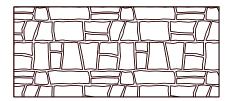


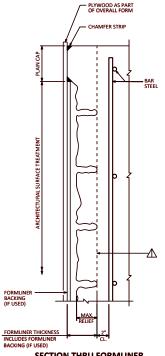
BROKEN RIB

FORMLINER THICKNESS = 3" ± ½"
WIDTH = 2" ± ½"
MAX. RELIEF = 2" ± ½"



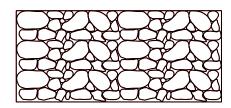
RUSTIC ASHLAR

FORMLINER THICKNESS = 3" SIZE = 8" TO 32" MAX. RELIEF = 2"



SECTION THRU FORMLINER

STRUCTURAL CONCRETE CAN ONLY BE ASSUMED TO TO THIS LINE. PROVIDE ADDITIONAL STRUCTURE SIZE AS NECESSARY TO MAINTAIN MINIMUM FULL STRUCTURAL CONCRETE DIMENSIONS AS INDICATED ON THE STANDARDS.



FIELD STONE - RANDOM

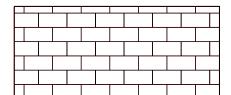
FORMLINER THICKNESS = 3½" SIZES BETWEEN 6" & 24" MAX. RELIEF = 2½"



RECTANGULAR CUT STONE

FORMLINER THICKNESS = 4" TO 5½" COURSE HEIGHT = ± 2"

MAX. RELIEF = 3" TO 4½"



RECTANGULAR BRICK

FORMLINER THICKNESS = 2" SIZE = VARIES MAX. RELIEF = 1"

RETAINING WALL NOTES

FORMLINER COURSING ON RETAINING WALLS SHALL BE LEVEL

ABUTMENT NOTES

WARNING

FORMLINER SHOWN ON THIS STANDARD IS A NON-PARTICIPATING AMENITY (CSD).

FORMLINER COURSING ON ABUTMENTS AND WINGS SHALL BE LEVEL.

THE FORMLINER COURSING ON THE WINGS SHALL BE VERTICALLY ALIGNED WITH THE FORMLINER COURSING ON THE FRONT OF THE ABUTMENT.

THE FORMLINER PATTERN SHALL BE CONTINUOUS ACROSS CONSTRUCTION JOINTS.

WRAPAROUND/MATCH FORMLINER PATTERN AT CORNERS.

PIER NOTES

FORMLINER COURSING ON PIERS SHALL BE LEVEL.

THE FORMLINER COURSING ON ALL FACES OF EACH COLUMN SHALL BE VERTICALLY ALIGNED.

SPACE ADJACENT PORTIONS OF FORMLINER ON SLOPED FACE SO THAT COURSING IS ALIGNED VERTICALLY WITH COURSING ON VERTICAL FACE.

THE FORMLINER PATTERN SHALL BE CONTINUOUS ACROSS CONSTRUCTION JOINTS.

WRAPAROUND/MATCH FORMLINER PATTERN AT CORNERS.

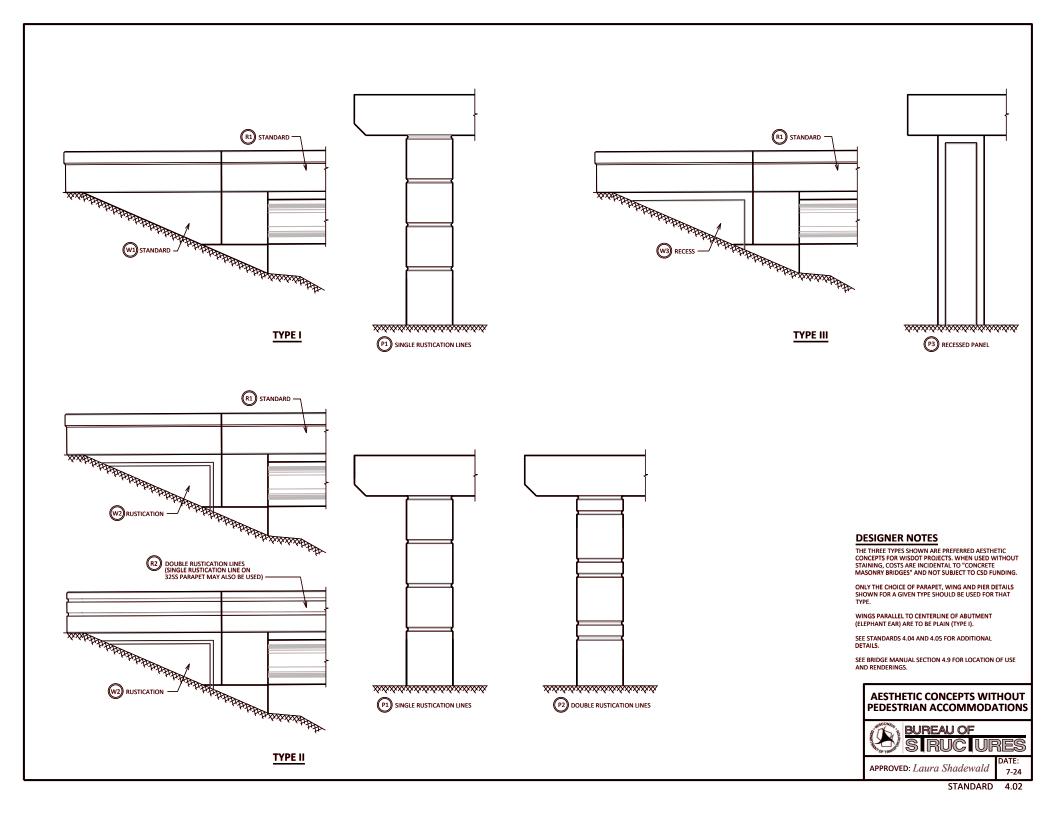
PARAPET NOTES

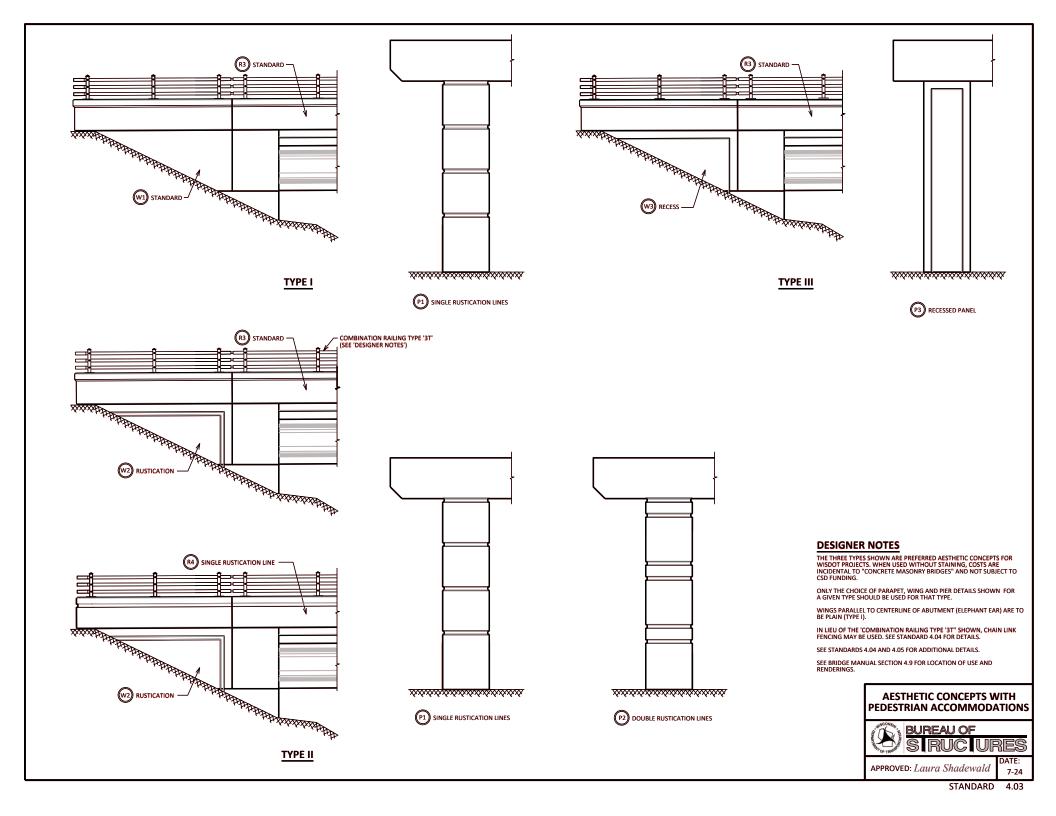
FORMLINER COURSING ON PARAPETS SHALL BE PARALLEL TO TOP OF PARAPET.

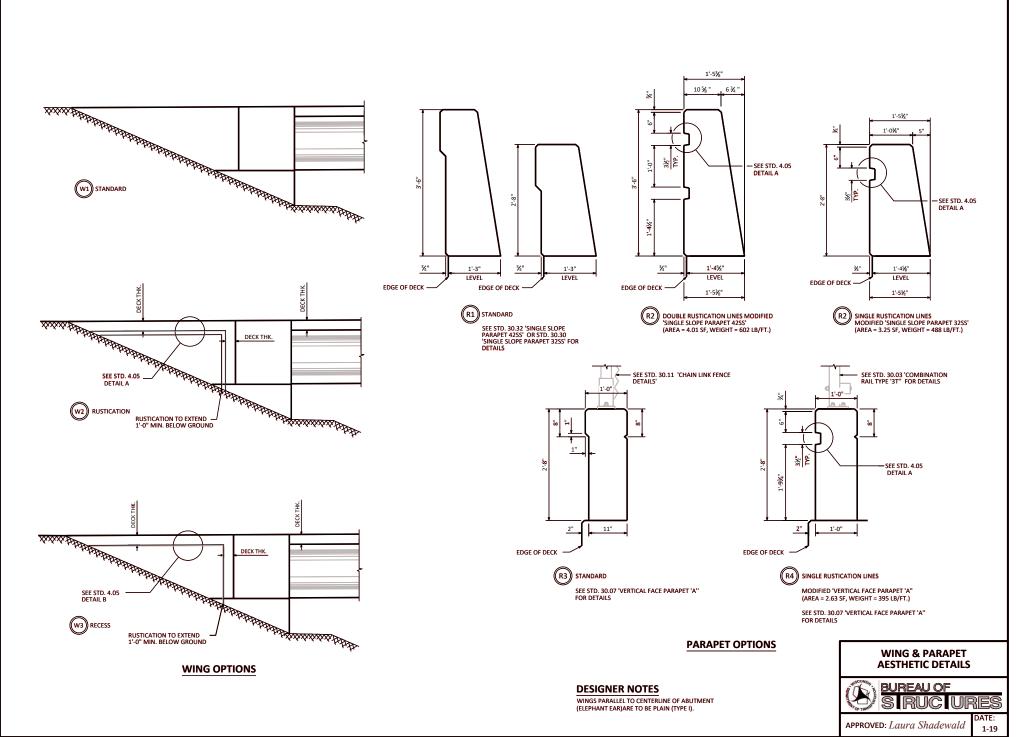
FORMLINER DETAILS

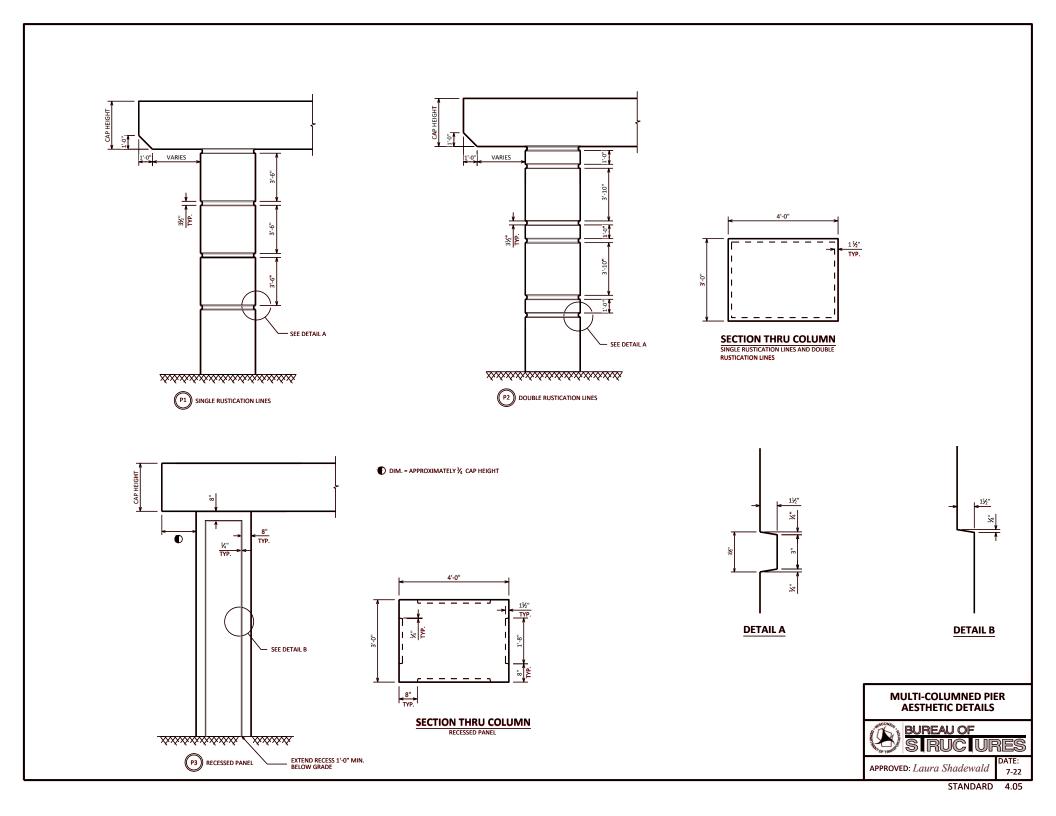


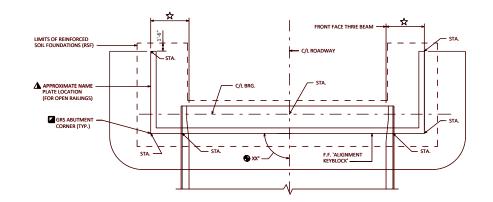
APPROVED: Laura Shadewald











NOTES

DRAWINGS SHALL NOT BE SCALED.

ALL GRS ABUTMENT STATIONING AND OFFSETS ARE GIVEN AT THE FRONT FACE OF THE 'ALICHMENT KEYBLOCK', SEE SECTIONS A-A AND B-B ON STANDARD 7.02 FOR LOCATION OF THE 'ALICHMENT KEYBLOCK'.

FACTORED BEARING RESISTANCE OF XX PSF AT BOTTOM OF REINFORCED SOIL FOUNDATION.

MAXIMUM ALLOWABLE WALL BATTER IS 8 VERTICAL TO 1 HORIZONTAL OR 7.1 DEGREES.

PROTECT MODULAR BLOCK DURING PLACEMENT OF HEAVY RIPRAP.

SEE SECTIONS A-A AND B-B AND 'GRS ABUTMENT INFORMATION' TABLE ON STANDARD 7.02 FOR REQUIRED LENGTHS OF GEOTEXTILE REINFORCEMENT.

PROVIDE CORNER BLOCKS AND/OR DETAILS COMPATIBLE WITH THE SELECTED MODULAR BLOCK SYSTEM. ROUNDED CORNERS ARE ALLOWABLE.

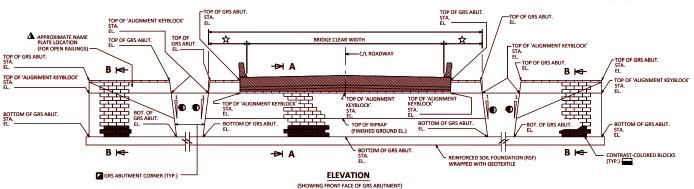
TEMPORARY FALSEWORK NOT TO BE SUPPORTED ON THE GRS ABUTMENT UNLESS APPROVED BY THE BUREAU OF STRUCTURES DEVELOPMENT SECTION.

DESIGNER NOTES

THE USE OF GRS ABUTMENTS IS SUBJECT TO PRIOR APPROVAL BY THE BUREAU OF STRUCTURES.

- PROVIDE AN ADEQUATE WORKING WIDTH FOR GUARDRAIL DEFLECTION PER FDM REQUIREMENTS. MINIMUM WIDTH SHALL BE 6'-6" FROM FRONT FACE OF THRIE BEAM TO FRONT FACE OF WALL.
- MAXIMUM SKEW ANGLE IS 15°.
- THE TOP OF THE CONTRAST-COLORED BLOCKS SHALL BE 2-3 BLOCK COURSES BELOW THE TOP OF RIPRAP ELEVATION.
- ▲ NAME PLATE TO BE LOCATED ON THE OUTSIDE OF THE FIRST RIGHT GRS ABUTMENT WHEN TRAVELING UPSTATION (FOR OPEN RAILINGS).

THE MINIMUM REQUIRED TENSILE STRENGTH OF THE GEOSYNTHETIC REINFORCEMENT SHALL BE SHOWN WITHIN THE SPECIAL PROVISION, 'GEOSYNTHETIC REINFORCED SOIL ABUTHENT'.



PLAN

SECTIONS A-A AND B-B ARE SHOWN ON STANDARD 7.02

TABLE OF GRS ABUTMENT STATIONS AND ELEVATIONS

GRS ABUT. STA.	ROADWAY ALIGN. STA.	ROADWAY STATION OFFSET (FT)	OFFSET DIR.	GRS ABUT. HT. (FT)	BOT. GRS ABUT. EL.	FINISHED GROUND EL.	TOP GRS ABUT. EL.

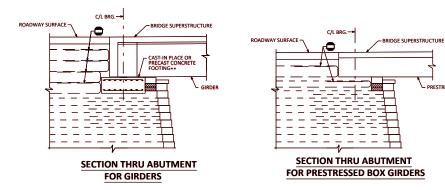
NOTE: STATIONS AND OFFSETS GIVEN AT FRONT FACE OF 'ALIGNMENT KEYBLOCK' AND AT ELEVATION XX.XX.

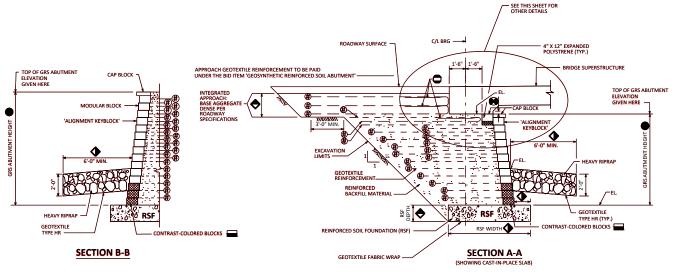
THESE STATIONS AND OFFSETS SHALL BE HELD REGARDLESS OF ACTUAL MODULAR BLOCK SIZE OR GRS ABUTMENT BATTER.

GRS ABUTMENT GENERAL PLAN



APPROVED: Laura Shadewald





PRESTRESSED BOX GIRDER

SECTIONS A-A AND B-B ARE DETAILED ON STANDARD 7.01

NOTES

FRONT FACE OF 'ALIGNMENT KEYBLOCK' LOCATION TO BE HELD REGARDLESS OF ACTUAL MODULAR BLOCK SIZE OR GRS ABUTMENT BATTER.

4'-0" WRAP (TYP.)

- INDICATES GEOSYNTHETIC REINFORCEMENT LAYER NUMBER, FOR LENGTHS, SEE 'GRS ABUTMENT INFORMATION' TABLE. SPACING OF GEOSYNTHETIC REINFORCEMENT LAYERS TO BE DESIGNED.
- FULL HEIGHT BLOCK IS TYPICAL IN FRONT OF BEARING SEAT BUT A HALF HEIGHT BLOCK AND A SPECIAL EXPANDED POLYSTYRENE THICKNESS MAY BE REQUIRED IN SOME APPLICATIONS.
- LIMITS OF GRS BACKFILL TO BE PAID FOR UNDER THE BID ITEM 'GEOSYNTHETIC REINFORCED SOIL ABUTMENT'

DESIGNER NOTES

THE TOP OF THE CONTRAST-COLORED BLOCKS SHALL BE 2-3 BLOCK COURSES BELOW THE TOP OF RIPRAP ELEVATION.

DIMENSION TO BE DESIGNED

THE MINIMUM REQUIRED TENSILE STRENGTH OF THE GEOSYNTHETIC REINFORCEMENT SHALL BE SHOWN WITHIN THE SPECIAL PROVISION, 'GEOSYNTHETIC REINFORCED SOIL ABUTMENT'.

- MINIMUM CLEAR SPACE SHALL BE 3" OR 2% OF GRS ABUTMENT HEIGHT, WHICHEVER IS GREATER. MINIMUM CLEAR SPACE SHALL BE SHOWN ON THE PLANS.
- ** CONCRETE SPREAD FOOTING TO BE DETERMINED PER DESIGN.

GRS ABUTMENT INFORMATION

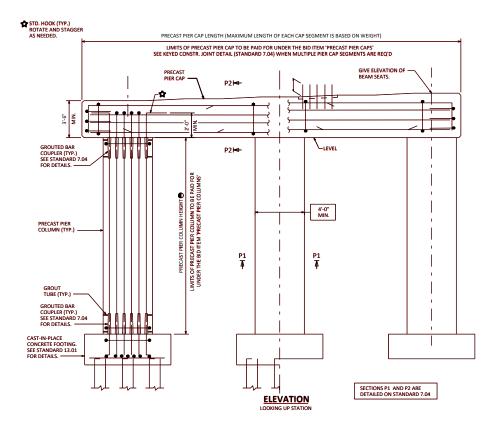
LAYER NUMBER	MINIMUM LENGTH* OF GEOTEXTILE (FT.)	EL. ±

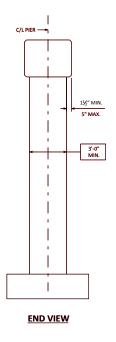
*LENGTH MEASURED FROM FRONT FACE OF MODULAR BLOCK TO END OF GEOTEXTILE, (DOES NOT INCLUDE WRAPPED GEOTEXTILE WHERE APPLICABLE).

GRS ABUTMENT DETAILS



APPROVED: Laura Shadewald





*MAKE ALL FOOTING LENGTHS THE SAME WITHIN A GIVEN PIER

2" X 6" BEVELED KEYWAY BETWEEN GIRDERS ROADWAY REF. LINE ON PRESTRESSED GIRDER STRUCTURES ONLY. REFER TO STANDARDS 19.33, 19.34, 19.35. FOOTING WIDTH ELASTOMERIC BEARING PADS PIER REF. LINE 1'-6" STEEL MASONRY MIN. TYP. PLATE OR LAMINATED 4 2 L_{C/L PIER} MIN.

PLAN

NOTES

PROVIDE A SUITABLE LIFTING DEVICE FOR THE PRECAST CAP AND COLUMN UNIT(S).

CAST-IN-PLACE ALTERNATIVE IS NOT ALLOWED.

STIRRUPS AT THE GROUTED COUPLERS ARE SIZED BASED ON A XX" OUTER DIAMETER COUPLER SLEEVE. ADJUST STIRRUP DIMENSIONS AS REQUIRED IF THE ACTUAL COUPLER SLEEVE DIAMETER DIFFERS.

■ MANUFACTURER TO DETERMINE THE PRECAST PIER COLUMN LENGTHS ASSUMING ½" STEEL SHIMS AT THE TOP AND BOTTOM OF THE COLUMN.

BID ITEM "PRECAST PIER COLUMNS" PAID PER PLAN VALUE AS BOTTOM OF PIER CAP ELEVATION MINUS TOP OF FOOTING ELEVATION.

DESIGNER NOTES

PIERS SHALL BE SUPPORTED BY A MINIMUM OF 3 COLUMNS. WHEN MULTIPLE PIER CAPS ARE USED EACH SEGMENT SHALL BE SUPPORTED BY A MINIMUM OF 2 COLUMNS.

THE FOLLOWING SPECIAL PROVISIONS SHALL BE USED:
GROUTED BAR COUPLERS (505.1000.S)
PRECAST PIER COLUMNS (SPV.0090.XXX) GROUTED BAR COUPLERS
PRECAST PIER COLUMNS
PRECAST PIER CAPS (SPV.0090.XXX)

THE MAXIMUM WEIGHT OF EACH PRECAST ELEMENT SHALL BE 90 KIP.

GROUTED COUPLER SLEEVES MAY BE OVERSIZED TO ALLOW FOR ADDITIONAL LATERAL TOLERANCE IN THE FIELD. STANDARD WISDOT PRACTICE IS TO OVERSIZE COUPLER SLEEVES BY 1 B DAR SIZE. ADJUST SHEAR STIRRUPS AS NECESSARY TO ACCOUNT FOR LARGER DIAMETER COUPLER SLEEVES.

VERIFY SEVERAL MANUFACTURER'S COUPLER SLEEVE DIMENSIONS PRIOR TO DESIGN.
ASSUME THE MAXIMUM DIAMETER OF COUPLER SLEEVE FOR COLUMN REINFORCEMENT DESIGN.

SEE STANDARDS 13.01 AND 13.07 FOR ADDITIONAL PIER NOTES AND DETAILS.

DETAILS AS SHOWN ON THIS STANDARD ARE INTENDED FOR REQUIRED PRECAST PIERS DESIGNED TO MEET PROJECT SPECIFIC REQUIREMENTS. SEE 7.1.4.1.2 IN THE BRIDGE MANUAL AND STANDARDS 7.05 AND 7.06 FOR ADDITIONAL GUIDANCE.

PRECAST PIER CAP AND COLUMNS



f'c = 3,500 P.S.I.

fy = 60,000 P.S.I.

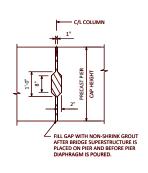
MATERIAL PROPERTIES: CONCRETE MASONRY BAR REINFORCEMENT, GRADE 60

APPROVED: Laura Shadewald 1-19

-C/L COLUMN COLUMN BAR (TYP.) Ш Ш GROUT TUBE (TYP.) PIER COLUMN GROUTED BAR COUPLER (TYP.) GROUT SUPPLIED BY COUPLER MANUFACTURES CAST-IN-PLACE CONCRETE FOOTING $\frac{1}{2}$ " \pm NON-SHRINK GROUT AND STEEL SHIMS. BEDDING GROUT TO HAVE THICKNESS SLIGHTLY LARGER THAN SHIMS IF PLACED IN SEAT BEFORE Ш Ш -11 Ш PXXX BARS (PIER FOOTING DOWELS) COLUMN. BEDDING GROUT SHALL BE NONMETALLIC.

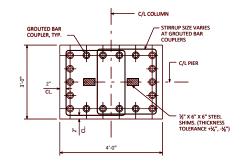
GROUTED BAR COUPLER DETAILS

(PIER COLUMN/FOOTING CONNECTION SHOWN. PIER CAP/COLUMN CONNECTION SIMILAR)



KEYED CONSTR. JOINT ELEVATION DETAIL

(FOR PRECAST PIER CAPS WITH MULTIPLE SEGMENTS)



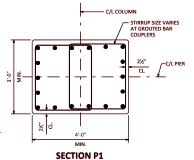
GROUTED COUPLER PLAN AT
TOP AND BOTTOM OF COLUMN

BILL OF BARS

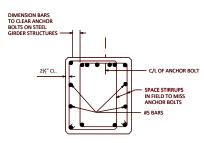
TOTAL COATED: XX LBS

BAR MARK	NO. REQ'D	LENGTH	CORT	BENT	LOCATION

NOTE: THIS BILL OF BARS IS SHOWN FOR INFORMATION ONLY. PAYMENT FOR REINFORCEMENT IN PRECAST COLUMNS AND PRECAST CAP IS INCLUDED IN THE BID ITEMS 'PRECAST PIER COLUMNS' AND 'PRECAST PIER CAPS'.



(PRECAST PIER COLUMN REINF. TO BE DESIGNED BY DESIGN ENGINEER)



SECTION P2

(PRECAST PIER CAP REINF. TO
BE DESIGNED BY DESIGN ENGINEER)

SECTIONS P1 AND P2 ARE CUT ON STANDARD 7.03

GROUTED SPLICE COUPLER CONNECTION SEQUENCE

FOLLOW THE WRITTEN INSTALLATION PROCEDURES OF THE COUPLER MANUFACTURER. THE FOLLOWING ARE GENERAL PROCEDURES THAT APPLY TO MOST COUPLER MANUFACTURERS:

- IT IS RECOMMENDED THAT THE ELEMENT WITH THE REINFORCEMENT BARS EXTENDING OUT BE FABRICATED WITH EXTRA BAR LENGTHS.
- 2. SURVEY LOCATION AND ELEVATION OF LOWER ELEMENT.
- 3. DETERMINE THE REQUIRED REINFORCING BAR EXTENSION LENGTHS AND THE REQUIRED SHIM HEIGHTS BASED ON THE SURVEY.
- CUT THE BAR EXTENSIONS TO THE REQUIRED LENGTH BASED ON THE SURVEY AND THE COUPLER MANUFACTURER'S RECOMMENDATIONS. FOR COATED BARS, THE ENDS OF THE BARS SHALL BE RE-COATED.
- PLACE BEDDING GROUT ON TOP OF LOWER ELEMENT. THE USE OF EXTRA GROUT THAT IS ALLOWED TO FLOW OUT DURING ELEMENT PLACEMENT IS RECOMMENDED. IN LIEU OF PRE-PLACEMENT OF BEDDING GROUT, THE BEDDING GROUT CAN BE FLOWED INTO PLACE AFTER ELEMENT ERECTION BUT PRIOR TO GROUTING OF COUPLERS.
- ERECT UPPER ELEMENT TO WITHIN THE SPECIFIED ERECTION TOLERANCES INDICATED IN THE SPECIAL PROVISIONS. PREVENT BEDDING GROUT FROM FLOWING INTO COUPLER.
- MAINTAIN INTEGRITY OF GROUT BED DURING SETTING OPERATION. REPAIR GROUT THAT IS DISPLACED OR GAPS THAT DEVELOP IN THE GROUT JOINT USING HAND TOOLS.
- 8. BRACE THE UPPER ELEMENT.
- INSTALL GROUT IN COUPLERS FOLLOWING THE MANUFACTURER'S WRITTEN PROCEDURES.
 IF THE COUPLER IS BELOW THE JOINT, COUPLER GROUT CAN BE INSTALLED PRIOR TO
 APPLICATION OF BEDDING GROUT.
- 10. ERECTION OF SUBSEQUENT ELEMENTS ABOVE A CONNECTION SHALL NOT COMMENCE UNTIL THE CONNECTION HAS ACHIEVED ADEQUATE STRENGTH AS DETERMINED THROUGH STRENGTH TESTING OF THE GROUT. THE TIMING OF SUBSEQUENT CONSTRUCTION STEPS SHOULD BE SPECIFIED IN BRIDGE ASSEMBLY PIAN.

GROUTED COUPLER NOTES

USE MATCHING TEMPLATES FOR THE LOCATION OF REINFORCEMENT AND GROUTED COUPLER PLACEMENT WITHIN THE ELEMENTS TO CONTROL CRITICAL DIMENSIONS AND ORIENTATION IN ALL DIRECTIONS.

CONSULT MANUFACTURER OF THE GROUTED COUPLER FOR PROPER DIMENSIONS "B" AND "D" AND FOR TOLERANCE OF THESE DIMENSIONS. FIELD CUT FOOTING AND CAP DOWELS AS REQUIRED.

BEFORE EXECUTING GROUTED COUPLER ASSEMBLIES, ALWAYS SEEK INSTALLATION RECOMMENDATIONS FROM THE MANUFACTURER OF THE GROUTED COUPLER USED.

CONTRACTOR TO PROVIDE ADEQUATE BRACING OF COLUMNS UNTIL GROUTED COUPLER CONNECTIONS HAVE ACHIEVED ADEQUATE STRENGTH.

ALL GROUTED COUPLERS SHALL BE EPOXY COATED.

ADJUST SHIM STACK HEIGHT TO CONTROL ERECTION ELEVATIONS.

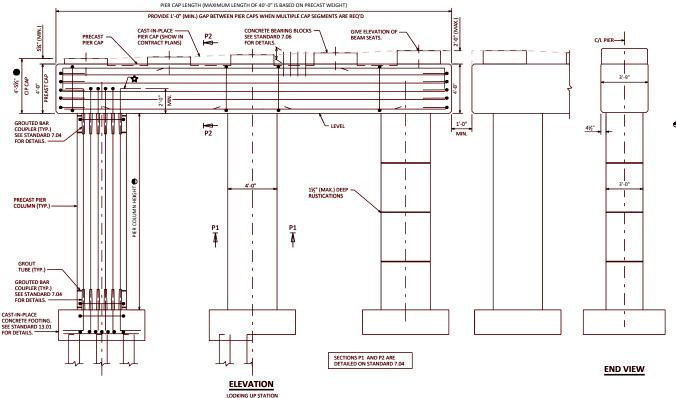
 $\mbox{\ensuremath{\mbox{\sc T}}}\mbox{\sc Tupply reinforcing bars according to grouted coupler requirements for embedment. Bars may be field cut if needed.}$

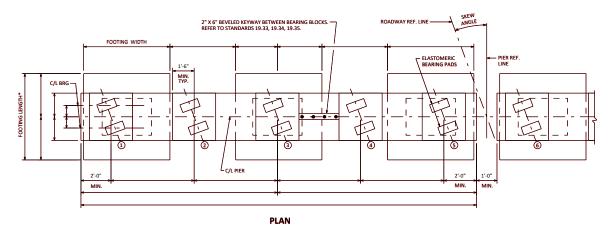
PRECASTER SHALL PROVIDE PORTS IN THE PRECAST ELEMENTS TO ALLOW THE COUPLERS TO BE GROUTED AFTER THE PRECAST ELEMENTS HAVE BEEN ERECTED.





APPROVED: Laura Shadewald





*MAKE ALL FOOTING LENGTHS

MATERIAL PROPERTIES: CONCRETE MASONRY BAR REINFORCEMENT, GRADE 60

f'c = 3.500 P.S.I

CONTRACTOR NOTES

THE CONTRACTOR SHALL FOLLOW THIS STANDARD WHEN PRECAST PIERS ARE USED IN LIEU OF THE CAST-IN-PLACE PIER. THE USE OF OPTIONAL PRECAST PIER DETAILS SHALL ONLY BE USED WHEN PLANS INDICATE ALLOWANCE OR WITH APPROVAL BY THE BUREAU OF STRUCTURES.

PROVIDE A SUITABLE LIFTING DEVICE FOR THE PRECAST CAP, COLUMN AND BEARING BLOCK UNIT(S).

STIRRUPS AT THE GROUTED COUPLERS ARE SIZED BASED ON A XX" DUTER DIAMETER COUPLER SLEEVE. ADJUST STIRRUP DIMENSIONS AS REQUIRED IF THE ACTUAL COUPLER SLEEVE DIAMETER DIFFERS.

● MANUFACTURER TO DETERMINE THE PRECAST PIER COLUMN LENGTHS ASSUMING ½" STEEL SHIMS AT THE TOP AND BOTTOM OF THE COLUMN.

GROUTED COUPLER SLEEVES MAY BE OVERSIZED TO ALLOW FOR ADDITIONAL LATERAL TOLERANCE IN THE FIELD. STANDARD WISDOT PRACTICE IS TO OVERSIZE COUPLER SLEEVES BY 1 BAR SIZE. ADJUST SHEAR STIRRUPS AS NECESSARY TO ACCOUNT FOR

ALL PRECAST ELEMENTS AND DIAPHRAGM ITEMS PAID PER C.I.P BID ITEMS. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR THE PRECAST PIER OPTION.

THE FOLLOWING SPECIAL PROVISIONS SHALL BE USED:

GROUTED BAR COUPLERS (505.1000.S) PRECAST PIER COLUMNS (SPV.0090.XXX) PRECAST PIER CAPS (SPV.0090.XXX)

THE FOLLOWING ADDITIONAL STANDARDS SHALL BE USED:

STANDARD 7.04 - PRECAST PIER CAP AND COLUMN DETAILS STANDARD 7.06 - PRECAST BEARING BLOCKS DETAILS

THE CONTRACTOR MAY USE PRECAST SEGMENTS AT THEIR DISCRETION (E.G. PRECAST CAP ONLY) WITH APPROVAL BY THE BUREAU OF STRUCTURES. SEE STANDARD 7.07 FOR CAST-IN-PLACE BEARING BLOCK DETAILS AND ADDITIONAL NOTES.

DESIGNER NOTES

INCLUDE THE FOLLOWING NOTE ON AT LEAST ONE PIER SHEET FOR EACH PIER:

THE CONTRACTOR MAY FURNISH A PRECAST CONCRETE PIER (INSERT ALLOWABLE THE CONTRACTOR MAY FUNDING A PRECAST LOWNER IE WISE (INSERT ALLOWABLE)
PRECAST ELEMENTS) IN LIEU OF THE CAST-IN-PLACE PIER WITH THE ACCEPTANCE OF
THE SHOP DRAWNINGS BY THE STRUCTURES DESIGN SECTION. THE PRECAST CONCRETE
PIER SHALL CONFORM TO PRECAST DETAILS IN CHAPTER 7 STRUCTURES OF THE
CURRENT WISCONSIN DOT BRIDGE MANUAL AND SPECIAL PROVISIONS RELATED TO
PRECAST ELEMENTS WITH THE EXCEPTION OF METHOD OF PAYMENT P. AYMENT FOR THE PRECAST PIER SHALL BE BASED ON THE QUANTITIES AND PRICES BID FOR THE ITEMS LISTED IN THE "TOTAL ESTIMATED QUANTITIES" FOR THE CAST-IN-PLACE PIER.

ALLOWABLE PRECAST ELEMENTS INCLUDE COLUMNS, CAPS, AND BEARING BLOCKS THAT HAVE BEEN DETERMINED TO BE INTERCHANGEABLE BETWEEN CLIP. AND PRECAST OPTIONS. WHEN A PIER CAP HAS BEEN DETERMINED NON-INTERCHANGEABLE "COLUMNS ONLY" MAY BE USED.

PROVIDE CAST-IN-PLACE DETAILS ONLY. PRECAST PIER REFERENCES ARE FOR DESIGNER INFORMATIONAL PURPOSES ONLY AND SHALL NOT BE PLACED ON THE PLANS. PRECAST PIER CONFIGURATION SHALL BE INTERCHANGEABLE BETWEEN C.I.P. AND PRECAST OPTIONS.

ONLY THE PIER CAP LENGTH AND COLUMN LENGTHS SHALL BE MODIFIED. ALL NOTED DIMENSIONS SHALL BE FOLLOWED.

PIERS SHALL BE SUPPORTED BY A MINIMUM OF 3 COLUMNS. WHEN MULTIPLE PIER CAPS ARE USED, EACH SEGMENT SHALL BE SUPPORTED BY A MINIMUM OF 2 COLUMNS.

PROVIDE A CONCRETE DIAPHRAGM BETWEEN PIER CAP SEGMENTS.

MULTIPLE PIER CAP SEGMENTS MAY BE SET AT DIFFERENT ELEVATIONS TO ACCOMMODATE BEARING ELEVATIONS BEYOND CONCRETE BEARING BLOCK LIMITS.

THE MAXIMUM WEIGHT OF EACH PRECAST ELEMENT SHALL BE 90 KIP.

SEE STANDARDS 7.03, 7.04, 7.06, 13.01 AND 13.07 FOR ADDITIONAL PIER NOTES

SEE 7.1.4.1.2 FOR ADDITIONAL PRECAST PIER GUIDANCE.

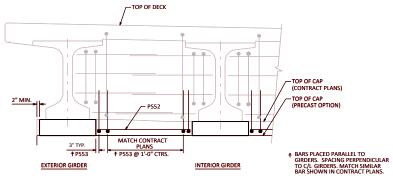
TO STD. HOOK (TYP.) ROTATE AND STAGGER AS NEEDED.

DIMENSION IS FROM BOTTOM OF PIER CAP TO LOW BEAM SEAT.

PRECAST PIER (OPTIONAL) **CAP AND COLUMNS**

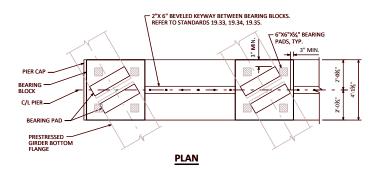


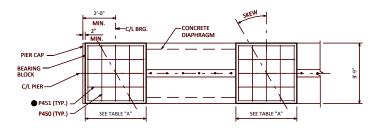
APPROVED: Laura Shadewald

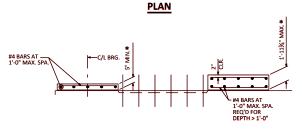


PARTIAL TRANSVERSE SECTION AT DIAPHRAGM PIER

STD. 19.35 SHOWN (STD. 19.33 & 19.34 SIM.)







ELEVATION

BILL OF BARS

TOTAL COATED: XX LBS

NOTE: THIS BILL OF BARS IS SHOWN FOR INFORMATION ONLY. PRECAST PIER SHOP DRAWINGS SHALL INCLUDE BILL OF BARS FOR IDAPHRAGM REINFORCEMENT. PAYMENT FOR ALL TEND ASSOCIATED WITH THE OPTIONAL PRECAST PIERS SHALL BE INCLUDED IN THE CAST-IN-PLACE CONCEPTE BILL ITEMS.



MATCH SIMILAR DIAPHRAGM REIN.
AS SHOWN IN CONTRACT PLANS.

TABLE "A"

SKEW ANGLE	BEARING BLOCK WIDTH (MIN.)	LONG. BAR LENGTH
0° TO 15°	3'-3"	2'-11"
15° TO 20°	3'-6"	3'-2"
> 20*	3'-9"	3'-5"

DESIGNER NOTE

SEE 7.1.4.1.2 FOR ADDITIONAL PRECAST PIER GUIDANCE.

CONTRACTOR NOTES

THE CONTRACTOR SHALL FOLLOW THIS STANDARD WHEN PRECAST PIERS ARE USED IN LIEU OF THE CAST-IN-PLACE PIER.

THE CONTRACTOR MAY USE CAST-IN-PLACE BEARING BLOCKS IN LIEU OF PRECAST BEARING BLOCK DETAILS. THE CONTRACTOR IS RESPONSIBLE FOR THE ADDITIONAL WEIGHT, WHICH MAY CAUSE PIER CAP SEGMENTS TO BE IN EXCESS OF 90 KIPS.

SEE STANDARD 7.07 FOR CAST-IN-PLACE BEARING BLOCK DETAILS AND ADDITIONAL NOTES.

PRECAST CONCRETE DETAIL NOTES

PRECAST BEARING BLOCK DETAILS SHALL ONLY BE USED WHEN PLANS INDICATE ALLOWANCE FOR PRECAST PIERS.

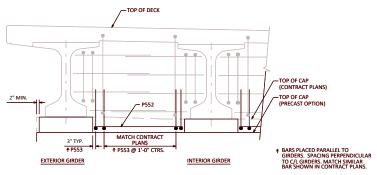
* PRECAST HEIGHT = VARIES (5" MIN. TO 1'-11 $\frac{3}{4}$ " MAX.). MANUFACTURER TO DETERMINE THE PRECAST BEARING BLOCK HEIGHT ASSUMING $\frac{3}{4}$ " GROUT AT THE BOTTOM OF THE BEARING BLOCK.

GROUT ¼" BENEATH PRECAST ELEMENT.

PRECAST BEARING BLOCK DETAILS



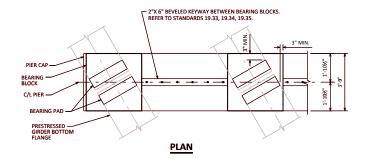
APPROVED: Laura Shadewald

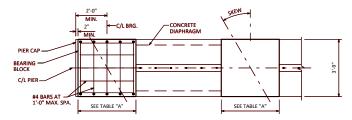


PARTIAL TRANSVERSE SECTION

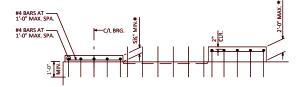
AT DIAPHRAGM PIER

STD. 19.35 SHOWN (STD. 19.33 & 19.34 SIM.)





PLAN



ELEVATION

DESIGNER NOTE

SEE 7.1.4.1.2 FOR ADDITIONAL PRECAST PIER GUIDANCE.

CONTRACTOR NOTES

THE CONTRACTOR SHALL FOLLOW THIS STANDARD WHEN PRECAST PIERS ARE USED AND WHEN CAST-IN-PLACE BEARING BLOCKS ARE USED IN LIEU OF PRECAST BEARING BLOCKS.

SEE STANDARD 7.06 FOR ADDITIONAL NOTES AND DETAILS.

CAST-IN-PLACE CONCRETE DETAIL NOTES

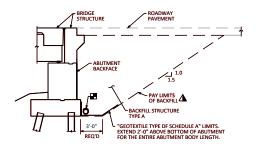
CAST-IN-PLACE BEARING BLOCK DETAILS SHALL ONLY BE USED WHEN PLANS INDICATE ALLOWANCE FOR PRECAST PIERS.

* CAST-IN-PLACE HEIGHT = VARIES (5½" MIN. TO 2'-0" MAX.). CONTRACTOR TO DETERMINE THE CAST-IN-PLACE BEARING BLOCK HEIGHTS.

CAST-IN-PLACE BEARING BLOCK DETAILS



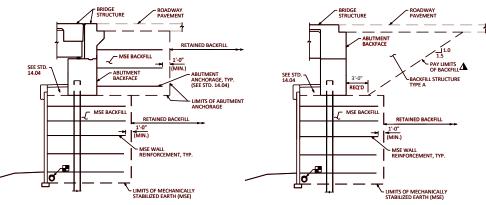
APPROVED: Laura Shadewald



BRIDGE STRUCTURE STRUCTURAL - ABUTMENT BACKFACE 1.5 1.5 PAY LIMITS OF BASE AGGREGATE DENSE 11/4" OF BACKFILL BACKFILL STRUCTURE "GEOTEXTILE TYPE DF SCHEDULE A" LIMITS. EXTEND 2'-0" ABOVE BOTTOM OF ABUTMENT FOR THE ENTIRE ABUTMENT BODY LENGTH. REQ'D

TYPICAL SECTION THRU ABUTMENT

TYPICAL SECTION THRU ABUTMENT



TYPICAL SECTION THRU ABUTMENT AT MSE WALL

TYPICAL SECTION THRU ABUTMENT AT MSE WALL



ABUTMENT BACKFILL DIAGRAM FOR WINGS PARALLEL TO ROADWAY

- = OUT TO OUT OF ABUTMENT, INCLUDING WINGS (FT) = AVERAGE ABUTMENT FILL HEIGHT (FT)
- = AVERAGE ABUTIMENT FILL HEIGHT (FT) EXPANSION FACTOR (1.2 DF OR CY BID ITEMS AND 1.00 FOR TON BID ITEMS) = $\lfloor (1|3.0)(|H) + \lfloor L|(0.5)(1.5H)(|H) \rfloor$ = $V_{\rm eff}(EF)/27$ = $V_{\rm eff}(2.0)$



ABUTMENT BACKFILL DIAGRAM FOR WINGS PARALLEL TO ABUTMENT

- = OUT TO OUT OF ABUTMENT BODY (FT) = AVERAGE ABUTMENT FILL HEIGHT (FT)
- = WING 1 LENGTH (FT) = WING 2 LENGTH (FT)
- wind / LENGTH [+1] EXPANSION FACTOR (1.20 FOR CY BID ITEMS AND 1.00 FOR TON BID ITEMS) = $\{L\}(3.0^3)(H) + \{L\}(0.5)(1.5H)(H) + (3.0^3)(0.5)(W1+W2)(H) = V_G(EF)/27 = V_G(2.0)$

NOTES

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

THE BACKFILL QUANTITIES ARE BASED ON THE PAY LIMITS SHOWN ON THE PLANS AND MAY NOT REFLECT ACTUAL PLACED QUANTITIES. "BACKFILL STRUCTURE TYPE A" REQUIRED DIRECTLY BEHIND ABUTIMENTS AND ABUTIMENTY WINGS FOR SFEET, BACKFILL PACED BEYOND FOR YLIMITS OR EXCEEDING PLAN QUANTITIES SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES."

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

DESIGNER NOTES

- THE DESIGN ENGINEER SHOULD PROVIDE ALL NECESSARY BACKFILL PAY LIMITS AND NOTES IN ORDER TO DETERMINE QUANTITIES. FOR ABUTMENTS, PROVIDE AN ABUTMENT BACKFILL DIAGRAM AS SHOWN ON THIS SHEET. SEE BRIDGE MANUAL SECTIONS 6.4.2 AND 9.10 FOR ADDITIONAL INFORMATION.
- SUBSURFACE DRAINAGE DETAILS AND NOTES SHOULD DIRECT DRAINAGE SUBSUIRFALE MARINASE LE FIALS AND MICE SAMULE DIRECT DEPARTMENT OF THE MARINASE LE FIALS AND MICE SAMULE AND MICE LE FIALS AND MICE SAMULE AND

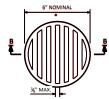
FOR ABUTMENTS WITH MSE BACKFILL BELOW THE REQUIRED "BACKFILL STRUCTURE TYPE A" WIDTH, PIPE UNDERDRAIN AND GEOTEXTILE ARE NOT REQUIRED BEHIND ABUTMENTS. PIPE UNDERDRAIN IS REQUIRED AT THE BOTTOM OF THE MSE WALL.

SEE STANDARD 9.02 FOR RETAINING WALL AND BOX CULVERT DETAILS.

SEE STANDARD 9.03 FOR WING FILL SECTIONS AT WING TIPS.

LEGEND

- A BACKFILL PAY LIMITS. BACKFILL BEYOND BACKFILL PAY LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR
- PIPE UNDERDRAIN WRAPPED (6-INCH). SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. (SHOW DETAIL ON PLANS)





RODENT SHIELD DETAIL

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

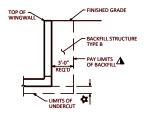
THE RODENT SHIELD, PIPE COUPLING AND SCREWS SHALL BE CONSIDERED INCIDENTAL TO THE BID ITEM "PIPE UNDERDRAIN WRAPPED 6-INCH".

THE RODENT SHIELD SHALL BE A PLY GRAFT SIMILAR TO THIS DETAIL. HIS GRAFT IS COMMERCIALLY AVAILABLE AS A FLOOR STRAINER. A PIPE COUPLING IS REQUIRED FOR THE ATTACHMENT OF THIS SHIELD TO THE EVACED FOR DO IT HE PIPE UNDERFORAIN. THE SHIELD SHALL BE FASTENED TO THE PIPE COUPLING WITH TWO OR MORE NO. 10 X 1-INCH STAINLESS STEEL SHEET INFETA SCREWS.

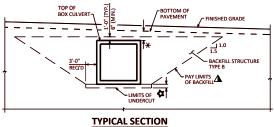
STRUCTURE BACKFILL **LIMITS AND NOTES 1**



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TYPICAL SECTION THRU BOX CULVERT WINGWALL



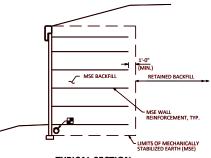
TYPICAL SECTION
THRU BOX CULVERT
(CIP BOX CULVERT WITH SHALLOW FILLS)

BACKERLL STRUCTURE
TYPE A

PAY LIMITS
OF BACKFILL

A

TYPICAL SECTION
THRU RETAINING WALL



TYPICAL SECTION
THRU MSE RETAINING WALL

NOTES (BOX CULVERTS)

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

THE BACKFILL QUANTITIES ARE BASED ON THE PAY LIMITS SHOWN ON THE PLANS AND MAY NOT REFLECT ACTUAL PLACED QUANTITIES. "BACKFILL STRUCTURE TYPE B" REQUIRED ON THE BOX CULVERT SIDES AND BEHIND APRON WINDS FOR 3 TEET. BACKFILL PLACED BEYOND PAY LIMITS OR EXCEEDING PLAN QUANTITIES SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES.

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

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

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

IN LIEU OF USING BREAKER RUN FOR THE BOX CONSTRUCTION PLATFORM, THE CONTRACTOR MAY ELECT TO SUBSTITUTE COARSE AGGREGATE AASHTO NO. 67 OR AASHTO NO. 40 M ACCORDANCE WITH STANDARD SPEE 310 AND 604, RESPECTIVELY, SELECT CRUSHED MATERIAL OR OTHER GRANULAR MATERIAL AS APPROVED BY THE ENGINEET. THE CONTRACTOR IS RESPONSIBLE FOR BASE STABILITY WITH ANY SUSSTITUTED MATERIAL. THE REGION GEOTECHNICAL ENGINEER MAY BE CONTACTED TO DETERMINE IF "OTHER GRANULAR MATERIAL" SA CCEPTABLE

PRECAST ELEMENTS SHALL BE PLACED ON A BEDDING OF "BACKFILL STRUCTURE TYPE B" OF 6" MINIMUM DEPTH AND AS APPROVED BY THE REGINEER, (NOTE APPLICABLE WHEN PRECAST ELEMENTS ARE ALLOWED PER STANDARD 36.02)

NOTES (RETAINING WALLS)

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

THE BACKFILL QUANTITIES ARE BASED ON THE PAY LIMITS SHOWN ON THE PLANS AND MAY NOT REFLECT ACTUAL PLACED QUANTITIES. "BACKFILL STRUCTURE TYPE A" REQUIRED FOR THE ENTIRE WALL LENGTH. BACKFILL PLACED BEYOND PAY LIMITS OR EXCEEDING PLAN QUANTITIES SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES.

DESIGNER NOTES

▲ THE DESIGN ENGINEER SHOULD PROVIDE ALL NECESSARY BACKFILL PAY LIMITS AND NOTES IN ORDER TO DETERMINE QUANTITIES. SEE BRIDGE MANUAL SECTIONS 6.4.2 AND 9.10 FOR ADDITIONAL INFORMATION.

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

 \bigstar 6" minimum of "backfill structure type B" required between bottom of roadway surface and top of culvert.

LEGEND

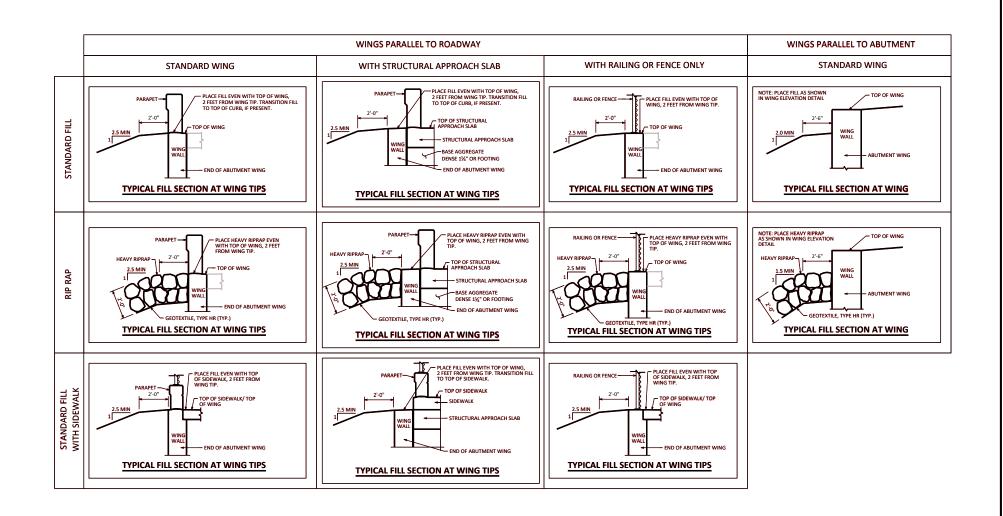
CULVERT UNDERCUT AND BEDDING BACKFILL TO BE DETERMINED BY GEOTECHNICAL ENGINEER.
(CHOOSE APPLICABLE NOTE, MODIFY AS NEEDED)

- BACKFILL PAY LIMITS. BACKFILL BEYOND BACKFILL PAY LIMITS SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES. LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE
- PIPE UNDERDRAIN WRAPPED (6-INCH). SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. (SHOW DETAIL ON PLANS)

STRUCTURE BACKFILL LIMITS AND NOTES 2

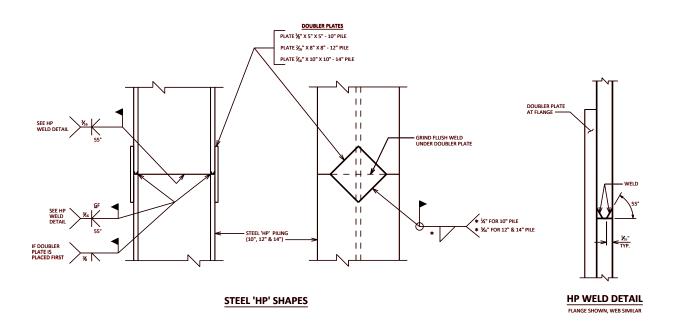


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WING FILL SECTIONS



DESIGNER NOTES

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

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

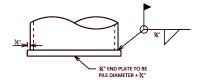
SEE BRIDGE MANUAL SECTION 11.3.1.17.7 FOR PILE RESISTANCE VALUES.

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

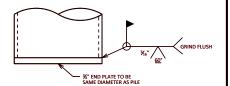
NOTES

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

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

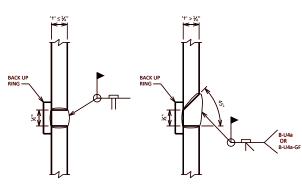


PILE RESISTANCE



END PLATE DETAIL FOR CIP PILING IN ARTESIAN CONDITIONS

(ONLY USE FOR ARTESIAN CONDITIONS)



FOR 12%" DIA. PILES, USE 6 - 87 BARS.
FOR 14" DIA. PILES, USE 8 - 87 BARS.
INCLUDE IN BILL OF BARS. EXTEND 1"-2"
(FOR ALL PILE SIZES) INTO CONCRETE CAP.
(FOR ALL PILE SIZES) INTO CONCRETE CAP.
(FOR TIMBER BACKED ABUTMENT 10"-0" BELOW
GROUNDUNE OR STREAMBED ELEVATION.
FOR TIMBER BACKED ABUTMENTS, CUT OFF
BAR STEEL REINFONCEMENT 0" BELOW TOP
OF PILE ON WING PILING.

#2 BARS AT 2"-0" CENTERS.
(INCLUDE IN BILL OF BARS)

NON-CORROSIVE BAR SPACERS
AT VERTICAL BAR STEEL
REINFONCEMENT AT 6"-0" CENTERS.

TABLE

PILE DIA DIM "A" LENGTH
12½" 9½" 3'-17"
183 BARS WT. = 0.38 LB/F1)

(#3 BAR WT. = 0.38 LB/F1)

'PILE PIPE'

BACK UP RING. ¾6" MIN. THICKNESS

FOR SMAW AND 1/4" MIN. THICKNESS FOR FCAW. —

CIP PILE WELD DETAIL

SECTION THRU CONCRETE

CAST-IN-PLACE PILING

USED WHEN PILES ARE EXPOSED

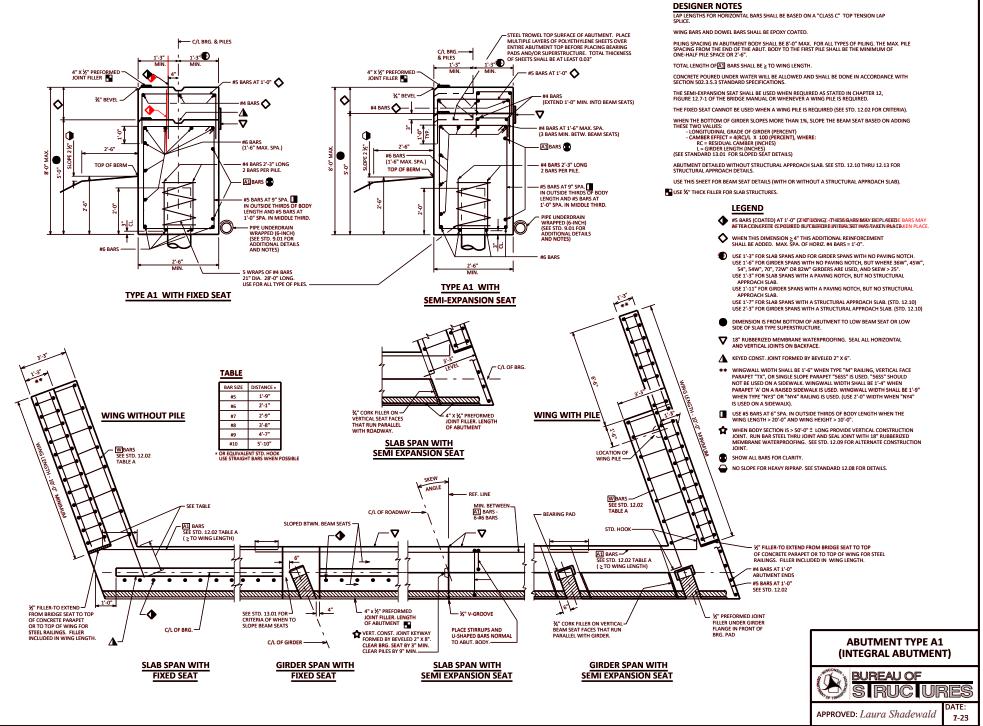
(OPEN PILE BENTS OR TIMBER BACKED ABUTMENTS)

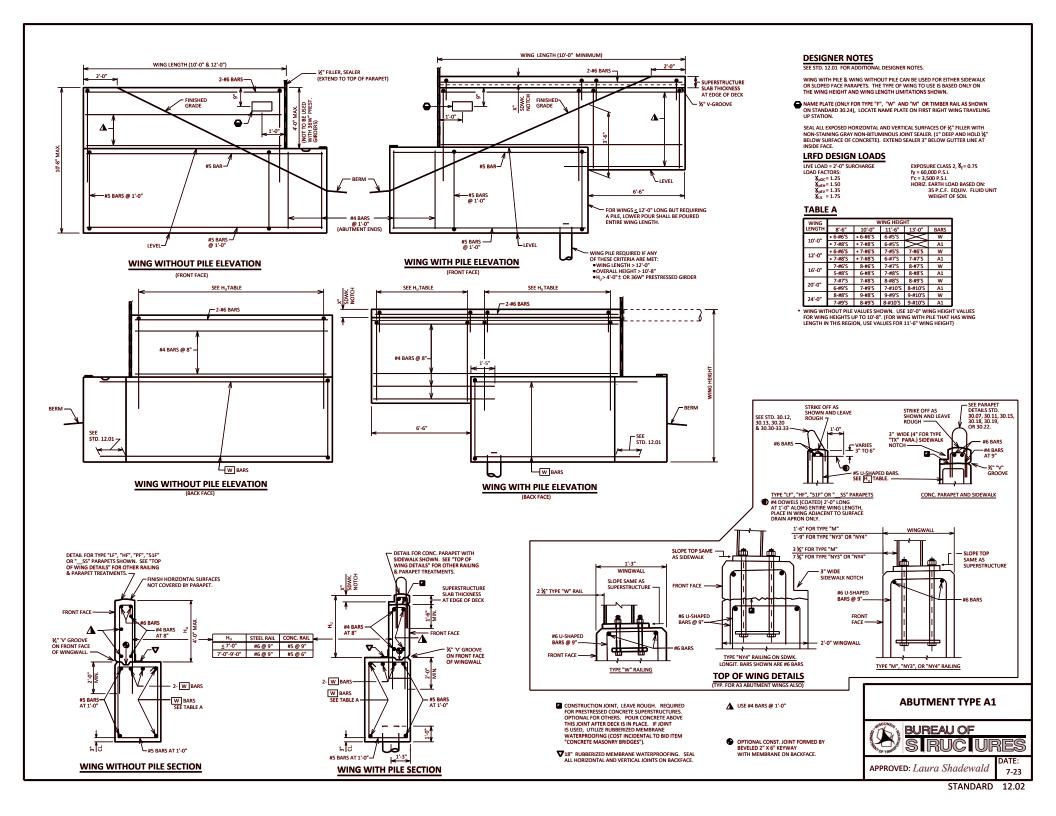


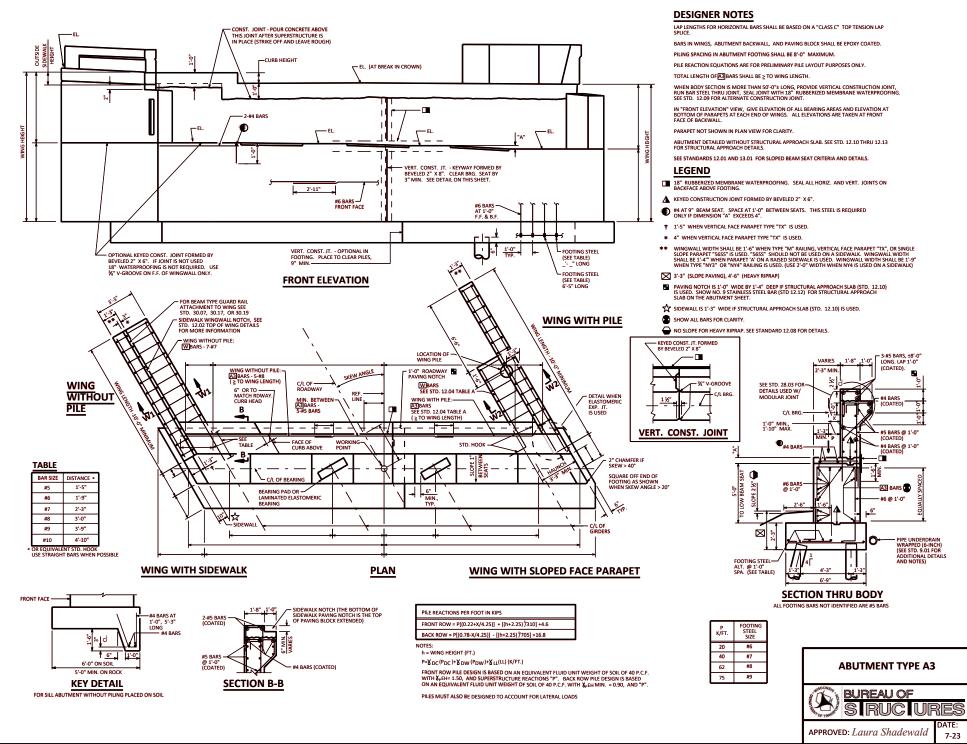


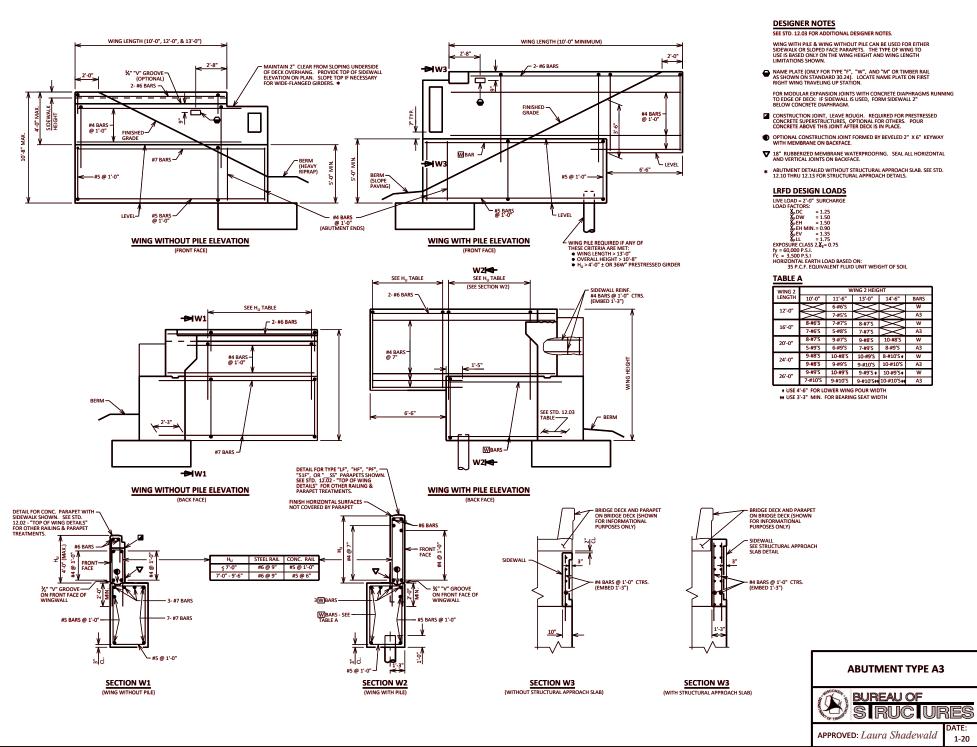
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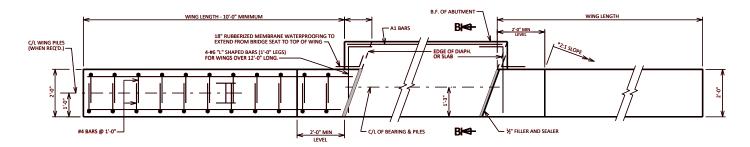
d 7-21





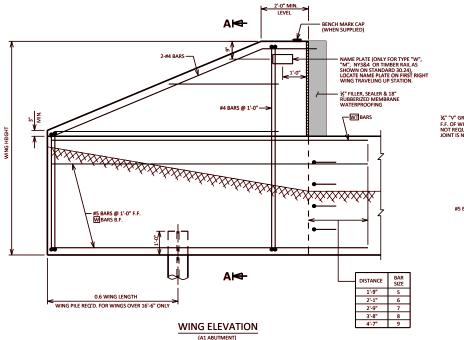






PLAN FOR TYPE A1 ABUTMENT

(SEE STD. 12.01 FOR ABUTMENT BODY DETAILS)



DESIGNER NOTES

THIS TYPE OF WING SHOULD BE USED WHEN POSSIBLE IN LIEU OF WINGS PARALLEL TO THE ROADWAY. DO NOT USE FOR STREAM CROSSINGS WHERE HIGH WATER ELEVATION IS ABOVE THE BOTTOM OF ABUTMENT.

WHEN TIMBER RAILING IS USED AS PER STANDARD 30.24, AND THE SKEW IS 5 °C, THIS CONSTRUCTION JOINT SHALL BE MANDATORY. THE WING CONCRETE SHALL BE PLACED ABOVE CONSTR. JT. AFTER THE TIMBER END POSTS ARE IN PLACE.

ALL WING BARS SHALL BE EPOXY COATED.

SHOW ALL LONGITUDINAL BARS FOR CLARITY.

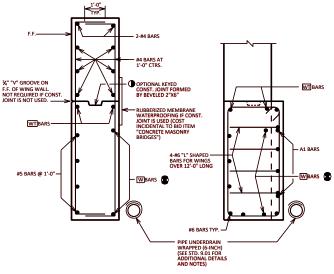
LRFD DESIGN LOADS (WINGS)

LIVE LOAD = 1'-0" SURCHARGE
LOAD FACTORS:
\$\forall pic = 1.25
\$\forall pi = 1.25
\$\forall

TABLE A

WING	WING HEIGHT								
LENGTH	8'-6"	10'-0"	11'-6"	13'-0"	BARS				
10'-0"	5-#5'S	5-#5'S	6-#5'S	> <	W				
	2-#5'S	2-#5'S	2-#5'S	${}$	WT				
	4-#6'S	4-#6'S	5-#6'S	${}$	A1				
12'-0"	X	5-#6'S	5-#7'S	6-#7'S	W				
	X	2-#7'S	2-#7'S	2-#8'S	WT				
	X	5-#6'S	6-#6'S	6-#7'S	A1				
16'-0"	\times	5-#8'S	6-#8'S	5-#9'S	w				
	X	2-#8'S	2-#8'S	2-#9'S	WT				
	X	5-#8'S	6-#8'S	7-#8'S	A1				
20'-0"	\times	\times	8-#8'S	8-#9'S	W				
	$\supset \!\! <$	$>\!\!<$	2-#8'S	2-#9'S	WT				
	X	X	7-#9'5	8-#9'5	A1				

▲ WING PILE REQUIRED

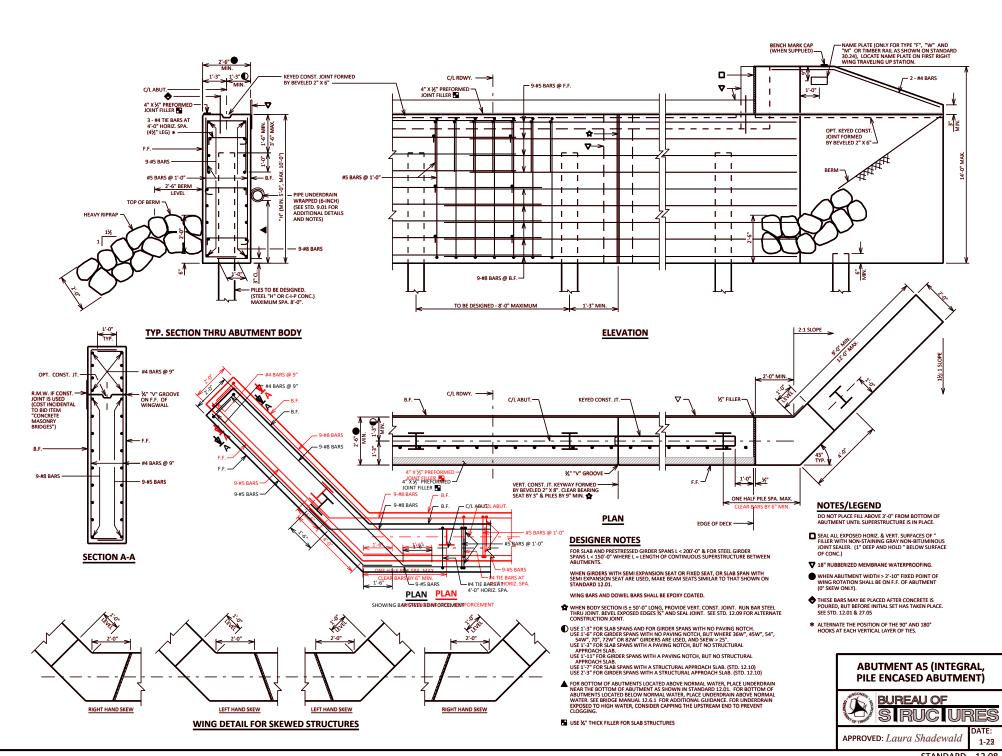


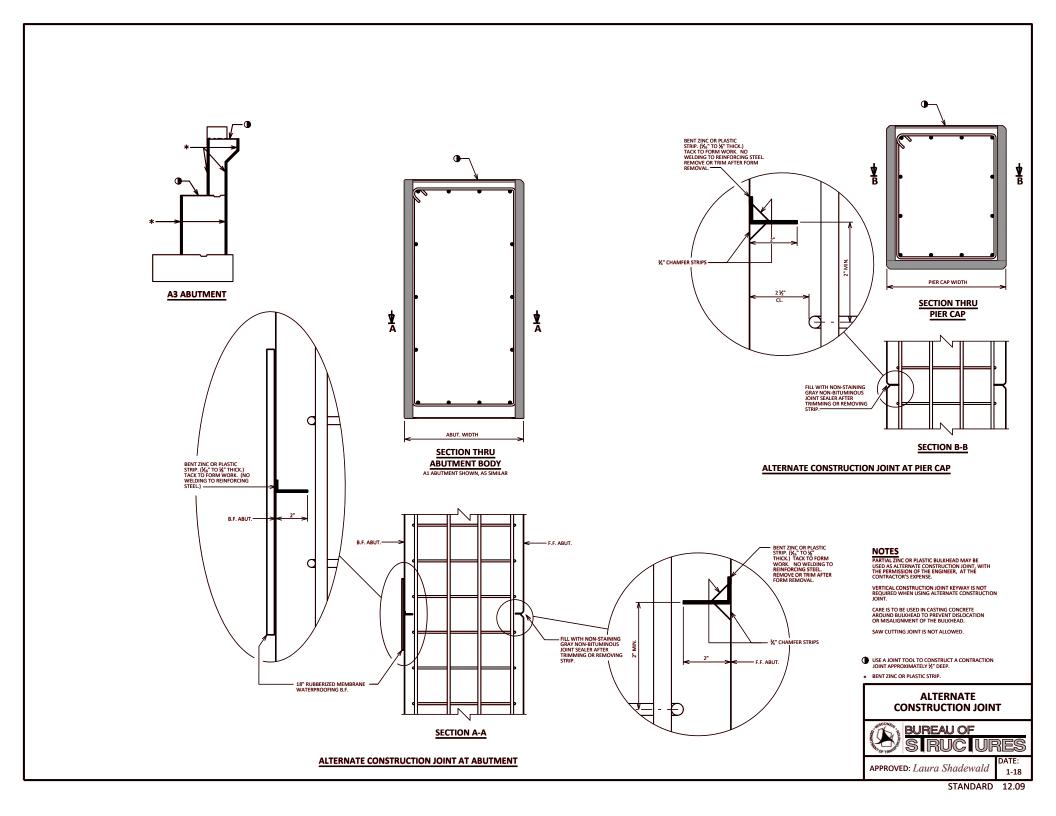
SECTION A-A

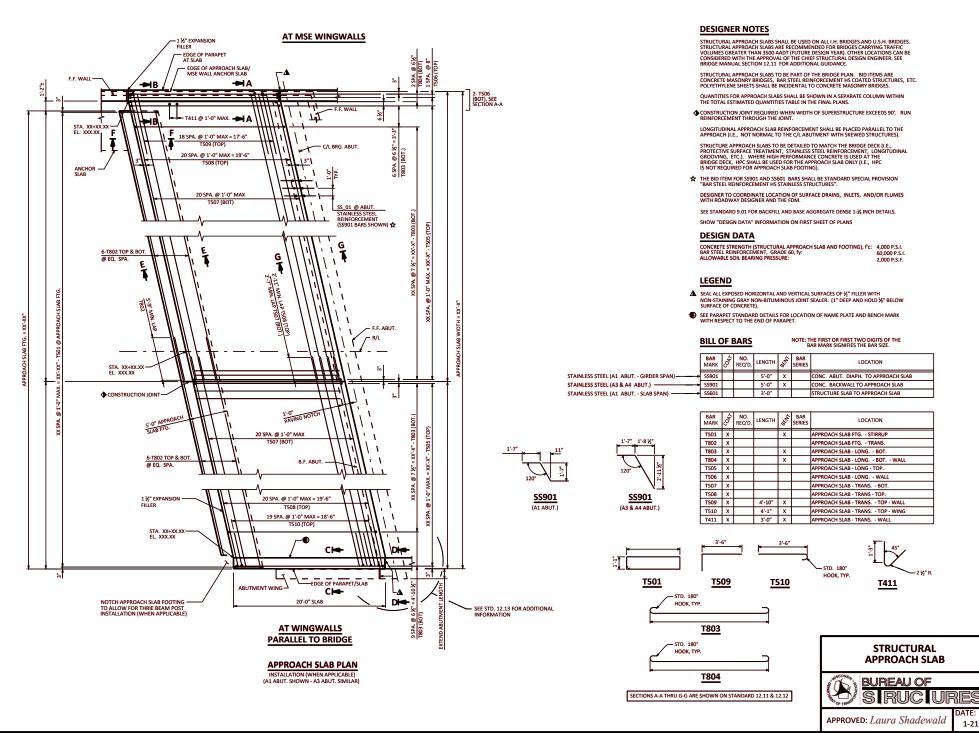
SECTION B-B SEE STD. 12.01 & 12.02 FOR NOTES & DETAILS **DETAILS FOR WINGS PARALLEL** TO A1 ABUTMENT CENTERLINE

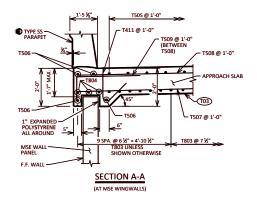


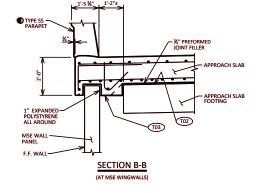
APPROVED: Laura Shadewald

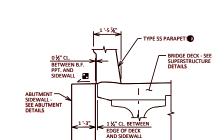












LEGEND

SLOPE TO DRAIN

TO2 STEEL TROWEL TOP SURFACE OF FOOTING AND PLACE MULTIPLE LAYERS (0.03" MIN. TOTAL THK.) OF POLYETHYLENE SHEETS OVER THE ENTIRE TOP OF FOOTING.

T03 PLACE MULTIPLE LAYERS (0.03" MIN. TOTAL THK.) OF POLYETHYLENE SHEETS OVER THE ENTIRE TOP OF SUBGRADE BENEATH SLAB. ▲ SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF ½" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD ¾" BELOW SURFACE OF CONCRETE).

SEE PARAPET STANDARD DETAILS FOR REINFORCEMENT, LOCATION OF NAME PLATE AND BENCH MARK WITH RESPECT TO THE END OF PARAPET, ETC.

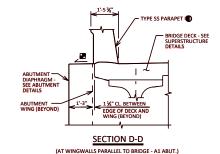
***** SECTION REPRESENTATIVE OF SIMILAR LOCATION AS SHOWN ON STANDARD 12.10 FOR DIFFERENT APPLICATION.

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

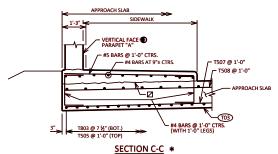
SECTION D-D * (AT WINGWALLS PARALLEL TO BRIDGE - A3 ABUT.)

TYPE SS PARAPET T510 @ 1'-0" (BETWEEN T508) ½" CL. BETWEEN B.F. PPT./APPROAC SLAB AND B.F. WING T507 @ 1'-0" T505 @ 1'-0" - T508 @ 1'-0" PPROACH SLAB WINGWALL -SEE ABUTMENT DETAILS T03 F.F. WING T803 @ 7 ½" SECTION C-C

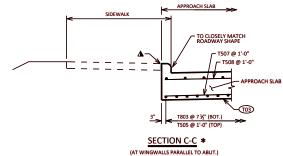
(AT WINGWALLS PARALLEL TO BRIDGE)

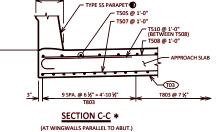






(AT WINGWALLS PARALLEL TO ABUT.)

