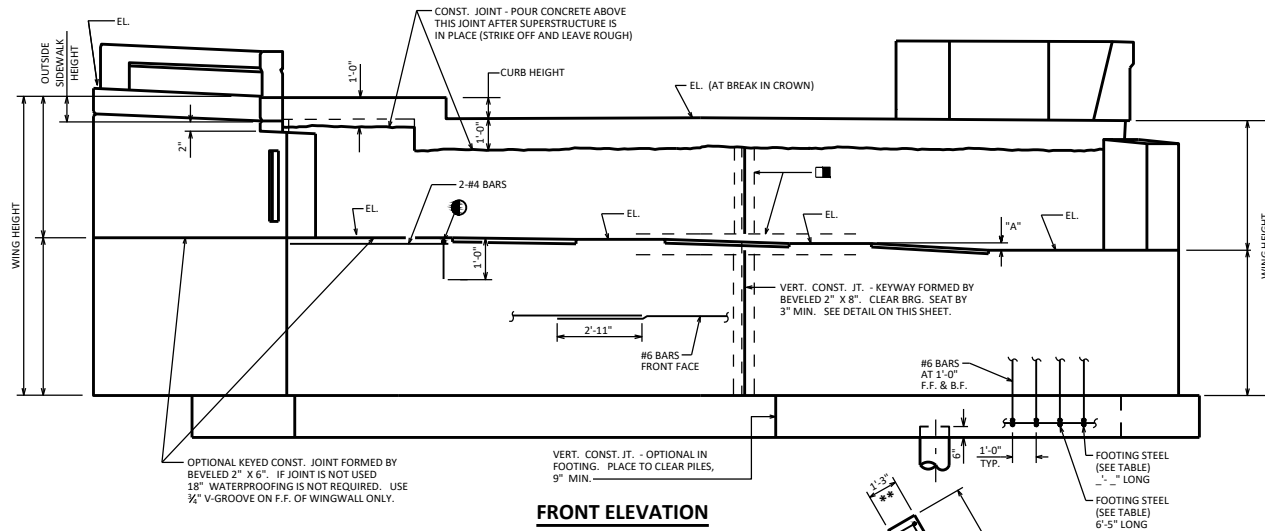
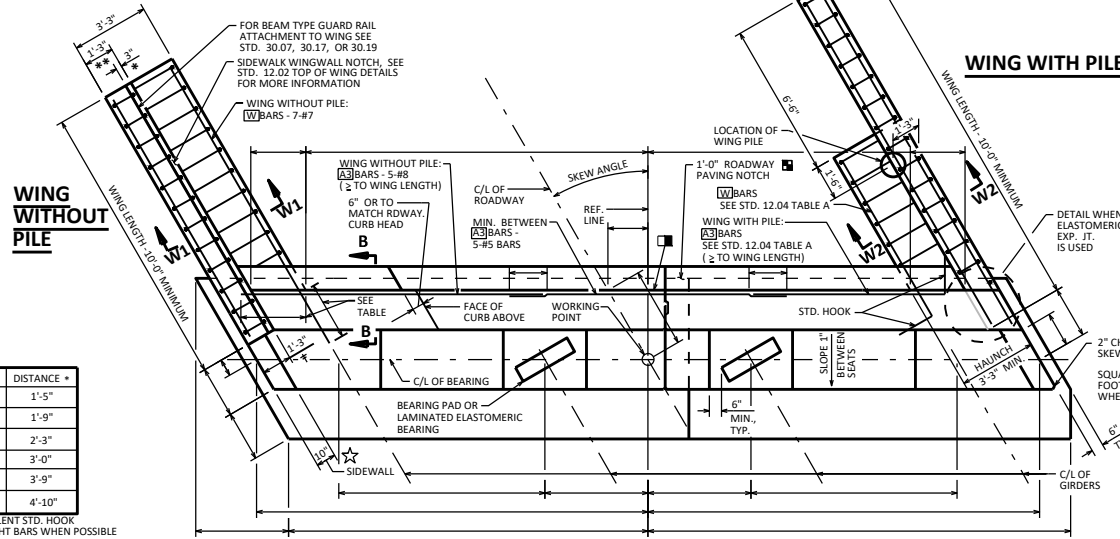




FRONT ELEVATION



TABLE

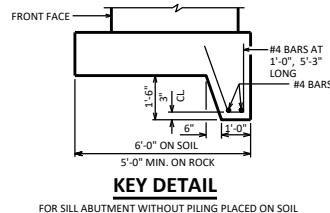
BAR SIZE	DISTANCE *
#5	1'-5"
#6	1'-9"
#7	2'-3"
#8	3'-0"
#9	3'-9"
#10	4'-10"

* OR EQUIVALENT STD. HOOK
USE STRAIGHT BARS WHEN POSSIBLE

WING WITH SIDEWALK

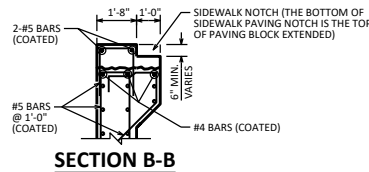
PLAN

WING WITH SLOPED FACE PARAPET



KEY DETAIL

FOR SILL ABUTMENT WITHOUT PILING PLACED ON SOIL



SECTION B-B

PILE REACTIONS PER FOOT IN KIPS	
FRONT ROW = $P[(0.22 \times X/4.25)] + [(h+2.25)/310] + 4.6$	
BACK ROW = $P[(0.78 \times X/4.25)] - [(h+2.25)/705] + 16.8$	

NOTES:

h = WING HEIGHT (FT.)

$P = \frac{1}{2} D_c (P_{dc} + \frac{1}{2} D_w (P_{dw} + \frac{1}{2} L_{LL}) (K/FT.))$

FRONT ROW PILE DESIGN IS BASED ON AN EQUIVALENT FLUID UNIT WEIGHT OF SOIL OF 40 P.C.F. WITH $\gamma_{EH} = 1.50$, AND SUPERSTRUCTURE REACTIONS "P". BACK ROW PILE DESIGN IS BASED ON AN EQUIVALENT FLUID UNIT WEIGHT OF SOIL OF 40 P.C.F. WITH $\gamma_{EH} \text{ MIN.} = 0.50$, AND "P".

PILES MUST ALSO BE DESIGNED TO ACCOUNT FOR LATERAL LOADS

DESIGNER NOTES

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

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

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

PILE REACTION EQUATIONS ARE FOR PRELIMINARY PILE LAYOUT PURPOSES ONLY.

TOTAL LENGTH OF A BARS SHALL BE $\geq$ TO WING LENGTH.

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.

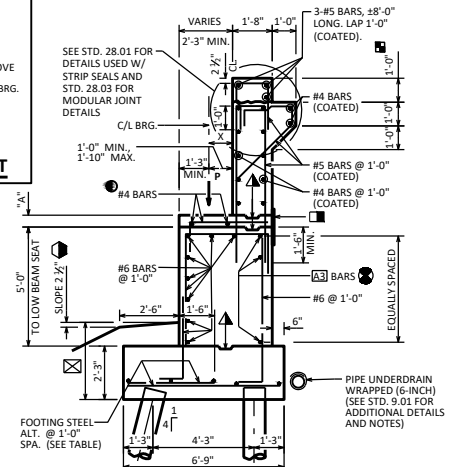
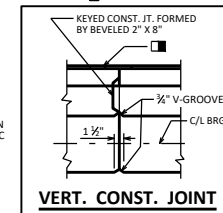
PARAPET NOT SHOWN IN PLAN VIEW FOR CLARITY.

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

SEE STANDARDS 12.01 AND 13.01 FOR SLOPED BEAM SEAT CRITERIA AND DETAILS.

LEGEND

- 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZ. AND VERT. JOINTS ON BACKFACE ABOVE FOOTING.
- KEYED CONSTRUCTION JOINT FORMED BY BEVELED 2" X 8".
- #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 "TM" RAILING, VERTICAL FACE PARAPET "TX", OR SINGLE SLOPE PARAPET "565S" IS USED. "565S" SHOULD NOT BE USED ON A SIDEWALK. WINGWALL WIDTH SHALL BE 1'-4" WHEN PARAPET "A" ON A RAISED SIDEWALK IS USED. WINGWALL WIDTH SHALL BE 1'-5" WHEN TYPE "NY3" OR "NY4" RAILING IS USED. (USE 2'-0" WIDTH WHEN NY4 IS USED ON A SIDEWALK)
- 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. SHOW NO. 9 STAINLESS STEEL BAR (STD 12.12) FOR STRUCTURAL APPROACH SLAB ON THE ABUTMENT SHEET.
- ☆ SIDEWALK IS 1'-3" WIDE IF STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED.
- SHOW ALL BARS FOR CLARITY.
- NO SLOPE FOR HEAVY RIPRAP. SEE STANDARD 12.08 FOR DETAILS.



