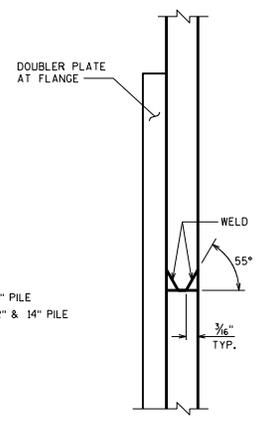
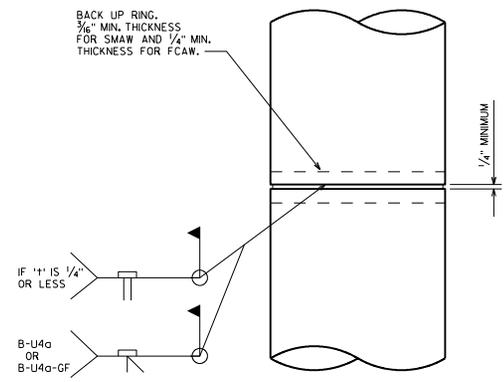


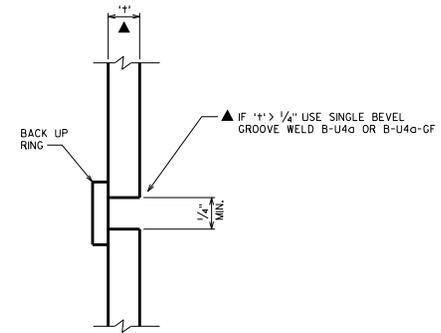
STEEL 'HP' SHAPES



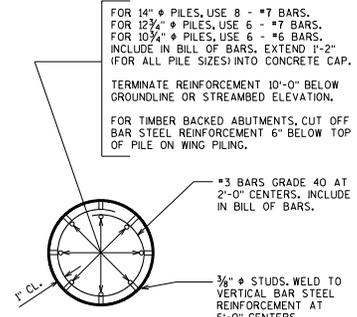
HP WELD DETAIL
FLANGE SHOWN, WEB SIMILAR



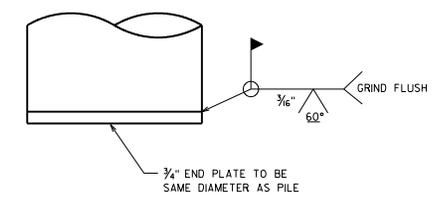
CAST-IN-PLACE 'PIPE PILE'



CIP PILE WELD DETAIL



SECTION THRU CONCRETE CAST-IN-PLACE PILING
USED WHEN PILES ARE EXPOSED
(OPEN PILE BENTS OR TIMBER BACKED ABUTMENTS)



END PLATE DETAIL FOR CIP PILING IN ARTESIAN CONDITIONS
(ONLY USE FOR ARTESIAN CONDITIONS)

DESIGNER NOTES

FULL DESIGN LOADING CAN BE USED IF PREBORED HOLE IS LARGE ENOUGH TO AVOID PILE HANGUPS AND ALLOW FILLING WITH SAND.
SEE WISDOT POLICY ITEM IN BRIDGE MANUAL 11.3.1.12.3 FOR GUIDANCE ON "HP" PILES.

NOTES

CAST-IN-PLACE PILE SHELL MATERIAL SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATION.

IF LESS THAN THE MAXIMUM AXIAL RESISTANCE IS REQUIRED BY DESIGN, STATE ONLY THE REQUIRED CORRESPONDING DRIVING RESISTANCE ON THE PLANS (IF AT LEAST 20 TONS LESS THAN THE TABLE VALUES BELOW). CONSULT WITH THE GEOTECHNICAL ENGINEER REGARDING POSSIBLE ESTIMATED PILE LENGTH ADJUSTMENT.

IF APPLICABLE, PLACE THE FOLLOWING NOTE ON THE PLANS:
PILES PLACED IN PREBORED HOLES CORED INTO ROCK DO NOT REQUIRE DRIVING.

PILE RESISTANCE

PILE SIZE	SHELL THICKNESSES (INCHES)	FACTORED AXIAL COMPRESSION RESISTANCE (P _r) (TONS)	REQUIRED DRIVING RESISTANCE (R _{dyn}) (TONS)
CAST-IN-PLACE PILES			
10 3/4"	0.219	55	110
10 3/4"	0.250	65	130
10 3/4"	0.365	75	150
10 3/4"	0.500	75	150
12 3/4"	0.250	80	160
12 3/4"	0.375	105	210
12 3/4"	0.500	105	210
14"	0.250	85	170
14"	0.375	120	240
14"	0.500	120	240
H PILES			
10x42	NA	90	180
12x53	NA	110	220
14x73	NA	125	250

PILE DETAILS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <u>Bill Oliva</u>	DATE: 1-12

DESIGNER NOTES

LAP LENGTHS FOR HORIZONTAL BARS SHALL BE BASED ON A "CLASS C" TOP TENSION LAP SPLICE.

PILING SPACING IN ABUTMENT BODY SHALL BE 8'-0" MAX. FOR ALL TYPES OF PILING. THE MAX. PILE SPACING FROM THE END OF THE ABUT. BODY TO THE FIRST PILE SHALL BE THE MINIMUM OF ONE-HALF PILE SPACE OR 2'-6".

★ WHEN BODY SECTION IS $> + 50'-0"$ 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.

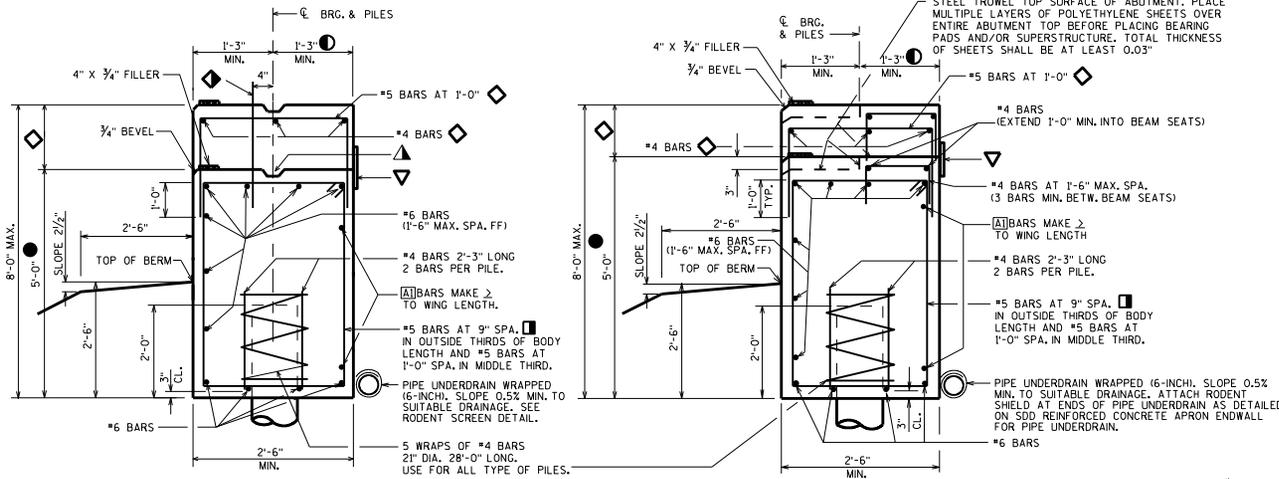
CONCRETE POURED UNDER WATER WILL BE ALLOWED AND SHALL BE DONE IN ACCORDANCE WITH SECTION 502.3.5.3 STANDARD SPECIFICATIONS.

THE SEMI-EXPANSION SEAT SHALL BE USED WHEN REQUIRED AS STATED IN CHAPTER 12, FIGURE 12.7-1 OF THE BRIDGE MANUAL OR WHENEVER A WING PILE IS REQUIRED.

THE FIXED SEAT CANNOT BE USED WHEN A WING PILE IS REQUIRED (SEE STD. 12.02 FOR CRITERIA)

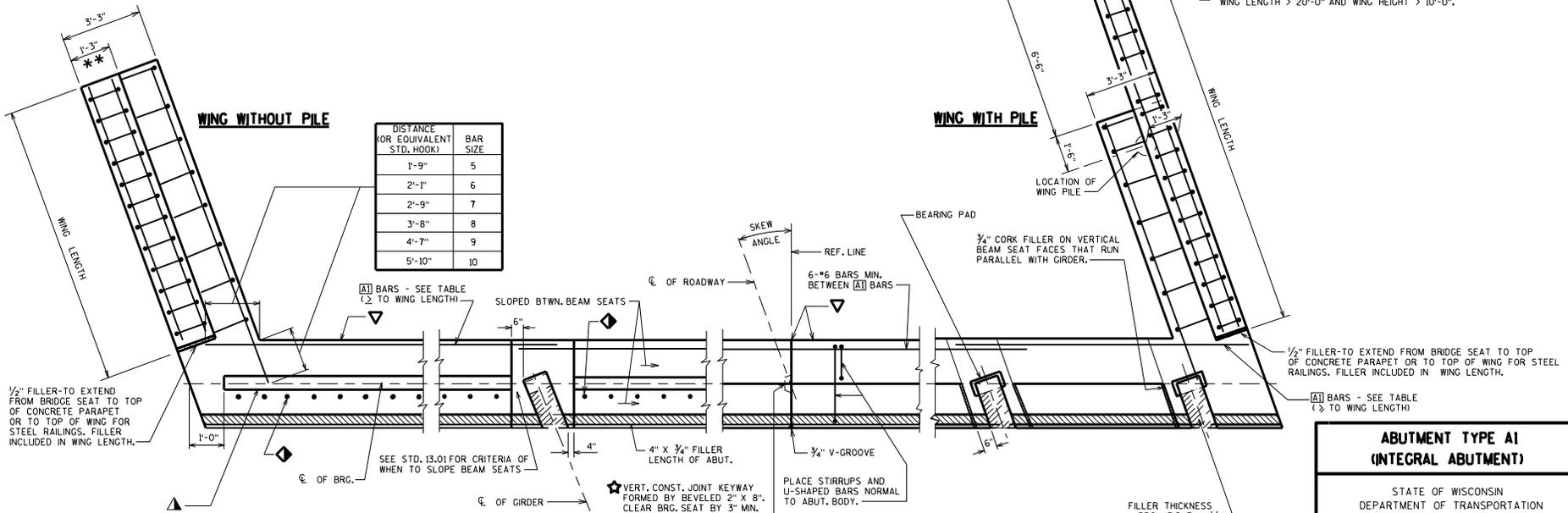
LEGEND

- ◆ #5 BARS (COATED) AT 1'-0" (2'-0" LONG). THESE BARS MAY BE PLACED AFTER CONCRETE IS POURED BUT BEFORE INITIAL SET HAS TAKEN PLACE.
- ◇ WHEN THIS DIMENSION $> 4"$ THIS ADDITIONAL REINFORCEMENT SHALL BE ADDED. MAX. SPA. OF HORIZ. #4 BARS = 1'-0".
- USE 1'-3" FOR ALL SLAB SPANS AND FOR GIRDER SPANS WITH NO PAVING NOTCH EXCEPT 36", 45", 54", 54", 70", 72" & 82" GIRDERS WITH SKEWS $> 25^\circ$ - USE 1'-6". USE 1'-11" FOR GIRDER SPANS WITH PAVING NOTCH.
- DIMENSION IS FROM BOTTOM OF ABUTMENT TO LOW BEAM SEAT OR LOW SIDE OF SLAB TYPE SUPERSTRUCTURE.
- ▽ 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.
- ▲ KEYED CONST. JOINT FORMED BY BEVELED 2" x 6".
- *** WINGWALL WIDTH SHALL BE 1'-6" WHEN TYPE "M" RAILING, VERTICAL FACE PARAPET "TX", OR SINGLE SLOPE PARAPET "5655" IS USED.
- USE #5 BARS AT 6" SPA. IN OUTSIDE THIRDS OF BODY LENGTH WHEN THE WING LENGTH $> 20'-0"$ AND WING HEIGHT $> 10'-0"$.



TYPE A1 WITH FIXED SEAT

TYPE A1 WITH SEMI-EXPANSION SEAT



SLAB SPAN WITH FIXED SEAT

GIRDER SPAN WITH FIXED SEAT

SLAB SPAN WITH SEMIEXPANSION SEAT

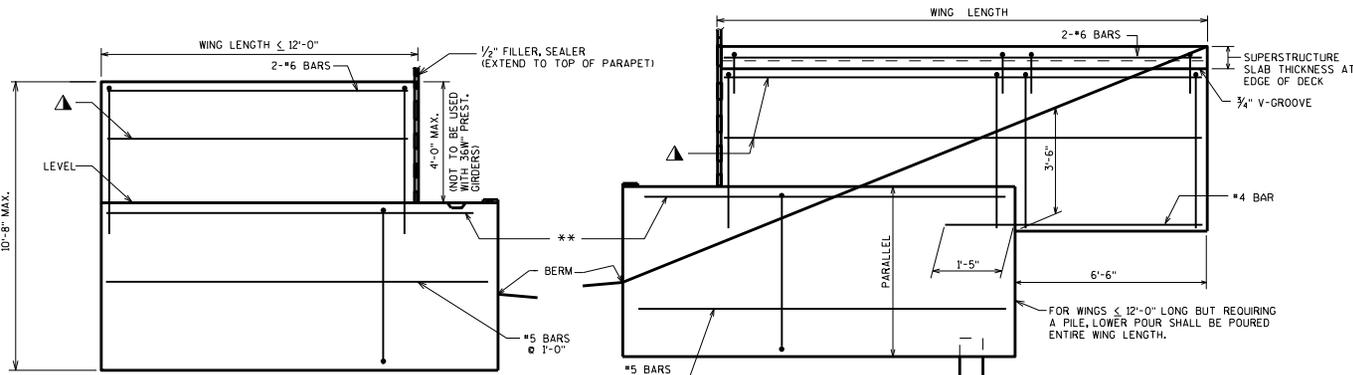
GIRDER SPAN WITH SEMIEXPANSION SEAT

ABUTMENT TYPE A1 (INTEGRAL ABUTMENT)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: *Bill Oliva*

DATE:
1-12



WING WITHOUT PILE ELEVATION
(FRONT FACE)

WING WITH PILE ELEVATION
(FRONT FACE)

DESIGNER NOTES

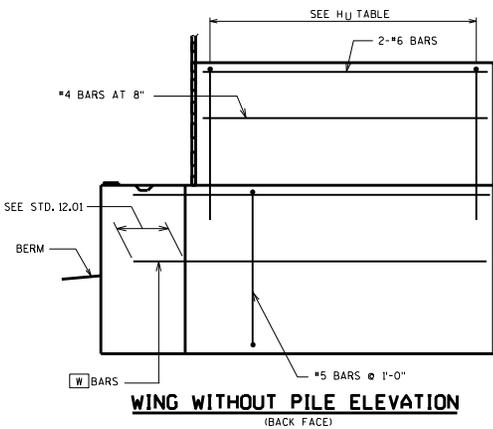
LENGTH OF A1 BARS SHALL BE ≥ TO WING LENGTH.
 WING WITH PILE & WING WITHOUT PILE CAN BE USED FOR EITHER SIDEWALK OR SLOPED FACE PARAPETS. THE TYPE OF WING TO USE IS BASED ONLY ON THE WING HEIGHT AND WING LENGTH LIMITATIONS SHOWN.
 LAP LENGTH FOR HORIZONTAL BARS SHALL BE BASED ON A "CLASS C" TOP TENSION LAP SPLICE.
 WING BARS AND DOWEL BARS SHALL BE EPOXY COATED.
 WHEN TYPE "F", "W" OR "M" RAILING IS USED, LOCATE NAME PLATE ON FIRST RIGHT WING TRAVELING UP STATION.
 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, EXTEND SEALER 3" BELOW GUTTER LINE AT INSIDE FACE.

LRFD DESIGN LOADS

LIVE LOAD = 2'-0" SURCHARGE
 LOAD FACTORS:
 γ_{DC} = 1.25
 γ_{DE} = 1.50
 γ_{DEW} = 1.35
 γ_{LS} = 1.75
 EXPOSURE CLASS 2, γ_E = 0.75
 f_y = 60,000 P.S.I.
 f'_C = 3,500 P.S.I.
 HORIZ. EARTH LOAD BASED ON: 35 P.C.F. EQUIV. FLUID UNIT WEIGHT OF SOIL

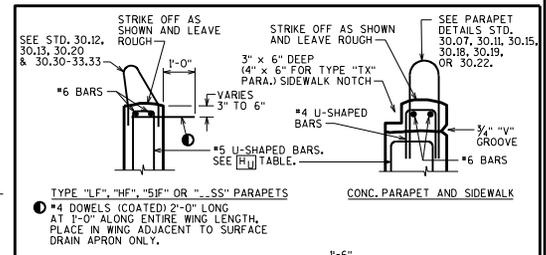
WING LENGTH	WING HEIGHT				BARS
	8'-6"	10'-0"	11'-6"	13'-0"	
10'-0"	#6 #6's	#6 #6's	5 #6's		W
12'-0"	#6 #6's	#7 #6's	7 #5's	7 #6's	W
15'-0"	#7 #8's	#7 #8's	6 #7's	7 #7's	A1
16'-0"	7 #6's	8 #6's	7 #7's	8 #7's	W
20'-0"	5 #8's	6 #8's	7 #8's	8 #8's	A1
24'-0"	7 #7's	7 #8's	8 #8's	8 #9's	W
	6 #9's	7 #9's	7 #10's	8 #10's	A1
	8 #8's	9 #8's	9 #9's	9 #10's	W
	7 #9's	8 #9's	8 #10's	9 #10's	A1

* WING WITHOUT PILE VALUES SHOWN. (FOR WING WITH PILE THAT HAS WING LENGTH IN THIS REGION, USE VALUES FOR 11'-6" WING HEIGHT.)



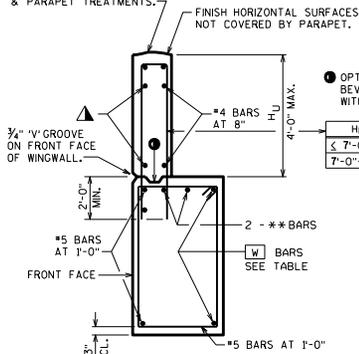
WING WITHOUT PILE ELEVATION
(BACK FACE)

WING WITH PILE ELEVATION
(BACK FACE)

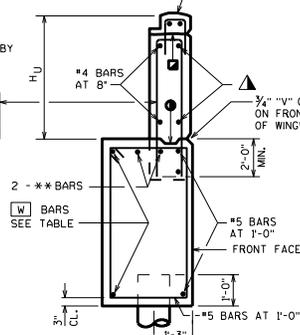


DETAIL FOR TYPE "LF", "HF", "PF", "SF" OR "SS" PARAPETS SHOWN. SEE "TOP OF WING DETAILS" FOR OTHER RAILING & PARAPET TREATMENTS.

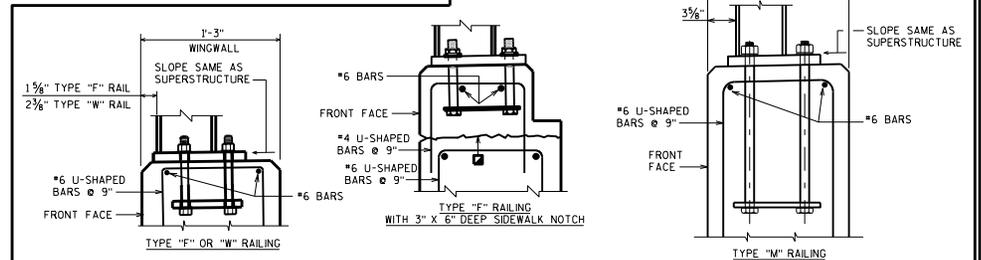
DETAIL FOR CONC. PARAPET WITH SIDEWALK SHOWN. SEE "TOP OF WING DETAILS" FOR OTHER RAILING & PARAPET TREATMENTS.



WING WITHOUT PILE SECTION



WING WITH PILE SECTION



TOP OF WING DETAILS
(TYP. FOR A3 ABUTMENT WINGS ALSO)

ABUTMENT TYPE A1

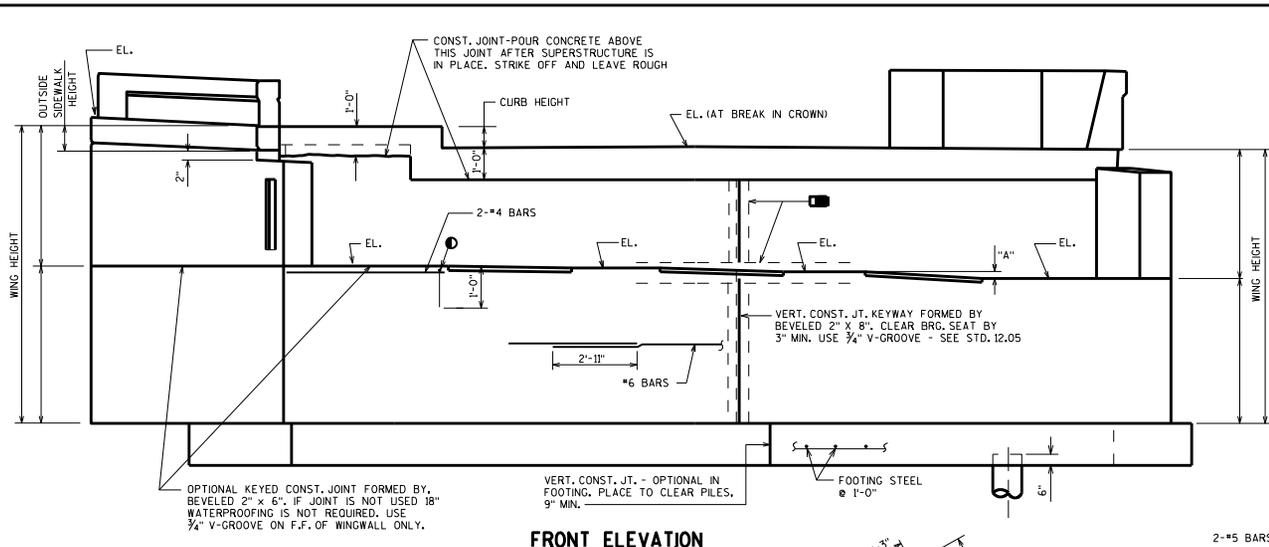
STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION
 STRUCTURES DEVELOPMENT SECTION

APPROVED: *Bill Oliva* DATE: 1-12

** BARS TO BE SAME SIZE AS "W" BARS.

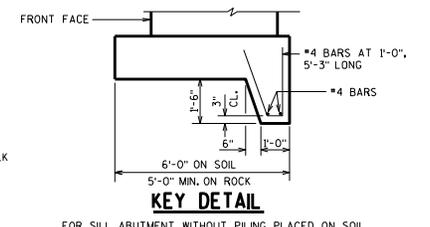
☑ CONSTRUCTION JOINT, LEAVE ROUGH, REQUIRED FOR PRESTRESSED CONCRETE SUPERSTRUCTURES. OPTIONAL FOR OTHERS. POUR CONCRETE ABOVE THIS JOINT AFTER DECK IS IN PLACE.

▲ USE #4 BARS @ 1'-6" FOR WINGWALL WIDTH = 1'-3". USE #4 BARS @ 1'-4" FOR WINGWALL WIDTH = 1'-5".

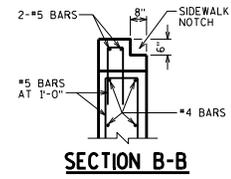


FRONT ELEVATION

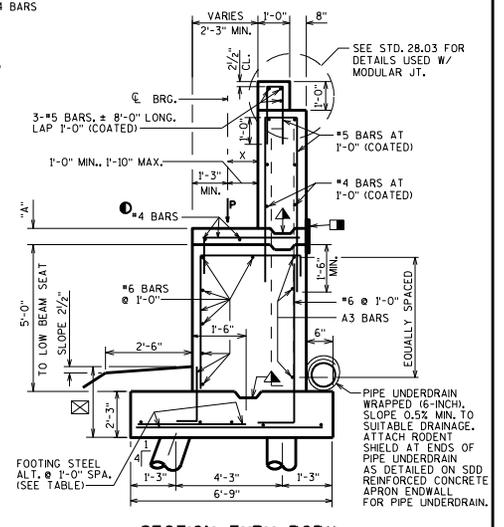
- DESIGNER NOTES**
- ☐ PILING SPACING IN ABUTMENT FOOTING SHALL BE 8'-0" MAXIMUM.
 - WHEN BODY SECTION IS MORE THAN ± 50'-0" LONG PROVIDE VERTICAL CONSTRUCTION JOINT, RUN BAR STEEL THRU JOINT, SEAL JOINT WITH 18" RUBBERIZED MEMBRANE WATERPROOFING, SEE STD. 12.09 FOR ALTERNATE CONSTRUCTION JOINT.
 - IN "FRONT ELEVATION" VIEW, GIVE ELEVATION OF ALL BEARING AREAS AND ELEVATION AT BOTTOM OF RAIL PARAPETS AT EACH END OF WINGS.
 - LAP LENGTHS FOR HORIZONTAL BARS SHALL BE BASED ON A "CLASS C" TOP TENSION LAP SPLICE.
 - ☐ 18" RUBBERIZED MEMBRANE WATERPROOFING, SEAL ALL HORIZ. AND VERT. JOINTS ON BACKFACE ABOVE FOOTING.
 - ▲ KEYED CONST. JOINT FORMED BY BEVELED 2" X 6".
 - #4 AT 3" 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.
 - ☒ 3'-3" (SLOPE PAVING), 4'-6" (HEAVY RIPRAP)



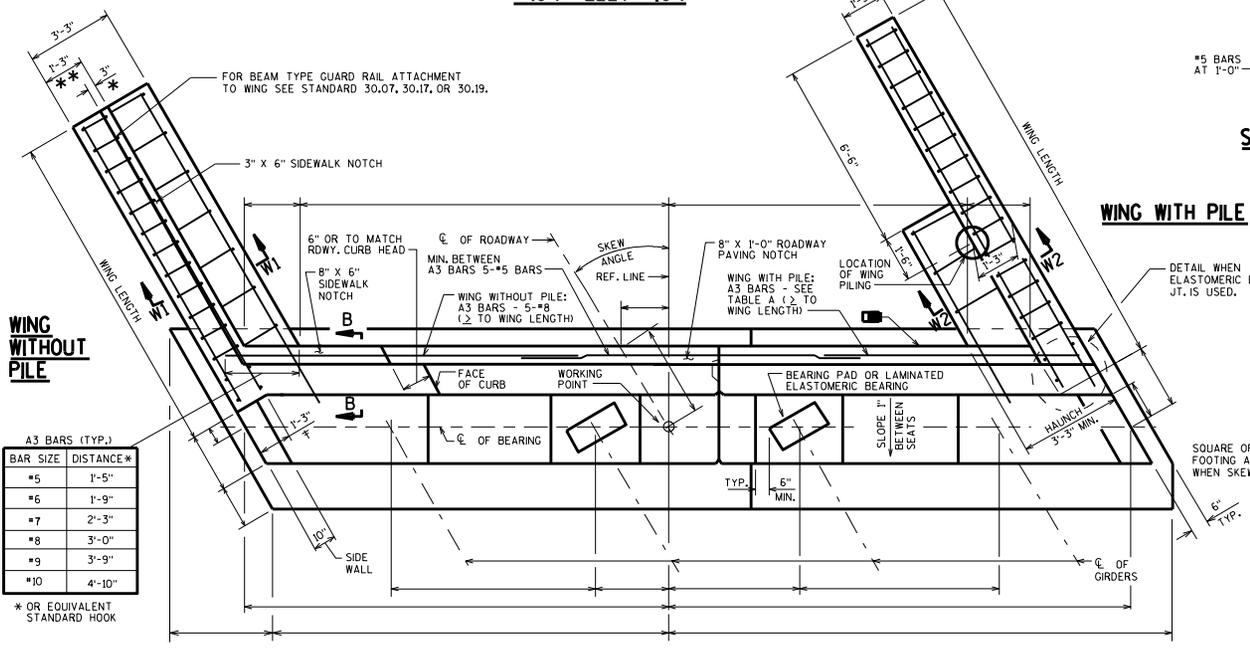
KEY DETAIL
FOR SILL ABUTMENT WITHOUT PILING PLACED ON SOIL



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

h = WING HEIGHT (FT.)
 $P = \gamma \times D_c \times (P_{DC} + \gamma \times D_w \times P_{DW} + \gamma \times L \times (LL))$ (K/FT.)

PILE REACTIONS PER FOOT IN KIPS

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

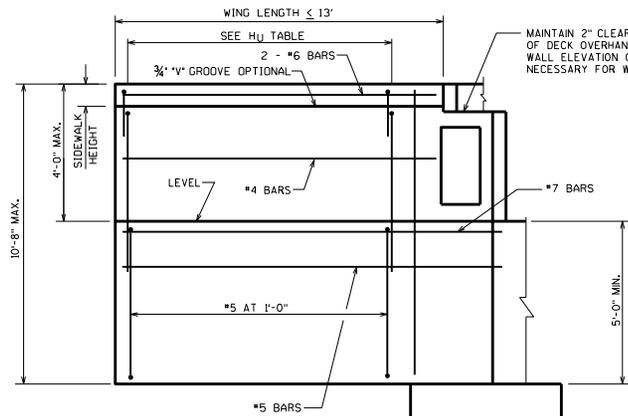
(PILES MUST ALSO BE DESIGNED TO ACCOUNT FOR LATERAL LOADS)

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

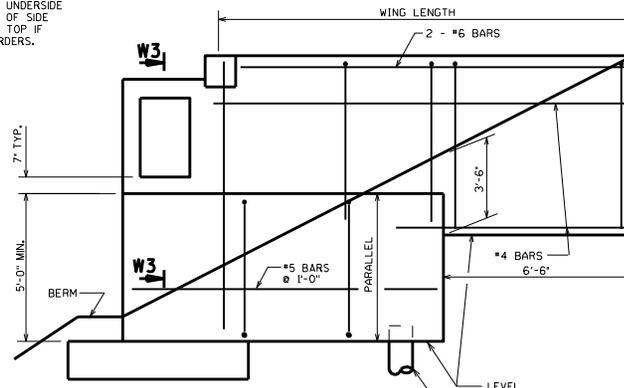
ABUTMENT TYPE A3

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION
 STRUCTURES DEVELOPMENT SECTION

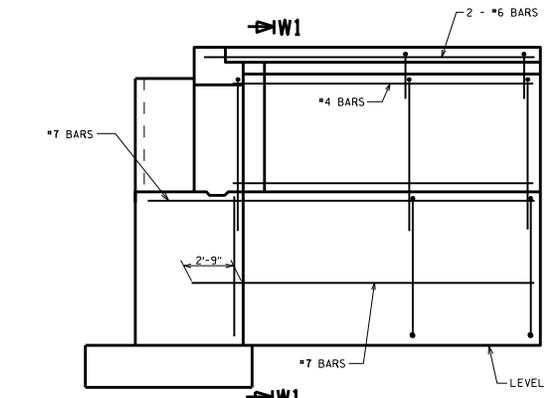
APPROVED: Bill Oliva DATE: 1-12



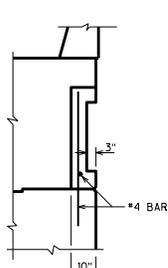
WING WITHOUT PILE ELEVATION
(FRONT FACE)



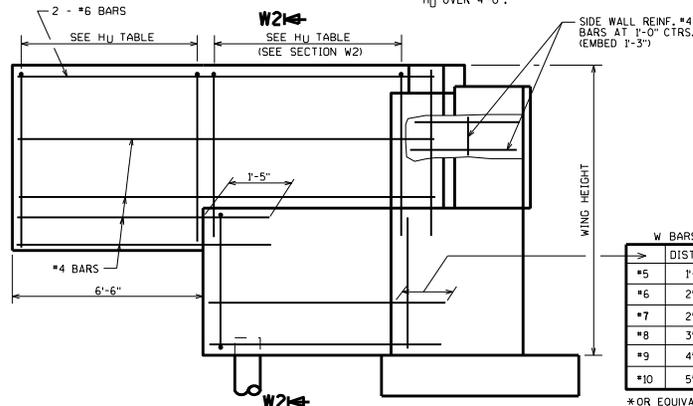
WING WITH PILE ELEVATION
(FRONT FACE)



WING WITHOUT PILE ELEVATION
(BACK FACE)

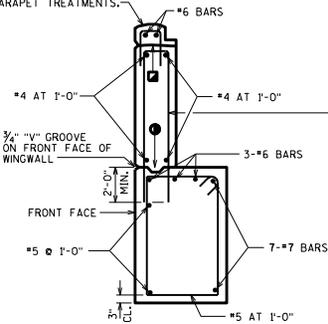


SECTION W3



WING WITH PILE ELEVATION
(BACK FACE)

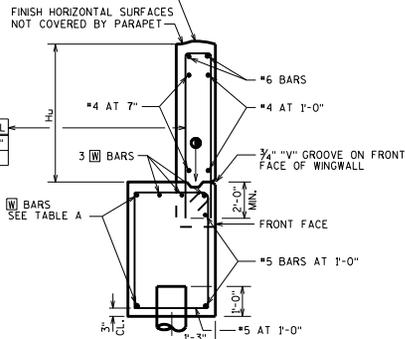
DETAIL FOR CONC. PARAPET WITH SIDEWALK SHOWN. SEE STD. 12.02 - "TOP OF WING DETAILS" FOR OTHER RAILING & PARAPET TREATMENTS.



