

**MINNESOTA DEPARTMENT OF TRANSPORTATION  
BLUE EARTH COUNTY**

MN. PROJ. NO.

**CONSTRUCTION PLAN FOR BRIDGE NO. 07586**

**GOVERNING SPECIFICATIONS**  
THE 2005 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

LOCATED 0.4 MILES NORTHEAST OF JCT C.R. 171, 1.4 MILES SOUTHWEST OF PEMBERTON, MN  
ON C.R. 168 OVER THE LITTLE COBB RIVER. (Geographical Description)

SEC. 11                      TWP. 106 N                      R 25 W                      (Legal Description)

STATE PROJ. NO.

STATE AID PROJ. NO. 07-598-25

GROSS LENGTH	_____ FEET	_____ MILES
BRIDGES-LENGTH	_____ FEET	_____ MILES
EXCEPTIONS-LENGTH	_____ FEET	_____ MILES
NET. LENGTH	_____ FEET	_____ MILES

GROSS LENGTH	69.00 FEET	0.013 MILES
BRIDGES-LENGTH	69.00 FEET	0.013 MILES
EXCEPTIONS-LENGTH	_____ FEET	_____ MILES
NET. LENGTH	69.00 FEET	0.013 MILES

**LIST OF SHEETS**

NO.	TITLE
1	TITLE SHEET
2	GENERAL PLAN & ELEVATION
3	BRIDGE LAYOUT
4-6	ABUTMENT DETAILS
7-8	SUPERSTRUCTURE DETAILS
9-10	PRESTRESSED CONCRETE BEAM TYPE 1
11-12	STRUCTURAL TUBE RAILING DESIGN SPECIAL
13-14	MISC. BRIDGE DETAILS
15	BRIDGE SURVEY
16	BRIDGE SURVEY ~ PLAN & PROFILE
17-20	APPROACH GUARDRAIL DETAILS

THIS PLAN CONTAINS 20 SHEETS.

**DESIGN DESIGNATION**

≤ N18<sup>20</sup>  
R VALUE  
ADT (2008) 145  
PROJ. ADT (2028) 232  
PROJ. HCADT  
SOIL FACTOR  
TON DESIGN

Design Speed 40 MPH  
Based on 305' Stopping Sight Distance  
Height of eye 3.5'  
Height of object 2.0' (Crest Curve)  
Height of object 0.5' (Sag Curve)  
Design Speed not achieved at:  
STA.                      TO STA.                      MPH  
STA.                      TO STA.                      MPH  
STA.                      TO STA.                      MPH

*Ronald Benson*                      RONALD BENSON  
DESIGN ENGINEER: I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE 1/30/08                      LICENSE NUMBER 22737

*Alan Ransley*                      DATE 4 Feb-08  
APPROVED: COUNTY ENGINEER

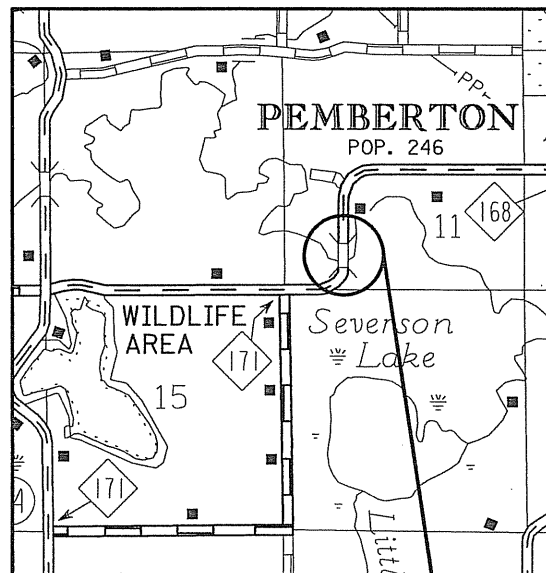
*Wmual 2 Nergum*                      DATE 3/24/08  
RECOMMEND FOR APPROVAL: STATE BRIDGE ENGINEER

*Al E. Haeder*                      DATE 3/11/08  
DISTRICT STATE AID ENGINEER: REVIEWED FOR COMPLIANCE WITH STATE-AID RULES/POLICY

APPROVED FOR STATE-AID FUNDING: STATE-AID ENGINEER                      DATE \_\_\_\_\_

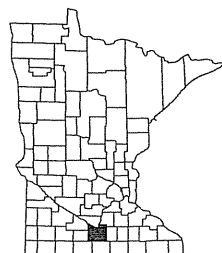
**PLAN SYMBOLS**

COUNTY LINE	-----
TOWNSHIP OR RANGE LINE	-----
SECTION LINE	-----
QUARTER LINE	-----
SIXTEENTH LINE	-----
EXISTING R/W	-----
NEW R/W	-----
TEMP EASE	-----
RAILROAD R/W	-----
UNSURFACED RD. OR SHLD.	-----
EDGE OF LAKE	-----
SWAMP BOUNDARY	-----
MISCELLANEOUS BOUNDARY	-----
CORPORATE OR CITY LIMITS	-----
VACATED PLATTED PROPERTY	-----
RECREATIONAL TRAIL	-----
ALIGNMENT STATIONS	-----
ALIGNMENT POINTS	-----
RIVER OR CREEK	-----
DRAINAGE DITCH	-----
BRIDGE	-----
RAILROAD (SINGLE TRACK)	-----
RR CROSSING PAVEMENT MARKING	-----
RR CROSSING GATE	-----
RR CROSSBUCK SIGN	-----
RR CROSSBUCK SIGN W/LIGHTS	-----
BARBED WIRE FENCE	-----
CHAIN LINK FENCE	-----
WOVEN WIRE, COMBINATION WOVEN AND BARB	-----
WOOD FENCE	-----
BILLBOARD	-----
RETAINING WALL	-----
GUARDRAIL (CABLE)	-----
GUARDRAIL (PLATE BEAM)	-----
DRAIN TILE	-----
CULVERT	-----
CULVERT WITH APRONS	-----
WOODS OR BRUSH, NURSERY	-----
DECIDUOUS TREES	-----
CONIFER (EVERGREEN) TREES	-----
HEDGE	-----
BUSH OR SHRUB	-----
STUMP	-----
SWAMP OR MARSH	-----
MONUMENT (CLACT,ACP,BCP,...)	-----
CONCRETE OR STONE MONUMENT	-----
IRON PIPE	-----
IRON PIN OR REBAR	-----
IRON PIN WITH BRASS DISK	-----
NAIL, PK NAIL, SPIKE, SFP, T-BAR, ...	-----
VERTICAL CONTROL	-----
HORIZONTAL CONTROL	-----
POWER POLE	-----
LIGHT POLE	-----
LIGHT AND TELEPHONE POLE	-----
LIGHT, TELEPHONE AND POWER POLE	-----
GUY POLE	-----
POLE ANCHOR	-----
TELEPHONE POLE	-----
TELEPHONE AND POWER POLE	-----
UNDERGROUND CABLE PEDESTAL	-----
TELEPHONE MANHOLE (VAULT)	-----
ELECTRIC CABLE IN CONDUIT	-----
TELEPHONE CABLE IN CONDUIT	-----
BURIED ELECTRIC CABLE	-----
BURIED TELEPHONE CABLE	-----
GAS LINE	-----
WATER LINE	-----
VALVE	-----
FIRE HYDRANT	-----
WATER MANHOLE	-----
WELL	-----
LAWN SPRINKLER HEAD	-----
MANHOLE	-----
CATCH BASIN	-----
SEPTIC TANK	-----
FORCE MAIN LIFT STA.	-----
SEWER LINE	-----
PERMANENT BARRICADE	-----
TRAFFIC SIGNAL LIGHT	-----
HAND HOLE	-----
ENTRANCE	-----
BUILDING	-----
SATELLITE DISH	-----
STEEL TOWER	-----
FLAG POLE	-----

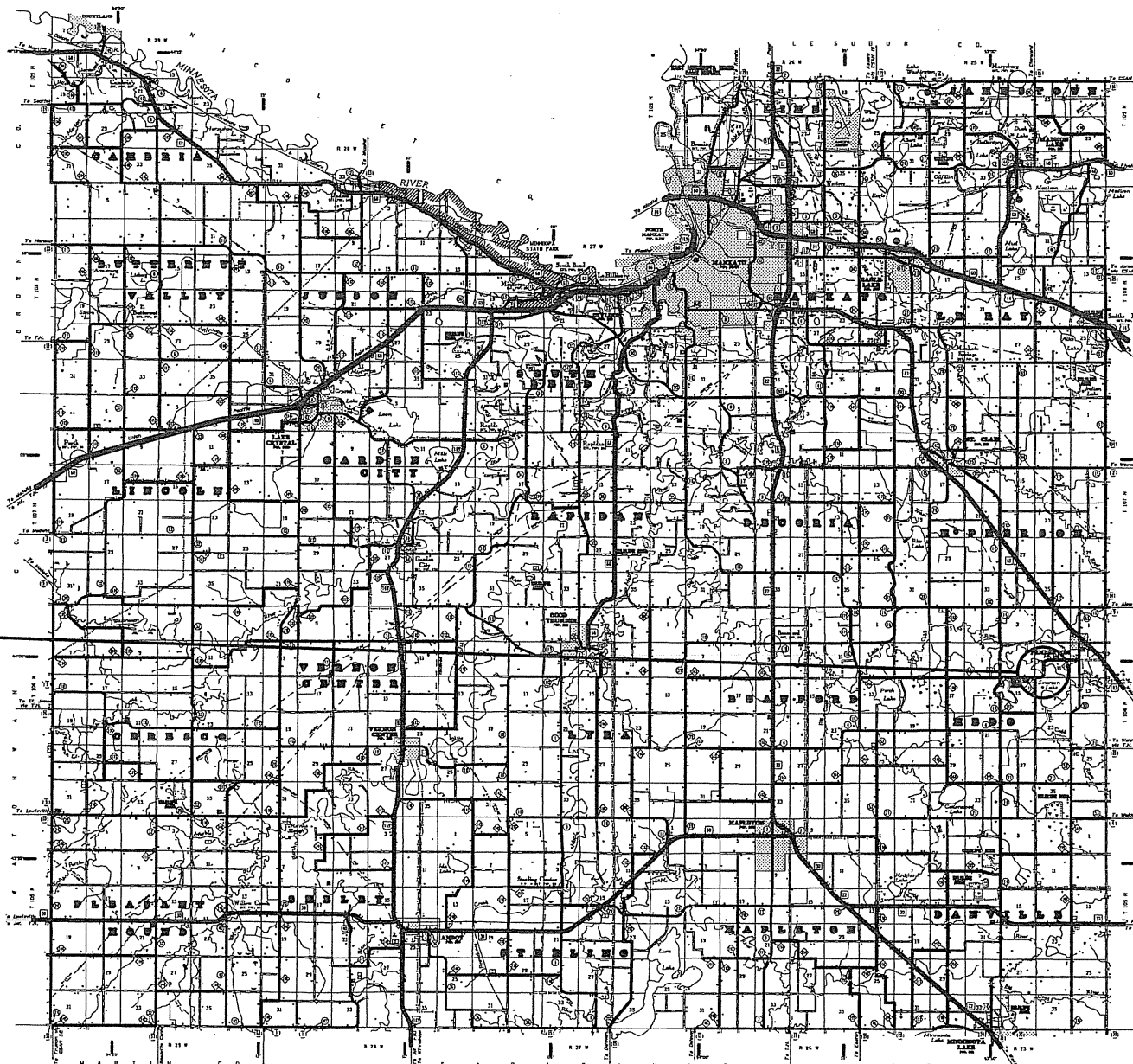


PROP. BRIDGE NO. 07586  
S.A.P. 07-598-25  
BEG. PROJ. 381+65.50  
END PROJ. 382+34.50  
EXIST. BRIDGE NO. 90577  
PRESTR. CHAN. SPAN  
LENGTH 50.0'  
ROAD WIDTH 24.0'  
YEAR BUILT 1958

**PROJECT LOCATION**  
Outline Map of Minnesota showing location of the County within the State.



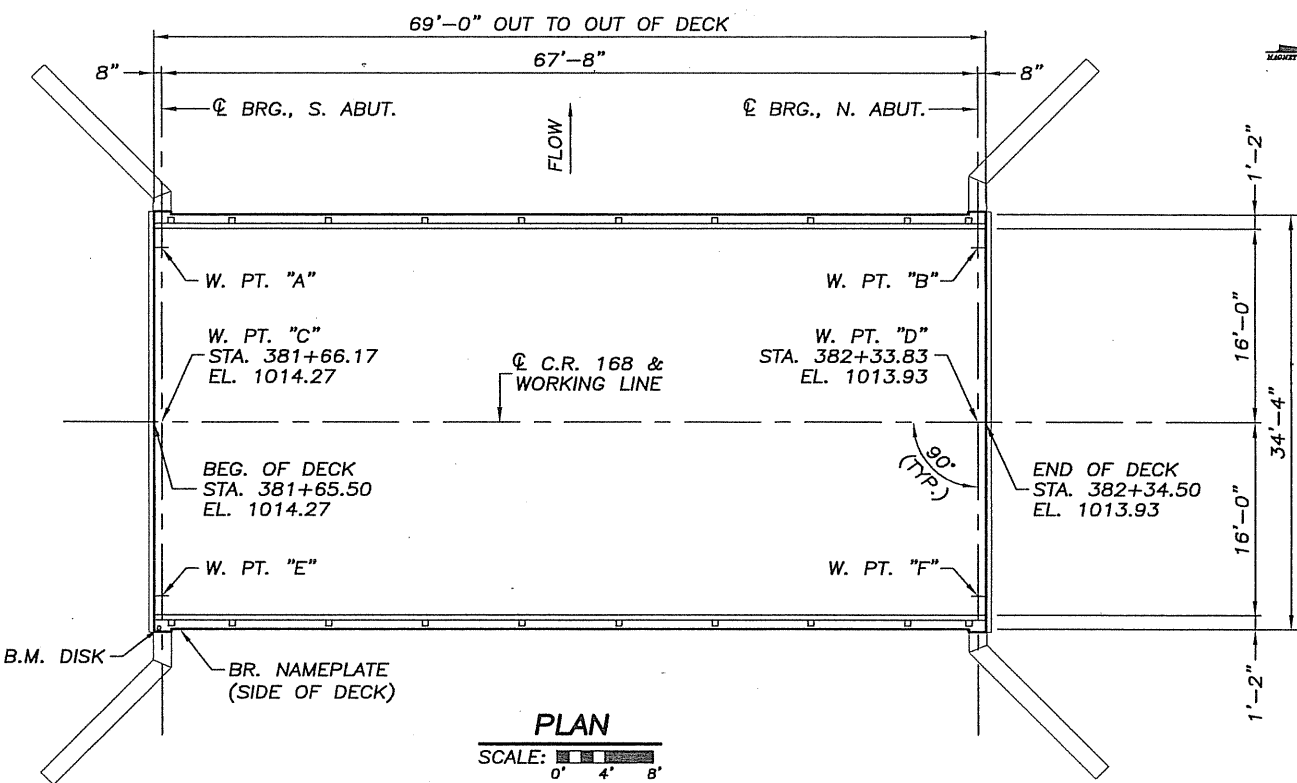
BLUE EARTH COUNTY



**ERICKSON ENGINEERING**  
Consulting Engineers

STATE AID PROJ. NO. 07-598-25  
STATE PROJ. NO.

SHEET NO. 1 OF 20 SHEETS



B.M. ELEV. 1011.38  
 LOCATION: DOUBLE SPIKE IN POWER POLE.  
 STA. 380+88, 34' RIGHT.

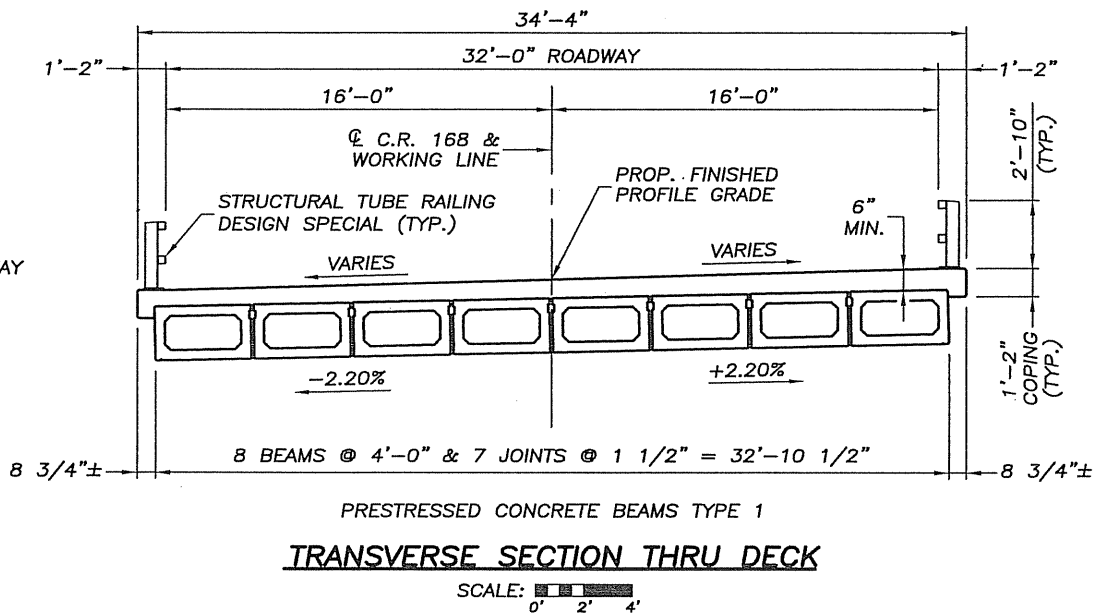
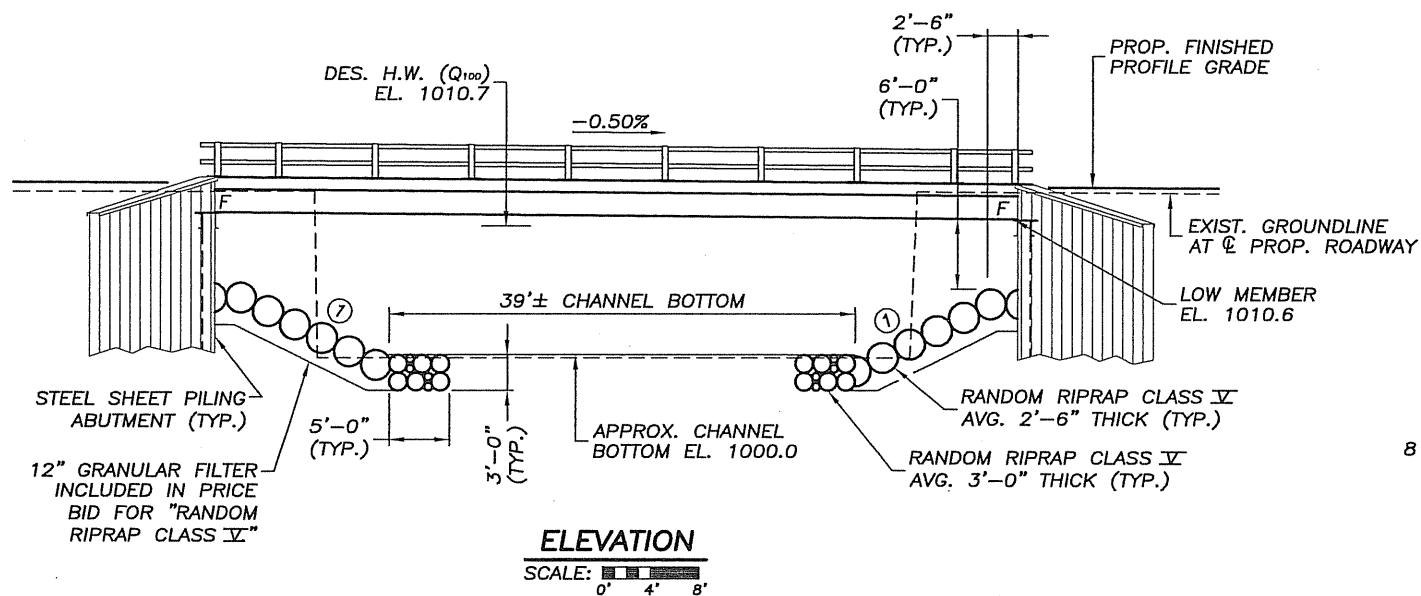
**DESIGN DATA**  
 2004 & CURRENT INTERIM. A.A.S.H.T.O. L.R.F.D. BRIDGE DESIGN SPECS.  
 LOAD & RESISTANCE FACTOR DESIGN METHOD ~ HL-93 LIVE LOAD  
 DEAD LOAD INCLUDES 20 PSF ALLOWANCE FOR FUTURE WEARING COURSE MODIFICATIONS.  
 MAXIMUM ALLOWABLE DESIGN STRESSES:  
 REINFORCED CONCRETE:  
 $f'_c = 4000$  PSI  $n = 8$   
 $f_s = 60000$  PSI REINFORCEMENT  
 PRESTRESSED CONCRETE:  
 $f'_c = 6000$  PSI  $n = 1$   
 $f_s = 270000$  PSI REINFORCEMENT

**CONSTRUCTION NOTES**

THE 2005 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.  
 THE FIRST TWO DIGITS OF EACH BAR MARK INDICATE THE BAR SIZE IN MILLIMETERS. BARS MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED.  
 THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."  
 THE SURVEY USED IN DEVELOPING THIS BRIDGE PLAN MUST BE VERIFIED WITH THE ACTUAL STREAM LOCATION AT THE TIME OF CONSTRUCTION STAKING. IF THE BRIDGE POSITION IS NOT COMPATIBLE WITH THE STREAM, THE ENGINEER SIGNING THESE PLANS SHALL BE NOTIFIED.  
 IF STATIONING IS CHANGED, THE REVISED PLANS SHALL BE SUBMITTED TO THE OWNER AND THE STATE AID BRIDGE UNIT FOR APPROVAL.

DECK AREA = 2,369 SQ. FT. DESIGN SPEED = 40 MPH  
 CURRENT ADT. 145 (2008) PROJ. ADT. 232 (2028)  
 OPERATING RATING = HS 48

LIST OF SHEETS	
NO.	TITLE
1	TITLE SHEET
2	GENERAL PLAN & ELEVATION
3	BRIDGE LAYOUT
4-6	ABUTMENT DETAILS
7-8	SUPERSTRUCTURE DETAILS
9-10	PRESTRESSED CONCRETE BEAM, TYPE 1
11-12	STRUCTURAL TUBE RAILING DESIGN SPECIAL
13-14	MISC. BRIDGE DETAILS
15	BRIDGE SURVEY
16	BRIDGE SURVEY ~ PLAN & PROFILE
17-20	GUARDRAIL DETAILS



APPROVED:  
*Alan Rowley*  
 COUNTY ENGINEER  
 BLUE EARTH COUNTY  
 DATE: 04 Feb-08

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
*Ronald Benson* RONALD BENSON  
 DATE: 1/30/08 LIC. NO. 22737

PLANS PREPARED BY:  
 ERICKSON ENGINEERING  
 9330 JAMES AVENUE SOUTH  
 BLOOMINGTON, MN 55431

C.R. 168 BLUE EARTH COUNTY  
 MINNESOTA DEPARTMENT OF TRANSPORTATION

**BRIDGE NO. 07586**  
 LOCATED 0.4 MILES N.E. OF JCT. C.R. 171 ON C.R. 168 OVER LITTLE COBB RIVER.  
 69 FT. PRESTRESSED CONC. BOX GIRDER SPAN 32'-0" ROADWAY ~ 0' SKEW  
 SPAN IDENTIFICATION NO. 507

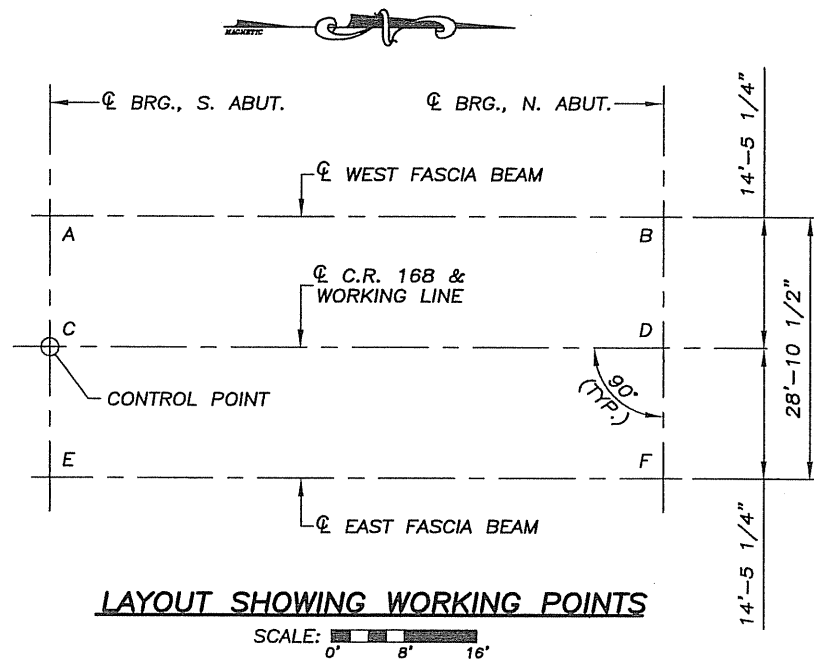
**GENERAL PLAN & ELEVATION**  
 SEC. 11 TWP. 106 N R 25 W  
 TOWNSHIP: MEDO COUNTY: BLUE EARTH  
 APPROVED: *Wendell Wengren*  
 STATE BRIDGE ENGINEER  
 DATE: 3/24/08

**SCHEDULE OF QUANTITIES FOR THE ENTIRE BRIDGE**

ITEM NO.	2021.501	2401.512	2401.541	2401.601	2401.601	2402.521	2402.521	2402.584	2402.603	2405.502	2442.501	2452.602
ITEM	MOBILIZATION	BRIDGE SLAB CONCRETE (3Y33A)	REINFORCEMENT BARS (EPOXY COATED)	STRUCTURE EXCAVATION	SLOPE PREPARATION	STRUCTURAL STEEL (3306)	STRUCTURAL STEEL (3309)	STRUCTURAL TUBE RAILING DESIGN SPECIAL	ELASTOMERIC BEARING PAD	PRESTRESSED CONCRETE BEAMS TYPE 1	REMOVE EXISTING BRIDGE	PILE ANALYSIS
QUANTITY	1	2,369 (P)	3,990 (P)	1	1	530 (P)	15,929 (P)	138 (P)	66 (P)	552 (P)	1	2
UNIT	LUMP SUM	SQ. FT.	POUND	LUMP SUM	LUMP SUM	POUND	POUND	LIN. FT.	LIN. FT.	LIN. FT.	LUMP SUM	EACH
ITEM NO.	2452.510	2452.510	2452.511	2452.511	2452.520	2452.520	2478.619	2502.601	2511.501	2554.501	2554.501	2554.501
ITEM	STEEL SHEET PILING (DRIVEN)	STEEL SHEET PILING (DRIVEN)	STEEL SHEET PILING (DELIVERED)	STEEL SHEET PILING (DELIVERED)	STEEL SHEET TEST PILE 50 FT. LONG	STEEL SHEET TEST PILE 55 FT. LONG	POLYAMIDE EPOXY-COALTAR PAINT SYSTEM	DRAINAGE SYSTEM TYPE SPECIAL	RANDOM RIPRAP CLASS V	TRAFFIC BARRIER DESIGN SPECIAL 1	TRAFFIC BARRIER DESIGN SPECIAL 2	TRAFFIC BARRIER DESIGN SPECIAL 3
QUANTITY	AZ 13	OMEGA 18	AZ 13	OMEGA 18	AZ 13	AZ 13	1	1	277	121	492	96
UNIT	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	LUMP SUM	LUMP SUM	CU. YD.	LIN. FT.	LIN. FT.	LIN. FT.