SECTION THRU BODY

ALL FOOTING BARS NOT IDENTIFIED ARE #5 BARS

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

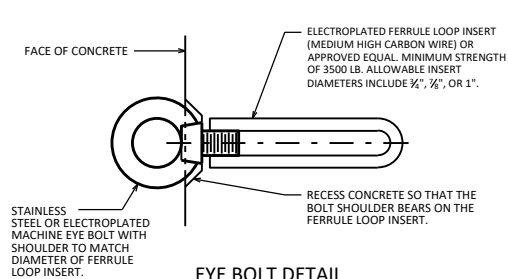
ABUTMENT TYPE A3



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STRUCTURES**

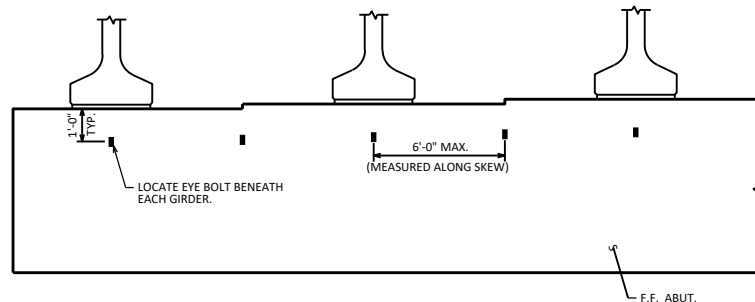
APPROVED: *Laura Shadewald*

DATE:
7-26



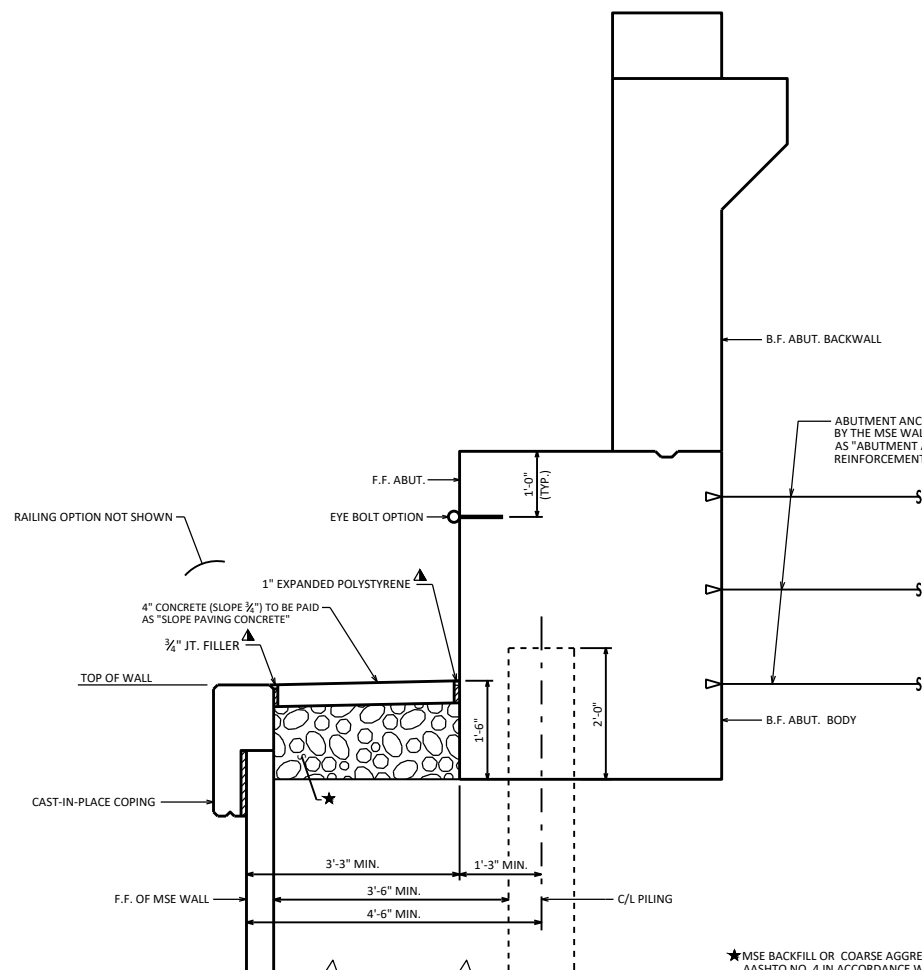
EYE BOLT DETAIL

COST INCIDENTAL TO BID ITEM "CONCRETE MASONRY BRIDGES".



PARTIAL ELEVATION OF F.F. ABUTMENT SHOWING EYE BOLT FALL PROTECTION OPTION

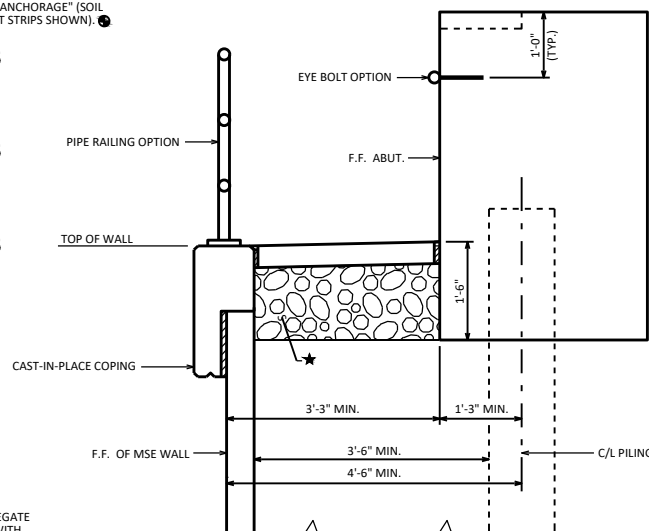
RETAINING WALL NOT SHOWN



CROSS SECTION THRU ABUTMENT AT MSE WALL

EXPANSION ABUT. SHOWN. SEE STANDARDS 12.01 & 12.02 FOR APPLICABLE BODY REINFORCEMENT AND STANDARDS 12.03 & 12.04 FOR BACKWALL AND WING REINFORCEMENT.

★MSE BACKFILL OR COARSE AGGREGATE AASHTO NO. 4 IN ACCORDANCE WITH STANDARD SPEC 604. COST INCIDENTAL TO BID ITEM "SLOPE PAVING CONCRETE".



CROSS SECTION THRU ABUTMENT AT MSE WALL SHOWING BOTH EYE BOLT AND RAILING FALL PROTECTION OPTIONS

TYPE A1 SEMI-EXPANSION ABUTMENT SHOWN

DESIGNER NOTES

MSE WALLS SHALL NOT BE USED FOR THE SINGULAR PURPOSE OF REDUCING SPAN LENGTH. SEE BRIDGE MANUAL SECTION 12.12 FOR ADDITIONAL INFORMATION.

FALL PROTECTION SHALL BE PROVIDED. THE OPTION PROVIDED SHOULD BE BASED ON THE PREFERENCE OF THE BRIDGE MAINTENANCE AND REGION PROJECT STAFF.

IF PIPE RAILING IS USED, SEE STD. 30.26 FOR APPLICABLE NOTES. (NOTE: STD. 30.26 IS STILL UNDER DEVELOPMENT)

"SLOPE PAVING CONCRETE" ITEMS TO BE SHOWN AS PART OF BRIDGE PLAN.

TYPE A1 ABUTMENTS:

FOR FIXED SEATS, TOTAL STRUCTURE LENGTH SHALL BE LIMITED TO 150-FEET.

TYPE A3 ABUTMENTS:

ABUTMENT ANCHORAGE IS NOT PREFERRED OVER TRADITIONAL A3 ABUTMENTS, BUT MAY BE CONSIDERED. WHEN ABUTMENT ANCHORAGE IS USED, THE DESIGNER SHALL SPECIFY, ON THE PLANS, ALL UNFACTORED LATERAL LOADS REQUIRED FOR THE DESIGN OF THE ABUTMENT ANCHORAGE.

NOTES

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

THE DESIGN OF THE WALL IN FRONT OF THE ABUTMENT SHALL INCLUDE THE HORIZONTAL EARTH LOADS AND 240 PSF LIVE LOAD SURCHARGE ACTING ON THE BACK OF THE ABUTMENT BELOW THE BEAM SEATS.

● UNFACTORED SUPERSTRUCTURE LATERAL LOADS TRANSFERRED TO THE ABUTMENT ARE TAKEN TO BE KIPS PER FOOT OF ABUTMENT LENGTH. THE VALUES ARE TO BE USED FOR THE LRFD DESIGN OF THE ABUTMENT ANCHORAGE BY THE MSE MANUFACTURER (MSE SYSTEM, DEAD MAN ANCHOR, OTHER). ABUTMENT ANCHORAGE SHALL ATTACHED TO THE ABUTMENT BODY AND NOT ATTACHED TO THE ABUTMENT BACKWALL.

UNFACTORED LATERAL DESIGN LOADS:

BR	=	---	KLF	WS	=	---	KLF	EH	=	---	KLF
TU	=	---	KLF	WL	=	---	KLF	LS	=	---	KLF
ABUT. LOAD LENGTH = -- FT											

MINIMUM REQUIRED LENGTH OF SOIL REINFORCEMENT FOR ABUTMENT ANCHORAGE SHALL BE TAKEN AS THE GREATER OF 0.7 TIMES THE HEIGHT OF THE ABUTMENT OR 8-FEET. HEIGHT OF THE ABUTMENT IS DEFINED AS PAVEMENT GRADE MINUS BOTTOM OF THE ABUTMENT.

