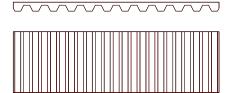


MAX.

FORMLINER THICKNESS INCLUDES FORMLINER BACKING (IF USED)

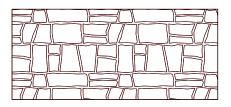
SECTION THRU FORMLINER

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 STRANDARDS.



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

FIELD STONE - RANDOM FORMLINER THICKNESS = 31/2" SIZES BETWEEN 6" & 24" MAX, RELIEF = 21/2"



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

WARNING

FORMLINER SHOWN ON THIS STANDARD IS A NON-PARTICIPATING ITEM (CSS).



RECTANGULAR CUT STONE
FORMLINER THICKNESS = 4" TO 51/2"
COURSE HEIGHT = # 2"
MAX. RELIEF = 3" TO 41/2"

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

RETAINING WALL NOTES

FORMLINER COURSING ON RETAINING WALLS SHALL BE LEVEL

ABUTMENT NOTES

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

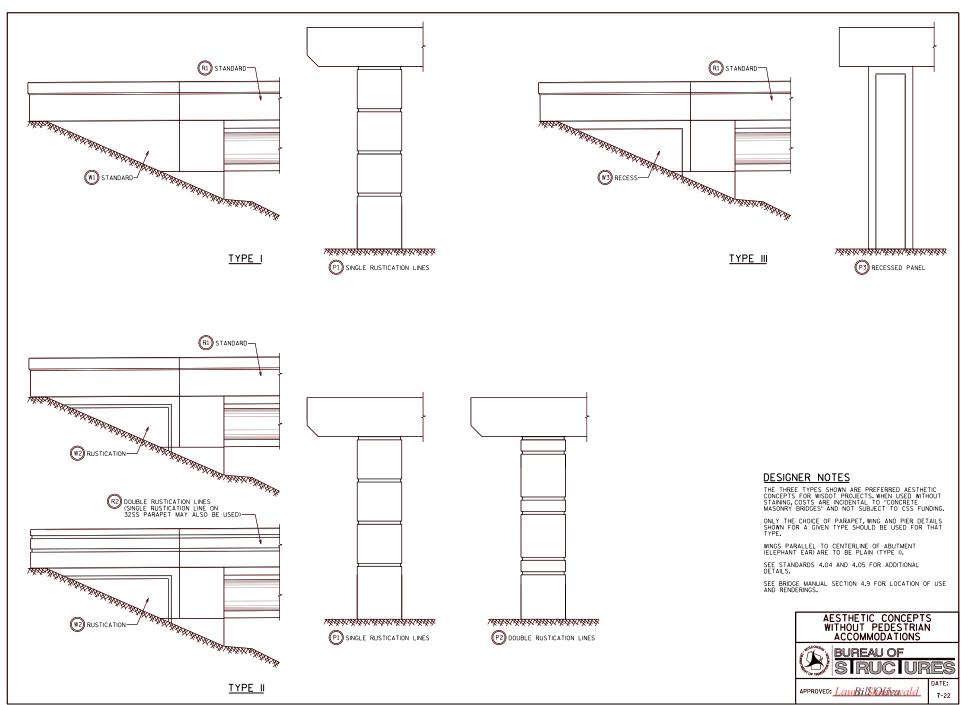
FORMLINER COURSING ON PARAPETS SHALL BE PARALLEL TO TOP OF PARAPET.

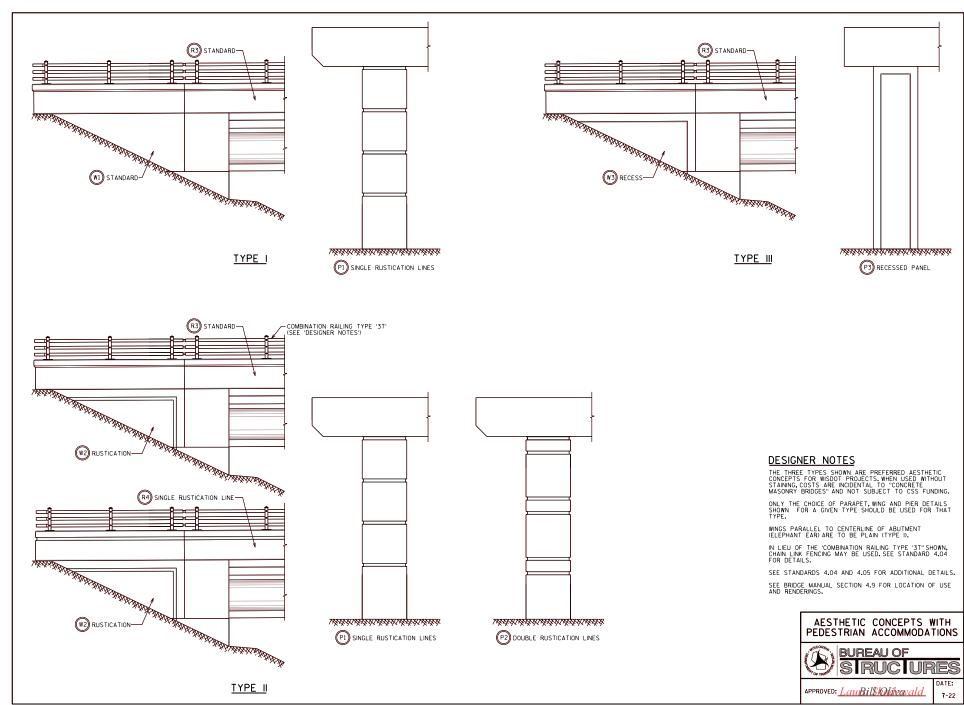
FORMLINER DETAILS

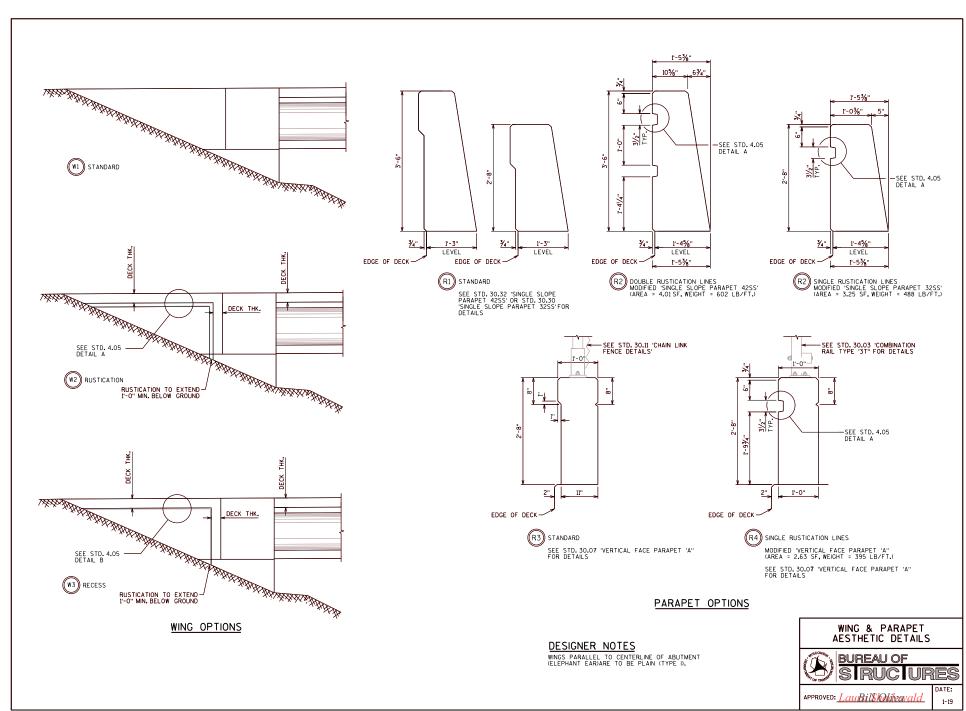


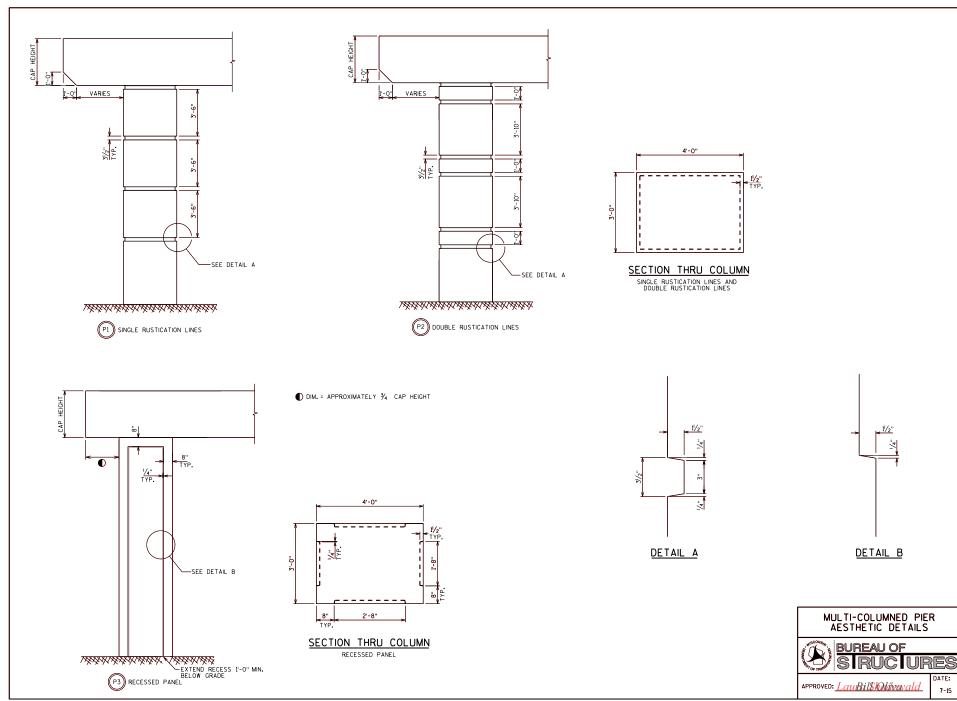
APPROVED: LauBils Widewald

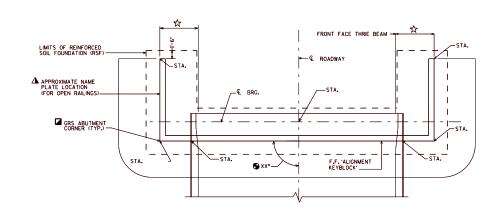
D: Laubalb Relativovald 7-16











NOTES

DRAWINGS SHALL NOT BE SCALED.

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

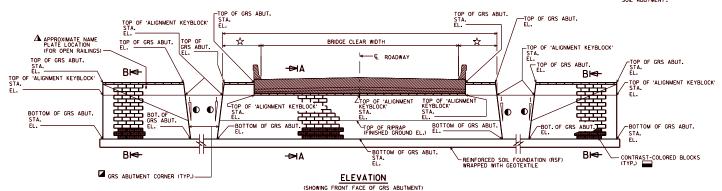
PROVIDE AN ADEQUATE WORKING WIDTH FOR GUARDRAIL DEFLECTION PER FDM REQUIREMENTS.
MINIMUM WIDTH SHALL BE 6'-6" FROM FRONT FACE OF THRIE BEAM TO FRONT FACE OF WALL.

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 ABUTMENT'.



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.

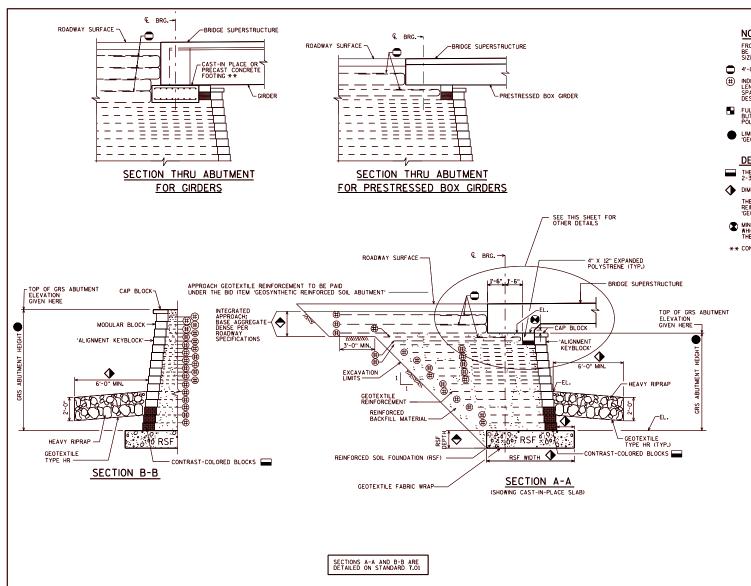
NOTE: STATIONS AND OFFSETS GIVEN AT FRONT FACE OF 'ALIGNMENT KEYBLOCK' AND AT ELEVATION XX.XX.

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

GRS ABUTMENT GENERAL PLAN



APPROVED: LauBils Waldrowald



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

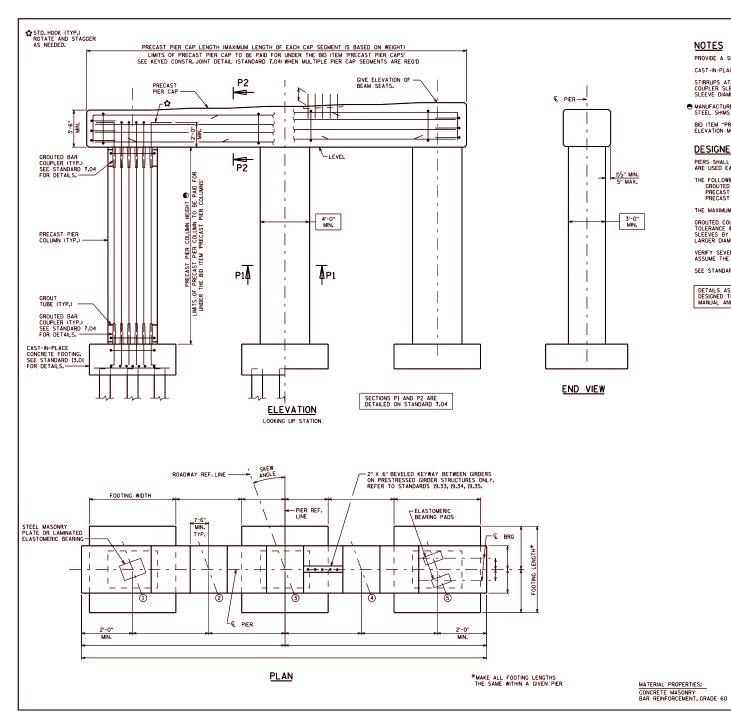
LAYER NUMBER	MINIMUM LENGTH* OF GEOTEXTILE (FT.)	EL. ±	

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

GRS ABUTMENT DETAILS



APPROVED: LauBilSlodileovale



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 JADJUST STIRRUP DIMENSIONS AS REQUIRED IF THE ACTUAL COUPLER SLEEVE DIAMETER DIFFERS.

 $\ \, \bullet$ 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 SUPPORT BY A MINIMUM OF 2 COLUMNS.

THE FOLLOWING SPECIAL PROVISIONS SHALL BE USED:
GROUTED BAR COUPLERS (505,1000,5)
PRECAST PIER COLUMNS (SPY,0090,XXX)
PRECAST PIER CAPS (SPY,0090,XXX)

f'c = 3,500 P.S.I. fy = 60,000 P.S.I.

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 I BAR 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 MANINAL AND STANDARDS 7.05 AND 7.06 FOR ADDITIONAL GUIDANCE.

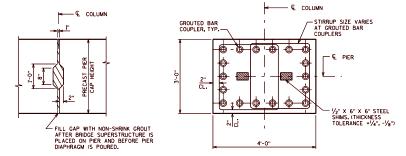
PRECAST PIER CAP AND COLUMNS



APPROVED: LauBilSlodileovale

BILL OF BARS TOTAL COATED: XX LBS BAR NΩ ''هي BEN LOCATION LENGTH MARK REO'D € COLUMN NOTE: THIS BILL OF BARS IS SHOWN FOR INFORMATION ONLY, PAYMENT FOR REINFORCEMENT IN PRECAST COLUMNS AND PRECAST CAP IS INLCUDED IN THE BID ITEMS "PRECAST PIER COLUMNS" AND "PRECAST PIER CAPS. Ш COLUMN BAR (TYP.) -11 -11 -11 -11 Ш Ш -11 Ш GROUT TUBE (TYP.) PIER COLUMN € COLUMN DIMENSION BARS TO CLEAR ANCHOR BOLTS ON STEEL GROUTED BAR COUPLER (TYP.) - STIRRUP SIZE VARIES AT GROUTED BAR COUPLERS GIRDER STRUCTURES GROUT SUPPLIED BY COUPLER MANUFACTURER 2½" CL. _€ PIER C OF ANCHOR BOLT 21/2" CL SPACE STIRRUPS IN FIELD TO MISS ANCHOR BOLTS CAST-IN-PLACE CONCRETE FOOTING 11 -11 Ш - 11 Ш #5 BARS 1/2" ± NON-SHRINK GROUT AND STEEL SHIMS. BEDDING GROUT TO HAVE THICKNESS SLIGHTLY LARGER THAN SHIMS IF PLACED IN SEAT BEFORE COLUMN. BEDDING GROUT SHALL BE NONMETALLIC. Ш Ш -11 Ш Ш Ш 公PXXX BARS (PIER FOOTING DOWELS) Ш Ш П Ш SECTION P1 SECTION P2 (PRECAST PIER COLUMN REINF. TO BE DESIGNED BY DESIGN ENGINEER (PRECAST PIER CAP REINF. TO BE DESIGNED BY DESIGN ENGINEER) GROUTED BAR COUPLER DETAILS

SECTIONS P1 AND P2 ARE CUT ON STANDARD 7.03



(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

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.
- 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.
- 5. 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.
- 6. 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.
- 9. 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 SUBSECUENT ELEMENTS ABOVE A CONNECTION SHALL NOT COMMENCE UNITL THE CONNECTION HAS ACHIEVED ADEQUATE STRENGTH AS DETERMINED THROUGH STRENGTH TESTING OF THE GROUT, THE TIMMO OF SUBSECUENT CONSTRUCTION STEPS SHOULD BE SPECIFIED IN BRIDGE ASSEMBLY PLAN.

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.

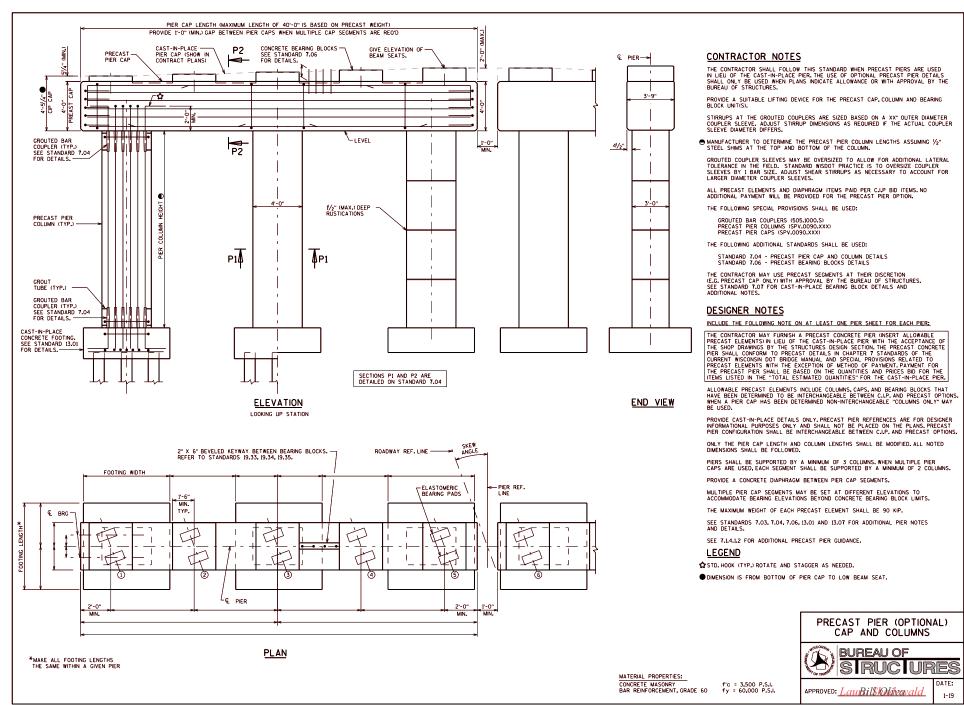
√X SUPPLY REINFORCING BARS ACCORDING TO GROUTED COUPLER REQUIREMENTS FOR EMBEDMENT, BARS MAY BE FIELD CUT IF NEEDED.

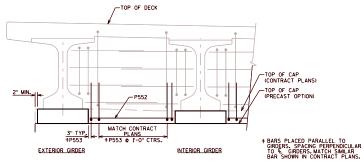
PRECASTER SHALL PROVIDE PORTS IN THE PRECAST ELEMENTS TO ALLOW THE COUPLERS TO BE GROUTED AFTER THE PRECAST ELEMENTS HAVE BEEN ERECTED.





APPROVED: <u>LauBilSlOddleoval</u>





PARTIAL TRANSVERSE SECTION AT DIAPHRAGM PIER

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

PIER CAP

PERARING PAD

PERSTRESSED

CROSS TO STANDARDS 19.33, 19.34, 19.35.

PIER CAP

PERSTRESSED

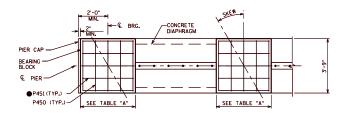
CROSS TO STANDARDS 19.34, 19.35.

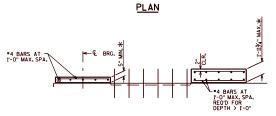
PERSTRESSED

CROSS TO STANDARDS 19.34, 19.35.

PRESTRESSED

PRESTRE





ELEVATION

BILL OF BARS

TOTAL COATED: XX LBS

BAR MARK	NO. REO'D.	LENGTH	coar	BENT	LOCATION
P450		3'-5"	х		TOP & BOTT, TRANS.
P451		•	Х		TOP & BOTT. LONG.
P552		_1"	Х		PIER DIAPHRAGM - BOTH FACES HORIZ BTWN GIRDERS
P553		_'"	Х	Х	PIER DIAPHRAGM - VERT BTWN GIRDERS

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



AMATCH 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 SECMENTS TO BE IN EXCESS OF 30 KIPS.

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

PRECAST CONCRETE DETAIL NOTES

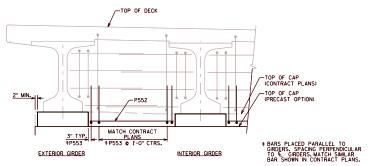
PRECAST BEARING BLOCK DETAILS SHALL ONLY BE USED WHEN PLANS INDICATE ALLOWANCE FOR PRECAST PIERS.

* PRECAST HEIGHT = VARIES IS* MIN. TO 1-HIY." MAX.). MANUFACTURER TO DETERMINE THE PRECAST BEARING BLOCK HEIGHT ASSUMING 1/4" GROUT AT THE BOTTOM OF THE BEARING BLOCK. GROUT 1/4". BENEATH PRECAST ELEMENT.

> PRECAST BEARING BLOCK DETAILS



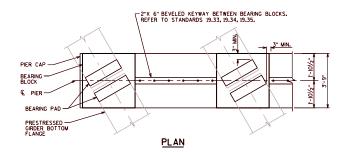
APPROVED: LauBils Willowald

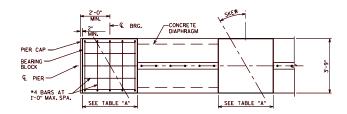


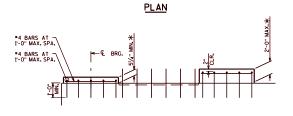
PARTIAL TRANSVERSE SECTION

AT DIAPHRAGM PIER

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







ELEVATION

DESIGNER NOTE SEE 7.1.4.1.2 FOR ADDITION

SEE 7.1.4.1.2 FOR ADDITIONAL PRECAST PIER GUIDANCE.

CONTRACTOR NOTES

THE CONTRACTOR SWALL 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

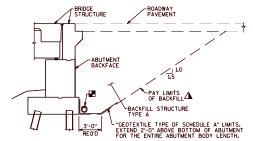
CAST-IN-PLACE BEARING BLOCK DETAILS SHALL ONLY BE USED WHEN PLANS INDICATE ALLOWANCE FOR PRECAST PIERS.

 $\mbox{$\frac{1}{2}$ CAST-IN-PLACE HEIGHT = VARIES (5 <math display="inline">\mbox{$\frac{1}{2}$}$ MIN, TO 2'-0" MAX.). CONTRACTOR TO DETERMINE THE CAST-IN-PLACE BEARING BLOCK HEIGHTS.

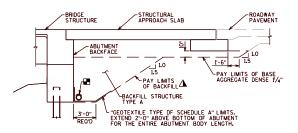
CAST-IN-PLACE BEARING BLOCK DETAILS



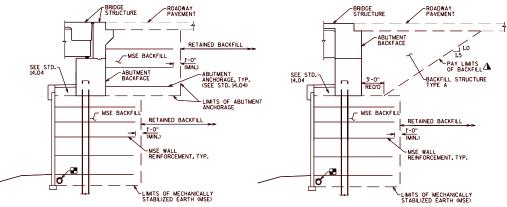
APPROVED: LauBils Woldwowald



TYPICAL SECTION THRU ABUTMENT



TYPICAL SECTION THRU ABUTMENT (ALABUTMENT WITH STRUCTURAL APPROACH)



TYPICAL SECTION
THRU ABUTMENT AT MSE WALL (A3 ABUTMENT WITH ABUTMENT ANCHORAGE)

TYPICAL SECTION
THRU ABUTMENT AT MSE WALL



ABUTMENT BACKFILL DIAGRAM FOR WINGS PARALLEL TO ROADWAY

- L = OUT TO OUT OF ABUTMENT, INCLUDING WINGS (FT)
 H = AVERAGE ABUTMENT FILL HEIGHT (FT)
 EF = EXPANSION FACTOR (120 FOR CY BID ITEMS AND 1.00 FOR TON BID ITEMS)
 V_{CT} = (L/13.07HI) + (L/10.5K1.5HI/H)
 V_{CY} = V_{CY} (EF).27
 V_{TOM} = V_{CY} (2.0.)



ABUTMENT BACKFILL DIAGRAM FOR WINGS PARALLEL TO ABUTMENT

- = OUT TO OUT OF ABUTMENT BODY (FT)
 = WING 1 LENGTH (FT)
 = WING 2 LENGTH (FT)
 = WING 2 LENGTH (FT)
 = VINGTH (FT)
 =

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. THE PLANS AND MAY HOT REFLECT ACTUAL PLACED QUANTITIES. AND ABUTHENT WINGS FOR 3 FEET BACKFILL PLACED BEYOND PAY LIMITS 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 UNDERTOON OF ABOVE BOTTOM OF ABUTMENT OF ABOVE BOTTOM OF ABUTMENT ON THE INTENDED FOR PILE SUPPORTED ABUTMENTS, SEE DESIGNER NOTES FOR MORE INFORMATION)

DESIGNER NOTES

- THE DESIGN ENGINEER SHOULD PROVIDE ALL NECESSARY BACKFILL PAY
 MITS AND NOTES IN ORDER TO DETERMINE OUANITITIES. 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 AROUND THE ABUTMENT RATHER THAN BELOW THE ABUTMENT RATHER THAN BELOW THE ABUTMENT MAY CAUSE SLOPE PAYING DAMAGE OR FALLURE. GEOTEXTILE SHALL EXTEND THE ENTIRE LENGTH OF THE ABUTMENT BODY. SEE STANDARD IZOS FOR GUIDANCE ON UNDERDRAIN PLACED ABOOK NOMBAL WATER, OR UNDERDRAIN EXCOSED TO HIGH WATER, CONSIDER CAPPING THE UPSTREAM END TO PREVENT CLOGGING.

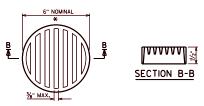
FOR ABUTMENTS WITH MSE BACKFILL BELOW THE REQUIRED "BACKFILL STRUCTURE TYPE A" WOTH, PIPE UNDERDRAIN AND GEOTEXTILE ARE NOT REQUIRED BEHIND ABUTMENTS. PIPE UNDERDRAIN IS REQUIRED AT THE BOTTOM OF THE MSE WALL.

SEE STANDARD 9.02 FOR RETAINING WALL AND BOX CULVERT DETAILS.

SEE STANDARD 9.03 FOR WING FILL SECTIONS AT WING TIPS.

LEGEND

- AAACKFILL PAY LIMITS. BACKFILL BEYOND BACKFILL PAY LIMITS SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES, 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.

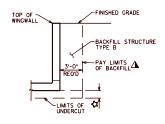
THE RODENT SHIELD, PIPE COUPLING AND SCREWS SHALL BE CONSIDERED INCIDENTAL TO THE BID ITEM "PIPE UNDERDRAIN WRAPPED 6-INCH".

THE RODENT SHIELD SHALL BE A PVC GRATE SMILLRE TO THIS DETAIL. THE CRATE IS COMMERCIALLY AVAILABLE AS A FLOOR STRANGER. AS PIPE COUPLING IS REQUIRED FOR THE ATTACHMENT OF THIS SHELD TO THE EXPOSED END OF THE PIPE UNDERGRAIN. THE SHELD SHALL BE FASTENED TO THE PIPE COUPLING WITH TWO OR MORE NO, 10 X 1-INCH STANLESS STEEL SHEET WETAL SCREWS.

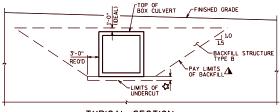
STRUCTURE BACKFILL LIMITS AND NOTES 1



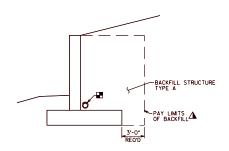
APPROVED: LauBilSlodileoval



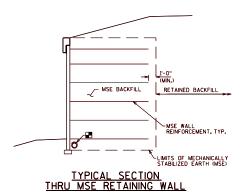
TYPICAL SECTION
THRU BOX CULVERT WINGWALL



TYPICAL SECTION
THRU BOX CULVERT



TYPICAL SECTION
THRU 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 WINCS FOR 3 FEET. 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 STRUTURE 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 LEU OF USING BREAKER RUN FOR THE BOX CONSTRUCTION PLATFORM, THE CONTRACTOR MAY ELECT TO SUBSTITUTE *1 OR *2 CONCRETE COARSE AGGREGATE, SELECT CRUSSTITUTE *1 OR *2 CONCRETE COARSE AGGREGATE, SELECT CRUSSTITUTE MATERIAL, S. APPROVED BY THE REMINEER ANY SUBSTITUTED MATERIAL, THE REGION CETCHNICAL ENGINEER MAY BE CONTACTED TO DETERMINE IF "OTHER GRANULAR MATERIAL" IS ACCEPTABLE.

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

NOTES (RETAINING WALLS)

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

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

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.

LEGEND

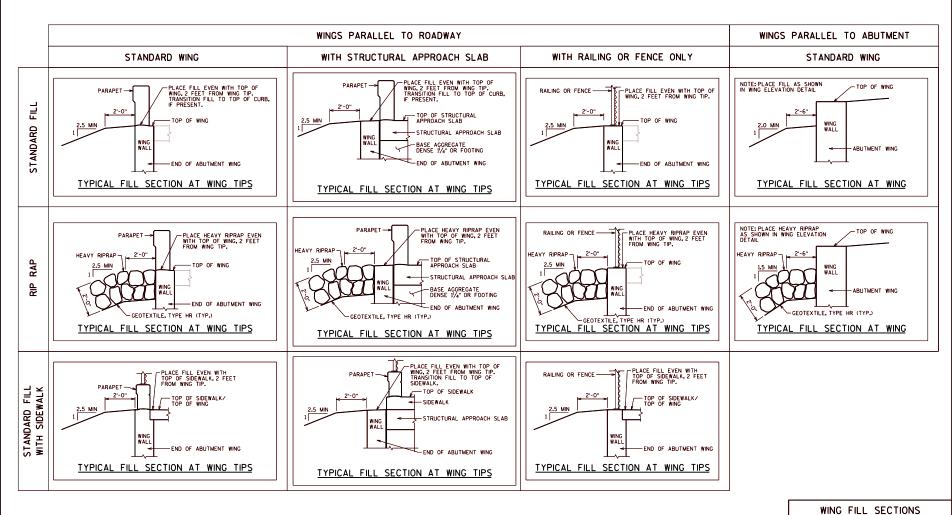
CULVERT UNDERCUT AND
BEDDING BACKFILL TO BE
DETERMINED BY GEOTECHNICAL
ENGINEER.
(CHOOSE APPLICABLE NOTE,
MODIFY AS NEEDED)

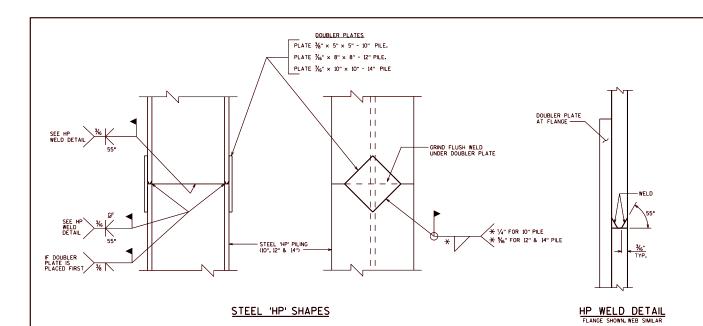
- A BACKFILL PAY LIMITS. BACKFILL BEYOND BACKFILL PAY LIMITS SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES. LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR.
- PIPE UNDERDRAIN WRAPPED (6-INCH), SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. (SHOW DETAIL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

STRUCTURE BACKFILL LIMITS AND NOTES 2



APPROVED: LauBils Waldwowald





BACK UP RING. 1/6" MIN. THICKNESS FOR SMAW AND 1/4" MIN. THICKNESS FOR FCAW. —

CAST-IN-PLACE

'PIPE PILE'

B-U4a OR

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.

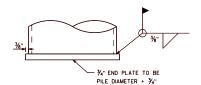
SEE BRIDGE MANUAL SECTION 11.3.1.17.7 FOR PILE RESISTANCE VALUES.

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 ADJ

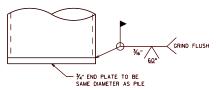
<u>NOTES</u>

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

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

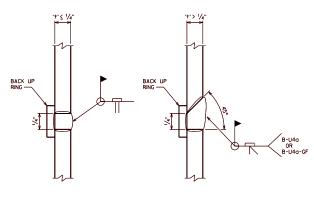


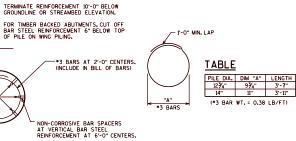
END PLATE DETAIL FOR CIP PILING



END PLATE DETAIL FOR CIP PILING IN ARTESIAN CONDITIONS

(ONLY USE FOR ARTESIAN CONDITIONS)





CIP PILE WELD DETAIL

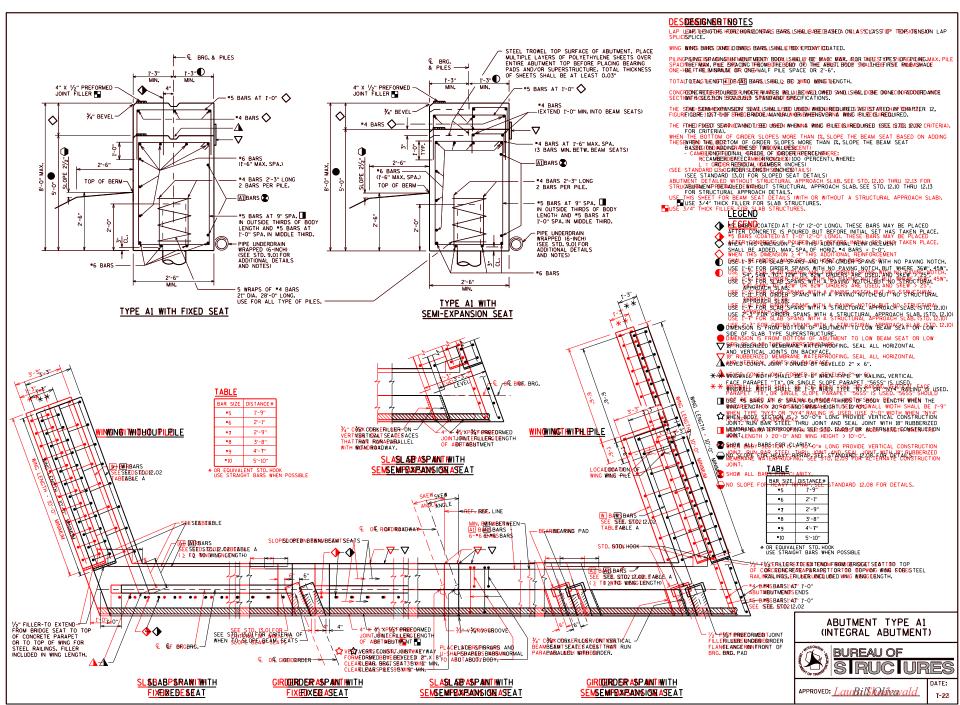
SECTION THRU CONCRETE CAST-IN-PLACE PILING

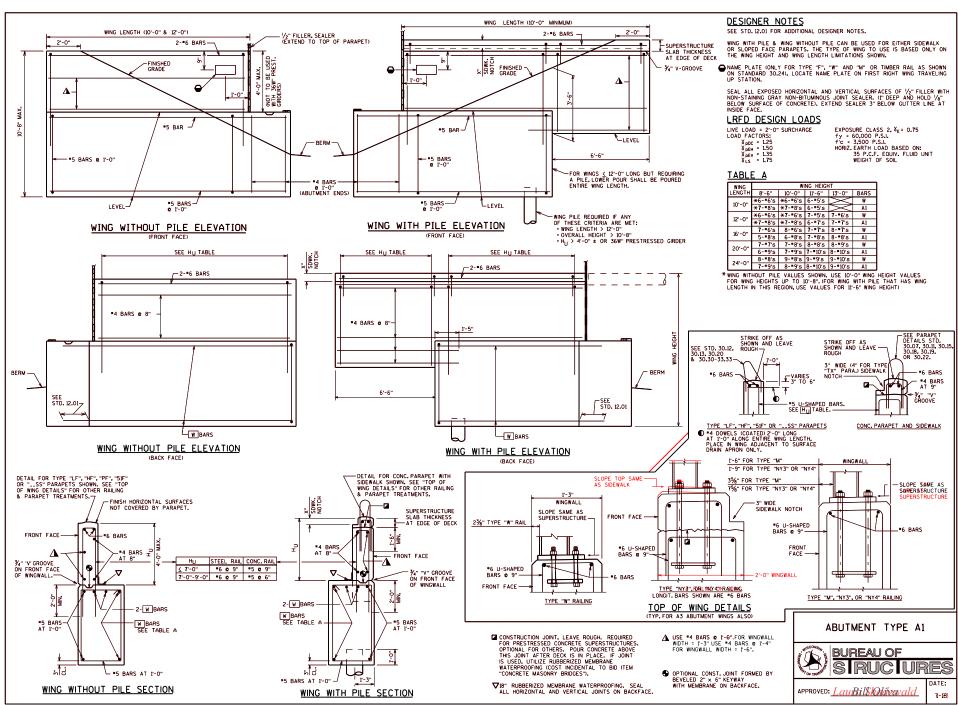
FOR 12¾" DIA. PILES, USE 6 - *7 BARS. FOR 14" DIA. PILES, USE 8 - *7 BARS. INCLUDE IN BILL OF BARS. EXTEND 1'-2" (FOR ALL PILE SIZES) INTO CONCRETE CAP.

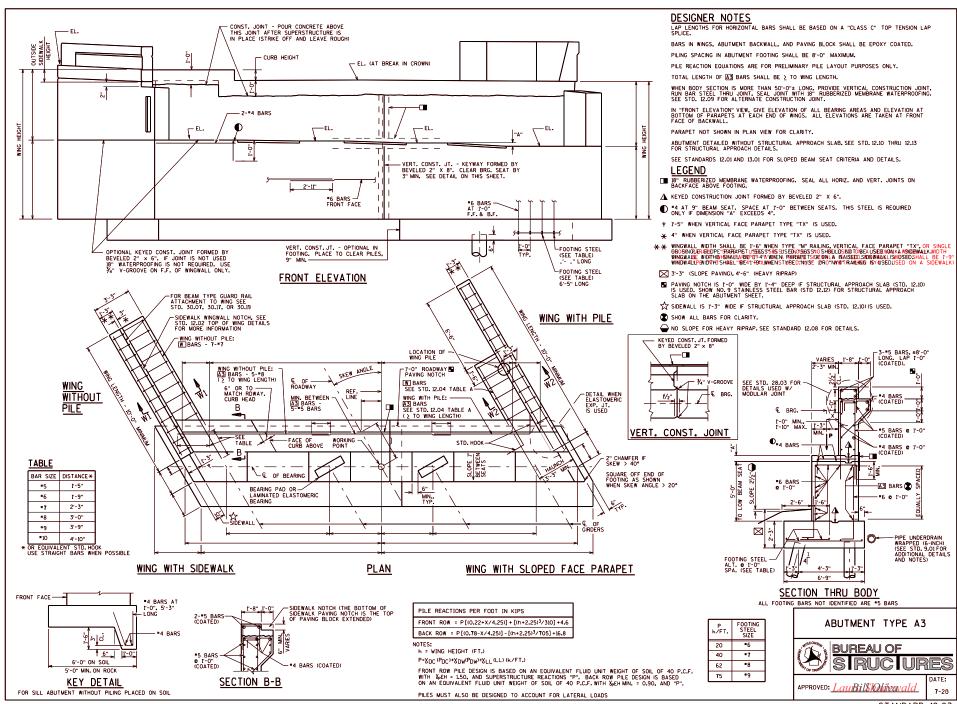
USED WHEN PILES ARE EXPOSED

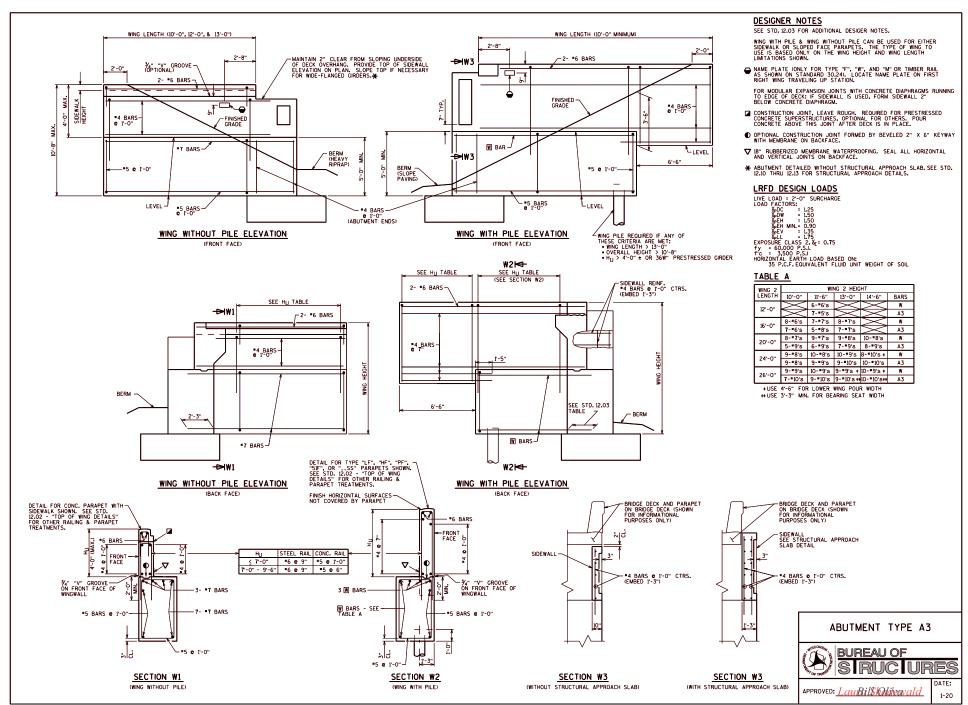
(OPEN PILE BENTS OR TIMBER BACKED ABUTMENTS)

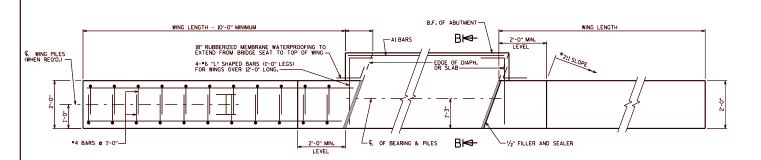




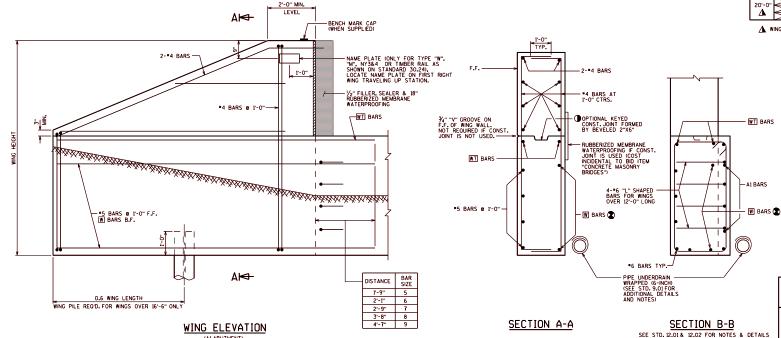








PLAN FOR TYPE ALABUTMENT (SEE STD. 12.01 FOR ABUTMENT BODY DETAILS)



(A1 ABUTMENT)

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.

*USE 2/2:1FOR THE UNSTABLE CLAYS WHICH ARE SOMETIMES ENCOUNTERED IN NORTHWEST WISC. (SUPERIOR AREA)

- ♦ WHEN TIMBER RAILING IS USED AS PER STANDARD 30.24, AND THE SKEW IS > 0°, THIS CONSTRUCTION JOINT SHALL BE MANDATORY. THE WING CONCRETE SHALL BE PLACED ABOVE CONSTR. JT. AFTER THE TIMBER END POSTS ARE IN PLACE.
- ALL WING BARS SHALL BE EPOXY COATED.
- SHOW ALL LONGITUDINAL BARS FOR CLARITY.

LRFD DESIGN LOADS (WINGS)

LIVE LOAD = "1-0" SURCHARGE
LOAD FACTORS:

\$poc = 1.25

\$pet = 1.75

EXPOSURE CLASS 2, \$\forall z\$, \$\forall

TABLE A

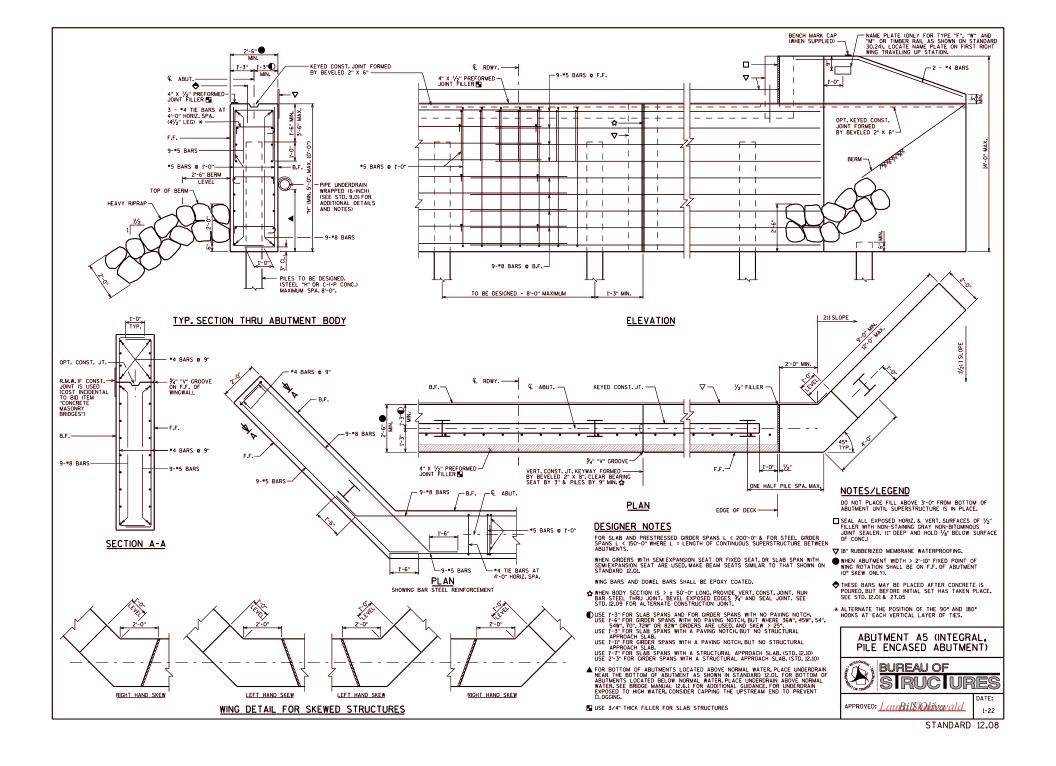
WING	WING HEIGHT							
LENGTH	8'-6"	10'-0"	11'-6"	13'-0"	BARS			
10'-0"	5-#5's	5-#5's	6-#5's	> <	W			
	2-#5's	2-#5's	2-#5's	X	WT			
	4-"6's	4-#6's	5- * 6's	> <	A1			
	\mathbb{X}	5- = 6's	5- *7 's	6-#7's	W			
12'-0"	Х	2- *7 's	2- *7 's	2-#8's	WT			
	\times	5- * 6's	6-#6's	6-#7's	A1			
	${}$	5- = 8's	6- = 8's	5- = 9's	W			
16'-0"	${}$	2-#8's	2-#8's	2-#9's	WT			
	> <	5-*8's	6-#8's	7-#8's	A1			
20'-0"	\times	> <	8-#8's	8-#9's	W			
20 - U	\times	> <	2-=8's	2- = 9's	WT			
∠▲	$\overline{}$	\sim	7-=9's	8-#9's	Δ1			

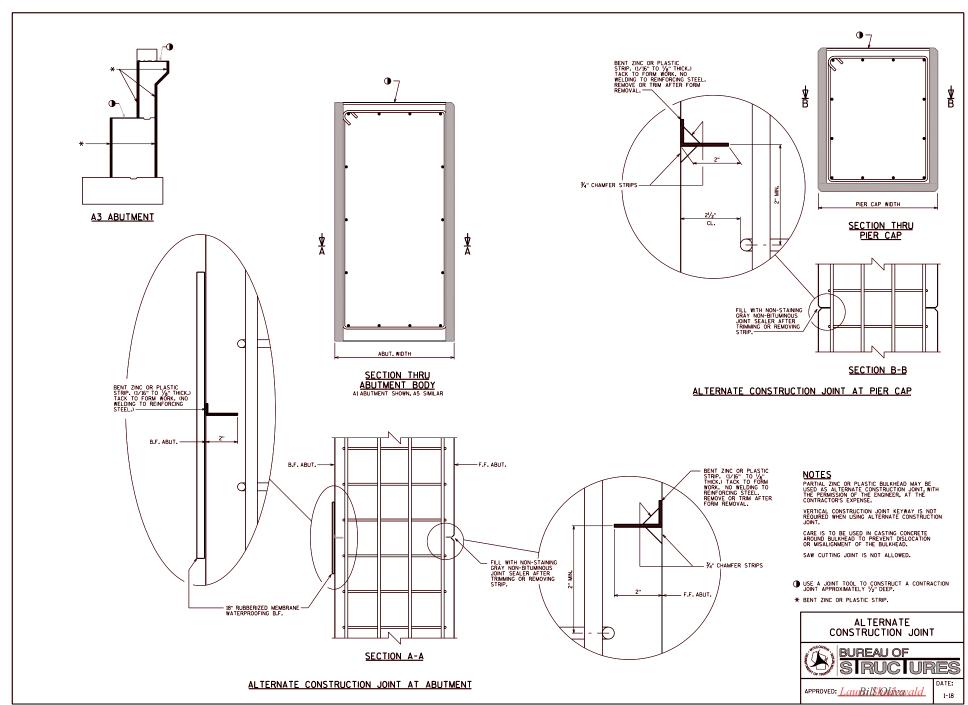
▲ WING PILE REQUIRED

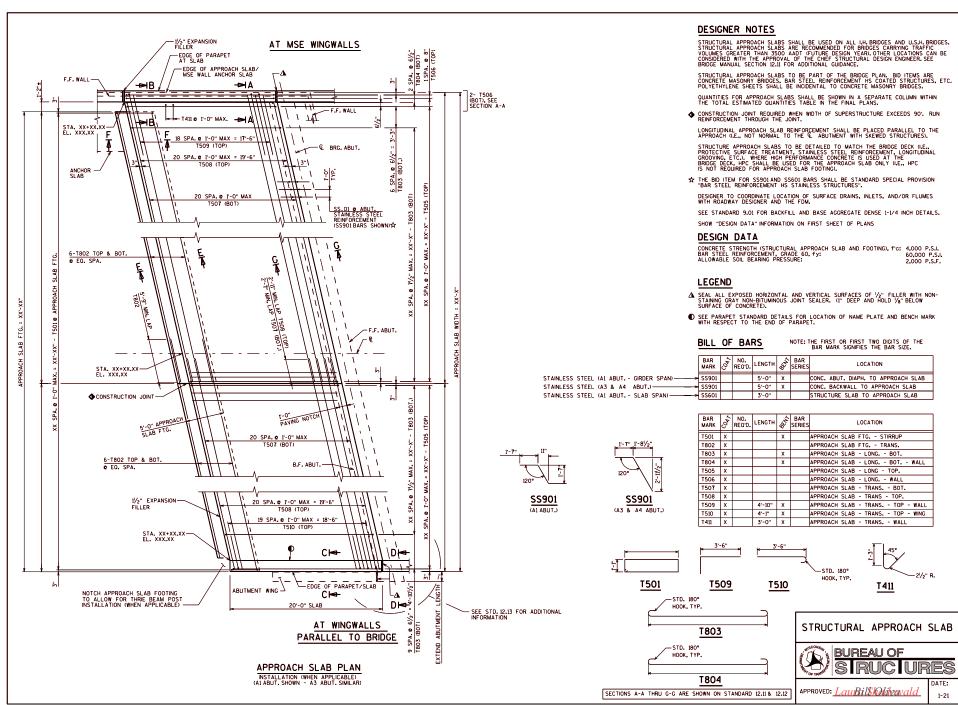
S RUC URES

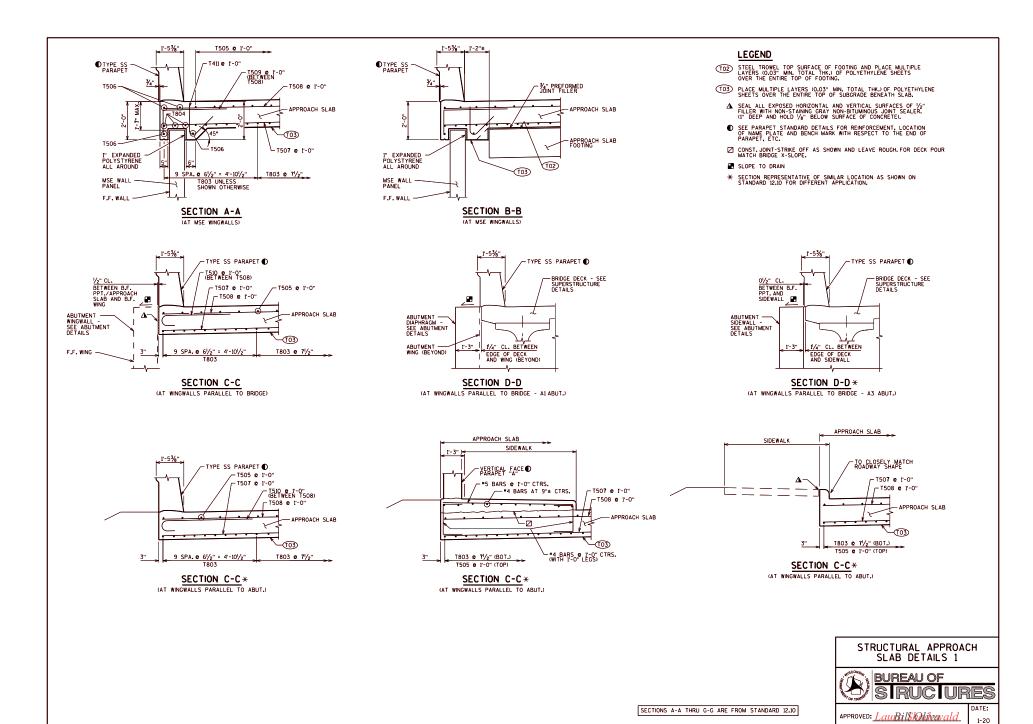
DETAILS FOR WINGS PARALLEL TO A1 ABUTMENT CENTERLINE

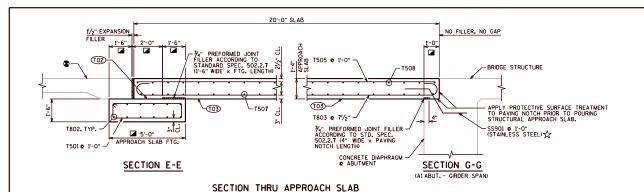
BUREAU OF











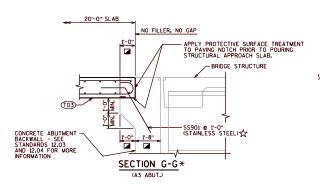
20'-0" SLAB 11/2" EXPANSION T02 RDWY PAVEMENT & ANCHOR SLAB. SEE R- - PLANS. T802, TYP. -

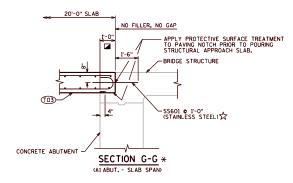
T501 @ 1'-0" -/

SECTION F-F (AT MSE WINGWALLS WITH ANCHOR SLAB)

□ 5'-0"

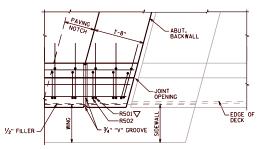
APPROACH SLAB FTG.



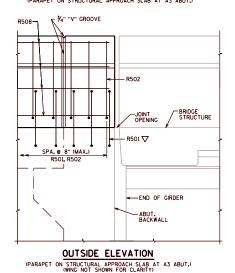


LEGEND

- TOZ) STEEL TROWEL TOP SURFACE OF FOOTING AND PLACE MULTIPLE LAYER (J.O.3" 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 PAYEMENT.
 - \star SECTION REPRESENTATIVE OF SIMILAR LOCATION AS SHOWN ON STANDARD 12.10 FOR DIFFERENT APPLICATION.
 - $\stackrel{\textstyle \leftarrow}{\bowtie}$ 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.



(PARAPET ON STRUCTURAL APPROACH SLAB AT A3 ABUT.)