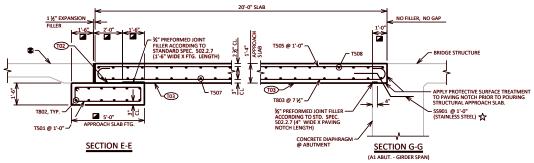




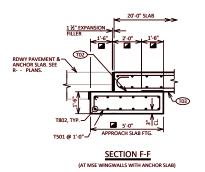


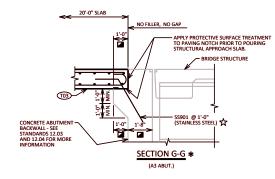


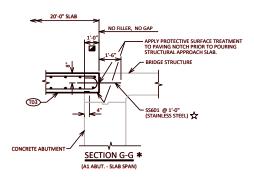
SECTIONS A-A THRU G-G ARE FROM STANDARD 12.10



SECTION THRU APPROACH SLAB

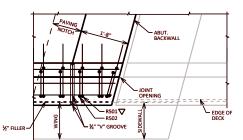






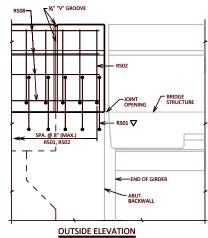
LEGEND

- TO2 STEEL TROWEL TOP SURFACE OF FOOTING AND PLACE MULTIPLE LAYERS (0.03" MIN. TOTAL THK.) OF POLYETHYLENE SHEETS OVER THE ENTIRE TOP OF FOOTING.
- PLACE MULTIPLE LAYERS (0.03" MIN. TOTAL THK.) OF POLYETHYLENE SHEETS OVER THE ENTIRE TOP OF SUBGRADE BENEATH SLAB.
- MEASURED NORMAL TO ABUTMENT
- FOLLOW FDM 14-10-25 REQUIREMENTS FOR ROADWAY APPROACH PAVEMENT.
- * SECTION REPRESENTATIVE OF SIMILAR LOCATION AS SHOWN ON STANDARD 12.10 FOR DIFFERENT APPLICATION.
- THE BID ITEM FOR SS901 AND SS601 BARS SHALL BE STANDARD SPECIAL PROVISION "BAR STEEL REINFORCEMENT HS STAINLESS STRUCTURES".
- ▼ R501 BARS TO BE TIED TO STRUCTURAL APPROACH SLAB STEEL AND ABUT. STEEL BEFORE STRUCTURAL APPROACH SLAB IS POURED.



PLAN

(PARAPET ON STRUCTURAL APPROACH SLAB AT A3 ABUT.)



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

DESIGNER NOTES

SEE CHAPTER 30 FOR PARAPETS ON STRUCTURAL APPROACH SLAB DETAILS.

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

STRUCTURAL APPROACH SLAB DETAILS 2

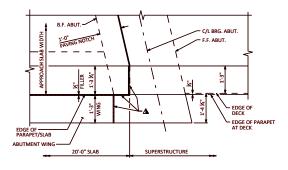


APPROVED: Laura Shadewald

B.F. ABUT. C/L BRG. ABUT. F.F. ABUT. F.

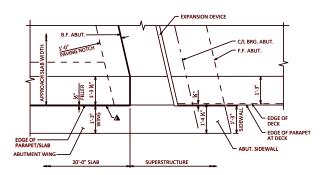
APPROACH SLAB PARTIAL PLAN

(AT WINGWALLS PARALLEL TO BRIDGE - A1 ABUT. - SLAB SPAN)



APPROACH SLAB PARTIAL PLAN

(AT WINGWALLS PARALLEL TO BRIDGE - A1 ABUT. - GIRDER SPAN)

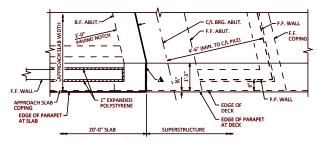


APPROACH SLAB PARTIAL PLAN *

(AT WINGWALLS PARALLEL TO BRIDGE - A3 ABUT. - GIRDER SPAN)

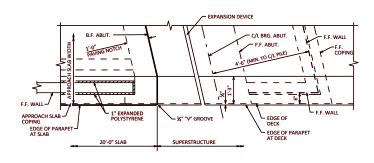
LEGEND

- SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF 'X" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD 'X" BELOW SURFACE OF CONCRETE).
- **★** PARTIAL PLAN REPRESENTATIVE OF SIMILAR LOCATION AS SHOWN ON STANDARD 12.10 FOR DIFFERENT APPLICATION.



APPROACH SLAB PARTIAL PLAN *

(AT WINGWALLS PARALLEL TO BRIDGE - A1 ABUT. AT MSE WINGWALLS - GIRDER SPAN)



APPROACH SLAB PARTIAL PLAN *

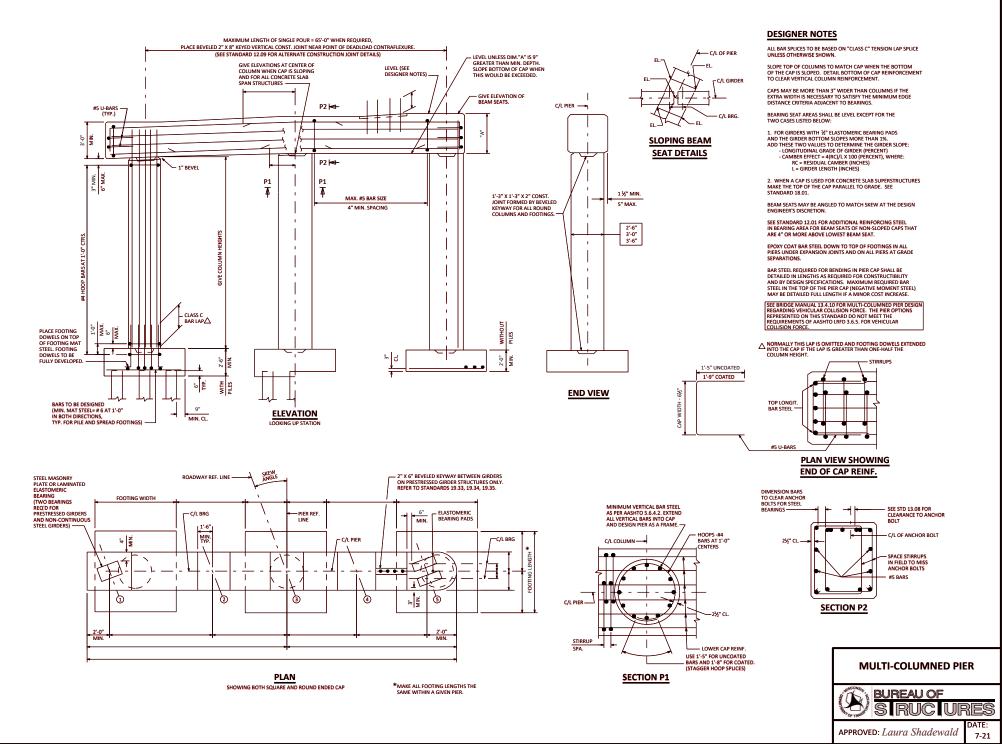
(AT WINGWALLS PARALLEL TO BRIDGE - A3 ABUT. AT MSE WINGWALLS - GIRDER SPAN)

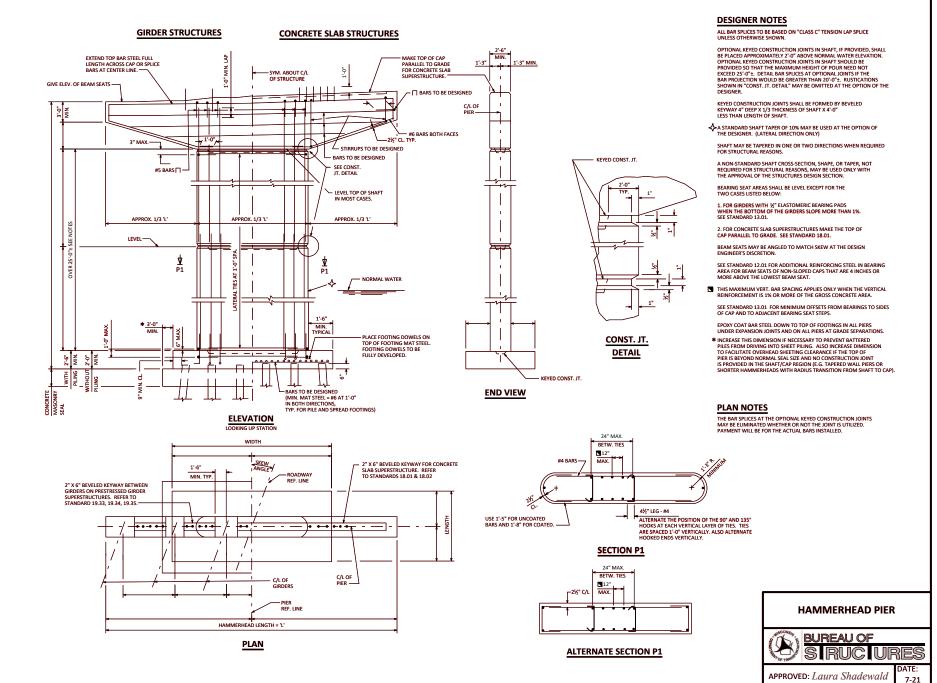
PARTIAL PLANS SHOWN HERE ARE FROM STANDARD 12.10

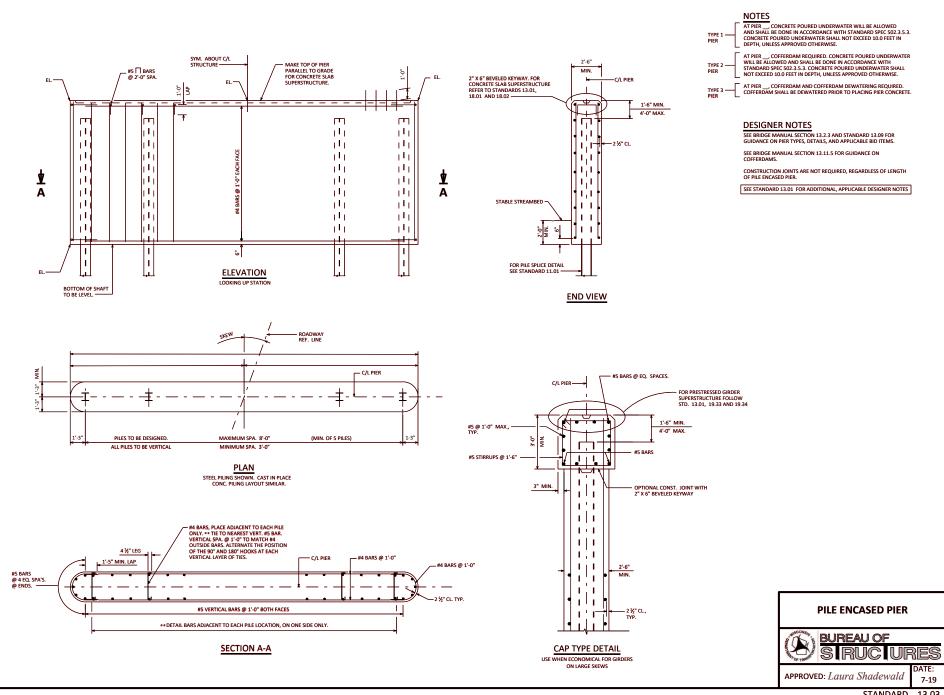
STRUCTURAL APPROACH SLAB DETAILS 3

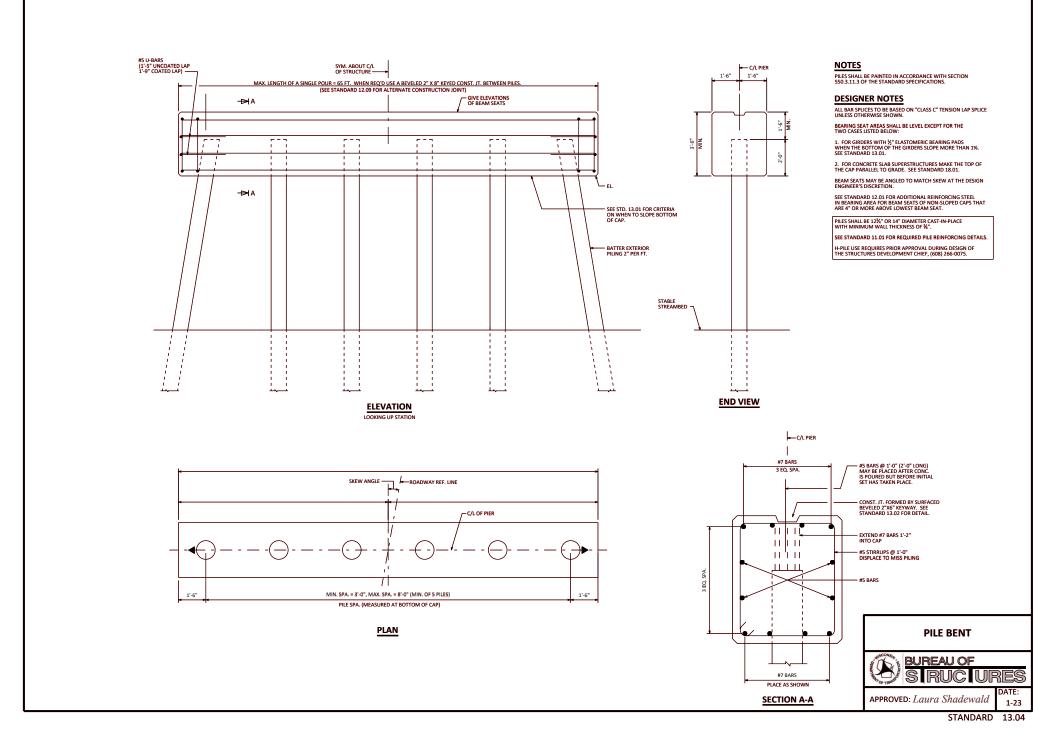


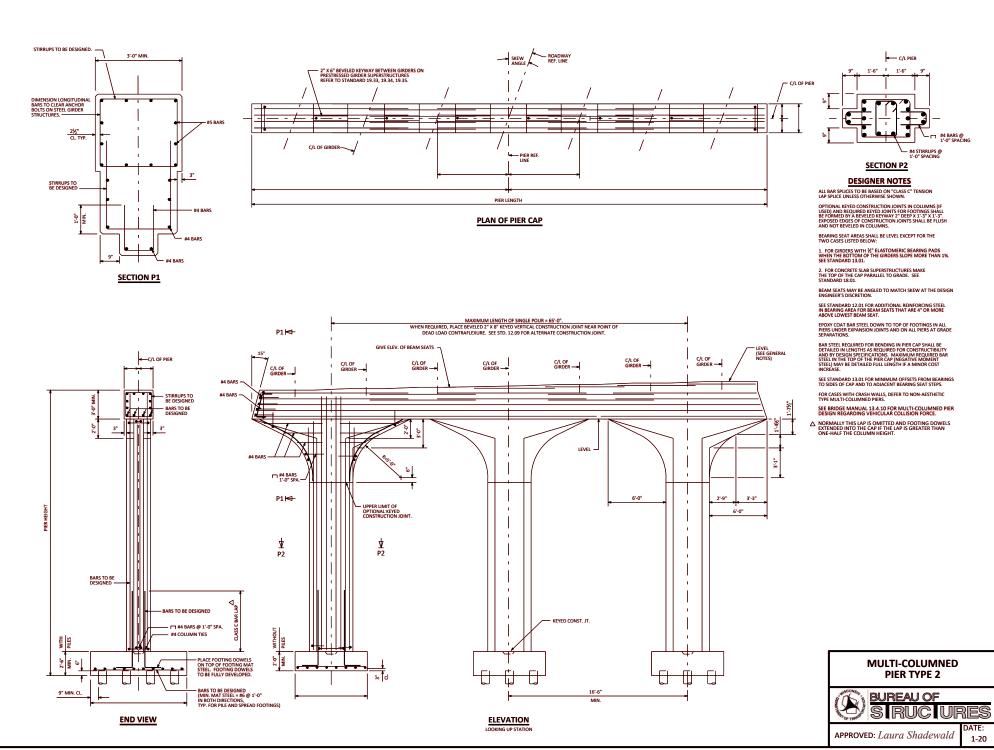
 ${\tt APPROVED} : Laura\ Shadewald$

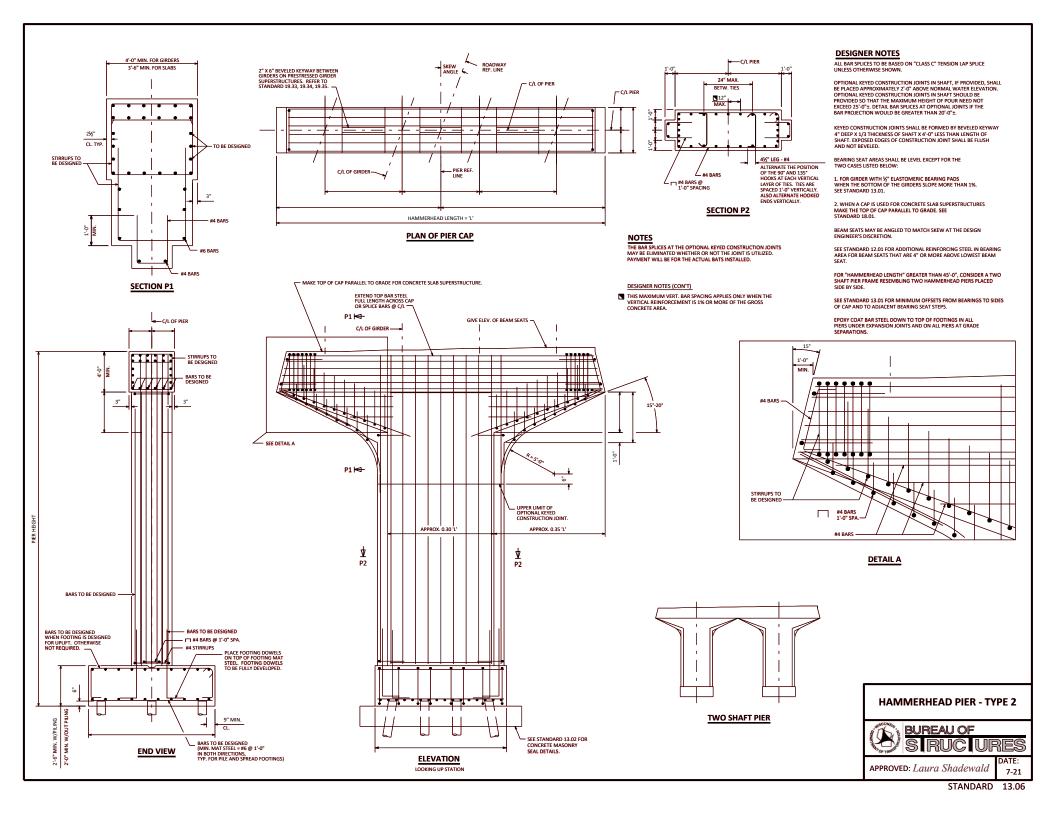


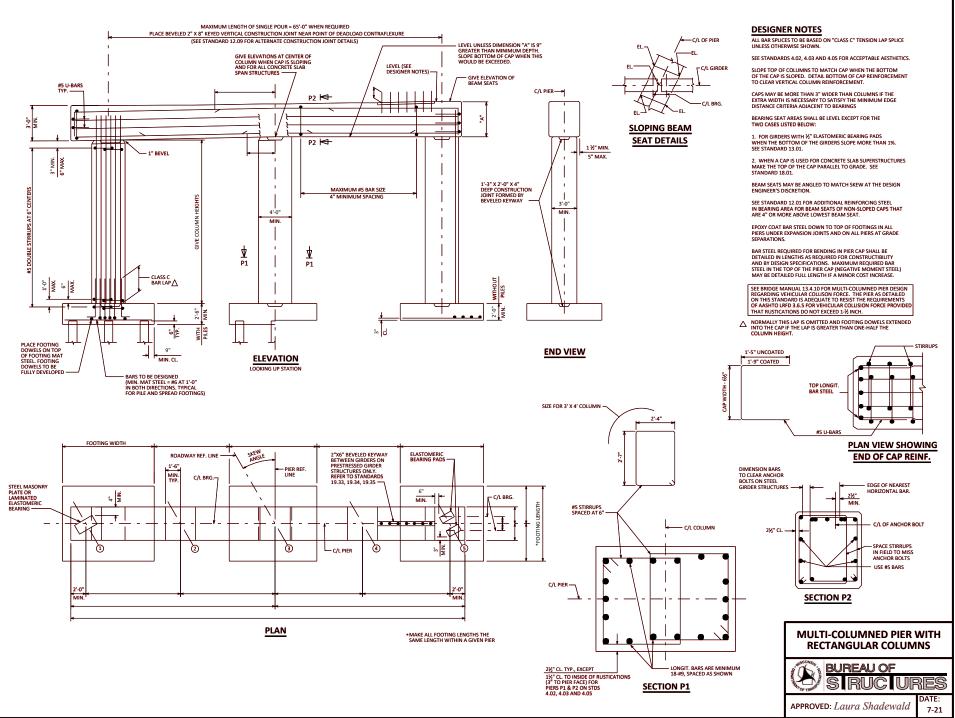


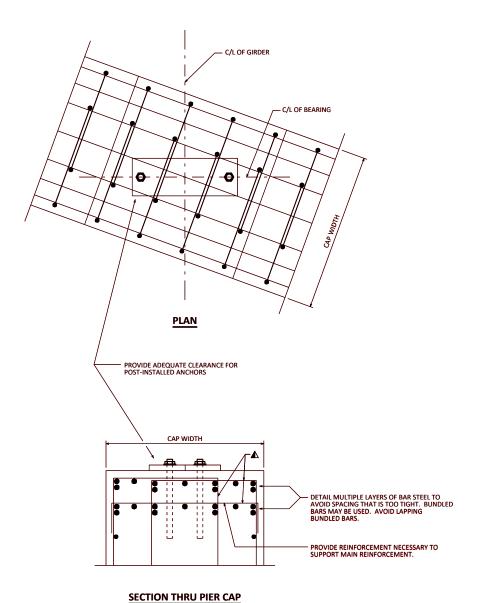












DESIGNER NOTES

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

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

SHOW ANCHORS LOCATIONS ON PIER CAP SHEETS.

ABUTMENT REINFORCEMENT LAYOUT SIMILAR TO PIER CAP REINFORCEMENT DETAILING.

NOTE

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

PIER CAP REINFORCEMENT DETAILING



APPROVED: Laura Shadewald

DESIGNER NOTES

PIER TYPES SHOWN ON THIS STANDARD ARE BASED ON THE OBSERVED WATER ELEVATION, OTHER FACTORS (VELOCITY, H2 ELEVATION, ETC.) SHOULD ALSO BE CONSIDERED WHEN SELECTING THE APPROPRIATE BID ITEMS AND PLAN NOTES.

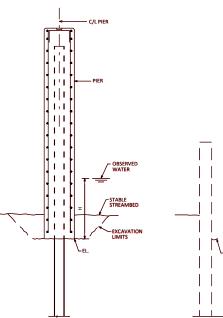
PILE ENCASED PIER TYPES:

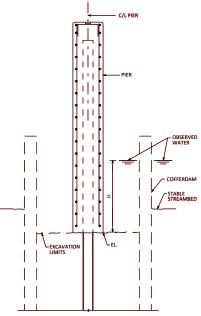
TYPE 1 - COFFERDAM BID ITEM NOT PROVIDED. CONSIDER PROVIDING UNDERWATER INSPECTION BID ITEM.

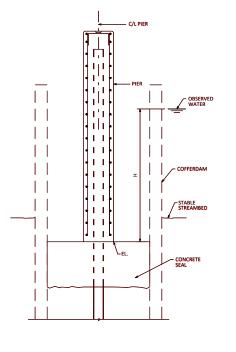
TYPE 2 - COFFERDAM AND UNDERWATER INSPECTION BID ITEMS REQUIRED.

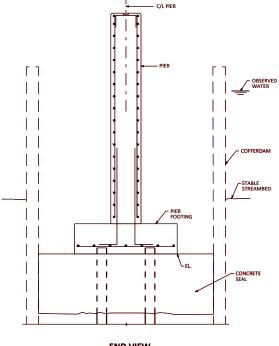
TYPE 3 - COFFERDAM AND SEAL BID ITEMS REQUIRED.

- WALL PIER ALTERNATIVES:
 SOLID WALL (AS SHOWN ON THIS STANDARD)
 HAMMERHEAD (SEE STANDARD 13.02)









END VIEW PILE ENCASED PIER - TYPE 1 (H ≤ 5.0 FEET)

END VIEW PILE ENCASED PIER - TYPE 2 (5.0 FT < H ≤ 10.0 FT)

ITEM NUMBER BID ITEM UNIT COFFERDAMS (STRUCTURE)
UNDERWATER SUBSTRUCTURE INSPECTION (STRUCTURE)

END VIEW PILE ENCASED PIER - TYPE 3 (H > 10.0 FT)

ITEM NUMBER BID ITEM UNIT COFFERDAMS (STRUCTURE) CONCRETE MASONRY SEAL EACH CY

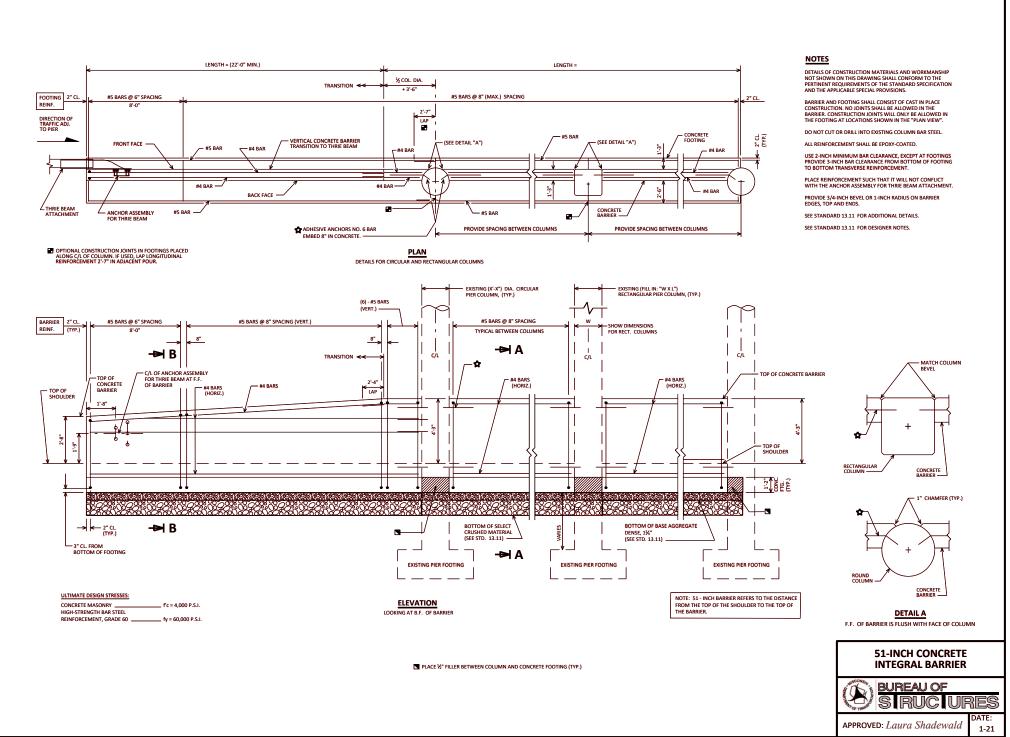
END VIEW SOLID WALL PIER (PILE ENCASED PIER ALTERNATIVE)

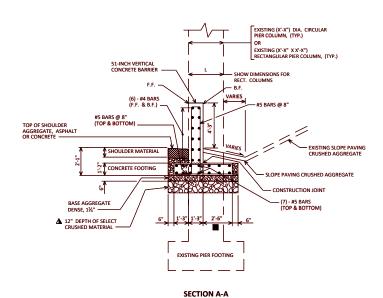
ITEM NUMBER BID ITEM 206.5001 502.1100 COFFERDAMS (STRUCTURE) CONCRETE MASONRY SEAL EACH CY

PILE ENCASED PIER (TYPES)



APPROVED: Laura Shadewald





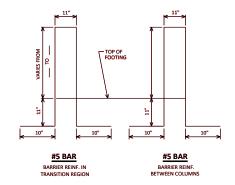
BETWEEN COLUMNS

LENGTH = 3'-2" *

#6 BAR

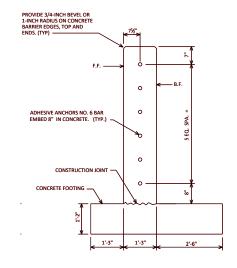
USED WITH CIRCULAR COLUMNS (ADHESIVE ANCHOR)

* FOR RECTANGULAR COLUMN USE STRAIGHT BARS OF THIS LENGTH



BAR BENDING DIAGRAMS

BAR DIMENSIONS ARE OUT TO OUT OF BAR



ADHESIVE ANCHOR LAYOUT

DESIGNER NOTES

THE DETAILS SHOWN ON STANDARDS 13.10 AND 13.11 ARE FOR VEHICLE PROTECTION AND ARE USED WITH EXISTING STRUCTURES.

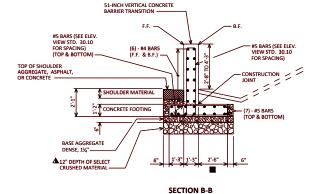
CONSIDER PROVIDING AN ADDITIONAL TRANSITION SECTION ADJACENT TO THE OTHER EXTERIOR PIER COLUMN FOR THE FOLLOWING CONDITIONS:

- TWO-LANE ROAD IS ADJACENT TO BARRIER AND THERE IS A CONCERN FOR TRAFFIC CROSS-OVER.
- FUTURE TRAFFIC CONTROL NEEDS MAY CAUSE THE DIRECTION OF TRAFFIC ADJACENT TO BARRIER TO BE REVERSED.
- HAZARDS MAY EXIST IN THIS REGION THAT REQUIRE SHIELDING.

CONTACT THE REGIONAL OFFICE FOR VERIFICATION OF ANY OF THESE CONDITIONS.

THESE DETAILS MEET CRITERIA FOR TEST LEVELS TL-3/TL-4.

FOR VEHICLE PROTECTION, SEE FDM 11-35-1 TO DETERMINE WHEN BEAM GUARD OR CONCRETE BARRIER SHOULD BE PLACED BETWEEN THE TRAFFIC AND THE PIER, OR WHEN AN INTEGRAL BARRIER SHOULD BE USED.



12" SELECT CRUSHED MATERIAL MAY BE ELIMINATED IF IT IS DETERMINED BY THE ENGINEER THAT THE EXISTING MATERIAL IS COMPACTED, GRANULAR MATERIAL

TRANSITION REGION

FOR COLUMNS WITH "DIA." OR "L" GREATER THAN 3'-0", INCREASE THIS VALUE SO THAT B.F. OF FOOTING EXTENDS 9" BEYOND B.F. OF COLUMN.

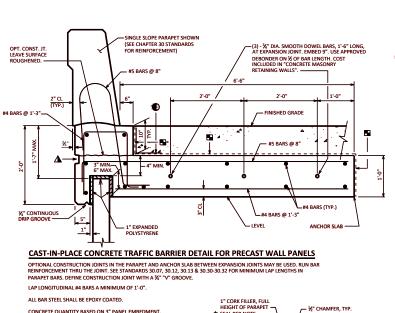
F.F. = FRONT FACE B.F. = BACK FACE

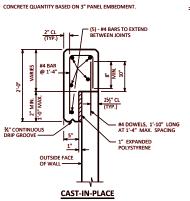
51-INCH VERTICAL CONCRETE BARRIER AND TRANSITION

SEE STANDARD 13.10 FOR ADDITIONAL DETAILS



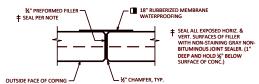
APPROVED: Laura Shadewald





CONCRETE COPING DETIAL

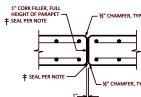
DESIGNER NOTE: CONCRETE COPING DESIGNED FOR STANDARD PEDESTRIAN RAILING WITH 10 FT MAXIMUM POST SPACING PER LRFD 13.8.2.



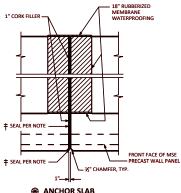
COPING EXPANSION JOINT

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

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



⊕ TRAFFIC BARRIER EXPANSION JOINT DETIAL

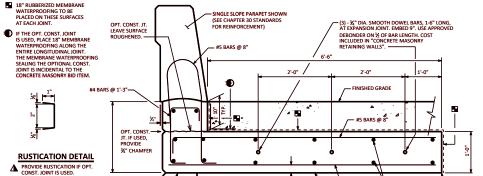


⊕ ANCHOR SLAB

EXPANSION JOINT DETIAL

EXPANSION JOINTS TO BE SPACED AT A MINIMUM OF 20' AND A MAXIMUM OF 30'. LOCATE EXPANSION JOINTS OVER WALL JOINTS. DO NOT RUN BAR STEEL THRU JOINT, EXCEPT FOR DOWEL BARS. JOINT TO EXTEND FULL DEPTH OF PARAPET AND ANCHOR SLAB.

PROVIDE THE NUMBER OF BARS AND OVERALL LENGTH FOR QUANTITY PURPOSES, ONLY. DO NOT DETAIL SPECIFIC BAR LENGTHS BETWEEN EXPANSION JOINTS AS THESE LENGTHS ARE BASED ON UNKNOWN MSE PANEL LENGTH AND CONFIGURATION.



CAST-IN-PLACE WALL

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

BARS @ 1'-3"

ANCHOR SLAB

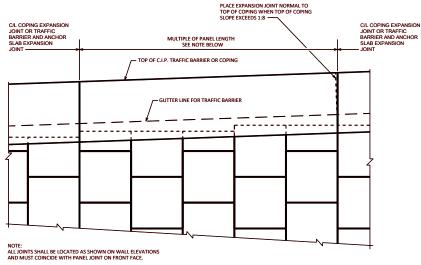
OPTIONAL CONSTRUCTION JOINTS IN THE PARAPET AND ANCHOR SLAB BETWEEN EXPANSION JOINTS MAY BE USED. RUN BAR REINFORCEMENT THRU THE JOINT. SEE STANDARDS 30.07, 30.12, 30.13 & 30.30-30.32 FOR MINIMUM LAP LENGTHS IN PARAPET BARS. DEFINE CONSTRUCTION JOINT WITH A 3/4" "V" GROOVE.

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

ALL BAR STEEL SHALL BE EPOXY COATED

LIQUID OR OTHER BOND BREAKER BETWEEN CAST-IN-PLACE CONCRETE

AND CAST-IN-PLACE WALL PANEL.



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

¾" CHAMFER FRONT, BACK, & TOP) COPING CONTRACTION JOINT

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

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

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

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

MSE RETAINING WALL DETAILS



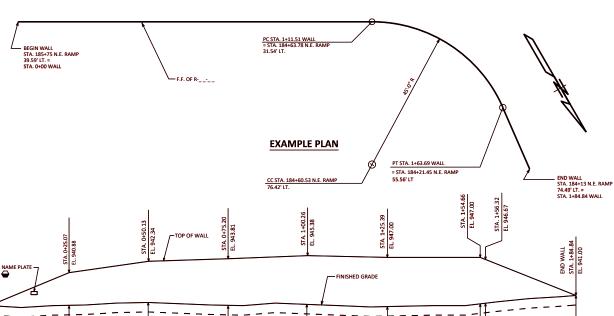
APPROVED: Laura Shadewald

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

THE PLAN QUANTITY FOR THE BID ITEM (INSERT WALL SYSTEM) IS BASED ON A WALL HEIGHT MEASURED FROM THE TOP OF WALL TO A CONSTANT DEPTH OF (INSERT VALUE) BELOW FINISHED GRADE

R/L N.E. RAMP



EXAMPLE ELEVATION

(LOOKING @ F.F. OF WALL)

WALL EXTERNAL & OVERALL STABILITY EVALUATION

STA. 0+50.13 EL. 939.90

DIMENSIONS	EVALUATED I	OCATIONS
WALL HEIGHT (FEET)		
EXPOSED WALL HEIGHT (FEET)		
MINIMUM LENGTH OF REINFORCEMENT (FEET)		
WALL STATION		
BORING USED		
CAPACITY TO DEMAND RATIO (C	CDR)	
SLIDING (CDR>1.0)		
ECCENTRICITY (CDR>1.0)		
OVERALL STABILITY (CDR>1.0)		
BEARING RESISTANCE (CDR>1.0)		
FACTORED BEARING RESISTANCE (PSF)		

GEOMETRY TABLE

BOTTOM OF WALL

(1'-6" MIN. BELOW FINISHED GRADE)

WALL	ROADWAY	OFFSET TO	TOP OF	FINISHED
STATION	STATION	F.F. WALL	WALL ELEV.	GRADE ELEV.

SOIL PARAMETERS

STRATUM LOCATIONS & SOIL DESCRIPTIONS	TOTAL UNIT WEIGHT (PCF)	FRICTION ANGLE (DEGREES)	COHESION (PCF)
GRANULAR BACKFILL (REINFORCING ZONE OR BACKFILL)			
(INSERT SOIL TYPE) RETAINED SOIL *			
(INSERT SOIL TYPE) FILL			
(INSERT SOIL TYPE) EL EL			
(INSERT SOIL TYPE) EL EL			
* DESIGN WALL FOR THESE VALUES	•		

DESIGN DATA

THE CONTRACTOR SHALL PROVIDE COMPLETE DESIGN, PLANS, DETAILS, SPECIFICATIONS, AND SHOP DRAWINGS FOR THE RETAINING WALLS IN ACCORDANCE WITH THE SPECIAL ROVISIONS. THE RETAINING WALL IMANUFACTURER SHALL PROVIDE TECHNICAL ASSISTANCE TO THE CONTRACTOR DURING CONSTRUCTION. THE COST OF FURNISHING THESE ITEMS SHALL BE INCLUDED IN THE BID ITEM "(INSERT WALL SYSTEM OR SYSTEMS)"

PLANS, ELEVATIONS AND DETAILS SHOWN ON THESE DRAWINGS ARE INTENDED TO INDICATE WALL LOCATIONS, LENGTHS, HEIGHTS, AND DETAILS COMMON TO THE WALL SYSTEM SELECTED. THE CONTRACTOR SHALL VERIEY THAT THE WALL SYSTEM SELECTED WILL CONFORM TO THE REQUIRED AUGMENTS AND DETAILS.

THE RETAINING WALL IS TO BE DESIGNED USING THE ELEVATIONS GIVEN ON THIS SHEET.

DESIGN FOR RETAINING WALL TO PROVIDE FOR FINISHED GRADE SLOPED BEHIND WALL AS SHOWN.

DESIGN RETAINING WALL FOR A LIVE LOAD SURCHARGE OF (INSERT VALUE)

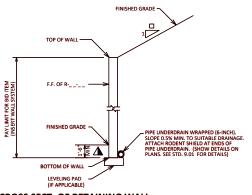
THE MAXIMUM VALUE OF THE ANGLE OF INTERNAL FRICTION OF THI WALL BACKFILL MATERIAL IN THE REINFORCED ZONE SHALL BE ASSUMED TO BE 30° WITHOUT CERTIFIED TEST VALUES.

DESIGNER NOTES

- THE LENGTHS PROVIDED IN THE TABLE ARE THE MINIMUM REQUIRED REINFORCEMENT LENGTHS BASED UPON THE MINIMUM DESCRIBED IN THE WALL SYSTEM SPECIAL PROVISIONS OR EXTERNAL AND OVERALL TSABILITY AT THE DESIGNATED LOCATIONS. THESE DESIGNATED LOCATIONS REPRESENT TYPICAL AND CRITICAL WALL LOCATIONS, BUT SHALL NOT BE CONSIDERED ALL INCLUSIVE. THE CONTRACTOR DESIGN LENGTHS SHALL MEET OR EXCRED THE MINIMUM VALUES REPRESENTED IN THE TABLE AT THESE DESIGNATED LOCATIONS.
- THE LENGTHS PROVIDED IN THE TABLE ARE THE MINIMUM REQUIRED REINFORCEMENT LENGTHS BASED ON OVERALL STABILITY PERFORMED BY THE WALL DESIGNER. COMPOUND STABILITY IS THE CONTRACTORS RESPONIBILITY.
- ▲ MINIMUM EMBEDMENT BASED ON SITE SPECIFIC PARAMETERS (1'-6" MINIMUM FOR ALL WALLS ON LEVEL GROUND). FIELD EMBEDMENTS SHALL MEET OR EXCEED THE MINIMUM MEREDMENTS. FIELD EMBEDMENTS BELOW MINIMUM EMBEDMENT SHALL NOT BE INCLUDED IN THE PAY LIMITS.
- STRATUM LOCATIONS & SOIL DESCRIPTIONS AT EACH BORING LOCATION.

NOMINAL MSE PANEL DIMENSIONS ARE 5-FOOT HIGH AND 5 TO 10 FOOT WIDE. THE WALL DESIGNER SHALL PROVIDE DETAILS BASED ON NOMINAL PANEL DIMENSIONS AND CONFIGURATION. DETAILS SHALL BE ABLE TO ACCOMMODATE VARIOUS PANEL DIMENSIONS. THE CONTRACTOR AND WALL SUPPLIER SHALL COORDINATE DETAILS BASED ON THE ACTUAL DIMENSIONS.

LOCATE NAME PLATE ON THE FRONT OF WALL APPROXIMATELY 3' TO 6' HIGH. CENTER NAME PLATE BETWEEN CAST-IN-PLACE CONCRETE COPING JOINTS, CENTERED ON A NON-CAS BLOCK, OR AS DIRECTED BY THE FIELD ENGINEER



TYP. CROSS SECT. OF RETAINING WALL

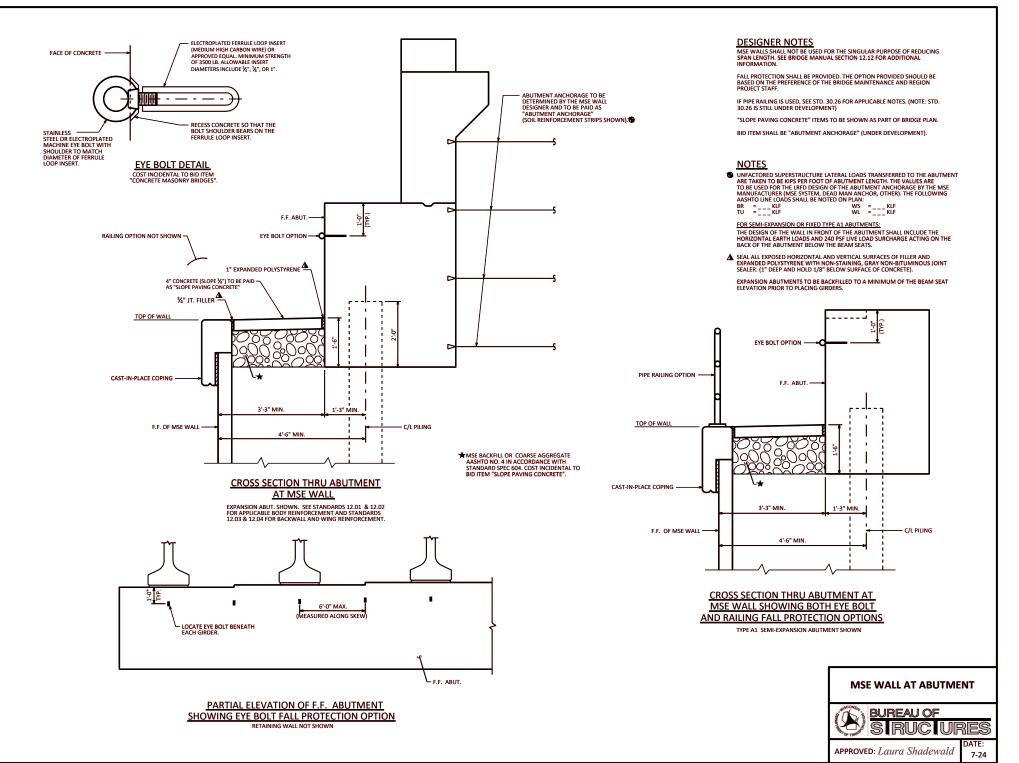
LIST OF DRAWINGS

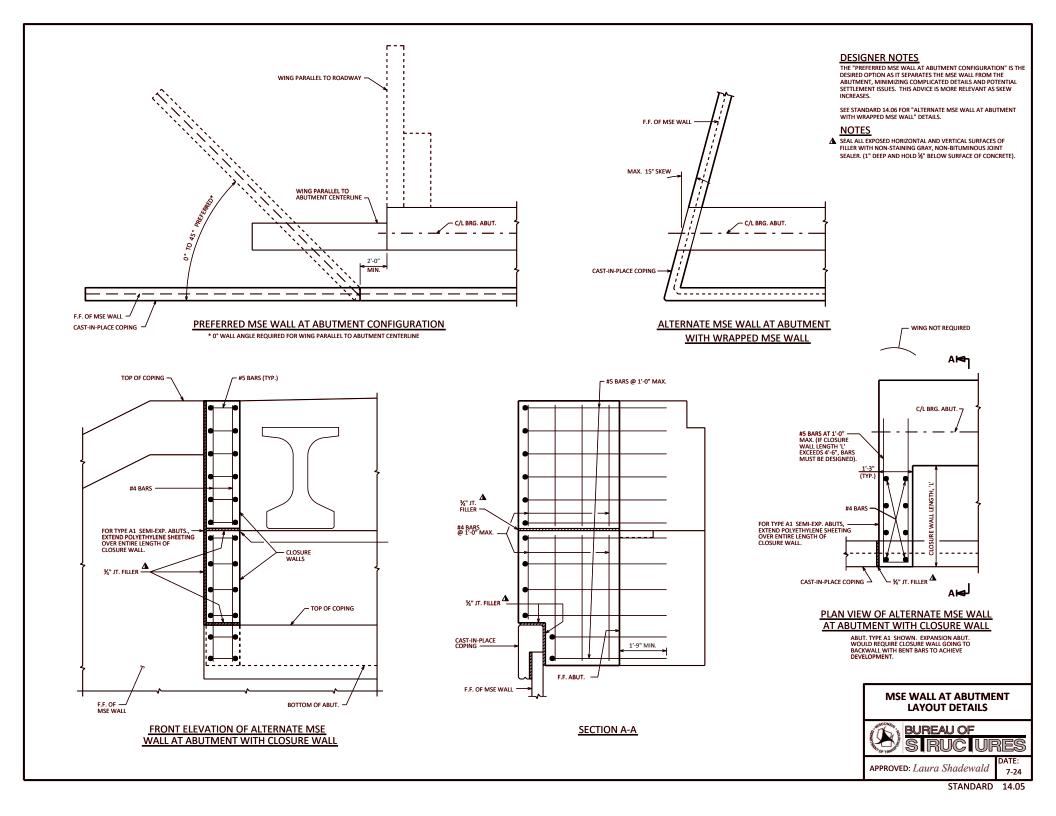
- 1. (INSERT WALL SYSTEM)
- 2. SUBSURFACE EXPLORATION

LRFD PROPRIETARY RETAINING WALLS (GENERAL PLAN)



APPROVED: Laura Shadewald





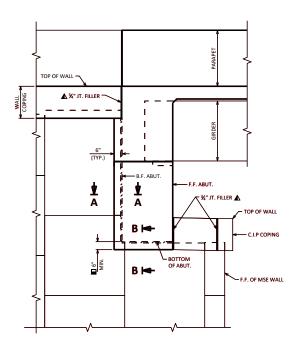
DESIGNER NOTES

- THIS STANDARD IS FOR INFORMATIONAL PURPOSES ONLY. MODIFY DETAILS TO THE PROJECT-SPECIFIC REQUIREMENTS.
- 6-INCH MINIMUM ASSUMES NO LONG-TERM DIFFERENTIAL SETTLEMENT BETWEEN THE ABUTMENT AND MSE WALL.

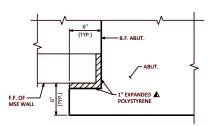
SEE STANDARD 14.04 FOR ADDITIONAL INFORMATION.

NOTES

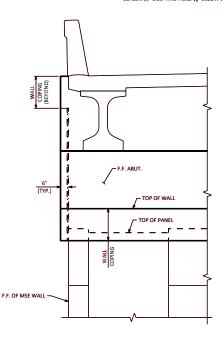
▲ SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF FILLER WITH NON-STAINING GRAY, NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD ½" BELOW SURFACE OF CONCRETE).



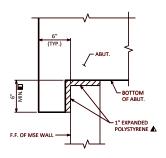
ALTERNATE MSE WALL AT ABUTMENT WITH WRAPPED MSE WALL



SECTION A-A



FRONT ELEVATION OF ALTERNATE MSE WALL AT ABUTMENT WITH WRAPPED MSE WALL



SECTION B-B

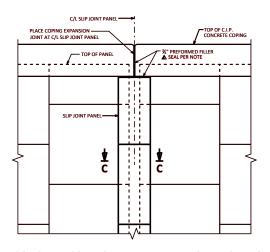
DESIGNER NOTES

SEE STANDARD 14.02 FOR C.I.P. CONCRETE COPING DETAILS.

WHEN REQUIRED FOR STAGING OR BY DESIGN, PROVIDE SLIP JOINT LOCATIONS ON THE PLANS AND PROVIDE COPING NOTES AND DETAILS TO ACCOMMODATE A SLIP JOINT. DO NOT RUN BAR STEEL THRU COPING EXPANSION JOINT.

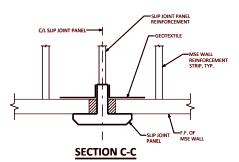
NOTES

▲ SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF FILLER WITH NON-STAINING GRAY, NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD ½" BELOW SURFACE OF CONCRETE).



C.I.P CONCRETE COPING PARTIAL ELEVATION AT SLIP JOINT

DO NOT RUN BAR STEEL THRU COPING EXPANSION JOINT

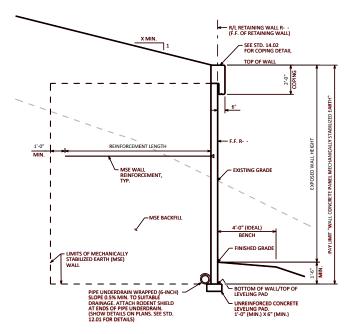


SLIP JOINT DETAIL SHOWN FOR INFORMATIONAL PURPOSES ONLY.
WALL SUPPLIER TO SUBMIT JOINT DETAIL FOR ACCEPTANCE.

MSE WALL DETAILS

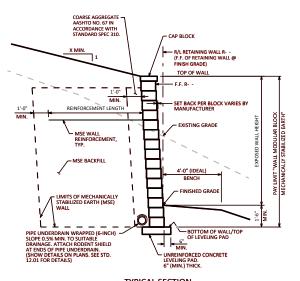


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TYPICAL SECTION

(MSE WALL WITH CONCRETE PANEL FACING)



TYPICAL SECTION
(MSE WALL WITH MODULAR BLOCK FACING)

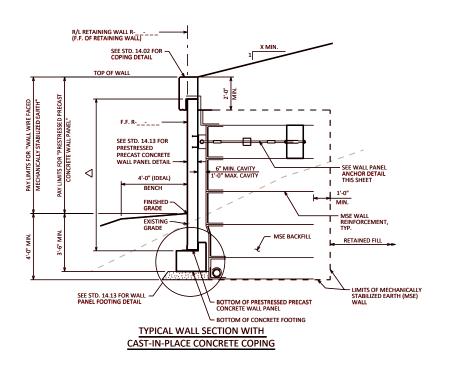
DESIGNER NOTE

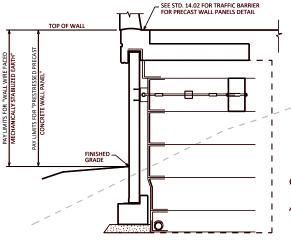
SEE STANDARD 14.02 FOR ADDITIONAL INFORMATION

MSE WALL PANEL AND BLOCK FACING



APPROVED: Laura Shadewald





TYPICAL WALL SECTION WITH CAST-IN-PLACE CONCRETE TRAFFIC BARRIER

SEE TYPICAL WALL SECTION WITH CAST-IN-PLACE CONCRETE COPING DETAIL FOR ADDITIONAL INFORMATION

MATERIAL PROPERTIES

CONCRETE MASONRY RETAINING WALLS
f'c = 3,500 PSI

PRESTRESSED PRECAST CONCRETE
WALL PANEL f'c = 5,000 PSI

BAR STEEL REINFORCEMENT GRADE 60 fy = 60,000 PSI

STRUCTURAL CARBON STEEL - ASTM A36 fy = 36,000 PSI

NOTES

CLEVIS, CLEVIS PIN, COUPLER, MULTIDIRECTIONAL CONNECTOR, AND TURNBUCKLE TO BE CORROSION RESISTANT AND DEVELOP 125% OF THE ULTIMATE STRENGTH OF THE 1½" DIAMETER ROD.

ST6X25, ROD, CONNECTING HARDWARE, AND DEADMAN ANCHOR INCLUDING ALL ASSOCIATED REINFORCEMENT ARE INCLUDED IN THE BID ITEM "PRESTRESSED PRECAST CONCRETE WALL PANEL".

FORCES APPLIED TO THE DEADMAN ANCHOR MUST BE ACCOUNTED FOR IN THE DESIGN OF MSE REINFORCEMENT WHEN SATISFYING FORCE AND MOMENT EQUILIBRIUM.

DESIGNER NOTES

SHOW BAR SIZE AND SPACING ONLY. DO NOT PROVIDE BILL OF BARS. BAR STEEL REINFORCEMENT AND CONCRETE INCLUDED IN BID ITEM "PRESTRESSED PRECAST CONCRETE WALL PANEL".

\(\) WALL PANEL HEIGHT IS DEFINED AS THE LENGTH FROM THE TOP OF THE WALL PANEL TO THE TOP OF THE CONCRETE FOOTING. THE MAXIMUM ALLOWABLE WALL PANEL HEIGHT IS 30'.

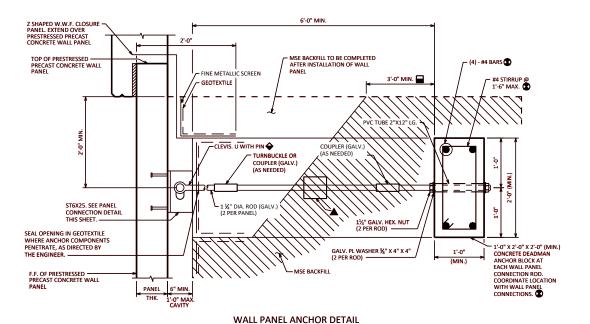
LEGEND

CONTRACTOR TO DESIGN LENGTH TO PROVIDE REQUIRED HORIZONTAL CAPACITY OF ANCHOR ASSEMBLY. MINIMUM 3'-0" OF COMPACTED FILL IN FRONT OF DEADMAN ANCHOR PRIOR TO WALL PANEL ERECTION. 1½" ROD TO BE 2'-0" MIN. BELOW TOP OF REINFORCED SOIL ZONE.

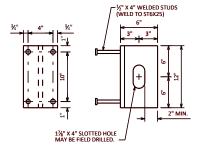
CLEVIS TO BE INSTALLED TOWARDS THE TOP OF THE SLOTTED HOLE, TO ALLOW FOR SETTLEMENT OF THE WIRE FACED MSE WALL.

OPTIONAL MULTIDIRECTIONAL CONNECTOR MAY BE USED TO FACILITATE ALIGNMENT AT THE CONNECTION.

INCLUDES CONCRETE FOR COPING, FOOTING, AND DEADMAN ANCHOR.



CAST-IN-PLACE CONCRETE COPING SHOWN CAST-IN-PLACE CONCRETE TRAFFIC BARRIER SIMILAR



PANEL CONNECTION DETAIL

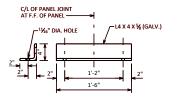
AS AN ALTERNATIVE, ½" (GALV.) ADHESIVE ANCHORS MAY BE USED TO AVOID AN OBSTRUCTION. ALTERNATIVE SHALL BE LIMITED TO ONE PANEL CONNECTION PER PANEL.

ST6X25 MAY BE WELDED TO ¾" THICK PLATE WITH (4)-½"X4" STUDS ANCHORED IN PRECAST CONCRETE PANEL. RESTORE ZINC COATING AROUND ANY WELDED AREAS. SUBMIT DETAILS FOR APPROVAL BY THE ENGINEER.

MSE WALL WIRE FACING 1

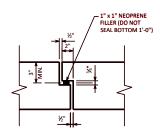


APPROVED: Laura Shadewald

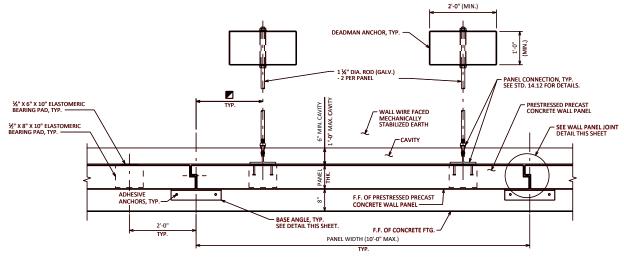


BASE ANGLE DETAIL

CENTERED ON PANEL JOINT OR AT EACH FOOTING END OR STEP



WALL PANEL JOINT DETAIL



TYPICAL WALL PANEL CONNECTION - PLAN VIEW

(2) - #4 AT TOP AND

BOTTOM OF PANEL

(2) - #4 AT EACH

(2) - #4 BENT BARS

(2'-0" X 2'-0") AT

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

APPROVED EQUAL.

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

PANEL CONNECTION,

SEE STD. 14.12

PRESTRESSING

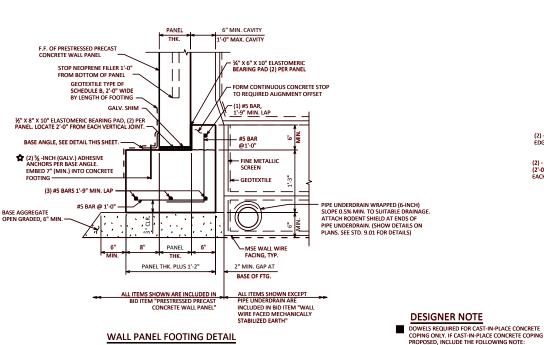
STRANDS PER WALL MANUFACTURER

WELDED WIRE REINFORCEMENT PER

WALL MANUFACTURER

-NA

FOR DETAILS.



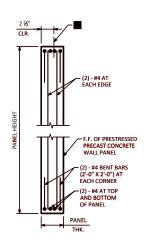
WALL PANEL FOOTING DETAIL

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

FACH CORNER PANEL WIDTH -►IA **ELEVATION PRESTRESSED** PRECAST CONCRETE WALL PANEL DO NOT PROVIDE BILL OF BARS. BAR STEEL REINF. AND CONCRETE ARE INCLUDED IN BID ITEM "PRESTRESSED PRECAST CONCRETE WALL PANEL".

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

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

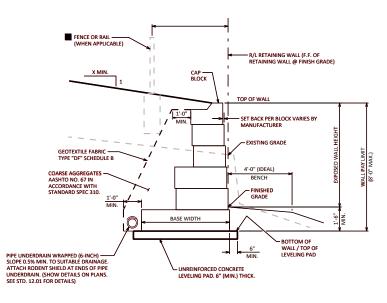


SECTION A-A

PRESTRESSING STRANDS NOT SHOWN FOR CLARITY.

MSE WALL WIRE FACING 2





TYPICAL SECTION

(GRAVITY WALL WITH WET CAST BLOCK FACING)

TOTAL ESTIMATED QUANTITIES

	<u>'</u>		
BID ITEM NUMBER	BID ITEM	UNIT	TOTAL
612.0406	PIPE UNDERDRAIN WRAPPED 6-INCH	LF	
SPV.0165.XX	WALL MODULAR BLOCK GRAVITY (STRUCTURE)	SF	

WALL EXTERNAL & OVERALL STABILITY EVALUATION

DIMENSIONS	EVALUATED LOCATIONS		ONS
WALL HEIGHT (FEET)			
EXPOSED WALL HEIGHT (FEET)			
MINIMUM BASE WIDTH (INCHES)			
WALL STATION			
BORING USED			
CAPACITY TO DEMA	AND RATIO (CDF) ⋤	
SLIDING (CDR > 1.0)			
ECCENTRICITY (CDR > 1.0)			
OVERALL STABILITY (CDR > 1.0)			
BEARING RESISTANCE (CDR > 1.0)			
FACTORED BEARING RESISTANCE (PSF)			

GEOMETRY TABLE

WALL STATION	ROADWAY STATION	OFFSET TO F.F. WALL	COHESION TOP OF WALL ELEV.	FINISHED GRADE ELEV.

SOIL PARAMETERS

SOIL DESCRIPTIONS	TOTAL UNIT WEIGHT (PCF)	FRICTION ANGLE (DEGREES)	COHESION (PCF)
WALL BACKFILL	120	30	0
RETAINED SOIL * (INSERT VALUES)	-	-	-
FOUNDATION SOIL * (INSERT VALUES)	-	-	

^{*} DESIGN WALL FOR THESE VALUES

GENERAL NOTES

DRAWINGS SHALL NOT BE SCALED.

THE PLAN QUANTITY FOR THE BID ITEM "WALL MODULAR BLOCK GRAVITY (STRUCTURE)" IS BASED ON A WALL HEIGHT MEASURED FROM THE TOP OF WALL TO A CONSTANT DEPTH OF (INSERT VALUE) BELOW FINISHED GRADE.

AT THE BACK FACE OF THE WALL ALL EXCAVATED VOLUME NOT OCCUPIED BY NEW STOTIOTIES SHALL BE BACKFILLED WITH BACKFILL TYPE A OR GRANULAR BACKFILL BOADE 1 AS SHOWN IN THE TYPICAL SECTION. BACKFILLING SHALL BE INCIDENTAL TO BID ITEM "WALL MODULAR BLOCK GRAVITY (STRUCTURE)". LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR.

DESIGN DATA

THE CONTRACTOR SHALL PROVIDE COMPILETE DESIGN, PLANS, DETAILS, SPECIFICATIONS, AND SHOP DRAWINGS FOR THE BETAINING WALLS IN ACCORDANCE WITH THE SPECIAL PROVISIONS. THE RETAINING WALL MANUFACTURER SHALL PROVIDE TECHNICAL ASSISTANCE TO THE CONTRACTOR DURING CONSTRUCTION. THE COST OF FURNISHING THESE TEMS SHALL BE INCLUDED IN THE BID ITEM "(INSERT WALL SYSTEM) OR SYSTEMS)".

PLANS, ELEVATIONS AND DETAILS SHOWN ON THESE DRAWINGS ARE INTENDED TO INDICATE WALL LOCATIONS, LENGTHS, HEIGHTS, AND DETAILS COMMON TO THE WALL SYSTEM SELECTED. THE CONTRACTOR SHALL VERIFY THAT THE WALL SYSTEM SELECTED WILL CONFORM TO THE REQUIRED ALIGNMENTS AND DETAILS.

THE RETAINING WALL IS TO BE DESIGNED USING THE ELEVATIONS GIVEN ON THIS SHEET

DESIGN FOR RETAINING WALL TO PROVIDE FOR FINISHED GRADE SLOPED BEHIND WALL AS SHOWN.

SEE SPECIAL PROVISIONS FOR AESTHETIC TREATMENT TO WALL.

DESIGN RETAINING WALL FOR A LIVE LOAD SURCHARGE OF (INSERT VALUE).

■ THE CONTRACTOR SHALL COORDINATE POST INSTALLATION WITH THE WALL DESIGN AND WALL DETAILS (WHEN APPLICABLE).

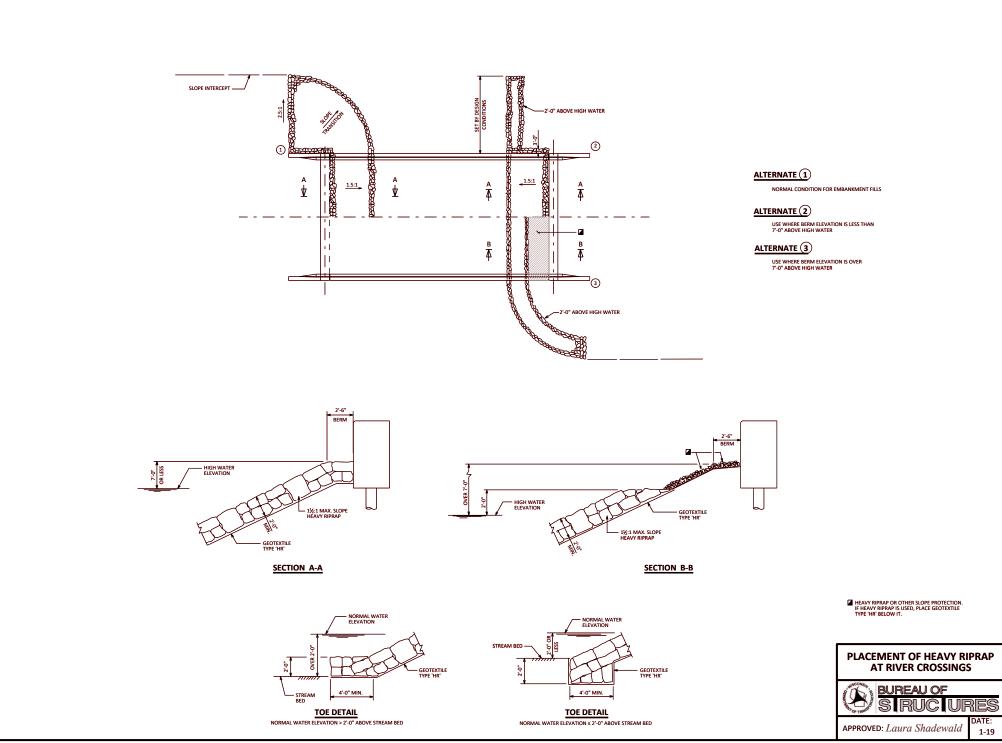
THE MAXIMUM VALUE OF THE ANGLE OF INTERNAL FRICTION OF THE WALL BACKFILL MATERIAL SHALL BE ASSUMED TO BE 30° WITHOUT CERTIFIED TEST VALUES.

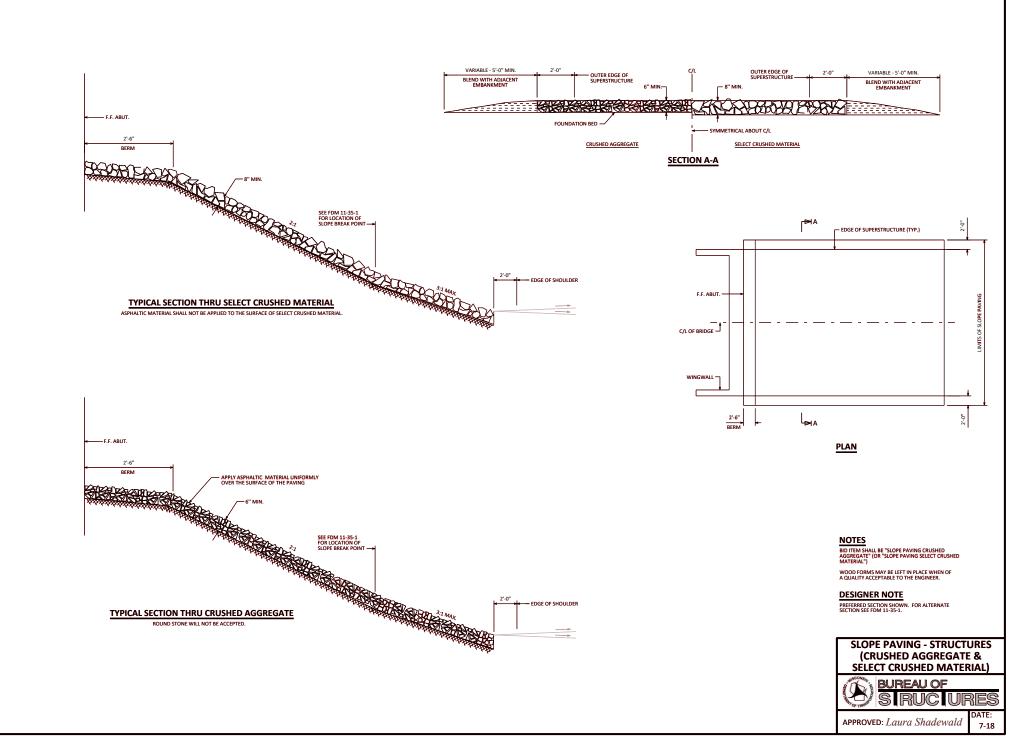
DESIGNER NOTES

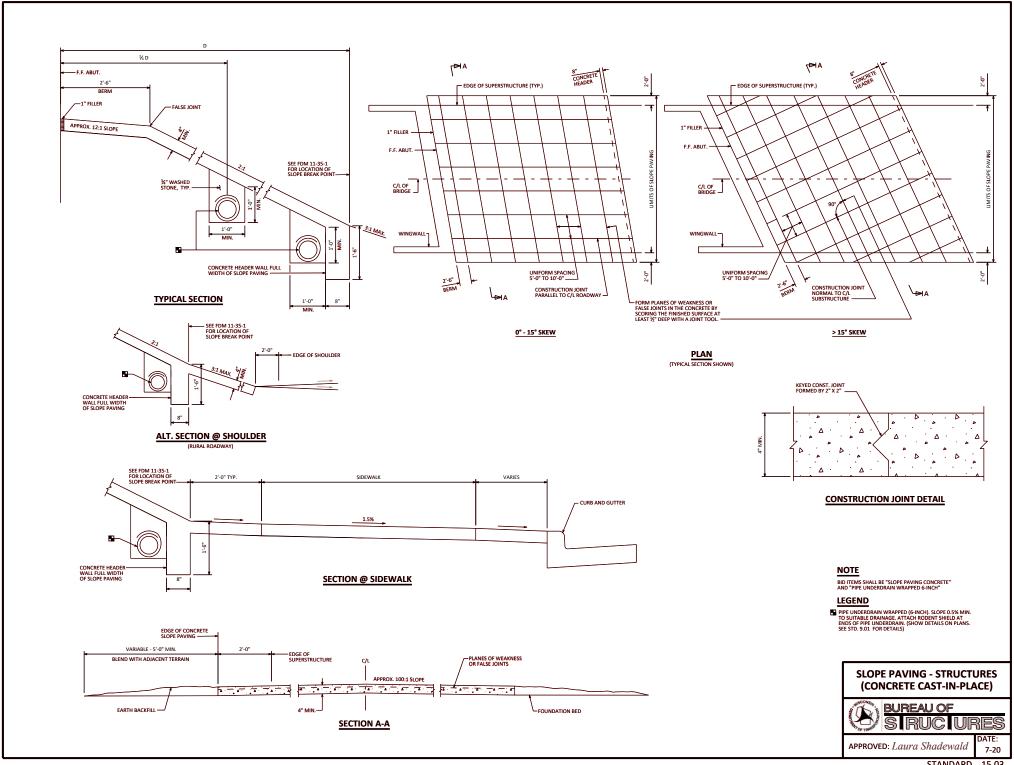
- THE WIDTH PROVIDED IN THE TABLE ARE THE MINIMUM REQUIRED BLOCK WIDTHS BASED UPON THE MINIMUM DESCRIBED IN THE WALL SYSTEM SPECIAL PROVISIONS OR EXTERNAL AND OVERALT STABILITY AT THE DESIGNATE ID CATIONS. THESE DESIGNATED LOCATIONS REPRESENT TYPICAL AND CRITICAL WALL LOCATIONS, BUT SHALL NOT BE CONSIDERED ALL INCLUSIVE. THE CONTRACTOR DESIGN SHALL MEET OR EXCEED THE MINIMUM VALUES REPRESENTED IN THE TABLE AT THESE DESIGNATED LOCATIONS.
- STRATUM LOCATIONS & SOIL DESCRIPTIONS AT EACH BORING LOCATION.
- WHEN APPLICABLE, RAILING OR FENCING SHOULD BE PLACED BEHIND WALL

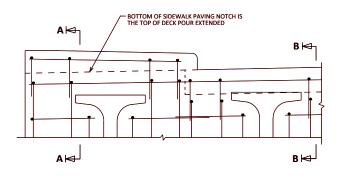
GRAVITY WALL







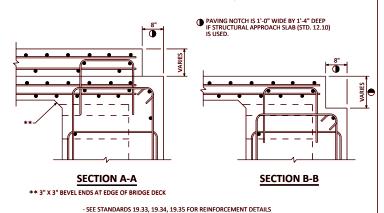




PART TRANSVERSE SECTION AT ABUTMENT TYPE A1 DIAPHRAGM WITH A RAISED SIDEWALK

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

- DETAILS SHOWN ARE FOR GIRDER STRUCTURES. SIMILAR REINFORCEMENT FOR SLAB STRUCTURES SHALL BE USED

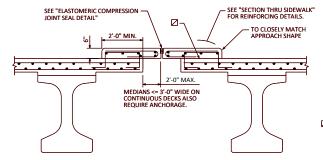


ROUGH FLOAT SURFACE OR SAME FINISH AS EXPOSED DECK. DO NOT APPLY PROTECTIVE SURFACE TREATMENT TO THIS AREA. #4 BARS AT 1'-6" MAX. FACH DIRECTION TO CLOSELY MATCH APPROACH SHAPE MEDIAN WIDTH *

CROSS SECTION THRU UNANCHORED MEDIAN

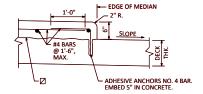
* (ANCHORAGE TO DECK NOT REQUIRED FOR WIDTHS > 3'-0", EXCEPT ALL MEDIAN SECTIONS ON TOP OF PAVING BLOCK MUST BE ANCHORED)

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



ANCHORED MEDIAN CURB DETAIL

@ 1'-6", MAX.

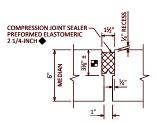


- FDGE OF MEDIAN

ADHESIVE ANCHORS NO. 4 BAR.

ANCHORED MEDIAN CURB DETAIL

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



ELASTOMERIC COMPRESSION SEAL DETAIL

- NARIES BASED ON JOINT MANUFACTURER
- ◆ MANUFACTURER SHALL LABEL TOP OF SEAL

SEE STD. 24.11 FOR DECK JOINT DETAIL FOR LONGITUDINAL AND TRANSVERSE JOINTS.

MEDIAN AND RAISED SIDEWALK DETAILS



7-24

CROSS SECTION THRU MEDIAN WITH A JOINT



DEFLECTION JOINT DETAIL

SHOW DEFLECTION JOINT IN PARAPET OR SIDEWALK

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

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

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

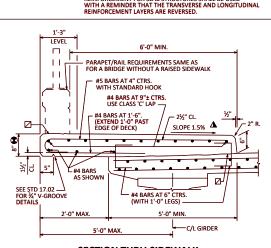
WHEN PARAPETS ARE POURED CONTINUOUSLY FROM END TO END, THEY SHALL BE SEPARATED AT THE DEFLECTION JOINTS BY A PIECE OF 1/8" ZINC OR PLASTIC PLATE CUT AS SHOWN IN THE "DEFLECTION JOINT DETAIL". IF CONSTRUCTION JOINTS IN PARAPETS ARE USED AT THE DEFLECTION JOINTS, ONE SIDE OF JOINT SHALL BE COATED WITH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

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

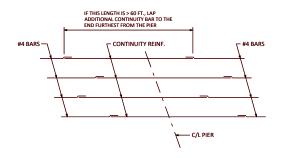
DESIGNER NOTES

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

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



SECTION THRU SIDEWALK



IF THIS LENGTH IS > 60FT., LAP ADDITIONAL CONTINUITY BAR TO THE END FURTHEST FROM THE PIER CONTINUITY REINF - #4 BARS #4 BARS C/L PIER

PLAN VIEW OF DECK CONTINUITY REINFORCEMENT

FOR PRESTRESSED GIRDER BRIDGES

(SHOWING TYPICAL BAR SPACING FROM CHAPTER 17 TABLES)

PLAN VIEW OF DECK CONTINUITY REINFORCEMENT FOR PRESTRESSED GIRDER BRIDGES SHOWING HALF-SPACES

(SHOWING TYPICAL BAR SPACING FROM CHAPTER 17 TABLES + HALF-SPACE)

LONGITUDINAL CONSTRUCTION JOINT DETAIL

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

DESIGNER NOTES

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

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

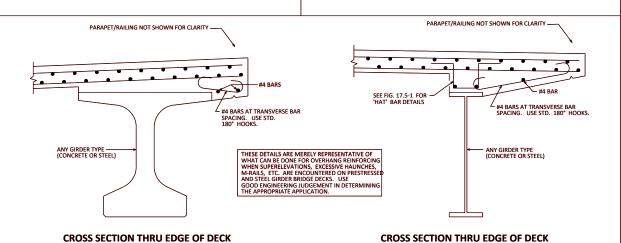
(SHOWING ADDITIONAL OVERHANG REINFORCEMENT)

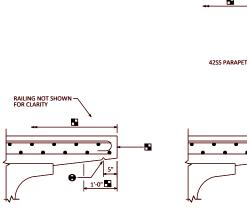
TYPICAL LOCATION OF CONTINUITY REINF. ADDITIONAL CONTINUITY REINE. AT HALF-SPACES. ONLY USED FOR PRESTRESSED GIRDER BRIDGES (IF NECESSARY).

CROSS SECTION THRU DECK

(SHOWING TOP LONGIT. REINF. LOCATION RELATIVE TO BOTTOM LONGIT. REINF.)

(SHOWING ADDITIONAL OVERHANG REINFORCEMENT)



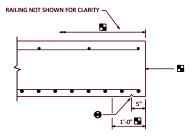


CROSS SECTION THRU EDGE OF DECK

(SHOWING DRIP GROOVE AND CONCRETE SEALING FOR OPEN RAILINGS)

CROSS SECTION THRU EDGE OF DECK

(SHOWING DRIP GROOVE AND CONCRETE SEALING FOR ALL PARAPETS)



CROSS SECTION THRU EDGE OF SLAB

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

DESIGNER NOTES

REFER TO STANDARD 40.01 FOR RESEALING CONCRETE SURFACES.

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

BID ITEM "PROTECTIVE SURFACE TREATMENT":

- APPLY TO DECK AND CONCRETE OVERLAY SURFACES.
- FOR OPEN RAILINGS, APPLY TO THE TOP AND EXTERIOR EXPOSED FACE OF WINGS, AND THE END 1'-0" OF THE FRONT FACE OF ABUTMENT.
- APPLY TO THE VERTICAL AND HORIZONTAL SURFACES OF SIDEWALKS, MEDIANS, AND PAVING NOTCHES.
- **▲** BID ITEM "PIGMENTED SURFACE SEALER": APPLY TO INSIDE & TOP FACES OF PARAPETS, INCLUDING PARAPETS ON WINGS.

NOTES

¾" V-GROOVE REQ'D. EXTEND TO 2'-0" FROM F.F. OF ABUT. BODY (FOR ABUTMENTS WITH EXPANSION JOINTS)

 \frak{W} " V-GROOVE REQ'D. EXTEND TO 6" FROM F.F. OF ABUT. DIAPH. (FOR TYPE A1 FIXED AND SEMI-EXPANSION ABUTMENTS)

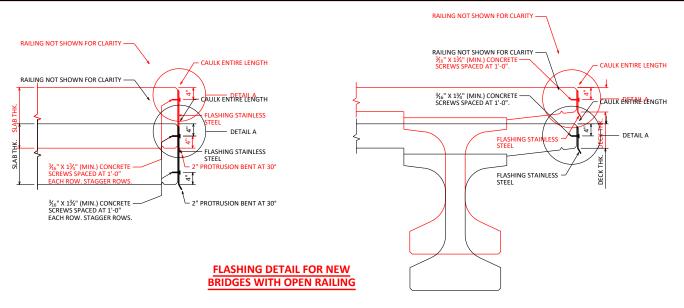
PROTECTIVE SURFACE TREATMENT SHALL BE APPLIED TO THE (INSERT LOCATIONS).

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

DECK AND SLAB DETAILS



APPROVED: Laura Shadewald



FLASHING DETAIL FOR NEW **BRIDGES WITH OPEN RAILING** THE BID ITEM "FLASHING STAINLESS STEEL" SHALL INCLUDE

PROVIDING AND INSTALLING THE STAINLESS STEEL FLASHING, CAULK, $\frac{3}{16}$ " CONCRETE SCREWS AND CLEANING THE EDGE RAILING NOT SHOWN FOR CLARITY -OF THE DECK PRIOR TO ATTACHMENT OF THE FLASHING. ¾6" X 1¾" (MIN.) CONCRETE SCREWS 1/4" X 23/4" (MIN.) CONCRETE SPACED AT 2'-0". (CAST-IN-PLACE OR POST SCREWS SPACED AT 1'-0" INSTALLED) *₀*= *₽* ₹ ₹ ₹ ₹ STAINLESS RAILING NOTINHOWNHFORSOLARITY STEEL CONCRETE (CA (CAST-IN-PLACE) **REHABILITATION FLASHING DETAIL 1** x 23/4" (MIN) CONCRETE IOTES (REHAB DETAIL 1) HE BID ITEM "FLASHING STAINLESS S NCLUDE PROVIDING AND INSTALLING THE INLESS STEEL FLASHING, AND CO - FLASHING STAINLESS ------3/6" X 13/4" (MIN.) α TER ELASHING IS INSTALLED AND TIMITED CONCRETE SCREWS PROTECTIVE SURFACE TREATMENT SHALL BE ANDLIED TO THE EXPOSED CONCRETE SURFACE SPACED AT 2'-0" THE TOP SURFACE OF THE SLAB, THE E THE SLAB, AND T UNDERSIDE OF THE SLAB CONCRETE SCREWS SHALL BE 410 STAINLESSURFACE REPAIR EXTEND FLASHING TO B.F. OF ABUTMENT DIAPHRAGM PROVIDE 2" MINIMUM FLASHING OVERLAP, FASTEN WITH ¾6" X 2" (MN). ETE S 3∕4" 43/4" REHABILITATION FLASHING DETAIL 1

DETAIL 1 NOT TO BE USED IF CLEARANCE IS AN ISSUE OR

THE BID ITEM "FLASHING STAINLESS STEEL" SHALL INCLUDE PROVIDING AND INSTALLING THE STAINLESS STEEL ELASHING AND CONCRETE SCREWS, INCLUDING THE 1/4" SCREWS USED TO SECURE THE CONCRETE SURFACE REPAIR

RAILING NOT SHOWN FOR CLARITY -¼" X 2¾" (MIN.) CONCRETE SCREWS SPACED AT 1'-0" CAULK ENTIRE LENGTH FLASHING STAINLESS RAILING NOTE SHOWNIFOR CLARKITY 2" PROTRUSION BENT AT 30° CONCRETE 1/4" X 23/4" (MIN.) CONCRETE -SURFACE CRADIENTENTIRE LENGTH SCREWS SPACED AT 1'-0" REHABILITATION FLASHING DETAIL **ENOTES (REHAB DETAIL 2)** FLASHING STAINLESS DE PROVIDING AND INSTALLING TH ITEM "FLASHING STAINLESS STEEL" S S STEEL FLASHING, SILICONE CAULK THE DECKARION TO ATTACHMENT OF THESE ING TO BE INSTALLED AFTER PROTECTIVE SURFA TREATMENT APPLICATION HE TOP SURFACE OF THE SLAB, THE I ALLER TRUSPENT AT 30°, EXTERIOR EDEENS THE ALL INCOMES CONCRETE CONCRETE SCREWS SHALL BE 410 STAINLESS STEEL. SLIREACE REPAIR EXTEND FLASHING TO B.F. OF ABUTMENT DIAPHRAGM TOP OF FLASHING TO BEGIN APPROX. 1-INCH BELOW TOP OF DECK/SLAB SURFACE. THE FLASHING IS TO BE A CONSTANT HEIGHT BASED ON THE THINNEST SLAB DEPTH OVER THE

REHABILITATION FLASHING DETAIL 2 X6" X 2" (MIN.) CONCRETE SCREWS.