THE CONTRACTOR SHALL PROVIDE COMPLETE DESIGN, PLANS, DETAILS, AND SHOP DRAWINGS FOR THE MSE BACKFILL SYSTEM, IN ACCORDANCE WITH THE SPECIAL PROVISIONS. THE MSE WALL MANUFACTURER SHALL PROVIDE TECHNICAL ASSISTANCE TO THE CONTRACTOR DURING CONSTRUCTION. THE COST OF FURNISHING THESE ITEMS IS INCLUDED IN THE BID ITEM "ABUTMENT ANCHORAGE".

THE COST OF FURNISHING AND PLACING MSE BACKFILL WITHIN A REINFORCED SOIL ZONE IS TO BE INCLUDED IN THE BID ITEM "ABUTMENT ANCHORAGE". REINFORCED SOIL ZONE LIMITS SHALL EXTEND 1-FOOT MINIMUM BEYOND SOIL REINFORCEMENTS IN ALL DIRECTIONS.

ABUTMENT TO BE BACKFILLED TO A MINIMUM OF THE BEAM SEAT ELEVATION PRIOR TO PLACING GIRDERS.

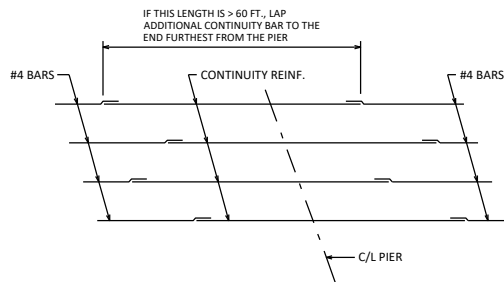
MSE WALL AT ABUTMENT



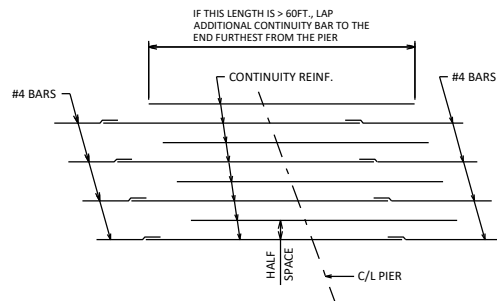
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DATE:
7-26



**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)

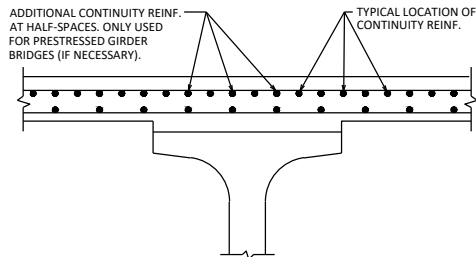
LONGITUDINAL CONSTRUCTION JOINT DETAIL

SEE STD. 24.11 FOR GIRDER SUPERSTRUCTURES
SEE STD. 18.02 FOR SLAB SUPERSTRUCTURES

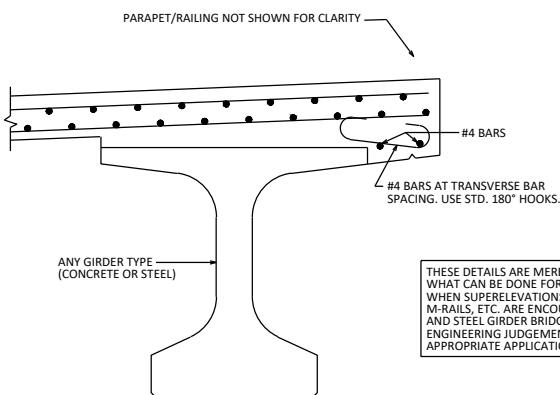
DESIGNER NOTES

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.

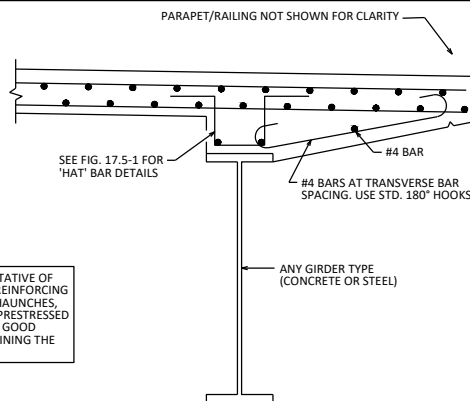
JOINTS SHOULD BE PLACED AT LEAST 6 INCHES FROM THE EDGE OF THE TOP FLANGE OF THE GIRDER AND PREFERABLY LOCATED BENEATH THE MEDIAN OR PARAPET. AVOID PLACING NEAR WHEEL PATHS (PLACE AT LANE LINES OR IN THE MIDDLE OF THE LANE).



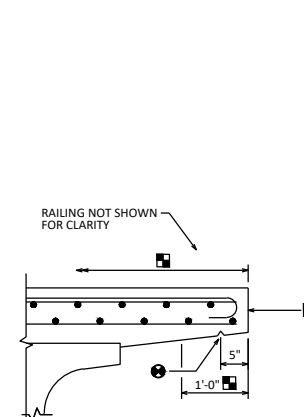
CROSS SECTION THRU DECK
(SHOWING TOP LONGIT. REINF. LOCATION RELATIVE TO BOTTOM LONGIT. REINF.)



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

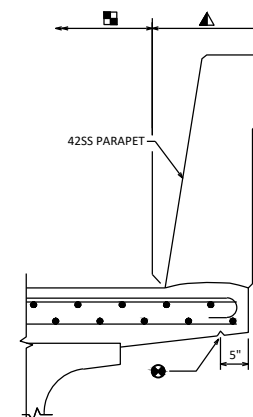


CROSS SECTION THRU EDGE OF DECK
(SHOWING ADDITIONAL OVERHANG REINFORCEMENT)



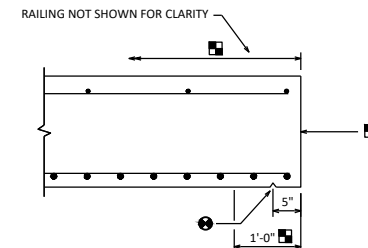
**CROSS SECTION THRU
EDGE OF DECK**

(SHOWING DRIP GROOVE AND CONCRETE SEALING FOR OPEN RAILINGS)



**CROSS SECTION THRU
EDGE OF DECK**

(SHOWING DRIP GROOVE AND CONCRETE SEALING FOR ALL PARAPETS)



CROSS SECTION THRU EDGE OF SLAB

(SHOWING DRIP GROOVE FOR ALL PARAPET AND RAILINGS, AND PROTECTIVE SURFACE TREATMENT FOR OPEN RAILINGS. FOR PARAPETS, PROTECTIVE SURFACE TREATMENT IS ONLY APPLIED GUTTERLINE TO GUTTERLINE)

DESIGNER NOTES

- ½" V-GROOVE REQUIRED AT THE EDGE OF DECK AND SLAB.

REFER TO STANDARD 40.01 FOR RESEALING CONCRETE SURFACES.

DO NOT APPLY CONCRETE SEALER TO SURFACES TO BE STAINED OR OTHER

■ BID ITEM "PROTECTIVE SURFACE TREATMENT":

- APPLY TO DECK AND CONCRETE OVERLAY SURFACES.
- FOR OPEN RAILINGS, APPLY TO THE TOP AND EXTERIOR EXPOSED FACE OF WINGS, AND THE END 1'-0" OF THE FRONT FACE OF ABUTMENT.
- APPLY TO THE VERTICAL AND HORIZONTAL SURFACES OF SIDEWALKS, MEDIANS, AND PAVING NOTCHES.

▲ BID ITEM "PIGMENTED SURFACE SEALER":

- APPLY TO INSIDE & TOP FACES OF PARAPETS, INCLUDING PARAPETS ON WINGS.

NOTES

- ½" V-GROOVE REQ'D. EXTEND TO 2'-0" FROM F.F. OF ABUT. BODY (FOR ABUTMENTS WITH EXPANSION JOINTS)
- ¾" V-GROOVE REQ'D. EXTEND TO 6" FROM F.F. OF ABUT. DIAPH. (FOR TYPE A1 FIXED AND SEMI-EXPANSION ABUTMENTS)

- PROTECTIVE SURFACE TREATMENT SHALL BE APPLIED TO THE (INSERT LOCATIONS).

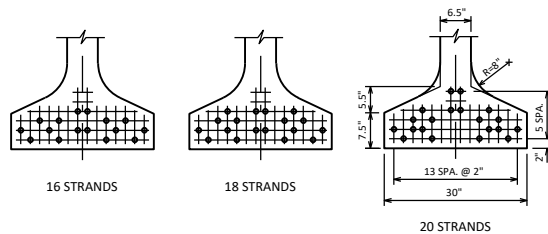
- ▲ PIGMENTED SURFACE SEALER SHALL BE APPLIED TO THE (INSERT LOCATIONS).