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

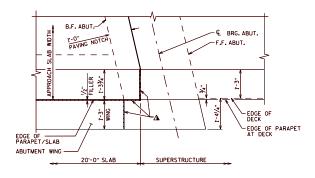


APPROVED: LauBilSlodileovale

EDGE OF PARAPET AT SLAB B.F. ABUT. P.O' DEN'NO NOTCH F.F. ABUT. EDGE OF SLAB BUT SLAB BUT

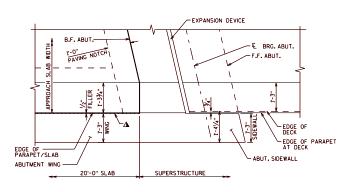
APPROACH SLAB PARTIAL PLAN

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



APPROACH SLAB PARTIAL PLAN

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

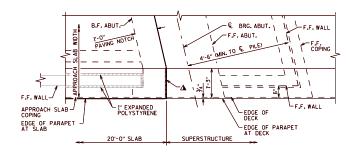


APPROACH SLAB PARTIAL PLAN*

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

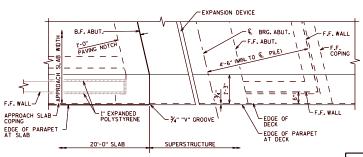
LEGEND

- A SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF 1/2" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD 1/8" 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 - ALABUT. AT MSE WINGWALLS - GIRDER SPAN)



APPROACH SLAB PARTIAL PLAN *

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

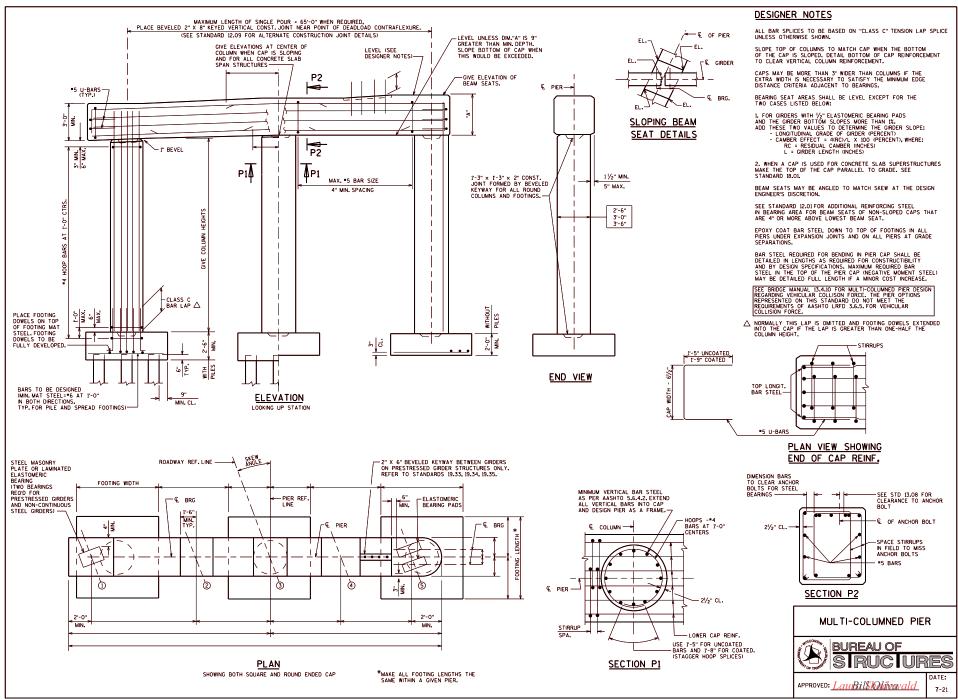
PARTIAL PLANS SHOWN HERE ARE FROM STANDARD 12.10

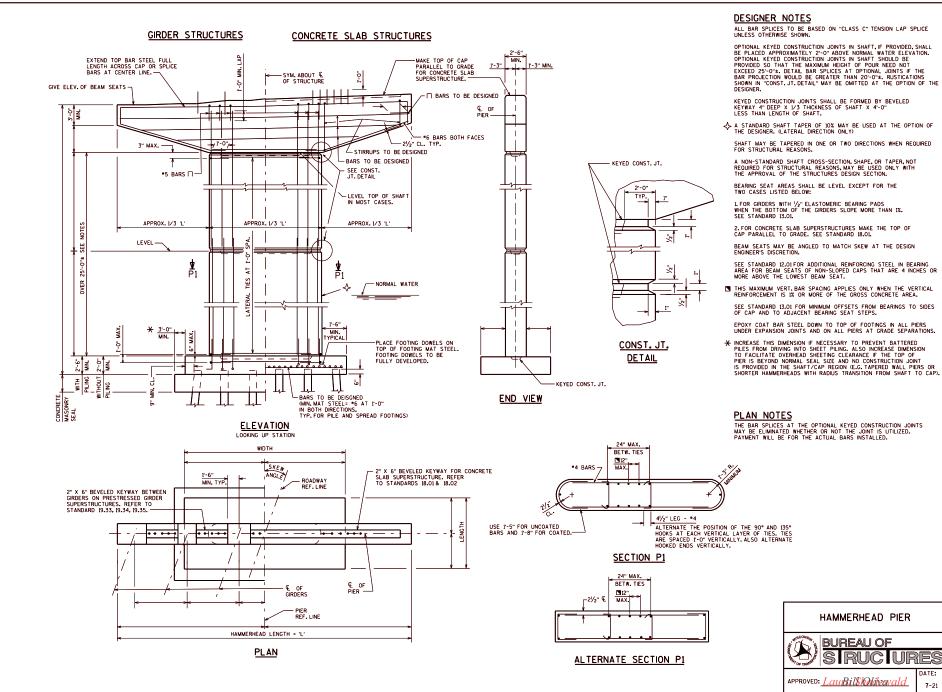
STRUCTURAL APPROACH SLAB DETAILS 3

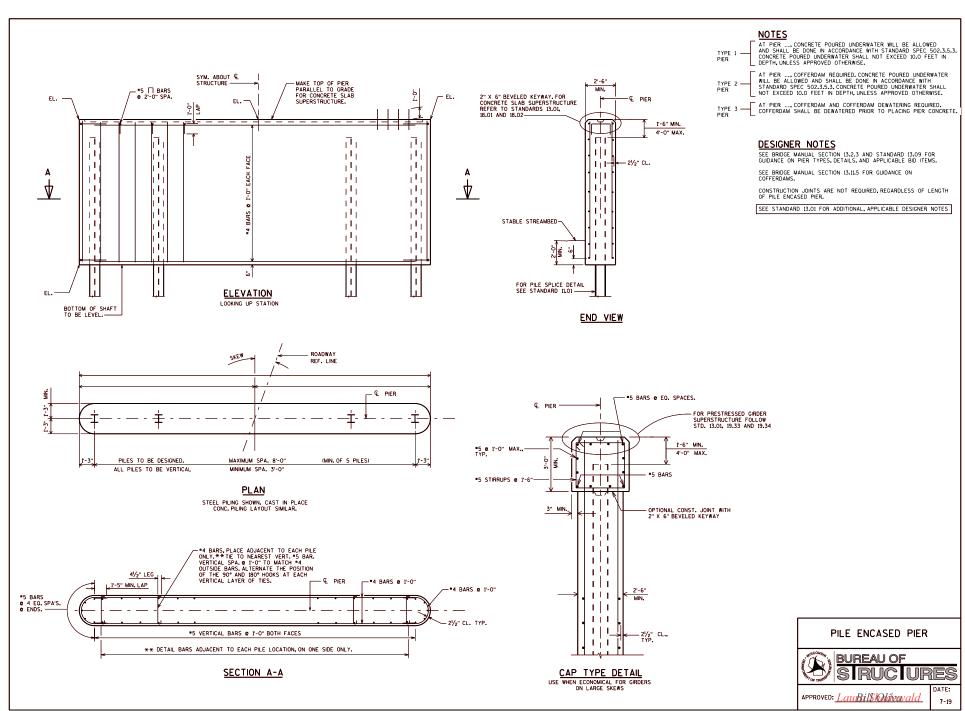


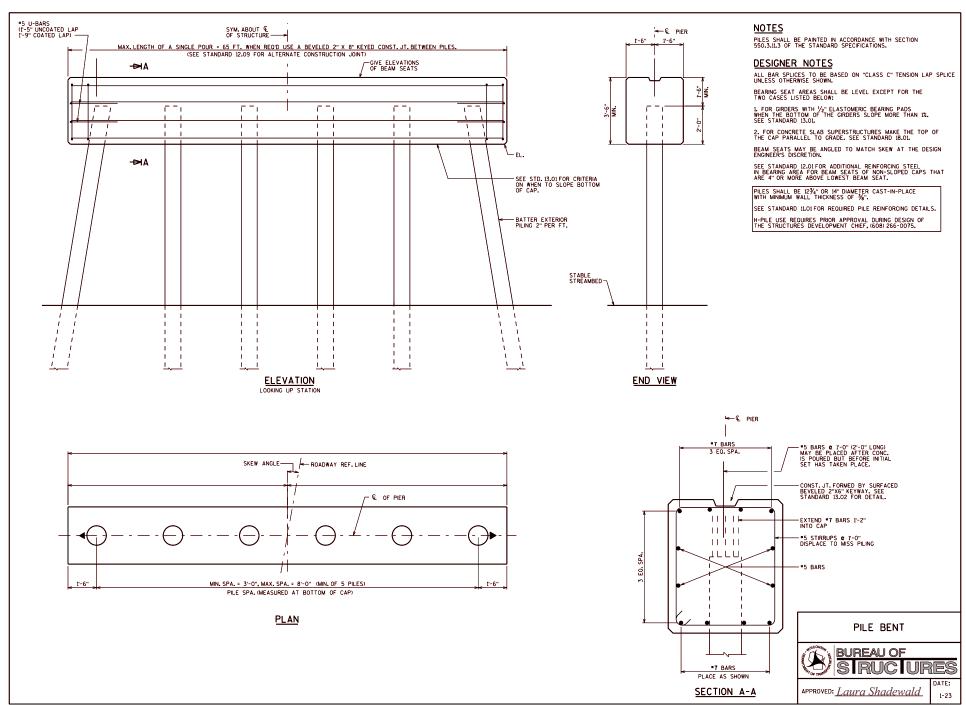
APPROVED: LauBils Waldewald

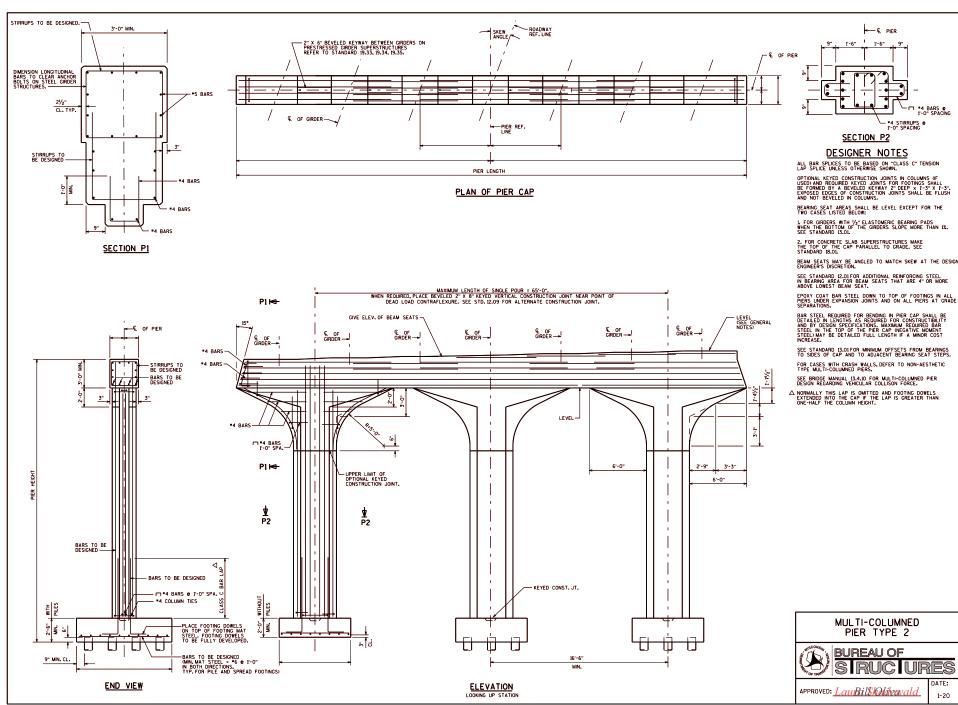
DD 12.17

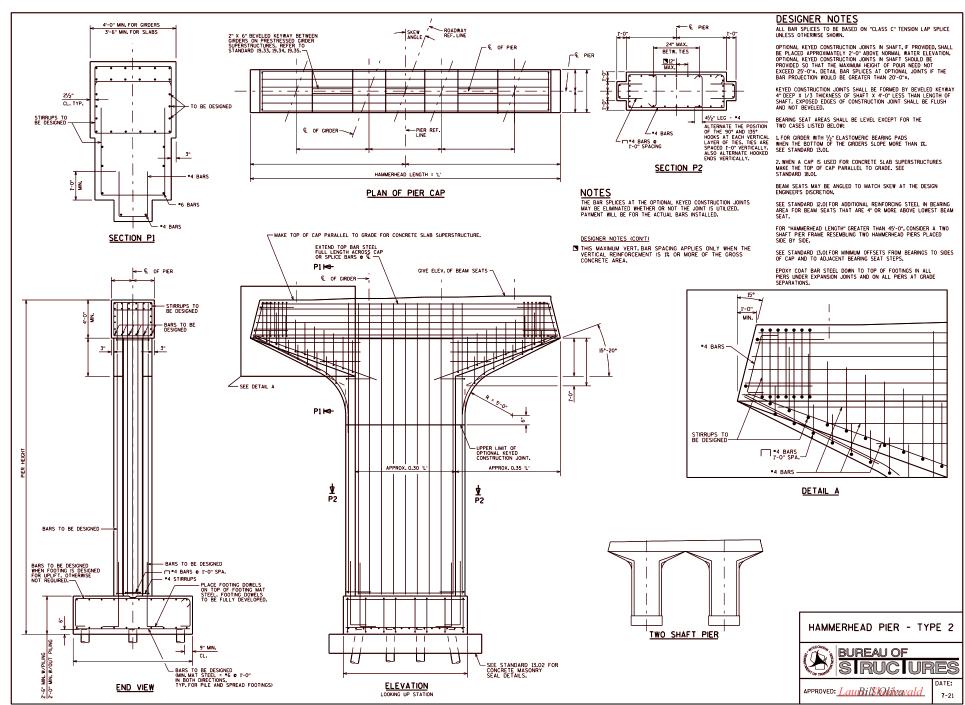


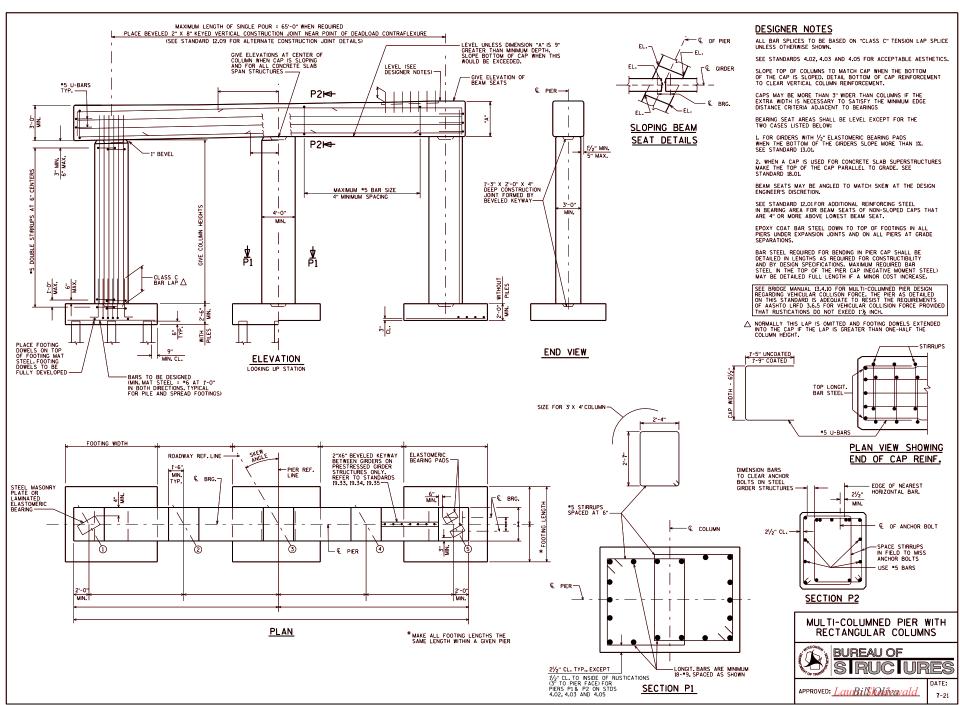


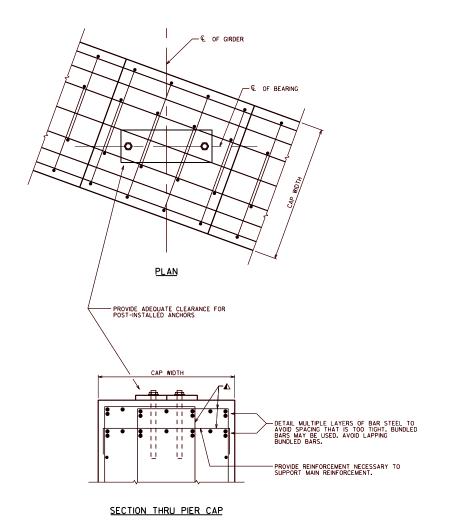












DESIGNER NOTES
PROVIDE 4" MIN. CLEAR BETWEEN ANCHOR BOLTS AND REINFORCEMENT.

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

SHOW ANCHORS LOCATIONS ON PIER CAP SHEETS.

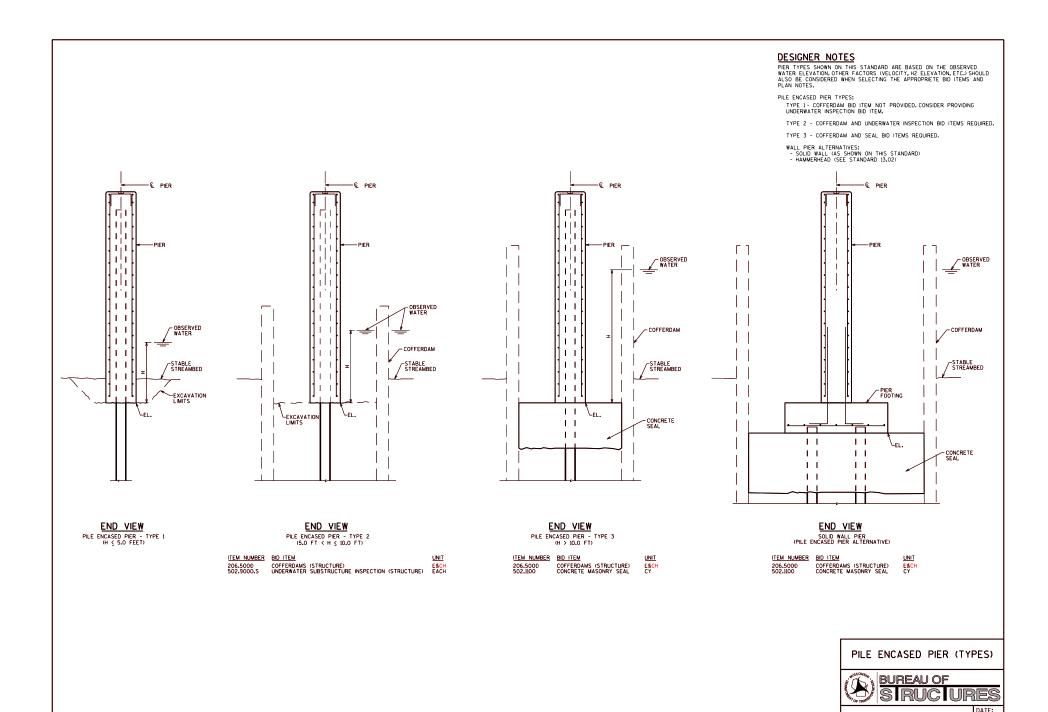
ABUTMENT REINFORCEMENT LAYOUT SIMILAR TO PIER CAP REINFORCEMENT DETAILING.

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

PIER CAP REINFORCEMENT DETAILING

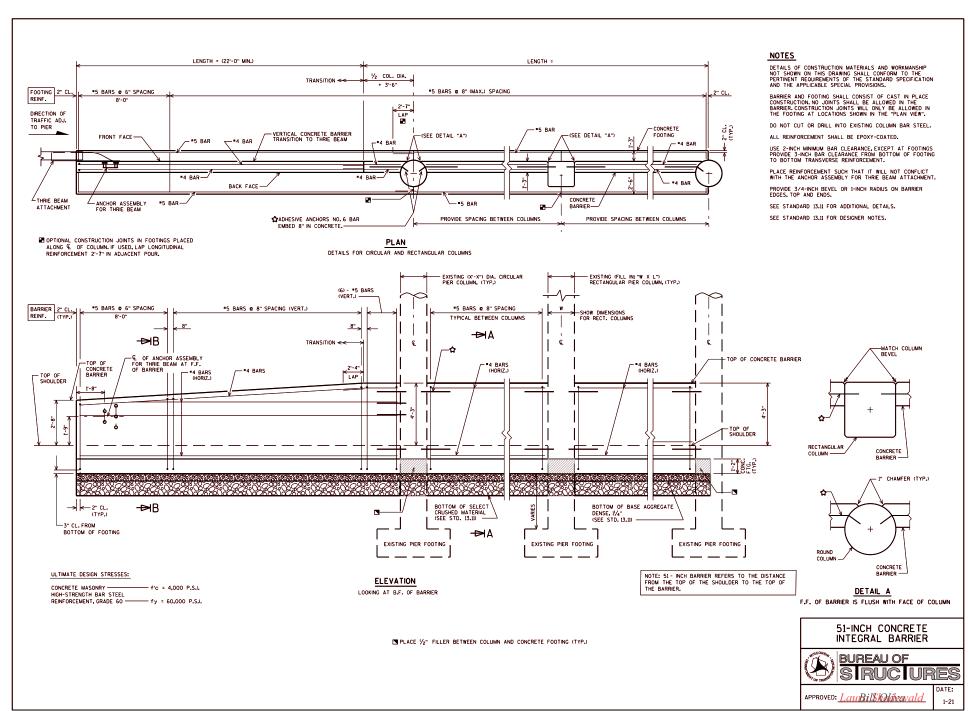


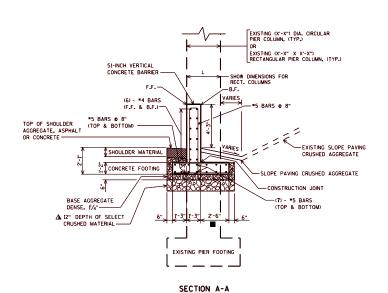
APPROVED: LauBils Willewald



7-23

APPROVED: LauBilSlolateovald



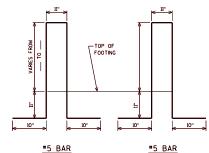


BETWEEN COLUMNS

LENGTH = 3'-2" *

USED WITH CIRCULAR COLUMNS (ADHESIVE ANCHOR)

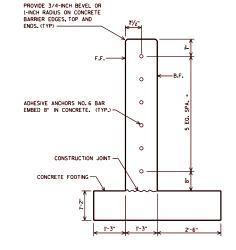
* FOR RECTANGULAR COLUMN USE STRAIGHT BARS OF THIS LENGTH



BARRIER REINF. IN TRANSITION REGION

BARRIER REINF. BETWEEN COLUMNS

BAR BENDING DIAGRAMS



ADHESIVE ANCHOR LAYOUT

BAR DIMENSIONS ARE OUT TO OUT OF BAR

51-INCH VERTICAL CONCRETE BARRIER TRANSITION *5 BARS (SEE ELEV. VIEW STD. 30.10 *5 BARS (SEE ELEV. FOR SPACING) (TOP & BOTTOM) VIEW STD. 30.10 FOR SPACING) (F.F. & B.F.) -TOP OF SHOULDER AGGREGATE, ASPHALT. -CONSTRUCTION _ _ _ OR CONCRETE -SHOULDER MATERIAL CONCRETE FOOTING (TOP & BOTTOM) BASE AGGREGATE DENSE, 11/4" ▲ 12" DEPTH OF SELECT CRUSHED MATERIAL 2'-6"

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

SECTION B-B

TRANSITION REGION

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

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 TO 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.

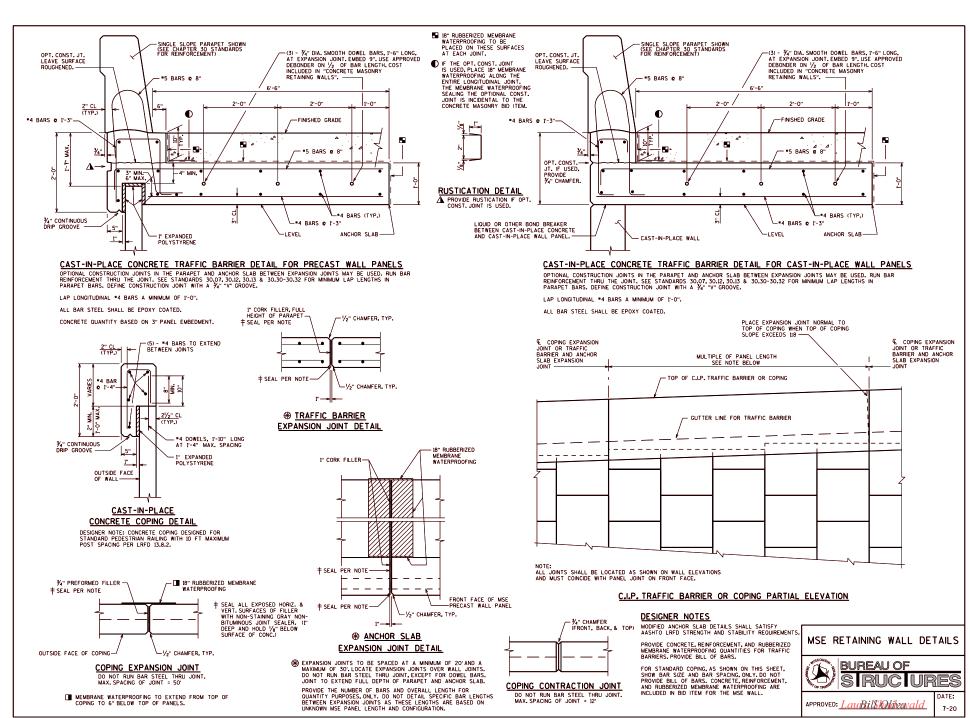
F.F. = FRONT FACE B.F. = BACK FACE

INTEGRAL BARRIER DETAILS



51-INCH VERTICAL CONCRETE BARRIER AND TRANSITION

SEE STANDARD 13.10 FOR ADDITIONAL DETAILS



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 N.E. RAMP PC STA. 1+11.51 WALL = STA. 184+63.78 N.E. RAMI 31.54"LT. - BEGIN WALL STA.185+75 N.E.RAMP 39.59'LT. = STA.0+00 WALL -F.F. OF R-__-EXAMPLE PLAN PT STA. 1+63.69 WALL = STA. 184+21.45 N.E. RAMF - END WALL STA. 184+13 N.E. RAMP 74.49'LT. = STA. 1+84.84 WALL CC STA. 184+60.53 N.E. RAMI 55.56'LT TOB OF WALL STA. 1+25.8 EL. 947.00 BEGIN WALL STA. 0+00 EL. 939.40 NAME PLATE -FINISHED GRADE STA. 0+50.IB EL. 939.90 STA, 1+00.06 EL. 939.60 STA. 0+75.8 EL. 939.40 STA. 0+25.0 EL. 939.40 STA. 0+00 EL. 939.40 BOTTOM OF WALL **EXAMPLE ELEVATION** (1'-6" MIN. BELOW FINISHED GRADE) (LOOKING @ F.F. OF WALL) GEOMETRY TABLE WALL ROADWAY STATION OFFSET TO FINISHED GRADE ELEV. TOP OF WALL ELEV. WALL EXTERNAL & OVERALL STABILITY EVALUATION SOIL PARAMETERS

DIMENSIONS	EVALUATED LOCATIONS		ATIONS
WALL HEIGHT (FEET)			
EXPOSED WALL HEIGHT (FEET)			
MINIMUM LENGTH OF REINFORCEMENT (FEET)			
WALL STATION			
BORING USED			
CAPACITY TO DEMAND RATIO (CDR)	•	
SLIDING (CDR>LO)			
ECCENTRICITY (CDR>1.0)			
OVERALL STABILITY (CDR>LO) 🏠			
BEARING RESISTANCE (CDR>1.0)			
FACTORED BEARING RESISTANCE (PSF)			

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 (2)			
(INSERT SOIL TYPE) (X) EL EL			
(INSERT SOIL TYPE) (X) 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 N ACCORDANCE WITH THE SPECIAL PROVISIONS, THE RETAINING WALL MANUFACTURER 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 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.

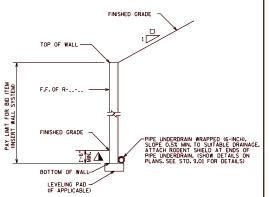
DESIGN RETAINING WALL FOR A LIVE LOAD SURCHARGE OF (INSERT

THE MAXIMUM VALUE OF THE ANGLE OF INTERNAL FRICTION OF THE 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 RESET UPON THE HAMMAM DESCRIBED IN THE WALL SYSTEM SPECIAL DESCRIBED TO THE WALL SYSTEM SPECIAL DESCRIBED TO THE WALL SYSTEM SPECIAL THESE DESIGNATED LOCATIONS REPRESENT TYPICAL AND CRITICAL WALL LOCATIONS.

 BHE SENGTH-SPECIAL STABLITY AND CRITICAL WALL LOCATIONS OF THE WALL SYSTEM SPECIAL THESE PROVISIONS OF DEFORMAN AND CRITICAL WALL LOCATIONS FROWING OF DEFORMAL AND CORTICAL STABLITY AT THE DESIGNATED LOCATIONS FERRESENT TYPICAL AND CRITICAL WALL LOCATIONS SHOWN THE STABLITY AND CRITICAL WALL LOCATIONS SHOWN THE STABLITY WE REPRESENT TYPICAL AND CRITICAL WALL LOCATIONS SHOWN THE STABLITY WE REPRESENT TYPICAL AND CRITICAL WALL LOCATIONS SHOWN THE STABLITY WE REPRESENT TYPICAL SHOWN THE SERVICE WALL THE SERVICE WALL WE REPRESENT TYPICAL AND CRITICAL WALL LOCATIONS SHOWN THE STABLITY WAS REPRESENT TYPICAL AND CRITICAL WALL LOCATIONS SHOWN THE SERVICE WALL WALL THE SERVICE WALL THE
- WHENLENGTHES PREVIOUS SKOTES THE STEELS FREETH-PROMABURING FREQUIRED INFORMERENT EGING THE BASED ON OVERAL ERSURBLITY ELEPERSORUBURY THE MALL LYDES CHEE. OWN-POLKED STREETH THE THE THE TOTAL THE SERVICE SERVICE SPREAD LETY TO SELLOW MINIMUM EMBEDIEMT SHALL HOT BE INCLUDED IN THE PAY LINT SHALL HOT SHALL HOT BE INCLUDED IN THE PAY LINT.
- MINIMUM EMBEDMENT BASED ON SITE SPECIFIC PARAMETERS (1'-6" MINIMUM BORANDE ON SITE SPECIFIC PARAMETERS (1'-6 OR EXCEED THE MINIMUM EMEMBEDMENT, FIELD EMBEDMENTS BELOW MINIMUM BUNDEDMENNSES#RANEINOMMEDSNOWELDED THE THE PROPHEMBEST OF FOOT WIDE. THE DESIGNER SHALL PROUDE DETAILS BASED ON NOMINIAL PANEL DIMENSIONS AND
- STRATURATION A TIDNSILS SHALLDESCRIPTIONS ATCEMENOBORING AGONTION AND DIMENSION J STATISHAM-LUGIA LIGIDISTOS SOBL-LUSSCHHETCONSO JAT-LEACH/OBGRIGIC/GRONEL DIMENSIONS
 THE CONTRACTOR AND WALL SUPPLIER SHALL COORDINATE DETAILS BASED ON THE
 MORMAU, BASELPAMER/MOMERISIONS ARE 5-FOOT HIGH AND 5-10 FOOT WIDE, THE WALL
 DESIGNER SHALL PROVIDE DETAILS BASED ON NOMINAL PANEL DIMENSIONS AND
 CORRECTION WITHOUT THE AND SHALL PROVIDE CETAILS BASED ON NOMINAL PANEL DIMENSIONS AND
 CORRECTION WITHOUT THE AND SHALL SUPPLIES PRASE COORDINATE OWNERING SHALL SHALL



TYP. CROSS SECT. OF RETAINING WALL

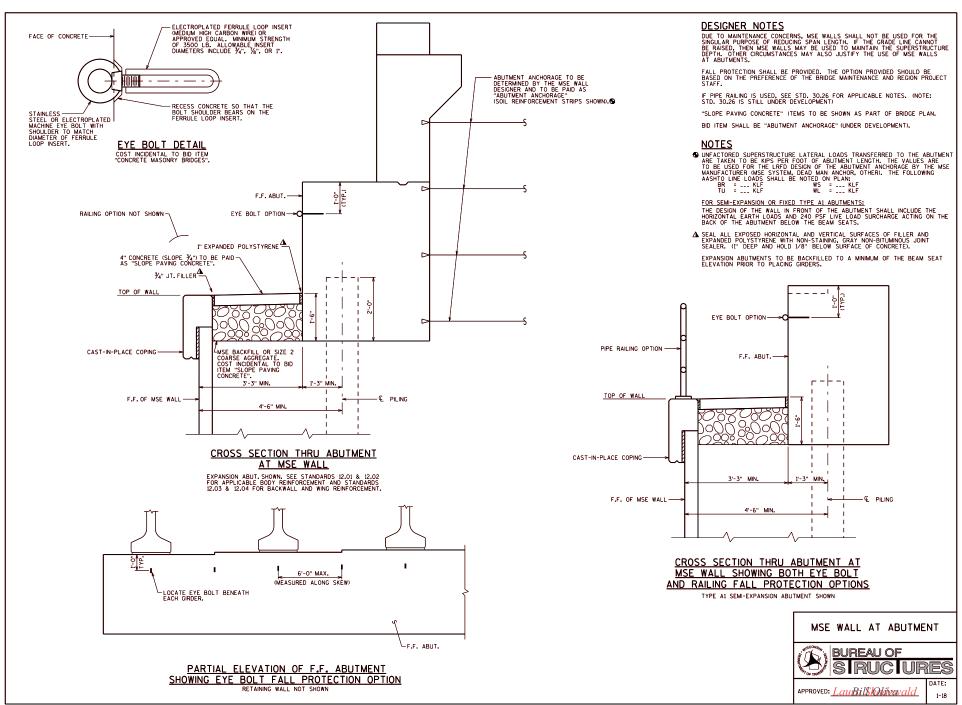
LIST OF DRAWINGS

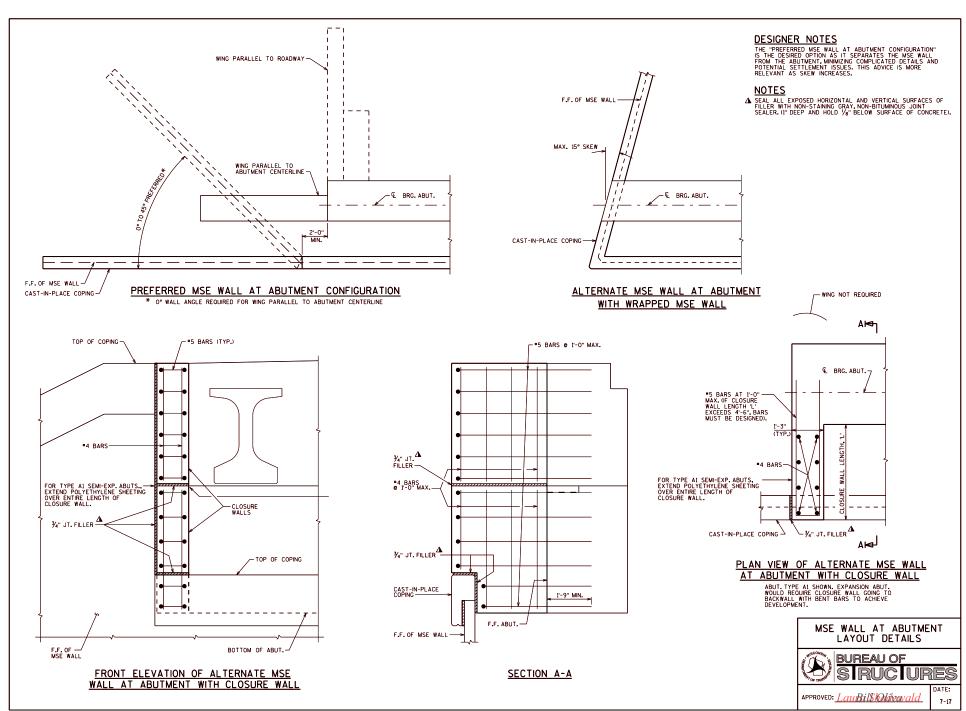
1. (INSERT WALL SYSTEM) 2. SUBSURFACE EXPLORATION LRFD PROPRIETARY RETAINING WALLS (GENERAL PLAN)

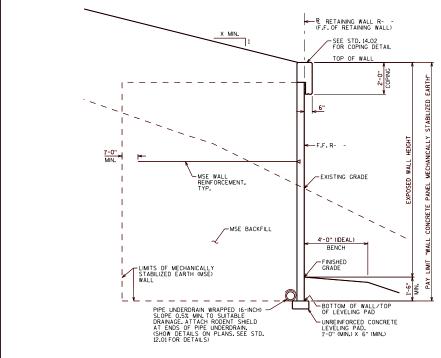


APPROVED: LauBilSlodileoval

STANDARD 14.03

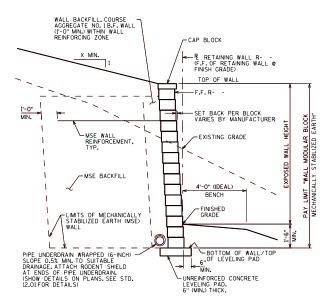






TYPICAL SECTION

(MSE WALL WITH CONCRETE PANEL FACING)



TYPICAL SECTION

(MSE WALL WITH MODULAR BLOCK FACING)

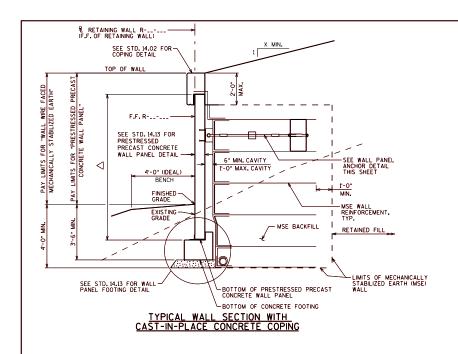
DESIGNER NOTE

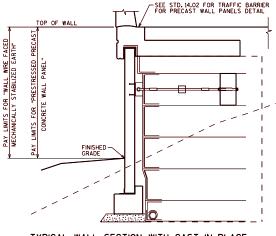
SEE STANDARD 14.02 FOR ADDITIONAL INFORMATION

MSE WALL PANEL AND BLOCK FACING

BUREAU OF
S RUC URES
DATE:

APPROVED: LauBils Willowald





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 11/4" DIAMETER ROD.

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

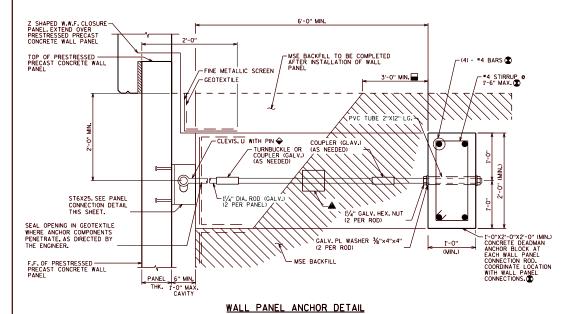
FORCES APPLIED TO THE DEADMAN ANCHOR MUST BE ACCOUNTED FOR IN THE DESIGN OF MSE REINFORCEMENT WHEN SATISIFYING FORCE AND MOMENT EQUILIBRIUM.

DESIGNER NOTES

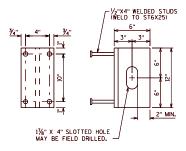
- SHOW BAR SIZE AND SPACING ONLY DO NOT PROVIDE BILL OF BARS. BAR STEEL REINFORCEMENT AND CONCRETE INCLUDED IN BID ITEM "PRESTRESSED PRECAST CONCRETE WALL PANEL".
- WALL PANEL HEIGHT IS DEFINED AS THE LENGTH FROM THE TOP OF THE WALL PANEL TO THE TOP OF THE CONCRETE FOOTING, THE MAXIMUM ALLOWABLE WALL PANEL HEIGHT IS 30'.

LEGEND

- CONTRACTOR TO DESIGN LENGTH TO PROVIDE REQUIRED HORIZONTAL CAPACITY OF ANCHOR ASSEMBLY, MINIMUM OF 3'-O" OF COMPACTED FILL IN FRONT OF DEADMAN ANCHOR PRIOR TO WALL PANEL ERECTION. 1/4" ROD TO BE 2'-O" 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

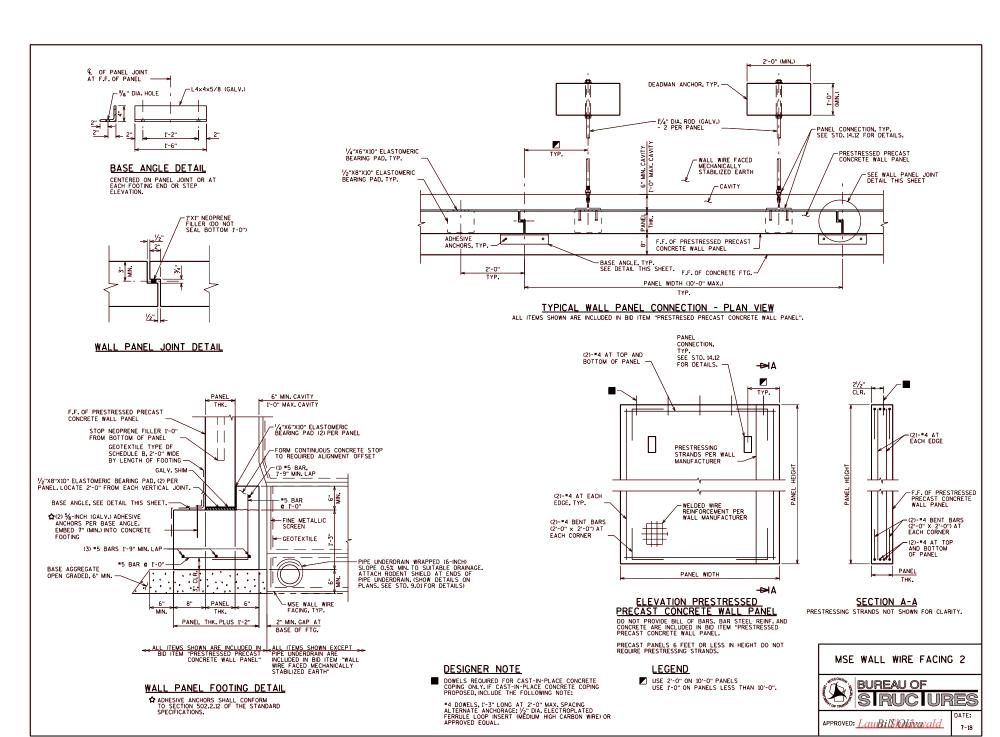
AS AN ALTERNATIVE, ½" (GALV.) ADHESIVE ANCHORS MAY BE USED TO AVOID AN OBSTRUCTION. ALTERNATIVE SHALL BE LIMITED TO ONE PANEL CONNECTION PER PANEL.

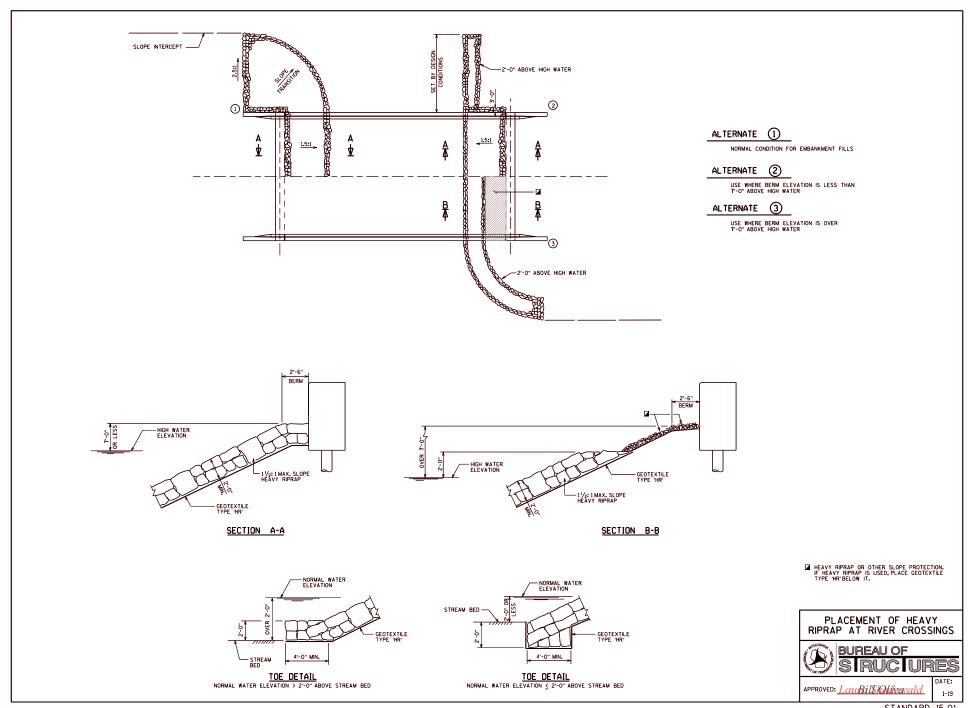
ST6X25 MAY BE WELDED TO ¾" THICK PLATE WITH (4)-½"X4" STUDS ANCHORED IN PRECAST CONCRETE PANEL, RESTORE ZINC COATING AROUND ANY WELDED AREAS, SUBMIT DETAILS FOR APPROVAL BY THE EMGINEER.

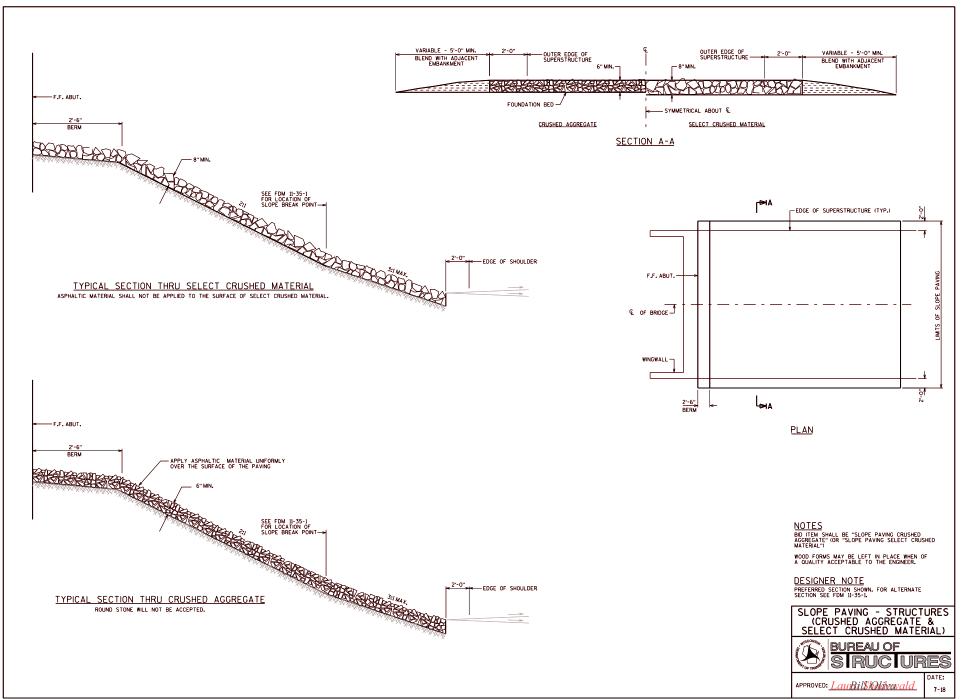
MSE WALL WIRE FACING 1

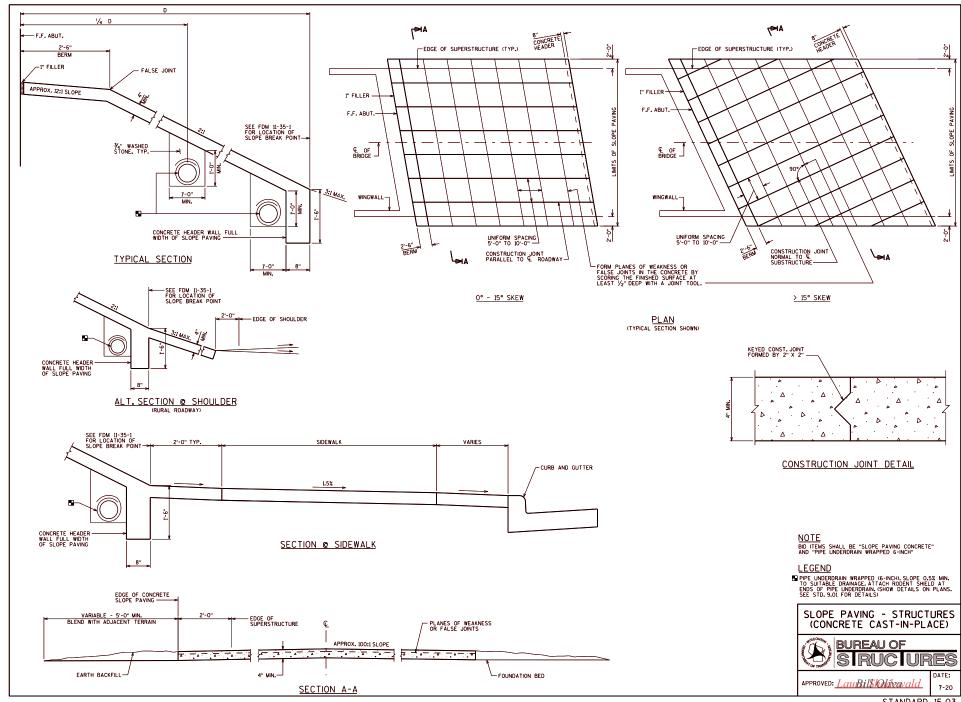


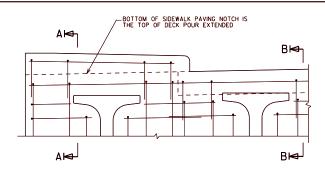
APPROVED: <u>LawBil\$101aleoval</u>





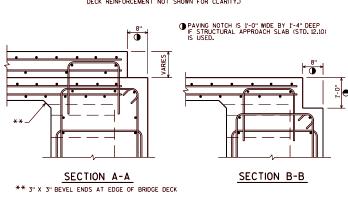




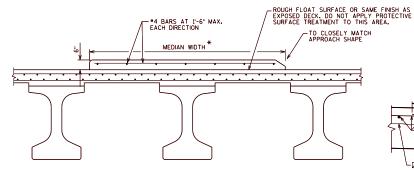


PART TRANSVERSE SECTION AT ABUTMENT TYPE A1 DIAPHRAGM WITH A RAISED SIDEWALK

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



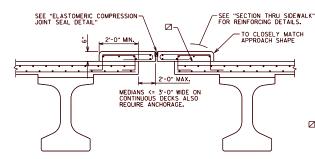
- SEE STANDARDS 19.33, 19.34, 19.35 FOR REINFORCEMENT DETAILS
- DETAILS SHOWN ARE FOR GIRDER STRUCTURES, SIMILAR
REINFORCEMENT FOR SLAB STRUCTURES SHALL BE USED
WITH A REMINDER THAT THE TRANSVERSE AND LONGITUDINAL REINFORCEMENT LAYERS ARE REVERSED.



CROSS SECTION THRU UNANCHORED MEDIAN

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

NOTE: CLEAN ALL LOSS MATERIAL ON THE DECK AT THE MEDIAN LOCATION PRIOR TO MEDIAN PLACEMENT USING HIGH PRESSURE WATER OR AIR, ENSURING ALL FREE-STANDING WATER IS REMOVED PRIOR TO MEDIAN PLACEMENT. NEAT CEMENT IS REQUIRED AS PER 509,3,9,2 OF THE STANDARD SPECIFICATIONS UNLESS THE MEDIAN IS POURED WITHIN 45 DAYS OF COMPLETING THE DECK POUR.



CROSS SECTION THRU MEDIAN WITH A JOINT

NOTES

WHEN PARAPETS ARE POURED CONTINUOUSLY FROM END TO END, THEY SHALL BE SEPARATED AT THE DETECTION JOINTS BY A PIECE OF '/e" ZINC OR PLASTIC PLATE CUT AS SHOWN IN THE "DEFLECTION JOINT OF STRUCTION JOINT OF STRUCTION JOINT OF STRUCTION JOINTS IN APARAPTS ARE USED AT THE DEFLECTION JOINTS IN APARAPTS ARE USED AT THE OFFICE TION JOINTS IN APARAPTS ARE USED AT THE OFFICE TION AND 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.
- ❸ 8" MIN. SIDEWALK THICKNESS ALSO REO'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

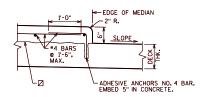
FOR EXTREME SIDEWALK WIDTHS AND/OR SUPERELEVATIONS THE DECK MAY BE LEVEL BENEATH THE SIDEWALK (MAINTAIN CONSTANT DECK THICKNESS) TO REDUCE EXCESSIVE SIDEWALK THICKNESS.

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

ANCHORED MEDIAN CURB DETAIL

₩_{4 BARS} @ I'-

-0

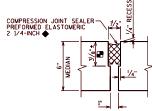


EDGE OF MEDIAN - 1" R.

ADHESIVE ANCHORS NO. 4 BAR. EMBED 5" IN CONCRETE.

ANCHORED MEDIAN CURB DETAIL

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



ELASTOMERIC COMPRESSION SEAL DETAIL

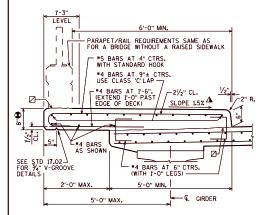
- NARIES BASED ON JOINT MANUFACTURER
- MANUFACTURER SHALL LABEL TOP OF SEAL

MEDIAN AND RAISED SIDEWALK DETAILS

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



APPROVED: <u>LawBil\$101aleoval</u>



SECTION THRU SIDEWALK

-FILL WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER -1/8" PLASTIC OR ZINC PLATE. PROVIDE NECESSARY HOLES FOR UTILITIES "V" GROOVE

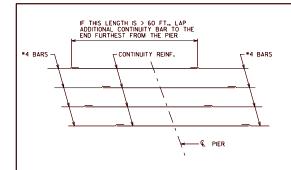
DEFLECTION JOINT DETAIL

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

L 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 & PIER.

IF THERE IS A LIGHT STANDARD AT THE PIER, PLACE A DEFLECTION JOINT APPROX. 4'-O" 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.



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

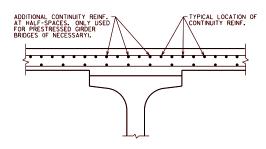
SEE STD. 24.11 FOR GIRDER SUPERSTRUCTURES SEE STD. 18.02 FOR SLAB SUPERSTRUCTURES

DESIGNER NOTES

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

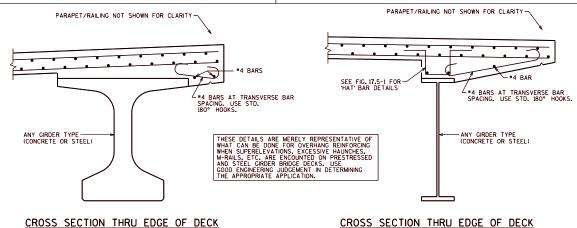
JOINTS SHOULD BE PLACED AT LEAST 6 INCHES FROM THE EDGE OF THE TOP FLANGE OF THE GIRDER AND PREFERABLY LOCATED BENEATH THE MEDIAN OR PRARPET, AVOID PLACING NEAR WHEEL PATHS (PLACE AT LANE LINES OR IN THE MIDDLE OF THE LANE).

(SHOWING ADDITIONAL OVERHANG REINFORCEMENT)

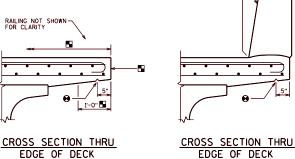


CROSS SECTION THRU DECK

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



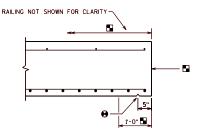
CROSS SECTION THRU EDGE OF DECK (SHOWING ADDITIONAL OVERHANG REINFORCEMENT)



EDGE OF DECK

(SHOWING DRIP GROOVE AND CONCRETE SEALING FOR ALL PARAPETS)

42SS PARAPET



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

➡ ¾" V-GROOVE REQUIRED AT THE EDGE OF DECK AND SLAB.

REFER TO STANDARD 40.01 FOR RESEALING CONCRETE SURFACES.

(SHOWING DRIP GROOVE AND CONCRETE SEALING FOR OPEN RAILINGS)

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'-O" OF THE FRONT FACE OF ABUTMENT.
- APPLY TO THE VERTICAL AND HORIZONTAL SURFACES OF SIDEWALKS, MEDIANS, AND PAVING NOTCHES.
- ♠ BID ITEM "PIGMENTED SUREFACE SEALER": APPLY TO INSIDE & TOP FACES OF PARAPETS, INCLUDING PARAPETS ON WINGS.

NOTES

₹4" V-GROOVE REO'D. EXTEND TO 2'-0" FROM F.F. OF ABUT. BODY (FOR ABUTMENTS WITH EXPANSION JOINTS)

₹4" V-GROOVE REO'D. EXTEND TO 6" FROM F.F. OF ABUT. DIAPH. (FOR TYPE A1FIXED 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: <u>LauBilSlOddleoval</u>

RAILING NOT SHOWN FOR CLARITY CAULK ENTIRE LENGTH CAULK ENTIRE LENGTH FLASHING STAINLESS STEEL We "X 1 ¾4" (MIN.) CONCRETE SCREWS SPACED AT 1"-0" EACH ROW. STAGGER ROWS.

RAILING NOT SHOWN FOR CLARITY *** (MIN.) CONCRETE *** CAULK ENTIRE LENGTH *** DETAIL A *** FLASHING STAINLESS STEEL

FLASHING DETAIL FOR NEW BRIDGES WITH OPEN RAILING

THE BID ITEM "FLASHING STAINLESS STEEL" SHALL INCLUDE PROVIDING AND INSTALLING THE STAINLESS STEEL FLASHING, CAULK, % "CONCRETE SCREMS AND CLEANING THE EDGE OF THE DECK PRIOR TO ATTACHMENT OF THE FLASHING.

DESIGNER NOTES

EDGE OF DECK FLASHING IS FOR OPEN RAIL BRIDGES AND MAY BE USED FOR REHABILITATION ON NEW CONSTRUCTION. CONTACT THE REGION BRIDGE MAINTENANCE ENGINEER FOR THE DECISION ON WHETHER OR NOT TO USE THE FLASHING ON NEW BRIDGES.

DETAIL 1 OR DETAIL 2, OR A COMBINATION OF THE TWO, MAY BE USED FOR REHABILITATION.

THE DESIGN ENGINEER SHALL PROVIDE CONCRETE SURFACE REPAIR DETAILS AS NEEDED. CONCEPTUAL DETAILS ARE SHOWN ON THIS STANDARD.

DO NOT USE FLASHING IF FREEBOARD IS LESS THAN 3" FOR A SLAB BRIDGE.

NOTES

THE BID ITEM "FLASHING STAINLESS STEEL" SHALL INCLUDE PROVIDING AND INSTALLING THE STAINLESS STEEL FLASHING, SILICONE CAULK AND $\frac{1}{16}$ " CONCRETE SCREWS.

FLASHING TO BE INSTALLED AFTER PROTECTIVE SURFACE TREATMENT APPLICATION.

CONCRETE SCREWS SHALL BE 410 STAINLESS STEEL.

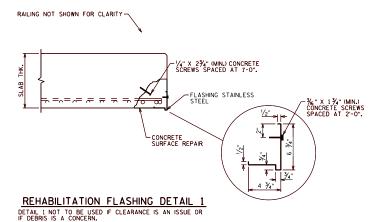
EXTEND FLASHING TO B.F. OF ABUTMENT DIAPHRAGM.

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 BRIDGE LENGTH.

PROVIDE 2" MINIMUM FLASHING OVERLAP, FASTEN WITH $\frac{1}{16}$ " X 2" (MIN.) CONCRETE SCREWS.

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



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

RAILING NOT SHOWN FOR CLARITY CAULK ENTIRE LENGTH CAULK ENTIRE LENGTH CAULK ENTIRE LENGTH CAULK ENTIRE LENGTH FLASHING STAINLESS STEEL STEEL DEFINE WITH 1/2" SAWCUT CONCRETE SURFACE REPAIR

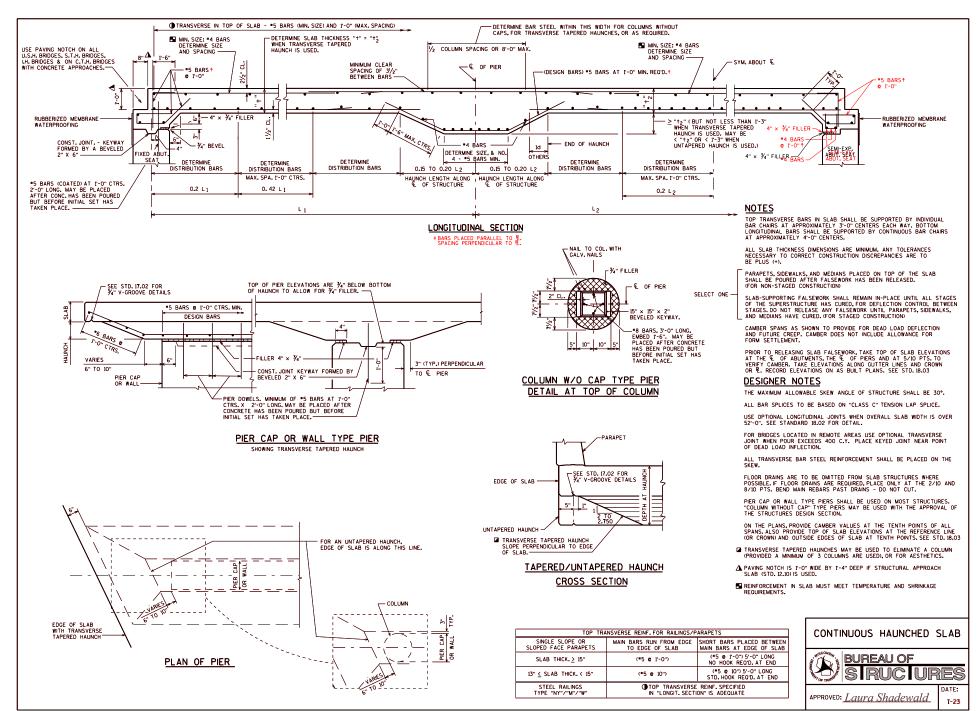
REHABILITATION FLASHING DETAIL 2

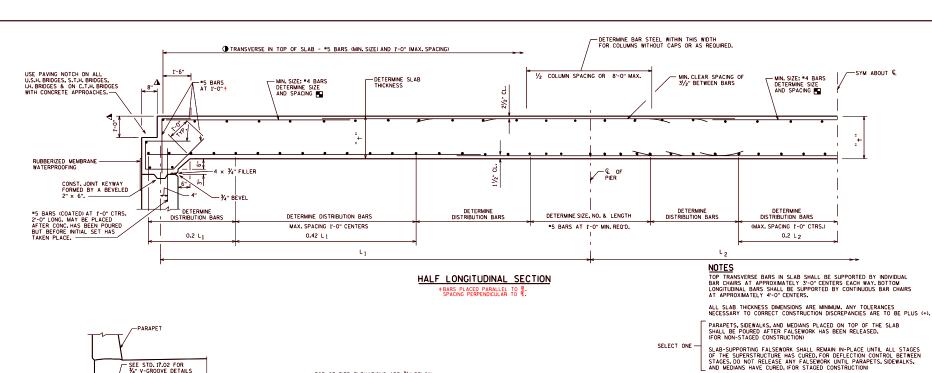
THE BID ITEM "FLASHING STAINLESS STEEL" SHALL INCLUDE PROVIDING AND INSTALLING THE STAINLESS STEEL FLASHING, CAULK, % " AND ¼" CONCRETE SCREWS, AND CLEANING THE EDGE OF THE DECK PRIOR TO ATTACHMENT OF THE FLASHING.

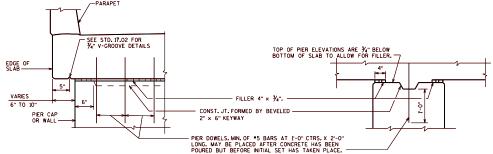
EDGE OF DECK FLASHING



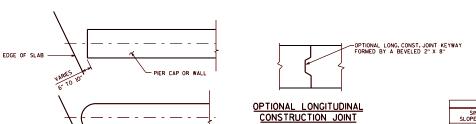
APPROVED: LauBils Waldvovald







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



PIER CAP OR WALL

PLAN OF PIER

TOP TRANSVERSE REINF. FOR RAILINGS/PARAPETS SINGLE SLOPE OR SLOPED FACE PARAPETS MAIN BARS RUN FROM EDGE SHORT BARS PLACED BETWEEN MAIN BARS AT EDGE OF SLAB (#5 @ 1'-0") 5'-0" LONG NO HOOK REO'D. AT END (#5 **e** 1'-0") SLAB THICK. > 15" (*5 @ 10") 5'-0" LONG STD. HOOK REO'D. AT END 13" < SLAB THICK. < 15" (*5 @ 10") STEEL RAILINGS TYPE "NY"/"M"/"W" ● TOP TRANSVERSE REINF, SPECIFIED IN "LONGIT, SECTION" IS ADEQUATE

 \blacksquare REINFORCEMENT IN SLAB MUST MEET TEMPERATURE AND SHRINKAGE REQUIREMENTS. CONTINUOUS FLAT SLAB **BUREAU OF** S RUC URES APPROVED: <u>Laura Shadewald</u> 7-23

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

PRIOR TO RELEASING SLAB FALSEWORK, TAKE TOP OF SLAB ELEVATIONS AT THE $\mathfrak L$ OF ABUTMENTS, THE $\mathfrak L$ OF PIERS AND AT 5/10 PTS, TO YERFY CAMERET, TAKE ELEVATIONS ALONG GUTTER LINES AND CROWN OR $\mathfrak L$. RECORD ELEVATIONS ON AS BUILT PLANS. SEE STD. 18.03

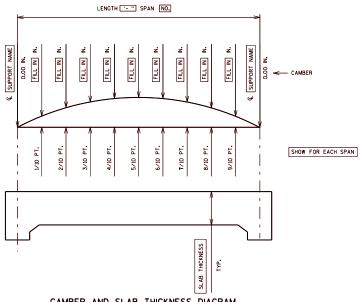
THE MAXIMUM ALLOWABLE SKEW ANGLE OF STRUCTURE SHALL BE 30°. ALL BAR SPLICES TO BE BASED ON "CLASS C" TENSION LAP SPLICE

 $\ensuremath{\Delta}$ Paving notch is 1'-0" wide by 1'-4" deep if structural approach slab (STD. 12.10) is used.

USE OPTIONAL LONGITUDINAL JOINTS WHEN OVERALL SLAB WIDTH IS OVER 52'-O".