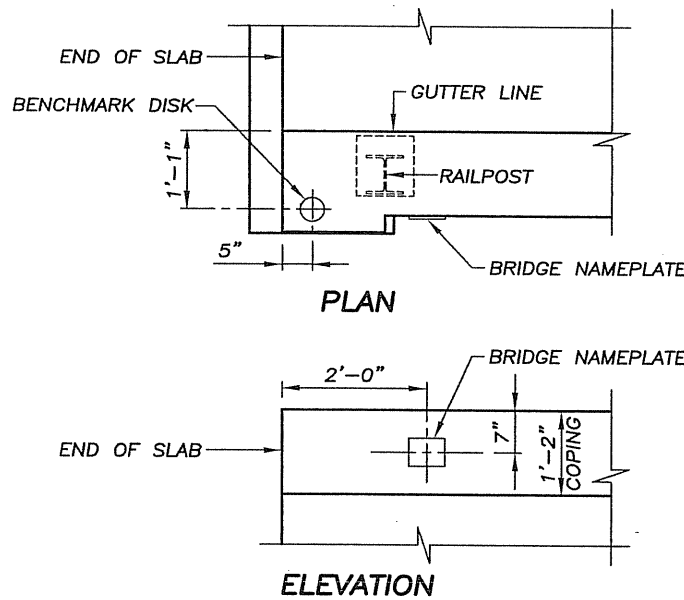
- ① 1:2 UPSTREAM  
1:2.3 DOWNSTREAM
- ② STA. 382+00 ~ NON-PARTICIPATING
- ③ SEE NOTE ⑦ ON SHEET 4.

S.A.P. 07-598-25  
 SHEET 2 OF 20 SHEETS  
 DES.: DJR DRN.: NBB  
 CHK.: RAB CHK.: DJR **07586**



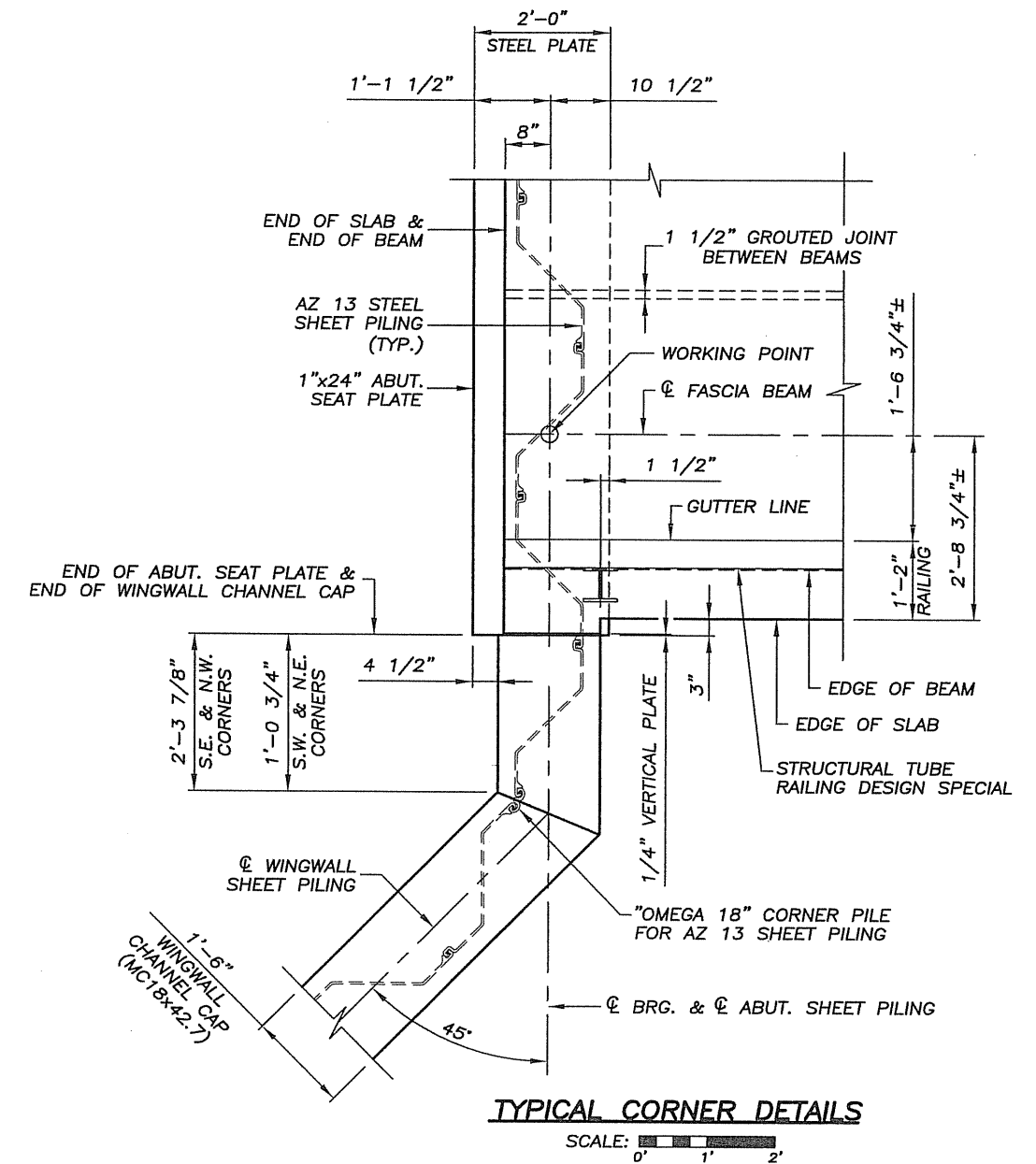
LAYOUT SHOWING WORKING POINTS

SCALE: 0' 8' 16'



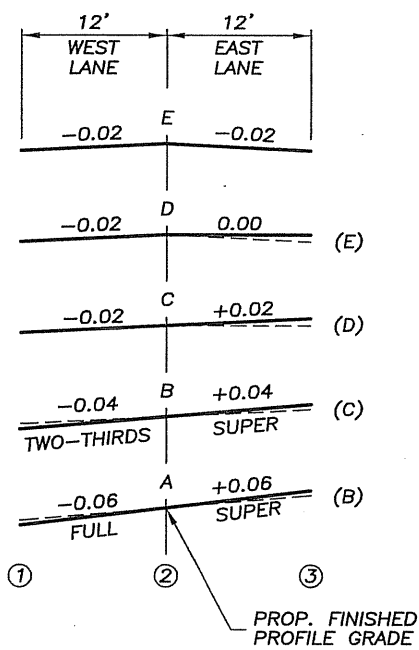
BENCHMARK & NAMEPLATE DETAILS

(S.E. CORNER ONLY)  
SCALE: 0' 1' 2'



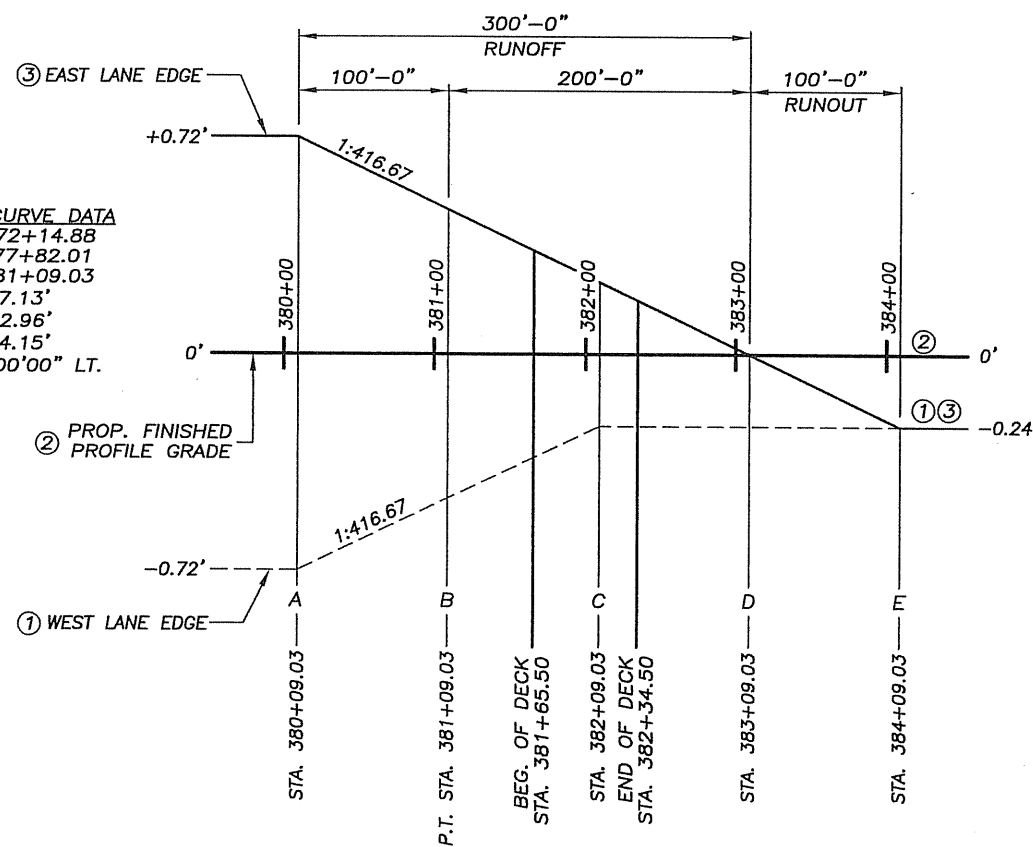
TYPICAL CORNER DETAILS

SCALE: 0' 1' 2'



SUPERELEVATION DIAGRAM ACROSS BRIDGE

**HORIZONTAL CURVE DATA**  
P.C. STA. 372+14.88  
P.I. STA. 377+82.01  
P.T. STA. 381+09.03  
T = 567.13'  
R = 572.96'  
L = 894.15'  
Delta = 10°00'00" LT.



SUPERELEVATION DIAGRAM AT BRIDGE

(SEE APPROACH GRADING FOR FULL SUPERELEVATION DETAILS)

LIST OF STANDARD PLATES	
PLATE NO.	DESCRIPTION
8000 I	STANDARD BARRICADES

THE ABOVE STANDARD PLATES, APPROVED BY THE F.H.W.A., SHALL APPLY ON THIS PROJECT.

CERTIFIED BY *Ronald Benson*  
PROFESSIONAL ENGINEER/RONALD BENSON  
LIC. NO. 22737 1/30/2008

MINNESOTA DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 07586  
BRIDGE LAYOUT

APPROVED:  
S.A.P. 07-598-25  
SHEET 3 OF 20 SHEETS  
DES.: DJR DRN.: NBB  
CHK.: RAB CHK.: DJR 07586

DIMENSIONS BETWEEN WORKING POINTS								ELEVATIONS						
POINT	STATION	A	B	C	D	E	F	TOP OF SLAB	SLAB THICKNESS	STOOL HEIGHT	BEAM HEIGHT	BEARING HEIGHT	BRIDGE SEAT	POINT
A	381+66.17		67.67	14.44	69.19		73.57	1013.86	0.50	0.10	2.25	0.04	1010.97	A
B	382+33.83				14.44	73.57		1013.64	0.50	0.22	2.25	0.04	1010.63	B
C	381+66.17				67.67	14.44	69.19	1014.27	0.50	0.19	2.25	0.04	1011.29	C
D	382+33.83						14.44	1013.93	0.50	0.19	2.25	0.04	1010.95	D
E	381+66.17						67.67	1014.68	0.50	0.28	2.25	0.04	1011.61	E
F	382+33.83							1014.15	0.50	0.09	2.25	0.04	1011.27	F

**STEEL SHEET PILING NOTES: ⑦**

ALL ABUTMENT STEEL SHEET PILES SHALL BE TYPE AZ 13 OR SHALL MEET OR EXCEED THE SECTION PROPERTIES IN THE STEEL SHEET MINIMUM SECTION PROPERTIES TABLE. SEE SPECIAL PROVISIONS. ALL ABUTMENT STEEL SHEET PILES SHALL BE MnDOT SPEC. 3373 GRADE 50.

ALL ABUTMENT AND WINGWALL PILES SHALL BE DRIVEN TO ELEVATION 983.0 OR BELOW.

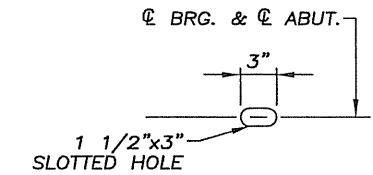
OBTAINED PILE BEARING SHALL BE BASED ON UTILIZING A PILE DRIVING ANALYZER®. ALL COSTS ASSOCIATED WITH DETERMINING PILE BEARING SHALL BE INCLUDED IN BID ITEM "PILE ANALYSIS". SEE SPECIAL PROVISIONS.

ALL SURFACES OF SHEET PILING AND STEEL ATTACHMENTS NOT COMPLETELY BURIED (FRONT FACE AND BACK FACE) SHALL BE COATED AFTER FIELD WELDING AND ALL STEEL INSTALLATION IS COMPLETED, WITH POLYAMIDE EPOXY-COALTAR PAINT TO AN ELEVATION 4'-0" BELOW TOP OF RIPRAP ELEVATION OR 1'-6" BELOW FINISHED GROUND SURFACE. BEAM SEAT PLATES SHALL BE PAINTED. SEE SPECIAL PROVISIONS.

ABUTMENT	
COMPUTED PILE LOAD - TONS/PILE ⑦	
	BOTH ABUTMENTS
FACTORED DEAD LOAD + EARTH PRESSURE	14.5
FACTORED LIVE LOAD	17.7
* FACTORED DESIGN LOAD	32.2

\* BASED ON STRENGTH I LOAD COMBINATION.

STEEL SHEET PILE MINIMUM SECTION PROPERTIES	
MOMENT OF INERTIA	144.3 IN <sup>4</sup> /FT.
SECTION MODULUS	24.2 IN <sup>3</sup> /FT.
AREA	6.47 IN <sup>2</sup> /FT.
WALL THICKNESS	0.375 IN.

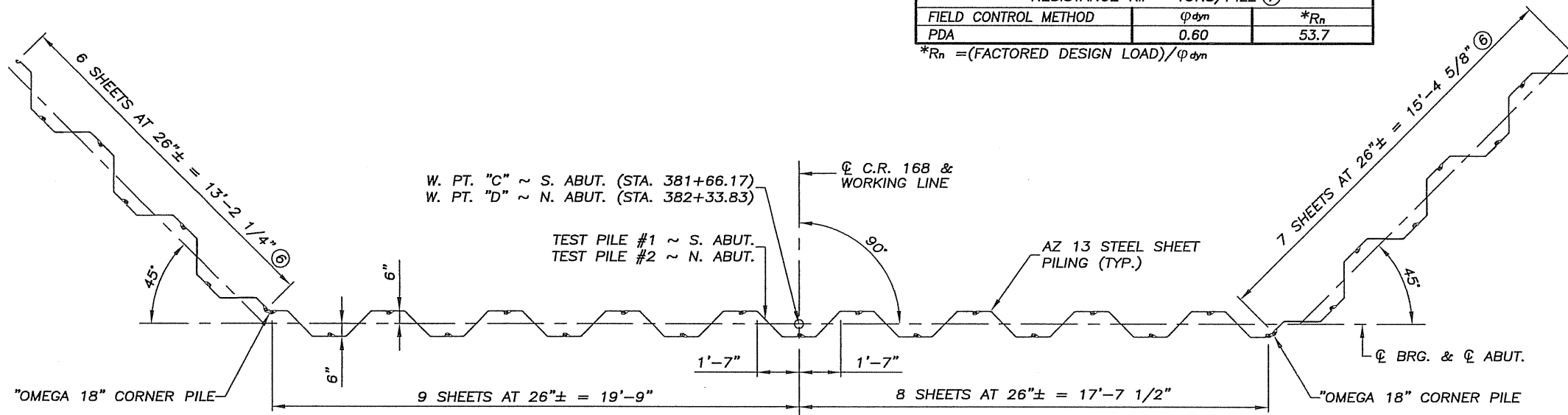


**SLOTTED HOLE DETAIL**

SCALE: 0' 6" 1'

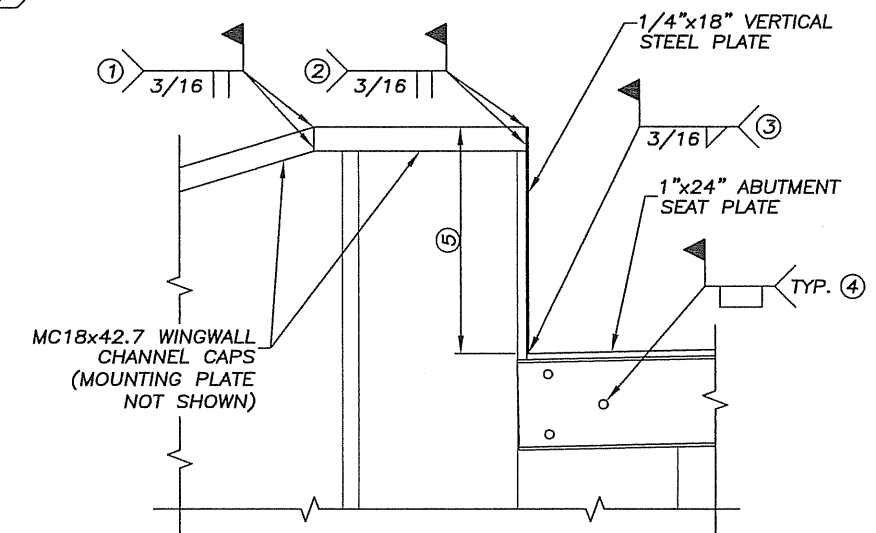
ABUTMENT		
REQUIRED NOMINAL PILE BEARING RESISTANCE R <sub>n</sub> - TONS/PILE ⑦		
FIELD CONTROL METHOD	φ <sub>dyn</sub>	*R <sub>n</sub>
PDA	0.60	53.7

\*R<sub>n</sub> = (FACTORED DESIGN LOAD) / φ<sub>dyn</sub>



**SHEET PILING LAYOUT PLAN**

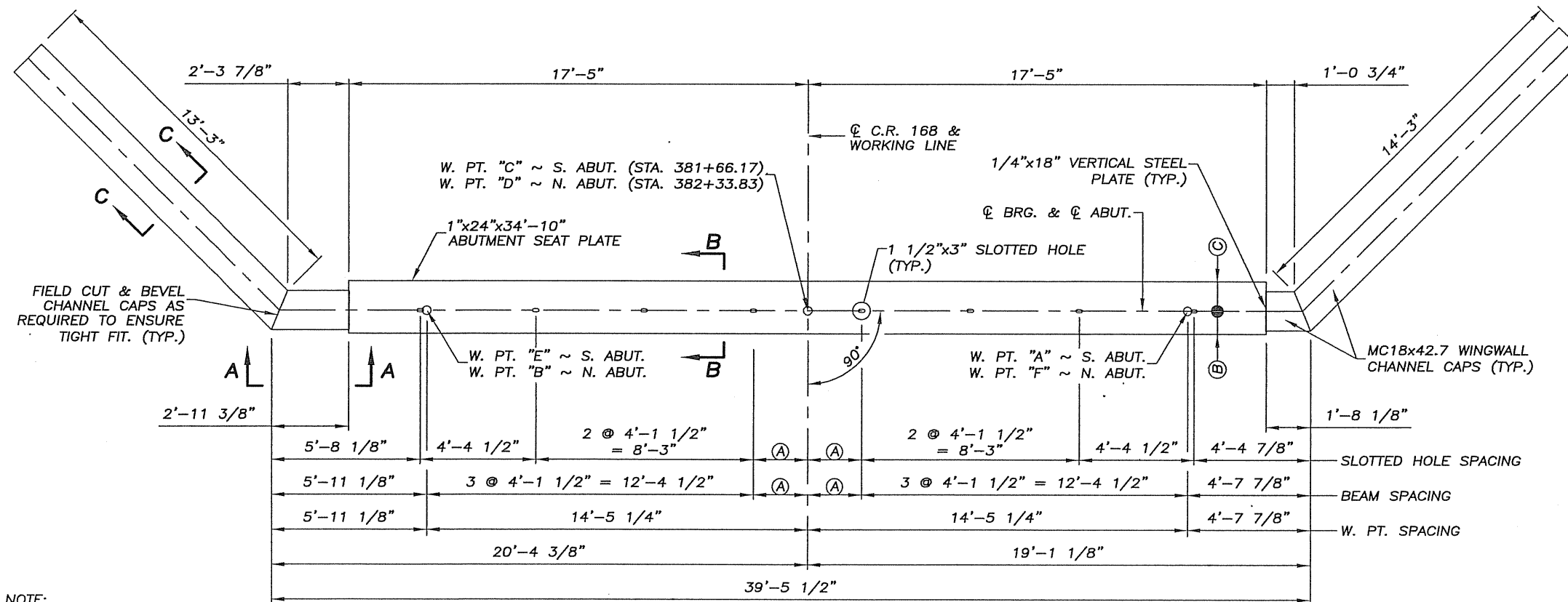
SCALE: 0' 2' 4'



**FIELD WELDING DETAIL A-A**

SCALE: 0' 1' 2'

- ① TOP & SIDES OF ADJOINING WINGWALL CHANNEL CAPS.
- ② TOP & SIDES OF WINGWALL CHANNEL CAP TO STEEL PLATE.
- ③ VERTICAL STEEL PLATE TO ABUTMENT SEAT PLATE.
- ④ SEAT CHANNEL TO STEEL SHEET PILING, MAY BE BOLTED INSTEAD, SEE SHEETS 5 & 6.
- ⑤ N.W. WINGWALL ~ 3'-0 1/2"  
N.E. WINGWALL ~ 2'-10"  
S.E. WINGWALL ~ 3'-0 5/8"  
S.W. WINGWALL ~ 2'-10 7/8"
- ⑥ WINGWALL PILES HAVE A 0 TON BEARING REQUIREMENT, BUT SHALL BE DRIVEN TO THE REQUIRED MINIMUM ELEVATION.
- ⑦ "PILE" SHALL BE DEFINED AS 1 SECTION OF SHEETING FOR THE PURPOSES OF THIS PLAN.



**ABUT. SEAT PLATE & WINGWALL CHANNEL CAP LAYOUT PLAN**

SCALE: 0' 2' 4'

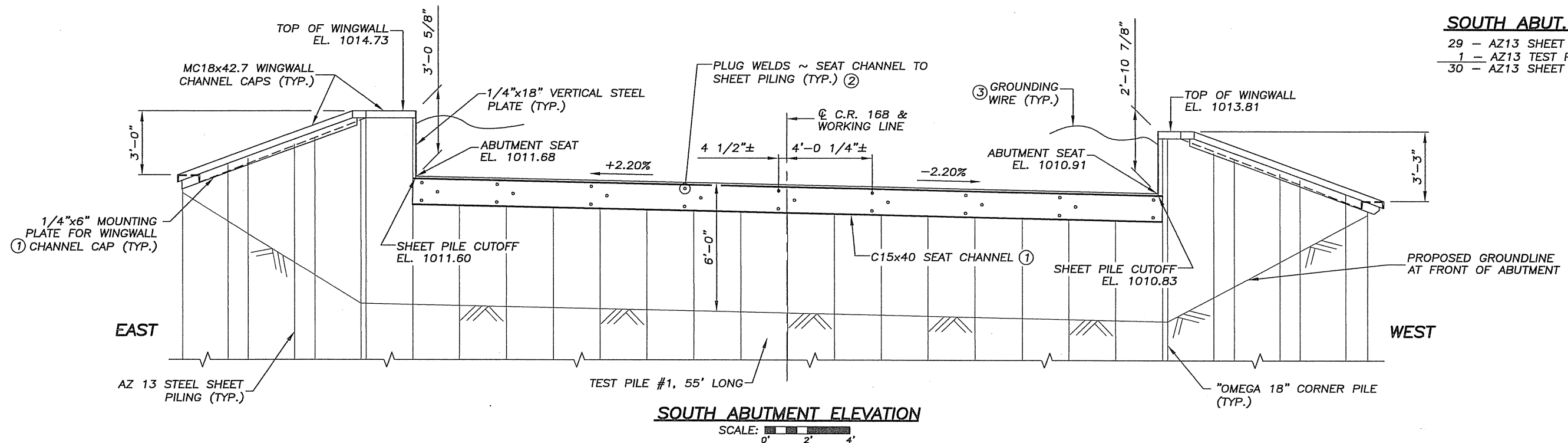
- Ⓐ 2'-0 3/4"
- Ⓑ 10 1/2"
- Ⓒ 1'-1 1/2"

NOTE:  
ALL ABUTMENT STEEL (WINGWALL CHANNEL CAPS, SEAT PLATE, ETC.) SHALL MEET THE REQUIREMENTS OF MnDOT SPEC. 3309.

NOTE:  
SEE SHEET 6 FOR SECTIONS B-B & C-C.

CERTIFIED BY *Ronald Benson*  
PROFESSIONAL ENGINEER/RONALD BENSON  
LIC. NO. 22737 1/30/2008

MINNESOTA DEPARTMENT OF TRANSPORTATION  
**BRIDGE NO. 07586**  
**ABUTMENT DETAILS**  
APPROVED:  
S.A.P. 07-598-25  
SHEET 4 OF 20 SHEETS  
DES.: DJR DRN.: NBB  
CHK.: RAB CHK.: DJR **07586**

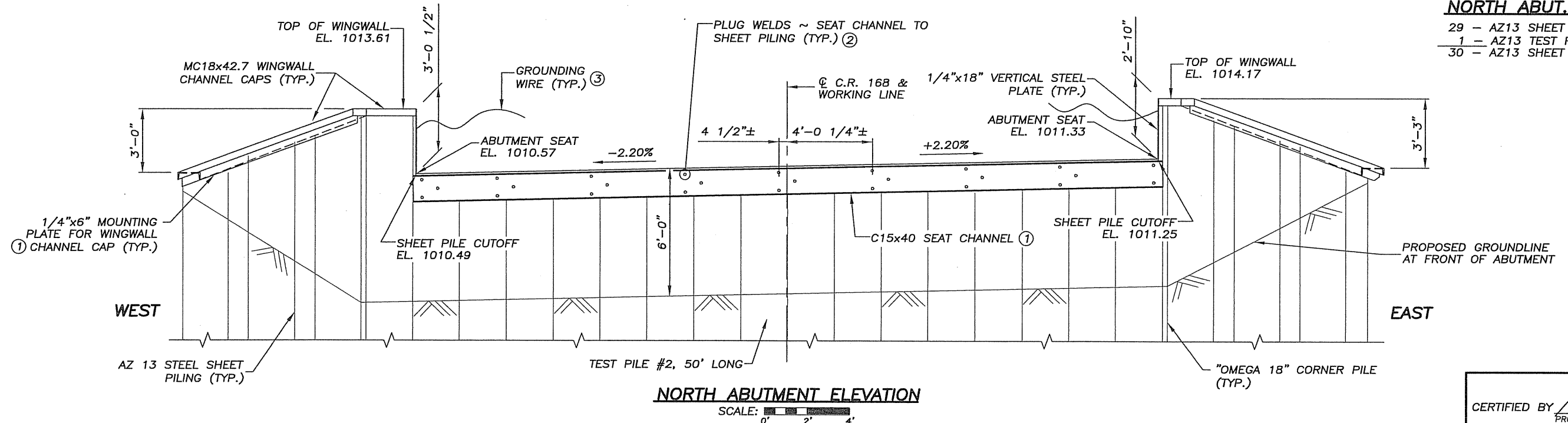


**SOUTH ABUT. PILE NOTES**

- 29 - AZ13 SHEET PILE, EST. LENGTH 45'
- 1 - AZ13 TEST PILE, 55' LONG
- 30 - AZ13 SHEET PILES, SOUTH ABUT.