DECK AND SLAB DETAILS

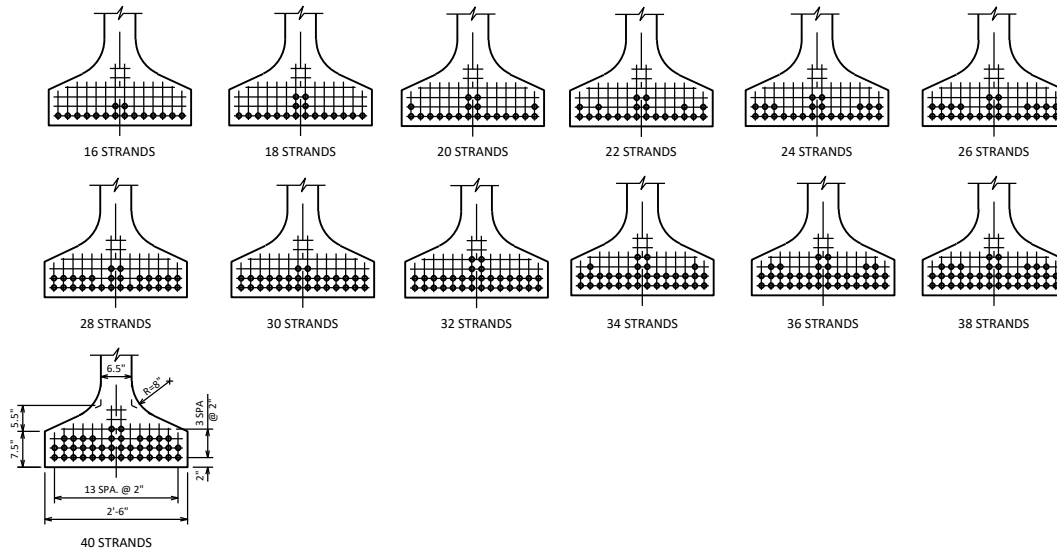


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7-26



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



ARRANGEMENT AT C/L SPAN - FOR GIRDERS WITH DRAPED 0.6" DIA. STRANDS

45W" GIRDER

$A = 692 \text{ SQ. IN.}$

$r^2 = 258.70 \text{ IN.}^2$

$Y_1 = 24.26 \text{ IN.}$

$Y_8 = -20.74 \text{ IN.}$

$I = 178,971 \text{ IN.}^4$

$S_T = 7,377 \text{ IN.}^3$

$S_B = -8,629 \text{ IN.}^3$

$WT. = 721 \text{ \#/FT.}$

PRE-TENSION

$f'_s = 270,000 \text{ P.S.I.}$

$f_s = 0.75 \times 270,000 = 202,500 \text{ P.S.I.}$
for low relaxation strands

PI PER 0.6" DIA. STRAND = $0.217 \times 202,500 = 43.94 \text{ KIPS}$

$\frac{Y_8}{r^2} = \frac{-20.74}{258.70} = -0.08017 \text{ IN/IN}^2$

$f_b (\text{init.}) = \frac{A_s f_s}{A} (1 + \frac{e_s Y_8}{r^2})$

(COMPRESSION IS POSITIVE)			
NO. STRANDS	e_s (inches)	$P(\text{init.}) = A_s f_s$ (KIPS)	$f_b (\text{init.})$ (K/sq.in.)
STANDARD STRAND PATTERNS FOR UNDRAPED STRANDS			
16	-16.24	703	2.339
18	-15.85	791	2.596
20	-15.14	879	2.812
STANDARD STRAND PATTERNS FOR DRAPED STRANDS			
16	-18.49	703	2.521
18	-18.07	791	2.799
20	-17.94	879	3.097
22	-17.83	967	3.394
24	-17.74	1055	3.693
26	-17.66	1143	3.991
28	-17.60	1230	4.285
30	-17.54	1318	4.583
32	-17.24	1406	4.840
34	-17.09	1494	5.117
36	-16.96	1582	5.395
38	-16.85	1670	5.674
40	-16.74	1758	5.950

DESIGNER NOTES

ON THE STRAND PATTERN SHEET, PLACE A BOX AROUND EACH STRAND PATTERN THAT APPLIES TO THE DESIGNED STRUCTURE AND LABEL THE SPAN IT IS USED IN.

45W" PRESTRESSED GIRDER DESIGN DATA



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C/L PILES & BRG.
 CONCRETE DIAPHRAGM
 #5 @ 1'-0" CTRS. BETWEEN GIRDERS. SEE STD. 12.01
 3" MIN.
 1'-3" MIN.
 1'-14"
 KEYED CONST. JOINT BETWEEN GIRDERS FORMED BY BEVELED 2" X 6"
 4" TYP.
 EDGE OF BEAM SEAT
 END OF GIRDER
 BACKFACE OF ABUTMENT
 PAVING NOTCH (ABOVE)
 8"
 2" MIN. (TOP FLG.)
 SEE "GIRDER FORM-OUT DETAIL" ***
 1/2" X 8" X 1" BW* NON-LAMINATED ELASTOMERIC BEARING PAD
 C/L OF GIRDER
 GIRDER TOP FLANGE
 GIRDER BOTTOM FLANGE
 4" TYP.
 1/2" PREFORMED JOINT FILLER

AT ABUTMENT

LEGEND

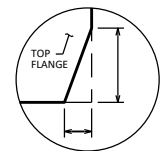
-  USE 2'-3" WITH A STRUCTURAL APPROACH SLAB (STD. 12.10)

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

- 1'-6" FOR 36W", 45W", 54",
54W", 70", 72W" & 82W"
GIRDERS WITH SKEWS >25°.



ABUTMENT: TYPE "A3"
 E TABLE FOR MIN. "A" VALUES
 Q'D. TO MEET MIN. CLEARANCE
 CRITERIA ABOVE.



GIRDER FORM-OUT
DETAIL**



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



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

■ "A" DIMENSION BASED ON BOTTOM FLANGE CLEARANCE IS CALCULATED USING 6" OFFSET FROM C/L BRG. TO END OF GIRDER AND 3" MIN. OFFSET BETWEEN FLANGE AND BACKWALL TO ACCOMMODATE EXPANSION. IF CONDITIONS REQUIRE OFFSETS OTHER THAN THESE, THE "A" DIMENSION MUST BE CALCULATED. "A" DIMENSION BASED ON MASONRY PLATE CLEARANCE IS CALCULATED ASSUMING A 10" LONG PLATE. IF LONGER PLATE IS REQUIRED, RECALCULATE "A".

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

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

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

DESIGNER NOTES

SEE PRESTRESSED GIRDER DETAILS FOR ADDITIONAL INFORMATION. BEARING PAD DETAILS FOR 45W" GIRDER SHOWN ON THIS SHEET, DETAILS FOR OTHER GIRDERS TYPES SIMILAR.

** WHEN NEEDED, FORM-OUT TOP FLANGE ON 36W", 45W", 54W", 70", 72W" & 82W" PRESTRESSED GIRDERS TO MEET MIN. CLR. REQ'D (SEE STD. 19.34, 19.35 OR 28.03). BOTTOM FLANGE FORM-OUT NOT ALLOWED.

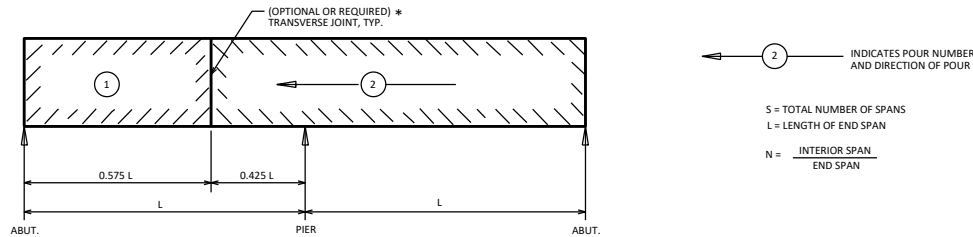
BEARING PAD DETAILS FOR PRESTRESSED CONCRETE GIRDERS



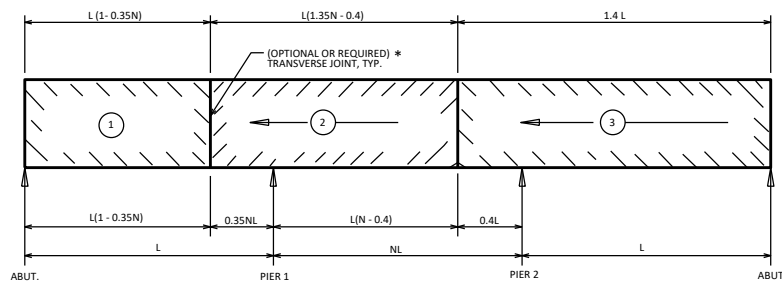
BUREAU OF STRUCTURES

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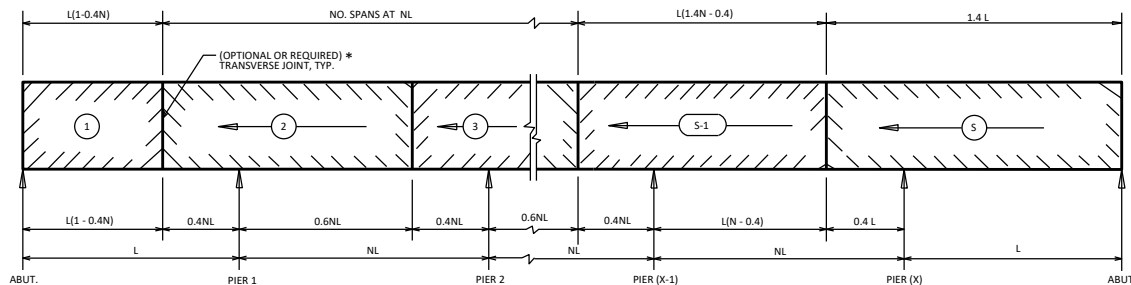
DATE:
7-26



