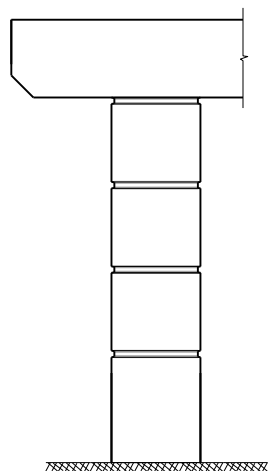
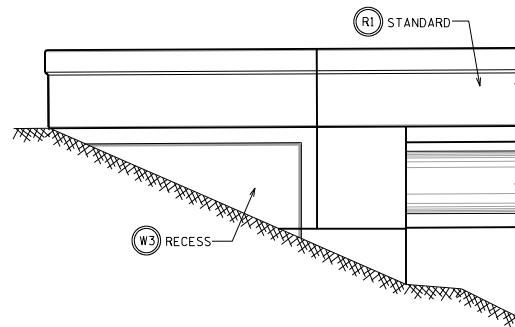


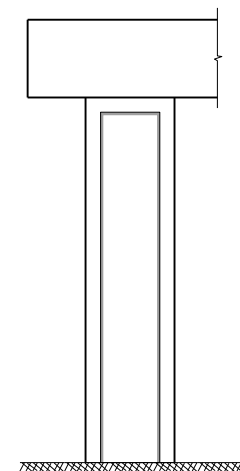
TYPE I



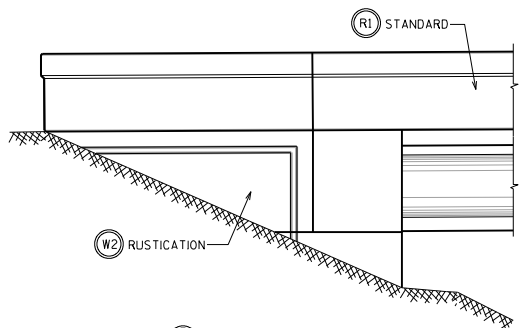
(P1) SINGLE RUSTICATION LINES



TYPE III

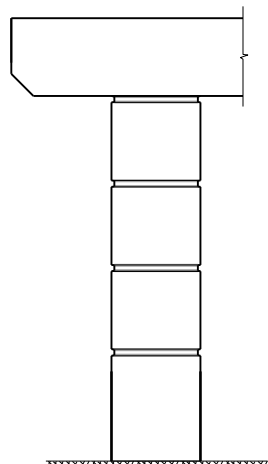
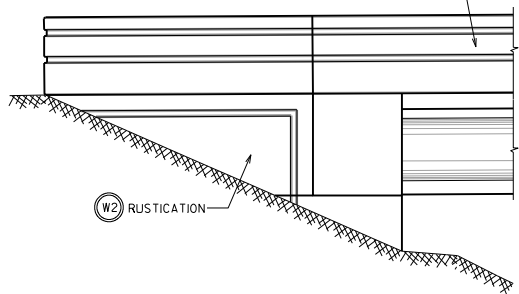


(P3) RECESSED PANEL

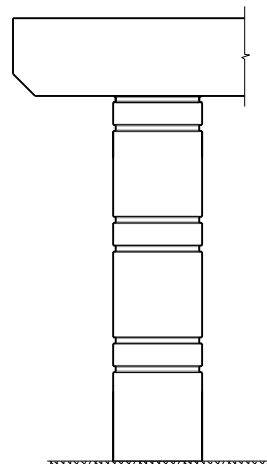


TYPE II

(R2) DOUBLE RUSTICATION LINES
(SINGLE RUSTICATION LINE ON
32SS PARAPET MAY ALSO BE USED)



(P1) SINGLE RUSTICATION LINES



(P2) DOUBLE RUSTICATION LINES

DESIGNER NOTES

THE THREE TYPES SHOWN ARE PREFERRED AESTHETIC CONCEPTS FOR WISDOT PROJECTS, WHEN USED WITHOUT STAINING, COSTS ARE INCIDENTAL TO "CONCRETE MASONRY BRIDGES" AND NOT SUBJECT TO CSS FUNDING.

ONLY THE CHOICE OF PARAPET, WING AND PIER DETAILS SHOWN FOR A GIVEN TYPE SHOULD BE USED FOR THAT TYPE.

WINGS PARALLEL TO CENTERLINE OF ABUTMENT (ELEPHANT EAR) ARE TO BE PLAIN (TYPE I).

SEE STANDARDS 4.04 AND 4.05 FOR ADDITIONAL DETAILS.

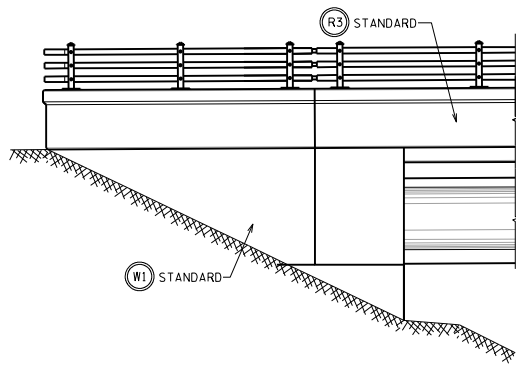
SEE BRIDGE MANUAL SECTION 4.9 FOR LOCATION OF USE AND RENDERINGS.

AESTHETIC CONCEPTS WITHOUT PEDESTRIAN ACCOMMODATIONS

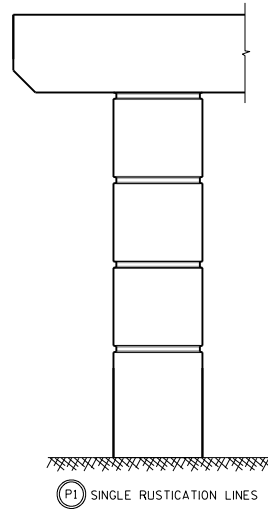
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva

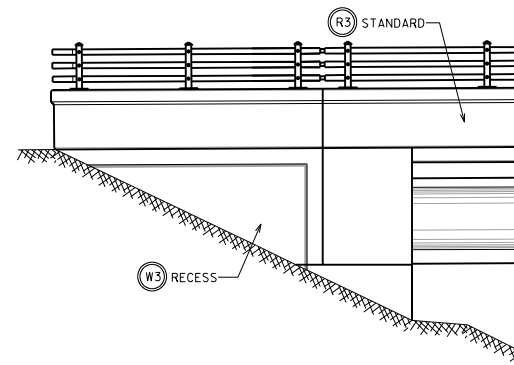
DATE:
7/15



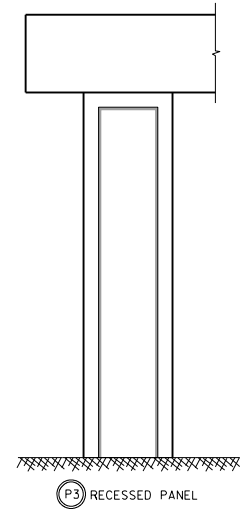
TYPE I



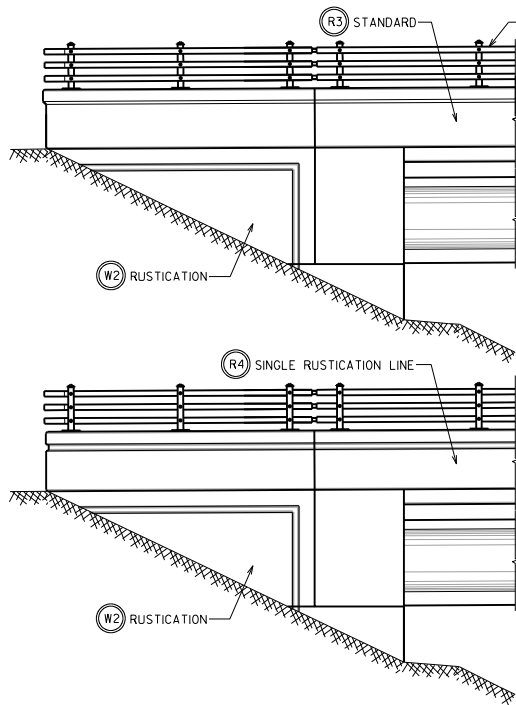
(P1) SINGLE RUSTICATION LINES



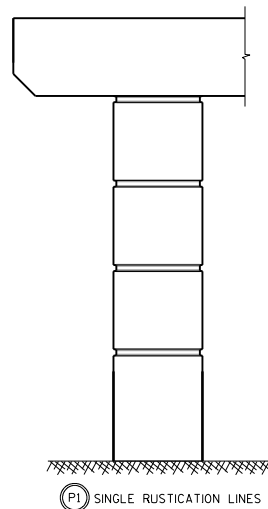
TYPE III



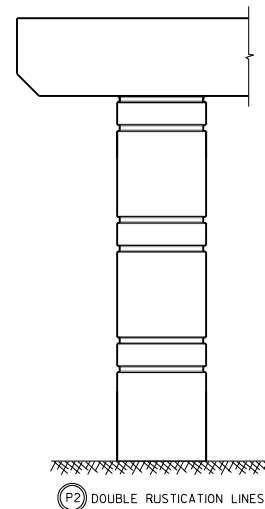
(P3) RECESSED PANEL



TYPE II



(P1) SINGLE RUSTICATION LINES



(P2) DOUBLE RUSTICATION LINES

DESIGNER NOTES

THE THREE TYPES SHOWN ARE PREFERRED AESTHETIC CONCEPTS FOR WISDOT PROJECTS. WHEN USED WITHOUT STAINING, COSTS ARE INCIDENTAL TO "CONCRETE MASONRY BRIDGES" AND NOT SUBJECT TO CSS FUNDING.

ONLY THE CHOICE OF PARAPET, WING AND PIER DETAILS SHOWN FOR A GIVEN TYPE SHOULD BE USED FOR THAT TYPE.

WINGS PARALLEL TO CENTERLINE OF ABUTMENT (ELEPHANT EAR) ARE TO BE PLAIN (TYPE I).

IN LIEU OF THE "COMBINATION RAILING TYPE '3T'" SHOWN, CHAIN LINK FENCING MAY BE USED. SEE STANDARD 4.04 FOR DETAILS.

SEE STANDARDS 4.04 AND 4.05 FOR ADDITIONAL DETAILS.

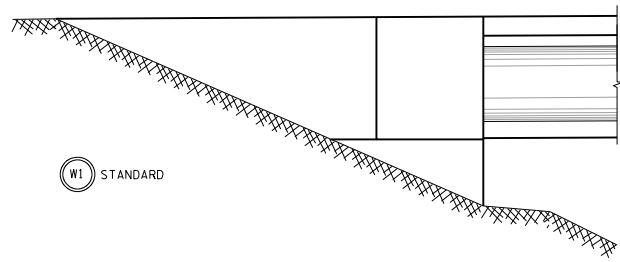
SEE BRIDGE MANUAL SECTION 4.9 FOR LOCATION OF USE AND RENDERINGS.

AESTHETIC CONCEPTS WITH PEDESTRIAN ACCOMMODATIONS

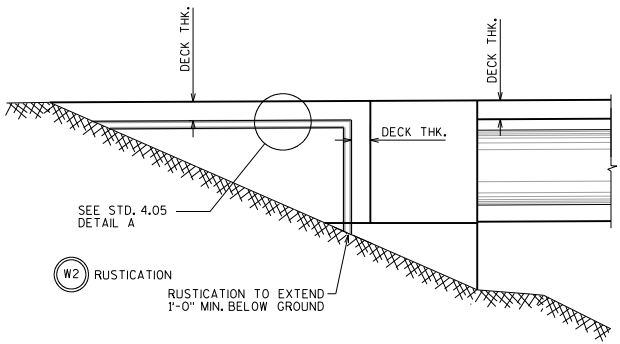
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva

DATE:
7/15

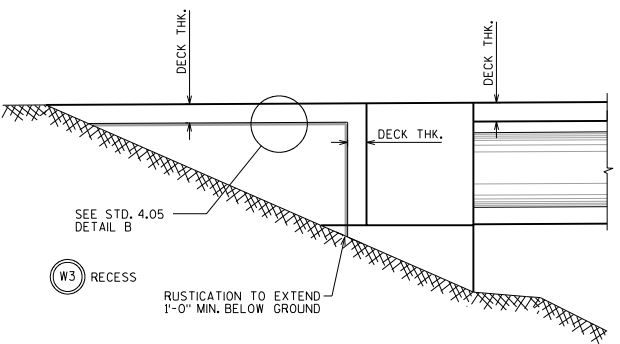


W1 STANDARD



W2 RUSTICATION

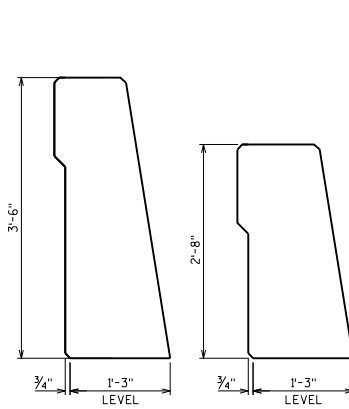
RUSTICATION TO EXTEND 1'-0" MIN. BELOW GROUND



W3 RECESS

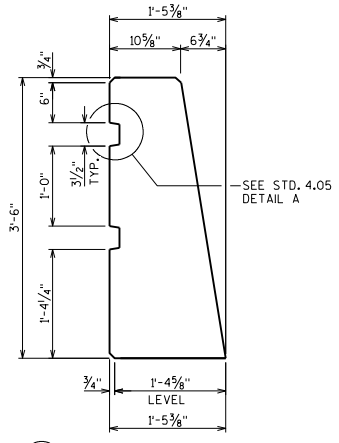
RUSTICATION TO EXTEND 1'-0" MIN. BELOW GROUND

WING OPTIONS



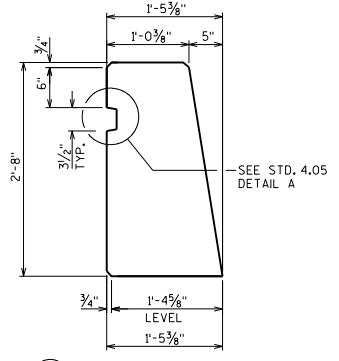
R1 STANDARD

SEE STD. 30.32 'SINGLE SLOPE PARAPET 42SS' OR STD. 30.30 'SINGLE SLOPE PARAPET 32SS' FOR DETAILS



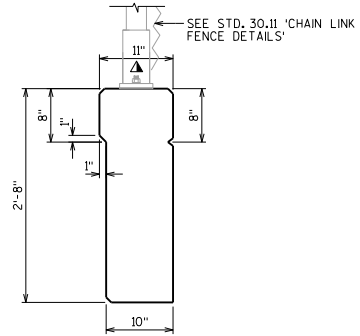
R2 DOUBLE RUSTICATION LINES

MODIFIED 'SINGLE SLOPE PARAPET 42SS' (AREA = 4.01 SF, WEIGHT = 602 LB/FT.)



R2 SINGLE RUSTICATION LINES

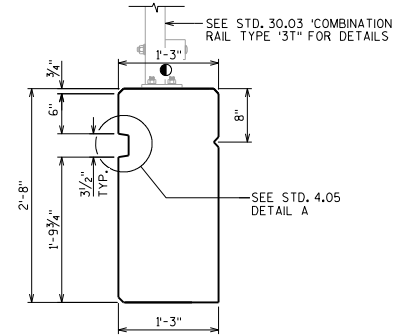
MODIFIED 'SINGLE SLOPE PARAPET 32SS' (AREA = 3.25 SF, WEIGHT = 488 LB/FT.)



R3 STANDARD

SEE STD. 30.07 'VERTICAL FACE PARAPET 'A'' FOR DETAILS

▲ USE 1'-3" TOP DIMENSION WHEN USED WITH 'COMBINATION RAIL TYPE '3T'' (AREA = 3.27 SF, WEIGHT = 474 LB/FT.)



R4 SINGLE RUSTICATION LINES

MODIFIED 'VERTICAL FACE PARAPET 'A'' (AREA = 3.29 SF, WEIGHT = 493 LB/FT.)

● USE 1'-0" WHEN USED WITH CHAIN LINK FENCING

PARAPET OPTIONS

DESIGNER NOTES

WINGS PARALLEL TO CENTERLINE OF ABUTMENT (ELEPHANT EAR) ARE TO BE PLAIN (TYPE 1).

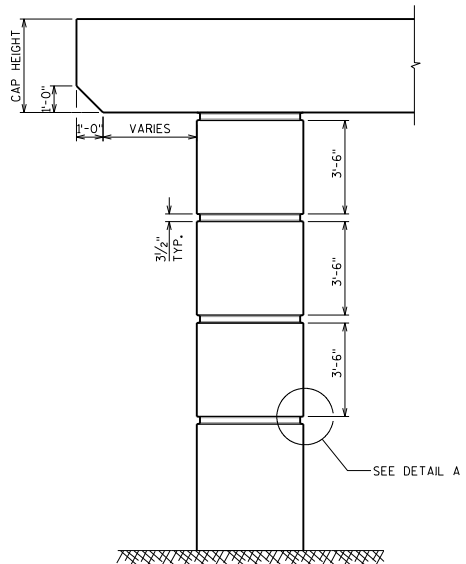
WING & PARAPET AESTHETIC DETAILS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

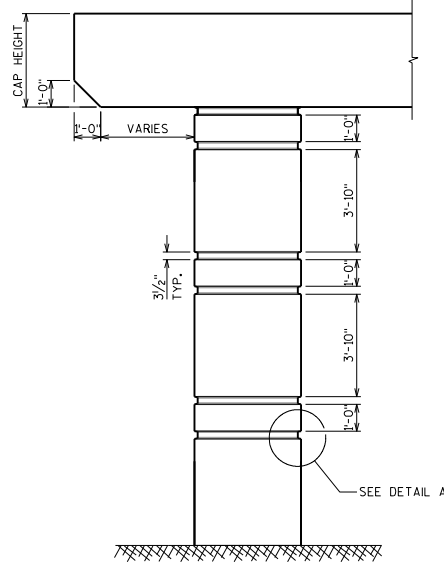
APPROVED: Bill Oliva

DATE:
7-15

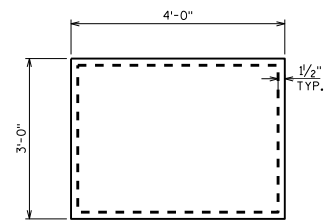
STANDARD 4.04



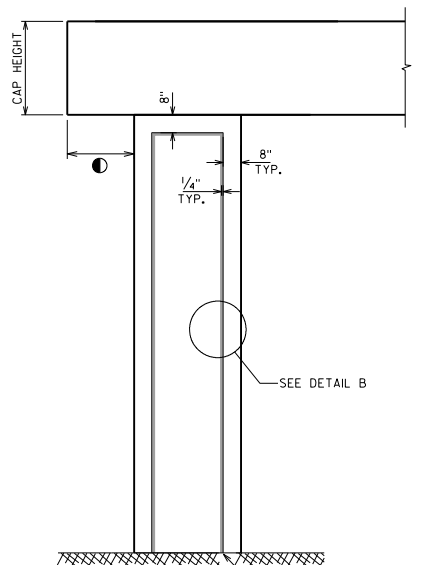
(P1) SINGLE RUSTICATION LINES



(P2) DOUBLE RUSTICATION LINES

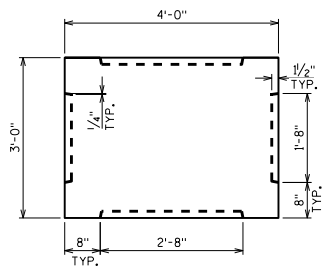


SECTION THRU COLUMN
SINGLE RUSTICATION LINES AND
DOUBLE RUSTICATION LINES

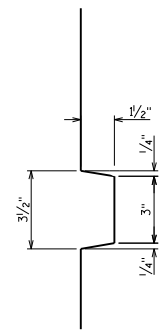


(P3) RECESSED PANEL

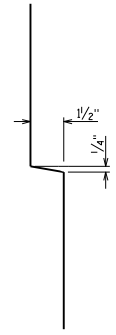
● DIM. = APPROXIMATELY 3/4 CAP HEIGHT



SECTION THRU COLUMN
RECESSED PANEL



DETAIL A

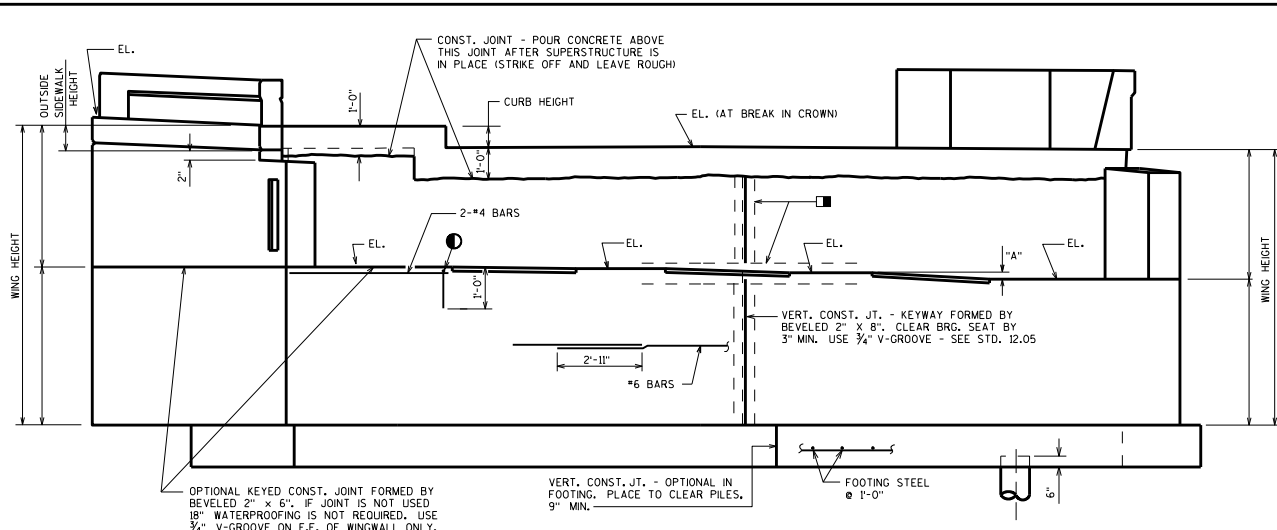


DETAIL B

EXTEND RECESS 1'-0" MIN. BELOW GRADE

MULTI-COLUMNED PIER AESTHETIC DETAILS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <u>Bill Oliva</u>	DATE: 7-15

STANDARD 4.05



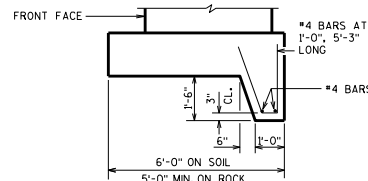
FRONT ELEVATION

DESIGNER NOTES

- PIILING SPACING IN ABUTMENT FOOTING SHALL BE 8'-0" MAXIMUM.
- WHEN BODY SECTION IS MORE THAN 50'-0" LONG, PROVIDE VERTICAL CONSTRUCTION JOINT. RUN BAR STEEL THRU JOINT. SEAL JOINT WITH 18" RUBBERIZED MEMBRANE WATERPROOFING. SEE STD. 12.09 FOR ALTERNATE CONSTRUCTION JOINT.
- IN "FRONT ELEVATION" VIEW, GIVE ELEVATION OF ALL BEARING AREAS AND ELEVATION AT BOTTOM OF PARAPETS AT EACH END OF WINGS. ALL ELEVATIONS ARE TAKEN AT FRONT FACE OF BACKWALL.
- LAP LENGTHS FOR HORIZONTAL BARS SHALL BE BASED ON A "CLASS C" TOP TENSION LAP SPLICE.
- PARAPET NOT SHOWN IN PLAN VIEW FOR CLARITY.
- ABUTMENT DETAILED WITHOUT STRUCTURAL APPROACH SLAB. SEE STD. 12.10 THRU 12.13 FOR STRUCTURAL APPROACH DETAILS.

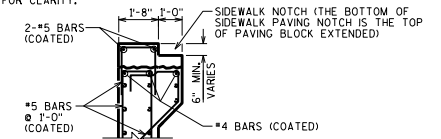
LEGEND

- 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZ. AND VERT. JOINTS ON BACKFACE ABOVE FOOTING.
- KEYED CONSTRUCTION JOINT FORMED BY BEVELED 2" X 6".
- #4 AT 9" BEAM SEAT, SPACE AT 1'-0" BETWEEN SEATS. THIS STEEL IS REQUIRED ONLY IF DIMENSION "A" EXCEEDS 4".
- 1'-5" WHEN VERTICAL FACE PARAPET TYPE "TX" IS USED.
- 4" WHEN VERTICAL FACE PARAPET TYPE "TX" IS USED.
- WINGWALL WIDTH SHALL BE 1'-6" WHEN TYPE "M" RAILING, VERTICAL FACE PARAPET "TX", OR SINGLE SLOPE PARAPET "565S" IS USED. "565S" SHOULD NOT BE USED ON A SIDEWALK. WINGWALL WIDTH SHALL BE 1'-9" WHEN TYPE "NY3" OR "NY4" RAILING IS USED.
- 3'-3" (SLOPE PAVING), 4'-6" (HEAVY RIPRAP)
- PAVING NOTCH IS 1'-0" WIDE BY 1'-4" DEEP IF STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED.
- SIDEWALL IS 1'-3" WIDE IF STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED.
- SHOW ALL BARS FOR CLARITY.

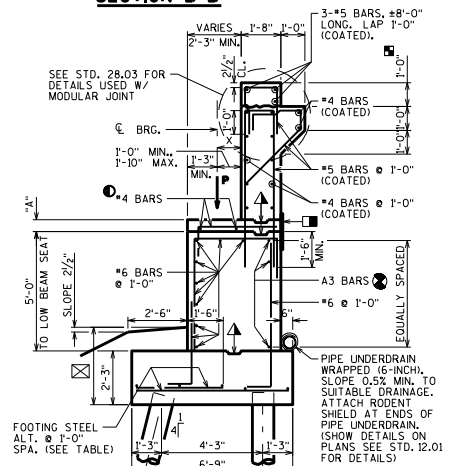


KEY DETAIL

FOR SILL ABUTMENT WITHOUT PILING PLACED ON SOIL

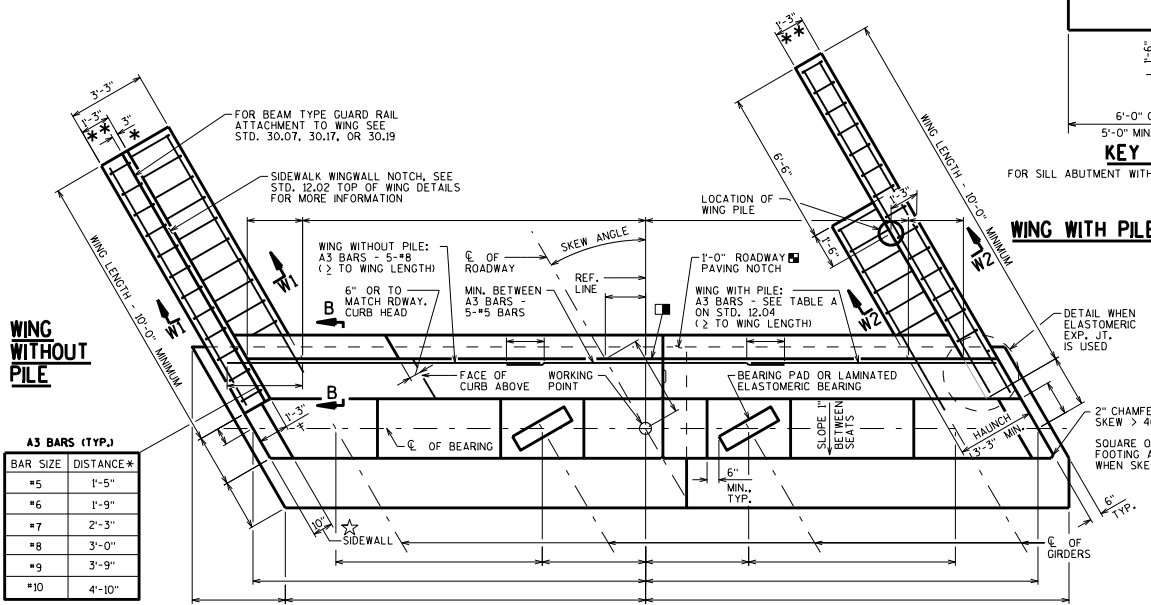


SECTION B-B



SECTION THRU BODY

ALL FOOTING BARS NOT IDENTIFIED ARE #5 BARS



A3 BARS (TYP.)

BAR SIZE	DISTANCE*
#5	1'-5"
#6	1'-9"
#7	2'-3"
#8	3'-0"
#9	3'-9"
#10	4'-10"

* OR EQUIVALENT STANDARD HOOK

WING WITH SIDEWALK

PLAN

WING WITH SLOPED FACE PARAPET

h = WING HEIGHT (FT.)
 $P = \gamma D C (P D C)^2 \gamma D W (P D W)^2 \gamma L L (L L) (k/FT.)$

PILE REACTIONS PER FOOT IN KIPS

FRONT ROW = $P [(0.22 + X/4.25)] + [(n + 2.25)^2 / 310] + 4.6$
BACK ROW = $P [(0.78 - X/4.25)] - [(n + 2.25)^2 / 705] + 16.8$

(PILES MUST ALSO BE DESIGNED TO ACCOUNT FOR LATERAL LOADS)

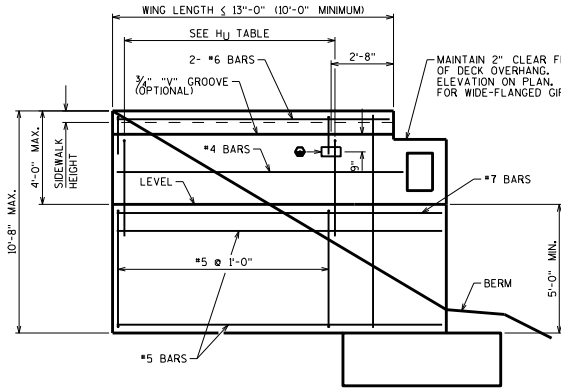
P k/FT.	FOOTING STEEL SIZE
20	#6
40	#7
62	#8
75	#9

ABUTMENT TYPE A3

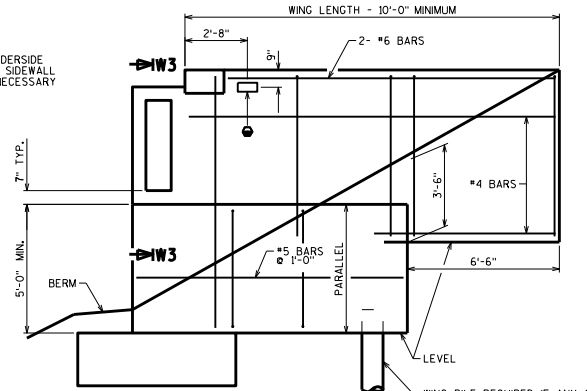
STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION
 STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva

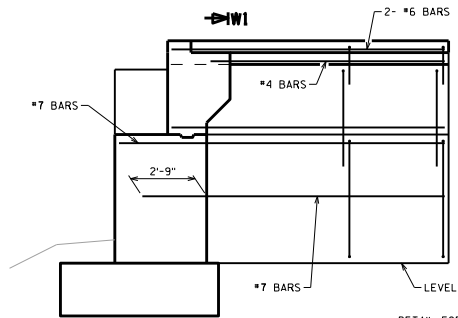
DATE:
7-15



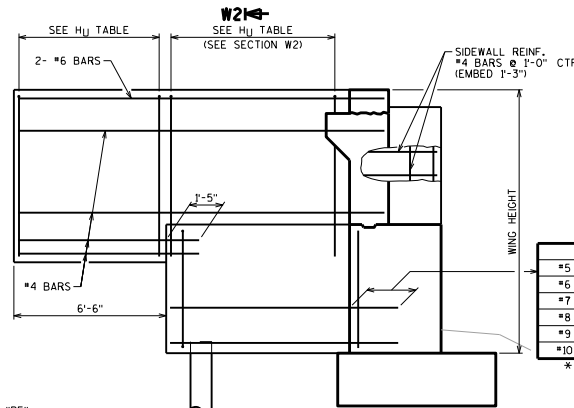
WING WITHOUT PILE ELEVATION
(FRONT FACE)



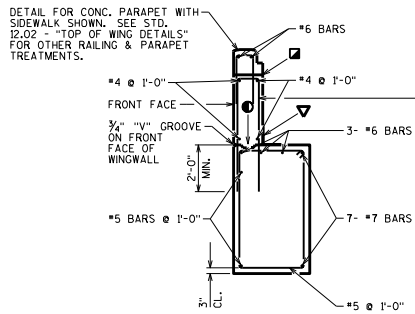
WING WITH PILE ELEVATION
(FRONT FACE)



WING WITHOUT PILE ELEVATION
(BACK FACE)



WING WITH PILE ELEVATION
(BACK FACE)

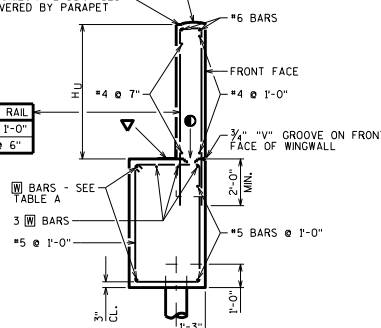


SECTION W1
(WING WITHOUT PILE)

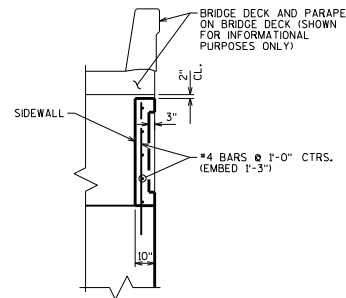
H _U	STEEL RAIL	CONC. RAIL
< 7'-0"	#6 @ 9"	#5 @ 1'-0"
7'-0" - 9'-6"	#6 @ 9"	#5 @ 6"

DETAIL FOR TYPE "LE", "HF", "PF", "SB", OR ".SS" PARAPETS SHOWN. SEE STD. 12.02 - "TOP OF WING DETAILS" FOR OTHER RAILING & PARAPET TREATMENTS.