**SOUTH ABUTMENT ELEVATION**

SCALE: 1"=4'



**NORTH ABUT. PILE NOTES**

- 29 - AZ13 SHEET PILE, EST. LENGTH 40'
- 1 - AZ13 TEST PILE, 50' LONG
- 30 - AZ13 SHEET PILES, NORTH ABUT.

**NORTH ABUTMENT ELEVATION**

SCALE: 1"=4'

SUMMARY OF STRUCTURAL STEEL (3309) ~ BOTH ABUTMENTS				
LB./FT.	QTY.	LENGTH	DESCRIPTION	WEIGHT
40.0	4	35'-2"	C15x40 SEAT CHANNEL	5,627
81.7	2	34'-10"	1"x24" SEAT PLATE	5,692
12.8	2	34'-10"	5"x3"x1/2" ANGLE	892
42.7	2	15'-3"	MC18x42.7 WINGWALL CAP	1,303
42.7	2	14'-3"	MC18x42.7 WINGWALL CAP	1,217
42.7	2	3'-0"	MC18x42.7 WINGWALL FILLER	257
42.7	2	1'-9"	MC18x42.7 WINGWALL FILLER	150
5.1	4	15'-3"	1/4"x6" MOUNTING PLATE	311
5.1	4	14'-3"	1/4"x6" MOUNTING PLATE	291
15.3	4	3'-1"±	1/4"x18" VERTICAL PLATE	189
TOTAL STRUCTURAL STEEL (3309)				15,929

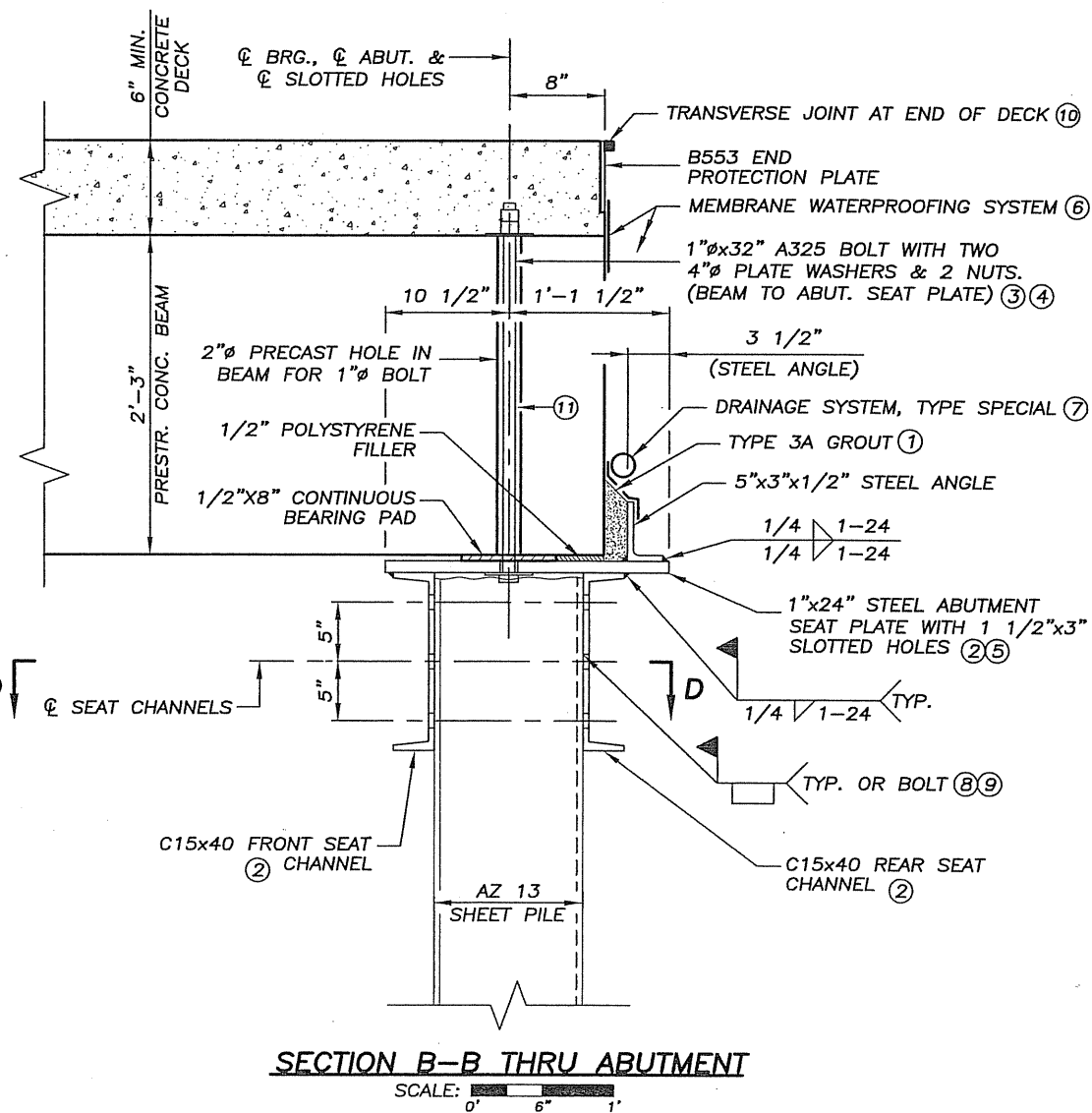
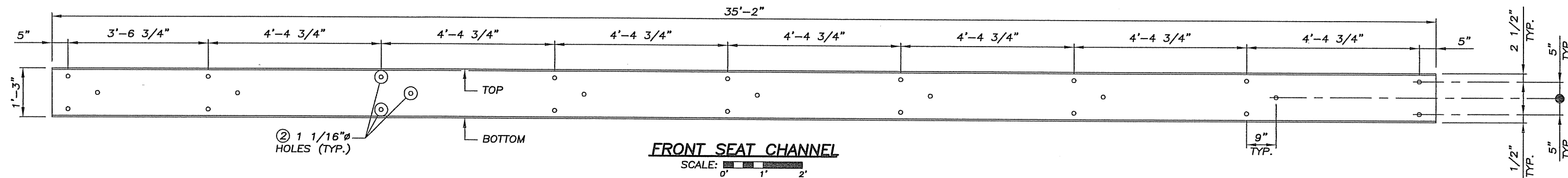
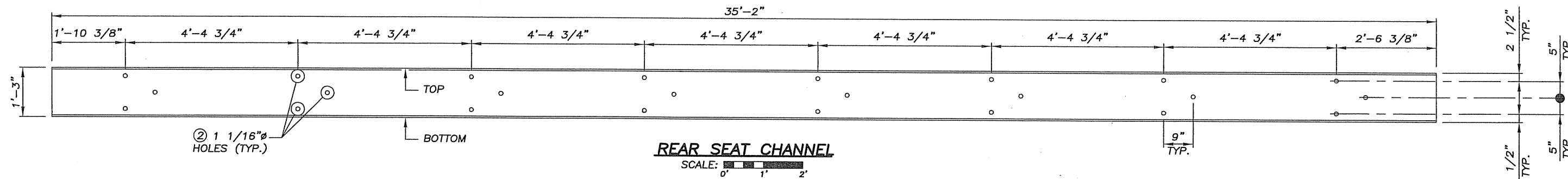
- ① 1 CHANNEL ON EACH SIDE OF SHEET PILING. SEE SHEET 6 FOR FRONT & REAR CHANNEL DETAILS.
- ② SEE SHEET 6 FOR PLUG WELDING DETAILS.
- ③ ATTACH RAIL ANCHOR PLATES TO SHEET PILING WITH A SOLID NO. 6 GAUGE COPPER WIRE WITH AN APPROVED TYPE CLAMP OR BRAZING.
- ④ MEASURED ALONG SLOPE AT OUTER FACE OF CHANNEL.
- ⑤ BACKFILL BEHIND ABUTMENTS SHALL BE SELECT GRANULAR BORROW, PER SPEC. 3149.2B2. SEE SURVEY SHEET FOR PLACEMENT LIMITS. APPROXIMATE QUANTITY (CV) IS 700 CU. YD. INCLUDED IN PRICE BID FOR STRUCTURE EXCAVATION. BACKFILL DENSITY SHALL BE ATTAINED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT BY BRAUN INTERTEC CORP. DATED 4-18-2007. NO BACKFILL SHALL BE PLACED UNTIL PRESTRESSED CONCRETE BEAMS HAVE BEEN BOLTED INTO THEIR FINAL POSITION ON THE ABUTMENTS. SEE SPECIAL PROVISIONS.

- ⑥ SEE NOTE 7 ON SHEET 4.
- ⑦ SEE SPECIAL PROVISIONS.

SUMMARY OF QUANTITIES ~ BOTH ABUTMENTS ⑥		
⑤	STRUCTURE EXCAVATION	1 LUMP SUM
	PILE ANALYSIS	2 EACH
	STEEL SHEET PILING, DELIVERED, AZ 13	2,465 LIN. FT.
	STEEL SHEET PILING, DRIVEN, AZ 13	2,465 LIN. FT.
	STEEL SHEET PILING, DELIVERED, OMEGA 18	170 LIN. FT.
	STEEL SHEET PILING, DRIVEN, OMEGA 18	170 LIN. FT.
	STEEL SHEET TEST PILE, 50 FT. LONG, AZ 13	1 EACH
	STEEL SHEET TEST PILE, 55 FT. LONG, AZ 13	1 EACH
	STRUCTURAL STEEL (3309)	15,929 POUND
⑦	POLYAMIDE EPOXY-COALTAR PAINT SYSTEM	1 LUMP SUM

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 PROFESSIONAL ENGINEER/RONALD BENSON  
 LIC. NO. 22737 1/30/2008

MINNESOTA DEPARTMENT OF TRANSPORTATION  
**BRIDGE NO. 07586**  
**ABUTMENT DETAILS**  
 APPROVED:  
 S.A.P. 07-598-25  
 SHEET 5 OF 20 SHEETS  
 DES.: DJR DRN.: NBB  
 CHK.: RAB CHK.: DJR **07586**



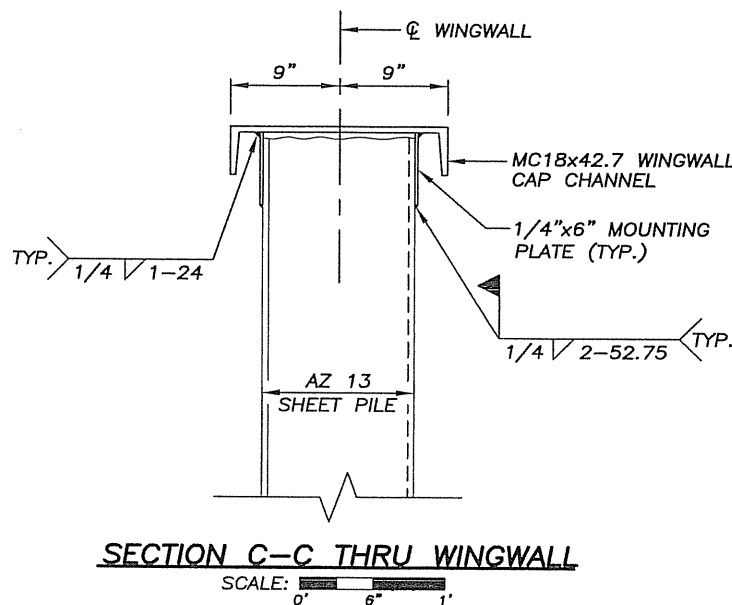
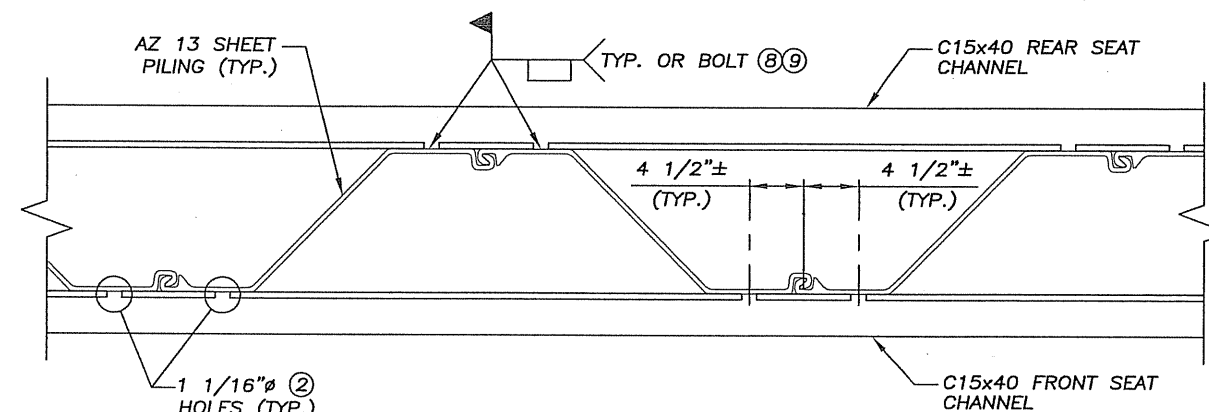
**WELDING NOTES**

ABUTMENT SEAT PLATE SHALL NOT BE FIELD WELDED TO SEAT CHANNELS UNTIL ENGINEER IN FIELD HAS VERIFIED PROPER POSITIONING OF SLOTTED HOLES.

ABUTMENT SEAT PLATE MAY BE SUPPLIED IN SECTIONS AND SHALL BE FIELD WELDED TOGETHER AS APPROVED BY THE ENGINEER IN THE FIELD.

SEAT CHANNELS SHALL BE CLAMPED TIGHTLY TO SHEET PILING BEFORE WELDING. TOP OF FLANGE ON SEAT CHANNELS SHALL BE AT THE SAME ELEVATION AS SHEET PILE CUT OFF.

WINGWALL CAP MOUNTING PLATES SHALL BE CLAMPED TIGHTLY TO SHEET PILING BEFORE WELDING.

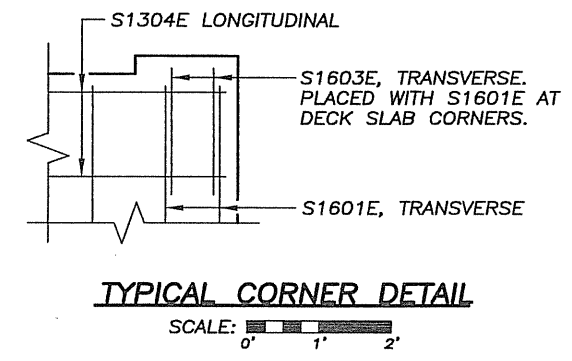
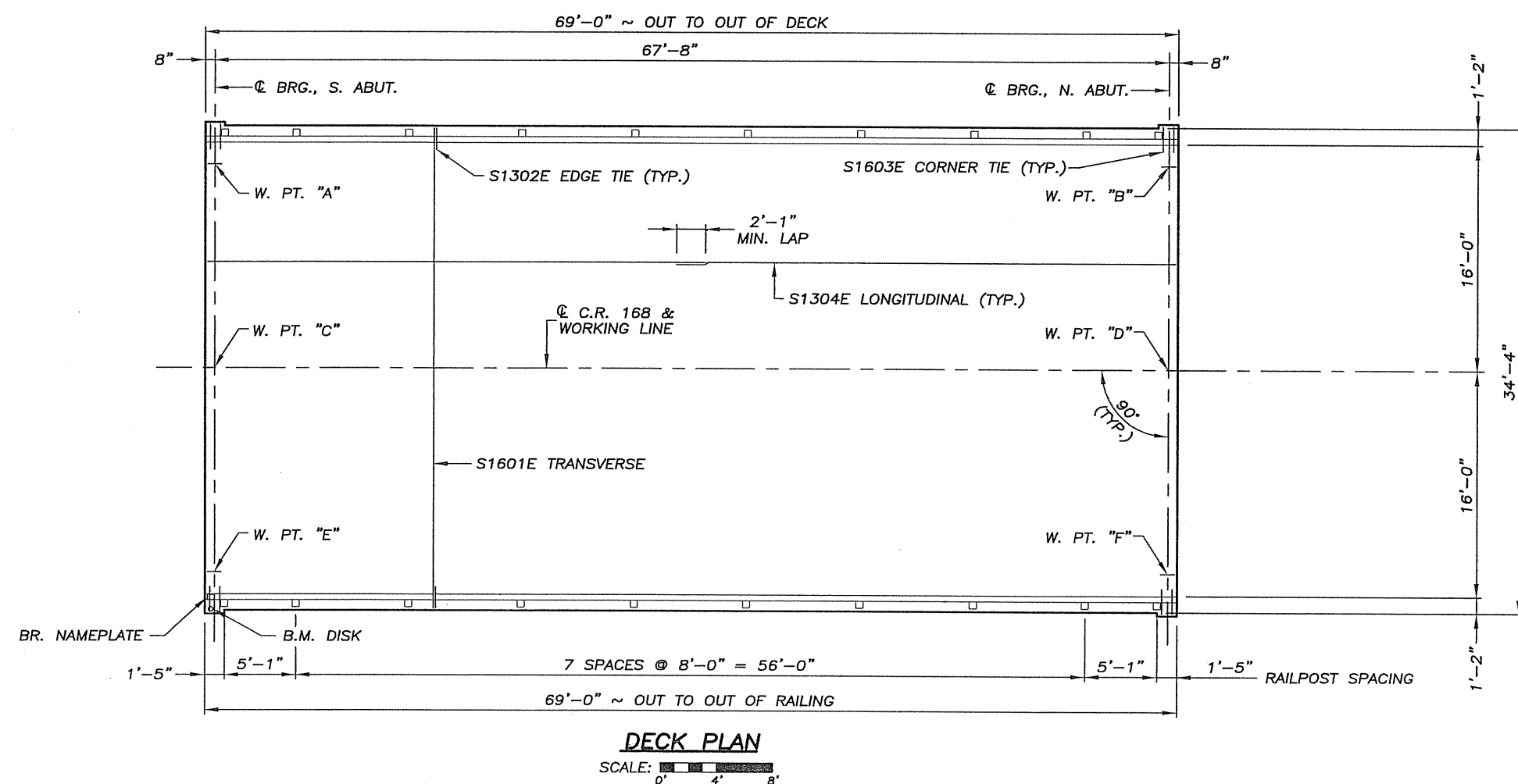
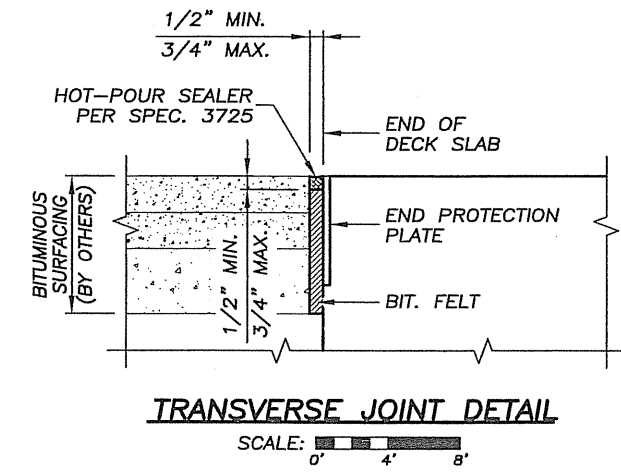
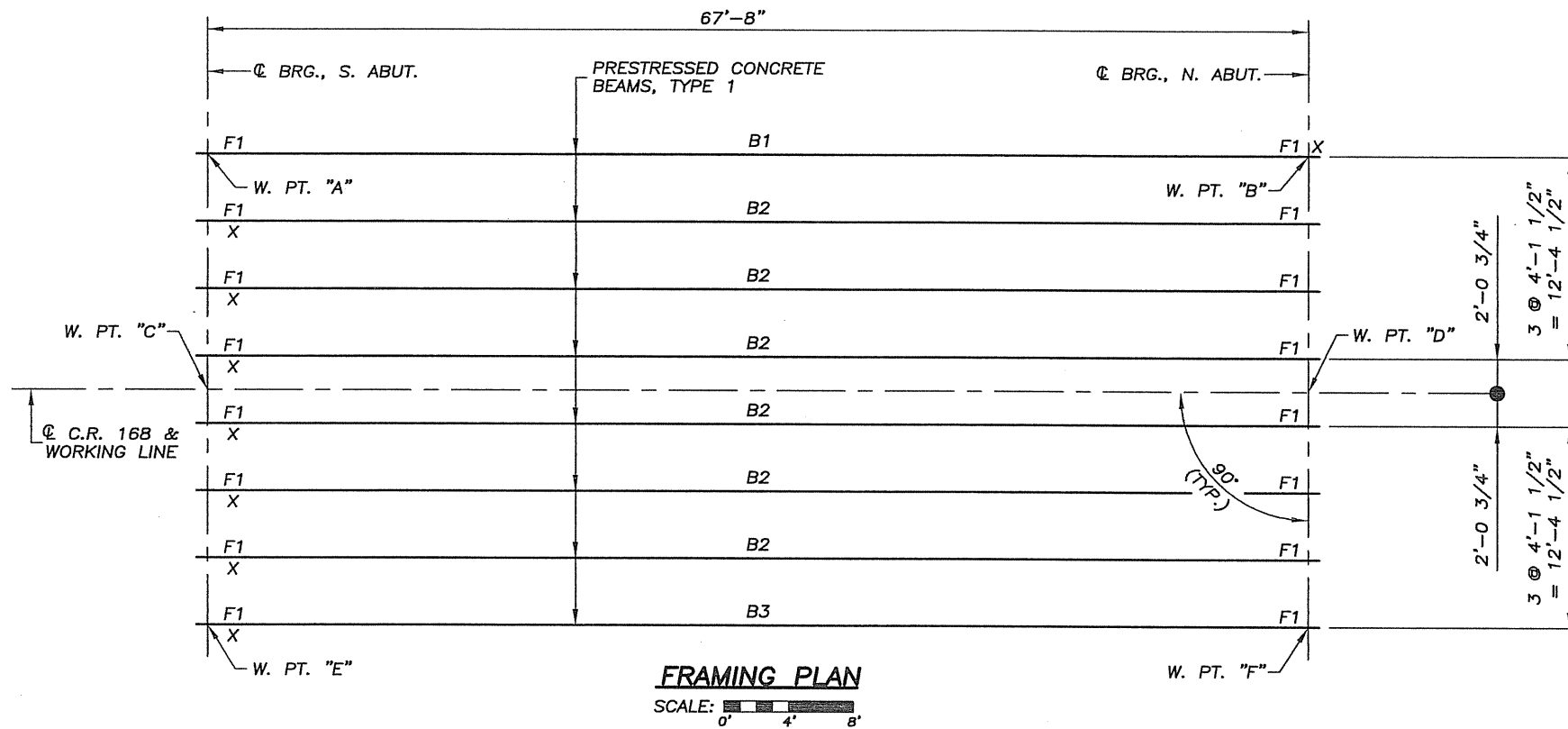


- ① PLACE TYPE 3A GROUT AT ENDS OF BEAMS AFTER POST-TENSIONING IS COMPLETE. GROUT INCIDENTAL TO BEAMS.
- ② SHOP DRILLED
- ③ BOLTS, NUTS & WASHERS ARE CONSIDERED INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.
- ④ NUTS SHALL BE SNUG TIGHTENED AND THREADS UPSET AFTER INSTALLATION.
- ⑤ SEAT PLATE SHALL REST ON THE SHEET PILING.
- ⑥ THE 12" WIDE MEMBRANE SHALL BE PLACED CENTERED ON THE GROUT AS SHOWN, CENTERED ON THE VERTICAL GROUT FILLED BEAM JOINTS, AND ON THE JOINT BETWEEN THE SLAB AND BEAMS. THE ENTIRE END OF BEAMS SHALL BE COATED WITH MASTIC.
- ⑦ SEE DETAIL ON SHEET 14.
- ⑧ IF BOLTED CONNECTION OPTION IS USED IN LIEU OF PLUG WELDED CONNECTION, BOLTS SHALL BE 1" x 2 1/2" LONG A325 TYPE 3, PER MnDOT SPEC. 3391 WITH TWO FLAT WASHERS AND ONE NUT PER BOLT. NUTS SHALL BE SNUG TIGHTENED AND THREADS UPSET AFTER INSTALLATION.
- ⑨ PLUG WELDS OR BOLTS ARE INCIDENTAL TO SHEET PILING.
- ⑩ TRANSVERSE JOINT MATERIALS & INSTALLATION INCIDENTAL TO BEAMS. SEE SHEET 7 FOR DETAILS.

- ⑪ VOID IN BEAM AROUND BOLT SHALL BE COMPLETELY FILLED WITH GROUT AFTER POST-TENSIONING DUCTS HAVE BEEN GROUTED. TEMPORARILY SUPPORT BOLT & BOTTOM PLATE WASHER FROM BELOW WHILE FILLING VOID WITH GROUT AND INSTALLING TOP PLATE WASHER AND NUTS. GROUT SHALL BE THE SAME AS USED TO FILL THE POST-TENSIONING DUCTS AND CONSIDERED INCIDENTAL TO BEAMS (SEE SPECIAL PROVISIONS).