THE BID ITEM "FLASHING STAINLESS STEEL" SHALL INCLUDE PROVIDING AND INSTALLINGIAME STAINLESS STEEL SHALL INCLUDE PROVIDING AND INSTALLINGIAME STAINLESS STEEL LASHING COADLRY MINAND WINT SEALER. CONCRETE SCREWS, AND CLEANING THE EDGE OF THE DECK PRIOR TO ATTACHMENT OF THE FLASHING.

DESIGNER NOTES

EEDGEOOFDDEGKFELASHING ISFEOROOPENFRAILBBRIDGESAANDWAAYBE LIBER DISETER FROM IR BIHADATTITANTION NORAN EVANSORIST RUMOT LONG NORAN TATETE REHE (REGION (BRIDGE INTAINTEN ANCE ENGINEER THORT THE DEGISION

CRETALLI CORPETALLI CORACCOMBINATION OF THE TWO MAY BE

THE DESIGN ENGINEER SHALL PROVIDE CONCRETE SURFACE TREPRIES DET ANS INSTANTANT CONCRETE SURFACE RSHOWN TIMITAIS STANDAR OND WILL BE PAID FOR SEPARATELY. DO NOT USE FLASHING IF FREEBOARD IS LESS THAN 3" DEORA SLAB BRINGING IF FREEBOARD IS LESS THAN 3" FOR A SLAB BRIDGE. DETAIL 1 NOT TO BE USED IF CLEARANCE IS AN ISSUE OR IF

NOTES (NEW BRIDGES WITH OPEN

LASHING STAINLESS STEEL SHALL INCLUDE PROVIDING AND INSTALLING THE STAINLESS STEEL FLASHING, SEIFON ECAULY AND SO CONCRETE SEREWHALL INCLUDE ROVIDING AND INSTALLING THE STAINLESS STEEL FLASHING,

SKLASAINGATO BEGINGRAETEDSARFERS PROTECTIVE SURFINGE EDGE OF THE FLASHING

FCONGRETES GREWST SHALL BE ALLO PATO INVESSOR SEERFACE TREATMENT APPLICATION, PROTECTIVE SURFACE TREATMENT SHALL BE APPLIED TEXTEP OF SHAND FOR THE SLAB,

AND THE FLAST ING TO BELOW TOP OF DECKISLAB SURFACE.
CONCRETE SCREWS SHALL BE 410 STAINLESS STEEL.

THE FLASHING IS TO BE A CONSTANT HEIGHT BASED EXTENDED LASEN NEST SLAB DEPTHS OWER THE DRIVE GENGTH.

TPROXIPEAS'IMINIMUM EHASHING QVERLARA EASTEN MUT UF DEKK/SIA'BLYNNAGQNCRETE SCREWS.

CAULK SHALL BE NON-STAINING, GRAY NON-BITUMINOUS JOINT HE MASHING IS TO BE A CONSTANT HEIGHT BASED ON THE THE MEST SLAB DEPTH OVER THE BRIDGE LENGTH.

PROVIDE 2" MINIMUM FLASHING OVERLAP, FASTEN WITH ¾6" X 2" (MIN.) CONCRETE SCREWS.

CAULK SHALL BE NON-STAINING, GRAY NON-BITUMINOUS JOINT

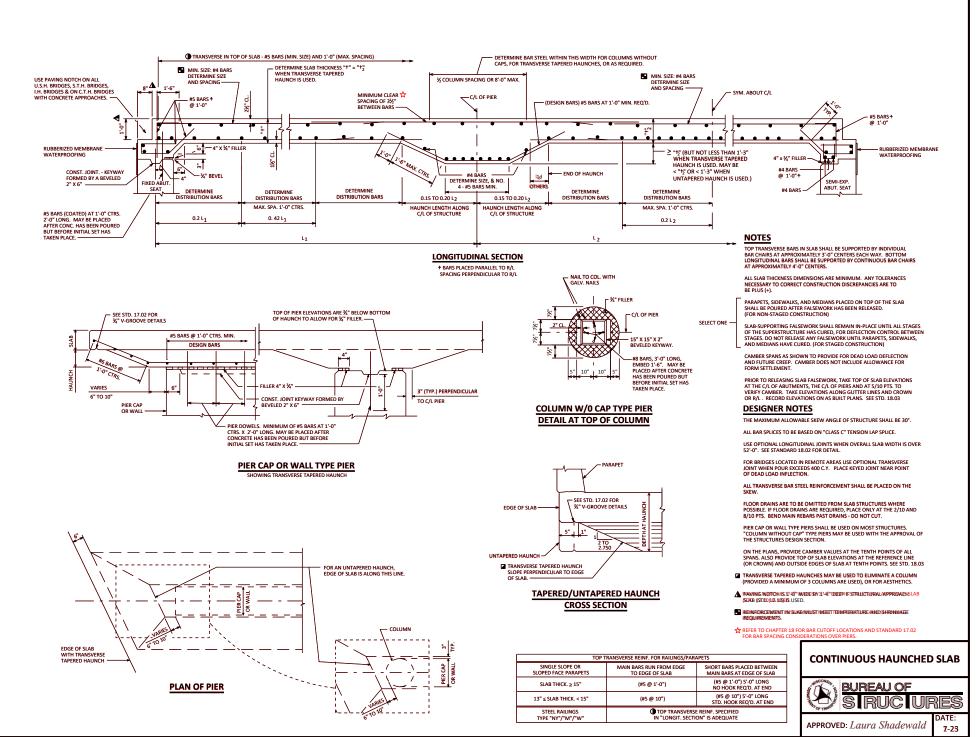
¾₆" X 1¾" (MIN.) CONCRETE SCREWS SPACED AT 1'-0" EACH ROW. STAGGER ROWS.

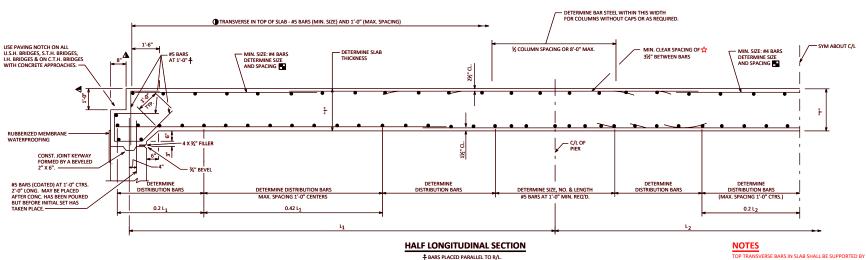
3/16" X 13/4" (MIN.) CONCRETE SCREWS SPACED AT 1'-0" EACH ROW, STAGGER ROWS.

EDGE OF DECK FLASHING



APPROVED: Laura Shadewald





SPACING PERPENDICULAR TO R/L

PARAPET SEE STD. 17.02 FOR X* V-GROOVE DETAILS TOP OF PIER ELEVATIONS ARE X* BELOW BOTTOM OF SLAB TO ALLOW FOR FILLER. VARIES 6* TO 10* CONST. IT. FORMED BY SEVELED

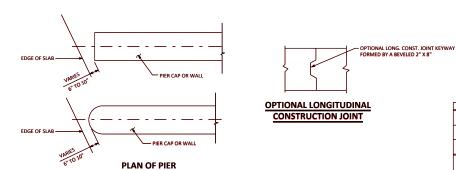
PIER DOWELS. MIN. OF #5 BARS AT 1'-0" CTRS. X 2'-0" LONG. MAY BE PLACED AFTER CONCRETE HAS BEEN

POURED BUT BEFORE INITIAL SET HAS TAKEN PLACE.

PIER CAP OR WALL TYPE PIER

2" X 6" KEYWAY

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



TOP T	TOP TRANSVERSE REINF. FOR RAILINGS/PARAPETS					
SINGLE SLOPE OR SLOPED FACE PARAPETS	MAIN BARS RUN FROM EDGE TO EDGE OF SLAB	SHORT BARS PLACED BETWEEN MAIN BARS AT EDGE OF SLAB				
SLAB THICK. ≥ 15"	(#5 @ 1'-0")	(#5 @ 1'-0") 5'-0" LONG NO HOOK REQ'D. AT END				
13" ≤ SLAB THICK. < 15"	(#5 @ 10")	(#5 @ 10") 5'-0" LONG STD. HOOK REQ'D. AT END				
STEEL RAILINGS TYPE "NY"/"M"/"W"						

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

SELECT ONE

SELECT ONE

AT JOHANN MATELY 4"O' CENTERS.
TOP TRANSVESSE BARS IN SLAB SHALL BE SUPPORTED BY INDIVIDUAL
RREGULAISS AT REPROMINATELY 3"O'CENTERS SA CHIWAYL BOTTODS
LONISTANDING GORSSTHALD RESUPPORTED BY GONTRIED JASSES SHARS. (+).
AT APPROXIMATELY 4"O'CENTERS.

PARAPETS, DIEWALKS, AND MEDIANS PLACED ON TOP OF THE SLAB
SHIBLER PHOCKNESS-OWN ENSEMBLAND HAVE BANKED LERANCES
(*EQESSAR'S TRICKORS CONSTRUCTION DISCREPANCIES ARE TO BE PLUS (+).

BORDETIS-GIDENMANS-AND-MEDIANE PLACED UNITIDE DOFFINE SUBBITAGES SHALLDER DURINGE DOFFINE SUBBITAGES AND MEDIAND REPRESENTATION DE LEVIMEN SHALLDER DURINGE MODES THAT SHALLDER SUBBITAGES AND MEDIANS AND EDIANS TRACEDED SONS TRACED CONSTRUCTION SLADS-SUPPORTING FALSEWORK SHALL REMAIN IN-PLACE UNTIL ALL STAGES CONTINUES AND MEDIANS TO SHALLDER SUBBITAGES AND MEDIANS TO SHALLDER SHALLDER SHALLDER SUBBITAGES AND FOR THE SUBBITAGES AND EDIANG SHALLDER SH

GAMIBER, SPAINS, AS, SHOWN, TO, SROVING FOR DECROLOGO, DELECTION AND INTRUSE CREEK-ACMBER 195 CENTON TO NELLOW BOOK OF ROYM SETTIFE MAPPIERS. TAKE LEEVATIONS ALONG GUTTER LINES AND CROWN OR R.I. RECORD ELEVATIONS ON AS BUILT PLANS. SEE STD. 186.03 PRIOR TO RELEASING SLAB FALSEWORK, TAKE TOP OF SLAB ELEVATIONS OF THE STORY OF THE

DESIGNER NOTES ON "CLASS C" TENSION LAP SPLICE.

THE MAXIMUM. BILLOMABREASKEYMANGER OF STRIKETUBEASHALD BE 30 OVER 52'-0".

ABARARISELEES TO BE BASED ON EGLASS STUTEN PION HAP SRAKS VERSE JOINT WHEN POUR EXCEEDS 400 C.Y. PLACE KEYED JOINT NEAR POINT OF DEAL LOAD USE QUENOMAL LONGTUDINAL JOINTS WHEN OVERALL SLAB WIDTH IS OVER 52'-0".

FOR BRIDGESTACCATED INTERMOTE AREAS USES ORTICINAL TRANSVERSES ONLY WHEN POUR EXCEEDS 400 C.V. PLACE REYED DIMIN THAT ARE POINT OF DEAD IDLD INDESS TORMAN ARE TO BE CONTITIED FROM SLAB STRUCTURES WHERE POSSIBLE IF FLOOR DRAINS ARE REQUIRED, PLACE ONLY AT THE 2/10 AND 8/10 PT.S. MALEFORMAN SEASOR AREA TRANSVERS OF CONTITIED THE STATE ON THE SERVICE OF THE SERVICE O

FLOOR-PRAINS ARETTO BEFORMITTERIER DIMEST-BISTRUSTURES, WHERE, POSSIBLE. ITE CLORAD DRAINS-BREE REQUIRED; PREAGENINGAT 37 HE 2/AD AND 18/10 NYSH THE REPRENDANTER PRAST ORANS SOON DECKNO.

Pirt Gatornyaldyre terselelnar belesed an mast structures lle Scalainaryathonad carditure pirte (see atta) 28.011) anay belased diet the Abrrryang-intestractures designises actionanth points. See Std. 18.03

A PAITHE RLANS RESOLUPTION MERT VALUE AT THE TENTH ACCOUNT OF CALLAB SPANS, ALSO PROVIDE TOP OF SLAB ELEVATIONS AT THE REFERENCE LINE (OR CROWN) AND OUTSIDE EDGES OF SLAB AT TENTH POINTS. SEE STD. 18.03

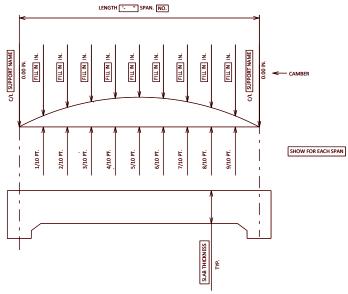
REINFORCEMENT IN SLAB MUST MEET TEMPERATURE AND SHRINKAGE RAWING NOSICH (IS 1'-0" WIDE BY 1'-4" DEEP IF STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED.

REFER TO CHAPTER 18 FOR BAR CUTOFF LOCATIONS AND STANDARD 17-02
REQUIREMENTS.

CONTINUOUS FLAT SLAB



APPROVED: Laura Shadewald



CAMBER AND SLAB THICKNESS DIAGRAM

CAMBER SHOWN IS BASED ON 3 TIMES DEAD LOAD DEFLECTION.

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

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

SLAB-SUPPORTING FALSEWORK SHALL REMAIN IN-PLACE UNTIL ALL STAGES OF THE SUPERSTRUCTURE HAS CURED, FOR DEFLECTION CONTROL BETWEEN STAGES. DO NOT RELEASE ANY FALSEWORK UNTIL PARAPETS, SIDEWALKS, AND MEDIANS HAVE CURED. (FOR STAGED CONSTRUCTION)

TO DETERMINE FALSEWORK ELEVATION AT EDGE OF SLAB, CROWN OR REFERENCE LINE FOLLOW THIS PROCEDURE:

FILL IN EDGE OF SLAB

TOP OF SLAB ELEVATION AT FINAL GRADE
MINUS..... SLAB THICKNESS
PUS..... CAMBER
PUS..... FORM SETILEMENT/DEFLECTION DUE TO PLACEMENT OF SLAB CONCRETE (TO BE COMPUTED BY THE CONTRACTOR)

— (FOR SIDEWALK OR OPEN RAILING APPLICATIONS)

EQUALS = TOP OF SLAB FALSEWORK ELEVATION

TOP OF SLAB ELEVATIONS

SHOW FOR EACH SPAN

	C/L BRG. SUPPORT NAME	1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10	9/10	C/L BRG. SUPPORT NAME
FILL IN GUTTER											
SELECT CROWN AND/OR R/L											
FILL IN GUTTER											

SURVEY TOP OF SLAB ELEVATIONS

SHOW FOR EACH SPAN

	C/L BRG. SUPPORT NAME	5/10 PT.	C/L BRG. SUPPORT NAME
FILL IN GUTTER			
SELECT CROWN AND/OR R/L			
FILL IN GUTTER			

— (FOR SIDEWALK OR OPEN RAILING APPLICATIONS) FILL IN EDGE OF SLAB 🏠

> PRIOR TO RELEASING SLAB FALSEWORK, TAKE TOP OF SLAB ELEVATIONS AT THE C/L OF ABUTMENTS, THE C/L OF PIERS AND AT 5/10 PTS. TO VERIFY CAMBER. TAKE ELEVATIONS ALONG GUTTER LINES AND CROWN OR R/L. RECORD THE ELEVATIONS IN THE ABOVE TABLE FOR THE "AS BUILT" PLANS.

FILL IN THE TABLE OF "SURVEY TOP OF SLAB ELEVATIONS" FOR EACH SPAN ON AS BUILT PLANS.

DEFINITION OF SLAB ELEVATION IS THE TOP OUTER EDGE OF THE SLAB BENEATH SIDEWALK. (FOR SIDEWALK OR OPEN RAILING APPLICATIONS)

DESIGNER NOTES

PROVIDE A "CAMBER AND SLAB THICKNESS DIAGRAM" AND TABLE OF "TOP OF SLAB ELEVATIONS" FOR EACH SPAN ON CONTRACT PLANS.

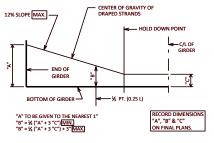
INCLUDE THE "SURVEY TOP OF SLAB ELEVATIONS" TABLE ON THE CONTRACT PLANS SO THAT IT MAY BE FILLED IN DURING CONSTRUCTION. TO VERIFY CAMBER, SURVEY LOCATIONS SHALL CORRESPOND WITH THE TABLE OF "TOP OF SLAB ELEVATIONS".

FOR BRIDGES WITH R/L LINE NOT ON THE CROWN, PROVIDE ELEVATIONS AT BOTH LOCATIONS.

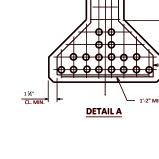
CONCRETE SLAB DETAILS



STANDARD 18.03



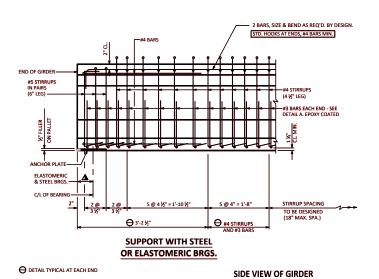
LOCATION OF DRAPED STRANDS



EPOXY COATED

#4 BAR AT TOP OF GIRDER #4 BAR AT BOTTOM OF GIRDER

PLAN VIEW



SUPPORT WITH 1/2" ELASTOMERIC BRG. PAD

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 503.3.4 OF STANDARD SPECIFICATIONS FOR GUIDANCE.

STRANDS SHALL BE FLUSH WITH END OF GIRDER. FOR GIRDER ENDS EMBEDDED COMPLETELVIN CONCRETE, END OF STRANDS SHALL BE COATED WITH MON-BITUMINOUS JOINT SEALER. FOR GIRDER ENDS THAT ARE FINALLY EXPOSED, COAT THE GIRDER ENDS, EXPOSED STRAND ENDS AND ALL MON-BOOMBINS SUPPRACES WITHIN YEEF OF THE GIRDER ENDS WITH A NON-PIGMENTED EPOXY COMPORTMING TO AASHTO M-235 TYPE III, GRADE 2, LASS B OR C. II HE POXY SHALL BE APPLIED AT LEAST JOHNS AND THE MOST CLAIMS OF THE STRAND THE OFFICE THE STRAND THE OFFICE THE STRAND THE APPLIED AT THE APPLIED ATTO OF THE STRAND THE OFFICE THE APPLIED ATTO OF THE STRAND THE APPLIED ATTO OF TH

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 AN EQUIVALENT OF WELDED WINE FABRIC (WWW.) AS IN ALDER WAT BE SUBSTITUTED FOR THE STIRRUP REINFORCEMENT SHOWN, UPON APPROVAL OF THE STRUCTURES DESIGN SECTION. IF USED, WWF SUBSTITUTION DETAILS SHALL BE SUBMITTED ELECTRONICALLY TO THE WISDOT FABRICATION LIBRARY AND ACCEPTED PRIOR TO SHOP DRAWING

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

DESIGNER NOTES

BID ITEM SHALL BE "PRESTRESSED GIRDER TYPE I 28-INCH".

SPECIFY CONCRETE STRENGTH AS REQUIRED BY DESIGN FROM A MINIMUM OF 6,000 PSI TO A MAX. OF 8,000 PSI. MAXIMUM RELEASE STRENGTH IS 6,800 PSI. USE ONLY 0.5" DIA. STRAND FOR THE DRAPED PATTERN. THE MAX. NUMBER OF DRAPED 0.5" DIA. STRANDS IS 8. USE 0.6" DIA. FOR THE STRAIGHT PATTERN, UNLESS ONLY 0.5" DIA. WORK FOR KEEPING STRESSES AT ACCEPTABLE LEVELS.

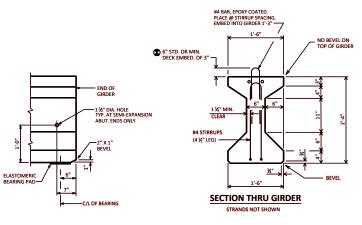
REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STANDARD STRAND PATTERNS LISTED ON STANDARD 19.02 AND THE SPAN LENGTHS SHOWN IN TABLE 19.3-1. USING DIFFERENT STRAND PATTERNS OR LONGER SPANS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT, WHICH REQUIRES PRIOR APPROVAL FROM THE BUREAU OF STRUCTURES.

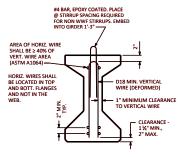
SHOW ONLY ONE STRAND SIZE ON THE PLANS.

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

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 ½" CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR ±¾" VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

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





SECTION THRU GIRDER

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

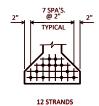


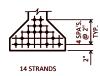


APPROVED: Laura Shadewald













*MAY REQUIRE DEBONDING AT ENDS, WHICH IS TO BE AVOIDED.

(0.5" DIA. STRANDS MAY ALSO BE USED) 10 STRANDS







8 STRANDS

10 STRANDS

12 STRANDS







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

PRE-TENSION

f'_s = 270,000 P.S.I. A = 312 SQ. IN. f_S = 0.75 x 270,000 = 202,500 P.S.I.

 $r^2 = 91.95 \, IN.^2$ for low relaxation strands

y_T = 14.58 IN. PI PER 0.5" DIA. STRAND = 0.1531 X 202,500 = 31.00 KIPS PI PER 0.6" DIA. STRAND = 0.217 X 202,500 = 43.94 KIPS

y_B = -13.42 IN. $\frac{y_B}{r^2}$ = $\frac{-13.42}{91.95}$ = -0.1459 IN./IN.² I = 28,687 IN.4

 $S_T = 1,968 \text{ IN.}^3$

 $f_B(init.) = \frac{A_S f_S}{A} (1 + \frac{e_S y_B}{r^2})$ $S_B = -2,138 \text{ IN.}^3$

WT. = 325 #/FT.

28" GIRDER

(COMPRESSION IS

			POSITIVE)						
NO. STRANDS	e _s (inches)	P(init.) = A _S f _S (KIPS)	f _B (init.) (K/sq.in.)						
STANDARD	STANDARD STRAND PATTERNS FOR UNDRAPED STRANDS (0.6" DIA.)								
8	-10.42	352	2.844						
10	-9.82	439	3.424						
12	-8.75	527	3.846						
14	-7.99	615	4.269						
*16	-9.42	703	5.351						
*18	-9.64	791	6.102						
STANDARD	STRAND PATTERNS FO	R UNDRAPED STRA	NDS (0.5" DIA.)						
8	-10.42	248	2.004						
10	-9.82	310	2.418						
12	-8.75	372	2.715						
14	-7.99	434	3.013						
16	-9.42	496	3.775						
18	-9.64	558	4.305						

(COMPRESSION IS

			POSITIVE)
NO. STRANDS	e (inches)	P(init.) = A _S f _S (KIPS)	f _B (init.) (K/sq.in.)
STANDARD S	TRAND PATTERNS F	OR DRAPED STRAN	DS (0.5" DIA.)
8	-10.42	248	2.004
10	-10.62	310	2.534
12	-10.42	372	3.006
14	-10.0	434	3.421
16	-9.42	496	3.775
18	-9.64	558	4.305

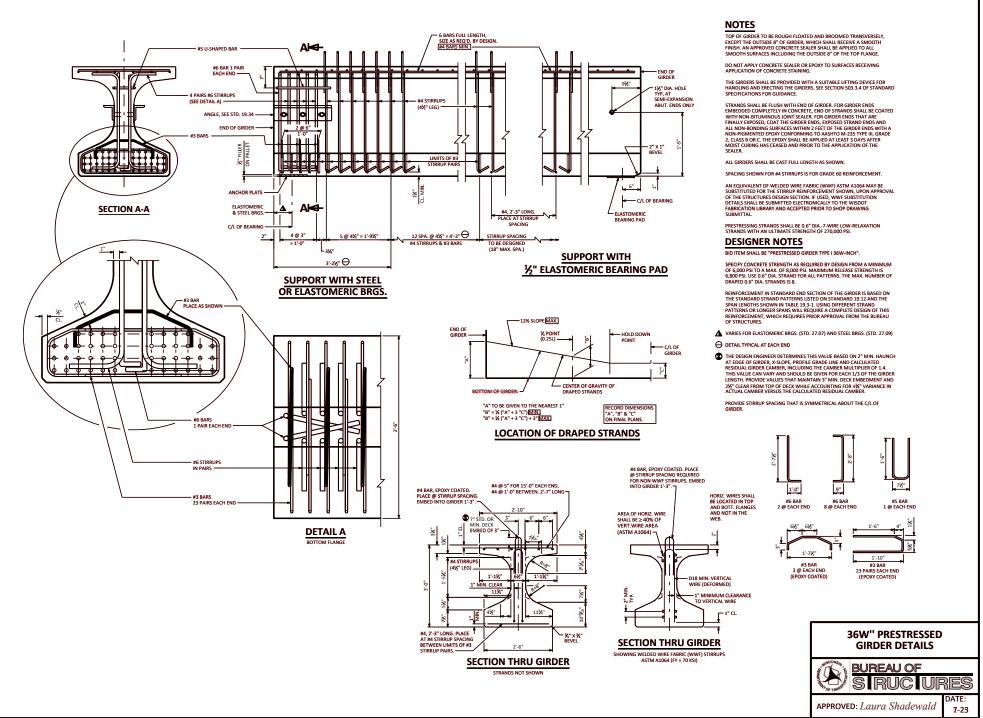
DESIGNER NOTES

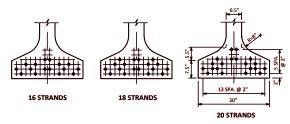
ON THE STRAND PATTERN SHEET, PLACE A BOX AROUND EACH STRAND PATTERN THAT APPLIES TO THE DESIGNED STRUCTURE AND LABEL THE SPAN IT IS USED IN.

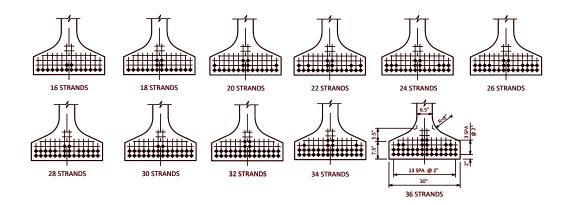
28" PRESTRESSED **GIRDER DESIGN DATA**



APPROVED: Laura Shadewald







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

36W" GIRDER

A = 632 SQ.IN. r^2 = 158.20 IN.² y_T = 19.37 IN. y_B = -16.63 IN. I = 99,980 IN.⁴ S_T = 5,162 IN.³ S_B = -6,012 IN.³ WT. = 658 */FT

PRE-TENSION

$$\begin{split} & \frac{f'_5}{f_5} = 270,000 \text{ P.S.I.} \\ & f_5 = 0.75 \text{ X } 270,000 = 202,500 \text{ P.S.I.} \\ & \text{for low relaxation strands} \\ & \text{Pi PER 0.6-}^o \text{ DIA. STRAND} = 0.217 \text{ X } 202,500 = \underline{43.94 \text{ KIPS}} \\ & \frac{y_6}{r^2} = \frac{-16.63}{158.20} = -0.10512 \text{ in/in}^2 \\ & f_6(\text{init.}) = \frac{A_5 f_5}{r^2} \left(1 + \frac{e_5 y_6}{r^2}\right) \end{split}$$

(COMPRESSION IS

			POSITIVE)	
NO. STRANDS	e _s (inches)	P(init.)=A _S f _S (KIPS)	f _B (init.) (K/sq.in.)	
STANDAF	STANDARD STRAND PATTERNS FOR UNDRAPED STRANDS			
16	-12.13	703	2.531	
18	-11.74	791	2.796	
20	-11.03	879	3.003	
STANDA	STANDARD STRAND PATTERNS FOR DRAPED STRANDS			
16	-14.38	703	2.794	
18	-13.96	791	3.088	
20	-13.83	879	3.413	
22	-13.72	967	3.737	
24	-13.63	1055	4.061	
26	-13.55	1143	4.385	
28	-13.49	1230	4.706	
30	-13.43	1318	5.030	
32	-13.13	1406	5.295	
34	-12.98	1494	5.589	
36	-12.85	1582	5.885	

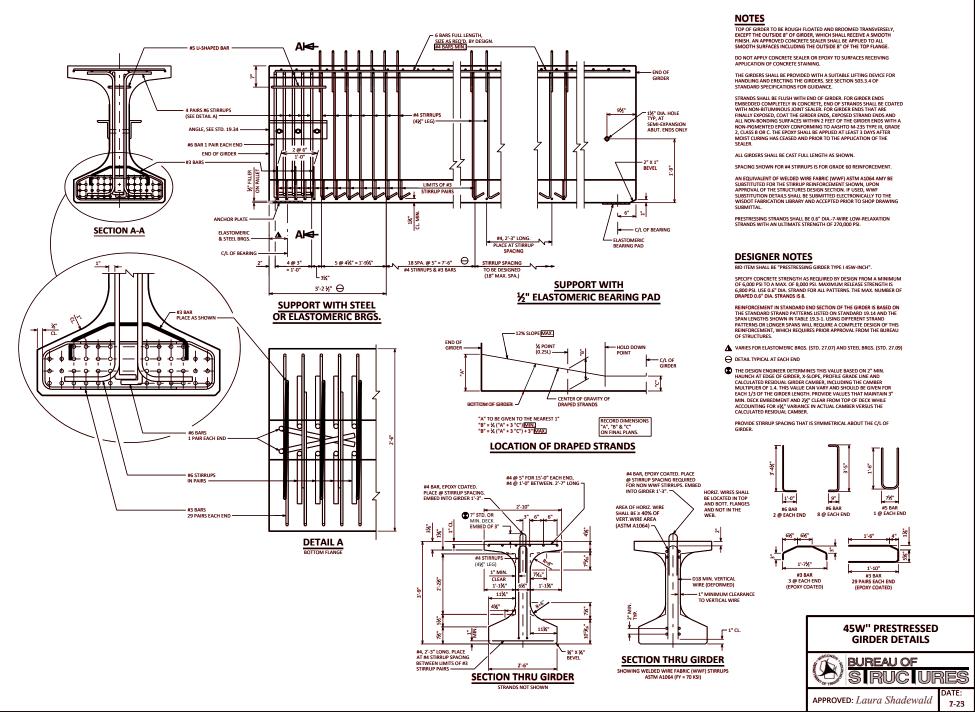
DESIGNER NOTES

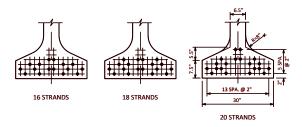
ON THE STRAND PATTERN SHEET, PLACE A BOX AROUND EACH STRAND PATTERN THAT APPLES TO THE DESIGNED STRUCTURE AND LABEL THE SPAN IT IS USED IN.

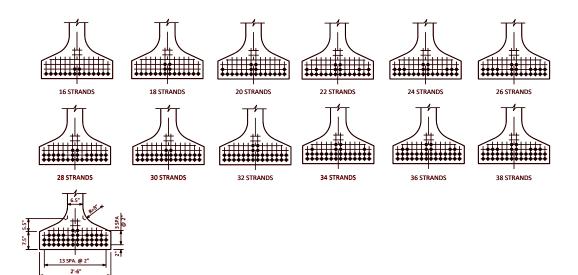
36W" PRESTRESSED GIRDER DESIGN DATA



APPROVED: Laura Shadewald







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

40 STRANDS

DESIGNER NOTES

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

45W" GIRDER

A = 692 SQ. IN

 $r^2 = 258.70 \, IN.^2$

 $y_T = 24.26 \text{ IN.}^2$

y_B = -20.74 IN.

I = 178,971 IN.⁴

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

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

WT. = 721 #/FT.

PRE-TENSION

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

Pi PER 0.6" DIA. STRAND = 0.217 X 202,500 = 43.94 KIPS

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

 f_B (init.) = $\frac{A_S f_S}{A} (1 + \frac{e_S y_B}{r^2})$

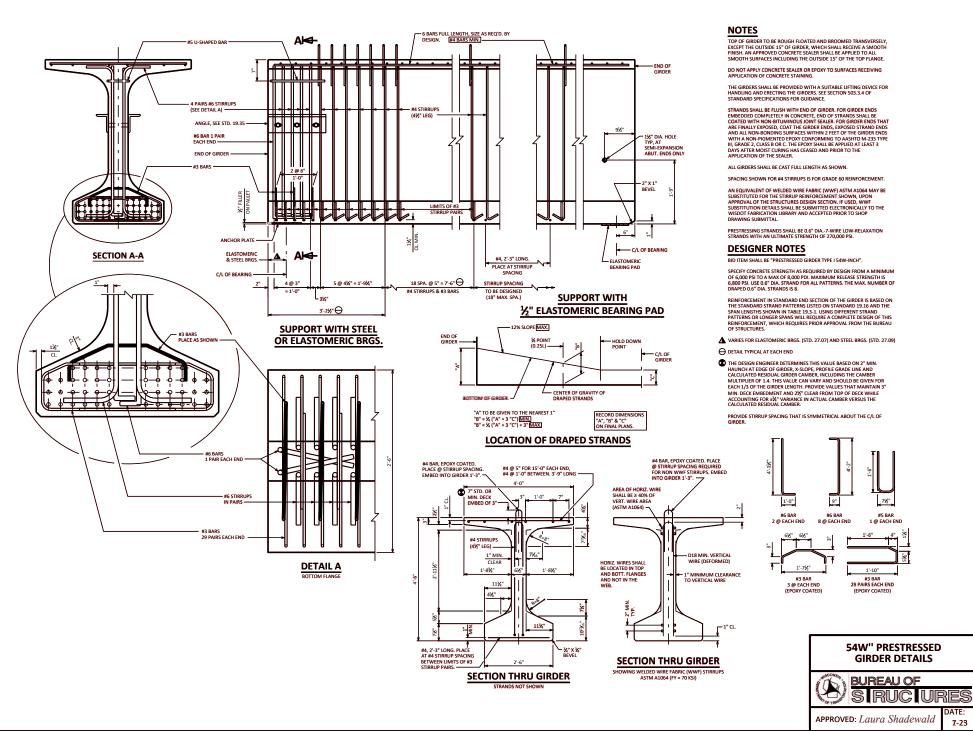
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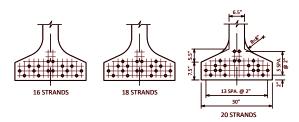
			POSITIVE)	
NO. STRANDS	e _s (inches)	P(init.)=A _S f _S (KIPS)	f _B (init.) (K/sq.in.)	
STANDAR	STANDARD STRAND PATTERNS FOR UNDRAPED STRANDS			
16	-16.24	703	2.339	
18	-15.85	791	2.596	
20	-15.14	879	2.812	
STANDA	STANDARD STRAND PATTERNS FOR DRAPED STRANDS			
16	-18.49	703	2.521	
18	-18.07	791	2.799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

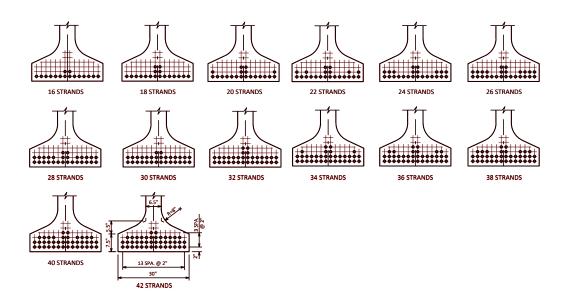
45W" PRESTRESSED GIRDER DESIGN DATA



APPROVED: Laura Shadewald







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

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.

54W" GIRDER

I = 321,049 IN.4

 $A = 798 \; \text{SQ.IN.} \qquad \qquad f'_{S} = 270,000 \; \text{P.S.I.}$

 $r^2 = 402.41 \text{ IN.}^2$ $f_s = 0.75 \text{ X } 270,000 = 202,500 \text{ P.S.I.}$

 $\mbox{$\gamma_T$ = 27.70 IN.} \label{eq:gamma_T} \mbox{for low relaxation strands}$

 y_{B} = -26.30 IN. Pi PER 0.6" DIA. STRAND = 0.217 X 202,500 = $\underline{43.94}$ KIPS

 $S_T = 11,592 \text{ IN.}^3$ $\frac{Y_B}{r^2} = \frac{-26.30}{402.41} = -0.06536 \text{ in/in}^2$

PRE-TENSION

 $S_B=-12,205~IN.^3$ $f_B(init.)=~\frac{A_5f_5}{A}~\left(1+\frac{e_5y_B}{r^2}\right)$ WT. = 831 $^8/FT$.

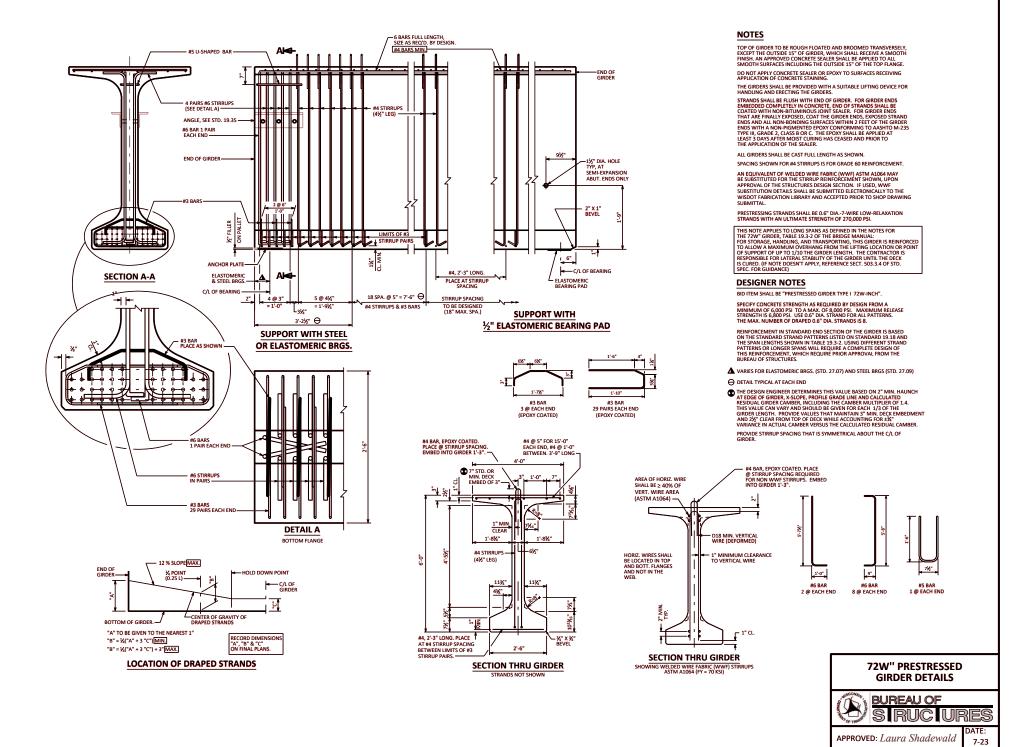
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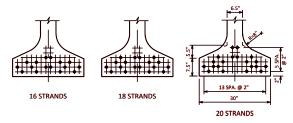
			POSITIVE)	
NO. STRANDS	e _s (inches)	P(init.)=A _S f _S (KIPS)	f _B (init.) (K/sq.in.)	
STANDAR	STANDARD STRAND PATTERNS FOR UNDRAPED STRANDS			
16	-21.80	703	2.136	
18	-21.41	791	2.378	
20	-20.70	879	2.592	
STANDARD STRAND PATTERNS FOR DRAPED STRANDS				
16	-24.05	703	2.266	
18	-23.63	791	2.522	
20	-23.50	879	2.793	
22	-23.39	967	3.065	
24	-23.30	1055	3.336	
26	-23.22	1143	3.607	
28	-23.16	1230	3.875	
30	-23.10	1318	4.146	
32	-22.80	1406	4.387	
34	-22.65	1494	4.643	
36	-22.52	1582	4.901	
38	-22.41	1670	5.159	
40	-22.30	1758	5.413	
42	-22.20	1846	5.670	

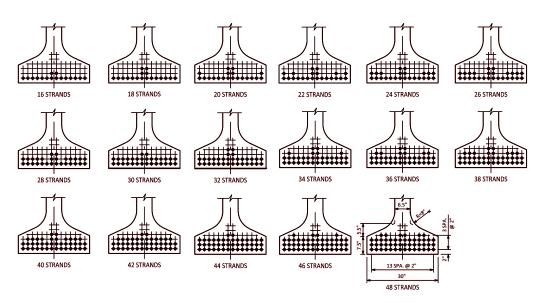
54W" PRESTRESSED GIRDER DESIGN DATA



APPROVED: Laura Shadewald







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

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.

72W" GIRDER

A = 915 SQ. IN.

 $r^2 = 717.5 \text{ IN.}^2$

y_T = 37.13 IN.

y_B = -34.87 IN.

I = 656,426 IN.4

 $S_T = 17,680 \text{ IN.}^3$

 $S_B = -18,825 \text{ IN.}^3$

WT. = 953 #/FT

PRE-TENSION

f'_s = 270,000 P.S.I.

 $f_S = 0.75 X 270,000 = 202,500 P.S.I.$ for low relaxation strands

Pi PER 0.6" DIA. STRAND = 0.217 X 202,500 = 43.94 KIPS

 $\frac{Y_B}{r^2} = \frac{-34.87}{717.50} = -0.0486 \text{ in/in}^2$

 $f_{B}(init.) = \frac{A_{S}f_{S}}{A} (1 + \frac{e_{S}y_{B}}{r^{2}})$

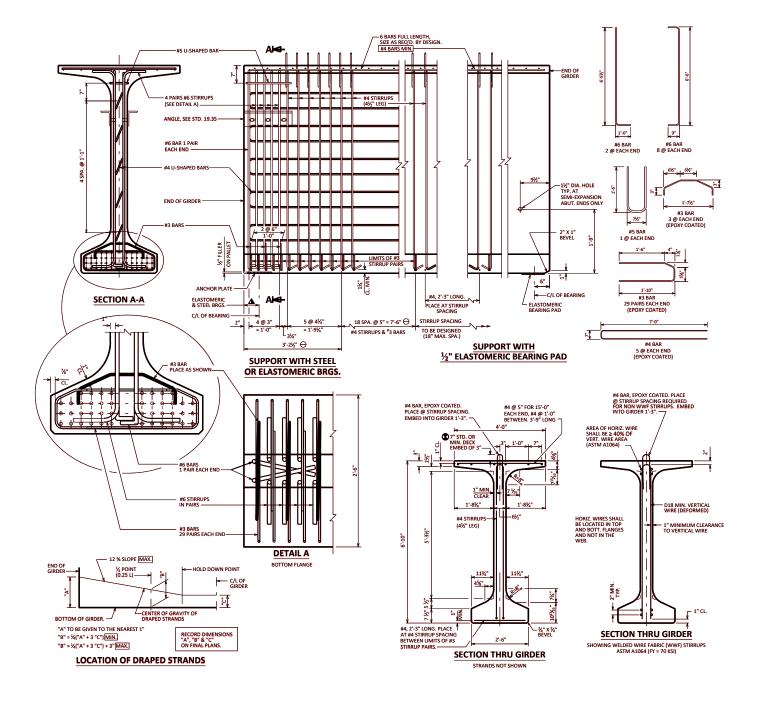
(COMPRESSION IS

			POSITIVE)	
NO. STRANDS	e _s (inches)	P(init.)=A _S f _S (KIPS)	f _B (init.) (K/sq.in.)	
STANDAR	STANDARD STRAND PATTERNS FOR UNDRAPED STRANDS			
16	-30.37	703	1.902	
18	-29.98	791	2.124	
20	-29.27	879	2.328	
STANDA	STANDARD STRAND PATTERNS FOR DRAPED STRANDS			
16	-32.62	703	1.986	
18	-32.20	791	2.217	
20	-32.07	879	2.458	
22	-31.96	967	2.698	
24	-31.87	1055	2.939	
26	-31.79	1143	3.179	
28	-31.73	1230	3.417	
30	-31.67	1318	3.657	
32	-31.37	1406	3.880	
34	-31.22	1494	4.110	
36	-31.09	1582	4.341	
38	-30.98	1670	4.574	
40	-30.87	1758	4.803	
42	-30.77	1846	5.034	
44	-30.69	1933	5.265	
46	-30.52	2021	5.484	
48	-30.37	2109	5.707	

72W" PRESTRESSED **GIRDER DESIGN DATA**



APPROVED: Laura Shadewald



NOTES

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

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

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

STRANDS SHALL BE FLUSH WITH END OF GIRDER. FOR GIRDER ENDS EMBEDDED COMPITEE'S IN GORDERTE, END OF STRANDS SHALL BE COATED WITH NON-BITUMINOUS JOINT SEALER. FOR GIRDER ENDS THAT ARE FINALLY EPOOSED, COAT THE GIRDER FRONS, EMPOSED STRAND ENDS AND ALL NON-BONDING SURFACES WITHIN Z FEET OF THE GIRDER ENDS WITH AND PROMERVING FOR POOR CONTROL OF THE GIRDER TO A STRAND STRAND

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 A JOGA MAY BE SUBSTITUTED FOR THE STRENP BERNDROKEMENT SHOWN, UPON APPROVAL OF THE STRUCTURES DESIGN SECTION. IF USED, WWF SUBSTITUTION DETAILS SHALL BE SUBMITTED LECETRONICALLY TO THE WISDOT FABRICATION LIBRARY AND ACCEPTED PRIOR TO SHOP DRAWING SUBMITTAL.

PRESTRESSING STRANDS SHALL BE 0.6" DIA.-7-WIRE LOW-RELAXATION STRANDS WITH AN ULTIMATE STRENGTH OF 270,000 PSI.

THIS NOTE APPLIES TO LONG SPANS AS DEFINED IN THE NOTES FOR THE 82W GIRDER, TABLE 19.3-2.0F THE BRIDGE MANUAL. FOR STORAGE, HANDLING, AND TRANSPORTING, IF, THIS GROCATION OF SOME AND THE STREAM OF THE STREAM OF THE STREAM OF THE STREAM OF STREAM OF THE THE STREAM OF SPONS OF STREAM OF THE STREAM OF THE GIRD WITH THE STREAM OF THE STREAM

DESIGNER NOTES

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

SPECIFY CONCRETE STRENGTH AS REQUIRED BY DESIGN FROM A MINIMUM OF 6,000 PSI. TO A MAX. OF 8,000 PSI. MAXIMUM RELEAS STRENGTH IS 6,800 PSI. US 0.6" DIA. STRAND FOR ALL PATTERNS. THE MAX. NUMBER OF DRAPED 0.6" DIA. STRANDS IS A.

REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STANDARD STRAND PATERISM SUISE ON STANDARD 13.2 OAN DE PATTERNS OR SO 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 GIBBOR CAMBER, INCLUDING THE CAMBER MULTIPLE OF 1.4. THIS VALUE CAN VARY AND SHOULD BE GIVEN FOR EACH 1/3 OF THE GIRDER LEIGHT, PROVIDE VALUES THAT MANTAIN 3" MIN. DESCRIBED AND A 27 CLEAR FRONT OP OF DECK WHILE ACCOUNTING FOR 3/2" VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

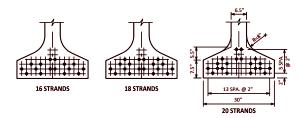
PROVIDE STIRRUP SPACING THAT IS SYMMETRICAL ABOUT THE C/L OF

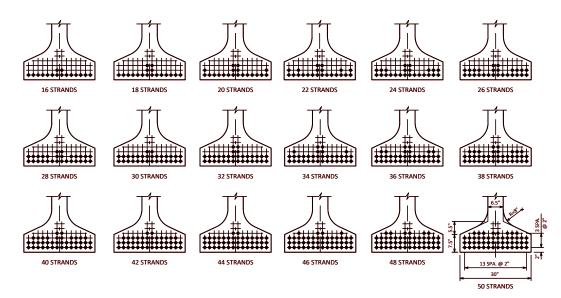
THERE IS CURRENTLY A MORATORIUM ON THE USE OF 82W" PRESTRESSED GIRDERS.

82W" PRESTRESSED GIRDER DETAILS



APPROVED: Laura Shadewald





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

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.

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

82W" GIRDER

A = 980 SQ. IN.

r² = 924.1 IN.²

y_T = 42.32 IN.

 $y_B = -39.68 \text{ IN}.$

I = 905,453 IN.⁴

 $S_T = 21,396 \text{ IN.}^3$ $S_B = -22,819 \text{ IN.}^3$

WT. = 1021 #/FT.

PRE-TENSION

f'_S = 270,000 P.S.I. f_S = 0.75 X 270,000 = 202,500 P.S.I. for low relaxation strands

Pi PER 0.6" DIA. STRAND = 0.217 X 202,500 = 43.94 KIPS

 $\frac{y_B}{r^2} = \frac{-39.68}{924.10} = -0.04294 \text{ in/in}^2$

 $f_B \text{ (init.)} = \frac{A_S f_S}{A} (1 + \frac{e_S y_B}{r^2})$

(COMPRESSION IS

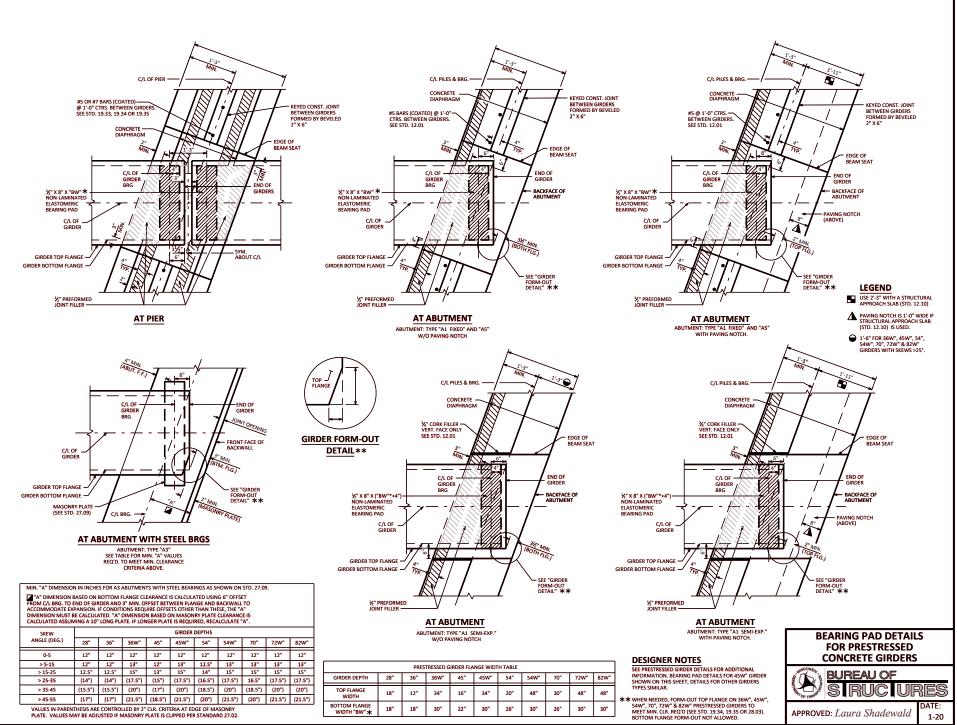
			(COMPRESSION IS POSITIVE)	
NO. STRANDS	e _s (inches)	P(init.)=A _S f _S (KIPS)	f _B (init.) (K/sq.in.)	
STANDAR	STANDARD STRAND PATTERNS FOR UNDRAPED STRANDS			
16	-35.18	703	1.801	
18	-34.79	791	2.013	
20	-34.08	879	2.209	
STANDA	STANDARD STRAND PATTERNS FOR DRAPED STRANDS			
16	-37.43	703	1.870	
18	-37.01	791	2.090	
20	-36.88	879	2.318	
22	-36.77	967	2.545	
24	-36.68	1055	2.772	
26	-36.60	1143	3.000	
28	-36.54	1230	3.224	
30	-36.48	1318	3.451	
32	-36.18	1406	3.664	
34	-36.03	1494	3.883	
36	-35.90	1582	4.104	
38	-35.79	1670	4.323	
40	-35.68	1758	4.542	
42	-35.58	1846	4.762	
44	-35.50	1933	4.978	
46	-35.33	2021	5.191	
48	-35.18	2109	5.404	
50	-35.04	2197	5.616	

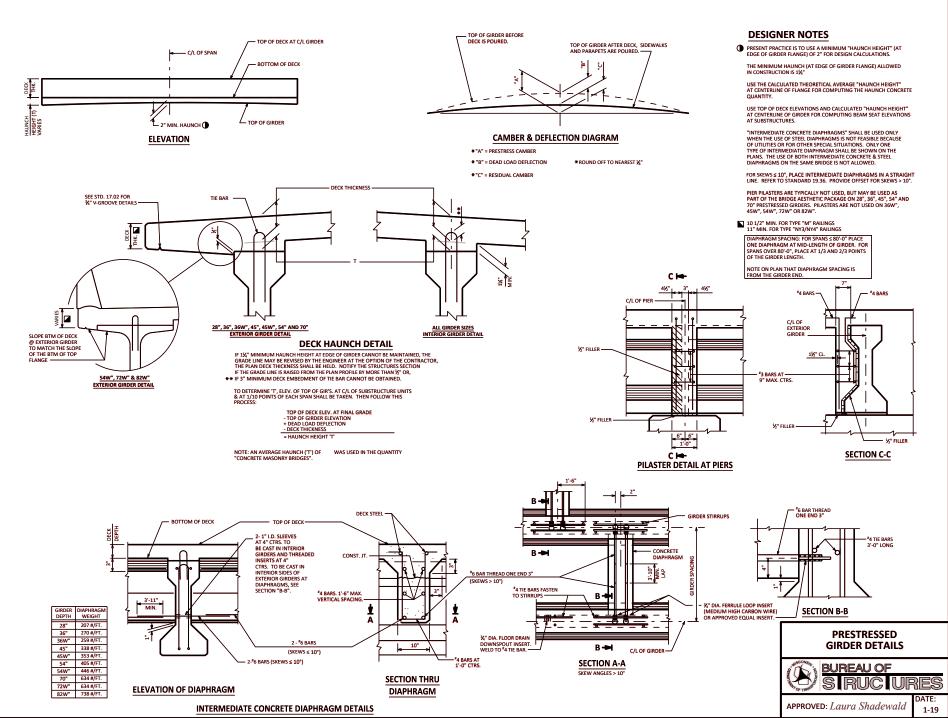
82W" PRESTRESSED GIRDER DESIGN DATA

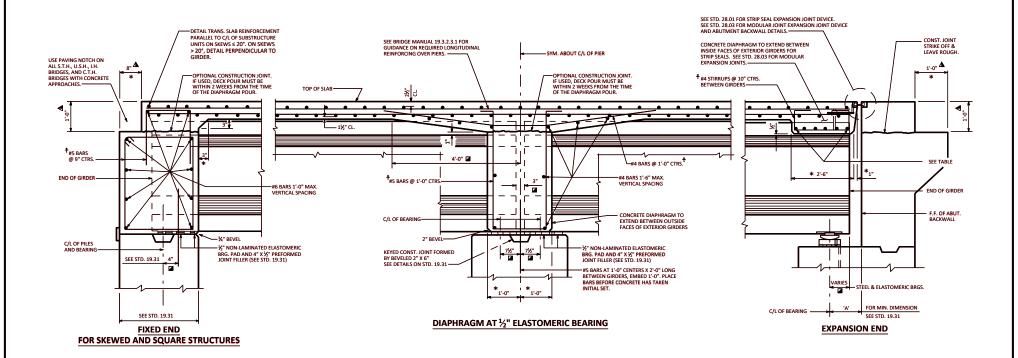


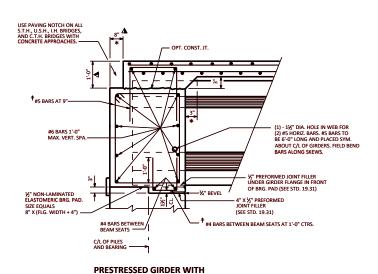
7-17

APPROVED: Laura Shadewald





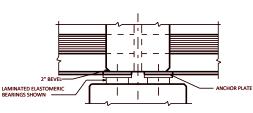




SEMI-EXPANSION SEAT

EXPANSION END DIAPHRAGM STEEL

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



DIAPHRAGM AT STEEL OR ELASTOMERIC BEARINGS SECTION THRU DIAPHRAGM AT PIER

FOR STEEL BEARINGS, FORM DIAPHRAGM APPROXIMATELY 3/4" ABOVE BEARING KEEPER BARS

DESIGNER NOTES

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

LEGEND

- DIMENSION IS TAKEN PARALLEL TO C/L GIRDER.
- * DIMENSION IS TAKEN NORMAL TO C/L SUBSTRUCTURE UNITS.
- A PAVING NOTCH IS 1"-0" WIDE BY 1"-4" DEEP IF STRUCTUAL APPROACH SLAB (STD. 1.2.10) IS USED. SHOW NO. 9 STAINLESS STELE BAR (STD. 12.12) FOR STRUCTURAL APPROACH SLAB ON THE SECTION THRU ABUT. OR ABUT. DIAPH.
- BARS PLACED PARALLEL TO GIRDERS.
 SPACING PERPENDICULAR TO C/L GIRDERS.

SEE STANDARD 19.34 FOR 36W" & 45W" PRESTESSED GIRDERS SLAB AND SUPERSTRUCTURE DETAILS

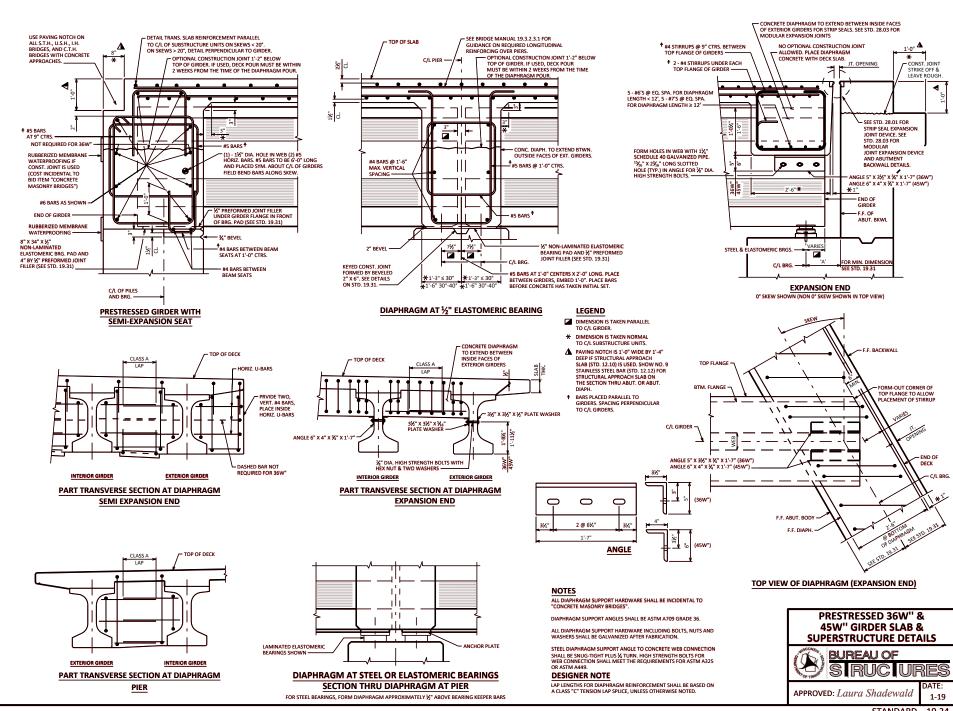
SEE STANDARD 19.35 FOR 54W", 72W" & 82W" PRESTRESSED

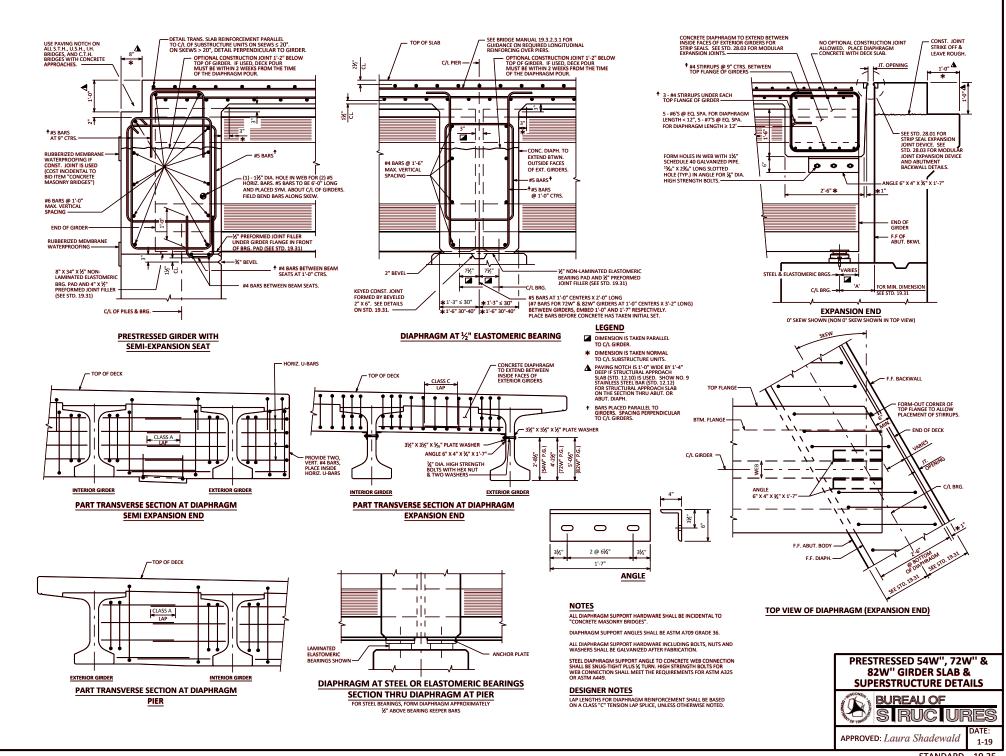
GIRDERS SLAB & SUPERSTRUCTURE DETAILS.

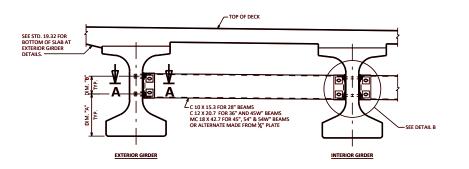
28" & 36" PRESTRESSED **GIRDERS SLAB & SUPERSTRUCTURE DETAILS**



APPROVED: Laura Shadewald

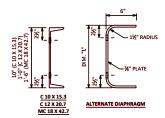






PART TRANSVERSE SECTION AT DIAPHRAGM

TABLE GIRDER HEIGHT DIM. 1'-0%" 57/8" 21/4" 31/4" 36" 1'-21/8" 9%" 1'-1½" 21/4" 1'-5%" 1'-11/8" 1'-5'4" 1'-9%' 87/8" 1'-01/2" 2¾" 54" 1'-7%" 1'-5%" 1'-9½" 41/4" 54W" 1'-91/8" 1'-5%" 1'-9½" 4¼"



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

EACH DIAPHRAGM BETWEEN GIRDERS SHALL CONSTITUTE ONE UNIT.

ALL DIAPHRAGM STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 36.

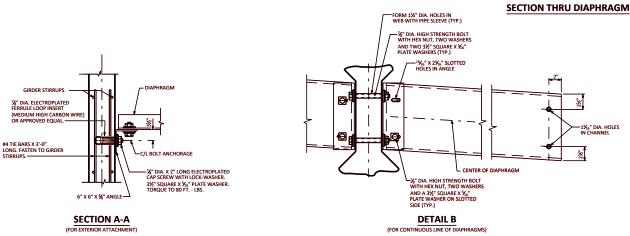
ALL DIAPHRAGM MATERIAL INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AFTER FABRICATION.

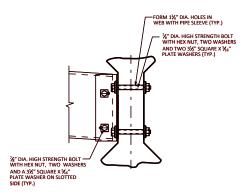
STEEL DIAPHRAGM TO CONCRETE WEB CONNECTION SHALL BE SNUG-TIGHT PLUS ¼ TURN, UNLESS NOTED OTHERWISE. HIGH STRENGTH BOLTS FOR WEB CONNECTION SHALL MEET THE REQUIREMENTS FOR ASTM A325 OR

DESIGNER NOTES

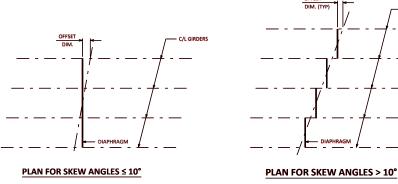
FOR SPANS EQUAL TO OR LESS THAN 80'-0", PLACE ONE DIAPHRAGM AT MID-LENGTH OF GIRDER. FOR SPANS OVER 80'-0", PLACE AT 1/3 AND 2/3 POINTS.

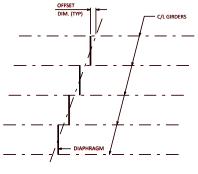
ON THE PLANS, SHOW LOCATION OF INSERTS/HOLES FOR DIAPHRAGM TO WEB CONNECTION, NOT ONLY FROM THE BOTTOM OF THE GIRDER (DIM "A" AND "B"), BUT ALSO FROM THE ENDS OF EACH GIRDER.

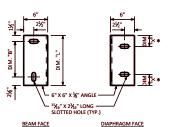




SECTION AT INTERIOR GIRDERS THRU DIAPHRAGM FOR SKEW ANGLES > 10°





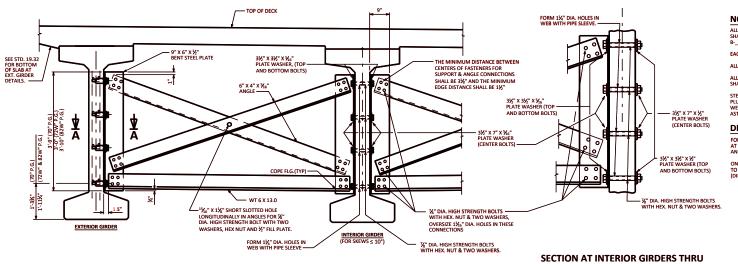


BEAM FACE **DIAPHRAGM SUPPORT** *2½" FOR ALTERNATE PLATE DIAPHRAGM

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



APPROVED: Laura Shadewald



PART TRANSVERSE SECTION AT DIAPHRAGM

NOTES

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

EACH DIAPHRAGM BETWEEN GIRDERS SHALL CONSTITUTE ONE UNIT.

ALL DIAPHRAGM STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 36.

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

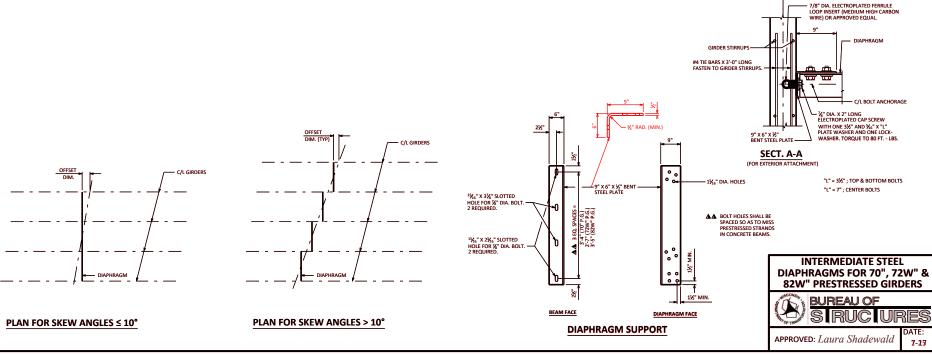
STEEL DIAPHRAGM TO CONCRETE WEB CONNECTION SHALL BE SNUG-TIGHT PLUS ¼ TURN, UNLESS NOTED OTHERWISE. HIGH STRENGTH BOLTS FOR WEB CONNECTION SHALL MEET THE REQUIREMENTS FOR ASTM A325 OR ASTM A425.

DESIGNER NOTES

DIAPHRAGM FOR SKEW ANGLES > 10°

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

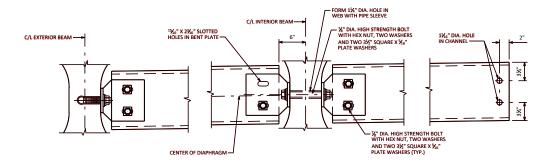
ON THE PLANS, SHOW LOCATION OF INSERTS/HOLES FOR DIAPHRAGM TO WEB CONNECTION, NOT ONLY FROM THE BOTTOM OF THE GIRDER (DIM "A" AND "B"), BUT ALSO FROM THE ENDS OF EACH GIRDER.



TOP OF DECK A C 12X20.7 DIAPHRAGM SEE DETAIL C 36W" PRESTRESSED GIRDER SEE DETAIL B

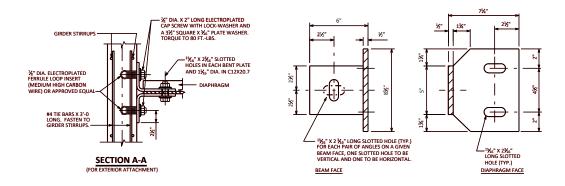
PART TRANSVERSE SECTION AT DIAPHRAGM

EXTERIOR GIRDER



INTERIOR GIRDER

DETAIL C DETAIL B



NOTES

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

EACH DIAPHRAGM BETWEEN GIRDERS SHALL CONSTITUTE ONE UNIT.

ALL DIAPHRAGM STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 36.

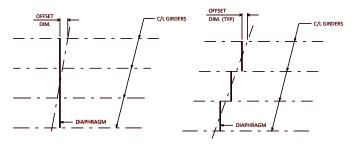
ALL DIAPHRAGM MATERIAL INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AFTER FABRICATION.

STEEL DIAPHRAGM TO CONCRETE WEB CONNECTION SHALL BE SNUG-TIGHT PLUS ½ TURN, UNLESS NOTED OTHERWISE. HIGH STRENGTH BOLTS FOR WEB CONNECTION SHALL MEET THE REQUIREMENTS FOR ASTM A325 OR

DESIGNER NOTES

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

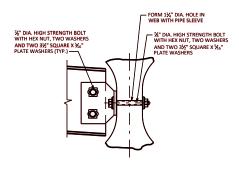
ON THE PLANS, SHOW LOCATION OF INSERTS/HOLES FOR DIAPHRAGM TO WEB CONNECTION, NOT ONLY FROM THE BOTTOM OF THE GIRDER (DIM "A" AND "B"), BUT ALSO FROM THE ENDS OF EACH GIRDER.



PLAN FOR SKEW ANGLES ≤ 10°

ATTACHMENT TO CHANNEL

PLAN FOR SKEW ANGLES > 10°



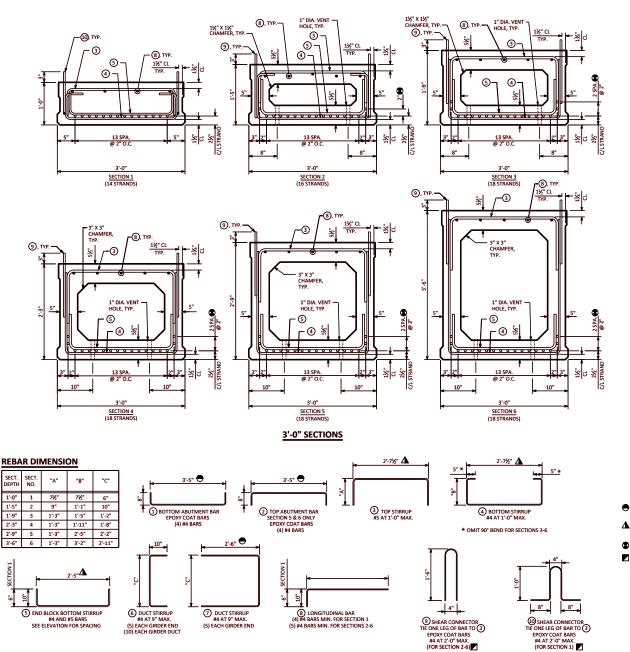
SECTION AT INTERIOR GIRDERS THRU DIAPHRAGM FOR SKEW ANGLES > 10°

INTERM. STEEL DIAPHS. FOR 36W" PRESTRESSED GIRDERS



APPROVED: Laura Shadewald

d 7-19



DEPTH 1'-0"

2'-3"

NOTES

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

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

STRANDS SHALL BE FLUSH WITH END OF GIRDER. FOR CONCRETE ABUTMENTS, END OF STRANDS SHALL BE COATED WITH MON-BITUMINOUS JOINT SEALER. FOR GRS ABUTMENTS, COAT THE GIRDER ENDS, EXPOSED STRAND ENDS, AND ALL NON-BONDING SURFACES WITHIN 2 FEET OF THE GIRDER BUDS WITH A WORLD FOR STRANDER OF THE STRANDER SHOWN STRANDER OF THE STRANDER SHOWN STRANDER OF THE STRANDER OF THE STRANDER OF THE STRANDER OF THE MOST CURING HAS GOOD. THE STRANDER OF THE MOST CURING HAS CLASED AND PRIOR TO THE APPLICATION OF THE SEALER.

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

FOUR WAY SLING MUST BE USED TO ENGAGE ALL 4 LIFTING DEVICES ON BOTH

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

SEAL WASHER SHALL BE SPONGE NEOPRENE GASKET $3\frac{1}{4}$ " MIN. THICK. STRESS POCKETS SHALL BE FILLED WITH CHLORIDE FREE NON-SHRINK GROUT AFTER POST-TENSIONING.

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

DESIGNER NOTES

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

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

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

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

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

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

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

SEE STANDARD 19.51 FOR SHEAR KEY RECESS DETAIL

MATERIAL PROPERTIES

f'c = 4,000 PSI fy = 60,000 PSI PRESTRESSED BOX GIRDERS, CONCRETE MASONRY f'c = 5.000 PSI STRANDS - 0.5" OR 0.6" DIA. ULTIMATE TENSILE STRENGTH fv = 270,000 PSI

PRE-TENSION

f. = 270,000 P.S.I

f_S = 0.75 X 270,000 = 202,500 P.S.I for low relaxation strands

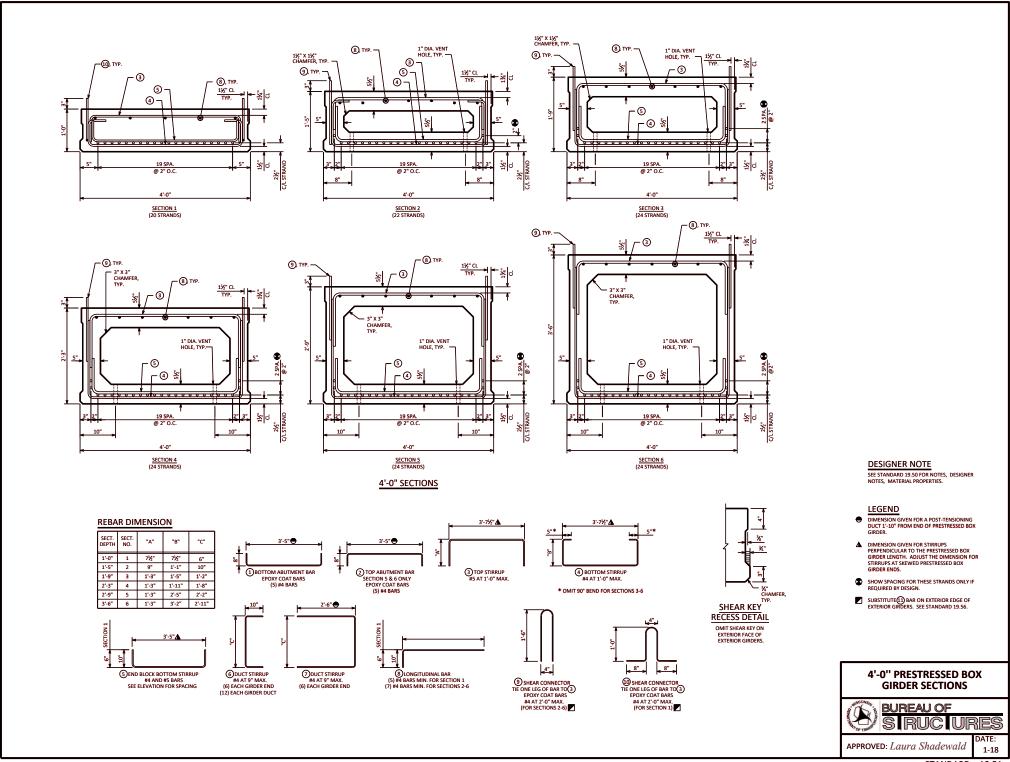
Pi PER 0.5" DIA. STRAND = 0.1531 X 202,500 = 31.00 KIPS

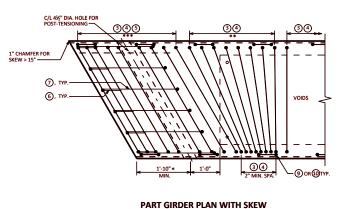
Pi PER 0.6" DIA. STRAND = 0.217 X 202,500 = 43.94 KIPS

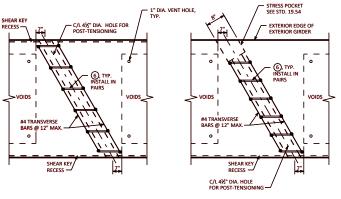
- DIMENSION GIVEN FOR A POST-TENSIONING DUCT 1'-10" FROM END OF PRESTRESSED BOX GIRDER.
- ▲ DIMENSION GIVEN FOR STIRRUPS PERPENDICULAR TO THE PRESTRESSED BOX GIRDER LENGTH. ADJUST THE DIMENSION FOR STIRRUPS AT SKEWED PRESTRESSED BOX GIRDER ENDS.
- SHOW SPACING FOR THESE STRANDS ONLY IF REQUIRED BY DESIGN.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

3'-0" PRESTRESSED BOX **GIRDER SECTIONS**









LEGEND

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

DESIGNER NOTES

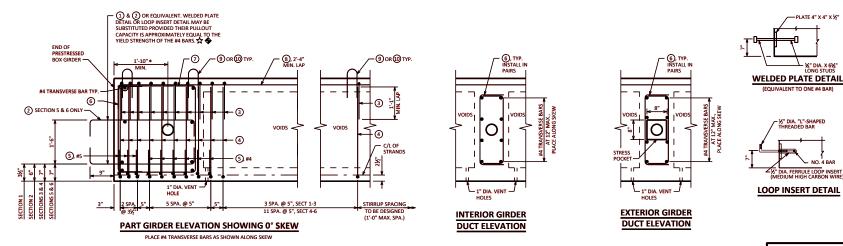
FOR BAR BEND DETAILS, SEE STANDARD 19.50 AND STANDARD 19.51

FOR SKEWED STRUCTURES CAST END OF PRESTRESSED BOX GIRDER ALONG SKEW.

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

INTERIOR GIRDER DUCT PLAN

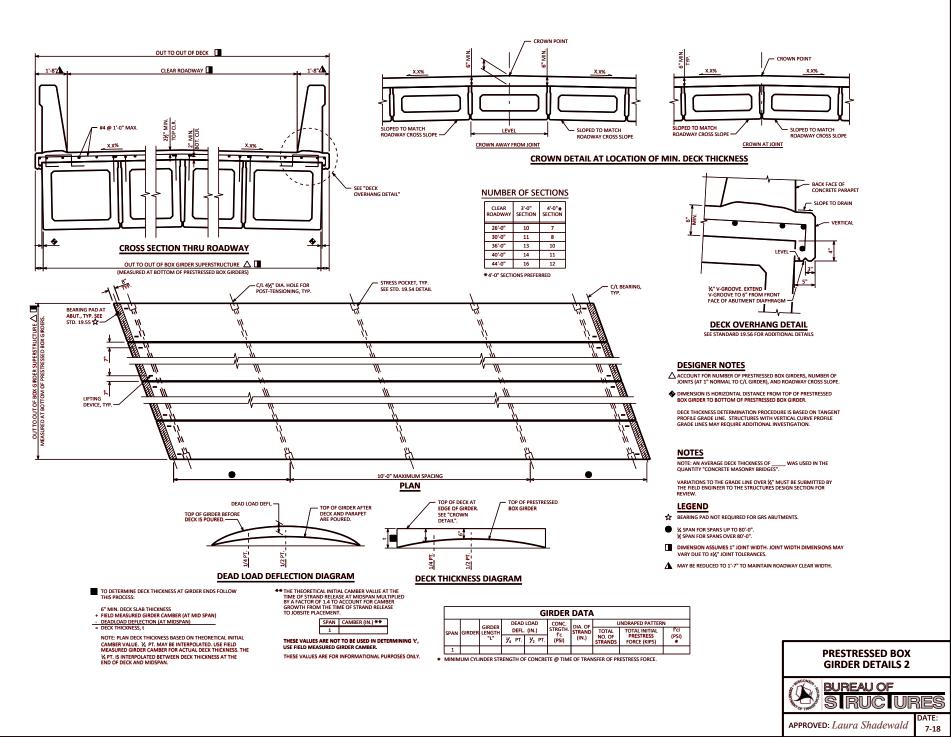
EXTERIOR GIRDER DUCT PLAN

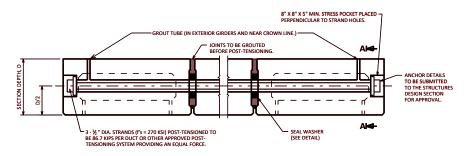


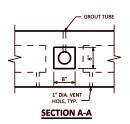
PRESTRESSED BOX GIRDER DETAILS 1

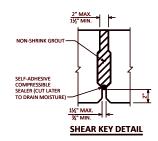


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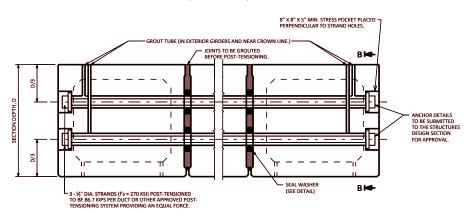


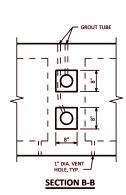




POST-TENSIONING DETAILS - ONE DUCT PER DIAPHRAGM

(SECTIONS 1 THROUGH 4

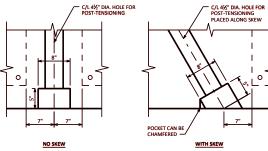




POST-TENSIONING DETAILS - TWO DUCTS PER DIAPHRAGM

(SECTIONS 5 AND 6)



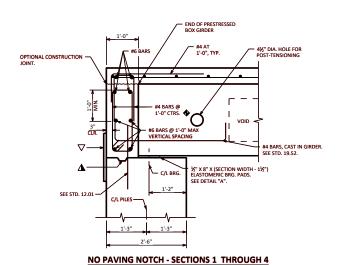


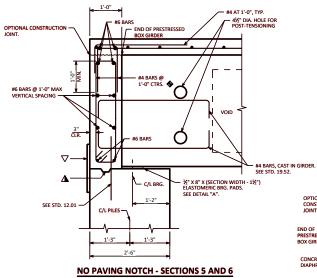
STRESS POCKET DETAIL

PRESTRESSED BOX GIRDER DETAILS 3



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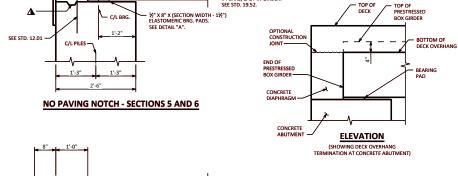


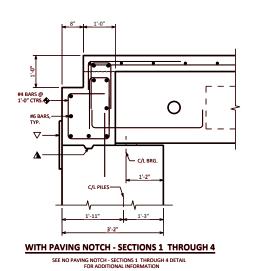


T'-6" RUBBERIZED MEMBRANE WATERPROOFING

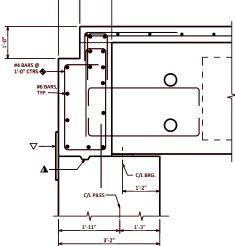
KEYED CONSTRUCTION JOINT FORMED BY BEVELED 2" X 6".