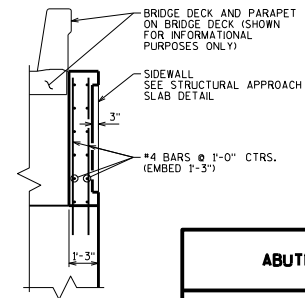
FINISH HORIZONTAL SURFACES NOT COVERED BY PARAPET



SECTION W2
(WING WITH PILE)



SECTION W3
(WITHOUT STRUTURAL APPROACH SLAB)



SECTION W3
(WITH STRUTURAL APPROACH SLAB)

DESIGNER NOTES

- LENGTH OF A3 BARS SHALL BE ≥ TO WING LENGTH.
- WING WITH PILE & WING WITHOUT PILE CAN BE USED FOR EITHER SIDEWALK OR SLOPED FACE PARAPETS. THE TYPE OF WING TO USE IS BASED ONLY ON THE WING HEIGHT AND WING LENGTH LIMITATIONS SHOWN.
- LAP LENGTH FOR HORIZONTAL BARS SHALL BE BASED ON A "CLASS C" TOP TENSION LAP SPLICE.
- BARS IN WINGS, ABUTMENT BACKWALL, AND PAVING BLOCK SHALL BE EPOXY COATED.
- NAME PLATE (ONLY FOR TYPE "F", "W", AND "M" OR TIMBER RAIL AS SHOWN ON STANDARD 30.24). LOCATE NAME PLATE ON FIRST RIGHT WING TRAVELING UP STATION.
- FRONT ROW PILE DESIGN IS BASED ON AN EQUIVALENT FLUID UNIT WEIGHT OF SOIL OF 40 P.C.F. WITH $\mu_{EH} = 150$, AND SUPERSTRUCTURE REACTIONS "P". BACK ROW PILE DESIGN IS BASED ON AN EQUIVALENT FLUID UNIT WEIGHT OF SOIL OF 40 P.C.F. WITH $\mu_{EH} \text{ MIN.} = 0.90$, AND "P".
- FOR MODULAR EXPANSION JOINTS WITH CONCRETE DIAPHRAGMS RUNNING TO EDGE OF DECK; IF SIDEWALL IS USED, FORM SIDEWALL 2" BELOW CONCRETE DIAPHRAGM.
- CONSTRUCTION JOINT. LEAVE ROUGH, REQUIRED FOR PRESTRESSED CONCRETE SUPERSTRUCTURES. OPTIONAL FOR OTHERS. POUR CONCRETE ABOVE THIS JOINT AFTER DECK IS IN PLACE.
- OPTIONAL CONSTRUCTION JOINT FORMED BY BEVELED 2" X 6" KEYWAY WITH MEMBRANE ON BACKFACE.
- "B" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.
- ABUTMENT DETAILED WITHOUT STRUCTURAL APPROACH SLAB. SEE STD. 12.10 THRU 12.13 FOR STRUCTURAL APPROACH DETAILS.

LRFD DESIGN LOADS

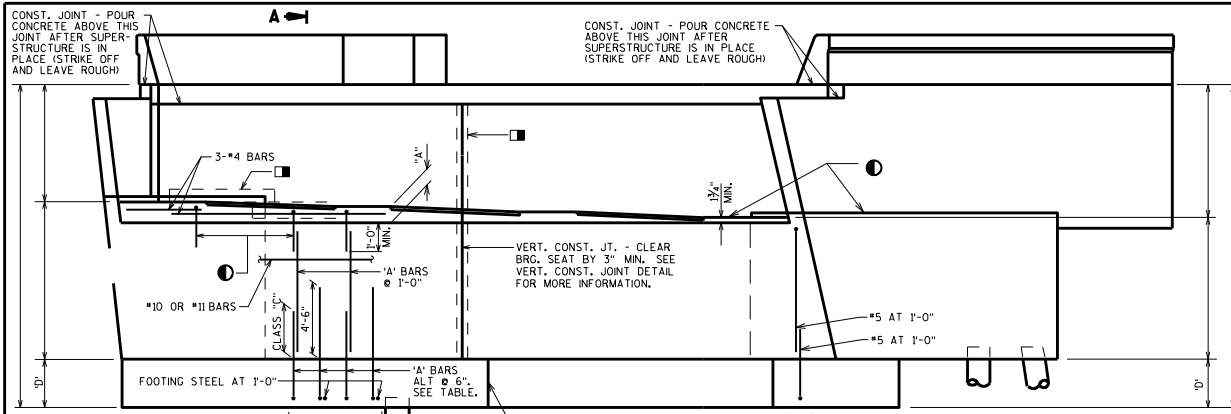
LIVE LOAD = 2'-0" SURCHARGE
LOAD FACTORS:
 $\gamma_{DC} = 1.25$
 $\gamma_{DW} = 1.50$
 $\gamma_{EH} = 1.50$
 $\gamma_{EH} \text{ MIN.} = 0.90$
 $\gamma_{EV} = 1.35$
 $\gamma_{LL} = 1.75$
 EXPOSURE CLASS $2_e = 0.75$
 $f_y = 60,000 \text{ P.S.I.}$
 $f_c = 3,500 \text{ P.S.I.}$
 HORIZONTAL EARTH LOAD BASED ON:
 35 P.C.F. EQUIVALENT FLUID UNIT WEIGHT OF SOIL

TABLE A

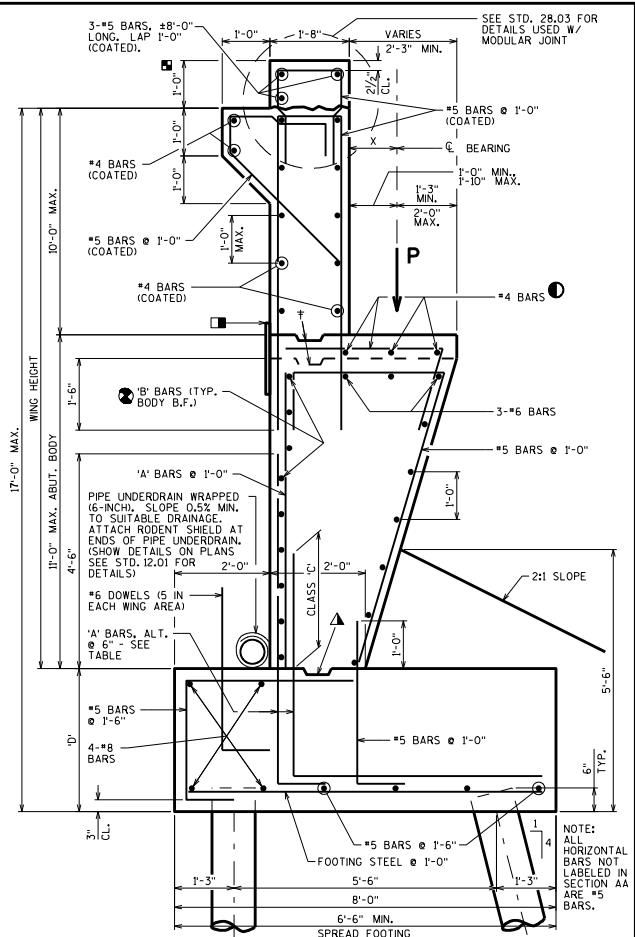
WING 2 LENGTH	WING 2 HEIGHT				BARS
	10'-0"	11'-6"	13'-0"	14'-6"	
12'-0"		6-#6's	7-#5's		W A3
16'-0"	8-#6's	7-#7's	8-#7's		W A3
20'-0"	8-#7's	9-#7's	9-#8's	10-#8's	W A3
24'-0"	9-#8's	10-#8's	10-#9's	8-#10's	W A3
26'-0"	9-#9's	10-#9's	9-#9's + 10-#9's		W A3

* USE 4'-6" FOR LOWER WING POUR WIDTH
 ** USE 3'-3" MIN. FOR BEARING SEAT WIDTH

ABUTMENT TYPE A3	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <i>Bill Oliva</i>	DATE: 7-15



FRONT ELEVATION



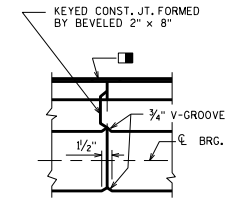
SECTION A-A

DESIGNER NOTES

PIILING SPACING IN ABUTMENT FOOTING SHALL BE 8'-0" MAXIMUM.
 WHEN BODY SECTION IS MORE THAN 50'-0"± LONG, PROVIDE VERTICAL CONSTRUCTION JOINT. RUN BAR STEEL THRU JOINT, SEAL JOINT WITH 18" RUBBERIZED MEMBRANE WATERPROOFING. SEE STD. 12.09 FOR ALTERNATE CONSTRUCTION JOINT.

DESIGNER NOTES CONT'D

IN "FRONT ELEVATION" VIEW, GIVE ELEVATION OF ALL BEARING AREAS AND ELEVATION AT BOTTOM OF PARAPETS AT EACH END OF WINGS. ALL ELEVATIONS ARE TAKEN AT FRONT FACE OF BACKWALL.
 LAP LENGTHS FOR HORIZONTAL BARS SHALL BE BASED ON A "CLASS C" TOP TENSION LAP SPLICE.
 PARAPET NOT SHOWN IN PLAN VIEW FOR CLARITY.
 SEE STD. 12.03 FOR ADDITIONAL DETAILS.
 ABUTMENT DETAILED WITHOUT STRUCTURAL APPROACH SLAB. SEE STD. 12.10 THRU 12.13 FOR STRUCTURAL APPROACH DETAILS.



VERT. CONST. JOINT

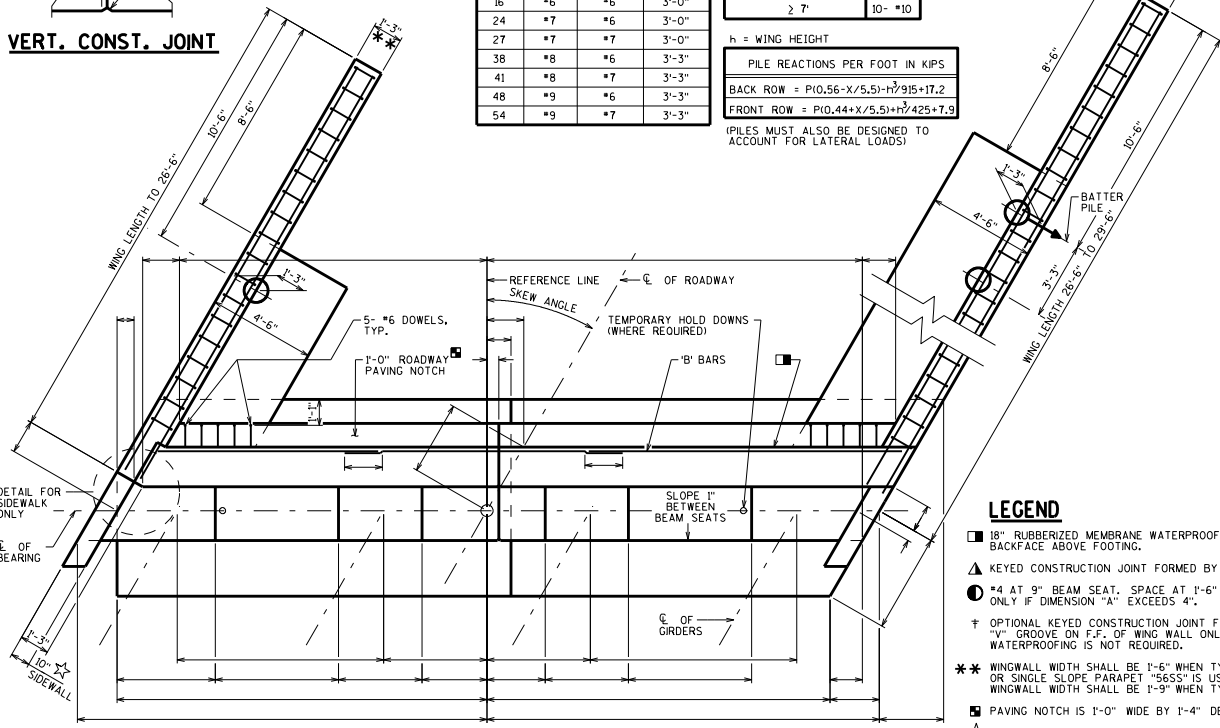
$$P = \gamma D C (P_{DC} + \gamma D W) P_{DW} + \gamma L L (P_{LL})$$

P, K/FT	'A' BAR SIZE	FOOTING STEEL SIZE	FOOTING DEPTH 'D'
16	#6	#6	3'-0"
24	#7	#6	3'-0"
27	#7	#7	3'-0"
38	#8	#6	3'-3"
41	#8	#7	3'-3"
48	#9	#6	3'-3"
54	#9	#7	3'-3"

ABUTMENT BODY DEPTH	'B' BARS
< 7'	9- #11
≥ 7'	10- #10

PILE REACTIONS PER FOOT IN KIPS	
BACK ROW	$= P(0.56 - X/5.5) - 17.915 + 17.2$
FRONT ROW	$= P(0.44 + X/5.5) + 17.425 + 7.9$

PILES MUST ALSO BE DESIGNED TO ACCOUNT FOR LATERAL LOADS!

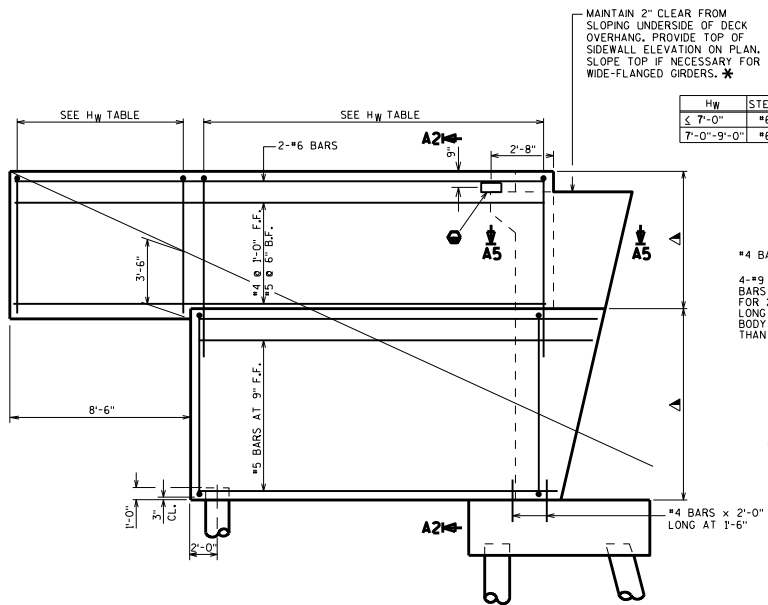


PLAN

LEGEND

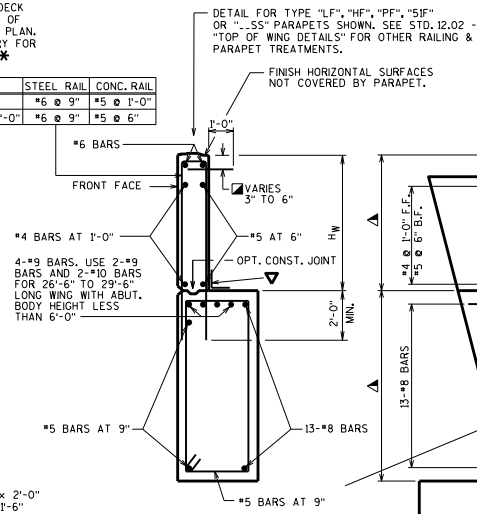
- 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZ. AND VERT. JOINTS ON BACKFACE ABOVE FOOTING.
- ▲ KEYED CONSTRUCTION JOINT FORMED BY BEVELED 2" X 6".
- #4 AT 9" BEAM SEAT. SPACE AT 1'-6" BETWEEN SEATS. THIS STEEL IS REQUIRED ONLY IF DIMENSION "A" EXCEEDS 4'.
- † OPTIONAL KEYED CONSTRUCTION JOINT FORMED BY BEVELED 2" X 6". USE 3/4" V" GROOVE ON F.F. OF WING WALL ONLY. IF JOINT IS NOT USED, WATERPROOFING IS NOT REQUIRED.
- ** WINGWALL WIDTH SHALL BE 1'-6" WHEN TYPE "M" RAILING, VERTICAL FACE PARAPET "TX", OR SINGLE SLOPE PARAPET "56SS" IS USED. "56SS" SHOULD NOT BE USED ON A SIDEWALK. WINGWALL WIDTH SHALL BE 1'-9" WHEN TYPE "NYS" OR "NY4" RAILING IS USED.
- PAVING NOTCH IS 1'-0" WIDE BY 1'-4" DEEP IF STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED.
- ☆ SIDEWALL IS 1'-3" WIDE IF STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED.
- SHOW ALL BARS FOR CLARITY.

ABUTMENT A4 PILE FOOTING	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <u>Bill Oliva</u>	DATE: 7-15

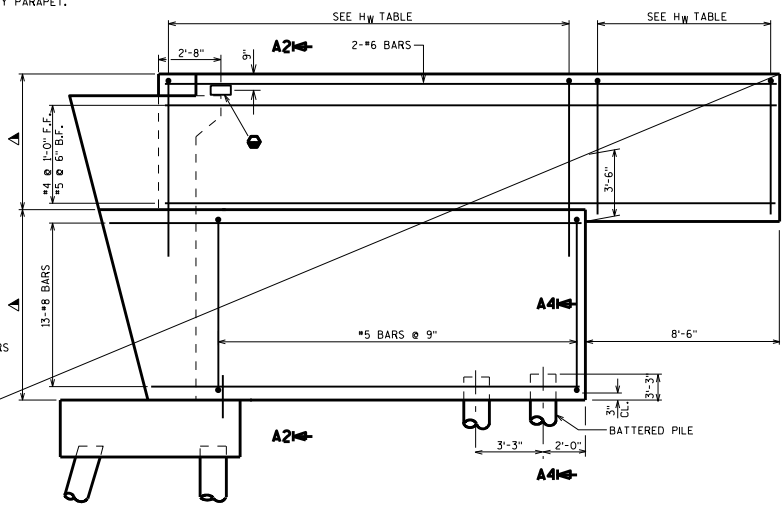


WING ELEVATION
WING LENGTH TO 26'-6"

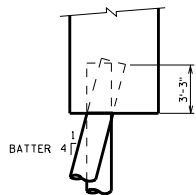
H _w	STEEL RAIL	CONC. RAIL
≤ 7'-0"	#6 @ 9"	#5 @ 1'-0"
7'-0"-9'-0"	#6 @ 9"	#5 @ 6"



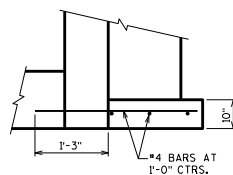
SECTION A2
ALL WING LENGTHS



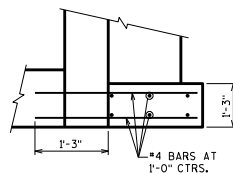
WING ELEVATION
WING LENGTH OVER 26'-6" TO 29'-6"



SECTION A4



SECTION A5
(WITHOUT STRUCTURAL APPROACH SLAB)



SECTION A5
(WITH STRUCTURAL APPROACH SLAB)

DESIGNER NOTES

BODY DESIGN IS BASED ON AN EQUIVALENT FLUID UNIT WEIGHT OF SOIL OF 40 P.C.F., A 1'-6" SURCHARGE, AND SUPERSTRUCTURE REACTIONS "P".

WING DESIGN IS BASED ON AN EQUIVALENT FLUID UNIT WEIGHT OF SOIL OF 35 P.C.F. AND A 2'-0" SURCHARGE. A 5 KIP LATERAL RESISTANCE IS USED FOR EACH WING PILE.

FRONT ROW PILE DESIGN IS BASED ON AN EQUIVALENT FLUID UNIT WEIGHT OF SOIL OF 40 P.C.F. WITH $\gamma_{DEH} = 1.50$, AND SUPERSTRUCTURE REACTIONS "P". BACK ROW PILE DESIGN IS BASED ON AN EQUIVALENT FLUID UNIT WEIGHT OF SOIL OF 20 P.C.F. WITH $\gamma_{DEHMIN} = 0.90$, AND "P".

UNIT WEIGHT OF SOIL IS ASSUMED AS 120 P.C.F.

BRIDGE SEATS BETWEEN BEARINGS SHALL SLOPE 1" FROM FRONT FACE OF BACKWALL.

PAY LIMITS FOR EXCAVATION FOR STRUCTURES & GRANULAR BACKFILL IS SHOWN IN CHAPTER 12 OF THE BRIDGE MANUAL.

BARS IN WINGS, ABUTMENT BACKWALL, AND PAVING BLOCK SHALL BE EPOXY COATED.

NAME PLATE (ONLY FOR TYPE "F", "W" AND "M" OR TIMBER RAIL AS SHOWN ON STANDARD 30.24), LOCATE NAME PLATE ON FIRST RIGHT WING TRAVELING UP STATION.

FOR MODULAR EXPANSION JOINTS W/CONC. DIAPH. RUNNING TO EDGE OF DECK: IF SIDEWALL IS USED, FORM SIDEWALL 2" BELOW CONC. DIAPH.

#4 DOWELS (COATED), 2'-0" LONG AT 1'-0" CTRS. FROM WING TIP TO PAVING NOTCH. PLACE IN WING ADJACENT TO SURFACE DRAIN APRON ONLY.

DIMENSIONS TO BE CONSTANT.

18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.

ABUTMENT DETAILED WITHOUT STRUCTURAL APPROACH SLAB. SEE STD. 12.10 THRU 12.13 FOR STRUCTURAL APPROACH DETAILS.

LRFD DESIGN LOADS

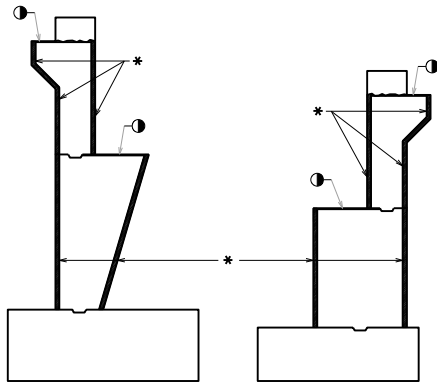
LIVE LOAD
BODY = 1'-6" SURCHARGE
WINGS = 2'-0" SURCHARGE
HORIZ. EARTH LOAD BASED ON:
BODY = 40 P.C.F. EQUIV. FLUID UNIT WGT. OF SOIL
WINGS = 35 P.C.F. EQUIV. FLUID UNIT WGT. OF SOIL
LOAD FACTORS:
 $\gamma_{DC} = 1.25$
 $\gamma_{DW} = 1.50$
 $\gamma_{DEH} = 1.50$
 $\gamma_{DEHMIN} = 0.90$
 $\gamma_{DEW} = 1.35$
 $\gamma_{LL} = 1.75$
EXPOSURE CLASS 2, $\gamma_E = 0.75$
 $f_y = 60,000$ P.S.I.
 $f'_c = 3,500$ P.S.I.

**ABUTMENT A4
PILE FOOTING**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

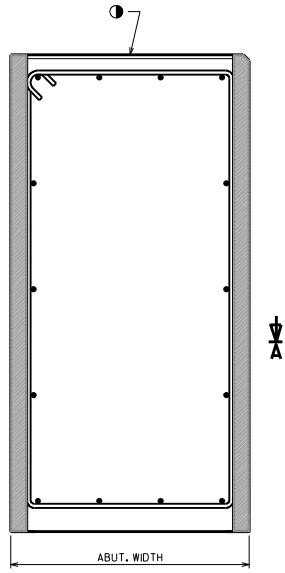
APPROVED: *Bill Oliva*

DATE:
7-15



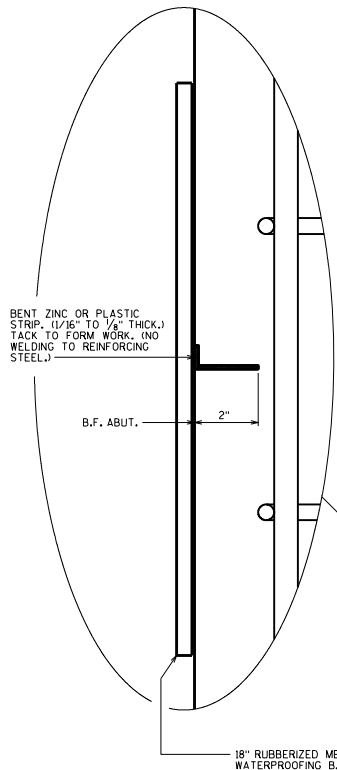
A4 ABUTMENT

A3 ABUTMENT



SECTION THRU ABUTMENT BODY

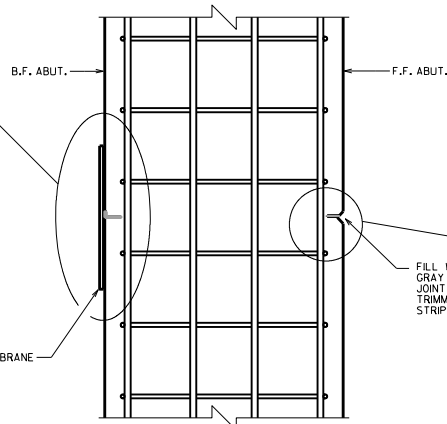
A1 ABUTMENT SHOWN, A5 SIMILAR



BENT ZINC OR PLASTIC STRIP. (1/16" TO 1/8" THICK.) TACK TO FORM WORK. (NO WELDING TO REINFORCING STEEL.)

B.F. ABUT.

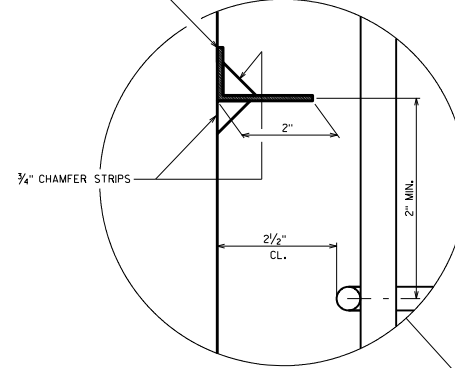
18" RUBBERIZED MEMBRANE WATERPROOFING B.F.



SECTION A-A

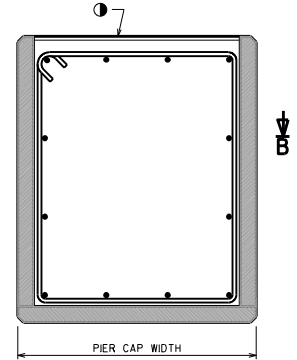
ALTERNATE CONSTRUCTION JOINT AT ABUTMENT

BENT ZINC OR PLASTIC STRIP. (1/16" TO 1/8" THICK.) TACK TO FORM WORK. (NO WELDING TO REINFORCING STEEL.) REMOVE OR TRIM AFTER FORM REMOVAL.

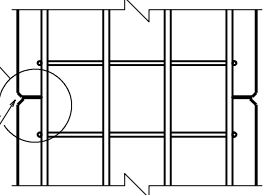


3/4" CHAMFER STRIPS

FILL WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER AFTER TRIMMING OR REMOVING STRIP.



SECTION THRU PIER CAP



SECTION B-B

ALTERNATE CONSTRUCTION JOINT AT PIER CAP

NOTES

PARTIAL ZINC OR PLASTIC BULKHEAD MAY BE USED AS ALTERNATE CONSTRUCTION JOINT, WITH THE PERMISSION OF THE ENGINEER, AT THE CONTRACTOR'S EXPENSE.

VERTICAL CONSTRUCTION JOINT KEYWAY IS NOT REQUIRED WHEN USING ALTERNATE CONSTRUCTION JOINT.

CARE IS TO BE USED IN CASTING CONCRETE AROUND BULKHEAD TO PREVENT DISLOCATION OR MISALIGNMENT OF THE BULKHEAD.

SAW CUTTING JOINT IS NOT ALLOWED.

1 USE A JOINT TOOL TO CONSTRUCT A CONTRACTION JOINT APPROXIMATELY 1/2" DEEP.

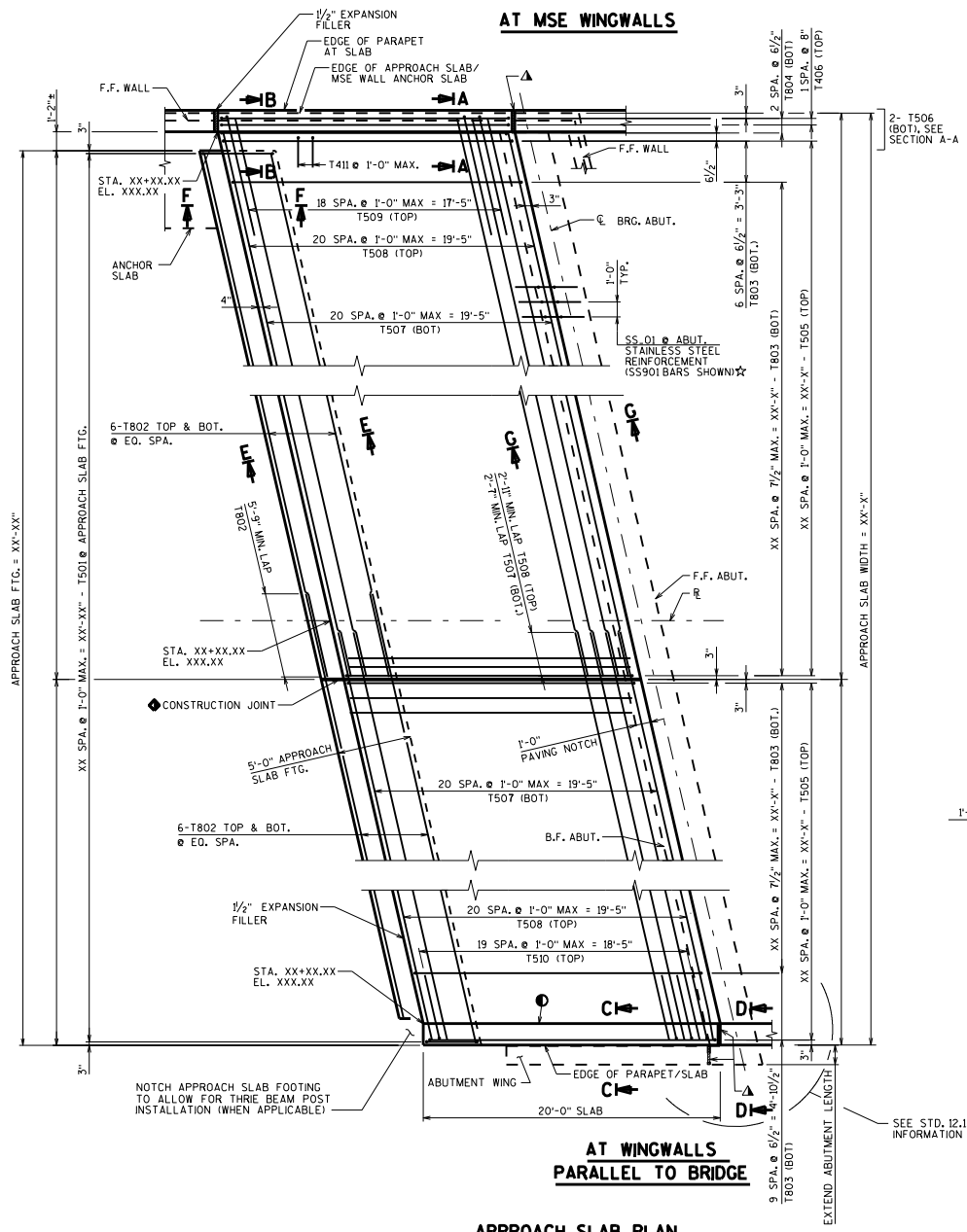
* BENT ZINC OR PLASTIC STRIP.

ALTERNATE CONSTRUCTION JOINT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva

DATE:
7-15



AT WINGWALLS PARALLEL TO BRIDGE
APPROACH SLAB PLAN
 INSTALLATION (WHEN APPLICABLE)
 (A1 ABUT. SHOWN - A3 & A4 ABUT. SIMILAR)

DESIGNER NOTES

STRUCTURAL APPROACH SLABS AND PARAPETS SHALL BE USED ON ALL BRIDGES CARRYING TRAFFIC VOLUMES GREATER THAN 3500 AADT (FUTURE DESIGN YEAR). OTHER LOCATIONS CAN BE CONSIDERED WITH THE APPROVAL OF THE CHIEF STRUCTURAL DESIGN ENGINEER.

STRUCTURAL APPROACH SLABS TO BE PART OF THE BRIDGE PLAN. BID ITEMS ARE CONCRETE MASONRY BRIDGES, BAR STEEL REINFORCEMENT HS COATED BRIDGES, ETC. POLYETHYLENE SHEETS SHALL BE INCIDENTAL TO CONCRETE MASONRY BRIDGES.

QUANTITIES FOR APPROACH SLABS SHALL BE SHOWN IN A SEPARATE COLUMN WITHIN THE TOTAL ESTIMATED QUANTITIES TABLE IN THE FINAL PLANS.

◆ CONSTRUCTION JOINT REQUIRED WHEN WIDTH OF SUPERSTRUCTURE EXCEEDS 90'. RUN REINFORCEMENT THROUGH THE JOINT.

LONGITUDINAL APPROACH SLAB REINFORCEMENT SHALL BE PLACED PARALLEL TO THE APPROACH (I.E., NOT NORMAL TO THE ABUTMENT WITH SKEWED STRUCTURES).

