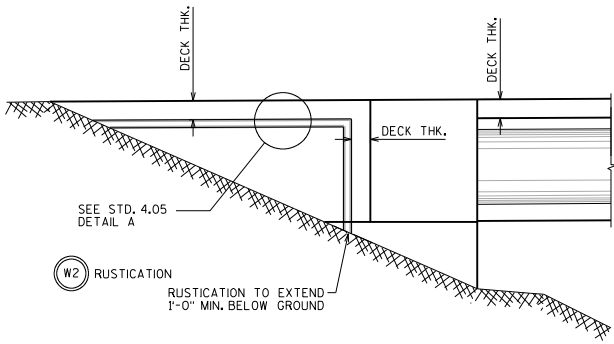
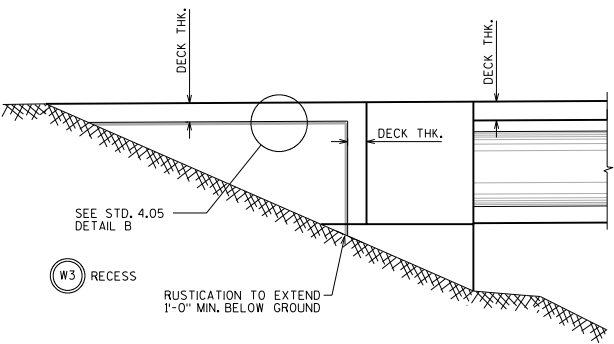


W1 STANDARD



W2 RUSTICATION

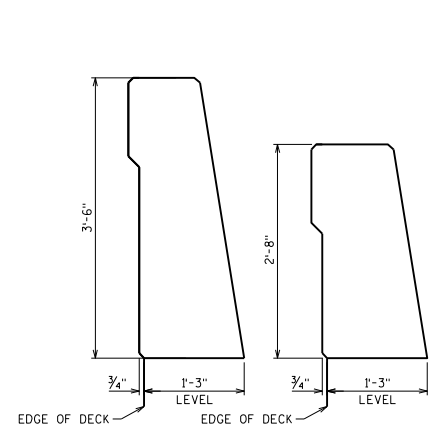
RUSTICATION TO EXTEND 1'-0" MIN. BELOW GROUND



W3 RECESS

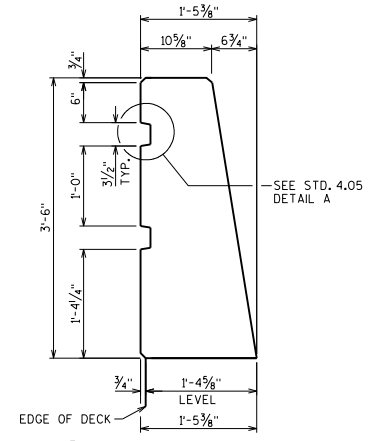
RUSTICATION TO EXTEND 1'-0" MIN. BELOW GROUND

WING OPTIONS



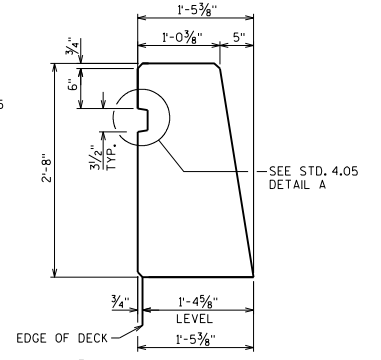
R1 STANDARD

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



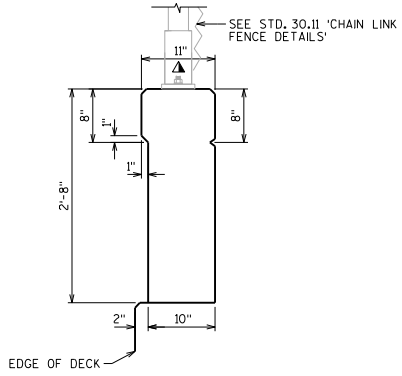
R2 DOUBLE RUSTICATION LINES

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



R2 SINGLE RUSTICATION LINES

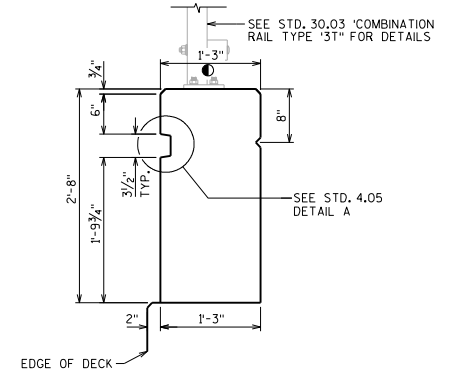
MODIFIED 'SINGLE SLOPE PARAPET 32SS' (AREA = 3.25 SF, WEIGHT = 488 LB/FT.)



R3 STANDARD

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

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



R4 SINGLE RUSTICATION LINES


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

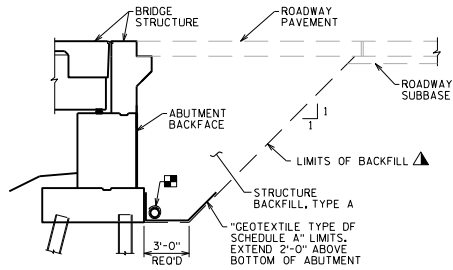
● USE 1'-0" WHEN USED WITH CHAIN LINK FENCING

PARAPET OPTIONS

DESIGNER NOTES

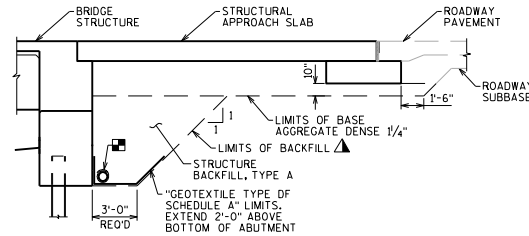
WINGS PARALLEL TO CENTERLINE OF ABUTMENT (ELEPHANT EAR) ARE TO BE PLAIN (TYPE 1).

WING & PARAPET AESTHETIC DETAILS	
	BUREAU OF STRUCTURES
APPROVED: <u>Bill Oliva</u>	DATE: 1-17



TYPICAL SECTION THRU ABUTMENT

(A3 ABUTMENT WITHOUT STRUCTURAL APPROACH)



TYPICAL SECTION THRU ABUTMENT

(A1 ABUTMENT WITH STRUCTURAL APPROACH)

NOTES (ABUTMENTS)

THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURES BRIDGES B--" SHALL BE THE EXISTING GROUNDLINE.

BACKFILL PAY LIMITS, BACKFILL BEYOND BACKFILL PAY LIMITS SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES. LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR.

AT THE BACKFACE OF ABUTMENT ALL VOLUME WHICH CANNOT BE PLACED BEFORE ABUTMENT CONSTRUCTION AND IS NOT OCCUPIED BY THE NEW STRUCTURE SHALL BE BACKFILLED WITH STRUCTURE BACKFILL.

EXCAVATION BELOW THE ABUTMENT AND ABUTMENT BEDDING MATERIALS REQUIRES ENGINEER APPROVAL. GEOTEXTILE SHALL BE SET AT THE BOTTOM OF EXCAVATION AND EXTEND 2'-0" ABOVE BOTTOM OF ABUTMENT, (NOTE INTENDED FOR PILE SUPPORTED ABUTMENTS, SEE DESIGNER NOTES FOR MORE INFORMATION)

NOTES (BOX CULVERTS)

THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURES CULVERTS C--" SHALL BE THE EXISTING GROUNDLINE.

BACKFILL PAY LIMITS, BACKFILL BEYOND BACKFILL PAY LIMITS SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES. LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR.

ALL VOLUME WHICH CANNOT BE PLACED BEFORE CULVERT CONSTRUCTION AND NOT OCCUPIED BY THE NEW STRUCTURE SHALL BE BACKFILLED WITH STRUCTURE BACKFILL WITHIN THE LENGTH OF THE CULVERT INCLUDING THE APRON WING WALLS.

NOTE AND DIMENSION NOT REQUIRED. (UNDERCUT NOT REQUIRED PER GEOTECHNICAL ENGINEER OR WHEN CONSTRUCTED ON FILLS)

UNDER CUT X'-X". EXCAVATION FOR UNDER CUT TO BE INCLUDED IN EXCAVATION FOR STRUCTURES. BACKFILL WITH "STRUCTURE BACKFILL TYPE B".

UNDER CUT X'-X". EXCAVATION FOR UNDER CUT TO BE INCLUDED IN EXCAVATION FOR STRUCTURES. PLACE "GEOTEXTILE TYPE C" AND BACKFILL WITH "BREAKER RUN".

IN LIEU OF USING BREAKER RUN FOR THE BOX CONSTRUCTION PLATFORM, THE CONTRACTOR MAY ELECT TO SUBSTITUTE #1 OR #2 CONCRETE COARSE AGGREGATE, SELECT CRUSHED MATERIAL OR OTHER GRANULAR MATERIAL AS APPROVED BY THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR BASE STABILITY WITH ANY SUBSTITUTED MATERIAL. THE REGION GEOTECHNICAL ENGINEER MAY BE CONTACTED TO DETERMINE IF "OTHER GRANULAR MATERIAL" IS ACCEPTABLE.

ALL PRECAST BOX SECTIONS SHALL BE PLACED ON A BEDDING OF "STRUCTURE BACKFILL TYPE B" OF 6" MINIMUM DEPTH. (NOTE APPLICABLE WHEN PRECAST NOTE IS SHOWN ON THE PLANS)

NOTES (RETAINING WALLS)

THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURES RETAINING WALLS R--" SHALL BE THE EXISTING GROUNDLINE.

BACKFILL PAY LIMITS, BACKFILL BEYOND BACKFILL PAY LIMITS SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES. LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR.

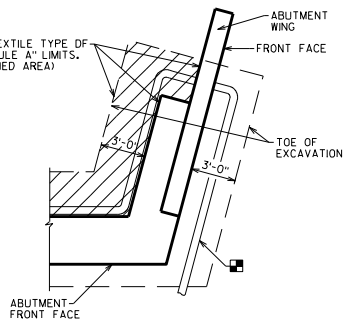
AT THE BACKFACE OF WALL ALL VOLUME WHICH CANNOT BE PLACED BEFORE WALL CONSTRUCTION AND NOT OCCUPIED BY THE NEW STRUCTURE SHALL BE BACKFILLED WITH STRUCTURE BACKFILL. (NOTE APPLICABLE FOR CAST-IN-PLACE CONCRETE CANTILEVER WALLS AND SIMILAR STRUCTURES)

DESIGNER NOTES

THE DESIGN ENGINEER SHOULD PROVIDE BACKFILL LIMIT DETAILS AND NOTES AS NEEDED, SEE BRIDGE MANUAL SECTIONS 6.4.2 AND 9.10 FOR ADDITIONAL INFORMATION.

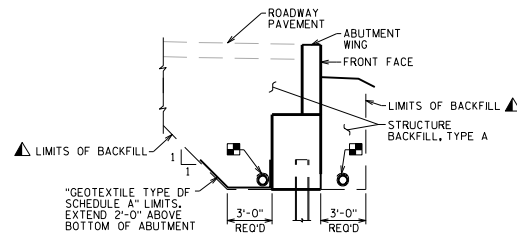
FOR CULVERTS, THE ABOVE NOTE REGARDING POTENTIAL SUBSTITUTION OF BREAKER RUN SHOULD ONLY BE INCLUDED ON THE PLANS IF ALLOWED BY THE REGION GEOTECHNICAL ENGINEER.

SUBSURFACE DRAINAGE DETAILS AND NOTES SHOULD DIRECT DRAINAGE AROUND THE ABUTMENT RATHER THAN BELOW THE ABUTMENT. DRAINAGE UNDER THE ABUTMENT MAY CAUSE SLOPE PAVING DAMAGE OR FAILURE.



ABUTMENT PLAN WITH WING

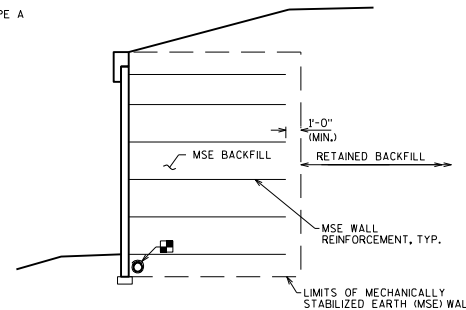
(A1 ABUTMENT WITHOUT STRUCTURAL APPROACH)



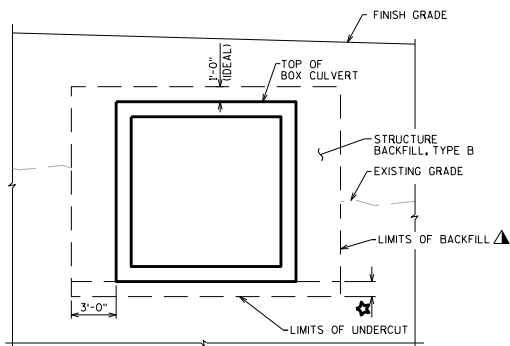
TYPICAL SECTION THRU WING

(A1 ABUTMENT WITHOUT STRUCTURAL APPROACH)

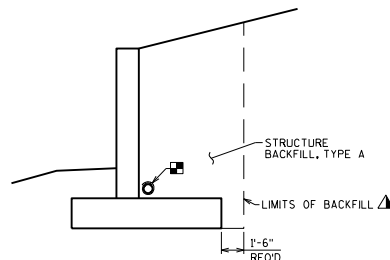
CULVERT UNDERCUT AND BEDDING BACKFILL TO BE DETERMINED BY GEOTECHNICAL ENGINEER. (CHOOSE APPLICABLE NOTE, MODIFY AS NEEDED)



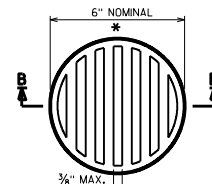
TYPICAL SECTION THRU MSE RETAINING WALL



TYPICAL SECTION THRU BOX CULVERT



TYPICAL SECTION THRU RETAINING WALL



RODENT SHIELD DETAIL

* DIMENSIONS ARE APPROXIMATE, THE GRATE IS SIZED TO FIT INTO A PIPE COUPLING, ORIENT SO SLOTS ARE VERTICAL.

THE RODENT SHIELD, PIPE COUPLING AND SCREWS SHALL BE CONSIDERED INCIDENTAL TO THE BID ITEM "PIPE UNDERDRAIN WRAPPED 6-INCH".

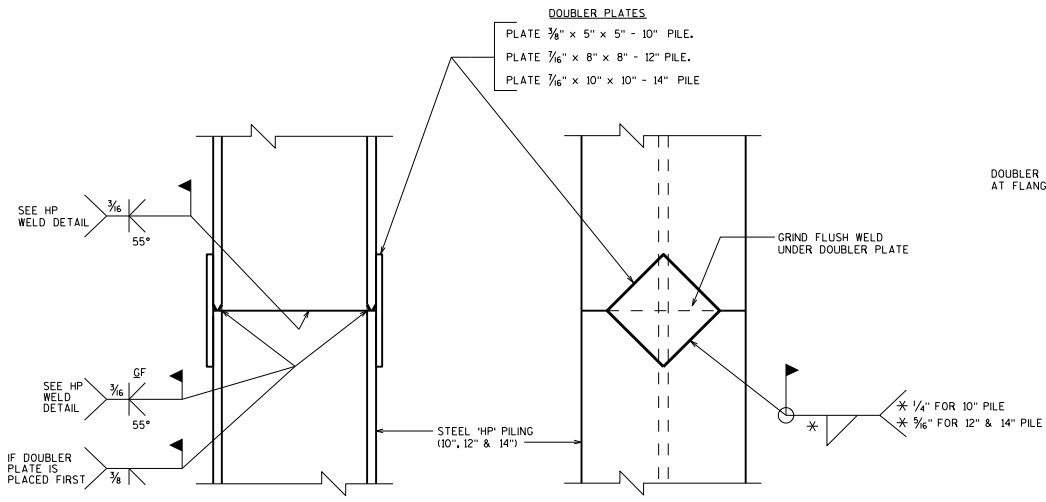
THE RODENT SHIELD SHALL BE A PVC GRATE SIMILAR TO THIS DETAIL. THE GRATE IS COMMERCIALY AVAILABLE AS A FLOOR STRAINER. A PIPE COUPLING IS REQUIRED FOR THE ATTACHMENT OF THIS SHIELD TO THE EXPOSED END OF THE PIPE UNDERDRAIN. THE SHIELD SHALL BE FASTENED TO THE PIPE COUPLING WITH TWO OR MORE NO. 10 X 1-INCH STAINLESS STEEL SHEET METAL SCREWS.



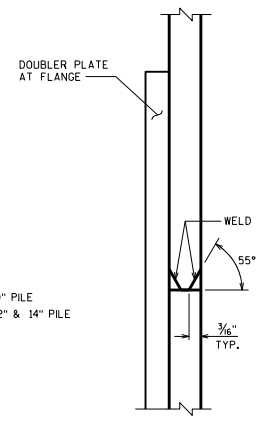
SECTION B-B

PIPE UNDERDRAIN WRAPPED (6-INCH), SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. (SHOW DETAIL ON PLANS)

STRUCTURE BACKFILL LIMITS AND NOTES	
	BUREAU OF STRUCTURES
APPROVED: <i>Bill Oliva</i>	DATE: 1-17



STEEL 'HP' SHAPES



HP WELD DETAIL
FLANGE SHOWN, WEB SIMILAR

DESIGNER NOTES

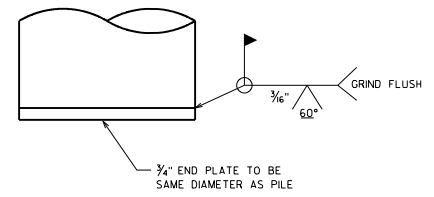
FULL DESIGN LOADING CAN BE USED IF PREBORED HOLE IS LARGE ENOUGH TO ALLOW PILE HANGUPS AND ALLOW FILLING WITH SAND.
SEE WISDOT POLICY ITEM IN BRIDGE MANUAL 11.3.112.3 FOR GUIDANCE ON "HP" PILES.
SEE BRIDGE MANUAL SECTION 11.3.117.7 FOR PILE RESISTANCE VALUES.

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.

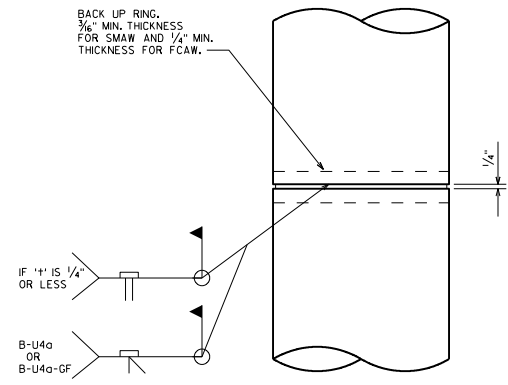
NOTES

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

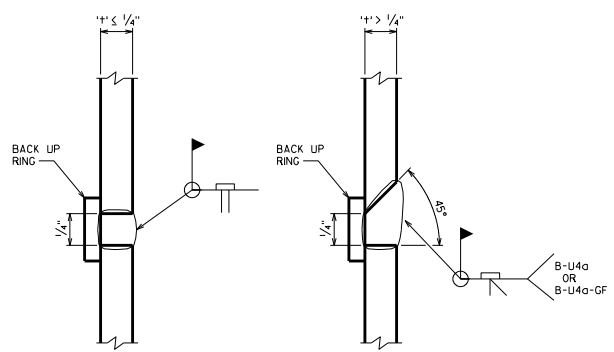
IF APPLICABLE, PLACE THE FOLLOWING NOTE ON THE PLANS:
PILES PLACED IN PREBORED HOLES CORED INTO ROCK DO NOT REQUIRE DRIVING.



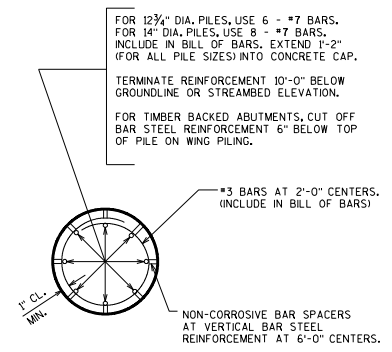
**END PLATE DETAIL FOR CIP PILING
IN ARTESIAN CONDITIONS**
(ONLY USE FOR ARTESIAN CONDITIONS)



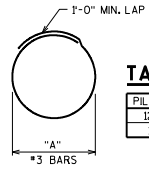
**CAST-IN-PLACE
'PIPE PILE'**



CIP PILE WELD DETAIL



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



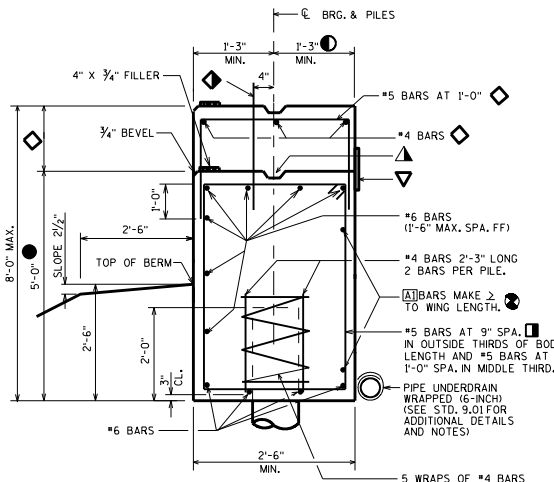
TABLE

PILE DIA.	DIM "A"	LENGTH
12 3/4"	9 3/4"	3'-7"
14"	11"	3'-11"

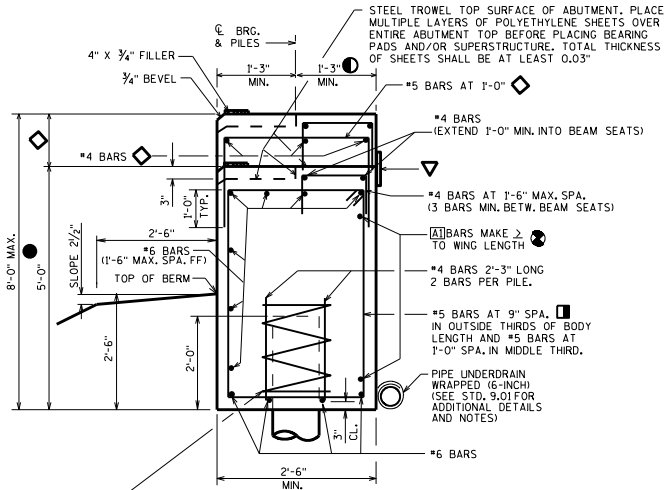
PILE DETAILS

BUREAU OF STRUCTURES

APPROVED: Bill Oliva DATE: 1-17



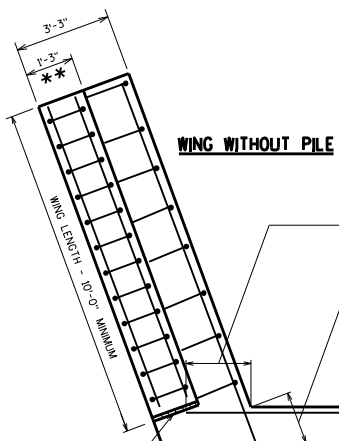
TYPE A1 WITH FIXED SEAT



TYPE A1 WITH SEMI-EXPANSION SEAT

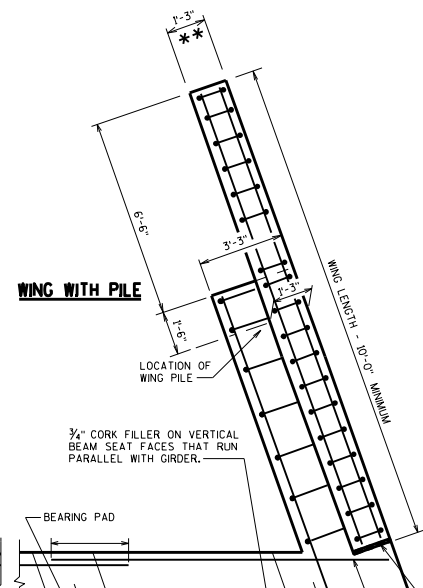
LEGEND

- ◆ #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 \geq 4" THIS ADDITIONAL REINFORCEMENT SHALL BE ADDED, MAX. SPA. OF HORIZ. #4 BARS = 1'-0".
- USE 1'-3" FOR SLAB SPANS AND FOR GIRDER SPANS WITH NO PAVING NOTCH, USE 1'-6" FOR GIRDER SPANS WITH NO PAVING NOTCH, BUT WHERE 36W", 45W", 54", 54W", 70", 72W" OR 82W" GIRDERS ARE USED, AND SKEW $>$ 25°. USE 1'-3" FOR SLAB SPANS WITH A PAVING NOTCH, BUT NO STRUCTURAL APPROACH SLAB.
- USE 1'-11" FOR GIRDER SPANS WITH A PAVING NOTCH, BUT NO STRUCTURAL APPROACH SLAB.
- USE 1'-7" FOR SLAB SPANS WITH A STRUCTURAL APPROACH SLAB, (STD. 12.10) USE 2'-3" FOR GIRDER SPANS WITH A STRUCTURAL APPROACH SLAB, (STD. 12.10)
- 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 "IX", OR SINGLE SLOPE PARAPET "SSSS" IS USED. WINGWALL WIDTH SHALL BE 1'-9" WHEN TYPE "NY3" OR "NY4" RAILING 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".
- ★ WHEN BODY SECTION IS $>$ 50'-0" LONG PROVIDE VERTICAL CONSTRUCTION JOINT, RUN BAR STEEL THRU JOINT AND SEAL JOINT WITH 18" RUBBERIZED MEMBRANE WATERPROOFING, SEE STD. 12.09 FOR ALTERNATE CONSTRUCTION JOINT.
- ⊗ SHOW ALL BARS FOR CLARITY.

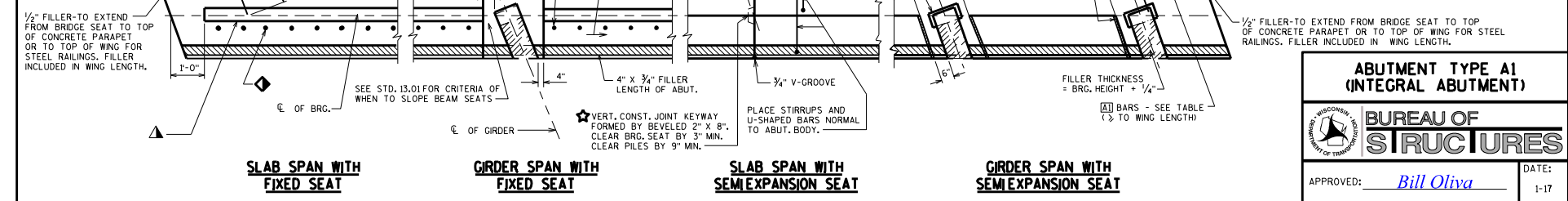


WING WITHOUT PILE

DISTANCE OR EQUIVALENT STD. HOOK	BAR SIZE
1'-9"	5
2'-1"	6
2'-9"	7
3'-8"	8
4'-7"	9
5'-10"	10



WING WITH PILE



SLAB SPAN WITH FIXED SEAT

GIRDER SPAN WITH FIXED SEAT

SLAB SPAN WITH SEMI-EXPANSION SEAT

GIRDER SPAN WITH SEMI-EXPANSION SEAT

DESIGNER NOTES

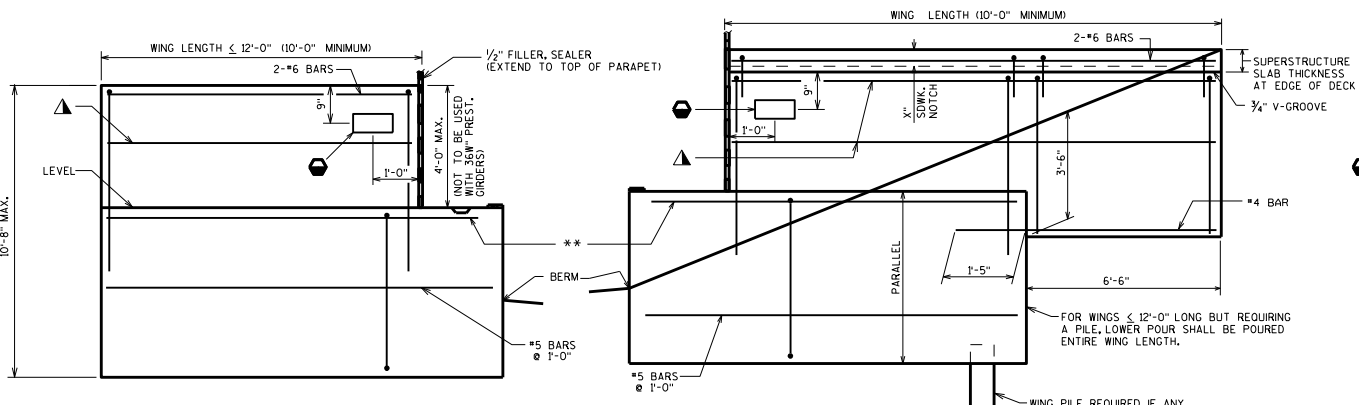
- LAP LENGTHS FOR HORIZONTAL BARS SHALL BE BASED ON A "CLASS C" TOP TENSION LAP SPLICE.
- PILING SPACING IN ABUTMENT BODY SHALL BE 8'-0" MAX. FOR ALL TYPES OF PILING, THE MAX. PILE SPACING FROM THE END OF THE ABUT. BODY TO THE FIRST PILE SHALL BE THE MINIMUM OF ONE-HALF PILE SPACE OR 2'-6".
- CONCRETE 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)

ABUTMENT TYPE A1 (INTEGRAL ABUTMENT)

BUREAU OF STRUCTURES

DATE: 1-17

APPROVED: *Bill Oliva*



WING WITHOUT PILE ELEVATION
(FRONT FACE)

WING WITH PILE ELEVATION
(FRONT FACE)

DESIGNER NOTES

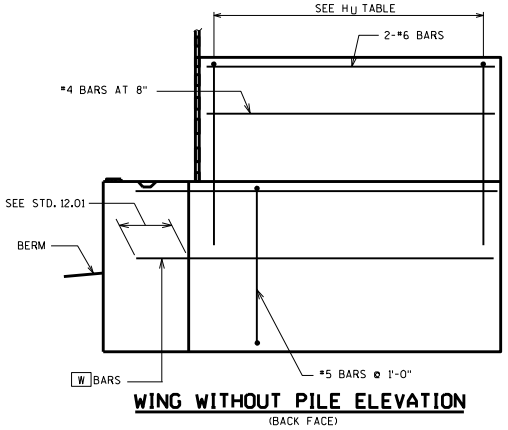
LENGTH OF A1 BARS SHALL BE ≥ TO WING LENGTH.
 WING WITH PILE & WING WITHOUT PILE CAN BE USED FOR EITHER SIDEWALK OR SLOPED FACE PARAPETS. THE TYPE OF WING TO USE IS BASED ONLY ON THE WING HEIGHT AND WING LENGTH LIMITATIONS SHOWN.
 LAP LENGTH FOR HORIZONTAL BARS SHALL BE SHOWN ON A "CLASS C" TOP TENSION LAP SPLICE.
 WING BARS AND DOWEL BARS SHALL BE EPOXY COATED.
 NAME PLATE (ONLY FOR TYPE "F", "W" AND "M" OR TIMBER RAIL AS SHOWN ON STANDARD 30.24), LOCATE NAME PLATE ON FIRST RIGHT WING TRAVELING UP STATION.
 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_{DEH} = 1.50
 γ_{DEV} = 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

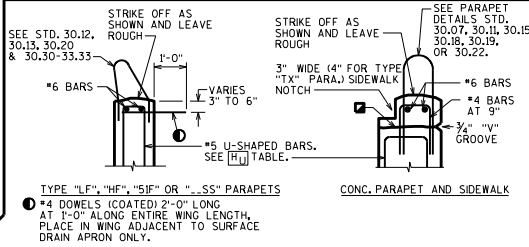
WING LENGTH	WING HEIGHT				BARS
	8'-6"	10'-0"	11'-6"	13'-0"	
10'-0"	#6-#6s	#6-#6s	#6-#5s		W
12'-0"	#7-#8s	#7-#8s	#7-#5s		A1
16'-0"	#7-#8s	#7-#8s	#7-#5s		W
20'-0"	#7-#8s	#7-#8s	#7-#5s		A1
24'-0"	#8-#8s	#8-#8s	#8-#5s		W
	#8-#8s	#8-#8s	#8-#5s		A1

* WING WITHOUT PILE VALUES SHOWN. (FOR WING WITH PILE THAT HAS WING LENGTH IN THIS REGION, USE VALUES FOR 1'-6" WING HEIGHT.)

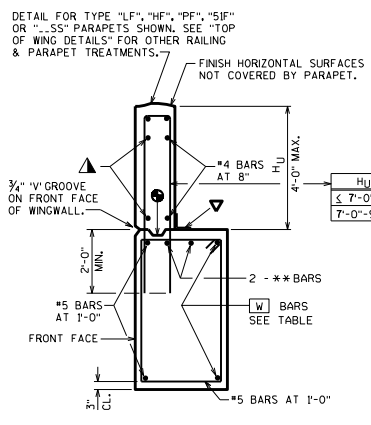


WING WITHOUT PILE ELEVATION
(BACK FACE)

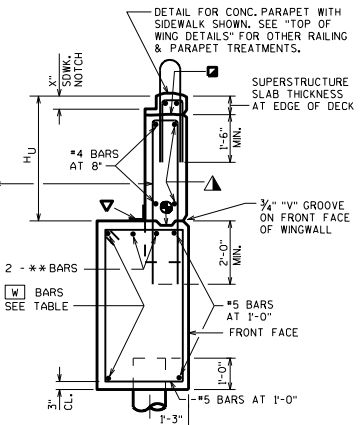
WING WITH PILE ELEVATION
(BACK FACE)



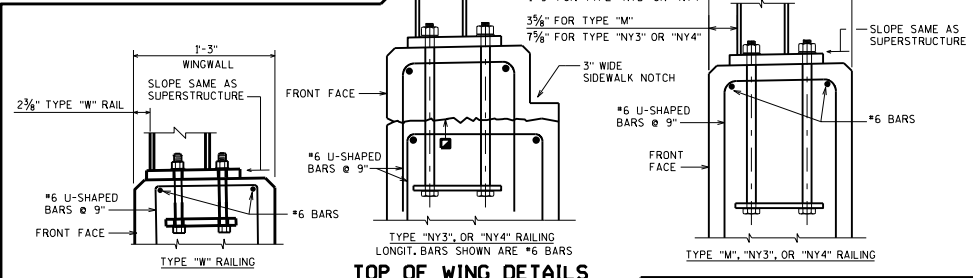
TOP OF WING DETAILS
(TYP. FOR A3 ABUTMENT WINGS ALSO)



WING WITHOUT PILE SECTION



WING WITH PILE SECTION



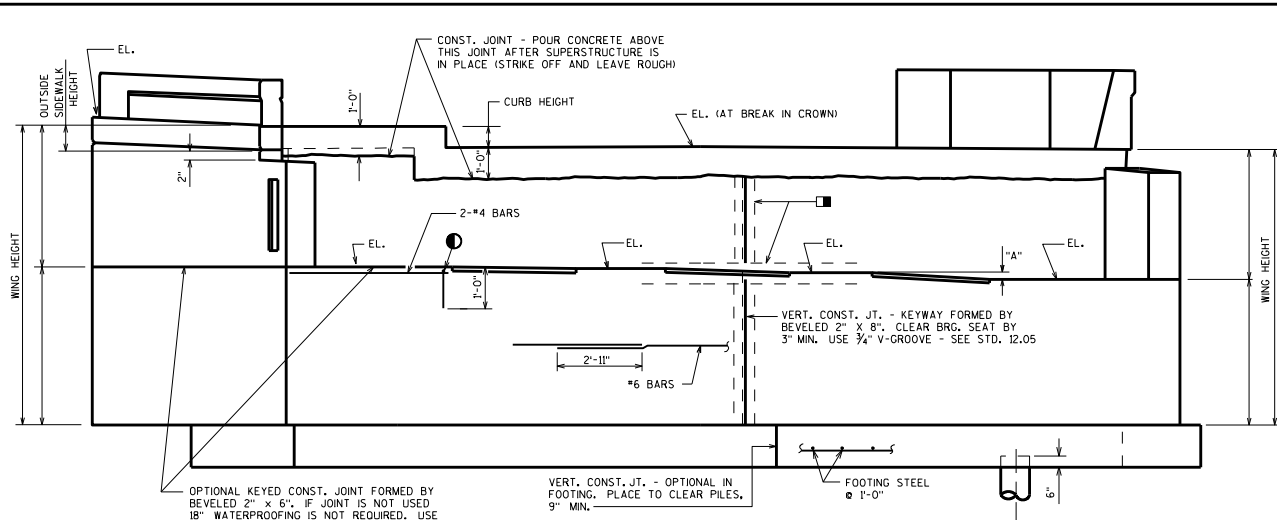
CONSTRUCTION JOINT, LEAVE ROUGH. REQUIRED FOR PRESTRESSED CONCRETE SUPERSTRUCTURES. OPTIONAL FOR OTHERS, POUR CONCRETE ABOVE THIS JOINT AFTER DECK IS IN PLACE. IF JOINT IS USED, UTILIZE RUBBERIZED MEMBRANE WATERPROOFING (COST INCIDENTAL TO BID ITEM "CONCRETE MASONRY BRIDGES").
 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.

USE #4 BARS @ 1'-6" FOR WINGWALL WIDTH = 1'-3" USE #4 BARS @ 1'-4" FOR WINGWALL WIDTH = 1'-6".
 BARS TO BE SAME SIZE AS "W" BARS.
 OPTIONAL CONST. JOINT FORMED BY BEVELED 2" x 6" KEYWAY WITH MEMBRANE ON BACKFACE.

ABUTMENT TYPE A1



APPROVED: Bill Oliva DATE: 1-17



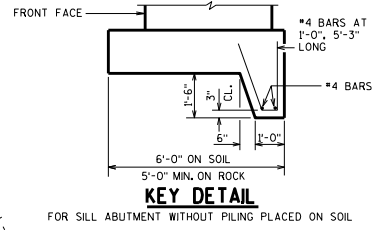
FRONT ELEVATION

DESIGNER NOTES

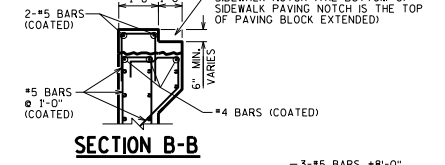
PILING SPACING IN ABUTMENT FOOTING SHALL BE 8'-0" MAXIMUM.
 WHEN BODY SECTION IS MORE THAN 50'-0" LONG, PROVIDE VERTICAL CONSTRUCTION JOINT. RUN BAR STEEL THRU JOINT. SEAL JOINT WITH 18" RUBBERIZED MEMBRANE WATERPROOFING. SEE STD. 12.09 FOR ALTERNATE CONSTRUCTION JOINT.
 IN "FRONT ELEVATION" VIEW, GIVE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

LEGEND

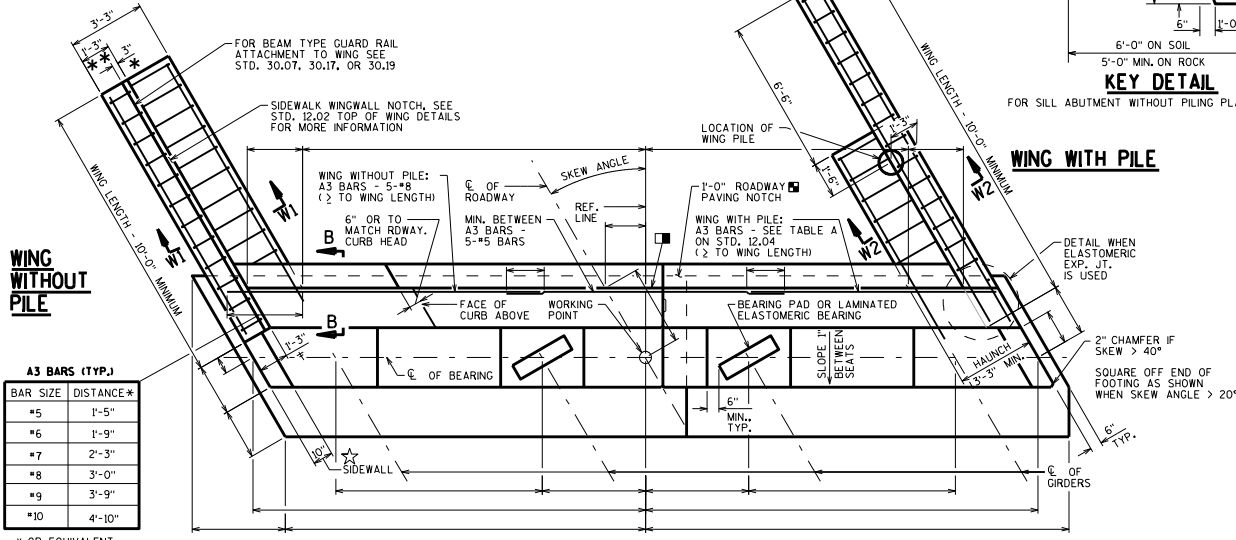
- ▣ 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZ. AND VERT. JOINTS ON BACKFACE ABOVE FOOTING.
- △ KEYED CONSTRUCTION JOINT FORMED BY BEVELED 2" X 6".
- #4 AT 9" BEAM SEAT. SPACE AT 1'-0" BETWEEN SEATS. THIS STEEL IS REQUIRED ONLY IF DIMENSION "A" EXCEEDS 4".
- † 1'-5" WHEN VERTICAL FACE PARAPET TYPE "TX" IS USED.
- * 4" WHEN VERTICAL FACE PARAPET TYPE "TX" IS USED.
- ** WINGWALL WIDTH SHALL BE 1'-6" WHEN TYPE "M" RAILING, VERTICAL FACE PARAPET "TX", OR SINGLE SLOPE PARAPET "56SS" IS USED. "56SS" SHOULD NOT BE USED ON A SIDEWALK. WINGWALL WIDTH SHALL BE 1'-9" WHEN TYPE "NY3" OR "NY4" RAILING IS USED.
- ☒ 3'-3" (SLOPE PAVING), 4'-6" (HEAVY RIPRAP)
- ☑ PAVING NOTCH IS 1'-0" WIDE BY 1'-4" DEEP IF STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED.
- ☆ SIDEWALL IS 1'-3" WIDE IF STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED.
- ⦿ SHOW ALL BARS FOR CLARITY.



KEY DETAIL



SECTION B-B



A3 BARS (TYP.)

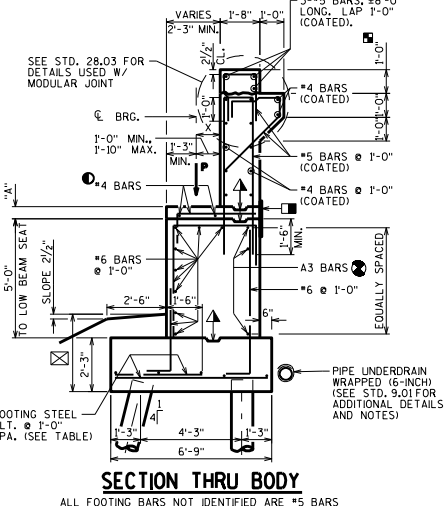
BAR SIZE	DISTANCE*
#5	1'-5"
#6	1'-9"
#7	2'-3"
#8	3'-0"
#9	3'-9"
#10	4'-10"

* OR EQUIVALENT STANDARD HOOK

WING WITH SIDEWALK

PLAN

WING WITH SLOPED FACE PARAPET



SECTION THRU BODY

h = WING HEIGHT (FT.)
 P = XDC (PDC) + XDW (PDW) + XLL (LL) (K/FT.)

PILE REACTIONS PER FOOT IN KIPS

FRONT ROW = $P [(0.22 \times X/4.25) + ((h+2.25)^{3/310}) + 4.6]$
 BACK ROW = $P [(0.78 \times X/4.25) - ((h+2.25)^{3/705}) + 16.8]$

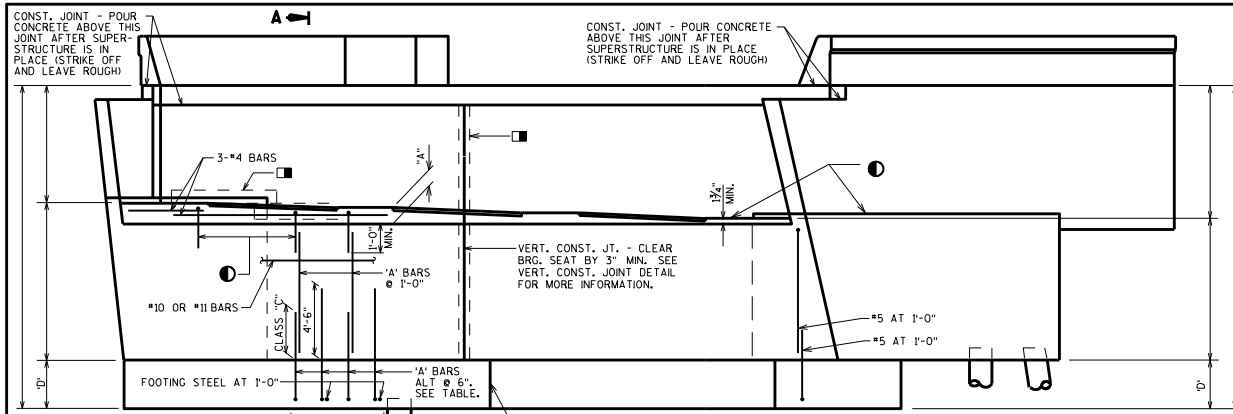
(PILES MUST ALSO BE DESIGNED TO ACCOUNT FOR LATERAL LOADS)

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

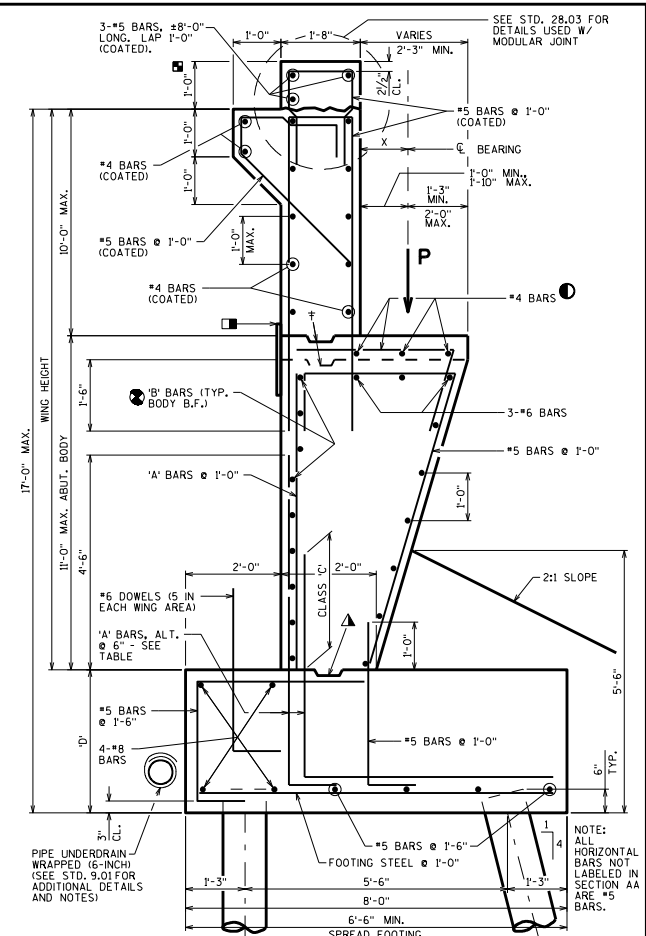
ABUTMENT TYPE A3

BUREAU OF STRUCTURES

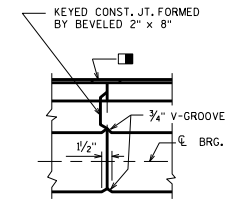
APPROVED: *Bill Oliva* DATE: 1-17



FRONT ELEVATION



SECTION A-A



VERT. CONST. JOINT

$P = \gamma D C (P D_c) + \gamma D_w (P D_w) + \gamma L L (P L L)$

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

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

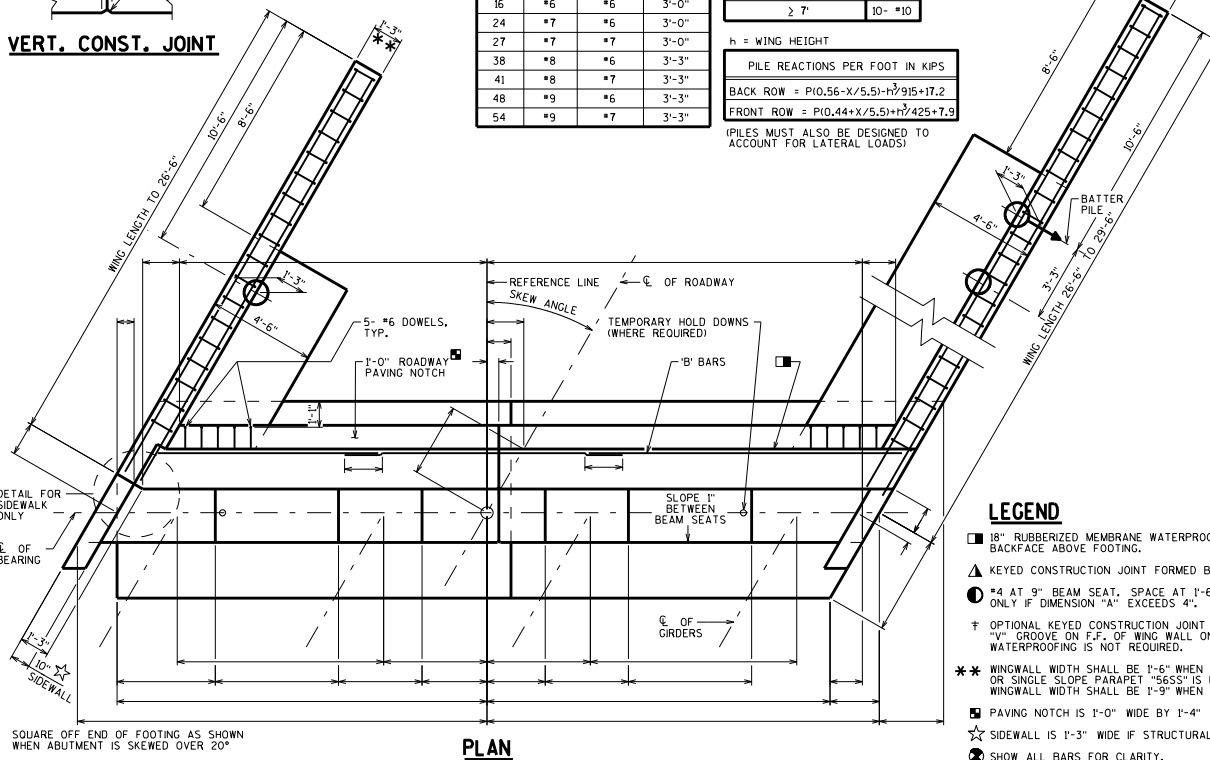
h = WING HEIGHT

PILE REACTIONS PER FOOT IN KIPS

BACK ROW = $P(0.56 - X/5.5) + 9.15 + 17.2$

FRONT ROW = $P(0.44 + X/5.5) + 9.15 + 7.9$

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



PLAN

DESIGNER NOTES

PIILING SPACING IN ABUTMENT FOOTING SHALL BE 8'-0" MAXIMUM.

