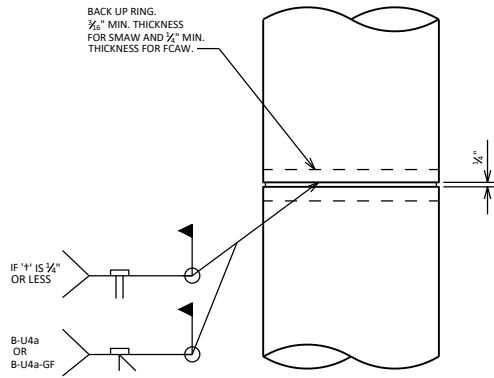
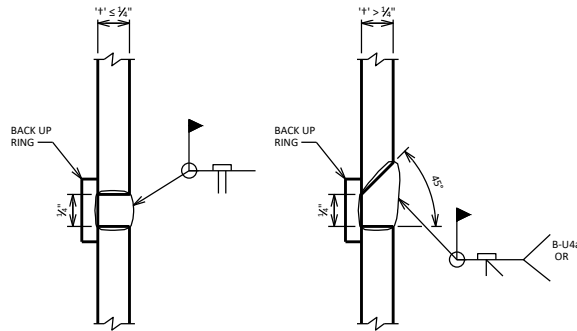


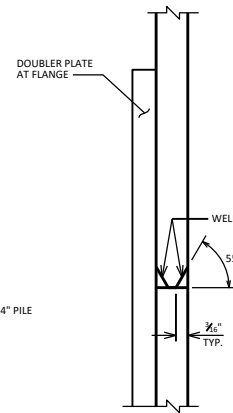
STEEL 'HP' SHAPES



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



CIP PILE WELD DETAIL



HP WELD DETAIL
FLANGE SHOWN, WEB SIMILAR

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.

DESIGNER NOTES

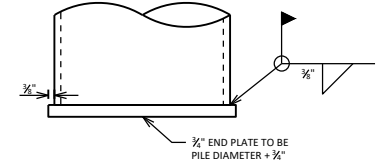
FULL DESIGN LOADING CAN BE USED IF PREBORED HOLE IS LARGE ENOUGH TO AVOID PILE HANGUPS AND ALLOW FILLING WITH SAND.

SEE WISDOT POLICY ITEM IN BRIDGE MANUAL 11.3.1.12.3 FOR GUIDANCE ON "HP" PILES.

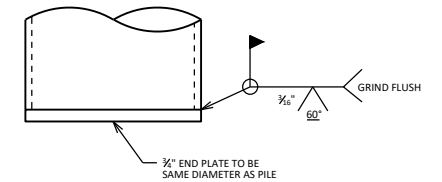
SEE BRIDGE MANUAL SECTION 11.3.1.17.7 FOR PILE RESISTANCE VALUES.

IF LESS THAN THE MAXIMUM AXIAL RESISTANCE IS REQUIRED BY DESIGN, STATE ONLY THE REQUIRED CORRESPONDING DRIVING RESISTANCE ON THE PLANS. CONSULT WITH THE GEOTECHNICAL ENGINEER REGARDING POSSIBLE ESTIMATED PILE LENGTH ADJUSTMENT.

WHEN RECOMMENDED IN THE SOILS REPORT, USE BID ITEM "PILE POINTS" AND PROVIDE THE APPROPRIATE PILE POINT DETAIL.

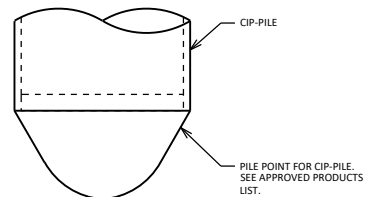


END PLATE DETAIL FOR CIP PILING



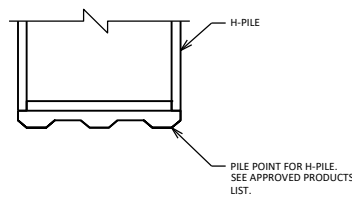
**END PLATE DETAIL FOR CIP PILING
IN ARTESIAN CONDITIONS**

DESIGNER NOTE: ONLY USE FOR ARTESIAN CONDITIONS



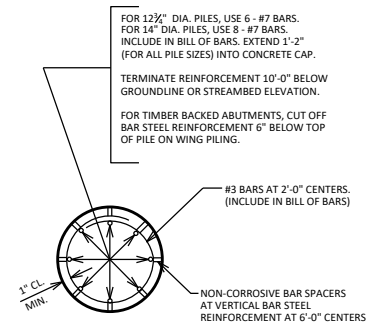
PILE POINT FOR CIP PILING

PILE POINT SHALL BE INSTALLED ACCORDING TO THE PILE POINT MANUFACTURE'S INSTRUCTIONS. ENSURE PILE POINT WELDS ARE WATERTIGHT.



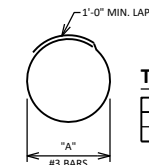
PILE POINT FOR H-PILING

PILE POINT SHALL BE INSTALLED ACCORDING TO THE PILE POINT MANUFACTURE'S INSTRUCTIONS.



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 1/2"	3'-7"
14"	11"	3'-11"

(#3 BAR WT. = 0.38 LB/FT)

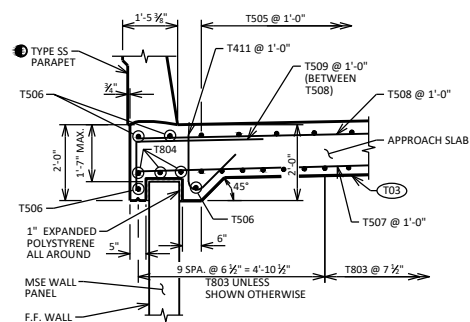
PILE DETAILS



**BUREAU OF
STRUCTURES**

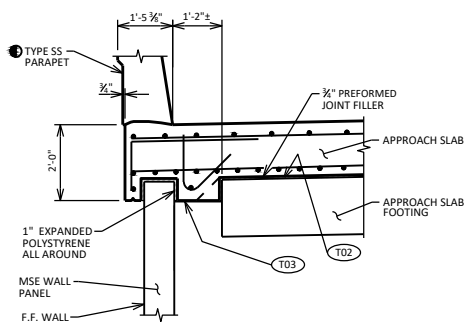
APPROVED: *Laura Shadewald*

DATE:
7-25



SECTION A-A

(AT MSE WINGWALLS)

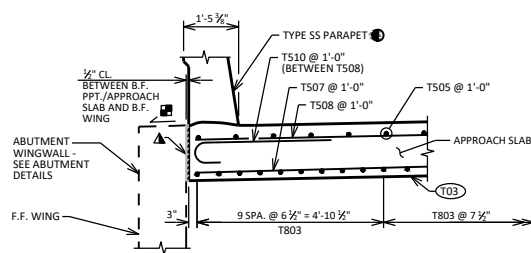


SECTION B-B

(AT MSE WINGWALLS)

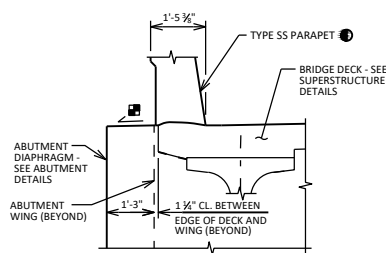
LEGEND

- T02** STEEL TROWEL TOP SURFACE OF FOOTING AND PLACE MULTIPLE LAYERS (0.03" 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.
- ▲** 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).
- ①** SEE PARAPET STANDARDS FOR REINFORCEMENT, LOCATION OF NAME PLATE AND BENCH MARK WITH RESPECT TO THE END OF PARAPET, ETC.
- ☒** CONST. JOINT-STRIKE OFF AS SHOWN AND LEAVE ROUGH. FOR DECK POUR MATCH BRIDGE X-SLOPE.
- ▣** SLOPE TO DRAIN
- *** SECTION REPRESENTATIVE OF SIMILAR LOCATION AS SHOWN ON STANDARD 12.10 FOR DIFFERENT APPLICATION.



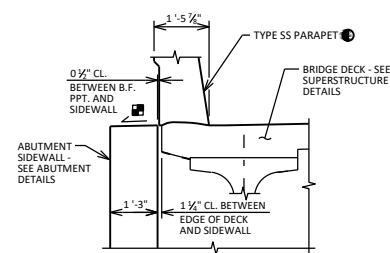
SECTION C-C

(AT WINGWALLS PARALLEL TO BRIDGE)



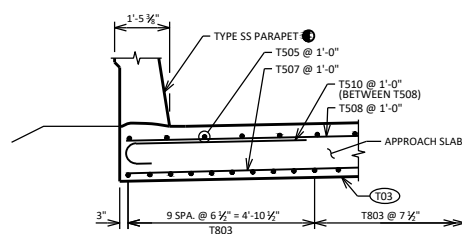
SECTION D-D

(AT WINGWALLS PARALLEL TO BRIDGE - A1 ABUT.)



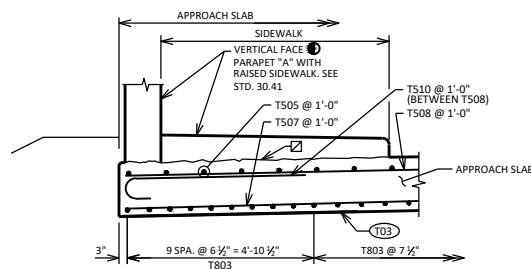
SECTION D-D *

(AT WINGWALLS PARALLEL TO BRIDGE - A3 ABUT.)



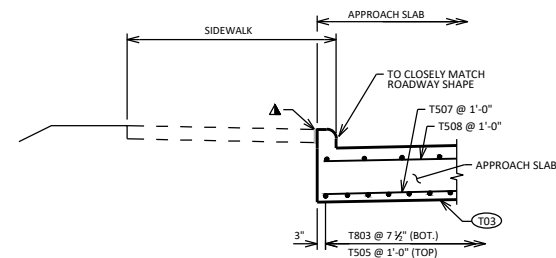
SECTION C-C *

(AT WINGWALLS PARALLEL TO ABUT.)



SECTION C-C *

(AT WINGWALLS PARALLEL TO ABUT.)



SECTION C-C *

(AT WINGWALLS PARALLEL TO ABUT.)

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

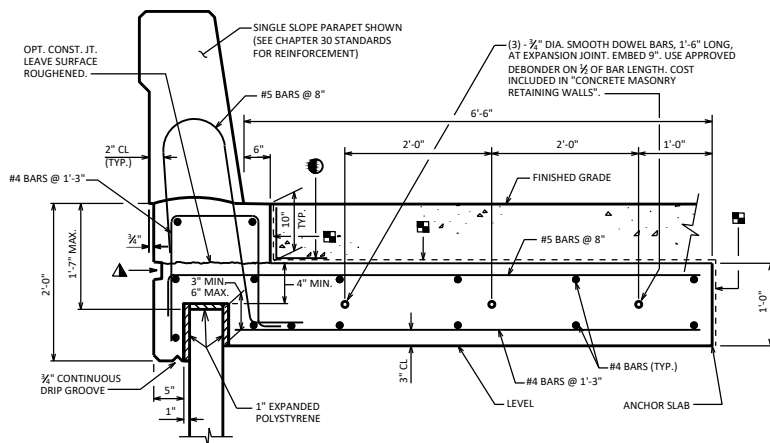
STRUCTURAL APPROACH SLAB DETAILS 1



**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

DATE:
7-25



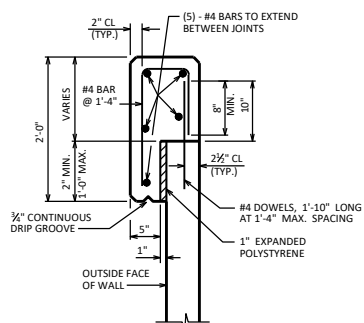
CAST-IN-PLACE CONCRETE TRAFFIC BARRIER DETAIL FOR PRECAST WALL PANELS

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 1/2" "V" GROOVE.

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

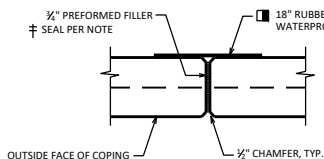
ALL BAR STEEL SHALL BE EPOXY COATED.

CONCRETE QUANTITY BASED ON 3" PANEL EMBEDMENT.



CAST-IN-PLACE CONCRETE COPING DETAIL

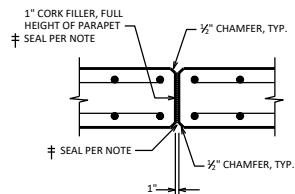
DESIGNER NOTE: CONCRETE COPING DESIGNED FOR STANDARD PEDESTRIAN RAILING WITH 10 FT MAXIMUM POST SPACING PER LRFD 13.8.2.



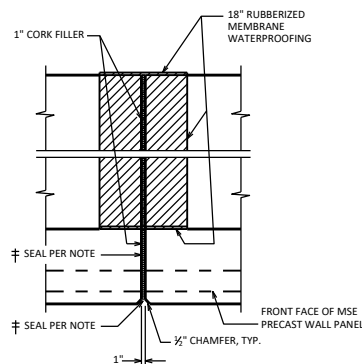
COPING EXPANSION JOINT

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

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



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.

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

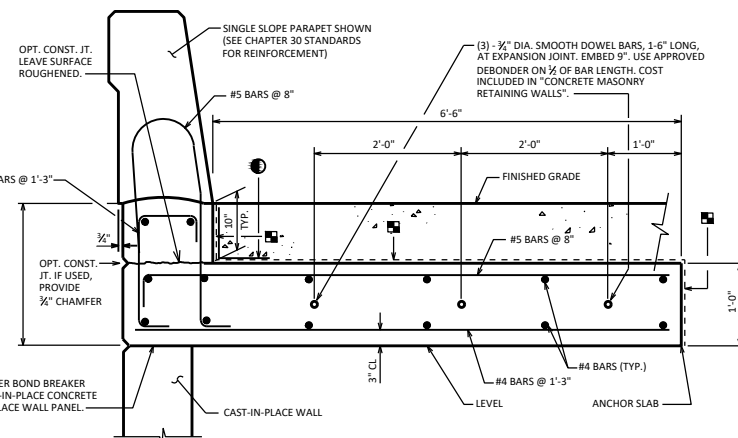
IF THE OPT. CONST. JOINT IS USED, PLACE 18" MEMBRANE WATERPROOFING ALONG THE ENTIRE LONGITUDINAL JOINT. THE MEMBRANE WATERPROOFING SEALING THE OPTIONAL CONST. JOINT IS INCIDENTAL TO THE CONCRETE MASONRY BID ITEM.



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

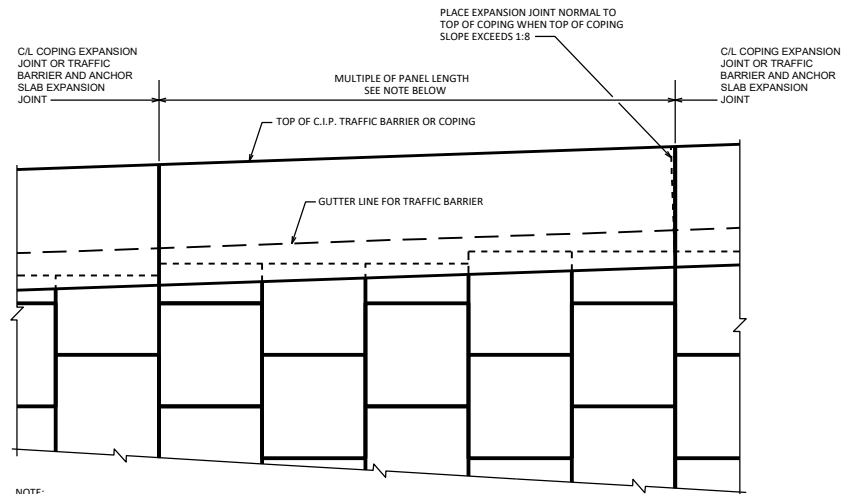


CAST-IN-PLACE CONCRETE TRAFFIC BARRIER DETAIL FOR CAST-IN-PLACE WALL PANELS

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 1/2" "V" GROOVE.

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

ALL BAR STEEL SHALL BE EPOXY COATED.



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

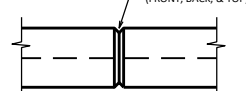
C.I.P. TRAFFIC BARRIER OR COPING PARTIAL ELEVATION

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.



COPING CONTRACTION JOINT

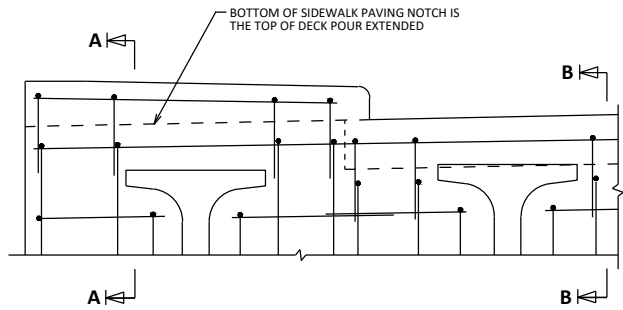
DO NOT RUN BAR STEEL THRU JOINT. MAX. SPACING OF JOINT = 12'

MSE RETAINING WALL DETAILS



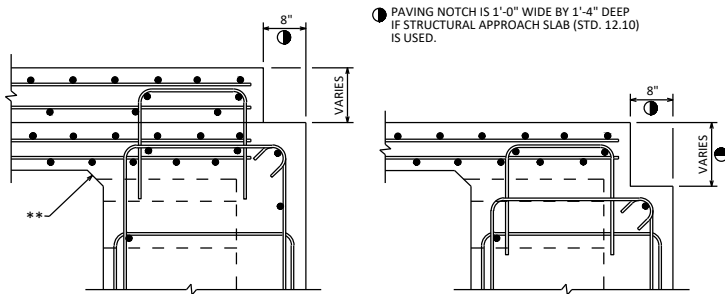
APPROVED: *Laura Shadewald*

DATE: 7-25



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

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

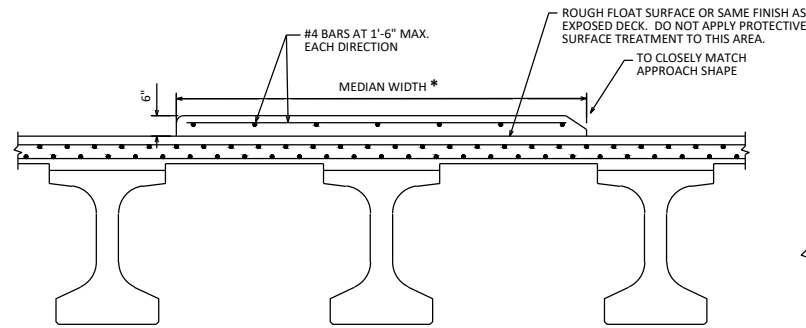


SECTION A-A

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

SECTION B-B

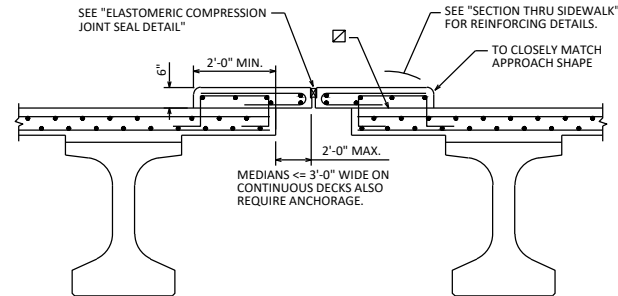
- SEE STANDARDS 19.33, 19.34, 19.35 FOR REINFORCEMENT DETAILS
- DETAILS SHOWN ARE FOR GIRDER STRUCTURES. SIMILAR REINFORCEMENT FOR SLAB STRUCTURES SHALL BE USED WITH A REMINDER THAT THE TRANSVERSE AND LONGITUDINAL REINFORCEMENT LAYERS ARE REVERSED.