STRUCTURE APPROACH SLABS TO BE DETAILED TO MATCH THE BRIDGE DECK (I.E., PROTECTIVE SURFACE TREATMENT, STAINLESS STEEL REINFORCEMENT, LONGITUDINAL GROOVING, ETC.). WHERE HIGH PERFORMANCE CONCRETE IS USED AT THE BRIDGE DECK, HPC SHALL BE USED FOR THE APPROACH SLAB ONLY (I.E., HPC IS NOT REQUIRED FOR APPROACH SLAB FOOTING).

☆ THE BID ITEM FOR SS901 AND SS601 BARS SHALL BE STANDARD SPECIAL PROVISION "BAR STEEL REINFORCEMENT HS STAINLESS STRUCTURES".

DESIGNER TO COORDINATE LOCATION OF SURFACE DRAINS, INLETS, AND/OR FLUMES WITH ROADWAY DESIGNER AND FDM SDD B02 OR B03.

LEGEND

▲ SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF 1/2" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD 1/4" BELOW SURFACE OF CONCRETE).

● SEE PARAPET STANDARD DETAILS FOR LOCATION OF NAME PLATE AND BENCH MARK WITH RESPECT TO THE END OF PARAPET.

DESIGN DATA

CONCRETE STRENGTH, f'c: 4,000 P.S.I.
 BAR STEEL REINFORCEMENT, GRADE 60, fy: 60,000 P.S.I.
 ALLOWABLE SOIL BEARING PRESSURE: 2,000 P.S.F.

NOTE:
 FOR NEW STRUCTURES ON NEW ALIGNMENTS, BASE AGGREGATE DENSE 1-1/4 INCH AS PER FDM 14-5 AND BRIDGE MANUAL FIGURE 12.6-2 SHALL BE UTILIZED. FOR REPLACEMENT STRUCTURES ON EXISTING ALIGNMENTS, THE EXISTING SOIL MAY REMAIN IN PLACE IF THE REGION SOILS ENGINEER DETERMINES THAT THE EXISTING SOIL BEARING PRESSURE MEETS THE REQUIREMENT ABOVE.

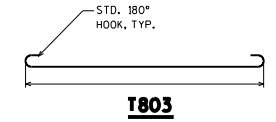
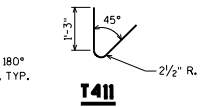
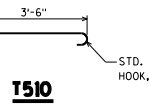
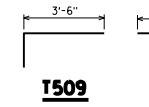
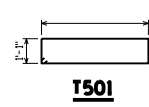
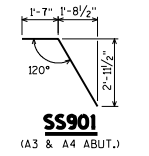
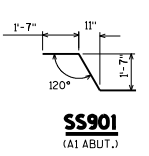
BILL OF BARS

NOTE: THE FIRST OR FIRST TWO DIGITS OF THE BAR MARK SIGNIFIES THE BAR SIZE.

BAR MARK	COAT	NO. REQ'D.	LENGTH	BEV	BAR SERIES	LOCATION
SS901			5'-0"	X		CONC. ABUT. DIAPH. TO APPROACH SLAB
SS901			5'-0"	X		CONC. BACKWALL TO APPROACH SLAB
SS601			3'-0"			STRUCTURE SLAB TO APPROACH SLAB

BAR MARK	COAT	NO. REQ'D.	LENGTH	BEV	BAR SERIES	LOCATION
T501	X			X		APPROACH SLAB FTG. - STIRRUP
T802	X					APPROACH SLAB FTG. - TRANS.
T803	X			X		APPROACH SLAB - LONG. - BOT.
T804	X					APPROACH SLAB - LONG. - BOT. - WALL
T505	X					APPROACH SLAB - LONG. - TOP.
T506	X					APPROACH SLAB - LONG. - WALL
T507	X					APPROACH SLAB - TRANS. - BOT.
T508	X					APPROACH SLAB - TRANS. - TOP.
T509	X	4'-10"	X			APPROACH SLAB - TRANS. - TOP - WALL
T510	X	4'-1"	X			APPROACH SLAB - TRANS. - TOP - WING
T411	X	3'-0"	X			APPROACH SLAB - TRANS. - WALL

STAINLESS STEEL (A1 ABUT. - GIRDER SPAN) → SS901
 STAINLESS STEEL (A3 & A4 ABUT.) → SS901
 STAINLESS STEEL (A1 ABUT. - SLAB SPAN) → SS601



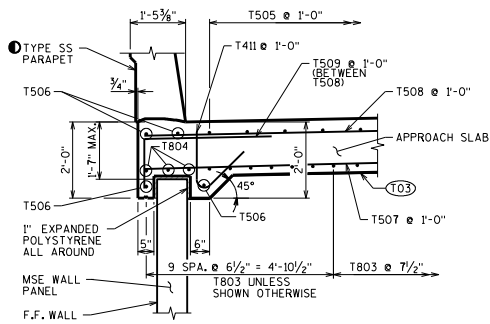
SEE STD. 12.13 FOR ADDITIONAL INFORMATION

SECTIONS A-A THRU G-G ARE SHOWN ON STANDARD 12.11 & 12.12

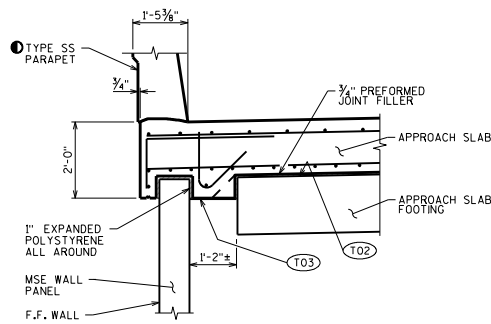
STRUCTURAL APPROACH SLAB

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION
 STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva DATE: 7-15



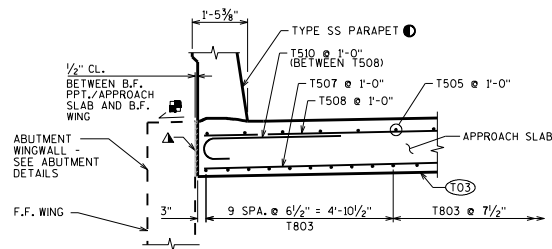
SECTION A-A
(AT MSE WINGWALLS)



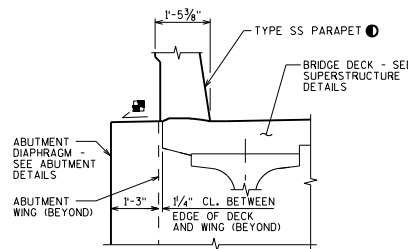
SECTION B-B
(AT MSE WINGWALLS)

LEGEND

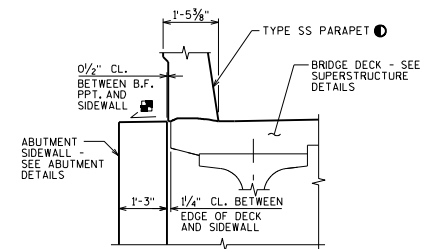
- (T02) STEEL TROWEL TOP SURFACE OF FOOTING AND PLACE MULTIPLE LAYERS (0.03\"/>



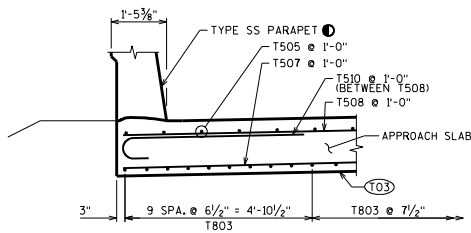
SECTION C-C
(AT WINGWALLS PARALLEL TO BRIDGE)



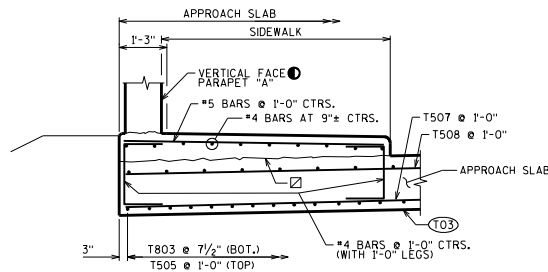
SECTION D-D
(AT WINGWALLS PARALLEL TO BRIDGE - A1 ABUT.)



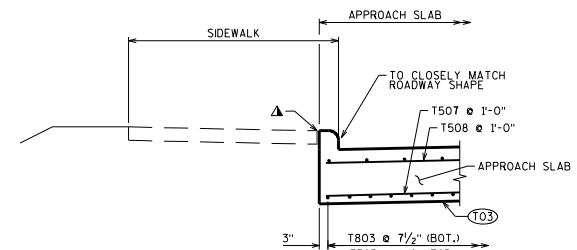
SECTION D-D*
(AT WINGWALLS PARALLEL TO BRIDGE - A3 & A4 ABUT.)



SECTION C-C*
(AT WINGWALLS PARALLEL TO ABUT.)



SECTION C-C*
(AT WINGWALLS PARALLEL TO ABUT.)



SECTION C-C*
(AT WINGWALLS PARALLEL TO ABUT.)

**STRUCTURAL APPROACH SLAB
DETAILS 1**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

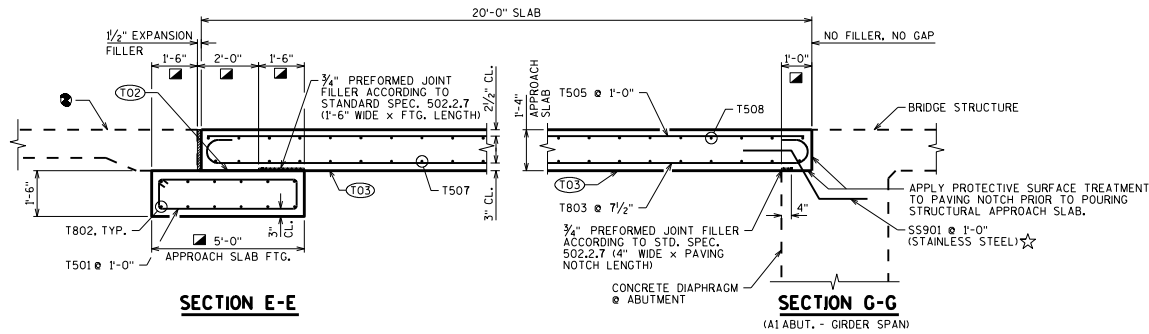
APPROVED: Bill Oliva

DATE:
7-15

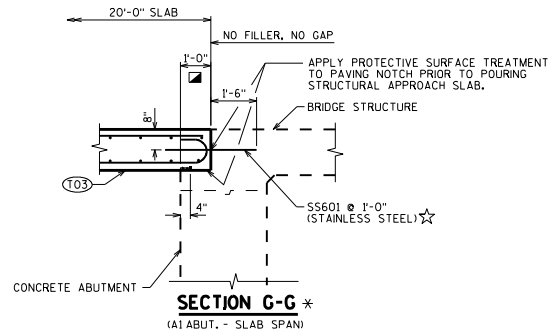
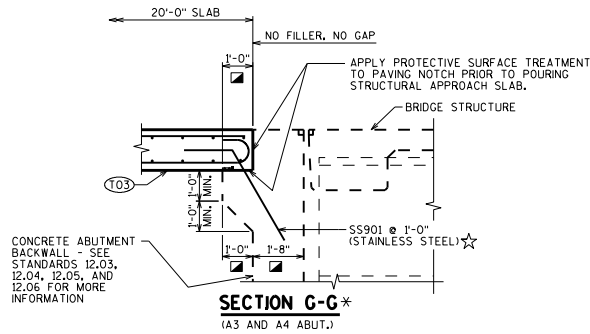
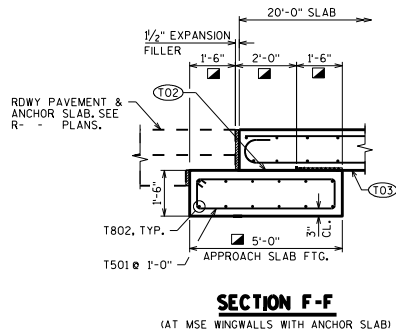
SECTIONS A-A THRU G-G ARE FROM STANDARD 12.10

STANDARD 12.11

SCALE: 5X



SECTION THRU APPROACH SLAB



LEGEND

- (T02) STEEL TROWEL TOP SURFACE OF FOOTING AND PLACE MULTIPLE LAYERS (0.03" MIN. TOTAL THK.) OF POLYETHYLENE SHEETS OVER THE ENTIRE TOP OF FOOTING.
- (T03) PLACE MULTIPLE LAYERS (0.03" MIN. TOTAL THK.) OF POLYETHYLENE SHEETS OVER THE ENTIRE TOP OF SUBGRADE BENEATH SLAB.
- ☑ MEASURED NORMAL TO ABUTMENT
- ⊙ FOLLOW FDM 14-10-15 REQUIREMENTS FOR ROADWAY APPROACH PAVEMENT.
- * SECTION REPRESENTATIVE OF SIMILAR LOCATION AS SHOWN ON STANDARD 12.10 FOR DIFFERENT APPLICATION.
- ☆ THE BID ITEM FOR SS901 AND SS601 BARS SHALL BE STANDARD SPECIAL PROVISION "BAR STEEL REINFORCEMENT HS STAINLESS STRUCTURES".

**STRUCTURAL APPROACH SLAB
DETAILS 2**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva

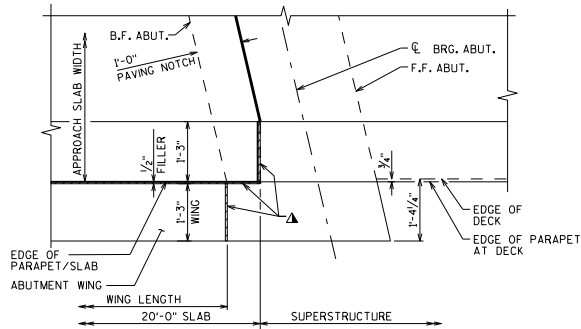
DATE:
7-15

SECTIONS A-A THRU G-G ARE FROM STANDARD 12.10

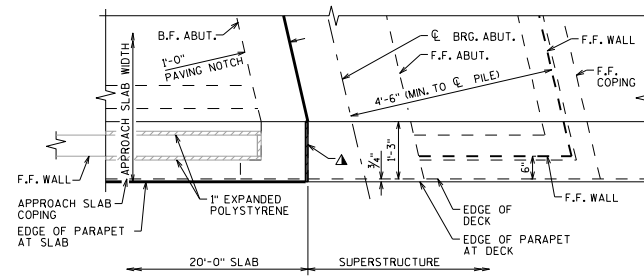
LEGEND

▲ SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF 1/2" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD 1/8" BELOW SURFACE OF CONCRETE).

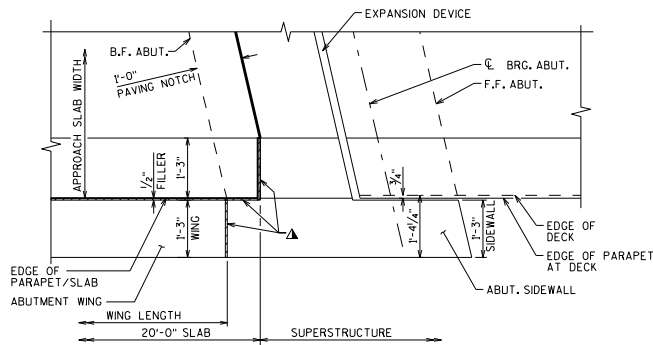
* PARTIAL PLAN REPRESENTATIVE OF SIMILAR LOCATION AS SHOWN ON STANDARD 12.10 FOR DIFFERENT APPLICATION.



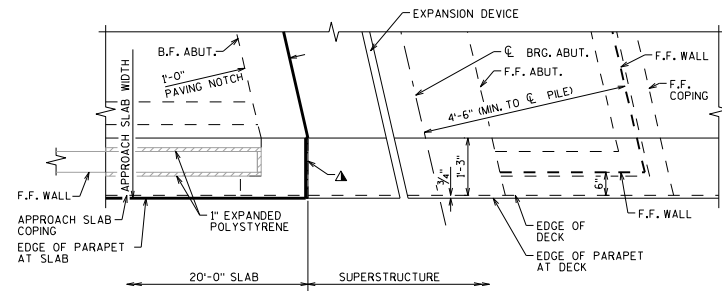
APPROACH SLAB PARTIAL PLAN
(AT WINGWALLS PARALLEL TO BRIDGE - A1 ABUT.)



APPROACH SLAB PARTIAL PLAN *
(AT WINGWALLS PARALLEL TO BRIDGE - A1 ABUT. AT MSE WINGWALLS)



APPROACH SLAB PARTIAL PLAN *
(AT WINGWALLS PARALLEL TO BRIDGE - A3 & A4 ABUT.)



APPROACH SLAB PARTIAL PLAN *
(AT WINGWALLS PARALLEL TO BRIDGE - A3 & A4 ABUT. AT MSE WINGWALLS)

**STRUCTURAL APPROACH SLAB
DETAILS 3**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

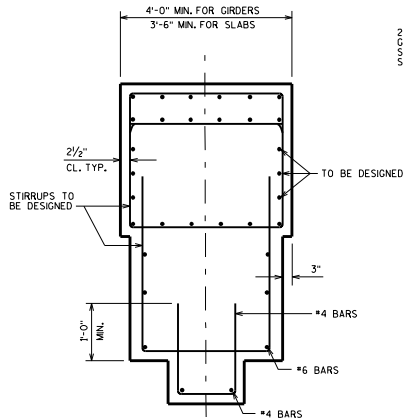
PARTIAL PLANS SHOWN HERE ARE FROM STANDARD 12.10

APPROVED: Bill Oliva

DATE:
7-15

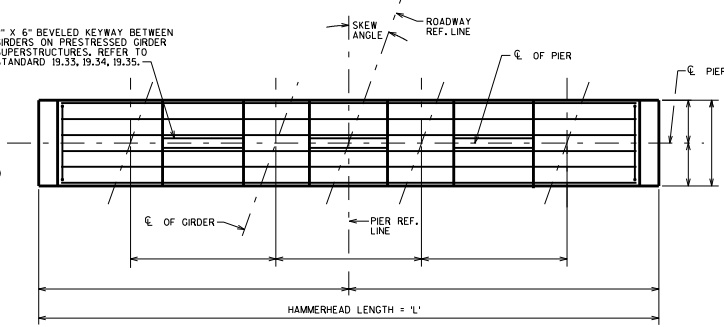
STANDARD 12.13

SCALE: 6X

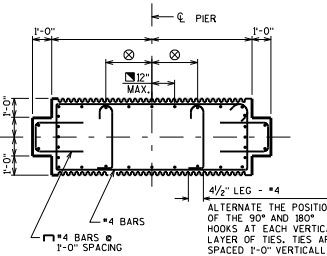


SECTION P1

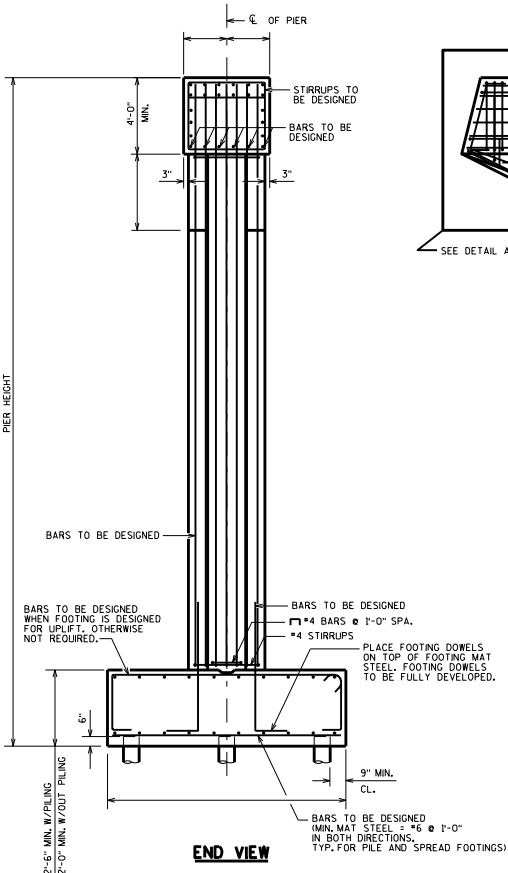
2" x 6" BEVELED KEYWAY BETWEEN GIRDERS ON PRESTRESSED GIRDER SUPERSTRUCTURES. REFER TO STANDARD 19.33, 19.34, 19.35.



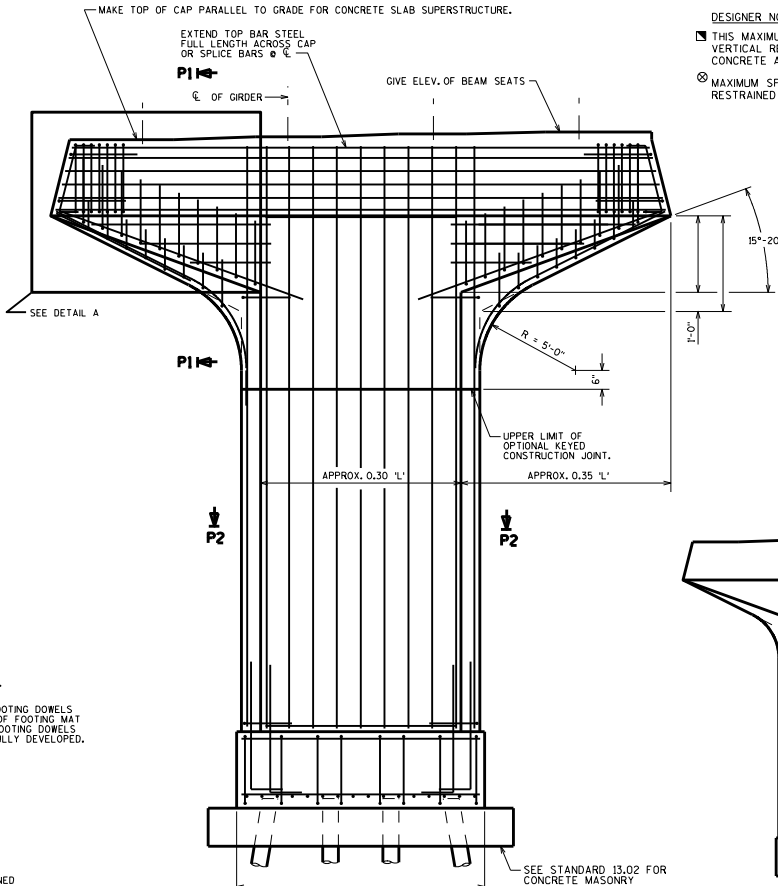
PLAN OF PIER CAP



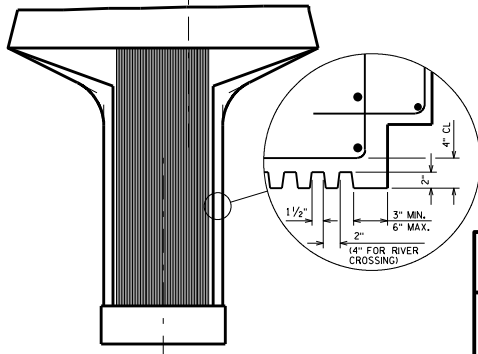
SECTION P2



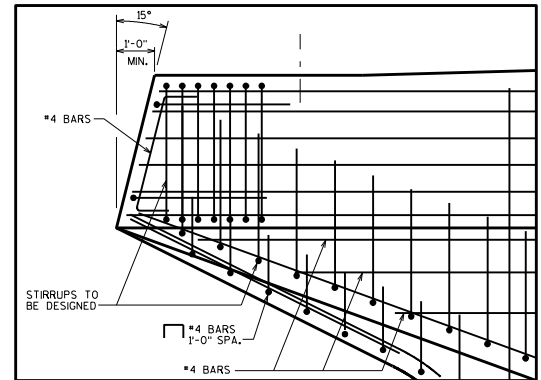
END VIEW



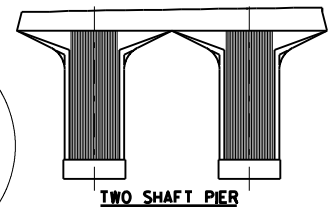
ELEVATION
LOOKING UP SHAFT



TEXTURING LIMITATIONS OF PIER WALL
(EACH FACE)



DETAIL A



TWO SHAFT PIER

DESIGNER NOTES

ALL BAR SPLICES TO BE BASED ON "CLASS C" TENSION LAP SPLICE UNLESS OTHERWISE SHOWN.

OPTIONAL KEYED CONSTRUCTION JOINTS IN SHAFT, IF PROVIDED, SHALL BE PLACED APPROXIMATELY 2'-0" ABOVE NORMAL WATER ELEVATION. OPTIONAL KEYED CONSTRUCTION JOINTS IN SHAFT SHOULD BE PROVIDED SO THAT THE MAXIMUM HEIGHT OF FOUR NEED NOT EXCEED 25'-0". DETAIL BAR SPLICES AT OPTIONAL JOINTS IF THE BAR PROJECTION WOULD BE GREATER THAN 20'-0".

KEYED CONSTRUCTION JOINTS SHALL BE FORMED BY BEVELED KEYWAY 4" DEEP X 1/3 THICKNESS OF SHAFT X 4'-0" LESS THAN LENGTH OF SHAFT. EXPOSED EDGES OF CONSTRUCTION JOINT SHALL BE FLUSH AND NOT BEVELED.

BEARING SEAT AREAS SHALL BE LEVEL EXCEPT FOR THE TWO CASES LISTED BELOW:

1. FOR GIRDER WITH 1/2" ELASTOMERIC BEARING PADS THAN WHEN THE BOTTOM OF THE GIRDERS SLOPE MORE THAN 1%. SEE STANDARD 13.01.

2. WHEN A CAP IS USED FOR CONCRETE SLAB SUPERSTRUCTURES MAKE THE TOP OF CAP PARALLEL TO GRADE. SEE STANDARD 18.01.

BEAM SEATS MAY BE ANGLED TO MATCH SKEW AT THE DESIGN ENGINEER'S DISCRETION.

SEE STANDARD 12.01 FOR ADDITIONAL REINFORCING STEEL IN BEARING AREA FOR BEAM SEATS THAT ARE 4" OR MORE ABOVE LOWEST BEAM SEAT.

FOR "HAMMERHEAD LENGTH" GREATER THAN 45'-0", CONSIDER A TWO SHAFT PIER FRAME RESEMBLING TWO HAMMERHEAD PIERS PLACED SIDE BY SIDE.

SEE STANDARD 13.01 FOR MINIMUM OFFSETS FROM BEARINGS TO SIDES OF CAP AND TO ADJACENT BEARING SEAT STEPS.

EPOXY COAT BAR STEEL DOWN TO TOP OF FOOTINGS IN ALL PIERS UNDER EXPANSION JOINTS AND ON ALL PIERS AT GRADE SEPARATIONS.

PLAN NOTES

THE BAR SPLICES AT THE OPTIONAL KEYED CONSTRUCTION JOINTS MAY BE ELIMINATED WHETHER OR NOT THE JOINT IS UTILIZED. PAYMENT WILL BE FOR THE ACTUAL BARS INSTALLED.

DESIGNER NOTES (CONT)

THIS MAXIMUM VERT. BAR SPACING APPLIES ONLY WHEN THE VERTICAL REINFORCEMENT IS 1% OR MORE OF THE GROSS CONCRETE AREA.

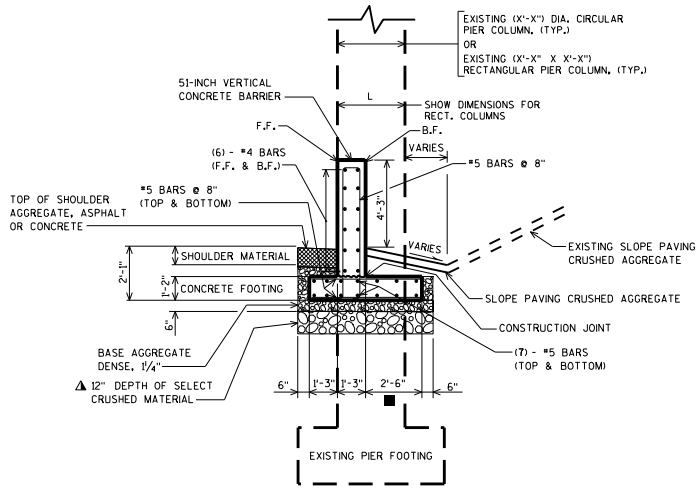
MAXIMUM SPACING BETWEEN UNRESTRAINED VERTICAL BAR AND RESTRAINED (TIED ACROSS MEMBER) VERTICAL BAR IS 24 INCHES

HAMMERHEAD PIER - TYPE 2

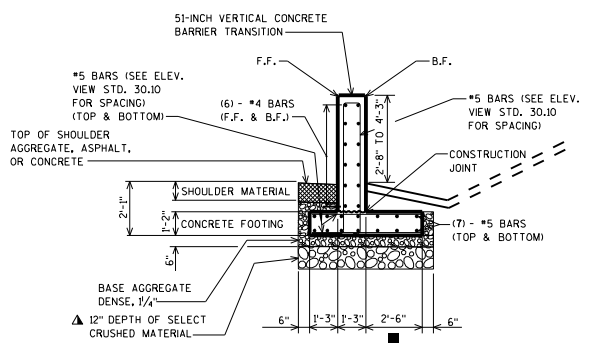
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

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DATE:
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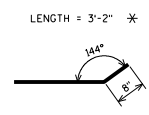


SECTION A-A
BETWEEN COLUMNS

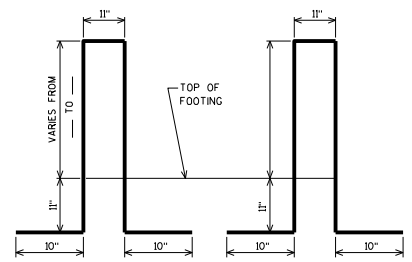


SECTION B-B
TRANSITION REGION

- ▲ 12" SELECT CRUSHED MATERIAL MAY BE ELIMINATED IF IT IS DETERMINED BY THE ENGINEER THAT THE EXISTING MATERIAL IS COMPACTED, GRANULAR MATERIAL.
- FOR COLUMNS WITH "DIA." OR "L" GREATER THAN 3'-0", INCREASE THIS VALUE SO THAT B.F. OF FOOTING EXTENDS 9" BEYOND B.F. OF COLUMN.



#6 BAR
USED WITH CIRCULAR COLUMNS (MASONRY ANCHOR)
* FOR RECTANGULAR COLUMN USE STRAIGHT BARS OF THIS LENGTH

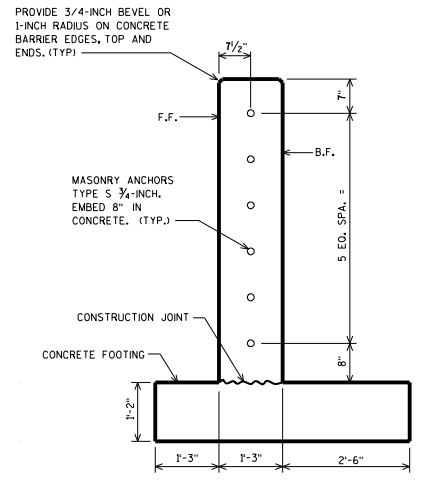


#5 BAR
BARRIER REINF. IN TRANSITION REGION

#5 BAR
BARRIER REINF. BETWEEN COLUMNS

BAR BENDING DIAGRAMS

BAR DIMENSIONS ARE OUT TO OUT OF BAR



MASONRY ANCHOR, TYPE S LAYOUT

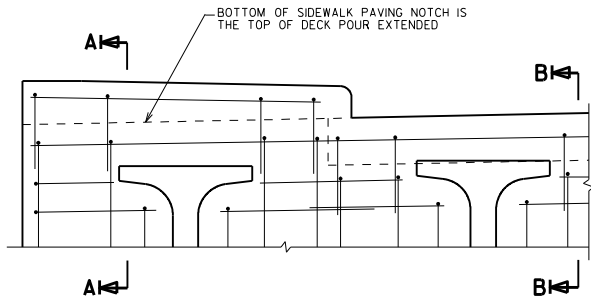
DESIGNER NOTES

- THE DETAILS SHOWN ON STANDARDS 13.10 AND 13.11 ARE FOR VEHICLE PROTECTION AND ARE USED WITH EXISTING STRUCTURES.
- CONSIDER PROVIDING AN ADDITIONAL TRANSITION SECTION ADJACENT TO THE OTHER EXTERIOR PIER COLUMN FOR THE FOLLOWING CONDITIONS:
 - TWO-LANE ROAD IS ADJACENT TO BARRIER AND THERE IS A CONCERN FOR TRAFFIC TO CROSS-OVER.
 - FUTURE TRAFFIC CONTROL NEEDS MAY CAUSE THE DIRECTION OF TRAFFIC ADJACENT TO BARRIER TO BE REVERSED.
 - HAZARDS MAY EXIST IN THIS REGION THAT REQUIRE SHIELDING.
- CONTACT THE REGIONAL OFFICE FOR VERIFICATION OF ANY OF THESE CONDITIONS.
- THESE DETAILS MEET CRITERIA FOR TEST LEVELS TL-3/TL-4.
- FOR VEHICLE PROTECTION, SEE FDM 11-25-1 TO DETERMINE WHEN BEAM GUARD OR CONCRETE BARRIER SHOULD BE PLACED BETWEEN THE TRAFFIC AND THE PIER, OR WHEN AN INTEGRAL BARRIER SHOULD BE USED.

F.F. = FRONT FACE
B.F. = BACK FACE

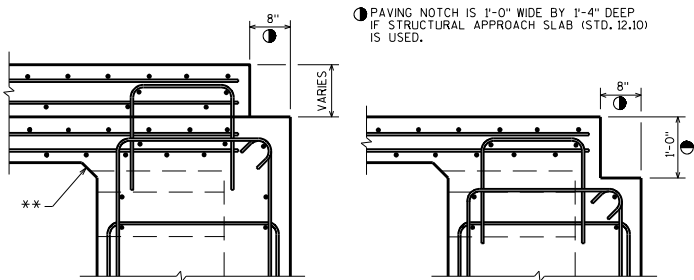
51-INCH VERTICAL CONCRETE BARRIER AND TRANSITION
SEE STANDARD 13.10 FOR ADDITIONAL DETAILS

INTEGRAL BARRIER DETAILS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <u>Bill Oliva</u>	DATE: 7-15



**PART TRANSVERSE SECTION AT ABUTMENT
TYPE A1 DIAPHRAGM WITH A RAISED SIDEWALK**

(HORIZ. BARS SHOWN ARE THE FF BARS.
DECK REINFORCEMENT NOT SHOWN FOR CLARITY.)