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 "LF", "HF", "PF", "SIF" OR "SS" PARAPETS SHOWN. SEE STD. 12.02 - "TOP OF WING DETAILS" FOR OTHER RAILING & PARAPET TREATMENTS.



SECTION W2
WING WITH PILE

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.
- WHEN TYPE "F", "W", OR "M" RAILING IS USED, LOCATE NAME PLATE ON FIRST RIGHT WING TRAVELING UP STATION.
- FRONT ROW PILE DESIGN IS BASED ON AN EQUIVALENT FLUID UNIT WGT. OF SOIL OF 40 P.C.F. WITH $\gamma_{\text{DE}} = 1.50$, AND SUPERSTRUCTURE REACTIONS "P". BACK ROW PILE DESIGN IS BASED ON AN EQUIVALENT FLUID UNIT WGT. OF SOIL OF 40 P.C.F. WITH $\gamma_{\text{DE}} \text{ MIN.} = 0.90$, AND "P".
- FOR MODULAR EXPANSION JOINTS W/CONC. DIAPH. RUNNING TO EDGE OF DECK; IF SIDEWALL IS USED, FORM SIDEWALL 2" BELOW CONC. DIAPH.
- CONSTRUCTION JOINT, LEAVE ROUGH. REQUIRED FOR PRESTRESSED CONCRETE SUPERSTRUCTURES. OPTIONAL FOR OTHERS. POUR CONCRETE ABOVE THIS JOINT AFTER DECK IS IN PLACE.
- OPTIONAL CONST. JOINT FORMED BY BEVELED 2" x 6" KEYWAY WITH MEMBRANE ON BACKFACE.

LRFD DESIGN LOADS

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

TABLE A

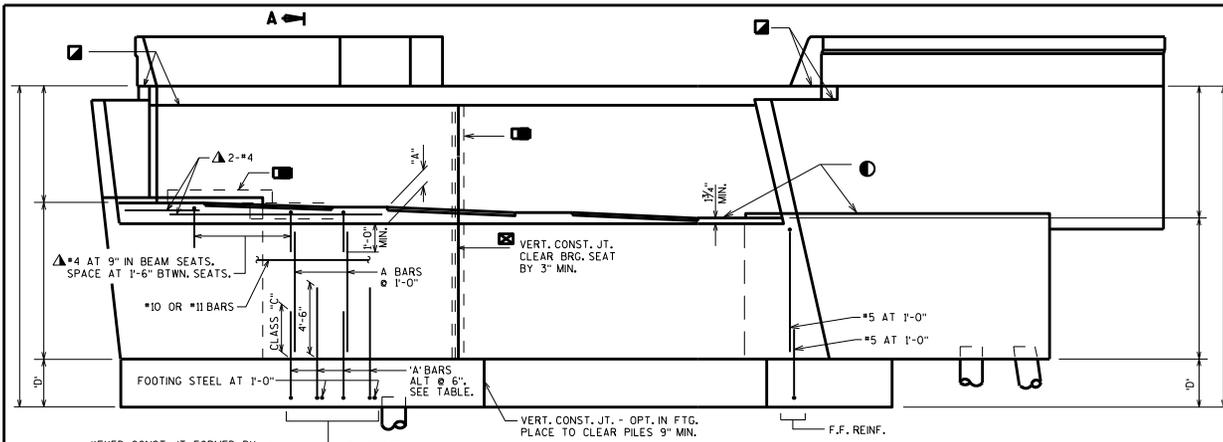
W BARS	DISTANCE*
#5	1'-9"
#6	2'-1"
#7	2'-9"
#8	3'-8"
#9	4'-7"
#10	5'-10"

*OR EQUIVALENT STANDARD HOOK

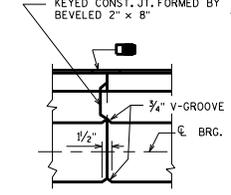
WING 2 LENGTH	WING 2 HEIGHT				BARS
	10'-0"	11'-6"	13'-0"	14'-6"	
12'-0"	5'-6"s	7'-5"s	8'-7"s	8'-7"s	W
16'-0"	8'-6"s	7'-7"s	8'-7"s	8'-7"s	A3
	7'-6"s	5'-8"s	7'-7"s	7'-7"s	A3
20'-0"	8'-7"s	9'-7"s	9'-8"s	10'-8"s	W
	5'-9"s	6'-9"s	7'-9"s	8'-9"s	A3
24'-0"	9'-8"s	10'-8"s	10'-9"s	8'-10"s	W
	9'-8"s	9'-9"s	9'-10"s	10'-10"s	A3
26'-0"	9'-9"s	10'-9"s	9'-9"s	10'-9"s	W
	7'-10"s	9'-10"s	9'-10"s	10'-10"s	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: 1-12



FRONT ELEVATION



VERT. CONST. JOINT

$P = \sum DC \cdot \rho DC + \sum DW \cdot \rho DW + \sum LL \cdot \rho LL$

IP/ K.F.T.	'A' BAR SIZE	FOOTING STEEL SIZE	FOOTING DEPTH 'D'	ABUTMENT BODY DEPTH	'B' BARS
16	#6	#6	3'-0"	<7'	9 #11'S
24	#7	#6	3'-0"	>7'	10 #10'S
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"		

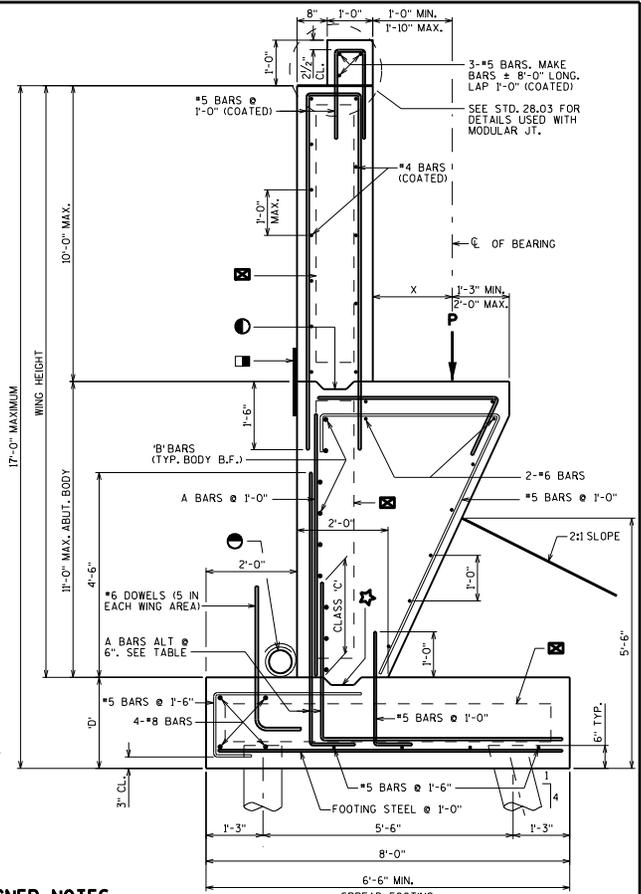
h = WING HEIGHT

PILE REACTIONS PER FOOT IN KIPS

BACK ROW = $\pi(0.56 \cdot X / 5.5) + h^2 / 915 + 17.2$

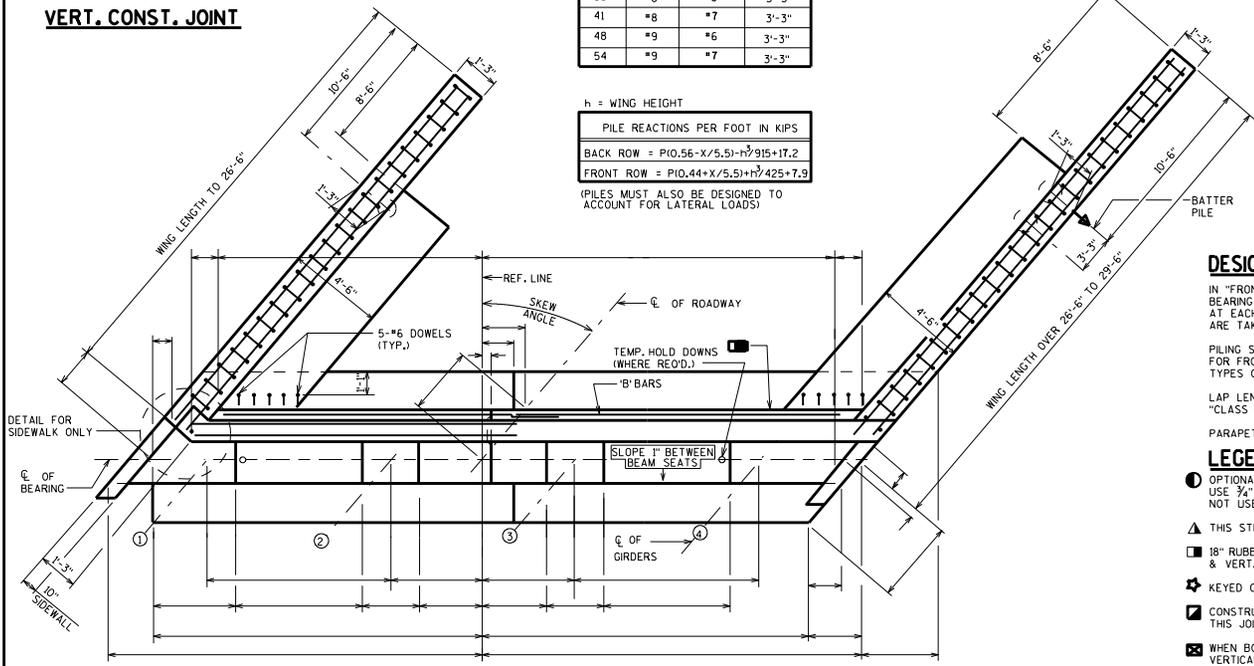
FRONT ROW = $\pi(0.44 \cdot X / 5.5) + h^2 / 425 + 7.3$

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



SECTION AA

NOTE: ALL HORIZONTAL BARS NOT LABELED IN SECTION AA ARE #5 BARS.



PLAN

SQUARE OFF END OF FOOTING AS SHOWN WHEN ABUTMENT IS SKEWED OVER 20°.

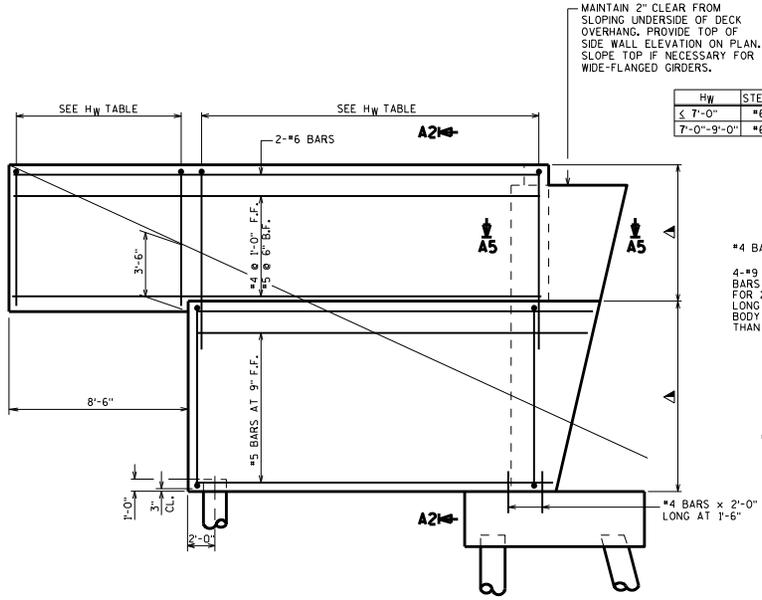
DESIGNER NOTES

- IN "FRONT ELEVATION" VIEW, GIVE ELEVATION OF ALL BEARING AREAS AND ELEVATION AT BOTTOM OF PARAPETS AT EACH END OF WINGS. ALL DIMENSIONS AND ELEVATIONS ARE TAKEN AT FRONT FACE OF BACKWALL.
- PIILING SPACING IN ABUTMENT BODY SHALL BE 8'-0" MAX. FOR FRONT ROW & 8'-0" MAX. FOR BACK ROW FOR ALL TYPES OF PILING.
- LAP LENGTH FOR HORIZONTAL BARS SHALL BE BASED ON A "CLASS C" TOP TENSION LAP SPLICE.
- PARAPET NOT SHOWN IN PLAN VIEW.

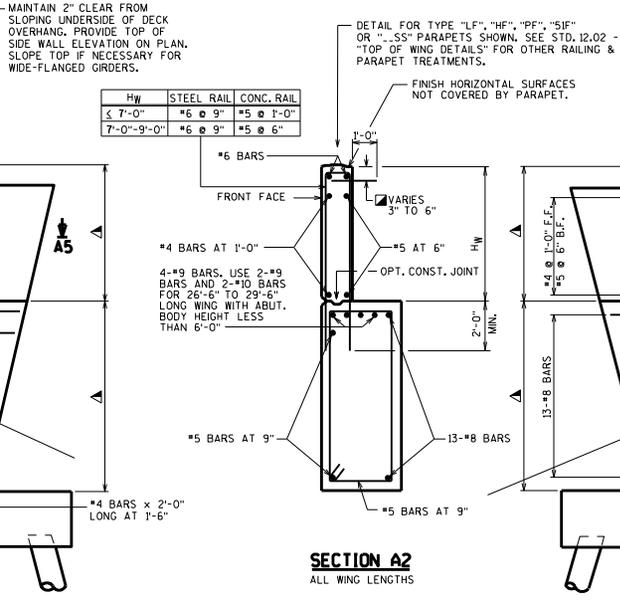
LEGEND

- OPTIONAL KEYED CONST. JOINT FORMED BY BEVELED 2" x 6". USE 3/4" V-GROOVE ON F.F. OF WINGWALL ONLY. IF JOINT IS NOT USED WATERPROOFING IS NOT RECD.
- THIS STEEL IS REQUIRED ONLY IF DIMENSION "A" EXCEEDS 4".
- 18" RUBBERIZED MEMBRANE WATERPROOFING, SEAL ALL HORIZ. & VERT. JOINTS ON BACKFACE ABOVE FOOTING.
- KEYED CONST. JOINT FORMED BY A BEVELED 2" x 6".
- CONSTRUCTION JOINT, LEAVE ROUGH, POUR CONCRETE ABOVE THIS JOINT AFTER SUPERSTRUCTURE CONCRETE IS IN PLACE.
- WHEN BODY SECTION IS MORE THAN ± 50'-0" LONG, PROVIDE VERTICAL CONST. JOINT, RUN BAR STEEL THRU JOINT. SEE STD. 12.09 FOR ALTERNATE CONSTRUCTION JOINT.
- PIPE UNDERDRAIN WRAPPED 16-INCH, SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN AS DETAILED ON SDD REINFORCED CONCRETE APRON ENDWALL FOR PIPE UNDERDRAIN.

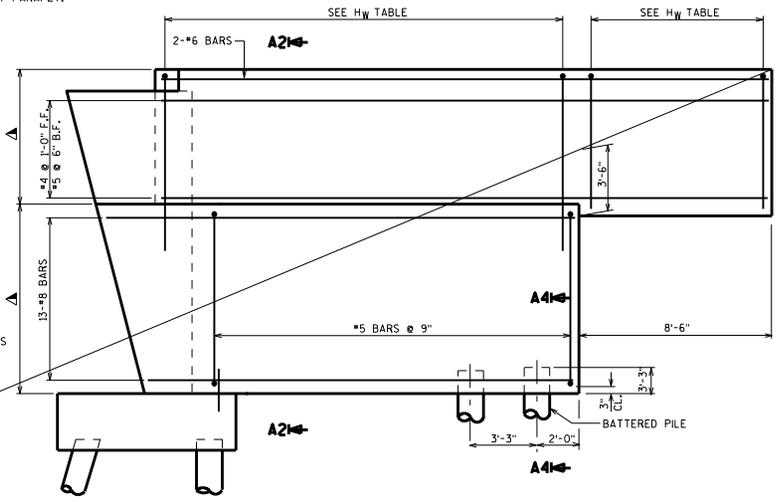
ABUTMENT A4 PILE FOOTING	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <i>Bill Oliva</i>	DATE: 1-12



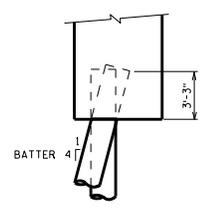
WING ELEVATION
WING LENGTH TO 26'-6"



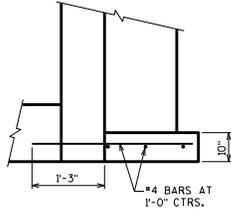
SECTION A2
ALL WING LENGTHS



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



SECTION A4



SECTION A5

DESIGNER NOTES

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

WING DESIGN IS BASED ON AN EQUIVALENT FLUID UNIT WGT. OF SOIL OF 40 P.C.F. WITH $X_{DEH} = 1.50$, AND SUPERSTRUCTURE REACTIONS "P". BACK ROW PILE DESIGN IS BASED ON AN EQUIVALENT FLUID UNIT WEIGHT OF SOIL OF 20 P.C.F. WITH $X_{DEH_{MIN}} = 0.90$, 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.

WHEN TYPE "F", "W" OR "M" RAILING IS USED, 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" L.G. AT 1'-0" CTRS. FROM WING TIP TO PAVING NOTCH, PLACE IN WING ADJACENT TO SURFACE DRAIN APRON ONLY.

▲ DIMENSIONS TO BE CONSTANT.

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:
 $X_{pdc} = 1.25$
 $X_{pdm} = 1.50$
 $X_{pdm} = 1.50$
 $X_{pdm} = 0.90$
 $X_{pev} = 1.35$
 $X_{ll} = 1.75$
EXPOSURE CLASS 2, $X_{ec} = 0.75$
 $F_y = 60,000$ P.S.I.
 $F_c = 3,500$ P.S.I.

ABUTMENT A4 PILE FOOTING	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <i>Bill Oliva</i>	DATE: 1-12

DESIGNER NOTES

THIS TYPE OF WING SHOULD BE USED WHEN POSSIBLE IN LIEU OF WINGS PARALLEL TO THE ROADWAY. DO NOT USE FOR STREAM CROSSINGS WHERE HIGH WATER MAY BE A PROBLEM.

*USE 2 1/2:1 FOR THE UNSTABLE CLAYS WHICH ARE SOMETIMES ENCOUNTERED IN NORTHWEST WISC. (SUPERIOR AREA)

① WHEN TIMBER RAILING IS USED AS PER STANDARD 30.24, AND THE SKEW IS > 0°, THIS CONSTRUCTION JOINT SHALL BE MANDATORY. THE WING CONCRETE SHALL BE PLACED ABOVE CONSTR. JT. AFTER THE TIMBER END POSTS ARE IN PLACE.

ALL WING BARS SHALL BE EPOXY COATED.

LRFD DESIGN LOADS (WINGS)

LIVE LOAD = 1'-0" SURCHARGE

LOAD FACTORS:

$\gamma_{DC} = 1.25$

$\gamma_{WH} = 1.50$

$\gamma_L = 1.75$

EXPOSURE CLASS 2, $\gamma_F = 0.75$

HORIZ. EARTH LOAD BASED ON: 35 P.C.F. EQUIV. FLUID UNIT

WEIGHT OF SOIL

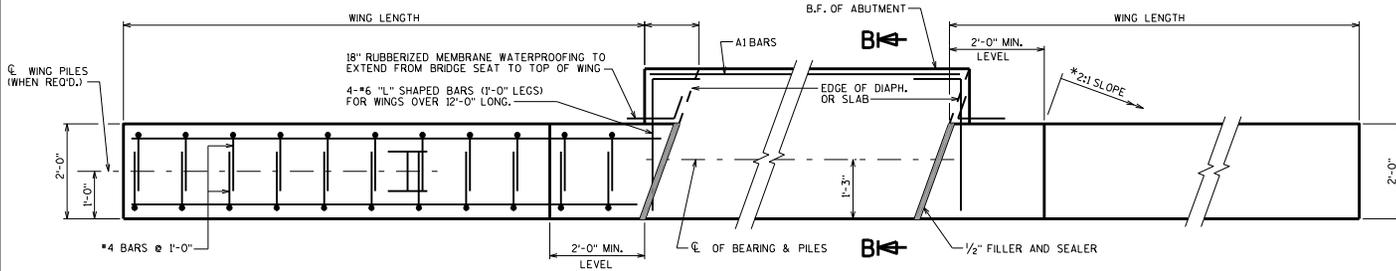
$F_y = 60,000$ P.S.I.

$F_c = 3,500$ P.S.I.

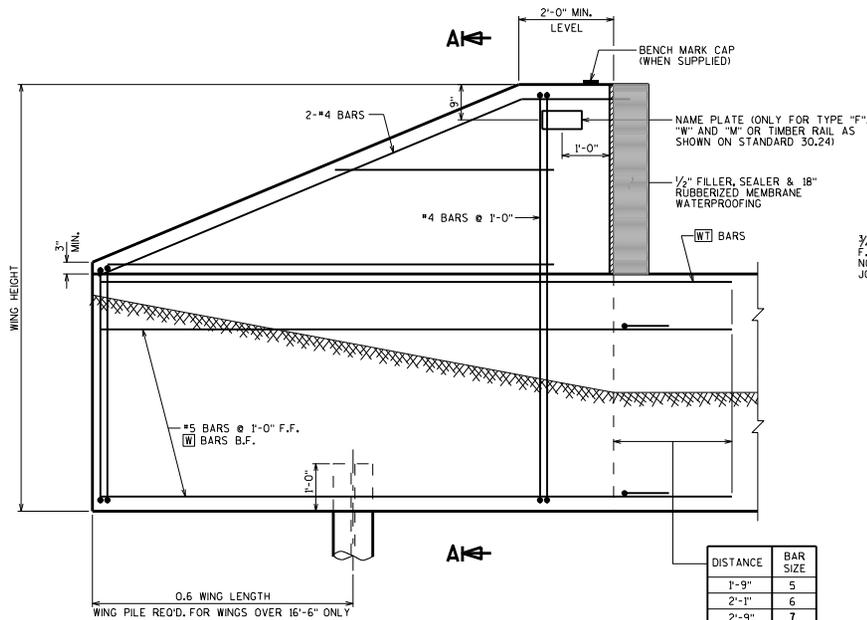
TABLE A

WING LENGTH	WING HEIGHT				BARS
	8'-6"	10'-0"	11'-6"	13'-0"	
5'-9"	5-#5's	5-#5's	6-#5's		W
10'-0"	2-#5's	2-#5's	2-#5's		WT
	4-#6's	4-#6's	5-#6's		A1
12'-0"		5-#6's	5-#7's	6-#7's	W
		2-#7's	2-#7's	2-#8's	WT
		5-#6's	6-#6's	6-#7's	A1
16'-0"		5-#8's	6-#8's	5-#9's	W
		2-#8's	2-#8's	2-#9's	WT
20'-0"		5-#8's	6-#8's	7-#8's	A1
			8-#8's	8-#9's	W
			2-#8's	2-#9's	WT
			7-#9's	8-#9's	A1

▲ WING PILE REQUIRED

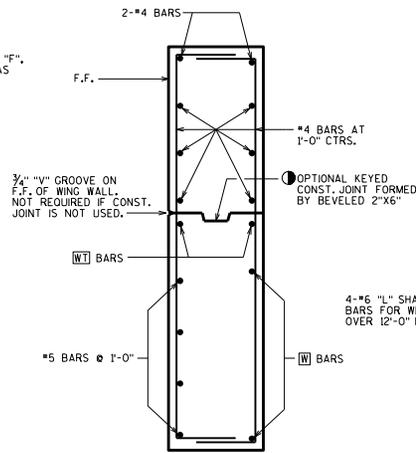


PLAN FOR TYPE A1 ABUTMENT
(SEE STD. 12.01 FOR ABUTMENT BODY DETAILS)

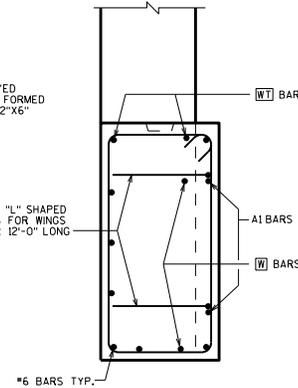


WING ELEVATION
(A1 ABUTMENT)

DISTANCE	BAR SIZE
1'-9"	5
2'-1"	6
2'-9"	7
3'-8"	8
4'-7"	9



SECTION A-A



SECTION B-B

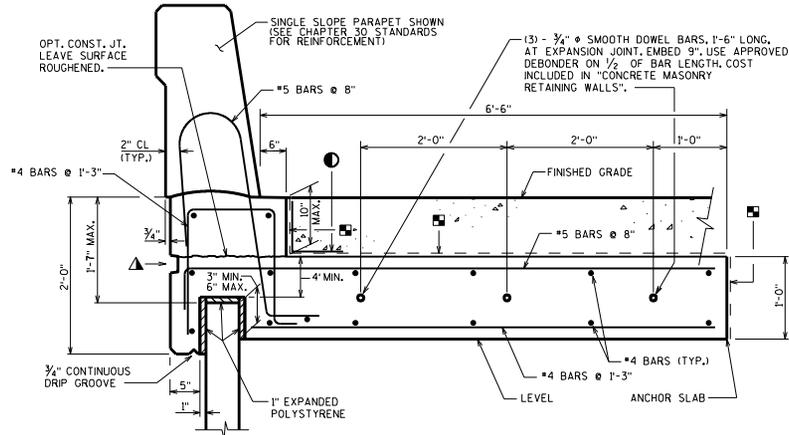
SEE STD. 12.01 & 12.02 FOR NOTES & DETAILS

DETAILS FOR WINGS PARALLEL TO A1 ABUTMENT CENTERLINE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva

DATE:
1-12



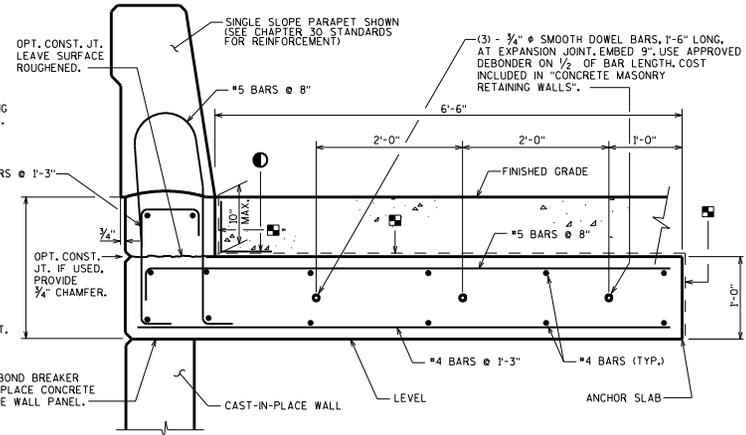
18" RUBBERIZED MEMBRANE WATERPROOFING TO BE PLACED ON THESE SURFACES AT EACH JOINT.

IF THE OPT. CONST. JOINT IS USED, PLACE 18" MEMBRANE WATERPROOFING ALONG THE ENTIRE LONGITUDINAL JOINT. THE MEMBRANE WATERPROOFING SEALING THE OPTIONAL CONST. JOINT IS INCIDENTAL TO THE CONCRETE MASONRY BID ITEM.

RUSTICATION DETAIL

PROVIDE RUSTICATION IF OPT. CONST. JOINT IS USED.

LIQUID OR OTHER BOND BREAKER BETWEEN CAST-IN-PLACE CONCRETE AND CAST-IN-PLACE WALL PANEL.



CAST-IN-PLACE CONCRETE TRAFFIC BARRIER DETAIL FOR PRECAST WALL PANELS

OPTIONAL CONSTRUCTION JOINTS IN THE PARAPET AND ANCHOR SLAB BETWEEN EXPANSION JOINTS MAY BE USED. RUN BAR REINFORCEMENT THRU THE JOINT. SEE STANDARDS 30.07, 30.12, 30.13 & 30.30-30.32 FOR MINIMUM LAP LENGTHS IN PARAPET BARS. DEFINE CONSTRUCTION JOINT WITH A 3/4" V-GROOVE.

LAP LONGITUDINAL #4 BARS A MINIMUM OF 1'-0".

ALL BAR STEEL SHALL BE EPOXY COATED.

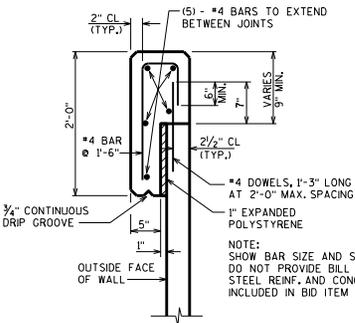
CONCRETE QUALITY BASED ON 3" PANEL EMBEDMENT.

CAST-IN-PLACE CONCRETE TRAFFIC BARRIER DETAIL FOR CAST-IN-PLACE WALL PANELS

OPTIONAL CONSTRUCTION JOINTS IN THE PARAPET AND ANCHOR SLAB BETWEEN EXPANSION JOINTS MAY BE USED. RUN BAR REINFORCEMENT THRU THE JOINT. SEE STANDARDS 30.07, 30.12, 30.13 & 30.30-30.32 FOR MINIMUM LAP LENGTHS IN PARAPET BARS. DEFINE CONSTRUCTION JOINT WITH A 3/4" V-GROOVE.

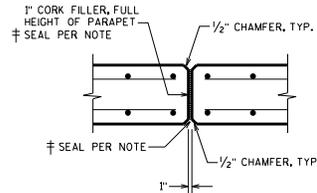
LAP LONGITUDINAL #4 BARS A MINIMUM OF 1'-0".

ALL BAR STEEL SHALL BE EPOXY COATED.

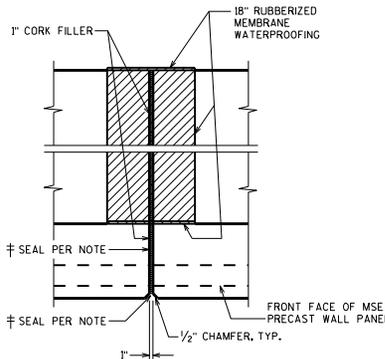


CAST-IN-PLACE CONCRETE COPING DETAIL

NOTE: SHOW BAR SIZE AND SPACING, ONLY. DO NOT PROVIDE BILL OF BARS. BAR STEEL REINF. AND CONCRETE ARE INCLUDED IN BID ITEM FOR THE MSE WALL.

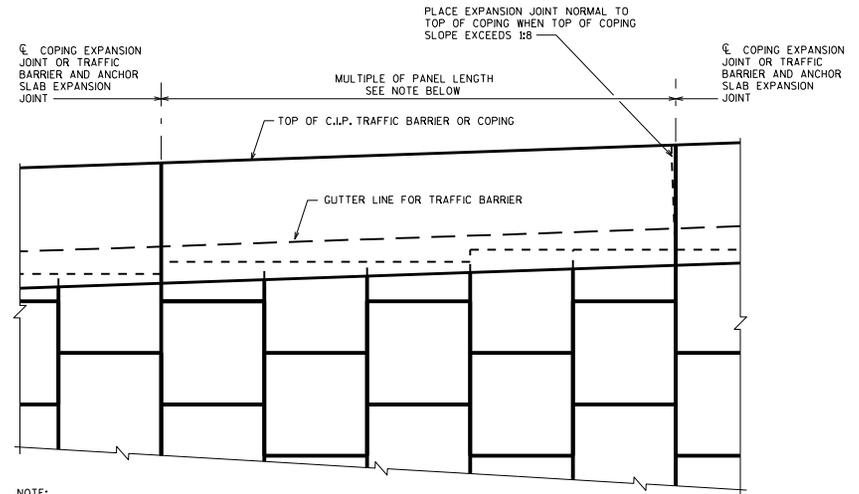


TRAFFIC BARRIER EXPANSION JOINT DETAIL

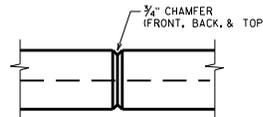


ANCHOR SLAB EXPANSION JOINT DETAIL

EXPANSION JOINTS TO BE SPACED AT A MINIMUM OF 20' AND A MAXIMUM OF 30'. LOCATE EXPANSION JOINTS OVER WALL JOINTS. DO NOT RUN BAR STEEL THRU JOINT, EXCEPT FOR DOWEL BARS. JOINT TO EXTEND FULL DEPTH OF PARAPET AND ANCHOR SLAB. PROVIDE THE NUMBER OF BARS AND OVERALL LENGTH FOR QUANTITY PURPOSES, ONLY. DO NOT DETAIL SPECIFIC BAR LENGTHS BETWEEN EXPANSION JOINTS AS THESE LENGTHS ARE BASED ON UNKNOWN MSE PANEL LENGTH AND CONFIGURATION.

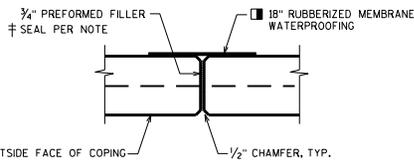


C.I.P. TRAFFIC BARRIER OR COPING PARTIAL ELEVATION



COPING CONTRACTION JOINT

DO NOT RUN BAR STEEL THRU JOINT. MAX. SPACING OF JOINT = 12'



COPING EXPANSION JOINT

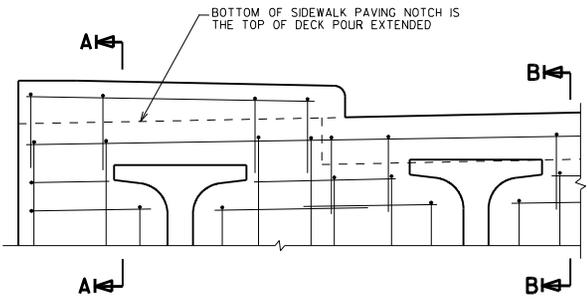
DO NOT RUN BAR STEEL THRU JOINT. MAX. SPACING OF JOINT = 50'

MEMBRANE WATERPROOFING TO EXTEND FROM TOP OF COPING TO 6" BELOW TOP OF PANELS.