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PROFESSIONAL ENGINEER/RONALD BENSON  
LIC. NO. 22737 4/30/2008

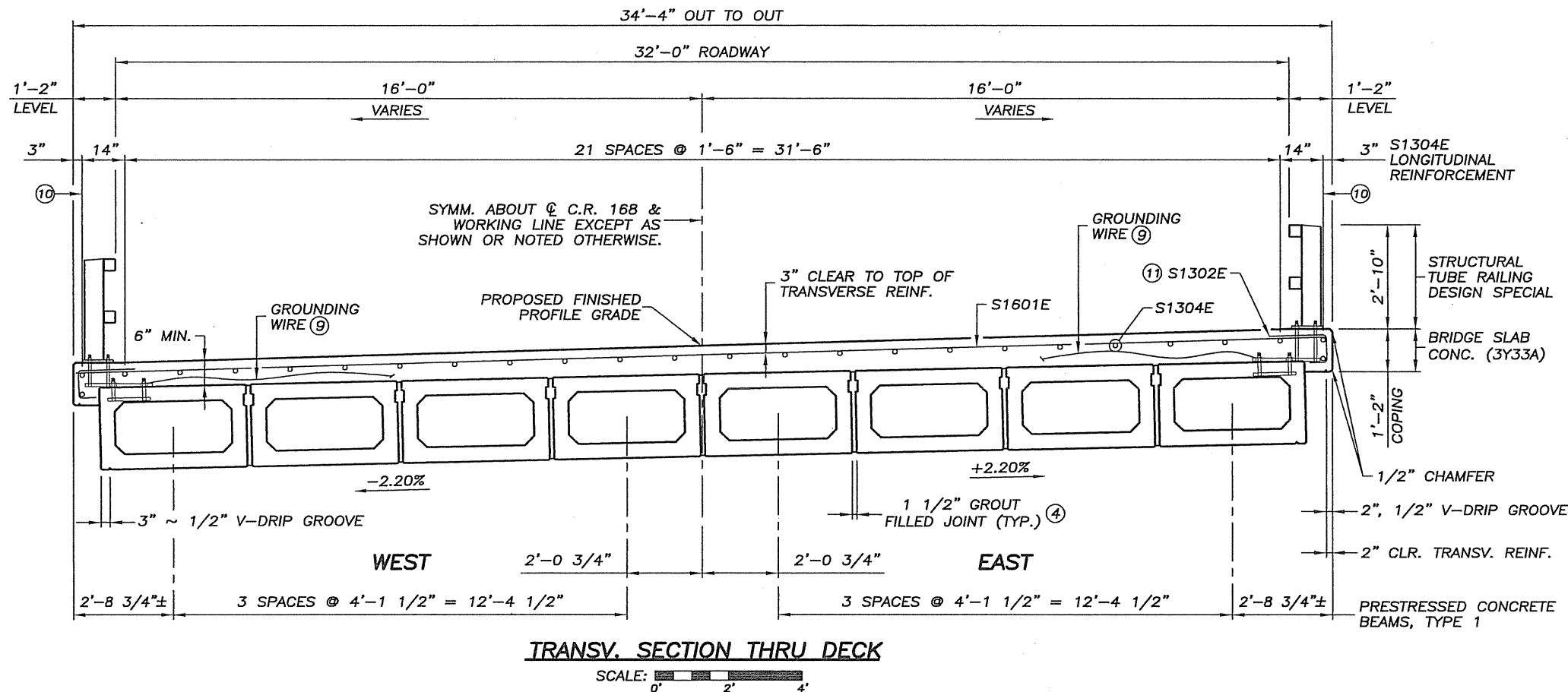
MINNESOTA DEPARTMENT OF TRANSPORTATION  
**BRIDGE NO. 07586**  
**ABUTMENT DETAILS**  
APPROVED:  
S.A.P. 07-598-25  
SHEET 6 OF 20 SHEETS  
DES.: DJR DRN.: NBB  
CHK.: RAB CHK.: DJR **07586**



**NOTES**  
F1 = CONTINUOUS ELASTOMERIC BEARING PAD, FIXED BEARING  
"X" DENOTES END OF BEAM.

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MINNESOTA DEPARTMENT OF TRANSPORTATION  
**BRIDGE NO. 07586**  
**SUPERSTRUCTURE DETAILS**  
APPROVED:  
S.A.P. 07-598-25  
SHEET 7 OF 20 SHEETS  
DES.: DJR DRN.: NBB  
CHK.: RAB CHK.: DJR **07586**



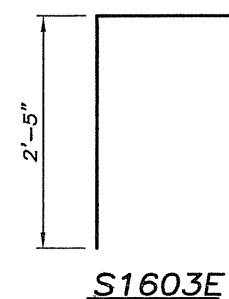
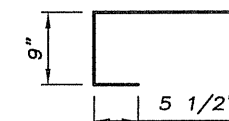
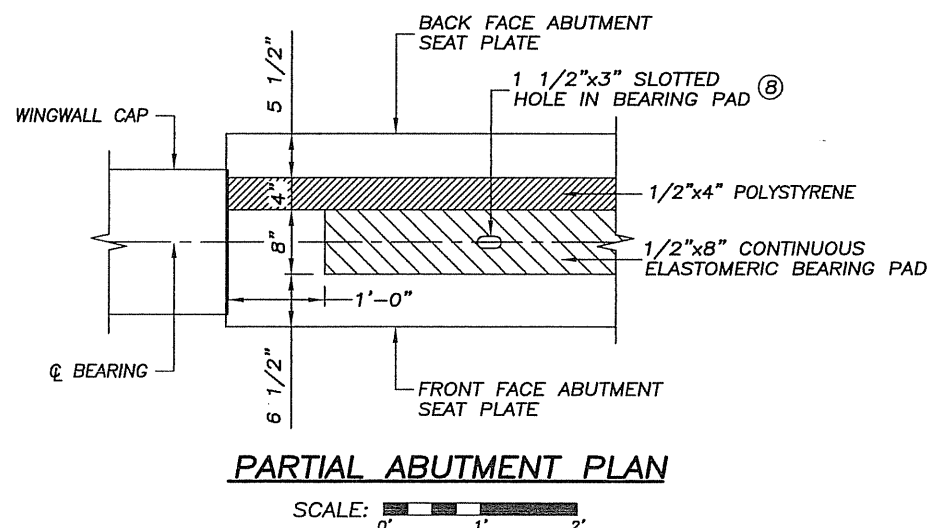
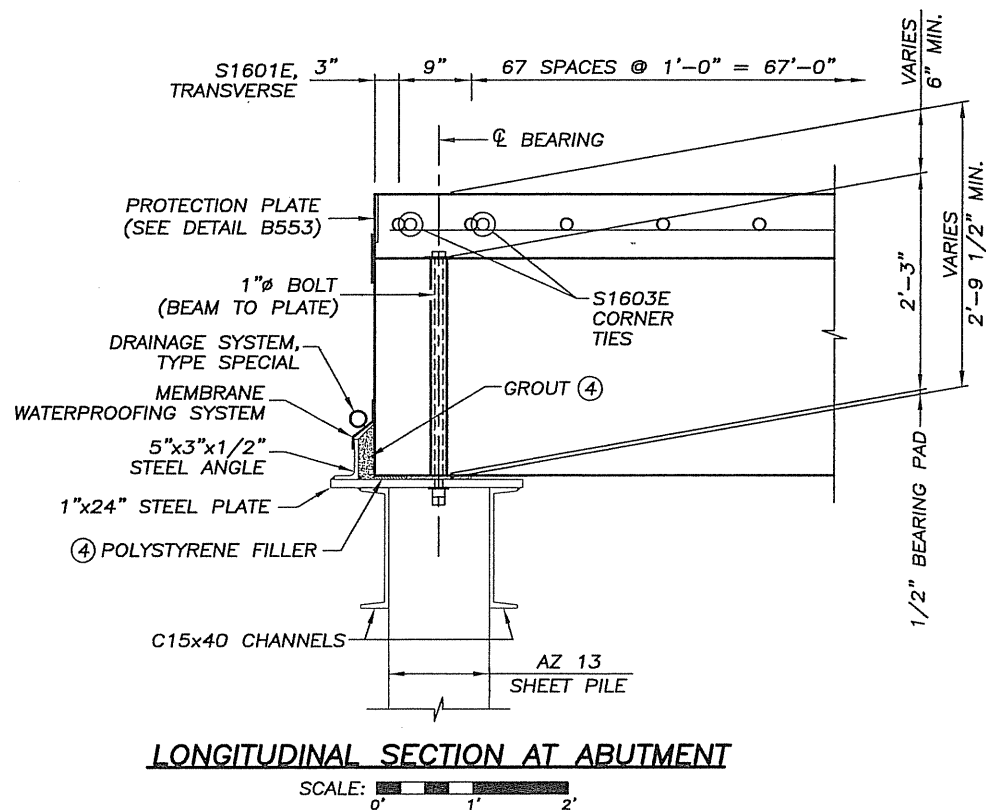
BILL OF REINFORCEMENT ~ SUPERSTRUCTURE					
BAR	NO.	LENGTH	SHAPE	LOCATION	
S1601E	70	34'-0"	STRT.	SLAB ~ TRANSVERSE	
S1302E	132	2'-9"	BENT	SLAB ~ EDGE TIE	
S1603E	8	3'-9"	BENT	SLAB ~ CORNER TIE	
S1304E	52	35'-5"	STRT.	SLAB ~ LONGITUDINAL	

LIST OF PREFORMED JOINT FILLERS			
TYPE	LIN. FT.	SIZE	LOCATION
POLYSTYRENE	70	1/2"x4"	ABUTMENT - BEARINGS

SUMMARY OF QUANTITIES ~ SUPERSTRUCTURE	
BRIDGE SLAB CONCRETE (3Y33A)	2,369 SQ. FT.
REINFORCEMENT BARS, EPOXY COATED	3,990 POUND
STRUCTURAL STEEL (3306)	530 POUND
PRESTRESSED CONCRETE BEAMS, TYPE 1-69	8 EACH
PRESTRESSED CONCRETE BEAMS, TYPE 1	552 LIN. FT.
STRUCTURAL TUBE RAILING DESIGN SPECIAL	138 LIN. FT.
DRAINAGE SYSTEM, TYPE SPECIAL	1 LUMP SUM

PROTECTION PLATE (SEE DETAIL B553)	
BRIDGE NAMEPLATE (SEE DETAIL B101)	
ELASTOMERIC BEARING PAD	66 LIN. FT.
MEMBRANE WATERPROOFING SYSTEM	82 LIN. FT.
BENCHMARK DISK	1 EACH

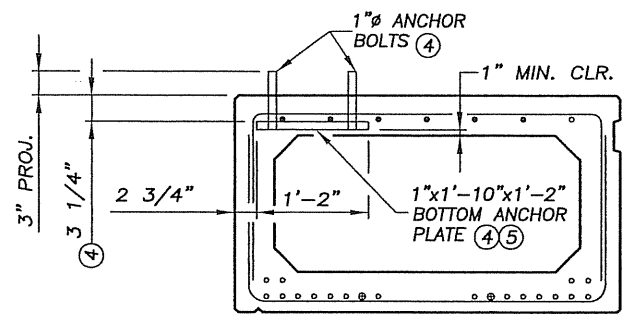
- ① 2 BARS PER LINE WITH 2'-1" MIN. LAP.
- ② SEE PARTIAL ABUTMENT PLAN ON THIS SHEET.
- ③ PAYMENT SHALL BE CONSIDERED INCIDENTAL TO "BRIDGE SLAB CONCRETE (3Y33A)".
- ④ SEE SPECIAL PROVISIONS.
- ⑤ APPROX. VOLUME = 54 CU. YDS. BASED ON AN AVERAGE SLAB DEPTH OF 7".
- ⑥ INCLUDED IN WEIGHT OF "STRUCTURAL STEEL (3306)".
- ⑦ COUNTY WILL FURNISH DISK. BEND PRONGS OUTWARD TO ANCHOR DISK IN CONCRETE. BOTTOM OF DISK TOP TO BE PLACED FLUSH WITH CONCRETE. PAYMENT SHALL BE CONSIDERED INCIDENTAL TO CONCRETE PAY ITEMS.
- ⑧ SEE ABUTMENT SHEETS FOR LOCATIONS.
- ⑨ ATTACH RAIL ANCHOR PLATES TO SHEET PILING WITH A SOLID NO. 6 GAUGE COPPER WIRE WITH AN APPROVED TYPE CLAMP OR BRAZING.
- ⑩ S1304E TOP & BOTTOM AT EDGE OF DECK.
- ⑪ SPACED WITH S1601E.
- ⑫ PAYMENT FOR BEAMS INCLUDED IN ITEM "PRESTRESSED CONCRETE BEAMS, TYPE 1" PER LINEAR FOOT. SHOP INSPECTION COSTS SHALL BE INCLUDED IN BID ITEM FOR BEAMS. SEE SPECIAL PROVISIONS.



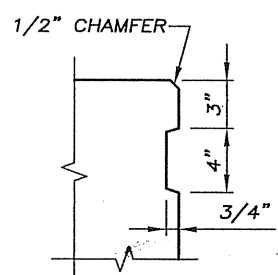
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PROFESSIONAL ENGINEER/RONALD BENSON  
LIC. NO. 22737 1/30/2008

MINNESOTA DEPARTMENT OF TRANSPORTATION  
**BRIDGE NO. 07586**  
**SUPERSTRUCTURE DETAILS**  
APPROVED:  
S.A.P. 07-598-25  
SHEET 8 OF 20 SHEETS  
DES.: DJR DRN.: NBB  
CHK.: RAB CHK.: DJR **07586**





**SECTION AT RAILPOST ANCHOR PLATE**  
ANCHOR PLATE AT VOID SHOWN,  
ANCHOR PLATE AT END DIAPHRAGM SIMILAR.



**SHEAR KEY DETAIL**  
OMIT SHEAR KEY ON OUTSIDE  
FACE OF FASCIA BEAMS

Y DISTANCES (INCHES)			
	NO.	CL. SPAN	END
TOTAL STRANDS	20	2.40	2.44

Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 2" CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.

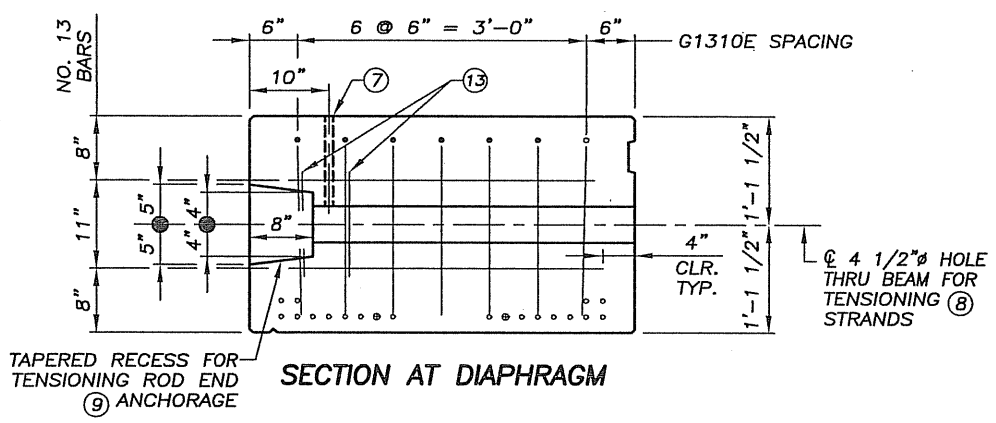
□ CENTER OF GRAVITY AT END OF BEAM IS CALCULATED NEGLECTING THE DEBONDED STRANDS.

MINIMUM CONCRETE STRENGTH - P.S.I.	
⑩ f'ci	⑪ f'c
4,800	6,000

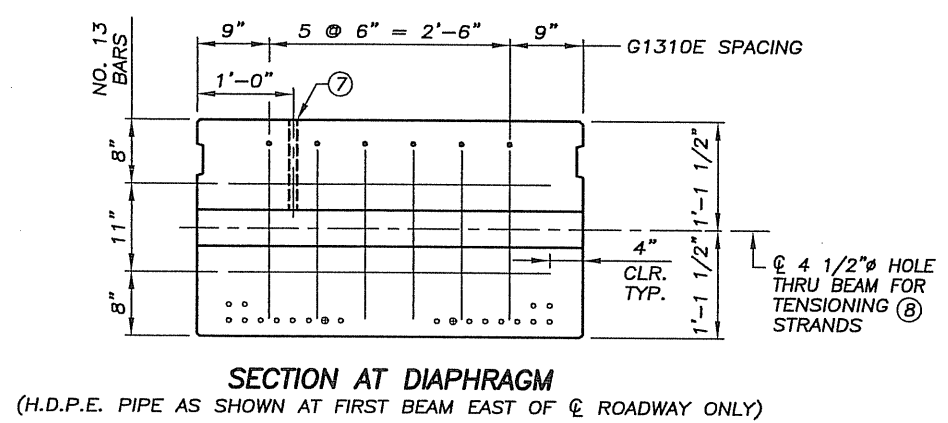
PRESTRESSING STRAND DIAMETER	
①	①
1/2" □	
0.60" ☒	

**GENERAL NOTES**

- TOPS OF BEAMS SHALL BE ROUGH FLOATED AND BROOMED TRANSVERSELY FOR BOND.
- PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.
- EACH BEAM SHALL BE MARKED, SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS. MARKINGS SHALL BE MADE ON THE END OF THE BEAM, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE DECK HAS BEEN POURED. ALL MARKINGS SHALL BE STENCILED 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, TYPE 1". SEE Mn/DOT SPEC. 2405.
- SEE FRAMING PLAN FOR BEAM END MARKED "X".
- APPROXIMATE WEIGHT OF BEAM IS 28 TONS.
- GROUT BETWEEN BEAMS SHALL BE RODDED DURING INSTALLATION TO INSURE THAT THE VOIDS ARE COMPLETELY FILLED.
- POST-TENSIONING OF THE TRANSVERSE STRANDS SHALL NOT BEGIN UNTIL THE GROUT BETWEEN THE PRECAST BEAMS HAS BEEN ALLOWED TO CURE FOR 48 HOURS.
- POST-TENSIONING DUCTS SHALL BE PRESSURE GROUTED AFTER THE TRANSVERSE STRANDS ARE INSTALLED AND TENSIONED (SEE SPECIAL PROVISIONS).
- CONCRETE DECK SHALL NOT BE POURED UNTIL AFTER THE POST-TENSIONING HAS BEEN COMPLETED.

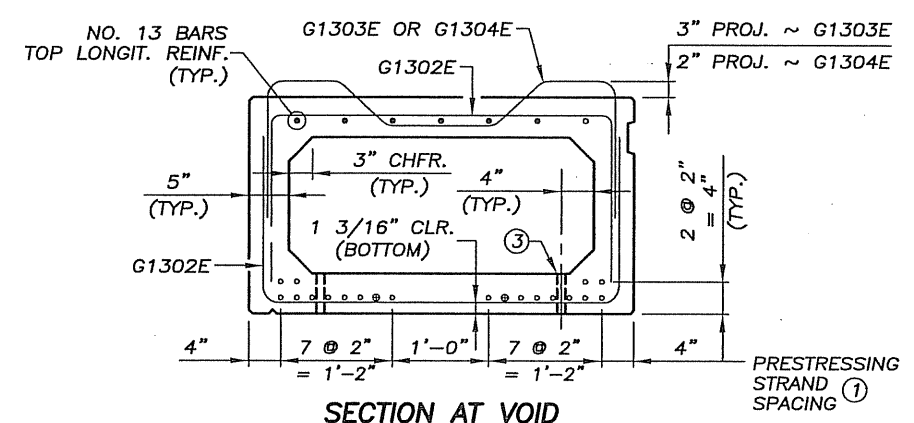


**SECTION AT DIAPHRAGM**

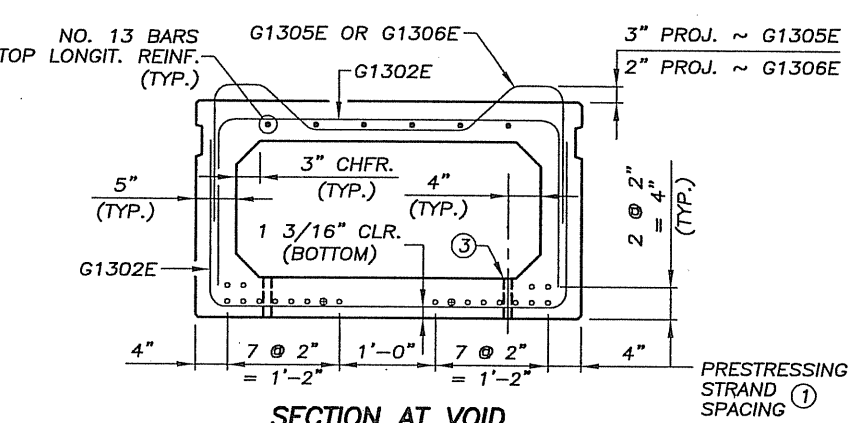


**SECTION AT DIAPHRAGM**

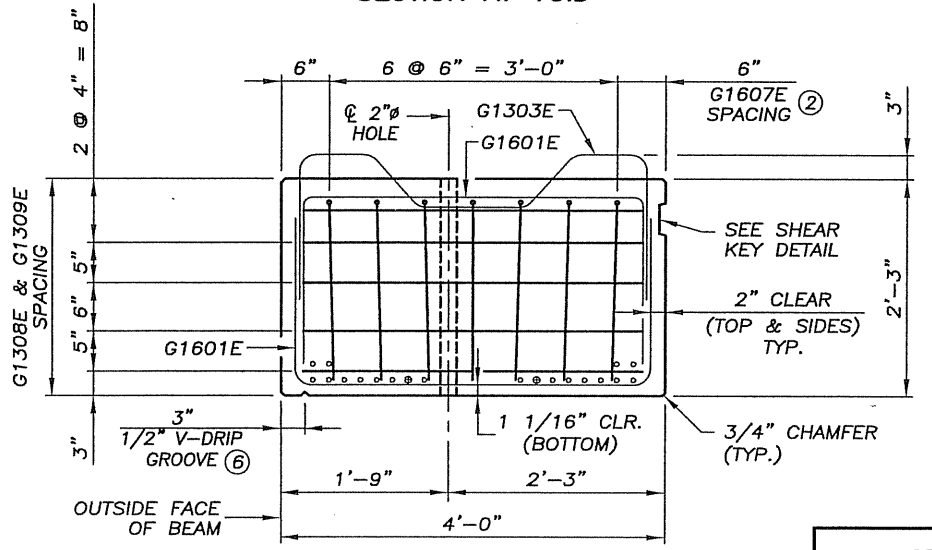
(H.D.P.E. PIPE AS SHOWN AT FIRST BEAM EAST OF CL. ROADWAY ONLY)



**SECTION AT VOID**



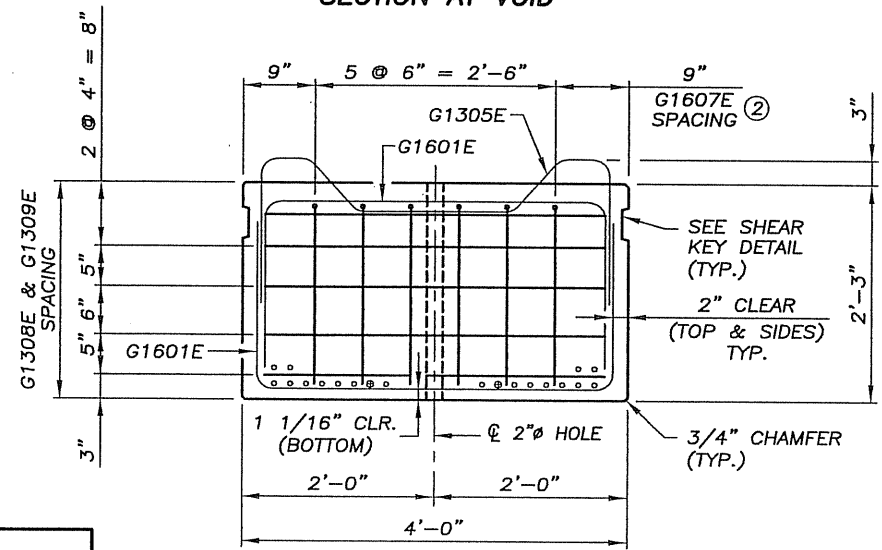
**SECTION AT VOID**



**END VIEW**

CUT STRANDS FLUSH WITH CONCRETE. PAINT ENDS WITH AN APPROVED GRAY EPOXY.

**FASCIA BEAMS (B1 & B3)**

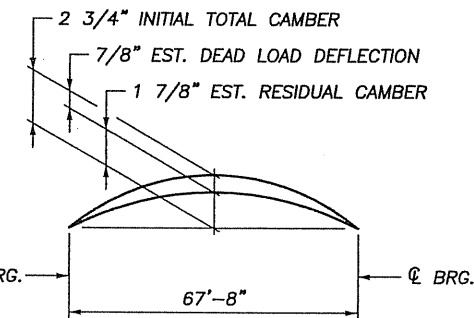


**END VIEW**

CUT STRANDS FLUSH WITH CONCRETE. PAINT ENDS WITH AN APPROVED GRAY EPOXY.

**INTERIOR BEAMS (B2)**

- = DENOTES STRAIGHT BONDED STRANDS
- ⊕ = DENOTES DEBONDED STRANDS (12)



**CAMBER DIAGRAM**

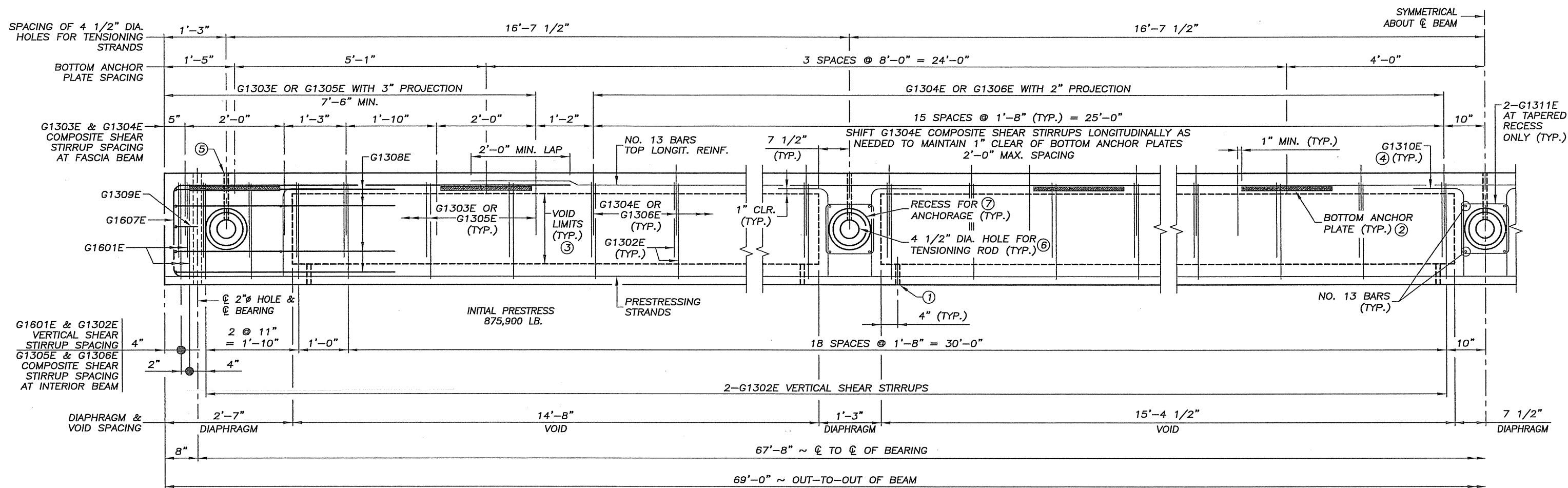
DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, RAILING, SIDEWALK AND MEDIAN WHERE APPLICABLE.  
ENGINEER WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE CONTRACTOR TO BUILD FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS.