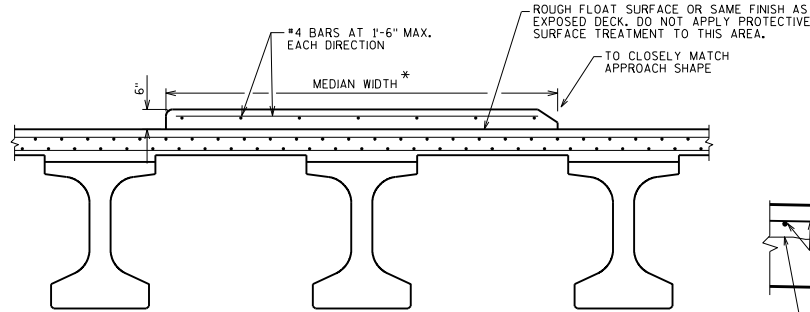


SECTION A-A

** 3" X 3" BEVEL ENDS AT EDGE OF BRIDGE DECK

SECTION B-B

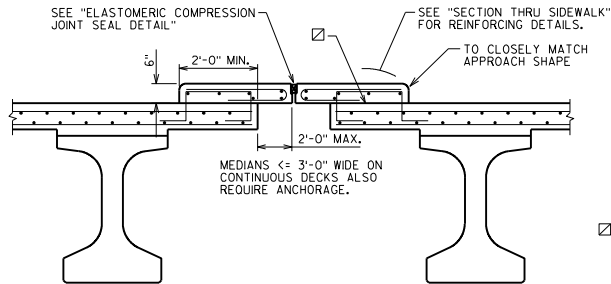
- SEE STANDARDS 19.33, 19.34, 19.35 FOR REINFORCEMENT DETAILS
- DETAILS SHOWN ARE FOR GIRDER STRUCTURES. SIMILAR REINFORCEMENT FOR SLAB STRUCTURES SHALL BE USED WITH A REMINDER THAT THE TRANSVERSE AND LONGITUDINAL REINFORCEMENT LAYERS ARE REVERSED.



CROSS SECTION THRU UNANCHORED MEDIAN

* (ANCHORAGE TO DECK NOT REQUIRED FOR WIDTHS > 3'-0", EXCEPT ALL MEDIAN SECTIONS ON TOP OF PAVING BLOCK MUST BE ANCHORED)

NOTE: CLEAN ALL LOOSE MATERIAL ON THE DECK AT THE MEDIAN LOCATION PRIOR TO MEDIAN PLACEMENT USING HIGH PRESSURE WATER OR AIR, ENSURING ALL FREE-STANDING WATER IS REMOVED PRIOR TO MEDIAN PLACEMENT. NEAT CEMENT IS REQUIRED AS PER 509.3.9.2 OF THE STANDARD SPECIFICATIONS UNLESS THE MEDIAN IS POURED WITHIN 45 DAYS OF COMPLETING THE DECK POUR.



CROSS SECTION THRU MEDIAN WITH A JOINT

NOTES

WHEN PARAPETS ARE POURED CONTINUOUSLY FROM END TO END, THEY SHALL BE SEPARATED AT THE DEFLECTION JOINTS BY A PIECE OF 1/4" ZINC OR PLASTIC PLATE CUT AS SHOWN IN THE "DEFLECTION JOINT DETAIL". IF CONSTRUCTION JOINTS IN PARAPETS ARE USED AT THE DEFLECTION JOINTS, ONE SIDE OF JOINT SHALL BE COATED WITH AN APPROVED LIQUID BOND BREAKER AND PLATE SEPARATORS MAY BE OMITTED.

☑ CONST. JOINT-STRIKE OFF AS SHOWN AND LEAVE ROUGH FOR DECK POUR, MATCH BRIDGE X-SLOPE.

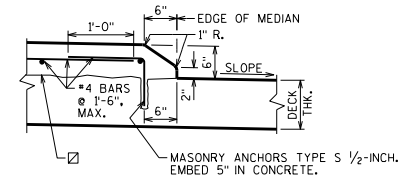
⊕ 8" MIN. SIDEWALK THICKNESS ALSO REQ'D AT EDGE OF DECK/SLAB.

▲ ±0.5% CONSTRUCTION TOLERANCE IN SIDEWALK CROSS SLOPE. THE SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

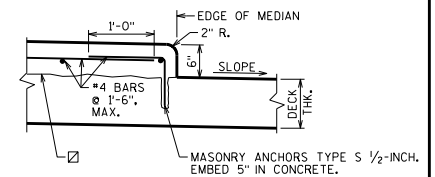
DESIGNER NOTES

FOR EXTREME SIDEWALK WIDTHS AND/OR SUPERELEVATIONS THE DECK MAY BE LEVEL BENEATH THE SIDEWALK (MAINTAIN CONSTANT DECK THICKNESS) TO REDUCE EXCESSIVE SIDEWALK THICKNESS.

SEE STD. 24.11 FOR DECK JOINT DETAIL FOR LONGITUDINAL AND TRANSVERSE JOINTS.

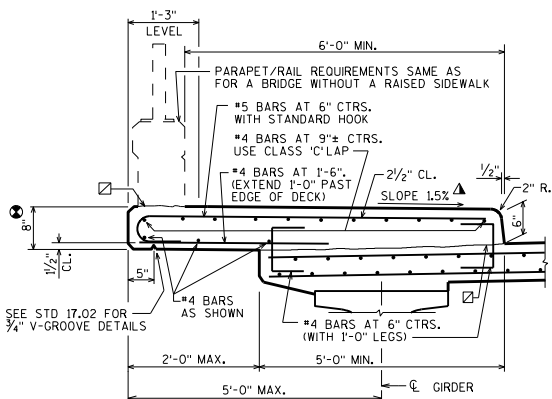


ANCHORED MEDIAN CURB DETAIL

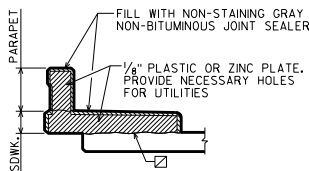


ANCHORED MEDIAN CURB DETAIL

☑ CONST. JOINT-STRIKE OFF AS SHOWN AND LEAVE ROUGH FOR DECK POUR, MATCH BRIDGE X-SLOPE.



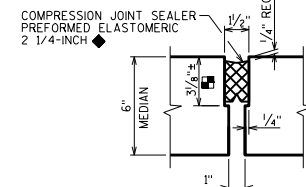
SECTION THRU SIDEWALK



DEFLECTION JOINT DETAIL

SHOW DEFLECTION JOINT IN PARAPET OR SIDEWALK USING THE FOLLOWING CRITERIA:

1. GIRDER STRUCTURES AND SLAB STRUCTURES WITH A RAISED SIDEWALK SHOULD HAVE A DEFLECTION JOINT IN THE SIDEWALK AND PARAPET OVER THE PIER. FOR SKEWS GREATER THAN 20°, DETAIL THE JOINT NORMAL TO THE SIDEWALK AND PARAPET WITH THE JOINT APPROX. CENTERED OVER \bar{C} PIER.
2. GIRDER STRUCTURES AND SLAB STRUCTURES WITHOUT SIDEWALKS SHOULD HAVE NO DEFLECTION JOINTS IN THE PARAPETS.



ELASTOMERIC COMPRESSION SEAL DETAIL

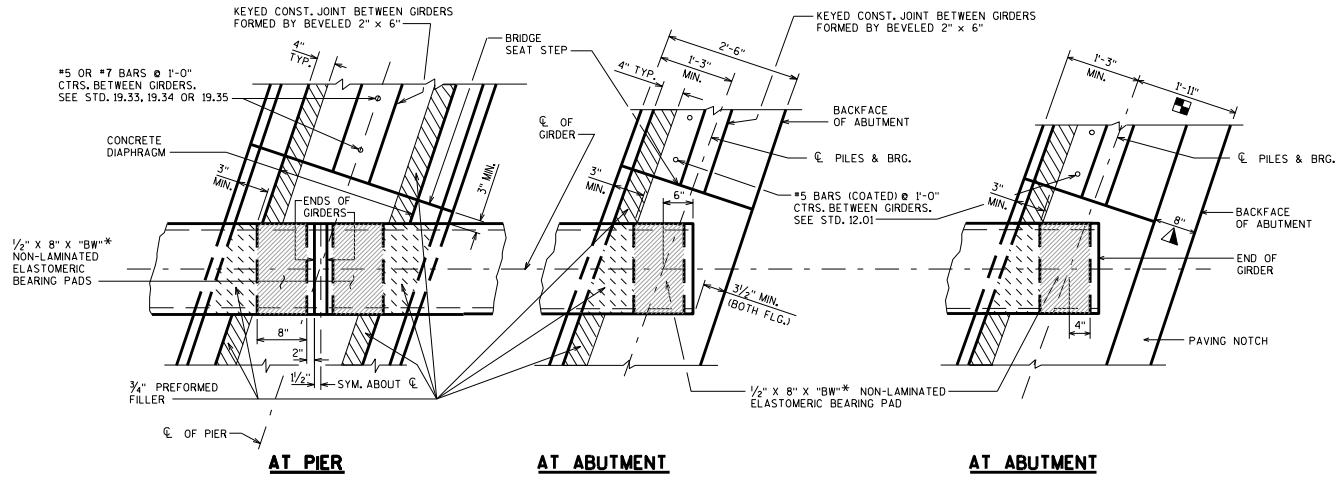
- ⊕ VARIES BASED ON JOINT MANUFACTURER
- ◆ MANUFACTURER SHALL LABEL TOP OF SEAL

MEDIAN AND RAISED SIDEWALK DETAILS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva

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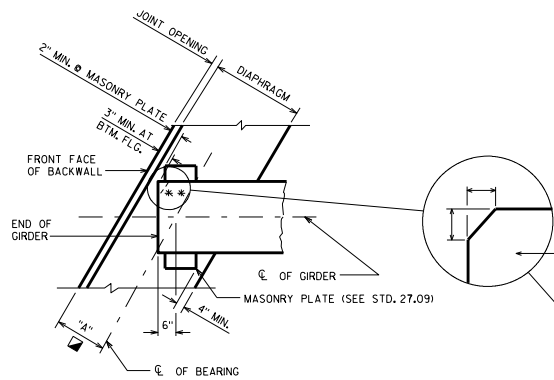
AT PIER

AT ABUTMENT

ABUTMENT: TYPE "A1 FIXED" AND "A5" W/O PAVING NOTCH

AT ABUTMENT

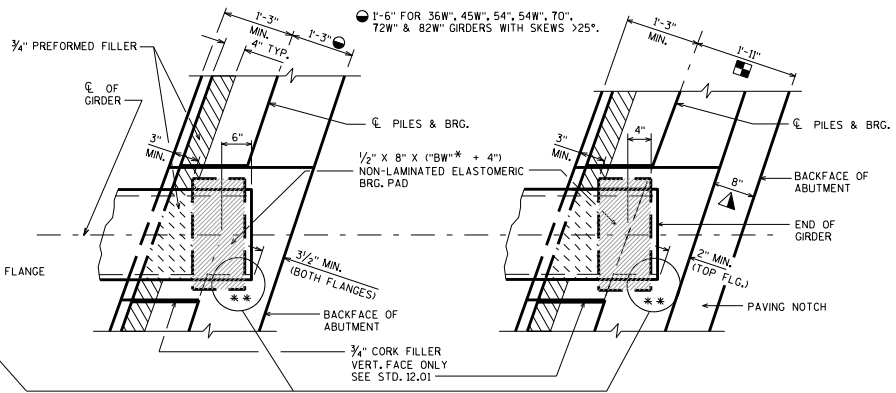
ABUTMENT: TYPE "A1 FIXED" AND "A5" WITH PAVING NOTCH.



PLAN AT ABUTMENT

ABUTMENT: TYPE "A3" OR "A4" SEE TABLE FOR MIN. "A" VALUES REQ'D. TO MEET MIN. CLEARANCE CRITERIA ABOVE.

* * FORM-OUT CORNER OF TOP FLANGE ON 36W", 45W", 54W", 70", 72W" & 82W" PRESTRESSED GIRDERS TO MEET MIN. CLEARANCE REQ'D.



AT ABUTMENT

ABUTMENT: TYPE "A1 SEMI-EXP." W/O PAVING NOTCH

AT ABUTMENT

ABUTMENT: TYPE "A1 SEMI-EXP." WITH PAVING NOTCH.

■ USE 2'-3" WITH A STRUCTURAL APPROACH SLAB (STD. 12.10)

▲ PAVING NOTCH IS 1'-0" WIDE IF STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED.

SKEW ANGLE °	GIRDER DEPTHS									
	28"	36"	36W"	45"	45W"	54"	54W"	70"	72W"	82W"
0-5	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"
> 5-15	12"	12"	13"	12"	13"	12.5"	13"	13"	13"	13"
> 15-25	12.5"	12.5"	15"	13"	15"	14"	15"	15"	15"	15"
> 25-35	(14")	(14")	(17.5")	(15")	(17.5")	(16.5")	(17.5")	16.5"	(17.5")	(17.5")
> 35-45	(15.5")	(15.5")	(20")	(17")	(20")	(18.5")	(20")	(18.5")	(20")	(20")
> 45-55	(17")	(17")	(21.5")	(18.5")	(21.5")	(20")	(21.5")	(20")	(21.5")	(21.5")

VALUES IN PARENTHESIS ARE CONTROLLED BY 2" CLR. CRITERIA AT EDGE OF MASONRY PLATE. VALUES MAY BE ADJUSTED IF MASONRY PLATE IS CLIPPED PER STANDARD 27.02.

GIRDER DEPTH	PRESTRESSED GIRDER FLANGE WIDTH TABLE									
	28"	36"	36W"	45"	45W"	54"	54W"	70"	72W"	82W"
TOP FLANGE WIDTH	18"	12"	34"	16"	34"	20"	48"	30"	48"	48"
BOTTOM FLANGE WIDTH "BW"*	18"	18"	30"	22"	30"	26"	30"	26"	30"	30"

DESIGNER NOTES

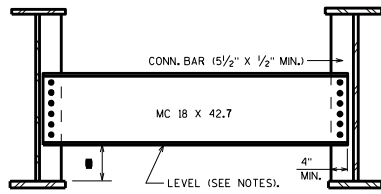
STANDARD DETAIL DRAWINGS FOR THE 45", 54" AND 70" CAN BE FOUND IN CHAPTER 40, BRIDGE REHABILITATION. THESE GIRDERS HAVE BEEN REPLACED WITH THE 45W", 54W" AND 72W" RESPECTIVELY AND ARE NO LONGER USED ON NEW CONSTRUCTION PROJECTS.

BEARING PAD DETAILS FOR PRESTRESSED CONCRETE GIRDERS

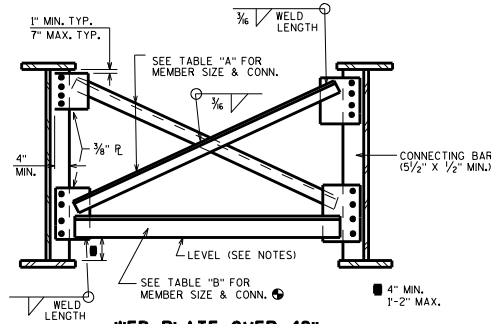
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**WEB PLATE $\leq 48"$
TYP. IN SPAN & AT PIER**



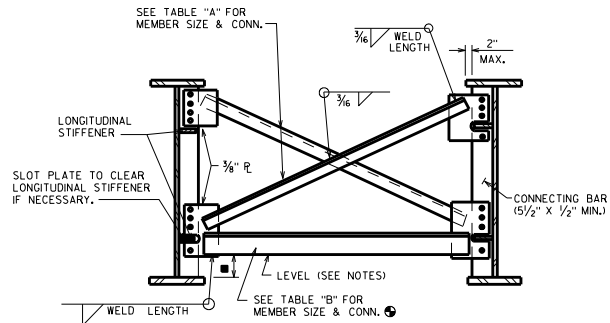
**WEB PLATE OVER 48"
TYP. IN SPAN & AT PIER**

TABLE "A"

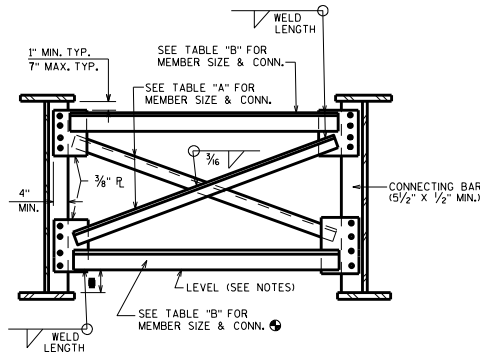
SIZE	MAX. LENGTH OF MEMBER	WELD LENGTH	NO. OF $\frac{3}{4}"$ ϕ BOLTS	WEIGHT PER FT.
L 3 $\frac{1}{2}$ X 3 $\frac{1}{2}$ X $\frac{5}{16}$	21'-6"	9"	4	7.2*
L 4 X 4 X $\frac{5}{16}$	25'-0"	11"	4	8.2*
L 5 X 5 X $\frac{5}{16}$	31'-0"	14"	5	10.3*

TABLE "B"

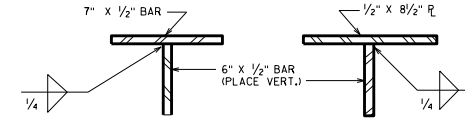
SIZE	MAX. LENGTH OF MEMBER	WELD SIZE	WELD LENGTH	NO. OF $\frac{3}{4}"$ ϕ BOLTS	WEIGHT PER FT.
L 5 X 5 X $\frac{5}{16}$	11'-6"	$\frac{1}{4}"$	11"	4	10.3*
L 6 X 6 X $\frac{5}{16}$	13'-6"	$\frac{3}{16}"$	13"	6	14.9*
$\frac{1}{2}"$ T SECTION SEE DETAIL "A"	17'-6"	$\frac{5}{16}"$	14"	7	16.6*
$\frac{1}{2}"$ T SECTION SEE DETAIL "B"	22'-0"	$\frac{3}{8}"$	13"	7	18.5*



**WEB PLATE OVER 48" WITH LONGITUDINAL STIFFENERS
TYP. IN SPAN & AT PIER**



**TYP. CURVED GIRDER DIAPHRAGM
ALSO USE TOP HORIZONTAL MEMBER AT DIAPHRAGMS
ADJACENT TO KINK POINTS OF KINKED GIRDERS**



DETAIL "A" DETAIL "B"
NOTE: WT 6 X 25 MAY BE SUBSTITUTED FOR DETAIL "A" OR "B"

NOTES

ALL BOLTED CONNECTIONS SHALL BE FRICTION TYPE USING $\frac{3}{4}"$ ϕ HIGH STRENGTH ASTM A325 BOLTS WITH DOUBLE WASHERS.

DIAPHRAGMS OR LOWER CROSS FRAME MEMBERS ARE SLOPED WHEN DIFFERENCE IN ADJACENT BOTTOM FLANGE ELEVATIONS EXCEEDS 6". HOLD 8" FROM TOP OF ADJACENT FLANGES TO BOTTOM OF DIAPHRAGMS OR LOWER CROSS FRAME WHEN THESE MEMBERS ARE SLOPED.

DIAPHRAGMS OR LOWER CROSS FRAME MEMBERS THAT ARE LEVEL SHALL BE PLACED 4" ABOVE THE TOP OF THE HIGHER BOTTOM FLANGE OF ADJACENT GIRDERS.

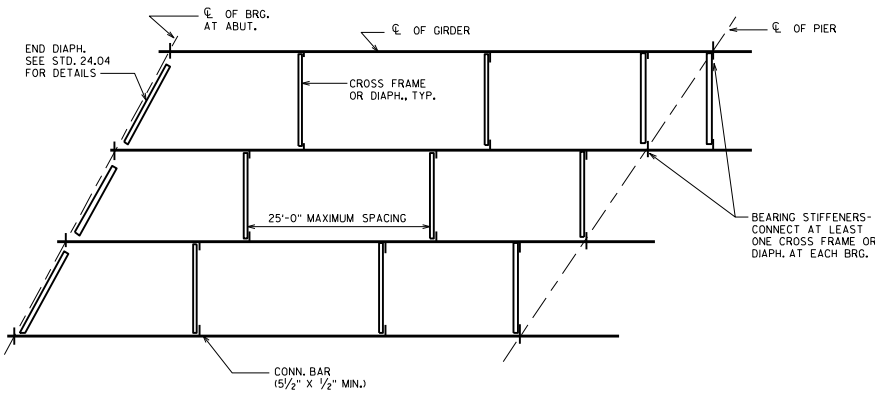
HOLES IN CROSS FRAME CONNECTIONS MAY BE OVERSIZED ϕ $\frac{1}{16}"$ DIA. IN 1 PLY.

DESIGNER NOTES

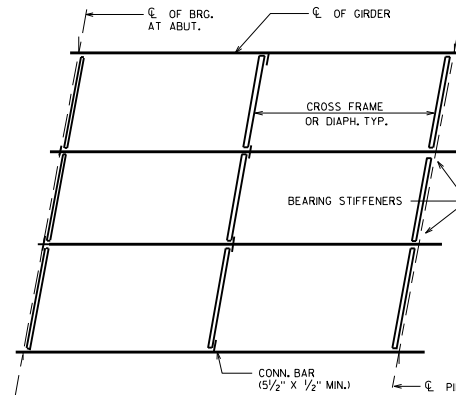
SEE STD. 24.02 FOR CONNECTION BAR CORNER COPE & WELD DETAILS.

FOR SPANS OVER 200', THE CROSS FRAMES AT THE PIERS SHALL BE DESIGNED TO RESIST THE LATERAL LOADS THAT ARE TRANSFERRED TO THE PIERS.

\odot HORIZONTAL CROSSFRAME MEMBER TO HAVE HORIZONTAL LEG TOP (AS SHOWN WHEN NO LOWER LATERALS ARE USED). WHEN LOWER LATERALS ARE USED THE HORIZONTAL LEG SHALL BE ON THE BOTTOM, THIS IS TO ALLOW FRAMING INTO THE LOWER LATERAL GUSSET. CURRENT PRACTICE IS TO AVOID THE USE OF LOWER LATERALS, HOWEVER.



FRAMING PLAN FOR SKEW $> 15^\circ$



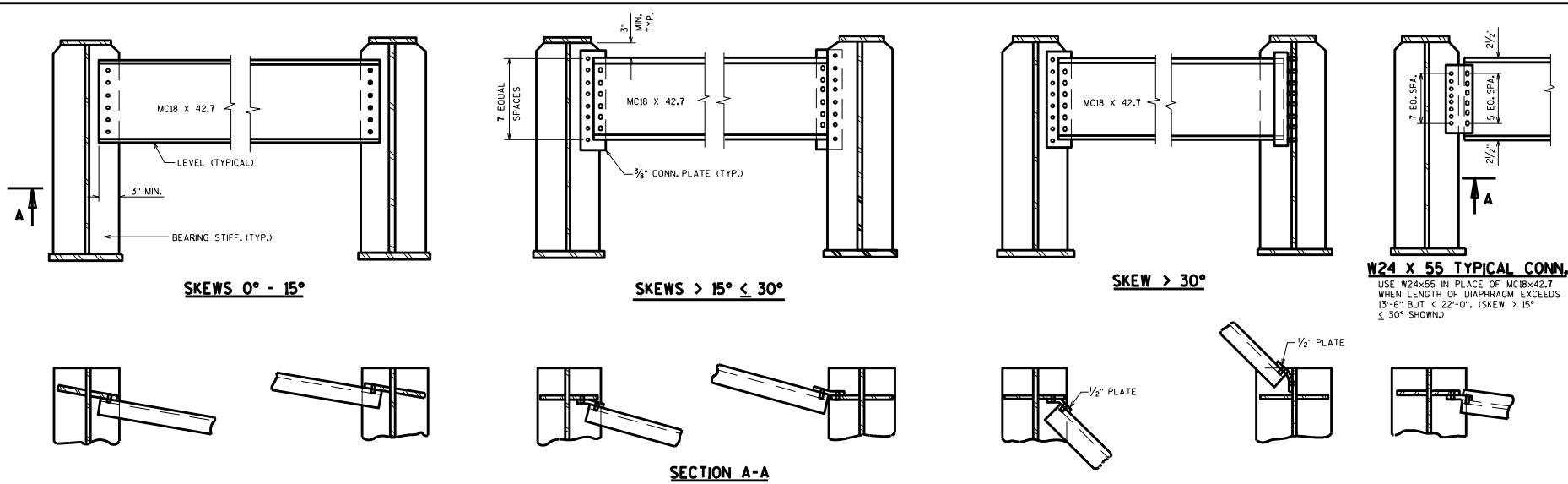
FRAMING PLAN FOR SKEW $\leq 15^\circ$

**PLATE GIRDER DIAPHRAGMS
AND CROSS FRAMES**

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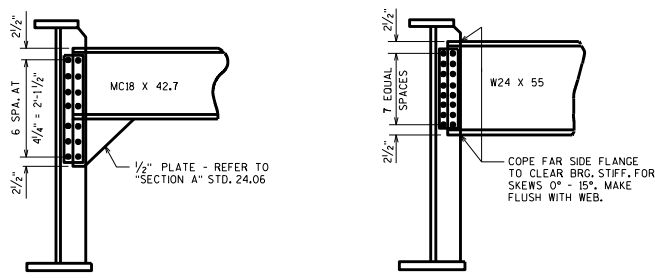
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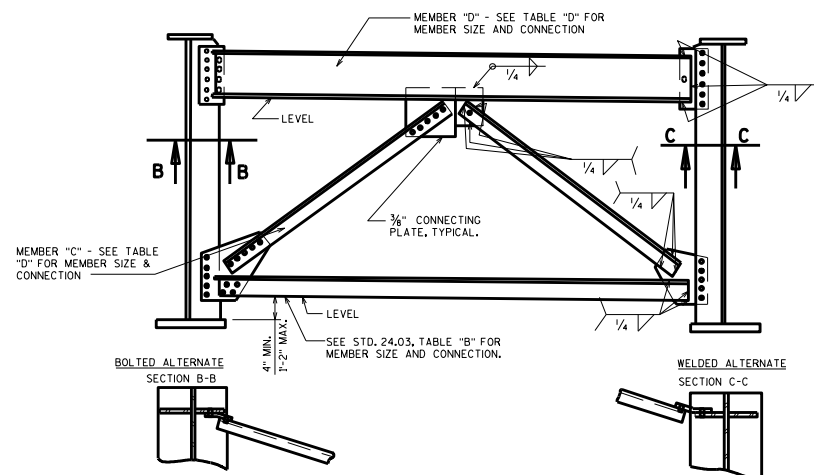
W24 X 55 TYPICAL CONN.
 USE W24X55 IN PLACE OF MC18X42.7
 WHEN LENGTH OF DIAPHRAGM EXCEEDS
 13'-6" BUT < 22'-0". (SKEW > 15°
 < 30° SHOWN.)

END DIAPHRAGM CONNECTIONS - WEB DEPTHS < 48"



TYPICAL CONNECTION FOR MC18 X 42.7 AND W24 X 55. USE MC18 X 42.7
 WHEN DIAPHRAGM LENGTH IS < 13'-6". USE W24 X 55 FOR LENGTHS
 > 13'-6" < 22'-0". (SKEW > 15° < 30° SHOWN)

END DIAPHRAGM CONNECTIONS - WEB DEPTHS > 48" < 60"



END DIAPHRAGM CONNECTIONS - WEB DEPTHS > 60"

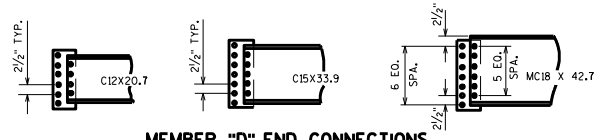
NOTES
 ALL BOLTED CONNECTIONS SHALL BE
 FRICTION TYPE MADE WITH 3/4" HIGH
 STRENGTH ASTM A325 BOLTS.

DESIGNER NOTES
 SEE STANDARD 24.02 FOR BEARING
 STIFFENER COPE & WELD DETAILS.
 FOR WEB DEPTHS GREATER THAN 60",
 THE NUMBER OF BOLTS REQUIRED
 BETWEEN BEARING STIFFENERS AND
 LOWER CONNECTING PLATES EQUALS
 THE NUMBER OF BOLTS REQUIRED IN
 MEMBER "C" OR THE NUMBER REQUIRED
 IN THE LOWER HORIZONTAL MEMBER,
 WHICHEVER IS GREATER.

TABLE "D"

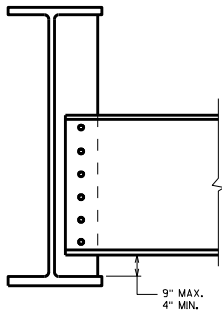
MEMBER "C" MAXIMUM LENGTH	WEB DEPTH									MEMBER "D" SIZE	MEMBER "D" CONN.	
	5'-0" - 6'-6"			6'-6" - 7'-6"			7'-6" - 8'-9"				CONN. PLATE TO BRG. STIFF.	MEMBER "D"
	MEMBER "C" SIZE	NO. OF 3/4" Ø BOLTS	LENGTH OF 1/4" WELD	MEMBER "C" SIZE	NO. OF 3/4" Ø BOLTS	LENGTH OF 1/4" WELD	MEMBER "C" SIZE	NO. OF 3/4" Ø BOLTS	LENGTH OF 1/4" WELD			
11'-6"	4 X 4 X 3/8"	5	13	4 X 4 X 3/8"	5	12	4 X 4 X 3/8"	5	11	C12 X 20.7	6 Ø 2 1/2"	4 Ø 2 1/2"
13'-6"	5 X 5 X 3/8"	6	17	5 X 5 X 3/8"	6	16	5 X 5 X 3/8"	6	15	C12 X 20.7	6 Ø 2 1/2"	4 Ø 2 1/2"
17'-6"	6 X 6 X 3/8"	8	20	5 X 5 X 3/8"	7	18	5 X 5 X 3/8"	6	16	C15 X 33.9	7 Ø 2 1/2"	5 Ø 2 1/2"
22'-0"	6 X 6 X 3/8"	9	23	6 X 6 X 3/8"	8	21	6 X 6 X 3/8"	7	19	MC18 X 42.7	7 Ø 2 1/2"	6 Ø 2 1/2"

NOTE: ALL MEMBER "C" SIZES REPRESENT ANGLES.

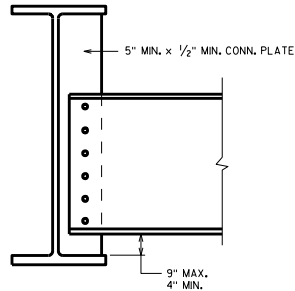


MEMBER "D" END CONNECTIONS
 OMIT END CONNECTING PLATE FOR SKEWS 0° - 15°

END DIAPHRAGMS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <i>Bill Oliva</i>	DATE: 7-15



36" W. GIRDER



33" W. GIRDER

INTERMEDIATE DIAPHRAGM SIZES

ALL INTERMEDIATE CONNECTIONS	
GIRDER DEPTH	INTERMEDIATE DIAPHRAGMS
36"	MC18 X 42.7
33"	MC18 X 42.7
30"	C15 X 33.9
27"	C15 X 33.9
24"	C12 X 20.7
21"	C10 X 15.3
18"	C8 X 11.5

NOTES

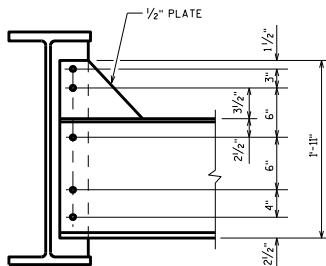
DIAPHRAGMS SHALL BE HORIZONTAL EXCEPT WHEN THE DIFFERENCE IN ADJACENT GIRDER ELEVATIONS IS OF A MAGNITUDE THAT NECESSITATES SLOPING THE DIAPHRAGMS.

WHEN DIAPHRAGMS ARE SLOPED, PLACE CENTER OF DIAPHRAGM AT MID-DEPTH OF GIRDER.

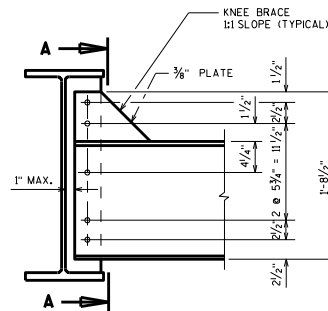
ALL BOLTED CONNECTIONS SHALL BE MADE WITH 3/4" ϕ HIGH STRENGTH ASTM A325 BOLTS.

DESIGNER NOTES

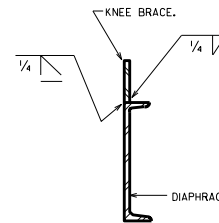
SEE STANDARD 24.02 FOR CONNECTION BAR CORNER COPE & WELD DETAILS.