CROSS SECTION THRU UNANCHORED MEDIAN

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

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



CROSS SECTION THRU MEDIAN WITH A JOINT

NOTES

WHEN PARAPETS ARE POURED CONTINUOUSLY FROM END TO END, THEY SHALL BE SEPARATED AT THE DEFLECTION JOINTS BY A PIECE OF 1/2" ZINC OR PLASTIC PLATE CUT AS SHOWN IN THE "DEFLECTION JOINT DETAIL". IF CONSTRUCTION JOINTS IN PARAPETS ARE USED AT THE DEFLECTION JOINTS, ONE SIDE OF JOINT SHALL BE COATED WITH AN APPROVED LIQUID BOND BREAKER AND PLATE SEPARATORS MAY BE OMITTED.

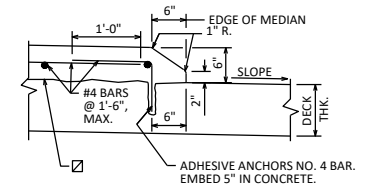
- ☑ CONST. JOINT-STRIKE OFF AS SHOWN AND LEAVE ROUGH. FOR DECK POUR, MATCH BRIDGE X-SLOPE.
- ⊕ 8" MIN. SIDEWALK THICKNESS ALSO REQ'D AT EDGE OF DECK/SLAB.
- ⚠ ± 0.5% CONSTRUCTION TOLERANCE IN SIDEWALK CROSS SLOPE. THE SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

DESIGNER NOTES

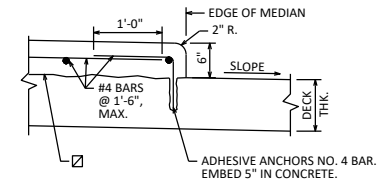
FOR EXTREME SIDEWALK WIDTHS AND/OR SUPERELEVATIONS THE DECK MAY BE LEVEL BENEATH THE SIDEWALK (MAINTAIN CONSTANT DECK THICKNESS) TO REDUCE EXCESSIVE SIDEWALK THICKNESS.

FOR DEAD LOAD PURPOSES, THE SUPERSTRUCTURE DESIGN SHALL ACCOUNT FOR A MAXIMUM 2% SIDEWALK CROSS SLOPE.

SEE STD. 30.41 FOR ALTERNATIVE RAISED SIDEWALK DETAILS.

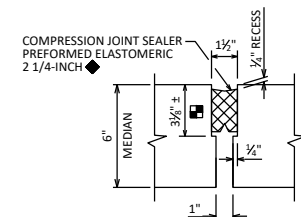


ANCHORED MEDIAN CURB DETAIL



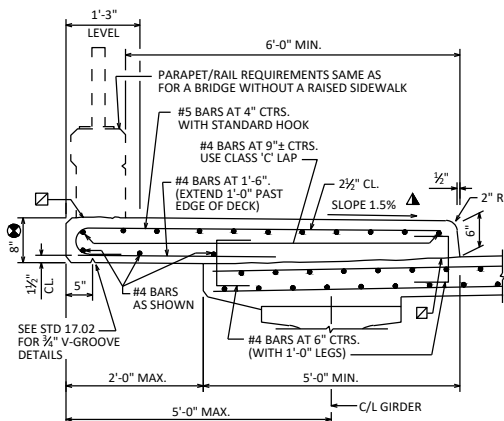
ANCHORED MEDIAN CURB DETAIL

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

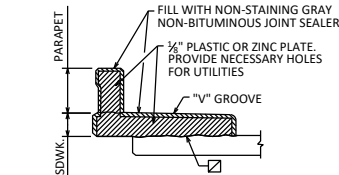


ELASTOMERIC COMPRESSION SEAL DETAIL

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



SECTION THRU SIDEWALK



DEFLECTION JOINT DETAIL

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

1. GIRDER STRUCTURES AND SLAB STRUCTURES WITH A RAISED SIDEWALK SHOULD HAVE A DEFLECTION JOINT IN THE SIDEWALK AND PARAPET OVER THE PIER. FOR SKEWS GREATER THAN 20°, DETAIL THE JOINT NORMAL TO THE SIDEWALK AND PARAPET WITH THE JOINT APPROX. CENTERED OVER C/L PIER.

IF THERE IS A LIGHT STANDARD AT THE PIER, PLACE A DEFLECTION JOINT APPROX. 4'-0" EACH SIDE OF PIER, WITH NONE DIRECTLY OVER THE PIER.

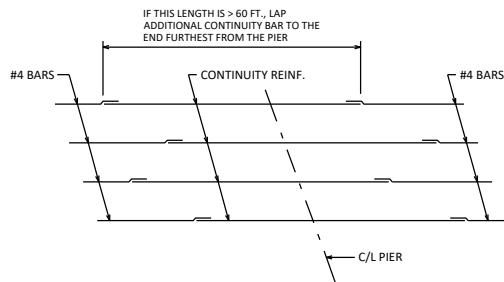
2. GIRDER STRUCTURES AND SLAB STRUCTURES WITHOUT SIDEWALKS SHOULD HAVE NO DEFLECTION JOINTS IN THE PARAPETS.

MEDIAN AND RAISED SIDEWALK DETAILS

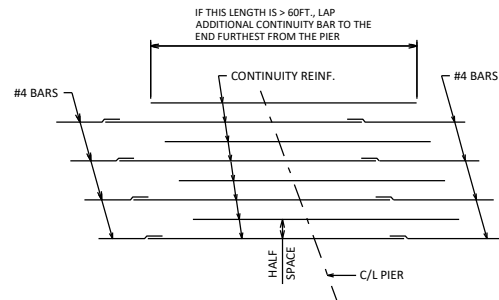


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DATE:
7-25



**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)

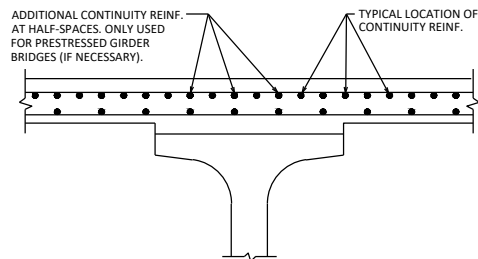
LONGITUDINAL CONSTRUCTION JOINT DETAIL

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

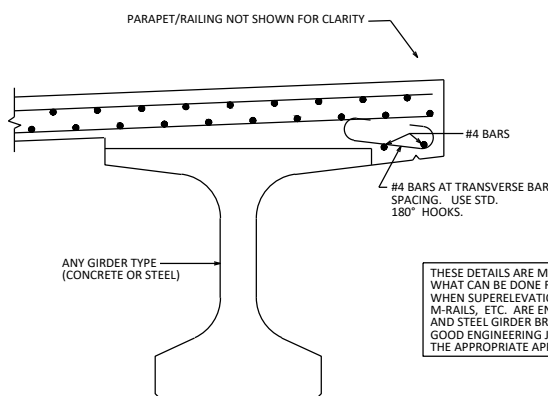
DESIGNER NOTES

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.

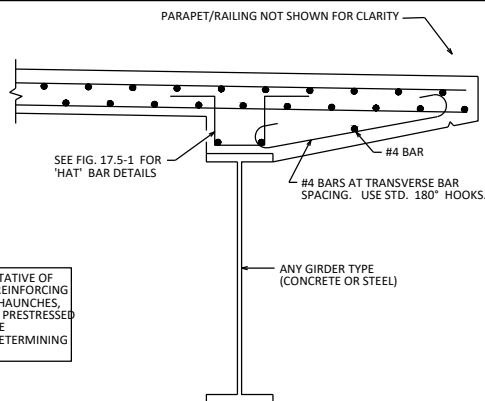
JOINTS SHOULD BE PLACED AT LEAST 6 INCHES FROM THE EDGE OF THE TOP FLANGE OF THE GIRDER AND PREFERABLY LOCATED BENEATH THE MEDIAN OR PARAPET. AVOID PLACING NEAR WHEEL PATHS (PLACE AT LANE LINES OR IN THE MIDDLE OF THE LANE).



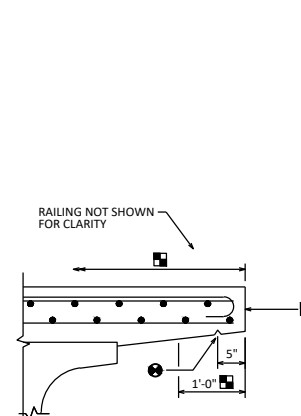
CROSS SECTION THRU DECK
(SHOWING TOP LONGIT. REINF. LOCATION RELATIVE TO BOTTOM LONGIT. REINF.)



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

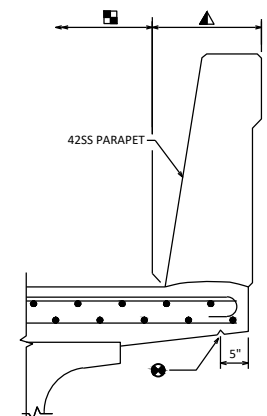


CROSS SECTION THRU EDGE OF DECK
(SHOWING ADDITIONAL OVERHANG REINFORCEMENT)



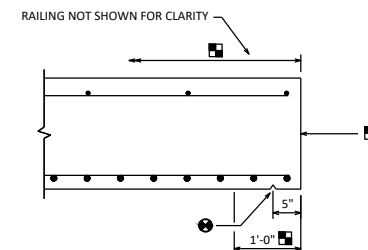
**CROSS SECTION THRU
EDGE OF DECK**

(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

- $\frac{3}{4}$ " 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

- $\frac{3}{4}$ " V-GROOVE REQ'D. EXTEND TO 2'-0" FROM F.F. OF ABUT. BODY (FOR ABUTMENTS WITH EXPANSION JOINTS)

$\frac{3}{4}$ " 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).

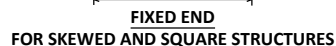
DECK AND SLAB DETAILS



**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

DATE:
7-25



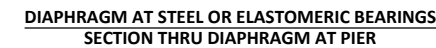
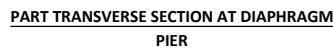
DIAPHRAGM LENGTH (ALONG SKEW) BETWEEN GIRDERS (C/L TO C/L OF GIRDERS)	NO. OF BARS AND BAR SIZE	
	28"	36"
≤ 8'-4"	6 - #6	6 - #6
> 8'-4" ≤ 11'-4"	6 - #8	6 - #7
> 11'-4" ≤ 14'-9"		6 - #8

LAP LENGTHS FOR ALL BARS SHALL BE BASED ON A "CLASS C" TENSION LAP SPLICE, EXCEPT HORIZONTAL DIAPHRAGM BARS, IF SPLICED, CAN UTILIZE A "CLASS A" TENSION LAP SPLICE.

- ☑ DIMENSION IS TAKEN PARALLEL TO C/L GIRDER.
- * DIMENSION IS TAKEN NORMAL TO C/L SUBSTRUCTURE UNITS.
- ⚠ PAYING 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 SECTION THRU ABUT. OR ABUT. DIAPH.
- † BARS PLACED PARALLEL TO GIRDERS. SPACING PERPENDICULAR TO C/L GIRDERS.



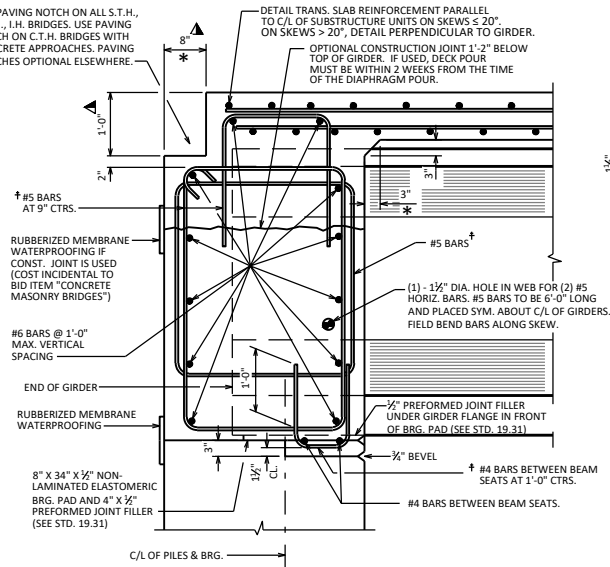
FOR STEEL BEARINGS, FORM DIAPHRAGM APPROXIMATELY $\frac{1}{2}$ " ABOVE BEARING KEEPER BARS



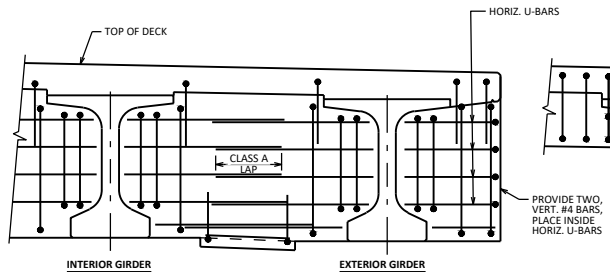
LEGEND

-
- Technical drawing of an angle showing top and side views with dimensions:
- Top View:**
 - Overall width: 1'-7"
 - Distance from left edge to first hole center: 3 1/4"
 - Distance between hole centers: 2 @ 6 1/4"
 - Distance from last hole center to right edge: 3 1/4"
 - Side View:**
 - Overall height: 5"
 - Distance from top edge to hole center: 3 3/4"
 - Overall width: 4"
 - Distance from left edge to hole center: 3 3/4"
 - Distance from hole center to right edge: 6"
- ANGLE**

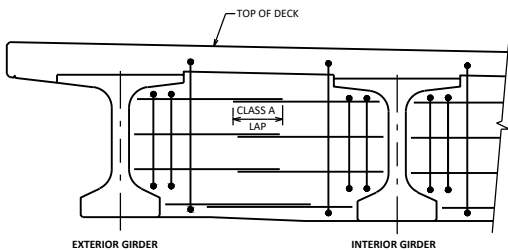
USE PAVING NOTCH ON ALL S.T.H., U.S.H., I.H. BRIDGES. USE PAVING NOTCH ON C.T.H. BRIDGES WITH CONCRETE APPROACHES. PAVING NOTCHES OPTIONAL ELSEWHERE.



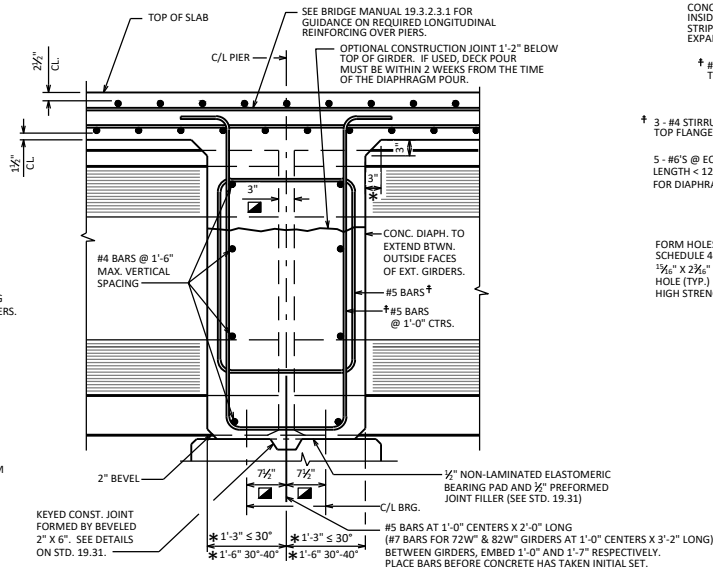
PRESTRESSED GIRDER WITH SEMI-EXPANSION SEAT



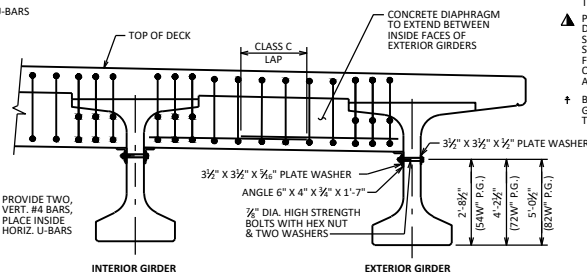
PART TRANSVERSE SECTION AT DIAPHRAGM SEMI EXPANSION END



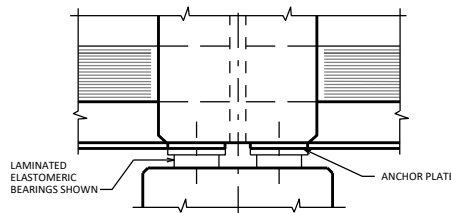
PART TRANSVERSE SECTION AT DIAPHRAGM PIER



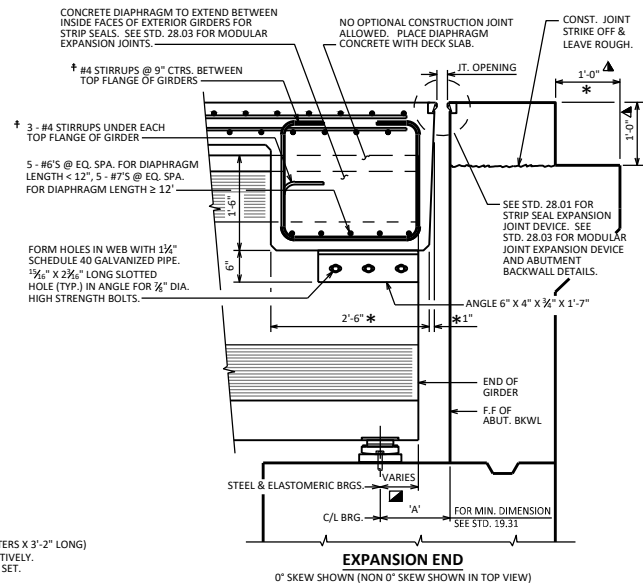
DIAPHRAGM AT 1/2" ELASTOMERIC BEARING



PART TRANSVERSE SECTION AT DIAPHRAGM EXPANSION END



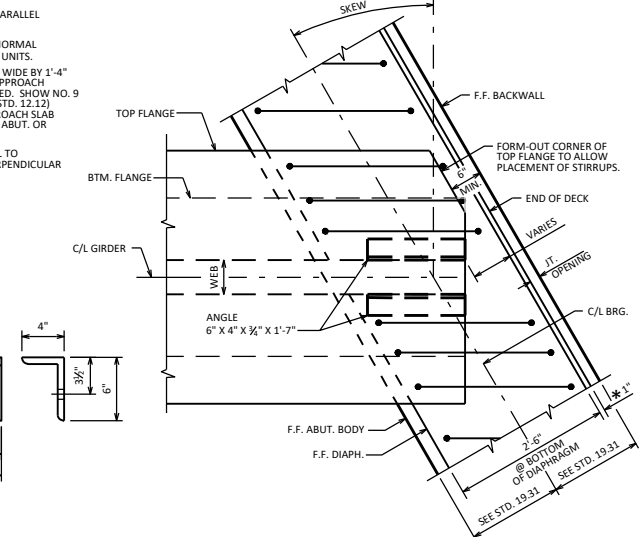
DIAPHRAGM AT STEEL OR ELASTOMERIC BEARINGS SECTION THRU DIAPHRAGM AT PIER
FOR STEEL BEARINGS, FORM DIAPHRAGM APPROXIMATELY 1/2" ABOVE BEARING KEEPER BARS



EXPANSION END
0' SKEW SHOWN (NON 0' SKEW SHOWN IN TOP VIEW)

LEGEND

- DIMENSION IS TAKEN PARALLEL TO C/L GIRDER.
- * DIMENSION IS TAKEN NORMAL TO C/L SUBSTRUCTURE UNITS.
- ▲ 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 SECTION THRU ABUT. OR ABUT. DIAPH.
- † BARS PLACED PARALLEL TO GIRDERS. SPACING PERPENDICULAR TO C/L GIRDERS.