FOR BRIDGES LOCATED IN REMOTE AREAS USE OPTIONAL TRANSVERSE JOINT WHEN POUR EXCEEDS 400 C.Y. PLACE KEYED JOINT NEAR POINT OF DEAD LOAD

ALL TRANSVERSE BAR STEEL REINFORCEMENT SHALL BE PLACED ON THE SKEW. FLOOR DRAINS ARE TO BE OMITTED FROM SLAB STRUCTURES WHERE POSSIBLE. IF FLOOR DRAINS ARE REQUIRED, PLACE ONLY AT THE 2/10 AND 8/10 PTS. BEND MAIN REBARS PAST DRAINS - DO NOT CUI. PIER CAP OR WALL TYPE PIERS SHALL BE USED ON MOST STRUCTURES. "COLUMN WITHOUT CAP" TYPE PIERS (SEE STD. 18.01) MAY BE USED WITH THE APPROVAL OF THE STRUCTURES DESIGN SECTION. ON THE PLANS, PROVIDE CAMBER VALUES AT THE TENTH POINTS OF ALL 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



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)

SELECT ONE -

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
PLUS..... CAMBER
PLUS....... FORM SETTLEMENT/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

	© BRG. SUPPORT NAME	1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10	9/10	€ BRG. SUPPORT NAME
FILL IN GOGEERF SLAB											
SELECT CROWN AND/OR R											
FILL IN GOGEERF SLAB											

SURVEY TOP OF SLAB ELEVATIONS

SHOW FOR EACH SPAN

	s	© BR©G. BRG. JPPORJPROMME NAM	Œ	5/10 B710 PT.	s	© BR <mark>©. BRG.</mark> JPP <mark>ORJPPNAME NAM</mark>	E
FILL IN GUTTER							
SELECT CROWN AND/OR R							
FILL IN GUTTER							

PRIOR TO RELEASING SLAB FALSEWORK JAKE 10P OF SLAB BLEEVATIONS AT THE Q. OF ABUTHENTS, THE Q. OF PIERS AND AT 5/10 PTS, TO VERIFY CAMBER, TAKE ELEVATIONS ALONG GUITER LINES AND CROWN OR Q. RECORD THE LEEVATIONS IN PRIOR BODY BLAB BLEEVATIONS IN THE Q. OF DIETR AND THE CONTROL OF DIETR AND THE CONTROL OF DIETR AND THE Q. OF DIETR AND THE CONTROL OF DIETR AND THE Q. OF DIETR AND THE Q. OF DIETR AND THE QUELTIONS IN THE Q. OF DIETR AND THE QUELTIONS AND THE Q. OF DIETR AND THE QUELTIONS AND THE QUELTIONS AND THE Q. OF DIETR AND THE QUELTIONS AND THE ELEVATIONS AT THE \$\(^{\text{P}}\) OF ABUTMENTS, THE \$\(^{\text{P}}\) OF PIERS AND AT 5/10 PTS, TO VERIFY CAMBER, TAKE LELEVATIONS ALONG CUTTER LINES AND CROWN OR \$\(^{\text{R}}\). 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 $\underline{\mathsf{AS}}$ BUILT PLANS.

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.

DESIGNER NOTES OF OF SLAB ELEVATIONS" TABLE ON THE HANDER AND LAW THOUGHT ON THE HAND THE THE THREE SLIFT ON TOWN THE THE THREE THREE STATE OF THREE T

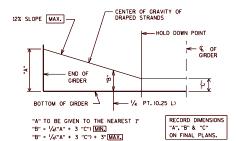
INCLUDE THE "SURVEY TOP OF SLAB ELEVATIONS" TABLE ON THE CONTRACTED WHAT NOT MAY BE FRICED WITH TABLE ON THE CONTRACTED WHAT NOT MAY BE FRICED WITH TOWN OF CONTRACTED WHAT NOT MAY BE FRICED WITH TOWN OF CONTRACTED WHAT NOT MAY BE FRICED WITH TOWN OF CONTRACTED WHAT NOT MAY BE FRICED WITH TOWN OF CONTRACTED WHAT NOT WELL WE WAS A WAY OF THE WORLD WITH THE WAY OF AT BOTH LOCATIONS.

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

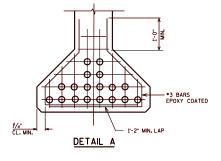
CONCRETE SLAB DETAILS

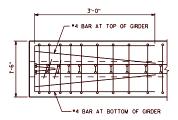


APPROVED: <u>Laura Shadewald</u>

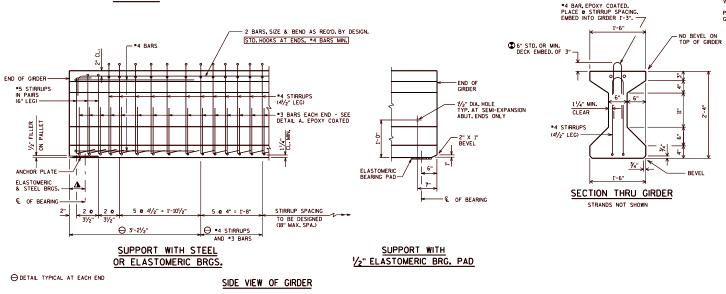


LOCATION OF DRAPED STRANDS





PLAN VIEW



NOTES

TOP OF GRDER 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 GROER, FOR GROER ENDS EMBEDDED COMPLETELY IN CONCRETE, END OF STRANDS SHALL BE COATED WITH NON-BITUMNOUS JOINT SEALER, FOR GRORE RIDS THAT ARE FRAILLY EXPOSED, COAT THE GROER ENDS, EXPOSED STRAND ENDS AND ALL NON-BONDHOS SUFFACES WITHIN 2 FEET OF THE GROER ENDS WITH A NON-PICKENTED EPOXY CONFORMING TO AASHTO M-235 TYPE III, GRADE 2 CLASS BO OR C. THE EPOXY SHALL BE APPLIED AT LEAST 3 DAYS AFFER MOIST CUBING 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 STRUCTURES MEANING MAKECESCOTOSE, WEED WATER FOR A STAULTURES MEANING MAKECESCOTOSE, WEED, WWF ASTM 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 28-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 6800 PSI. USE ONLY 0.5" DIA. STRAND FOR THE DRAPED PATTERN. THE MAX, NUMBER OF DRAPED 0.5" DIA. STRANDS IS 8, USE 0.6" DIA, FOR THE STRANGTH PATTERN, UNLESS ONLY 0.5" DIA. WORK FOR KEEPING STRESSES AT ACCEPTABLE LEVELS.

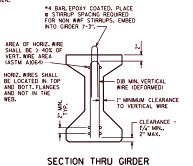
REMFORCEMENT IN STANDARD END SECTION OF THE GROER IS BASED ON THE STANDARD STRAND PATTERNS LISTED ON STANDARD ISJOZ AND THE SPAN LENGTHS. SHOWN IN TABLE 19.3-1. LUSING DIFFERENT STRAND PATTERNS OR LONGER SPANS WILL REQUIRE A COMPLETE DESIGN OF THIS REIMFORCEMENT, WHICH REDUIRES PRIOR APPROVAL FROM THE 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 GREDE CAMBER, INCLUDING THE CAMBER MULTIPLER OF 1.4. THIS VALUE CAN VARY AND SHOULD BE GIVEN FOR EACH 1/3 OF THE GRIDER LEAGHT, PROVIDE VALUES THAT MAINTAIN 3" MIN. DECK EMBEDMENT AND 2½" CLEAR FROM TOP OF DECK HINLE ACCOUNTING FOR ±½" VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESDUAL CAMBER.

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



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



28" PRESTRESSED

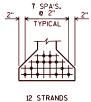
APPROVED: LauBils Waldvovald







10 STRANDS



14 STRANDS





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

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

(0.5" DIA. STRANDS MAY ALSO BE USED)







10 STRANDS



12 STRANDS



14 STRANDS



16 STRANDS



ARRANGEMENT AT € SPAN - FOR GIRDERS WITH DRAPED 0.5" DIA. STRANDS

28" GIRDER

A = 312 SQ. IN.

 $r^2 = 91.95 \text{ IN.}^2$ y_t = 14.58 IN.

y_B = -13.42 IN.

I = 28,687 IN.4 S_T = 1,968 IN.³ $S_B = -2,138 \text{ IN.}^3$

WT. = 325 #/FT.

PRE-TENSION

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

 $f_s = 0.75 \times 270,000 = 202,500 P.S.I$ 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

 $\frac{y_B}{r^2} = \frac{-13.42}{91.95} = -0.1459 \text{ IN./IN.}^2$ $f_B (\text{init.}) = \frac{A_S f_S}{A} (1 + \frac{e_S y_B}{r^2})$

(COMPRESSION IS

			POSITIVE)
NO. STRANDS	e _s (inches)	P(init,)=A _S f _S (KIPS)	f _B (init.) (K/sq.in.)
STANDARD STR	ND PATTERNS FO	R UNDRAPED ST	RANDS (O.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 STR	ND PATTERNS FO	R UNDRAPED ST	RANDS (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 STRA	ND PATTERNS F	OR DRAPED STR	ANDS (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

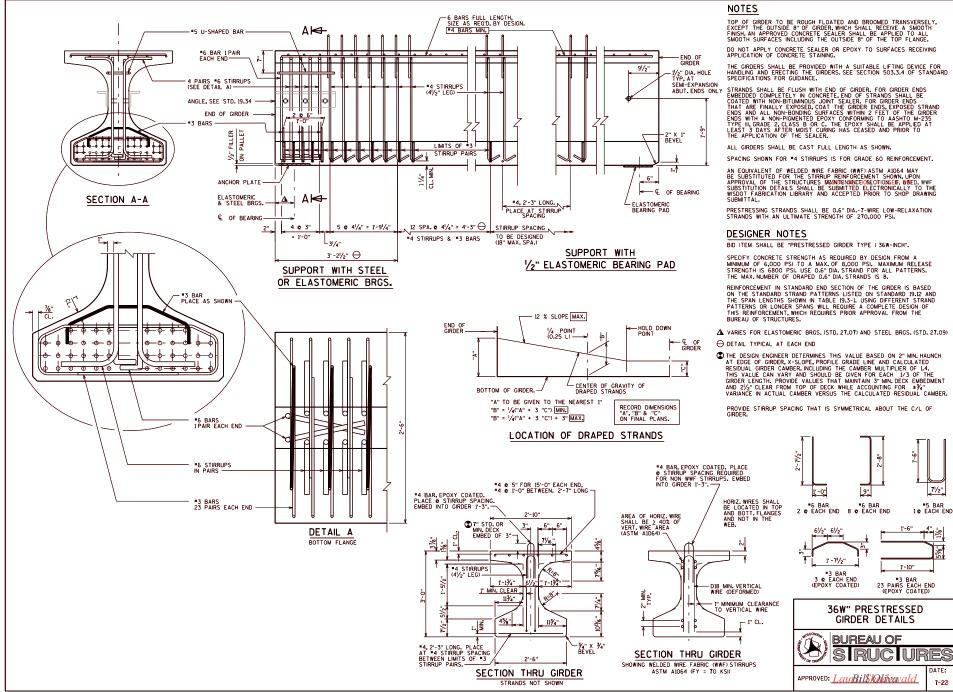
ON THE STRAND PATTERN SHEET, PLACE A BOX AROUND EACH STRAND PATTERN THAT APPLIES TO THE DESIGNED STRUCTURE AND LABEL THE SPAN IT IS USED IN.

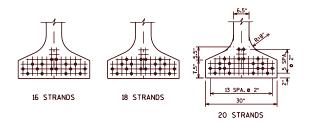
28" PRESTRESSED GIRDER DESIGN DATA

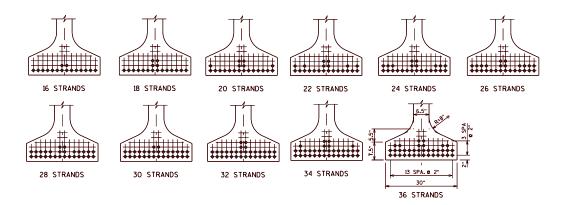


APPROVED: LauBilSlolateovald

STANDARD 19.02







ARRANGEMENT AT & SPAN - FOR GIRDERS WITH DRAPED 0.6" DIA. STRANDS

36W" GIRDER

A = 632 SQ. IN.

r² = 158.20 IN.²

- 10 77 11

 $y_{T} = 19.37 \text{ IN.}$ $y_{B} = -16.63 \text{ IN.}$

I = 99,980 IN.

 $S_{T} = 5.162 \text{ IN.}^{3}$

 $S_B = -6.012 \text{ IN.}^3$

WT. = 658 */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

 $\frac{y_B}{r^2} = \frac{-16.63}{158.20} = -0.10512 \text{ in/in}^2$

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

(COMPRESSION IS

			POSITIVE)
NO. STRANDS	e _s (inches)	P(init.)=A _S f _S (KIPS)	f _B (init.) (K/sq.in.)
STANDARD	STRAND PATTER	NS FOR UNDRAP	D STRANDS
16	-12.13	703	2.531
18	-11.74	791	2.796
20	-11.03	879	3.003
STANDARD	STRAND PATTER	NS 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

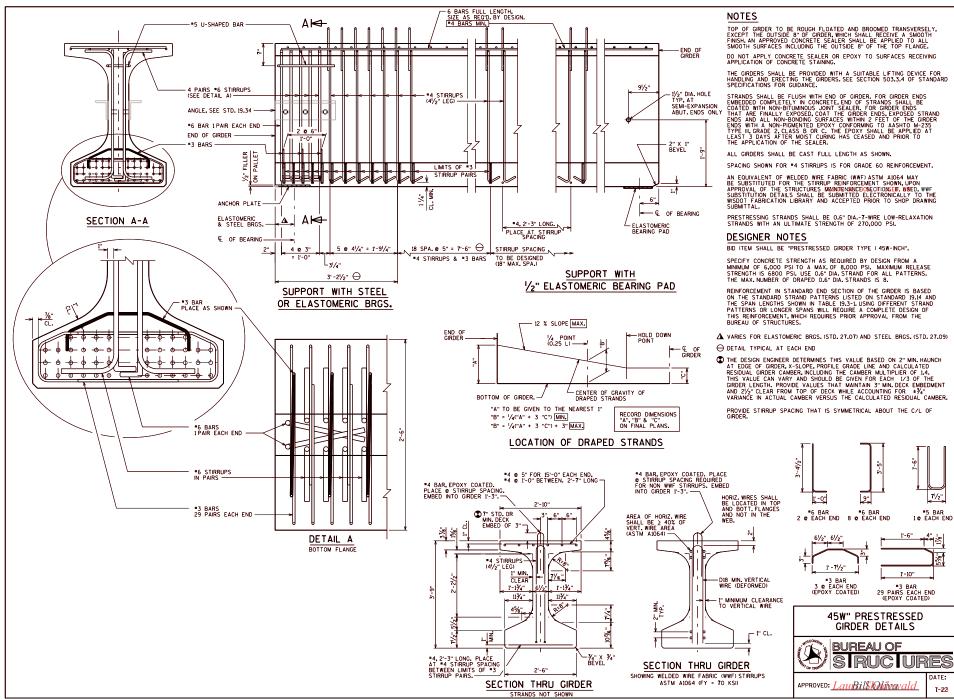
ON THE STRAND PATTERN SHEET, PLACE A BOX AROUND EACH STRAND PATTERN THAT APPLIES TO THE DESIGNED STRUCTURE AND LABEL THE SPAN IT IS USED IN.

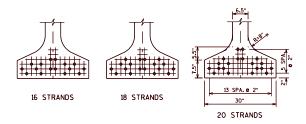
36W" PRESTRESSED GIRDER DESIGN DATA

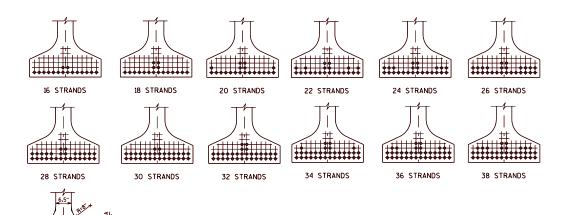


APPROVED: LauBils Woldwowald

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ARRANGEMENT AT € 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 PRE-

A = 692 SQ. IN.

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

1 - - 230.10 1

y_T = 24.26 IN.

 $y_B = -20.74 \text{ IN.}$ $I = 178.971 \text{ IN.}^4$

S_T = 7.377 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 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

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

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

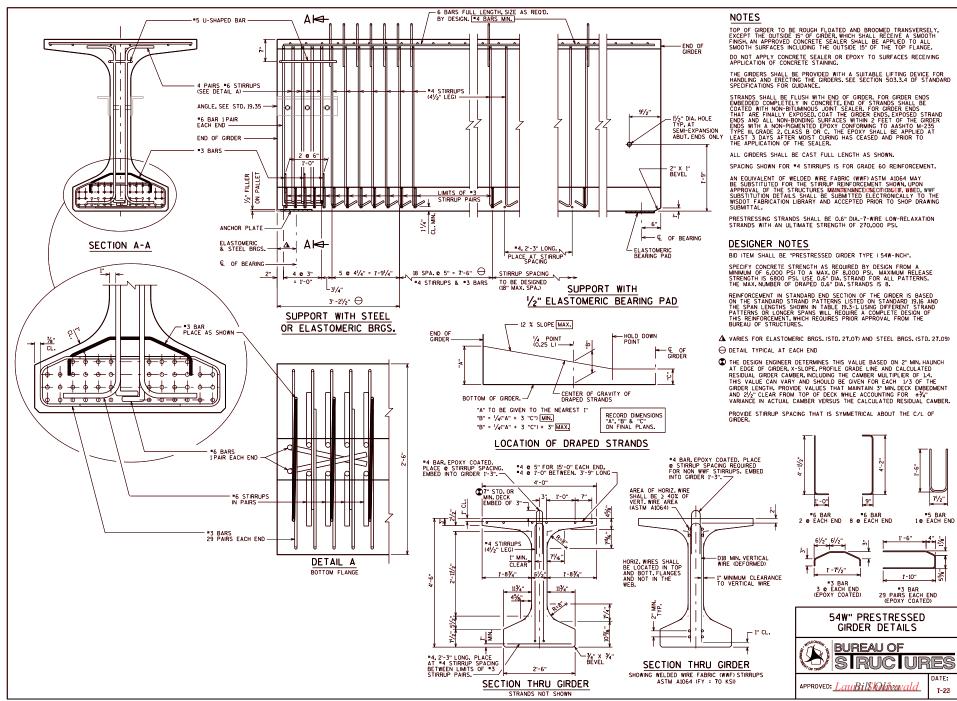
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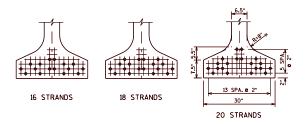
			POSITIVE)
NO. STRANDS	e _s (inches)	P(init.)=A _S f _S (KIPS)	f _B (init.) (K/sq.in.)
STANDARD	STRAND PATTER	NS FOR UNDRAP	ED STRANDS
16	-16.24	703	2.339
18	-15.85	791	2.596
20	-15.14	879	2.812
STANDARD	STRAND PATTER	RNS FOR DRAPED	STRANDS
16	-18.49	703	2.521
18	-18.07	791	2.799
20	-17.94	879	3.097
22	-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

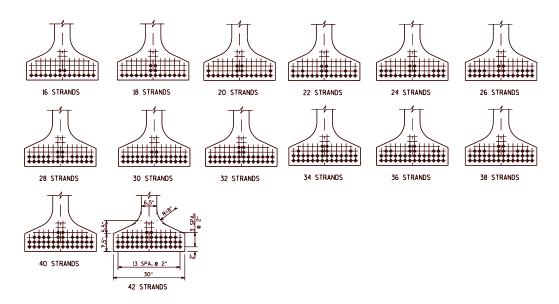
45W" PRESTRESSED GIRDER DESIGN DATA



APPROVED: LauBils Woldwowald







ARRANGEMENT AT & 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

A = 798 SQ. IN.

 $r^2 = 402.41 \, \text{IN.}^2$

y_T = 27.70 IN.

y_B = -26.30 IN.

I = 321,049 IN.4

 $S_T = 11,592 \text{ IN.}^3$

 $S_B = -12,205 \text{ IN.}^3$ WT. = 831 */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

 $\frac{y_B}{r^2} = \frac{-26.30}{402.41} = -0.06536 \text{ in/in}^2$

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

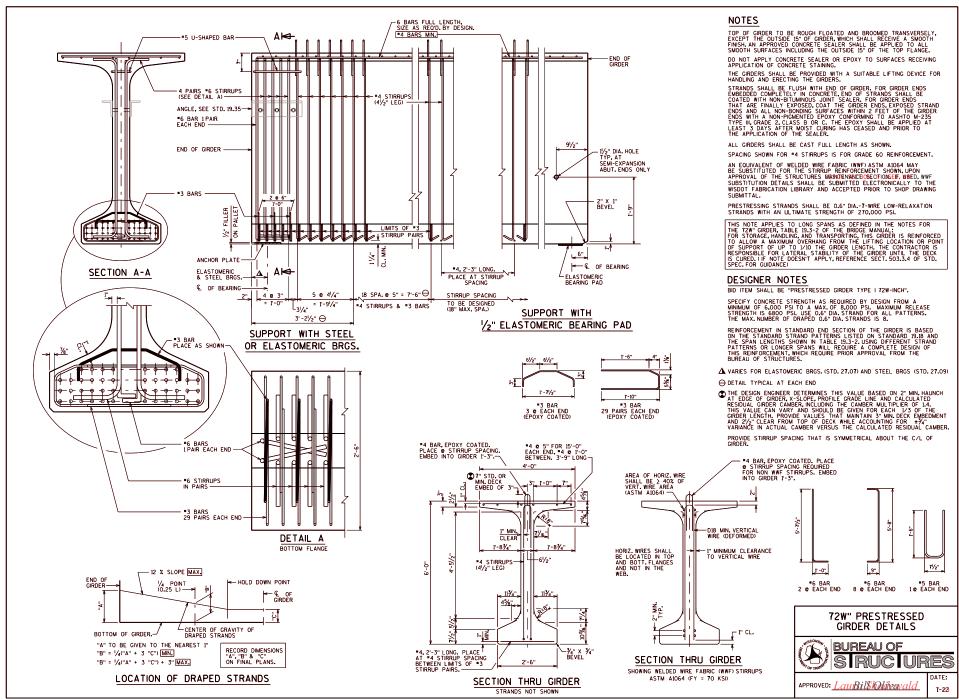
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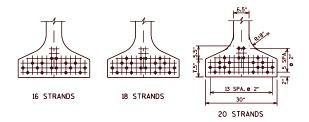
			POSITIVE)
NO. STRANDS	e _s (inches)	P(init.)=A _S f _S (KIPS)	f _B (init.) (K/sq.in.)
STANDARD	STRAND PATTER	NS FOR UNDRAP	D STRANDS
16	-21.80	703	2.136
18	-21.41	791	2.378
20	-20.70	879	2.592
STANDARD	STRAND PATTER	RNS FOR DRAPED	STRANDS
16	-24.05	703	2.266
18	-23.63	791	2.522
20	-23.50	879	2 .7 93
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

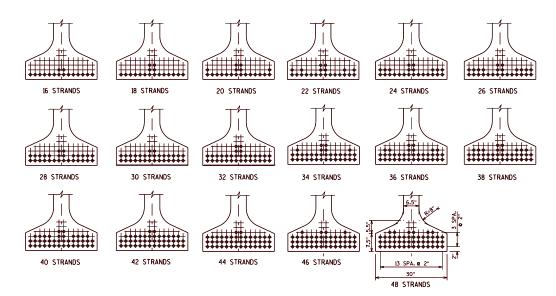
54W" PRESTRESSED GIRDER DESIGN DATA



APPROVED: LauBils Woldwowald







ARRANGEMENT AT & 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 IN.3

S_B = -18,825 IN.3

WT. = 953 */FT.

PRE-TENSION

f_s = 270,000 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

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

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

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

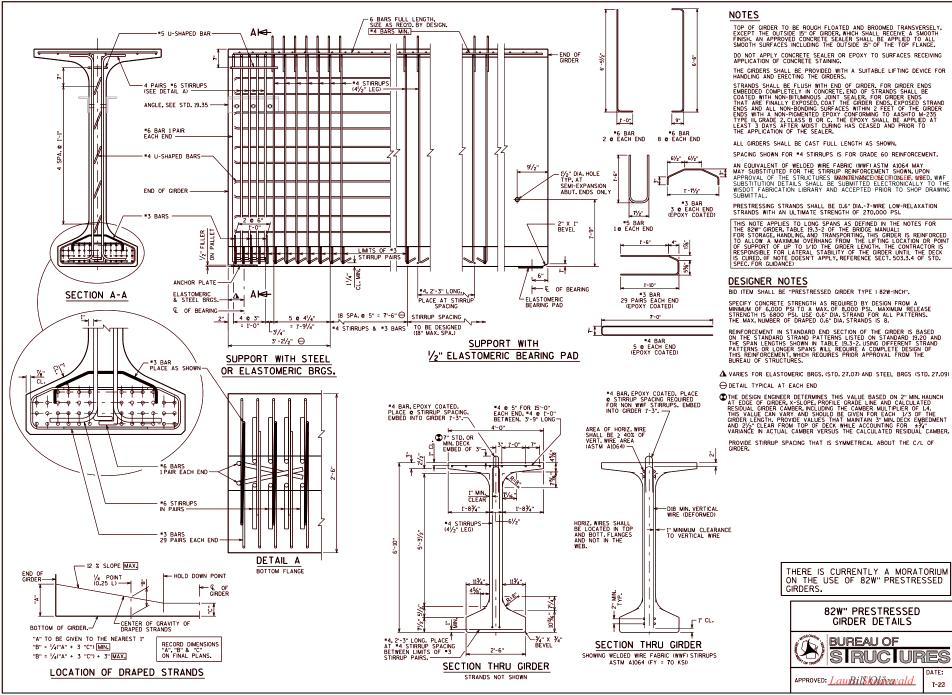
(COMPRESSION IS

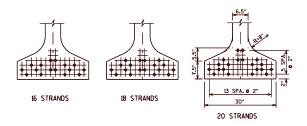
			POSITIVE)
NO. STRANDS	e _s (inches)	P(init.)=A _s f _s (KIPS)	f _B (init.) (K/sq.in.)
STANDARD	STRAND PATTER	NS FOR UNDRAP	ED STRANDS
16	-30.37	703	1.902
18	-29.98	791	2.124
20	-29.27	879	2.328
STANDARD	STRAND PATTER	NS FOR DRAPED	STRANDS
16	-32.62	703	1.986
18	-32.20	791	2.217
20	-32.07	879	2.458
22	-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

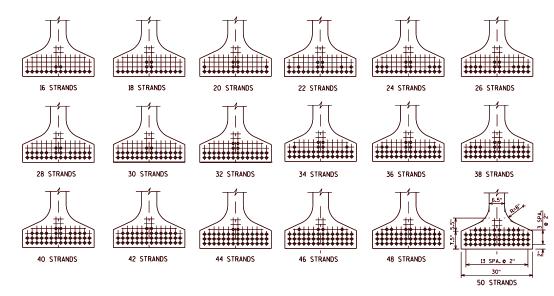
72W" PRESTRESSED GIRDER DESIGN DATA



APPROVED: LauBils Woldbowald







ARRANGEMENT AT & 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.

 $r^2 = 924.1 \, \text{IN.}^2$

 $y_{T} = 42.32 \text{ IN.}$

y_B = -39.68 IN.

I = 905,453 IN.4

S_T = 21,396 IN.3

 $S_B = -22.819 \text{ IN.}^3$

WT. = 1021 */FT.

PRE-TENSION

f; = 270,000 P.S.I.

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

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

 $\frac{y_B}{r^2} = \frac{-39.68}{924.10} = -0.04294 \text{ in/in}^2$ $f_B \text{ (init.)} = \frac{A_S f_S}{A} (1 + \frac{e_S y_B}{r^2})$

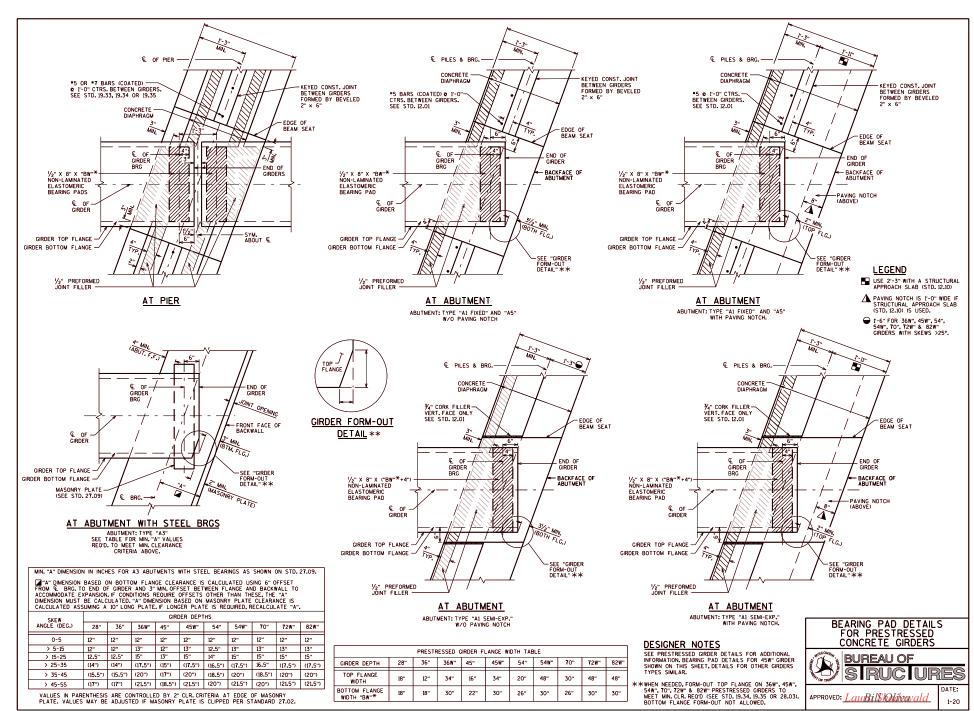
(COMPRESSION IS

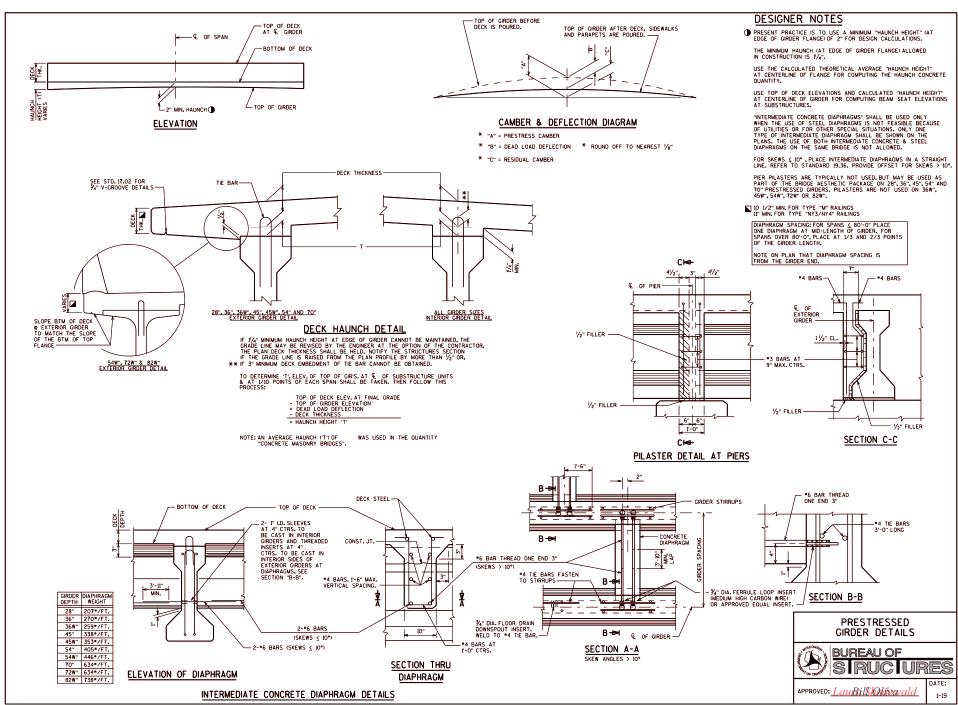
			POSITIVE)
NO. STRANDS	e _s (inches)	P(init.)=A _S f _S (KIPS)	f _B (init.) (K/sq.in.)
STANDARD	STRAND PATTER	NS FOR UNDRAP	ED STRANDS
16	-35.18	703	1.801
18	-34.79	791	2.013
20	-34.08	879	2.209
STANDARD	STRAND PATTER	RNS FOR DRAPED	STRANDS
16	-37.43	703	1.870
18	-37.01	791	2.090
20	-36.88	879	2.318
22	-36.77	967	2.545
24	-36.68	1055	2 .77 2
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

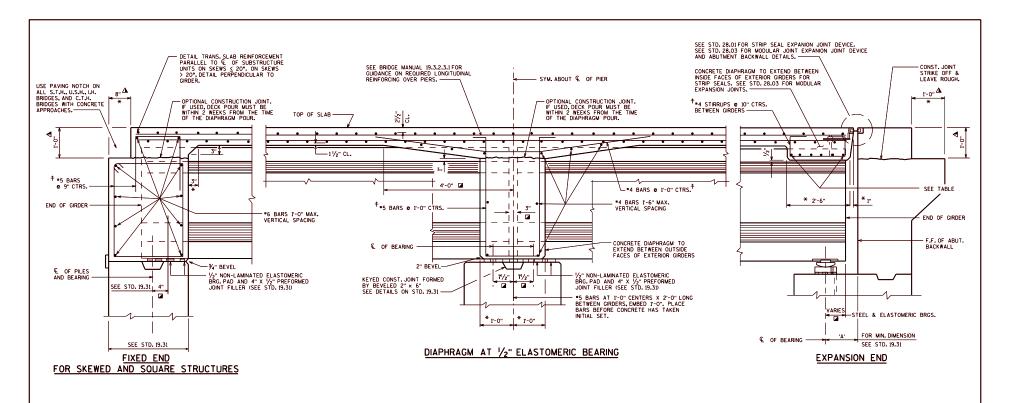
82W" PRESTRESSED GIRDER DESIGN DATA

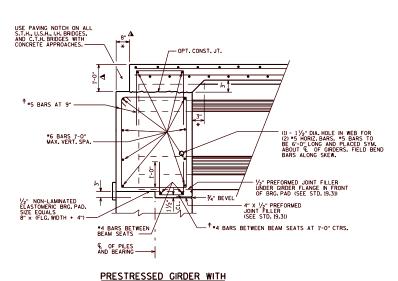


APPROVED: LauBils Woldbowald





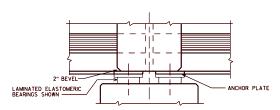




SEMI-EXPANSION SEAT

EXPANSION END DIAPHRAGM STEEL

DIAPHRAGM LENGTH (ALONG SKEW)	NO. OF BARS	& BAR SIZE
BETWEEN GIRDERS (© TO © OF GRDS.)	28"	36"
≤ 8'-4"	6 - *6	6 - *6
> 8'-4" < 11'-4"	6 - *8	6 - •7
> 11'-4" <u><</u> 14'-9"		6 - •8



DIAPHRAGM AT STEEL OR ELASTOMERIC BEARINGS SECTION THRU DIAPHRAGM AT PIER

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

DESIGNER NOTES

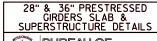
LAP LENGTHS FOR ALL BARS SHALL BE BASED ON A "CLASS C" TENSION LAP SPLICE, EXCEPT HORIZONTAL DIAPHRAGM BARS, IF SPLICED, CAN UTILIZE A "CLASS A" TENSION LAP SPLICE.

LEGEND

- DIMENSION IS TAKEN PARALLEL TO € GIRDER.
- * DIMENSION IS TAKEN NORMAL TO \P . SUBSTRUCTURE UNITS.
- ▲ PAVING NOTCH IS 1'-0" WIDE BY 1'-4" DEEP IF STRUCTUAL APPROACH SLAB (STD. 12:10) IS USED. SHOW NO.9 STAINLESS STEEL BAR (STD. 12:12) FOR STRUCTURAL APPROACH SLAB ON THE SECTION THRU ABUT. OR ABUT. DIAPH.
- † BARS PLACED PARALLEL TO GIRDERS. SPACING PERPENDICULAR TO Q. GIRDERS.

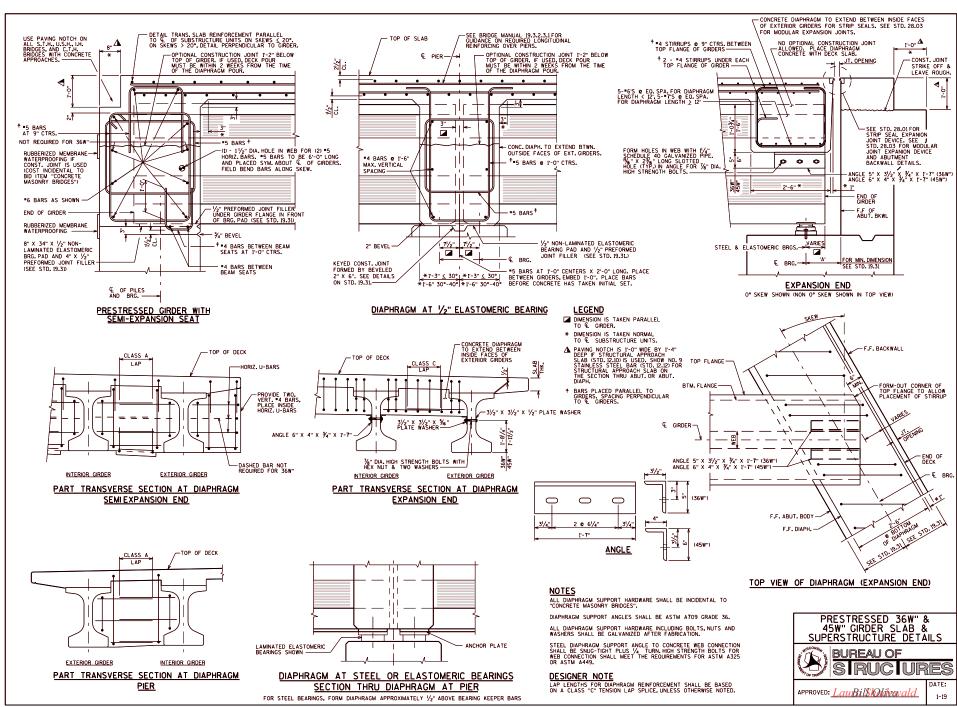
SEE STANDARD 19.34 FOR 36W" & 45W" PRESTESSED GIRDERS SLAB AND SUPERSTRUCTURE DETAILS

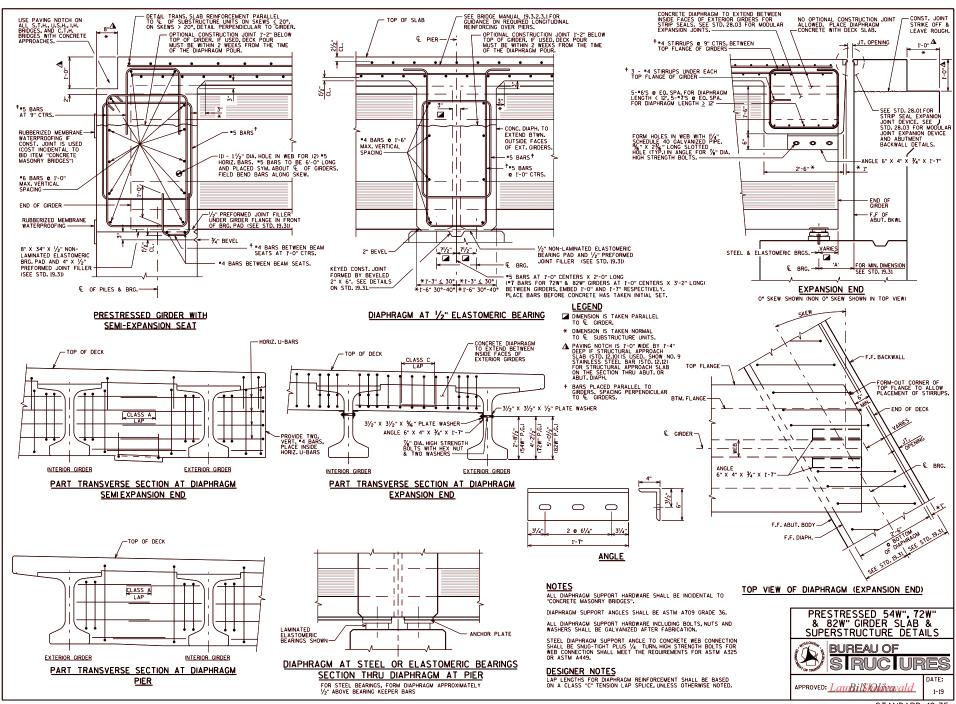
SEE STANDARD 19.35 FOR 54W", 72W" & 82W" PRESTRESSED GIRDERS SLAB & SUPERSTRUCTURE DETAILS.





APPROVED: LauBilSl@dileowale





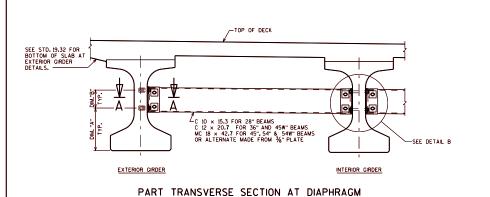
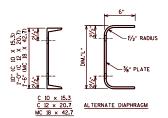


TABLE GIRDER DIM. DIM. DIM. ₩ DIM. 91/2" 28" 1'-0%'' 5%" 21/4" 1'-21/8" 9%" 1'-1 1/2" 31/4" 45" 1-5%" 1-1%" 1'-51/2" 21/4" 45W" 1'-91/8" 8%" 1'-01/2" 2¾" 1'-91/2" 41/4" 1'-71/8" 1'-5%" 1-91/8" 1-51/8" 1-91/2" 54W" 41/4"



NOTES

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

EACH DIAPHRAGM BETWEEN GIRDERS SHALL CONSTITUTE ONE UNIT.

ALL DIAPHRAGM STRUCTURAL STEEL SHALL BE ASTM A709 GRADE 36.

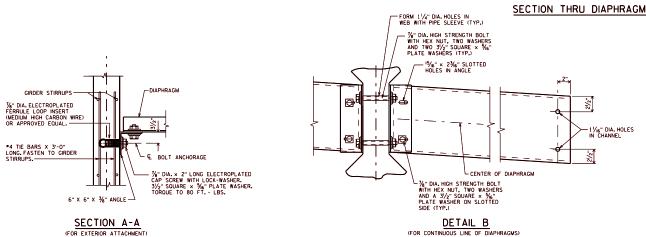
ALL DIAPHRAGM MATERIAL INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AFTER FABRICATION.

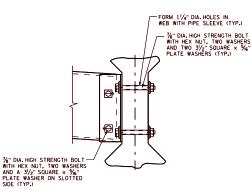
STEEL DIAPHRAGM TO CONCRETE WEB CONNECTION SHALL BE SNUG-TIGHT PLUS 1/4 TURN, UNLESS NOTED OTHERWISE. HIGH STRENGTH BOLTS FOR WEB CONNECTION SHALL MEET THE REQUIREMENTS FOR ASTM A325 OR

DESIGNER NOTES

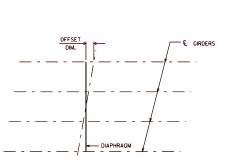
FOR SPANS EQUAL TO OR LESS THAN 80'-0", PLACE ONE DIAPHRAGM AT MID-LENGTH OF GIRDER. FOR SPANS OVER 80'-0", PLACE AT 1/3 AND 2/3 POINTS.

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 $\frac{\text{FROM THE ENDS OF EACH GIRDER}}{\text{FROM THE ENDS OF EACH GIRDER}}.$

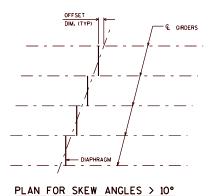


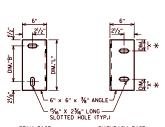


SECTION AT INTERIOR GIRDERS THRU
DIAPHRAGM FOR SKEW ANGLES > 10°



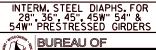
PLAN FOR SKEW ANGLES ≤ 10°





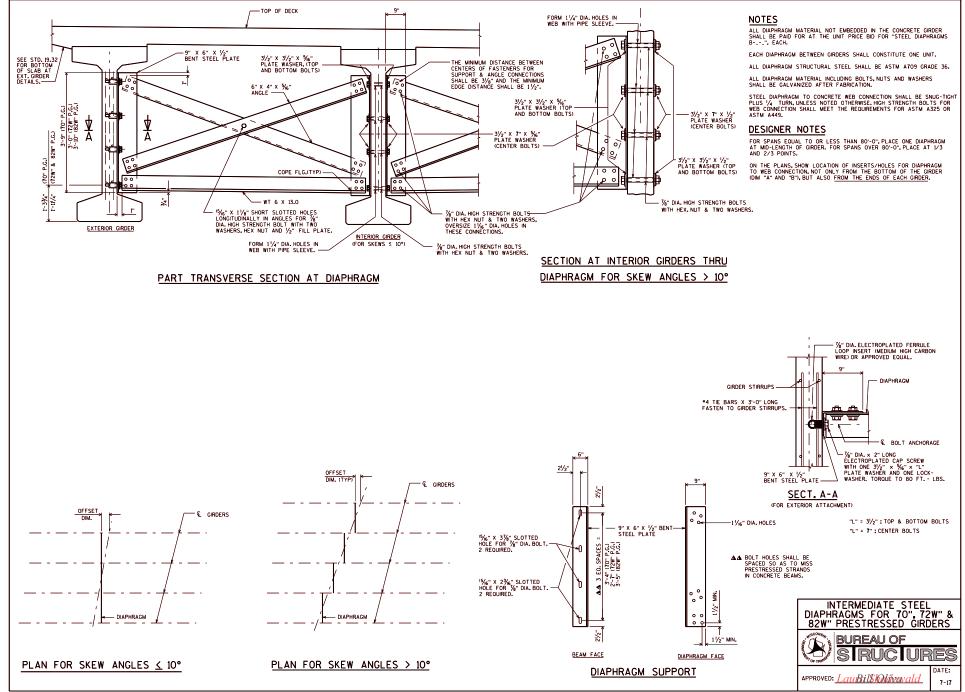
DIAPHRAGM SUPPORT

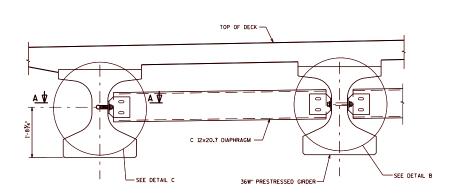
₹21/2" FOR ALTERNATE PLATE DIAPHRAGM



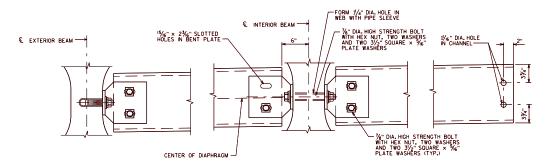
SIRUCIURES

APPROVED: LauBils Wildleowal





PART TRANSVERSE SECTION AT DIAPHRAGM

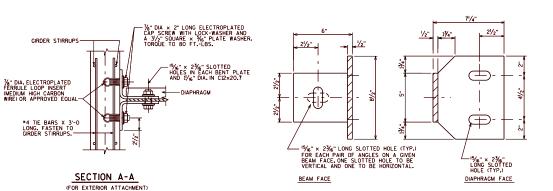


INTERIOR GIRDER

DETAIL B

DETAIL C

EXTERIOR GIRDER



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.

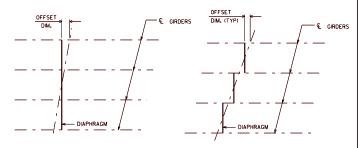
ALL DIAPHRAGM MATERIAL INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AFTER FABRICATION.

STEEL DIAPHRAGM TO CONCRETE WEB CONNECTION SHALL BE SNUG-TIGHT PLUS '/ TURN, UNLESS NOTED OTHERWISE, HIGH STRENGTH BOLTS FOR WEB CONNECTION SHALL MEET THE REQUIREMENTS FORASTM A325 OR ASTM A494,

DESIGNER NOTES

FOR SPANS EQUAL TO OR LESS THAN 80'-O", PLACE ONE DIAPHRAGM AT MID-LENGTH OF GIRDER. FOR SPANS OVER 80'-O", 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.

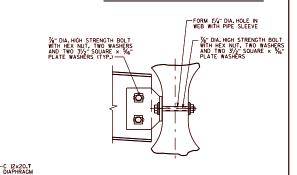


PLAN FOR SKEW ANGLES ≤ 10°

BENT PLATE

ATTACHMENT TO CHANNEL

PLAN FOR SKEW ANGLES > 10°

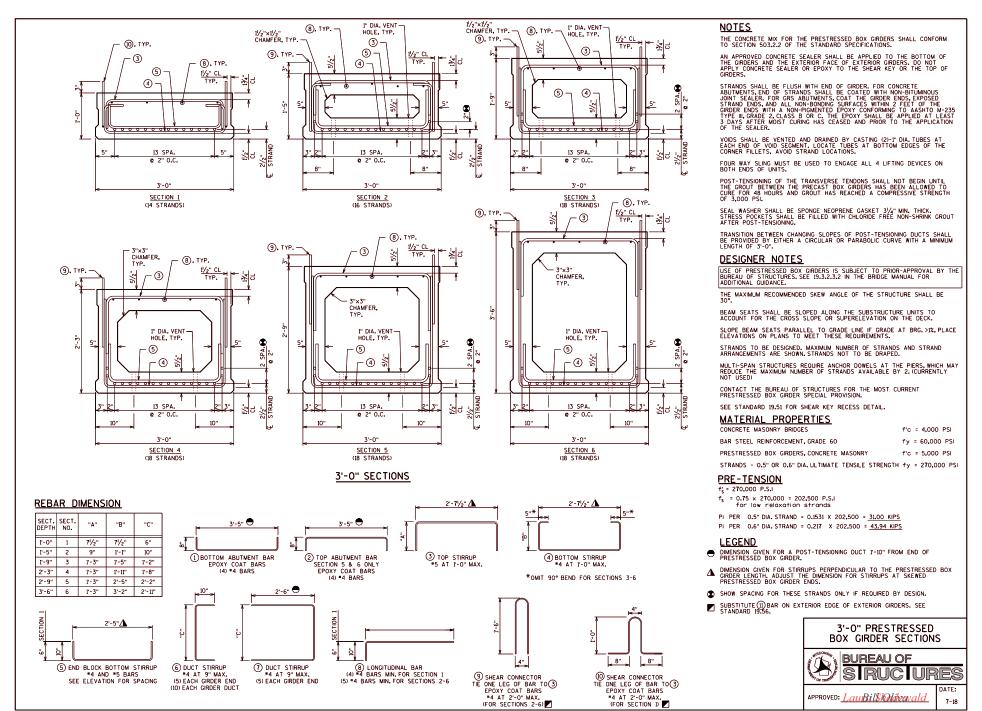


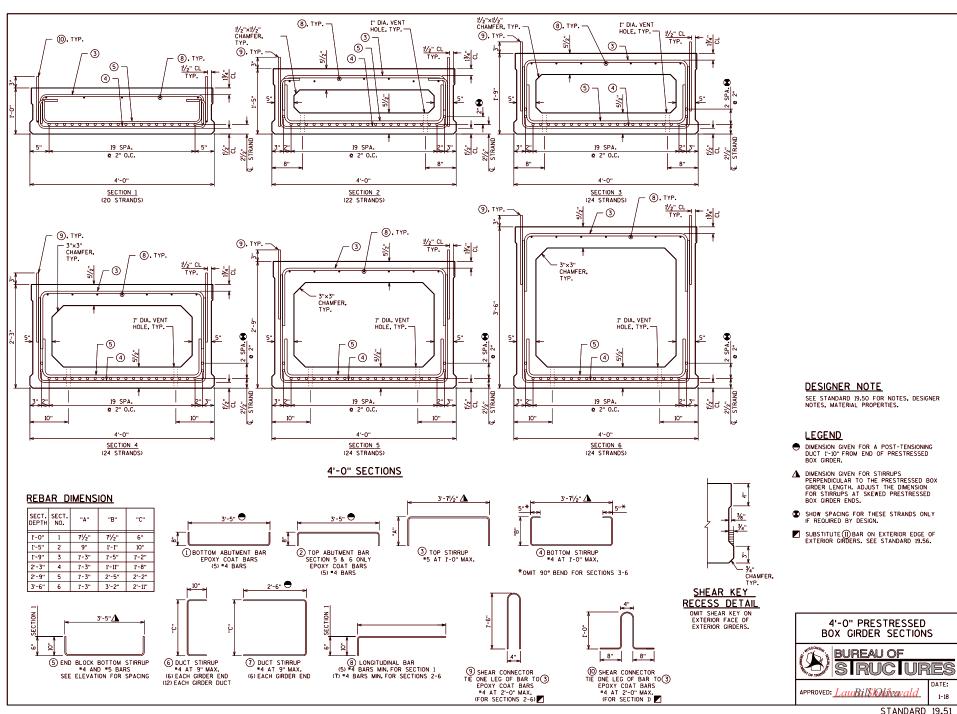
SECTION AT INTERIOR GIRDERS THRU
DIAPHRAGM FOR SKEW ANGLES > 10°

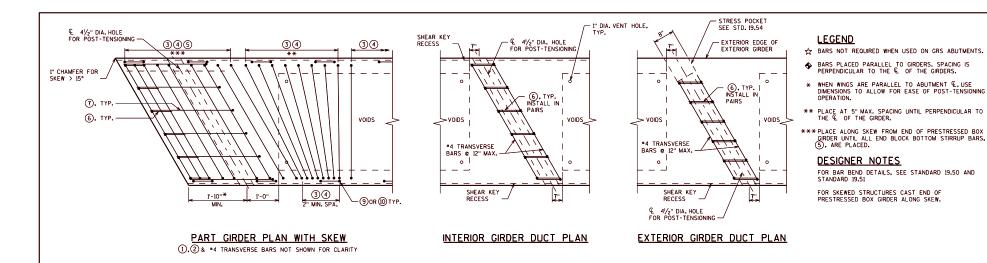


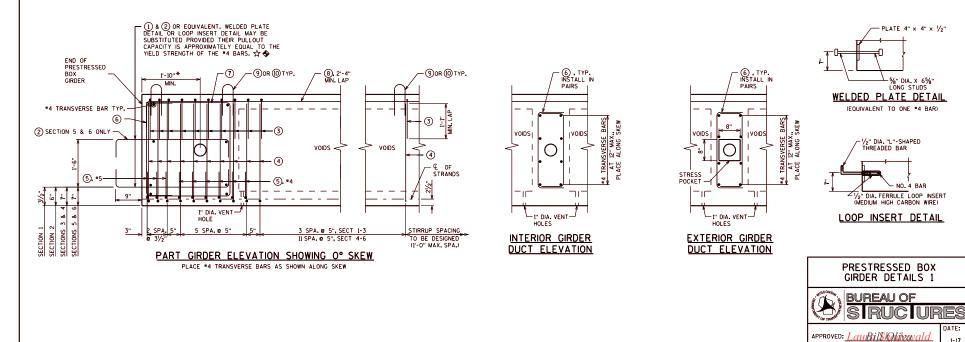


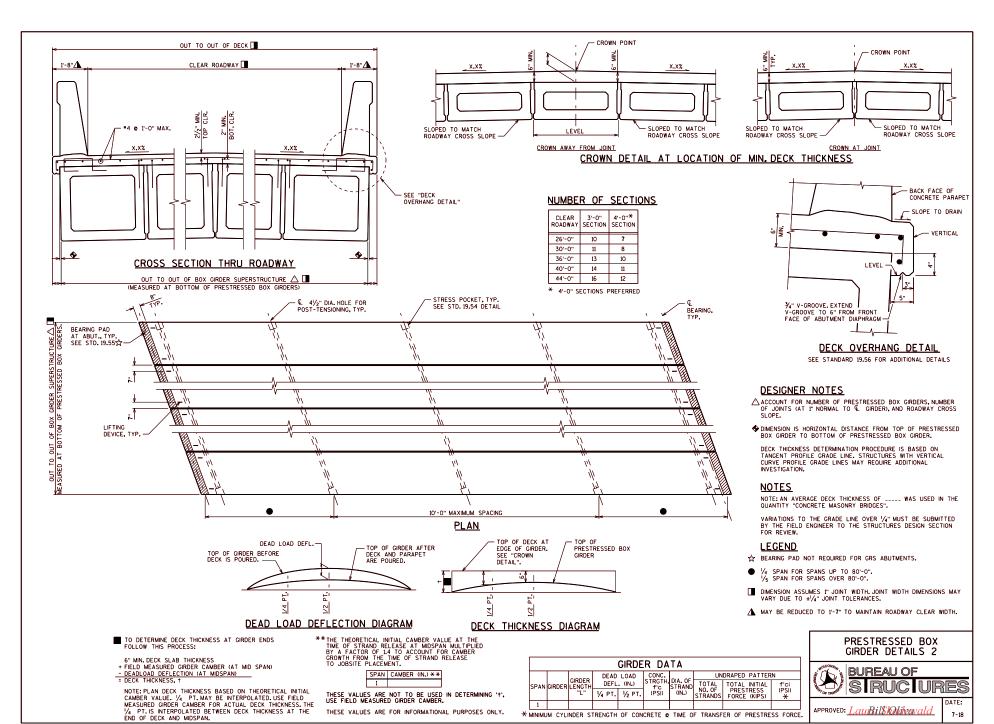
APPROVED: LauBils Waldeovald

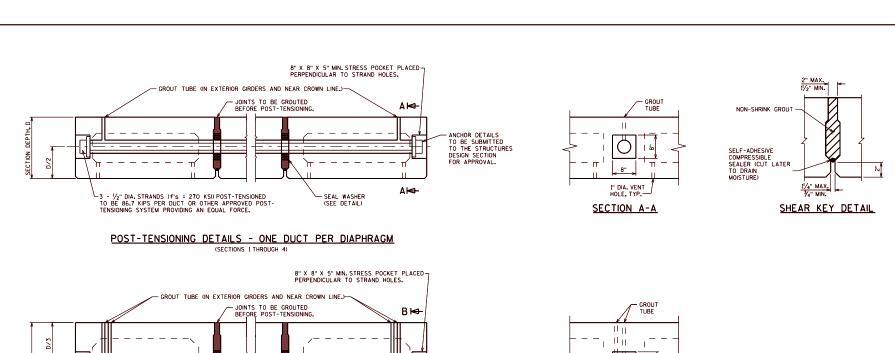


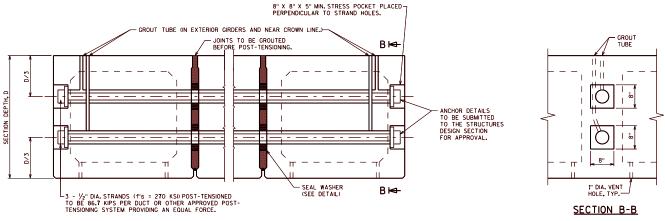








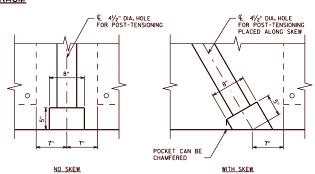






SEAL WASHER (MAY ALSO BE ROUND)

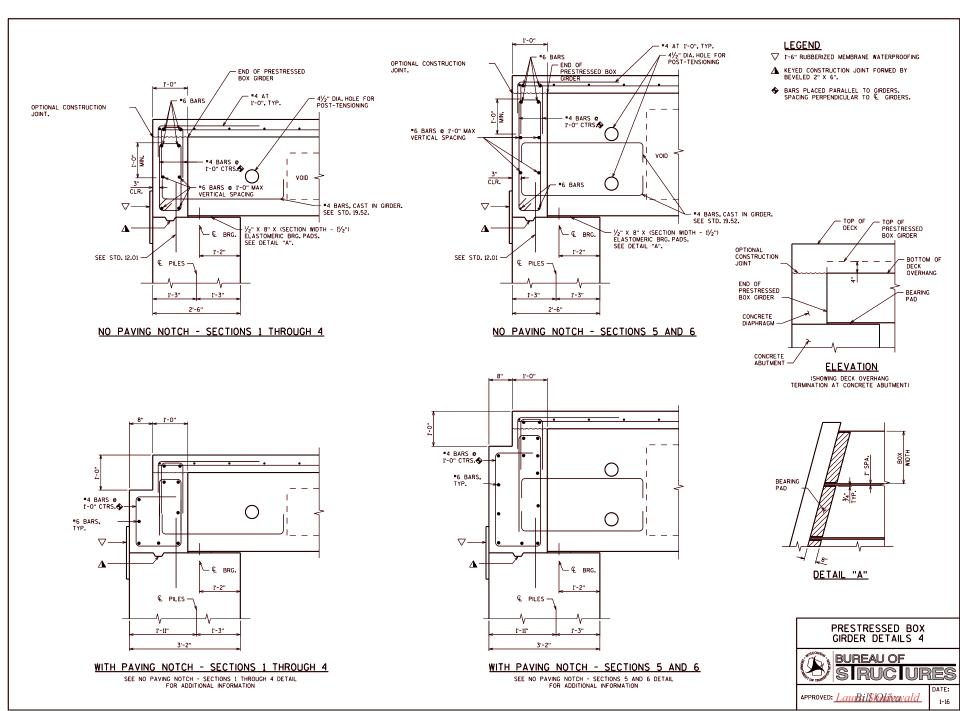
SPONGE NEOPRENE 31/4" MIN. THICK

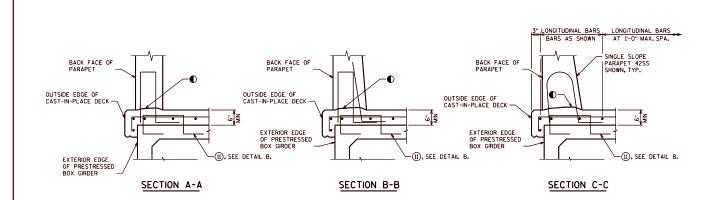


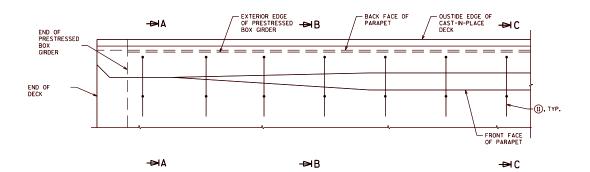
STRESS POCKET DETAIL

PRESTRESSED BOX GIRDER DETAILS 3

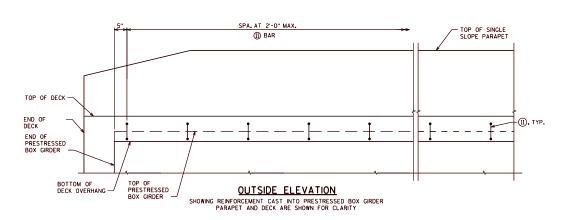


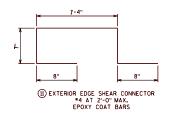


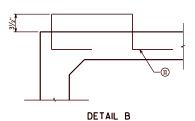




PLAN
SHOWING REINFORCEMENT CAST INTO PRESTRESSED BOX GIRDER
PARAPET AND DECK ARE SHOWN FOR CLARITY







LEGEND

CONST. JOINT - STRIKE OFF AS SHOWN.

NOTE

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

DESIGNER NOTES

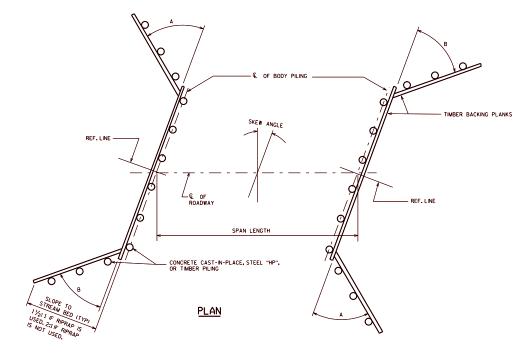
SEE CHAPTER 30 STANDARDS FOR SINGLE SLOPE PARAPET DETAILS.