MSE RETAINING WALL DETAILS

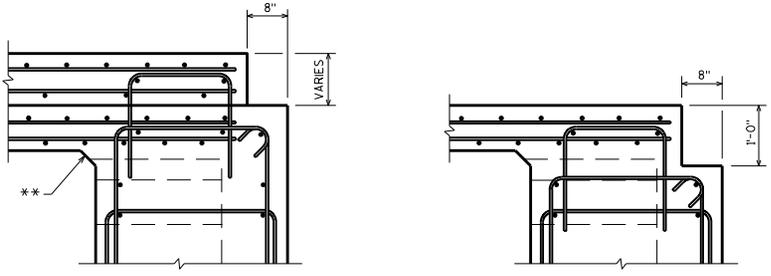
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: *Bill Oliva* DATE: 1-12



**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.)

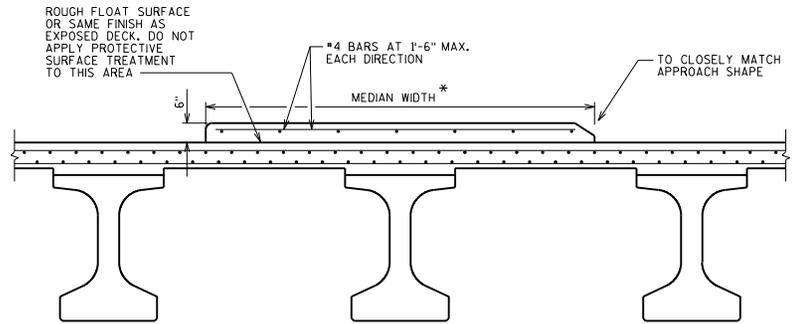


SECTION A-A

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

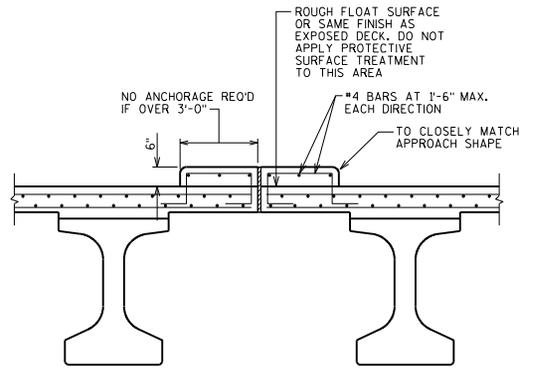
SECTION B-B

- 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.

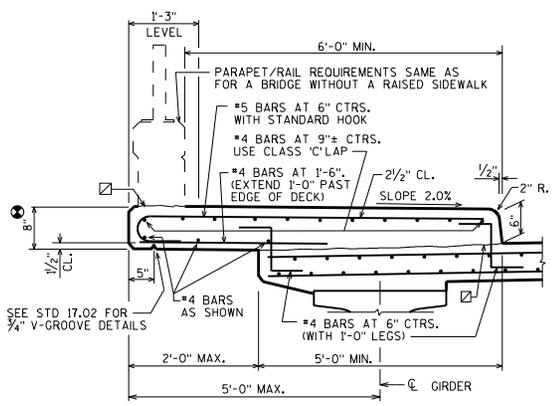


CROSS SECTION THRU UNANCHORED MEDIAN

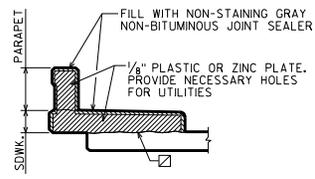
* (ANCHORAGE TO DECK NOT REQUIRED FOR WIDTHS > 3'-0")
CLEAN ALL LOOSE MATERIAL ON THE DECK AT THE MEDIAN LOCATION PRIOR TO MEDIAN PLACEMENT USING HIGH PRESSURE WATER OR AIR, ENSURING ALL FREE-STANDING WATER IS REMOVED PRIOR TO MEDIAN PLACEMENT. NEAT CEMENT IS REQUIRED AS PER 509.3.8.2 OF THE STANDARD SPECIFICATIONS UNLESS THE MEDIAN IS POURED WITHIN 45 DAYS OF COMPLETING THE DECK POUR.



CROSS SECTION THRU ANCHORED MEDIAN



SECTION THRU SIDEWALK



DEFLECTION JOINT DETAIL

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

1. GIRDER STRUCTURES AND SLAB STRUCTURES WITH A SIDEWALK SHOULD HAVE A DEFLECTION JOINT IN THE SIDEWALK AND PARAPET OVER THE PIER.
2. GIRDER STRUCTURES AND SLAB STRUCTURES WITHOUT SIDEWALKS SHOULD HAVE NO DEFLECTION JOINTS IN THE PARAPETS.

NOTES

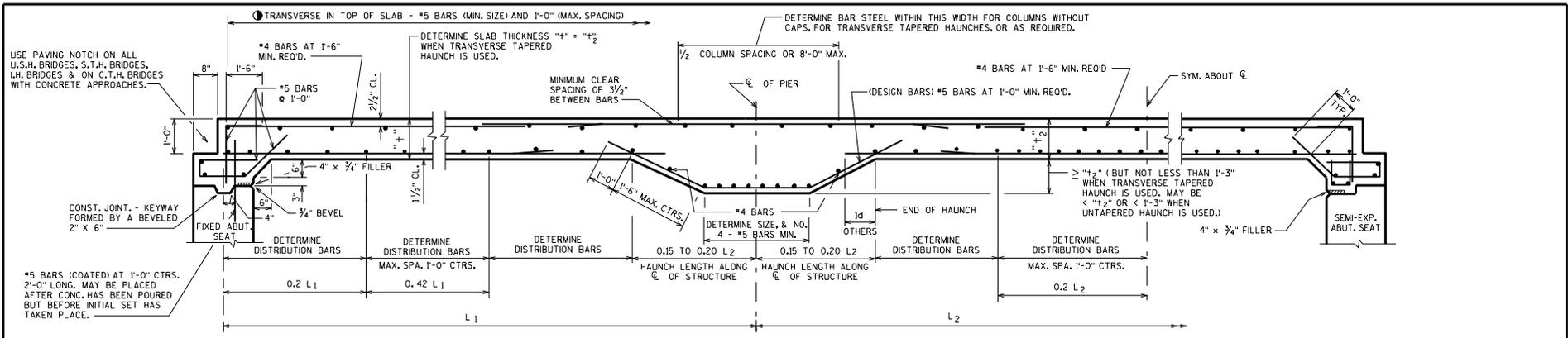
WHEN PARAPETS ARE POURED CONTINUOUSLY FROM END TO END, THEY SHALL BE SEPARATED AT THE DEFLECTION JOINTS BY A PIECE OF 1/8" ZINC OR PLASTIC PLATE CUT AS SHOWN IN THE "DEFLECTION JOINT DETAIL". IF CONSTRUCTION JOINTS IN PARAPETS ARE USED AT THE DEFLECTION JOINTS, ONE SIDE OF JOINT SHALL BE COATED WITH 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.

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.

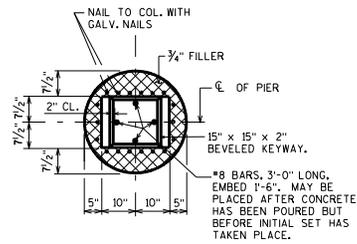
MEDIAN AND RAISED SIDEWALK DETAILS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <i>Bill Oliva</i>	DATE: 1-12



GENERAL NOTES

- TOP TRANSVERSE BARS IN SLAB SHALL BE SUPPORTED BY INDIVIDUAL BAR CHAIRS AT APPROXIMATELY 3'-0" CENTERS EACH WAY. BOTTOM LONGITUDINAL BARS SHALL BE SUPPORTED BY CONTINUOUS BAR CHAIRS AT APPROXIMATELY 4'-0" CENTERS.
- ALL SLAB THICKNESS DIMENSIONS ARE MINIMUM. ANY TOLERANCES NECESSARY TO CORRECT CONSTRUCTION DISCREPANCIES ARE TO BE PLUS (+).
- PARAPETS, SIDEWALKS AND MEDIANS PLACED ON TOP OF THE SLAB SHALL BE POURED AFTER FALSEWORK HAS BEEN RELEASED, EXCEPT FOR STAGED CONSTRUCTION.
- CAMBER SPANS AS SHOWN TO PROVIDE FOR DEAD LOAD DEFLECTION AND FUTURE CREEP. CAMBER DOES NOT INCLUDE ALLOWANCE FOR FORM SETTLEMENT.

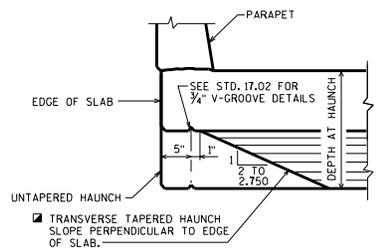
**COLUMN W/O CAP TYPE PIER
DETAIL AT TOP OF COLUMN**



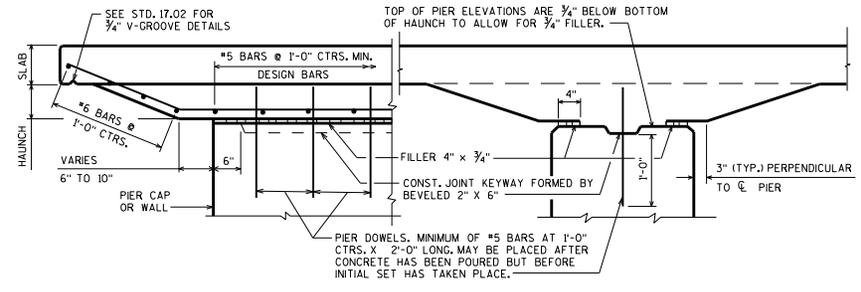
DESIGNER NOTES

- THE MAXIMUM ALLOWABLE SKEW ANGLE OF STRUCTURE SHALL BE 30°.
- ALL BAR SPLICES TO BE BASED ON "CLASS C" TENSION LAP SPLICE.
- USE OPTIONAL LONGITUDINAL JOINTS WHEN OVERALL SLAB WIDTH IS OVER 52'-0". SEE STANDARD 18.02 FOR DETAIL.
- FOR BRIDGES LOCATED IN REMOTE AREAS USE OPTIONAL TRANSVERSE JOINT WHEN POUR EXCEEDS 400 C.Y. PLACE KEYED JOINT NEAR POINT OF DEAD LOAD INFLECTION.
- ALL TRANSVERSE BAR STEEL REINFORCEMENT SHALL BE PLACED ON THE SKEW.
- FLOOR DRAINS ARE TO BE OMITTED FROM SLAB STRUCTURES WHERE POSSIBLE. IF FLOOR DRAINS ARE REQUIRED, PLACE ONLY AT THE 2/10 AND 8/10 PTS. BEND MAIN REBARS PAST DRAINS - DO NOT CUT.
- PIER CAP OR WALL TYPE PIERS SHALL BE USED ON MOST STRUCTURES. "COLUMN WITHOUT CAP" TYPE PIERS MAY BE USED WITH THE APPROVAL OF THE STRUCTURES DESIGN SECTION.
- ON THE PLANS, PROVIDE CAMBER VALUES AT THE TENTH POINTS OF ALL SPANS. ALSO PROVIDE TOP OF SLAB ELEVATIONS AT THE CENTERLINE (AND/OR CROWN) AND OUTSIDE EDGES OF SLAB AT TENTH POINTS.
- TRANSVERSE TAPERED HAUNCHES MAY BE USED TO ELIMINATE A COLUMN (PROVIDED A MINIMUM OF 3 COLUMNS ARE USED, OR FOR AESTHETICS).

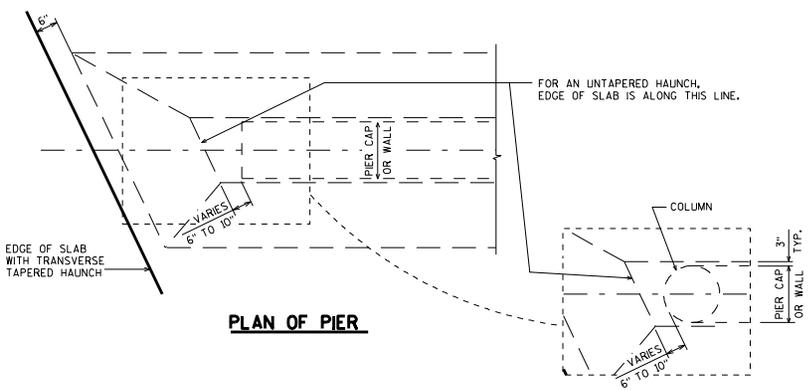
**TAPERED/UNTAPERED HAUNCH
CROSS SECTION**



**PIER CAP OR WALL TYPE PIER
SHOWING TRANSVERSE TAPERED HAUNCH**



PLAN OF PIER

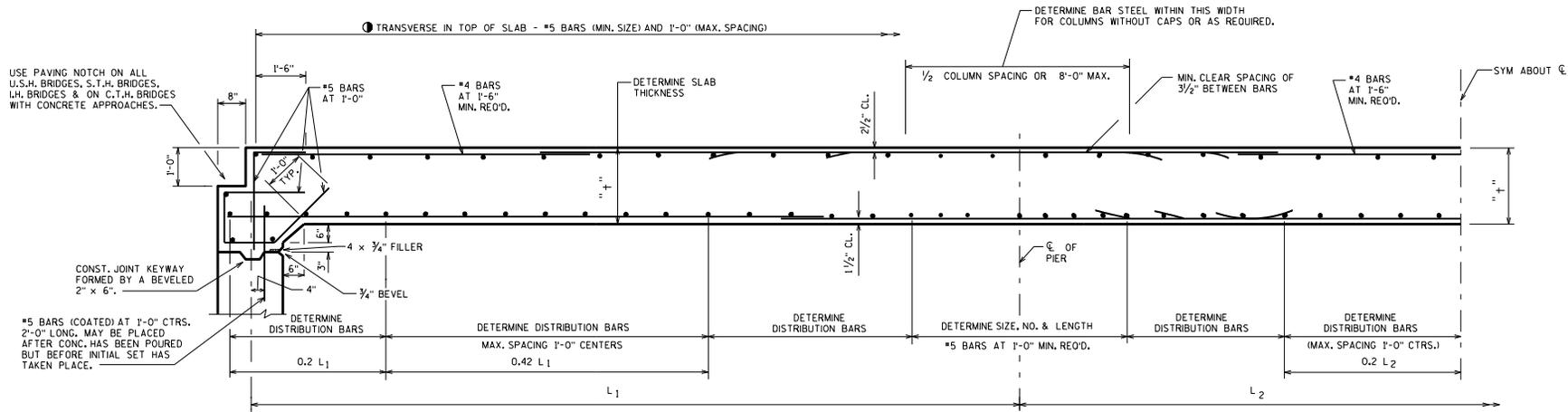


TOP TRANSVERSE REINF. FOR RAILINGS/PARAPETS		
SINGLE SLOPE OR SLOPED FACE PARAPETS	MAIN BARS RUN FROM EDGE TO EDGE OF SLAB	SHORT BARS PLACED BETWEEN MAIN BARS AT EDGE OF SLAB
SLAB THICK. ≥ 15"	(#5 @ 1'-0")	(#5 @ 1'-0") 5'-0" LONG NO HOOK REQ'D. AT END
13" ≤ SLAB THICK. < 15"	(#5 @ 10")	(#5 @ 10") 5'-0" LONG STD. HOOK REQ'D. AT END
STEEL RAILINGS TYPE "M"/"W"	TOP TRANSVERSE REINF. SPECIFIED IN "LONGIT. SECTION" IS ADEQUATE	

CONTINUOUS HAUNCHED SLAB

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva DATE: 1-12



HALF LONGITUDINAL SECTION

GENERAL NOTES

TOP TRANSVERSE BARS IN SLAB SHALL BE SUPPORTED BY INDIVIDUAL BAR CHAIRS AT APPROXIMATELY 3'-0" CENTERS EACH WAY. BOTTOM LONGITUDINAL BARS SHALL BE SUPPORTED BY CONTINUOUS BAR CHAIRS AT APPROXIMATELY 4'-0" CENTERS.

ALL SLAB THICKNESS DIMENSIONS ARE MINIMUM. ANY TOLERANCES NECESSARY TO CORRECT CONSTRUCTION DISCREPANCIES ARE TO BE PLUS (+).

PARAPETS, SIDEWALKS AND MEDIANS PLACED ON TOP OF THE SLAB SHALL BE POURED AFTER FALSEWORK HAS BEEN RELEASED, EXCEPT FOR STAGED CONSTRUCTION.

CAMBER SPANS AS SHOWN TO PROVIDE FOR DEAD LOAD DEFLECTION AND FUTURE CREEP. CAMBER DOES NOT INCLUDE ALLOWANCE FOR FORM SETTLEMENT.

DESIGNER NOTES

THE MAXIMUM ALLOWABLE SKEW ANGLE OF STRUCTURE SHALL BE 30°.

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

USE OPTIONAL LONGITUDINAL JOINTS WHEN OVERALL SLAB WIDTH IS OVER 52'-0".

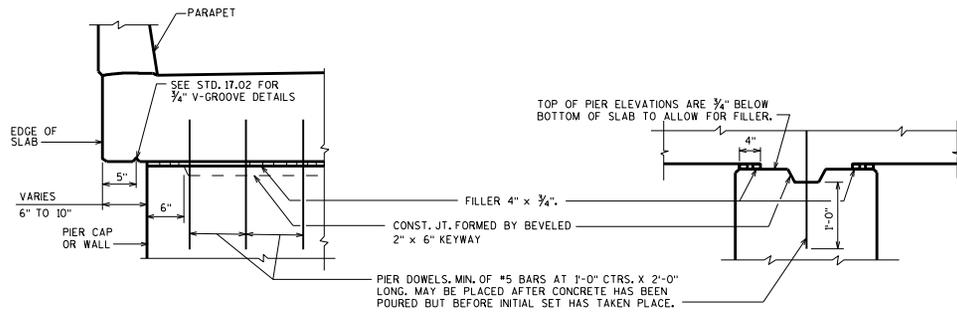
FOR BRIDGES LOCATED IN REMOTE AREAS USE OPTIONAL TRANSVERSE JOINT WHEN POUR EXCEEDS 400 C.Y. PLACE KEYED JOINT NEAR POINT OF DEAD LOAD INFLECTION.

ALL TRANSVERSE BAR STEEL REINFORCEMENT SHALL BE PLACED ON THE SKEW.

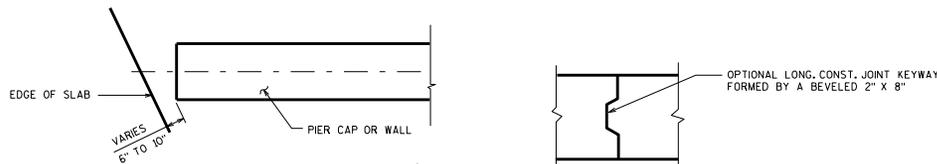
FLOOR DRAINS ARE TO BE OMITTED FROM SLAB STRUCTURES WHERE POSSIBLE. IF FLOOR DRAINS ARE REQUIRED, PLACE ONLY AT THE 2/10 AND 8/10 PTS. BEND MAIN REBARS PAST DRAINS - DO NOT CUT.

PIER CAP OR WALL TYPE PIERS SHALL BE USED ON MOST STRUCTURES. "COLUMN WITHOUT CAP" TYPE PIERS (SEE STD. 18.01) MAY BE USED WITH THE APPROVAL OF THE STRUCTURES DESIGN SECTION.

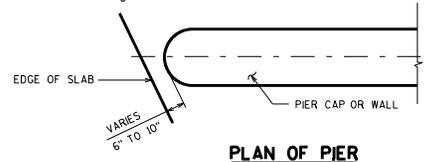
ON THE PLANS, PROVIDE CAMBER VALUES AT THE TENTH POINTS OF ALL SPANS. ALSO PROVIDE TOP OF SLAB ELEVATIONS AT THE CENTERLINE (AND/OR CROWN) AND OUTSIDE EDGES OF SLAB AT TENTH POINTS.



PIER CAP OR WALL TYPE PIER
SEE STD. 18.01 FOR COLUMN W/O CAP PIER DETAIL.



OPTIONAL LONGITUDINAL CONSTRUCTION JOINT



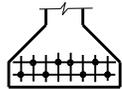
PLAN OF PIER

TOP TRANSVERSE REINF. FOR RAILINGS/PARAPETS		
SINGLE SLOPE OR SLOPED FACE PARAPETS	MAIN BARS RUN FROM EDGE TO EDGE OF SLAB	SHORT BARS PLACED BETWEEN MAIN BARS AT EDGE OF SLAB
SLAB THICK. ≥ 15"	(#5 @ 1'-0")	(#5 @ 1'-0") 5'-0" LONG NO HOOK RE'OD. AT END
13" ≤ SLAB THICK. < 15"	(#5 @ 10")	(#5 @ 10") 5'-0" LONG STD. HOOK RE'OD. AT END
STEEL RAILINGS TYPE "M"/"W"	① TOP TRANSVERSE REINF. SPECIFIED IN "LONGIT. SECTION" IS ADEQUATE	

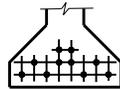
CONTINUOUS FLAT SLAB

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

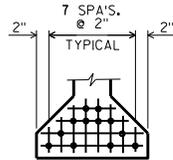
APPROVED: *Bill Oliva* DATE: 1-12



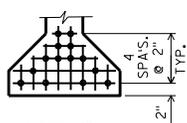
8 STRANDS



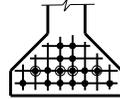
10 STRANDS



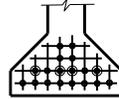
12 STRANDS



14 STRANDS



*16 STRANDS



*18 STRANDS

* NEEDS BOND BREAKERS AT ENDS. SEE BOND BREAKER DETAIL.

⊙ INDICATES STRAND TO BE DEBONDED

STANDARD ARRANGEMENTS TO RAISE CENTER OF GRAVITY TO AVOID DRAPING OF 0.6"ϕ STRANDS (0.5"ϕ STRANDS MAY ALSO BE USED)

28" GIRDER

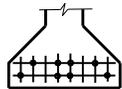
A = 312 SQ. IN.
 $r^2 = 91.95 \text{ IN.}^2$
 $y_T = 14.58 \text{ IN.}$
 $y_B = -13.42 \text{ IN.}$
 $I = 28,687 \text{ IN.}^4$
 $S_T = 1,968 \text{ IN.}^3$
 $S_B = -2,138 \text{ IN.}^3$
 WT. = 325 #/FT.

PRE-TENSION

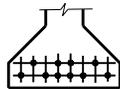
$f'_s = 270,000 \text{ P.S.I.}$
 $f_s = 0.75 \times 270,000 = 202,500 \text{ P.S.I.}$
 for low relaxation strands
 $P_i \text{ PER } 0.5" \phi \text{ STRAND} = 0.1531 \times 202,500 = \underline{31,00 \text{ KIPS}}$
 $P_i \text{ PER } 0.6" \phi \text{ STRAND} = 0.217 \times 202,500 = \underline{43,94 \text{ KIPS}}$
 $\frac{y_B}{r^2} = \frac{-13.42}{91.95} = -0.1459 \text{ IN./IN.}^2$
 $f_b (\text{init.}) = \frac{A_s f_s}{A} (1 + \frac{e_s y_B}{r^2})$

(COMPRESSION IS POSITIVE)

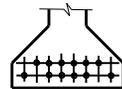
NO. STRANDS	e_s (inches)	$P(\text{init.}) = A_s f_s$ (KIPS)	$f_b (\text{init.})$ (K/sq.in.)
STANDARD STRAND PATTERNS FOR UNDRAPED STRANDS (0.6"ϕ)			
8	-10.40	352	2,841
10	-9.80	439	3,419
12	-8.73	527	3,841
14	-7.97	615	4,264
*16	-9.4	703	5,345
*18	-9.6	791	6,087
STANDARD STRAND PATTERNS FOR DRAPED STRANDS (0.5"ϕ)			
8	-10.4	248	2,001
10	-10.6	310	2,531
12	-10.4	372	3,002
14	-10.0	434	3,421
16	-9.4	496	3,771
18	-9.6	558	4,294



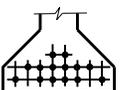
8 STRANDS



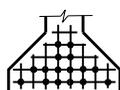
10 STRANDS



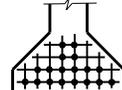
12 STRANDS



14 STRANDS

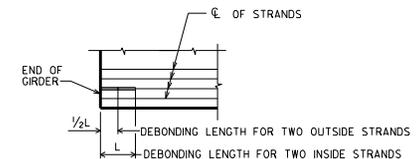


16 STRANDS



18 STRANDS

ARRANGEMENT AT \bar{C} SPAN - FOR GIRDERS WITH DRAPED 0.5"ϕ STRANDS



BOND BREAKER DETAIL

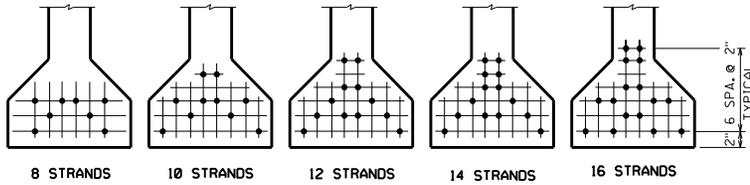
SHOWING LENGTHS OF DEBONDING FROM END OF GIRDER. DEBOND LENGTHS TO BE DESIGNED. STRAND TRANSFER LENGTH IS 60 X STRAND DIAMETER.

28" PRESTRESSED GIRDER DESIGN DATA

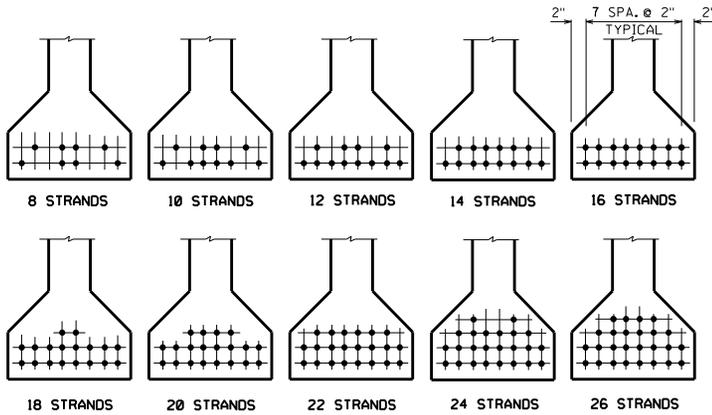
STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION
 STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva

DATE:
 1-12



**STANDARD ARRANGEMENTS TO RAISE CENTER OF GRAVITY
TO AVOID DRAPING OF 0.6"φ STRANDS**
(0.5"φ STRANDS MAY ALSO BE USED)



ARRANGEMENT AT $\frac{1}{4}$ SPAN - FOR GIRDERS WITH DRAPED 0.5"φ STRANDS

36" GIRDER

A = 369 SQ. IN.
 $r^2 = 138.15 \text{ IN.}^2$
 $y_T = 20.17 \text{ IN.}$
 $y_B = -15.83 \text{ IN.}$
 $I = 50,979 \text{ IN.}^4$
 $S_T = 2,527 \text{ IN.}^3$
 $S_B = -3,220 \text{ IN.}^3$
 WT. = 384 #/FT.

PRE-TENSION

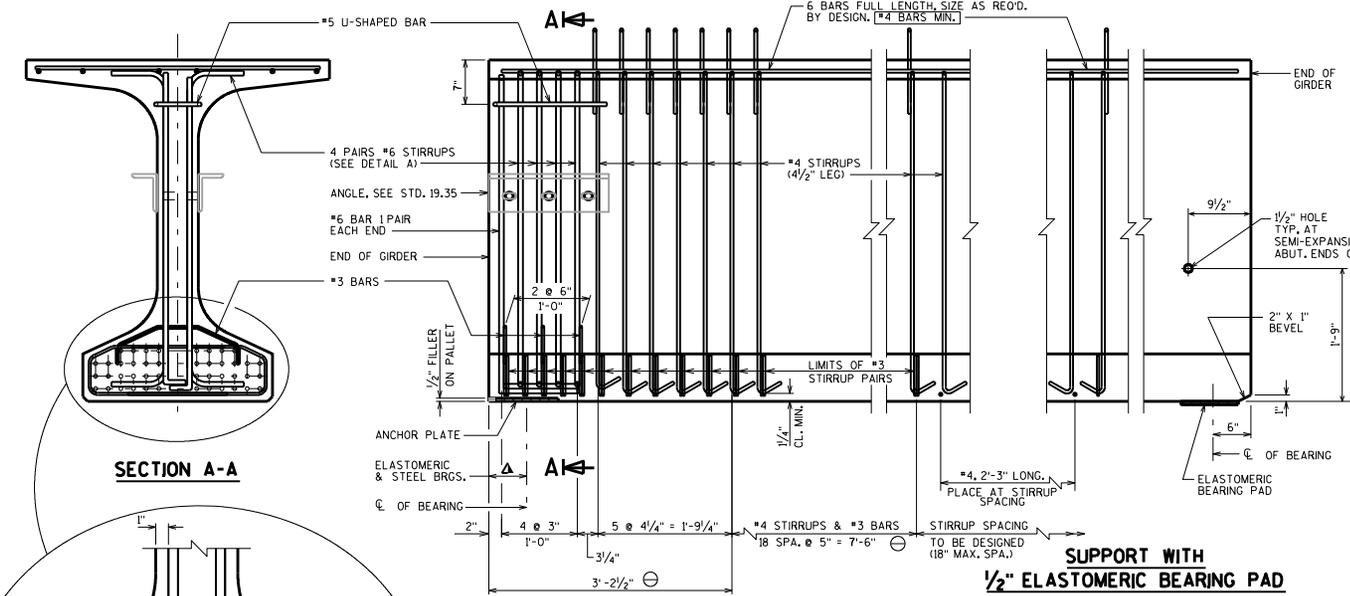
$f'_s = 270,000 \text{ P.S.I.}$
 $f_s = 0.75 \times 270,000 = 202,500 \text{ P.S.I.}$
 for low relaxation strands
 PI PER 0.5" φ STRAND = $0.1531 \times 202,500 = 31,00 \text{ KIPS}$
 PI PER 0.6" φ STRAND = $0.217 \times 202,500 = 43,94 \text{ KIPS}$
 $\frac{y_B}{r^2} = \frac{-15.83}{138.15} = -0.1146 \text{ IN./IN.}^2$
 $f_B (\text{ini. t.}) = \frac{A_s f_s}{A} (1 + \frac{e_s y_B}{r^2})$

NO. STRANDS	e_s (inches)	(COMPRESSION IS POSITIVE)	
		$P(\text{ini. t.}) = A_s f_s$ (KIPS)	$f_B (\text{ini. t.})$ (K/sq.in.)
STANDARD STRAND PATTERNS FOR UNDRAPED STRANDS (0.6"φ)			
8	-11.33	352	2.192
10	-10.23	439	2.584
12	-9.83	527	3.036
14	-9.26	615	3.435
16	-9.08	703	3.887
STANDARD STRAND PATTERNS FOR DRAPED STRANDS (0.5"φ)			
8	-12.83	248	1.660
10	-13.03	310	2.094
12	-13.16	372	2.528
14	-12.97	434	2.924
16	-12.83	496	3.320
18	-12.50	558	3.678
20	-12.23	620	4.034
22	-12.01	682	4.392
24	-11.66	744	4.710
26	-11.37	806	5.030

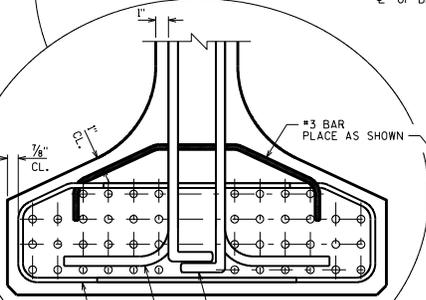
**36" PRESTRESSED GIRDER
DESIGN DATA**

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION
 STRUCTURES DEVELOPMENT SECTION

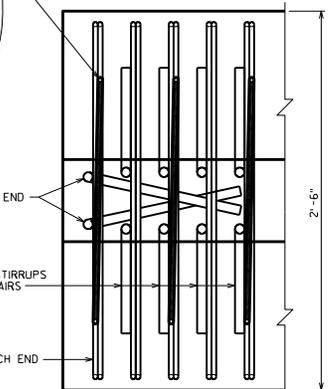
APPROVED: Bill Oliva DATE: 1-12



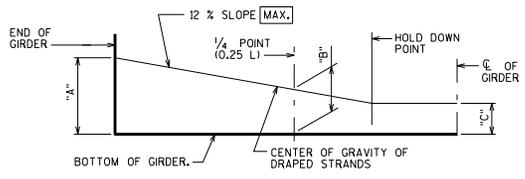
SECTION A-A



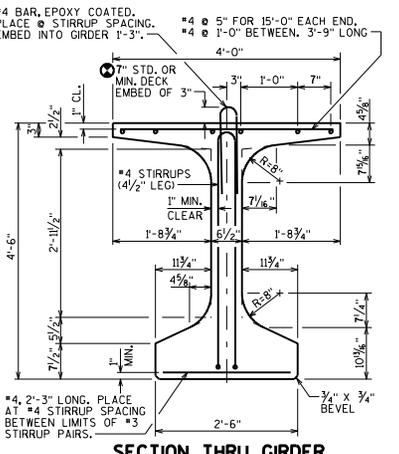
SUPPORT WITH STEEL OR ELASTOMERIC BRGS.