WHEN BODY SECTION IS MORE THAN 50'-0" LONG, PROVIDE VERTICAL CONSTRUCTION JOINT. RUN BAR STEEL THRU JOINT. SEAL JOINT WITH 18" RUBBERIZED MEMBRANE WATERPROOFING. SEE STD. 12.09 FOR ALTERNATE CONSTRUCTION JOINT.

DESIGNER NOTES CONT'D

IN "FRONT ELEVATION" VIEW, GIVE ELEVATION OF ALL BEARING AREAS AND ELEVATION AT BOTTOM OF PARAPETS AT EACH END OF WINGS. ALL ELEVATIONS ARE TAKEN AT FRONT FACE OF BACKWALL.

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

PARAPET NOT SHOWN IN PLAN VIEW FOR CLARITY.

SEE STD. 12.03 FOR ADDITIONAL DETAILS.

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

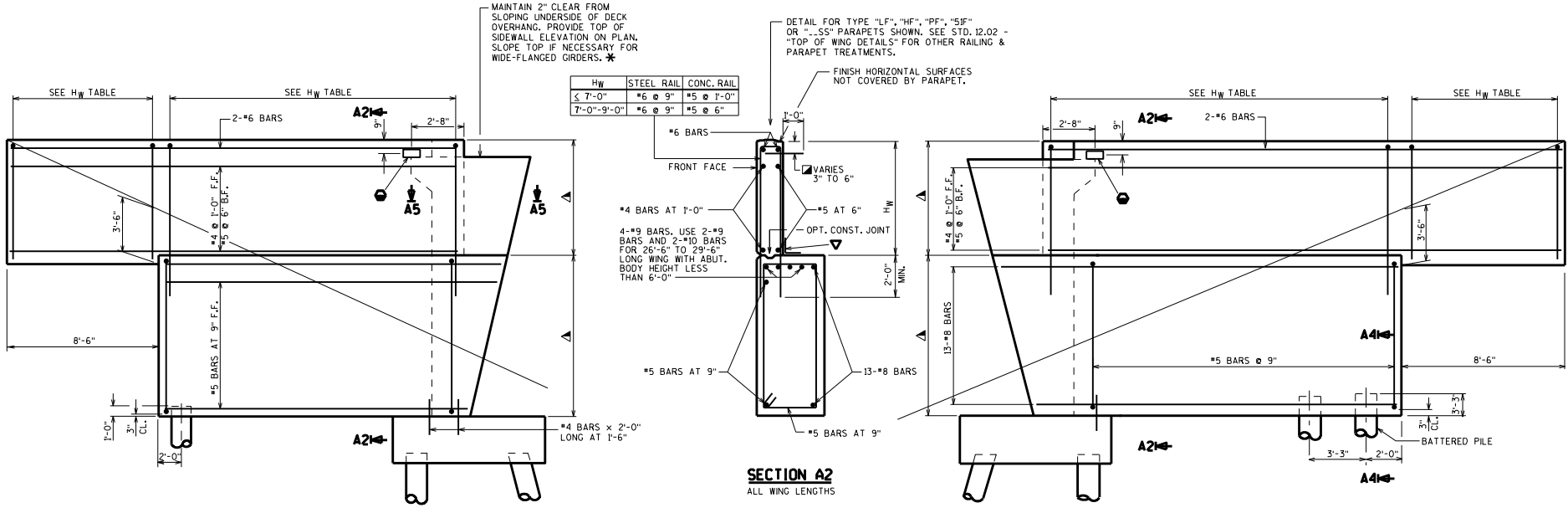
LEGEND

- 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZ. AND VERT. JOINTS ON BACKFACE ABOVE FOOTING.
- ▲ KEYED CONSTRUCTION JOINT FORMED BY BEVELED 2" X 6".
- #4 AT 9" BEAM SEAT. SPACE AT 1'-6" BETWEEN SEATS. THIS STEEL IS REQUIRED ONLY IF DIMENSION "A" EXCEEDS 4".
- † OPTIONAL KEYED CONSTRUCTION JOINT FORMED BY BEVELED 2" X 6". USE 3/4" "V" GROOVE ON F.F. OF WING WALL ONLY. IF JOINT IS NOT USED, WATERPROOFING IS NOT REQUIRED.
- * WINGWALL WIDTH SHALL BE 1'-6" WHEN TYPE "M" RAILING, VERTICAL FACE PARAPET "TX", OR SINGLE SLOPE PARAPET "56SS" IS USED. "56SS" SHOULD NOT BE USED ON A SIDEWALK. WINGWALL WIDTH SHALL BE 1'-9" WHEN TYPE "NY3" OR "NY4" RAILING IS USED.
- ☆ PAVING NOTCH IS 1'-0" WIDE BY 1'-4" DEEP IF STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED.
- ★ SIDEWALL IS 1'-3" WIDE IF STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED.
- ⊙ SHOW ALL BARS FOR CLARITY.

ABUTMENT A4 PILE FOOTING



APPROVED: Bill Oliva DATE: 1-17



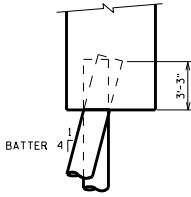
MAINTAIN 2" CLEAR FROM SLOPING UNDERSIDE OF DECK OVERHANG. PROVIDE TOP OF SIDEWALL ELEVATION ON PLAN. SLOPE TOP IF NECESSARY FOR WIDE-FLANGED GIRDERS. *

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

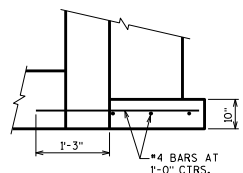
WING ELEVATION
WING LENGTH TO 26'-6"

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

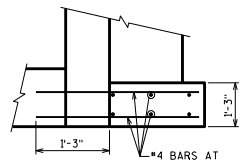
SECTION A2
ALL WING LENGTHS



SECTION A4



SECTION A5
(WITHOUT STRUCTURAL APPROACH SLAB)



SECTION A5
(WITH STRUCTURAL APPROACH SLAB)

DESIGNER NOTES

- BODY DESIGN IS BASED ON AN EQUIVALENT FLUID UNIT WEIGHT OF SOIL OF 40 P.C.F., A 1'-6" SURCHARGE, AND SUPERSTRUCTURE REACTIONS "P".
- WING DESIGN IS BASED ON AN EQUIVALENT FLUID UNIT WEIGHT OF SOIL OF 35 P.C.F. AND A 2'-0" SURCHARGE. A 5 KIP LATERAL RESISTANCE IS USED FOR EACH WING PILE.
- FRONT ROW PILE DESIGN IS BASED ON AN EQUIVALENT FLUID UNIT WEIGHT OF SOIL OF 40 P.C.F. WITH $\gamma_{DEH} = 1.50$, AND SUPERSTRUCTURE REACTIONS "P". BACK ROW PILE DESIGN IS BASED ON AN EQUIVALENT FLUID UNIT WEIGHT OF SOIL OF 20 P.C.F. WITH $\gamma_{DEH_{MIN}} = 0.90$, 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.
- NAME PLATE (ONLY FOR TYPE "W", "M", NY3&4 OR TIMBER RAIL AS SHOWN ON STANDARD 30.24), LOCATE NAME PLATE ON FIRST RIGHT WING TRAVELING UP STATION.
- FOR MODULAR EXPANSION JOINTS W/CONC. DIAPH. RUNNING TO EDGE OF DECK: IF SIDEWALL IS USED, FORM SIDEWALL 2" BELOW CONC. DIAPH.
- #4 DOWELS (COATED), 2'-0" LONG AT 1'-0" CTRS. FROM WING TIP TO PAVING NOTCH. PLACE IN WING ADJACENT TO SURFACE DRAIN APRON ONLY.
- DIMENSIONS TO BE CONSTANT.
- 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.
- ABUTMENT DETAILED WITHOUT STRUCTURAL APPROACH SLAB. SEE STD. 12.10 THRU 12.13 FOR STRUCTURAL APPROACH DETAILS.

LRFD DESIGN LOADS

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

ABUTMENT A4 PILE FOOTING



APPROVED: Bill Oliva DATE: 7-16

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 2½:1 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.

2 ALL WING BARS SHALL BE EPOXY COATED.
3 SHOW ALL LONGITUDINAL BARS FOR CLARITY.

LRFD DESIGN LOADS (WINGS)

LIVE LOAD = 1'-0" SURCHARGE

LOAD FACTORS:

$\gamma_{DC} = 1.25$

$\gamma_{SW} = 1.50$

$\gamma_{LS} = 1.75$

EXPOSURE CLASS 2, $\gamma_F = 0.75$

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

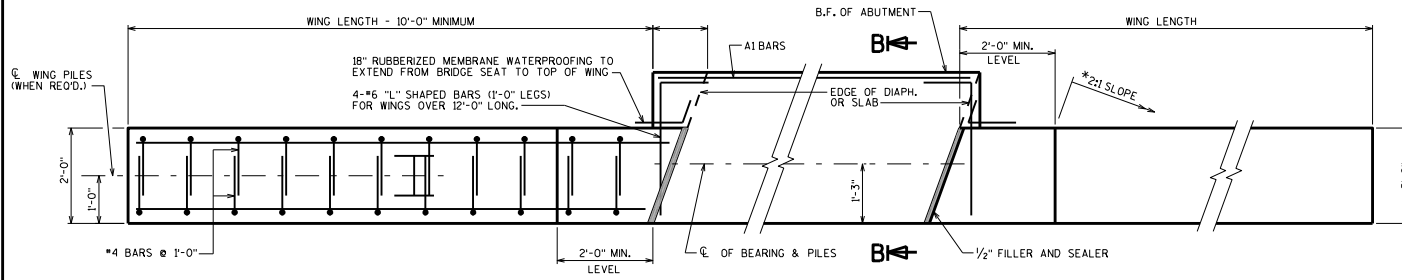
$F_Y = 60,000$ P.S.I.

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

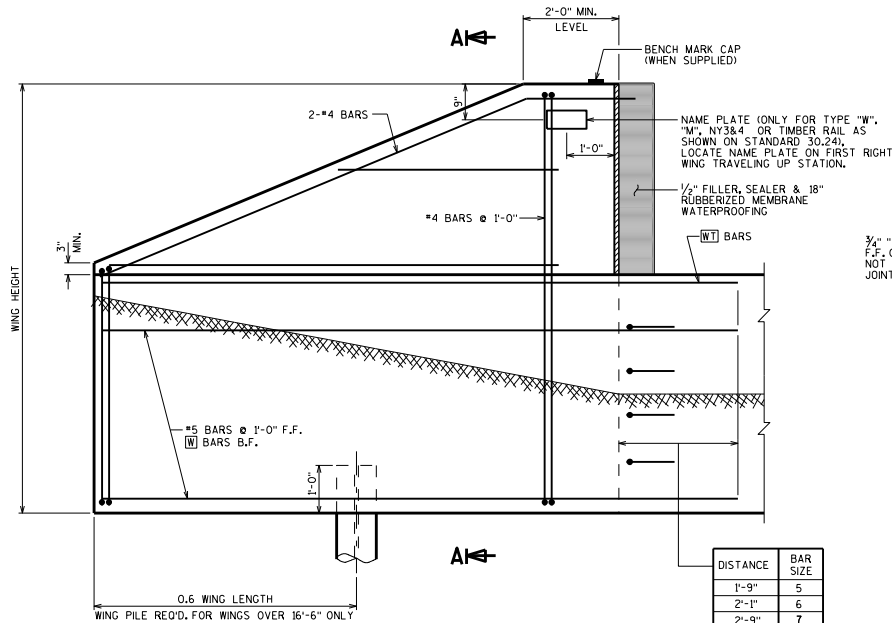
TABLE A

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

▲ WING PILE REQUIRED

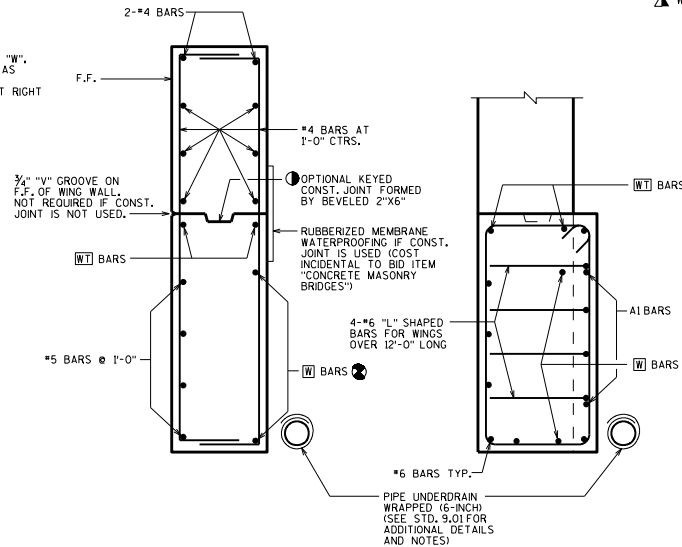


PLAN FOR TYPE A1 ABUTMENT
(SEE STD. 12.01 FOR ABUTMENT BODY DETAILS)



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

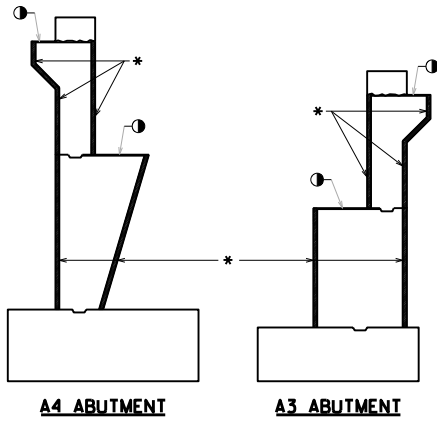
DETAILS FOR WINGS PARALLEL TO A1 ABUTMENT CENTERLINE



BUREAU OF STRUCTURES

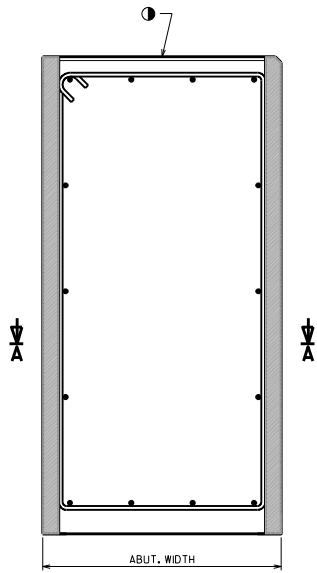
APPROVED: Bill Oliva

DATE:
1-17



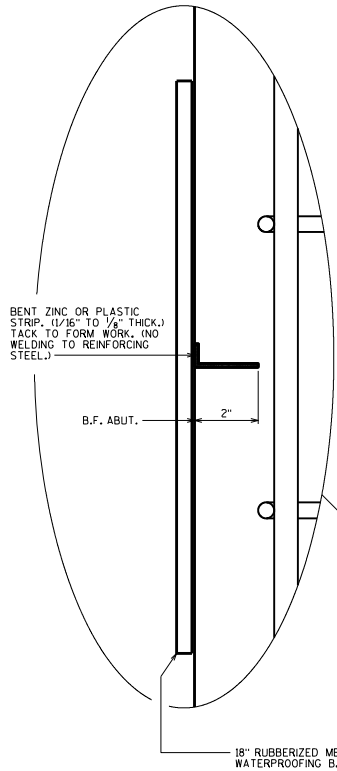
A4 ABUTMENT

A3 ABUTMENT



SECTION THRU ABUTMENT BODY

A1 ABUTMENT SHOWN, A5 SIMILAR



BENT ZINC OR PLASTIC STRIP. (1/16\"/>

B.F. ABUT.

18\"/>

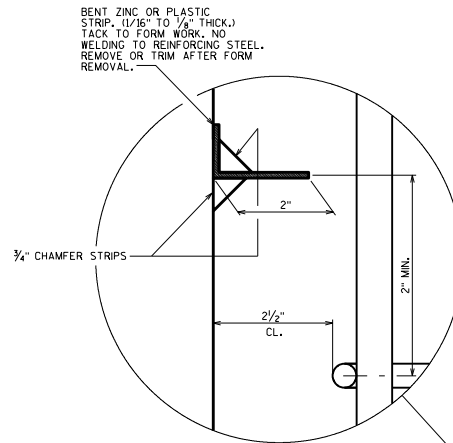
B.F. ABUT.

F.F. ABUT.

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

SECTION A-A

ALTERNATE CONSTRUCTION JOINT AT ABUTMENT



BENT ZINC OR PLASTIC STRIP. (1/16\"/>

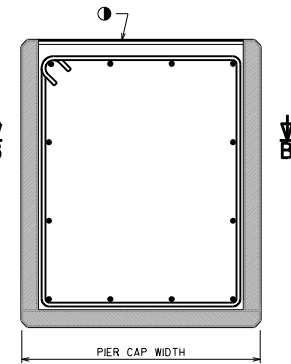
3/4\"/>

2\"/>

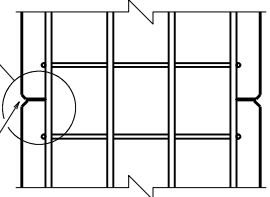
2 1/2\"/>

2\"/>

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

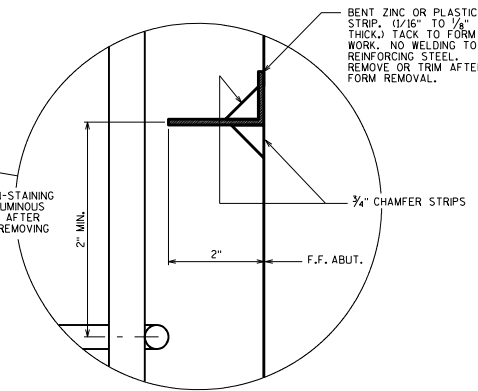


SECTION THRU PIER CAP



SECTION B-B

ALTERNATE CONSTRUCTION JOINT AT PIER CAP



BENT ZINC OR PLASTIC STRIP. (1/16\"/>

3/4\"/>

F.F. ABUT.

2\"/>

2\"/>

NOTES

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


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

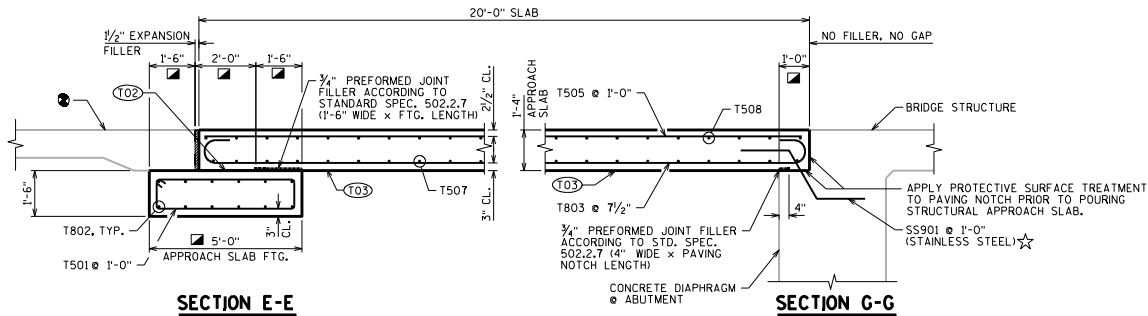
CARE IS TO BE USED IN CASTING CONCRETE AROUND BULKHEAD TO PREVENT DISLOCATION OR MISALIGNMENT OF THE BULKHEAD.

SAW CUTTING JOINT IS NOT ALLOWED.

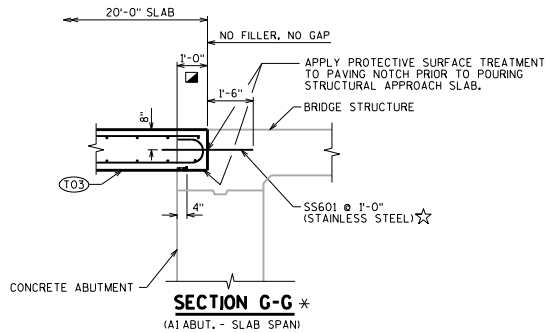
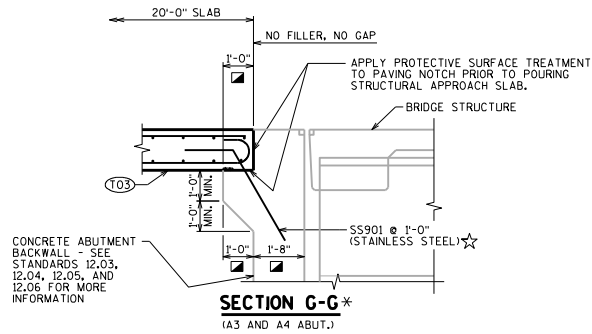
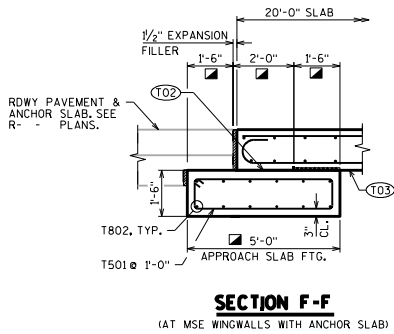
1 USE A JOINT TOOL TO CONSTRUCT A CONTRACTION JOINT APPROXIMATELY 1/2\"/>

* BENT ZINC OR PLASTIC STRIP.

ALTERNATE CONSTRUCTION JOINT	
 BUREAU OF STRUCTURES	
APPROVED: <u>Bill Oliva</u>	DATE: 1-17

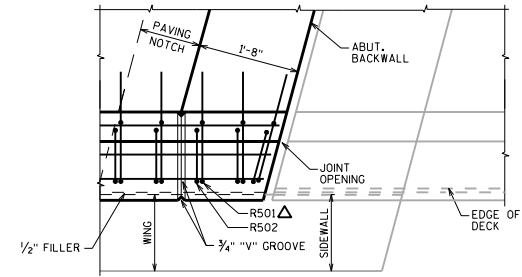


SECTION THRU APPROACH SLAB

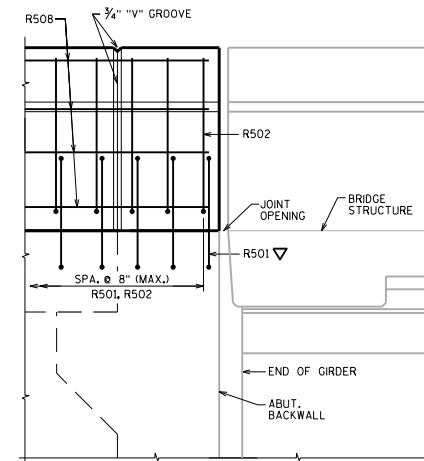


LEGEND

- (T02) STEEL TROWEL TOP SURFACE OF FOOTING AND PLACE MULTIPLE LAYERS (0.03" MIN. TOTAL THK.) OF POLYETHYLENE SHEETS OVER THE ENTIRE TOP OF FOOTING.
- (T03) PLACE MULTIPLE LAYERS (0.03" MIN. TOTAL THK.) OF POLYETHYLENE SHEETS OVER THE ENTIRE TOP OF SUBGRADE BENEATH SLAB.
- ☑ MEASURED NORMAL TO ABUTMENT
- ⊙ FOLLOW FDM 14-10-15 REQUIREMENTS FOR ROADWAY APPROACH PAVEMENT.
- * SECTION REPRESENTATIVE OF SIMILAR LOCATION AS SHOWN ON STANDARD 12.10 FOR DIFFERENT APPLICATION.
- ☆ THE BID ITEM FOR SS901 AND SS601 BARS SHALL BE STANDARD SPECIAL PROVISION "BAR STEEL REINFORCEMENT H5 STAINLESS STRUCTURES".
- ▽ R501 BARS TO BE TIED TO STRUCTURAL APPROACH SLAB STEEL AND ABUT. STEEL BEFORE STRUCTURAL APPROACH SLAB IS POURED.



(PARAPET ON STRUCTURAL APPROACH SLAB AT A3 AND A4 ABUT.)



(PARAPET ON STRUCTURAL APPROACH SLAB AT A3 AND A4 ABUT.)
(WING NOT SHOWN FOR CLARITY)

DESIGNER NOTES

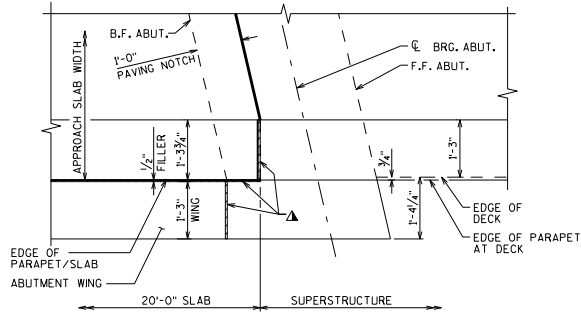
SEE CHAPTER 30 FOR PARAPETS ON STRUCTURAL APPROACH SLAB DETAILS.
SECTIONS A-A THRU G-G ARE FROM STANDARD 12.10

STRUCTURAL APPROACH SLAB DETAILS 2	
	BUREAU OF STRUCTURES
APPROVED: <u>Bill Oliva</u>	DATE: 1-17

LEGEND

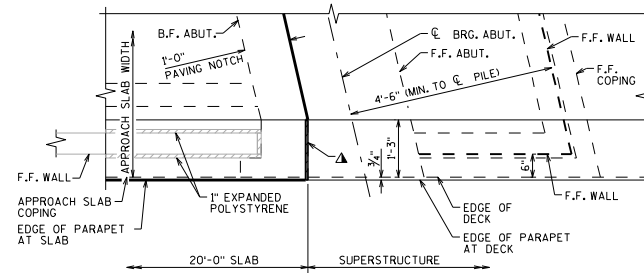
▲ SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF 1/2" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER, (1" DEEP AND HOLD 1/2" BELOW SURFACE OF CONCRETE).

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



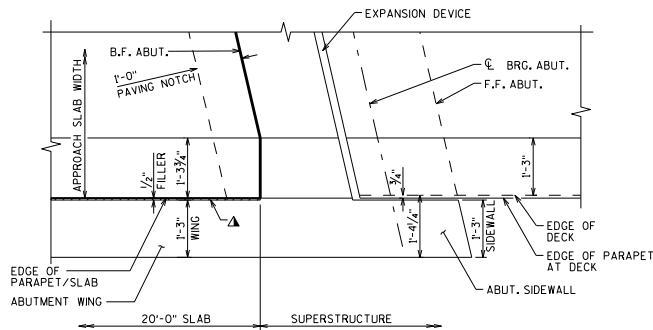
APPROACH SLAB PARTIAL PLAN

(AT WINGWALLS PARALLEL TO BRIDGE - AI ABUT.)



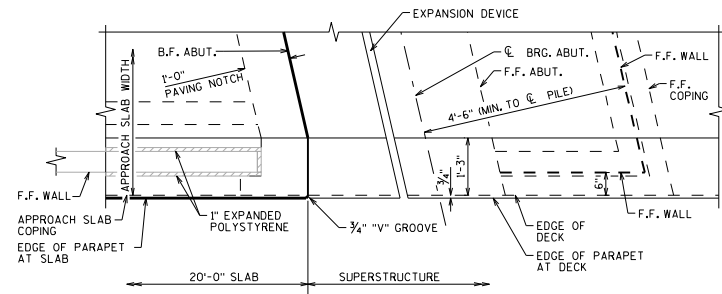
APPROACH SLAB PARTIAL PLAN *

(AT WINGWALLS PARALLEL TO BRIDGE - AI ABUT. AT MSE WINGWALLS)



APPROACH SLAB PARTIAL PLAN *


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

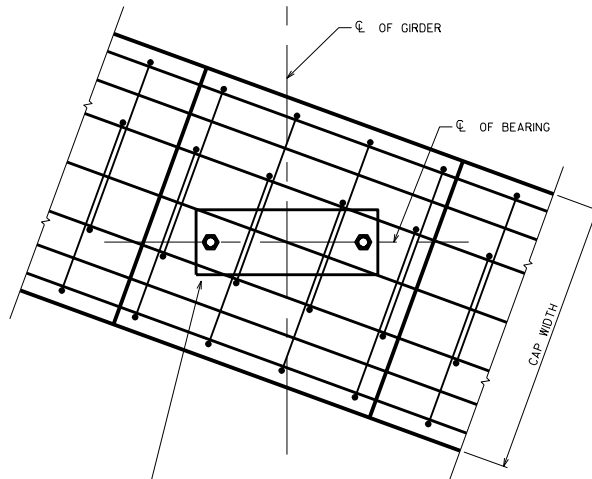


APPROACH SLAB PARTIAL PLAN *

(AT WINGWALLS PARALLEL TO BRIDGE - A3 & A4 ABUT. AT MSE WINGWALLS)

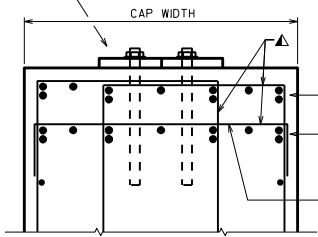
PARTIAL PLANS SHOWN HERE ARE FROM STANDARD 12.10

STRUCTURAL APPROACH SLAB DETAILS 3	
	BUREAU OF STRUCTURES
APPROVED: <i>Bill Oliva</i>	DATE: 1-17



PLAN

PROVIDE ADEQUATE CLEARANCE FOR POST-INSTALLED ANCHORS



SECTION THRU PIER CAP

DETAIL MULTIPLE LAYERS OF BAR STEEL TO AVOID SPACING THAT IS TOO TIGHT. BUNDLED BARS MAY BE USED. AVOID LAPPING BUNDLED BARS.

PROVIDE REINFORCEMENT NECESSARY TO SUPPORT MAIN REINFORCEMENT.

DESIGNER NOTES

PROVIDE 4" MIN. CLEAR BETWEEN ANCHOR BOLTS AND REINFORCEMENT.


FOR PIER CAPS UP TO 3'-6" WIDE, PROVIDE AT LEAST ONE 5" MIN. CLEARANCE BETWEEN REINFORCING BARS FOR CONCRETE PLACEMENT BY TREMIE AND FOR VIBRATION. FOR CAPS GREATER THAN 3'-6" WIDE, PROVIDE AT LEAST TWO SUCH GAPS.

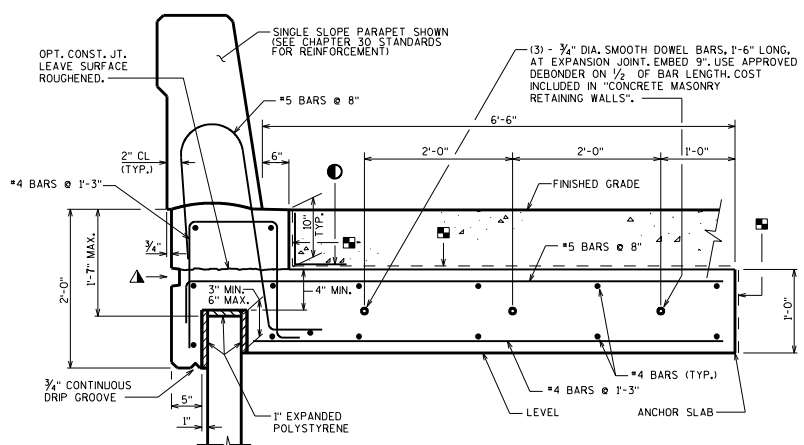
SHOW ANCHORS LOCATIONS ON PIER CAP SHEETS.

ABUTMENT REINFORCEMENT LAYOUT SIMILAR TO PIER CAP REINFORCEMENT DETAILING.

NOTE

▲ DISPLACE TRANSVERSE STIRRUP BARS AS NEEDED TO PROVIDE 4" MIN. CLEAR BETWEEN ANCHOR BOLTS AND REINFORCEMENT.

PIER CAP REINFORCEMENT DETAILING	
	BUREAU OF STRUCTURES
APPROVED: <u>Bill Oliva</u>	DATE: 1-17



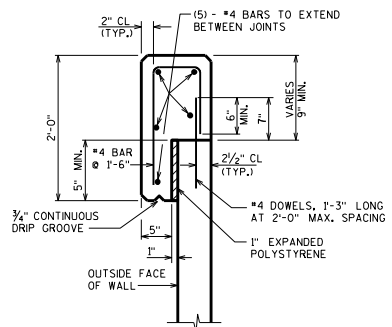
CAST-IN-PLACE CONCRETE TRAFFIC BARRIER DETAIL FOR PRECAST WALL PANELS

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".

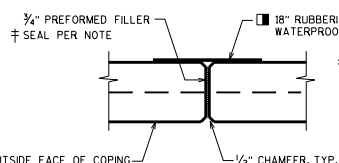
ALL BAR STEEL SHALL BE EPOXY COATED.

CONCRETE QUANTITY BASED ON 3" PANEL EMBEDMENT.



CAST-IN-PLACE CONCRETE COPING DETAIL

NOTE: CONCRETE COPING REINFORCING STEEL SHALL BE DESIGNED AT LOCATIONS WHERE RAILING, FENCING, OR ANY OTHER ATTACHMENTS ARE MADE.



COPING EXPANSION JOINT

DO NOT RUN BAR STEEL THRU JOINT. MAX. SPACING OF JOINT = 5'-0".

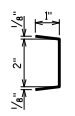
MEMBRANE WATERPROOFING TO EXTEND FROM TOP OF COPING TO 6" BELOW TOP OF PANELS.

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

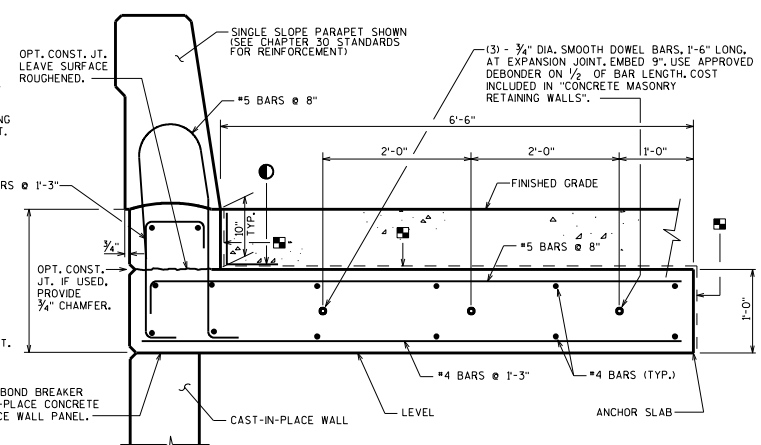
IF THE OPT. CONST. JOINT IS USED, PLACE 18" MEMBRANE WATERPROOFING ALONG THE ENTIRE LONGITUDINAL JOINT. THE MEMBRANE WATERPROOFING SEALING THE OPTIONAL CONST. JOINT IS INCIDENTAL TO THE CONCRETE MASONRY BID ITEM.

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.

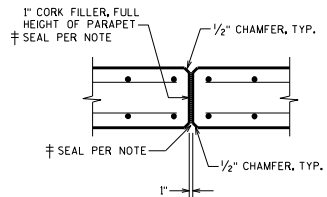


CAST-IN-PLACE CONCRETE TRAFFIC BARRIER DETAIL FOR CAST-IN-PLACE WALL PANELS

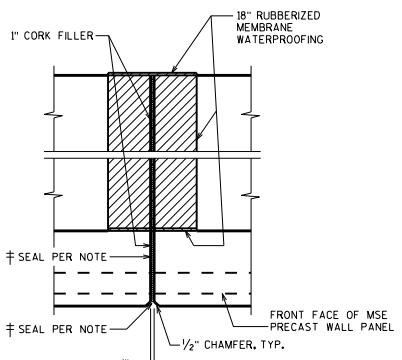
OPTIONAL CONSTRUCTION JOINTS IN THE PARAPET AND ANCHOR SLAB BETWEEN EXPANSION JOINTS MAY BE USED. RUN BAR REINFORCEMENT THRU THE JOINT. SEE STANDARDS 30.07, 30.12, 30.13 & 30.30-30.32 FOR MINIMUM LAP LENGTHS IN PARAPET BARS. DEFINE CONSTRUCTION JOINT WITH A 3/4" V" GROOVE.

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

ALL BAR STEEL SHALL BE EPOXY COATED.

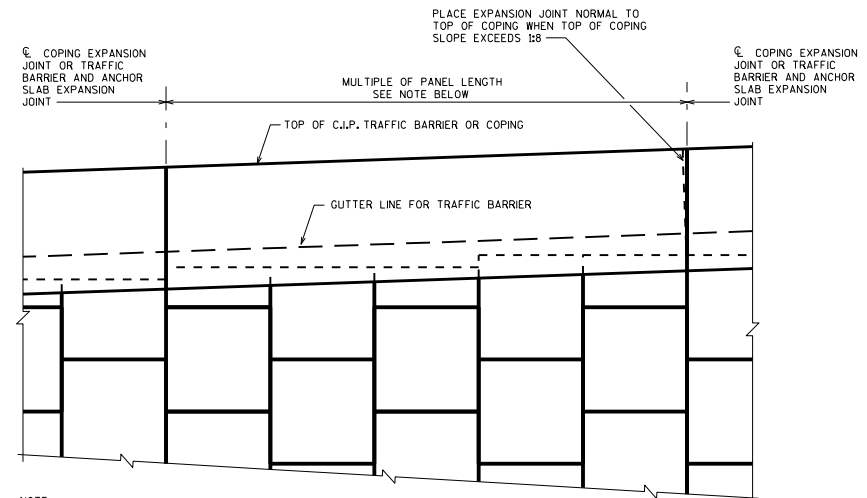


TRAFFIC BARRIER EXPANSION JOINT DETAIL



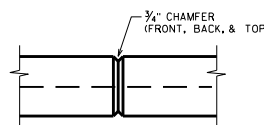
ANCHOR SLAB EXPANSION JOINT DETAIL

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.J.P. TRAFFIC BARRIER OR COPING PARTIAL ELEVATION

NOTE: ALL JOINTS SHALL BE LOCATED AS SHOWN ON WALL ELEVATIONS AND MUST COINCIDE WITH PANEL JOINT ON FRONT FACE.



COPING CONTRACTION JOINT

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

DESIGNER NOTES

MODIFIED ANCHOR SLAB DETAILS SHALL SATISFY AASHTO LRFD STRENGTH AND STABILITY REQUIREMENTS.

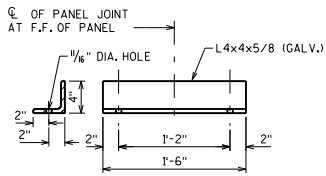
PROVIDE CONCRETE, REINFORCEMENT, AND RUBBERIZED MEMBRANE WATERPROOFING QUANTITIES FOR TRAFFIC BARRIERS. PROVIDE BILL OF BARS.

FOR STANDARD COPING, AS SHOWN ON THIS SHEET, SHOW BAR SIZE AND BAR SPACING, ONLY. DO NOT PROVIDE BILL OF BARS, CONCRETE, REINFORCEMENT, AND RUBBERIZED MEMBRANE WATERPROOFING ARE INCLUDED IN BID ITEM FOR THE MSE WALL.

MSE RETAINING WALL DETAILS

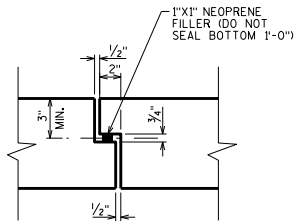


APPROVED: *Bill Oliva* DATE: 1-17

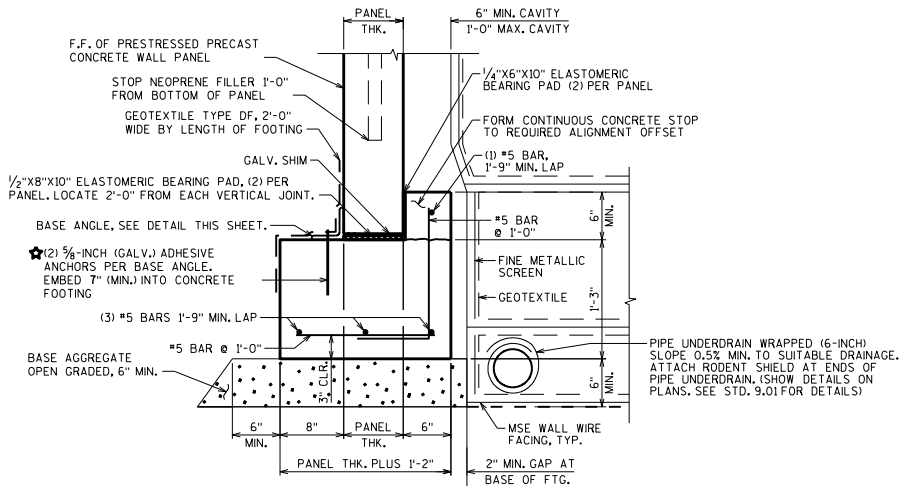


BASE ANGLE DETAIL

CENTERED ON PANEL JOINT OR AT EACH FOOTING END OR STEP ELEVATION.



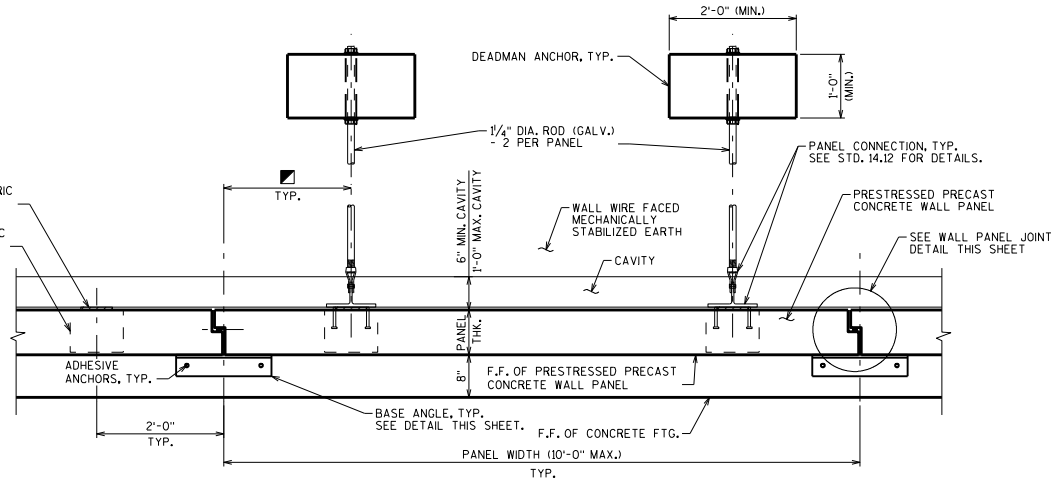
WALL PANEL JOINT DETAIL



WALL PANEL FOOTING DETAIL

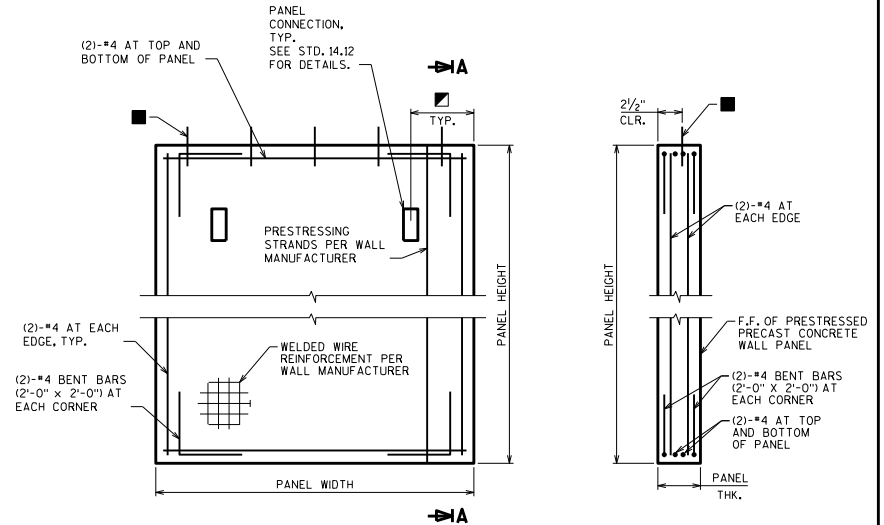
ADHESIVE ANCHORS SHALL CONFORM TO SECTION 502.2.12 OF THE STANDARD SPECIFICATIONS.

1/4"X6"X10" ELASTOMERIC BEARING PAD, TYP.
1/2"X8"X10" ELASTOMERIC BEARING PAD, TYP.



TYPICAL WALL PANEL CONNECTION - PLAN VIEW

ALL ITEMS SHOWN ARE INCLUDED IN BID ITEM "PRESTRESSED PRECAST CONCRETE WALL PANEL".



ELEVATION PRESTRESSED PRECAST CONCRETE WALL PANEL

DO NOT PROVIDE BILL OF BARS, BAR STEEL REINF. AND CONCRETE ARE INCLUDED IN BID ITEM "PRESTRESSED PRECAST CONCRETE WALL PANEL".

PRECAST PANELS 6 FEET OR LESS IN HEIGHT DO NOT REQUIRE PRESTRESSING STRANDS.

SECTION A-A

PRESTRESSING STRANDS NOT SHOWN FOR CLARITY.

DESIGNER NOTE

DOWELS REQUIRED FOR CAST-IN-PLACE CONCRETE COPING ONLY, IF CAST-IN-PLACE CONCRETE COPING PROPOSED, INCLUDE THE FOLLOWING NOTE:

*4 DOWELS, 1'-3" LONG AT 2'-0" MAX. SPACING. ALTERNATE ANCHORAGE: 1/2" DIA. ELECTROPLATED FERRULE LOOP INSERT (MEDIUM HIGH CARBON WIRE) OR APPROVED EQUAL.

LEGEND

USE 2'-0" ON 10'-0" PANELS
USE 1'-0" ON PANELS LESS THAN 10'-0".

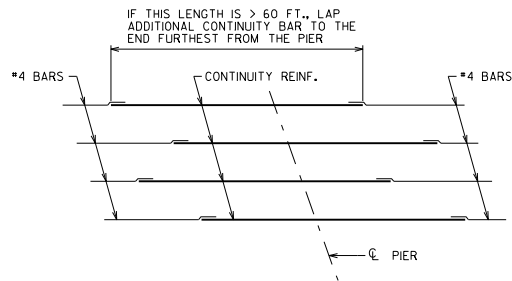
MSE WALL WIRE FACING 2



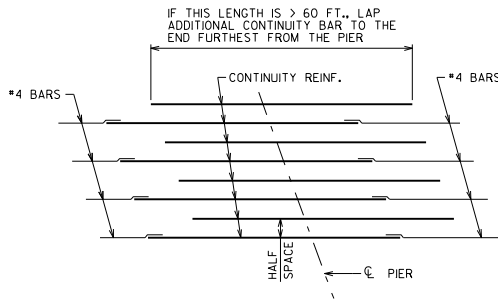
BUREAU OF STRUCTURES

APPROVED: *Bill Oliva*

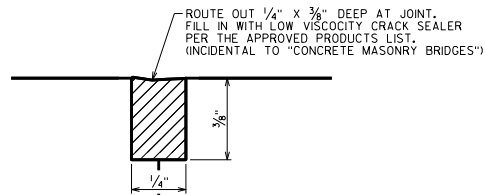
DATE: 1-17



PLAN VIEW OF DECK CONTINUITY REINFORCEMENT FOR PRESTRESSED GIRDER BRIDGES
(SHOWING TYPICAL BAR SPACING FROM CHAPTER 17 TABLES)



PLAN VIEW OF DECK CONTINUITY REINFORCEMENT FOR PRESTRESSED GIRDER BRIDGES SHOWING HALF-SPACES
(SHOWING TYPICAL BAR SPACING FROM CHAPTER 17 TABLES + HALF-SPACE)

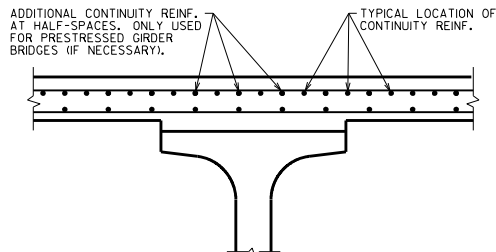


LONGITUDINAL CONSTRUCTION JOINT DETAIL

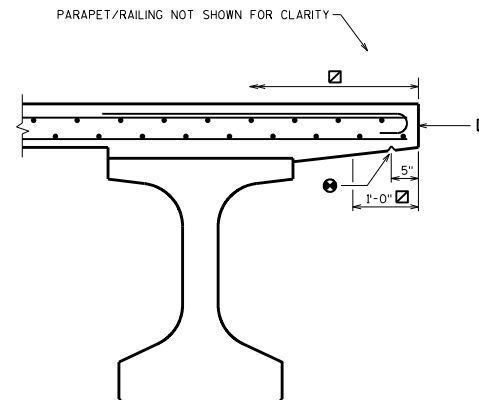
DESIGNER NOTES

DETAIL REQUIRED WHEN WIDTH OF DECK EXCEEDS 90 FEET FOR GIRDER SUPERSTRUCTURES AND 52 FEET FOR SLAB SUPERSTRUCTURES. DETAIL SHOULD BE USED FOR STAGED CONSTRUCTION AND FOR OTHER COLD JOINT APPLICATIONS WITHIN THE DECK. OPTIONAL (CONTRACTOR) JOINTS ARE TO BE APPROVED BY THE ENGINEER.

