | | SAVE |
| 87+27 | 48' LT. | STUMP | | 1 | |
| 87+64 | 40' LT. | TREE | 1 | 1 | |
| 87+66 | 44' RT. | HEDGE | | | REMOVE PORTION |
| 88+29 | 40' LT. | BUSH | | | REMOVE |
| | | | | | |
| | | | | | |
| | | | | | |
| | | TOTALS | 21 | 22 | |

NOTE: PARK AREA BY ACRE = 0.3 ACRE

## DRIVEWAY CONSTRUCTION

| STATION | ADDRESS | REMARKS | REMOVE CONC. S.Y. | REMOVE BIT. S.Y. ③ | CONC. DRIVEWAY PAVEMENT APRON SQ. YD. WIDTH | 6" | 8" | DRIVEWAY S.Y. WIDTH | 6" | 8" | BIT. PAVEMENT DRIVEWAY SQ.YD. WIDTH | REPL. | NEW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 74+67 RT. | 6661 | | 8 | 4 | 18' | 9 | | | | | 18' | 4 | |
| 75+14 LT. | | PAVE TO R/W | | | 14' | 8 | | | | | 14' | | 16 |
| 75+62 LT. | 6654 | | | 17 | 12' | 7 | | | | | 12' | 20 | |
| 77+21 LT. | 6664 | | | 13 | 12' | 7 | | | | | 12' | 20 | |
| 77+46 LT. | | | | | 16' | | 9 | | | | 16' | | 9 |
| 81+70 RT. | 6745 | | | 89 | 18' | 10 | | | | | 18' | 44 | |
| 82+50 RT. | 6755 | | | 44 | 16' | 9 | | | | | 16' | 4 | |
| 83+63 RT. | 6765 | | 33 | | 12' | 7 | | 12' | 19 | | | | |
| 84+00 RT. | 6775 | | 25 | | 12' | 7 | | 12' | 29 | | | | |
| 85+38 RT. | 6785 | | | 33 | 12' | 7 | | | | | 12' | 3 | |
| 85+90 RT. | 6795 | | | 72 | 14' | 8 | | | | | 14' | 44 | |
| 75+58 RT. | | REMOVE | 8 | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | TOTALS | 74 | 272 | | 79 | 9 | | 48 | | | 139 | 25 |

③ ALL BITUMINOUS REMOVALS ARE INCLUDED WITH COMMON EXCAVATION FOR PAYMENT.

## REMOVE CONC. CURB & GUTTER

| LOCATION | LIN. FT. | REMARKS |
|---|---|---|
| 74+55 - 77+27 RT. | 267 | |
| 74+65 - 76+03 LT. | 138 | ISLAND |
| 74+65 - 76+03 RT. | 138 | ISLAND |
| 74+92 - 78+54 LT. | 362 | |
| 77+54 - 80+20 LT. | 287 | |
| 84+50 LT. | 52 | HARTMAN CIRCLE |
| 84+95 LT. | 49 | HARTMAN CIRCLE |
| 88+05 RT. | 45 | LOCKE LAKE RD. |
| 88+40 RT. | 34 | LOCKE LAKE RD. |
| | | |
| | | |
| | | |
| TOTAL | 1372 | |

C.S.A.H. 1 ANOKA COUNTY
STATE OF MINNESOTA

# TABULATIONS

S.A.P. 02-601-29 L.H.C.
SHEET 65 OF 615 SHEETS F.M.J.

## ADJUST GATE VALVES

| STA. | LOC. | REMARKS |
|---|---|---|
| 75+30 | 44' RT. | |
| 77+10 | 31' RT. | |
| 77+26 | 31' RT. | |
| 83+62 | 22' LT. | GAS, ADJ. BY OTHERS |
| 84+68 | 23' RT. | |
| 88+13 | 31' RT. | |
| | | |
| | | |

## REMOVE PIPE SEWER (C.M.P.)

| LOC. | LIN. FT. | REMARKS |
|---|---|---|
| 79+72 RT. | 100 | |
| 81+08 RT. | 20 | |
| 82+51 LT. | 83 | |
| | | |
| | | |
| | | |
| TOTAL | 203 | |

## SALVAGE & INSTALL FENCE

| LOCATION | SALV. | INST. | TYPE | REMARKS |
|---|---|---|---|---|
| 77+16 - 80+63 RT. | 347 | 52 | CHAIN LK. | |
| 81+19 - 81+51 RT. | 50 | 50 | CHAIN LK. | |
| 77+50 - 78+30 LT. | 80 | 80 | WOOD | |
| 78+30 - 80+63 LT. | 233 | 196 | CHAIN LK. | |
| 81+51 - 83+62 LT. | 211 | 250 | CHAIN LK. | |
| 84+98 - 89+00 LT. | 438 | 100 | CHAIN LK. | |
| 86+34 LT. | 25 | 5 | CHAIN LK. | LINE FENCE |
| 87+50 LT. | 26 | 5 | CHAIN LK. | LINE FENCE |
| 88+29 LT. | 26 | 5 | CHAIN LK. | LINE FENCE |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| TOTALS | 1436 | 743 | | |

NOTE: FENCE INSTALLATION LOCATIONS TO BE DETERMINED BY ENGINEER IN FIELD.

## HYDRANT RELOCATION

| EXISTING LOC. | PROPOSED LOC. |
|---|---|
| 76+83 49' RT. | 7' EAST |
| 84+96 38' LT. | 20' N.W. |
| 88+03 34' RT. | 20' S.E. |
| | |
| | |

NOTE: ALL HYDRANT LEADS, TIE BARS, BRACING AND OTHER EQUIPMENT, WORK AND MATERIALS REQUIRED TO COMPLETE THE JOB AS SPECIFIED SHALL BE CONSIDERED AS INCIDENTAL TO RELOCATING HYDRANTS.

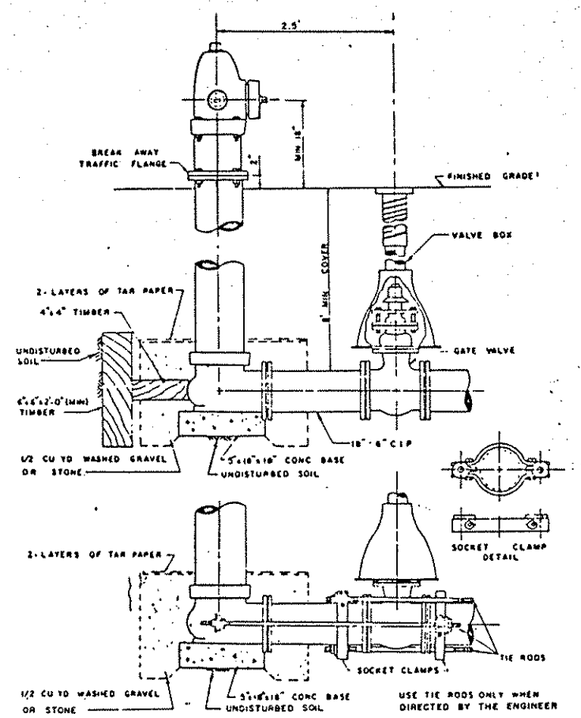
## RECONSTRUCT MANHOLES

| STA. | LOC. | LIN.FT. | REMARKS |
|---|---|---|---|
| 82+90 | 37' RT. | 5.1 | SAN. SEWER |
| | | | |
| | | | |
| | | | |
| | | | |

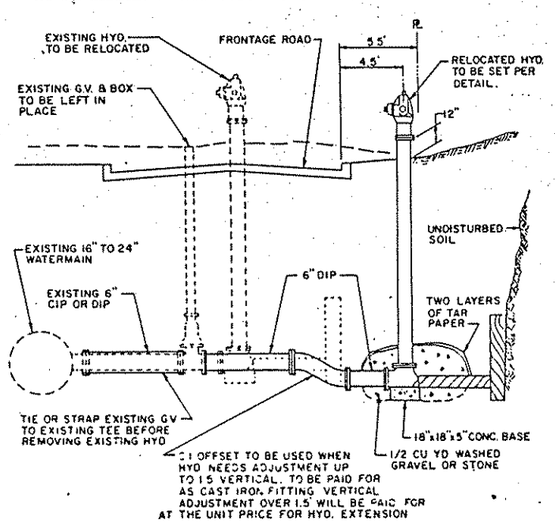
NOTE: THE CITY MAY FURNISH A NEW HYDRANT AND REMOVE THE EXISTING HYDRANT FROM THE JOB SITE. THE CONTRACTOR SHALL INSTALL THIS REPLACEMENT HYDRANT AS IF IT WAS THE HYDRANT REMOVED AND NO ADDITIONAL COMPENSATION WILL BE MADE.

## ADJUST FRAME & RING CASTINGS

| STA. | LOC. | TYPE | REMARKS |
|---|---|---|---|
| 76+06 | 4' LT. | M.H. | SAN. SEWER |
| 76+20 | 37' LT. | M.H. | SAN. SEWER |
| 77+28 | 54' RT. | M.H. | SAN. SEWER |
| 77+36 | 37' LT. | M.H. | SAN. SEWER |
| 84+80 | 35' RT. | M.H. | SAN. SEWER |
| 88+24 | 29' RT. | M.H. | SAN. SEWER |
| | | | |
| | | | |
| | | | |

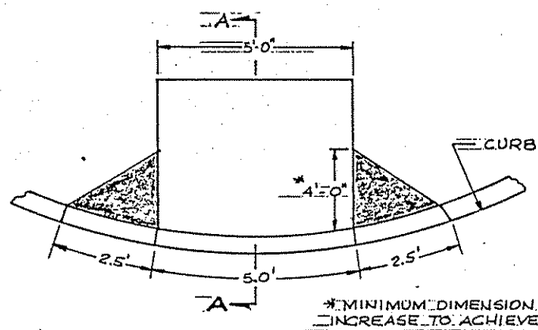



TYPICAL HYDRANT SETTING DETAIL




NOTE: HYDRANT RELOCATION SHALL INCLUDE ALL TOOLS, MATERIALS AND LABOR TO SECURE THE EXISTING GATE VALVE TO THE EXISTING TEE, REMOVE AND RELOCATE THE EXISTING HYDRANT WITHOUT SHUTTING DOWN THE EXISTING WATERMAIN.

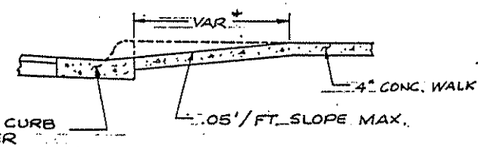
HYDRANT RELOCATION DETAIL




PLAN VIEW




ELEVATION




SECTION A-A

PEDESTRIAN RAMP DETAIL

C.S.A.H. 1 ANOKA COUNTY
STATE OF MINNESOTA

TABULATIONS

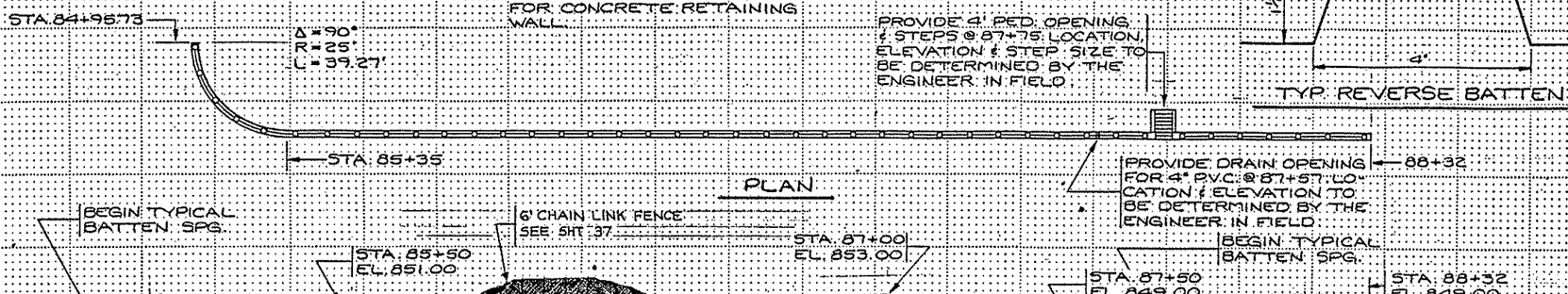
| | |
|---|---|
| S.A.P. 02-601-29 | L.H.C. |
| SHEET 66 OF 615 SHEETS | F.M.J. |

Fed. Proj. No.

NOTE: WORK AND ALL MATERIAL FOR PED. OPENING & 4" P.V.C. DRAIN INCLUDED IN PRICE BID FOR CONCRETE RETAINING WALL.

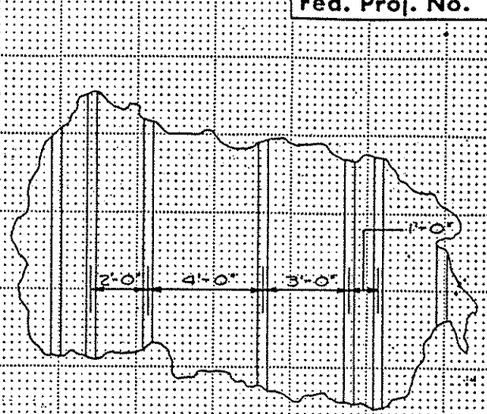
PROVIDE 4' PED. OPENING & STEPS @ 87+75. LOCATION, ELEVATION & STEP SIZE TO BE DETERMINED BY THE ENGINEER IN FIELD.

PROVIDE DRAIN OPENING FOR 4" P.V.C. @ 87+57. LOCATION & ELEVATION TO BE DETERMINED BY THE ENGINEER IN FIELD.




PLAN

ELEVATION




TYP. REVERSE BATTEN




TYP. REVERSE BATTEN RUSTICATION PATTERN

## NOTES

FOR RETAINING WALL AND FOOTING REINFORCEMENT SEE SHEETS 68 TO 610.

FOOTING STEP AND FOOTING WIDTH SHOWN ARE GUIDELINES ONLY. ACTUAL DIMENSIONS MAY BE DETERMINED FROM MN/DOT STANDARD SHEETS 5-297.620 AND THE ENGINEERS APPROVAL.

TOP OF STEM ELEVATIONS ARE TO BE VERIFIED BY ENGINEER IN FIELD.

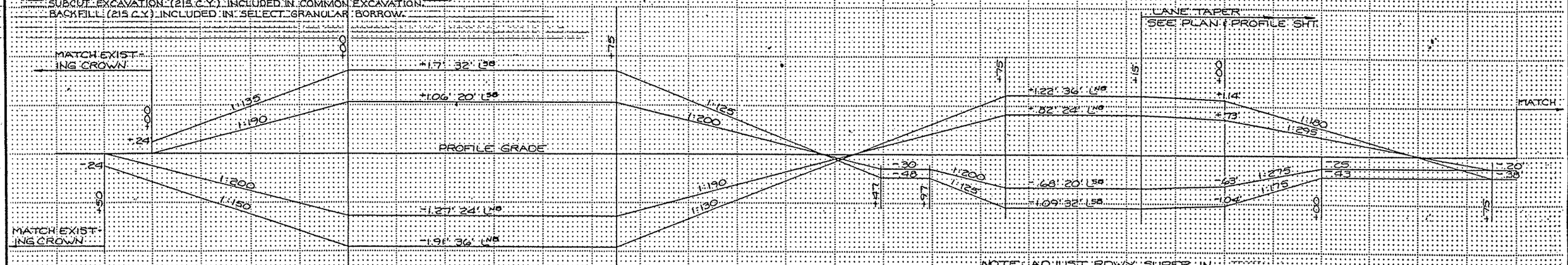
FOR FENCE POST BOLT ANCHORAGE DETAILS SEE SHEET 37.

FOR SPECIAL SURFACE TREATMENT SEE SPECIAL PROVISIONS.

REVERSED BATTEN TREATMENT SHALL EXTEND 1 FT. BELOW GROUND LINE. INCLUDED IN PRICE BID FOR CONC. RETAINING WALL. SEE SPECIAL PROVISIONS.

① LIMITS OF 3' SUBCUT BELOW BOTTOM OF FOOTING (APPROX.). SIDE SLOPES OF EXCAVATION TO BE MIN. 0.5:1. BACKFILL WITH SELECT GRANULAR BORROW AND COMPACT TO 100% OF STANDARD PROCTOR DENSITY. ACTUAL DIMENSIONS TO BE DETERMINED BY THE FIELD ENGINEER. SUBCUT EXCAVATION (215 C.Y.) INCLUDED IN COMMON EXCAVATION. BACKFILL (215 C.Y.) INCLUDED IN SELECT GRANULAR BORROW.

RETAINING WALL

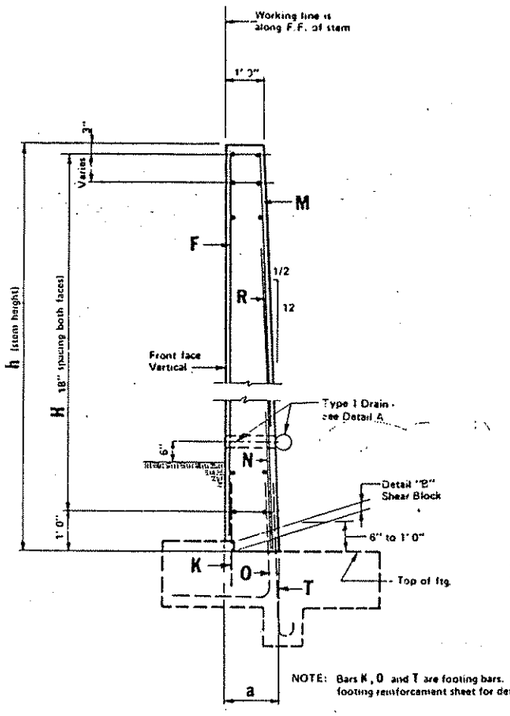



NOTE: ADJUST RDWY. SUPER. IN VICINITY OF BRIDGE TO MATCH DECK ELEVATIONS

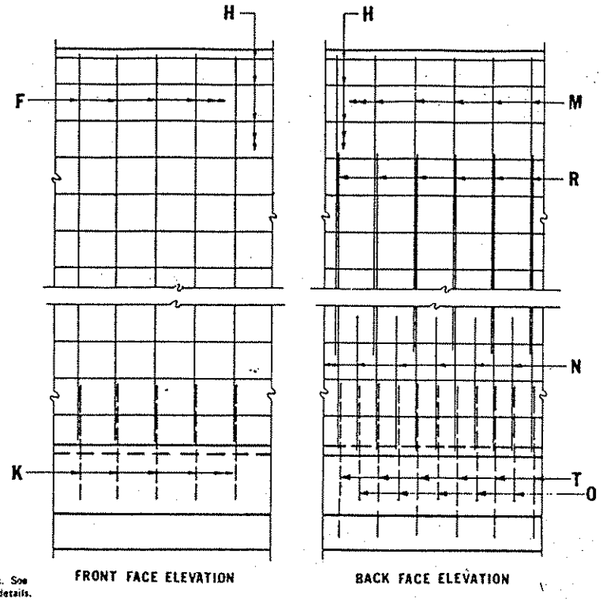
SUPERELEVATION CHART

74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89

State Proj. No. S.A.P. 02-601-29 Sheet No. 67 of 615 Sheets




NOTE: Bars K, O and T are footing bars. See footing reinforcement sheet for details.




FRONT FACE ELEVATION

BACK FACE ELEVATION

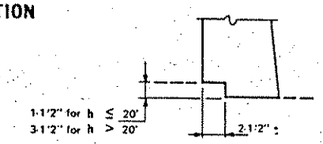
## TYPICAL SECTION THRU STEM

STEM ELEVATION

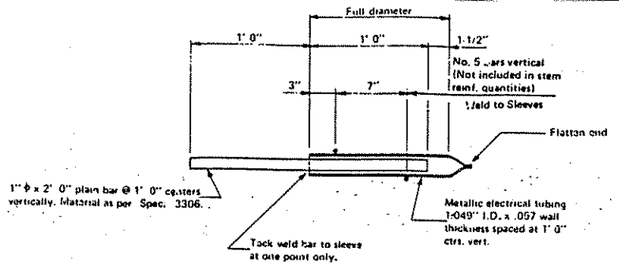
(1) The smallest "C" dimension bar to be placed at the top of wall and increases downward with wall depth.

(2) Use "J" Bars and 4 additional "F" Bars at dowel joints. These bars are not included in quantities per lineal foot of stem. (See stem joint detail)

(3) Weight includes "J" bars and four "F" bars per stem joint.

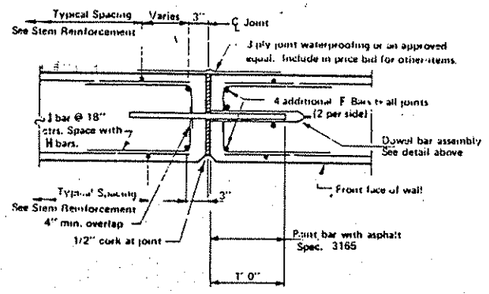



DETAIL B



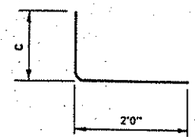

## DOWEL BAR ASSEMBLY

Material and placing to be included in price bid for other items




Cork shall comply with Spec. 7702. Secure cork with 2-1/2" long 11 ga. copper nails about 18" ctrs. Cork and nails included in price bid for other items.

## TYPICAL SECTION THRU STEM JOINT




J BAR

APPROVED Feb. 27, 1980

Director

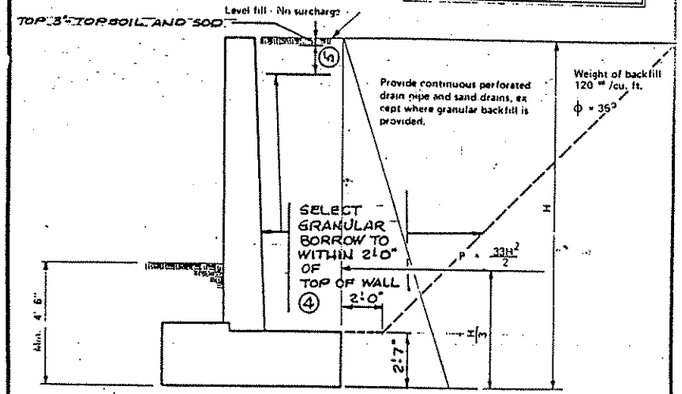
OFFICE OF ENGINEERING STANDARDS

**Fed. Proj. No.**

A.A.S.H.T.O. DESIGN SPECIFICATIONS

$f_c$ = 1600 p.s.i. $n$ = 8 Concrete Reinforcement

$f_s$ = 24,000 p.s.i.



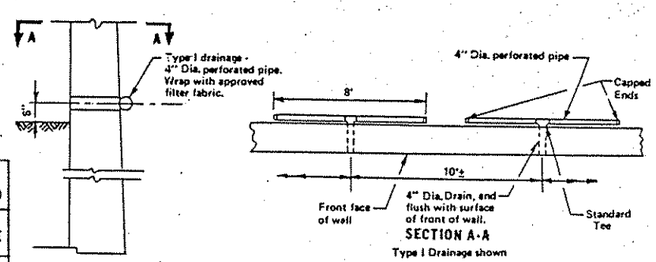

DRAINAGE: USE TYPE I DRAINAGE AS SHOWN.

SPREAD FTGS: SEE SOIL REPORT.

④ 1500 CU. YDS OF GRANULAR BORROW INCLUDED IN PRICE BID FOR RETAINING WALL.

⑤ COMMON BORROW-INCLUDED IN PRICE BID FOR RETAINING WALL

## DESIGN CRITERIA




SECTION A-A

Type I Drainage shown

DETAIL A

4" Dia. drains @ about 10' ctrs. horiz. Thermoplastic pipe as per Spec. 3245.

| STEM GEOMETRICS | | STEM REINFORCEMENT BARS | | | | | | | | | | | | | | | | | | | | | | QUANTITIES / LIN. FT. OF STEM② | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| h | a | J (BARS) ①② | | | | | | F② (VERTICAL) | | | H (HORIZONTAL) | | | M (VERTICAL) | | | N (VERTICAL) | | | R (VERTICAL) | | | REINF. | CONCRETE |
| | | | | C | | | | | | | | | | | | | | | | | | | | | |
| HT. | WIDTH | SIZE | LENGTH | 7" | 10" | 13" | 16" | TOTAL WEIGHT③ | SIZE | LENGTH | SPAC. | SIZE | NO. | MAX. SP. | SIZE | LENGTH | SPAC. | SIZE | LENGTH | SPAC. | SIZE | LENGTH | SPAC. | POUND | CU. YDS. |
| 5' | 1' 2 1/2" | 6 | 2'+C | 16 | | | | 74.6 | 4 | 4' 8" | 12" | 5 | 8 | 18" | 4 | 4' 10" | 14 1/2" | | | | | | | 13.1 | .203 |
| 6 | 1 3 | 6 | 2'+C | 20 | | | | 92.7 | 4 | 5 8 | 12 | 5 | 10 | 18 | 4 | 5 10 | 14-1/2 | | | | | | | 17.4 | .249 |
| 7 | 1 3-1/2 | 6 | 2'+C | 20 | | | | 95.4 | 4 | 6 8 | 12 | 5 | 10 | 18 | 4 | 6 10 | 14 1/2 | | | | | | | 18.7 | .296 |
| 8 | 1 4 | 6 | 2'+C | 20 | 4 | | | 115.1 | 4 | 7 8 | 12 | 5 | 12 | 18 | 4 | 7 10 | 14 1/2 | | | | | | | 22.0 | .345 |
| 9 | 1 4-1/2 | 6 | 2'+C | 20 | 8 | | | 134.8 | 4 | 8 8 | 12 | 5 | 14 | 18 | 4 | 8 10 | 14 1/2 | | | | | | | 25.3 | .395 |
| 10 | 1 5 | 6 | 2'+C | 20 | 8 | | | 137.5 | 4 | 9 8 | 12 | 5 | 14 | 18 | 4 | 9 10 | 14 1/2 | | | | | | | 26.5 | .446 |
| 11 | 1 5-1/2 | 6 | 2'+C | 20 | 12 | | | 157.2 | 4 | 10 8 | 12 | 5 | 16 | 18 | 4 | 10 10 | 14-1/2 | | | | | | | 29.8 | .500 |
| 12 | 1 6 | 6 | 2'+C | 20 | 16 | | | 176.9 | 4 | 11 8 | 12 | 5 | 18 | 18 | 5 | 11 10 | 14-1/2 | | | | | | | 34.8 | .555 |
| 13 | 1 6-1/2 | 6 | 2'+C | 20 | 16 | | | 179.5 | 4 | 12 8 | 12 | 5 | 18 | 18 | 5 | 12 0 | 14 1/2 | | | | 5 | 5 0 | 14 1/2" | 41.9 | .611 |
| 14 | 1 7 | 6 | 2'+C | 20 | 20 | | | 199.2 | 4 | 13 8 | 12 | 5 | 20 | 18 | 5 | 12 0 | 14 1/2 | | | | 6 | 5 0 | 14 1/2 | 46.6 | .669 |
| 15 | 1 7-1/2 | 6 | 2'+C | 20 | 24 | | | 210.9 | 4 | 14 8 | 12 | 5 | 22 | 18 | 5 | 12 0 | 14 1/2 | | | | 7 | 5 0 | 14 1/2 | 51.6 | .728 |
| 16 | 1 8 | 6 | 2'+C | 20 | 24 | | | 221.6 | 4 | 15 8 | 12 | 5 | 22 | 18 | 5 | 12 0 | 14 1/2 | | | | 7 | 6 0 | 14 1/2 | 53.9 | .789 |
| 17 | 1 8-1/2 | 6 | 2'+C | 20 | 28 | | | 241.3 | 4 | 16 8 | 12 | 5 | 26 | 18 | 5 | 12 0 | 14 1/2 | | | | 8 | 7 0 | 14 1/2 | 62.0 | .851 |
| 18 | 1 9 | 6 | 2'+C | 20 | 32 | | | 261.0 | 4 | 17 8 | 12 | 5 | 26 | 18 | 5 | 12 0 | 13 | | | | 8 | 8 0 | 13 | 72.2 | .916 |
| 19 | 1 9-1/2 | 6 | 2'+C | 20 | 32 | | | 263.7 | 4 | 18 8 | 12 | 5 | 26 | 18 | 5 | 12 0 | 13 | 6 | 7' 0" | 13" | 6 | 9 0 | 13 | 74.6 | 981 |
| 20 | 1 10 | 6 | 2'+C | 20 | 32 | 4 | | 284.9 | 4 | 19 8 | 12 | 5 | 28 | 18 | 5 | 12 0 | 13 | 7 | C 0 | 13 | 6 | 10 0 | 13 | 82.8 | 1.049 |
| 21 | 1 10-1/2 | 6 | 2'+C | 20 | 32 | 8 | | 305.6 | 4 | 20 6 | 12 | 5 | 30 | 18 | 5 | 12 0 | 13 | 7 | 7 0 | 13 | 7 | 11 0 | 13 | 90.5 | 1.116 |
| 22 | 1 11 | 6 | 2'+C | 20 | 32 | 8 | | 308.3 | 4 | 21 6 | 12 | 5 | 30 | 18 | 5 | 12 0 | 13 | 7 | 8 0 | 13 | 7 | 12 0 | 13 | 94.9 | 1.186 |
| 23 | 1 11 1/2 | 6 | 2'+C | 20 | 32 | 12 | | 329.5 | 4 | 22 6 | 12 | 5 | 32 | 18 | 5 | 12 0 | 13 | 8 | 9 0 | 13 | 7 | 13 0 | 13 | 106.7 | 1.257 |
| 24 | 2 0 | 6 | 2'+C | 20 | 32 | 16 | | 350.7 | 4 | 23 6 | 12 | 5 | 34 | 18 | 5 | 12 0 | 13 | 8 | 10 0 | 13 | 7 | 14 0 | 13 | 113.8 | 1.331 |
| 25 | 2 0-1/2 | 6 | 2'+C | 20 | 32 | 16 | | 353.3 | 4 | 24 6 | 12 | 5 | 34 | 18 | 5 | 12 0 | 13 | 8 | 9 0 | 13 | 8 | 15 0 | 13 | 122.5 | 1.406 |
| 26 | 2 1 | 6 | 2'+C | 20 | 32 | 20 | | 374.6 | 4 | 25 6 | 12 | 5 | 36 | 18 | 5 | 12 0 | 14-1/2 | 9 | 10 0 | 14-1/2 | 9 | 16 0 | 14 1/2 | 138.1 | 1.482 |
| 27 | 2 1-1/2 | 6 | 2'+C | 20 | 32 | 24 | | 395.7 | 4 | 26 6 | 12 | 5 | 38 | 18 | 5 | 12 0 | 14-1/2 | 10 | 10 0 | 14-1/2 | 9 | 17 0 | 14-1/2 | 151.1 | 1.560 |
| 28 | 2 2 | 6 | 2'+C | 20 | 32 | 24 | | 398.4 | 4 | 27 6 | 12 | 5 | 38 | 18 | 5 | 12 0 | 13 | 10 | 11 0 | 13 | 9 | 18 0 | 13 | 169.7 | 1.639 |
| 29 | 2 2-1/2 | 6 | 2'+C | 20 | 32 | 28 | | 419.6 | 4 | 28 6 | 12 | 5 | 40 | 18 | 5 | 12 0 | 12 | 10 | 11 0 | 12 | 9 | 19 0 | 12 | 185.2 | 1.720 |
| 30' | 2' 3" | 6 | 2'+C | 20 | 32 | 32 | | 440.0 | 4 | 29 6" | 12" | 5 | 42 | 18' | 5 | 12 0" | 11" | 10 | 11' 0" | 11" | 9 | 20' 0" | 11" | 203.3 | 1.803 |

## STEM NOTES

1. Maximum spacing of stem joints (panels) is 32 feet. Use dowel assemblies at all joints. No reinf. thru joint.
2. Concrete in stems to be Concrete Mix No. 3Y43.
3. Reinforcement bars shall be deformed billet steel bars conforming to ASTM A615 Grade 60.
4. Bar lap at authorized splices: 36 diameters for No. 4 to No. 7 bars and 40 diameters for No. 8 to No. 11 bars except as noted.
5. All reinforcement bars to have a 2" minimum cover. When 1" or less rustication is used, move front face reinf. bars in to maintain 2" cover. For rustication over 1" in depth, increase stem width to depth of rustication to maintain minimum reinforcement cover.
6. Edges of concrete on all exposed joints and top of stem wall shall be formed with 1/2" vee unless otherwise noted.
7. Construction to be in accordance with Spec. 2411 AND SPECIAL PROVISIONS.
8. When stem heights vary by less than four feet in any panel, the rebars shall be sized and spaced for the maximum height in the panel.
9. When stem heights at the ends of any panel differ by more than four feet, but less than eight feet, the panel shall be divided into two approximately equal parts (or on some other logical basis) for rebar design. The bars for each portion of the panel shall be sized and spaced for the maximum stem height in that portion.
10. When stem heights vary by more than eight feet, the panel shall be divided into 3 parts for rebar design. The maximum stem height in each portion shall be used for determining rebar sizing and spacing in that portion.
11. When stem heights are five feet or less, the rebars shall be sized and spaced as required for h = 5 feet.
12. Vertical bars F and M in stems or varying heights and transverse bars O, P, and Q in footings of varying widths shall vary in length in accordance with the dimensions of the structure.

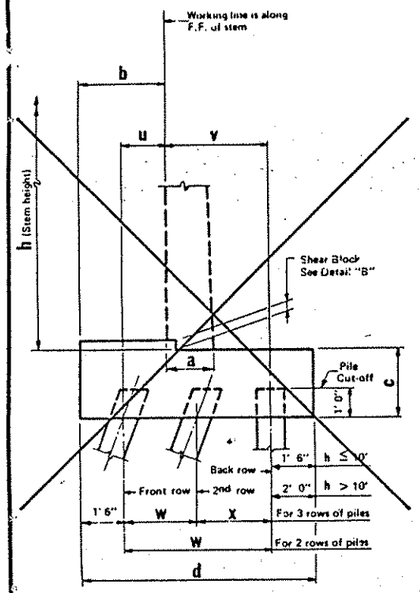
# RETAINING WALL - LEVEL FILL

(STEM DETAILS)

State Proj. No. S.A.P. 02-601-29

Sheet No. 68 of 615 Sheets

Fed. Proj. No.

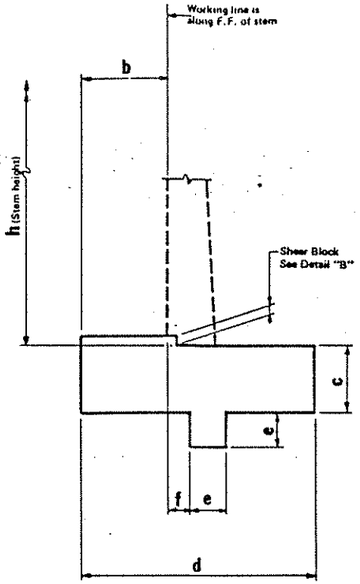



All piles to be battered 4" in 12" in direction shown, except back row.

**TYPICAL SECTION THRU PILE FOOTING**

## PILE FOOTING GEOMETRICS

| h HT. | a WIDTH | b OFFSET | c DEPTH | d WIDTH | u OFFSET | v OFFSET |
|---|---|---|---|---|---|---|
| 5' | 1' 2-1/2" | 1' 3-1/2" | 1' 11" | 4' 0" | -2-1/2" | 1' 2-1/2" |
| 6 | 1 3 | 1 5-1/2 | 2 0 | 4 5 | -0-1/2 | 1 5-1/2 |
| 7 | 1 3-1/2 | 1 7-1/2 | 2 0 | 4 10 | +1-1/2 | 1 8-1/2 |
| 8 | 1 4 | 1 9-1/2 | 2 1 | 5 3 | +3-1/2 | 1 11-1/2 |
| 9 | 1 4-1/2 | 1 11-1/2 | 2 1 | 5 8 | 5-1/2 | 2 2-1/2 |
| 10 | 1 5 | 2 1-1/2 | 2 2 | 6 1 | 7-1/2 | 2 5-1/2 |
| 11 | 1 5-1/2 | 2 3-1/2 | 2 2 | 6 6 | 9-1/2 | 2 2-1/2 |
| 12 | 1 6 | 2 5-1/2 | 2 3 | 6 11 | 11-1/2 | 2 5-1/2 |
| 13 | 1 6-1/2 | 2 7-1/2 | 2 3 | 7 4 | 1 1-1/2 | 2 8-1/2 |
| 14 | 1 7 | 2 9-1/2 | 2 4 | 7 9 | 1 3-1/2 | 2 11-1/2 |
| 15 | 1 7-1/2 | 2 11-1/2 | 2 4 | 8 2 | 1 5-1/2 | 3 2-1/2 |
| 16 | 1 8 | 3 1-1/2 | 2 5 | 8 7 | 1 7-1/2 | 3 5-1/2 |
| 17 | 1 8-1/2 | 3 3-1/2 | 2 5 | 9 0 | 1 9-1/2 | 3 8-1/2 |
| 18 | 1 9 | 3 5-1/2 | 2 6 | 9 5 | 1 11-1/2 | 3 11-1/2 |
| 19 | 1 9-1/2 | 3 7-1/2 | 2 6 | 9 10 | 2 1-1/2 | 4 2-1/2 |
| 20 | 1 10 | 3 9-1/2 | 2 7 | 10 3 | 2 3-1/2 | 4 5-1/2 |
| 21 | 1 10-1/2 | 3 11-1/2 | 2 7 | 10 8 | 2 5-1/2 | 4 8-1/2 |
| 22 | 1 11 | 4 1-1/2 | 2 8 | 11 1 | 2 7-1/2 | 4 11-1/2 |
| 23 | 1 11-1/2 | 4 3-1/2 | 2 8 | 11 6 | 2 9-1/2 | 5 2-1/2 |
| 24 | 2 0 | 4 5-1/2 | 2 9 | 11 11 | 2 11-1/2 | 5 5-1/2 |
| 25 | 2 0-1/2 | 4 7-1/2 | 2 9 | 12 4 | 3 1-1/2 | 5 8-1/2 |
| 26 | 2 1 | 4 9-1/2 | 2 10 | 12 9 | 3 3-1/2 | 5 11-1/2 |
| 27 | 2 1-1/2 | 4 11-1/2 | 2 10 | 13 2 | 3 5-1/2 | 6 2-1/2 |
| 28 | 2 2 | 5 1-1/2 | 2 11 | 13 7 | 3 7-1/2 | 6 5-1/2 |
| 29 | 2 2-1/2 | 5 3-1/2 | 2 11 | 14 0 | 3 9-1/2 | 6 8-1/2 |
| 30 | 2' 3" | 5' 5-1/2" | 3' 0" | 14' 5" | 3' 11-1/2" | 6' 11-1/2" |




**TYPICAL SECTION THRU SPREAD FOOTING**

## SPREAD FOOTING GEOMETRICS

| h HT. | b OFFSET | c DEPTH | d WIDTH | e BLOCK | f OFFSET |
|---|---|---|---|---|---|
| 5' | 9-1/2" | 1' 2" | 3' 0" | 1' 0" | 0' 9-1/2" |
| 6 | 11-1/2 | 1 3 | 3 6-1/2 | 1 0 | 10 |
| 7 | 1 1-1/2 | 1 3 | 4 1 | 1 0 | 10-1/2 |
| 8 | 1 3-1/2 | 1 4 | 4 7-1/2 | 1 0 | 11 |
| 9 | 1 5-1/2 | 1 4 | 5 2 | 1 0 | 11-1/2 |
| 10 | 1 7-1/2 | 1 5 | 5 8-1/2 | 1 0 | 1 0 |
| 11 | 1 9-1/2 | 1 5 | 6 3 | 1 0 | 1 0-1/2 |
| 12 | 1 11-1/2 | 1 6 | 6 9-1/2 | 1 0 | 1 1 |
| 13 | 2 1-1/2 | 1 6 | 7 4 | 1 0 | 1 1-1/2 |
| 14 | 2 3-1/2 | 1 7 | 7 10-1/2 | 1 2 | 1 2 |
| 15 | 2 5-1/2 | 1 7 | 8 5 | 1 2 | 1 2-1/2 |
| 16 | 2 7-1/2 | 1 8 | 8 11-1/2 | 1 2 | 1 3 |
| 17 | 2 9-1/2 | 1 8 | 9 6 | 1 2 | 1 3-1/2 |
| 18 | 2 11-1/2 | 1 9 | 10 0-1/2 | 1 2 | 1 4 |
| 19 | 3 1-1/2 | 1 9 | 10 7 | 1 2 | 1 4-1/2 |
| 20 | 3 3-1/2 | 1 10 | 11 1-1/2 | 1 2 | 1 5 |
| 21 | 3 5-1/2 | 1 10 | 11 8 | 1 2 | 1 5-1/2 |
| 22 | 3 7-1/2 | 1 11 | 12 2-1/2 | 1 4 | 1 6 |
| 23 | 3 9-1/2 | 1 11 | 12 9 | 1 4 | 1 6-1/2 |
| 24 | 3 11-1/2 | 2 0 | 13 3-1/2 | 1 4 | 1 7 |
| 25 | 4 1-1/2 | 2 0 | 13 10 | 1 4 | 1 7-1/2 |
| 26 | 4 3-1/2 | 2 1 | 14 4-1/2 | 1 4 | 1 8 |
| 27 | 4 5-1/2 | 2 1 | 14 11 | 1 4 | 1 8-1/2 |
| 28 | 4 7-1/2 | 2 2 | 15 5-1/2 | 1 4 | 1 9 |
| 29 | 4 9-1/2 | 2 2 | 16 0 | 1 4 | 1 9-1/2 |
| 30 | 4' 11-1/2" | 2' 3" | 16' 6-1/2" | 1' 4" | 1' 10" |

## BASE PRESSURE (KIPS/SQ.FT.)

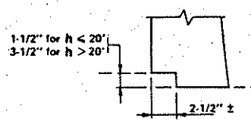
| h HT. | AT TOE | AT HEEL |
|---|---|---|
| 5' | 1.35 | 0.27 |
| 6 | 1.50 | .28 |
| 7 | 1.65 | .29 |
| 8 | 1.82 | .30 |
| 9 | 2.00 | .32 |
| 10 | 2.15 | .34 |
| 11 | 2.30 | .37 |
| 12 | 2.46 | .39 |
| 13 | 2.61 | .41 |
| 14 | 2.77 | .43 |
| 15 | 2.94 | .48 |
| 16 | 3.09 | .51 |
| 17 | 3.23 | .54 |
| 18 | 3.39 | .57 |
| 19 | 3.54 | .60 |
| 20 | 3.68 | .63 |
| 21 | 3.82 | .68 |
| 22 | 4.00 | .71 |
| 23 | 4.12 | .74 |
| 24 | 4.25 | .78 |
| 25 | 4.35 | .80 |
| 26 | 4.50 | .87 |
| 27 | 4.64 | .92 |
| 28 | 4.77 | .96 |
| 29 | 4.88 | 1.00 |
| 30 | 5.00 | 1.03 |

## QTY./LIN. FT. OF FOOTING

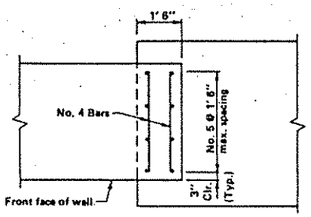
| h HT. | CONCRETE CU. YDS. |
|---|---|
| 5' | .172 |
| 6 | .207 |
| 7 | .233 |
| 8 | .273 |
| 9 | .300 |
| 10 | .348 |
| 11 | .375 |
| 12 | .425 |
| 13 | .456 |
| 14 | .524 |
| 15 | .557 |
| 16 | .617 |
| 17 | .652 |
| 18 | .717 |
| 19 | .753 |
| 20 | .823 |
| 21 | .883 |
| 22 | .976 |
| 23 | 1.016 |
| 24 | 1.097 |
| 25 | 1.139 |
| 26 | 1.225 |
| 27 | 1.269 |
| 28 | 1.361 |
| 29 | 1.406 |
| 30 | 1.502 |

## FOOTING NOTES

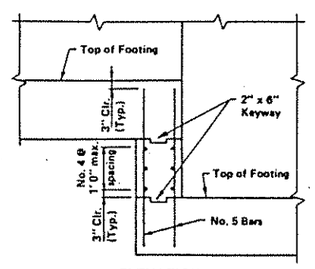
1. Construction joints unloading are permissable. Construction joints shall be located a min. of 2' away from stem joints. A keyway is required.
2. ~~Pile spacing is at bottom of footing.~~
3. ~~Pile spacing shown is based on a design loading of:~~
   ~~24 tons per pile, timber piles,~~
   ~~30 tons per pile, timber piling.~~
4. ~~See Spec. 2452.3C4~~
4. Concrete in footings to be Concrete Mix No. 1A 43
5. Eliminate shear key on spread footing where footing is 6" or more into rock.
6. Where sound very hard rock is encountered the footing shall be keyed into rock as directed by the Engineer.
7. Reinforcement bars shall be deformed Billet Steel bars conforming to ASTM A615 Grade 60.
8. Bar lap at authorized splices: 36 diameters for No. 4 to No. 7 bars and 40 diameters for No. 8 to No. 11 bars.
9. All reinforcement bars to have a 3" minimum cover unless noted otherwise. When rustication is used, move front face vertical dowel K in to maintain 2" cover. For rustication over 1" in depth increase stem width to depth of rustication to maintain reinforcement cover.
10. Maximum longitudinal slope on bottom of footing shall be 10 to 1. Steps shall be used for steeper slopes.
11. ~~Pile per foot quantities listed are approximate figures.~~
12. Footing reinforcement to continue through joints.




**DETAIL B**




**PLAN**




**ELEVATION**

**TYPICAL STEP FOOTING DETAIL**
(Footing reinforcement not shown)

## PILE SPACING — TIMBER PILE SPACING DESIGN LOAD 24 TONS/PILE

(See Spec. 3471 for diameter of piles)

| h HT. | TRANSVERSE W | TRANSVERSE X | LONGITUDINAL ROW FRONT ROW | LONGITUDINAL ROW 2nd ROW | LONGITUDINAL ROW BACK ROW | QTY./LIN. FT. OF FOOTING PILES NO. | QTY./LIN. FT. OF FOOTING CONCRETE CU. YDS. |
|---|---|---|---|---|---|---|---|
| 5' | 1' 0" | | 12' 0" | | 12' 0" | .167 | .291 |
| 6 | 1 5 | | 11 1 | | 12 0 | .173 | .336 |
| 7 | 1 10 | | 10 2 | | 12 0 | .181 | .367 |
| 8 | 2 3 | | 9 3 | | 12 0 | .192 | .415 |
| 9 | 2 8 | | 8 4 | | 12 0 | .203 | .448 |
| 10 | 3 1 | | 7 5 | | 12 0 | .218 | .500 |
| 11 | 3 0 | | 6 10 | | 12 0 | .230 | .534 |
| 12 | 3 5 | | 6 3 | | 12 0 | .243 | .590 |
| 13 | 3 10 | | 5 8 | | 12 0 | .260 | .625 |
| 14 | 4 3 | | 5 1 | | 12 0 | .280 | .685 |
| 15 | 4 8 | | 4 6 | | 12 0 | .308 | .722 |
| 16 | 5 1 | | 4 2 | | 12 0 | .323 | .785 |
| 17 | 5 6 | | 3 10 | | 12 0 | .344 | .823 |
| 18 | 5 11 | | 3 5 | | 12 0 | .369 | .890 |
| 19 | 6 4 | | 3 2 | | 12 0 | .399 | .930 |
| 20 | 6 4 | | 3 7 | | 12 0 | .493 | 1.001 |
| 21 | 7 2 | | 3 6 | | 12 0 | .517 | 1.067 |
| 22 | 7 7 | | 3 5 | | 12 0 | .546 | 1.143 |
| 23 | 3 0 | 5' 0" | 3 4 | 5 0 | 12 0 | .583 | 1.186 |
| 24 | 3 0 | 5 5 | 3 3 | 4 1 | 12 0 | .636 | 1.266 |
| 25 | 3 0 | 5 10 | 3 3 | 3 3 | 12 0 | .638 | 1.310 |
| 26 | 3 0 | 6 3 | 3 1 | 3 1 | 11 0 | .740 | 1.394 |
| 27 | 3 0 | 6 8 | 2 11 | 3 0 | 10 0 | .776 | 1.439 |
| 28 | 3 0 | 7 1 | 2 9 | 2 10 | 9 0 | .828 | 1.527 |
| 29 | 3 0 | 7 6 | 2 7 | 2 9 | 8 0 | .876 | 1.574 |
| 30 | 3' 0" | 7' 11" | 2' 6" | 2' 8" | 7' 0" | .918 | 1.665 |

## PILE SPACING — TIMBER PILE SPACING DESIGN LOAD 30 TONS/PILE

(See Spec. 3471 for diameter of piles)

| h HT. | TRANSVERSE W | TRANSVERSE X | LONGITUDINAL ROW FRONT ROW | LONGITUDINAL ROW 2nd ROW | LONGITUDINAL ROW BACK ROW | QTY./LIN. FT. OF FOOTING PILES NO. | QTY./LIN. FT. OF FOOTING CONCRETE CU. YDS. |
|---|---|---|---|---|---|---|---|
| 5' | 1' 0" | | 12' 0" | | 12' 0" | .167 | .291 |
| 6 | 1 5 | | 12 0 | | 12 0 | .167 | .336 |
| 7 | 1 10 | | 12 0 | | 12 0 | .167 | .367 |
| 8 | 2 3 | | 11 9 | | 12 0 | .168 | .415 |
| 9 | 2 8 | | 10 9 | | 12 0 | .176 | .448 |
| 10 | 3 1 | | 9 9 | | 12 0 | .186 | .500 |
| 11 | 3 0 | | 8 10 | | 12 0 | .197 | .534 |
| 12 | 3 5 | | 7 11 | | 12 0 | .210 | .590 |
| 13 | 3 10 | | 7 0 | | 12 0 | .226 | .625 |
| 14 | 4 3 | | 6 5 | | 12 0 | .239 | .685 |
| 15 | 4 8 | | 5 10 | | 12 0 | .255 | .722 |
| 16 | 5 1 | | 5 3 | | 12 0 | .274 | .785 |
| 17 | 5 6 | | 4 8 | | 12 0 | .298 | .823 |
| 18 | 5 11 | | 4 3 | | 11 8 | .321 | .890 |
| 19 | 6 4 | | 3 11 | | 11 0 | .346 | .930 |
| 20 | 6 9 | | 3 8 | | 10 4 | .370 | 1.001 |
| 21 | 7 2 | | 3 5 | | 9 9 | .395 | 1.067 |
| 22 | 7 7 | | 3 2 | | 9 0 | .427 | 1.143 |
| 23 | 3 0 | 5' 0" | 4 2 | 6' 3" | 12 0 | .483 | 1.186 |
| 24 | 3 0 | 5 5 | 4 1 | 5 1 | 12 0 | .525 | 1.266 |
| 25 | 3 0 | 5 10 | 4 1 | 4 1 | 12 0 | .570 | 1.310 |
| 26 | 3 0 | 6 3 | 3 10 | 3 10 | 12 0 | .605 | 1.394 |
| 27 | 3 0 | 6 8 | 3 8 | 3 9 | 12 0 | .623 | 1.439 |
| 28 | 3 0 | 7 1 | 3 5 | 3 7 | 11 3 | .661 | 1.527 |
| 29 | 3 0 | 7 6 | 3 3 | 3 5 | 10 0 | .700 | 1.574 |
| 30 | 3' 0" | 7' 11" | 3' 1" | 3' 4" | 8' 9" | .739 | 1.665 |

## CONCRETE RETAINING WALL NOTES

ALL MATERIAL AND PLACING, INCLUDING REINFORCEMENT BARS, CONCRETE FOR STEM & FOOTING, JOINT MATERIAL, DRAINAGE SYSTEM, EXCAVATION, BACKFILL, TEMPORARY SOIL SUPPORT SYSTEMS, AND ALL HARDWARE NEEDED FOR 6' FENCE ARE INCLUDED IN PRICE BID FOR CONCRETE RETAINING WALL.

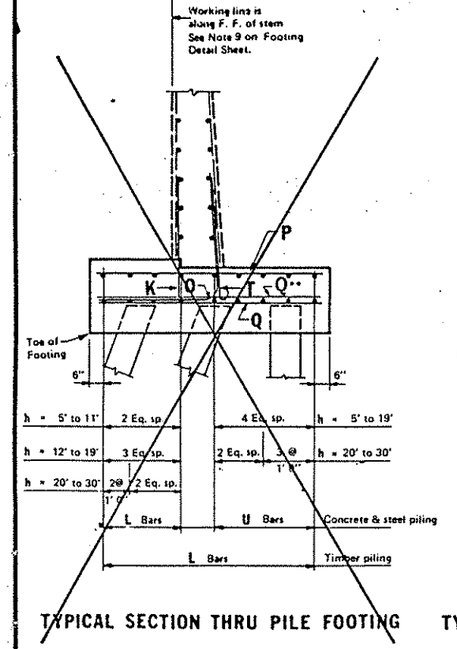
REVERSE BATTEN SURFACE TREATMENT IS INCLUDED IN PRICE BID FOR CONCRETE RETAINING WALL. SEE SPECIAL PROVISIONS.