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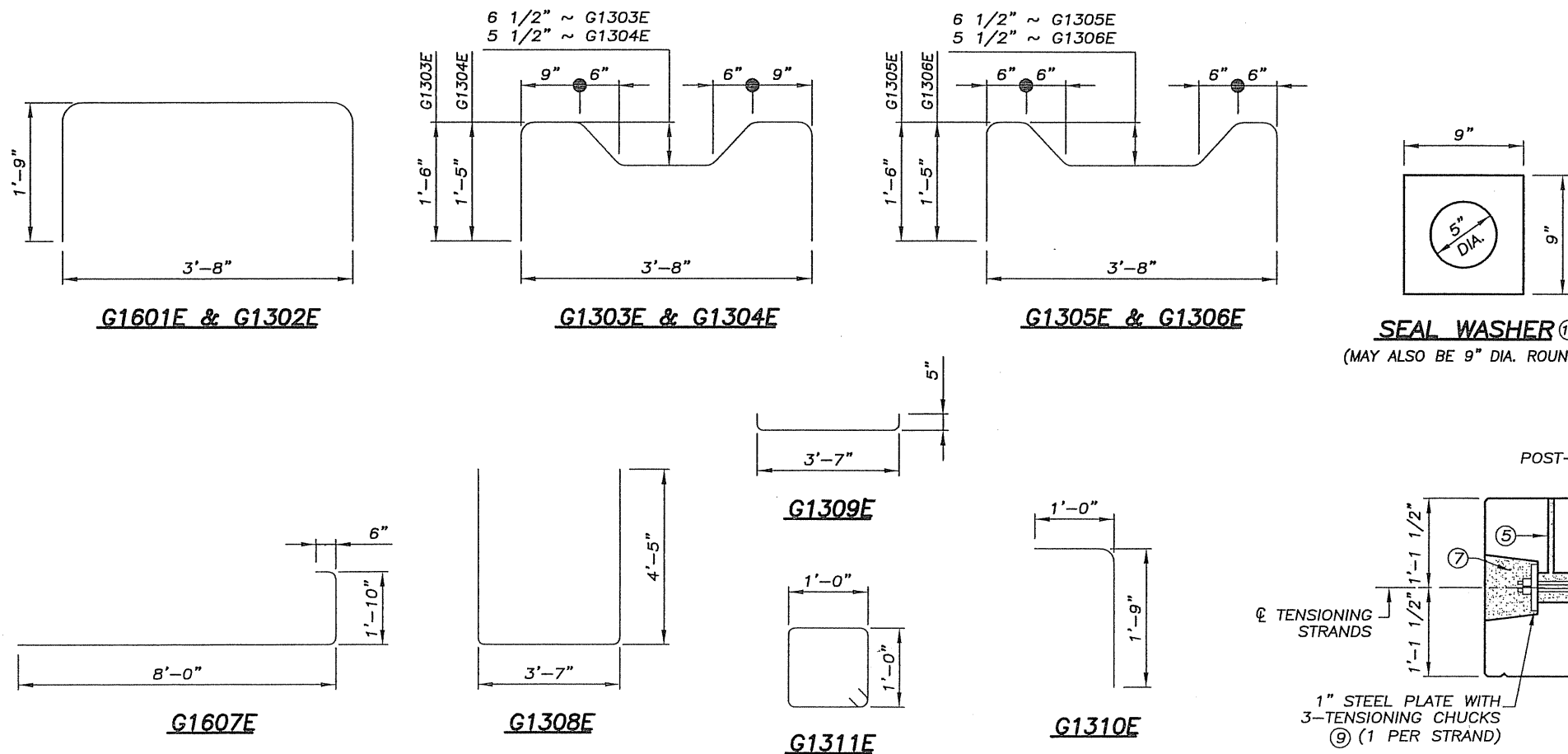
MINNESOTA DEPARTMENT OF TRANSPORTATION

**BRIDGE NO. 07586**  
**PRESTRESSED CONCRETE BEAM, TYPE 1**

APPROVED:  
S.A.P. 07-598-25  
SHEET 9 OF 20 SHEETS  
DES.: DJR DRN.: NBB  
CHK.: RAB CHK.: DJR **07586**

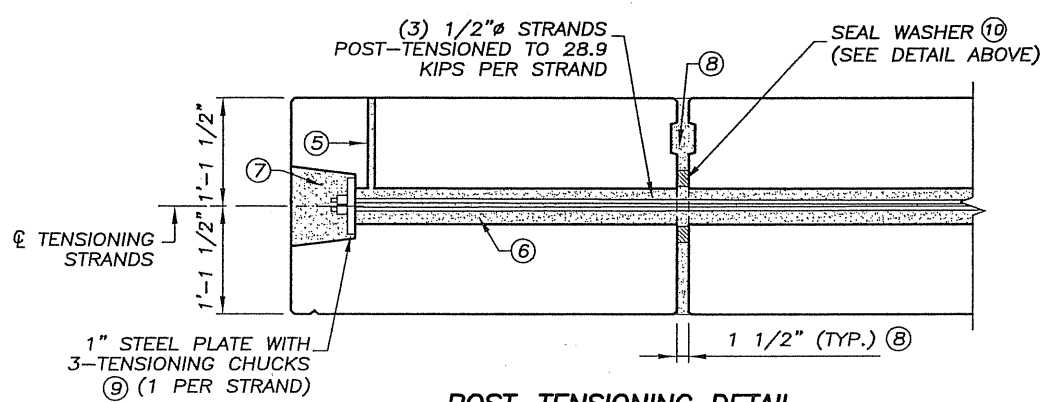


**BEAM ELEVATION**  
(FASCIA BEAM SHOWN, INTERIOR BEAM SIMILAR)



**SEAL WASHER ⑩**  
(MAY ALSO BE 9" DIA. ROUND)

- ① 1" H.D.P.E. DRAIN PIPE AT EACH CORNER OF VOID (TYP.)
- ② CAST INTO BEAM. TOP OF PLATE SHALL BE PLACED TIGHTLY TO BOTTOM OF TOP LONGITUDINAL REINFORCEMENT. 1" ANCHOR BOLTS NOT SHOWN FOR CLARITY.
- ③ 3" INTERNAL CHAMFER NOT SHOWN.
- ④ PLACE HORIZONTAL LEG PARALLEL TO  $\phi$  BEAM.
- ⑤ 1" H.D.P.E. PIPE FOR GROUT INJECTION LOCATED AT FASCIA BEAMS AND FIRST BEAM EAST OF  $\phi$  ROADWAY (TYP.). SEE SHEET 9 FOR LOCATION WITHIN CROSS SECTION.
- ⑥ FILL 4 1/2" HOLE AROUND TENSIONING ROD WITH GROUT AFTER TENSIONING. SEE SPECIAL PROVISIONS. (TYP.)
- ⑦ OUTSIDE FACE OF FASCIA BEAM ONLY. FILL TAPERED RECESS AT END OF TENSIONING ROD WITH GROUT AFTER TENSIONING. GROUT SHALL BE FLUSH WITH FACE OF BEAM. SEE SPECIAL PROVISIONS. (TYP.)
- ⑧ FILL 1 1/2" SPACE BETWEEN BEAMS WITH GROUT AND ALLOW TO CURE FOR 48 HOURS MIN. BEFORE POST-TENSIONING. SEE SPECIAL PROVISIONS.
- ⑨ ANCHOR DETAILS TO BE SUBMITTED TO THE BRIDGE OFFICE FOR APPROVAL.
- ⑩ SEAL WASHER SHALL BE SPONGE NEOPRENE GASKET MATERIAL 2 1/2" MIN. THICK.



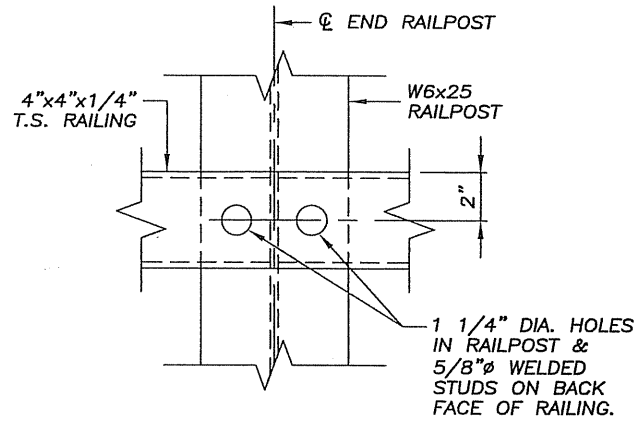
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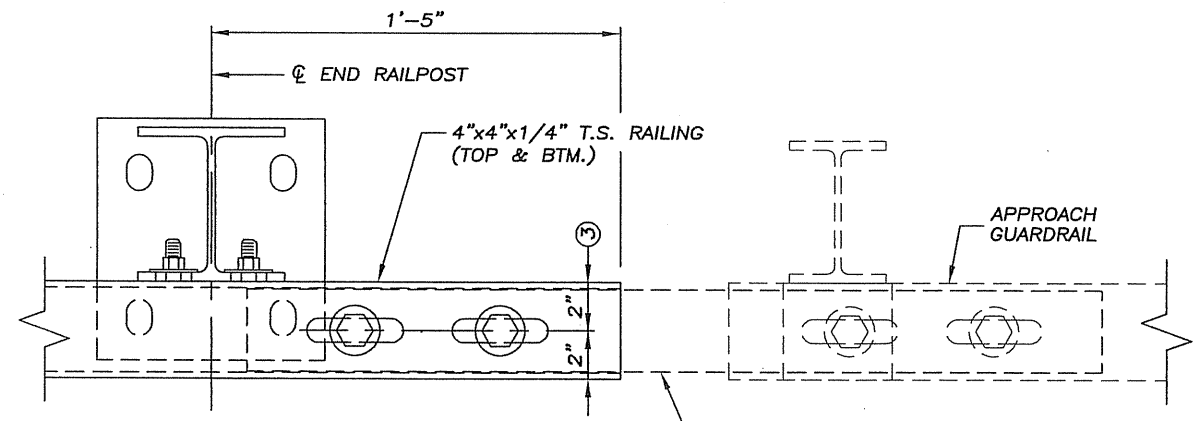
**BRIDGE NO. 07586**  
**PRESTRESSED CONCRETE**  
**BEAM, TYPE 1**

APPROVED:  
S.A.P. 07-598-25  
SHEET 10 OF 20 SHEETS  
DES.: DJR DRN.: NBB  
CHK.: RAB CHK.: DJR **07586**

- ① BOLT LENGTH WILL VARY FROM POST TO POST DUE TO VARYING DECK THICKNESS. SEE BOLT LENGTH CHART BELOW SHOWING MAXIMUM BOLT LENGTHS AT CORNERS OF BRIDGE.
- ② SHIMS ARE INCIDENTAL TO RAILING ITEMS AND SHALL BE SUPPLIED BY CONTRACTOR AS REQUIRED TO INSTALL TOP ANCHOR PLATE LEVEL.
- ③ DIMENSIONS TYPICAL AT TOP & BOTTOM RAILING.
- ④ SQUARE SLEEVE FABRICATED FROM 1/4" PLATE. PROVIDE "SLIDING FIT" WITH A MINIMUM OUT TO OUT DIMENSION OF 3 13/32".
- ⑤ TS 3"x3"x1/4"x2'-2" LONG INNER SLEEVE, CENTERED ON JOINT. PROVIDE 1/2" DIA. SURFACE WELDS ON ALL SIDES AS SHOWN. GRIND WELDS TO FIT FREE INTO I.D. OF 4"x4" T.S. RAILING. PROVIDE 3/8"Øx1/2" WELDING STUDS ON TOP AND BOTTOM SURFACES AT CENTERLINE.
- ⑥ ATTACH RAIL ANCHOR PLATES TO SHEET PILING WITH A SOLID NO. 6 GAUGE COPPER WIRE WITH AN APPROVED TYPE CLAMP OR BRAZING.
- ⑦ BOTTOM ANCHOR PLATE AND 1"Ø ANCHOR BOLTS ARE PRECAST INTO PRESTRESSED CONCRETE BOX GIRDERS BY MANUFACTURER.
- ⑧ CONTINUOUS 1/2" V-DRIP GROOVE OR EQUIVALENT REQUIRED ON BOTTOM EDGE OF DECK SLAB.



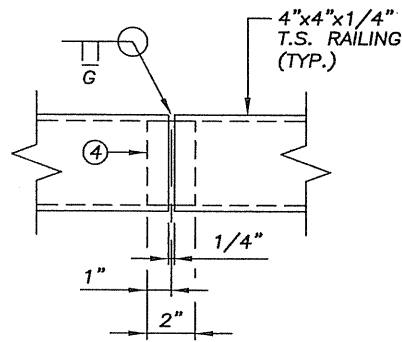
**RAILING MOUNTING DETAIL**



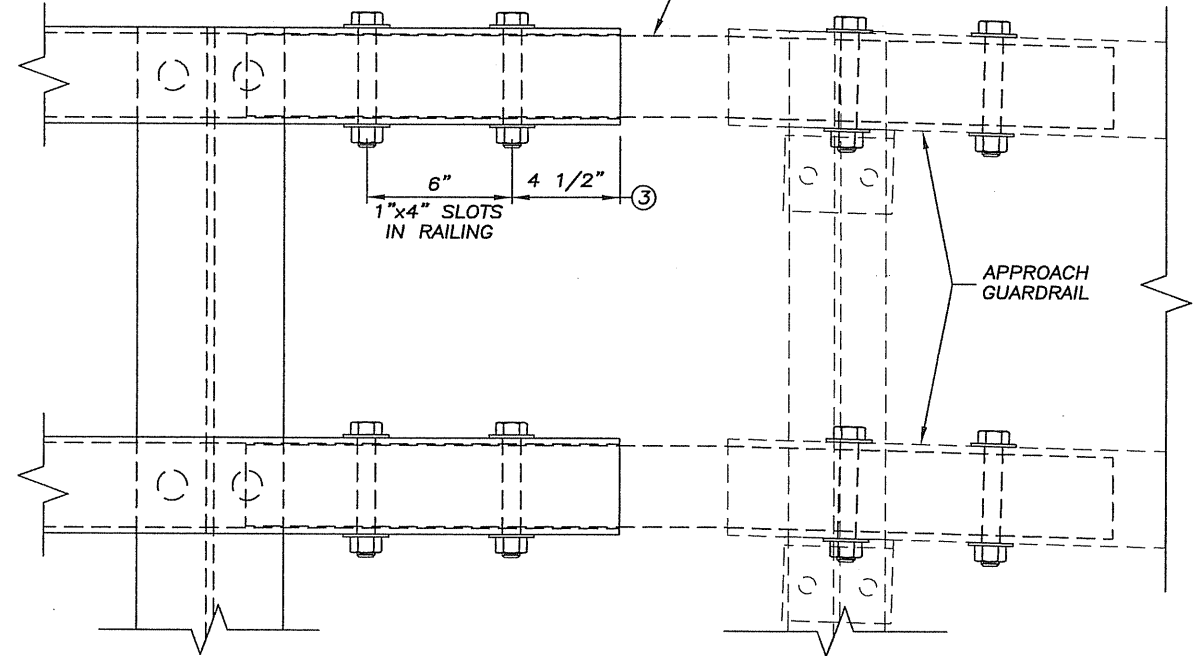
**PLAN**

SEE GUARDRAIL SHEETS FOR EXPANSION CONNECTION DETAILS (TYP.)

BOLT LENGTH CHART	
POST LOCATION	BOLT LENGTH
NORTHWEST CORNER	12 1/4"
NORTHEAST CORNER	10 3/4"
SOUTHWEST CORNER	10 1/2"
SOUTHEAST CORNER	13 1/4"

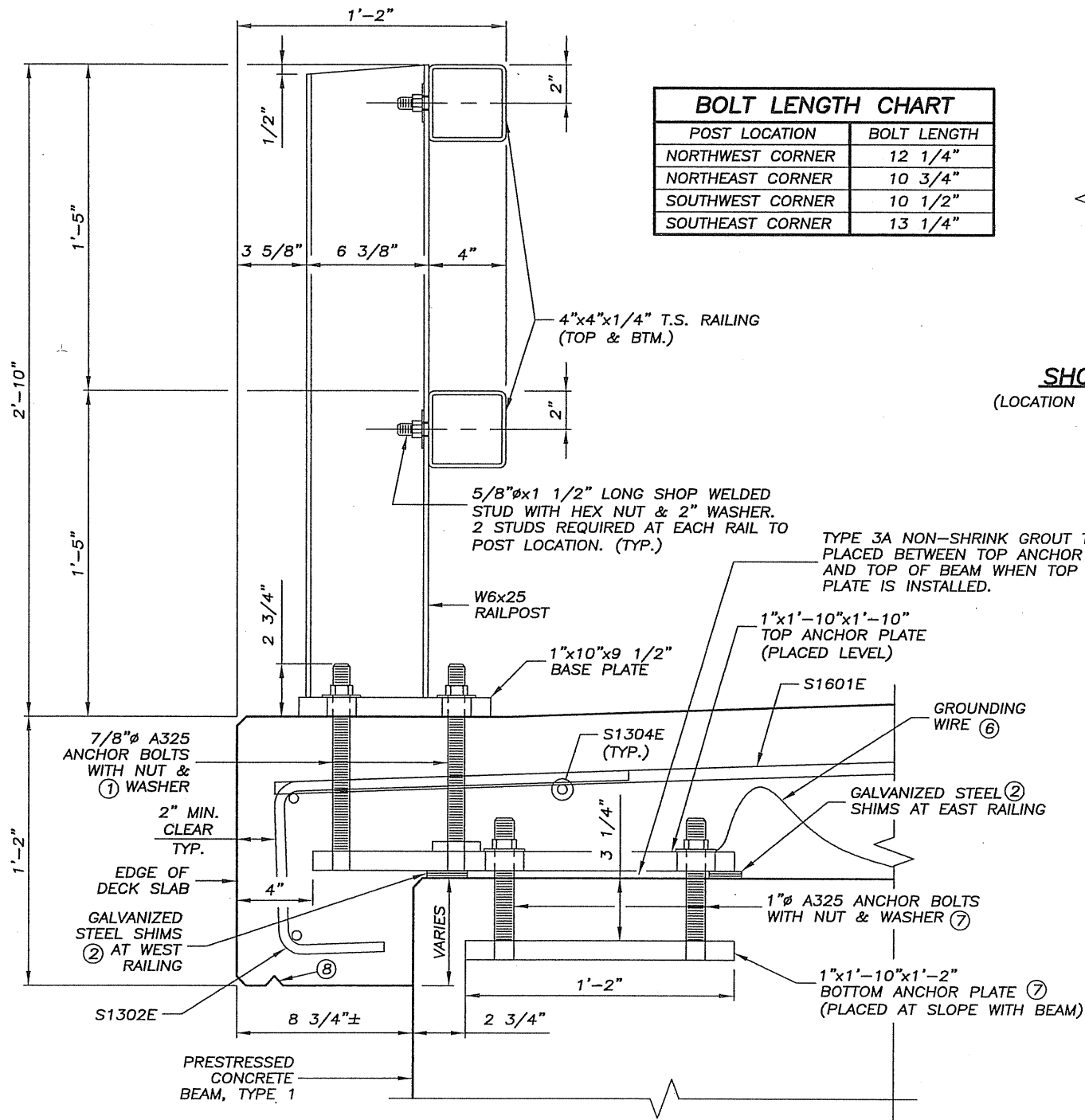


**SHOP RAIL SPLICE DETAIL**  
(LOCATION MUST BE SHOWN ON SHOP DRAWINGS)

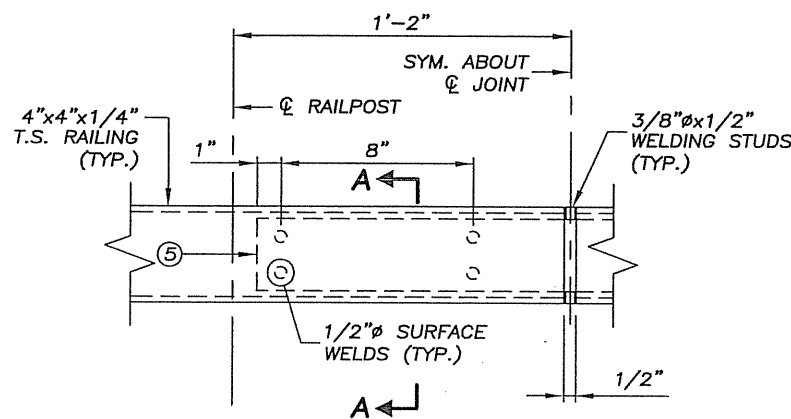


**ELEVATION**

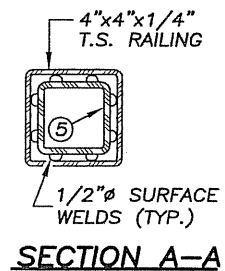
**RAILING END EXPANSION CONNECTION DETAIL**



**SECTION THRU RAILING ON DECK**



**FIELD ERECTION JOINT DETAIL**

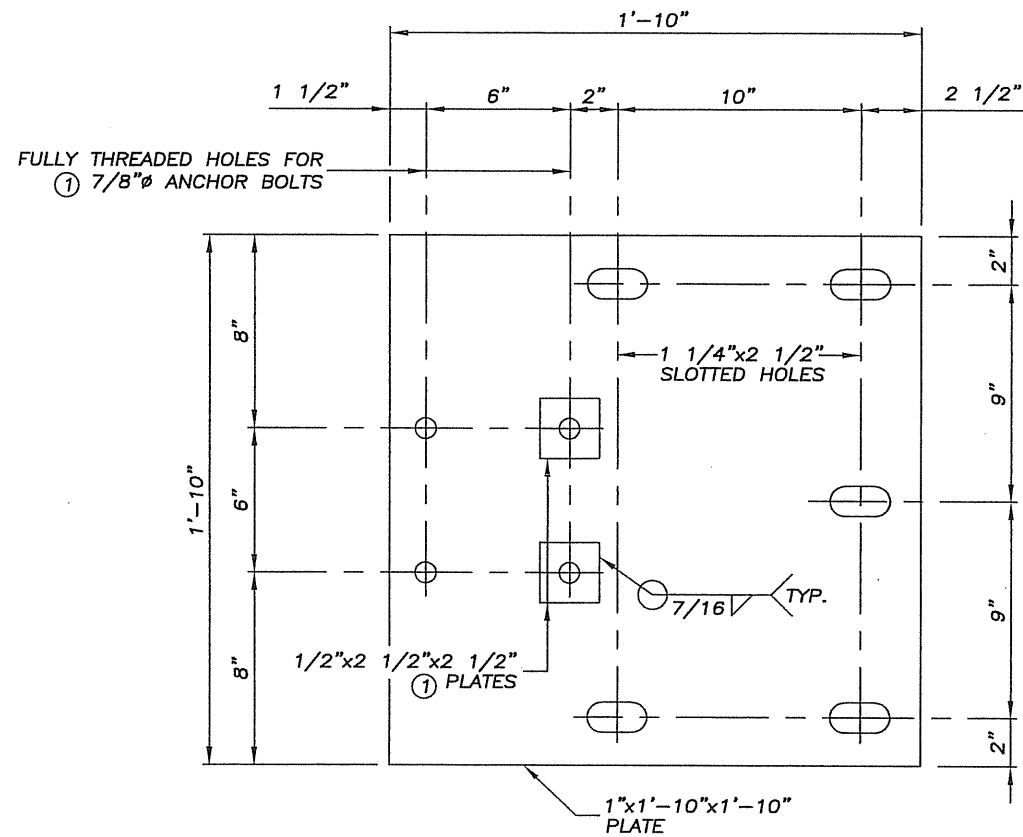


**SECTION A-A**

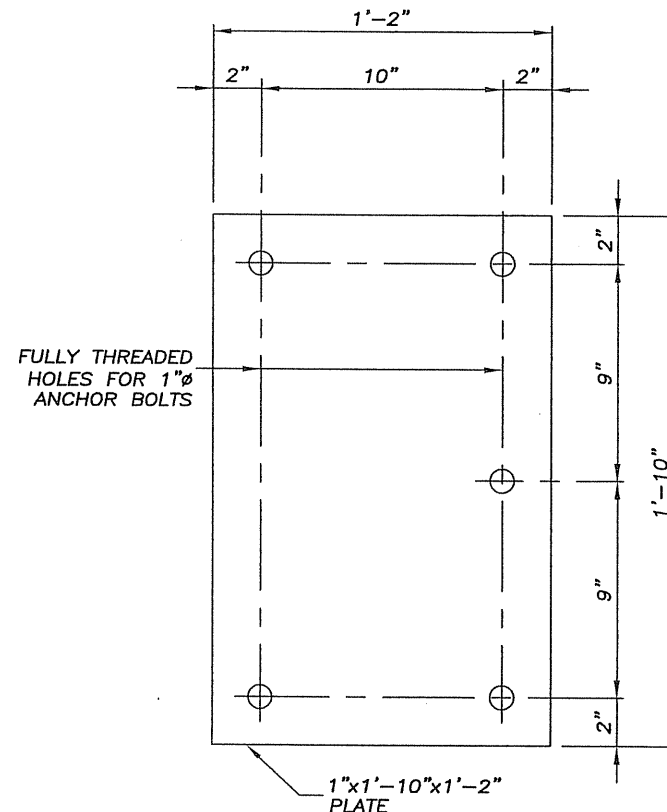
CERTIFIED BY *Ronald Benson*  
PROFESSIONAL ENGINEER/RONALD BENSON  
LIC. NO. 22737 1/30/2008

MINNESOTA DEPARTMENT OF TRANSPORTATION  
**BRIDGE NO. 07586**  
**STRUCTURAL TUBE RAILING DESIGN SPECIAL DETAILS**

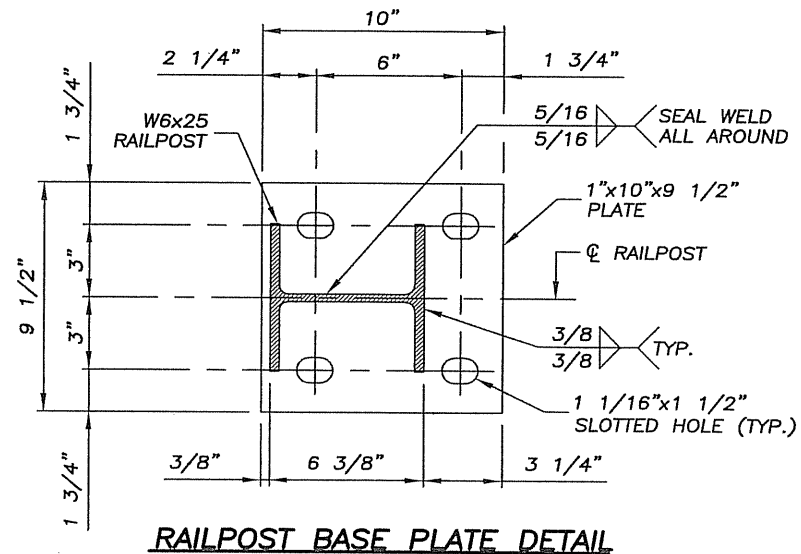
APPROVED:  
S.A.P. 07-598-25  
SHEET 11 OF 20 SHEETS  
DES.: DJR DRN.: NBB  
CHK.: RAB CHK.: DJR **07586**



**TOP ANCHOR PLATE DETAIL**



**BOTTOM ANCHOR PLATE DETAIL ②**



**RAILPOST BASE PLATE DETAIL**

**NOTES**

ALL RAILING MATERIALS, INCLUDING ALL PLATES AND HARDWARE NOT CAST INTO THE BEAMS, AND INSTALLATION IS INCIDENTAL TO BID ITEM "STRUCTURAL TUBE RAILING DESIGN SPECIAL".

MATERIALS AND CONSTRUCTION PER SPEC. 2554 AND THE SPECIAL PROVISIONS, EXCEPT AS NOTED.

ALL STRUCTURAL STEEL FOR RAILING SHALL BE ASTM A709 GRADE 36 EXCEPT AS NOTED.

STRUCTURAL TUBES ARE A.S.T.M. A500, GRADE B PER Mn/DOT SPEC. 3361.

RAILING SHALL BE FABRICATED IN LENGTHS THAT INCLUDE 3 OR 4 POSTS.

POST BASE PLATES SHALL BE FLAT WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL. ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUT.

GALVANIZE BOLTS, NUTS, AND WASHERS PER Mn/DOT SPEC. 3392.

ALL STRUCTURAL STEEL MATERIAL CAST INTO THE BEAMS OR DECK SLAB SHALL BE GALVANIZED AFTER FABRICATION PER Mn/DOT SPEC. 3394.