TOP VIEW OF DIAPHRAGM (EXPANSION END)

NOTES

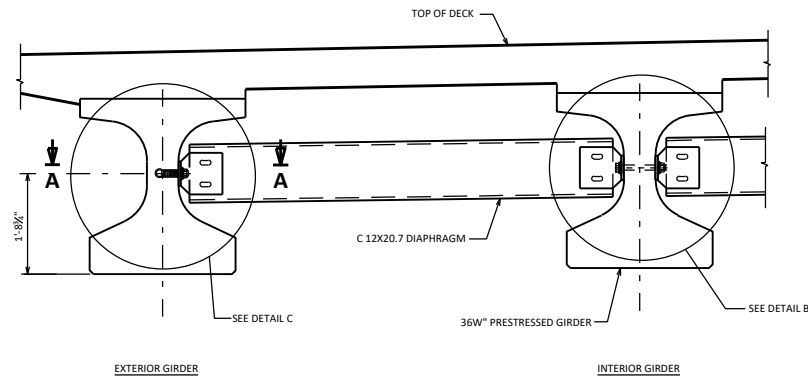
- ALL DIAPHRAGM SUPPORT HARDWARE SHALL BE INCIDENTAL TO "CONCRETE MASONRY BRIDGES".
- DIAPHRAGM SUPPORT ANGLES SHALL BE ASTM A709 GRADE 36.
- ALL DIAPHRAGM SUPPORT HARDWARE INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AFTER FABRICATION.
- STEEL DIAPHRAGM SUPPORT ANGLE TO CONCRETE WEB CONNECTION SHALL BE SNUG-TIGHT PLUS 1/2 TURN. HIGH STRENGTH BOLTS FOR WEB CONNECTION SHALL MEET THE REQUIREMENTS FOR ASTM A325 OR ASTM A449.
- DESIGNER NOTES**
- LAP LENGTHS FOR DIAPHRAGM REINFORCEMENT SHALL BE BASED ON A CLASS "C" TENSION LAP SPLICE, UNLESS OTHERWISE NOTED.

PRESTRESSED 54W" , 72W" & 82W" GIRDER SLAB & SUPERSTRUCTURE DETAILS

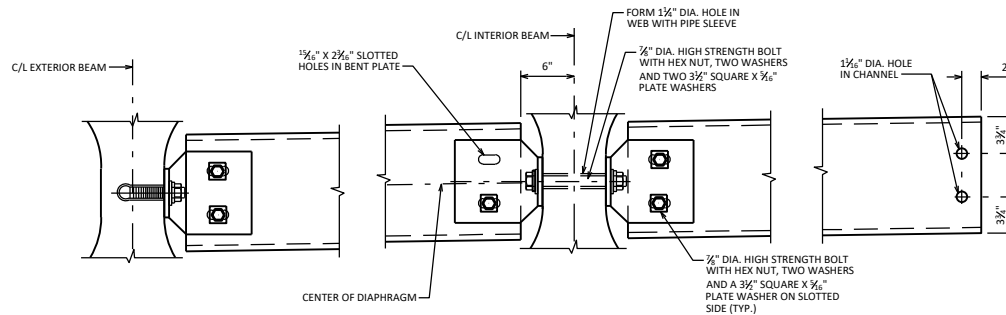


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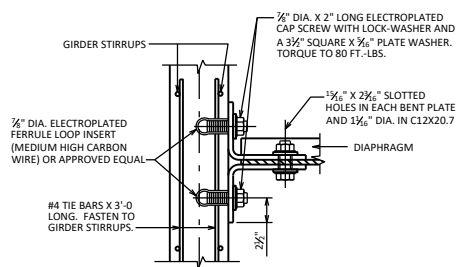


PART TRANSVERSE SECTION AT DIAPHRAGM



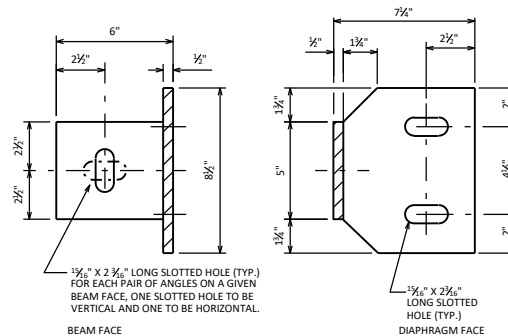
DETAIL C

DETAIL B



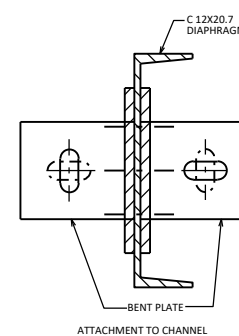
SECTION A-A

(FOR EXTERIOR ATTACHMENT)

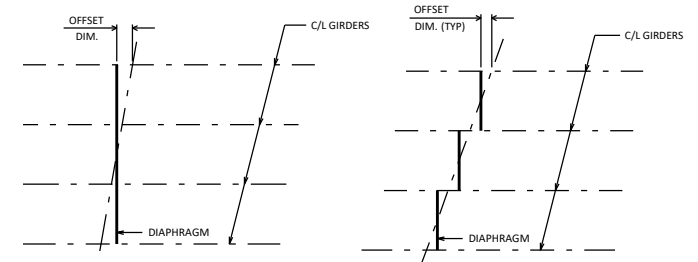


BEAM FACE

DIAPHRAGM FACE

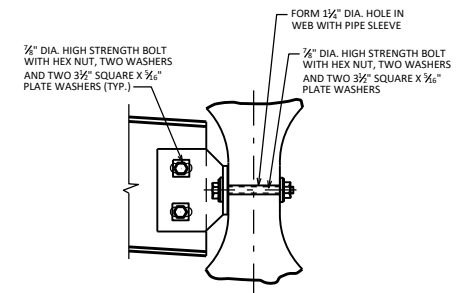


ATTACHMENT TO CHANNEL



PLAN FOR SKEW ANGLES ≤ 10°

PLAN FOR SKEW ANGLES > 10°



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 1/2 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.

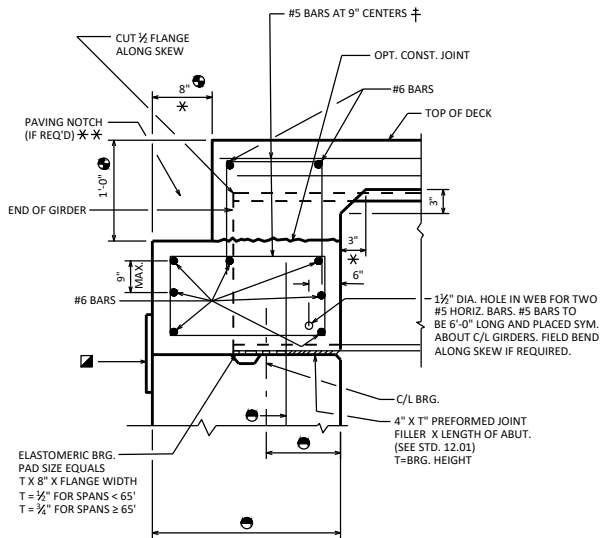
INTERM. STEEL DIAPHS. FOR 36W" PRESTRESSED GIRDERS



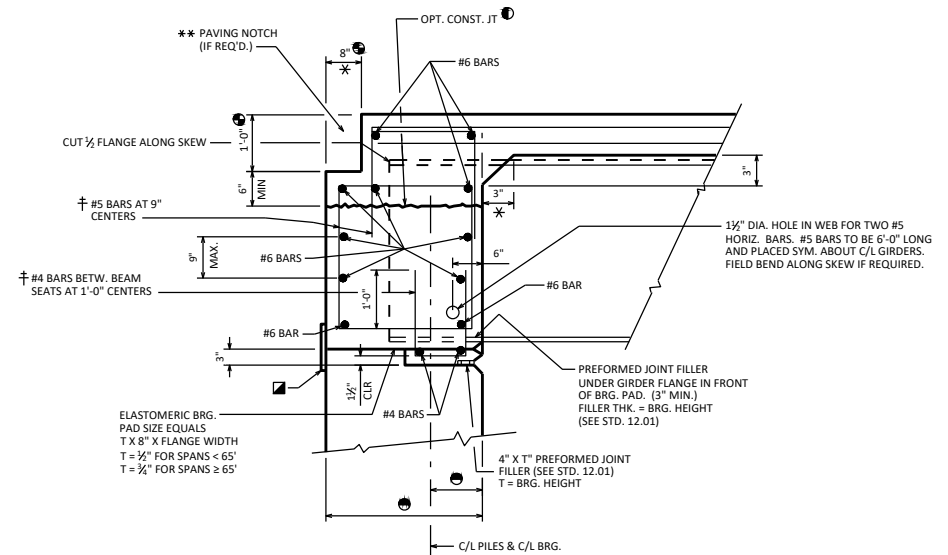
BUREAU OF STRUCTURES

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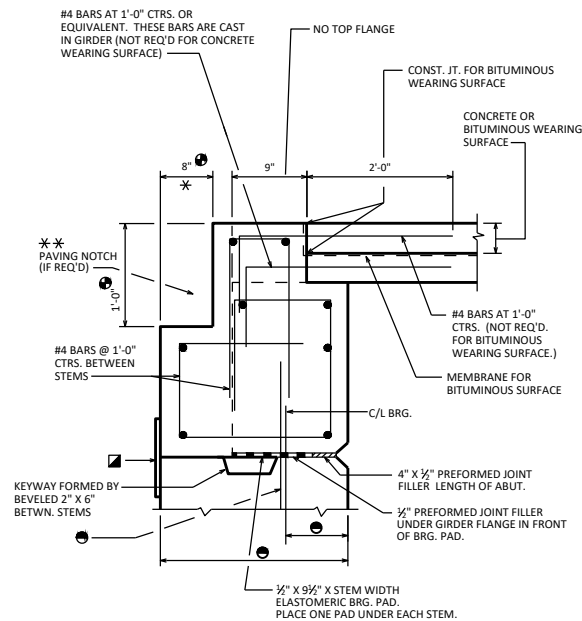
DATE:
7-25



**STEEL GIRDER WITH
FIXED SEAT**



**STEEL GIRDER WITH
SEMI-EXPANSION SEAT**



**PRECAST DOUBLE TEE OR
MULTI-STEM SECTION**

NOTES

FOR SKEWED STRUCTURES CAST END OF PRECAST TEE ALONG SKEW.

* DIMENSION IS TAKEN NORMAL TO C/L SUBSTRUCTURE UNITS.

1'-6" RUBBERIZED MEMBRANE WATERPROOFING

† BARS PLACED PARALLEL TO GIRDERS. SPACING PERPENDICULAR TO C/L GIRDERS.

DESIGNER NOTES

SEE STANDARD 19.55 FOR PRESTRESSED BOX GIRDER BEARING DETAILS.

1 THE USE OF THIS OPT. CONST. JOINT IS NOT RECOMMENDED FOR SKEWS OVER 15° WHEN LARGE DEADLOAD END ROTATION IS ANTICIPATED.

** USE PAVING NOTCH ON ALL S.T.H., U.S.H., I.H. BRIDGES. USE PAVING NOTCH ON C.T.H. BRIDGES WITH CONCRETE APPROACHES. PAVING NOTCHES OPTIONAL ELSEWHERE.

PAVING NOTCH IS 1'-0" WIDE BY 1'-4" DEEP IF STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED.

SEE STD. 12.01

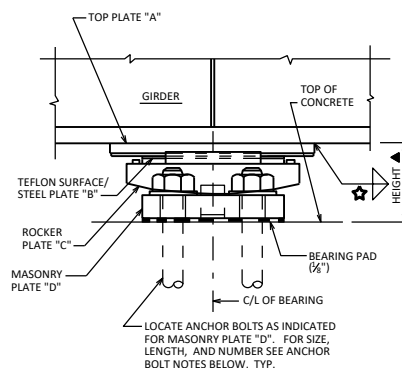
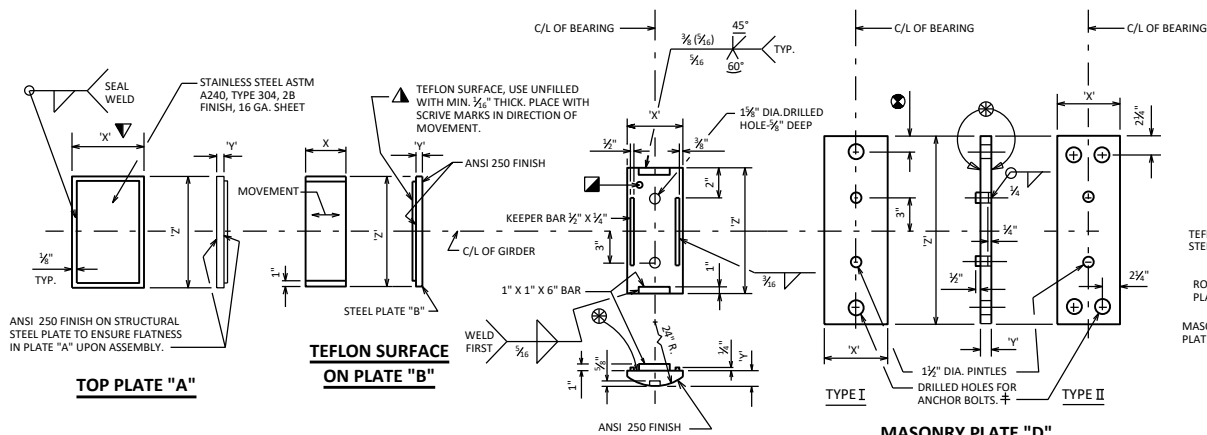
**BRG. DETAILS FOR STEEL
GDRS. AND PRECAST
UNITS ON A1 ABUTMENTS**



**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

DATE:
7-25



EXPANSION BEARING ASSEMBLY

(SEE "DESIGNER NOTES" FOR BEARING REPLACEMENTS)

DESIGNER NOTES

HEIGHT OF BEARINGS GIVEN IN TABLES INCLUDES $\frac{1}{8}$ " BEARING PAD, 16 GAGE STAINLESS STEEL SHEET AND $\frac{1}{8}$ " TEFLON SURFACE.

DETAIL SHIM PLATES AS DESCRIBED IN NOTES ON STANDARD 24.02.

SEE STANDARD 27.02 FOR THE USE OF BEVELED ROCKER PLATE "C" ON GRADES GREATER THAN 3% AND ALSO CLEARANCE REQUIREMENTS.

AT ABUTMENTS, WHEN THE "X" DIMENSION OF PLATE "A" EXCEEDS 11", INCREASE STANDARD DISTANCE FROM C/L OF BEARING TO END OF GIRDER.

★ 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 OF THE EDGE OF THE BOTTOM FLANGE TO THE TOP OF PLATE "A". SEE STANDARD 40.08 FOR DETAILS.

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) - $\frac{1}{2}$ " 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) - $\frac{1}{2}$ " DIA. x 1'-10" LONG ANCHOR BOLTS.

FOR SPAN LENGTHS GREATER THAN 150'-0":
USE A TYPE II MASONRY PLATE "D" WITH (4) - $\frac{1}{2}$ " DIA. x 1'-10" LONG ANCHOR BOLTS.

CHECK THAT ANCHOR BOLTS PROVIDE ADEQUATE HORIZONTAL CAPACITY.

BEARING NOTES

ALL BEARINGS ARE SYMMETRICAL ABOUT C/L OF GIRDER AND C/L 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 SHOP PAINTED FINISH 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 $\frac{1}{2}$ " DIA. ANCHOR BOLTS ARE USED AND 2 $\frac{1}{2}$ " WHEN $\frac{3}{4}$ " 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.

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.

PROVIDE $\frac{1}{8}$ " 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 $\frac{1}{2}$ ", ABOVE TOP OF CONCRETE.

CHAMFER TOP OF PINTLES $\frac{1}{8}$ ". DRILL HOLES FOR ALL PINTLES IN MASONRY PLATE "D" FOR A DRIVING FIT.

STEEL PINTLES SHALL CONFORM TO ASTM A449 OR ASTM A572 GRADE 50.

ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM F1554 GRADE 55, OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

PLACE SHIM PLATES BETWEEN BEARING PAD AND MASONRY PLATE "D". PLATES SHALL HAVE "X" AND "Z" DIMENSIONS THAT MATCH MASONRY PLATE "D".