FOOTING DIMENSIONS SHOWN ON SHEET G7 ARE GUIDELINES ONLY. ACTUAL DIMENSIONS MAY BE DETERMINED FROM MN/DOT STANDARD SHEETS 5-297.620 AND THE ENGINEER'S APPROVAL.

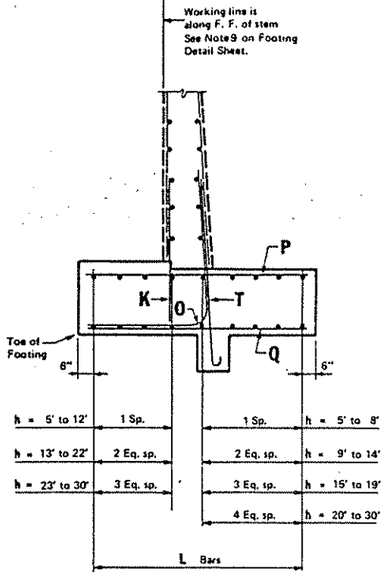
# RETAINING WALL - LEVEL FILL

(FOOTING DETAIL - SPREAD FOOTING & TIMBER PILING)

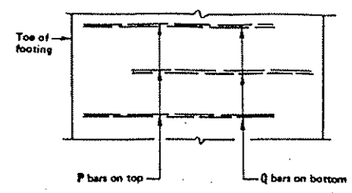
Fed. Proj. No.



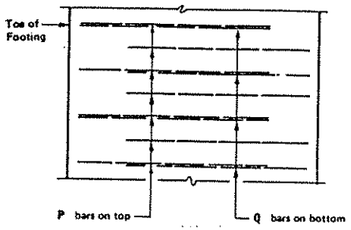

TYPICAL SECTION THRU PILE FOOTING




TYPICAL SECTION THRU SPREAD FOOTING




CASE 1

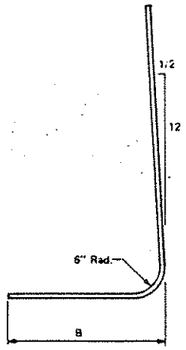



CASE 2

PART FOOTING PLAN
(SHOWING STAGGERED P AND Q BARS ONLY)

| TYPE OF FOOTING | CASE 1 | CASE 2 |
|---|---|---|
| TIMBER PILING | h = 5' to 22' | h = 23' to 30' |
| CONCRETE PILING | h = 5' to 24' | h = 25' to 30' |
| STEEL PILING | h = 5' to 24' | h = 25' to 30' |
| SPREAD | h = 5' to 18' | h = 19' to 30' |

P bars and Q bars are spaced according to wall heights




BAR O

BAR T*

* Hook bars in Spread Footing from bar size #8 and up.

SPREAD FOOTING REINFORCEMENT BARS

| h | K (FRONT DOWELS) | | | L (LONGIT.) | | O (TOE) | | | | P (TRANSVERSE) | | | Q (TRANSVERSE) | | | T (BACK DOWELS) | | | WEIGHT /LIN. FT. OF WALL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HT. | SIZE | LENGTH | SPAC. | SIZE | NO. | SIZE | LENGTH | SPAC. | B | SIZE | LENGTH | SPAC. | SIZE | LENGTH | SPAC. | SIZE | LENGTH | SPAC. | POUNDS |
| 5' | # 4 | 3' 0" | 12" | # 5 | 8 | | | | | # 4 | 2' 8" | 14 1/2" | # 4 | 2' 6" | 14-1/2" | # 4 | 3' 5" | 14-1/2" | 15.35 |
| 6 | 4 | 3 0 | 12 | 5 | 8 | | | | | 4 | 2 11 | 14-1/2 | 4 | 2 11 | 14-1/2 | 4 | 3 6 | 14 1/2 | 15.86 |
| 7 | 4 | 3 0 | 12 | 5 | 8 | | | | | 4 | 3 4 | 14-1/2 | 4 | 3 4 | 14 1/2 | 4 | 3 6 | 14-1/2 | 16.32 |
| 8 | 4 | 3 0 | 12 | 5 | 8 | | | | | 4 | 3 9 | 14-1/2 | 4 | 3 9 | 14-1/2 | 4 | 3 7 | 14-1/2 | 16.83 |
| 9 | 4 | 3 0 | 12 | 5 | 10 | | | | | 4 | 4 2 | 14-1/2 | 4 | 4 2 | 14-1/2 | 4 | 3 7 | 14-1/2 | 19.45 |
| 10 | 4 | 3 0 | 12 | 5 | 10 | | | | | 4 | 4 7 | 14-1/2 | 4 | 4 7 | 14-1/2 | 5 | 4 1 | 14-1/2 | 21.46 |
| 11 | 4 | 3 0 | 12 | 5 | 10 | | | | | 5 | 5 0 | 14-1/2 | 4 | 5 0 | 14-1/2 | 5 | 4 1 | 14-1/2 | 23.47 |
| 12 | 4 | 3 0 | 12 | 5 | 10 | # 4 | 5' 7" | 14-1/2" | 3' 1" | 5 | 5 5 | 14-1/2 | 4 | 5 5 | 14-1/2 | 4 | 3 9 | 14-1/2 | 25.69 |
| 13 | 4 | 3 0 | 12 | 5 | 12 | 5 | 6 3 | 14-1/2 | 3 3 | 6 | 5 10 | 14-1/2 | 4 | 5 10 | 14 1/2 | 4 | 3 9 | 14-1/2 | 32.89 |
| 14 | 4 | 3 0 | 12 | 5 | 12 | 5 | 6 6 | 14-1/2 | 3 6 | 6 | 6 3 | 14-1/2 | 4 | 6 3 | 14-1/2 | 5 | 4 5 | 14-1/2 | 35.69 |
| 15 | 4 | 3 0 | 12 | 5 | 14 | 6 | 7 1 | 14 1/2 | 3 8 | 7 | 6 8 | 14-1/2 | 4 | 6 8 | 14-1/2 | 5 | 4 5 | 14-1/2 | 44.11 |
| 16 | 5 | 4 0 | 12 | 5 | 14 | 6 | 7 4 | 14 1/2 | 3 11 | 7 | 7 1 | 14 1/2 | 4 | 7 1 | 14 1/2 | 6 | 4 10 | 14-1/2 | 50.41 |
| 17 | 5 | 4 0 | 12 | 5 | 14 | 7 | 8 0 | 14 1/2 | 4 1 | 8 | 7 6 | 14-1/2 | 4 | 7 6 | 14 1/2 | 6 | 4 10 | 14-1/2 | 59.64 |
| 18 | 5 | 4 0 | 12 | 5 | 14 | 7 | 8 3 | 13 | 4 4 | 8 | 7 11 | 13 | 4 | 7 11 | 13 | 6 | 4 11 | 13 | 66.16 |
| 19 | 5 | 4 0 | 12 | 5 | 14 | 7 | 8 6 | 13 | 4 6 | 8 | 8 4 | 6 1/2 | 4 | 8 4 | 13 | 7 | 5 4 | 13 | 73.73 |
| 20 | 5 | 4 0 | 12 | 5 | 16 | 8 | 9 5 | 13 | 4 11 | 7 | 8 9 | 6 1/2 | 4 | 8 9 | 13 | 7 | 5 5 | 13 | 93.40 |
| 21 | 5 | 4 0 | 12 | 5 | 16 | 8 | 9 8 | 13 | 5 2 | 7 | 9 2 | 6 1/2 | 5 | 9 2 | 13 | 8 | 7 0 | 13 | 106.06 |
| 22 | 5 | 4 0 | 12 | 5 | 16 | 9 | 10 5 | 13 | 5 4 | 7 | 9 7 | 6 1/2 | 5 | 9 7 | 13 | 8 | 7 3 | 13 | 117.51 |
| 23 | 5 | 4 0 | 12 | 5 | 18 | 9 | 10 8 | 13 | 5 7 | 8 | 10 0 | 6 1/2 | 5 | 10 0 | 13 | 9 | 8 1 | 13 | 141.49 |
| 24 | 5 | 4 0 | 12 | 5 | 18 | 10 | 11 4 | 13 | 5 9 | 8 | 10 5 | 6 1/2 | 5 | 10 5 | 13 | 9 | 8 2 | 13 | 155.75 |
| 25 | 5 | 4 0 | 12 | 5 | 18 | 10 | 11 7 | 13 | 6 0 | 8 | 10 10 | 6 1/2 | 5 | 10 10 | 13 | 10 | 8 9 | 13 | 168.72 |
| 26 | 5 | 4 0 | 12 | 5 | 18 | 11 | 12 4 | 14 1/2 | 6 2 | 9 | 11 3 | 7 | 5 | 11 3 | 14-1/2 | 11 | 9 6 | 14 1/2 | 195.01 |
| 27 | 5 | 4 0 | 12 | 5 | 18 | 11 | 12 7 | 14 1/2 | 6 5 | 10 | 11 9 | 7 | 5 | 11 8 | 14 1/2 | 11 | 9 6 | 14 1/2 | 216.96 |
| 28 | 5 | 4 0 | 12 | 5 | 18 | 11 | 12 10 | 13 | 6 7 | 10 | 12 1 | 6 1/2 | 5 | 12 1 | 13 | 11 | 9 7 | 13 | 241.29 |
| 29 | 5 | 4 0 | 12 | 5 | 18 | 11 | 13 1 | 12 | 6 7 | 10 | 12 6 | 6 | 5 | 12 6 | 12 | 11 | 9 7 | 12 | 264.77 |
| 30' | # 5 | 4' 0" | 12" | # 5 | 18 | # 11 | 13' 4" | 11" | 6' 10" | # 9 | 12' 11" | 5 1/2" | # 5 | 12' 11" | 11" | # 11 | 9' 8" | 11" | 267.55 |

USE WITH SPREAD FOOTING ONLY

PILE FOOTING REINFORCEMENT BARS

| h | K (FRONT DOWELS) | | | O (TOE) | | | | T (BACK DOWELS) | | | L (LONGIT.) | P (TRANSVERSE) | | | Q (TRANSVERSE) | | | WEIGHT /LIN. FT. OF WALL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HT. | SIZE | LENGTH | SPAC. | SIZE | LENGTH | SPAC. | B | SIZE | LENGTH | SPAC. | SIZE | SIZE | LENGTH | SPAC. | SIZE | LENGTH | SPAC. | POUNDS |
| 5' | # 4 | 3' 0" | 12" | | | | | # 4 | 3' 5" | 14-1/2" | # 5 | # 4 | 3' 0" | 14 1 2" | # 4 | 3' 0" | 14-1/2 | 23.90 |
| 6 | 4 | 3 0 | 12 | | | | | 4 | 3 5 | 14 1/2 | 5 | 4 | 3 4 | 14-1/2 | 4 | 3 4 | 14 1/2 | 24.27 |
| 7 | 4 | 3 0 | 12 | | | | | 4 | 3 5 | 14 1/2 | 5 | 4 | 3 8 | 14-1/2 | 4 | 3 8 | 14 1/2 | 24.64 |
| 8 | 4 | 3 0 | 12 | | | | | 4 | 3 5 | 14 1/2 | 5 | 4 | 4 0 | 14-1/2 | 4 | 4 0 | 14 1/2 | 25.01 |
| 9 | 4 | 3 0 | 12 | # 4 | 5' 8" | 14 1/2" | 2' 11" | 4 | 3 5 | 14 1/2 | 5 | 4 | 4 4 | 14-1/2 | 4 | 4 4 | 14 1/2 | 28.51 |
| 10 | 4 | 3 0 | 12 | 4 | 5 11 | 14 1/2 | 3 2 | 5 | 3 11 | 14-1/2 | 5 | 4 | 4 8 | 14-1/2 | 4 | 4 8 | 14 1/2 | 30.51 |
| 11 | 4 | 3 0 | 12 | 4 | 6 1 | 14 1/2 | 3 4 | 5 | 3 11 | 14 1/2 | 5 | 4 | 5 0 | 14-1/2 | 5 | 5 0 | 14 1/2 | 32.52 |
| 12 | 4 | 3 0 | 12 | 4 | 6 4 | 14 1/2 | 3 7 | 4 | 3 5 | 14-1/2 | 5 | 5 | 5 4 | 14-1/2 | 5 | 5 4 | 14 1/2 | 33.73 |
| 13 | 4 | 3 0 | 12 | 5 | 6 11 | 14 1/2 | 3 9 | 4 | 3 5 | 14 1/2 | 5 | 5 | 5 8 | 14-1/2 | 5 | 5 8 | 14 1/2 | 38.43 |
| 14 | 4 | 3 0 | 12 | 5 | 7 2 | 14 1/2 | 4 0 | 5 | 3 11 | 14 1/2 | 5 | 5 | 6 0 | 14-1/2 | 5 | 6 0 | 14 1/2 | 40.72 |
| 15 | 4 | 3 0 | 12 | 6 | 7 8 | 14 1/2 | 4 2 | 5 | 3 11 | 14 1/2 | 5 | 6 | 6 4 | 14-1/2 | 5 | 6 4 | 14 1/2 | 47.04 |
| 16 | 5 | 4 0 | 12 | 6 | 7 11 | 14 1/2 | 4 5 | 6 | 4 4 | 14 1/2 | 5 | 6 | 6 8 | 14-1/2 | 6 | 6 8 | 14 1/2 | 54.76 |
| 17 | 5 | 4 0 | 12 | 7 | 8 6 | 14 1/2 | 4 7 | 6 | 4 4 | 14 1/2 | 5 | 7 | 7 0 | 14-1/2 | 5 | 7 0 | 14 1/2 | 60.62 |
| 18 | 5 | 4 0 | 12 | 7 | 8 10 | 13 | 4 10 | 6 | 4 5 | 13 | 5 | 7 | 7 3 | 13 | 5 | 7 3 | 13 | 66.39 |
| 19 | 5 | 4 0 | 12 | 7 | 9 0 | 13 | 5 0 | 7 | 5 0 | 13 | 5 | 7 | 7 6 | 13 | 6 | 7 6 | 13 | 73.91 |
| 20 | 5 | 4 0 | 12 | 8 | 10 0 | 13 | 5 3 | 7 | 5 1 | 13 | 5 | 7 | 7 9 | 13 | 5 | 7 9 | 13 | 83.44 |
| 21 | 5 | 4 0 | 12 | 8 | 10 2 | 13 | 5 | 8 | 5 10 | 13 | 5 | 8 | 8 0 | 13 | 6 | 8 0 | 13 | 97.36 |
| 22 | 5 | 4 0 | 12 | 9 | 11 0 | 13 | 5 8 | 8 | 5 11 | 13 | 5 | 8 | 8 3 | 13 | 6 | 8 3 | 13 | 107.99 |
| 23 | 5 | 4 0 | 12 | 9 | 11 2 | 13 | 5 10 | 9 | 6 9 | 13 | 5 | 8 | 8 6 | 13 | 6 | 8 6 | 13 | 112.17 |
| 24 | 5 | 4 0 | 12 | 10 | 11 11 | 13 | 6 1 | # 9 | 6 10 | 13 | 5 | 8 | 8 9 | 13 | 6 | 8 9 | 13 | 134.32 |
| 25 | 5 | 4 0 | 12 | 10 | 12 1 | 13 | 6 3 | 10 | 7 5 | 13 | 5 | 8 | 9 0 | 13 | 6 | 9 0 | 13 | 144.09 |
| 26 | 5 | 4 0 | 12 | 11 | 12 11 | 14 1/2 | 6 6 | 11 | 8 2 | 14 1/2 | 5 | 8 | 9 3 | 7 | 4 | 9 3 | 14 1/2 | 167.34 |
| 27 | 5 | 4 0 | 12 | 11 | 13 1 | 14 1/2 | 6 8 | 11 | 8 2 | 14 1/2 | 5 | 8 | 9 6 | 7 | 4 | 9 6 | 14 1/2 | 169.33 |
| 28 | 5 | 4 0 | 12 | 11 | 13 5 | 13 | 6 11 | 11 | 8 3 | 13 | 5 | 8 | 9 9 | 6 1/2 | 6 | 9 9 | 13 | 194.97 |
| 29 | 5 | 4 0 | 12 | 11 | 13 7 | 12 | 7 1 | 11 | 8 3 | 12 | 5 | 8 | 10 0 | 6 | 6 | 10 0 | 12 | 214.54 |
| 30' | # 5 | 4' 0" | 12" | # 11 | 13' 11" | 11" | 7' 4" | # 11 | 8' 4" | 11" | # 5 | # 8 | 10' 3" | 5 1/2" | # 5 | 10' 3" | 11" | 227.37 |

USE WITH ALL PILING

| h | L (LONGIT.) | P (TRANSVERSE) | | | Q① (TRANSVERSE) | | | Q② (TRANSVERSE) | | | U (LONGIT.) | | ① WEIGHT /LIN. FT. OF WALL | ② WEIGHT /LIN. FT. OF WALL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HT. | SIZE | SIZE | LENGTH | SPAC. | SIZE | LENGTH | SPAC. | SIZE | LENGTH | SPAC. | SIZE | NO. | POUNDS | POUNDS |
| 5' | # 5 | # 4 | 3' 0" | 14-1/2" | # 4 | 3' 0" | 14 1/2" | # 4 | 3' 0" | 14 1/2" | # 6 | 10 | 28.49 | 28.49 |
| 6 | 5 | 4 | 3 3 | 14-1/2 | 4 | 3 4 | 14 1/2 | 4 | 3 4 | 14 1/2 | 6 | 10 | 28.86 | 28.86 |
| 6 | 5 | 4 | 3 8 | 14-1/2 | 4 | 3 8 | 14 1/2 | 4 | 3 8 | 14 1/2 | 6 | 10 | 29.23 | 29.23 |
| 6 | 5 | 4 | 4 0 | 14-1/2 | 4 | 4 0 | 14 1/2 | 5 | 4 0 | 14 1/2 | 6 | 10 | 29.60 | 30.84 |
| 6 | 5 | 4 | 4 4 | 14-1/2 | 4 | 4 4 | 14 1/2 | 7 | 4 4 | 14 1/2 | 6 | 10 | 36.09 | 38.04 |
| 6 | 5 | 4 | 4 8 | 14 1/2 | 4 | 4 8 | 14 1/2 | 8 | 4 8 | 14 1/2 | 6 | 10 | 40.42 | 42.84 |
| 6 | 5 | 4 | 5 0 | 14-1/2 | 5 | 5 0 | 14-1/2 | 8 | 5 0 | 14-1/2 | 6 | 10 | 43.85 | 43.85 |
| 8 | 5 | 4 | 5 4 | 14-1/2 | 5 | 5 4 | 14-1/2 | 9 | 5 4 | 14-1/2 | 6 | 10 | 45.50 | 48.73 |
| 8 | 5 | 5 | 5 8 | 14-1/2 | 5 | 5 8 | 14-1/2 | 9 | 5 8 | 14-1/2 | 6 | 10 | 50.65 | 54.08 |
| 8 | 5 | 5 | 6 0 | 14 1/2 | 5 | 6 0 | 14 1/2 | 9 | 6 0 | 14-1/2 | 6 | 10 | 53.39 | 57.01 |
| 8 | 6 | 6 | 6 4 | 14 1/2 | 6 | 6 4 | 14 1/2 | 9 | 6 4 | 14-1/2 | 6 | 10 | 60.17 | 63.99 |
| 8 | 6 | 6 | 6 8 | 14-1/2 | 6 | 6 8 | 14 1/2 | 9 | 6 8 | 14-1/2 | 6 | 10 | 65.80 | 69.83 |
| 8 | 5 | 7 | 7 0 | 14-1/2 | 5 | 7 0 | 14 1/2 | 10 | 7 0 | 14-1/2 | 6 | 10 | 78.87 | 84.10 |
| 8 | 5 | 7 | 7 3 | 13 | 5 | 7 3 | 13 | 10 | 7 3 | 13 | 6 | 10 | 86.76 | 92.80 |
| 8 | 5 | 7 | 7 6 | 13 | 5 | 7 6 | 13 | 11 | 7 6 | 13 | 6 | 10 | 97.89 | 104.88 |
| 10 | 5 | 7 | 7 9 | 13 | 5 | 7 9 | 13 | 11 | 7 9 | 13 | 6 | 12 | 112.26 | 119.49 |
| 10 | 5 | 8 | 8 0 | 13 | 5 | 8 0 | 13 | 11 | 8 0 | 13 | 6 | 12 | 131.01 | 131.01 |
| 10 | 5 | 8 | 8 3 | 13 | 5 | 8 3 | 13 | 11 | 8 3 | 13 | 6 | 12 | 142.52 | 142.52 |
| 10 | 5 | 9 | 8 6 | 13 | 5 | 8 6 | 13 | 9 | 8 6 | 13 | 6 | 12 | 142.20 | 149.29 |
| 10 | 5 | 9 | 8 9 | 13 | 5 | 8 9 | 13 | 10 | 8 9 | 13 | 6 | 12 | 150.43 | 163.62 |
| 10 | 5 | 9 | 9 0 | 13 | 5 | 9 0 | 13 | 10 | 9 0 | 13 | 6 | 12 | 179.80 | 188.19 |
| 10 | 6 | 9 | 9 3 | 14-1/2 | 6 | 9 3 | 14 1/2 | 8 | 9 3 | 7-1/4 | 6 | 12 | 193.78 | 208.63 |
| 10 | 6 | 9 | 9 6 | 14 1/2 | 6 | 9 6 | 14 1/2 | 10 | 9 6 | 7-1/4 | 6 | 12 | 206.36 | 237.31 |
| 10 | 6 | 9 | 9 9 | 13 | 6 | 9 9 | 13 | 10 | 9 9 | 13 ** | 6 | 12 | 217.86 | 264.41 |
| 10 | 6 | 10 | 10 0 | 12 | 6 | 10 0 | 12 | 10 | 10 0 | 12 ** | 6 | 12 | 270.03 | 288.09 |
| 10 | 6 | # 8 | 10' 3" | 5 1/2" | # 6 | 10' 3" | 11" | 10 | 10' 3" | 11"** | # 6 | 12 | 297.36 | 311.56 |

USE WITH CONCRETE PILING ONLY

① For Design Load 50 Tons/Pile

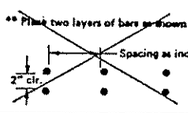
② For Design Load 60 Tons/Pile

USE WITH STEEL PILING ONLY

| h | L (LONGIT.) | P (TRANSVERSE) | | | Q (TRANSVERSE) | | | U (LONGIT.) | | WEIGHT /LIN. FT. OF WALL | h |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HT. | SIZE | SIZE | LENGTH | SPAC. | SIZE | LENGTH | SPAC. | SIZE | NO. | POUNDS | HT. |
| 5' | # 6 | # 3 | 3' 0" | 14-1/2" | # 4 | 3' 0" | 14 1/2" | * 7 | 10 | 36.67 | 5' |
| 6 | 6 | 4 | 3 4 | 14-1/2 | 4 | 3 4 | 14 1/2 | 7 | 10 | 37.03 | 6 |
| 6 | 6 | 4 | 3 8 | 14-1/2 | 4 | 3 8 | 14 1/2 | 7 | 10 | 37.40 | 7 |
| 6 | 6 | 4 | 4 0 | 14-1/2 | 4 | 4 0 | 14 1/2 | 7 | 10 | 37.77 | 8 |
| 6 | 6 | 4 | 4 4 | 14 1/2 | 5 | 4 4 | 14 1/2 | 7 | 10 | 42.62 | 9 |
| 6 | 6 | 4 | 4 8 | 14-1/2 | 7 | 4 8 | 14 1/2 | 7 | 10 | 48.59 | 10 |
| 6 | 6 | 4 | 5 0 | 14-1/2 | 8 | 5 0 | 14-1/2 | 7 | 10 | 49.43 | 11 |
| 6 | 8 | 4 | 5 4 | 14 1/2 | 8 | 5 4 | 14 1/2 | 7 | 10 | 54.59 | 12 |
| 6 | 8 | 5 | 5 8 | 14-1/2 | 8 | 5 8 | 14 1/2 | 7 | 10 | 59.75 | 13 |
| 6 | 8 | 5 | 6 0 | 14-1/2 | 8 | 6 0 | 14 1/2 | 7 | 10 | 66.11 | 14 |
| 6 | 8 | 6 | 6 4 | 14-1/2 | 8 | 6 4 | 14 1/2 | 7 | 10 | 73.08 | 15 |
| 6 | 8 | 6 | 6 8 | 14-1/2 | 8 | 6 8 | 14 1/2 | 7 | 10 | 71.44 | 16 |
| 6 | 8 | 7 | 7 0 | 14-1/2 | 6 | 7 0 | 14 1/2 | 7 | 10 | 76.96 | 17 |
| 6 | 8 | 7 | 7 3 | 13 | 7 | 7 3 | 13 | 7 | 10 | 86.77 | 18 |
| 6 | 8 | 7 | 7 6 | 13 | 7 | 7 6 | 13 | 7 | 10 | 91.34 | 19 |
| 6 | 10 | 7 | 7 9 | 13 | 6 | 7 9 | 13 | 7 | 12 | 103.32 | 20 |
| 6 | 10 | 8 | 8 0 | 13 | 6 | 8 0 | 13 | 7 | 12 | 113.06 | 21 |
| 6 | 10 | 8 | 8 3 | 13 | 6 | 8 3 | 13 | 7 | 12 | 124.59 | 22 |
| 6 | 10 | 9 | 8 6 | 13 | 6 | 8 6 | 13 | 7 | 12 | 138.41 | 23 |
| 6 | 10 | 9 | 8 9 | 13 | 6 | 8 9 | 13 | 7 | 12 | 152.09 | 24 |
| 6 | 10 | 9 | 9 0 | 6 1/2 | 4 | 9 0 | 13 | 7 | 12 | 160.70 | 25 |
| 6 | 10 | 8 | 9 3 | 7 | 4 | 9 3 | 14-1/2 | 7 | 12 | 183.95 | 26 |
| 6 | 10 | 8 | 9 6 | 7 | 6 | 9 6 | 14-1/2 | 7 | 12 | 192.52 | 27 |
| 6 | 10 | 8 | 9 9 | 6 1/2 | 7 | 9 9 | 13 | 7 | 12 | 216.96 | 28 |
| 6 | 10 | 8 | 10 0 | 6 | 7 | 10 0 | 12 | 7 | 12 | 233.57 | 29 |
| * 6 | 10 | # 8 | 10' 3" | 5 1/2" | # 6 | 10' 3" | 11" | # 7 | 12 | 249.21 | 30' |

NOTE: Reinforcement quantities for pile footings include bars K, O & T

** Place two layers of bars as shown




# RETAINING WALL - LEVEL FILL

(FOOTING REINFORCEMENT)

Feb. 27, 1980

State Proj. No. S.A.P. 02-601-29

Sheet No. G10 of G15 Sheets

Fed. Proj. No.

N

MANOMIN COUNTY PARK

NOTE: PLACE GROUTED RIPRAP FROM OUTLET TO STREAM AS DIRECTED BY ENG. IN FIELD (APPROX. QUANTITY = 30 CU. YD.). THIS WORK SHALL BE CONSIDERED INCIDENTAL TO STORM SEWER CONSTRUCTION.

BR. 02541

CAUTION: BURIED GAS —

GROUTED RIPRAP

RICE CREEK

WOODS

BANFILL TAVERN

E.R.R. P.I. 84+87.53
Δ = 11° 45'
D = 3° 00'
R = 1909.86'
T = 196.52'
L = 391.67'

E.R.R. P.C. 82+91.01

E.R.R. PT 86+82.68

HARTMAN CIRCLE

B.M. ELEV. 843.77
TOP HYDRANT
STA. 84+96, 38' LT.

NOTE: 84+96 LT. — RELOCATE HYD. 20' N.W.

NOTE: 85+04 TO 86+30 LT — RELOCATE SPRINKLER SYSTEM 20' WEST.

WOOD RET. WALL

STONE RET. WALL

CONC. RETAINING WALL

+00 END PROJECT

END TAPER

BEG. TAPER

+13.68 BEG. PROJECT L.S.

PR 1 PR 2 PR 3 PR 4 PR 8 PR 9 PR 13 PR 14 PR 15 PR 16 PR 17 PR 18 PR 19 PR 20 PR 21

+85 RAD. PT. (2°)

+80 RAD. PT. (2°)

+30 RAD. PT. (2°)

+15 RAD. PT. (3°)

+50 RAD. PT. (2°)

40' R.

5' T.E.

15' T.E.

10:1

33:1

T-BUR

BIT.

CONC.

1-S-F 6765

1-S-F 6745

1-S-F 6755

1-S-F 6775

1-S-F 6795

NOTE: 76+83 RT. — RELOCATE HYD. 7' EAST

NOTE: ADJUST RDWY. IN VICINITY OF BRIDGE TO MATCH DECK ELEVATIONS.

E.R.R. P.T. 80+80.35

E.R.R. P.C. 75+13.68

RICE CREEK WAY

LOCKE RD.

LOCKE LAKE

E.R.R. P.I. 78+08.90
Δ = 39° 40'
D = 7° 00'
R = 818.51'
T = 295.22'
L = 566.67'

B.M. ELEV. 834.09
TOP HYDRANT
STA. 76+83, 49' RT.

WEST GUTTER
P.V.I. @ 80+50 EL. 826.50
G1 = -1.83%
G2 = 2.00%
M = 1.92'
L = 400'

EAST GUTTER
P.V.I. @ 80+50 EL. 822.27
G1 = 2.00%
G2 = 4.61%
M = 3.31'
L = 400'

100' V.C. M = 0.10'

400' V.C. M = 2.63'

400' V.C. M = 1.37

PROFILE GRADE

1.2%

-2.0%

3.25%

0.51%

15" x 127' R.C.P. 1.0%

15" x 135' R.C.P. 1.9%

15" x 100' R.C.P. 1.8%

18" x 70' R.C.P. 1.1%

21" x 52' R.C.P. 0.6%

21" x 50' R.C.P. 0.6%

24" x 53' R.C.P. 2.0%

12" x 32' R.C.P. 1.5%

12" x 52' R.C.P. 2.0%

12" x 31" R.C.P. 1.0%

12" x 44' R.C.P. 1.0%

12" x 38' R.C.P. 1.0%

15" x 48' R.C.P. 1.7%

12" x 47' R.C.P. 1.0%

18" x 170' R.C.P. 2.0%

12" x 32' R.C.P. 2.0%

12" x 13' R.C.P. 1.0%

12" x 37' R.C.P. 1.0%

24" x 47' R.C.P. 2.0%

18" x 38' R.C.P. 0.55%

12" x 47' R.C.P. 1.0%

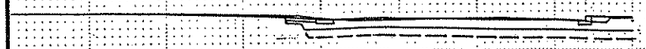
State Proj. No. S.A.P. 02-601-29

Sheet No. 611 of 615 Sheets

Fed. Proj. No.

75+61.6 834.19
BIT. ENT. LT.

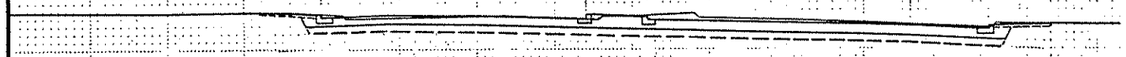
EXC. FILL



EXC. FILL

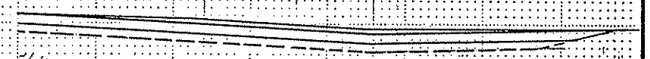
77+35 830.94
℄ RICE CR. WAY RT.

75+50 834.36



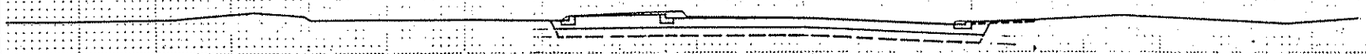
77+23 831.22
SO. GUTTER RICE CR. WAY RT.

323 183



MATCH INPLACE @ 75+13.68

75+00 835.08

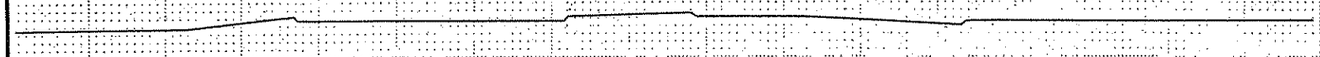


77+21 831.15
ENT. LT.

86 51

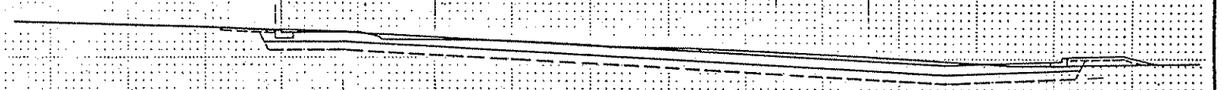
MATCH INPLACE @ 74+65 RT.

74+60 835.51

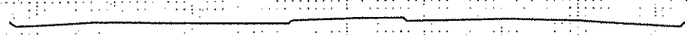


473 256

77+00 831.59

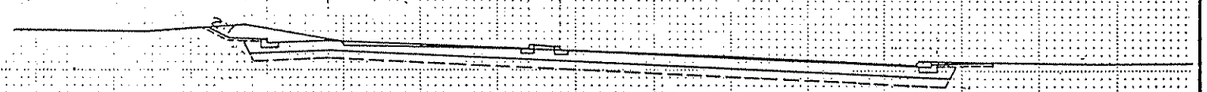


74+00 835.90

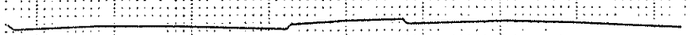


473 256

76+50 832.50

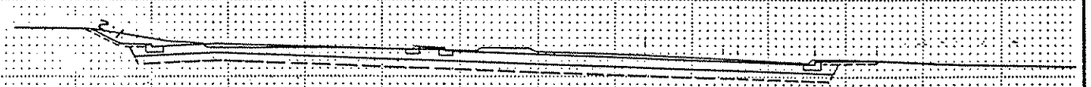


73+50 836.36

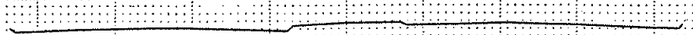


443 229

76+00 833.28



73+00 836.79



417 225

STA 73+00 TO STA. 77+35

State Proj. No. S.A.P. 02-601-29

Sheet No. 612 of 615 Sheets

Fed. Proj. No.

80+00 827.26

EXC FILL

82+00 830.03

EXC FILL

79+50 827.47

377 296

81+70 829.17
BIT. ENT. RT.

79+00 827.91

386 302

81+50 828.80

418 357

78+50 828.64

367 307

81+25 828.24

78+00 829.61

360 277

BRIDGE #02541
STA. 80+62.96 TO STA. 81+19.04
SEE SHEETS TO

126 137

859 538

77+54 830.59
NO. GUTTER RICE CR. WAY RT.

80+50 827.50

78 42

77+46 830.76
ENT. LT.

482 314

STA. 77+46 TO STA. 82+00

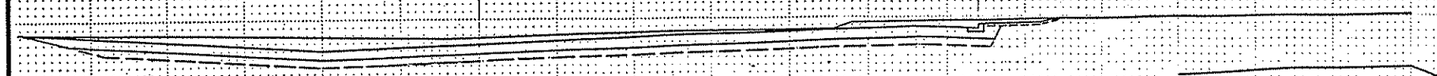
State Proj. No. S.A.P. 02-601-29

Sheet No. 613 of 615 Sheets

Fed. Proj. No.

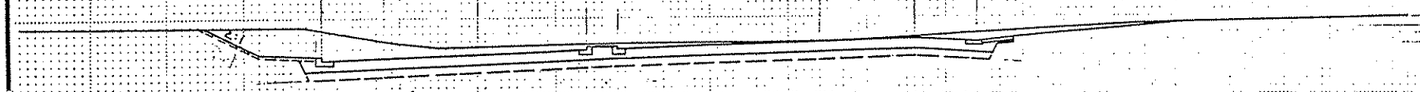
EXC FILL

84+50 838.30
SO. GUTTER HARTMAN CIRCLE LT.



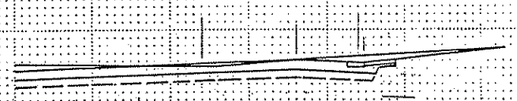
84+00 836.72
CONC. ENT. RT.

588 218

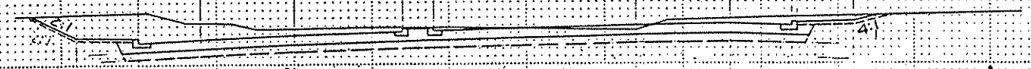



83+68 835.64
CONC. ENT. RT.

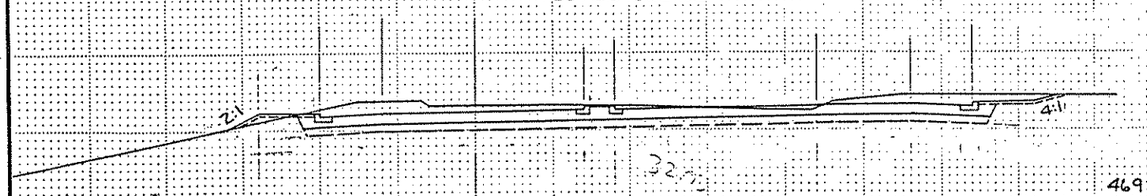
622 221



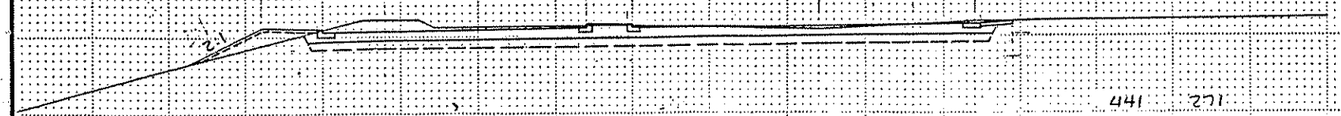
83+50 834.88




83+00 833.06



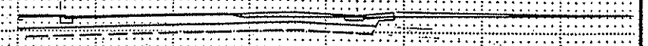

82+50 831.43
BIT. ENT. RT.



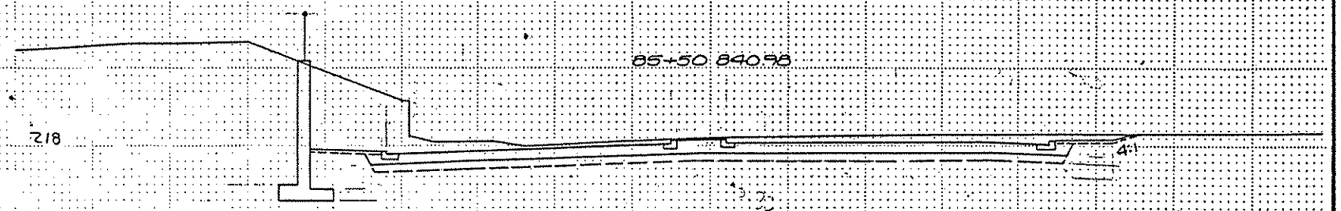

441 271

85+89.5 841.70
BIT. ENT. RT.

EXC FILL



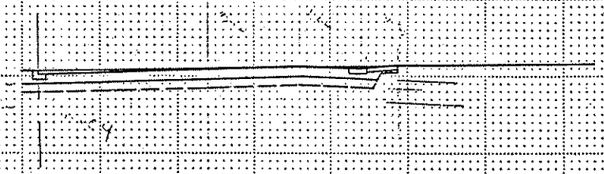
85+50 840.98



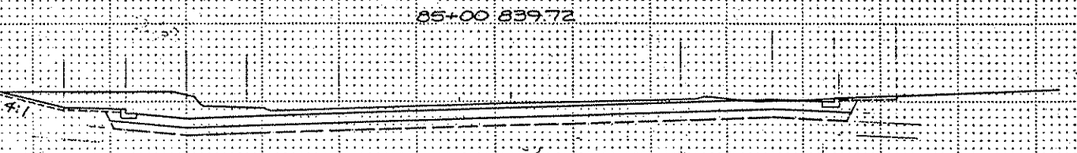

SEE SHT. 67 FOR LIMITS OF FOUNDATION
SUBCUT.

85+38 840.66
BIT. ENT. RT.

673 232



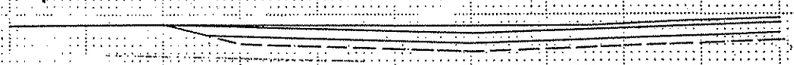
85+00 839.72




547 237

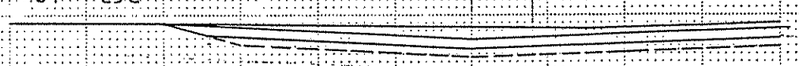
84+95 839.53
NO. GUTTER HARTMAN CIRCLE LT.

539 228



84+72 838.96
℄ HARTMAN CIRCLE LT.

469 252



STA. 82+50 TO STA. 85+89.5

State Proj. No. S.A.P. 02-601-29

Sheet No. 614 of 615 Sheets

Fed. Proj. No.

EXC FILL

88+05 844.24
SO. GUTTER LOCKE LAKE RD. RT.

88+00 844.20

431 197

87+50 843.74

512 194

87+00 843.26

653 207

86+50 842.72

637 718

86+00 841.94

677 224

SEE SHT. G7 FOR LIMITS OF FOUNDATION SUBCUT.

EXC FILL

90+00 845.33

89+00 844.71

769 363

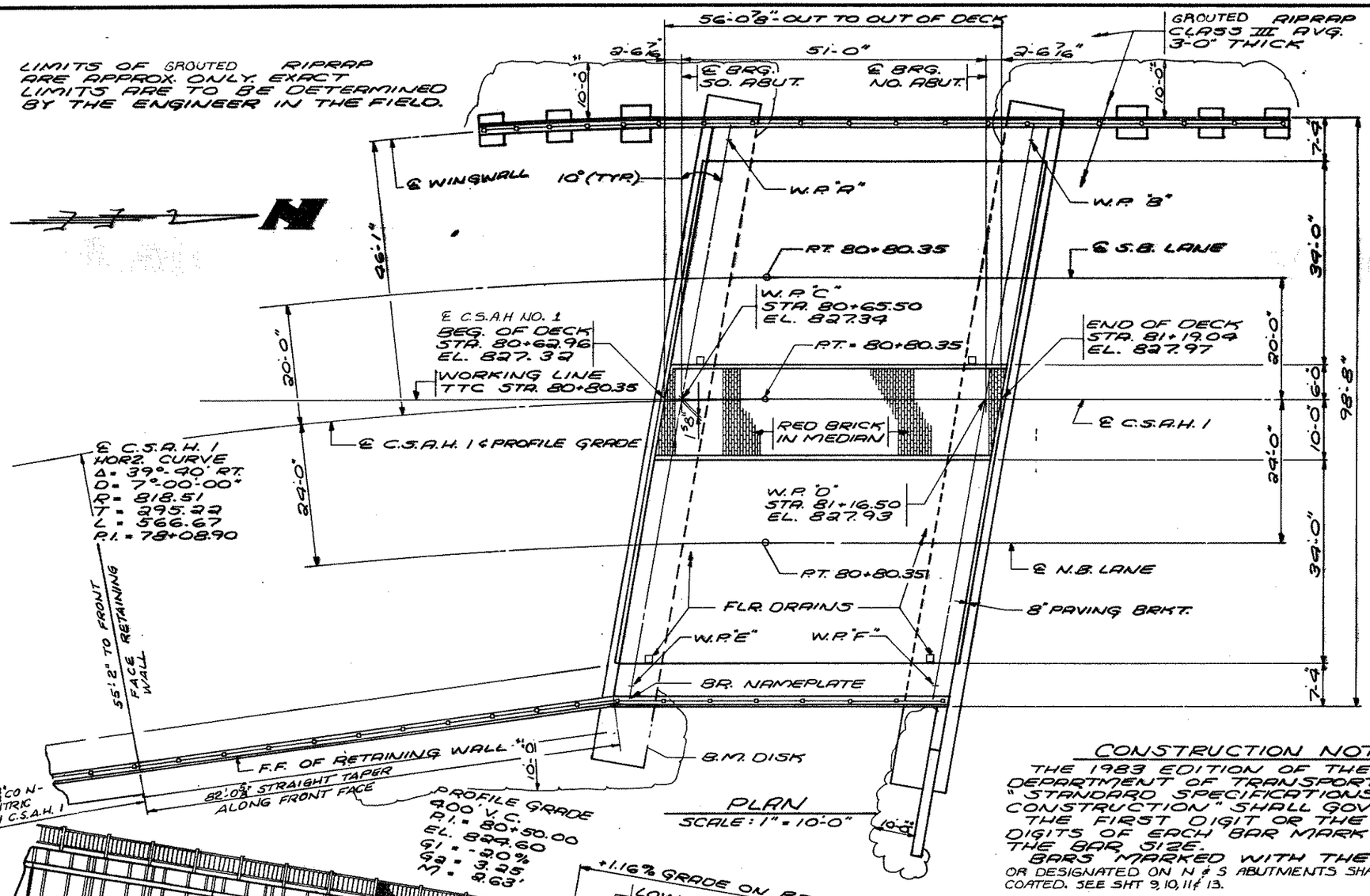
88+40 844.48
NO. GUTTER LOCKE LAKE RD. RT.

88+24 844.41
℄ LOCKE LAKE RD. RT.

STA. 86+00 TO STA. 90+00

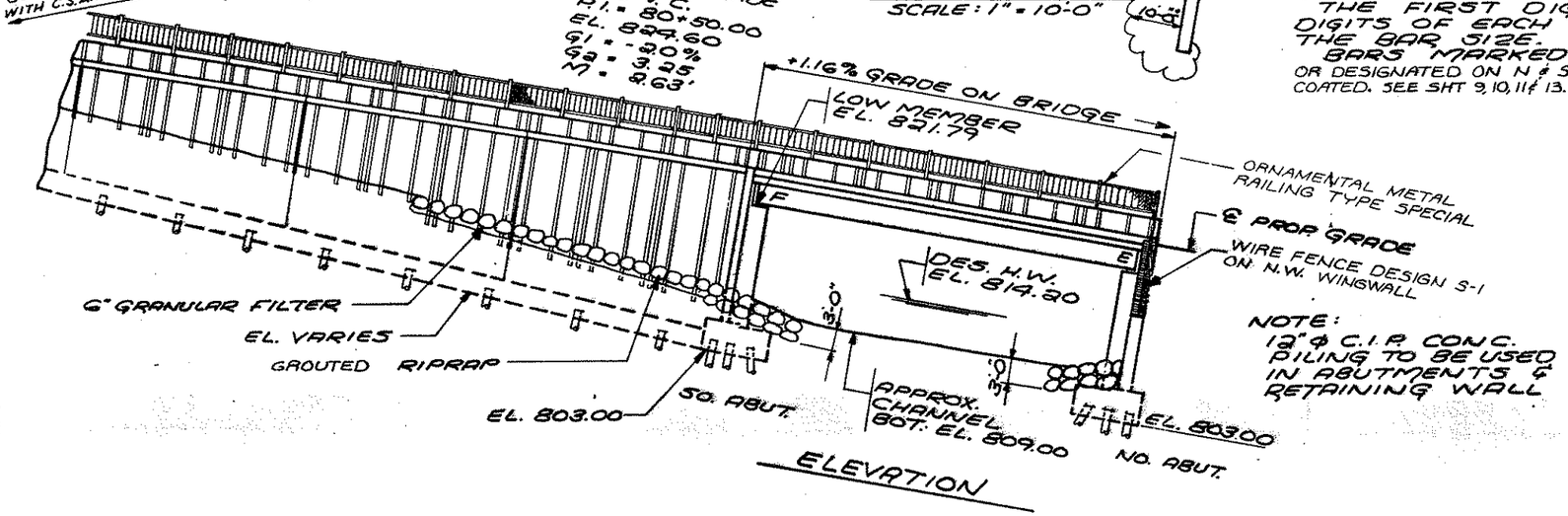
State Proj. No. S.A.P. 02-601-29 Sheet No. G15 of G15 Sheets

LIMITS OF GROUTED RIPRAP ARE APPROX. ONLY. EXACT LIMITS ARE TO BE DETERMINED BY THE ENGINEER IN THE FIELD.




PLAN
SCALE: 1" = 10'-0"

PROFILE GRADE
400' V.C.
P.I. = 80+50.00
EL. 824.60
G1 = -2.0%
G2 = 3.25
M = 2.63




ELEVATION

## CONSTRUCTION NOTES

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

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

BARS MARKED WITH THE SUFFIX "E" OR DESIGNATED ON N & S ABUTMENTS SHALL BE EPOXY COATED. SEE SHT 9, 10, 11 & 13.

NOTE:
12" ϕ C.I.P. CONC. PILING TO BE USED IN ABUTMENTS & RETAINING WALL

B.M. EL. 834.09 (MSL 1929 ADJ.)
TOP NUT OF HYDRANT S.E. QUAD EAST RIVER ROAD & RICE CREEK WAY.

## DESIGN DATA

1983 & INTERIM A.A.S.H.T.O. DESIGN SPECS. LOAD FACTOR DESIGN METHOD HS-20 LOADING- INCLUDES 17 P.S.F. DEAD LOAD ALLOWANCE FOR FUTURE WEARING COURSE MODIFICATIONS.