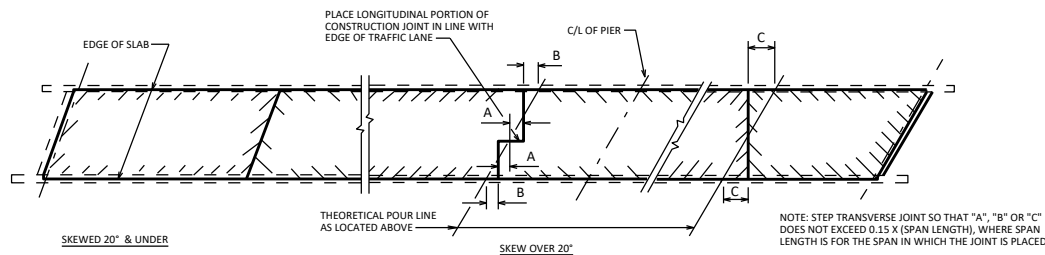
IDEAL DECK POUR SEQUENCE
(CONTINUOUS STEEL GIRDER - 2 SPANS SHOWN)



IDEAL DECK POUR SEQUENCE
(CONTINUOUS STEEL GIRDER - 3 SPANS SHOWN)



IDEAL DECK POUR SEQUENCE
(CONTINUOUS STEEL GIRDER - ANY NUMBER OF SPANS SHOWN)



PLAN VIEW - SHOWING PLACEMENT OF TRANSVERSE CONSTRUCTION JOINTS

NOTES

THE RATE OF PLACING CONCRETE SHALL EQUAL OR EXCEED 1/2 SPAN LENGTH PER HOUR BUT NEED NOT EXCEED 100 CU. YDS. PER HOUR. (REQUIRED ONLY FOR CONTINUOUS STEEL GIRDERS.)

IF OPTIONAL JOINTS ARE PROVIDED, TWO OR MORE SEQUENTIAL POURS MAY BE COMBINED AND PLACED IN ONE CONTINUOUS OPERATION. TWO OR MORE ALTERNATE DECK POURS (E.G. 1 & 3) MAY BE PLACED ON THE SAME DAY.

THE CONTRACTOR SHALL NOT PLACE CONCRETE IN AN ADJACENT POUR UNTIL A MINIMUM OF 72 HOURS HAS PASSED AFTER THE COMPLETION OF THE PRECEDING POUR. (NOTE: SEE DESIGNER NOTES WHEN FOR HPC IS USED)

THE CONTRACTOR MAY SUBMIT AN ALTERNATE POURING SEQUENCE SUBJECT TO THE APPROVAL OF THE STRUCTURES DESIGN SECTION. (NOTE: APPLICABLE WHEN OPTIONAL TRANSVERSE CONSTRUCTION JOINTS ARE SHOWN.)

THE CONTRACTOR SHALL POUR THE ENTIRE DECK PER THE DECK POUR SEQUENCE IF REQUIRED TRANSVERSE CONSTRUCTION JOINTS ARE SHOWN ON THE PLANS. THE CONTRACTOR MAY SUBMIT AN ALTERNATE POURING SEQUENCE SUBJECT TO THE APPROVAL OF THE STRUCTURES DESIGN SECTION. (NOTE: REQUIRED WHEN REQUIRED TRANSVERSE CONSTRUCTION JOINTS ARE SHOWN.)

DESIGNER NOTES

* THE DESIGNER SHALL DETERMINE IF TRANSVERSE JOINTS ARE OPTIONAL OR REQUIRED.

OPTIONAL TRANSVERSE CONSTRUCTION JOINTS SHALL BE DETAILED ON THE PLANS TO LIMIT THE VOLUME OF POUR TO < 600 CU. YDS. IN URBAN AREAS AND < 300 CU. YDS. IN OTHER AREAS. GENERALLY FOR STEEL GIRDER SUPER-STRUCTURES LOCATE THE TRANSVERSE JOINTS AT THE 0.6 POINT (CONCRETE IN 60% OF SPAN) AND FOR PRESTRESS GIRDER SUPERSTRUCTURES LOCATE JOINTS NEAR THE 0.75 POINT. (CONCRETE IN 75% OF SPAN) CONSIDER CUT-OFF POINTS OF CONTINUITY REINFORCING STEEL WHEN LOCATING JOINTS FOR PRESTRESS GIRDER SUPERSTRUCTURES. LOCATION OF JOINTS IN STEEL GIRDER SUPERSTRUCTURES MAY VARY IF DEFLECTIONS ARE INFLUENCED BY IN SPAN HINGES OR UNUSUAL SPAN LENGTH RATIOS. CHECK WITH THE STRUCTURES DEVELOPMENT SECTION FOR ADDITIONAL INFORMATION.

REQUIRED TRANSVERSE CONSTRUCTION JOINTS SHALL BE DETAILED ON THE PLANS ONLY WHEN REQUIRED BY DESIGN. SEQUENTIAL STAGES ARE DISCUSSED IN SECTION 24.12.2. ALL PLACEMENT REQUIREMENTS SHALL BE NOTED ON THE PLANS.

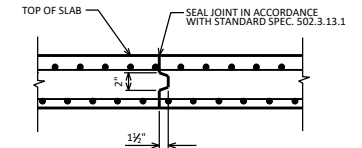
DETAIL TRANSVERSE CONSTRUCTION JOINTS 5'-0" FROM C/L OF IN SPAN HINGES, (ONE ON EACH SIDE OF HINGE) THE CONCRETE BETWEEN THESE JOINTS SHOULD BE THE LAST POUR PLACED.

WHEN THE WIDTH OF THE DECK IS GREATER THAN 120 FEET, A LONGITUDINAL CONSTRUCTION JOINT SHALL BE DETAILED. FOR DECK WIDTHS BETWEEN 90 AND 120 FEET, AND OPTIONAL LONGITUDINAL JOINT SHALL BE DETAILED. LOCATE LONGITUDINAL CONSTRUCTION JOINT ALONG EDGE OF LANE LINE AND AT LEAST 6 INCHES FROM EDGE OF TOP FLANGE OF GIRDER.

FOR GRADES OVER 3% THE PREFERRED DIRECTION OF POUR IS UPHILL.

AN ALTERNATE POURING SEQUENCE IS TO POUR THE DL POSITIVE MOMENT AREAS AND THEN THE DL NEGATIVE MOMENT AREAS. THE SEQUENCE MAY BE STARTED ANYWHERE ON THE BRIDGE.

THE DEPARTMENT MAY CONSIDER THE FOLLOWING ALLOWANCE FOR HPC DECK POURS: THE CONTRACTOR SHALL NOT PLACE CONCRETE IN AN ADJACENT POUR UNTIL A MINIMUM OF 48 HOURS HAS PASSED AFTER THE COMPLETION OF THE PRECEDING POUR AND ACHIEVED A MINIMUM STRENGTH OF 75% OF THE 28-DAY STRENGTH.



SECTION THRU TRANSVERSE JOINT

SLAB POURING SEQUENCE



**BUREAU OF
STRUCTURES**

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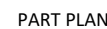
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I IF TEMPERATURE TABLE IS SHOWN, PLACE FOLLOWING NOTE ADJACENT TO TABLE: "A SMALL JOINT OPENING DUE TO A HIGH TEMPERATURE AT TIME OF CONSTRUCTION MAY REQUIRE NEOPRENE STRIP SEAL INSTALLATION INTO STEEL EXTRUSIONS PRIOR TO SETTING THE EXPANSION JOINT."