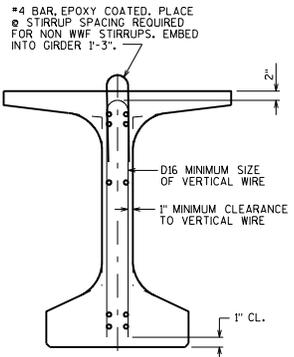
SUPPORT WITH 1/2" ELASTOMERIC BEARING PAD



LOCATION OF DRAPED STRANDS



SECTION THRU GIRDER STRANDS NOT SHOWN



SECTION THRU GIRDER SHOWING WELDED WIRE FABRIC (WWF) STIRRUPS

GENERAL NOTES

TOP OF GIRDER TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY FOR BONDING TO THE SLAB, EXCEPT THE OUTSIDE 8" OF GIRDER, WHICH SHALL RECEIVE A SMOOTH FINISH. AN APPROVED CONCRETE SEALER SHALL BE APPLIED TO ALL SMOOTH SURFACES INCLUDING THE OUTSIDE 15" OF THE TOP FLANGE.

DO NOT APPLY CONCRETE SEALER TO SURFACES RECEIVING APPLICATION OF CONCRETE STAINING.

THE GIRDERS SHALL BE PROVIDED WITH A SUITABLE LIFTING DEVICE FOR HANDLING AND ERECTING THE GIRDERS.

STRANDS SHALL BE FLUSH WITH END OF GIRDER, FOR GIRDER ENDS EMBEDDED COMPLETELY IN CONCRETE, END OF STRANDS SHALL BE COATED WITH NON-BITUMINOUS JOINT SEALER. FOR GIRDER ENDS THAT ARE FINALLY EXPOSED, COAT THE GIRDER ENDS, EXPOSED STRAND ENDS AND ALL NON-BONDING SURFACES WITHIN 2 FEET OF THE GIRDER ENDS WITH A NON-PIGMENTED EPOXY CONFORMING TO AASHTO M-235 TYPE III, GRADE 2, CLASS B OR C. THE EPOXY SHALL BE APPLIED AT LEAST 3 DAYS AFTER MOIST CURING HAS CEASED AND PRIOR TO THE APPLICATION OF THE SEALER.

ALL GIRDERS SHALL BE CAST FULL LENGTH AS SHOWN.

SPACING SHOWN FOR #4 STIRRUPS IS FOR GRADE 60 REINFORCEMENT. IF THE FABRICATOR WANTS TO BUILD A BAR STEEL CAGE BY WELDING LONGITUDINAL REINFORCEMENT TO THE #4 STIRRUPS, THE FOLLOWING ONE OPTION IS AVAILABLE:

USE ASTM A706, GRADE 60 REINFORCEMENT AND THE STIRRUP SPACING AS SHOWN ON THE PLANS.

AN ALTERNATE EQUIVALENT OF WELDED WIRE FABRIC (WWF) ASTM A497 MAY BE SUBSTITUTED FOR THE STIRRUP REINFORCEMENT SHOWN, UPON APPROVAL OF THE STRUCTURES DEVELOPMENT CHIEF, (608)266-5361.

DESIGNER NOTES

BID ITEM SHALL BE "PRESTRESSED GIRDER TYPE I 54W-INCH".

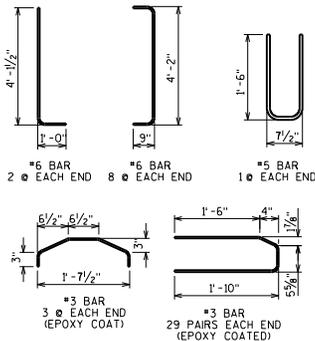
SPECIFY CONCRETE STRENGTH AS REQUIRED BY DESIGN FROM A MINIMUM OF 6,000 PSI TO A MAX. OF 8,000 PSI. MAXIMUM RELEASE STRENGTH IS 6800 PSI. USE 0.6" STRAND FOR ALL PATTERNS. THE MAX. NUMBER OF DRAPED 0.6" STRANDS IS 8.

REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STRAND PATTERNS LISTED ON STANDARD 19.16 AND THE SPAN LENGTHS SHOWN IN TABLE 19.3-2. USING DIFFERENT STRAND PATTERNS OR LONGER SPANS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT. PRIOR APPROVAL FROM THE BUREAU OF STRUCTURES IS REQUIRED IF DESIGN OF THE END REINFORCEMENT IS REQUIRED.

▲ VARIES FOR ELASTOMERIC BRGS. (STD. 27.07) AND STEEL BRGS. (STD. 27.09).

○ DETAIL TYPICAL AT EACH END

● THE DESIGN ENGINEER DETERMINES THIS VALUE BASED ON 2" MIN. LAUNCH AT EDGE OF GIRDER, X-SLOPE, PROFILE GRADE LINE AND CALCULATED RESIDUAL GIRDER CAMBER, INCLUDING THE CAMBER MULTIPLIER OF 1.4. THIS VALUE CAN VARY AND SHOULD BE GIVEN FOR EACH 1/3 OF THE GIRDER LENGTH. PROVIDE VALUES THAT MAINTAIN 3" MIN. DECK EMBEDMENT AND 2 1/2" CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR ±3/4" VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

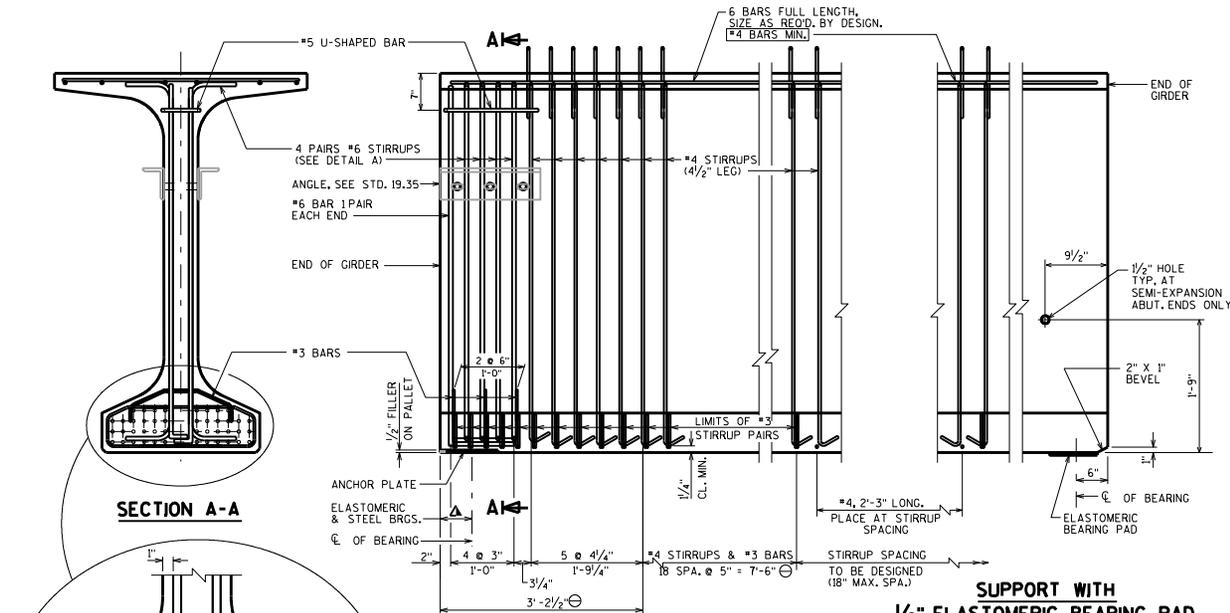


54W" PRESTRESSED GIRDER DETAILS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: *Bill Oliva*

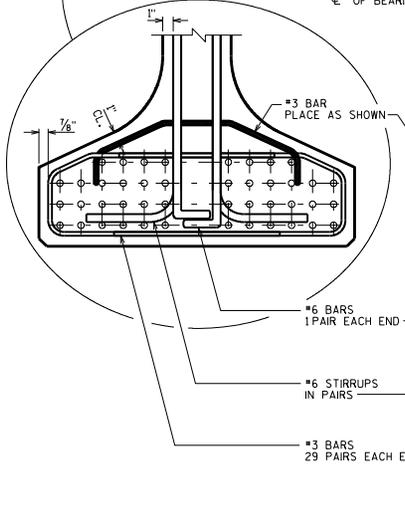
DATE: 1-12



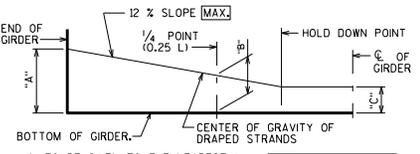
SECTION A-A

SUPPORT WITH STEEL OR ELASTOMERIC BRGS.

SUPPORT WITH 1/2" ELASTOMERIC BEARING PAD



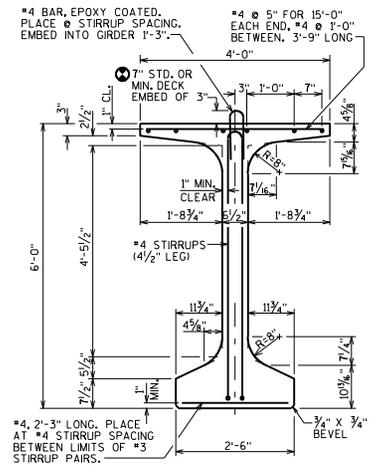
DETAIL A
BOTTOM FLANGE



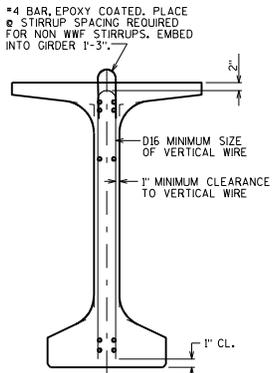
"A" TO BE GIVEN TO THE NEAREST 1"
 "B" = $1/4("A" + 3 "C")$ MIN.
 "C" = $1/4("A" + 3 "C") + 3"$ MAX.

RECORD DIMENSIONS "A", "B" & "C" ON FINAL PLANS.

LOCATION OF DRAPED STRANDS



SECTION THRU GIRDER
STRANDS NOT SHOWN



SECTION THRU GIRDER

SHOWING WELDED WIRE FABRIC (WWF) STIRRUPS

GENERAL NOTES

TOP OF GIRDER TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY FOR BONDING TO THE SLAB, EXCEPT THE OUTSIDE 8" OF GIRDER, WHICH SHALL RECEIVE A SMOOTH FINISH. AN APPROVED CONCRETE SEALER SHALL BE APPLIED TO ALL SMOOTH SURFACES INCLUDING THE OUTSIDE 15" OF THE TOP FLANGE.

DO NOT APPLY CONCRETE SEALER TO SURFACES RECEIVING APPLICATION OF CONCRETE STAINING.

THE GIRDERS SHALL BE PROVIDED WITH A SUITABLE LIFTING DEVICE FOR HANDLING AND ERECTING THE GIRDERS.

STRANDS SHALL BE FLUSH WITH END OF GIRDER. FOR GIRDER ENDS EMBEDDED COMPLETELY IN CONCRETE, END OF STRANDS SHALL BE COATED WITH NON-BITUMINOUS JOINT SEALER. FOR GIRDER ENDS THAT ARE FINALLY EXPOSED, COAT THE GIRDER ENDS, EXPOSED STRAND ENDS AND ALL NON-BONDING SURFACES WITHIN 2 FEET OF THE GIRDER ENDS WITH A NON-PIGMENTED EPOXY CONFORMING TO AASHTO M-255 TYPE III, GRADE 2, CLASS B OR C. THE EPOXY SHALL BE APPLIED AT LEAST 3 DAYS AFTER MOIST CURING HAS CEASED AND PRIOR TO THE APPLICATION OF THE SEALER.

ALL GIRDERS SHALL BE CAST FULL LENGTH AS SHOWN.

SPACING SHOWN FOR #4 STIRRUPS IS FOR GRADE 60 REINFORCEMENT. IF THE FABRICATOR WANTS TO BUILD A BAR STEEL CAGE BY WELDING LONGITUDINAL REINFORCEMENT TO THE #4 STIRRUPS, THE FOLLOWING ONE OPTION IS AVAILABLE:

USE ASTM A706, GRADE 60 REINFORCEMENT AND THE STIRRUP SPACING AS SHOWN ON THE PLANS.

AN ALTERNATE EQUIVALENT OF WELDED WIRE FABRIC (WWF) ASTM A497 MAY BE SUBSTITUTED FOR THE STIRRUP REINFORCEMENT SHOWN, UPON APPROVAL OF THE STRUCTURES DEVELOPMENT CHIEF, (608)266-5161.

THIS NOTE APPLIES TO LONG SPANS AS DEFINED IN THE NOTES FOR THE 72W" GIRDER, TABLE 19.3-2 OF THE BRIDGE MANUAL: FOR STORAGE, HANDLING, AND TRANSPORTING, THIS GIRDER IS REINFORCED TO ALLOW A MAXIMUM OVERHANG FROM THE LIFTING LOCATION OR POINT OF SUPPORT OF UP TO 1/10 THE GIRDER LENGTH. THE CONTRACTOR IS RESPONSIBLE FOR LATERAL STABILITY OF THE GIRDER UNTIL THE DECK IS CURED.

DESIGNER NOTES

BID ITEM SHALL BE "PRESTRESSED GIRDER TYPE I 72W-INCH".

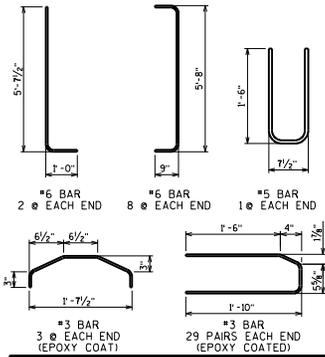
SPECIFY CONCRETE STRENGTH AS REQUIRED BY DESIGN FROM A MINIMUM OF 6,000 PSI TO A MAX. OF 8,000 PSI. MAXIMUM RELEASE STRENGTH IS 6800 PSI. USE 0.6" STRAND FOR ALL PATTERNS. THE MAX. NUMBER OF DRAPED 0.6" STRANDS IS 8.

REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STRAND PATTERNS LISTED IN STANDARD 19.3B AND THE SPAN LENGTHS SHOWN IN TABLE 19.3-2. USING DIFFERENT STRAND PATTERNS OR LONGER SPANS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT. PRIOR APPROVAL FROM THE BUREAU OF STRUCTURES IS REQUIRED IF DESIGN OF THE END REINFORCEMENT IS REQUIRED.

▲ VARIES FOR ELASTOMERIC BRGS. (STD. 27.07) AND STEEL BRGS. (STD. 27.09)

⊙ DETAIL TYPICAL AT EACH END

⊙ THE DESIGN ENGINEER DETERMINES THIS VALUE BASED ON 2" MIN. HAUNCH AT EDGE OF GIRDER, X-SLOPE, PROFILE GRADE LINE AND CALCULATED RESIDUAL GIRDER CAMBER, INCLUDING THE CAMBER MULTIPLIER OF 1.4. THIS VALUE CAN VARY AND SHOULD BE GIVEN FOR EACH 1/3 OF THE GIRDER LENGTH. PROVIDE VALUES THAT MAINTAIN 3" MIN. DECK EMBEDMENT AND 2" CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR ±2% VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

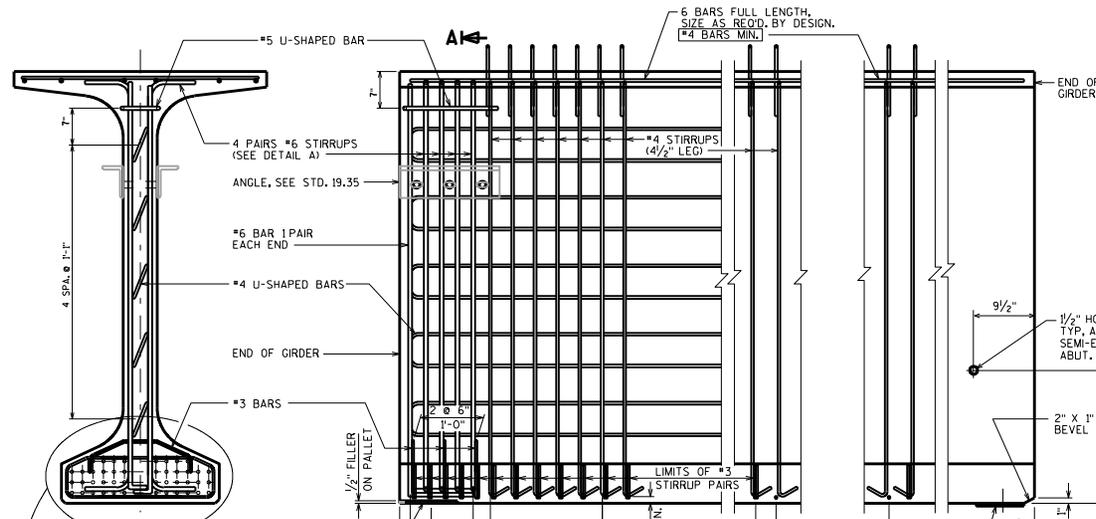


72W" PRESTRESSED GIRDER DETAILS

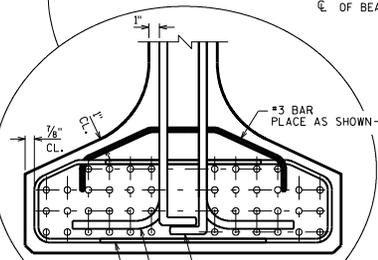
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: *Bill Oliva*

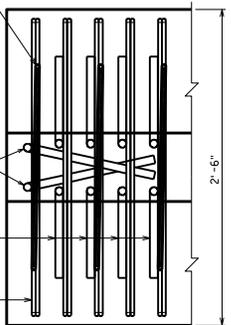
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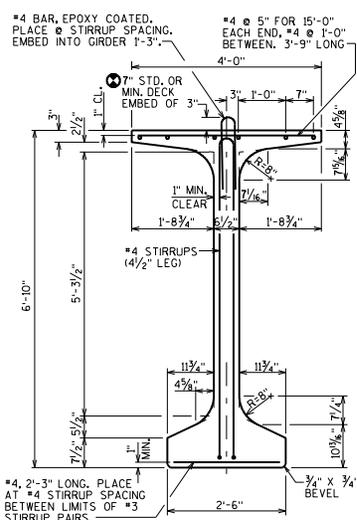
SECTION A-A



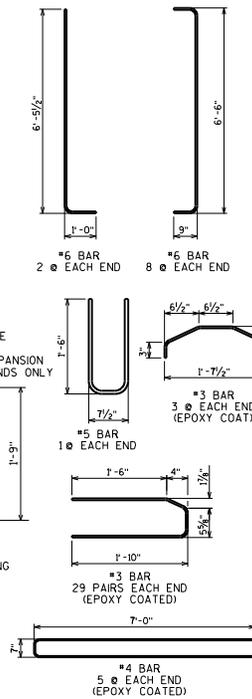
SUPPORT WITH STEEL OR ELASTOMERIC BRGS.



**DETAIL A
BOTTOM FLANGE**



**SECTION THRU GIRDER
STRANDS NOT SHOWN**



**SECTION THRU GIRDER
SHOWING WELDED WIRE FABRIC (WWF) STIRRUPS**

GENERAL NOTES

TOP OF GIRDER TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY FOR BONDING TO THE SLAB, EXCEPT THE OUTSIDE 8" OF GIRDER, WHICH SHALL RECEIVE A SMOOTH FINISH. AN APPROVED CONCRETE SEALER SHALL BE APPLIED TO ALL SMOOTH SURFACES INCLUDING THE OUTSIDE 15" OF THE TOP FLANGE.

DO NOT APPLY CONCRETE SEALER TO SURFACES RECEIVING APPLICATION OF CONCRETE STAINING.

THE GIRDERS SHALL BE PROVIDED WITH A SUITABLE LIFTING DEVICE FOR HANDLING AND ERECTING THE GIRDERS.

STRANDS SHALL BE FLUSH WITH END OF GIRDER. FOR GIRDER ENDS EMBEDDED COMPLETELY IN CONCRETE, END OF STRANDS SHALL BE COATED WITH NON-BITUMINOUS JOINT SEALER. FOR GIRDER ENDS THAT ARE FINALLY EXPOSED, COAT THE GIRDER ENDS, EXPOSED STRAND ENDS AND ALL NON-BONDING SURFACES WITHIN 2 FEET OF THE GIRDER ENDS WITH A NON-PIGMENTED EPOXY CONFORMING TO AASHTO M-235 TYPE III, GRADE 2, CLASS B OR C. THE EPOXY SHALL BE APPLIED AT LEAST 3 DAYS AFTER MOIST CURING HAS CEASED AND PRIOR TO THE APPLICATION OF THE SEALER.

ALL GIRDERS SHALL BE CAST FULL LENGTH AS SHOWN.

SPACING SHOWN FOR #4 STIRRUPS IS FOR GRADE 60 REINFORCEMENT. IF THE FABRICATOR WANTS TO BUILD A BAR STEEL CAGE WITH LONGITUDINAL REINFORCEMENT TO THE #4 STIRRUPS, THE FOLLOWING ONE OPTION IS AVAILABLE:

USE ASTM A706, GRADE 60 REINFORCEMENT AND THE STIRRUP SPACING AS SHOWN ON THE PLANS.

AN ALTERNATE EQUIVALENT OF WELDED WIRE FABRIC (WWF) ASTM A497 MAY BE SUBSTITUTED FOR THE STIRRUP REINFORCEMENT SHOWN, UPON APPROVAL OF THE STRUCTURES DEVELOPMENT CHIEF, (608)266-5161.

THIS NOTE APPLIES TO LONG SPANS AS DEFINED IN THE NOTES FOR THE 82W" GIRDER, TABLE 19.3-2 OF THE BRIDGE MANUAL; FOR STORAGE, HANDLING, AND TRANSPORTING, THIS GIRDER IS REINFORCED TO ALLOW A MAXIMUM OVERHANG FROM THE LIFTING LOCATION OR POINT OF SUPPORT OF UP TO 1/10 THE GIRDER LENGTH. THE CONTRACTOR IS RESPONSIBLE FOR LATERAL STABILITY OF THE GIRDER UNTIL THE DECK IS CURED.

DESIGNER NOTES

BID ITEM SHALL BE "PRESTRESSED GIRDER TYPE I 82W-INCH".

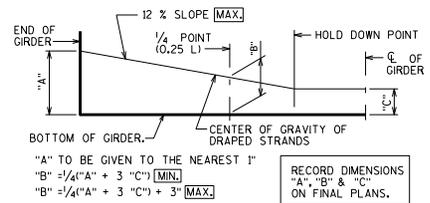
SPECIFY CONCRETE STRENGTH AS REQUIRED BY DESIGN FROM A MINIMUM OF 6,000 PSI TO A MAX. OF 8,000 PSI. MAXIMUM RELEASE STRENGTH IS 6800 PSI. USE 0.6" STRAND FOR ALL PATTERNS. THE MAX. NUMBER OF DRAPED 0.6" STRANDS IS 8.

REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STRAND PATTERNS LISTED ON STANDARD 19.20 AND THE SPAN LENGTHS SHOWN IN TABLE 19.3-2. USING DIFFERENT STRAND PATTERNS OR LONGER SPANS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT. PRIOR APPROVAL FROM THE BUREAU OF STRUCTURES IS REQUIRED IF DESIGN OF THE END REINFORCEMENT IS REQUIRED.

▲ VARIES FOR ELASTOMERIC BRGS. (STD. 27.07) AND STEEL BRGS. (STD. 27.09)

⊖ DETAIL TYPICAL AT EACH END

⊕ THE DESIGN ENGINEER DETERMINES THIS VALUE BASED ON 2" MIN. HAUNCH AT EDGE OF GIRDER, 4% SLOPE PROFILE GRADE LINE AND CALCULATED RESIDUAL GIRDER CAMBER, INCLUDING THE CAMBER MULTIPLIER OF 1.4. THIS VALUE CAN VARY AND SHOULD BE GIVEN FOR EACH 1/3 OF THE GIRDER LENGTH. PROVIDE VALUES THAT MAINTAIN 3" MIN. DECK EMBEDMENT AND 2 1/2" CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR ±3% VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.



LOCATION OF DRAPED STRANDS

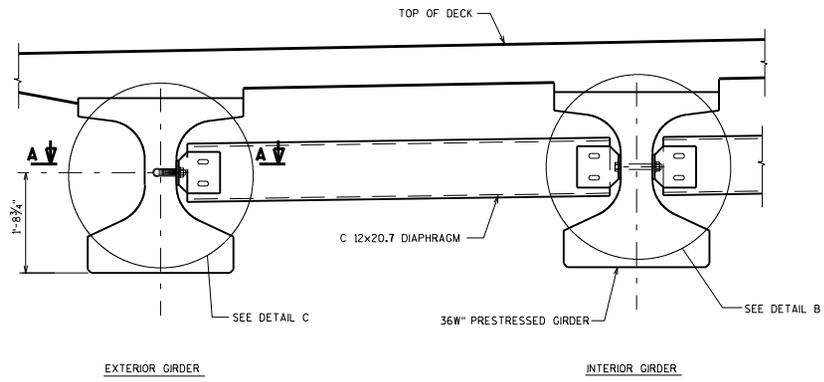
THERE IS CURRENTLY A MORATORIUM ON THE USE OF 82W" PRESTRESSED GIRDERS.

82W" PRESTRESSED GIRDER DETAILS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: *Bill Oliva*

DATE:
1-12



PART TRANSVERSE SECTION AT DIAPHRAGM

NOTES

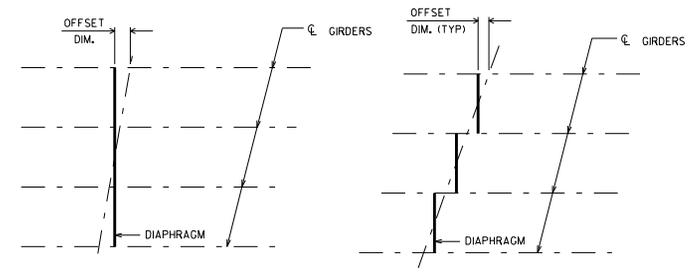
ALL DIAPHRAGM MATERIAL NOT EMBEDDED IN THE CONCRETE GIRDER SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "STEEL DIAPHRAGMS B-1", EACH.

EACH DIAPHRAGM BETWEEN GIRDERS SHALL CONSTITUTE ONE UNIT.

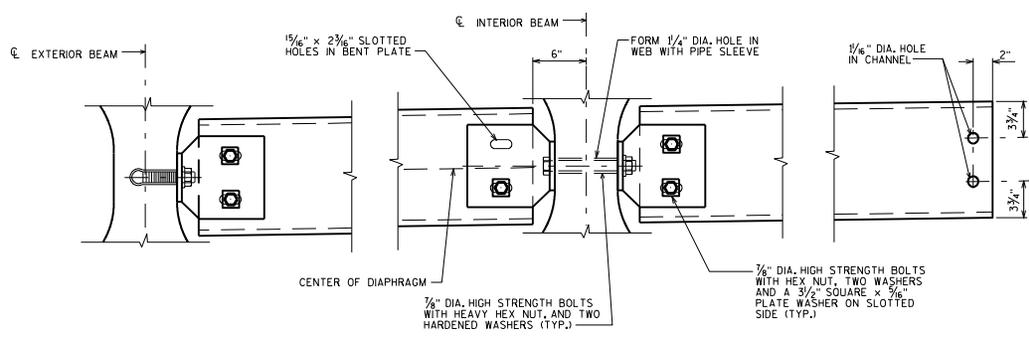
ALL DIAPHRAGM STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 36. ALL BOLTS, NUTS AND WASHERS SHALL BE ASTM A325 TYPE 1.

ALL DIAPHRAGM STRUCTURAL STEEL SHOWN SHALL BE HOT-DIPPED GALVANIZED. ALL BOLTS, NUTS AND WASHERS SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A153 CLASS C. GALVANIZED NUTS SHALL BE TAPPED OVERSIZE IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A563 AND SHALL MEET THE REQUIREMENTS OF SUPPLEMENTARY REQUIREMENT S1 OF ASTM A563, LUBRICANT AND TEST FOR COATED NUTS.

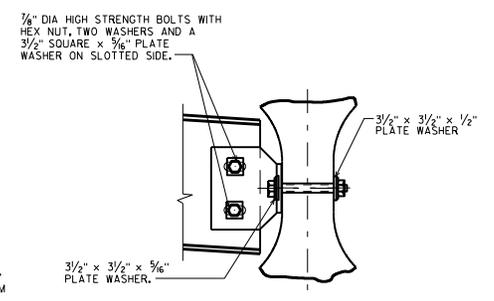
FOR SPANS EQUAL TO OR LESS THAN 80'-0", PLACE ONE DIAPHRAGM AT MID-LENGTH OF GIRDER. FOR SPANS OVER 80'-0", PLACE AT 1/3 AND 2/3 POINTS.



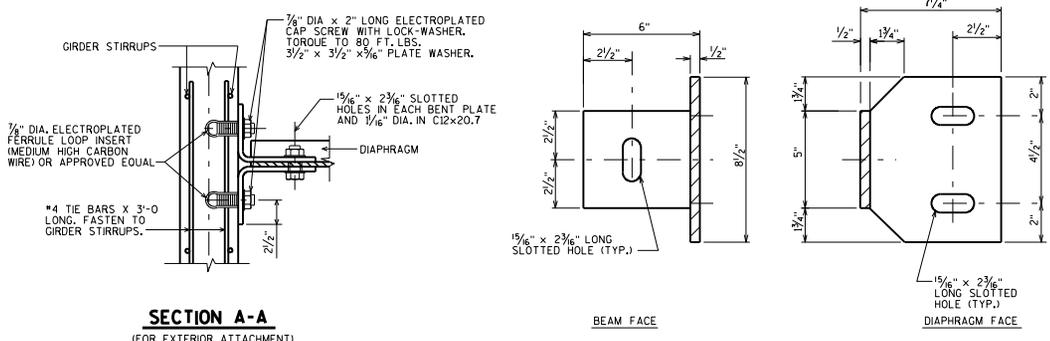
PLAN FOR SKEW ANGLES ≤ 10° **PLAN FOR SKEW ANGLES > 10°**



DETAIL C **DETAIL B**

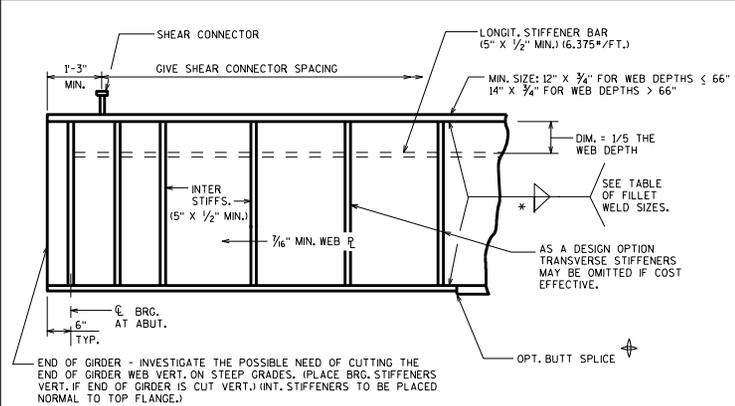


SECTION AT INTERIOR GIRDERS THRU DIAPHRAGM FOR SKEW ANGLES > 10°

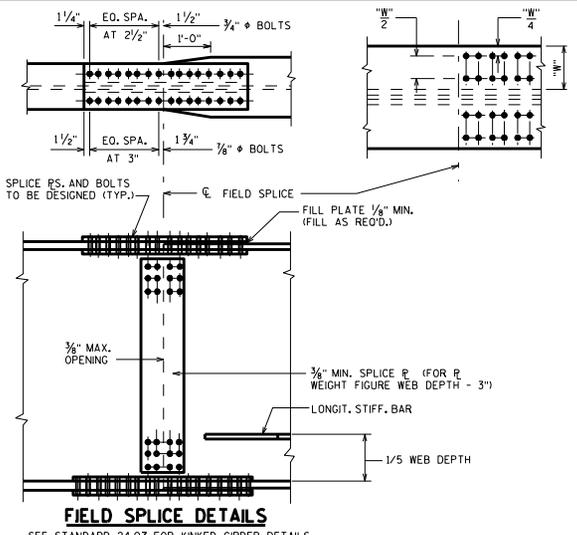


SECTION A-A
(FOR EXTERIOR ATTACHMENT)

INTERM. STEEL DIAPHS. FOR 36W PRESTRESSED GIRDERS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <u>Bill Oliva</u>	DATE: 1-12



PART GIRDER ELEVATION

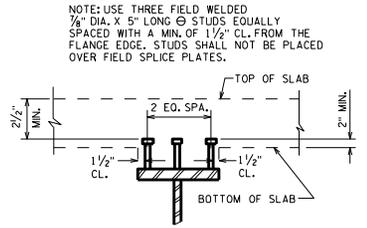


FIELD SPLICE DETAILS

SEE STANDARD 24.07 FOR KINKED GIRDER DETAILS.

