

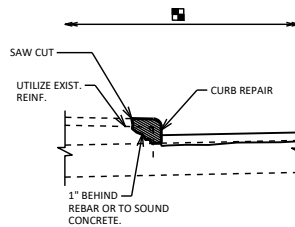
PARAPET REPAIR DETAIL

| | | |
|----------|-------------------------------------|----|
| 502.3215 | PROTECTIVE SURFACE TREATMENT RESEAL | SY |
| 502.3205 | PIGMENTED SURFACE SEALER RESEAL | SY |
| 509.1500 | CONCRETE SURFACE REPAIR | SF |

NOTES

PROTECTIVE SURFACE TREATMENT RESEAL SHALL BE APPLIED TO THE (INSERT LOCATIONS). SURFACE PREPARATION IS INCLUDED IN THE BID ITEM "PROTECTIVE SURFACE TREATMENT RESEAL"

PIGMENTED SURFACE SEALER RESEAL SHALL BE APPLIED TO THE (INSERT LOCATIONS). SURFACE PREPARATION IS INCLUDED IN THE BID ITEM "PIGMENTED SURFACE SEALER RESEAL"



CURB REPAIR DETAIL

| | | |
|----------|-------------------------------------|----|
| 502.3215 | PROTECTIVE SURFACE TREATMENT RESEAL | SY |
| 509.1200 | CURB REPAIR | LF |

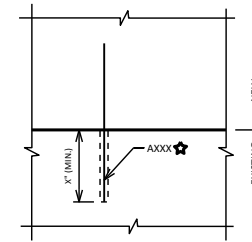
DESIGNER NOTES

DETAILS MAY BE SHOWN ON PLANS IF NECESSARY FOR CLARITY.

INCLUDE APPLICABLE CONCRETE MASONRY BID ITEM TO FILL REPAIRS.

REFER TO STANDARD 17.02 FOR TYPICAL SEALING LOCATIONS.

THE "RESEAL" QUANTITY SHOULD INCLUDE THE REPAIRED CONCRETE SURFACES. FOR EXAMPLE, "PIGMENTED SURFACE SEALER RESEAL" SHOULD BE APPLIED TO THE EXISTING AND REPAIRED PARAPET SURFACES, AS SHOWN.



ANCHOR DETAIL (EXAMPLE)

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

DESIGNER NOTES

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

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

NOTE

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

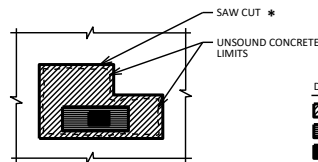
★ (CHOOSE ONE OF THE FOLLOWING AND PLACE ON PLAN)

ADHESIVE ANCHORS X/X-INCH.
EMBED "X" IN CONCRETE.

ADHESIVE ANCHORS NO. X BAR.
EMBED "X" IN CONCRETE.

ADHESIVE ANCHORS X/X-INCH.
EMBED "XX" IN CONCRETE.
ANCHORS SHALL BE APPROVED FOR
USE IN CRACKED CONCRETE.

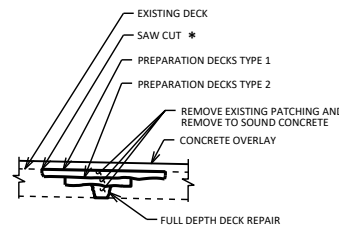
ADHESIVE ANCHORS NO. X BAR.
EMBED "XX" IN CONCRETE.
ANCHORS SHALL BE APPROVED FOR
USE IN CRACKED CONCRETE.



DECK REPAIR DETAIL - PLAN

FOR DESIGNER INFORMATION ONLY
(DO NOT PLACE ON PLANS)

| | | |
|--------------|--|----|
| 509.0301 | PREPARATION DECKS TYPE 1 | SY |
| 509.0302 | PREPARATION DECKS TYPE 2 | SY |
| ★ 509.0310.S | SAWING PAVEMENT DECK PREPARATION AREAS | LF |
| 509.2000 | FULL-DEPTH DECK REPAIR | SY |
| ▲ 509.2500 | CONCRETE MASONRY OVERLAY DECKS | CY |



DECK REPAIR DETAIL - SECTION

FOR DESIGNER INFORMATION ONLY
(DO NOT PLACE ON PLANS)



FULL-DEPTH DECK REPAIR DETAIL

FOR DESIGNER INFORMATION ONLY
(DO NOT PLACE ON PLANS)

| | | |
|--------------|--|----|
| ★ 509.0310.S | SAWING PAVEMENT DECK PREPARATION AREAS | LF |
| 509.2000 | FULL-DEPTH DECK REPAIR | SY |
| ▲ 509.2500 | CONCRETE MASONRY OVERLAY DECKS | CY |

DESIGNER NOTES

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

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

▲ USE "CONCRETE MASONRY DECK REPAIR" (509.2100.S) FOR DECK REPAIRS UNDER POLYMER, ASPHALTIC, OR POLYMER MOD. ASPHALTIC OVERLAYS. USE "CONCRETE MASONRY DECK REPAIR" FOR DECK REPAIRS WITHOUT OVERLAYS.

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

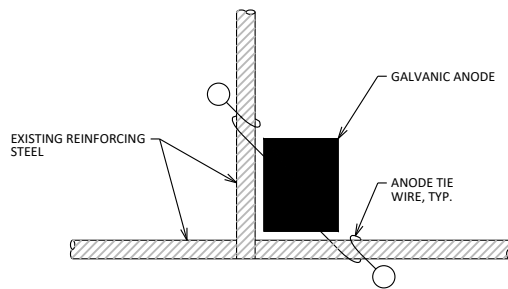
CONCRETE REPAIR DETAILS



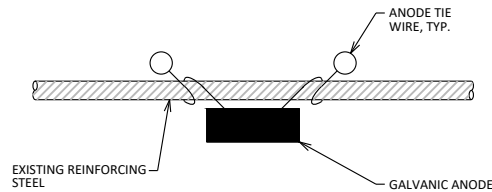
**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

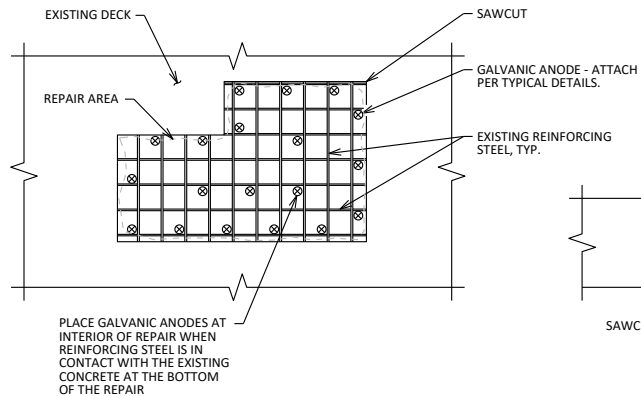
DATE:
7-23



**TYPICAL INSTALLATION AT
BAR STEEL INTERSECTION**

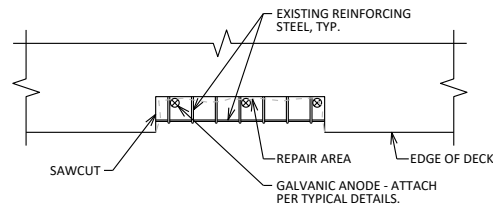


**TYPICAL INSTALLATION
FOR BAR STEEL**



PART. PLAN TYPICAL REPAIR DETAIL

| | | |
|----------|--------------------------|------|
| 509.1500 | CONCRETE SURFACE REPAIR | SF |
| SPV.0060 | EMBEDDED GALVANIC ANODES | EACH |



NOTES

SURFACE REPAIR AREAS WITH CATHODIC PROTECTION ARE BASED ON THE PLANS AND AS DETERMINED BY THE ENGINEER. THE PLAN QUANTITY FOR THE BID ITEM "EMBEDDED GALVANIC ANODES" IS BASED ON A MAXIMUM SPACING OF 24-INCHES AROUND THE SURFACE REPAIR PERIMETER. THE ACTUAL QUANTITY SHALL BE BASED ON THE FIELD CONDITIONS AND AS RECOMMENDED BY THE GALVANIC ANODE SUPPLIER.

SURFACE REPAIRS SHALL BE FILLED WITH REPAIR MATERIALS COMPATIBLE WITH CATHODIC PROTECTION, AS RECOMMENDED BY THE ANODE SUPPLIER.

EXISTING REINFORCING STEEL TO BE COMPLETELY CLEANED OF CORRODED MATERIAL AND CONCRETE TO PROVIDE SUFFICIENT ELECTRICAL CONNECTION AND BOND. CATHODIC PROTECTION PREPARATIONS ARE INCLUDED IN THE BID ITEM "EMBEDDED GALVANIC ANODES".

ANODES NEAREST TO EDGE OF REPAIR TO BE WITHIN 6" OF EDGE.

AFTER PLACEMENT, GALVANIC ANODES SHOULD MAINTAIN A MINIMUM TOP COVER OF $1\frac{1}{4}$ " AND A MINIMUM BOTTOM COVER OF $\frac{3}{4}$ "

DESIGNER NOTES

CATHODIC PROTECTION SHALL BE USED ONLY AT THE REQUEST OF THE REGIONAL BRIDGE MAINTENANCE ENGINEER.

INCLUDE APPLICABLE CONCRETE MASONRY BID ITEM TO FILL REPAIRS.

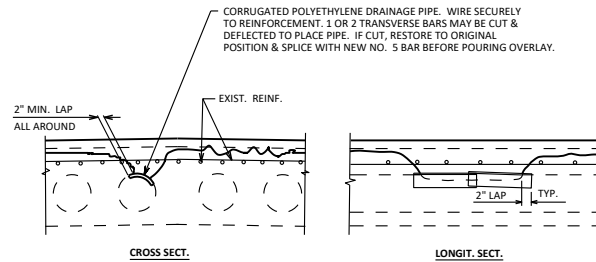
CATHODIC PROTECTION



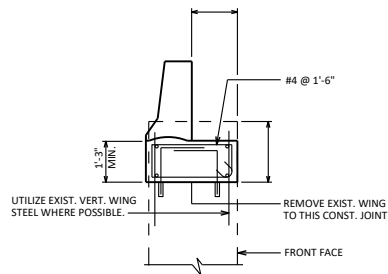
**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

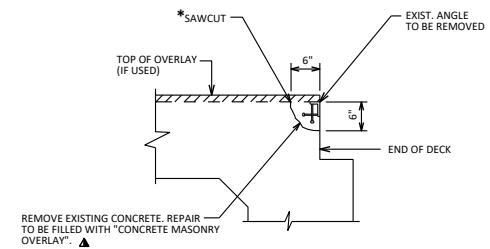
DATE:
1-21



RUPTURED VOID REPAIR



SECTION THRU PARAPET ON WING



SECTION AT END OF SLAB

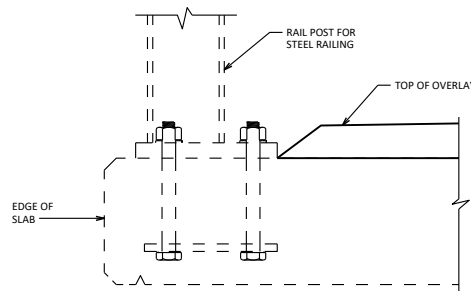
| | | |
|--------------|--|----|
| 509.0301 | PREPARATION DECKS TYPE 1 | SY |
| 509.0302 | PREPARATION DECKS TYPE 2 | SY |
| * 509.0310.5 | SAWING PAVEMENT DECK PREPARATION AREAS | LF |
| 509.2000 | FULL-DEPTH DECK REPAIR | SY |
| ▲ 509.2500 | CONCRETE MASONRY OVERLAY DECKS | CY |

DESIGNER NOTES

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

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

PROVIDE (IF AVAILABLE) THE MOST CURRENT DECK CONDITION ASSESSMENT SURVEY ON PLANS. INCLUDE SURVEY TYPE AND DATE COMPLETED. THERMOGRAPHY DATA CAN BE FOUND IN HSIS WITHIN GENERAL INVENTORY/FILE/INSPECTION/DATE/INSPECTION SPECIAL REPORT. DECK CONDITION ASSESSMENT SURVEY DATES CAN BE FOUND WITHIN INSPECTION/HISTORY UNDER THE "DEVAL" ACTIVITY TYPE.



SECTION THRU RAILING

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

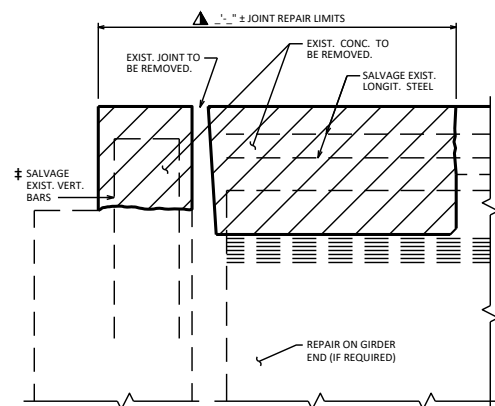
OVERLAY DETAILS



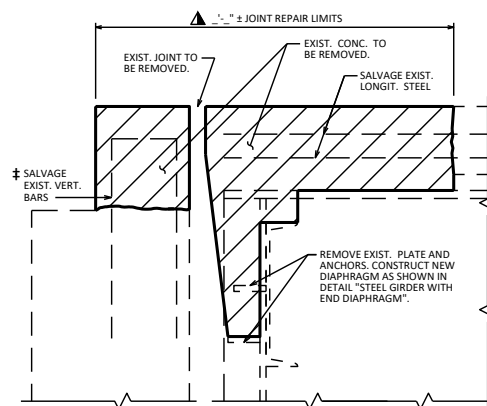
BUREAU OF STRUCTURES

APPROVED: *Laura Shadewald*

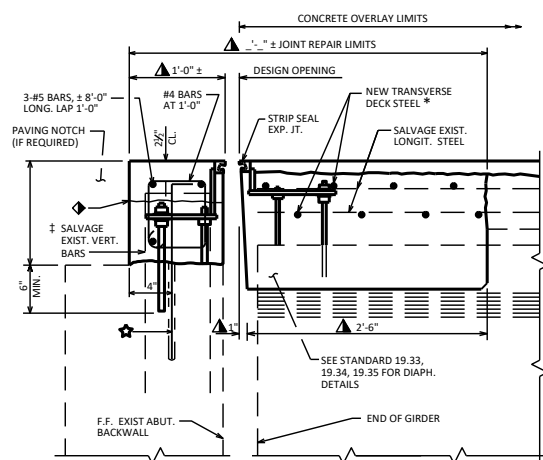
DATE:
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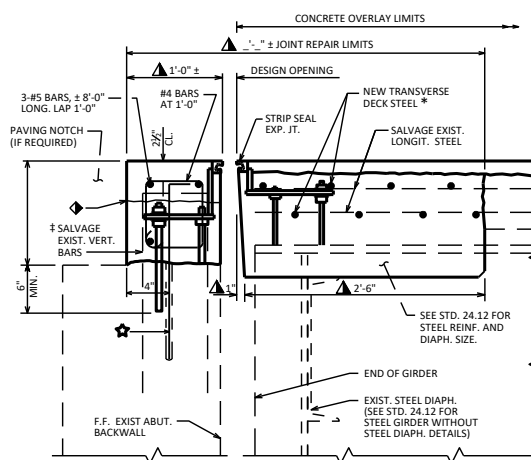
**JOINT REPAIR-REMOVAL
PRESTRESSED GIRDER**



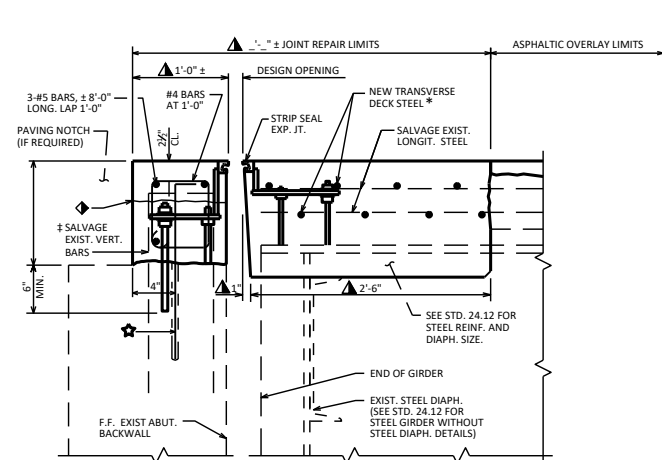
**JOINT REPAIR-REMOVAL
STEEL GIRDER**



**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 | LF | |
| 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.

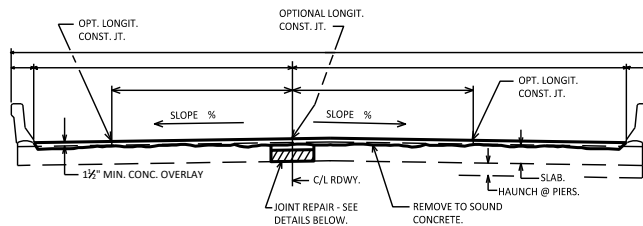
STRIP SEALS & DIAPH. DETAILS FOR OVERLAYS



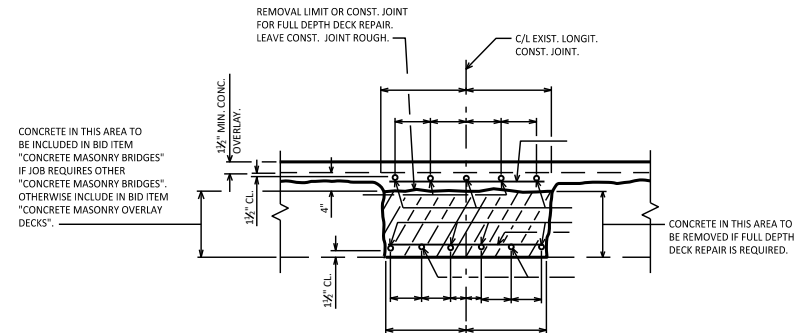
**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

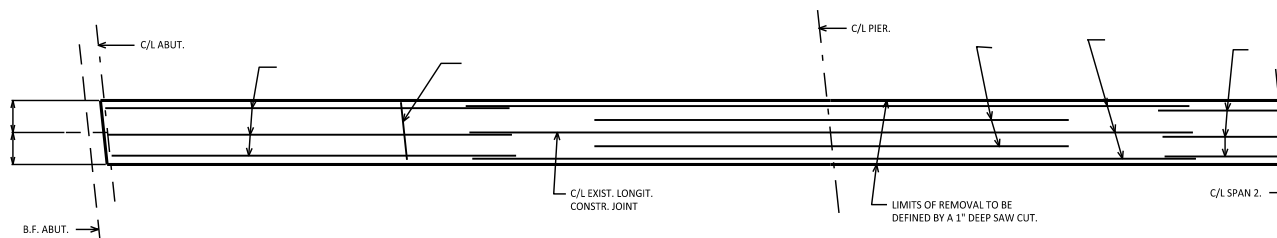
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7-24



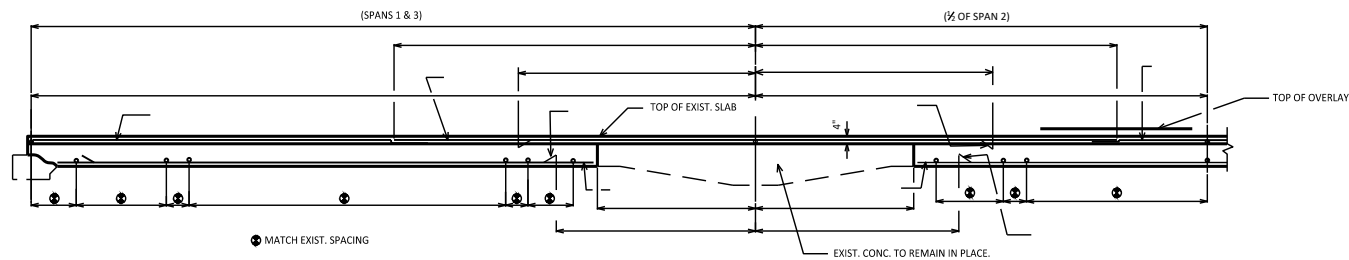
CROSS SECTION THRU ROADWAY LOOKING EAST



TYP. SECTION THRU JOINT



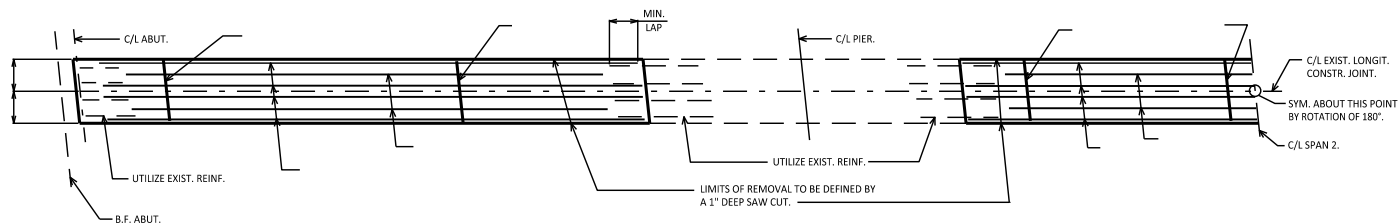
HALF PLAN SHOWING TOP BAR STEEL REINF.