✱ PROVIDE A METHOD FOR HANDLING ROCKER PLATE "C" DURING GALVANIZING.

▲ BOND STEEL PLATE "B" AND TEFLON WITH ADHESIVE MATERIAL MEETING THE REQUIREMENTS FOUND IN THE STANDARD SPECIFICATION.

✱ DRILLED HOLES FOR ANCHOR BOLTS IN MASONRY PLATE "D" SHALL HAVE A DIAMETER $\frac{1}{8}$ " LARGER THAN ANCHOR BOLT.

AT INSTALLATION, ENSURE STAINLESS STEEL SLIDING FACE OF THE UPPER ELEMENT AND THE TEFLON SLIDING FACE OF THE LOWER ELEMENT HAVE THE SURFACE FINISH SPECIFIED AND ARE CLEAN AND FREE OF ALL DUST, MOISTURE, OR ANY OTHER FOREIGN MATTER.

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"	$\frac{5}{8}$ "	10"	5"	$\frac{1}{2}$ "	10"	7"	$1\frac{1}{16}$ "	$1'-0\frac{1}{4}"$	8"	$1\frac{1}{2}$ "	1'-8"	0.360
180	1'-1"	$\frac{5}{8}$ "	10"	9"	$\frac{1}{2}$ "	10"	11"	$2\frac{3}{8}$ "	$1'-0\frac{1}{4}"$	8"	$1\frac{1}{2}$ "	1'-8"	0.438
260	1'-5"	$\frac{5}{8}$ "	10"	1'-1"	$\frac{1}{2}$ "	10"	1'-3"	$3\frac{3}{4}"$	$1'-0\frac{1}{4}"$	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"	$\frac{5}{8}$ "	1'-2"	7"	$\frac{1}{2}$ "	1'-2"	9"	$1\frac{1}{16}$ "	1'-4 $\frac{1}{4}"$	8"	$1\frac{1}{2}$ "	2'-0"	0.401
375	1'-5"	$\frac{5}{8}$ "	1'-2"	1'-1"	$\frac{1}{2}$ "	1'-2"	1'-3"	$3\frac{3}{8}"$	1'-4 $\frac{1}{4}"$	1'-2"	$2\frac{1}{2}"$	2'-0"	0.677
500	1'-9"	$\frac{5}{8}$ "	1'-2"	1'-5"	$\frac{1}{2}$ "	1'-2"	1'-7"	$4\frac{1}{8}"$	1'-4 $\frac{1}{4}"$	1'-5"	$3\frac{3}{4}"$	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"	$\frac{5}{8}$ "	1'-6"	7"	$\frac{1}{2}$ "	1'-6"	9"	$1\frac{1}{16}$ "	1'-8 $\frac{1}{4}"$	9"	2"	2'-4"	0.443
360	1'-1"	$\frac{5}{8}$ "	1'-6"	9"	$\frac{1}{2}$ "	1'-6"	11"	$2\frac{3}{8}"$	1'-8 $\frac{1}{4}"$	11"	2"	2'-4"	0.479
600	1'-7"	$\frac{5}{8}$ "	1'-6"	1'-3"	$\frac{1}{2}$ "	1'-6"	1'-5"	$3\frac{3}{8}"$	1'-8 $\frac{1}{4}"$	1'-5"	$3\frac{3}{8}"$	2'-5"	0.719
650	1'-11"	$\frac{5}{8}$ "	1'-6"	1'-7"	$\frac{1}{2}$ "	1'-6"	1'-9"	$4\frac{1}{8}"$	1'-8 $\frac{1}{4}"$	1'-10"	$3\frac{3}{8}"$	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"	$\frac{5}{8}$ "	1'-0"	5"	$\frac{1}{2}$ "	1'-0"	7"	$1\frac{1}{16}$ "	1'-2 $\frac{1}{4}"$	8"	$1\frac{1}{2}$ "	1'-10"	0.360
175	11"	$\frac{5}{8}$ "	1'-0"	7"	$\frac{1}{2}$ "	1'-0"	9"	$1\frac{1}{16}$ "	1'-2 $\frac{1}{4}"$	8"	$1\frac{1}{2}$ "	1'-10"	0.401
275	1'-3"	$\frac{5}{8}$ "	1'-0"	11"	$\frac{1}{2}$ "	1'-0"	1'-1"	$2\frac{3}{8}"$	1'-2 $\frac{1}{4}"$	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"	$\frac{5}{8}$ "	1'-4"	7"	$\frac{1}{2}$ "	1'-4"	9"	$1\frac{1}{16}$ "	1'-6 $\frac{1}{4}"$	8"	$1\frac{1}{2}$ "	2'-2"	0.401
370	1'-3"	$\frac{5}{8}$ "	1'-4"	11"	$\frac{1}{2}$ "	1'-4"	1'-1"	$2\frac{3}{8}"$	1'-6 $\frac{1}{4}"$	1'-0"	$2\frac{3}{8}"$	2'-3"	0.552
525	1'-7"	$\frac{5}{8}$ "	1'-4"	1'-3"	$\frac{1}{2}$ "	1'-4"	1'-5"	$3\frac{3}{8}"$	1'-6 $\frac{1}{4}"$	1'-4"	$3\frac{3}{8}"$	2'-3"	0.719
575	1'-9"	$\frac{5}{8}$ "	1'-4"	1'-5"	$\frac{1}{2}$ "	1'-4"	1'-7"	$4\frac{1}{8}"$	1'-6 $\frac{1}{4}"$	1'-6"	$3\frac{3}{8}"$	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"	$\frac{5}{8}$ "	1'-8"	5"	$\frac{1}{2}$ "	1'-8"	7"	$1\frac{1}{16}$ "	1'-10 $\frac{1}{4}"$	8"	$1\frac{1}{2}$ "	2'-6"	0.360
315	11"	$\frac{5}{8}$ "	1'-8"	7"	$\frac{1}{2}$ "	1'-8"	9"	$1\frac{1}{16}$ "	1'-10 $\frac{1}{4}"$	9"	2"	2'-6"	0.443
495	1'-3"	$\frac{5}{8}$ "	1'-8"	11"	$\frac{1}{2}$ "	1'-8"	1'-1"	$2\frac{3}{8}"$	1'-10 $\frac{1}{4}"$	1'-1"	$2\frac{3}{8}"$	2'-7"	0.594
675	1'-7"	$\frac{5}{8}$ "	1'-8"	1'-3"	$\frac{1}{2}$ "	1'-8"	1'-5"	$3\frac{3}{8}"$	1'-10 $\frac{1}{4}"$	1'-6"	$3\frac{3}{8}"$	2'-7"	0.760
705	1'-11"	$\frac{5}{8}$ "	1'-8"	1'-7"	$\frac{1}{2}$ "	1'-8"	1'-9"	$4\frac{1}{8}"$	1'-10 $\frac{1}{4}"$	1'-11"	$3\frac{3}{8}"$	2'-7"	0.844

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



BUREAU OF STRUCTURES

APPROVED: *Laura Shadewald*

DATE:
7-25

DESIGNER NOTES

- ★ PROTECTION ANGLE ARMOR MAY BE USED ON UNPAVED (GRAVEL) APPROACH ROADWAYS. PROTECTION ANGLE ARMOR SHOULD NOT BE USED ON PAVED (CONCRETE OR ASPHALT) APPROACH ROADWAYS WITH OR WITHOUT PAVING NOTCHES. EXTEND PROTECTION ANGLE FULL WIDTH OF ROADWAY (GUTTER LINE TO GUTTER LINE). PROVIDE PAY LIMITS ON THE PLANS. BID AS "STRUCTURAL STEEL CARBON". SEE BRIDGE MANUAL SECTION 28.7 FOR ADDITIONAL INFORMATION.

- 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."

LEGEND

- ▲ 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°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 ¾" DIA. X 6½" LONG AT 6" ALTERNATE CENTERS. WELD TO EXTRUSIONS AND BEND AS SHOWN AFTER WELDING.
- 2A ½" 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'-6" 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 TO NO. 1. 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 ⅛" 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.

NOTES

ONE FIELD SPICE PERMITTED IN STEEL EXTRUSIONS, UNLESS MORE ARE REQUIRED FOR STAGED CONSTRUCTION, HANDLING OR GALVANIZING REQUIREMENTS. IF USED, ANCHOR PLATES SHALL BE PROVIDED 3" FROM EACH SIDE OF THE FIELD SPICE. DETAILS SHALL BE SUBMITTED FOR APPROVAL. NO SPLICING PERMITTED IN NEOPRENE STRIP SEAL.

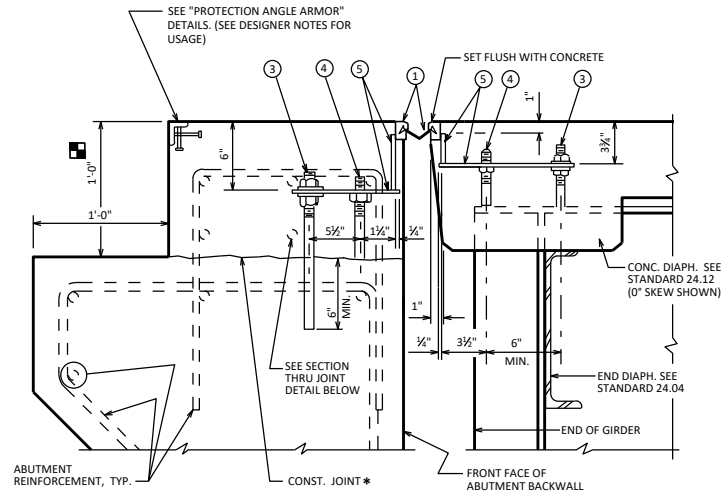
AFTER FABRICATION, BUT BEFORE SHIPMENT, STRAIGHTEN STEEL EXTRUSIONS SUCH THAT THEY SHALL BE FREE FROM WARP, TWIST AND SWEEP.

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.

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

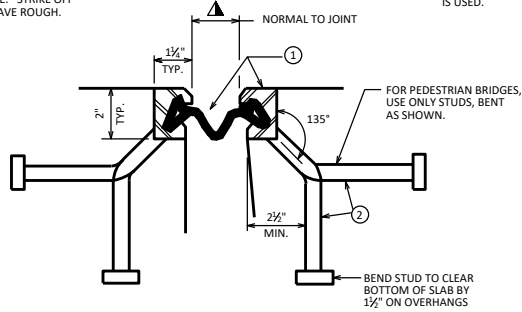


TYPICAL SECTION THRU JOINT AT STEEL GIRDER

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

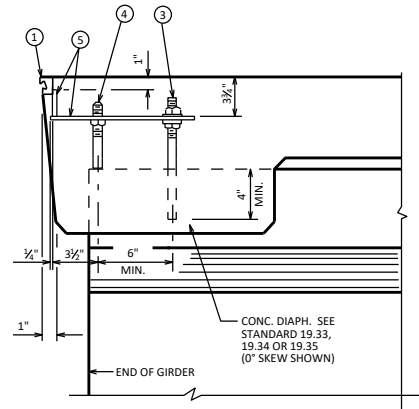
NORMAL TO C/L SUBSTRUCTURE

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



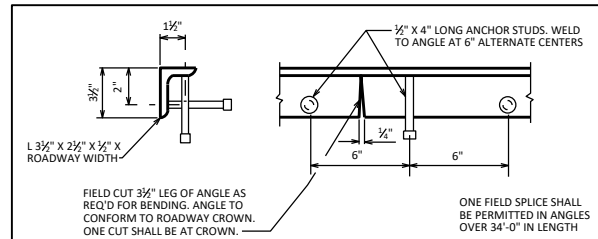
SECTION THRU JOINT

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



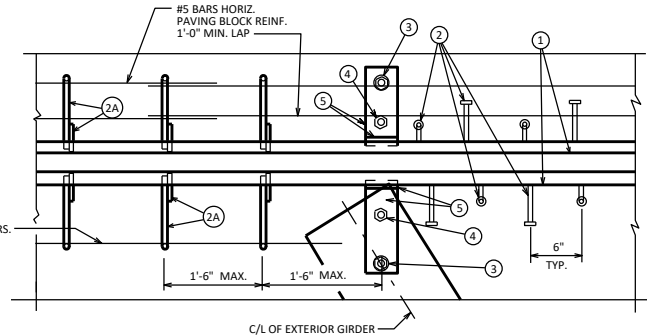
PART SECTION THRU JOINT AT PRESTRESSED GIRDERS

NORMAL TO C/L SUBSTRUCTURE

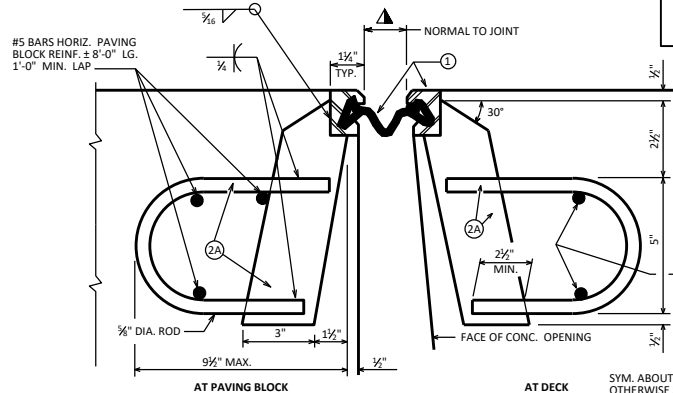


PROTECTION ANGLE ARMOR ★

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

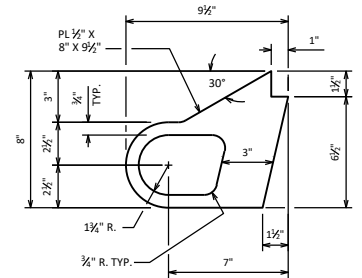


PART PLAN



SECTION THRU JOINT

ROADWAY TRAFFIC AREA BETWEEN EXTERIOR GIRDERS.



ALTERNATE STRIP SEAL ANCHOR

STRIP SEAL EXPANSION JOINT DETAILS



BUREAU OF STRUCTURES

APPROVED: *Laura Shadewald*

DATE:
7-25

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.

ALTERNATE BRACKETS ARE NOT ALLOWED.

ALL MATERIAL FOR FLOOR DRAINS TO BE INCLUDED IN THE BID ITEM "FLOOR DRAINS TYPE WF".

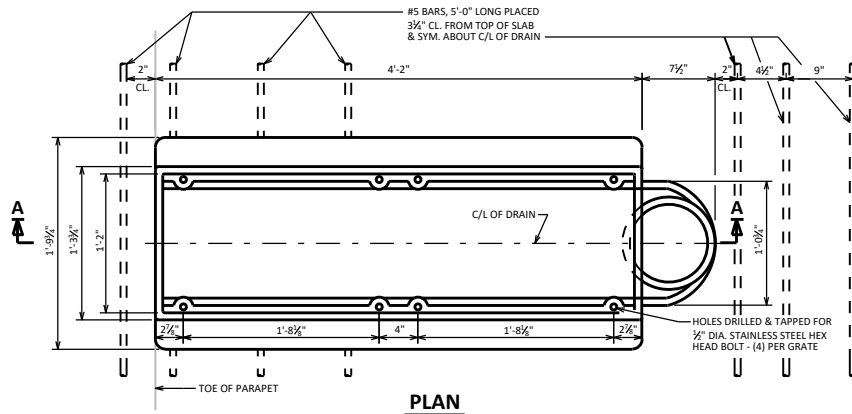
ALL MATERIAL FOR DOWNSPOUTS, DOWNSPOUT CONNECTIONS, AND BRACKETS TO BE INCLUDED IN THE BID ITEM "DOWNSPOUT 8-INCH".

- 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.

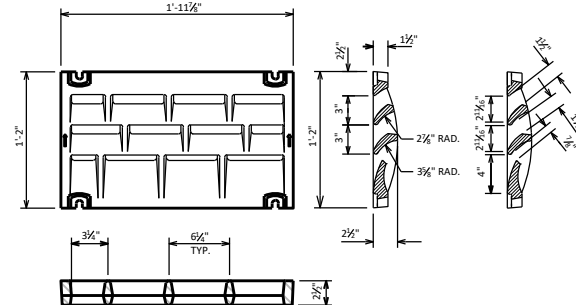
DESIGNER NOTES

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

- * A DECK X-SLOPE OF 2% PROVIDES AN INTERNAL SLOPE OF 8% (AS SHOWN IN THIS DETAIL) AND A PLUMB DOWNSPOUT COUPLER CONNECTION. DECK X-SLOPE MAY BE ADJUSTED UP TO 6% TO MAINTAIN AN INTERNAL SLOPE OF 2%.

