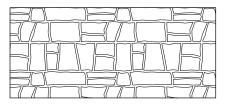
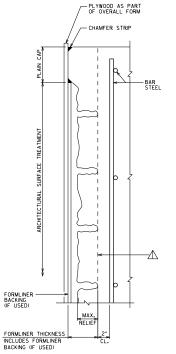


BROKEN RIB FORMLINER THICKNESS = 3" ± ½" WIDTH = 2" ± ½" MAX. RELIEF = 2" ± ½"

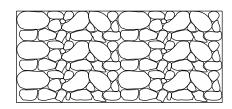


RUSTIC ASHLAR FORMLINER THICKNESS = 3" SIZE = 8" TO 32" MAX. RELIEF = 2"

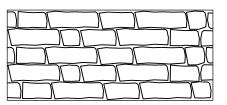


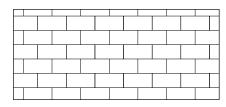
SECTION THRU FORMLINER

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



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





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

FORMLINER COURSING ON RETAINING WALLS SHALL BE LEVEL

### ABUTMENT NOTES

WARNING

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

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.

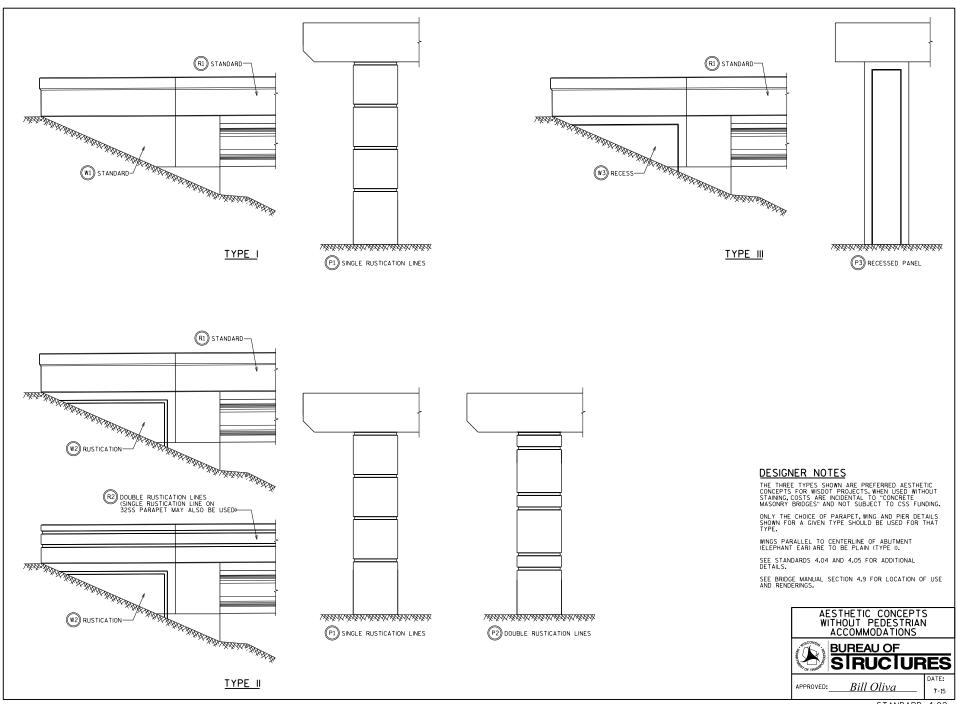
### PARAPET NOTES

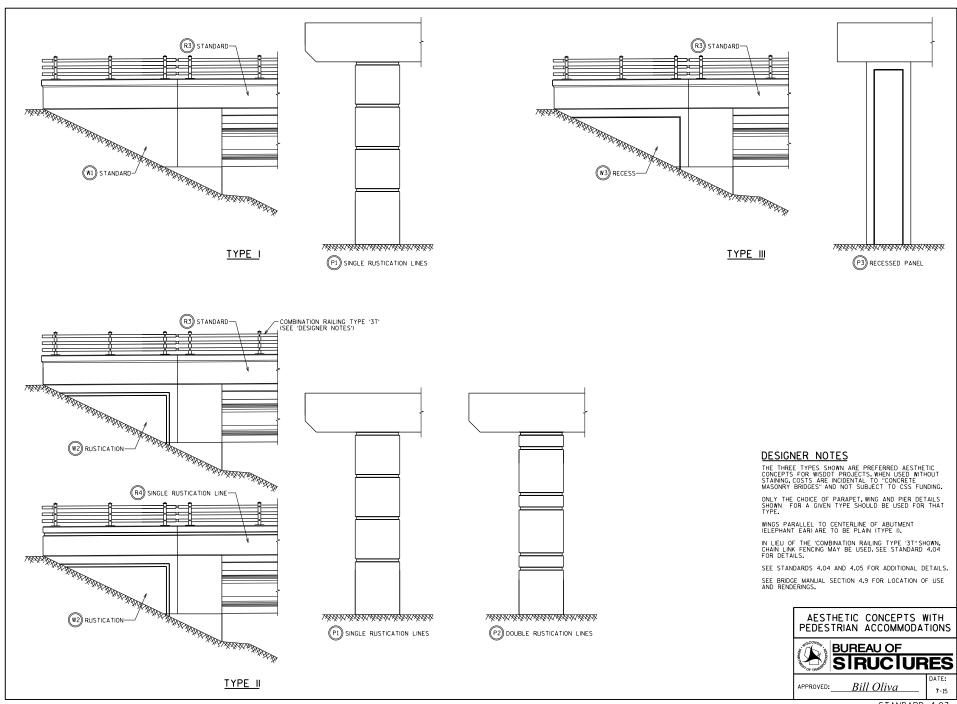
FORMLINER COURSING ON PARAPETS SHALL BE PARALLEL TO TOP OF PARAPET.

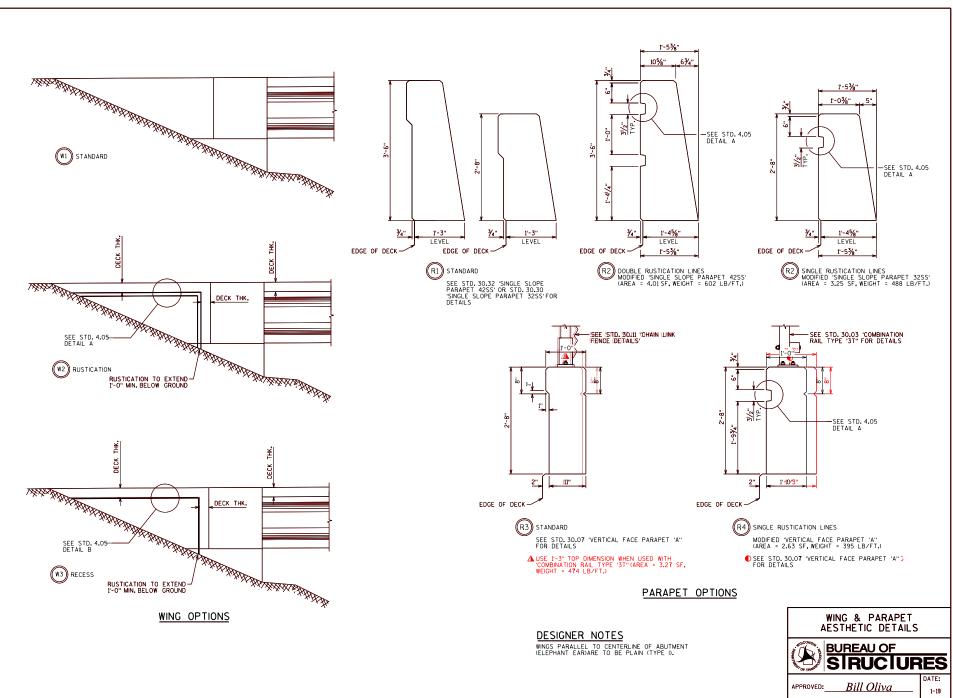
FORMLINER DETAILS

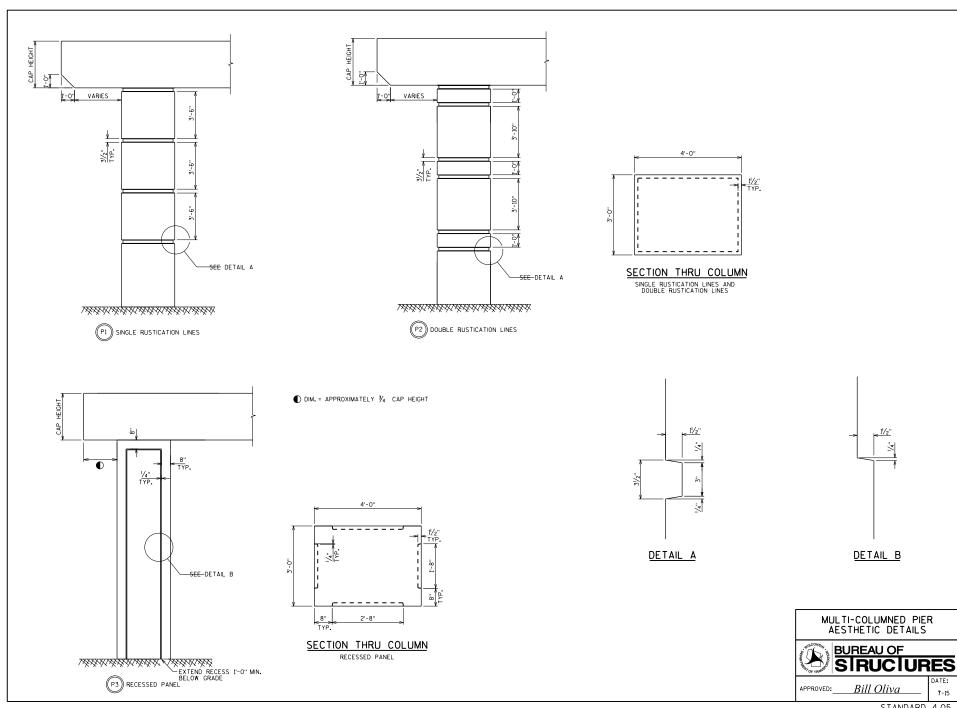


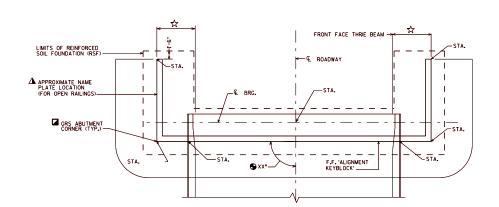
APPROVED: <u>Bill Oliva</u>











### 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.

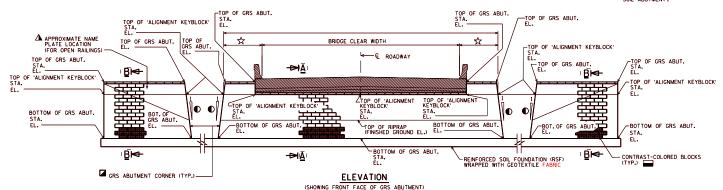
TEMPORARY FALSEWORK NOT TO BE SUPPORTED ON THE GRS ABUTMENT UNLESS APPROVED BY THE BUREAU OF STRUCTURES DEVELOPMENT SECTION.