HALF LONGIT. SECTION

TOTAL ESTIMATED QUANTITIES

| BID ITEMS | |
|--|----|
| JOINT REPAIR | SY |
| BAR STEEL REINFORCEMENT HS COATED STRUCTURES | LB |
| CONCRETE MASONRY BRIDGES | CY |
| CONCRETE MASONRY OVERLAY DECKS | CY |



HALF PLAN SHOWING BOTTOM BAR STEEL REINF

(REQUIRED ONLY FOR FULL DEPTH DECK REPAIR)

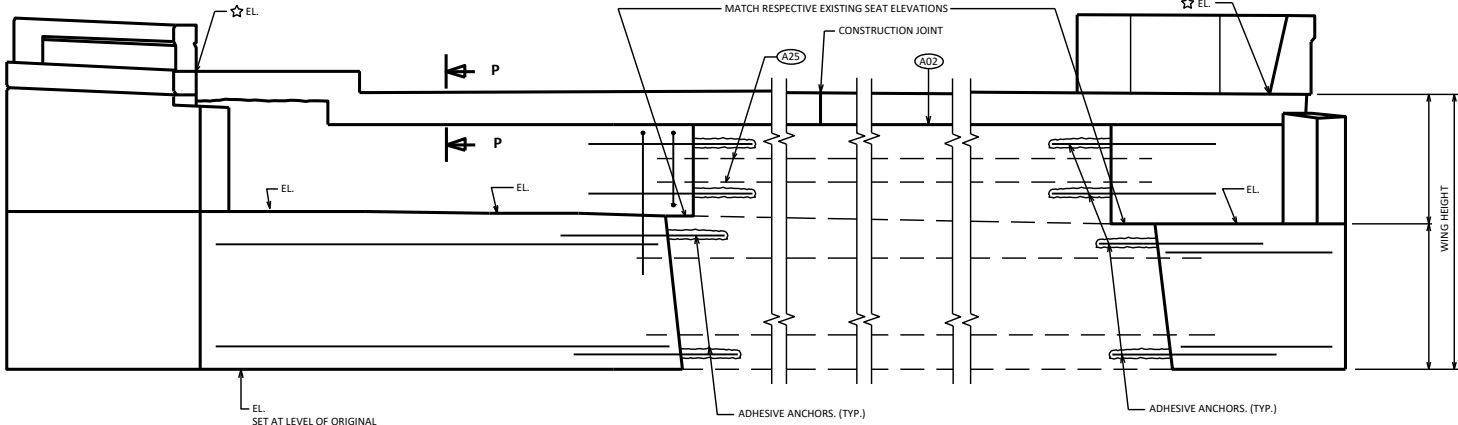
LONGIT. CONST. JOINT REPAIRS



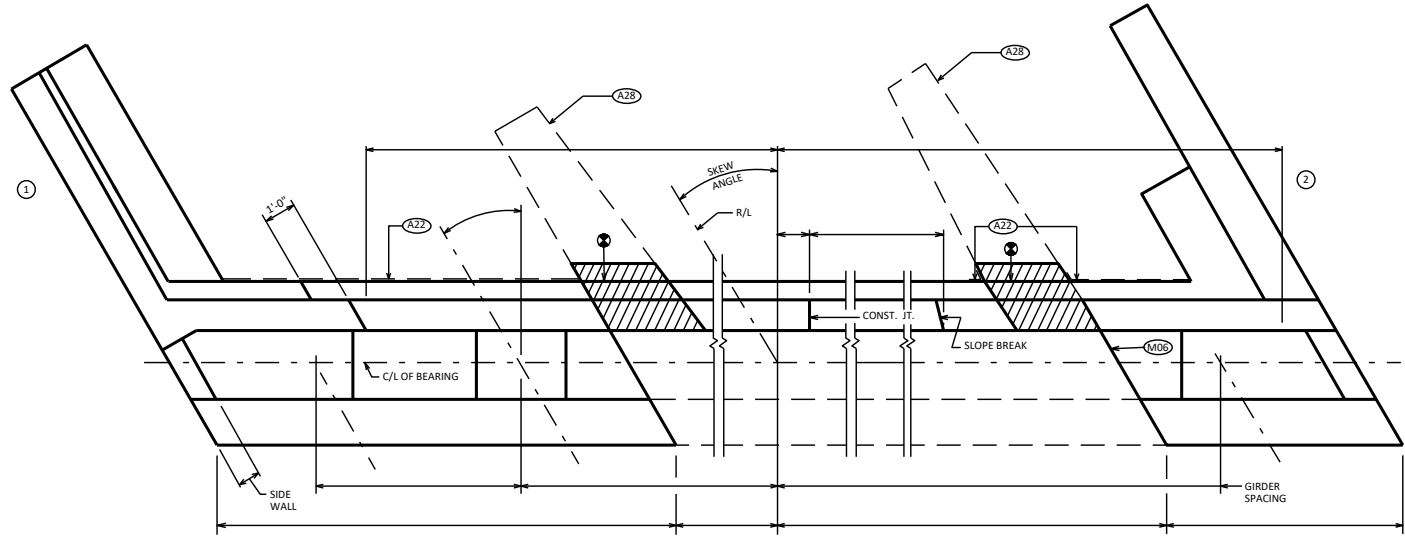
BUREAU OF STRUCTURES

APPROVED: *Laura Shadewald*

DATE:
7-16

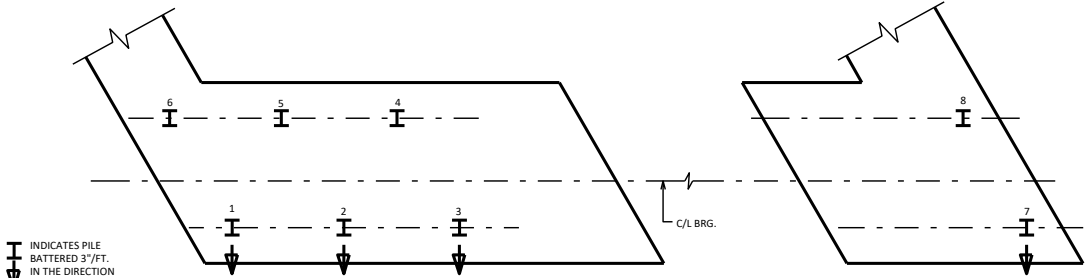


ELEVATION

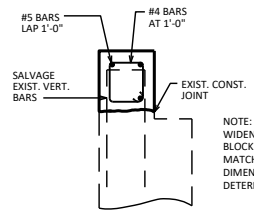


WING WITHOUT PILE

WING WITH PILE



PILE PLAN



SECTION P-P

SEE STANDARD 40.04 FOR ADDITIONAL DETAILS

NOTE:
WIDENED PORTION OF PAVING
BLOCK DIMENSIONS SHALL
MATCH EXISTING PLAN
DIMENSIONS UNLESS DESIGNER
DETERMINES OTHERWISE.

NOTES

- (A02) CONSTRUCTION JOINT: POUR CONCRETE ABOVE THIS JOINT AFTER SUPERSTRUCTURE CONCRETE IS IN PLACE. STRIKE OFF AND LEAVE ROUGH.
- (A22) 18" (RMW) RUBBERIZED MEMBRANE WATERPROOFING SEAL ALL HORIZ. & VERT. JOINTS AT BACKFACE.
- (A25) SALVAGE EXIST. REINF. & EXTEND FULL LENGTH INTO NEW WORK.
- (M05) ROUGHEN SURFACE OF CONCRETE 1/2" DEEP MINIMUM AT ALL AREAS WHERE NEW CONCRETE CONTACTS EXISTING CONCRETE.
- (A28) EXISTING WINGS. REMOVE A MIN. OF 2'-0" BELOW FINISHED GRADE.
- ☆ ELEV. @ F.F. ABUT. BACKWALL AND GUTTERLINE.
- ⊗ REMOVE CONC. IN THIS AREA DOWN TO EXIST. BRIDGE SEAT. INCORPORATE EXIST. BAR STEEL INTO NEW WORK.

DESIGNER NOTES

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

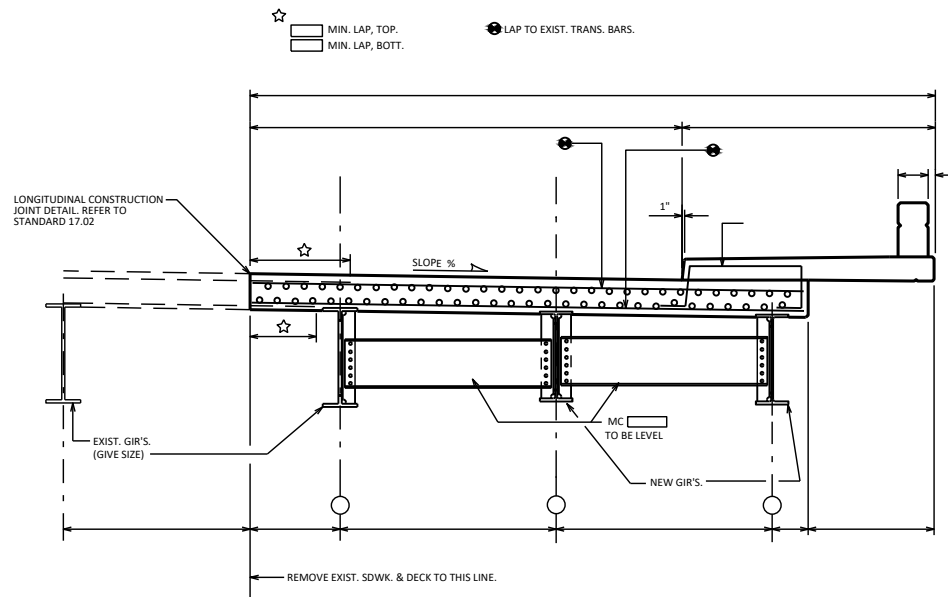
ABUTMENT WIDENING



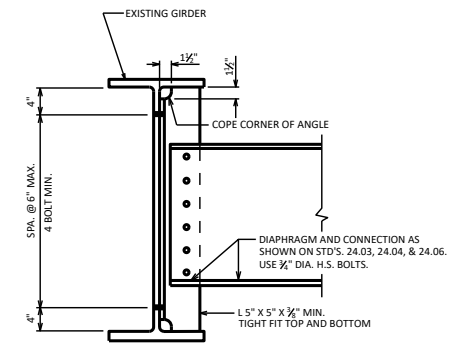
BUREAU OF STRUCTURES

APPROVED: *Laura Shadewald*

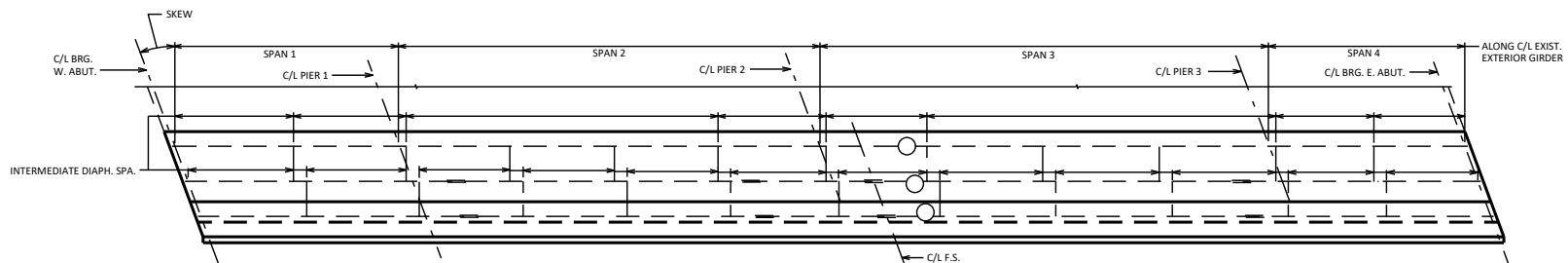
DATE:
7-19



CROSS SECT. THRU RDWY.



DIAPHRAGM CONNECTION TO EXISTING STEEL GIRDER



PLAN

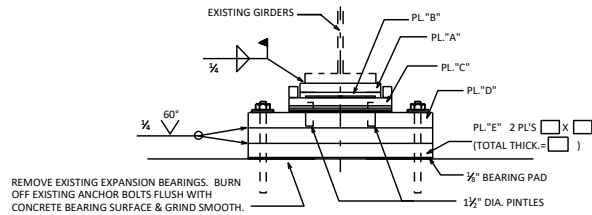
SLAB WIDENING



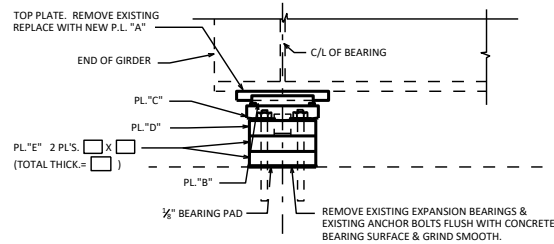
BUREAU OF STRUCTURES

APPROVED: *Laura Shadewald*

DATE:
7-16



FRONT ELEVATION



SIDE ELEVATION

EXPANSION BEARING REPLACEMENT - STEEL GIRDERS

STEEL BEARINGS

SEE STANDARD 27.08 FOR BEARING DETAILS

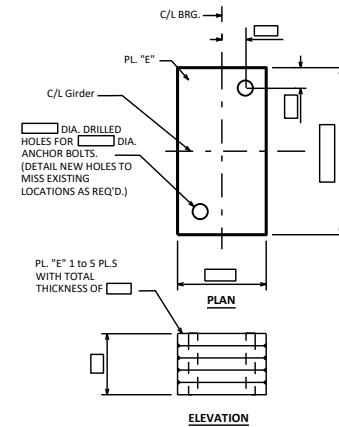
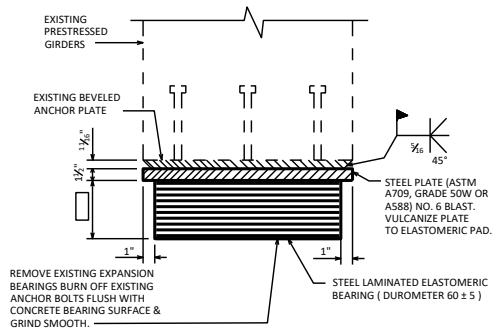
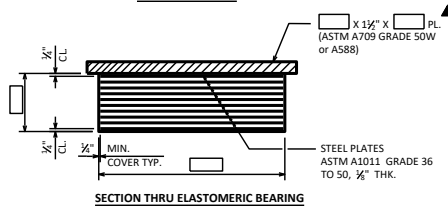


PLATE 'E' DETAILS

(SEE STD. 40.10 FOR CONCRETE BLOCK ALTERNATE)



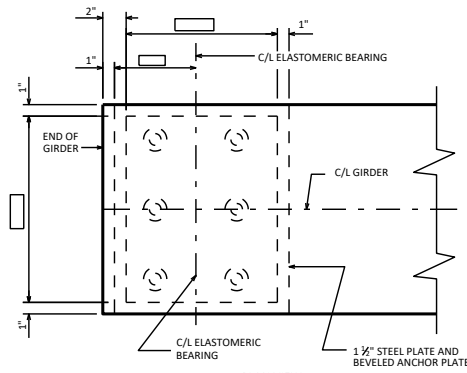
FRONT ELEVATION



SECTION THRU ELASTOMERIC BEARING

EXPANSION BEARING REPLACEMENT - PRESTRESSED GIRDERS

ELASTOMERIC BEARINGS



PLAN VIEW

NOTES

ALL MATERIAL USED FOR BEARINGS SHALL BE PAID AT THE UNIT PRICE BID FOR "BEARING PADS ELASTOMERIC LAMINATED."

GRIND EXIST. WELD THAT ATTACHED EXIST. TOP PLATE TO EXIST. BOT. FLANGE. GRIND AFFECTED AREAS SMOOTH.

DESIGNER NOTES

THE STEEL TOP PLATE THICKNESS MAY BE REDUCED (1/8" MIN.) TO MATCH THE OVERALL EXISTING BEARING HEIGHT. WHEN THE THICKNESS IS REDUCED, THE FOLLOWING NOTE SHALL BE LOCATED ON THE PLANS:

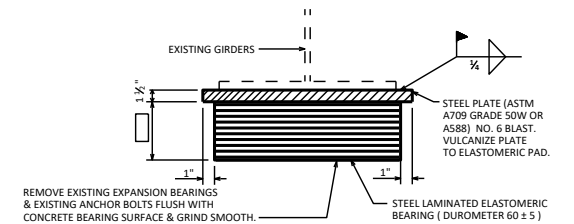
"WELDING PROCEDURES SHALL BE ESTABLISHED BY THE CONTRACTOR TO RESTRICT THE MAXIMUM TEMPERATURE REACHED BY SURFACES IN CONTACT WITH ELASTOMER TO 200°F (93°C). TEMPERATURES SHALL BE CONTROLLED BY TEMPERATURE INDICATING WAX PENCILS OR OTHER SUITABLE MEANS APPROVED BY THE ENGINEER."

TOP STEEL PLATE MAY NOT BE OMITTED.

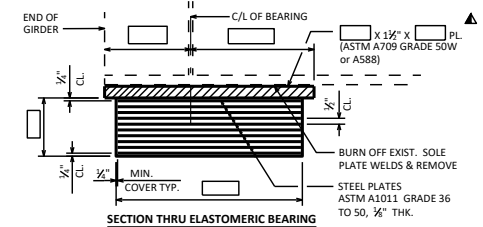
▲ CHECK 27.2.1. ELASTOMERIC BEARINGS IN THE BRIDGE MANUAL FOR REQUIREMENTS TO SEE IF THIS PLATE SHOULD BE TAPERED.

DO NOT INCLUDE PRESTRESSED GIRDER SHRINKAGE WHEN DESIGNING BEARINGS FOR BRIDGE REHABILITATION PROJECTS.

SEE STANDARD 27.07 FOR ADDITIONAL INFORMATION.



FRONT ELEVATION



SECTION THRU ELASTOMERIC BEARING

EXPANSION BEARING REPLACEMENT - STEEL GIRDERS

ELASTOMERIC BEARINGS

NOTES & DESIGNER NOTES

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

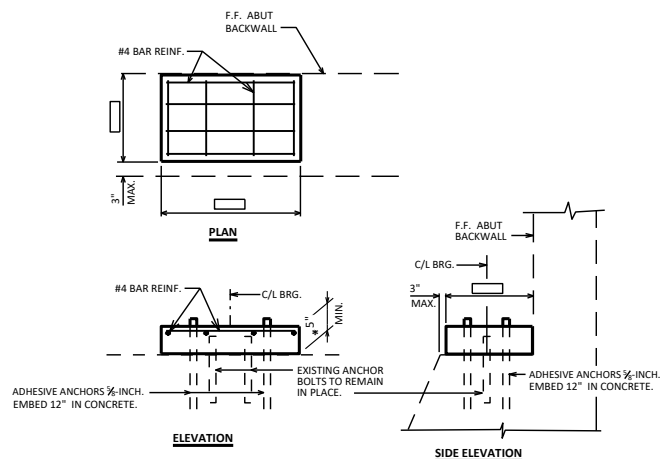
EXPANSION BEARING REPLACEMENT DETAILS



BUREAU OF
STRUCTURES

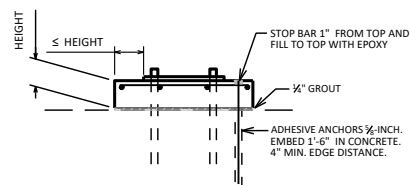
APPROVED: *Laura Shadewald*

DATE:
1-22



CONCRETE BEARING BLOCK DETAILS

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



PRECAST CONCRETE BLOCK DETAIL

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

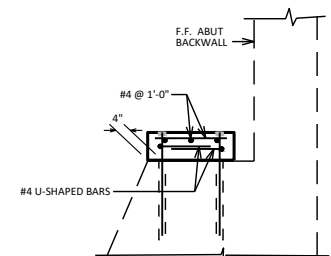
ANCHOR IN AT LEAST 4 LOCATIONS (ANCHORS INCLUDE ADHESIVE ANCHORS, ANCHOR BOLTS OR COMBINATION).

GROUT 1/2" BENEATH PRECAST ELEMENT - ELIMINATE STRESS CONCENTRATION AND REDUCE CRACKING.

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

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

BURN EXISTING ANCHOR BOLTS OFF FLUSH WITH BEAM SEAT.



*ALTERNATE DETAIL

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

GIRDER REACTIONS AT BEARINGS (KIPS)

| | | C/L BRG. [SUPPORT NAME] | C/L BRG. [SUPPORT NAME] | C/L BRG. [SUPPORT NAME] |
|-----------------|----|----------------------------|----------------------------|----------------------------|
| INTERIOR GIRDER | DL | | | |
| | LL | | | |
| EXTERIOR GIRDER | DL | | | |
| | LL | | | |

NOTES

THE THEORETICAL SERVICE LOADS (UNFACTORED) SHOWN IN THE TABLE ARE BASED ON THE BRIDGE IN ITS FINAL CONFIGURATION. ADDITIONAL LOAD RESULTING FROM STAGING AND/OR CONTRACTOR OPERATIONS, SUCH AS UNEVEN JACKING OF ADJACENT GIRDERS OR ADJACENT SUBSTRUCTURE UNITS, IS NOT INCLUDED.

THE LL REACTIONS ARE BASED ON (HS-20/HL-93) AND INCLUDE IMPACT.

EXTERIOR GIRDER DEAD LOAD REACTIONS WERE INCREASED 10% TO ACCOUNT FOR VARIABILITY IN COMPOSITE DL DISTRIBUTION METHODS.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ADEQUACY OF THE GIRDER AT THE JACKING LOCATION.

DESIGNER NOTES

THE BID ITEM FOR JACKING GIRDERS AND REMOVING EXISTING BEARINGS IS STSP "REMOVING BEARINGS".

THE BID ITEM FOR JACKING BRIDGES ONLY IS STSP "BRIDGE JACKING".

ADD 10% TO THE EXTERIOR GIRDER DL TO ACCOUNT FOR VARIABILITY IN COMPOSITE DL DISTRIBUTION METHODS.

INDICATE WHETHER HS-20 OR HL-93 LOADING WAS USED TO DETERMINE THE LL REACTIONS, WHICH INCLUDE IMPACT.

DO NOT INCLUDE LL REACTIONS FOR JACKING SITUATIONS THAT WILL NOT BE UNDER TRAFFIC.

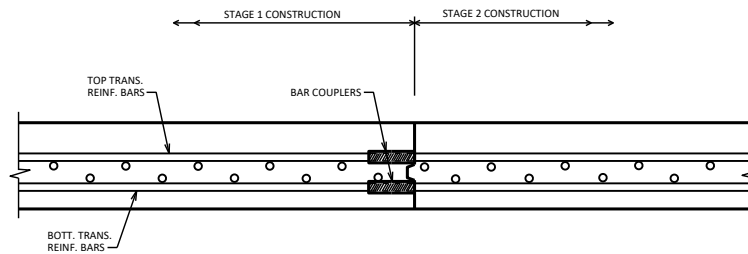
CONCRETE BEARING BLOCK DETAILS



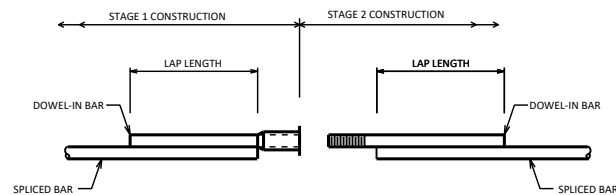
BUREAU OF STRUCTURES

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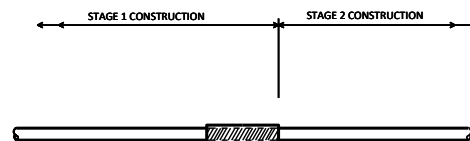
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SECTION THRU DECK
ONE-PIECE THREADED COUPLER SHOWN



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.