ATTACH RAIL ANCHOR PLATES TO SHEET PILING WITH A SOLID NO. 6 GAUGE COPPER WIRE WITH AN APPROVED TYPE CLAMP OR BRAZING.

RAILING SHALL BE GALVANIZED AFTER FABRICATION (SEE SPECIAL PROVISIONS).

GALVANIZED STEEL POST SHIMS (NOT DETAILED) MAY BE USED UNDER POSTS WHERE REQUIRED FOR VERTICAL ALIGNMENT.

FILL BOLT SLOT OPENINGS IN RAILPOST BASE PLATE AND ANY OPENINGS AROUND POST SHIMS AND BASE PLATE WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

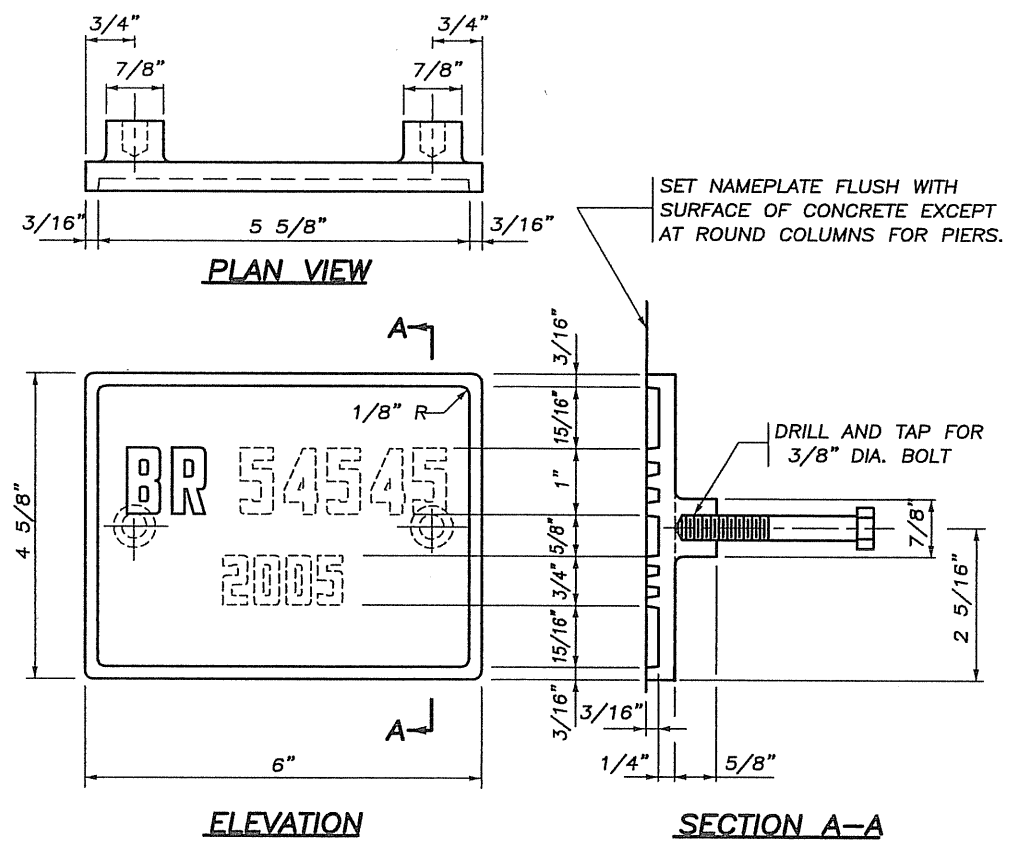
① THREAD HOLES FOR 7/8"Ø ANCHOR BOLTS AFTER WELDING 1/2"x2 1/2"x2 1/2" PLATES TO TOP ANCHOR PLATE.

② BOTTOM ANCHOR PLATE IS PRECAST INTO PRESTRESSED CONCRETE BOX GIRDERS BY MANUFACTURER.

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LIC. NO. 22737 1/30/2008

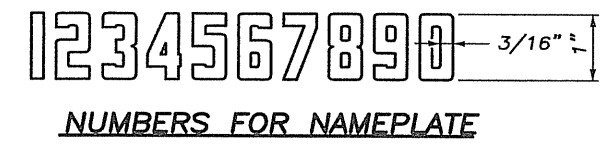
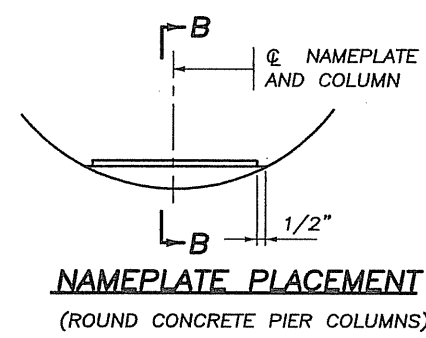
MINNESOTA DEPARTMENT OF TRANSPORTATION  
**BRIDGE NO. 07586**  
**STRUCTURAL TUBE RAILING DESIGN SPECIAL DETAILS**

APPROVED:  
S.A.P. 07-598-25  
SHEET 12 OF 20 SHEETS  
DES.: DJR DRN.: NBB  
CHK.: RAB CHK.: DJR **07586**

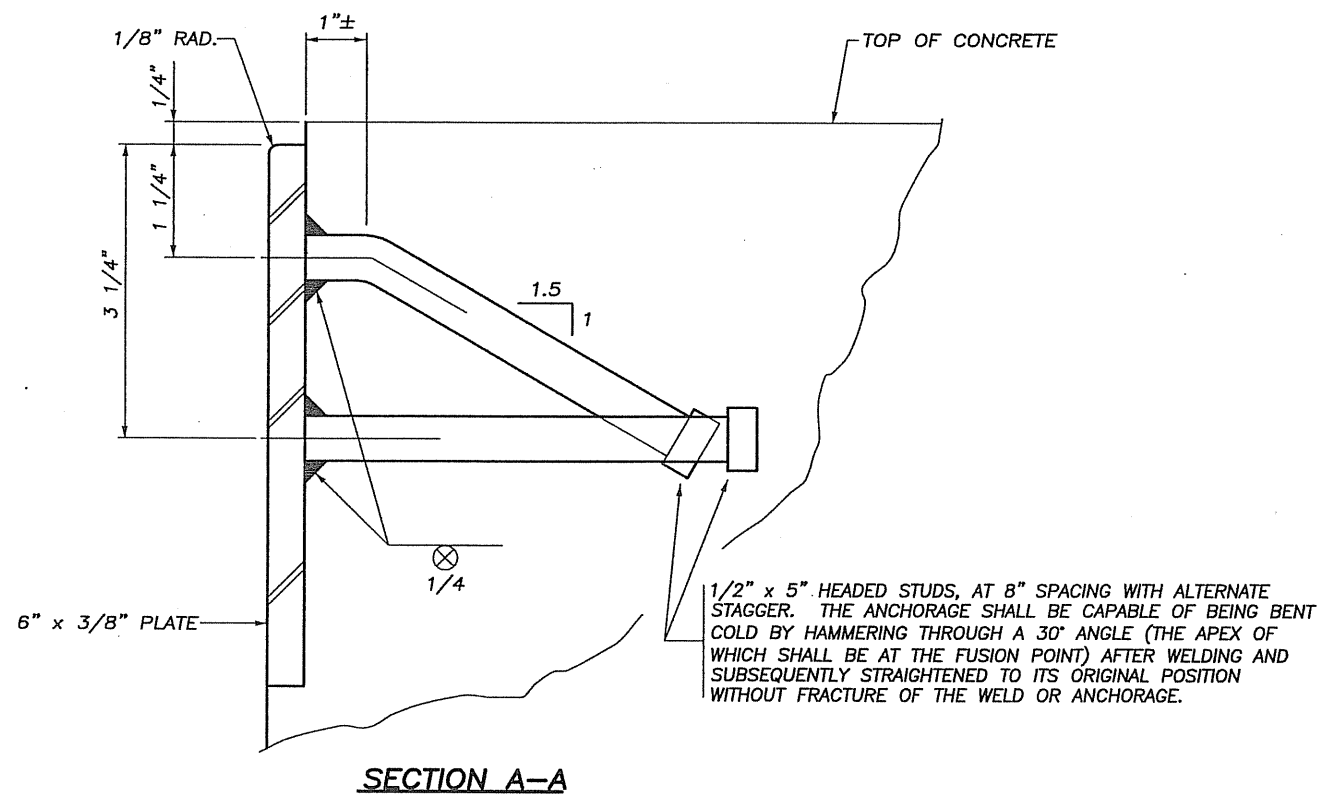
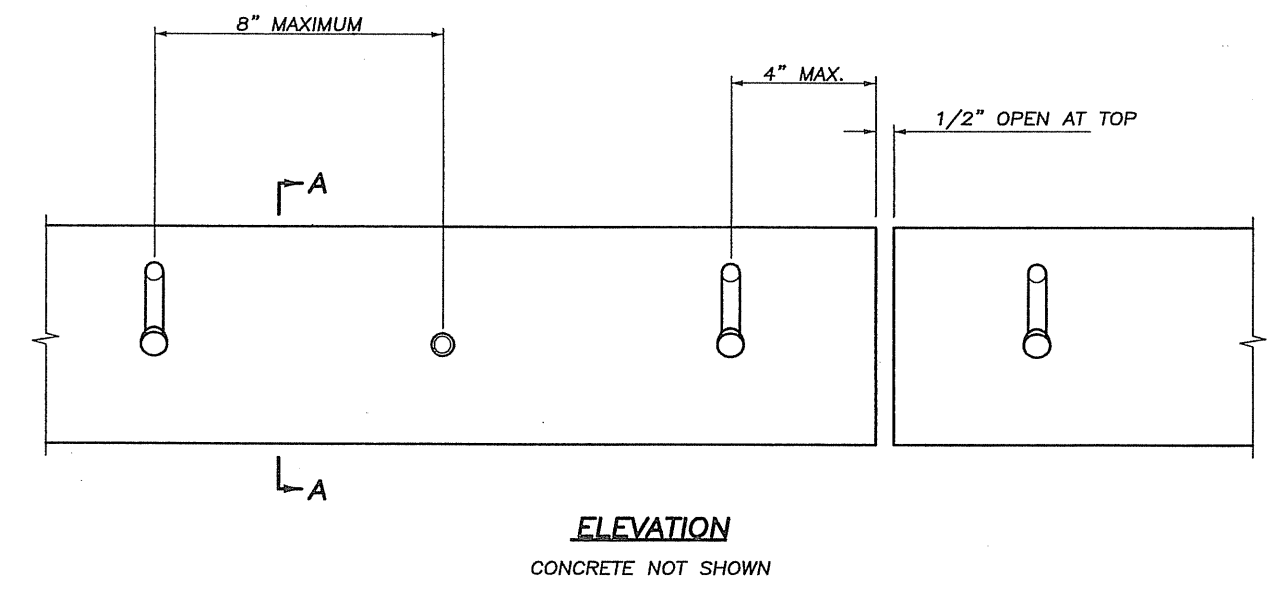


THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION. DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

BRIDGE 07586  
YEAR 2008



- NOTES:**
- NO SHOP DRAWING REQUIRED.
  - MATERIAL SHALL COMPLY WITH Mn/DOT 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.



1/2" x 5" HEADED STUDS, AT 8" SPACING WITH ALTERNATE STAGGER. THE ANCHORAGE SHALL BE CAPABLE OF BEING BENT COLD BY HAMMERING THROUGH A 30° ANGLE (THE APEX OF WHICH SHALL BE AT THE FUSION POINT) AFTER WELDING AND SUBSEQUENTLY STRAIGHTENED TO ITS ORIGINAL POSITION WITHOUT FRACTURE OF THE WELD OR ANCHORAGE.

- NOTES:**
- PLATES SHALL EXTEND FULL WIDTH OF ROADWAY BETWEEN GUTTER LINES WITH A 1/2" OPEN JOINT AT EACH BREAK IN CROWN PROFILE. MAX. LENGTH 22 FT.
  - MATERIALS: STRUCTURAL STEEL PER Mn/DOT SPEC. 3306. GALVANIZE AFTER FABRICATION PER Mn/DOT SPEC. 3394
  - SET PLATE TO PROPER GRADE AND CROWN.

APPROVED: NOVEMBER 22, 2002 <i>Daniel J. Morgan</i> STATE BRIDGE ENGINEER	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION <b>BRIDGE NAMEPLATE</b> (FOR NEW BRIDGES)	REVISION	DETAIL NO. <b>B101</b>
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APPROVED: NOVEMBER 22, 2002 <i>Daniel J. Morgan</i> STATE BRIDGE ENGINEER	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION <b>PROTECTION PLATE</b> (FOR END OF SLAB)	REVISION	DETAIL NO. <b>B553</b>
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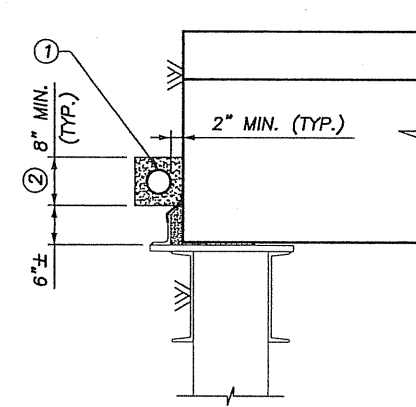
CERTIFIED BY <i>Ronald Benson</i> PROFESSIONAL ENGINEER/RONALD BENSON LIC. NO. 22737	MISC. BRIDGE DETAILS 1/30/2008	DES.: DJR DRN.: NBB CHK.: RAB CHK.: DJR S.A.P. 07-598-25 APPROVED: SHEET 13 OF 20 SHEETS	BRIDGE NO. <b>07586</b>
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**SUMMARY OF QUANTITIES  
FOR DRAINAGE SYSTEM  
TYPE SPECIAL**

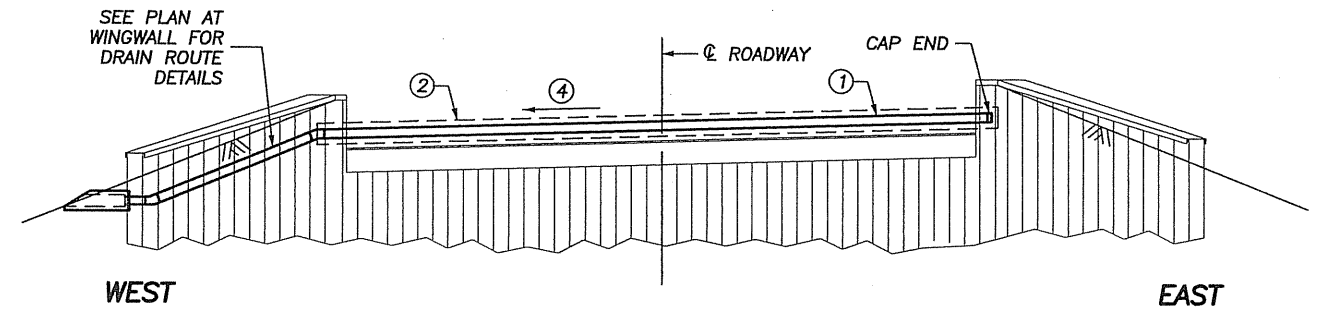
4" DIA. PERFORATED PIPE	76 LIN. FT.
4" DIA. NON-PERFORATED PIPE	38 LIN. FT.
45° ELBOW	4 EACH
4" DIA. END CAP	2 EACH
PRECAST CONCRETE HEADWALL	2 EACH

THE SUMMARY OF QUANTITIES FOR DRAINAGE SYSTEM IS SHOWN ABOVE FOR THE CONTRACTOR'S CONVENIENCE. ANY ADDITIONAL MINOR ITEMS OR SLIGHT CHANGES OF QUANTITIES REQUIRED SHALL BE FURNISHED BY THE CONTRACTOR WITH NO ADDITIONAL COMPENSATION.

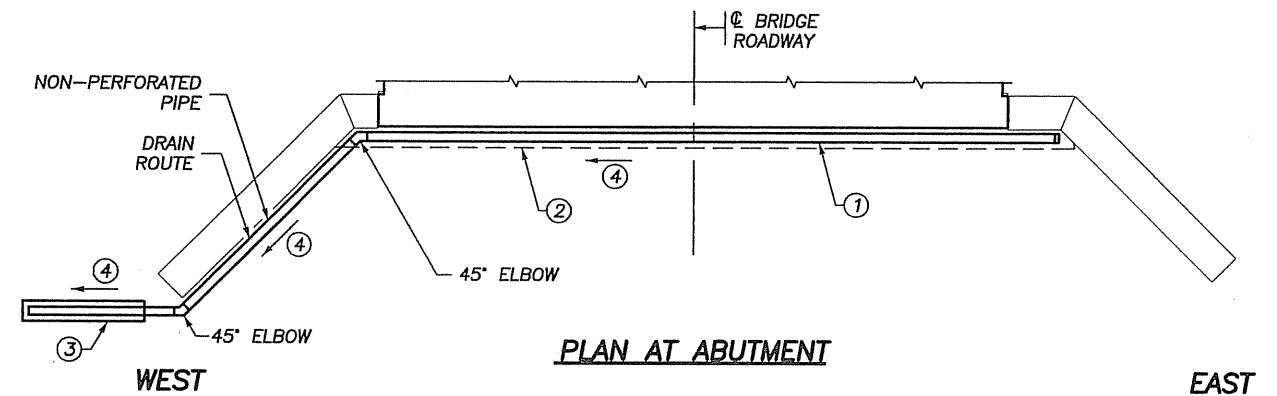
PAYMENT WILL BE INCLUDED IN THE SINGLE LUMP SUM PRICE FOR BID ITEM 2502.601 "DRAINAGE SYSTEM, TYPE SPECIAL".



**SECTION AT ABUTMENT**



**ELEVATION AT BACK FACE OF ABUTMENT**



**PLAN AT ABUTMENT**

**NOTES:**

ALL PIPE SHALL BE PER Mn/DOT SPEC. 3245.

- ① 4" NOMINAL DIA. THERMOPLASTIC PERFORATED PIPE. SLOPE PIPE TO DITCH. WRAP PIPE WITH GEOTEXTILE AS PER Mn/DOT SPEC. 3733.
- ② BACKFILL WITH FINE AGGREGATE, Mn/DOT SPEC. 3149, MODIFIED TO 0-3% PASSING A NO. 200 SIEVE.
- ③ PRECAST CONCRETE HEADWALL WITH A RODENT SCREEN ON THE END. SEE STANDARD PLATE 3131 FOR DETAILS.
- ④ 1/8" PER FT. MINIMUM SLOPE.

**DRAINAGE SYSTEM, TYPE SPECIAL**

CERTIFIED BY *Ronald Benson*  
PROFESSIONAL ENGINEER/RONALD BENSON  
LIC. NO. 22737  
1/30/2008

**MISC. BRIDGE DETAILS**

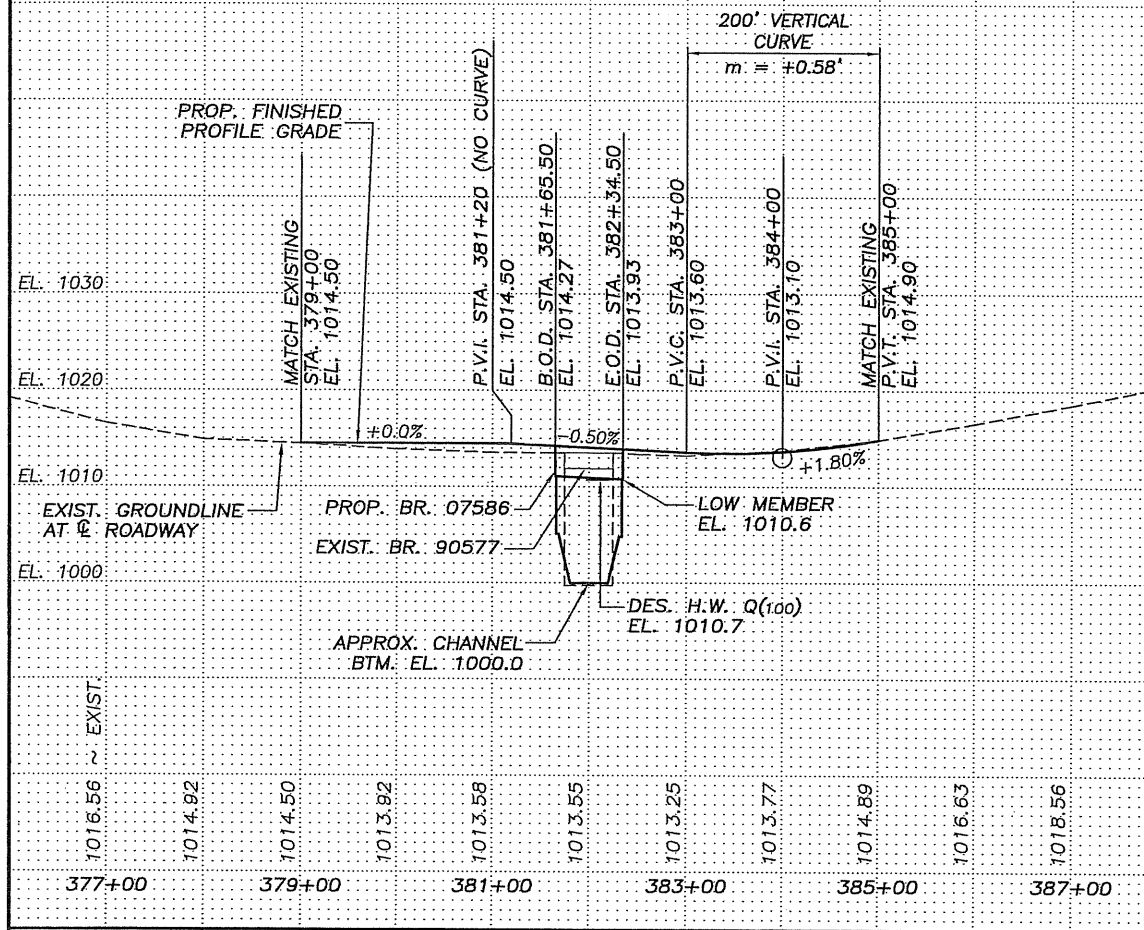
DES.: DJR DRN.: NBB APPROVED:  
CHK.: RAB CHK.: DJR  
S.A.P. 07-598-25  
SHEET 14 OF 20 SHEETS

**BRIDGE NO.**

**07586**

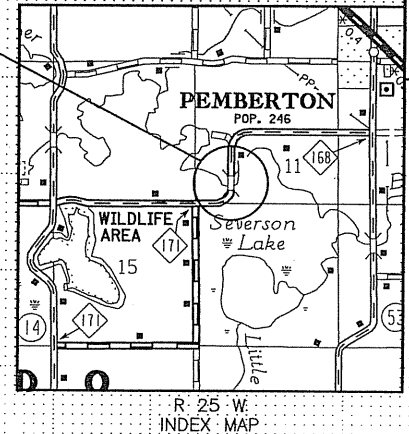
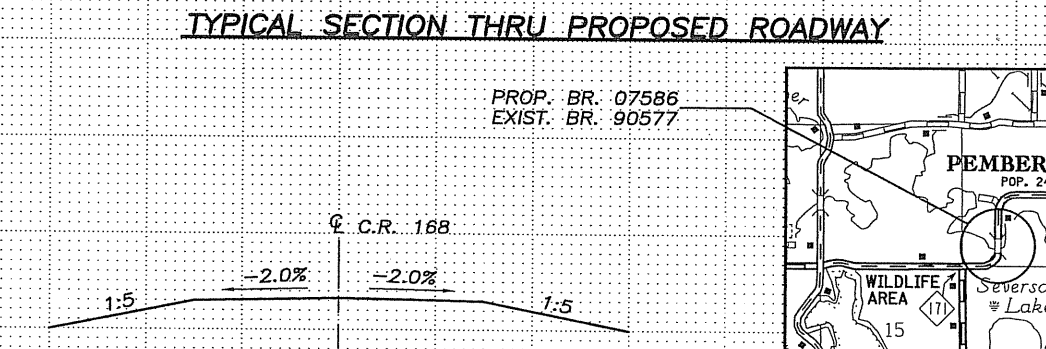
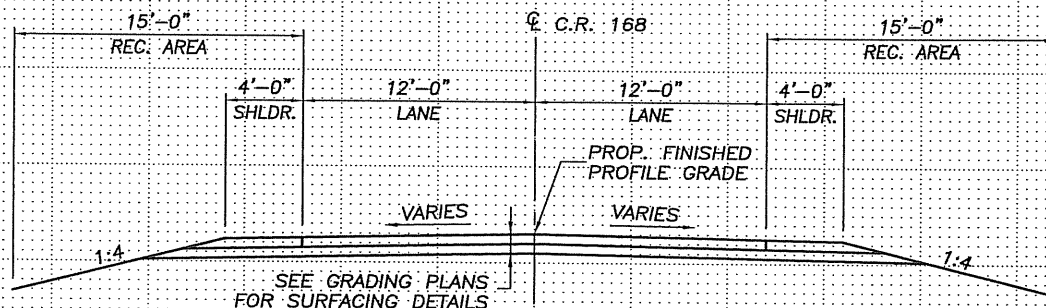
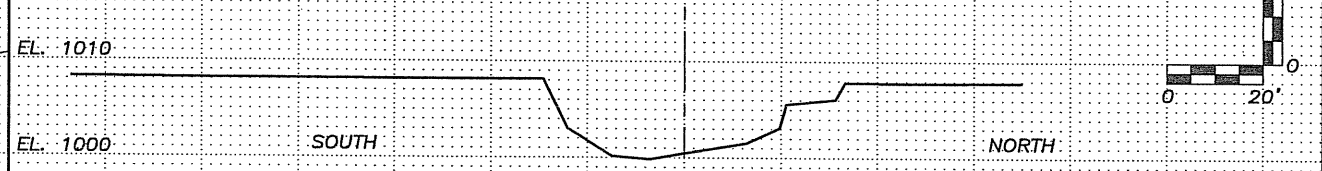
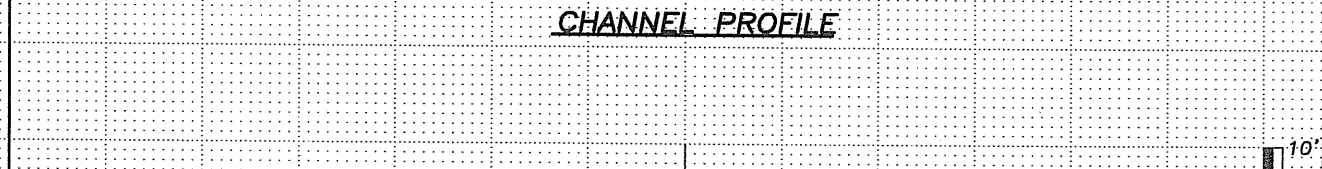
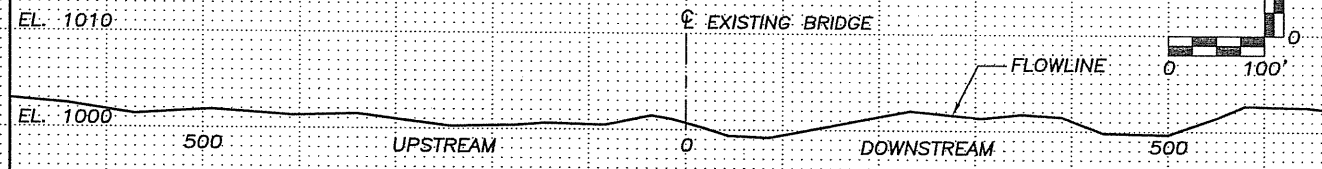
**CONTRACTED PROFILE**

SCALE: HOR. 1"=100' VER. 1"=10'



**TYPICAL SECTIONS & PERTINENT DATA**

SCALES AS SHOWN



Fed. Proj. No.