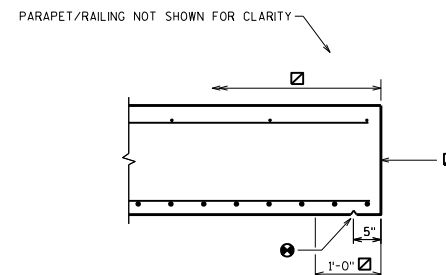
JOINTS SHOULD BE PLACED AT LEAST 6 INCHES FROM THE EDGE OF THE TOP FLANGE OF THE GIRDER AND PREFERABLY LOCATED BENEATH THE MEDIAN OR PARAPET. AVOID PLACING NEAR WHEEL PATHS (PLACE AT LANE LINES OR IN THE MIDDLE OF THE LANE).



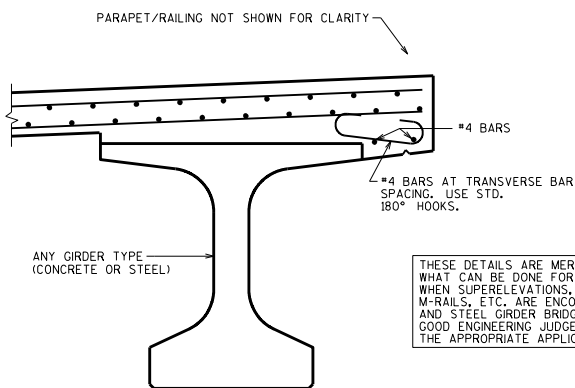
CROSS SECTION THRU DECK
(SHOWING TOP LONGIT. REINF. LOCATION RELATIVE TO BOTTOM LONGIT. REINF.)



CROSS SECTION THRU EDGE OF DECK
(SHOWING DRIP GROOVE FOR ALL PARAPET AND RAILINGS, AND PROTECTIVE SURFACE TREATMENT FOR OPEN RAILINGS)

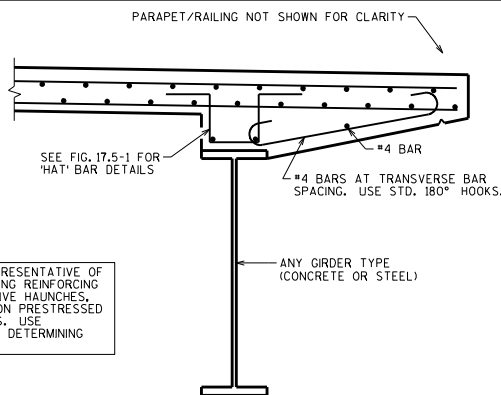


CROSS SECTION THRU EDGE OF SLAB
(SHOWING DRIP GROOVE FOR ALL PARAPET AND RAILINGS, AND PROTECTIVE SURFACE TREATMENT FOR OPEN RAILINGS)



CROSS SECTION THRU EDGE OF DECK
(SHOWING ADDITIONAL OVERHANG REINFORCEMENT)

THESE DETAILS ARE MERELY REPRESENTATIVE OF WHAT CAN BE DONE FOR OVERHANG REINFORCING WHEN SUPERELEVATIONS, EXCESSIVE HAUNCHES, M-RAILS, ETC. ARE ENCOUNTERED ON PRESTRESSED AND STEEL GIRDER BRIDGE DECKS. USE GOOD ENGINEERING JUDGEMENT IN DETERMINING THE APPROPRIATE APPLICATION.



CROSS SECTION THRU EDGE OF DECK
(SHOWING ADDITIONAL OVERHANG REINFORCEMENT)

DESIGNER NOTES

- ① 3/4" V-GROOVE, TERMINATE 2'-0" FROM FRONT FACE OF EXPANSION ABUTMENTS, OR FIXED ABUTMENTS ON STEEL BEARINGS.
- 3/4" V-GROOVE, EXTEND V-GROOVE TO 6" FROM FRONT FACE OF ABUTMENT DIAPHRAGM FOR TYPE A1 FIXED AND SEMI-EXPANSION ABUTMENTS.
- V-GROOVES ARE REQUIRED.

- ☑ FOR OPEN RAILINGS, COAT WITH "PROTECTIVE SURFACE TREATMENT" AS PER THE STANDARD SPECIFICATIONS. PROTECTIVE SURFACE TREATMENT TO BE APPLIED TO THE TOP AND EXTERIOR EXPOSED FACE OF WINGS, AND THE END 1'-0" OF THE FRONT FACE OF ABUTMENT.

USE "PIGMENTED SURFACE SEALER" FOR INSIDE & TOP FACES OF PARAPETS.

NOTES

- ① 3/4" V-GROOVE REQ'D. EXTEND TO 2'-0" FROM F.F. OF ABUT.
- 3/4" V-GROOVE REQ'D. EXTEND TO 6" FROM F.F. OF ABUT. DIAPH.

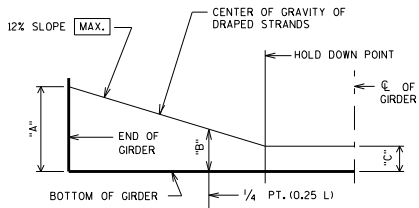
- ☑ COAT WITH "PROTECTIVE SURFACE TREATMENT" AS PER THE STANDARD SPECIFICATIONS.

DECK AND SLAB DETAILS



BUREAU OF STRUCTURES

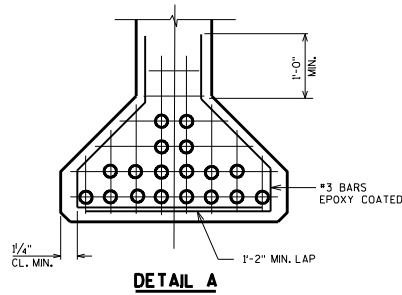
APPROVED: Bill Oliva DATE: 1-17



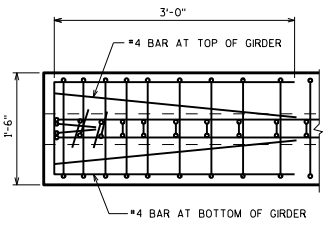
"A" TO BE GIVEN TO THE NEAREST 1"
 "B" = $\frac{1}{4}("A" + 3 "C")$ [MIN]
 "B" = $\frac{1}{4}("A" + 3 "C") + 3$ [MAX]

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

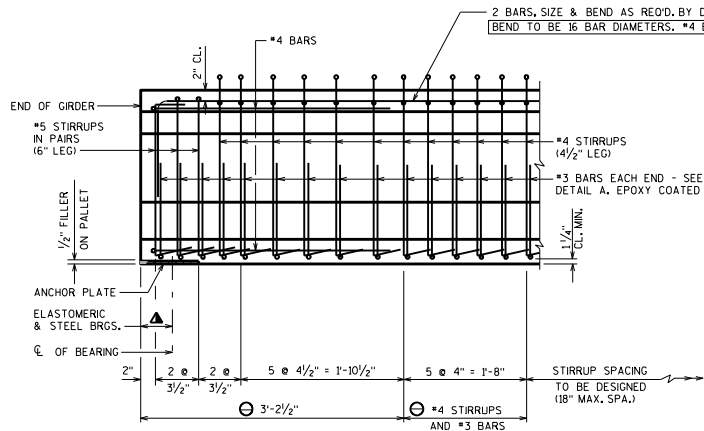
LOCATION OF DRAPED STRANDS



DETAIL A



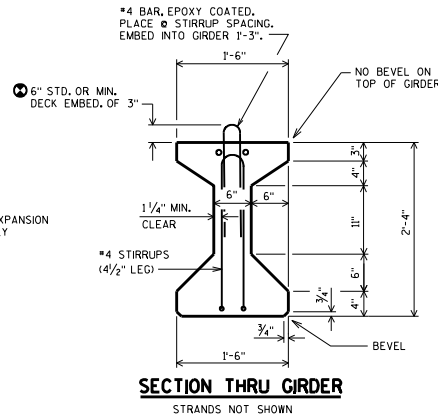
PLAN VIEW



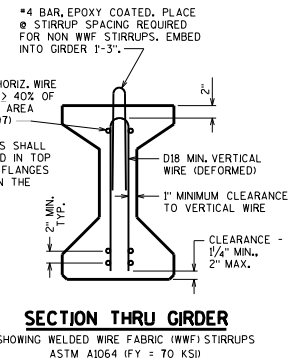
SUPPORT WITH STEEL OR ELASTOMERIC BRGS.

SIDE VIEW OF GIRDER

SUPPORT WITH 1/2\"/>



SECTION THRU GIRDER



SECTION THRU GIRDER
 SHOWING WELDED WIRE FABRIC (WWF) STIRRUPS
 ASTM A1064 (FY = TO KS)

NOTES

TOP OF GIRDER TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY, EXCEPT THE OUTSIDE 2" OF GIRDER, WHICH SHALL RECEIVE A SMOOTH FINISH. AN APPROVED CONCRETE SEALER SHALL BE APPLIED TO ALL SMOOTH SURFACES INCLUDING THE OUTSIDE 2" OF THE TOP FLANGE.

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

THE GIRDERS SHALL BE PROVIDED WITH A SUITABLE LIFTING DEVICE FOR HANDLING AND ERECTING THE GIRDERS. SEE SECTION 503.3.3 OF STANDARD SPECIFICATIONS FOR GUIDANCE.

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 ASTM 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.

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

PRESTRESSING STRANDS SHALL BE (DIA.)-7-WIRE LOW-RELAXATION STRANDS WITH AN ULTIMATE STRENGTH OF 270,000 PSI.

DESIGNER NOTES

BID ITEM SHALL BE "PRESTRESSED GIRDER TYPE I 28-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 ONLY 0.5" DIA. STRAND FOR THE DRAPED PATTERN. THE MAX. NUMBER OF DRAPED 0.5" DIA. STRANDS IS 8. USE 0.6" DIA. FOR THE STRAIGHT PATTERN, UNLESS ONLY 0.5" DIA. WORK FOR KEEPING STRESSES AT ACCEPTABLE LEVELS.


REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STANDARD STRAND PATTERNS LISTED ON STANDARD 19.02 AND THE SPAN LENGTHS SHOWN IN TABLE 19.3-L USING DIFFERENT STRAND PATTERNS OR LONGER SPANS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT, WHICH REQUIRES PRIOR APPROVAL FROM THE BUREAU OF STRUCTURES.

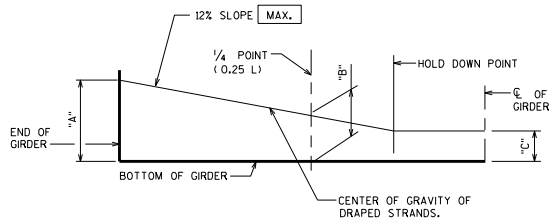
▲ VARIES FOR ELASTOMERIC BRGS. (STD. 27.07) AND STEEL BRGS. (STD. 27.09)

⊙ 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 1/2" CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR ±3% VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

PROVIDE STIRRUP SPACING THAT IS SYMMETRICAL ABOUT THE C/L OF GIRDER.

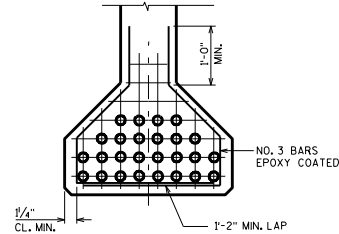
28" PRESTRESSED GIRDER DETAILS	
	BUREAU OF STRUCTURES
APPROVED: <u>Bill Oliva</u>	DATE: <u>1-17</u>



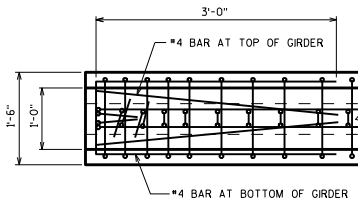
"A" TO BE GIVEN TO THE NEAREST 1"
 "B" = $1/4("A" + 3 "C")$ (MIN)
 "B" = $1/4("A" + 3 "C") + 3$ (MAX)

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

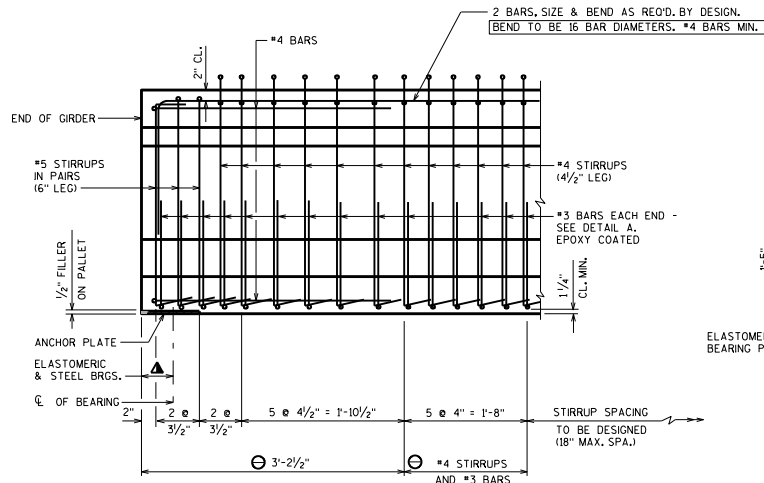
LOCATION OF DRAPED STRANDS



DETAIL A

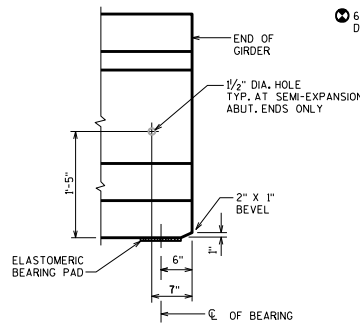


PLAN VIEW

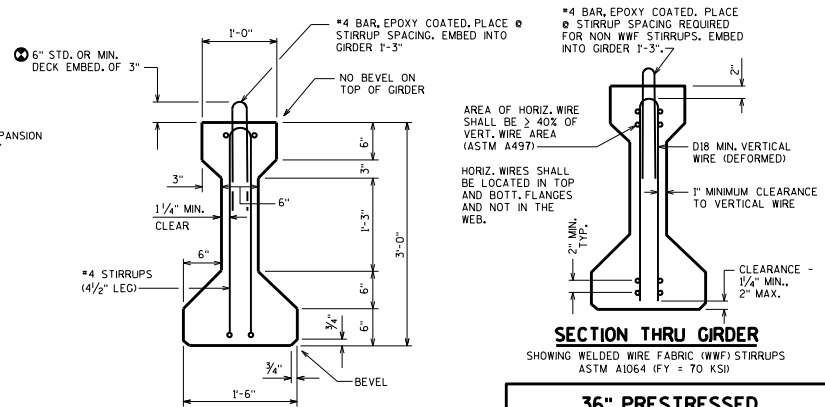


SUPPORT WITH STEEL OR ELASTOMERIC BRGS.

SIDE VIEW OF GIRDER



SUPPORT WITH 1/2\"/>



SECTION THRU GIRDER

STRANDS NOT SHOWN

NOTES

TOP OF GIRDER TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY. EXCEPT THE OUTSIDE 2" OF GIRDER, WHICH SHALL RECEIVE A SMOOTH FINISH, AN APPROVED CONCRETE SEALER SHALL BE APPLIED TO ALL SMOOTH SURFACES INCLUDING THE OUTSIDE 2" OF THE TOP FLANGE.

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

THE GIRDERS SHALL BE PROVIDED WITH A SUITABLE LIFTING DEVICE FOR HANDLING AND ERECTING THE GIRDERS. SEE SECTION 503.3.3 OF STANDARD SPECIFICATIONS FOR GUIDANCE.

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.

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

PRESTRESSING STRANDS SHALL BE (1 DIA.)-7-WIRE LOW-RELAXATION STRANDS WITH AN ULTIMATE STRENGTH OF 270,000 PSI.

DESIGNER NOTES

BID ITEM SHALL BE "PRESTRESSED GIRDER TYPE I 36-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 ONLY 0.5" DIA. STRAND FOR THE DRAPED PATTERN. THE MAX. NUMBER OF DRAPED 0.5" DIA. STRANDS IS 8. USE 0.6" DIA. FOR THE STRAIGHT PATTERN, UNLESS ONLY 0.5" DIA. WORK FOR KEEPING STRESSES AT ACCEPTABLE LEVELS.

REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STANDARD STRAND PATTERNS LISTED ON STANDARD 19.04 AND THE SPAN LENGTHS SHOWN IN TABLE 19.3-1. USING DIFFERENT STRAND PATTERNS OR LONGER SPANS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT, WHICH REQUIRES PRIOR APPROVAL FROM THE BUREAU OF STRUCTURES.

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

○ DETAIL TYPICAL AT EACH END

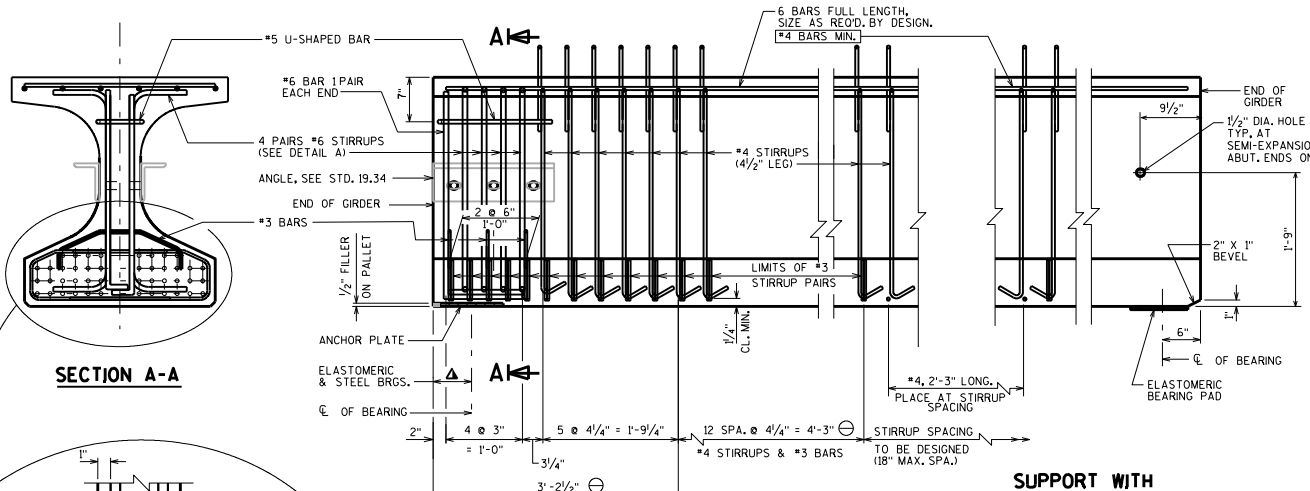
● THE DESIGN ENGINEER DETERMINES THIS VALUE BASED ON 2" MIN. HAUNCH AT EDGE OF GIRDER, % SLOPE, PROFILE GRADE LINE AND CALCULATED RESIDUAL GIRDER CAMBER, INCLUDING THE CAMBER MULTIPLIER OF 1.4. THIS VALUE CAN VARY AND SHOULD BE GIVEN FOR EACH 1/3 OF THE GIRDER LENGTH. PROVIDE VALUES THAT MAINTAIN 3" 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.

PROVIDE STIRRUP SPACING THAT IS SYMMETRICAL ABOUT THE C/L OF GIRDER.

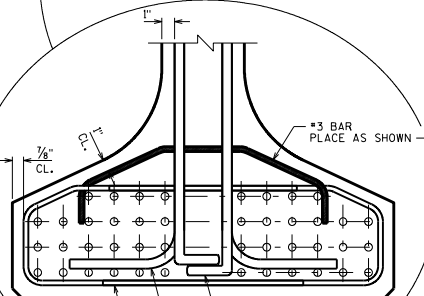
36" PRESTRESSED GIRDER DETAILS



APPROVED: Bill Oliva DATE: 1-17

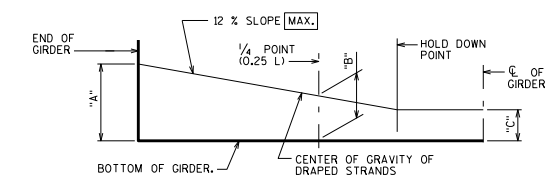


SECTION A-A

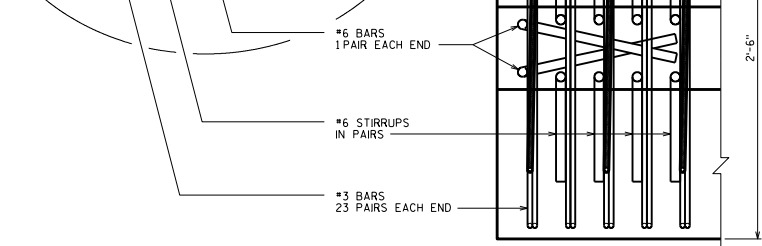


SUPPORT WITH STEEL OR ELASTOMERIC BRGS.

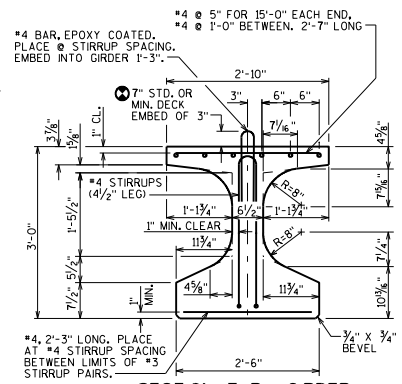
SUPPORT WITH 1/2" ELASTOMERIC BEARING PAD



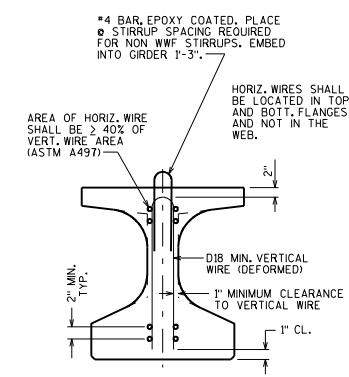
LOCATION OF DRAPED STRANDS



**DETAIL A
BOTTOM FLANGE**



**SECTION THRU GIRDER
STRANDS NOT SHOWN**



**SECTION THRU GIRDER
SHOWING WELDED WIRE FABRIC (WWF) STIRRUPS
ASTM A1064 (FY = 70 KSI)**

NOTES

TOP OF GIRDER TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY, 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 8" OF THE TOP FLANGE.

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

THE GIRDERS SHALL BE PROVIDED WITH A SUITABLE LIFTING DEVICE FOR HANDLING AND ERECTING THE GIRDERS. SEE SECTION 503.3.3 OF STANDARD SPECIFICATIONS FOR GUIDANCE.

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

PRESTRESSING STRANDS SHALL BE () DIA.-7-WIRE LOW-RELAXATION STRANDS WITH AN ULTIMATE STRENGTH OF 270,000 PSI.

DESIGNER NOTES

BID ITEM SHALL BE "PRESTRESSED GIRDER TYPE I 36W-INCH". SPECIFY CONCRETE STRENGTH AS REQUIRED BY DESIGN FROM A MINIMUM OF 6,000 PSI TO A MAX. OF 8,000 PSI. MAXIMUM ALLOWED STRENGTH IS 6800 PSI. USE 0.6" DIA. STRAND FOR ALL PATTERNS. THE MAX. NUMBER OF DRAPED 0.6" DIA. STRANDS IS 8.

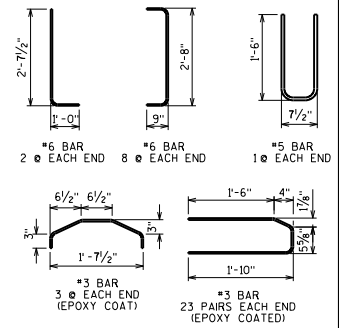
REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STANDARD STRAND PATTERNS LISTED ON STANDARD 19.12 AND THE SPAN LENGTHS SHOWN IN TABLE 19.3-1. USING DIFFERENT STRAND PATTERNS OR LONGER SPANS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT, WHICH REQUIRES PRIOR APPROVAL FROM THE BUREAU OF STRUCTURES.

▲ 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 1/2" CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR #3/4" VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

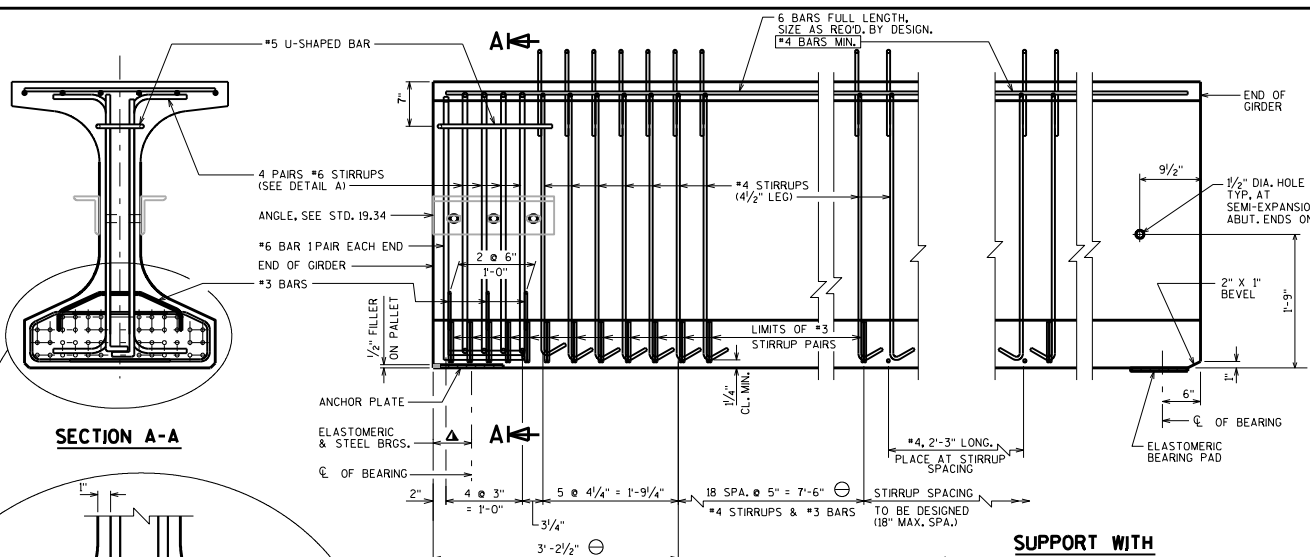
PROVIDE STIRRUP SPACING THAT IS SYMMETRICAL ABOUT THE C/L OF GIRDER.



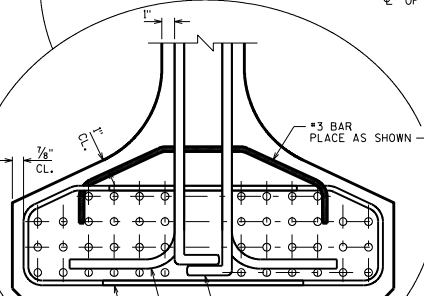
36W" PRESTRESSED GIRDER DETAILS



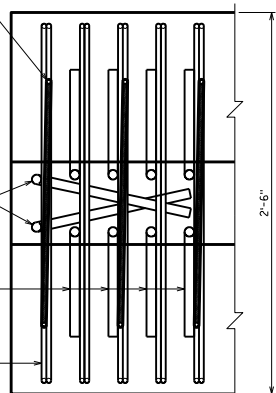
APPROVED: Bill Oliva DATE: 1-17



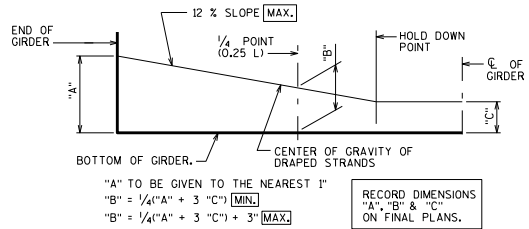
SECTION A-A



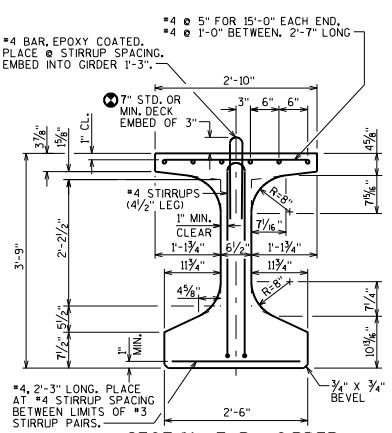
SUPPORT WITH STEEL OR ELASTOMERIC BRGS.



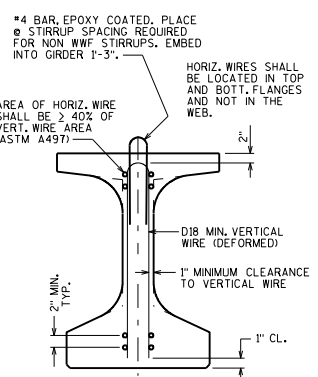
**DETAIL A
BOTTOM FLANGE**



LOCATION OF DRAPED STRANDS



SECTION THRU GIRDER
STRANDS NOT SHOWN



SECTION THRU GIRDER

SHOWING WELDED WIRE FABRIC (WWF) STIRRUPS
ASTM A1064 (FY = 70 KSI)

NOTES

TOP OF GIRDER TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY, 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 8" OF THE TOP FLANGE.

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

THE GIRDERS SHALL BE PROVIDED WITH A SUITABLE LIFTING DEVICE FOR HANDLING AND ERECTING THE GIRDERS. SEE SECTION 503.3.3 OF STANDARD SPECIFICATIONS FOR GUIDANCE.

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 MOST 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.

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

PRESTRESSING STRANDS SHALL BE () DIA.-7-WIRE LOW-RELAXATION STRANDS WITH AN ULTIMATE STRENGTH OF 270,000 PSI.

DESIGNER NOTES

BID ITEM SHALL BE "PRESTRESSED GIRDER TYPE I 45W-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" DIA. STRAND FOR ALL PATTERNS. THE MAX. NUMBER OF DRAPED 0.6" DIA. STRANDS IS 8.

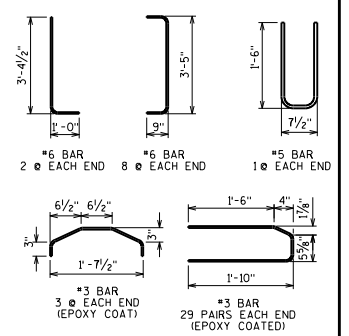
REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STANDARD STRAND PATTERNS LISTED ON STANDARD 19.14 AND THE SPAN LENGTHS SHOWN IN TABLE 19.3-1. USING DIFFERENT STRAND PATTERNS OR LONGER SPANS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT, WHICH REQUIRES PRIOR APPROVAL FROM THE BUREAU OF STRUCTURES.

▲ 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 1/2" CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR ± 3/4" VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

PROVIDE STIRRUP SPACING THAT IS SYMMETRICAL ABOUT THE C/L OF GIRDER.



45W" PRESTRESSED GIRDER DETAILS



APPROVED: Bill Oliva DATE: 1-17

NOTES

TOP OF GIRDER TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY, EXCEPT THE OUTSIDE 15" 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 OR EPOXY TO SURFACES RECEIVING APPLICATION OF CONCRETE STAINING.

THE GIRDERS SHALL BE PROVIDED WITH A SUITABLE LIFTING DEVICE FOR HANDLING AND ERECTING THE GIRDERS. SEE SECTION 503.3.3 OF STANDARD SPECIFICATIONS FOR GUIDANCE.

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.

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

PRESTRESSING STRANDS SHALL BE () DIA.-7-WIRE LOW-RELAXATION STRANDS WITH AN ULTIMATE STRENGTH OF 270,000 PSI.

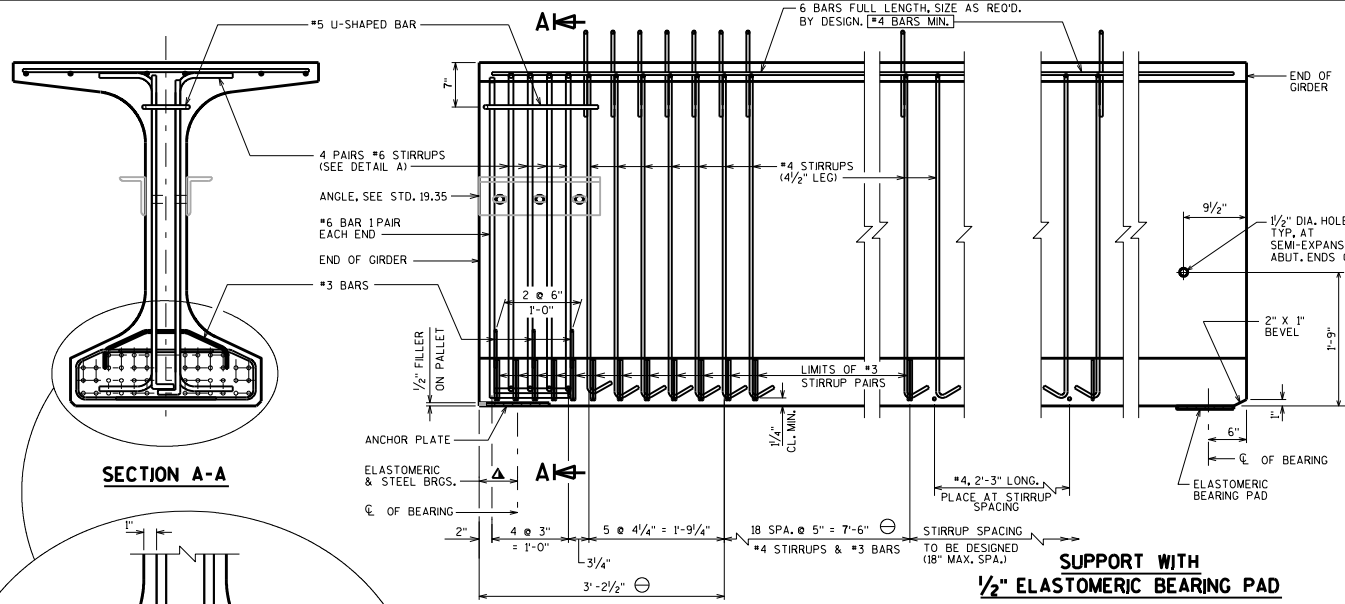
DESIGNER NOTES

BID ITEM SHALL BE "PRESTRESSED GIRDER TYPE 1 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 8800 PSI. USE 0.6" DIA. STRAND FOR ALL PATTERNS. THE MAX. NUMBER OF DRAPED 0.6" DIA. STRANDS IS 8.

REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STANDARD 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, WHICH REQUIRES PRIOR APPROVAL FROM THE BUREAU OF STRUCTURES.

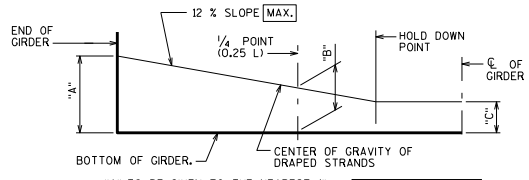
- ▲ VARIES FOR ELASTOMERIC BRGS. (STD. 27.07) AND STEEL BRGS. (STD. 27.09)
 - DETAIL TYPICAL AT EACH END
 - THE DESIGN ENGINEER DETERMINES THIS VALUE BASED ON 2" MIN. HAUNCH AT EDGE OF GIRDER, X-SLOPE, PROFILE GRADE LINE AND CALCULATED RESIDUAL GIRDER CAMBER, INCLUDING THE CAMBER MULTIPLIER OF L4. THIS 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.
- PROVIDE STIRRUP SPACING THAT IS SYMMETRICAL ABOUT THE C/L OF GIRDER.



SECTION A-A

SUPPORT WITH STEEL OR ELASTOMERIC BRGS.

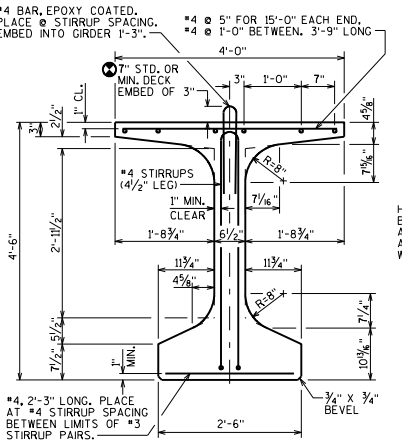
SUPPORT WITH 1/2\"/>



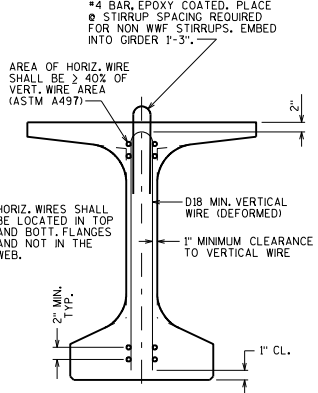
"A" TO BE GIVEN TO THE NEAREST 1"
 "B" = 1/4("A" + 3 "C") MIN.
 "C" = 1/4("A" + 3 "C") + 3" MAX.

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

LOCATION OF DRAPED STRANDS

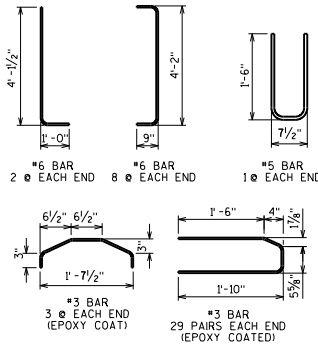


SECTION THRU GIRDER
STRANDS NOT SHOWN



SECTION THRU GIRDER

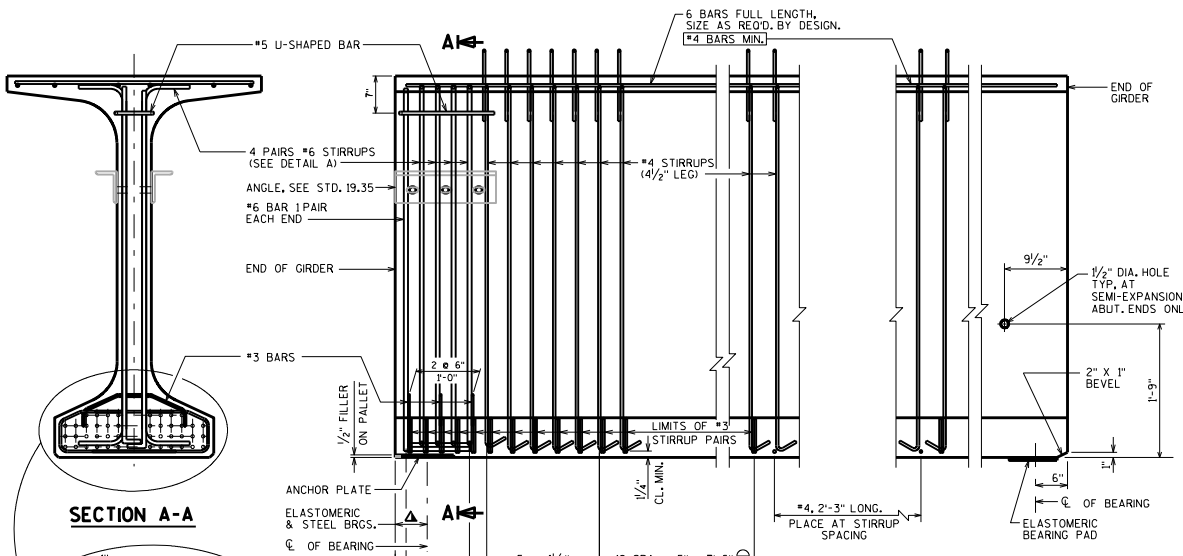
SHOWING WELDED WIRE FABRIC (WWF) STIRRUPS
ASTM A1064 (FY = 70 KSI)



54W" PRESTRESSED GIRDER DETAILS



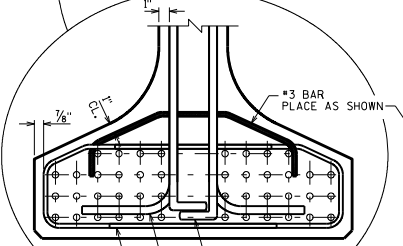
APPROVED: Bill Oliva DATE: 1-17



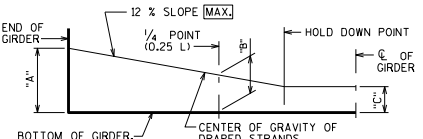
SECTION A-A

SUPPORT WITH STEEL OR ELASTOMERIC BRGS.

SUPPORT WITH 1/2" ELASTOMERIC BEARING PAD

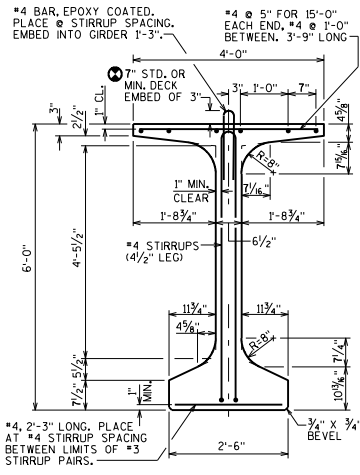


**DETAIL A
BOTTOM FLANGE**

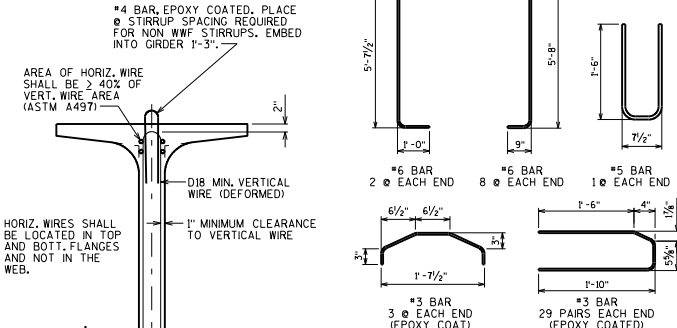


"A" TO BE GIVEN TO THE NEAREST 1"
 "B" = 1/4("A" + 3 "C") [MIN.]
 "B" = 1/4("A" + 3 "C") + 3" [MAX.]

LOCATION OF DRAPED STRANDS



**SECTION THRU GIRDER
STRANDS NOT SHOWN**



SECTION THRU GIRDER

SHOWING WELDED WIRE FABRIC (WWF) STIRRUPS
 ASTM A1064 (FY = 70 KSI)

NOTES

TOP OF GIRDER TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY, EXCEPT THE OUTSIDE 15" 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 OR EPOXY 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.

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

PRESTRESSING STRANDS SHALL BE () DIA.-7-WIRE LOW-RELAXATION STRANDS WITH AN ULTIMATE STRENGTH OF 270,000 PSI.

THIS NOTE APPLIES TO LONG SPANS AS DEFINED IN THE NOTES FOR THE 72W GIRDER, TABLE 19.3-2 OF THE BRIDGE MANUAL. 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. (IF NOTE DOESN'T APPLY, REFERENCE SECT. 503.3.3 OF STD. SPEC. FOR GUIDANCE)

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" DIA. STRAND FOR ALL PATTERNS. THE MAX. NUMBER OF DRAPED 0.6" DIA. STRANDS IS 8.

REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STANDARD STRAND PATTERNS LISTED ON STANDARD 19.18 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, WHICH REQUIRE PRIOR APPROVAL FROM THE BUREAU OF STRUCTURES.

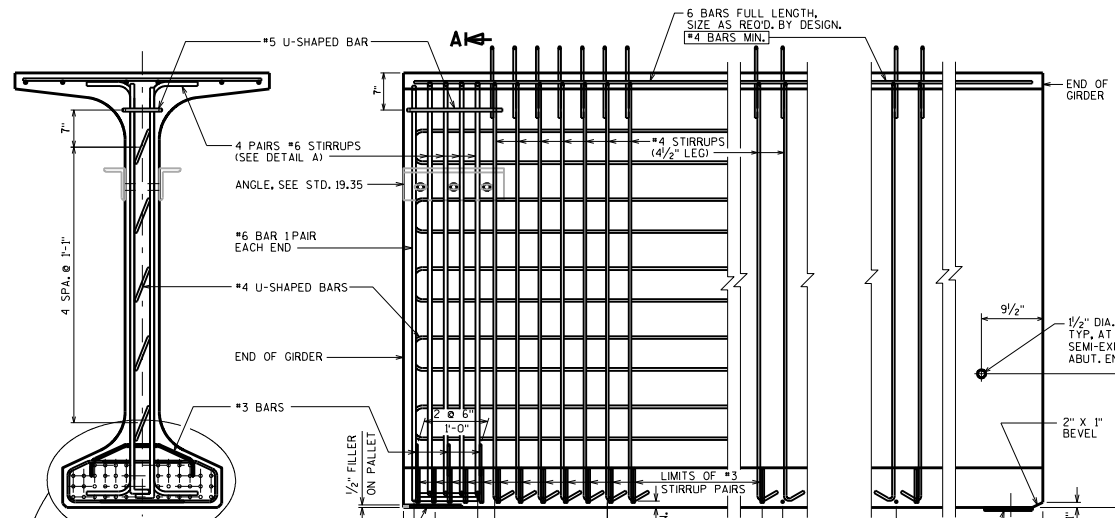
- ▲ VARIES FOR ELASTOMERIC BRGS. (STD. 27.07) AND STEEL BRGS (STD. 27.09)
- ⊙ DETAIL TYPICAL AT EACH END
- ⊙ THE DESIGN ENGINEER DETERMINES THIS VALUE BASED ON 2" MIN. HAUNCH AT EDGE OF GIRDER, X-SLOPE, PROFILE GRADE LINE AND CALCULATED RESIDUAL GIRDER CAMBER, INCLUDING THE CAMBER MULTIPLIER OF 1.4. 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 1/2" CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR ± 1/4" VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

PROVIDE STIRRUP SPACING THAT IS SYMMETRICAL ABOUT THE C/L OF GIRDER.

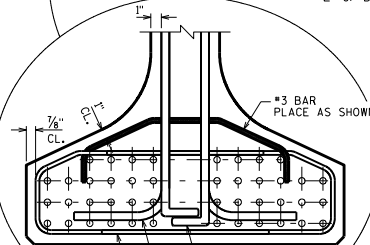
72W" PRESTRESSED GIRDER DETAILS



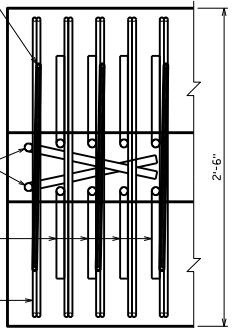
APPROVED: Bill Oliva DATE: 1-17



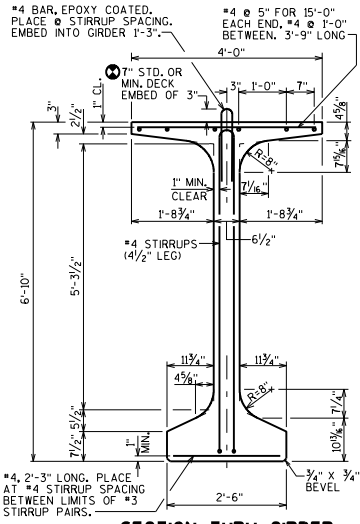
SECTION A-A



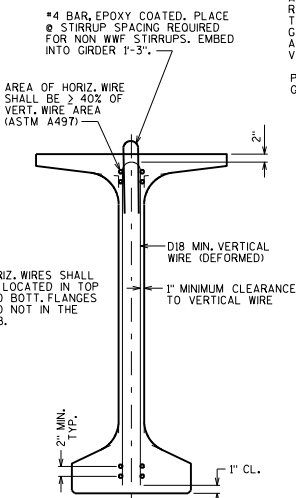
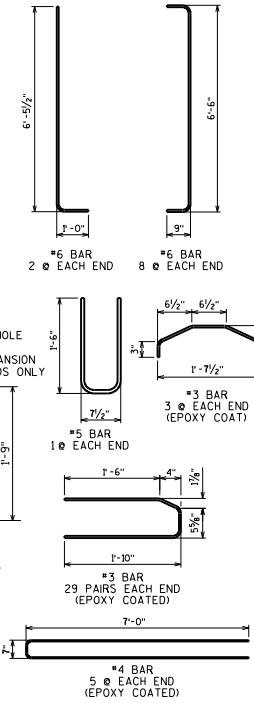
SUPPORT WITH STEEL OR ELASTOMERIC BRGS.



SUPPORT WITH 1/2" ELASTOMERIC BEARING PAD



SECTION THRU GIRDER
STRANDS NOT SHOWN



SECTION THRU GIRDER

SHOWING WELDED WIRE FABRIC (WWF) STIRRUPS
ASTM A1064 (FY = 70 KSI)

NOTES

TOP OF GIRDER TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY, EXCEPT THE OUTSIDE 15" 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 OR EPOXY 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.

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

PRESTRESSING STRANDS SHALL BE (DIA.)-7-WIRE LOW-RELAXATION STRANDS WITH AN ULTIMATE STRENGTH OF 270,000 PSI.

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. IF NOTE DOESN'T APPLY, REFERENCE SECT. 503.3.3 OF STD. SPEC. FOR GUIDANCE)

DESIGNER NOTES

BID ITEM SHALL BE "PRESTRESSED GIRDER TYPE 1 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" DIA. STRAND FOR ALL PATTERNS. THE MAX. NUMBER OF DRAPED 0.6" DIA. STRANDS IS 8.

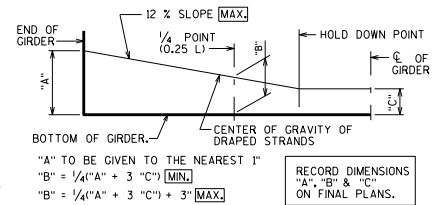
REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STANDARD STRAND PATTERNS LISTED ON STANDARD 19.20 AND THE SPAN LENGTHS SHOWN IN TABLE 19.3-2. USING DIFFERENT STRAND PATTERNS OR LONGER SPANS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT, WHICH REQUIRES PRIOR APPROVAL FROM THE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

▲ 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 1/2 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.

PROVIDE STIRRUP SPACING THAT IS SYMMETRICAL ABOUT THE C/L OF GIRDER.