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

PRESTRESSED BOX GIRDER DETAILS 5



APPROVED: LauBils Woldwowald



NOTES

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 BRODGE PLANK OR PRECAST CONCRETE PLANK IN LIEU OF TIMBER BACKED ABUTMENT PLANKING, SUBJECT TO APPROVAL BY THE ENGINEER.

wing CLEAT	
WING PLANKS	OUTSIDE EDGE OF SUPERSTRUCTURE
CLEAT - CUT TO FIT.	CONCRETE OR TIMBER.
%" DIA, BOLT & WASHER, BOLT TO EVERY OTHER BODY PLANK, (HARDWARE)	WORKING POINT
	<u> </u>
	BODY PLANKS
6" MIN. 2'-6"	21/2" DIA. SPLIT RING CONNECTOR.
MAX.	->

CORNER DETAIL	
---------------	--

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

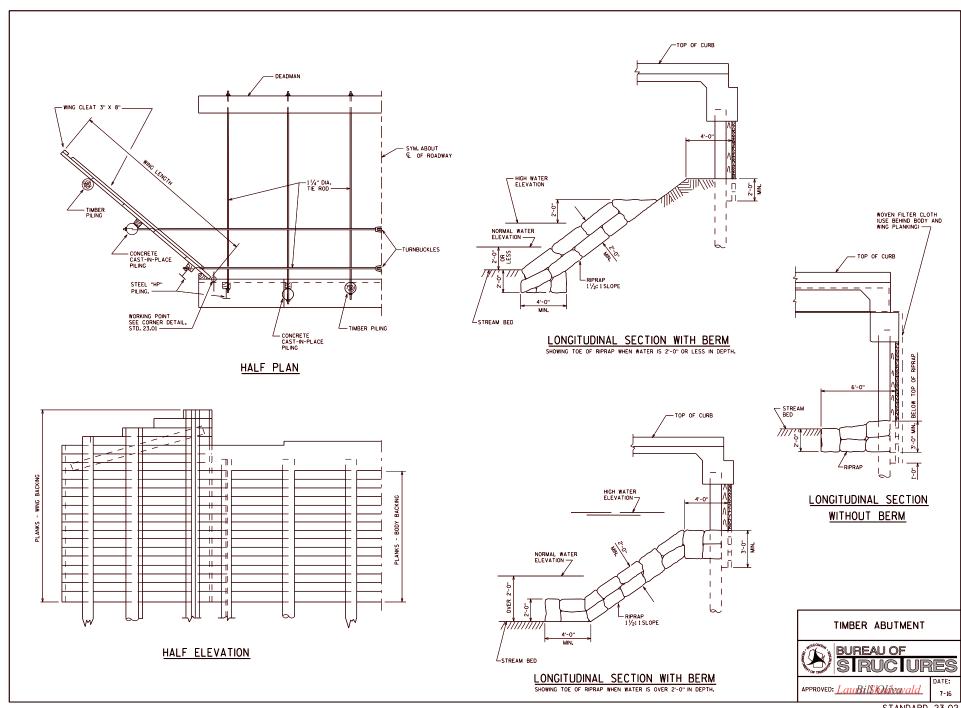
SECTION	MOMENT CAPACITY (INCH - KIPS/FT,)
10 GAGE (6' × 2') GRADE A * ARMCO	22.9 (fb = 18 K.S.I.)
7 GAGE (6' × 2') GRADE A * ARMCO	30.0 (f _b = 18 K.S.I.)

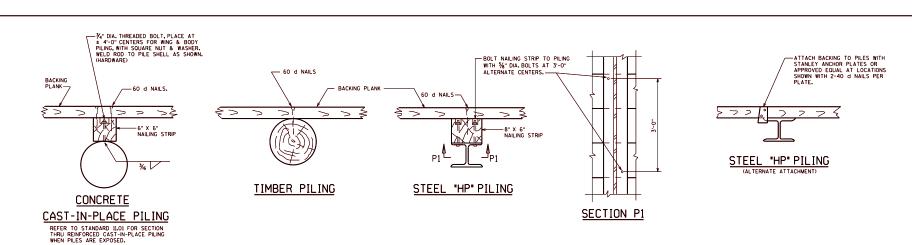
^{*}ASTM A446



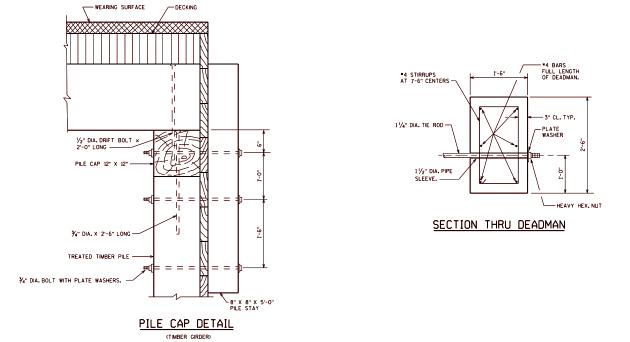


APPROVED: LauBils Woldward





BODY & WING PLANK CONNECTION DETAILS

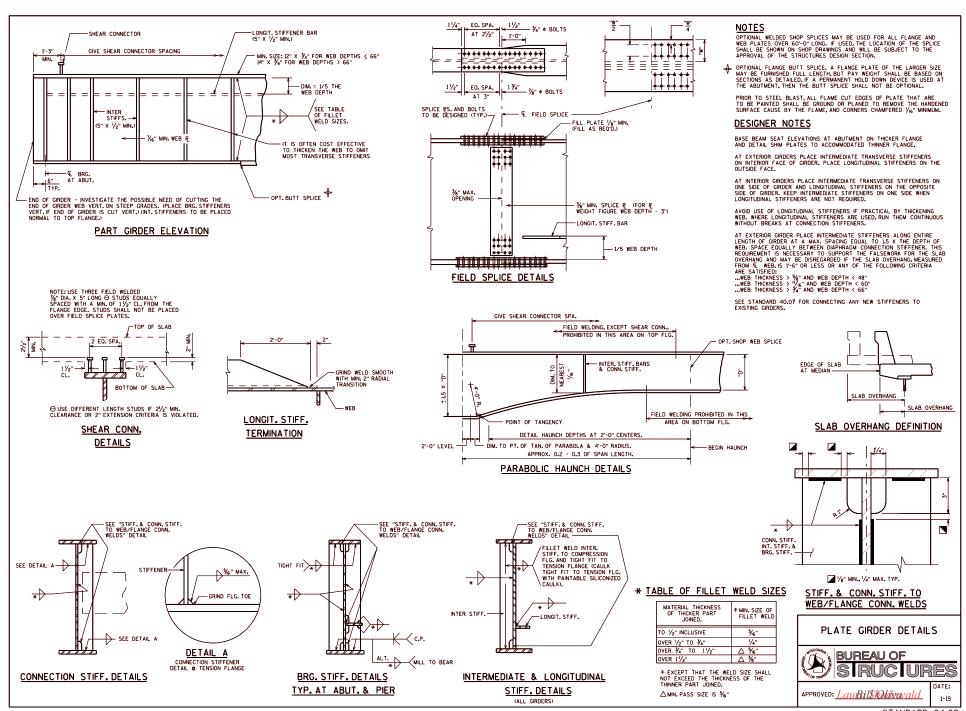


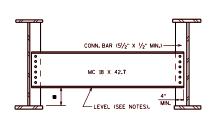
TIMBER ABUTMENT DETAILS

S RUC URES

BUREAU OF

APPROVED: LauBils Woldwovala





WEB PLATE < 48"

TYP. IN SPAN & AT PIER

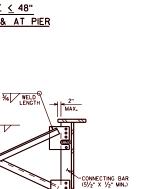
9 36 V

SEE TABLE "A" FOR MEMBER SIZE & CONN.-

LONGITUDINAL STIFFENER —

WELD LENGTH

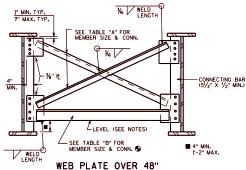
SLOT PLATE TO CLEAR LONGITUDINAL STIFFENER IF NECESSARY.



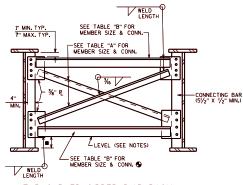
WEB PLATE OVER 48" WITH LONGITUDINAL STIFFENERS
TYP, IN SPAN & AT PIER

LEVEL (SEE NOTES)

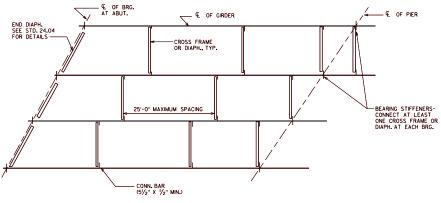
- SEE TABLE "B" FOR MEMBER SIZE & CONN. •



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



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



FRAMING PLAN FOR SKEW > 15°

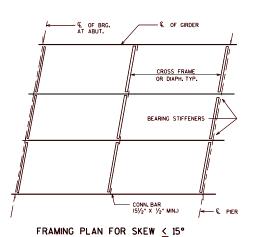
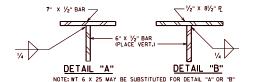


TABLE "A"

SIZE	MAX.LENGTH OF MEMBER	WELD LENGTH	NO. OF ¾" ¢ BOLTS	WEIGHT PER FT.		
L 31/2 X 31/2 X 5/6	21'-6"	9"	4	7.2*		
L4 X 4 X 1/6	25'-0"	11"	4	8.2*		
L 5 X 5 X 1/6	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.
L 5 X 5 X 1/6	11'-6"	1/4"	11"	4	10.3*
L 6 X 6 X 3/8	13'-6"	5/16"	13"	6	14.9
1/2" T SECTION SEE DETAIL "A"	17'-6"	5/16"	14"	7	16.6*
1/2" T SECTION SEE DETAIL "B"	22'-0"	3/8"	13"	7	18.5*



NOTES

ALL BOLTED CONNECTIONS SHALL BE FRICTION TYPE USING $\frac{1}{4}$ " ϕ 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.

HOLES IN CROSS FRAME CONNECTIONS MAY BE OVERSIZED & $^{15}\!/_{16}"$ DIA. IN 1PLY.

DESIGNER NOTES

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

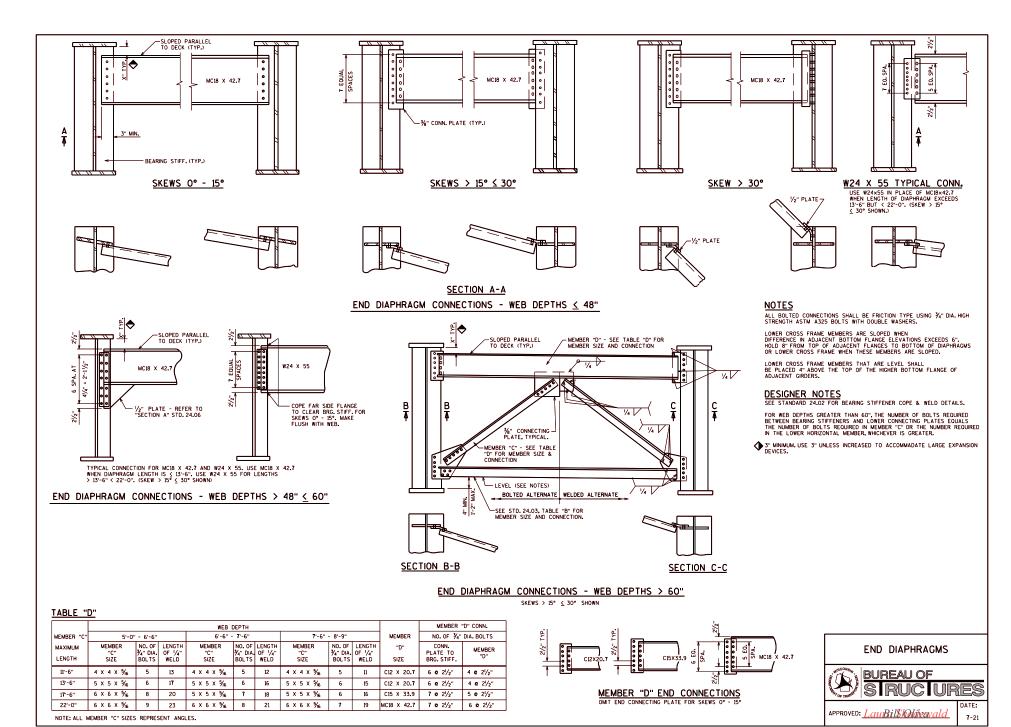
FOR SPANS OVER 200, THE CROSS FRAMES AT THE PIERS SHALL BE DESIGNED TO RESIST THE LATERAL LOADS THAT ARE TRANSFERRED TO THE PIERS.

♦ 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: LauBilSlodileowald



INTERMEDIATE DIAPHRAGM SIZES

	-	— 5" MIN, $ imes V_2$ " MIN, CONN, PLATI
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لے		9" MAX. 4" MIN.

33" W. GIRDER

ALL INTERMEDIATE CONNECTIONS											
GIRDER DEPTH	INTERMEDIATE DIAPHRAGMS										
36"	MC18 X 42.7										
33"	MC18 X 42.7										
30"	C15 X 33.9										
2 7 "	C15 X 33.9										
24"	C12 X 20.7										
21"	C10 X 15.3										
18"	C8 X 11.5										

DIAPHRAGMS SHALL BE HORIZONTAL EXCEPT WHEN THE DIFFERENCE IN ADJACENT GROER 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 $\frac{3}{4}$ $^{\circ}$ $^{\circ}$ HIGH STRENGTH ASTM A325 BOLTS.

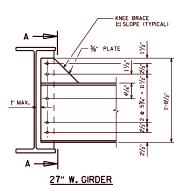
NOTES

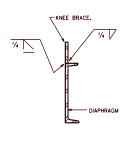
DESIGNER NOTES

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

36" W. GIRDER

— ½" PLATE

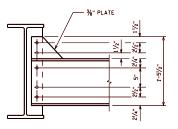


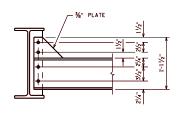


SECTION A

30" W. GIRDER

24" W. GIRDER



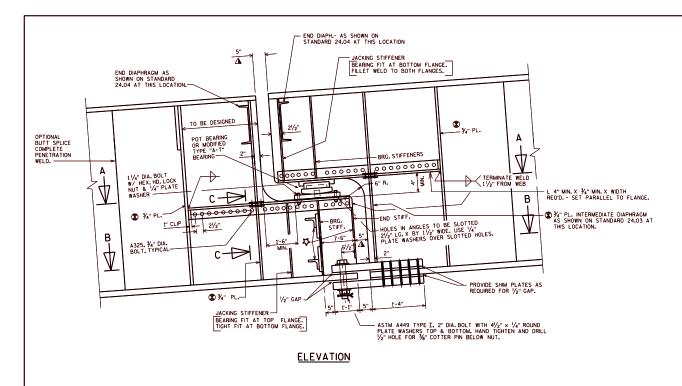


21" W. GIRDER

18" W. GIRDER

ROLLED GIRDER DIAPHRAGMS





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

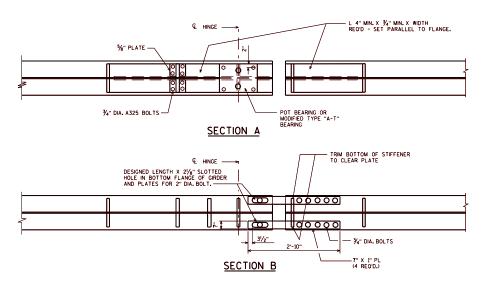
SIZE AND LENGTH OF ANGLES, NUMBER OF BOLTS THRU ANGLES, THICKNESS OF WEB PLATE, AND SIZE OF BEARING STIFFENERS AND JACKING STIFFENERS SHALL BE DETERMINED FROM AN ANALYSIS USING THE VERTICAL AND HORIZONTAL FORCES ACTING AT THE HINDE.

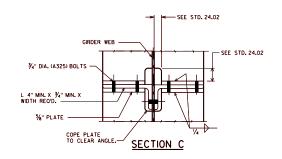
⚠ THE 5" OPENING BETWEEN GIRDER WEB AND FLANGE PLATES IS FOR FABRICATION ACTUAL OPENING IS BASED ON EXPANSION LENGTH AND TEMPERATURE.

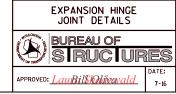
SLOTTED HOLES OF 6" IN THE FLANGES AND CONNECTING BARS WILL ACCOMMODATE A TOTAL TEMPERATURE MOVEMENT OF 8" (± 4" FROM 45° F). THE DESIGNER MAY NEED TO INCREASE OR DECREASE THE LENGTH OF THE SLOT TO MEET SPECIFIC JOB REQUIREMENTS.

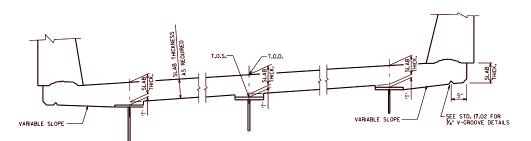
CROSS FRAME UNDER BRG. AND END STIFFENER IS ONLY REO'D. IF TOTAL WEB HEIGHT EXCEEDS 8'-O".

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



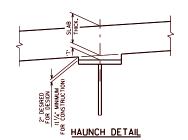






SECTION THRU SLAB

-SLAB THICKNESS AS SHOWN IN CHAPTER 17 OF BRIDGE MANUAL.



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 $\frac{y}{4}$ ", THE GIRDER SHALL BE CAMBERED TO REDUCE THE VARIATIONS IN HAUNCH THICKNESS.

NOTES

'T' = HAUNCH HEIGHT AT CENTERLINE OF GIRDER.

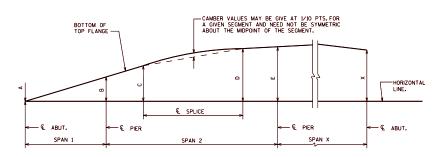
TO DETERMINE 'T': AFTER ALL STRUCTURAL STEEL HAS BEEN ERECTED, ELEVATIONS OF THE TOP FLANGES SHALL BE TAKEN AT CENTERLINE OF BEARINGS AND AT O.1 POINTS.

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

TREATMENT OF EXTERIOR GIRDER AT SIDEWALK OVERHANG

SEE STD. 17.02 FOR 34" V-GROOVE DETAILS-



BLOCKING DIAGRAM

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

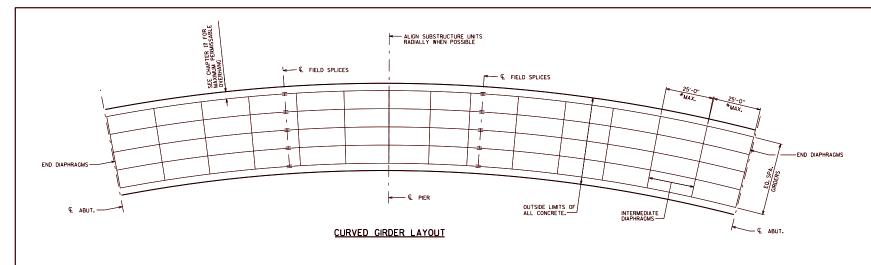
										H		
		W. ABUT.	0.1 SPAN	0.2 SPAN	0.3 SPAN		© PIER	€ SPLICE		L		€ ABUT.
GIRDER 1	T.O.D.	861.17	861.13	861.08	861.04		860.99					860.69
	T.0.S.	860.48					860.35	860.35				860.00
	T.O.D.	860.62	860.58	860.53	860.49 ∠	ے ح	860.45		4	75	7	860.16
GIRDER 2	T.0.S.	859.93					859.80	859.80				859.59
GIRDER X	T.O.D.											
	T.O.S.											

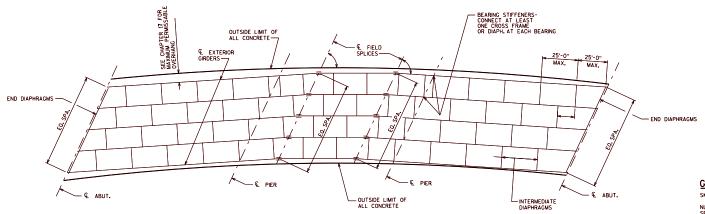
THESE ELEVATIONS ARE TO TOP OF STEEL (SPLICE AND COVER PLATE THICKNESS, IF APPLICABLE, ARE ACCOUNTED FOR AND THEY ARE FOR THE MATERIAL AS ERECTED. THE ELEVATION OF THE 10PD STEEL AT THE FIELD SPLICE POINTS SHALL BE CHECKED, AND CORRECTED, IF POSSIBLE, AFTER ERECTION AND BEFORE PERMANENTLY BOLTING THE DIAPHRAGMS IN PLACE.

BLOCKING & SLAB HAUNCH DETAILS



APPROVED: LauBils Woldwowald





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 $\mbox{\footnote{One of Substructure Units and $\mbox{\footnote{One of Splices}}$}$ 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 REO'D. FOR MORE SEVERE CURVATURES

GIRDER LAYOUT ON CURVE



APPROVED: Laskap & Bedkevald

(OPTIONAL OR REQUIRED) ** TRANSVERSE JOINT, TYP. INDICATES POUR NUMBER AND DIRECTION OF POUR S = TOTAL NUMBER OF SPANS L = LENGTH OF END SPAN n = INTERIOR SPAN END SPAN 0.575 L 0.425 L ABUT. PIER ABUT. IDEAL DECK POUR SEQUENCE (CONTINOUS STEEL GIRDER - 2 SPANS SHOWN) L (1- 0.35 n) L(1.35 n - 0.4) (1) L (1 - 0.35 n) 0.35nl L(n- 0.4) 0.4L ABUT. PIFR 1 PIFR 2 ABUT IDEAL DECK POUR SEQUENCE (CONTINOUS STEEL GIRDER - 3 SPANS SHOWN) NO. SPANS AT nL L(1-0.4 n) L (L4 n -0.4) (OPTIONAL OR REQUIRED) X TRANSVERSE JOINT, TYP. (1) 0.6 nL 0.6 nl L(1-0.4 n) 0.4 nL L(n-0.4) 0.4 L nΙ ABUT. PIER 1 PIER 2 PIER (X-1) PIER (X) ABUT. IDEAL DECK POUR SEQUENCE (CONTINOUS STEEL GIRDER - ANY NUMBER OF SPANS SHOWN) PLACE LONGITUDINAL PORTION OF CONSTRUCTION JOINT IN LINE WITH EDGE OF TRAFFIC LANE € OF PIER-FDGE OF SLAB b NOTE: STEP TRANSVERSE JOINT SO THAT "c", "b" OR "c" DOES NOT EXCEED 0.15 X (SPAN LENGTH), WHERE SPAN LENGTH IS FOR THE SPAN IN WHICH THE JOINT IS PLACED AS LOCATED ABOVE SKEWED 20° & UNDER SKEW OVER 20° PLAN VIEW - SHOWING PLACEMENT OF TRANSVERSE CONSTRUCTION JOINTS

IOTES

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

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 PREVIOUS POUR.

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. MOTE: REQUIRED WHEN THE STRUCTURES DESIGN SECTION.

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, VTOS, IN JURBAN AREAS AND < 300 CU, VTOS, IN JURBAN AREAS AND < 300 CU, VTOS, IN JURBAN AREAS STRUCTURES LOCATE THE TRANSVERSE JOINTS AT THE 0.6 POINT (CONCRETE IN 60% OF SPAN) AND FOR PRESTRESS GORTS AT THE 0.6 POINT (CONCRETE JOINTS NEAR THE 0.75 POINT, ICONCRETE IN TSX OF SPAN) CONSIDER CUTOFF POINTS OF CONTINUTY REPROFICIORS STEEL HERN LOCATING JOINT SET OF POINTS OF CONTINUTY REPROFICIORS STEEL HERN LOCATING JOINT ELECTROST STRUCTURES AND THE OFFICE OF THE STRUCTURES AND THE OFFICE OFFICE TOWN ARE INCLUMED BY IN SPAN HINGES OR LUNISLAL SPAN LENGTH RATIOS, CHECK WITH THE STRUCTURES DEVELOPMENT SECTION FOR ADDITIONAL INFORMATION.

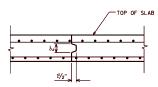
REQUIRED TRANSVERSE CONSTRUCTION JOINTS SHALL BE DETAILED ON THE PLANS ONLY WHEN REQUIRED BY DESIGN. SEQUENTAIL STAGES ARE DISCUSSED IN SECTION 24/12.2. ALL PLACEMENT REQUIREMENTS SHALL BE NOTED ON THE PLANS.

DETAIL TRANSVERSE CONSTRUCTION JOINTS 5'-0" FROM \P 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 NICHES FROM EDGE OF TOP FLANGE OF GRIDER.

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.

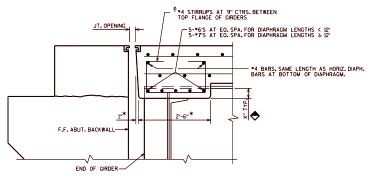


SECTION THRU TRANSVERSE
OR LONGITUDINAL JOINT

SLAB POURING SEQUENCE

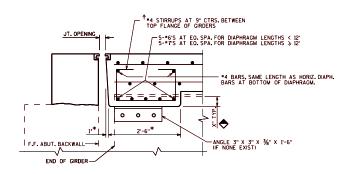


APPROVED: LauBils Waldwowald



SECTION THRU EXPANSION END

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



SHOWING EXISTING STEEL GIRDER WITHOUT EXISTING STEEL DIAPHRAGM

(SEE STD. 40.04 FOR ADDITIONAL DETAILS)

SECTION THRU EXPANSION END OF NEW DECK

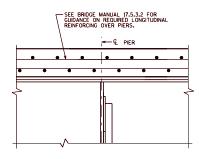
<u>NOTES</u>

FOR REHABILITATION PROJECTS:
DIAPHRAGM SUPPORT ANGLES SHALL BE ASTM A709 GRADE 36.
BOLTS ARE 47 DIA. ALL BOLTS, NUTS AND WASHERS SHALL BE
ASTM A325 TYPE 1.

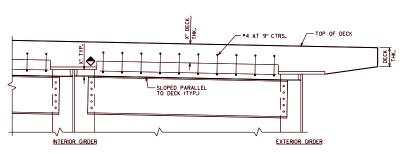
ALL SUPPORT ANGLES SHALL BE HOT-DIPPED GALYANZED.
ALL BOLTS, MUTS AND MASPES SHALL BE HOT-DIPPED GALYANZED
IN ACCORDANCE WITH ASTM ASS CLASS C. GALYANZED NUTS SHALL
BE TAPPED OVERSIZED IN ACCORDANCE WITH THE REQUIREMENTS OF
ASTM ASS3 AND SHALL MEET THE REQUIREMENTS OF SUPPLEMENTARY
REQUIREMENTS 10F ASTM ASS3, 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.



SECTION AT PIER



PART TRANSVERSE SECTION AT DIAPHRAGM EXPANSION END

DESIGNER NOTE

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

LEGEND

- † BARS PLACED PARALLEL TO GIRDERS. SPACING PERPENDICULAR TO € GIRDERS.
- * DIMENSION IS TAKEN NORMAL TO & ABUTMENT

STEEL GIRDER SLAB & SUPERSTRUCTURE DETAILS



APPROVED: LauBils Waldrewald

STANDARD 24.12

PLATE C LENGTH OF PLATE "C" Z Z FEET 10" 215 23/8" 10" 8" 13/4" 1'-7" 0.354 23/8" | 1'-0" 9" 13/4" 0.354 260 5" 1'-9" 12" 280 23/8" 1'-0" 10" 2%" 1'-9" 0.406 280 115%" 1'-2" 9" 13/4" 1'-11" 0.318 335 23/8" 1'-2" 11" 2%" F-11" 0.406 21/8" 385 5" 23/8" 1'-2" 1'-1" 1'-11" 0.448 23/8" 1'-2" 1'-3" 23/8" 2'-0" 410 5" 0.448 275 5" 11%" 1'-4" 8" 1¾" 2'-1" 330 5" 11%" 11-4" 10" 23%" 2'-1" 0.370 390 5" 23/8" 1'-4" 1'-0" 23/8" 2'-1" 0.406 465 5" 23/8" 1'-4" 1'-2" 21/8" 2'-2" 0.448 23/8" | 1'-4" | 1'-4" | 3%" 490 5" 2'-2" 325 5" 1156" 1'-6" 9" 13/4" 0.318 2'-3" 390 5" 11%" 1'-6" 11" 23%" 2'-3" 0.370 465 5" 23/8" 1'-6" 1'-1" 23/8" 2'-4" 0.448 23/8" 1'-6" 1'-2" 21/8" 2'-4" 0.448 495 5" 23/8" | 1'-6" | 1'-4" | 33/8" | 2'-4" | 0.490 115/6" 11-8" 9" 13/4" 2'-5" 0.318 5" 350 380 5" 11%" 1'-8" 10" 2%" 2'-5" 0.370 5" 23%" 1'-8" 1'-0" 23%" 2'-6" 460 530 23/8" | 1'-8" | 1'-2" | 23/8" | 2'-6" 600 5" 23%" 1'-8" 1'-4" 33%" 2'-6" 0.490 5" 23/8" 1'-8" 1'-6" 31/8" 2'-6" 0.531 405 5" 11%" 1'-10" 10" 23%" 2'-7" 490 5" 11%6" 1'-10" 1'-0" 23%" 2'-8" 0.370 565 5" 23%" 1-10" 1-2" 27%" 2'-8" 0.448 635 5" 23/8" 1-10" 1-4" 33/8" 2'-8" 0.490 705 5" 23/8" 1"-10" 1"-6" 33/8" 2"-8" 0.531 720 5" 2¾" 1-10" 1-8" 3¾" 2'-8" 0.531

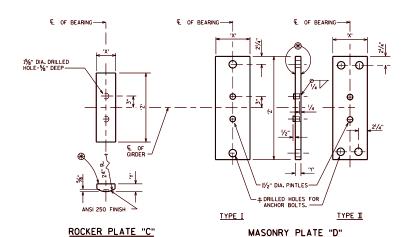
ANCHOR BOLT NOTES

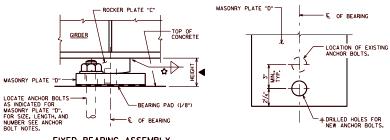
FOR SPAN LENGTHS UP TO 100'-0": USE A TYPE I MASONRY PLATE "D" WITH (2) - 11/4" DIA. x 1'-5" LONG ANCHOR BOLTS.

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

FOR SPAN LENGTHS GREATER THAN 150'-0": USE A TYPE II MASONRY PLATE "D" WITH (4) - $1^1\!\!/_2$ " DIA. x 1'-10" LONG ANCHOR BOLTS.

CHECK THAT ANCHOR BOLTS PROVIDE ADEQUATE HORIZONTAL CAPACITY.

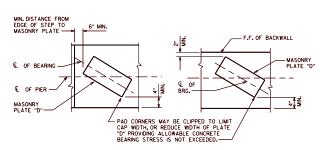




FIXED BEARING ASSEMBLY
(SEE "DESIGNER NOTES" FOR BEARING REPLACEMENTS)

MASONRY PLATE "D"
BEARING REPLACEMENTS

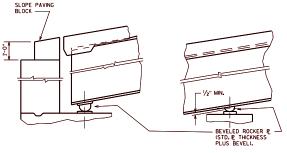
AT FIXED BRG.



AT SKEWED PIER

AT SKEWED ABUTMENTS

CLEARANCE DIAGRAM



AT EXPANSION BRG.

BEVELED ROCKERS WITH GRADES GREATER THAN 3%

BEARING NOTES

ALL BEARINGS ARE SYMMETRICAL ABOUT & OF GIRDER AND & 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 + 2½", 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-.-". EACH.

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

PROVIDE 1/8" 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 50, 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".

- \pm DRILLED HOLES FOR ANCHOR BOLTS IN MASONRY PLATE "D" SHALL HAVE A DIAMETER $3\!\!\!/\!\!\!/$ 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 1/8" 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". SEE STANDARD 40.08 FOR DETAILS.

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

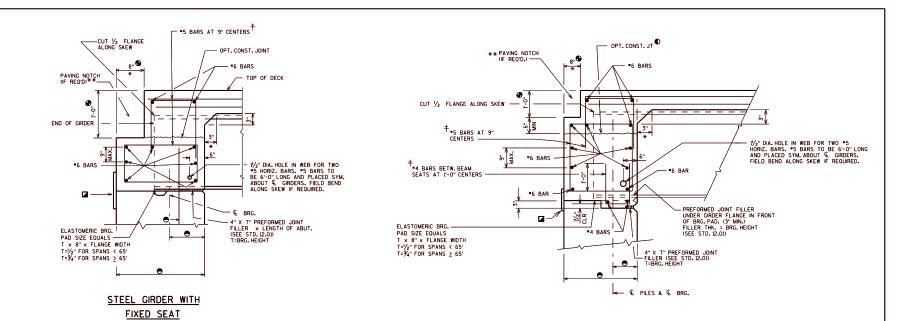
THE VALUES IN THE TABLES ARE THE BEARING CAPACITIES FOR "TOTAL LOAD" (DC + DW + (LL + IM)).

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

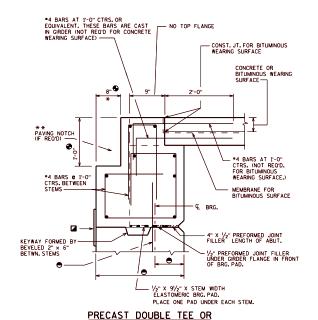




APPROVED: <u>LawBilSWaldrowald</u>



STEEL GIRDER WITH SEMI-EXPANSION SEAT



MULTI-STEM SECTION

NOTES

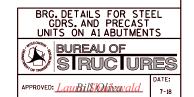
FOR SKEWED STRUCTURES CAST END OF PRECAST TEE ALONG SKEW.

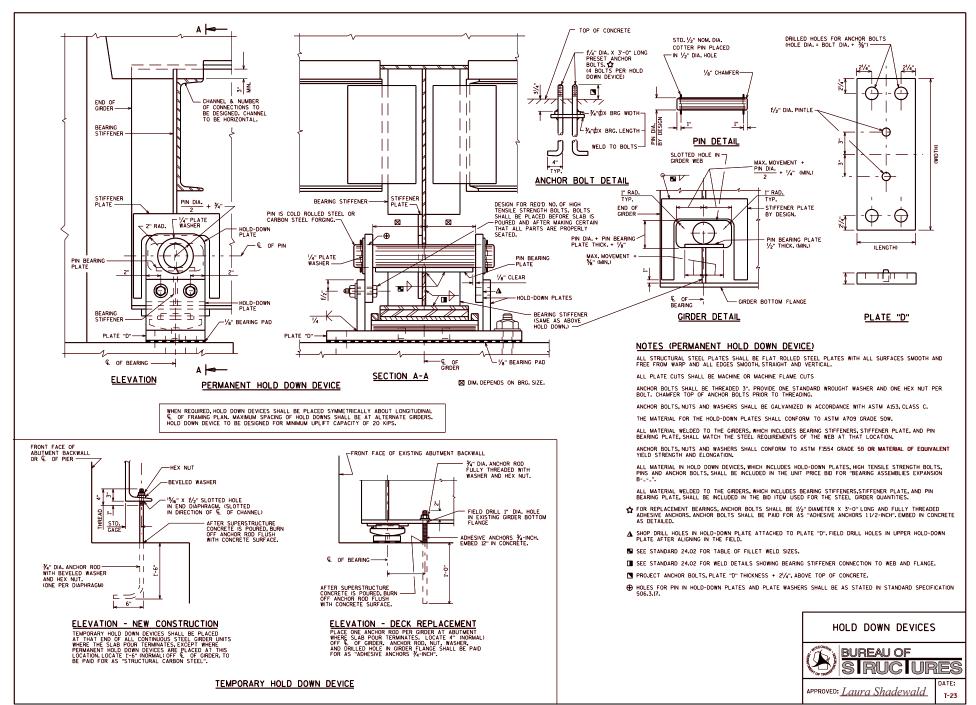
- * DIMENSION IS TAKEN NORMAL TO & SUBSTRUCTURE
- 1'-6" RUBBERIZED MEMBRANE WATERPROOFING
- $\ \ +\ \$ BARS PLACED PARALLEL TO GIRDERS. SPACING PERPENDICULAR TO $\ \ \$ GIRDERS.

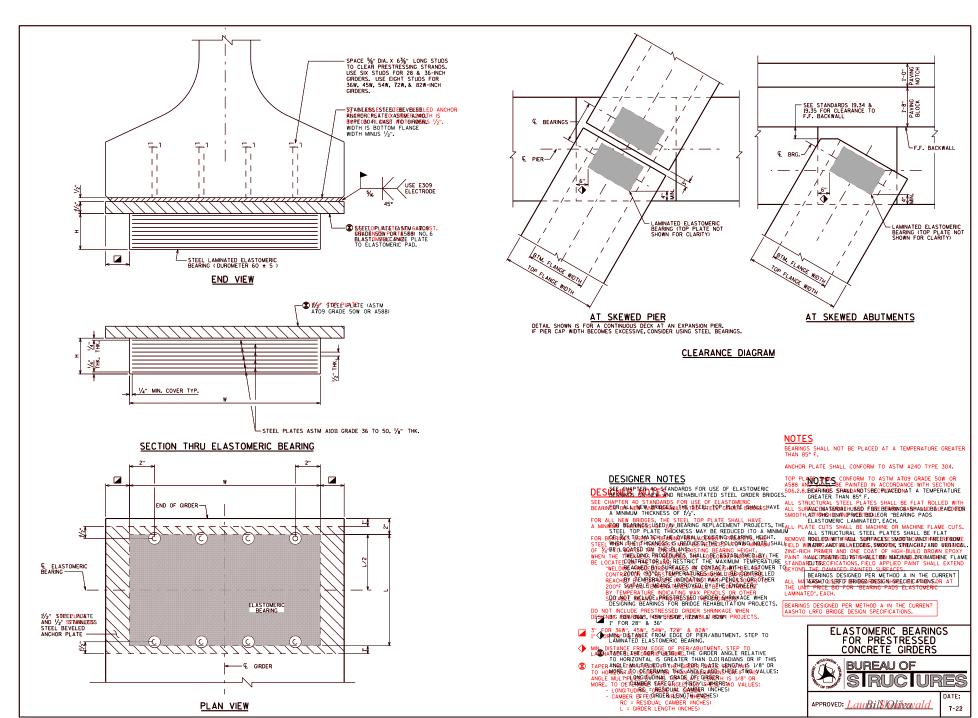
DESIGNER NOTES

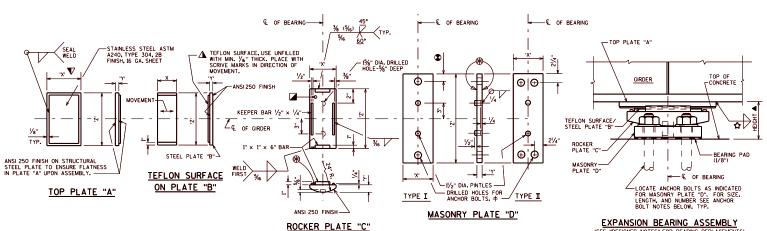
SEE STANDARD 19.55 FOR PRESTRESSED BOX GIRDER BEARING DETAILS.

- THE USE OF THIS OPT. CONST. JOINT IS NOT RECOMMENDED FOR SKEWS OVER IS 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









EXPANSION BEARING

10" BEARING

TOTAL LOAD	PLA	TE A	4	PL	PLATE B PLATE C PLATE D					D	HEIGHT		
(KIPS)	Х	Υ	Z	х	Υ	Z	х	Υ	Z	Х	Υ	Z	FEET
100	9"	5⁄8"	10"	5"	1/2"	10"	7"	1¾6 "	1'-0'/4"	8"	11/2"	1'-8"	0.360
180	1-1"	%"	10"	9"	1/2"	10"	11"	2¾"	1'-0'/4"	8"	11/2"	1'-8"	0.438
260	1'-5"	%"	10"	r-r	1/2"	10"	1'-3"	3%"	1'-0'/4"	11"	2"	1'-8"	0.604

14" BEARING

TOTAL	PLAT	PLATE A PLATE B					PI	LATE	С	PI	HEIGHT		
(KIPS)	x	Υ	Z	х	Υ	Z	x	Υ	Z	х	Υ	Z	FEET
210	11"	%"	1'-2"	7"	1/2"	1'-2"	9"	115/16"	1-41/4"	8"	11/2"	2'-0"	0.401
375	1'-5"	%"	1'-2"	1'-1"	1/2"	1'-2"	1'-3"	3%"	1'-4'/4"	1'-2"	2 1/8"	2'-0"	0.677
500	1'-9"	%"	1'-2"	1'-5"	1/2"	1'-2"	1'-7"	41/8"	1-41/4"	1'-5"	3%"	2"-1"	0.802

18" BEARING

TOTAL					ATE	В	PLATE C			PL	HEIGHT		
(KIPS)	х	Υ	z	х	Υ	Z	x	Υ	Z	х	Υ	Z	FEET
280	11"	%"	1'-6"	7"	1/2"	1'-6"	9"	115/16"	1'-8'/4"	9"	2"	2'-4"	0.443
360	r-r	%"	1'-6"	9"	1/2"	1'-6"	11"	23/8"	1'-8'/4"	11"	2"	2'-4"	0.479
600	1'-7"	%"	1'-6"	1'-3"	1/2"	1'-6"	1'-5"	3%"	1'-8'/4"	1'-5"	3¾"	2"-5"	0.719
650	r-1r	%"	1'-6"	1'-7"	1/2"	1'-6"	1'-9"	4%"	1'-8'/4"	1'-10"	31/8"	2'-5"	0.844

12" BEARING

TOTAL LOAD	PLATE A			PLATE B			PLATE C			PLATE D			HEIGHT
(KIPS)	х	Y	Z	х	Υ	Z	х	Υ	Z	x	Υ	Z	FEET
125	9"	%"	1'-0"	5"	1/2"	1'-0"	7"	11/16"	1'-2'/4"	8"	11/2"	1'-10"	0.360
175	11"	%°	1'-0"	7"	1/2"	1'-0"	9"	115% "	1'-2'/4"	8"	11/2"	1'-10"	0.401
275	1'-3"	5 ₈ "	1'-0"	11"	1/2"	1'-0"	r-r	2%"	1'-2'/4"	11"	2"	1'-10"	0.521

16" BEARING

TOTAL	Pl	ATE	Α	PLATE B			PLATE C			PLATE D			HEIGHT	
(KIPS)	х	Υ	Z	х	Υ	Z	х	Y	Z	х	Y	Z	FEET	ı
245	11"	%"	1'-4"	7"	1/2"	1'-4"	9"	115%;"	1'-61/4"	8	11/2"	2'-2"	0.401	
370	1'-3"	%"	1'-4"	11"	½ "	1'-4"	1'-1"	2%"	1'-6'/4"	1'-0"	23/8"	2'-3"	0.552	
525	1-7"	%"	1'-4"	1'-3"	1/2"	1'-4"	1'-5"	3%"	1'-6'/4"	1'-4"	3¾"	2'-3"	0.719	
575	1'-9"	%"	1'-4"	1'-5"	1/2"	1'-4"	1'-7"	4%"	1'-6'/4"	1'-6"	3%"	2'-3"	0.844	

20" BEARING

	TOTAL LOAD	PLATE A			PLATE B			PLATE C			PLATE D			HEIGHT
	(KIPS)	х	Y	Z	х	Υ	Z	x	Υ	Z	х	Y	Z	FEET
	225	9"	5∕8"	1'-8"	5"	1/2"	1'-8"	7"	1¾6"	1'-10'/4"	8"	11/2"	2'-6"	0.360
Γ	315	11"	%"	1'-8"	7"	1/2"	1'-8"	9"	115% "	1'-10'/4"	9"	2"	2'-6"	0.443
	495	1'-3"	%"	1'-8"	11"	1/2"	1'-8"	1'-1"	2%"	1'-10'/4"	1'-1"	2%"	2'-7"	0.594
	675	1'-7"	%"	1'-8"	1'-3"	1/2"	1'-8"	1'-5"	3%"	1'-10'/4"	1'-6"	3%"	2'-7"	0.760
	705	r-11"	%"	1'-8"	1'-7"	1/2"	1'-8"	1'-9"	4%"	1'-10'/4"	r-1r	3%"	2'-7"	0.844

BEARING NOTES

ALL BEARINGS ARE SYMMETRICAL ABOUT \P OF GIRDER AND \P OF BEARING.

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

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

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

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

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

DIMENSION IS 2" WHEN 11/4" DIA. ANCHOR BOLTS ARE USED AND 21/4" WHEN 11/2" DIA. ANCHOR BOLTS ARE USED.

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

CHAMFER ANCHOR BOLTS PRIOR TO THREADING.

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

ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS.

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 $\slash\!\!/_8"$ 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 + 21/4", ABOVE TOP OF CONCRETE.

CHAMFER TOP OF PINTLES 1/8". DRILL HOLES FOR ALL PINTLES IN MASONRY PLATE "D" FOR A DRIVING FIT.

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

ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM F1554 GRADE 50, OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

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

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

A 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 3/6" LARGER THAN ANCHOR BOLT.

AT INSTALLATION, ENSURE STAINLESS STEEL SLIDING FACE OF THE UPPER ELEMENT AND THE TEE 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.

▼ 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 CHIRDWISE.

🏠 FOR WELD SIZE, REFER TO STANDARD 24.02.

BOLT CLEARANCE INFORMATION.

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

(SEE "DESIGNER NOTES" FOR BEARING REPLACEMENTS)

HEIGHT OF BEARINGS GIVEN IN TABLES INCLUDES 1/6" BEARING PAD, 16 GAGE STAINLESS STEEL SHEET AND 1/6" TEFLON SURFACE.

DETAIL SHIM PLATES AS DESCRIBED IN NOTES ON STANDARD 24.02.

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

AT ABUTMENTS, WHEN THE 'X' DIMENSION OF PLATE "A" EXCEEDS 11", INCREASE STANDARD DISTANCE FROM ${\mathfrak C}$ OF BEARING TO END OF GROER.

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

FOR BEARING REPLACEMENTS, SEE STD. 27.02 FOR MINIMUM ANCHOR

CALCULATE THE REACTIONS AT THE BEARINGS DUE TO "TOTAL LOADS" AND ALSO "DEAD LOADS" ONLY, USE THE ASHTO LEAPS DERVICE I LOAD COMBINATION. CONSIDER ONLY DEAD LOAD (DC + DW) AND HL-93 LIVE LOADS (LL), INCLUDING A 332 DYNAMIC LOAD ALLOWANCE (M).

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 LOAD" REACTION.

ANCHOR BOLT NOTES

DESIGNER NOTES

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

FOR SPAN LENGTHS FROM 100'-0" UP TO 150'-0": USE A TYPE I MASONRY PLATE "D" WITH (2) - 11/2" DIA. X 1'-10" LONG ANCHOR BOLTS.

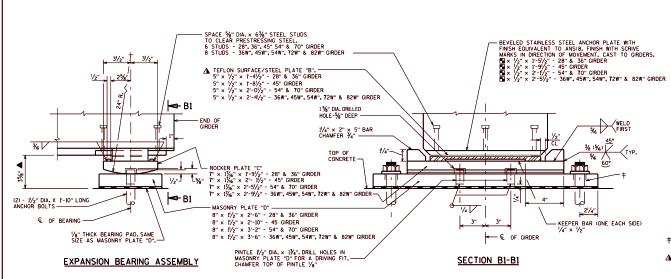
FOR SPAN LENGTHS GREATER THAN 150'-0": USE A TYPE I MASONRY PLATE "D" WITH (4) - 1/2" DIA. X 1'-10" LONG

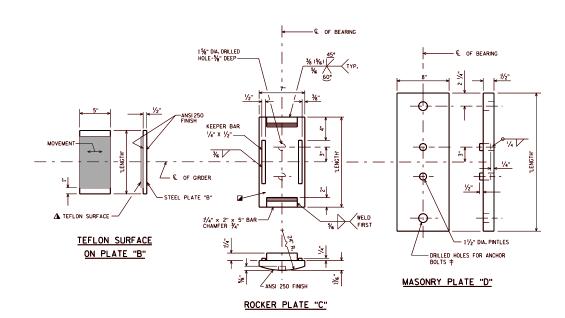
CHECK THAT ANCHOR BOLTS PROVIDE ADEQUATE HORIZONTAL CAPACITY.

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



APPROVED: <u>LauBil\$1601abeovalo</u>





EXPANSION BEARING

BEARING NOTES

ALL BEARINGS ARE SYMMETRICAL ABOUT € OF GIRDER AND € 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 50, 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 + 21/4", ABOVE TOP OF CONCRETE.

CHAMFER ANCHOR BOLTS PRIOR TO THREADING.

MASONRY PLATE "D", ROCKER PLATE "C", ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM AIS3, CLASS "C". STEEL PLATE "B" SHALL BE SHOP PANIED, DO NOT PAINT TEFLON SURFACE.

ALL MATERIAL IN "STEEL BEARINGS FOR PRESTRESSED CONCRETE GIRDERS", INCLUDING BEARING PADS, SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "BEARING ASSEMBLIES EXPANSION B---", EACH.

- † DRILLED HOLES FOR ANCHOR BOLTS IN MASONRY PLATE "D" SHALL HAVE A DIAMETER %" LARGER THAN ANCHOR BOLT.
- Δ TEFLON SURFACE, USE UNFILLED WITH MINIMUM $/\!/_{6}^{\circ}$ THICKNESS, PLACE WITH SCRIVE MARKS IN DIRECTION OF MOVEMENT. BOND STEEL PLATE "B" AND TEFLON WITH ADHESIVE MATERIAL MEETING THE REQUIREMENTS FOUND IN THE STANDARD SPECIFICATION.
- ☐ PROVIDE A METHOD FOR HANDLING ROCKER PLATE "C" DURING GALVANIZING.

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

DESIGNER NOTES

IF ALL BEARINGS AT A GIVEN SUBSTRUCTURE UNIT ARE FIXED, UTILIZE $\frac{1}{2}$ " THICK ELASTOMERIC BEARING PADS AND FULL-DEPTH CONCRETE DIAPHRAGMS.

FOR EXPANSION BEARINGS, USE LAMINATED ELASTOMERIC BEARINGS WHENEVER POSSIBLE.

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

HEIGHT OF BEARING SHOWN IN "EXPANSION BEARING ASSEMBLY" INCLUDES $1\!\!/_8$ BEARING PAD AND $1\!\!/_{16}$ TEFLON SURFACE.

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

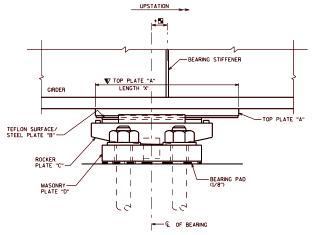
CALCULATE THE REACTIONS AT THE BEARINGS DUE TO "TOTAL LOADS" AND ALSO "DEAD LOADS" ONLY, USE THE AGSHTO LRFD SERVICE I LOAD COMBINATION, AND CHECK TO SEE IF THE REACTIONS EXCEED THE BEARING CAPACITES IN THE TABLE BELOW. CONSIDER ONLY DEAD LOAD (DC + DW) AND HL-93 LIVE LOADS (LL), INCLUDING A 33% DYNAMIC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

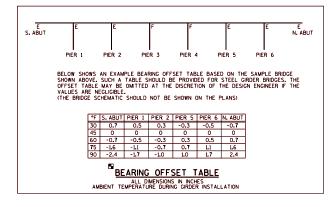
IF EITHER REACTION EXCEEDS ITS CORRESPONDING BEARING CAPACITY, THE BEARING DETAILS AS SHOWN ON THIS STANDARD MUST BE MODIFIED TO INCREASE THE BEARING CAPACITY, IF BEARING DETAILS ARE CHANGED AND ANY PLATE HAS A THICKNESS GREATER THAN 2", THEN PROVIDE AN ANSIZ50 FINISH TO TOP AND BOTTOM SURFACE OF THESE PLATES.

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



APPROVED: <u>LauBilSiOdaleovald</u>





EXPANSION BEARING ASSEMBLY (SHOW ON PLANS)

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

FOR PRESTRESSED GROER 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":

- 1/2 TEFLON PLATE "B" LENGTH 'X'

 + THERMAL MOVEMENT (USE 60-(-30)=90 DEGREES)

 + I" CONSTRUCTION TOLERANCE
- = 1/2 TOP PLATE "A" LENGTH (DOUBLE THIS FOR PLATE "A" LENGTH)

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

- PROCEDURE FOR SIZING ANCHOR PLATE:

 2/2 INCHES = 1/2 TEFLON PLATE LENGTH

 + THERMAL MOVEMENT (USE 60-5=55 DEGREES)

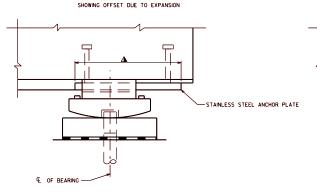
 + SHRINKAGE = 0.0003'/'

 + I" CONSTRUCTION TOLERANCE

- = 1/2 ANCHOR PLATE LENGTH (DOUBLE THIS FOR ANCHOR 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 LO, WITH THE "CONSTRUCTION TOLERANCE BEING USED IN LIEU OF THE HIGHER LOAD FACTOR.

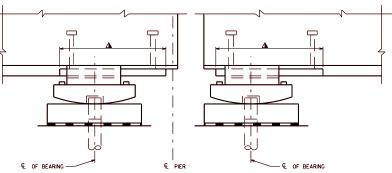
THE 90 DEGREE TEMPERATURE RANGE FOR STEEL BEARINGS, BASED ON A 60 DEGREE SETTING TEMPERATURE, IS SLIGHTLY CONSERVATIVE IF THE BEARING OFFSET TABLE IS UTILIZED, SINCE AT 45 DEGREES THE OFFSET WOULD BE ZERO.



EXPANSION BEARING AT ABUTMENT

PRESTRESSED CONCRETE GIRDER
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)



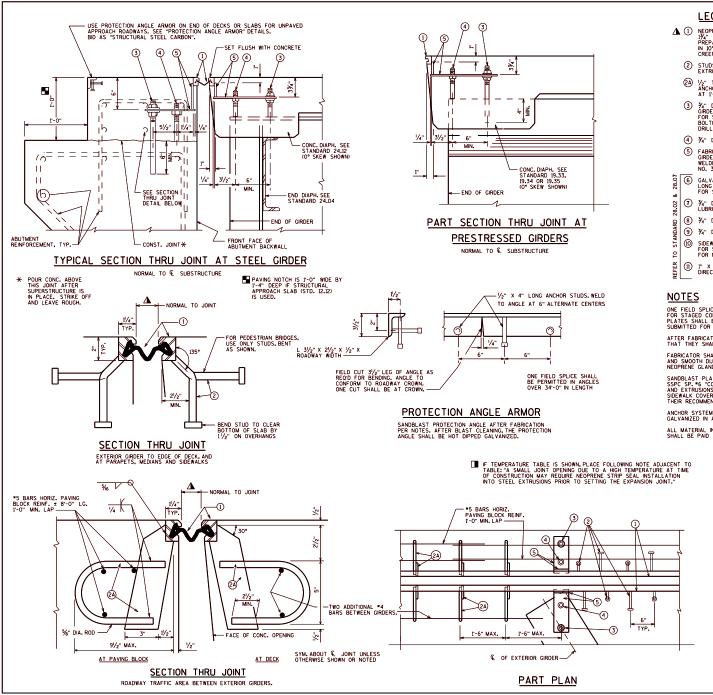
SHOWING OFFSET DUE TO EXPANSION OR CONTRACTION

STEEL EXPANSION BEARING DETAILS



APPROVED: LauBilSl@dileowale

STANDARD 27.10



LEGEND

- ⚠ ① NEOPRENE STRIP SEAL (.-INCH) AND STEEL EXTRUSIONS. SET JOINT OPENING AT 13/4" WHEN EXPANSION LENGTH < 230-0". WHEN EXPANSION LENGTH > 230-0". PREPARE A TEMPERATURE TABLE SHOWING JOINT OPENINGS FROM 5'F TO 85'F IN 10'F INCREMENTS. ACCOUNT FOR PRESTRESSED GRIDER SHRINKAGE DUE TO CREEP WHEN DETERMINING THIS TABLE. JOINT OPENINGS GIVEN NORMAL TO JOINT.
 - 2 STUDS %" DIA. X 6%" LONG AT 6" ALTERNATE CENTERS. WELD TO EXTRUSIONS AND BEND AS SHOWN AFTER WELDING.
 - (2A) 1/2" THICK ANCHOR PLATE WITH 5%" 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 € OF GIRDER. FOR STEEL GIRDERS, WELD THREADED ROD TO TOP FLANGE OR ATTACH BY BOLTING THRU FLANGE. ON ABUTINENT SIGNE, GROUT THREADED ROD INTO FIELD DRILLED HOLES IN ABUTINENT BACKWALL AS SHOWN.
 - 4 34" DIA, THREADED ROD WITH NUT, TACK WELD NUT TO NO. 5.
 - 5 FABRICATE SUPPORT FROM 3" X 1/2" BAR AS SHOWN OR EQUIVALENT, ONE PER CIPGER FOR SIDE. SHOP OR FIELD WELD TO NO. 1. IF FIELD WELDED, COVER WELDED AREAS WITH EPOXY-COATING MATERIAL. PROVIDE 1/2" DIA. HOLE FOR NO. 3 AND 1" DIA. HOLE FOR NO. 45
- G GALVANIZED PLATE %" 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 SLOPEL PACE PARAPET. SEE STANDARD 28.07.
- (8) 34" DIA. X 4" GALVANIZED HEX HEAD BOLT, BEND 45°.
- (9) 3/4" DIA. X 21/4" GALVANIZED THREADED COUPLING.
- (iii) SIDEWALK COVER PLATE 3/6" X 12"-0" WIDE FOR SKEWS TO 45" AND 3"-0" WIDE FOR SKEWS TO 45" AND 45"
- (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 FOR STAGED CONSTRUCTION, HANDLING OR GALVANIZING REQUIREMENTS, IF USED, ANCHOR PLATES SHALL BE PROVIDED 3" FROM EACH JOE OF THE FIELD SPLICE DETAILS SHALL BE SUBMITTED FOR APPROVAL NO SPLICING PERMITTED IN NEOPRENE STRIP SEAL.

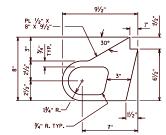
AFTER FABRICATION, BUT BEFORE SHIPMENT, STRAIGHTEN STEEL EXTRUSIONS SUCH THAT THEY SHALL BE FREE FROM WARP, TWIST AND SWEEP.

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

SANDBLAST PLATES, SUPPORTS AND EXTRUSIONS AFTER FABRICATION IN ACCORDANCE WITH SPEC SP. "6 "COMMERCIAL BLAST CLEANING", AFTER BLAST CLEANING, THE FLATES, SUPPORTS AND EXTRUSIONS SHALL BE HOT DIPPED GALVANAZED. SLP-RESISTANT SUFFACE IS APPLIED TO SIDEMALK COVER PLATES BY THE MANUFACTURER AND THEN HOT DIPPED GALVANIZED TO THER RECOMMENDATIONS TO MAINTAIN THE INTEGRIT 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.

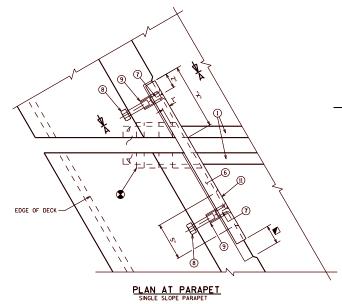
ALL MATERIAL IN THE EXPANSION JOINT ASSEMBLY, INCLUDING ANCHOR STUDS AND HARDWARE SHALL BE PAID AT THE UNIT PRICE BID FOR "EXPANSION DEVICE", LF.

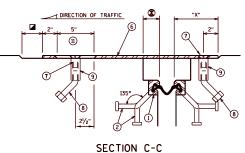


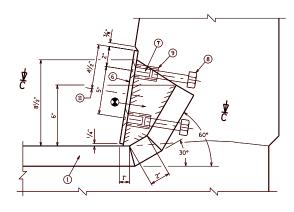
ALTERNATE STRIP SEAL ANCHOR



APPROVED: <u>Laura Shadewald</u>

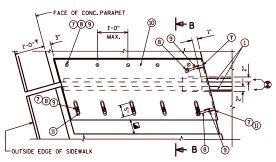






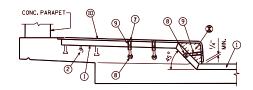
SECTION A-A
SINGLE SLOPE PARAPET

"X" - \	/ALUES IN	INCHES				ι	JSE "X" =	6½" F0F	R O° SKEN	V			
SKEW	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°
RHF	61/2	61/2	61/2	61/2	61/2	61/2	61/2	61/2	61/2	7	7	71/2	8
LHF	7	71/2	8	81/2	9	91/2	101/2	11	111/2	13	131/2	141/2	151/2

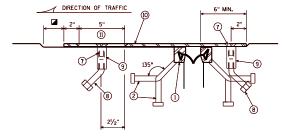


PLAN AT SIDEWALK

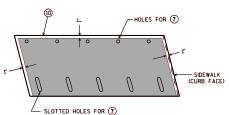
† 1'-2" WHEN "VERTICAL FACE PARAPET TYPE 'TX'IS USED



SECTION AT SIDEWALK



SECTION B-B



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).

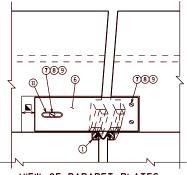
DESIGNER NOTES

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.