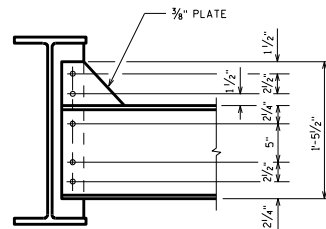
30" W. GIRDER



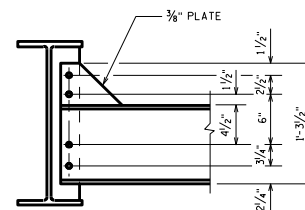
27" W. GIRDER



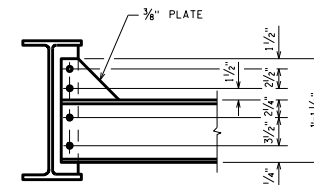
SECTION A



24" W. GIRDER



21" W. GIRDER



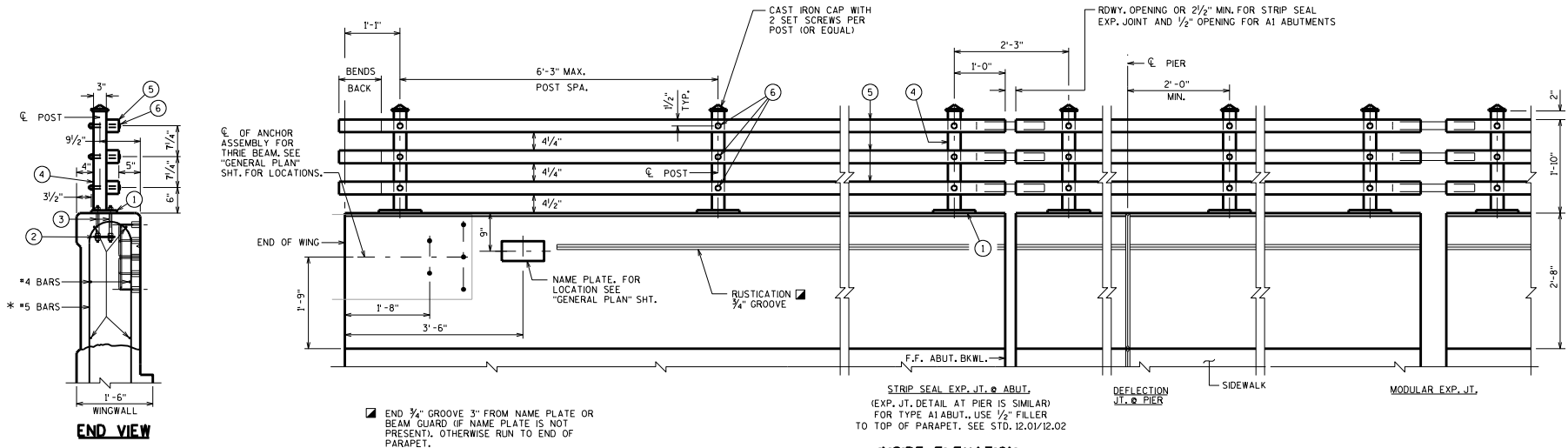
18" W. GIRDER

ROLLED GIRDER DIAPHRAGMS

STATE OF WISCONSIN
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STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva

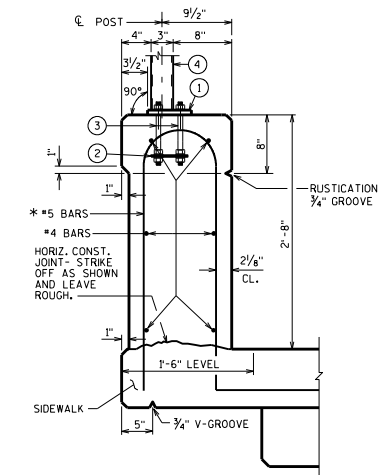
DATE:
7-15



END 3/4" GROOVE 3" FROM NAME PLATE OR BEAM GUARD (IF NAME PLATE IS NOT PRESENT). OTHERWISE RUN TO END OF PARAPET.

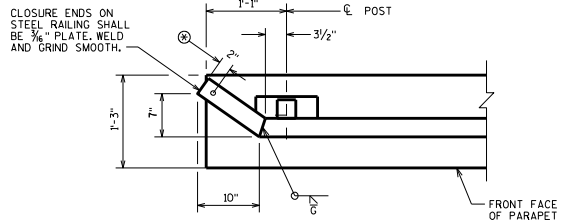
STRIP SEAL EXP. JT. @ ABUT. (EXP. JT. DETAIL AT PIER IS SIMILARY FOR TYPE A1 ABUT.). USE 1/2" FILLER TO TOP OF PARAPET. SEE STD. 12.01/12.02

OPTIONAL CONSTRUCTION JOINTS IN THE PARAPETS MAY BE USED. RUN BAR REIN. THRU THE JOINT. LAP LONGIT. BARS A MIN. OF 1'-5". MIN. JOINT SPACING OF 80'-0". DEFINE CONSTR. JT. WITH A 3/4" V-GROOVE.



SECTION THRU PARAPET ON BRIDGE

* ADJUST LOCATIONS OF BARS TO ALLOW PLACEMENT OF ANCHOR ASSEMBLY FOR RAILING AND BEAM GUARD.



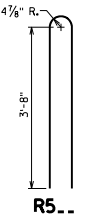
END POST DETAIL

3/4" DIA. DRAIN HOLE IN BOTTOM OF ALL TUBES.

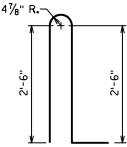
BILL OF BARS

BAR MARK	Qty	ABUT.	ABUT.	LENGTH	REIN.	LOCATION
R5..	X			8-8	X	PARAPET VERT. @ WINGS
R4..	X			-		PARAPET HORIZ. @ WINGS

BAR MARK	Qty	SUPERSTR.	LENGTH	REIN.	LOCATION
S5..	X		7-0	X	PARAPET VERT.-SUPER.
S4..	X		-		PARAPET VERT.-SUPER.



R5..



S5..

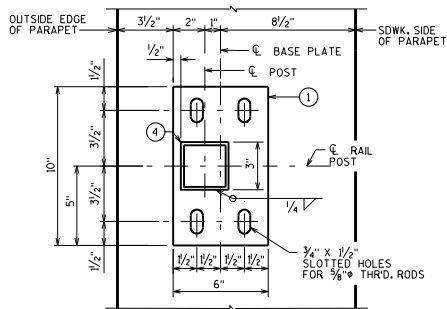
2'-8" CONC. PARAPET
AREA 3.16 S.F.
WEIGHT 474 LB./FT.

STEEL RAILING WEIGHT = 25 LB/FT BASED ON 6'-3" POST SPA.

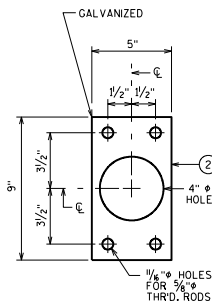
DESIGNER NOTES

SEE STANDARD 30.09 FOR ADDITIONAL RAILING DETAILS
 SEE STANDARD 30.07 FOR:
 DEFLECTION JOINT DETAILS AND NOTES
 - BEAM GUARD ANCHOR ASSEMBLY DETAILS
 - SIDEWALK REINFORCEMENT AND DETAILS
 - PARAPET REINFORCING BAR SIZE AND SPACING

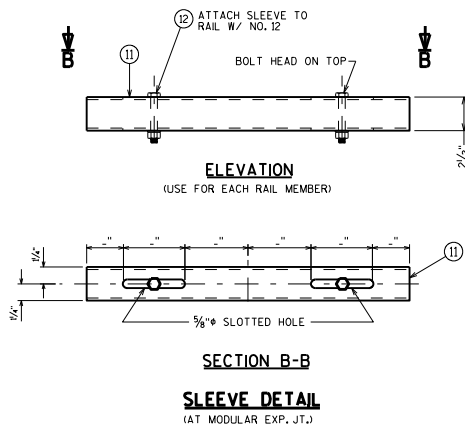
COMBINATION RAILING TYPE '3T'	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <u>Bill Oliva</u>	DATE: 7-15



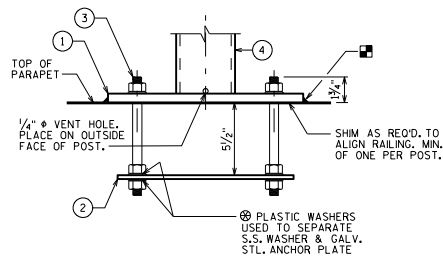
TYPICAL RAIL POST BASE PLATE



ANCHOR PLATE

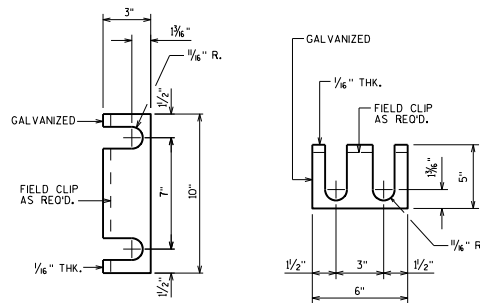


NOTE: CONSTRUCT BOTTOM RAIL AND SLEEVE CONNECTION FIRST, THEN MIDDLE RAIL, AND THEN TOP RAIL, TO ALLOW EASE IN PLACEMENT OF BOLT NO. 12.



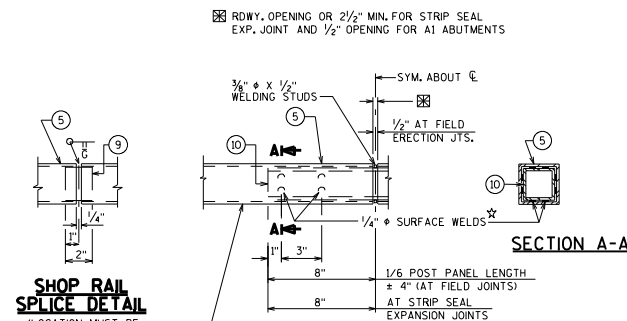
ANCHORAGE FOR RAIL POSTS

NOTE: ANCHOR PLATE NOT REQUIRED WHEN TYPE 5 ANCHORS ARE USED.



RAIL POST SHIM DETAIL

(2 SETS PER POST)



FIELD ERECTION JOINT DETAIL

☆ MIN. 3/8" FLAT SURFACE DIA. PUNCHINGS OR STUDS MAY BE USED AS AN ALTERNATE.

PROVIDE 3/4" DIA. DRAIN HOLES IN LOW END OF ALL RAILS, CLEAR OF SPLICE SLEEVE.

LEGEND

- ① BASE PLATE 3/8" X 6" X 10" WITH 3/4" X 1/2" SLOTTED HOLES FOR THRD RODS NO. 3, WELD TO NO. 4 AS SHOWN. SLOTS PARALLEL TO LONG SIDE OF PLATE.
- ② 1/4" X 5" X 9" ANCHOR PLATE (GALVANIZED) WITH 1/8" DIA. HOLES FOR THRD. RODS NO. 3.
- ③ 3/8" DIA. X 9" LONG, TYPE 316 STAINLESS STEEL THREADED RODS (MIN. TENSILE STRENGTH = 70 KSI) WITH NUT AND WASHERS OF SAME ALLOY GROUP. (ALTERNATE RAIL POST ANCHORAGE: 4 EQUIVALENT STAINLESS STEEL CONCRETE MASONRY ANCHORS TYPE 5 3/8-INCH. EMBED 7" IN CONCRETE FOR RAIL POSTS.)
- ④ STRUCTURAL TUBING 3" X 3" X 3/8" POSTS, PLACE VERTICAL. WELD TO NO. 1 AND USE 1" DIA. HOLES (FRONT AND BACK) FOR BOLT NO. 6.
- ⑤ STRUCTURAL TUBING 3" X 3" X 3/8" RAILS, WITH 1/8" DIA. HOLES (FRONT AND BACK) FOR BOLT NO. 6.
- ⑥ 3/4" DIA. A325 SLOTTED ROUND HEAD BOLT WITH HEX NUT, 3/8" X 1/2" X 1 1/2" WASHER, AND LOCK WASHER.
- ⑦ RECTANGULAR SLEEVE FABRICATED FROM 3/8" PLATES. PROVIDE "SLIDING FIT".
- ⑧ RECTANGULAR SLEEVE FABRICATED FROM 3/8" PLATES, 11'-4" @ FIELD ERECTION JTS., 11'-4" @ STRIP SEAL EXP. JTS.
- ⑨ SLEEVE FABRICATED FROM STRUCTURAL TUBING 2 1/2" X 2 1/2" X 3/8" X 1'-" LONG. SLOTTED HOLES IN TOP AND BOTTOM.
- ⑩ 1/2" DIA. STAINLESS STEEL BOLT WITH NUT AND LOCKWASHER.

RAILING NOTES

BID ITEM SHALL BE "RAILING STEEL TYPE 3T B-...", WHICH SHALL INCLUDE ALL STEEL ITEMS SHOWN.

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.

ENDS OF STRUCTURAL TUBING SHALL BE SAWEED, GRIND SMOOTH EXPOSED EDGES. ALL CUT ENDS SHALL BE TRUE AND SMOOTH.

ALL PLATES, AND RECTANGULAR SLEEVES SHALL CONFORM TO ASTM A709 GRADE 36. ALL STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B.

ANCHORAGES SHALL BE ACCURATELY PLACED TO PROVIDE CORRECT ALIGNMENT OF RAILING. SET NORMAL TO GRADE.

CUT BOTTOM OF POST TO MAKE POST VERTICAL IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTION.

STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATE NO. 1, WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED.

CAULK AROUND PERIMETER OF BASE PLATES, NO. 1 AND FILL BOLT SLOT OPENINGS IN SHIMS AND BASE PLATES WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

ALL JOINTS IN CONCRETE PARAPET ARE TO BE VERTICAL.

ALL MATERIAL (EXCEPT NO. 3 & 12) SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING, THE STEEL RAILING SHALL BE GIVEN A NO. 6 BLAST CLEANING PER SSPC SPECIFICATIONS.

VENT HOLES SHALL BE DRILLED IN POST AND RAIL MEMBERS AS REQUIRED TO FACILITATE GALVANIZING AND DRAINAGE.

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

WHEN PAINTING REQ'D: (ADD)

PAINT OVER GALVANIZING (EXCEPT NO. 2) WITH AN APPROVED TIE COAT AND TOP COAT AS SPECIFIED IN THE "BRIDGE SPECIAL PROVISIONS". THE RAILING SHALL BE PAINTED FEDERAL COLOR NO. . . (FILL IN COLOR NAME).

INSIDE OF TUBES TO BE PAINTED AT ALL FIELD ERECTION AND EXPANSION JOINTS.

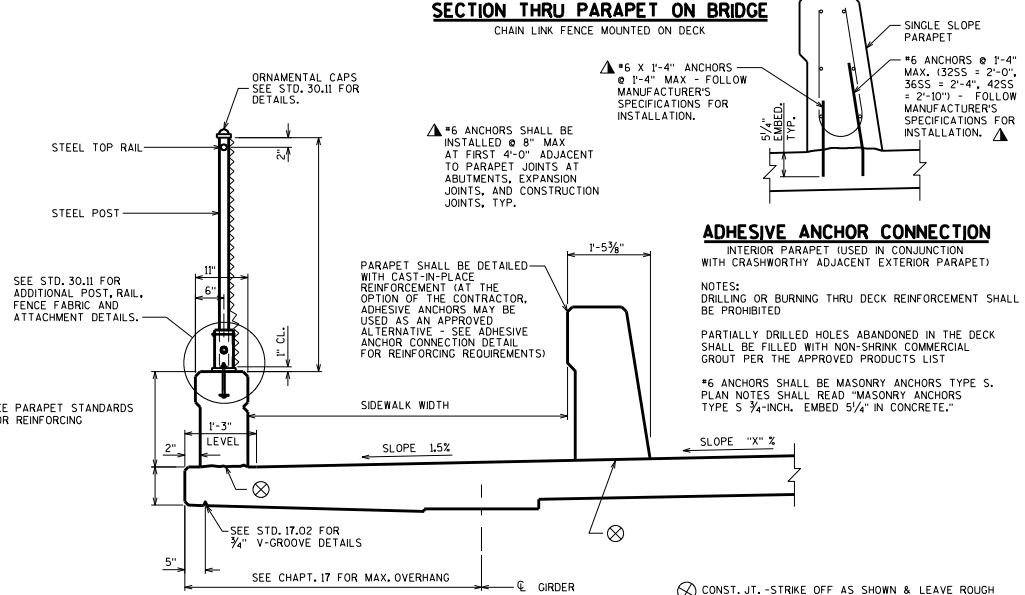
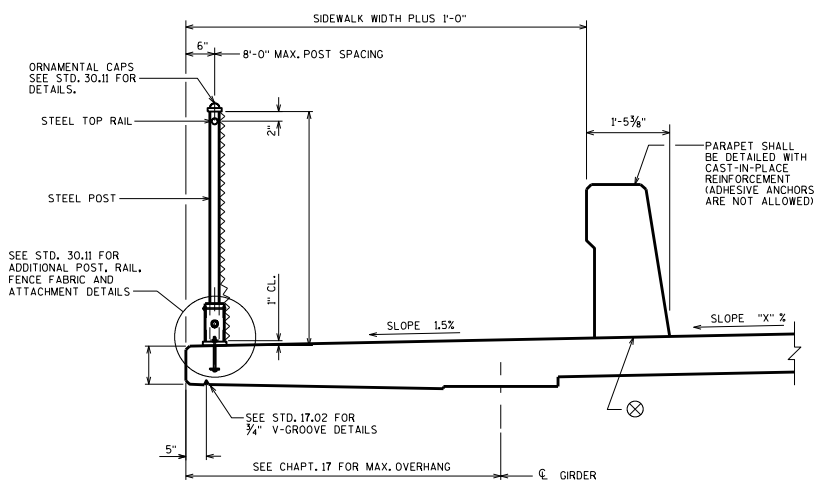
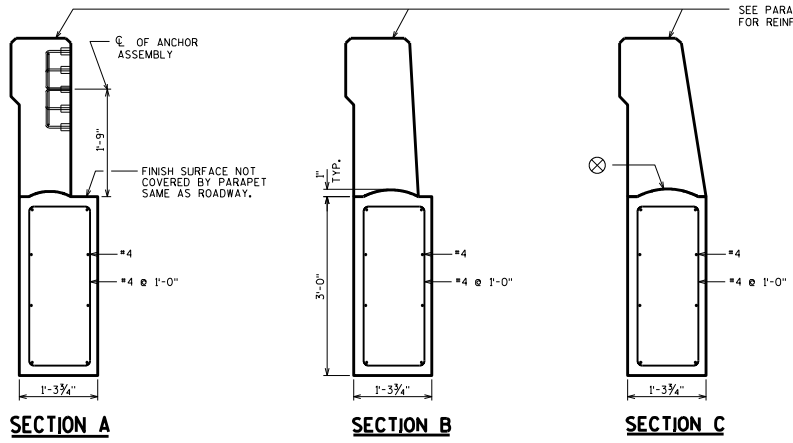
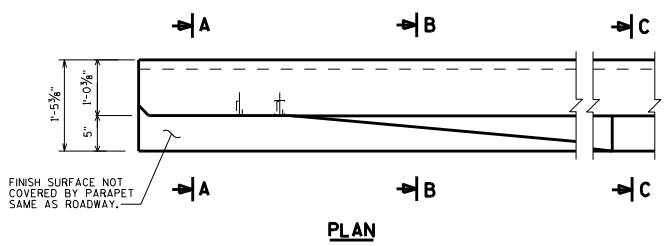
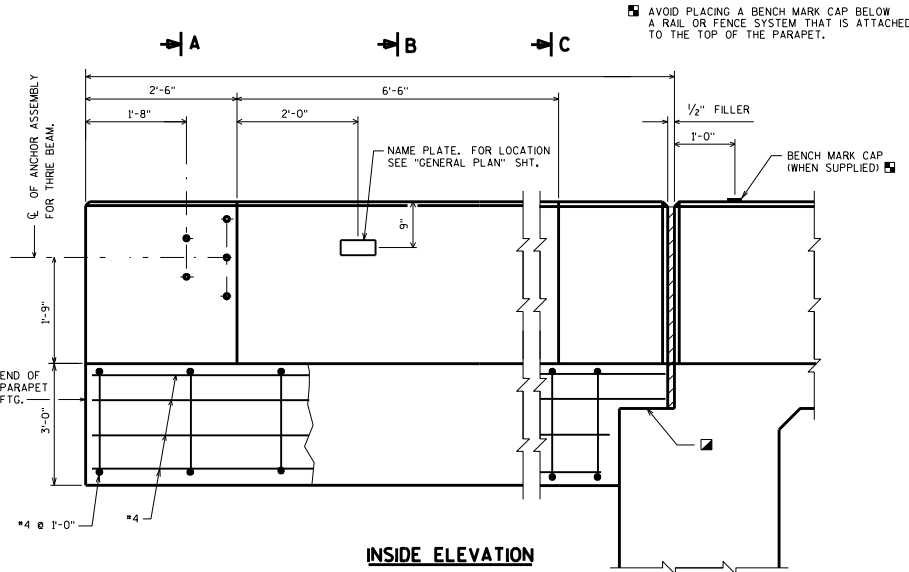
TOUCH-UP PAINTING TO BE DONE AT COMPLETION OF STEEL RAILING INSTALLATION TO THE SATISFACTION OF THE ENGINEER AT NO EXTRA COST.

**COMBINATION RAILING
TYPE '3T' DETAILS**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva

DATE:
7-15



DESIGNER NOTES

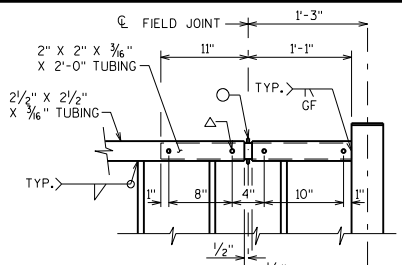
'325S' PARAPET SHOWN IN THIS STANDARD. FOR DETAILS, INCLUDING REINFORCING, SEE STANDARD 30.30. SEE STANDARDS 30.31, 30.32, AND 30.33 FOR SIMILAR DETAILS USED WITH OTHER PARAPET TYPES.

ALL PARAPET FOOTING BARS SHALL BE EPOXY COATED.

DO NOT SHOW THE ADHESIVE ANCHOR CONNECTION DETAIL ON THE PLAN. THE CONTRACTOR MAY REQUEST THIS DETAIL IF DESIRED.

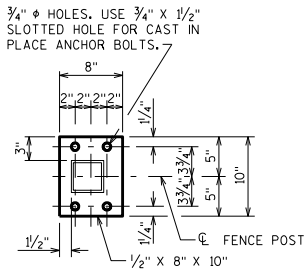
- STEEL TROWEL HORIZONTAL SURFACE OF PAVING NOTCH. PLACE MULTIPLE LAYERS OF POLYETHYLENE SHEETS BETWEEN PARAPET FOOTING AND HORIZONTAL SURFACE OF PAVING NOTCH. TOTAL THICKNESS OF SHEETS SHALL BE AT LEAST 0.03".

PARAPET FOOTING	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
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LEGEND
 ○ 5/16" x 3/8" WELDED STUDS
 △ WELD BEAD ON EACH SIDE OF TUBE, GRIND BEADS SO THAT SLEEVE FITS FREELY INSIDE THE 2 1/2" X 2 1/2" TUBE.

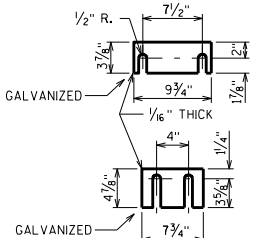
RAILING EXPANSION JOINT DETAIL



BASE PLATE

ANCHORAGE DETAIL

5/8" CAST-IN-PLACE ANCHOR BOLTS. MASONRY ANCHORS MAY BE SUBSTITUTED FOR C.I.P. ANCHOR BOLTS. ANCHORAGE PLATE NOT REQUIRED WHEN TYPE S ANCHORS ARE USED.
 MASONRY ANCHOR TYPE S 5/8" INCH. EMBED 7" IN CONCRETE.



SHIM PLATE DETAILS

TWO SHIMS OF EACH SIZE REQUIRED PER POST

NOTES
 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.
 STRUCTURAL TUBING SHALL CONFORM TO ASTM A500, GRADE B. PLATES, ANGLES, BARS AND SHIMS SHALL CONFORM TO ASTM A709, GRADE 36. FENCE FABRIC SHALL CONFORM TO ASTM F668, CLASS 2B.

ANCHORAGES SHALL BE ACCURATELY PLACED TO PROVIDE CORRECT ALIGNMENT OF RAILING. SET POSTS NORMAL TO GRADE.
 ALL POST SPACINGS ARE TAKEN HORIZONTAL ALONG CENTERLINE OF RAILING AT BASE OF POST.

STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATES WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED.
 CAULK AROUND PERIMETER OF BASE PLATES AND FILL PORTION OF SLOTTED HOLES AROUND ANCHOR BOLTS WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

CUT BOTTOM OF POST TO MAKE VERTICAL IN TRANSVERSE DIRECTION.
 ANCHOR BOLTS, NUTS AND WASHERS SHALL BE EITHER STAINLESS STEEL OR ASTM 307. IF 307 IS USED, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED.

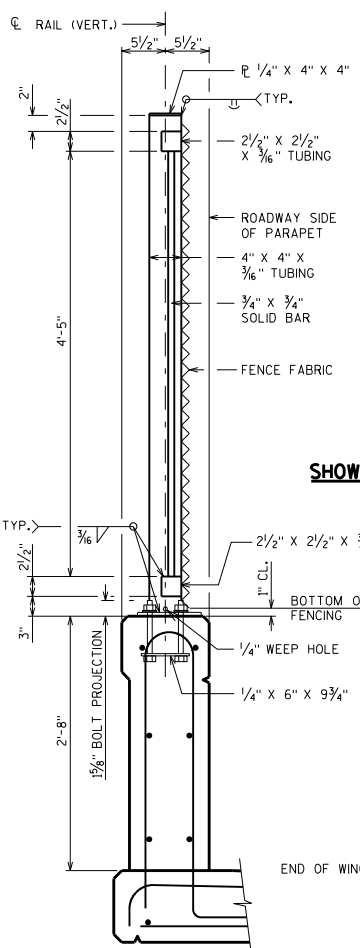
THE BID ITEM SHALL BE "RAILING TUBULAR SCREENING B-1" WHICH SHALL INCLUDE ALL ITEMS SHOWN.
 RAILING SHALL BE FABRICATED IN LENGTHS THAT INCLUDE NOT MORE THAN 3 POSTS.

VENT HOLES SHALL BE DRILLED IN MEMBERS AS REQUIRED TO FACILITATE GALVANIZING AND DRAINAGE.
 ALL RAILING MATERIAL SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING THE STEEL RAILING SHALL BE GIVEN A NO. 6 BLAST CLEANING PER SSPC SPECIFICATIONS. PAINT OVER GALVANIZING WITH AN APPROVED TOP COAT AND TOP COAT AS SPECIFIED IN THE "BRIDGE SPECIAL PROVISIONS". THE RAILING SHALL BE PAINTED FEDERAL COLOR NO. FENCE FABRIC AND TIES TO BE VINYL-COATED, COLOR SHALL BE (SPECIFY: DARK GREEN, BROWN OR BLACK) IN ACCORDANCE WITH ASTM F934.

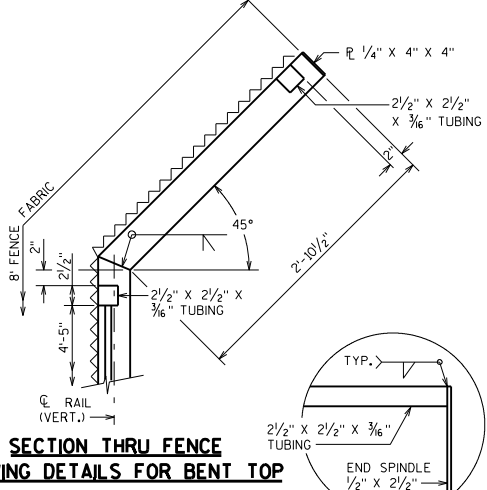
THE END OF THE FABRIC SHALL BE ATTACHED TO THE POST BY MEANS OF A TENSION BAR THREADED THROUGH THE END LOOPS OF THE FABRIC AND SECURED TO THE POST WITH CLAMPS & BOLT. THE FABRIC SHALL BE STRETCHED TO REMOVE ALL SLACK.

DESIGNER NOTES
 TUBULAR SCREENING MAY BE USED ON STRUCTURES WITH A 45 M.P.H. DESIGN SPEED OR LESS, OR WHEN THE SIDEWALK IS SEPARATED FROM THE ROADWAY BY A PARAPET.

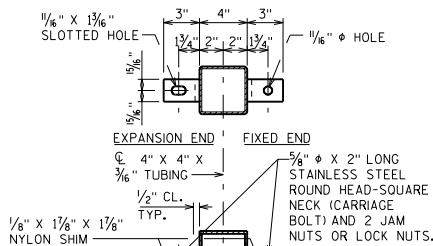
THIS RAILING MAY BE MOUNTED DIRECTLY TO A BRIDGE SIDEWALK OR RETAINING WALL PROVIDED THE SIDEWALK IS SEPARATED FROM THE ROADWAY BY A TRAFFIC BARRIER. USE 6" CLEAR SPACING BETWEEN VERTICAL MEMBERS IF CHAIN LINK FENCE IS NOT USED.
 FENCE HEIGHT, CURVED OR STRAIGHT, MESH SIZE, COATING AND COLOR SHOULD BE COORDINATED WITH THE REGION. SEE BRIDGE MANUAL 30.3 (8) FOR ADDITIONAL GUIDANCE.



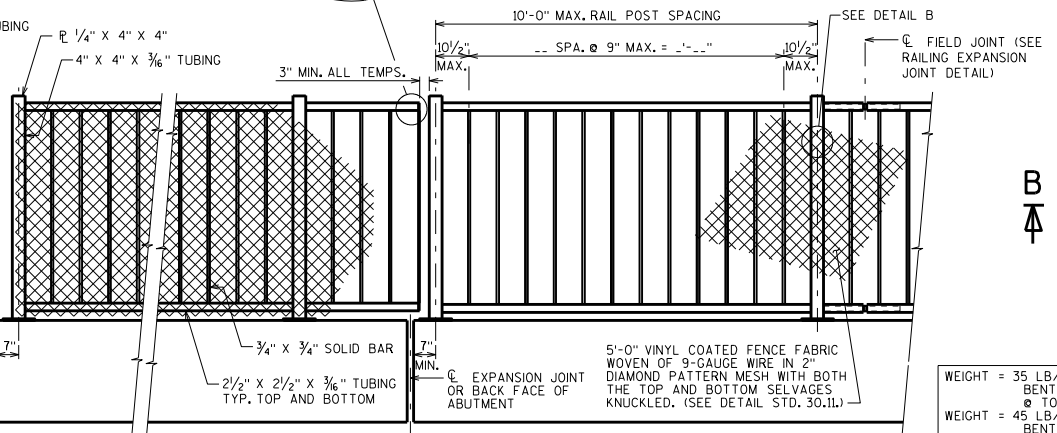
SECTION THRU RAILING



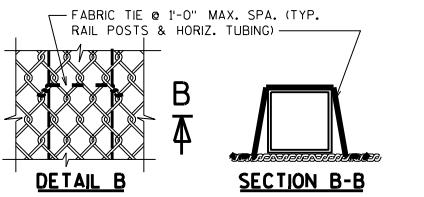
SECTION THRU FENCE SHOWING DETAILS FOR BENT TOP



TOP RAIL CONNECTION FOR FENCE W/ BENT TOP



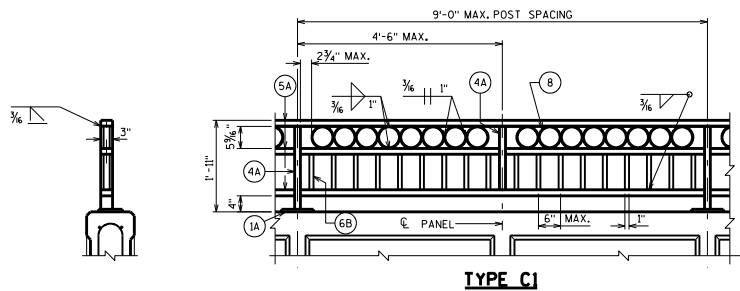
INSIDE ELEVATION OF RAILING



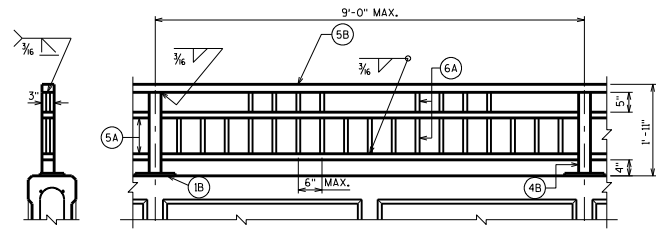
TUBULAR STEEL RAILING SCREENING

WEIGHT = 35 LB/FT (W/O BENT SECTION @ TOP)
 WEIGHT = 45 LB/FT (W/ BENT SECTION @ TOP)

STATE OF WISCONSIN
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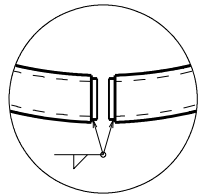


TYPE C1



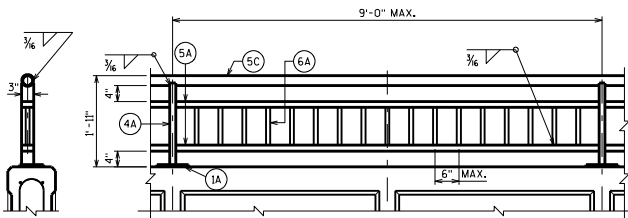
TYPE C4

FIELD ERECTION JT. LOCATION, SEE "DETAIL A" FOR CURVED MEMBER END CLOSURE. SEE STD. 30.18 FOR STRAIGHT MEMBER FIELD SPLICE DETAIL.

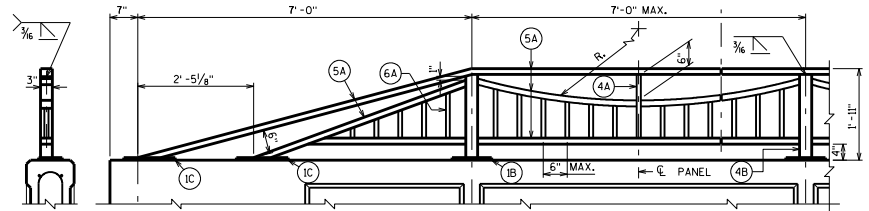


DETAIL A

SEAL ENDS ON CURVED STRUCTURAL TUBING WITH 1/4" PLATE, WELD AND GRIND SMOOTH.