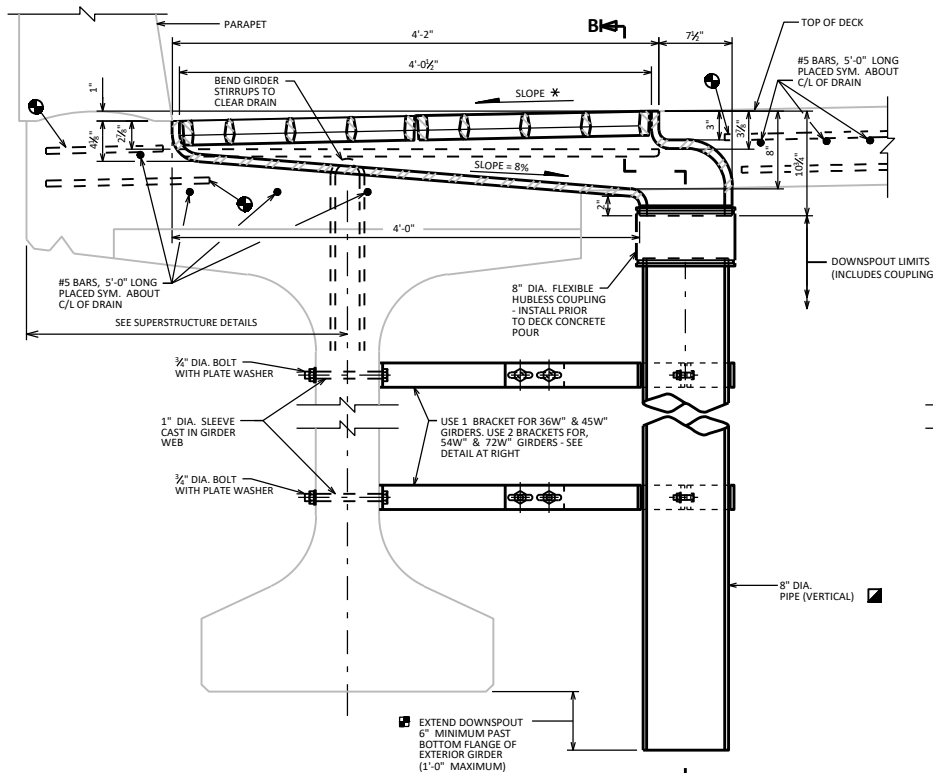


PLAN

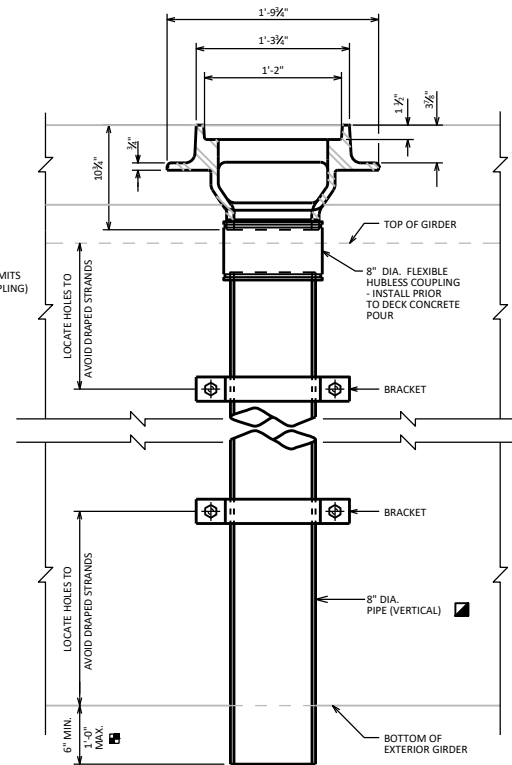


GRATE CASTING DETAILS

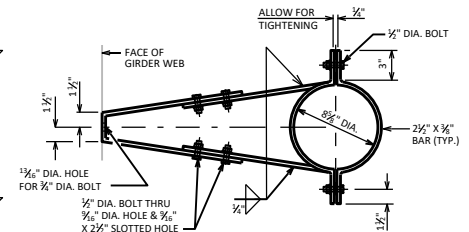
ATTACH GRATES TO FRAME FOR SHIPMENT



SECTION A-A



SECTION B-B



BRACKET DETAIL

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

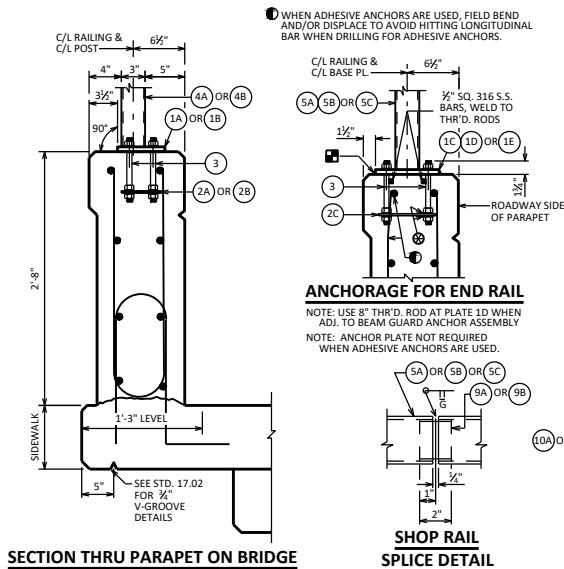
FLOOR DRAIN TYPE 'WF'



BUREAU OF
STRUCTURES

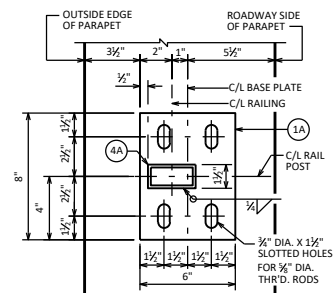
APPROVED: *Laura Shadewald*

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7-25



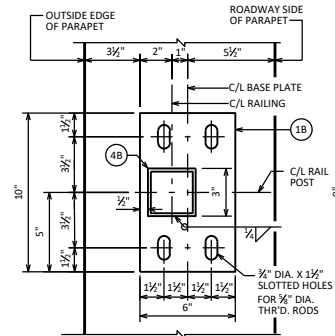
SECTION THRU PARAPET ON BRIDGE

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



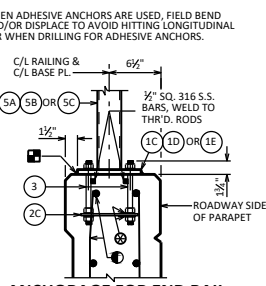
TYPICAL RAIL POST BASE PLATE

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



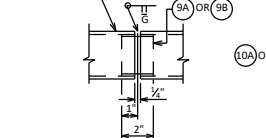
TYPICAL RAIL POST BASE PLATE

FOR 3" X 3" X 3/8" POSTS (1B)



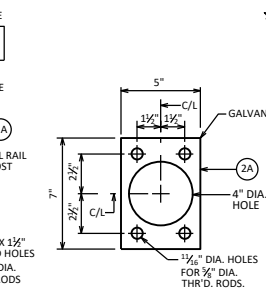
ANCHORAGE FOR END RAIL

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



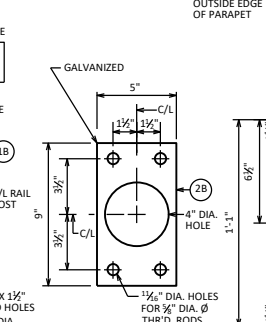
SHOP RAIL SPICE DETAIL

(LOCATION MUST BE SHOWN ON SHOP DRAWINGS)



ANCHOR PLATE

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



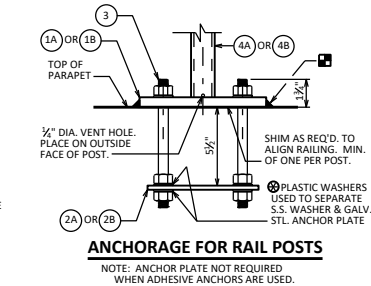
ANCHOR PLATE

FOR 3" X 3" X 3/8" POSTS (1B)



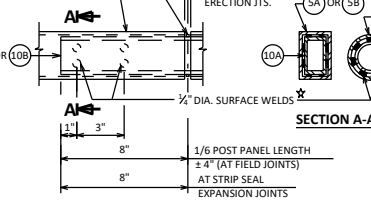
TYPICAL RAIL POST BASE PLATE

FOR 3" X 3" X 3/8" POSTS (1B)



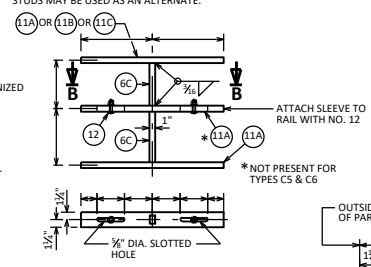
ANCHORAGE FOR RAIL POSTS

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



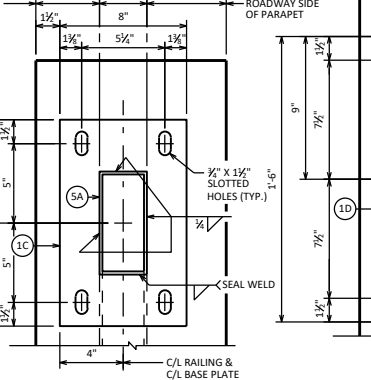
FIELD ERECTION JOINT DETAIL

*MIN. 1/2" FLAT SURFACE DIA. PUNCHING OR STUDS MAY BE USED AS AN ALTERNATE.



SECTION B-B MODULAR JOINT SLEEVE DETAIL

*NOT PRESENT FOR TYPES CS & CG



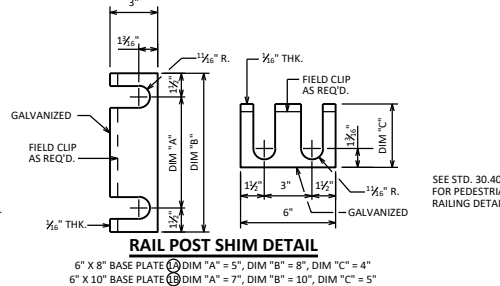
END RAIL BASE PLATE

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



END RAIL BASE PLATE

FOR 2 1/2" DIA. STANDARD PIPE RAIL (1C)

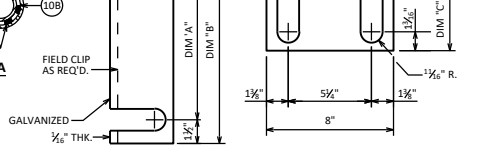


RAIL POST SHIM DETAIL

6" X 8" BASE PLATE (1D) DIM "A" = 5", DIM "B" = 8", DIM "C" = 4"

6" X 10" BASE PLATE (1E) DIM "A" = 7", DIM "B" = 10", DIM "C" = 5"

(2 SETS PER POST)



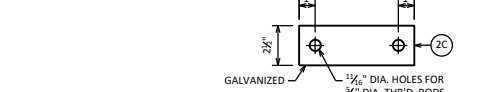
END RAIL SHIM DETAIL

8" X 1 1/2" BASE PLATE (1F) DIM "A" = 10", DIM "B" = 1 1/2", DIM "C" = 6 1/2"

8" X 1 1/2" BASE PLATE (1G) DIM "A" = 1 1/2", DIM "B" = 1 1/2", DIM "C" = 9"

8" X 1 1/2" BASE PLATE (1H) DIM "A" = 1 1/2", DIM "B" = 1 1/2", DIM "C" = 7 1/2"

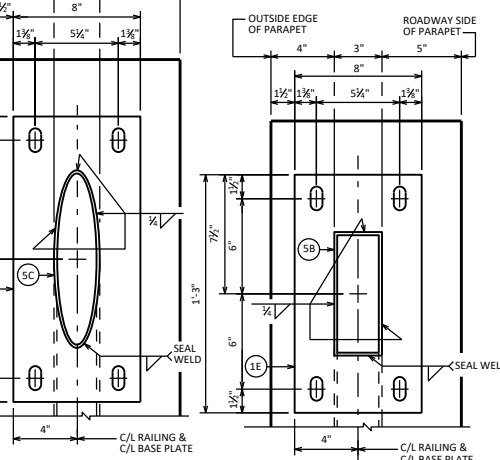
(2 SETS PER POST)



END RAIL ANCHOR PLATE

FOR END RAIL BASE PLATES (1D, 1E)

2 REQ'D. PER END RAIL BASE PLATE



END RAIL BASE PLATE

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



END RAIL BASE PLATE

FOR 2 1/2" DIA. STANDARD PIPE RAIL (1C)

FOR 2 1/2" DIA. STANDARD PIPE RAIL (1C)

- LEGEND**
- (1A) PLATE 3/4" X 6" X 8" WITH 3/4" X 1 1/2" SLOTTED HOLES.
 - (1B) PLATE 3/4" X 6" X 10" WITH 3/4" X 1 1/2" SLOTTED HOLES.
 - (1C) PLATE 3/4" X 8" X 1'-1" WITH 3/4" X 1 1/2" SLOTTED HOLES.
 - (1D) PLATE 3/4" X 8" X 1'-6" WITH 3/4" X 1 1/2" SLOTTED HOLES.
 - (1E) PLATE 3/4" X 8" X 1'-3" WITH 3/4" X 1 1/2" SLOTTED HOLES.
 - (2A) 3/4" X 5" X 7" ANCHOR PLATE WITH 1/4" DIA. HOLES FOR THRD. RODS NO.3.
 - (2B) 3/4" X 5" X 9" ANCHOR PLATE WITH 1/4" DIA. HOLES FOR THRD. RODS NO.3.
 - (2C) 3/4" X 2 1/2" X 7 1/2" ANCHOR PLATE WITH 1/4" DIA. HOLES FOR THRD. RODS NO.3.
 - (3) 3/4" DIA. X 9" LONG, TYPE 316 STAINLESS STEEL THREADED RODS (MIN. TENSILE STRENGTH = 70 KSI) WITH NUT AND WASHERS OF SAME ALLOY GROUP. ALTERNATIVE ANCHORAGE: CONCRETE ADHESIVE ANCHORS 5/8" INCH EMBED 7" IN CONCRETE FOR RAIL POSTS. EMBED 5" IN CONCRETE FOR END RAILS. ADHESIVE ANCHORS SHALL CONFORM TO SECTIONS 502.2.12 AND 502.3.14 OF THE STANDARD SPECIFICATIONS.
 - (4A) STRUCTURAL TUBING 3" X 3" X 3/8". PLACE VERTICAL. WELD TO NO.1 & 5.
 - (4B) STRUCTURAL TUBING 3" X 3" X 3/8". PLACE VERTICAL. WELD TO NO.1 & 5.
 - (5A) STRUCTURAL TUBING 3" X 2" X 3/8" RAILS. WELD TO NO.1 & NO.4. INSIDE OF TUBE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.
 - (5B) STRUCTURAL TUBING 3" X 2" X 3/8" RAILS. WELD TO NO.1 & NO.4. INSIDE OF TUBE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.
 - (5C) STRUCTURAL TUBING 2 1/2" DIA. (STANDARD SIZE) (2.875" O.D.). WELD TO NO.1 & 4. INSIDE OF TUBE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.
 - (6A) BAR 1" X 1" PICKETS. WELD TO NO. 5. (SPACE AT 6" MAX. C/L TO C/L SPACING). PLACE VERTICAL.
 - (6B) BAR 1" X 1 1/2" PICKETS. WELD TO NO.5. (SPACE AT 6" MAX. C/L TO C/L SPACING). PLACE VERTICAL.
 - (6C) BAR 1" X 1 1/2" PICKETS. WELD TO NO.11. PLACE VERTICAL.
 - (7) BAR 1" X 1" - BEND TO REQUIRED RADIUS. WELD TO NO. 4 & 5.
 - (8) STRUCTURAL TUBING 5" DIA. (STANDARD SIZE) (5.563" O.D.). 1 1/2" LONG SLICES. WELD TO NO.5A.
 - (9A) RECTANGULAR SLEEVE FABRICATED FROM 3/8" PLATES. PROVIDE "SLIDING FIT".
 - (9B) CIRCULAR SLEEVE FABRICATED FROM STRUCTURAL TUBING 2" DIA. (STANDARD SIZE) (2.375" O.D.).
 - (10A) RECTANGULAR SLEEVE FABRICATED FROM 3/8" PLATES. (1'-4" @ FIELD ERECTION JTS.) (1'-4" @ STRIP SEAL EXP. JTS.)
 - (10B) CIRCULAR SLEEVE FABRICATED FROM STRUCTURAL TUBING 2" DIA. (STANDARD SIZE) (2.375" O.D.). (1'-4" @ FIELD ERECTION JTS.) (1'-4" @ STRIP SEAL EXP. JTS.)
 - (11A) BAR 2 1/2" X 1" X 1" -
 - (11B) BAR 2 1/2" X 1 1/2" X 1" -
 - (11C) STRUCTURAL TUBING 2" DIA. (STANDARD SIZE) (2.375" O.D.) X 1" -
 - (12) 1/2" DIA. STAINLESS STEEL BOLT WITH NUT AND LOCKWASHER.

NOTES
BID ITEM SHALL BE "RAILING TYPE C(1-6)", WHICH SHALL INCLUDE ALL STEEL ITEMS SHOWN.
POST BASE PLATES SHALL BE FLAT WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL. ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS.
ALL PLATES, BARS, AND RECTANGULAR SLEEVES SHALL CONFORM TO ASTM A709 GRADE 36. ALL STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B.
ANCHORAGES SHALL BE ACCURATELY PLACED TO PROVIDE CORRECT ALIGNMENT OF RAILING. SET NORMAL TO GRADE.
CUT BOTTOM OF POST TO MAKE POST VERTICAL IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTION.
STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATES WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED.
CAULK AROUND PERIMETER OF BASE PLATES, NO. 1, AND FILL BOLT SLOTTED OPENINGS IN SHIMS AND BASE PLATES WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.
ALL JOINTS AND RECESSES IN CONCRETE PARAPET ARE TO BE VERTICAL.
ALL MATERIAL (EXCEPT NO. 3 & 12) SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING, THE STEEL RAILING SHALL BE GIVEN A NO. 6 BLAST CLEANING PER SSPC SPECIFICATIONS. PAINT OVER GALVANIZING WITH AN APPROVED TIE COAT AND TOP COAT AS SPECIFIED IN THE CONTRACT DOCUMENTS. THE RAILING SHALL BE PAINTED AMS STD. COLOR NO. 1. FILL IN COLOR NAME).
RAILING SHALL BE FABRICATED IN LENGTHS THAT INCLUDE 3 OR 4 POSTS.
VENT HOLES SHALL BE DRILLED IN POST AND RAIL MEMBERS AS REQUIRED TO FACILITATE GALVANIZING AND DRAINAGE.
TOUCH-UP PAINTING TO BE DONE AT COMPLETION OF STEEL RAILING INSTALLATION TO THE SATISFACTION OF THE ENGINEER AT NO EXTRA COST.