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



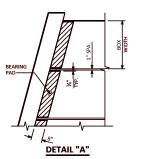






WITH PAVING NOTCH - SECTIONS 5 AND 6

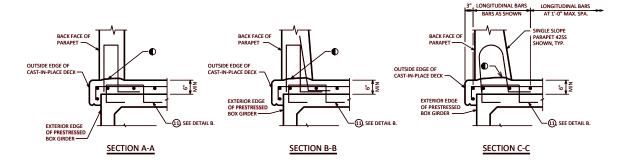
SEE NO PAVING NOTCH - SECTIONS 5 AND 6 DETAIL FOR ADDITIONAL INFORMATION

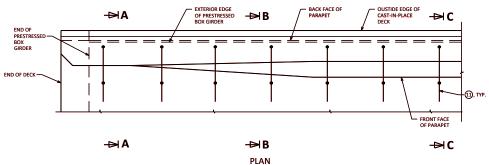


PRESTRESSED BOX GIRDER DETAILS 4

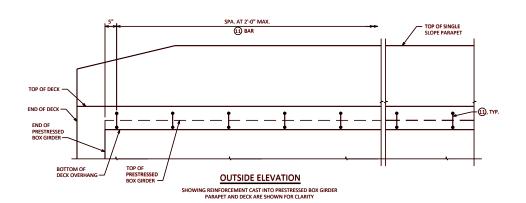


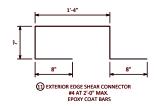
APPROVED: Laura Shadewald

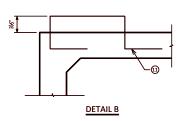




SHOWING REINFORCEMENT CAST INTO PRESTRESSED BOX GIRDER PARAPET AND DECK ARE SHOWN FOR CLARITY







LEGEND

ONST. JOINT - STRIKE OFF AS SHOWN.

NOTE

BAR 11 TO BE PAID AS PART OF BID ITEM
"PRESTRESSED BOX GIRDER TYPE XX-INCH".

DESIGNER NOTES

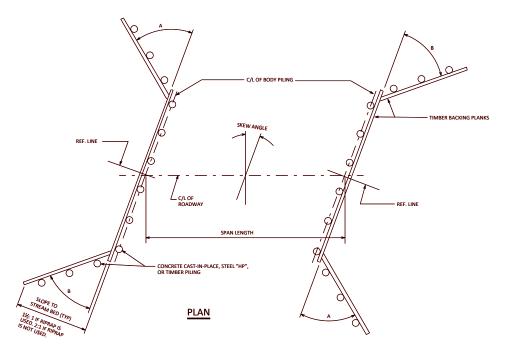
SEE CHAPTER 30 STANDARDS FOR SINGLE SLOPE PARAPET

DETAILS SHOWN ARE APPLICABLE FOR CONCRETE ABUTMENTS. DETAILS TO BE MODIFIED FOR GRS ABUTMENTS.





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OUTSIDE EDGE OF SUPERSTRUCTURE CONCRETE OR TIMBER.

WORKING POINT

BODY PLANKS

WING CLEAT

6" MIN.

2'-6" MAX.

CORNER DETAIL

CLEAT - CUT TO FIT. -

%" DIA. BOLT & WASHER. BOLT TO EVERY OTHER BODY PLANK. (HARDWARE)

"H" HEIGHT FROM STREAM BED OR BERM TO GRADE WING ANGLE "A" WING ANGLE "B" 0° TO 15° INCL. 45° * H > 10'-0" 50° 50° 0° TO 15° INCL. 15° TO 20° INCL. 55° 30° H < 10'-0" 50° 15° TO 20° INCL * H > 10'-0" 50° OVER 20° H ≤ 10'-0" 65° 25° OVER 20° ● H > 10'-0" 65° 25°

* USE TIE RODS ON WING PILING

 USE TIE RODS WITH A DEADMAN ON WING PILING.

SECTION	MOMENT CAPACITY (INCH - KIPS/FT.)
10 GAGE (6' X 2') GRADE A * ARMCO	22.9 (f _b = 18 K.S.I.)
7 GAGE (6' X 2') GRADE A * ARMCO	30.0 (f _b = 18 K.S.I.)

^{*}ASTM A446

ALL TIMBER O MALLEABLE IR

ALL TIMBER CONNECTORS AND HARDWARE EXCEPT THOSE OF MALLEABLE IRON SHALL BE GALVANIZED.

TREAT ALL LUMBER AND TIMBER WITH ONE OF THE PRESERVATIVES RECOMMENDED IN THE STANDARD SPECIFICATIONS.

TIE RODS SHALL BE COATED WITH THE COAL TAR OR BITUMASTIC COMPOUND USED FOR COVERING WING PILE ENDS.

REFER TO AASHTO LRFD SPECIFICATIONS FOR LUMBER AND TIMBER DESIGN REQUIREMENTS.

THE BODY BACKING PLANKS SHALL BE CONTINUOUS OVER 4 PILES (3 PANELS). PLANK SPLICES, IF REQUIRED SHALL BE AT THE CENTERLINE OF PILING AND ADJACENT SPLICES SHALL BE STAGGERED.

ALL TIE RODS, TURNBUCKLES, NUTS AND WASHERS SHALL BE PAID FOR AS "STRUCTURAL STEEL CARBON".

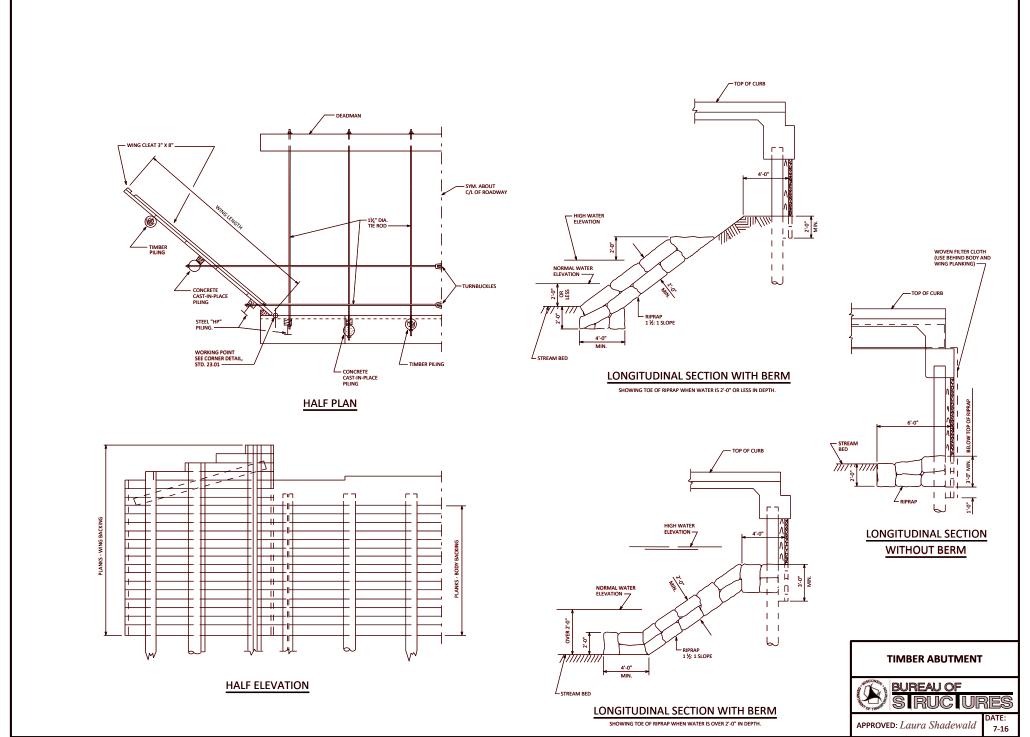
TIMBER CONNECTORS AND HARDWARE SHALL BE INCLUDED IN THE COST FOR "TREATED LUMBER AND TIMBER".

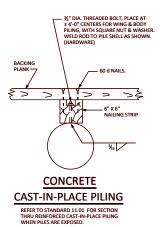
ALTERNATE DETAILS MAY BE SUBMITTED USING EITHER GALVANIZED STEEL BRIDGE PLANK OR PRECAST CONCRETE PLANK IN LIEU OF TIMBER BACKED ABUTMENT PLANKING, SUBJECT TO APPROVAL BY THE ENGINEER.

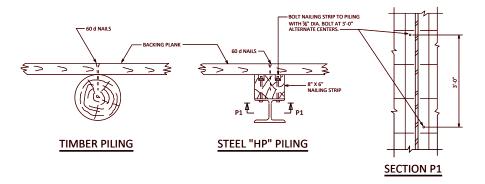
TIMBER ABUTMENTS GENERAL

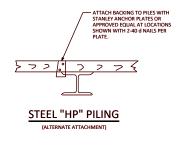


APPROVED: Laura Shadewald

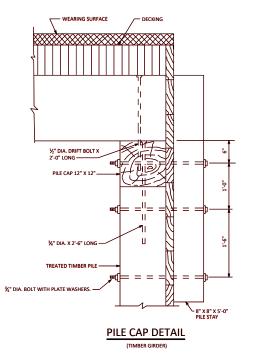


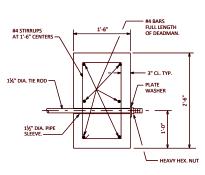






BODY & WING PLANK CONNECTION DETAILS



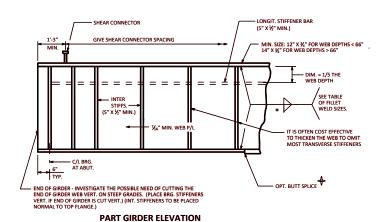


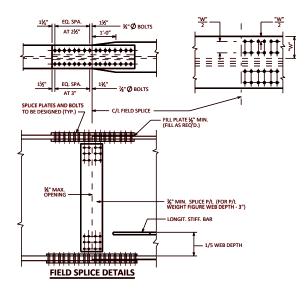
SECTION THRU DEADMAN



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d 7-16





NOTES

OPTIONAL WELDED SHOP SPLICES MAY BE USED FOR ALL FLANGE AND WEB PLATES OVER 60'-0" LONG. IF USED, THE LOCATION OF THE SPLICE SHALL BE SHOWN ON SHOP DRAWINGS AND WILL BE SUBJECT TO THE APPROVAL OF THE STRUCTURES

OPTIONAL FLANGE BUTT SPLICE. A FLANGE PLATE OF THE LARGER SIZE MAY BE FURNISHED FULL LENGTH, BUT PAY WEIGHT SHALL BE BASED ON SECTIONS AS DETAILED. IF A PERMANENT HOLD DOWN DEVICE IS USED AT THE ABUTMENT, THEN THE BUTT SPLICE SHALL NOT BE OPTIONAL

PRIOR TO STEEL BLAST, ALL FLAME CLIT EDGES OF PLATE THAT ARE TO BE PAINTED. SHALL BE GROUND OR PLANET OF THE HAD SHEET FAIR THE TO BE PAINTED SHALL BE GROUND OR PLANET TO REMOVE THE HADDENED SURFACE CAUSE BY THE FLAME, AND CORNERS CHAMFERED 1/16" MINIMUM.

- TOP FLANGE TENSION ZONE. FIELD WELDING PROHIBITED IN TOP FLANGE TENSION ZONE AREAS, EXCEPT SHEAR CONNECTORS.
- BOTTOM FLANGE TENSION ZONE. FIELD WELDING PROHIBITED IN BOTTOM FLANGE TENSION ZONE AREAS.

DESIGNER NOTES

BASE REAM SEAT ELEVATIONS AT ABUTMENT ON THICKER ELANGE AND DETAIL SHIM PLATES TO ACCOMMODATED THINNER FLANGE

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

AT INTERIOR GIRDERS PLACE INTERMEDIATE TRANSVERSE STIFFENERS ON ONE SIDE OF GIRDER AND LONGITUDINAL STIFFENERS ON THE OPPOSITE SIDE OF GIRDER. KEEP INTERMEDIATE STIFFENERS ON ONE SIDE WHEN LONGITUDINAL STIFFENERS ARE NOT REQUIRED.

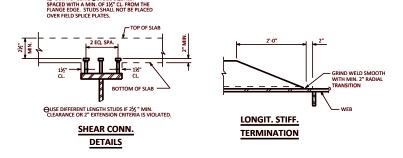
AVOID USE OF LONGITUDINAL STIFFENERS IF PRACTICAL BY THICKENING WEB. WHERE LONGITUDINAL STIFFENERS ARE USED, RUN THEM CONTINUOUS WITHOUT BREAKS AT CONNECTION STIFFENERS

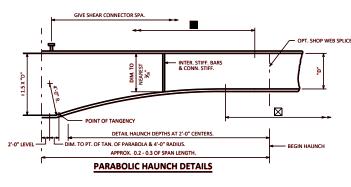
AT EXTERIOR GIRDER PLACE INTERMEDIATE STIFFENERS ALONG ENTIRE LENGTH OF GIRDER AT A MAX. SPACING EQUAL TO 1.5 X THE DEPTH OF WEB. SPACE EQUALLY BETWEEN DIAPHRAGM CONNECTION STIFFENER. THIS WEB. SPACE EQUALIT BETWEEN DIAPHRAGIAN CONNECTIONS TIFFENER. THE REQUIREMENT IS NECESSARY TO SUPPORT THE FALSEWORK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

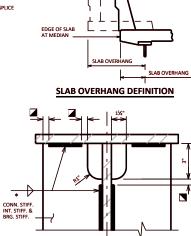
- ...WEB THICKNESS > ½" AND WEB DEPTH < 48" ...WEB THICKNESS > ½" AND WEB DEPTH < 60" ...WEB THICKNESS > ¾" AND WEB DEPTH < 66"

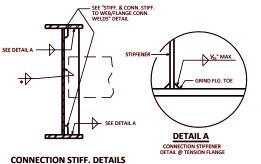
SEE STANDARD 40.07 FOR CONNECTING ANY NEW STIFFENERS TO EXISTING GIRDERS.

SHOW THE TENSION ZONES ON THE PLANS.

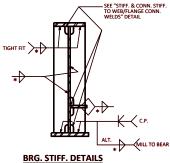




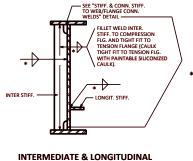




NOTE: USE THREE FIELD WELDED %" DIA. X 5" LONG ⊖STUDS EQUALLY



TYP. AT ABUT. & PIER



STIFF. DETAILS

(ALL GIRDERS)

OF THICKER PART IOINED. O ½" INCLUSIVE ¾6" ₩. OVER 1/2" TO 3/4" OVER ¾" TO 1½" Δ 1/16" OVER 1½"

TABLE OF FILLET WELD SIZES

***FYCEPT THAT THE WELD SIZE SHALL** NOT EXCEED THE THICKNESS OF THE THINNER PART JOINED.

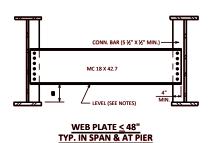
△ MIN. PASS SIZE IS ¾6"

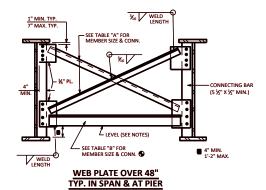


¼" MIN., ¼" MAX. TYP.

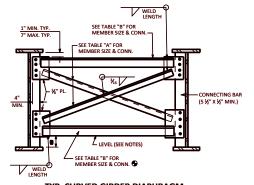


1-24 STANDARD 24.02





SEE TABLE "A" FOR MEMBER SIZE & CONN. SIFFENER LONGITUDINAL STIFFENER LONGITUDINAL STIFFENER SLOT PLATE TO CLEAR LONGITUDINAL STIFFENER (S ½" X ½" MIN.) SEE TABLE "B" FOR MEMBER SIZE & CONN. WELD LEVEL (SEE NOTES) SEE TABLE "B" FOR MEMBER SIZE & CONN.



WEB PLATE OVER 48" WITH LONGITUDINAL STIFFENERS TYP. IN SPAN & AT PIER

TYP. CURVED GIRDER DIAPHRAGM ALSO USE TOP HORIZONTAL MEMBER AT DIAPHRAGMS ADJACENT TO KINK POINTS OF KINKED GIRDERS

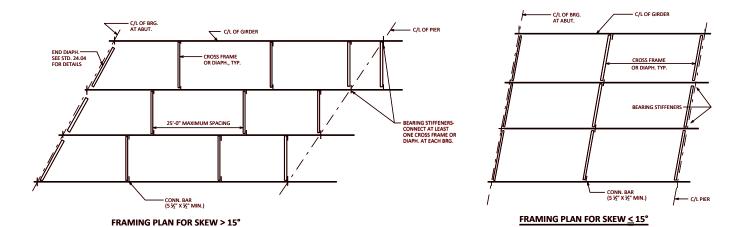


TABLE "A"

SIZE	MAX. LENGTH OF MEMBER	WELD LENGTH	NO. OF ¾" Ø BOLTS	WEIGHT PER FT.
T3½X3½X½ ⁶	21'-6"	9"	4	7.2#
L4X4X%6	25'-0"	11"	4	8.2#
L5 X 5 X 1⁄26	31'-0"	14"	5	10.3#

TABLE "B"

SIZE	MAX. LENGTH OF MEMBER	WELD SIZE	WELD LENGTH	NO. OF ¾" Ø BOLTS	WEIGHT PER FT.
L5 X 5 X ¾6	11'-6"	⅓"	11"	4	10.3#
L6X6X¾	13'-6"	¾ ₆ "	13"	6	14.9#
½" T SECTION SEE DETAIL "A"	17'-6"	5∕16"	14"	7	16.6#
½" T SECTION SEE DETAIL "B"	22'-0"	%"	13"	7	18.5#



NOTES

ALL BOLTED CONNECTIONS SHALL BE FRICTION TYPE USING $\mbox{\ensuremath{\chi^{\!\!\!\!/}}}$ Ø HIGH STRENGTH ASTM A325 BOLTS WITH DOUBLE WASHERS.

DIAPHRAGMS OR LOWER CROSS FRAME MEMBERS ARE SLOPED WHEN DIFFERENCE IN ADJACENT BOTTOM FLANGE ELEVATIONS EXCEEDS 6". HOLD 8" FROM TOP OF ADJACENT FLANGES TO BOTTOM OF DIAPHRAGMS OR LOWER CROSS FRAME WHEN THESE MEMBERS ARE SLOPED.

DIAPHRAGMS OR LOWER CROSS FRAME MEMBERS THAT ARE LEVEL SHALL BE PLACED 4" ABOVE THE TOP OF THE HIGHER BOTTOM FLANGE OF ADJACENT GIRDERS.

DESIGNER NOTES

SEE STD. 24.02 FOR CONNECTION BAR CORNER COPE & WELD DETAILS.

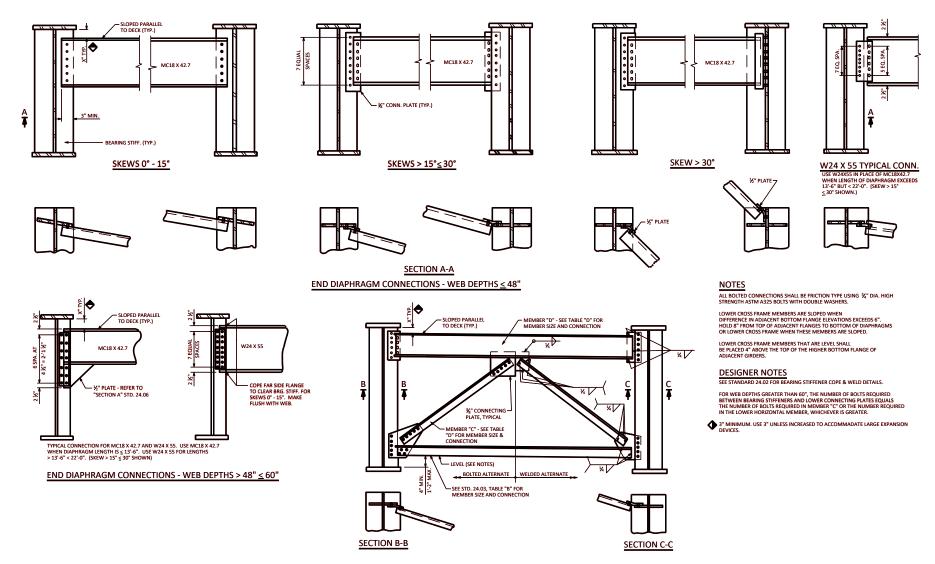
FOR SPANS OVER 200°, THE CROSS FRAMES AT THE PIERS SHALL BE DESIGNED TO RESIST THE LATERAL LOADS THAT ARE TRANSFERRED TO THE PIERS.

♠ HORIZONTAL CROSSFRAME MEMBER TO HAVE HORIZONTAL LEG TOP (AS SHOWN) WHEN NO LOWER LATERALS ARE USED. WHEN LOWER LATERALS ARE USED THE HORIZONTAL LEG SHALL BE ON THE BOTTOM, THIS IS TO ALLOW FRAMING INTO THE LOWER LATERAL GUSSET. CURRENT PRACTICE IS TO AVOID THE USE OF LOWER LATERALS, HOWEVER.

PLATE GIRDER DIAPHRAGMS AND CROSS FRAMES



APPROVED: Laura Shadewald



END DIAPHRAGM CONNECTIONS - WEB DEPTHS > 60"

SKEWS > 15° ≤ 30° SHOWN

TABLE "D'	•											
				WEB I	DEPTH						MEMBER "	D" CONN.
MEMBER "C"	5'-0" -	6'-6"		6'-6"	- 7'-6"		7'-6"	- 8'-9"		MEMBER "D"	NO. OF ¾" DIA. BOLTS	
MAXIMUM	MEMBER "C" SIZE	NO. OF ¾" DIA. BOLTS	LENGTH OF 1/4" WELD	MEMBER "C" SIZE	NO. OF ¾" DIA. BOLTS		MEMBER "C" SIZE	NO. OF ¾" DIA. BOLTS	LENGTH OF ½" WELD	SIZE	CONN. PLATE TO BRG. STIFF.	MEMBER "D"
11'-6"	4 X 4 X 1/16	5	13	4 X 4 X 1⁄26	5	12	4 X 4 X ⅓ ₁₆	5	11	C12 X 20.7	6@2½"	4 @ 2 ½"
13'-6"	5 X 5 X ¾6	6	17	5 X 5 X ¾6	6	16	5 X 5 X ¾6	6	15	C12 X 20.7	6@2½"	4 @ 2 ½"
17'-6"	6 X 6 X ⅓ ₆	8	20	5 X 5 X ⅓ ₆	7	18	5 X 5 X ⅓ ₆	6	16	C15 X 33.9	7 @ 2 ½"	5 @ 2 ½"
22'-0"	6 X 6 X ¾6	9	23	6 X 6 X ¾6	8	21	6 X 6 X ¾6	7	19	MC18 X 42.7	7@2½"	6 @ 2 ½"

NOTE: ALL MEMBER "C" SIZES REPRESENT ANGLES.

C15X33.9 G K MC18 X 42.7

MEMBER "D" END CONNECTIONS

OMIT END CONNECTING PLATE FOR SKEWS 0" - 15"

BUREAU OF
SIRUCIURES

APPROVED: Laura Shadewald

DATE:
7-21

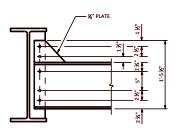
9" MAX. 4" MIN.

36" W. GIRDER

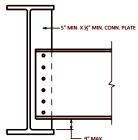
- ½" PLATE

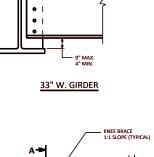


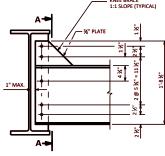




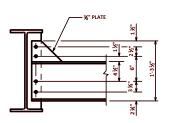
24" W. GIRDER







27" W. GIRDER



21" W. GIRDER

INTERMEDIATE DIAPHRAGM SIZES

ALL INTERMEDIATE CONNECTIONS										
GIRDER DEPTH	INTERMEDIATE DIAPHRAGMS									
36"	MC18 X 42.7									
33"	MC18 X 42.7									
30"	C15 X 33.9									
27"	C15 X 33.9									
24"	C12 X 20.7									
21" C10 X 15.3										
18"	C8 X 11.5									

NOTES

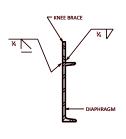
DIAPHRAGMS SHALL BE HORIZONTAL EXCEPT WHEN THE DIFFERENCE IN ADJACENT GIRDER ELEVATIONS IS OF A MAGNITUDE THAT NECESSITATES SLOPING THE DIAPHRAGMS.

WHEN DIAPHRAGMS ARE SLOPED, PLACE CENTER OF DIAPHRAGM AT MID-DEPTH OF GIRDER.

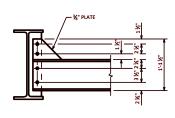
ALL BOLTED CONNECTIONS SHALL BE MADE WITH $\frac{1}{N}$ $\!\!\!\!/\!\!\!/\!\!\!\!/$ $\!\!\!\!/$ HIGH STRENGTH ASTM A325 BOLTS.

DESIGNER NOTES

SEE STANDARD 24.02 FOR CONNECTION BAR CORNER COPE & WELD DETAILS.



SECTION A



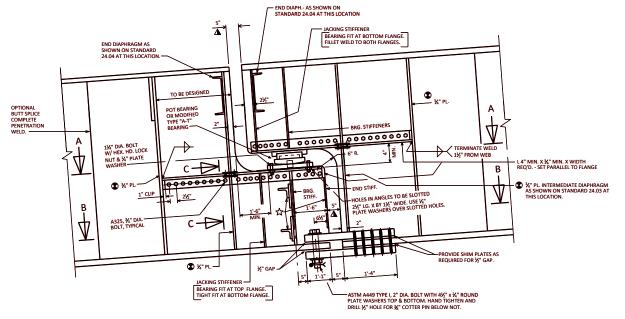
18" W. GIRDER





APPROVED: Laura Shadewald

d 7-15



NOTES

FOR WELDING DETAILS SEE "CONNECTION STIFFENER DETAILS" ON STANDARD 24.02 MINIMUM PLATE SIZE SHOWN. DESIGN ACTUAL SIZE REQUIRED.

STIFFENERS AND BEARING PLATES ARE ALL PERPENDICULAR TO FLANGES. ANGLES ARE PARALLEL TO FLANGES.

DESIGNER NOTES

SIZE AND LENGTH OF ANGLES, NUMBER OF BOLTS THRU ANGLES, THICKNESS OF WEB PLATE, AND SIZE OF BEARING STIFFENERS AND JACKING STIFFENERS SHALL BE DETERMINED FROM AN ANALYSIS USING THE VERTICAL AND HORIZONTAL FORCES ACTING AT THE BINGE

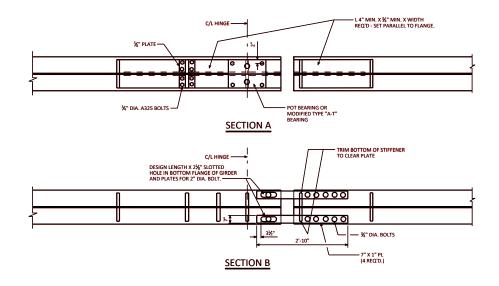
⚠ THE 5" OPENING BETWEEN GIRDER WEB AND FLANGE PLATES IS FOR FABRICATION ACTUAL OPENING IS BASED ON EXPANSION LENGTH AND TEMPERATURE.

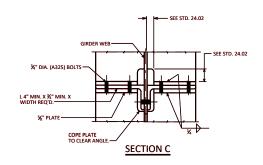
SLOTTED HOLES OF 6" IN THE FLANGES AND CONNECTING BARS WILL ACCOMMODATE A TOTAL TEMPERATURE MOVEMENT OF 8" (± 4" FROM 45" F). THE DESIGNER MAY NEED TO INCREASE OR DECREASE THE LENGTH OF THE SLOT TO MEET SPECIFIC LIPS DECU

CROSS FRAME UNDER BRG. AND END STIFFENER IS ONLY REQ'D. IF TOTAL WEB HEIGHT EXCEEDS 8'-0".

SEE BRIDGE MANUAL, SECTION 24.1 FOR CRITERIA FOR LOCATING HINGE JOINTS.

ELEVATION

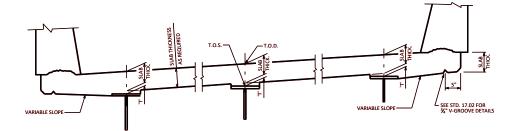






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d 7-16



SECTION THRU SLAB

DESIGNER NOTES

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

HAUNCH DEPTH VARIATIONS NEED NOT BE SHOWN ON THE PLANS.

IF HAUNCH VARIATIONS EXCEED $\frac{1}{N}$, the Girder shall be cambered to reduce the variations in Haunch Thickness.

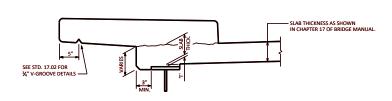
NOTES

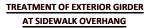
 $^{\mathsf{T}}$ = HAUNCH HEIGHT AT CENTERLINE OF GIRDER.

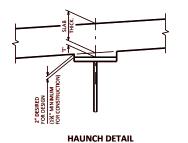
TO DETERMINE 'T': AFTER ALL STRUCTURAL STEEL HAS BEEN ERECTED, ELEVATIONS OF THE TOP FLANGES SHALL BE TAKEN AT CENTERLINE OF BEARINGS AND AT 0.1 POINTS.

TOP OF DECK ELEVATION AT FINAL GRADE

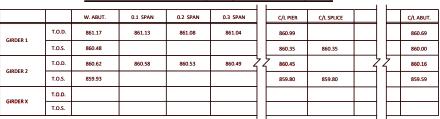
- TOP OF STEEL ELEVATION AFTER STEEL ERECTION
- + CONC. ONLY DEFLECTION; DOWNWARD DEFLECTION IS ADDED, UPWARD DEFLECTION IS SUBTRACTED
- SLAB THICKNESS
- = 'T' VALUE FOR SETTING HAUNCH







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



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

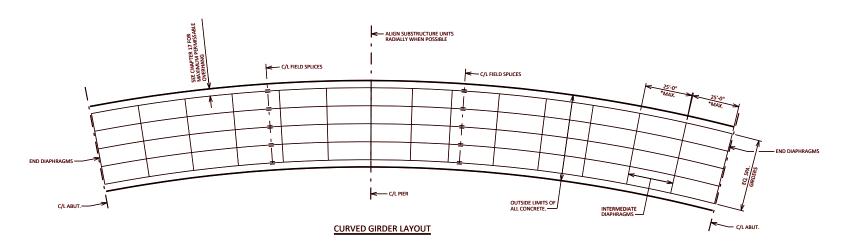
BOTTOM OF A GIVEN SEGMENT AND NEED NOT BE SYMMETRIC ABOUT THE MIDPOINT OF THE SEGMENT. C/L SPLICE C/L ABUT. SPAN 1 SPAN 2 CAMBER VALUES MAY BE GIVEN AT 1/10 PTS. FOR A GIVEN SEGMENT. HORIZONTAL LINE. C/L ABUT. SPAN X

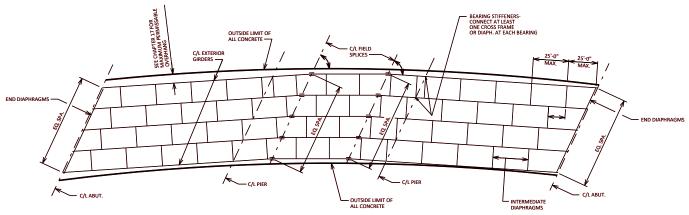
BLOCKING DIAGRAM

BLOCKING & SLAB HAUNCH DETAILS



APPROVED: Laura Shadewald





KINKED GIRDER LAYOUT

GENERAL NOTES

SKETCHES AND NOTES APPLY TO ANY NUMBER OF SPANS.

NUMBER AND SIZE OF GIRDERS AND LOCATION OF FIELD SPLICES TO BE DETERMINED BY DESIGN.

FOR HORIZONTAL CURVES WITH A RADIUS OF LESS THAN 1400 FT., THE GIRDERS SHALL BE FABRICATED ALONG THE CURVE. FOR A RADIUS GREATER THAN 1400 FT, CONSIDERATION SHALL BE GIVEN TO KINKING GIRDERS AT FIELD SPLICE LOCATIONS.

FOR KINKED GIRDER LAYOUT:
HOLD C/L OF SUBSTRUCTURE UNITS AND C/L OF SPLICES
PARALLEL TO EACH OTHER WHEN POSSIBLE.

GIRDERS ARE TO BE HELD PARALLEL TO EACH OTHER BETWEEN FIELD SPLICES.

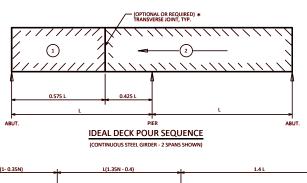
FOR CURVED GIRDER LAYOUT:
PLACE SUBSTRUCTURE UNITS ON RADIAL LINES WHEN
POSSIBLE.

*TIGHTER SPACING MAY BE REQ'D. FOR MORE SEVERE CURVATURES

GIRDER LAYOUT ON CURVE



APPROVED: Laura Shadewald





- S = TOTAL NUMBER OF SPANS
- N = INTERIOR SPAN

END SPAN

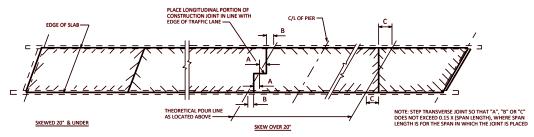
L (1-0.35N) L(1 - 0.35N) ABUT.

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

L(1-0.4N) NO. SPANS AT NL (OPTIONAL OR REQUIRED) * TRANSVERSE JOINT, TYP. (1) 0.6NL ABUT. PIER (X)

IDEAL DECK POUR SEQUENCE

(CONTINUOUS STEEL GIRDER - ANY NUMBER OF SPANS SHOWN)



PLAN VIEW - SHOWING PLACEMENT OF TRANSVERSE CONSTRUCTION JOINTS

THE RATE OF PLACING CONCRETE SHALL EQUAL OR EXCEED ½ SPAN LENGTH PER HOUR BUT NEED NOT EXCEED 100 CU. YDS. PER HOUR. (REQUIRED ONLY FOR CONTINUOUS STEEL GIRDERS.)

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

THE NEXT DECK POUR CAN BE MADE NO LESS THAN 72 HOURS AFTER THE

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

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

DESIGNER NOTES

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

OPTIONAL TRANSVERSE CONSTRUCTION JOINTS SHALL BE DETAILED ON THE PLANS TO LIMIT THE VOLUME OF POUR TO < 600 CU, YDS. IN URBAN AREAS AND < 300 CU, YDS. IN OTHER AREAS, GENERALLY FOR STEEL GIRDRER SUPER-STRUCTURES LOCATE THE TRANSVERSE JOINTS AT THE OF POINT (CONCRETE IN 60% OF 594M) AND FOR PRESTRES GIRDRER SUPERSTRUCTURES LOCATE IN DUBY OF PAINJ NUME FOR THE STATES SINGLED APPEARS INCLUDES LOCATE TO JOINTS NEAR THE 0.75 POINT. (CONCRETE IN 75% OF SPAN) CONSIDER CUT-OFF POINTS OF CONTINUITY REINFORCING STEEL WHEN LOCATING JOINTS FOR PRESTRESS GIRDER SUPERSTRUCTURES. LOCATION OF JOINTS IN STEEL GIRDER SUPERSTRUCTURES MAY VARY IF DEFLECTIONS ARE INFLUENCED BY IN SPAN HINGES OR UNUSUAL SPAN LENGTH RATIOS. CHECK WITH THE STRUCTURES DEVELOPMENT SECTION FOR ADDITIONAL INFORMATION.

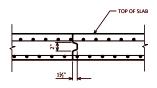
REQUIRED TRANSVERSE CONSTRUCTION JOINTS SHALL BE DETAILED ON THE PLANS ONLY WHEN REQUIRED BY DESIGN. SEQUENTIAL STAGES ARE DISCUSSED IN SECTION 24.12.2. ALL PLACEMENT REQUIREMENTS SHALL BE NOTED ON THE PLANS.

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

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

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

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

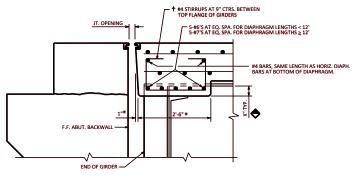


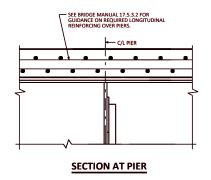
SECTION THRU TRANSVERSE OR LONGITUDINAL JOINT

SLAB POURING SEQUENCE



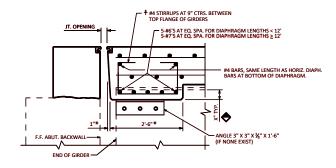
APPROVED: Laura Shadewald

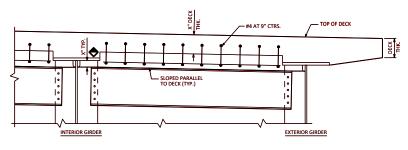




SECTION THRU EXPANSION END

DIAPHRAGM TO EXTEND TO GIRDER WEB (SEE PART TRANSVERSE SECTION AT DIAPHRAGM EXPANSION END FOR TYPICAL EXTENTS)





PART TRANSVERSE SECTION AT DIAPHRAGM **EXPANSION END**

SECTION THRU EXPANSION END OF NEW DECK

SHOWING EXISTING STEEL GIRDER

WITHOUT EXISTING STEEL DIAPHRAGM

(SEE STD. 40.04 FOR ADDITIONAL DETAILS)

NOTES

FOR REHABILITATION PROJECTS:

DIAPHRAGM SUPPORT ANGLES SHALL BE ASTM A709 GRADE 36. BOLTS ARE ½" DIA. ALL BOLTS, NUTS AND WASHERS SHALL BE ASTM A325 TYPE 1.

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

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

ALL REPLACEMENT PAVING BLOCK DIMENSIONS SHALL MATCH EXISTING PLAN DIMENSIONS UNLESS DESIGNER DETERMINES OTHERWISE.

DESIGNER NOTE

3" MINIMUM. USE 3" UNLESS INCREASED TO ACCOMMODATE LARGE EXPANSION DEVICES.

LEGEND

- BARS PLACED PARALLEL TO GIRDERS.
 SPACING PERPENDICULAR TO C/L GIRDERS.
- * DIMENSION IS TAKEN NORMAL TO C/L ABUTMENT

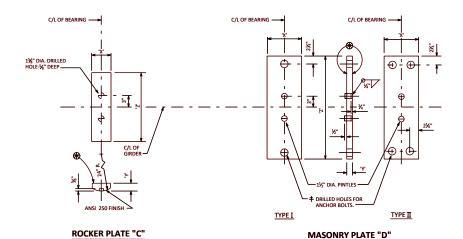
STEEL GIRDER SLAB & SUPERSTRUCTURE DETAILS



APPROVED: Laura Shadewald

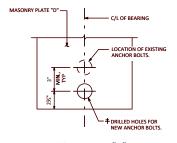
STANDARD 24.12

PLATE "C	LENGTH OF	TOTAL		PLATE (0		PLATE D		HEIGHT
12" 260 5" 22" 1-0" 9" 13" 1-9" 0.354 280 5" 22" 1-0" 9" 13" 1-9" 0.406 280 5" 22" 1-0" 9" 13" 1-9" 0.406 385 5" 22" 1-2" 9" 13" 1-11" 0.318 410 5" 22" 1-2" 1-1" 23" 1-11" 0.406 385 5" 22" 1-2" 1-1" 23" 1-11" 0.406 385 5" 22" 1-2" 1-3" 22" 1-11" 0.406 385 5" 23" 1-2" 1-3" 22" 1-11" 0.406 385 5" 23" 1-2" 1-3" 22" 1-11" 0.406 400 5" 23" 1-4" 1-0" 23" 2-1" 0.370 390 5" 23" 1-4" 1-0" 23" 2-1" 0.406 465 5" 23" 1-4" 1-0" 23" 2-1" 0.406 465 5" 23" 1-4" 1-0" 23" 2-2" 0.448 465 5" 23" 1-4" 1-4" 33" 2-2" 0.438 390 5" 23" 1-4" 1-4" 33" 2-2" 0.370 390 5" 13" 1-6" 9" 13" 2-3" 0.318 390 5" 13" 1-6" 1-1" 23" 2-3" 0.318 390 5" 13" 1-6" 1-1" 23" 2-4" 0.448 465 5" 23" 1-6" 1-2" 23" 2-4" 0.490 5" 23" 1-3" 1-3" 1-3" 1-3" 2-5" 0.318 380 5" 13" 1-8" 10" 23" 2-5" 0.318 380 5" 13" 1-8" 10" 23" 2-6" 0.466 500 5" 23" 1-8" 1-2" 23" 2-6" 0.468 460 5" 23" 1-8" 1-2" 23" 2-6" 0.468 560 5" 23" 1-8" 1-2" 23" 2-7" 0.370 490 5" 13" 1-10" 1-0" 23" 2-7" 0.370 490 5" 13" 1-10" 1-0" 23" 2-7" 0.370 490 5" 13" 1-10" 1-0" 23" 2-7" 0.370 490 5" 13" 1-10" 1-0" 23" 2-7" 0.370 490 5" 13" 1-10" 1-0" 23" 2-7" 0.370 490 5" 13" 1-10" 1-0" 23" 2-8" 0.448 563 5" 23" 1-10" 1-0" 23" 2-7" 0.370 490 5" 13" 1-10" 1-0" 23" 2-7" 0.370 490 5" 13" 1-10" 1-0" 23" 2-7" 0.370 490 5" 13" 1-10" 1-0" 23" 2-7" 0.370 490 5" 13" 1-10" 1-0" 23" 2-7" 0.370 490 5" 13" 1-10" 1-0" 23" 2-7" 0.370 490 5" 13" 1-10" 1-0" 23	PLATE "C"	LOAD KIPS	х	Υ	Z	х	Y	Z	FEET
12" 280 5" 2½" 10" 10" 2½" 119" 0.406 335 5" 1½" 112" 11" 2½" 111" 0.318 335 5" 2½" 112" 11" 2½" 111" 0.406 410 5" 2½" 112" 11" 2½" 11" 0.406 420 5" 2½" 112" 11" 2½" 11" 0.406 420 5" 2½" 11" 12" 11" 0.406 420 5" 2½" 11" 12" 12" 12" 0.406 420 5" 1½" 11" 13" 12" 0.406 420 5" 2½" 11" 11" 12" 0.418 490 5" 2½" 11" 11" 12" 2½" 21" 0.310 465 5" 2½" 11" 11" 12" 2½" 21" 0.406 450 5" 1½" 11" 11" 12" 2½" 21" 0.406 450 5" 1½" 11" 11" 2½" 21" 0.406 450 5" 1½" 11" 11" 2½" 21" 0.406 450 5" 1½" 11" 11" 2½" 21" 0.408 450 5" 1½" 11" 11" 2½" 21" 0.438 460 5" 2½" 11" 11" 2½" 21" 0.438 460 5" 2½" 11" 11" 2½" 21" 0.438 460 5" 2½" 11" 11" 2½" 21" 0.438 460 5" 2½" 11" 11" 2½" 21" 0.438 460 5" 2½" 11" 11" 2½" 21" 0.438 460 5" 2½" 11" 11" 2½" 2½" 21" 0.438 460 5" 2½" 11" 11" 2½" 2½" 0.438 460 5" 2½" 11" 11" 2½" 2½" 0.438 460 5" 2½" 11" 11" 2½" 2½" 0.438 460 5" 2½" 11" 11" 2½" 2½" 21" 0.438 460 5" 2½" 11" 11" 2½" 2½" 21" 0.438 460 5" 2½" 11" 11" 2½" 2½" 21" 0.438 460 5" 2½" 11" 11" 2½" 2½" 21" 0.438 460 5" 2½" 11" 11" 2½" 2½" 21" 0.438 460 5" 2½" 11" 11" 2½" 2½" 21" 0.438 460 5" 2½" 11" 11" 2½" 2½" 21" 0.438 460 5" 2½" 11" 11" 2½" 2½" 21" 0.438 460 5" 2½" 11" 11" 2½" 2½" 21" 0.438 460 5" 2½" 11" 11" 11" 2½" 2½" 0.438 460 5" 2½" 11" 11" 11" 2½" 2½" 0.438 460 5" 2½" 11" 11" 11" 2½" 2½" 0.438 460 5" 2½" 11" 11" 11" 2½" 2½" 21" 0.438 460	10"	215	5"	2⅓"	10"	8"	1¾"	1'-7"	0.354
14" 280 5" 28" 1-0" 10" 28" 1-9" 0.406 385 5" 28" 1-2" 9" 1½" 1-11" 0.406 385 5" 28" 1-2" 1-1" 2½" 1-11" 0.406 385 5" 28" 1-2" 1-1" 2½" 1-11" 0.406 385 5" 28" 1-2" 1-3" 2½" 1-11" 0.408 400 5" 28" 1-2" 1-3" 2½" 2-0" 0.448 330 5" 1½" 1-4" 10" 2½" 2-1" 0.370 465 5" 2½" 1-4" 1-0" 2½" 2-1" 0.406 465 5" 2½" 1-4" 1-0" 2½" 2-1" 0.406 465 5" 2½" 1-4" 1-0" 2½" 2-1" 0.406 465 5" 2½" 1-4" 1-0" 3½" 2-2" 0.448 460 5" 2½" 1-6" 1-2" 2½" 2-2" 0.448 560 5" 2½" 1-6" 1-1" 2½" 2-3" 0.318 380 5" 1½" 1-6" 1-1" 2½" 2-3" 0.310 465 5" 2½" 1-6" 1-1" 2½" 2-3" 0.370 465 5" 2½" 1-6" 1-4" 3½" 2-5" 0.318 380 5" 1½" 1-8" 1-0" 2½" 2-5" 0.318 380 5" 1½" 1-8" 1-0" 2½" 2-6" 0.460 530 5" 2½" 1-8" 1-2" 2½" 2-6" 0.460 530 5" 2½" 1-8" 1-2" 2½" 2-5" 0.370 460 5" 2½" 1-8" 1-2" 2½" 2-6" 0.460 530 5" 2½" 1-8" 1-2" 2½" 2-6" 0.460 540 5" 2½" 1-8" 1-2" 2½" 2-6" 0.460 540 5" 2½" 1-8" 1-2" 2½" 2-6" 0.430 460 5" 2½" 1-8" 1-2" 2½" 2-5" 0.330 550 5" 2½" 1-8" 1-2" 2½" 2-6" 0.460 560 5" 2½" 1-8" 1-2" 2½" 2-6" 0.490 560 5" 2½" 1-8" 1-2" 2½" 2-7" 0.370 490 5" 1½" 1-10" 1-2" 2½" 2-8" 0.370 490 5" 1½" 1-10" 1-2" 2½" 2-8" 0.370 565 5" 2½" 1-10" 1-4" 3½" 2-8" 0.440 705 5" 2½" 1-10" 1-4" 3½" 2-8" 0.440 705 5" 2½" 1-10" 1-4" 3½" 2-8" 0.440 705 5" 2½" 1-10" 1-4" 3½" 2-8" 0.440 705 5" 2½" 1-10" 1-4" 3½" 2-8" 0.440 705 5" 2½" 1-10" 1-4" 3½" 2-8" 0.450 705 5" 2½" 1-10" 1-4" 3½" 2-8" 0.450 705 5" 2½" 1-10" 1-4"	420	260	5"	23/8"	1'-0"	9"	1¾"	1'-9"	0.354
14" 335 5" 2½" 11-2" 11" 2½" 11-11" 0.406	12	280	5"	2¾"	1'-0"	10"	23/8"	1'-9"	0.406
16" 385 5" 2½" 1-2" 1-1" 2½" 1-11" 0.448 410 5" 2½" 1-2" 1-3" 2½" 2-0" 0.448 410 5" 2½" 1-2" 1-3" 2½" 2-0" 0.448 30 5" 1-3" 1-4" 8" 1½" 2-1" 0.318 330 5" 1-½" 1-4" 1-0" 2½" 2-1" 0.406 465 5" 2½" 1-4" 1-0" 2½" 2-1" 0.406 465 5" 2½" 1-4" 1-2" 2½" 2-2" 0.448 490 5" 2½" 1-4" 1-4" 1-4" 3½" 2-2" 0.430 330 5" 1-½" 1-4" 1-4" 1-4" 2½" 2-2" 0.430 330 5" 1-½" 1-4" 1-4" 1-2" 2½" 2-3" 0.430 330 5" 1-½" 1-6" 1-1" 2½" 2-3" 0.430 330 5" 1-½" 1-6" 1-1" 2½" 2-3" 0.430 330 5" 1-½" 1-6" 1-1" 2½" 2-3" 0.370 330 5" 1-½" 1-6" 1-1" 2½" 2-4" 0.448 560 5" 2½" 1-6" 1-2" 2½" 2-4" 0.448 350 5" 1-½" 1-8" 1-0" 2½" 2-5" 0.370 330 5" 1-½" 1-8" 1-2" 2½" 2-6" 0.460 5" 2½" 1-8" 1-2" 2½" 2-6" 0.460 5" 2½" 1-8" 1-2" 2½" 2-6" 0.448 600 5" 2½" 1-8" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-8" 1-2" 2½" 2-6" 0.460 5" 2½" 1-8" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-8" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-8" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-8" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-8" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-8" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-8" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-8" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-10" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-10" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-10" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-10" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-10" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-2" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-2" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-2" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-2" 1-2" 2½" 2-6" 0.450 600 5" 2½" 1-2" 1-2" 2½" 2-6" 0.45		280	5"	115/16"	1'-2"	9"	1¾"	1'-11"	0.318
18	14"	335	5"	2¾"	1'-2"	11"	23/8"	1'-11"	0.406
16" 2" 3" 3" 3" 3" 3" 3" 3	14	385	5"	2¾"	1'-2"	1'-1"	27/8"	1'-11"	0.448
18" 30 5" 1"ks" 1"4" 10" 2½" 2"1" 0.370 465 5" 2½" 1"4" 1"0" 2½" 2"1" 0.406 465 5" 2½" 1"4" 1"2" 2½" 2"2" 0.448 460 5" 2½" 1"4" 1"4" 3½" 2"3" 0.430 390 5" 1½" 1"6" 9" 1½" 2"3" 0.370 465 5" 1½" 1"6" 1" 2½" 2"3" 0.318 465 5" 1½" 1"6" 1" 2½" 2"3" 0.370 465 5" 2½" 1"6" 1" 2½" 2"4" 0.448 560 5" 2½" 1"6" 1"4" 3½" 2"4" 0.448 380 5" 1½" 1"8" 1"4" 2½" 2"5" 0.318 380 5" 1½" 1"8" 1"4" 3½" 2"5" 0.318 380 5" 1½" 1"8" 1"4" 2½" 2"5" 0.318 380 5" 1½" 1"8" 1"4" 3½" 2"5" 0.318 380 5" 1½" 1"8" 1"2" 2½" 2"5" 0.318 380 5" 1½" 1"8" 1"2" 2½" 2"5" 0.448 600 5" 2½" 1"8" 1"2" 2½" 2"6" 0.448 600 5" 2½" 1"8" 1"4" 3½" 2"6" 0.448 600 5" 2½" 1"8" 1"4" 3½" 2"6" 0.531 490 5" 1½" 1"8" 1"2" 2½" 2"7" 0.370 490 5" 1½" 1"10" 1"0" 2½" 2"8" 0.370 565 5" 2½" 1"10" 1"0" 2½" 2"8" 0.448 705 5" 2½" 1"10" 1"0" 2½" 2"8" 0.440 705 5" 2½" 1"10" 1"0" 2½" 2"8" 0.440 705 5" 2½" 1"10" 1"0" 3½" 2"8" 0.440 705 5" 2½" 1"10" 1"6" 3½" 2"8" 0.440 705 5" 2½" 1"10" 1"6" 3½" 2"8" 0.450		410	5"	2¾"	1'-2"	1'-3"	27/8"	2'-0"	0.448
16" 390 5" 2½" 1'4" 1'0" 2½" 2'1" 0.406 465 5" 2½" 1'4" 1'2" 2½" 2'2" 0.448 490 5" 2½" 1'4" 1'2" 2½" 2'2" 0.490 390 5" 1½" 1'6" 9" 1½" 2'3" 0.318 390 5" 1½" 1'6" 1" 2½" 2'3" 0.370 465 5" 2½" 1'6" 1'1" 2½" 2'4" 0.448 560 5" 2½" 1'6" 1'2" 2½" 2'4" 0.448 560 5" 2½" 1'6" 1'4" 3½" 2'4" 0.449 380 5" 1½" 1'8" 1'2" 2½" 2'5" 0.318 380 5" 1½" 1'8" 1" 1" 2½" 2'5" 0.318 380 5" 1½" 1'8" 1" 2½" 2'5" 0.318 380 5" 1½" 1'8" 1" 2½" 2'5" 0.318 380 5" 1½" 1'8" 1'2" 2½" 2'6" 0.490 560 5" 2½" 1'8" 1'2" 2½" 2'5" 0.370 640 5" 2½" 1'8" 1'2" 2½" 2'6" 0.448 600 5" 2½" 1'8" 1'4" 3½" 2'6" 0.531 22" 405 5" 1½" 1'8" 1'2" 2½" 2'5" 0.370 640 5" 1½" 1'8" 1'2" 2½" 2'5" 0.370 650 5" 1½" 1'10" 1'0" 2½" 2'7" 0.370 650 5" 2½" 1'10" 1'0" 2½" 2'8" 0.440 650 5" 2½" 1'10" 1'0" 2½" 2'8" 0.440 650 5" 2½" 1'10" 1'0" 2½" 2'8" 0.440 650 5" 2½" 1'10" 1'0" 2½" 2'8" 0.440 650 5" 2½" 1'10" 1'0" 2½" 2'8" 0.440		275	5"	1 ¹ ½6"	1'-4"	8"	1¾"	2'-1"	0.318
18" 465 5" 2½" 1"4" 1"-2" 2½" 2"2" 0.448 490 5" 2½" 1"4" 1"-4" 3½" 2"-2" 0.439 390 5" 1½" 1"6" 1" 2½" 2"3" 0.318 390 5" 1½" 1"6" 1" 2½" 2"3" 0.370 465 5" 2½" 1"6" 1" 2½" 2"4" 0.448 495 5" 2½" 1"6" 1"-2" 2½" 2"4" 0.448 495 5" 2½" 1"6" 1"-2" 2½" 2"4" 0.448 350 5" 1½" 1"6" 1"-2" 2½" 2"4" 0.448 350 5" 1½" 1"6" 1"-2" 2½" 2"4" 0.448 350 5" 1½" 1"6" 1"-2" 2½" 2"6" 0.318 380 5" 1½" 1"8" 1"0" 2½" 2"5" 0.370 360 5" 2½" 1"8" 1"0" 2½" 2"6" 0.406 550 5" 2½" 1"8" 1"0" 2½" 2"6" 0.448 600 5" 2½" 1"8" 1"-2" 2½" 2"6" 0.449 640 5" 2½" 1"8" 1"-6" 3½" 2"6" 0.370 490 5" 1½" 1"10" 1" 0" 2½" 2"5" 0.370 490 5" 1½" 1"10" 1" 0" 2½" 2"5" 0.370 565 5" 2½" 1"10" 1"0" 2½" 2½" 2"8" 0.449 705 5" 2½" 1"10" 1"0" 2½" 2"8" 0.449 705 5" 2½" 1"10" 1"0" 2½" 2"8" 0.449 705 5" 2½" 1"10" 1"0" 2½" 2"8" 0.449 705 5" 2½" 1"10" 1"0" 2½" 2"8" 0.449 705 5" 2½" 1"10" 1"0" 2½" 2"8" 0.449 705 5" 2½" 1"10" 1"0" 2½" 2"8" 0.449 705 5" 2½" 1"10" 1"0" 1"0" 2½" 2"8" 0.449 705 5" 2½" 1"10" 1"0" 1"4" 3½" 2"8" 0.449 705 5" 2½" 1"10" 1"0" 1"4" 3½" 2"8" 0.449 705 7"8" 2"8" 0.450 705 7"8" 1"10" 1"6" 3%" 2"8" 0.453 7"8" 0.453 7"8" 0.453 7"8" 0.453 7"8" 0.453 7"8" 0.4		330	5"	1 ¹ / ₁₆ "	1'-4"	10"	2¾"	2'-1"	0.370
18" 490 5" 2½" 1"4" 1"4" 3½" 2"2" 0.490 325 5" 1"½" 1"6" 9" 1½" 2"3" 0.318 330 5" 1½" 1"6" 11" 2½" 2"3" 0.370 465 5" 2½" 1"6" 1"1 2½" 2"4" 0.448 465 5" 2½" 1"6" 1"4" 3½" 2"4" 0.448 560 5" 2½" 1"6" 1"4" 3½" 2"4" 0.490 460 5" 2½" 1"8" 1"4" 3½" 2"5" 0.370 460 5" 2½" 1"8" 1"0" 2½" 2"6" 0.490 550 5" 2½" 1"8" 1"0" 2½" 2"6" 0.490 550 5" 2½" 1"8" 1"4" 3½" 2"6" 0.490 550 5" 2½" 1"8" 1"4" 3½" 2"6" 0.490 550 5" 1½" 1"8" 1"2" 2½" 2"6" 0.490 550 5" 1½" 1"8" 1"2" 2½" 2"6" 0.531 400 5" 1½" 1"6" 1"0" 2½" 2"7" 0.370 450 5" 1½" 1"10" 1"0" 2½" 2"8" 0.370 555 5" 2½" 1"10" 1"0" 2½" 2"8" 0.490 705 5" 2½" 1"10" 1"6" 3½" 2"8" 0.490 705 5" 2½" 1"10" 1"6" 3½" 2"8" 0.490 705 5" 2½" 1"10" 1"6" 3½" 2"8" 0.490 705 5" 2½" 1"10" 1"6" 3½" 2"8" 0.490 705 5" 2½" 1"10" 1"6" 3½" 2"8" 0.490 705 5" 2½" 1"10" 1"6" 3½" 2"8" 0.490 705 5" 2½" 1"10" 1"6" 3½" 2"8" 0.450	16"	390	5"	2¾"	1'-4"	1'-0"	2¾"	2'-1"	0.406
18" 325 5" 11½s" 11-6" 9" 13" 21-3" 0.318		465	5"	2¾"	1'-4"	1'-2"	21/8"	2'-2"	0.448
18" 390 5" 1"kg" 1"e" 11" 2"k" 2"d" 0.438 465 5" 2"k" 1"e" 1"d" 2"k" 2"d" 0.448 495 5" 2"k" 1"e" 1"d" 2"k" 2"d" 0.448 560 5" 2"k" 1"e" 1"d" 3"k" 2"d" 0.448 380 5" 1"kg" 1"e" 1"d" 3"k" 2"5" 0.318 380 5" 1"kg" 1"e" 1" 2"k" 2"5" 0.318 380 5" 2"k" 1"e" 1"d" 2"k" 2"5" 0.348 460 5" 2"k" 1"e" 1"d" 2"k" 2"6" 0.466 530 5" 2"k" 1"e" 1"d" 3"k" 2"e" 0.448 600 5" 2"k" 1"e" 1"d" 3"k" 2"e" 0.531 490 5" 1"kg" 1"lo" 1"d" 3"k" 2"e" 0.370 490 5" 1"kg" 1"lo" 1"d" 2"k" 2"e" 0.430 565 5" 2"k" 1"lo" 1"d" 2"k" 2"e" 0.440 705 5" 2"k" 1"lo" 1"d" 2"k" 2"e" 0.430 705 5" 2"k" 1"lo" 1"d" 2"k" 2"e" 0.430 705 5" 2"k" 1"lo" 1"d" 3"k" 2"e" 0.430 706 5" 2"k" 1"lo" 1"d" 3"k" 2"e" 0.430 707 708 708 1"lo" 1"d" 3"k" 2"e" 0.430 708 708 1"lo" 1"d" 3"k" 2"e" 0.430 708 708 1"lo" 1"d" 3"k" 2"e" 0.430 709 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700 700		490	5"	2¾"	1'-4"	1'-4"	3%"	2'-2"	0.490
18"		325	5"	115/16"	1'-6"	9"	1¾"	2'-3"	0.318
20" 495 5" 2½" 1'-6" 1'-2" 2½" 2'-4" 0.448 560 5" 2½" 1'-8" 1'-4" 3½" 2'-4" 0.490 318 330 5" 1'½" 1'-8" 9" 1½" 2'-5" 0.318 330 5" 1'½" 1'-8" 10" 2½" 2'-5" 0.370 370 350 5" 2½" 1'-8" 1'-0" 2½" 2'-6" 0.406 550 5" 2½" 1'-8" 1'-2" 2½" 2'-6" 0.448 600 5" 2½" 1'-8" 1'-2" 2½" 2'-6" 0.490 640 5" 2½" 1'-8" 1'-4" 3½" 2'-5" 0.531 25" 3'-2" 3'-3" 3'-2" 3'-3" 3'-2" 3'-3" 3'-2" 3'-3" 3'-2" 3'-3" 3'-2" 3'-3" 3'-2" 3'-3" 3'-2" 3'-3" 3'-2" 3'-3" 3'-2" 3'-3" 3'-2" 3'-3" 3'-2" 3'-3" 3'-2" 3'-3" 3'-2" 3'-3" 3		390	5"	115/16"	1'-6"	11"	2¾"	2'-3"	0.370
20" 560 5" 22" 1-6" 1-4" 33" 2-4" 0.490 380 5" 1½" 1-8" 9" 1½" 2-5" 0.318 380 5" 1½" 1-8" 9" 1½" 2-5" 0.318 380 5" 1½" 1-8" 1-0" 2½" 2-5" 0.370 360 5" 2½" 1-8" 1-2" 2½" 2-6" 0.496 500 5" 2½" 1-8" 1-2" 2½" 2-6" 0.496 600 5" 2½" 1-8" 1-4" 3½" 2-6" 0.490 640 5" 2½" 1-8" 1-4" 3½" 2-6" 0.531 350 25" 1½" 1-10" 10" 2½" 2-7" 0.370 370 35" 2½" 1-10" 1-0" 2½" 2-8" 0.438 35" 2-8" 0.448 35" 2-8" 0.448 35" 2-2" 370 37	18"	465	5"	2¾"	1'-6"	1'-1"	21/8"	2'-4"	0.448
20" 350 5" 1½6" 1.8" 9" 1½" 2.5" 0.318 380 5" 1½6" 1.8" 10" 2½" 2.5" 0.370 370 380 5" 2½" 1.8" 1.0" 2½" 2.6" 0.406 550 5" 2½" 1.8" 1.2" 2½" 2.6" 0.406 600 5" 2½" 1.8" 1.4" 3½" 2.6" 0.490 640 5" 2½" 1.8" 1.4" 3½" 2.6" 0.490 640 5" 2½" 1.8" 1.4" 3½" 2.6" 0.490 640 5" 1½6" 1.10" 10" 2½" 2.7" 0.370 370 490 5" 1½6" 1.10" 1.0" 2½" 2.8" 0.370 655 5" 2½" 1.10" 1.2" 2½" 2½" 2.8" 0.490 705 5" 2½" 1.10" 1.4" 3½" 2.8" 0.490 705 5" 2½" 1.10" 1.6" 3½" 2.8" 0.531		495	5"	2¾"	1'-6"	1'-2"	21/8"	2'-4"	0.448
20" 380 5" 11% 11-8" 10" 2½" 2:5" 0.370		560	5"	2¾"	1'-6"	1'-4"	3¾"	2'-4"	0.490
20" 460 5" 2½" 1'8" 1'0" 2½" 2'6" 0.406		350	5"	11½"	1'-8"	9"	1¾"	2'-5"	0.318
20" 530 5" 2½" 1'.8" 1'.2" 2½" 2'.6" 0.448 600 5" 2½" 1'.8" 1'.4" 3¾" 2'.6" 0.490 640 5" 2½" 1'.8" 1'.6" 3½" 2'.6" 0.531 7.6" 0.531 7.6" 0.5"		380	5"	11½"	1'-8"	10"	2¾"	2'-5"	0.370
530 5" 2½" 1'-8" 1'-2" 2½" 2'-6" 0.448 600 5" 2½" 1'-8" 1'-4" 3½" 2'-6" 0.490 640 5" 2½" 1'-8" 1'-6" 3½" 2'-6" 0.531 490 5" 1'½" 1'-10" 10" 2½" 2'-7" 0.370 490 5" 1'½" 1'-10" 1'-0" 2½" 2'-8" 0.370 565 5" 2½" 1'-10" 1'-2" 2½" 2'-8" 0.448 635 5" 2½" 1'-10" 1'-4" 3½" 2'-8" 0.490 705 5" 2½" 1'-10" 1'-6" 3½" 2'-8" 0.531	20"	460	5"	2¾"	1'-8"	1'-0"	2¾"	2'-6"	0.406
22" 640 5" 2½" 1'.8" 1'.6" 3½" 2'.6" 0.531 405 5" 1½% 1'.10" 10" 2½" 2'.7" 0.370 490 5" 1½% 1'.10" 1'.0" 2½" 2'.8" 0.370 565 5" 2½" 1'.10" 1'.2" 2½" 2'.8" 0.484 635 5" 2½" 1'.10" 1'.6" 3½" 2'.8" 0.490 705 5" 2½" 1'.10" 1'.6" 3½" 2'.8" 0.531	20	530	5"	2¾"	1'-8"	1'-2"	21/8"	2'-6"	0.448
22" 405 5" 11½6" 1"-10" 10" 2½" 2"-7" 0.370		600	5"	2¾"	1'-8"	1'-4"	3¾"	2'-6"	0.490
22"		640	5"	21/8"	1'-8"	1'-6"	37/8"	2'-6"	0.531
22"		405	5"	1 ¹⁵ / ₁₆ "	1'-10"	10"	2¾"	2'-7"	0.370
22" 635 5" 2½" 1'·10" 1'·4" 3½" 2'·8" 0.490 705 5" 2½" 1'·10" 1'·6" 3½" 2'·8" 0.531		490	5"	1 ¹⁵ / ₁₆ "	1'-10"	1'-0"	23/6"	2'-8"	0.370
635 5" 2¾" 1'-10" 1'-4" 3¾" 2'-8" 0.490 705 5" 2¾" 1'-10" 1'-6" 3¾" 2'-8" 0.531	22"	565	5"	2¾"	1'-10"	1'-2"	21/8"	2'-8"	0.448
703 3 27 1 10 1 0 378 1 0 4 4 4	22	635	5"	2¾"	1'-10"	1'-4"	3¾"	2'-8"	0.490
720 5" 2¾" 1'-10" 1'-8" 3¾" 2'-8" 0.531		705	5"	2¾"	1'-10"	1'-6"	31/8"	2'-8"	0.531
		720	5"	2¾"	1'-10"	1'-8"	31/8"	2'-8"	0.531



ROCKER PLATE "C" TOP OF CONCRETE LOCATE ANCHOR BOLTS AS INDICATED FOR MASONRY PLATE "D". BEARING PAD (%") FOR SIZE, LENGTH, AND - C/L OF BEARING NUMBER SEE ANCHOR BOLT NOTES.

FIXED BEARING ASSEMBLY (SEE "DESIGNER NOTES" FOR BEARING REPLACEMENTS)



MASONRY PLATE "D" BEARING REPLACEMENTS

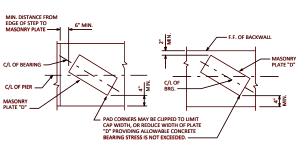
ANCHOR BOLT NOTES

FOR SPAN LENGTHS UP TO 100'-0": USE A TYPE I MASONRY PLATE "D" WITH (2) - 11/4" DIA. x 1'-5" LONG ANCHORS BOLTS.

FOR SPAN LENGTHS FROM 100'-0" UP TO 150'-0": USE A TYPE I MASONRY PLATE "D" WITH (2) - $1\frac{1}{2}$ " DIA. x 1'-10" LONG ANCHORS BOLTS.

FOR SPAN LENGTHS GREATER THAN 150'-0": USE A TYPE I MASONRY PLATE "D" WITH (4) - 1½" DIA. x 1'-10" LONG ANCHORS BOLTS.

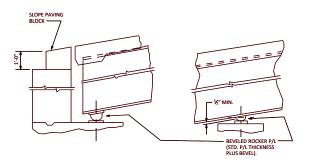
CHECK THAT ANCHOR BOLTS PROVIDE ADEQUATE HORIZONTAL CAPACITY.



AT SKEWED PIER

AT SKEWED ABUTMENTS

CLEARANCE DIAGRAM



AT EXPANSION BRG.

AT FIXED BRG.

BEVELED ROCKERS WITH GRADES GREATER THAN 3%

BEARING NOTES

ALL BEARINGS ARE SYMMETRICAL ABOUT C/L OF GIRDER AND C/L OF BEARING.

IN LIEU OF USING SHIM PLATES, FABRICATOR MAY INCREASE THICKNESS OF MASONRY PLATE "D" BY THE SHIM PLATE THICKNESS.

ALL STRUCTURAL STEEL BEARING PLATES SHALL BE FLAT ROLLED STEEL PLATES WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL.

ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS

ALL FINISHED SURFACES SHALL BE MACHINE FINISHED BY AN AUTOMATIC PROCESS.

ANCHOR BOLTS SHALL BE THREADED 3". PROVIDE ONE STANDARD WROUGHT WASHER AND ONE HEX NUT PER BOLT. PROJECT ANCHOR BOLTS, MASONRY PLATE "D" THICKNESS + 21/4", ABOVE TOP OF CONCRETE.

ALL MATERIAL IN BEARINGS, INCLUDING SHIM PLATES, BUT EXCLUDING PINTLES, ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A709 GRADE 50W.

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

ALL MATERIAL IN TYPE "A" BEARINGS, INCLUDING SHIM PLATES AND BEARING PADS, SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "BEARING ASSEMBLIES FIXED B-_-",

CHAMFER TOP OF PINTLES $\frac{1}{6}$ ". DRILL HOLES FOR ALL PINTLES IN MASONRY PLATE "D" FOR A DRIVING FIT.

PROVIDE $\frac{1}{6}$ "Thick bearing pad the same size as masonry plate "d" for each bearing.

CHAMFER ANCHOR BOLTS PRIOR TO THREADING.

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

ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153, CLASS C.

ROCKER PLATE "C" SHALL BE SHOP PAINTED WITH A WELDABLE PRIMER

MASONRY PLATE "D" SHALL BE GALVANIZED.

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

† DRILLED HOLES FOR ANCHOR BOLTS IN MASONRY PLATE "D" SHALL HAVE A
DIAMETER ¾" LARGER THAN ANCHOR BOLT.

₱ FINISH THESE SURFACES TO ANSI 250 IF 'Y' DIMENSION IS GREATER THAN 2".

DESIGNER NOTES

HEIGHT OF BEARINGS GIVEN IN TABLE INCLUDES ¾" BEARING PAD.

DETAIL SHIM PLATES AS DESCRIBED IN NOTES ON STANDARD 24.02.

REFER TO THE DETAILS BELOW FOR THE USE OF BEVELED ROCKER PLATE "C" ON GRADES GREATER THAN 3% AND ALSO CLEARANCE REQUIREMENTS.

FOR WELD SIZE, REFER TO STANDARD 24.02

▲ ADJUST HEIGHT IF BEVELED ROCKER PLATE "C" IS USED.

FOR BEARING REPLACEMENTS, DESIGNER SHALL UTILIZE A WIDER BEARING THAN THE EXISTING GIRDER BOTTOM FLANGE WIDTH TO ALLOW FOR FIELD WELDING OF THE EDGE OF THE BOTTOM FLANGE TO THE TOP OF PLATE "C".

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

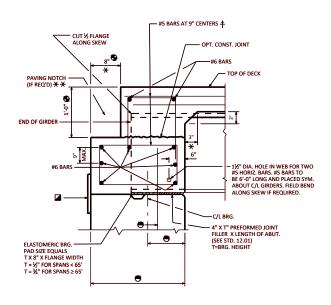
THE VALUES IN THE TABLES ARE THE BEARING CAPACITIES FOR "TOTAL LOAD" (DC + DW + (LL + IM)).

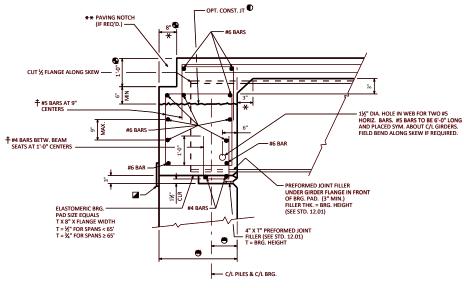
SELECT A BEARING THAT HAS A CAPACITY GREATER THAN OR EQUAL TO THE CALCULATED REACTION FOR "TOTAL LOADS".

FIXED BEARING DETAILS TYPE 'A' - STEEL GIRDERS



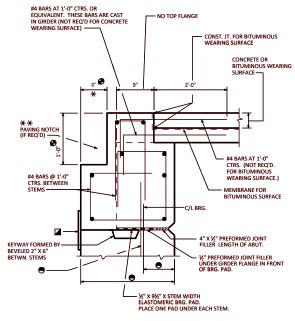
APPROVED: Laura Shadewald





STEEL GIRDER WITH
SEMI-EXPANSION SEAT

STEEL GIRDER WITH FIXED SEAT



PRECAST DOUBLE TEE OR MULTI-STEM SECTION

NOTES

FOR SKEWED STRUCTURES CAST END OF PRECAST TEE ALONG SKEW.

* DIMENSION IS TAKEN NORMAL TO C/L SUBSTRUCTURE

■ 1'-6" RUBBERIZED MEMBRANE WATERPROOFING

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

DESIGNER NOTES

SEE STANDARD 19.55 FOR PRESTRESSED BOX GIRDER BEARING DETAILS.

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

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

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

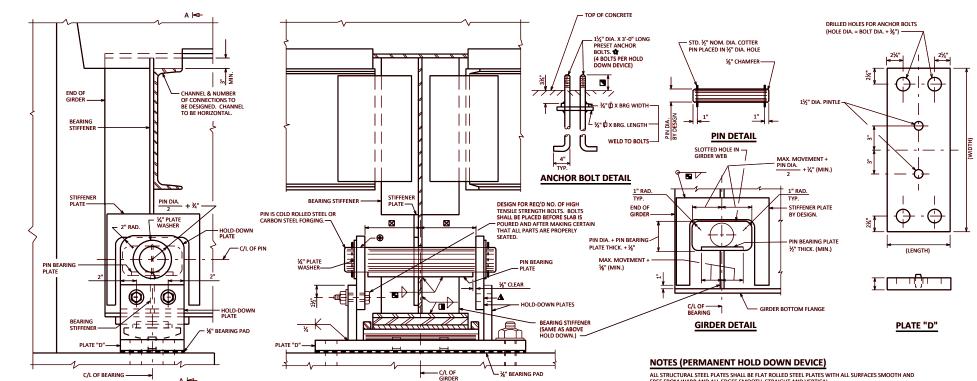
SEE STD. 12.01

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



APPROVED: Laura Shadewald

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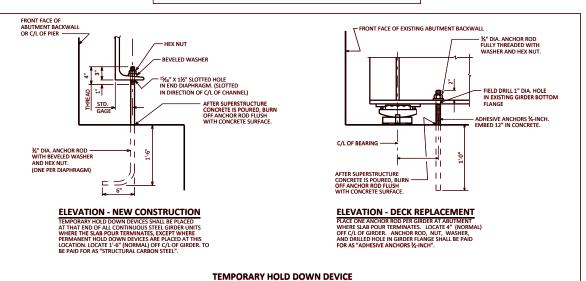
■ DIM. DEPENDS ON BRG. SIZE.

WHEN REQUIRED, HOLD DOWN DEVICES SHALL BE PLACED SYMMETRICALLY ABOUT LONGITUDINAL C/L OF FRAMING PLAN. MAXIMUM SPACING OF HOLD DOWNS SHALL BE AT ALTERNATE GIRDERS. HOLD DOWN DEVICE TO BE DESIGNED FOR MINIMUM UPLIFT CAPACITY OF 20 KIPS.

PERMANENT HOLD DOWN DEVICE

ELEVATION

SECTION A-A



ALL STRUCTURAL STEEL PLATES SHALL BE FLAT ROLLED STEEL PLATES WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL.

ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS

ANCHOR BOLTS SHALL BE THREADED 3". PROVIDE ONE STANDARD WROUGHT WASHER AND ONE HEX NUT PER BOLT. CHAMFER TOP OF ANCHOR BOLTS PRIOR TO THREADING.

ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153, CLASS C.

THE MATERIAL FOR THE HOLD-DOWN PLATES SHALL CONFORM TO ASTM A709 GRADE 50W

ALL MATERIAL WELDED TO THE GIRDERS, WHICH INCLUDES BEARING STIFFENERS, STIFFENER PLATE, AND PIN BEARING PLATE, SHALL MATCH THE STEEL REQUIREMENTS OF THE WEB AT THAT LOCATION.

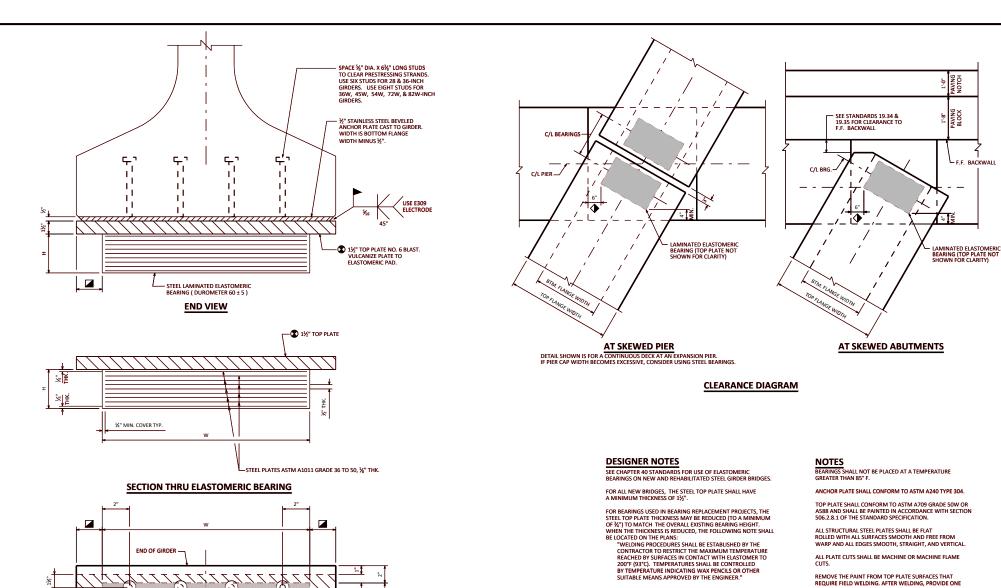
ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM F1554 GRADE 55 OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

ALL MATERIAL IN HOLD DOWN DEVICES, WHICH INCLUDES HOLD-DOWN PLATES, HIGH TENSILE STRENGTH BOLTS, PINS AND ANCHOR BOLTS, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "BEARING ASSEMBLIES EXPANSION

ALL MATERIAL WELDED TO THE GIRDERS, WHICH INCLUDES BEARING STIFFENERS, STIFFENER PLATE, AND PIN BEARING PLATE, SHALL BE INCLUDED IN THE BID ITEM USED FOR THE STEEL GIRDER QUANTITIES.

- FOR REPLACEMENT BEARINGS, ANCHOR BOLTS SHALL BE 1½" DIAMETER X 3".0" LONG AND FULLY THREADED ADHESIVE ANCHORS. ANCHOR BOLTS SHALL BE PAID FOR AS "ADHESIVE ANCHORS 1 1/2-INCH". EMBED IN CONCRETE
- A SHOP DRILL HOLES IN HOLD-DOWN PLATE ATTACHED TO PLATE "D". FIELD DRILL HOLES IN UPPER HOLD-DOWN PLATE AFTER ALIGNING IN THE FIELD.
- SEE STANDARD 24.02 FOR TABLE OF FILLET WELD SIZES.
- SEE STANDARD 24.02 FOR WELD DETAILS SHOWING BEARING STIFFENER CONNECTION TO WEB AND FLANGE.
- PROJECT ANCHOR BOLTS, PLATE "D" THICKNESS + 2½", ABOVE TOP OF CONCRETE.
- Occupance of the policy for pin in Hold-down plates and plate washers shall be as stated in Standard Specification 506.3.17.