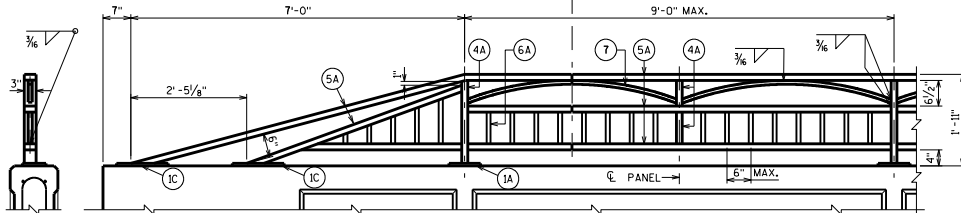


TYPE C2

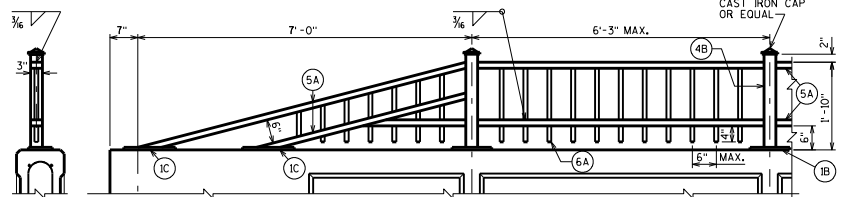


TYPE C5

FIELD ERECTION JT. LOCATION, SEE "DETAIL A" FOR CURVED MEMBER END JT. DETAIL. SEE STD. 30.18 FOR STRAIGHT MEMBER FIELD SPLICE DETAIL.



TYPE C3



TYPE C6

DESIGNER NOTES

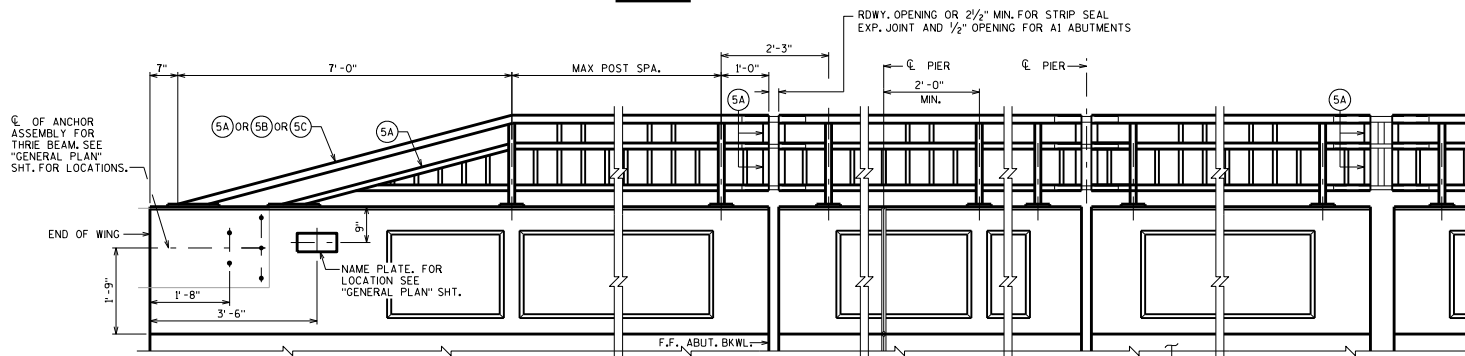
COMBINATION RAILINGS TYPE C1-C6 MAY ALSO BE USED AS A PEDESTRIAN RAIL MOUNTED DIRECTLY TO A BRIDGE SIDEWALK OR RETAINING WALL BY INCREASING THE RAILING HEIGHT TO A MINIMUM OF 3'-6" AND A MAXIMUM OF 4'-6" AND USING A MINIMUM POST SIZE OF 3"x3"x3/8". WHEN USED ON A BRIDGE, A TRAFFIC BARRIER IS REQUIRED BETWEEN THE ROADWAY AND THE SIDEWALK. FOR THIS PEDESTRIAN RAILING, BID ITEM SHALL BE "RAILING STEEL PEDESTRIAN TYPE C1-C6 B-...". THE CLEAR SPACE BETWEEN THE TOP TWO RAILS MAY BE INCREASED TO A 6" MAXIMUM EXCEPT FOR "TYPE C1" RAILING.

A MINIMUM 12'-0" WING LENGTH IS RECOMMENDED TO ACCOMMODATE THE RAIL END TRANSITION AND PROVIDE A POST SPACING ON THE WING THAT WILL MAINTAIN THE RAIL AESTHETICS.

SEE STANDARD 30.18 FOR ADDITIONAL RAILING DETAILS.

SEE STANDARD 30.07 FOR:

- DEFLECTION JOINT DETAILS AND NOTES
- BEAM GUARD ANCHOR ASSEMBLY DETAILS
- SIDEWALK REINFORCEMENT AND DETAILS



USE THIS END TRANSITION FOR ALL RAILING TYPES UNLESS SHOWN OTHERWISE

STRIP SEAL EXP. JT. @ ABUT. FOR TYPE A1 ABUT., USE 1/2" FILLER TO TOP OF PARAPET. SEE STD. 12.01/12.02

DEFLECTION JT. @ PIER

STRIP SEAL EXP. JT. @ PIER - SIDEWALK

MODULAR EXP. JT.

INSIDE ELEVATION

OPTIONAL CONSTRUCTION JOINTS IN THE PARAPETS MAY BE USED. RUN BAR REINF. THRU THE JOINT, LAP LONGIT. BARS A MIN. OF 1'-5". MIN. JOINT SPACING OF 80'-0". DEFINE CONSTR. JT. WITH A 3/4" V-GROOVE.

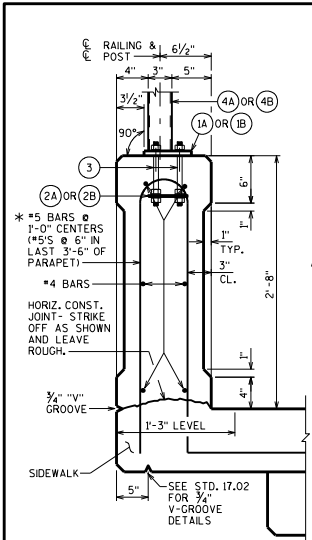
RAILING WEIGHT = 22 LB/FT

COMBINATION RAILING TYPES 'C1 - C6'

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

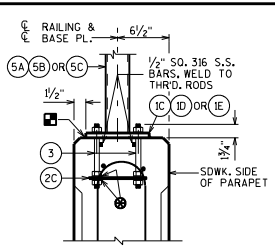
APPROVED: Bill Oliva

DATE: 7-15



SECTION THRU PARAPET ON BRIDGE

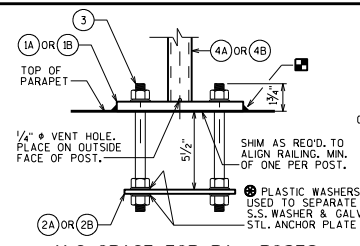
* ADJUST LOCATIONS OF BARS TO ALLOW PLACEMENT OF ANCHOR ASSEMBLY FOR RAILING AND BEAM GUARD (WHEN REQ'D.).



ANCHORAGE FOR END RAIL

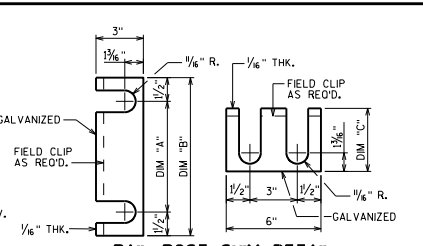
NOTE: USE 8" THRD. ROD AT PLATE ID WHEN ADJ. TO BEAM GUARD ANCHOR ASSEMBLY

NOTE: ANCHOR PLATES NOT REQ'D. WHEN TYPE "S" ANCHORS ARE USED.



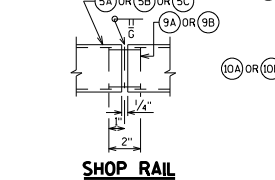
ANCHORAGE FOR RAIL POSTS

NOTE: ANCHOR PLATE NOT REQUIRED WHEN TYPE "S" ANCHORS ARE USED.



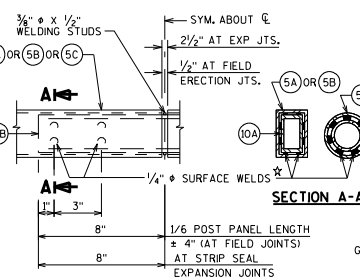
RAIL POST SHIM DETAIL

6" x 8" BASE PLATE (A) DIM "A" = 5", DIM "B" = 8", DIM "C" = 4"
6" x 10" BASE PLATE (B) DIM "A" = 7", DIM "B" = 10", DIM "C" = 5"
(2 SETS PER POST)



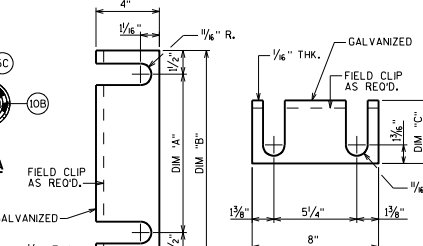
SHOP RAIL SPLICE DETAIL

(LOCATION MUST BE SHOWN ON SHOP DRAWINGS)



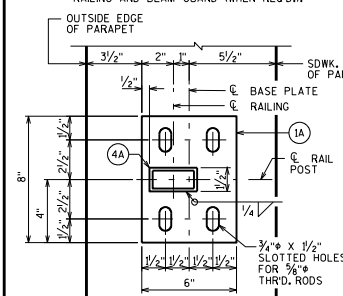
FIELD ERECTION JOINT DETAIL

* MIN. 3/8" FLAT SURFACE DIA. PUNCHING OR STUDS MAY BE USED AS AN ALTERNATE.



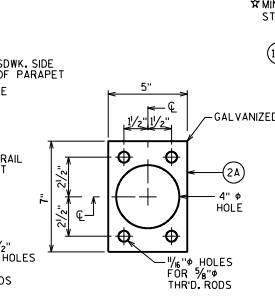
END RAIL SHIM DETAIL

8" x 1'-1" BASE PLATE (A) DIM "A" = 10", DIM "B" = 1'-1", DIM "C" = 6 1/2"
8" x 1'-6" BASE PLATE (B) DIM "A" = 1'-3", DIM "B" = 1'-6", DIM "C" = 9"
8" x 1'-3" BASE PLATE (C) DIM "A" = 1'-0", DIM "B" = 1'-3", DIM "C" = 7 1/2"
(2 SETS PER POST)



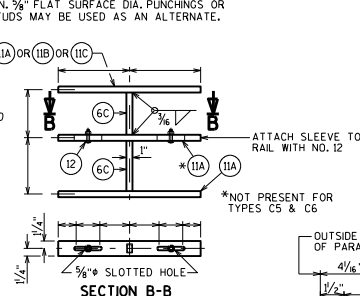
TYPICAL RAIL POST BASE PLATE

FOR 3" x 1/2" x 3/8" POSTS (A)

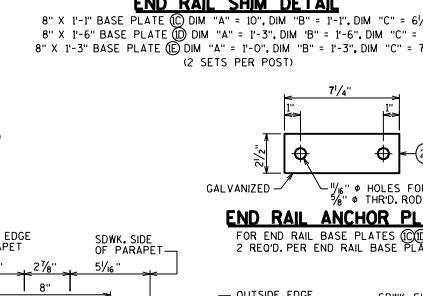


ANCHOR PLATE

FOR 3" x 1/2" x 3/8" POSTS (A)

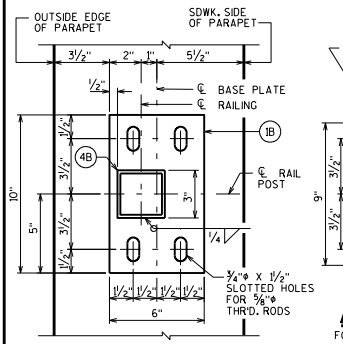


MODULAR JOINT SLEEVE DETAIL



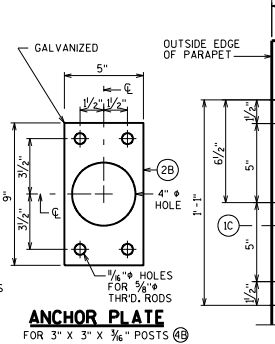
END RAIL ANCHOR PLATE

FOR END RAIL BASE PLATES (C) (D) (E)
2 REQ'D. PER END RAIL BASE PLATE



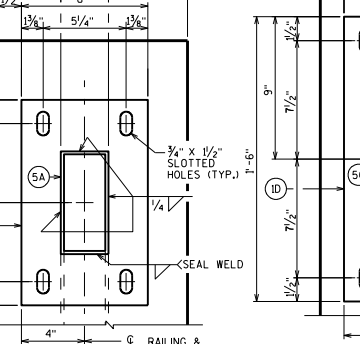
TYPICAL RAIL POST BASE PLATE

FOR 3" x 3" x 3/8" POSTS (B)



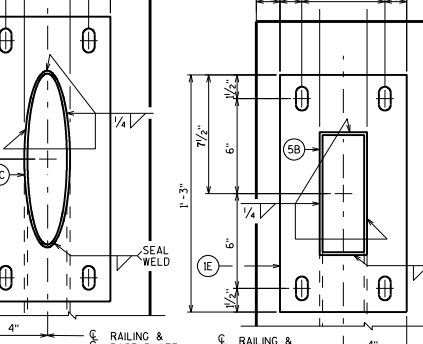
ANCHOR PLATE

FOR 3" x 3" x 3/8" POSTS (B)



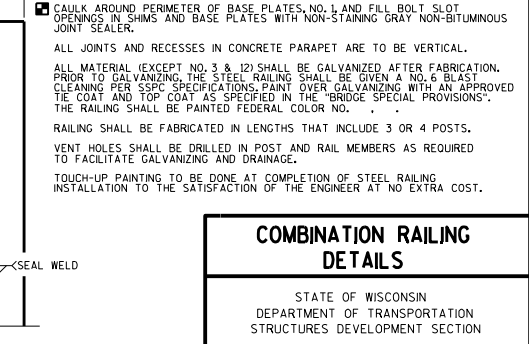
END RAIL BASE PLATE

FOR 3" x 1/2" x 3/8" RAIL (C)



END RAIL BASE PLATE

FOR 2 1/2" x STANDARD PIPE RAIL (C)



END RAIL BASE PLATE

FOR 3" x 2" x 3/8" RAIL (E)

LEGEND

- (A) PLATE 3/4" x 6" x 8" WITH 3/4" x 1/2" SLOTTED HOLES.
- (B) PLATE 3/8" x 6" x 10" WITH 3/4" x 1/2" SLOTTED HOLES.
- (C) PLATE 3/8" x 8" x 1'-1" WITH 3/4" x 1/2" SLOTTED HOLES.
- (D) PLATE 3/8" x 8" x 1'-6" WITH 3/4" x 1/2" SLOTTED HOLES
- (E) PLATE 3/8" x 8" x 1'-3" WITH 3/4" x 1/2" SLOTTED HOLES
- (F) 1/4" x 5" x 7" ANCHOR PLATE WITH 1/8" x HOLES FOR THRD. RODS NO. 3.
- (G) 1/4" x 5" x 9" ANCHOR PLATE WITH 1/8" x HOLES FOR THRD. RODS NO. 3.
- (H) 1/4" x 2 1/2" x 7 1/4" ANCHOR PLATE WITH 1/8" x HOLES FOR THRD. RODS NO. 3.
- (I) 3/8" DIA. x 9" LONG, TYPE 316 STAINLESS STEEL THREADED RODS (MIN. TENSILE STRENGTH = TO KSD) WITH NUT AND WASHERS OF SAME ALLOY GROUP.
- (J) ALTERNATE RAIL POST ANCHORAGE: 4 EQUIVALENT STAINLESS STEEL CONCRETE MASONRY ANCHORS TYPE S 5/8"-INCH, EMBED 7" IN CONCRETE FOR RAIL POSTS. EMBED 5" IN CONCRETE FOR END RAILS.)
- (K) STRUCTURAL TUBING 3" x 1/2" x 3/8". PLACE VERTICAL. WELD TO NO.1 & 5.
- (L) STRUCTURAL TUBING 3" x 3" x 3/8". PLACE VERTICAL. WELD TO NO.1 & 5.
- (M) STRUCTURAL TUBING 3" x 1 1/2" x 3/8" RAILS. WELD TO NO.1 & NO.4. INSIDE OF TUBE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.
- (N) STRUCTURAL TUBING 3" x 2" x 3/8" RAILS. WELD TO NO.1 & NO.4. INSIDE OF TUBE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.
- (O) STRUCTURAL TUBING 2 1/2" x (STANDARD SIZE) (2.875" O.D.), WELD TO NO.1 & 4. INSIDE OF TUBE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.
- (P) BAR 1" x 1" PICKETS. WELD TO NO.5. (SPACE AT 6" MAX. C. TO C. SPACING). PLACE VERTICAL.
- (Q) BAR 1" x 1 1/2" PICKETS. WELD TO NO.5. (SPACE AT 6" MAX. C. TO C. SPACING). PLACE VERTICAL.
- (R) BAR 1" x 1 1/2" PICKETS. WELD TO NO.1. PLACE VERTICAL.
- (S) BAR 1" x 1". BEND TO REQUIRED RADIUS. WELD TO NO.4 & 5.
- (T) STRUCTURAL TUBING 5" x (STANDARD SIZE) (5.563" O.D.) 1/2" LONG SLICES. WELD TO NO.5A.
- (U) RECTANGULAR SLEEVE FABRICATED FROM 3/8" PLATES. PROVIDE "SLIDING FIT".
- (V) CIRCULAR SLEEVE FABRICATED FROM STRUCTURAL TUBING 2" x (STANDARD SIZE) (2.375" O.D.)
- (W) RECTANGULAR SLEEVE FABRICATED FROM 3/8" PLATES. (1'-4" x 1/4" FIELD ERECTION JTS.) (1'-4" x 1/4" STRIP SEAL EXP. JTS.)
- (X) CIRCULAR SLEEVE FABRICATED FROM STRUCTURAL TUBING 2" x (STANDARD SIZE) (2.375" O.D.) (1'-4" x 1/4" FIELD ERECTION JTS.) (1'-4" x 1/4" STRIP SEAL EXP. JTS.)
- (Y) BAR 2 1/2" x 1" x " - "
- (Z) BAR 2 1/2" x 1 1/2" x " - "
- (AA) STRUCTURAL TUBING 2" x (STANDARD SIZE) (2.375" O.D.) x " - "
- (AB) 1/2" DIA. STAINLESS STEEL BOLT WITH NUT AND LOCKWASHER.

RAILING NOTES

BID ITEM SHALL BE "RAILING STEEL TYPE (C11-6) B-...", WHICH SHALL INCLUDE ALL STEEL ITEMS SHOWN.

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 CUTS.

ALL PLATES, BARS, AND RECTANGULAR SLEEVES SHALL CONFORM TO ASTM A709 GRADE 36. ALL STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B.

ANCHORAGES SHALL BE ACCURATELY PLACED TO PROVIDE CORRECT ALIGNMENT OF RAILING. SET NORMAL TO GRADE.

CUT BOTTOM OF POST TO MAKE POST VERTICAL IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTION.

STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATES WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED.

CAULK AROUND PERIMETER OF BASE PLATES, NO. 1, AND FILL BOLT SLOT OPENINGS IN SHIMS AND BASE PLATES WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

ALL JOINTS AND RECESSES IN CONCRETE PARAPET ARE TO BE VERTICAL.

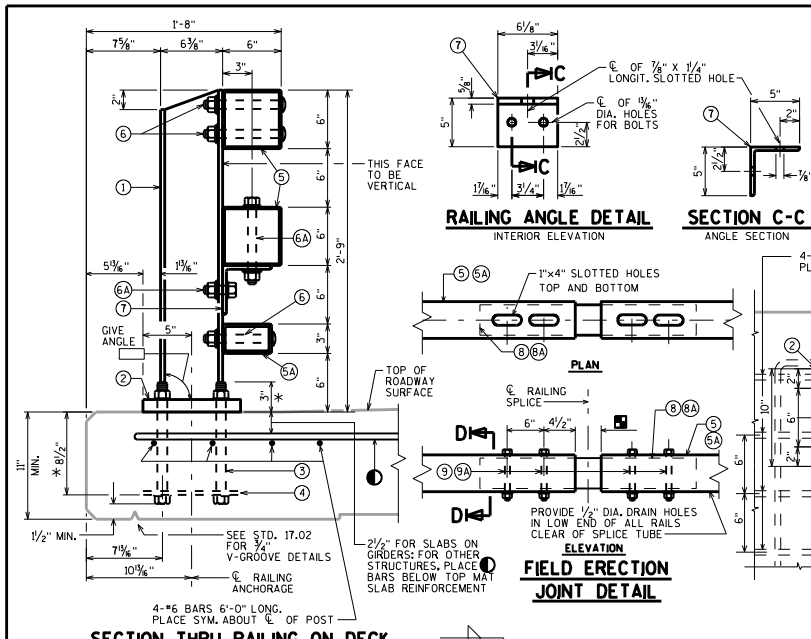
ALL MATERIAL (EXCEPT NO. 3 & 12) SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING, THE STEEL RAILING SHALL BE GIVEN A NO. 6 BLAS CLEANING PER SSPC SPECIFICATIONS. PAINT OVER GALVANIZING WITH AN APPROVED TOP COAT AS SPECIFIED IN THE "BRIDGE SPECIAL PROVISIONS". THE RAILING SHALL BE PAINTED FEDERAL COLOR NO. .

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

VENT HOLES SHALL BE DRILLED IN POST AND RAIL MEMBERS AS REQUIRED TO FACILITATE GALVANIZING AND DRAINAGE.

TOUCH-UP PAINTING TO BE DONE AT COMPLETION OF STEEL RAILING INSTALLATION TO THE SATISFACTION OF THE ENGINEER AT NO EXTRA COST.

COMBINATION RAILING DETAILS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <i>Bill Oliva</i>	DATE: 7-15



LEGEND

- ① W6 x 25 with 1/4" x 1 1/2" HORIZONTAL SLOTTED HOLES ON EACH SIDE OF POST FOR BOLT NO. 6 AT NO. 5. USE 1" DIA. HOLES FOR BOLT NO. 6 AT NO. 5A AND FOR BOLT NO. 6A AT NO. 7. CUT BOTTOM OF POST TO MATCH CROSS SLOPE OF ROADWAY. PLACE POST VERTICAL. PLACE POSTS NORMAL TO GRADE LINE.
 - ② PLATE 1/2" x 10" x 1'-2" WITH 1/8" x 1 1/2" SLOTTED HOLES FOR ANCHOR BOLTS NO. 3, WELD TO NO. 1 AS SHOWN. SLOTS PARALLEL TO SHORT SIDE OF PLATE.
 - ③ ASTM A449 - 1" DIA. ANCHOR BOLTS WITH HEAVY HEX NUT AND 2" O.D. HARDENED WASHER (ALL GALVANIZED). 4 REQUIRED PER POST TO THREAD 3" AND PLACE NORMAL TO PLATE NO. 2. CHAMFER TOP OF BOLTS BEFORE THREADING. USE 1/2" LONG BOLT FOR CONCRETE DECKS, ON CONCRETE SLAB SUPERSTRUCTURES, USE 1'-3" LONG BOLT FOR SLAB THICKNESS > 16" AND 1 1/2" LONG FOR THICKNESS ≤ 16". USE 1'-9" LONG IN ABUTMENT WINGS. (AN EQUIVALENT THREADED ROD WITH HEAVY HEX NUTS AND HARDENED WASHERS MAY BE SUBSTITUTED FOR ANCHOR BOLTS IN WINGS IF REQUIRED FOR CONSTRUCTIBILITY.)
 - ④ 3/8" x 10" x 1'-2" ANCHOR PLATE (GALVANIZED WITH 1/8" DIA. HOLES FOR ANCHOR BOLTS NO. 3).
 - ⑤ TS 6 x 6 x 3/8" STRUCTURAL TUBING, USE 1" DIA. HOLES FOR BOLT NO. 6 (FRONT & BACK) & 3/8" DIA. HOLES FOR BOLT NO. 6A (TOP & BOTTOM).
 - ⑥A TS 5 x 3 x 1/4" STRUCTURAL TUBING, USE 1 1/4" x 1 1/2" HORIZONTAL SLOTTED HOLES FOR BOLT NO. 6 (FRONT & BACK) AND A 2" O.D. WASHER UNDER BOLT HEAD.
 - ⑥ 7/8" DIA. A325 SLOTTED ROUND HEAD BOLT WITH HEX NUT, 3/8" x 1 1/2" x 1 1/2" WASHER, AND SPRING LOCK WASHER (2 REQUIRED AT RAIL TO POST LOCATIONS SHOWN).
 - ⑥A 7/8" DIA. A325 BOLT WITH HEX NUT & SPRING LOCK WASHER (1 REQUIRED AT RAIL TO ANGLE & 2 REQUIRED AT ANGLE TO POST LOCATIONS SHOWN WITH 3/8" x 1 1/2" x 1 1/2" WASHER).
 - ⑦ L 5 x 5 x 5/8" STRUCTURAL ANGLE. ATTACH TO NO. 1 AND NO. 5 AS SHOWN.
 - ⑧ TS 5 x 5 x 3/8" x 2'-4" LONG SPLICE TUBE. 1 PER RAIL. USED IN NO. 5.
 - ⑧A 4/4" x 2/8" x 2'-4" LONG SPLICE BAR. 1 PER RAIL. USED IN NO. 5A.
 - ⑨ 3/4" DIA. A325 FULLY THREADED BOLTS, 7/8" LONG, WITH 2 WASHERS AND HEAVY HEX NUT ON EACH BOLT. NUT TO BE FINGER TIGHT. (4 REQUIRED PER SPLICE). USE 1" x 4" SLOTTED HOLES IN TOP AND BOTTOM OF NO. 5.
 - ⑨A 3/4" DIA. A325 FULLY THREADED BOLTS, 4/4" LONG, WITH 2 WASHERS AND HEAVY HEX NUT ON EACH BOLT. NUT TO BE FINGER TIGHT. (4 REQUIRED PER SPLICE). USE 1" x 4" SLOTTED HOLES IN TOP AND BOTTOM OF NO. 5A.
 - ⑩ SPLICE SLEEVE FABRICATED FROM 1/4" PLATE. PROVIDE "SLIDING FIT".
- ▣ ROADWAY OPENING OR 2 1/2" MIN. FOR STRIP SEAL EXP. JOINT & 1/2" OPENING FOR A1 ABUTMENT. 1/2" AT FIXED JOINTS. SPLICES ARE REQUIRED IN ANY RAILING SPAN BETWEEN POSTS THAT CONTAINS A SUPERSTRUCTURE EXPANSION JOINT.
- ▲ PROTRUSIONS CAUSED BY WELDING OR GALVANIZING ARE NOT PERMITTED ON THE ADJOINING SURFACES OF THE RAILS, SPLICE TUBES AND FILL PLATES.
- ① * 6 BARS X 12'-0" LONG, BEND AS SHOWN, TIE TO TOP MAT OF STEEL. (DESIGNER TO PLACE THESE BARS IN BILL OF BARS FOR SUPERSTRUCTURE.)

NOTES

BID ITEM SHALL BE "RAILING STEEL TYPE NY3 B-...", WHICH INCLUDES ALL ITEMS SHOWN.

RAILING SHALL BE CONTINUOUS OVER A MINIMUM OF THREE (3) POSTS WITHOUT SPLICES WHERE POSSIBLE.

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.

ALL MATERIAL SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING, ALL STEEL RAILING POSTS, ANGLES, SPLICE TUBES, SPLICE BARS AND STEEL TUBING SHALL BE GIVEN A NO. 6 BLAST CLEANING PER SSPC SPECIFICATIONS.

WHEN PAINTING IS REQUIRED, ALL MATERIAL EXCEPT ANCHORAGE DETAIL (NO. 3 & NO. 4) SHALL BE PAINTED OVER GALVANIZING WITH AN APPROVED TIE COAT AND TOP COAT AS SPECIFIED IN THE "BRIDGE SPECIAL PROVISIONS". THE RAILING SHALL BE PAINTED FEDERAL COLOR NO. []

RAIL POST, BASE PLATES, SPLICE BAR, ANGLES AND SPLICE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A709 GRADE 50. STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500 GRADE B OR C WITH A CERTIFIED T_y ≥ 50 KSI. ANCHOR PLATES & SHIMS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A709 GRADE 50.

THE NUT SECURING THE POST BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8" TURN.

FILL BOLT SLOT OPENINGS IN POST SHIMS AND PLATE NO. 2 WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. CAULK AROUND PERIMETER OF NO. 2 WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

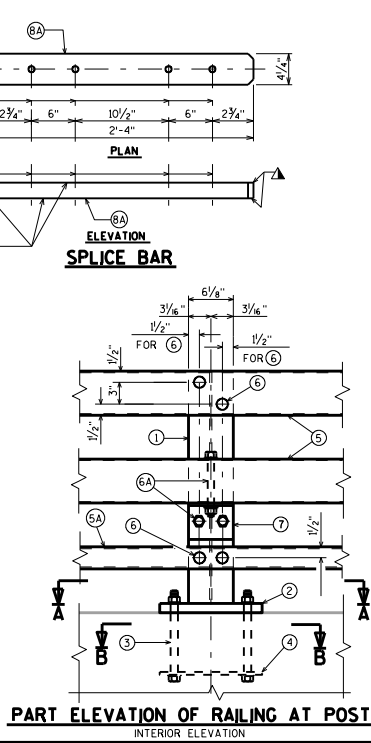
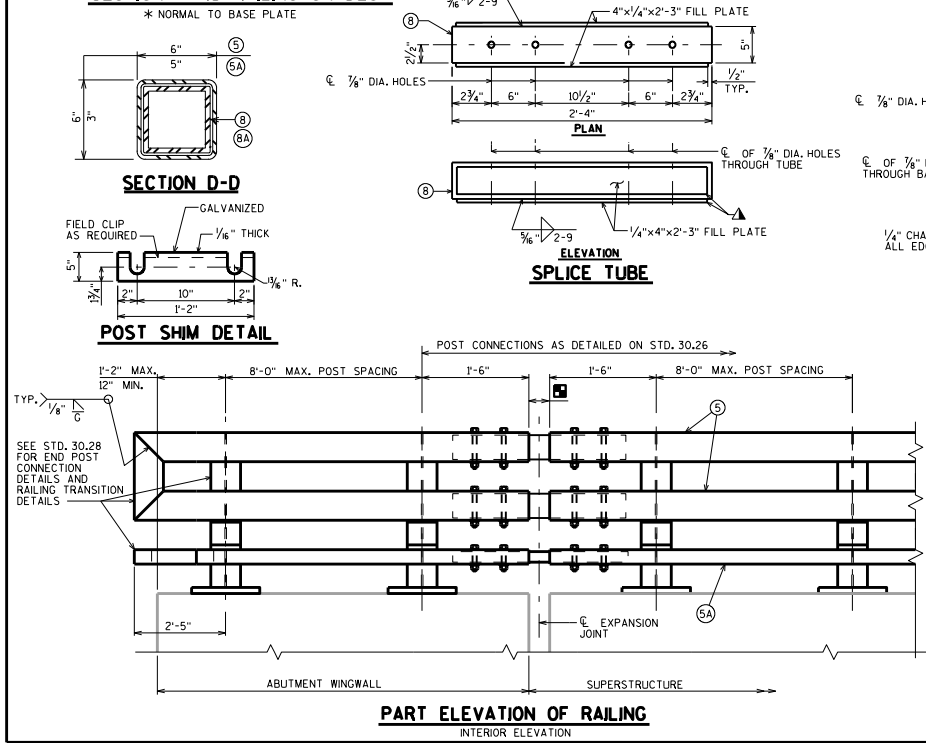
STEEL SHIMS SHALL BE PROVIDED & USED UNDER PLATE NO. 2 WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED.

PLACE FIRST BOTTOM LONGITUDINAL REINFORCING BAR CLEAR OF DRIP GROOVE.

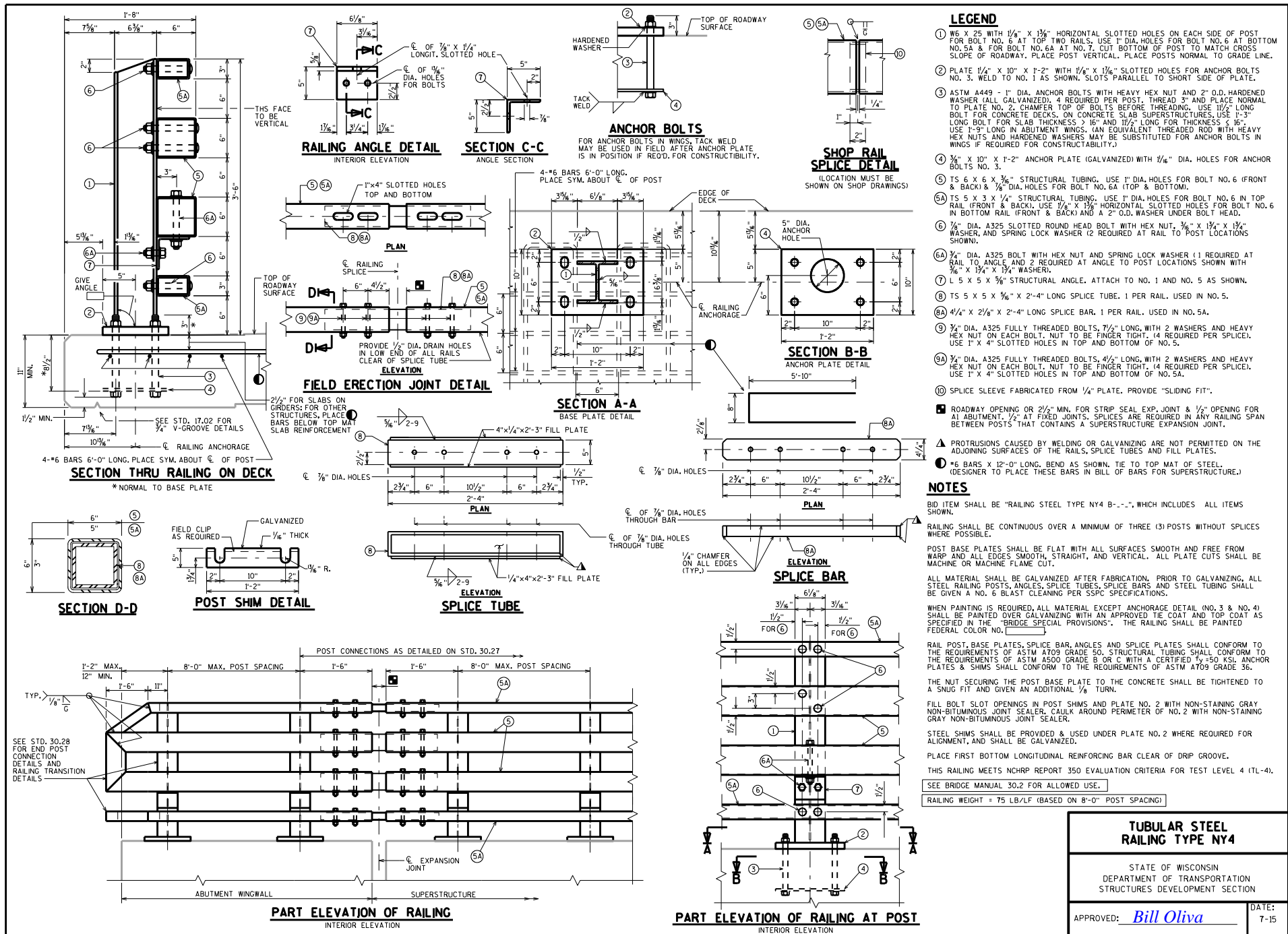
THIS RAILING MEETS NCHRP REPORT 350 EVALUATION CRITERIA FOR TEST LEVEL 4 (TL-4).