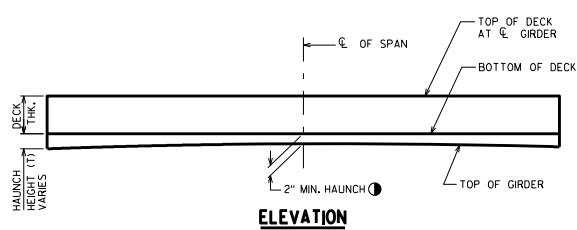
LOCATION OF DRAPED STRANDS

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

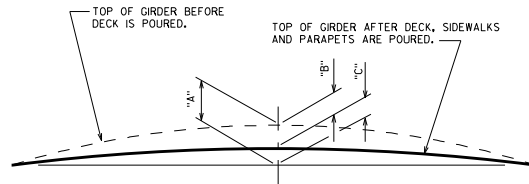
82W" PRESTRESSED GIRDER DETAILS

BUREAU OF STRUCTURES

APPROVED: Bill Oliva DATE: 1-17



ELEVATION



CAMBER & DEFLECTION DIAGRAM

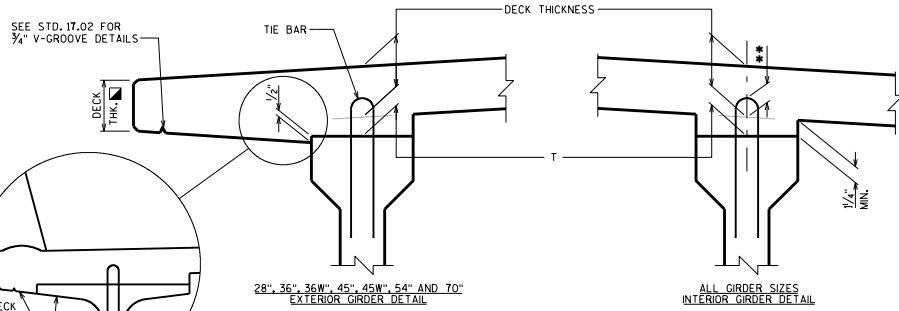
- * "A" = PRESTRESS CAMBER
- * "B" = DEAD LOAD DEFLECTION * ROUND OFF TO NEAREST 1/8"
- * "C" = RESIDUAL CAMBER

DESIGNER NOTES

- 1 PRESENT PRACTICE IS TO USE A MINIMUM "HAUNCH HEIGHT" (AT EDGE OF GIRDER FLANGE) OF 2" FOR DESIGN CALCULATIONS. THE MINIMUM HAUNCH (AT EDGE OF GIRDER FLANGE) ALLOWED IN CONSTRUCTION IS 1 1/4".
- USE THE CALCULATED THEORETICAL AVERAGE "HAUNCH HEIGHT" AT CENTERLINE OF FLANGE FOR COMPUTING THE HAUNCH CONCRETE QUANTITY.
- USE TOP OF DECK ELEVATIONS AND CALCULATED "HAUNCH HEIGHT" AT CENTERLINE OF GIRDER FOR COMPUTING BEAM SEAT ELEVATIONS AT SUBSTRUCTURES.
- "INTERMEDIATE CONCRETE DIAPHRAGMS" SHALL BE USED ONLY WHEN THE USE OF STEEL DIAPHRAGMS IS NOT FEASIBLE BECAUSE OF UTILITIES OR FOR OTHER SPECIAL SITUATIONS. ONLY ONE TYPE OF INTERMEDIATE DIAPHRAGM SHALL BE SHOWN ON THE PLANS. THE USE OF BOTH INTERMEDIATE CONCRETE & STEEL DIAPHRAGMS ON THE SAME BRIDGE IS NOT ALLOWED.
- FOR SKEWS ≤ 10°, PLACE INTERMEDIATE DIAPHRAGMS IN A STRAIGHT LINE. REFER TO STANDARD 19.36. PROVIDE OFFSET FOR SKEWS > 10°.
- PIER PILASTERS ARE TYPICALLY NOT USED, BUT MAY BE USED AS PART OF THE BRIDGE AESTHETIC PACKAGE ON 28", 36", 45", 54" AND 70" PRESTRESSED GIRDERS. PILASTERS ARE NOT USED ON 36W", 45W", 54W", 72W" OR 82W".

- 10 1/2" MIN. FOR TYPE "M" RAILINGS
- 1" MIN. FOR TYPE "NY3/NY4" RAILINGS

DIAPHRAGM SPACING: FOR SPANS ≤ 80'-0" PLACE ONE DIAPHRAGM AT MID-LENGTH OF GIRDER, FOR SPANS OVER 80'-0" PLACE AT 1/3 AND 2/3 POINTS.



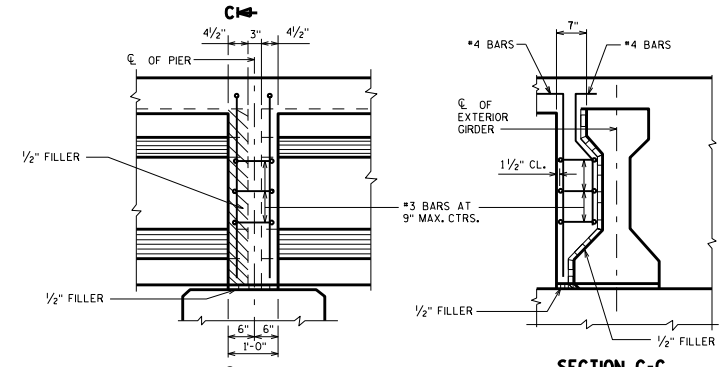
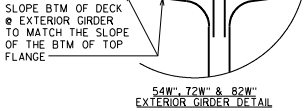
DECK HAUNCH DETAIL

IF 1/4" MINIMUM HAUNCH HEIGHT AT EDGE OF GIRDER CANNOT BE MAINTAINED, THE GRADE LINE MAY BE REVISED BY THE ENGINEER AT THE OPTION OF THE CONTRACTOR. THE PLAN DECK THICKNESS SHALL BE HELD. NOTIFY THE STRUCTURES SECTION IF THE GRADE LINE IS RAISED FROM THE PLAN PROFILE BY MORE THAN 1/2" OR, ** IF 3" MINIMUM DECK EMBEDMENT OF TIE BAR CANNOT BE OBTAINED.

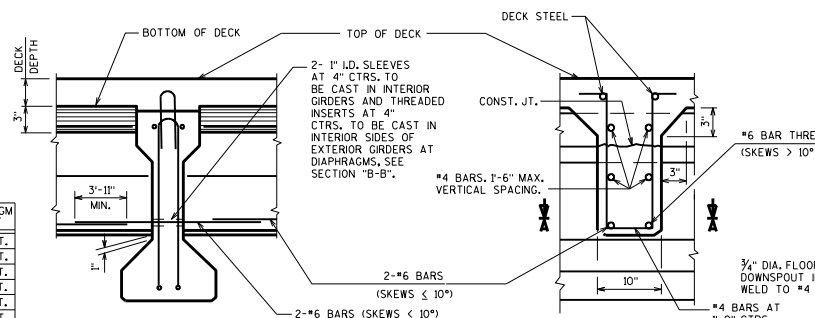
TO DETERMINE 'T', ELEV. OF TOP OF GRS. AT C.G. OF SUBSTRUCTURE UNITS & AT 1/10 POINTS OF EACH SPAN SHALL BE TAKEN. THEN FOLLOW THIS PROCESS:

- TOP OF DECK ELEV. AT FINAL GRADE
- TOP OF GIRDER ELEVATION
- + DEAD LOAD DEFLECTION
- DECK THICKNESS
- = HAUNCH HEIGHT 'T'

NOTE: AN AVERAGE HAUNCH ('T') OF WAS USED IN THE QUANTITY "CONCRETE MASONRY BRIDGES".



PLASTER DETAIL AT PIERS

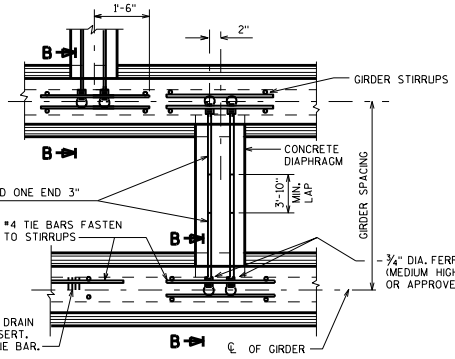


ELEVATION OF DIAPHRAGM

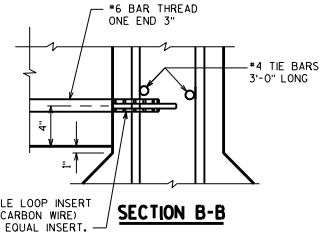
SECTION THROUGH DIAPHRAGM

INTERMEDIATE CONCRETE DIAPHRAGM DETAILS

GIRDER DEPTH	DIAPHRAGM WEIGHT
28"	207#/FT.
36"	270#/FT.
36W"	259#/FT.
45"	338#/FT.
45W"	353#/FT.
54"	405#/FT.
54W"	446#/FT.
70"	634#/FT.
72W"	634#/FT.
82W"	738#/FT.



SECTION A-A
SKEW ANGLES > 10°

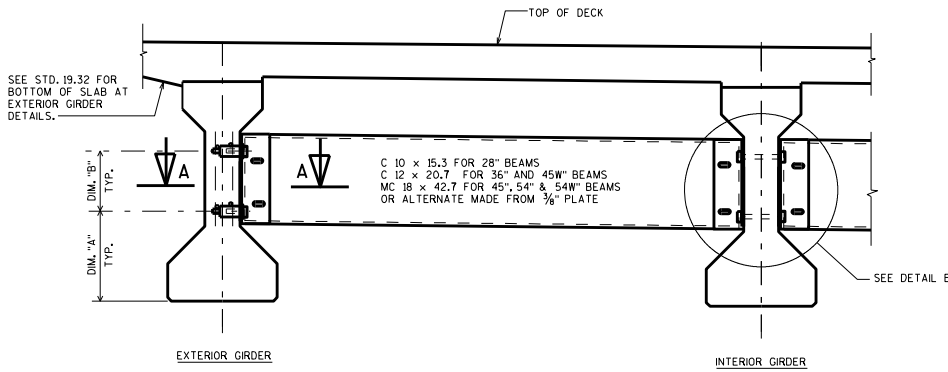


PRESTRESSED GIRDER DETAILS

BUREAU OF STRUCTURES

WISCONSIN DEPARTMENT OF TRANSPORTATION

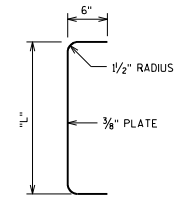
APPROVED: Bill Oliva DATE: 1-17



PART TRANSVERSE SECTION AT DIAPHRAGM

TABLE

GIRDER HEIGHT	DIM. "A"	DIM. "B"	DIM. "L"	* DIM. "X"
28"	1'-0 7/8"	5 7/8"	9 1/2"	2 1/4"
36"	1'-2 1/8"	9 7/8"	1'-1 1/2"	3 1/4"
45"	1'-5 3/8"	1'-1 7/8"	1'-5 1/2"	2 1/4"
45W"	1'-9 1/8"	8 7/8"	1'-0 1/2"	2 3/4"
54"	1'-7 7/8"	1'-5 3/8"	1'-9 1/2"	4 1/4"
54W"	1'-9 1/8"	1'-5 7/8"	1'-9 1/2"	4 1/4"



SECTION THRU ALTERNATE DIAPHRAGM

*DIM "X" = 2 1/2" FOR ALTERNATE PLATE DIAPHRAGM

NOTES

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

EACH DIAPHRAGM BETWEEN GIRDERS SHALL CONSTITUTE ONE UNIT.

ALL DIAPHRAGM STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 36.

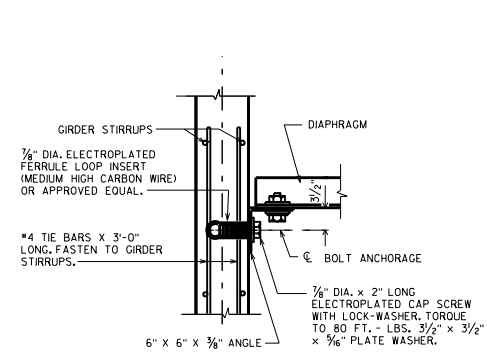
ALL DIAPHRAGM MATERIAL INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AFTER FABRICATION.

STEEL DIAPHRAGM TO CONCRETE WEB CONNECTION SHALL BE SNUG-TIGHT PLUS 1/4 TURN, UNLESS NOTED OTHERWISE. HIGH STRENGTH BOLTS FOR WEB CONNECTION SHALL MEET THE REQUIREMENTS FOR ASTM A325 OR ASTM A449.

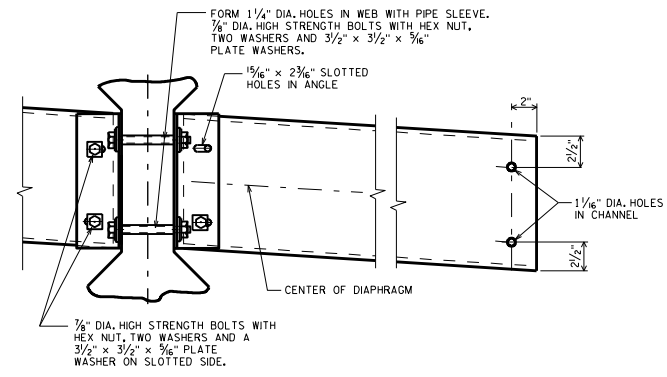
DESIGNER NOTES

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.

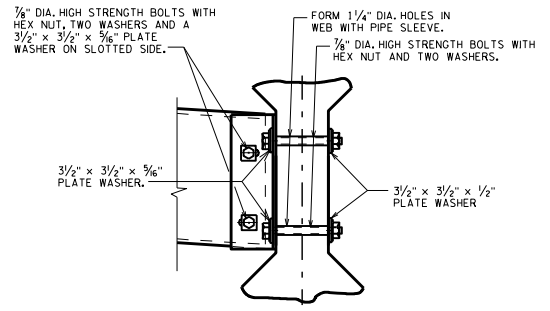
ON THE PLANS, SHOW LOCATION OF INSERTS/HOLES FOR DIAPHRAGM TO WEB CONNECTION, NOT ONLY FROM THE BOTTOM OF THE GIRDER (DIM "A" AND "B"), BUT ALSO FROM THE ENDS OF EACH GIRDER.



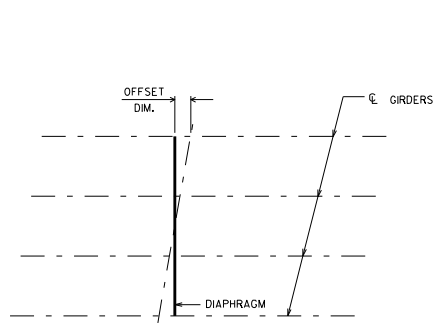
SECT. A-A
(FOR EXTERIOR ATTACHMENT)



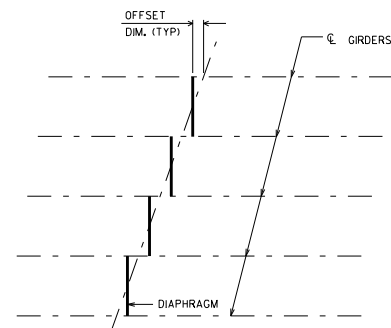
DETAIL B
(FOR CONTINUOUS LINE OF DIAPHRAGMS)



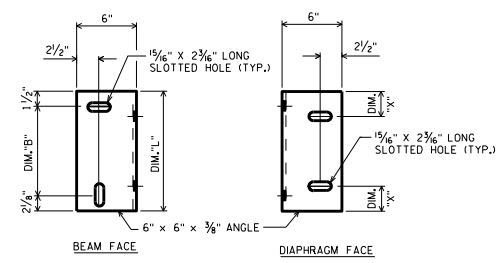
SECTION AT INTERIOR GIRDERS THRU DIAPHRAGM FOR SKEW ANGLES > 10°



PLAN FOR SKEW ANGLES ≤ 10°



PLAN FOR SKEW ANGLES > 10°

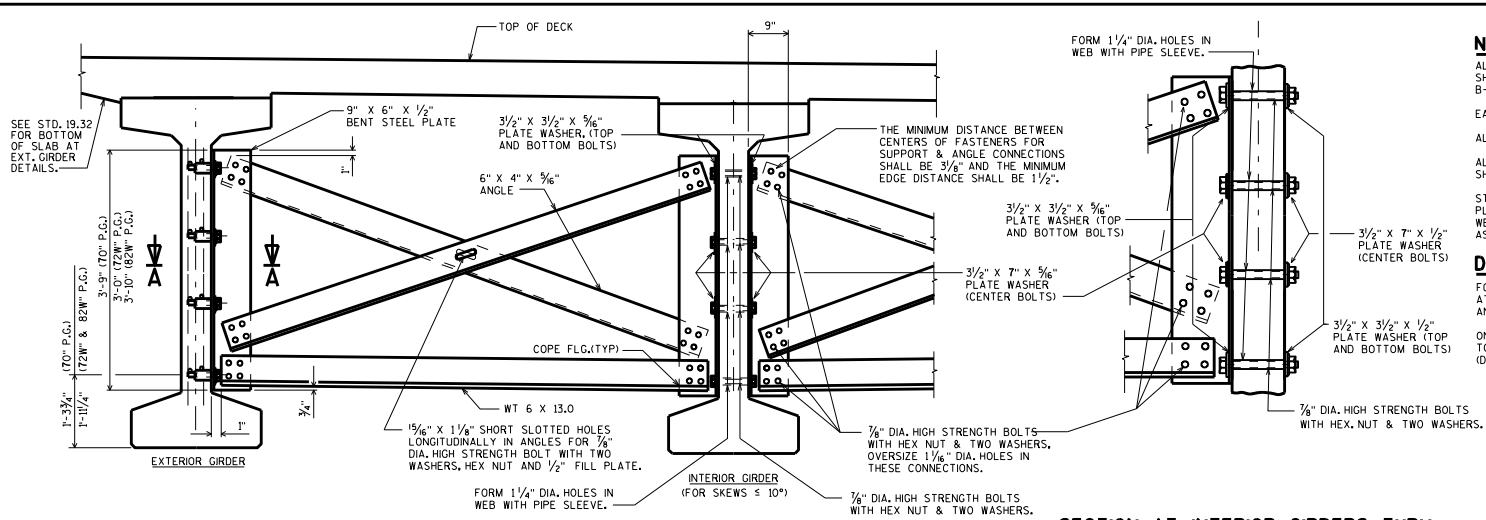


DIAPHRAGM SUPPORT

INTER. STEEL DIAPHS. FOR 28", 36", 45", 45W" 54" & 54W" PRESTRESSED GIRDERS



APPROVED: Bill Oliva DATE: 1-17



PART TRANSVERSE SECTION AT DIAPHRAGM

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

NOTES

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

EACH DIAPHRAGM BETWEEN GIRDERS SHALL CONSTITUTE ONE UNIT.

ALL DIAPHRAGM STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 36.

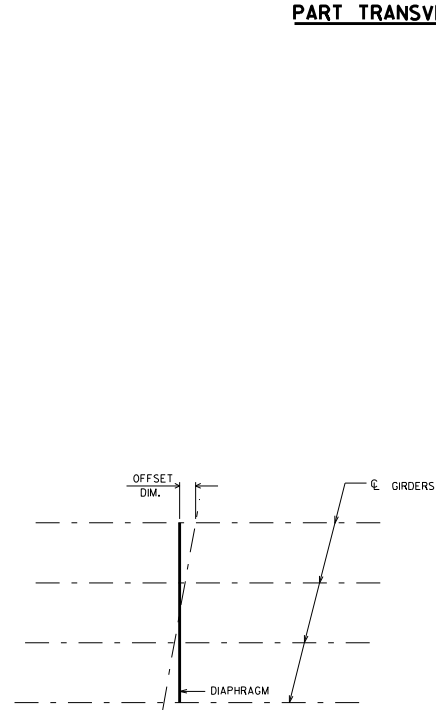
ALL DIAPHRAGM MATERIAL INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AFTER FABRICATION.

STEEL DIAPHRAGM TO CONCRETE WEB CONNECTION SHALL BE SNUG-TIGHT PLUS 1/4 TURN, UNLESS NOTED OTHERWISE. HIGH STRENGTH BOLTS FOR WEB CONNECTION SHALL MEET THE REQUIREMENTS FOR ASTM A325 OR ASTM A449.

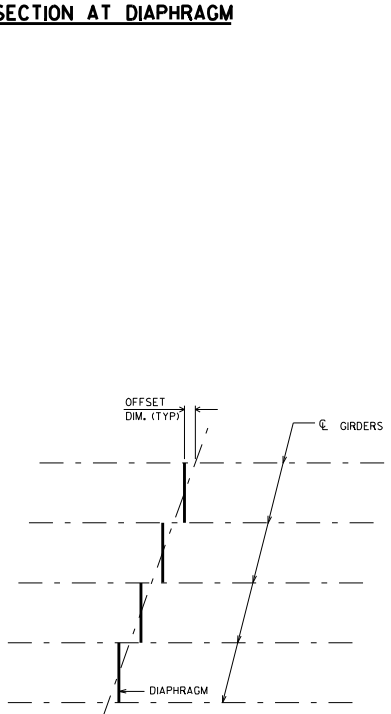
DESIGNER NOTES

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.

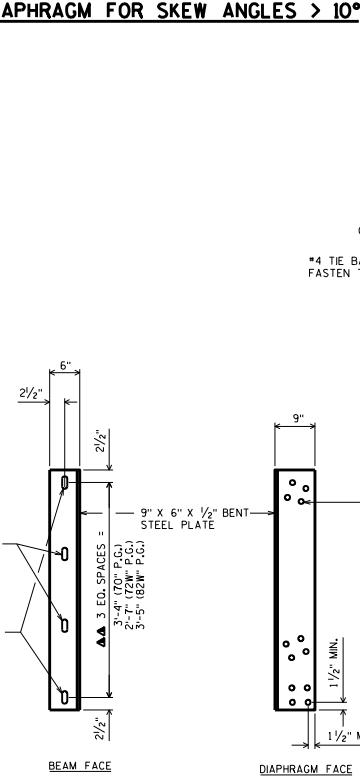
ON THE PLANS, SHOW LOCATION OF INSERTS/HOLES FOR DIAPHRAGM TO WEB CONNECTION, NOT ONLY FROM THE BOTTOM OF THE GIRDER (DIM "A" AND "B"), BUT ALSO FROM THE ENDS OF EACH GIRDER.



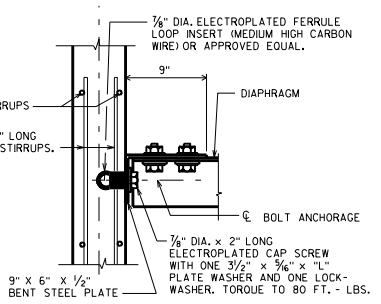
PLAN FOR SKEW ANGLES ≤ 10°



PLAN FOR SKEW ANGLES > 10°



DIAPHRAGM SUPPORT



SECT. A-A (FOR EXTERIOR ATTACHMENT)

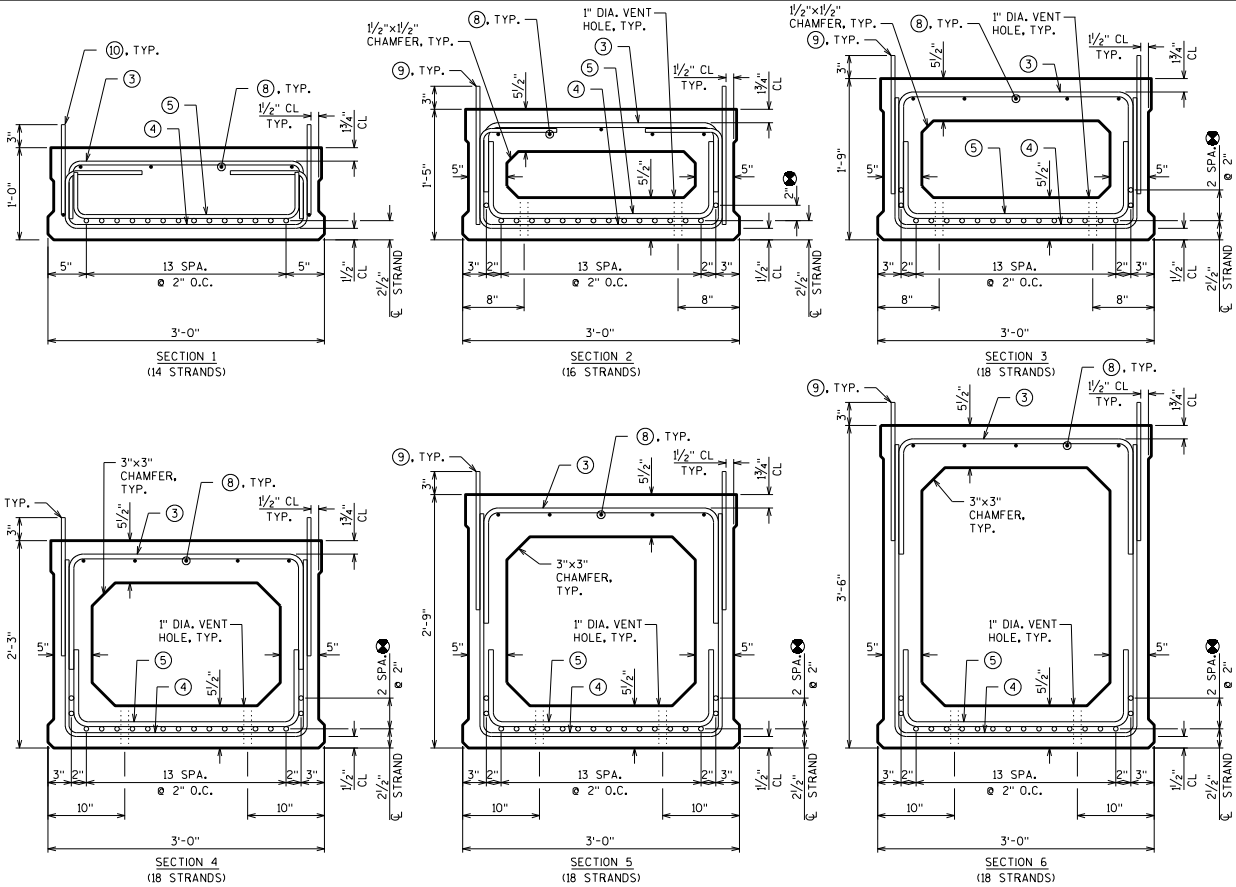
"L" = 3 1/2"; TOP & BOTTOM BOLTS
 "L" = 7"; CENTER BOLTS

▲▲ BOLT HOLES SHALL BE SPACED SO AS TO MISS PRESTRESSED STRANDS IN CONCRETE BEAMS.

INTERMEDIATE STEEL DIAPHRAGMS FOR 70", 72W" & 82W" PRESTRESSED GIRDERS

BUREAU OF STRUCTURES

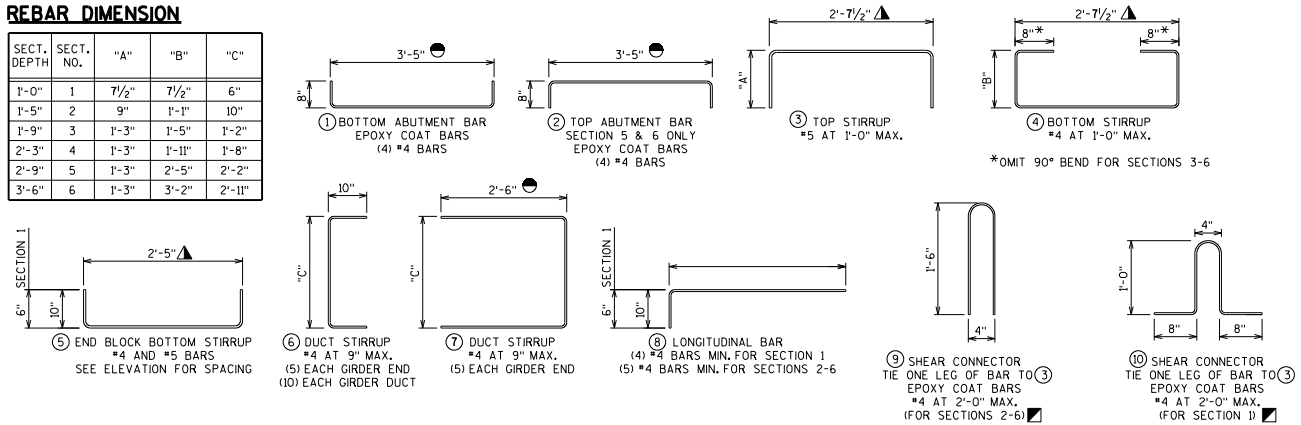
APPROVED: Bill Oliva DATE: 1-17



3'-0" SECTIONS

REBAR DIMENSION

SECT. DEPTH	SECT. NO.	"A"	"B"	"C"
1'-0"	1	7 1/2"	7 1/2"	6"
1'-5"	2	9"	1'-1"	10"
1'-9"	3	1'-3"	1'-5"	1'-2"
2'-3"	4	1'-3"	1'-11"	1'-8"
2'-9"	5	1'-3"	2'-5"	2'-2"
3'-6"	6	1'-3"	3'-2"	2'-11"



NOTES

THE CONCRETE MIX FOR THE PRESTRESSED BOX GIRDERS SHALL CONFORM TO SECTION 503.2.2 OF THE STANDARD SPECIFICATIONS.

AN APPROVED CONCRETE SEALER SHALL BE APPLIED TO THE BOTTOM OF THE GIRDERS AND THE EXTERIOR FACE OF EXTERIOR GIRDERS. DO NOT APPLY CONCRETE SEALER OR EPOXY TO THE SHEAR KEY OR THE TOP OF GIRDERS.

STRANDS SHALL BE FLUSH WITH END OF GIRDER. FOR CONCRETE ABUTMENTS, END OF STRANDS SHALL BE COATED WITH NON-BITUMINOUS JOINT SEALER. FOR GRS ABUTMENTS, 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.

VOIDS SHALL BE VENTED AND DRAINED BY CASTING (2)-1" DIA. TUBES AT EACH END OF VOID SEGMENT, LOCATE TUBES AT BOTTOM EDGES OF THE CORNER FILLETS, AVOID STRAND LOCATIONS.

FOUR WAY SLING MUST BE USED TO ENGAGE ALL 4 LIFTING DEVICES ON BOTH ENDS OF UNITS.

POST-TENSIONING OF THE TRANSVERSE TENDONS SHALL NOT BEGIN UNTIL THE GROUT BETWEEN THE PRECAST BOX GIRDERS HAS BEEN ALLOWED TO CURE FOR 48 HOURS AND GROUT HAS REACHED A COMPRESSIVE STRENGTH OF 3,000 PSI.

SEAL WASHER SHALL BE SPONGE NEOPRENE GASKET 3/4" MIN. THICK. STRESS POCKETS SHALL BE FILLED WITH CHLORIDE FREE NON-SHRINK GROUT AFTER POST-TENSIONING.

TRANSITION BETWEEN CHANGING SLOPES OF POST-TENSIONING DUCTS SHALL BE PROVIDED BY EITHER A CIRCULAR OR PARABOLIC CURVE WITH A MINIMUM LENGTH OF 3'-0".

DESIGNER NOTES

USE OF PRESTRESSED BOX GIRDERS IS SUBJECT TO PRIOR-APPROVAL BY THE BUREAU OF STRUCTURES, SEE 19.3.2.3.2 IN THE BRIDGE MANUAL FOR ADDITIONAL GUIDANCE.

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

BEAM SEATS SHALL BE SLOPED ALONG THE SUBSTRUCTURE UNITS TO ACCOUNT FOR THE CROSS SLOPE OR SUPERELEVATION ON THE DECK.

SLOPE BEAM SEATS PARALLEL TO GRADE LINE IF GRADE AT BRG. > 1%, PLACE ELEVATIONS ON PLANS TO MEET THESE REQUIREMENTS.

STRANDS TO BE DESIGNED. MAXIMUM NUMBER OF STRANDS AND STRAND ARRANGEMENTS ARE SHOWN. STRANDS NOT TO BE DRAPED.

MULTI-SPAN STRUCTURES REQUIRE ANCHOR DOWELS AT THE PIERS, WHICH MAY REDUCE THE MAXIMUM NUMBER OF STRANDS AVAILABLE BY 2. (CURRENTLY NOT USED)

CONTACT THE BUREAU OF STRUCTURES FOR THE MOST CURRENT PRESTRESSED BOX GIRDER SPECIAL PROVISION.

SEE STANDARD 19.51 FOR SHEAR KEY RECESS DETAIL.

MATERIAL PROPERTIES

- CONCRETE MASONRY BRIDGES $f_c = 4,000$ PSI
- BAR STEEL REINFORCEMENT, GRADE 60 $f_y = 60,000$ PSI
- PRESTRESSED BOX GIRDERS, CONCRETE MASONRY $f_c = 5,000$ PSI
- STRANDS - 0.5" OR 0.6" DIA. ULTIMATE TENSILE STRENGTH $f_y = 270,000$ PSI

LEGEND

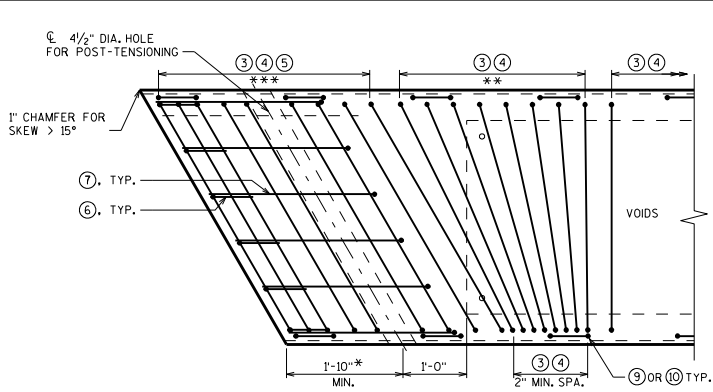
- DIMENSION GIVEN FOR A POST-TENSIONING DUCT 1'-10" FROM END OF PRESTRESSED BOX GIRDER.
- ▲ DIMENSION GIVEN FOR STIRRUPS PERPENDICULAR TO THE PRESTRESSED BOX GIRDER LENGTH, ADJUST THE DIMENSION FOR STIRRUPS AT SKEWED PRESTRESSED BOX GIRDER ENDS.
- SHOW SPACING FOR THESE STRANDS ONLY IF REQUIRED BY DESIGN.
- SUBSTITUTE (11) BAR ON EXTERIOR EDGE OF EXTERIOR GIRDERS. SEE STANDARD 19.56.

3'-0" PRESTRESSED BOX GIRDER SECTIONS

WISCONSIN DEPARTMENT OF TRANSPORTATION

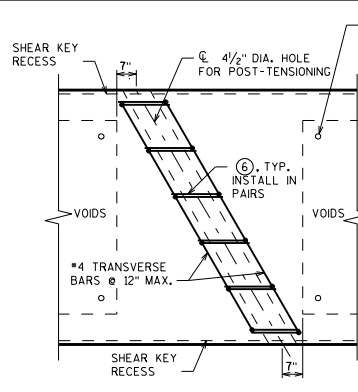
BUREAU OF STRUCTURES

APPROVED: Bill Oliva DATE: 1-17

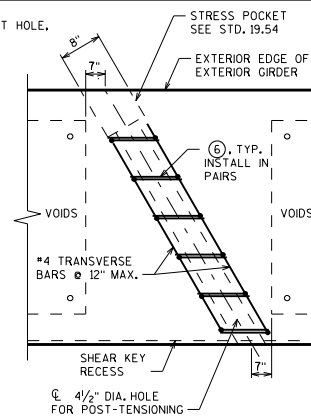


PART GIRDER PLAN WITH SKEW

①, ② & #4 TRANSVERSE BARS NOT SHOWN FOR CLARITY



INTERIOR GIRDER DUCT PLAN

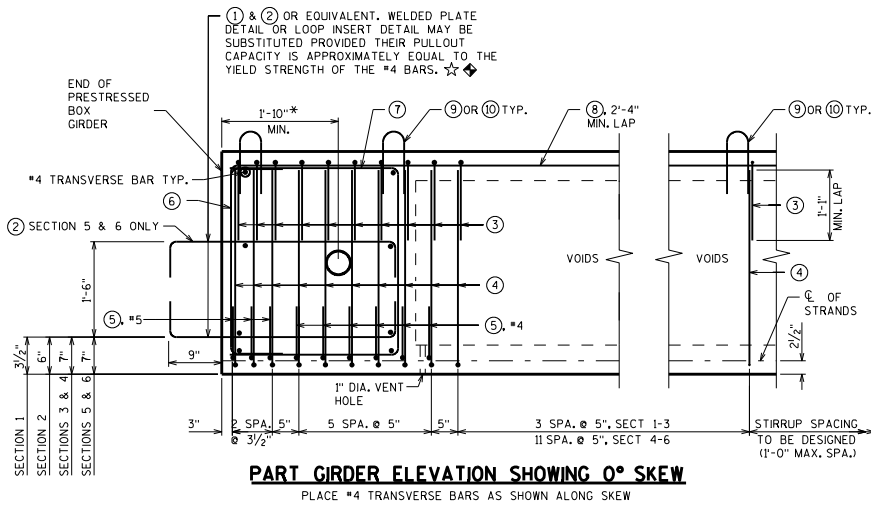


EXTERIOR GIRDER DUCT PLAN

- LEGEND**
- ☆ BARS NOT REQUIRED WHEN USED ON GRS ABUTMENTS.
 - ◆ BARS PLACED PARALLEL TO GIRDERS. SPACING IS PERPENDICULAR TO THE ϵ OF THE GIRDERS.
 - * WHEN WINGS ARE PARALLEL TO ABUTMENT ϵ , USE DIMENSIONS TO ALLOW FOR EASE OF POST-TENSIONING OPERATION.
 - ** PLACE AT 5" MAX. SPACING UNTIL PERPENDICULAR TO THE ϵ OF THE GIRDER.
 - *** PLACE ALONG SKEW FROM END OF PRESTRESSED BOX GIRDER UNTIL ALL END BLOCK BOTTOM STIRRUP BARS, ⑤, ARE PLACED.

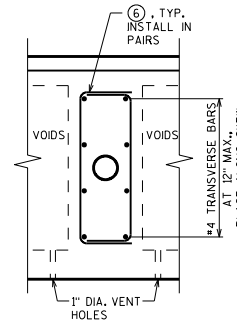
DESIGNER NOTES

FOR BAR BEND DETAILS, SEE STANDARD 19.50 AND STANDARD 19.51
 FOR SKEWED STRUCTURES CAST END OF PRESTRESSED BOX GIRDER ALONG SKEW.

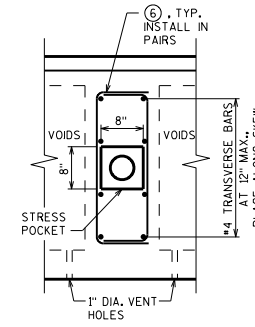


PART GIRDER ELEVATION SHOWING 0° SKEW

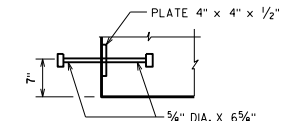
PLACE #4 TRANSVERSE BARS AS SHOWN ALONG SKEW



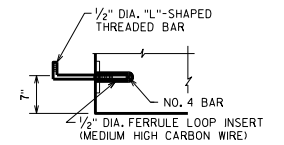
INTERIOR GIRDER DUCT ELEVATION



EXTERIOR GIRDER DUCT ELEVATION



WELDED PLATE DETAIL
 (EQUIVALENT TO ONE #4 BAR)

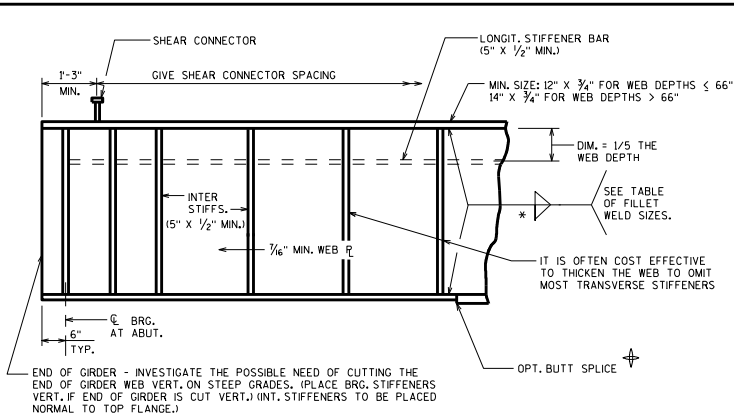


LOOP INSERT DETAIL

PRESTRESSED BOX GIRDER DETAILS 1

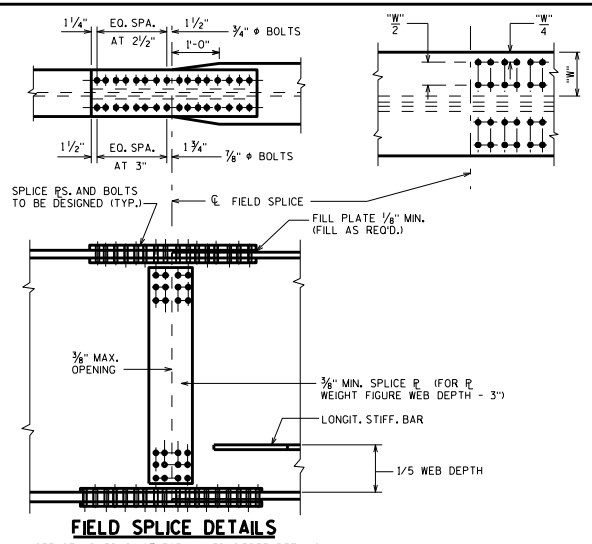
BUREAU OF STRUCTURES

APPROVED: Bill Oliva DATE: 1-17



PART GIRDER ELEVATION

END OF GIRDER - INVESTIGATE THE POSSIBLE NEED OF CUTTING THE END OF GIRDER WEB VERT. ON STEEP GRADES. (PLACE BRG. STIFFENERS VERT. IF END OF GIRDER IS CUT VERT.) INT. STIFFENERS TO BE PLACED NORMAL TO TOP FLANGE.)



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.

PRIOR TO STEEL BLAST, ALL FLAME CUT EDGES OF PLATE THAT ARE TO BE PAINTED SHALL BE GROUND OR PLANED TO REMOVE THE HARDENED SURFACE CAUSED BY THE FLAME, AND CORNERS CHAMFERED 1/16" MINIMUM.

DESIGNER NOTES

BASE BEAM SEAT ELEVATIONS AT ABUTMENT ON THICKER FLANGE AND DETAIL SHM PLATES TO ACCOMMODATE THINNER FLANGE.

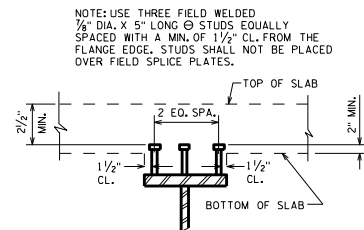
AT EXTERIOR GIRDERS PLACE INTERMEDIATE TRANSVERSE STIFFENERS ON INTERIOR FACE OF GIRDER, PLACE LONGITUDINAL STIFFENERS ON THE OUTSIDE FACE.

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.

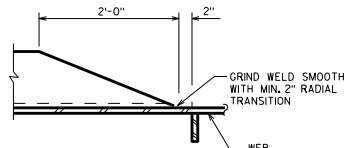
AT EXTERIOR GIRDER PLACE INTERMEDIATE TRANSVERSE STIFFENERS ALONG ENTIRE LENGTH OF GIRDER AT A MAX. SPACING EQUAL TO 1.5 X THE DEPTH OF WEB. SPACE EQUALLY BETWEEN DIAPHRAGM CONNECTION STIFFENER. THIS REQUIREMENT IS NECESSARY TO SUPPORT THE FALSEWORK FOR THE SLAB OVERHANG AND MAY BE DISREGARDED IF THE SLAB OVERHANG, MEASURED FROM \bar{C} WEB, IS 1'-6" OR LESS OR ANY OF THE FOLLOWING CRITERIA ARE SATISFIED:

- ...WEB THICKNESS $> 3/8"$ AND WEB DEPTH $\leq 48"$
- ...WEB THICKNESS $\geq 1/2"$ AND WEB DEPTH $\leq 60"$
- ...WEB THICKNESS $\geq 3/4"$ AND WEB DEPTH $\leq 66"$

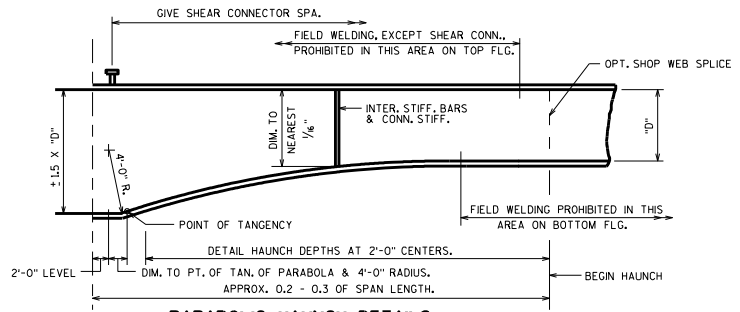


\bar{O} USE DIFFERENT LENGTH STUDS IF 2 1/2" MIN. CLEARANCE OR 2" EXTENSION CRITERIA IS VIOLATED.

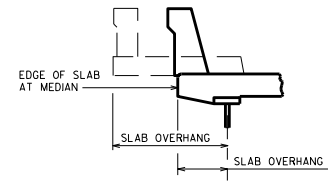
SHEAR CONN. DETAILS



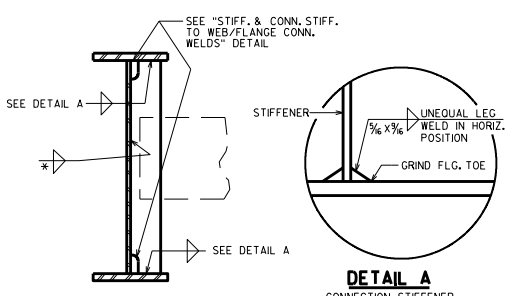
LONGIT. STIFF. TERMINATION



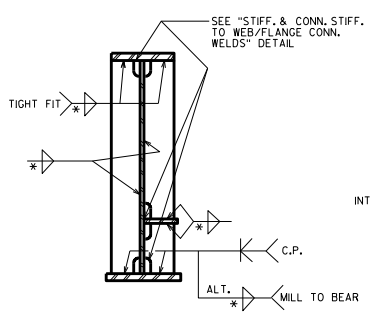
PARABOLIC HAUNCH DETAILS



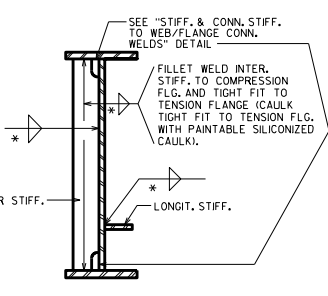
SLAB OVERHANG DEFINITION



CONNECTION STIFF. DETAILS



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



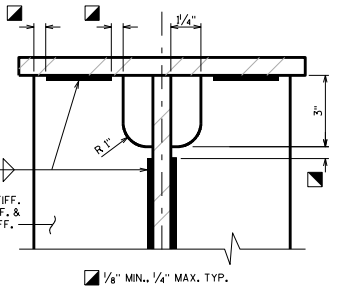
INTERMEDIATE & LONGITUDINAL STIFF. DETAILS (ALL GIRDERS)

*** 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"	Δ 5/16"
OVER 1 1/2"	Δ 3/8"

∇ EXCEPT THAT THE WELD SIZE SHALL NOT EXCEED THE THICKNESS OF THE THINNER PART JOINED.

Δ MIN. PASS SIZE IS 3/16"

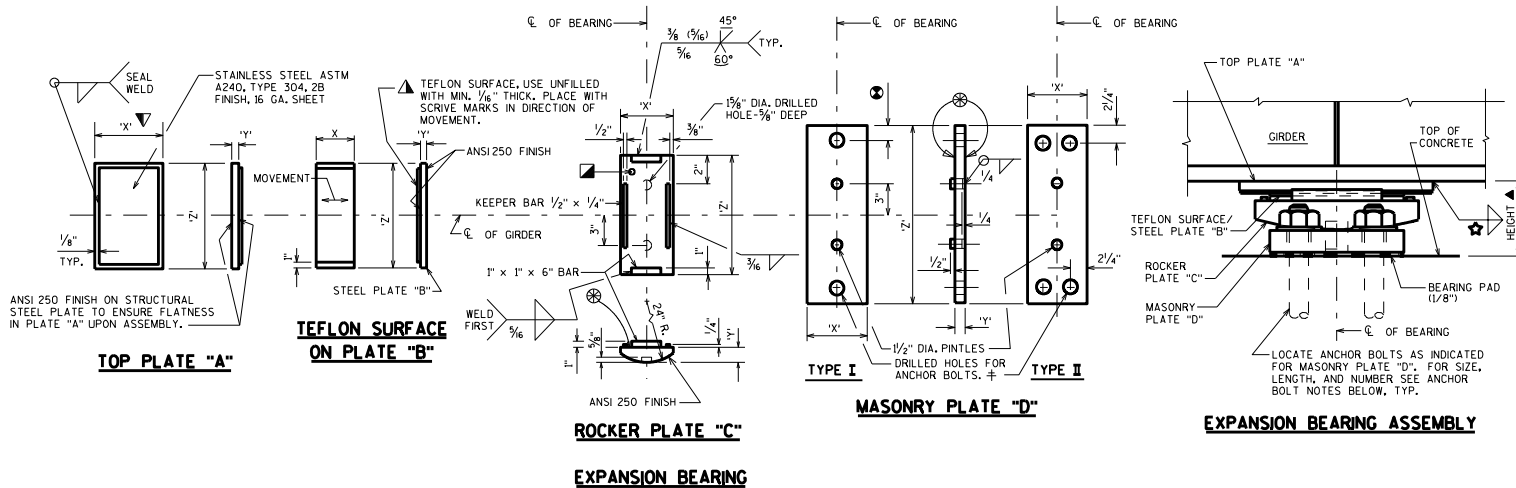


STIFF. & CONN. STIFF. TO WEB/FLANGE CONN. WELDS

PLATE GIRDER DETAILS



APPROVED: Bill Oliva DATE: 1-17



BEARING NOTES

- ALL BEARINGS ARE SYMMETRICAL ABOUT \bar{C} OF GIRDER AND \bar{C} OF BEARING.
- FINISH THESE SURFACES TO ANSI 250 IF "Y" DIMENSION IS GREATER THAN 2".
- ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153, CLASS C.
- ROCKER PLATE "C" AND MASONRY PLATE "D" SHALL BE GALVANIZED. TOP PLATE "A" AND STEEL PLATE "B" SHALL BE SHOP PAINTED. USE A WELDABLE PRIMER ON TOP PLATE "A". DO NOT PAINT STAINLESS STEEL OR TEFLON SURFACES.
- ALL MATERIAL IN BEARINGS, INCLUDING SHIM PLATES, BUT EXCLUDING STAINLESS STEEL SHEET, TEFLON SURFACE, PINTLES, ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A709 GRADE 50W.
- IN LIEU OF USING SHIM PLATES, FABRICATOR MAY INCREASE THICKNESS OF TOP PLATE "A" OR MASONRY PLATE "D" BY THE SHIM PLATE THICKNESS.
- DIMENSION IS 2" WHEN $1/2"$ DIA. ANCHOR BOLTS ARE USED AND $2/4"$ WHEN $1/2"$ DIA. ANCHOR BOLTS ARE USED.