REINFORCED CONCRETE:
f'c = 4000 P.S.I. n = 8
fy = 60000 P.S.I. REINFORCEMENT

STRUCTURAL STEEL:
fy = 36000 P.S.I. SPEC. 3306
fy = 50000 P.S.I. SPEC. 3309

PRESTRESSED CONCRETE:
fy = 270,000 P.S.I. (LOW RELAXATION STRANDS)
fc = 4000 P.S.I. n = 6

DECK AREA = 3533 SQ. FT.
PROJECTED ADT IS OVER 20,000

## LIST OF SHEETS



APPROVED: Paul K. Lund
ANOKA CO. ENGINEER
DATE: Jan. 23, 1987

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION & THAT I AM A DULY REGISTERED PROFFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA
Robert R. Erickson
REG. NO. 6924
DATE: 1-15-87

ANOKA CO. C.S.A.H. 1
MINNESOTA DEPARTMENT OF TRANSPORTATION

# BRIDGE NO. 02541

0.25 MILES NO. OF C.S.A.H. 6 ON C.S.A.H. 1 OVER RICE CREEK
51'-0" SIMPLE STEEL BM. SPAN
2-34'-0" ROADWAY
7° CURVE 10° SKEW
SPAN IDENT. NO. 501

## GENERAL PLAN & ELEVATION

SEC. 15 TWP. 30N R. 24W
ANOKA COUNTY
APPROVED: Darwin A. England
1/15/88 for BRIDGE ENGINEER

## SCHEDULE OF QUANTITIES FOR PRESTRESSED CONC. BM. ALTERNATE

| ITEM NO. | 2405.501 | 2405.511 | 0402.606 | 0402.607 | | | 0011.601 | |
|---|---|---|---|---|---|---|---|---|
| ITEM | PRESTRESSED CONC. BMS. TYPE 36 - 53 | DIAPHRAGMS FOR TYPE 36 PREST. BEAMS | FIXED CURVED PLATE BRG. ASSEMBLY TYPE 1 | EXPANSION CURVED PLATE BRG. ASSEMBLY TYPE 1 | | | REVISED BRIDGE PLANS | |
| UNIT | EACH | LIN. FT. | EACH | EACH | | | LUMP SUM | |
| QUANTITY | 10 | 92 | 10 | 10 | | | 1 | |

## PRESTRESSED CONC. BM. SCHEDULE

| BEAM TYPE | 36 - 53 | | |
|---|---|---|---|
| NO. OF STRAIGHT STRANDS | 16 | | |
| NO. OF DRAPED STRANDS | 8 | | |
| TOTAL NO. OF STRANDS | 24 | | |
| ① f'ci | 5780 | | |
| ② f'c | 6000 | | |
| BEAM SPACING | 10'-3" | | |
| INT. DIAPH. DETAIL | 8403, 8802, 1 SPECIAL | | |
| | | | |
| | | | |

## CURVED PLATE BEARING ASSEMBLY SCHEDULE

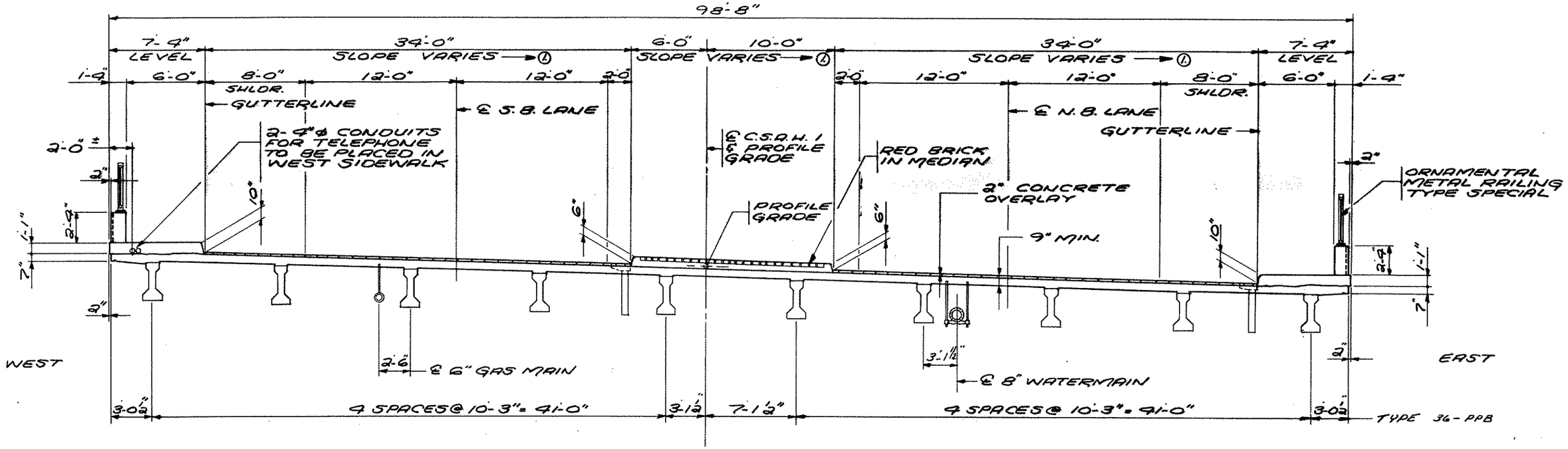
| BEARING ASS'Y. TYPE | FIXED TYPE 1 | EXPANSION TYP 1 | |
|---|---|---|---|
| DETAIL NO. | 8310 | 8311 | |
| MAXIMUM MOVEMENT | ——— | 5/8" | |
| DESIGN DEAD LOAD | 53 KIPS | 53 KIPS | |
| DES. DEAD & LIVE LOAD | 123 KIPS | 123 KIPS | |
| | | | |
| | | | |

PRESTRESSED CONC. BM. ALTERNATE

DES. | DR. | CHK. | CHK. | APR 7-15-88

Sheet No. 1AR of 45 Sheets

Bridge No. 02541



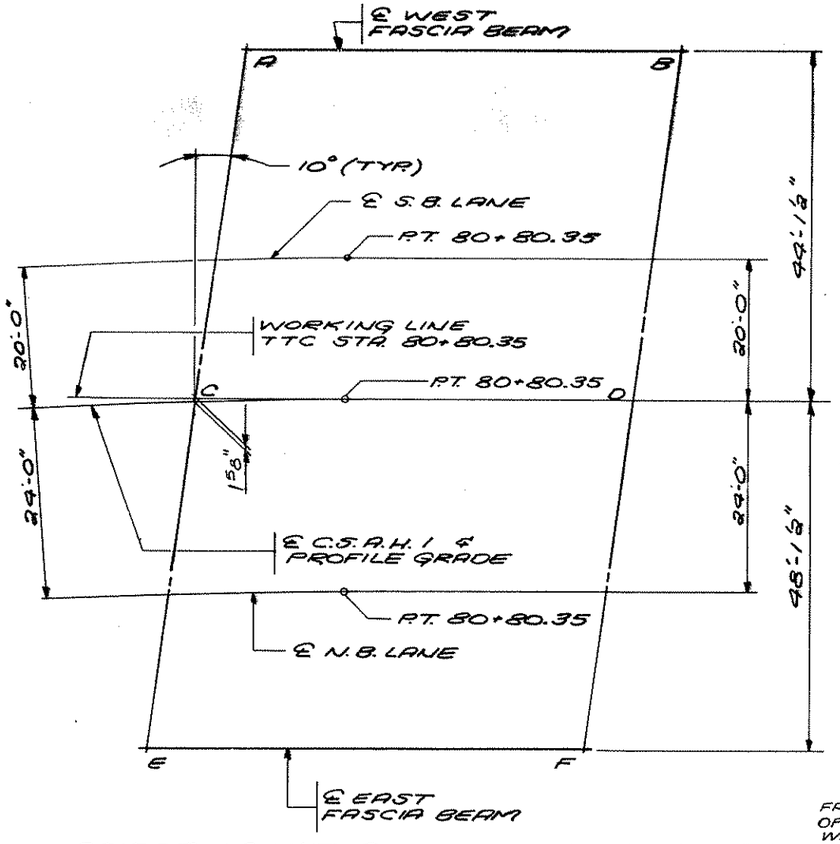

## TRANSVERSE SECTION THRU DECK

SCALE: ¼" = 1'-0"

① TRANS. SLOPE ACROSS THE DECK HAVE BEEN SET USING VERTICAL CURVES AT PROFILE GRADE AND BOTH GUTTERLINES. SEE VERTICAL CURVES BELOW

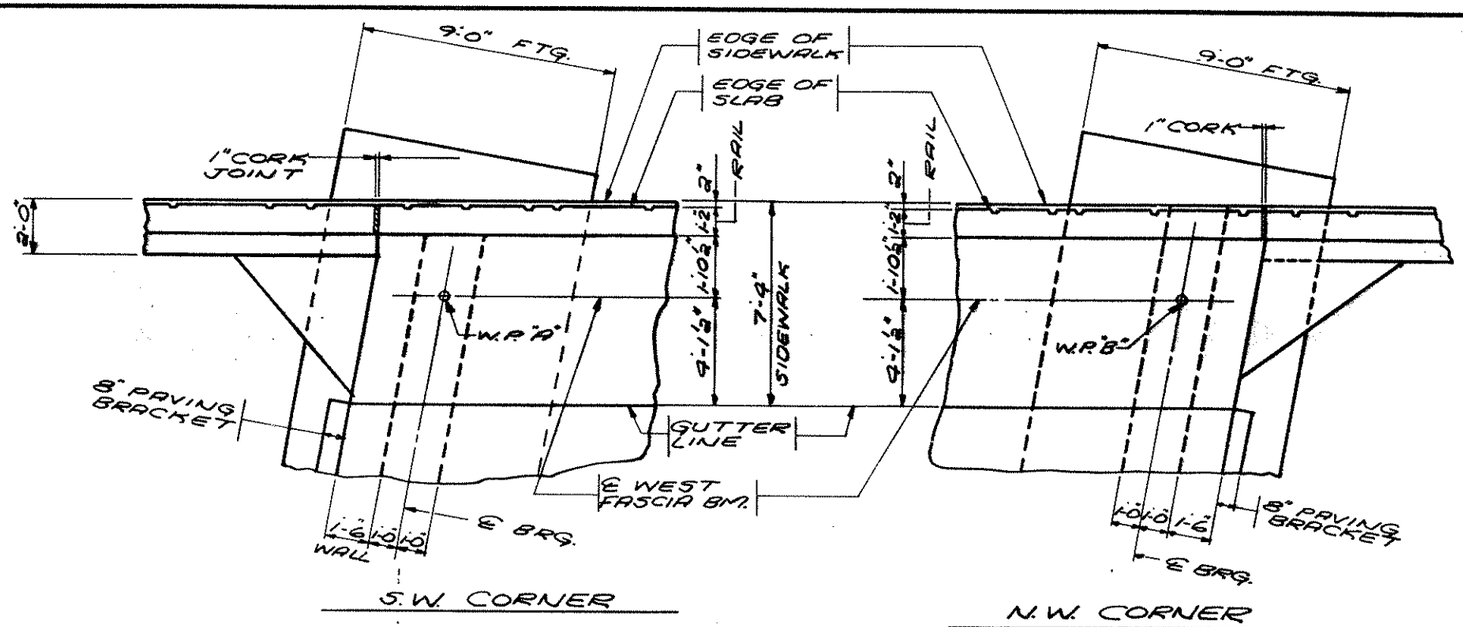
| WEST GUTTER | PROFILE GRADE | EAST GUTTER |
|---|---|---|
| 400' V.C. | 400' V.C. | 400' V.C. |
| P.I. = 80+50.00 | P.I. = 80+50.00 | P.I. = 80+50.00 |
| EL. 826.50 | EL. = 829.60 | EL. = 822.27 |
| G1 = -1.83% | G1 = -3.0% | G1 = -2.00% |
| G2 = 2.00% | G2 = 3.25% | G2 = 2.61% |
| M = 1.92' | M = 2.63' | M = 3.31' |

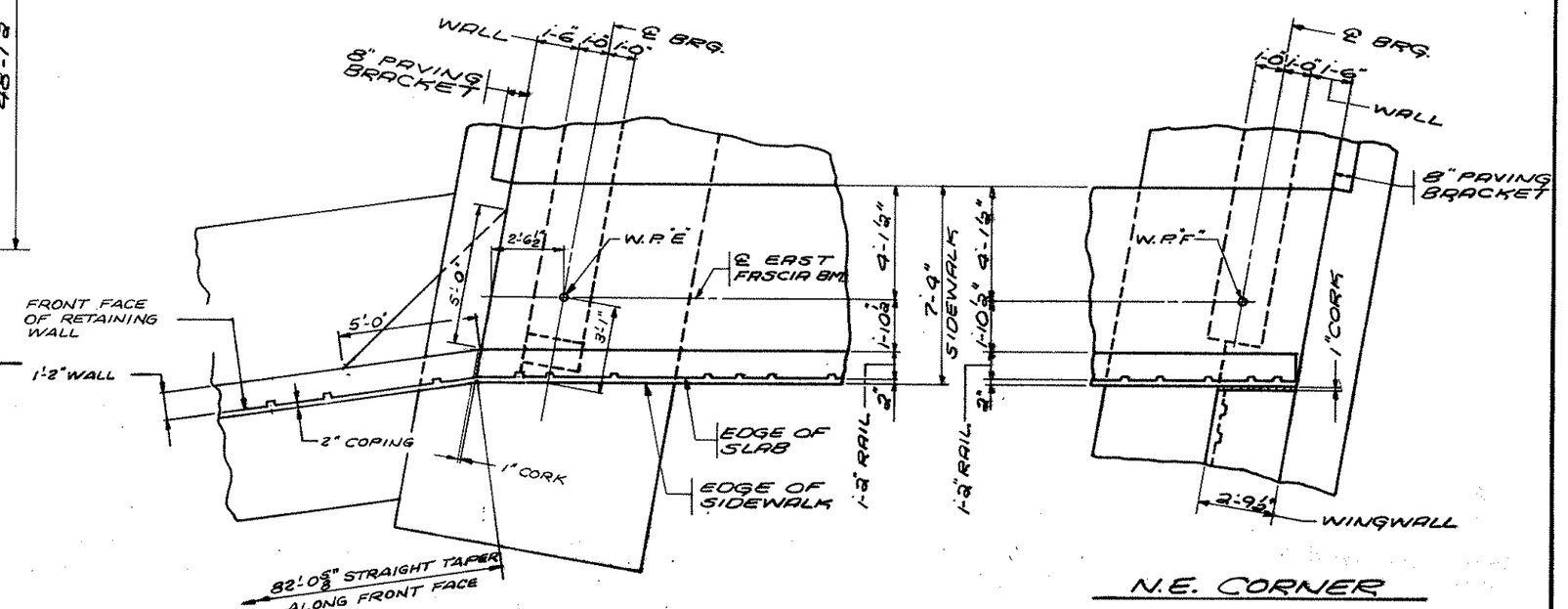
| | | | | |
|---|---|---|---|---|
| TRANSVERSE SECTION THRU DECK | DRAWN: O.J.V. | CHECKED: R.R.T. | APPROVED: 7-15-88 | BRIDGE NUMBER 02541 |
| | SHEET 28 OF 45 SHEETS | | | |




BRIDGE LAYOUT SHOWING WORKING POINTS
NO SCALE

| TOP OF SLAB TO BRIDGE SEAT | | |
|---|---|---|
| | S. ABUT. | N. ABUT. |
| SLAB THICKNESS | 9" | 9" |
| STOOL HEIGHT | 1 5/8" | 1 3/4" |
| BEAM HEIGHT | 36" | 36" |
| BEARING HEIGHT | 3 3/4" | 4 3/8" |
| | | |
| TOTAL | 4'-2 3/8" | 4'-3 1/8" |



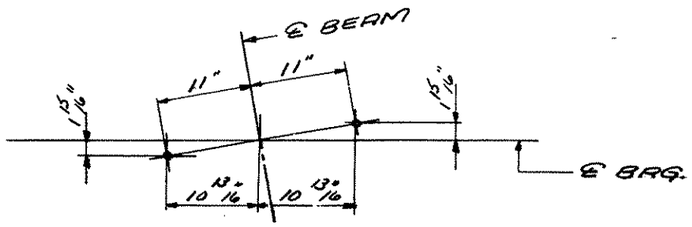




| DIMENSIONS BETWEEN WORKING POINTS | | | | | | | | ELEVATIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| POINT | STATION | A | B | C | D | E | F | TOP OF WR. CR. | W.C. TO BR. SEAT | BRIDGE SEAT | POINT |
| A | 80+73.64 | | 51.00 | 44.81 | 61.77 | | 98.57 | 828.46 | 4.20 | 824.26 | A |
| B | 81+24.28 | | | 73.50 | 44.81 | 114.17 | | 828.74 | 4.26 | 824.48 | B |
| C | 80+65.50 | | | | 51.00 | 48.87 | 64.21 | 827.34 | —— | —— | C |
| D | 81+16.50 | | | | | 76.51 | 48.81 | 827.93 | —— | —— | D |
| E | 80+55.56 | | | | | | 51.00 | 825.67 | 4.20 | 821.47 | E |
| F | 81+08.01 | | | | | | | 826.61 | 4.26 | 822.35 | F |

CORNER DETAILS
SCALE: 3/8" = 1'-0"

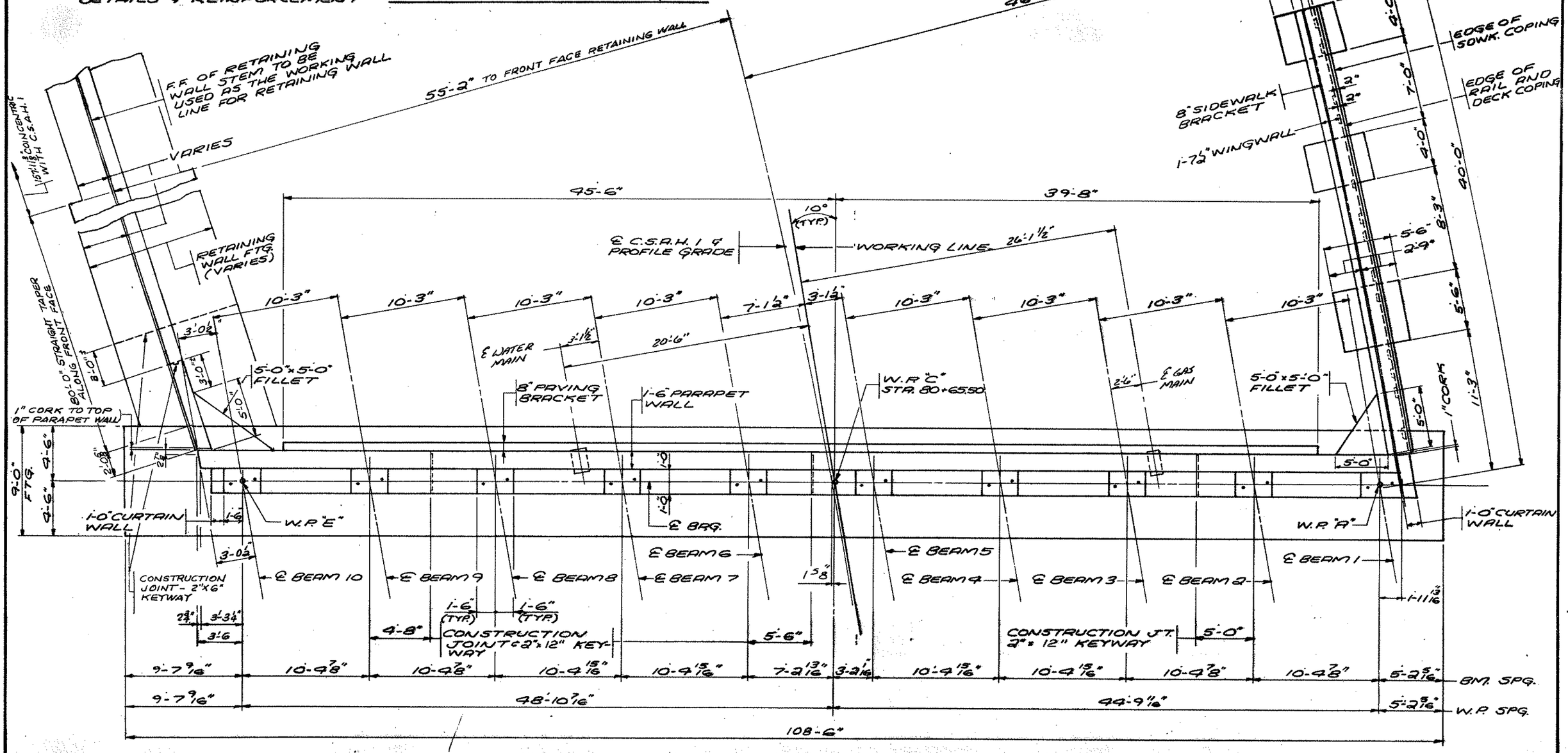
S.A.P. 02-601-29

| BRIDGE LAYOUT & CORNER DETAILS | DRAWN: O.J.V. | CHECKED: R.R.T. | APPROVED: 7-15-98 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 3A OF 45 SHEETS | | | |




TYP. ANCHOR ROD SPG.

NOTE:
SEE SHEETS 25-29 FOR RETAINING WALL DETAILS & REINFORCEMENT

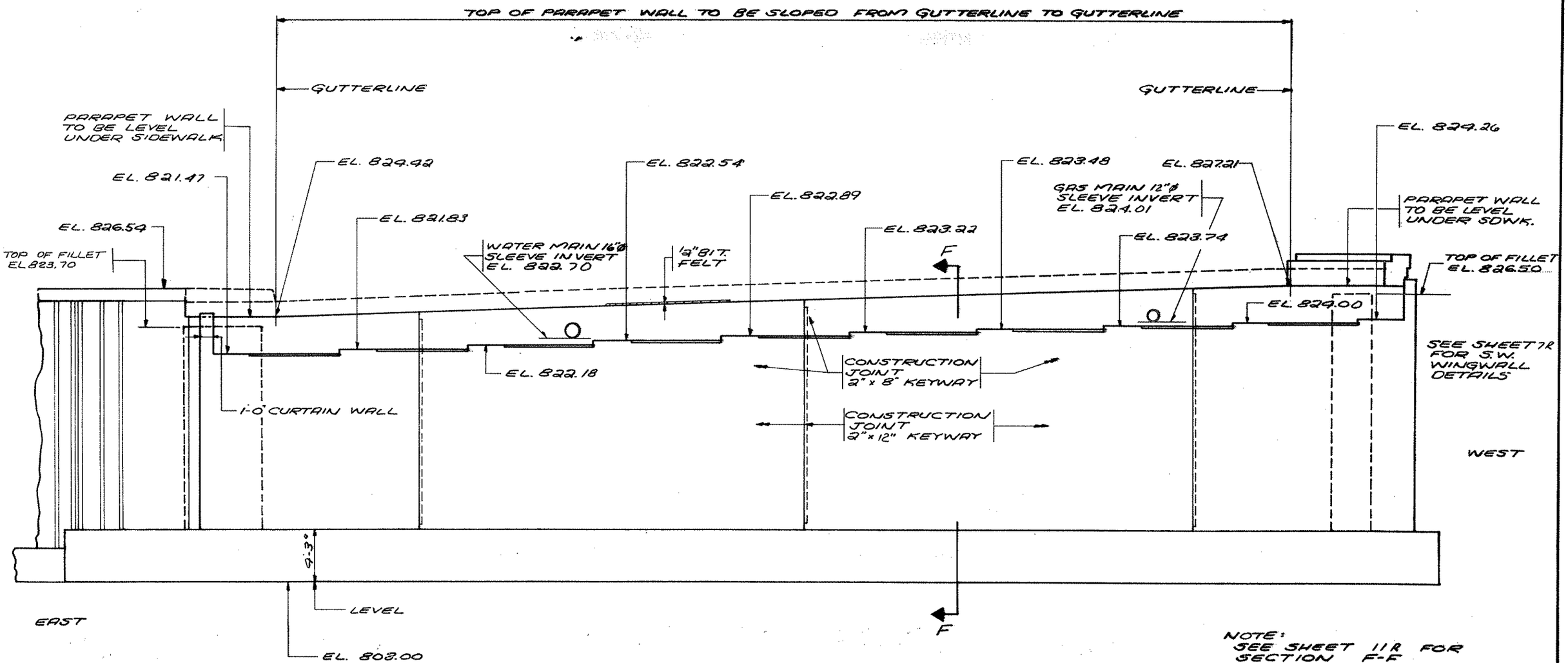



PLAN
SCALE: 1/4"=1'-0"

S.D.P. 02-601-29

| 30. ABUTMENT DETAILS | DRAWN: O.J.V. | CHECKED R.R.T. | APPROVED 7-15-98 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 48 OF 95 SHEETS | | | |

NOTE:
SEE SHEETS 25-29
FOR RETAINING
WALL DETAILS




NOTE:
SEE SHEET 11R FOR
SECTION F-F

SOUTH ABUTMENT ELEVATION
SCALE: ¼" = 1'-0"

S.A.P. 02-601-89

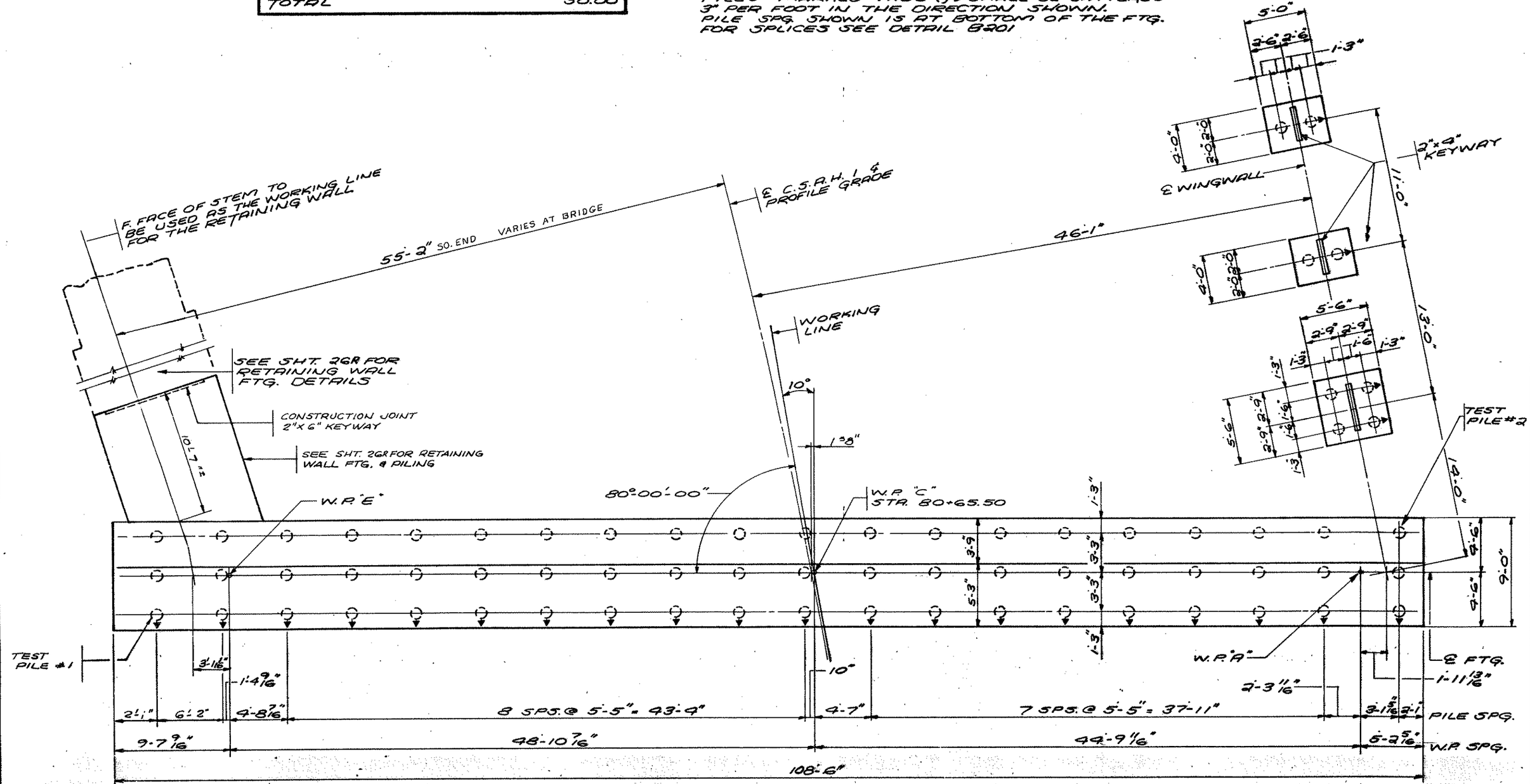
| | | | | |
|---|---|---|---|---|
| SO. ABUTMENT DETAILS | DRAWN: O.J.V. | APPROVED: 7-15-98 | CHECKED: R.R.T. | BRIDGE NUMBER 02541 |
| | SHEET 5R OF 95 SHEETS | | | |

| COMPUTED PILE LOADS - TONS PER PILE | |
|---|---|
| DEAD LOAD + EARTH PRESSURE = | 42.6 |
| LIVE LOAD | 7.4 |
| TOTAL | 50.00 |

## PILE NOTES

2 - C.I.P. CONC. TEST PILES 35 FT. LONG
58 - C.I.P. CONC. PILES EST. LENGTH 25 FT.
4 - C.I.P. CONC. WINGWALL PILES EST. LENGTH 25 FT.
4 - C.I.P. CONC. WINGWALL PILES EST. LENGTH 35 FT.
68 - C.I.P. CONC. PILES REQ'D. FOR THE SO. ABUT. FOOTING.

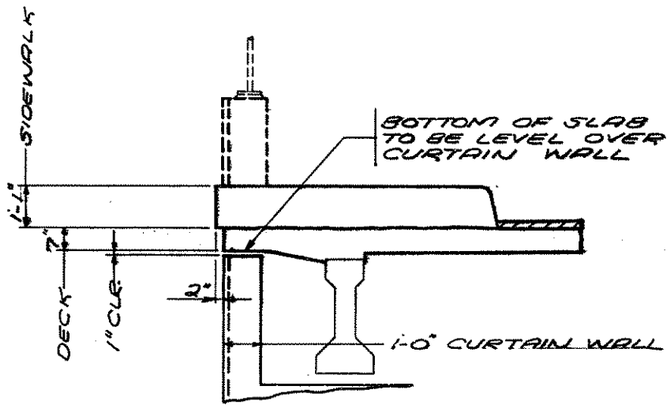
ALL PILES TO BE 12"Ø C.I.P. CONC. PILES
PILES MARKED THUS ⊙→ SHALL BE BATTERED 3" PER FOOT IN THE DIRECTION SHOWN.
PILE SPG. SHOWN IS AT BOTTOM OF THE FTG.
FOR SPLICES SEE DETAIL B201



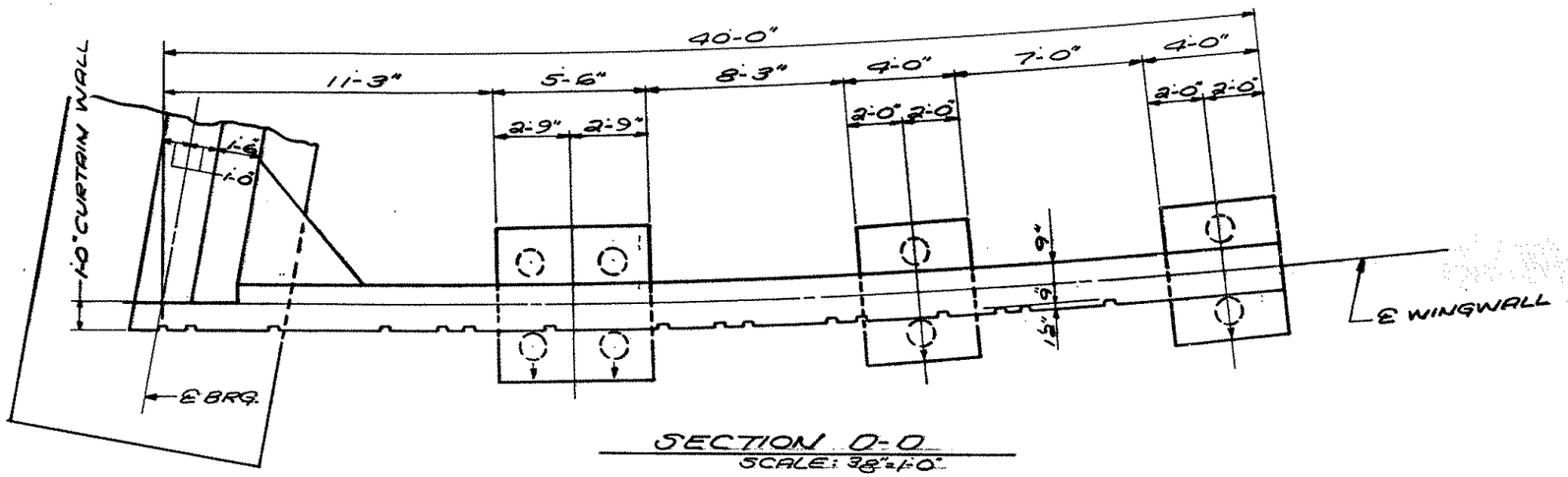

FOOTING PLAN
SCALE: 1/4" = 1'-0"

S.A.P. 02-601-29

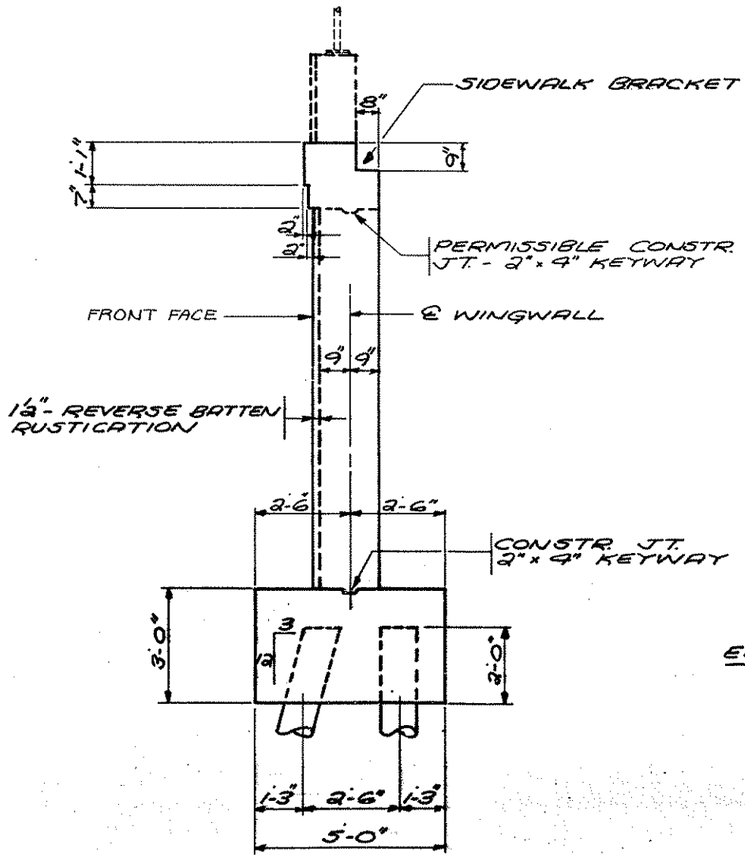
| SO. ABUTMENT FTG. DETAILS | DRAWN: D.J.V. | CHECKED: R.R.T. | APPROVED: 7-15-98 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 6R OF 45 SHEETS | | | |



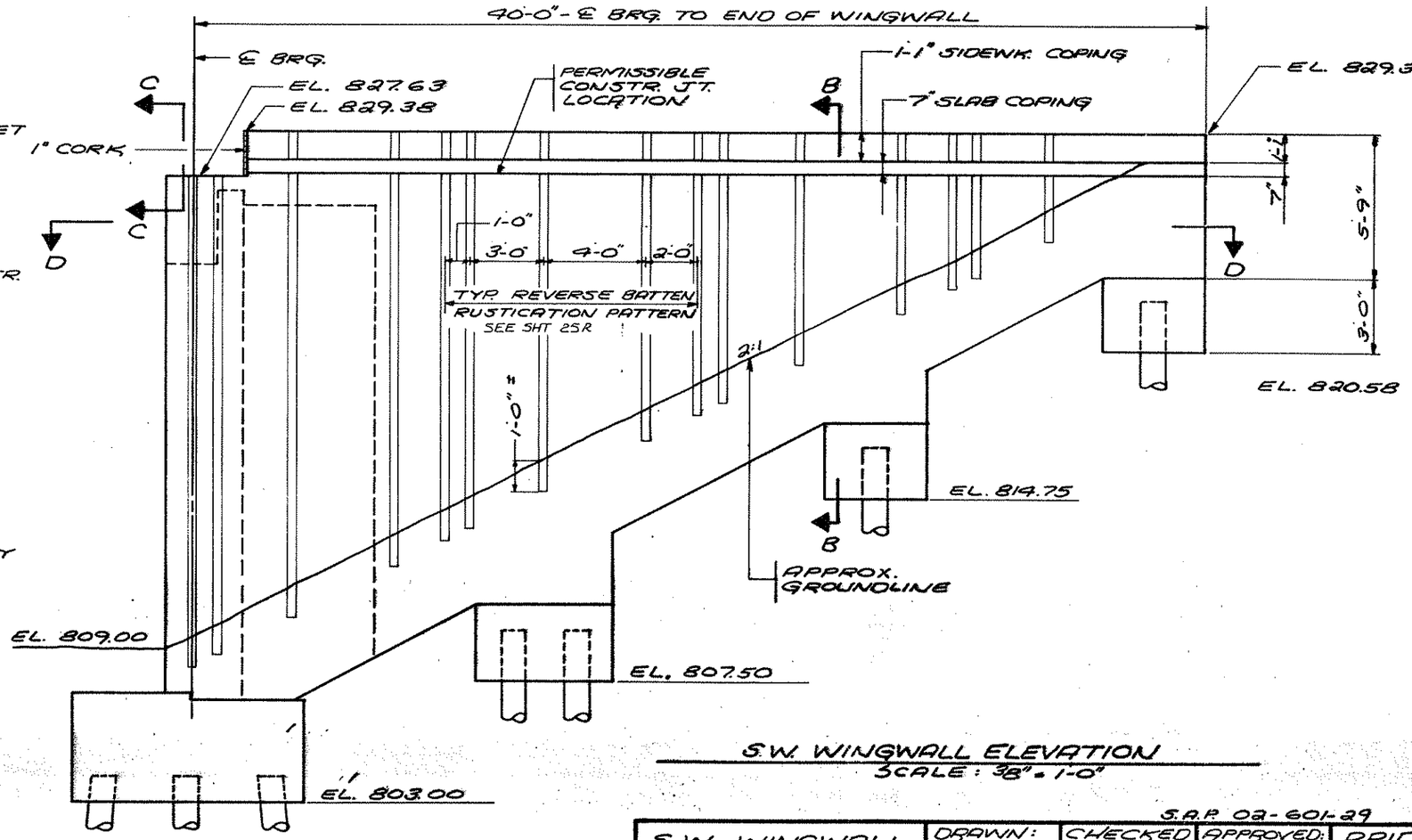

SECTION C-C




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



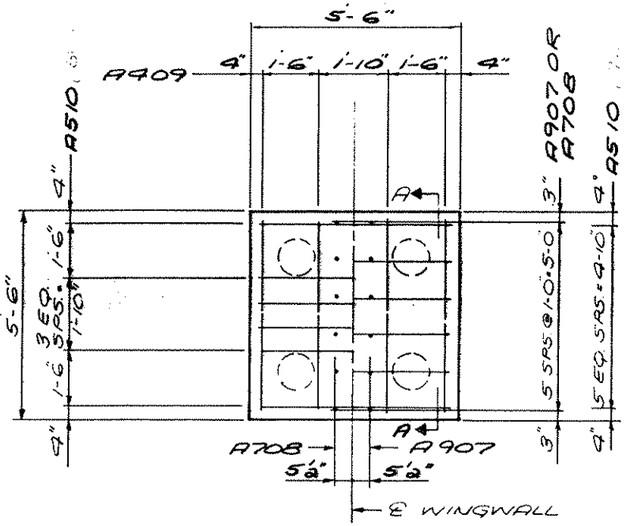

SECTION B-B
SCALE: 1"=1'-0"



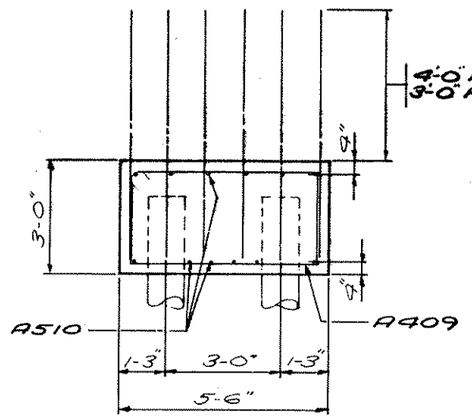

S.W. WINGWALL ELEVATION
SCALE: 3/8" = 1'-0"

S.A.P. 02-601-29

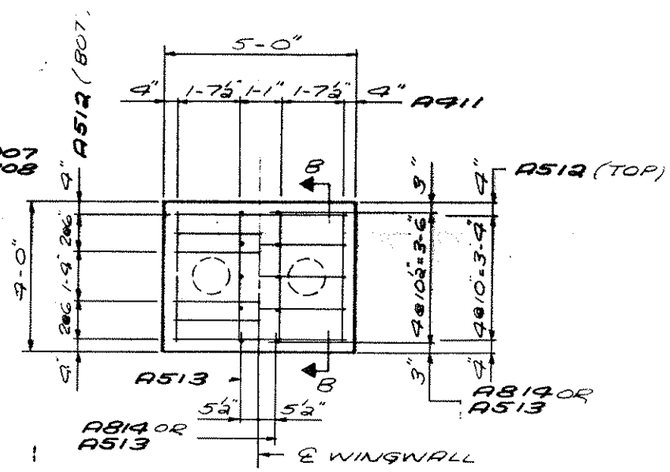
| S.W. WINGWALL DETAILS | DRAWN: D.J.V. | CHECKED R.R.T. | APPROVED: 7-15-88 | BRIDGE NUMBER 02591 |
|---|---|---|---|---|
| | SHEET 7R OF 45 SHEETS | | | |



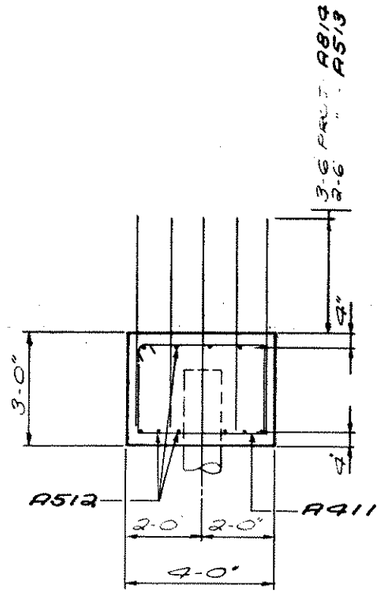

WINGWALL FTG. PLAN
SCALE: ½" = 1'-0"



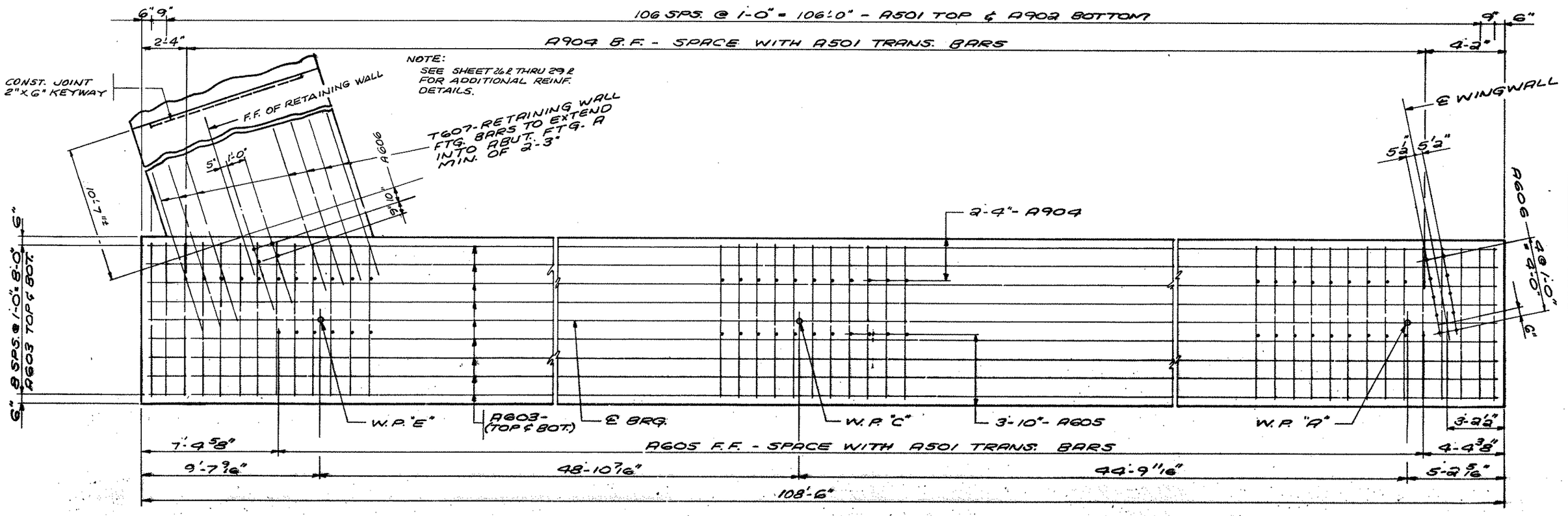

SECTION A-A




WINGWALL FTG. PLAN



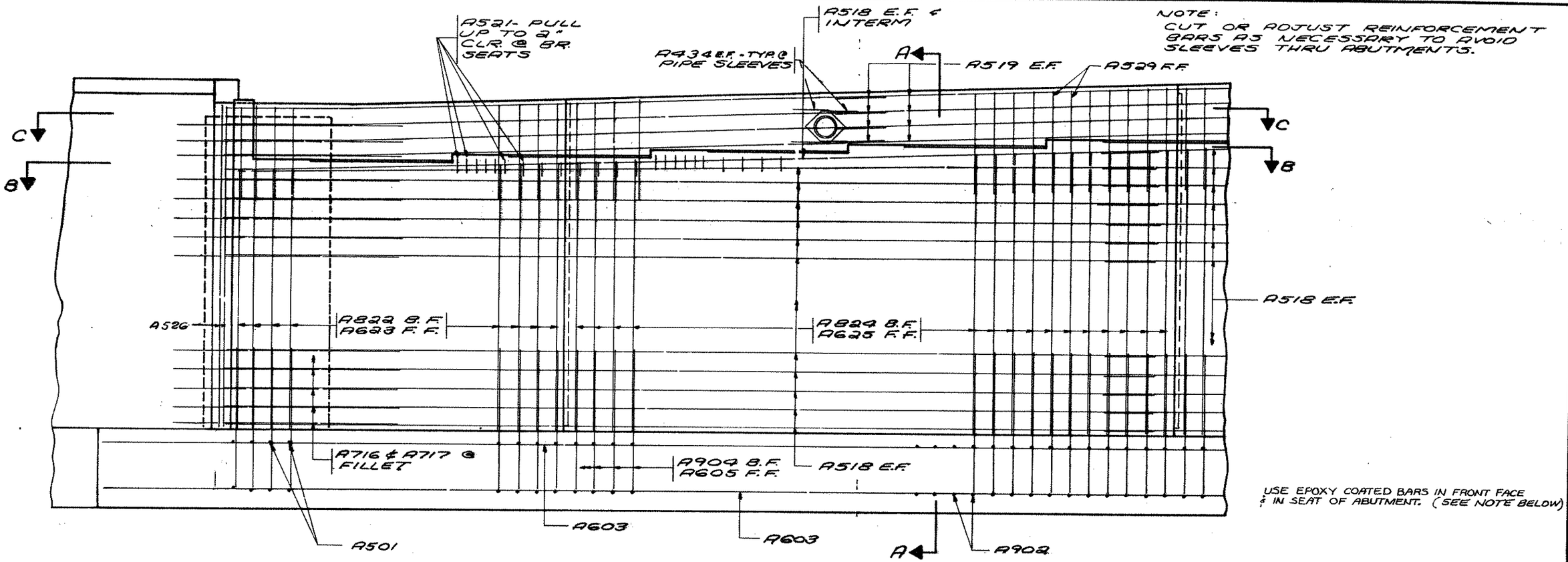

SECTION B-B



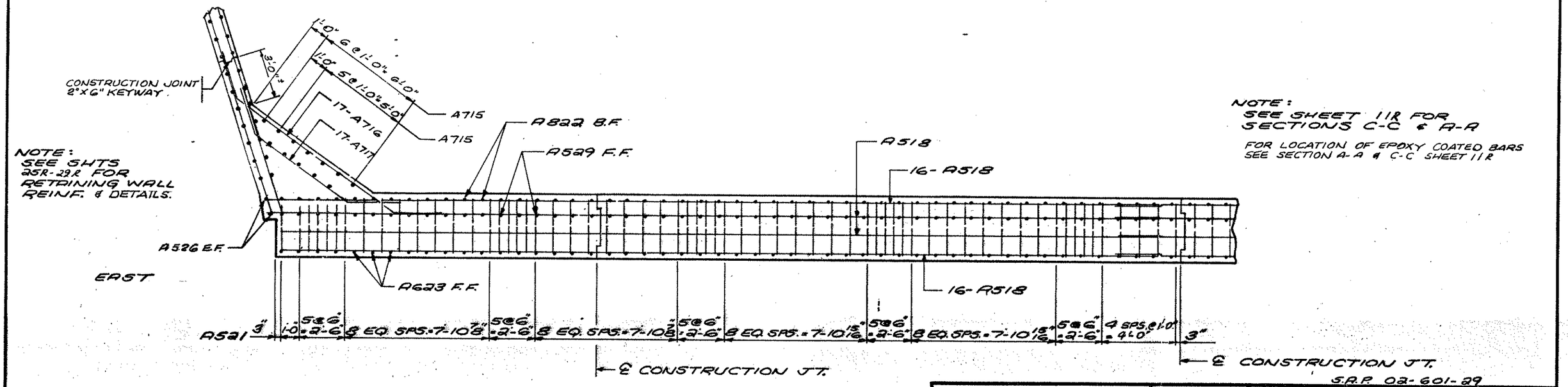

SQ. ABUT. FOOTING REINFORCEMENT

| | | | | |
|---|---|---|---|---|
| SQ. ABUTMENT FTG REINF. | DRAWN: D.J.V. | CHECKED R.P.T. | APPROVED 7-15-88 | BRIDGE NUMBER 02541 |
| | SHEET 8R OF 45 | | | |

S.R.R 02-601-29




ELEVATION
SCALE: 3/8" = 1'-0"




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

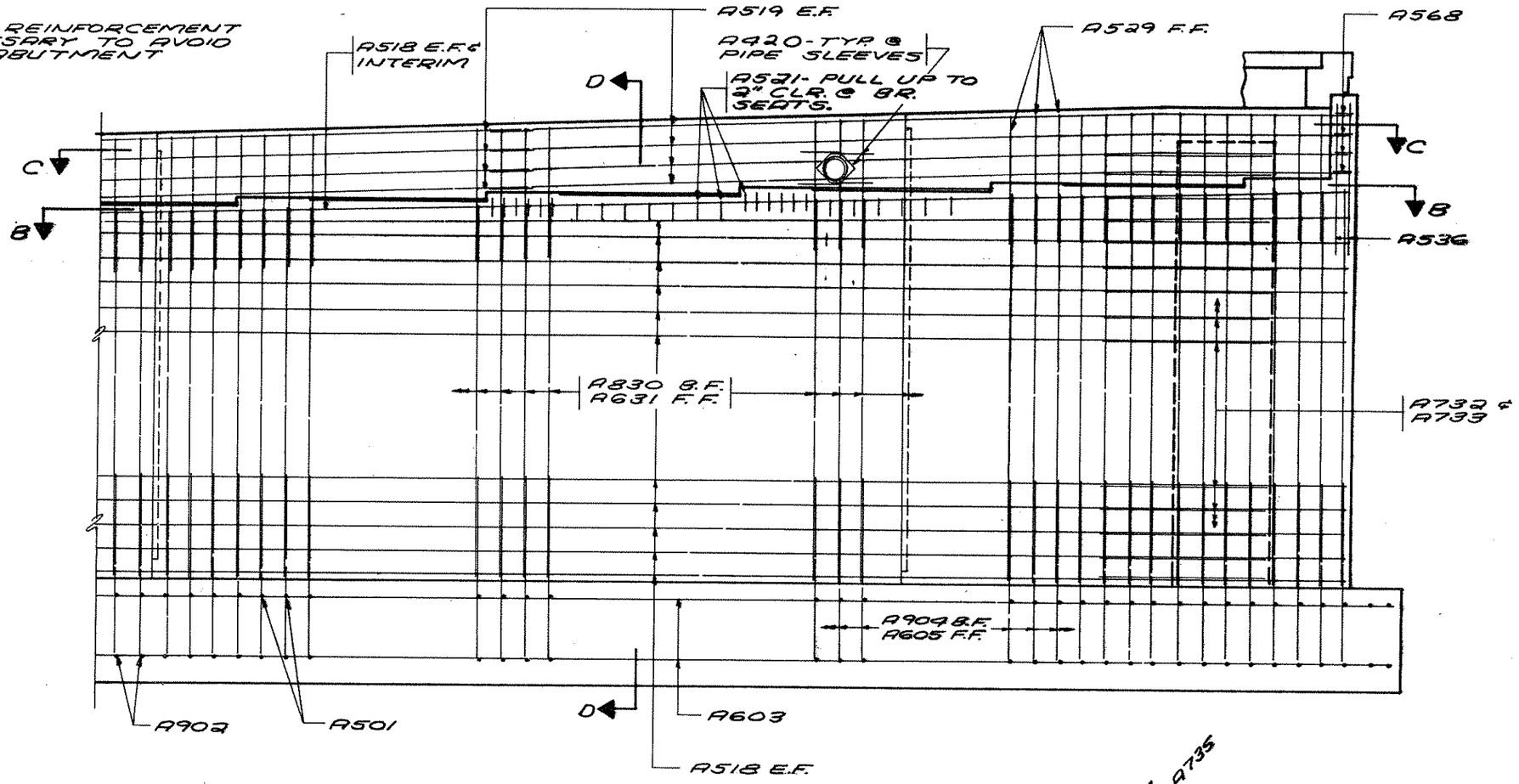
NOTE:
SEE SHEET 11R FOR SECTIONS C-C & A-A

FOR LOCATION OF EPOXY COATED BARS SEE SECTION A-A & C-C SHEET 11R

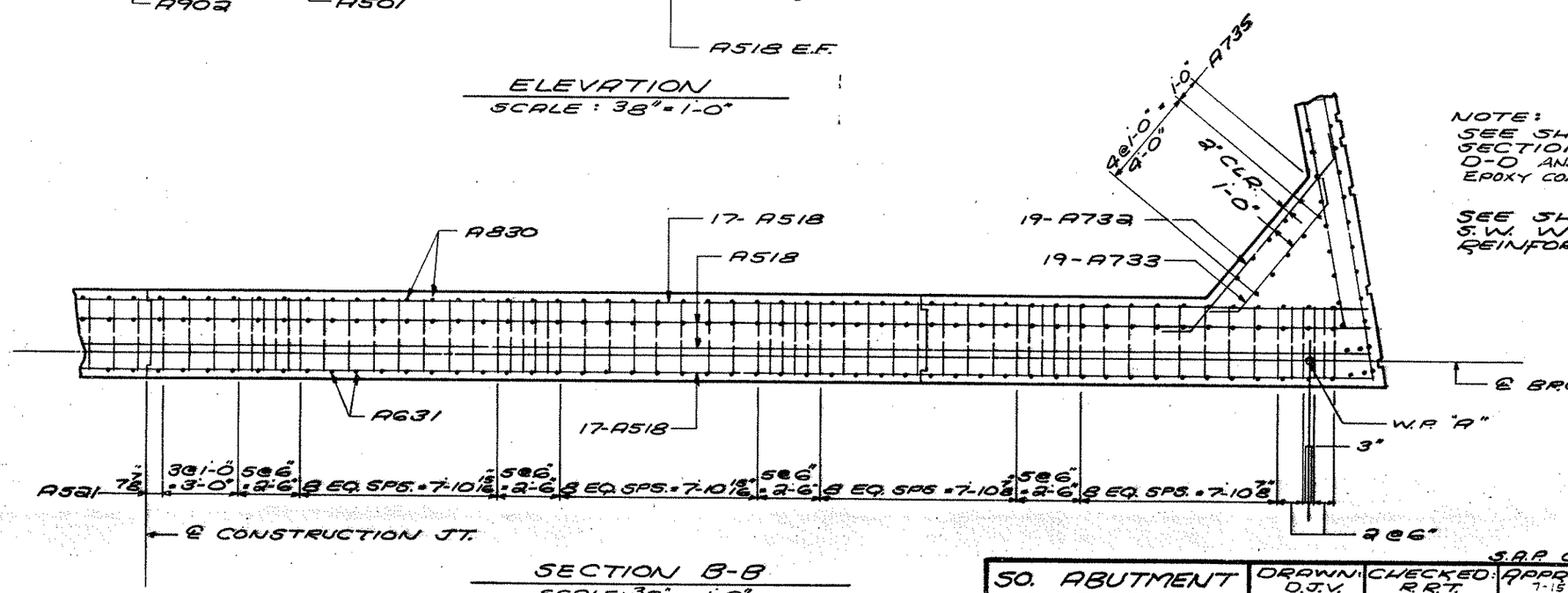
S.R.P. 02-601-29

| | | | | |
|---|---|---|---|---|
| SO. ABUTMENT REINFORCEMENT | DRAWN: O.J.V. | CHECKED: R.R.T. | APPROVED: 7-15-88 | BRIDGE NUMBER 02541 |
| | SHEET 9R OF 45 SHEETS | | | |