C/L ELASTOMERIC BEARING

1½" TOP PLATE AND ½" STAINLESS STEEL BEVELED ELASTOMERIC

C/L GIRDER

PLAN VIEW

1"

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

3" FOR 36W", 45W", 54W", 72W" & 82W" 1" FOR 28" & 36"

MIN. DISTANCE FROM EDGE OF PIER/ABUTMENT. STEP TO LAMINATED ELASTOMERIC BEARING.

TAPER THE TOP PLATE IF THE GIRDER ANGLE RELATIVE TO HORZOWIAL IS GREATER THAN O.0.1 ROJANNS OR IF THIS ANGLE MULTIPLIED BY THE TOP PLATE LENGTH IS 1/8" OR MORE. TO DETERMINE THIS ANGLE, ADD THESE TWO VALUES: - LONGITUDINAL GRADE OF GIRDER - CAMBER EFFECT = 4RICALL WHERE:

- CAMBER EFFECT = 4(RC)/L, WHERE: RC = RESIDUAL CAMBER (INCHES) L = GIRDER LENGTH (INCHES) REMOVE THE PAINT FROM TOP PLATE SURFACES THAT REQUIRE FILLO WELDING, ATTER WELDING, PROVIDE ONE COAT OF ORGANIC ZINC-RICH PRIMER AND ONE COAT OF HIGH-BUILD BROWN FEOVY PAINT IN ACCORDANCE WITH SECTION 517.3.1.8.2 OF THE STANDARD SPECIFICATIONS. FIELD APPLIED PAINT SHALL EXTEND BEYOND THE DAMAGED PAINTED SURFACES.

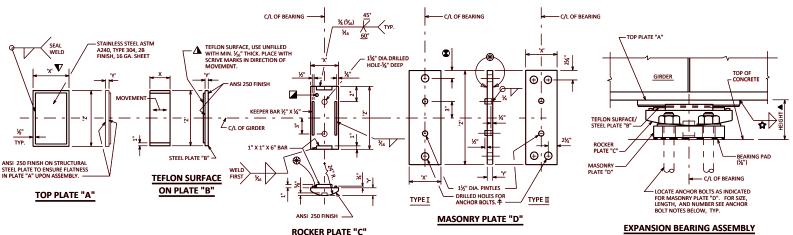
ALL MATERIAL USED FOR BEARINGS SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "BEARING PADS ELASTOMERIC LAMINATED" EACH.

BEARINGS DESIGNED PER METHOD A IN THE CURRENT AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.





APPROVED: Laura Shadewald



EXPANSION BEARING

10" BEARING

TOTAL LOAD	Р	LATE A	١	P	LATE	В		PLATE	С	P	D	HEIGHT	
(KIPS)	х	Υ	Z	х	Υ	Z	х	Υ	Z	х	Υ	Z	FEET
100	9"	%"	10"	5"	½"	10"	7"	11/16"	1'-0¼"	8"	1½"	1'-8"	0.360
180	1'-1"	%"	10"	9"	₩"	10"	11"	23%"	1'-01/4"	8"	1½"	1'-8"	0.438
260	1'-5"	%"	10"	1'-1"	½"	10"	1'-3"	3%"	1'-0¼"	11"	2"	1'-8"	0.604

14" BEARING

TOTAL LOAD	PLATE A PLATE B							PLATE	С		PLATE I	D	HEIGHT
(KIPS)	х	Υ	Z	х	Υ	Z	х	Υ	Z	х	Υ	Z	FEET
210	11"	%"	1'-2"	7"	½"	1'-2"	9"	1 ¹⁵ ⁄/ ₁₆ "	1'-4¼"	8"	1½"	2'-0"	0.401
375	1'-5"	% "	1'-2"	1'-1"	½"	1'-2"	1'-3"	31/8"	1'-41/4"	1'-2"	21/8"	2'-0"	0.677
500	1'-9"	%"	1'-2"	1'-5"	₩"	1'-2"	1'-7"	4%"	1'-4¾"	1'-5"	3¾"	2'-1"	0.802

18" BEARING

TOTAL	Р	LATE A	4	PLATE B				PLATE	С	-	,	HEIGHT	
(KIPS)	х	Υ	Z	х	Υ	Z	х	Υ	Z	х	Y	Z	FEET
280	11"	%"	1'-6"	7"	₩"	1'-6"	9"	1 ¹⁵ ⁄ ₁₆ "	1'-8¼"	9"	2"	2'-4"	0.443
360	1'-1"	%"	1'-6"	9"	½"	1'-6"	11"	23/8"	1'-81⁄4"	11"	2"	2'-4"	0.479
600	1'-7"	5%"	1'-6"	1'-3"	⅓"	1'-6"	1'-5"	3½"	1'-81/4"	1'-5"	3¾"	2'-5"	0.719
650	1'-11"	%"	1'-6"	1'-7"	₩"	1'-6"	1'-9"	4%"	1'-81/4"	1'-10"	31/8"	2'-5"	0.844

12" BEARING

TOTAL	P	LATE	A	Р	LATE	В		PLATE	С	P)	HEIGHT	
(KIPS)	х	Y	Z	х	Υ	Z	х	Υ	Z	Х	Υ	Z	FEET
125	9"	%"	1'-0"	5"	₩"	1'-0"	7"	17/16"	1'-2¼"	8"	1½"	1'-10"	0.360
175	11"	%"	1'-0"	7"	1∕2"	1'-0"	9"	1 ¹⁵ ⁄16"	1'-21/4"	8"	1½"	1'-10"	0.401
275	1'-3"	%"	1'-0"	11"	½"	1'-0"	1'-1"	21/8"	1'-2¼"	11"	2"	1'-10"	0.521

16" BEARING

TOTAL LOAD	F	LATE	A	PI	LATE	В		PLATE	С	F	D	HEIGHT	
(KIPS)	х	Y	Z	х	Υ	Z	х	Υ	Z	х	Υ	Z	FEET
245	11"	%"	1'-4"	7"	₩"	1'-4"	9"	1 ¹⁵ / ₁₆ "	1'-61/4"	8"	1½"	2'-2"	0.401
370	1'-3"	%"	1'-4"	11"	½"	1'-4"	1'-1"	21/8"	1'-61/4"	1'-0"	2¾"	2'-3"	0.552
525	1'-7"	%"	1'-4"	1'-3"	½"	1'-4"	1'-5"	31/8"	1'-6¼"	1'-4"	3%"	2'-3"	0.719
575	1'-9"	%"	1'-4"	1'-5"	½"	1'-4"	1'-7"	4%"	1'-61/4"	1'-6"	3%"	2'-3"	0.844

20" BEARING

ſ	TOTAL LOAD	Р	LATE	Α	F	LATE	В		PLATE	С		PLATE I	D	HEIGHT
L	(KIPS)	X	Υ	Z	Х	Υ	Z	х	Υ	Z	х	Υ	Z	FEET
	225	9"	%"	1'-8"	5"	½"	1'-8"	7"	17⁄16"	1'-10¾"	8"	1½"	2'-6"	0.360
ſ	315	11"	%"	1'-8"	7"	½"	1'-8"	9"	1 ¹⁵ / ₁₆ "	1'-101/4"	9"	2"	2'-6"	0.443
	495	1'-3"	%"	1'-8"	11"	⅓"	1'-8"	1'-1"	27/8"	1'-101/4"	1'-1"	21/8"	2'-7"	0.594
	675	1'-7"	%"	1'-8"	1'-3"	₩"	1'-8"	1'-5"	3%"	1'-10¼"	1'-6"	3%"	2'-7"	0.760
	705	1'-11"	%"	1'-8"	1'-7"	⅓"	1'-8"	1'-9"	41/8"	1'-10¼"	1'-11"	3%"	2'-7"	0.844

DESIGNER NOTES

HEIGHT OF BEARINGS GIVEN IN TABLES INCLUDES ½" BEARING PAD, 16 GAGE STAINLESS STEEL SHEET AND ½6" TEFLON SURFACE.

(SEE "DESIGNER NOTES" FOR BEARING REPLACEMENTS)

DETAIL SHIM PLATES AS DESCRIBED IN NOTES ON STANDARD 24.02

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

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

- FOR WELD SIZE, REFER TO STANDARD 24.02.
- ▲ ADJUST HEIGHT IF BEVELED ROCKER PLATE "C" IS USED.

FOR BEARING REPLACEMENTS, DESIGNER SHALL UTILIZE A WIDER BEARING THAN THE EXISTING GIRDER BOTTOM FLANGE WIDTH TO ALLOW FOR FIELD WELDING OF THE EDGE OF THE BOTTOM FLANGE TO THE TOP OF PLATE "A". SEE STANDARD 40.08 FOR DETAILS.

FOR BEARING REPLACEMENTS, SEE STD. 27.02 FOR MINIMUM ANCHOR BOLT CLEARANCE INFORMATION.

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

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

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

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

ANCHOR BOLT NOTES

FOR SPAN LENGTHS UP TO 100'-0": USE A TYPE I MASONRY PLATE "D" WITH (2) - $1\frac{1}{4}$ " DIA. x 1'-5" LONG ANCHOR BOLTS.

FOR SPAN LENGTHS FROM 100'-0" UP TO 150'-0": USE A TYPE] MASONRY PLATE "D" WITH (2) - $1\frac{1}{2}$ DIA. X 1'-0" LONG ANCHOR BOLTS.

FOR SPAN LENGTHS GREATER THAN 150'-0": USE A TYPE II MASONRY PLATE "D" WITH (4) - 1½" DIA. X 1'-10" LONG ANCHOR BOLTS.

CHECK THAT ANCHOR BOLTS PROVIDE ADEQUATE HORIZONTAL CAPACITY.

BEARING NOTES

ALL BEARINGS ARE SYMMETRICAL ABOUT C/L OF GIRDER

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

ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153, CLASS C.

ROCKER PLATE "C" AND MASONRY PLATE "D" SHALL BE GALVANIZED. TOP PLATE "A" AND STEEL PLATE "B" SHALL BE SHOP PAINTED. USE A WELDABLE PRIMER ON TOP PLATE "A". DO NOT PAINT STAINLESS STEEL OR TEFLON SUBFACES.

ALL MATERIAL IN BEARINGS, INCLUDING SHIM PLATES, BUT EXCLUDING STAINLESS STEEL SHEET, TEFLON SURFACE, PINTLES, ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A709 GRADE 50W.

IN LIEU OF USING SHIM PLATES, FABRICATOR MAY INCREASE THICKNESS OF TOP PLATE "A" OR MASONRY PLATE "D" BY THE SHIM PLATE THICKNESS.

DIMENSION IS 2" WHEN 1½" DIA. ANCHOR BOLTS ARE USED AND 2½" WHEN 1½" DIA.ANCHOR BOLTS ARE USED.

ALL MATERIAL IN TYPE "A-T" BEARINGS, INCLUDING SHIM PLATES AND BEARING PADS, SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "BEARING ASSEMBLIES EXPANSION B-_-", EACH.

CHAMFER ANCHOR BOLTS PRIOR TO THREADING.

ALL FINISHED SURFACES SHALL BE MACHINE FINISHED BY AN AUTOMATIC PROCESS.

ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS.

ALL STRUCTURAL STEEL BEARING PLATES SHALL BE FLAT ROLLED STEEL PLATES WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL.

PROVIDE 1/8" THICK BEARING PAD THE SAME SIZE AS MASONRY PLATE "D" FOR EACH BEARING.

ANCHOR BOLTS SHALL BE THREADED 3". PROVIDE ONE STANDARD WROUGHT WASHER AND ONE HEX NUT PER BOLT. PROJECT ANCHOR BOLTS, MASONRY PLATE "D" THICKNESS + 2½", ABOVE TOP OF CONCRETE.

CHAMFER TOP OF PINTLES ½". DRILL HOLES FOR ALL PINTLES IN MASONRY PLATE "D" FOR A DRIVING FIT.

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

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

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

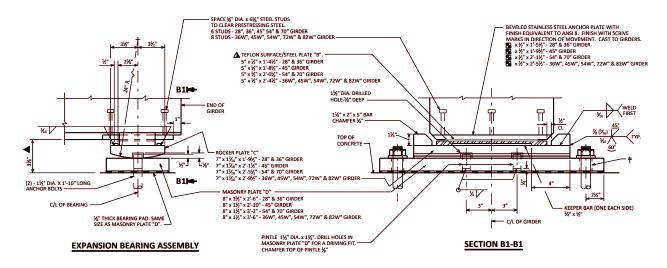
- PROVIDE A METHOD FOR HANDLING ROCKER PLATE "C"
- ▲ BOND STEEL PLATE "B" AND TEFLON WITH ADHESIVE MATERIAL MEETING THE REQUIREMENTS FOUND IN THE STANDARD SPECIFICATION.
- + DRILLED HOLES FOR ANCHOR BOLTS IN MASONRY PLATE "D" SHALL HAVE A DIAMETER %" LARGER THAN ANCHOR BOLT.

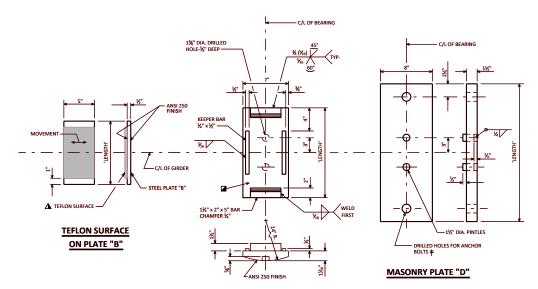
AT INSTALLATION, ENSURE STAINLESS STEEL SLIDING FACE OF THE UPPER ELBEMENT AND THE TFE SLIDING FACE OF THE LOWER ELEMENT HAVE THE SURFACE FINISH SPECIFIED AND ARE CLEAN AND FREE OF ALL DUST, MOISTURE, OR ANY OTHER FOREIGN MATTER.

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



APPROVED: Laura Shadewald





ROCKER PLATE "C"

EXPANSION BEARING

BEARING NOTES

ALL BEARINGS ARE SYMMETRICAL ABOUT C/L OF GIRDER AND C/L OF BEARING.

ALL MATERIAL IN BEARINGS, BUT EXCLUDING STAINLESS STEEL PLATE, TEFLON SURFACE, PINTLES, ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A709 GRADE 50W.

STAINLESS STEEL PLATE SHALL CONFORM TO ASTM A240, TYPE 304.

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

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

ALL STRUCTURAL STEEL BEARING PLATES SHALL BE FLAT ROLLED STEEL PLATES WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT, AND VERTICAL

ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS.

ALL FINISHED SURFACES SHALL BE MACHINE FINISHED BY AN AUTOMATIC PROCESS.

ANCHOR BOLTS SHALL BE THREADED 3". PROVIDE ONE STANDARD WROUGHT WASHER AND ONE HEX NUT PER BOLT. PROJECT ANCHOR BOLTS, MASONRY PLATE "D" THICKNESS + 2½", ABOVE TOP CONCRETE.

CHAMFER ANCHOR BOLTS PRIOR TO THREADING.

MASONRY PLATE "D", ROCKER PLATE "C", ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153, CLASS "C". STEEL PLATE "B" SHALL BE SHOP PAINT TELON SURFACE.

ALL MATERIAL IN "STEEL BEARINGS FOR PRESTRESSED CONCRETE GIRDERS". INCLUDING BEARING PADS, SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "BEARING ASSEMBLES FXPANSION R. - "FACT."

- † DRILLED HOLES FOR ANCHOR BOLTS IN MASONRY PLATE "D" SHALL HAVE A DIAMETER %" LARGER THAN ANCHOR BOLT.
- ▲ TEFLON SURFACE, USE UNFILLED WITH MINIMUM ¼_a" THICKNESS. PLACE WITH SCRIVE MARKS IN DIRECTION OF MOVEMENT. BOND STEEL PLATE "B" AND TEFLON WITH ADDESIVE MATERIAL MEETING THE REQUIREMENTS FOUND IN THE STANDARD SPECIFICATION.
- PROVIDE A METHOD FOR HANDLING ROCKER PLATE "C" DURING GALVANIZING

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

DESIGNER NOTES

IF ALL BEARINGS AT A GIVEN SUBSTRUCTURE UNIT ARE FIXED, UTILIZE ½" THICK ELASTOMERIC BEARING PADS AND FULL-DEPTH CONCRETE DIAPHRAGMS.

FOR EXPANSION BEARINGS, USE LAMINATED ELASTOMERIC BEARINGS WHENEVER POSSIBLE.

SEE STANDARD 27.02 AND 19.31 FOR CLEARANCE REQUIREMENTS AND STANDARD 27.02 FOR THE USE OF BEVELED ROCKER PLATE "C" ON GRADES GREATER THAN 3%.

HEIGHT OF BEARING SHOWN IN "EXPANSION BEARING ASSEMBLY" INCLUDES $\frac{1}{3}$ " BEARING PAD AND $\frac{1}{3}$ 8" TEFLON SURFACE.

- ▲ ADJUST HEIGHT IF BEVELED ROCKER PLATE "C" IS USED.
- ANCHOR PLATE LENGTH TO BE DESIGNED. MINIMUM LENGTH IS 10". SEE STD. 27.10 FOR ADDITIONAL GUIDANCE.

CALCULATE THE REACTIONS AT THE BEARINGS DUE TO "TOTAL LOADS" AND ALSO "DEAD LOADS" ONLY USE THE ANSHTO LERFO SERVICE! LOAD COMBINATION AND CHECK TO SEE IF THE REACTIONS EXCEED THE BEARING CAPACITIES IN THE TRALE BELOW. CONSIDER ONLY DEAD LOAD (DC + DW) AND H-93 LIVE LOADS (LL), INCLUDING A 33% PYNAMIC LOAD ALLOWANCE (M).

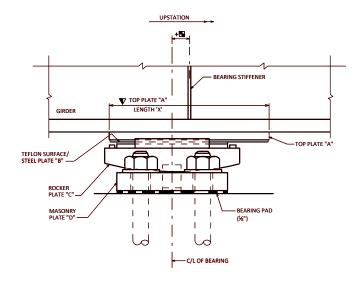
IF EITHER REACTION EXCEEDS ITS CORRESPONDING BEARING CAPACITY, THE BEARING DETAILS AS SHOWN ON THIS STANDARD MUST BE MODIFIED TO INCREASE THE BEARING PAPACITY. IF BEARING DETAILS ARE CHANGED AND ANY PLATE HAS A THICKNESS GREATER THAN 2", THEN PROVIDE AN ANSI 250 FINISH TO TOP AND BOTTOM SURFACE OF THESE PLATES.

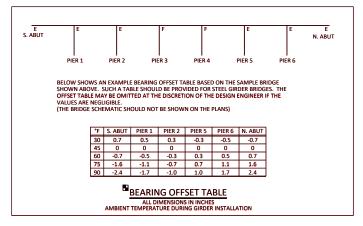
	GIRDER SIZE	28" & 36"	45"	54" & 70"	36W", 45W", 54W", 72W" & 82W"
BEARING CAPACITY (KIPS)	TOTAL LOAD (DC+DW+(LL+IM))	180	230	280	330
	DEAD LOAD (DC + DW)	110	140	170	200

STEEL BEARINGS FOR PRESTRESSED CONCRETE GIRDERS



APPROVED: Laura Shadewald





EXPANSION BEARING ASSEMBLY

FOR STEEL GIRDER (SHOW ON PLANS)

NOTES

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

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

DESIGNER NOTES

THIS STANDARD SHOULD ONLY BE USED FOR STEEL BEARINGS.

▼ TOP PLATE "A" FOR STEEL GIRDER BEARINGS TO BE DESIGNED TO ACCOUNT FOR THERMAL MOVEMENT AND CONSTRUCTION TOLERANCE. (USE GREATER OF VALUE FROM PROCEDURE BELOW OR SIZE FROM STANDARD 27.08).

PROCEDURE FOR SIZING TOP PLATE "A":

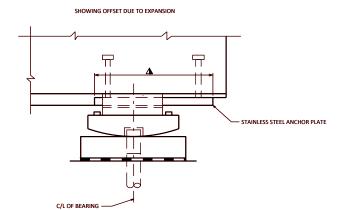
- ½ TEFLON PLATE "B" LENGTH 'X' + THERMAL MOVEMENT (USE 60-(-30)=90 DEGREES)
- +1" CONSTRUCTION TOLERANCE
 =½ TOP PLATE "A" LENGTH (DOUBLE THIS FOR PLATE "A" LENGTH)
- ANCHOR PLATES IN PRESTRESSED GIRDERS TO BE DESIGNED TO ACCOUNT FOR THERMAL MOVEMENT, GIRDER SHRINKAGE AND CONSTRUCTION TOLERANCE.

PROCEDURE FOR SIZING ANCHOR PLATE:

- 2½ INCHES = ½ TEFLON PLATE LENGTH + THERMAL MOVEMENT (USE 60-5=55 DEGREES)
- + SHRINKAGE = 0.0003'/'
- + 1" CONSTRUCTION TOLEARNCE
- = ½ ANCHOR PLATE LENGTH (DOUBLE THIS FOR PLATE LENGTH)

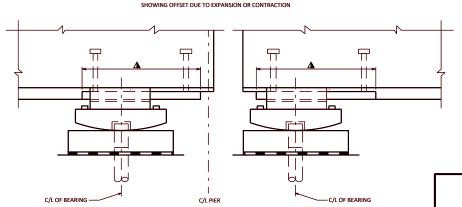
ACCORDING TO AASHTO, THE LOAD FACTOR FOR TU IS 1.20 FOR DEFORMATIONS. THE PROCEDURE OUTLINED ABOVE SHOULD BE USED WITH A LOAD FACTOR OF 1.0, WITH THE 1" CONSTRUCTION TOLERANCE BEING USED IN LIEU OF THE HIGHER LOAD FACTOR.

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



EXPANSION BEARING AT ABUTMENT

FOR DESIGNER INFORMATION, ONLY (DO NOT PUT ON THE PLANS)



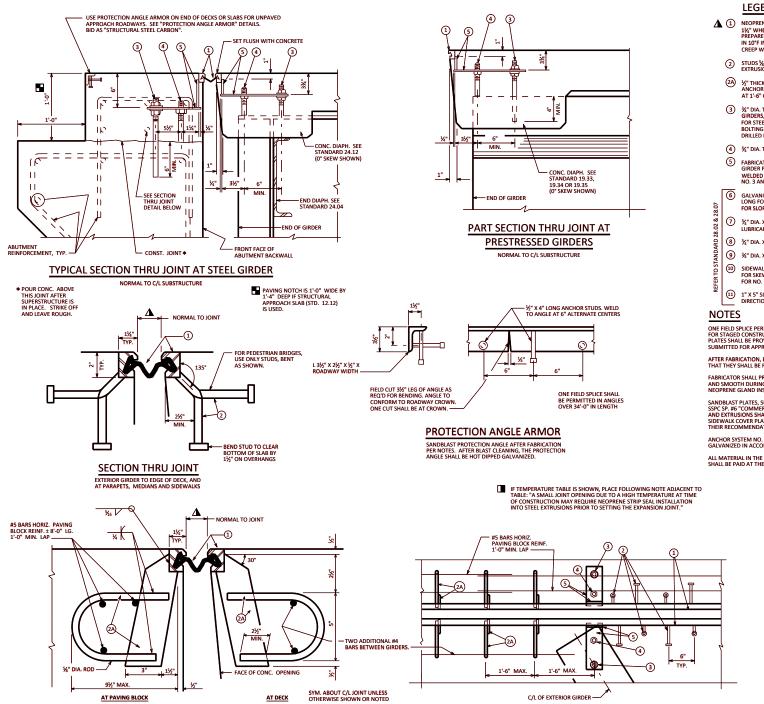
EXPANSION BEARINGS AT PIER

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

STEEL EXPANSION **BEARING DETAILS**



APPROVED: Laura Shadewald



PART PLAN

SECTION THRU JOINT

ROADWAY TRAFFIC AREA BETWEEN EXTERIOR GIRDERS.

LEGEND

- ▲ ① NEOPRENE STRIP SEAL (_-INCH) AND STEEL EXTRUSIONS. SET JOINT OPENING AT 13/" WHEN EXPANSION ENGTH 5 230"-0". WHEN EXPANSION LENGTH > 230"-0". PREPARE A TEMPERATURE TABLE SHOWING JOINT OPENINGS FROM 5"F TO 85"F IN 10"F INCREMENTS. ACCOUNT FOR PRESTRESSED GIRDER SHRINKAGE DUE TO CREEP WHEN DETERMINING THIS TABLE. JOINT OPENINGS GIVEN NORMAL TO JOINT.
- ② STUDS ¾" DIA. X 6¾" LONG AT 6" ALTERNATE CENTERS. WELD TO EXTRUSIONS AND BEND AS SHOWN AFTER WELDING.
- $\frac{1}{2}$ " THICK ANCHOR PLATE WITH $\frac{1}{2}$ " DIA. ROD (OR ALTERNATE STRIP SEAL ANCHOR). WELD ROD TO ANCHOR PLATE, WELD ANCHOR PLATE TO NO. 1 AT 1'-6" CENTERS BETWEEN GIRDERS.
- 3 ¾" DIA. THREADED ROD WITH 2 NUTS AND PLATE WASHERS. FOR PRESTRESSED GIRDERS, GROUT THREADED ROD INTO FIELD DRILLED HOLES ON C/L OF GIRDER. FOR STEEL GIRDERS, WELD THREADED ROD TO TOP FLANGE OR ATTACH BY BOLTING THRU FLANGE. ON ABUTMENT SIDE, GROUT THREADED ROD INTO FIELD DRILLED HOLES IN ABUTMENT BACKWALL AS SHOWN.
- (4) ¾" DIA. THREADED ROD WITH NUT. TACK WELD NUT TO NO. 5.
- FABRICATE SUPPORT FROM 3" X ½" BAR AS SHOWN OR EQUIVALENT. ONE PER GIRDER PER SIDE. SHOP OR FIELD WELD TO NO. 1 IF FIELD WELDED, COVER WELDED AREAS WITH EPOXY-COATING MATERIAL. PROVIDE 1½" DIA. HOLE FOR NO. 3 AND 1" DIA. HOLE FOR NO. 4.
- GALVANIZED PLATE $\frac{1}{3}$ " X 10" X (2'-2" LONG FOR SKEWS TO 45" AND 3'-0" LONG FOR SKEWS > 45") WITH HOLES FOR NO. 7, FOR SINGLE SLOPE PARAPET. FOR SLOPED FACE PARAPET, SEE STANDARD 28.07.
- 3/4" DIA. X 11/2" STAINLESS STEEL SOCKET FLAT HEAD SCREWS WITH ANTI-SEIZE LUBRICANT. PLACE IN COUNTERSUNK HOLE. RECESS 1/26" BELOW PLATE SURFACE.
- (8) ¾" DIA. X 4" GALVANIZED HEX HEAD BOLT, BEND 45°.
- ¾" DIA. X 2¾" GALVANIZED THREADED COUPLING.
- (3) SIDEWALK COVER PLATE ½" X (2'-0" WIDE FOR SKEWS TO 45" AND 3'-0" WIDE FOR SKEWS -54") X LIMITS SHOWN. BEIND DOWN FACE OF SIDEWALK WITH HOLES FOR NO. 7. GALVANIZE PLATE AFTER SLIP-RESISTANT SURFACE APPLIED.
- (1) 1" X 5" SLOTTED COUNTERSUNK HOLE FOR NO. 7. PLACE SLOT PARALLEL TO DIRECTION OF MOVEMENT.

ONE FIELD SPLICE PERMITTED IN STEEL EXTRUSIONS, UNLESS MORE ARE REQUIRED ONE FIELD PLICE PERMITTED IN STANDLING OR GALVANIZING REQUIREMENTS. IF USED, ANCHOR PLATES SHALL BE FOOD EACH STANDLING STANDLING SPICE. DEFAILS SHALL BE SUBMITTED FOR APPROVIDED 3" FROM EACH SIDE OF THE FIELD SPICE. DEFAILS SHALL BE SUBMITTED TO THE PROPERTY OF THE PRO

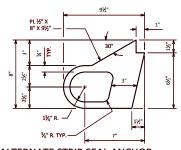
AFTER FABRICATION, BUT BEFORE SHIPMENT, STRAIGHTEN STEEL EXTRUSIONS SUCH THAT THEY SHALL BE FREE FROM WARP, TWIST AND SWEEP.

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

SANDBLAST PLATES, SUPPORTS AND EXTRUSIONS AFTER FABRICATION IN ACCORDANCE WITH SSPC SP. 46 "COMMERCIAL BLAST CLEANING". AFTER BLAST CLEANING, THE PLATES, SUPPORTS AND EXTRUSIONS SHALL BE HOT DIPPED GALVANIZED. SLIP-RESISTANT SURFACE IS APPLIED TO SIDEWALK COVER PLATES BY THE MANUFACTURER AND THEN HOT DIPPED GALVANIZED TO THEIR RECOMMENDATIONS TO MAINTAIN THE INTEGRITY OF THIS SURFACE.

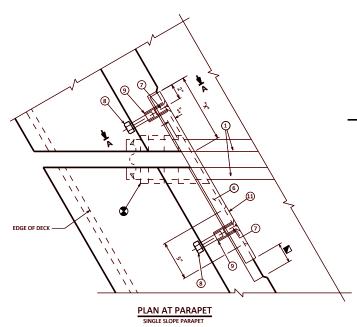
ANCHOR SYSTEM NO. 8 AND NO. 9 SHALL CONFORM TO ASTM A307 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 CLASS C AND D.

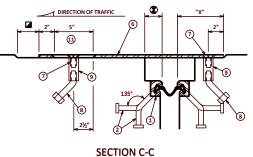
ALL MATERIAL IN THE EXPANSION JOINT ASSEMBLY, INCLUDING ANCHOR STUDS AND HARDWARE SHALL BE PAID AT THE UNIT PRICE BID FOR "EXPANSION DEVICE", LF.

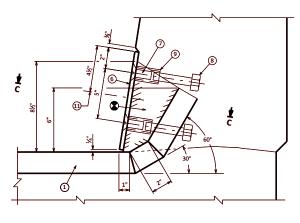


ALTERNATE STRIP SEAL ANCHOR



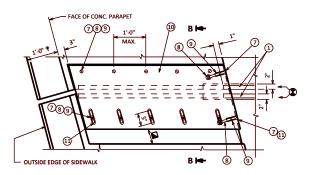






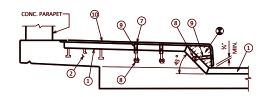
SECTION A-A SINGLE SLOPE PARAPET

"X" - VAI	UES IN INC	CHES		USE "X" = 6½" FOR 0° SKEW									
SKEW	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°
RHF	6⅓	6⅓	6⅓	6⅓	6½	6½	6⅓	6½	6½	7	7	7½	8
LHF	7	7½	8	8½	9	9½	10½	11	11½	13	13½	14½	15½

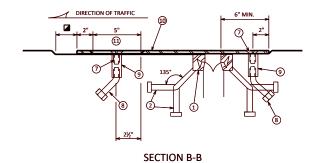


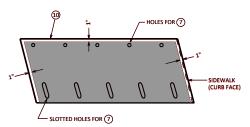
PLAN AT SIDEWALK

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



SECTION AT SIDEWALK





PLAN OF SIDEWALK COVER PLATE WITH SLIP-RESISTANT SURFACE

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

DESIGNER NOTES

PRODUCT

SLIPNOT GRADE 2, STEEL

ALGRIP, STEEL

FOR NEW BRIDGES, JOINT TO BE DETAILED STRAIGHT.

FOR JOINT REPLACEMENT PROJECTS, JOINT SHALL BE DETAILED TO MATCH ORIGINAL CONFIGURATION (STRAIGHT OR KINKED) IN ORDER TO REDUCE SUBSTRUCTURE MODIFICATIONS REQUIRED.

APPROVED SLIP-RESISTANT APPLIED SURFACES FOR STEEL PLATES

MANUFACTURER

W. S. MOLNAR COMPANY

ROSS TECHNOLOGY CORP.

CONTACT AT

1-800-SLIPNOT

1-800-345-8170

PLAN DETAILS SHALL REMOVE ENOUGH PARAPET LATERALLY, AND FULL HEIGHT, TO ENSURE DURABILITLY OF THE JOINT REPLACEMENT.

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VIEW OF PARAPET PLATES

FROM ROADWAY

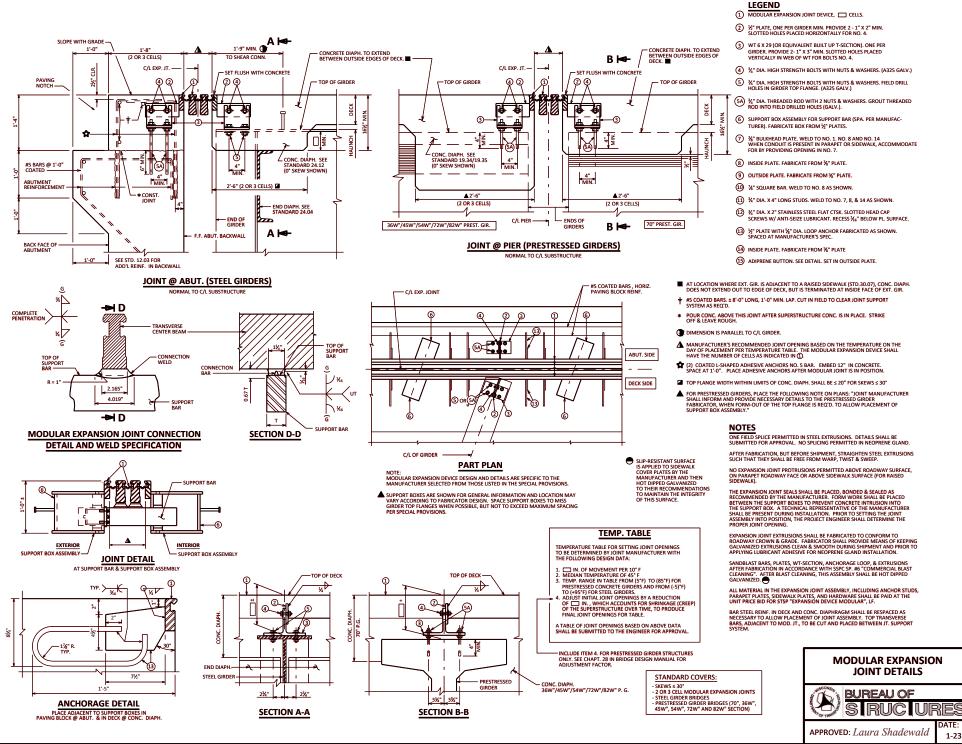
SINGLE SLOPE PARAPET

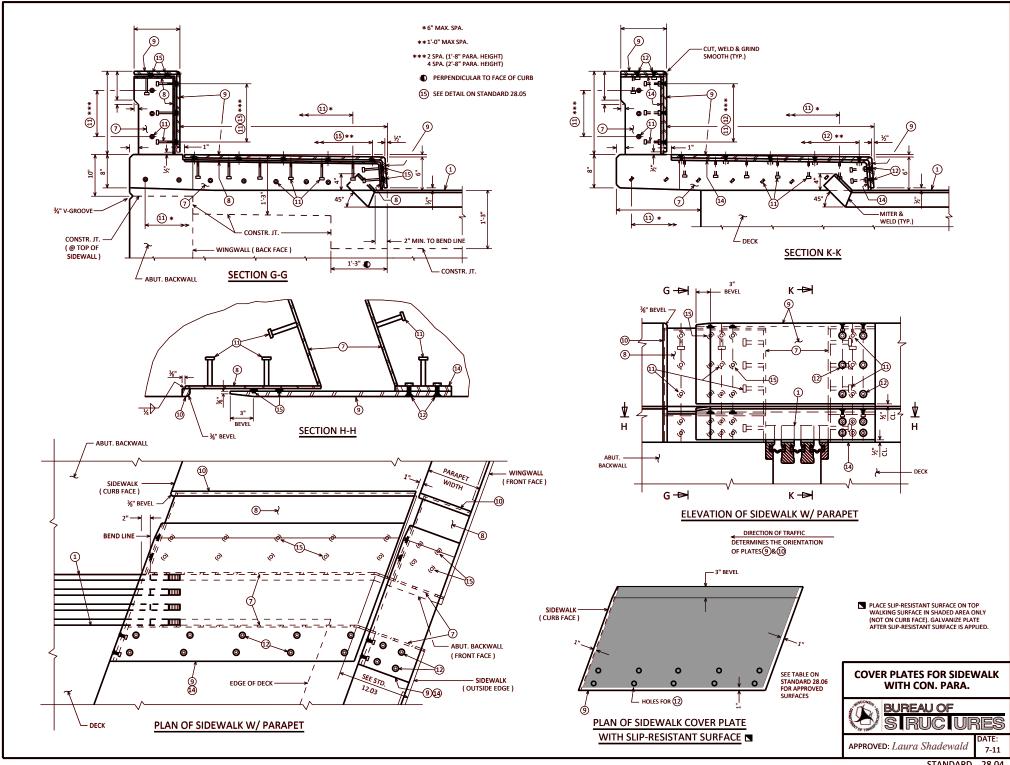
- BLOCK OUT CONCRETE 2" EACH SIDE OF JOINT OPENING
- JOINT OPENING DIM. ALONG SKEW PLUS ½"

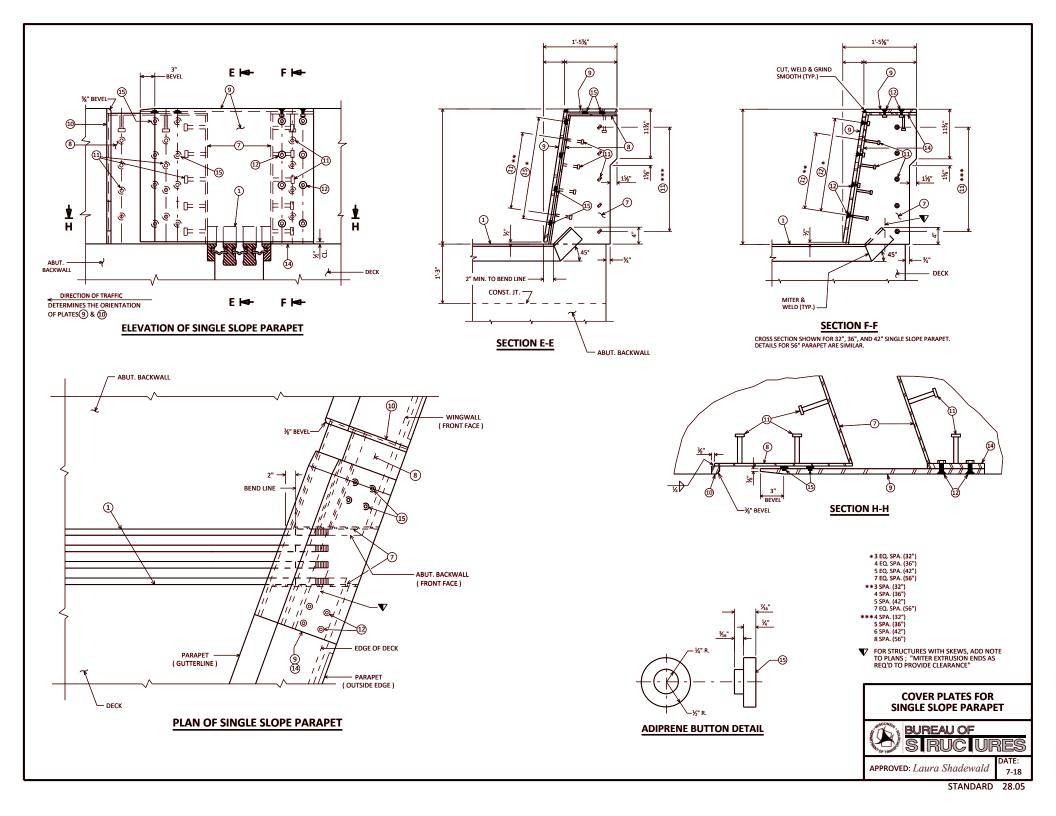
STRIP SEAL COVER PLATES SINGLE SLOPE PARA./SDWK.

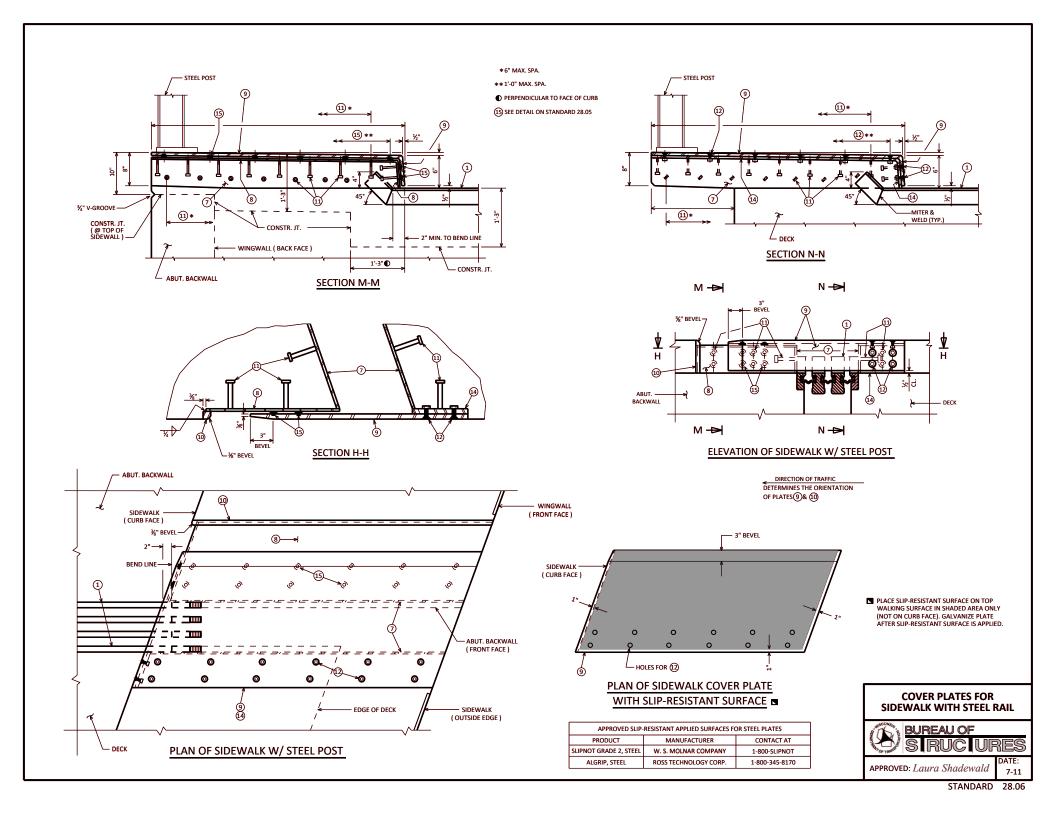


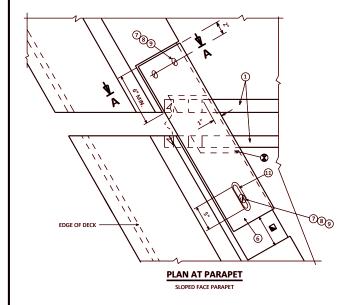
APPROVED: Laura Shadewald

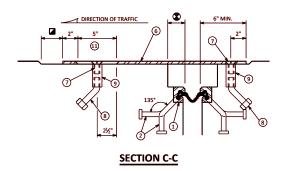


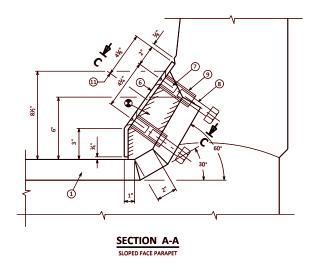




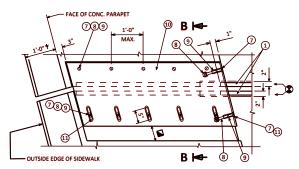






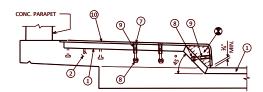


6 GALVANIZED PLATE $\frac{1}{3}$ " X 10½" X (2'-2" LONG FOR SKEWS TO 45° AND 3'-0" LONG FOR SKEWS \geq 45°) WITH HOLES FOR NO. 7. BEND AS SHOWN.

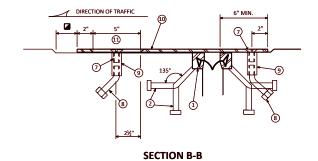


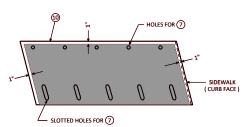
PLAN AT SIDEWALK

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



SECTION AT SIDEWALK





PLAN OF SIDEWALK COVER PLATE WITH SLIP-RESISTANT SURFACE

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

DESIGNER NOTES

PRODUCT

ALGRIP, STEEL

SLIPNOT GRADE 2, STEEL

FOR JOINT REPLACEMENT PROJECTS, JOINT SHALL BE DETAILED TO MATCH ORIGINAL CONFIGURATION (STRAIGHT OR KINKED) IN ORDER TO REDUCE SUBSTRUCTURE MODIFICATIONS REQUIRED.

APPROVED SLIP-RESISTANT APPLIED SURFACES FOR STEEL PLATES

MANUFACTURER

W. S. MOLNAR COMPANY

ROSS TECHNOLOGY CORP.

CONTACT AT

1-800-SLIPNOT

1-800-345-8170

PLAN DETAILS SHALL REMOVE ENOUGH PARAPET LATERALLY, AND FULL HEIGHT, TO ENSURE DURABILITLY OF THE JOINT REPLACEMENT.

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VIEW OF PARAPET PLATES					

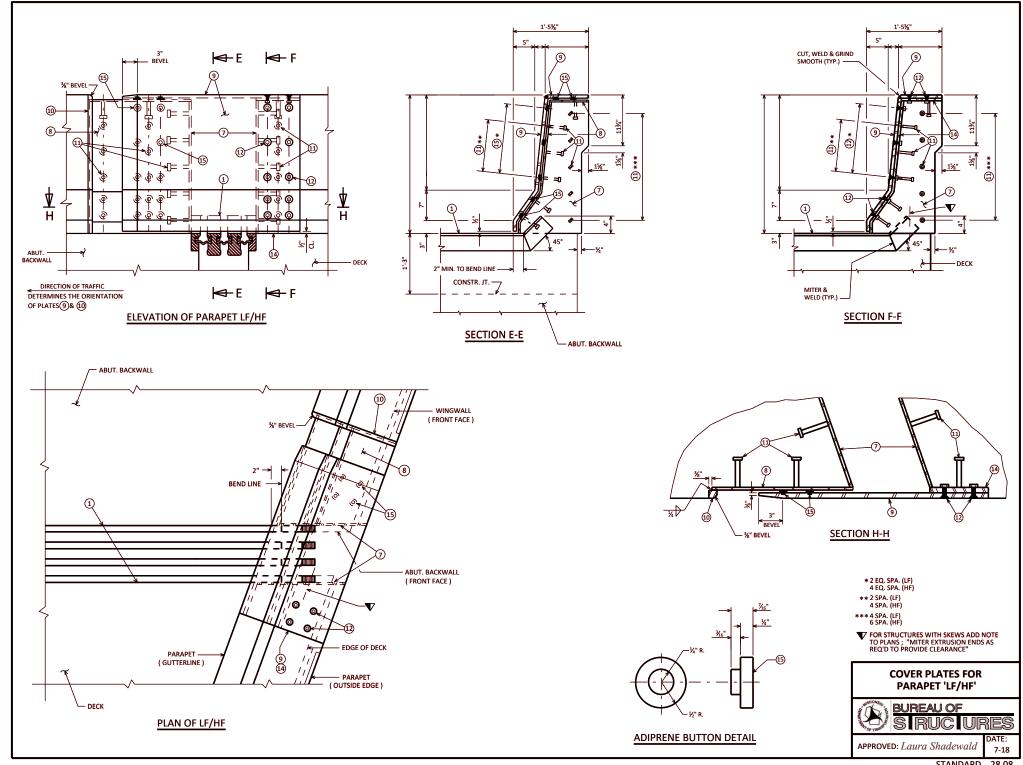
FROM ROADWAY

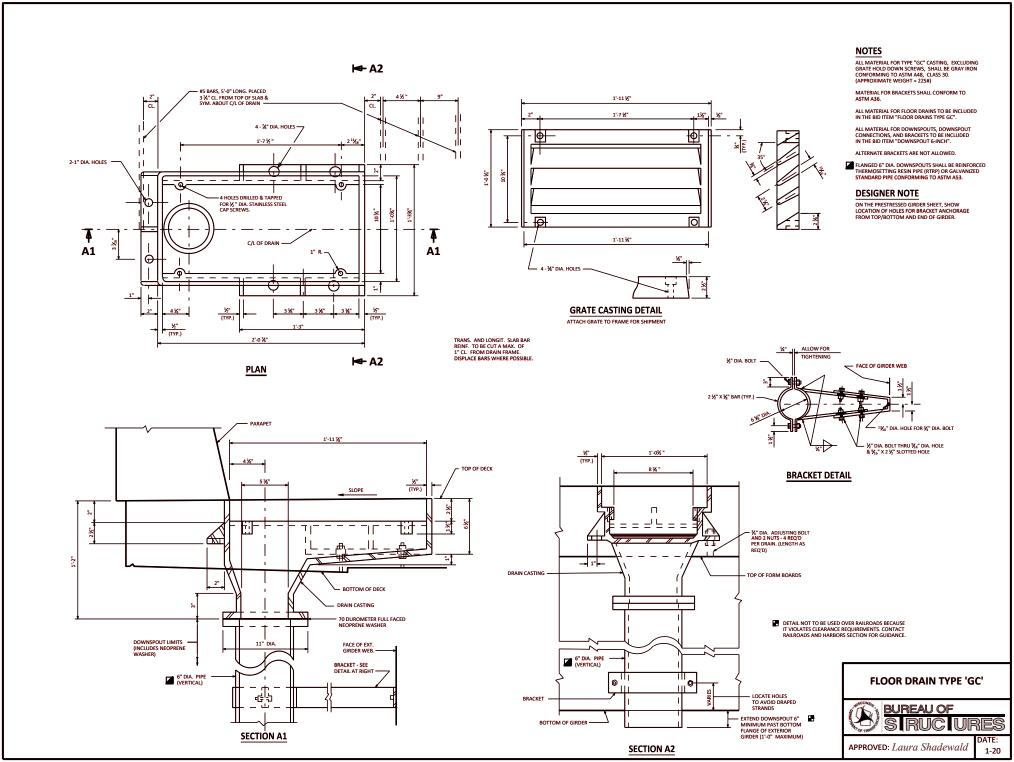
SLOPED FACE PARAPET

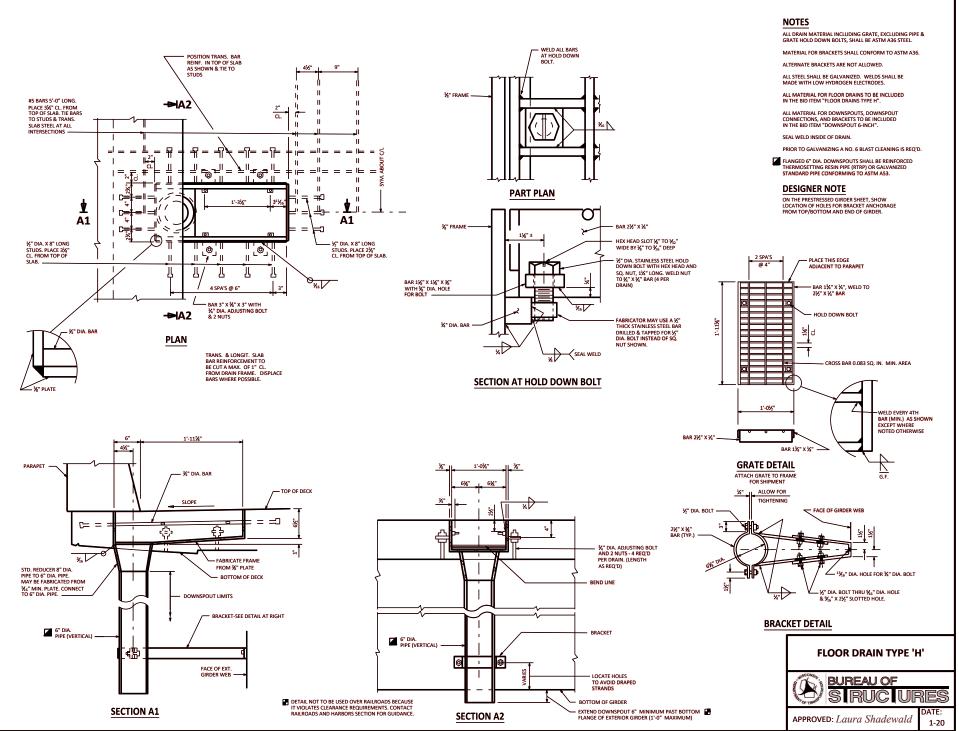
- BLOCK OUT CONCRETE 2" EACH SIDE OF JOINT OPENING
- JOINT OPENING DIM. ALONG SKEW PLUS ½"

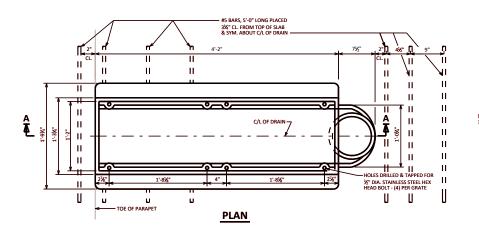
STRIP SEAL COVER PLATES SLOPED FACE PARA./SDWK.

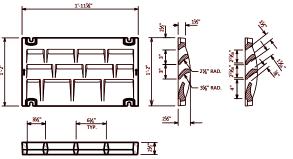












GRATE CASTING DETAILS

ATTACH GRATES TO FRAME FOR SHIPMENT

NOTES

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

MATERIAL FOR BRACKETS SHALL CONFORM TO ASTM A36.

ALTERNATE BRACKETS ARE NOT ALLOWED.

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

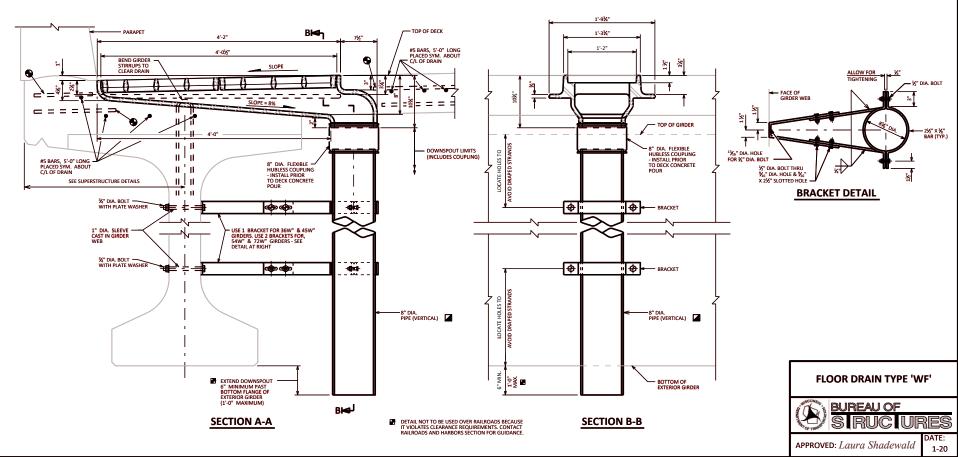
ALL MATERIAL FOR DOWNSPOUTS, DOWNSPOUT CONNECTIONS, AND BRACKETS TO BE INCLUDED IN THE BID ITEM "DOWNSPOUT 8-INCH".

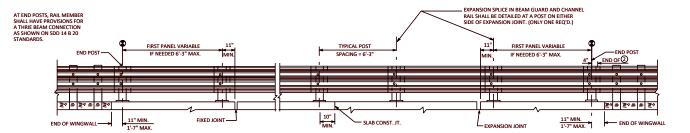
8" DIA. DOWNSPOUTS SHALL BE REINFORCED THERMOSETTING RESIN PIPE (RTRP).

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

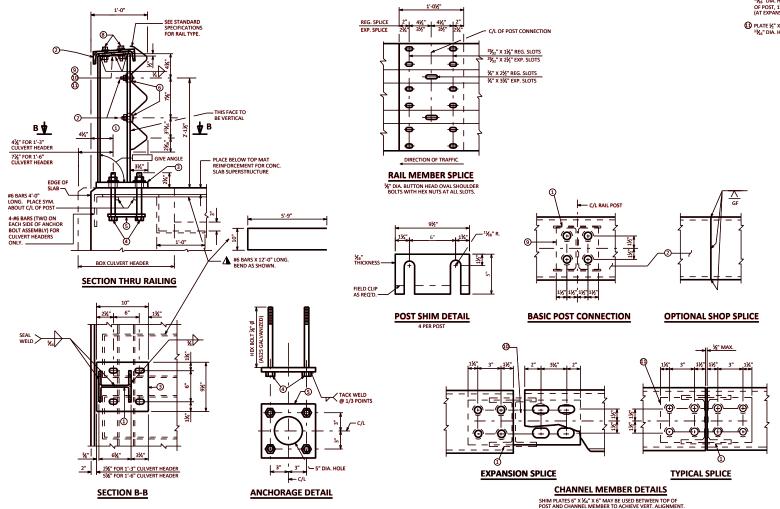
DESIGNER NOTE

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





ELEVATION OF RAILING



LEGEND

- W6x25 WITH 2 ½" X 2½" VERT. SLOTS IN FLG. (SLOT ON OTHER SIDE OF WEB IS OPTIONAL) FOR NO.7 CUT BOTTOM OF POST TO MATCH CROSS SLOPE OF ROADWAY. PLACE POSTS VERTICAL AND NORMAL TO GRADE LINE

 WESTICAL AND NORMAL LINE

 WESTICAL AND NORMAL
- ② C8x11.5 WITH 13/16" DIA. HOLES FOR NO. 8.
- (3) BASE PLATE 1" X 9½" X 10" WITH 1½6" X 1½"
 SLOTTED HOLES FOR ANCHOR BOLTS NO.4 WELD TO NO.1 AS
- (a) A225 3/4" HER BOLTS (GALVANIZED) WITH A235 NUT AND WASHER 14" LONG AT END POSTS AND AT POSTS ON CONCRETE SLAB SUPERSTRUCTURES WHERE THE SLAB THICKNESS IS > 15". USE 8" LONG AT ALL OTHER LOCATION. A RECUP. PER POST. THREAD 3" AND PLACE NORMAL TO PLATE NO.3 CHAMFER TOP OF BOLTS BEFORE THREAD NO.3 CHAMFER TOP OF BOLTS BEFORE THREAD TO.3
- ⑥ 1¾" X 3" MOUNTING BOLT WASHER (GALVANIZED).
- $\begin{picture}(60,0)\put(0,0){\line(0,0){10}} \put(0,0){\line(0,0){10}} \put(0,0)$
- (8) %" DIA. X 2" HEX BOLTS WITH NUT AND TWO WASHERS EACH.
- ¶ PLATE ½" X 5¾" X 6" AT BASIC POST CONNECTION.

 1¼" DIA. HOLES IN PLATE. 1¾6" DIA. HOLES IN CHANNEL.

 14. DIA. HOLES IN PLATE. 1 № 1 DIA. HOLES IN CHANNEL.

 14. DIA. HOLES IN PLATE. 1 № 1 DIA. HOLES IN CHANNEL.

 15. DIA. HOLES IN PLATE. 1 № 1 DIA. HOLES IN CHANNEL.

 16. DIA. HOLES IN PLATE. 1 № 1 DIA. HOLES IN CHANNEL.

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 17. DIA. HOLES IN PLATE. 1 № 1 DIA. HOLES IN CHANNEL.

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 20. DIA. HOLES IN PLATE. 1 № 1 DIA. HOLES IN CHANNEL.

 20. DIA. HOLE
- PLATE ½" X 5¾" X 11½". 1½" DIA. HOLES IN PLATE,

 1¾6" DIA. HOLES IN CHANNEL. (AT TYPICAL SPLCE.)

NOTES

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

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

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

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

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

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

SEE STANDARD SPECIFICATIONS FOR RAIL TYPE.

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

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

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

SEE BRIDGE MANUAL 30.2 FOR ALLOWED USE.

- ▲ TIE TO TOP MAT OF STEEL. PUT THESE BARS IN BILL OF BARS FOR SUPERSTRUCTURE. NOT REQ'D. FOR BOX CULVERT HEADERS.
- PAY LIMITS FOR TYPE "W" STEEL RAILING.

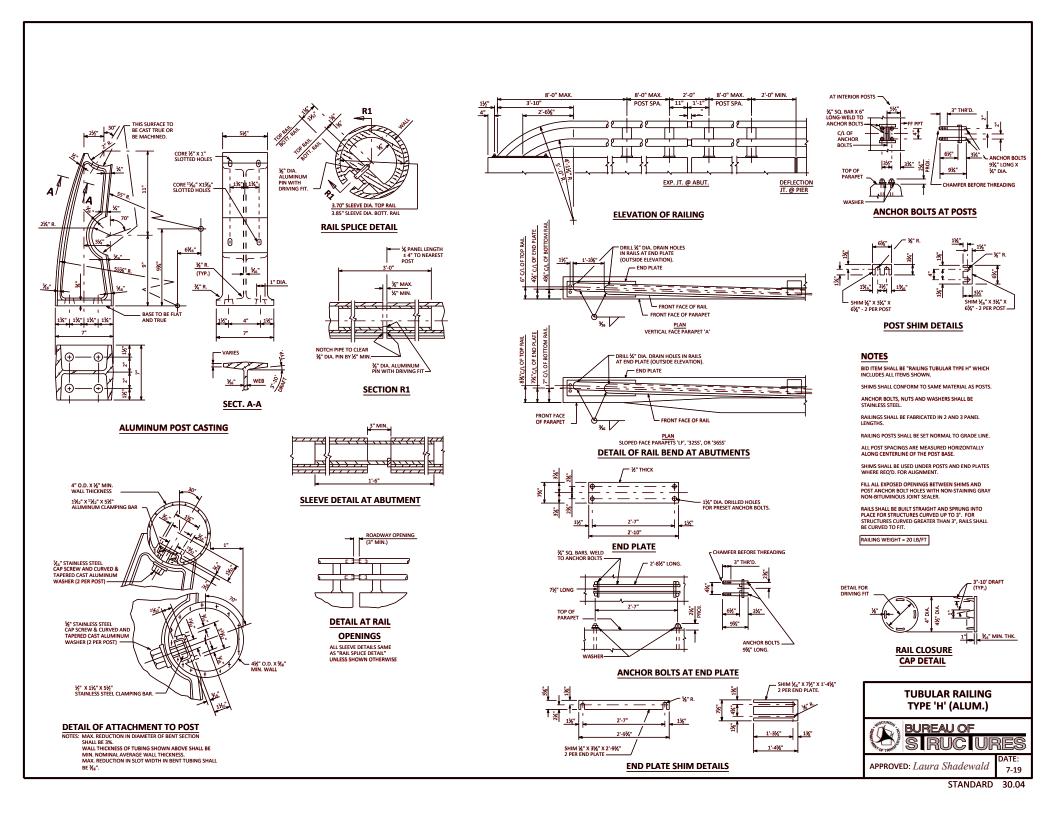
WEIGHT = 45 LB/FT

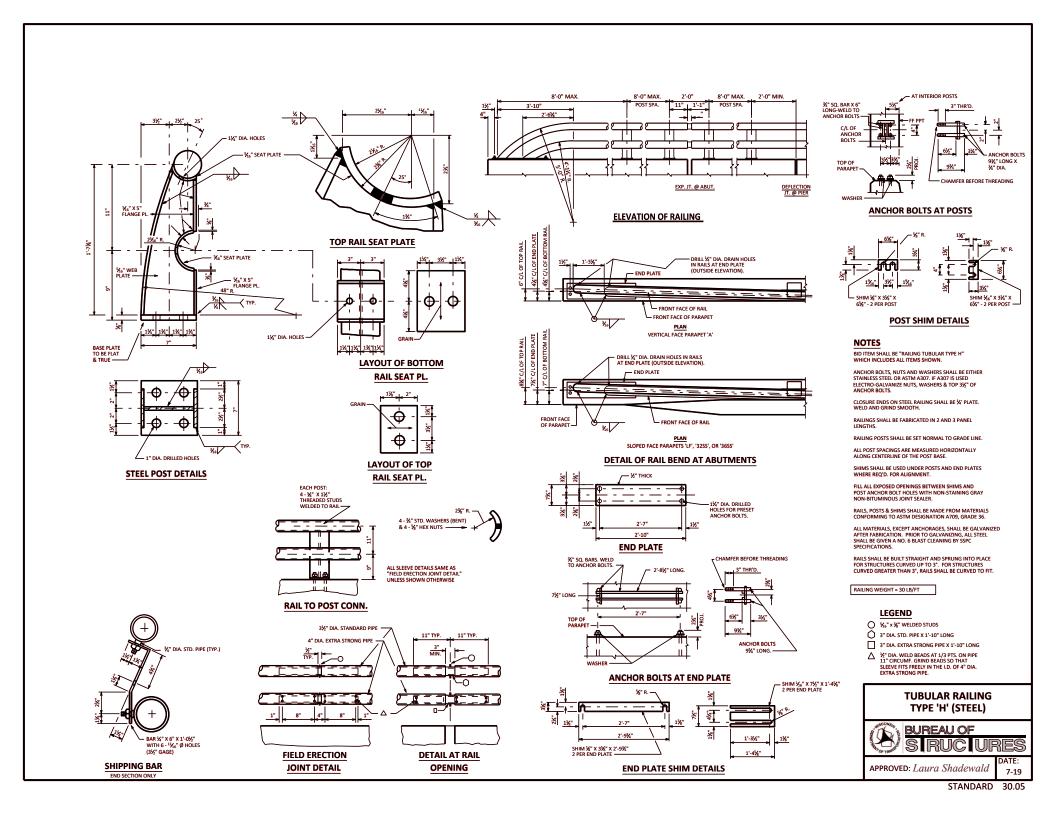
STEEL RAILING TYPE 'W'

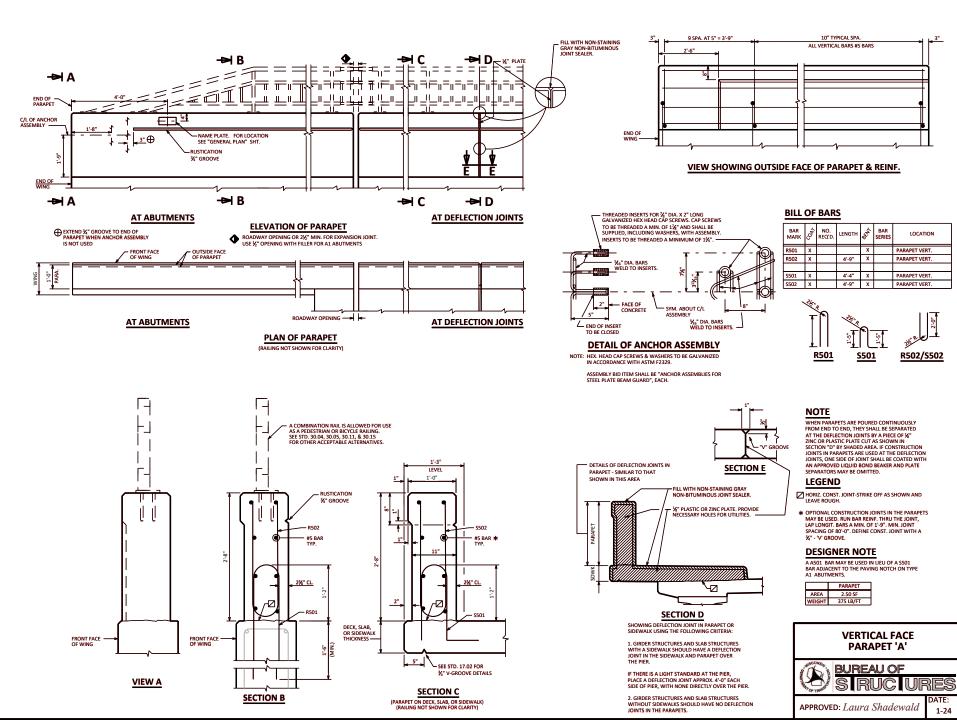


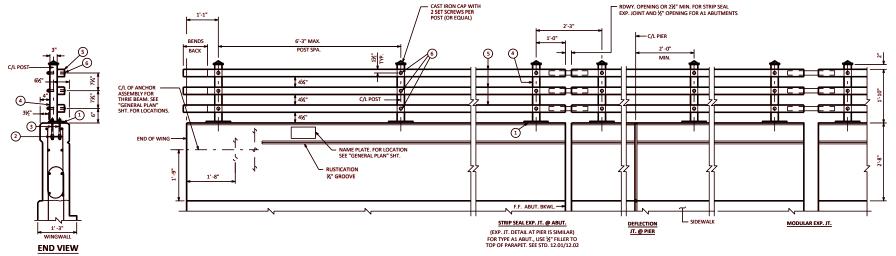
APPROVED: Laura Shadewald

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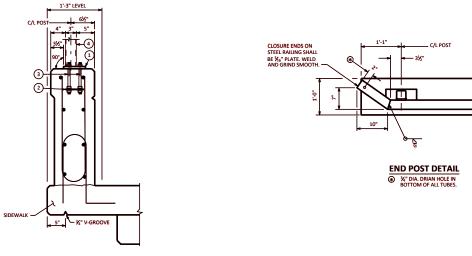






INSIDE ELEVATION

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 CONSTR. JT. WITH A ¾" "V"-GROOVE.



SECTION THRU PARAPET ON BRIDGE

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

DESIGNER NOTES

SEE STANDARD 30.09 FOR ADDITIONAL RAILING DETAILS

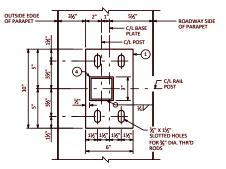
- SEE STANDARD 30.07 FOR:
 DEFLECTION JOINT DETAILS AND NOTES
 BEAM GUARD ANCHOR ASSEMBLY DETAILS
 SIDEWALK REINFORCEMENT AND DETAILS
 PARAPET REINFORCING BAR SIZE AND SPACING

STEEL RAILING WEIGHT = 25 LB/FT BASED ON 6'-3" POST SPA.

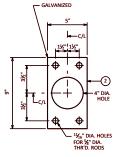
COMBINATION RAILING TYPE '3T'



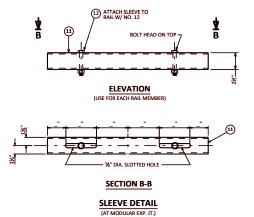
APPROVED: Laura Shadewald



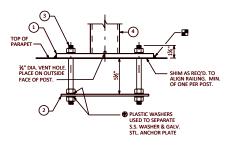
TYPICAL RAIL POST BASE PLATE



ANCHOR PLATE

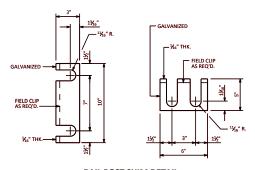


NOTE: CONSTRUCT BOTTOM RAIL AND SLEEVE CONNECTION FIRST, THEN MIDDLE RAIL, AND THEN TOP RAIL, TO ALLOW EASE IN PLACEMENT OF BOLT NO. 12.

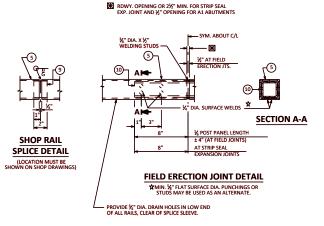


ANCHORAGE FOR RAIL POSTS

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



RAIL POST SHIM DETAIL



LEGEND

- (3) ¾" DIA. X 9" LONG, TYPE 316 STAINLESS STEEL THREADED RODS (MIN. TENSILE STRENGTH = 70 KSI) WITH NUT AND WASHERS OF SAME ALLOY GROUP.

- $\ensuremath{6}$ $\ensuremath{\%}$ "Dia. A325 slotted round head bolt with hex nut, $\ensuremath{\%}_6$ " x 1½" x 1½" washer, and lock washer.
- (9) RECTANGULAR SLEEVE FABRICATED FROM ¾6" PLATES. PROVIDE "SLIDING FIT".
- \bigodot rectangular sleeve fabricated from $\aleph_6"$ plates. (1'-4" @ field erection JTs.) (1'-4" @ Strip seal exp. JTs.)
- 11) SLEEVE FABRICATED FROM STRUCTURAL TUBING $2\frac{1}{2}$ " X $2\frac{1}{2}$ " X $\frac{3}{2}$ " X $\frac{3}{2}$ " X 1 " LONG. SLOTTED HOLES IN TOP AND BOTTOM.
- (12) ½" DIA. STAINLESS STEEL BOLT WITH NUT AND LOCKWASHER.
- ALTERNATIVE ANCHORAGE: 4 EQUIVALENT STAINLESS STEEL CONCRETE ADHESIVE ANCHORS % - INCH. EMBED 7" IN CONCRETE. ADHESIVE ANCHORS SHALL CONFORM TO SECTIONS 502.2.12 AND 502.3.14 OF THE STANDARD

NOTES

BID ITEM SHALL BE "RAILING STEEL TYPE 3T", WHICH SHALL INCLUDE ALL STEEL ITEMS SHOWN.

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

ENDS OF STRUCTURAL TUBING SHALL BE SAWED. GRIND SMOOTH EXPOSED EDGES. ALL CUT ENDS SHALL BE TRUE AND SMOOTH.

ALL PLATES, AND RECTANGULAR SLEEVES SHALL CONFORM TO ASTM A709 GRADE 36. ALL STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B.

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

CUT BOTTOM OF POST TO MAKE POST VERTICAL IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTION.

STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATE NO. 1, WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED.

CAULK AROUND PERIMETER OF BASE PLATES, NO. 1, AND FILL BOLT SLOT OPENINGS IN SHIMS AND BASE PLATES WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

ALL JOINTS IN CONCRETE PARAPET ARE TO BE VERTICAL.

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

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

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

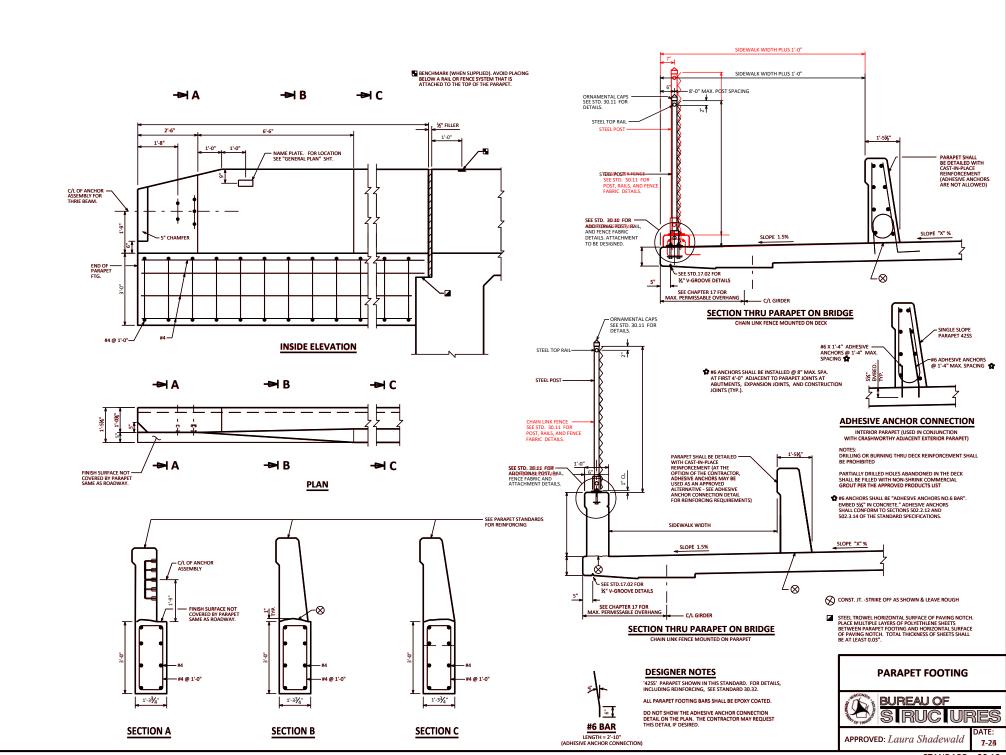
PAINT OVER GALVANIZING (EXCEPT NO. 2) WITH AN APPROVED TIE COAT AND TOP COAT AS SPECIFIED IN THE CONTRACT DOCUMENTS. THE RAILING SHALL BE PAINTED AMS STD. COLOR NO. ______ (Fill IN COLOR NAME).

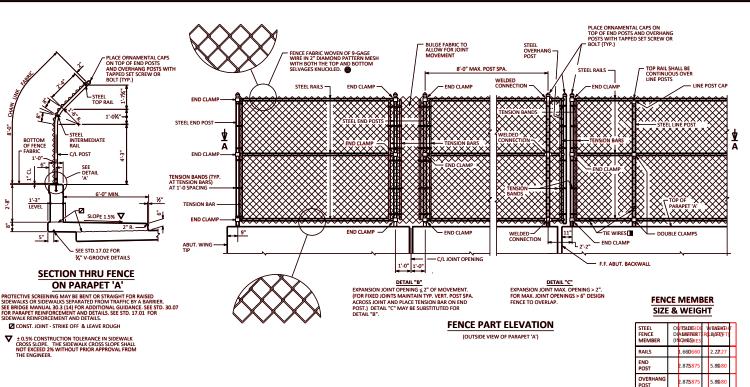
INSIDE OF TUBES TO BE PAINTED AT ALL FIELD ERECTION AND EXPANSION JOINTS.

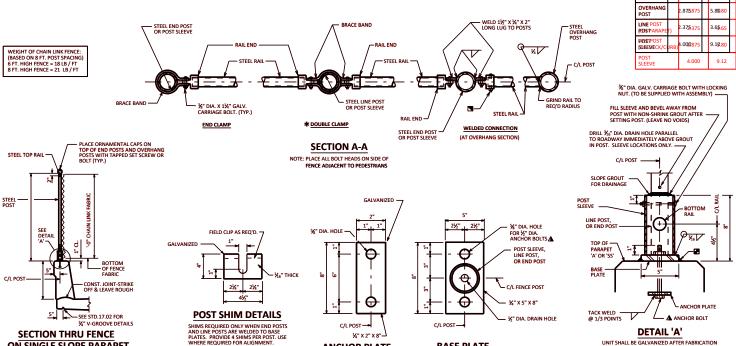
TOUCH-UP PAINTING TO BE DONE AT COMPLETION OF STEEL RAILING INSTALLATION TO THE SATISFACTION OF THE ENGINEER AT NO EXTRA COST.

COMBINATION RAILING TYPE '3T' DETAILS









ANCHOR PLATE

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

BASE PLATE

ON SINGLE SLOPE PARAPET

FOR TRAFFIC BARRIER APPLICATION, USE STRAIGHT POSTS (NOT BENT POSTS)

NOTES

POSTS ARE TO BE SET VERTICAL

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

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

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

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

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

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

THE BID ITEM SHALL BE "FENCE CHAIN LINK POLYMER - COATED

COMPLETE ANY REQUIRED WELDING OF COMPONENTS BEFORE

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

BASE PLATES, ANCHOR PLATES AND SHIMS SHALL BE ASTM A709

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

- CAULK AROUND PERIMETER OF BASE PLATE AND FILL PORTION OF SLOTTED HOLE AROUND ANCHOR BOLT IN SHIM WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.
- * ALTERNATE TO DOUBLE CLAMP: USE LINE RAIL CLAMP (BOULEVARD)
 OR 180° BRACE BAND, WHICH MAY BE USED WHEN THE POSTS ARE
 EITHER BOLTED TO THE POST SLEEVES OR DIRECTLY WELDED TO THE BASE PLATE.
- ▲ ANCHOR BOLTS, NUTS AND WASHERS SHALL BE EITHER STAINLESS STEEL OR ASTM 307. IF 307 IS USED, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED.
- ☆ ALTERNATIVE ANCHORAGE: CONCRETE ADHESIVE ANCHORS ½"-INCH. EMBED 7" IN CONCRETE. ADHESIVE ANCHORS SHALL CONFORM TO SECTIONS 502.2.12 AND 502.3.14 OF THE STANDARD SPECIFICATIONS.
- ATTACH FABRIC TO RAILS, AND TO POSTS WITHOUT TENSION BANDS, VITH TIE WIRES (ROUND, 9-GAGE) SPACED AT 1'-0".
- BOLT RAIL TO RAIL END TO SECURE OVERHANG SECTION. ALTERNATE IS TO WELD RAIL DIRECTLY TO END POST.

MINIMUM LENGTH OF TOP RAIL BETWEEN SPLICES SHALL BE 20'-0". LOCATE SPLICES NEAR ½ POINT OF POST SPACING.

DESIGNER NOTES

THE CHAIN LANK RENCE SYSTEM SELECTED FOR THE STRUCTURE H SHAKINE PEMETALEIS, COAVED PENGE SYSTEMT, OR A EPOLYMER-EQAVED PENOR SYSTEM! Y. A PARAPET. 8'-0" MAXIMUM POST SPACI

● AAR AMESH MAY BE USED ON PROTECTIVE SCREENING IN HIGHLY VULNERABLE AREAS, OR AS STATED IN FDM PROCEDURE 11-35-1 FOR PROJECTIVE SERVEN SMOUNTED ON CURB OR DECK.

PERESTRIAN MAILING MAY SELVISED ON IN INGWIALL PARAPETRIF CHAIN BINK FENCE DOES NOTECONTINUE/SEYOND BRIDGE.