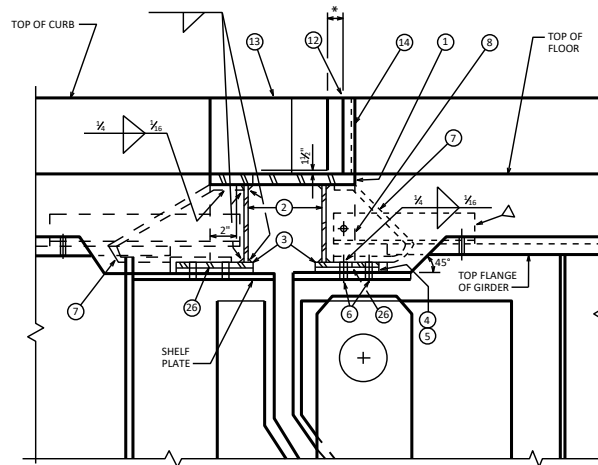
BAR SPLICER (COUPLER) DETAILS AT STAGE CONSTRUCTION



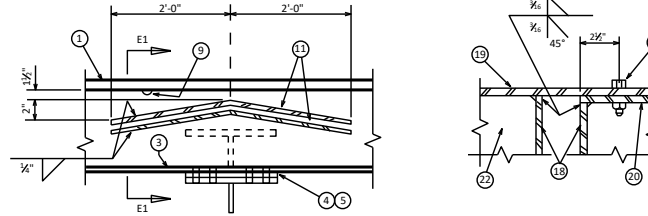
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STRUCTURES**

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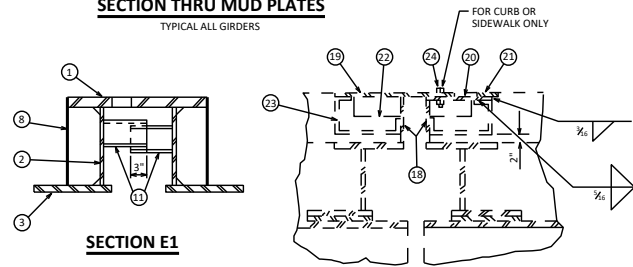
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SECTION THRU JOINT
MUD PLATES NOT SHOWN

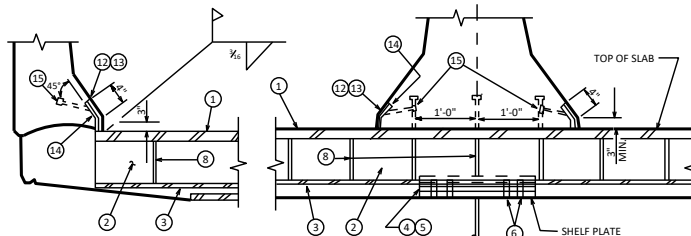


SECTION THRU MUD PLATES
TYPICAL ALL GIRDERS



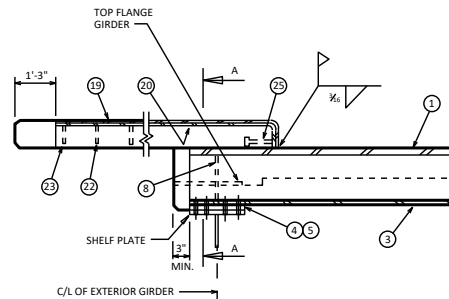
SECTION E1

SECTION A-A

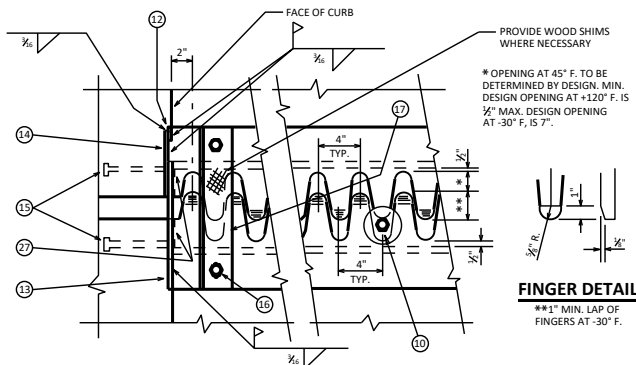


DETAIL AT PARAPET

DETAIL AT MEDIAN



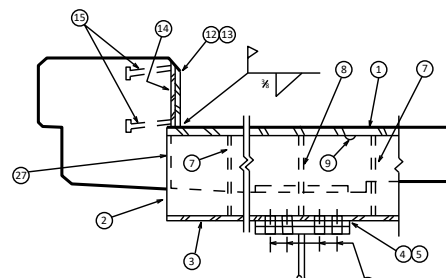
SECTION THRU SIDEWALK



PART PLAN OF FINGER PLATE AT BRUSH CURB

NO SKEW

FINGER DETAIL
**1" MIN. LAP OF FINGERS AT -30° F.



SECTION THRU JOINT AT BRUSH CURB
MUD PLATES NOT SHOWN
ANGLE 3 1/2" X 3 1/2" X 3/8" FIELD DRILL 3/8" DIA. ERECTION BOLT HOLES OR WELD TO STIFFENER OR TOP FLG.

LEGEND

1. FINGER PLATE. SIZE TO BE DETERMINED BY DESIGN.
2. WEB PLATE. SIZE TO BE DETERMINED BY DESIGN.
3. FLANGE PLATE. SIZE TO BE DETERMINED BY DESIGN.
4. BEVELED SHIM PLATE 3/8" THICK. 1/2" DIA. HOLES FOR NO. 6.
5. 3/4" LAMINATED SHIM WITH SLOTTED OPENINGS.
6. 3/4" DIA. ERECTION BOLTS. DRILL HOLES IN SHELF PLATE IN THE FIELD.
7. ANCHOR BAR 3/4" DIA. AT 1'-0" CENTERS. BEND AS SHOWN.
8. STIFFENER BAR 3/4" THICK. 1/2" FILLET WELD ALL AROUND. PLACE AT C/L OF GIRDER AND AT 2'-0" CENTERS BETWEEN GIRDERS.
9. 3/4" VENT HOLES AT 3'-0" CENTERS.
10. 3/4" DIA. ADJUSTING BOLT AT APPROX. 4'-0" CENTERS WITH TWO 3/8" DIA. X 3/4" PLATE WASHERS. ONE ON EACH SIDE OF FINGER PLATE.
11. MUD PLATE 3/4" THICK.
12. 3/8" PLATE. BEND AS SHOWN.
13. 3/8" PLATE. BEND AS SHOWN.
14. 3/8" PLATE. BEND AS SHOWN.
15. 3/8" DIA. STUDS X 6 1/2" LONG. WELD TO PLATES NO. 13 AND NO. 14.
16. 3/4" DIA. BOLT FOR SHIPPING. TACK WELD NUT TO BOTTOM OF PLATE NO. 1.
17. 3" DIA. X 3" DIA. X 3/4" X 5'-0" SPACING. SLOTTED HOLE 3/4" X 2 1/2" IN ONE END OF ANGLE AS SHOWN. FOR BOLT NO. 16.
18. CLOSING PLATE 3/8" CUT AS SHOWN. SEE WELD DETAIL.
19. 3/8" PLATE. BEND AS SHOWN.
20. 3/8" PLATE. BEND AS SHOWN.
21. 3/8" PLATE. BEND AS SHOWN.
22. 3/8" PLATE. WELD ALL AROUND, 1/2" FILLET WELD TO PLATES NO. 18, 19, AND 20.
23. 3/4" DIA. STUDS X 6 1/2" LONG. BEND AFTER WELD.
24. 3/4" DIA. BOLT WITH SQ. NUT. GREASE FOR EASY REMOVAL. 3/4" X 1 1/2" SLOTTED HOLE IN PL. NO. 19. LONG DIMENSION OF HOLE PARALLEL TO C/L OF ROADWAY. TACK WELD NUT TO PLATE NO. 20 AT 2'-0" SPA.
25. 3/8" DIA. STUDS X 6 1/2" LONG. WELD TO PLATE NO. 20.
26. FLANGE PLATE. SAME THICKNESS AS PLATE NO. 3 AND SAME WIDTH AS SHELF PLATE. SHOP BUTT WELD TO PLATE NO. 3.
27. 3/8" CLOSING PLATE. WELD TO PLATES NO. 1 AND NO. 2.

NOTES

REMOVE ANGLE NO. 17 AND ADJUSTING BOLT NO. 10 AFTER VERTICAL AND HORIZONTAL ALIGNMENT IS SECURE IN FIELD. FILL HOLES WITH HOT POURED JOINT SEALER.

IN SOME CASES THE GIRDER FLANGES AND WEB PLATES DO NOT HAVE TO BE CUT TO ACCOMMODATE THE FINGER JOINT SECTION, THE SLAB DEPTH MAY BE UTILIZED EFFECTIVELY.

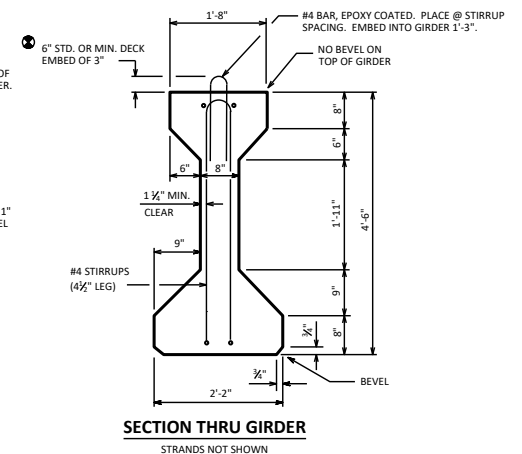
FINGER TYPE EXPANSION JOINT - PLATE GIRDER



BUREAU OF STRUCTURES

APPROVED: *Laura Shadewald*

DATE:
7-16



SUPPORT WITH
1/2" ELASTOMERIC BRG. PAD

DESIGNER NOTES

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

SPECIFY CONCRETE STRENGTH AS REQUIRED BY DESIGN FROM A MINIMUM OF 6,000 PSI TO A MAX. OF 8,000 PSI. MAXIMUM RELEASE STRENGTH IS 6800 PSI. USE 0.5" DIA. OR 0.6" DIA. STRANDS FOR ALL PATTERNS AS REQUIRED. THE MAX. NUMBER OF DRAPED 0.5" DIA. STRANDS IS 12 AND THE MAX. NUMBER FOR 0.6" DIA. STRANDS IS 10.

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

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

⊖ DETAIL TYPICAL AT EACH END

✖ THE DESIGN ENGINEER DETERMINES THIS VALUE BASED ON 2" MIN. HAUNCH AT EDGE OF GIRDER, X-SLOPE, PROFILE GRADE LINE AND CALCULATED RESIDUAL GIRDER CAMBER, INCLUDING THE CAMBER MULTIPLIER OF 1.4. THIS VALUE CAN VARY AND SHOULD BE GIVEN FOR EACH 1/3 OF THE GIRDER LENGTH. PROVIDE VALUES THAT MAINTAIN 3" MIN. DECK EMBEDMENT AND $2\frac{1}{2}$ " CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR $\pm\frac{1}{8}$ " VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

NOTES

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

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

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

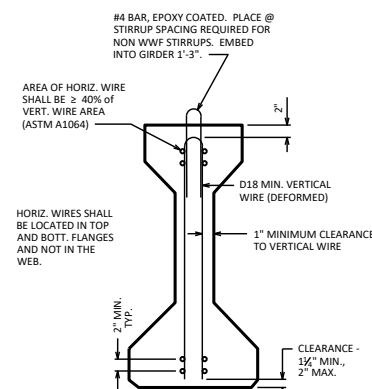
STRANDS SHALL BE FLUSH WITH END OF GIRDER. FOR GIRDER ENDS EMBEDDED COMPLETELY IN CONCRETE, END OF STRANDS SHALL BE COATED WITH NON-BITUMINOUS JOINT SEALER. FOR GIRDER ENDS THAT ARE FINALLY EXPOSED, COAT THE GIRDER ENDS, EXPOSED STRAND ENDS AND ALL NON-BONDING SURFACES WITHIN 2 FEET OF THE GIRDER ENDS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

ALL GIRDERS SHALL BE CAST FULL LENGTH AS SHOWN.

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

AN ALTERNATE EQUIVALENT OF WELDED WIRE FABRIC (WWF) ASTM A1064 MAY BE SUBSTITUTED FOR THE STIRRUP REINFORCEMENT SHOWN, UPON APPROVAL OF THE STRUCTURES DEVELOPMENT SECTION.

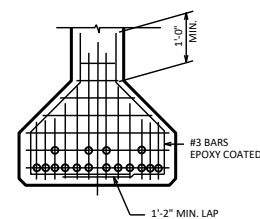
PRESTRESSING STRANDS SHALL BE (DIA.)-7-WIRE LOW RELAXATION STRANDS WITH AN ULTIMATE STRENGTH OF 270,000 PSI.



LOCATION OF DRAPED STRANDS

SECTION THRU GIRDER

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



DETAIL A

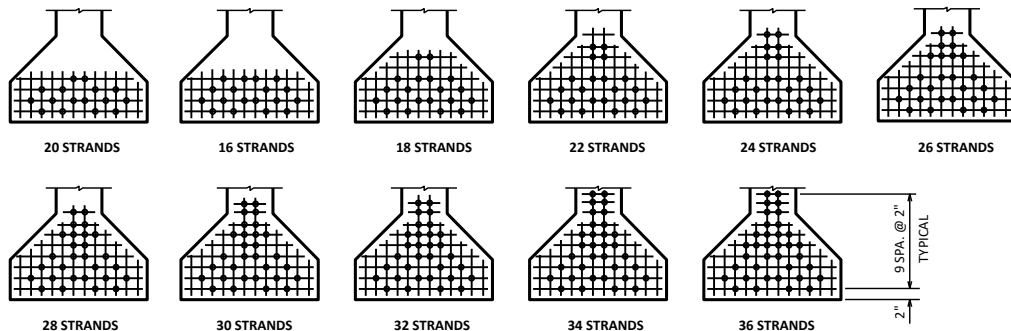
54" PRESTRESSED GIRDER DETAILS



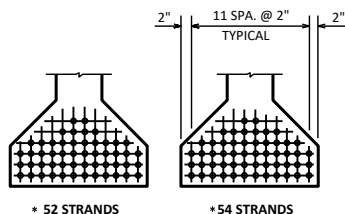
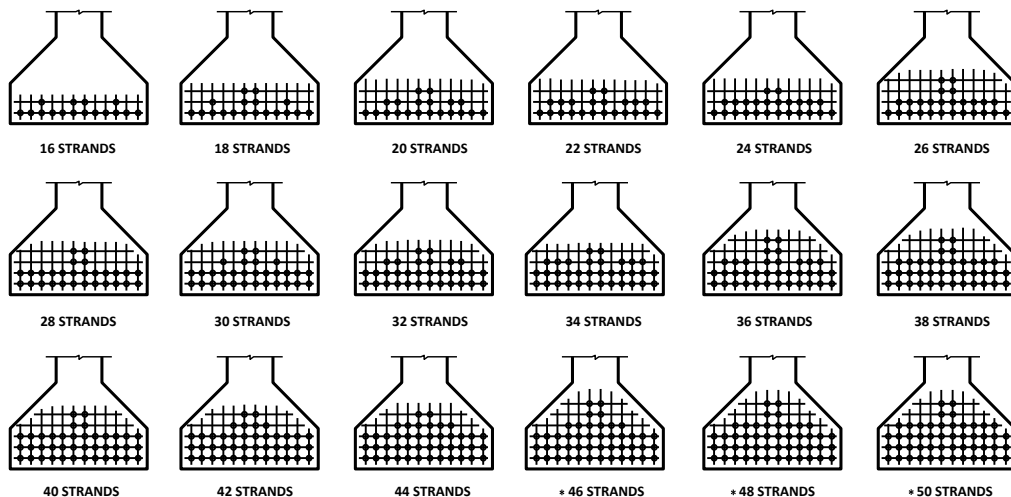
BUREAU OF STRUCTURES

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DATE:
7-23



**STANDARD ARRANGEMENTS TO RAISE CENTER OF GRAVITY
TO AVOID DRAPING OF 0.5" DIA. AND 0.6" DIA. STRANDS**



ARRANGEMENT AT C/L SPAN - FOR GIRDERS WITH DRAPED 0.5" DIA. AND 0.6" DIA. STRANDS

* 0.5" DIA. STRANDS ONLY

54" GIRDER

$$A = 789 \text{ SQ. IN.}$$

$$r^2 = 330.46 \text{ IN.}^2$$

$$y_T = 29.27 \text{ IN.}$$

$$y_B = -24.73 \text{ IN.}$$

$$I = 260,730 \text{ IN.}^4$$

$$S_T = 8,908 \text{ IN.}^3$$

$$S_B = -10,543 \text{ IN.}^3$$

$$\text{WT.} = 822 \text{ \#/FT.}$$

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.

$$\text{PI PER 0.5" DIA. STRAND} = 0.1531 \times 202,500 = \underline{31.00 \text{ KIPS}}$$

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

(5)

$$f_b \text{ (INIT.)} = \frac{(4)}{(3)} \text{ (K/SQ. IN.)}$$

$$\frac{y_B}{r^2} = \frac{-24.73}{330.46} = -0.07484 \text{ IN./IN.}^2$$

(COMPRESSION IS POSITIVE)

| N NO. STRANDS | (1) e_s (INCHES) | (2) $(1 + \frac{e_s y_B}{r^2})$ | (3) $(A/(2))$ (SQ. IN.) | (4) $P(\text{INIT.}) = A_s f_s$ 0.5" DIA. STRANDS (KIPS) | (4) $P(\text{INIT.}) = A_s f_s$ 0.6" DIA. STRANDS (KIPS) | (5) $f_b \text{ (INIT.)} = (4)/(3)$ 0.5" DIA. STRANDS (K/SQ. IN.) | (5) $f_b \text{ (INIT.)} = (4)/(3)$ 0.6" DIA. STRANDS (K/SQ. IN.) |
|---|--------------------------|------------------------------------|-------------------------------|---|---|--|--|
| STANDARD PATTERNS FOR UNDRAPED STRANDS | | | | | | | |
| 16 | -20.23 | 2.514 | 313.84 | 496 | 703 | 1.580 | 2.240 |
| 18 | -19.84 | 2.485 | 317.51 | 558 | 791 | 1.757 | 2.491 |
| 20 | -19.13 | 2.432 | 324.42 | 620 | 879 | 1.911 | 2.709 |
| 22 | -18.37 | 2.375 | 332.21 | 682 | 967 | 2.053 | 2.911 |
| 24 | -17.55 | 2.313 | 341.12 | 744 | 1055 | 2.181 | 3.093 |
| 26 | -17.18 | 2.286 | 345.14 | 806 | 1143 | 2.335 | 3.312 |
| 28 | -17.02 | 2.274 | 346.97 | 868 | 1230 | 2.502 | 3.545 |
| 30 | -16.33 | 2.222 | 355.09 | 930 | 1318 | 2.619 | 3.712 |
| 32 | -16.23 | 2.215 | 356.21 | 992 | 1406 | 2.785 | 3.947 |
| 34 | -15.54 | 2.163 | 364.77 | 1054 | 1494 | 2.889 | 4.096 |
| 36 | -15.50 | 2.160 | 365.28 | 1116 | 1582 | 3.055 | 4.331 |
| STANDARD PATTERNS FOR DRAPED STRANDS | | | | | | | |
| 16 | -22.23 | 2.664 | 296.17 | 496 | 703 | 1.675 | 2.374 |
| 18 | -21.84 | 2.634 | 299.54 | 558 | 791 | 1.863 | 2.641 |
| 20 | -21.73 | 2.626 | 300.46 | 620 | 879 | 2.064 | 2.926 |
| 22 | -21.64 | 2.619 | 301.26 | 682 | 967 | 2.264 | 3.210 |
| 24 | -21.57 | 2.614 | 301.84 | 744 | 1055 | 2.465 | 3.495 |
| 26 | -21.19 | 2.586 | 305.10 | 806 | 1143 | 2.642 | 3.746 |
| 28 | -21.16 | 2.584 | 305.34 | 868 | 1230 | 2.843 | 4.028 |
| 30 | -20.99 | 2.571 | 306.88 | 930 | 1318 | 3.031 | 4.295 |
| 32 | -20.85 | 2.560 | 308.20 | 992 | 1406 | 3.219 | 4.562 |
| 34 | -20.73 | 2.551 | 309.29 | 1054 | 1494 | 3.408 | 4.830 |
| 36 | -20.39 | 2.526 | 312.35 | 1116 | 1582 | 3.573 | 5.065 |
| 38 | -20.31 | 2.520 | 313.10 | 1178 | 1670 | 3.762 | 5.334 |
| 40 | -20.23 | 2.514 | 313.84 | 1240 | 1758 | 3.951 | 5.602 |
| 42 | -20.06 | 2.501 | 315.47 | 1302 | 1846 | 4.127 | 5.852 |
| 44 | -19.91 | 2.490 | 316.87 | 1364 | 1933 | 4.305 | 6.100 |
| 46 | -19.60 | 2.467 | 319.82 | 1426 | | 4.459 | |
| 48 | -19.48 | 2.458 | 320.99 | 1488 | | 4.636 | |
| 50 | -19.37 | 2.450 | 322.04 | 1550 | | 4.813 | |
| 52 | -19.19 | 2.436 | 323.89 | 1612 | | 4.977 | |
| 54 | -19.03 | 2.424 | 325.50 | 1674 | | 5.143 | |

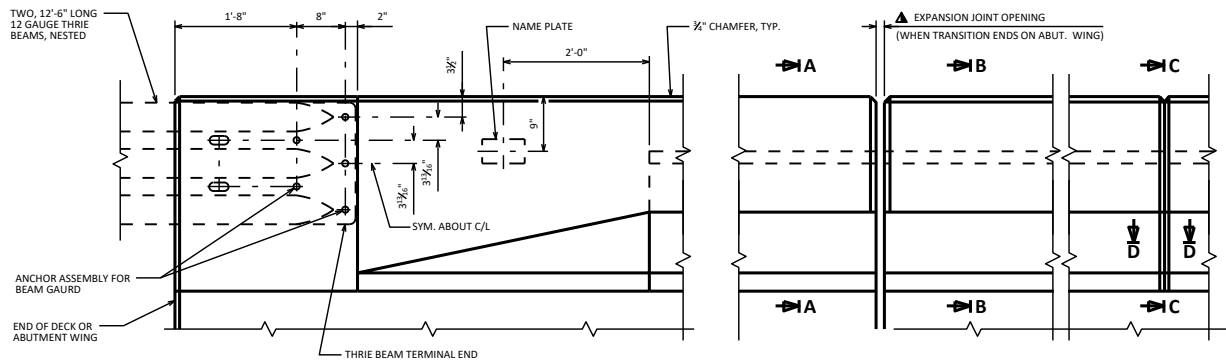
54" PRETENSIONED GIRDER DESIGN DATA



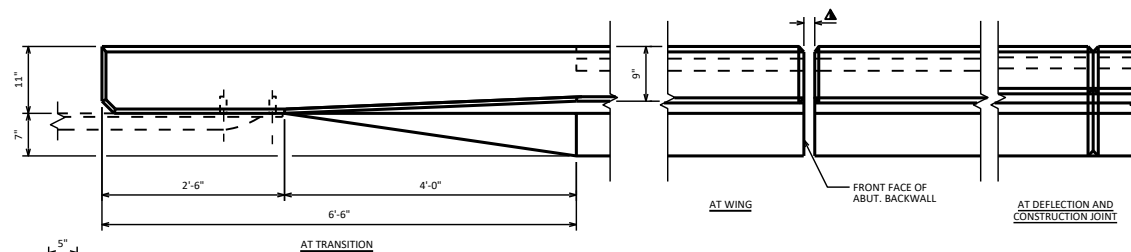
**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