NOTE:
CUT OR ADJUST REINFORCEMENT BARS AS NECESSARY TO AVOID SLEEVES THRU ABUTMENT




ELEVATION
SCALE : 3/8" = 1'-0"




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

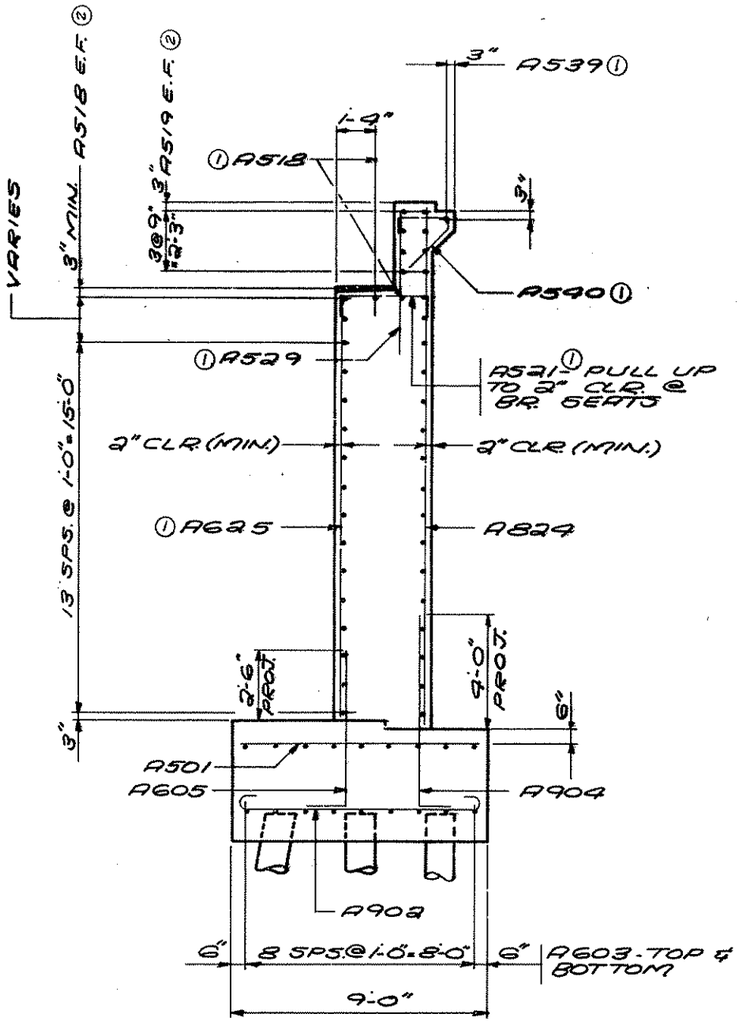
NOTE:
SEE SHT. 11R FOR SECTIONS C-C & D-D AND LOCATION OF EPOXY COATED BARS

SEE SHT. 12R FOR S.W. WINGWALL REINFORCEMENT

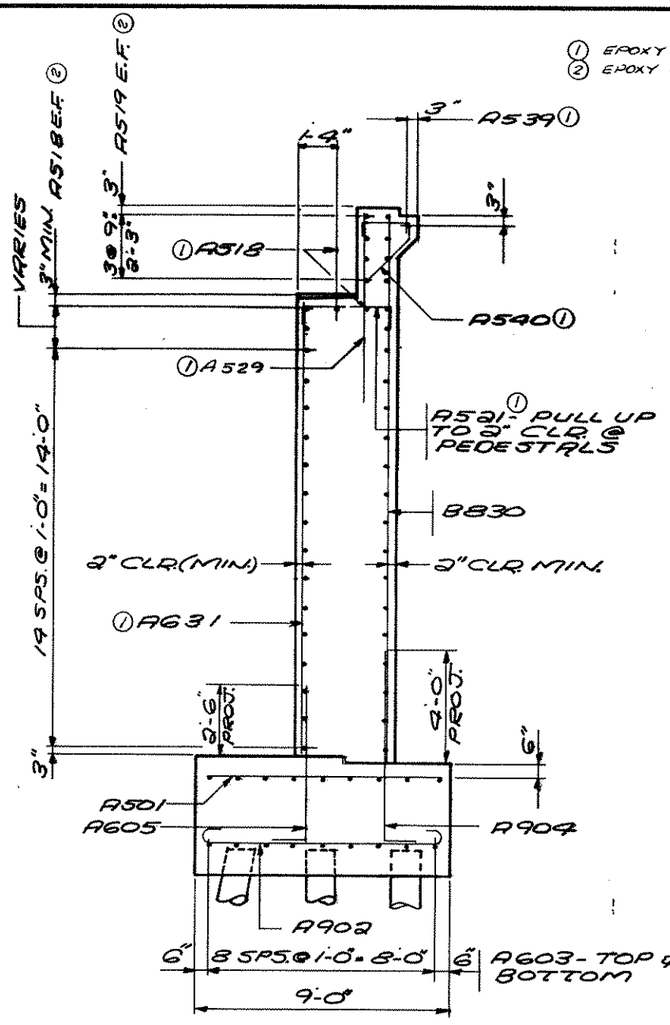
S.A.P. 02-601-29

| 50. ABUTMENT REINFORCEMENT | DRAWN: D.J.V. | CHECKED: R.R.T. | APPROVED: 7-15-98 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 10R OF 45 SHEETS | | | |

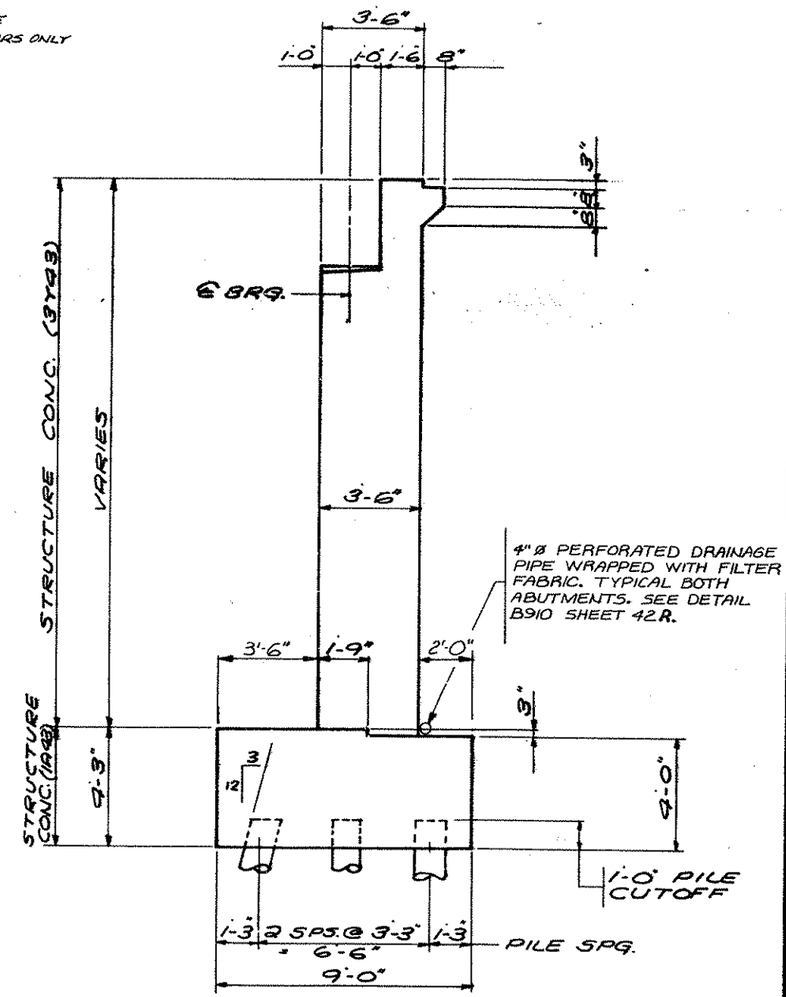
① EPOXY COATED REINF.
② EPOXY COATED F.F. BARS ONLY



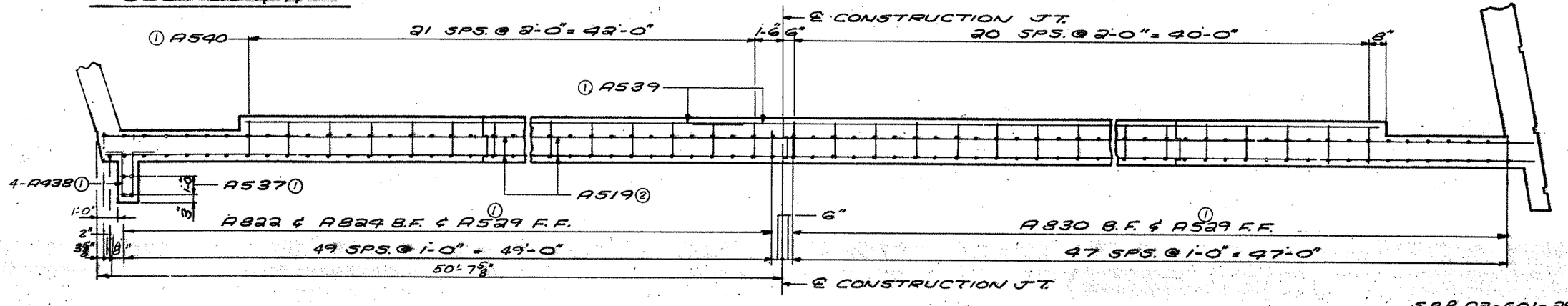

SECTION A-A




SECTION D-D



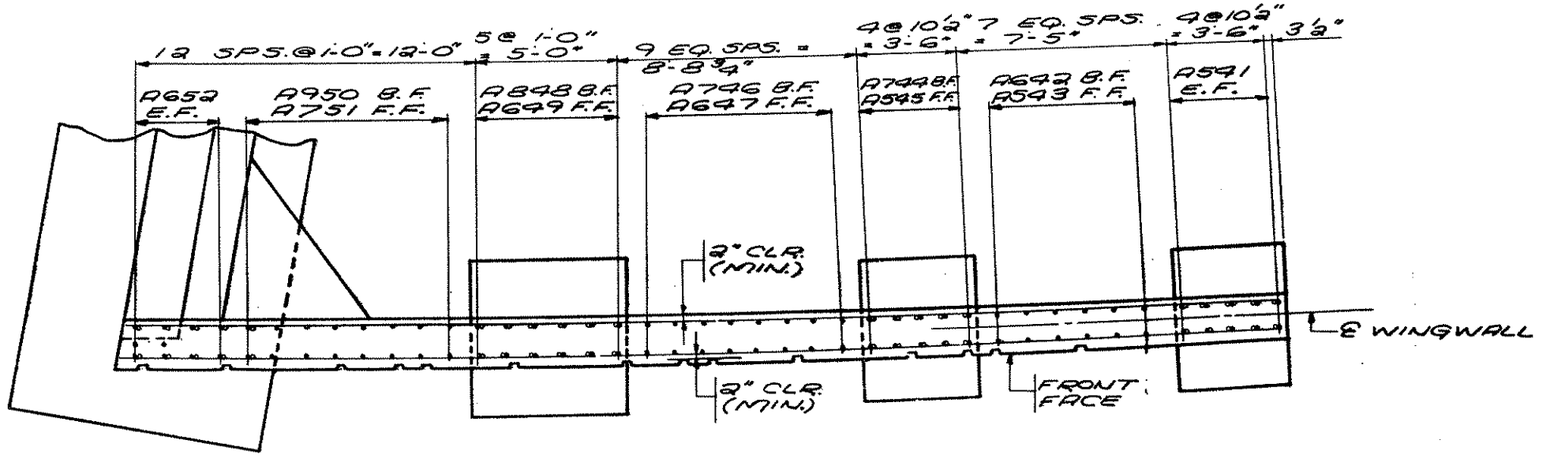

SECTION F-F



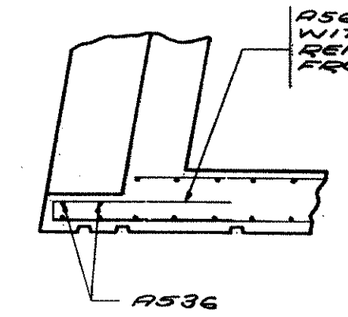

SECTION C-C

S.A.P. 02-601-29

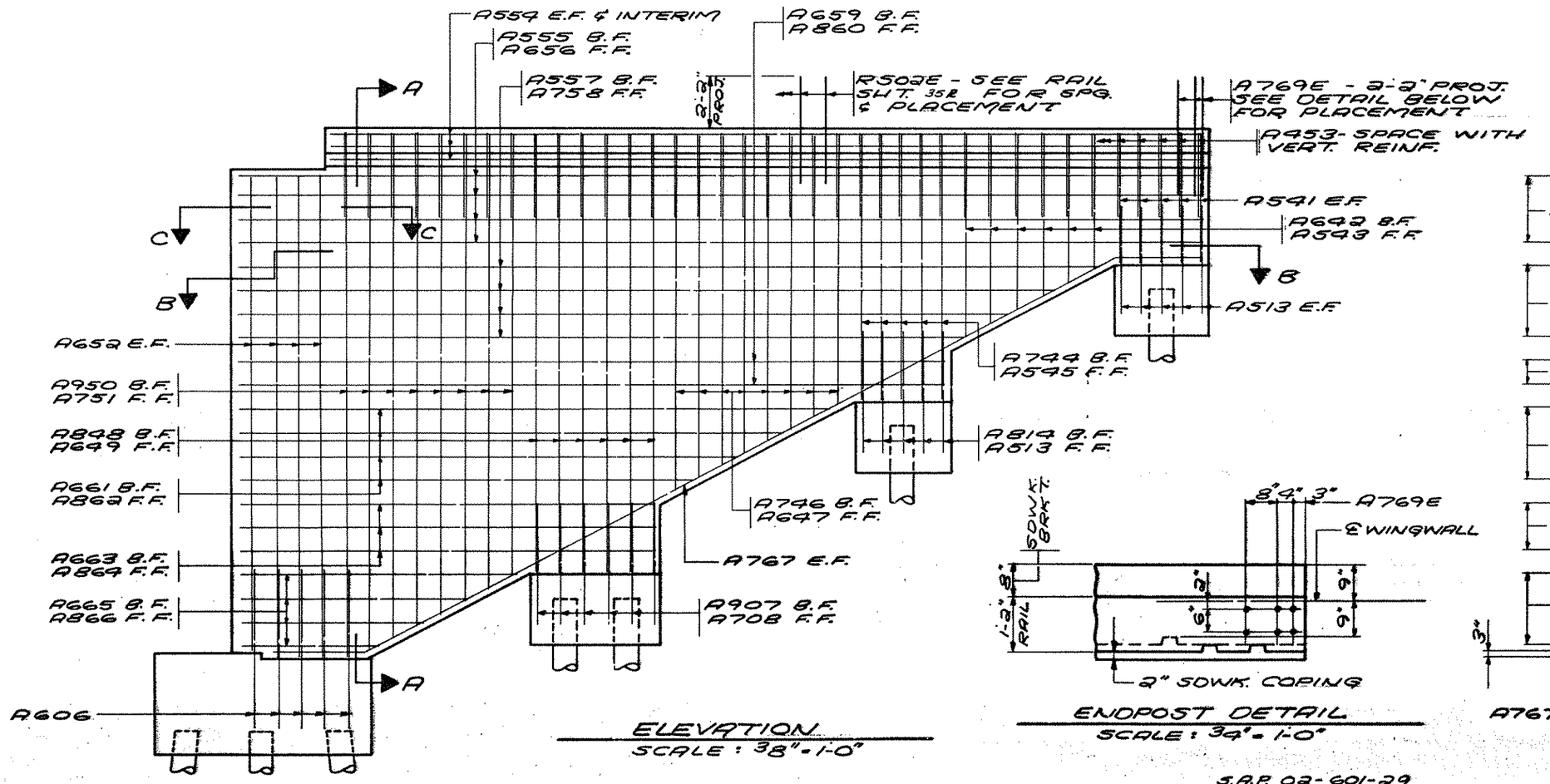
| | | | | |
|---|---|---|---|---|
| SO. ABUTMENT REINFORCEMENT | DRAWN O.J.V. | CHECKED R.R.T. | APPROVED: 7-15-88 | BRIDGE NUMBER 02591 |
| | SHEET 11 OF 45 SHEETS | | | |




SECTION B-B



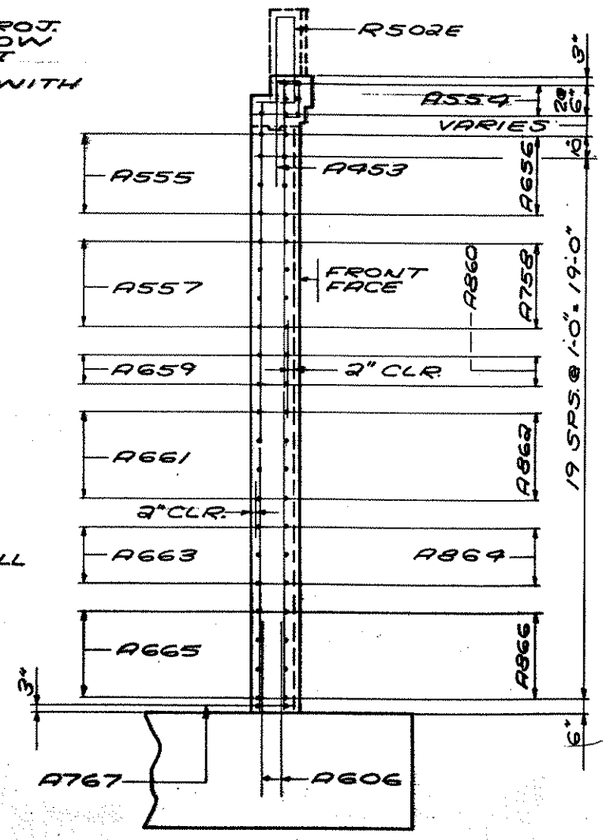

SECTION C-C




ELEVATION
SCALE : 38" = 1'-0"



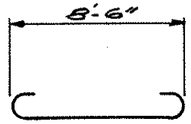

ENDPOST DETAIL
SCALE : 34" = 1'-0"



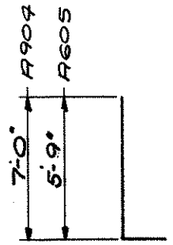

SECTION A-A

S.A.P. 02-601-29

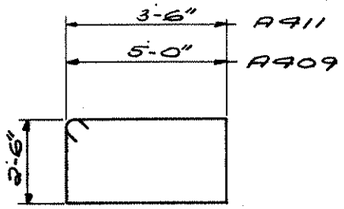
| S.W. WINGWALL REINFORCEMENT | DRAWN: D.J.V. | CHECKED: E.R.T. | APPROVED: 7-15-88 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 12R OF 45 SHEETS | | | |



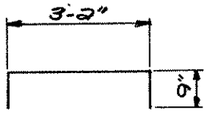

A902



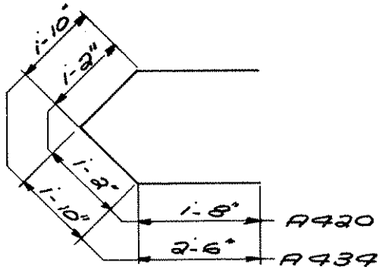

A904 & A605



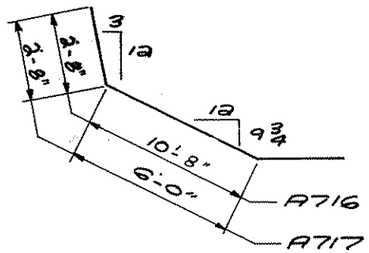

A409 & A411



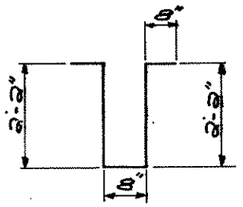

A521



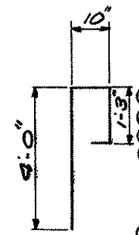

A420 & A434



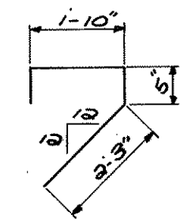

A716 & A717



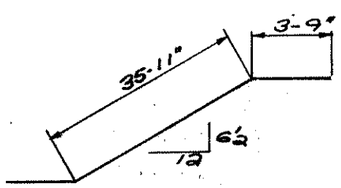

A438



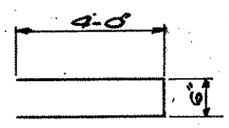

A453



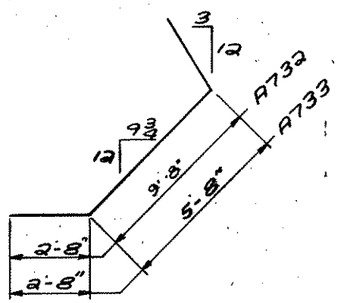

A540




A767




A568




A732 & A733

| BILL OF REINFORCEMENT-30. ABUT. | | | | | |
|---|---|---|---|---|---|
| | BAR | NO. | LEN. | SHAPE | LOCATION |
| | A862 | 1 SER. OF 4 | 19'-3" to 25'-0" | STR. | S.W. WINGWALL |
| | A863 | 3 | 17'-5" | " | " " |
| | A864 | 3 | 17'-5" | " | " " |
| | A665 | 1 SER. OF 4 | 5'-10" to 11'-7" | " | " " |
| | A866 | 1 SER. OF 4 | 5'-10" to 11'-7" | " | " " |
| | A767 | 2 | 43'-8" | BENT | " " |
| ⑤ | A568 | 4 | 8'-6" | " | " " |
| | A769E | 6 | 6'-0" | STR. | S.W. - ENDPOST |

① 3 LINES WITH 2'-3" MIN. LAP

② 2 LINES WITH 1'-11" MIN. LAP

⑤ EPOXY COATED

⑥ EPOXY COAT BARS IN F.F. @ INTERM. - SEE SHEET 11R.

| SUMMARY OF QUANTITIES FOR SOUTH ABUTMENT | | |
|---|---|---|
| STRUCTURE CONCRETE (1A93) | 158 | CU. YD. |
| STRUCTURE CONCRETE (3Y93) | 271 | CU. YD. |
| REINFORCEMENT BARS | 27050 | POUND |
| REINFORCEMENT BARS (EPOXY COATED) | 6420 | POUND |
| | | |
| C.I.P. CONC. TEST PILES 35 FT. LONG | 2 | EACH |
| ③ C.I.P. CONC. PILING DELIVERED | 1690 | LIN. FT. |
| ③ C.I.P. CONC. PILING DRIVEN | 1690 | LIN. FT. |
| ④ DRAINAGE SYSTEM - SEE SHEET 29. | | |
| ④ FOUNDATION PREPARATION | 1 | LUMP SUM |

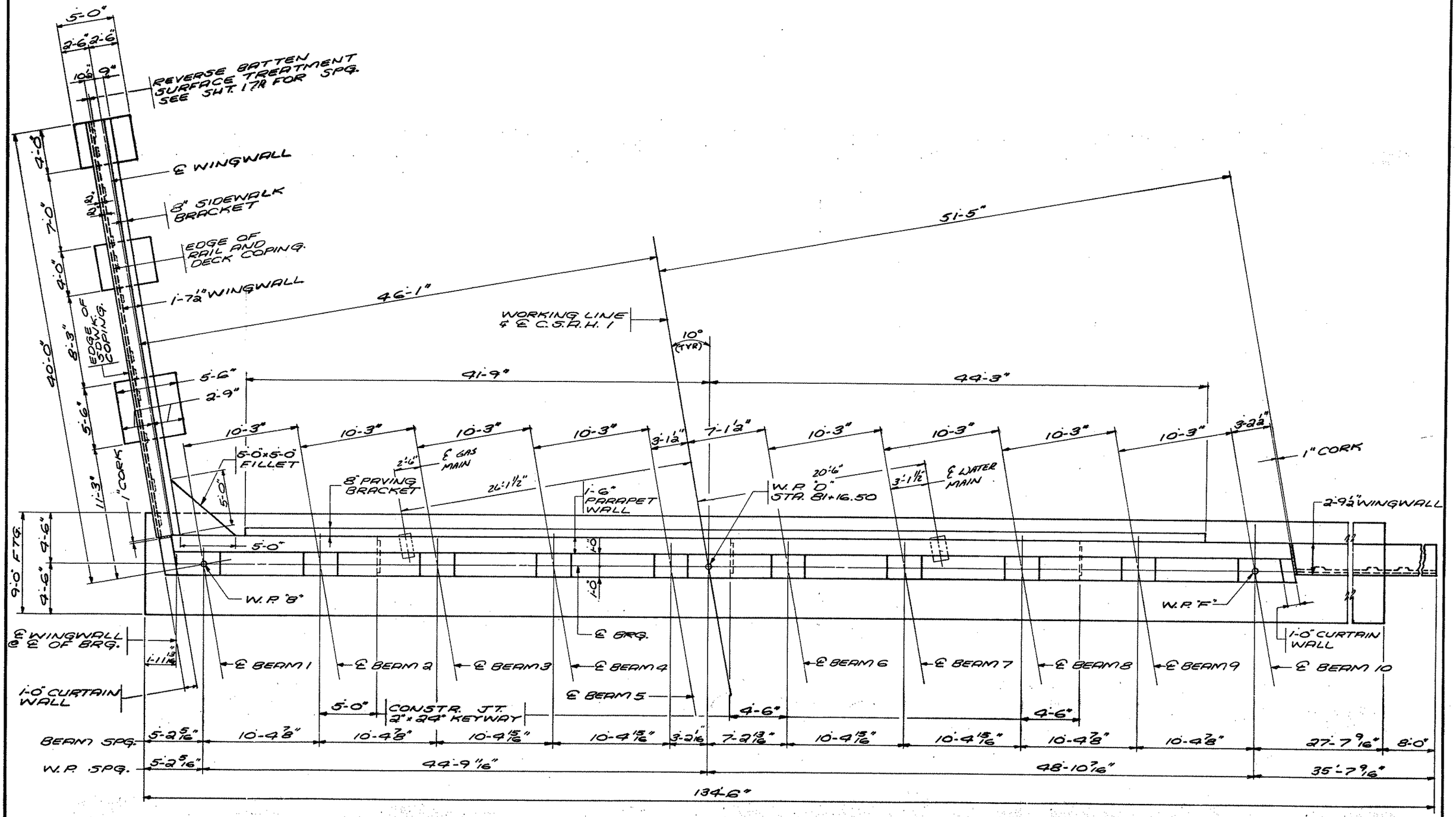
③ DOES NOT INCLUDE TEST PILES

④ SEE SPECIAL PROVISIONS

| BILL OF REINFORCEMENT-30. ABUT. | | | | | |
|---|---|---|---|---|---|
| | BAR | NO. | LEN. | SHAPE | LOCATION |
| | A501 | 109 | 8'-6" | STR. | FTG.-TOP TRANS. |
| | A902 | 109 | 11'-0" | BENT | " - BOT. " |
| ① | A603 | 54 | 37'-8" | STR. | " - LONGIT. |
| | A904 | 103 | 8'-0" | BENT | " - DOWELS |
| | A605 | 98 | 6'-9" | " | " - " |
| | A606 | 14 | 5'-6" | STR. | " " |
| | A907 | 6 | 6'-6" | " | " - WING DOWELS |
| | A708 | 8 | 5'-6" | " | " " |
| | A909 | 4 | 15'-9" | BENT | " " - STIRRUPS |
| | A510 | 12 | 5'-0" | STR. | " " - TRANS. |
| | A911 | 8 | 12'-9" | BENT | " " - STIRRUPS |
| | A512 | 28 | 4'-6" | STR. | " " - TRANS. |
| | A513 | 15 | 5'-0" | " | " " - DOWELS |
| | A814 | 5 | 6'-0" | " | " " - " |
| | A715 | 11 | 16'-3" | " | FILLET - VERT. |
| | A716 | 17 | 16'-0" | BENT | " - HOR'Z. |
| | A717 | 17 | 11'-4" | " | " - " |
| ⑥② | A518 | 70 | 51'-2" | STR. | BR. ST. - LONGIT. |
| ⑤① | A519 | 24 | 36'-0" | " | PARR. WALL - VERT. |
| ⑤ | A420 | 4 | 5'-8" | BENT | " " @ SLEEVE |
| ⑤ | A521 | 137 | 4'-8" | BENT | BR. ST. - TIES |
| | A822 | 1 SER. OF 19 | 17'-0" to 17'-3" | STR. | " " - VERT. |
| ⑤ | A623 | 1 SER. OF 19 | 14'-0" to 14'-3" | " | " " " |
| | A824 | 1 SER. OF 32 | 17'-3" to 18'-3" | " | " " " |
| ⑤ | A625 | 1 SER. OF 32 | 14'-3" to 15'-3" | " | " " " |
| | A526 | 2 | 17'-0" | " | " " " |
| | | | | | |
| | A528 | 2 | 3'-4" | " | " " - HOR'Z. |
| ⑤ | A529 | 98 | 6'-0" | " | PARR. WALL - VERT. |
| | A830 | 1 SER. OF 48 | 18'-3" to 19'-8" | " | BR. ST. - VERT. |
| ⑤ | A631 | 1 SER. OF 48 | 15'-3" to 16'-6" | " | " " " |
| | A732 | 19 | 15'-0" | BENT | FILLET - HOR'Z. |
| | A733 | 19 | 11'-0" | " | " " |
| ⑤ | A434 | 4 | 8'-8" | " | PARR. WALL - SLEEVE |
| | A735 | 10 | 18'-3" | STR. | FILLET - VERT. |
| ⑤ | A536 | 2 | 6'-0" | " | CURTAIN WALL |
| ⑤ | A537 | 4 | 6'-0" | " | " " |
| ⑤ | A438 | 4 | 6'-4" | BENT | " " |
| ⑤ | A539 | 3 | 43'-6" | STR. | PAVING BRK'T. |
| ⑤ | A540 | 93 | 4'-11" | BENT | " " |
| | A541 | 10 | 5'-6" | STR. | S.W. WINGWALL |
| | A642 | 1 SER. OF 6 | 5'-9" to 8'-8" | " | " " |
| | A543 | 1 SER. OF 6 | 5'-9" to 8'-8" | " | " " |
| | A744 | 5 | 11'-3" | " | " " |
| | A545 | 5 | 11'-3" | " | " " |
| | A746 | 1 SER. OF 8 | 11'-6" to 15'-2" | " | " " |
| | A647 | 1 SER. OF 8 | 11'-6" to 15'-2" | " | " " |
| | A848 | 6 | 18'-8" | " | " " |
| | A649 | 6 | 18'-8" | " | " " |
| | A950 | 1 SER. OF 8 | 18'-9" to 22'-0" | " | " " |
| | A751 | 1 SER. OF 8 | 18'-9" to 22'-0" | " | " " |
| | A652 | 8 | 20'-6" | " | " " |
| | A953 | 38 | 6'-5" | BENT | " " |
| | A554 | 7 | 37'-0" | STR. | " " |
| | A555 | 4 | 40'-8" | " | " " |
| | A656 | 4 | 40'-8" | " | " " |
| | A557 | 1 SER. OF 9 | 30'-8" to 36'-6" | " | " " |
| | A758 | 1 SER. OF 4 | 30'-8" to 36'-6" | " | " " |
| | A659 | 2 | 30'-0" | " | " " |
| | A860 | 2 | 30'-0" | " | " " |
| | A661 | 1 SER. OF 4 | 19'-3" to 25'-0" | " | " " |

S.A.P. 02-601-29

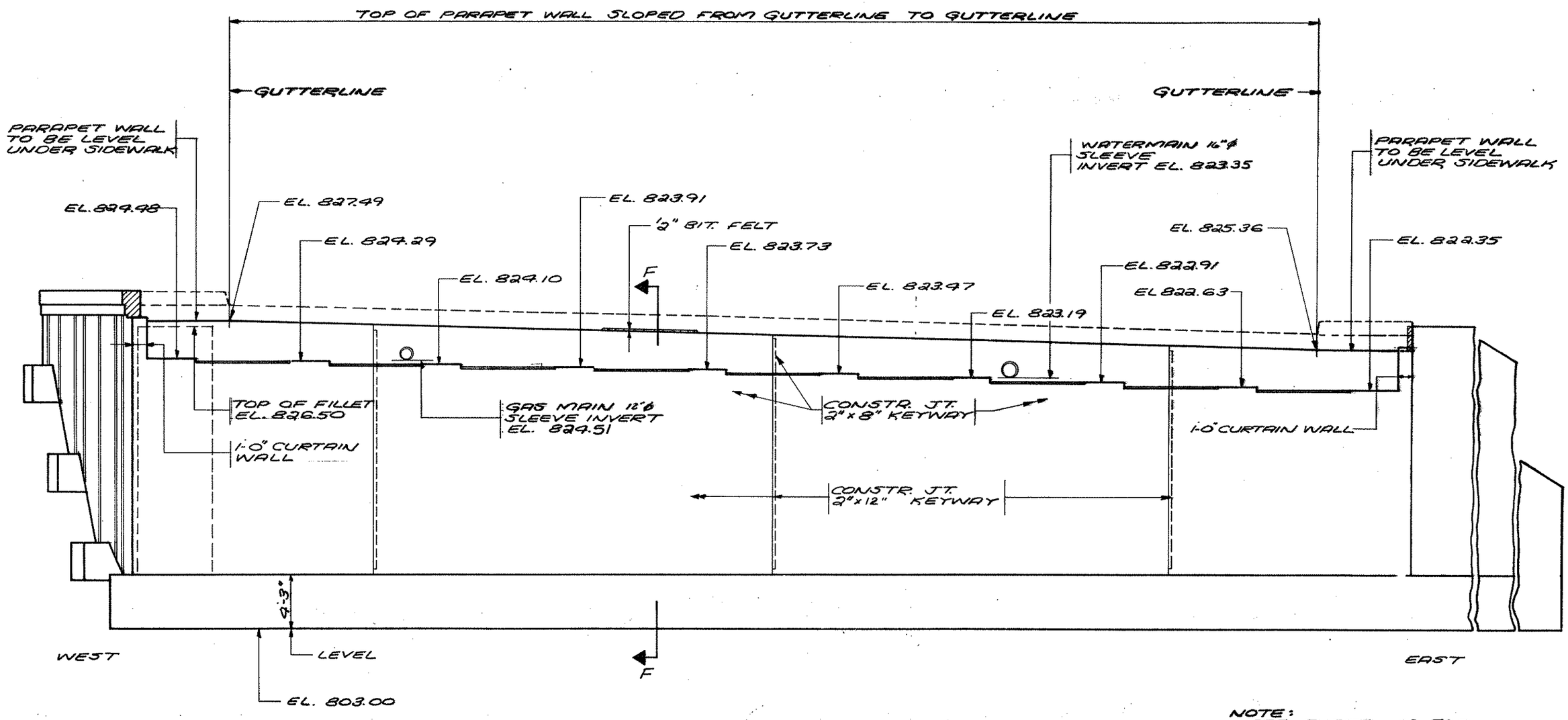
| SOUTH ABUTMENT REINFORCEMENT | DRAWN: O.J.V. | CHECKED: R.R.T. | APPROVED: 7-15-88 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 13R OF 45 SHEETS | | | |




PLAN
SCALE: 4" = 1'-0"

S.A.P. 02-601-29

| NO. ABUTMENT DETAILS | DRAWN: D.J.V. | CHECKED: R.R.T. | APPROVED: 7-15-98 | BRIDGE NUMBER 02591 |
|---|---|---|---|---|
| | SHEET 14R OF 95 SHEETS | | | |




NOTE:
SEE SHEET 17R FOR N.W. WINGWALL DETAILS.

## NORTH ABUTMENT ELEVATION

NOTE:
SEE SHEET 18R FOR N.E. WINGWALL DETAILS

SEE SHEET 11R FOR SECTION F-F

S.A.P. 02-601-89

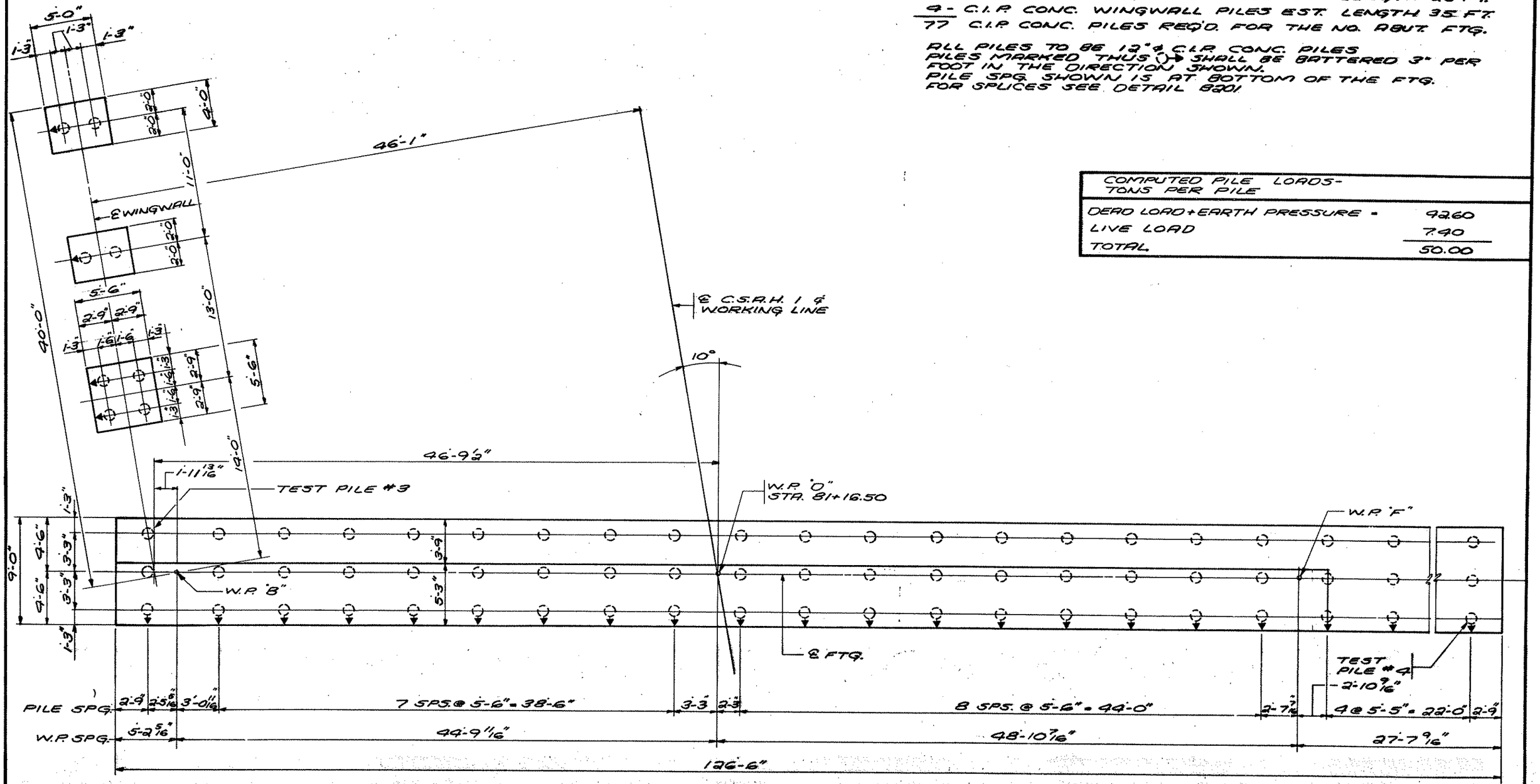
| NORTH ABUTMENT DETAILS | DRAWN: O.J.V. | CHECKED: R.R.T. | APPROVED: 7-15-98 | BRIDGE NUMBER 02591 |
|---|---|---|---|---|
| | SHEET 15R OF 45 SHEETS | | | |

## PILE NOTES

2 - C.I.P. CONC. TEST PILES 35 FT. LONG
67 - C.I.P. CONC. PILES EST. LENGTH 25 FT.
4 - C.I.P. CONC. WINGWALL PILES EST. LENGTH 25 FT.
4 - C.I.P. CONC. WINGWALL PILES EST. LENGTH 35 FT.
77 C.I.P. CONC. PILES REQ'D. FOR THE NO. ABUT. FTG.

ALL PILES TO BE 12"ϕ C.I.P. CONC. PILES
PILES MARKED THUS (1)→ SHALL BE BATTERED 3" PER FOOT IN THE DIRECTION SHOWN.
PILE SPG. SHOWN IS AT BOTTOM OF THE FTG.
FOR SPLICES SEE DETAIL B201

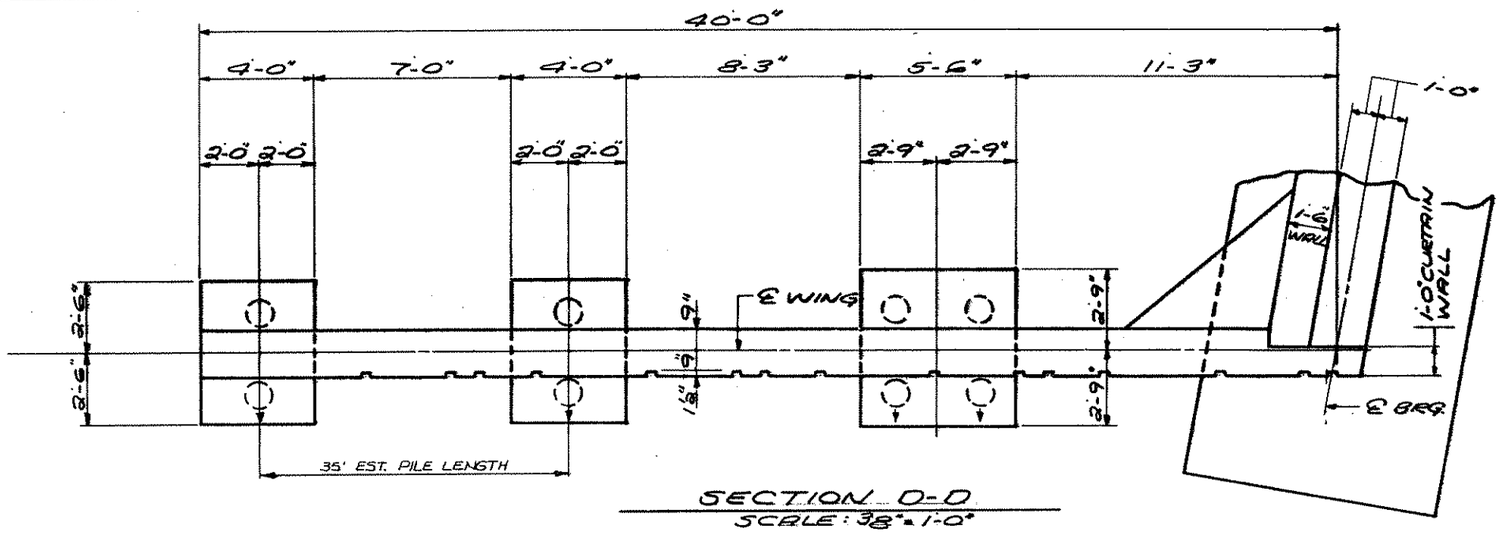
| COMPUTED PILE LOADS- TONS PER PILE | |
|---|---|
| DEAD LOAD + EARTH PRESSURE = | 42.60 |
| LIVE LOAD | 7.40 |
| TOTAL | 50.00 |



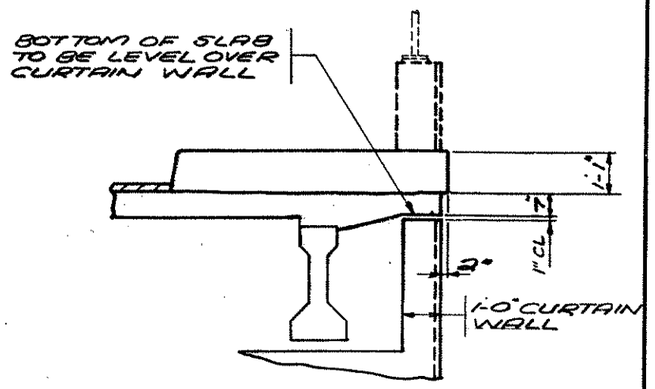

FOOTING PLAN
SCALE: 1/4" = 1'-0"

S.A.P. 02-601-29

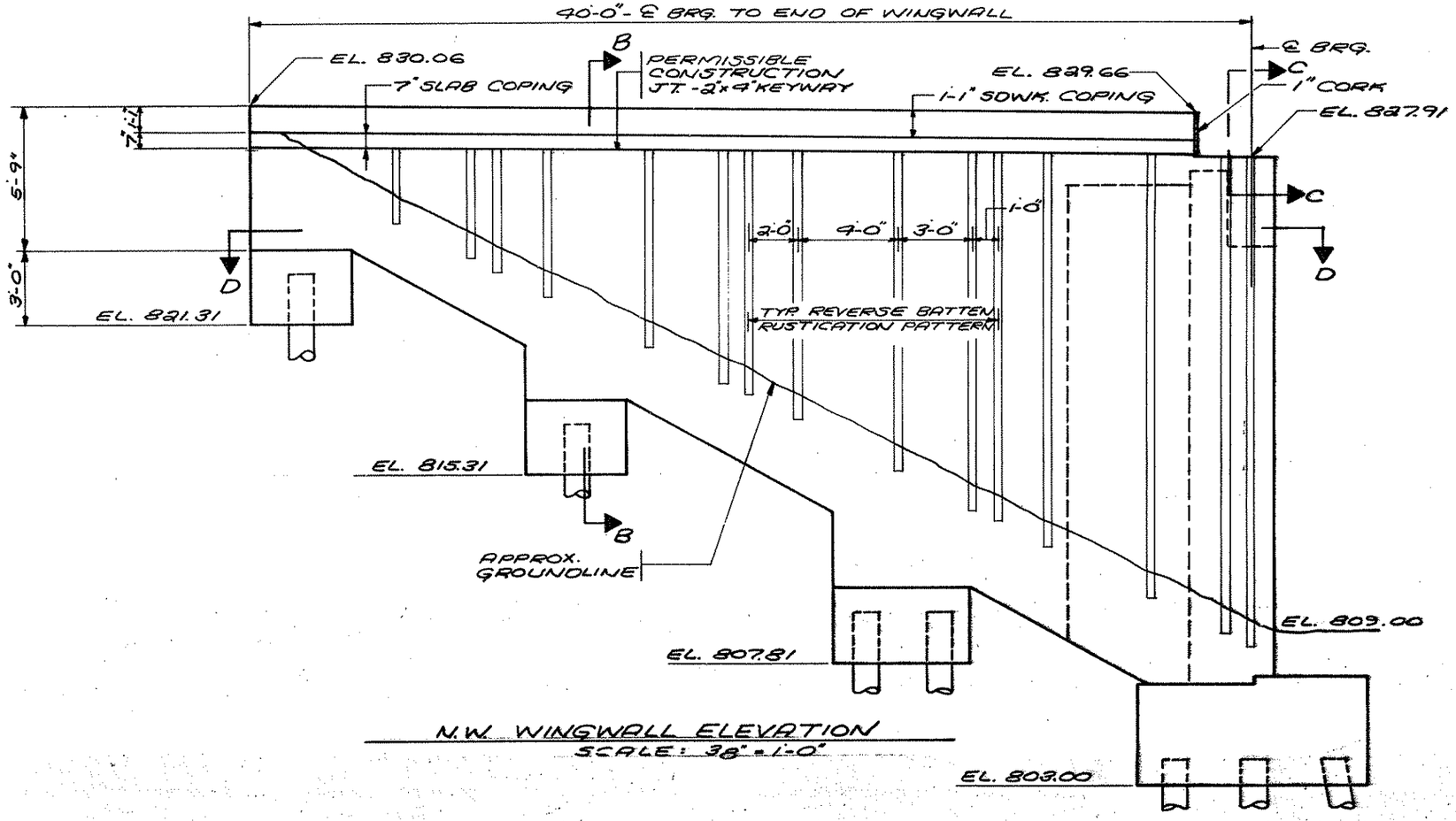
| NO. ABUTMENT FTG. DETAILS | DRAWN: D.J.V. | CHECKED: R.R.T. | APPROVED 7-15-98 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 16R OF 45 SHEETS | | | |



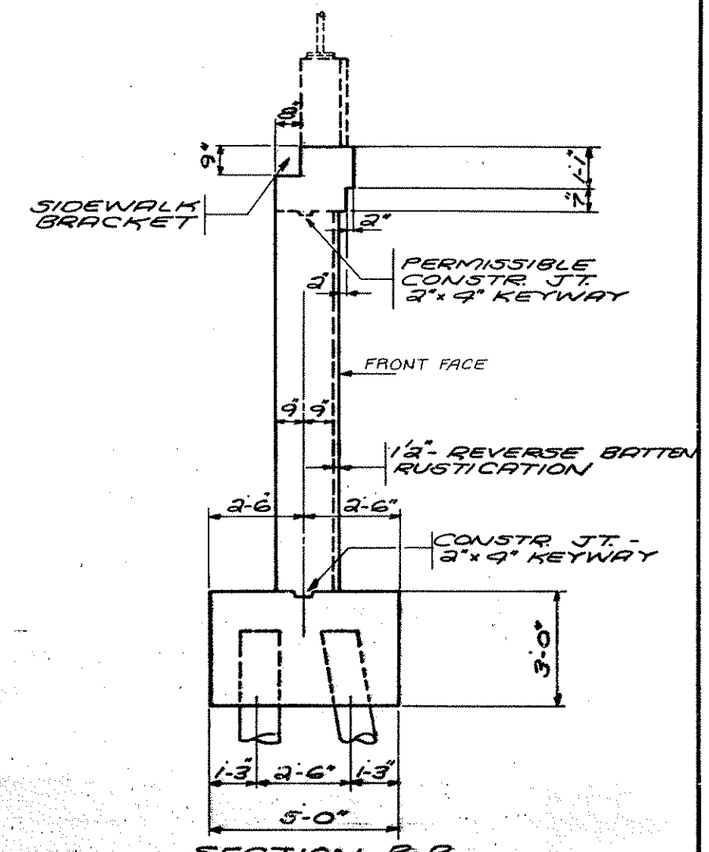

SECTION O-O
SCALE: 3/8" = 1'-0"




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



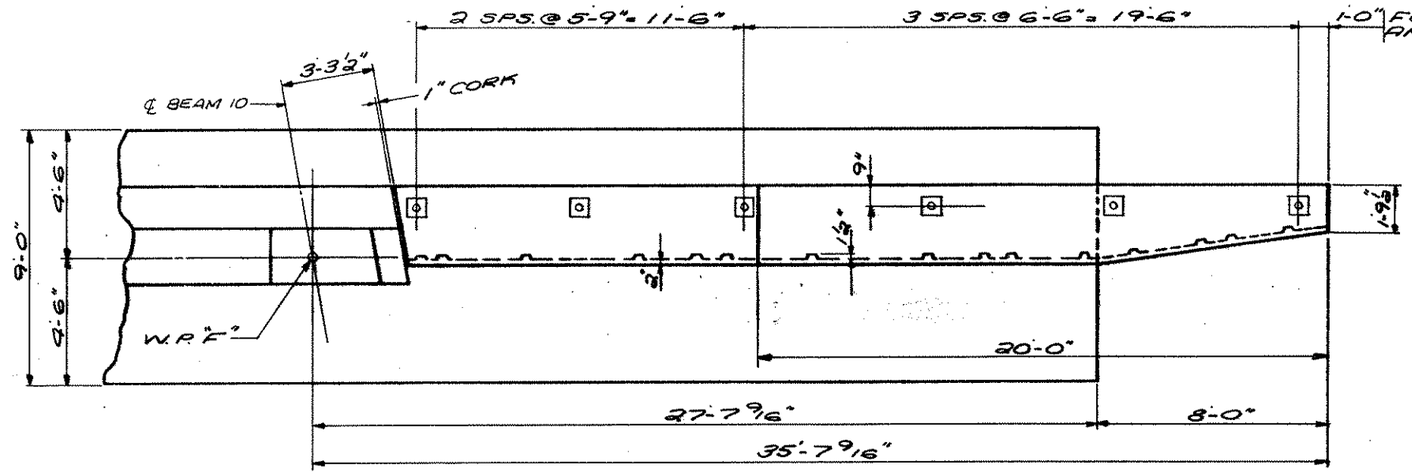

N.W. WINGWALL ELEVATION
SCALE: 3/8" = 1'-0"