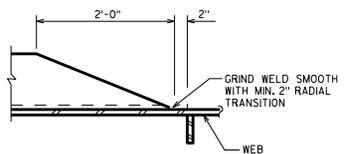
NOTES

- OPTIONAL WELDED SHOP SPLICES MAY BE USED FOR ALL FLANGE AND WEB PLATES OVER 60'-0" LONG. IF USED, THE LOCATION OF THE SPLICE SHALL BE SHOWN ON SHOP DRAWINGS AND WILL BE SUBJECT TO THE APPROVAL OF THE STRUCTURES DESIGN SECTION.
- OPTIONAL FLANGE BUTT SPLICE. A FLANGE PLATE OF THE LARGER SIZE MAY BE FURNISHED FULL LENGTH, BUT PAY WEIGHT SHALL BE BASED ON SECTIONS AS DETAILED. IF A PERMANENT HOLD DOWN DEVICE IS USED AT THE ABUTMENT, THEN THE BUTT SPLICE SHALL NOT BE OPTIONAL.
- (REMINDER - BASE BEARING SEAT ELEVATIONS AT ABUTMENT ON THICKER FLANGE AND DETAIL SHM PLATES TO ACCOMMODATE THINNER FLANGE.)
- AT EXTERIOR GIRDERS PLACE INTERMEDIATE TRANSVERSE STIFFENERS ON INTERIOR FACE OF GIRDER. PLACE LONGITUDINAL STIFFENERS ON THE OUTSIDE FACE.
- AT INTERIOR GIRDERS PLACE INTERMEDIATE TRANSVERSE STIFFENERS ON ONE SIDE OF GIRDER AND LONGITUDINAL STIFFENERS ON THE OPPOSITE SIDE OF GIRDER. KEEP INTERMEDIATE STIFFENERS ON ONE SIDE WHEN LONGITUDINAL STIFFENERS ARE NOT REQUIRED.
- AVOID USE OF LONGITUDINAL STIFFENERS IF PRACTICAL BY THICKENING WEB. WHERE LONGITUDINAL STIFFENERS ARE USED, RUN THEM CONTINUOUS WITHOUT BREAKS AT CONNECTION STIFFENERS.
- AT EXTERIOR GIRDER PLACE INTERMEDIATE STIFFENERS ALONG ENTIRE LENGTH OF GIRDER AT A MAX. SPACING EQUAL TO 1.5 X THE DEPTH OF WEB. SPACE EQUALLY BETWEEN DIAPHRAGM CONNECTION STIFFENER. THIS REQUIREMENT IS NECESSARY TO SUPPORT THE FALSEWORK FOR THE SLAB OVERHANG AND MAY BE DISREGARDED IF THE SLAB OVERHANG, MEASURED FROM CL. WEB, IS 1'-6" OR LESS OR ANY OF THE FOLLOWING CRITERIA ARE SATISFIED:
 - ...WEB THICKNESS > 3/8" AND WEB DEPTH < 48"
 - ...WEB THICKNESS > 1/16" AND WEB DEPTH < 60"
 - ...WEB THICKNESS > 3/4" AND WEB DEPTH < 66"
- PRIOR TO STEEL BLAST, ALL FLAME CUT EDGES OF PLATES THAT ARE TO BE PAINTED SHALL BE GROUND OR PLANED TO REMOVE THE HARDENED SURFACE CAUSED BY THE FLAME.

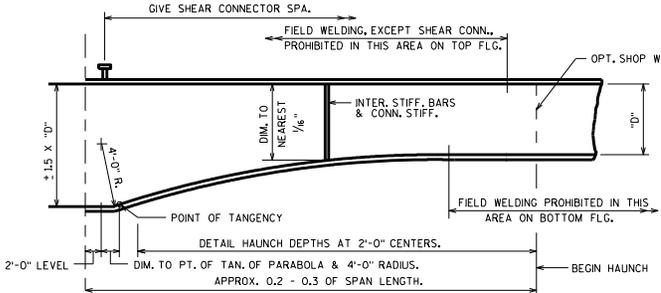


SHEAR CONN. DETAILS

phi USE DIFFERENT LENGTH STUDS IF 2 1/2" MIN. CLEARANCE OR 2" EXTENSION CRITERIA IS VIOLATED.

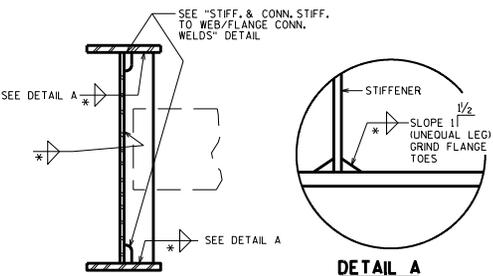


LONGIT. STIFF. TERMINATION

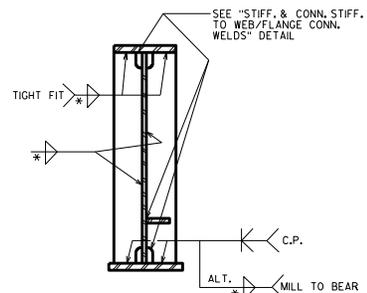


PARABOLIC HAUNCH DETAILS

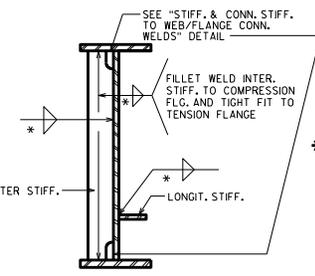
SLAB OVERHANG DEFINITION



CONNECTION STIFF. DETAILS



BRG. STIFF. DETAILS TYP. AT ABUT. & PIER

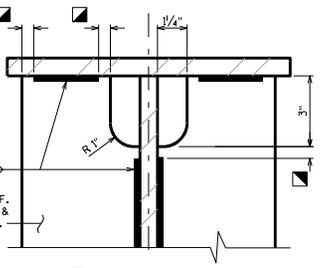


INTERMEDIATE & LONGITUDINAL STIFF. DETAILS (ALL GIRDERS)

*** TABLE OF FILLET WELD SIZES**

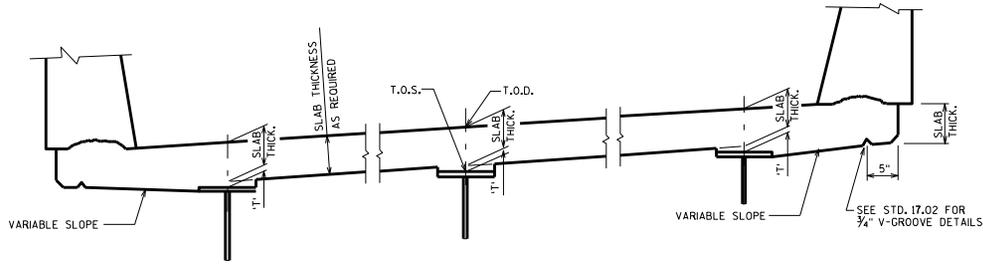
MATERIAL THICKNESS OF THICKER PART JOINED.	MIN. SIZE OF FILLET WELD
TO 1/2" INCLUSIVE	3/16"
OVER 1/2" TO 3/4"	1/4"
OVER 3/4" TO 1 1/2"	5/16"
OVER 1 1/2" TO 2 1/4"	3/8"
OVER 2 1/4" TO 6"	1/2"

EXCEPT THAT THE WELD SIZE SHALL NOT EXCEED THE THICKNESS OF THE THINNER PART JOINED.
MIN. PASS SIZE IS 3/16"



STIFF. & CONN. STIFF. TO WEB/FLANGE CONN. WELDS

PLATE GIRDER DETAILS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <i>Bill Oliva</i>	DATE: 1-12



SECTION THRU SLAB

DESIGNER NOTES

HAUNCH HEIGHTS WILL NORMALLY BE MADE 2" AT EDGE OF GIRDER, AT ABUTMENTS, HINGES, AND FIELD SPLICES.

HAUNCH DEPTH VARIATIONS NEED NOT BE SHOWN ON THE PLANS.

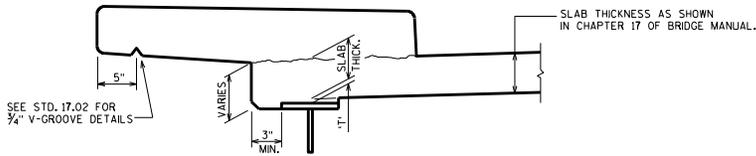
IF HAUNCH VARIATIONS EXCEED 3/4", THE GIRDER SHALL BE CAMBERED TO REDUCE THE VARIATIONS IN HAUNCH THICKNESS.

NOTES

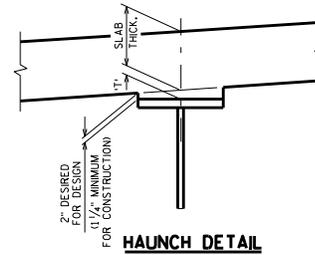
'T' = HAUNCH HEIGHT AT CENTERLINE OF GIRDER.

TO DETERMINE 'T': AFTER ALL STRUCTURAL STEEL HAS BEEN ERECTED, ELEVATIONS OF THE TOP FLANGES SHALL BE TAKEN AT CENTERLINE OF BEARINGS AND AT O.I. POINTS.

- TOP OF DECK ELEVATION AT FINAL GRADE
- TOP OF STEEL ELEVATION AFTER STEEL ERECTION
- + CONC. ONLY DEFLECTION; DOWNWARD DEFLECTION IS ADDED, UPWARD DEFLECTION IS SUBTRACTED
- SLAB THICKNESS
- = 'T' VALUE FOR SETTING HAUNCH



TREATMENT OF EXTERIOR GIRDER AT SIDEWALK OVERHANG

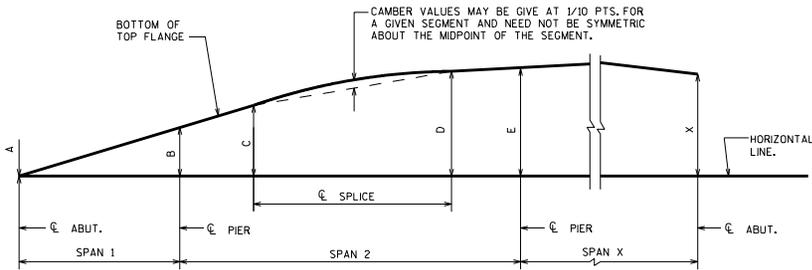


HAUNCH DETAIL

ELEVATIONS AT TOP OF DECK (T.O.D.) & TOP OF STEEL (T.O.S.)

		W. ABUT.	O.I. SPAN	O.2 SPAN	O.3 SPAN	℄ PIER	℄ SPLICE		℄ ABUT.
GIRDER 1	T.O.D.	861.17	861.13	861.08	861.04	860.99			860.69
	T.O.S.	860.48				860.35	860.35		860.00
GIRDER 2	T.O.D.	860.62	860.58	860.53	860.49	860.45			860.16
	T.O.S.	859.93				859.80	859.80		859.59
GIRDER X	T.O.D.								
	T.O.S.								

THESE ELEVATIONS ARE TO TOP OF STEEL (SPICE AND COVER PLATE THICKNESS, IF APPLICABLE, ARE ACCOUNTED FOR) AND THEY ARE FOR THE MATERIAL AS ERECTED. THE ELEVATION OF THE TOP STEEL AT THE FIELD SPLICE POINTS SHALL BE CHECKED, AND CORRECTED, IF POSSIBLE, AFTER ERECTION AND BEFORE PERMANENTLY BOLTING THE DIAPHRAGMS IN PLACE.



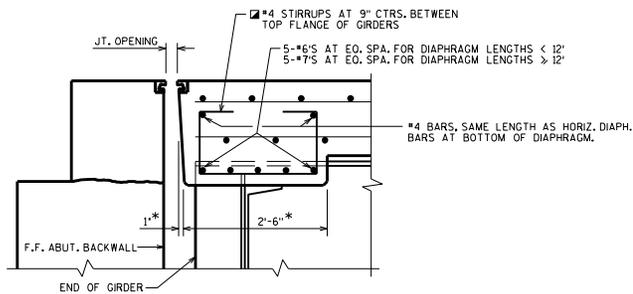
BLOCKING DIAGRAM

BLOCKING & SLAB HAUNCH DETAILS

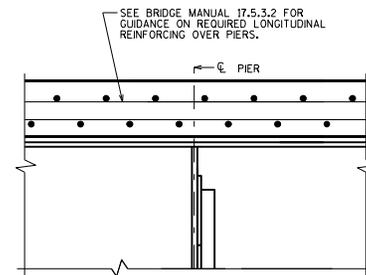
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva

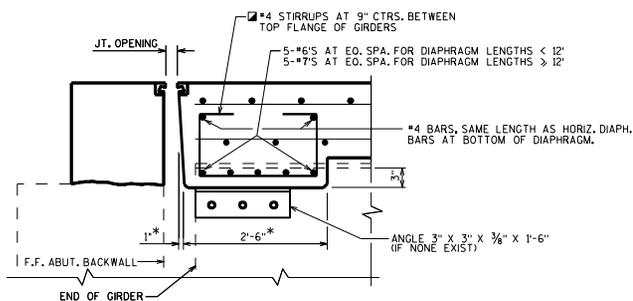
DATE:
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SECTION THRU EXPANSION END

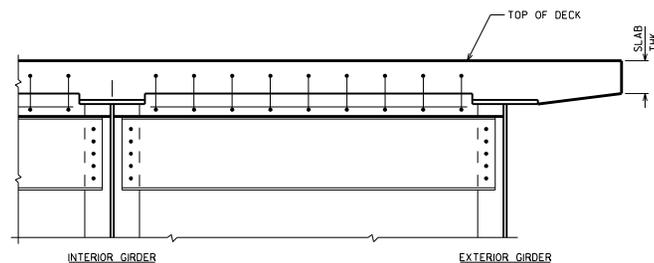


SECTION AT PIER



**SECTION THRU EXPANSION END OF NEW DECK
SHOWING EXISTING STEEL GIRDER
WITHOUT EXISTING STEEL DIAPHRAGM**

(SEE STD. 40.04 FOR ADDITIONAL DETAILS)



**PART TRANSVERSE SECTION AT DIAPHRAGM
EXPANSION END**

NOTES

FOR REHABILITATION PROJECTS:
DIAPHRAGM SUPPORT ANGLES SHALL BE ASTM A709 GRADE 36.
ALL BOLTS, NUTS AND WASHERS SHALL BE ASTM A325 TYPE 1.

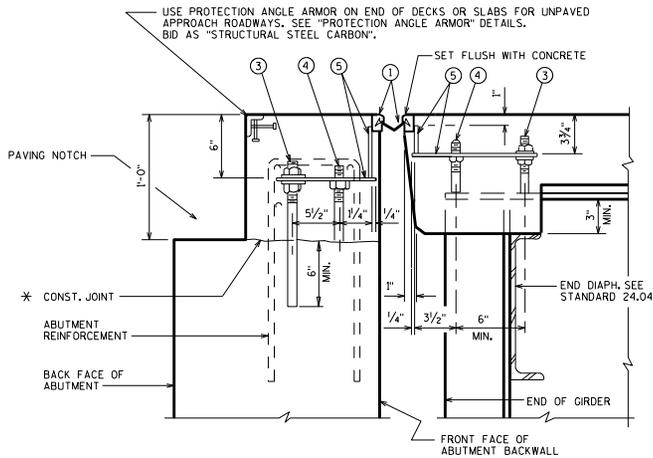
ALL SUPPORT ANGLES SHALL BE HOT-DIPPED GALVANIZED.
ALL BOLTS, NUTS AND WASHERS SHALL BE HOT-DIPPED GALVANIZED
IN ACCORDANCE WITH ASTM A153 CLASS C. GALVANIZED NUTS SHALL
BE TAPPED OVERSIZED IN ACCORDANCE WITH THE REQUIREMENTS OF
ASTM A563 AND SHALL MEET THE REQUIREMENTS OF SUPPLEMENTARY
REQUIREMENT S1 OF ASTM A563, LUBRICANT AND TEST FOR COATED NUTS.

ALL DIAPHRAGM SUPPORT HARDWARE SHALL BE INCIDENTAL TO
"CONCRETE MASONRY BRIDGES".

LEGEND

- ☐ DIMENSION IS TAKEN PARALLEL TO C GIRDER
- * DIMENSION IS TAKEN NORMAL TO C ABUTMENT

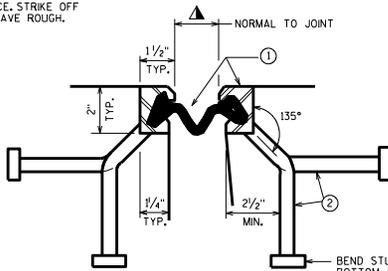
STEEL GIRDER SLAB & SUPERSTRUCTURE DETAILS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <u>Bill Oliva</u>	DATE: 1-12



TYPICAL SECTION THRU JOINT AT STEEL GIRDER

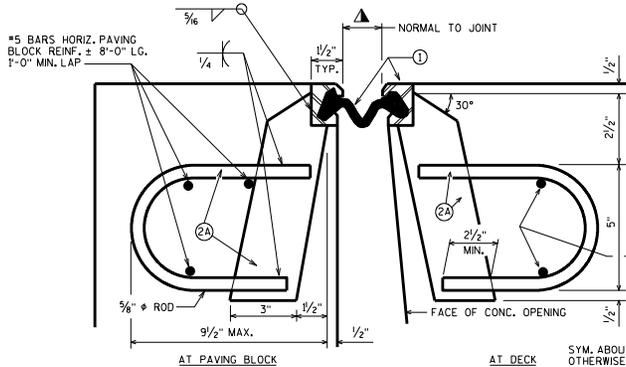
NORMAL TO \bar{C} SUBSTRUCTURE

* POUR CONC. ABOVE THIS JOINT AFTER SUPERSTRUCTURE IS IN PLACE. STRIKE OFF AND LEAVE ROUGH.



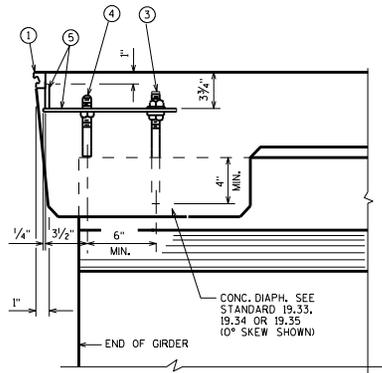
SECTION THRU JOINT

EXTERIOR GIRDER TO EDGE OF DECK, AND AT PARAPETS, MEDIANS AND SIDEWALKS



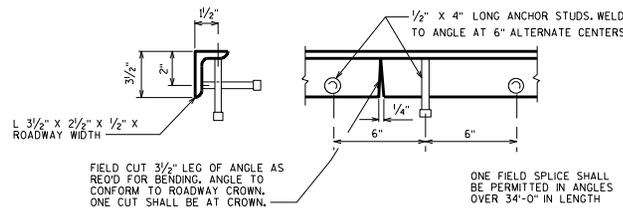
SECTION THRU JOINT

ROADWAY TRAFFIC AREA BETWEEN EXTERIOR GIRDERS.



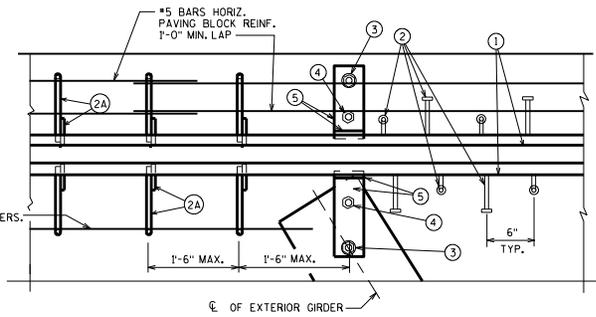
PART SECTION THRU JOINT AT PRESTRESSED GIRDERS

NORMAL TO \bar{C} SUBSTRUCTURE



PROTECTION ANGLE ARMOR

IF TEMPERATURE TABLE IS SHOWN, PLACE FOLLOWING NOTE ADJACENT TO TABLE: "A SMALL JOINT OPENING DUE TO A HIGH TEMPERATURE AT TIME OF CONSTRUCTION MAY REQUIRE NEOPRENE STRIP SEAL INSTALLATION INTO STEEL EXTRUSIONS PRIOR TO SETTING THE EXPANSION JOINT."



PART PLAN

LEGEND

- 1 NEOPRENE STRIP SEAL (1/2-INCH) AND STEEL EXTRUSIONS, SET JOINT OPENING AT 1/4" WHEN EXPANSION LENGTH \leq 230'-0", WHEN EXPANSION LENGTH $>$ 230'-0", PREPARE A TEMPERATURE TABLE SHOWING JOINT OPENINGS FROM 5°F TO 85°F IN 10°F INCREMENTS. ACCOUNT FOR PRESTRESSED GIRDER SHRINKAGE DUE TO CREEP WHEN DETERMINING THIS TABLE. JOINT OPENINGS GIVEN NORMAL TO JOINT.
- 2 STUDS 3/8" ϕ x 6 3/4" LONG AT 6" ALTERNATE CENTERS. WELD TO EXTRUSIONS AND BEND AS SHOWN AFTER WELDING.
- 2A 1/2" THICK ANCHOR PLATE WITH 3/8" ϕ ROD OR ALTERNATE STRIP SEAL ANCHOR. WELD ROD TO ANCHOR PLATE, WELD ANCHOR PLATE TO NO. 1 AT 1'-6" CENTERS BETWEEN GIRDERS.
- 3 3/4" ϕ THREADED ROD WITH 2 NUTS AND PLATE WASHERS. FOR PRESTRESSED GIRDERS, GROUT THREADED ROD INTO FIELD DRILLED HOLES ON \bar{C} OF GIRDER. FOR STEEL GIRDERS, WELD THREADED ROD TO TOP FLANGE OR ATTACH BY BOLTING THRU FLANGE. ON ABUTMENT SIDE, GROUT THREADED ROD INTO FIELD DRILLED HOLES IN ABUTMENT BACKWALL AS SHOWN.
- 4 3/4" ϕ THREADED ROD WITH NUT. TACK WELD NUT TO NO. 5.
- 5 FABRICATE SUPPORT FROM 3" x 1/2" BAR AS SHOWN OR EQUIVALENT. ONE PER GIRDER PER SIDE, SHOP OR FIELD WELD TO NO. 1. IF FIELD WELDED, COVER WELDED AREAS WITH EPOXY-COATING MATERIAL. PROVIDE 1/2" ϕ HOLE FOR NO. 3 AND 1" ϕ HOLE FOR NO. 4.
- 6 GALVANIZED PLATE 3/8" x 10" x 12'-0" LONG FOR SKEWS TO 45° AND 3'-0" LONG FOR SKEWS $>$ 45° WITH HOLES FOR NO. 7. FOR SINGLE SLOPE PARAPET, FOR SLOPED FACE PARAPET, USE 10 1/2" PLATE AND BEND AS SHOWN.
- 7 3/4" ϕ x 1 1/2" STAINLESS STEEL SOCKET FLAT HEAD SCREWS WITH ANTI-SEIZE LUBRICANT. PLACE IN COUNTERSUNK HOLE, RECESS 1/16" BELOW PLATE SURFACE.
- 8 3/4" ϕ x 4" GALVANIZED HEX HEAD BOLT. BEND 45°.
- 9 3/4" ϕ x 2 1/4" GALVANIZED THREADED COUPLING.
- 10 SIDEWALK COVER PLATE 3/8" x 12'-0" WIDE FOR SKEWS TO 45° AND 3'-0" WIDE FOR SKEWS $>$ 45° x LIMITS SHOWN. BEND DOWN FACE OF SIDEWALK WITH HOLES FOR NO. 7. GALVANIZE PLATE AFTER SLIP-RESISTANT SURFACE IS APPLIED.
- 11 1" x 5" SLOTTED COUNTERSUNK HOLE FOR NO. 7. PLACE SLOT PARALLEL TO DIRECTION OF MOVEMENT.

REFER TO STANDARD 28.02 & 28.07

GENERAL NOTES

ONE FIELD SPLICE PERMITTED IN STEEL EXTRUSIONS, UNLESS MORE ARE REQUIRED FOR STAGED CONSTRUCTION. IF USED, DETAILS SHALL BE SUBMITTED FOR APPROVAL. NO SPLICING PERMITTED IN NEOPRENE STRIP SEAL.

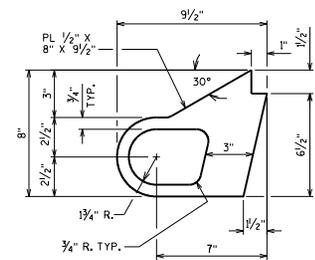
AFTER FABRICATION, BUT BEFORE SHIPMENT, STRAIGHTEN STEEL EXTRUSIONS SUCH THAT THEY SHALL BE FREE FROM WARP, TWIST AND SWEEP.

FABRICATOR SHALL PROVIDE MEANS OF KEEPING GALVANIZED EXTRUSIONS CLEAN AND SMOOTH DURING SHIPMENT AND PRIOR TO APPLYING LUBRICANT ADHESIVE FOR NEOPRENE GLAND INSTALLATION.

SANDBLAST PLATES AND EXTRUSIONS AFTER FABRICATION IN ACCORDANCE WITH SSPC SP. #6 "COMMERCIAL BLAST CLEANING". AFTER BLAST CLEANING, THE PROTECTION ANGLE, PLATES AND EXTRUSIONS SHALL BE HOT DIPPED GALVANIZED. SLIP-RESISTANT SURFACE IS APPLIED TO SIDEWALK COVER PLATES BY THE MANUFACTURER AND THEN HOT DIPPED GALVANIZED TO THEIR RECOMMENDATIONS TO MAINTAIN THE INTEGRITY OF THIS SURFACE.

ANCHOR SYSTEM NO. 8 AND NO. 9 SHALL CONFORM TO ASTM A307 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 CLASS C AND D.

STRIP SEAL EXPANSION JOINT ASSEMBLY, INCLUDING ANCHOR STUDS AND HARDWARE WILL BE PAID FOR AT THE LUMP SUM PRICE BID FOR "EXPANSION DEVICE B-...".



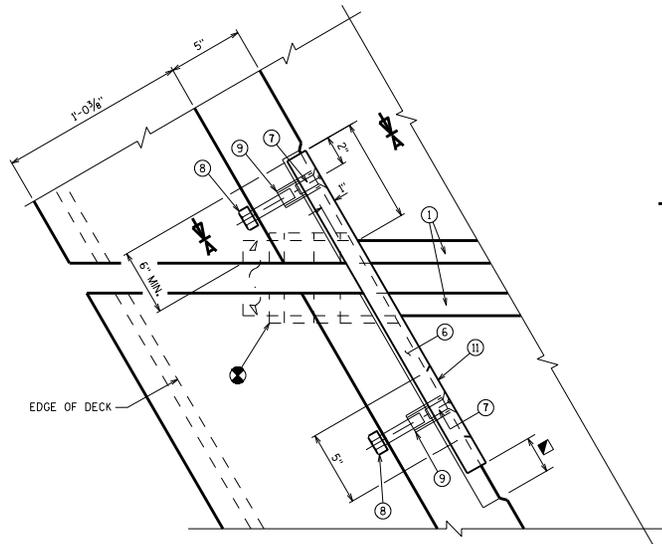
ALTERNATE STRIP SEAL ANCHOR

STRIP SEAL EXPANSION JOINT DETAILS

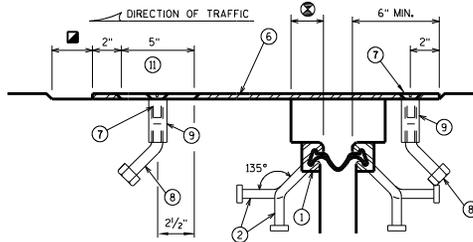
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: *Bill Oliva*

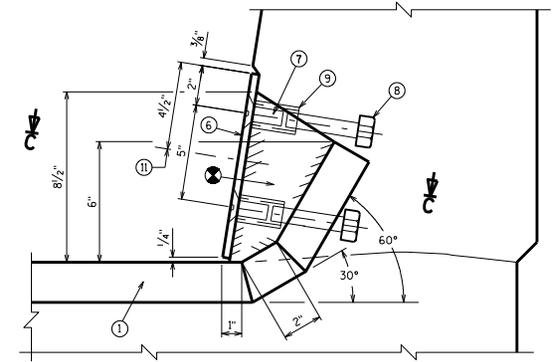
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1-12



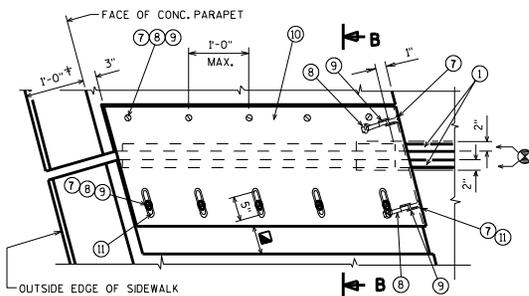
PLAN AT PARAPET
SINGLE SLOPE PARAPET



SECTION C-C

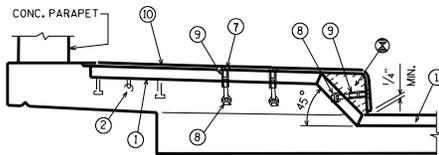


SECTION A-A
SINGLE SLOPE PARAPET

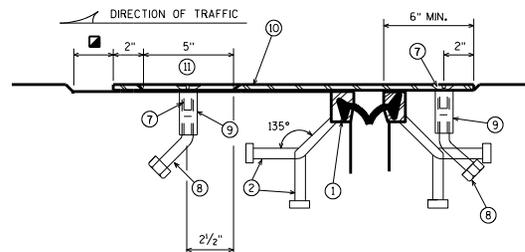


PLAN AT SIDEWALK

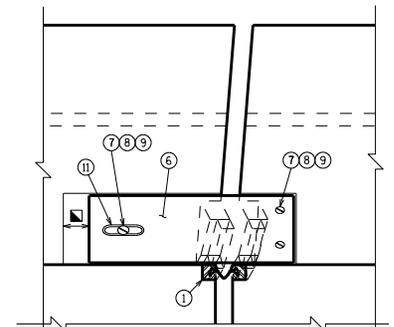
± 1'-2" WHEN "VERTICAL FACE PARAPET TYPE 'TX' IS USED



SECTION AT SIDEWALK

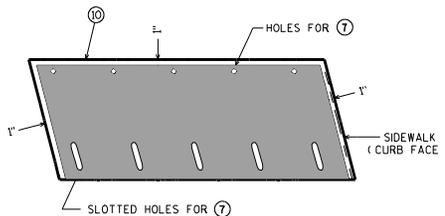


SECTION B-B



VIEW OF PARAPET PLATES

FROM ROADWAY
SINGLE SLOPE PARAPET



PLAN OF SIDEWALK COVER PLATE WITH SLIP-RESISTANT SURFACE

PLACE SLIP-RESISTANT SURFACE ON TOP WALKING SURFACE IN SHADED AREA ONLY (NOT ON CURB FACE).

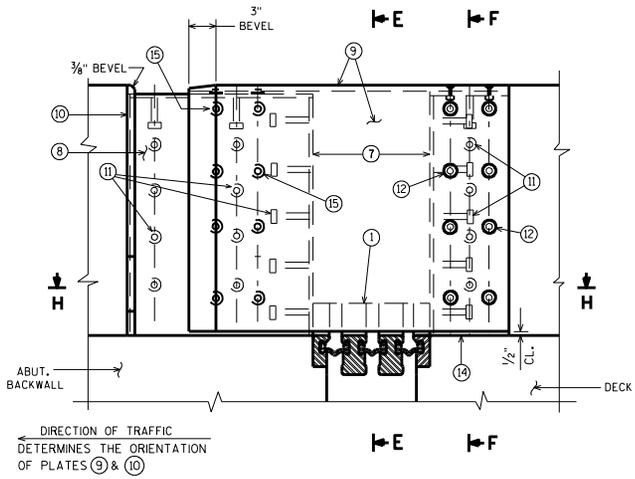
APPROVED SLIP-RESISTANT APPLIED SURFACES FOR STEEL PLATES		
PRODUCT	MANUFACTURER	CONTACT AT
SLIPNOT GRADE 2, STEEL	W. S. MOLNAR COMPANY	1-800-SLIPNOT
ALGRIP, STEEL	ROSS TECHNOLOGY CORP.	1-800-345-8170

- ⊗ BLOCK OUT CONCRETE 2" EACH SIDE OF JOINT OPENING
- ⊠ JOINT OPENING DIM. ALONG SKEW PLUS 1/2"

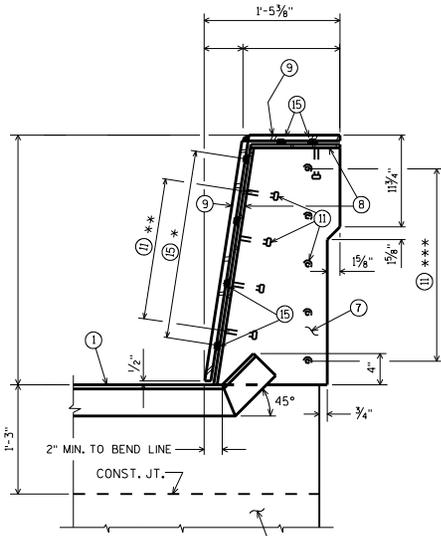
STRIP SEAL COVER PLATES
SINGLE SLOPE PARA./SDWK.