- ALL MATERIAL IN TYPE "A-T" BEARINGS, INCLUDING SHIM PLATES AND BEARING PADS, SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "BEARING ASSEMBLIES EXPANSION B--", EACH.
- CHAMFER ANCHOR BOLTS PRIOR TO THREADING.
- ALL FINISHED SURFACES SHALL BE MACHINE FINISHED BY AN AUTOMATIC PROCESS.
- ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS.

DESIGNER NOTES

- HEIGHT OF BEARINGS GIVEN IN TABLES INCLUDES $1/8"$ BEARING PAD, 16 GAGE STAINLESS STEEL SHEET AND $1/16"$ TEFLON SURFACE.
- DETAIL SHIM PLATES AS DESCRIBED IN NOTES ON STANDARD 24.02.
- PROVIDE $1/8"$ THICK BEARING PAD THE SAME SIZE AS MASONRY PLATE "D" FOR EACH BEARING.
- ANCHOR BOLTS SHALL BE THREADED 3". PROVIDE ONE STANDARD WROUGHT WASHER AND ONE HEX NUT PER BOLT. PROJECT ANCHOR BOLTS, MASONRY PLATE "D" THICKNESS + $2/4"$, ABOVE TOP OF CONCRETE.

- FOR WELD SIZE, REFER TO STANDARD 24.02.
- ADJUST HEIGHT IF BEVELED ROCKER PLATE "C" IS USED.
- FOR BEARING REPLACEMENTS, DESIGNER SHALL UTILIZE A WIDER BEARING THAN THE EXISTING GIRDER BOTTOM FLANGE WIDTH TO ALLOW FOR FIELD WELDING CLEARANCES.
- FOR BEARING REPLACEMENTS, SEE STD. 27.02 FOR MINIMUM ANCHOR BOLT CLEARANCE INFORMATION.

- DIMENSION "X" SHOWN FOR TOP PLATE "A" IS A MINIMUM. PROVIDE ADEQUATE LENGTH TO ENSURE PLATE "B" IS ALWAYS COVERED FOR ALL EXPECTED MOVEMENTS. SEE STD. 27.10 FOR ADDITIONAL GUIDANCE.

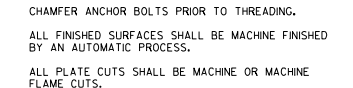
CALCULATE THE REACTIONS AT THE BEARINGS DUE TO "TOTAL LOADS" AND ALSO "DEAD LOADS" ONLY. USE THE AASHTO LRFD SERVICE I LOAD COMBINATION. CONSIDER ONLY DEAD LOAD (DC + DW) AND HL-93 LIVE LOADS (LL), INCLUDING A 33% DYNAMIC LOAD ALLOWANCE (IM).

THE VALUES IN THE TABLES ARE THE BEARING CAPACITIES FOR "TOTAL LOAD" (DC + DW + LL + IM). TAKE 60% OF THE VALUES IN THE TABLES TO DETERMINE THE BEARING CAPACITIES FOR "DEAD LOAD" ONLY (DC + DW).

SELECT A BEARING THAT HAS A "TOTAL LOAD" CAPACITY GREATER THAN OR EQUAL TO THE CALCULATED "TOTAL LOAD" REACTION AND ALSO A "DEAD LOAD" CAPACITY GREATER THAN OR EQUAL TO THE CALCULATED "DEAD LOAD" REACTION.

ANCHOR BOLT NOTES

- FOR SPAN LENGTHS UP TO 100'-0": USE A TYPE I MASONRY PLATE "D" WITH (2) - $1/4"$ DIA. X 1'-5" LONG ANCHOR BOLTS.
- FOR SPAN LENGTHS FROM 100'-0" UP TO 150'-0": USE A TYPE I MASONRY PLATE "D" WITH (2) - $1/2"$ DIA. X 1'-10" LONG ANCHOR BOLTS.
- FOR SPAN LENGTHS GREATER THAN 150'-0": USE A TYPE II MASONRY PLATE "D" WITH (4) - $1/2"$ DIA. X 1'-10" LONG ANCHOR BOLTS.
- CHECK THAT ANCHOR BOLTS PROVIDE ADEQUATE HORIZONTAL CAPACITY.



10" BEARING

TOTAL LOAD (KIPS)	PLATE A			PLATE B			PLATE C			PLATE D			HEIGHT FEET
	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z	
100	9"	$5/8"$	10"	5"	$1/2"$	10"	7"	$1 1/8"$	1'-0"	8"	$1/2"$	1'-8"	0.360
180	1'-1"	$5/8"$	10"	9"	$1/2"$	10"	11"	$2 3/8"$	1'-0"	8"	$1/2"$	1'-8"	0.438
260	1'-5"	$5/8"$	10"	1'-1"	$1/2"$	10"	1'-3"	$3 3/8"$	1'-0"	11"	2"	1'-8"	0.604

14" BEARING

TOTAL LOAD (KIPS)	PLATE A			PLATE B			PLATE C			PLATE D			HEIGHT FEET
	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z	
210	11"	$5/8"$	1'-2"	7"	$1/2"$	1'-2"	9"	$1 5/8"$	1'-4"	8"	$1/2"$	2'-0"	0.401
375	1'-5"	$5/8"$	1'-2"	1'-1"	$1/2"$	1'-2"	1'-3"	$3 3/8"$	1'-4"	1'-2"	$2 3/8"$	2'-0"	0.677
500	1'-9"	$5/8"$	1'-2"	1'-5"	$1/2"$	1'-2"	1'-7"	$4 7/8"$	1'-4"	1'-5"	$3 3/8"$	2'-1"	0.802

18" BEARING

TOTAL LOAD (KIPS)	PLATE A			PLATE B			PLATE C			PLATE D			HEIGHT FEET
	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z	
280	11"	$5/8"$	1'-6"	7"	$1/2"$	1'-6"	9"	$1 5/8"$	1'-8"	9"	2"	2'-4"	0.443
360	1'-1"	$5/8"$	1'-6"	9"	$1/2"$	1'-6"	11"	$2 3/8"$	1'-8"	11"	2"	2'-4"	0.479
600	1'-7"	$5/8"$	1'-6"	1'-3"	$1/2"$	1'-6"	1'-5"	$3 3/8"$	1'-8"	1'-5"	$3 3/8"$	2'-5"	0.719
650	1'-11"	$5/8"$	1'-6"	1'-7"	$1/2"$	1'-6"	1'-9"	$4 7/8"$	1'-8"	1'-10"	$3 3/8"$	2'-5"	0.844

12" BEARING

TOTAL LOAD (KIPS)	PLATE A			PLATE B			PLATE C			PLATE D			HEIGHT FEET
	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z	
125	9"	$5/8"$	1'-0"	5"	$1/2"$	1'-0"	7"	$1 1/8"$	1'-2"	8"	$1/2"$	1'-10"	0.360
175	11"	$5/8"$	1'-0"	7"	$1/2"$	1'-0"	9"	$1 5/8"$	1'-2"	8"	$1/2"$	1'-10"	0.401
275	1'-3"	$5/8"$	1'-0"	11"	$1/2"$	1'-0"	1'-1"	$2 3/8"$	1'-2"	11"	2"	1'-10"	0.521

16" BEARING

TOTAL LOAD (KIPS)	PLATE A			PLATE B			PLATE C			PLATE D			HEIGHT FEET
	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z	
245	11"	$5/8"$	1'-4"	7"	$1/2"$	1'-4"	9"	$1 5/8"$	1'-6"	8"	$1/2"$	2'-2"	0.401
370	1'-3"	$5/8"$	1'-4"	11"	$1/2"$	1'-4"	1'-1"	$2 3/8"$	1'-6"	1'-0"	$2 3/8"$	2'-3"	0.552
525	1'-7"	$5/8"$	1'-4"	1'-3"	$1/2"$	1'-4"	1'-5"	$3 3/8"$	1'-6"	1'-4"	$3 3/8"$	2'-3"	0.719
575	1'-9"	$5/8"$	1'-4"	1'-5"	$1/2"$	1'-4"	1'-7"	$4 7/8"$	1'-6"	1'-6"	$3 3/8"$	2'-3"	0.844

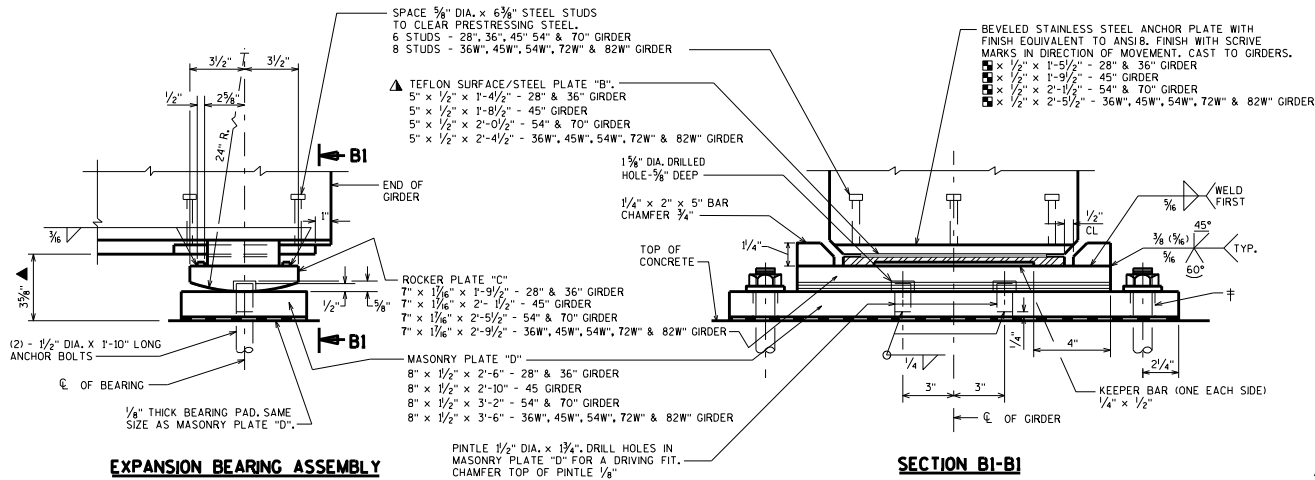
20" BEARING

TOTAL LOAD (KIPS)	PLATE A			PLATE B			PLATE C			PLATE D			HEIGHT FEET
	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z	
225	9"	$5/8"$	1'-8"	5"	$1/2"$	1'-8"	7"	$1 1/8"$	1'-10"	8"	$1/2"$	2'-6"	0.360
315	11"	$5/8"$	1'-8"	7"	$1/2"$	1'-8"	9"	$1 5/8"$	1'-10"	9"	2"	2'-6"	0.443
495	1'-3"	$5/8"$	1'-8"	11"	$1/2"$	1'-8"	1'-1"	$2 3/8"$	1'-10"	1'-1"	$2 3/8"$	2'-7"	0.594
675	1'-7"	$5/8"$	1'-8"	1'-3"	$1/2"$	1'-8"	1'-5"	$3 3/8"$	1'-10"	1'-6"	$3 3/8"$	2'-7"	0.760
705	1'-11"	$5/8"$	1'-8"	1'-7"	$1/2"$	1'-8"	1'-9"	$4 7/8"$	1'-10"	1'-11"	$3 3/8"$	2'-7"	0.844

STAINLESS STEEL - TFE EXPANSION BEARING DETAILS TYPE 'A-T'

BUREAU OF STRUCTURES

APPROVED: Bill Oliva DATE: 1-17



BEARING NOTES

- ALL BEARINGS ARE SYMMETRICAL ABOUT CL OF GIRDER AND CL OF BEARING.
- ALL MATERIAL IN BEARINGS, BUT EXCLUDING STAINLESS STEEL PLATE, TEFLON SURFACE, PINTLES, ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A709 GRADE 50W.
- STAINLESS STEEL PLATE SHALL CONFORM TO ASTM A240, TYPE 304.
- STEEL PINTLES SHALL CONFORM TO ASTM A449 OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.
- ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A709 GRADE 36, OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.
- ALL STRUCTURAL STEEL BEARING PLATES SHALL BE FLAT ROLLED STEEL PLATES WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT, AND VERTICAL.
- ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS.
- ALL FINISHED SURFACES SHALL BE MACHINE FINISHED BY AN AUTOMATIC PROCESS.
- ANCHOR BOLTS SHALL BE THREADED 3". PROVIDE ONE STANDARD WROUGHT WASHER AND ONE HEX NUT PER BOLT. PROJECT ANCHOR BOLTS, MASONRY PLATE "D" THICKNESS + 2/4", ABOVE TOP OF CONCRETE.
- CHAMFER ANCHOR BOLTS PRIOR TO THREADING.

- MASONRY PLATE "D", ROCKER PLATE "C", ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153, CLASS "C". STEEL PLATE "B" SHALL BE SHOP PAINTED. DO NOT PAINT TEFLON SURFACE.
- ALL MATERIAL IN "STEEL BEARINGS FOR UNRESTRICTED CONCRETE GIRDERS", INCLUDING BEARING PADS, SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "BEARING ASSEMBLIES EXPANSION B-1", EACH.
- DRILLED HOLES FOR ANCHOR BOLTS IN MASONRY PLATE "D" SHALL HAVE A DIAMETER 3/6" LARGER THAN ANCHOR BOLT.
- TEFLON SURFACE, USE UNFILLED WITH MINIMUM 1/16" THICKNESS. PLACE WITH SCRIVE MARKS IN DIRECTION OF MOVEMENT. BOND STEEL PLATE "B" AND TEFLON WITH ADHESIVE MATERIAL MEETING THE REQUIREMENTS FOUND IN THE STANDARD SPECIFICATION.
- PROVIDE A METHOD FOR HANDLING ROCKER PLATE "C" DURING GALVANIZING.
- AT INSTALLATION, ENSURE STAINLESS STEEL SLIDING FACE OF THE UPPER ELEMENT AND THE TFE SLIDING FACE OF THE LOWER ELEMENT HAVE THE SURFACE FINISH SPECIFIED AND ARE CLEAN AND FREE OF ALL DUST, MOISTURE, AND ANY OTHER FOREIGN MATTER.

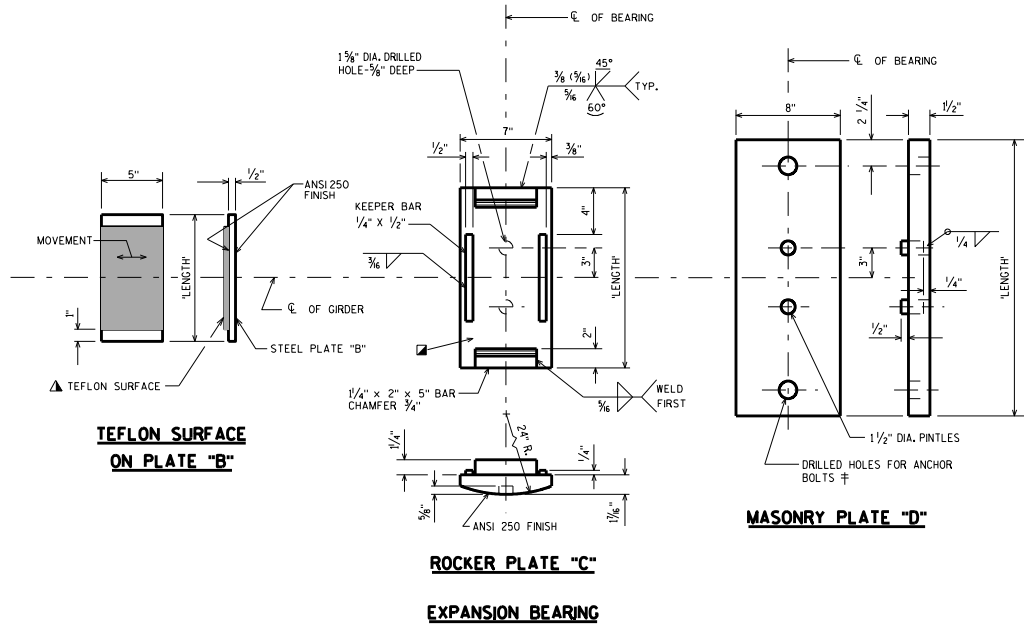
DESIGNER NOTES

- IF ALL BEARINGS AT A GIVEN SUBSTRUCTURE UNIT ARE FIXED, UTILIZE 1/2" THICK ELASTOMERIC BEARING PADS AND FULL-DEPTH CONCRETE DIAPHRAGMS.
- FOR EXPANSION BEARINGS, USE LAMINATED ELASTOMERIC BEARINGS WHENEVER POSSIBLE.
- SEE STANDARD 27.02 AND 19.31 FOR CLEARANCE REQUIREMENTS AND STANDARD 27.02 FOR THE USE OF BEVELED ROCKER PLATE "C" ON GRADES GREATER THAN 3%.
- HEIGHT OF BEARING SHOWN IN "EXPANSION BEARING ASSEMBLY" INCLUDES 1/8" BEARING PAD AND 1/16" TEFLON SURFACE.
- ADJUST HEIGHT IF BEVELED ROCKER PLATE "C" IS USED.
- ANCHOR PLATE LENGTH TO BE DESIGNED. MINIMUM LENGTH IS 10". SEE STD. 27.10 FOR ADDITIONAL GUIDANCE.

CALCULATE THE REACTIONS AT THE BEARINGS DUE TO "TOTAL LOADS" AND ALSO "DEAD LOADS" ONLY. USE THE AASHTO LRFD SERVICE I LOAD COMBINATION AND CHECK TO SEE IF THE REACTIONS EXCEED THE BEARING CAPACITIES IN THE TABLE BELOW. CONSIDER ONLY DEAD LOAD (DC + DW) AND HL-93 LIVE LOADS (LL), INCLUDING A 33% DYNAMIC LOAD ALLOWANCE (IM).

IF EITHER REACTION EXCEEDS ITS CORRESPONDING BEARING CAPACITY, THE BEARING DETAILS AS SHOWN ON THIS STANDARD MUST BE MODIFIED TO INCREASE THE BEARING CAPACITY. IF BEARING DETAILS ARE CHANGED AND ANY PLATE HAS A THICKNESS GREATER THAN 2", THEN PROVIDE AN ANS1250 FINISH TO TOP AND BOTTOM SURFACE OF THESE PLATES.

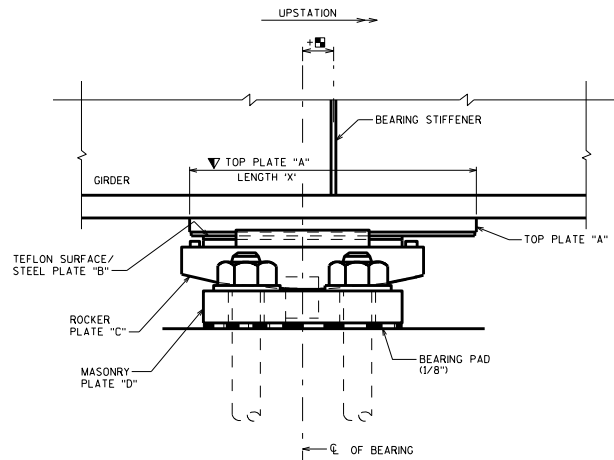
GIRDER SIZE	28" & 36"	45"	54" & 70"	36W", 45W", 54W", 72W" & 82W"
TOTAL LOAD (DC+DW+(LL+IM))	180	230	280	330
DEAD LOAD (DC + DW)	110	140	170	200



STEEL BEARINGS FOR PRESTRESSED CONCRETE GIRDERS

BUREAU OF STRUCTURES

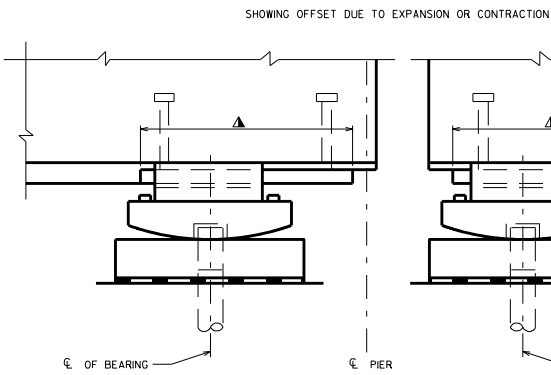
APPROVED: Bill Oliva DATE: 1-17



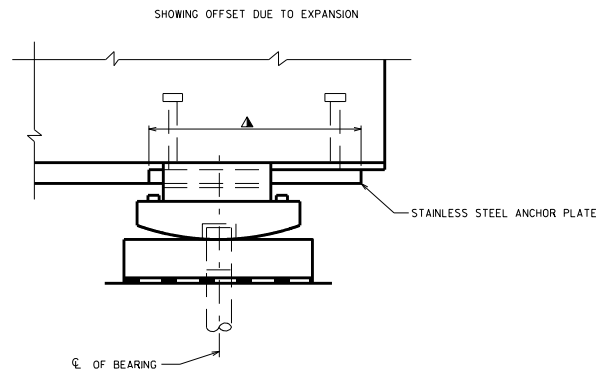
EXPANSION BEARING ASSEMBLY
FOR STEEL GIRDER
(SHOW ON PLANS)

°F	S. ABUT	PIER 1	PIER 2	PIER 3	PIER 4	PIER 5	PIER 6	N. ABUT
30	0.7	0.5	0.3	-0.3	-0.5	-0.7		
45	0	0	0	0	0	0		
60	-0.7	-0.5	-0.3	0.3	0.5	0.7		
75	-1.6	-1.1	-0.7	0.7	1.1	1.6		
90	-2.4	-1.7	-1.0	1.0	1.7	2.4		

BEARING OFFSET TABLE
ALL DIMENSIONS IN INCHES
AMBIENT TEMPERATURE DURING GIRDER INSTALLATION



EXPANSION BEARINGS AT PIER
PRESTRESSED GIRDER (CONC. DIAPHS. NOT SHOWN FOR CLARITY)
FOR DESIGNER INFORMATION, ONLY
(DO NOT PUT ON THE PLANS)



EXPANSION BEARING AT ABUTMENT
PRESTRESSED GIRDER
FOR DESIGNER INFORMATION, ONLY
(DO NOT PUT ON THE PLANS)

NOTES

FOR STEEL GIRDER BEARINGS:
USE TEMPERATURE SETTING TABLE, RATHER THAN CENTERING BEARINGS BENEATH BEARING STIFFENERS FOR ALL TEMPERATURES.

FOR PRESTRESSED GIRDER BEARINGS:
PLACE BEARINGS AS SHOWN ON THE SUBSTRUCTURE PLAN, PROVIDING ADJUSTMENT FOR SUBSTRUCTURE LOCATION DISCREPANCIES. PLACE EACH GIRDER CENTERED BETWEEN ITS GIVEN BEARINGS.

DESIGNER NOTES

THIS STANDARD SHOULD ONLY BE USED FOR STEEL BEARINGS.

TOP PLATE "A" FOR STEEL GIRDER BEARINGS TO BE DESIGNED TO ACCOUNT FOR THERMAL MOVEMENT AND CONSTRUCTION TOLERANCE. USE GREATER OF VALUE FROM PROCEDURE BELOW OR SIZE FROM STANDARD 27.09.

PROCEDURE FOR SIZING TOP PLATE "A":
 $\frac{1}{2}$ TEFLON PLATE "B" LENGTH "X"
 + THERMAL MOVEMENT (USE $60 - (-30) = 90$ DEGREES)
 + 1" CONSTRUCTION TOLERANCE
 = $\frac{1}{2}$ TOP PLATE "A" LENGTH (DOUBLE THIS FOR PLATE "A" LENGTH)

ANCHOR PLATES IN PRESTRESSED GIRDERS TO BE DESIGNED TO ACCOUNT FOR THERMAL MOVEMENT, GIRDER SHRINKAGE AND CONSTRUCTION TOLERANCE.

PROCEDURE FOR SIZING ANCHOR PLATE:
 $2\frac{1}{2}$ INCHES = $\frac{1}{2}$ TEFLON PLATE LENGTH
 + THERMAL MOVEMENT (USE $60 - 5 = 55$ DEGREES)
 + SHRINKAGE = $0.0003 \cdot L$
 + 1" CONSTRUCTION TOLERANCE
 = $\frac{1}{2}$ ANCHOR PLATE LENGTH (DOUBLE THIS FOR ANCHOR PLATE LENGTH)

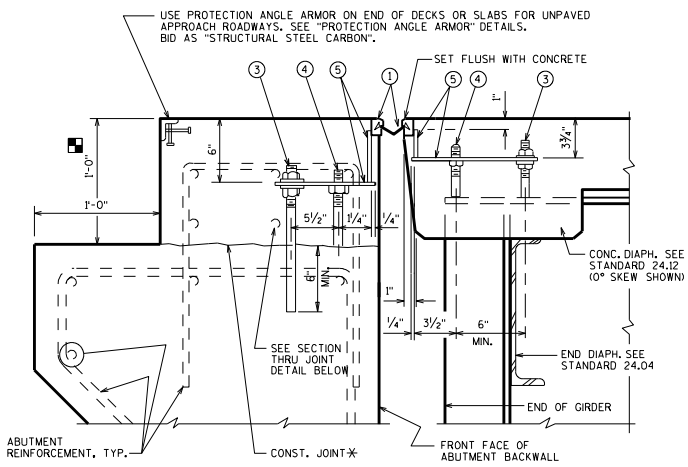
ACCORDING TO AASHTO, THE LOAD FACTOR FOR T_U IS 1.20 FOR DEFORMATIONS. THE PROCEDURE OUTLINED ABOVE SHOULD BE USED WITH A LOAD FACTOR OF 1.0, WITH THE 1" CONSTRUCTION TOLERANCE BEING USED IN LIEU OF THE HIGHER LOAD FACTOR.

THE 90 DEGREE TEMPERATURE RANGE FOR STEEL BEARINGS, BASED ON A 60 DEGREE SETTING TEMPERATURE, IS SLIGHTLY CONSERVATIVE IF THE BEARING OFFSET TABLE IS UTILIZED, SINCE AT 45 DEGREES THE OFFSET WOULD BE ZERO.

STEEL EXPANSION BEARING DETAILS

BUREAU OF STRUCTURES

APPROVED: Bill Oliva DATE: 1-17

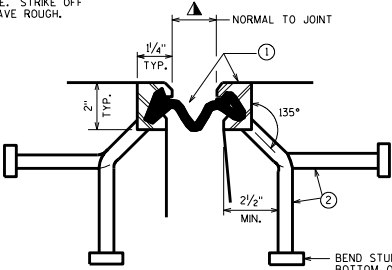


TYPICAL SECTION THRU JOINT AT STEEL GIRDER

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

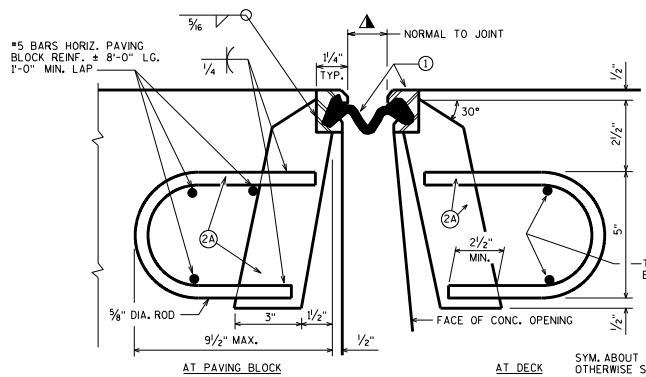
NORMAL TO \perp SUBSTRUCTURE

PAVING NOTCH IS 1'-0" WIDE BY 1'-4" DEEP IF STRUCTURAL APPROACH SLAB (STD. 12.12) IS USED.



SECTION THRU JOINT

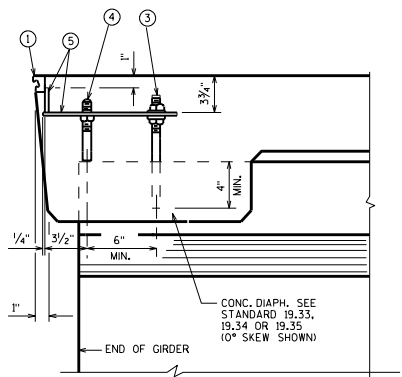
EXTERIOR GIRDER TO EDGE OF DECK, AND AT PARAPETS, MEDIANS AND SIDEWALKS



SECTION THRU JOINT

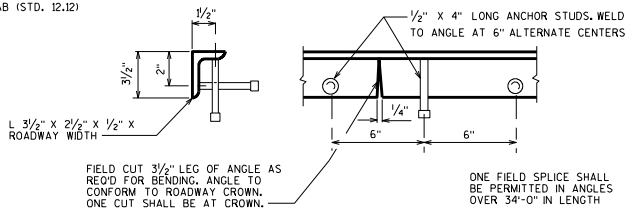
ROADWAY TRAFFIC AREA BETWEEN EXTERIOR GIRDERS.

SYM. ABOUT \perp JOINT UNLESS OTHERWISE SHOWN OR NOTED



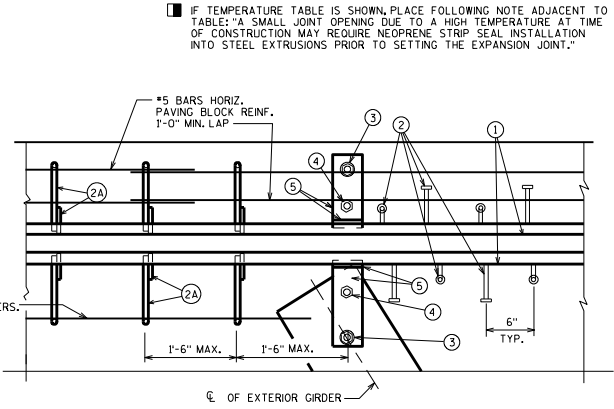
PART SECTION THRU JOINT AT PRESTRESSED GIRDERS

NORMAL TO \perp SUBSTRUCTURE



PROTECTION ANGLE ARMOR

SANDBLAST PROTECTION ANGLE AFTER FABRICATION PER NOTES. AFTER BLAST CLEANING, THE PROTECTION ANGLE SHALL BE HOT DIPPED GALVANIZED.



PART PLAN

LEGEND

- 1 NEOPRENE STRIP SEAL (1-INCH) AND STEEL EXTRUSIONS. SET JOINT OPENING AT 1 1/2" WHEN EXPANSION LENGTH < 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" DIA. X 6 3/8" LONG AT 6" ALTERNATE CENTERS. WELD TO EXTRUSIONS AND BEND AS SHOWN AFTER WELDING.
- 2A 1/2" THICK ANCHOR PLATE WITH 3/8" DIA. 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" DIA. THREADED ROD WITH 2 NUTS AND PLATE WASHERS. FOR PRESTRESSED GIRDERS, CROUT THREADED ROD INTO FIELD DRILLED HOLES ON \perp OF GIRDER. FOR STEEL GIRDERS, WELD THREADED ROD TO TOP FLANGE OR ATTACH BY BOLTING THRU FLANGE. ON ABUTMENT SIDE, CROUT THREADED ROD INTO FIELD DRILLED HOLES IN ABUTMENT BACKWALL AS SHOWN.
- 4 3/4" DIA. 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" DIA. HOLE FOR NO. 3 AND 1" DIA. HOLE FOR NO. 4.
- 6 GALVANIZED PLATE 3/4" X 10" X (2'-2" 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, SEE STANDARD 28.07.
- 7 3/4" DIA. 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" DIA. X 4" GALVANIZED HEX HEAD BOLT. BEND 45°.
- 9 3/4" DIA. X 2 1/4" GALVANIZED THREADED COUPLING.
- 10 SIDEWALK COVER PLATE 3/4" X (2'-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.

NOTES

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

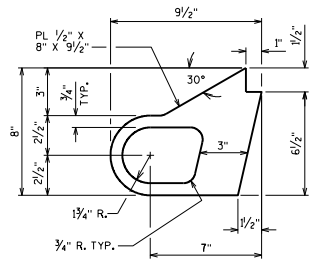
AFTER FABRICATION, BUT BEFORE SHIPMENT, STRAIGHTEN STEEL EXTRUSIONS SUCH THAT THEY SHALL BE FREE FROM WARP, TWIST AND SWEEP.

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, SUPPORTS AND EXTRUSIONS AFTER FABRICATION IN ACCORDANCE WITH SSPC SP. #6 "COMMERCIAL BLAST CLEANING". AFTER BLAST CLEANING, THE PLATES, SUPPORTS 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.

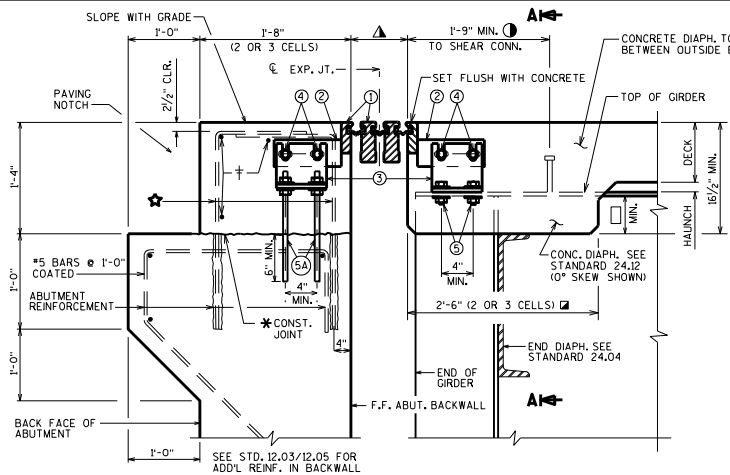
ANCHOR SYSTEM NO. 8 AND NO. 9 SHALL CONFORM TO ASTM A307 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 CLASS C AND D.

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

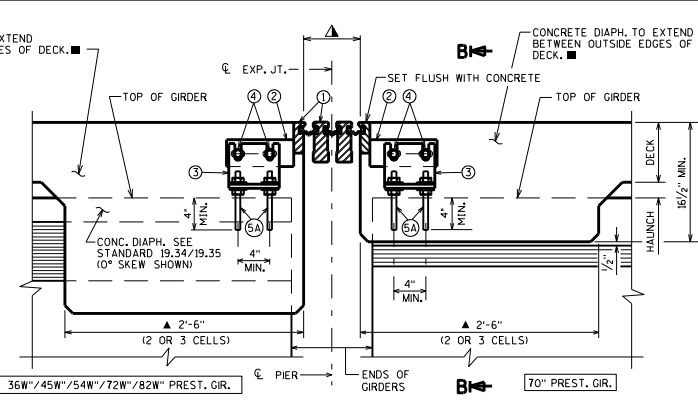


ALTERNATE STRIP SEAL ANCHOR

STRIP SEAL EXPANSION JOINT DETAILS	
	BUREAU OF STRUCTURES
APPROVED: <u>Bill Oliva</u>	DATE: 1-17

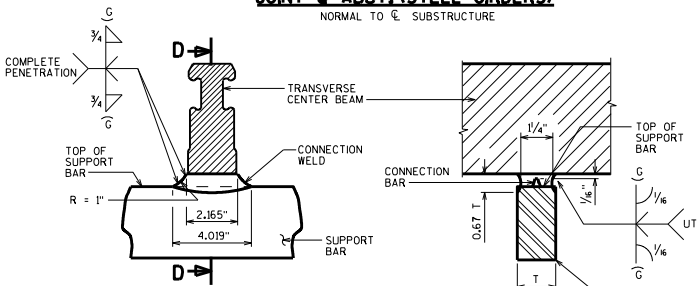


JOINT @ ABUT. (STEEL GIRDERS)
NORMAL TO \bar{C} SUBSTRUCTURE



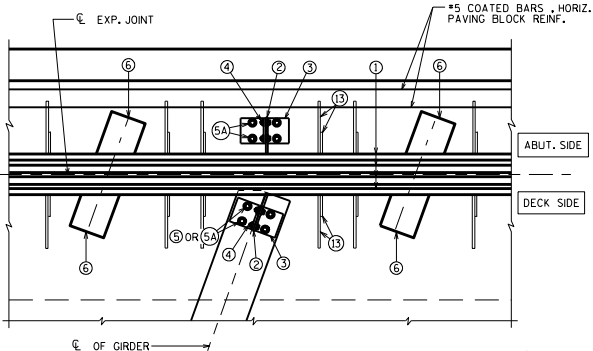
JOINT @ PIER (PRESTRESSED GIRDERS)
NORMAL TO \bar{C} SUBSTRUCTURE

- LEGEND**
- ① MODULAR EXPANSION JOINT DEVICE, \square CELLS.
 - ② 1/2" PLATE, ONE PER GIRDER MIN. PROVIDE 2 - 1" x 2" MIN. SLOTTED HOLES PLACED HORIZONTALLY FOR NO. 4.
 - ③ WT 6 x 29 OR EQUIVALENT BUILT UP I-SECTION, ONE PER GIRDER. PROVIDE 2 - 1" x 3" MIN. SLOTTED HOLES PLACED VERTICALLY IN WEB OF WT FOR BOLTS NO. 4.
 - ④ 3/4" DIA. HIGH STRENGTH BOLTS WITH NUTS & WASHERS. (A325 GALV.)
 - ⑤ 3/4" DIA. HIGH STRENGTH BOLTS WITH NUTS & WASHERS. FIELD DRILL HOLES IN GIRDER TOP FLANGE. (A325 GALV.)
 - ⑤A 3/4" DIA. THREADED ROD WITH 2 NUTS & WASHERS. GROUT THREADED ROD INTO FIELD DRILLED HOLES (GALV.)
 - ⑥ SUPPORT BOX ASSEMBLY FOR SUPPORT BAR (SPA, PER MANUFACTURER). FABRICATE BOX FROM 1/2" PLATES.
 - ⑦ 3/8" BULKHEAD PLATE. WELD TO NO. 1, NO. 8 AND NO. 14. WHEN CONDUIT IS PRESENT IN PARAPET OR SIDEWALK, ACCOMMODATE FOR BY PROVIDING OPENING IN NO. 7.
 - ⑧ INSIDE PLATE. FABRICATE FROM 3/8" PLATE.
 - ⑨ OUTSIDE PLATE. FABRICATE FROM 3/8" PLATE.
 - ⑩ 1/2" SQUARE BAR, WELD TO NO. 8 AS SHOWN.
 - ⑪ 3/4" DIA. x 4" LONG STUDS, WELD TO NO. 7, 8, & 14 AS SHOWN.
 - ⑫ 3/4" DIA. x 2" STAINLESS STEEL FLAT CTSK. SLOTTED HEAD CAP SCREWS W/ ANTI-SEIZE LUBRICANT. RECESS 1/16" BELOW PL. SURFACE.
 - ⑬ 1/2" PLATE WITH 3/8" DIA. LOOP ANCHOR FABRICATED AS SHOWN. SPACED AT MANUFACTURER'S SPEC.
 - ⑭ INSIDE PLATE. FABRICATE FROM 3/8" PLATE
 - ⑮ ADIPRENE BUTTON. SEE DETAIL. SET IN OUTSIDE PLATE.



**MODULAR EXPANSION JOINT CONNECTION
DETAIL AND WELD SPECIFICATION**

SECTION D-D

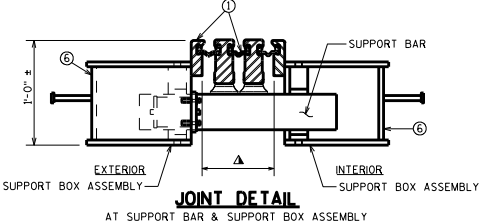


PART PLAN

- AT LOCATION WHERE EXT. GR. IS ADJACENT TO A RAISED SIDEWALK (STD.30.07), CONC. DIAPHR. DOES NOT EXTEND OUT TO EDGE OF DECK, BUT IS TERMINATED AT INSIDE FACE OF EXT. GR.
- † #5 COATED BARS, ± 8'-0" LONG, 1'-0" MIN. LAP. CUT IN FIELD TO CLEAR JOINT SUPPORT SYSTEM AS REQ'D.
- * POUR CONC. ABOVE THIS JOINT AFTER SUPERSTRUCTURE CONC. IS IN PLACE, STRIKE OFF & LEAVE ROUGH.
- ① DIMENSION IS PARALLEL TO \bar{C} GIRDER.
- ▲ MANUFACTURER'S RECOMMENDED JOINT OPENING BASED ON THE TEMPERATURE ON THE DAY OF PLACEMENT PER TEMPERATURE TABLE, THE MODULAR EXPANSION DEVICE SHALL HAVE THE NUMBER OF CELLS AS INDICATED IN (D).
- ★ (2) COATED L-SHAPED ADHESIVE ANCHORS 3/8" INCH, EMBED 12" IN CONCRETE. SPACE AT 1'-0". PLACE ADHESIVE ANCHORS AFTER MODULAR JOINT IS IN POSITION.
- TOP FLANGE WIDTH WITHIN LIMITS OF CONC. DIAPHR. SHALL BE $\leq 20"$ FOR SKEWS $\leq 30^\circ$
- ▲ FOR PRESTRESSED GIRDERS, PLACE THE FOLLOWING NOTE ON PLANS: "JOINT MANUFACTURER SHALL INFORM AND PROVIDE NECESSARY DETAILS TO THE PRESTRESSED GIRDER FABRICATOR, WHEN FORM-OUT OF THE TOP FLANGE IS REQ'D. TO ALLOW PLACEMENT OF SUPPORT BOX ASSEMBLY."

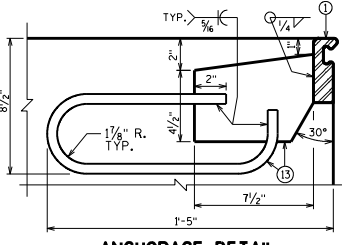
NOTES

ONE FIELD SPICE PERMITTED IN STEEL EXTRUSIONS, DETAILS SHALL BE SUBMITTED FOR APPROVAL. NO SPlicing PERMITTED IN NEOPRENE GLAND. AFTER FABRICATION, BUT BEFORE SHIPMENT, STRAIGHTEN STEEL EXTRUSIONS SUCH THAT THEY SHALL BE FREE FROM WARP, TWIST & SWEEP. NO EXPANSION JOINT PROTRUSIONS PERMITTED ABOVE ROADWAY SURFACE, ON PARAPET ROADWAY FACE OR ABOVE SIDEWALK SURFACE FOR RAISED SIDEWALK. THE EXPANSION JOINT SEALS SHALL BE PLACED, BONDED & SEALED AS RECOMMENDED BY THE MANUFACTURER. FORM WORK SHALL BE PLACED BETWEEN THE SUPPORT BOXES TO PREVENT CONCRETE INTRUSION INTO THE SUPPORT BOX. A TECHNICAL REPRESENTATIVE OF THE MANUFACTURER SHALL BE PRESENT DURING INSTALLATION. PRIOR TO SETTING THE JOINT ASSEMBLY INTO POSITION, THE PROJECT ENGINEER SHALL DETERMINE THE PROPER JOINT OPENING. EXPANSION JOINT EXTRUSIONS SHALL BE FABRICATED TO CONFORM TO ROADWAY CROWN & GRADE. FABRICATOR SHALL PROVIDE MEANS OF KEEPING GALVANIZED EXTRUSIONS CLEAN & SMOOTH DURING SHIPMENT AND PRIOR TO APPLYING LUBRICANT ADHESIVE FOR NEOPRENE GLAND INSTALLATION. SANDBLAST BARS, PLATES, WT-SECTION, ANCHORAGE LOOP, & EXTRUSIONS AFTER FABRICATION IN ACCORDANCE WITH SSP SP. #6 "COMMERCIAL BLAST CLEANING". AFTER BLAST CLEANING, THIS ASSEMBLY SHALL BE HOT DIPPED GALVANIZED. COST OF FURNISHING & PLACING OF THE EXPANSION JOINTS COMPLETE WITH PARAPET PLATES & SIDEWALK PLATES SHALL BE PAID FOR UNDER THE PRICE BID FOR "EXPANSION DEVICE MODULAR B". BAR STEEL REINF. IN DECK AND CONC. DIAPHR. GRAM SHALL BE RESPAVED AS NECESSARY TO ALLOW PLACEMENT OF JOINT ASSEMBLY. TOP TRANSVERSE BARS, ADJACENT TO MOD. JT., TO BE CUT AND PLACED BETWEEN JT. SUPPORT SYSTEM.



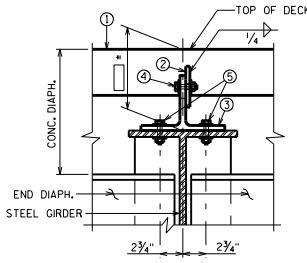
JOINT DETAIL

AT SUPPORT BAR & SUPPORT BOX ASSEMBLY

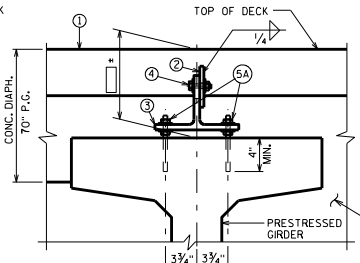


ANCHORAGE DETAIL

PLACE ADJACENT TO SUPPORT BOXES IN PAVING BLOCK @ ABUT. & IN DECK @ CONC. DIAPHR.



SECTION A-A



SECTION B-B

NOTE: MODULAR EXPANSION DEVICE DESIGN AND DETAILS ARE SPECIFIC TO THE MANUFACTURER SELECTED FROM THOSE LISTED IN THE SPECIAL PROVISIONS. ▲ SUPPORT BOXES ARE SHOWN FOR GENERAL INFORMATION AND LOCATION MAY VARY ACCORDING TO FABRICATOR DESIGN. SPACE SUPPORT BOXES TO MISS GIRDER TOP FLANGES WHEN POSSIBLE, BUT NOT TO EXCEED MAXIMUM SPACING PER SPECIAL PROVISIONS.

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.

TEMP. TABLE

TEMPERATURE TABLE FOR SETTING JOINT OPENINGS TO BE DETERMINED BY JOINT MANUFACTURER WITH THE FOLLOWING DESIGN DATA:

1. \square IN. OF MOVEMENT PER 10° F
2. MEDIAN TEMPERATURE OF 45° F
3. TEMP. RANGE IN TABLE FROM (5° F) TO (185° F) FOR PRESTRESSED CONCRETE GIRDERS AND FROM (-5° F) TO (+95° F) FOR STEEL GIRDERS.
4. ADJUST INITIAL JOINT OPENINGS BY A REDUCTION OF \square IN. WHICH ACCOUNTS FOR SHRINKAGE (CREEP) OF THE SUPERSTRUCTURE OVER TIME, TO PRODUCE FINAL JOINT OPENINGS FOR TABLE.

A TABLE OF JOINT OPENINGS BASED ON ABOVE DATA SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

INCLUDE ITEM 4. FOR PRESTRESSED GIRDER STRUCTURES ONLY. SEE CHAPT. 28 IN BRIDGE DESIGN MANUAL FOR ADJUSTMENT FACTOR.