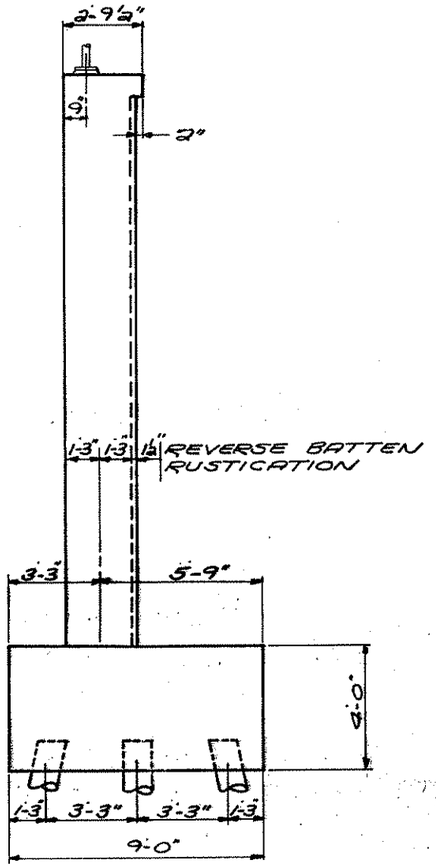

SECTION B-B

S.A.P. 02-601-29

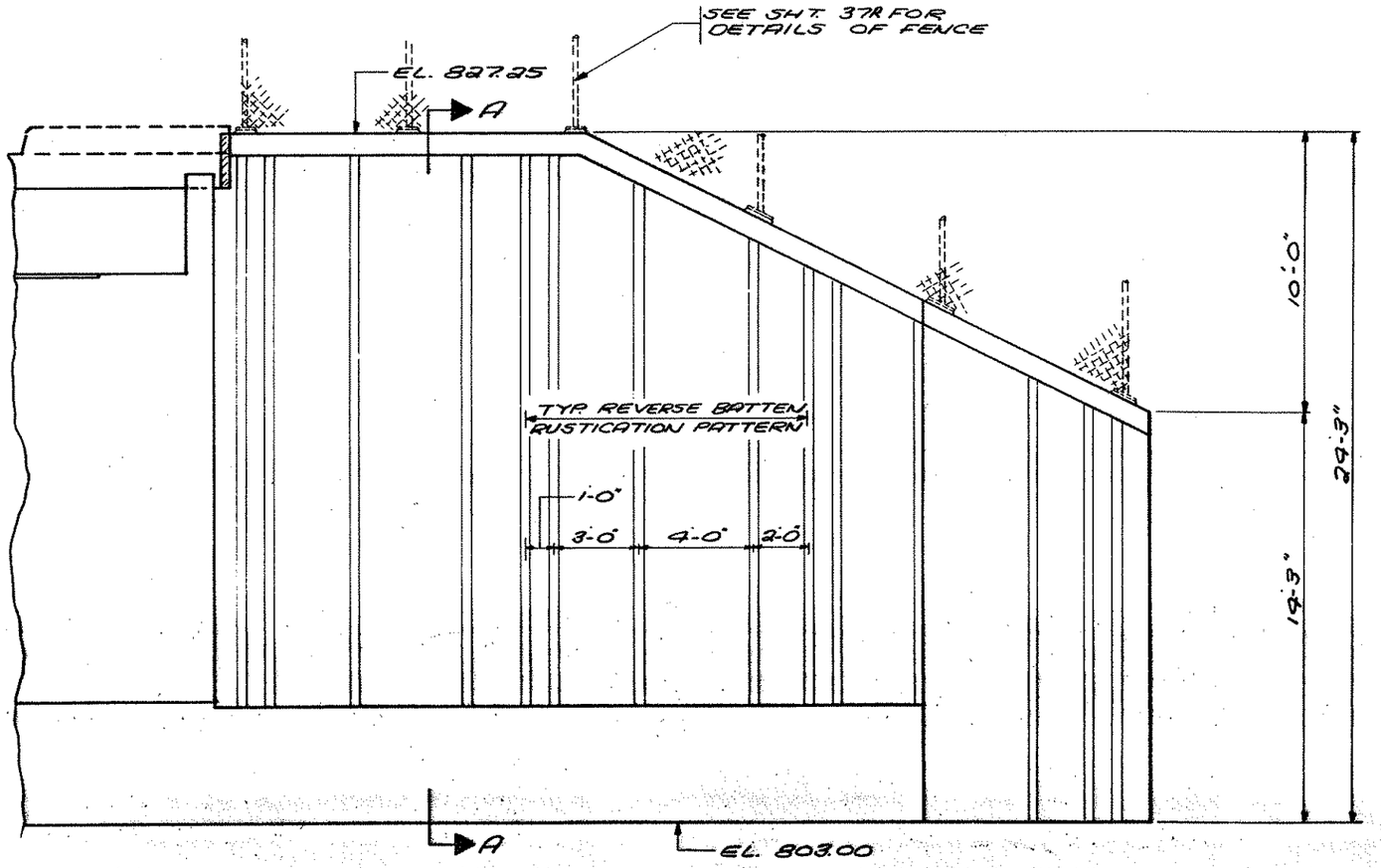
| N.W. WINGWALL DETAILS | DRAWN: D.J.V. | CHECKED: R.R.T. | APPROVED 7-15-88 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 17A OF 45 SHEETS | | | |




PLAN
SCALE: 3/8" = 1'-0"



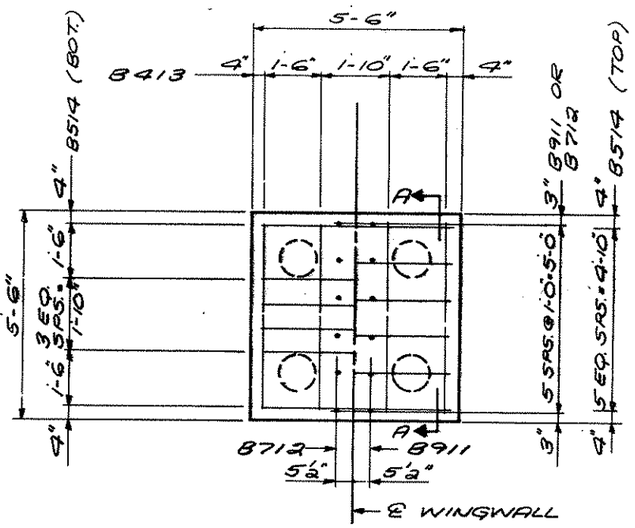

SECTION A-A



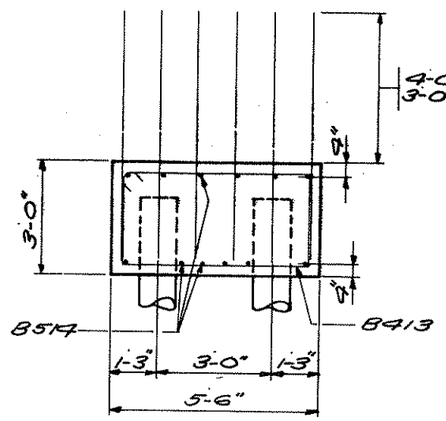

ELEVATION

S.A.P. 02-601-39

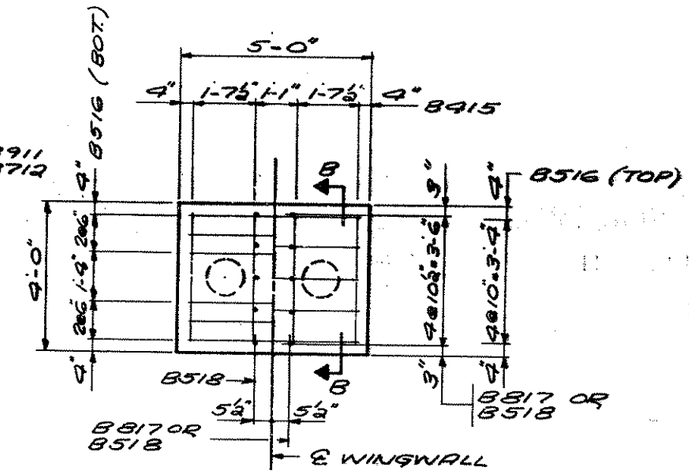
| N.E. WINGWALL DETAILS | DRAWN: D.J.V. | CHECKED: R.R.T. | APPROVED: 7-15-88 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 18 OF 45 SHEETS | | | |



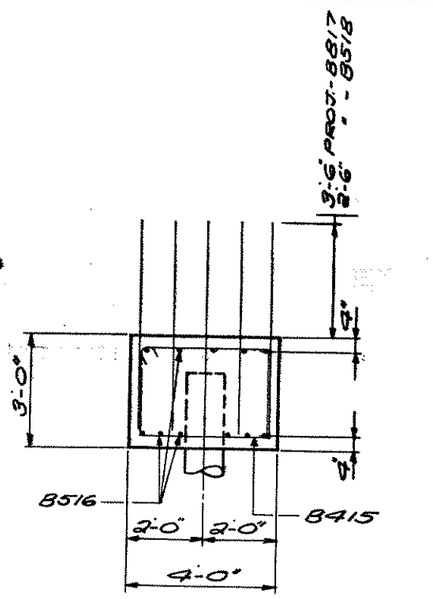

WINGWALL FTG. PLAN
SCALE: ½" = 1'-0"



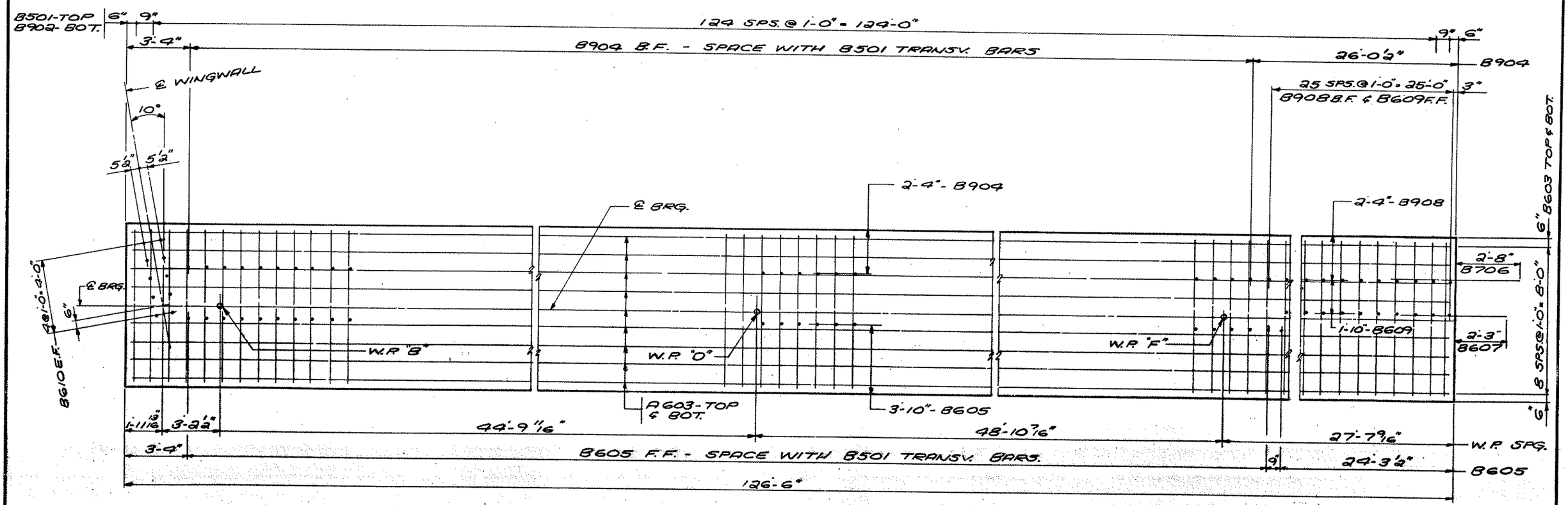

SECTION A-A




WINGWALL FTG. PLAN



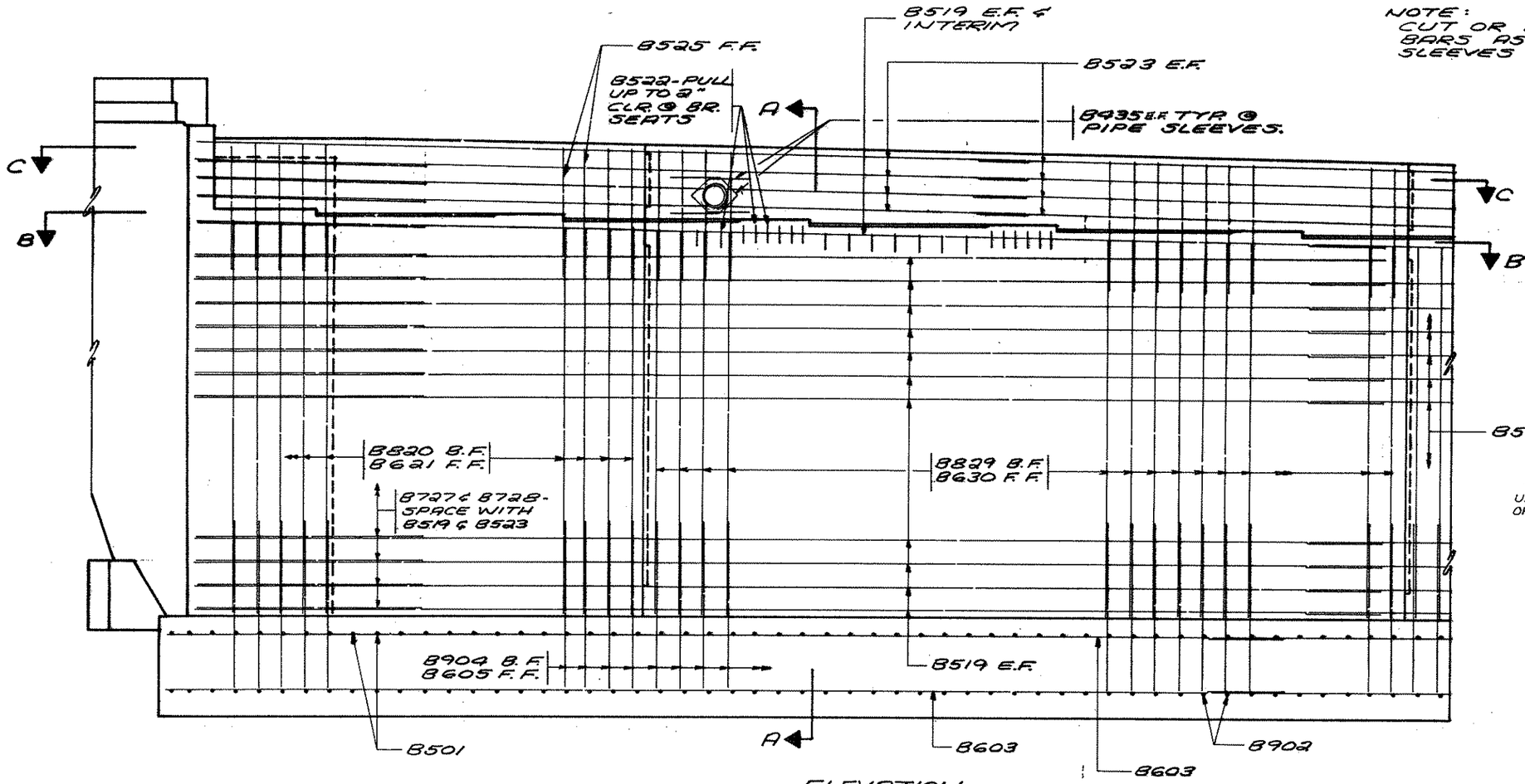

SECTION B-B




S.A.P. 02-601-29

| NO. ABUTMENT FTG. DETAILS | DRAWN: O.J.V. | CHECKED: R.R.T. | APPROVED: 7-15-98 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 19 OF 45 SHEETS | | | |

NOTE:
CUT OR ADJUST REINFORCEMENT BARS AS NECESSARY TO AVOID SLEEVES THRU ABUTMENT.



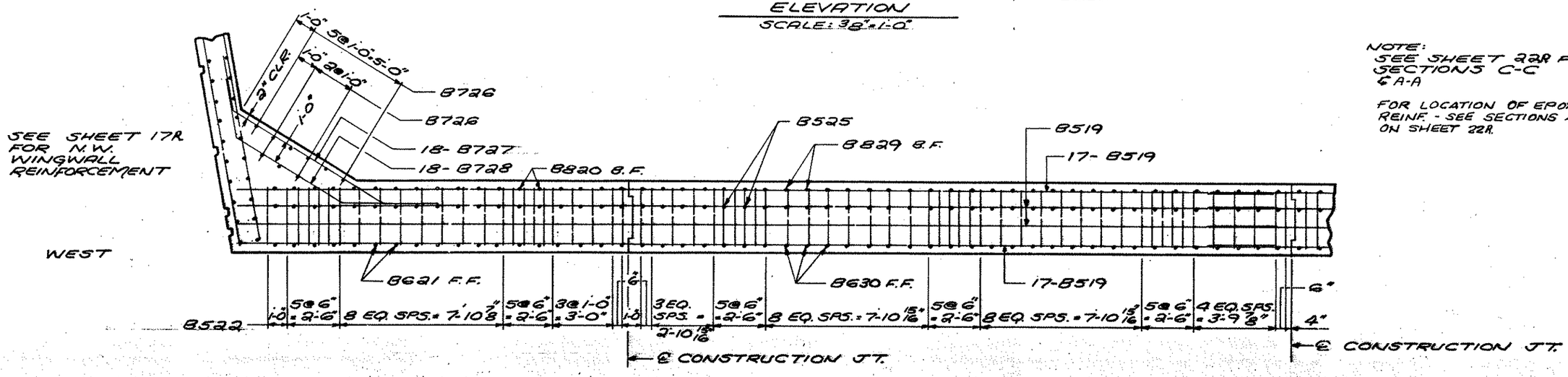

ELEVATION
SCALE: 3/8" = 1'-0"

USE EPOXY COATED BARS ON FRONT FACE & SEAT OF ABUTMENT. (SEE NOTE BELOW)

NOTE:
SEE SHEET 22R FOR SECTIONS C-C & A-A

FOR LOCATION OF EPOXY COATED REINF. - SEE SECTIONS A-A & C-C ON SHEET 22R.

SEE SHEET 17R FOR N.W. WINGWALL REINFORCEMENT

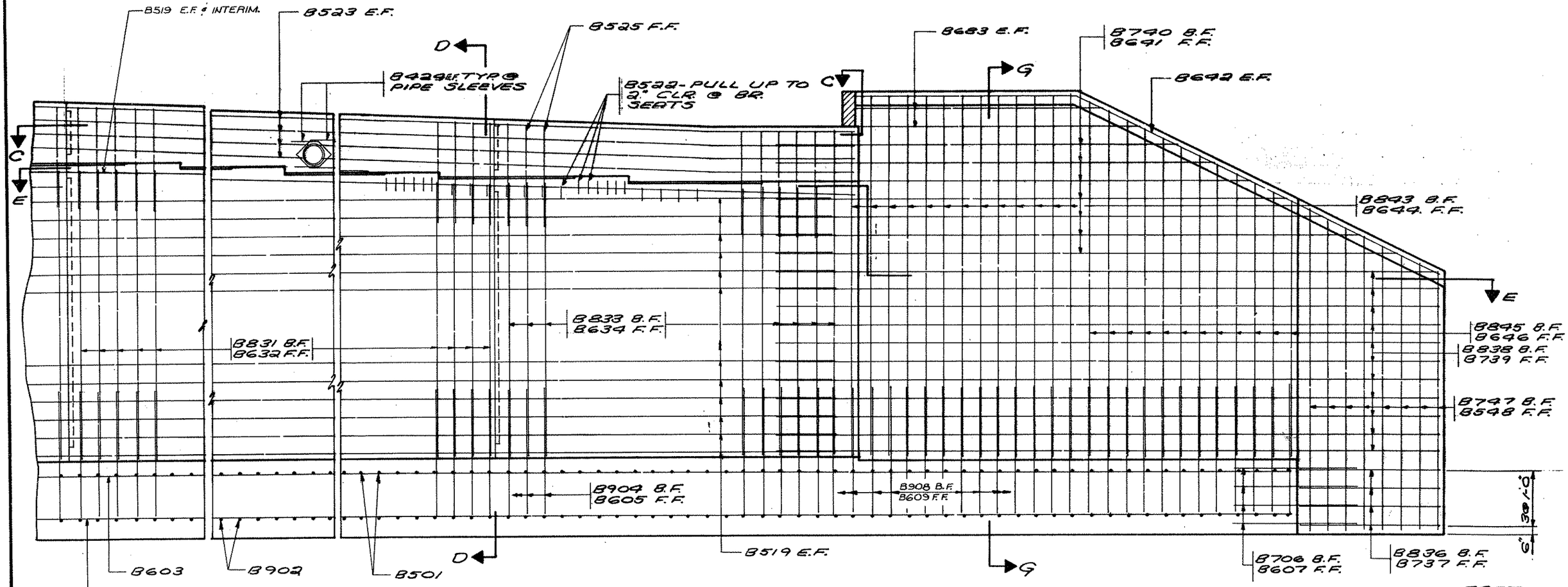



SECTION B-B
SCALE: 3/8" = 1'-0"

S.A.P. 02-601-39

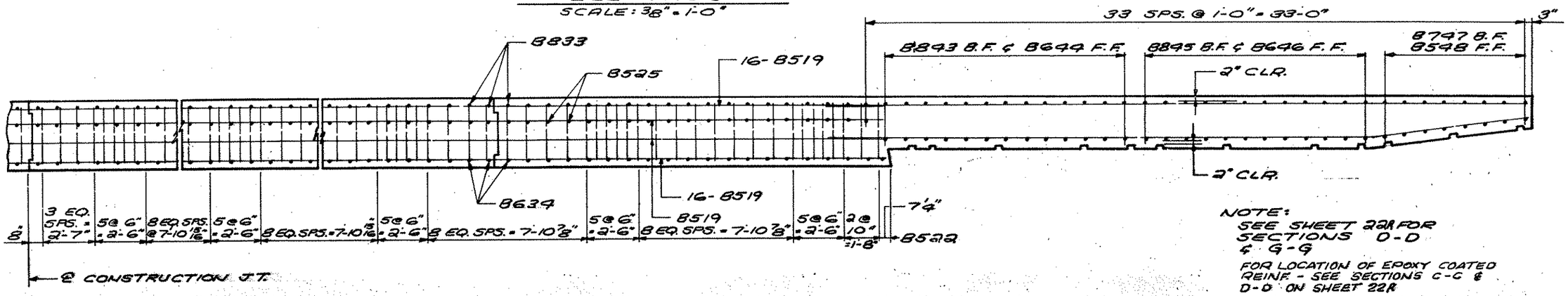
| NO ABUTMENT REINFORCEMENT | DRAWN: D.J.V. | CHECKED: R.R.T. | APPROVED: 7-15-88 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 20R OF 45 SHEETS | | | |

NOTE:
CUT OR ADJUST REINFORCEMENT BARS AS NECESSARY TO AVOID SLEEVES THRU ABUTMENTS.




EAST

## ELEVATION
SCALE: 3/8" = 1'-0"




## SECTION E-E

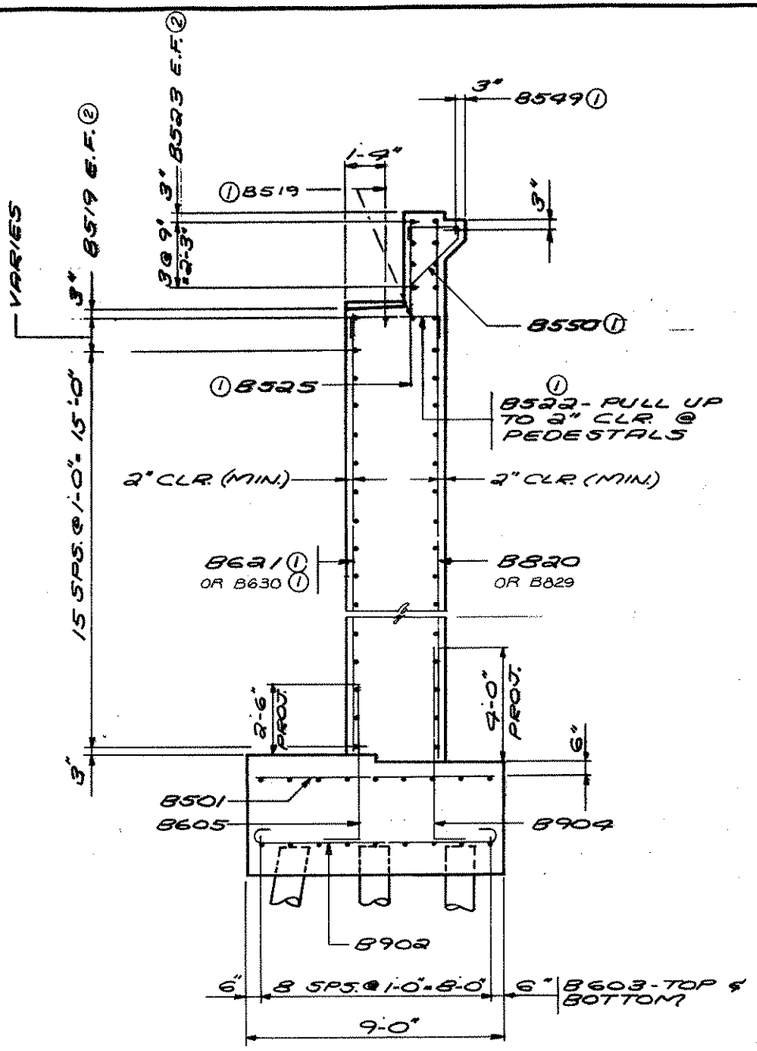
NOTE:
SEE SHEET 22R FOR SECTIONS D-D & G-G

FOR LOCATION OF EPOXY COATED REINF. - SEE SECTIONS C-C & D-D ON SHEET 22R

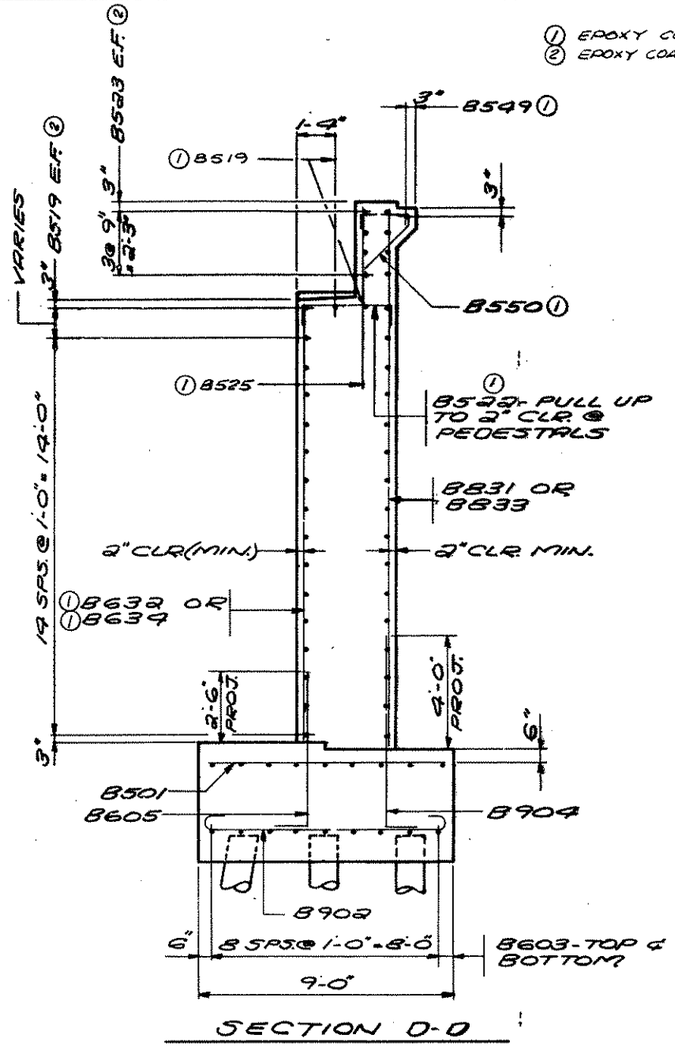
S.A.P. 02-601-29

| NO. ABUTMENT REINFORCEMENT | DRAWN: D.J.Y. | CHECKED R.E.T. | APPROVED 7-15-98 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 21R OF 45 SHEETS | | | |

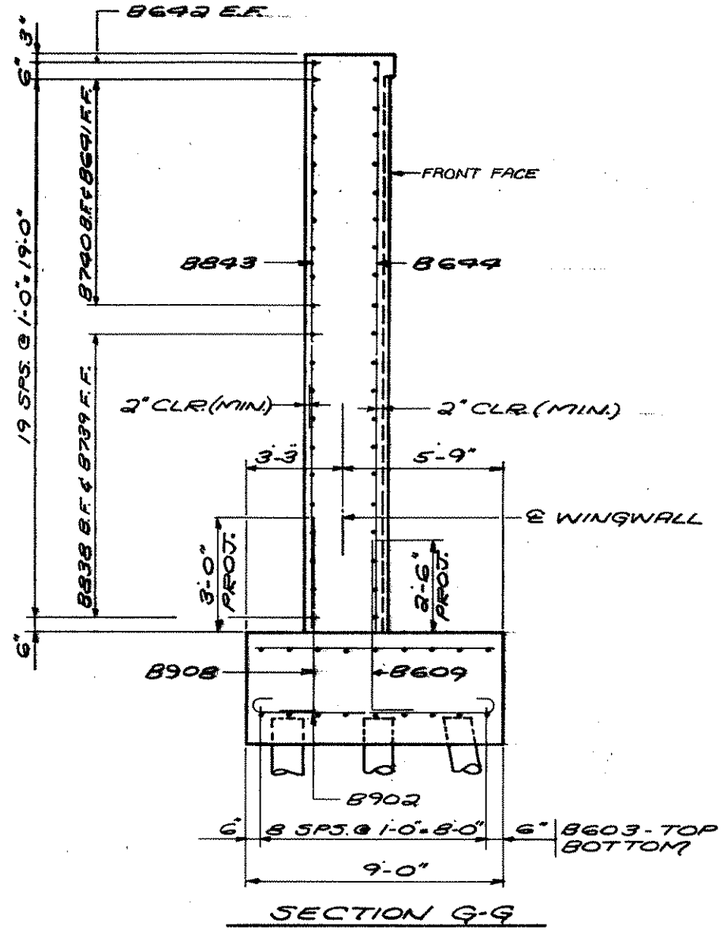
(1) EPOXY COATED REINF.
(2) EPOXY COATED F.F. BARS ONLY



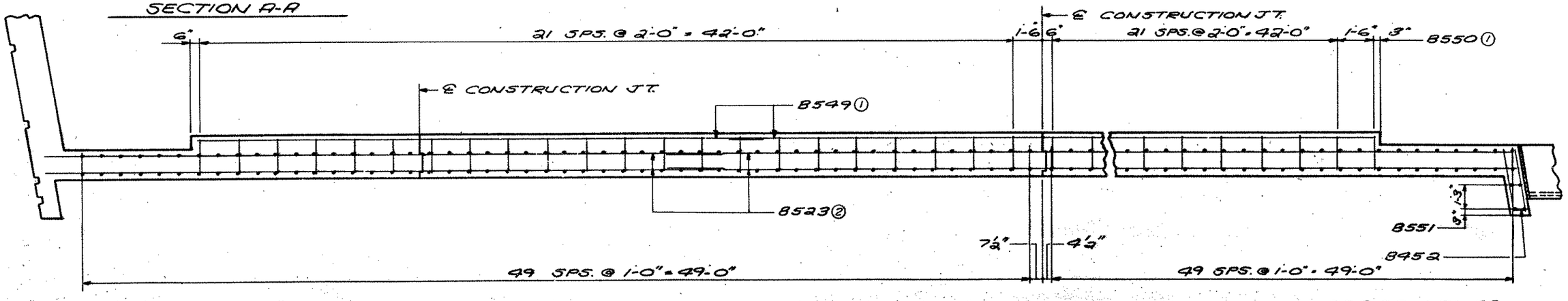

SECTION A-A




SECTION D-D



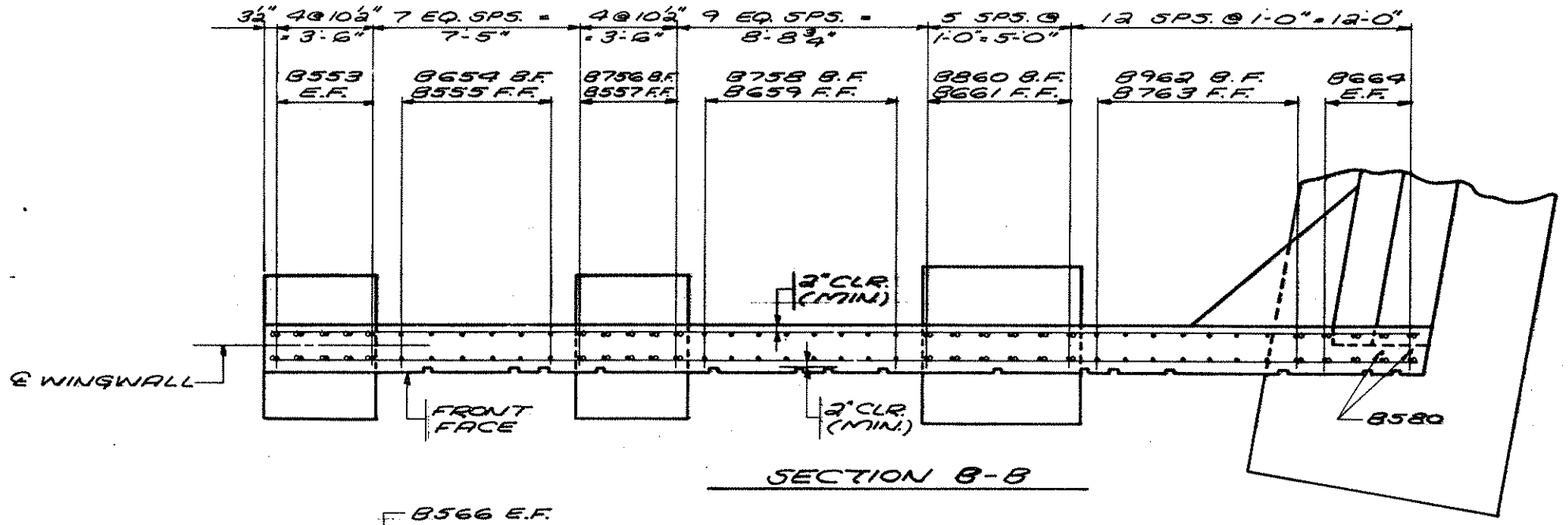

SECTION G-G



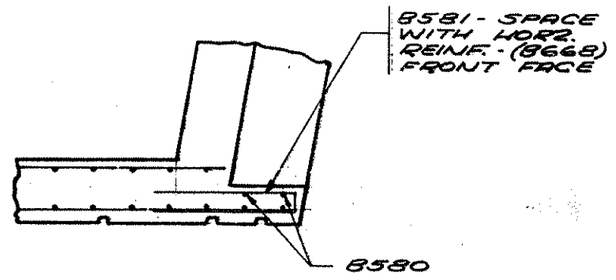

SECTION C-C

S.A.P. 02-601-29

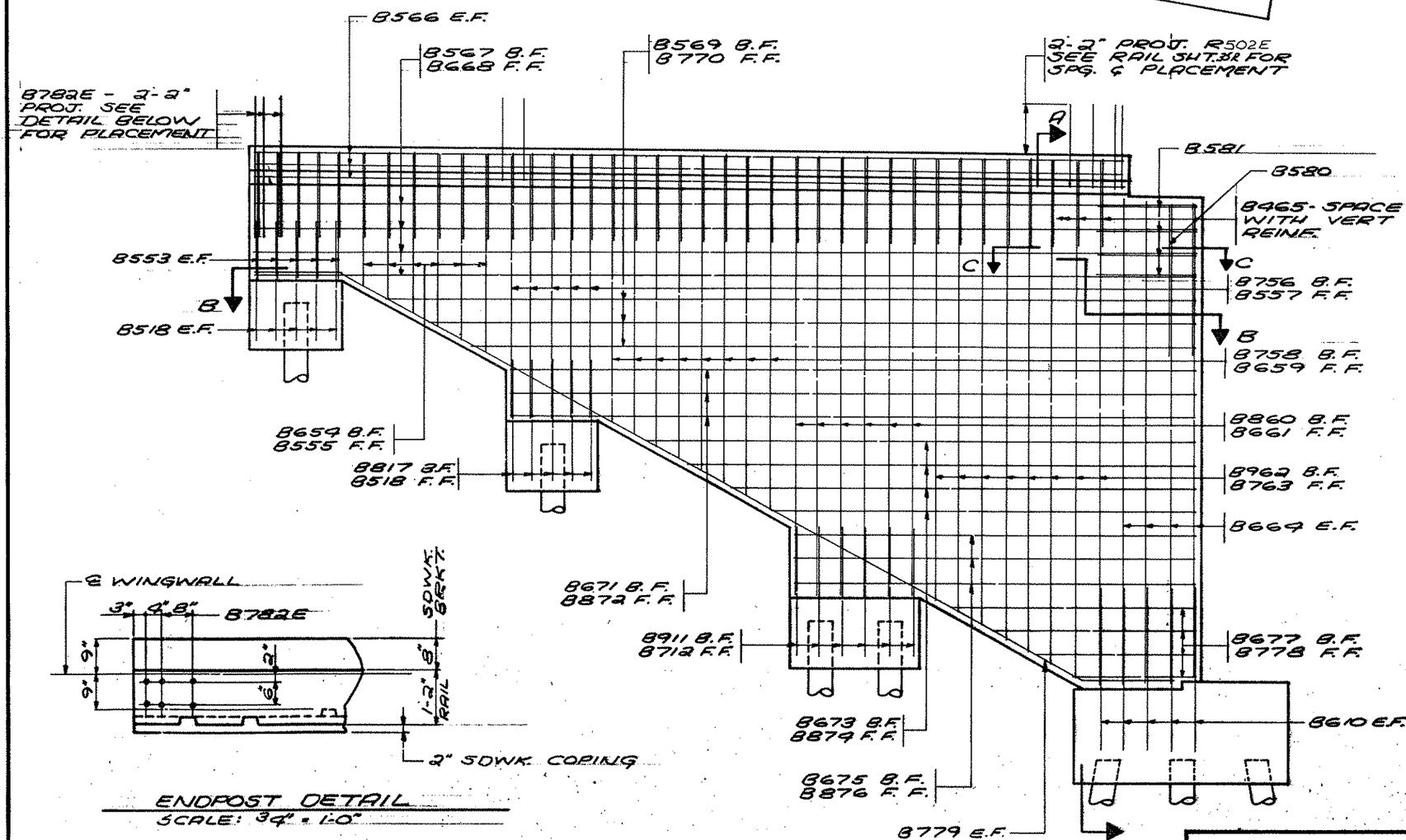
| NO. ABUTMENT REINFORCEMENT | DRAWN: D.J.V. | CHECKED: R.R.T. | APPROVED: 7-15-88 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 22R OF 45 SHEETS | | | |




SECTION B-B



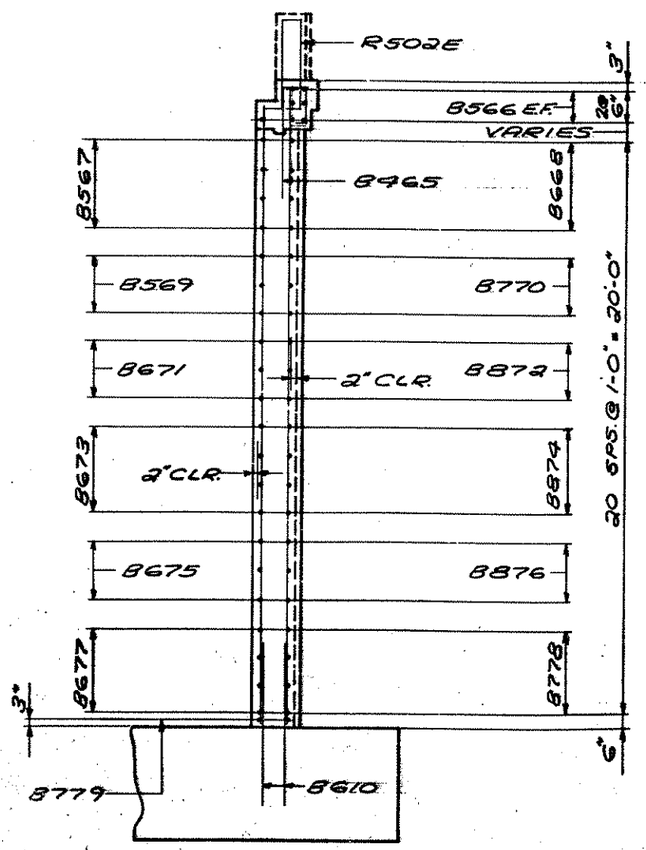

SECTION C-C




ELEVATION
SCALE: 3/8" = 1'-0"



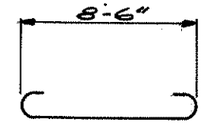

ENDPOST DETAIL
SCALE: 3/4" = 1'-0"



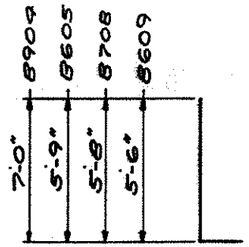

SECTION A-A

S.B.P. 02-601-29

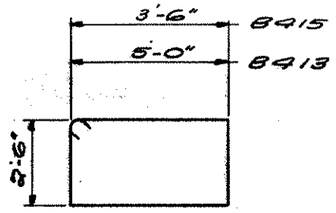
| | | | | |
|---|---|---|---|---|
| N.W. WINGWALL REINFORCEMENT | DRAWN: O.J.V. | CHECKED: R.R.T. | APPROVED 7-15-85 | BRIDGE NUMBER 02541 |
| | SHEET 23R OF 45 SHEETS | | | |



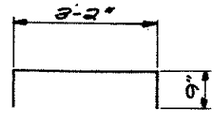

B902



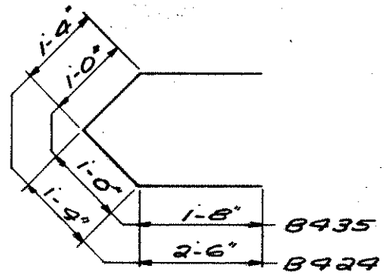

B904, B605, B708 & B609



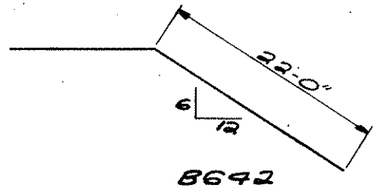

B413 & B415



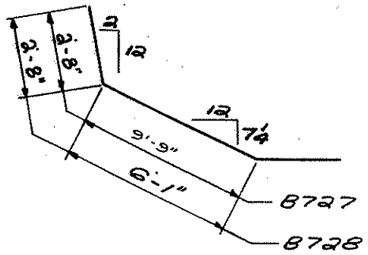

B522



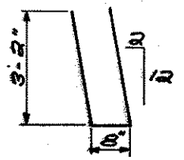

B424 & B435



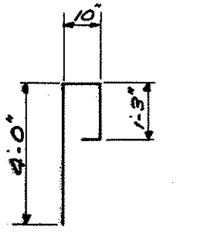

B642



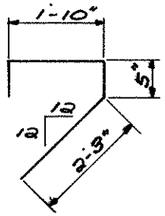

B727 & B728



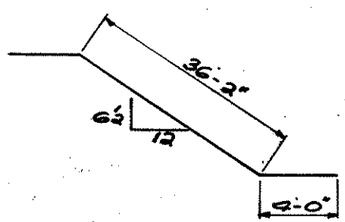

B452



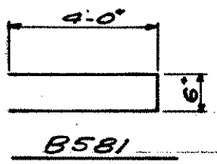

B465



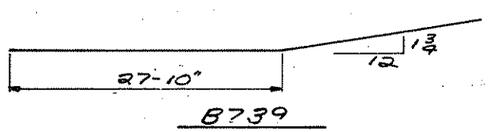

B550




B779




B581




B739

## BILL OF REINFORCEMENT - NO. ABUT.

| | BAR | NO. | LEN. | SHAPE | LOCATION |
|---|---|---|---|---|---|
| | B659 | 1 SER. OF 8 | 11-5" to 15-1" | STR. | N.W. WING-VERT. |
| | B660 | 6 | 18-8" | " | " " " |
| | B661 | 6 | 18-8" | " | " " " |
| | B662 | 1 SER. OF 8 | 18-9" to 22-5" | " | " " " |
| | B663 | 1 SER. OF 8 | 18-9" to 22-5" | " | " " " |
| | B664 | 8 | 20-3" | " | " " " |
| | B665 | 38 | 6'-5" | BENT | " " " |
| | B566 | 7 | 37-0" | STR. | " " - HORZ. |
| | B567 | 4 | 40-8" | " | " " " |
| | B668 | 4 | 40-8" | " | " " " |
| | B569 | 1 SER. OF 3 | 30-9" to 34-6" | " | " " " |
| | B770 | 1 SER. OF 3 | 30-9" to 34-6" | " | " " " |
| | B671 | 3 | 29-4 | " | " " " |
| | B872 | 3 | 29-4" | " | " " " |
| | B673 | 1 SER. OF 4 | 18-0" to 23-5" | " | " " " |
| | B874 | 1 SER. OF 4 | 18-0" to 23-5" | " | " " " |
| | B675 | 3 | 17-0" | " | " " " |
| | B876 | 3 | 17-0" | " | " " " |
| | B677 | 1 SER. OF 4 | 5-2" to 10'-6" | " | " " " |
| | B778 | 1 SER. OF 4 | 5-2" to 10'-6" | " | " " " |
| | B779 | 2 | 43'-11" | BENT | " " " |
| | B580 | 2 | 6'-0" | STR. | CURTAIN WALL |
| | B581 | 4 | 8'-6" | BENT | " " |
| | B782E | 6 | 6'-0" | STR. | END POST |
| ③ | B683 | 2 | 29-4" | " | N.E. WING-HORZ. |

① 3 LINES WITH 2'-3" MIN. LAP
② 2 LINES WITH 2'-3" MIN. LAP
③ CUT 2 FROM 1
⑥ BEND IN FIELD
⑦ EPOXY COATED

⑨ EPOXY COAT BARS IN F.F. & INTERM. - SEE SHEET 22R

## SUMMARY OF QUANTITIES FOR NORTH ABUTMENT

| | | | |
|---|---|---|---|
| | STRUCTURE CONCRETE (1P43) | 182 | CU. YD. |
| | STRUCTURE CONCRETE (3Y43) | 327 | CU. YD. |
| | REINFORCEMENT BARS | 34160 | POUND |
| | REINFORCEMENT BARS (EPOXY COATED) | 5880 | POUND |
| | C.I.P. CONC. TEST PILES 35 FT. LONG | 2 | EACH |
| ④ | C.I.P. CONC. PILING DELIVERED | 1915 | LIN. FT. |
| ④ | C.I.P. CONC. PILING DRIVEN | 1915 | LIN. FT. |
| ⑤ | DRAINAGE SYSTEM - SEE SHEET 29 | | |
| | WIRE FENCE DES S-1 | 32 | LIN. FT. |
| ⑤ | FOUNDATION PREPARATION. | 1 | LUMP SUM |

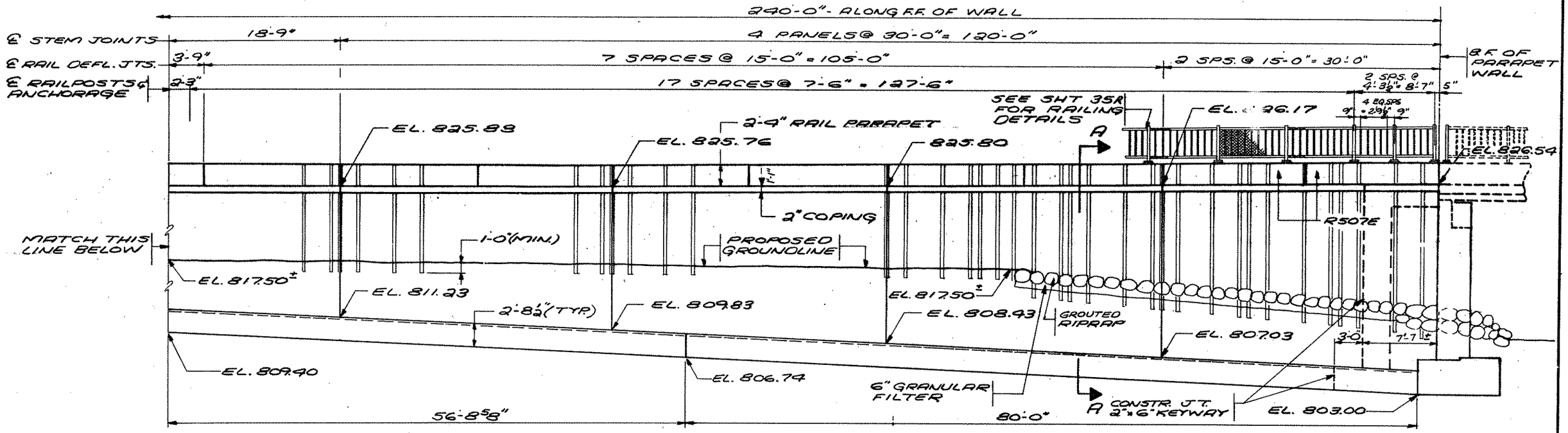
④ DOES NOT INCLUDE TEST PILES
⑤ SEE SPECIAL PROVISIONS

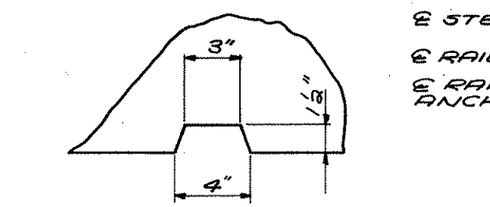
## BILL OF REINFORCEMENT - NO. ABUT.