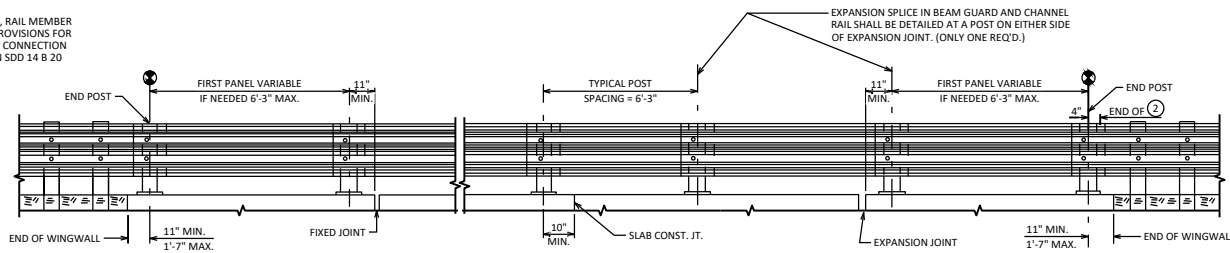
REFER TO STANDARD 28.02 & 28.07

- ① NEOPRENE STRIP SEAL (1-INCH) AND STEEL EXTRUSIONS. SET JOINT OPENING AT 1½" WHEN EXPANSION LENGTH ≤ 230'-0". WHEN EXPANSION LENGTH > 230'-0", PREPARE A TEMPERATURE TABLE SHOWING JOINT OPENINGS FROM 5" 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 ¾" DIA. X 6⅝" LONG AT 6" ALTERNATE CENTERS. WELD TO EXTRUSIONS AND BEND AS SHOWN AFTER WELDING.
- ②A ¾" THICK ANCHOR PLATE WITH ¾" DIA. ROD (OR ALTERNATE STRIP SEAL ANCHOR). WELD ROD TO ANCHOR PLATE, WELD ANCHOR PLATE TO NO. 1 AT 1'-0" CENTERS BETWEEN GIRDERS.
- ③ ¾" DIA. THREADED ROD WITH 2 NUTS AND PLATE WASHERS, FOR PRESTRESSED GIRDERS, GROUT THREADED ROD INTO FIELD DRILLED HOLES ON C/L OF GIRDER. FOR STEEL GIRDERS, WELD THREADED ROD TO TOP FLANGE OR ATTACH BY BOLTING THRU FLANGE. ON ABUTMENT SIDE, GROUT THREADED ROD INTO FIELD DRILLED HOLES IN ABUTMENT BACKWALL AS SHOWN.
- ④ ¾" DIA. THREADED ROD WITH NUT. TACK WELD NUT TO NO. 5.
- ⑤ FABRICATE SUPPORT FROM 3" X ¾" BAR AS SHOWN OR EQUIVALENT. ONE PER GIRDER PER SIDE. SHOP OR FIELD WELD. IF FIELD WELDED, COVER WELDED AREAS WITH EPOXY-COATING MATERIAL. PROVIDE 1½" DIA. HOLE FOR NO. 3 AND 1" DIA. HOLE FOR NO. 4.
- ⑥ GALVANIZED PLATE ¾" 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 ¾" DIA. X 1½" STAINLESS STEEL SOCKET FLAT HEAD SCREWS WITH ANTI-SEIZE LUBRICANT. PLACE IN COUNTERSUNK HOLE. RECESS ⅝" BELOW PLATE SURFACE.
- ⑧ ¾" DIA. X 4" GALVANIZED HEX HEAD BOLT, BEND 45°.
- ⑨ ¾" DIA. X 2½" GALVANIZED THREADED COUPLING.
- ⑩ SIDEWALK COVER PLATE ¾" 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 APPLIED.
- ⑪ 1" X 5" SLOTTED COUNTERSUNK HOLE FOR NO. 7. PLACE SLOT PARALLEL TO DIRECTION OF MOVEMENT.

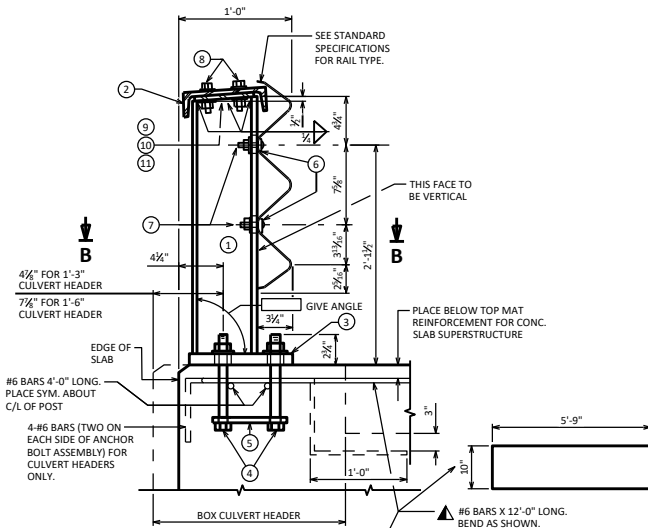
ALL MATERIAL IN THE EXPANSION JOINT ASSEMBLY, INCLUDING ANCHOR STUDS AND HARDWARE SHALL BE PAID AT THE UNIT PRICE BID FOR "EXPANSION DEVICE", LF.



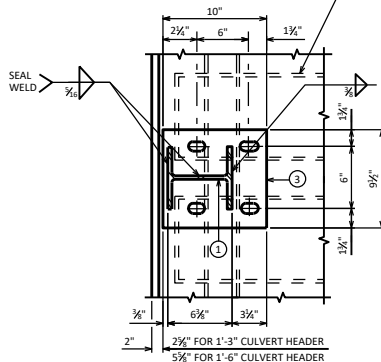
AT END POSTS, RAIL MEMBER SHALL HAVE PROVISIONS FOR A THRIE BEAM CONNECTION AS SHOWN ON SDD 14 B 20 STANDARDS.



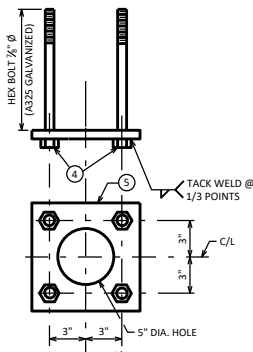
ELEVATION OF RAILING



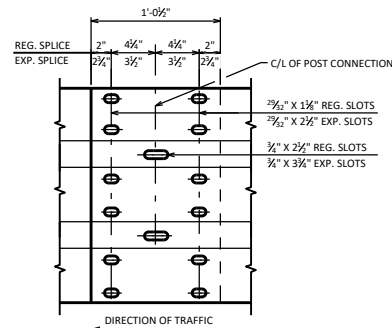
SECTION THRU RAILING



SECTION B-B

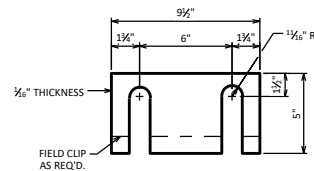


ANCHORAGE DETAIL



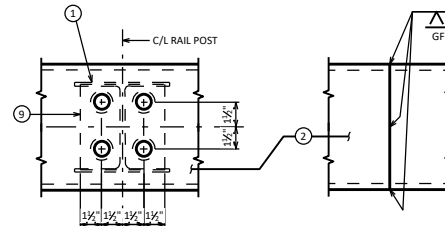
RAIL MEMBER SPlice

1/2" DIA. BUTTON HEAD OVAL SHOULDER BOLTS WITH HEX NUTS AT ALL SLOTS.



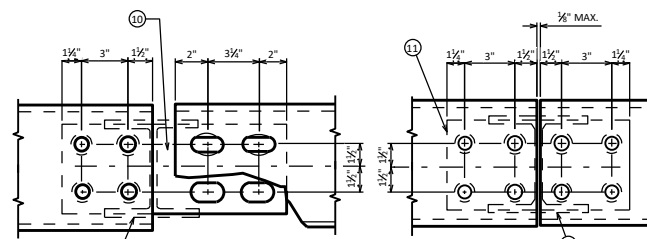
POST SHIM DETAIL

4 PER POST



BASIC POST CONNECTION

OPTIONAL SHOP SPlice



EXPANSION SPlice

TYPICAL SPlice

CHANNEL MEMBER DETAILS

SHIM PLATES 6" X 1/2" X 6" MAY BE USED BETWEEN TOP OF POST AND CHANNEL MEMBER TO ACHIEVE VERT. ALIGNMENT.

LEGEND

- 1 W6x25 WITH 2 - 3/4" X 2 1/2" VERT. SLOTS IN FLG. (SLOT ON OTHER SIDE OF WEB IS OPTIONAL) FOR NO.7 CUT BOTTOM OF POST TO MATCH CROSS SLOPE OF ROADWAY. PLACE POSTS VERTICAL AND NORMAL TO GRADE LINE.
- 2 C8x11.5 WITH 1 1/2" DIA. HOLES FOR NO. 8.
- 3 BASE PLATE 1" X 9 1/2" X 10" WITH 1 1/2" X 1 1/2" SLOTTED HOLES FOR ANCHOR BOLTS NO.4 WELD TO NO.1 AS SHOWN.
- 4 A325 - 3/4" HEX BOLTS (GALVANIZED) WITH A325 NUT AND WASHER. 14" LONG AT END POSTS AND AT POSTS ON CONCRETE SLAB SUPERSTRUCTURES WHERE THE SLAB THICKNESS IS > 15". USE 8" LONG AT ALL OTHER LOCATIONS. 4 REQ'D. PER POST. THREAD 3" AND PLACE NORMAL TO PLATE NO.3 CHAMFER TOP OF BOLTS BEFORE THREADING.
- 5 1/2" X 8" X 8" FLAT BAR WITH 1 1/2" DIA. HOLES FOR ANCHOR BOLTS NO.4.
- 6 1 1/2" X 3" MOUNTING BOLT WASHER (GALVANIZED).
- 7 3/4" DIA. BUTTON HEAD POST MOUNTING BOLT WITH ROUND WASHER AND NUT.
- 8 3/4" DIA. X 2" HEX BOLTS WITH NUT AND ONE WASHER ON CHANNEL AND 1 1/2" X 1 1/2" X 1/2" PLATE WASHER ON EACH.
- 9 PLATE 1/2" X 5 1/2" X 6" AT BASIC POST CONNECTION. 1 1/2" DIA. HOLES IN PLATE. 1 1/2" DIA. HOLES IN CHANNEL.
- 10 PLATE 1/2" X 5 1/2" X 1 1/2". 1 1/2" DIA. HOLES IN PLATE. 1 1/2" DIA. HOLES IN CHANNEL EXPANSION SLOTS ON JOINT SIDE OF POST. 1 1/2" X 2 1/2" IN PLATE. 1 1/2" X 2 1/2" IN CHANNEL. (AT EXPANSION SPlice.)
- 11 PLATE 1/2" X 5 1/2" X 1 1/2". 1 1/2" DIA. HOLES IN PLATE. 1 1/2" DIA. HOLES IN CHANNEL. (AT TYPICAL SPlice.)