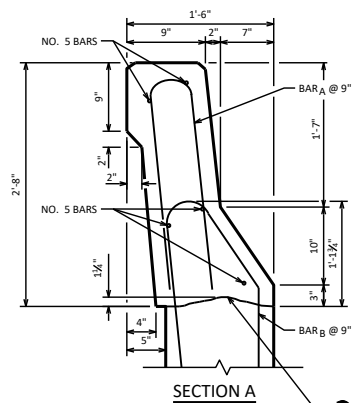
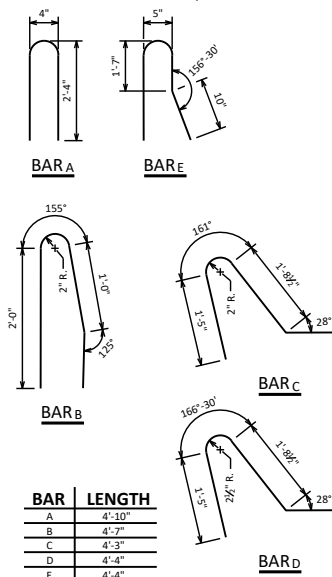
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7-16



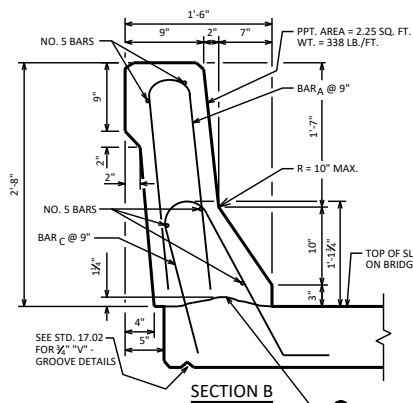
ELEVATION OF PARAPET



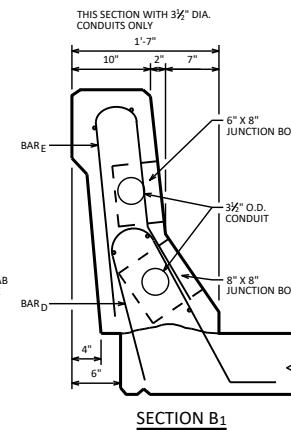
PART PLAN ON PARAPET



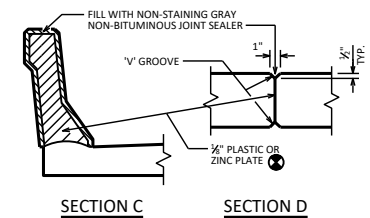
SECTION A



SECTION B



SECTION B1



SLOPED FACE PARAPET 'B'



BUREAU OF STRUCTURES

APPROVED: Laura Shadewald

DATE: 7-23

NOTES

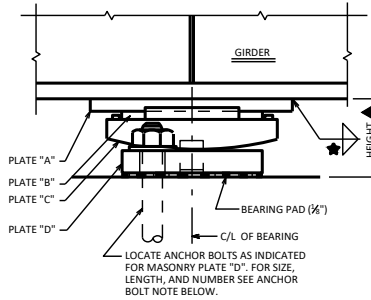
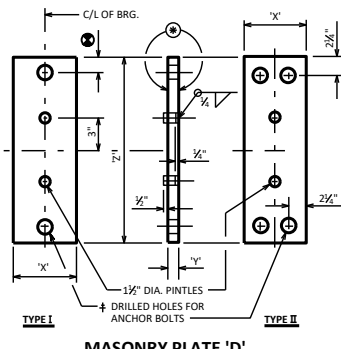
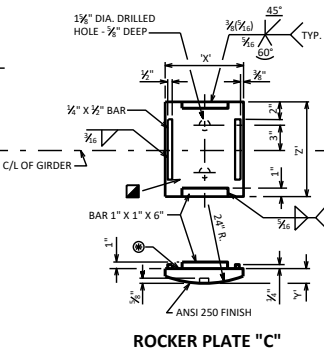
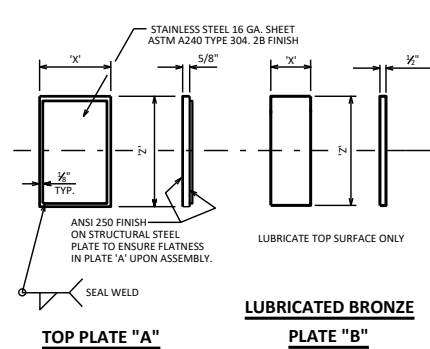
ALL SLOPED FACE PARAPET "B" REINFORCEMENT ARE NO. 4 BARS UNLESS OTHERWISE SHOWN.

- PLATE REQUIRED WHEN DEFLECTION JOINTS ARE REQUIRED. IF CONSTRUCTION JOINTS IN PARAPETS ARE USED, PLATE SEPARATORS SHALL BE OMITTED. DEFLECTION JOINTS ARE REQUIRED ON SLAB SPAN STRUCTURES ONLY.

OPTIONAL CONSTRUCTION JOINTS IN THE PARAPETS MAY BE USED. RUN BAR REINFORCEMENT THRU THE JOINT. LAP LONGIT. BARS A MIN. OF 2'-11". MIN. JOINT SPACING OF 80'-0". DEFINE CONST. JOINT WITH A 1" "V" GROOVE.

- CONST. JOINT - STRIKE OFF AS SHOWN & FINISH WITH A WOODEN TROWEL.

| | PARAPET |
|--------|-----------|
| AREA | 2.25 SF |
| WEIGHT | 338 LB/FT |



NOTES

FOR BEARING NOTES, CLEARANCE DIAGRAM, AND WHEN TO BEVEL ROCKER PLATES, SEE STANDARD 27.02.

- FINISH THESE SURFACES ANSI 250 IF DIMENSION "Y" IS GREATER THAN 2".

ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AS REQUIRED BY ASTM DESIGNATION A153, CLASS "C". PLATE "C" & "D" SHALL BE GALVANIZED. FOR UNPAINTED STRUCTURES PLATE "C" & "D" SHALL BE SHOP PAINTED AFTER GALVANIZING. PLATE "A" SHALL BE SHOP PAINTED. USE WELDABLE PRIMER ON PLATE "A".

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

ALL MATERIAL INCLUDING SHIMS, BUT EXCLUDING STAINLESS STEEL SHEET, BRONZE PLATE, PINTLES, ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A709 GRADE 50W.

- WELD SIZE, REFER TO STANDARD 24.2.
- ADJUST HEIGHT IF TAPERED BEARINGS ARE REQUIRED.
- FABRICATOR MAY INCREASE PLATE "A" OR PLATE "D" THICKNESS AS AN ALTERNATE TO SHIMS.
- DIMENSION IS 2" WHEN 1 1/2" DIA. ANCHOR BOLTS ARE USED AND 2 1/2" WHEN 1 3/4" DIA. ANCHOR BOLTS ARE USED.

FOR NEW OR REPLACEMENT STEEL BEARINGS, INCLUDING STEEL BEARINGS USED FOR BRIDGE WIDENINGS, USE TYPE "A-T" AS SHOWN ON STANDARD 27.08. THIS STANDARD IS FOR INFORMATIONAL PURPOSES ONLY.

10" BEARING

| CAP. KIPS | PLATE A | | | PLATE B | | | PLATE C | | | PLATE D | | | HEIGHT FEET |
|--------------|---------|-----|-------|---------|--------|--------|-----------|-----------|--------|---------|-------|---|----------------|
| | X | Y | Z | X | Y | Z | X | Y | Z | X | Y | Z | |
| 75 | 9" | 10" | 10" | 5" | 10" | 7" | 1 1/8" | 1'-0 1/2" | 8" | 1 1/2" | 1'-8" | | .354 |
| 105 | 11" | 10" | 10" | 7" | 10" | 9" | 1 1/8" | 1'-0 1/2" | 8" | 1 1/2" | 1'-8" | | .375 |
| 135 | 1'-1" | 10" | 10" | 9" | 10" | 11" | 1 1/8" | 1'-0 1/2" | 8" | 1 1/2" | 1'-8" | | .396 |
| 160 | 1'-3" | 10" | 11" | 10" | 1'-1" | 2 1/2" | 1'-0 1/2" | 9" | 1 1/2" | 1'-8" | | | .432 |
| 190 | 1'-5" | 10" | 1'-1" | 10" | 1'-3" | 2 1/2" | 1'-0 1/2" | 10" | 1 1/2" | 1'-8" | | | .495 |
| 220 | 1'-7" | 10" | 1'-3" | 10" | 1'-5" | 3 1/2" | 1'-0 1/2" | 1'-0" | 2" | 1'-8" | | | .599 |
| 250 | 1'-9" | 10" | 1'-5" | 10" | 1'-7" | 3 1/2" | 1'-0 1/2" | 1'-1" | 2 1/2" | 1'-8" | | | .630 |
| 280 | 1'-11" | 10" | 1'-7" | 10" | 1'-9" | 4 1/2" | 1'-0 1/2" | 1'-3" | 2 1/2" | 1'-8" | | | .755 |
| 310 | 2'-1" | 10" | 1'-9" | 10" | 1'-11" | 4 1/2" | 1'-0 1/2" | 1'-4" | 2 1/2" | 1'-8" | | | .755 |

12" BEARING

| CAP. KIPS | PLATE A | | | PLATE B | | | PLATE C | | | PLATE D | | | HEIGHT FEET |
|--------------|---------|-------|-------|---------|--------|--------|-----------|-------|--------|---------|---|---|----------------|
| | X | Y | Z | X | Y | Z | X | Y | Z | X | Y | Z | |
| 90 | 9" | 1'-0" | 5" | 1'-0" | 7" | 1 1/2" | 1'-2 1/2" | 8" | 1 1/2" | 1'-10" | | | .354 |
| 125 | 11" | 1'-0" | 7" | 1'-0" | 9" | 1 1/2" | 1'-2 1/2" | 8" | 1 1/2" | 1'-10" | | | .375 |
| 160 | 1'-1" | 1'-0" | 9" | 1'-0" | 11" | 1 1/2" | 1'-2 1/2" | 8" | 1 1/2" | 1'-10" | | | .396 |
| 195 | 1'-3" | 1'-0" | 11" | 1'-0" | 1'-1" | 2 1/2" | 1'-2 1/2" | 9" | 1 1/2" | 1'-10" | | | .432 |
| 230 | 1'-5" | 1'-0" | 1'-1" | 1'-0" | 1'-3" | 2 1/2" | 1'-2 1/2" | 11" | 2" | 1'-10" | | | .516 |
| 265 | 1'-7" | 1'-0" | 1'-3" | 1'-0" | 1'-5" | 3 1/2" | 1'-2 1/2" | 1'-1" | 2 1/2" | 1'-10" | | | .630 |
| 300 | 1'-9" | 1'-0" | 1'-5" | 1'-0" | 1'-7" | 3 1/2" | 1'-2 1/2" | 1'-2" | 2 1/2" | 1'-10" | | | .630 |
| 335 | 1'-11" | 1'-0" | 1'-7" | 1'-0" | 1'-9" | 4 1/2" | 1'-2 1/2" | 1'-4" | 2 1/2" | 1'-10" | | | .755 |
| 370 | 2'-1" | 1'-0" | 1'-9" | 1'-0" | 1'-11" | 4 1/2" | 1'-2 1/2" | 1'-5" | 2 1/2" | 1'-11" | | | .755 |

14" BEARING

| CAP. KIPS | PLATE A | | | PLATE B | | | PLATE C | | | PLATE D | | | HEIGHT FEET |
|--------------|---------|-------|-------|---------|--------|--------|-----------|-------|--------|---------|---|---|----------------|
| | X | Y | Z | X | Y | Z | X | Y | Z | X | Y | Z | |
| 105 | 9" | 1'-2" | 5" | 1'-2" | 7" | 1 1/2" | 1'-4 1/2" | 8" | 1 1/2" | 2'-0" | | | .354 |
| 145 | 11" | 1'-2" | 7" | 1'-2" | 9" | 1 1/2" | 1'-4 1/2" | 8" | 1 1/2" | 2'-0" | | | .375 |
| 185 | 1'-1" | 1'-2" | 9" | 1'-2" | 11" | 1 1/2" | 1'-4 1/2" | 8" | 1 1/2" | 2'-0" | | | .396 |
| 225 | 1'-3" | 1'-2" | 11" | 1'-2" | 1'-1" | 2 1/2" | 1'-4 1/2" | 10" | 1 1/2" | 2'-0" | | | .453 |
| 270 | 1'-5" | 1'-2" | 1'-1" | 1'-2" | 1'-3" | 2 1/2" | 1'-4 1/2" | 1'-0" | 2" | 2'-0" | | | .516 |
| 310 | 1'-7" | 1'-2" | 1'-3" | 1'-2" | 1'-5" | 3 1/2" | 1'-4 1/2" | 1'-1" | 2 1/2" | 2'-0" | | | .630 |
| 350 | 1'-9" | 1'-2" | 1'-5" | 1'-2" | 1'-7" | 3 1/2" | 1'-4 1/2" | 1'-3" | 2 1/2" | 2'-1" | | | .672 |
| 390 | 1'-11" | 1'-2" | 1'-7" | 1'-2" | 1'-9" | 4 1/2" | 1'-4 1/2" | 1'-4" | 2 1/2" | 2'-1" | | | .755 |
| 435 | 2'-1" | 1'-2" | 1'-9" | 1'-2" | 1'-11" | 4 1/2" | 1'-4 1/2" | 1'-6" | 3 1/2" | 2'-1" | | | .838 |

16" BEARING

| CAP. KIPS | PLATE A | | | PLATE B | | | PLATE C | | | PLATE D | | | HEIGHT FEET |
|--------------|---------|-------|-------|---------|--------|--------|-----------|-------|--------|---------|---|---|----------------|
| | X | Y | Z | X | Y | Z | X | Y | Z | X | Y | Z | |
| 120 | 9" | 1'-4" | 5" | 1'-4" | 7" | 1 1/2" | 1'-6 1/2" | 8" | 1 1/2" | 2'-2" | | | .354 |
| 165 | 11" | 1'-4" | 7" | 1'-4" | 9" | 1 1/2" | 1'-6 1/2" | 8" | 1 1/2" | 2'-2" | | | .375 |
| 215 | 1'-1" | 1'-4" | 9" | 1'-4" | 11" | 1 1/2" | 1'-6 1/2" | 9" | 1 1/2" | 2'-2" | | | .396 |
| 260 | 1'-3" | 1'-4" | 11" | 1'-4" | 1'-1" | 2 1/2" | 1'-6 1/2" | 11" | 2" | 2'-2" | | | .474 |
| 310 | 1'-5" | 1'-4" | 1'-1" | 1'-4" | 1'-3" | 2 1/2" | 1'-6 1/2" | 1'-0" | 2" | 2'-2" | | | .516 |
| 355 | 1'-7" | 1'-4" | 1'-3" | 1'-4" | 1'-5" | 3 1/2" | 1'-6 1/2" | 1'-2" | 2 1/2" | 2'-3" | | | .630 |
| 400 | 1'-9" | 1'-4" | 1'-5" | 1'-4" | 1'-7" | 3 1/2" | 1'-6 1/2" | 1'-3" | 2 1/2" | 2'-3" | | | .672 |
| 450 | 1'-11" | 1'-4" | 1'-7" | 1'-4" | 1'-9" | 4 1/2" | 1'-6 1/2" | 1'-5" | 2 1/2" | 2'-3" | | | .755 |
| 500 | 2'-1" | 1'-4" | 1'-9" | 1'-4" | 1'-11" | 4 1/2" | 1'-6 1/2" | 1'-7" | 3 1/2" | 2'-3" | | | .838 |

18" BEARING

| CAP. KIPS | PLATE A | | | PLATE B | | | PLATE C | | | PLATE D | | | HEIGHT FEET |
|--------------|---------|-------|-------|---------|--------|--------|-----------|-------|--------|---------|---|---|----------------|
| | X | Y | Z | X | Y | Z | X | Y | Z | X | Y | Z | |
| 135 | 9" | 1'-6" | 5" | 1'-6" | 7" | 1 1/2" | 1'-8 1/2" | 8" | 1 1/2" | 2'-4" | | | .354 |
| 185 | 11" | 1'-6" | 7" | 1'-6" | 9" | 1 1/2" | 1'-8 1/2" | 8" | 1 1/2" | 2'-4" | | | .375 |
| 240 | 1'-1" | 1'-6" | 9" | 1'-6" | 11" | 1 1/2" | 1'-8 1/2" | 9" | 1 1/2" | 2'-4" | | | .396 |
| 295 | 1'-3" | 1'-6" | 11" | 1'-6" | 1'-1" | 2 1/2" | 1'-8 1/2" | 11" | 2" | 2'-4" | | | .474 |
| 350 | 1'-5" | 1'-6" | 1'-1" | 1'-6" | 1'-3" | 2 1/2" | 1'-8 1/2" | 1'-1" | 2 1/2" | 2'-5" | | | .547 |
| 400 | 1'-7" | 1'-6" | 1'-3" | 1'-6" | 1'-5" | 3 1/2" | 1'-8 1/2" | 1'-2" | 2 1/2" | 2'-5" | | | .630 |
| 455 | 1'-9" | 1'-6" | 1'-5" | 1'-6" | 1'-7" | 3 1/2" | 1'-8 1/2" | 1'-4" | 2 1/2" | 2'-5" | | | .672 |
| 505 | 1'-11" | 1'-6" | 1'-7" | 1'-6" | 1'-9" | 4 1/2" | 1'-8 1/2" | 1'-6" | 3 1/2" | 2'-5" | | | .838 |
| 560 | 2'-1" | 1'-6" | 1'-9" | 1'-6" | 1'-11" | 4 1/2" | 1'-8 1/2" | 1'-8" | 3 1/2" | 2'-5" | | | .838 |

20" BEARING

| CAP. KIPS | PLATE A | | | PLATE B | | | PLATE C | | | PLATE D | | | HEIGHT FEET |
|--------------|---------|-------|-------|---------|--------|--------|------------|-------|--------|---------|---|---|----------------|
| | X | Y | Z | X | Y | Z | X | Y | Z | X | Y | Z | |
| 150 | 9" | 1'-8" | 5" | 1'-8" | 7" | 1 1/2" | 1'-10 1/2" | 8" | 1 1/2" | 2'-6" | | | .354 |
| 210 | 11" | 1'-8" | 7" | 1'-8" | 9" | 1 1/2" | 1'-10 1/2" | 8" | 1 1/2" | 2'-6" | | | .375 |
| 270 | 1'-1" | 1'-8" | 9" | 1'-8" | 11" | 1 1/2" | 1'-10 1/2" | 10" | 1 1/2" | 2'-6" | | | .417 |
| 325 | 1'-3" | 1'-8" | 11" | 1'-8" | 1'-1" | 2 1/2" | 1'-10 1/2" | 11" | 2" | 2'-6" | | | .474 |
| 385 | 1'-5" | 1'-8" | 1'-1" | 1'-8" | 1'-3" | 2 1/2" | 1'-10 1/2" | 1'-1" | 2 1/2" | 2'-7" | | | .547 |
| 445 | 1'-7" | 1'-8" | 1'-3" | 1'-8" | 1'-5" | 3 1/2" | 1'-10 1/2" | 1'-3" | 2 1/2" | 2'-7" | | | .672 |
| 505 | 1'-9" | 1'-8" | 1'-5" | 1'-8" | 1'-7" | 3 1/2" | 1'-10 1/2" | 1'-5" | 2 1/2" | 2'-7" | | | .672 |
| 565 | 1'-11" | 1'-8" | 1'-7" | 1'-8" | 1'-9" | 4 1/2" | 1'-10 1/2" | 1'-7" | 3 1/2" | 2'-7" | | | .838 |
| 625 | 2'-1" | 1'-8" | 1'-9" | 1'-8" | 1'-11" | 4 1/2" | 1'-10 1/2" | 1'-9" | 3 1/2" | 2'-7" | | | .838 |

ANCHOR BOLT NOTES:

FOR SPAN LENGTHS UP TO 100'-0", USE A TYPE I MASONRY PLATE "D" WITH (2) 1 1/2" DIA. X 1'-5" LONG ANCHOR BOLTS.

FOR SPAN LENGTHS FROM 100'-0" TO 150'-0", USE A TYPE I MASONRY PLATE "D" WITH (2) 1 1/2" DIA. X 1'-10" LONG ANCHOR BOLTS.

FOR SPAN LENGTHS GREATER THAN 150'-0", USE A TYPE II MASONRY PLATE "D" WITH (4) 1 1/2" DIA. X 1'-10" LONG ANCHOR BOLTS.

- DRILLED HOLES FOR ANCHOR BOLTS IN MASONRY PLATE "D" SHALL HAVE A DIAMETER 1/8" LARGER THAN ANCHOR BOLT.

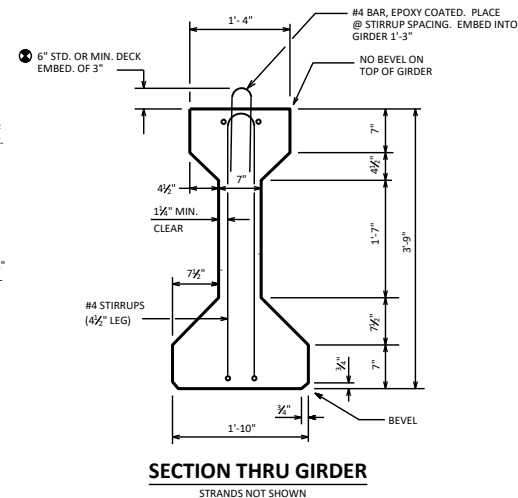
EXPANSION BEARING DETAILS TYPE 'A' - STEEL GIRDERS



**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

DATE:
7-16



SUPPORT WITH
1/2" ELASTOMERIC BRG. PAD

DESIGNER NOTES

SPECIFY CONCRETE STRENGTH AS REQUIRED BY DESIGN FROM A MINIMUM OF 6,000 PSI TO A MAX. OF 8,000 PSI. MAXIMUM RELEASE STRENGTH IS 6800 PSI. USE 0.5" OR 0.6" DIA. STRANDS FOR THE DRAPED PATTERN AS REQUIRED. THE MAX. NUMBER OF DRAPED 0.5" DIA. STRANDS IS 10 AND THE MAX. NUMBER FOR 0.6" DIA. STRANDS IS 8. FOR THE STRAIGHT PATTERN USE ONLY 0.6" DIA. STRANDS.