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

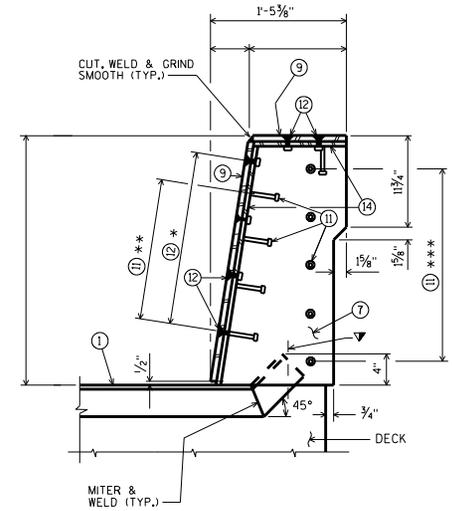
APPROVED: *Bill Oliva* DATE: 1-12



ELEVATION OF SINGLE SLOPE PARAPET

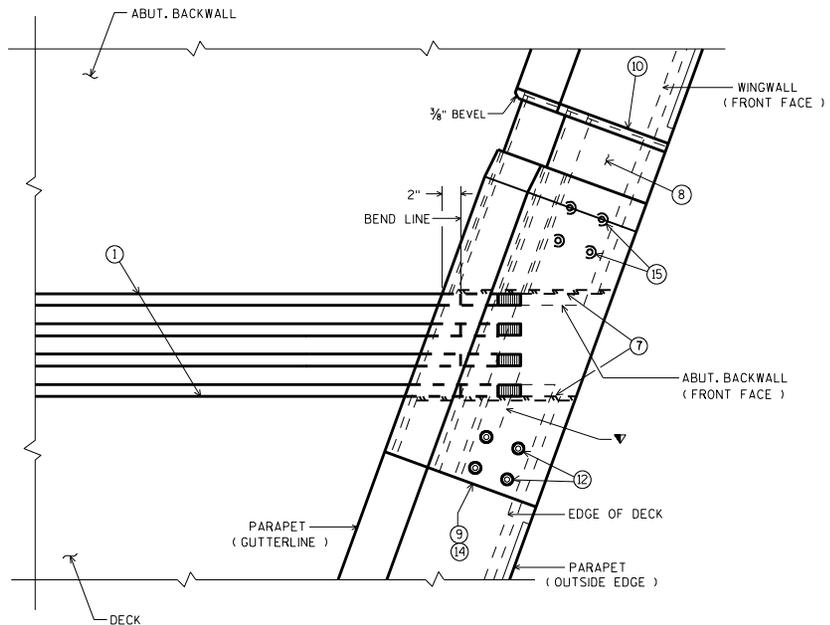


SECTION E-E

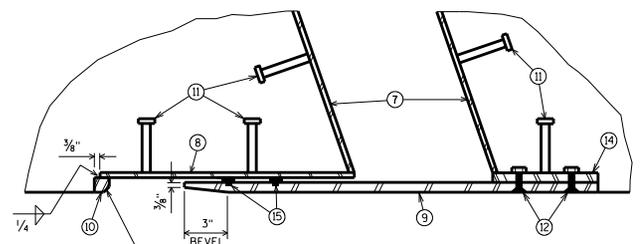


SECTION F-F

CROSS SECTION SHOWN FOR 32", 36", AND 42" SINGLE SLOPE PARAPET. DETAILS FOR 56" PARAPET ARE SIMILAR.



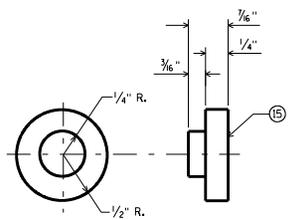
PLAN OF SINGLE SLOPE PARAPET



SECTION H-H

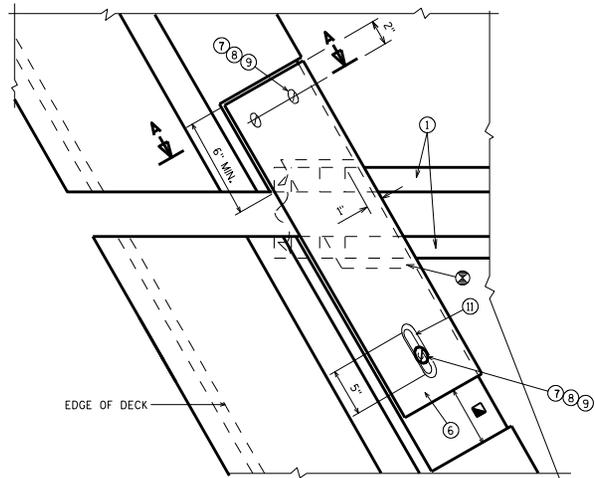
- * 3 EQ. SPA. (32")
- 4 EQ. SPA. (36")
- 5 EQ. SPA. (42")
- 7 EQ. SPA. (56")
- ** 3 SPA. (32")
- 4 SPA. (36")
- 5 SPA. (42")
- 7 EQ. SPA. (56")
- *** 4 SPA. (32")
- 5 SPA. (36")
- 6 SPA. (42")
- 8 SPA. (56")

▼ FOR STRUCTURES WITH SKEWS, ADD NOTE TO PLANS: "MITER EXTRUSION ENDS AS REQ'D TO PROVIDE CLEARANCE"

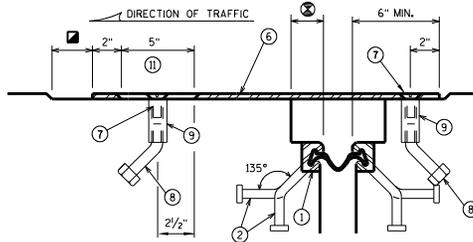


ADIPRENE BUTTON DETAIL

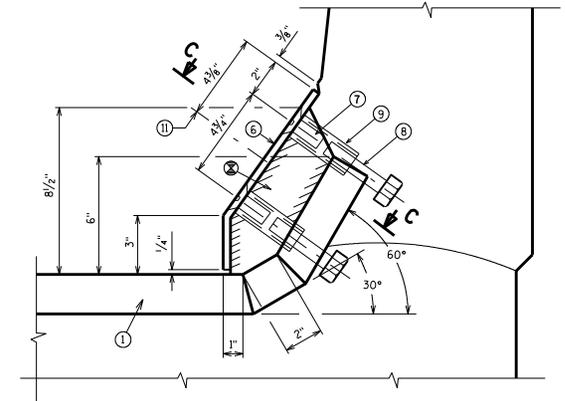
COVER PLATES FOR SINGLE SLOPE PARAPET	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <i>Bill Oliva</i>	DATE: 1-12



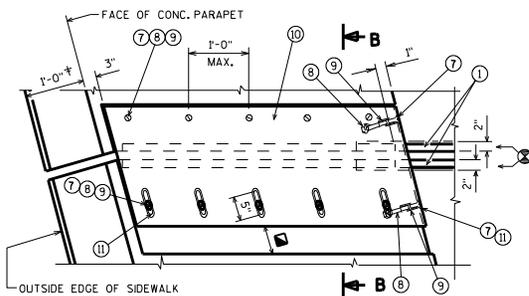
PLAN AT PARAPET
SLOPED FACE PARAPET



SECTION C-C

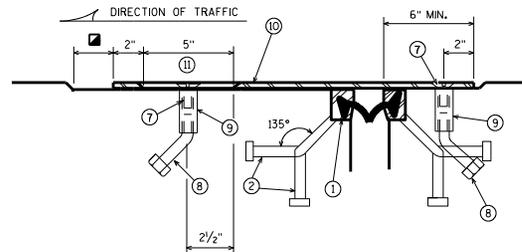


SECTION A-A
SLOPED FACE PARAPET

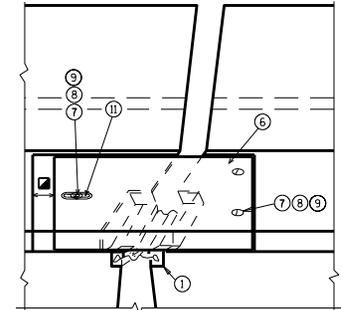


PLAN AT SIDEWALK

± 1'-2" WHEN "VERTICAL FACE PARAPET TYPE 'TX' IS USED

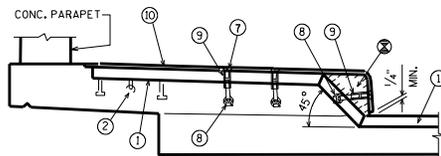


SECTION B-B

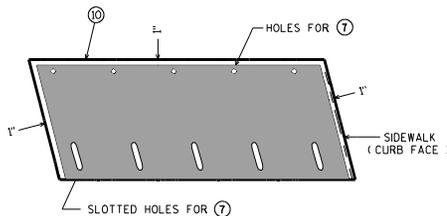


VIEW OF PARAPET PLATES
FROM ROADWAY
SLOPED FACE PARAPET

- ⊗ BLOCK OUT CONCRETE 2" EACH SIDE OF JOINT OPENING
- ⊠ JOINT OPENING DIM. ALONG SKEW PLUS 1/2"



SECTION AT SIDEWALK



PLAN OF SIDEWALK COVER PLATE
WITH SLIP-RESISTANT SURFACE

PLACE SLIP-RESISTANT SURFACE ON TOP WALKING SURFACE IN SHADED AREA ONLY (NOT ON CURB FACE).

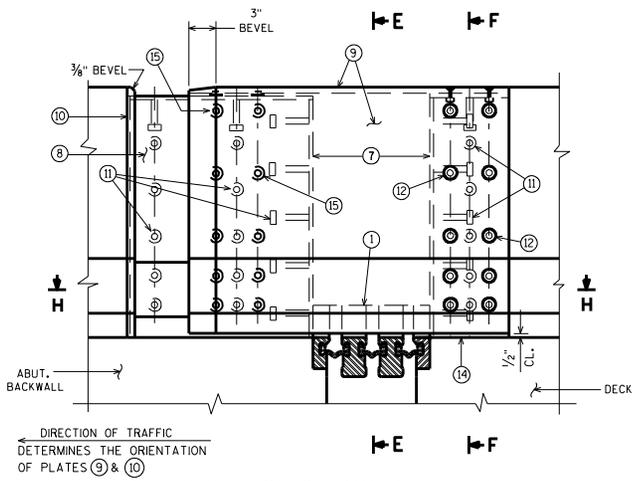
APPROVED SLIP-RESISTANT APPLIED SURFACES FOR STEEL PLATES		
PRODUCT	MANUFACTURER	CONTACT AT
SLIPNOT GRADE 2, STEEL	W. S. MOLNAR COMPANY	1-800-SLIPNOT
ALGRIP, STEEL	ROSS TECHNOLOGY CORP.	1-800-345-8170

STRIP SEAL COVER PLATES
SLOPED FACE PARA./SDWK.

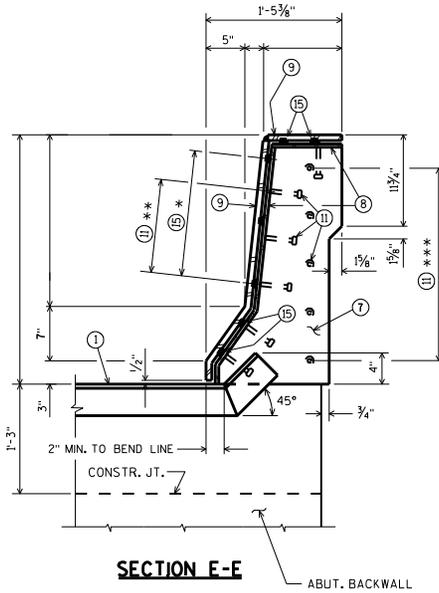
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: *Bill Oliva*

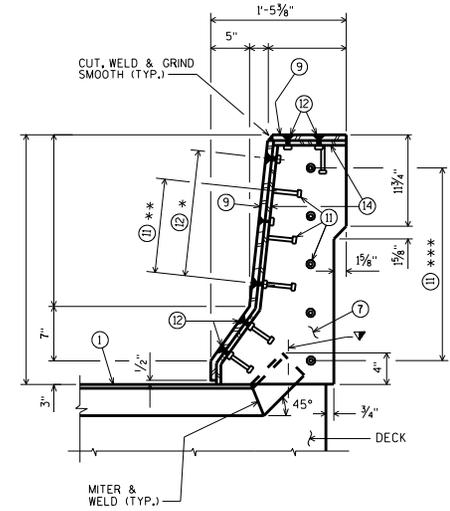
DATE:
1-12



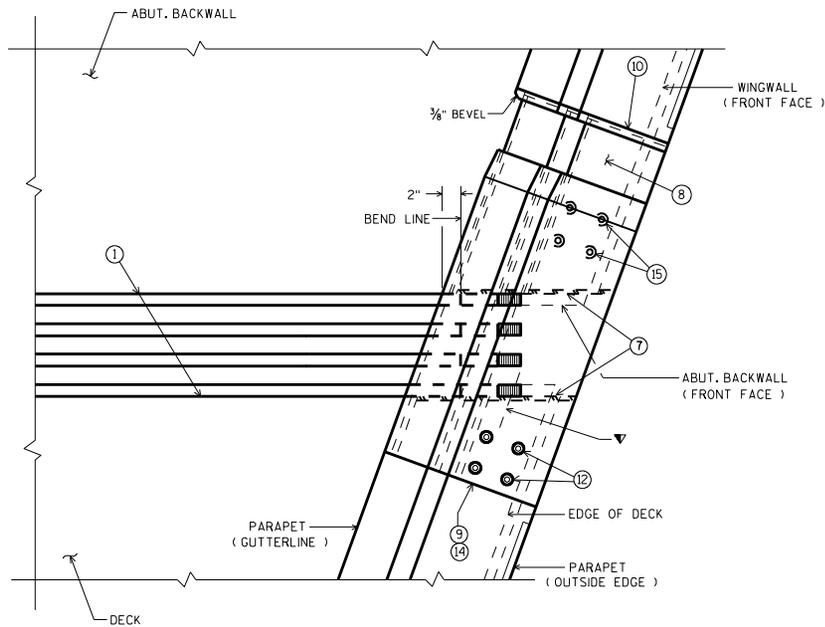
ELEVATION OF PARAPET LF/HF



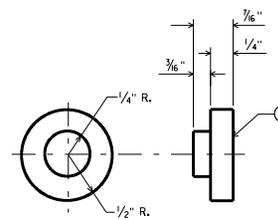
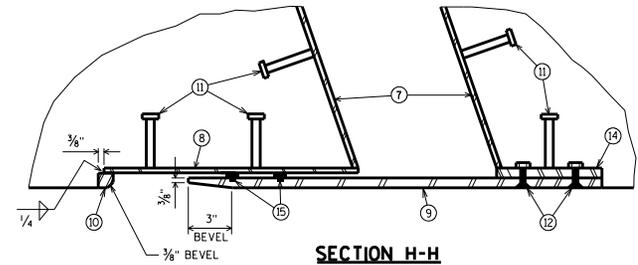
SECTION E-E



SECTION F-F



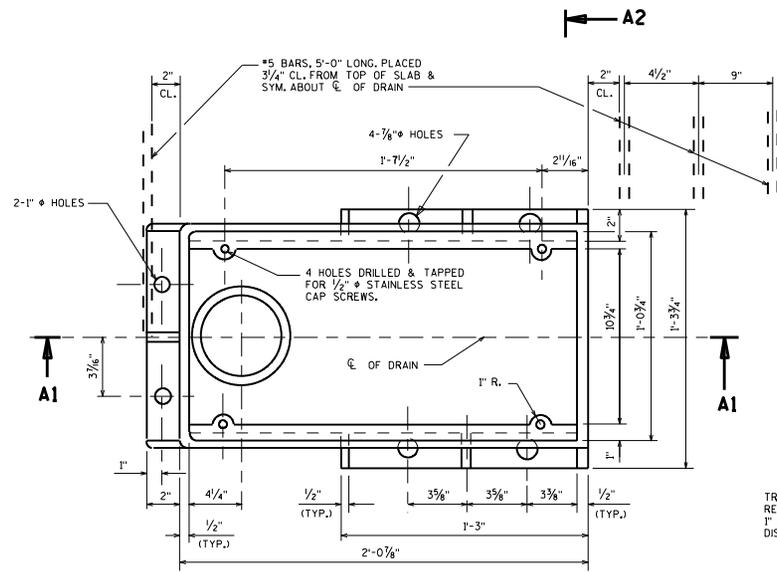
PLAN OF LF/HF



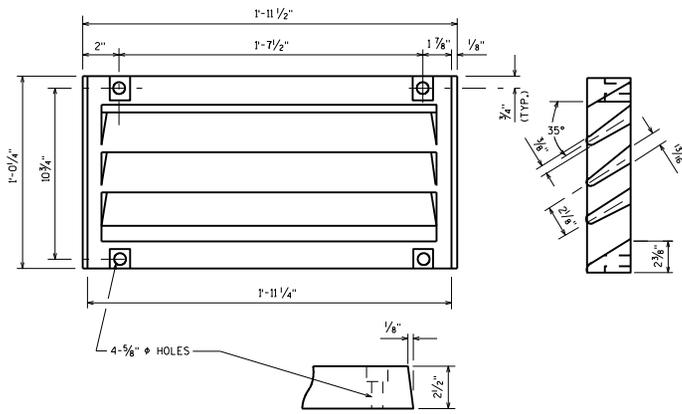
- * 2 EQ. SPA. (LF)
 4 EQ. SPA. (HF)
- ** 2 SPA. (LF)
 4 SPA. (HF)
- *** 4 SPA. (LF)
 6 SPA. (HF)

▼ FOR STRUCTURES WITH SKEWS ADD NOTE TO PLANS: "MITER EXTRUSION ENDS AS REQ'D TO PROVIDE CLEARANCE"

COVER PLATES FOR PARAPET 'LF/HF'	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <i>Bill Oliva</i>	DATE: 1-12



PLAN



GRATE CASTING DETAIL
ATTACH GRATE TO FRAME FOR SHIPMENT

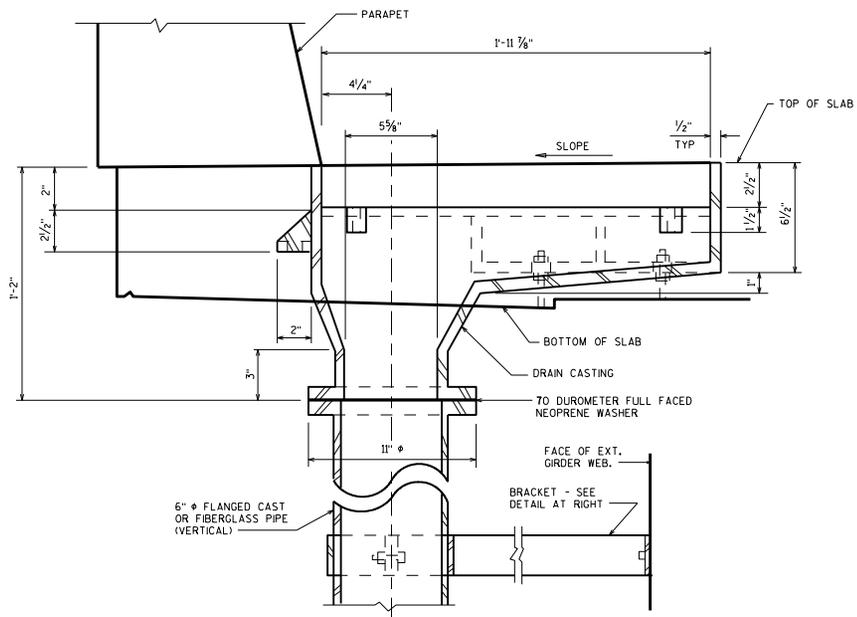
TRANS. AND LONGIT. SLAB BAR REINF. TO BE CUT A MAX. OF 1" CL. FROM DRAIN FRAME. DISPLACE BARS WHERE POSSIBLE.

GENERAL NOTES

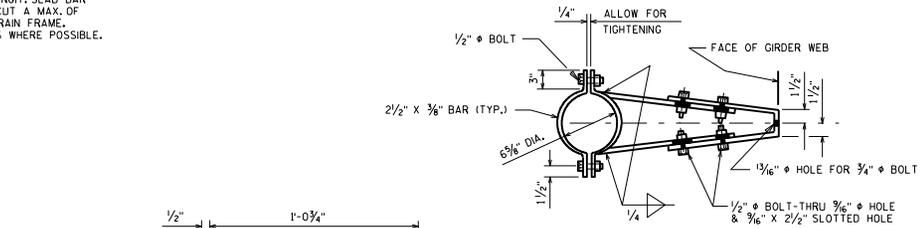
ALL MATERIAL FOR TYPE "GC" CASTING, EXCLUDING GRATE HOLD DOWN SCREWS, SHALL BE GRAY IRON CONFORMING TO ASTM A48, CLASS 30. (APPROXIMATE WEIGHT = 225#)

MATERIAL FOR BRACKETS SHALL CONFORM TO ASTM A36. THE CONTRACTOR MAY PROPOSE AN ALTERNATE TYPE OF BRACKET. THE PROPOSED ALTERNATE DETAILS SHALL BE SUBMITTED AND SUBJECT TO THE APPROVAL OF THE ENGINEER.

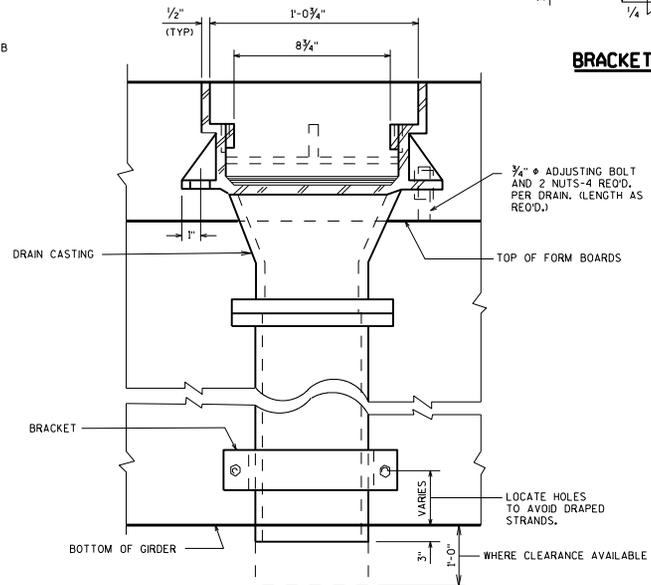
FLANGED 6" DIA. DOWNSPOUTS SHALL BE EITHER CAST MATERIAL OR FIBERGLASS CONFORMING TO ASTM D2996, GRADE 1, CLASS A.



SECTION A1

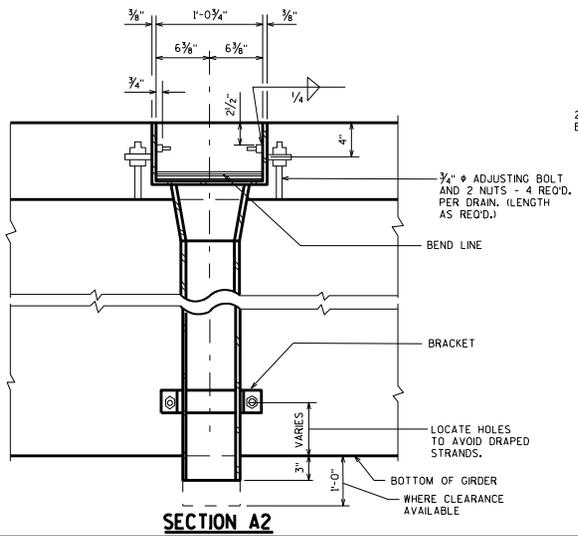
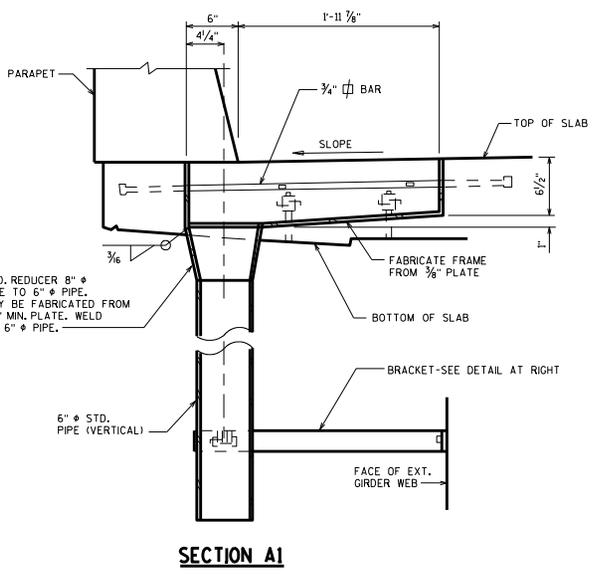
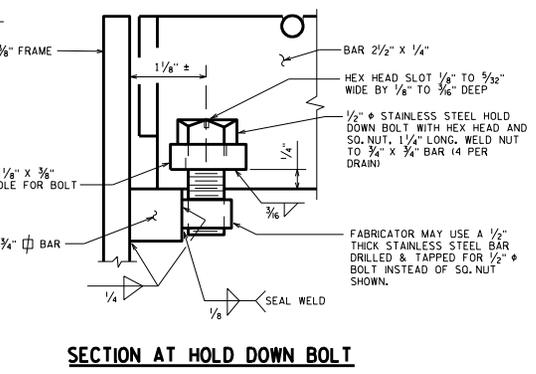
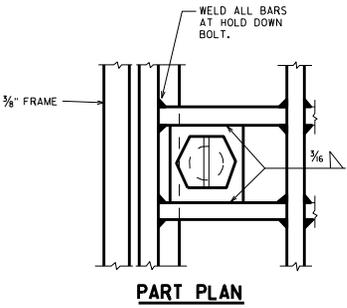
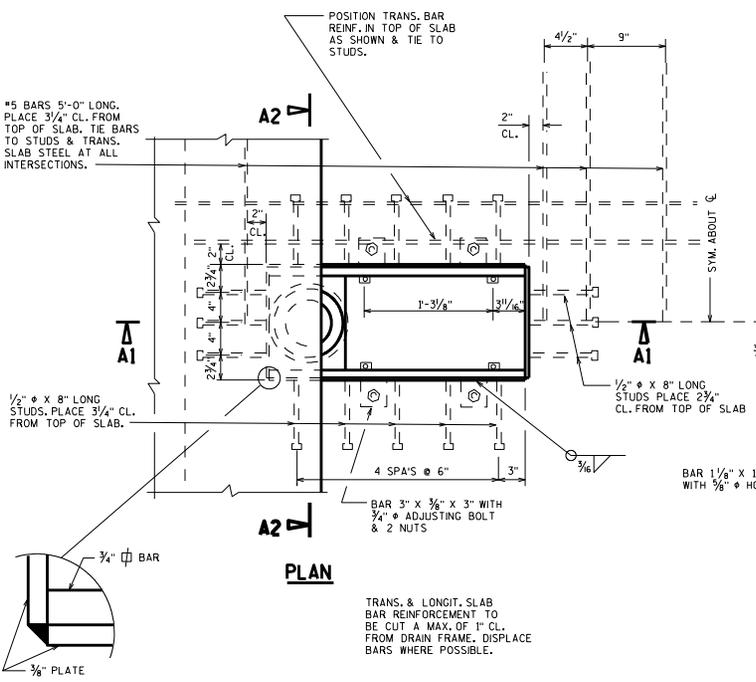


BRACKET DETAIL



SECTION A2

FLOOR DRAIN TYPE "GC"	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <i>Bill Oliva</i>	DATE: 1-12



GENERAL NOTES

ALL DRAIN MATERIAL INCLUDING GRATE, EXCLUDING PIPE & GRATE HOLD DOWN BOLTS, SHALL BE ASTM A36 STEEL.

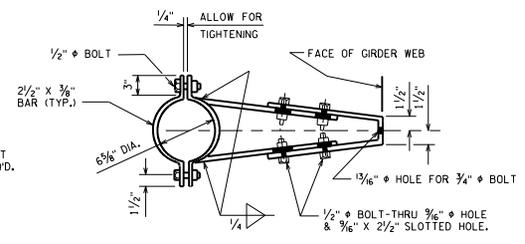
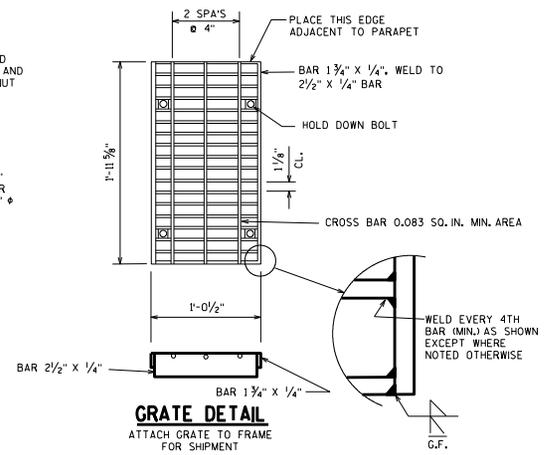
ALL STEEL SHALL BE GALVANIZED. WELDS SHALL BE MADE WITH LOW HYDROGEN ELECTRODES.

SEAL WELD INSIDE OF DRAIN.

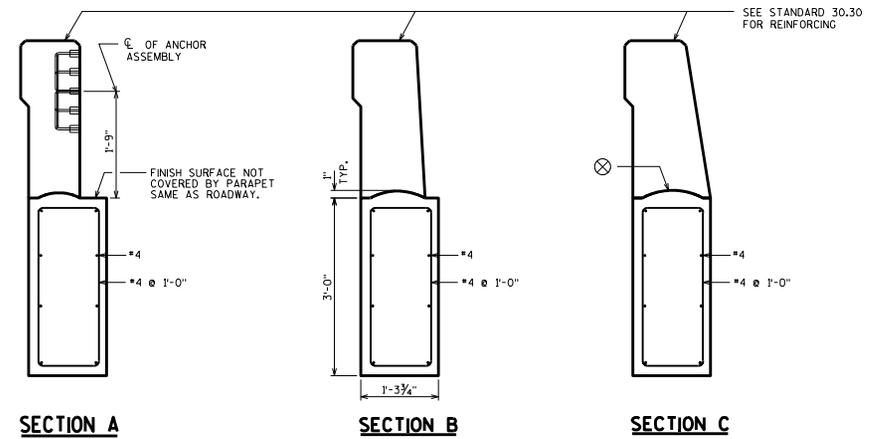
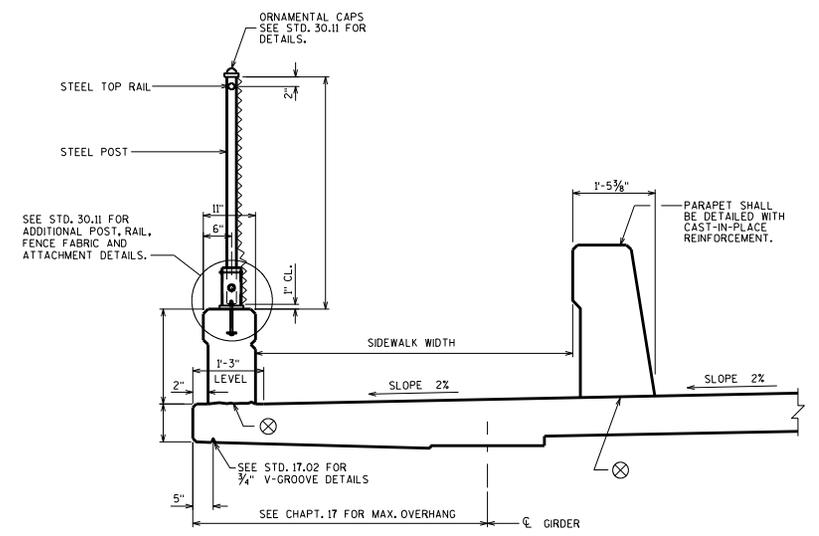
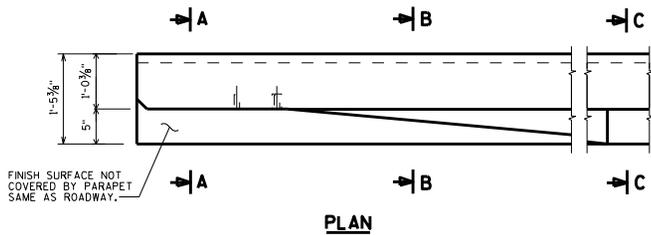
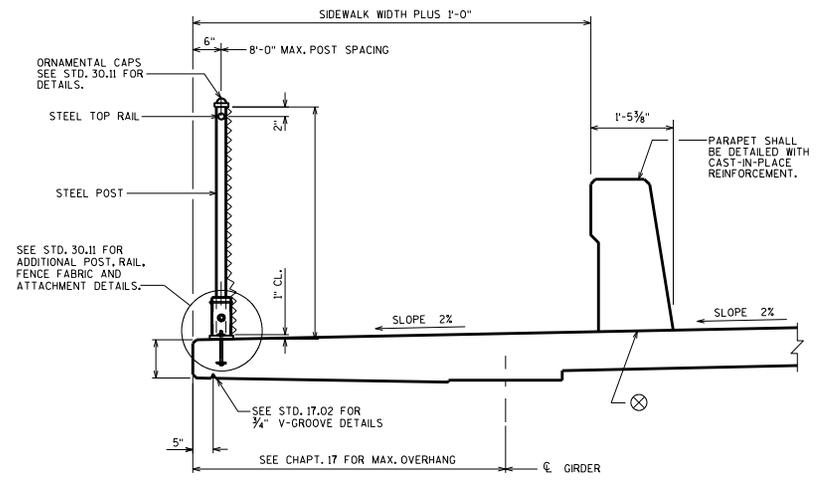
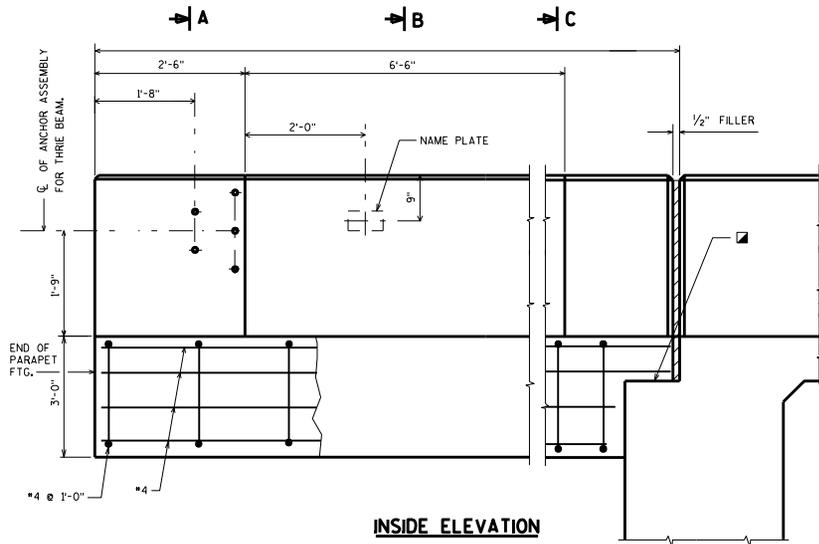
THE CONTRACTOR MAY PROPOSE AN ALTERNATE TYPE OF BRACKET. THE PROPOSED ALTERNATE DETAILS SHALL BE SUBMITTED AND SUBJECT TO THE APPROVAL OF THE ENGINEER.