### **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.

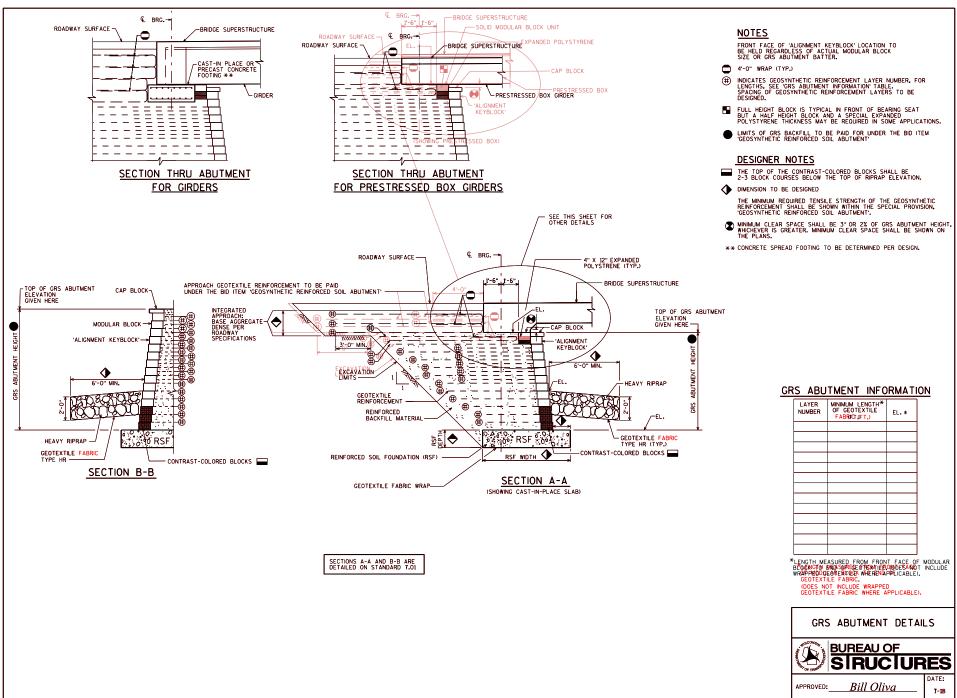
NOTE: STATIONS AND OFFSETS GIVEN AT FRONT FACE OF 'ALIGNMENT KEYBLOCK' AND AT ELEVATION XX,XX,
THESE STATIONS AND OFFSETS SHALL BE HELD REGARDLESS OF ACTUAL MODULAR BLOCK SIZE OR GRS ABUTMENT BATTER.

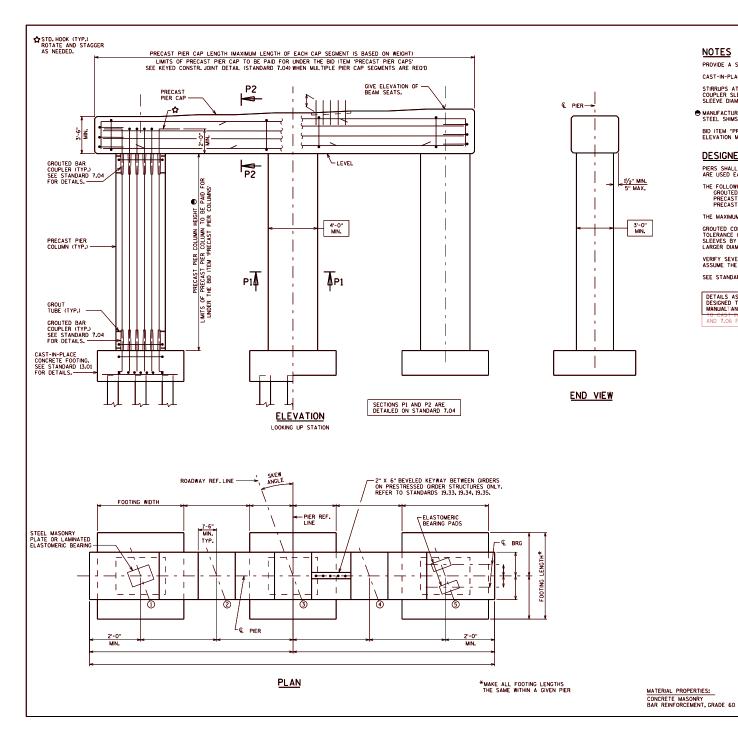
GRS ABUTMENT GENERAL PLAN



APPROVED: Bill Oliva

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### 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

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 (SOS, DESCRIPTION)
PRECAST PIER CAUMNS (SPV.0090,XXX)
PRECAST PIER CAPS (SPV.0090,XXX)

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

GROUTED COUPLER SLEEVES MAY BE OVERSIZED TO ALLOW FOR ADDITIONAL LATERAL TOLERANCE IN THE FIELD. STANDARD WISDOT PRACTICE IS TO OVERSIZE COUPLER SLEEVES BY 1 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, SEELTH-ALEZING THE BRIDGES, MANUAL LAND (STANDARDS) T.05 "AND T-T-06" LE OR MADDITIONAL GUIDANCES ALTERNATIVES. AND 7.06 FOR ADDITIONAL GUIDANCE.

> PRECAST PIER CAP AND COLUMNS



APPROVED:

f'c = 3.500 P.S.I. fy = 60,000 P.S.I.

Bill Oliva

### BILL OF BARS

SECTIONS PLAND P2 ARE CUT ON STANDARD 7.03

### TOTAL COATED: XX LBS



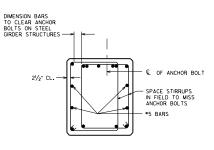
NOTE: THIS BILL OF BARS IS SHOWN FOR INFORMATION ONLY, PAYMENT FOR REINFORCEMENT IN PRECAST COLUMNS AND PRECAST PIER COLUMNS AND "PRECAST PIER CAPS."

€ COLUMN COLUMN BAR (TYP.) -11 П Ш Ш Ш П GROUT TUBE (TYP.) PIER COLUMN COUPLER (TYP.) GROUT SUPPLIED BY COUPLER MANUFACTURER Ш 11 -11 Ш -11 -11 CONCRETE FOOTING Ш Ш Ш Ш Ш П PXXX BARS
(PIER FOOTING DOWELS) Ш Ш Ш

'/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.

# € COLUMN -STIRRUP SIZE VARIES AT GROUTED BAR COUPLERS ← C PIFR 2½" CL.

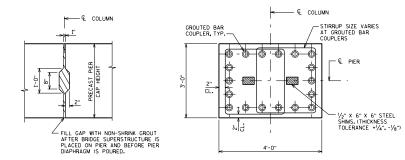
SECTION P1 (PRECAST PIER COLUMN REINF. TO BE DESIGNED BY DESIGN ENGINEER)



SECTION P2 (PRECAST PIER CAP REINF. TO BE DESIGNED BY DESIGN ENGINEER)

GROUTED BAR COUPLER DETAILS

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



KEYED CONSTR. JOINT ELEVATION DETAIL

(FOR PRECAST PIER CAPS WITH MULTIPLE SEGMENTS)

GROUTED COUPLER PLAN AT TOP AND BOTTOM OF COLUMN

### GROUTED SPLICE COUPLER CONNECTION SEQUENCE

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

- IT IS RECOMMENDED THAT THE ELEMENT WITH THE REINFORCEMENT BARS EXTENDING OUT BE FABRICATED WITH EXTRA BAR LENGTHS.
- 2. SURVEY LOCATION AND ELEVATION OF LOWER ELEMENT.
- 3. DETERMINE THE REQUIRED REINFORCING BAR EXTENSION LENGTHS AND THE REQUIRED SHIM HEIGHTS BASED ON THE SURVEY.
- CUT THE BAR EXTENSIONS TO THE REQUIRED LENGTH BASED ON THE SURVEY AND THE COUPLER MANUFACTURER'S RECOMMENDATIONS, FOR COATED BARS, THE ENDS OF THE BARS SHALL BE RE-COATED.
- 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 TO FRANCES 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 SUBSEQUENT ELEMENTS ABOVE A CONNECTION SHALL NOT COMMENCE UNTIL THE CONNECTION HAS ACHIEVED ADEQUARE STRENGTH AS DETERMINED THROUGH STRENGTH TESTING OF THE GROUT. THE TIMING OF SUBSEQUENT CONSTRUCTION STEPS SHOULD BE SPECFIED 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.

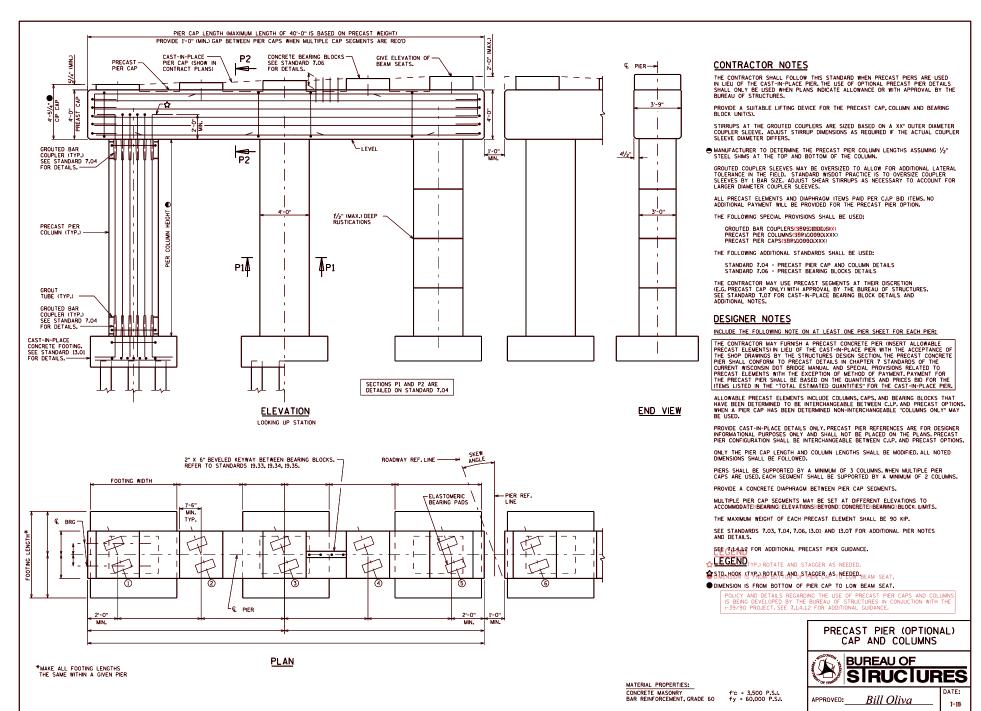
☼ SUPPLY REINFORCING BARS ACCORDING TO GROUTED COUPLER REQUIREMENTS FOR EMBEDMENT, BARS MAY BE FIELD CUT IF NEEDED.

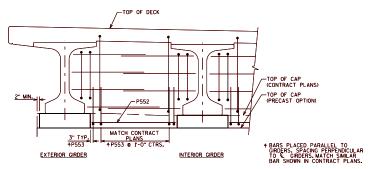
PRECASTER SHALL PROVIDE PORTS IN THE PRECAST ELEMENTS TO ALLOW THE COUPLERS TO BE GROUTED AFTER THE PRECAST ELEMENTS HAVE BEEN ERECTED.