SEE BRIDGE MANUAL 30.2 FOR ALLOWED USE.

RAILING WEIGHT = 60 LB/LF (BASED ON 8'-0" POST SPACING)



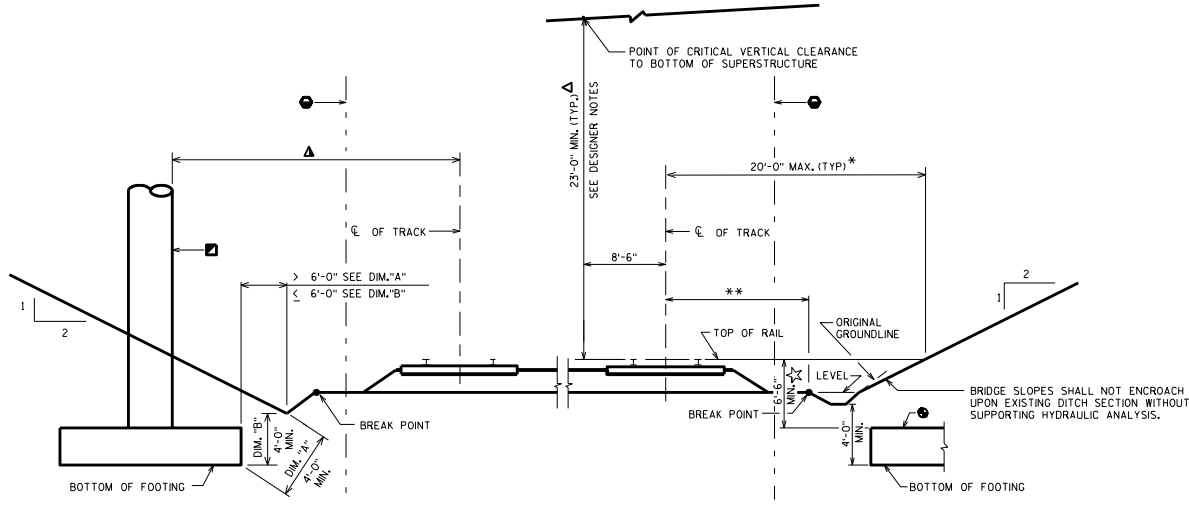
TUBULAR STEEL RAILING TYPE NY3	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <i>Bill Oliva</i>	DATE: 7-15



- LEGEND**
- W6 x 25 WITH 1/8" x 1 1/2" HORIZONTAL SLOTTED HOLES ON EACH SIDE OF POST FOR BOLT NO. 6 AT TOP TWO RAILS, USE 1" DIA. HOLES FOR BOLT NO. 6 AT BOTTOM NO. 5A & FOR BOLT NO. 6A AT NO. 7. CUT BOTTOM OF POST TO MATCH CROSS SLOPE OF ROADWAY, PLACE POST VERTICAL, PLACE POSTS NORMAL TO GRADE LINE.
 - PLATE 1/2" x 10" x 1'-2" WITH 1/8" x 1 1/2" SLOTTED HOLES FOR ANCHOR BOLTS NO. 3, WELD TO NO. 1 AS SHOWN, SLOTS PARALLEL TO SHORT SIDE OF PLATE.
 - ASTM A449 - 1" DIA. ANCHOR BOLTS WITH HEAVY HEX NUT AND 2" O.D. HARDENED WASHER (ALL GALVANIZED), 4 REQUIRED PER POST, THREAD 3" AND PLACE NORMAL TO PLATE NO. 2, CHAMFER TOP OF BOLTS BEFORE THREADING, USE 1 1/2" LONG BOLT FOR CONCRETE DECKS, ON CONCRETE SLAB SUPERSTRUCTURES, USE 1'-3" LONG BOLT FOR SLAB THICKNESS > 16" AND 1 1/2" LONG FOR THICKNESS < 16", USE 1'-9" LONG IN ABUTMENT WINGS, (AN EQUIVALENT THREADED ROD WITH HEAVY HEX NUTS AND HARDENED WASHERS MAY BE SUBSTITUTED FOR ANCHOR BOLTS IN WINGS IF REQUIRED FOR CONSTRUCTIBILITY.)
 - 3/8" x 10" x 1'-2" ANCHOR PLATE (GALVANIZED) WITH 1/16" DIA. HOLES FOR ANCHOR BOLTS NO. 3.
 - TS 6 x 6 x 3/8" STRUCTURAL TUBING, USE 1" DIA. HOLES FOR BOLT NO. 6 (FRONT & BACK) & 3/8" DIA. HOLES FOR BOLT NO. 6A (TOP & BOTTOM).
 - TS 5 x 3 x 1/4" STRUCTURAL TUBING, USE 1" DIA. HOLES FOR BOLT NO. 6 IN TOP RAIL (FRONT & BACK), USE 1/8" x 1 1/2" HORIZONTAL SLOTTED HOLES FOR BOLT NO. 6 IN BOTTOM RAIL (FRONT & BACK) AND A 2" O.D. WASHER UNDER BOLT HEAD.
 - 7/8" DIA. A325 SLOTTED ROUND HEAD BOLT WITH HEX NUT, 3/8" x 1 1/2" x 1 1/4" WASHER, AND SPRING LOCK WASHER (2 REQUIRED AT RAIL TO POST LOCATIONS SHOWN).
 - 7/8" DIA. A325 BOLT WITH HEX NUT AND SPRING LOCK WASHER (1 REQUIRED AT RAIL TO ANGLE AND 2 REQUIRED AT ANGLE TO POST LOCATIONS SHOWN WITH 3/8" x 1 1/4" x 1 1/4" WASHER).
 - L 5 x 5 x 3/8" STRUCTURAL ANGLE, ATTACH TO NO. 1 AND NO. 5 AS SHOWN.
 - TS 5 x 5 x 3/8" x 2'-4" LONG SPLICE TUBE, 1 PER RAIL, USED IN NO. 5.
 - 4/4" x 2/8" x 2'-4" LONG SPLICE BAR, 1 PER RAIL, USED IN NO. 5A.
 - 3/4" DIA. A325 FULLY THREADED BOLTS, 7/8" LONG, WITH 2 WASHERS AND HEAVY HEX NUT ON EACH BOLT, NUT TO BE FINGER TIGHT, (4 REQUIRED PER SPLICE), USE 1" x 4" SLOTTED HOLES IN TOP AND BOTTOM OF NO. 5.
 - 3/4" DIA. A325 FULLY THREADED BOLTS, 4/8" LONG, WITH 2 WASHERS AND HEAVY HEX NUT ON EACH BOLT, NUT TO BE FINGER TIGHT, (4 REQUIRED PER SPLICE), USE 1" x 4" SLOTTED HOLES IN TOP AND BOTTOM OF NO. 5A.
 - SPLICE SLEEVE FABRICATED FROM 1/4" PLATE, PROVIDE "SLDING FIT".
 - ROADWAY OPENING OR 2 1/2" MIN. FOR STRIP SEAL EXP. JOINT & 1/2" OPENING FOR AT ABUTMENT, 1/2" AT FIXED JOINTS, SPLICES ARE REQUIRED IN ANY RAILING SPAN BETWEEN POSTS THAT CONTAINS A SUPERSTRUCTURE EXPANSION JOINT.
 - PROTRUSIONS CAUSED BY WELDING OR GALVANIZING ARE NOT PERMITTED ON THE ADJOINING SURFACES OF THE RAILS, SPLICE TUBES AND FILL PLATES.
 - #6 BARS X 12'-0" LONG, BEND AS SHOWN, TIE TO TOP MAT OF STEEL (DESIGNER TO PLACE THESE BARS IN BILL OF BARS FOR SUPERSTRUCTURE.)

- NOTES**
- BID ITEM SHALL BE "RAILING STEEL TYPE NY4 B--", WHICH INCLUDES ALL ITEMS SHOWN.
- RAILING SHALL BE CONTINUOUS OVER A MINIMUM OF THREE (3) POSTS WITHOUT SPLICES WHERE POSSIBLE.
- 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.
- ALL MATERIAL SHALL BE GALVANIZED AFTER FABRICATION, PRIOR TO GALVANIZING, ALL STEEL RAILING POSTS, ANGLES, SPLICE TUBES, SPLICE BARS AND STEEL TUBING SHALL BE GIVEN A NO. 6 BLAST CLEANING PER SSPC SPECIFICATIONS.
- WHEN PAINTING IS REQUIRED, ALL MATERIAL EXCEPT ANCHORAGE DETAIL (NO. 3 & NO. 4) SHALL BE PAINTED OVER GALVANIZING WITH AN APPROVED THE COAT AND TOP COAT AS SPECIFIED IN THE "BRIDGE SPECIAL PROVISIONS". THE RAILING SHALL BE PAINTED FEDERAL COLOR NO. 1.
- RAIL POST, BASE PLATES, SPLICE BAR, ANGLES AND SPLICE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A709 GRADE 50. STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500 GRADE B OR C WITH A CERTIFIED 150 KSI ANCHOR PLATES & SHIMS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A709 GRADE 36.
- THE NUT SECURING THE POST BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8" TURN.
- FILL BOLT SLOT OPENINGS IN POST SHIMS AND PLATE NO. 2 WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER, CAULK AROUND PERIMETER OF NO. 2 WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.
- STEEL SHIMS SHALL BE PROVIDED & USED UNDER PLATE NO. 2 WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED.
- PLACE FIRST BOTTOM LONGITUDINAL REINFORCING BAR CLEAR OF DRIP GROOVE.
- THIS RAILING MEETS NCHRP REPORT 350 EVALUATION CRITERIA FOR TEST LEVEL 4 (TL-4).
- SEE BRIDGE MANUAL 30.2 FOR ALLOWED USE.
- RAILING WEIGHT = 75 LB/LF (BASED ON 8'-0" POST SPACING)

TUBULAR STEEL RAILING TYPE NY4	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <i>Bill Oliva</i>	DATE: 7-15



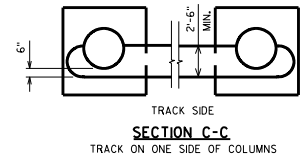
RAILROAD CROSS SECTIONS

DESIGNER NOTES

- DIMENSIONS SHOWN APPLY TO CUT OR FILL SITUATIONS.
- DECK DRAINS OR DOWN SPOUTS SHALL NOT DISCHARGE ONTO RAILROAD TRACK BED.
- SINGLE SLOPE PARAPET SHALL BE USED. PEDESTRIAN RAILING WILL ONLY BE PROVIDED IF THERE IS A SIDEWALK. SEE CHAPTER 38 OF THE BRIDGE MANUAL.
- ▲ VERTICAL CLEARANCE LESS THAN 23'-0" MAY BE PROVIDED IN SOME SITUATIONS WITH APPROVAL OF THE OFFICE OF THE COMMISSIONER OF RAILROADS. CONSULT WITH CENTRAL OFFICE RAILROAD UNIT. MAXIMUM ALLOWABLE VERTICAL CLEARANCE OF 23'-3/2" IS ALLOWED BY FHWA.
 - ** VARIABLE DISTANCE WHICH IS FOUND FROM FIELD SURVEY.
 - * SITE SPECIFIC JUSTIFICATION REQUIRED FOR GREATER DISTANCES. LATERAL CLEARANCES SHALL BE ESTABLISHED BASED ON SITE SPECIFIC CONDITIONS AND ECONOMICAL STRUCTURE DESIGN. CONSULT WITH CENTRAL OFFICE RAILROAD UNIT. SEE 23 CODE OF FEDERAL REGULATIONS PT 646, SUBPT. B APPENDIX.
 - ▲ FOR OFFSETS UP TO, AND INCLUDING 25'-0", A CRASH WALL OR HAMMERHEAD PIER DESIGNED TO AREMA STANDARDS (30 SO. FT. MIN. X-SECT) IS REQUIRED.
 - ▲ ACCOMODATION FOR ADDITIONAL TRACKS REQUIRES DEPARTMENT APPROVAL. CONFER WITH STATEWIDE RAILROAD STRUCTURE AND TRACK ENGINEER IN CENTRAL OFFICE RAILROADS AND HARBORS SECTION AT 16081 266-0233.
 - ▲ HORIZONTAL CLEARANCES LESS THAN 18'-0" SHOULD BE REVIEWED WITH THE STATEWIDE RAILROAD AND TRACK ENGINEER IN THE CENTRAL OFFICE RAILROADS AND HARBORS SECTION.
- TEMPORARY CONSTRUCTION CLEARANCES ARE 21'-0" VERTICAL (21'-6" FOR BNSF AND UP RAILROADS) AND 12'-0" HORIZONTAL FROM CENTERLINE OF TRACK TO FALSEWORK.
- DESIGNER SHALL SHOW HORIZONTAL LOCATION OF SHORING NEEDED IN PLAN VIEW. DESIGNER SHALL ALSO DETERMINE IF THE SHORING IS TO BE DESIGNED FOR ZONE A, B OR C.
- ☆ 6'-6" MIN. NOT REQ'D IF BEDROCK IS PRESENT.
- THIS STANDARD IS TO MEET WISDOT REQUIREMENTS ONLY. THE DESIGN ENGINEER SHALL CONTACT THE RAILROAD FOR THEIR REQUIREMENTS.
- BNSF AND UP RAILROADS HAVE GREATER REQUIREMENTS THAN SHOWN. CONFER WITH STATEWIDE RAILROAD STRUCTURE AND TRACK ENGINEER IN CENTRAL OFFICE RAILROADS AND HARBORS SECTION.
 - BNSF AND UP RAILROAD REQUIRE A DEPTH OF FOOTING 6'-0" MIN. FROM BASE OF RAIL TO TOP OF FOOTING. IN LOCATIONS WHERE BEDROCK IS PRESENT, COORDINATE FOOTING DEPTHS WITH RAILROAD PROJECT COORDINATION ENGINEER.
 - LIMITS OF RAILROAD RIGHT-OF-WAY. LOCATIONS SHOWN ARE FOR REFERENCE ONLY AND NEED NOT BE DIMENSIONED.
 - AESTHETICS SHALL NOT BE EMPLOYED ALONG RAILROAD TRACKS.

NOTES

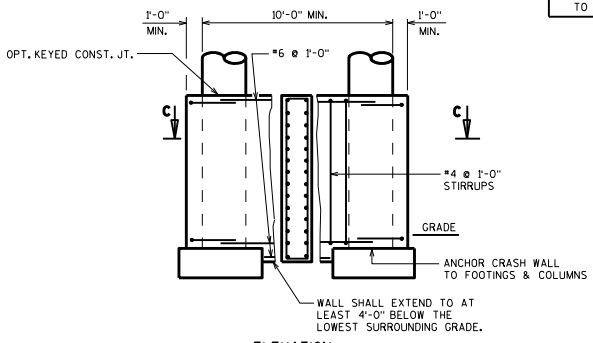
FINAL LOCATION AND TYPE OF SHORING SYSTEM TO BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL SUBMIT ALL DESIGN DRAWINGS AND CALCULATIONS DIRECTLY TO THE RAILROAD. SHORING COVERED BY BID ITEM "SPV.0165 TEMPORARY SHORING RAILROAD".



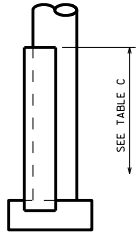
SECTION C-C
TRACK ON ONE SIDE OF COLUMNS

TABLE C

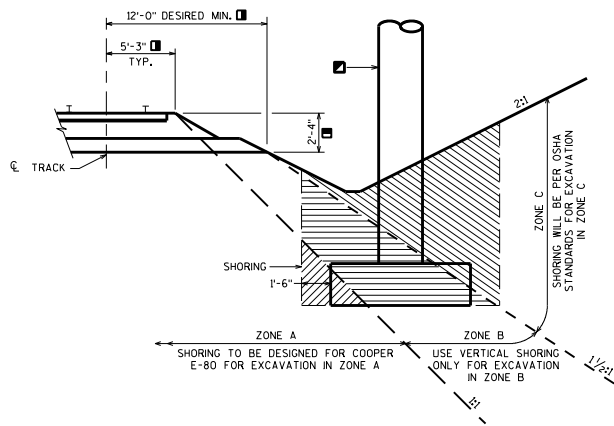
PIER LOCATION	HEIGHT OF CRASH WALL ABOVE TOP OF RAIL
PIERS < 12'-0" FROM CL TRACK	12'-0"
PIERS 12'-0" TO 25'-0"	6'-0"



CRASH WALL DETAILS



END VIEW



LIMITS BEFORE SHORING REQUIRED

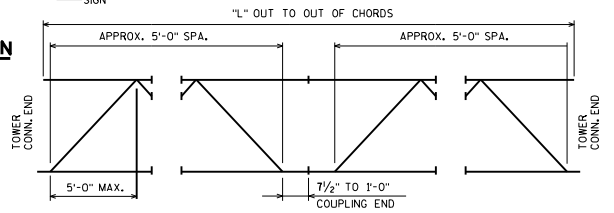
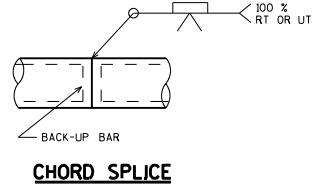
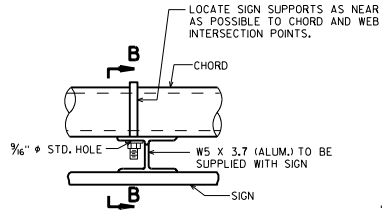
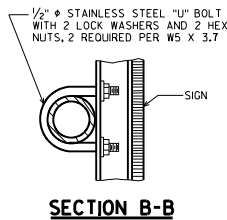
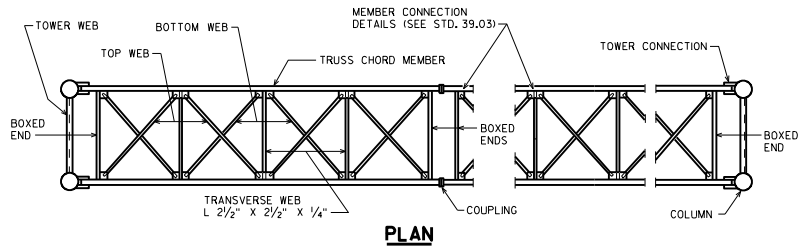
- ▨ ZONE A SHORING
- ▨ ZONE B SHORING
- ▨ ZONE C SHORING

HIGHWAY OVER RAILROAD DESIGN REQUIREMENTS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva

DATE:
7-15



FABRICATOR MAY MAKE TRUSSES ANY LENGTH KEEPING A SECTION A MINIMUM OF 20'-0" & A MULTIPLE OF 5'-0". CHORD FIELD SPLICES SHALL BE MADE WITH COUPLINGS. CHORD SHOP SPLICE SHALL BE THE WELDED SPLICE SHOWN ABOVE.

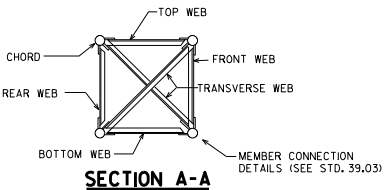
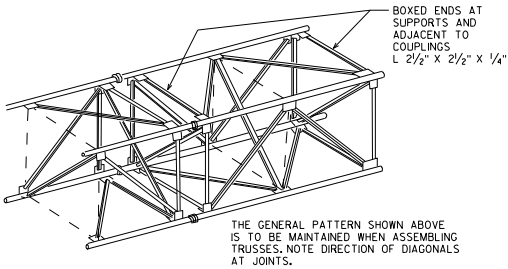
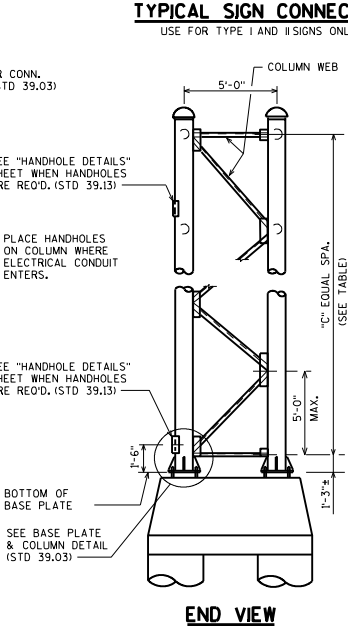
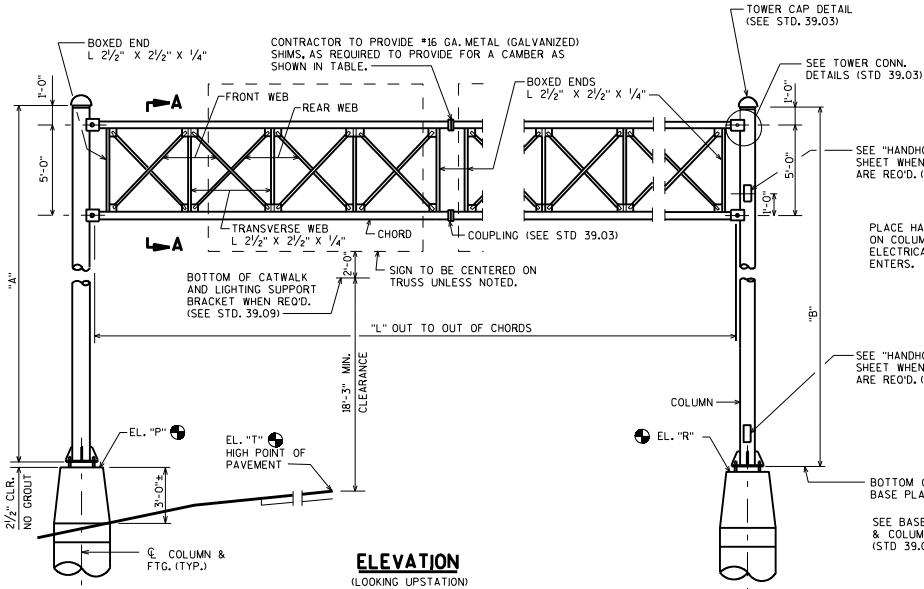
GENERAL NOTES

- DRAWINGS SHALL NOT BE SCALED.
- STEEL COLUMN AND CHORD PIPE SHALL BE API SPEC. 5L GRADE X42 Fy = 42,000 PSI**
- PLATES, BARS, & STRUCTURAL ANGLES SHALL BE ASTM A709 GRADE 36 Fy = 36,000 PSI
- ALL STRUCTURAL STEEL MEMBERS SHALL BE GALVANIZED.
- ALL BOLTED CONNECTIONS SHALL BE MADE WITH 3/4" A325 BOLTS, GALVANIZED ASTM A53, CLASS C, AND INSTALLED WITH DTI WASHERS.
- WELDED CONNECTIONS CAN BE USED IN LIEU OF BOLTED CONNECTIONS, IF UNIT CAN BE GALVANIZED IN ONE PIECE.
- STEEL ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F1554 GRADE 55, ASTM A563A HEAVY HEX NUTS, AND ASTM F436 WASHERS.
- THE UPPER 12" OF ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE AASHTO SPECIFICATION AS STATED IN SECTION 64L OF THE WISDOT STANDARD SPECIFICATIONS.
- WELD TEST AS PER AWS D11.
- ** ALTERNATE MATERIAL FOR COLUMN AND CHORD LESS THAN 10" DIAMETER MAY BE ASTM A500 GRADE B Fy = 42,000 PSI, GRADE C Fy = 46,000 PSI, OR ASTM A53 GRADE B Fy = 35,000 PSI.
- ELEVATIONS TO BE SHOWN ON LAYOUT SHEET.

DESIGN DATA

DEAD LOAD - 3 PSF OF SIGN, WT. OF SUPPORTING STRUCTURE, CATWALK, LIGHTS AND RAILINGS.
 ICE LOAD - 3 PSF TO 1 FACE OF SIGN & AROUND SURFACE OF MEMBERS.
 WIND PRESSURE - 90 MPH (3-SECOND GUST SPEED) TO SIGN AREA & EXPOSED MEMBERS.
 FATIGUE GROUP LOAD IS APPLIED PER SECTION 39.4.2 OF THE WISDOT BRIDGE MANUAL.
 DESIGNED ACCORDING TO THE 6TH EDITION OF AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS."

STRUCTURE	DESIGN SIGN AREA	MAX. SIGN DEPTH



STANDARDS 39.03, 39.09, AND 39.13 DETAILS ARE USED WITH THIS STANDARD TO DETAIL A "4-CHORD GALVANIZED STEEL SIGN BRIDGE" FOR TYPE I AND II SIGNS ONLY.

DIMENSIONS, MEMBER SIZES, & CAMBER

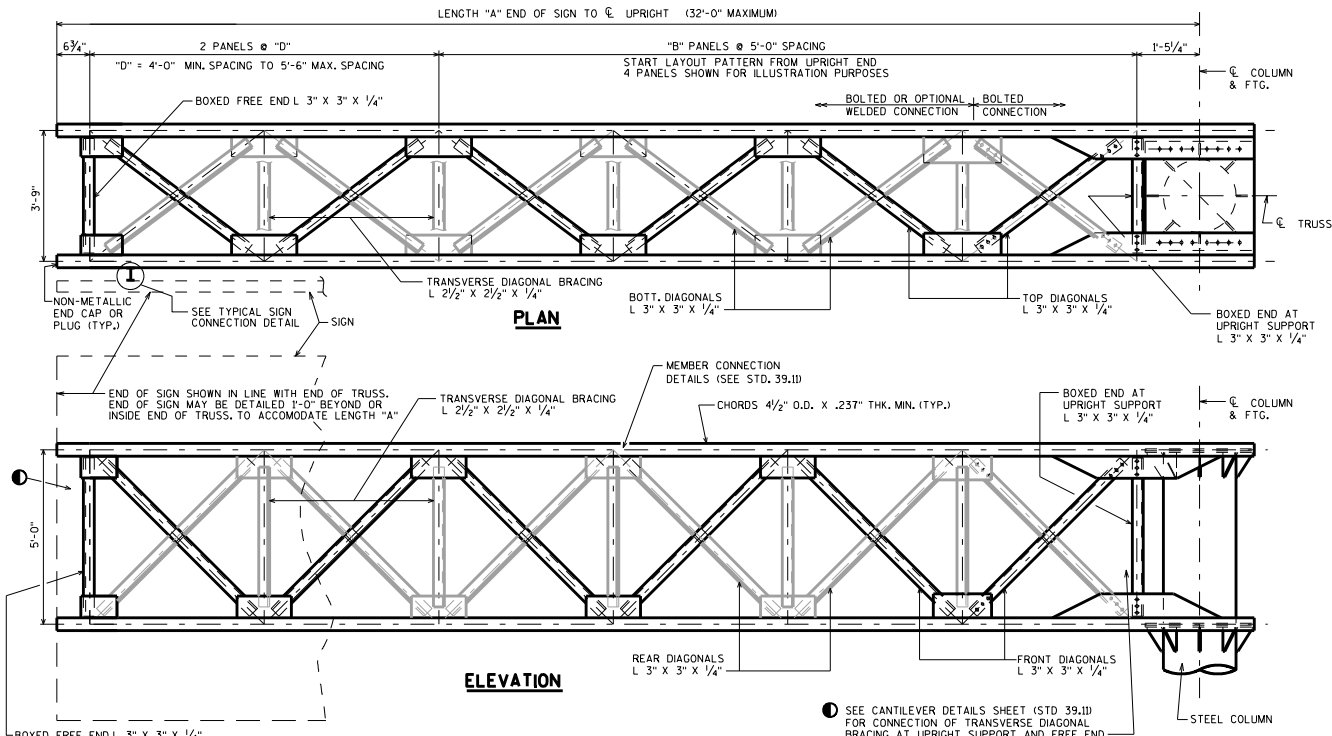
STRUCTURE	"A"	"B"	"C"	CHORDS O.D. X THK.	TOP & BOTTOM WEB	FRONT & REAR WEB	COUPLING PLATE "D1" & "T"	COUPLING BOLT CIRCLE DIA. "D2"	NO. OF BOLTS IN COUPLING	CAMBER	STEEL COLUMN O.D. X THK.	COLUMN WEBS	"L"

TABLE ENTRIES TO BE DESIGNED

4-CHORD GALVANIZED STEEL SIGN BRIDGE

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION
 STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva DATE: 7-15



GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

STEEL COLUMN AND CHORD PIPE SHALL BE API SPEC. 5L GRADE x42 Fy = 42,000 PSI **

PLATES, BARS, & STRUCTURAL ANGLES SHALL BE ASTM A709 GRADE 36 Fy = 36,000 PSI

ALL STRUCTURAL STEEL MEMBERS SHALL BE GALVANIZED.

ALL BOLTED CONNECTIONS SHALL BE MADE WITH 3/4" φ A325 BOLTS, GALVANIZED ASTM A153, CLASS C, AND INSTALLED WITH DTI WASHERS.

WELDED CONNECTIONS CAN BE USED IN LIEU OF BOLTED CONNECTIONS, IF UNIT CAN BE GALVANIZED IN ONE PIECE.

STEEL ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F1554 GRADE 55, ASTM A563A HEAVY HEX NUTS, AND ASTM F436 WASHERS.

THE UPPER 12" OF ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE AASHTO SPECIFICATION AS STATED IN SECTION 64L OF THE WISDOT STANDARD SPECIFICATIONS.

WELD TEST AS PER AWS D11.

PREFABRICATE CAMBER INTO THE HORIZONTAL SUPPORT PROVIDING AN AMOUNT "Y" AT END OF TRUSS SHOWN IN "CAMBER DIAGRAM". **DO NOT** RAKE VERTICAL UPRIGHT BY ADJUSTMENT OF LEVELING NUTS.

** ALTERNATE MATERIAL FOR CHORD LESS THAN 10" DIAMETER MAY BE ASTM A500 GRADE B Fy = 42,000 PSI, GRADE C Fy = 46,000 PSI, OR ASTM A53 GRADE B Fy = 35,000 PSI.

DESIGN DATA

DEAD LOAD - 3 PSF OF SIGN, WT. OF SUPPORTING STRUCTURE, CATWALK, LIGHTS AND RAILINGS.

ICE LOAD - 3 PSF TO 1FACE OF SIGN & AROUND SURFACE OF MEMBERS.

WIND PRESSURE - 90 MPH (3-SECOND GUST SPEED) TO SIGN AREA & EXPOSED MEMBERS. FATIGUE CATEGORY I WITHOUT GALLOPING WIND EFFECTS.

DESIGNED ACCORDING TO THE 6TH EDITION OF AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS."

STRUCTURE	DESIGN SIGN AREA	MAX. SIGN DEPTH

DIMENSIONS, CAMBER & ELEVATIONS

TABLE ENTRIES TO BE DESIGNED

STRUCTURE	"A"	"L"	"B"	"D"	"Y"

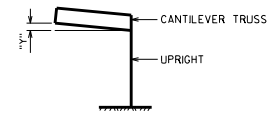
DESIGNER NOTES

CAMBER VALUES						
		"Y" (IN.)				
"L"	"A"	32	30	28	26	24
30	4 1/4	3 1/2	2 3/4	2 3/8	2 1/4	1 3/4
28	3 3/4	3 1/4	2 3/4	2 1/4	2 1/4	1 3/4
26	3 3/8	3	2 1/2	2 1/8	2 1/8	1 3/4
24	3 3/8	2 7/8	2 3/8	2	2	1 1/2
22	3 3/8	2 5/8	2 1/4	1 7/8	1 7/8	1 1/2

"A" & "L" IN FT.