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

APPROVED SLIP-RESISTA	NT APPLIED SURFACES FOR	STEEL PLATES
PRODUCT	MANUFACTURER	CONTACT AT
SLIPNOT GRADE 2, STEEL	W.S. MOLNAR COMPANY	1-800-SLIPNOT
ALGRIP, STEEL	ROSS TECHNOLOGY CORP.	1-800-345-8170



VIEW OF PARAPET PLATES

FROM ROADWAY

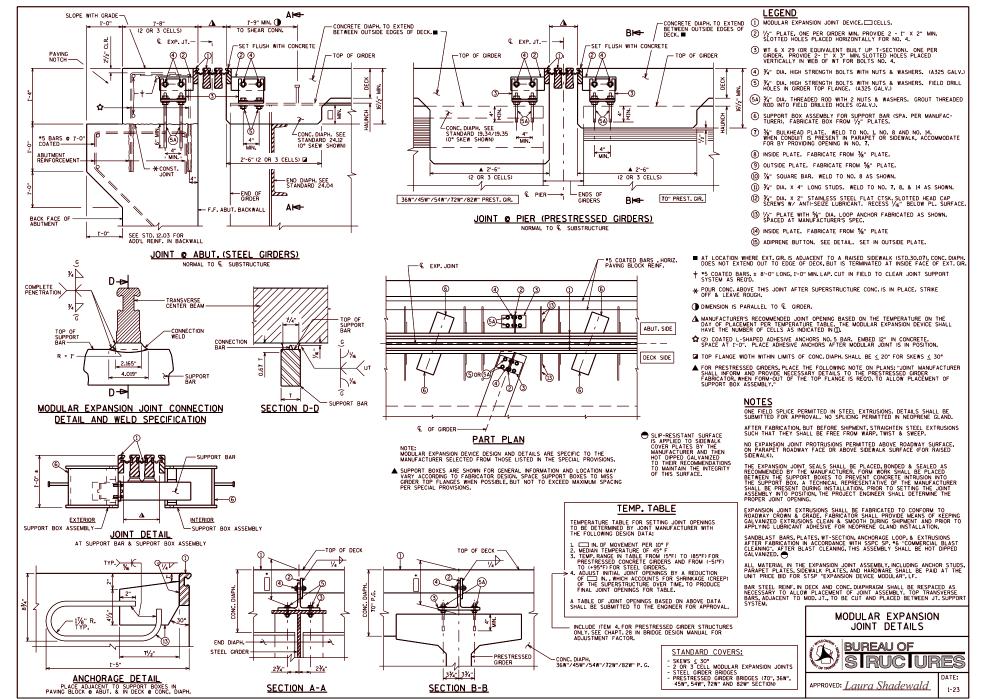
SINGLE SLOPE PARAPET

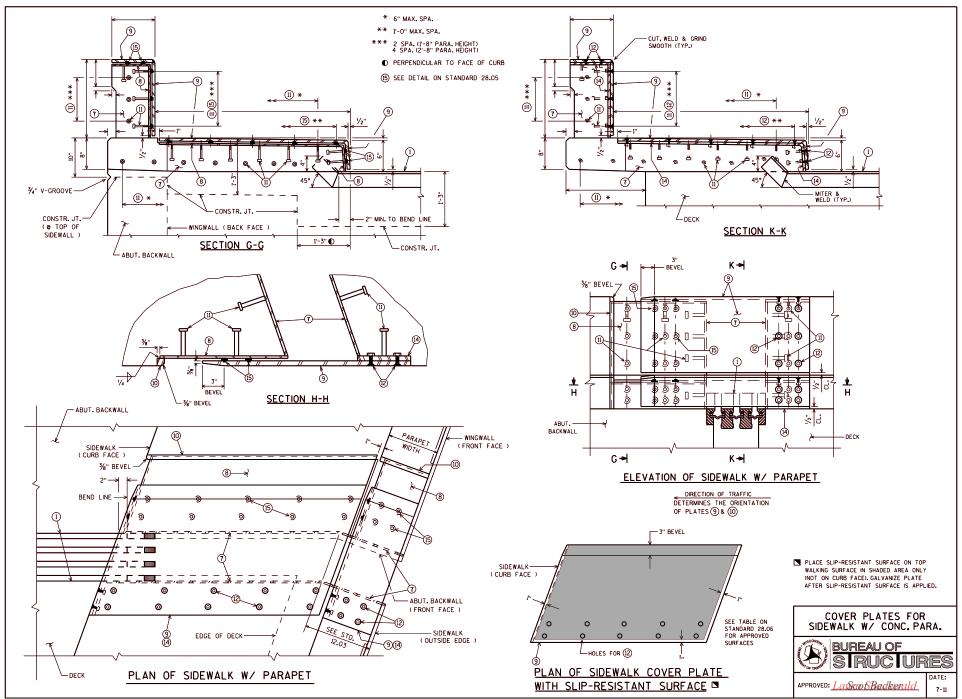
- BLOCK OUT CONCRETE 2" EACH SIDE OF JOINT OPENING
- JOINT OPENING DIM. ALONG SKEW PLUS 1/2"

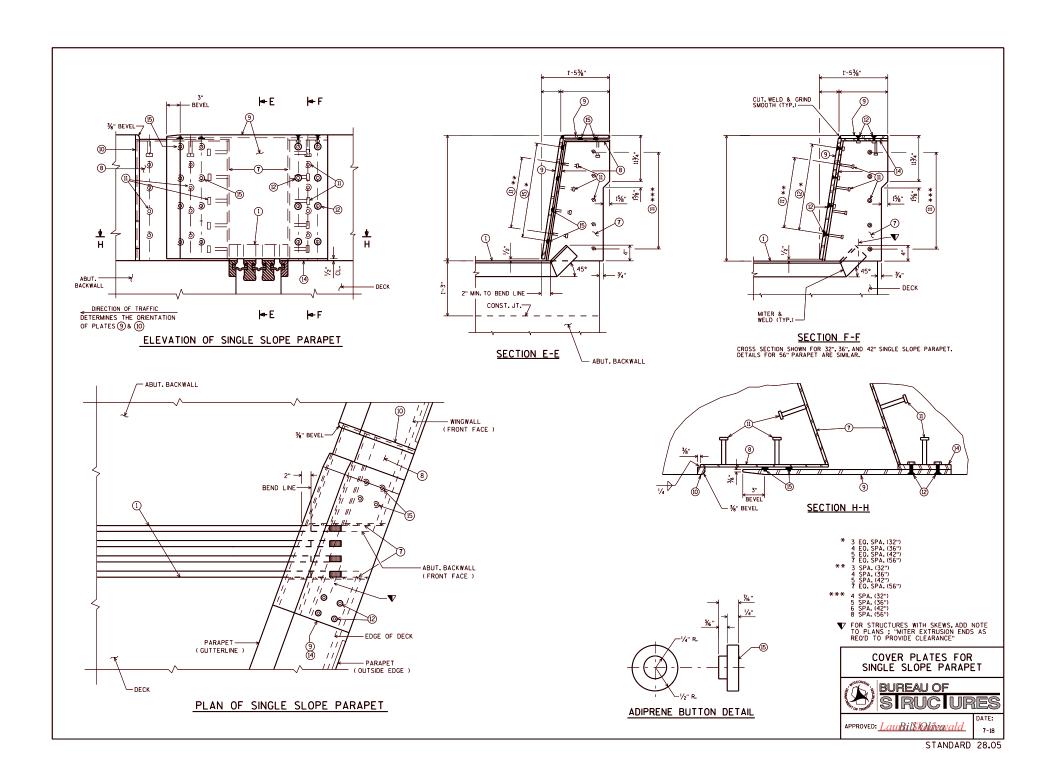
STRIP SEAL COVER PLATES SINGLE SLOPE PARA./SDWK.

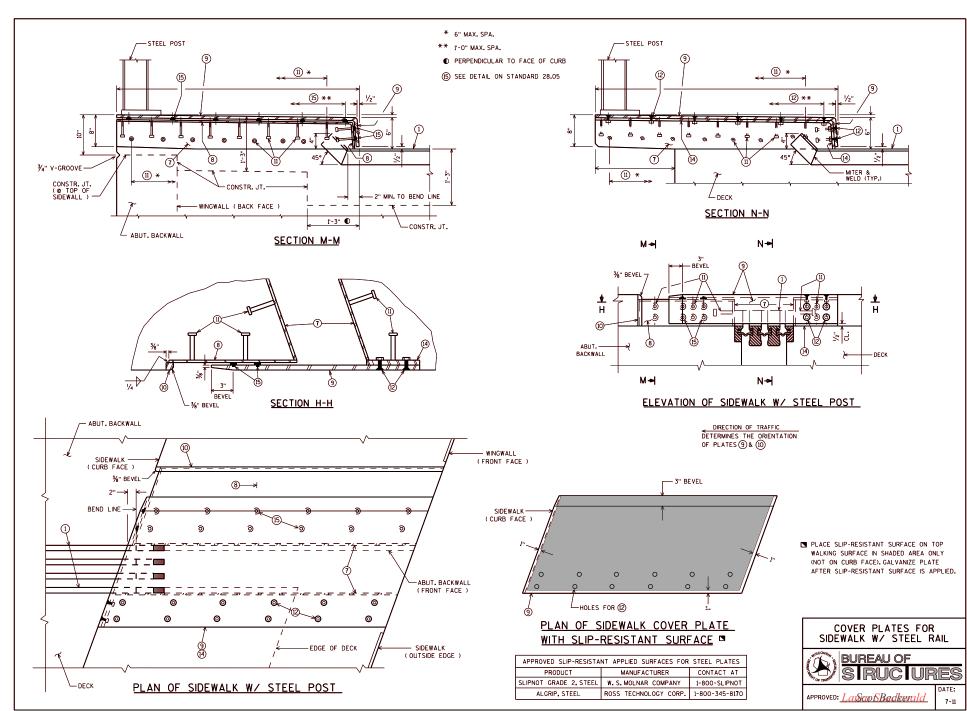


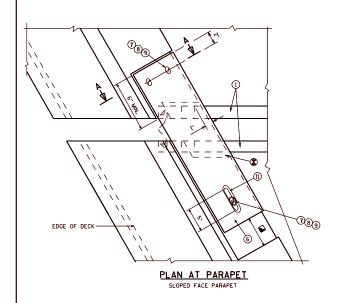
APPROVED: <u>LawBil\$1001alvovald</u>

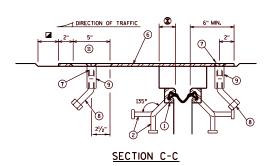


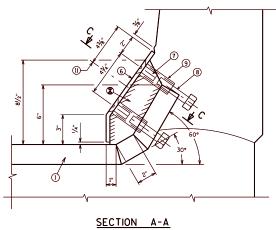






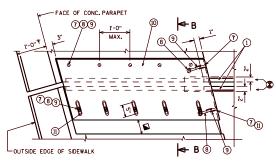






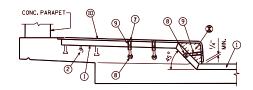
SLOPED FACE PARAPET

6 GALVANIZED PLATE $\frac{1}{9}$ " \times 10½" \times (2'-2" LONG FOR SKEWS TO 45° AND 3'-0" LONG FOR SKEWS \geq 45°) WITH HOLES FOR NO. 7. BEND AS SHOWN.

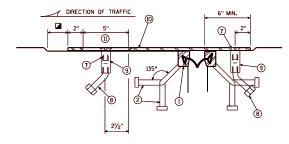


PLAN AT SIDEWALK

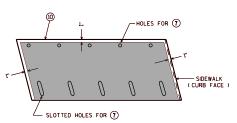
† 1'-2" WHEN "VERTICAL FACE PARAPET TYPE 'TX'IS USED



SECTION AT SIDEWALK



SECTION B-B



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

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

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

MANUFACTURER

ROSS TECHNOLOGY CORP.

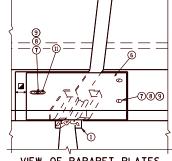
CONTACT AT

1-800-SLIPNOT

1-800-345-8170

APPROVED SLIP-RESISTANT APPLIED SURFACES FOR STEEL PLATES

SLIPNOT GRADE 2, STEEL W. S. MOLNAR COMPANY



VIEW OF PARAPET PLATES

FROM ROADWAY

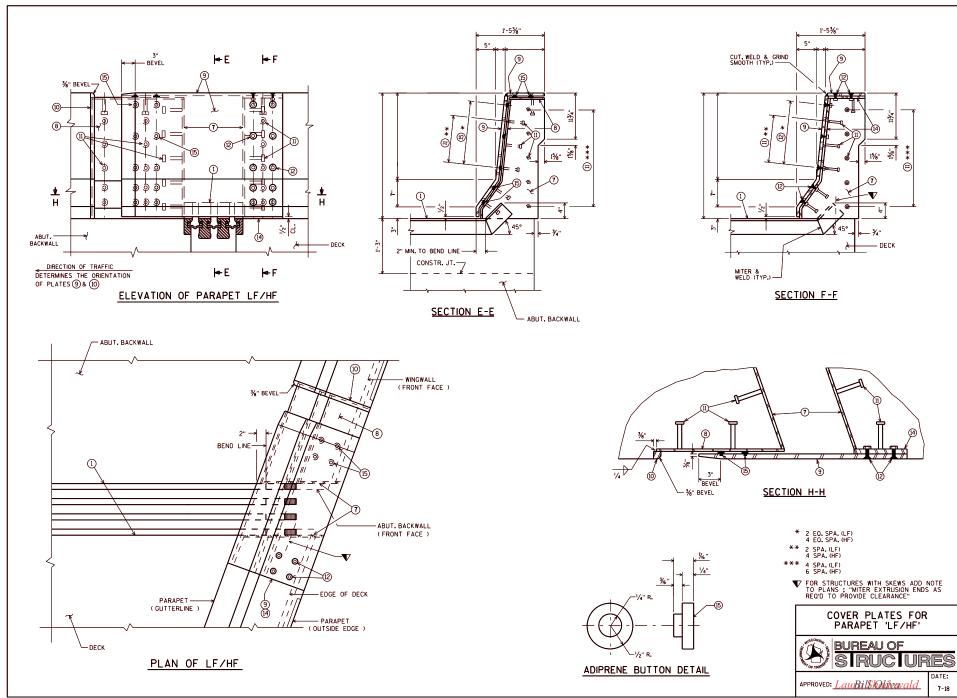
SLOPED FACE PARAPET

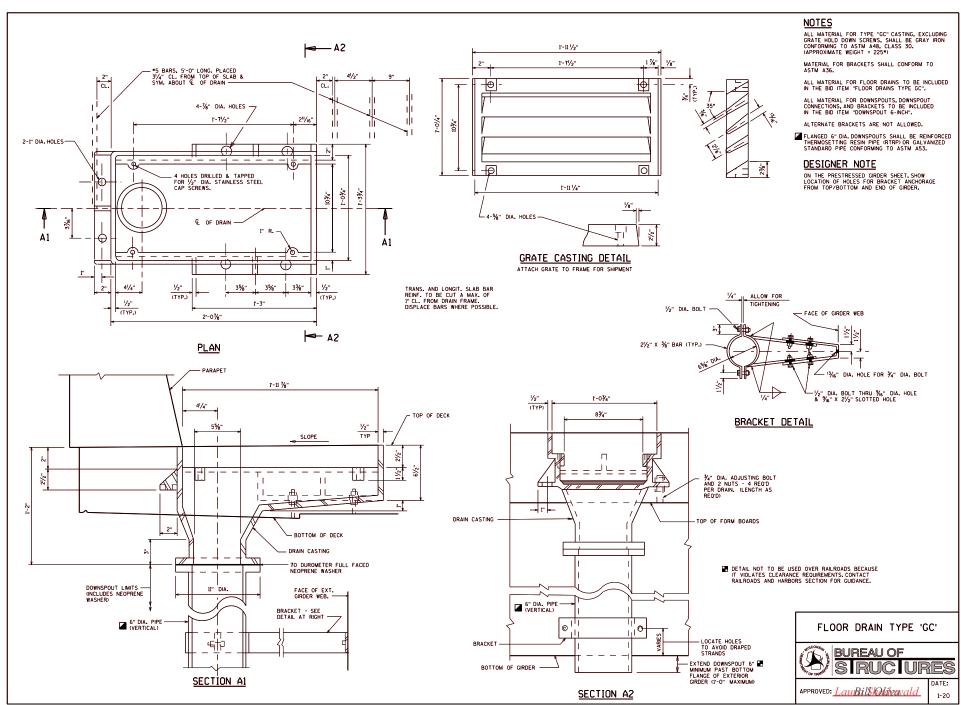
- BLOCK OUT CONCRETE 2" EACH SIDE OF JOINT OPENING
- JOINT OPENING DIM. ALONG SKEW PLUS 1/2"

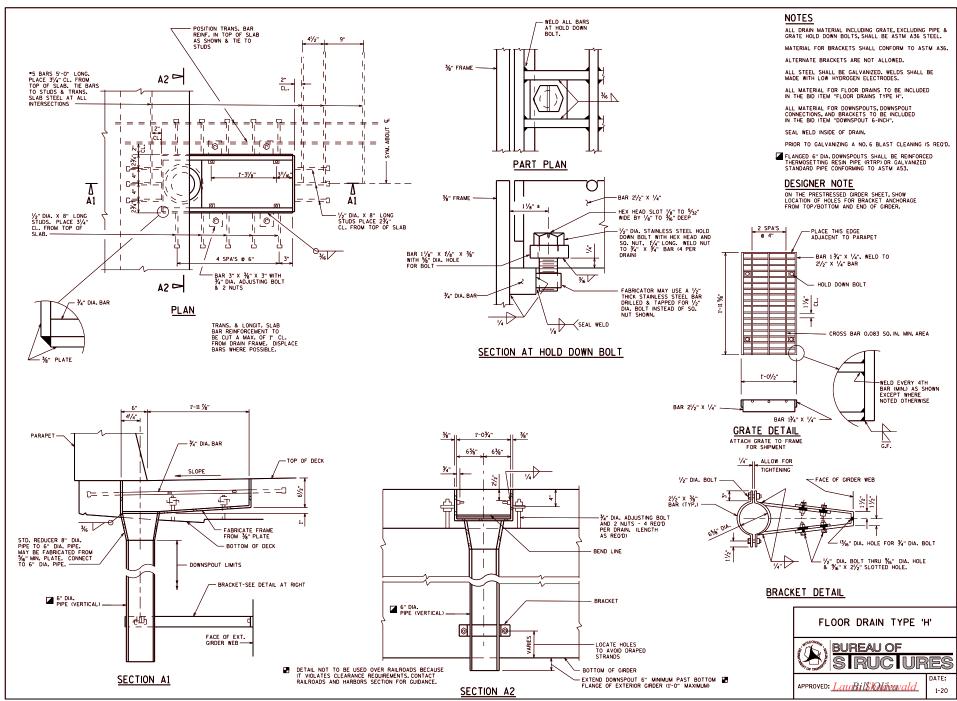
STRIP SEAL COVER PLATES SLOPED FACE PARA./SDWK.

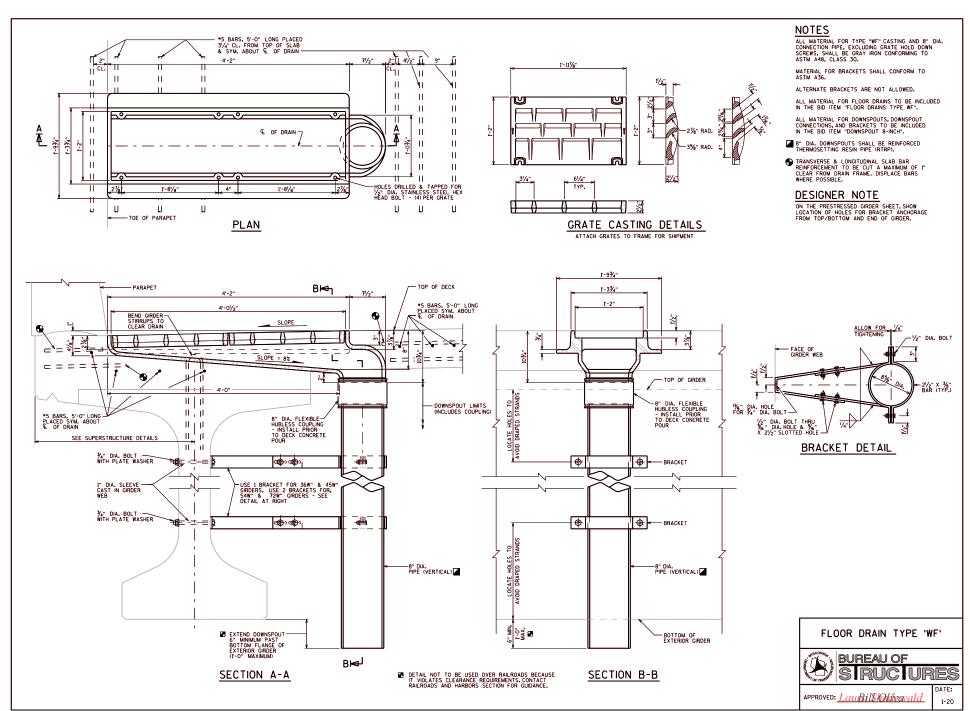


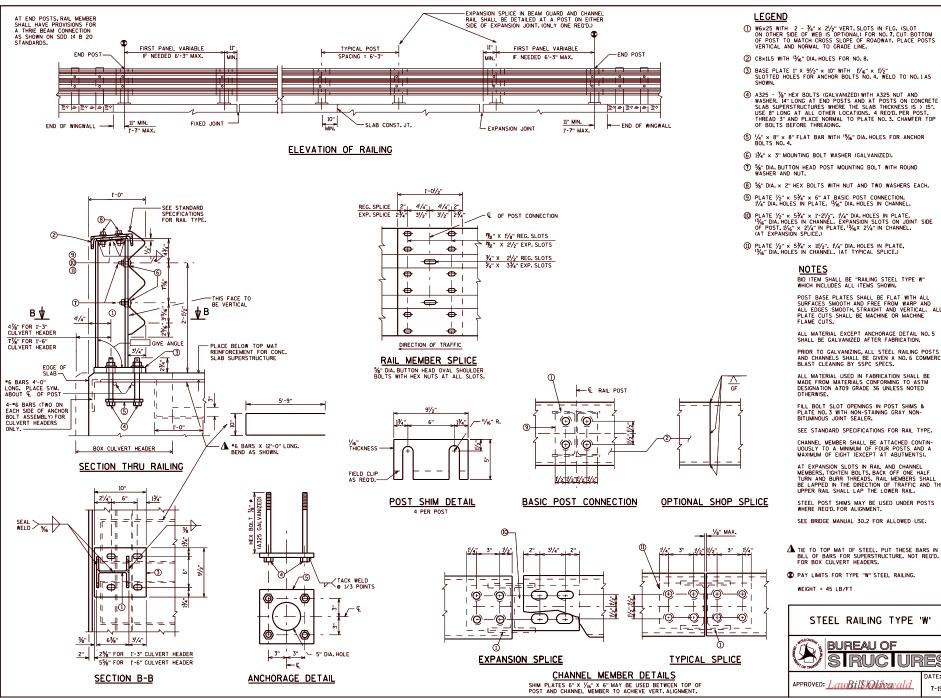
APPROVED: LauBilSlodileovale











- (3) BASE PLATE 1" X 91/2" × 10" WITH 11/16" × 11/2" SLOTTED HOLES FOR ANCHOR BOLTS NO. 4. WELD TO NO. 1 AS
- ③ A325 7% HEX BOLTS (CALVANIZED) WITH A325 NUT AND WASHER, 14" LONG AT END POSTS AND AT POSTS ON CONCRETE SLAB SUPPERSTRUCTURES WHERE THE SLAB THICKNESS IS > 15". USE 8" LONG AT ALL OTHER LOCATIONS. 4 REO'D. PER POST. THREAD 3" AND PLACE NORMAL TO PLATE NO. 3. CHAMPER TOP

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

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

SEE STANDARD SPECIFICATIONS FOR RAIL TYPE.

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

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

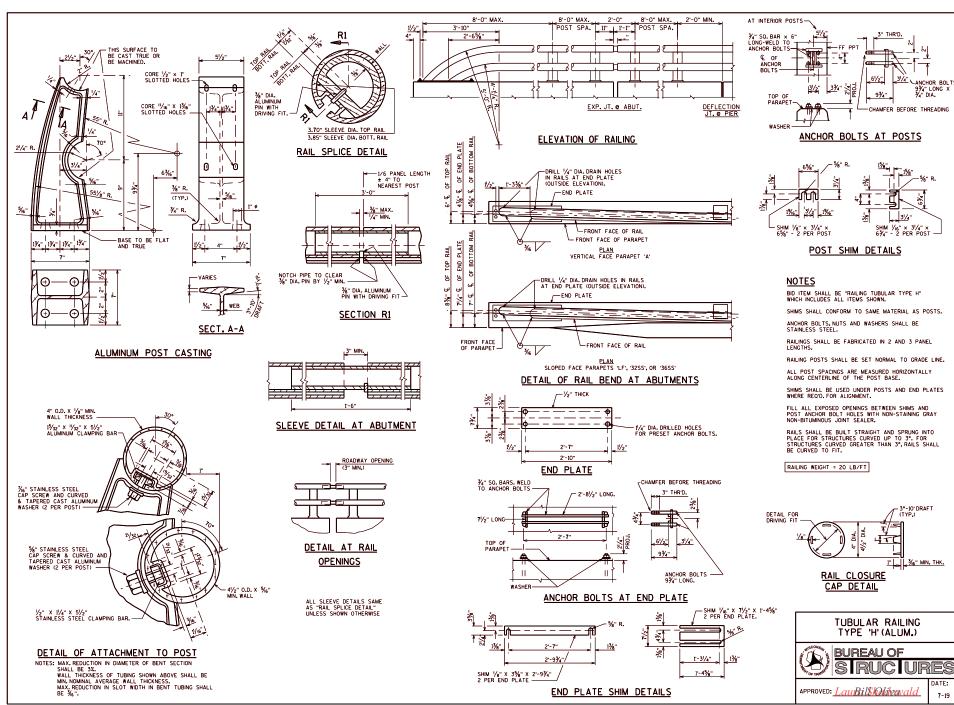
SEE BRIDGE MANUAL 30.2 FOR ALLOWED USE.

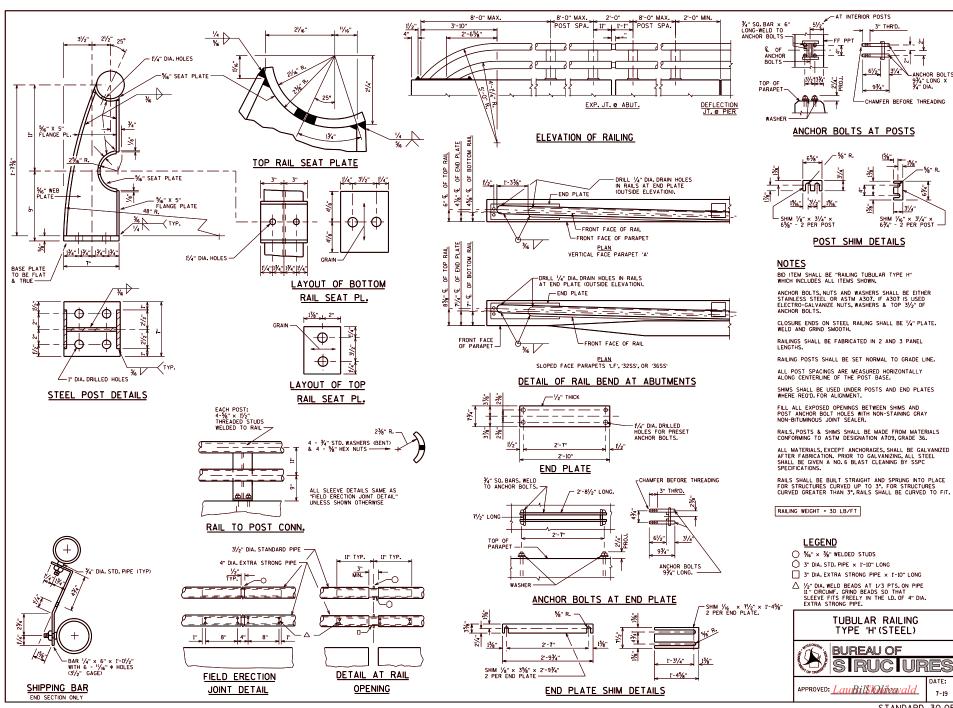
- PAY LIMITS FOR TYPE "W" STEEL RAILING.

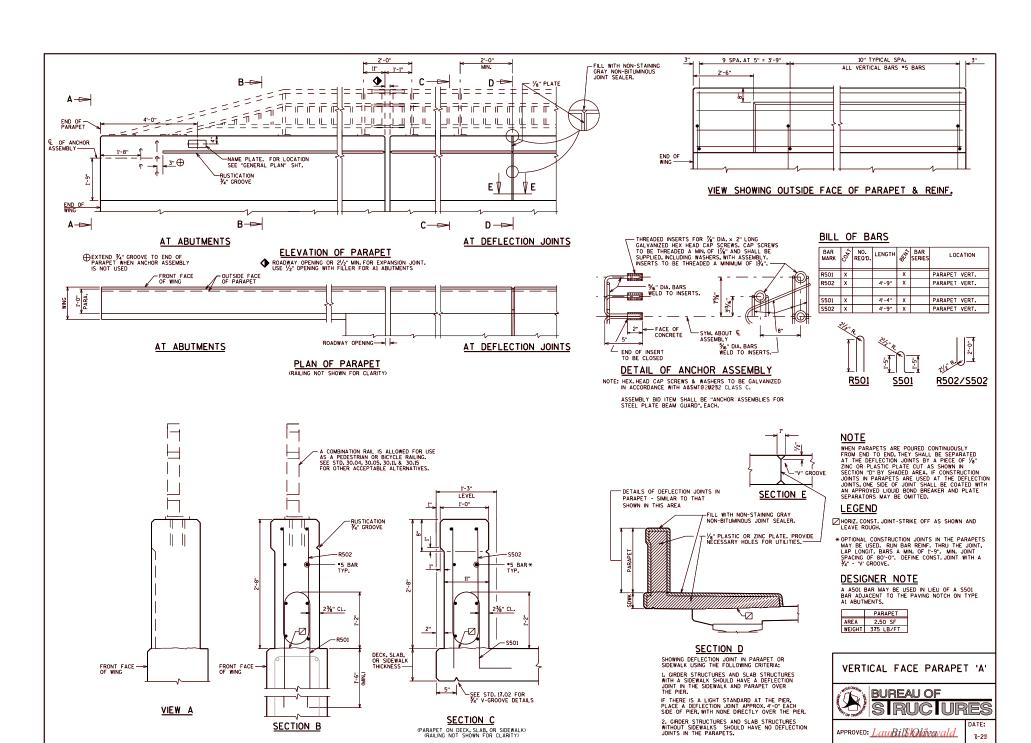


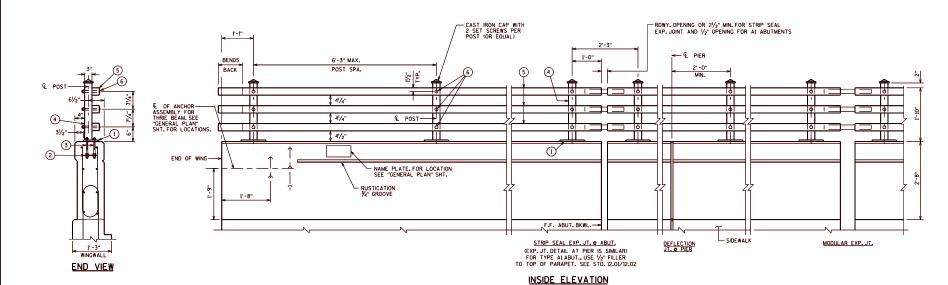


APPROVED: <u>LauBilSlOddleoval</u>

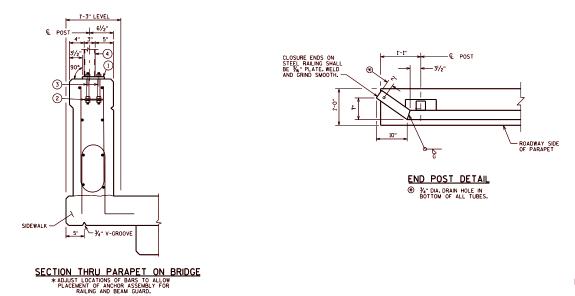








OPTIONAL CONSTRUCTION JOINTS IN THE PARAPETS MAY BE USED. RIN BAR REINF, THRU THE JOINT, LAP LONGIT, BARS A MIN, OF 1-9°, MIN, JOINT SPACING OF 80-0°, DEFINE CONSTR. J1, MITH A $\frac{7}{4}$ ° """-GROVE.

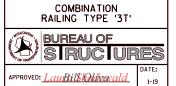


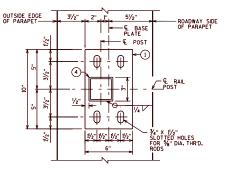
DESIGNER NOTES

SEE STANDARD 30.09 FOR ADDITIONAL RAILING DETAILS

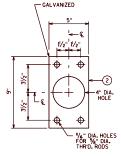
- SEE STANDARD 30.03 FOR ADDITIONAL MALERY DELTA SEE STANDARD 30.07 FOR: DEFLECTION JOINT DETAILS AND NOTES BEAM GUARD ANCHOR ASSEMBLY DETAILS SIDEWALK REINFORCEMENT AND DETAILS PARAPET REINFORCEMENT AND DETAILS

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

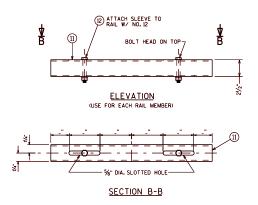




TYPICAL RAIL POST BASE PLATE



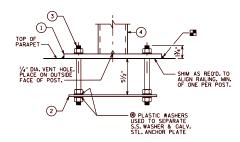
ANCHOR PLATE

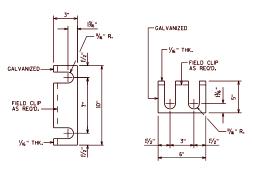


SLEEVE DETAIL

(AT MODULAR EXP. JT.)

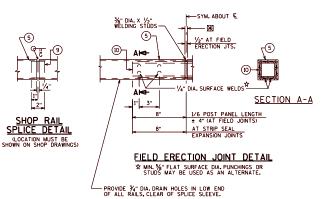
NOTE: CONSTRUCT BOTTOM RAIL AND SLEEVE CONNECTION FIRST,
THEN MIDDLE RAIL, AND THEN TOP RAIL, TO ALLOW EASE IN
PLACEMENT OF BOLT NO. 12.





RAIL POST SHIM DETAIL
(2 SETS PER POST)





LEGEND

- BASE PLATE %" X 6" X 10" WITH 34" X 11/2" SLOTTED HOLES FOR THR'D RODS NO. 3. WELD TO NO. 4 AS SHOWN. SLOTS PARALLEL TO LONG SIDE OF PLATE.
- 2 1/4" X 5" X 9" ANCHOR PLATE (GALVANIZED) WITH 1/6" DIA. HOLES FOR THR'D. RODS
- (3) %" DIA. X 9" LONG, TYPE 316 STAINLESS STEEL THREADED RODS (MIN. TENSILE STRENGTH = 70 KSI) WITH NUT AND WASHERS OF SAME ALLOY GROUP. ☆
- 4 STRUCTURAL TUBING 3" X 3" X 3" X 3" N 16" POSTS, PLACE VERTICAL. WELD TO NO. 1, AND USE 1" DIA. HOLES (FRONT AND BACK) FOR BOLT NO. 6.
- $\begin{picture}(5)\label{thm:bound} STRUCTURAL TUBING 3" X 3" X <math display="inline">\begin{picture}(60,0) \put(0,0) \put(0,$
- $\begin{picture}(6)\end{picture}$ %" DIA. A325 SLOTTED ROUND HEAD BOLT WITH HEX NUT, $\%_6$ " X $11\!/_2$ " X $11\!/_2$ " WASHER, AND LOCK WASHER.
- RECTANGULAR SLEEVE FABRICATED FROM %" PLATES. PROVIDE "SLIDING FIT".
- (1) RECTANGULAR SLEEVE FABRICATED FROM %" PLATES. (1'-4" @ FIELD ERECTION JTS.) (1'-4" @ STRIP SEAL EXP. JTS.)
- (1) SLEEVE FABRICATED FROM STRUCTURAL TUBING 2½" X 2½" X $\%_6$ " X '- "LONG. SLOTTED HOLES IN TOP AND BOTTOM.
- (12) 1/2" 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 SPECIFICATIONS.

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 SLEEYES 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.

■ CALIK ARQUIND 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.

HEN PAINTING REO'D: (ADD)

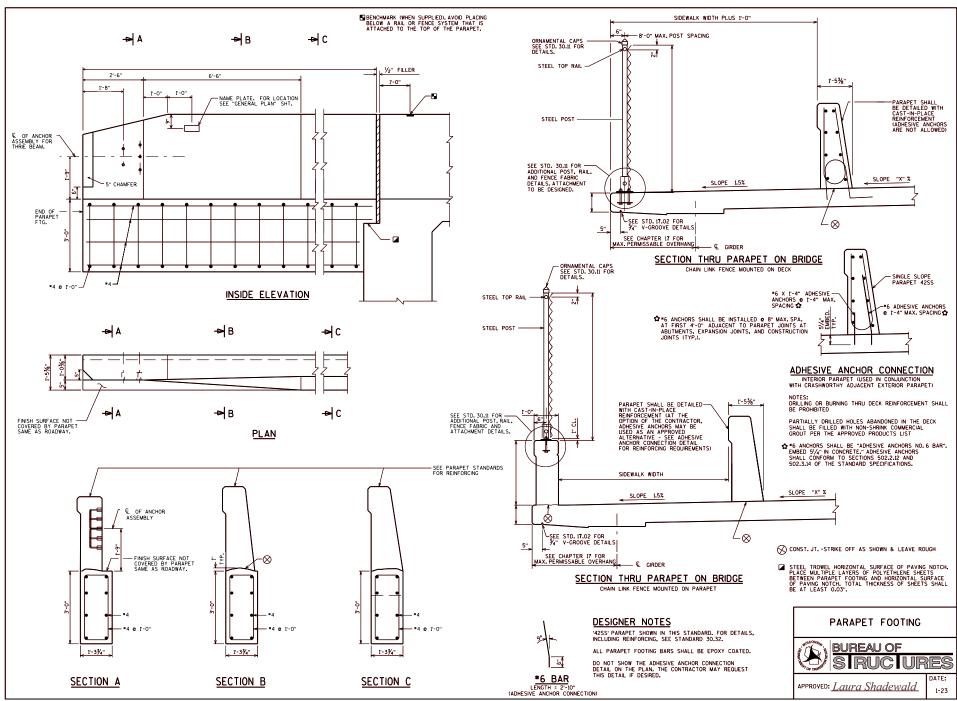
PANT OVER GALVANIZING (EXCEPT NO. 2) WITH AN APPROVED TIE COAT AND TOP COAT AS SPECIFIED IN THE CONTRACT DOCUMENTS, THE RAILING SHALL BE PAINTED AMS STD. COLOR NO. _____, ____ (FILL IN COLOR NAME).

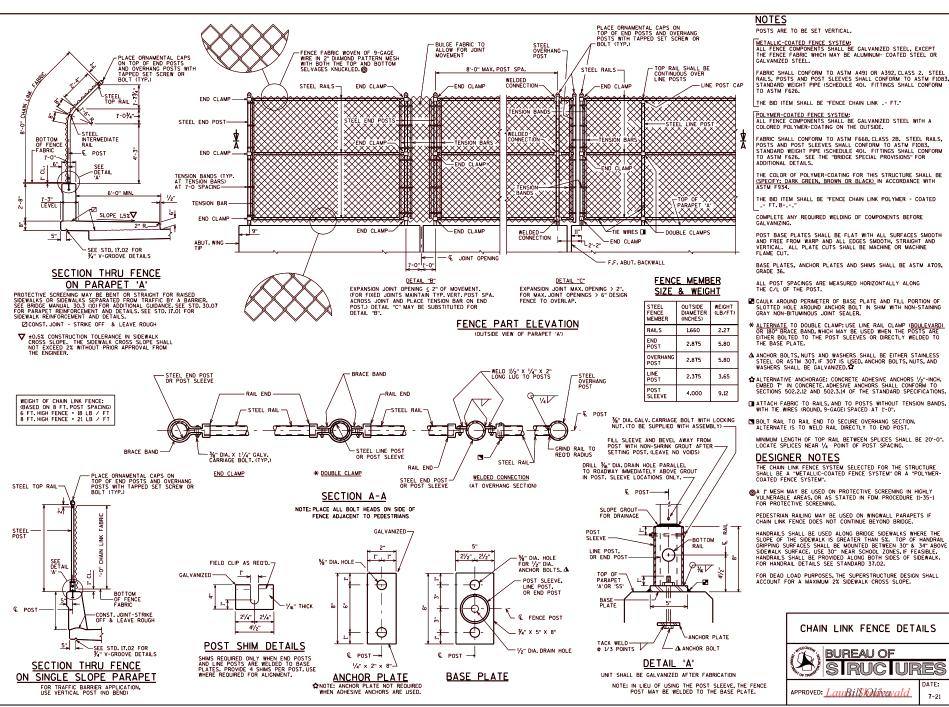
INSIDE OF TUBES TO BE PAINTED AT ALL FIELD ERECTION AND EXPANSION JOINTS. TOUCH-UP PAINTING TO BE DONE AT COMPLETION OF STEEL RAILING INSTALLATION TO THE SATISFACTION OF THE ENGINEER AT NO EXTRA COST.

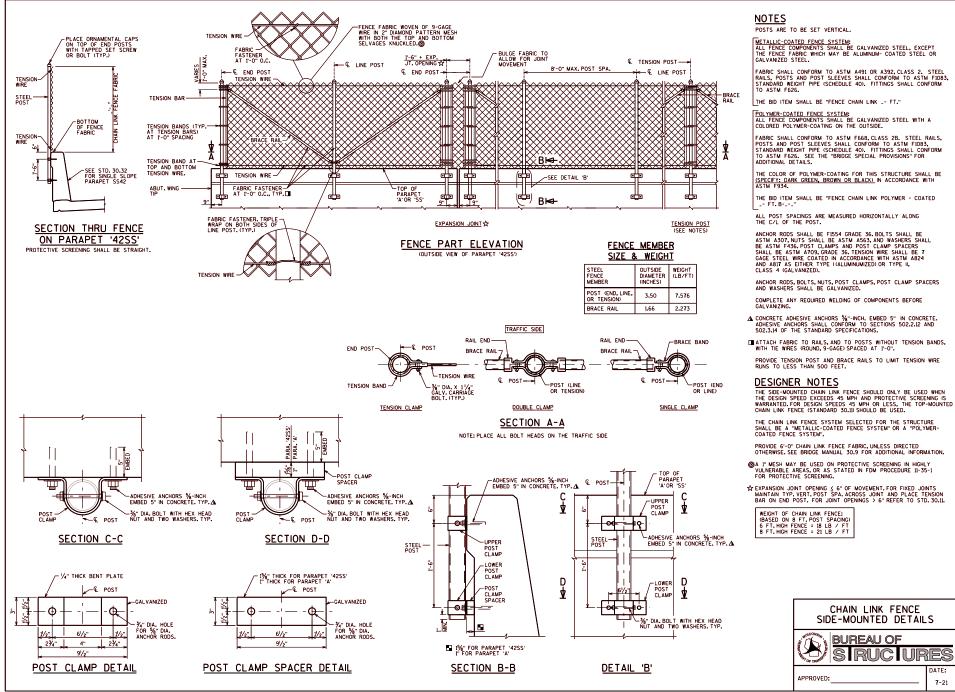
COMBINATION RAILING
TYPE '3T' DETAILS

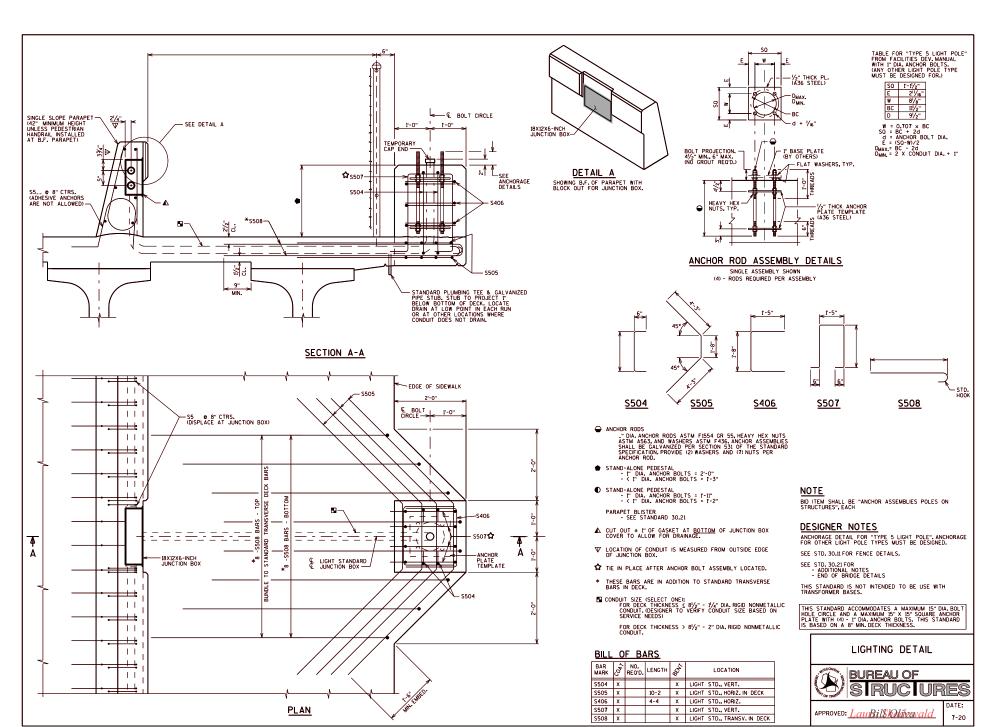


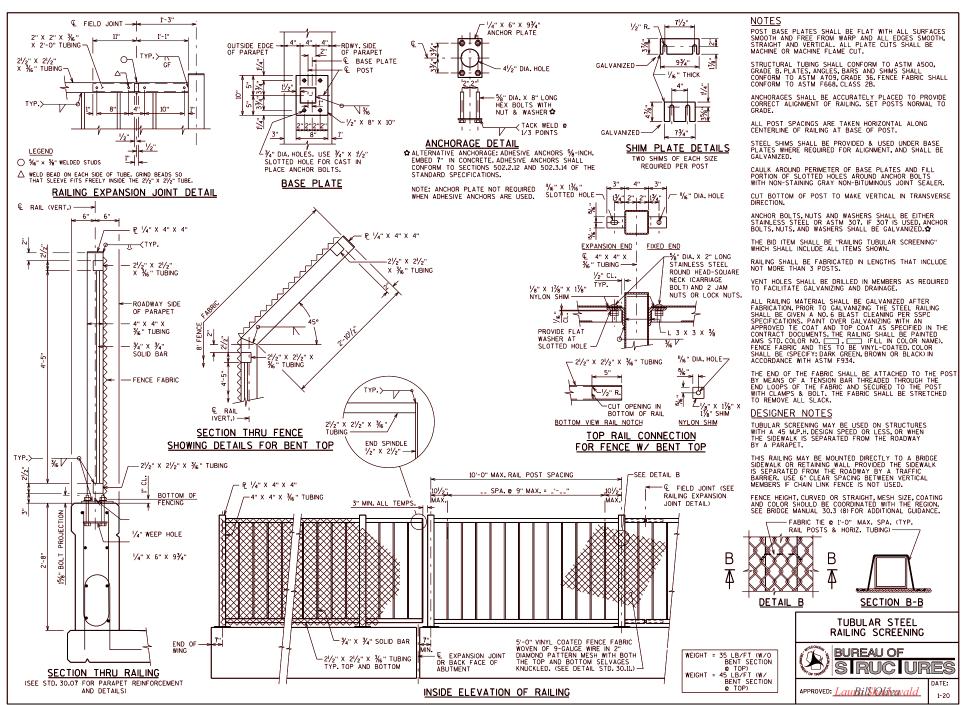
APPROVED: LauBils Willowald

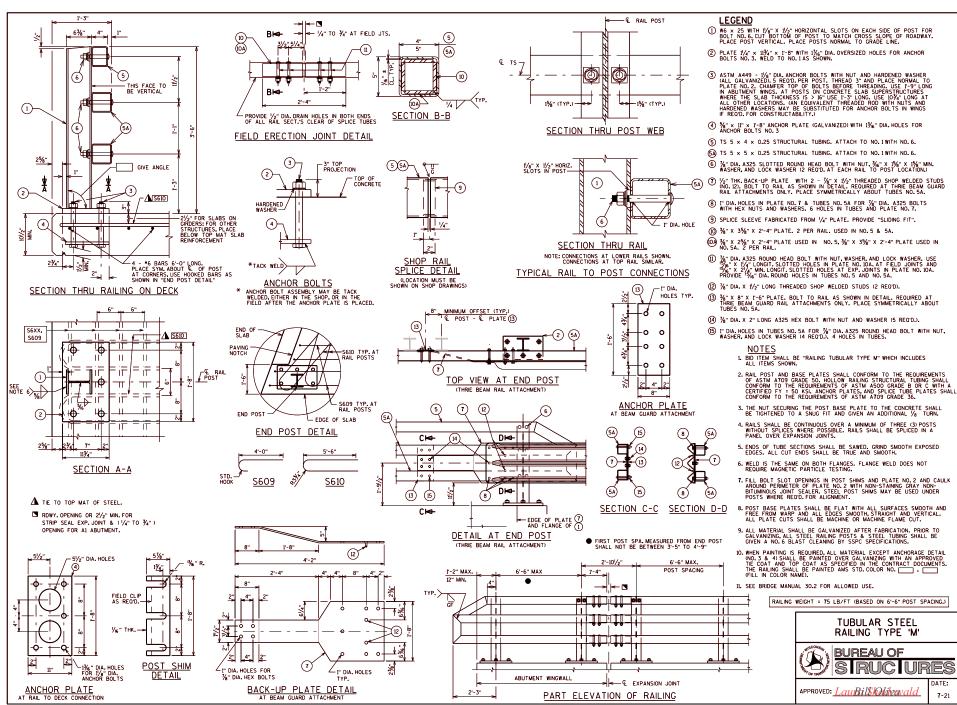


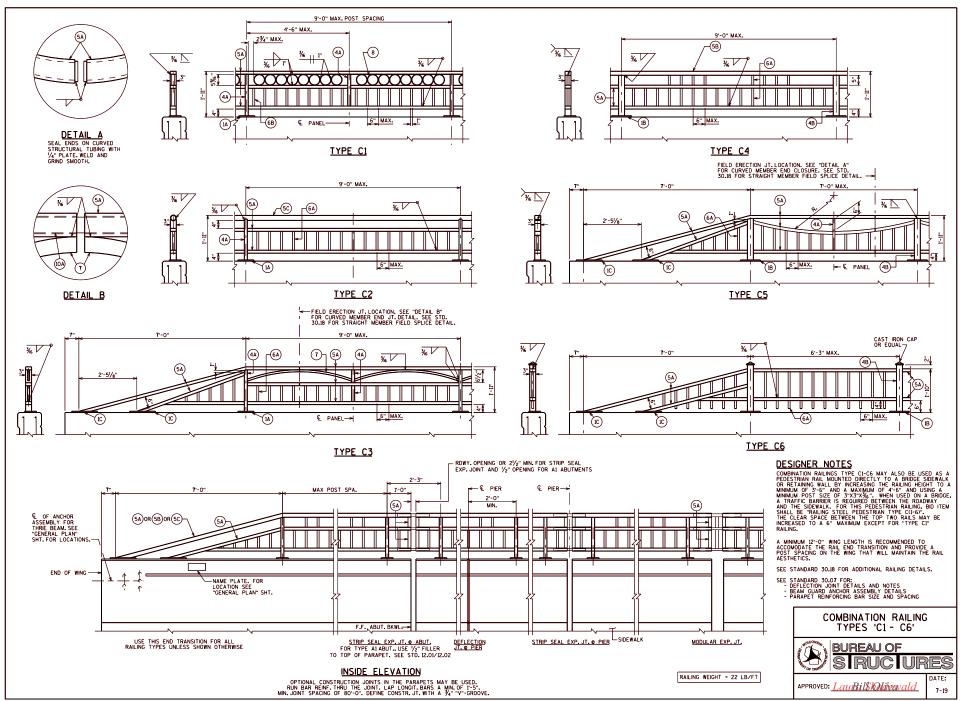


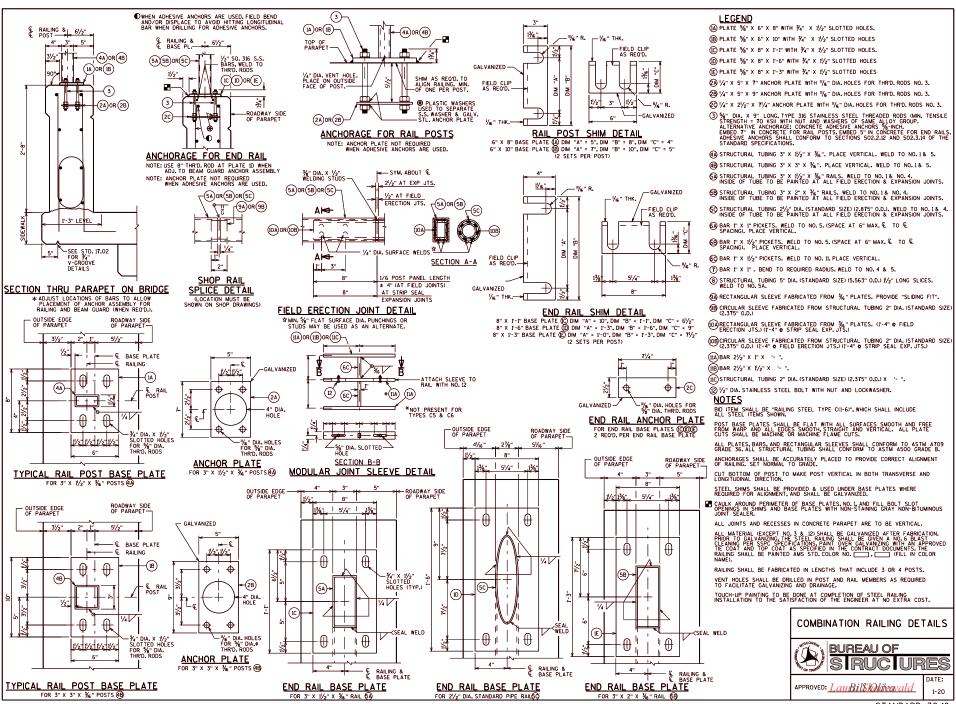


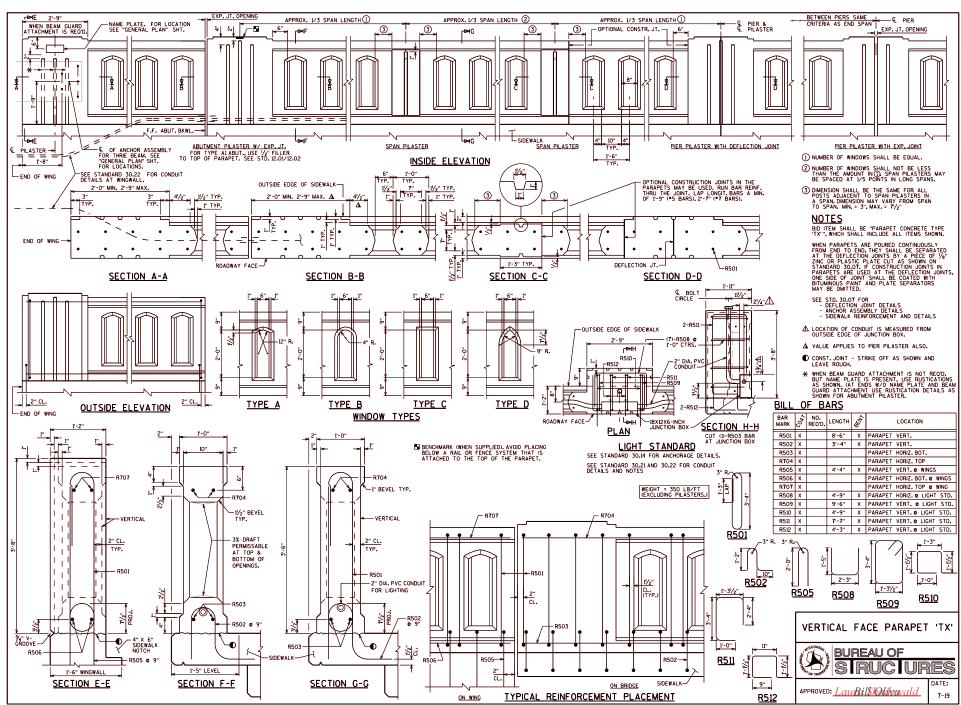


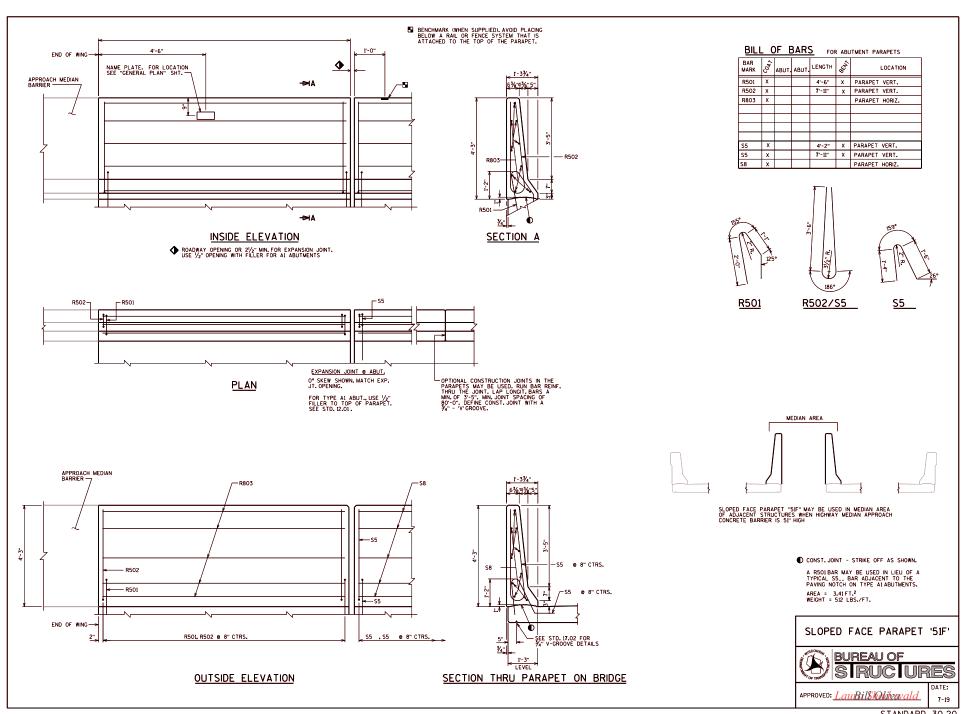


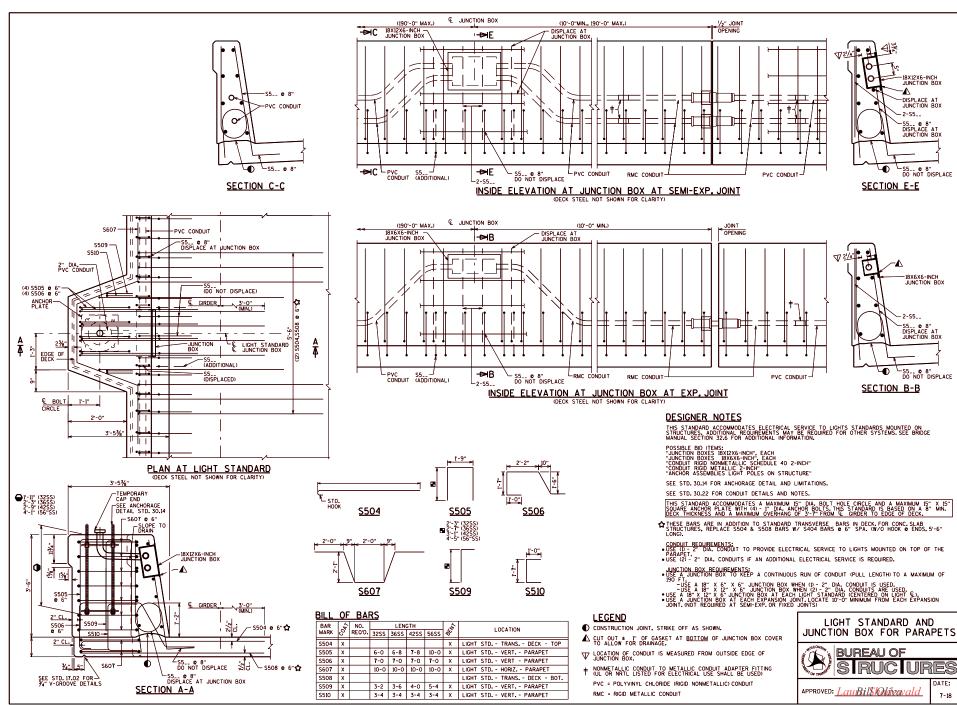


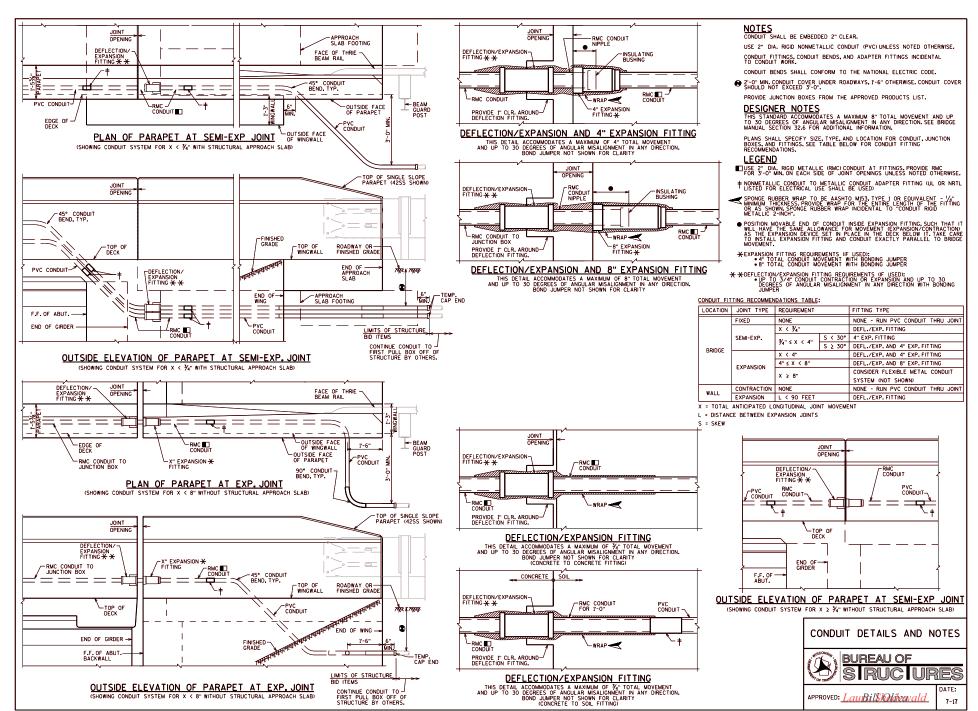


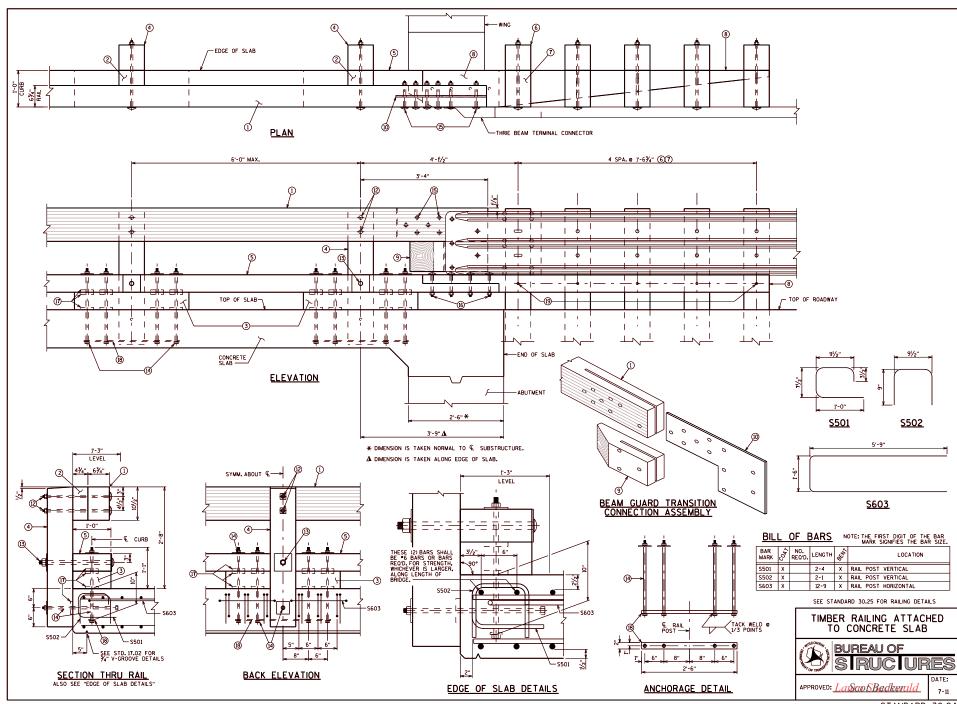


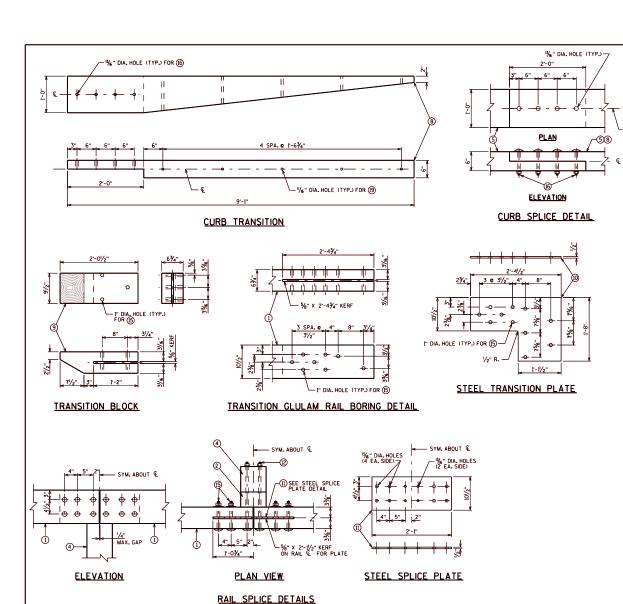












BILL OF TREATED LUMBER

ITEM	NO. REO'D.	SIZE	LENGTH	мвм
GLULAM RAIL		6¾" X 10½		
RAIL SPACER BLOCK		8" X 4¾"	101/2"	
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 43/4" X 101/2"
- (3) SCUPPER BLOCK 6" X 12" X 3'-0"
- (4) RAIL POST @ STRUCTURE 8" X 8" X 3'-8"
- (S) CURB 6" Y 12
- 6 RAIL POST @ BEAM GUARD 8" X 8"
- T RAIL SPACER BLOCK & BEAM GUARD 8" X 111/2" X 1'-101/2"
- (8) CURB TRANSITION & BEAM GUARD
- (9) TRANSITION BLOCK & BEAM GUARD
- (IO) STEEL TRANSITION PLATE, ASTM A36.
- (I) STEEL SPLICE PLATE, ASTM A36.
- (2) 3/4" DIA. X 1'-10" LONG ASTM A307, GRADE 2, DOME-HEAD BOLT W/ 1-PLATE WASHER PER BOLT. (2 REO'D. @ EACH RAIL TO POST CONNECTION, 4 REO'D. @ EACH RAIL SPLICE).
- (3) 11/4" DIA. X 1'-10" LONG ASTM A325, DOME-HEAD BOLT W/ 2 51/2" X 51/2" X 1/4" PLATE WASHERS, W/ 13/6" DIA. HOLE. (1 REO'D. @ EACH CURB TO POST CONNECTION.)
- 4 $\mbox{\%}^{\circ}$ dia. x [-1]" long astm a325 bolt. 1- 4" x 4" x $\mbox{\%}^{\circ}$ plate washer reod, at curb to slab connection. 1- 4" x 4" x $\mbox{\%}^{\circ}$ plate washer reod, at post to slab connection.
- (5) 1/8" DIA. X 9" LONG ASTM A307, GRADE 2, DOME HEAD BOLT AT RAIL SPLICE DETAIL AND AT BEAM GUARD ATTACHMENT.
- (6) $\frac{3}{4}$ " DIA. X 8" LONG ASTM A307, GRADE 2, DOME-HEAD BOLT (4 REO'D. @ EACH CURB SPLICE DETAIL.)
- ① 4" DIA. SHEAR PLATE (8 REO'D. @ EACH CURB TO SCUPPER CONNECTION, 4 REO'D. @ EACH SCUPPER TO SLAB CONNECTION AND TREO'D. @ EACH POST TO SLAB CONNECTION. MALLEABLE IRON WEETING REQUIREMENTS OF ASTIM A47, GRADE 32510.
- (B) 2" X 2'-6" X %6" ANCHOR PLATE WITH 4 $^{13}\!\!/_{16}$ " DIA. HOLES FOR ANCHOR BOLTS NO. 14 (CURB TO SLAB CONNECTION).
- (9) %" DIA. ASTM A325 DOME-HEAD BOLT W/ 1-PLATE WASHER PER BOLT. (1 REO'D. € EACH THRIE BEAM POST TO CURB TRANSITION CONNECTION.)