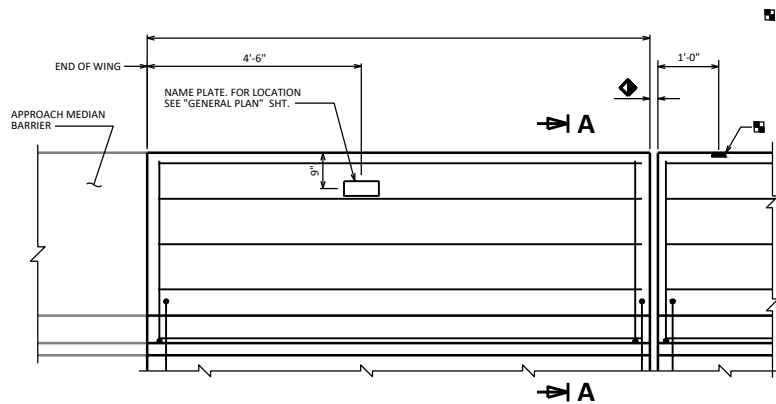
COMBINATION RAILING DETAILS

BUREAU OF STRUCTURES

APPROVED: *Laura Shadewald*

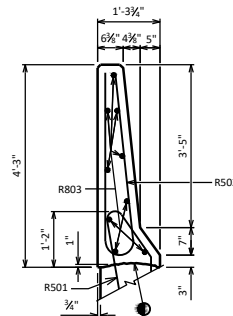
DATE: 7-25

STANDARD 30.18

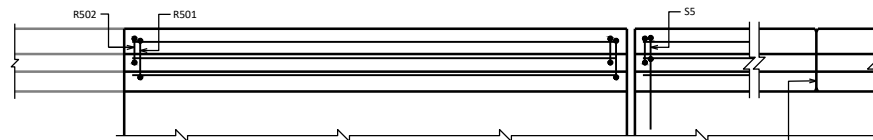


INSIDE ELEVATION

◆ ROADWAY OPENING OR $2\frac{1}{2}$ " MIN. FOR EXPANSION JOINT. USE $\frac{1}{2}$ " OPENING WITH FILLER FOR A1 ABUTMENTS



SECTION A

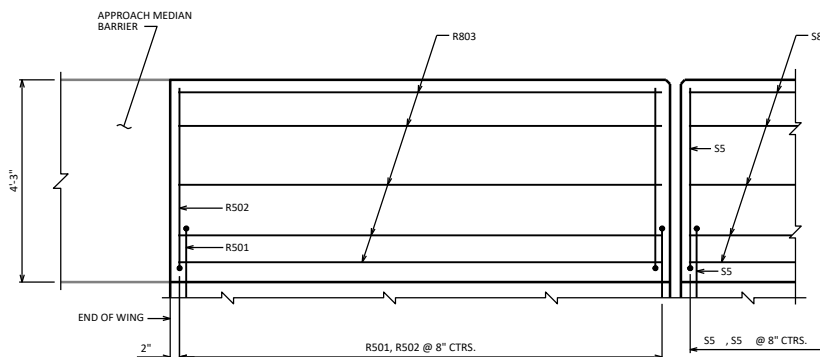


PLAN

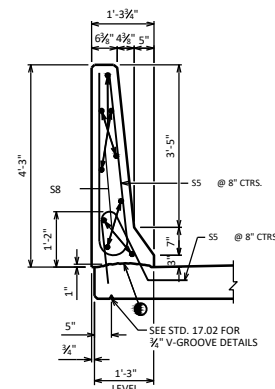
EXPANSION JOINT @ ABUT.
0' SKEW SHOWN. MATCH EXP. JT. OPENING.

FOR TYPE A1 ABUT., USE $\frac{1}{2}$ " FILLER TO TOP OF PARAPET. SEE STD. 12.01.

OPTIONAL CONSTRUCTION JOINTS IN THE PARAPETS MAY BE USED. RUN BAR REINF. THRU THE JOINT. LAP LONGIT. BARS A MIN. OF 3'-5" MIN. JOINT SPACING OF 80'-0". DEFINE CONST. JOINT WITH A $\frac{1}{2}$ " - 'V' GROOVE.



OUTSIDE ELEVATION

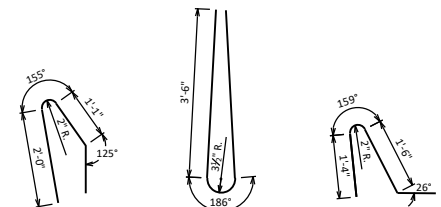


SECTION THRU PARAPET ON BRIDGE

BILL OF BARS

FOR ABUTMENT PARAPETS

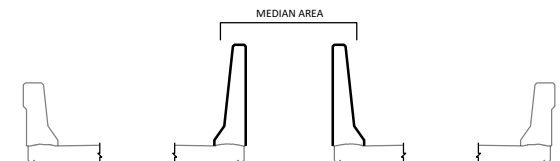
BAR MARK	CONC.	ABUT.	ABUT.	LENGTH	REIN.	LOCATION
R501	X			4'-6"	X	PARAPET VERT.
R502	X			7'-11"	X	PARAPET VERT.
R803	X					PARAPET HORIZ.
S5	X			4'-2"	X	PARAPET VERT.
S5	X			7'-11"	X	PARAPET VERT.
S8	X					PARAPET HORIZ.



R501

R502/S5

S5



SLOPED FACE PARAPET "51F" MAY BE USED IN MEDIAN AREA OF ADJACENT STRUCTURES WHEN HIGHWAY MEDIAN APPROACH CONCRETE BARRIER IS 51" HIGH

① CONST. JOINT - STRIKE OFF AS SHOWN.

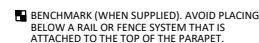
A R501 BAR MAY BE USED IN LIEU OF A TYPICAL S5 BAR ADJACENT TO THE PAVING NOTCH ON TYPE A1 ABUTMENTS.
AREA = 3.41 FT.²
WEIGHT = 512 LBS./FT.

SLOPED FACE PARAPET '51F'




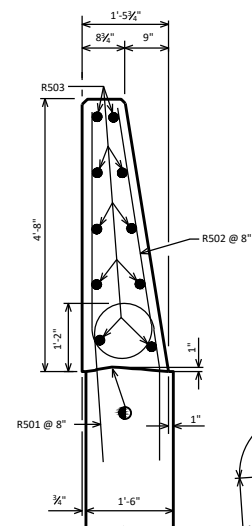
APPROVED: *Laura Shadewald*

DATE:
7-25

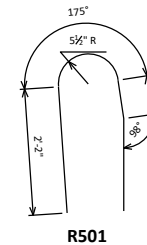


INSIDE ELEVATION

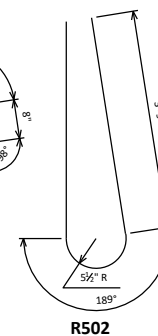
 ROADWAY OPENING OR 2½" MIN. FOR EXPANSION JOINT.
USE ¾" OPENING WITH FILLER FOR A1 ABUTMENTS



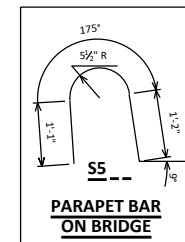
SECTION A



R501



R502



PARAPET BAR
ON BRIDGE

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" - "V" GROOVE.

DESIGNER NOTES

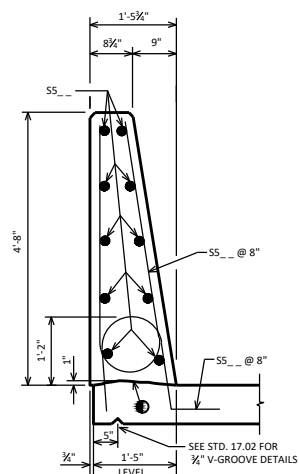
THE 'S6SS' PARAPET IS ONLY TO BE USED IF A 'TYPE S56'
SINGLE SLOPE CONCRETE ROADWAY BARRIER ADJOINS THE END OF
THE 'S6SS' PARAPET.

USE A 1'-6" WING WIDTH FOR WINGS PARALLEL TO THE ROADWAY.

AREA = 5.16 SF
WEIGHT = 774 LB/FT

● CONST. JOINT - STRIKE OFF AS SHOWN.

▽ R501 BARS TO BE TIED TO WING STEEL BEFORE WING IS POURED. DESIGNER MAY ELECT TO USE A R501 BAR IN LIEU OF A S5__ BAR ADJACENT TO THE PAVING NOTCH ON TYPE A1 ABUTMENTS.



SECTION THRU PARAPET ON BRIDGE

SINGLE SLOPE PARAPET 56SS

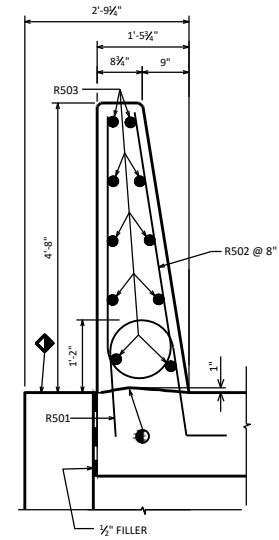
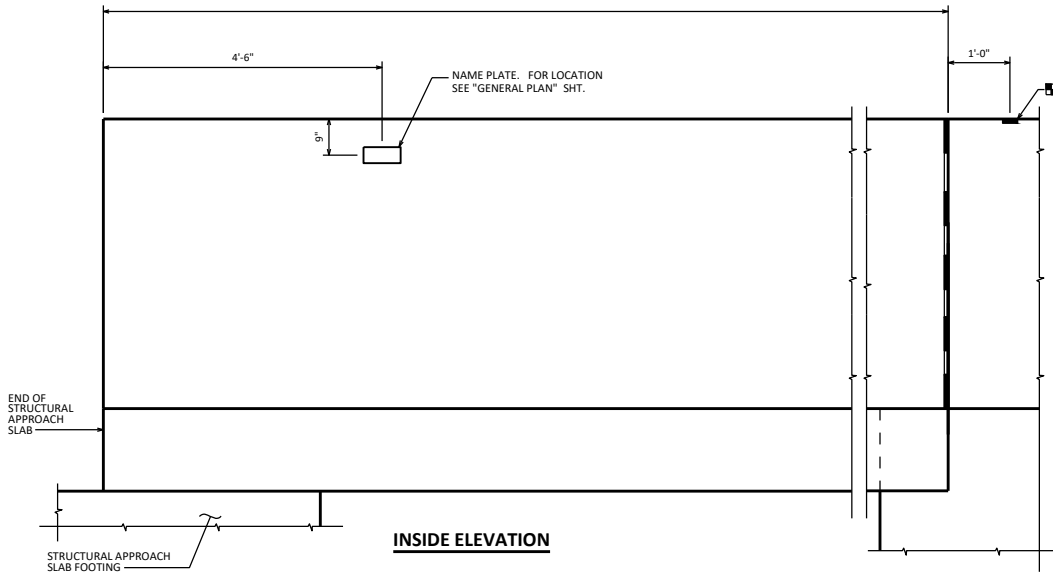


BUREAU OF
STRUCTURES

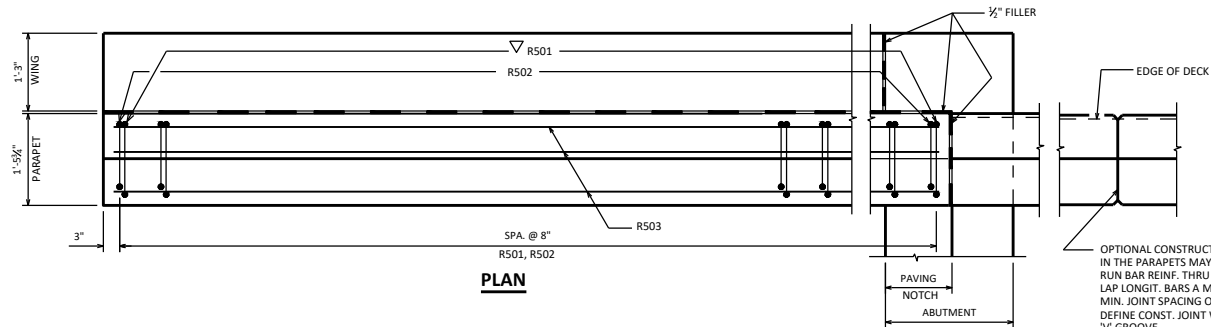
APPROVED: *Laura Shadewald*

DATE:
7-25

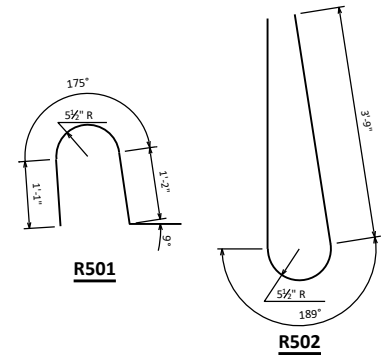
BENCHMARK (WHEN SUPPLIED). AVOID PLACING BELOW A RAIL OR FENCE SYSTEM THAT IS ATTACHED TO THE TOP OF THE PARAPET.



SECTION A



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.



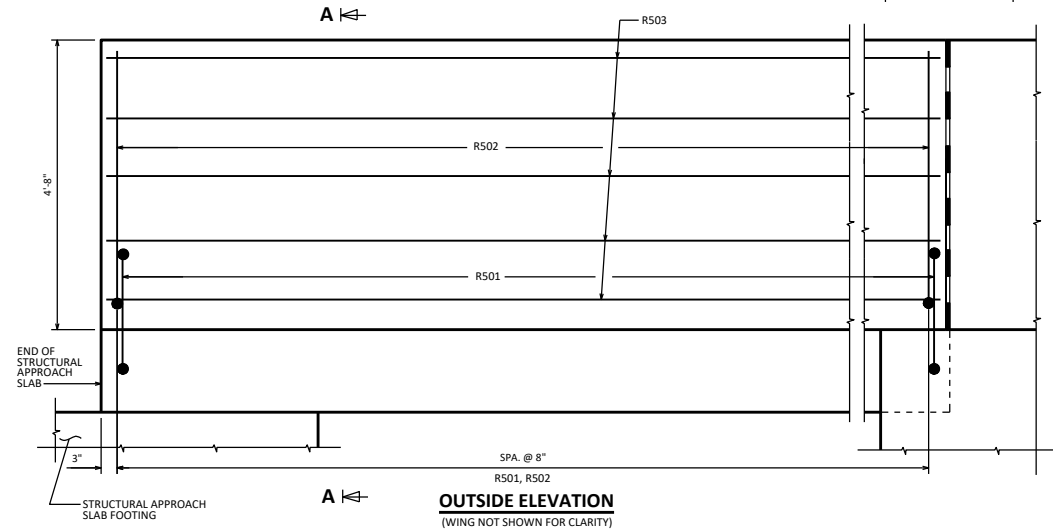
DESIGNER NOTES

THE '56SS' PARAPET IS ONLY TO BE USED IF A 'TYPE S56'
SINGLE SLOPE CONCRETE ROADWAY BARRIER ADJOINS THE END OF
THE '56SS' PARAPET.

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

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

SEE STANDARD 30.33 FOR DETAILS OF 56SS PARAPET ON BRIDGE.




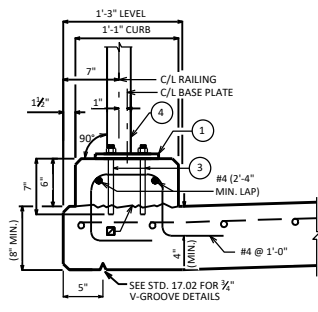
AREA = 5.16 SF
WEIGHT = 774 LB/FT

 CONST. JOINT - STRIKE OFF AS SHOWN.

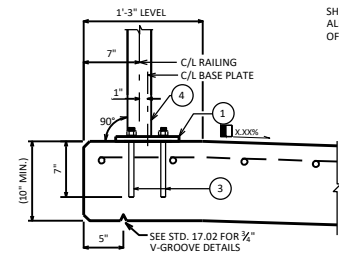
▽ R501 BARS TO BE TIED TO STRUCTURAL APPROACH SLAB STEEL BEFORE STRUCTURAL APPROACH SLAB IS POURED.

 SLOPE FOR DRAINAGE

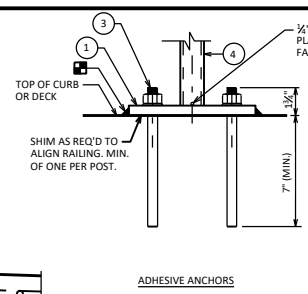
<p>SINGLE SLOPE PARAPET 56SS WITH STRUCTURAL APPROACH SLAB</p>	
	<p>BUREAU OF STRUCTURES</p>
<p>APPROVED: <i>Laura Shadewald</i></p>	<p>DATE: 7-25</p>



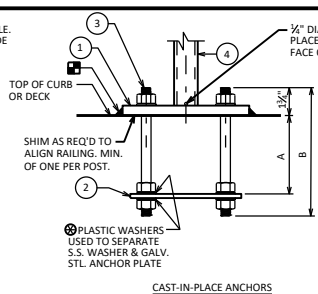
CURB MOUNTED PEDESTRIAN RAILING
 CONST. JOINT-STRIKE OFF AS SHOWN AND LEAVE ROUGH.



DECK MOUNTED PEDESTRIAN RAILING



ADHESIVE ANCHORS



CAST-IN-PLACE ANCHORS

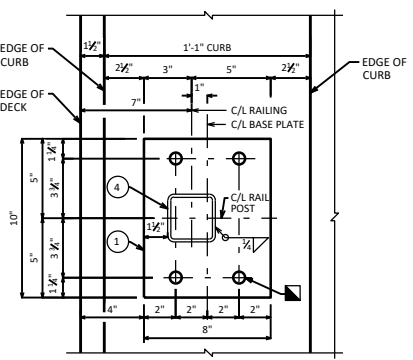
ANCHORAGE FOR RAIL POSTS

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

APPLICATION	A	B
CURB MOUNTED	7"	10 1/2"
DECK MOUNTED	5 1/2"	9"

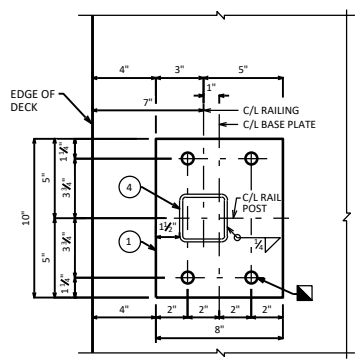
LEGEND

- 1 PLATE 3/8" X 8" X 10" WITH 3/8" HOLES.
- 2 3/4" X 6" X 9 3/4" ANCHOR PLATE WITH 1/2" DIA. HOLES FOR THRD. RODS NO.3.
- 3 3/4" DIA. X 10 1/2" LONG, TYPE 316 STAINLESS STEEL THREADED RODS (MIN. TENSILE STRENGTH = 70 KSI) WITH NUT AND WASHERS OF SAME ALLOY GROUP. ALTERNATIVE ANCHORAGE: CONCRETE ADHESIVE ANCHORS 3/4"-INCH. EMBED 7" IN CONCRETE FOR RAIL POSTS. ADHESIVE ANCHORS SHALL CONFORM TO SECTIONS 502.2.12 AND 502.3.14 OF THE STANDARD SPECIFICATIONS.
- 4 3/4" DIA. X 9" LONG, TYPE 316 STAINLESS STEEL THREADED RODS (MIN. TENSILE STRENGTH = 70 KSI) WITH NUT AND WASHERS OF SAME ALLOY GROUP. ALTERNATIVE ANCHORAGE: CONCRETE ADHESIVE ANCHORS 3/4"-INCH. EMBED 7" IN CONCRETE FOR RAIL POSTS. ADHESIVE ANCHORS SHALL CONFORM TO SECTIONS 502.2.12 AND 502.3.14 OF THE STANDARD SPECIFICATIONS.



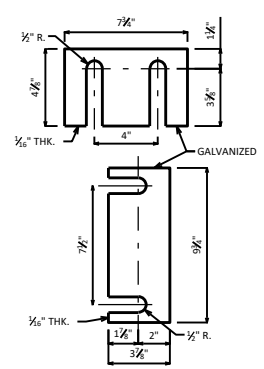
RAIL POST BASE PLATE - CURB MOUNTED

- 1/2" DIA. HOLES FOR ADHESIVE ANCHORS
- 3/4" DIA. X 1 1/2" SLOTTED HOLES FOR CAST-IN-PLACE ANCHORS. PLACE SLOTTED HOLES PARALLEL TO C/L RAILING.