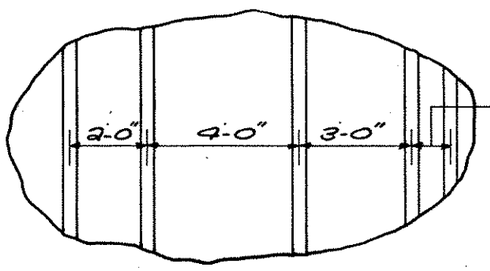
| | BAR | NO. | LEN. | SHAPE | LOCATION |
|---|---|---|---|---|---|
| | B501 | 127 | 8'-6" | STR. | FTG.-TOP TRANS. |
| | B902 | 127 | 11'-0" | BENT | " - BOT. " |
| ① | B603 | 54 | 43'-6" | STR. | " - T.&B. LONGIT. |
| | B904 | 98 | 8'-0" | BENT | " - DOWELS |
| | B605 | 100 | 6'-9" | " | " " |
| | B706 | 4 | 5'-8" | STR. | " - WING DOWELS |
| | B607 | 4 | 4'-9" | " | " " " |
| | B908 | 26 | 6'-8" | BENT | " " " |
| | B609 | 26 | 6'-6" | " | " " " |
| | B610 | 10 | 5'-6" | STR. | " " " |
| | B911 | 6 | 6'-6" | " | " " " |
| | B712 | 6 | 5'-6" | " | " " " |
| | B413 | 4 | 15'-9" | BENT | " " - STIRRUP |
| | B514 | 12 | 5'-0" | STR. | " " - HORZ. |
| | B415 | 8 | 12'-9" | BENT | " " - STIRRUP |
| | B516 | 22 | 4'-6" | STR. | " " - HORZ. |
| | B817 | 5 | 6'-0" | " | " " - DOWELS |
| | B518 | 15 | 5'-0" | " | " " " |
| ⑨② | B519 | 70 | 52'-0" | " | BR. ST. - HORZ. |
| | B820 | 1 SER. OF 18 | 19-10" to 20-1" | " | " " - VERT. |
| ⑦ | B621 | 1 SER. OF 18 | 16'-8" to 16'-10" | " | " " " |
| ⑦ | B522 | 128 | 4'-8" | BENT | " " - TIES |
| ⑦① | B523 | 24 | 35'-0" | STR. | PARR. WALL-HORZ. |
| | B424 | 4 | 7'-8" | BENT | " " @ SLEEVE |
| | B525 | 100 | 6'-0" | STR. | " " VERT. |
| | B726 | 9 | 19'-3" | " | FILLET - VERT. |
| | B727 | 20 | 15'-1" | BENT | " - HORZ. |
| | B728 | 20 | 11'-5" | " | " - " |
| | B829 | 1 SER. OF 32 | 19-2" to 19-10" | STR. | BR. ST. - VERT. |
| ⑦ | B630 | 1 SER. OF 32 | 16-0" to 16-7" | " | " " " |
| | B831 | 1 SER. OF 31 | 18-5" to 19-5" | " | " " " |
| ⑦ | B632 | 1 SER. OF 31 | 15-1" to 16'-0" | " | " " " |
| | B833 | 1 SER. OF 19 | 18-0" to 18'-4" | " | " " " |
| ⑦ | B634 | 1 SER. OF 20 | 14-11" to 15'-2" | " | " " " |
| | B435 | 4 | 5'-4" | BENT | PARR. WALL-SLEEVE |
| | B836 | 4 | 7'-9" | STR. | N.E. WING-HORZ. |
| | B737 | 4 | 7'-9" | " | " " " |
| | B838 | 11 | 35'-8" | " | " " " |
| | B739 | 11 | 35'-8" | BENT | " " " |
| | B740 | 1 SER. OF 7 | 21'-9" to 34'-0" | STR. | " " " |
| ⑥ | B641 | 1 SER. OF 7 | 21'-9" to 34'-0" | BENT | " " " |
| | B642 | 2 | 34'-2" | BENT | " " " |
| | B843 | 13 | 20'-0" | STR. | " " - VERT. |
| | B644 | 13 | 20'-0" | " | " " " |
| | B845 | 1 SER. OF 12 | 19'-2" to 19'-8" | " | " " " |
| | B646 | 1 SER. OF 12 | 19'-2" to 19'-8" | " | " " " |
| | B747 | 1 SER. OF 8 | 14'-2" to 17'-9" | " | " " " |
| | B548 | 1 SER. OF 8 | 14'-2" to 17'-9" | " | " " " |
| ⑦ | B549 | 2 | 44'-8" | " | PAVING BRK'T. |
| ⑦ | B550 | 45 | 9'-11" | BENT | " " |
| | B551 | 4 | 6'-0" | STR. | CURTAIN WALL |
| | B452 | 4 | 7'-0" | BENT | " " |
| | B553 | 10 | 5'-6" | STR. | N.W. WING-VERT. |
| | B654 | 1 SER. OF 6 | 5'-9" to 8'-6" | " | " " " |
| | B555 | 1 SER. OF 6 | 5'-9" to 8'-6" | " | " " " |
| | B756 | 5 | 11'-9" | " | " " " |
| | B557 | 5 | 11'-9" | " | " " " |
| | B758 | 1 SER. OF 8 | 11-5" to 15'-1" | " | " " " |

S.A.P. 02-601-29

| NORTH ABUTMENT REINFORCEMENT | DRAWN: D.J.V. | CHECKED: R.R.T. | APPROVED 7-15-88 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 24R OF 45 SHEETS | | | |

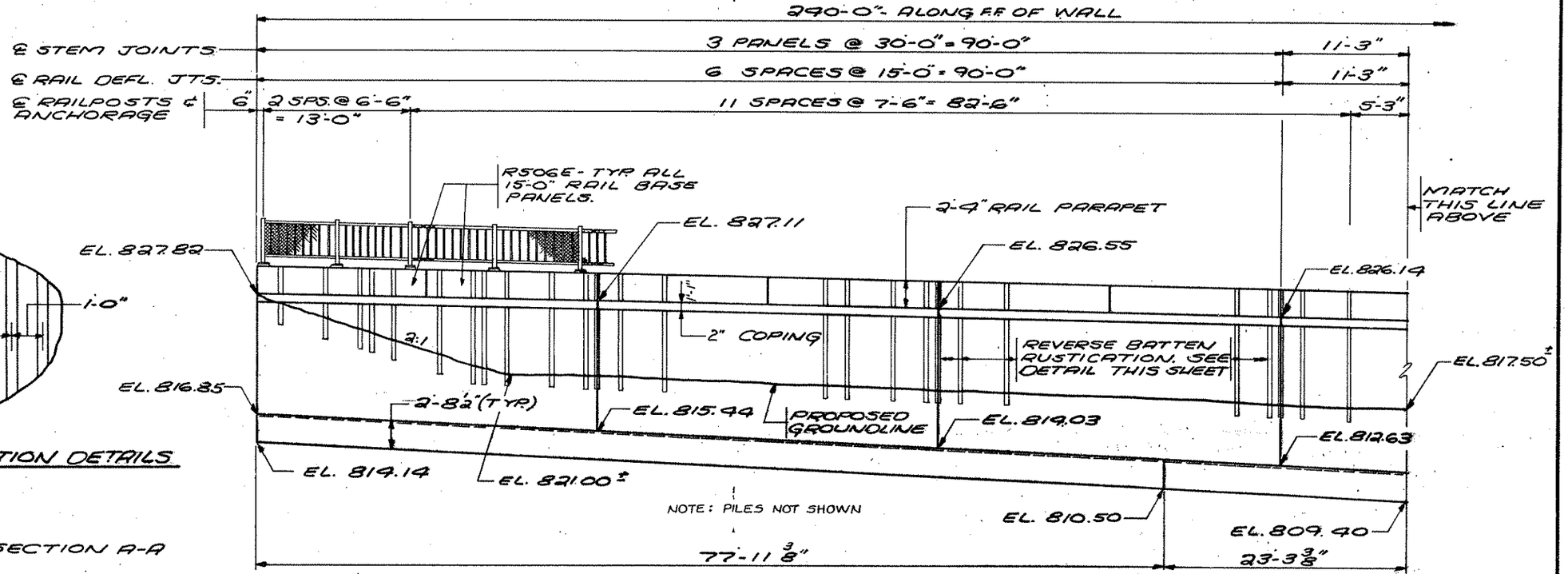



REVERSE BATTEN RUSTICATION DETAILS

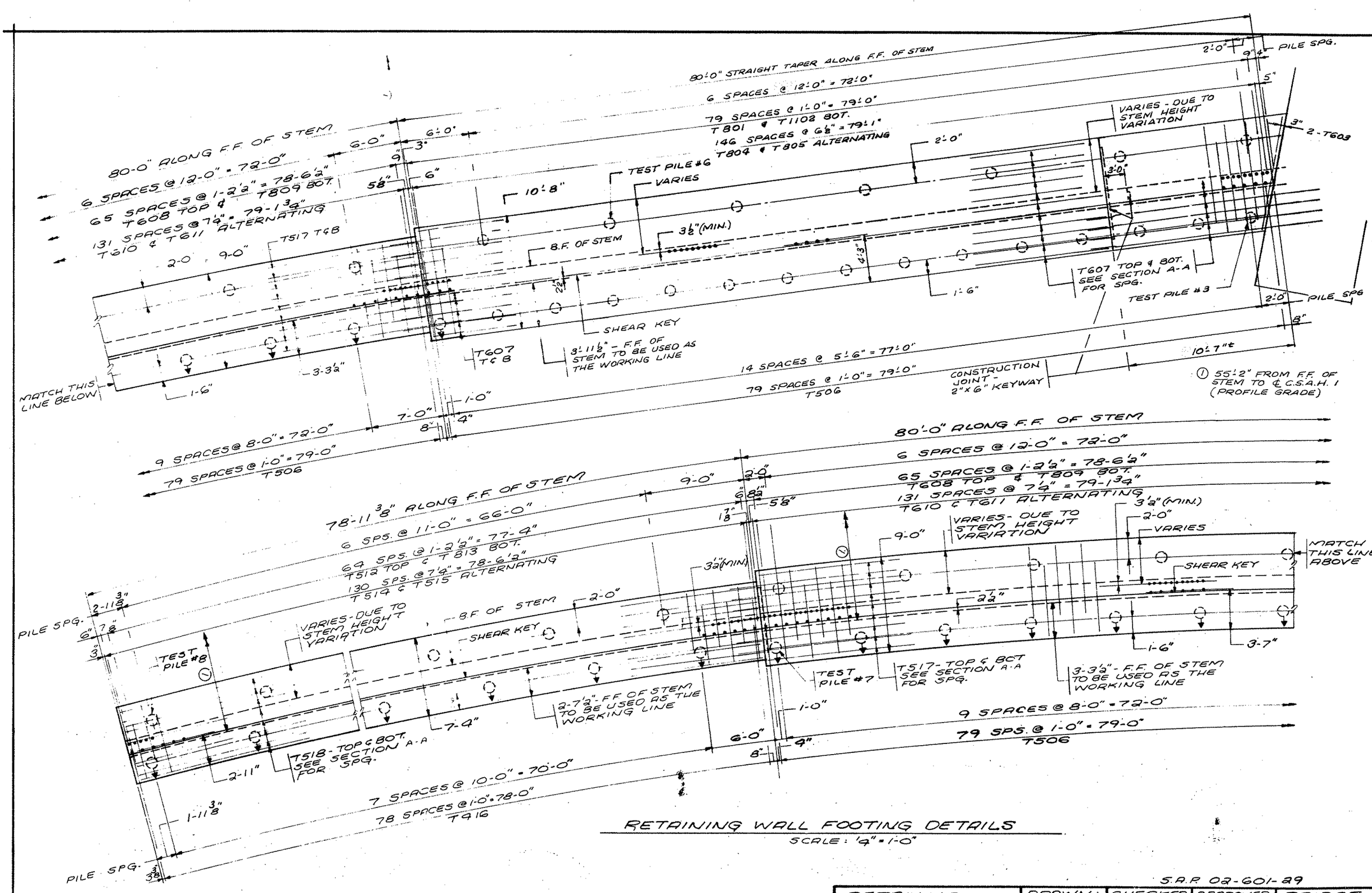
NOTE:
SEE SHT. 28R FOR SECTION A-A




RETAINING WALL ELEVATION
SCALE 3/16" = 1'-0"
(LOOKING WEST)

S.A.P. 02-601-89

| RETAINING WALL DETAILS | DRAWN: O.J.V. | CHECKED: R.R.T. | APPROVED: 7-15-88 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 25R OF 45 SHEETS | | | |

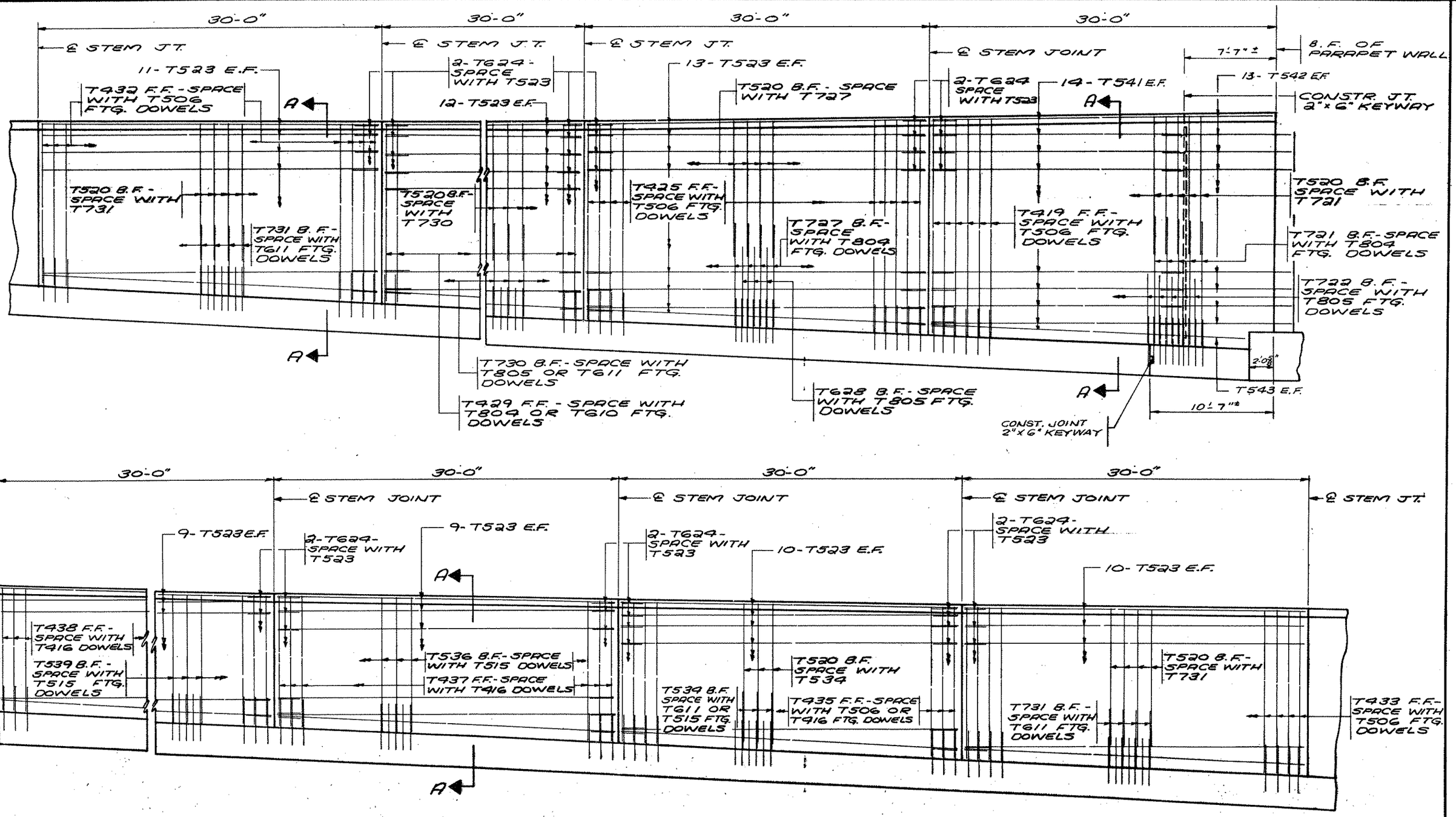



## RETAINING WALL FOOTING DETAILS

SCALE: ¼" = 1'-0"

S.A.P. 02-601-89

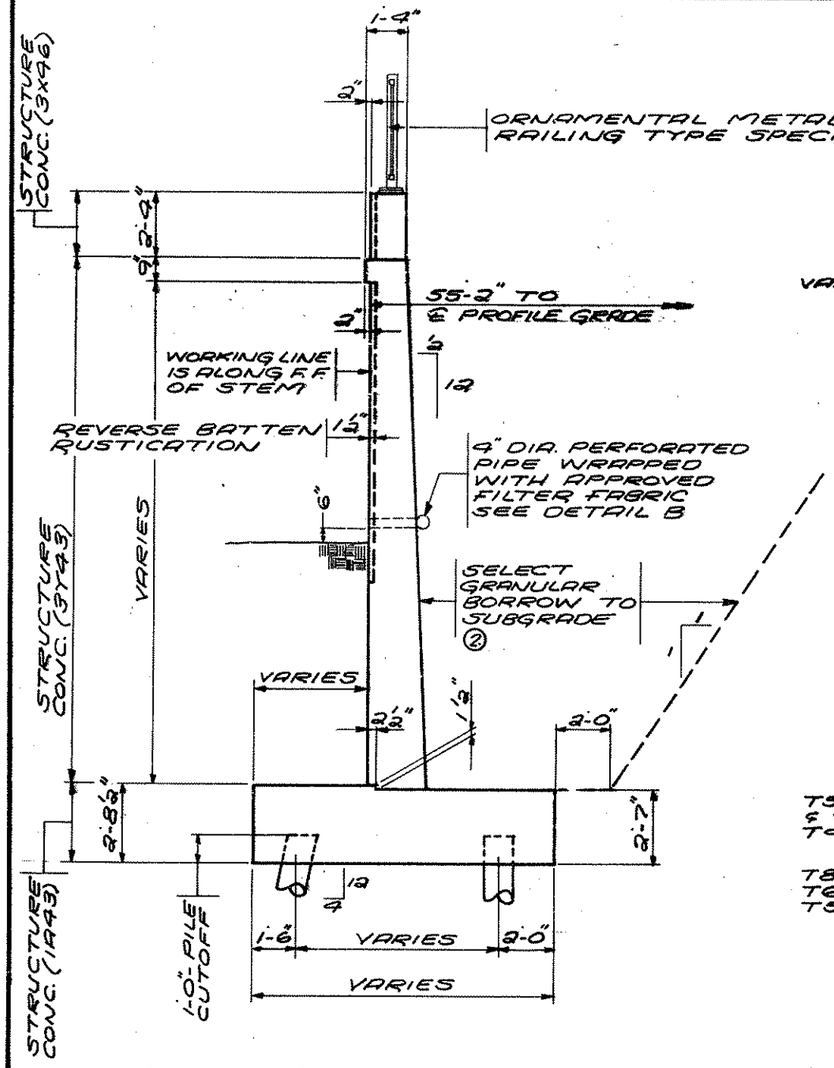
| RETAINING WALL DETAILS | DRAWN: O.J.V. | CHECKED: R.R.T. | APPROVED: 7-15-88 | BRIDGE NUMBER 02591 |
|---|---|---|---|---|
| | SHEET 38 OF 45 SHEETS | | | |




# RETAINING WALL REINFORCEMENT

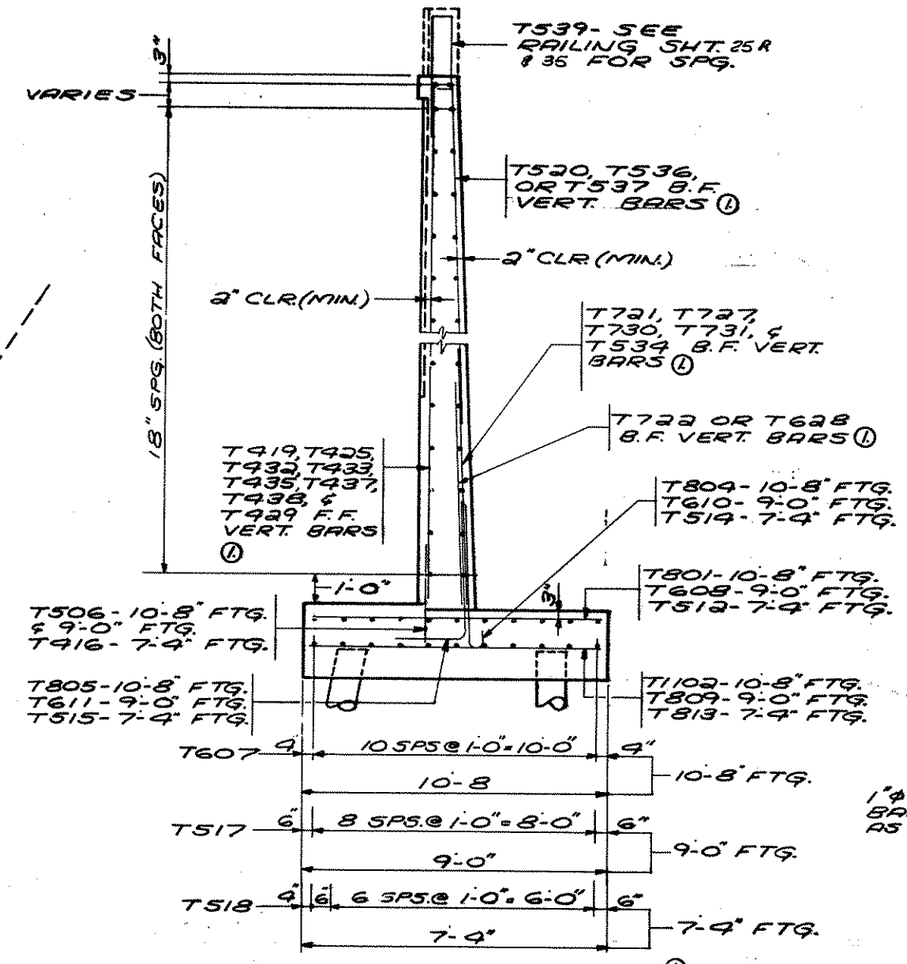
S.A.P. 02-601-29

| RETAINING WALL REINFORCEMENT | DRAWN: D.J.V. | CHECKED: R.R.T. | APPROVED 7-15-98 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 27R OF 45 SHEETS | | | |




TYPICAL SECTION THRU STEM

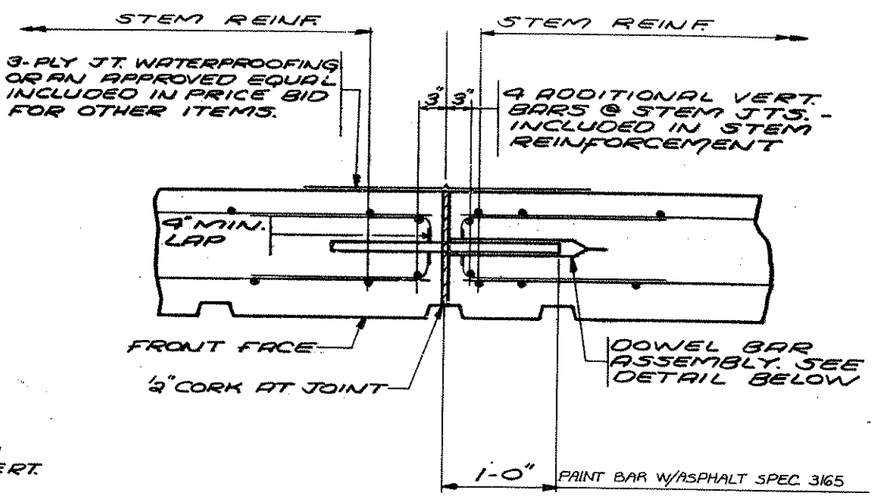
SCALE: 3/8" = 1'-0"




① SEE SHT. 27R FOR EXACT LOCATIONS

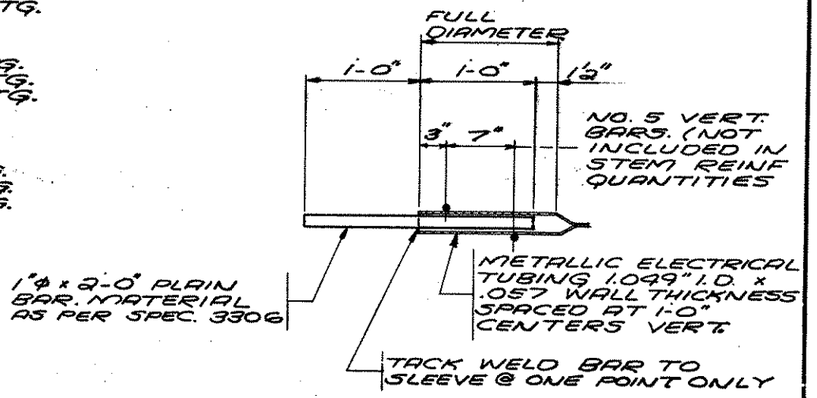
SECTION A-A

SHOWING REINF.



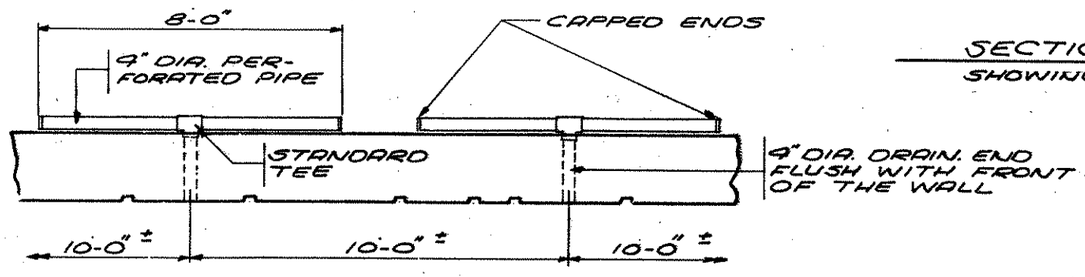

CORK SHALL COMPLY WITH SPEC. 3702. SECURE CORK WITH 2½" COPPER NAILS AT ABOUT 18" CTRS. CORK AND NAILS INCLUDED IN PRICE BID FOR OTHER ITEMS.

TYPICAL SECTION THRU STEM JOINT




DOWEL BAR ASSEMBLY

MATERIAL AND PLACING TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS




THERMOPLASTIC PIPE PER SPEC. 3295

DETAIL B

SCALE: ½" = 1'-0"

② SELECT GRANULAR MATERIAL TO BE UNDER GRADING PORTION OF THE CONTRACT.

S.A.P. 02-601-29

| RETAINING WALL DETAILS | DRAWN: D.J.V. | CHECKED: R.R.T. | APPROVED: 7-15-88 | BRIDGE NUMBER 02591 |
|---|---|---|---|---|
| | SHEET 28R OF 45 SHEETS | | | |

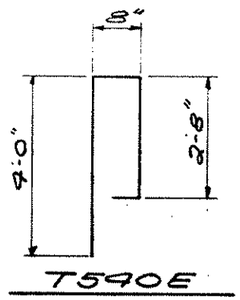
## PILE NOTES

4 - C.I.P. CONC. TEST PILES 35 FT. LONG
50 - C.I.P. CONC. PILING EST. LENGTH 25 FT.
54 - C.I.P. CONC. PILES REQ'D FOR RETAINING WALL

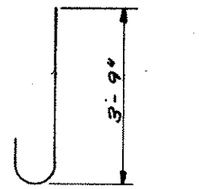
ALL PILES TO BE 12"ϕ C.I.P. PILES
PILES MARKED THUS ⊖→ TO BE BATTERED 4" PER FOOT IN THE DIRECTION SHOWN.
PILE SPG. SHOWN IS AT BOTTOM OF FOOTING
FOR SPLICES SEE DETAIL 8201
DESIGN LOAD = 50 TONS PER PILE

⑨ SUMMARY OF QUANTITIES FOR DRAINAGE SYS.

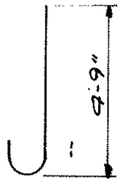
| | |
|---|---|
| 4" ϕ PERFORATED PIPE | 420 LIN. FT. |
| FILTER FABRIC | 490 SQ. FT. |
| 4" STANDARD TEE | 23 EA. |
| COARSE FILTER AGGREGATE (CV) | 15 CU. YD. |



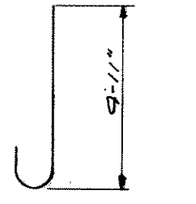
T590E



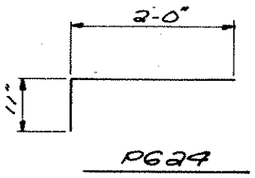
P514



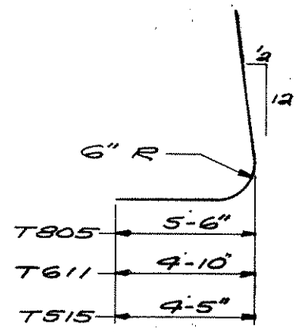
P610



P804



P624



T805, T611, & T515

BILL OF REINFORCEMENT - RETAIN. WALL

| | BAR | NO. | LEN. | SHAPE | LOCATION |
|---|---|---|---|---|---|
| | T801 | 81 | 8'-0" | STR. | FTG. - TRANS. |
| | T1102 | 81 | 8'-0" | " | " " |
| | T603 | 9 | 10'-4" | " | " " |
| | T804 | 74 | 5'-10" | BENT | " - DOWELS |
| | T805 | 74 | 10'-2" | " | " " |
| | T506 | 160 | 9'-0" | STR. | " " |
| ②① | T607 | 44 | 44'-6" | " | " - LONGIT. |
| | T608 | 66 | 7'-3" | " | " - TRANS. |
| | T809 | 66 | 7'-3" | " | " " |
| | T610 | 66 | 5'-5" | BENT | " - DOWELS |
| | T611 | 66 | 8'-10" | " | " " |
| | T512 | 66 | 5'-8" | STR. | " - TRANS. |
| | T813 | 66 | 5'-8" | " | " " |
| | T514 | 66 | 9'-9" | BENT | " - DOWELS |
| | T515 | 65 | 7'-11" | STR. | " " |
| | T416 | 79 | 3'-0" | " | " " |
| ③ | T517 | 36 | 91'-0" | " | " - LONGIT. |
| ③ | T518 | 32 | 40'-6" | " | " " |
| | T419 | 1 SER. OF 30 | 18'-10" to 20'-6" | " | STEM - VERT. |
| | T520 | 157 | 12'-0" | " | " " |
| | T721 | 28 | 11'-0" | " | " " |
| | T722 | 28 | 7'-0" | " | " " |
| | T523 | 148 | 29'-8" | " | " - HORZ. |
| ② | T624 | 324 | 2'-11" | BENT | " @ JTS. |
| | T425 | 1 SER. OF 30 | 17'-1" to 18'-9" | STR. | " - VERT. |
| | T727 | 28 | 9'-0" | " | " " |
| | T628 | 28 | 7'-0" | " | " " |
| | T429 | 1 SER. OF 30 | 15'-8" to 17'-0" | " | " " |
| | T730 | 28 | 8'-0" | " | " " |
| | T731 | 50 | 6'-0" | " | " " |
| | T432 | 1 SER. OF 30 | 14'-4" to 15'-7" | " | " " |
| | T433 | 1 SER. OF 30 | 13'-3" to 14'-3" | " | " " |
| | T534 | 25 | 5'-0" | " | " " |
| | T435 | 1 SER. OF 30 | 12'-3" to 13'-7" | " | " " |
| | T536 | 1 SER. 25 | 11'-5" to 12'-3" | " | " " |
| | T437 | 1 SER. OF 30 | 11'-5" to 12'-3" | " | " " |
| | T438 | 1 SER. OF 30 | 10'-8" to 11'-5" | " | " " |
| | T539 | 1 SER. OF 25 | 10'-8" to 11'-5" | " | " " |
| | T540E | 308 | 7'-10" | BENT | RAIL - TIES |
| | T541 | 28 | 22'-5" | STR | STEM - HORIZ. |
| | T542 | 26 | 11'-0" | " | " - " |
| | T543 | 2 | 9'-7" | " | " - " |

① 2 LINES WITH 2'-3" MIN. LAP
② CUT TO FIT IN THE FIELD
③ 2 LINES WITH 1'-11" MIN. LAP

SUMMARY OF QUANTITIES FOR RETAINING WALL

| | | |
|---|---|---|
| | STRUCTURE CONCRETE (1A93) | 211 CU. YDS. |
| | STRUCTURE CONCRETE (3Y43) | 203 CU. YDS. |
| | REINFORCEMENT BARS | 35,600 POUND |
| | REINFORCEMENT BARS (EPOXY COATED) | 2520 POUND |
| ④ | C.I.P. CONC. PILING DELIVERED | 1250 LIN. FT. |
| ④ | C.I.P. CONC. PILING DRIVEN | 1250 LIN. FT. |
| | C.I.P. CONC. TEST PILES 35 FT. LONG | 4 EA. |
| ⑤ | STRUCTURE EXCAVATION | 1 LUMP SUM |
| ⑥ | TYPE SPECIAL RAILING CONCRETE (3X46) | 292 LIN. FT. |
| | ORNAMENTAL METAL RAILING, TYPE SPECIAL | 240 LIN. FT. |
| ⑦ | DOWEL BAR ASSEMBLIES | 103 EACH |
| ⑨⑤ | DRAINAGE SYSTEM | 1 LUMP SUM |

⑥ APPROX. QUANTITY = 25 CU. YDS.

⑨ INCLUDES DRAINGE SYSTEM QUANTITIES FOR BOTH ABUTMENTS. & RETAINING WALL.
② CUT T607 BARS IN FIELD LEAVING 2'-3" PROJ. BEYOND PERMISSIBLE CONSTR. JT. LAP ONTO PROJECTING T607 BARS WITH CUT T607 BARS WHEN RETAINING WALL OPERATION CONTINUES.
⑦ INCLUDED IN PRICE BID FOR OTHER ITEMS.
④ DOES NOT INCLUDE TEST PILES
⑤ SEE SPECIAL PROVISIONS

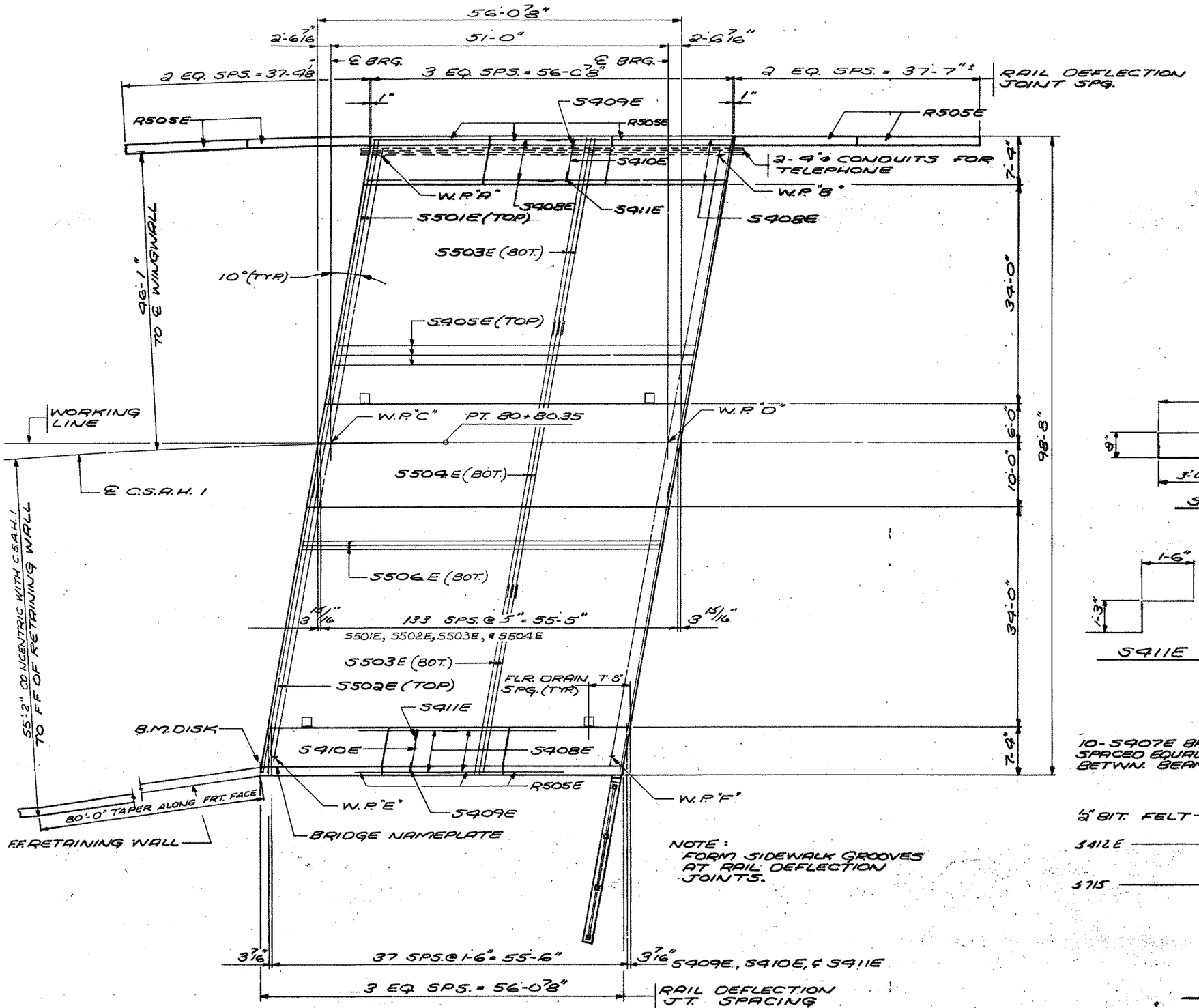
S.A.P. 0a-601-29

RETAINING WALL DETAILS

| DRAWN: O.J.V. | CHECKED: R.R.T. | APPROVED: 7-15-98 |
|---|---|---|

SHEET 29R OF 45 SHEETS

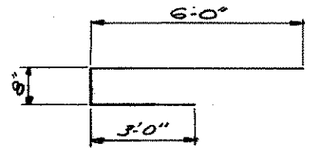
BRIDGE NUMBER 03591



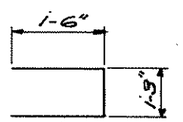

NOTE:
FORM SIDEWALK GROOVES AT RAIL DEFLECTION JOINTS.

## DECK PLAN
SCALE: 1/8" = 1'-0"

| BILL OF REINFORCEMENT - SUPERSTR. | | | | |
|---|---|---|---|---|
| BAR | NO. | LEN. | SHAPE | LOCATION |
| S501E | 134 | 56'-0" | STR. | TOP TRANS. - SLAB |
| S502E | 134 | 45'-6" | " | " " - " |
| S503E | 268 | 30'-0" | " | BOT. " " |
| S504E | 134 | 44'-0" | " | " " " |
| S405E | 73 | 55'-8" | " | TOP LONGIT. " |
| S506E | 117 | 55'-8" | " | BOT. " " |
| S407E | 180 | 9'-8" | BENT | END OF SLAB |
| S408E | 32 | 28'-8" | STR. | SIDEWALK - LONGIT. |
| S409E | 76 | 9'-3" | BENT | " - TIES |
| S410E | 76 | 6'-10" | STR. | " - TRANS. |
| S411E | 76 | 9'-3" | BENT | " - TIES |
| S412E | 126 | 4'-0" | " | END DIAPHRAGM |
| S413 | 36 | 8'-10" | STR. | " " |
| S714E | 18 | 16'-0" | BENT | " " |
| S713 | 36 | 9'-3" | STR. | " " |
| S714 | 32 | 3'-0" | " | " " |



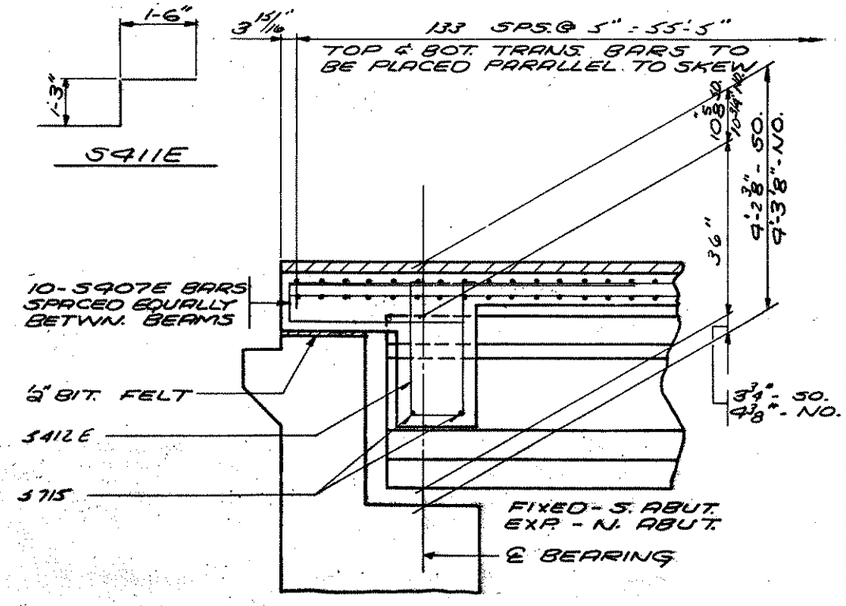

S407E




S409E



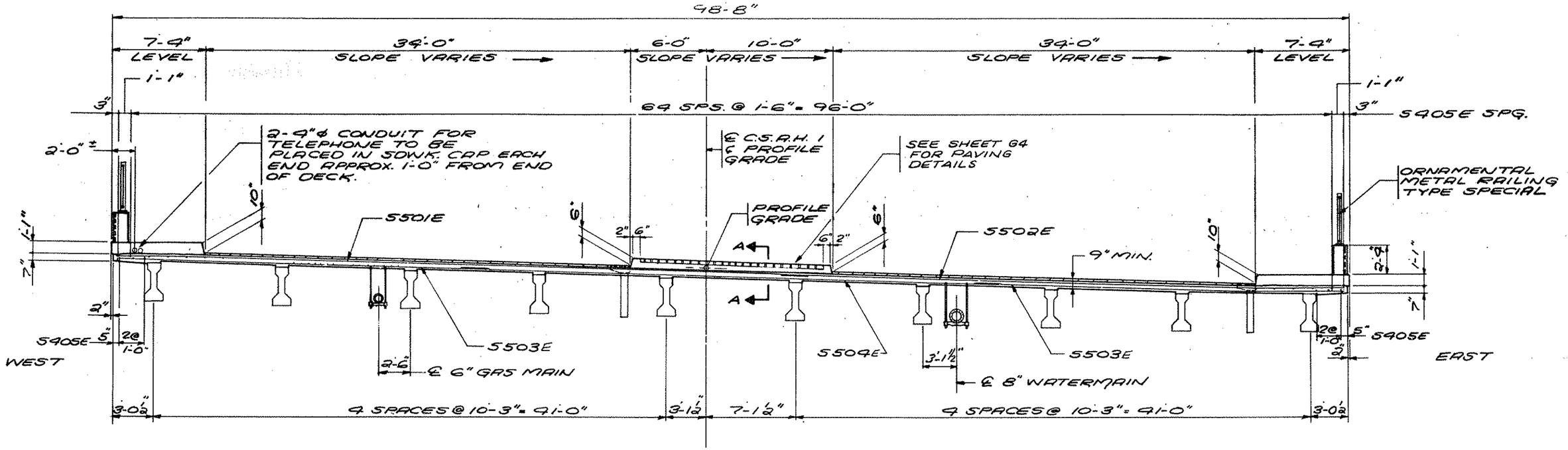

S411E



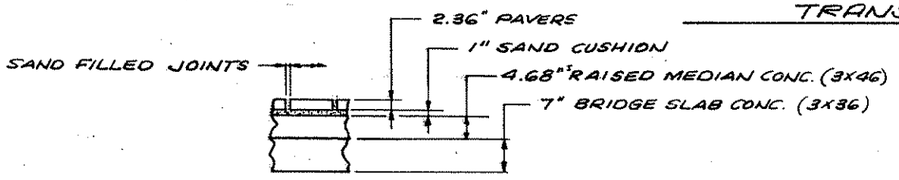

## SECTION THRU ABUTMENT
SCALE: 3/4" = 1'-0"

S.A.P. 02-601-29

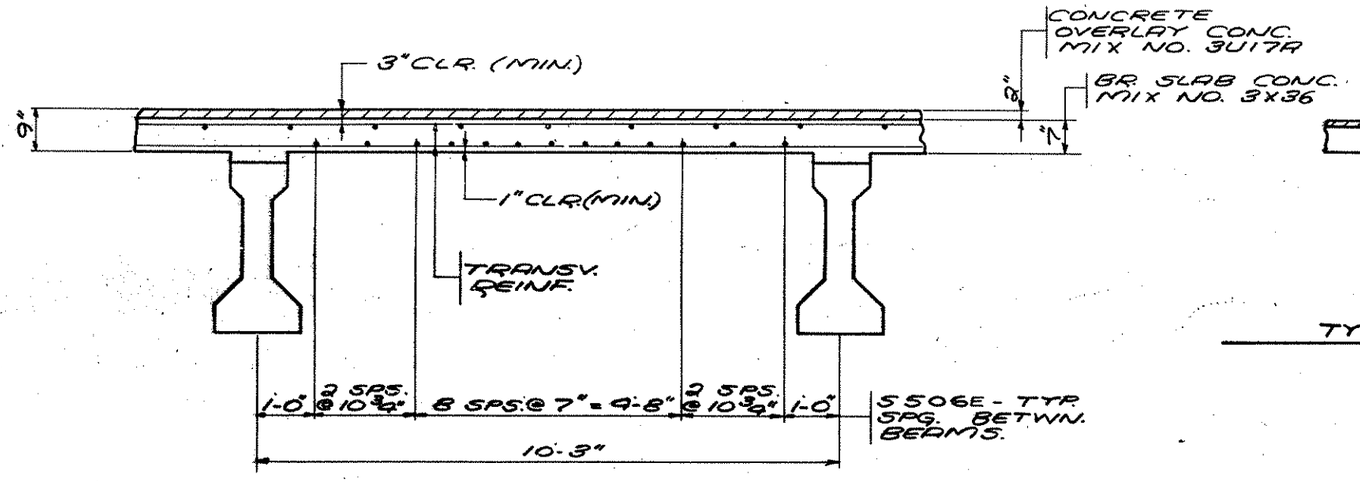
| SUPERSTRUCTURE DETAILS | DRAWN: D.J.V. | CHECKED: R.R.T. | APPROVED 7-15-88 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 30 OF 45 SHEETS | | | |



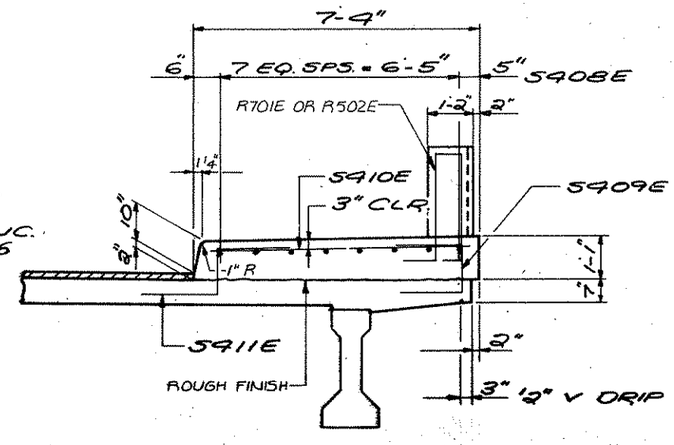

TRANSVERSE SECTION THRU DECK
SCALE: ¼" = 1'-0"




SECTION A-A



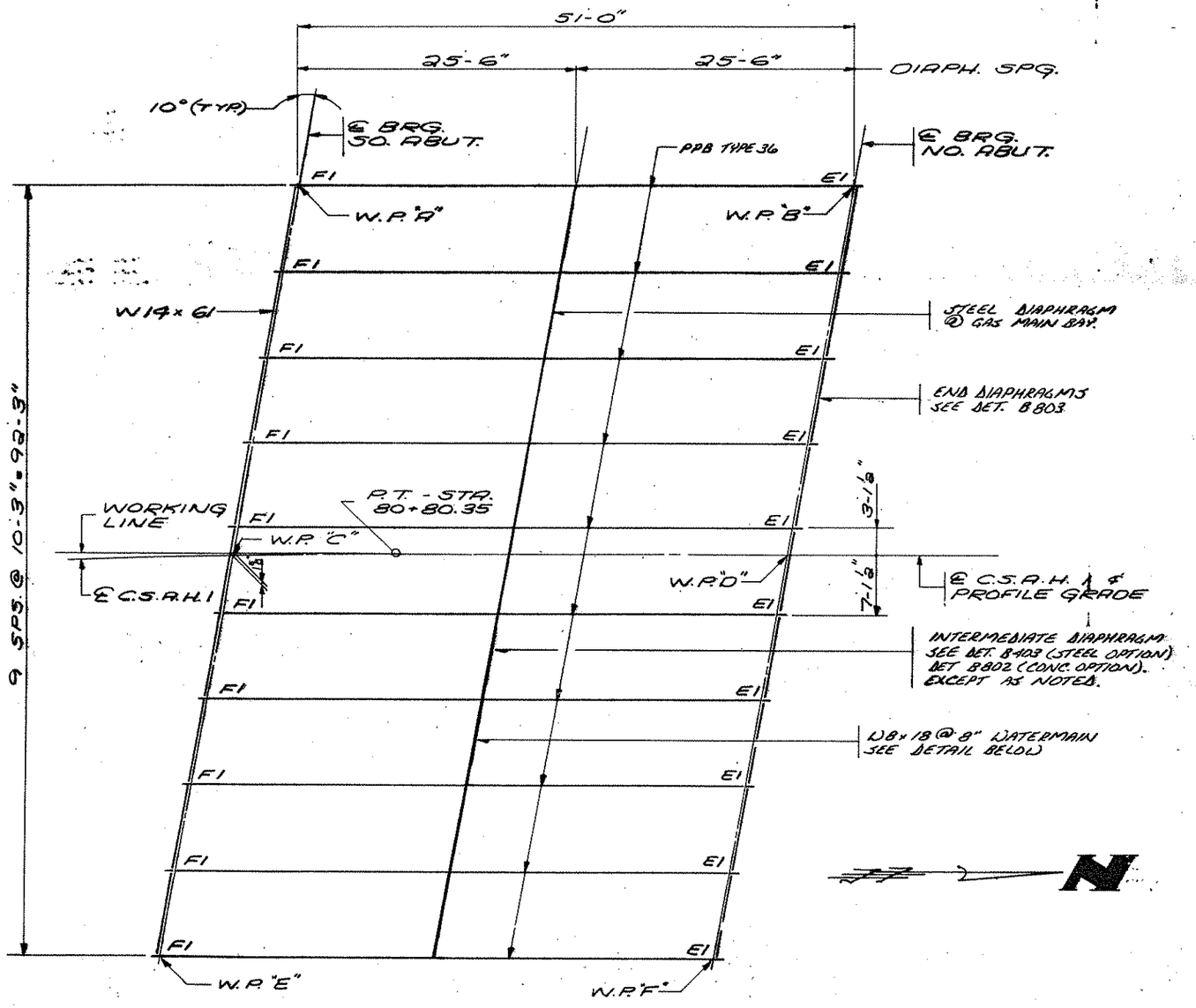

PART SECTION THRU DECK
SCALE: ¾" = 1'-0"




TYPICAL SECTION THRU SIDEWALK
SCALE: ½" = 1'-0"

S.A.P. 02-601-29

| SUPERSTRUCTURE DETAILS | DRAWN: D.J.V. | CHECKED: R.R.T. | APPROVED: 7-15-88 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 31R OF 45 SHEETS | | | |




F1 = CURVED ℝ BRG. ASSEMBLY (FIXED)

E1 = CURVED ℝ BRG. ASSEMBLY (EXP.)

FRAMING PLAN

| | | | |
|---|---|---|---|
| | SUMMARY OF QUANTITIES - SUPERSTRUCTURE | | |
| 2 3 | BRIDGE SLAB CONCRETE 3X36 | 5514 | SQ. FT. |
| 4 | SIDEWALK CONCRETE (3X96) | 823 | SQ. FT. |
| 5 | TYPE SPECIAL RAILING CONCRETE (3X96) | 192 | LIN. FT. |
| 8 | CONCRETE OVERLAY, 3U17A | 3813 | SQ. FT. |
| 11 | STRUCTURE CONCRETE 3W43 | 16 | CU. YD. |
| | REINFORCEMENT BARS (EPOXY COATED) | 41,890 | POUND |
| 2 | EXP. CURVED ℝ BRG. ASSEMBLIES, TYPE 1 | 10 | EACH |
| 2 | FIXED CURVED ℝ BRG. ASSEMBLIES, TYPE 1 | 10 | EACH |
| | ORNAMENTAL METAL RAILING, TYPE SPECIAL | 185 | LIN. FT. |
| | FLOOR DRAINS, TYPE B701 | 4 | EACH |
| 6 | NAMEPLATE | 1 | UNIT |
| | PRESTRESSED CONCRETE BEAMS TYPE 36-53 | 10 | EACH |
| | REINFORCEMENT BARS | 1220 | POUND |
| 7 | B.M. D13K | | |
| 2 6 4 | CORK | | |
| 2 6 9 | BIT. FELT | | |
| 2 | CONDUIT SYSTEM (TELEPHONE) | 1 | LUMP SUM |
| 7 | BRICK MEDIAN | 92 | SQ. YD. |
| 10 | RAISED MEDIAN CONCRETE (3X96) | 898 | SQ. FT. |
| | DIAPHR. FOR PRESTR. CONC. BEAMS, TYPE 36 | 92 | LIN. FT. |

(1) INCLUDES ALL RAILING QUANTITIES

(2) SEE SPECIAL PROVISIONS

(3) APPROX. VOLUME = 136 CU. YDS. BASED ON AVERAGE STOOL HEIGHT OF 1'2"

(4) APPROX. VOLUME = 32 CU. YDS.

(5) APPROX. VOLUME = 20 CU. YDS.

(6) INCLUDED IN PRICE BID FOR OTHER ITEMS.

(7) COUNTY WILL FURNISH D13K. PAYMENT FOR PLACING IS TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS. SEE STANDARD PL. NO. 9301 FOR PLACING.

(8) APPROX. VOLUME = 24 CU. YDS.

(9) SEE SCHEDULE BELOW

(10) APPROX. VOLUME = 14 CU. YDS.

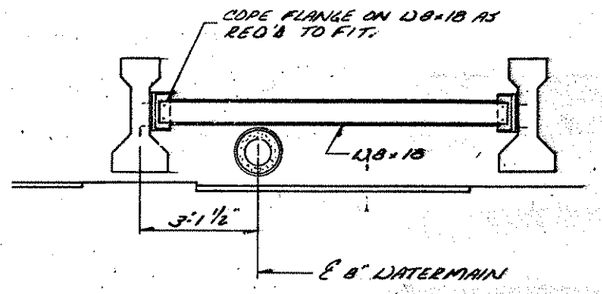
(11) END DIAPHRAGM CONCRETE

LIST OF PREFORMED CORK JOINT FILLER

1- 1" x 1-7" x 2-4" - S.E. WINGWALL
1- 1" x 1-11" x 2-0" - N.W. WINGWALL
2- 1" x 2'-0" x 2'-0" - N.E. & S.W. WINGWALLS
23- 1" x 1-2" x 2-4" - RAILING DEFLECT. JTS.