"POLYMER-COATED FENCE SYSTEM" HANDRAILS SHALL BE USED ALONG BRIDGE SIDEWALKS WHERE THE SALOPE, OF THE SALE BY A SHALL BE USED ALONG BRIDGE SIDEWALKS WHERE THE SALE BY A SHALL BE SALE BY A SHALL BE SALE BY A SHALL BE PROVIDED ALONG BOTH STATES AND A SHALL BE PROVIDED ALONG BOTH DISCO FEDERALE. HANDRAILS SHALL BE PROVIDED ALONG BOTH DISCO FEDERALE. FORMANDRAILDETAILS SEESTANDARD 37,02 WALL PARAPETS IF FOR DEAD LOAD PURPOSES, THE SUPERSTRUCTURE DESIGN SHALL AGGORNILEGRALMAXUMEMAZOGO ENOLE GROSWALRS WHERE THE

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

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

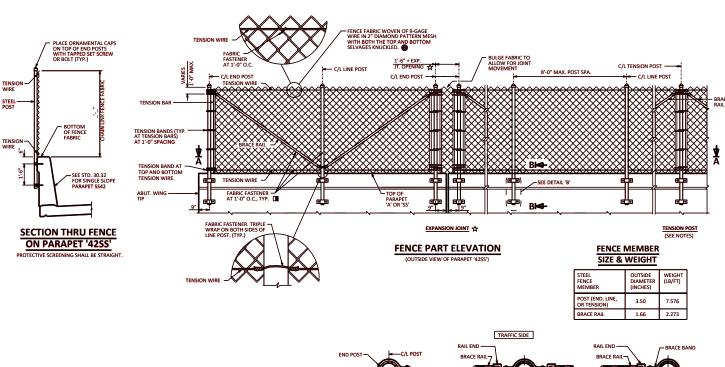


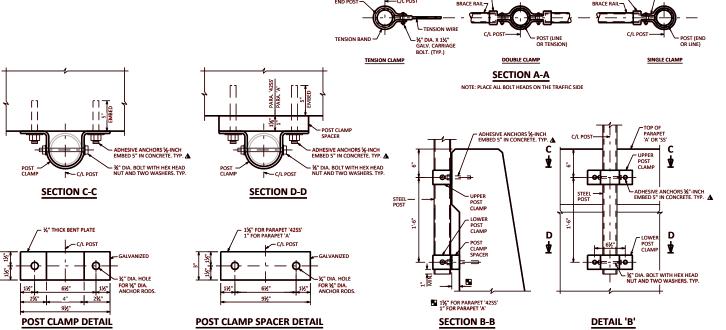


APPROVED: Laura Shadewald

NOTE: IN LIEU OF USING THE POST SLEEVE, THE FENCE

POST MAY BE WELDED TO THE BASE PLATE.





NOTES

POSTS ARE TO BE SET VERTICAL.

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

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

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

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

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

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

THE BID ITEM SHALL BE "FENCE CHAIN LINK POLYMER - COATED _- FT. B-_-_"

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

ANCHOR RODS SHALL BE F1554 GRADE 36. BOLTS SHALL BE ASTM A307, NUTS SHALL BE ASTM A563, AND WASHERS SHALL BE ASTM F436. POST CLAMPS AND POST CLAMP SPACERS SHALL BE ASTM A709, GRADE 36. TENSION WIRE SHALL BE 7
GAGE STEEL WIRE COATED IN ACCORDANCE WITH ASTM A824
AND A817 AS EITHER TYPE I (ALUMINUMIZED) OR TYPE II, CLASS 4 (GALVANIZED).

ANCHOR RODS, BOLTS, NUTS, POST CLAMPS, POST CLAMP SPACERS AND WASHERS SHALL BE GALVANIZED.

COMPLETE ANY REQUIRED WELDING OF COMPONENTS BEFORE

- ▲ CONCRETE ADHESIVE ANCHORS ¾"-INCH. EMBED 5" IN CONCRETE. ADHESIVE ANCHORS SHALL CONFORM TO SECTIONS 502.2.12 AND 502.3.14 OF THE STANDARD SPECIFICATIONS.
- ATTACH FABRIC TO RAILS, AND TO POSTS WITHOUT TENSION BANDS, WITH TIE WIRES (ROUND, 9-GAGE) SPACED AT 1'-0".

PROVIDE TENSION POST AND BRACE RAILS TO LIMIT TENSION WIRE RUNS TO LESS THAN 500 FEET.

DESIGNER NOTES

THE SIDE MOUNTED CHAIN LINK FENCE SHOULD ONLY BE USED WHEN THE DESIGN SPEED EXCEEDS AS MIPH AND PROTECTIVE SCREENING IS WARRANTED. FOR DESIGN SPEED AS HOR ARE LEST, BY HET OR MICHINETED FROM SPEEDS AS HOR ARE LEST, BY HET OR MICHINETED FROM SPEEDS AS HOR ARE LEST, BY HET OR DESIGN SPEEDS AS MIPH OR LESS, THE TOP-MOUNTED CHAIN LINK FENCE THE STRIPPING BY STAY SELECTED FOR THE STRUCTURE SHALL BE A "METALLIC-COATED FENCE SYSTEM" OR A "POLYMER-COATED FENCE SYSTEM" OR THE STRUCTURE

PROVIDER'NO"FCHAIN LINK FENCE FABRIC, UNLESS DIRECTED OTHERWISE, SEE BRIDGE MANUAL 30.9 FOR ADDITIONAL INFORMATION.

- PROVIDE 6'-0" CHAIN LINK FENCE FABRIC, UNLESS DIRECTED

 A 1-1-14-65-14-4-49-1-BRIUSED ON PROTEGTIVE SCREENING IN HIGHEN
 VULNERABLE AREAS, OR AS STATED IN FDM PROCEDURE 11-35-1
- @ FOR RROTECTAVESCOSEEN IN G-PROTECTIVE SCREENING IN HIGHLY

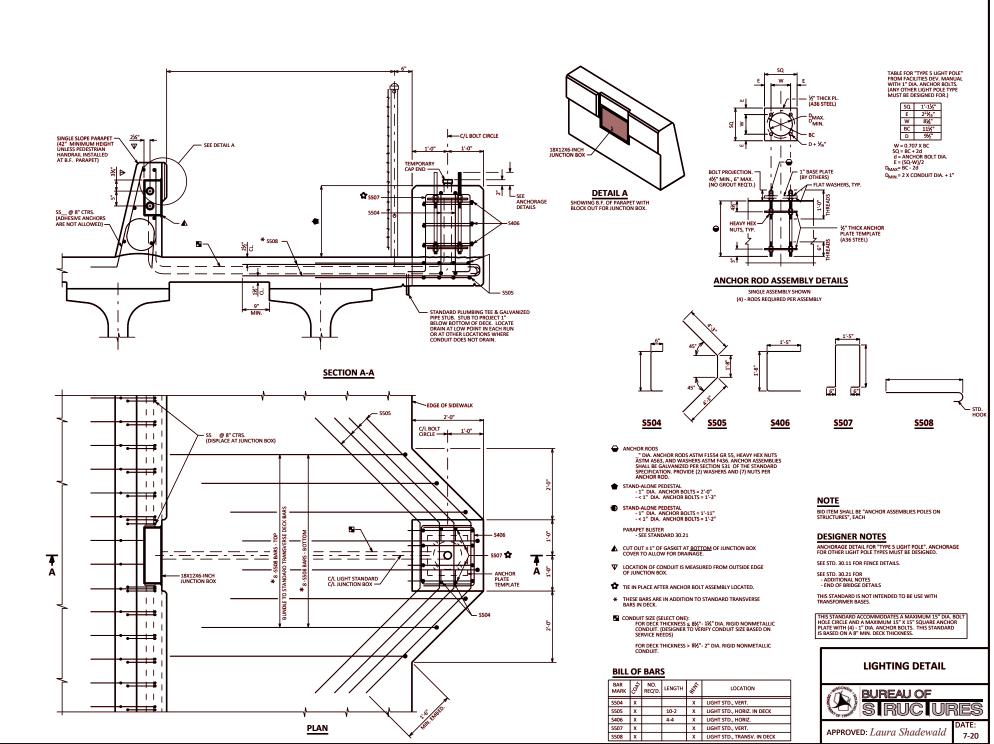
- BAN EIGHENDFROMAINFON KORNICOPEI

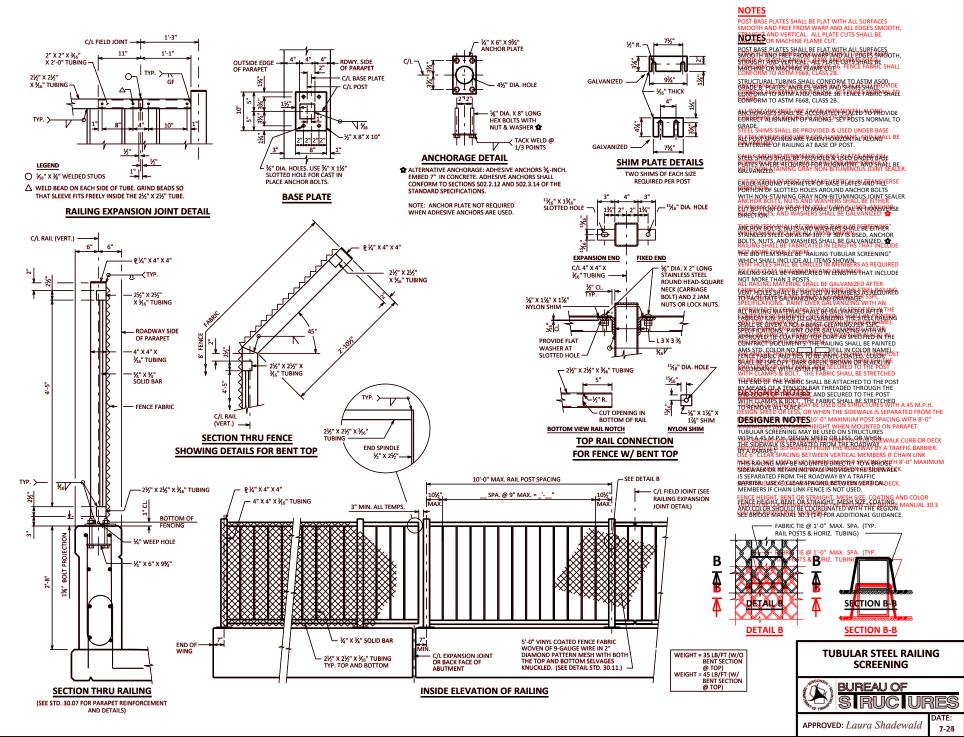
BASED ON 8 FT POST SPACING BETCHIGHTEEN CREISE BENETE

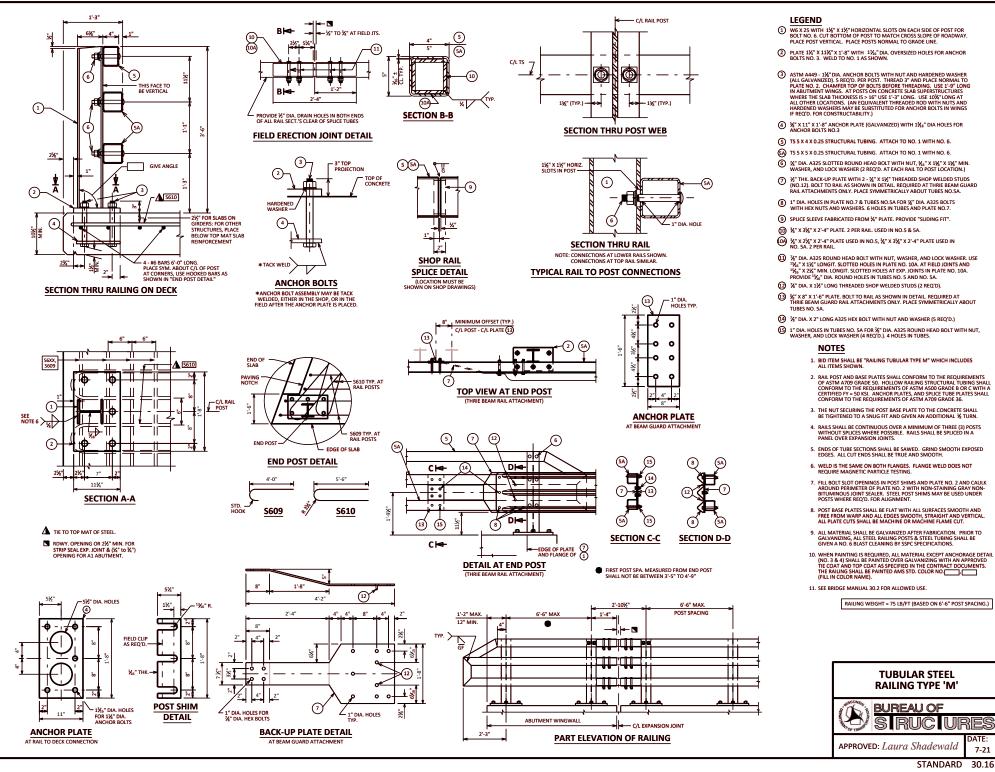
8 FT, HIGH FENCE = 21 LB / FT

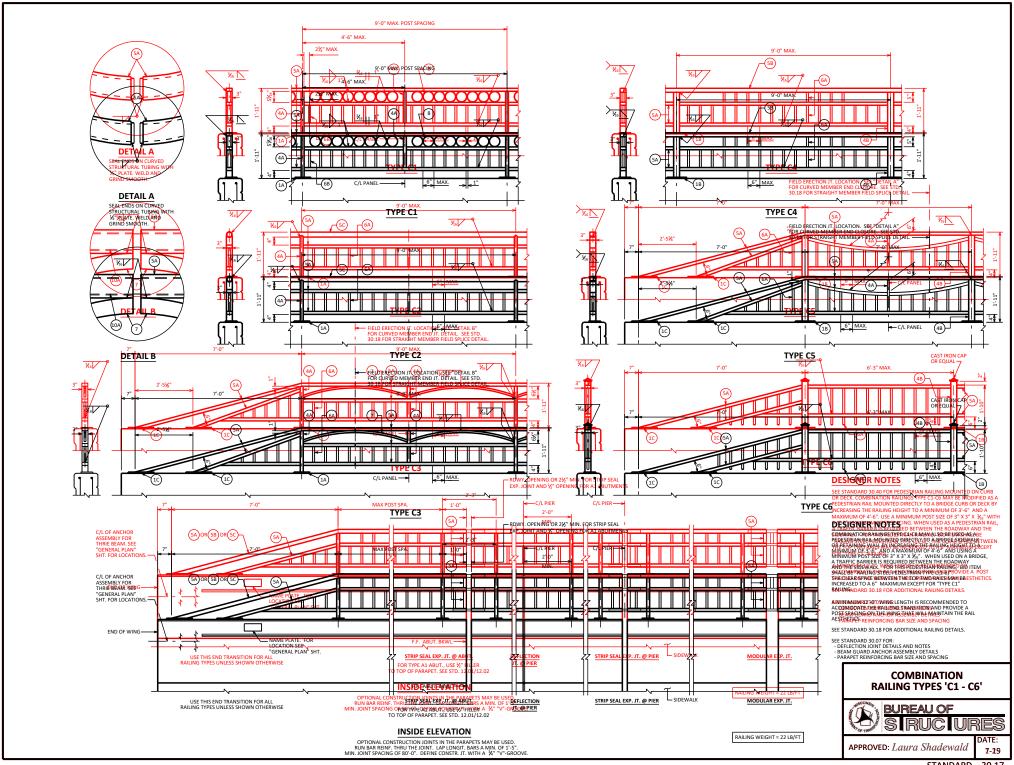
CHAIN LINK FENCE SIDE-MOUNTED DETAILS

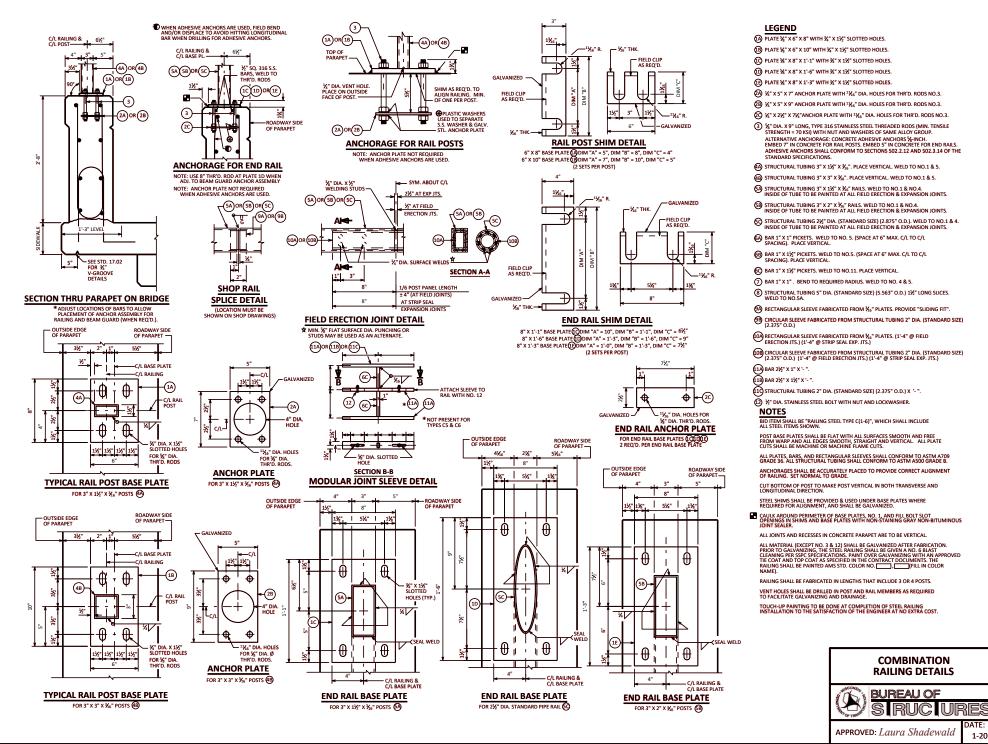


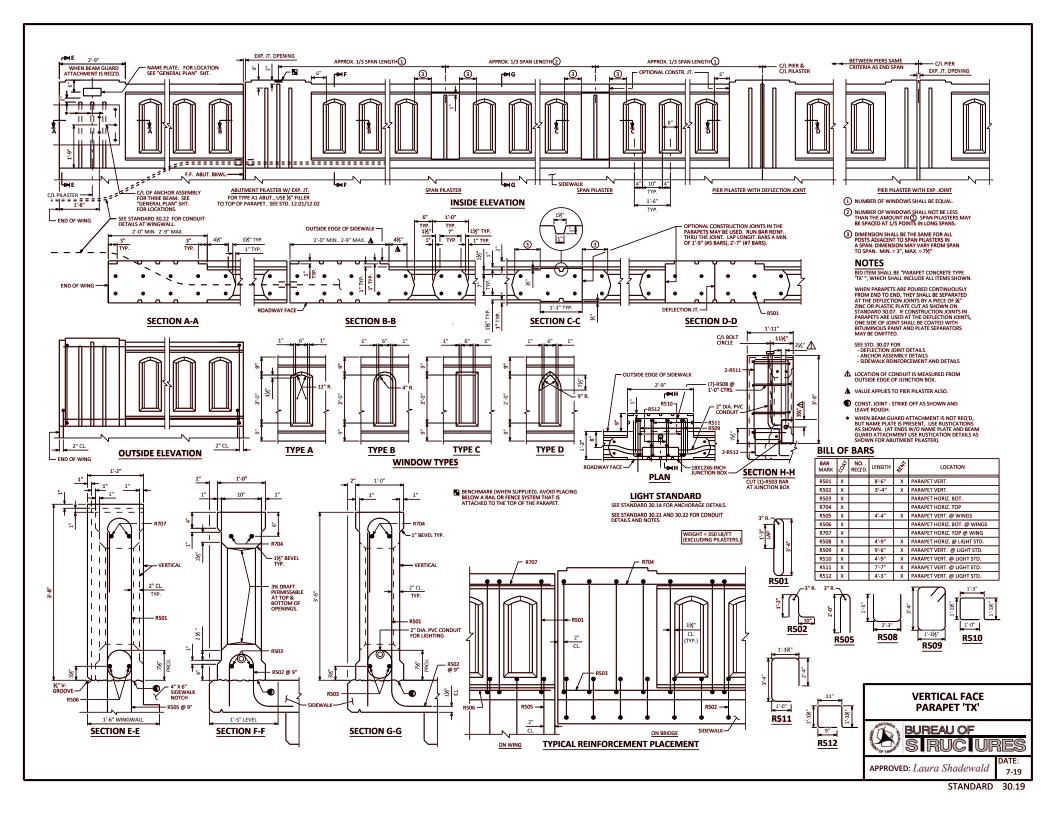


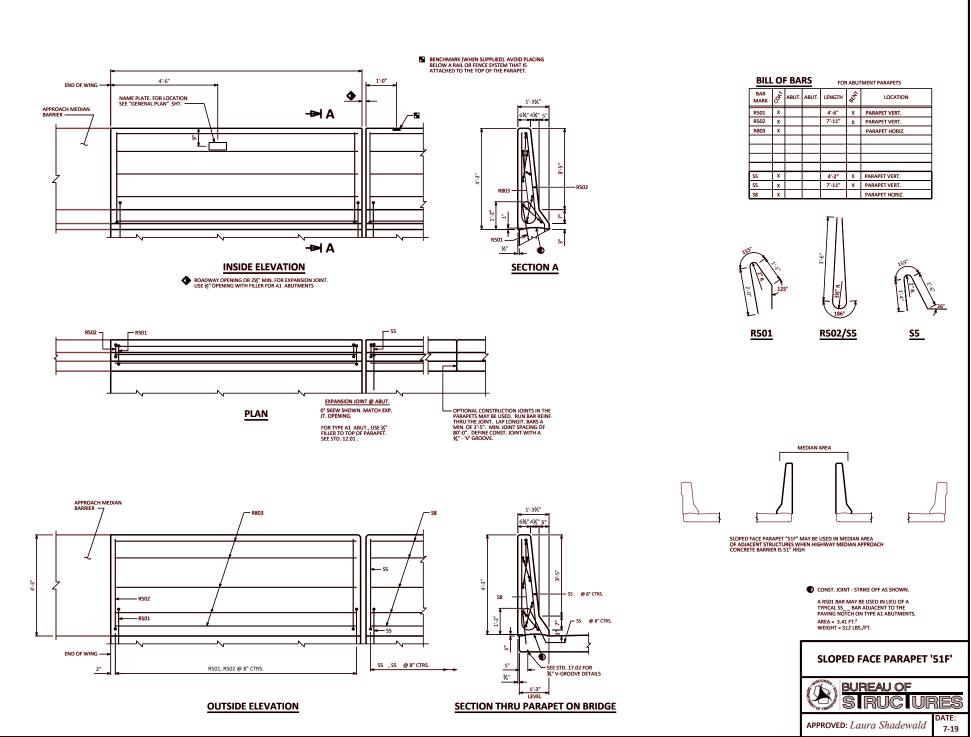


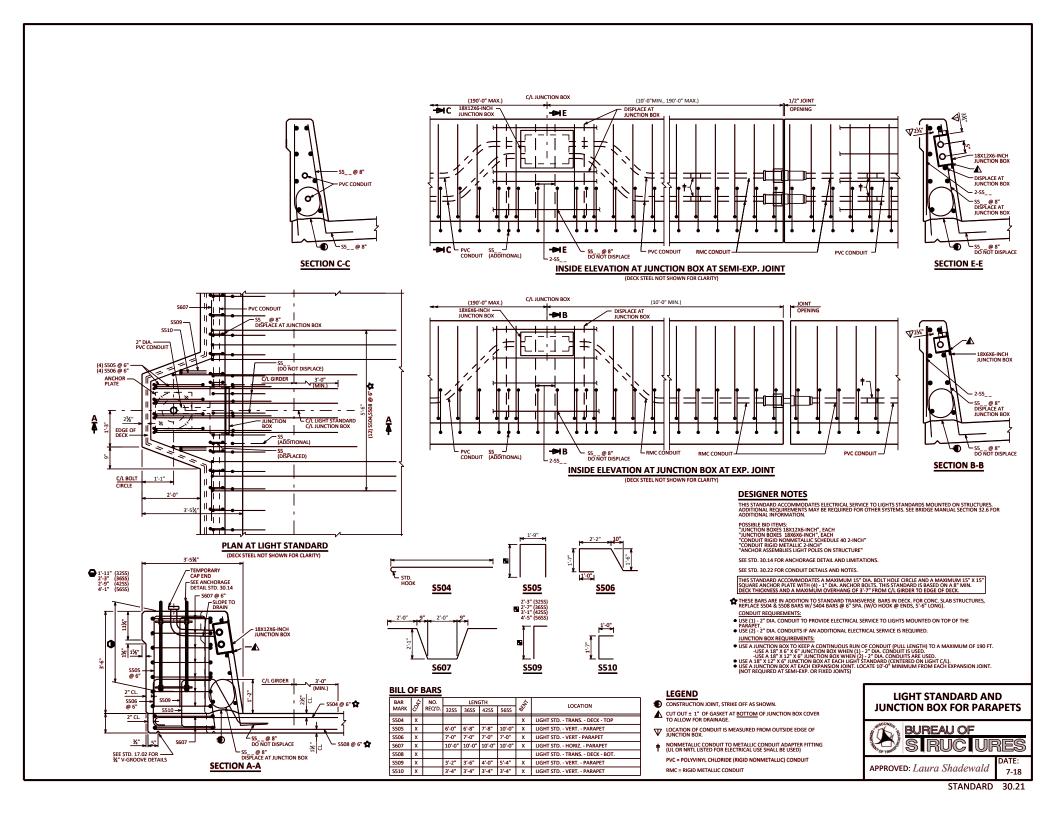


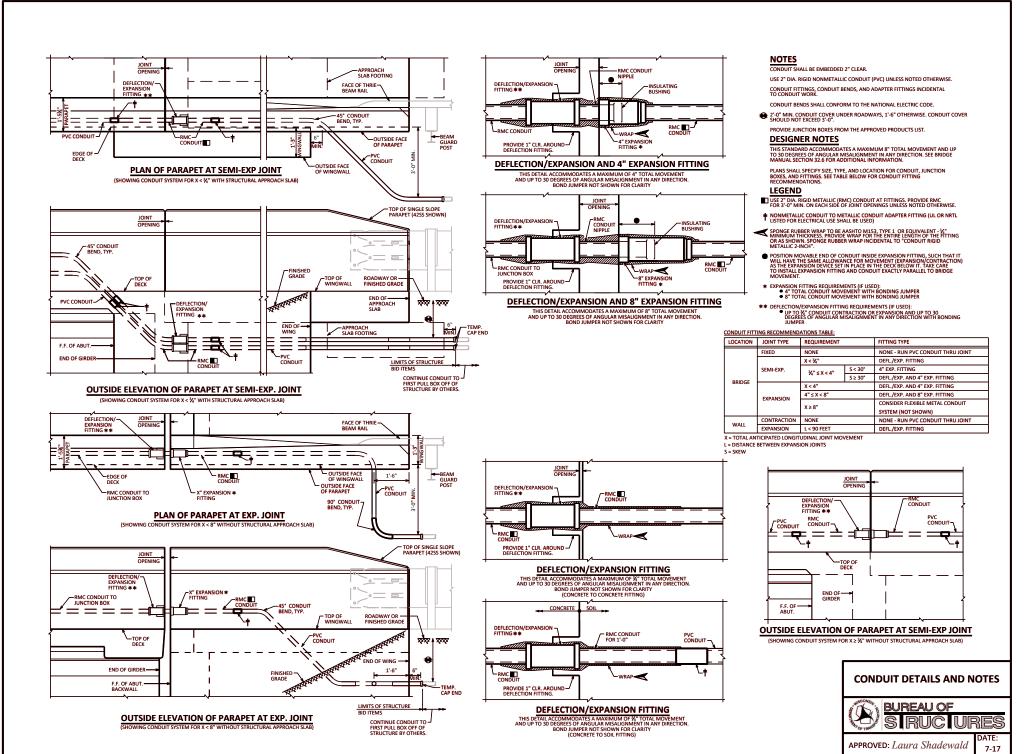


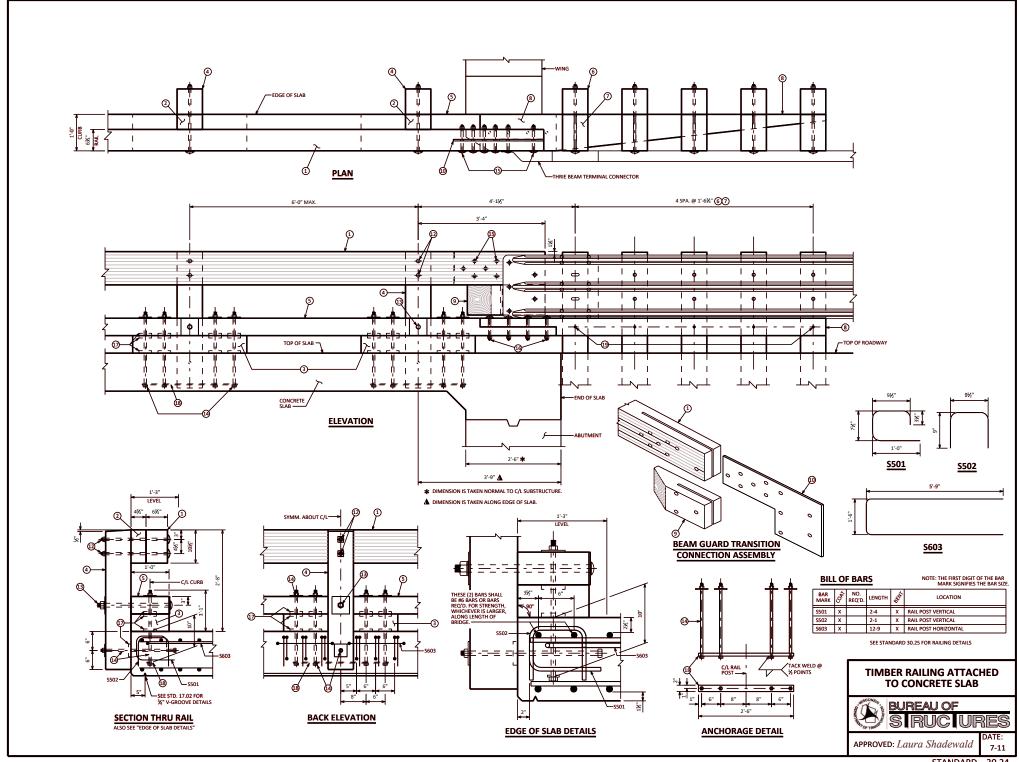


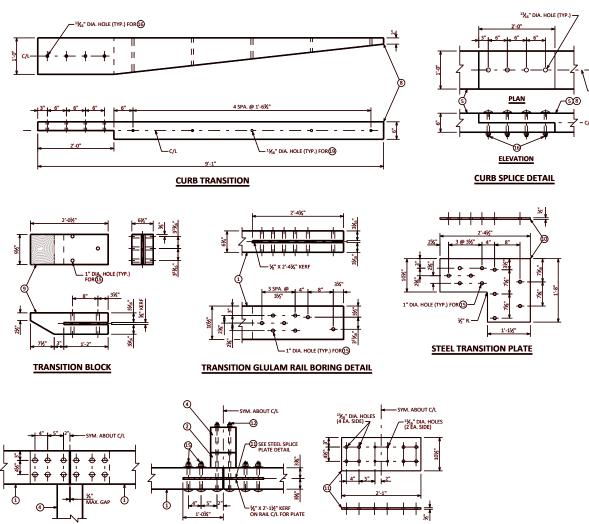












PLAN VIEW

RAIL SPLICE DETAILS

ELEVATION

BILL OF TREATED LUMBER

STEEL SPLICE PLATE

ITEM	NO. REQ'D.	SIZE	LENGTH	мвм
GLULAM RAIL		6¾" X 10½"		
RAIL SPACER BLOCK		8" X 4¾"	10½"	
SCUPPER BLOCK		6" X 12"	3'-0"	
RAIL POST		8" X 8"		
CURB		6" X 12"		
CURB TRANSITION				
TRANSITION BLOCK				
TOTAL MBM				

LEGEND

- ① GLULAM RAIL 6¾" X 10½"
- ② RAIL SPACER BLOCK 8" X 4¾" X 10½"
- 3 SCUPPER BLOCK 6" X 12" X 3'-0"
- 4 RAIL POST @ STRUCTURE 8" X 8" X 3'-8"
- ⑤ CURB 6" X 12"
- 6 RAIL POST @ BEAM GUARD 8" X 8"
- RAIL SPACER BLOCK @ BEAM GUARD 8" X 11½" X 1'-10½"
- (8) CURB TRANSITION @ BEAM GUARD
- TRANSITION BLOCK @ BEAM GUARD
- (10) STEEL TRANSITION PLATE, ASTM A36.
- STEEL SPLICE PLATE, ASTM A36.
- (2) ¾" DIA. X 1'-10" LONG ASTM A307, GRADE 2, DOME-HEAD BOLT W/ 1-PLATE WASHER PER BOLT. (2 REQ'D. @ EACH RAIL TO POST CONNECTION, 4 REQ'D. @ EACH RAIL SPLICE).
- ① 1½" DIA. X 1'-10" LONG ASTM A325, DOME-HEAD BOLT W/ 2 5½" X 5½" X ½" PLATE WASHERS, W/ 1¾" DIA. HOLE. (1 REQ'D. @ EACH CURB TO POST CONNECTION.)
- ¾" DIA. X 1'-11" LONG ASTM A325 BOLT. 1 4" X 4" X ¾6" PLATE WASHER REQ'D. AT CURB TO SLAB CONNECTION. 1 4" X 4" X ¾6" PLATE WASHER REQ'D. AT POST TO SLAB CONNECTION.
- (1) %" DIA. X 9" LONG ASTM A307, GRADE 2, DOME HEAD BOLT AT RAIL SPLICE DETAIL AND AT BEAM GUARD ATTACHMENT.
- $\fill \begin{tabular}{ll} \begin{tabular}{ll$
- 4" DIA. SHEAR PLATE (8 REQ'I). @ EACH CURB TO SCUPPER CONNECTION, 4 REQ'O, @ EACH SCUPPER TO SLAB CONNECTION). MALEJABLE IRON MEETING REQUIREMENTS OF ASTM 447, GRADE 32510.
- √I DIA. ASTM A325 DOME-HEAD BOLT W/ 1-PLATE WASHER PER BOLT. (1 REQ'D. @ EACH THRIE BEAM POST TO CURB TRANSITION CONNECTION.)

 1. **THRIE BEAM POST TO CURB TRANSITION CONNECTION.**

 1. **THRIE BEAM POST TO CURB TRANSITION CONNECTION CONN

NOTES

- 1. BID ITEM SHALL BE "TREATED LUMBER AND TIMBER" WHICH INCLUDES ALL ITEMS SHOWN EXCEPT ITEMS NO 6, 7 AND THRIE BEAM TERMINAL CONNECTOR.
- 2. DIMENSIONS GIVEN FOR GLUED-LAMINATED (GLULAM) TIMBER RAILS ARE ACTUAL DIMENSIONS.
- DIMENSIONS FOR WOOD POSTS, CURBS AND SCUPPERS ARE GIVEN AS NOMINAL DIMENSIONS. ACTUAL DIMENSIONS
 MAY BE A MAXIMUM OF ½; INCH LESS THAN THE STATED NOMINAL DIMENSIONS. DIMENSION FOR SPACER BLOCK
 DEPTH ARE ACTUAL DIMENSIONS.
- 4. CURB AND RAIL SPLICES SHALL BE LOCATED SO THAT CURB AND RAIL MEMBERS ARE CONTINUOUS OVER NOT LESS THAN TWO POSTS. CURB SPLICES SHALL BE LOCATED A MINIMIMIM OF LS POST SPACINGS AWAY FROM RAIL SPLICES. IT IS RECOMMENDED THAT GLULAM RAILS BE CONTINUOUS OVER THE LENGTH OF THE BRIDGE.
- SAWN LUMBER AND GLULAM SHALL COMPLY WITH THE REQUIREMENTS OF AASHTO M168 AND SHALL BE PRESSURE TREATED WITH WOOD PRESERVATIVES IN ACCORDANCE WITH AASHTO M133 AND STANDARD SPECIFICATIONS.
- 6. BRIDGE RAIL SHALL BE HORIZONTALLY LAMINATED GLULAM, VISUALLY GRADED WESTERN SPECIES COMBINATION NO. 2, OR VISUALLY GRADED SOUTHERN PINE COMBINATION NO. 48. OTHER SPECIES AND GRADES OF GLULAM MAY BE USED, PROVIDED THE MINIMUM TABULATED VALUES ARE NOT LESS THAN THE FOLLOWING.
 - $F_{byy} = 1,800 \text{ LB/IN}^2 \text{ E} = 1,800,000 \text{ LB/IN}^2$
- 7. POCTS, CURBS, SCUPPERS, TRANSITION RIDCYCS AND SPACER BLOCKS MAY BE SAWN LUMBER OR CHULAM, WHEN SAWN LUMBER IS USED, MATERIAL ISHALI BE VISUALITY GRADER ON 1. SOUTHERN PIN FOR VISUALITY GRADER ON 1 DOUGLAS FIR-LARCH, GLULAM AND OTHER SPECIES AND GRADES OF SAWN LUMBER MAY BE USED, PROVIDED THE MINIMUM TABULATED VALUES ARE NO LESS THAN THE FOLLOWING:

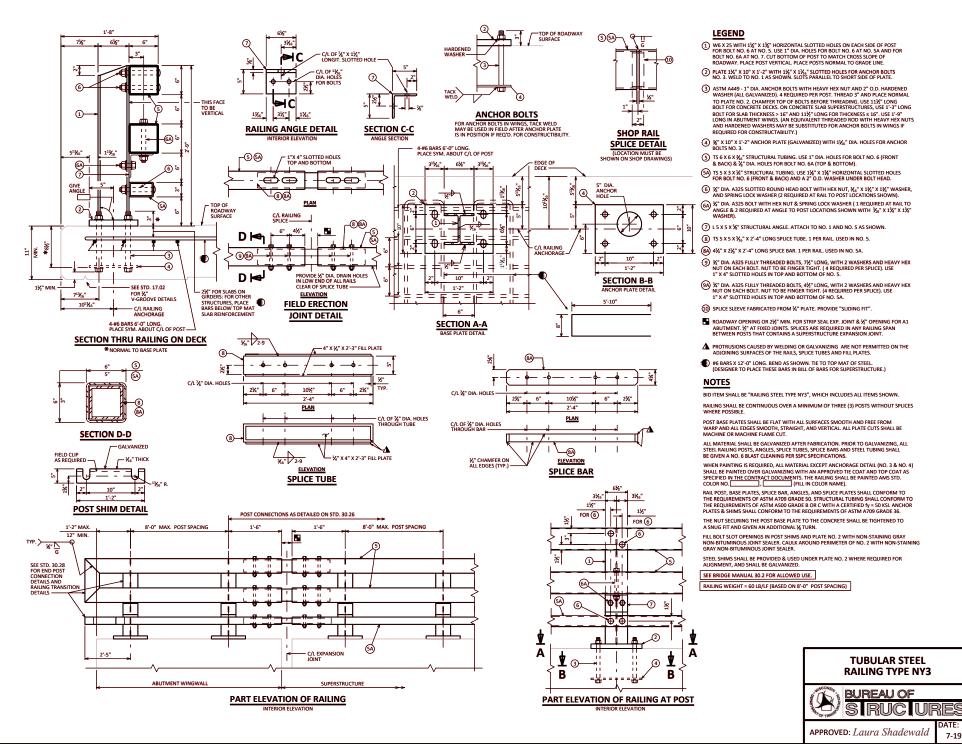
 $F_b = 1,350 \text{ LB/IN}^2 \text{ E} = 1,500,000 \text{ LB/IN}^2$

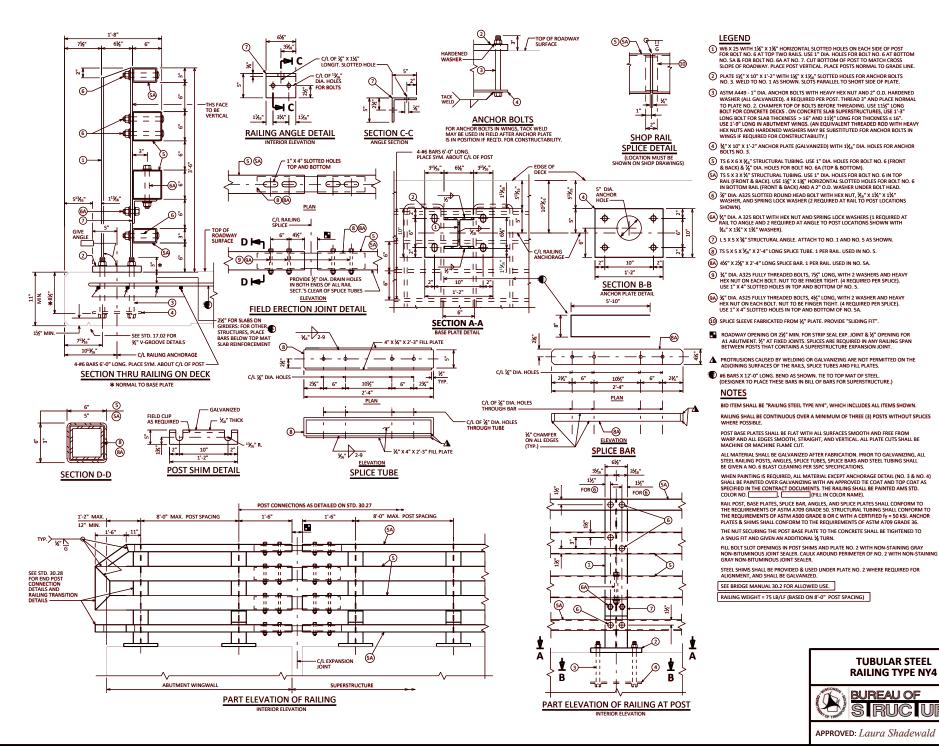
- 8. ALL STEEL COMPONENTS AND FASTENERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111 OR M232.
- 9. TO THE EXTENT POSSBIE, ALL WOOD SHALL BE CUT, DRILLED, AND COMPLETELY FABRICATED PRIOR TO PRESSURE TREATMENT WITH PRESENKINYTES, WHEN FILE TABRICATION OF WOOD IS REQUIRED OR IF WOOD IS DRAMAGED, ALL CUTS, BORE HOLES, AND DAMAGE SHALL BE IMMEDIATELY TREATED WITH WOOD PRESERVATIVE IN ACCORDANCE WITH ASAINT ON 1333 AND STANDARDS PSECIFICATIONS.
- 10. UNLESS NOTED, MALLEABLE IRON WASHERS SHALL BE PROVIDED UNDER BOLT HEADS AND UNDER NUTS THAT ARE IN CONTACT WITH WOOD. WHEN THE SIZE AND STRENGTH OF THE HEAD ARE SUFFICIENT TO DEVILED CONNECTION STRENGTH WITHOUT WOOD CRUSHING, WASHERS MAY BE OMITTED UNDER HEADS OF DOME-HEAD TIMBER BOLTS.
- 11. TOPS OF RAIL POSTS AND TOP OF THE RAIL SPLICE PLATE KERF SHALL BE SEALED WITH ROOFING CEMENT OR OTHERWISE PROTECTED FROM DIRECT EXPOSURE TO WEATHER.
- 12. DESTROY THREADS ON ALL BOLTS WITH A CENTER PUNCH AFTER TIGHTENING NUT. EXPOSED BOLT PROJECTION OVER 1" SHALL BE CUT OFF. REPAIR END OF BOLT BY PAINTING WITH ZINC RICH PRIMER.
- 13. WHEN PLACING OVERLAY (FWS) ON TOP OF EXISTING SLAB, THE THICKNESS OF THE OVERLAY MUST BE TAPERED NEAR THE VICINITY OF THE RAILING TO MAINTAIN THE REQ'D. (CRASH TESTED) DISTANCE FROM TOP OF SLAB TO TOP OF RAIL TO 32 INCHES.
- 14. THIS RAILING MEETS NCHRP REPORT 350 EVALUATION CRITERIA FOR TEST LEVEL 2 (TL-2).

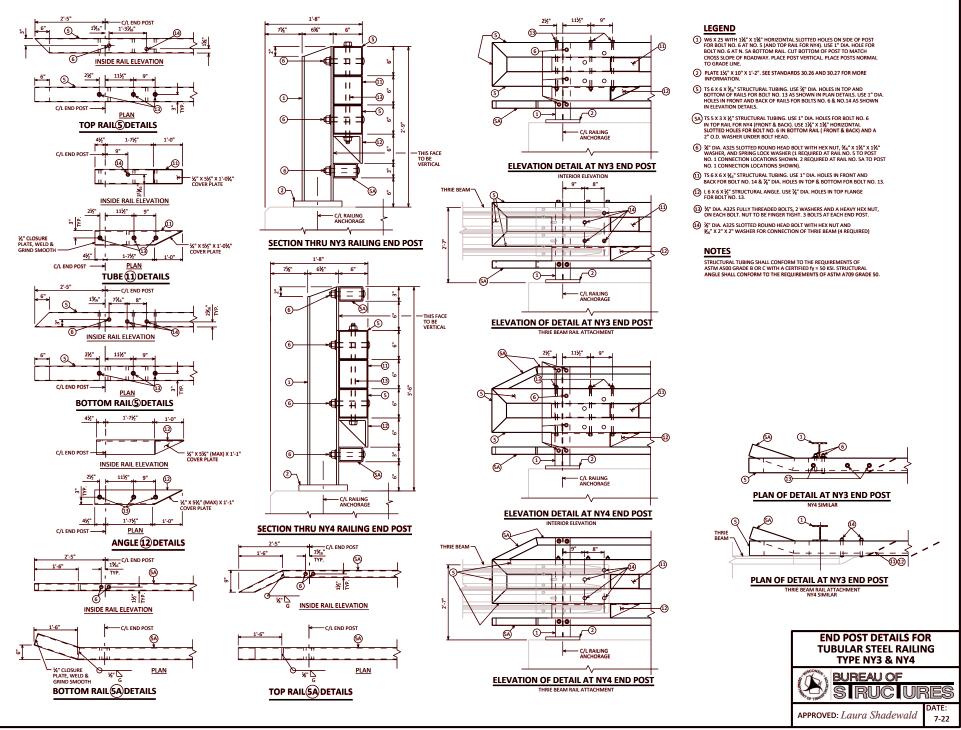
THESE RAILING DETAILS MAY BE USED WITH CONCRETE SLAB SUPERSTRUCTURES (SLAB DEPTH ≥ 14") THAT HAVE A1 ABUTMENTS WITH WINGS PARALLEL TO C/L OF ABUTMENT OR HAVE AS ABUTMENTS.

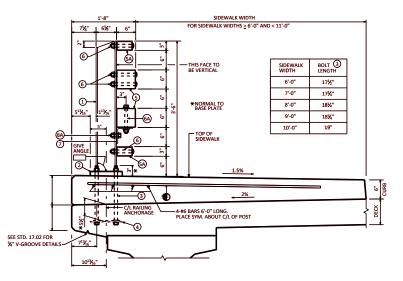
TIMBER RAILING ATTACHED TO CONCRETE SLAB DETAILS



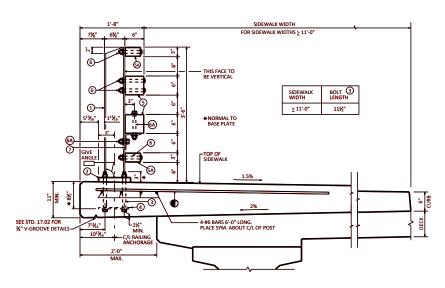








SECTION THRU RAILING ON SIDEWALK



SECTION THRU RAILING ON SIDEWALK

LEGEND

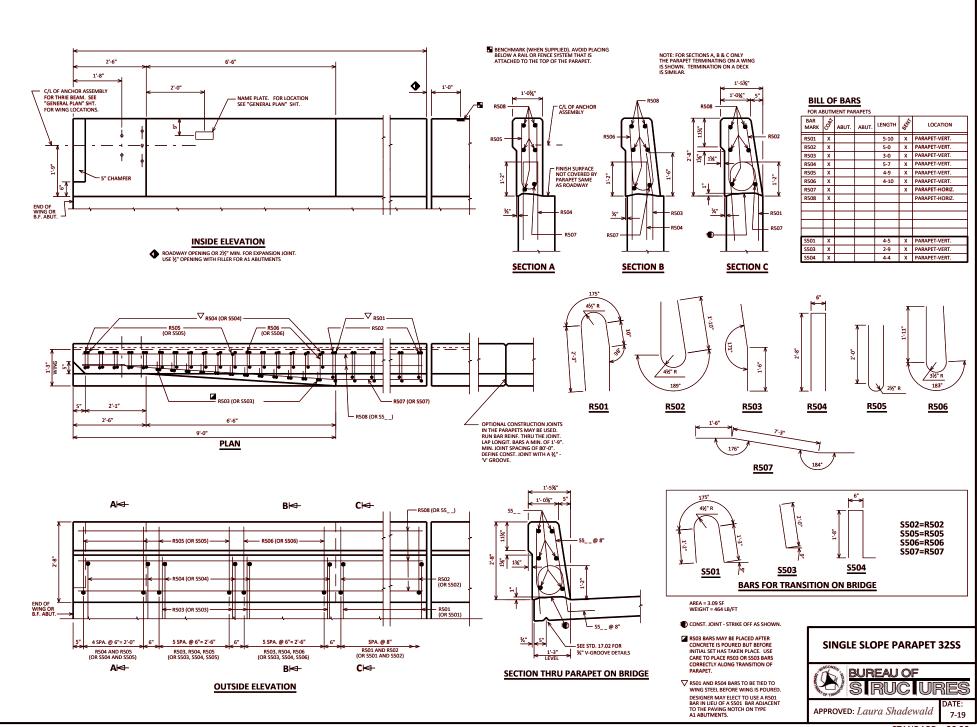
- (1) W6 X 25 WITH 1½" X 1½" HORIZONTAL SLOTTED HOLES ON EACH SIDE OF POST FOR BOLT NO. 6 AT TOP TWO RAILS. USE 1" DIA. HOLES FOR BOLT NO. 6 AT BOTTOM NO. 5A & FOR BOLT NO. 6 AT NO. 7. CUT BOTTOM OF POST TO MATCH CROSS SLOPE OF ROADWAY. PLACE POST VERTICAL. PLACE POSTS NORMAL TO GRADE UNE.
- 2) PLATE 1½" X 10" X 1'-2" WITH 1½" X 1½6" SLOTTED HOLES FOR ANCHORS BOLTS NO. 3. WELD TO NO. 1 AS SHOWN. SLOTS PARALLEL TO SHORT SIDE OF PLATE.
- ③ ASTM A449 1" DIA. ANCHOR BOLTS WITH HEAVY HEX NUT AND 2" O.D. HARDENED WASHER (ALL CALVANIZED). A REQUIRED PER ROST. THREAD 3" AND PLACE NORMALT OP HATE NO. 2. CHAMPER TOP OF BOLTS BEFORE THREADING. USE 11½" LONG BOLT FOR CONCRETE SIDEWALKS ≥ 11-"0" WIDE AND SEE TABLE TO THE LEFT FOR CONCRETE SIDEWALKS ≥ 61-"0" AND 11-"0" WIDE FOR PROPER BOLT LENGTHS. USE 1-"9" LONG IN ABUTMENT WINGS. (AN EQUIVALENT THREADED ROD WITH HEAVY HER NUTS AND HARDENED WASHERS MAY BE SUBSTITUTED FOR ANCHOR BOLTS IN WINGS IF REQUIRED FOR CONSTRUCTABILITY.)
- ④ ¾" X 10" X 1'-2" ANCHOR PLATE (GALVANIZED) WITH 1⅓6" DIA. HOLES FOR ANCHOR BOLTS NO. 3.
- \S TS 6 X 6 X $rac{3}{4}$ s" STRUCTURAL TUBING. USE 1" DIA. HOLES FOR BOLT NO. 6 (FRONT & BACK) & $rac{3}{4}$ " DIA. HOLES FOR BOLT NO. 6A (TOP & BOTTOM).
- (A) TS 5 X 3 X ½" STRUCTURAL TUBING. USE 1" DIA. HOLES FOR BOLT NO. 6 IN TOP RAIL (FRONT & BACK). Use 1½" x 1½" HORIZONTAL SLOTTED HOLES FOR BOLT NO. 6 IN BOTTOM RAIL (FRONT & BACK) AND A 2" O.D. WASHER UNDER BOLT HEAD.
- (6) %" DIA. A325 SLOTTED ROUND HEAD BOLT WITH HEX NUT, $\%_6$ " X $1\%_1$ " X $1\%_1$ " X $1\%_1$ " WASHER, AND SPRING LOCK WASHER (2 REQUIRED AT RAIL TO POST LOCATIONS SHOWN).
- (A) ¾" DIA. A325 BOLT WITH HEX NUT AND SPRING LOCK WASHER (1 REQUIRED AT RAIL TO ANGLE AND 2 REQUIRED AT ANGLE TO POST LOCATIONS SHOWN WITH ¾", X 1¾" X 1¾" WASHER).
- (7) L 5 X 5 X %" STRUCTURAL ANGLE. ATTACH TO NO. 1 AND NO. 5 AS SHOWN.
- #6 BARS X 12'-0" LONG. BEND AS SHOWN. TIE TO TOP OF MAT OF STEEL. (DESIGNER TO PLACE THESE BARS IN BILL OF BARS FOR SUPERSTRUCTURE.)

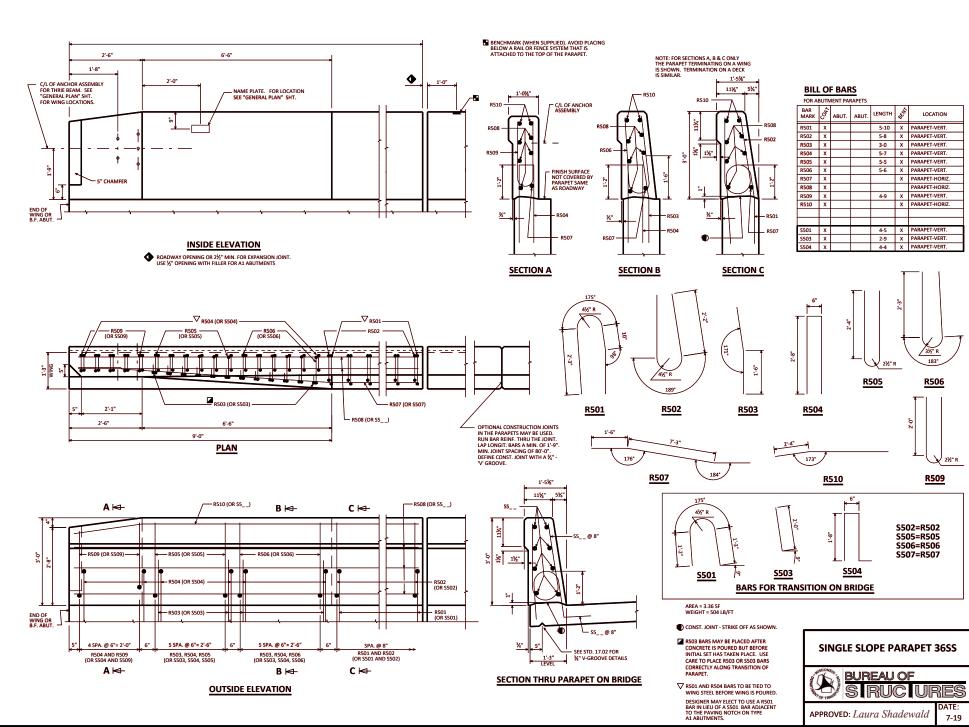
FOR ALL TUBULAR STEEL RAILING TYPE NY4 DETAILS SEE STD. 30.27.

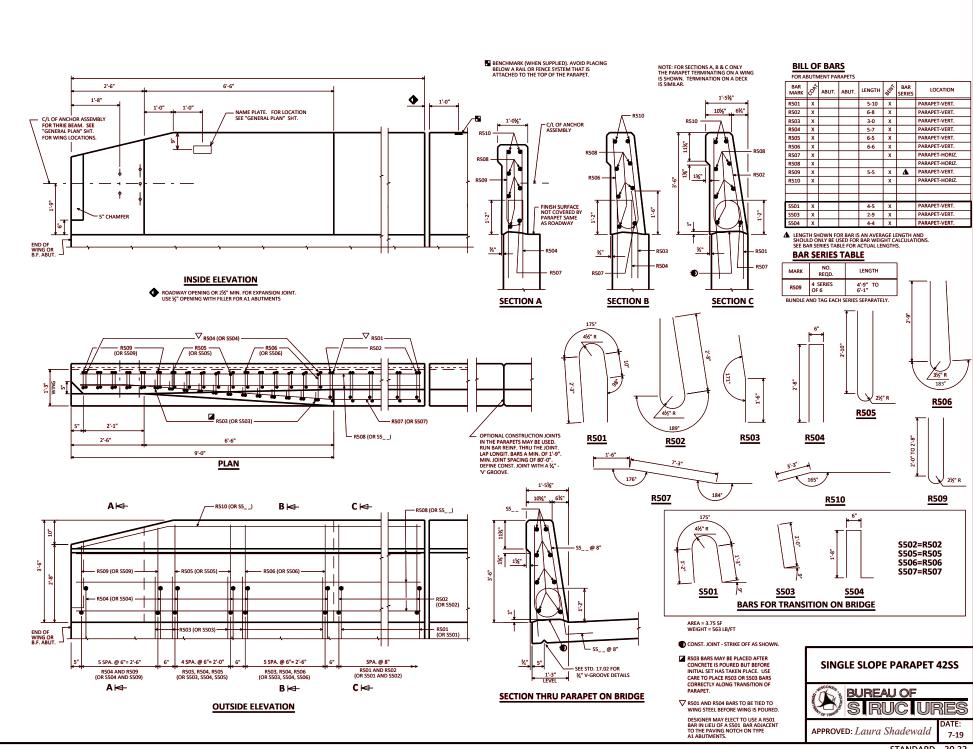
SIDEWALK DETAILS FOR TUBULAR STEEL RAILING TYPE NY4

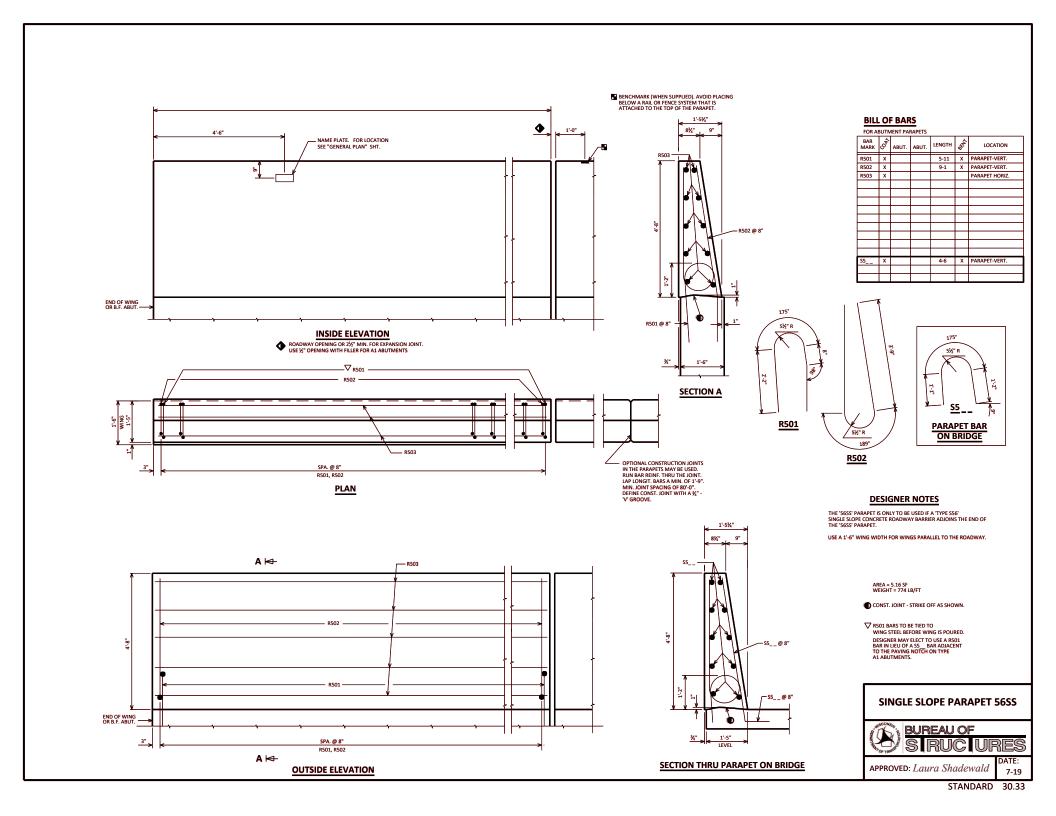


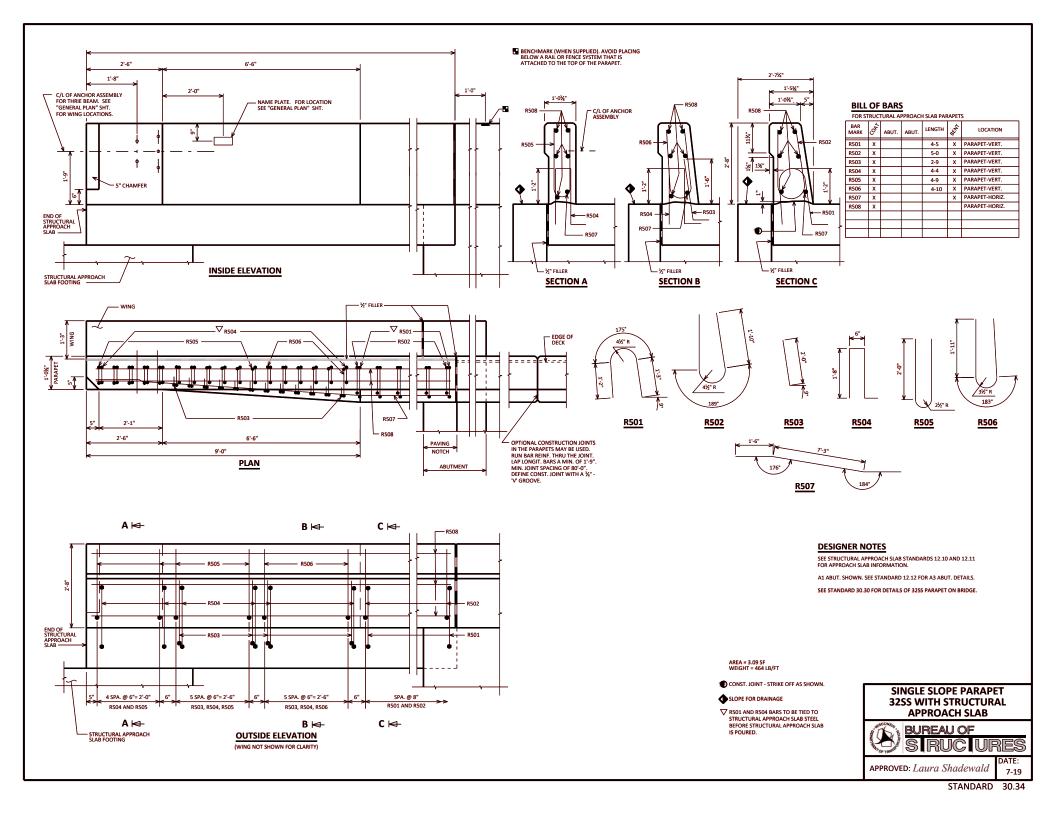
APPROVED: Laura Shadewald

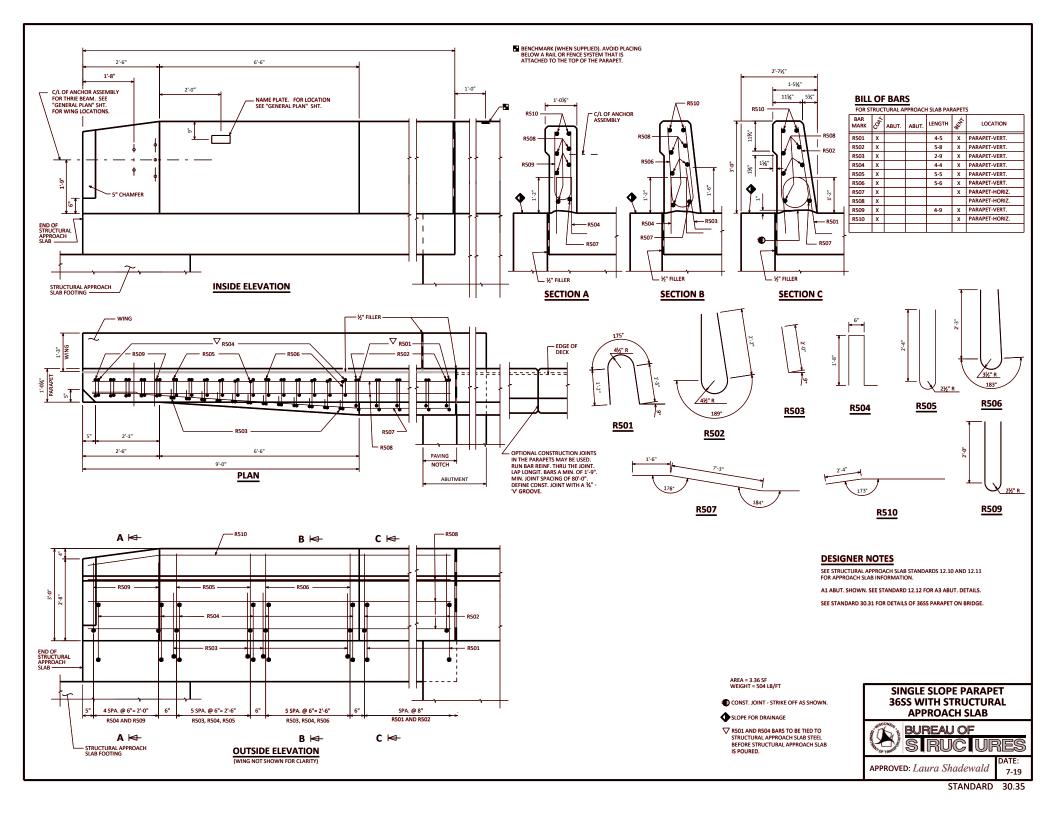


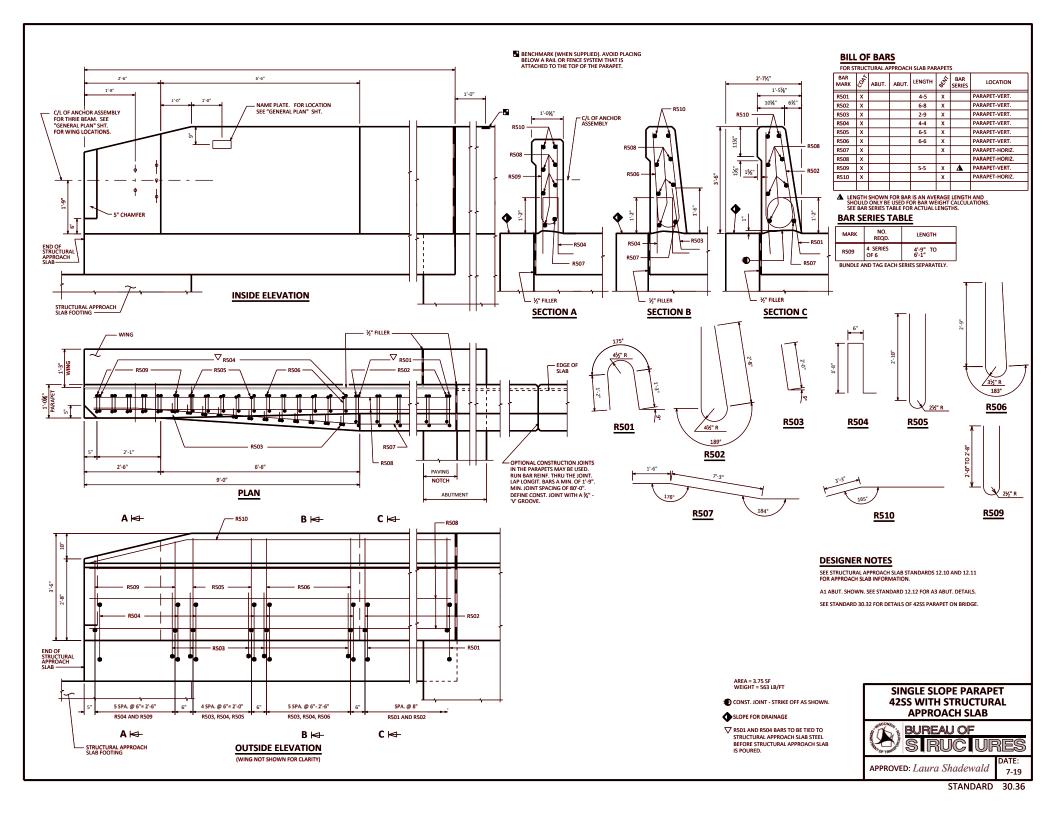


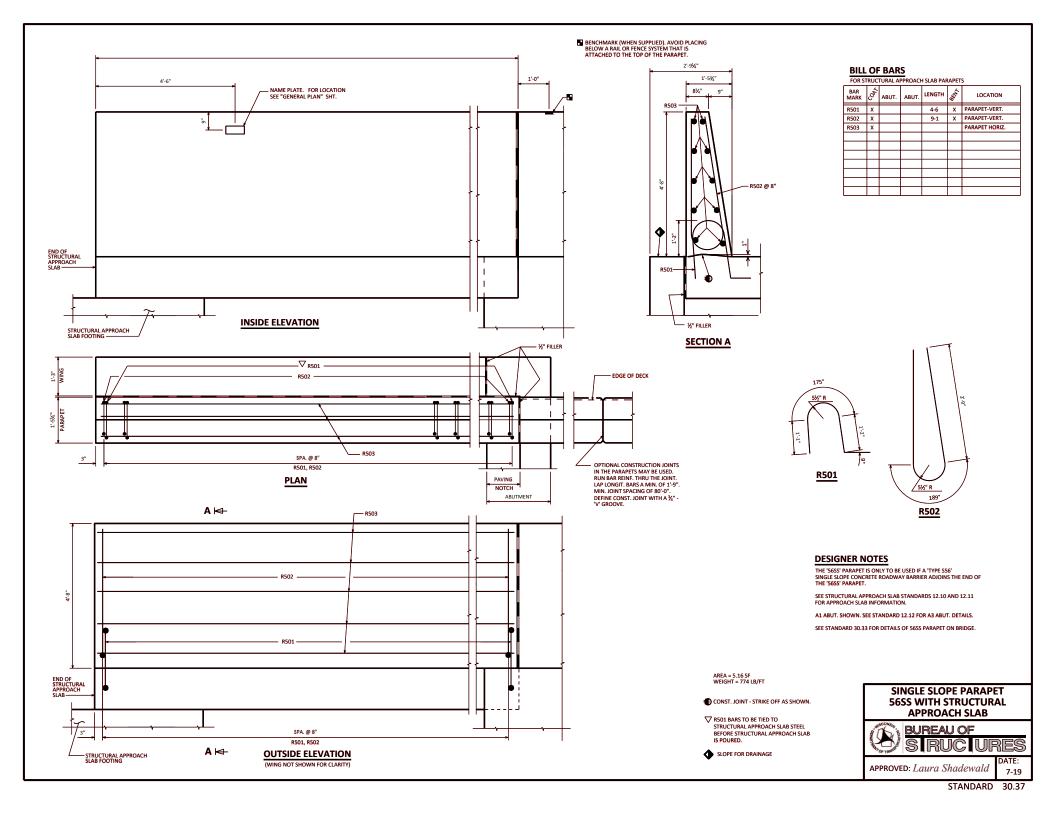


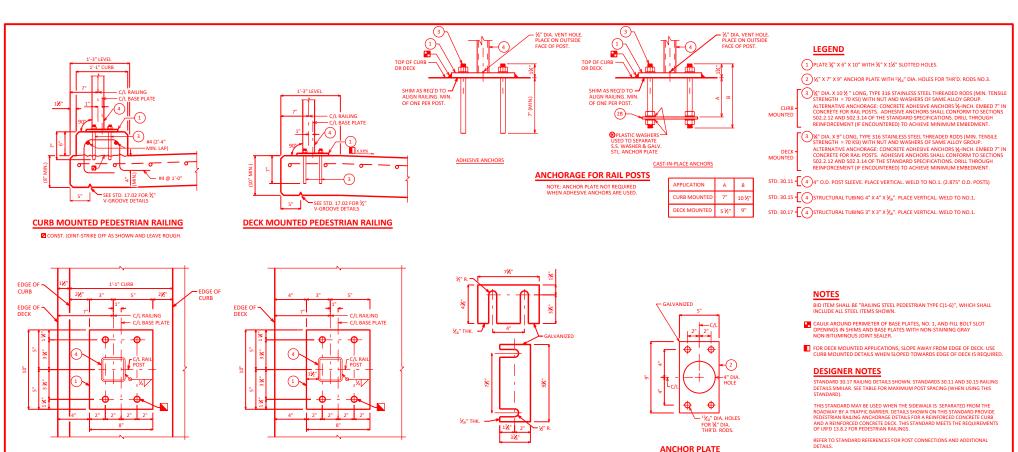










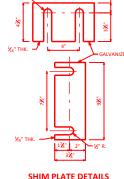


RAIL POST BASE PLATE - CURB MOUNTED

3/4" DIA. HOLES FOR ADHESIVE ANCHORS

RAIL POST BASE PLATE - DECK MOUNTED

3/4" DIA. HOLES FOR ADHESIVE ANCHORS ¾" DIA. X 1½" SLOTTED HOLES FOR CAST-IN-PLACE ANCHORS



SHIM PLATE DETAILS

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

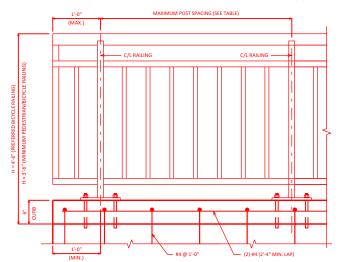
DESIGN DATA

CONCRETE STRENGTH, fo

REQUIRED CHARACTERISTIC BOND STRESS, Juner:

3,500 P.S.I. 970 P.S.I. (MIN.)

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

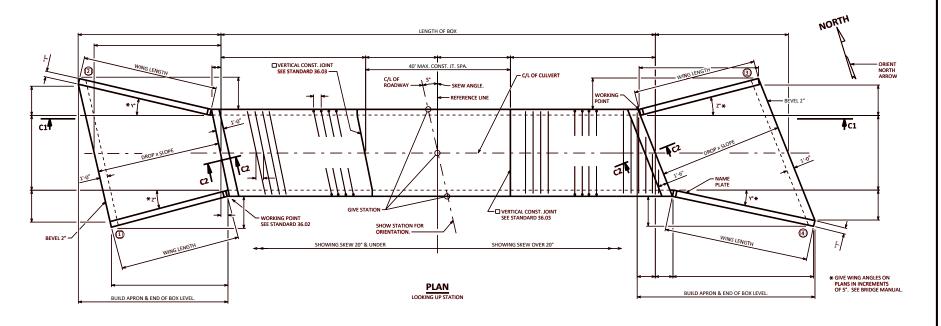


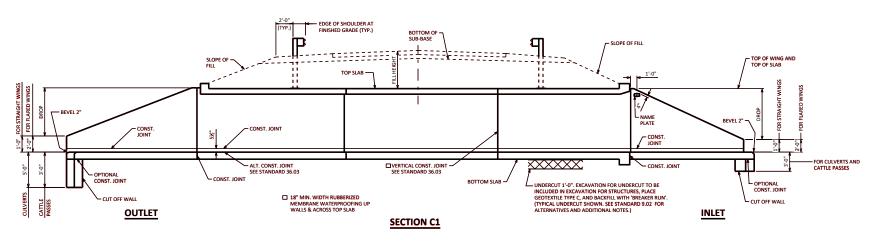
PARTIAL ELEVATION FOR PEDESTRIAN RAIL ON CURB

PEDESTRIAN RAILING



APPROVED: Laura Shadewald





LEGEND DESIGN DATA LIVE LOAD: DESIGN LOADING: HL-93 INVENTORY RATING FACTOR: RF-1. OPERATING FAITING FACTOR: RF-1. WISCONSIN STANDARD PERMIT VEHICLE (WIS.SPV):...(KIPS) ** DESIGN DATA

 MATERIAL PROPERTIES:

 CONCRETE MASONRY
 f'c = 3,500 P.S.I.

 BAR STEEL REINFORCEMENT
 fy = 60,000 P.S.I.

NOTES

SEE STANDARD 36.02 FOR NOTES.

DESIGNER NOTES

FOR SECTION C2 AND CONST. JOINT DETAILS SEE STANDARD 36.03

** SEE SECTION 36.5 FOR DESIGN RANGE OF FILL HEIGHTS. HEIGHT TO BE TO THE NEAREST 0.5 FEET ON FILLS UNDER 4 FEET AND TO THE NEAREST FOOT ON FILLS OVER 4 FEET.

SEE STANDARD 36.02 FOR ADDITIONAL DESIGNER NOTES.

SEE CHAPTER 45 FOR LOAD RATING OF EXISTING CONCRETE BOX CULVERTS.

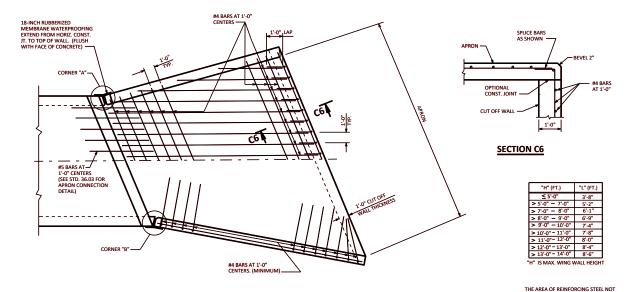
LOCATE THE NAME PLATE ON THE FIRST RIGHT WING TRAVELING IN THE HIGHWAY CARDINAL DIRECTIONS OF NORTH OR EAST.

BOX CULVERT LAYOUT



APPROVED: Laura Shadewald

d 7-24



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

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

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

DESIGNER NOTES

IF PRECAST ELEMENTS ARE ALLOWED, INCLUDE THE FOLLOWING NOTE ON THE LAYOUT SHEET:

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

ALLOWABLE PRECAST ELERITS INCLUDE: BDX CLUVEST BARREL SECTIONS, WHIGHALLS HADDERS, AND COTOFF WHALE, ARRON FLOORS CHAIR E CAST HAVE ARE UNLESS DESCRIBED OTHERWISE. THE DESIGNES SHAIL DETERMINE FREEZE SECRETION FOR A PROJECT-BY PROJECT BASE. PRECAST CHAIR FROM A PROJECT BASE PROJECT ONLY DESIGNES RECOULTE PRIOR A PROPOVAL BY THE BUREAU OF STRUCTURES. WHEN PRECAST ELEMENTS HAVE BEEN DETERMINED TO BE PROHIBITED, ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS HAVE BEEN DETERMINED TO BE THE PROHIBITED, ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOTED ACCORDING FOR THE PLANS (E.G. "A PRECAST ELEMENTS SHAIL BE NOT WINGWALL ALTERNATIVE IS NOT ALLOWED").

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

PRECAST ONLY DESIGNS REQUIRE PRIOR APPROVAL BY THE BUREAU OF STRUCTURES. SEE BRIDGE MANUAL SECTIONS 36.11.4 AND 36.12 FOR ADDITIONAL INFORMATION. I L'USED, PROVIDE PRECAST DETAILS FOLLOWING STANDARDS 36.05 AND 36.06 WITH THE FOLLOWING PRECIDENT AND ASSESSED AS A SECURIOR OF THE PROPERTY OF THE PR

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

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

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

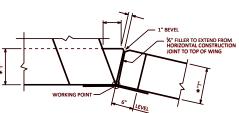
SEE STANDARDS 9.02 AND 36.01 FOR ADDITIONAL NOTES.

SEE STANDARDS 36.05 AND 36.06 FOR PRECAST BOX CULVERT DETAILS.



APRON DETAIL

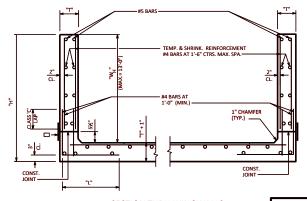
CORNER "A"



CORNER "B"

REINFORCEMENT **ALTERNATE SECTION C6** SHEET PILING (MIN PAYMENT BASED ON CONCRETE CUT OFF WA

ALTERNATE CUT OFF WALL



IDENTIFIED IN SECTIONS SHALL CONFORM TO THE FOLLOWING TEMPERATURE AND SHRINKAGE REQUIREMENTS: THICKNESS T&S REINF.

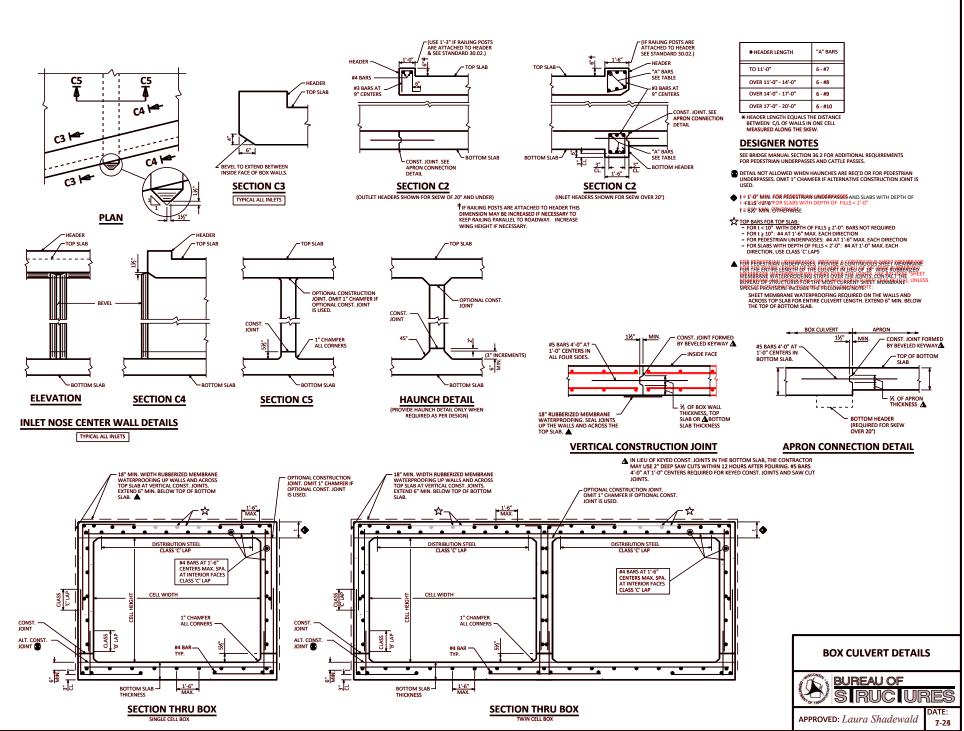
SECTION THRU WINGWALLS

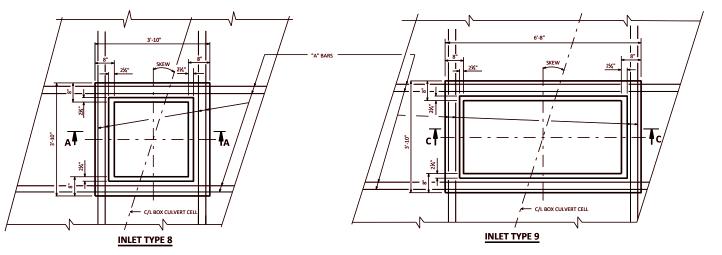
☐ 18" MIN. WIDTH RUBBERIZED MEMBRANE WATERPROOFING ALONG HORIZ. CONSTR. JT. IN WING.