LOCATION ENGINEER'S OBSERVATION AT BRIDGE SITE

DATE .....

1. Special Features: Waterfalls, dams, floods, ice, debris, sliding banks, rec. boats.

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 1011.9 Obtained from COUNTY SURVEY DATA

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

HYDRAULIC ENGINEER'S RECOMMENDATION  
DATE 2-12-2007

Stream or ditch designation LITTLE COBB RIVER  
Drainage area 109.2 SQ. MI.  
Max. flood on record UNKN Design flood (100 yr. freq.) 3350 C.F.S.  
Max. observed highwater elev. 1011.9 Design highwater elev. 1010.7  
Design mean velocity through structure 5.3 F.P.S.  
Low superstructure at or above elevation 1010.7  
Flowline elevation 1000.0 Skew angle 0°  
Waterway area req'd below elev. 1010.7 = 632 Square Feet @ right angles to channel

In the interest of flood plain zoning the regional flood (100 yr. freq.) is 3350 C.F.S. at stage 1010.7 and mean velocity of 5.3 F.P.S. with 0.3 Ft. swellhead. The above recommendation will provide a structure of adequate waterway to pass the regional flood within criteria established by the Dept. of Natural Resources.

SCOUR CODE: L

ENGINEER'S RECOMMENDATION  
DATE 2-12-2007

69' PRESTRESSED CONCRETE BEAM SPAN  
0° SKEW, 32 FT. ROADWAY WIDTH

Bridge survey sheets made from: SURVEY NOTES FROM BLUE EARTH COUNTY (DATED MAY 2004)

Benchmark elevation 1011.38  
Location: DOUBLE SPIKE IN POWER POLE STA. 380+88, 34' RIGHT.

STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION

**BRIDGE SURVEY**

AT MILE POINT ..... ON C.R. 168

PROPOSED BRIDGE LOCATED 0.4 MILES N.E. OF

JCT. C.R. 171 OVER THE LITTLE

COBB RIVER

SEC. 11 TWP. 106 N R. 25 W

TOWNSHIP MEDO COUNTY BLUE EARTH

EXIST. BRIDGE NO. 90577

PROP. BRIDGE NO. 07586

**PLAT**

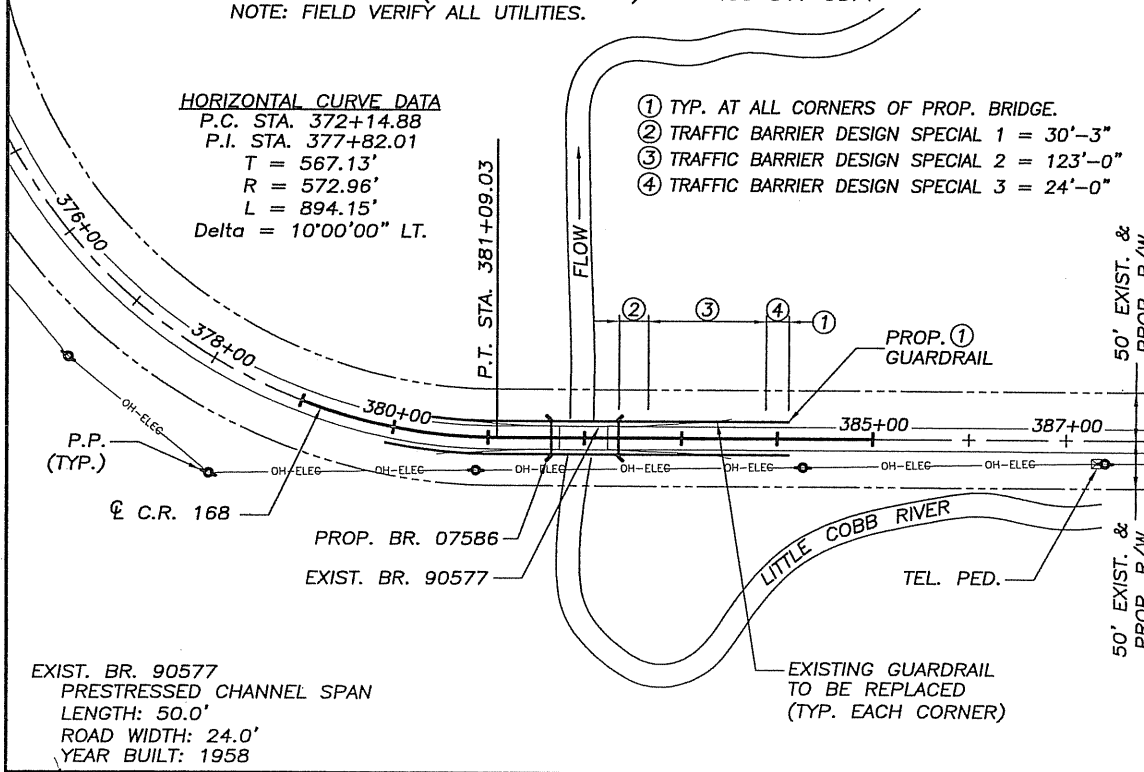
SCALE: 1"=100'

UTILITY INFORMATION  
WARNING: DIAL GOPHER STATE ONE CALL AT 1-800-252-1166 48 HOURS IN ADVANCE OF CONSTRUCTION OPERATIONS TO OBTAIN COMPLETE UTILITY PROPERTY OWNERSHIP AND LOCATION INFORMATION.

UTILITY INFO AVAILABLE FOR PLAN PREPARATION:  
BENCO ELECTRIC (OVERHEAD POWER) 507-387-7963  
HICKORY TECH (BURIED TELEPHONE) 406-541-9571  
NOTE: FIELD VERIFY ALL UTILITIES.

HORIZONTAL CURVE DATA  
P.C. STA. 372+14.88  
P.I. STA. 377+82.01  
T = 567.13'  
R = 572.96'  
L = 894.15'  
Delta = 10°00'00" LT.

- ① TYP. AT ALL CORNERS OF PROP. BRIDGE.
- ② TRAFFIC BARRIER DESIGN SPECIAL 1 = 30'-3"
- ③ TRAFFIC BARRIER DESIGN SPECIAL 2 = 123'-0"
- ④ TRAFFIC BARRIER DESIGN SPECIAL 3 = 24'-0"



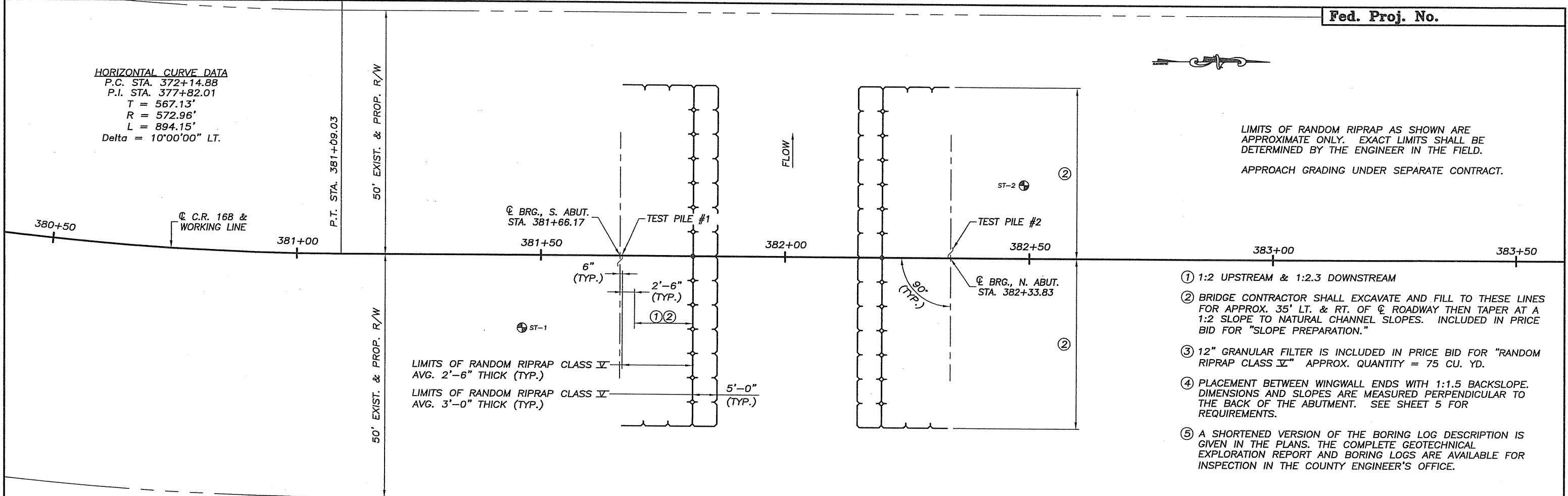
CERTIFIED BY Ernest Benson LIC. NO. 22737 1/30/2008

State Aid Proj. No. 07-598-25

Sheet No. 15 of 20 Sheets

**HORIZONTAL CURVE DATA**  
 P.C. STA. 372+14.88  
 P.I. STA. 377+82.01  
 T = 567.13'  
 R = 572.96'  
 L = 894.15'  
 Delta = 10°00'00" LT.

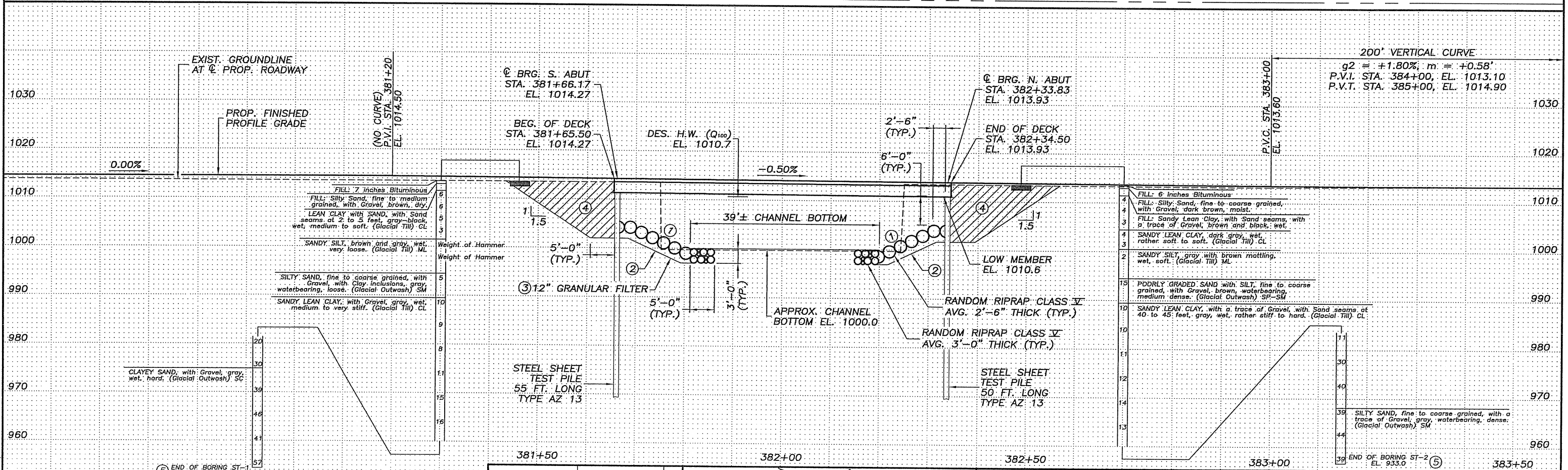
50' EXIST. & PROP. R/W



LIMITS OF RANDOM RIPRAP AS SHOWN ARE APPROXIMATE ONLY. EXACT LIMITS SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD.  
 APPROACH GRADING UNDER SEPARATE CONTRACT.

LIMITS OF RANDOM RIPRAP CLASS V  
 AVG. 2'-6" THICK (TYP.)  
 LIMITS OF RANDOM RIPRAP CLASS V  
 AVG. 3'-0" THICK (TYP.)

- ① 1:2 UPSTREAM & 1:2.3 DOWNSTREAM
- ② BRIDGE CONTRACTOR SHALL EXCAVATE AND FILL TO THESE LINES FOR APPROX. 35' LT. & RT. OF C. ROADWAY THEN TAPER AT A 1:2 SLOPE TO NATURAL CHANNEL SLOPES. INCLUDED IN PRICE BID FOR "SLOPE PREPARATION."
- ③ 12" GRANULAR FILTER IS INCLUDED IN PRICE BID FOR "RANDOM RIPRAP CLASS V" APPROX. QUANTITY = 75 CU. YD.
- ④ PLACEMENT BETWEEN WINGWALL ENDS WITH 1:1.5 BACKSLOPE. DIMENSIONS AND SLOPES ARE MEASURED PERPENDICULAR TO THE BACK OF THE ABUTMENT. SEE SHEET 5 FOR REQUIREMENTS.
- ⑤ A SHORTENED VERSION OF THE BORING LOG DESCRIPTION IS GIVEN IN THE PLANS. THE COMPLETE GEOTECHNICAL EXPLORATION REPORT AND BORING LOGS ARE AVAILABLE FOR INSPECTION IN THE COUNTY ENGINEER'S OFFICE.



⑤ END OF BORING ST-1  
 EL. 933.0

END OF BORING ST-2  
 EL. 933.0

BORINGS SHOWN ST-1 & ST-2  
 TAKEN WITH STD 140 LB HAMMER  
 30 INCH DROP  
 2 INCH O.D. SAMPLER

CERTIFIED BY: *Ronald Benson*  
 PROFESSIONAL ENGINEER/RONALD BENSON  
 LIC. NO. 22737

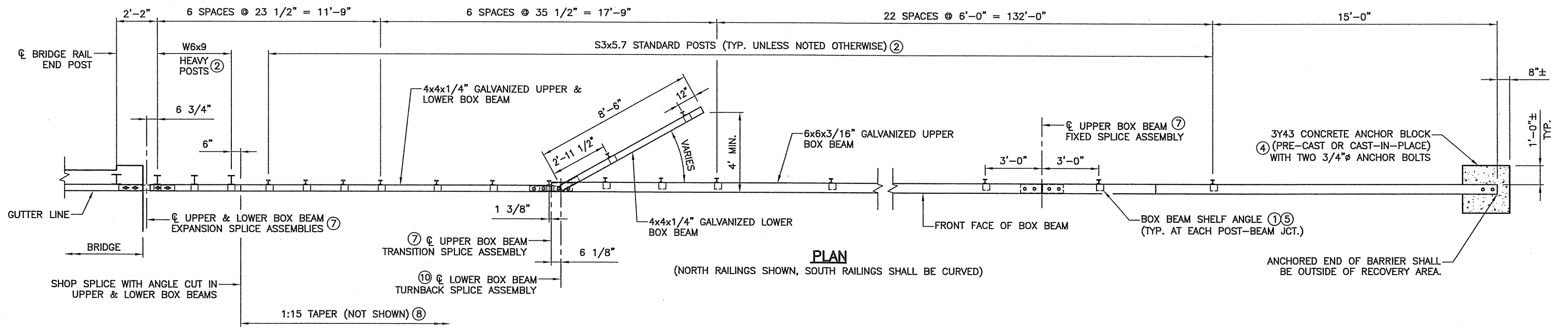
**BRIDGE SURVEY PLAN & PROFILE**  
 State Aid Proj. No. 07-598-25

DES.: DJR DRN.: NBB APPROVED:  
 CHK.: RAB CHK.: DJR

**Bridge No.**  
 07586

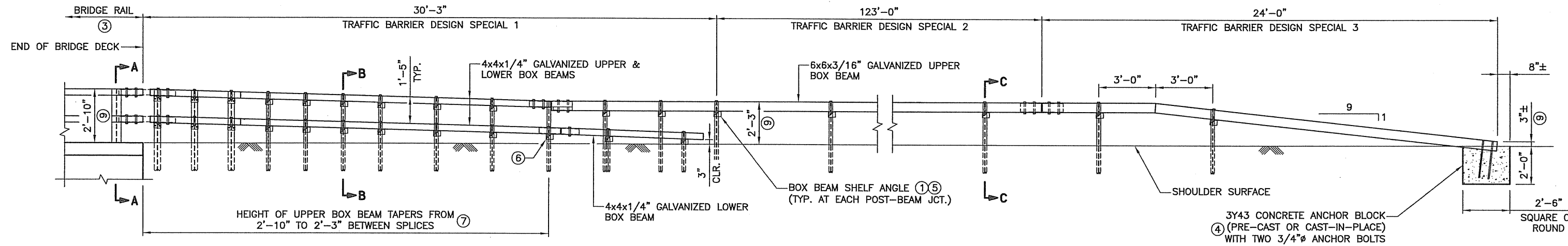
Sheet 16 of 20 Sheets





**PLAN**

(NORTH RAILINGS SHOWN, SOUTH RAILINGS SHALL BE CURVED)



**ELEVATION**

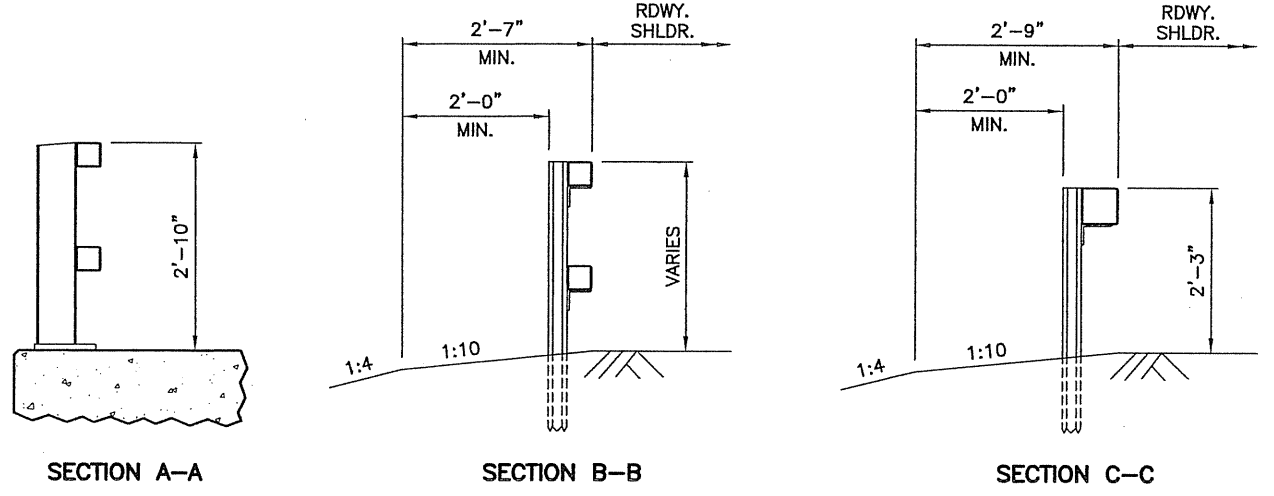
(NORTH RAILINGS SHOWN, SOUTH RAILINGS SHALL BE CURVED)

**KEYNOTES:**

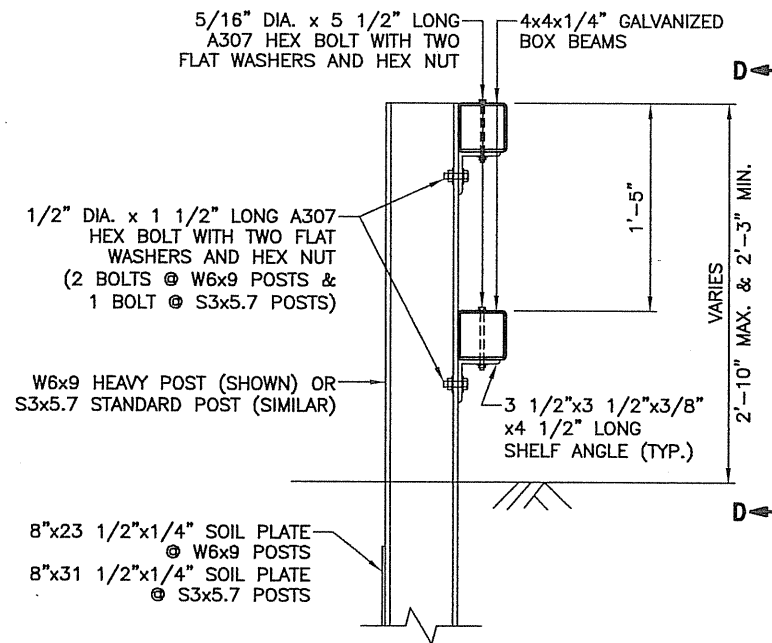
- ① SEE TYPICAL BOX BEAM TO POST CONNECTION DETAIL ON SHEET 18.
- ② SEE POST DETAILS ON SHEET 18.
- ③ PAYMENT FOR BRIDGE RAIL IS INCLUDED IN PAY ITEM "STRUCTURAL TUBE RAILING DESIGN SPECIAL".
- ④ ALL REINFORCEMENT IN ANCHOR BLOCK SHALL BE GRADE 60 AND EPOXY COATED AS PER SPEC. 3301. SEE SHEET 20 FOR ANCHOR DETAILS.
- ⑤ HOLES IN POSTS FOR LOWER SHELF ANGLES MAY BE FIELD DRILLED.
- ⑥ THE 5/8" DIA. HOLE DRILLED IN THE SHELF ANGLE MAY BE FIELD DRILLED (TYP.).
- ⑦ SEE SHEET 19 FOR SPLICE DETAILS.
- ⑧ THE TRAFFIC BARRIER SHALL BE TAPERED AWAY FROM SHOULDER AT 1:15 SO THAT THE END OF THE BARRIER ANCHORED TO THE CONCRETE BLOCK IS OUTSIDE THE RECOVERY AREA. SEE SHEET 15 FOR ROADWAY HORIZONTAL CURVE INFORMATION ON SOUTH BRIDGE APPROACH. TRAFFIC BARRIER SHALL BE FABRICATED TO SMOOTHLY ACCOMMODATE CURVE WHERE APPLICABLE AND INCLUDE 1:15 TAPER AWAY FROM THE SHOULDER.
- ⑨ DIMENSIONS SHOWN FROM TOP OF SHOULDER. SEE SHEET 15 FOR ROADWAY VERTICAL CURVE INFORMATION AND GRADING PLANS (BY OTHERS) FOR ROADWAY CROSS SLOPE INFORMATION.
- ⑩ SEE SHEET 20 FOR SPLICE DETAILS.

**NOTES:**

ALL MATERIAL AND FABRICATION PER SPEC. 2402 & 2471.  
 STRUCTURAL STEEL PER SPEC. 3306.  
 STRUCTURAL STEEL TUBING ASTM A500 GRADE B SPEC. 3361.  
 ALL GALVANIZING PER SPEC. 2471.  
 GALVANIZE ALL HARDWARE PER SPEC. 3392.  
 GALVANIZE STRUCTURAL SHAPES PER SPEC. 3394 AFTER FABRICATION.  
 REPAIR OF GALVANIZED SURFACES PER SPEC. 2471.

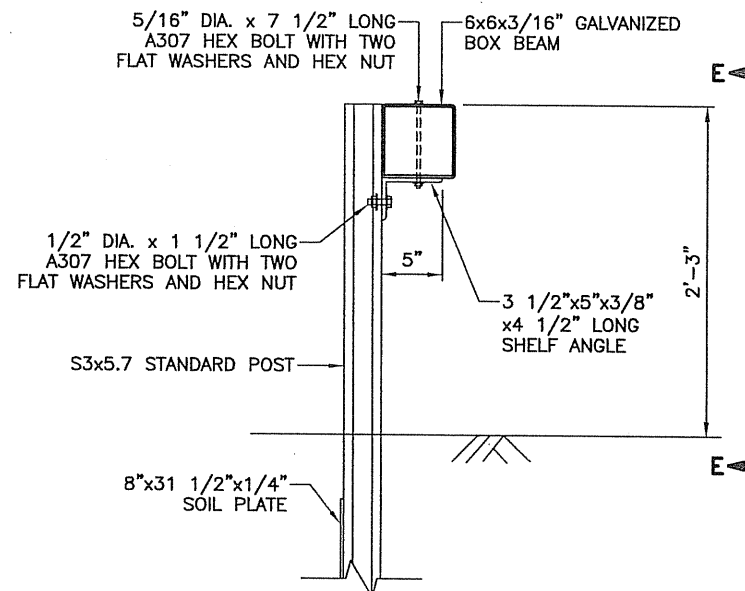


CERTIFIED BY: <i>Ronald Benson</i> PROFESSIONAL ENGINEER/RONALD BENSON	DES.: DJR	DRN.: NBB	TITLE: <b>TRAFFIC BARRIER DESIGN SPECIAL</b>
	CHK.: RAB	CHK.: DJR	
LIC. NO. 22737	1/30/2008		S.A.P. NO. 07-598-25 SHEET NO. 17 OF 20 SHEETS 07586

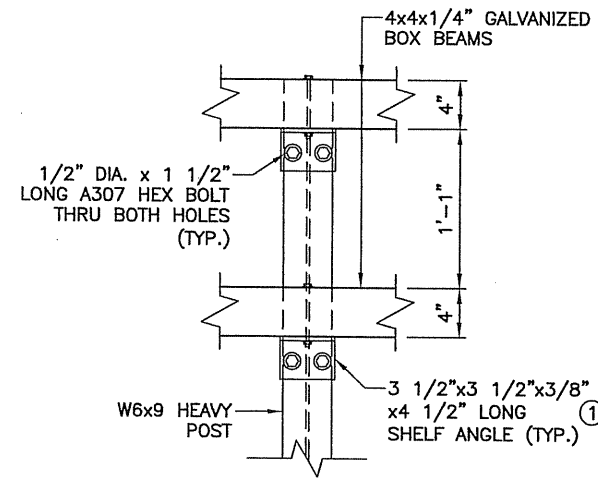


**POST SIDE DETAIL WITH 4"x4" UPPER & LOWER BOX BEAMS**

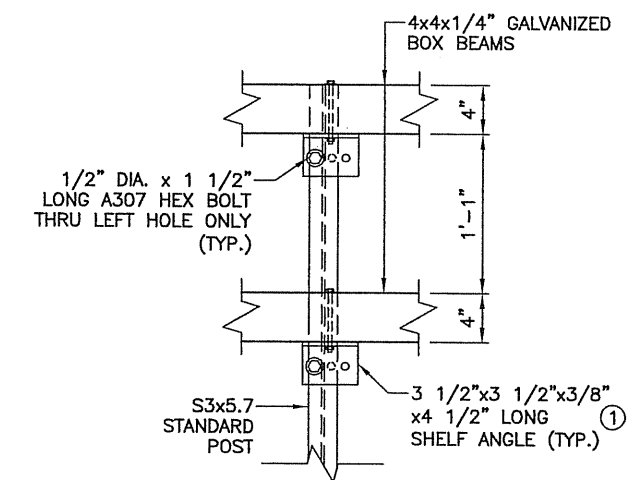
POST DETAIL AT LOWER BOX BEAM TURNBACK SIMILAR



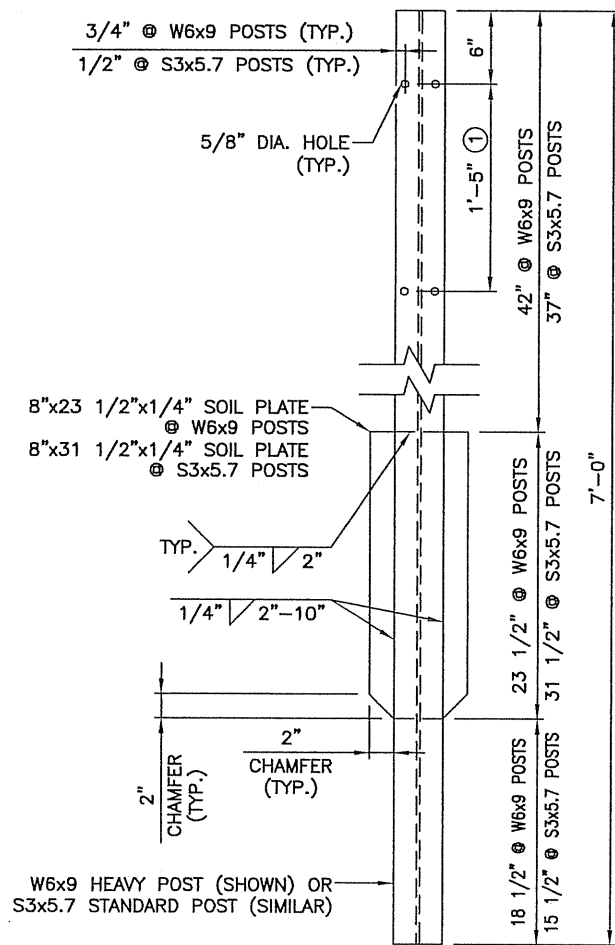
**POST SIDE DETAIL WITH 6"x6" UPPER BOX BEAM**