LIST OF PREFORMED BITUM. FELT JOINT FILLER

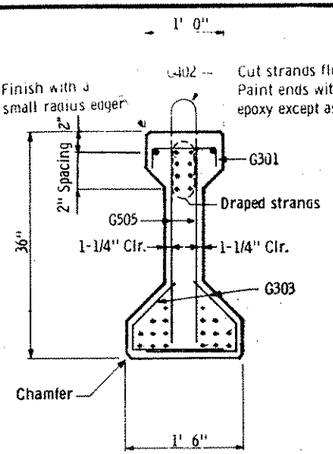
2- ½" x 1-6" x 100-0" - TOP OF PARAPET WALL




DIAPHRAGM @ WATERMAIN (INTERMEDIATE DIAPH.)

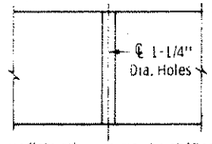
S.A.P. 02-601-29

| SUPERSTRUCTURE DETAILS | DRAWN: D.J.V. | CHECKED: R.R.T. | APPROVED 7-15-88 | BRIDGE NUMBER 02541 |
|---|---|---|---|---|
| | SHEET 32R OF 45 SHEETS | | | |




Details not shown are the same as the SECTION AT ℄ BEAM

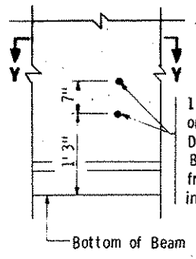
**END VIEW**



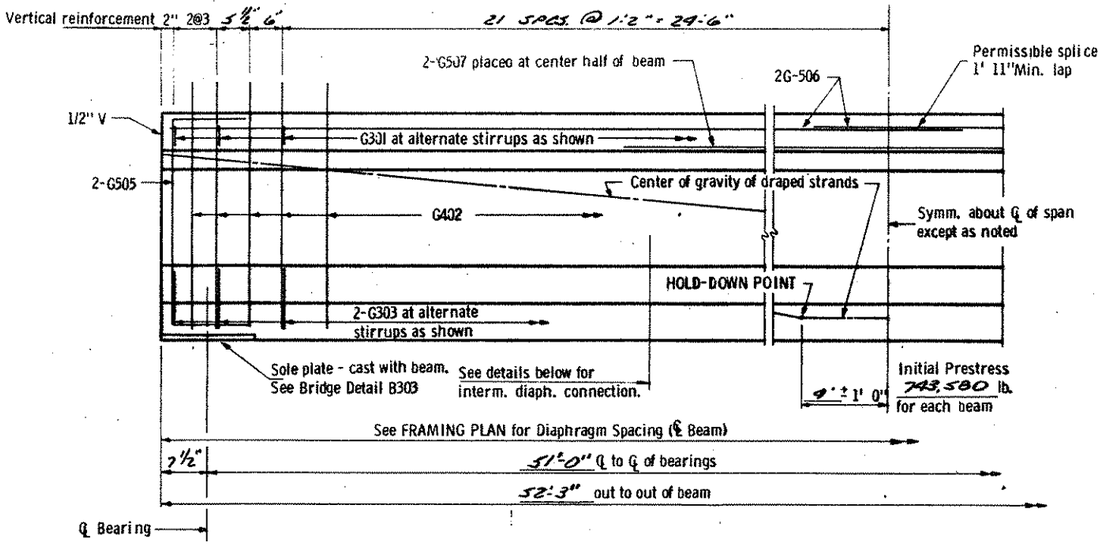

Intermediate stirrups may be shifted the minimum distance required to clear holes or inserts for intermediate diaphragms.

**SECTION Y-Y**

**USE AT INTERIOR BEAM WITH STEEL DIAPHRAGM**




**FOR USE WITH STEEL INTERMEDIATE DIAPHRAGM**

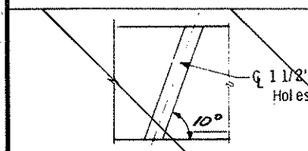



**HALF ELEVATION**

| Bar | Wt. |
|---|---|
| G 301 | .44 lb. |
| G 402 | 3.56 lb. |
| G 303 | .78 lb. |
| G 505 | 4.87 lb. |
| G 506 | |
| G 507 | |

| Girder Section Data |
|---|
| Wt./Ft. = 385 lbs. |
| Cross sec. area at ℄ of span = 369 in.² |
| C. G. (from bottom) = 15.83 in. |
| I = 50,980 in.⁴ |
| $S_B$ = 3,221 in.³ |
| 1/2" ϕ 270k strand wt./ft. = .525 lb. |
| 1/2" ϕ 270k strand area = .1531 sq. in. |

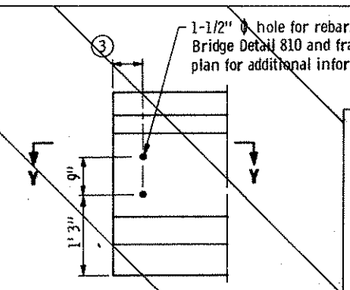
LOW RELAXATION STRANDS



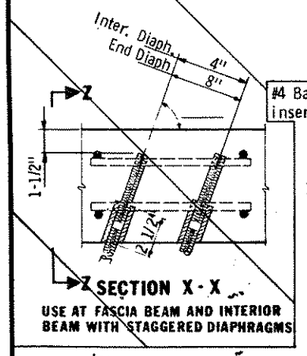

See FRAMING PLAN for skew direction. Intermediate stirrups may be shifted the minimum distance required to clear holes or inserts for intermediate diaphragms.

**SECTION Y-Y**

**FOR USE WITH CONCRETE END DIAPHRAGMS WITH PILE BENT ABUTMENTS**

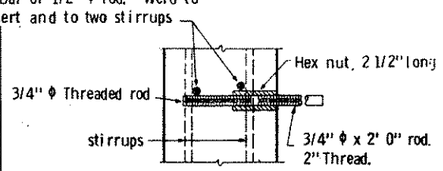



**CONCRETE END DIAPHRAGMS PILE BENT ABUTMENT**



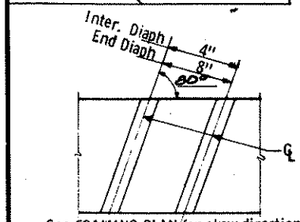

**SECTION X-X**

**USE AT FASCIA BEAM AND INTERIOR BEAM WITH STAGGERED DIAPHRAGMS**




Nuts and rods per Spec. 3306. No paint

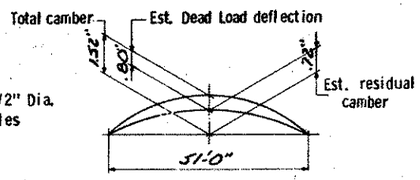
**SECTION Z-Z**




See FRAMING PLAN for skew direction. Intermediate stirrups may be shifted the minimum distance required to clear holes or inserts for intermediate diaphragms.

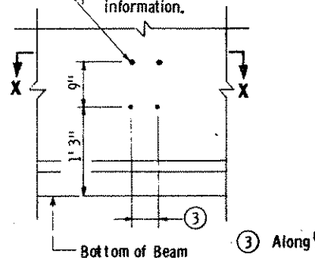
**SECTION X-X**

**USE AT INTERIOR BEAM WITH CONTINUOUS CONCRETE DIAPHRAGM**



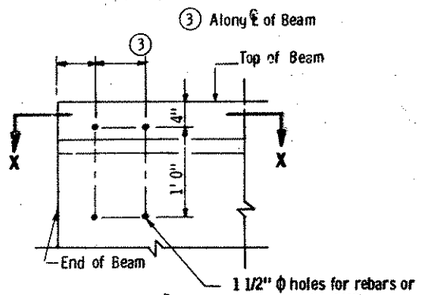

Deflections shown are for weight of slab, wearing course, railing, sidewalk, median and diaphragms only. Engineer will take elevations at top of beams after erection and will allow for deflections shown to enable contractor to build forms to correct grade and specified slab thickness.

**CAMBER DIAGRAM**

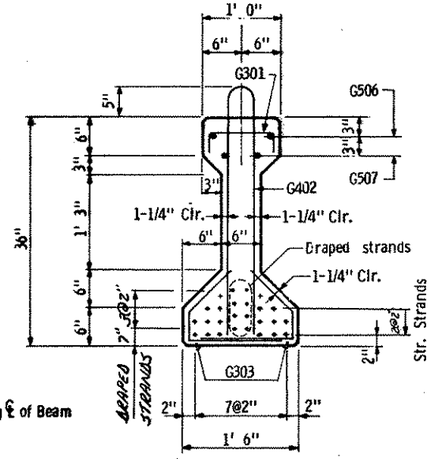



③ Along ℄ of Beam

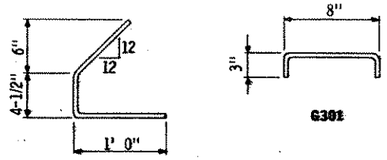
**FOR USE WITH CONCRETE INTERMEDIATE DIAPHRAGM**



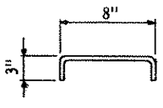

**CONCRETE END DIAPHRAGMS PARAPET ABUTMENT**



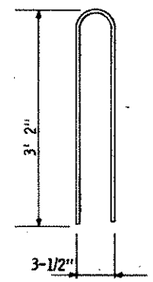

**SECTION AT ℄ BEAM**



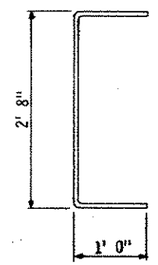

**G303**




**G301**




**G402**




**G505**

First digit of bar mark indicates bar size. All bar dimensions are out-to-out.

| Y DISTANCES (IN INCHES) | | | |
|---|---|---|---|
| | NO. | ℄ SPAN | END |
| Straight strands | 16 | 3.75 | |
| Draped strands | 8 | 10.00 | 31.00* |
| Total strands | 24 | 5.83 | |

Y = distance of Center of Gravity of strands from bottom of beam. All strands spaced 2" c-c, horizontally and vertically except as noted.

All strands 1/2" ϕ 270 kip, ultimate strength.

*A tolerance of ± 2" will be permitted in this dimension.

S.A.P. 02-601-29

**GENERAL NOTES:**

Tops of beams shall be rough floated and broomed transversely for bond.

Provide handling hooks or devices as required by Contractor. Hooks or devices provided will be subject to approval of Engineer and shall be installed within 4' 0" of the end of beam.

A modified strand pattern or a bundled strand pattern which does not change center of gravity of strands may be submitted to the Engineer for approval.

A post-tensioned beam may be used as an alternate for the pretensioned design shown. Mn/DOT will provide plans for the post-tensioned alternate on request.

Each beam shall be marked, showing bridge number, casting date, and individual identification letters and numbers. Markings shall be made on the face of the beam, near the end, so located that they will be exposed after the end diaphragms have been cast. Fascia beams shall be marked on an inside face. All markings shall be stencilled and be clearly legible. For location of beams, see framing plan.

All material and work shown or noted on this sheet shall be included in unit price bid for prestressed concrete beams. See Spec. 2405.

See framing plan for beam ends marked "X".

Approximate weight of beam 10.03 tons.

As an alternate to the diaphragm anchorages shown, the contractor may submit details of a cast-in-place anchorage to the engineer for approval. Anchorage must provide an ultimate pull out strength of 15 kips per anchorage.

| MINIMUM CONCRETE STRENGTH - P.S.I. | | |
|---|---|---|
| | ① f'ci | ② f'c |
| Required min. Concrete Strength | 5780 | 6000 |

① Minimum concrete strength at time of prestress transfer.

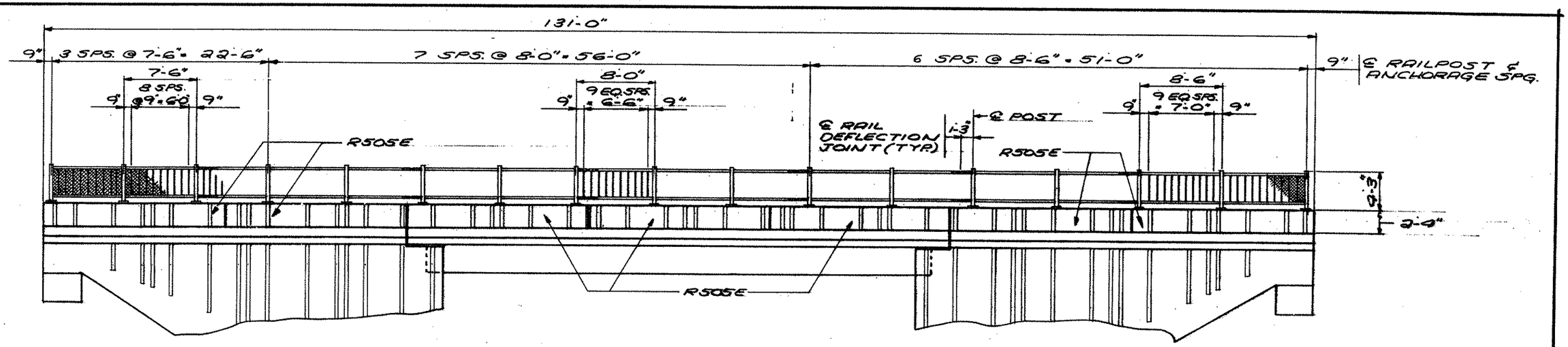
② Minimum concrete strength when curing can be discontinued and beam transported and installed.

**Fig. 5-397.502**

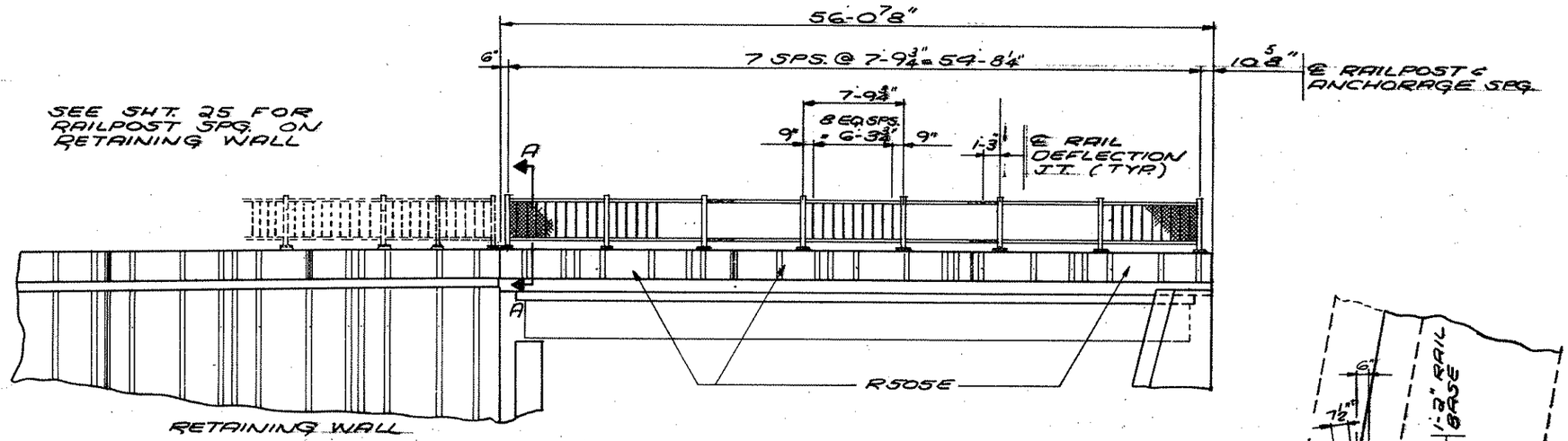
Revised: January 22, 1980 Approved: May 18, 1977

BEAMS B1-B10

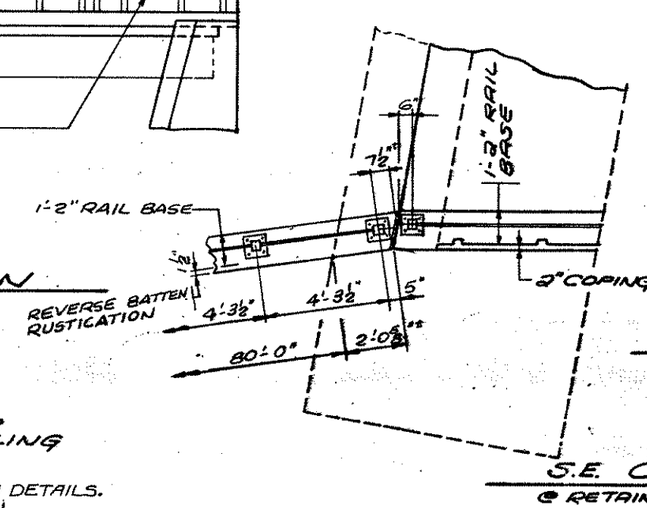
| TITLE: 36" PRESTRESSED CONCRETE BEAM (PRETENSIONED) TYPE 36-53 | DES: | DR: | APPROVED: 7-15-88 | Bridge No. |
|---|---|---|---|---|
| | CHK: | CHK: | Sheet No. 33 of 45 Sheets | 02541 |



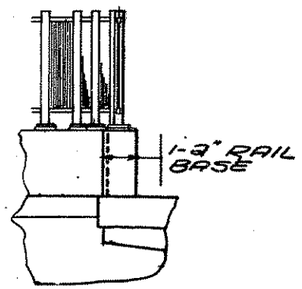

WEST RAILING ELEVATION
SCALE: 3/16" = 1'-0"




EAST RAILING ELEVATION
SCALE: 3/16" = 1'-0"




S.E. CORNER
@ RETAINING WALL



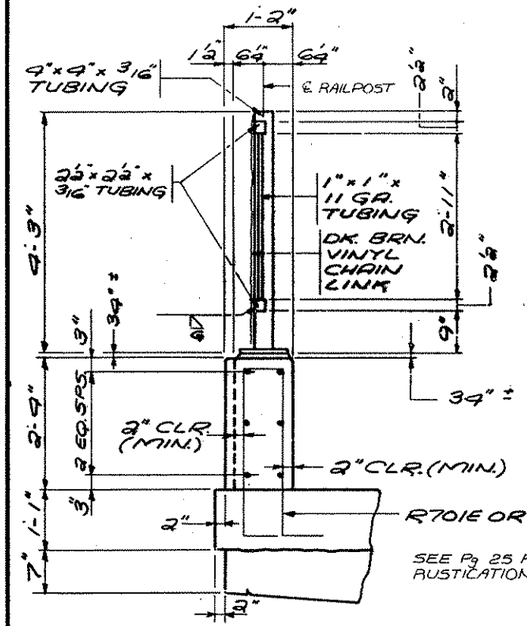

SECTION A-A

NOTE:
SEE SHT. 35 FOR TYPE SPECIAL RAILING DETAILS.

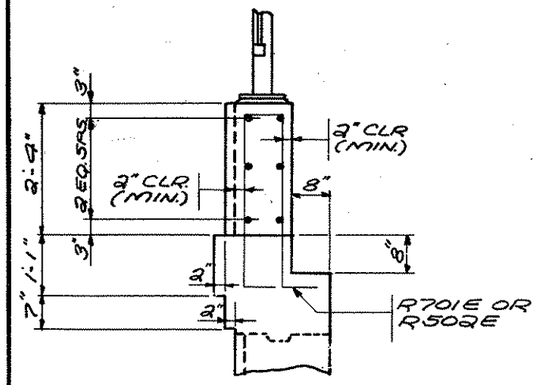
SEE SHT 25 FOR RUSTICATION DETAILS.

S.A.P. 02-601-29

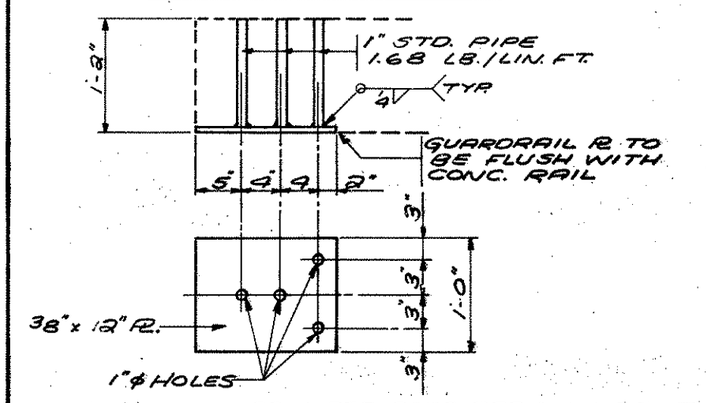
| RAILING DETAILS | DRAWN: O.J.Y. | CHECKED: R.R.T. | APPROVED 7-15-88 | BRIDGE NUMBER 02591 |
|---|---|---|---|---|
| | SHEET 34 OF 45 SHEETS | | | |




SECTION @ DECK

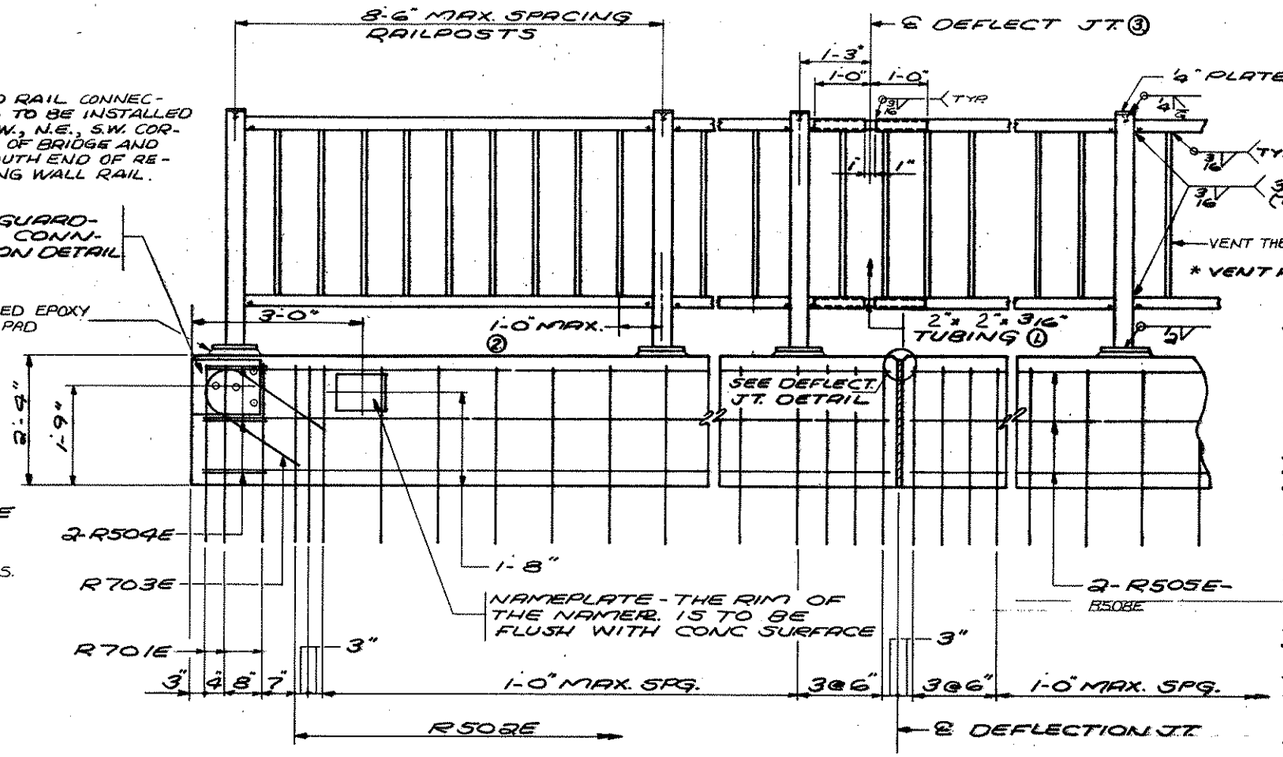


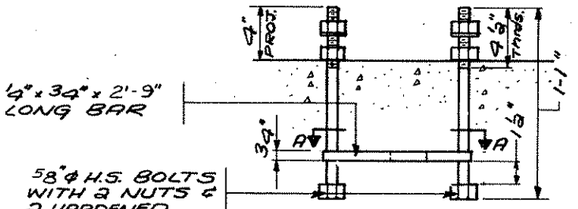

SECTION @ WINGWALL



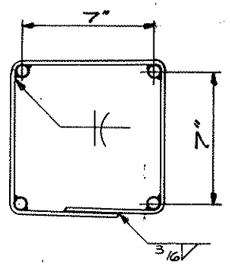

GALV. PER SPEC. 3394. NO PAINT STEEL PER SPEC. 3306

GUARDRAIL CONNECTION DETAIL

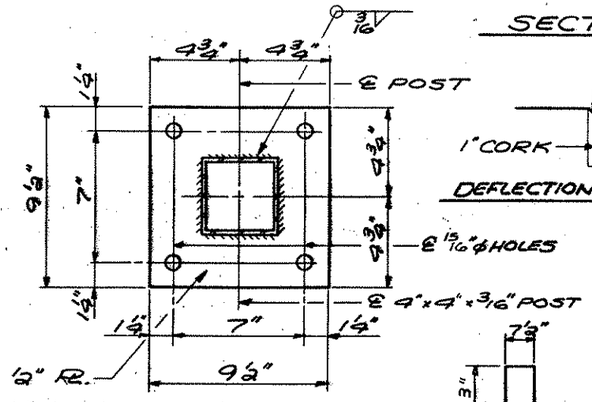



RAILPOST ANCHORAGE

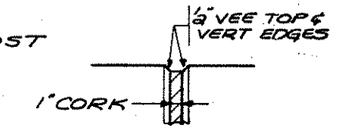



SECTION A-A

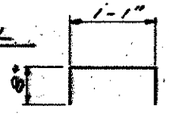



BASE PLATE DETAILS

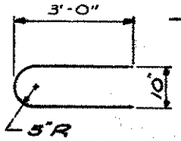
SCALE: 3" = 1'-0"



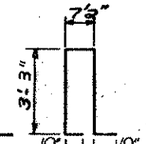

DEFLECTION JT. DETAIL




R504E




R703E




R701E OR R502E

① BEFORE GALV. GRIND AS NECESSARY TO PRODUCE SMOOTH WORKING JT. SHIM AS NECESSARY

② DIMENSION VARIES WITH POST SPG. SEE SHTS 25 & 34 FOR 1"x1" VERT POST SPG.

③ RAIL DEFLECTION JTS. SHALL BE LOCATED IN THE PANEL DIRECTLY ABOVE CORK DEFLECTION JTS. IN RAIL BASE (24 FT. MAX.)

⑨ BILL OF REINFORCEMENT - RAILING

| BAR | NO. | LEN. | SHAPE | LOCATION |
|---|---|---|---|---|
| R701E | 12 | 8'-0" | BENT | ENDPOST |
| R502E | 239 | 8'-0" | " | VERT. |
| R703E | 9 | 5'-0" | " | ENPOST |
| R504E | 24 | 2'-5" | " | " |
| R505E | 60 | 18'-3" | STR. | HORZ. |
| R506E | 84 | 14'-7" | " | " |
| R507E | 12 | 16'-4" | " | " |
| R508E | 6 | 5'-0" | " | " |

⑨ INC. W/SUPERSTRUCTURE QUANTITIES.

## NOTES:

GUARDRAIL CONNECTION IS INCLUDED IN PRICE BID FOR OTHER ITEMS.

BARS MARKED WITH SUFFIX "E" SHALL BE EPOXY COATED

ALL MATERIAL IN THE CONC. RAIL BASE IS INCLUDED IN SUPERSTRUCTURE QUANTITIES.

THE GUARDRAIL CONNECTION SHALL BE STRUCTURAL STEEL SPEC. 3306. & GALVANIZED AFTER FABRICATION PER SPEC. 3394.

ALL STRUCTURAL STEEL TUBING IN RAIL SHALL BE A500, GRADE B AND A513, GRADE 2

MATERIAL FOR CLOSURE RS, BASE RS, & ANCHOR BOLT ASSEMBLIES SHALL CONFORM TO SPEC. 3306.

ANCHOR BOLT ASSEMBLIES, NUTS & WASHERS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SPEC. 3392 & SPEC. 3394.

ANCHORAGES SHALL BE ACCURATELY PLACED TO PROVIDE CORRECT ALIGNMENT FOR THE RAILING.

RAILPOSTS SHALL BE VERTICAL

RAILPOST SPACING IS MEASURED HORIZONTALLY ALONG TOP OF SIDEWALK, WINGWALLS & RETAINING WALL.

GRINDING WILL NOT BE PERMITTED AFTER MATERIAL IS GALVANIZED.

PRICE BID FOR TYPE SPECIAL RAILING INCLUDES MATERIALS FOR AND PLACING OF RAILPOST ANCHORS POSTS, RAILING, ELECTRICAL GROUNDS AND ALL OTHER MATERIAL ABOVE TOP OF SIDEWALK, WINGWALLS, OR RETAINING WALL.

GALVANIZE ALL HARDWARE PER SPEC. 3392 STRUCTURAL SHAPES PER SPEC. 3394.

CONC. IN RAIL BASE SHALL BE MIX NO. 3X46.

THE CHAIN LINK FABRIC SHALL BE VINYL COATED & CONFORM TO SPEC. 3376. THE COLOR SHALL BE DARK BROWN.

STEEL TUBING SHALL BE PAINTED IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

THE RAILING BASE RS., PROTUDING PORTIONS OF BOLTS, NUTS & WASHERS SHALL BE PAINTED IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

⑧ SUMMARY OF QUANTITIES - TYPE SPECIAL RAILING

| | | |
|---|---|---|
| ⑦⑥④ | ORNAMENTAL METAL RAILING, TYPE SPECIAL | 425 L.F. |
| ⑦⑥⑤ | STEEL IN RAILING | 10565 POUND |
| ⑦⑥⑤ | ANCHOR ASSEMBLIES | 59 EACH |
| ⑥⑦ | DK. BRN. VINYL CHAIN LINK FABRIC 4 FT. WIDE | 425 L.F. |

④ INCLUDES ALL RAILING MEMBERS & BASE PLATES
⑤ INCLUDES ANCHOR BOLTS, SPACER BAR, NUTS & WASHERS.
⑥ INCLUDED IN PRICE BID FOR TYPE SPECIAL RAILING
⑦ INCLUDED FOR CONTRACTORS CONVENIENCE ONLY.
⑧ INCLUDES RETAINING WALL, WINGWALL & SUPERSTRUCTURE QUANTITIES. SEE SHT 29 & 32.

TYPE SPECIAL RAILING

DRAWN: | CHECKED: | APPROVED: 7-15-08

SHEET 35R OF 95 SHEETS

BRIDGE NUMBER 02541

SAP 03-601-89

## NOTES

④ ALL ITEMS AS LISTED ARE TO BE INCLUDED IN THE PRICE BID FOR WATERMAIN SYSTEM. ANY ADDITIONAL MINOR ITEMS REQUIRED SHALL BE FURNISHED & INSTALLED BY THE CONTRACTOR WITH NO ADDITIONAL COMPENSATION.

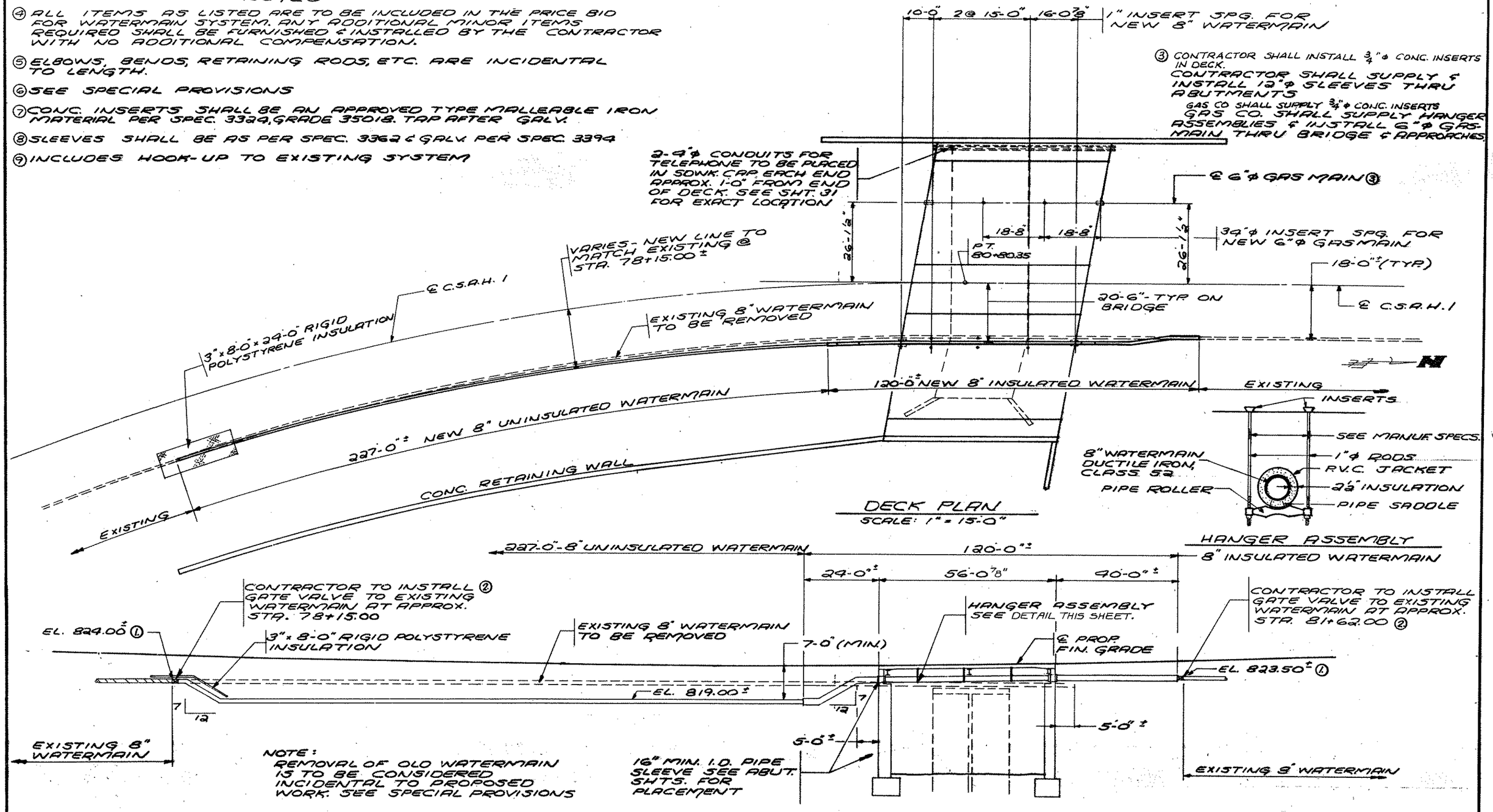
⑤ ELBOWS, BENDS, RETRAINING RODS, ETC. ARE INCIDENTAL TO LENGTH.

⑥ SEE SPECIAL PROVISIONS

⑦ CONC. INSERTS SHALL BE AN APPROVED TYPE MALLEABLE IRON MATERIAL PER SPEC. 3324, GRADE 35018. TAP AFTER GALV.

⑧ SLEEVES SHALL BE AS PER SPEC. 3362 & GALV. PER SPEC. 3394

⑨ INCLUDES HOOK-UP TO EXISTING SYSTEM




DECK PLAN
SCALE: 1" = 15'-0"

HANGER ASSEMBLY




WATERMAIN ELEVATION

④⑥⑨ SUMMARY OF QUANTITIES-WATERMAIN SYSTEM

| | | |
|---|---|---|
| ⑤ 8" WATERMAIN & JACKET | 120 | LIN. FT. |
| ⑤ 8" UNINSULATED WATERMAIN | 227 | LIN. FT. |
| ⑦ 1" THREADED INSERTS | 6 | EACH |
| ⑧ SLEEVES THR ABUTS., 16" I.D. | 2 | EACH |
| ⑥ HANGER & ROLLER ASSEMBLIES | 3 | EACH |
| REMOVE EXISTING WATERMAIN | 347 | LIN. FT. |
| 3"x 8'x 24' RIGID POLYSTYRENE INSULATION | 192 | SQ. FT. |

⑤⑧⑦ QUANTITIES-GAS MAIN (PROVISIONS)

| | | |
|---|---|---|
| ⑧ SLEEVES THRU ABUTMENTS, 12"ø | 2 | EACH |
| ⑦ 34"ø - THREADED INSERTS | 2 | EACH |

⑤⑥ QUANTITIES- CONDUIT SYSTEM (TELEPHONE)

| | | |
|---|---|---|
| ⑥ 4"ø CONDUITS | 116 | LIN. FT |
| END CAPS | 4 | EACH |

① ALL ELEVATIONS TO BE VERIFIED IN THE FIELD.

② CONTRACTOR SHALL VERIFY EXACT LOCATION OF GATE VALVES WITH THE ENGINEER IN THE FIELD.

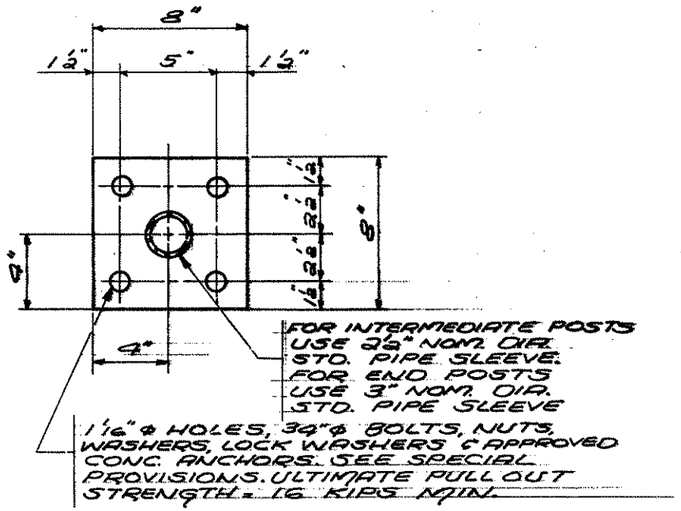
S.A.P. 02-601-29

UTILITY DETAILS

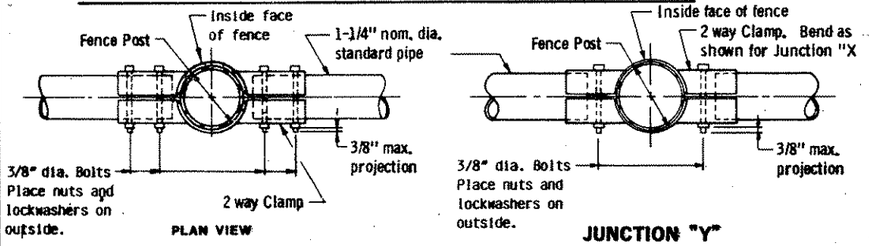
DRAWN: D.J.V. | CHECKED: R.R.T. | APPROVED 7-15-80

SHEET 36R OF 45 SHEETS

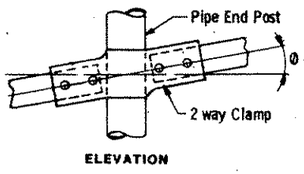
BRIDGE NUMBER 02541




TYPE A FENCE POST ANCHORAGE




JUNCTION "Y"

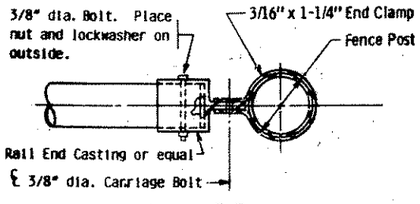



ELEVATION

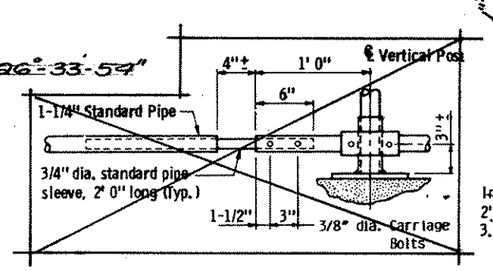
JUNCTION "X"

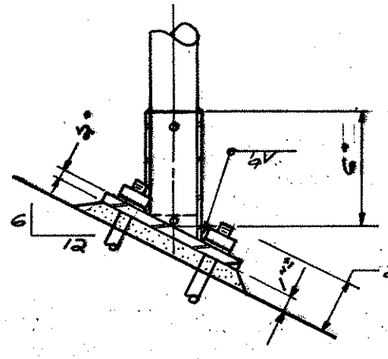
**2-WAY CLAMP BENDING TABLE**

| Grade of Fence | θ |
|---|---|
| 0° to 2° | 0° |
| 2° to 6° | 4° |
| 6° to 10° | 8° |

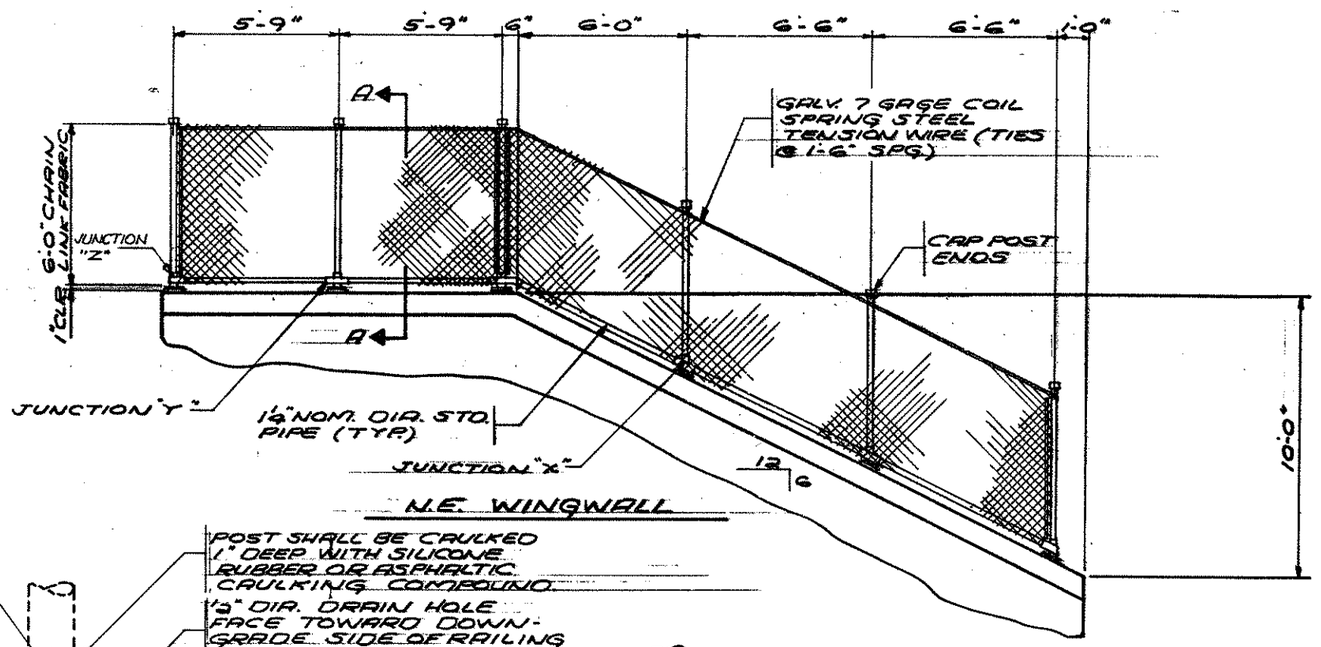



JUNCTION "Z"

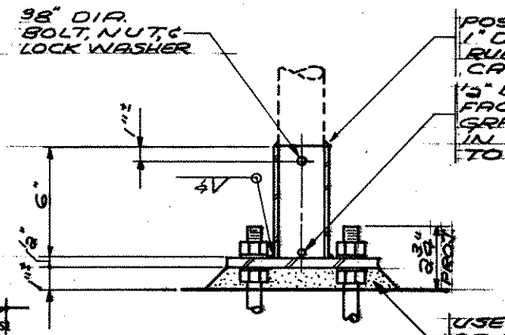



FENCE POST ANCHORAGE




N.E. WINGWALL



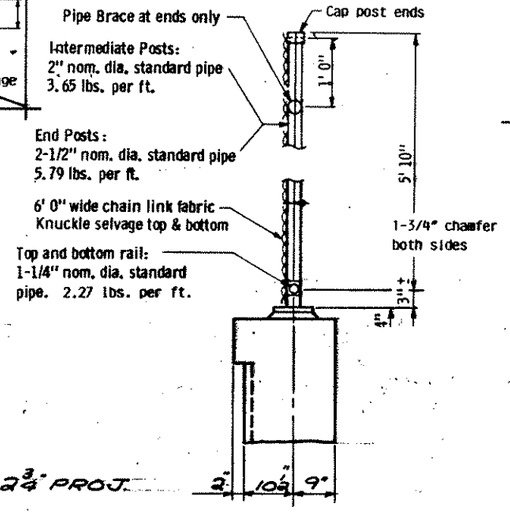

FENCE POST ANCHORAGE

EST. WT. = 12 LBS.

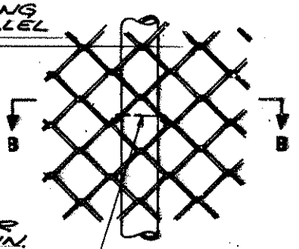
POST SHALL BE CAULKED 1" DEEP WITH SILICONE RUBBER OR ASPHALTIC CAULKING COMPOUND.

½" DIA. DRAIN HOLE FACE TOWARD DOWN-GRADE SIDE OF RAILING IN DIRECTION PARALLEL TO FENCE.

USE EPOXY APPROVED OR LATEX MOD. MORTAR TO FILL SPACE BETWN. CONC. & BASE R. AS REQUIRED.

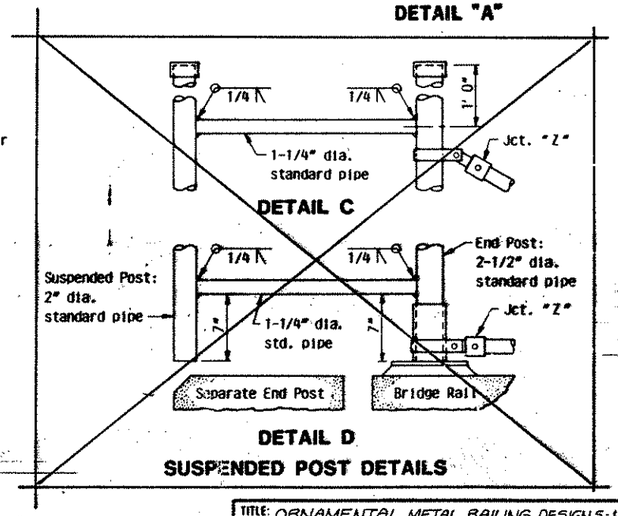



SECTION A-A




SECTION B-B

DETAIL "A"




Fence post anchorages shall be Type A. ~~See Standard Detail 8005 "Fence Post Anchorage".~~

~~Bars marked with the suffix "E" shall be epoxy coated in accordance with Spec. 3301.~~

All posts shall have a means to securely hold the top tension wire in position and allow for the removal and replacement of a post without damaging the top wire.

Wire ties may be 9 gage galvanized steel or 0.179" minimum aluminum alloy conforming to ASTM B211, Alloy 1100-H18. Use 12-1/2 gage galvanized hog rings for tension wire ties.

End posts and bracing shall be at 500 ft. maximum intervals.

~~Concrete in the rail base and the end posts shall be Mix No. 3X46~~

~~For spacing of fence post, joints and electrical grounds, see superstructure sheets.~~

~~All material in the concrete base and end posts is included in the superstructure quantities.~~

See special provisions for requirements not included on this sheet and for basis of payment.

℄ of fence post anchorage shall be a minimum of 6" from joints.

Fence posts and fence post anchorages shall be set vertical, unless otherwise noted.

~~The guard rail connection is included in the price bid for other items.~~

~~Maximum spacing of deflection joints shall be 20' 0"~~

~~The length of railing concrete shall be measured for payment between the outside faces of the end posts or the ends of the concrete rail base.~~

~~Guardrail connection shall be Structural Steel, Spec. 3306 and galvanized after fabrication per Spec. 3394.~~

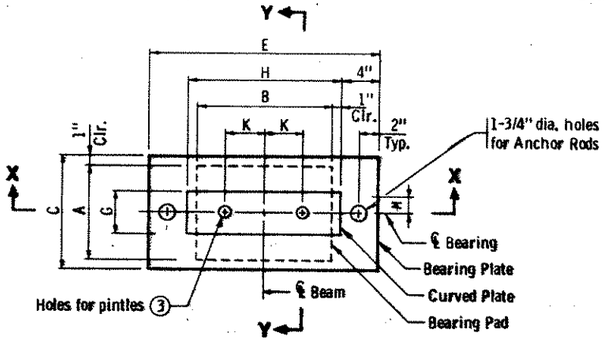
STRUCTURAL STEEL 3306
STRUCTURAL PIPE 3362
GALV. THE FENCE POST ANCHORAGE AFTER PER SPEC. 3394
GALV. THE FASTENERS PER SPEC. 3393.
2" NOM. DIA. PIPE = 3.65 LBS./FT.
2½" " " " = 5.79 LBS./FT.
3" " " " = 7.58 LBS./FT.

S.A.P. 02-601-29

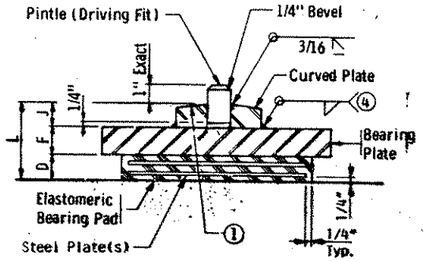
| REVISED: | APPROVED: Nov. 26, 1985 | FIG. 5-397.120 |
|---|---|---|

TITLE: ORNAMENTAL METAL RAILING DESIGN 5-1
CONCRETE & FENCE RAILING
(TYPE F)

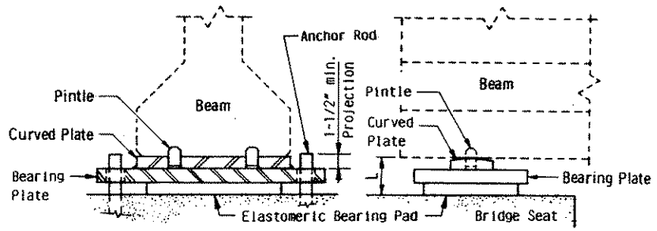
| DES: | DR: | APPROVED: 7-15-88 | Bridge No. |
|---|---|---|---|
| CHK: | CHK: | Sheet No. 37R of 45 Sheets | 02541 |




PLAN



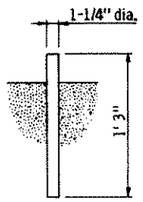

SECTION Y-Y
( ENLARGED BEARING ASSEMBLY )




SECTION X-X




END ELEVATION
( Anchor Rods Not Shown )




ANCHOR ROD DETAIL

**PINTLE SPACING TABLE**

| BEAM SIZE | K |
|---|---|
| 28" | 4" |
| 36" | 6" |
| 40", 45M 54M, 63" 72" & 81" | 8" |
| Bulb Tee | 9" |

**TABLE ②**

| Beam Size | Bearing Pad Size A | B | D | Steel Plates No. | Thick. | Laminates No. | Thick. | Shape Factor | Bearing Plate Size C | E | F | Curved Plate Size G | H | J | Pintle Dia. | Pintle Spacing K | Anchor Rod Offset M | Assy. Height L | Assembly Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36-PPB | 12" | 16" | 1 1/4" | 2 | 1/8" | 1 | 1/2" | 6.9 | 14" | 26" | 1 1/4" | 4 1/2" | 18" | 1 1/4" | 1 1/4" | 6" | 0" | 3 3/4" | F1 |

**NOTES:**

For elastomeric materials & pad construction, see Spec. 3741 and special provisions, except as noted.

All steel plates & anchor rods shall comply with Spec. 3306, except as noted.

All plates shall be flat after fabrication and galvanizing. Welding distortion of bearing plates shall be straightened to within 1/16" of flatness by mechanical means without damage to the zinc coating.

Pintles shall comply with Spec. 3314, Type II

Galvanize anchor rods and structural steel bearing assembly after fabrication per Spec. 3394, except as noted.

Payment for bearing assembly shall include all material on this detail.

① The radius of the curved plate shall be 1' 0" min. & 1' 6" max. Finish to 250 Micro. The finished thickness of the plate may be 1/16" less than shown.