PRECAST PIER CAP AND COLUMN DETAILS



STANDARD 7.04

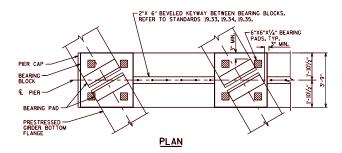


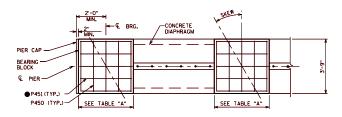


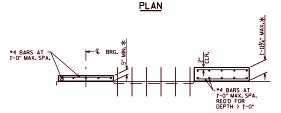
## PARTIAL TRANSVERSE SECTION

### AT DIAPHRAGM PIER

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







**ELEVATION** 

### BILL OF BARS

### TOTAL COATED: XX LBS

BAR MARK	NO. REO'D.	LENGTH	COAT	BEM	LOCATION
P450		3'-5"	<u>x</u>	T .	TOP & BOTT, TRANS.
P451		•	X	_	TOP & BOTT.LONG.
P552		21-21	X		PIER DIAPHRAGM - BOTH FACES HORIZ BTWN GIRDERS
P553		21-211	X	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 DIAPPHAGN RENFORCEMENT, PAYMENT FOR ALL THIS ASSOCIATED WITH THE OPTIONAL PRECAST PIERS SHALL BE INCLUDED IN THE CAST-IN-FLACE CONCERTE BUT IESM.



▲ MATCH SIMILAR DIAPHRAGM REIN. AS SHOWN IN CONTRACT PLANS.

### TABLE "A"

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

### DESIGNER NOTE

SEE 7.1.4.1.2 FOR ADDITIONAL PRECAST PIER GUIDANCE.

### CONTRACTOR NOTES

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

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

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

### PRECAST CONCRETE DETAIL NOTES

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

\* PRECAST HEIGHT = VARIES (5" MM, TO 1"-IIJ/" MAX.). MANUFACTURER TO DETERMINE THE PRECAST BEARING BLOCK HEIGHT ASSUMING \( \frac{1}{2} \) erout at the Bottom of the Bearing BLOCK. GROUT \( \frac{1}{2} \) ENEATH PRECAST ELEMENT.

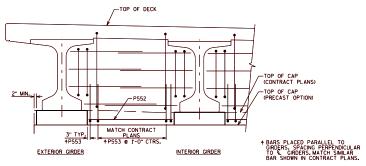
POLICY AND DETAILS REGARDING THE USE OF PRECAST PIER CAPS AND COLUMNS IS BEING DEVELOPED BY THE BUREAU OF STRUCTURES IN CONJUCTION WITH THE 1-39/90 PROJECT. SEE 7.1.4.12. FOR ADDITIONAL GUIDANCE.

PRECAST BEARING BLOCK DETAILS



APPROVED:

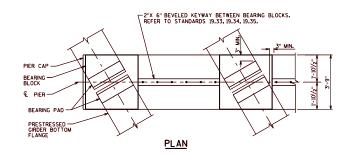
Bill Oliva

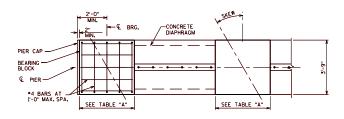


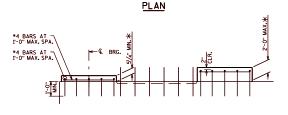
### PARTIAL TRANSVERSE SECTION

### AT DIAPHRAGM PIER

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







**ELEVATION** 

### DESIGNER NOTE

SEE 7.1.4.1.2 FOR ADDITIONAL PRECAST PIER GUIDANCE.

### **CONTRACTOR NOTES**

THE CONTRACTOR SHALL FOLLOW THIS STANDARD WHEN PRECAST PIERS ARE USED AND WHEN CAST-IN-PLACE BEARING BLOCKS ARE USED ILEU OF PRECAST BEARING BLOCKS. SEE STANDARD 7.06 FOR ADDITIONAL NOTES AND DETAILS.

### CAST-IN-PLACE CONCRETE DETAIL NOTES

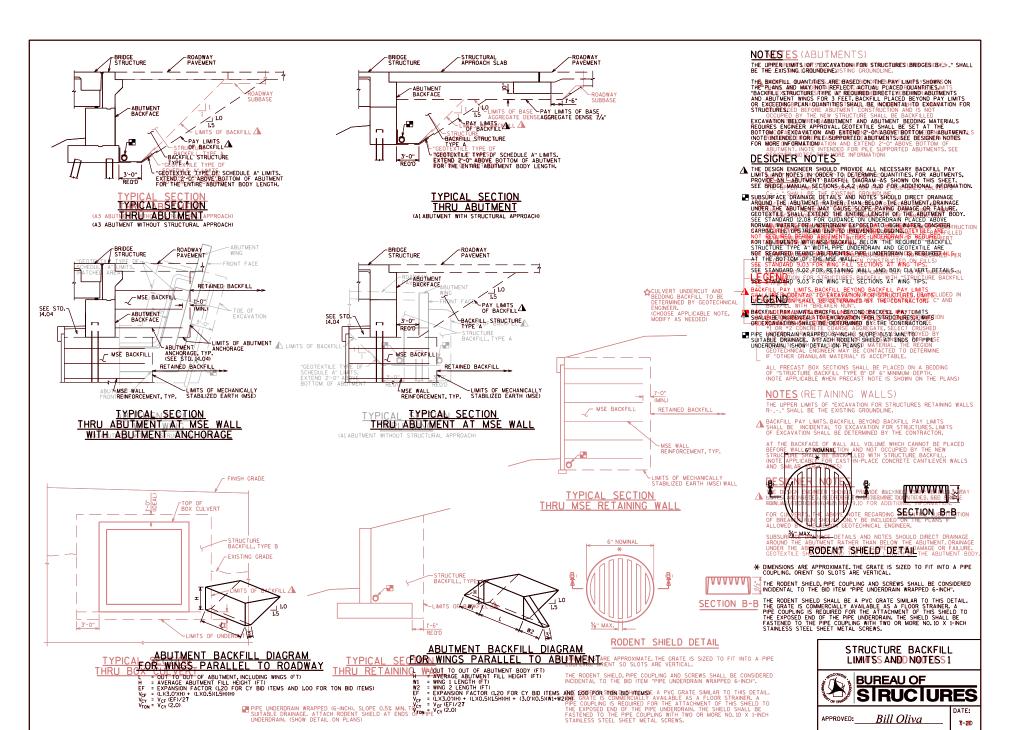
CAST-IN-PLACE BEARING BLOCK DETAILS SHALL ONLY BE USED WHEN PLANS INDICATE ALLOWANCE FOR PRECAST PIERS.

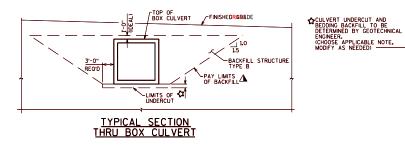
\* CAST-IN-PLACE HEIGHT = VARIES (5½" MIN. TO 2'-0" MAX.). CONTRACTOR TO DETERMINE THE CAST-IN-PLACE BEARING BLOCK HEIGHTS.

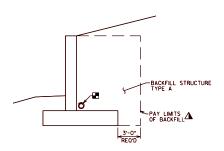
POLICY AND DETAILS REGARDING THE USE OF PRECAST PIER CAPS AND COLUMNS IS BEING DEVELOPED BY THE BUREAU OF STRUCTURES IN CONJUCTION WITH THE I-39/90 PROJECT. SEE 7.1.4.1.2 FOR ADDITIONAL GUIDANCE.

CAST-IN-PLACE BEARING BLOCK DETAILS

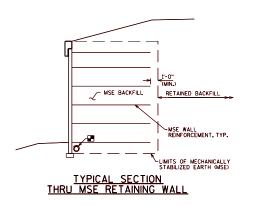








TYPICAL SECTION
THRU RETAINING WALL



### NOTES (BOX CULVERTS)

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

THE BACKFILL QUANTITES ARE BASED ON THE PAY LIMITS SHOWN ON THE PLANS AND MAY WOT REFLECT ACTUAL PLACED QUANTITES. "BACKFILL STRUCTURE TYPE B" REQUIRED ON THE BOX CILLYERT SIDES AND BEHIND APRON WINDS 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 LIEU OF USING BREAKER RUN FOR THE BOX CONSTRUCTION PLATFORM, THE CONTRACTOR MAY ELECT TO SUBSTITUTE "I OR "2 CONCRETE COASES AGGREGATE SELECT CRUSHED MATERIAL OR THE CONTRACTOR IS RESPONSIBLE FOR BASE STABILITY WITH ANY SUBSTITUTED MATERIAL. THE REGION GEOTECHNICAL BROWNER 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. "RECURRED FOR THE ENTIRE WALL LENGTH. BACKFILL PLACED BEYOND PAY LIMITS OR EXCEEDING PLAN QUANTITIES SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES."

### DESIGNER NOTES

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

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

### **LEGEND**

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.

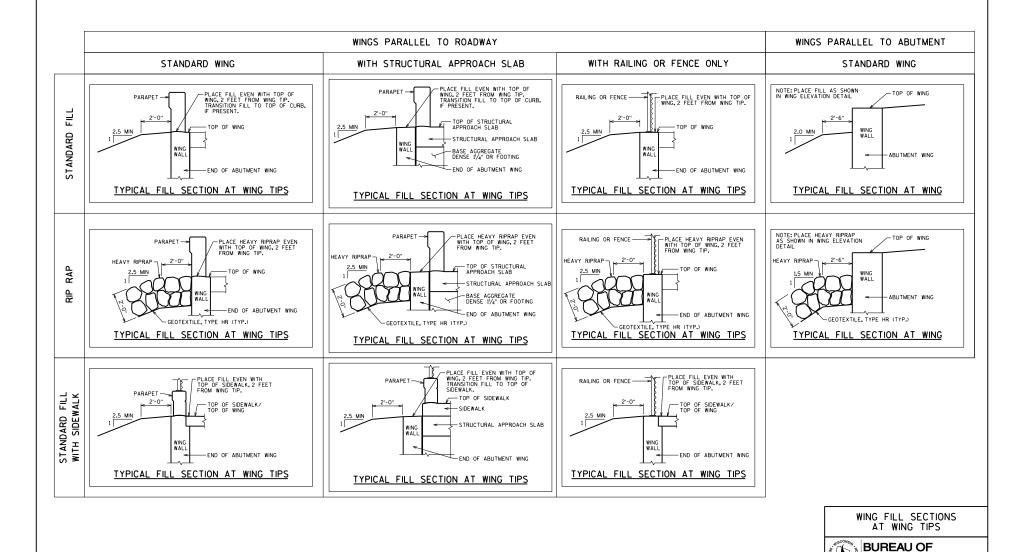
PIPE UNDERDRAIN WRAPPED (6-INCH), SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. (SHOW DETAIL ON PLANS)

STRUCTURE BACKFILL LIMITS AND NOTES 2



APPROVED:

Bill Oliva

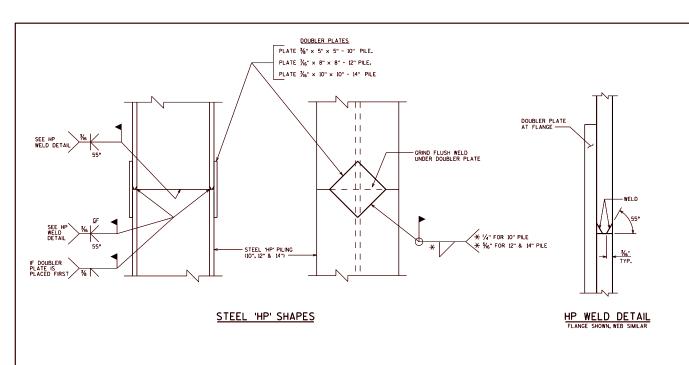


1-18

SIRUCIURES

Bill Oliva

APPROVED:



BACK UP RING. 3/6" MIN. THICKNESS FOR SMAW AND 1/4" MIN. THICKNESS FOR FCAW.—

CAST-IN-PLACE

'PIPE PILE'

B-U4a

### 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.

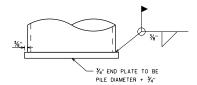
SEE BRIDGE MANUAL SECTION 11.3.1.17.7 FOR PILE RESISTANCE VALUES.