**VIEW D-D AT W6x9 HEAVY POST**

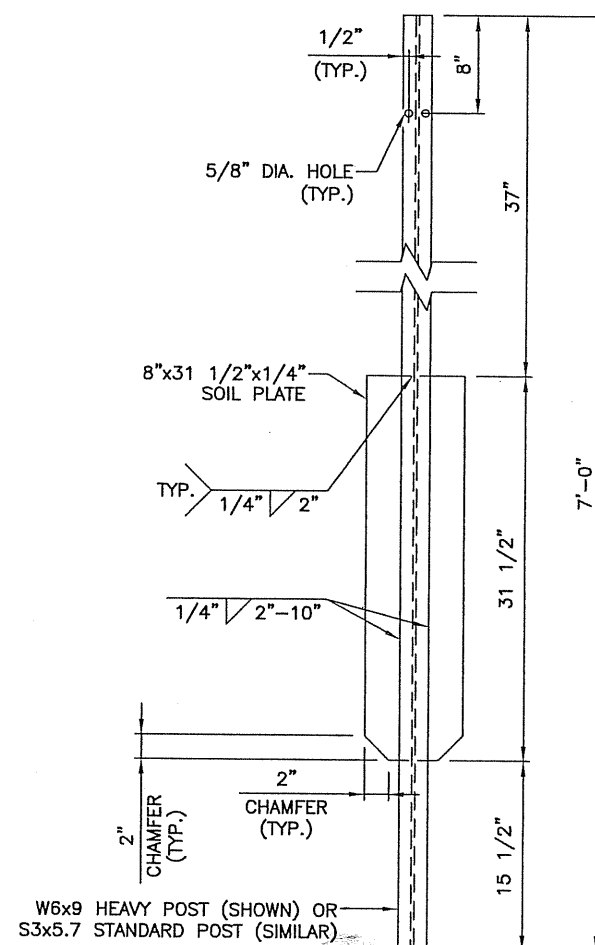


**VIEW D-D AT S3x5.7 STANDARD POST**

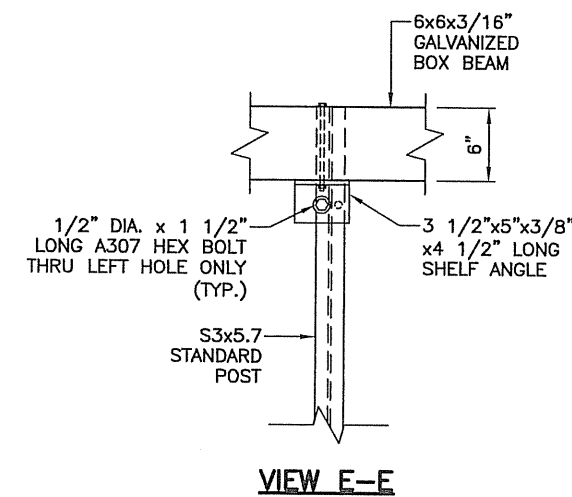


**POST FRONT DETAIL WITH 4"x4" UPPER & LOWER BOX BEAMS**

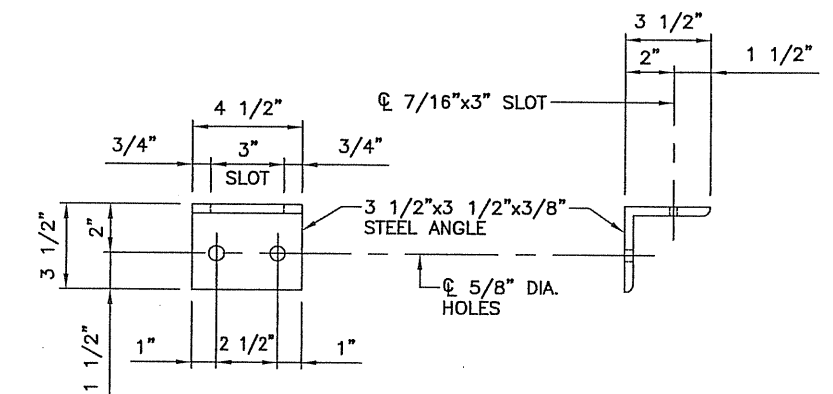
POST DETAIL AT LOWER BOX BEAM TURNBACK SIMILAR



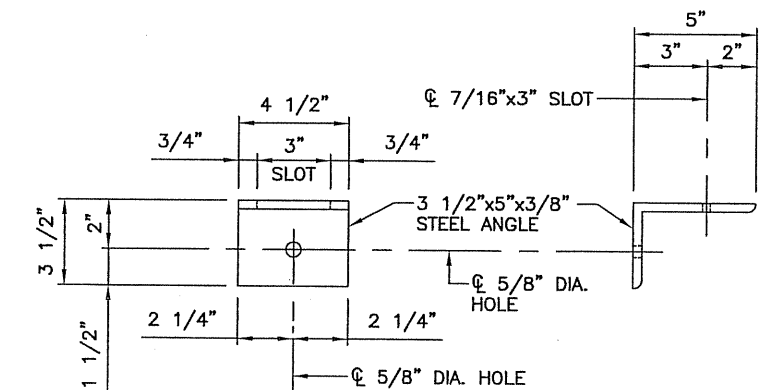
**POST FRONT DETAIL WITH 6"x6" UPPER BOX BEAM**



**VIEW E-E**



**SHELF ANGLE ② AT 4"x4" GALVANIZED BOX BEAMS**

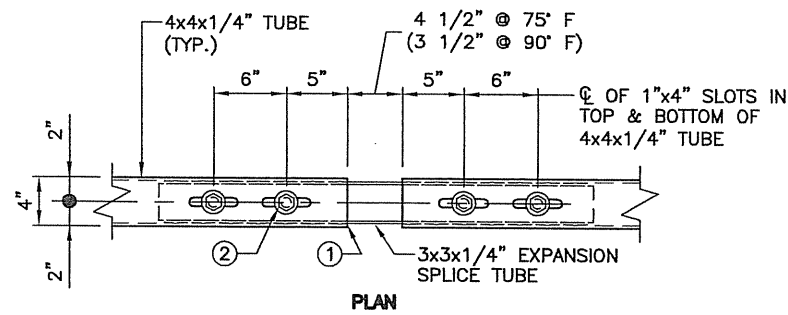


**SHELF ANGLE ② AT 6"x6" GALVANIZED BOX BEAM**

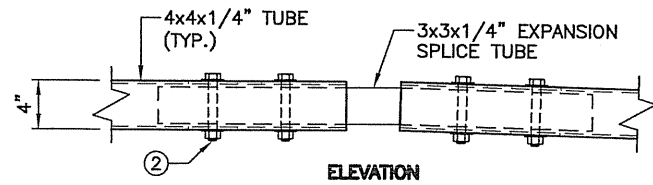
**KEYNOTES:**

- ① HOLES IN POSTS FOR LOWER SHELF ANGLES MAY BE FIELD LOCATED AND DRILLED, THEN GALVANIZED PER SPEC. 2471.
- ② SHELF ANGLES SHALL BE AASHTO M 270M (ASTM A709) GRADE 36 STEEL. AFTER ALL HOLES ARE PUNCHED AND CUTS ARE MADE, ANGLES SHALL BE GALVANIZED PER SPEC. 3394.

CERTIFIED BY: <i>Ronald Benson</i> PROFESSIONAL ENGINEER/RONALD BENSON	DES.: DJR	DRN.: NBB	TITLE: <b>TRAFFIC BARRIER DESIGN SPECIAL DETAILS</b>
	CHK.: RAB	CHK.: DJR	
LIC. NO. 22737	1/30/2008	S.A.P. NO. 07-598-25	SHEET NO. 18 OF 20 SHEETS 07586

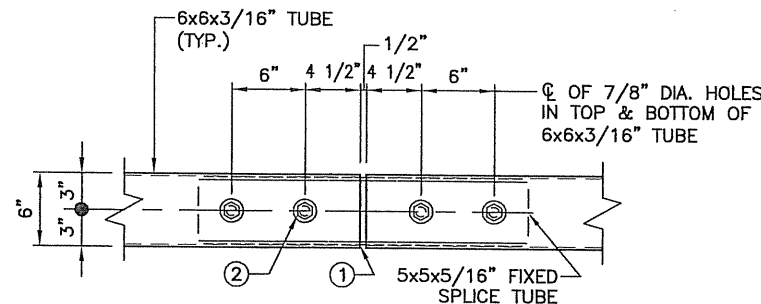


PLAN

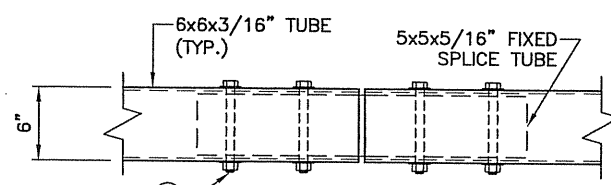


ELEVATION

**EXPANSION SPLICE ASSEMBLY**

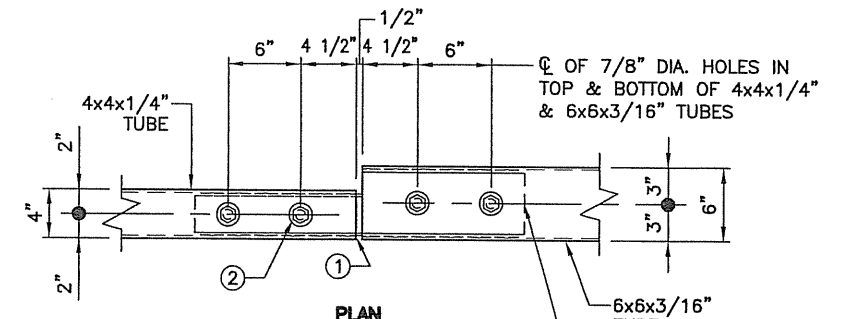


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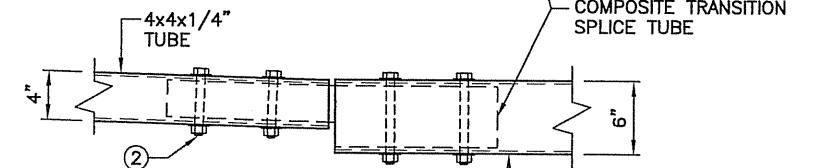


ELEVATION

**FIXED SPLICE ASSEMBLY**

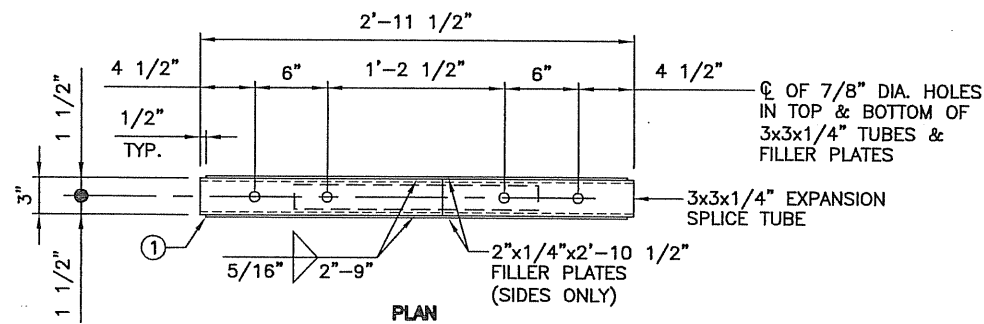


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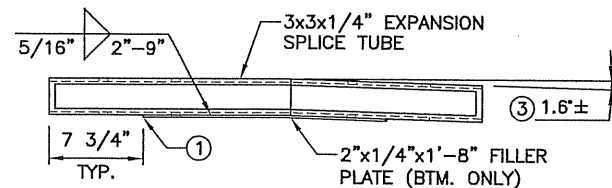


ELEVATION

**TRANSITION SPLICE ASSEMBLY**

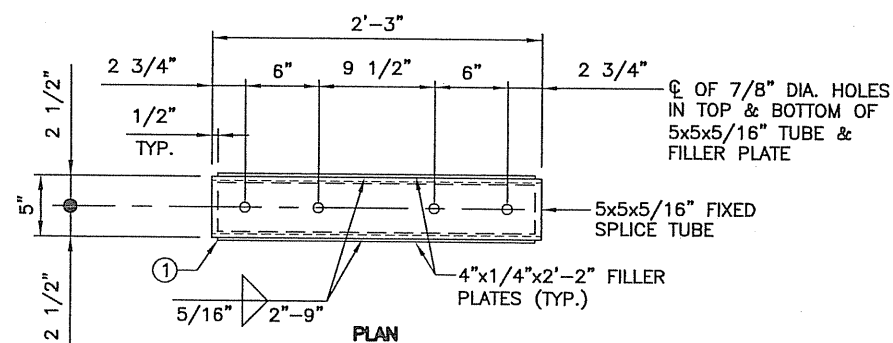


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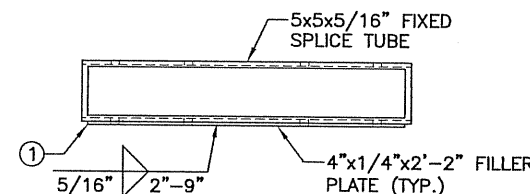


ELEVATION

**EXPANSION SPLICE TUBE**

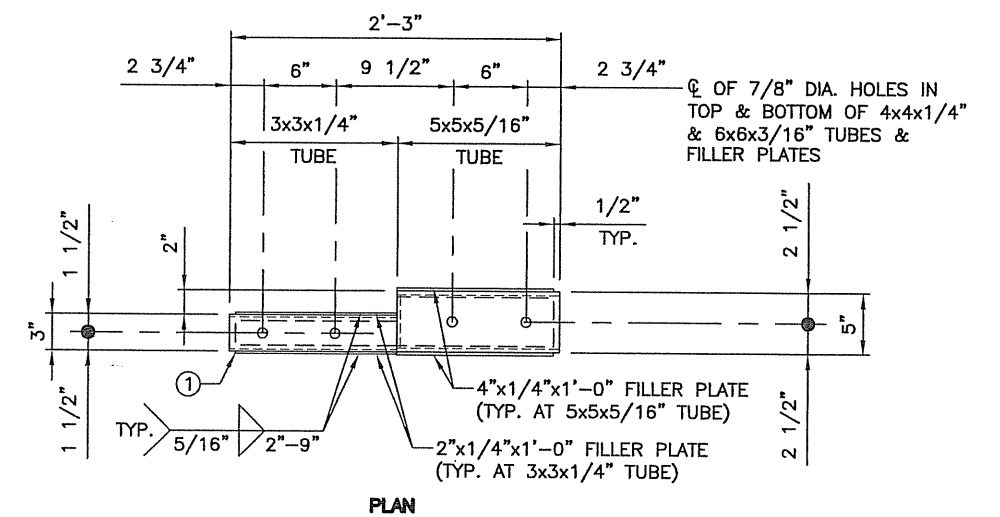


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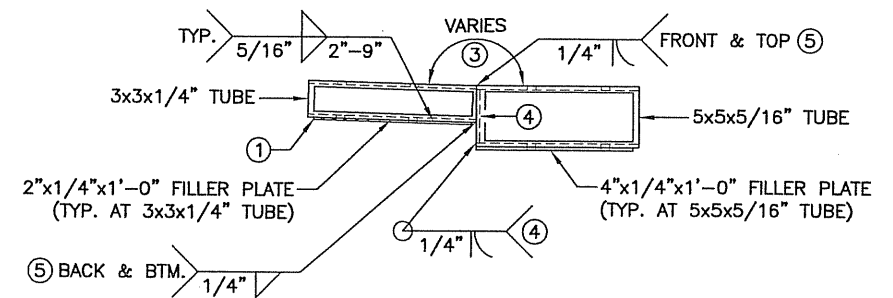


ELEVATION

**FIXED SPLICE TUBE**



PLAN



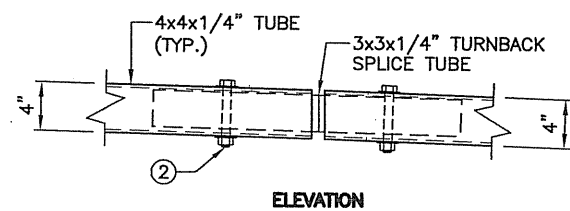
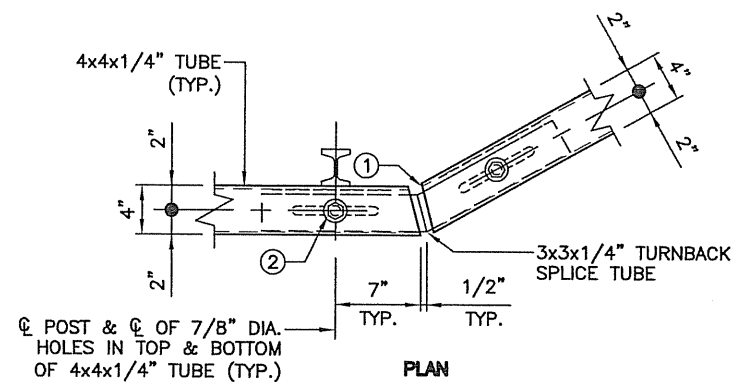
ELEVATION

**COMPOSITE TRANSITION SPLICE TUBE**

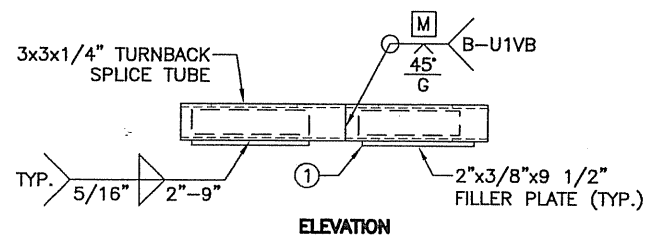
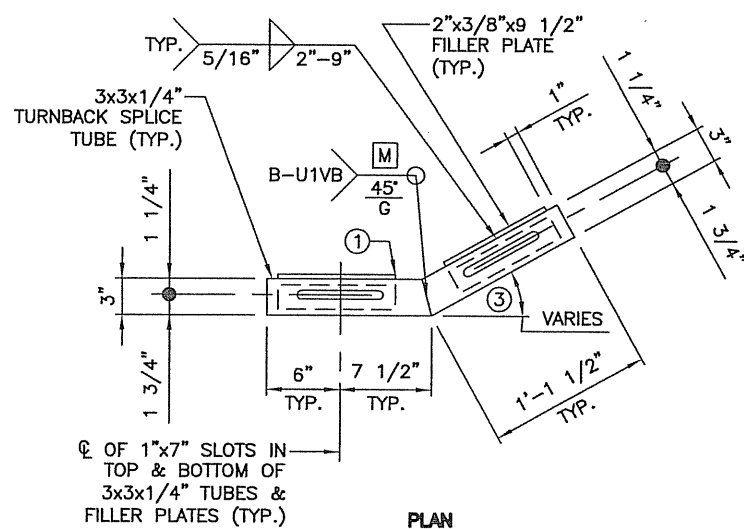
**KEYNOTES:**

- ① PROTRUSIONS CAUSED BY WELDING OR GALVANIZING ARE NOT PERMITTED ON THE ADJOINING SURFACES OF THE BOX BEAM RAILS, SPLICE TUBES AND FILL PLATES.
- ② 3/4" DIA. FULLY THREADED BOLTS, 5 1/2" LONG @ 4"x4" TUBES & 7 1/2" LONG @ 6"x6" TUBES (ASTM A325 TYPE 1 OR 3, OR A307 TYPE 3) WITH TWO FLAT WASHERS AND A HEAVY HEX NUT ON EACH BOLT. NUT TO BE FINGER TIGHT AND THE FIRST THREAD BELOW THE NUT TO BE DAMAGED AS DIRECTED BY THE ENGINEER IN THE FIELD. FOUR BOLTS AT EACH SPLICE.
- ③ FABRICATOR TO FIELD VERIFY ANGLE DIMENSION.
- ④ WELD 4 5/16"x4 5/16"x5/16" PLATE FLUSH WITH END OF 5x5x5/16" TUBE AND GRIND SMOOTH.
- ⑤ 3x3x1/4" TUBE TO 5x5x5/16" TUBE.

CERTIFIED BY: <i>Ronald Benson</i> PROFESSIONAL ENGINEER/RONALD BENSON	DES.: DJR	DRN.: NBB	TITLE: <b>TRAFFIC BARRIER DESIGN SPECIAL DETAILS</b>
	CHK.: RAB	CHK.: DJR	
LIC. NO. 22737	1/30/2008	S.A.P. NO. 07-598-25	SHEET NO. 19 OF 20 SHEETS
			07586



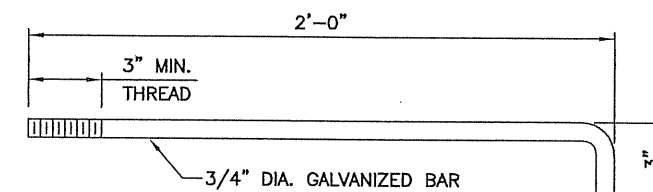
**TURNBACK SPLICE ASSEMBLY**



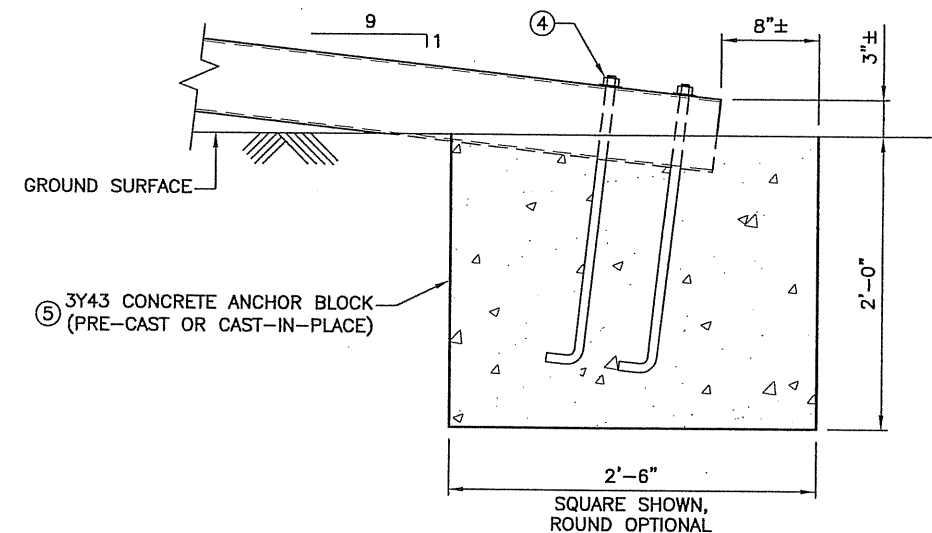
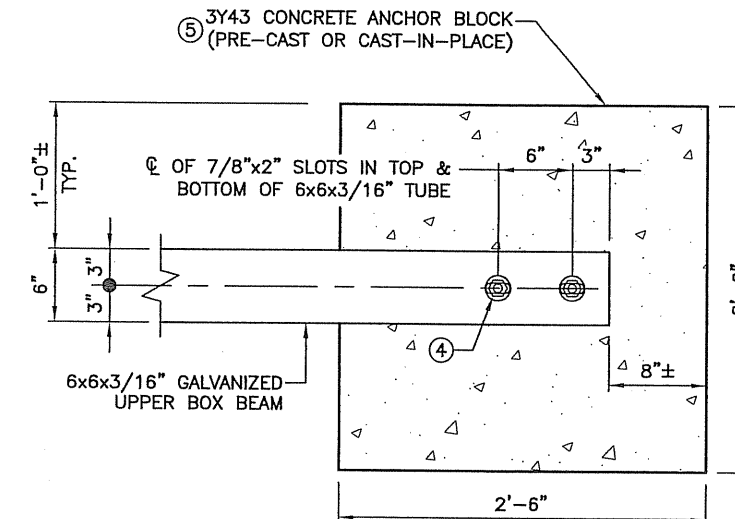
**TURNBACK SPLICE TUBE**

**KEYNOTES:**

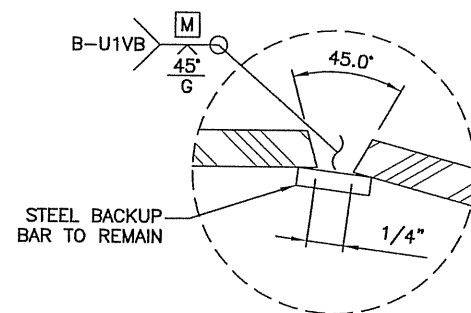
- ① PROTRUSIONS CAUSED BY WELDING OR GALVANIZING ARE NOT PERMITTED ON THE ADJOINING SURFACES OF THE BOX BEAM RAILS, SPLICE TUBES AND FILL PLATES.
- ② 3/4" DIA. x 5 1/2" LONG BOLTS (ASTM A325 TYPE 1 OR 3, OR A449 TYPE 1) WITH TWO FLAT WASHERS, ONE LOCK WASHER AND A HEAVY HEX NUT ON EACH BOLT. TWO BOLTS AT EACH SPLICE.
- ③ FABRICATOR TO FIELD VERIFY ANGLE DIMENSION.
- ④ 3/4" DIA. ANCHOR BOLT WITH HARDENED WASHER & HEX NUT. TWO ANCHOR BOLTS AT EACH CONCRETE ANCHOR BLOCK.
- ⑤ MINIMUM CONCRETE ANCHOR BLOCK REINFORCEMENT SHALL CONSIST OF NO. 10 BARS AT 12" MAXIMUM SPACING ON ALL FACES.



**ANCHOR BOLT DETAIL**



**ANCHOR BLOCK DETAIL**



**WELD DETAIL FOR SPLICE TUBE**

CERTIFIED BY: <i>Ronald Benson</i> PROFESSIONAL ENGINEER/RONALD BENSON	DES.: DJR	DRN.: NBB	TITLE: TRAFFIC BARRIER DESIGN SPECIAL DETAILS
	CHK.: RAB	CHK.: DJR	
LIC. NO. 22737	1/30/2008	S.A.P. NO. 07-598-25	SHEET NO. 20 OF 20 SHEETS