STANDARD COVERS:

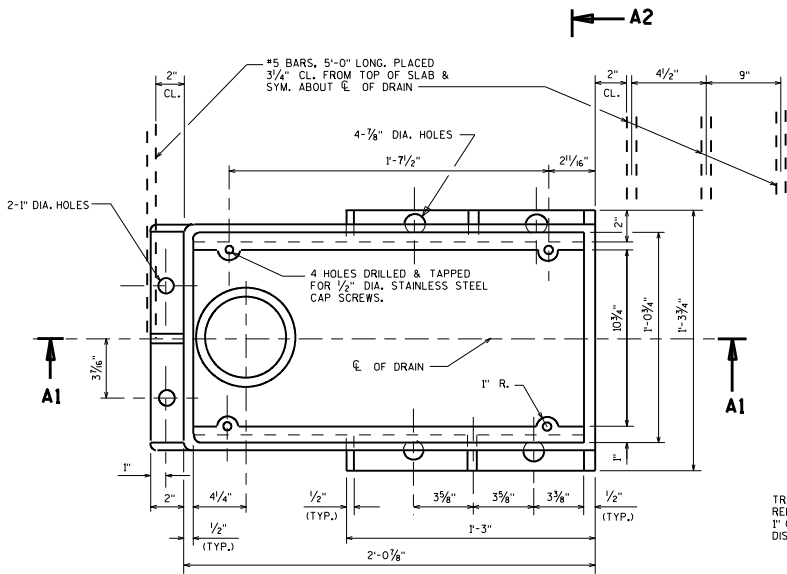
- SKEWS $\leq 30^\circ$
- 2 OR 3 CELL MODULAR EXPANSION JOINTS
- STEEL GIRDER BRIDGES
- PRESTRESSED GIRDER BRIDGES (70", 36W", 45W", 54W", 72W" AND 82W" SECTION)

MODULAR EXPANSION JOINT DETAILS

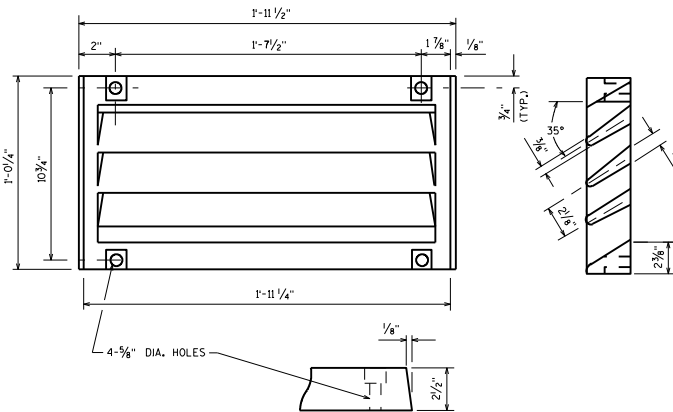
BUREAU OF STRUCTURES

APPROVED: *Bill Oliva* DATE: 1-17

STANDARD 28.03



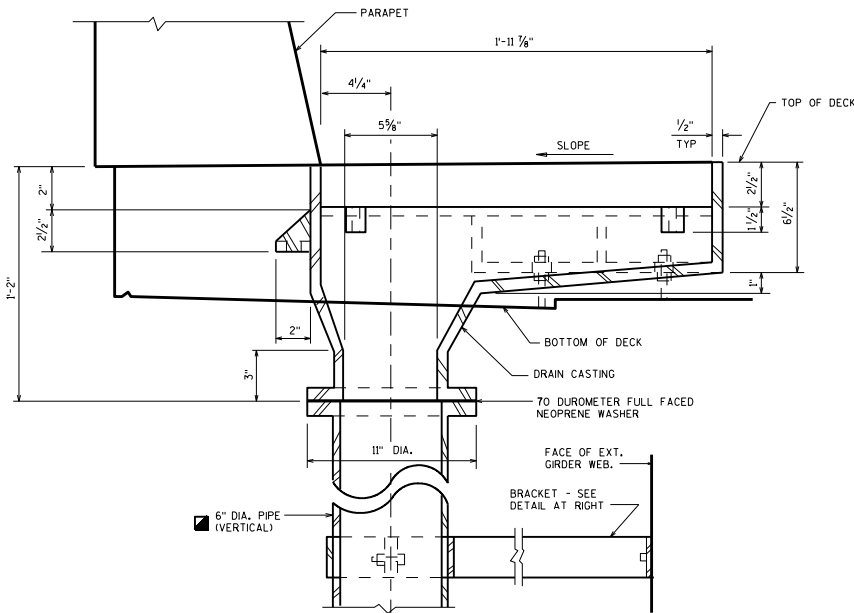
PLAN



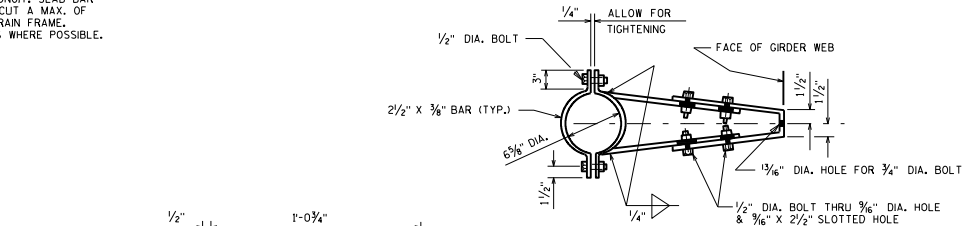
GRATE CASTING DETAIL

ATTACH GRATE TO FRAME FOR SHIPMENT

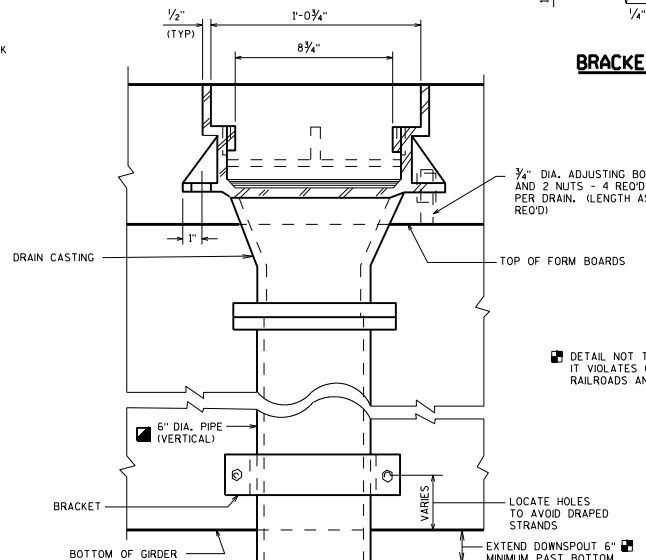
TRANS. AND LONGIT. SLAB BAR REINF. TO BE CUT A MAX. OF 1" CL. FROM DRAIN FRAME. DISPLACE BARS WHERE POSSIBLE.



SECTION A1



BRACKET DETAIL



SECTION A2

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 REINFORCED THERMOSETTING RESIN PIPE (RTRP) OR GALVANIZED STANDARD PIPE CONFORMING TO ASTM A53.

DESIGNER NOTES

ALL MATERIAL FOR FLOOR DRAINS AS SHOWN ON THIS SHEET SHALL BE INCLUDED IN THE BID ITEM "FLOOR DRAINS TYPE GC".

ALL MATERIAL FOR DOWNSPOUTS AND BRACKETS AS SHOWN ON THIS SHEET SHALL BE INCLUDED IN THE BID ITEM "DOWNSPOUT 6-INCH".

ON THE PRESTRESSED GIRDER SHEET, SHOW LOCATION OF HOLES FOR BRACKET ANCHORAGE FROM TOP/BOTTOM AND END OF GIRDER.

DETAIL NOT TO BE USED OVER RAILROADS BECAUSE IT VIOLATES CLEARANCE REQUIREMENTS, CONTACT RAILROADS AND HARBORS SECTION FOR GUIDANCE.

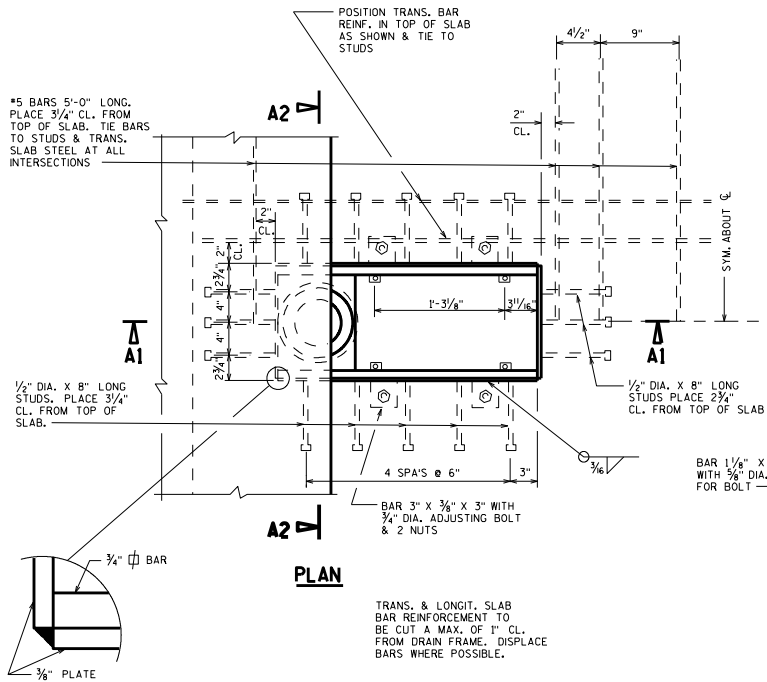
FLOOR DRAIN TYPE 'GC'



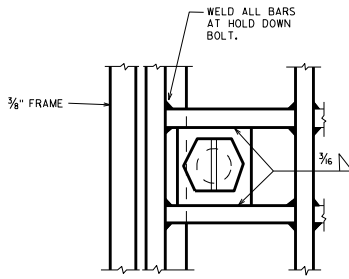
BUREAU OF STRUCTURES

APPROVED: *Bill Oliva*

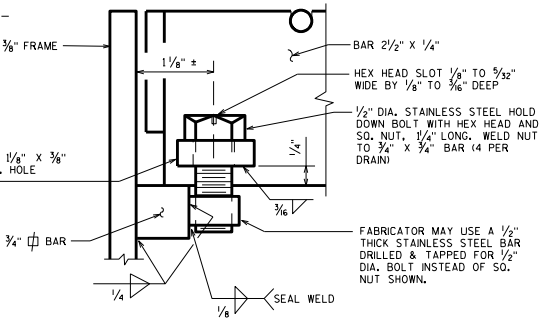
DATE: 1-17



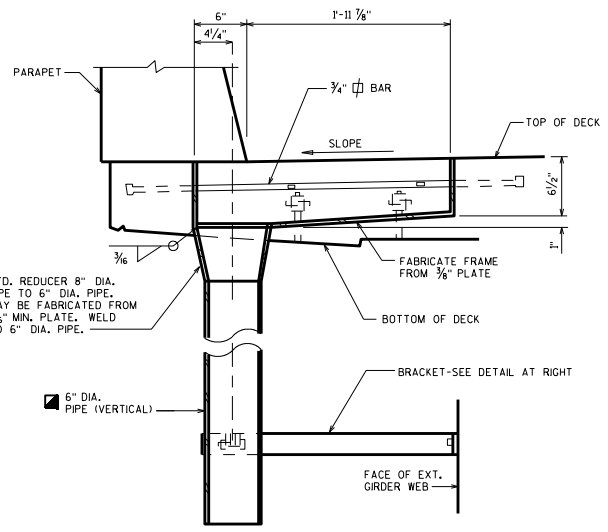
PLAN



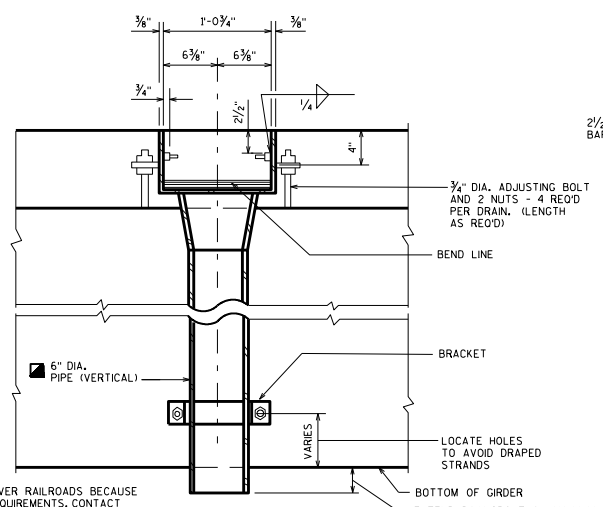
PART PLAN



SECTION AT HOLD DOWN BOLT



SECTION A1



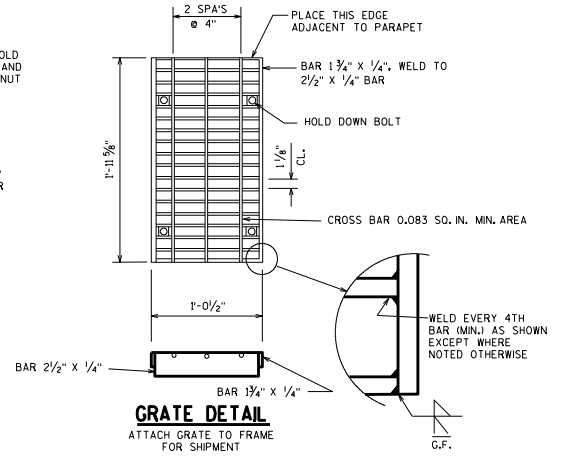
SECTION A2

NOTES

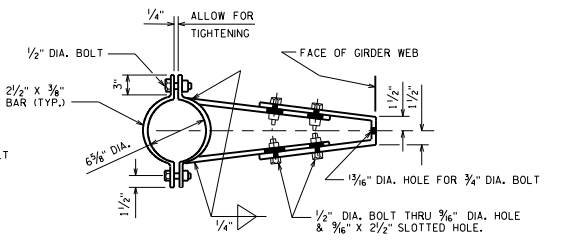
- ALL DRAIN MATERIAL INCLUDING GRATE, EXCLUDING PIPE & GRATE HOLD DOWN BOLTS, SHALL BE ASTM A36 STEEL.
- MATERIAL FOR BRACKETS SHALL CONFORM TO ASTM A36.
- THE CONTRACTOR MAY PROPOSE AN ALTERNATE TYPE OF BRACKET. THE PROPOSED ALTERNATE DETAILS SHALL BE SUBMITTED AND SUBJECT TO THE APPROVAL OF THE ENGINEER.
- ALL STEEL SHALL BE GALVANIZED, WELDS SHALL BE MADE WITH LOW HYDROGEN ELECTRODES.
- SEAL WELD INSIDE OF DRAIN.
- PRIOR TO GALVANIZING A NO. 6 BLAST CLEANING IS REQ'D.
- FLANGED 6" DIA. DOWNSPOUTS SHALL BE REINFORCED THERMOSETTING RESIN PIPE (RTRP) OR GALVANIZED STANDARD PIPE CONFORMING TO ASTM A53.

DESIGNER NOTES

- ALL MATERIAL FOR FLOOR DRAINS AS SHOWN ON THIS SHEET SHALL BE INCLUDED IN THE BID ITEM "FLOOR DRAINS TYPE H".
- ALL MATERIAL FOR DOWNSPOUTS AND BRACKETS AS SHOWN ON THIS SHEET SHALL BE INCLUDED IN THE BID ITEM "DOWNSPOUT 6-INCH".
- ON THE PRESTRESSED GIRDER SHEET, SHOW LOCATION OF HOLES FOR BRACKET ANCHORAGE FROM TOP/BOTTOM AND END OF GIRDER.



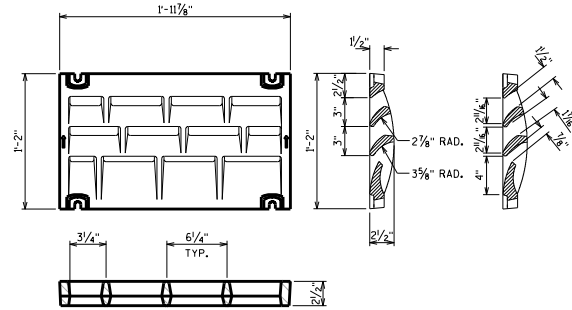
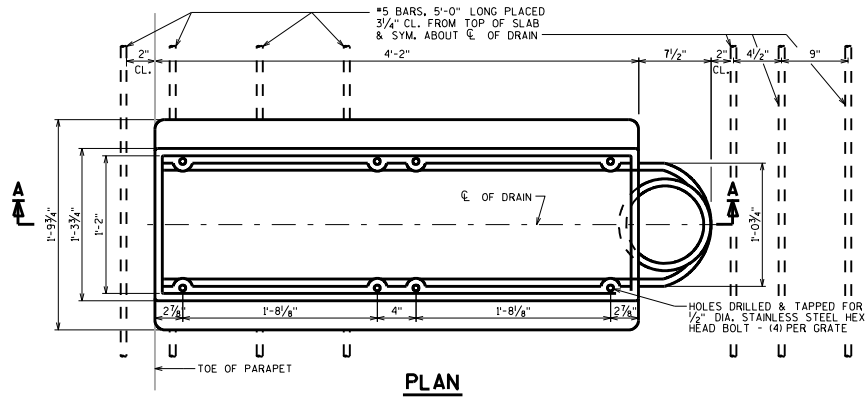
GRATE DETAIL



BRACKET DETAIL

DETAIL NOT TO BE USED OVER RAILROADS BECAUSE IT VIOLATES CLEARANCE REQUIREMENTS. CONTACT RAILROADS AND HARBORS SECTION FOR GUIDANCE.

FLOOR DRAIN TYPE 'H'	
	BUREAU OF STRUCTURES
APPROVED: <i>Bill Oliva</i>	DATE: 1-17



NOTES

ALL MATERIAL FOR TYPE "WF" CASTING AND 8" DIA. CONNECTION PIPE, EXCLUDING GRATE HOLD DOWN SCREWS, SHALL BE GRAY IRON CONFORMING TO ASTM A48, CLASS 30.

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.

8" DIA. DOWNSPOUTS SHALL BE REINFORCED THERMOSETTING RESIN PIPE (RTRP).

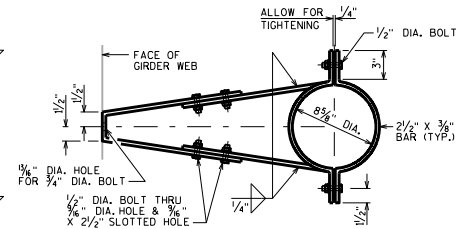
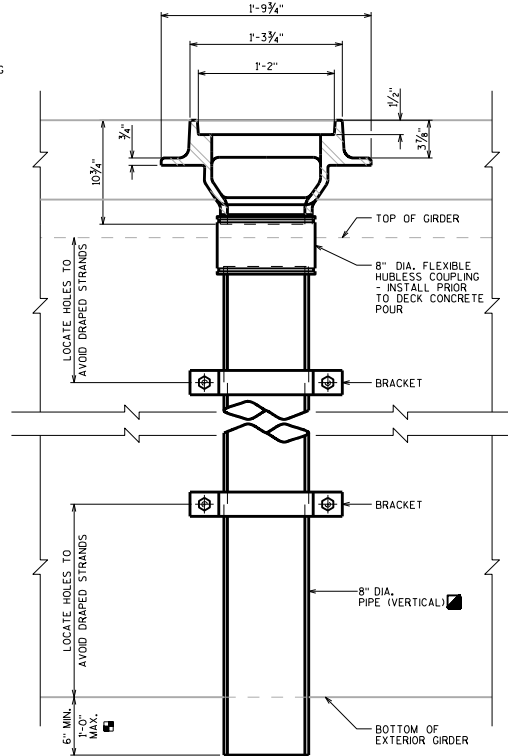
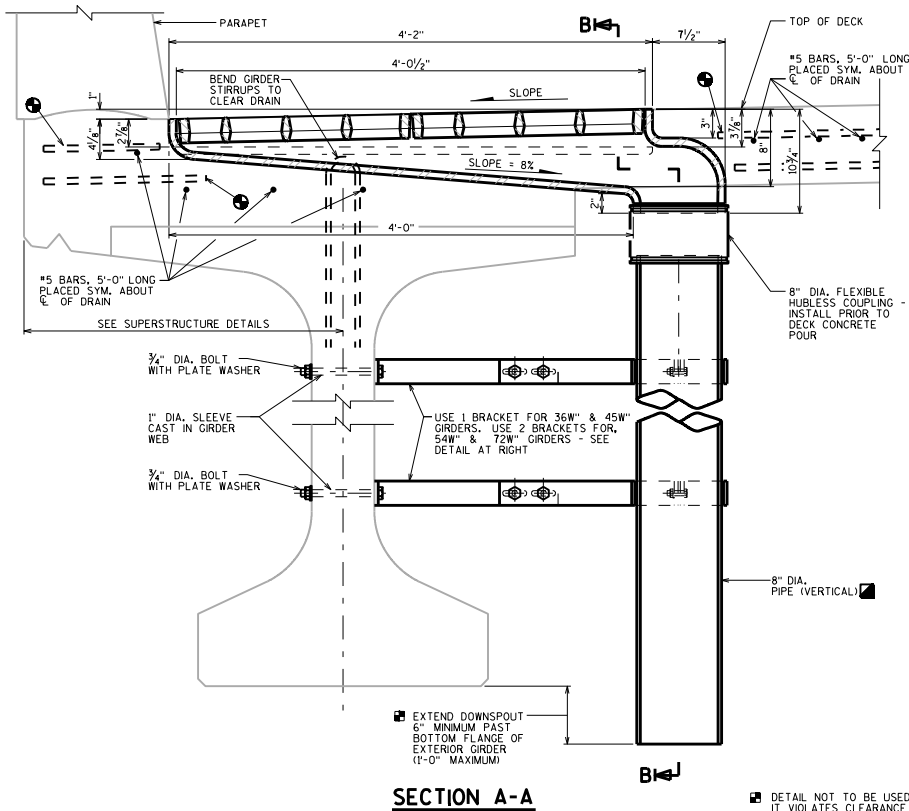
TRANSVERSE & LONGITUDINAL SLAB BAR REINFORCEMENT TO BE CUT A MAXIMUM OF 1" CLEAR FROM DRAIN FRAME. DISPLACE BARS WHERE POSSIBLE.

DESIGNER NOTES

ALL MATERIAL FOR FLOOR DRAINS AS SHOWN ON THIS SHEET SHALL BE INCLUDED IN THE BID ITEM "FLOOR DRAINS TYPE WF".

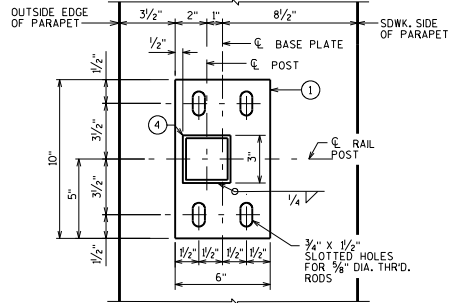
ALL MATERIAL FOR DOWNSPOUTS, CONNECTORS, AND BRACKETS AS SHOWN ON THIS SHEET SHALL BE INCLUDED IN THE BID ITEM "DOWNSPOUT 8-INCH".

ON THE PRESTRESSED GIRDER SHEET, SHOW LOCATION OF HOLES FOR BRACKET ANCHORAGE FROM TOP/BOTTOM AND END OF GIRDER.

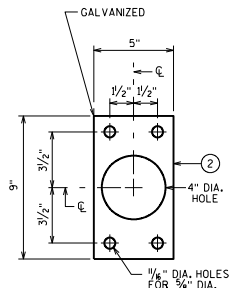


DETAIL NOT TO BE USED OVER RAILROADS BECAUSE IT VIOLATES CLEARANCE REQUIREMENTS; CONTACT RAILROADS AND HARBORS SECTION FOR GUIDANCE.

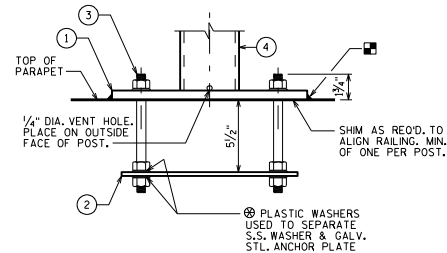
FLOOR DRAIN TYPE 'WF'	
	BUREAU OF STRUCTURES
	APPROVED: <u>Bill Oliva</u>
DATE: 1-17	



TYPICAL RAIL POST BASE PLATE



ANCHOR PLATE



ANCHORAGE FOR RAIL POSTS

★NOTE: ANCHOR PLATE NOT REQUIRED WHEN ADHESIVE ANCHORS ARE USED.

LEGEND

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

★ ALTERNATIVE ANCHORAGE: 4 EQUIVALENT STAINLESS STEEL CONCRETE ADHESIVE ANCHORS 3/8-INCH EMBED 7" IN CONCRETE. ADHESIVE ANCHORS SHALL CONFORM TO SECTION 502.212 OF THE STANDARD SPECIFICATIONS.

NOTES

- BID ITEM SHALL BE "RAILING STEEL TYPE 3T B-...", WHICH SHALL INCLUDE ALL STEEL ITEMS SHOWN.
- POST BASE PLATES SHALL BE FLAT WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT, AND VERTICAL. ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUT.
- ENDS OF STRUCTURAL TUBING SHALL BE SAWED, GRIND SMOOTH EXPOSED EDGES. ALL CUT ENDS SHALL BE TRUE AND SMOOTH.
- ALL PLATES, AND RECTANGULAR SLEEVES SHALL CONFORM TO ASTM A709 GRADE 36. ALL STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B.
- ANCHORAGES SHALL BE ACCURATELY PLACED TO PROVIDE CORRECT ALIGNMENT OF RAILING. SET NORMAL TO GRADE.
- CUT BOTTOM OF POST TO MAKE POST VERTICAL IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTION.
- STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATE NO. 1, WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED.

■ CAULK AROUND PERIMETER OF BASE PLATES, NO. 1, AND FILL BOLT SLOT OPENINGS IN SHIMS AND BASE PLATES WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. ALL JOINTS IN CONCRETE PARAPET ARE TO BE VERTICAL.

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

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

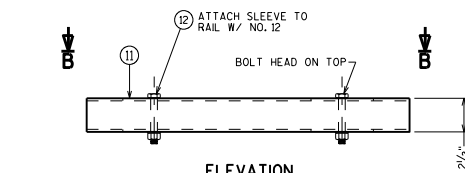
RAILING SHALL BE FABRICATED IN LENGTHS THAT INCLUDE 3 OR 4 POSTS.

WHEN PAINTING REQ'D: (ADD)

PAINT OVER GALVANIZING (EXCEPT NO. 2) WITH AN APPROVED TIE COAT AND TOP COAT AS SPECIFIED IN THE CONTRACT DOCUMENTS. THE RAILING SHALL BE PAINTED FEDERAL COLOR NO. [] (FILL IN COLOR NAME).

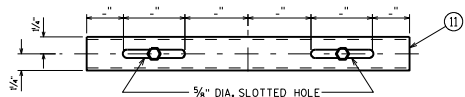
INSIDE OF TUBES TO BE PAINTED AT ALL FIELD ERECTION AND EXPANSION JOINTS.

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



ELEVATION

(USE FOR EACH RAIL MEMBER)

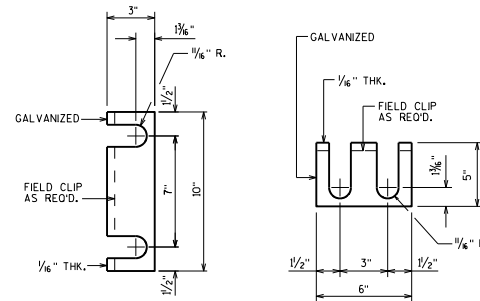


SECTION B-B

SLEEVE DETAIL

(AT MODULAR EXP. JT.)

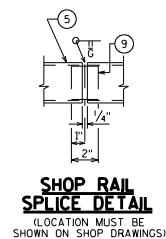
NOTE: CONSTRUCT BOTTOM RAIL AND SLEEVE CONNECTION FIRST, THEN MIDDLE RAIL, AND THEN TOP RAIL, TO ALLOW EASE IN PLACEMENT OF BOLT NO. 12.



RAIL POST SHIM DETAIL

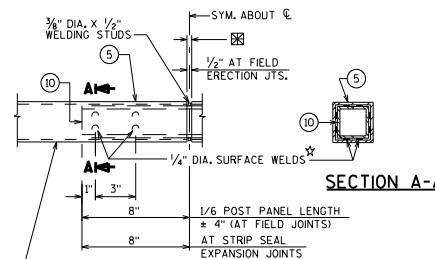
(2 SETS PER POST)

□ RDWY. OPENING OR 2 1/2" MIN. FOR STRIP SEAL EXP. JOINT AND 1/2" OPENING FOR A1 ABUTMENTS



SHOP RAIL SPLICE DETAIL


(LOCATION MUST BE SHOWN ON SHOP DRAWINGS)

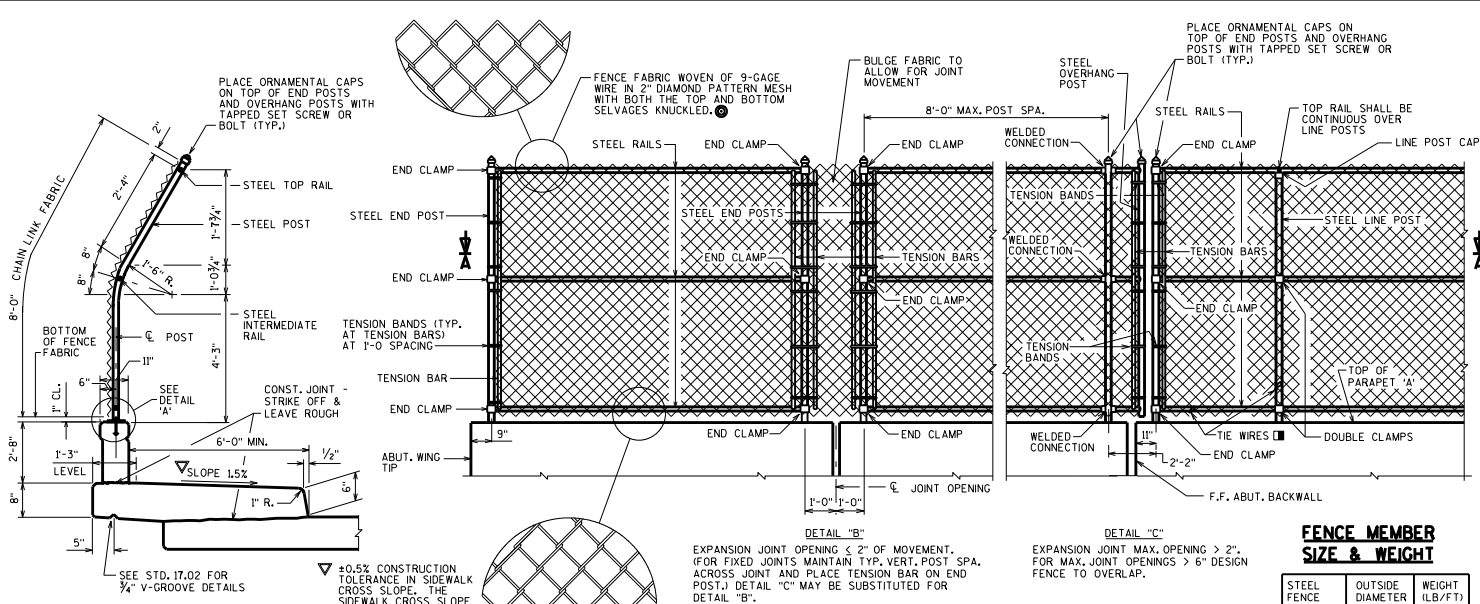


FIELD ERECTION JOINT DETAIL

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

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

COMBINATION RAILING TYPE '3T' DETAILS	
	BUREAU OF STRUCTURES
APPROVED: <u>Bill Oliva</u>	DATE: 1-17



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. B-...", L.F.

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. B-...", L.F.

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.

CAULK AROUND PERIMETER OF BASE PLATE AND FILL PORTION OF SLOTTED HOLE AROUND ANCHOR BOLT IN SHIM WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

ALTERNATE TO DOUBLE CLAMP: USE LINE RAIL CLAMP (BOULEVARD) OR 180° BRIDGE END RAIL BAND, WHICH MAY BE USED WHEN THE POSTS ARE EITHER BOLTED TO THE POST SLEEVES OR DIRECTLY WELDED TO THE BASE PLATE.

1/2" DIA. X 6 7/8" LONG GALVANIZED HEX BOLT WITH NUT & WASHER.

ALTERNATIVE ANCHORAGE: CONCRETE ADHESIVE ANCHORS 1/2" INCH. EMBED 7" IN CONCRETE. ADHESIVE ANCHORS SHALL CONFORM TO SECTION 502.2.12 OF THE STANDARD SPECIFICATIONS.

ATTACH FABRIC TO RAILS, AND TO POSTS WITHOUT TENSION BANDS, WITH THE WIRES (ROUND, 9-GAGE) SPACED AT 1'-0".

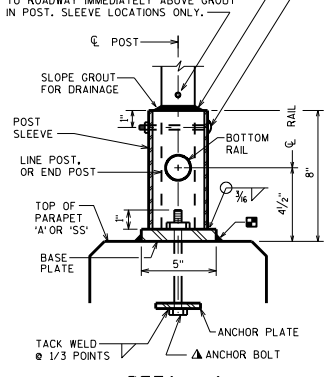
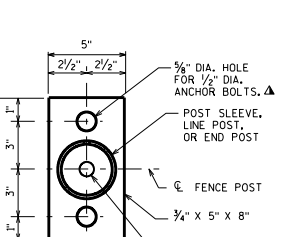
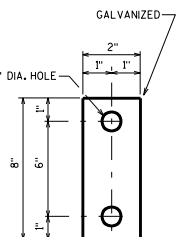
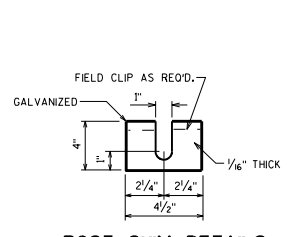
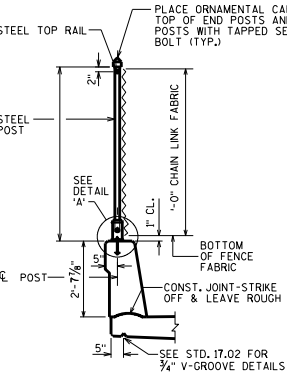
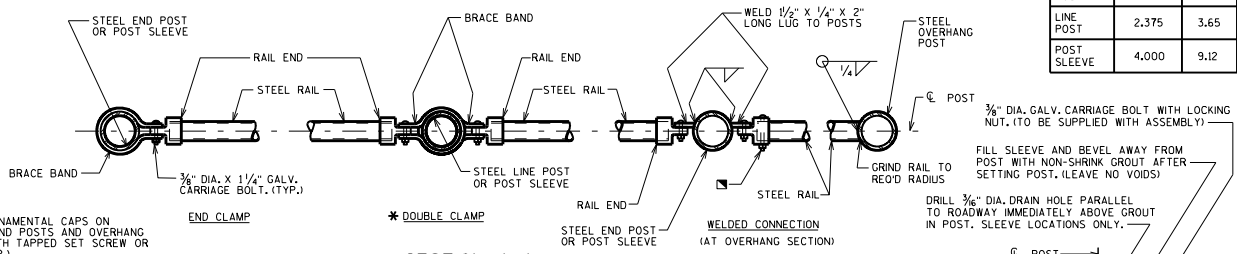
BOLT RAIL TO RAIL END TO SECURE OVERHANG SECTION. ALTERNATE IS TO WELD RAIL DIRECTLY TO END POST.

MINIMUM LENGTH OF TOP RAIL BETWEEN SPLICES SHALL BE 20'-0". LOCATE SPLICES NEAR 1/4 POINT OF POST SPACING.

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

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



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 11-35-1 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.

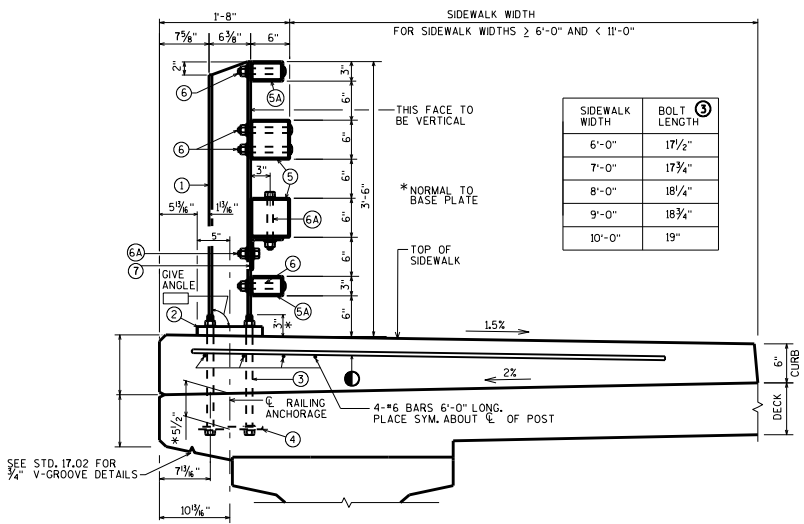
THE DESIGN ENGINEER SHALL DESIGN THE SUPERSTRUCTURE TO ACCOUNT FOR THE MAXIMUM 2% SIDEWALK CROSS SLOPE.

CHAIN LINK FENCE DETAILS

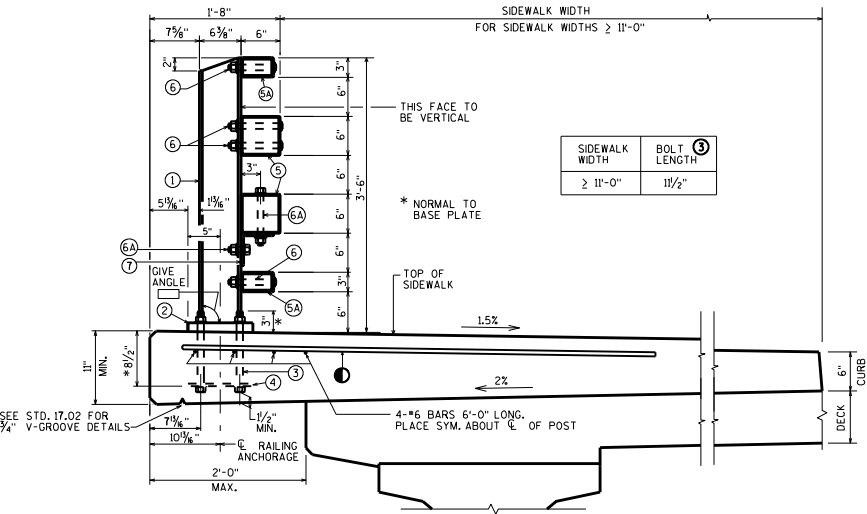
BUREAU OF STRUCTURES

APPROVED: Bill Oliva

DATE: 1-17



SECTION THRU RAILING ON SIDEWALK



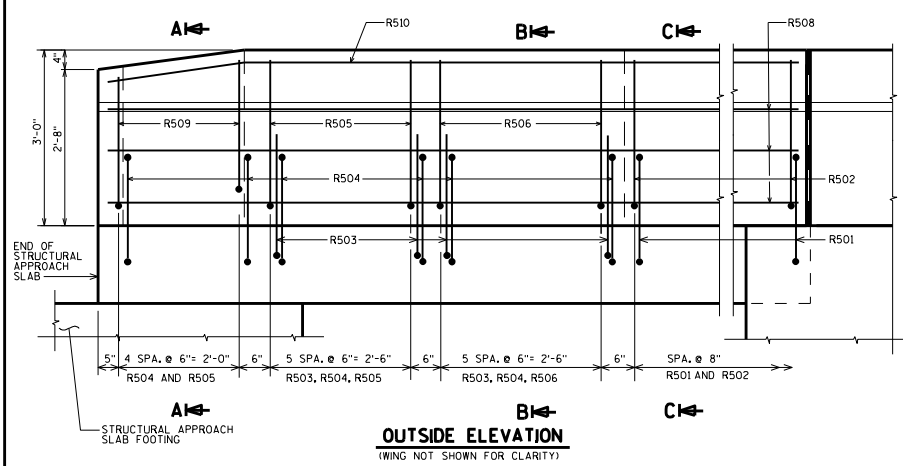
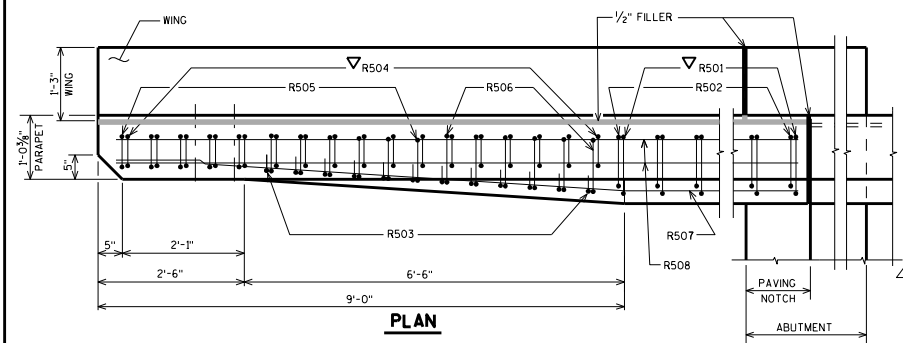
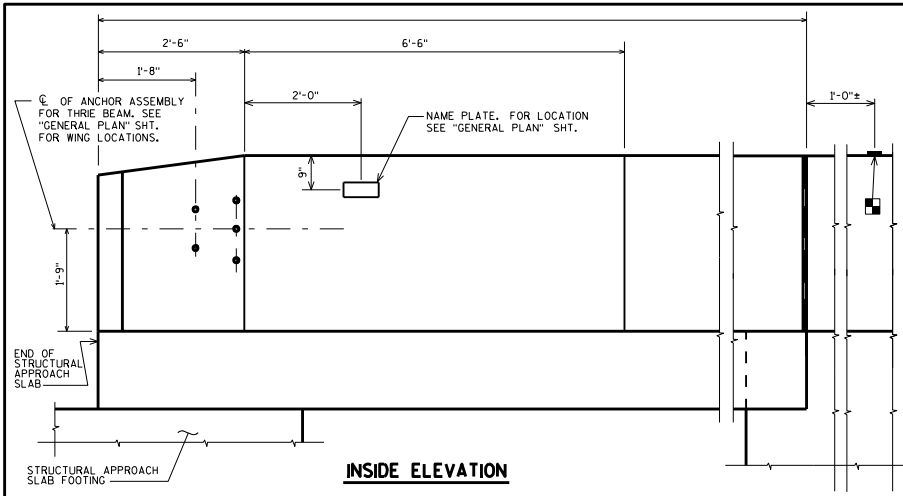
SECTION THRU RAILING ON SIDEWALK

LEGEND

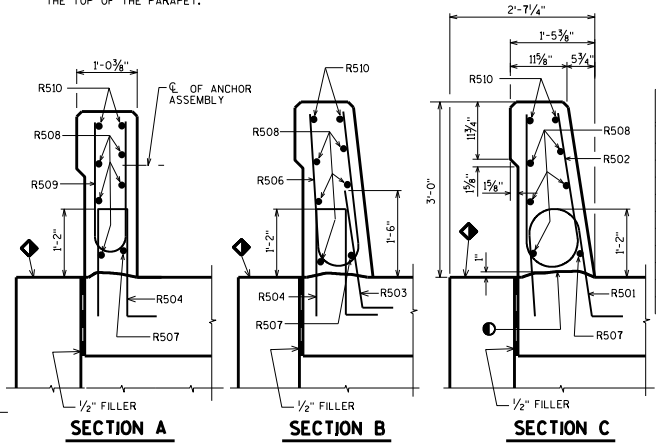
- ① W6 X 25 WITH 1/4" X 1 3/8" HORIZONTAL SLOTTED HOLES ON EACH SIDE OF POST FOR BOLT NO. 6 AT TOP TWO RAILS, USE 1" DIA. HOLES FOR BOLT NO. 6 AT BOTTOM NO. 6A & FOR BOLT NO. 6A AT NO. 7, CUT BOTTOM OF POST TO MATCH CROSS-SLOPE OF ROADWAY, PLACE POST VERTICAL, PLACE POSTS NORMAL TO GRADE LINE.
- ② PLATE 1/4" X 10" X 1'-2" WITH 1/4" X 1 1/2" SLOTTED HOLES FOR ANCHOR BOLTS NO. 3, WELD TO NO. 1 AS SHOWN, SLOTS PARALLEL TO SHORT SIDE OF PLATE.
- ③ ASTM A449 - 1" DIA. ANCHOR BOLTS WITH HEAVY HEX NUT AND 2" O.D. HARDENED WASHER (ALL GALVANIZED), 4 REQUIRED PER POST, THREAD 3" AND PLACE NORMAL TO PLATE NO. 2, CHAMFER TOP OF BOLTS BEFORE THREADING, USE 1 1/2" LONG BOLT FOR CONCRETE SIDEWALKS \geq 11'-0" WIDE AND SEE TABLE TO THE LEFT FOR CONCRETE SIDEWALKS \geq 6'-0" AND $<$ 11'-0" WIDE FOR PROPER BOLT LENGTHS, USE 1'-9" LONG IN ABUTMENT WINGS, (AN EQUIVALENT THREADED ROD WITH HEAVY HEX NUTS AND HARDENED WASHERS MAY BE SUBSTITUTED FOR ANCHOR BOLTS IN WINGS IF REQUIRED FOR CONSTRUCTABILITY.)
- ④ 3/8" X 10" X 1'-2" ANCHOR PLATE (GALVANIZED) WITH 1/6" DIA. HOLES FOR ANCHOR BOLTS NO. 3.
- ⑤ TS 6 X 6 X 3/8" STRUCTURAL TUBING, USE 1" DIA. HOLES FOR BOLT NO. 6 (FRONT & BACK) & 1/6" DIA. HOLES FOR BOLT NO. 6A (TOP & BOTTOM).
- ⑥A TS 5 X 3 X 1/4" STRUCTURAL TUBING, USE 1" DIA. HOLES FOR BOLT NO. 6 IN TOP RAIL (FRONT & BACK), USE 1/6" X 1 3/8" HORIZONTAL SLOTTED HOLES FOR BOLT NO. 6 IN BOTTOM RAIL (FRONT & BACK) AND A 2" O.D. WASHER UNDER BOLT HEAD.
- ⑥ 7/8" DIA. A325 SLOTTED ROUND HEAD BOLT WITH HEX NUT, 3/8" X 1 3/4" X 1 3/4" WASHER AND SPRING LOCK WASHER (2 REQUIRED AT RAIL TO POST LOCATIONS SHOWN).
- ⑥A 3/4" DIA. A325 BOLT WITH HEX NUT AND SPRING LOCK WASHER (1 REQUIRED AT RAIL TO ANGLE AND 2 REQUIRED AT ANGLE TO POST LOCATIONS SHOWN WITH 3/8" X 1 3/4" X 1 3/4" WASHER).
- ⑦ L 5 X 5 X 5/8" STRUCTURAL ANGLE, ATTACH TO NO. 1 AND NO. 5 AS SHOWN.
- ⑧ *6 BARS X 12'-0" LONG, BEND AS SHOWN, TIE TO TOP MAT OF STEEL, (DESIGNER TO PLACE THESE BARS IN BILL OF BARS FOR SUPERSTRUCTURE.)

FOR ALL TUBULAR STEEL RAILING TYPE NY4 DETAILS SEE STD. 30.27.

SIDEWALK DETAILS FOR TUBULAR STEEL RAILING TYPE NY4	
BUREAU OF STRUCTURES	
APPROVED: <u>Bill Oliva</u>	DATE: 7-16



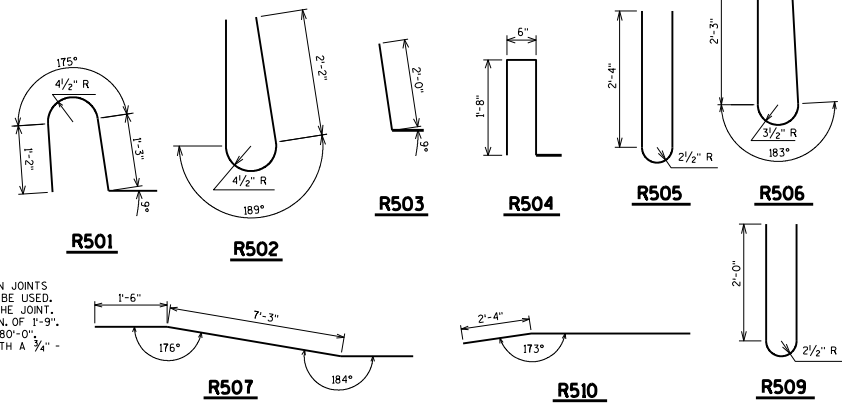
☐ BENCH MARK CAP (WHEN SUPPLIED). AVOID PLACING A BENCH MARK CAP BELOW A RAIL OR FENCE SYSTEM THAT IS ATTACHED TO THE TOP OF THE PARAPET.



BILL OF BARS

FOR STRUCTURAL APPROACH SLAB PARAPETS

BAR MARK	QTY	ABUT.	ABUT.	LENGTH	REIN.	LOCATION
R501	X			4-5	X	PARAPET-VERT.
R502	X			5-8	X	PARAPET-VERT.
R503	X			2-9	X	PARAPET-VERT.
R504	X			4-4	X	PARAPET-VERT.
R505	X			5-5	X	PARAPET-VERT.
R506	X			5-6	X	PARAPET-VERT.
R507	X				X	PARAPET-HORIZ.
R508	X				X	PARAPET-HORIZ.
R509	X			4-9	X	PARAPET-VERT.
R510	X				X	PARAPET-HORIZ.



OPTIONAL CONSTRUCTION JOINTS IN THE PARAPETS MAY BE USED. RUN BAR REINF. THRU THE JOINT. LAP LONGIT. BARS A MIN. OF 1'-9". MIN. JOINT SPACING OF 80'-0". DEFINE CONST. JOINT WITH A 3/4" V-GROOVE.

DESIGNER NOTES

SEE STRUCTURAL APPROACH SLAB STANDARDS 12.10 AND 12.11 FOR APPROACH SLAB INFORMATION.
 A1 ABUT. SHOWN. SEE STANDARD 12.12 FOR A3 & A4 ABUT. DETAILS.
 SEE STANDARD 30.31 FOR DETAILS OF 36SS PARAPET ON BRIDGE.

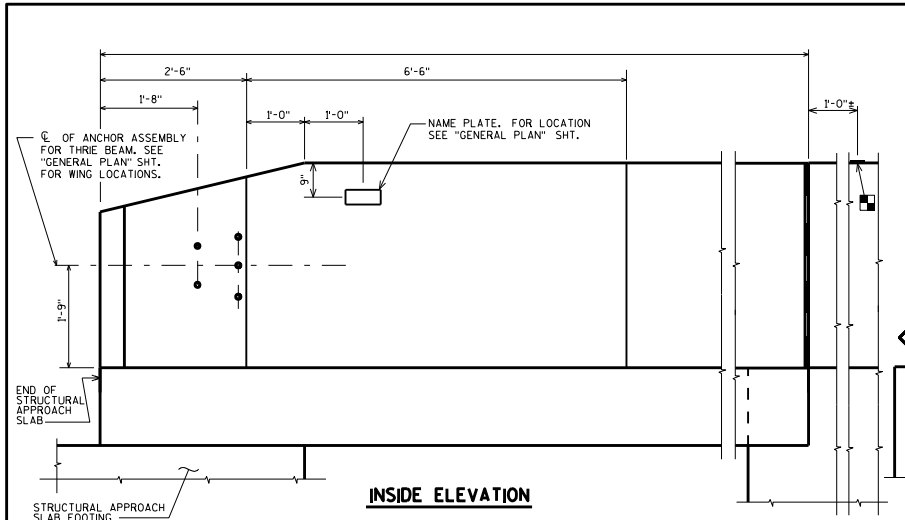
AREA = 3.36 SF
 WEIGHT = 504 LB/FT

- ☐ CONST. JOINT - STRIKE OFF AS SHOWN.
- ◊ SLOPE FOR DRAINAGE
- ▽ R501 AND R504 BARS TO BE TIED TO STRUCTURAL APPROACH SLAB STEEL BEFORE STRUCTURAL APPROACH SLAB IS POURED.