NOTES

BID ITEM SHALL BE "RAILING STEEL TYPE 'W' WHICH INCLUDES ALL ITEMS SHOWN.

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

ALL MATERIAL EXCEPT ANCHORAGE DETAIL NO. 5 SHALL BE GALVANIZED AFTER FABRICATION.

PRIOR TO GALVANIZING, ALL STEEL RAILING POSTS AND CHANNELS SHALL BE GIVEN A NO. 6 COMMERCIAL BLAST CLEANING BY SSPC SPECS.

ALL MATERIAL USED IN FABRICATION SHALL BE MADE FROM MATERIALS CONFORMING TO ASTM DESIGNATION A709 GRADE 36 UNLESS NOTED OTHERWISE.

FILL BOLT SLOT OPENINGS IN POST SHIMS & PLATE NO. 3 WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

SEE STANDARD SPECIFICATIONS FOR RAIL TYPE.

CHANNEL MEMBER SHALL BE ATTACHED CONTINUOUSLY TO A MINIMUM OF FOUR POSTS AND A MAXIMUM OF EIGHT (EXCEPT AT ABUTMENTS).

AT EXPANSION SLOTS IN RAIL AND CHANNEL MEMBERS, TIGHTEN BOLTS, BACK OFF ONE HALF TURN AND BURR THREADS. RAIL MEMBERS SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC AND THE UPPER RAIL SHALL LAP THE LOWER RAIL.

STEEL POST SHIMS MAY BE USED UNDER POSTS WHERE REQ'D. FOR ALIGNMENT.

SEE BRIDGE MANUAL 30.2 FOR ALLOWED USE.

▲ TIE TO TOP MAT OF STEEL PUT THESE BARS IN BILL OF BARS FOR SUPERSTRUCTURE. NOT REQ'D. FOR BOX CULVERT HEADERS.

● PAY LIMITS FOR TYPE "W" STEEL RAILING.

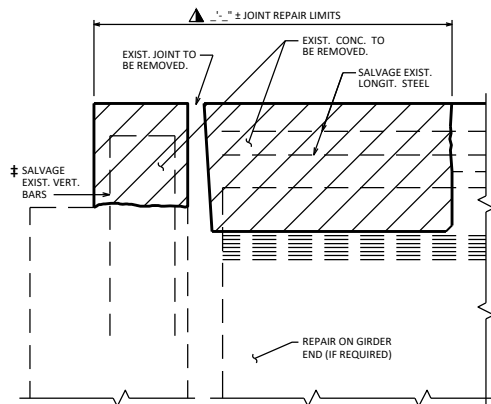
WEIGHT = 45 LB/FT

STEEL RAILING TYPE 'W'

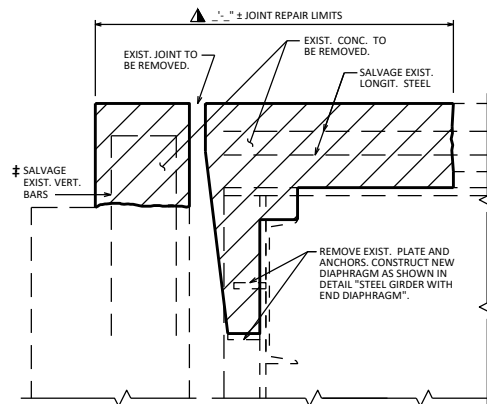


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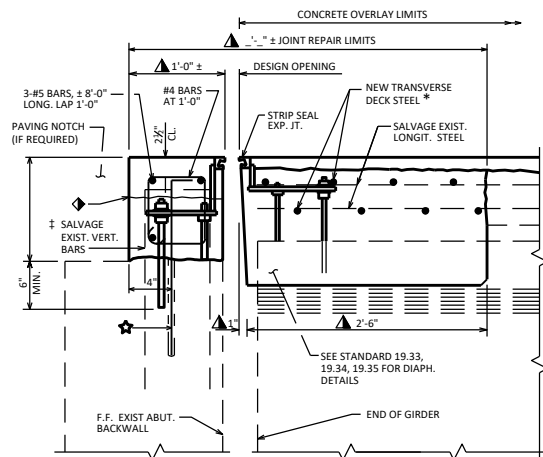
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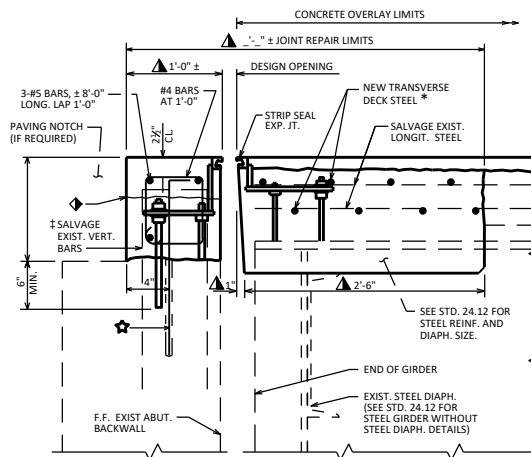
**JOINT REPAIR-REMOVAL
PRESTRESSED GIRDER**



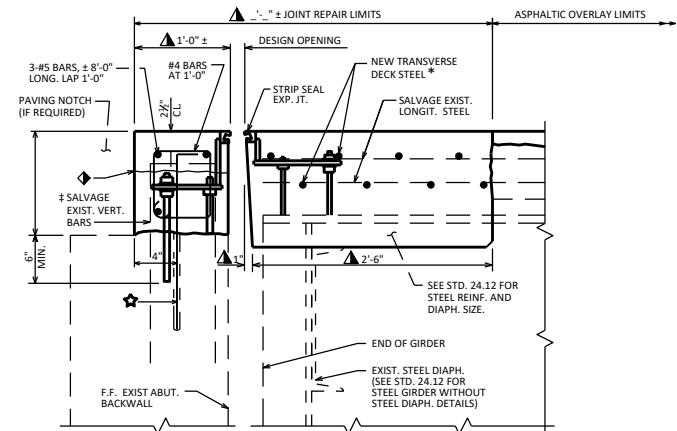
**JOINT REPAIR-REMOVAL
STEEL GIRDER**



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



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



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

LEGEND

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

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

◆ OPT. CONST. IT. 1" MIN. BELOW EXIST. REINF.

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

DESIGNER NOTES

SEE STANDARD 28.01 FOR SUPPORTS USED FOR 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. NEW TRANSVERSE BARS ARE PLACED ALONG THE SKEW.

BARS IN JOINT REPAIR SHALL MATCH EXISTING REINFORCEMENT TYPE (COATED OR UNCOATED).

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

■ FOR STEEL GIRDERS, USE BID ITEM "PREPARATION AND COATING OF TOP FLANGES (STRUCTURE)" FOR JOINT REPAIRS OR DECK REPLACEMENTS.