IF LESS THAN THE MAXIMUM AXIAL RESISTANCE IS REQUIRED BY DESIGN, STATE ONLY THE REQUIRED CORRESPONDING DRIVING RESISTANCE ON THE PLANS. GONAGULE MENT CHIEF GOES DESIGNATION OF THE PLANS. BY THE PROPERTY OF THE PROPERTY OF

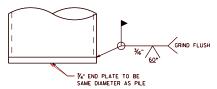
### NOTES

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

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



### END PLATE DETAIL FOR CIP PILING

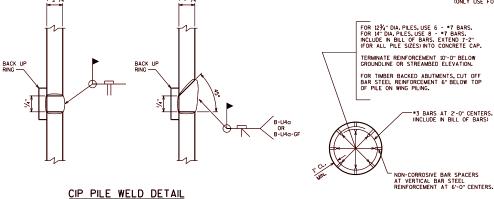


- 1'-0" MIN. LAP

# END PLATE DETAIL FOR CIP PILING

### IN ARTESIAN CONDITIONS

(ONLY USE FOR ARTESIAN CONDITIONS)

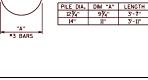


SECTION THRU CONCRETE

CAST-IN-PLACE PILING

USED WHEN PILES ARE EXPOSED

(OPEN PILE BENTS OR TIMBER BACKED ABUTMENTS)

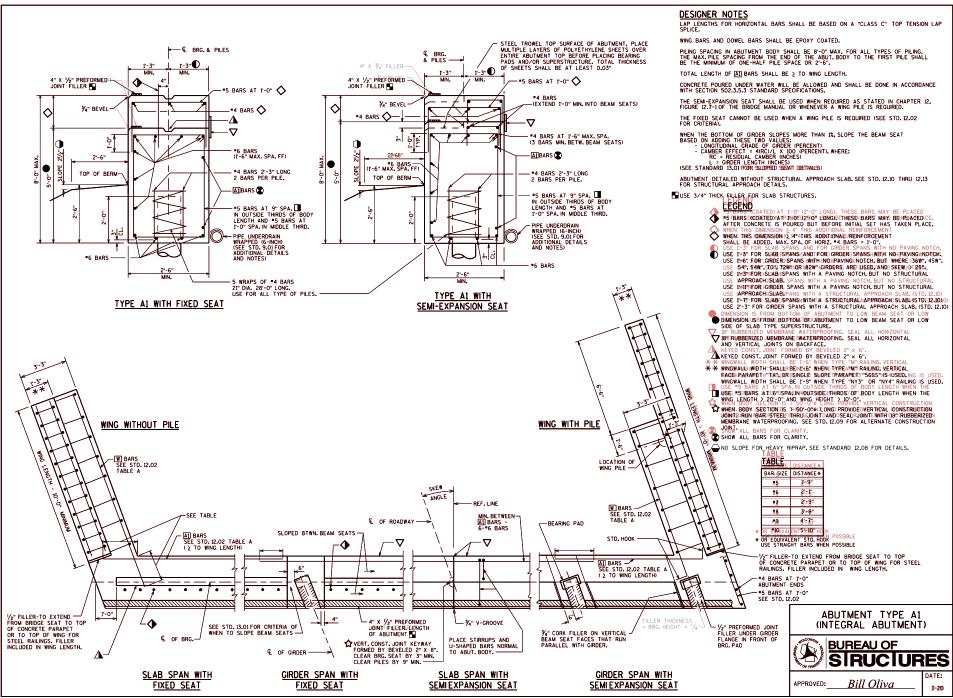


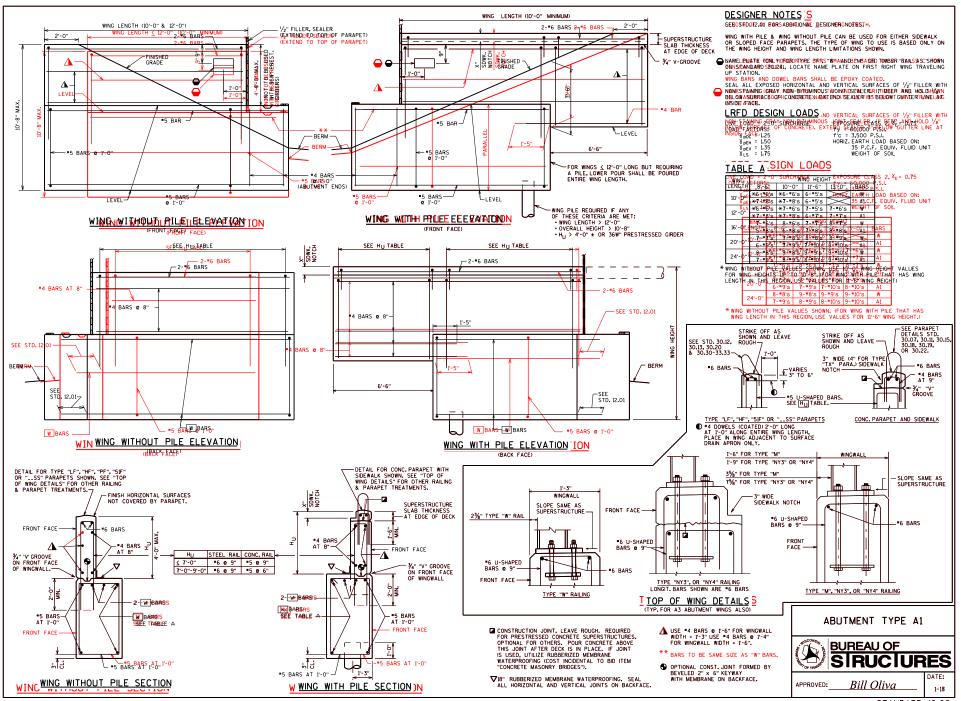
TABLE

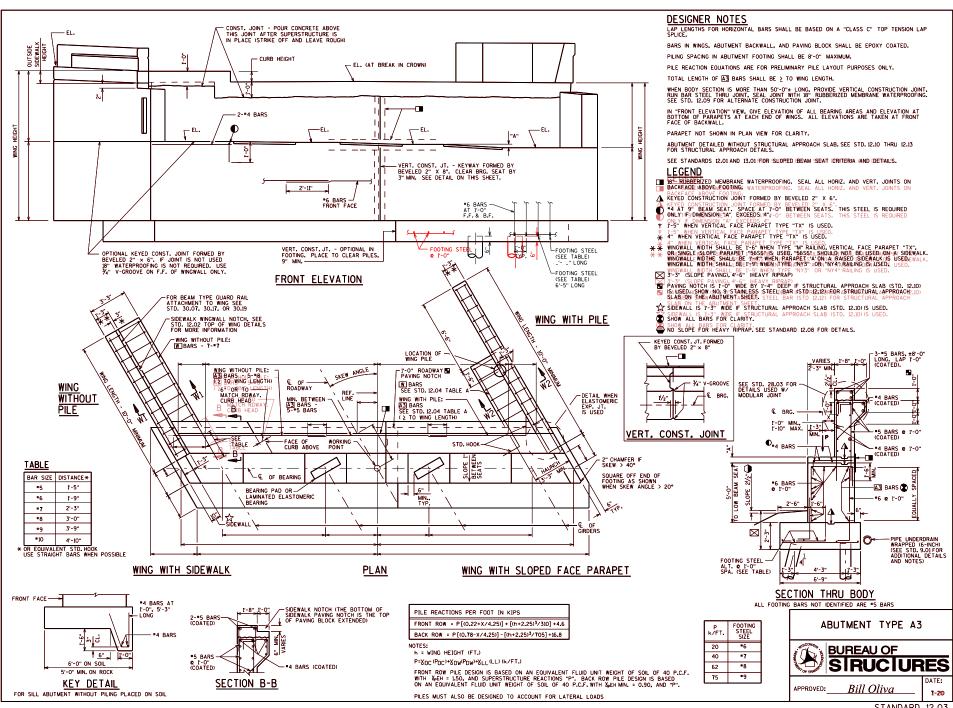
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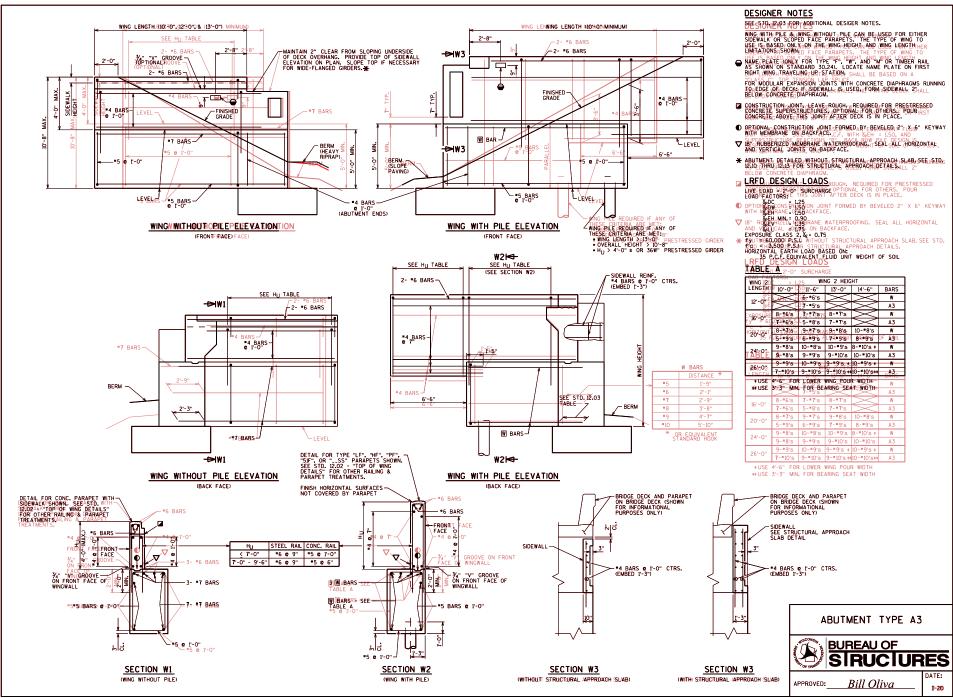
APPROVED: Bill Oliva DATE:
7-18