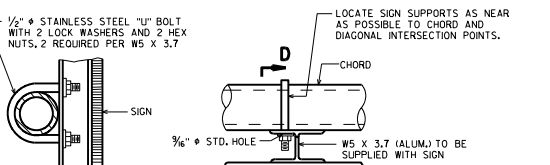
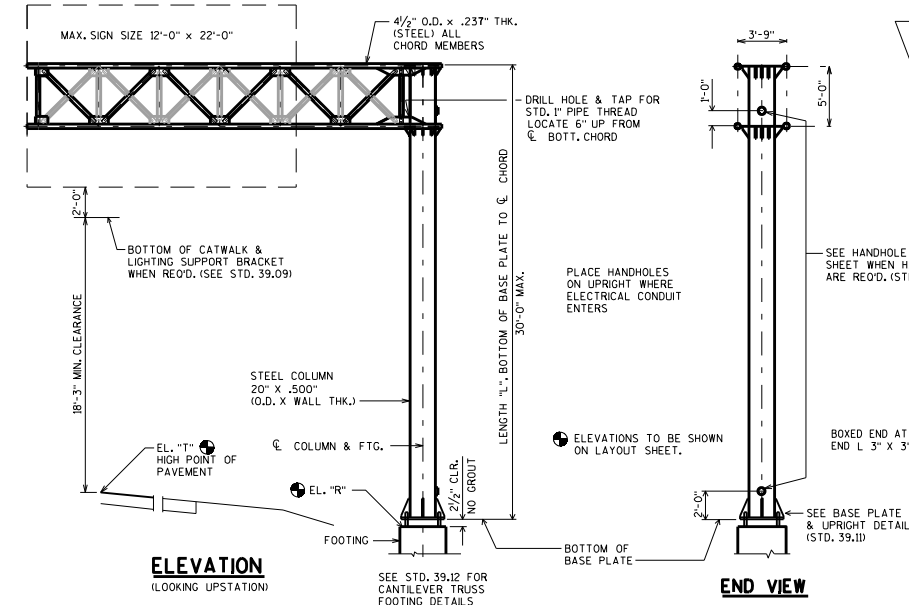
INTERPOLATE FOR VALUES NOT SHOWN

TABLES REFLECT CATWALK LOADING. FOR CAMBER VALUES WITHOUT CATWALK LOADING, MULTIPLY TABLE VALUES ABOVE AS FOLLOWS: MULTIPLY "Y" BY .72



CAMBER DIAGRAM

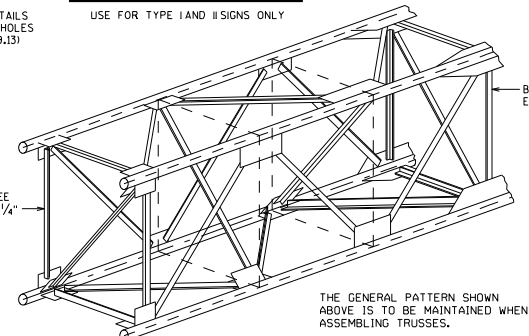
STANDARDS 39.9, 39.11, 39.12 AND 39.13 DETAILS ARE USED WITH THIS STANDARD TO DETAIL A "GALVANIZED STEEL CANTILEVER SIGN TRUSS" FOR TYPE I AND II SIGNS ONLY.



SECTION D-D

TYPICAL SIGN CONNECTION

USE FOR TYPE I AND II SIGNS ONLY



TYPICAL TRUSS SECTION

THE GENERAL PATTERN SHOWN ABOVE IS TO BE MAINTAINED WHEN ASSEMBLING TRUSSES.

GALVANIZED STEEL CANTILEVER SIGN TRUSS

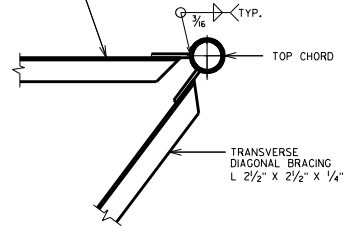
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva DATE: 7-15

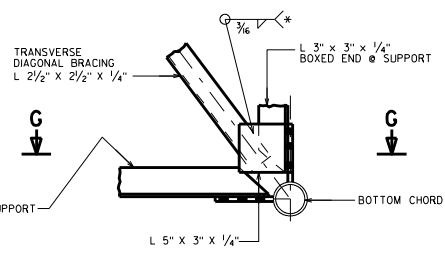
TOP DIAGONAL
L 3" X 3" X 1/4"

* ANGLE
L 2 1/2" X 2 1/2" X 1/4"
L 3" X 3" X 1/4"

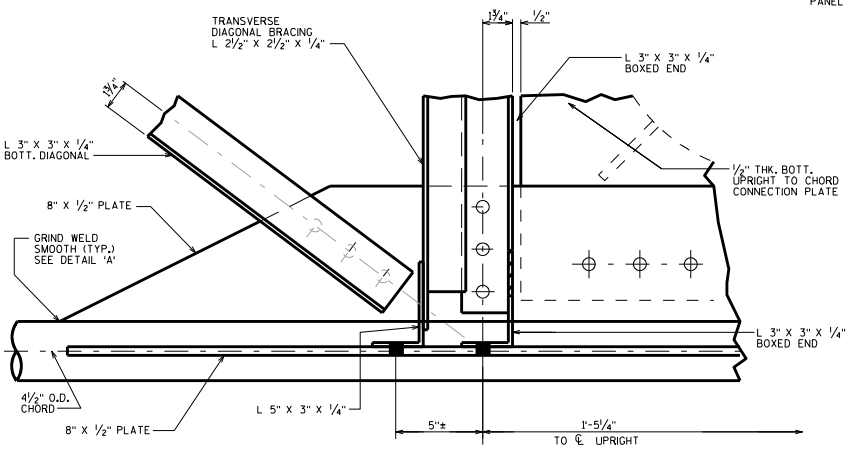
WELD LENGTH (MIN.)
7"
8"



SECTION B-B

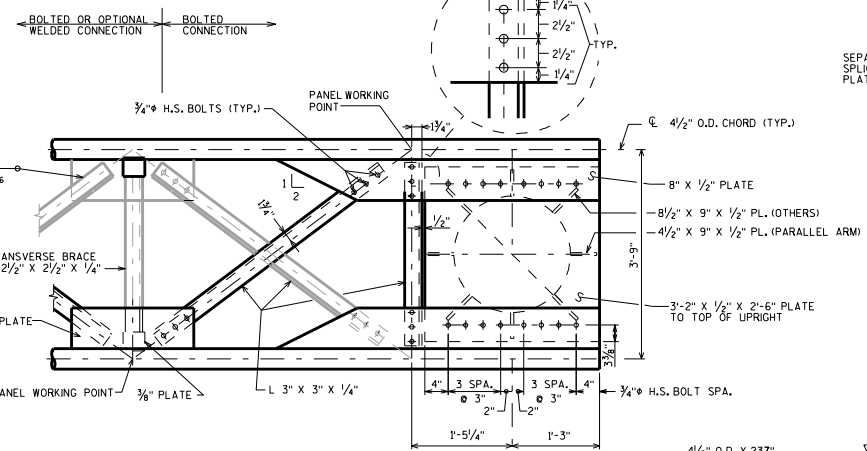


SECTION H-H

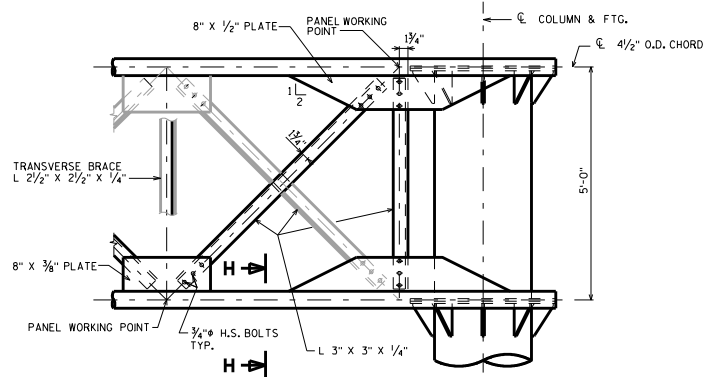


SECTION G-G

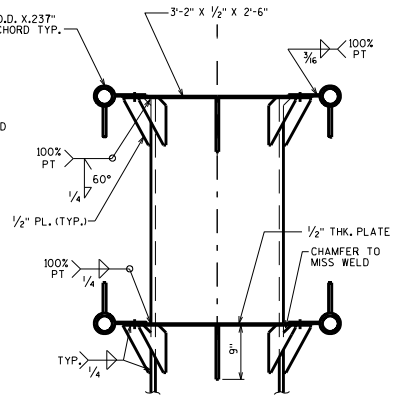
(LOOKING DOWN @ BOT. HORIZ. PLANE @ FRONT CHORD)



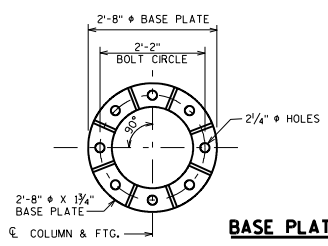
PLAN TRUSS TO UPRIGHT



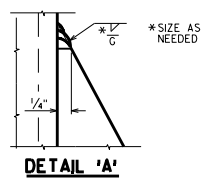
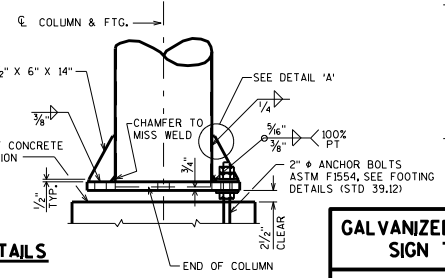
ELEVATION TRUSS TO UPRIGHT



END VIEW TRUSS TO UPRIGHT



BASE PLATE DETAILS

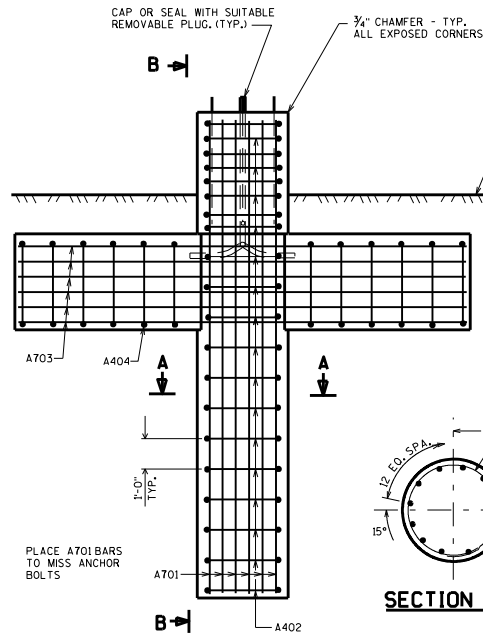


GALVANIZED STEEL CANTILEVER SIGN TRUSS DETAILS

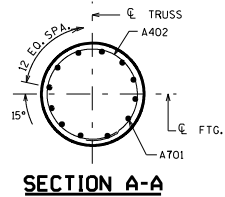
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva

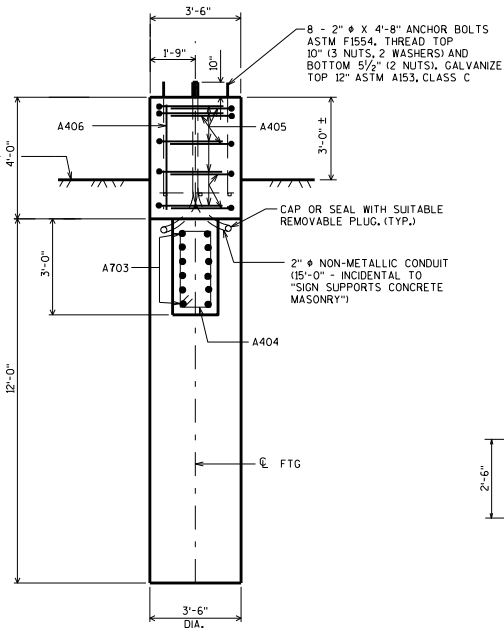
DATE:
7-15



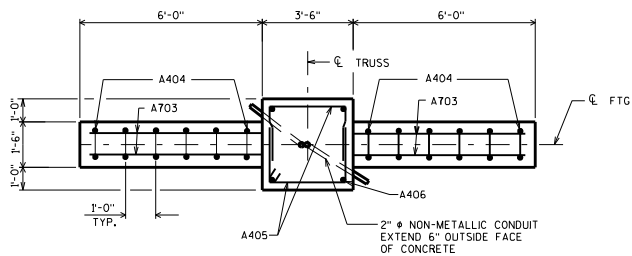
ELEVATION
(8 C.Y.)



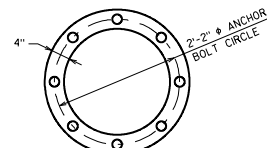
SECTION A-A



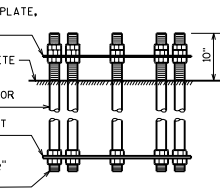
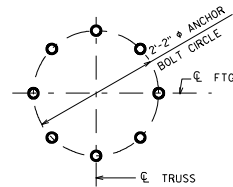
SECTION B-B



PLAN



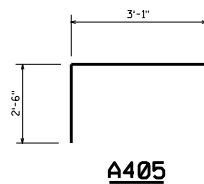
TOP VIEW OF TOP & BOTTOM TEMPLATES



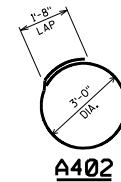
ANCHOR BOLT DETAILS

BILL OF BARS

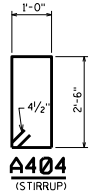
BAR MARK	COAT	NO. REQ'D	LENGTH	REVT	CUT. DIAG.	BUN. DLE	LOCATION
A701	X	12	15'-6"				FOOTING - COLUMN/TOP
A402	X	16	11'-2"	X			FOOTING - COLUMN/TOP
A703	X	12	15'-0"				FOOTING - WINGS
A404	X	12	7'-6"	X			FOOTING - WINGS
A405	X	10	7'-11"	X			FOOTING - TOP
A406	X	4	3'-6"				FOOTING - TOP - COLUMNS



A405



A402



A404
(STIRRUP)

GENERAL NOTES

- DRAWINGS SHALL NOT BE SCALED.
- BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 3" CLEAR UNLESS DETAILED OTHERWISE.
- THE FIRST OR FIRST TWO DIGITS OF THE BAR MAR SIGNIFIES THE BAR SIZE.
- PRIOR TO INSTALLATION, ANCHOR BOLTS SHALL BE RIGIDLY HELD IN POSITION DURING CONCRETE PLACEMENT USING STEEL ANCHOR PLATE AND TOP PLATE. CENTER ANCHOR BOLT ASSEMBLY TO MISS BAR STEEL REINFORCEMENT.

ULTIMATE DESIGN STRESSES

- CONCRETE MASONRY $f'_c=3,500$ PSI
- BAR STEEL REINFORCEMENT, GRADE 60 $f_y=60,000$ PSI
- ANCHOR BOLTS ASTM F1554 $f_y=55,000$ PSI

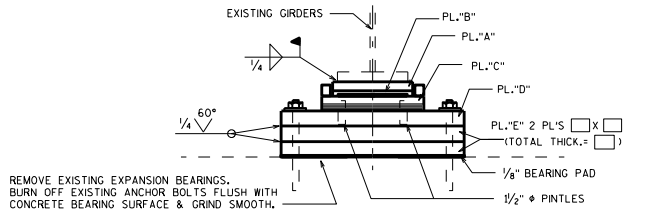
FOUNDATION DATA

ALLOWABLE SOIL BEARING PRESSURE = 2T/5F

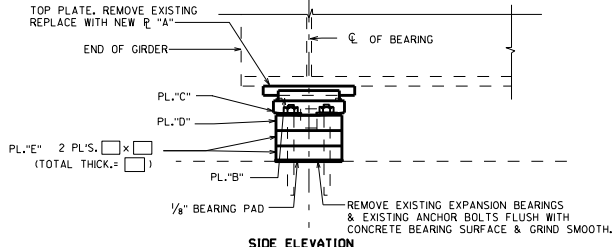
TOTAL ESTIMATED QUANTITIES (1 FTG.)

- SIGN SUPPORTS CONCRETE MASONRY 8 CY
- SIGN SUPPORTS STEEL REINFORCEMENT HS 980 LB

CANTILEVER TRUSS FOOTING	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <i>Bill Oliva</i>	DATE: 7-15



FRONT ELEVATION



SIDE ELEVATION

EXPANSION BEARING REPLACEMENT - STEEL GIRDERS
STEEL BEARINGS

SEE STANDARD 27.08 FOR BEARING DETAILS

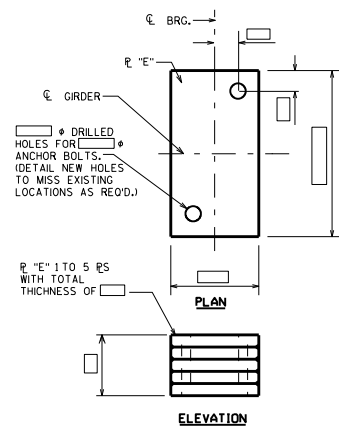
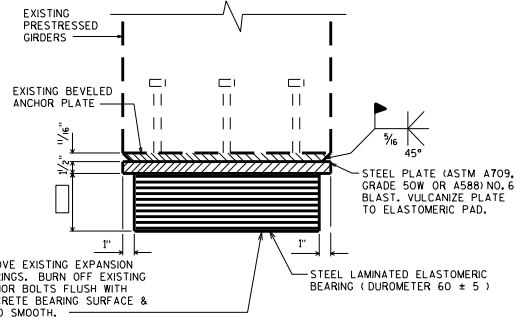
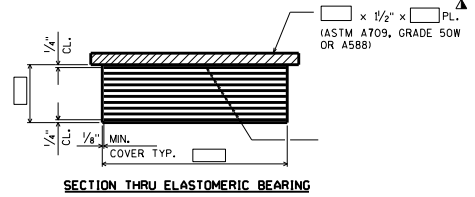


PLATE 'E' DETAILS

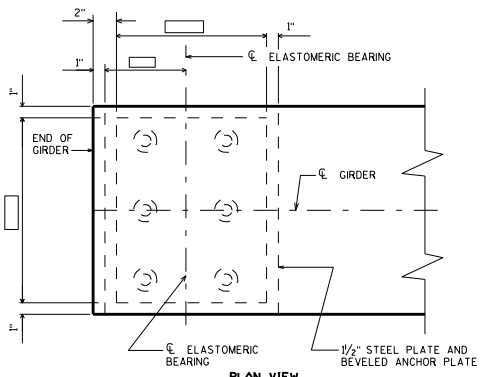
(SEE STD. 40.10 FOR CONCRETE BLOCK ALTERNATE)



FRONT ELEVATION



EXPANSION BEARING REPLACEMENT - PRESTRESSED GIRDERS
ELASTOMERIC BEARINGS



NOTES

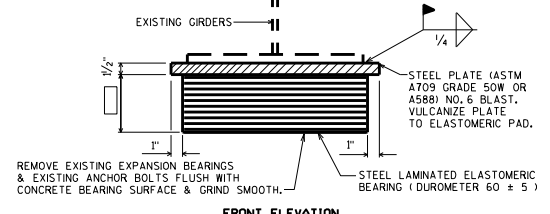
ALL MATERIAL USED FOR BEARINGS SHALL BE PAID AT THE UNIT PRICE BID FOR "BEARING PADS ELASTOMERIC LAMINATED."
GRIND EXIST. WELD THAT ATTACHED EXIST. TOP PLATE TO EXIST. BOT. FLANGE. GRIND AFFECTED AREAS SMOOTH.

DESIGNER NOTES

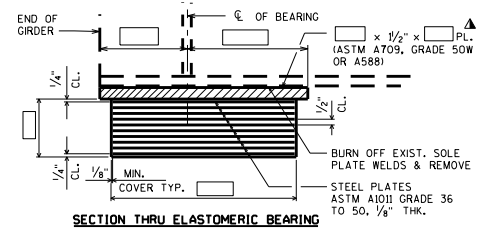
THE STEEL TOP PLATE THICKNESS MAY BE REDUCED (1" MIN.) TO MATCH THE OVERALL EXISTING BEARING HEIGHT. WHEN THE THICKNESS IS REDUCED, THE FOLLOWING NOTE SHALL BE LOCATED ON THE PLANS:
"WELDING PROCEDURES SHALL BE ESTABLISHED BY THE CONTRACTOR TO RESTRICT THE MAXIMUM TEMPERATURE REACHED BY SURFACES IN CONTACT WITH ELASTOMER TO 200°F (93°C). TEMPERATURES SHALL BE CONTROLLED BY TEMPERATURE INDICATING WAX PENCILS OR OTHER SUITABLE MEANS APPROVED BY THE ENGINEER."

▲ CHECK 27.2.1 ELASTOMERIC BEARINGS IN THE BRIDGE MANUAL FOR REQUIREMENTS TO SEE IF THIS PLATE SHOULD BE OMITTED.

TOP STEEL PLATE MAY NOT BE OMITTED.
SEE STANDARD 27.07 FOR ADDITIONAL INFORMATION.



FRONT ELEVATION



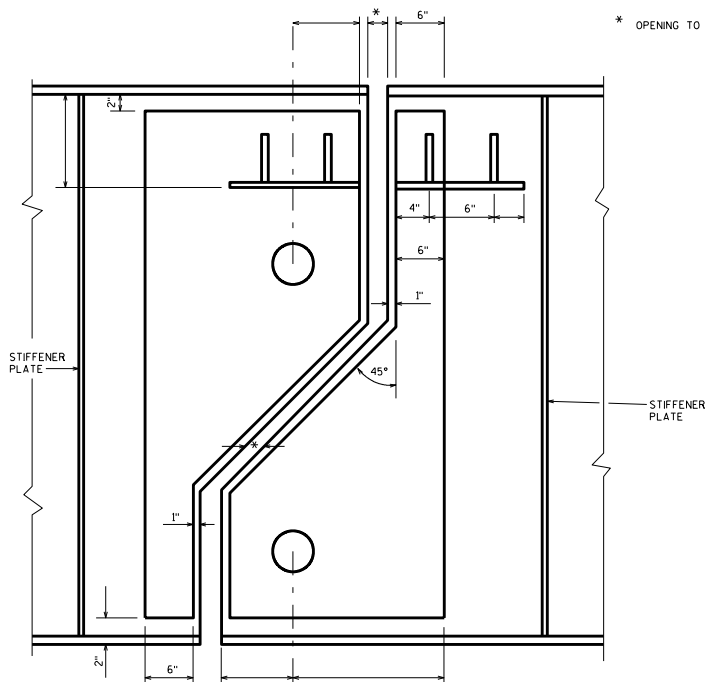
SECTION THRU ELASTOMERIC BEARING

EXPANSION BEARING REPLACEMENT - STEEL GIRDERS
ELASTOMERIC BEARINGS

NOTES & DESIGNER NOTES

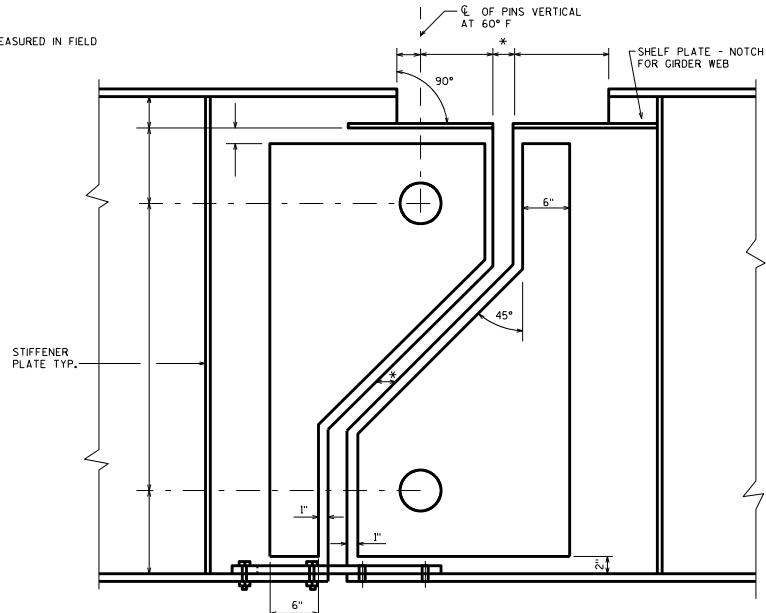
SEE "EXPANSION BEARING REPLACEMENT - PRESTRESSED GIRDERS" ON THIS STANDARD.

EXPANSION BEARING REPLACEMENT DETAILS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <u>Bill Oliva</u>	DATE: 7-15



TYPICAL HINGE DETAIL FOR WATERTIGHT EXPANSION DEVICE

NOTE:
DETAILS NOT SHOWN ARE IDENTICAL TO DETAILS SHOWN
FOR "FINGER TYPE EXPANSION DEVICE".



TYPICAL HINGE DETAIL FOR FINGER TYPE EXPANSION DEVICE

(HANGER PLATES NOT SHOWN)

NOTES

INSIDE HOLES OF HANGER PLATES SHALL BE COATED WITH "BLOXIDE" OR AN APPROVED EQUAL AFTER FINISHING. THE BUSHINGS SHALL HAVE A PRESS FIT INTO HANGER PLATES. THE INSIDE DIAMETER OF THE BUSHING SHALL PROVIDE A CLEARANCE OF 0.005" MINIMUM AND 0.010" MAXIMUM OVER THE FINISHED DIAMETER OF THE PIN. NOTE THAT THE HOLE DIAMETER SHALL BE SMALLER THAN THE BUSHING O.D. BY AT LEAST 0.001". FINISH ANS125.

REMOVE EXISTING HANGER PLATES, PINS, AND WIND TRANSFER PLATES AND REPLACE WITH NEW MATERIALS.

BID ITEM SHALL BE "HINGE REPLACEMENT". EACH ALL MATERIAL AND WORK INVOLVED SHALL BE PAID FOR UNDER "HINGE REPLACEMENT".

NEW PINS SHALL MATCH THE DIAMETER OF THE EXISTING PINS. CONTRACTOR TO CONTACT ENGINEER IF CORROSION AT EXISTING PIN IS PRESENT.

BLAST CLEAN GIRDER WEB AND FLANGES WITHIN 2'-0" OF $\frac{1}{4}$ " OF HINGE IN ACCORDANCE WITH THE STEEL STRUCTURES PAINTING COUNCIL'S SPECIFICATION SSPC-SP6. PAINT AREA CLEANED WITH ORGANIC ZINC RICH PAINT SYSTEM.

HANGER PLATES AND WIND TRANSFER PLATES SHALL BE SHOP PAINTED.

BUSHINGS SHALL BE THE SAME LENGTH AS THE HANGER PLATE THICKNESS.

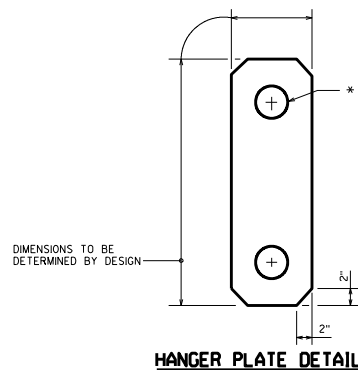
NON-METALLIC WASHERS SHALL HAVE AN INSIDE DIAMETER OF BETWEEN 0.005" AND 0.010" LARGER THAN THE PIN DIAMETER.

STEEL FOR PINS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 6.4.2 AND ASTM A276. PINS TO BE FINISHED ANS163.

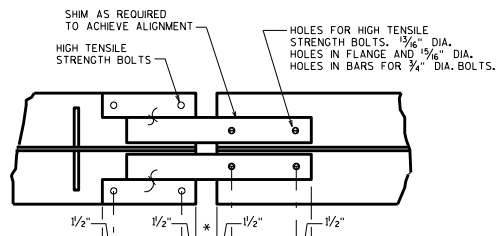
☑ BUSHINGS SHALL BE GAR-MAX AS MANUFACTURED BY GARLOCK BEARINGS, INC. OR DURALON JOURNAL BEARINGS AS MANUFACTURED BY REKNORD BEARING DIVISION, OR APPROVED EQUAL. BUSHINGS SHALL HAVE A NOMINAL WALL THICKNESS OF $\frac{1}{4}$ ".

⚠ NON-METALLIC WASHERS REQUIRED FOR USE AS SPACERS BETWEEN THE PIN PLATES AND THE HANGER PLATES AND THE HANGER PLATES AND NUTS SHALL BE MADE FROM ONE OF THE FOLLOWING MATERIALS:

1. PHENOLIC, CANVAS REINFORCED, MIL-P-35035
2. POLYETHYLENE, HIGH DENSITY, ASTM D4976, CLASS 3
3. ACETAL, FEDERAL SPECIFICATION L-P-392
4. TEFLON TFE, MIL-P-22241A

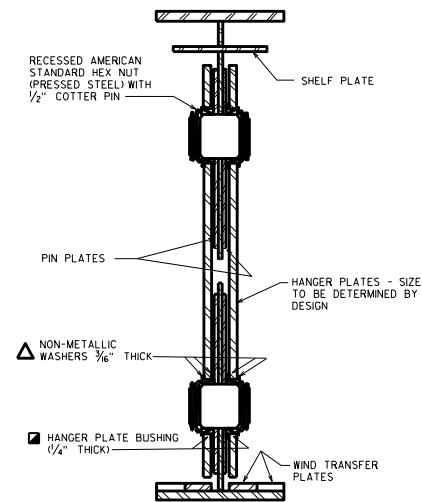


HANGER PLATE DETAIL



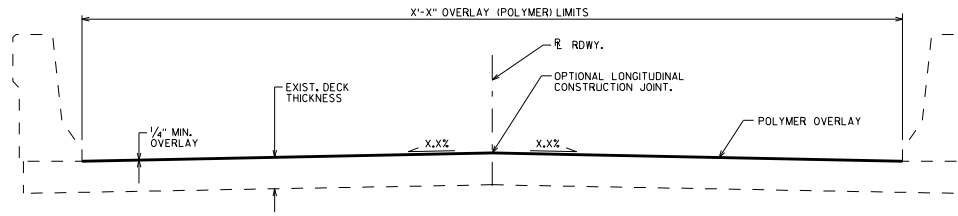
TYPICAL WIND TRANSFER PLATES DETAIL

CONTACT AREA OF WIND TRANSFER PLATES TO BE FINISHED ANS125.



SECTION THRU HINGE

HINGED JOINT REHABILITATION	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <u>Bill Oliva</u>	DATE: 7-15



CROSS SECTION THRU ROADWAY
LOOKING NORTH

DESIGNER NOTES

REPAIRS USING CONCRETE REQUIRE A MINIMUM CURE TIME OF 28 DAYS BEFORE PLACING OVERLAY. ALTERNATIVES TO CONCRETE DECK PATCHES MAY BE USED TO SHORTEN TIME REQUIRED FOR PLACING OVERLAY.
DO NOT PROVIDE A PROFILE GRADE LINE ON THE PLANS.

DESIGN DATA

LIVE LOAD: _____
INVENTORY RATING: HS-...
OPERATING RATING: HS-...
MAXIMUM STANDARD PERMIT VEHICLE LOAD = ... KIPS

MATERIAL PROPERTIES:
CONCRETE MASONRY - DECK PATCHING f'c = 4,000 P.S.I.

NOTES

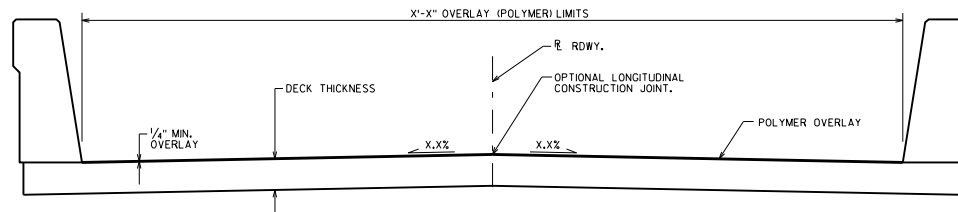
DRAWINGS SHALL NOT BE SCALED.
DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS.
DECK SURFACE PREPARATION IS INCLUDED IN THE BID ITEM "POLYMER OVERLAY".
AREAS OF "PREPARATION DECK TYPE 1" SHALL BE DEFINED BY A SAW CUT.
PREPARATION DECKS TYPE 1, PREPARATION DECKS TYPE 2, AND FULL-DEPTH DECK REPAIR AREAS ARE BASED ON THE PLANS AND AS DETERMINED BY THE ENGINEER. DECK PREPARATION AND FULL-DEPTH DECK REPAIRS SHALL BE FILLED WITH "CONCRETE MASONRY DECK PATCHING".

TOTAL ESTIMATED QUANTITIES

BID ITEM NUMBER	BID ITEMS	UNIT	TOTAL
509.0301	PREPARATION DECKS TYPE 1	SY	
509.0302	PREPARATION DECKS TYPE 2	SY	
509.2000	FULL-DEPTH DECK REPAIR	SY	
509.5100.S	POLYMER OVERLAY	SY	
SPV.0035	CONCRETE MASONRY DECK PATCHING	CY	
SPV.0090	SAWING PAVEMENT DECK PREPARATION AREAS	LF	

THIS IS A PARTIAL LIST OF POSSIBLE BID ITEMS. BID ITEMS MAY NEED TO BE ADDED OR REMOVED TO FIT EACH INDIVIDUAL CASE.

REHABILITATION OVERLAY



CROSS SECTION THRU ROADWAY
LOOKING NORTH

DESIGNER NOTES

PREVENTATIVE OVERLAY INTENDED FOR USE ON DECKS WITH A MINIMUM AGE OF 28 DAYS AND A MAXIMUM AGE OF 2 YEARS. AN ADDITIONAL CONTRACT MAY BE REQUIRED FOR APPLYING THE OVERLAY DUE TO SCHEDULE AND DECK AGE CONSIDERATIONS.
WHEN BID ITEM "POLYMER OVERLAY" IS USED RATING SHOULD INCLUDE THE 5 PSF OVERLAY.

DESIGN DATA

LIVE LOAD: _____
DESIGN LOADING: HL-93
INVENTORY RATING FACTOR: RF=1...
OPERATING RATING FACTOR: RF=1...
MAXIMUM STANDARD PERMIT VEHICLE LOAD = ... KIPS

STRUCTURE IS DESIGNED FOR A FUTURE WEARING SURFACE OF 20 POUNDS PER SQUARE FOOT.

NOTES

DRAWINGS SHALL NOT BE SCALED.
DECK SURFACE PREPARATION IS INCLUDED IN THE BID ITEM "POLYMER OVERLAY".

TOTAL ESTIMATED QUANTITIES

BID ITEM NUMBER	BID ITEMS	UNIT	TOTAL
509.5100.S	POLYMER OVERLAY	SY	

PREVENTATIVE OVERLAY

POLYMER OVERLAY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva

DATE:
7-15