BOX CULVERT APRON DETAILS



APPROVED: Laura Shadewald





FIELD CUT BAR STEEL REINFORCEMENT IN TOP SLAB TO CLEAR THE OPENING PROVIDED FOR MEDIAN INLET.

ADJUSTMENT OF THE COVER TO GRADE MAY BE ACCOMPLISHED BY THE USE OF MORTAR AND BRICK. MAXIMUM ADJUSTMENT SHALL BE 8".

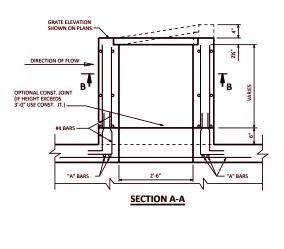
DESIGN NOTES

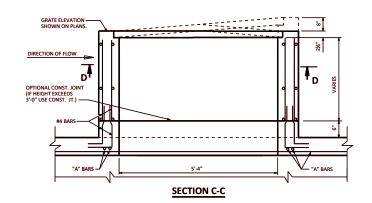
SIZE AND LENGTH OF "A" BARS TO BE DETERMINED BY THE DESIGNER.

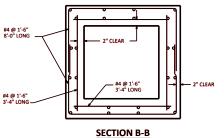
STEEL SHOWN IS ADEQUATE TO DEPTHS UP TO 15'-6" FOR INLET TYPE 9 AND 44'-0" FOR INLET TYPE 9, ASSUMING A COEFFICIENT OF LATERAL EARTH PRESSURE OF 0.5 AND A UNIT WEIGHT OF SOIL OF 0.120 KCF.

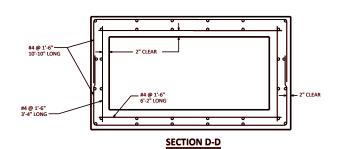
VERTICAL STEEL ADEQUATE FOR DEPTH UP TO 25'-0" ASSUMING WIND LOAD OF 50#/SQ. FT..

MEDIAN INLET PLAN (INLET COVER NOT SHOWN)



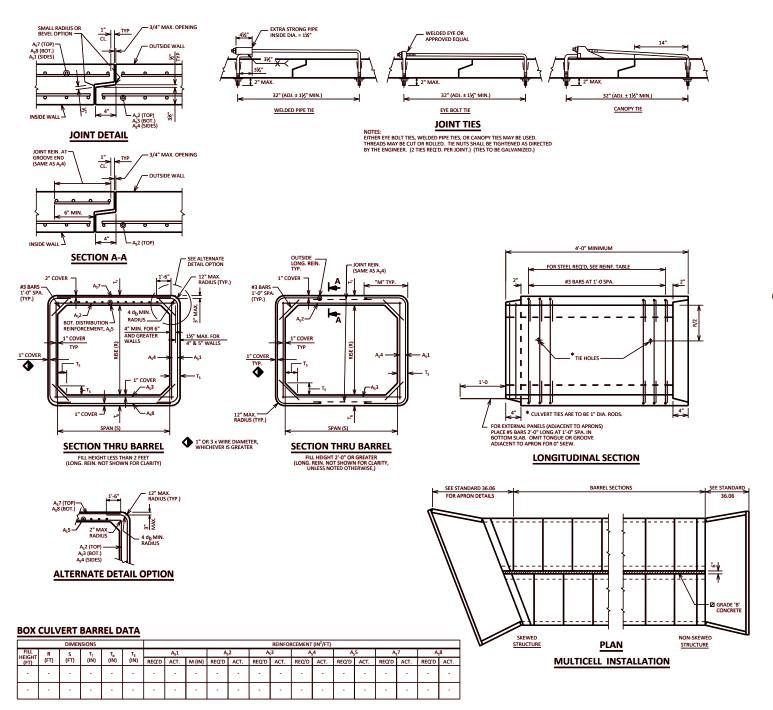






BOX CULVERT MANHOLE FOR INLET TYPE 8 & 9





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

THE DESIGN OF PRECAST BOX CULVERTS WITH ALL FILL HEIGHTS SHALL BE AS STATED IN ASTM C1577.

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

PRECAST CONCRETE SECTIONS SHALL BE PLACED ON A BEDDING OF "STRUCTURE BACKFILL TYPE B" OF 6" MINIMUM DEPTH AND AS APPROVED BY THE ENGINEER.

THE COVER OF CONCRETE OVER THE REINFORCEMENT SHALL BE 1 INCH OR 2 INCHES AS SHOWN WITH AN ALLOWABLE VARIATION OF -¾" TO +½".

THE SPACING CTR. TO CTR. OF THE CIRCUMFERENTIAL WIRES SHALL NOT BE LESS THAN 2 INCHES NOR MORE THAN 4 INCHES. THE SPACING CTR. TO CTR. OF THE LONGIT. WIRES SHALL NOT BE MORE THAN 8 INCHES. PROVIDE 0.03 SQ. IN./FT MINIMUM LONG. REINFORCEMENT AT EACH FACE IN SLABS AND WALLS.

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

WHEN TWO OR MORE BARRELS ARE UTILIZED IN PARALLEL FOR MULTICELL INSTALLATIONS THE CLEAR SPACING BETWEEN BARRELS SHALL BE 6 INCHES AND THE SPACE BETWEEN ADJACENT BARRELS FROM TOP OF BEDDING TO TOP OF TOP SLAB SHALL BE FILLED WITH

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

MATERIAL PROPERTIES:

PRECAST CONCRETE -	— f'c = 5,000 P.S.I.
BAR STEEL REINFORCEMENT -	— fy = 60,000 P.S.I.
STEEL REINFORCEMENT (WIRE)	- fv = 65 000 P S I

DESIGNER NOTES:

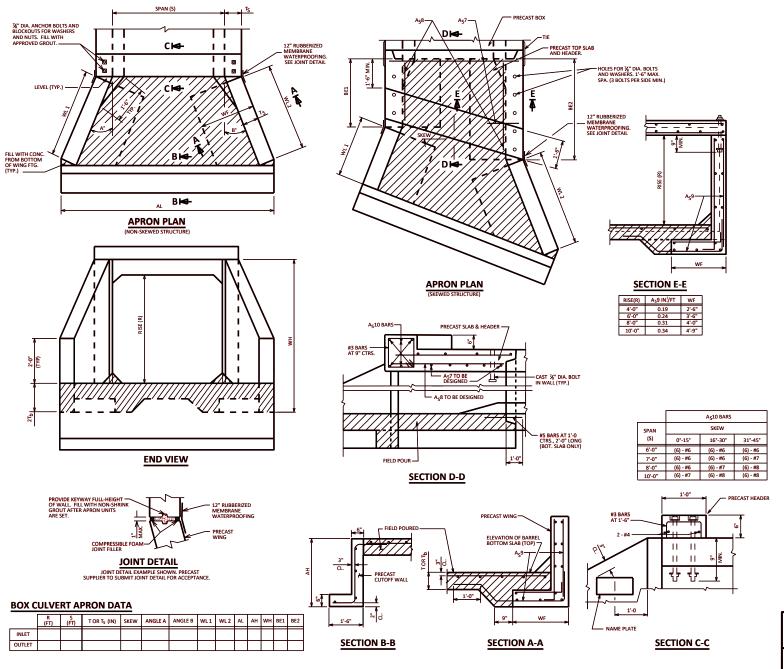
PROVIDE PRECAST DETAILS WHEN SPECIAL DETAILS ARE REQUIRED OR WHEN A PRECAST ONLY DESIGN IS PROVIDED, SEE STD. 36.02 FOR

PROVIDE "BOX CUI VERT BARREL DATA" ON CONTRACT PLANS WHEN BOX CULVERT BARREL SECTIONS WARRANT DESIGN REQUIREMENTS
BEYOND ASTM C1577 "TABLE A". SEE BRIDGE MANUAL SECTION 36.12 FOR SPECIAL CONDITIONS WARRANTING A SEPARATE ANALYSIS.

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

> PRECAST CONCRETE BOX **CULVERT BARREL DETAILS**





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

STEEL REINFORCEMENT MAY BE EITHER GRADE 60 DEFORMED BARS (FY = 60,000 P.S.I.) OR WELDED DEFORMED - WIRE FABRIC OF EQUIVALENT AREA, (FY = 65,000 P.S.I.)

THE MINIMUM CONCRETE STRENGTH OF THE FIELD POURED CONCRETE SHALL BE 3,500 P.S.I.

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

THE MINIMUM CONCRETE STRENGTH OF THE CONCRETE IN THE PRECAST APRON ELEMENTS SHALL BE 4,000 P.S.I.

THE PRECAST ELEMENTS SHALL BE PROVIDED WITH SUITABLE LIFTING DEVICES FOR HANDLING AND PLACEMENT OF THE ELEMENTS.

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

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

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

THE MAXIMUM BAR SIZE OF GRADE 60 DEFORMED BARS, OTHER THAN THE $\rm A_{S}10$ BARS, SHALL BE #5.

THE %" DIA. ANCHOR BOLTS SHALL BE GALVANIZED AND CONFORM TO THE REQUIREMENTS OF A.S.T.M. A575.

ALL EXPOSED CORNERS SHALL BE BEVELED $\frac{1}{4}$ " ON THE SIDES OR TOOL EDGED WITH A $\frac{1}{4}$ " MINIMUM RADIUS EDGER.

PRECAST CUT OF WALLS MAY BE FIELD SPLICED BY EXTENDING THE REINFORCING STEEL FROM BOTH SEGMENTS TO BE SPLICED 1'-6" INTO THE SPLICE ZONE, LAPPING THE STEEL 1'-6" AND FIELD POURING A SECTION OF CUT OFF WALL 1'-6" LONG.

PRECAST ELEMENTS MAY BE POURED IN PLACE AT THE OPTION OF THE CONTRACTOR.

APRON SHALL BE POURED AND CURED PRIOR TO BACKFILLING WINGWALLS.

DESIGNER NOTE:

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

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

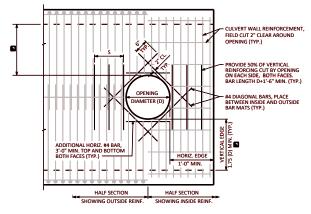


APPROVED: Laura Shadewald

ALL BAR STEEL REINFORCEMENT SHALL BE CUT 2" CLEAR AROUND OPENING.

DESIGNER NOTES

DETAILS SHOWN ARE FOR CAST-IN-PLACE CULVERTS. PRECAST CULVERT DETAILS TO BE SIMILAR.



ELEVATION

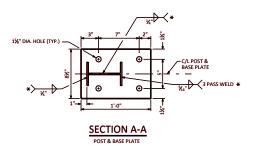
WHEN D ≤ 1'-6" S = 1'-6" WHEN D > 1'-6" S = 1'-6" MIN, D MAX

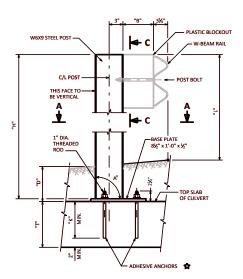
PIPE OPENING IN CULVERT WALL



APPROVED: Laura Shadewald

★ WELDING IS TO BE COMPLETED USING THE GAS-METAL ARC WELDING (GMAW) PROCESS WITH ER70S-3 WELDING WIRE AND ARGON-OXYGEN OR CO₂ COVER GAS.



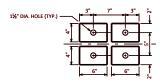


ELEVATION

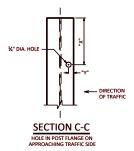
GUARDRAIL POST ANCHORS TYPE 1

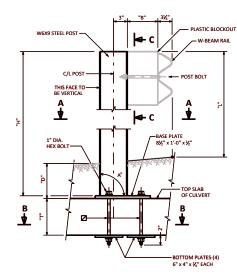
USE FOR THICKNESS "T" OF 11-INCHES OR MORE WITH A MINIMUM EMBEDMENT "K" OF 9-INCHES FOR A CONCRETE STRENGTH ($f_{\rm c}$) OF 3,500 PSI

USE FOR THICKNESS "T" OF 10-INCHES OR MORE WITH A MINIMUM EMBEDMENT "K" OF 8-INCHES FOR A CONCRETE STRENGTH ($f_{\rm C}$) OF 4,000 PSI



SECTION B-B





ELEVATION

GUARDRAIL POST ANCHORS TYPE 2

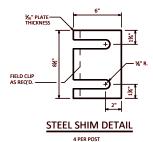
USE FOR THICKNESS "T" OF 8-INCHES OR MORE AND MINIMUM CONCRETE STRENGTH (f'c) OF 3,500 PSI

GUARDRAIL POST ANCHORAGE SYSTEM

CRITERIA:

USE FOR POSTS WITH "D" EMBEDMENT LESS THAN OR EQUAL TO 4'-0" AND GREATER THAN OR EQUAL TO 9".
NOT REQ'D FOR POSTS WITH "D" EMBEDMENT MORE THAN 4'-0".
NOT ALLOWED FOR POSTS WITH "D" EMBEDMENT LESS THAN 9".

	"L"	"B"	"X"	"Y"	SOURCE
CLASS "A" GUARDRAIL	2'- 41/8"	8"	7"	13/ ₁₆ "	SDD 14 B 15
MGS GUARDRAIL	2'- 71/8"	12"	7⅓"	¾"	SDD 14 B 42



NOTES

DETAILS SHOWN FOR POSTS, PLATES, ANCHORAGE SYSTEM AND INSTALLATION, BLOCKS, AND GUARDRAIL ARE NOT PART OF THE STRUCTURE CONTRACT, BUT ARE BID PER THE ROADWAY DESIGN PLANS.

POST BASE PLATES (AND BOTTOM PLATES IF USED) 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.

CUT BOTTOM OF POST SO THAT POST WILL BE VERTICAL WHEN POST ASSEMBLY IS PLACED ON TOP OF THE CULVERT. ALONG THE ROADWAY THE POST WILL BE NORMAL TO GRADE LINE. HEX BOLTS AND THERABLED RODS ARE TO BE PLACED PREPREDICULAR TO THE BASE PLATE (AND BOTTOM PLATE IF USED).

POST, BASE PLATE (AND BOTTOM PLATE IF USED), AND SHIMS SHALL BE GALVANIZED AFTER FABRICATION.

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

ALL MATERIAL USED IN POSTS AND PLATES SHALL BE MADE FROM MATERIAL CONFORMING TO ASTM DESIGNATION A709

HEX BOLTS, THREADED RODS, HEX NUTS AND WASHERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F1554 GRADE 36, AND SHALL BE GALVANIZED. RODS ARE TO BE FULLY THREADED AND BOLTS TO BE THREADED AND BOLTS TO BE THREADED 3". CHAMFER TOP OF BOLTS AND RODS BEFORE THREADING.

- ADHESIVE ANCHORS (1-INCH DIA. THREADED ROD). EMBED IN CONCRETE AS DETAILED. CHARACTERISTIC BOND STRENGTH SHALL MEET OR EXCEED 1305 PSI FOR UNCRACKED CONCRETE. SEE STANDARD SPECIFICATION 502.3.14 AND APPLY TO THREADED RODS.
- \blacksquare THRU-BOLTS (1-INCH DIA. HEX BOLT). DRILL THRU TOP SLAB WHEN THE CONCRETE HAS ACHIEVED ITS DESIGN STRENGTH (f_c).

STEEL SHIMS MAY BE USED BETWEEN PLATES AND SLAB WHERE REQUIRED FOR ALIGNMENT.

DESIGNER NOTES

CHECK CRITERIA TO SEE IF POST ANCHORAGE SYSTEM IS REQUIRED BASED ON FILL HEIGHT "D" AT POSTS. IF REQUIRED, THEN SELECT WHICH TYPE OF ANCHORAGE (TYPE 1 OR TYPE 2) SHOULD BE USED.

'MGS' GUARDRAIL SHOULD BE USED FOR ALL NEW SYSTEMS. CONTACT THE ROADWAY DESIGN SECTION TO VERIFY THAT CONDITIONS AT THE SITE OF THE STRUCTURE WOULD NOT REQUIRE A CLASS 'A' GUARDRAIL SYSTEM TO BE USED.

POST SMALING IS 21-31/F PER FEM SID 14 B S1. SEE FAM SID 14 B S1 FOR MINIMUM CLEARNICES FROM EDGES, JOINTS OR OBSTRUCTIONS TO ANCHORAGE SYSTEM. FOR TYPE 2 ANCHORAGE MAKE SURE BOTTOM PLATE IS NOT PLACED AT THE SLOPED HAUNCH BETWEEN THE WALL AND TOP SLAB. SHIFT LOCATION OF POSTS (LONGTUDINALLY ALONG CL) OF POSTS IN REQUIRED TO MEET SPACING AND CLEARNICE REQUIREMENTS. CHECK WITH ROADWAY DESIGN SECTION TO VERITY SPACING IS ACCEPTABLE.

SHOW DETAILS AND PERTINENT NOTES FOUND ON THIS STANDARD ON THE STRUCTURE PLANS FOR THE CHOSEN ANCHOR TYPE.

SHOW LOCATION OF POSTS AND SPACING ALONG C/L OF POST IN PLAN VIEW OF STRUCTURE PLANS. LABEL EACH POST (P1, P2, ETC.). SHOW A TABLE PROVIDING THE ESTIMATED LENGTH "H" OF EACH POST, AND THE ANGLE A" BETWEEN BASE PLATE AND POST.

IN THE TOP SLAB PROVIDE A MINIMUM OF #4 BARS AT 1'-0" SPACING IN EACH DIRECTION FOR TOP AND BOTTOM MAT WHEN TYPE 1 OR TYPE 2 ANCHORAGE DETAILS ARE USED.

THIS 'MGS' GUARDRAIL SYSTEM AND ANCHORAGE SYSTEM MEET

GUARDRAIL POST ANCHORAGE SYSTEM



APPROVED: Laura Shadewald

DESIGNER NOTES FOR PRECAST CONCRETE STRUCTURE

BID ITEM SHALL BE "THREE-SIDED PRECAST CONCRETE STRUCTURE".

PRECAST BRIDGES WILL BE LIMITED TO SPANS NOT TO EXCEED 42'-0".

SECURE WISDOT BOS AND GEOTECHNICAL (SOILS) ENGINEER'S APPROVAL BEFORE INCORPORATING PRECAST BRIDGES IN ANY PROJECT

CHECK FOUNDATION PRESSURE, SCOUR AND SETTLEMENT TO ENSURE THAT NO FOUNDATION FAILURE OCCURS. PREFERBALY, PROVIDE FOOTING ON NON-PILEDING FOUNDATION MATERIAL. HOWEVER, ALLOWABLE DIFFERENTIAL SETTLEMENT FOR FOOTING ON SOIL SUPPORTING THE STRUCTURE E. DOUZO ET, PER FT, I (MAX) OF THE SPAN. DESIGN STRUCTURE COMPONENTS TO RESIST FORCES CAUSED BY THIS DIFFERENTIAL SETTLEMENT. ADEQUATELY REINFORCE THE ENTIRE FOOTING AS REQUIRED BY THE DESIGN.

WHEN BEAM GUARD POSTS ARE TO BE EMBEDDED IN FILL ABOVE THE PRECAST ARCH UNIT, PROVIDE A DEPTH OF FILL, MEASURED FROM TOP OF ARCH CROWN TO TOP OF ROADWAY, AT LEAST EQUAL TO THE MINIMUM EMBEDMENT DEPTH SHOWN ON 50D 14842 PLUS 6".

FOR SHORTER SPAN CULVERTS, WHERE BEAM GUARD CROSSES THE LENGTH OF THE STRUCTURE, CONSIDERATION SHALL BE GIVEN TO THE DETAILS SHOWN ON SDD 14B43 PROVIDED ALL REQUIREMENTS ON THIS STANDARD CAN BE MET.

WHEN A CONCRETE BARRIER (SINGLE SLOPE) CROSSES THE LENGTH OF THE STRUCTURE, THE FILL DEPTH MUST BE ADEQUATE TO ACCOMMODATE THE REQUIRED FOOTING DEPTH. SEE SDD 14832 AND SDD 14834 FOR CONCRETE BARRIER DETAILS.

PROVIDE A SUITABLE DRAINAGE PIPE ALONG THE CULVERT AND WINGWALLS TO RELEASE HYDROSTATIC PRESSURE. WHERE SIGNIFICANT SEPPAGE OR RELATIVELY BAPID ACCUMULATION OF WATER IS ANTICIPATED BEHIND THE WALL IN INCORPORATE PIPE UNDERSPRAN WRAPPED AS SPICHIEP, INTO THE BACKFILL STRUCTURE, BEHIND THE WALL TO INFROVE DRAINAGE CONDITIONS. DIRECT SEPPAGE FROM DRAINAGE PIPE TO WEEP HOLES ALONG THE EXTERIOR FACE OF THE WALL OR TO THE STORM WATER CONVEYANCES.

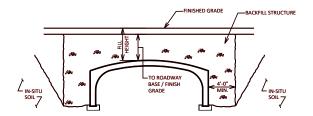
PLACE FOOTINGS BELOW SCOUR AND FROST DEPTHS. PLACE BOTTOM OF FOOTING AT A MINIMUM DEPTH EQUAL TO PREVAILING FROST DEPTH OR SCOUR DEPTH BUT NOT LESS THAN 4'-0" BELOW GROUND ELEVATION UNLESS CONSTRUCTED ON ROCK FOUNDATION OR OTHERWISE INDICATED.

PROVIDE DUCTILE JOINT SYSTEM BETWEEN VERTICAL LEG OF THE PRECAST SEGMENT AND FOOTER AS INDICATED ON THE STANDARD DETAIL DRAWINGS.

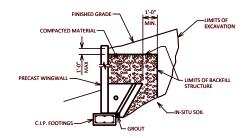
BENDING OF REINFORCEMENT FOR PRECAST BRIDGE UNITS - THE OUTSIDE AND INSIDE CIRCUMFERENTIAL REINFORCING STEEL FOR THE CORNERS OF THE BRIDGE SHALL BE BENT TO SUCH AN ANGLE THAT IS APPROXIMATELY EQUAL TO THE CONFIGURATION OF THE BRIDGES OUTSIDE CONNER.

LRFD DESIGN LOADS

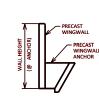
LIVE LOAD: HL-93
HORIZONTAL EARTH PRESSURE: UNIT WEIGHT = 125 PCF
VERTICAL EARTH PRESSURE: UNIT WEIGHT = 120 PCF



BACKFILL REQUIREMENTS



WALL BACKFILL REQUIREMENTS



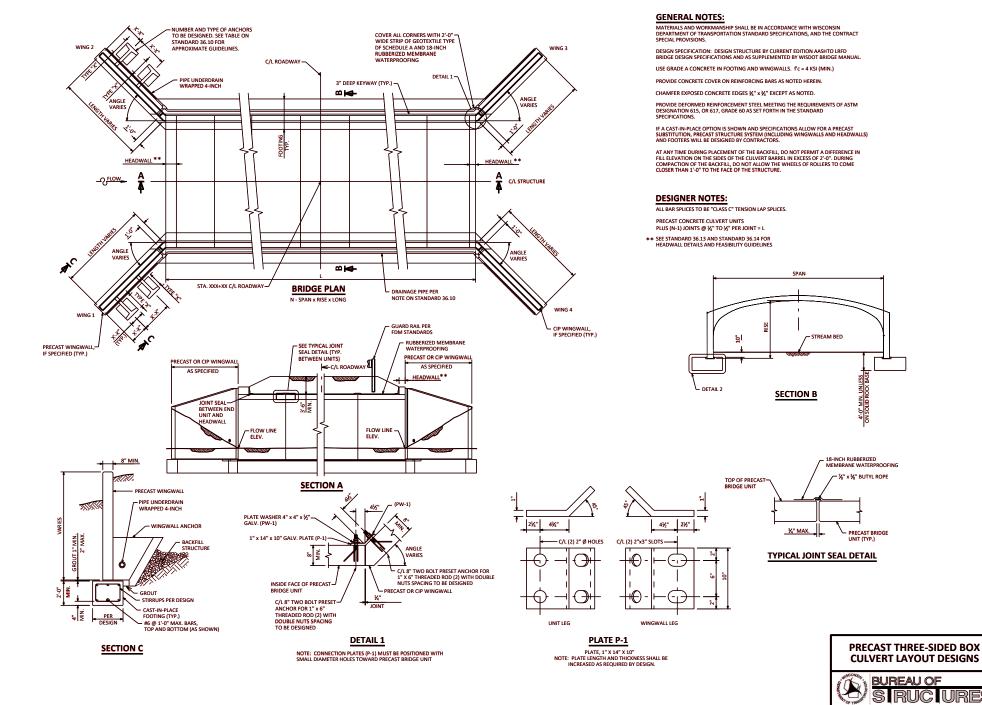
APPROXIMATE/GUIDELINE NUMBER OF ANCHORS PER WALL								
LENGTH OF WALL	NO. ANCHORS							
L = 14'-0"	2							
L = 20'-0"	3							
L = 24'-0"	4							
24'-0" < L	MULTIPLE-PIECE WINGWALL*							

*NOTE: ADJACENT SEGMENTS SHALL BE ATTACHED TO EACH OTHER TO KEEP FRONT FACES IN ALIGNMENT. PLACE A FILLER AT THESE JOINTS WITH A MEMBRANE ALONG THE JOINT AT THE BACK FACE.

PRECAST THREE-SIDED BOX CULVERT DESIGN NOTES

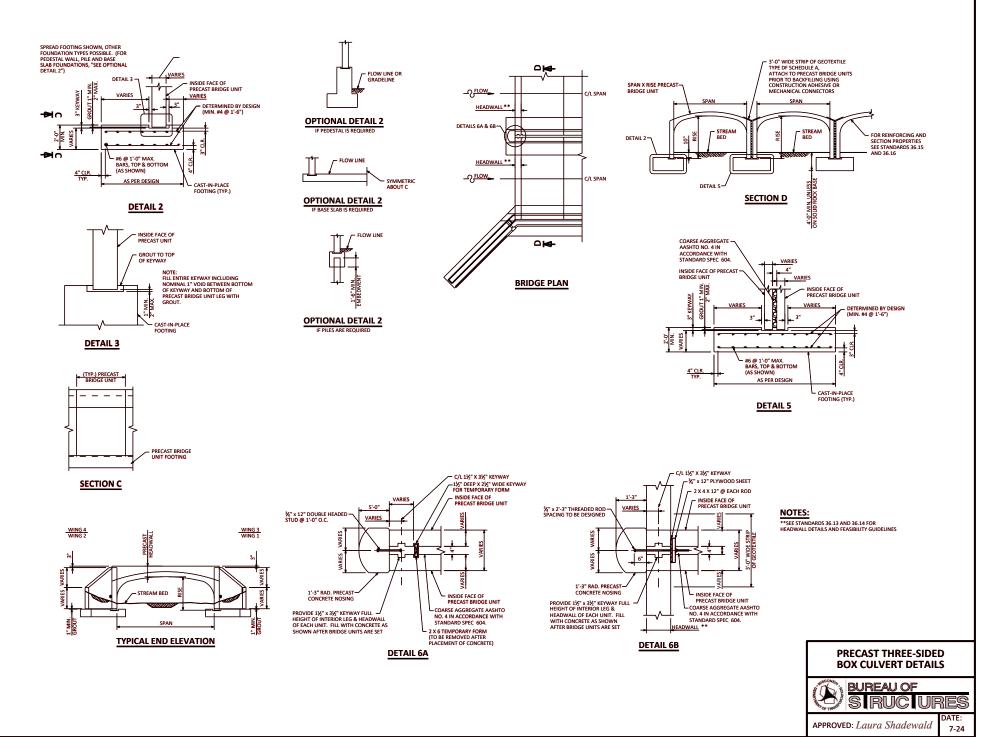


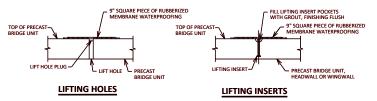
APPROVED: Laura Shadewald



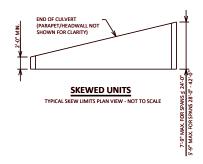
7-18

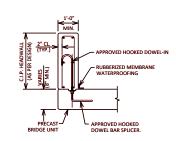
APPROVED: Laura Shadewald



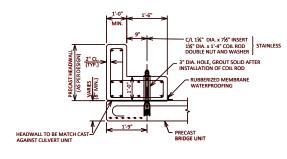


TYPICAL LIFT POINT SEALING DETAIL





CAST-IN-PLACE HEADWALL DETAIL NOT TO SCALE



PRECAST HEADWALL DETAIL WITH COLLAR

£	된 보	
*[[

MAX. HEIGHT @ CROWN TO T/HEADWALL (NO LIVE LOAD SURCHARGE)

8'-0"

6'-0"

4'-0"

14'-0"

20'-0" - 28'-0"

42'-0"

H2 MAX. APPROXIMATE HEIGHT @ EDGE OF SPAN

9'-6¾"

10'-0"

10'-6"

10'-0"

LRFD COLLAR/HEADWALL DESIGN NOTES:

- HEADWALL PETSIAS HOWN HERE HAVE ONLY BEEN DESIGNED FOR THE FOLLOWING 2 LOAD CASES:

 1) EARTH PRESSURE ONLY.

 2) EARTH PRESSURE THAT DAD SURCHARGE.

 1) EARTH PRESSURE THAT DAD SURCHARGE.

 1) EARTH PRESSURE THAT DAY SURCHARGE.

 1-10-11 THOUGH AS BARRIER TO THE HEADWALL.

 1-10-11 HEADWALL THICKNESS.

 501 BEHIND HEADWALL SAT SAME ELEVATION AS TOP OF HEADWALL.

 1-10-11 THICKNESS.

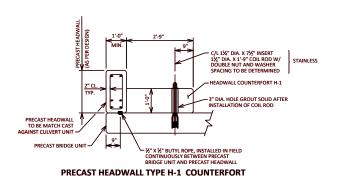
 501 BEHIND HEADWALL SAT SAME ELEVATION AS TOP OF HEADWALL.

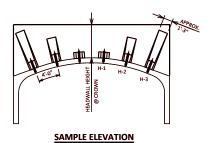
 1-10-11 THICKNESS.

PRECAST THREE-SIDED **BOX CULVERT HEADWALL DETAILS**



APPROVED: Laura Shadewald





NOTE: THE ACTUAL NUMBER AND TYPE OF THE ACTUAL NUMBER AND TYPE OF PRECAST HEADWALL COUNTERFORTS IS TO BE DESIGNED. HOWEVER, USE THE FOLLOWING CHART AS A GENERAL GUIDE TO FEASIBILITY OF COUNTERFORT USE.

	COUNTERFORT	MAX HEADWALL HEIGHT @ COUNTERFORT LOCATION			
	COUNTERPORT	NO SURCHARGE	W/ 2'-0" SURCHARGE		
	H-1	7'-0"	5'-0"		
14'-0" SPAN	H-2	7'-0"	5'-0"		
	H-3	8'-0"	6'-0"		
	H-1	8'-0"	6'-0"		
20'-0" - 42'-0" SPANS	H-2	10'-0"	7'-0"		
5115	H-3	10'-0"	8'-0"		

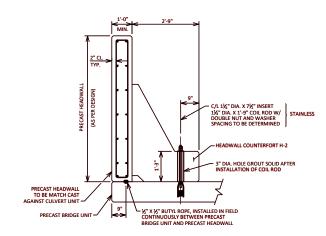
LRFD HEADWALL COUNTERFORTS

- HEADWAIL DETAILS SHOWN HERE HAVE ONLY BEEN DESIGNED FOR THE FOLLOWING 2 LOAD CASES:

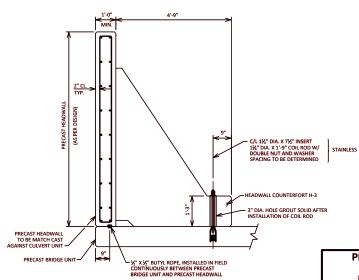
 1) EARTH PRESSURE FLIVE LOAD SURCHARGE
 THESE DETAILS ARE NOT TO BE USED WHERE A VEHICLE LOAD CAN BE TRANSMITTED THROUGH A BARRIER TO THE HEADWALL.

 ASSUMED 4.0° SACKING FOR COUNTERPORTS

- 1'-0" HEADWALL THICKNESS MIN.
 SOIL BEHIND HEADWALL IS AT SAME ELEVATION AS TOP OF HEADWALL
 ADDITIONAL HEADWALL HEIGHT MAY BE ACHIEVED WITH CLOSER
- COUNTERFORT SPACING
 FOR DETACHED HEADWALL DESIGNS ONLY



PRECAST HEADWALL TYPE H-2 COUNTERFORT



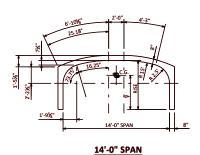
PRECAST HEADWALL TYPE H-3 COUNTERFORT

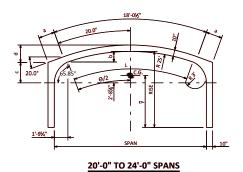
NOT TO SCALE

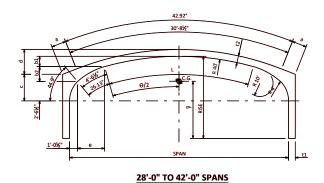
PRECAST THREE-SIDED **BOX CULVERT HEADWALL DETAILS**



APPROVED: Laura Shadewald







	CENTER OF GRAVITY 7 FT								AREA OF CONCRETE SECTION SQ. FT					
RISE			SPAN	I - FT				RISE			SPAN	- FT		
FT	14	20	24	28	36	42		FT	14	20	24	28	36	42
4	3.2							4	15.2					
5	3.9	3.8						5	16.5	24.8				
6	4.6	4.6	4.6					6	17.8	26.5	29.1			
7	5.2	5.3	5.3	5.3				7	19.2	28.2	30.8	39.9		
8	5.8	6.0	6.0	6.0	5.8			8	20.5	29.9	32.5	41.9	54.1	
9	6.5	6.6	6.6	6.7	6.5			9	21.8	31.5	34.2	43.9	56.4	
10	7.1	7.3	7.3	7.4	7.2	6.9		10	23.0	33.2	35.8	45.9	58.7	64.7
11				8.0	7.9	7.7		11				47.9	61.1	67.0
12					8.6	8.4		12					63.4	69.4
13					9.3	9.1		13					65.7	71.7

	GEOMETRIC PROPERTIES (FT.) (NOT SHOWN ON DRAWING)							
		S	PAN - FT					
	20	24	28	36	42			
θ	38.43°	48.29°	25.30°	37.93°	47.86°			
L	16.77	21.07	17.66	26.48	33.41			
a	2.13	4.25	0.00	4.48	4.48			
b	1.39	2.19						
b1			0.97	2.17	3.50			
b2			1.96	2.40	2.75			
с	2.68	2.75	3.76	3.91	4.31			
d	2.29	3.01	2.84	4.48	5.66			
e			4.07	3.83	3.63			
t1			1.00	1.17	1.17			
t2			0.83	1.00	1.00			

(REFER TO STANDARDS 36.16 FOR REINFORCING DETAILS)

							A	RCH UNIT PRI	MARY REINFORCI	NG (MINIMUI	M)							
	4	14'-0" SPAN '-0" TO 10'-0"		5	20'-0" SPAI '-0" TO 10'-0"		6	24'-0" SPAI '-0" TO 10'-0"		7	28'-0" SPA "0-'10 11'-0"			36'-0" SPA 8'-0" TO 13'-0'		1	42'-0" SPA 0'-0" TO 13'-0	
COVER ft	A1 SQ. IN/FT	A3 SQ. IN/FT	f'c REQ'D. PSI	A1 SQ. IN/FT	SQ. IN/FT	f'c REQ'D. PSI	A1 SQ. IN/FT	A3 SQ. IN/FT	f'c REQ'D. PSI	A1 SQ. IN/FT	A3 SQ. IN/FT	f'c REQ'D. PSI	A1 SQ. IN/FT	A3 SQ. IN/FT	f'c REQ'D. PSI	A1 SQ. IN/FT	A3 SQ. IN/FT	f'c REQ'D. PSI
3	0.66	0.48	5000	0.90	0.78	5000	0.72	0.84	5000	0.96	1.08	5000	1.50	1.68	6000	1.44	1.44	6000
6	0.66	0.48	5000	0.72	0.78	5000	0.72	1.08	5000	0.96	1.32	5000	1.50	1.92	6000	1.44	1.44	6000 ④
9	0.66	0.48	5000	0.72	0.90	5000	0.72	1.44	5000	0.96	1.68	5000 ①	1.50	2.40	6000	1.44	1.92	6000 ①
12	0.66	0.60	5000	0.72	1.08	5000	0.72	1.80	6000 ①	0.96	1.80	6000 ①	1.50	3.00	6000 ①	1.44	2.16	6000 ①

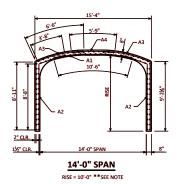
① SHEAR REINFORCEMENT REQUIRED
② SHEAR REINFORCEMENT REQUIRED FOR 6'-0" & 7'-0" RISE
③ SHEAR REINFORCEMENT REQUIRED FOR 8'-0" & 9'-0" RISE
③ SHEAR REINFORCEMENT REQUIRED FOR 10'-0" & 11'-0" RISE
⑤ MINIMUM PRECAST UNIT WIDTH = 3'-11½"

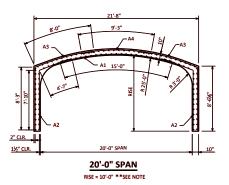
NOTE: THESE STEEL AREAS ARE SHOWN FOR COVER OF 12'-0" OR LESS.

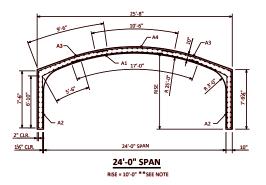
PRECAST THREE-SIDED BOX CULVERT CROSS SECTIONS



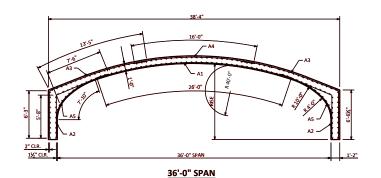
APPROVED: Laura Shadewald







28'-0" SPAN 28'-0" SPAN



0.13

A4 = 0.24

14'-0" SPAN 24'-0" SPAN CIRCUMF. AREA REQ'D ONGITUDINAL AREA REQ'D CIRCUMF. AREA REQ'D SQ. IN/FT ONGITUDINAL AREA REQ'D LENGTH FT AREA REQ'D SQ. IN/FT AREA REQ'D SQ. IN/FT A1 = ** 17'-0' 12'-3" A2 = 0.24 12'-4" 0.13 0.13 12'-5" A2 = 0.24 0.13 A2 = 0.24

A4 = 0.24

	28'-0" SPAN		3	6'-0" SPAN		42'-0" SPAN			
CIRCUMF. AREA REQ'D SQ. IN/FT	LONGITUDINAL AREA REQ'D SQ. IN/FT	LENGTH FT	CIRCUMF. AREA REQ'D SQ. IN/FT	LONGITUDINAL AREA REQ'D SQ. IN/FT	LENGTH FT	CIRCUMF, AREA REQ'D SQ. IN/FT	LONGITUDINAL AREA REQ'D SQ. IN/FT	LENGTH FT	
A1A =**	0.13	22'-0"	A1A = **	0.13	26'-0"	A1A =**	0.13	31'-0"	
A1B = **	NOT REQ'D	16'-0"	A1B = **	NOT REQ'D	18'-0"	A1B = **	NOT REQ'D	23'-0"	
A2 = 0.36	0.13	12'-6"	A2 = 0.36	0.13	13'-2"	A2 = 0.48	0.13	14'-4"	
A3A =**	0.13	17'-6"	A3A = **	0.13	19'-8"	A3A = **	0.13	21'-9"	
A3B = **	NOT REQ'D	13'-6"	A3B = **	NOT REQ'D	15'-8"	A3B =**	NOT REQ'D	17'-9"	
A4 = 0.36	0.13	14'-3"	A4 = 0.36	0.13	16'-0"	A4 = 0.48	0.13	20'-0"	
A5 = 0.24	0.13	7'-10"	A5 = 0.24	0.13	7'-10"	A5 = 0.24	0.13	7'-10"	

16'-3"

NOTES:

** SEE ARCH UNIT PRIMARY REINFORCING CHART ON STANDARD 36.15 FOR MORE INFORMATION.

ALL REINFORCING DIMENSIONS SHOWN ARE FOR 10'-0" RISE. A2 AND A3 STEEL LENGTHS SHALL BE REVISED ACCORDINGLY FOR RISES OTHER THAN

THESE STEEL AREAS, STEEL LENGTHS AND ARCH THICKNESS ARE SHOWN FOR COVER OF 12'-0" OR LESS.

THREE-SIDED PRECAST CONCRETE STRUCTURES SHALL BE DESIGNED FOR COVER GREATER THAN 12'-0", AND CAN BE DESIGNED FOR UP TO THE LIMITS OF COVER SHOWN IN THE TABLE BELOW.

THE COVER OF CONCRETE OVER THE OUTSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2 INCHES MINIMUM.

THE COVER OF CONCRETE OVER THE INSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 11/2 INCHES MINIMUM.

THE CLEAR DISTANCE OF THE END CIRCUMFERENTIAL WIRES SHALL NOT BE LESS THAN 1" NOR MORE THAN 2" FROM THE ENDS OF EACH SECTION.

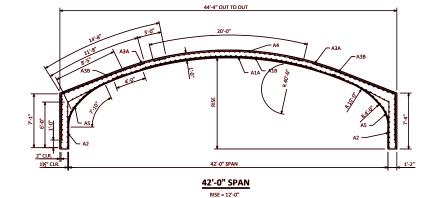
AN ALTERNATE EQUIVALENT OF WELDED WIRE FABRIC (WWF) ASTM A497 MAY BE SUBSTITUTED FOR THE REINFORCEMENT SHOWN, UPON APPROVAL OF THE STRUCTURES DEVELOPMENT SECTION.

MINIMUM COVER FOR WILDED WIRE FABRIC: 1-INCH

DESIGN DATA:

f'c = 5.000 PSI MINIMUM FOR CONCRETE fy = 60,000 PSI FOR STEEL REINFORCING BARS fy = 65,000 PSI FOR WELDED WIRE FABRIC (IN FLAT SHEET)

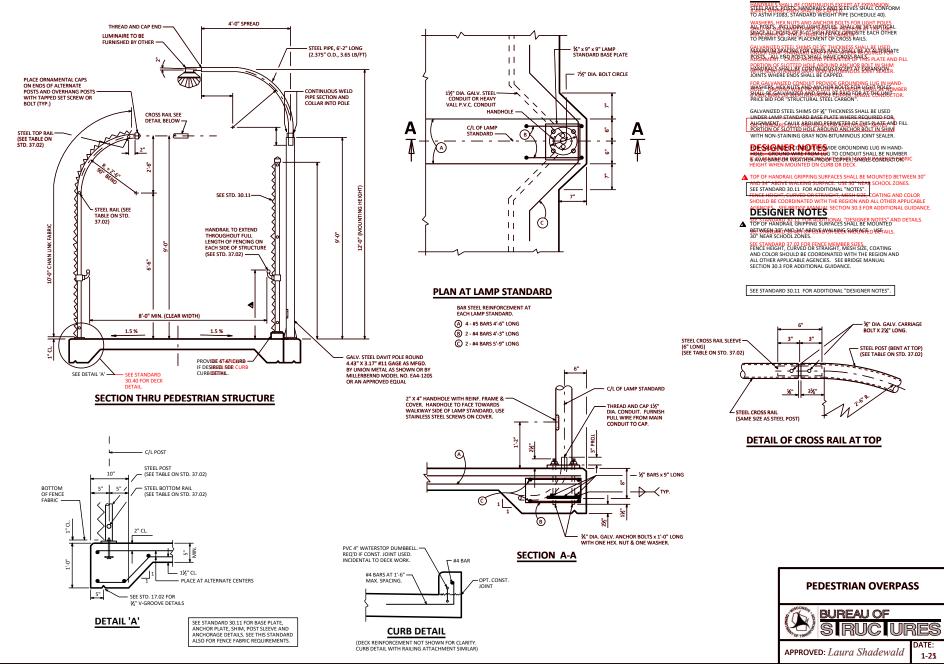
SPAN FT	APPROX. MAX. COVER
14'	50'
20' - 24'	30'
28' - 36'	20'
42'	15'



PRECAST THREE-SIDED BOX **CULVERT REINFORCEMENT**

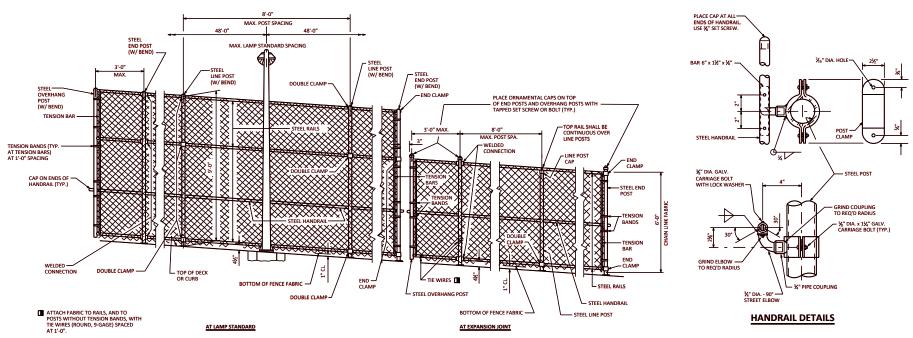


APPROVED: Laura Shadewald

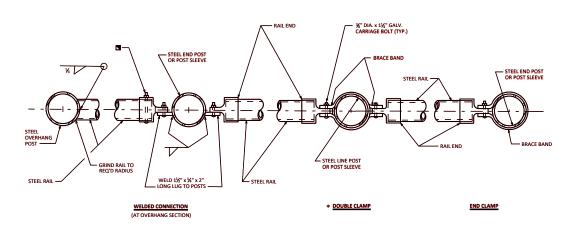


STEEL RAILS, POSTS, HANDRAILS AND SLEEVES SHALL CONFORM TO ASTM F1083, STANDARD WEIGHT PIPE (SCHEDULE 40). ALL POSTS, INCLUDING LIGHT POLES, SHALL BE SET VERTICAL. SPACE ALL POSTS OF 9-0" HIGH FENCE OPPOSITE EACH OTHER TO PERMIT SQUARE PLACEMENT OF CROSS RAILS.

MAXIMUM SPACING FOR CROSS RAILS SHALL BE AT ALTERNATE NOTE:



ELEVATION OF FENCE



PLAN OF RAILING ■ BOLT RAIL TO RAIL END TO SECURE OVERHANG SECTION.

ALTERNATE IS TO WELD RAIL DIRECTLY TO END POST.

NOTE: PLACE ALL BOLT HEADS ON SIDE OF

* ALTERNATE TO DOUBLE CLAMP: USE LINE RAIL CLAMP
(BOULEVARD) OR 180° BRACE BAND, WHICH MAY BE USED
WHEN THE POSTS ARE EITHER BOLTED TO THE POST SLEEVES OR DIRECTLY WELDED TO THE BASE PLATE. (AS SHOWN ON STANDARD 30.11)

STEEL FENCE MEMBER

RAILS

END POST

LINE POST

OVERHAN POST

HANDRAII

CROSS

RAIL SLEEVE HANDRAII

SLEEVE

2.875

1.660

1.900

1.315

4.000

3.69

2.27

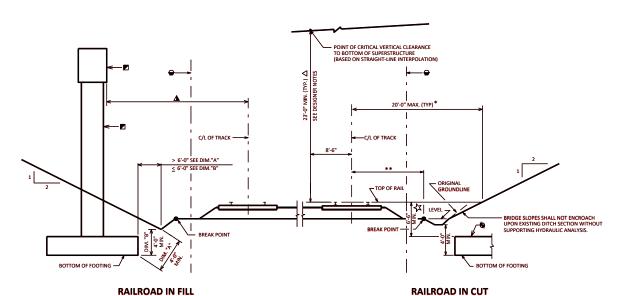
2.72

1.68

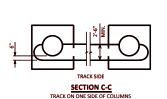
9.12

- DRILL ¼6" DIA. HOLES FOR ⅓" DIA. GALV. CARRIAGE BOLTS STEEL HANDRAIL SLEEVE (8" LONG) **FENCE MEMBER** - STEEL HANDRAIL SIZE & WEIGHT HANDRAIL SPLICE WEIGHT (LB/FT) DIAMETER (INCHES) 1.660 2.27 2.875 3.89 2.875 3.85





RAILROAD IN CUT



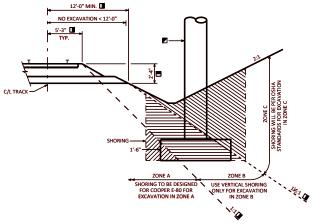
	PIER LOCATION	WALL ABOVE TOP OF RAIL			
GENERAL ARFMA	PIERS ≤ 12'-0" FROM C/L TRACK	12'-0"			
REQUIREMENT	PIERS 12'-0" TO 25'-0"	6'-0"			
CP RAIL	PIERS < 15'-0" FROM C/L TRACK	12'-0"			
REQUIREMENT	PIERS > 15'-0" TO 25'-0"	8'-0"			

TABLE C

RAILROAD CROSS SECTIONS

10'-0" MIN. MIN. OPT. KEYED CONST. JT. #4@1'-0" ANCHOR CRASH WALL TO FOOTINGS & COLUMNS WALL SHALL EXTEND TO AT LEAST 4'-0" BELOW THE LOWEST SURROUNDING GRADE. **END VIEW** ELEVATION

CRASH WALL DETAILS



LIMITS BEFORE SHORING REQUIRED

DESIGNER NOTES

DIMENSIONS SHOWN APPLY TO CUT OR FILL SITUATIONS.

DECK DRAINS OR DOWN SPOUTS SHALL NOT DISCHARGE ONTO RAILROAD TRACK BED.

SINGLE SLOPE PARAPET SHALL BE USED. PEDESTRIAN RAILING WILL ONLY BE PROVIDED IF THERE IS A SIDEWALK. SEE CHAPTER 38 OF THE BRIDGE MANUAL.

- △ VERTICAL CLEARANCE MUST BE AT LEAST 23'-0" AFTER CONSTRUCTION. USE A STRAIGHT-LINE INTERPOLATION BETWEEN TOP OF BEARMINGS TO DETERMINE THE CLEARANCE, PROVIDED THAT POSITIVE CAMBER IS REALIZED. LI DEFLECTION NEED NOT BE CONSIDERED WITH THE STRAIGHT-LINE APPROACH. DESIGN FOR (APPROX.) 23'-2" TO AVOID GOING BELOW THE MINIMUM DURING CONSTRUCTION. MAXIMUM ALLOWABLE VERTICAL CLEARANCE OF 23'-3½" IS ALLOWED BY FHWA, VERTICAL CLEARANCE LESS THAN 23'-0" MAY BE PROVIDED IN SOME SITUATIONS WITH APPROVAL OF THE OFFICE OF THE COMMISSIONER OF RAILROADS. CONSULT WITH CENTRAL OFFICE RAILROAD UNIT.
- ** VARIABLE DISTANCE WHICH IS FOUND FROM FIELD SURVEY.
- * SITE SPECIFIC JUSTIFICATION REQUIRED FOR GREATER DISTANCES. LATERAL CLEARANCES SHALL BE ESTABLISHED BASED ON SITE SPECIFIC CONDITIONS AND ECONOMICAL STRUCTURE DESIGN; CONSULT WITH CENTRAL OFFICE RAILROAD UNIT. SEE 23 CODE OF FEDERAL REGULATIONS PT 646, SUBPT. B APPENDIX.
- ▲ FOR OFFSETS UP TO, AND INCLUDING 25'-0", A CRASH WALL OR HAMMERHEAD PIER DESIGNED TO AREMA STANDARDS (30 SQ. FT. MIN. X-SECT) IS REQUIRED. CP RAIL REQUIRES CRASH WALLS BE DESIGNED TO RESIST A 600 KIP EXTREME EVENT FORCE APPLIED 6 FEET ABOVE THE GROUND. THE CRASH WALLS SHOWN ON THIS STANDARD ARE NOT DESIGNED TO ACCOUNT FOR THIS LOAD.
- **ACCOMODATION FOR ADDITIONAL TRACKS REQUIRES DEPARTMENT APPROVAL. CONFER WITH STATEWIDE RAILROAD STRUCTURE AND TRACK ENGINEER IN CENTRAL OFFICE** RAILROADS AND HARBORS SECTION AT (608) 266-0233.
- ▲ HORIZONTAL CLEARANCES LESS THAN 18'-0" SHOULD BE REVIEWED WITH THE STATEWIDE RAILROAD AND TRACK ENGINEER IN THE CENTRAL OFFICE RAILROADS AND HARBORS SECTION. 18'-0" CLEARANCE IS MEASURED TO THE HEAREST ENCROACHING ELEMENT (PIER CAPS, MSE WALL COPING, ETC.)

TEMPORARY CONSTRUCTION CLEARANCES ARE 21'-0" VERTICAL (21'-6" FOR BNSF AND UP RAILROADS) AND 12'-0" HORIZONTAL (15'-0" FOR BNSF AND UP RAILROADS) FROM CENTERLINE OF TRACK TO FASEWORK. UNLESS INSTRUCTED OTHERWISE, A CONSTRUCTION CLEARANCE DETAIL SHOULD NOT BE INCLUDED IN THE PLANS AS CONSTRUCTION CLEARANCES ARE STATED IN SECTION 107.17.1 OF THE STANDARD SPECIFICATIONS.

DESIGNER SHALL SHOW HORIZONTAL LOCATION OF SHORING NEEDED IN PLAN VIEW. INCLUDE BID ITEM "TEMPORARY SHORING RAILROAD" WHEN SHORING ENCROACHES

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

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

- BNSF AND UP RAILROADS HAVE GREATER REQUIREMENTS THAN SHOWN. CONFER WITH BISTAND OF MILLIODS TRIVE SHAPE IN EQUIPMENTS I FIRMS STOWN. CONTENSITY OF STATEWING ENGINED AS TRIVETURE AND TRACK ENGINEER IN CENTRAL OFFICE RAILROADS AND HABBORS SECTION. DESIGNER SHOULD CONSIDER FIELD TOLERANCES AND CONTINGENCIES WHEN SHOWING SHORING REQUIPMENTS. REFER TO "GUIPELINES FOR TEMPORARY SHORING" PUBLICATION BY UP AND BNSF FOR ADDITIONAL INFORMATION.
- BNSF AND UP RAILROAD REQUIRE A DEPTH OF FOOTING 6'-0" MIN. FROM BASE OF RAIL TO TOP OF FOOTING. IN LOCATIONS WHERE BEDROCK IS PRESENT,
 COORDINATE FOOTING DEPTHS WITH RAILROAD PROJECT COORDINATION ENGINEER
- $\begin{tabular}{ll} \end{tabular} \begin{tabular}{ll} \end{tabular} Limits of railroad right-of-way. Locations shown are for reference only and need not be dimensioned. \\ \end{tabular}$
- AESTHETICS SHALL NOT BE EMPLOYED ALONG RAILROAD TRACKS.

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

ZONE A SHORING ZONE B SHORING

ZONE C SHORING

HIGHWAY OVER RAILROAD DESIGN REQUIREMENTS



APPROVED: Laura Shadewald



CURB REPAIR DETAIL

502.3215 PROTECTIVE SURFACE TREATMENT RESEAL CURB REPAIR

NOTES

PROTECTIVE SURFACE TREATMENT RESEAL

PIGMENTED SURFACE SEALER RESEAL

CONCRETE SURFACE REPAIR

502.3215

502.3205

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"

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.

NOTE

ADHESIVE ANCHORS SHALL CONFORM TO SECTION 502.2.12
OF THE STANDARD SPECIFICATIONS. (PROVIDE NOTE WHEN
THE ADHESIVE ANCHOR BIO 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.

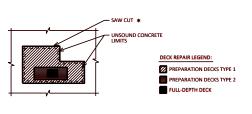
ANCHOR DETAIL (EXAMPLE)

502.41 ADHESIVE ANCHORS _INCH EACH 502.42 ADHESIVE ANCHORS NO. _BAR EACH 505.0605 BAR STEEL REINFORCEMENT HS COATED STRUCTURES LB

DESIGNER NOTES

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

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



DECK REPAIR DETAIL - PLAN

FOR DESIGNER INFORMATION ONLY

509.0301 509.0302 * 509.0310.S 509.2000 \$ 509.2500 PREPARATION DECKS TYPE 1
PREPARATION DECKS TYPE 2
SAWING PAVEMENT DECK PREPARATION AREAS
FULL-DEPTH DECK REPAIR
CONCRETE MASONRY OVERLAY DECKS

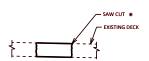
PREPARATION DECKS TYPE 1
PREPARATION DECKS TYPE 2
PREPARATION DECKS TYPE 2
REMOVE TO SOUND CONCRETE
CONCRETE OVERLAY
FULL DEPTH DECK REPAIR

EXISTING DECK

DECK REPAIR DETAIL - SECTION

FOR DESIGNER INFORMATION ONL' (DO NOT PLACE ON PLANS)

,



FULL-DEPTH DECK REPAIR DETAIL

(DO NOT PLACE ON PLANS)

***** 509.0310.S SAWING PAVEMENT DECK PREPARATION AREAS 509.2000 FULL-DEPTH DECK REPAIR CONCRETE MASONRY OVERLAY DECKS

DESIGNER NOTES

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

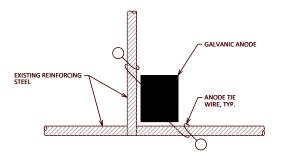
- * "SAWING PAVEMENT DECK PREPARATION AREAS" NOT REQUIRED FOR CONCRETE OVERLAYS.
- ▲ USE "CONCRETE MASONRY DECK REPAIR" (509.2100.5) FOR DECK REPAIRS UNDER POLYMER, ASPHALTIC, OR POLYMER MOD. ASPHALTIC OVERLAYS. USE "CONCRETE MASONRY DECK REPAIR" FOR DECK REPAIRS "HOUT OVERLAYS.

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

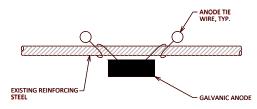
CONCRETE REPAIR DETAILS



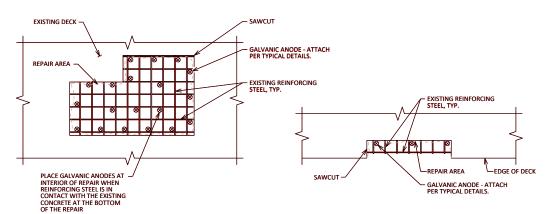
APPROVED: Laura Shadewald







TYPICAL INSTALLATION FOR BAR STEEL



PART. PLAN TYPICAL REPAIR DETAIL

509.1500 SPV.0060 CONCRETE SURFACE REPAIR EMBEDDED GALVANIC ANODES

SF 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 ANDOES" 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 $1\frac{1}{2}$ " AND A MINIMUM BOTTOM COVER OF $\frac{3}{4}$ "

DESIGNER NOTES

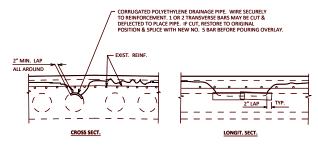
CATHODIC PROTECTION SHALL BE USED ONLY AT THE REQUEST OF THE REGIONAL BRIDGE MAINTENANCE ENGINEER.

INCLUDE APPLICABLE CONCRETE MASONRY BID ITEM TO FILL REPAIRS.

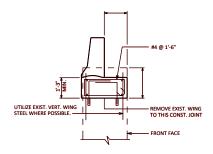
CATHODIC PROTECTION



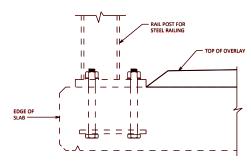
APPROVED: Laura Shadewald



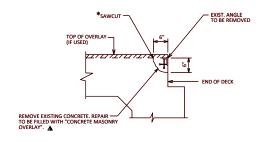
RUPTURED VOID REPAIR



SECTION THRU PARAPET ON WING



SECTION THRU RAILING



SECTION AT END OF SLAB

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

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 REPAIR WITHOUT OVERLAYS.

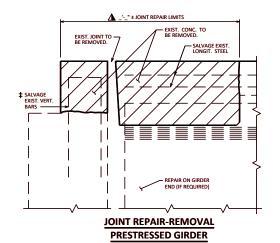
PROVIDE (IF AVAILABLE) THE MOST CURRENT DECK CONDITION ASSESSMENT SURVEY ON PLANS. INCLUDE SURVEY TYPE AND DATE COMPLETED. THERMOGRAPHY DATA CAN BE FOUND IN HSIS WITHIN GENERAL INVENTORY/FILE/INSPECTION) PEGCIA REPORT. DECK CONDITION ASSESSMENT SURVEY DATES CAN BE FOUND WITHIN INSPECTION/HISTORY UNDER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

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

OVERLAY DETAILS



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SALVAGE EXIST. CONC. TO BE REMOVED. # SALVAGE EXIST. CONC. TO BE REMOVED. # SALVAGE EXIST. PLATE AND ANCHORS CONSTRUCT NEW DETAIL "STEEL GIRDER WITH END DIAPHRAGM". # SOUTH REPAIR - REMOVAL STEEL GIRDER

LEGEND

- EXISTING BARS ARE LIKELY TO BE CORRODED AND/OR DAMAGED DURING CONCRETE REMOVAL SALVAGE AND INCORPORATE AS MIJCH 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. JT. 1" MIN. BELOW EXIST. REINF.

DESIGNER NOTES

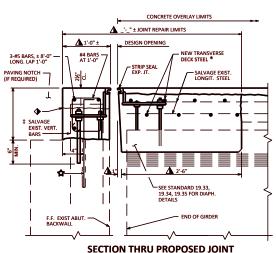
SEE STANDARD 28.01 FOR SUPPORTS USED FOR STRIP SEAL STEEL EXTRUSIONS.

* 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

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

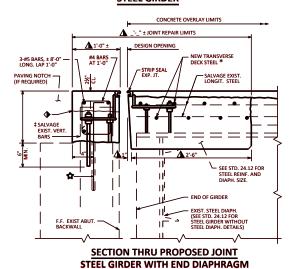
ALL REPLACEMENT PAVING BLOCK DIMENSIONS SHALL MATCH EXISTING PLAN DIMENSIONS UNLESS DESIGNER DETERMINES OTHERWISE, TYP. FOR ALL SECTIONS SHOWN ON THIS STANDARD.

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

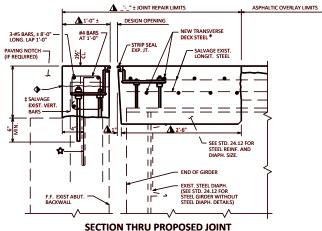


PRESTRESSED GIRDER WITH END DIAPHRAGM

CONCRETE OVERLAY



CONCRETE OVERLAY



STEEL GIRDER WITH END DIAPHRAGM

ASPHALTIC OVERLAY

TOTAL ESTIMATED QUANTITIES

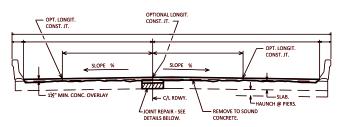
BID ITEM NUMBER	BID ITEMS	UNIT	TOTAL
502.3101	EXPANSION DEVICE	LF	
502.4205	ADHESIVE ANCHORS NO. 5 BAR	EACH	
509.1000	JOINT REPAIR	LF	
509.2100.S	CONCRETE MASONRY DECK REPAIR	СУ	
	POSSIBLE ADDITIONAL BID ITEMS		
505.0400	BAR STEEL REINFORCEMENT HS STRUCTURES	LB	
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	
509.2500	CONCRETE MASONRY OVERLAY DECKS	CY	
517.0901.S	PREPARATION AND COATING OF TOP FLANGES (STRUCTURE)	EACH	

STRIP SEALS & DIAPH.
DETAILS FOR OVERLAYS



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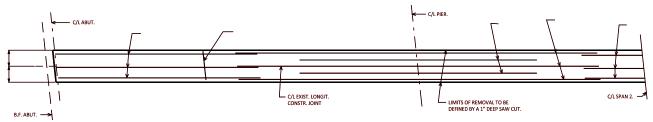
d 7-24



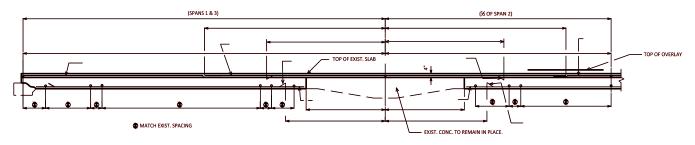
REMOVAL LIMIT OR CONST. JOINT FOR FULL DEPTH DECK REPAIR. LEAVE CONST. JOINT ROUGH. CONCRETE IN THIS AREA TO BE INCLUDED IN BID ITEM "CONCRETE MASONRY BRIDGES" ("CONCRETE MASONRY BRIDGES") CONCRETE MASONRY BRIDGES. CONCRETE MASONRY OVERLAY DECKS." DECKS." REMOVED IT FOR REQUIRED. CONCRETE IN THIS AREA TO BE REMOVED IT FULL DEPTH DECK REPAIR IS REQUIRED.

CROSS SECTION THRU ROADWAY LOOKING EAST

TYP. SECTION THRU JOINT



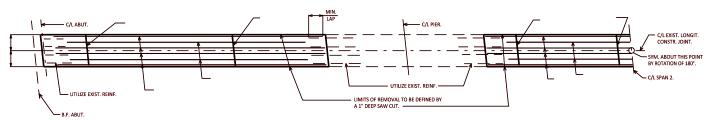
HALF PLAN SHOWING TOP BAR STEEL REINF.



TOTAL ESTIMATED QUANTITIES

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

HALF LONGIT. SECTION



HALF PLAN SHOWING BOTTOM BAR STEEL REINF

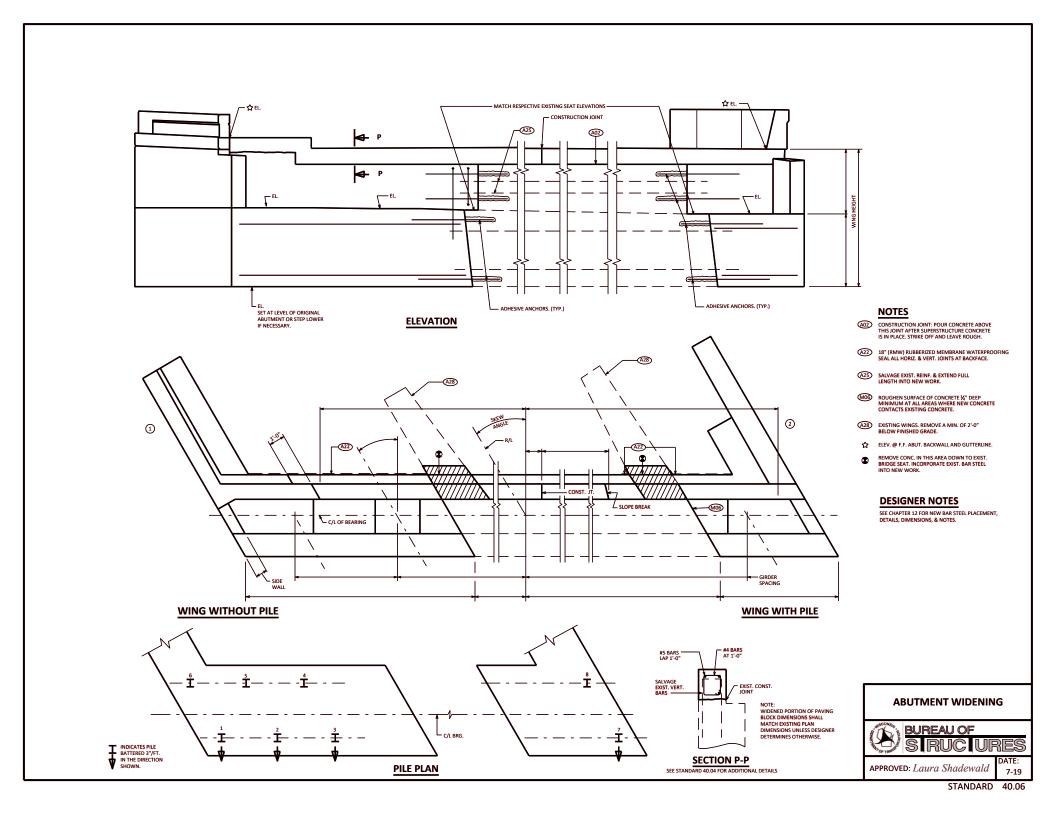
(REQUIRED ONLY FOR FULL DEPTH DECK REPAIR)

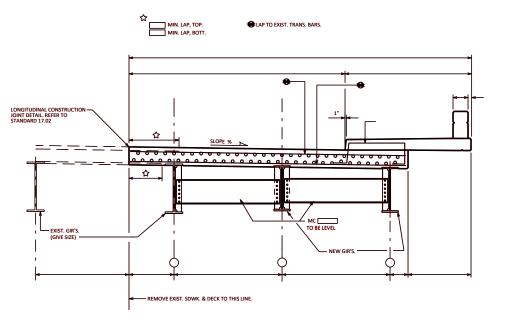
JOINT REPAIRS

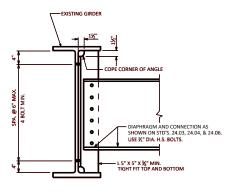
BUREAU OF
S RUC URES

LONGIT. CONST.

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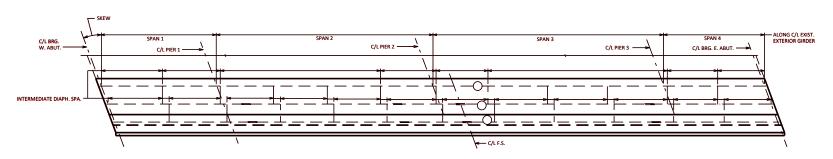




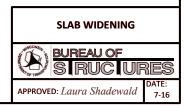


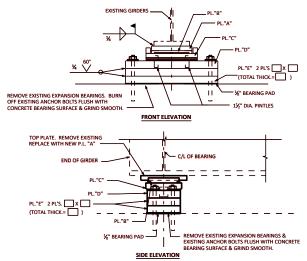
DIAPHRAGM CONNECTION TO EXISTING STEEL GIRDER

CROSS SECT. THRU RDWY.



PLAN

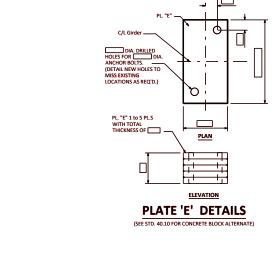




EXPANSION BEARING REPLACEMENT - STEEL GIRDERS

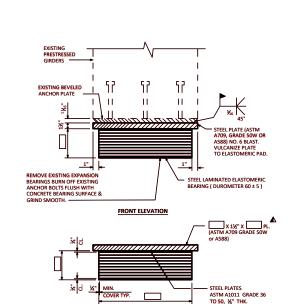
STEEL BEARINGS

SEE STANDARD 27.08 FOR BEARING DETAILS

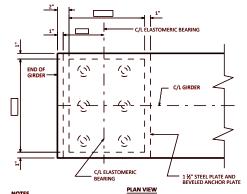


SEE "EXPANSION BEARING REPLACMENT - PRESTRESSED

C/L BRG. -



SECTION THRU ELASTOMERIC BEARING



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 (¾" MIN.) TO MATCH THE OVERALL EXISTING BEARING HEIGHT. WHEN THE THICKNESS IS REDUCED, THE FOLLOWING NOTE SHALL BE LOCATED ON THE PLANS:

JOALEU DN THE PLANS.

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

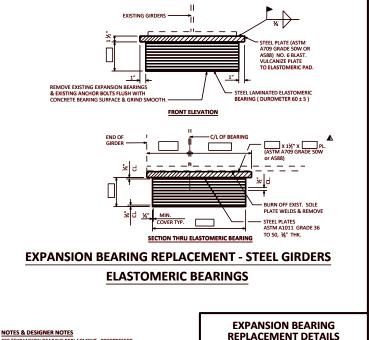
TOP STEEL PLATE MAY NOT BE OMITTED.

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

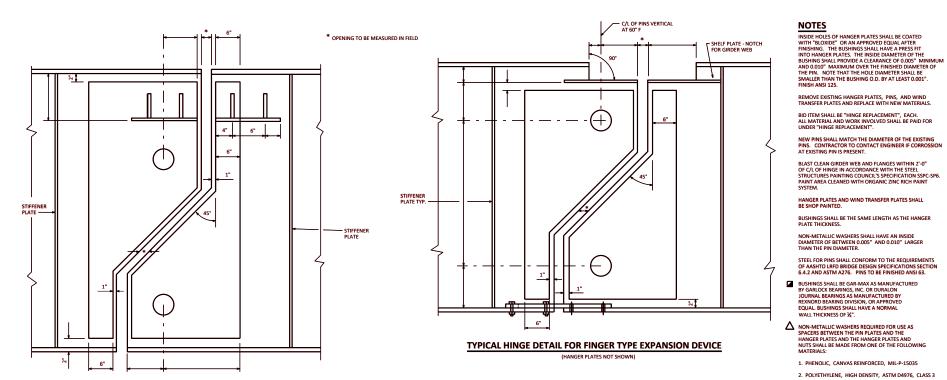
DO NOT INCLUDE PRESTRESSED GIRDER SHRINKAGE WHEN DESIGNING BEARINGS FOR BRIDGE REHABILITATION PROJECTS.

SEE STANDARD 27.07 FOR ADDITIONAL INFORMATION.

EXPANSION BEARING REPLACEMENT - PRESTRESSED GIRDERS ELASTOMERIC BEARINGS



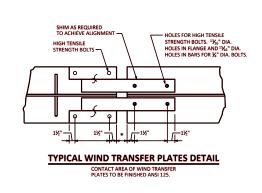


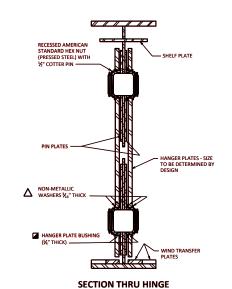


TYPICAL HINGE DETAIL FOR WATERTIGHT EXPANSION DEVICE

NOTE: DETAILS NOT SHOWN ARE IDENTICAL TO DETAILS SHOWN FOR "FINGER TYPE EXPANSION DEVICE".

DIMENSIONS TO BE DETERMINED BY DESIGN HANGER PLATE DETAIL





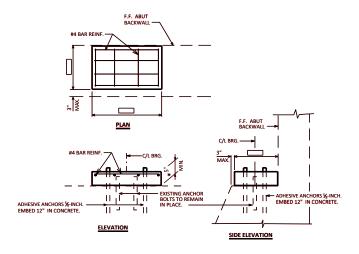
HINGED JOINT REHABILITATION



APPROVED: Laura Shadewald

ACETAL, FEDERAL SPECIFICATION L-P-392
 TEFLON TFE, MIL-P-22241A

d 7-15

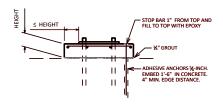


CONCRETE BEARING BLOCK DETAILS

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

GIRDER REACTIONS AT BEARINGS (KIPS)

		C/L BRG. SUPPORT NAME	C/L BRG. SUPPORT NAME	C/L BRG. SUPPORT NAME
	DL			
INTERIOR GIRDER	LL			
EXTERIOR GIRDER	DL			
EXTERIOR GIRDER	LL			



PRECAST CONCRETE BLOCK DETAIL

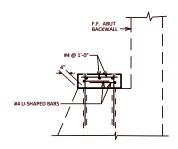
DEPTH = MIN. 5", MAX. 1'-0"*

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

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 BOVONWARD AND OUTWARD STRESS DISTRIBUTION. THIS PROVISION CAN BE DISREGARDED IF A PULL-DEPTH CONCRETE DUAPHRAGM IS USED IN CONJUNCTION WITH A FY HINCK ELASTONBER PAD IFERDE STRESS.

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" O

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 SUBSTRUCTURE UNITS, SI 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.

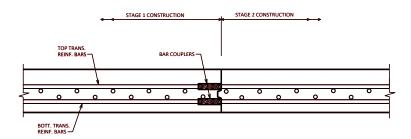
INDICATE WHETHER HS-20 OR HL-93 LOADING WAS USED TO DETERMINE THE LL REACTIONS, WHICH INCLUDE IMPACT.

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

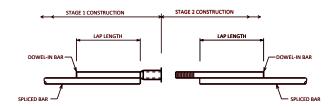
CONCRETE BEARING BLOCK DETAILS



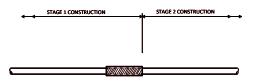
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SECTION THRU DECK



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

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)".

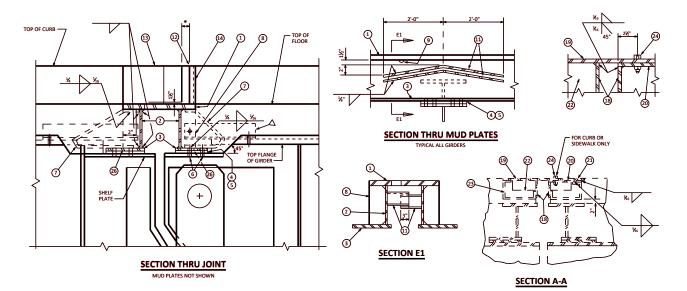
ON THE PLANS SHOW DETAILS SIMILAR TO "SECTION THRU DECK" AND " $\mbox{\footnotesize BAR}$ COUPLER ALTERNATIVES".

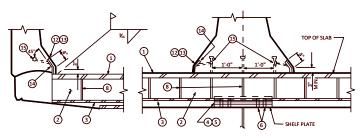
AT THE PLAN BILL OF BARS, INDICATE WHICH BARS REQUIRE BAR COUPLERS BY USE OF A SYMBOL. USING THE SAME SYMBOL, ADD A NOTE STATING THAT A BAR COUPLER IS REQUIRED. BAR EINCHTAS ARE COMPLETE TO THE CLOTE THE CONTINGCTION OINT AND SHALL BE MODIFIED BY THE BAR COUPLER MANUFACTURERS RECOMMENDATIONS. DOWEL BARS ARE NOT TO BE OFFAILED, AS THOSE BARS ARE INCLUDED IN THE BAR COUPLER BID ITEM SHOULD THE DOWEL OPTION BE CHOSEN.



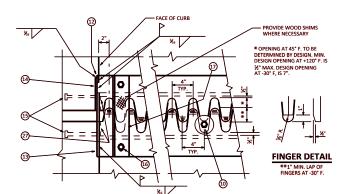


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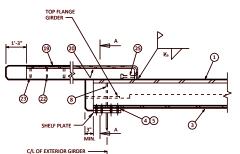




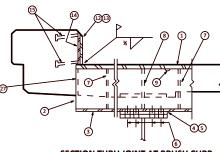


PART PLAN OF FINGER PLATE AT BRUSH CURB

NO SKEW



SECTION THRU SIDEWALK



SECTION THRU JOINT AT BRUSH CURB

MUD PLATES NOT SHOWN

 $\Delta \ \ \ \text{ANGLE 3½" X 3½" X ½s" FIELD DRILL ½" DIA. ERECTION BOLT HOLES OR WELD TO STIFFENER OR TOP FLG.$

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. 15/16" DIA. HOLES FOR NO. 6.
- 5. ¾" LAMINATED SHIM WITH SLOTTED OPENINGS
- $6.\,\mbox{\%}"$ dia. Erection Bolts. Drill holes in shelf plate in the field.
- 7. ANCHOR BAR ¾" DIA. AT 1'-0" CENTERS. BEND AS SHOWN
- STIFFENER BAR ¾" THICK . ¾" FILLET WELD ALL AROUND.
 PLACE AT C/L OF GIRDER AND AT +2'-0" CENTERS BETWEEN GIRDERS.
- 9. 74" VENT HOLES AT 3'-0" CENTERS.
- 10. $\frac{1}{4}$ " DIA. ADJUSTING BOLT AT APPROX. 4'-0" CENTERS WITH TWO $\frac{1}{6}$ " DIA. X $\frac{1}{4}$ " PLATE WASHERS. ONE ON EACH SIDE OF FINGER PLATE.
- 11. MUD PLATE 1/4" THICK
- 12. ¾" PLATE. BEND AS SHOWN.
- 13. ¾" PLATE. BEND AS SHOWN
- 14. ¾" PLATE. BEND AS SHOWN.
- 15. $\frac{1}{8}$ " DIA. STUDS X $6\frac{1}{16}$ " LONG. WELD TO PLATES NO. 13 AND NO. 14.
- 16. $\[\frac{3}{4} \]$ DIA. BOLT FOR SHIPPING. TACK WELD NUT TO BOTTOM OF PLATE NO. 1.
- 17. 3" DIA. X 3" DIA. X $\frac{1}{N}$ " + 5'-0" SPACING. SLOTTED HOLE $\frac{1}{N}$ " X $2\frac{1}{N}$ " IN ONE END OF ANGLE AS SHOWN. FOR BOLT NO. 16.
- 18. CLOSING PLATE 3/4" CUT AS SHOWN. SEE WELD DETAIL.
- 19. ¾" PLATE. BEND AS SHOWN.
- 20. ¾" PLATE, BEND AS SHOWN
- 21. ¾" PLATE. BEND AS SHOWN.
- 22. $\mbox{\%}"$ PLATE. WELD ALL AROUND, $\mbox{\%}"$ FILLET WELD TO PLATES NO. 18, 19, AND 20.
- 23. $\mbox{\%}"$ DIA. STUDS X $6\mbox{\%}_{6}"$ LONG. BEND AFTER WELD.
- 24. ¾" DIA. BOLT WITH SQ. NUT. GREASE FOR EASY REMOVAL ¾" X 1¾" SLOTTED HOLE IN PL. NO. 19. LONG DIMENSION OF HOLE PARALLEL TO C/L OF ROADWAY. TACK WELD NUT TO PLATE NO. 20 + 2'-0" SPA.
- 25. $\frac{1}{8}$ " DIA. STUDS X $6\frac{1}{16}$ " 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. $\mbox{\ensuremath{\%^{\prime\prime}}}$ CLOSING PLATE. WELD TO PLATES NO. 1 AND NO. 2.