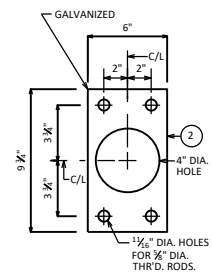
RAIL POST BASE PLATE - DECK MOUNTED

- 1/2" DIA. HOLES FOR ADHESIVE ANCHORS
- 3/4" DIA. X 1 1/2" SLOTTED HOLES FOR CAST-IN-PLACE ANCHORS. PLACE SLOTTED HOLES PARALLEL TO C/L RAILING.



SHIM PLATE DETAILS

TWO SHIMS OF EACH SIZE REQUIRED PER POSTS



ANCHOR PLATE

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

NOTES

BID ITEM SHALL BE "RAILING STEEL PEDESTRIAN TYPE C(1-6)", WHICH SHALL INCLUDE ALL STEEL ITEMS SHOWN.

- 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.

DESIGNER NOTES

STANDARD 30.17 RAILING DETAILS SHOWN. STANDARDS 30.11 AND 30.15 RAILING DETAILS SIMILAR. SEE TABLE FOR MAXIMUM POST SPACING (WHEN USING THIS STANDARD).

THIS STANDARD MAY BE USED WHEN THE SIDEWALK IS SEPARATED FROM THE ROADWAY BY A TRAFFIC BARRIER. DETAILS SHOWN ON THIS STANDARD PROVIDE PEDESTRIAN RAILING ANCHORAGE DETAILS FOR A REINFORCED CONCRETE CURB AND A REINFORCED CONCRETE DECK. THIS STANDARD MEETS THE REQUIREMENTS OF LRFD 13.8.2 FOR PEDESTRIAN RAILINGS.

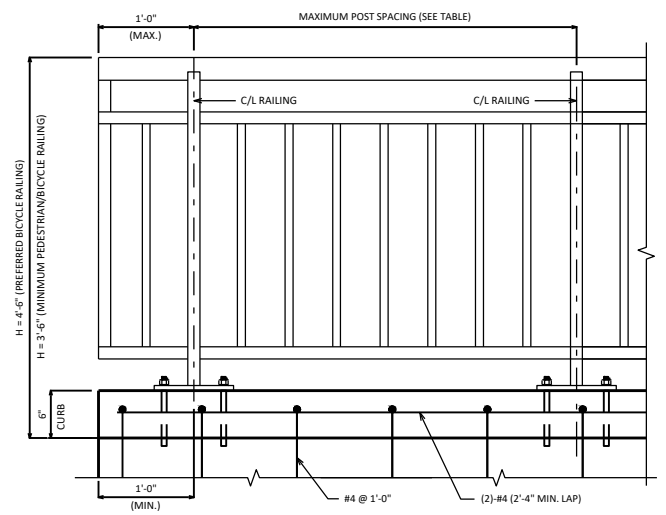
REFER TO STANDARD REFERENCES FOR POST CONNECTIONS AND ADDITIONAL DETAILS.

- FOR DECK MOUNTED APPLICATIONS, SLOPE AWAY FROM EDGE OF DECK. USE CURB MOUNTED DETAILS WHEN SLOPED TOWARDS EDGE OF DECK IS REQUIRED.

DESIGN DATA

CONCRETE STRENGTH, f'_c : 3,500 P.S.I.
 REQUIRED CHARACTERISTIC BOND STRESS, μ_{req} : 970 P.S.I. (MIN.)

RAILING HEIGHT "H"	MAXIMUM POST SPACING	STANDARD REFERENCES
≤ 4'-6"	9'-0"	30.17
> 4'-6"	8'-0"	30.11 & 30.15

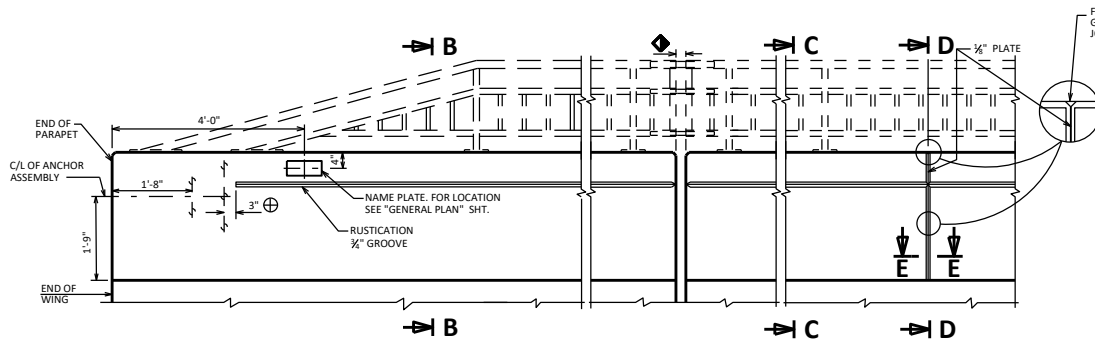


PARTIAL ELEVATION FOR PEDESTRIAN RAIL ON CURB
 (SEE STD. 30.17 FOR RAILING DETAILS. DECK REINFORCEMENT NOT SHOWN FOR CLARITY)

PEDESTRIAN RAILING

BUREAU OF STRUCTURES

APPROVED: *Laura Shadewald* DATE: 7-25



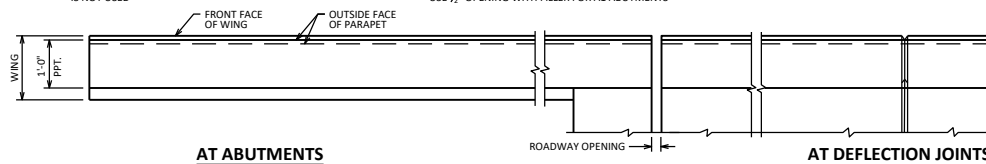
AT ABUTMENTS

ELEVATION OF PARAPET

AT DEFLECTION JOINTS

⊕ EXTEND 3/4" GROOVE TO END OF PARAPET WHEN ANCHOR ASSEMBLY IS NOT USED

◆ ROADWAY OPENING OR 2 1/2" MIN. FOR EXPANSION JOINT. USE 3/4" OPENING WITH FILLER FOR A1 ABUTMENTS

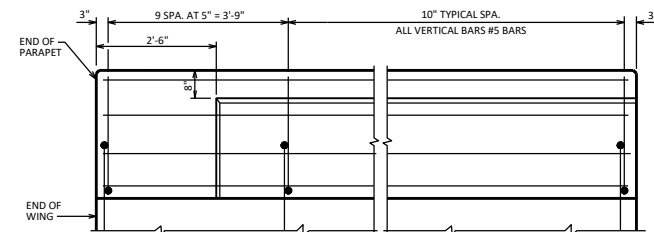


AT ABUTMENTS

AT DEFLECTION JOINTS

PLAN OF PARAPET

(RAILING NOT SHOWN FOR CLARITY)

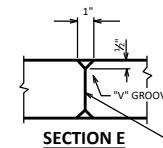


VIEW SHOWING OUTSIDE FACE OF PARAPET & REINF.

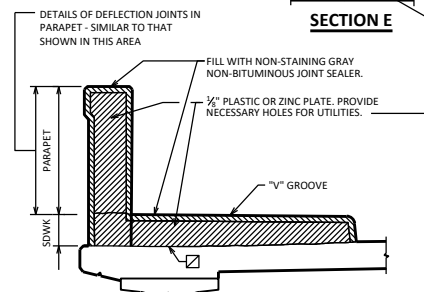
(RAILING NOT SHOWN FOR CLARITY)

BILL OF BARS

BAR MARK	QTY	NO. REQ'D.	LENGTH	BEND	BAR SERIES	LOCATION
R501	X			X		PARAPET VERT.
R502	X			X		PARAPET VERT.
S501	X		4'-4"	X		PARAPET VERT.
S502	X			X		PARAPET VERT.



SECTION E



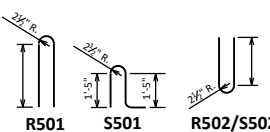
SECTION D

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

1. GIRDER STRUCTURES AND SLAB STRUCTURES WITH A RAISED SIDEWALK SHOULD HAVE A DEFLECTION JOINT IN THE SIDEWALK AND PARAPET OVER THE PIER. FOR SKEWS GREATER THAN 20-DEG., DETAIL THE JOINT NORMAL TO THE SIDEWALK AND PARAPET WITH THE JOINT APPROX. CENTERED OVER C/L PIER.

IF THERE IS A LIGHT STANDARD AT THE PIER, PLACE A DEFLECTION JOINT APPROX. 4'-0" EACH SIDE OF PIER, WITH NONE DIRECTLY OVER THE PIER.

2. GIRDER STRUCTURES AND SLAB STRUCTURES WITHOUT SIDEWALKS SHOULD HAVE NO DEFLECTION JOINTS IN THE PARAPETS.



NOTE

WHEN PARAPETS ARE POURED CONTINUOUSLY FROM END TO END, THEY SHALL BE SEPARATED AT THE DEFLECTION JOINTS BY A PIECE OF 3/4" ZINC OR PLASTIC PLATE CUT AS SHOWN IN SECTION "D" BY SHADED AREA. IF CONSTRUCTION JOINTS IN PARAPETS ARE USED AT THE DEFLECTION JOINTS, ONE SIDE OF JOINT SHALL BE COATED WITH AN APPROVED LIQUID BOND BREAKER AND PLATE SEPARATORS MAY BE OMITTED.

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

DESIGNER NOTES

THIS STANDARD MEETS MASH TL-2 REQUIREMENTS.

THIS STANDARD MAY BE USED ON STRUCTURES WITH A 45 M.P.H. DESIGN SPEED OR LESS, OR WHEN THE SIDEWALK IS SEPARATED FROM THE ROADWAY BY A PARAPET. THIS STANDARD IS AN ALTERNATIVE TO STANDARD 17.01 WITH NO OVERHANG OR MAY BE USED FOR STRUCTURAL APPROACH SLABS.

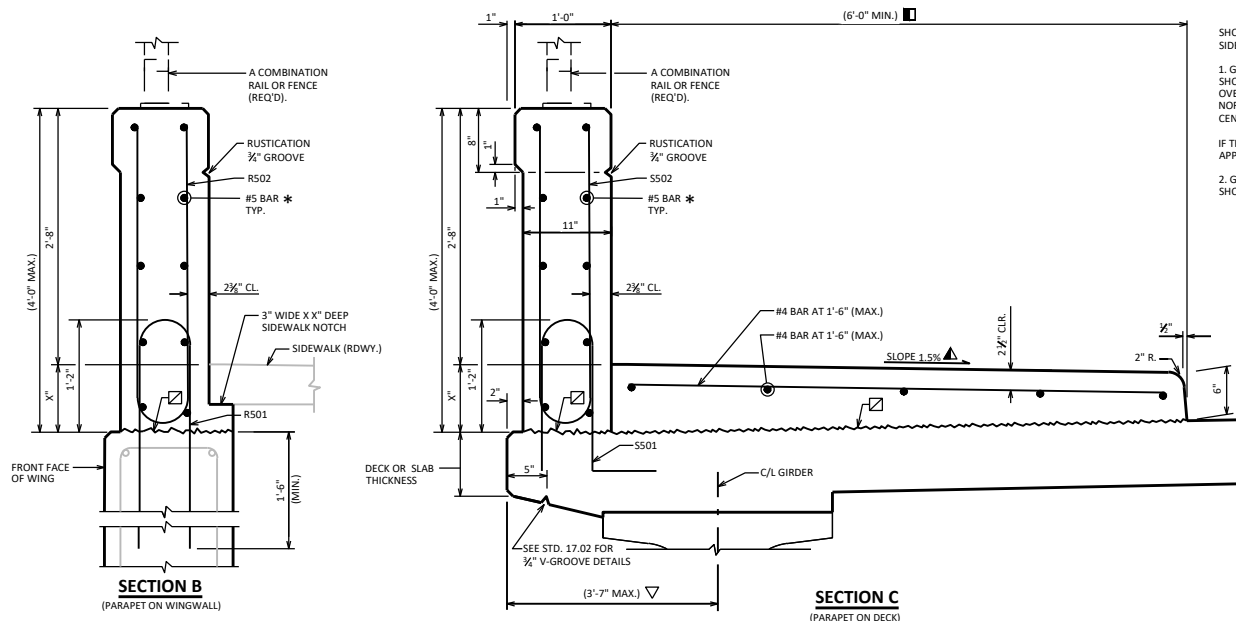
PROVIDE COMBINATION RAIL OR FENCE FOR PEDESTRIAN PROTECTION (3'-6" MINIMUM TOTAL HEIGHT MEASURED FROM TOP OF SIDEWALK).

FOR DEAD LOAD PURPOSES, THE SUPERSTRUCTURE DESIGN SHALL ACCOUNT FOR A MAXIMUM 2% SIDEWALK CROSS SLOPE.

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

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

PROVIDE ADDITIONAL DECK REINFORCEMENT ACCORDING TO CHAPTER 17 FOR DECK OVERHANGS.



SECTION B (PARAPET ON WINGWALL)

SECTION C (PARAPET ON DECK)

LEGEND

☑ HORIZ. CONST. JOINT-STRIKE OFF AS SHOWN AND LEAVE ROUGH.

* OPTIONAL CONSTRUCTION JOINTS IN THE PARAPETS MAY BE USED. RUN BAR REINF. THRU THE JOINT, LAP LONGIT. BARS A MIN. OF 1'-0" MIN. JOINT SPACING OF 8'-0" TO 10'-0". DEFINE CONST. JOINT WITH A 3/4" - V" GROOVE.

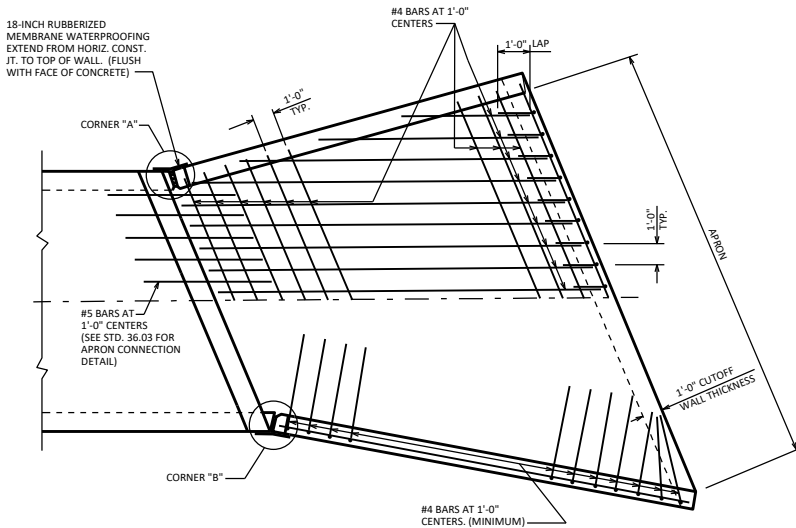
▲ ±0.5% CONSTRUCTION TOLERANCE IN SIDEWALK CROSS SLOPE. THE SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

VERTICAL FACE PARAPET 'A' WITH RAISED SIDEWALK

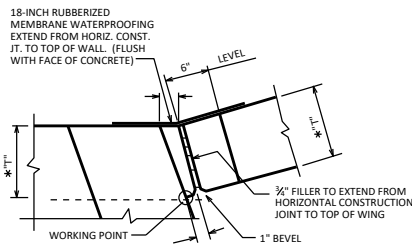


APPROVED: *Laura Shadewald*

DATE:
7-25

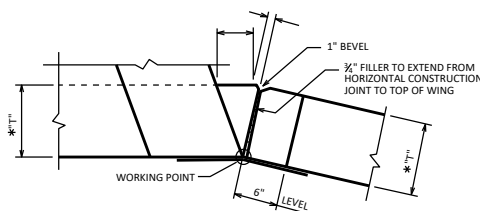


APRON DETAIL



CORNER "A"

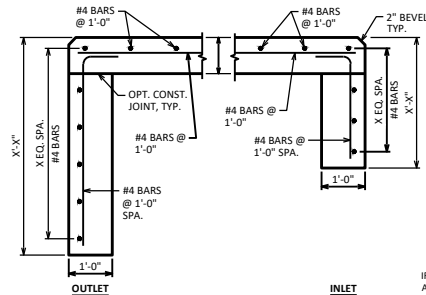
* DIMENSION "T" TO BE DETERMINED FROM BARREL DESIGN



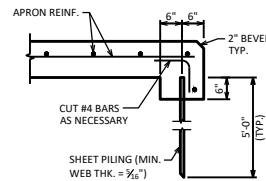
CORNER "B"

"H" (FT.)	"L" (FT.)
≤ 5'-0"	3'-8"
> 5'-0" - 7'-0"	5'-2"
> 7'-0" - 8'-0"	6'-1"
> 8'-0" - 9'-0"	6'-9"
> 9'-0" - 10'-0"	7'-4"
> 10'-0" - 11'-0"	7'-8"
> 11'-0" - 12'-0"	8'-0"
> 12'-0" - 13'-0"	8'-4"
> 13'-0" - 14'-0"	8'-6"

"H" IS MAX. WING WALL HEIGHT

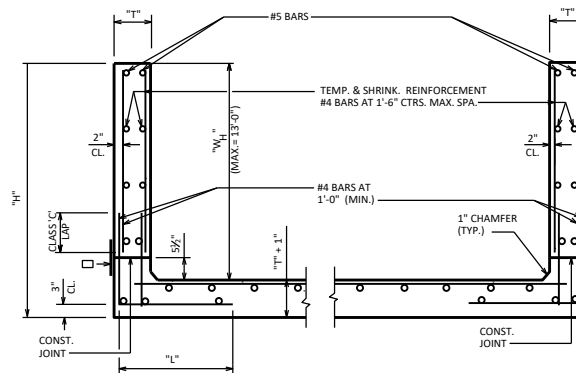


CUTOFF WALLS



ALTERNATE CUTOFF WALLS

THE ABOVE ALTERNATIVE MAY BE USED IN LIEU OF CAST-IN-PLACE CONCRETE CUTOFF WALLS. PAYMENT WILL BE BASED ON THE CONCRETE CUTOFF WALLS.



SECTION THRU WINGWALLS

18" MIN. WIDTH RUBBERIZED MEMBRANE WATERPROOFING ALONG HORIZ. CONSTR. JT. IN WING.