**SINGLE SLOPE PARAPET
 36SS WITH STRUCTURAL
 APPROACH SLAB**

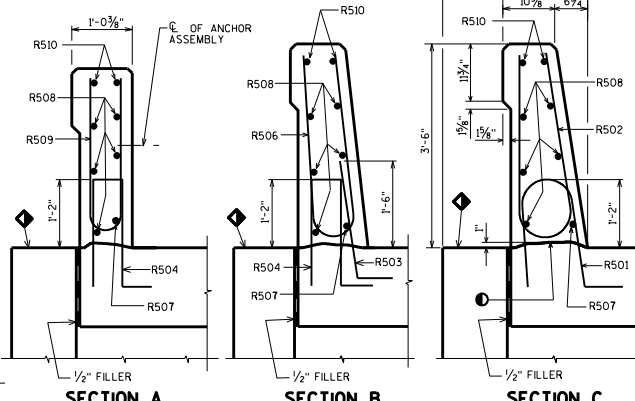
**BUREAU OF
 STRUCTURES**

APPROVED: Bill Oliva DATE: 1-17



INSIDE ELEVATION

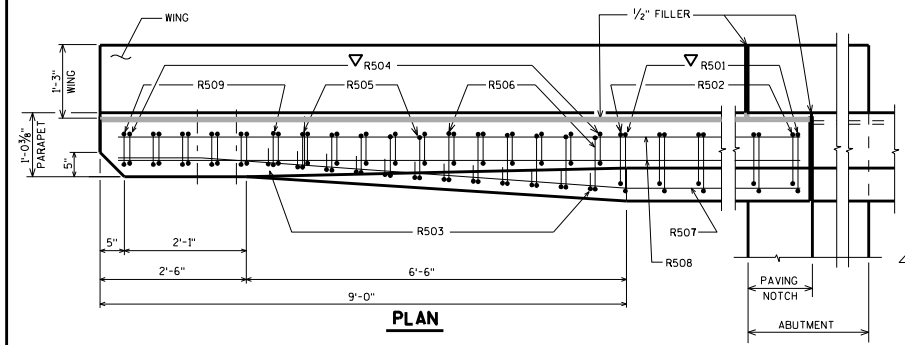
☐ BENCH MARK CAP (WHEN SUPPLIED). AVOID PLACING A BENCH MARK CAP BELOW A RAIL OR FENCE SYSTEM THAT IS ATTACHED TO THE TOP OF THE PARAPET.



SECTION A

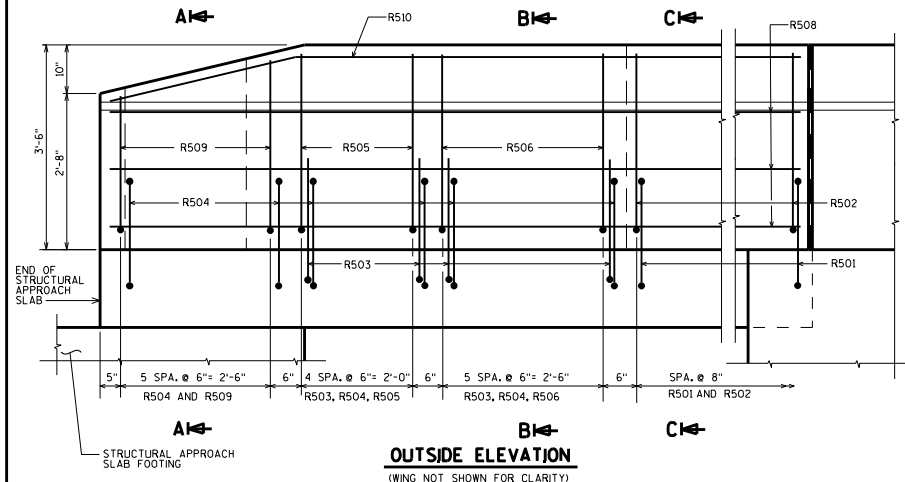
SECTION B

SECTION C

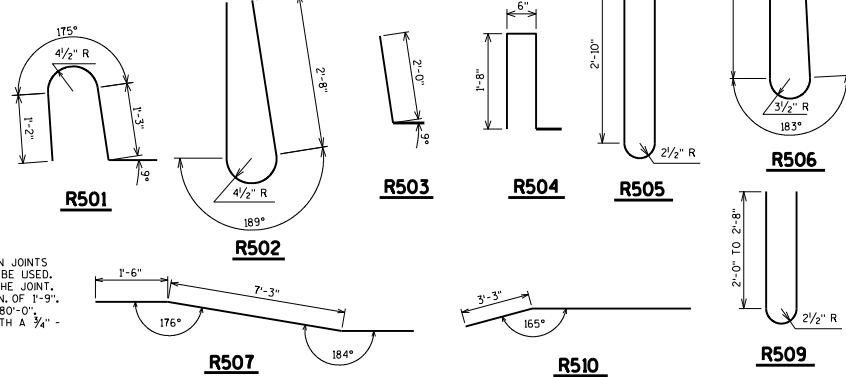


PLAN

OPTIONAL CONSTRUCTION JOINTS IN THE PARAPETS MAY BE USED. RUN BAR REINF. THRU THE JOINT. LAP LONGIT. BARS A MIN. OF 1'-9". MIN. JOINT SPACING OF 80'-0". DEFINE CONST. JOINT WITH A 3/4" - 1/4" GROOVE.



OUTSIDE ELEVATION



BILL OF BARS

FOR STRUCTURAL APPROACH SLAB PARAPETS

BAR MARK	COY.	ABUT.	ABUT.	LENGTH	BAR SERIES	LOCATION
R501	X			4-5	X	PARAPET-VERT.
R502	X			6-8	X	PARAPET-VERT.
R503	X			2-9	X	PARAPET-VERT.
R504	X			4-4	X	PARAPET-VERT.
R505	X			6-5	X	PARAPET-VERT.
R506	X			6-6	X	PARAPET-VERT.
R507	X				X	PARAPET-HORIZ.
R508	X				X	PARAPET-HORIZ.
R509	X			5-5	X	PARAPET-VERT.
R510	X				X	PARAPET-HORIZ.

▲ LENGTH SHOWN FOR BAR IS AN AVERAGE LENGTH AND SHOULD ONLY BE USED FOR BAR WEIGHT CALCULATIONS. SEE BAR SERIES TABLE FOR ACTUAL LENGTHS.

BAR SERIES TABLE

MARK	NO. REQD.	LENGTH
R509	4 SERIES OF 6	4'-9" TO 6'-1"

BUNDLE AND TAG EACH SERIES SEPARATELY.

DESIGNER NOTES

- SEE STRUCTURAL APPROACH SLAB STANDARDS 12.10 AND 12.11 FOR APPROACH SLAB INFORMATION.
- A1 ABUT. SHOWN. SEE STANDARD 12.12 FOR A3 & A4 ABUT. DETAILS.
- SEE STANDARD 30.32 FOR DETAILS OF 42SS PARAPET ON BRIDGE.

AREA = 3.75 SF
WEIGHT = 563 LB/FT

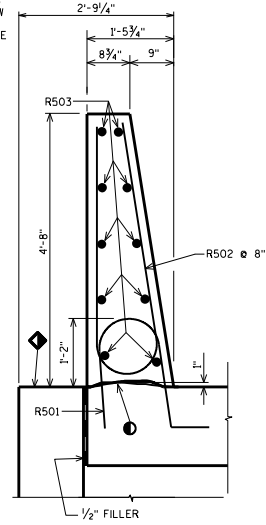
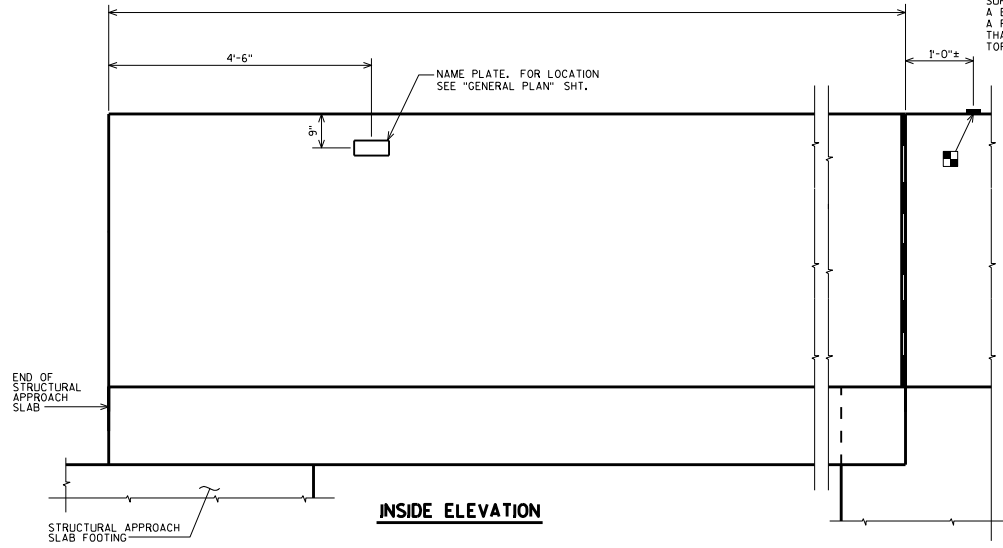
- ☐ CONST. JOINT - STRIKE OFF AS SHOWN.
- ◆ SLOPE FOR DRAINAGE
- ▽ R501 AND R504 BARS TO BE TIED TO STRUCTURAL APPROACH SLAB STEEL BEFORE STRUCTURAL APPROACH SLAB IS POURED.

SINGLE SLOPE PARAPET 42SS WITH STRUCTURAL APPROACH SLAB

BUREAU OF STRUCTURES

APPROVED: Bill Oliva DATE: 1-17

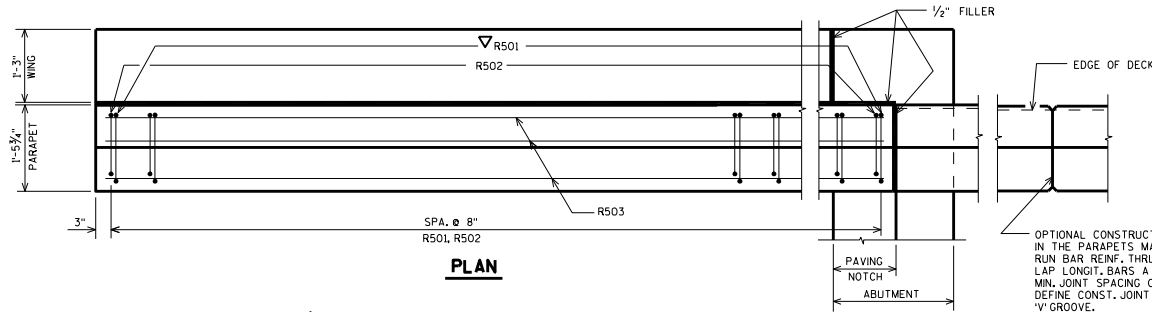
■ BENCH MARK CAP (WHEN SUPPLIED), AVOID PLACING A BENCH MARK CAP BELOW A RAIL OR FENCE SYSTEM THAT IS ATTACHED TO THE TOP OF THE PARAPET.



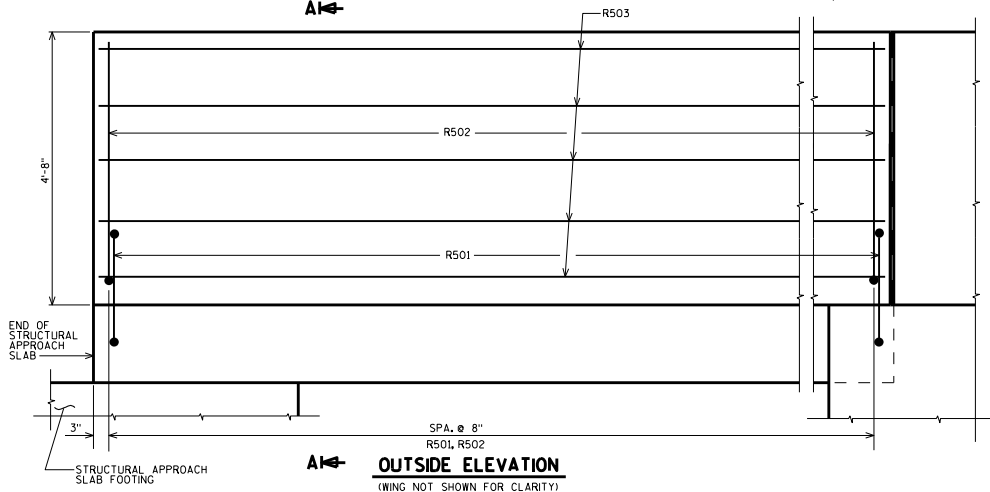
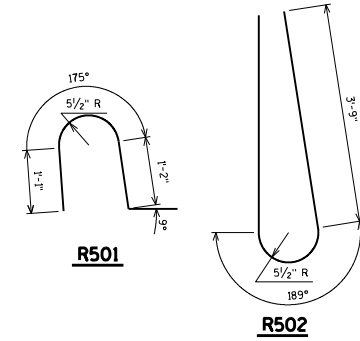
BILL OF BARS

FOR STRUCTURAL APPROACH SLAB PARAPETS

BAR MARK	QTY	ABUT.	ABUT.	LENGTH	REIN.	LOCATION
R501	X			4-6	X	PARAPET - VERT.
R502	X			9-1	X	PARAPET - VERT.
R503	X				X	PARAPET HORIZ.



OPTIONAL CONSTRUCTION JOINTS IN THE PARAPETS MAY BE USED. RUN BAR REINF. THRU THE JOINT. LAP LONGIT. BARS A MIN. OF 1'-9". MIN. JOINT SPACING OF 80'-0". DEFINE CONST. JOINT WITH A 3/4" - 'V' GROOVE.



DESIGNER NOTES

THE '565S' PARAPET IS ONLY TO BE USED IF A 'TYPE S56' SINGLE SLOPE CONCRETE ROADWAY BARRIER ADJOINS THE END OF THE '565S' PARAPET.

SEE STRUCTURAL APPROACH SLAB STANDARDS 12.10 AND 12.11 FOR APPROACH SLAB INFORMATION.

A1 ABUT. SHOWN. SEE STANDARD 12.12 FOR A3 & A4 ABUT. DETAILS.

SEE STANDARD 30.33 FOR DETAILS OF 565S PARAPET ON BRIDGE.

AREA = 5.16 SF
WEIGHT = 774 LB/FT

◆ CONST. JOINT - STRIKE OFF AS SHOWN.

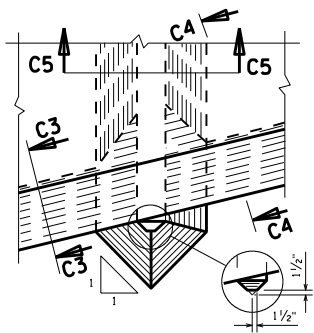
▽ R501 BARS TO BE TIED TO STRUCTURAL APPROACH SLAB STEEL BEFORE STRUCTURAL APPROACH SLAB IS POURED.

◆ SLOPE FOR DRAINAGE

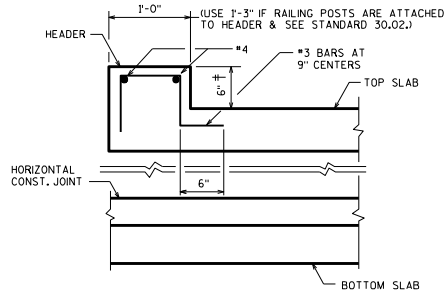
SINGLE SLOPE PARAPET 565S WITH STRUCTURAL APPROACH SLAB

BUREAU OF STRUCTURES

APPROVED: Bill Oliva DATE: 1-17

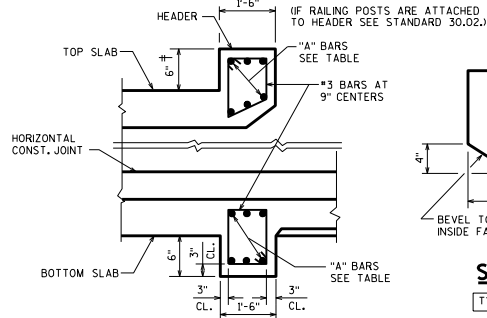


PLAN



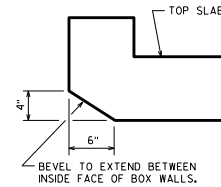
SECTION C2 FOR SKEW OF 20° AND UNDER

OUTLET HEADERS SHOWN



SECT C2 FOR SKEW OVER 20°

† IF RAILING POSTS ARE ATTACHED TO HEADER THIS DIMENSION MAY BE INCREASED IF NECESSARY TO KEEP RAILING PARALLEL TO ROADWAY. INCREASE WING HEIGHT IF NECESSARY.

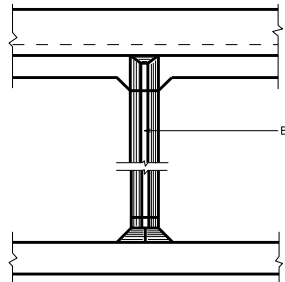


SECTION C3

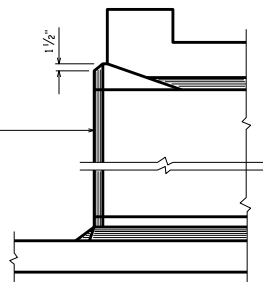
TYPICAL ALL INLETS

* HEADER LENGTH	"A" BARS
TO 11'-0"	6 - #7
OVER 11'-0" - 14'-0"	6 - #8
OVER 14'-0" - 17'-0"	6 - #9
OVER 17'-0" - 20'-0"	6 - #10

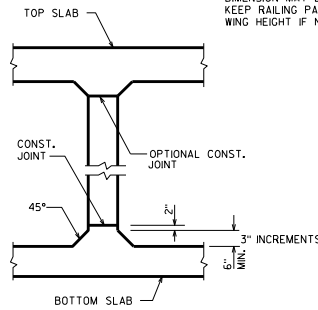
* HEADER LENGTH EQUALS THE DISTANCE BETWEEN C. OF WALLS IN ONE CELL MEASURED ALONG THE SKEW.



ELEVATION



SECTION C4



SECTION C5

HAUNCH DETAIL REQUIRED FOR INLET NOSE DETAIL AND WHEN REQUIRED STRUCTURALLY.

INLET NOSE CENTERWALL DETAILS

INLET NOSE MAY BE REQUIRED FOR HYDRAULIC PURPOSES.

DESIGNER NOTES

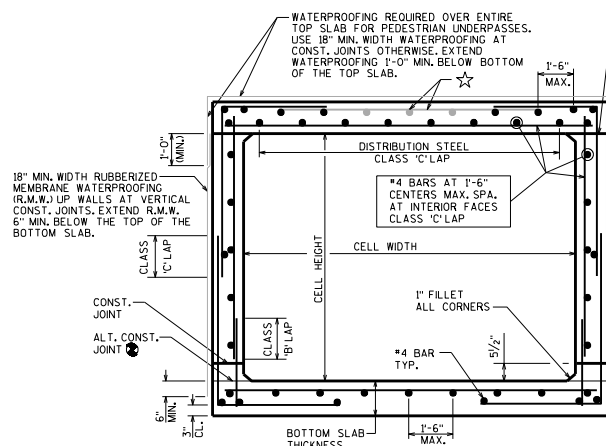
SEE BRIDGE MANUAL SECTION 36.2 FOR ADDITIONAL REQUIREMENTS FOR PEDESTRIAN UNDERPASSES AND CATTLEPASSES.

⊙ DETAIL NOT ALLOWED WHEN HAUNCHES ARE REQ'D OR FOR PEDESTRIAN UNDERPASSES. OMIT 1" FILLET IF ALTERNATIVE CONSTRUCTION JOINT IS USED.

◆ † = 1'-0" MIN. FOR PEDESTRIAN UNDERPASSES AND SLABS WITH DEPTH OF FILLS < 2'-0" † = 6 1/2" MIN. OTHERWISE

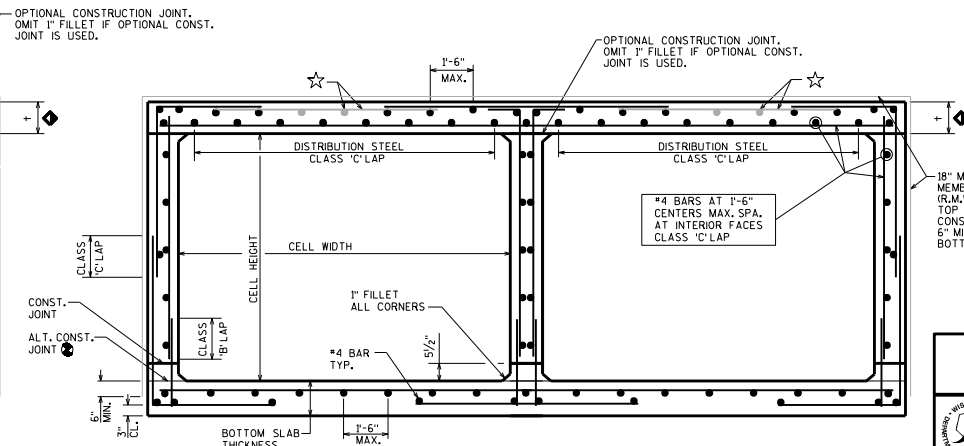
☆ TOP BARS FOR TOP SLAB:

- FOR † < 10' WITH DEPTH OF FILLS > 2'-0": BARS NOT REQUIRED
- FOR † > 10': #4 AT 1'-6" MAX. EACH DIRECTION
- FOR PEDESTRIAN UNDERPASSES: #4 AT 1'-6" MAX. EACH DIRECTION
- FOR SLABS WITH DEPTH OF FILLS < 2'-0": #4 AT 1'-0" MAX. EACH DIRECTION
- USE CLASS 'C'LAPS



SECTION THRU BOX

SINGLE CELL BOX



SECTION THRU BOX

TWIN CELL BOX

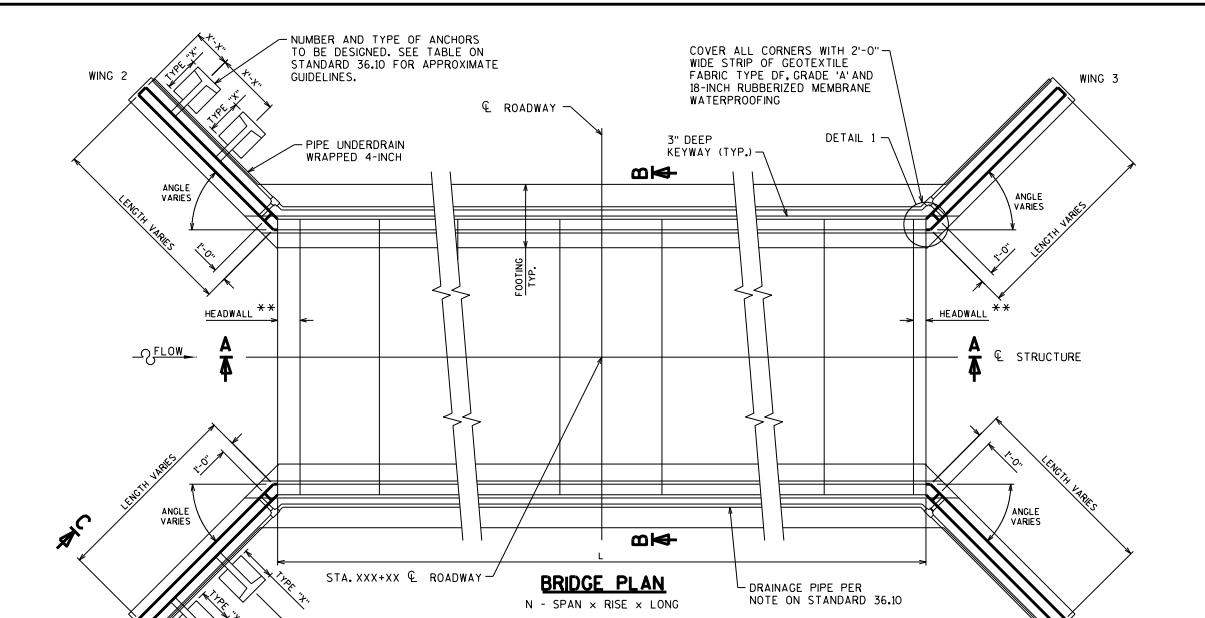
BOX CULVERT DETAILS



BUREAU OF STRUCTURES

APPROVED: Bill Oliva

DATE:
1-17



GENERAL NOTES:

MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH WISCONSIN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, AND THE CONTRACT SPECIAL PROVISIONS.

DESIGN SPECIFICATION: DESIGN STRUCTURE BY CURRENT EDITION AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND AS SUPPLEMENTED BY WISDOT BRIDGE MANUAL.

USE GRADE A CONCRETE IN FOOTING AND WINGWALLS. $f'c = 4$ KSI (MIN.)

PROVIDE CONCRETE COVER ON REINFORCING BARS AS NOTED HEREIN.

CHAMFER EXPOSED CONCRETE EDGES $\frac{3}{4}$ " x $\frac{3}{4}$ " EXCEPT AS NOTED.

PROVIDE DEFORMED REINFORCEMENT STEEL MEETING THE REQUIREMENTS OF ASTM DESIGNATION 615, OR 617, GRADE 60 AS SET FORTH IN THE STANDARD SPECIFICATIONS.

IF A CAST-IN-PLACE OPTION IS SHOWN AND SPECIFICATIONS ALLOW FOR A PRECAST SUBSTITUTION, PRECAST STRUCTURE SYSTEM INCLUDING WINGWALLS AND HEADWALLS) AND FOOTERS WILL BE DESIGNED BY CONTRACTORS.

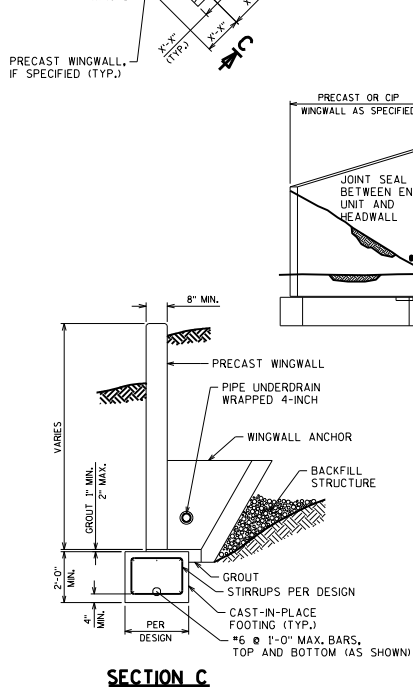
AT ANY TIME DURING PLACEMENT OF THE BACKFILL, DO NOT PERMIT A DIFFERENCE IN FILL ELEVATION ON THE SIDES OF THE CULVERT BARREL IN EXCESS OF 2'-0". DURING COMPACTION OF THE BACKFILL, DO NOT ALLOW THE WHEELS OF ROLLERS TO COME CLOSER THAN 1'-0" TO THE FACE OF THE OF THE STRUCTURE.

DESIGNER NOTES:

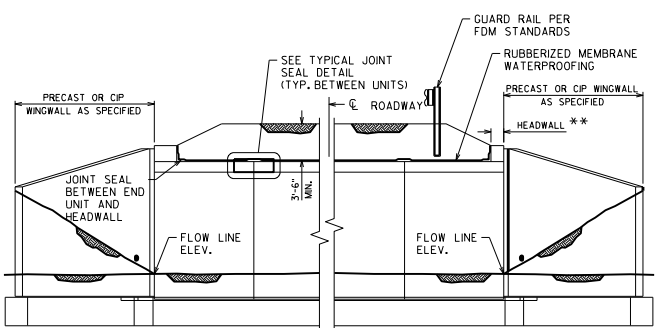
ALL BAR SPLICES TO BE "CLASS C" TENSION LAP SPLICES.

PRECAST CONCRETE CULVERT UNITS PLUS (N-1) JOINTS @ $\frac{1}{4}$ " TO $\frac{1}{2}$ " PER JOINT = L

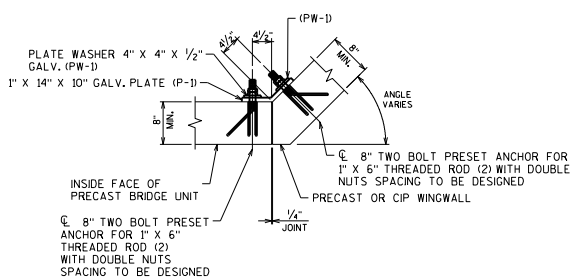
** SEE STANDARD 36.13 AND STANDARD 36.14 FOR HEADWALL DETAILS AND FEASIBILITY GUIDELINES



SECTION C



SECTION A



DETAIL 1

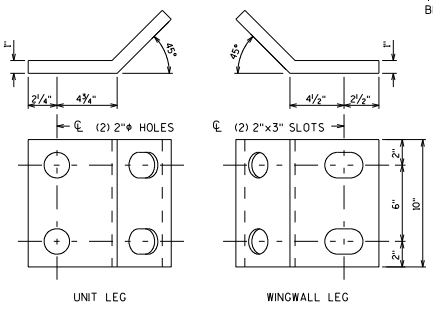
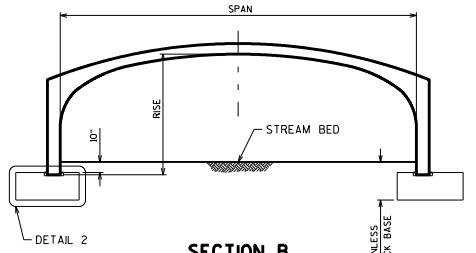
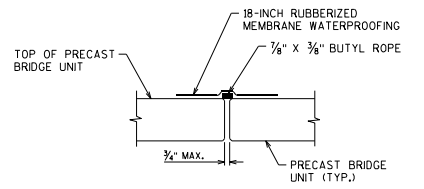


PLATE P-1



SECTION B

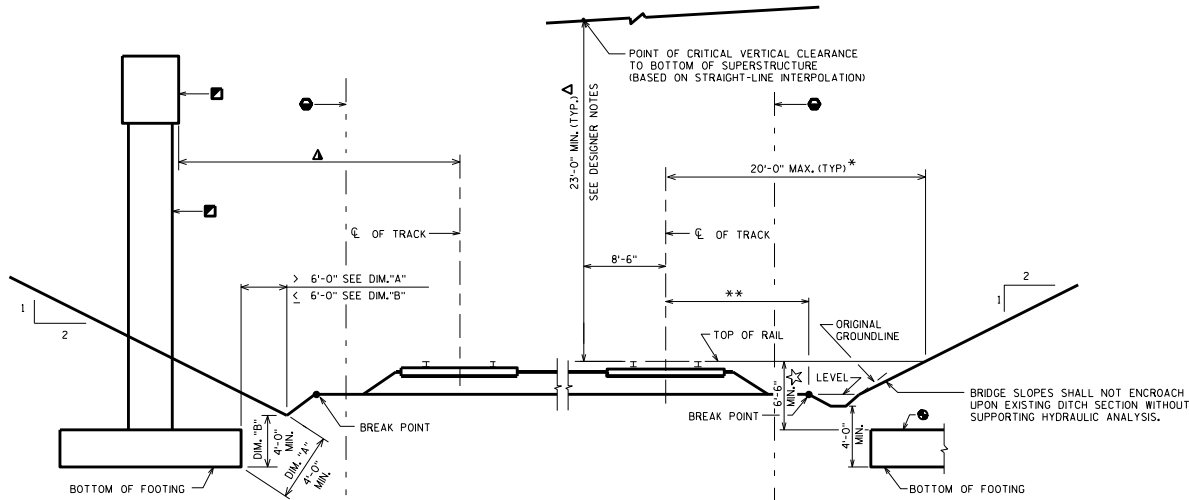


TYPICAL JOINT SEAL DETAIL

NOTE: CONNECTION PLATES (P-1) MUST BE POSITIONED WITH SMALL DIAMETER HOLES TOWARD PRECAST BRIDGE UNIT

NOTE: PLATE LENGTH AND THICKNESS SHALL BE INCREASED AS REQUIRED BY DESIGN.

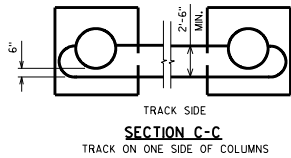
PRECAST THREE-SIDED BOX CULVERT LAYOUT DESIGNS	
	BUREAU OF STRUCTURES
APPROVED: <u>Bill Oliva</u>	DATE: <u>1-17</u>



RAILROAD IN FILL

RAILROAD CROSS SECTIONS

RAILROAD IN CUT

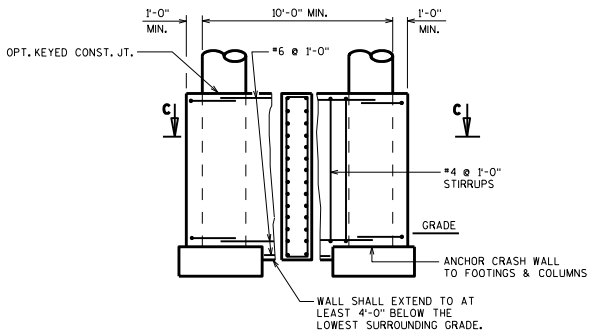


SECTION C-C

TRACK ON ONE SIDE OF COLUMNS

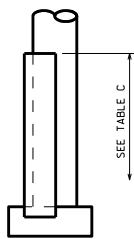
	PIER LOCATION	HEIGHT OF CRASH WALL ABOVE TOP OF RAIL
GENERAL AREMA REQUIREMENT	PIERS $\leq 12'-0"$ FROM ϵ OF TRACK	12'-0"
	PIERS $12'-0"$ TO $25'-0"$	6'-0"
CP RAIL REQUIREMENT	PIERS $< 15'-0"$ FROM ϵ OF TRACK	12'-0"
	PIERS $\geq 15'-0"$ TO $25'-0"$	8'-0"

TABLE C

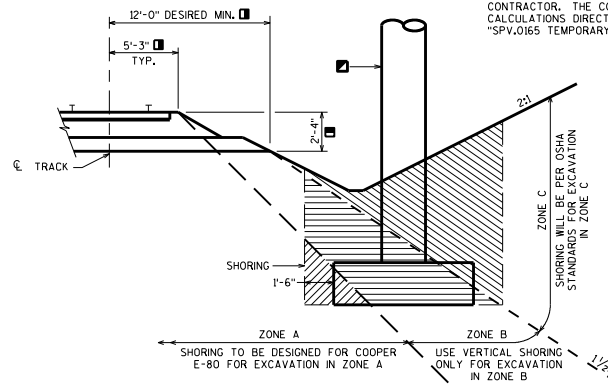


ELEVATION

CRASH WALL DETAILS



END VIEW



LIMITS BEFORE SHORING REQUIRED

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 MUST BE AT LEAST 23'-0" AFTER CONSTRUCTION. USE A STRAIGHT-LINE INTERPOLATION BETWEEN TOP OF BEARINGS TO DETERMINE THE CLEARANCE, PROVIDED THAT POSITIVE CAMBER IS REALIZED. LL DEFLECTION NEED NOT BE CONSIDERED WITH THE STRAIGHT-LINE APPROACH. DESIGN FOR (APPROX.) 23'-2" TO AVOID GOING BELOW THE MINIMUM DURING CONSTRUCTION. MAXIMUM ALLOWABLE VERTICAL CLEARANCE OF 23'-3/2" IS ALLOWED BY FHWA. 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.

** VARIABLE DISTANCE WHICH IS FOUND FROM FIELD SURVEY.

* SITE SPECIFIC JUSTIFICATION REQUIRED FOR GREATER DISTANCES. LATERAL CLEARANCES SHALL BE ESTABLISHED BASED ON SITE SPECIFIC CONDITIONS AND ECONOMICAL STRUCTURE DESIGN; CONSULT WITH CENTRAL OFFICE RAILROAD UNIT. SEE 23 CODE OF FEDERAL REGULATIONS PT 646, SUBPT. B APPENDIX.

▲ FOR OFFSETS UP TO, AND INCLUDING 25'-0", A CRASH WALL OR HAMMERHEAD PIER DESIGNED TO AREMA STANDARDS (30 SQ. FT. MIN. X-SECT) IS REQUIRED. CP RAIL REQUIRES CRASH WALLS BE DESIGNED TO RESIST A 600 KIP EXTREME EVENT FORCE APPLIED 6 FEET ABOVE THE GROUND. THE CRASH WALLS SHOWN ON THIS STANDARD ARE NOT DESIGNED TO ACCOUNT FOR THIS LOAD.

▲ ACCOMODATION FOR ADDITIONAL TRACKS REQUIRES DEPARTMENT APPROVAL. CONFER WITH STATEWIDE RAILROAD STRUCTURE AND TRACK ENGINEER IN CENTRAL OFFICE RAILROADS AND HARBORS SECTION AT (608) 266-0233.

▲ HORIZONTAL CLEARANCES LESS THAN 18'-0" SHOULD BE REVIEWED WITH THE STATEWIDE RAILROAD AND TRACK ENGINEER IN THE CENTRAL OFFICE RAILROADS AND HARBORS SECTION. 18'-0" CLEARANCE IS MEASURED TO THE NEAREST ENCRANCHING ELEMENT (PIER CAPS, MSE WALL COPING, ETC.)

TEMPORARY CONSTRUCTION CLEARANCES ARE 21'-0" VERTICAL (21'-6" FOR BNSF AND UP RAILROADS) AND 12'-0" HORIZONTAL (15'-0" FOR BNSF AND UP RAILROADS) FROM CENTERLINE OF TRACK TO FALSEWORK.

DESIGNER SHALL SHOW HORIZONTAL LOCATION OF SHORING NEEDED IN PLAN VIEW. DESIGNER SHALL ALSO DETERMINE IF THE SHORING IS TO BE DESIGNED FOR ZONE A, B OR C.

☆ 6'-6" MIN. NOT REQ'D IF BEDROCK IS PRESENT.

THIS STANDARD IS TO MEET WISDOT REQUIREMENTS ONLY. THE DESIGN ENGINEER SHALL CONTACT THE RAILROAD FOR THEIR REQUIREMENTS.

1 BNSF AND UP RAILROADS HAVE GREATER REQUIREMENTS THAN SHOWN. CONFER WITH STATEWIDE RAILROAD STRUCTURE AND TRACK ENGINEER IN CENTRAL OFFICE RAILROADS AND HARBORS SECTION.

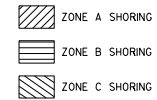
2 BNSF AND UP RAILROAD REQUIRE A DEPTH OF FOOTING 6'-0" MIN. FROM BASE OF RAIL TO TOP OF FOOTING. IN LOCATIONS WHERE BEDROCK IS PRESENT, COORDINATE FOOTING DEPTHS WITH RAILROAD PROJECT COORDINATION ENGINEER.

3 LIMITS OF RAILROAD RIGHT-OF-WAY. LOCATIONS SHOWN ARE FOR REFERENCE ONLY AND NEED NOT BE DIMENSIONED.

4 AESTHETICS SHALL NOT BE EMPLOYED ALONG RAILROAD TRACKS.

NOTES

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



HIGHWAY OVER RAILROAD DESIGN REQUIREMENTS



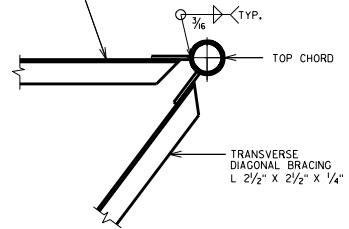
BUREAU OF STRUCTURES

APPROVED: Bill Oliva

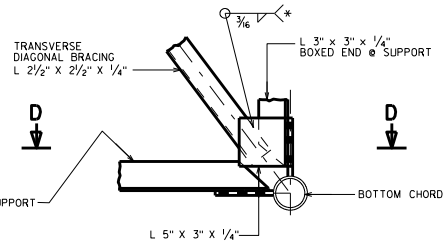
DATE: 1-17

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

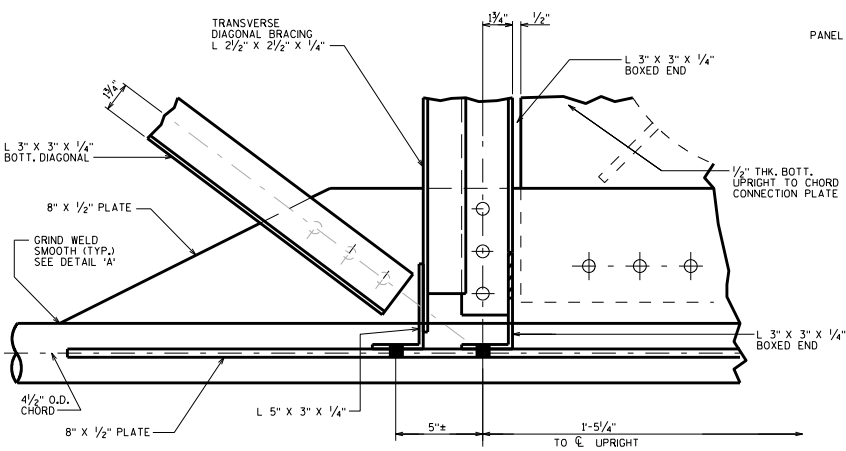
ANGLE SIZE	*WELD LENGTH (MIN.)
L 2 1/2" x 2 1/2" x 1/4"	7"
L 3" x 3" x 1/4"	8"



SECTION B-B

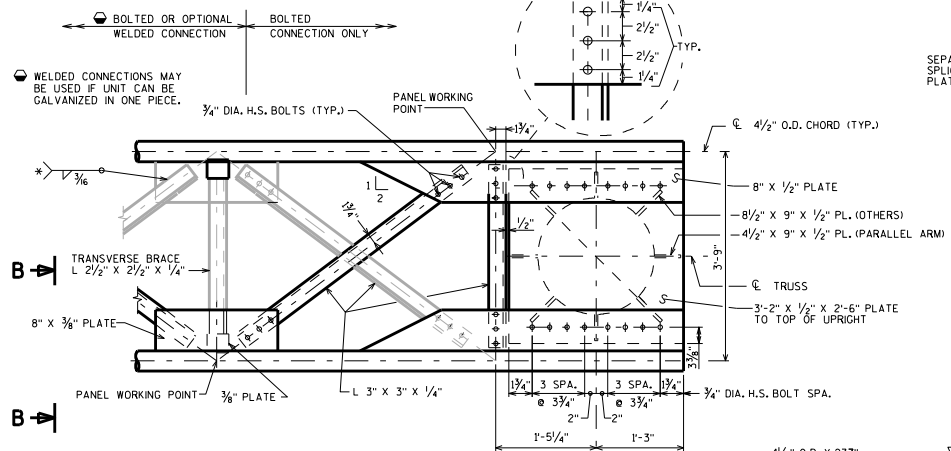


SECTION C-C

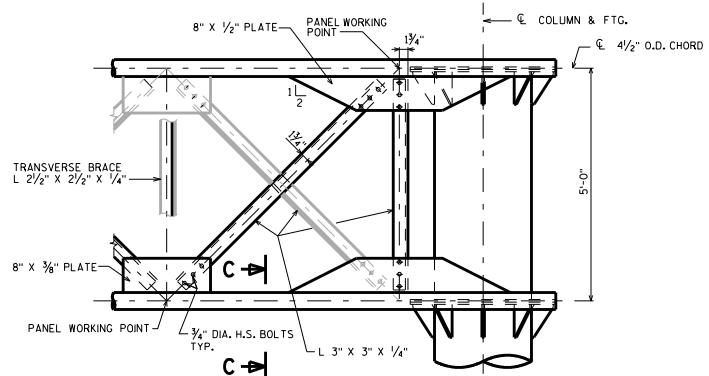


SECTION D-D

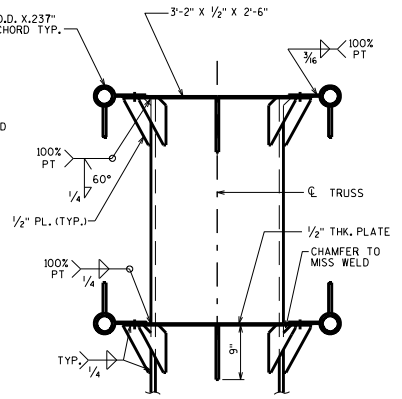
(LOOKING DOWN @ BOTT. HORIZ. PLANE @ FRONT CHORD)



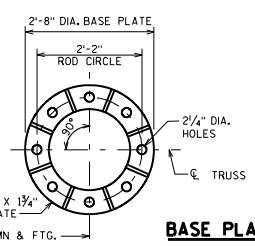
PLAN TRUSS TO UPRIGHT



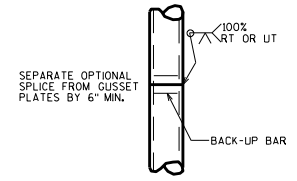
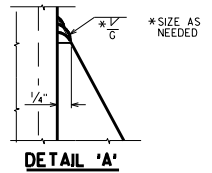
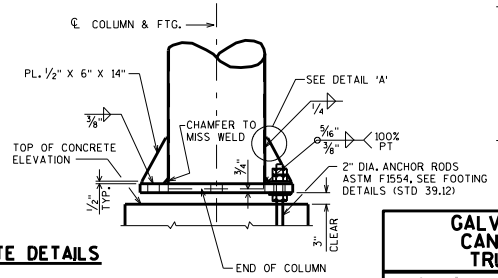
ELEVATION TRUSS TO UPRIGHT



END VIEW TRUSS TO UPRIGHT



BASE PLATE DETAILS



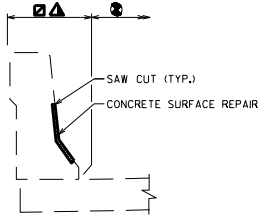
OPTIONAL COLUMN OR CHORD SPLICE DETAIL

GALVANIZED STEEL CANTILEVER SIGN TRUSS DETAILS

BUREAU OF STRUCTURES

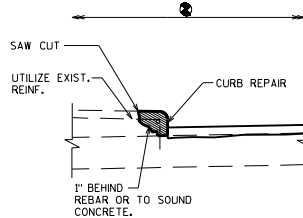
APPROVED: Bill Oliva DATE: 1-17

- ☐ "CLEANING PARAPETS" LIMITS
- ▲ "PIGMENTED SURFACE SEALER" LIMITS
- "PROTECTIVE SURFACE TREATMENT" LIMITS



PARAPET REPAIR DETAIL

502.3200	PROTECTIVE SURFACE TREATMENT	SY
502.3210	PIGMENTED SURFACE SEALER	SY
509.1500	CONCRETE SURFACE REPAIR	SF
509.9050.S	CLEANING PARAPETS	LF

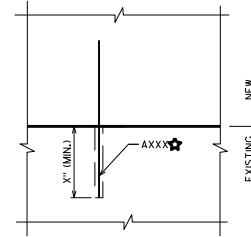


CURB REPAIR DETAIL

502.3200	PROTECTIVE SURFACE TREATMENT	SY
509.1200	CURB REPAIR	LF

DESIGNER NOTES

DETAILS MAY BE SHOWN ON PLANS IF NECESSARY FOR CLARITY.
INCLUDE APPLICABLE CONCRETE MASONRY BID ITEM TO FILL REPAIRS.



NOTE

ADHESIVE ANCHORS SHALL CONFORM TO SECTION 502.2.12 OF THE STANDARD SPECIFICATIONS. (PROVIDE NOTE WHEN THE ADHESIVE ANCHOR BID ITEM IS NOT USED, BUT ARE ALLOWED AS AN ALTERNATIVE ANCHORAGE)

- ★ (CHOOSE ONE OF THE FOLLOWING AND PLACE ON PLAN)
ADHESIVE ANCHORS X/X-INCH.
EMBED X" IN CONCRETE.
- ADHESIVE ANCHORS X/X-INCH.
EMBED X" IN CONCRETE.
ANCHORS SHALL BE APPROVED FOR
USE IN CRACKED CONCRETE.

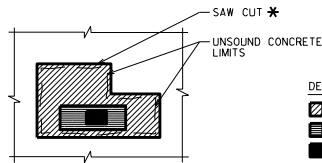
ANCHOR DETAIL (EXAMPLE)

502.41..	ADHESIVE ANCHORS	..-INCH	EACH
502.42..	ADHESIVE ANCHORS	NO. .BAR	EACH
505.0605	BAR STEEL REINFORCEMENT	HS COATED STRUCTURES	LB

DESIGNER NOTES

THE DESIGN ENGINEER SHALL PROVIDE ANCHOR DETAILS AS NEEDED. PLANS SHALL INCLUDE ANCHOR "NOTES" WHEN ADHESIVE ANCHORS ARE USED.

ANCHOR DETAIL EXAMPLE APPLICABLE FOR ADHESIVE ANCHORS LOCATED IN UNCRACKED CONCRETE. SEE CHAPTER 40.16 FOR ADDITIONAL GUIDANCE.

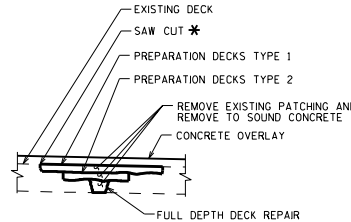


DECK REPAIR DETAIL - PLAN

FOR DESIGNER INFORMATION ONLY
(DO NOT PLACE ON PLANS)

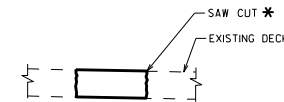
509.0301	PREPARATION DECKS TYPE 1	SY
509.0302	PREPARATION DECKS TYPE 2	SY
509.2000	FULL-DEPTH DECK REPAIR	SY
▲509.2500	CONCRETE MASONRY OVERLAY DECKS	CY
*SPV.0090	SAWING PAVEMENT DECK PREPARATION AREAS	LF

- DECK REPAIR LEGEND:**
- ☐ PREPARATION DECKS TYPE 1
 - ▨ PREPARATION DECKS TYPE 2
 - FULL-DEPTH DECK



DECK REPAIR DETAIL - SECTION

FOR DESIGNER INFORMATION ONLY
(DO NOT PLACE ON PLANS)



FULL-DEPTH DECK REPAIR DETAIL

FOR DESIGNER INFORMATION ONLY
(DO NOT PLACE ON PLANS)

509.2000	FULL-DEPTH DECK REPAIR	SY
▲509.2500	CONCRETE MASONRY OVERLAY DECKS	CY
*SPV.0090	SAWING PAVEMENT DECK PREPARATION AREAS	LF

DESIGNER NOTES

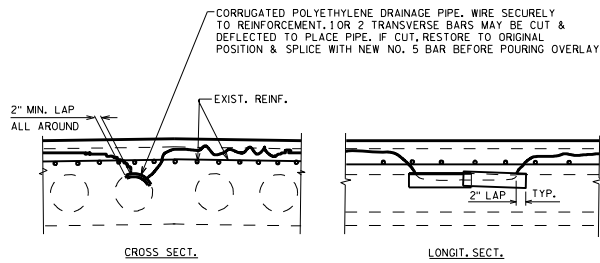
DETAILS APPLICABLE TO ALL OVERLAY METHODS AND DECK REPAIRS WITHOUT OVERLAYS.