TOTAL ESTIMATED QUANTITIES

BID ITEM NUMBER	BID ITEMS	UNIT	TOTAL
502.3101	EXPANSION DEVICE	LF	
502.4205	ADHESIVE ANCHORS NO. 5 BAR	EACH	
509.1000	JOINT REPAIR	SY	
509.2100.5	CONCRETE MASONRY DECK REPAIR	CY	
POSSIBLE ADDITIONAL BID ITEMS			
505.0400	BAR STEEL REINFORCEMENT HS STRUCTURES	LB	
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	
509.2500	CONCRETE MASONRY OVERLAY DECKS	CY	
517.0901.5	PREPARATION AND COATING OF TOP FLANGES (STRUCTURE)	EACH	

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

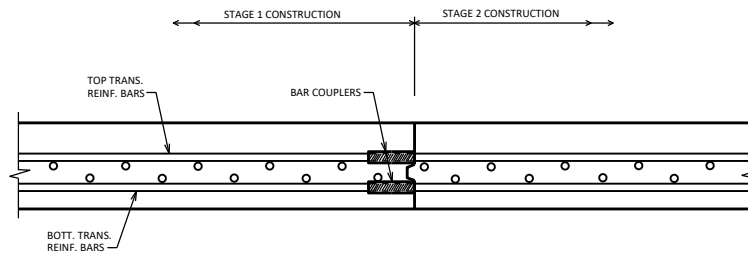
STRIP SEALS & DIAPH. DETAILS FOR OVERLAYS



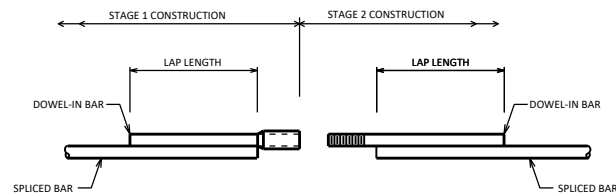
**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

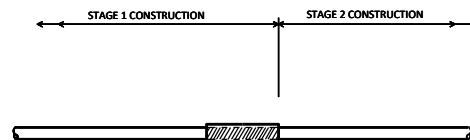
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SECTION THRU DECK
ONE-PIECE THREADED COUPLER SHOWN



DOWEL BAR COUPLER
STAGE 2 DOWEL SCREWS INTO
COUPLER PLACED IN STAGE 1



ONE-PIECE THREADED COUPLER

BAR COUPLER ALTERNATIVES

NOTES

FOR DOWEL BAR COUPLERS, ALL DOWEL BARS SHALL BE LAPPED AND TIED TO THE REINFORCEMENT BARS.

DESIGNER NOTES

ON THE PLANS PROVIDE LOCATION, STAGING, SIZE AND QUANTITY REQ'D. DO NOT GIVE SPECIFIC INFORMATION REGARDING THE COUPLER AS THIS IS COVERED BY THE BID ITEM "BAR COUPLERS (SIZE)".

ON THE PLANS SHOW DETAILS SIMILAR TO "SECTION THRU DECK" AND "BAR COUPLER ALTERNATIVES".

AT THE PLAN BILL OF BARS, INDICATE WHICH BARS REQUIRE BAR COUPLERS BY USE OF A SYMBOL. USING THE SAME SYMBOL, ADD A NOTE STATING THAT A BAR COUPLER IS REQUIRED. BAR LENGTHS ARE COMPUTED TO THE C/L OF THE CONSTRUCTION JOINT AND SHALL BE MODIFIED BY THE BAR COUPLER MANUFACTURERS RECOMMENDATIONS. DOWEL BARS ARE NOT TO BE DETAILED, AS THOSE BARS ARE INCLUDED IN THE BAR COUPLER BID ITEM SHOULD THE DOWEL OPTION BE CHOSEN.

BAR SPLICER (COUPLER) DETAILS AT STAGE CONSTRUCTION



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★ **FOR CULVERT WINGS:**

WITH WING WALL THICKNESS $\geq 8"$ USE:
ADHESIVE ANCHORS $\frac{5}{8}"$ - INCH.
EMBED 5" IN CONCRETE.
SEE DETAIL "A".

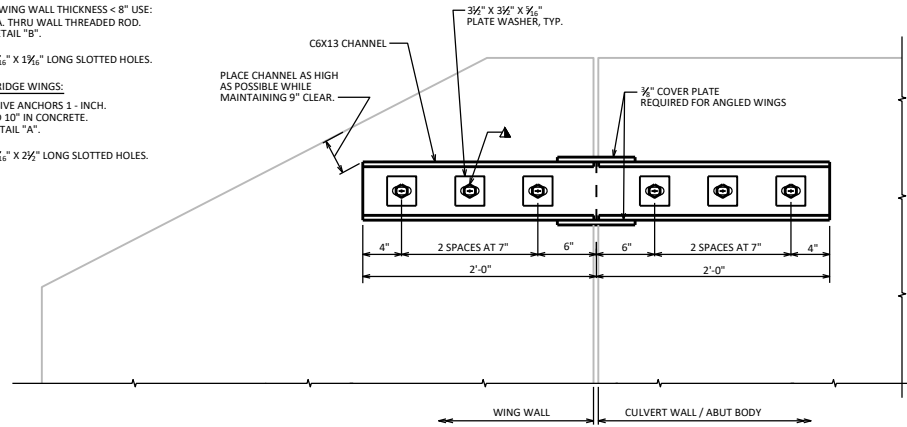
WITH WING WALL THICKNESS $< 8"$ USE:
 $\frac{3}{4}"$ DIA. THRU WALL THREADED ROD.
SEE DETAIL "B".

USE $1\frac{1}{8}" \times 1\frac{1}{8}"$ LONG SLOTTED HOLES.

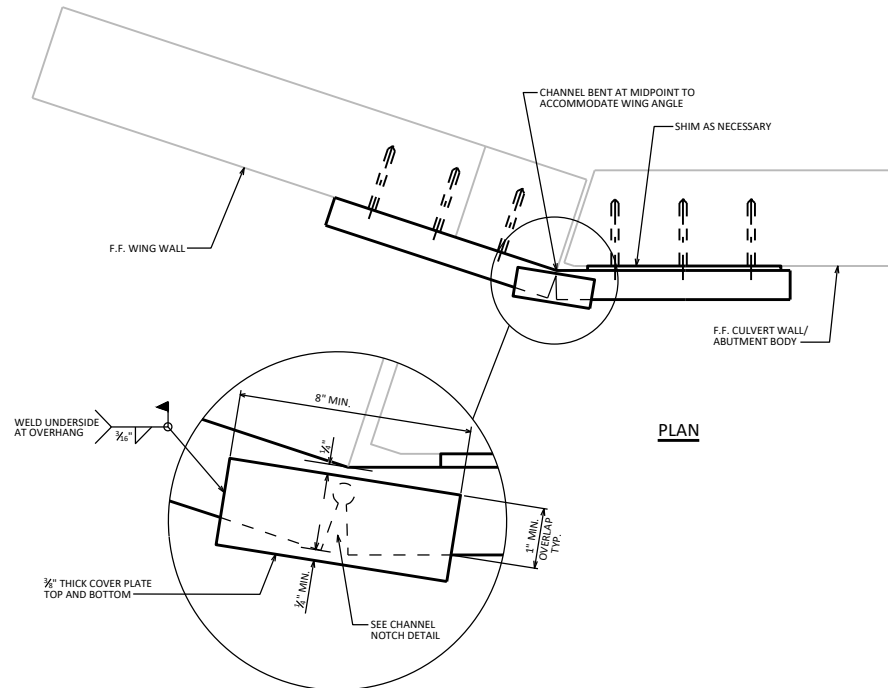
FOR BRIDGE WINGS:

ADHESIVE ANCHORS 1 - INCH.
EMBED 10" IN CONCRETE.
SEE DETAIL "A".

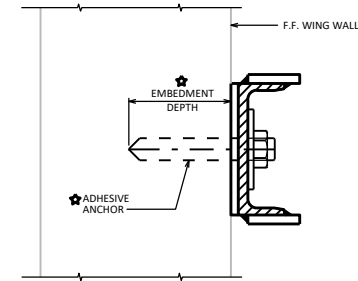
USE $1\frac{1}{8}" \times 2\frac{1}{2}"$ LONG SLOTTED HOLES.



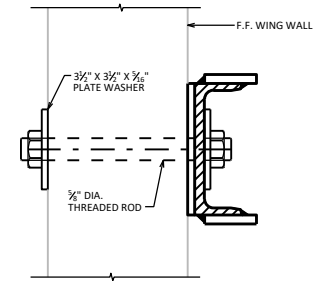
WING ELEVATION



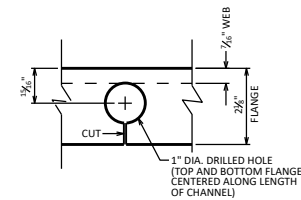
PLAN



DETAIL "A"
SECTION THRU CHANNEL



DETAIL "B"
SECTION THRU CHANNEL



CHANNEL NOTCH DETAIL
FOR USE WITH ANGLED WINGS ONLY

DESIGNER NOTES

WING STRAPPING DETAIL FOR THE PURPOSE OF MITIGATING INWARD WING TIPPING, AS AN ALTERNATIVE TO THE PREFERRED METHOD OF WING REPLACEMENT.

WISDOT REGIONAL BRIDGE MAINTENANCE ENGINEER TO APPROVE USE OF DETAIL PRIOR TO INSTALLATION.

NOTES

BID ITEM SHALL BE "STRAPPING B-XX-XXX" WHICH INCLUDES ALL ITEMS SHOWN.

ALL PROVIDED STEEL MATERIAL SHALL CONFORM TO ASTM A36.

ALL STRUCTURAL STEEL SHOWN SHALL BE GALVANIZED. THREADED RODS, MASONRY ANCHORS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 CLASS C.

CUTTING AND DRILLING OF CHANNEL SHALL BE DONE IN FABRICATION SHOP, PRIOR TO GALVANIZING.

IF WELDING COVER PLATE IN FIELD, PRIOR TO WELDING, REMOVE GALVANIZING FROM AREA TO BE WELDED. TOUCH UP WITH PAINT ALL AREAS LACKING GALVANIZING WHEN COMPLETE.

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

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

WING STRAPPING



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