FLANGED 6" Ø FIBERGLASS PIPE CONFORMING TO ASTM D2996, GRADE I, CLASS A, MAY BE USED AS AN ALTERNATE TO GALVANIZED STD. PIPE CONFORMING TO ASTM A53.

PRIOR TO GALVANIZING A NO. 6 BLAST CLEANING IS REQ'D.



FLOOR DRAIN TYPE "H"	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <i>Bill Oliva</i>	DATE: 1-12



⊗ CONST. JT. - STRIKE OFF AS SHOWN & LEAVE ROUGH

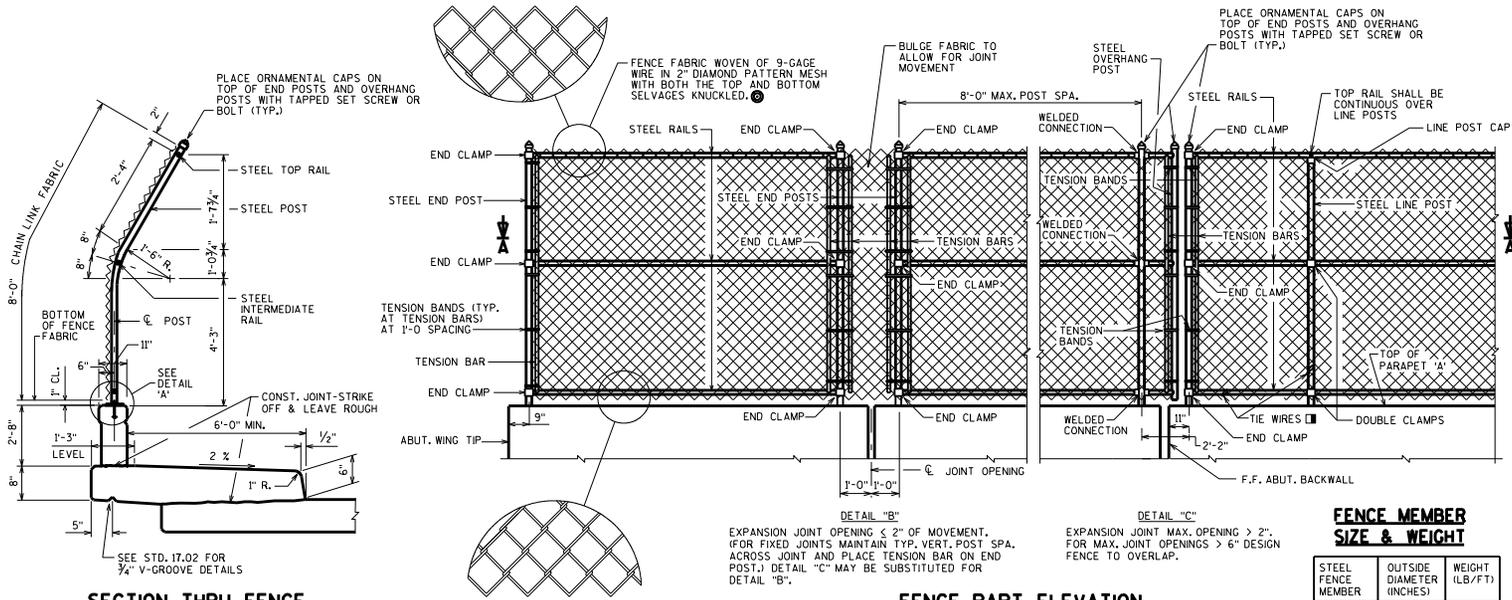
☑ STEEL TROWEL HORIZONTAL SURFACE OF PAVING NOTCH. PLACE MULTIPLE LAYERS OF POLYETHYLENE SHEETS BETWEEN PARAPET FOOTING AND HORIZONTAL SURFACE OF PAVING NOTCH. TOTAL THICKNESS OF SHEETS SHALL BE AT LEAST 0.03".

DESIGNER NOTES

FOR '325S' PARAPET DETAILS, INCLUDING REINFORCING, SEE STANDARD 30.30.

ALL PARAPET FOOTING BARS SHALL BE EPOXY COATED.

PARAPET FOOTING	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <i>Bill Oliva</i>	DATE: 1-12



SECTION THRU FENCE ON PARAPET 'A'
PROTECTIVE SCREENING

FENCE PART ELEVATION
(OUTSIDE VIEW OF PARAPET 'A')

FENCE MEMBER SIZE & WEIGHT

STEEL FENCE MEMBER	OUTSIDE DIAMETER (INCHES)	WEIGHT (LB/FT)
RAILS	1.660	2.27
END POST	2.875	5.80
OVERHANG POST	2.875	5.80
LINE POST	2.375	3.65
POST SLEEVE	4.000	9.12

GENERAL NOTES

POSTS ARE TO BE SET VERTICAL.

METALLIC-COATED FENCE SYSTEM:
ALL FENCE COMPONENTS SHALL BE GALVANIZED STEEL, EXCEPT THE FENCE FABRIC WHICH MAY BE ALUMINUM-COATED STEEL OR GALVANIZED STEEL.

FABRIC SHALL CONFORM TO ASTM A491 OR A392, CLASS 2. STEEL RAILS, POSTS AND POST SLEEVES SHALL CONFORM TO ASTM F1083, STANDARD WEIGHT PIPE (SCHEDULE 40). FITTINGS SHALL CONFORM TO ASTM F626.

THE BID ITEM SHALL BE "FENCE CHAIN LINK - FT.", LF.

POLYMER-COATED FENCE SYSTEM:
ALL FENCE COMPONENTS SHALL BE GALVANIZED STEEL WITH A COLORED POLYMER-COATING ON THE OUTSIDE.

FABRIC SHALL CONFORM TO ASTM F668, CLASS 2B. STEEL RAILS, POSTS AND POST SLEEVES SHALL CONFORM TO ASTM F1083, STANDARD WEIGHT PIPE (SCHEDULE 40). FITTINGS SHALL CONFORM TO ASTM F626. SEE THE "BRIDGE SPECIAL PROVISIONS" FOR ADDITIONAL DETAILS.

THE COLOR OF POLYMER-COATING FOR THIS STRUCTURE SHALL BE (SPECIFY) DARK GREEN, BROWN OR BLACK IN ACCORDANCE WITH ASTM F934.

THE BID ITEM SHALL BE "FENCE CHAIN LINK POLYMER-COATED - FT.", LF.

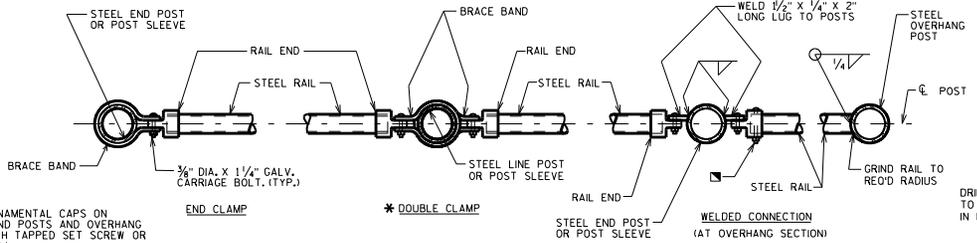
COMPLETE ANY REQUIRED WELDING OF COMPONENTS BEFORE GALVANIZING.

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.

BASE PLATES, ANCHOR PLATES AND SHIMS SHALL BE ASTM A709, GRADE 36.

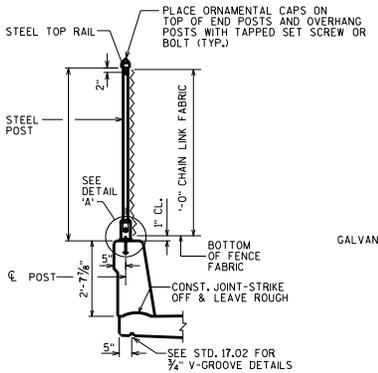
ALL POST SPACINGS ARE MEASURED HORIZONTALLY ALONG THE C/L OF THE POST.

WEIGHT OF CHAIN LINK FENCE:
(BASED ON 8 FT. POST SPACING)
6 FT. HIGH FENCE = 18 LB / FT
8 FT. HIGH FENCE = 21 LB / FT



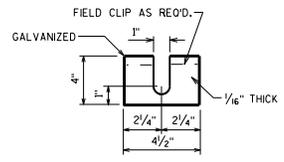
SECTION A-A

NOTE: PLACE ALL BOLT HEADS ON SIDE OF FENCE ADJACENT TO PEDESTRIANS



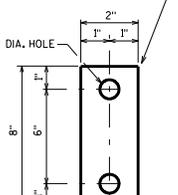
SECTION THRU FENCE ON PARAPET 'L'

FOR TRAFFIC BARRIER APPLICATION, USE VERTICAL POST (NO BEND)

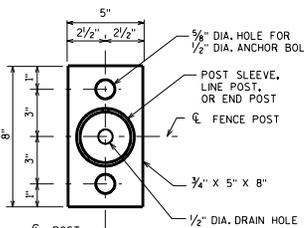


POST SHIM DETAILS

SHIMS REQUIRED ONLY WHEN END POSTS AND LINE POSTS ARE WELDED TO BASE PLATES. PROVIDE 4 SHIMS PER POST, USE WHERE REQUIRED FOR ALIGNMENT.



ANCHOR PLATE



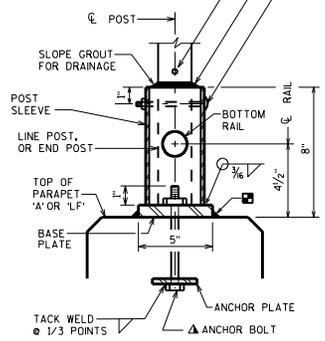
BASE PLATE

3/8" DIA. GALV. CARRIAGE BOLT WITH LOCKING NUT. (TO BE SUPPLIED WITH ASSEMBLY)

WELD 1/2" x 1/4" x 2" LONG LUG TO POSTS

FILL SLEEVE AND BEVEL AWAY FROM POST WITH NON-SHRINK GROUT AFTER SETTING POST. (LEAVE NO VOIDS)

DRILL 3/8" DIA. DRAIN HOLE PARALLEL TO ROADWAY IMMEDIATELY ABOVE GROUT IN POST. SLEEVE LOCATIONS ONLY.



DETAIL 'A'

UNIT SHALL BE GALVANIZED AFTER FABRICATION

NOTE: IN LIEU OF USING THE POST SLEEVE, THE FENCE POST MAY BE WELDED TO THE BASE PLATE.

DESIGNER NOTES

THE CHAIN LINK FENCE SYSTEM SELECTED FOR THE STRUCTURE SHALL BE A "METALLIC-COATED FENCE SYSTEM" OR A "POLYMER-COATED FENCE SYSTEM".

● A 1" MESH MAY BE USED ON PROTECTIVE SCREENING IN HIGHLY VULNERABLE AREAS, OR AS STATED IN FDM PROCEDURE II-35-1 FOR PROTECTIVE SCREENING.

PEDESTRIAN RAILING MAY BE USED ON WINGWALL PARAPETS IF CHAIN LINK FENCE DOES NOT CONTINUE BEYOND BRIDGE.

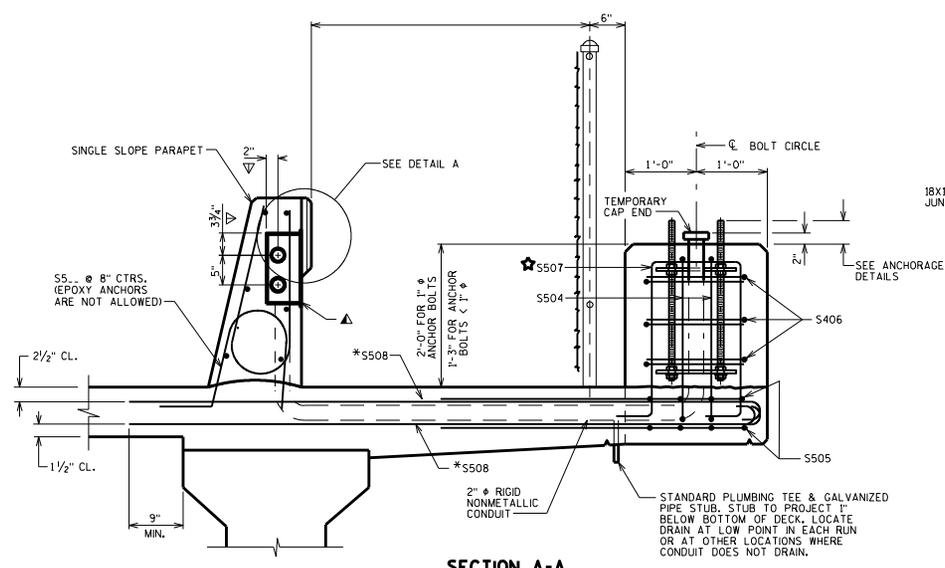
HANDRAILS SHALL BE USED ALONG BRIDGE SIDEWALKS WHERE THE SLOPE OF THE SIDEWALK IS GREATER THAN 5%. TOP OF HANDRAIL GRIPPING SURFACES SHALL BE MOUNTED BETWEEN 30" & 34" ABOVE SIDEWALK SURFACE. USE 30" NEAR SCHOOL ZONES, IF FEASIBLE. HANDRAILS SHALL BE PROVIDED ALONG BOTH SIDES OF SIDEWALK. FOR HANDRAIL DETAILS SEE STANDARD 37.02.

CHAIN LINK FENCE DETAILS

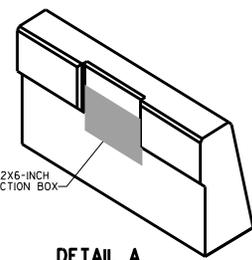
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: *Bill Oliva*

DATE: 1-12



SECTION A-A



DETAIL A
SHOWING B.F. OF PARAPET WITH
BLOCK OUT FOR JUNCTION BOX.

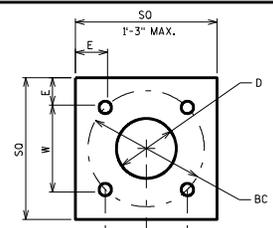
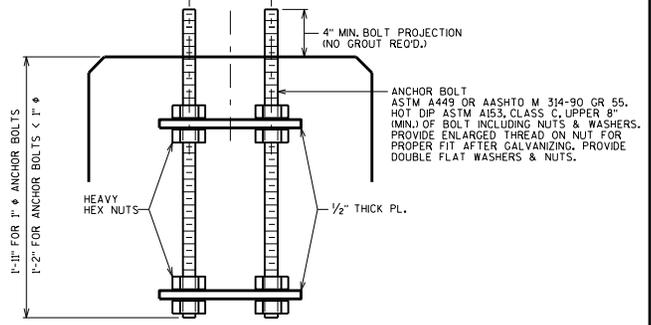


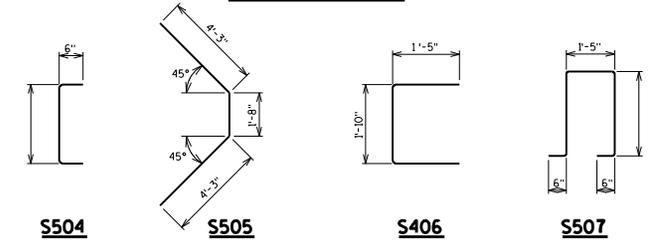
TABLE FOR "TYPE 5 LIGHT POLE"
FROM FACILITIES DEV. MANUAL
WITH 1" ANCHOR BOLTS.
(ANY OTHER LIGHT POLE TYPE
MUST BE DESIGNED FOR.)

SO	1'-1/2"
E	2 11/16"
W	8 1/8"
BC	11 1/2"
D	9 1/2"

W = 0.707 x BC
SO = BC + 2d
d = ANCHOR BOLT DIA.
E = (SO-W)/2
D_{MAX} = BC - 2d
D_{MIN} = 2 x CONDUIT DIA. + 1"



ANCHORAGE DETAIL



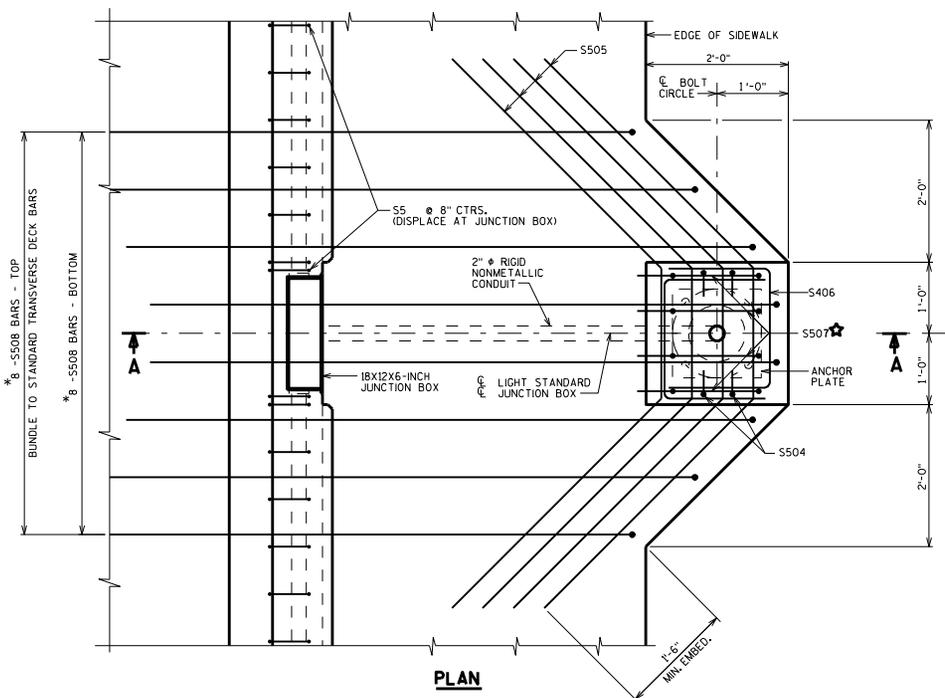
S504

S505

S406

S507

S508



PLAN

NOTES

- BID ITEM SHALL BE "ANCHOR ASSEMBLIES LIGHT POLES" EA.
- SEE STD. 30.11 FOR FENCE DETAILS.
- SEE STD. 30.21 FOR - ADDITIONAL NOTES - END OF BRIDGE DETAILS
- THIS STANDARD ACCOMMODATES A MAXIMUM 15" BOLT HOLE CIRCLE AND A MAXIMUM 15" X 15" SQUARE ANCHOR PLATE WITH (4) - 1" ANCHOR BOLTS. THIS STANDARD IS BASED ON A 8" MIN. DECK THICKNESS.

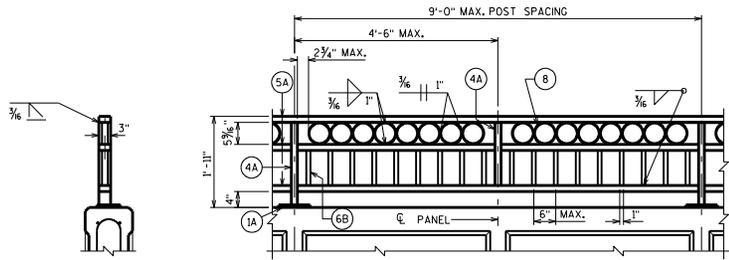
BILL OF BARS

BAR MARK	CO ₂	NO. REQD.	LENGTH	BEN ₁	LOCATION
S504	X			X	LIGHT STD., VERT.
S505	X	10-2		X	LIGHT STD., HORIZ. IN DECK
S406	X	4-6		X	LIGHT STD., HORIZ.
S507	X			X	LIGHT STD., VERT.
S508	X			X	LIGHT STD., TRANSV. IN DECK

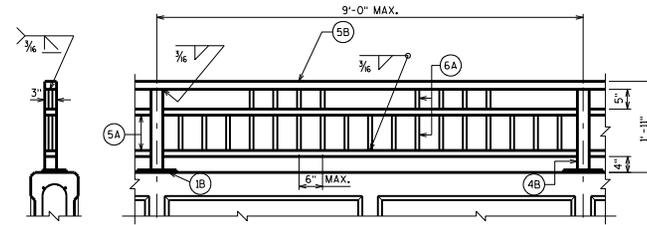
LIGHTING DETAIL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva DATE: 1-12

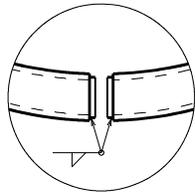


TYPE C1



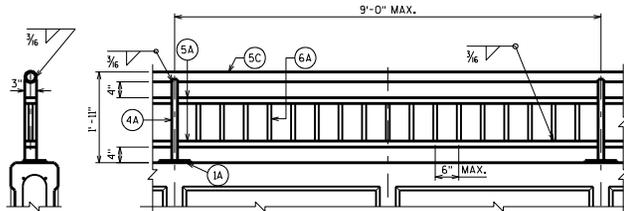
TYPE C4

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

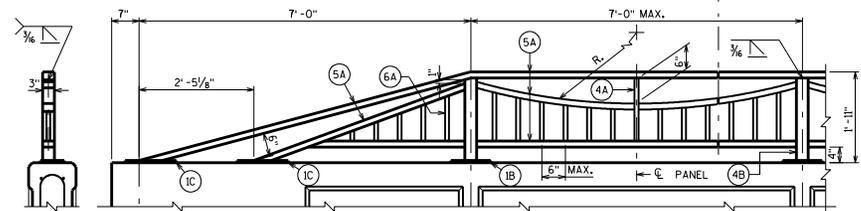


DETAIL A

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

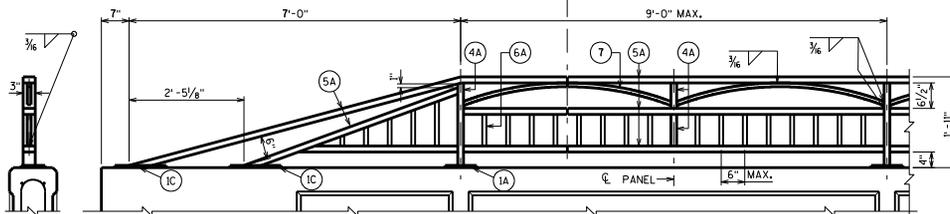


TYPE C2

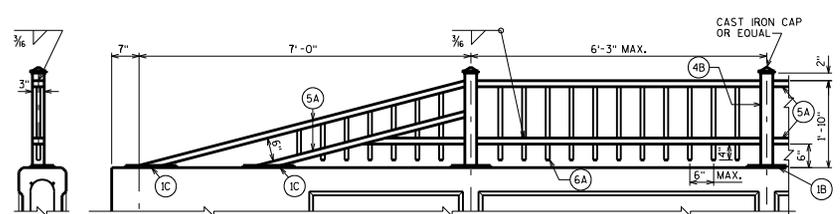


TYPE C5

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

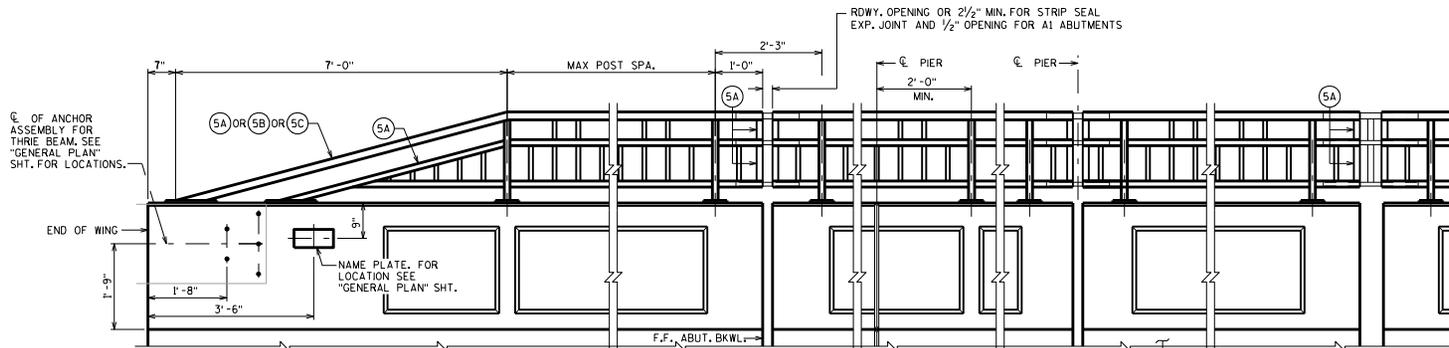
COMBINATION RAILINGS MAY ALSO BE USED AS A PEDESTRIAN
RAIL MOUNTED DIRECTLY TO A BRIDGE SIDEWALK OR
RETAINING WALL BY INCREASING THE RAILING HEIGHT TO A
MINIMUM OF 3'-6" AND A MAXIMUM OF 4'-6" AND USING A
MINIMUM POST SIZE OF 3"x3"x3/8". WHEN USED ON A BRIDGE
A TRAFFIC BARRIER IS REQUIRED BETWEEN THE ROADWAY
AND THE SIDEWALK. FOR THIS PEDESTRIAN RAILING, BID ITEM
SHALL BE "RAILING STEEL TYPE C (1-6) GALVANIZED
PEDESTRIAN B-...". THE CLEAR SPACE BETWEEN THE TOP
TWO RAILS MAY BE INCREASED TO A 8" MAXIMUM EXCEPT
FOR "TYPE C1" RAILING.

A MIN. 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 ADD'L 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.

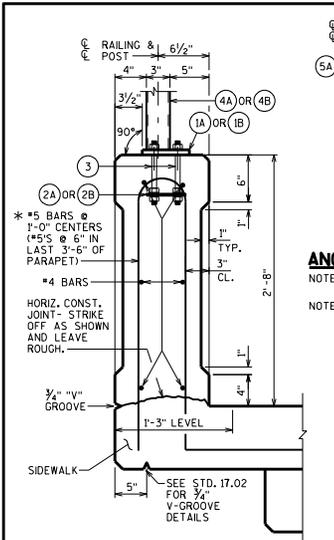
RAILING WEIGHT = 22 LB/FT

**COMBINATION RAILING
TYPES "C1 - C6"**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

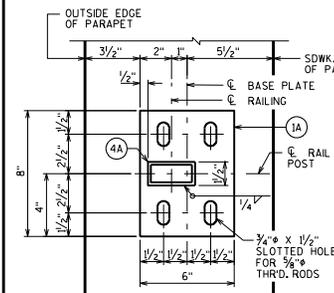
APPROVED: *Bill Oliva*

DATE:
1-12

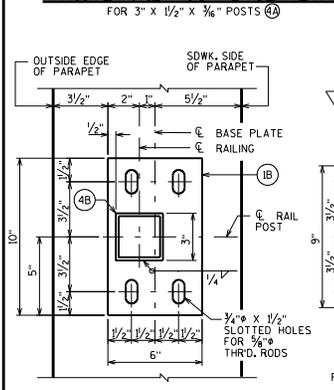


SECTION THRU PARAPET ON BRIDGE

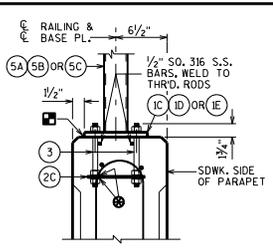
* ADJUST LOCATIONS OF BARS TO ALLOW PLACEMENT OF ANCHOR ASSEMBLY FOR RAILING AND BEAM GUARD (WHEN RECD.).



TYPICAL RAIL POST BASE PLATE
FOR 3" x 1/2" x 3/8" POSTS (2A)



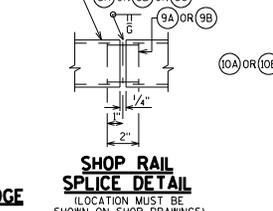
TYPICAL RAIL POST BASE PLATE
FOR 3" x 3" x 3/8" POSTS (4B)



ANCHORAGE FOR END RAIL

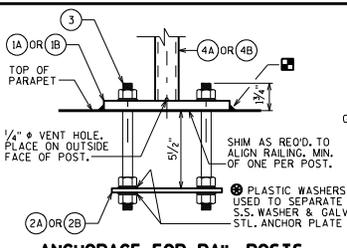
NOTE: USE 8" THRD. ROD AT PLATE ID WHEN ADJ. TO BEAM GUARD ANCHOR ASSEMBLY

NOTE: ANCHOR PLATES NOT RECD. WHEN TYPE "S" ANCHORS ARE USED.