* "SAWING PAVEMENT DECK PREPARATION AREAS" NOT REQUIRED FOR CONCRETE OVERLAYS.

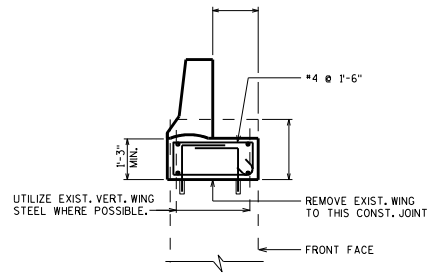
▲ USE "CONCRETE MASONRY DECK REPAIR" (SPV.0035) FOR DECK REPAIRS UNDER POLYMER, ASPHALTIC, OR POLYMER MOD. ASPHALTIC OVERLAYS. USE "CONCRETE MASONRY DECK REPAIR" FOR DECK REPAIRS WITHOUT OVERLAYS.

RESTRICTIONS ON REMOVAL ITEMS SHALL BE PLACED ON THE PLANS TO PREVENT DAMAGE TO REINFORCING STEEL.

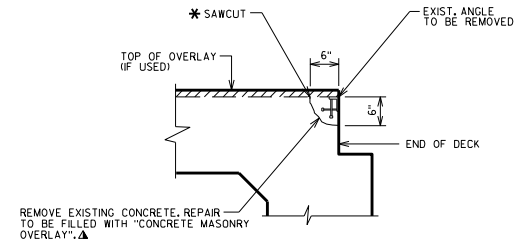
CONCRETE REPAIR DETAILS	
	BUREAU OF STRUCTURES
APPROVED: <u>Bill Oliva</u>	DATE: <u>1-17</u>



RUPTURED VOID REPAIR



SECTION THRU PARAPET ON WING

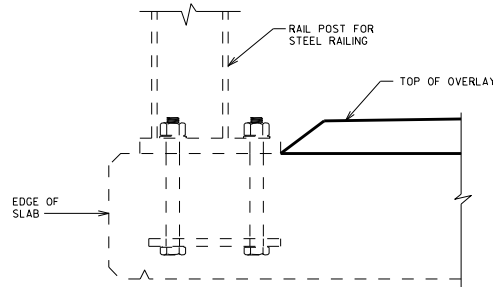


SECTION AT END OF SLAB

509.0301	PREPARATION DECKS TYPE 1	SY
509.0302	PREPARATION DECKS TYPE 2	SY
509.2000	FULL-DEPTH DECK REPAIR	SY
▲509.2500	CONCRETE MASONRY OVERLAY DECKS	CY
*SPV.0090	SAWING PAVEMENT DECK PREPARATION AREAS	LF

DESIGNER NOTES

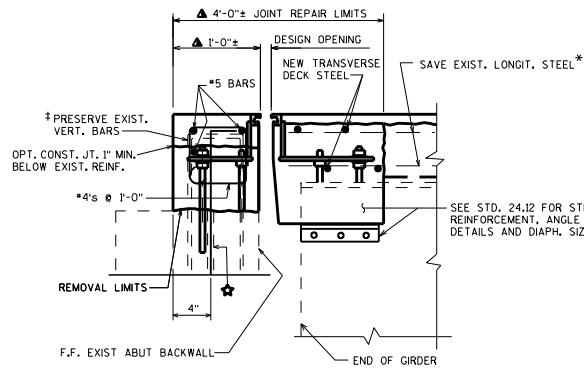
- * "SAWING PAVEMENT DECK PREPARATION AREAS" NOT REQUIRED FOR CONCRETE OVERLAYS.
- ▲ USE "CONCRETE MASONRY DECK REPAIR" (SPV.0035) FOR DECK REPAIRS UNDER POLYMER, ASPHALTIC, OR POLYMER MOD. ASPHALTIC OVERLAYS. USE "CONCRETE MASONRY DECK REPAIR" FOR DECK REPAIRS WITHOUT OVERLAYS.



SECTION THRU RAILING

ATTACHING PARAPETS OR RAILINGS TO BRIDGE DECKS WITH EPOXY ANCHORS IS NOT ALLOWED BY FHWA.

OVERLAY DETAILS	
	BUREAU OF STRUCTURES
APPROVED: <u>Bill Oliva</u>	DATE: <u>1-17</u>

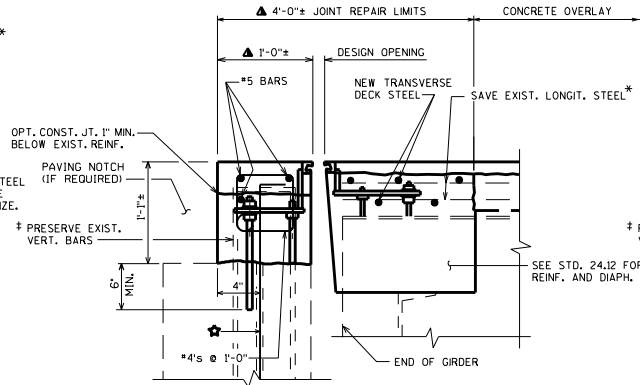


**SECTION THRU JOINT
STEEL GIRDER WITHOUT END DIAPHRAGM**

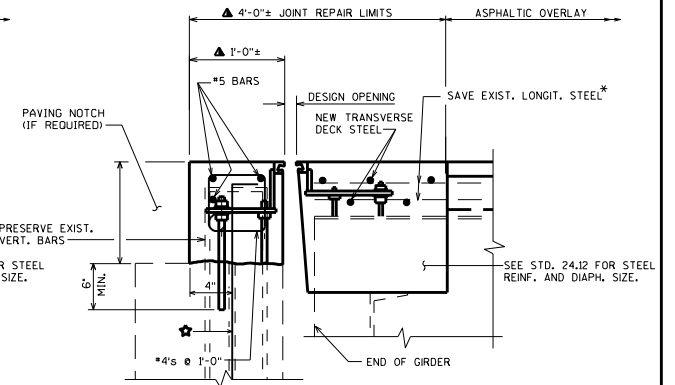
‡ EXISTING BARS ARE LIKELY TO BE CORRODED AND/OR DAMAGED DURING CONCRETE REMOVAL. PRESERVE AND INCORPORATE AS MUCH REBAR AS PRACTICAL. SUPPLEMENT WITH THE BARS INDICATED BY ★.

★ ADHESIVE ANCHORS NO. 5 BAR, EMBED 1'-6" IN CONCRETE. SPACE AT 1'-0". TURN 10" LEG AS NECESSARY TO FIT.

ALL REPLACEMENT PAVING BLOCK DIMENSIONS SHALL MATCH EXISTING PLAN DIMENSIONS UNLESS DESIGNER DETERMINES OTHERWISE, TYP. FOR ALL SECTIONS SHOWN ON THIS STANDARD.



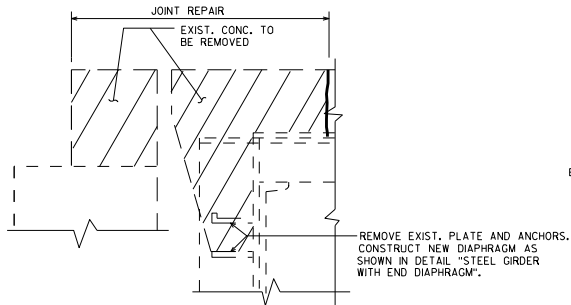
**SECTION THRU PROPOSED JOINT
STEEL GIRDER WITH END DIAPHRAGM
CONCRETE OVERLAY**



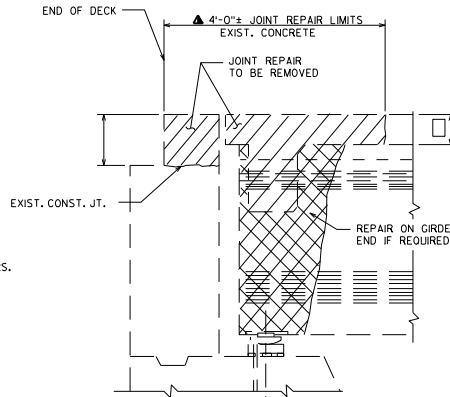
**SECTION THRU PROPOSED JOINT
STEEL GIRDER WITH END DIAPHRAGM
ASPHALTIC OVERLAY**

TOTAL ESTIMATED QUANTITIES

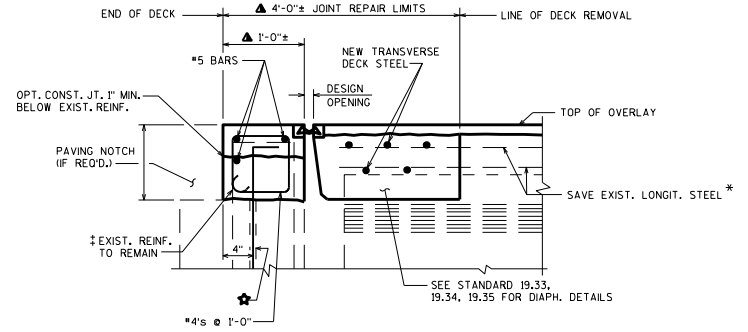
BID ITEMS	UNIT
JOINT REPAIR	SY
EXPANSION DEVICE B-1	1 LS
BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB



**JOINT REPAIR-REMOVAL
STEEL GIRDER**



**JOINT REPAIR-REMOVAL
SECTION THRU JOINT-PRESTRESSED GIRDER**



▲ DIMENSIONS GIVEN ARE NORMAL TO C. OF SUBSTRUCTURE UNIT. INCORPORATE EXISTING REINFORCEMENT

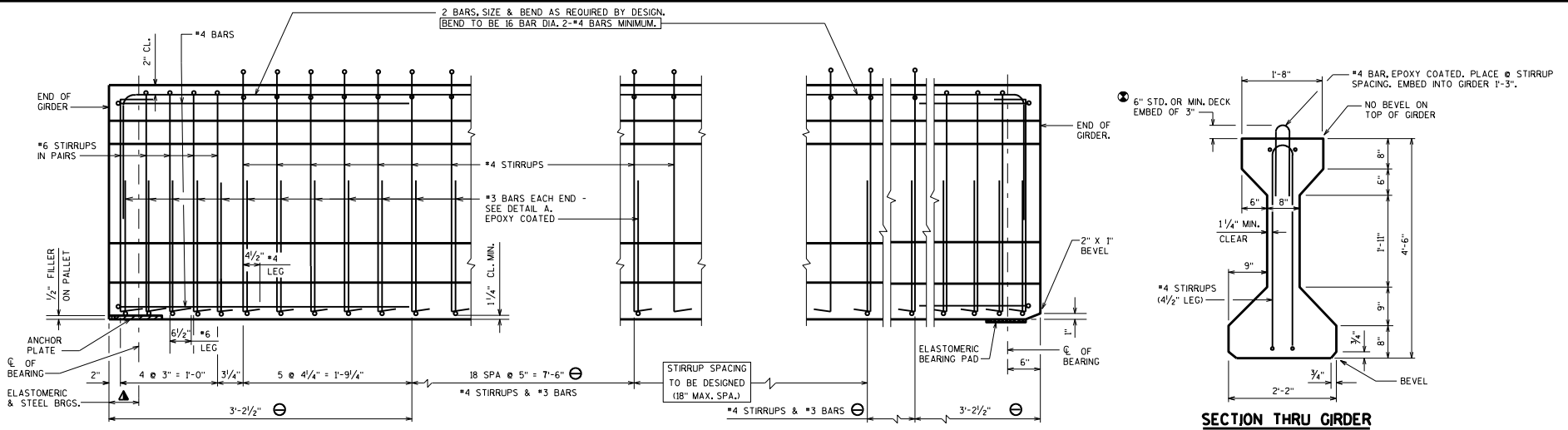
SEE STANDARD 28.01 FOR SUPPORTS USED WITH STRIP SEAL - STEEL EXTRUSIONS.

*FOR SKEWS > 20°, WHERE ORIGINAL TRANSVERSE DECK REINFORCEMENT WAS PLACED NORMAL TO THE GIRDERS, SAVE AND INCORPORATE 1'-6" MIN. OF TRANSVERSE REINFORCING BARS.

STRIP SEALS & DIAPH. DETAILS FOR OVERLAYS

BUREAU OF STRUCTURES

APPROVED: Bill Oliva DATE: 1-17



SUPPORT WITH STEEL OR ELASTOMERIC BRGS.

SUPPORT WITH 1/2" ELASTOMERIC BRG. PAD

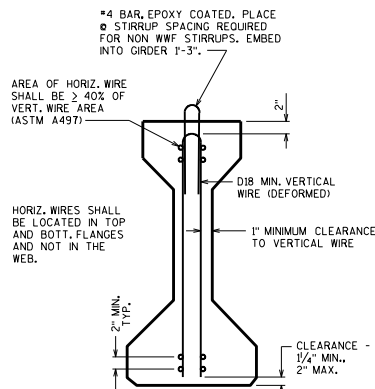
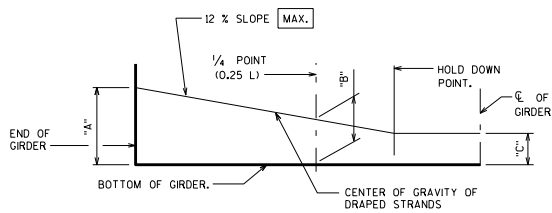
DESIGNER NOTES

SIDE VIEW OF GIRDER

BID ITEM SHALL BE "PRESTRESSED GIRDER TYPE I 54-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 0.5" DIA. OR 0.6" DIA. STRANDS FOR ALL PATTERNS AS REQUIRED. THE MAX. NUMBER OF DRAPED 0.5" DIA. STRANDS IS 12 AND THE MAX. NUMBER FOR 0.6" DIA. STRANDS IS 10.

REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STANDARD STRAND PATTERNS LISTED ON STANDARD 40.14 AND THE SPAN LENGTHS SHOWN IN TABLE 40.7-1. USING DIFFERENT STRAND PATTERNS OR LONGER SPANS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT, WHICH REQUIRES PRIOR APPROVAL FROM THE BUREAU OF STRUCTURES.



"A" TO BE GIVEN TO THE NEAREST 1"

"B" = 1/4("A") + 3 ("C") (MIN.)

"B" = 1/4("A") + 3 ("C") + 3" (MAX.)

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

SECTION THRU GIRDER

SHOWING WELDED WIRE FABRIC (WWF) STIRRUPS ASTM A1064 (FY = 70 KSI)

- 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 2/2" CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR ± 3/4" VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

NOTES

TOP OF GIRDER TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY, EXCEPT THE OUTSIDE 2" OF GIRDER, WHICH SHALL RECEIVE A SMOOTH FINISH. AN APPROVED CONCRETE SEALER SHALL BE APPLIED TO ALL SMOOTH SURFACES INCLUDING THE OUTSIDE 2" OF THE TOP FLANGE.

DO NOT APPLY CONCRETE SEALER OR EPOXY 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.

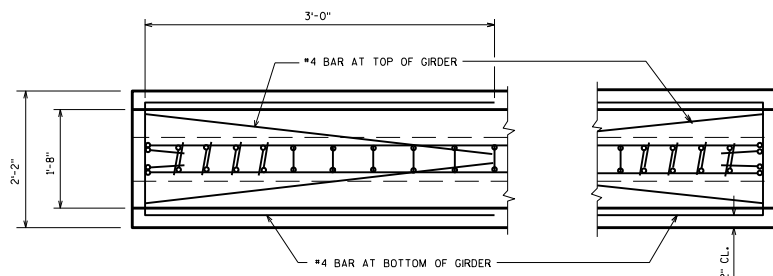
ALL GIRDERS SHALL BE CAST FULL LENGTH AS SHOWN.

SPACING SHOWN FOR #4 STIRRUPS IS FOR GRADE 60 REINFORCEMENT.

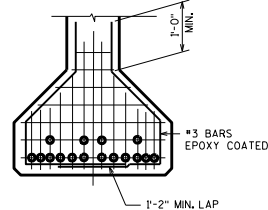
AN ALTERNATE EQUIVALENT OF WELDED WIRE FABRIC (WWF) ASTM A497 MAY BE SUBSTITUTED FOR THE STIRRUP REINFORCEMENT SHOWN, UPON APPROVAL OF THE STRUCTURES DEVELOPMENT SECTION.

PRESTRESSING STRANDS SHALL BE 1 DIA.-7 WIRE LOW RELAXATION STRANDS WITH AN ULTIMATE STRENGTH OF 270,000 PSI.

LOCATION OF DRAPED STRANDS

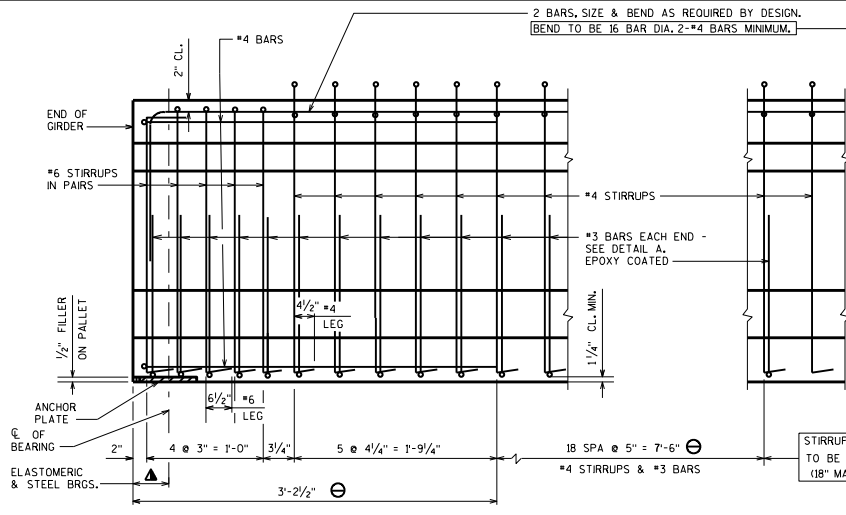


PLAN VIEW

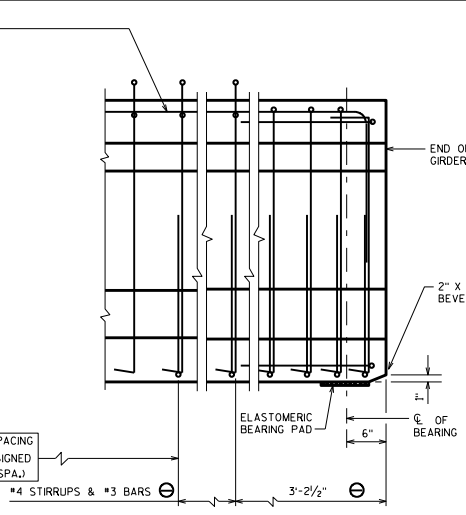


DETAIL A

54" PRESTRESSED GIRDER DETAILS	
	BUREAU OF STRUCTURES
APPROVED: <u>Bill Oliva</u>	DATE: 1-17

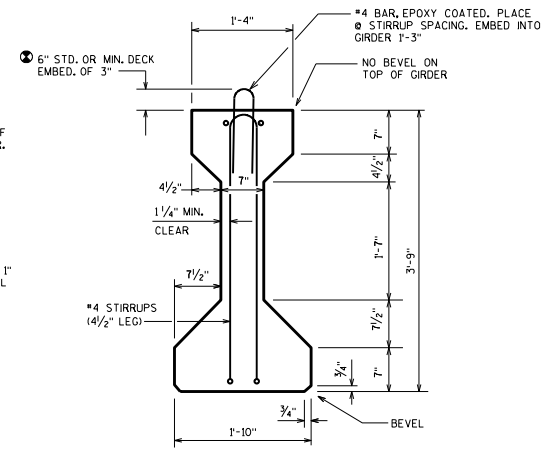


SUPPORT WITH STEEL OR ELASTOMERIC BRGS.

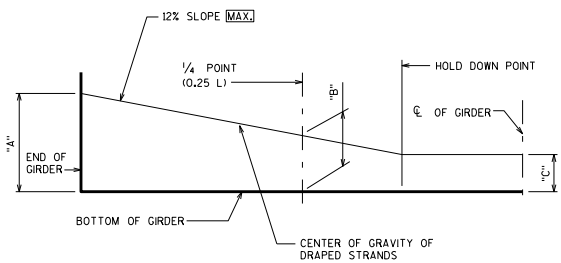


SUPPORT WITH 1/2" ELASTOMERIC BRG. PAD

SIDE VIEW OF GIRDER



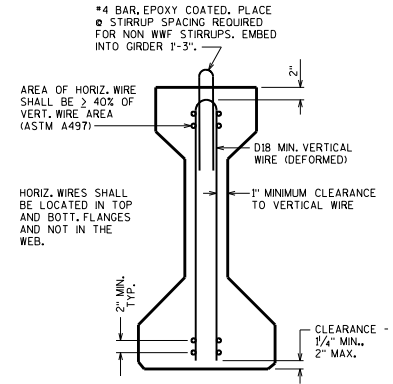
SECTION THRU GIRDER
STRANDS NOT SHOWN



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

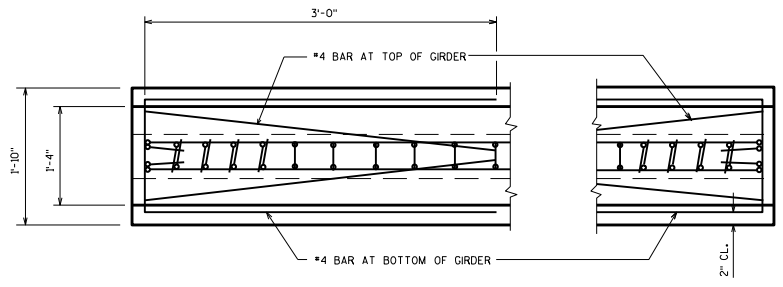
RECORD DIMENSIONS "A", "B" & "C" ON FINAL PLANS.

LOCATION OF DRAPED STRANDS

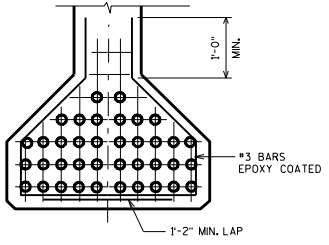


SECTION THRU GIRDER

SHOWING WELDED WIRE FABRIC (WWF) STIRRUPS ASTM A1064 (F_y = 70 KSI)



PLAN VIEW



DETAIL A

DESIGNER NOTES

BID ITEM SHALL BE "PRESTRESSED GIRDER TYPE I 45-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 0.5" OR 0.6" DIA. STRANDS FOR THE DRAPED PATTERN AS REQUIRED. THE MAX. NUMBER OF DRAPED 0.5" DIA. STRANDS IS 10 AND THE MAX. NUMBER FOR 0.6" DIA. STRANDS IS 8. FOR THE STRAIGHT PATTERN USE ONLY 0.6" DIA. STRANDS.

REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STANDARD STRAND PATTERNS LISTED ON STANDARD 40.18 AND THE SPAN LENGTHS SHOWN IN TABLE 40.7-1. USING DIFFERENT STRAND PATTERNS OR LONGER SPANS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT, WHICH REQUIRES PRIOR APPROVAL FROM THE BUREAU OF STRUCTURES.

- ▲ 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 1/2" CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR ±3/4" VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

NOTES

TOP OF GIRDER TO BE ROUGH FLOATED AND BROOMED TRANSVERSELY, EXCEPT THE OUTSIDE 2" OF GIRDER, WHICH SHALL RECEIVE A SMOOTH FINISH. AN APPROVED CONCRETE SEALER SHALL BE APPLIED TO ALL SMOOTH SURFACES INCLUDING THE OUTSIDE 2" OF THE TOP FLANGE.

DO NOT APPLY CONCRETE SEALER OR EPOXY 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.

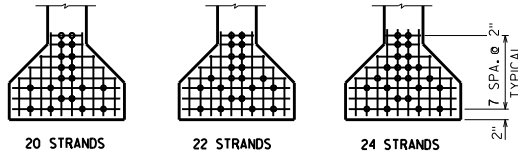
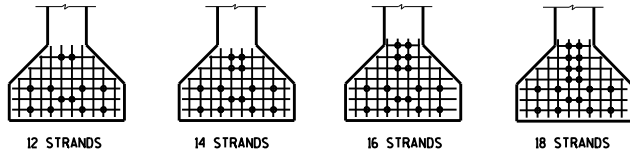
ALL GIRDERS SHALL BE CAST FULL LENGTH AS SHOWN.

SPACING SHOWN FOR #4 STIRRUPS IS FOR GRADE 60 REINFORCEMENT.

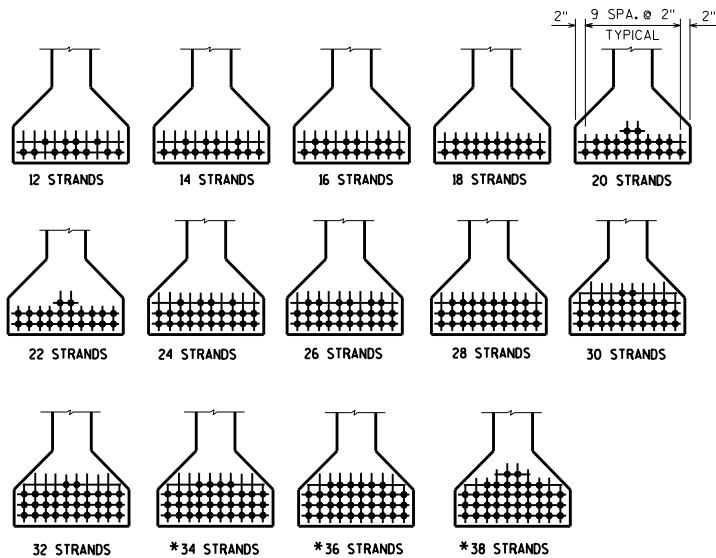
AN ALTERNATE EQUIVALENT OF WELDED WIRE FABRIC (WWF) ASTM A497 MAY BE SUBSTITUTED FOR THE STIRRUP REINFORCEMENT SHOWN, UPON APPROVAL OF THE STRUCTURES DEVELOPMENT SECTION.

PRESTRESSING STRANDS SHALL BE (DIA.)-7-WIRE LOW-RELAXATION STRANDS WITH AN ULTIMATE STRENGTH OF 270,000 PSI.

45" PRESTRESSED GIRDER DETAILS	
 BUREAU OF STRUCTURES	
APPROVED: <u>Bill Oliva</u>	DATE: 1-17



STANDARD ARRANGEMENTS TO RAISE CENTER OF GRAVITY TO AVOID DRAPING OF 0.6" DIA. STRANDS



ARRANGEMENT AT $\frac{1}{4}$ SPAN - FOR GIRDERS WITH DRAPED 0.5" DIA. AND 0.6" DIA. STRANDS

*0.5" DIA. STRANDS ONLY

45" GIRDER

A = 560 SQ. IN.
 $r^2 = 223.91 \text{ IN.}^2$
 $y_T = 24.73 \text{ IN.}$
 $y_B = -20.27 \text{ IN.}$
 $I = 125,390 \text{ IN.}^4$
 $S_T = 5,070 \text{ IN.}^3$
 $S_B = -6,186 \text{ IN.}^3$
 WT. = 583 #/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.
 $P_i \text{ PER } 0.5" \text{ DIA. STRAND} = 0.1531 \times 202,500 = 31.00 \text{ KIPS}$
 $P_i \text{ PER } 0.6" \text{ DIA. STRAND} = 0.217 \times 202,500 = 43.94 \text{ KIPS}$
 $\frac{y_B}{r^2} = \frac{-20.27}{223.91} = -0.09053 \text{ IN./IN.}^2$

(COMPRESSION IS POSITIVE)

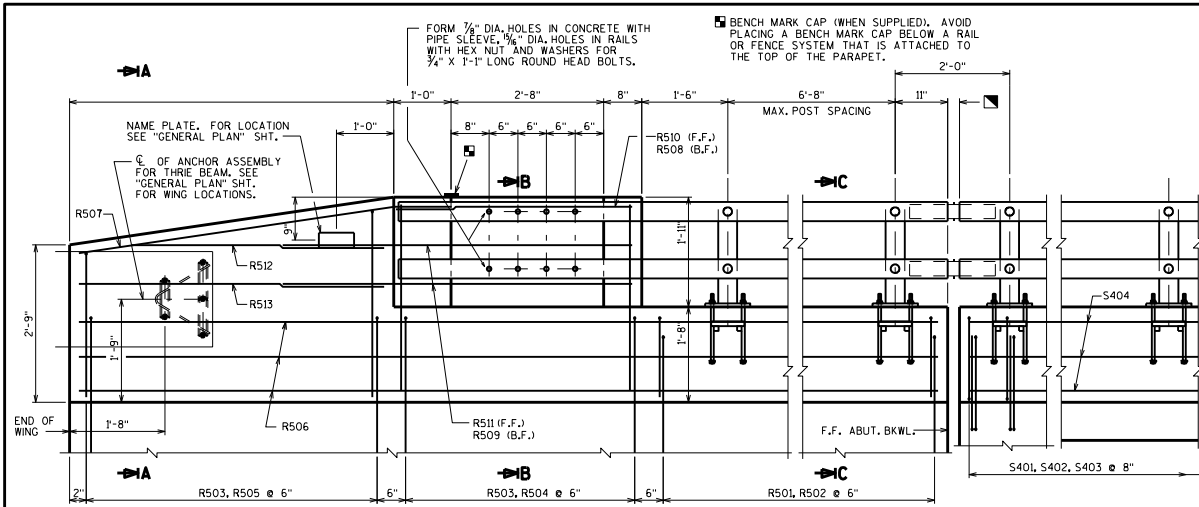
N NO. STRANDS	(1) e_s (inches)	(2) $(1 + \frac{e_s y_B}{r^2})$	(3) $(A/(2))$ (sq. in.)	(4) $P(\text{ini.}) = A_s f_s$ 0.5" DIA. STRANDS (KIPS)	(4) $P(\text{ini.}) = A_s f_s$ 0.6" DIA. STRANDS (KIPS)	(5) $f_b (\text{ini.}) = (4)/(3)$ 0.5" DIA. STRANDS (K/Sq. In.)	(5) $f_b (\text{ini.}) = (4)/(3)$ 0.6" DIA. STRANDS (K/Sq. In.)
STANDARD PATTERNS FOR UNDRAPED STRANDS							
12	-14.94	2.352	238.10		527		2.213
14	-14.27	2.292	244.33		615		2.517
16	-13.27	2.201	254.43		703		2.763
18	-13.15	2.190	255.71		791		3.093
20	-12.27	2.111	265.28		879		3.313
22	-12.27	2.111	265.28		967		3.645
24	-12.10	2.095	267.30		1055		3.947
STANDARD PATTERNS FOR DRAPED STRANDS							
12	-17.60	2.593	215.97	372	527	1.722	2.440
14	-17.70	2.602	215.22	434	615	2.017	2.858
16	-17.52	2.586	216.55	496	703	2.290	3.246
18	-17.38	2.573	217.64	558	791	2.564	3.634
20	-17.07	2.545	220.04	620	879	2.818	3.995
22	-17.01	2.540	220.47	682	967	3.093	4.386
24	-16.77	2.518	222.40	744	1055	3.345	4.744
26	-16.58	2.501	223.91	806	1143	3.600	5.105
28	-16.41	2.486	225.26	868	1230	3.853	5.460
30	-16.13	2.460	227.64	930	1318	4.085	5.790
32	-16.02	2.450	228.57	992	1406	4.340	6.151
34	-15.80	2.430	230.45	1054		4.574	
36	-15.60	2.412	232.17	1116		4.807	
38	-15.32	2.387	234.60	1178		5.021	

45" PRESTRESSED GIRDER DESIGN DATA

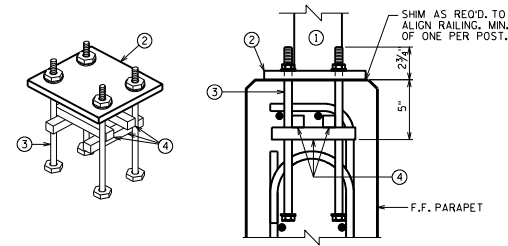
BUREAU OF STRUCTURES

DATE: 7-16

APPROVED: Bill Oliva



RDWY. OPENING OR 2 1/2" MIN. FOR STRIP SEAL EXP. JOINT & 1/2" OPENING FOR ABUTMENT

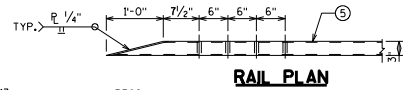


ANCHOR BOLTS FOR RAIL POSTS

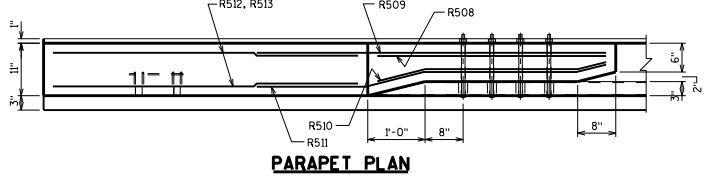
STRIP SEAL EXP. JT. @ ABUT. FOR TYPE A1 ABUT., USE 1/2" FILLER TO TOP OF PARAPET. SEE STD. 12.01/12.02

INSIDE ELEVATION

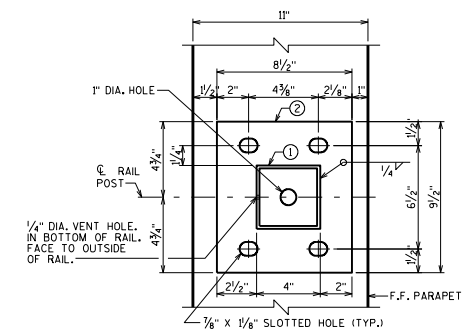
OPTIONAL CONSTRUCTION JOINTS IN THE PARAPETS MAY BE USED. RUN BAR REINF. THRU THE JOINT, LAP LONGIT. BARS A MIN. OF 1'-5". MIN CONSTR. JT. SPACING OF 80'-0". DEFINE CONSTR. JT. WITH A 3/4" V-GROOVE.



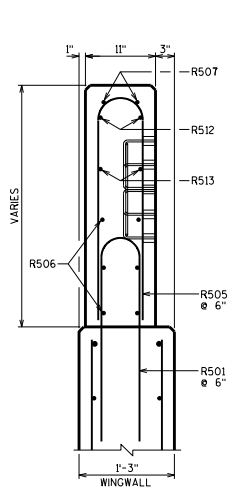
RAIL PLAN



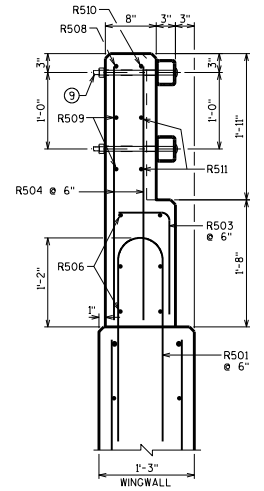
PARAPET PLAN



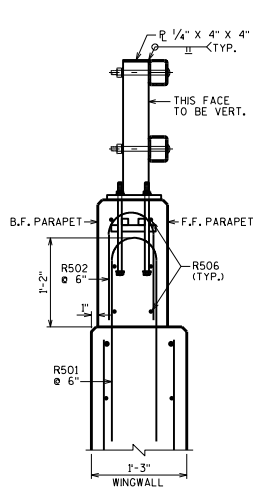
BASE PLATE



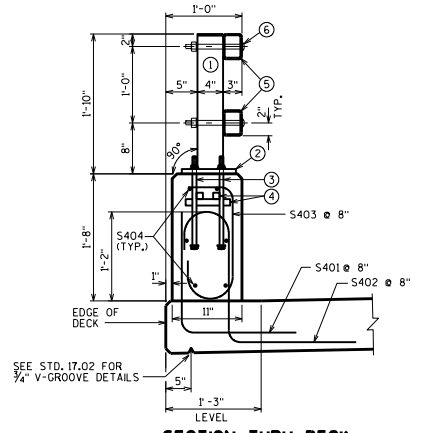
SECTION A-A



SECTION B-B



SECTION C-C




SECTION THRU DECK

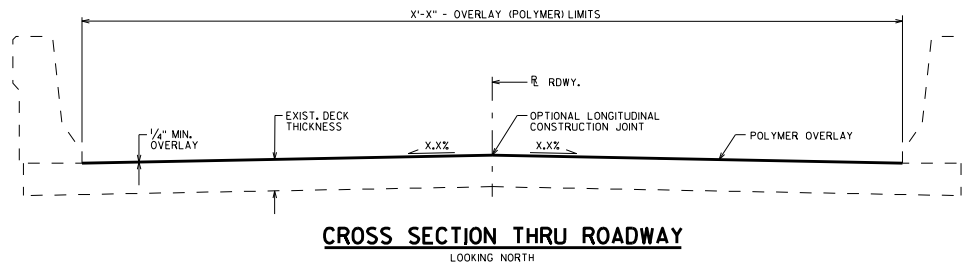
ADJUST LOCATIONS OF BARS TO ALLOW PLACEMENT OF ANCHOR ASSEMBLY FOR RAILING AND BEAM GUARD (WHEN REQ'D.).

DESIGNER NOTES

DETAILS LIMITED TO SKEWS < 40°. SEE STANDARD 40.25 FOR RAILING DETAILS

RAILING WEIGHT = 30 LB/FT

RAILING TUBULAR TYPE 'PF'	
	BUREAU OF STRUCTURES
APPROVED: <u>Bill Oliva</u>	DATE: 1-17



CROSS SECTION THRU ROADWAY
LOOKING NORTH

DESIGNER NOTES

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

DESIGN DATA

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

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

NOTES

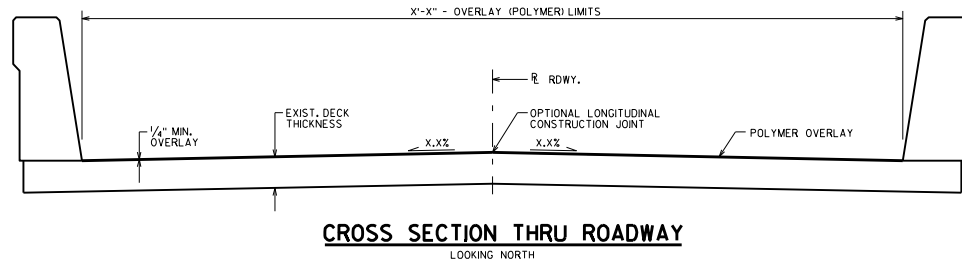
DRAWINGS SHALL NOT BE SCALED.
DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS.
DECK SURFACE PREPARATION IS INCLUDED IN THE BID ITEM "POLYMER OVERLAY".
AREAS OF "PREPARATION DECKS TYPE 1" SHALL BE DEFINED BY A SAW CUT.
PREPARATION DECKS TYPE 1, PREPARATION DECKS TYPE 2, AND FULL-DEPTH DECK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

TOTAL ESTIMATED QUANTITIES

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

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

REHABILITATION
OVERLAY



CROSS SECTION THRU ROADWAY
LOOKING NORTH

DESIGNER NOTES

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

DESIGN DATA

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

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

NOTES

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

TOTAL ESTIMATED QUANTITIES

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

PREVENTATIVE
OVERLAY

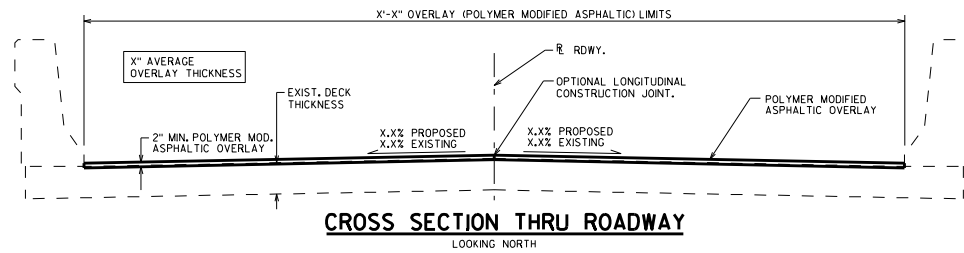
POLYMER OVERLAY



BUREAU OF STRUCTURES

APPROVED: Bill Oliva

DATE:
1-17



CROSS SECTION THRU ROADWAY

LOOKING NORTH

DESIGNER NOTES

CONCRETE OVERLAYS ARE THE CURRENT PREFERRED METHOD TO OVERLAY A BRIDGE.

REPAIRED AREAS REQUIRE A MINIMUM CURE TIME OF 7 DAYS BEFORE PLACING OVERLAY. ALTERNATIVES TO CONCRETE DECK PATCHES MAY BE USED TO SHORTEN TIME REQUIRED FOR PLACING OVERLAY.

PROVIDE AN AVERAGE OVERLAY THICKNESS ON THE PLANS. THIS AVERAGE OVERLAY THICKNESS VALUE IS BASED ON THE THEORETICAL AVERAGE OVERLAY THICKNESS PLUS 1/2" TO ACCOUNT FOR VARIATIONS IN THE DECK SURFACE. QUANTITIES ARE BASED ON THE AVERAGE OVERLAY THICKNESS.

DO NOT PROVIDE A PROFILE GRADE LINE ON THE PLANS.

OVERLAYS NOT REQUIRING SHEET MEMBRANE WATERPROOFING ARE PREFERRED.

DESIGNER TO CONTACT THE REGIONAL BRIDGE MAINTENANCE ENGINEER TO DETERMINE IF POLYMER MODIFIED ASPHALTIC MATERIAL IS AVAILABLE.

RESTRICTIONS ON REMOVAL ITEMS SHALL BE PLACED ON THE PLANS TO PREVENT DAMAGE TO REINFORCING STEEL.

TOTAL ESTIMATED QUANTITIES

BID ITEM NUMBER	BID ITEMS	UNIT	TOTAL
509.0301	PREPARATION DECKS TYPE 1	SY	
509.0302	PREPARATION DECKS TYPE 2	SY	
509.2000	FULL-DEPTH DECK REPAIR	SY	
SPV.0035	CONCRETE MASONRY DECK REPAIR	CY	
SPV.0090	SAWING PAVEMENT DECK PREPARATION AREAS	LF	
509.3500.S	HMA OVERLAY POLYMER-MODIFIED	TON	
	POSSIBLE ADDITIONAL BID ITEMS		
509.9005.S	REMOVING CONCRETE MASONRY DECK OVERLAY	SY	
509.9010.S	REMOVING ASPHALTIC CONCRETE DECK OVERLAY (STRUCTURE)	SY	

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

DESIGN DATA

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

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

NOTES

DRAWINGS SHALL NOT BE SCALED.

DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS.

AREAS OF "PREPARATION DECKS TYPE 1" SHALL BE DEFINED BY A SAW CUT.

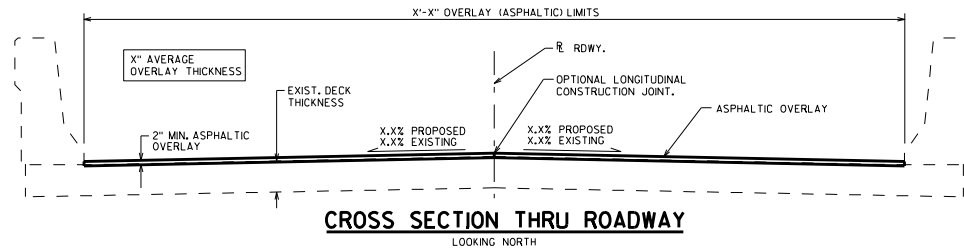
PREPARATION DECKS TYPE 1, PREPARATION DECKS TYPE 2, AND FULL-DEPTH DECK REPAIR AREAS ARE BASED ON THE PLANS AND AS DETERMINED BY THE ENGINEER. DECK PREPARATION AND FULL-DEPTH DECK REPAIRS SHALL BE FILLED WITH "CONCRETE MASONRY DECK REPAIR".

ANY EXCAVATION REQUIRED TO COMPLETE THE OVERLAY OR JOINT REPAIR AT THE ABUTMENTS TO BE CONSIDERED INCIDENTAL TO THE BID ITEM "HMA OVERLAY POLYMER-MODIFIED".

THE PLAN QUANTITY FOR THE BID ITEM "HMA OVERLAY POLYMER-MODIFIED" IS BASED ON THE AVERAGE OVERLAY THICKNESS.

PROFILE GRADE LINE SHALL BE DETERMINED IN THE FIELD BASED ON A MINIMUM OVERLAY THICKNESS OF 2" PLACED ABOVE THE DECK SURFACE. EXPECTED AVERAGE OVERLAY THICKNESS IS 2 1/2" (OR AS GIVEN ON THE PLANS). IF EXPECTED AVERAGE OVERLAY THICKNESS IS EXCEEDED BY MORE THAN 1/2", CONTACT THE STRUCTURES DESIGN SECTION.

POLYMER MODIFIED ASPHALTIC OVERLAY



CROSS SECTION THRU ROADWAY

LOOKING NORTH

DESIGNER NOTES

CONCRETE OVERLAYS ARE THE CURRENT PREFERRED METHOD TO OVERLAY A BRIDGE.

REPAIRS USING CONCRETE REQUIRE A MINIMUM CURE TIME OF 7 DAYS BEFORE PLACING OVERLAY. ALTERNATIVES TO CONCRETE DECK PATCHES MAY BE USED TO SHORTEN TIME REQUIRED FOR PLACING OVERLAY.

PROVIDE AN AVERAGE OVERLAY THICKNESS ON THE PLANS. THIS AVERAGE OVERLAY THICKNESS VALUE IS BASED ON THE THEORETICAL AVERAGE OVERLAY THICKNESS PLUS 1/2" TO ACCOUNT FOR VARIATIONS IN THE DECK SURFACE. QUANTITIES ARE BASED ON THE AVERAGE OVERLAY THICKNESS.

DO NOT PROVIDE A PROFILE GRADE LINE ON THE PLANS.

OVERLAYS NOT REQUIRING SHEET MEMBRANE WATERPROOFING ARE PREFERRED.

COORDINATE ASPHALTIC DESIGN WITH REGION BRIDGE MAINTENANCE AND ROADWAY ENGINEERS.

THE PLAN QUANTITY FOR THE BID ITEM "HMA PAVEMENT TYPE E-X" IS BASED ON (INSERT VALUE) LBS/SY X (AVERAGE OVERLAY THICKNESS) X (OVERLAY AREA). ASSUME 112 LBS/(SY-IN) IF NO ADDITIONAL INFORMATION IS PROVIDED.

THE PLAN QUANTITY FOR THE BID ITEM "ASPHALTIC MATERIAL PGXX-XX" IS BASED ON (INSERT VALUE) % OF BID ITEM "HMA PAVEMENT TYPE E-X". ASSUME 6% IF NO ADDITIONAL INFORMATION IS PROVIDED.

THE PLAN QUANTITY FOR THE BID ITEM "TACK COAT" IS BASED ON AN APPLICATION RATE OF 0.05 TO 0.07 GALLONS/SY. ASSUME 0.07 GALLONS/SY IF PLACING OVER MILLED HMA OR CONCRETE.

RESTRICTIONS ON REMOVAL ITEMS SHALL BE PLACED ON THE PLANS TO PREVENT DAMAGE TO REINFORCING STEEL.

TOTAL ESTIMATED QUANTITIES

BID ITEM NUMBER	BID ITEMS	UNIT	TOTAL
455.0XXX	ASPHALTIC MATERIAL PGXX-XX	TON	
455.0605	TACK COAT	GAL	
460.1XXX	HMA PAVEMENT TYPE E-X	TON	
509.0301	PREPARATION DECKS TYPE 1	SY	
509.0302	PREPARATION DECKS TYPE 2	SY	
509.2000	FULL-DEPTH DECK REPAIR	SY	
SPV.0035	CONCRETE MASONRY DECK REPAIR	CY	
SPV.0090	SAWING PAVEMENT DECK PREPARATION AREAS	LF	
	POSSIBLE ADDITIONAL BID ITEMS		
509.9005.S	REMOVING CONCRETE MASONRY DECK OVERLAY	SY	
509.9010.S	REMOVING ASPHALTIC CONCRETE DECK OVERLAY (STRUCTURE)	SY	

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

DESIGN DATA

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

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

NOTES

DRAWINGS SHALL NOT BE SCALED.

DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS.

AREAS OF "PREPARATION DECKS TYPE 1" SHALL BE DEFINED BY A SAW CUT.

PREPARATION DECKS TYPE 1, PREPARATION DECKS TYPE 2, AND FULL-DEPTH DECK REPAIR AREAS ARE BASED ON THE PLANS AND AS DETERMINED BY THE ENGINEER. DECK PREPARATION AND FULL-DEPTH DECK REPAIRS SHALL BE FILLED WITH "CONCRETE MASONRY DECK REPAIR".

ANY EXCAVATION REQUIRED TO COMPLETE THE OVERLAY OR JOINT REPAIR AT THE ABUTMENTS TO BE CONSIDERED INCIDENTAL TO THE BID ITEM "HMA PAVEMENT TYPE E-X".

THE PLAN QUANTITY FOR THE BID ITEM "HMA PAVEMENT TYPE E-X" IS BASED ON THE AVERAGE OVERLAY THICKNESS.

PROFILE GRADE LINE SHALL BE DETERMINED IN THE FIELD BASED ON A MINIMUM OVERLAY THICKNESS OF 2" PLACED ABOVE THE DECK SURFACE. EXPECTED AVERAGE OVERLAY THICKNESS IS 2 1/2" (OR AS GIVEN ON THE PLANS). IF EXPECTED AVERAGE OVERLAY THICKNESS IS EXCEEDED BY MORE THAN 1/2", CONTACT THE STRUCTURES DESIGN SECTION.

ASPHALTIC OVERLAY

POLYMER MODIFIED ASPHALTIC AND ASPHALTIC OVERLAYS



APPROVED: Bill Oliva DATE: 1-17