THE AREA OF REINFORCING STEEL NOT IDENTIFIED IN SECTIONS SHALL CONFORM TO THE FOLLOWING TEMPERATURE AND SHRINKAGE REQUIREMENTS:

THICKNESS	T&S REINF.
≤ 12"	#4 @ 18"
> 12" - 18"	#4 @ 12"

NOTES

BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2" CLEAR UNLESS OTHERWISE SHOWN OR NOTED.

THE CONCRETE IN THE CUTOFF WALL MAY BE PLACED UNDERWATER IF THE EXCAVATION CANNOT BE DEWATERED.

THE "ALTERNATE CUTOFF WALL" DETAIL SHOWN ON THIS SHEET MAY BE USED IN LIEU OF THE CAST-IN-PLACE CONCRETE CUTOFF WALLS. PAYMENT SHALL BE BASED ON CONCRETE CUTOFF WALLS.

THE CONTRACTOR MAY FURNISH (INSERT ALLOWABLE PRECAST ELEMENTS) IN LIEU OF THE CAST-IN-PLACE BOX CULVERT WITH THE ACCEPTANCE OF THE SHOP DRAWINGS BY THE STRUCTURES DESIGN SECTION. THE PRECAST CONCRETE BOX CULVERT SHALL CONFORM TO PRECAST DETAILS IN CHAPTER 36 STANDARDS OF THE CURRENT WISCONSIN DOT BRIDGE MANUAL AND SPECIAL PROVISIONS. PAYMENT FOR THE PRECAST CULVERT SYSTEM SHALL BE BASED ON THE QUANTITIES AND PRICES BID FOR THE ITEMS LISTED IN THE "TOTAL ESTIMATED QUANTITIES" FOR THE CAST-IN-PLACE CULVERT SYSTEM. ADDITIONAL ITEMS REQUIRED FOR THE PRECAST SYSTEM SHALL BE INCIDENTAL TO "CONCRETE MASONRY CULVERTS".

THE CONTRACTOR SHALL FOLLOW THESE NOTES WHEN PRECAST ELEMENTS ARE USED IN LIEU OF THE CAST-IN-PLACE ELEMENTS:

THE FOLLOWING SPECIAL PROVISIONS SHALL BE USED:

PRECAST CONCRETE WINGWALLS (STRUCTURE) (SPV.0060)
PRECAST CONCRETE BOX CULVERT, (SPAN SIZE) FT X (RISE SIZE) FT (SPV.0090)

THE FOLLOWING STANDARDS SHALL BE USED:

PRECAST CONCRETE BOX CULVERT DETAILS (STANDARD 36.05)
PRECAST WINGS, HEADERS, AND CUTOFF WALLS FOR PRECAST CONCRETE BOX CULVERT (STANDARD 36.06)

THE MOST CURRENT STANDARDS AND SPECIAL PROVISIONS CAN BE OBTAINED ON THE BUREAU OF STRUCTURES' WEBSITE:

<https://wisconsin.dot.gov/Pages/doing-business-with-us/consultants/cnslt-rsres/strct/design-policy-memos.aspx>

JOINT TIES ARE REQUIRED (INSERT LOCATIONS WHERE JOINT TIES ARE REQUIRED).

(INSERT PRECAST BOX CULVERT UNDERCUT AND BEDDING BACKFILL NOTES. NOTES SHALL BE COMPATIBLE WITH A 6" MINIMUM TYPE B BEDDING. REFER TO STANDARD 9.02 FOR TYPICAL CULVERT UNDERCUT AND BEDDING NOTES. MODIFY NOTES AS REQUIRED.)

(INSERT PRECAST ELEMENTS) NOT ALLOWED.

DESIGNER NOTES (CAST-IN-PLACE CONCRETE)

ALL BAR STEEL FOR CAST-IN-PLACE CONCRETE BOX CULVERTS SHALL BE UNCOATED, EXCEPT WHEN FILL IS LESS THAN 2-FT WHILE SUPPORTING TRAFFIC LOAD. EPOXY COATED BARS SHALL BE USED IN THE TOP SLAB (TOP, BOTTOM, AND CORNER BARS). PRECAST BOX CULVERT NOT ALLOWED FOR WHEN FILL IS LESS THAN 2-FT WHILE SUPPORTING TRAFFIC LOAD.

BAR STEEL FOR CAST-IN-PLACE CONCRETE APRONS SHOULD BE UNCOATED AND BAR STEEL FOR WINGWALL DOWELS AND ALL WINGWALL BARS SHALL BE EPOXY COATED.

FOR "B" DESIGNATED CONCRETE BOX CULVERTS HAVING THEIR TOP SURFACE AT GRADE, HAND HELD FINISHING MACHINES MAY BE USED. NOTE THIS ON PLANS WHEN APPLICABLE.

SEE STANDARDS 9.02 AND 36.01 FOR ADDITIONAL NOTES.

DESIGNER NOTES (PRECAST CONCRETE)

IT IS THE RESPONSIBILITY OF THE DESIGNER TO DETERMINE IF PRECAST ELEMENTS ARE ALLOWED. FOR SITE CONDITIONS NOT COVERED BY THE STANDARD DETAILS AND SPECIAL PROVISIONS, ADDITIONAL NOTES AND DETAILS MAY BE REQUIRED.

ALLOWABLE PRECAST ELEMENTS INCLUDE: BOX CULVERT BARREL SECTIONS, WINGWALLS, HEADERS, AND CUTOFF WALLS. APRON FLOORS SHALL BE CAST-IN-PLACE, UNLESS DESIGNED OTHERWISE. THE DESIGNER SHALL DETERMINE IF PRECAST ELEMENTS ARE ALLOWED ON A PROJECT-BY-PROJECT BASIS.

PROVIDE CAST-IN-PLACE DETAILS ONLY, UNLESS SPECIAL PRECAST DETAILS ARE REQUIRED OR WHEN A PRECAST ONLY DESIGN IS PROVIDED.

PRECAST ONLY DESIGNS REQUIRE PRIOR APPROVAL BY THE BUREAU OF STRUCTURES. SEE BRIDGE MANUAL SECTIONS 36.11.4 AND 36.12 FOR ADDITIONAL INFORMATION. IF USED, PROVIDE PRECAST DETAILS FOLLOWING STANDARDS 36.05 AND 36.06 WITH THE FOLLOWING SPECIAL PROVISIONS:

PRECAST CONCRETE WINGWALLS (STRUCTURE) (SPV.0060)
PRECAST CONCRETE BOX CULVERT, (SPAN SIZE) FT X (RISE SIZE) FT (SPV.0090)

JOINT TIES ARE REQUIRED BETWEEN THE LAST TWO BARREL SECTIONS ON SKEWED STRUCTURES OR AT OTHER LOCATIONS DETERMINED BY THE ENGINEER. WHEN JOINT TIES ARE REQUIRED AT OTHER LOCATIONS, PROVIDE A PLAN NOTE OR LIMITS IDENTIFYING THE REQUIRED JOINT LOCATIONS. SITES SUSCEPTIBLE TO DIFFERENTIAL SETTLEMENT MAY WARRANT JOINT TIES ALONG THE BOX CULVERT LENGTH.

SEE STANDARDS 9.02 AND 36.01 FOR ADDITIONAL NOTES.

SEE STANDARDS 36.05 AND 36.06 FOR PRECAST BOX CULVERT DETAILS.

BOX CULVERT APRON DETAILS



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DETAILS FOR MATERIALS, FABRICATION, CONSTRUCTION AND DESIGN OF PRECAST BOX CULVERTS NOT SHOWN OR STATED ON THIS DRAWING SHALL BE IN ACCORDANCE WITH THE CURRENT ASTM SPECIFICATION C1577; AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS; WISCONSIN DOT BRIDGE MANUAL; WISCONSIN DOT STANDARD SPECIFICATIONS & APPLICABLE SPECIAL PROVISIONS, EXCEPT THAT THE CONCRETE MIXTURE SHALL CONTAIN NOT LESS THAN 565 LBS. OF CEMENTITIOUS MATERIALS PER CUBIC YARD.

THE JOINT ON ALL SIDES OF THE CULVERT SHALL BE SEALED WITH A PREFORMED BUTYL RUBBER SEALANT IN CONFORMANCE WITH ASTM C990 SECTION 6.2. A 2'-0" STRIP OF GEOTEXTILE TYPE D SCHEDULE A SHALL BE PLACED OVER THE JOINTS ON THE TOP AND ON THE SIDES OF THE CULVERT. THE GEOTEXTILE SHALL CONFORM TO SECTION 645.2.2.4 OF THE STANDARD SPECIFICATION. (FABRIC NOT REQUIRED OVER INSIDE WALL JOINTS OF MULTICELL INSTALLATION.)

THE COVER OF CONCRETE OVER THE REINFORCEMENT SHALL BE 1 INCH OR 2 INCHES AS SHOWN WITH AN ALLOWABLE VARIATION OF $-\frac{3}{8}$ " TO $+\frac{1}{4}$ ".

NOT MORE THAN FOUR (4) HOLES MAY BE CAST, DRILLED OR OTHERWISE NEATLY MADE IN THE SHELL OF EACH PIECE OF BOX SECTION FOR HANDLING. THE HOLES SHALL BE TAPERED UNLESS DRILLED. HOLES SHALL BE FILLED WITH PORTLAND CEMENT MORTAR. EXCEPT TAPERED HOLES MAY BE FILLED WITH CONCRETE PLUGS SECURED WITH PORTLAND CEMENT MORTAR OR OTHER APPROVED ADHESIVE.

SHOP DRAWINGS SHALL PROVIDE "BOX CULVERT BARREL DATA" WITH REQUIRED AND ACTUAL REINFORCEMENT AREAS.

CONCRETE (PRECAST BOX) ————— $f'_c = 5,000$ P.S.I.
 BAR STEEL REINFORCEMENT ————— $f_y = 60,000$ P.S.I.
 STEEL REINFORCEMENT (WIRE) ————— $f_y = 65,000$ P.S.I.

SEE STANDARD 36.02 FOR DESIGNER NOTES.



FILL HEIGHT LESS THAN 2 FEET
(LONG. REIN. NOT SHOWN FOR CLARITY)



NOTES:
EITHER EYE BOLT TIES, WELDED PIPE TIES, OR CANOPY TIES MAY BE USED.
THREADS MAY BE CUT OR ROLLED. TIE NUTS SHALL BE TIGHTENED AS DIRECTED
BY THE ENGINEER. (2 TIES REQ'D. PER JOINT.) (TIES TO BE GALVANIZED.)

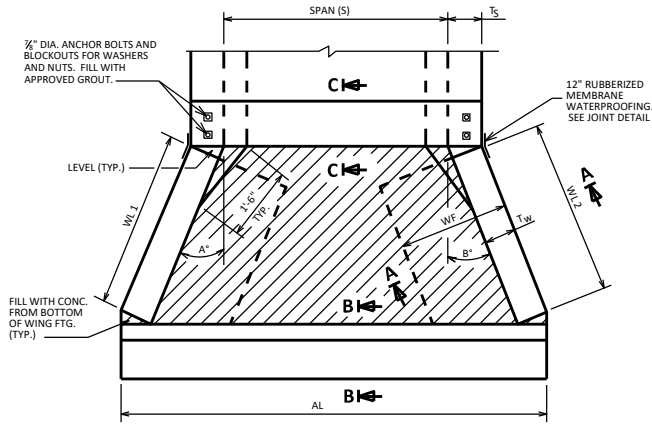


FILL HEIGHT 2'-0" OR GREATER
(LONG. REIN. NOT SHOWN FOR CLARITY,
UNLESS NOTED OTHERWISE.)

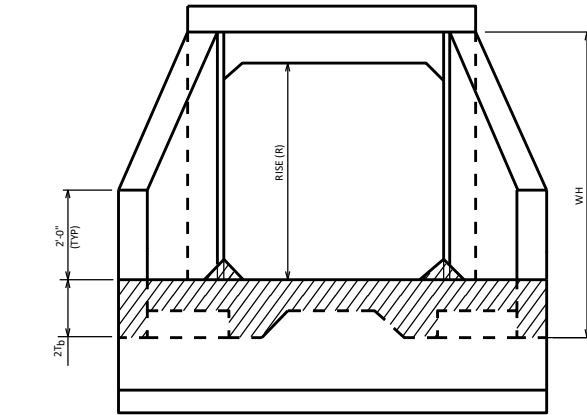


MULTICELL INSTALLATION

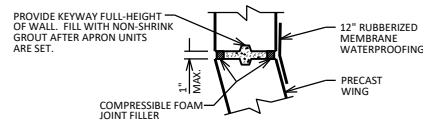
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APRON PLAN
(NON-SKEWED STRUCTURE)



END VIEW

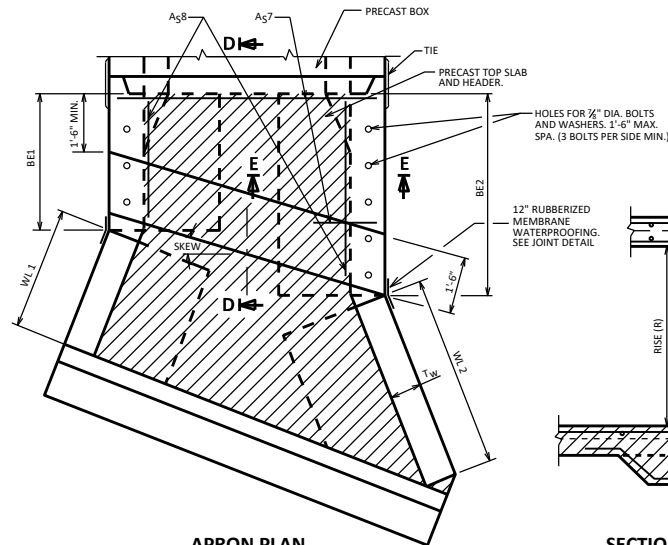


JOINT DETAIL

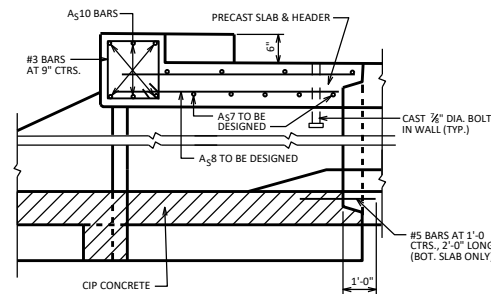
JOINT DETAIL EXAMPLE SHOWN. PRECAST SUPPLIER TO SUBMIT JOINT DETAIL FOR ACCEPTANCE.

BOX CULVERT APRON DATA

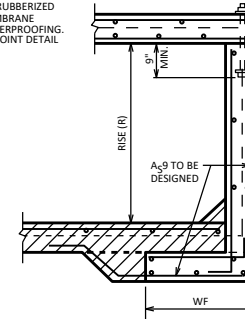
	R (Ft)	S (Ft)	T OR T ₅ (IN)	SKEW	ANGLE A	ANGLE B	WL 1	WL 2	AL	AH	WH	BE1	BE2
INLET													
OUTLET													



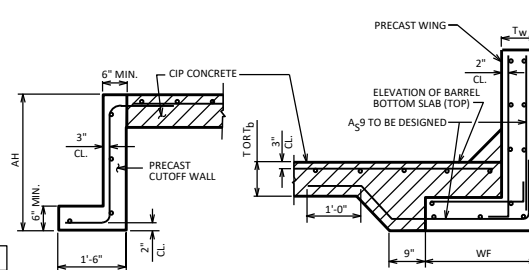
APRON PLAN
(SKEWED STRUCTURE)



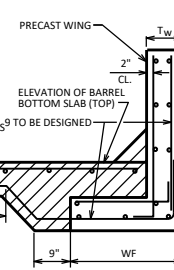
SECTION D-D



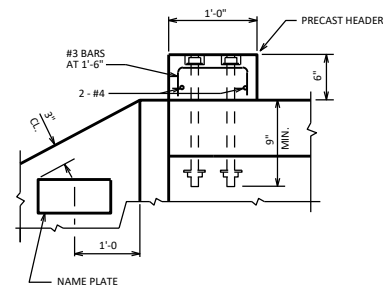
SECTION E-E



SECTION B-B



SECTION A-A



SECTION C-C

NOTES

CONCRETE COVER ON ALL REINFORCEMENT IN THE PRECAST ELEMENTS SHALL BE 2" UNLESS SHOWN OR NOTED OTHERWISE.

ALTERNATE DETAILS OF EQUAL STRENGTH AND HYDRAULIC CAPACITY TO THE DETAILS SHOWN ON THIS SHEET MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

VERTICAL CONSTRUCTION JOINTS THRU THE WALLS AND FOOTING WILL BE ALLOWED ONLY WITH THE APPROVAL OF THE ENGINEER. DETAILS MUST BE SHOWN ON THE SHOP DRAWINGS FOR APPROVAL.

THE AREA OF REINFORCING STEEL NOT IDENTIFIED IN SECTIONS SHALL BE DESIGNED AND SHALL EXCEED TO THE FOLLOWING TEMPERATURE AND SHRINKAGE REQUIREMENTS:

THICKNESS	T&S REINF.
≤ 12"	#4 @ 18"
> 12" - 18"	#4 @ 12"

THE 1/2" DIA. ANCHOR BOLTS SHALL BE GALVANIZED AND CONFORM TO THE REQUIREMENTS OF ASTM A575.

MATERIAL PROPERTIES:

CONCRETE (CAST-IN-PLACE)	f _c = 3,500 P.S.I.
CONCRETE (PRECAST WING)	f _c = 4,000 P.S.I.
BAR STEEL REINFORCEMENT	f _y = 60,000 P.S.I.
STEEL REINFORCEMENT (WIRE)	f _y = 65,000 P.S.I.

RISE (R)	T _w (MIN.)	WF (MIN.)
4'-0"	8"	2'-6"
6'-0"	8"	3'-6"
8'-0"	8"	4'-0"
10'-0"	10"	4'-9"

SPAN (S)	A510 BARS (MIN.)		
	SKEW		
	0°-15°	16°-30°	31°-45°
6'-0"	(6) - #6	(6) - #6	(6) - #6
7'-0"	(6) - #6	(6) - #6	(6) - #7
8'-0"	(6) - #6	(6) - #7	(6) - #8
10'-0"	(6) - #7	(6) - #8	(6) - #8

DESIGNER NOTE:

SEE STANDARD 36.02 FOR DESIGNER NOTES.

PROVIDE "BOX CULVERT APRON DATA" TABLE ON CONTRACT PLANS WHEN A PRECAST ONLY DESIGN IS PROVIDED.

PRECAST WINGS, HEADERS, AND CUTOFF WALLS FOR PRECAST CONCRETE BOX CULVERT



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