NOTES

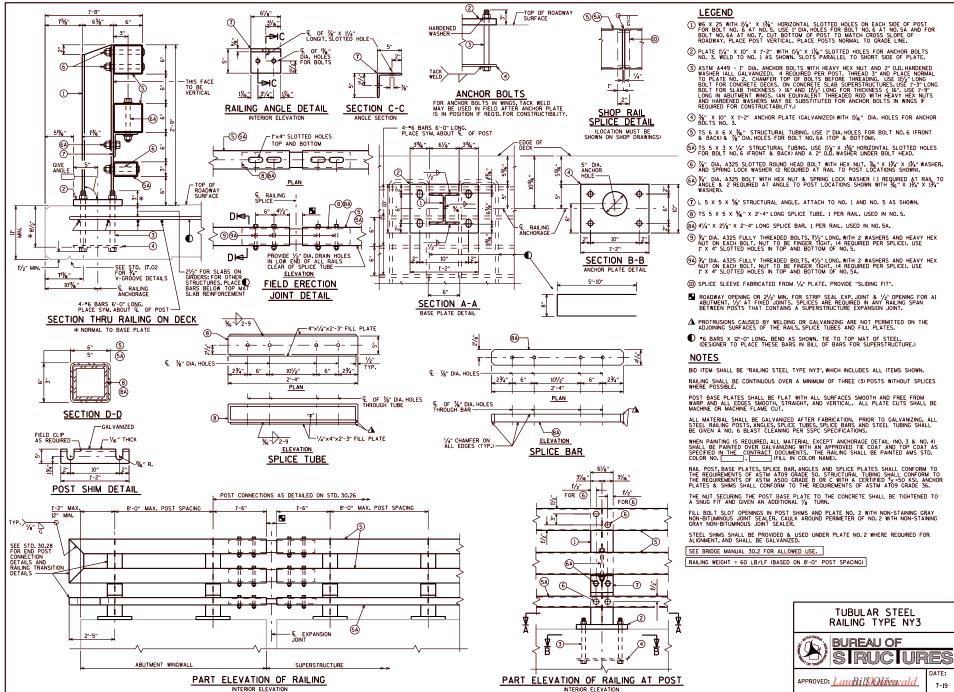
- BID ITEM SHALL BE "TREATED LUMBER AND TIMBER" WHICH INCLUDES ALL ITEMS SHOWN EXCEPT ITEMS NO 6, 7
 AND THRIE BEAM TERMINAL CONNECTOR..
- 2. DIMENSIONS GIVEN FOR GLUED-LAMINATED (GLULAM) TIMBER RAILS ARE ACTUAL DIMENSIONS.
- 3. DIMENSIONS FOR WOOD POSTS, CURBS AND SCUPPERS ARE GIVEN AS NOMINAL DIMENSIONS, ACTUAL DIMENSIONS MAY BE A MAXIMUM OF 1/2 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 MINIMUM OF 1.5 POST SPACINGS AWAY FROM RAIL SPLICES. IT IS RECOMMENDED THAT COLLAM RAILS BE CONTINUOUS OVER THE LENGTH OF THE BRIDGE.
- 5. SAWN LUMBER AND GLULAM SHALL COMPLY WITH THE REQUIREMENTS OF AASHTO MI68 AND SHALL BE PRESSURE TREATED WITH WOOD PRESERVATIVES IN ACCORDANCE WITH AASHTO MI33 AND STANDARD SPECIFICATIONS.
- 6. BRIDGE RAIL SHALL BE HORIZONTALLY LAMINATED GLULAM, VISUALLY GRADED WESTERN SPECIES COMBINATION NO. 2; OR VISUALTY GRADED SOUTHERN FINE 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 LB/IN² E = 1,800,000 LB/IN²
- 7. POSTS, CURBS, SCUPPERS, TRANSITION BLOCKS AND SPACER BLOCKS MAY BE SAWN LUMBER OR GLULAM, WHEN SAWN LUMBER IS USED, MATERIAL SHALL BE VISUALLY GRADED NO. I SOUTHERN PINE OR VISUALLY GRADED NO I 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 LB/IN² E = 1,500,000 LB/IN²
- 8. ALL STEEL COMPONENTS AND FASTENERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO MIII OR M232.
- 9. TO THE EXTENT POSSIBLE, ALL WOOD SHALL BE CUT, DRILLED, AND COMPLETELY FABRICATED PRIOR TO PRESSURE TREATMENT WITH PRESERVATIVES. WHEN FIELD FABRICATION OF WOOD IS REQUIRED OR IF WOOD IS DAMAGED, ALL CUTS, BORE HOLES, AND DAMAGE SHALL BE IMMEDIATELY TREATED WITH WOOD PRESERVATIVE IN ACCORDANCE WITH AASHTO MI33 AND STANDARD SPECIFICATIONS.
- IO. UNLESS NOTED, MALLEABLE IRON WASHERS SHALL BE PROVIDED UNDER BUIT HEADS AND UNDER NUTS THAT ARE NOTHACT WITH WOOD. WHEN THE SIZE AND STRENGTH OF THE HEAD ARE SUFFICIENT TO BEVELOF CONCETION STRENGTH WITHOUT WOOD CRUSHING, WASHERS MAY BE OMITTED UNDER HEADS OF DOME-HEAD TIMBER BUITS.
- 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 REO'D, ICRASH 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).

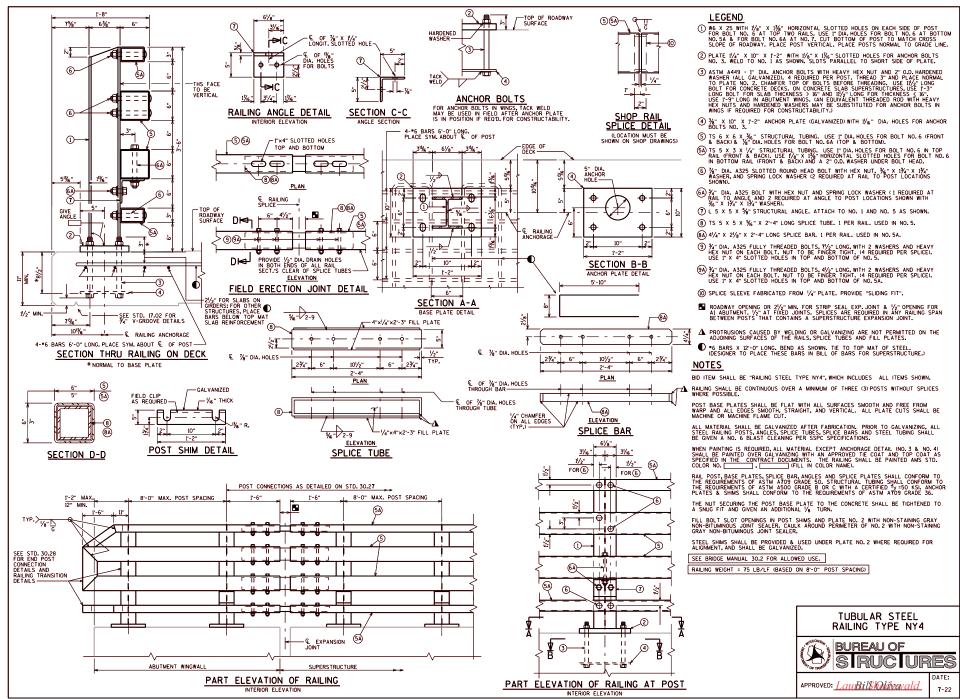
THESE RAILING DETAILS MAY BE USED WITH CONCRETE SLAB SUPERSTRUCTURES (SLAB DEPTH ≥ 14") THAT HAVE AT ABUTMENTS WITH WINGS PARALLEL TO € OF ABUTMENT OR HAVE A5 ABUTMENTS.

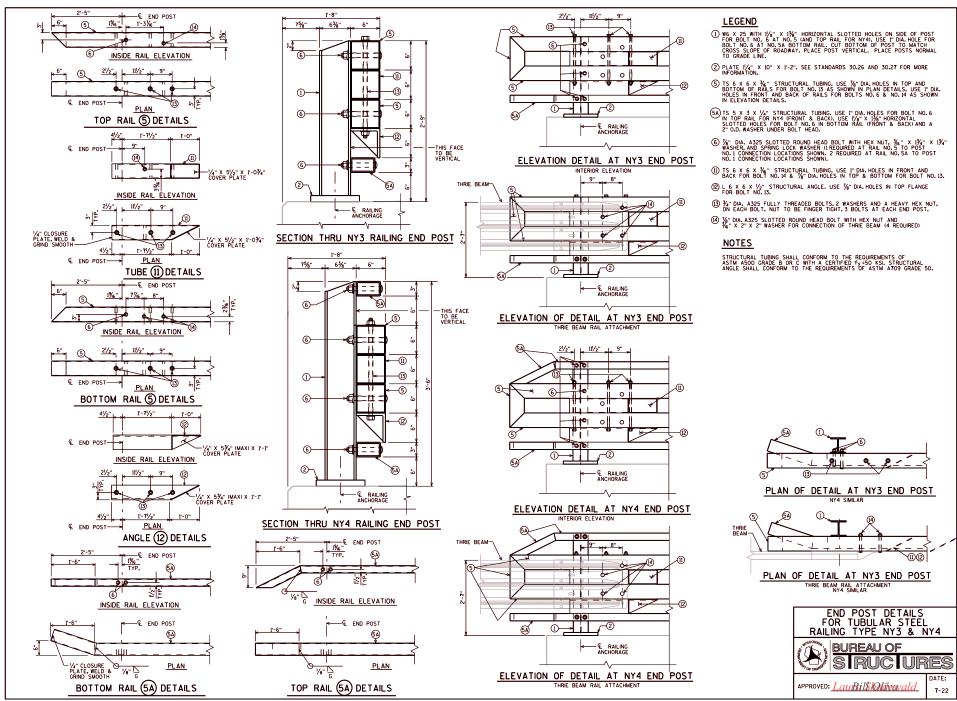
TIMBER RAILING ATTACHED
TO CONCRETE SLAB DETAILS

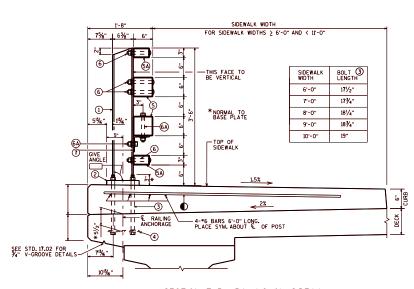


APPROVED: LauBils Willowald

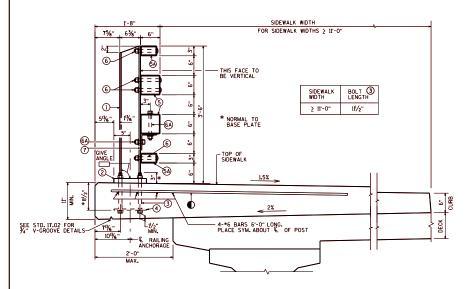








SECTION THRU RAILING ON SIDEWALK



SECTION THRU RAILING ON SIDEWALK

LEGEND

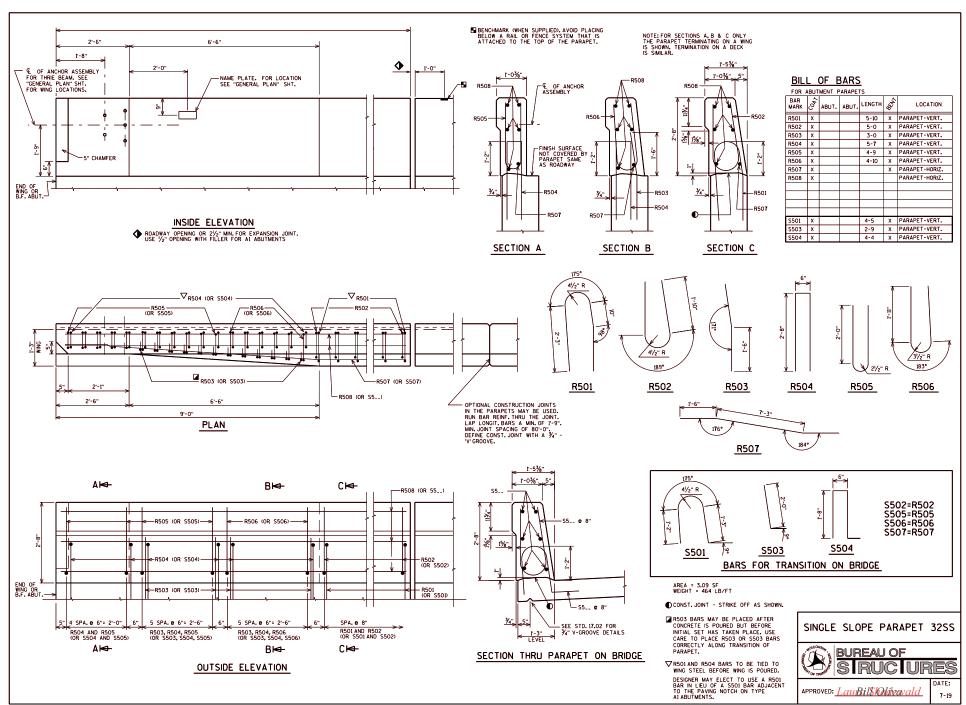
- (1) W6 X 25 WITH 11/8" X 13/8" HORIZONTAL SLOTTED HOLES ON EACH SIDE OF POST FOR BOLT NO. 6 AT TOP TWO RAILS. USE 1" DIA. HOLES FOR BOLT NO. 6 AT BOTTOM NO. 5A & FOR BOLT NO. 6A AT NO. 7. CUT BOTTOM OF POST TO MATCH CROSS SLOPE OF ROADWAY. PLACE POST VERTICAL. PLACE POSTS NORMAL TO GRADE LINE.
- 2 PLATE 11/4" X 10" X 1'-2" WITH 11/6" X 11/6" SLOTTED HOLES FOR ANCHOR BOLTS NO. 3. WELD TO NO. 1 AS SHOWN. SLOTS PARALLEL TO SHORT SIDE OF PLATE.
- 3 ASTM 4449 I" DIA. ANCHOR BOLTS WITH HEAVY HEX NUT AND 2" O.D. HARDENED WASHER (ALL OAL VANIZED). 4 A REQUIRED FER PORT HEREAD 3" AND FLACE NORMAL TO BOLT FOR CONCRETE SIDEMALKS 2" OF "O" WIDE AND SEE TABLE TO THE LET FOR CONCRETE SIDEMALKS 2" OF "O" WIDE AND SEE TABLE TO THE LET FOR CONCRETE SIDEMALKS 2" OF "O" WIDE AND SEE TABLE TO THE LET FOR CONCRETE SIDEMALKS 2" OF "O" WIDE FOR PROPER BOLT LENGTHS, USE 1"9" LONG IN ABDITMENT WINGS. (AN EQUIVALENT THREADED ROD WITH HEAVY HEX NUTS AND HANDENED WASHERS MAY BE SUBSTITUTED FOR ANCHOR BOLTS IN WINGS IF REQUIRED FOR CONSTRUCTABILITY.)
- 4 $\mbox{\%}"$ X 10" X 1'-2" ANCHOR PLATE (GALVANIZED) WITH 11/16" DIA. HOLES FOR ANCHOR BOLTS NO. 3.
- (5) TS 6 X 6 X $\frac{1}{16}$ " STRUCTURAL TUBING. USE 1" DIA.HOLES FOR BOLT NO.6 (FRONT & BACK) & $\frac{1}{16}$ " DIA.HOLES FOR BOLT NO.6A (TOP & BOTTOM).
- (SA) TS 5 X 3 X 1/4" STRUCTURAL TUBING. USE 1" DIA. HOLES FOR BOLT NO. 6 IN TOP RAIL (FRONT & BACK). USE 1/6" X 1/3" HORIZONTAL SLOTTED HOLES FOR BOLT NO. 6 IN BOTTOM RAIL (FRONT & BACK) AND A 2" CO.D. WASHER UNDER BOLT HEAD.
- 6 %" DIA. A325 SLOTTED ROUND HEAD BOLT WITH HEX NUT, %" X 1%" X 1% X X 1% X 1% X 1% X 1% X 1% X 1% X X 1% X X 1
- (6A) 1/4" DIA, A325 BOLT WITH HEX NUT AND SPRING LOCK WASHER (I REQUIRED AT RAIL TO ANGLE AND 2 REQUIRED AT ANGLE TO POST LOCATIONS SHOWN WITH 1/4" X 1/4" X
- T 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 MAT OF STEEL. (DESIGNER TO PLACE THESE BARS IN BILL OF BARS FOR SUPERSTRUCTURE.)

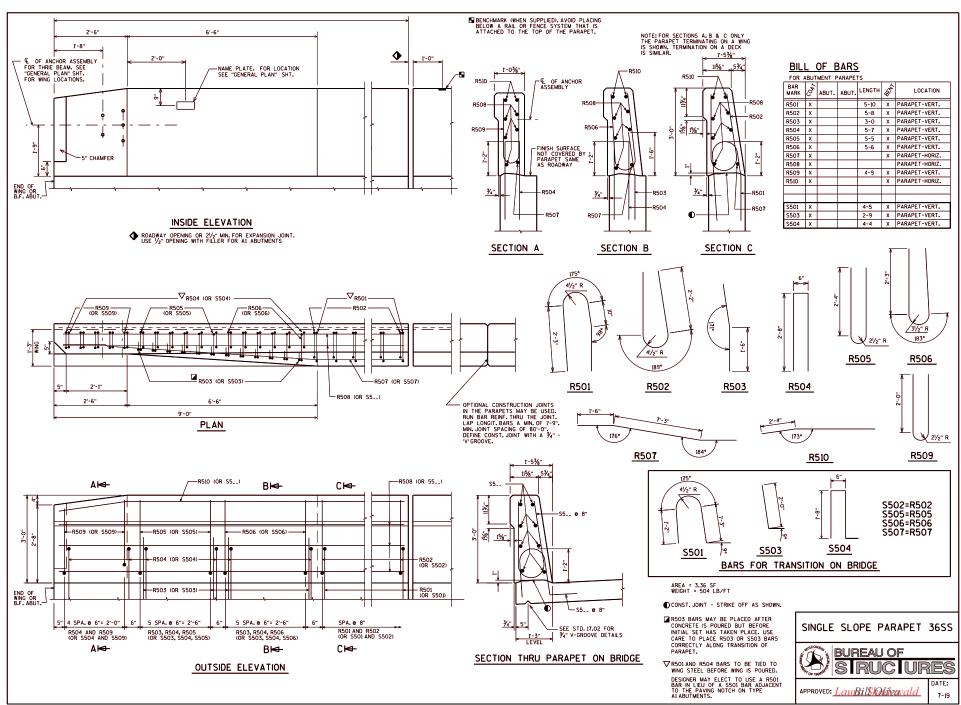
FOR ALL TUBULAR STEEL RAILING TYPE NY4 DETAILS SEE STD. 30.27.

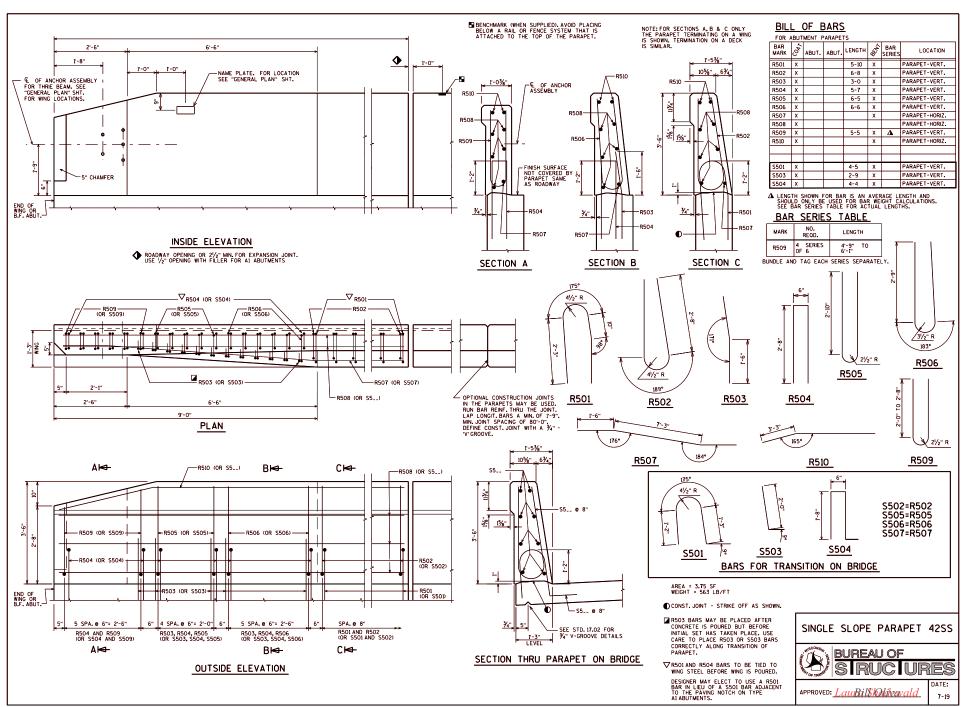


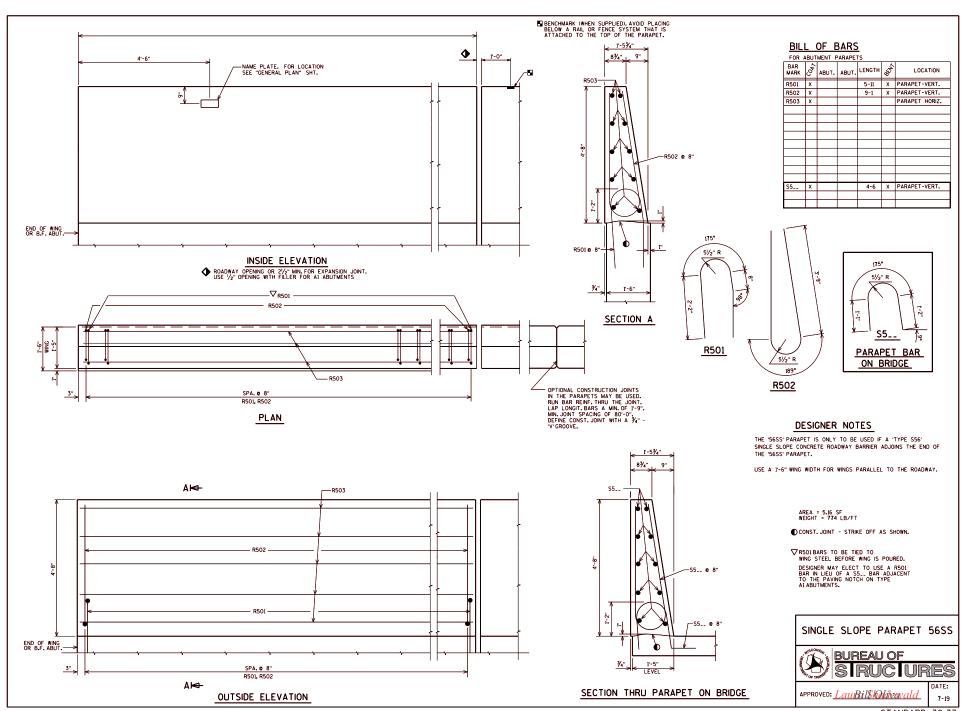


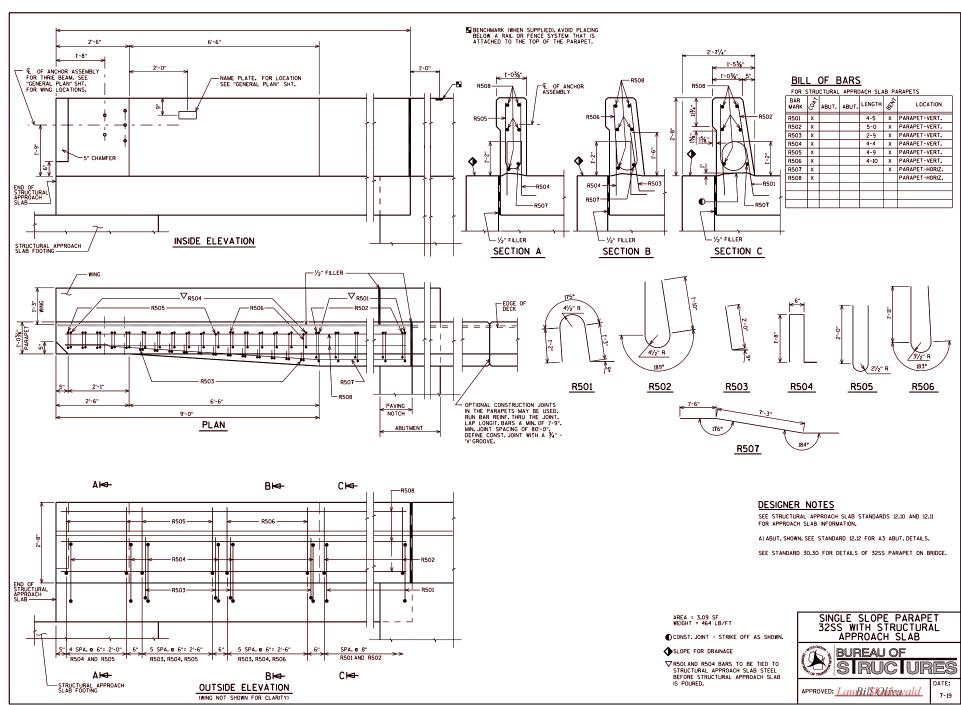
APPROVED: LauBils Waldwovald

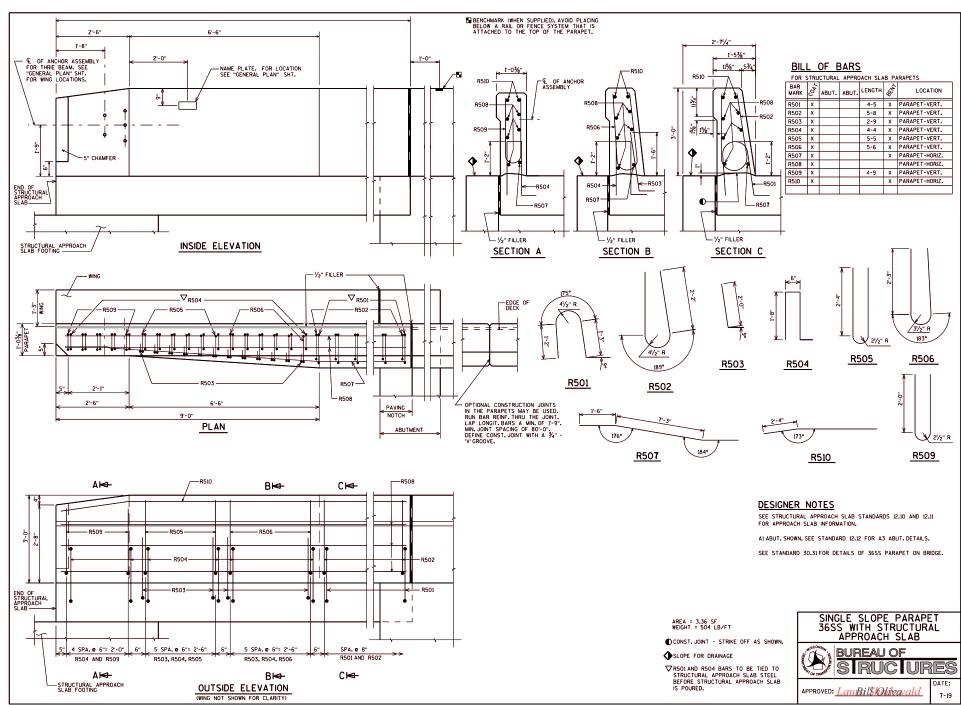


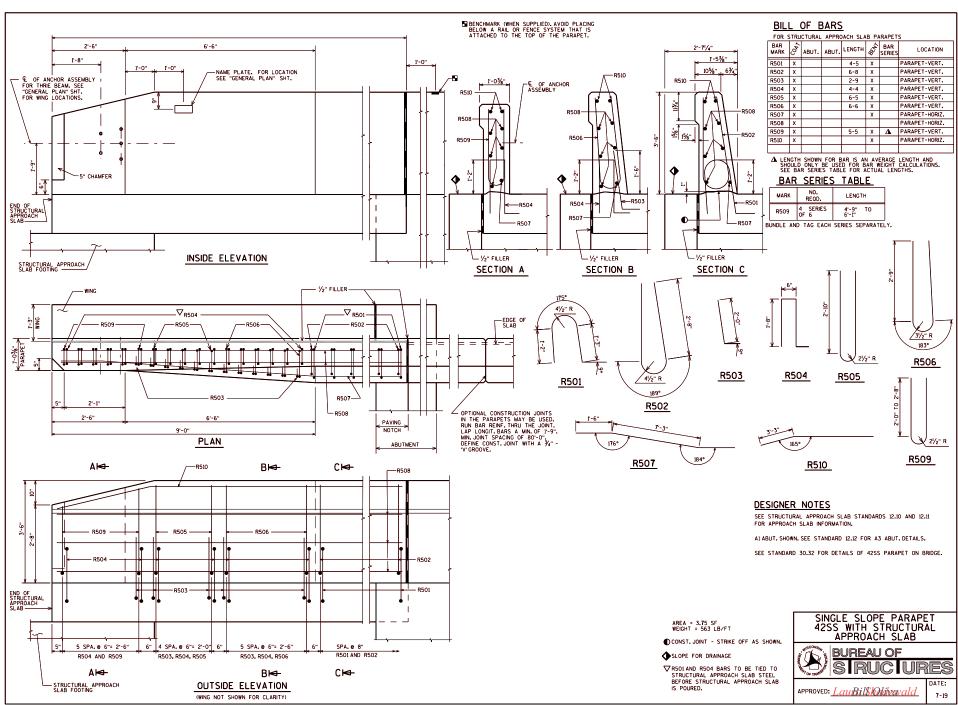


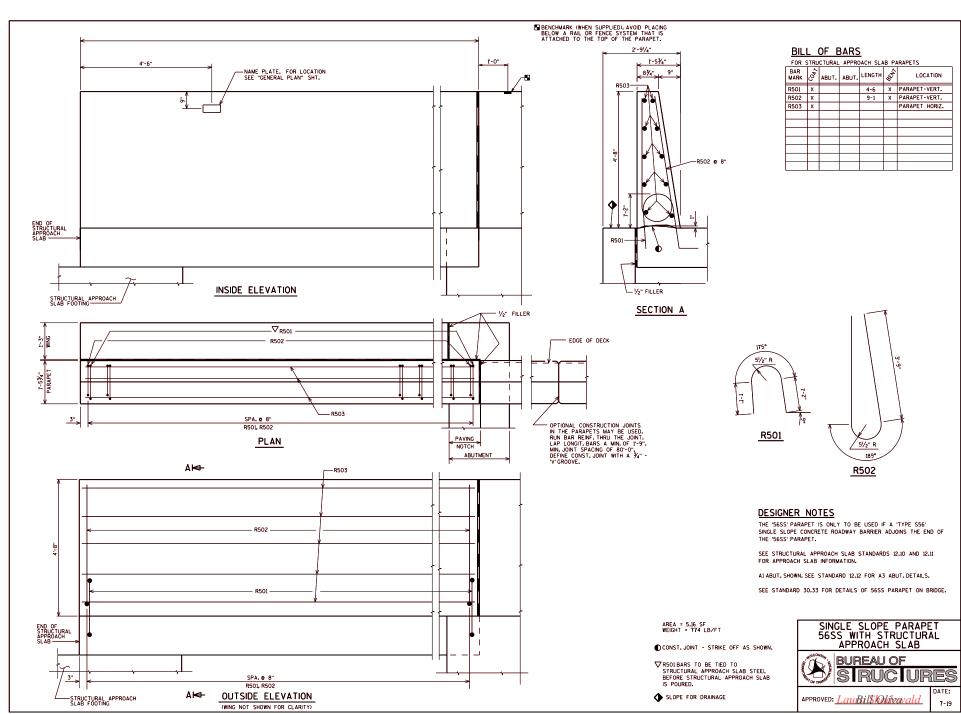


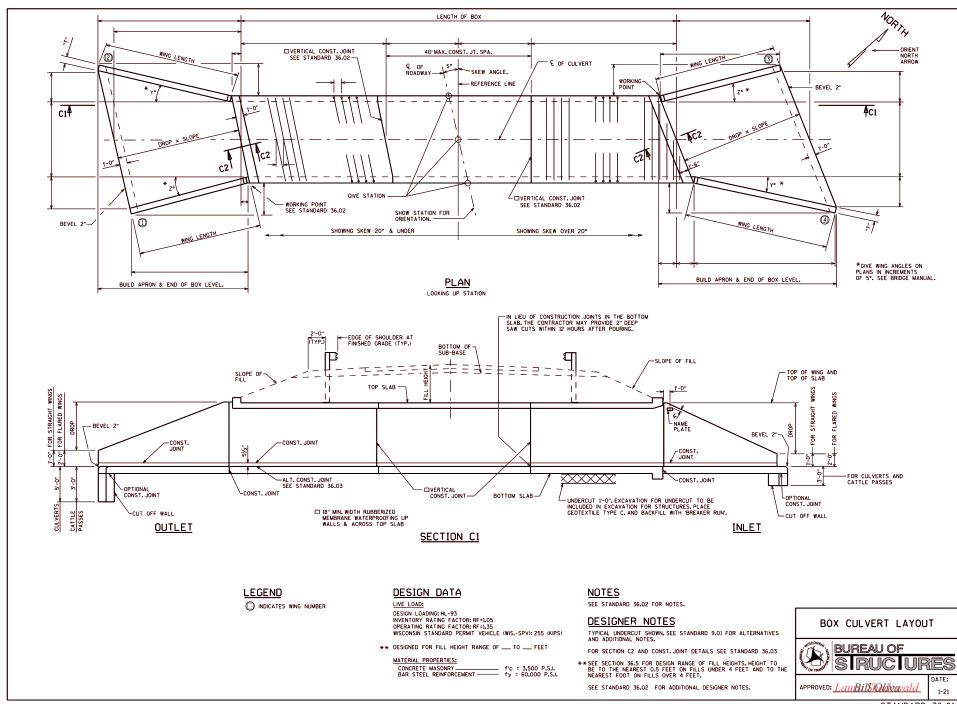


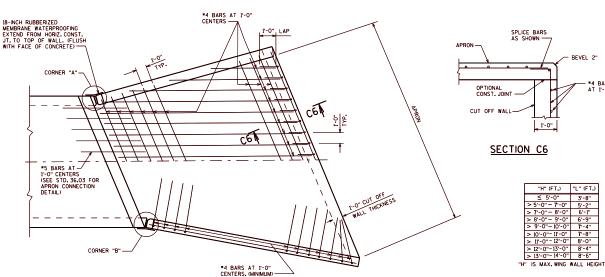












APRON DETAIL

SPLICE BARS AS SHOWN — BEVEL 2"

SECTION C6

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

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"

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

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,

LOCATE NAME PLATE ON NEAREST RIGHT WING TRAVELING UP STATION, FACE NAME PLATE UP STATION.

DESIGNER NOTES

 $\frac{\mathsf{IF}}{\mathsf{PRECAST}}$ ELEMENTS ARE ALLOWED, INCLUDE THE FOLLOWING NOTE ON THE LAYOUT SHEET:

THE CONTRACTOR MAY FURNISH (INCLUDE ALLOWABLE PRECAST ELEMENTS) IN LIEU OF THE CAST-N-PLACE BOX CULVERT WITH THE ACCEPTANCE OF THE SHOP DRAWINGS BY THE STRUCTURES MAINTENANCE SECTION. THE PRECAST CONCRETE BOX CULVERT SHALL COMPORN TO PRECAST DETAILS IN CHAPTER 36 STANDARDS OF THE CURRENT WISCONSIN DOT BRODGE MANUAL, PATMENT FOR THE PRECAST CULVERT SHALL BE BASED ON THE QUANTITIES AND PRICES BID FOR THE ITEMS LISTED IN THE "TOTAL ESTIMATED QUANTITIES".

ALLOWABLE PRECAST ELEMENTS INCLUDE: BOX CULVERT BARREL SECTIONS, WINDWALLS, HEADERS, AND CUITOFF WALLS, APRON FLOORS SHALL BE CAST-IN-PLACE, UNLESS DESIDED OTHERWISE. THE DESIGNER SHALL DETERMENE IF PRECAST ELEMENTS ARE ALLOWED ON A PROJECT-BY-PROJECT BASIS, PRECAST ONLY DESIGNS REQUIRE PRIOR APPROVAL BY THE BURBAU OF STRUCTURES, MHEN PRECAST ELEMENTS HAVE BEEN DETERMINED OF BE PROPRIED LEWENTS SHALL BE NOTED ACCORDINGLY ON THE FLANS CLO. "A PRECAST WINDWALL 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 BRODE MANIAL SECTIONS S.LIA AND SEZE FOR ADDITIONAL INFORMATION. IF USED, PROVIDE PRECAST DETAILS FOLLOWING STANDARDS 36.05 AND 36.06 WITH THE FOLLOWING SPECIFICATIONS (STRUCTURE) (504,1000.5) PRECAST CONCRETE WINDWALLS (STRUCTURE) (504,1000.5) PRECAST CONCRETE WINDWALLS (STRUCTURE) (504,1000.5)

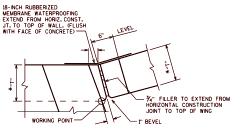
ALL BAR STEEL FOR CAST-IN-PLACE CONCRETE BOX CULVERTS SHALL BE UNCOATED, EXCEPT WHEN THERE IS NO FILL OVER THE CULVERT, EPOXY COATED BARS SHALL BE USED FOR THE TOP AND BOTTOM BARS IN THE TOP SLAB.

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

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.

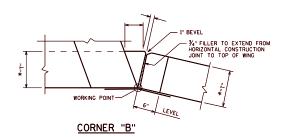
SEE STANDARDS 9.01 AND 36.01 FOR ADDITIONAL NOTES.

SEE STANDARDS 36.05 AND 36.06 FOR PRECAST BOX CULVERT DETAILS.

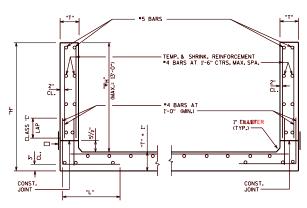


CORNER "A"

* DIMENSION "T" TO BE



- REINFORCEMENT BEVEL 2" ALTERNATE SECTION C6 SHEET PILING (MIN. WEB THICKNESS 5/6") PAYMENT BASED ON CONCRETE CUT OFF WALL. ALTERNATE CUT OFF WALL



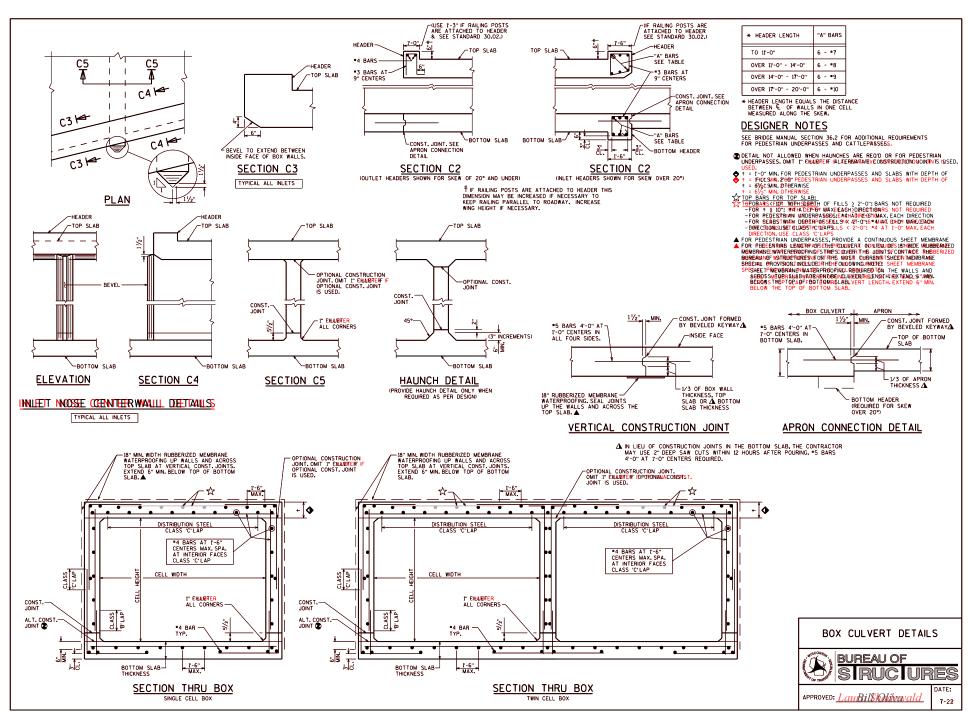
SECTION THRU WINGWALLS

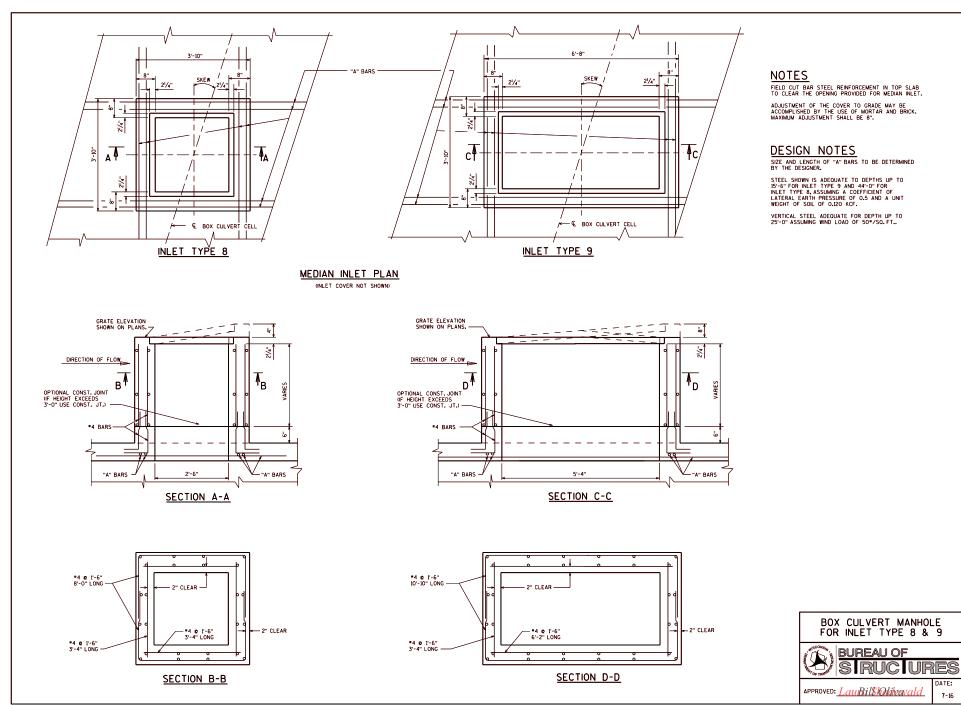
☐ 18" MIN. WIDTH RUBBERIZED MEMBRANE WATERPROOFING ALONG HORIZ. CONSTR. JT. IN WING.

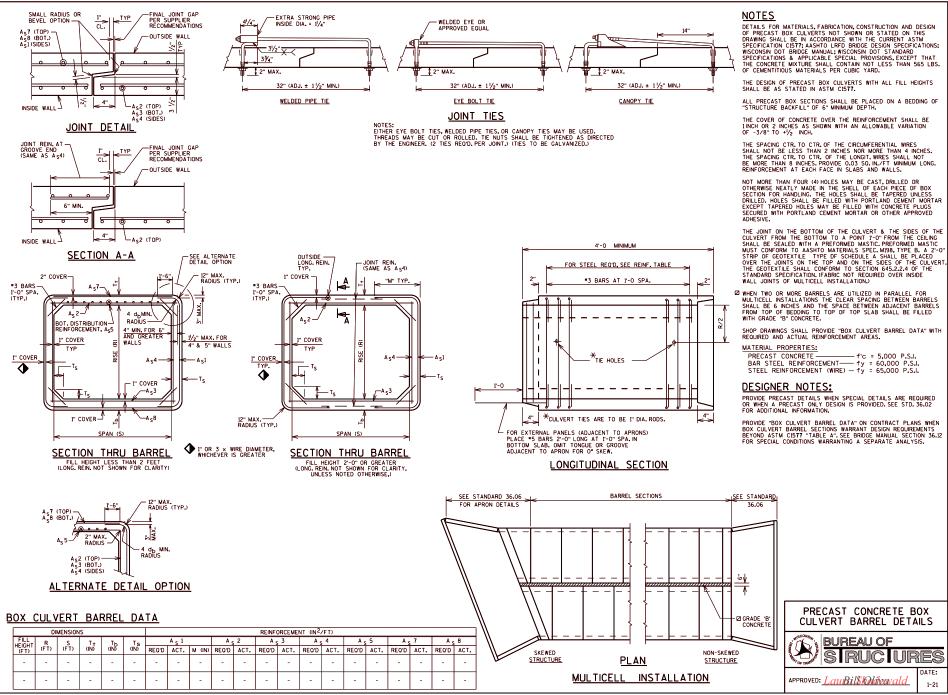
BOX CULVERT APRON DETAILS

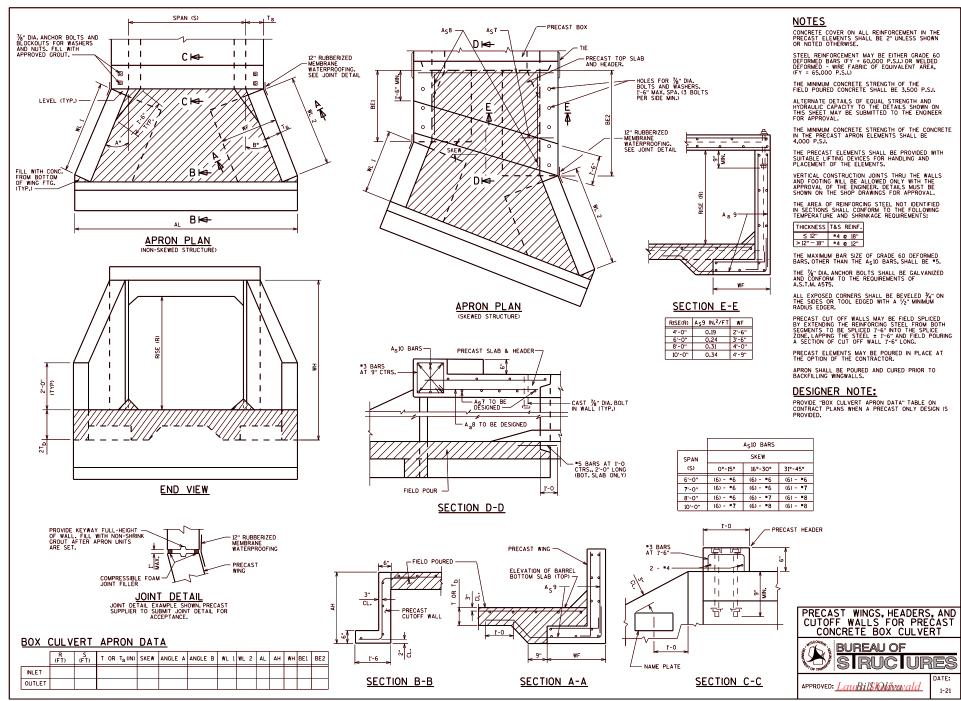


APPROVED: LauBilSlodileovale







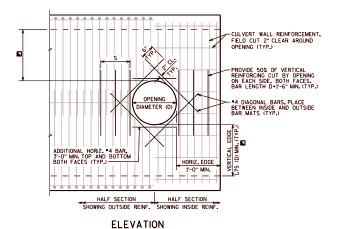


<u>NOTES</u>

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.



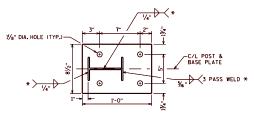
WHEN D & 1'-6" S = 1'-6" WHEN D > 1'-6" S = 1'-6" MIN, D MAX

PIPE OPENING IN CULVERT WALL

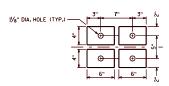


APPROVED: LauBils Woldwowald

* 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.

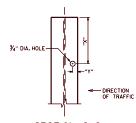


SECTION A-A

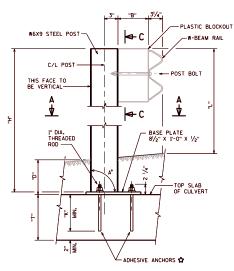


SECTION B-B

(4)-BOTTOM PLATES



SECTION C-C
HOLE IN POST FLANGE ON
APPROACHING TRAFFIC SIDE

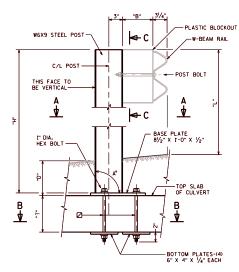


ELEVATION

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_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'c) OF 4,000 PSI



ELEVATION

GUARDRAIL POST ANCHORS TYPE 2

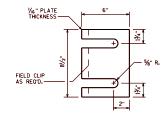
USE FOR THICKNESS "T" OF 8-INCHES OR MORE AND MINIMUM CONCRETE STRENGTH (f_c) OF 3,500 PSI

GUARDRAIL POST ANCHORAGE SYSTEM

CRITERIA

USE FOR POSTS WITH "D" EMBEDMENT LESS THAN OR EQUAL TO 4"-O" AND GREATER THAN OR EQUAL TO 9".
NOT REO'D FOR POSTS WITH "D" EMBEDMENT MORE THAN 4"-O".
NOT ALLOWED FOR POSTS WITH "D" EMBEDMENT LESS THAN 9".

	"L"	"B"	"X"	"Y"	SOURCE
CLASS "A" GUARDRAIL	2'-4%"	8"	7"	13/16"	SDD 14 B 15
MGS GUARDRAIL	2'-7%"	12"	71/8"	3/4"	SDD 14 B 42



STEEL SHIM DETAIL

4 PER POST

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 EGGES SMOOTH, STRAIGHT AND VERTICAL, ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS.

CUI 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 THREADED RODS ARE TO BE PLACED PERPENDICULAR 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 GRADE 50 OR 50S.

HEX BOLTS, THREADED RODS, HEX NUTS AND WASHERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F1554 GRADE 36. AND SHALL BE GALVANUED. RODS ARE TO BE FULLY 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 Psifor Uncracked Concrete. See Standard Specification 502.3.14 and APPLY to Threaded Rods.
- $\hfill \Box$ 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 10R 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'

POST SPACING IS 3"-1½" PER FDM SDD 14 8 51. SEE FDM SDD 15 8 51. SEE FDM SDD 15 8 51. SEE FDM SDD 15 8 51. SEE FDM SDD 16 8 51. SEE FDM

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 (P), 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'-O" 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 MASH 2016 EVALUATION CRITERIA FOR TEST LEVEL 3 (TL-3).





APPROVED: <u>Laura Shadewald</u>

ANDADD 76.00

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. PREFERABLY, PROVIDE FOOTING ON NON-WIELDING FOUNDATION MATERIAL HOWEVER, ALLOWABLE DIFFERENTIAL SETTLEMENT FOR FOOTING ON SOIL SUPPORTING THE STRUCTURE = 0.002 FT.PER FT, MAXL, 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 SOD 18482 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 14B32 AND SDD 14B34 FOR CONCRETE BARRIER DETAILS.

PROVIDE A SUITABLE DRAINAGE PIPE ALONG THE CULVERT AND WINGWALLS TO RELEASE HYDROSTATIC PRESSURE, WHERE SIGNIFICANT SEEPAGE OR RELATIVELY RAPID ACCUMULATION OF WATER IS ANTICIPATED BEHIND THE WALL, INCORPORATE PIPE UNDERDRAIN WRAPPED AS SPECIFIED, NITO THE BEACKFILL STRUCTURE, BEHIND THE WALL TO REPROVE DRAINAGE CONDITIONS, DIRECT SEEPAGE FROM DRAINAGE PIPE TO WEEP HOLES ALONG THE EXTERIOR FACE OF THE WALL OR TO THE STORM WATER CONVEYANCES.

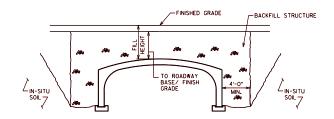
PLACE FOOTINGS BELOW SCOUR AND FROST DEPTHS, PLACE BOTTOM OF FOOTING AT A MINIMUM DEPTH EQUAL TO PREVAILING FROST DEPTH OR SCOUR DEPTH BUT NOT LESS THAN 4-0" BELOW GROUND ELEVATION UNLESS CONSTRUCTED ON ROCK FOUNDATION OR OTHERWISE MONICATED.

PROVIDE DUCTILE JOINT SYSTEM BETWEEN VERTICAL LEG OF THE PRECAST SEGMENT AND FOOTER AS INDICATED ON THE STANDARD DETAIL DRAWINGS.

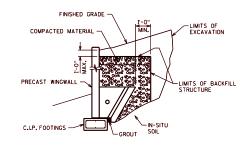
BENDING OF REINFORCEMENT FOR PRECAST BRIDGE UNITS - THE OUTSIDE AND INSIDE CIRCUMFERENTIAL REINFORCING STEEL FOR THE COMPREN OF THE BRIDGE SHALL BE BENT TO SUCH AN ANGLE THAT IS APPROXIMATELY EQUAL TO THE CONFIGURATION OF THE BRIDGE'S OUTSIDE CORNER,

LRFD DESIGN LOADS

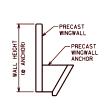
LIVE LOAD: HL-93 HORIZONTAL EARTH PRESSURE: UNIT WEIGHT = 125 PCF VERTICAL EARTH PRESSURE: UNIT WEIGHT = 120 PCF



BACKFILL REQUIREMENTS



WALL BACKFILL REQUIREMENTS



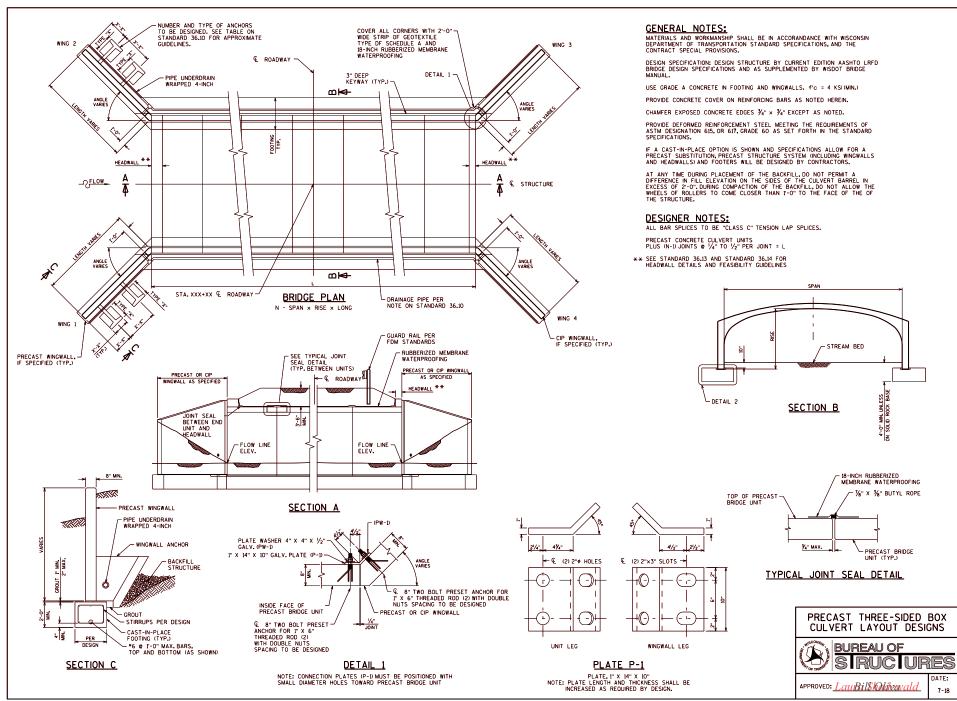
APPROXIMATE/ NUMBER OF ANCHO	
LENGTH OF WALL	NO. ANCHORS
L = 14'-0"	2
L = 20'-0"	3
L = 24'-0"	4
24'-0" < L	MULTIPLE-PIECE WINGWALL*

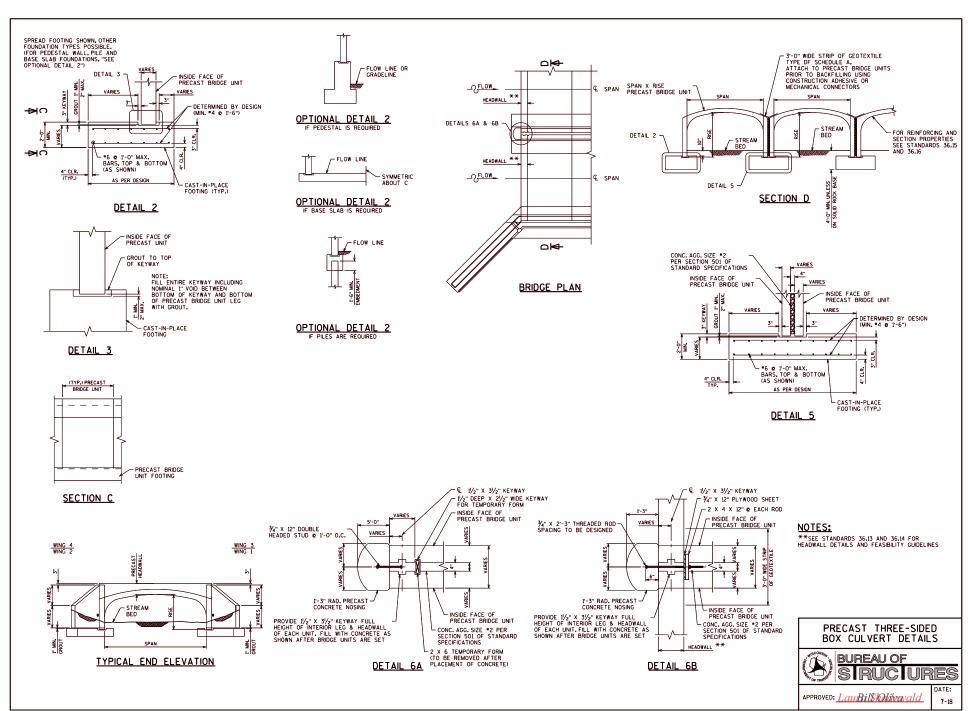
*NOTE: ADJACENT SEGMENTS SHALL BE ATTACHED TO EACH OTHER TO KEEP FRONT FACES IN ALIGNMENT, PLACE A FLILER AT THESE JOINTS WITH A MEMBRANE ALONG THE JOINT AT THE BACK FACE.

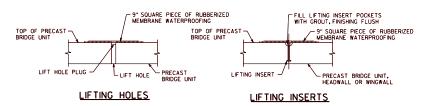
PRECAST THREE-SIDED BOX CULVERT DESIGN NOTES



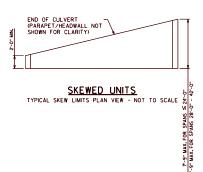
APPROVED: LauBils Waldwowald

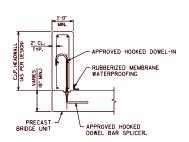




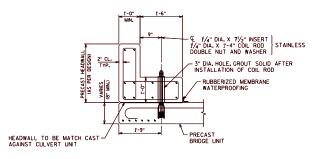


TYPICAL LIFT POINT SEALING DETAIL





CAST-IN-PLACE HEADWALL DETAIL



PRECAST HEADWALL DETAIL WITH COLLAR

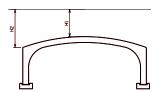
LRFD COLLAR/HEADWALL DESIGN NOTES:

- HEADWALL DETAILS SHOWN HERE HAVE ONLY BEEN DESIGNED FOR THE FOLLOWING 2 LOAD CASES:

DEARTH PRESSURE + LIVE LOAD SURCHARGE THESE DETAILS ARE NOT TO BE USED WHERE A VEHICLE LOAD CAN BE TRANSMITTED THROUGH A BASRIER TO THE HEADWALL.

1-O" HEADWALL THICKNESS
1-O" COLLAR THICKNESS
5 OLI BEHIND HEADWALL IS AT SAME ELEVATION AS TOP OF HEADWALL ADDITIONAL HW HEIGHT MAY BE ACHIEVED WITH ADDITIONAL STEEL REINFORCEMENT OR THICKENED COLLAR
FOR DETACHED HEADWALL DESIGNS ONLY

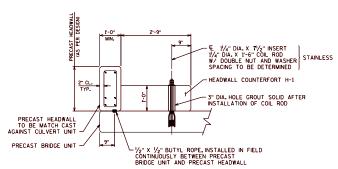
	HI	H2
UNIT SPAN	MAX.HEIGHT & CROWN TO T/HEADWALL (NO LIVE LOAD SURCHARGE)	MAX. APPROXIMATE HEIGHT @ EDGE OF SPAN
14'-0"	8'-0"	9'-6¾"
20'-0" - 28'-0"	7'-0"	10'-0"
36'-0"	6'-0"	10'-6"
42'-0"	4'-0"	10'-0"



PRECAST THREE-SIDED BOX CULVERT HEADWALL DETAILS



APPROVED: Lawa & Bedkeval



PRECAST HEADWALL TYPE H-1 COUNTERFORT NOT TO SCALE

SAMPLE ELEVATION

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		LL HEIGHT © RT LOCATION
	COUNTERFORT	NO SURCHARGE	W/ 2'-0" SURCHARGE
	H-1	7'-0"	5'-0"
14'-0" SPAN	H-2	7'-0"	5'-0"
	н-3	8'-0"	6'-0"
	H-1	8'-0"	6'-0"
20'-0" - 42'-0" SPANS	H-2	10'-0"	7'-0"
	H-3	10'-0"	8'-0"

LRFD HEADWALL COUNTERFORTS

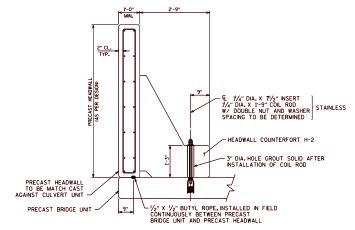
- LRFD HEADWALL COUNTERFORTS

 HEADWALL DETAILS SHOWN HERE HAVE ONLY BEEN DESIGNED FOR THE FOLLOWING 2 LOAD CASES:

 DEARTH PRESSURE LIVE LOAD SURCHARGE
 LYESE DETAILS ARE NOT TO BE USED WHERE A VEHICLE LOAD CAN BE TRANSMITTED THROUGH A BARRIER TO THE HEADWALL.