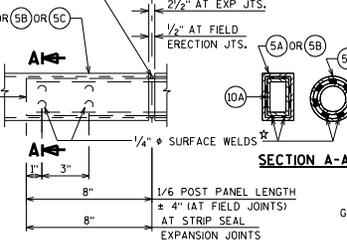
SHOP RAIL SPLICE DETAIL

(LOCATION MUST BE SHOWN ON SHOP DRAWINGS)



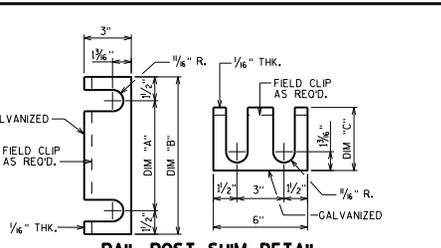
ANCHORAGE FOR RAIL POSTS

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



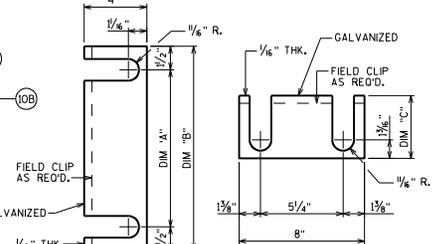
FIELD ERECTION JOINT DETAIL

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



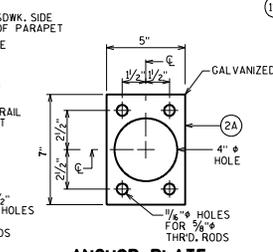
RAIL POST SHIM DETAIL

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)

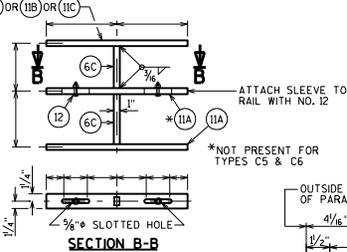


END RAIL SHIM DETAIL

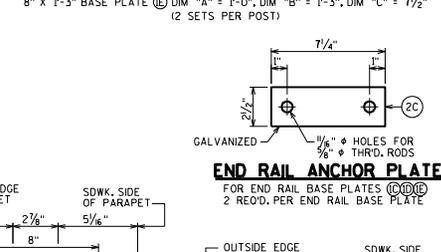
8" x 1"-1" BASE PLATE (A) DIM "A" = 10", DIM "B" = 1"-1", DIM "C" = 6 1/2"
8" x 1'-6" BASE PLATE (B) DIM "A" = 1'-3", DIM "B" = 1'-6", DIM "C" = 9"
8" x 1'-3" BASE PLATE (C) DIM "A" = 1'-0", DIM "B" = 1'-3", DIM "C" = 7 1/2"
(2 SETS PER POST)



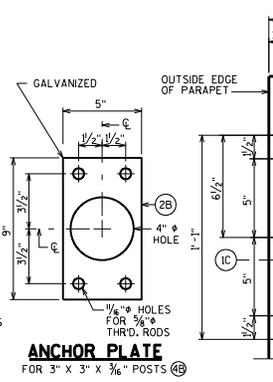
ANCHOR PLATE
FOR 3" x 1/2" x 3/8" POSTS (4A)



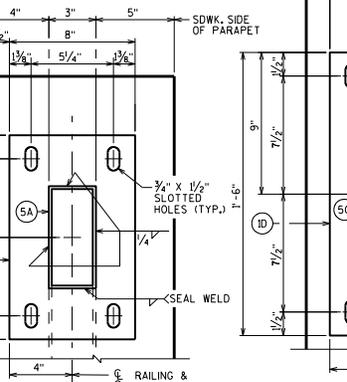
MODULAR JOINT SLEEVE DETAIL



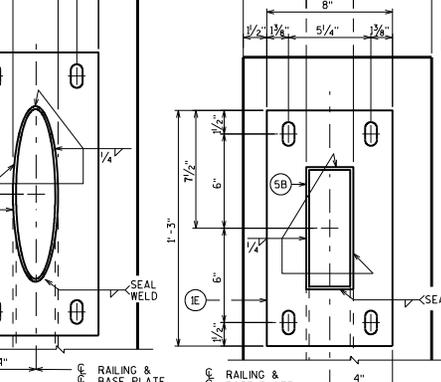
END RAIL ANCHOR PLATE
FOR END RAIL BASE PLATES (10A, 10B)
2 RECD. PER END RAIL BASE PLATE



ANCHOR PLATE
FOR 3" x 3" x 3/8" POSTS (4B)



END RAIL BASE PLATE
FOR 3" x 1/2" x 3/8" RAIL (6A)



END RAIL BASE PLATE
FOR 2 1/2" STANDARD PIPE RAIL (6B)

- LEGEND**
- (1A) PLATE 3/4" x 6" x 8" WITH 3/4" x 1/2" SLOTTED HOLES.
 - (1B) PLATE 3/8" x 6" x 10" WITH 3/4" x 1/2" SLOTTED HOLES
 - (1C) PLATE 5/8" x 8" x 1'-1" WITH 3/4" x 1/2" SLOTTED HOLES.
 - (1D) PLATE 5/8" x 8" x 1'-6" WITH 3/4" x 1/2" SLOTTED HOLES
 - (1E) PLATE 5/8" x 8" x 1'-3" WITH 3/4" x 1/2" SLOTTED HOLES
 - (2A) 1/4" x 5" x 7" ANCHOR PLATE WITH 1/4" HOLES FOR THRD. RODS NO. 3.
 - (2B) 1/4" x 5" x 9" ANCHOR PLATE WITH 1/4" HOLES FOR THRD. RODS NO. 3.
 - (2C) 1/4" x 2 1/2" x 7 1/4" ANCHOR PLATE WITH 1/4" 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 EQUAL, STAINLESS STEEL CONCRETE MASONRY ANCHORS, TYPE S (EPOXY), 3/8" DIA. MINIMUM PULLOUT CAPACITY OF 13 KIPS. EMBED A MIN. OF 7" FOR RAIL POSTS AND 5" FOR END RAILS.)
 - (4A) STRUCTURAL TUBING 3" x 1 1/2" x 3/8". PLACE VERTICAL. WELD TO NO. 1 & 5.
 - (4B) STRUCTURAL TUBING 3" x 3" x 3/8". PLACE VERTICAL. WELD TO NO. 1 & 5.
 - (4C) 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.
 - (4D) 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.
 - (5) 2 1/2" STANDARD PIPE RAIL (2.875" O.D.). WELD TO NO. 1 & NO. 4. INSIDE OF PIPE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.
 - (6A) BAR 1" x 1" PICKETS, WELD TO NO. 5. (SPACE AT 6" MAX. TO TO SPACING). PLACE VERTICAL.
 - (6B) BAR 1" x 1/2" PICKETS, WELD TO NO. 5. (SPACE AT 6" MAX. TO TO SPACING). PLACE VERTICAL.
 - (6C) BAR 1" x 1/2" PICKETS, WELD TO NO. 11. PLACE VERTICAL.
 - (7) BAR 1" x 1". BEND TO REQUIRED RADIUS. WELD TO NO. 4 & 5.
 - (8) 5" SCH. 40 PIPE (5.315" O.D.) 1/2" LONG SLICES. WELD TO NO. 5A.
 - (9A) RECTANGULAR SLEEVE FABRICATED FROM 3/4" PLATES. PROVIDE "SLIDING FIT".
 - (9B) CIRCULAR SLEEVE FABRICATED FROM 2" STANDARD PIPE.
 - (10A) RECTANGULAR SLEEVE FABRICATED FROM 3/4" PLATES. (1'-4" FIELD ERECTION JTS.) (1'-4" STRIP SEAL EXP. JTS.)
 - (10B) CIRCULAR SLEEVE FABRICATED FROM 2" STANDARD PIPE. (1'-4" FIELD ERECTION JTS.) (1'-4" STRIP SEAL EXP. JTS.)
 - (11A) BAR 2 1/2" x 1" x " ".
 - (11B) BAR 2 1/2" x 1/2" x " ".
 - (11C) 2" STANDARD PIPE x " ".
 - (12) 1/2" DIA. STAINLESS STEEL BOLT WITH NUT AND LOCKWASHER.

RAILING NOTES

BID ITEM SHALL BE "RAILING STEEL TYPE (C1-6) GALVANIZED 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.

NO. 1, 2, 6, 7, 8, 9, 10 AND 11 SHALL CONFORM TO ASTM A709 GRADE 36. STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B (NO. 4 & NO. 5).

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.

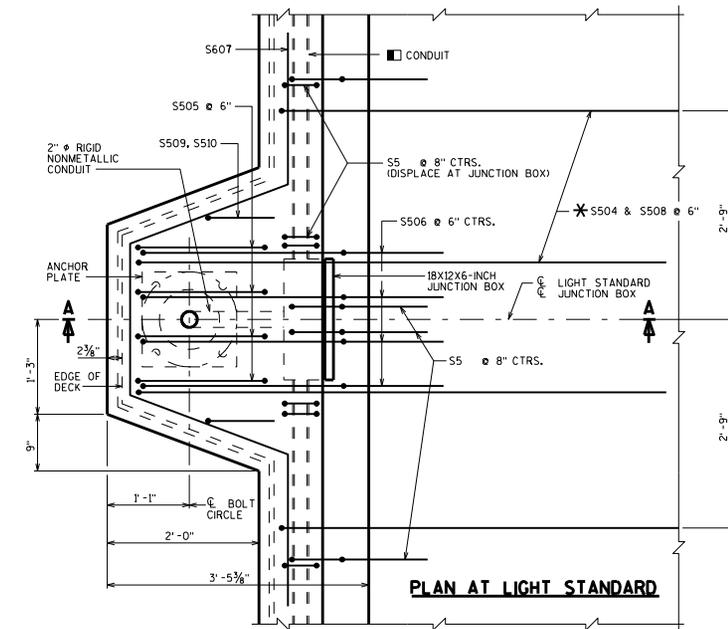
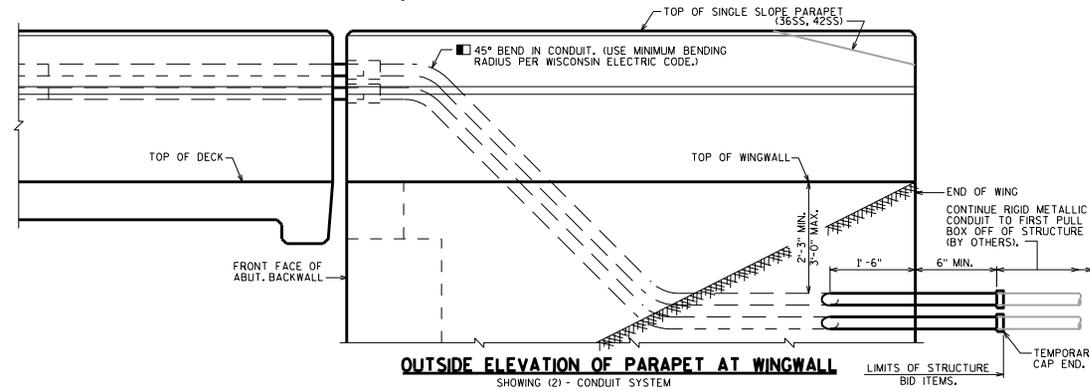
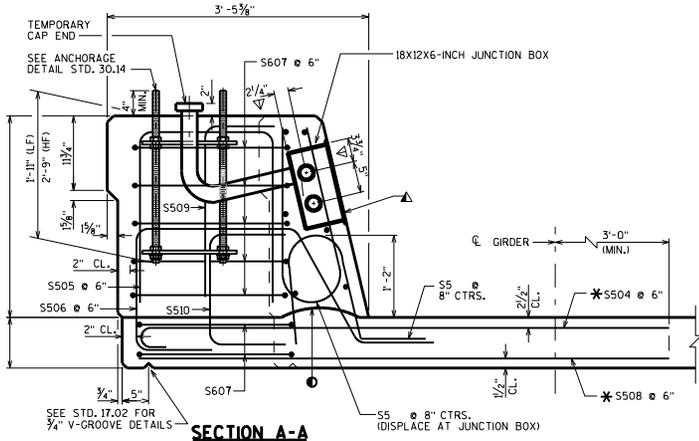
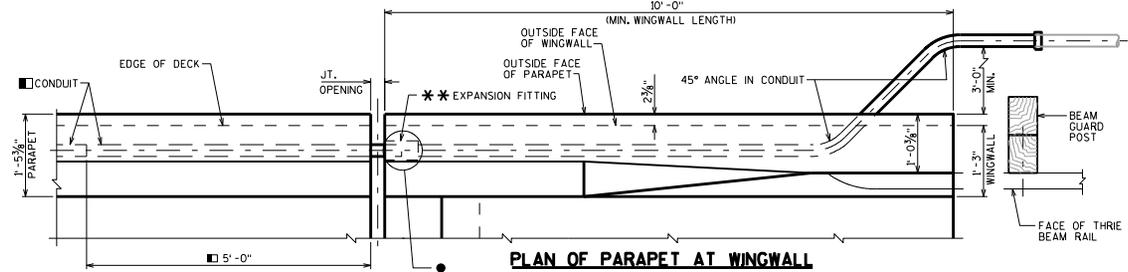
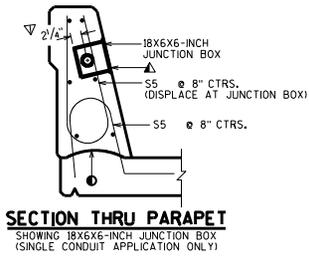
ALL MATERIAL (EXCEPT NO. 3 & 12) SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING, THE STEEL RAILING SHALL BE GIVEN A NO. 6 BLAST CLEANING PER SPECIFICATIONS, PAINT OVER GALVANIZING WITH AN APPROVED TIE COAT AND TOP COAT AS SPECIFIED IN THE "BRIDGE SPECIAL PROVISIONS". THE RAILING SHALL BE PAINTED FEDERAL COLOR NO. 1.

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.

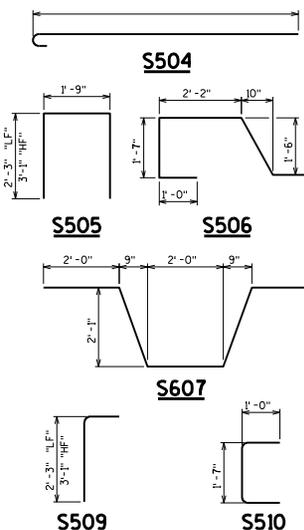
TOUCH-UP PAINTING TO BE DONE AT COMPLETION OF STEEL RAILING INSTALLATION TO THE SATISFACTION OF THE ENGINEER AT NO EXTRA COST.

COMBINATION RAILING DETAILS	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <i>Bill Oliva</i>	DATE: _____
1-12	



● POSITION MOVABLE END OF CONDUIT INSIDE EXPANSION FITTING, SUCH THAT IT WILL HAVE THE SAME ALLOWANCE FOR MOVEMENT (EXPANSION/CONTRACTION) AS THE EXPANSION FITTING. SET IN PLACE IN THE DECK BELOW IT. TAKE CARE TO INSTALL EXPANSION FITTING AND CONDUIT EXACTLY PARALLEL TO BRIDGE MOVEMENT.

- CONSTR. JT. STRIKE OFF AS SHOWN
- USE 2" RIGID NONMETALLIC CONDUIT EXCEPT AT EXPANSION FITTING. AT EXPANSION FITTING USE RIGID METALLIC CONDUIT 5'-0" INTO PARAPET ON DECK SIDE AND THRU PARAPET AND WINGWALL TO A MINIMUM OF 6" BEYOND END OF WINGWALL (FOR GROUNDING PURPOSES.)
- ▲ CUT OUT $\frac{1}{2}$ " OF GASKET AT BOTTOM OF JUNCTION BOX COVER TO ALLOW FOR DRAINAGE.
- * THESE BARS ARE IN ADDITION TO STANDARD TRANSVERSE BARS IN DECK. FOR CONC. SLAB STRUCTURES, REPLACE S504 & S508 BARS W/ S404 BARS @ 6" SPA. (W/O HOOK @ ENDS, 5'-6" LONG.)
- ▽ LOCATION OF CONDUIT IS MEASURED FROM OUTSIDE EDGE OF JUNCTION BOX.



NOTES

BID ITEMS SHALL BE:
 "JUNCTION BOXES 18X12X6-INCH", EACH;
 "JUNCTION BOXES 18X6X6-INCH", EACH;
 "CONDUIT RIGID NONMETALLIC SCHEDULE 40 2-INCH"
 "CONDUIT RIGID METALLIC 2-INCH";
 "ANCHOR ASSEMBLIES LIGHT POLES"

EXPANSION FITTINGS, ANGLES AND ADAPTER FITTINGS TO BE INCIDENTAL TO "CONDUIT RIGID METALLIC 2-INCH".

WHEN CONNECTING NONMETALLIC CONDUIT TO METALLIC CONDUIT, ONLY ADAPTER FITTINGS U.L. OR NRTL LISTED FOR ELECTRICAL USE SHALL BE USED.

APPROVED MANUFACTURERS - JUNCTION BOXES:
 SEE APPROVED MATERIAL LIST.

APPROVED MANUFACTURER OR EQUIVALENT - EXPANSION FITTING (SPECIFY SIZE ON PLANS);
 0-Z/GEDNEY TYPE AX-200 AND BONDING JUMPER (4" TOTAL CONDUIT MOVEMENT),
 0-Z/GEDNEY TYPE AX-8-200 AND BONDING JUMPER (8" TOTAL CONDUIT MOVEMENT),
 0-Z/GEDNEY TYPE EX-200 WITH PBS-200-125 AND BONDING JUMPER (10" TOTAL CONDUIT MOVEMENT).

THIS STANDARD ACCOMMODATES A MAXIMUM 15" BOLT HOLE CIRCLE AND A MAXIMUM 15" X 15" SQUARE ANCHOR PLATE WITH (4) - 1" ANCHOR BOLTS. THIS STANDARD IS BASED ON A 8" MIN. DECK THICKNESS AND A MAXIMUM OVERHANG OF 3'-7" FROM \bar{C} GIRDER TO EDGE OF DECK.

JUNCTION BOX REQUIREMENTS

- PLACE A 18" X 12" X 6" JUNCTION BOX AT EACH LIGHT STANDARD (CENTERED ON LIGHT \bar{C}).
- USE A JUNCTION BOX TO KEEP A CONTINUOUS RUN OF CONDUIT (PULL LENGTH) TO A MAXIMUM OF 190 FT. CONTACT THE BUREAU OF HIGHWAY OPERATIONS, ELECTRICAL SECTION WHEN PULL LENGTH IS > 190 BUT < 200'.

CONDUIT REQUIREMENTS

- USE (1) - 2" CONDUIT TO PROVIDE ELECTRICAL SERVICE TO LIGHTS MOUNTED ON TOP OF THE PARAPET.
- USE (2) - 2" CONDUITS IF AN ADDITIONAL ELECTRICAL SERVICE IS REQUIRED.
- USE A 18" X 6" X 6" JUNCTION BOX WHEN (1) - 2" CONDUIT IS PRESENT.
- USE A 18" X 12" X 6" JUNCTION BOX WHEN (2) - 2" CONDUITS ARE PRESENT.

**** EXPANSION FITTING REQUIREMENTS**

- USE AN APPROVED EXPANSION FITTING AT EACH SEMI-EXPANSION OR EXPANSION JOINT.
- RUN CONDUIT STRAIGHT THROUGH (WITHOUT A FITTING) AT EACH FIXED JOINT.

BILL OF BARS

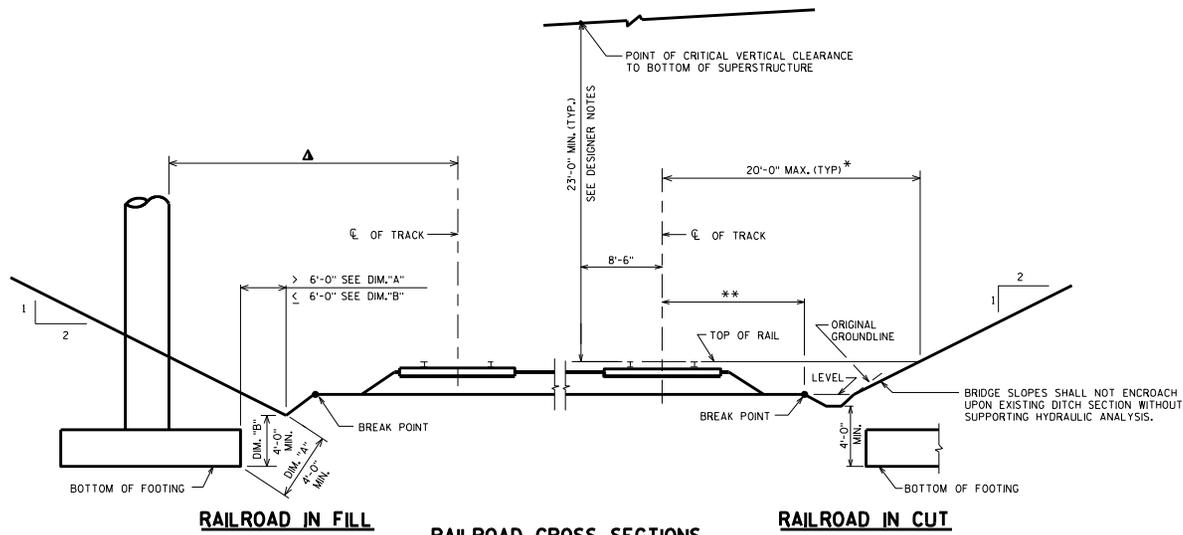
BAR MARK	CO ₂	NO. REOD.	LENGTH LF	HF	BENT	LOCATION
S504	X				X	DECK TRANSV. @ LIGHT STD.
S505	X	6-0	7-8		X	PARAPET VERT. @ LIGHT STD.
S506	X	7-0	7-0		X	PARAPET VERT. @ LIGHT STD.
S607	X	10-0	10-0		X	PARAPET HORIZ. @ LIGHT STD.
S508	X					DECK TRANSV. @ LIGHT STD.
S509	X	3-2	4-0		X	PARAPET VERT. @ LIGHT STD.
S510	X	3-5	3-5		X	PARAPET VERT. @ LIGHT STD.

LIGHT STD., JUNCTION BOX, & EXP. FITTING FOR "LF"/"HF" PARA.

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION
 STRUCTURES DEVELOPMENT SECTION

APPROVED: *Bill Oliva*

DATE: 1-12



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 1/2" 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 (30 SQ. FT. MIN. X-SECT) IS REQUIRED. FOR OFFSETS BETWEEN 25'-0" THROUGH 50'-0" A CRASH WALL, HAMMERHEAD PIER OR A SPECIALLY DESIGNED PIER FOR COLLISION (SEE 13.4.10) IS REQUIRED. IF THE PIER IS SUFFICIENTLY PROTECTED BY AN EMBANKMENT, A CRASH WALL IS NOT RECD.
- ▲ ACCOMMODATION FOR ADDITIONAL TRACKS REQUIRES DEPARTMENT APPROVAL CONFER WITH RAILROAD PROJECT COORDINATION ENGINEER IN CENTRAL OFFICE RAILROADS AND HARBORS SECTION AT (608) 266-0233.
- ▲ HORIZONTAL CLEARANCES LESS THAN 18'-0" AND VERTICAL CLEARANCES LESS THAN 23'-0" SHOULD BE REVIEWED WITH THE RAILROAD COORDINATION ENGINEER IN THE RAILS AND HARBORS SECTION, (608) 266-0233.
- TEMPORARY CONSTRUCTION CLEARANCES ARE 21'-0" VERTICAL AND 12'-0" HORIZONTAL FROM CENTERLINE OF TRACK TO FALSEWORK.
- BNSF AND UP RAILROADS HAVE GREATER REQUIREMENTS THAN SHOWN, CONFER WITH RAILROAD PROJECT COORDINATION ENGINEER IN CENTRAL OFFICE RAILROADS AND HARBORS SECTION.
- THIS STANDARD IS TO MEET WISDOT REQUIREMENTS ONLY. THE DESIGN ENGINEER SHALL CONTACT THE RAILROAD FOR THEIR REQUIREMENTS.

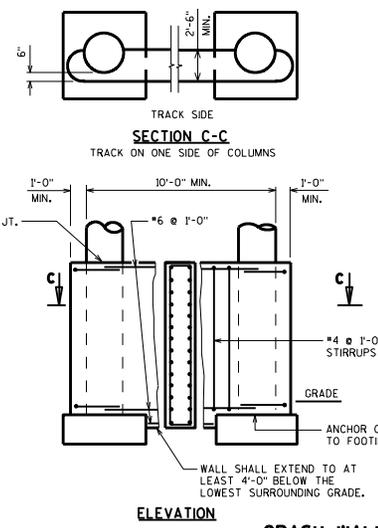
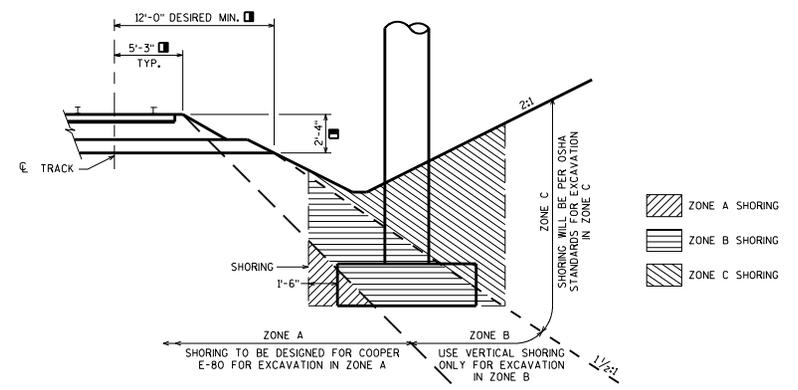


TABLE C

PIER LOCATION	HEIGHT OF CRASH WALL ABOVE TOP OF RAIL
PIERS < 12'-0" FROM € TRACK	12'-0"
PIERS 12'-0" TO 50'-0"	6'-0"

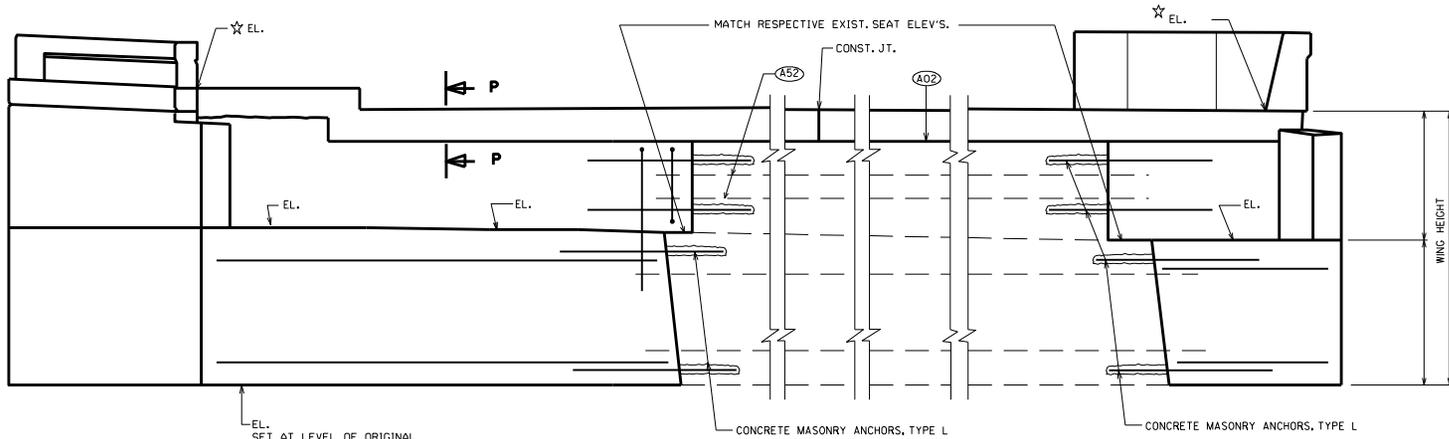


LIMITS BEFORE SHORING REQUIRED

HIGHWAY OVER RAILROAD DESIGN REQUIREMENTS

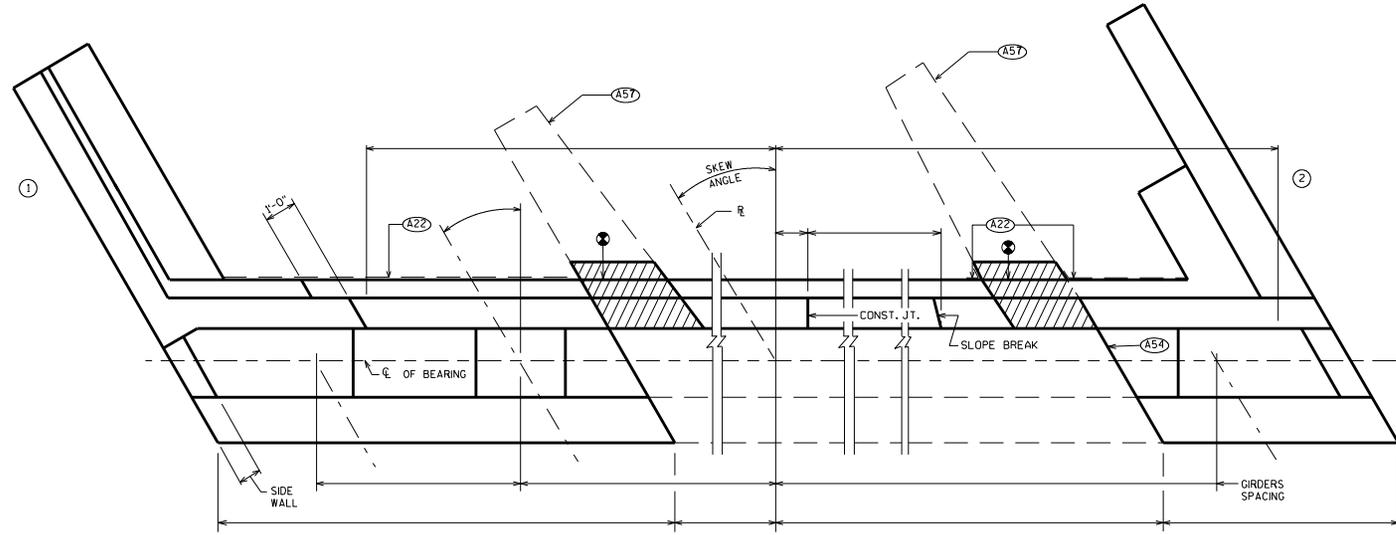
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
STRUCTURES DEVELOPMENT SECTION

APPROVED: Bill Oliva DATE: 1-12



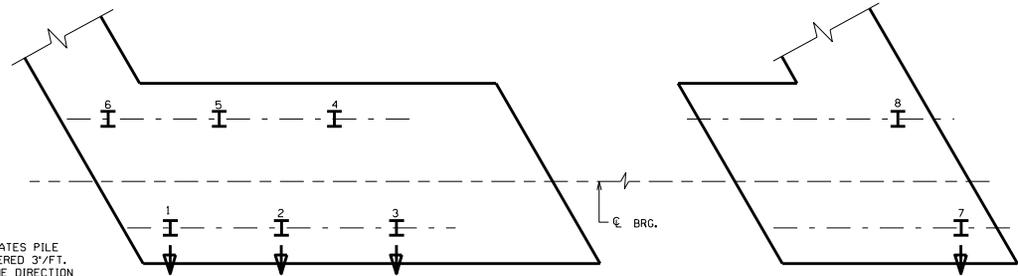
ELEVATION

EL. SET AT LEVEL OF ORIGINAL ABUTMENT OR STEP LOWER IF NECESSARY.



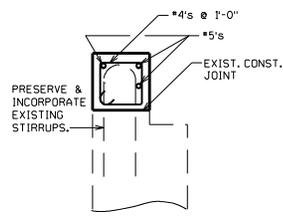
WING WITHOUT PILE

WING WITH PILE



PILE PLAN

INDICATES PILE BATTERED 3"/FT. IN THE DIRECTION SHOWN.



SECTION P
ALSO SEE STANDARD 40.04

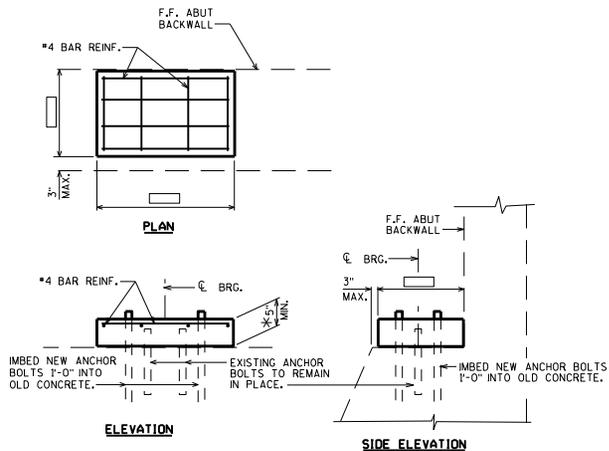
NOTES

- (A02) CONSTRUCTION JOINT: POUR CONCRETE ABOVE THIS JOINT AFTER SUPERSTRUCTURE CONCRETE IS IN PLACE. STRIKE OFF AND LEAVE ROUGH.
- (A22) 18" (RMW) RUBBERIZED MEMBRANE WATERPROOFING SEAL ALL HORIZ. & VERT. JOINTS AT BACKFACE.
- (A52) SALVAGE EXIST. REINF. & EXTEND FULL LENGTH INTO NEW WORK.
- (A54) ROUGHEN SURFACE OF CONCRETE 1/4" DEEP MIN. ALL AREAS OF NEW TO EXIST. CONCRETE CONTACT.
- (A57) EXIST. WINGS, REMOVE A MIN. OF 2'-0" BELOW FINISHED GRADE.
- ☆ ELEV. @ F.F. ABUT. BACKWALL AND GUTTERLINE.
- ⊙ REMOVE CONC. IN THIS AREA DOWN TO EXIST. BRIDGE SEAT. INCORPORATE EXIST. BAR STEEL INTO NEW WORK.

DESIGNER NOTES

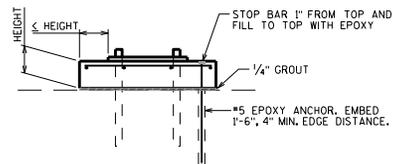
SEE CHPT. 12 FOR NEW BAR STEEL PLACEMENT, DETAILS, DIMENSIONS, & NOTES.

ABUTMENT WIDENING	
STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STRUCTURES DEVELOPMENT SECTION	
APPROVED: <i>Bill Oliva</i>	DATE: 1-12



CONCRETE BEARING BLOCK DETAILS

(MAY BE USED IN LIEU OF PLATE 'E' AS SHOWN ON STD. 40.08)



PRECAST CONCRETE BLOCK DETAIL

DEPTH = MIN. 5", MAX. 1'-0" *

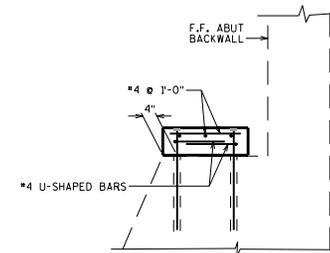
ANCHOR IN AT LEAST 4 LOCATIONS (ANCHORS INCLUDE EPOXY ANCHORS, ANCHOR BOLTS OR COMBINATION).

GROUT 1/4" BENEATH PRECAST ELEMENT - ELIMINATE STRESS CONCENTRATION AND REDUCE CRACKING.

PRECAST BLOCK (OR ANY CONCRETE BLOCK) MUST EXTEND BEYOND BEARING A DISTANCE EQUAL TO, OR GREATER THAN, THE HEIGHT OF THE CONCRETE BLOCK *. THIS IS TO ACCOUNT FOR 45-DEGREE DOWNWARD AND OUTWARD STRESS DISTRIBUTION. THIS PROVISION CAN BE DISREGARDED IF A FULL-DEPTH CONCRETE DIAPHRAGM IS USED IN CONJUNCTION WITH A 1/2" THICK ELASTOMERIC PAD (FIXED SEAT).

REINFORCEMENT SHOULD BE IN BOTH DIRECTIONS UTILIZING #4 @ 1'-0" MAXIMUM SPACING.

BURN EXISTING ANCHOR BOLTS OFF FLUSH WITH BEAM SEAT.



* ALTERNATE DETAIL

TO BE USED FOR CASES WHERE HEIGHT EXCEEDS 1'-0" OR INSUFFICIENT EDGE DISTANCE (PRECAST OPTION SHOWN)

CONCRETE BEARING BLOCK DETAILS

STATE OF WISCONSIN
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APPROVED: Bill Oliva

DATE:
1-12