NOTES

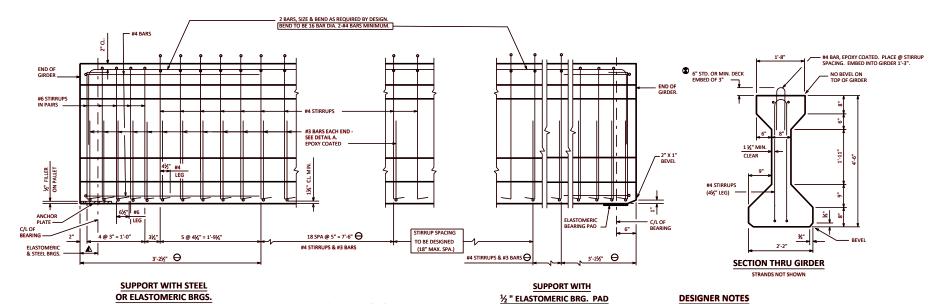
REMOVE ANGLE NO. 17 AND ADJUSTING BOLT NO. 10 AFTER VERTICAL AND HORIZONTAL ALIGNMENT IS SECURE IN FIELD. FILL HOLES WITH HOT POURED JOINT SEALER.

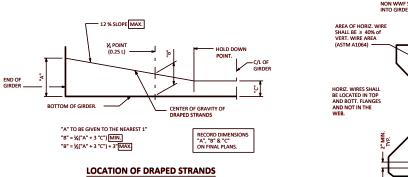
IN SOME CASES THE GIRDER FLANGES AND WEB PLATES DO NOT HAVE TO BE CUT TO ACCOMMODATE THE FINGER JOINT SECTION, THE SLAB DEPTH MAY BE UTILIZED EFFECTIVELY.

FINGER TYPE EXPANSION
JOINT - PLATE GIRDER

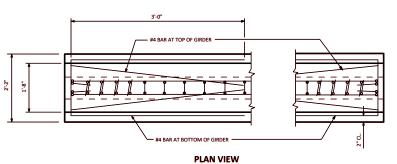


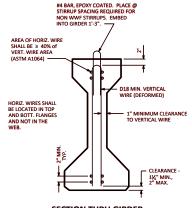
APPROVED: Laura Shadewald





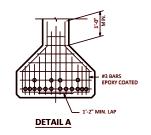
SIDE VIEW OF GIRDER





SECTION THRU GIRDER SHOWING WELDED WIRE FABRIC (WWF) STIRRUPS

ASTM A1064 (FY = 70 KSI)



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 800 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 4.11 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)

O 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 CAM VARY AND SHOULD BE GIVEN FOR EACH 1/3 OF THE GIRDER LENSTH. PROVIDE VALUES THAT MAINTAIN 3" MIN. DECK EMBEDMENT AND 2% CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR $\pm 2\%$ "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 FIRMSH. 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 OR C. THE EPOXY SHALL BE APPLIED AT LEAST 3 DAYS AFTER MOIST CURING HAS CEASED AND PRIOR TO THE

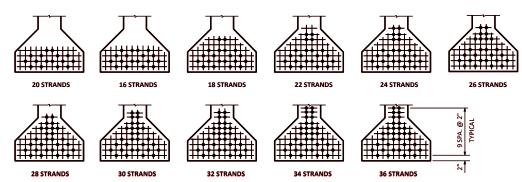
ALL GIRDERS SHALL BE CAST FULL LENGTH AS SHOWN.

SPACING SHOWN FOR #4 STIRRUPS IS FOR GRADE 60 REINFORCEMENT

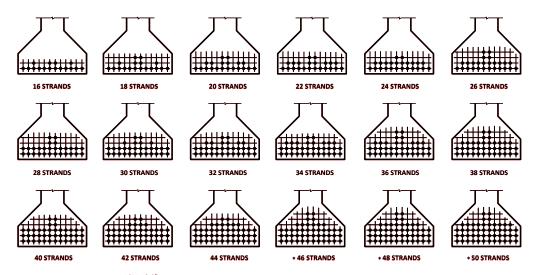
AN ALTERNATE EQUIVALENT OF WELDED WIRE FABRIC (WWF) ASTM A1064 MAY BE SUBSTITUTED FOR THE STIRRUP REINFORCEMENT SHOWN, UPON APPROVAL OF THE STRUCTURES DEVELOPMENT SECTION.

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





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

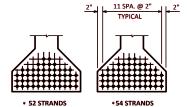


.	PRE-TENSION	
54" GIRDER	f's = 270,000 P.S.I.	
A = 789 SQ. IN.	f _s = 0.75 X 270,000 = 202,500 P.S.I.	
r ² = 330.46 IN. ²	FOR LOW RELAXATION STRANDS.	
1 - 550.40 114.	PI PER 0.5" DIA. STRAND = 0.1531 X 202,50	
$y_T = 29.27 \text{ IN}.$	PI PER 0.6" DIA. STRAND = 0.217 X 202,500	= 43.94 KIPS
y _B = -24.73 IN.		(5)
I = 260,730 IN. ⁴		$f_B \text{ (INIT.)} = \frac{(4)}{(3)}$
S _T = 8,908 IN. ³	$\frac{y_B}{r^2} = \frac{-24.73}{330.46} = -0.07484 \text{ IN./IN.}^2$	(K/SQ. IN.)
S _B = -10,543 IN. ³		

WT. = 822 #/FT.

(COMPRESSION IS POSITIVE)

N	(1)	(2)	(3)	(4)	(4)	(5)	(5)
		0.4		P(INIT.) = A _S f _S	P(INIT.) = A _s f _s	f _R (INIT.)=(4)/(3)	f _R (INIT.)=(4)/(3)
NO.	es	$(1+\frac{e_{S}y_{B}}{r^{2}})$	(A/(2))	0.5" DIA. STRANDS		0.5" DIA. STRANDS	0.6" DIA. STRANDS
STRANDS	(INCHES)		(SQ. IN.)	(KIPS)	(KIPS)	(K/SQ. IN.)	(K/SQ. IN.)
		STA	NDARD I	PATTERNS FOR U	NDRAPED STRAN	IDS	
16	-20.23	2.514	313.84	496	703	1.580	2.240
18	-19.84	2.485	317.51	558	791	1.757	2491
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
		ST	TANDARI	PATTERNS FOR	DRAPED STRANI	DS	
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	

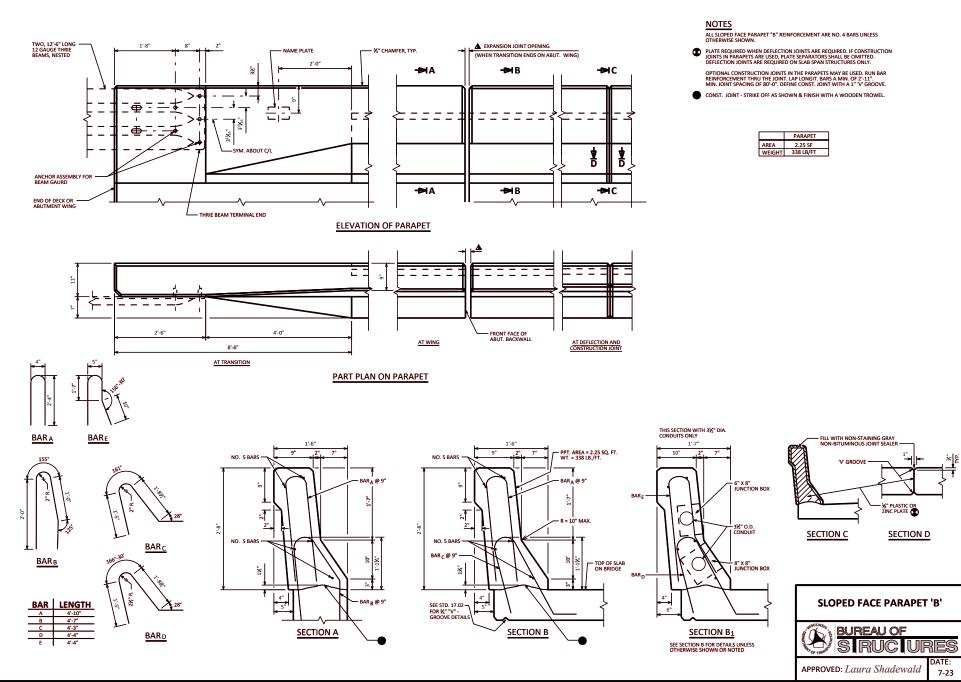


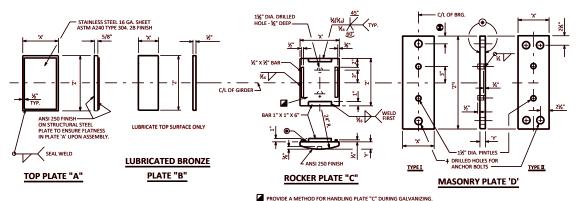
ARRANGEMENT AT C/L SPAN - FOR GIRDERS WITH DRAPED 0.5" DIA. AND 0.6" DIA. STRANDS

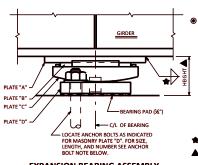
* 0.5" DIA. STRANDS ONLY

54" PRETENSIONED GIRDER DESIGN DATA









EXPANSION BEARING ASSEMBLY

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 ALSO, CLASS "C. PAUTE" C" & "O" SHALL BE GALVANIZED. FOR UNPAINTED STRUCTURES PLATE "C" & "O" SHALL BE SHOP PAINTED AFTER GALVANIZING. PLATE "A" 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 1½" DIA. ANCHOR BOLTS ARE USED AND 2½" WHEN 1½" 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.	PLA [*]	PLATE A		PLATE B		PLATE (:		PLATE D)	HEIGHT
KIPS	Х	Z	X	Z	Х	Υ	Z	Х	Υ	Z	FEET
75	9"	10"	5"	10"	7"	17/16"	1'-01/4"	8"	1½"	1'-8"	.354
105	11"	10"	7"	10"	9"	111/16"	1'-01/4"	8"	1½"	1'-8"	.375
135	1'-1"	10"	9"	10"	11"	115/16"	1'-01/4"	8"	1½"	1'-8"	.396
160	1'-3"	10"	11"	10"	1'-1"	23/8"	1'-0¼"	9"	1½"	1'-8"	.432
190	1'-5"	10"	1'-1"	10"	1'-3"	27/8"	1'-01/4"	10"	1¾"	1'-8"	.495
220	1'-7"	10"	1'-3"	10"	1'-5"	37/8"	1'-0¼"	1'-0"	2"	1'-8"	.599
250	1'-9"	10"	1'-5"	10"	1'-7"	37/8"	1'-01/4"	1'-1"	2¾"	1'-8"	.630
280	1'-11"	10"	1'-7"	10"	1'-9"	47/8"	1'-0¼"	1'-3"	27/8"	1'-8"	.755
310	2'-1"	10"	1'-9"	10"	1'-11"	47/8"	1'-01/4"	1'-4"	27/8"	1'-8"	.755

12" BEARING

CAP.	PLA'	PLATE A		PLATE B		PLATE C			PLATE E)	HEIGHT
KIPS	Х	Z	Х	Z	х	Υ	Z	Х	Υ	Z	FEET
90	9"	1'-0"	5"	1'-0"	7"	17/16"	1'-21/4"	8"	1½"	1'-10"	.354
125	11"	1'-0"	7"	1'-0"	9"	111/16"	1'-21/4"	8"	1½"	1'-10"	.375
160	1'-1"	1'-0"	9"	1'-0"	11"	115/16"	1'-21/4"	8"	1½"	1'-10"	.396
195	1'-3"	1'-0"	11"	1'-0"	1'-1"	23/8"	1'-21/4"	9"	1½"	1'-10"	.432
230	1'-5"	1'-0"	1'-1"	1'-0"	1'-3"	21/8"	1'-21/4"	11"	2"	1'-10"	.516
265	1'-7"	1'-0"	1'-3"	1'-0"	1'-5"	37/8"	1'-21/4"	1'-1"	2¾"	1'-10"	.630
300	1'-9"	1'-0"	1'-5"	1'-0"	1'-7"	31/8"	1'-21/4"	1'-2"	2¾"	1'-10"	.630
335	1'-11"	1'-0"	1'-7"	1'-0"	1'-9"	4%"	1'-2¼"	1'-4"	27/8"	1'-10"	.755
370	2'-1"	1'-0"	1'-9"	1'-0"	1'-11"	4%"	1'-21/4"	1'-5"	27/8"	1'-11"	.755

14" BEARING

CAP.	PLATE A		PLATE B			PLATE C			PLATE D	HEIGHT				
KIPS	Х	Z	X	Z	Х	Υ	Z	Х	Υ	Z	FEET			
105	9"	1'-2"	5"	1'-2"	7"	17/16"	1'-41/4"	8"	1½"	2'-0"	.354			
145	11"	1'-2"	7"	1'-2"	9"	111/16"	1'-4¼"	8"	1½"	2'-0"	.375			
185	1'-1"	1'-2"	9"	1'-2"	11"	115/16"	1'-41/4"	8"	1½"	2'-0"	.396			
225	1'-3"	1'-2"	11"	1'-2"	1'-1"	23/8"	1'-4¼"	10"	1¾"	2'-0"	.453			
270	1'-5"	1'-2"	1'-1"	1'-2"	1'-3"	27/8"	1'-41/4"	1'-0"	2"	2'-0"	.516			
310	1'-7"	1'-2"	1'-3"	1'-2"	1'-5"	37/8"	1'-4¼"	1'-1"	2¾"	2'-0"	.630			
350	1'-9"	1'-2"	1'-5"	1'-2"	1'-7"	37/8"	1'-4¼"	1'-3"	2%"	2'-1"	.672			
390	1'-11"	1'-2"	1'-7"	1'-2"	1'-9"	4%"	1'-4¼"	1'-4"	21/8"	2'-1"	.755			
435	2'-1"	1'-2"	1'-9"	1'-2"	1'-11"	4%"	1'-4¼"	1'-6"	3%"	2'-1"	.838			

16" BEARING

CAP.	PLA [*]	PLATE A		PLATE B		PLATE C			PLATE [HEIGHT	
KIPS	Х	Z	х	Z	х	Υ	Z	Х	Υ	Z	FEET
120	9"	1'-4"	5"	1'-4"	7"	17/16"	1'-61/4"	8"	1½"	2'-2"	.354
165	11"	1'-4"	7"	1'-4"	9"	11½6"	1'-61/4"	8"	1½"	2'-2"	.375
215	1'-1"	1'-4"	9"	1'-4"	11"	1 ¹⁵ / ₁₆ "	1'-61/4"	9"	1½"	2'-2"	.396
260	1'-3"	1'-4"	11"	1'-4"	1'-1"	2¾"	1'-61/4"	11"	2"	2'-2"	.474
310	1'-5"	1'-4"	1'-1"	1'-4"	1'-3"	27/8"	1'-61/4"	1'-0"	2"	2'-2"	.516
355	1'-7"	1'-4"	1'-3"	1'-4"	1'-5"	37/8"	1'-61/4"	1'-2"	2¾"	2'-3"	.630
400	1'-9"	1'-4"	1'-5"	1'-4"	1'-7"	37%"	1'-61/4"	1'-3"	27/8"	2'-3"	.672
450	1'-11"	1'-4"	1'-7"	1'-4"	1'-9"	47/8"	1'-61/4"	1'-5"	21/8"	2'-3"	.755
500	2'-1"	1'-4"	1'-9"	1'-4"	1'-11"	47/8"	1'-61/4"	1'-7"	3%"	2'-3"	.838

18" BEARING

CAP.	PLATE A		PLATE B			PLATE C			PLATE D)	HEIGHT
KIPS	Х	Z	х	Z	X	Υ	Z	X	Υ	Z	FEET
135	9"	1'-6"	5"	1'-6"	7"	17/16"	1'-8¼"	8"	1½"	2'-4"	.354
185	11"	1'-6"	7"	1'-6"	9"	11½"	1'-81/4"	8"	1½"	2'-4"	.375
240	1'-1"	1'-6"	9"	1'-6"	11"	1 ¹⁵ / ₁₆ "	1'-8¼"	9"	1½"	2'-4"	.396
295	1'-3"	1'-6"	11"	1'-6"	1'-1"	2¾"	1'-8¼"	11"	2"	2'-4"	.474
350	1'-5"	1'-6"	1'-1"	1'-6"	1'-3"	27/8"	1'-8¼"	1'-1"	2¾"	2'-5"	.547
400	1'-7"	1'-6"	1'-3"	1'-6"	1'-5"	31/8"	1'-8¼"	1'-2"	2⅓"	2'-5"	.630
455	1'-9"	1'-6"	1'-5"	1'-6"	1'-7"	3%"	1'-8¼"	1'-4"	21/8"	2'-5"	.672
505	1'-11"	1'-6"	1'-7"	1'-6"	1'-9"	47/8"	1'-8¼"	1'-6"	3%"	2'-5"	.838
560	2'-1"	1'-6"	1'-9"	1'-6"	1'-11"	47/8"	1'-8¼"	1'-8"	3%"	2'-5"	.838

20" BEARING

CAP. KIPS	PLATE A		PLATE B		PLATE C			PLATE D			HEIGHT
	х	Z	х	Z	x	Y	Z	X	Υ	Z	FEET
150	9"	1'-8"	5"	1'-8"	7"	17/16"	1'-10¼"	8"	1½"	2'-6"	.354
210	11"	1'-8"	7"	1'-8"	9"	11½"	1'-10¾"	8"	1½"	2'-6"	.375
270	1'-1"	1'-8"	9"	1'-8"	11"	1 ¹⁵ / ₁₆ "	1'-10¼"	10"	1¾"	2'-6"	.417
325	1'-3"	1'-8"	11"	1'-8"	1'-1"	2¾"	1'-10¼"	11"	2"	2'-6"	.474
385	1'-5"	1'-8"	1'-1"	1'-8"	1'-3"	27/8"	1'-10¼"	1'-1"	2¾"	2'-7"	.547
445	1'-7"	1'-8"	1'-3"	1'-8"	1'-5"	31/8"	1'-10¼"	1'-3"	27/8"	2'-7"	.672
505	1'-9"	1'-8"	1'-5"	1'-8"	1'-7"	37/8"	1'-10¼"	1'-5"	21/8"	2'-7"	.672
565	1'-11"	1'-8"	1'-7"	1'-8"	1'-9"	47/8"	1'-10¼"	1'-7"	3%"	2'-7"	.838
625	2'-1"	1'-8"	1'-9"	1'-8"	1'-11"	47/8"	1'-101/4"	1'-9"	37/8"	2'-7"	.838

ANCHOR BOLT NOTES:

FOR SPAN LENGTHS UP TO 100'-0". USE A TYPE I MASONRY PLATE "D" WITH (2) 1½" 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) 1½" DIA. X 1'-10" LONG ANCHOR BOLTS.

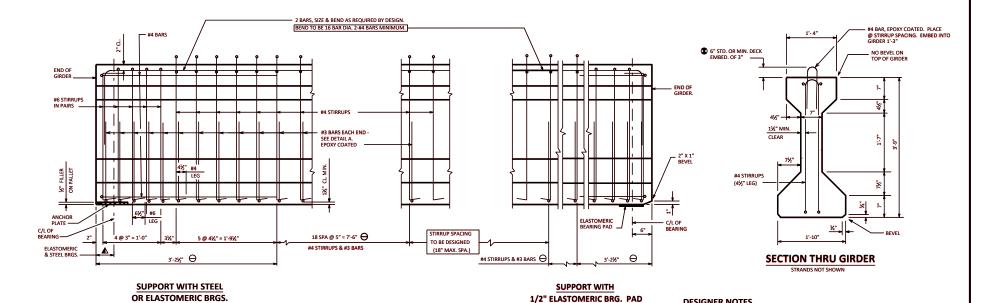
FOR SPAN LENGTHS GREATER THAN 150'-0", USE A TYPE II MASONRY PLATE "D" WITH (4) 11/2" DIA. X 1'-10" LONG ANCHOR BOLTS.

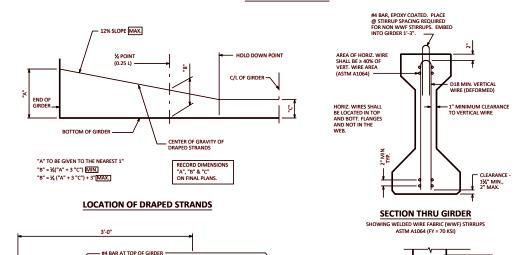
† DRILLED HOLES FOR ANCHOR BOLTS IN MASONRY PLATE "D" SHALL HAVE A DIAMETER 3/4" LARGER THAN ANCHOR BOLT.

EXPANSION BEARING DETAILS TYPE 'A' - STEEL GIRDERS



APPROVED: Laura Shadewald





#4 BAR AT BOTTOM OF GIRDER

PLAN VIEW

SIDE VIEW OF GIRDER

REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STANDARD STRAND PATTERNS LISTED ON STANDARD 4.0.15 AND THE STAN LEGATIS STOWN IN TABLE 4.0.7-1. USING DIFFERENT STRAND PATTERNS OR LONGER STANS 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) O 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 2½" CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR ±¾" 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.

EPOXY COATED

DETAIL A

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, COATTHE GIRDER ENDS, EXPOSED STRAND ENDS AND ALL NON-BONDING SURFACES WITHIN 2 FEET OF THE GIRDER ENDS WITH A NON-PIGMENTED EPOLY 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

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 0.3" DIA. STRANDS IS 3. FOR

ALL GIRDERS SHALL BE CAST FULL LENGTH AS SHOWN.

DESIGNER NOTES

BID ITEM SHALL BE "PRESTRESSED GIRDER TYPE I 45-INCH."

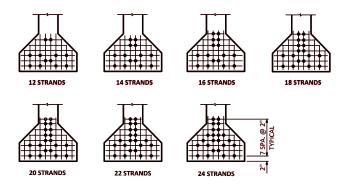
THE STRAIGHT PATTERN USE ONLY 0.6" DIA. STRANDS.

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

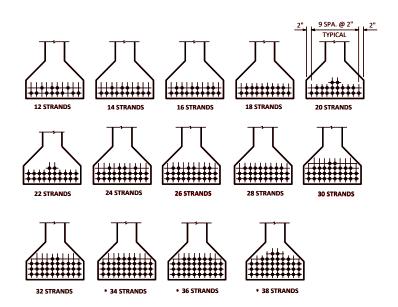
AN ALTERNATE EQUIVALENT OF WELDED WIRE FABRIC (WWF) ASTM A1064 MAY BE SUBSTITUTED FOR THE STIRRUP REINFORCEMENT SHOWN, UPON APPROVAL OF THE STRUCTURES DEVELOPMENT SECTION.

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





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

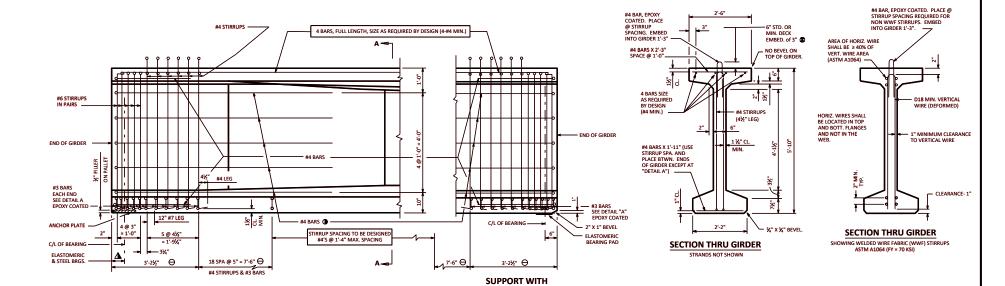
45" GIRDER	PRE-TENSION
A = 560 SQ. IN.	f' _S = 270,000 P.S.I.
r ² = 223.91 IN. ²	$f_S = 0.75 \times 270,000 = 202,500 \text{ P.S.I.}$ FOR LOW RELAXATION STRANDS.
y _T = 24.73 IN.	PI PER 0.5" DIA. STRAND = 0.1531 X 202,500 = <u>31.00 KIPS</u>
y _B = -20.27 IN.	PI PER 0.6" DIA. STRAND = 0.217 X 202,500 = 43.94 KIPS
I = 125,390 IN. ⁴	$\frac{y_B}{r^2} = \frac{-20.27}{223.91} = -0.09053 \text{ IN./IN.}^2$
S _T = 5,070 IN. ³	r 223.91
S _B = -6,186 IN. ³	
WT. = 583 #/FT.	

(COMPRESSION IS POSITIVE)

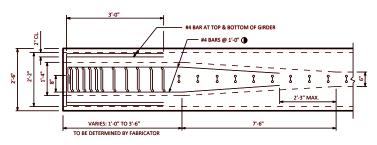
N NO.	(1) e _s	(2) $(1 + \frac{e_5 y_B}{r^2})$	(3) (A/(2))	(4) P(INIT.) = A _S f _S 0.5" DIA. STRANDS	(4) P(INIT.) = A _S f _S 0.6" DIA. STRANDS	(5) f _B (INIT.)=(4)/(3) 0.5" DIA. STRANDS	(5) f _B (INIT.)=(4)/(3) 0.6" DIA. STRANDS						
STRANDS	(INCHES)	(- r ₂ /	(SQ. IN.)	(KIPS)	(KIPS)	(K/SQ.IN.)	(K/SQ.IN.)						
		STA	NDARD PATTERN	S 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





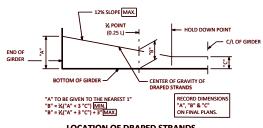
SIDE VIEW OF GIRDER



SUPPORT WITH STEEL

OR ELASTOMERIC BRGS.

PLAN VIEW ⊖



LOCATION OF DRAPED STRANDS

DESIGNER NOTES

1/2" ELASTOMERIC BEARING PAD

BID ITEM SHALL BE "PRESTRESSED GIRDER TYPE I 70-INCH."

SHOW ONLY ONE STRAND SIZE ON THE PLANS

GIRDER LENGTHS IN EXCESS OF 140 FEET MAY BE CONTROLLED BY TRANSPORTATION LIMITATIONS AND REQUIRE APPROVAL BY THE PRESTRESS GIRDER MANUFACTURERS AND CONCURRANCE BY THE STRUCTURES DEVELOPMENT SECTION.

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° TO 8.0° TO 8.1° TANABOLS FOR ALL PATTERNS AS REQUIRED. USE ONLY OBE STRAND SIZE IN EACH PATTERN. THE MAX. NUMBERS OF DRAPED 0.6° "DAJE. STRANDS IS 8.

REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED NEINFORCEMENT IN STANDARD TEND SELTION OF THE GINCHEN IS BASED ON THE STANDARD 40.20 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)

O DETAIL TYPICAL AT EACH END

● INCREASE THE SIZE OF THESE BARS IF REQUIRED BY AASHTO LRFD 5.8.3.5

▼ 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

Output

The Design Engineer Determines this value based on 2" MIN. HAUNCH AT EDGE OF THE CAMBER

AND THE DESIGN ENGINEER DETERMINES THIS VALUE BASED ON 2" MIN. HAUNCH AT EDGE OF THE CAMBER

THE DESIGN ENGINEER DETERMINES THIS VALUE BASED ON 2" MIN. HAUNCH AT EDGE OF THE CAMBER

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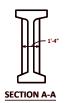
THE DESIGN ENGINEER DETERMINES THIS VALUE BASED ON 2" MIN. HAUNCH AT EDGE OF THE CAMBER

THE DESIGN ENGINEER DETERMINES THIS VALUE BASED ON 2" MIN. HAUNCH AT EDGE OF THE CAMBER

THE DESIGN ENGINEER DETERMINES THIS VALUE BASED ON 2" MIN. HAUNCH AT EDGE OF THE CAMBER

THE DESIGN ENGINEER DETERMINES THE CAMBER

THE DESIGN ENGINEER 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"





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 FLANCE.

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 MON-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 FPOXY 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

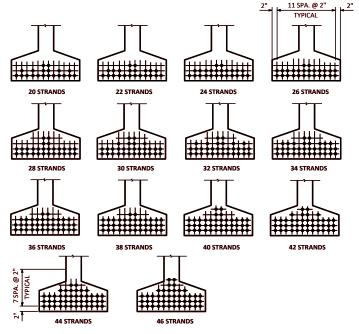
SPACING SHOWN FOR #4 STIRRUPS IS FOR GRADE 60 REINFORCEMENT.

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.

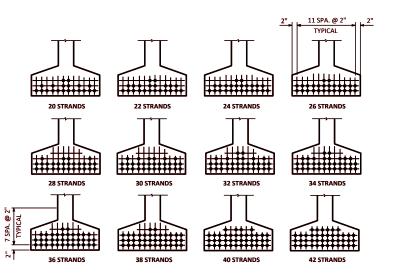
PRESTRESSING STRANDS SHALL BE ($\,$ DIA.)-7-WIRE LOW-RELAXATION STRANDS WITH AN ULTIMATE STRENGTH OF 270,000 PSI.

70" PRESTRESSED **GIRDER DETAILS**





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)

(COMPRESSION IS NEGATIVE)

(5)

 $f_B(INIT.) = (4)/(3)$

0.6" DIA.

STRANDS

(K/SQ.IN)

3.020

3.612

3.909

4.191

4.475

4.748

5.032

5.316

5.601

5.874

6.146

(4)

 $P(INIT.) = A_S f_S$

0.6" DIA.

STRANDS

(KIPS)

879

1143

1230

1318

1406

1494

1582

1758

1846

N	(1)	(2)	(3)	(4)	(5)
NO. STRANDS	e _s 0.5" DIA. STRANDS (INCHES)	$(1 + \frac{e_S \ y_B}{r^2})$ 0.5" DIA. STRANDS	(A/(2)) 0.5" DIA. STRANDS (SQ.IN.)	P(INIT.) = A _S f _S 0.5" DIA. STRANDS (KIPS)	f _B (INIT.) = (4)/(3) 0.5" DIA. STRANDS (K/SQ.IN)

STANDARD PATTERNS - 0.5" DIA. DRAPED STRANDS

STAND	AKU PAT	I EKINS - C	וט כ.נ	A. DKAPED	31KAND3
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

(2)

 $(1 + \frac{e_S y_B}{r^2})$

0.6" DIA.

STRANDS

2.659

2.655

2.650

2.647

2.637

2.628

2.614

2.607

2.601

2.596

2.586

2.577

(3)

(A/(2))

0.6" DIA.

STRANDS

(SQ.IN.)

291.090

291.530

292.080

292,410

293.520

294.520

296.100

296.890

297.580

298.150

299,300

300.350

STANDARD PATTERNS - 0.6" DIA. DRAPED STRANDS

(1)

0.6" DIA.

STRANDS

(INCHES)

-31.62

-31.53

-31.45

-31.39

-31.19

-31.02

-30.74

-30.62

-30.41

-30.22

NO

STRANDS

20

22

24

26

28

30

32

34

36

38

40

42

70" GIRDER

A = 774 SQ. IN.

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

 $y_T = 35.38 \text{ IN.}$

y_B = -34.62 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

PRE-TENSION

f's = 270,000 P.S.I.

f_S = 0.75 X 270,000 = 202,500 P.S.I. FOR LOW RELAXATION STRANDS

PI PER 0.5" DIA. STRAND = 0.1531 X 202,500 = <u>31.00 KIPS</u>

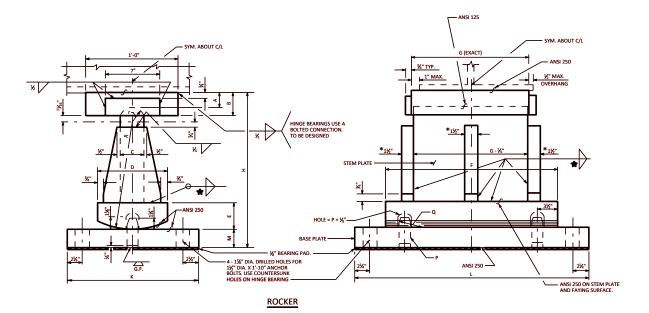
PI PER 0.6" DIA. STRAND = 0.217 X 202,500 = 43.94 KIPS

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

70" PRESTRESSED GIRDER DESIGN DATA



APPROVED: Laura Shadewald



★ 400 K ≤ REACTION < 1000 K. USE ¾" WELD. 1000 K ≤ REACTION ≤ 1500 K. USE ¾" WELD. * FOR REACTION ≥ 1000 KIPS USE 2" STIFFENERS.

TABLE OF DIMENSIONS

											G VAI	.UES											,	PIN	TIF
REACTION (KIPS)	Α	В	С	D	E	G=:	1'-7"	G=1	'-9"	G=1	'-11"	G=2	2'-1"	G:	2'-3"	G=2	!'-5"	н	K	М	R				
(KIF3)						F	L	F	L	F	L	F	L	F	L	F	L					STEM	PLATE	P DIA.	Q
400-499	1 ¹⁵ / ₁₆ "	2 ¹⁵ / ₁₆ "	3"	1'-2"	21/8"	2'-0"	2'-11"	2'-2"	2'-11"	2'-4"	3'-0"	2'-6"	3'-2"	_	_	_	_	1'-7½"	1'-6"	21/8"	1'-1"	111/16"	145/64"	2"	31/2"
500-599	115/16"	215/16"	3"	1'-2"	21/8"	2'-1"	3'-4"	2'-2"	3'-4"	2'-4"	3'-4"	2'-6"	3'-4"	_	_	_	_	1'-8½"	1'-7"	27/8"	1'-2"	111/16"	141/4"	2"	31/2"
600-699	115/16"	215/16"	3"	1'-2"	21/8"	_	_	2'-3"	3'-8"	2'-4"	3'-8"	2'-6"	3'-8"	2'-8"	3'-8"	_	_	1'-9½"	1'-8"	27/8"	1'-3"	111/16"	141/4"	2"	31/2"
700-799	23/16"	37/16"	3½"	1'-4"	3⅓"	_	_	_	_	2'-6"	3'-10"	2'-6"	3'-10"	2'-8"	3'-10"	2'-10"	3'-10"	1'-11½"	1'-10"	31/8"	1'-4"	115/16"	161/ ₆₄ "	2"	31/2"
800-899	2¾6"	37/16"	3½"	1'-4"	3¾"	_	I	ı	_	2'-7"	3'-11"	2'-7"	3'-11"	2'-8"	3'-11"	2'-10"	3'-11"	2'-0½"	2'-0"	3¾"	1'-5"	115/16"	1 ⁶ 1⁄64"	2"	3½"
900-999	23/16"	37/16"	3½"	1'-4"	3¾"	_				2'-11"	4'-0"	2'-11"	4'-0"	2'-11"	4'-0"	2'-11"	4'-0"	2'-1½"	2'-2"	3%"	1'-6"	115/ ₁₆ "	1 ⁶ 1⁄64"	2"	3½"
1000-1099	27/16"	315/16"	4"	1'-6"	3%"		_		_	<u> </u>	_	3'-1"	4'-1"	3'-1"	4'-1"	3'-1"	4'-1"	2'-3½"	2'-4"	3%"	1'-7"	2¾ ₁₆ "	213/64"	2½"	3¾"
1100-1199	27/16"	315/16"	4"	1'-6"	3%"	_	_	_	_	—	_	3'-3"	4'-2"	3'-3"	4'-2"	3'-3"	4'-2"	2'-41/2"	2'-6"	31/8"	1'-8"	2¾ ₆ "	213/64"	2½"	3¾"
1200-1299	27/16"	315/16"	4"	1'-6"	31/8"	_	I	-	_	_	_	I	_	3'-5"	4'-4"	3'-5"	4'-4"	2'-5½"	2'-7"	37/8"	1'-9"	2¾6"	213/64"	2½"	3¾"
1300-1399	27/16"	315/16"	4"	1'-6"	3%"	_	-	_	l	_	-	_	_	3'-7"	4'-7"	3'-7"	4'-7"	2'-6½"	2'-8"	31/8"	1'-10"	23/16"	213/64"	2½"	3¾"
1400-1500	27/16"	315/16"	4"	1'-6"	31/8"	_	_	_	l	_	-	_	_	3'-9"	4'-9"	3'-9"	4'-9"	2'-7½"	2'-9"	37/8"	1'-11"	23/16"	213/64"	2½"	3¾"
						G=1	'-2"			G=:	1'-3"			G=:	1'-4"										
0-300	115/16"	2 ¹⁵ ⁄ ₁₆ "	3"	1-0"	2¾"	1'-7"	2'-3"			1'-8"	2'-4"			1'-9"	2'-5"			1'-5"	1'-4"	2¾"	11"	11½6"	145/64"	2"	3½"

NOTES

FABRICATOR MAY INCREASE 'BASE PLATE' THICKNESS AS AN ALTERNATE TO SHIMS.

ALL STRUCTURAL STEEL BEARING PLATES SHALL BE FLAT ROLLED STEEL PLATES WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT, AND VERTICAL.

ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS. ON WELDED BEARINGS, FINAL MACHINING CAN BE PERFORMED BEFORE WELDING IS COMPLETED.

ALL MATERIAL IN TYPE "B" ROCKER BEARINGS, INCLUDING SHIMS, SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "BEARING ASSEMBLIES EXPANSION B. . . "

ALL MATERIALS FOR BEARINGS INCLUDING SHIMS BUT EXCLUDING PINTLES, ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM SPECIFICATION TYPE A709 GRADE 50W STEEL.

PINTLES SHALL CONFORM TO ASTM SPECIFICATION TYPE A449 STEEL. PINTLES SHALL BE MACHINED TO A DRIVING FIT.

ALL ANCIOR BOLTS, NUTS, AND WASHERS SHALL COMPORE TO ASTM PSPCIFICATION TYPE A705 GRAD SE @ESTEEL ANDHOR BOLTS SHALL BE THEADED 3". PROVIDE ONE STANDARD WROUGHT WASHER AND ONE HEX NUT PER BOLT, PROJECT ANDHOR BOLTS ""PLATE THICKNESS + 2½", ABOU'E TOP OF CONCRETE MASONRY, CHAMFER ANCHOR BOLTS PRIOR TO THEADING."

RADIAL SURFACES ON ROCKER SHALL BE MACHINE FINISHED AFTER WEI DING

ALL SURFACES MARKED " J*" SHALL BE MACHINE FINISHED BY AN AUTOMATIC PROCESS. THE CONTACT AREA OF BOTTOM SURFACE OF THE GIRDER FLANGE SHALL BE MACHINE FINISHED.

ANCHOR BOLT EDGE DISTANCE ALONG "L" MAY BE INCREASED FROM MINIMUM SHOWN WHEN A COMMON GRID DETAIL IS DESIRED FOR SEVERAL BEARINGS.

FOR UNPAINTED STRUCTURES THE UPPER 6" OF ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AS REQUIRED BY ASTM DESIGNATION A153, CLASS C OR B633.

USE AASHTO LRFD SERVICE I LOADS FOR BEARING SELECTION. CONSIDER ONLY DEAD LOAD AND HL-93 LIVE LOADS INCLUDING 33% DYNAMIC LOAD ALLOWANCE: THE BEARINGS ON THIS STANDARD WERE DESIGNED USING THE STANDARD SPECIFICATION.

ROCKER SETTING DATA

TEMPERATURE TIME OF SETTING - *F	(+) - 1	_	TICAL S	} (·)
S	PIER	PIER	PIER	PIER
120				
100				
80				
60				
40				
20				
0				
-20				

ROCKER BEARING SHALL BE SET VERTICAL AT 45° F.

ROCKER BEARING SHALL BE USED WITH A MINIMUM FRICTION VALUE OF 2% AND A MAXIMUM FRICTION VALUE OF 4%.

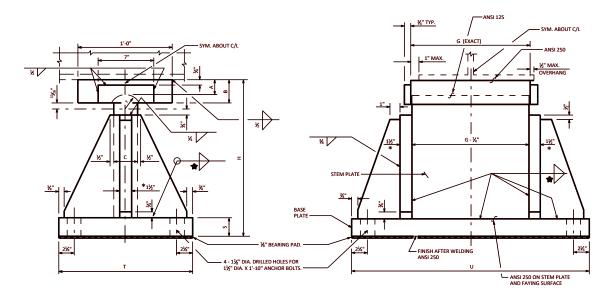
MAXIMUM MOVEMENT FROM 45° F = (D - 1")/2 BUT ACTUAL MOVEMENT NOT TO EXCEED R/3.

OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

ROCKER BEARING TYPE 'B'
- STEEL GIRDERS



APPROVED: Laura Shadewald



FIXED SHOE

400 K ≤ REACTION < 1000 K, USE ¾" WELD. 1000 K ≤ REACTION ≤ 1500 K, USE ¾" WELD. * FOR REACTIONS ≥ 1000 KIPS USE 2" STIFFENERS.

TABLE OF DIMENSIONS

DEACTION						G VA	LUES					r		
REACTION (KIPS)	Α	В	С	G=1'-7"	G=1'-9"	G=1'-11"	G=2'-1"	G=2'-3"	G=2'-5"	н			s	т
				U	U	U	U	U	U		STEM	PLATE		
400-499	115/16"	215/16"	3"	2'-8"	2'-8"	2'-10"	3'-0"	_	_	1'-6"	111/16"	145/64"	2¾"	1'-4"
500-599	115/16"	2 ¹⁵ / ₁₆ "	3"	3'-0"	3'-0"	3'-0"	3'-0"	_		1'-7"	1 ¹¹ / ₁₆ "	145/64"	2¾"	1'-5"
600-699	115/16"	215/16"	3"	_	3'-3"	3'-3"	3'-3"	3'-3"	_	1'-9"	111/16"	145/64"	2¾"	1'-6"
700-799	21/16"	37/16"	3½"	_	_	3'-6"	3'-6"	3'-6"	3'-6"	1'-10"	115/16"	161/64"	27/8"	1'-7"
800-899	23/16"	37/16"	3½"	_	-	3'-9"	3'-9"	3'-9"	3'-9"	2'-0"	115/16"	1 ⁶ 1⁄64"	2%"	1'-8"
900-999	2¾,6"	37/16"	3½"	_	_	3'-10"	3'-10"	3'-10"	3'-10"	2'-1"	115/16"	161/64"	21/8"	1'-10'
1000-1099	27/16"	315/16"	4"	_	_	_	4'-0"	4'-0"	4'-0"	2'-3"	23/16"	213/64"	3¾"	1'-11'
1100-1199	27/16"	315/16"	4"	_	_	_	4'-2"	4'-2"	4'-2"	2'-4"	23/16"	213/64"	3¾"	2'-0"
1200-1299	27/16"	315/16"	4"	_	_	I —	—	4'-4"	4'-4"	2'-5"	2¾6"	213/64"	3¾"	2'-1"
1300-1399	27/16"	315/16"	4"	_	_	_	_	4'-6"	4'-6"	2'-6"	23/16"	213/64"	3¾"	2'-2"
1400-1500	27/16"	315/16"	4"	_	_	_	_	4'-8"	4'-8"	2'-7"	2¾6"	213/64"	3¾"	2'-3"

NOTES

FABRICATOR MAY INCREASE 'BASE PLATE' THICKNESS AS AN ALTERNATE TO SHIMS.

ALL STRUCTURAL STEEL BEARING PLATES SHALL BE FLAT ROLLED STEEL PLATES WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL EDGES SMOOTH, STRAIGHT AND VERTICAL.

ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS, ON WELDED BEARINGS. FINAL MACHINING CAN BE PERFORMED BEFORE WELDING IS COMPLETED.

ALL MATERIAL FOR BEARINGS INCLUDING SHIMS BUT EXCLUDING ANCHOR BOLTS, NUTS, AND WASHERS SHALL CONFORM TO ASTM SPECIFICATION TYPE A709 GRADE 50W STEEL.

ALL ANCHOR BOLTS, MUTS, AND WASHERS SHALL CONFORM TO ASTM SPECIFICATION TYPE ATOM GRADE 26 GBTSETA, ANCHOR BOLTS SHALL BET HIREADED 3". PROVIDE ONE STANDARD WROUGHT WASHER AND ONE HEX NUT PER BOLT. PROJECT ANCHOR BOLTS "F JEATE THICKNESS." + 2%" ABOVE TOP OF CONCRETE MASONRY, CHAMFER ANCHOR BOLTS PRIGOR TO THEADLING.

AFTER WELDING SHOE ASSEMBLY, FINISH BOTTOM OF BASE PLATE TO A FLAT SURFACE.

ALL SURFACES MARKED " \int^α shall be machine finished by an automatic process. The contact area of bottom surface of the girder flange shall be machine finished.

ANCHOR BOLT DISTANCES ALONG "T" OR "U" MAY BE INCREASED FROM MINIMUM SHOWN WHEN A COMMON GRID DETAIL IS DESIRED FOR SEVERAL BEARINGS.

FOR UNPAINTED STRUCTURES THE UPPER 6" OF THE ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AS REQUIRED BY ASTM DESIGNATION A153, CLASS C OR B633.

ALL MATERIALS IN TYPE "B" FIXED SHOE BEARINGS, INCLUDING SHIMS, SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "BEARING ASSEMBLIES FIXED B-_-".

OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

USE AASHTO LRFD SERVICE I LOADS FOR BEARING SELECTION. CONSIDER ONLY DEAD LOAD AND HL-93 LIVE LOADS INCLUDING 33% DYNAMIC LOAD ALLOWANCE. THE BEARINGS ON THIS STANDARD WERE DESIGNED USING THE STANDARD SPECIFICATION.

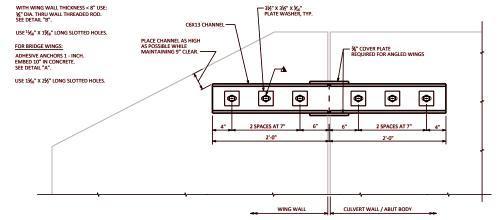
TYPE 'B' - STEEL GIRDERS FIXED SHOE

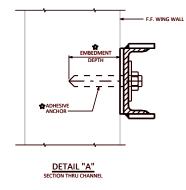


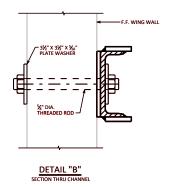
APPROVED: Laura Shadewald



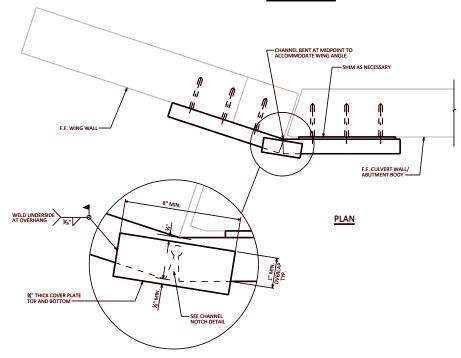
WITH WING WALL THICKNESS ≥ 8" USE: ADHESIVE ANCHORS 5/6 - INCH. EMBED 5" IN CONCRETE. SEE DETAIL "A".

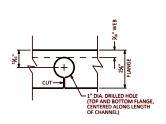






WING ELEVATION





CHANNEL NOTCH DETAIL

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.

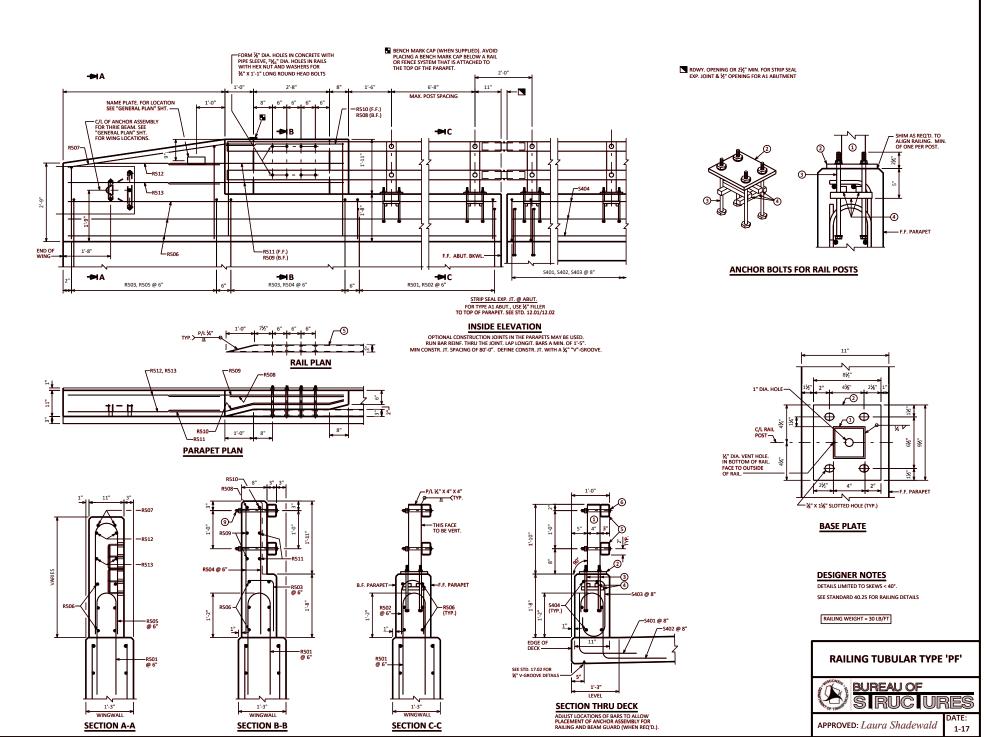
CAULK AROUND PERIMETER OF CHANNEL AND FILL PORTION OF HOLE AROUND ANCHOR BOLT AND SHIM WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

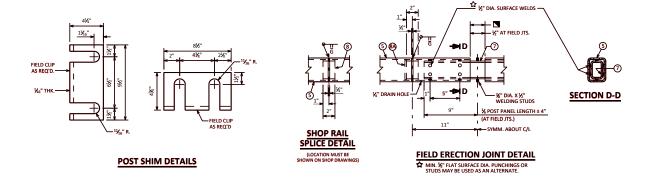
ADHESIVE ANCHORS SHALL CONFORM TO SECTION 502.2.12 OF THE STANDARD SPECIFICATIONS.

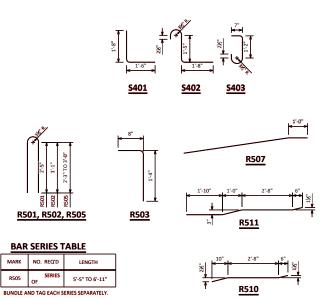
WING STRAPPING



APPROVED: Laura Shadewald







BILI	0	BAR	<u>es</u>	NOTE: THE FIRST OR FIRST TWO DIGITS OF THE BAR MARK SIGNIFIES THE BAR SIZE.						
BAR MARK	Sy's	NO. REQ'D	LENGTH	BENY	BAR SERIES	LOCATION				
S401	х		3'-0"	х		PARAPET VERT.				
S402	Х		4'-1"	х		PARAPET VERT.				
S403	Х		2'-9"	х		PARAPET VERT.				
S404	Х					PARAPET HORIZ.				
R501	X		5'-9"	Х		PARAPET VERT.				
R502	х		3'-1"	х		PARAPET VERT.				
R503	х		1'-11"	х		PARAPET VERT.				
R504	х		3'-4"			PARAPET VERT.				
R505	х		6'-2"	х	A	PARAPET VERT.				
R506	Х					PARAPET HORIZ.				
R507	Х			х		PARAPET HORIZ.				
R508	Х		4'-0"			PARAPET HORIZ.				
R509	Х		5'-8"			PARAPET HORIZ.				
R510	Х		4'-0"	х		PARAPET HORIZ.				
R511	Х		6'-0"	х		PARAPET HORIZ.				
R512	Х					PARAPET HORIZ.				
R513	х					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.

NOTES

BID 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 B.

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 REQUIRED FOR ALIGNMENT.

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. ,

1/4" DIA. VENT HOLES TO BE LOCATED AT LOW END OF RAILS.

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).

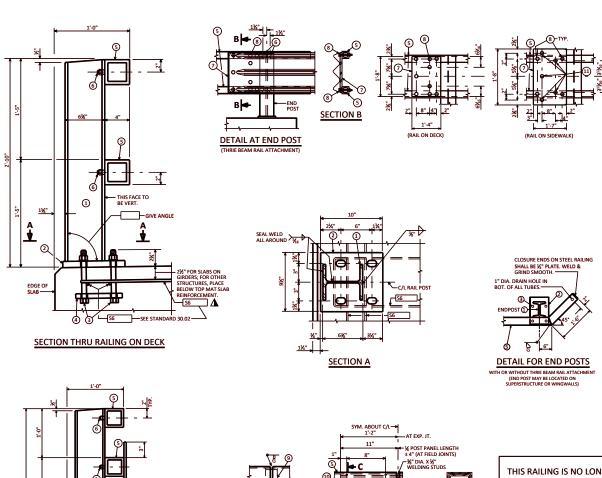
■ RDWY. OPENING OR 2½" MIN. FOR STRIP SEAL EXP. JOINT & ½" OPENING FOR A1 ABUTIMENT.

LEGEND

- TS 4 X 4 X 0.25 X 1'-9½" STRUCTURAL TUBING WITH 1½5" DIA. HOLES FOR BOLT NO. 6. PLACE POSTS VERTICAL IN TRANSVERSE DIRECTION. WELD TO NO. 2. PLACE POSTS NORMAL TO GRADE LINE.
- ② PLATE ¾" X 8½" X 9½" WITH ¾" X 1½" SLOTTED HOLES FOR ANCHOR BOLTS NO. 3. WELD TO NO. 1 AS SHOWN. SLOTS PARALLEL TO SHORT SIDE OF PLATE.
- 3 %" DIA. X 1'-1" LONG ASTM A325 HEX BOLTS (GALVANIZED) WITH A325 NUT AND WASHER. 4 REQ'D. PER POST. THREAD 3" AND PLACE NORMAL TO PLATE NO. 2. EMBED A MIN. OF 10". CHAMFER TOP OF BOLTS BEFORE THREADING.
- 4 BAR ¾" SQ. X 7" LONG. WELD TO ANCHOR BOLTS NO. 3 (GALVANIZED).
- (5) TS 4 X 3 X 0.25 STRUCTURAL TUBING. ATTACK TO NO. 1 WITH BOLTS NO. 6. PROVIDE $^1\!H_{16}^{**}$ DIA. HOLE FOR NO. 6.
- 6 ¾" DIA. X 9" LONG ROUND HEAD BOLTS, ASTM A307, WITH HEX NUT AND WASHERS AND LOCK WASHER. (1 REQ'D. AT EACH RAIL TO POST LOCATION.)
- RECTANGULAR SLEEVE FABRICATED FROM ¾" PLATES. 1'-6" LONG.
- (3) RECTANGULAR SLEEVE FABRICATED FROM $\frac{1}{2}$ " PLATES. PROVIDE "SLIDING FIT" WITH MIN. OUT TO OUT DIMENSION OF $3^1\frac{1}{2}$ " X $2^1\frac{1}{2}$ ".
- RECTANGULAR SLEEVE FABRICATED FROM ½" PLATES. PROVIDE "SLIDING FIT" WITH
 MIN. OUT TO OUT DIMENSION OF 3¹½," X 2¹½," WITH ½,6" PLATE AT ONE END
 WELDED ALL AROUND TO BLOCK WATER.
- 9 ¾" DIA. X 1'-1" LONG ROUND HEAD BOLTS, ASTM A307, WITH HEX NUT AND WASHERS.



RAILING TUBULAR



SHOP RAIL

SPLICE DETAIL

(LOCATION MUST BE

8'-0" MAX.

ABUTMENT WINGWALL

1'-1" MAX.

✓ ½" DIA \blacksquare

(AT FIELD JOINTS) —

FIELD ERECTION

JOINT DETAIL

MIN. %" FLAT SURFACE DIA. PUNCHINGS OR STUDS MAY BE USED AS AN ALTERNATE.

PART ELEVATION OF RAILING

SECTION C

8'-0" MAX. POST SPACING

- C/L EXPANSION JOINT

1%"

1

THIS FACE TO BE VERT.

4

SECTION THRU RAILING

ON SIDEWALK



LEGEND

- (1) W6 X 25 WITH 1½" 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
- 2 PLATE 1" X 9½" X 10" WITH 1½6" X 1½" SLOTTED HOLES FOR ANCHOR BOLTS NO. 3. WELD TO NO. 1 AS SHOWN.
- (3) A325 ¾" 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'ID. PER POST. THREAD 3" AND PLACE NORMAL TO PLATE NO. 2. CHAMFER TOP OF BOLTS BEFORE
- 4 ¼" x 8" x 8" FLAT BAR WITH 15/4" DIA. HOLES FOR ANCHOR BOLTS NO. 3.
- (5) 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.
- $\fill \begin{picture}(2000)(0,0) \put(0,0){\line(0,0){100}} \put(0,0){\li$
- 7 PLATE ¾" X 1'-4" (1'-7" ON SDWK.) X 1'-8". BOLT TO RAIL AS SHOWN IN DETAIL. REQUIRED AT THRIE BEAM GUARD RAIL ATTACHMENTS ONLY. PLACE SYMMETRICALLY ABOUT TUBES NO. 5.
- (8) 1" DIA. HOLES IN PLATE NO. 7 & TUBES NO. 5 FOR %" DIA. A325 BOLTS W/ HEX NUTS AND WASHERS.
- 9 SQUARE SLEEVE FABRICATED FROM $\frac{1}{4}$ " PLATE. PROVIDE "SLIDING FIT" WITH A MINIMUM OUT TO OUT DIMENSION OF $3^{1}\frac{1}{2}$."
- (1) TS 3 X 3 X 0.25 X (2'-4" AT EXPANSION JOINTS) & (1'-10" AT FIELD JOINTS) IS 3 X 3 C.25 X (2-4) AT EXPANSION JURIS) & (1-10) AT FIELD JURIS) LONG. PROVIDE ½" DIA. SUFFACE WELDS ON ALL SIDES AS SHOWN. GRIND WELDS TO FIT FREE INTO I.D. OF NO. 5. PROVIDE ¾" DIA. X ½" WELDING STUDS ON TOP AND BOTTOM SURFACES AT CENTERLINE.
- (1) ½" DIA. X 1½" LONG THREADED SHOP WELDED STUDS. (REQ'D FOR SDWK. 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. 6 BLAST CLEANING BY SSPC SPECIFICATIONS.

FOR RAILING TO BE PAINTED, ALL MATERIAL EXCEPT ANCHORAGE DETAIL NO. 3 & 4. FOR MAILING IO BE PAINTED, ALL MAIRMAIL EXCEPT ANCHORAGE DETAIL NO. 3 & 4, SHALL BE PAINTED WITH A THREE-COAT ZING 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.

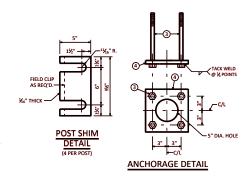
FILL BOLT SLOT OPENINGS IN POST SHIMS AND PLATE NO. 2 WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

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

PLACE FIRST BOTTOM LONGITUDINAL BAR CLEAR OF DRIP GROOVE.



RAILING WEIGHT = 37 LB/LF (BASED ON 8'-0" POST SPACING.



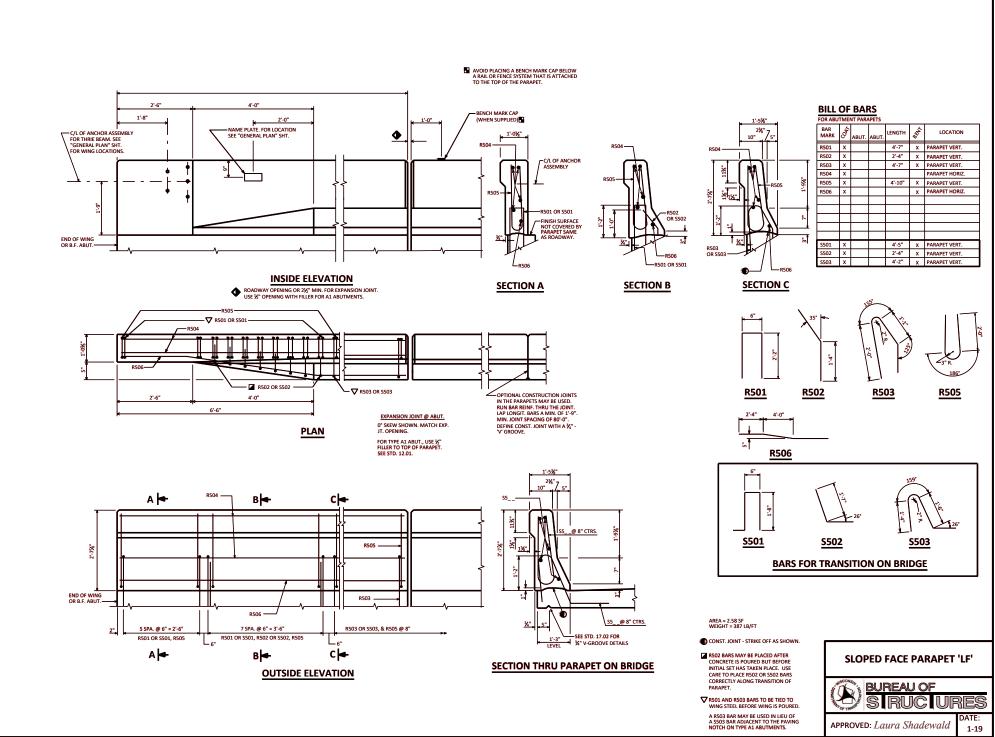
RDWY, OPENING OR 23/5" MIN. FOR

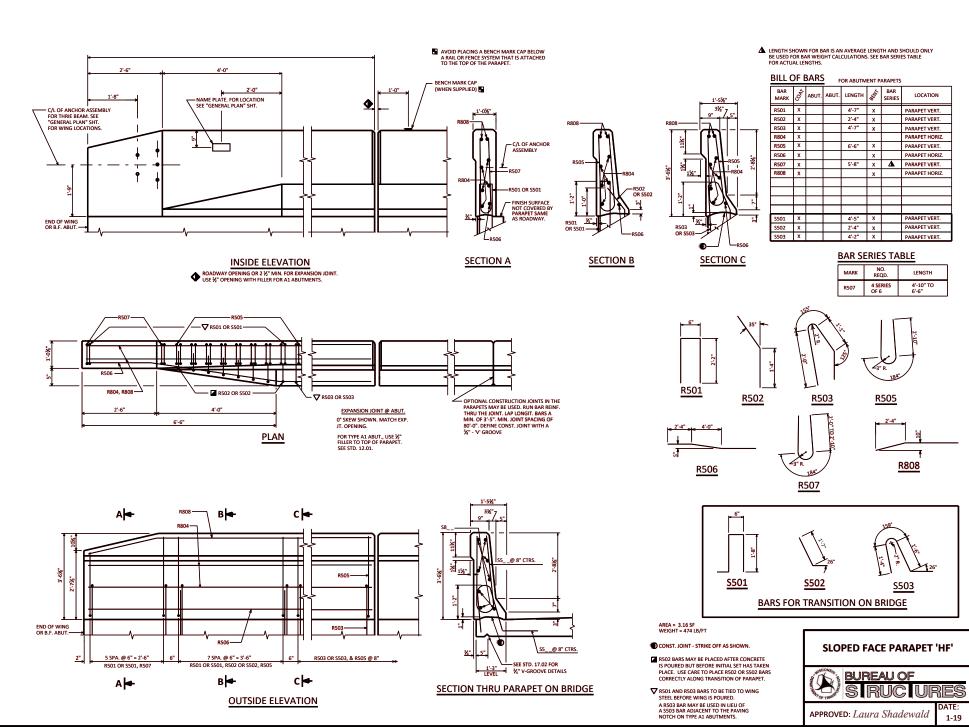
▲ TIE TO TOP MAT OF STEEL.

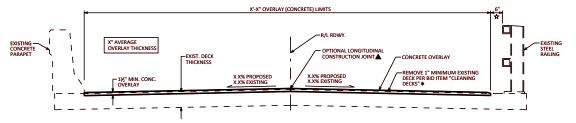
TUBULAR STEEL RAILING TYPE 'F'



APPROVED: Laura Shadewald

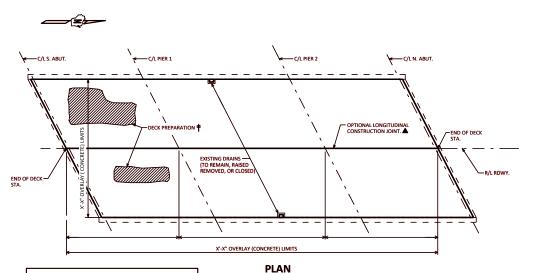






CROSS SECTION THRU ROADWAY

LOOKING NORTH



SURVEY TYPE:
SURVEY COMPLETED DATE: _ _/_ _/ ___

TOP OF DECK SHOWN

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 DARTIAL	LIST OF BOSSIBLE BID ITEMS, BID ITEMS MAY NEED TO BE ADDED		

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

DESIGN DATA

LIVE LOAD:

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

MATERIAL PROPERTIE

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 $\frac{1}{2}$ -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 1½" PLACED ABOVE THE DECK SUBFACE AFTER SURFACE PREPARATION. EXPECTED AVERAGE OVERLAY THICKNESS S: 0" (OR AS GWEND ON THE PLANS), I EXPECTED AVERAGE OVERLAY THICKNESS IS EXCREDED BY MORE THAN ½", 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 ½" 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 EVISTING DECK UNDER BID TEM "CLEANING DECKS" IS NOT INTENDED FOR PREVIOUSLY OVERLIND DECKS EXISTING CONCERTE COVER IL' MIN JISHALL BE AMANTAINED AND CONSIDERED WHICH DETERMINING CONCERTE REMOVALS. INCLUDE THE BID TEM "CLEANING DECKS TO REAPPLY CONCRETE MASONING OVERLAY." WHEN BROWNED EXISTING OVERLAY.
- PROVIDE (IF AVAILABLE) THE MOST CURRENT DECK CONDITION ASSESSMENT SURVEY ON PLANS. INCLUDE
 SURVEY TIPE AND DATE COMPLETED. THERMOGRAPHY DATA CAN BE FOUND IN HISS WITHIN GENERAL
 INVENTORY/FILE/INSPECTION/DATE/INSPECTION SPECIAL REPORT. DECK CONDITION ASSESSMENT SURVEY
 DATE SCAM 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 OVERLY POURS.

CONCRETE OVERLAY

BUREAU OF
SIRUCIURES

APPROVED: Laura Shadewald
7-22

REHABILITATION **OVERLAY**

PREVENTATIVE OVERLAY

X'-X" - OVERLAY (POLYMER) LIMITS -R/L RDWY. 1 □¼" MIN. OVERLAY POLYMER OVERLAY X.X% X.X%

CROSS SECTION THRU ROADWAY

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	
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

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 BASEO ON THE PLANS AND AS DETERMINED BY THE ENGINEER. DECK PREPARATION AND FULL-DEPTH DECK REPAIRS SHALL BE FILLED WITH "CONCRETE MASONRY DECK REPAIRS".

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

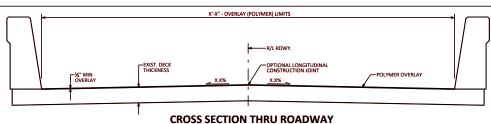
DECK REPAIRS USING A PORTLAND CEMENT BASED CONCRETE REQUIRES A MINIMUM CURE TIME OF 28 DAYS PRIOR OVERLAY PLACEMENT. WHEN DEEMED ASSOLUTELY NECESSARY (BY REGION AND BOS DESIGN STAFF) PARIOI SET DECK PERPAIR" MAY BE USED IN LIEU OF "CONCRETE MASONRY DECK REPAIR" TO SHORTEN TIME REQUIRED FOR PLACING OVERLAY.

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 THEATMENT POLYMER OVERLAY" MAY BE USED IN LIEU OF "POLYMER OVERLAY". SEE BRIDGE MANUAL SECTION 405.1.1 FOR ADDITIONAL GUIDANCE.



	TOTAL E	STIMATED QUANTITIES		
	BID ITEM NUMBER	BID ITEMS	UNIT	TOTAL
	509.5100.S	POLYMER OVERLAY	SY	
		POSSIBLE BID ITEM		
۸_	SDV 0190	HIGH ERICTION SURFACE TREATMENT POLYMER OVERLAY	cv	

DESIGN DATA

LIVE LOAD: DESIGN LOADING: HL-93
INVENTORY RATING FACTOR: RF=1._
OPERATING RATING FACTOR: RF=1._
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

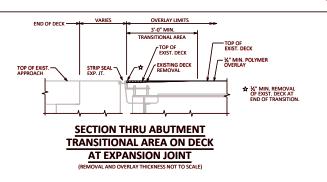
PREVENTATIVE OVERLAY INTENDED FOR USE ON DECKS WITH A MINIMUM AGE OF 28 DAYS AND A MAXIMUM AGE OF 2 YEARS. AN ADDITIONAL CONTRACT MAY BE REQUIRED FOR APPLYING THE OVERLAY DUE TO SCHEDULE AND DECK AGE CONSIDERATIONS.

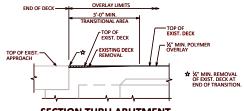
WHEN BID ITEM "POLYMER OVERLAY" IS USED RATING SHOULD INCLUDE THE 5 PSF OVERLAY.

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". ASE BRIDGE MANUAL SECTION 40.5.1.1 FOR ADDITIONAL GUIDANCE.





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



APPROVED: Laura Shadewald

CROSS SECTION THRU ROADWAY

DESIGNER NOTES

ONCRETE 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

PROVIDE AN AVERAGE OVERLAY THICKNESS ON THE PLANS. THIS AVERAGE OVERLAY THICKNESS VALUE IS BASED ON THE THEORETICAL AVERAGE OVERLAY THICKNESS PLUS *\" 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

* 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 CONSIDER WHEN DETERMINING CONCRETE REMOVALS. X° MINIMUM REMOVAL OF EXISTING DECK IS INCLUDED WITHIN "REMOVING (OVERLY TYPE) DECK OVERLAY (STRUCTURE)" BID ITEMS.

PROVIDE (IF AVAILABLE) THE MOST CURRENT DECK CONDITION ASSESSMENT SURVEY ON PLANS. INCLUDE SURVEY TYPE AND DATE COMPETED. THERMOGRAPHY DATA CAN BE FOUND IN HISIS WITHIN GENERAL INVENTORY/FLE/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

POLYMER MODIFIED **ASPHALTIC OVERLAY**

LIVE LOAD: INVENTORY RATING: HS.

OPERATING RATING: HS

VISCONSIN 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

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 2½" (OR AS GIVEN ON THE PLANS). IF EXPECTED AVERAGE OVERLAY THICKNESS IS EXCEEDED BY MORE THAN 3/11. CONTACT THE STRUCTURES DESIGN SECTION.

X'-X" OVERLAY (ASPHALTIC) LIMITS OVERLAY THICKNESS OPTIONAL LONGITUDINAL CONSTRUCTION JOINT. EXIST. DECK ASPHALTIC OVERLAY REMOVE EXISTING X.X% PROPOSED 2" MIN. ASPHALTIC OVERLAY OVERLAY *

CROSS SECTION THRU ROADWAY

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

PROVIDE AN AVERAGE OVERLAY THICKNESS ON THE PLANS. THIS AVERAGE OVERLAY THICKNESS VALUE IS BASED ON THE THEORETICAL AVERAGE OVERLAY THICKNESS PLUS ½" 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

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. "X." 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 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
	455.0605	455.0605 TACK COAT		
	460.1XXX 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

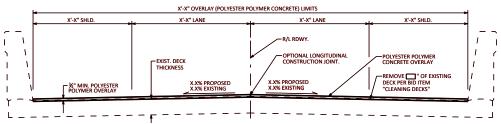
PROFILE GRADE LINE SHALL BE DETERMINED IN THE FIELD BASED ON A MINIMUM OVERLAY THICKNESS OF 2" PLACED ABOVE THE DECK SURFACE. EXPECTED AVERAGE OVERLAY THICKNESS IS 2½" (OR AS GIVEN ON THE PLANS). IF EXPECTED AVERAGE OVERLAY THICKNESS IS EXCEEDED BY MORE THAN ½", CONTACT THE STRUCTURES DESIGN SECTION.

> POLYMER MODIFIED ASPHALTIC AND ASPHALTIC OVERLAYS

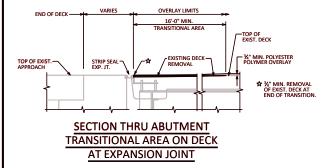
ASPHALTIC OVERLAY

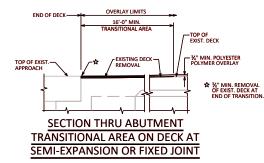


APPROVED: Laura Shadewald



CROSS SECTION THRU ROADWAY





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.

—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 $\frac{3}{4}$ " 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.

OVERLAY LIMITS END OF DECK REMOVE ¾" OF EXISTING DECK PER BID ITEM TOP OF EXIST. DECK "CLEANING DECKS" TOP OF EXIST. -¾" MIN. POLYESTER POLYMER OVERLAY

SECTION THRU ABUTMENT

(WHEN BID ITEM "CLEANING DECKS" IS USED. TRANSITIONAL AREA NOT REQUIRED.)

TOTAL ESTIMATED QUANTITIES

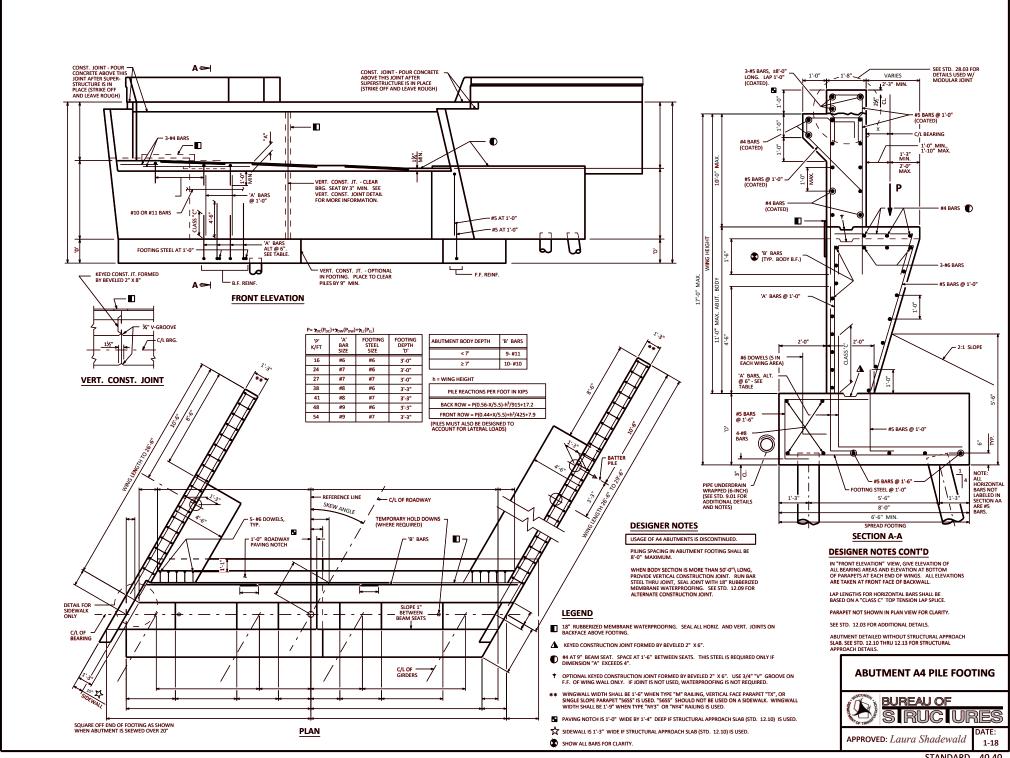
BID ITEM NUMBER	BID ITEMS	UNIT	TOTAL
509.0301	PREPARATION DECKS TYPE 1	SY	
509.0302	PREPARATION DECKS TYPE 2	SY	
509.0310.S	SAWING PAVEMENT DECK PREPARATION AREAS	LF	
509.2000	FULL-DEPTH DECK REPAIR	SY	
SPV.0035	RAPID SET DECK REPAIR	CY	
SPV.0180	POLYESTER POLYMER CONCRETE OVERLAY	SY	
	POSSIBLE ADDITIONAL BID ITEMS		
509.0500	CLEANING DECKS	SY	

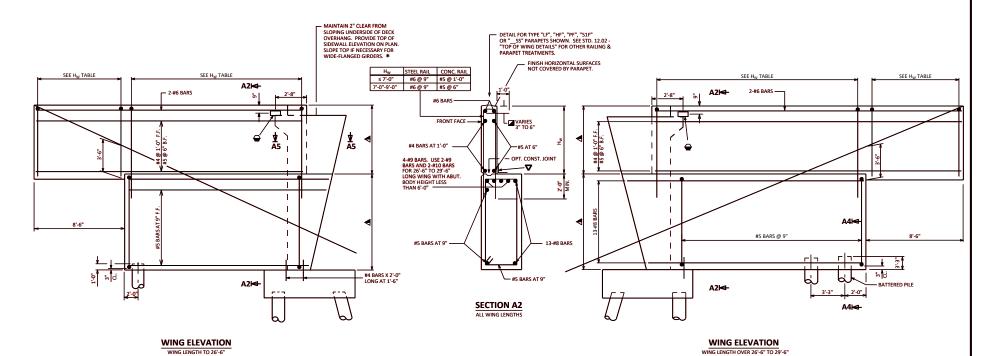
THIS IS A PARTIAL LIST OF POSSIBLE BID ITEMS. BID ITEMS MAY NEED TO BE ADDED OR REMOVED TO FIT EACH INDIVIDUAL CASE.

POLYESTER POLYMER CONCRETE OVERLAY



APPROVED: Laura Shadewald





SECTION A5

(WITHOUT STRUCTURAL APPROACH SLAB)

SECTION A5 (WITH STRUCTURAL APPROACH SLAB)

1 17

SECTION A4

BATTER

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

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

▲ 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

LIVE LOAD

800Y = 1'-6" SURCHARGE

WINGS = 2'-0" SURCHARGE

HORIZ, EARTH LOAD BASE DO NO.

800Y = 40 P.C.F. EQUIV. FLUID UNIT WGT. OF SOIL

WINGS = 35 P.C.F. EQUIV. FLUID UNIT WGT. OF SOIL

LOAD FACTORS:

7_{pbc} = 1.25

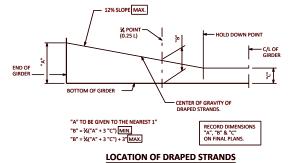
7_{pOW} = 1.50 7_{pEH} = 1.50 7_{pEH} = 0.90 7_{pEV} = 1.35 7_{LL} = 1.75

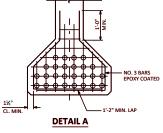
EXPOSURE CLASS 2, $\gamma_E = 0.75$ $f_Y = 60,000$ P.S.I. $f'_C = 3,500$ P.S.I.

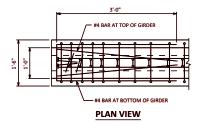
ABUTMENT A4 PILE FOOTING

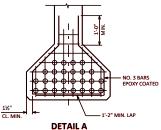


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NOTES

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 FLANCE.

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 COMPLETELY IN CUMERET, RID OF STRANDS SHALL BE CUATED WITH MON-BITUMINOUS JOINT SEALER. FOR GIRDER RIDS THAT ARE FINALLY EXPOSED, COAT THE GIRDER RIDS, 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 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, WWW 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 MINIMIMUM 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 O.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.

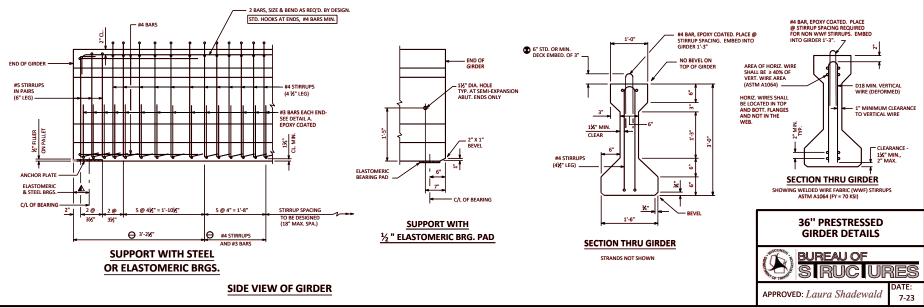
REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STANDARD STRAND PATTERNS LISTED ON STANDARD 40.43 AND THE SPAN LENGTHS SHOWN IN TABLE 19.3-1. USING DIFFERENT STRAND PATTERNS OR LONGER SPANS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT, WHICH REQUIRES PRIOR APPROVAL FROM THE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

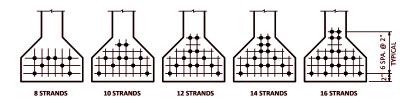
▲ VARIES FOR ELASTOMERIC BRGS. (STD. 27.07) AND STEEL BRGS. (STD. 27.09)

O 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 2½" CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR ±3/4" VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

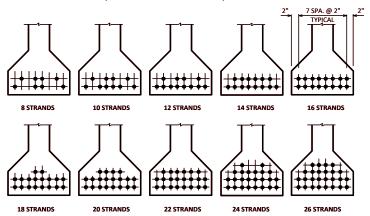
PROVIDE STIRRUP SPACING THAT IS SYMMETRICAL ABOUT THE C/L OF GIRDER.





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" GIRDERA = 369 SQ. IN.

 $r^2 = 138.15 \text{ IN.}^2$ $y_T = 20.17 \text{ IN.}$ $y_B = -15.83 \text{ IN.}$ $I = 50,979 \text{ IN.}^4$ $S_T = 2,527 \text{ IN.}^3$

S_B = -3,220 IN.³ WT. = 384 #/FT.

PRE-TENSION

f's = 270,000 P.S.I.

f_s = 0.75 X 270,000 = 202,500 P.S.I.

FOR LOW RELAXATION STRANDS

PI PER 0.5" DIA. STRAND = 0.1531 X 202,500 = <u>31.00 KIPS</u> PI PER 0.6" DIA. STRAND = 0.217 X 202,500 = <u>43.94 KIPS</u>

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

 f_B (INIT.) = $\frac{A_S f_S}{A}$ (1+ $\frac{e_S y_B}{r^2}$)

(COMPRESSION IS POSITIVE)

NO. STRANDS	e _s (INCHES)	P(INIT.)=A _S f _S (KIPS)	f _B (INIT.) (K/SQ.IN.)					
STANDARD STR	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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