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

⊖ DETAIL TYPICAL AT EACH END

THE DESIGN ENGINEER DETERMINES THIS VALUE BASED ON 2" MIN. HAUNCH AT EDGE OF GIRDER, X-SLOPE, PROFILE GRADE LINE AND CALCULATED RESIDUAL GIRDER CAMBER, INCLUDING THE CAMBER MULTIPLIER OF 1.4. THIS VALUE CAN VARY AND SHOULD BE GIVEN FOR EACH 1/3 OF THE GIRDER LENGTH. PROVIDE VALUES THAT MAINTAIN 3" MIN. DECK EMBEDMENT AND $\frac{25}{8}$ " CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR $\pm\frac{1}{8}$ " VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

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

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

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

STRANDS SHALL BE FLUSH WITH END OF GIRDER. FOR GIRDER ENDS EMBEDDED COMPLETELY IN CONCRETE, END

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

ALL GIRDERS SHALL BE CAST FULL LENGTH AS SHOWN.

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

AN ALTERNATE EQUIVALENT OF WELDED WIRE FABRIC (WWF) ASTM A1064 MAY BE SUBSTITUTED FOR THE STIRRUP REINFORCEMENT SHOWN, UPON APPROVAL OF THE STRUCTURES DEVELOPMENT SECTION.

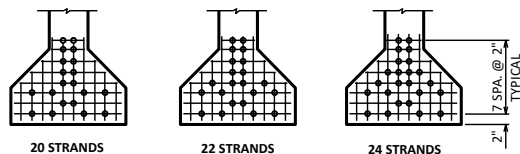
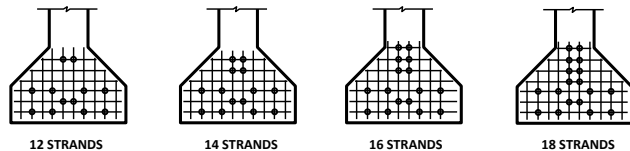
PRESTRESSING STRANDS SHALL BE (DIA.)-7-WIRE LOW-RELAXATION STRANDS WITH AN ULTIMATE STRENGTH OF 270,000 PSI.



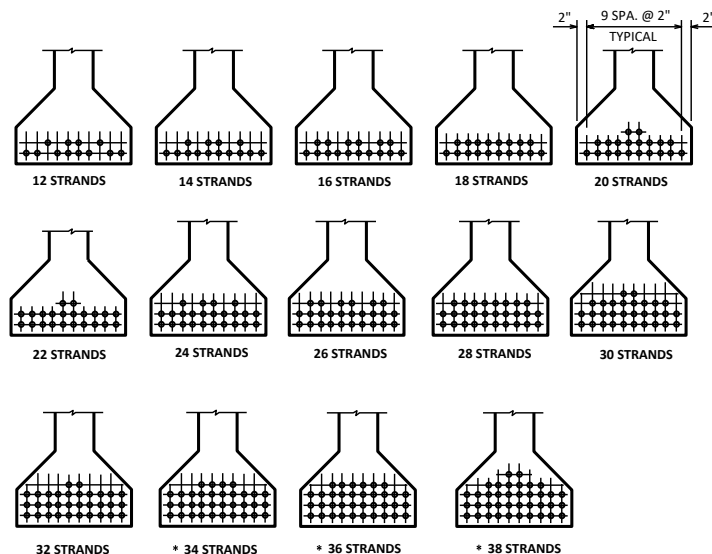
BUREAU OF STRUCTURES

APPROVED: *Laura Shadewald*

DATE: 7-23



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



ARRANGEMENT AT C/L SPAN - FOR GIRDERS WITH DRAPED 0.5" DIA. AND 0.6" DIA. STRANDS

* 0.5" DIA. STRANDS ONLY

45" GIRDER

$$A = 560 \text{ SQ. IN.}$$

$$I^2 = 223.91 \text{ IN.}^2$$

$$Y_T = 24.73 \text{ IN.}$$

$$Y_B = -20.27 \text{ IN.}$$

$$I = 125,390 \text{ IN.}^4$$

$$S_T = 5,070 \text{ IN.}^3$$

$$S_B = -6,186 \text{ IN.}^3$$

$$\text{WT.} = 583 \text{ \#/FT.}$$

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.

$$\text{PI PER 0.5" DIA. STRAND} = 0.1531 \times 202,500 = 31.00 \text{ KIPS}$$

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

$$\frac{Y_B}{I^2} = \frac{-20.27}{223.91} = -0.09053 \text{ IN./IN.}^2$$

(COMPRESSION IS POSITIVE)

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

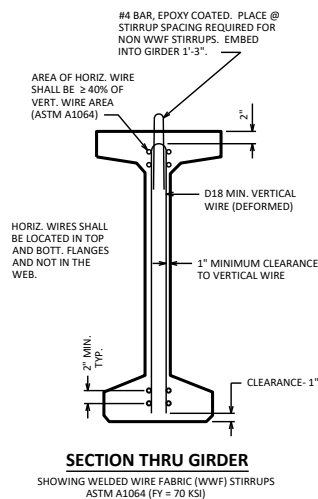
45" PRESTRESSED GIRDER DESIGN DATA



**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

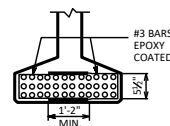
DATE:
7-16



SUPPORT WITH
1/2" ELASTOMERIC BEARING PAD

SECTION THRU GIRDER
STRANDS NOT SHOWN

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



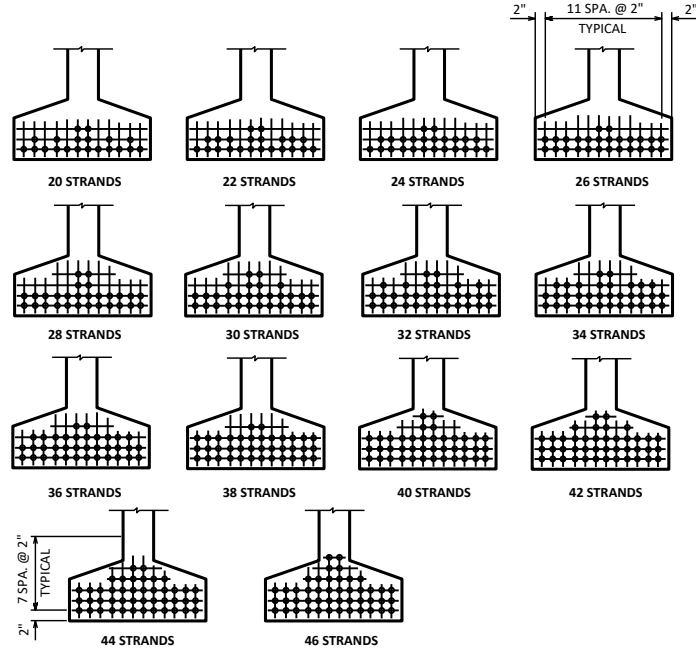
DETAIL A

✱ THE DESIGN ENGINEER DETERMINES THIS VALUE BASED ON 2" MIN. HAUNCH AT EDGE OF GIRDER, X-SLOPE, PROFILE GRADE LINE AND CALCULATED RESIDUAL GIRDER CAMBER, INCLUDING THE CAMBER MULTIPLIER OF 1.4. THIS VALUE CAN VARY AND SHOULD BE GIVEN FOR EACH 1/3 OF THE GIRDER LENGTH. PROVIDE VALUES THAT MAINTAIN 3" MIN. DECK EMBEDMENT AND $\frac{3}{8}$ " CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR $\pm\frac{1}{8}$ " VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

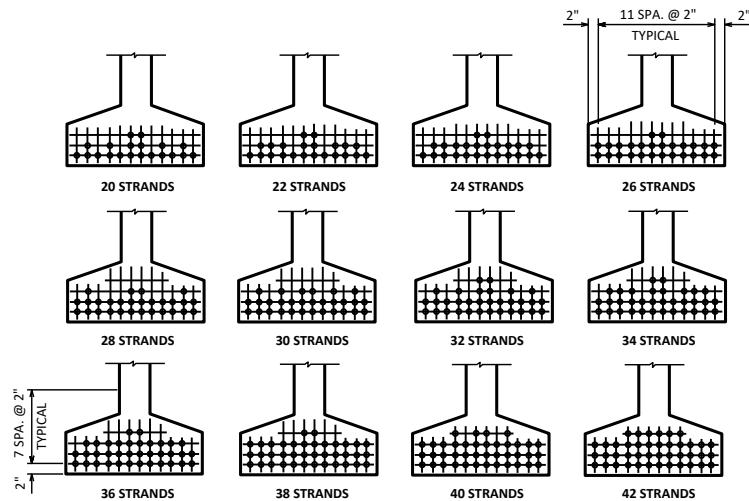
PRESTRESSING STRANDS SHALL BE (DIA.)-7-WIRE LOW-RELAXATION STRANDS WITH AN ULTIMATE STRENGTH OF 270,000 PSI.

BUREAU OF STRUCTURES

DATE: 7-23



ARRANGEMENT AT C/L SPAN FOR GIRDERS WITH DRAPED 0.5" DIA. STRANDS



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

(COMPRESSION IS NEGATIVE)

| N NO. STRANDS | (1) e_s 0.5" DIA. STRANDS (INCHES) | (2) $(1 + \frac{e_s y_b}{r^2})$ 0.5" DIA. STRANDS (SQ.IN.) | (3) $(A/(2))$ 0.5" DIA. STRANDS (SQ.IN.) | (4) $P(INIT.) = A_s f_s$ 0.5" DIA. STRANDS (KIPS) | (5) $f_b(INIT.) = (4)/(3)$ 0.5" DIA. STRANDS (K/SQ.IN) |
|---------------------|--|--|--|---|--|
| 20 | -31.62 | 2.659 | 291.090 | 620 | 2.130 |
| 22 | -31.53 | 2.655 | 291.530 | 682 | 2.339 |
| 24 | -31.45 | 2.650 | 292.080 | 744 | 2.547 |
| 26 | -31.39 | 2.647 | 292.410 | 806 | 2.756 |
| 28 | -31.05 | 2.629 | 294.410 | 868 | 2.948 |
| 30 | -30.89 | 2.621 | 295.310 | 930 | 3.149 |
| 32 | -30.75 | 2.614 | 296.100 | 992 | 3.350 |
| 34 | -30.62 | 2.607 | 296.890 | 1054 | 3.550 |
| 36 | -30.51 | 2.601 | 297.580 | 1116 | 3.750 |
| 38 | -30.41 | 2.596 | 298.150 | 1178 | 3.951 |
| 40 | -30.12 | 2.581 | 299.880 | 1240 | 4.135 |
| 42 | -29.95 | 2.572 | 300.930 | 1302 | 4.327 |
| 44 | -29.80 | 2.564 | 301.870 | 1364 | 4.519 |
| 46 | -29.49 | 2.548 | 303.770 | 1426 | 4.694 |

STANDARD PATTERNS - 0.5" DIA. DRAPED STRANDS

70" GIRDER

A = 774 SQ. IN.

$r^2 = 659.70 \text{ IN.}^2$

$y_T = 35.38 \text{ IN.}$

$y_B = -34.62 \text{ IN.}$

I = 510,613 IN.⁴

$S_T = 14,430 \text{ IN.}^3$

$S_B = -14,750 \text{ IN.}^3$

WT. = 0.806 KIPS/FT. +
6.6 KIPS FOR BOTH END BLOCKS

(COMPRESSION IS NEGATIVE)

| N NO. STRANDS | (1) e_s 0.6" DIA. STRANDS (INCHES) | (2) $(1 + \frac{e_s y_b}{r^2})$ 0.6" DIA. STRANDS (SQ.IN.) | (3) $(A/(2))$ 0.6" DIA. STRANDS (SQ.IN.) | (4) $P(INIT.) = A_s f_s$ 0.6" DIA. STRANDS (KIPS) | (5) $f_b(INIT.) = (4)/(3)$ 0.6" DIA. STRANDS (K/SQ.IN) |
|---------------------|--|--|--|---|--|
| 20 | -31.62 | 2.659 | 291.090 | 879 | 3.020 |
| 22 | -31.53 | 2.655 | 291.530 | 967 | 3.317 |
| 24 | -31.45 | 2.650 | 292.080 | 1055 | 3.612 |
| 26 | -31.39 | 2.647 | 292.410 | 1143 | 3.909 |
| 28 | -31.19 | 2.637 | 293.520 | 1230 | 4.191 |
| 30 | -31.02 | 2.628 | 294.520 | 1318 | 4.475 |
| 32 | -30.74 | 2.614 | 296.100 | 1406 | 4.748 |
| 34 | -30.62 | 2.607 | 296.890 | 1494 | 5.032 |
| 36 | -30.51 | 2.601 | 297.580 | 1582 | 5.316 |
| 38 | -30.41 | 2.596 | 298.150 | 1670 | 5.601 |
| 40 | -30.22 | 2.586 | 299.300 | 1758 | 5.874 |
| 42 | -30.05 | 2.577 | 300.350 | 1846 | 6.146 |

STANDARD PATTERNS - 0.6" DIA. DRAPED STRANDS

PRE-TENSION

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

$f_s = 0.75 \times 270,000 = 202,500 \text{ P.S.I.}$
FOR LOW RELAXATION STRANDS

PI PER 0.5" DIA. STRAND
= $0.1531 \times 202,500 = \underline{31.00 \text{ KIPS}}$

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

$$\frac{y_b}{r^2} = \frac{-34.62}{659.70} = -0.05248 \text{ IN./IN.}^2$$

70" PRESTRESSED GIRDER DESIGN DATA



**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

DATE:
7-16

★ FOR CULVERT WINGS:

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

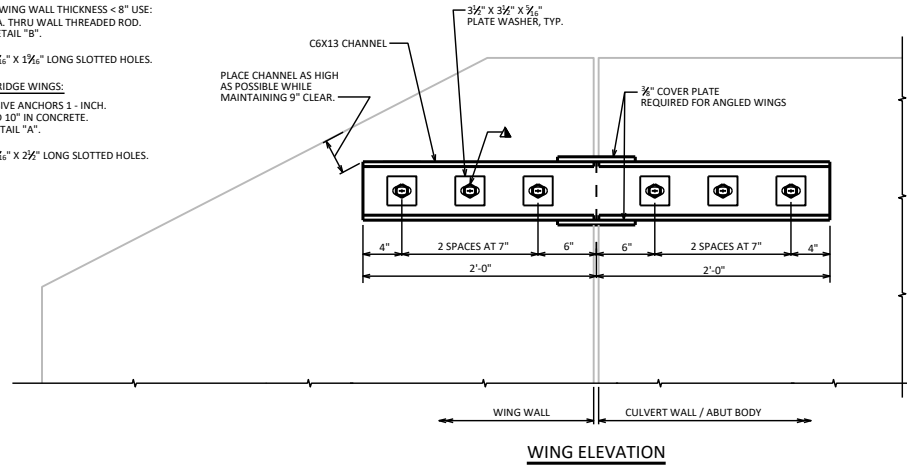
WITH WING WALL THICKNESS $< 8"$ USE:
 $\frac{3}{4}"$ DIA. THRU WALL THREADED ROD.
SEE DETAIL "B".

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

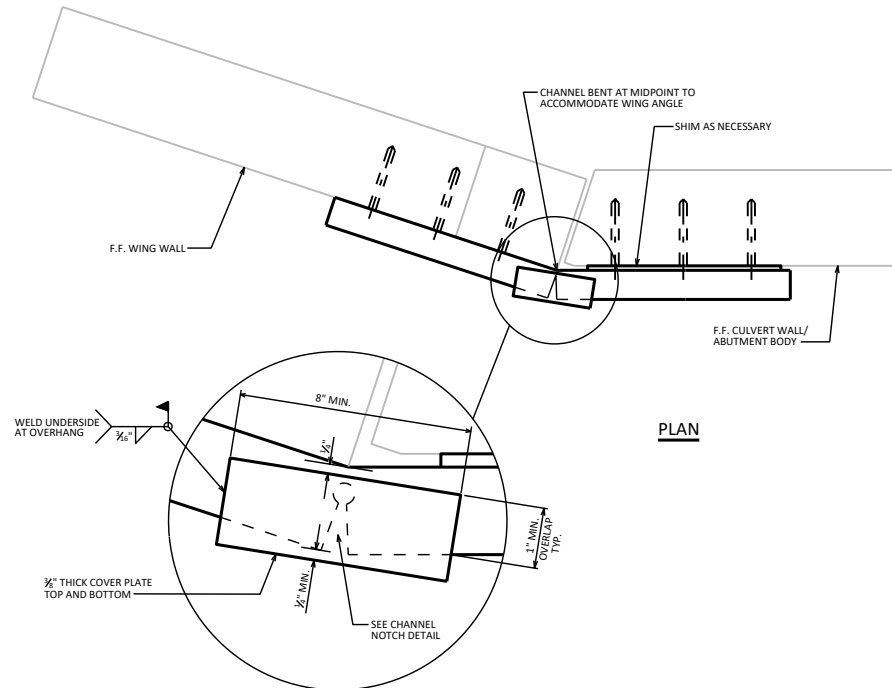
FOR BRIDGE WINGS:

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

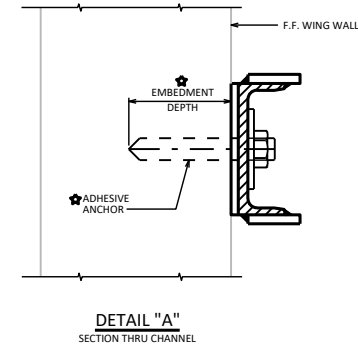
USE $1\frac{1}{2}" \times 2\frac{1}{2}"$ LONG SLOTTED HOLES.



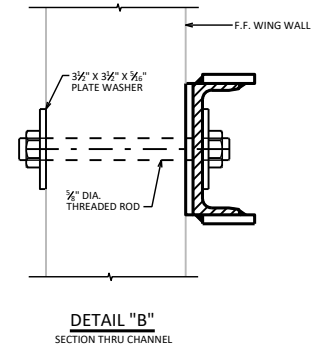
WING ELEVATION



PLAN



DETAIL "A"
SECTION THRU CHANNEL



DETAIL "B"
SECTION THRU CHANNEL

NOTES

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

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

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

ALL PROVIDED STEEL MATERIAL SHALL CONFORM TO ASTM A36.

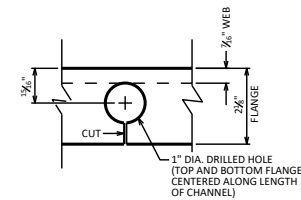
ALL STRUCTURAL STEEL SHOWN SHALL BE GALVANIZED. THREADED RODS, MASONRY ANCHORS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 CLASS C.

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.



CHANNEL NOTCH DETAIL
FOR USE WITH ANGLED WINGS ONLY

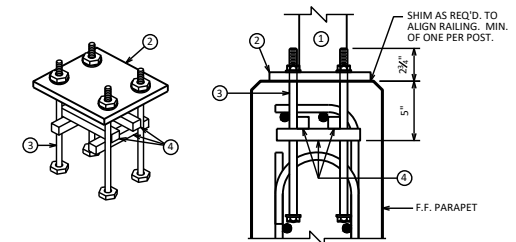
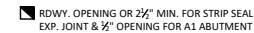
WING STRAPPING



**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

DATE:
7-18

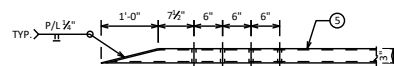


ANCHOR BOLTS FOR RAIL POSTS

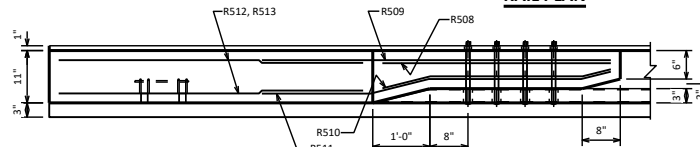
STRIP SEAL EXP. JT. @ ABUT.
FOR TYPE A1 ABUT., USE 3/4" FILLER
TO TOP OF PARAPET. SEE STD. 12.01/12.02

INSIDE ELEVATION

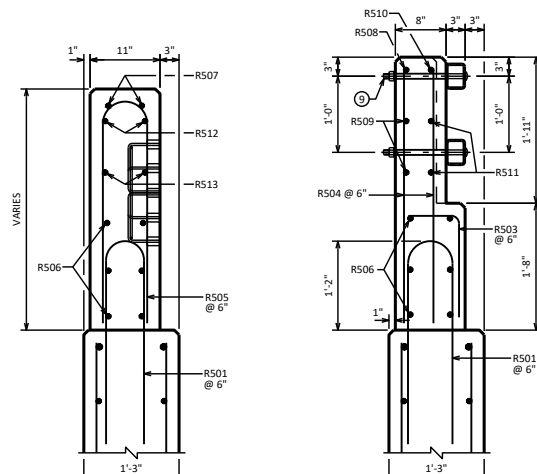
OPTIONAL CONSTRUCTION JOINTS IN THE PARAPETS MAY BE USED.
RUN BAR REINF. THRU THE JOINT. LAP LONGIT. BARS A MIN. OF 1'-5".
MIN CONSTR. JT. SPACING OF 80'-0". DEFINE CONSTR. JT. WITH A 3/4" "V"-GROOVE.



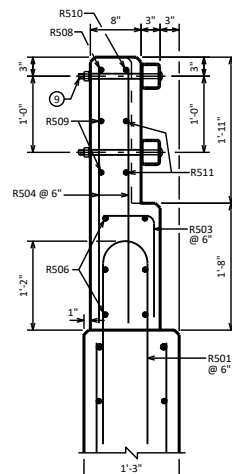
RAIL PLAN



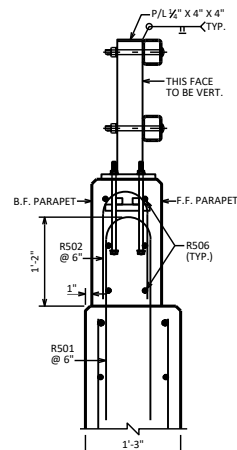
PARAPET PLAN



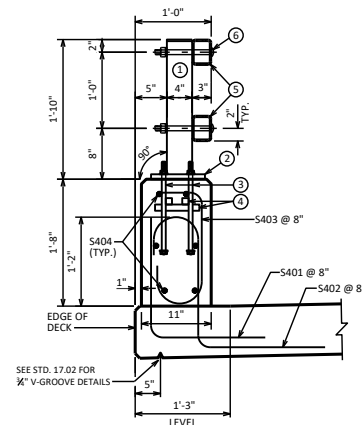
SECTION A-A



SECTION B-B

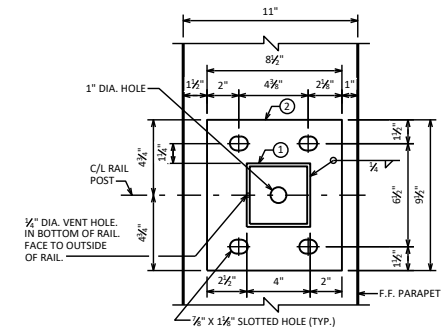


SECTION C-C



SECTION THRU DECK

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



BASE PLATE

DESIGNER NOTES

DETAILS LIMITED TO SKEWS $< 40^\circ$.