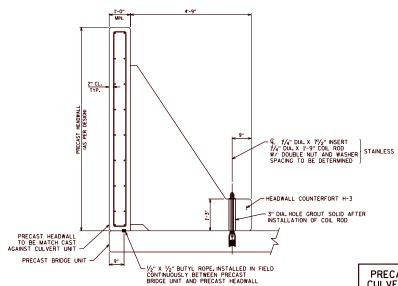
 ASSUMED 4-0° SPACING OF COUNTERFORTS

 I'-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

NOT TO SCALE



PRECAST HEADWALL TYPE H-3 COUNTERFORT

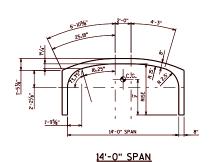
NOT TO SCALE

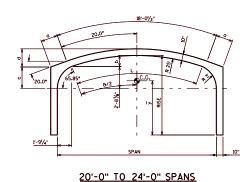
PRECAST THREE-SIDED BOX CULVERT HEADWALL DETAILS

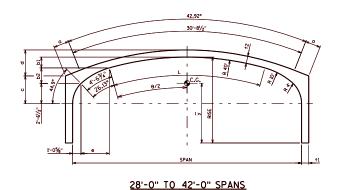


APPROVED: Lawa & Bedkeval

STANDARD 36.14







	CENTER OF GRAVITY Y FT												
RISE		SPAN - FT											
FT	14	20	24	28	36	42							
4	3.2												
5	3.9	3.8											
6	4.6	4.6	4.6										
7	5.2	5.3	5.3	5.3									
8	5.8	6.0	6.0	6.0	5.8								
9	6.5	6.6	6.6	6.7	6.5								
10	7.1	7.3	7.3	7.4	7.2	6.9							
11				8.0	7.9	7.7							
12					8.6	8.4							
13					9.3	9.1							

AREA OF CONCRETE SECTION SQ. FT										
RISE			SPAN	- FT						
FT	14	20	24	28	36	42				
4	15.2									
5	16.5	24.8								
6	17.8	26.5	29.1							
7	19.2	28.2	30.8	39.9						
8	20.5	29.9	32.5	41.9	54.1					
9	21.8	31.5	34.2	43.9	56.4					
10	23.0	33.2	35.8	45.9	58.7	64.7				
11				47.9	61.1	67.0				
12					63.4	69.4				
13					65.7	71.7				

	GEOMETRIC PROPERTIES (FT.) (NOT SHOWN ON DRAWING)											
		SPAN - FT										
	20	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							
ь	1.39	2.19										
ы			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							
е			4.07	3.83	3.63							
+1			1.00	1.17	1.17							
†2			0.83	1.00	1.00							

(REFER TO STANDARDS 36.16 FOR REINFORCING DETAILS)

	ARCH UNIT PRIMARY REINFORCING (MINIMUM)																	
	4'-	14'-0" SP# 0" TO 10'-0		5'-	20'-0" SP 0" TO 10'-0		6'-	24'-0" SP 0" TO 10'-0		7'-	28'-0" SP. 0" TO 11'-0		8'-	36'-0" SP 0" TO 13'-0		10"	42'-0" SP 0" TO 13'-0	
COVER ft	A1 SQ. IN/FT	A3 SQ. IN/FT	f'c REO'D. PSI	A1 SQ. IN/FT	A3 SQ. IN/FT	f'c REO'D. PSI	A1 SQ. IN/FT	A3 SQ. IN/FT	f'c REO'D. PSI	A1 SQ. IN/FT	A3 SQ. IN/FT	f'c REO'D. PSI	A1 SQ. IN/FT	A3 SQ. IN/FT	f'c REO'D. PSI	A1 SQ. IN/FT	A3 SQ. IN/FT	f'c REO'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

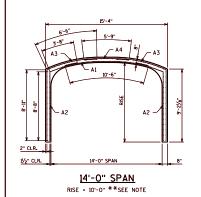
⊕SHEAR REINFORCEMENT REQUIRED FOR 6'-0" & 7'-0" RISE ©SHEAR REINFORCEMENT REQUIRED FOR 8'-0" & 9'-0" RISE ©SHEAR REINFORCEMENT REQUIRED FOR 10'-0" & 9'-0" RISE ⑤SHEAR REINFORCEMENT REQUIRED FOR 10'-0" & 11'-0" RISE ⑤MINIMUM PRECAST UNIT WIDTH = 3'-11¾"

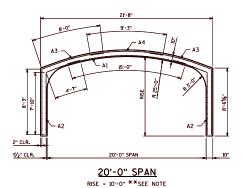
NOTE: THESE STEEL AREAS ARE SHOWN FOR COVER OF 12'-0" OR LESS. PRECAST THREE-SIDED BOX CULVERT CROSS SECTIONS

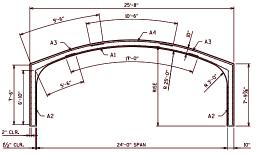
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APPROVED: Lassaco Badkerald

APPROVED: Lassaco Badkerald



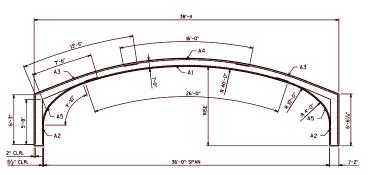




24'-0" SPAN RISE = 10'-0" **SEE NOTE

37'-6" A2 -2" CLR. 11/2" CLR. 28'-0" SPAN





36'-0" SPAN RISE = 10'-0"

44'-4" OUT TO OUT _ A4 2" CLR. 11/2" CLR. 42'-0" SPAN

42'-0" SPAN RISE = 12'-0"

	ARCH UNIT LONGITUDINAL REINFORCEMENT (MINIMUM)												
1	4'-0" SPAN		2	0'-0" SPAN		2	4'-0" SPAN						
CIRCUMF. AREA REO'D SO. IN/FT	LONGITUDINAL AREA REO'D SO.IN/FT	LENGTH FT	CIRCUMF. AREA REO'D SO. IN/FT	LONGITUDINAL AREA REO'D SO. IN/FT	LENGTH FT	CIRCUMF. AREA REO'D SO. IN/FT	LONGITUDINAL AREA REO'D SO. IN/FT	LENGTH FT					
A1 = **	0.13	10'-6"	A1 = **	0.13	15'-0"	A1 = **	0.13	17'-0"					
A2 = 0.24	0.13	12'-3"	A2 = 0.24	0.13	12'-5"	A2 = 0.24	0.13	12'-4"					
A3 = **	0.13	15'-4"	A3 = **	0.13	16'-3"	A3 = **	0.13	17'-0"					
A4 = 0.24	0.13	5'-9"	A4 = 0.24	0.13	9'-3"	A4 = 0.24	0.13	10'-6"					

2	8'-0" SPAN		3	6'-0" SPAN		4	2'-0" SPAN	
CIRCUMF. AREA REO'D SQ. IN/FT	LONGITUDINAL AREA REO'D SQ. IN/FT	LENGTH FT	CIRCUMF. AREA REO'D SQ. IN/FT	LONGITUDINAL AREA REO'D SO.IN/FT	LENGTH FT	CIRCUMF. AREA REO'D SQ. IN/FT	LONGITUDINAL AREA REO'D SO. IN/FT	LENGTH FT
A1A = **	0.13	22'-0"	A1A = **	0.13	26'-0"	A1A = **	0.13	31'-0"
A1B = **	NOT REO'D	16'-0"	A1B = **	NOT REO'D	18'-0"	A1B = **	NOT REO'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 REO'D	13'-6"	A3B = **	NOT REO'D	15'-8"	A3B = **	NOT REO'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"

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 10'-0".

THESE STEEL AREAS, STEEL LENGTHS AND ARCH THICKNESS ARE SHOWN FOR COVER OF 12'-O" 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 $1/\!\!/_2$ INCHES MINIMUM.

THE CLEAR DISTANCE OF THE END CIRCUMFERENTIAL WIRES SHALL NOT BE LESS THAN I' NOR MORE THAN 2' FROM THE ENDS OF EACH SECTION.
AN ALTERNATE EQUIVALENT OF WELDD 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:

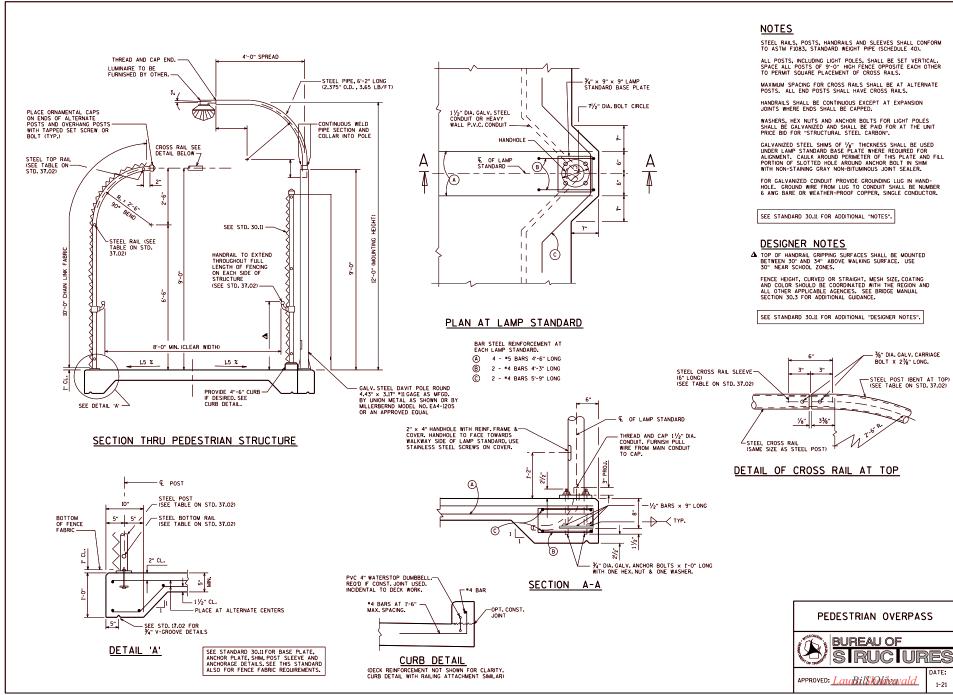
f'c = 5000 PSI MINIMUM FOR CONCRETE fy = 60,000 PSI FOR STEEL REINFORCING BARS fy = 65,000 PSI FOR WELDED WIRE FABRIC (IN FLAT SHEET)

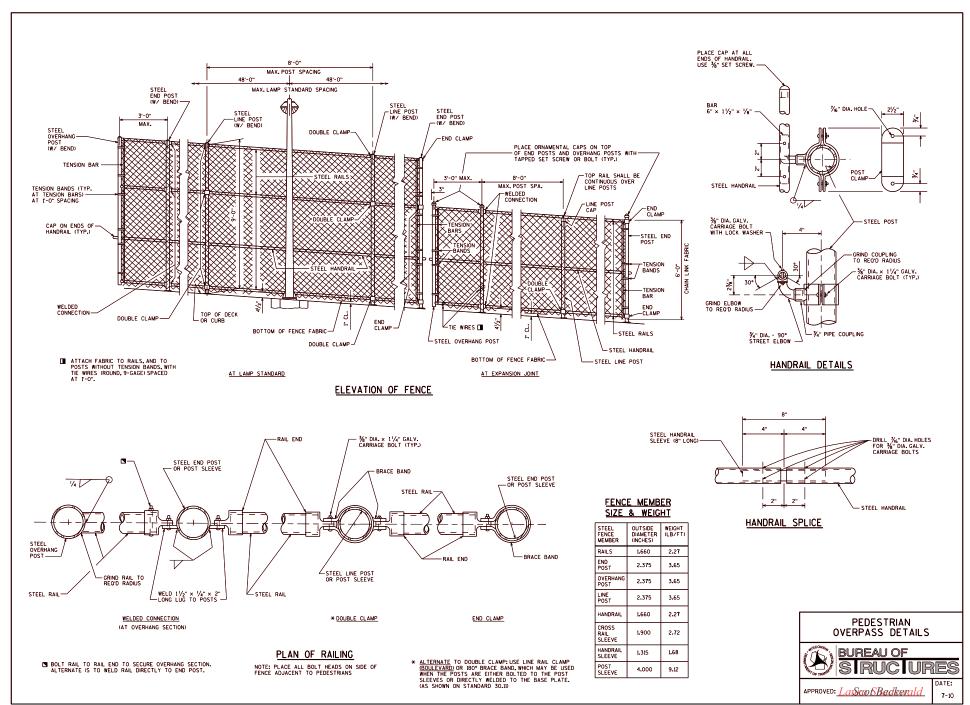
SPAN FT	APPROX. MAX. COVER
14'	50'
20' - 24'	30'
28' - 36'	20'
42'	15'

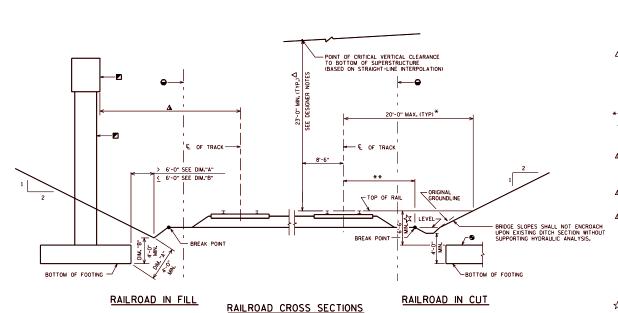
PRECAST THREE-SIDED BOX CULVERT REINFORCEMENT



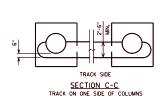
APPROVED: LauBilSlodileowald





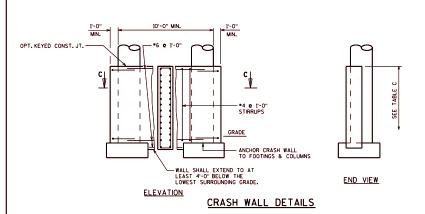


PIER LOCATION HEIGHT OF CRASH
WALL ABOVE TOP OF RAIL



	PIER LOCATION	WALL ABOVE TOP OF RAIL			
GENERAL AREMA	PIERS ≤ 12'-0" FROM € TRACK	12'-0"			
REQUIREMENT	PIERS 12'-0" TO 25'-0"	6'-0"			
CP RAIL	PIERS < 15'-0" FROM € TRACK	12'-0"			
REQUIREMENT	PIERS > 15'-0" TO 25'-0"	8'-0"			

TABLE C





DIMENSIONS SHOWN APPLY TO CUT OR FILL SITUATIONS.

DECK DRAINS OR DOWN SPOUTS SHALL NOT DISCHARGE ONTO RAILROAD TRACK BED.

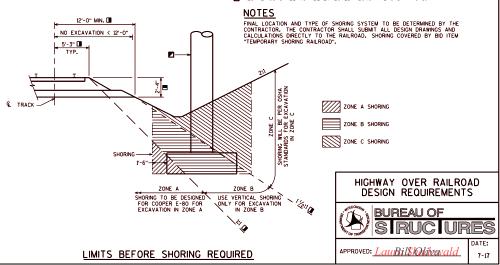
SINGLE SLOPE PARAPET SHALL BE USED. PEDESTRIAN RAILING WILL ONLY BE PROVIDED IF THERE IS A SIDEWALK. SEE CHAPTER 38 OF THE BRIDGE MANUAL.

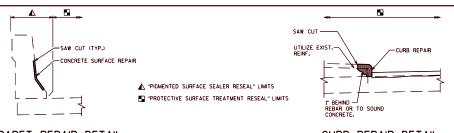
- △ VERTICAL CLEARANCE MUST BE AT LEAST 23"-0" AFTER CONSTRUCTION, USE A STRAIGHT-LINE INTERPOLATION BETWEEN TOP OF BEARINGS TO DETERMINE THE CLEARANCE, PROVIDED THAT POSITIVE CAMBER IS REALIZED, LL DEFILECTION NEED NOT BE CONSIDERED WITH THE STRAIGHT-LINE APPROACH, DESIGN FOR (APPROX.) 23"-2" TO AVOID 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 RALIROAD UNIT. SEE 23 CODE OF FEDERAL REGULATIONS PT 646, SUBPT, B APPENDIX.
- ▲ FOR OFFSETS UP TO, AND INCLUDING 25'-O", A CRASH WALL OR HAMMERHEAD PIER DESIGNED TO AREMA STANDARDS (30 SO, FT, MMN, X-SECT) IS REQUIRED. OF RAIL REQUIRES CRASH WALLS BE DESIGNED TO RESIST A GOO 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. CONFEWITH STATEWIDE RAILROAD STRUCTURE AND TRACK ENGINEER IN CENTRAL OFFICE RAILROADS AND HARBORDS SECTION AT 16092 666-0233.
- A HORZONTAL CLEARANCES LESS THAN 18-0" SHOULD BE REVEWED WITH THE STATEMBE RAILFOAD MOI TRACK ENGINEER IN THE CENTRAL OFFICE RAILFOADS AND HARBORS SECTION, 18-0" CLEARANCE IS MEASURED TO THE NEAREST ENCROACHING ELEMENT (PIERE CAPS, MEE WALL COPINIC, ETC.)

TEMPORARY CONSTRUCTION CLEARANCES ARE 21'-0" VERTICAL (21'-6" FOR BNSF AND UP RALIROADS) AND 12'-0" HORIZONTAL (15'-0" FOR BNSF AND UP RALIROADS) FROM CENTERLING OF TRACK TO FALSEWORK, UNLESS INSTRUCTED OTHERWISE, A CONSTRUCTION CLEARANCE DETAIL SHOULD NOT BE INCLUDED IN THE PLANS AS CONSTRUCTION CLEARANCES ARE STATED IN SECTION 1071.10 OF THE STANDARD SPECIFICATIONS.

DESIGNER SHALL SHOW HORIZONTAL LOCATION OF SHORING NEEDED IN PLAN VIEW. INCLUDE BID ITEM "TEMPORARY SHORING RAILROAD" WHEN SHORING ENCROACHES ZONF A OR R.

- ☆ 6'-6" MIN. NOT REO'D IF BEDROCK IS PRESENT.
 - THIS STANDARD IS TO MEET WISDOT REQUIREMENTS ONLY. THE DESIGN ENGINEER SHALL CONTACT THE RAILROAD FOR THEIR REQUIREMENTS.
- DI BNSF AND UP RAILROADS HAVE GREATER REQUIREMENTS THAN SHOWN. CONFER WITH STATEWIDE RAILROAD STRUCTURE AND TRACK ENGINEER IN CENTRAL OFFICE RAILROADS AND HARBORS SECTION. DESIGNER SHOULD CONSIDER FIELD TOLERANCES AND CONTINCENCIES WHEN SHOWNOS SHORING REQUIREMENTS, REFER TO "QUIEDLINES FOR TEMPORARY SHORING" PUBLICATION BY UP AND BNSF FOR ADDITIONAL INFORMATION.
- S BNSF AND UP RAILROAD REQUIRE A DEPTH OF FOOTING S'-O" MIN. FROM BASE OF RAIL TO TOP OF FOOTING. IN LOCATIONS WHERE BEDROCK IS PRESENT COORDINATE FOOTING DEPTHS WITH RAILROAD PROJECT COORDINATION ENGINEER.
- ← LIMITS OF RAILROAD RIGHT-OF-WAY. LOCATIONS SHOWN ARE FOR REFERENCE ONLY AND NEED NOT BE DIMENSIONED.
- AESTHETICS SHALL NOT BE EMPLOYED ALONG RAILROAD TRACKS.





PARAPET REPAIR DETAIL

502.3205 PROTECTIVE SURFACE TREATMENT RESEAL
502.3205 PIGMENTED SURFACE SEALER RESEAL
509.1500 CONCRETE SURFACE REPAIR

SY SY SF

CURB REPAIR DETAIL

502.3205 PROTECTIVE SURFACE TREATMENT RESEAL 509.1200 CURB REPAIR

NOTES

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

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

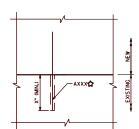
DESIGNER NOTES

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, CPROVIDE NOTE WHEN
THE ADHESIVE ANCHOR BID ITEM IS NOT USED, BUT ARE
ALLOWED AS AN ALTERNATIVE ANCHORAGE)

CHOOSE ONE OF THE FOLLOWING AND PLACE ON PLAN)

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

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

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

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

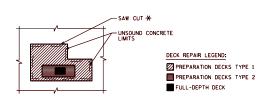
ANCHOR DETAIL (EXAMPLE)

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

DESIGNER NOTES

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

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



DECK REPAIR DETAIL - PLAN

FOR DESIGNER INFORMATION ONLY (DO NOT PLACE ON PLANS)

| 509.0301 | PREPARATION DECKS TYPE | PREPARATION DECKS TYPE | PREPARATION DECKS TYPE | PREPARATION DECKS TYPE | PREPARATION DECK PREPARATION AREAS | PROPARATION DECKS TYPE | PROPAR

EXISTING DECK

SAW CUT #

PREPARATION DECKS TYPE 1

PREPARATION DECKS TYPE 2

REMOVE EXISTING PATCHING AND REMOVE TO SOUND CONCRETE

CONCRETE OVERLAY

FULL DEPTH DECK REPAIR

DECK REPAIR DETAIL - SECTION

FOR DESIGNER INFORMATION ONLY (DO NOT PLACE ON PLANS)

SAW CUT *

EXISTING DECK

FULL-DEPTH DECK REPAIR DETAIL

(DO NOT PLACE ON PLANS)

★509.03IO.S
509.2000SAWING PAVEMENT DECK PREPARATION AREAS
FULL-DEPTH DECK REPAIR
CONCRETE MASONRY OVERLAY DECKSL

DESIGNER NOTES

SY

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

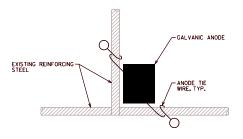
- * "SAWING PAVEMENT DECK PREPARATION AREAS" NOT REQUIRED FOR CONCRETE OVERLAYS.
- ▲ USE "CONCRETE MASONRY DECK REPAIR" (509.2:00.S) FOR DECK REPAIRS UNDER POLYMER, ASPHALTIC, OR POLYMER MOD. ASPHALTIC OVERLAYS. USE "CONCRETE MASONRY DECK REPAIR" FOR DECK REPAIRS "HOUT OVERLAYS.

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

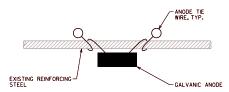
CONCRETE REPAIR DETAILS



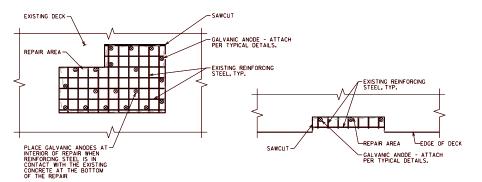
APPROVED: <u>LauBil\$100labowald</u>







TYPICAL INSTALLATION FOR BAR STEEL



PART. PLAN TYPICAL REPAIR DETAIL

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

<u>NOTES</u>

SUFFACE REPAR AREAS WITH CATHODIC PROTECTION ARE BASED ON THE PLANS MAN AS DETERMINED BY THE ENDINEET, HEP AM DIAMYTH FOR THE BID ITEM "EMBEDDED CALVANIC AMODES" IS BASED ON A MAXIMUM SPACING CAHORIES AROUND THE SUFFACE REPAIR PERIMETER, THE ACTUAL OUANTITY SHALL BE BASED ON THE FIELD CONDITIONS AND AS RECOMMENDED BY THE GALVANIC AMODE 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, CALVANIC ANODES SHOULD MAINTAIN A MINIMUM TOP COVER OF $\frac{1}{2}$ " AND A MINIMUM BOTTOM COVER OF $\frac{3}{2}$ 4"

DESIGNER NOTES

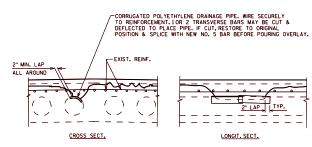
CATHODIC PROTECTION SHALL BE USED ONLY AT THE REQUEST OF THE REGIONAL BRIDGE MAINTENANCE ENGINEER.

INCLUDE APPLICABLE CONCRETE MASONRY BID ITEM TO FILL REPAIRS.

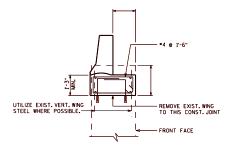
CATHODIC PROTECTION



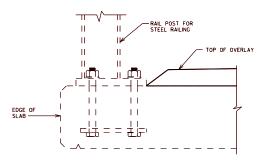
APPROVED: LauBils Waldvovald



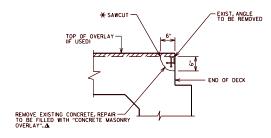
RUPTURED VOID REPAIR



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
X509.0310.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.

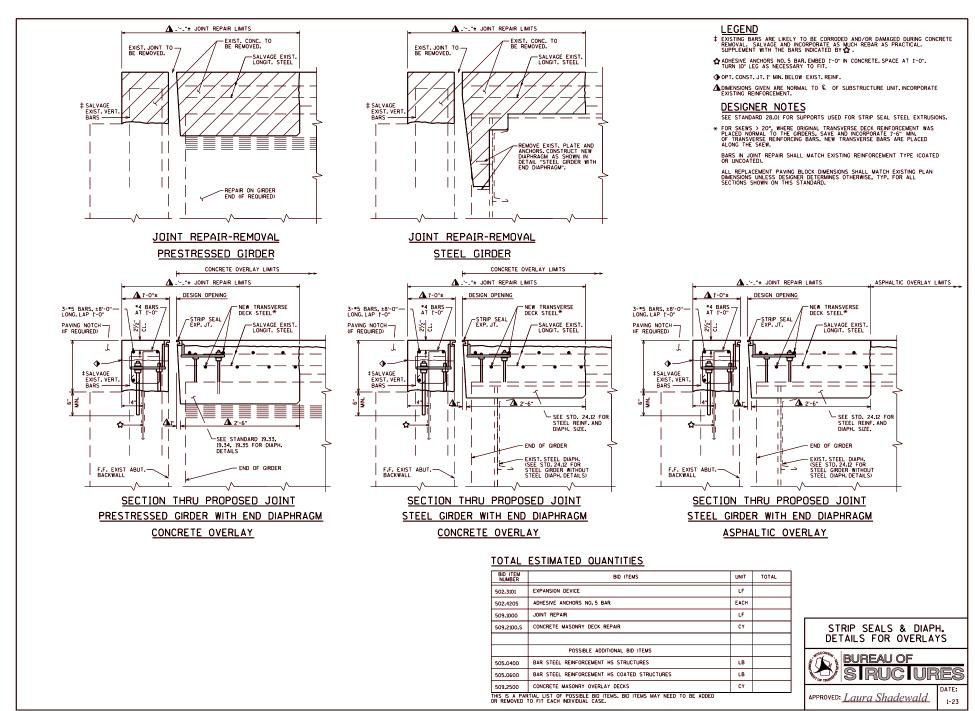
PROVIDE (IF AVAILABLE) THE MOST CURRENT DECK CONDITION ASSESSMENT SURVEY ON PLANS, INCLUDE SURVEY TYPE AND DATE COMPETED, THERMOGRAPHY DATA CAN BE FOUND IN HSIS WITHIN GENERAL INVENTORY/THE/NEPSECTION/DATE/MSPECTION SPECIAL REPORT DECK CONDITION ASSESSMENT SURVEY DATES CAN BE FOUND WITHIN INSPECTION/HISTORY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

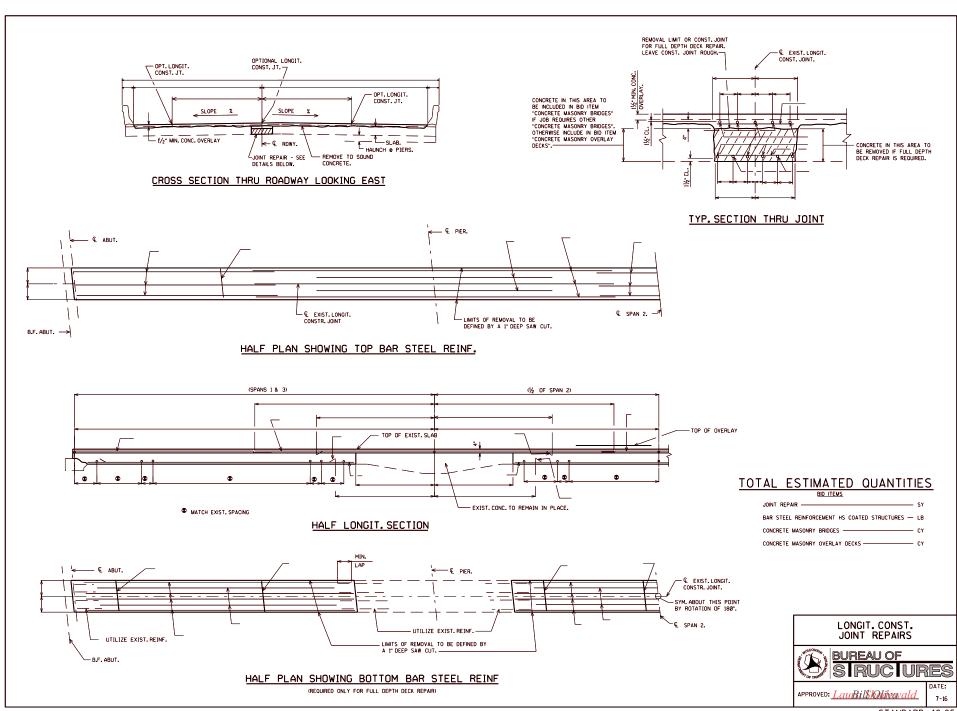
ATTACHING PARAPETS OR RAILINGS TO BRIDGE DECKS WITH EPOXY ANCHORS IS NOT ALLOWED BY FHWA.

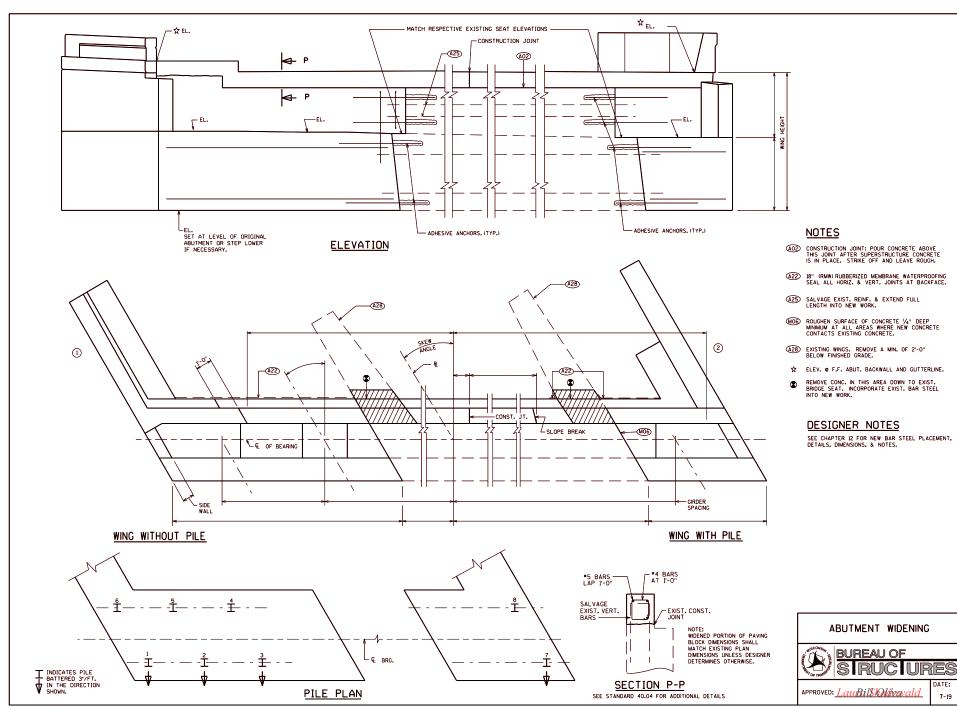
OVERLAY DETAILS

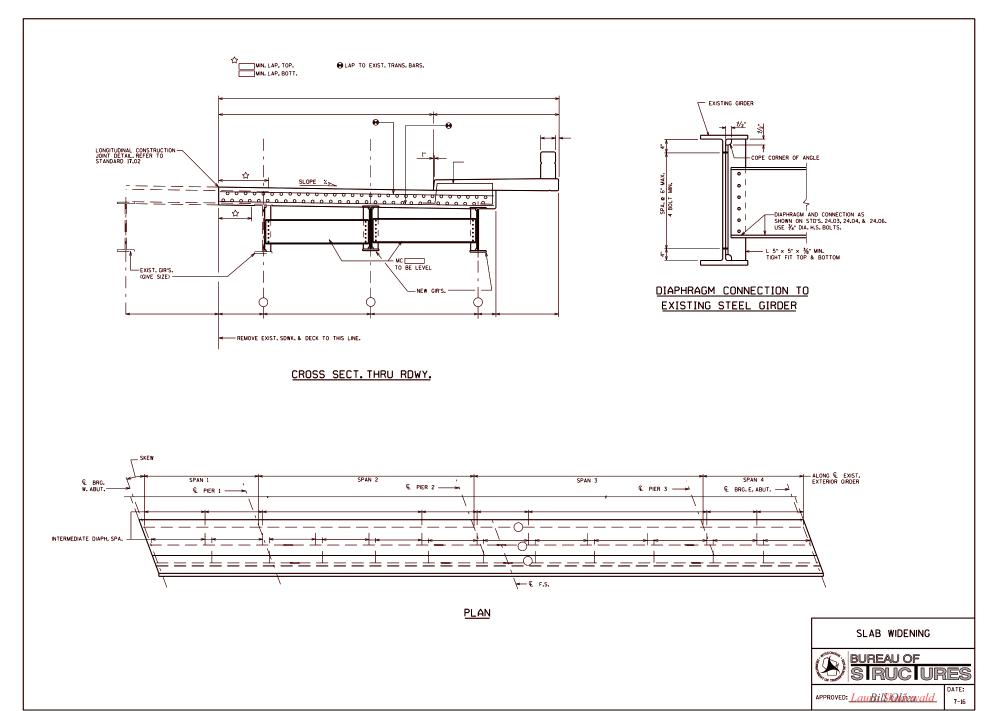


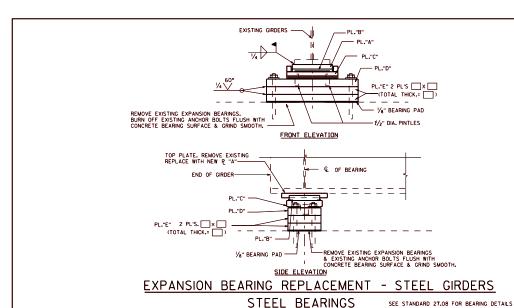
APPROVED: <u>LauBil\$101alvovald</u>











ELEVATION PLATE 'E' DETAILS (SEE STD. 40.10 FOR CONCRETE BLOCK ALTERNATE)

€ GIRDER-

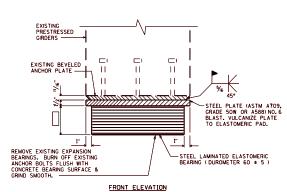
DIA. DRILLED
HOLES FOR DIA.
ANCHOR BOLTS.
(DETAIL NEW HOLES
TO MISS EXISTING

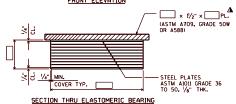
LOCATIONS AS REO'D.

P "E" 1 TO 5 PS THICHNESS OF . € BRG. →

Ó

<u>PLAN</u>





ELASTOMERIC BEARING END OF GIRDER -€ GIRDER € ELASTOMERIC BEARING 1/2" STEEL PLATE AND BEVELED ANCHOR PLATE

<u>NOTES</u> 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

DESIGNER NULES
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:

"WELDING PROCEDURES SHALL BE ESTABLISHED BY THE CONTRACTOR TO RESTRICT THE MAXIMUM TEMPERATURE REACHED BY SUPFACES IN CONTACT WITH ELASTOWER TO 200°F (33°C). TEMPERATURES SHALL BE CONTROLLED BY TEMPERATURE MAX PENCILS OR OTHER SUITABLE MEANS APPROVED BY THE ENGINEER."

TOP STEEL PLATE MAY NOT BE OMITTED.

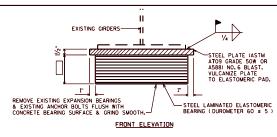
 Δ CHECK 27.2.1 ELASTOMERIC BEARINGS IN THE BRIDGE MANUAL FOR REQUIREMENTS TO SEE IF THIS PLATE SHOULD BE TAPERED.

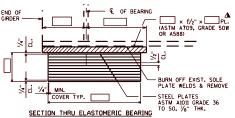
DO NOT INCLUDE PRESTRESSED GIRDER SHRINKAGE WHEN DESIGNING BEARINGS FOR BRIDGE REHABILITATION PROJECTS.

SEE STANDARD 27.07 FOR ADDITIONAL INFORMATION.

EXPANSION BEARING REPLACEMENT - PRESTRESSED GIRDERS

ELASTOMERIC BEARINGS





EXPANSION BEARING REPLACEMENT - STEEL GIRDERS **ELASTOMERIC BEARINGS**

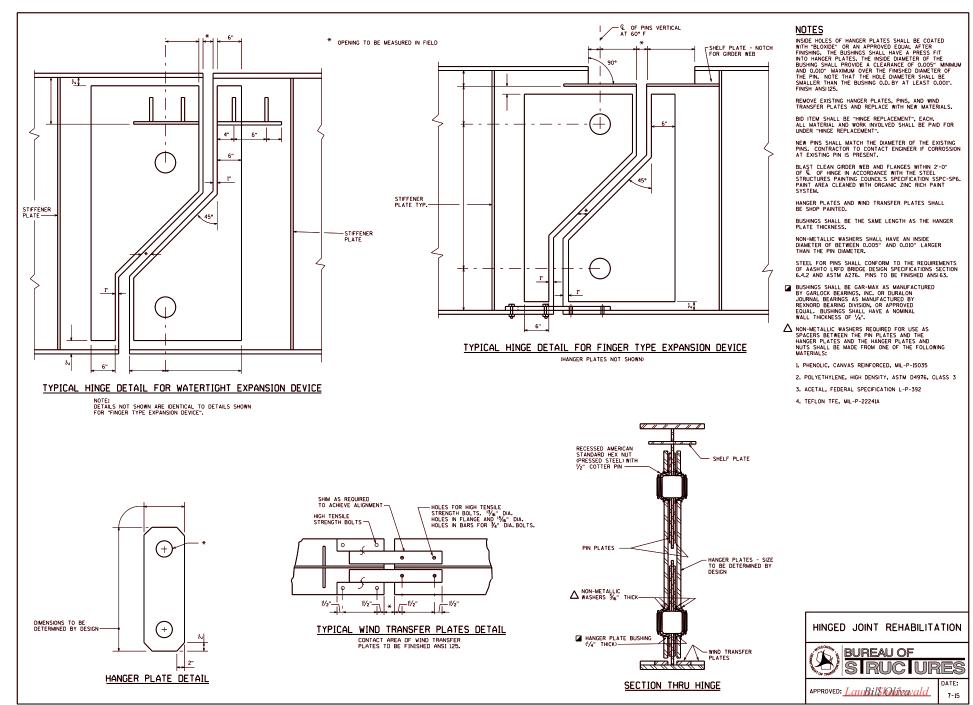
NOTES & DESIGNER NOTES SEE "EXPANSION BEARING REPLACMENT - PRESTRESSED GIRDERS" ON THIS STANDARD.

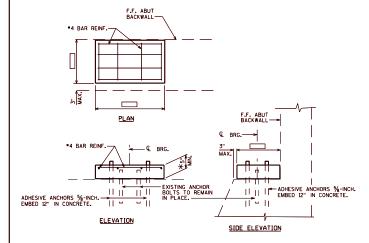
EXPANSION BEARING REPLACEMENT DETAILS



APPROVED: LauBilSlodileowald

STANDARD 40.08



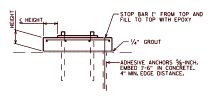


CONCRETE BEARING BLOCK DETAILS

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

GIRDER REACTIONS AT BEARINGS (KIPS)

		€ BRG. SUPPORT NAME	€ BRG. SUPPORT NAME	€ BRG. SUPPORT NAME
	DL			
INTERIOR GIRDER	LL			
EXTERIOR GIRDER	DL			
EXIERIOR 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).

GROUT $\slash\hspace{-0.6em} \slash\hspace{-0.6em} \slash$

PRECAST BLOCK (OR ANY CONCRETE BLOCK) MUST EXTEND BEYOND BEARING A DISTANCE EQUAL TO, OR GREATER THAN, THE HEIGHT OF THE CONCRETE BLOCK $\stackrel{\star}{\sim}$ THIS IS TO ACCOUNT FOR 45-BECREE DOWNARD AND SUMMARD STRESS DISTRIBUTION. THIS PROVISION CAN BE DISTRIBUTION OF A FULL-DETH CONCRETE GUARMRAGAM IS USED IN CONJUNCTION WITH A $\frac{1}{2}$ THACK LASTOMERIC PAD FIRED SEAT.

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

BURN EXISTING ANCHOR BOLTS OFF FLUSH WITH BEAM SEAT.

*4 U-SHAPED BARS *A U-SHAPED BARS *A U-SHAPED BARS

* ALTERNATE DETAIL

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

NOTES

THE THEORETICAL SERVICE LOADS (UNFACTORED) SHOWN IN THE TABLE ARE BASED ON THE BRIDGE IN 115 FINAL CONFIGURATION, ADDITIONAL LOAD RESULTING FROM STAGING AMD/OR CONTRACTOR OPERATIONS, SUCH AS UNEVEN JACKING OF ADJACENT GIRDERS OR ADJACENT SUBSTRUCTURE UNITS, IS NOT INCLUDED.

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

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

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

DESIGNER NOTES

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

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

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

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

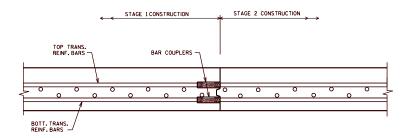
DO NOT INCLUDE LL REACTIONS FOR JACKING SITUATIONS THAT WILL NOT BE UNDER TRAFFIC.

CONCRETE BEARING BLOCK DETAILS

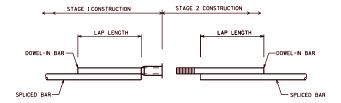


APPROVED: Laura Shadewald

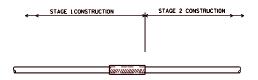
STANDARD 40.10



SECTION THRU DECK ONE-PIECE THREADED COUPLER SHOWN



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



ONE-PIECE THREADED COUPLER

BAR COUPLER ALTERNATIVES

NOTES

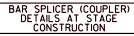
FOR DOWEL BAR COUPLERS, ALL DOWEL BARS SHALL BE LAPPED AND TIED TO THE REINFORCEMENT BARS.

DESIGNER NOTES

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

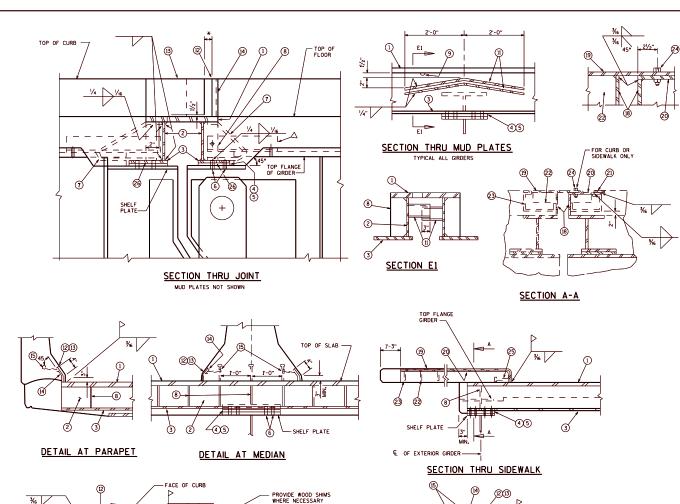
ON THE PLANS SHOW DETAILS SIMILAR TO "SECTION THRU DECK" AND "BAR COUPLER ALTERNATIVES".

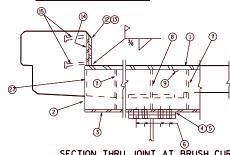
AT THE PLAN BILL OF BARS, INDICATE WHICH BARS REQUIRE BAR COUPLERS BY USE OF A SYMBOL, JOING THE SAME SYMBOL, ADD A NOTE STATING THAT A BAR COUPLER IS REQUIRED. BAR LENGTHS ABE COMPUTED TO THE \$\frac{1}{2}\$ OF THE CONSTRUCTION JOINT AND SHALL BE MODIFIED BY THE BAR COUPLER MANUFACTURERS RECOMMENDATIONS. DOWEL BARS ARE NOT TO BE DETAILED, AS THOSE BARS ARE INCLUDED IN THE BAR COUPLER BID ITEM SHOULD THE DOWEL OPTION BE CHOSEN.





APPROVED: LauBils Wolalegwald





SECTION THRU JOINT AT BRUSH CURB

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 36" THICK. 15/6" DIA. HOLES FOR NO. 6.
- 5. $\frac{1}{4}$ " LAMINATED SHIM WITH SLOTTED OPENINGS
- 6. 34" DIA. ERECTION BOLTS. DRILL HOLES IN SHELF PLATE IN THE FIELD.
- 7. ANCHOR BAR 56" DIA. AT 1'-0" CENTERS. BEND AS SHOWN.
- 8. STIFFENER BAR ¾" THICK. ¼" FILLET WELD ALL AROUND. PLACE AT © OF GIRDER AND AT +2'-O" CENTERS BETWEEN GIRDERS.
- 9. $\frac{1}{6}$ " 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 $\frac{1}{6}$ " PLATE WASHERS. ONE ON EACH SIDE OF FINGER PLATE.
- 12. 3/8" PLATE. BEND AS SHOWN.
- 13. 3/8" PLATE BEND AS SHOWN.
- 14. 3/8" PLATE BEND AS SHOWN.
- 15. %" DIA. STUDS X 6%6" LONG. WELD TO PLATES NO. 13 AND NO. 14.
- 16. 3/4" DIA. BOLT FOR SHIPPING. TACK WELD NUT TO BOTTOM OF PLATE NO. 1.
- 17. 3" DIA, X 3" DIA, X 1/4" + 5'-0" SPACING, SLOTTED HOLE 7/6" X 23/6" IN ONE END OF ANGLE AS SHOWN, FOR BOLT NO. 16.
- 18. CLOSING PLATE $\frac{3}{8}$ " CUT AS SHOWN. SEE WELD DETAIL
- 19. 3/8" PLATE. BEND AS SHOWN.
- 20. %" PLATE. BEND AS SHOWN.
- 21. 38" PLATE. BEND AS SHOWN.
- 22. 3/8" PLATE. WELD ALL AROUND, 1/4" FILLET WELD TO PLATES NO. 18. 19. & 20.
- 23. %" DIA. STUDS X 6%6" LONG. BEND AFTER WELD.
- 24. $\frac{1}{4}$ " DIA, BOLT WITH SO, NUT. GREASE FOR EASY REMOVAL, $\frac{1}{6}$ " X 1 $\frac{1}{4}$ " SLOTTED HOLE IN PL. NO. 19. LONG DIMENSION OF HOLE PARALLEL TO $\mathbb Q$. OF ROADWAY, TACK WELD NUT TO PLATE NO. 20 + 2"-0" SPA.
- 25. %" DIA. STUDS X 6%6" 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. 36" 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



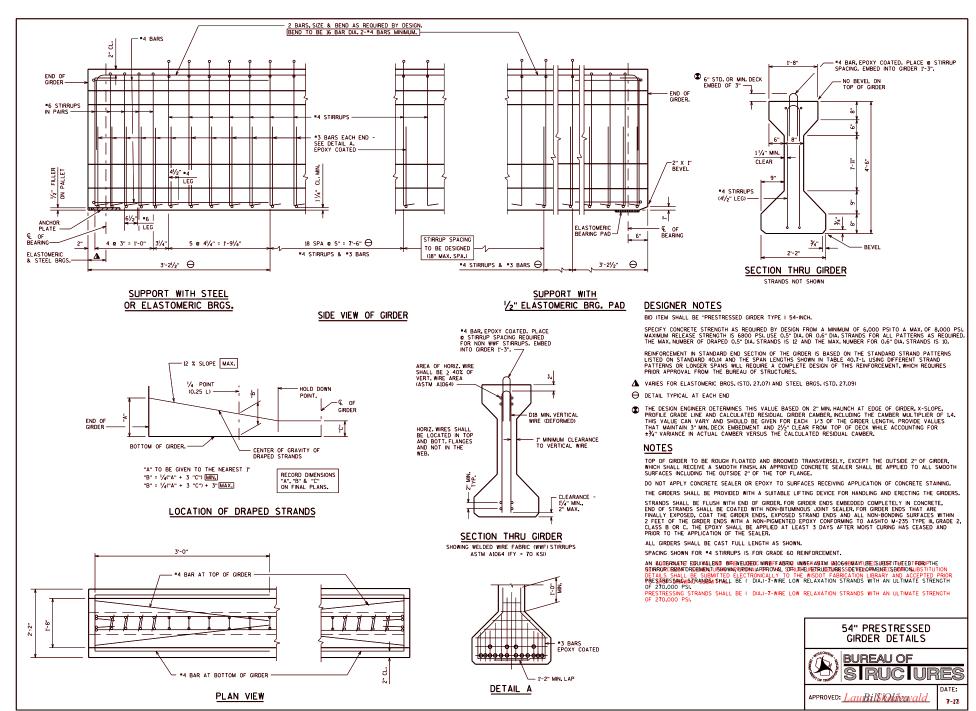
APPROVED: LauBilSlodileovale

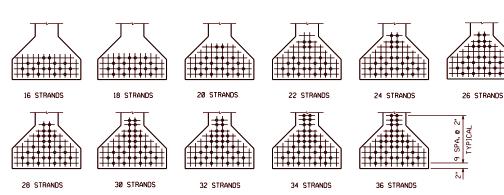
*OPENING AT 45° F. TO BE DETERMINED BY DESIGN, MIN. DESIGN OPENING AT +120° F. IS V₂" MAX. DESIGN OPENING AT -30° F. IS 7".

FINGER DETAIL

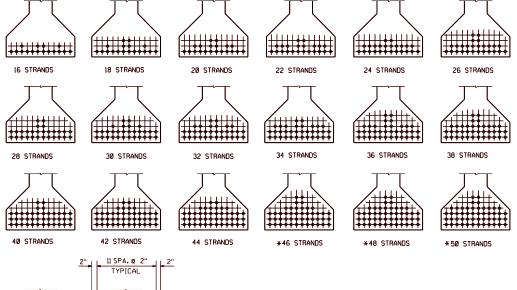
** 1" MIN. LAP OF FINGERS AT -30° F.

PART PLAN OF FINGER PLATE AT BRUSH CURB





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



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 = 31.00 KIPS Pi PER 0.6" DIA. STRAND = 0.217 X 202,500 = 43.94 KIPS

 f_B (Init.)= $\frac{(4)}{(3)}$ $\frac{y_B}{r^2} = \frac{-24.73}{330.46} = -0.07484 \text{ IN./IN.}^2$

(K/Sq. In.)

 $S_B = -10.543 \text{ IN.}^3$ WT. = 822 */FT.

54" GIRDER

A = 789 SQ. IN.

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

 $y_{T} = 29.27 \text{ IN.}$

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

I = 260,730 IN.4

S_T = 8,908 IN.³

(COMPRESSION IS POSITIVE)

	111 022	· / · · ·				ICUMPI	(E2210N 12 PO2111VE)
N	(1)	(2)	(3)	(4)	(4)	(5)	(5)
		е, ч.		P(Init.) = A. f.	P(Init.) = A. f.	f _a (Ini †.)=(4)/(3)	f _a (Ini t _a)=(4)/(3)
NO.	e _s	(1+ -5 -8)	(A/(2))	0.5" DIA. STRANDS	0.6" DIA. STRANDS	f _B (Ini t.)=(4)/(3) 0.5" DIA. STRANDS	0.6" DIA. STRANDS
STRANDS	(inches)	· ·	(sq. 1n.)		(KIPS)	(K/Sq. In.)	(K/Sq. In.)
		STANDARD	PATTE	RNS FOR UNDR	APED STRANDS		
16	-20.23	2.514	313.84	496	703	1.580	2.240
18	-19.84	2.485	317.51	558	791	1.757	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
		STANDARD	PATTE	RNS FOR DRAP	ED STRANDS		
16	-22.23	2.664	296.17	496	703	1,675	2.374
18	-21.84	2.634	299.54	558	791	1.863	2.641
20	-21.73	2,626	300.46	620	879	2.064	2.926
22	-21.64	2,619	301.26	682	967	2.264	3.210
24	-21.57	2.614	301.84	744	1055	2,465	3.495
26	-21.19	2.586	305.10	806	1143	2,642	3.746
28	-21.16	2.584	305.34	868	1230	2.843	4.028
30	-20.99	2.571	306.88	930	1318	3.031	4.295
32	-20.85	2.560	308.20	992	1406	3.219	4.562
34	-20.73	2.551	309.29	1054	1494	3.408	4.830
36	-20.39	2.526	312.35	1116	1582	3.573	5.065
38	-20.31	2,520	313.10	1178	1670	3.762	5.334
40	-20.23	2.514	313.84	1240	1758	3.951	5.602
42	-20.06	2,501	315.47	1302	1846	4.127	5.852
44	-19.91	2.490	316.87	1364	1933	4.305	6.100
46	-19.60	2.467	319.82	1426		4.459	
48	-19.48	2.458	320.99	1488		4.636	
50	-19.37	2.450	322.04	1550		4.813	
52	-19.19	2.436	323.89	1612		4.977	
54	-19.03	2.424	325.50	1674		5.143	

*54 STRANDS

*52 STRANDS

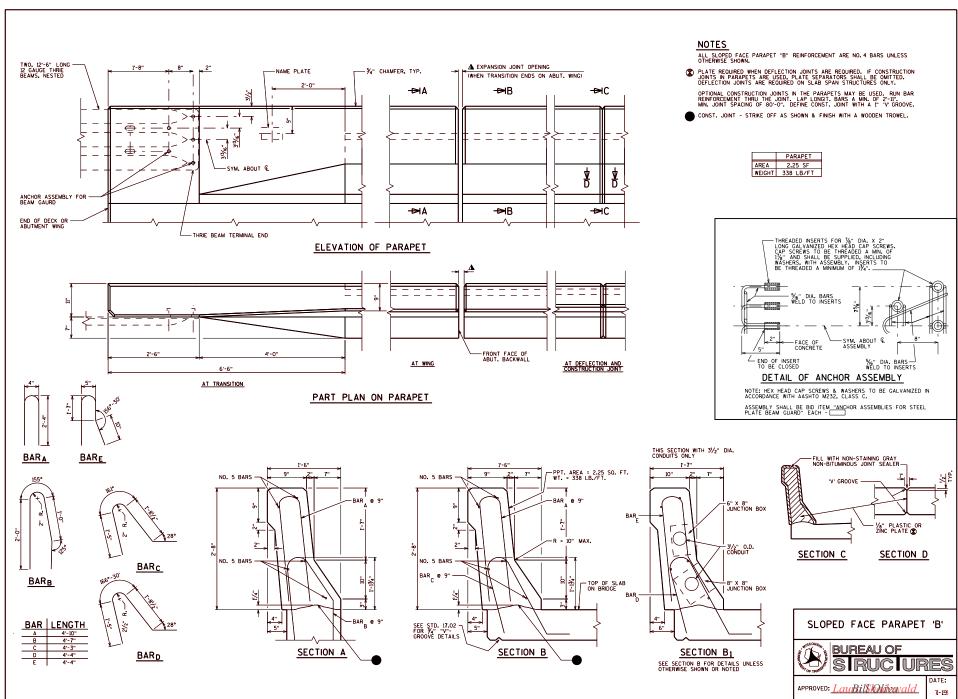
ARRANGEMENT AT 4 SPAN - FOR GIRDERS WITH DRAPED 0.5" DIA. AND 0.6" DIA. STRANDS

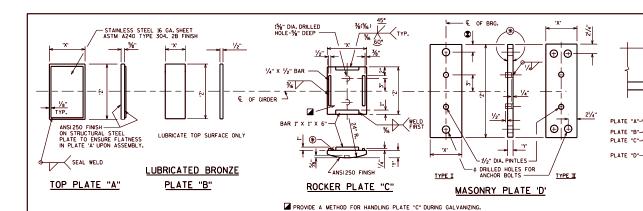
*0.5" DIA. STRANDS ONLY





APPROVED: LauBils Woldbowald





LOCATE ANCHOR BOLTS AS INDICATED
FOR MASONRY PLATE "D". FOR SIZE,
LENGTH, AND NUMBER SEE ANCHOR
BOLT NOTE BELOW.

EXPANSION BEARING ASSEMBLY

₽,

ألمأ

GIRDER

F OF BEARING

- BEARING PAD (1/8")

<u>NOTES</u>

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

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

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

AT ABUTMENTS WHEN THE "X" DIMENSION OF PLATE "A" EXCEEDS 11" INCREASE STANDARD DISTANCE FROM $\ @\$ BRG. TO END OF GIRDER.

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

- * 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.

 $\hfill \hfill \hfill$

FOR NEW OR REPLACEMENT STEEL BEARINGS, INCLUDING STEEL BEARINGS USED FOR BRIDGE WIDENINGS, USE TYPE "A-T" AS SHOWN ON STANDARD Z.7.08. THIS STANDARD IS FOR INFORMATIONAL PURPOSES ONLY.

10" BEARING

CAP.	PLAT	EΑ	PLATE	В	F	LATE	С	Р	ATE	D	HEIGHT
KIPS	х	Z	Х	Z	Х	Y	Z	Х	Υ	Z	FEET
75	9"	10"	5"	10"	7"	11/16"	1'-0'/4"	8"	11/2"	1'-8"	.354
105	11"	10"	7"	10"	9"	111/16"	1'-0'/4"	8"	11/2"	1'-8"	.375
135	1'-1"	10"	9"	10"	11"	115/16 "	1'-0'/4"	8"	11/2"	1'-8"	.396
160	1'-3"	10"	11"	10"	1'-1"	2%"	1'-0'/4"	9"	11/2"	1'-8"	.432
190	1'-5"	10"	1'-1"	10"	1'-3"	2%"	1'-0'/4"	10"	13/4"	1'-8"	.495
220	1'-7"	10"	1'-3"	10"	1'-5"	3%"	1'-0'/4"	1'-0"	2"	1'-8"	.599
250	1'-9"	10"	1'-5"	10"	1'-7"	3%"	1'-0'/4"	1'-1"	2%"	1'-8"	.630
280	1'-11"	10"	1'-7"	10"	ľ-9"	4%"	1'-0'/4"	1'-3"	21/8"	1'-8"	.755
310	2'-1"	10"	1'-9"	10"	1'-11"	4%"	1'-0'/4"	1'-4"	2%"	1'-8"	.755

16" BEARING

CAP.	PLAT	EΑ	PLATE	В	F	LATE	С	Р	LATE	D	HEIGHT
KIPS	Х	Z	Х	Z	X	Y	Z	Х	Y	Z	FEET
120	9"	1'-4"	5"	1'-4"	7"	11/16"	1'-6'/4"	8"	11/2"	2'-2"	.354
165	11"	1'-4"	7"	1'-4"	9"	111/16"	1'-6'/4"	8"	11/2"	2'-2"	.375
215	1'-1"	1'-4"	9"	1'-4"	11"	115/16 "	1'-6'/4"	9"	11/2"	2'-2"	.396
260	1'-3"	1'-4"	11"	1'-4"	1'-1"	2%"	1'-6'/4"	11"	2"	2'-2"	.474
310	1'-5"	1'-4"	r-r	1'-4"	1'-3"	2%"	1'-6'/4"	1'-0"	2"	2'-2"	.516
355	1'-7"	1'-4"	1'-3"	1'-4"	1'-5"	3%"	1'-6'/4"	1'-2"	2%"	2'-3"	.630
400	1'-9"	1'-4"	1'-5"	1'-4"	1'-7"	3%"	1'-6'/4"	1'-3"	21/8"	2'-3"	.672
450	1'-11"	1'-4"	1'-7"	1'-4"	1'-9"	4%"	1'-6'/4"	1'-5"	21/8"	2'-3"	.755
500	2"-1"	1'-4"	1'-9"	1'-4"	1'-11"	4%"	1'-6'/4"	1'-7"	3%"	2'-3"	.838

ANCHOR BOLT NOTES:

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

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

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

+ DRILLED HOLES FOR ANCHOR BOLTS IN MASONRY PLATE "D" SHALL HAVE A DIAMETER $\frac{1}{2}$ 6" LARGER THAN ANCHOR BOLT.