PILE DETAILS









### B.F. OF ABUTMENT-WING LENGTH - 10'-0" MINIMUM WING LENGTH ₽₩ - A1 BARS 2'-0" MIN. 18" RUBBERIZED MEMBRANE WATERPROOFING TO EXTEND FROM BRIDGE SEAT TO TOP OF WING-\*2:1 SL OPE 4-#6 "L" SHAPED BARS (I'-O" LEGS) FOR WINGS OVER 12'-O" LONG. OR SLAB В₩ - € OF BEARING & PILES -1/2" FILLER AND SEALER LEVEL

### PLAN FOR TYPE A1 ABUTMENT

(SEE STD. 12.01 FOR ABUTMENT BODY DETAILS)

### 2'-0" MIN. LEVEL A₩ BENCH MARK CAP (WHEN SUPPLIED) 2-#4 BARS-- NAME PLATE (ONLY FOR TYPE "W", "M", NY3&4 OR TIMBER RAIL AS SHOWN ON STANDARD 30.24), LOCATE NAME PLATE ON FIRST RIGHT WING TRAYELING UP STATION. 2-**4** BARS F.F. -1'-0" · ½" FILLER, SEALER & 18" RUBBERIZED MEMBRANE WATERPROOFING - \*4 BARS AT 1'-0" CTRS. \*4 BARS @ 1'-0"-WT BARS OPTIONAL KEYED CONST. JOINT FORMED BY BEVELED 2"X6" ¾" "V" GROOVE ON F.F. OF WING WALL. NOT REQUIRED IF CONST. JOINT IS NOT USED. WT BARS - RUBBERIZED MEMBRANE WATERPROOFING IF CONST. JOINT IS USED (COST INCIDENTAL TO BID ITEM "CONCRETE MASONRY BRIDGES") WT BARS A1 BARS 4-#6 "L" SHAPED BARS FOR WINGS OVER 12'-0" LONG ■5 BARS @ 1'-0" W BARS -\*5 BARS @ 1'-0" F.F. W BARS B.F. - W BARS ■6 BARS TYP. PIPE UNDERDRAIN — WRAPPED (6-INCH) (SEE STD. 9.01 FOR ADDITIONAL DETAILS AND NOTES) A₩ BAR SIZE DISTANCE 1'-9" 0.6 WING LENGTH 2'-1" 6 7 WING PILE REO'D. FOR WINGS OVER 16'-6" ONLY 2'-9" 8 3'-8" SECTION A-A SECTION B-B WING ELEVATION

(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 GMEY WEION PROBLEM.
THE BOTTOM OF ABUTMENT,
WISE SOLVE OF THE MINISTRALE CLASS.

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: \$\_{00} = 1.25\$ \$\_{00} = 1.25\$ \$\_{00} = 1.25\$ \$\_{00} = 1.25\$ \$\_{00} = 1.25\$ \$\_{00} = 1.25\$ \$\_{00} = 1.25\$ \$\_{00} = 1.25\$ \$\_{00} = 1.25\$ \$\_{00} = 1.25\$ \$\_{00} = 0.75\$ \$\_{00} = 0.75\$ \$\_{00} = 0.75\$ \$\_{00} = 0.75\$ \$\_{00} = 0.95\$ \$\_{00} =

### 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- <b>"</b> 5's	2-#5's	2-=5's	${}$	WT				
	4-#6's	4-#6's	5-*6's	> <	A1				
12"-0"	X	5-#6's	5-*7's	6-#7's	W				
	Х	2- <b>*7</b> 's	2- <b>*7</b> 's	2-#8's	WT				
	X	5- <b>=</b> 6's	6-#6's	6-#7's	A1				
	X	5-=8's	6- <b>=</b> 8's	5-#9's	W				
16'-0"	X	2-#8's	2-*8's	2-#9's	WT				
	$\times$	5-#8's	6-#8's	7-#8's	A1				
20'-0"	X	> <	8-=8's	8-#9's	W				
<b>A</b>	X	> <	2- <b>=</b> 8's	2- <b>=</b> 9's	WT				
	<    <	${\sim}$	7-*9's	8-#9's	A1				