SEE STANDARD 40.25 FOR RAILING DETAILS

RAILING WEIGHT = 30 LB/FT

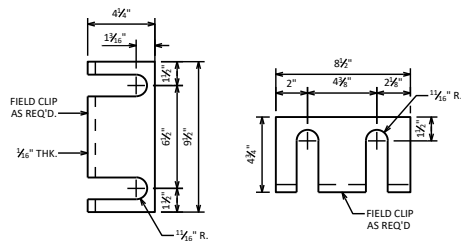
RAILING TUBULAR TYPE 'PF'



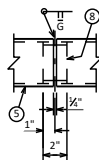
BUREAU OF STRUCTURES

APPROVED: *Laura Shadewald*

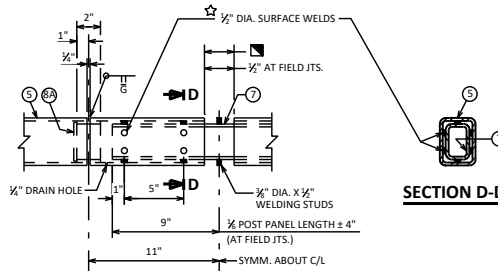
DATE:
1-17



POST SHIM DETAILS



**SHOP RAIL
SPLICE DETAIL**
(LOCATION MUST BE
SHOWN ON SHOP DRAWINGS)



FIELD ERECTION JOINT DETAIL
☆ MIN. 3/8\"/>

NOTES

DID ITEM SHALL BE "RAILING TUBULAR TYPE PF B-_-_-", WHICH SHALL INCLUDE ALL STEEL ITEMS SHOWN, AND PAINTING.

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

NO. 2, NO. 7 AND NO. 8 SHALL CONFORM TO ASTM A709 GRADE 36. STRUCTURAL TUBING, NO. 1 AND NO. 5, SHALL CONFORM TO ASTM A500 GRADE 8.

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

CUT BOTTOM OF POST TO MAKE POST VERTICAL IN TRANSVERSE DIRECTION.

STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATES WHERE PERIMETER OF PLATE NO. 2 WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

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

ALL JOINTS IN CONCRETE PARAPET ARE TO BE VERTICAL.

AFTER FABRICATION, ALL MATERIAL, EXCEPT ANCHORAGE NO. 3 & 4 & SHIMS SHALL BE PAINTED WITH A THREE COAT ZINC-RICH EPOXY SYSTEM PER WISDOT STANDARD SPECIFICATION, SECTION 517, EPOXY SYSTEM. SHIMS SHALL BE GIVEN ONE COAT OF ZINC RICH PRIMER PAINT. THE FINISH COLOR SHALL BE AMS STD. COLOR NO. 1.

3/4\"/>

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

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

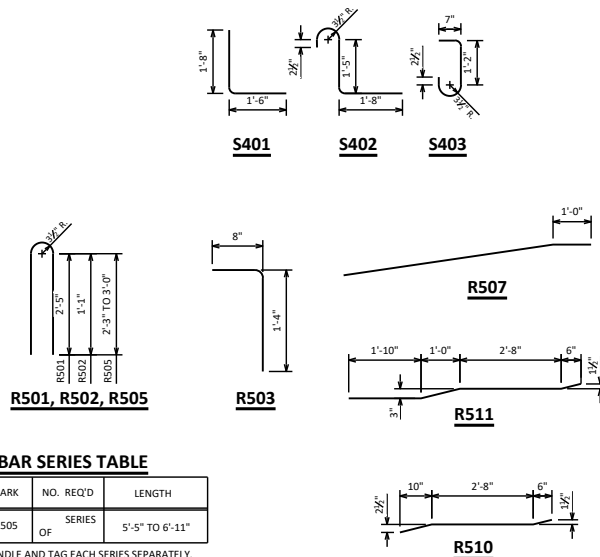
SEE STD. 30.07 FOR BEAM GUARD ANCHOR ASSEMBLY DETAILS.

THIS RAILING MEETS NCHRP REPORT 350 EVALUATION CRITERIA FOR TEST LEVEL 2 (TL-2).

■ RDWY. OPENING OR 2 1/2\"/>

LEGEND

- ① TS 4 x 4 x 0.25 x 1'-9 1/2\"/>
- ② PLATE 3/4\"/>
- ③ 3/4\"/>
- ④ BAR 3/4\"/>
- ⑤ TS 4 x 3 x 0.25 STRUCTURAL TUBING. ATTACK TO NO. 1 WITH BOLTS NO. 6. PROVIDE 1 1/2\"/>
- ⑥ 3/4\"/>
- ⑦ RECTANGULAR SLEEVE FABRICATED FROM 3/4\"/>
- ⑧ RECTANGULAR SLEEVE FABRICATED FROM 3/4\"/>
- ⑨ 3/4\"/>



BILL OF BARS

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

| BAR MARK | Qty | NO. REQ'D | LENGTH | Rein. | BAR SERIES | LOCATION |
|----------|-----|-----------|--------|-------|------------|----------------|
| S401 | X | | 3'-0" | X | | PARAPET VERT. |
| S402 | X | | 4'-1" | X | | PARAPET VERT. |
| S403 | X | | 2'-9" | X | | PARAPET VERT. |
| S404 | X | | | | | PARAPET HORIZ. |
| R501 | X | | 5'-9" | X | | PARAPET VERT. |
| R502 | X | | 3'-1" | X | | PARAPET VERT. |
| R503 | X | | 1'-11" | X | | PARAPET VERT. |
| R504 | X | | 3'-4" | | | PARAPET VERT. |
| R505 | X | | 6'-2" | X | ▲ | PARAPET VERT. |
| R506 | X | | | | | PARAPET HORIZ. |
| R507 | X | | | X | | PARAPET HORIZ. |
| R508 | X | | 4'-0" | | | PARAPET HORIZ. |
| R509 | X | | 5'-8" | | | PARAPET HORIZ. |
| R510 | X | | 4'-0" | X | | PARAPET HORIZ. |
| R511 | X | | 6'-0" | X | | PARAPET HORIZ. |
| R512 | X | | | | | PARAPET HORIZ. |
| R513 | X | | | | | PARAPET HORIZ. |

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

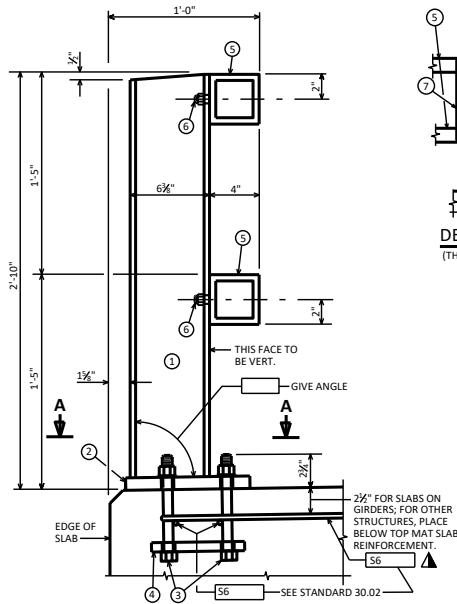
RAILING TUBULAR TYPE 'PF' DETAILS



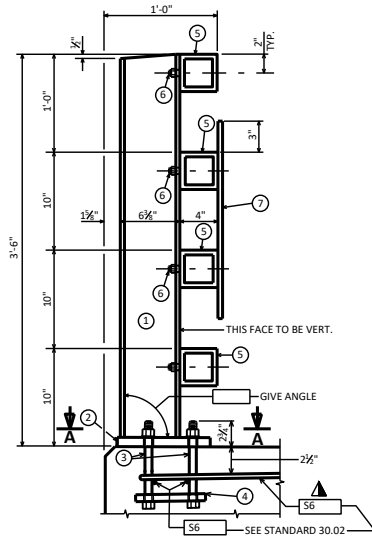
**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

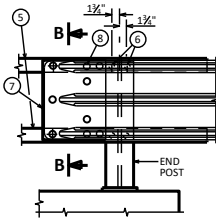
DATE:
1-19



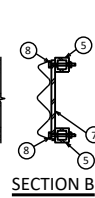
SECTION THRU RAILING ON DECK



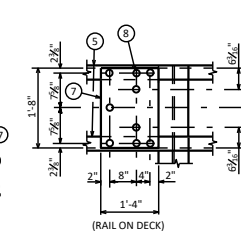
SECTION THRU RAILING ON SIDEWALK



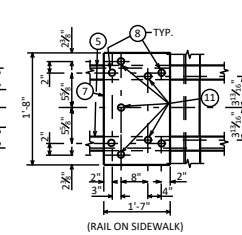
DETAIL AT END POST
(THREE BEAM RAIL ATTACHMENT)



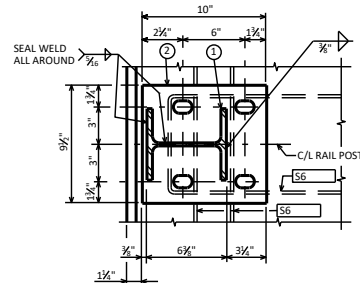
SECTION B



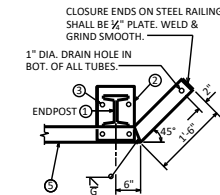
RAIL ON DECK



RAIL ON SIDEWALK

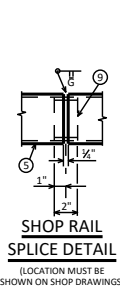


SECTION A



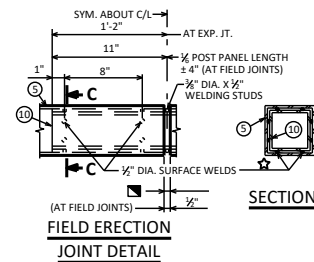
DETAIL FOR END POSTS

WITH OR WITHOUT THREE BEAM RAIL ATTACHMENT
(END POST MAY BE LOCATED ON SUPERSTRUCTURE OR WINGWALLS)



SHOP RAIL
SPLICE DETAIL

(LOCATION MUST BE SHOWN ON SHOP DRAWINGS)

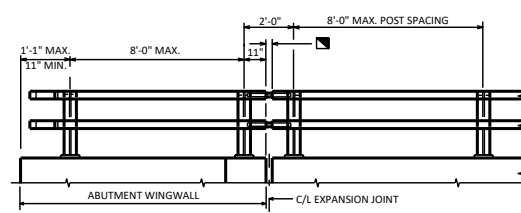


FIELD ERECTION
JOINT DETAIL

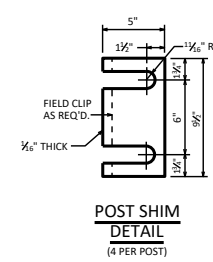
★ MIN. 3/8" FLAT SURFACE DIA. PUNCHINGS OR STUDS MAY BE USED AS AN ALTERNATE.

SECTION C

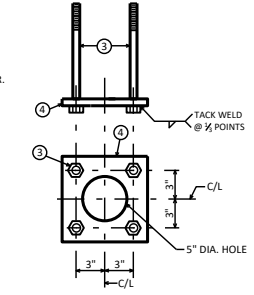
THIS RAILING IS NO LONGER USED AND IS SHOWN FOR INFORMATIONAL PURPOSES ONLY:



PART ELEVATION OF RAILING



POST SHIM
DETAIL
(4 PER POST)



ANCHORAGE DETAIL

LEGEND

- WE X 25 WITH 1 1/2" DIA. HOLES ON EACH SIDE OF POST FOR STUD NO. 6. CUT BOTTOM OF POST TO MATCH CROSS SLOPE OF ROADWAY (OR SIDEWALK, AS APPLICABLE). PLACE POST VERTICAL. PLACE POSTS NORMAL TO GRADE LINE.
- PLATE 1" X 9 1/2" X 10" WITH 1 1/2" X 1 1/2" SLOTTED HOLES FOR ANCHOR BOLTS NO. 3. WELD TO NO. 1 AS SHOWN.
- A325 - 7/8" DIA. HEX BOLTS (GALVANIZED) WITH A325 NUT & 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. 2. CHAMFER TOP OF BOLTS BEFORE THREADING.
- 1/2" X 8" X 8" FLAT BAR WITH 1 1/2" DIA. HOLES FOR ANCHOR BOLTS NO. 3.
- TS 4 X 4 X 0.25 STRUCTURAL TUBING, CONFORMING TO ASTM DESIGNATION A501 OR A500 GRADE B. ATTACH TO NO. 1 WITH STUDS NO. 6.
- 3/4" DIA. X 1 1/2" LONG SHOP WELDED STUDS WITH HEX NUT AND 2" WASHERS (2 REQ'D. AT EACH RAIL TO POST LOCATION).
- PLATE 3/4" X 1'-4" (1'-7" ON SIDEWALK) X 1'-8". BOLT TO RAIL AS SHOWN IN DETAIL. REQUIRED AT THREE BEAM GUARD RAIL ATTACHMENTS ONLY. PLACE SYMMETRICALLY ABOUT TUBES NO. 5.
- 1" DIA. HOLES IN PLATE NO. 7 & TUBES NO. 5 FOR 3/4" DIA. A325 BOLTS W/ HEX NUTS AND WASHERS.
- SQUARE SLEEVE FABRICATED FROM 1/2" PLATE. PROVIDE "SLIDING FIT" WITH A MINIMUM OUT TO OUT DIMENSION OF 3 1/2".
- TS 3 X 3 X 0.25 X (2'-4" AT EXPANSION JOINTS) & (1'-10" AT FIELD JOINTS) LONG. PROVIDE 1/2" DIA. SURFACE WELDS ON ALL SIDES AS SHOWN. GRIND WELDS TO FIT FREE INTO I.D. OF NO. 5. PROVIDE 3/4" DIA. X 1/2" WELDING STUDS ON TOP AND BOTTOM SURFACES AT CENTERLINE.
- 7/8" DIA. X 1 1/2" LONG THREADED SHOP WELDED STUDS. (REQ'D FOR SIDEWALK RAIL ONLY.)

NOTES

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

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

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

FOR RAILING NOT TO BE PAINTED, ALL MATERIAL EXCEPT ANCHORAGE DETAIL NO. 4 SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING, ALL STEEL RAILING POSTS & STEEL TUBING SHALL BE GIVEN A NO. 11 NEAR WHITE BLAST CLEANING BY SSPC SPECIFICATIONS.

FOR RAILING TO BE PAINTED, ALL MATERIAL EXCEPT ANCHORAGE DETAIL NO. 3 & 4 SHALL BE PAINTED WITH A THREE-COAT ZINC RICH EPOXY SYSTEM. PRIOR TO PAINTING, ALL STEEL RAILING POSTS & STEEL TUBING SHALL BE GIVEN A NO. 11 NEAR WHITE BLAST CLEANING BY SSPC SPECIFICATIONS.

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

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


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

PLACE FIRST BOTTOM LONGITUDINAL BAR CLEAR OF DRIP GROOVE.

FOR 2'-10" RAILING ON DECK:
RAILING WEIGHT = 37 LB/LF (BASED ON 8'-0" POST SPACING.)

- RDWY. OPENING OR 2 1/2" MIN. FOR STRIP SEAL EXP. JOINT & 1/2" OPENING FOR A1 ABUTMENTS.
- TIE TO TOP MAT OF STEEL.

TUBULAR STEEL RAILING TYPE 'F'

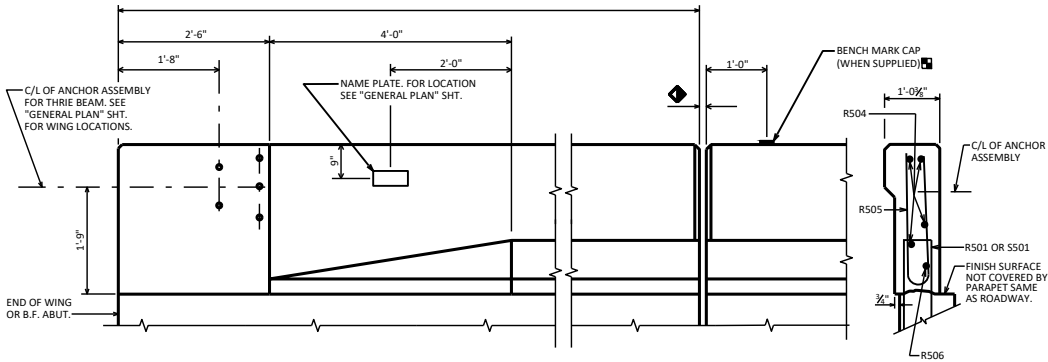


BUREAU OF STRUCTURES

DATE:
7-16

APPROVED: *Laura Shadewald*

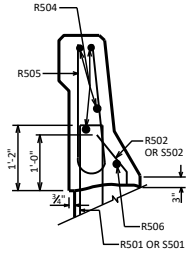
■ AVOID PLACING A BENCH MARK CAP BELOW A RAIL OR FENCE SYSTEM THAT IS ATTACHED TO THE TOP OF THE PARAPET.



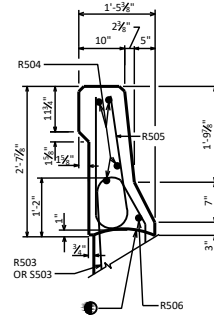
INSIDE ELEVATION

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

SECTION A



SECTION B

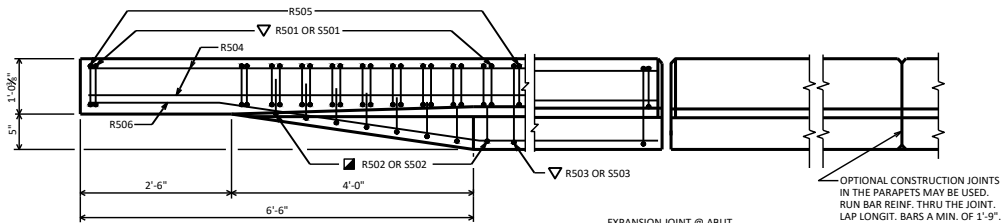


SECTION C

FOR ABUTMENT PARAPETS

FOR ABUTMENT PARAPETS

| BAR MARK | COR. | ABUT. | ABUT. | LENGTH | BENT | LOCATION |
|-------------|------|-------|-------|--------|------|----------------|
| R501 | X | | | 4'-7" | X | PARAPET VERT. |
| R502 | X | | | 2'-4" | X | PARAPET VERT. |
| R503 | X | | | 4'-7" | X | PARAPET VERT. |
| R504 | X | | | | | PARAPET HORIZ. |
| R505 | X | | | 4'-10" | X | PARAPET VERT. |
| R506 | X | | | | X | PARAPET HORIZ. |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| S501 | X | | | 4'-5" | X | PARAPET VERT. |
| S502 | X | | | 2'-4" | X | PARAPET VERT. |
| S503 | X | | | 4'-2" | X | PARAPET VERT. |

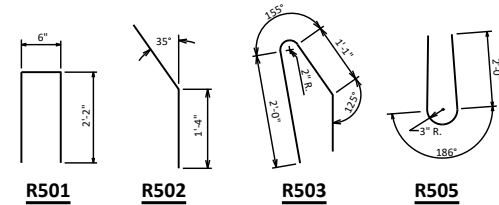


PLAN

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

FOR TYPE A1 ABUT., USE $\frac{3}{2}$ "
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 1'-9". MIN. JOINT SPACING OF 80'-0". DEFINE CONST. JOINT WITH A ¼" - "V" GROOVE.

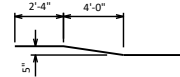


R50

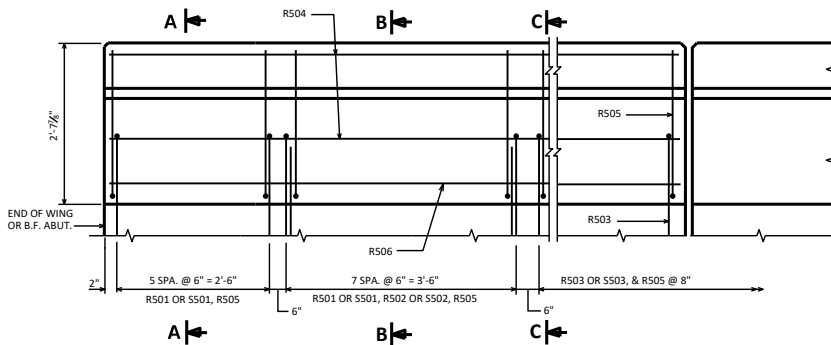
R502

R503

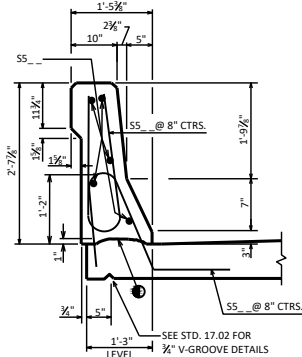
2505



R506



OUTSIDE ELEVATION



SECTION THRU PARAPET ON BRIDGE

AREA = 2.58 SF
WEIGHT = 387 LB/FT

● CONST. JOINT - STRIKE OFF AS SHOWN.

■ R502 BARS MAY BE PLACED AFTER CONCRETE IS POURED BUT BEFORE INITIAL SET HAS TAKEN PLACE. USE CARE TO PLACE R502 OR S502 BARS CORRECTLY ALONG TRANSITION OF PARAPET.

▽ R501 AND R503 BARS TO BE TIED TO WING STEEL BEFORE WING IS POURED.

A R503 BAR MAY BE USED IN LIEU OF
A S503 BAR ADJACENT TO THE PAVING
NOTCH ON TYPE A1 ABUTMENTS.