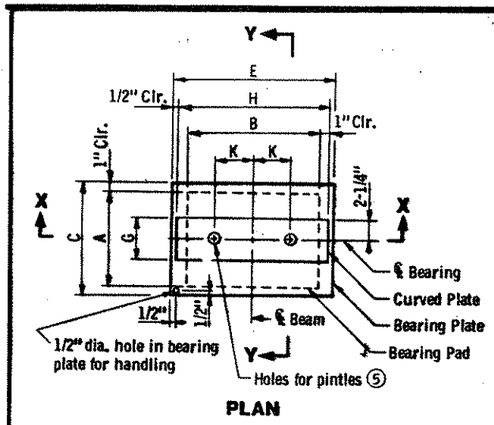
② See Bridge Design Manual for design requirements.

③ 1-1/4" dia. pintle for total loads to 200 Kips. 1-1/2" dia. pintle for total loads over 200 Kips.

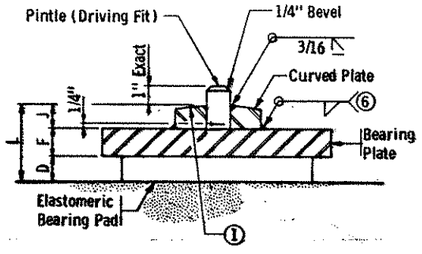
④ For bearing plate thicknesses up to 1-1/2" use 5/16" fillet welds; for thicknesses over 1-1/2" to 2-1/4" use 3/8" fillet welds; for thicknesses over 2-1/4" use 1/2" fillet welds with minimum preheat of 300°.

SOUTH ABUTMENT

| APPROVED: Aug 4, 1987 | STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION | REVISION | DETAIL NO. |
|---|---|---|---|
| Developed by: ENGINEERING STANDARDS and BRIDGES & STRUCTURES | **CURVED PLATE BEARING ASSEMBLY** PRESTRESSED CONCRETE BEAMS (FIXED) | | **B310** |
| Issued by: ENGINEERING STANDARDS | | | |



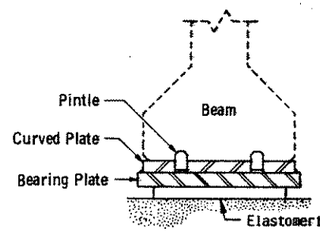

PLAN



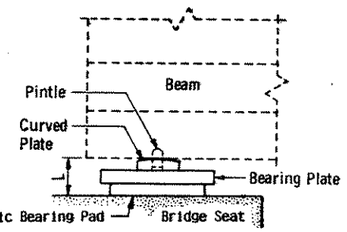

SECTION Y-Y
( ENLARGED BEARING ASSEMBLY )

**PINTLE SPACING TABLE**

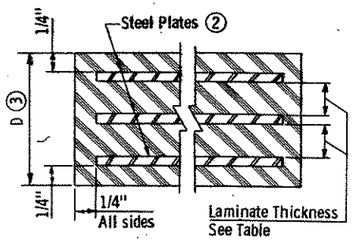
| BEAM SIZE | K |
|---|---|
| 28" | 4" |
| 36" | 6" |
| 40", 45M 54M, 63" 72" & 81" | 8" |
| Bulb Tee | 9" |




SECTION X-X




END ELEVATION




SECTION THRU BEARING PAD

**TABLE ④**

| Beam Size | Bearing Pad Size A | B | D | Steel Plates No. | Thick. | Laminates No. | Thick. | Shape Factor | Bearing Plate Size C | E | F | Curved Plate Size G | H | J | Pintle Dia. | Pintle Spacing K | Assy. Height L | Assembly Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36-PPB | 12" | 16" | 1 7/8" | 3 | 1/8" | 2 | 1/2" | 6.9 | 14" | 19" | 1 1/4" | 4 1/2" | 18" | 1 1/4" | 1 1/4" | 6" | 4 3/8" | E1 |

**NOTES:**

For elastomeric materials & pad construction, see Spec. 3741 and special provisions, except as noted.

All steel plates shall comply with Spec. 3306, except as noted.

All plates shall be flat after fabrication and galvanizing. Welding distortion of bearing plates shall be straightened to within 1/16" of flatness by mechanical means without damage to the zinc coating.

Pintles shall comply with Spec. 3314, Type II

Galvanize structural steel bearing assembly after fabrication per Spec. 3394, except as noted.

Payment for bearing assembly shall include all material on this detail.

① The radius of the curved plate shall be 1' 0" min. & 1' 6" max. Finish to 250 Micro. The finished thickness of the plate may be 1/16" less than shown.

② Do not galvanize these plates.

③ The total thickness shown includes the steel plates.

④ See Bridge Design Manual for design requirements.

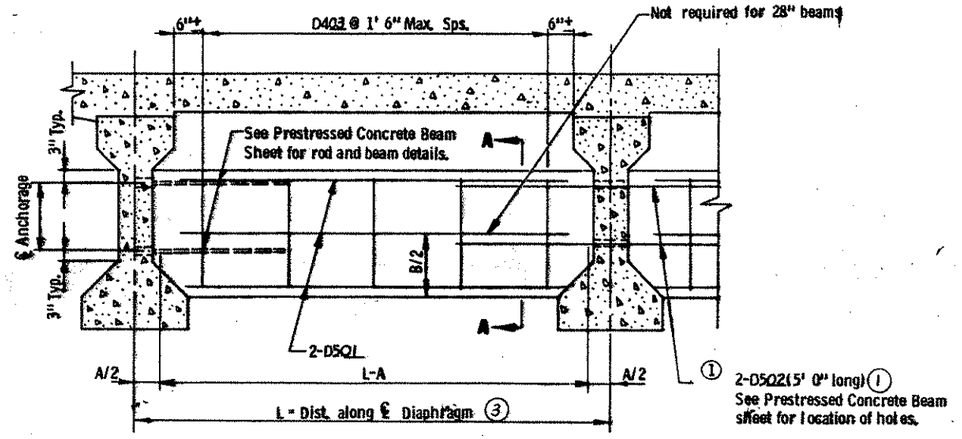
⑤ 1-1/4" dia. pintle for total loads to 200 Kips. 1-1/2" dia. pintle for total loads over 200 Kips.

⑥ For sole plate or bearing plate thicknesses up to 1-1/2", use 5/16" fillet welds; for thicknesses over 1-1/2" to 2-1/4", use 3/8" fillet welds; for thicknesses over 2-1/4", use 1/2" fillet welds with minimum preheat of 300°.

NORTH ABUTMENT

| APPROVED: Aug 4, 1987 | STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION | REVISION | DETAIL NO. |
|---|---|---|---|
| Developed by: ENGINEERING STANDARDS & BRIDGES AND STRUCTURES OFFICES | **CURVED PLATE BEARING ASSEMBLY** PRESTRESSED CONCRETE BEAMS (EXPANSION) | | **B311** |
| Issued by: OFFICE OF ENGINEERING STANDARDS | | | |

APR. 7-15-88

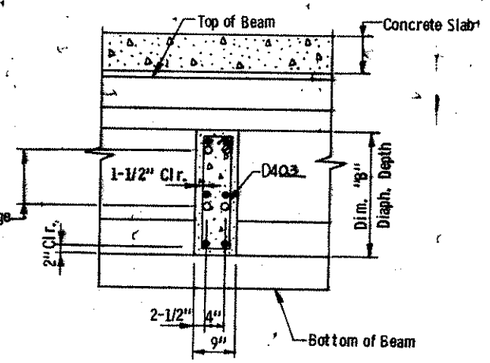



**PART TRANSVERSE SECTION**

| Bm. Ht. | Dim. "A" For comp. volume | Diaph. Dim. "B" | D403 Length |
|---|---|---|---|
| 28" | 7-1/2" | 1'-4" | 3'-9" |
| 36" | 7-3/4" | 1'-9" | 4'-7" |
| 40" | 8-3/4" | 1'-11" | 4'-11" |
| 45" | 9" | 2'-2 1/2" | 5'-6" |
| 54" | 10-1/2" | 2'-8" | 6'-5" |

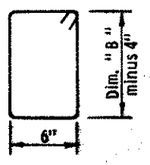
Concrete volume per diaphragm

$$\frac{(L - A) \times B \times .75}{27} = \text{(Cu. yd.)}$$




**SECTION A-A**

| BAR | NO | LENGTH | SHAPE | LOCATION |
|---|---|---|---|---|
| D501 | 108 | 9'0" | STR. | DIAPH. HORIZ. |
| D502 | 64 | 5'2" | STR. | DIAPH. HORIZ |
| D403 | 126 | 4'7" | BENT | DIAPH. VERT. |
| | | | | |




D403

**GENERAL NOTES**

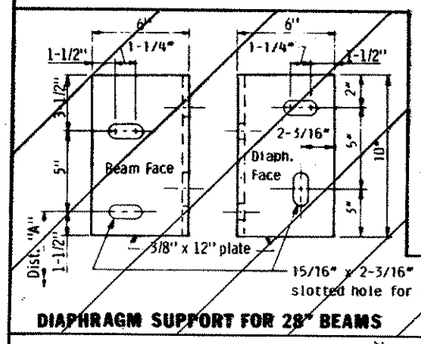
1. For Diaphragms 20° and over, use threaded rods as shown on standard prestressed concrete beam sheet.
2. All diaphragm concrete and reinforcement bars shown on this detail to be included in payment for diaphragms for prestressed beams. Threaded rods are included in payment for prestressed concrete beams.
3. PAYMENT LENGTH FOR DIAPHRAGMS

| APPROVED: MARCH 27, 1979 | MINNESOTA DEPARTMENT OF TRANSPORTATION | | DETAIL NO. |
|---|---|---|---|
| Developed by: OFFICE OF ENGINEERING STANDARDS AND BRIDGE DESIGN<br>Issued by: OFFICE OF ENGINEERING STANDARDS | **CONCRETE INTERMEDIATE DIAPHRAGM (FOR 28"-54" PRESTRESSED CONCRETE BEAM SPANS)** | | **B802** |

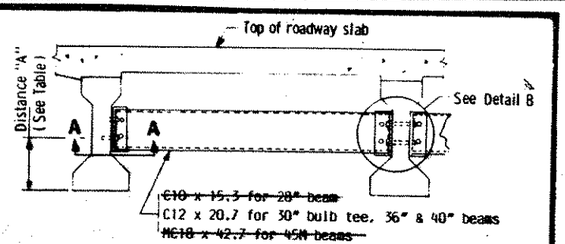
**TABLE**

| Beam Ht. | Distance "A" |
|---|---|
| 28" | 1' 0" |
| 30" | 1' 2" |
| 36" | 1' 3" |
| 40" | 1' 5½" |
| 45M | 1' 3-3/4" |

Bulb Tee

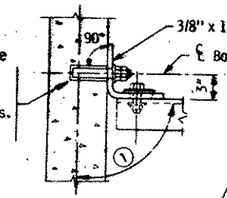


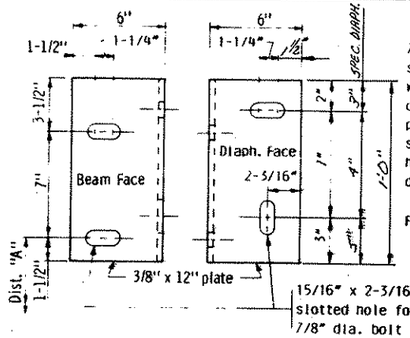

**DIAPHRAGM SUPPORT FOR 28" BEAMS**




**PART TRANSVERSE SECTION AT DIAPHRAGM**

7/8" dia. cast-in-place bolt anchor with one 5" sq. x 5/16" plate washer and two hex nuts. Torque anchor bolts to 80 ft.-lbs.

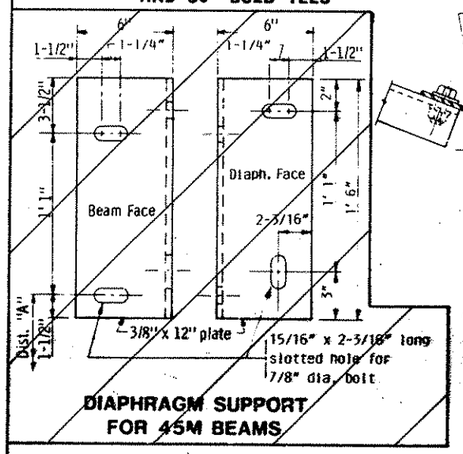


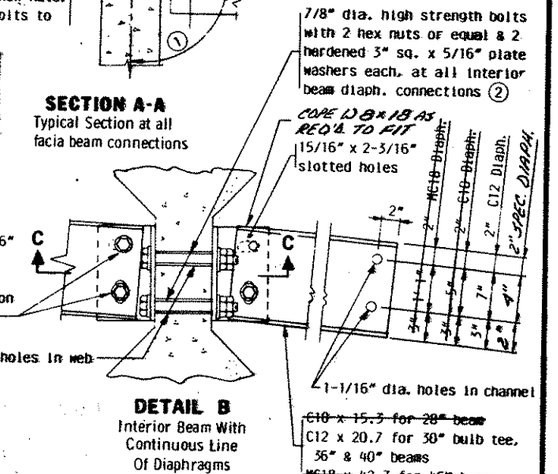

7/8" dia. high strength bolts with hex nut and one 5" sq. x 5/16" plate washer on slotted side and hardened washer on diaphragm side

Form 1-1/4" dia. holes in web

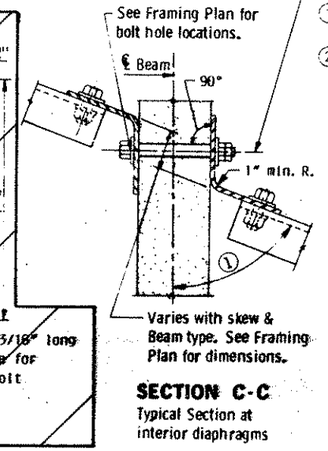
**DIAPHRAGM SUPPORT FOR 36" & 40" BEAMS AND 30" BULB TEES**




**DIAPHRAGM SUPPORT FOR 45M BEAMS**




**DETAIL B**
Interior Beam With Continuous Line Of Diaphragms




**SECTION C-C**
Typical Section at interior diaphragms

(1) For skew angles under 20°, use 90° less the skew angle. For skew angles over 20°, use 90°.

(2) As an alternative to the 7/8" bolt connection, the contractor may submit details of a cast-in-place anchorage to the engineer for approval.

**GENERAL NOTES:**

See Spec. 2405.3M for installation.

The leg of the 12" plate shall be shop bent to conform to the diaphragm. A 3/8" x 6" x6" angle may be used for diaphragms perpendicular to beams

For bolt lengths greater than 9", use high strength bolts per Spec. SAE Grade 5 or better.

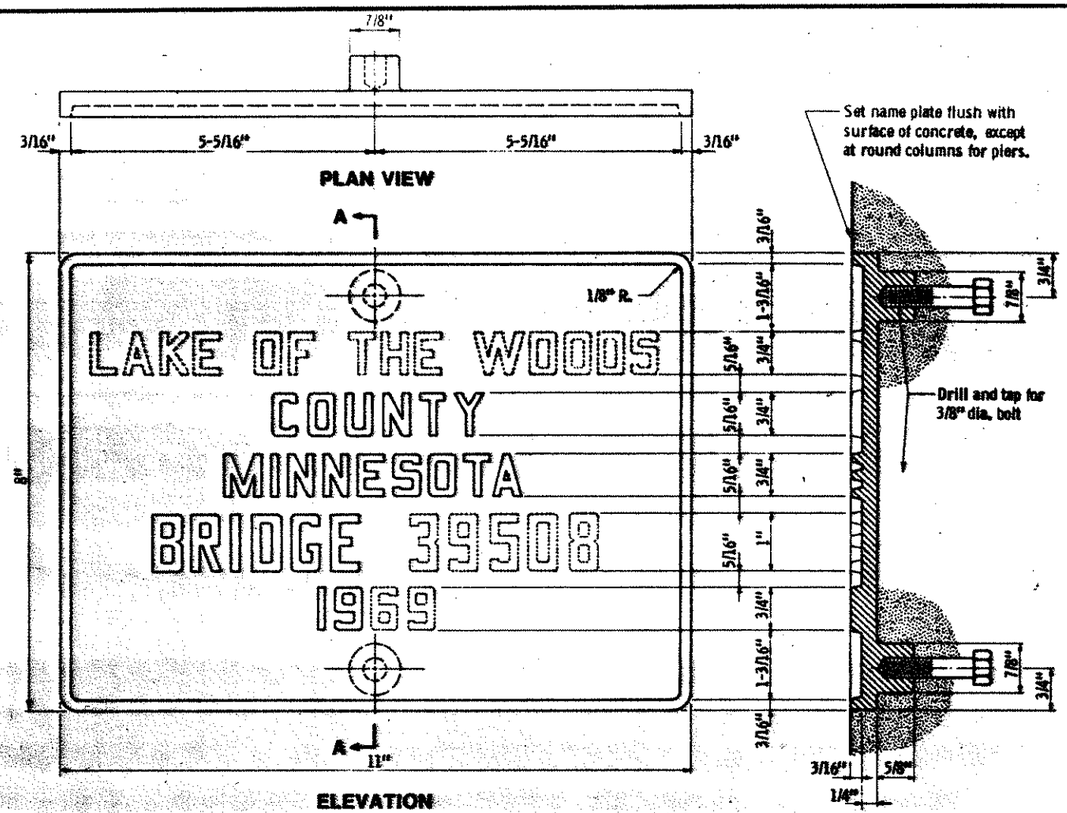
All structural steel shown on this detail, including bolts and washers, shall be included in the payment for diaphragms for prestressed beams.

Diaphragms over the piers are considered to be intermediate if the slab is continuous.

| APPROVED September 24, 1987 | STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION | REVISION | DETAIL NO. |
|---|---|---|---|
| Developed by ENGINEERING STANDARDS & BRIDGES AND STRUCTURES OFFICES<br>Issued by OFFICE OF ENGINEERING STANDARDS | **STEEL INTERMEDIATE DIAPHRAGM (FOR 28"-45M PRESTRESSED CONC. BEAM SPANS AND 30" BULB TEE BEAMS)** | | **B403** |

APR. 7-15-88

| S.A.P. 02-601-29 | SHEET 39 R OF 45 SHTS. | DETAILS | 02541 |
|---|---|---|---|




**ELEVATION**

**SECTION A-A**

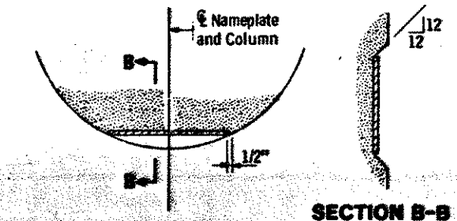
The dotted letters & numbers shown above are for illustration.
Data to be shown on name plate is as follows:

COUNTY ANOKA
BRIDGE 02541
YEAR 1987

1234567890 3/16"

ABCDEFGHIJKLMNOPQRSTUVWXYZ 3/16"

**LETTERS & NUMBERS FOR NAMEPLATES**



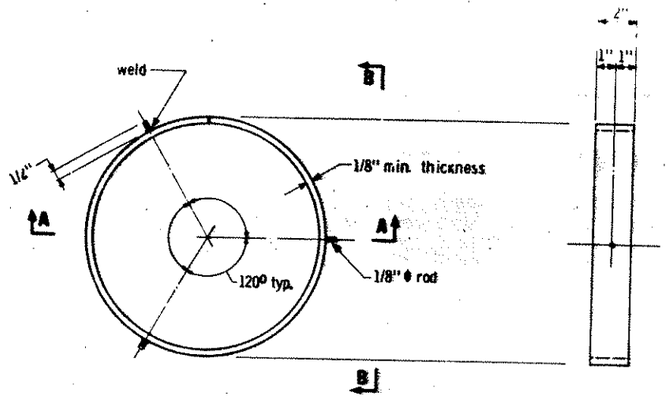

**SECTION B-B**

**NAMEPLATE PLACEMENT**
(Round Concrete Pier Columns)

**NOTES:**

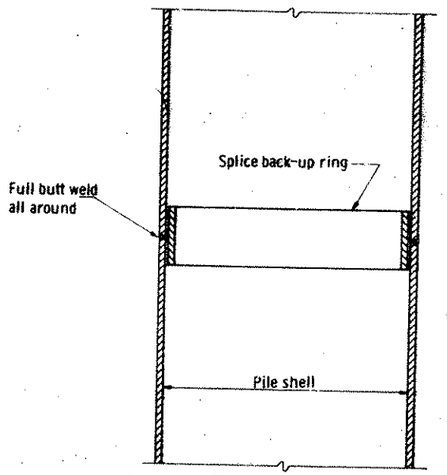
No shop drawing required.
Material shall comply with Spec. 3327
Letters and numbers shall conform to those shown.
Draft on letters and numbers shall not be more than 3° in 12°.
Horizontal spacing of letters and numbers shall produce a balanced layout in proportion to spacing shown.
Top surface of letters, numbers and frames shall be burnished.
Furnish 2 steel bolts 3/8" dia. x 3" long with each plate.
All dimensions for 3/4" high letters and numbers shall be in direct proportion to those shown for the 1" high letters and numbers.

| APPROVED: May 1, 1985 | STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION | REVISION | DETAIL NO. |
|---|---|---|---|
| Developed by: ENGINEERING STANDARDS & BRIDGES AND STRUCTURES OFFICES | **BRIDGE NAMEPLATE** | | **B103** |
| Issued by: OFFICE OF ENGINEERING STANDARDS | **COUNTY BRIDGES** | | |




**PLAN VIEW**
(Pile not shown)

**SECTION B - B**
(Pile not shown)




**SECTION A - A**

**NOTES:**

Approved commercial pile splice back-up ring may be used in lieu of the type detailed. Back-up ring shall have a tight fit.

Welding electrodes shall be A.W.S. Type E7016 or E7018 (low-hydrogen).

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.

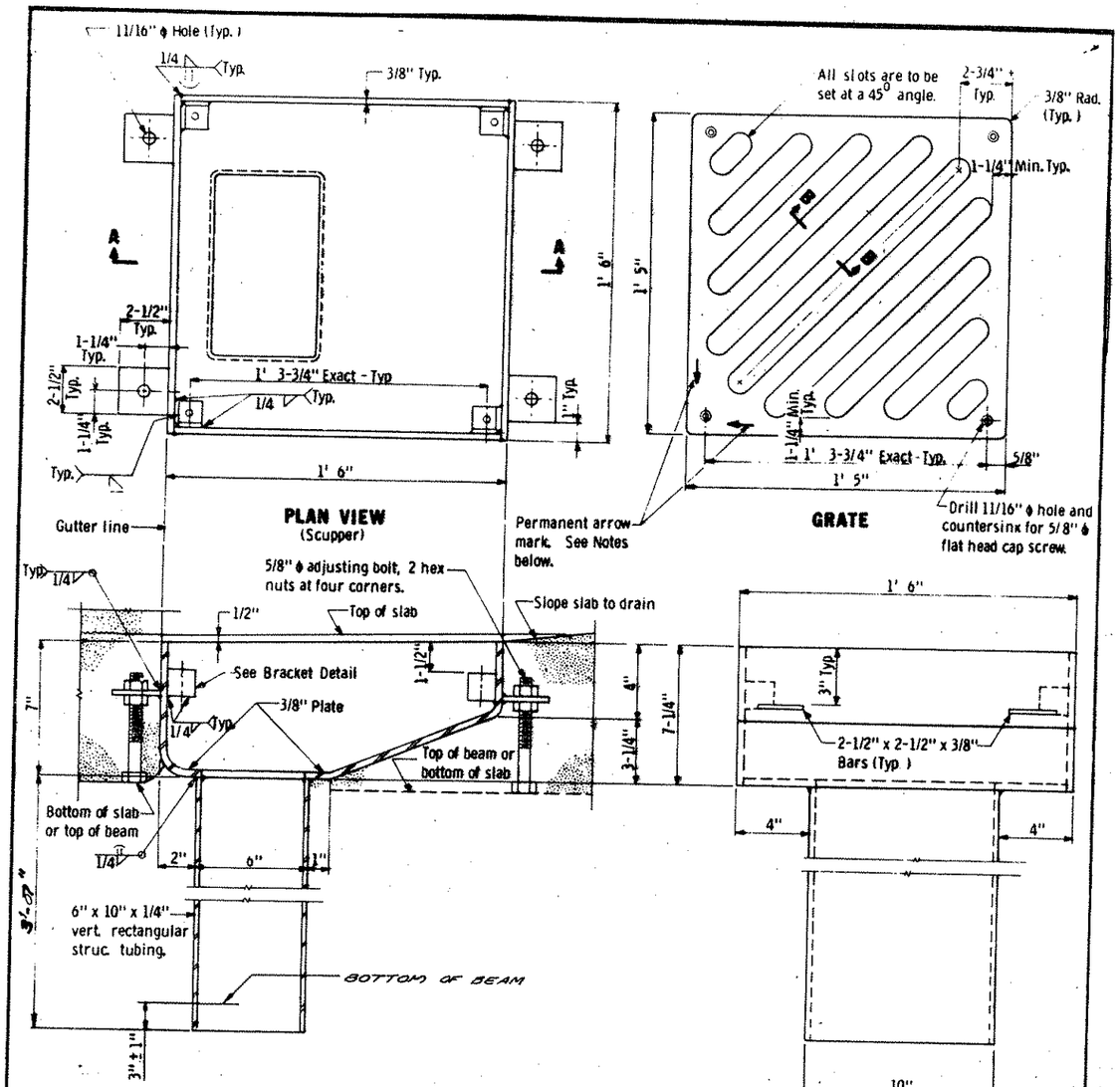
Electrodes which have become wet, soiled or damaged shall not be used.

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 July 21, 1972 | MINNESOTA DEPARTMENT OF TRANSPORTATION | | DETAIL NO. |
|---|---|---|---|
| Engineering Standards Engineer RESEARCH AND STANDARDS DIVISION | **PILE SPLICE** CAST-IN-PLACE CONCRETE PILES | | **B201** |

APR. 7-15-88

| SHEET 40 OF 45 SHEETS | S.A.P. 02-601-29 | DETAILS | 02541 |
|---|---|---|---|




**NOTES**

All steel plates per Spec. 3306. Fabricate grate using automatically controlled cutting torch.

Malleable iron grate alternate per Spec. 3324 Grade 35018.

Workmanship and fabrication per Spec. 2471.

Blast clean scupper and grate after fabrication.

Galvanize scupper and grate per Spec. 3394.

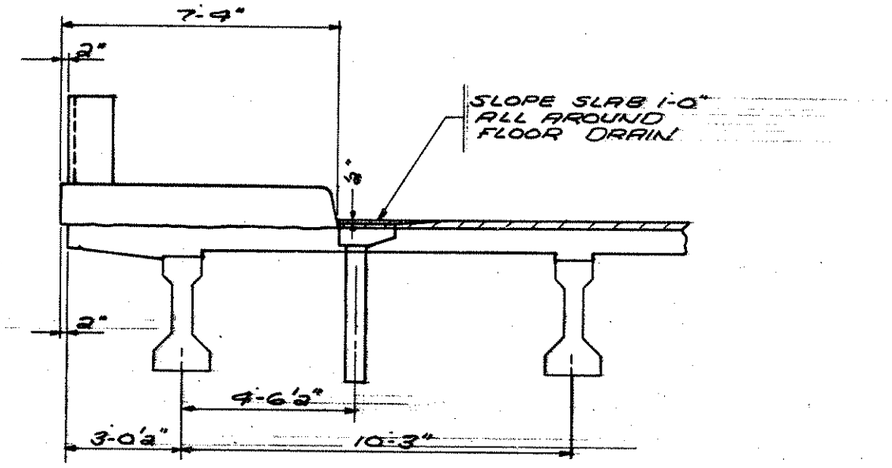
Galvanize hardware per Spec. 3392.

Install grate with arrow on curb side and in direction of flow.

Payment for Floor Drain, Type B701 shall include all material shown on this detail.

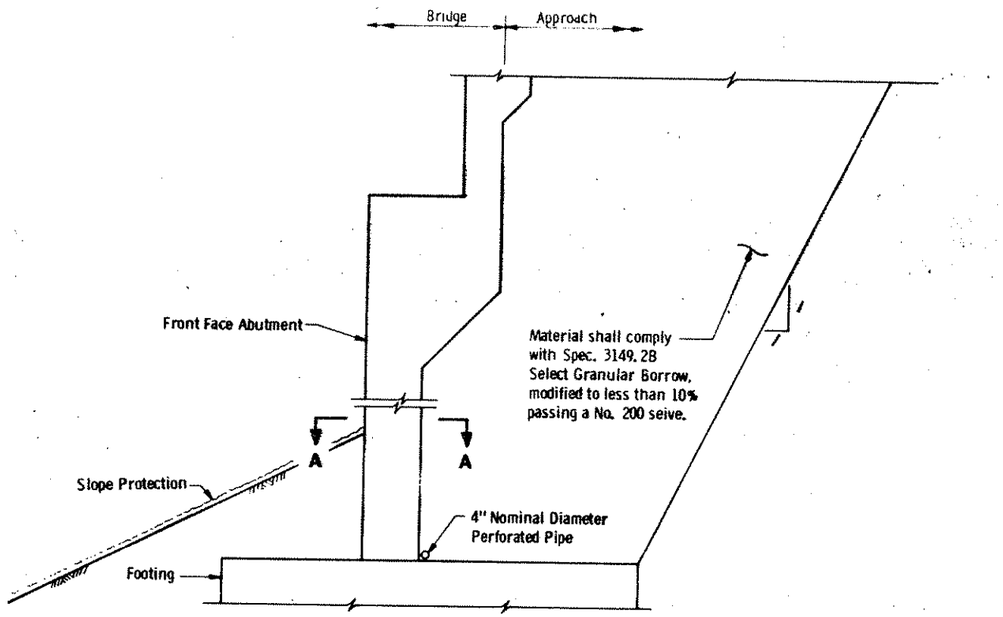
Grate opening area 110 sq. in.

| | | | |
|---|---|---|---|
| APPROVED: Aug. 12, 1975<br>Developed by: OFFICE OF ENGINEERING STANDARDS AND BRIDGE DESIGN<br>Issued by: OFFICE OF ENGINEERING STANDARDS | STATE OF MINNESOTA<br>DEPARTMENT OF TRANSPORTATION<br>**BRIDGE FLOOR DRAIN**<br>**WELDED BOX** | REVISION<br>Feb. 13, 1979 | DETAIL NO.<br>**B701** |

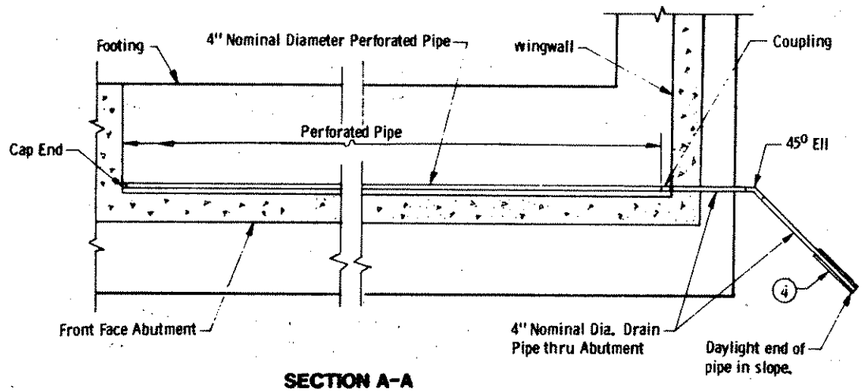



SECTION THRU DECK SHOWING FLR. DRAINS

SCALE: ½" = 1-0"




**SECTION THRU ABUTMENT**
*(TYPICAL BOTH ABUTMENTS)*




**SECTION A-A**

**NOTES:**

1. All pipe shall be as per Spec. 3245
2. Wrap perforated pipe with Geotextile as per Spec. 3733, Type I. Attach to pipe as per Spec. 2502
3. See bridge plans for notes and "Summary of Quantities". *(SEE SHEET 62)*

(4) 5 ft. long corrugated metal oversleeve with rodent screen on end, or a Precast Concrete Headwall.

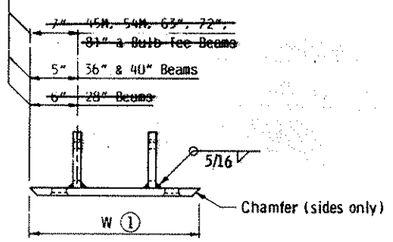
5. *SEE SHT 29 FOR QUANTITIES.*

| | | | |
|---|---|---|---|
| APPROVED: March 13, 1985<br>Developed by: ENGINEERING STANDARDS & BRIDGES AND STRUCTURES OFFICES<br>Issued by: OFFICE OF ENGINEERING STANDARDS | STATE OF MINNESOTA<br>DEPARTMENT OF TRANSPORTATION<br>**DRAINAGE SYSTEM FOR HIGH ABUTMENTS** | REVISION | DETAIL NO.<br>**B910** |

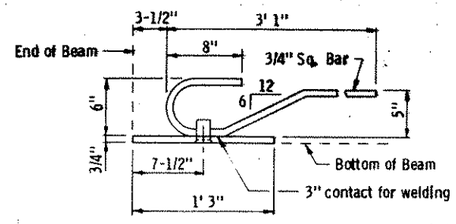
APR 7-15-88

| | | | |
|---|---|---|---|
| SHEET 42 OF 45 SHEETS | S.A.P. 02-601-89 | DETAILS | 02541 |

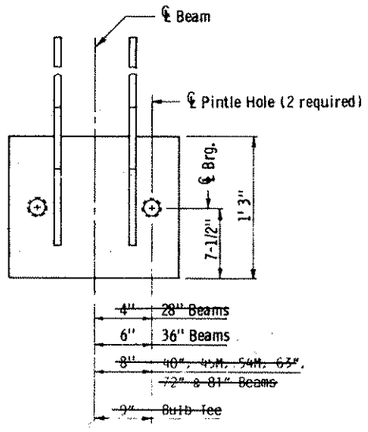
These dimensions may be modified to clear prestressed strands. However, changes must be approved by the Engineer.



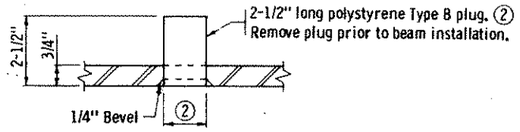

**FRONT VIEW**




**SIDE VIEW**




**TOP VIEW**




**PINTLE HOLE DETAIL**

**NOTES:**

Material to be structural steel per Spec. 3306

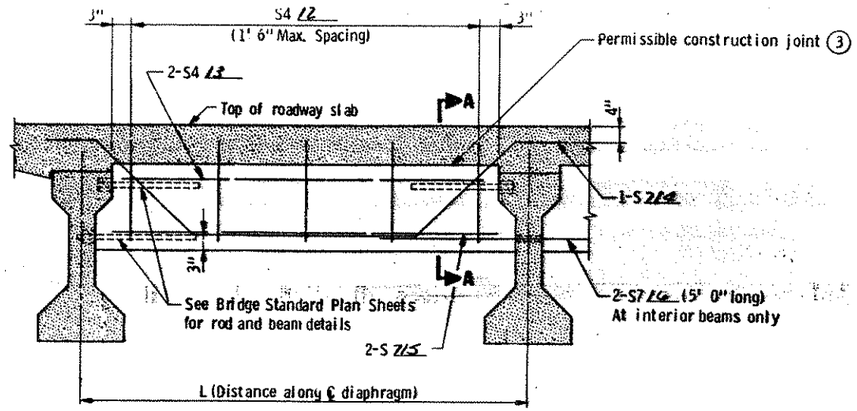
Sole plate for Bearing Assembly to be hot dipped galvanized per Spec. 3394 after fabrication.
Pintle holes shall be free of zinc build up from galvanizing.

Payment for sole plates to be included in price bid for Prestressed Concrete Beams.

(1) Dimension "W" to be the width at the bottom flange of the beam minus 1/4".

(2) 1-1/2" dia. for 1-1/4" dia. pintles.
1-3/4" dia. for 1-1/2" dia. pintles.
Check bearing assemblies for pintle size used.

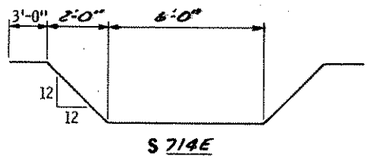
| APPROVED: March 12, 1987 | STATE OF MINNESOTA<br>DEPARTMENT OF TRANSPORTATION | REVISION | DETAIL NO. |
|---|---|---|---|
| Developed by: ENGINEERING STANDARDS and BRIDGES & STRUCTURES<br>Issued by: ENGINEERING STANDARDS | **SOLE PLATE**<br>**PRESTRESSED CONCRETE BEAMS**<br>**(FOR BEARINGS WITH PINTLES)** | | **B303** |



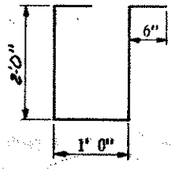

**PART TRANSVERSE SECTION AT END DIAPHRAGM**

**LONGITUDINAL REINFORCEMENT IN BOTTOM OF DIAPHRAGM**

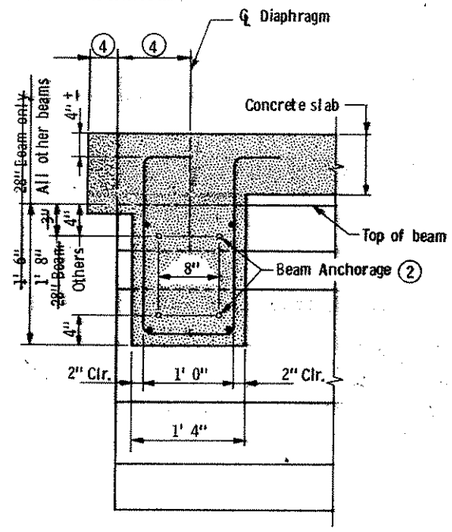
| BEAM SPACING ℄ TO ℄ (1) | BARS REQUIRED | | | |
|---|---|---|---|---|
| | STRAIGHT | | BENT | |
| | NO. | SIZE | NO. | SIZE |
| Up to 8' | 2 | 6 | 1 | 5 |
| Over 8' to 11' | 2 | 7 | 1 | 6 |
| Over 11' to 13' | 2 | 8 | 1 | 8 |
| Over 13' to 15' | 2 | 9 | 1 | 10 |
| Over 15' to 18' | 2 | 11 | 1 | 11 |




**S 714E**




**S412E**




**SECTION A-A**

NOTE:

(1) Distance measured along ℄ of diaphragm.

(2) BEAM ANCHORAGES
Fascia beams only: four 3/4" dia. threaded rods.
Interior beams: Two 3/4" dia. threaded rods on top two No. 7 bars on bottom.

(3) When construction joint is used at this location, diaphragm falsework shall remain in place until completion of slab curing period.

(4) See plans for dimensions.

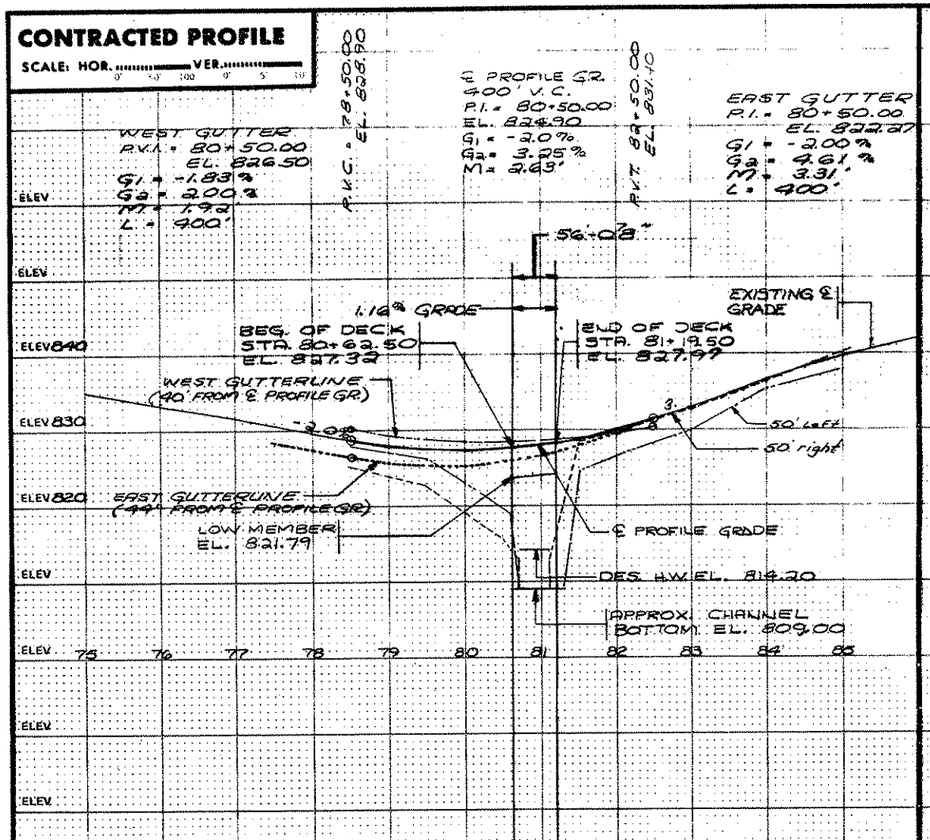
(5) All diaphragm bars shown are listed with the superstructure reinforcement. Diaphragm concrete and reinforcement quantities are included in superstructure quantites (except threaded rods are included in payment for prestressed beams).

| APPROVED: March 3, 1977 | STATE OF MINNESOTA<br>DEPARTMENT OF TRANSPORTATION | REVISION<br>AUG. 29, 1978 | DETAIL NO. |
|---|---|---|---|
| Developed by: ENGINEERING STANDARDS, AND BRIDGES AND STRUCTURES<br>Issued by: ENGINEERING STANDARDS | **END DIAPHRAGM**<br>**(28"-54" PRESTRESSED CONCRETE BEAM SPAN WITH PARAPET ABUTS.)** | | **B803** |

APR 7-15-88

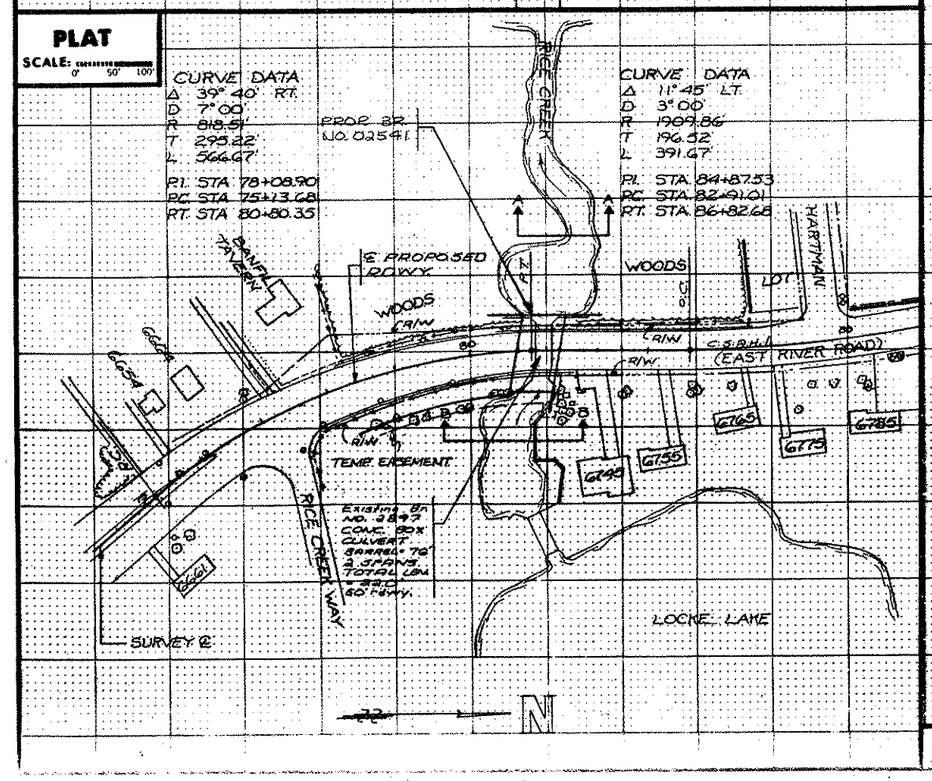
## CONTRACTED PROFILE

SCALE: HOR. ..... VER. .....



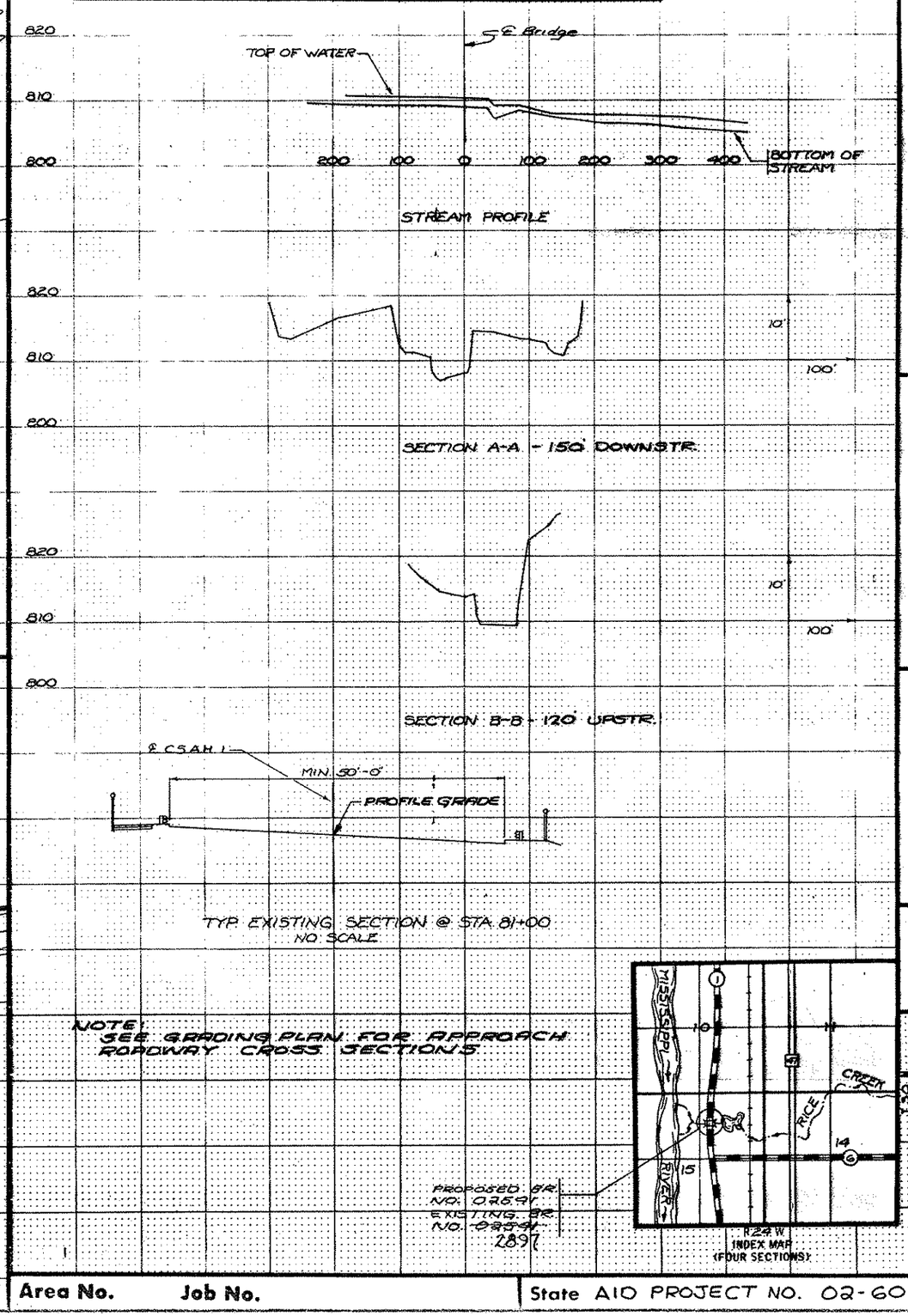

## PLAT

SCALE: 0' 50' 100'




## TYPICAL SECTIONS & PERTINENT DATA

SCALES AS SHOWN







**Fed. Proj. No.**

LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

1. Special Features: Waterfalls, dams, floods, ice, debris, sliding banks, recreational boating.
DROP INLET @ LOCKE LAKE

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 1-2-85

Stream or ditch designation RICE CREEK
Drainage area 164 SQ. MILES
Max. flood on record UNKN. Design flood (50 yr. freq.) 1955 C.F.S.
Max. observed highwater elevation UNKN. Design highwater elevation 815.70
Design mean velocity through structure 7.8 F.P.S.
Low superstructure at or above elevation 820.20
Flowline elevation 809.00 Skew angle NONE
Waterway area req'd. below elevation 814.2 = 250 Sq. Ft. at Rt. angles to channel

In the interest of flood plain zoning the regional flood (100 yr. freq.) is 2390 C.F.S. at stage 815.7 and mean velocity of 8.7 F.P.S. with 1.0 Ft. freeboard.
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 .....

51'-0" SIMPLE PRECAST CONC. BEAM SPAN
2 - 34'-0" ROADWAYS
16'-0" CENTER MEDIAN
2 - 7'-4" SIDEWALKS
10° SKEW

Bridge survey sheets made from: ERICKSON ENGINEERING SURVEY NOTES

Bench mark elevation 834.09 (M.S.L. 1929 Adj.)
Location: T.N.H. S.E. QUAD. E.Rr. Ro. & R.Cr. WAY

MINNESOTA DEPARTMENT OF TRANSPORTATION

## BRIDGE SURVEY

AT MILE POINT ..... ON C.S.A.H. 1 (T.H., C.S.A.H., C.R. etc.)
PROPOSED BRIDGE LOCATED 0.25 MILES NORTH OF C.S.A.H. 6
SEC. 15 TWP. 30 N R. 24 W
CITY FRIDLEY COUNTY ANOKA
BRIDGE NO. 02541
APR. 7-15-88

Area No. Job No. | State AID PROJECT NO. 02-601-29 | Sheet No. 44 of 45 Sheets

N

6" STEEL GAS MAIN (EXISTING)

TEST PILE #5

EXIST. TIMBER SIDEWALK

FLOW

TEST PILE #3

EXISTING SHEET PILE WALLS

EXISTING CHAIN LINK FENCE

10° (TYR)

℄ BRG. - SO. ABUT.
STA. 80+65.50
EL. 827.34

P.T. 80+80.35

T-485

EXISTING R. BM. GUARDRAIL

℄ BRG. - NO. ABUT.
STA. 81+16.50
EL. 827.93

C.S.A.H. 1

80+00

81+00

82+00

SURVEY ℄

79+00

HORZ. CURVE DATA
Δ = 39°-40' RT.
D = 7°-00'
R = 818.51'
T = 295.22
L = 566.67
P.I. = 78+08.90
P.C. = 75+13.68
P.T. = 80+80.35

T-484

8" C.I.P. (Exist)

EXISTING R. BM. GUARDRAIL

55'-0"

EXISTING CHAIN LINK FENCE

Existing BR. No. 2897 to Be Removed.

3" SAN. SERV. (Exist.)

TEST PILE #1

TEST PILE #4

F.F. OF RETAINING WALL

400' V.C.
P.I. = 80+50.00
EL. 824.90
G1 = -2.0 %
G2 = 3.25 %
M = 2.63%

51'-0"

35" CONC. ENCASED 8" INSULATED WATER MAIN (EXISTING)

APPROACH GRADING BY THE COUNTY

LOW MEMBER EL. 821.79

Existing BR. No. 2897

℄ BRG. - NO. ABUT.
STA. 81+16.50
827.93

℄ BRG. - SO. ABUT.
STA. 80+65.50
EL. 827.32

℄ PROFILE GRADE (PROPOSED)

+1.16 % GRADE ON BRIDGE

EXISTING ℄ PROFILE

830

820

810

50' LT.

50' RT.

8" WATERMAIN (EXISTING)

8" WATERMAIN (EXISTING)

Brn. Rdwy. Loamy S. ℄ G.
Brn. Moist Fill
Loamy S. tan Moist Fill
Loamy S. dk. brn. Moist Fill
Loamy S. tan Moist Fill
Very Loamy S. blk. moist
Clay Loam till gn moist firm
Calcareous Wood & Layers
Plastic S. Loam till Red moist Firm
Sand & Gravel brn. Wet

Cr. S. & Gr. slightly Org. Wet
Clay till gn moist firm
SOUTH ABUT.
Loamy S. brn. Wet
Plastic S.L. brn. moist firm
Fine S. brn. Wet
Non-Plastic Cl. Red moist Firm
Gravel brn. Wet

DES. H.W. EL. 814.20

NORTH ABUT.

APPROX. CHANNEL BOTTOM EL. 809.00

EL. 766.00

T-484

EL. 767.75

T-485

12"ø CONC. CAST-IN-PLACE TEST PILES 35 FT. LONG.

79+00 +50 80+00 +50 81+00 +50 82+00

BORINGS SHOWN T TAKEN WITH STD. 140 LB HAMMER 30" DROP 2" O.D. SAMPLER

NOTE: BURIED GAS MAIN ELEVATION TO BE FIELD VERIFIED.

BURIED TELEPHONE LINES ELEVATION TO BE FIELD VERIFIED.

APR. 715-88

State Proj. No. S.A.P. 02-601-29

Sheet No. 45 of 45 Sheets