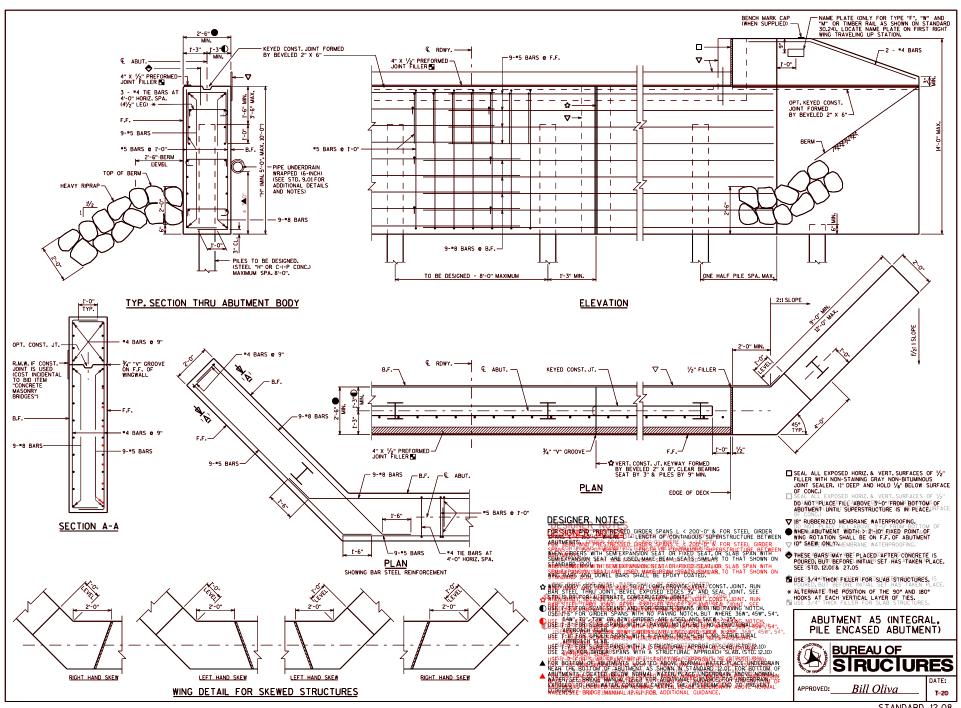
▲ WING PILE REQUIRED

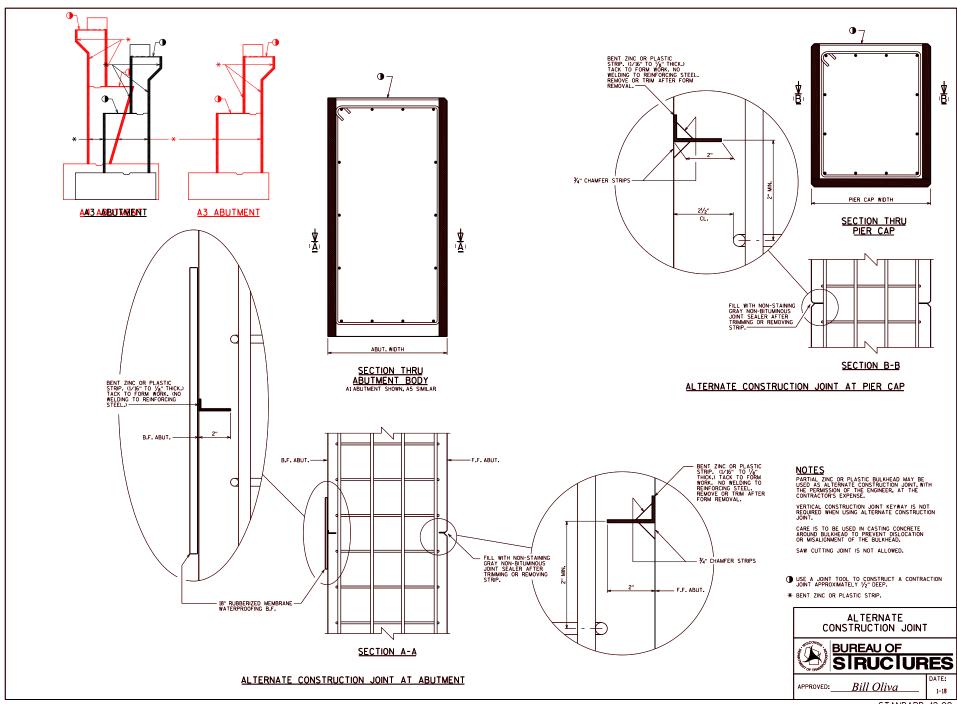


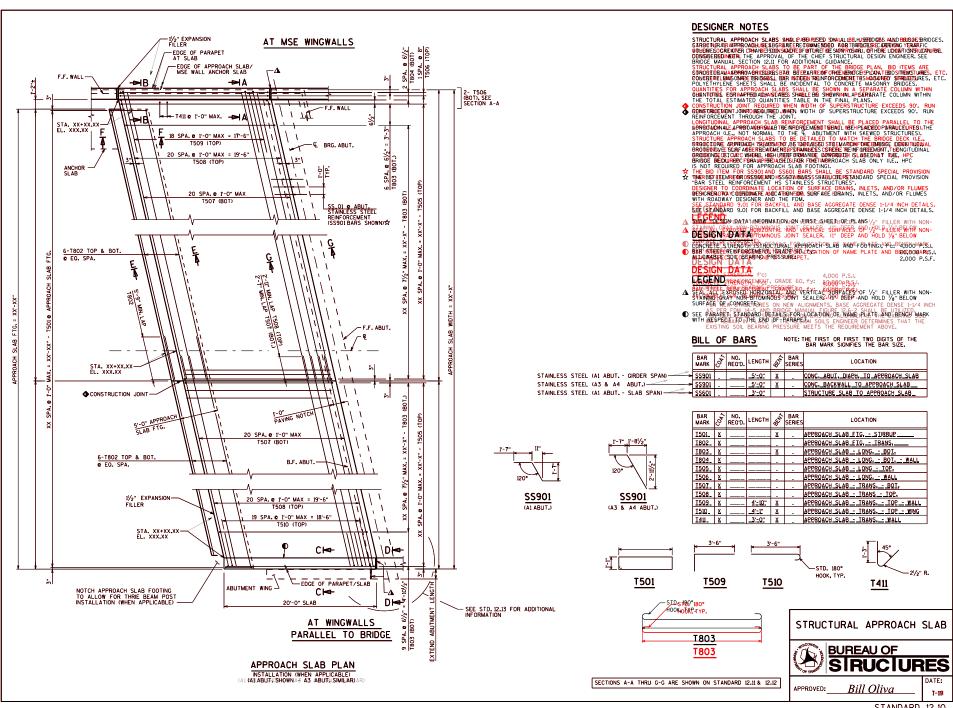


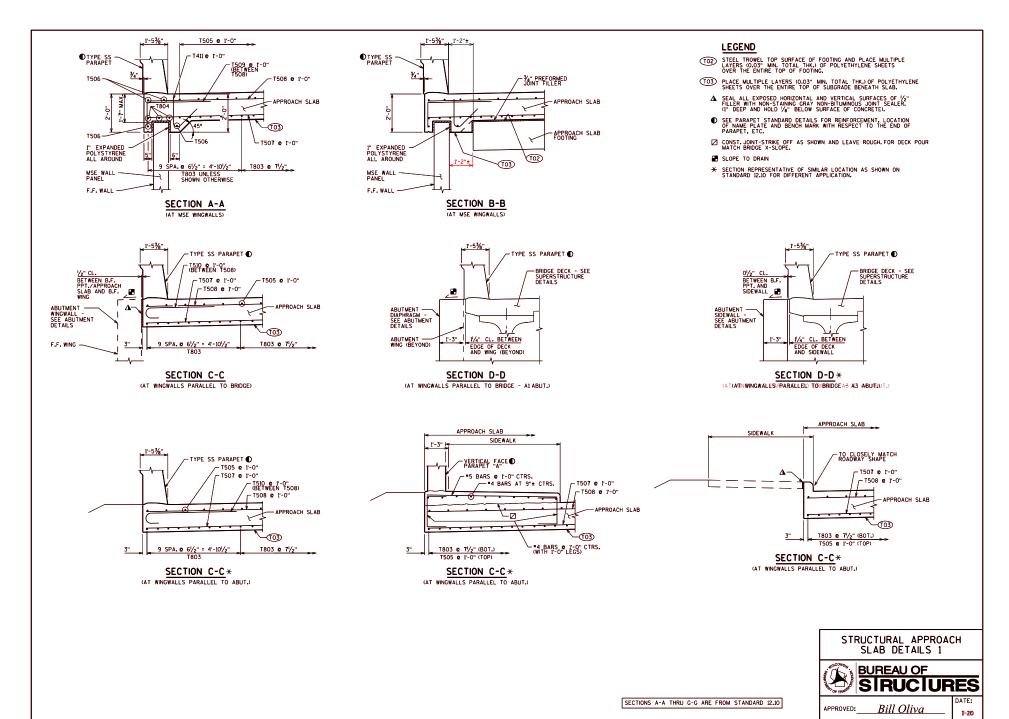
APPROVED: Bill Oliva

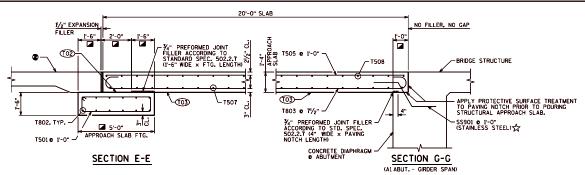
SEE STD. 12.01 & 12.02 FOR NOTES & DETAILS



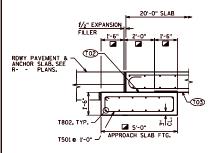




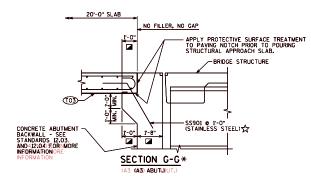


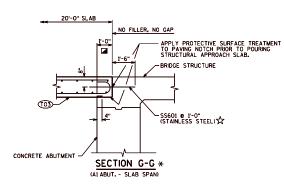


### SECTION THRU APPROACH SLAB



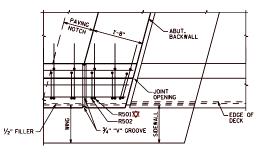
SECTION F-F (AT MSE WINGWALLS WITH ANCHOR SLAB)





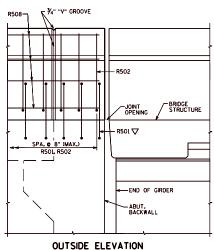
### LEGEND

- TO2) STEEL TROWEL TOP SURFACE OF FOOTING AND PLACE MULTIPLE LAYERS (0.03" MIN. TOTAL THK.) OF POLYETHYLENE SHEETS OVER THE ENTIRE TOP OF FOOTING.
- PLACE MULTIPLE LAYERS (0.03" MIN. TOTAL THK.) OF POLYETHYLENE SHEETS OVER THE ENTIRE TOP OF SUBGRADE BENEATH SLAB.
- MEASURED NORMAL TO ABUTMENT
- FOLLOW FDM 14-10-25 RECOMPREMENTS FOOR ROOMONWAY METEROMONICHI PAVEMENT.
- $\mbox{\ensuremath{\pmb{\times}}}$  Section representative of similar location as shown on standard 12.10 for different application.
- THE BID ITEM FOR SS901 AND SS601 BARS SHALL BE STANDARD SPECIAL PROVISION "BAR STEEL REINFORCEMENT HS STAINLESS STRUCTURES".
- ♥ R501 BARS TO BE THED TO STRUCTURAL APPROACH SLAB STEEL AND ABUT, STEEL BEFORE STRUCTURAL APPROACH SLAB IS POURED.



PLAN

(PAR(PARAPET 'ONILSTRUCTURALPFAPPROACHESLAB (AT (A3) ABUTLBUT.)



(PAR(PARAPET (ON ISTRUCTURAL PAPEROACH (SLAB AT AS) ABUT, BUT.)
(WING NOT SHOWN FOR CLARITY)

### **DESIGNER NOTES**

SEE CHAPTER 30 FOR PARAPETS ON STRUCTURAL APPROACH SLAB DETAILS. SECTIONS A-A THRU G-G ARE FROM STANDARD 12.10

STRUCTURAL APPROACH SLAB DETAILS 2

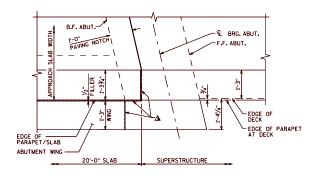


APPROVED: Bill Oliva T-18

# EDGE OF PARAPET AT SLAB B.F. ABUT. C BRG. ABUT. F.F. ABUT. EDGE OF SLAB BUT SLAB

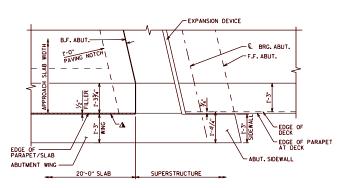
### APPROACH SLAB PARTIAL PLAN

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



### APPROACH SLAB PARTIAL PLAN

(AT WINGWALWISIGWARAISLERARIALLERIDGE BRADGEBUTA1- ABROTER SPAN)

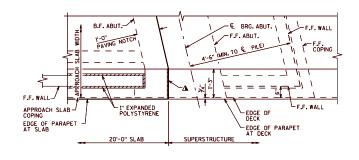


### APPROACH SLAB PARTIAL PLAN\*

(AT(AWINGWALLUSICHARAISLEIARIOLTERIDGO (ERAZGIABULA 3-40000ER) SPAN)

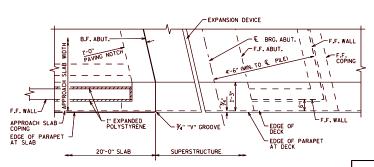
### LEGEND

- 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 WINGWALWSNOPMARALS ERARIOLIERIDGE BRADGABUT MATABUSE MINGWALWSNOW GLEDER SPAN)



### APPROACH SLAB PARTIAL PLAN \*

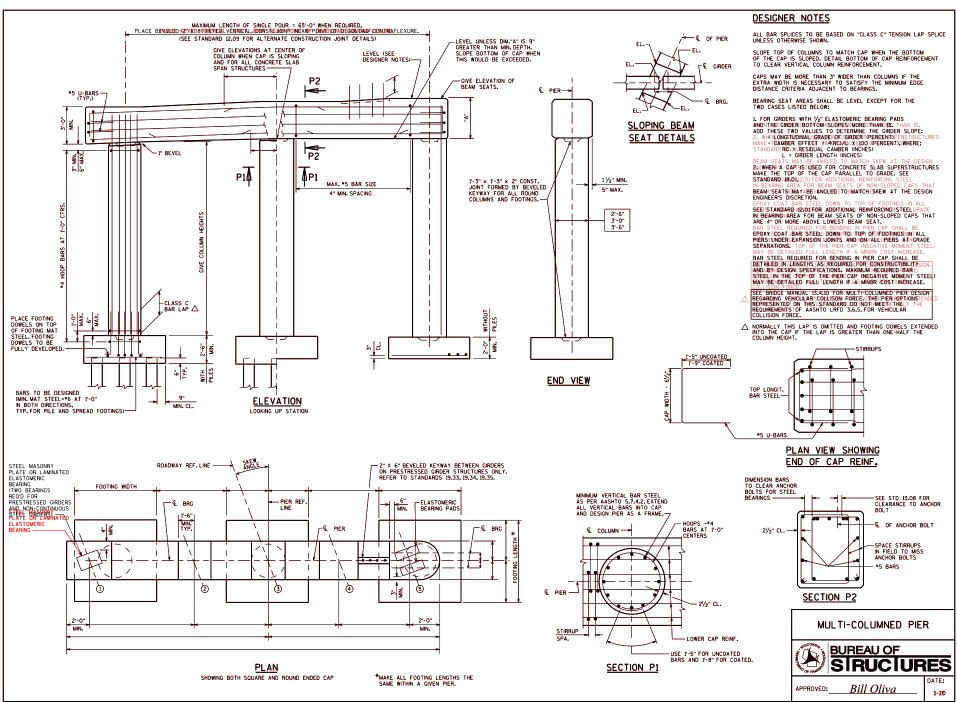
(AT WINGWALLUSI CHARATA FEATIOL LERID GELLERAD GABLITA 3ATA BRISET AVINCINAE USIGNI GIRDER SPAN)