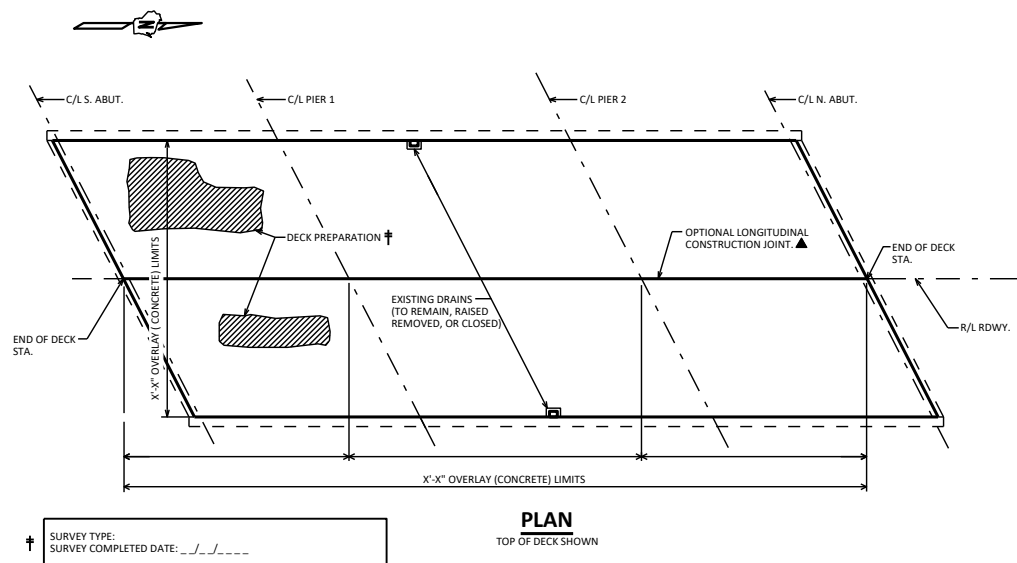
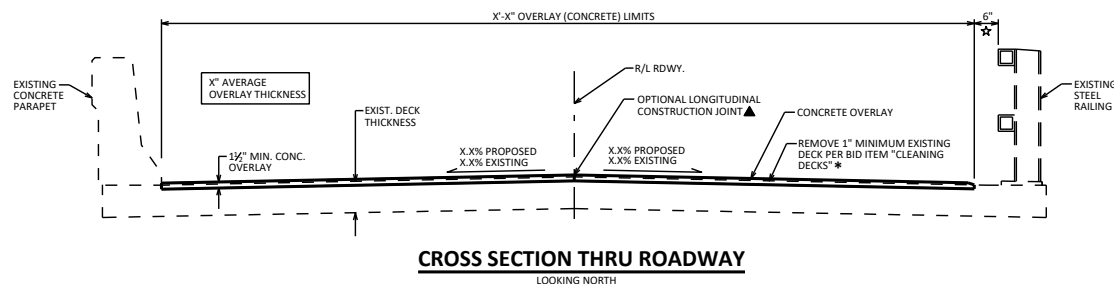
SLOPED FACE PARAPET 'LF'



**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

DATE:
1-19



TOTAL ESTIMATED QUANTITIES

| BID ITEM NUMBER | BID ITEMS | UNIT | TOTAL |
|-----------------|--|------|-------|
| 502.3200 | PROTECTIVE SURFACE TREATMENT | SY | |
| 509.0301 | PREPARATION DECKS TYPE 1 | SY | |
| 509.0302 | PREPARATION DECKS TYPE 2 | SY | |
| 509.0500 | CLEANING DECKS | SY | |
| 509.2000 | FULL-DEPTH DECK REPAIR | SY | |
| 509.2500 | CONCRETE MASONRY OVERLAY DECKS | CY | |
| | POSSIBLE ADDITIONAL BID ITEMS | | |
| 502.3210 | PIGMENTED SURFACE SEALER | SY | |
| * 509.0505.S | CLEANING DECKS TO REAPPLY CONCRETE MASONRY OVERLAY | SY | |
| * 509.9005.S | REMOVING CONCRETE MASONRY DECK OVERLAY (STRUCTURE) | SY | |
| 514.0900 | ADJUSTING FLOOR DRAINS | EACH | |

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

DESIGN DATA

LIVE LOAD:
INVENTORY RATING: HS-__
OPERATING RATING: HS-__
WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) = __ __ __ KIPS

MATERIAL PROPERTIES:
CONCRETE MASONRY OVERLAY DECKS $f'_c = 4,000$ P.S.I.

NOTES

DRAWINGS SHALL NOT BE SCALED.

DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS.

PROTECTIVE SURFACE TREATMENT SHALL BE APPLIED TO THE ENTIRE TOP SURFACE OF THE NEW CONCRETE OVERLAY.

SEAL OVERLAY CONSTRUCTION JOINTS ACCORDING TO SECTION 502.3.13.1 OF THE STANDARD SPECIFICATIONS. COST INCIDENTAL TO BID ITEM "CONCRETE MASONRY OVERLAY DECKS".

A MINIMUM OF 1-INCH OF CONCRETE SHALL BE REMOVED FROM THE ENTIRE BRIDGE DECK UNDER THE BID ITEM "CLEANING DECKS".

THE AVERAGE OVERLAY THICKNESS IS BASED ON THE MINIMUM OVERLAY THICKNESS PLUS 1/2-INCH TO ACCOUNT FOR VARIATIONS IN THE DECK SURFACE.

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

ANY EXCAVATION REQUIRED TO COMPLETE THE OVERLAY OR JOINT REPAIRS AT THE ABUTMENTS TO BE CONSIDERED INCIDENTAL TO THE BID ITEM "CONCRETE MASONRY OVERLAY DECKS".

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

DRAINS REMOVED OR CLOSED IS INCIDENTAL TO THE BID ITEM "CONCRETE MASONRY OVERLAY DECKS".

DESIGNER NOTES

PLAN VIEW APPLICABLE TO ALL OVERLAY METHODS AND DECK REPAIRS WITHOUT OVERLAYS.

FOR CROSS SECTIONS NOT IN SUPERELEVATION TRANSITIONS, THE PREFERRED MINIMUM SLOPE IS 2%.

PROVIDE AN AVERAGE OVERLAY THICKNESS ON THE PLANS. THE AVERAGE OVERLAY THICKNESS IS THE MINIMUM OVERLAY THICKNESS PLUS 1/2" TO ACCOUNT FOR VARIATIONS IN THE DECK SURFACE. CHANGES IN CROSS-SLOPE INCREASE THE AVERAGE OVERLAY THICKNESS. QUANTITIES ARE BASED ON THE AVERAGE OVERLAY THICKNESS.

DO NOT PROVIDE A PROFILE GRADE LINE ON THE PLANS.

DO NOT INCLUDE BID ITEM "SAWING PAVEMENT DECK PREPARATION AREAS" FOR DECK PREPARATION.

* REMOVAL OF 1" OF EXISTING DECK UNDER BID ITEM "CLEANING DECKS" IS NOT INTENDED FOR PREVIOUSLY OVERLAID DECKS. EXISTING CONCRETE COVER (1" MIN.) SHALL BE MAINTAINED AND CONSIDERED WHEN DETERMINING CONCRETE REMOVALS. INCLUDE THE BID ITEM "CLEANING DECKS TO REAPPLY CONCRETE MASONRY OVERLAY" WHEN REMOVING EXISTING OVERLAY.

† PROVIDE (IF AVAILABLE) THE MOST CURRENT DECK CONDITION ASSESSMENT SURVEY ON PLANS. INCLUDE SURVEY TYPE AND DATE COMPLETED. THERMOGRAPHY DATA CAN BE FOUND IN HSS WITHIN GENERAL INVENTORY/FILE/INSPECTION/DATE/INSPECTION SPECIAL REPORT. DECK CONDITION ASSESSMENT SURVEY DATES CAN BE FOUND WITHIN INSPECTION/HISTORY UNDER THE "DEVAL" ACTIVITY TYPE.

JOINT REPAIR AREAS SHOULD NOT BE INCLUDED IN DECK REPAIR AREAS OR OVERLAY QUANTITIES. SEE STANDARD 40.04.

INCLUDE THE BID ITEM "ADJUSTING FLOOR DRAINS" WHEN DRAINS ARE TO BE RAISED.

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

▲ OVERLAY LIMIT SHOULD BE OFFSET FROM EXISTING OPEN STEEL RAILING FOR IMPROVED ACCESS FOR DECK REMOVAL AND OVERLAY PLACEMENT. OVERLAY LIMITS FOR PREVIOUSLY OVERLAID DECKS SHALL BE BASED ON THE EXISTING OVERLAY LIMITS.

OPTIONAL CONSTRUCTION JOINTS SHALL BE LOCATED AT CROWN POINTS AND OTHER GRADE BREAK LOCATIONS. COORDINATE STAGING TO AVOID GRADE BREAKS WITHIN A GIVEN STAGE, WHICH WILL REQUIRE SEPARATE OVERLAY POURS.

CONCRETE OVERLAY

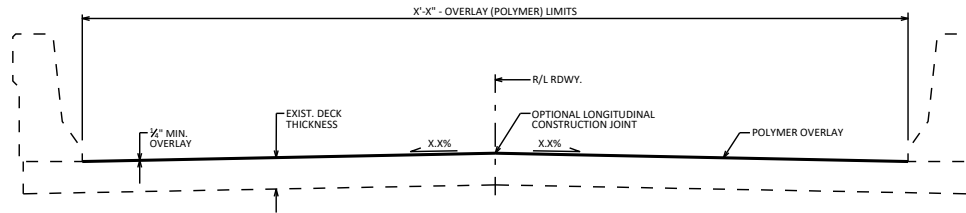


BUREAU OF
STRUCTURES

APPROVED: *Laura Shadewald*

DATE:
7-22

REHABILITATION OVERLAY



CROSS SECTION THRU ROADWAY

LOOKING NORTH

TOTAL ESTIMATED QUANTITIES

| BID ITEM NUMBER | BID ITEMS | UNIT | TOTAL |
|-----------------|---|------|-------|
| 509.0301 | PREPARATION DECKS TYPE 1 | SY | |
| 509.0302 | PREPARATION DECKS TYPE 2 | SY | |
| 509.0310.S | SAWING PAVEMENT DECK PREPARATION AREAS | LF | |
| 509.2000 | FULL-DEPTH DECK REPAIR | SY | |
| 509.2100.S | CONCRETE MASONRY DECK REPAIR | CY | |
| 509.5100.S | POLYMER OVERLAY | SY | |
| | POSSIBLE BID ITEM | | |
| SPV.0035 | RAPID SET DECK REPAIR | CY | |
| ★ SPV.0180 | HIGH FRICTION SURFACE TREATMENT POLYMER OVERLAY | SY | |

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

DESIGN DATA

LIVE LOAD:
INVENTORY RATING: HS-20
OPERATING RATING: HS-20
WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) = ___ KIPS

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

NOTES

DRAWINGS SHALL NOT BE SCALED.

DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS.

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

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

DECK REPAIRS SHALL BE FILLED PRIOR TO OVERLAY PLACEMENT. DECK REPAIRS USING A PORTLAND CEMENT BASED CONCRETE REQUIRES A MINIMUM CURE TIME OF 28 DAYS PRIOR TO OVERLAY PLACEMENT.

SHOT BLASTING, DECK SURFACE PREPARATIONS, AND TRANSITIONAL AREAS ARE INCLUDED IN THE BID ITEM "POLYMER OVERLAY".

DESIGNER NOTES

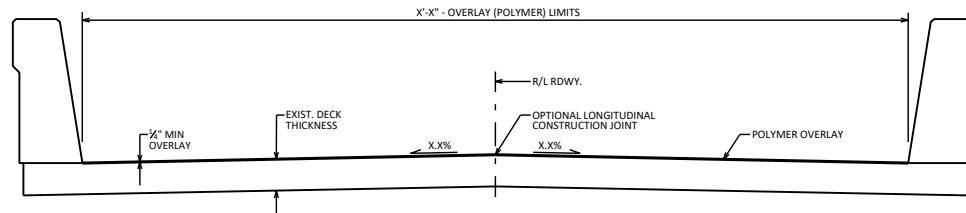
DECK REPAIRS USING A PORTLAND CEMENT BASED CONCRETE REQUIRES A MINIMUM CURE TIME OF 28 DAYS PRIOR TO OVERLAY PLACEMENT. WHEN DEEMED ABSOLUTELY NECESSARY (BY REGION AND BOS DESIGN STAFF) "RAPID SET DECK REPAIR" MAY BE USED IN LIEU OF "CONCRETE MASONRY DECK REPAIR" TO SHORTEN TIME REQUIRED FOR PLACING OVERLAY.

DO NOT PROVIDE A PROFILE GRADE LINE ON THE PLANS.

POLYMER OVERLAYS AND TRANSITIONAL AREAS ARE NOT RECOMMENDED ON CONCRETE APPROACHES.

PROVIDE OVERLAY TRANSITIONAL AREA DETAILS AND IDENTIFY LOCATIONS ON THE PLANS.

★ WHEN DEEMED NECESSARY (BY REGION AND AGREED UPON BY BOS) "HIGH FRICTION SURFACE TREATMENT POLYMER OVERLAY" MAY BE USED IN LIEU OF "POLYMER OVERLAY". SEE BRIDGE MANUAL SECTION 40.5.1.1 FOR ADDITIONAL GUIDANCE.



CROSS SECTION THRU ROADWAY

LOOKING NORTH

TOTAL ESTIMATED QUANTITIES

| BID ITEM NUMBER | BID ITEMS | UNIT | TOTAL |
|-----------------|---|------|-------|
| 509.5100.S | POLYMER OVERLAY | SY | |
| | POSSIBLE BID ITEM | | |
| ★ SPV.0180 | HIGH FRICTION SURFACE TREATMENT POLYMER OVERLAY | SY | |

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

DESIGN DATA

LIVE LOAD:
DESIGN LOADING: HL-93
INVENTORY RATING FACTOR: RF=1.0
OPERATING RATING FACTOR: RF=1.0
WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) = ___ KIPS

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

NOTES

DRAWINGS SHALL NOT BE SCALED.

SHOT BLASTING, DECK SURFACE PREPARATIONS, AND TRANSITIONAL AREAS ARE INCLUDED IN THE BID ITEM "POLYMER OVERLAY".

DESIGNER NOTES

PREVENTATIVE OVERLAY INTENDED FOR USE ON DECKS WITH A MINIMUM AGE OF 28 DAYS AND A MAXIMUM AGE OF 2 YEARS. AN ADDITIONAL CONTRACT MAY BE REQUIRED FOR APPLYING THE OVERLAY DUE TO SCHEDULE AND DECK AGE CONSIDERATIONS.

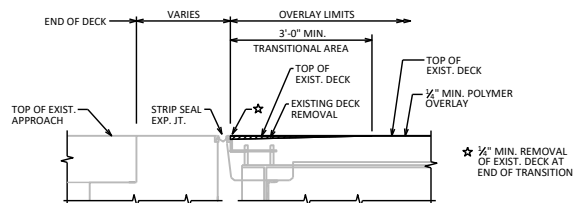
WHEN BID ITEM "POLYMER OVERLAY" IS USED RATING SHOULD INCLUDE THE 5 PSF OVERLAY.

POLYMER OVERLAYS AND TRANSITIONAL AREAS ARE NOT RECOMMENDED ON CONCRETE APPROACHES.

PROVIDE OVERLAY TRANSITIONAL AREA DETAILS AND IDENTIFY LOCATIONS ON THE PLANS.

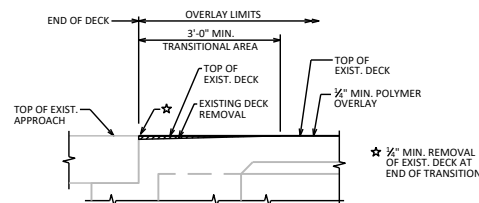
★ WHEN DEEMED NECESSARY (BY REGION AND AGREED UPON BY BOS) "HIGH FRICTION SURFACE TREATMENT POLYMER OVERLAY" MAY BE USED IN LIEU OF "POLYMER OVERLAY". SEE BRIDGE MANUAL SECTION 40.5.1.1 FOR ADDITIONAL GUIDANCE.

PREVENTATIVE OVERLAY



SECTION THRU ABUTMENT TRANSITIONAL AREA ON DECK AT EXPANSION JOINT

(REMOVAL AND OVERLAY THICKNESS NOT TO SCALE)



SECTION THRU ABUTMENT TRANSITIONAL AREA ON DECK AT SEMI-EXPANSION OR FIXED JOINT

(REMOVAL AND OVERLAY THICKNESS NOT TO SCALE)

NOTE: TRANSITIONAL AREA REQUIRED WHEN APPROACH PAVEMENT HAS BEEN PLACED PRIOR TO OVERLAY PLACEMENT.

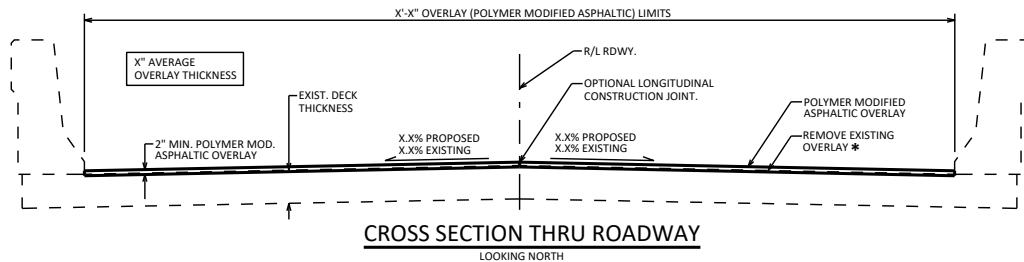
POLYMER OVERLAY



BUREAU OF
STRUCTURES

APPROVED: *Laura Shadewald*

DATE:
7-22



DESIGNER NOTES

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

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

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

DO NOT PROVIDE A PROFILE GRADE LINE ON THE PLANS.

OVERLAYS NOT REQUIRING SHEET MEMBRANE WATERPROOFING ARE PREFERRED.

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

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

* REMOVAL OF 1" OF EXISTING DECK UNDER BID ITEM "CLEANING DECKS" IS NOT INTENDED FOR PREVIOUSLY OVERLAID DECKS. EXISTING CONCRETE COVER (1" MIN.) SHALL BE MAINTAINED AND CONSIDERED WHEN DETERMINING CONCRETE REMOVALS. $\frac{3}{4}$ " MINIMUM REMOVAL OF EXISTING DECK IS INCLUDED WITHIN "REMOVING (OVERLAY TYPE) DECK OVERLAY (STRUCTURE)" BID ITEMS.

PROVIDE (IF AVAILABLE) THE MOST CURRENT DECK CONDITION ASSESSMENT SURVEY ON PLANS. INCLUDE SURVEY TYPE AND DATE COMPLETED. THERMOGRAPHY DATA CAN BE FOUND IN HHS WITHIN GENERAL INVENTORY/FILE/INSPECTION/DATE/INSPECTION SPECIAL REPORT. DECK CONDITION ASSESSMENT SURVEY DATES CAN BE FOUND WITHIN INSPECTION/HISTORY UNDER THE "DEVAL" ACTIVITY TYPE.

TOTAL ESTIMATED QUANTITIES

| BID ITEM NUMBER | BID ITEMS | UNIT | TOTAL |
|-----------------|--|------|-------|
| 509.0301 | PREPARATION DECKS TYPE 1 | SY | |
| 509.0302 | PREPARATION DECKS TYPE 2 | SY | |
| 509.0310.S | SAWING PAVEMENT DECK PREPARATION AREAS | LF | |
| 509.2000 | FULL-DEPTH DECK REPAIR | SY | |
| 509.2100.S | CONCRETE MASONRY DECK REPAIR | CY | |
| 509.3500.S | HMA OVERLAY POLYMER-MODIFIED | TON | |
| | | | |
| | POSSIBLE ADDITIONAL BID ITEMS | | |
| * 509.9005.S | REMOVING CONCRETE MASONRY DECK OVERLAY (STRUCTURE) | SY | |
| * 509.9010.S | REMOVING ASPHALTIC CONCRETE DECK OVERLAY (STRUCTURE) | SY | |

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

DESIGN DATA

LIVE LOAD:
INVENTORY RATING: HS-___
OPERATING RATING: HS-___
WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) = ___ _ KIPS

MATERIAL PROPERTIES:

CONCRETE MASONRY - DECK PATCHING f'_c = 4,000 P.S.I.

NOTES

DRAWINGS SHALL NOT BE SCALED.

DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS.

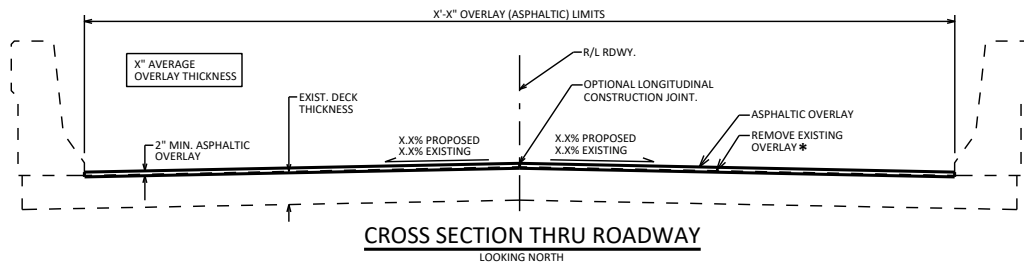
AREAS OF "PREPARATION DECKS TYPE 1" SHALL BE DEFINED BY A SAW CUT.

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

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

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

PROFILE GRADE LINE SHALL BE DETERMINED IN THE FIELD BASED ON A MINIMUM OVERLAY THICKNESS OF 2" PLACED ABOVE THE DECK SURFACE. EXPECTED AVERAGE OVERLAY THICKNESS IS $2\frac{3}{4}$ " (OR AS GIVEN ON THE PLANS). IF EXPECTED AVERAGE OVERLAY THICKNESS IS EXCEEDED BY MORE THAN $\frac{1}{2}$ ", CONTACT THE STRUCTURES DESIGN SECTION.



DESIGNER NOTES

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

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

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

DO NOT PROVIDE A PROFILE GRADE LINE ON THE PLANS.

OVERLAYS NOT REQUIRING SHEET MEMBRANE WATERPROOFING ARE PREFERRED.

COORDINATE WITH REGION BRIDGE MAINTENANCE AND ROADWAY ENGINEERS FOR THE ASPHALTIC DESIGN AND QUANTITIES.

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

* REMOVAL OF 1" OF EXISTING DECK UNDER BID ITEM "CLEANING DECKS" IS NOT INTENDED FOR PREVIOUSLY OVERLAID DECKS. EXISTING CONCRETE COVER (1" MIN.) SHALL BE MAINTAINED AND CONSIDERED WHEN DETERMINING CONCRETE REMOVALS. $\frac{3}{4}$ " MINIMUM REMOVAL OF EXISTING DECK IS INCLUDED WITHIN "REMOVING (OVERLAY TYPE) DECK OVERLAY (STRUCTURE)" BID ITEMS.