12" BEARING

CAP.	PLAT	E A	PLATE	В	F	LATE	С	l P	LATE	D	HEIGHT
KIPS	Х	Z	Х	Z	х	Y	Z	х	Y	Z	FEET
90	9"	1'-0"	5"	1'-0"	7"	11/16"	1'-21/4"	8"	11/2"	1'-10"	.354
125	11"	1'-0"	7"	1'-0"	9"	111/16"	1'-21/4"	8"	11/2"	1'-10"	.375
160	1'-1"	1'-0"	9"	1'-0"	11"	115/16 "	1'-21/4"	8"	11/2"	1'-10"	.396
195	1'-3"	1'-0"	11"	1'-0"	r-r	2%"	1'-2'/4"	9"	11/2"	1'-10"	.432
230	1'-5"	1'-0"	1'-1"	1'-0"	1'-3"	2%"	1'-21/4"	11"	2"	1'-10"	.516
265	1'-7"	1'-0"	1'-3"	1'-0"	1'-5"	3%"	1'-2'/4"	1'-1"	2%"	1'-10"	.630
300	1'-9"	1'-0"	1'-5"	1'-0"	1'-7"	3%"	1'-21/4"	1'-2"	2%"	1'-10"	.630
335	1'-11"	1'-0"	1'-7"	1'-0"	1'-9"	4%"	1'-2'/4"	1'-4"	2%"	1'-10"	.755
370	2'-1"	1'-0"	1'-9"	1'-0"	1'-11"	4%"	1'-21/4"	1'-5"	27/a"	r-11"	.755

18" BEARING

CAP.	PLAT	E A	PLATE	В	F	LATE	С	Р	LATE	D	HEIGHT
KIPS	Х	Z	Х	Z	Х	Y	Z	Х	Υ	Z	FEET
135	9"	1'-6"	5"	1'-6"	7"	11/16"	1'-8'/4"	8"	11/2"	2'-4"	.354
185	11"	1'-6"	7"	1'-6"	9"	111/16"	1'-81/4"	8"	11/2"	2'-4"	.375
240	1'-1"	1'-6"	9"	1'-6"	11"	115/16 "	1'-8'/4"	9"	11/2"	2'-4"	.396
295	1'-3"	1'-6"	11"	1'-6"	1'-1"	2%"	1'-8'/4"	11"	2"	2'-4"	.474
350	1'-5"	1'-6"	1'-1"	1'-6"	1'-3"	2%"	1'-8'/4"	1'-1"	2¾"	2'-5"	.547
400	1'-7"	1'-6"	1'-3"	1'-6"	1'-5"	3%"	1'-8'/4"	1'-2"	2%"	2'-5"	.630
455	1'-9"	1'-6"	1'-5"	1'-6"	1'-7"	3%"	1'-8'/4"	1'-4"	2%"	2'-5"	.672
505	1'-11"	1'-6"	1'-7"	1'-6"	1'-9"	4%"	1'-8'/4"	1'-6"	3%"	2'-5"	.838
560	2'-1"	1'-6"	1'-9"	1'-6"	1'-11"	4%"	1'-81/4"	1'-8"	3%"	2'-5"	.838

14" BEARING

CAP.	PLAT	EΑ	PLATE	В	F	LATE	С	Р	LATE	D	HEIGHT
KIPS	Х	Z	Х	Z	Х	Y	Z	Х	Y	Z	FEET
105	9"	1'-2"	5"	1'-2"	7"	11/16"	1'-4'/4"	8"	11/2"	2'-0"	.354
145	11"	1'-2"	7"	1'-2"	9"	111/16"	1'-4'/4"	8"	11/2"	2'-0"	.375
185	1'-1"	1'-2"	9"	1'-2"	11"	115/16 "	1'-4'/4"	8"	11/2"	2"-0"	.396
225	1'-3"	1'-2"	11"	1'-2"	1'-1"	2%"	1'-4'/4"	10"	13/4"	2'-0"	.453
270	1'-5"	1'-2"	1'-1"	1'-2"	1'-3"	2%"	1'-4'/4"	1'-0"	2"	2'-0"	.516
310	1'-7"	1'-2"	1'-3"	1'-2"	1'-5"	3%"	1'-4'/4"	1'-1"	23/8"	2'-0"	.630
350	1'-9"	1'-2"	1'-5"	1'-2"	1'-7"	3%"	1'-4'/4"	1'-3"	27/8"	2'-1"	.672
390	1'-11"	1'-2"	1'-7"	1'-2"	1'-9"	4%"	1'-4'/4"	1'-4"	2%"	2"-1"	.755
435	2'-1"	1'-2"	1'-9"	1'-2"	1'-11"	4%"	1'-4'/4"	1'-6"	3%"	2'-1"	.838

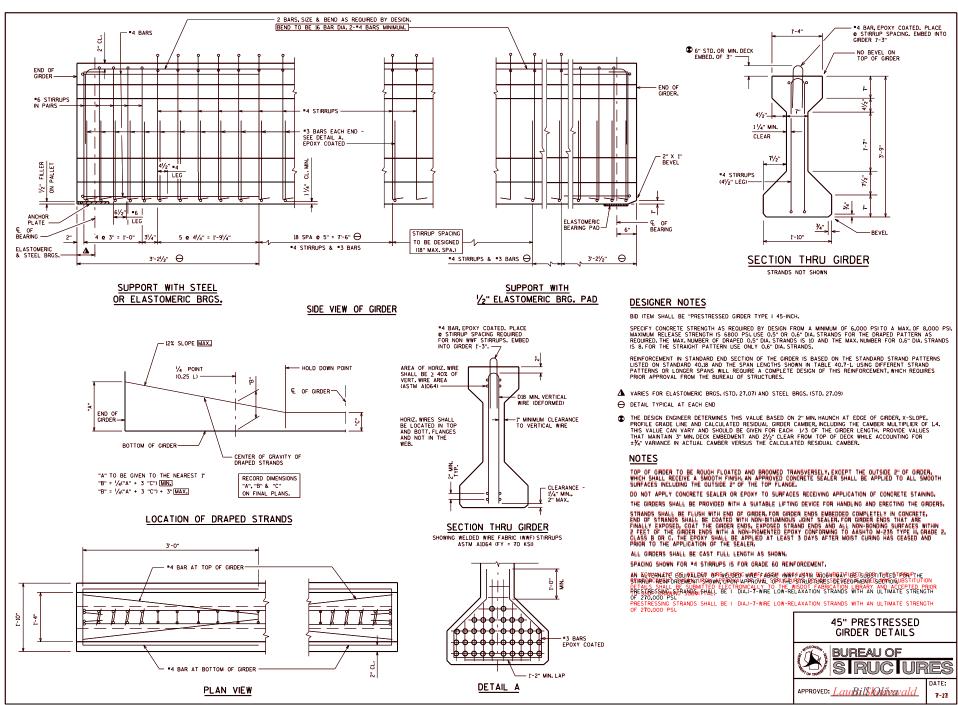
20" BEARING

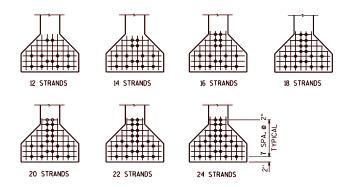
CAP.	PLAT	EΑ	PLATE	В	F	LATE	С	Р	LATE	D	HEIGHT
KIPS	х	Z	X	Z	Х	Y	Z	X	Y	Z	FEET
150	9"	1'-8"	5"	1'-8"	7"	11/16"	1'-10'/4"	8"	11/2"	2'-6"	.354
210	11"	1'-8"	7"	1'-8"	9"	111/16"	1'-10'/4"	8"	11/2"	2'-6"	.375
270	1'-1"	1'-8"	9"	1'-8"	11"	115/16"	1'-10'/4"	10"	1¾"	2'-6"	.417
325	1'-3"	1'-8"	11"	1'-8"	1'-1"	2%"	1'-10'/4"	11"	2"	2'-6"	.474
385	1'-5"	1'-8"	1'-1"	1'-8"	1'-3"	2%"	1'-10'/4"	1'-1"	2¾"	2'-7"	.547
445	1'-7"	1'-8"	1'-3"	1'-8"	1'-5"	3%"	1'-10'/4"	1'-3"	2%"	2'-7"	.672
505	1'-9"	1'-8"	1'-5"	1'-8"	1'-7"	3%"	1'-10'/4"	1'-5"	2%"	2'-7"	.672
565	1'-11"	1'-8"	1'-7"	1'-8"	1'-9"	4%"	1'-10'/4"	1'-7"	3%"	2'-7"	.838
625	2'-1"	1'-8"	1'-9"	1'-8"	1'-11"	4%"	1'-10'/4"	1'-9"	3%"	2'-7"	.838

EXPANSION BEARING DETAILS TYPE 'A' - STEEL GIRDERS

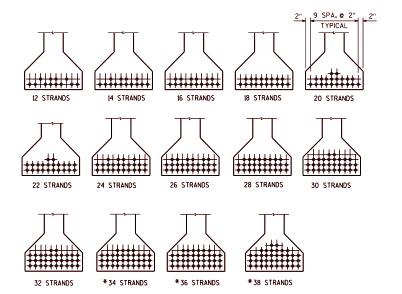


APPROVED: LauBils Waldwovald





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



45" GIRDER PRE-TENSION

A = 560 SO. IN. $f'_{S} = 270,000 \text{ P.S.I}$

 r^2 = 223.91 IN. f_s = 0.75 X 270,000 = 202,500 P.S.I for low relaxation strands.

 $y_T = 24.73 \text{ IN.}$ Pi PER 0.5" DIA. STRAND = 0.1531 X 202,500 = 31.00 KIPS

 $y_{\rm B}$ = -20.27 IN. Pi PER 0.6" DIA. STRAND = 0.217 X 202,500 = 43.94 KIPS

 $I = 125,390 \text{ IN.}^4$ $\frac{y_B}{r^2} = \frac{-20.27}{223.91} = -0.09053 \text{ IN./IN.}^2$

 $S_T = 5.070 \text{ IN.}^3$ $S_B = -6.186 \text{ IN.}^3$

WT. = 583 */FT.

(COMPRESSION IS POSITIVE)

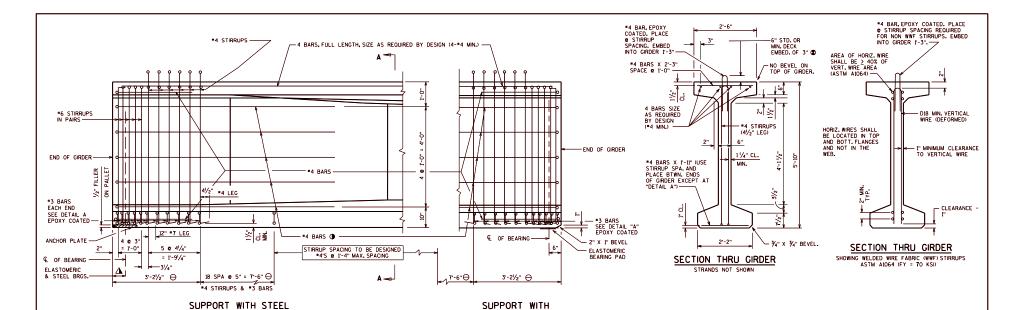
N	æ	(2)	(3)	(4)	(4)	(5)	(5)
	e	$(1 + \frac{e_s y_B}{r^2})$	(A/(2))	P(Init.) = A _s f _s	P(Init.) = A _s f _s	f _B (Ini t.)=(4)/(3) 0.5" DIA. STRANDS	f _B (Ini †.)=(4)/(3)
NO. STRANDS	(inches)	r² ′	(sq. in.)	(KIPS)	(KIPS)	(K/Sq. In.)	(K/Sq. In.)
STANDARD PATTERNS FOR UNDRAPED STRANDS							
12	-14.94	2,352	238.10		527		2.213
14	-14.27	2.292	244.33		615		2.517
16	-13.27	2.201	254.43		703		2,763
18	-13.15	2.190	255.71		791		3.093
20	-12,27	2.111	265,28		879		3,313
22	-12.27	2.111	265.28		967		3.645
24	-12.10	2.095	267.30		1055		3.947
STANDARD PATTERNS FOR DRAPED STRANDS							
		317	INDAND TATTE	INIO I ON DIVA	ED STITATIOS	1	1
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	

ARRANGEMENT AT & SPAN - FOR GIRDERS WITH DRAPED 0.5" DIA. AND 0.6" DIA. STRANDS

*0.5" DIA. STRANDS ONLY



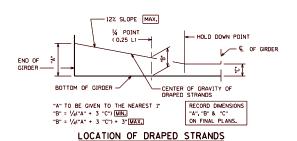
APPROVED: LauBils Waldeovald



SIDE VIEW OF GIRDER

OR ELASTOMERIC BRGS.

PLAN VIEW \ominus



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 PSITO A MAX.OF 6,000 PSI.MAXIMUM RELEAS STRENGTH IS 6800 PSI.USE 0,5° OR 0,6° DIA STRANDS FOR ALL PATTERNS AS REQUIRED. USE ONLY ONE STRAND SIZE IN EACH PATTERN, THE MAX. NUMBER OF DRAPED, 0,6° DIA. STRANDS IS 8.

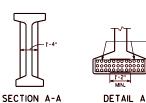
REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STANDARD STRAND PATTERNS LISTED ON STANDARD 40.200 AND ADDRESS OF THE STANDARD ADD

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

 \ominus DETAIL TYPICAL AT EACH END

- ① 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, INCLUDIONG 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 MEMBEDMENT AND 2½" CILEAR FROM TOP OF DECK WHILE ACCOUNTING FOR \$\frac{1}{2}\chi^{\chi}\ VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

EPOXY COATED



NOTES

TOP OF GIRDER TO BE ROUCH 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.

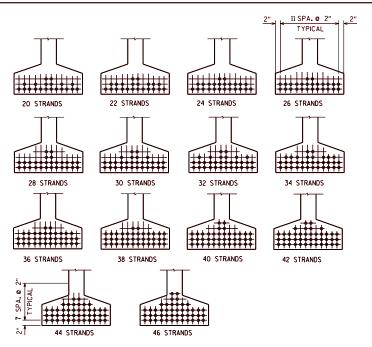
STANDS SHALL BE FLUSH WITH END OF GRDER, FOR GRDER ENDS EMBEDDED COMPLETELY IN CONCRETE, END OF STRANDS SHALL BE COATED WITH NON-BITUMINUS JOINT SEALER, FOR GRDER ENDS THAT ARE FINALLY EXPOSED, COAT THE GRDER ENDS, EXPOSED STRAND ENDS AND ALL NON-BONDING SURFACES WITHIN 2 FEET OF THE GRDER ENDS WITH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

ALL GIRDERS SHALL BE CAST FULL LENGTH AS SHOWN.

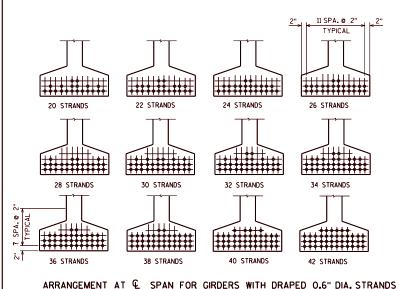
SPACING SHOWN FOR $\P4$ STIRRUPS IS FOR GRADE 60 REINFORCEMENT.

AN ADDERNATE CRUINALEND BREWELDERD CHRIBET ARIDI (MUREA ARIA) RECOGRAMM LICE OF BREGGES THE LICE OF FRANCIS AND ARIA CHRIBET C





ARRANGEMENT AT & SPAN FOR GIRDERS WITH DRAPED 0.5" DIA. STRANDS



				(COMPRI	ESSION IS NEGATIVE)		
N	Œ	(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.)		
STAND	ARD PAT	TERNS -	0. 5" DI	A. DRAPED	STRANDS		
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		
3Ø	-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		

303.770

(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

 $P(Init.) = A_s f_s$

0.6" DIA.

STRANDS

(KIPS)

879

967

1143

1230

1318

1494

1582

1670

1846

0.6" DIA. DRAPED STRANDS

-29.49

(1)

es

0.6" DIA.

STRANDS

(inches)

STANDARD PATTERNS

-31.62

-31.53

-31.45

-31.39

-31.19

-31.02

-30.74

-30,62

-30.51

-30.41

-30.22

-30.05

NO.

STRANDS

20

22

26

28

32

34

36

38

40

42

2.548

 $(1 + \frac{e_S - y_B}{})$

0.6" DIA.

2,659

2.655

2.650

2.647

2,637

2.628

2.614

2,607

2,601

2.596

2.586

2,577

r 2

70" GIRDER

A = 774 SQ. IN.

r2 = 659.70 IN.2

 $y_{T} = 35.38$ IN.

 $y_{n} = -34.62$ IN.

I = 510,613 IN.4

S, = 14,430 IN. 3

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

WT. = 0.806 KIPS/FT. +

6.6 KIPS FOR BOTH END BLOCKS

(COMPRESSION IS NEGATIVE)

f_B (Init.)=(4)/(3)

0.6" DIA.

STRANDS

(K/Sq. In.)

3,020

3.317

3.909

4.191

4.475

4.748

5.032

5.316

5.601

5.874

6.146

4.694

PRE-TENSION f; = 270,000 P.S.I.

= 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

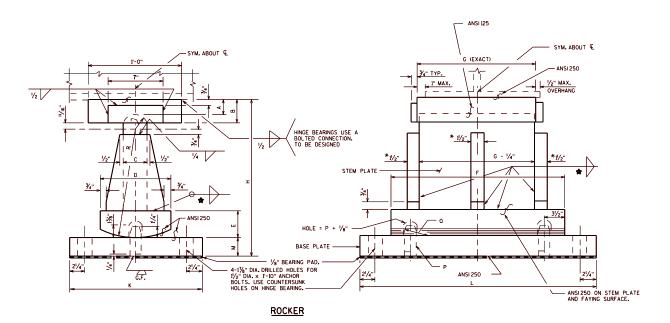
= 0.217 X 202,500 = 43.94 KIPS

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

70" PRESTRESSED GIRDER DESIGN DATA



APPROVED: LauBils Waldrewald



★ 400 K ≤ REACTION < 1000 K. USE 5%" WELD. 1000 K ≤ REACTION ≤ 1500 K. USE 34" WELD. * FOR REACTION > 1000 KIPS USE 2" STIFFENERS.

TABLE OF DIMENSIONS

											G	VALUE	S									١,	-	PINTL	E
REACTION (KIPS)	A	В	С	D	E	G=1	r- 7 "	G=1	-9"	G=1'	-11"	G=2	"-1"	G=	2'-3"	G=2	'-5"	н	K	М	R				_
Will 37						F	L	F	L	F	L	F	L	F	L	F	L					STEM	PLATE	P DIA.	0
400-499	115//6"	215%"	3"	1'-2"	2%"	2'-0"	2"-11"	2'-2"	2'-11"	2'-4"	3'-0'	2'-6"	3'-2"	_	_	_	_	1'-7'/2"	1'-6"	21/8"	1'-1"	1"/16"	1% "	2"	31/2"
500-599	115//6"	215/6"	3"	1'-2"	21/8"	2'-1"	3'-4"	2'-2"	3'-4"	2'-4"	3'-4"	2'-6"	3'-4"	_	_	_	_	1'-81/2"	1'-7"	21/8"	1'-2"	1"/16"	1% "	2"	31/2"
600-699	115%6"	215/6"	3"	1'-2"	21/8"	_	_	2'-3"	3'-8"	2'-4"	3'-8"	2'-6"	3'-8"	2"-8"	3'-8"	_	_	1'-91/2"	1'-8"	21/8"	1'-3"	1"/16"	1% "	2"	31/2"
700-799	2¾6"	31/6"	31/2"	1'-4"	3¾"	_	_			2'-6"	3'-10"	2'-6"	3'-10"	2"-8"	3'-10"	2'-10"	3'-10	1'-111/2"	1'-10"	3¾"	1'-4"	115//6"	161/64 "	2"	31/2"
800-899	2¾6"	3⅓6"	31/2"	1'-4"	3%"	_	_	_	_	2'-7"	3'-11"	2'-7"	3'-11"	2'-8"	3'-11"	2'-10"	3'-11"	2'-01/2"	2'-0"	3%"	1'-5"	115%;"	161/64 "	2"	31/2"
900-999	2¾6"	31/6"	31/2"	1'-4"	3%"	_	_	_	_	2'-11'	4'-0"	2'-11"	4'-0"	2'-11"	4'-0"	2"-11"	4'-0"	2'-1/2"	2"-2"	3%"	1'-6"	115% "	161/64 "	2"	31/2"
1000-1099	21/6"	315/6"	4"	1'-6"	31/8"	_			_	_	_	3'-1"	4'-1"	3"-1"	4'-1"	3'-1"	4'-1"	2'-31/2"	2'-4"	3%"	1'-7"	2%"	211/64 "	21/2"	3¾"
1100-1199	21/16"	315/6"	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"	2%"	211/64 "	21/2"	3¾"
1200-1299	21/6"	315/6"	4"	1'-6"	3%"	_	-	_	_	_	_	_	_	3'-5"	4'-4"	3'-5"	4'-4"	2'-51/2"	2"-7"	31/8"	1'-9"	2%"	213/kg "	21/2"	3¾"
1300-1399	21/16"	315/6"	4"	1'-6"	31/8"	_	_	_	_	_	_	_	_	3'-7"	4'-7"	3'-7"	4'-7"	2'-61/2"	2"-8"	31/8"	1'-10"	2%"	213/64 "	21/2"	3¾"
1400-1500	21/6"	315/6"	4"	1'-6"	3%"	_	_	_	_	_	_	_	_	3'-9"	4'-9"	3'-9"	4'-9"	2'-71/2"	2"-9"	3%"	1'-11"	2%"	211/64 "	21/2"	3¾"
						G=1	-2"			G=1	'-3"			G=1	-4"										
0-300	115/16"	215/16"	3"	1-0"	23/8"	1'-7"	2'-3"			1'-8"	2'-4"			1'-9"	2"-5"			1'-5"	1'-4"	2%"	11"	1"/16"	1% "	2"	31/2"

<u>NOTES</u>

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 ANCHOR BOLTS, NUTS, AND WASHERS SHALL CONFORM TO ASTM SPECIFICATION TYPE ATO9 GRADE 36 ♠ STEEL. ANCHOR BOLTS SHALL BE THREADED 3". PROVUE ONE STANDARD WROUGHT WASHER AND ONE HEX MUIT PER BOLT. PROJECT ANCHOR BOLTS "M" PLATE THICKNESS + 2½", ABOYE TOP OF CONCRETE MASONRY, CHAMFER ANCHOR BOLTS PRIOR TO THREADING.

RADIAL SURFACES ON ROCKER SHALL BE MACHINE FINISHED AFTER

ALL SURFACES MARKED " $\mathcal F$ " 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 BE ARRING.

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 ILOADS 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

MPERATURE TIME OF TTING - °F	(+)									
# 55	PIER	PIER	PIER	PIER						
120										
100										
80										
60										
40										
20										
0										
-20										
	80 60 40 20	120 100 80 60 40 20	120 100 80 60 40 20	120 100 80 60 40 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%.

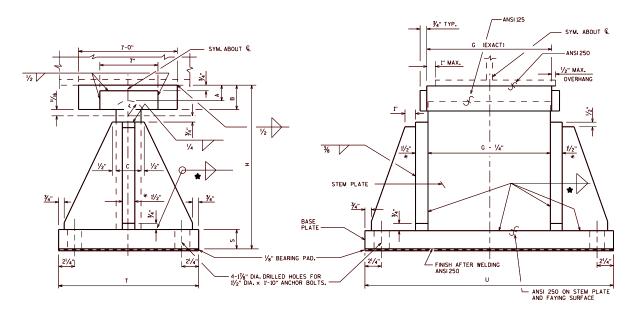
MAXIMUM MOVEMENT FROM 45° F = (D - 1")/2 BUT ACTUAL MOVEMENT NOT TO EXCEED R/3.

OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

ROCKER BEARING TYPE 'B' - STEEL GIRDERS



APPROVED: LauBils Willewald



FIXED SHOE

 $\label{eq:kappa} \begin{tabular}{lllll} 400 K \leq REACTION $<$ 1000 K, USE $\%$" WELD. \\ 1000 K \leq REACTION \leq 1500 K, USE $\%$" WELD. \\ \end{tabular}$

* FOR REACTIONS > 1000 KIPS USE 2" STIFFENERS.

TABLE OF DIMENSIONS

REACTION						G V	ALUES				r			
(KIPS)	А	В	С	G=1'-7"	G=1'-9"	G=1'-11"	G=2'-1"	G=2'-3"	G=2'-5"	н	STEM	PLATE	s	т
400-499	115%6"	21%"	3"	2'-8"	2'-8"	2'-10"	3'-0"		_	1'-6"	1"/6"	1% "	23/6"	1'-4"
500-599	115//6"	21%"	3"	3'-0"	3'-0"	3'-0"	3'-0"	_	_	1'-7"	1"/6"	1% "	23/8"	1'-5"
600-699	115%6"	215%"	3"	_	3'-3"	3'-3"	3'-3"	3'-3"	_	1'-9"	1"/6"	1% "	2¾"	1'-6"
700-799	23/6"	31/6"	31/2"	_	_	3'-6"	3'-6"	3'-6"	3'-6"	1'-10"	115/16"	161/64 "	21/8"	1'-7"
800-899	2¾6"	31/16"	31/2"	_	_	3'-9"	3'-9"	3'-9"	3'-9"	2'-0"	115/16 "	161/64 "	21/8"	1'-8"
900-999	23/6"	31/16"	31/2"	_	_	3'-10"	3'-10"	3'-10"	3'-10"	2'-1"	115/16"	161/64 "	21/8"	1'-10'
1000-1099	21/6"	315/16"	4"	_	_	_	4'-0"	4'-0"	4'-0"	2'-3"	23/6"	211/4 "	3¾"	1'-11"
1100-1199	21/6"	315/6"	4"	_	_	_	4'-2"	4'-2"	4'-2"	2'-4"	2%"	211/4 "	3%"	2'-0'
1200-1299	21/6"	315/16"	4"	_	_	_	_	4'-4"	4'-4"	2'-5"	2%"	21/61 "	3%"	2'-1"
1300-1399	21/6"	315/6"	4"	_	_	_	_	4'-6"	4'-6"	2'-6"	2¾6"	211/64 "	3%"	2'-2'
1400-1500	21/6"	315/16"	4"	_	_	_	_	4'-8"	4'-8"	2'-7"	2%"	211/4 "	3%"	2'-3'
														ı

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, NUTS, AND WASHERS SHALL CONFORM TO ASTM SPECIFICATION TYPE ATO9 GRADE 36 € STEEL, ANCHOR BOLTS SHALL BE THREADED 3". PROVIDE ONE STANDARD WROUGHT WASHER AND ONE HEX NUT PER BOLT. PROJECT ANCHOR BOLTS "S" PLATE THICKNESS + 2½", ABOYT TOP OF CONCRETE MASONRY, CHAMFER ANCHOR BOLTS PRIOR TO THREADING.

AFTER WELDING SHOE ASSEMBLY, FINISH BOTTOM OF BASE PLATE TO A FLAT SURFACE.

ALL SURFACES MARKED $\mathcal F$ 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-_-.".

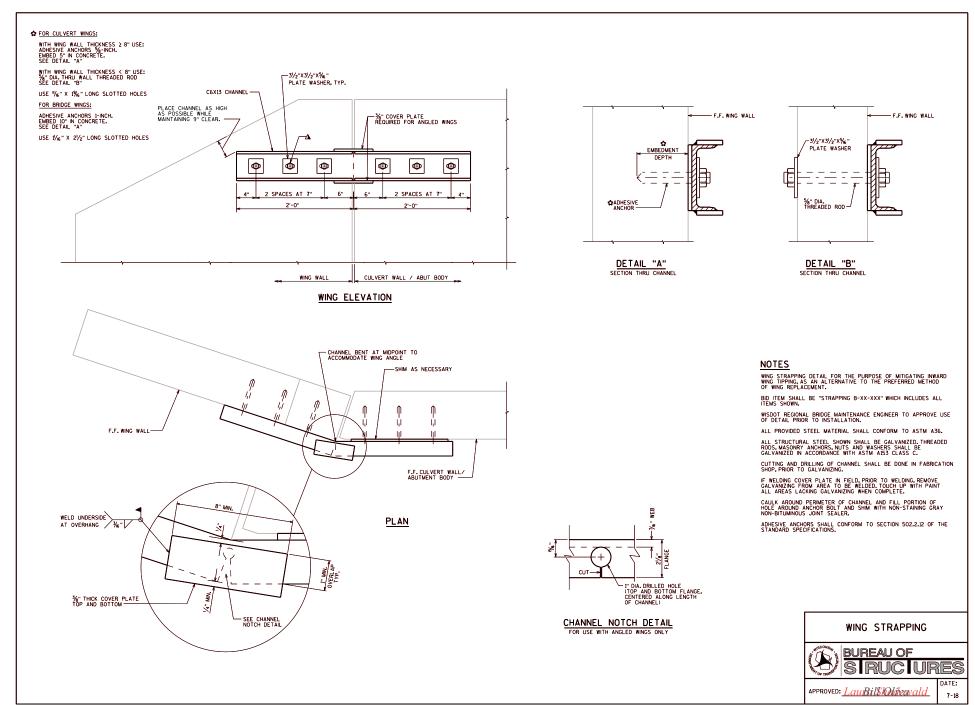
OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

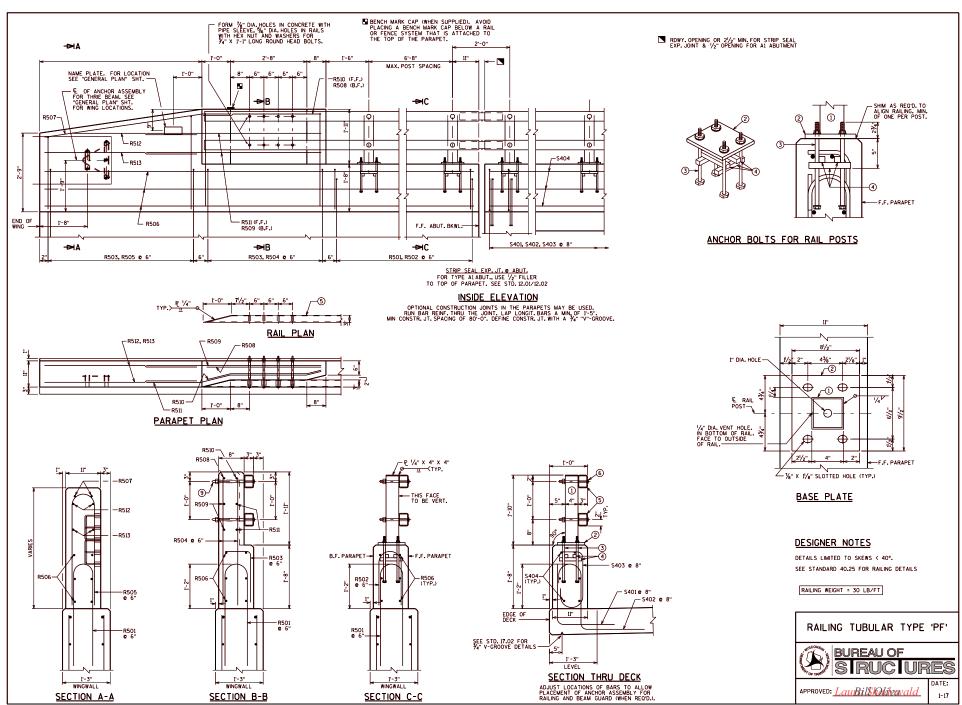
USE AASHTO LRFD SERVICE ILOADS FOR BEARING SELECTION. CONSIDER ONLY DEAD LOAD AND HL-93 LIVE LOADS INCLUDING 33% DYNAMIC LOAD ALLOWANCE. THE BEARINGS ON THIS STANDARD WERE DESIGNED USING THE STANDARD SPECIFICATION.

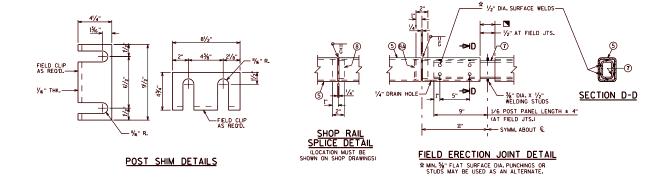
TYPE 'B' - STEEL GIRDERS FIXED SHOE

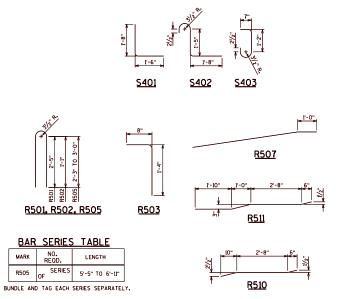


APPROVED: LauBils Waldwowald









BILL OF BARS

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

BAR MARK	00	NO. REO'D.	LENGTH	S.	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	х		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	Δ	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.

<u>NOTES</u>

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 ALICANMENT.

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.

 $\frac{1}{4}$ " 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.

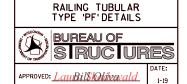
SEE STD. 30.07 FOR BEAM GUARD ANCHOR ASSEMBLY DETAILS.

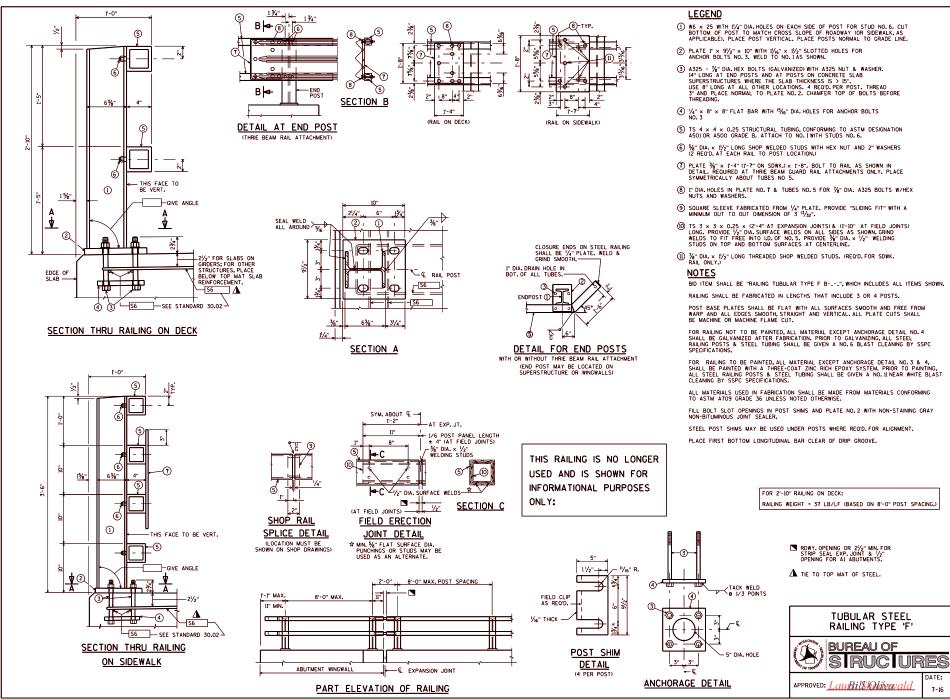
THIS RAILING MEETS NCHRP REPORT 350 EVALUATION CRITERIA FOR TEST LEVEL 2 (TL-2).

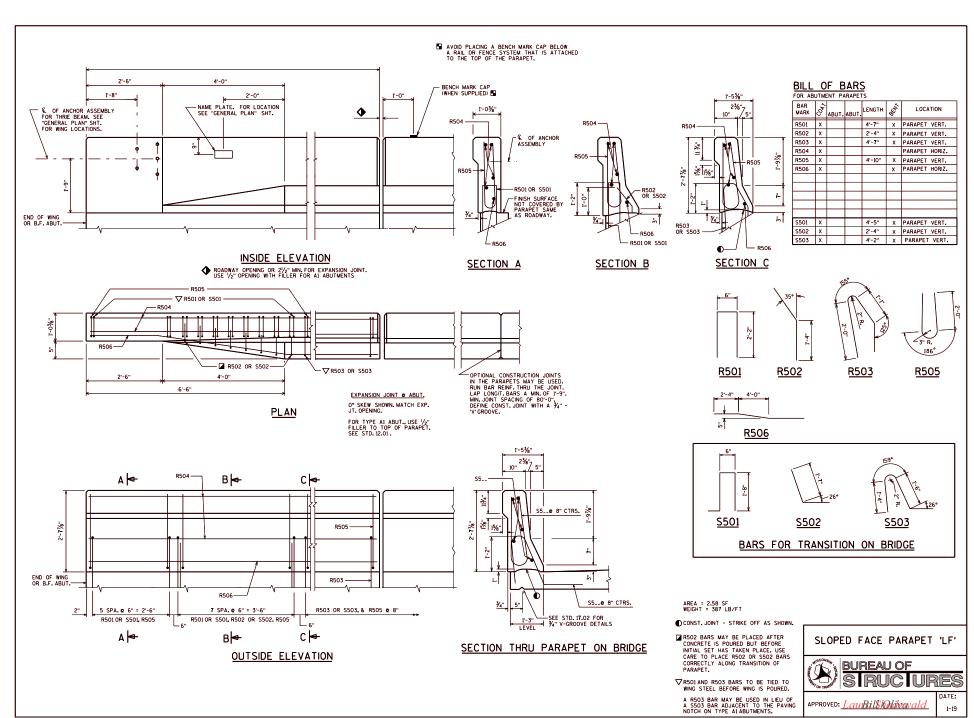
 \blacksquare RDWY, OPENING OR $21\!/_2$ " MIN. FOR STRIP SEAL EXP. JOINT & $1\!/_2$ " OPENING FOR A1 ABUTMENT.

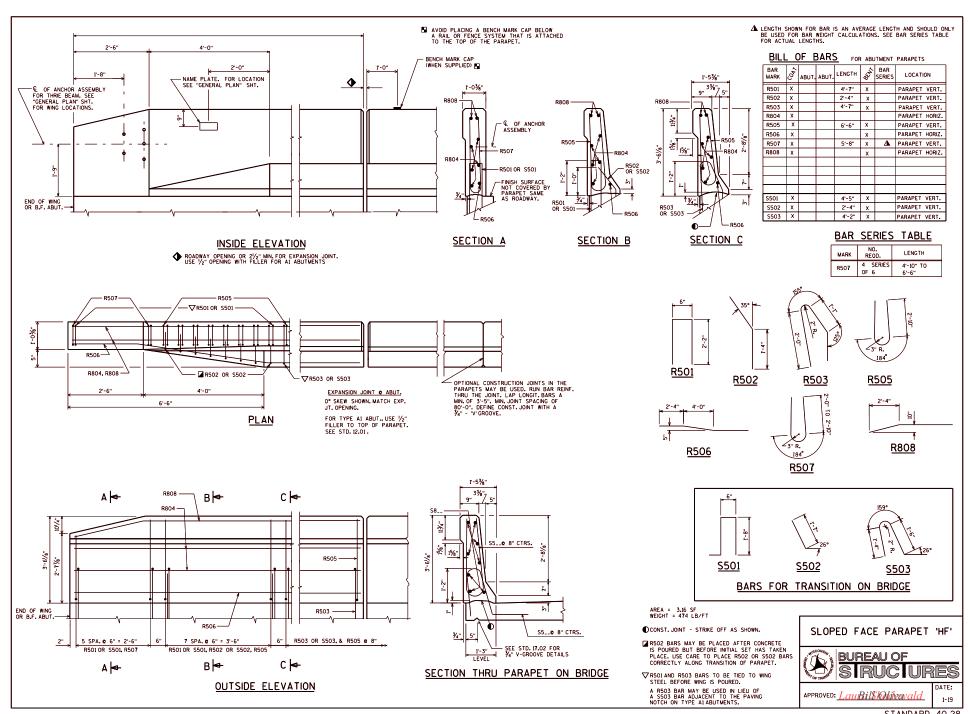
LEGEND

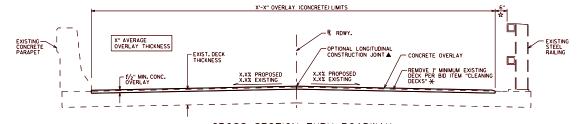
- ① TS 4 X 4 X 0.25 X 1'-9/4" STRUCTURAL TUBING WITH % DIA. HOLES FOR BOLT NO. 6. PLACE POSTS VERTICAL IN TRANSVERSE DIRECTION. WELD TO NO. 2. PLACE POSTS NORMAL TO GRADE LINE
- ② PLATE ¾" X 8½" X 9½" WITH ¾" X 1½" SLOTTED HOLES FOR ANCHOR BOLTS NO. 3. WELD TO NO. 1AS SHOWN, SLOTS PARALLEL TO SHORT SIDE OF PLATE.
- 3 %" DIA. X 1"-1" LONG ASTM A325 HEX BOLTS (GALVANIZED) WITH A325 NUT AND WASHER. 4 REO'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" SO. X 7" LONG. WELD TO ANCHOR BOLTS NO. 3 (GALVANIZED).
- $\begin{tabular}{lll} \hline \begin{tabular}{lll} \begi$
- (6) 1/4" DIA. X 9" LONG ROUND HEAD BOLTS, ASTM A307, WITH HEX. NUT AND WASHERS AND LOCK WASHER. (I REO'D. AT EACH RAIL TO POST LOCATION.)
- ? RECTANGULAR SLEEVE FABRICATED FROM 1/4" PLATES. 1'-6" LONG.
- (8) RECTANGULAR SLEEVE FABRICATED FROM 1/4" PLATES. PROVIDE "SLIDING FIT" WITH MIN. OUT TO OUT DIMENSION OF $3^0\!k_2"$ x $2^0\!k_2"$.
- RECTANGULAR SLEEVE FABRICATED FROM ¼* PLATES. PROVIDE "SLIDING FIT" WITH
 MIN. OUT TO OUT DIMENSION OF 3½* "X 2½* WITH ¾6" PLATE AT ONE END
 WELDED ALL AROUND TO BLOCK WATER. ½*
 NEW PLATE AT ONE ONE
 NEW PLATE AT ONE
 NE
- ¶ ¾" DIA. X 1'-1" LONG ROUND HEAD BOLTS, ASTM A307, WITH HEX NUT AND WASHERS



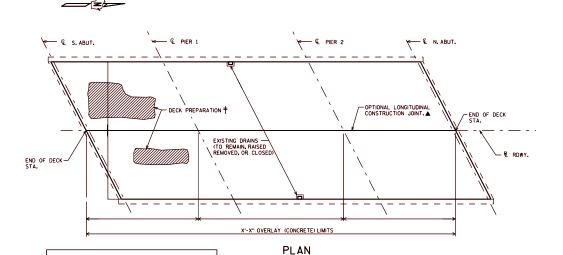








CROSS SECTION THRU ROADWAY



SURVEY TYPE: SURVEY COMPLETED DATE: __/__/___

TOTAL ESTIMATED QUANTITIES

TOP OF DECK SHOWN

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	

DESIGN DATA

INVENTORY RATING: HS-_-

WISCONSIN STANDARD PERMIT VEHICLE (WIS-SPV) = ___ KIPS

MATERIAL PROPERTIES:

CONCRETE MASONRY OVERLAY DECKS f'c = 4,000 P.S.I.

NOTES

DRAWINGS SHALL NOT BE SCALED.

DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS.

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

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 ${\it V}_2$ -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 PLAN'S AND AS DETERMINED BY THE THE REGINEER, DECK PREPARATION AND FULL-DEPTH DECK REPAIRS SHALL BE FILLED WITH "CONCRETE MASONRY OVERLAY DECKS".

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

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

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

DESIGNER NOTES

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

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

PROVIDE AN AVERAGE OVERLAY THICKNESS ON THE PLANS, THE AVERAGE OVERLAY THICKNESS IS THE MINIMAIN OVERLAY THICKNESS PLUS 'Y'S TO ACCOUNT FOR VARIATIONS IN THE DECK SURFACE CHANCES IN CROSS-SLOPE INCREASE THE AVERAGE OVERLAY THICKNESS, QUANTITIES ARE BASED ON THE AVERAGE OVERLAY THICKNESS.

DO NOT PROVIDE A PROFILE GRADE LINE ON THE PLANS.

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

- ** REMOVAL OF 1" OF EXISTING DECK UNDER BID ITEM "CLEANING DECKS" IS NOT INTENDED FOR PREVIOUSLY OVERLAID DECKS. EXISTING CONCERE COVER IT MIND SHALL BE MAINTAINED AND CONSIDERED WHEN DETERMINING CONCERET REMOVALS, INCLUDE THE BID ITEM "CLEANING DECKS TO REAPPLY CONCRETE MASONRY OVERLA" WHEN REMOVING EXISTING OVERLA".
- # 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/HEL/INSPECTION/DATE/INSPECTION/SPECIAL REPORT, DECK CONDITION ASSESSMENT SURVEY DATES CAN BE FOUND WITHIN INSPECTION/HISTORY UNDER THE "DEVAL" ACTIVITY TYPE.

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

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

- ☆RESTRICTIONS ON REMOVAL ITEMS SHALL BE PLACED ON THE PLANS TO PREVENT DAMAGE TO REINFORCING STEEL.
- ▲ OVERLAY LIMIT SHOULD BE OFFSET FROM EXISTING OPEN STEEL RAILING FOR IMPROVED ACCESS FOR DECK REMOVAL AND OVERLAY PLACEMENT. OVERLAY LIMITS FOR PREVIOUSLY OVERLAID DECKS SHALL BE BASED ON THE EXISTING OVERLAY LIMITS.

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

CONCRETE OVERLAY

BUREAU OF
STRUCTURES

APPROVED: <u>LauBilSlOddleoval</u>

1 7-22

X'-X" - OVERLAY (POLYMER) LIMITS - R RDWY. EXIST. DECK THICKNESS OPTIONAL LONGITUDINAL CONSTRUCTION JOINT - ¼" MIN. OVERLAY POLYMER OVERLAY

CROSS SECTION THRU ROADWAY

LOOKING NORTH

TOTAL ESTIMATED QUANTITIES

BID ITEM NUMBER	BID ITEMS	UNIT	TOTAL				
509.0301	PREPARATION DECKS TYPE 1	SY					
509.0302	09.0310.S SAWING PAVEMENT DECK PREPARATION AREAS						
509.0310.5							
509.2000							
509.2100.S	CONCRETE MASONRY DECK REPAIR	CY					
509.5100.5	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

REHABILITATION OVERLAY

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 ENDINEER, DECK PREPARATION AND TULL-DEPTH DECK PEARS SHALL BE FILLED WITH "CONCRETE MASONNY DECK REPAIR".

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

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

DESIGNER NOTES

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

DO NOT PROVIDE A PROFILE GRADE LINE ON THE PLANS.

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

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

THEN DEEMED NECESSARY (BY REGION AND AGREED UPON BY BOS) HIGH FRICTION SURFACE TREATMENT POLYMER OVERLAY" MAY BE USED IN LIEU OF "POLYMER OVERLAY". SEE BRIDGE MANUAL SECTION 40.5.1.IFOR ADDITIONAL GUIDANCE.

X'-X" - OVERLAY (POLYMER) LIMITS - R RDWY. EXIST. DECK THICKNESS OPTIONAL LONGITUDINAL CONSTRUCTION JOINT OVERLAY POLYMER OVERLAY CROSS SECTION THRU ROADWAY

LOOKING NORTH TOTAL ESTIMATED QUANTITIES

		-		
	BID ITEM NUMBER	BID ITEMS	UNIT	TOTAL
	509.5100.5	POLYMER OVERLAY	SY	
		POSSIBLE BID ITEM		
7	SPV.0180	HIGH FRICTION SURFACE TREATMENT POLYMER OVERLAY	SY	

DESIGN DATA

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

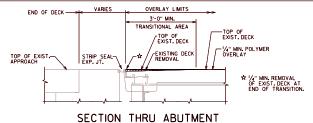
PREVENTATIVE OVERLAY INTENDED FOR USE ON DECKS WITH A MINIMUM AGE OF 28 DAYS AND A MAXMUM AGE OF 2 YEARS, AN ADDITIONAL CONTRACT WAY BE REQUIRED FOR APPLYING THE OVERLAY DUE TO SCHEDULE AND DECK AGE CONSIDERATIONS.

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

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

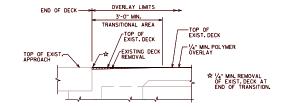
PROVIDE OVERLAY TRANSITIONAL AREA DETAILS AND IDENTIFY LOCATIONS ON THE PLANS.

WHEN DEEMED NECESSARY (BY REGION AND AGREED UPON BY BOS) "HIGH FRICTION SURFACE TREATMENT POLYMER OVERLAY" MAY BE USED IN LIEU OF "POLYMER OVERLAY". SEE BRIDGE MANUAL SECTION 40.5.LIFOR ADDITIONAL GUIDANCE.



TRANSITIONAL AREA ON DECK AT EXPANSION JOINT

(REMOVAL AND OVERLAY THICKNESS NOT TO SCALE)



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

(REMOVAL AND OVERLAY THICKNESS NOT TO SCALE) NOTE: TRANSITIONAL AREA REQUIRED WHEN APPROACH PAVEMENT HAS BEEN PLACED PRIOR TO OVERLAY PLACEMENT. POLYMER OVERLAY

PREVENTATIVE OVERLAY



APPROVED: LauBilSlodileovale

CROSS SECTION THRU ROADWAY

LOOKING NORTH

DESIGNER NOTES

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

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

PROVIDE AN AVERAGE OVERLAY THICKNESS ON THE PLANS, THIS AVERAGE OVERLAY THICKNESS VALUE IS BASED ON THE THEORETICAL AVERAGE OVERLAY THICKNESS PLUS I_2^{\prime} = TO ACCOUNT FOR VARIATIONS IN THE DECK SURFACE, OUANTITIES ARE BASED ON THE AVERAGE OVERLAY THICKNESS.

DO NOT PROVIDE A PROFILE GRADE LINE ON THE PLANS.

OVERLAYS NOT REQUIRING SHEET MEMBRANE WATERPROOFING ARE PREFERRED.

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

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

* REMOVAL OF I" OF EXISTING DECK UNDER BID ITEM "CLEANING DECKS" IS NOT INTENDED FOR PREVIOUSLY OVERLAID DECKS. EXISTING CONCRETE COVERTE COVER "IMM, SHALL BE MAINTAINED AND CONSIDERED WHEN DETERMINING CONCRETE REMOVALS, V_A" WINNIUM 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 COMPETED. THERMOGRAPHY DATA CAN BE FOUND IN HISIS WITHIN GENERAL INVENTIORY/FILE/MSPECTION/DATE/MSPECTION 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	
	509.2100.5	CONCRETE MASONRY DECK REPAIR	CY	
	509.3500.5	HMA OVERLAY POLYMER-MODIFIED	TON	
		POSSIBLE ADDITIONAL BID ITEMS		
×	509.9005.S	REMOVING CONCRETE MASONRY DECK OVERLAY (STRUCTURE)	SY	
×	509.9010.5	REMOVING ASPHALTIC CONCRETE DECK OVERLAY (STRUCTURE)	SY	
- 1	THIS IS A PAR	TIAL LIST OF POSSIBLE BID ITEMS, BID ITEMS MAY NEED TO BE	ADDED	

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 L 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 "HIMA OVERLAY POLYMER-MODIFIED" IS BASED ON THE AVERAGE OVERLAY THICKNESS.

PROFILE GRADE LINE SHALL BE DETERMINED IN THE FIELD BASED ON A MINIMUM OVERLAY THICKNESS OF $2^{\rm P}$ PLACED ABOVE THE DECK SURFACE. EXPECTED AVERAGE OVERLAY THICKNESS IS $2/5^{\rm P}$ for as given on the plans, if expected average overlay thickness is exceeded by more than $1/2^{\rm P}$, contact the structures design section.

X"-X" OVERLAY (ASPHALTIC) LIMITS R RDWY. OPTIONAL LONGITUDINAL CONSTRUCTION JOINT. ASPHALTIC OVERLAY OVERLAY ASPHALTIC OVERLAY ASPHALTIC OVERLAY ASPHALTIC OVERLAY OVERLAY ASPHALTIC OVERLAY

CROSS SECTION THRU ROADWAY

LOOKING NORTH

DESIGNER NOTES

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

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

PROVIDE AN AVERAGE OVERLAY THICKNESS ON THE PLANS. THIS AVERAGE OVERLAY THICKNESS VALUE IS BASED ON THE THEORETICAL AVERAGE OVERLAY THICKNESS PLOY $\frac{1}{2}$ - TO ACCOUNT FOR VARIATIONS IN THE DECK SUMFACE, OURNITIES ARE BASED ON THE AVERAGE OVERLAY THICKNESS.

DO NOT PROVIDE A PROFILE GRADE LINE ON THE PLANS.

OVERLAYS NOT REQUIRING SHEET MEMBRANE WATERPROOFING ARE PREFERRED.

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

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

*REMOVAL OF 1" OF EXISTING DECK UNDER BID ITEM "CLEANING DECKS" IS NOT INTENDED FOR PREVIOUSLY OVERALD DECKS. EXISTING CONCRETE COVER (I" MINL) SHALL BE MAINTAINED AND CONSIDERED WHEN DETERMINING CONCRETE REMOVALS. \(\)_{\text{in}} 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 COMPETED. THERMOGRAPHY DATA CAN BE FOUND IN HIS WITHIN CEMERAL INVENTORY/FILE/INSPECTION/DATE/

TOTAL ESTIMATED QUANTITIES

BID ITEM NUMBER	BID ITEMS	UNIT	TOTAL
455.0605	TACK COAT	GAL	
460.1XXX	HMA PAVEMENT (INSERT TYPE)	TON	
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	
	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

INVENTORY RATING: HS-_OPERATING 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.

<u>NOTES</u>

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 MASONINY DECK REPAIRS".

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

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

PROFILE CRADE LINE SHALL BE DETERMINED IN THE FIELD BASED ON A MINIMUM OVERLAY THICKNESS OF $2^{\rm o}$ PLACED ABOVE THE DECK SURFACE. EXPECTED AVERAGE OVERLAY THICKNESS IS $2^{\rm i}/_{2}^{\rm o}$ (or as given on the Plans), if expected average overlay thickness is exceeded by more than $1^{\rm i}/_{2}^{\rm o}$, contact the structures design section.

POLYMER MODIFIED ASPHALTIC AND ASPHALTIC OVERLAYS

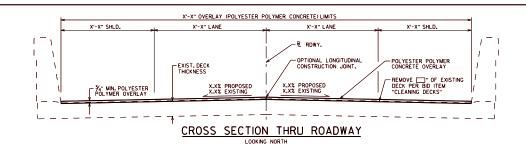
ASPHALTIC OVERLAY

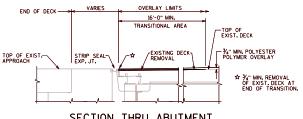
POLYMER MODIFIED

ASPHALTIC OVERLAY

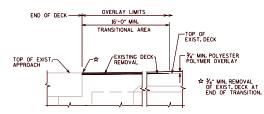


APPROVED: LauBils Waldwowald





SECTION THRU ABUTMENT TRANSITIONAL AREA ON DECK AT EXPANSION JOINT



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

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.

—I-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", POLVESTER 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 DESION 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 STAGMEN WEED 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 THE RAPARS, OR THE NEED TO PARTIALLY REMOVE THE ENTIRE DECK WITH BID ITEM "CLEANING DECKS" IS NOT EXPECTED ON WARRANTED.

PPC OVERLAYS AND TRANSTIONAL AREAS ARE NOT RECOMMENDED ON CONCRETE APPROACHES, PLANS SHALL SPECIFY THE MINIMUM TRANSTION TAPER LENGTH, THE PROVIDED TRANSTION LENGTH, AS SHOWN ON THIS SHEET, IS BASED ON A ½" OVERLAY THICKNESS, PROVIDE OVERLAY TRANSTIONAL 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 COMPETED, 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.

REMOVE % OF EXISTING DECK PER BIO ITEM "CLEANING DECKS" TOP OF EXIST. TOP OF EXIST. APPROACH TOP OF EXIST. POLYMER OVERLAY

SECTION THRU ABUTMENT

(WHEN BID ITEM "CLEANING DECKS" IS USED, TRANSITIONAL AREA NOT REQUIRED.)

TOTAL ESTIMATED QUANTITIES

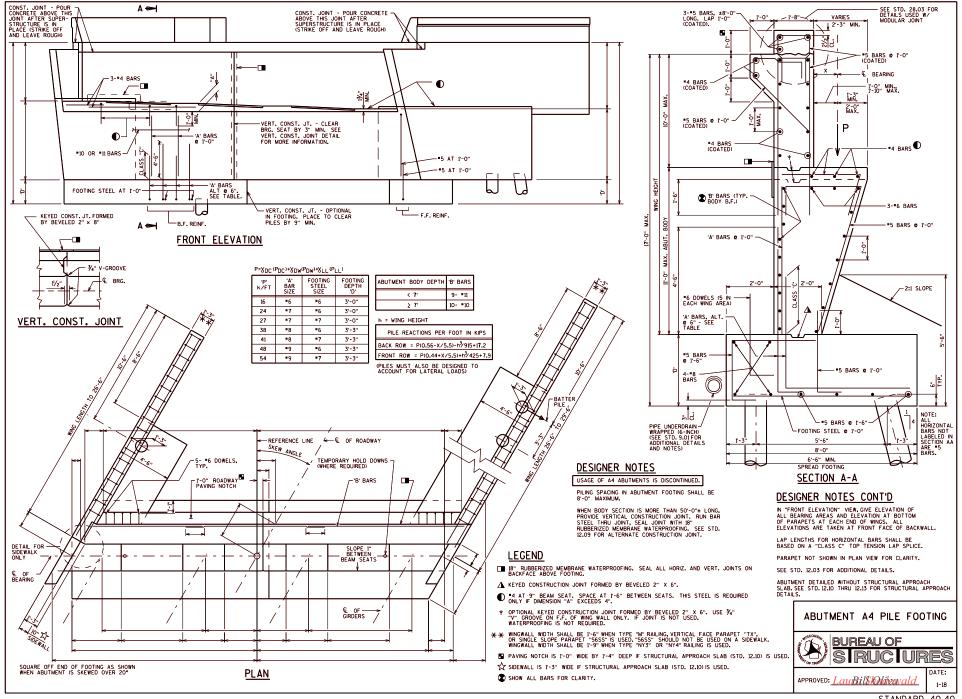
BID ITEM NUMBER	BID ITEMS	UNIT	TOTAL
509.0301	PREPARATION DECKS TYPE 1	SY	
509.0302	PREPARATION DECKS TYPE 2	SY	
509.0310.S	SAWING PAVEMENT DECK PREPARATION AREAS	LF	
509.2000	FULL-DEPTH DECK REPAIR	SY	
SPV.0035	RAPID SET DECK REPAIR	CY	
SPV.0180	POLYESTER POLYMER CONCRETE OVERLAY	SY	
	POSSIBLE ADDITIONAL BID ITEMS		
509.0500	CLEANING DECKS	SY	

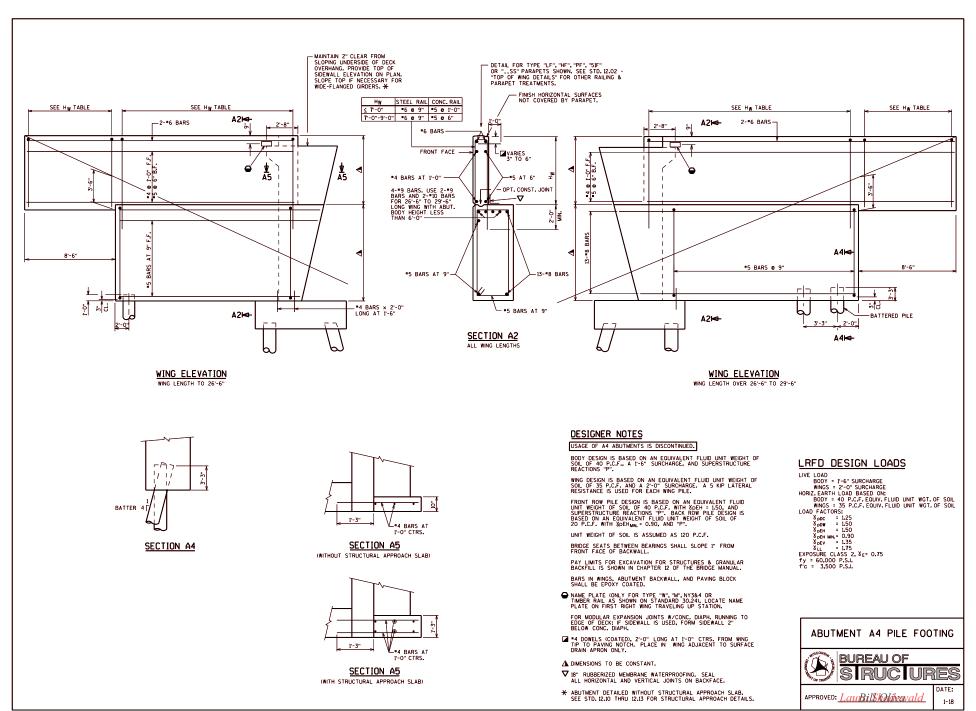
THIS IS A PARTIAL LIST OF POSSIBLE BID ITEMS. BID ITEMS MAY NEED TO BE ADDED OR REMOVED TO FIT EACH INDIVIDUAL CASE.

POLYESTER POLYMER CONCRETE OVERLAY



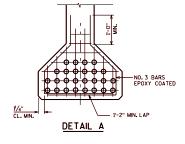
APPROVED: LauBils Waldwowald

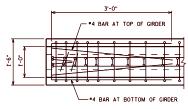




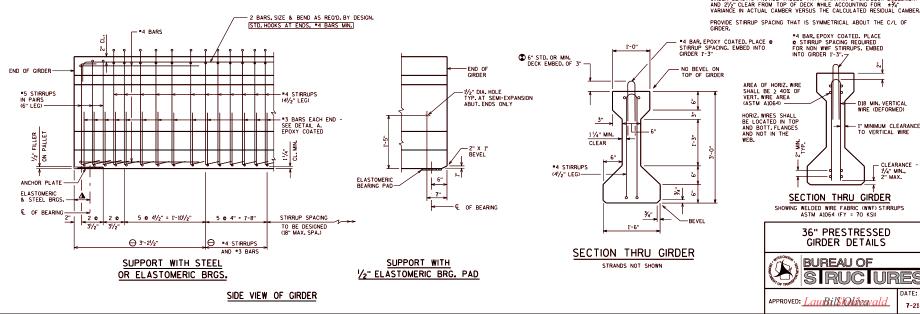
- 12% SLOPE MAX. -HOLD DOWN POINT (0.25 L) -€ OF GIRDER BOTTOM OF GIRDER CENTER OF GRAVITY OF DRAPED STRANDS. "A" TO BE GIVEN TO THE NEAREST 1" RECORD DIMENSIONS "A". "B" & "C" ON FINAL PLANS. "B" = 1/4("A" + 3 "C") MIN.

LOCATION OF DRAPED STRANDS





PLAN VIEW



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

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

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

STRANDS SHALL BE FLUSH WITH END OF GIRDER, FOR GIRDER ENDS EMBEDDED COMPLETELY IN CONCRETE, END OF STRANDS SHALL BE COATED WITH NON-BITUMINOUS JOINT SEALER, FOR GIRDER ENDS THAT ARE FINALLY EXPOSED, COAT THE GIRDER ENDS, EXPOSED STRAND ENDS AND ALL NON-BOONDING SUFFACES WITHIN 2 FEET OF THE GIRDER ENDS WITH A NON-PICIMENTED EPOXY CONFORMING TO AASHTO M-235 TYPE III, GRADE 2, CLASS B OR C. THE EPOXY SHALL BE APPLIED AT LEAST 3 DAYS AFFER 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 OFFI-HE STERRUPERES ENAMELS. SET DELON, WOSED, WWF SUBSTITUTION DETAILS SHALL BE SUBMITTED ELECTRONICALLY TO THE WISDOT FABRICATION LIBRARY AND ACCEPTED PRIOR TO SHOP DRAWNO

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

DESIGNER NOTES

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

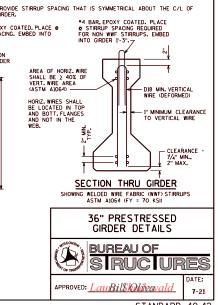
SPECIFY CONCRETE STRENGTH AS REQUIRED BY DESIGN FROM A MINIMUM OF 6,000 PSI TO A MAX, OF 8,000 PSI. MAXIMUM RELEASE STRENGTH IS 6800 PSI. USE ONLY 0.5" DIA. STRAND FOR THE DRAPED PATTERN, THE MAX. NUMBER OF DRAPED 0.5" DIA. STRANDS IS 8. USE 0.5" DIA. FOR THE STRAIGHT PATTERN, UNLESS ONLY 0.5" DIA. WORK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

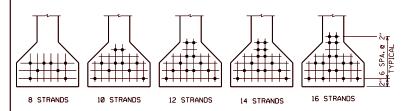
REINFORCEMENT IN STANDARD END SECTION OF THE GIRDER IS BASED ON THE STANDARD STRAND PATTERNS LISTED ON STANDARD 40.43 AND THE SPAN LENGTHS SHOWN IN TABLE 19.3-1. USING DIFFERENT STRAND PATTERNS OR LONGER SPANS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT, WHICH REQUIRES PRIOR APPROVAL FROM THE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

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

O DETAIL TYPICAL AT EACH END

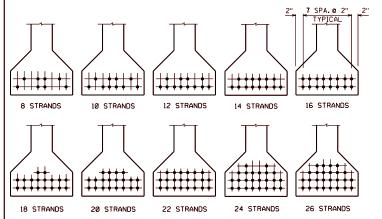
THE DESIGN ENGINEER DETERMINES THIS VALUE BASED ON 2" MIN, HAUNCH AT EDGE OF GIRDER, X-SLOPE, PROFILE GRADE LINE AND CALCULATED RESDUAL GROPER CAMBER, INCLUDING THE CAMBER MULTURIER OF 1.4. THIS VALUE CAN VARY AND SHOULD BE GIVEN FOR EACH 1/3 OF THE GROPE LEBOTH, PROVIDE VALUES THAT MAINTAIN 3 MIN, DECK EMBEDMENT AND 2½" CLEAR FROM TOP OF DECK MHLE ACCOUNTING FOR 3½" VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESDUAL CAMBER.





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 € SPAN - FOR GIRDERS WITH DRAPED 0.5" DIA. STRANDS

36" GIRDER

A = 369 SO. IN. r^2 = 138.15 IN.² y_T = 20.17 IN. y_B = -15.83 IN. I = 50.979 IN.⁴ S_T = 2.527 IN.³

 $S_B = -3,220 \text{ IN.}^3$ WT. = 384 */FT.

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 = <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 STRAN	ID PATTERNS FO	OR UNDRAPED ST	RANDS (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 STRA	ND PATTERNS F	OR DRAPED STR	ANDS (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



APPROVED: LauBils Woldwowald