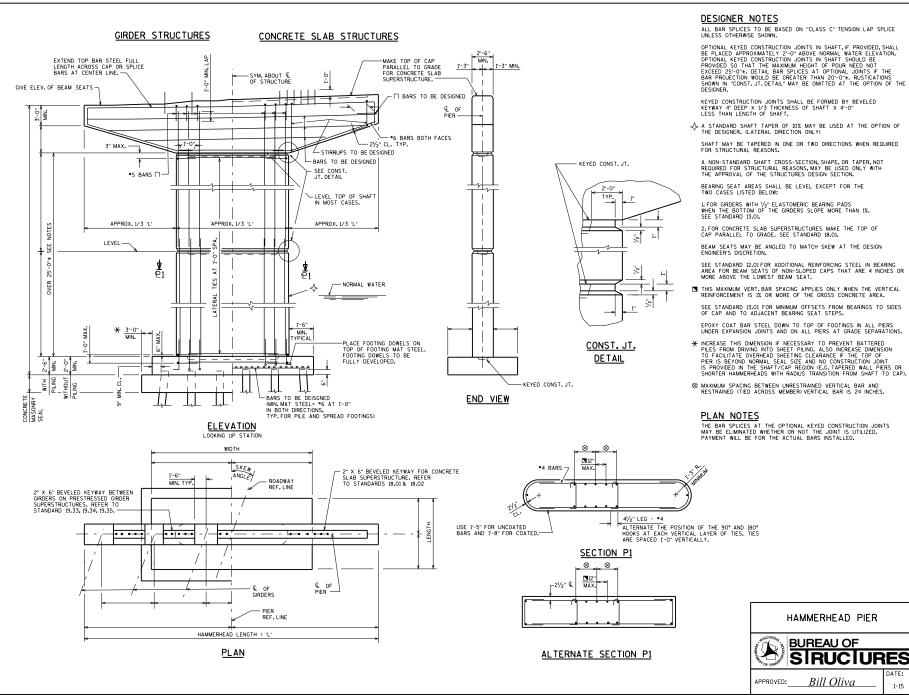
PARTIAL PLANS SHOWN HERE ARE FROM STANDARD 12.10

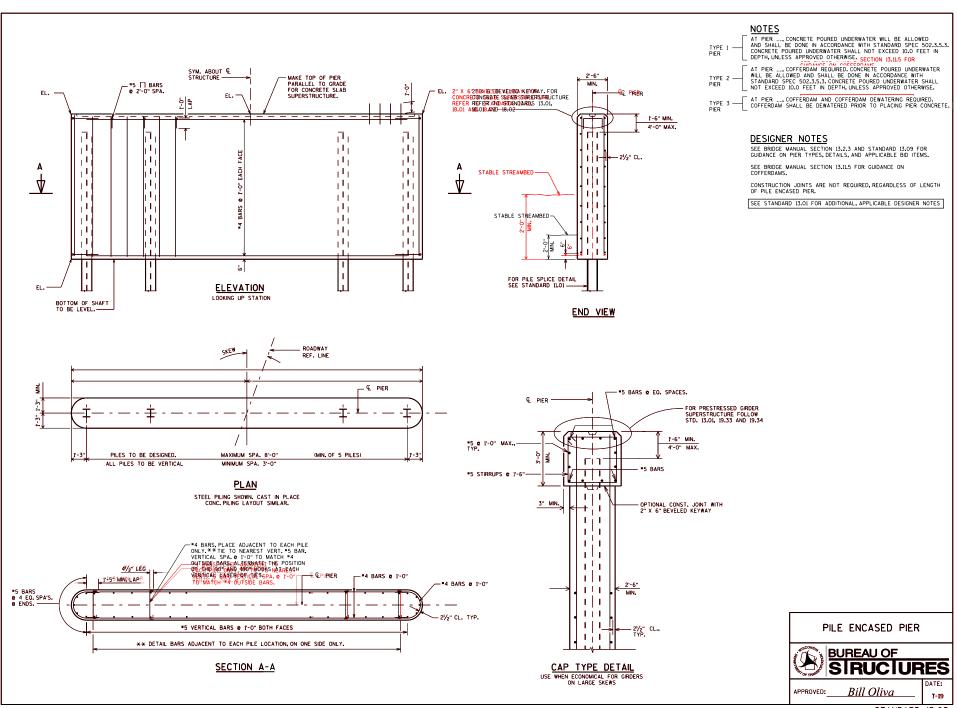
STRUCTURAL APPROACH SLAB DETAILS 3

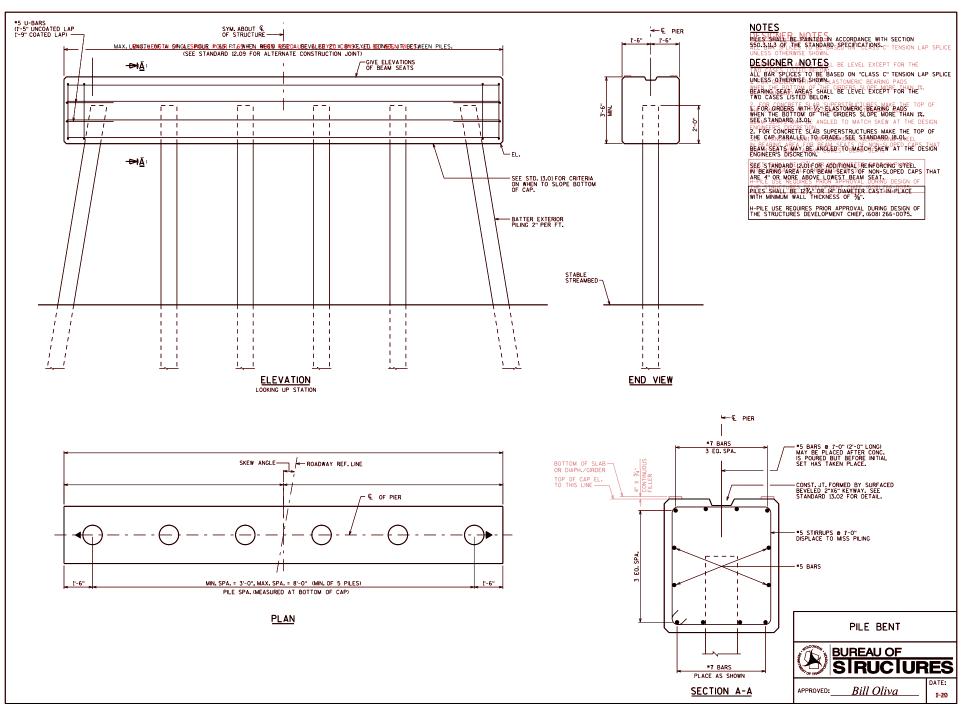


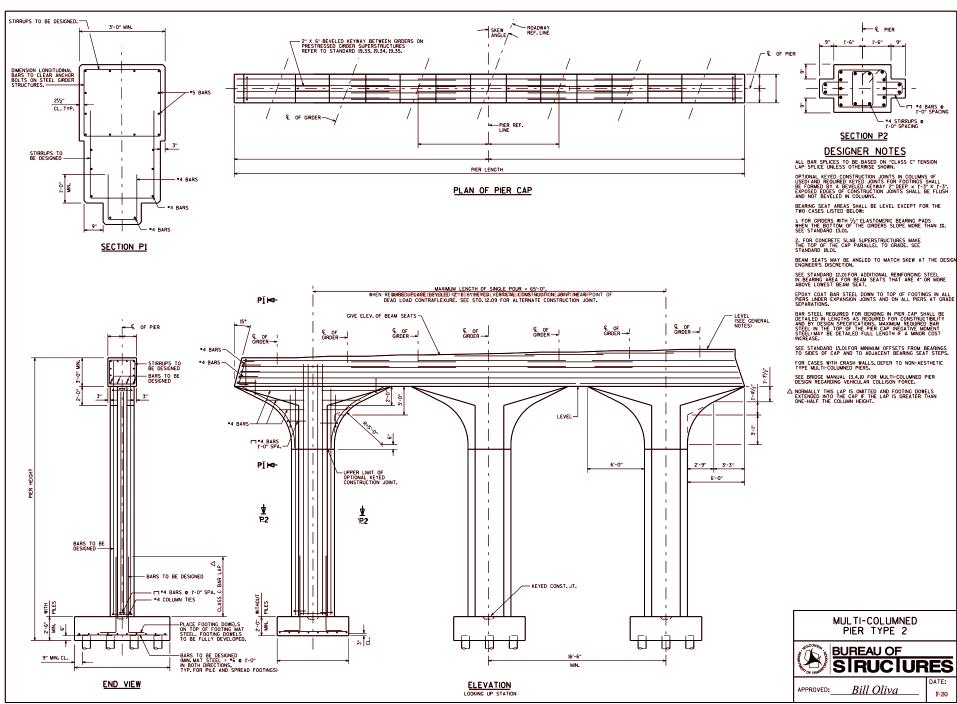
APPROVED: <u>Bill Oliva</u>

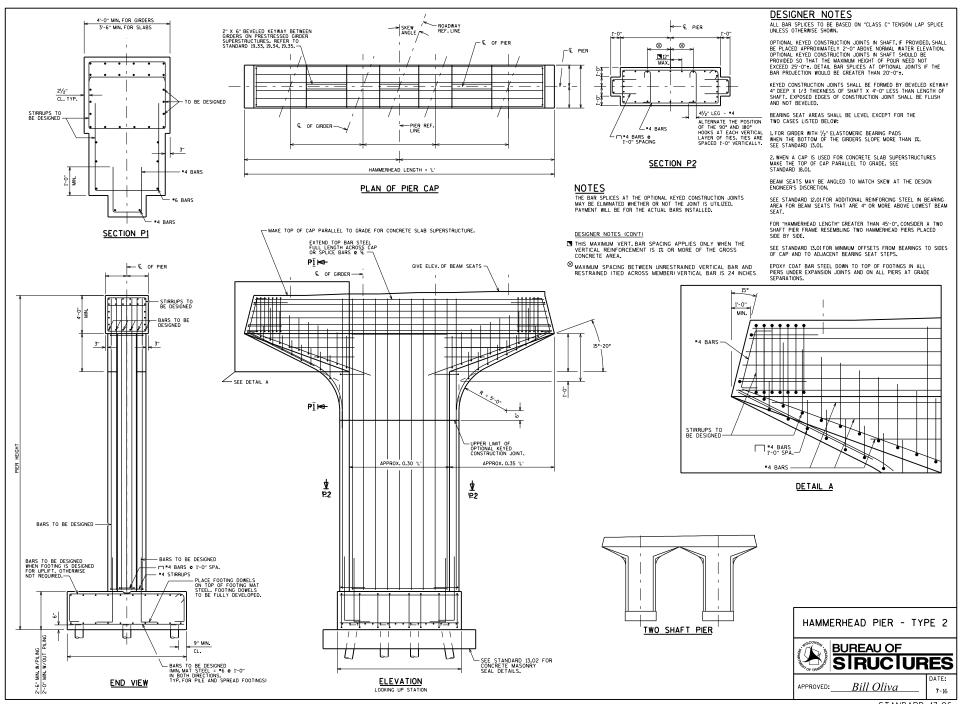


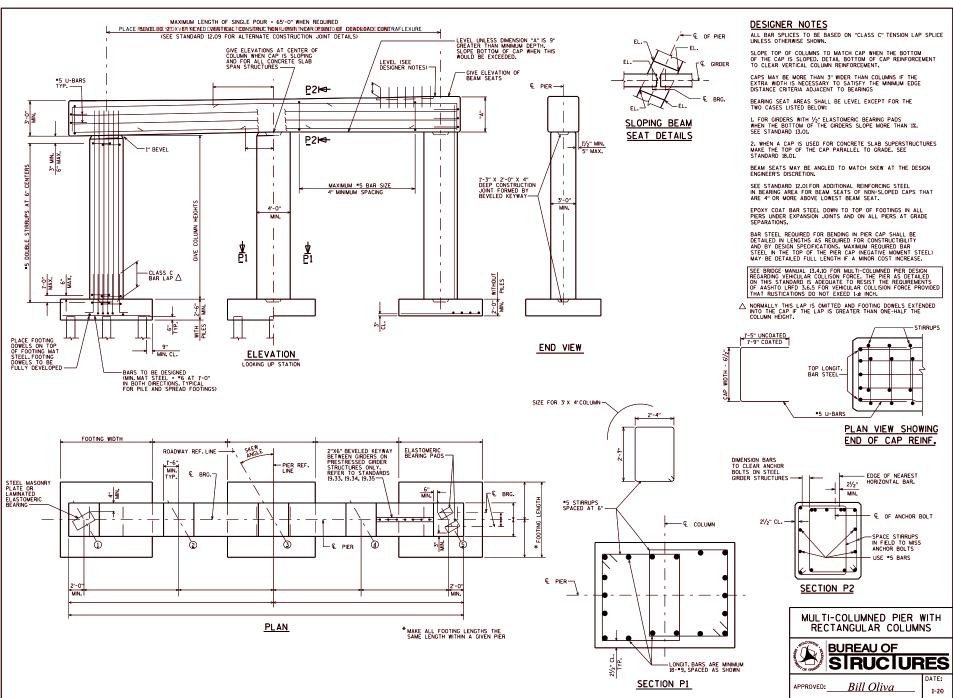


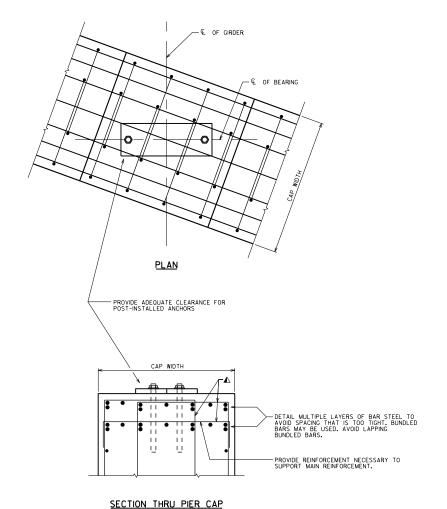












DESIGNER NOTES
PROVIDE 4" MIN. CLEAR BETWEEN ANCHOR BOLTS
AND REINFORCEMENT.