PROVIDE (IF AVAILABLE) THE MOST CURRENT DECK CONDITION ASSESSMENT SURVEY ON PLANS. INCLUDE SURVEY TYPE AND DATE COMPLETED. THERMOGRAPHY DATA CAN BE FOUND IN HHS WITHIN GENERAL INVENTORY/FILE/INSPECTION/DATE/INSPECTION SPECIAL REPORT. DECK CONDITION ASSESSMENT SURVEY DATES CAN BE FOUND WITHIN INSPECTION/HISTORY UNDER THE "DEVAL" ACTIVITY TYPE.

TOTAL ESTIMATED QUANTITIES

| BID ITEM NUMBER | BID ITEMS | UNIT | TOTAL |
|-----------------|--|------|-------|
| 455.0605 | TACK COAT | GAL | |
| 460.100X | HMA PAVEMENT (INSERT TYPE) | TON | |
| 509.0301 | PREPARATION DECKS TYPE 1 | SY | |
| 509.0302 | PREPARATION DECKS TYPE 2 | SY | |
| 509.0310.S | SAWING PAVEMENT DECK PREPARATION AREAS | LF | |
| 509.2000 | FULL-DEPTH DECK REPAIR | SY | |
| 509.2100.S | CONCRETE MASONRY DECK REPAIR | CY | |
| | | | |
| | POSSIBLE ADDITIONAL BID ITEMS | | |
| * 509.9005.S | REMOVING CONCRETE MASONRY DECK OVERLAY (STRUCTURE) | SY | |
| * 509.9010.S | REMOVING ASPHALTIC CONCRETE DECK OVERLAY (STRUCTURE) | SY | |

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

DESIGN DATA

LIVE LOAD:
INVENTORY RATING: HS-___
OPERATING RATING: HS-___
WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) = ___ _ KIPS

MATERIAL PROPERTIES:

CONCRETE MASONRY - DECK PATCHING f'_c = 4,000 P.S.I.

NOTES

DRAWINGS SHALL NOT BE SCALED.

DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS.

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

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

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

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

PROFILE GRADE LINE SHALL BE DETERMINED IN THE FIELD BASED ON A MINIMUM OVERLAY THICKNESS OF 2" PLACED ABOVE THE DECK SURFACE. EXPECTED AVERAGE OVERLAY THICKNESS IS $2\frac{3}{4}$ " (OR AS GIVEN ON THE PLANS). IF EXPECTED AVERAGE OVERLAY THICKNESS IS EXCEEDED BY MORE THAN $\frac{1}{2}$ ", CONTACT THE STRUCTURES DESIGN SECTION.

POLYMER MODIFIED ASPHALTIC OVERLAY

ASPHALTIC OVERLAY

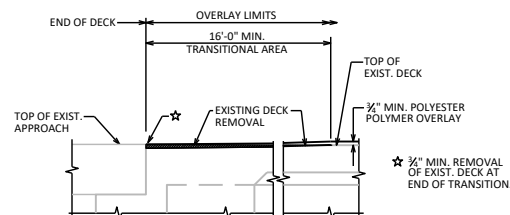
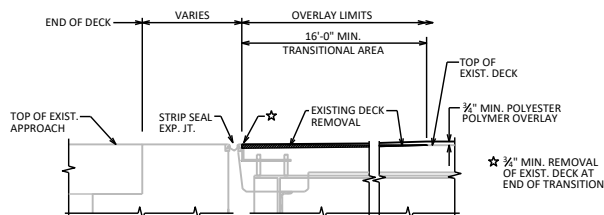
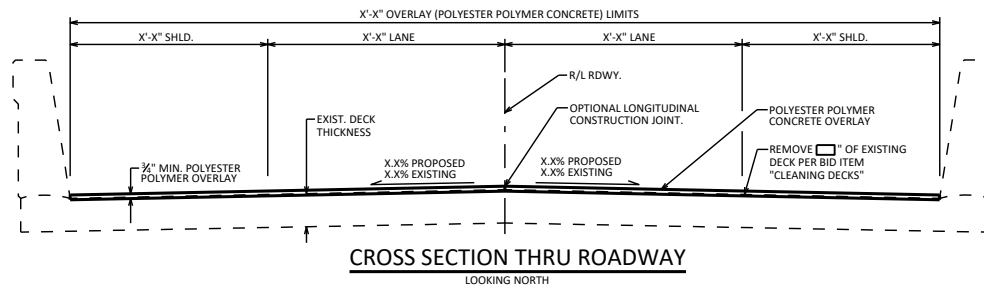
POLYMER MODIFIED ASPHALTIC AND ASPHALTIC OVERLAYS



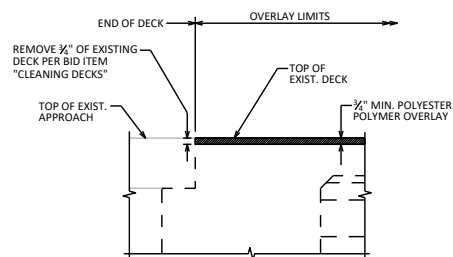
BUREAU OF STRUCTURES

APPROVED: *Laura Shadewald*

DATE:
7-22



NOTE: TRANSITIONAL AREA REQUIRED WHEN APPROACH PAVEMENT HAS BEEN PLACED PRIOR TO OVERLAY PLACEMENT.



DESIGN DATA

LIVE LOAD:
INVENTORY RATING: HS-___
OPERATING RATING: HS-___
WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) = ___ KIPS

NOTES

DRAWINGS SHALL NOT BE SCALED.

DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS.

1/2-INCH OF CONCRETE SHALL BE REMOVED FROM THE ENTIRE BRIDGE DECK UNDER THE BID ITEM "CLEANING DECKS".

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

PREPARATION DECKS TYPE 1, PREPARATION DECKS TYPE 2, AND FULL-DEPTH DECK REPAIR AREAS ARE BASED ON THE PLANS AND AS DETERMINED BY THE ENGINEER. DECK PREPARATION AND FULL-DEPTH DECK REPAIRS SHALL BE FILLED WITH "RAPID SET DECK REPAIR". POLYESTER POLYMER CONCRETE AND PORTLAND CEMENT BASED CONCRETE PATCHES MAY BE SUBSTITUTED AT NO EXTRA COST. PORTLAND CEMENT BASED CONCRETE PATCHES SHALL BE USED FOR JOINT REPAIRS AND FULL-DEPTH REPAIRS WITH A PLAN AREA LARGER THAN 4 SF, UNLESS APPROVED OTHERWISE BY THE STRUCTURES DESIGN SECTION.

DECK REPAIRS SHALL BE FILLED PRIOR TO OVERLAY PLACEMENT. DECK REPAIRS USING A PORTLAND CEMENT BASED CONCRETE REQUIRES A MINIMUM CURE TIME OF 28 DAYS PRIOR TO OVERLAY PLACEMENT.

SHOT BLASTING, OVERLAY PRIME COAT, DECK SURFACE PREPARATIONS, AND TRANSITIONAL AREAS ARE INCLUDED IN THE BID ITEM "POLYESTER POLYMER CONCRETE OVERLAY".

OVERLAY CONSTRUCTION JOINTS SHALL BE APPROVED BY THE ENGINEER. AVOID PLACING LONGITUDINAL JOINTS NEAR WHEEL PATHS. WHEN REQUIRED, PLACE LONGITUDINAL JOINTS AT LANE LINES OR IN THE MIDDLE OF THE LANE. WHEEL PATHS DURING TEMPORARY TRAFFIC STAGING NEED NOT BE CONSIDERED.

DESIGNER NOTES

USE OF PPC OVERLAYS ARE LIMITED. SEE 40.5 IN THE BRIDGE MANUAL FOR ADDITIONAL GUIDANCE.

PPC OVERLAYS ARE INTENDED TO BE PLACED ON DECKS WITH MINIMAL SURFACE DISTRESS WHERE FULL-DEPTH JOINT REPAIRS, FULL-DEPTH DECK REPAIRS, OR THE NEED TO PARTIALLY REMOVE THE ENTIRE DECK WITH BID ITEM "CLEANING DECKS" IS NOT EXPECTED OR WARRANTED.

PPC OVERLAYS AND TRANSITIONAL AREAS ARE NOT RECOMMENDED ON CONCRETE APPROACHES. PLANS SHALL SPECIFY THE MINIMUM TRANSITION TAPER LENGTH. THE PROVIDED TRANSITION LENGTH, AS SHOWN ON THIS SHEET, IS BASED ON A 3/4" OVERLAY THICKNESS. PROVIDE OVERLAY TRANSITIONAL AREA DETAILS AND IDENTIFY LOCATIONS ON THE PLANS. SEE 40.5.6 FOR ADDITIONAL GUIDANCE.

WHEN PARTIAL-DEPTH REMOVAL OF THE ENTIRE EXISTING DECK IS WARRANTED, USE BID ITEM "CLEANING DECKS". PLANS SHALL SPECIFY THE REQUIRED REMOVAL DEPTH.

DO NOT PROVIDE A PROFILE GRADE LINE ON THE PLANS.

PROVIDE (IF AVAILABLE) THE MOST CURRENT DECK CONDITION ASSESSMENT SURVEY ON PLANS. INCLUDE SURVEY TYPE AND DATE COMPLETED. THERMOGRAPHY DATA CAN BE FOUND IN HSIS WITHIN GENERAL INVENTORY/FILE/INSPECTION/DATE/INSPECTION SPECIAL REPORT. DECK CONDITION ASSESSMENT SURVEY DATES CAN BE FOUND WITHIN INSPECTION/HISTORY UNDER THE "DEVAL" ACTIVITY TYPE.

TOTAL ESTIMATED QUANTITIES

| BID ITEM NUMBER | BID ITEMS | UNIT | TOTAL |
|-----------------|--|------|-------|
| 509.0301 | PREPARATION DECKS TYPE 1 | SY | |
| 509.0302 | PREPARATION DECKS TYPE 2 | SY | |
| 509.0310.5 | SAWING PAVEMENT DECK PREPARATION AREAS | LF | |
| 509.2000 | FULL-DEPTH DECK REPAIR | SY | |
| SPV.0035 | RAPID SET DECK REPAIR | CY | |
| SPV.0180 | POLYESTER POLYMER CONCRETE OVERLAY | SY | |
| | | | |
| | POSSIBLE ADDITIONAL BID ITEMS | | |
| 509.0500 | CLEANING DECKS | SY | |

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

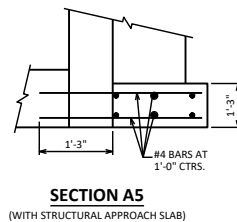
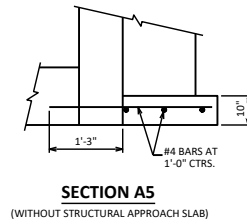
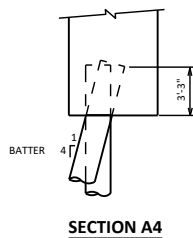
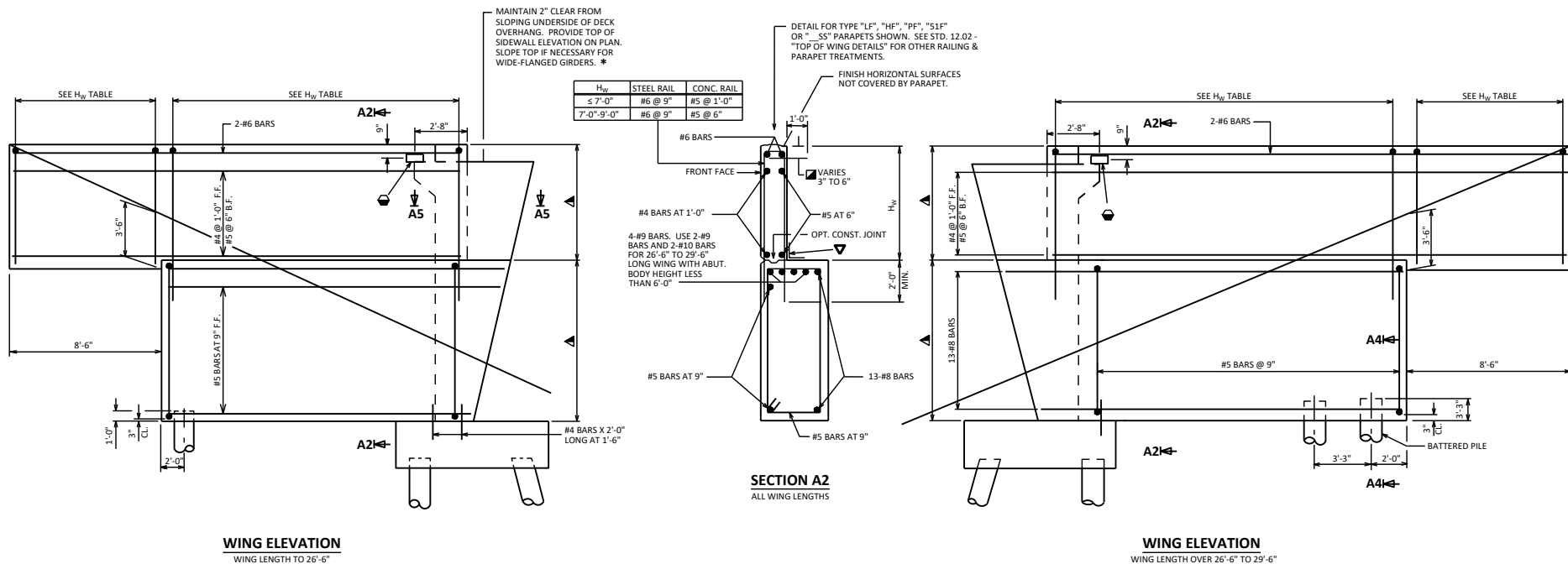
POLYESTER POLYMER CONCRETE OVERLAY



**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

DATE:
7-22



DESIGNER NOTES

USAGE OF A4 ABUTMENTS IS DISCONTINUED.

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

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

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

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

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

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

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

NAME PLATE (ONLY FOR TYPE "W", "M", NY3&4 OR TIMBER RAIL AS SHOWN ON STANDARD 30.24), LOCATE NAME PLATE ON FIRST RIGHT WING TRAVELING UP STATION.

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

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

DIMENSIONS TO BE CONSTANT.

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

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

LRFD DESIGN LOADS

LIVE LOAD
BODY = 1'-6" SURCHARGE
WINGS = 2'-0" SURCHARGE
HORIZ. EARTH LOAD BASED ON:
BODY = 40 P.C.F. EQUIV. FLUID UNIT WGT. OF SOIL
WINGS = 35 P.C.F. EQUIV. FLUID UNIT WGT. OF SOIL
LOAD FACTORS:
 $\gamma_{DC} = 1.25$
 $\gamma_{DW} = 1.50$
 $\gamma_{EH} = 1.50$
 $\gamma_{EH_{MIN}} = 0.90$
 $\gamma_{EV} = 1.35$
 $\gamma_1 = 1.75$
EXPOSURE CLASS 2, $\gamma_c = 0.75$
 $f_y = 60,000$ P.S.I.
 $f'_c = 3,500$ P.S.I.

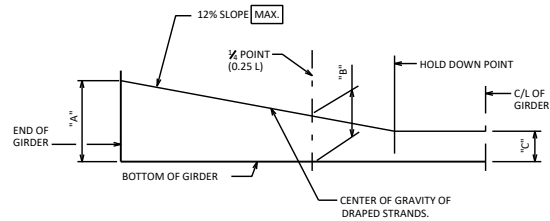
ABUTMENT A4 PILE FOOTING



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1-18



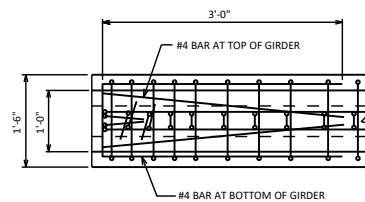
"A" TO BE GIVEN TO THE NEAREST 1"

"B" = $\frac{1}{4}("A" + 3 "C")$ [MIN.]

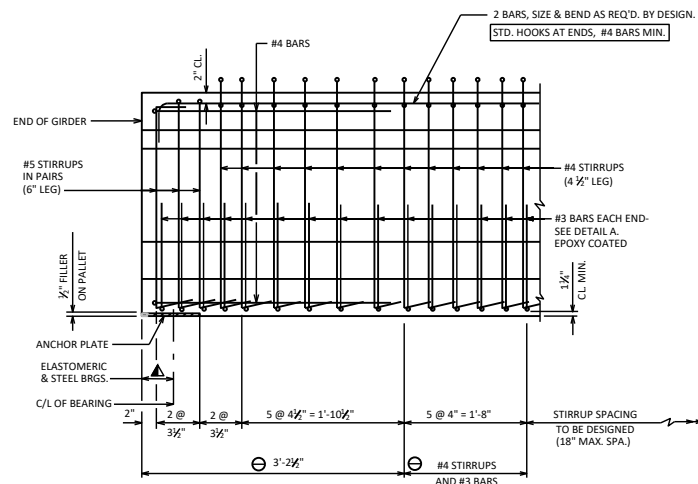
"B" = $\frac{1}{4}("A" + 3 "C") + 3$ [MAX.]

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

LOCATION OF DRAPED STRANDS

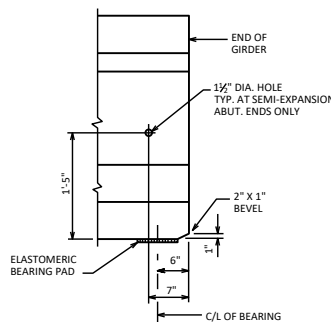


PLAN VIEW

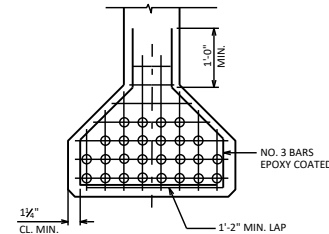


SUPPORT WITH STEEL OR ELASTOMERIC BRGS.

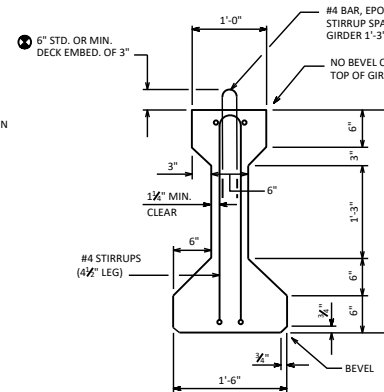
SIDE VIEW OF GIRDER



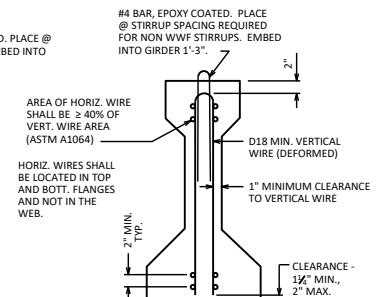
SUPPORT WITH 1/2" ELASTOMERIC BRG. PAD



DETAIL A



SECTION THRU GIRDER



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

36" PRESTRESSED GIRDER DETAILS



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7-23

NOTES

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

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

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

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

ALL GIRDERS SHALL BE CAST FULL LENGTH AS SHOWN.

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

AN EQUIVALENT OF WELDED WIRE FABRIC (WWF) ASTM A1064 MAY BE SUBSTITUTED FOR THE STIRRUP REINFORCEMENT SHOWN, UPON ACCEPTANCE OF THE STRUCTURES MAINTENANCE SECTION. IF USED, WWF SUBSTITUTION DETAILS SHALL BE SUBMITTED ELECTRONICALLY TO THE WISDOT FABRICATION LIBRARY AND ACCEPTED PRIOR TO SHOP DRAWING SUBMITTAL.

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

DESIGNER NOTES

BID ITEM SHALL BE "PRESTRESSED GIRDER TYPE I 36-INCH".

SPECIFY CONCRETE STRENGTH AS REQUIRED BY DESIGN FROM A MINIMUM OF 6,000 PSI TO A MAX. OF 8,000 PSI. MAXIMUM RELEASE STRENGTH IS 6800 PSI. USE ONLY 0.5" DIA. STRAND FOR THE DRAPED PATTERN. THE MAX. NUMBER OF DRAPED 0.5" DIA. STRANDS IS 8. USE 0.6" DIA. FOR THE STRAIGHT PATTERN, UNLESS ONLY 0.5" DIA. WORK FOR KEEPING STRESSES AT ACCEPTABLE LEVELS.

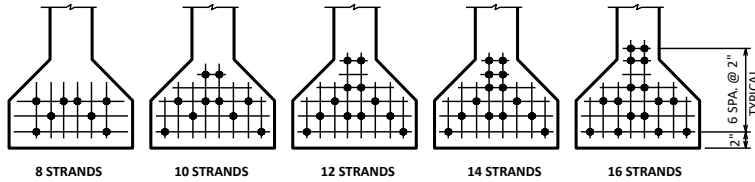
REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STANDARD STRAND PATTERNS LISTED ON STANDARD 40.43 AND THE SPAN LENGTHS SHOWN IN TABLE 19.3-1. USING DIFFERENT STRAND PATTERNS OR LONGER SPANS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT, WHICH REQUIRES PRIOR APPROVAL FROM THE BUREAU OF STRUCTURES.

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

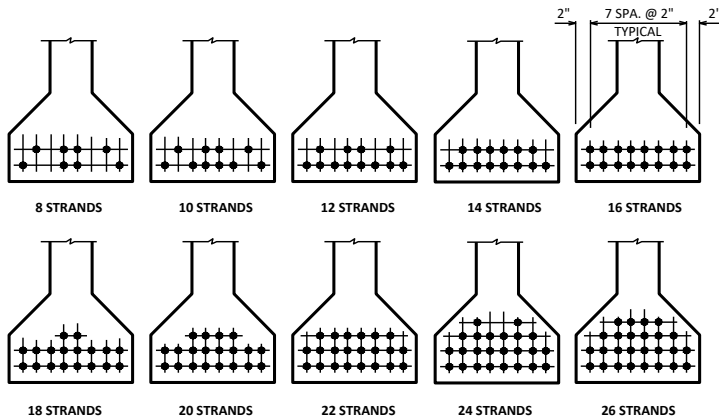
⊖ DETAIL TYPICAL AT EACH END

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

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



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



ARRANGEMENT AT C/L SPAN - FOR GIRDERS WITH DRAPED 0.5" DIA. STRANDS

36" GIRDER

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

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
 $PI \text{ PER } 0.5" \text{ DIA. STRAND} = 0.1531 \times 202,500 = \underline{31.00 \text{ KIPS}}$
 $PI \text{ PER } 0.6" \text{ DIA. STRAND} = 0.217 \times 202,500 = \underline{43.94 \text{ KIPS}}$

$$\frac{y_B}{r^2} = \frac{-15.83}{138.15} = -0.1146 \text{ IN./IN.}^2$$

$$f_b (\text{INIT.}) = \frac{A_s f_s}{A} \left(1 + \frac{e_s y_b}{r^2}\right)$$

(COMPRESSION IS POSITIVE)

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

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.

36" PRESTRESSED GIRDER DESIGN DATA



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DATE:
7-21