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.

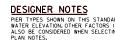
► DISPLACE TRANSVERSE STIRRUP BARS AS NEEDED TO PROVIDE 4" MIN. CLEAR BETWEEN ANCHOR BOLTS AND REINFORCEMENT.

PIER CAP REINFORCEMENT DETAILING



APPROVED:\_\_\_\_

Bill Oliva



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

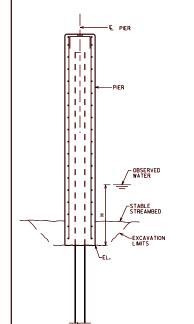
PILE ENCASED PIER TYPES:

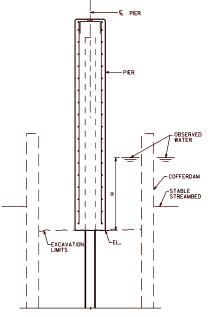
TYPE 1 - COFFERDAM BID ITEM NOT PROVIDED. CONSIDER PROVIDING UNDERWATER INSPECTION BID ITEM.

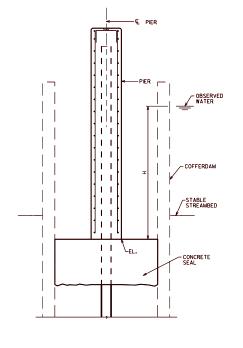
TYPE 2 - COFFERDAM AND UNDERWATER INSPECTION BID ITEMS REQUIRED.

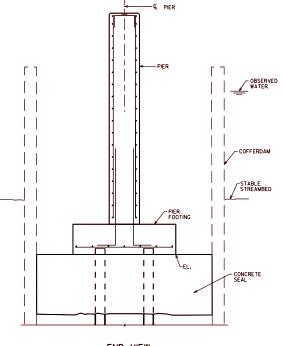
TYPE 3 - COFFERDAM AND SEAL BID ITEMS REQUIRED.

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









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

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

ITEM NUMBER BID ITEM

COFFERDAMS (STRUCTURE)
UNDERWATER SUBSURBUCTURES INSPECINIONTISTRUGELIRE)
LS
EACH

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

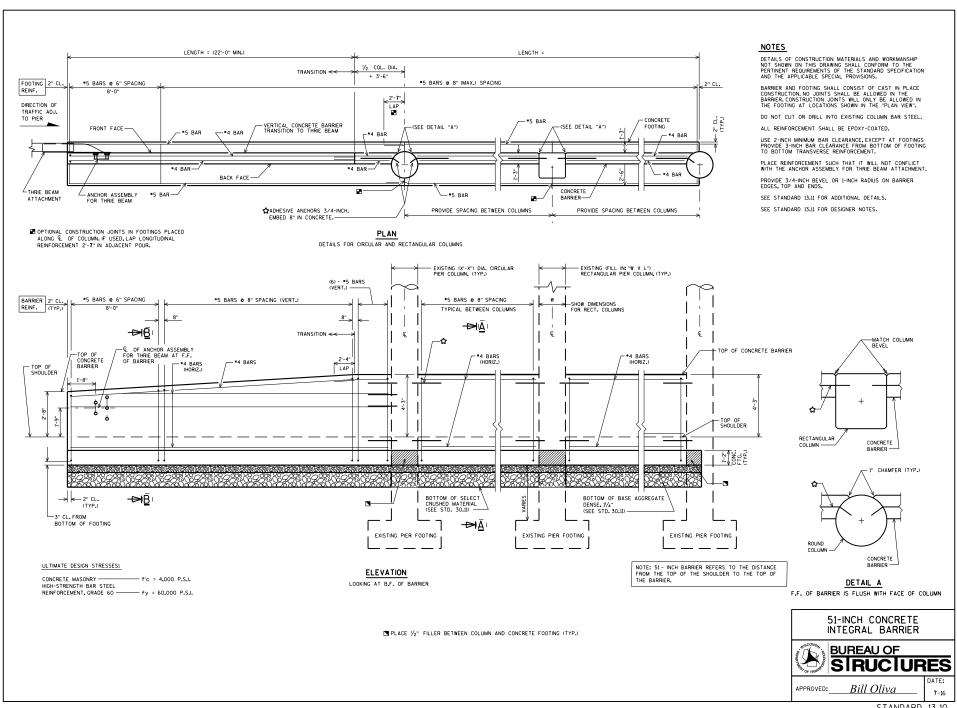
ITEM NUMBER BID ITEM UNIT

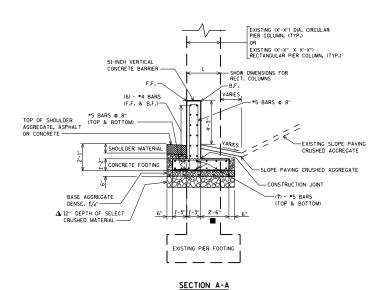
END VIEW SOLID WALL PIER (PILE ENCASED PIER ALTERNATIVE)

ITEM NUMBER BID ITEM COFFERDAMS (STRUCTURE) CONCRETE MASONRY SEAL LS

PILE ENCASED PIER (TYPES)







BETWEEN COLUMNS



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

LENGTH = 3'-2" X

#6 BAR

USED WITH CIRCULAR COLUMNS

(ADHESIVE ANCHOR)

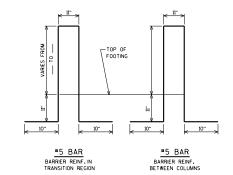
\* FOR RECTANGULAR COLUMN USE STRAIGHT BARS OF THIS LENGTH

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.

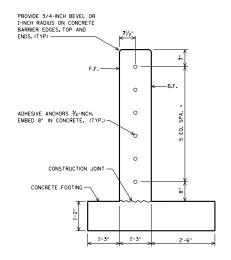
CONTACT THE REGIONAL OFFICE FOR VERIFICATION OF ANY OF THESE CONDITIONS. THESE DETAILS MEET CRITERIA FOR TEST LEVELS TL-3/TL-4.

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.



## BAR BENDING DIAGRAMS

BAR DIMENSIONS ARE OUT TO OUT OF BAR



ADHESIVE ANCHOR LAYOUT

51-INCH VERTICAL CONCRETE BARRIER TRANSITION F.F. \*5 BARS (SEE ELEV. VIEW STD. 30.10 FOR SPACING) \*5 BARS (SEE ELEV. (6) - #4 BARS VIEW STD. 30.10 FOR SPACING) (TOP & BOTTOM: (F.F. & B.F.) TOP OF SHOULDER AGGREGATE, ASPHALT, CONSTRUCTION \_ \_ \_ \$SHOULDER MATERIAL CONCRETE FOOTING -(7) - #5 BARS (TOP & BOTTOM) BASE AGGREGATE DENSE, 11/4"-▲ 12" DEPTH OF SELECT CRUSHED MATERIAL 2'-6"

> SECTION B-B TRANSITION REGION

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

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

INTEGRAL BARRIER DETAILS

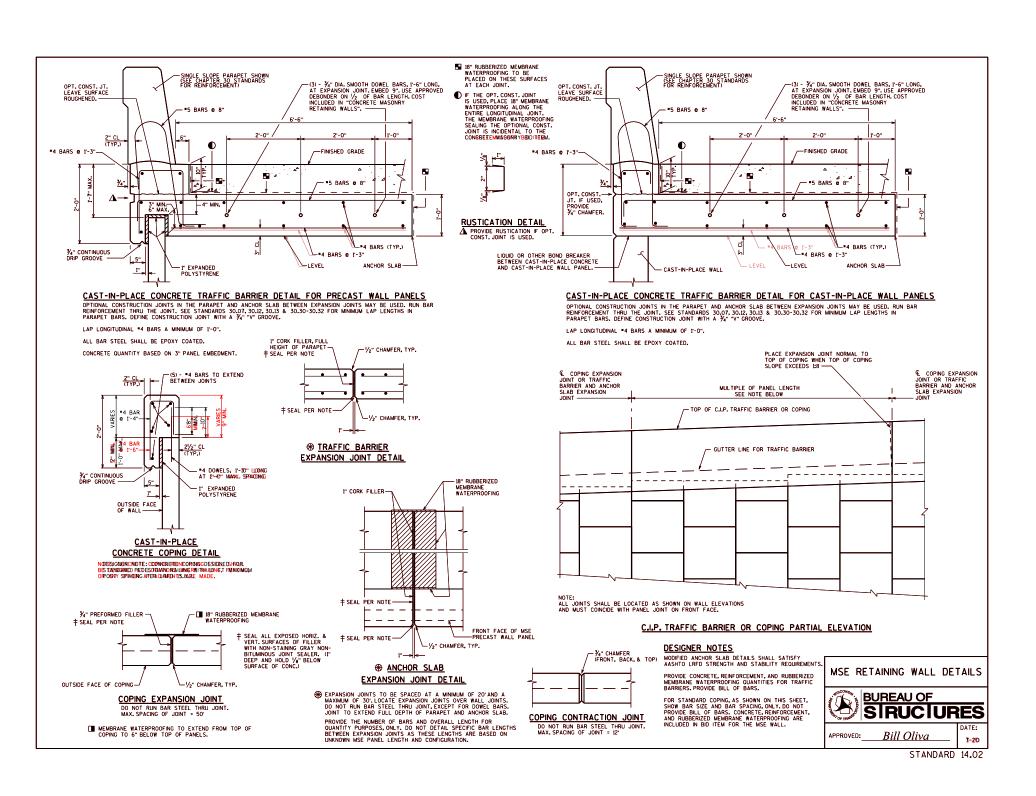


APPROVED:

Bill Oliva

7-16

# 51-INCH VERTICAL CONCRETE BARRIER AND TRANSITION



# 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. RAMF 31.54' L.T. 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. RAMP CC STA. 184+60.53 N.E. RAMP 76.42'LT. END WALL STA. 184+13 N.E. RAMP 74.49'LT. = STA. 1+84.84 WALL 55.56'LT STA. 1±54,66 EL. 947.00 STA. 1±25,39 EL. 947.00 TOP OF WALL ) WALL 4, 1+84.84 941.00 STA. BEGIN WALL STA. <u>0±00</u> EL. 939.40 - FINISHED GRADE STA. 1±25,39 EL. 939.20 STA. 0±75,20 EL. 939,40 STA. 1±00,26 EL. 939.60 STA. <u>0+25.0</u> EL. 939.40 STA. 0+00 EL. 939.40 STA. 1±54.66 EL. 939.70 STA. <u>1±56,32</u> EL. 939.80 BOTTOM OF WALL **EXAMPLE ELEVATION** (1'-6" MIN. BELOW FINISHED GRADE) (LOOKING @ F.F. OF WALL) GEOMETRY TABLE

# WALL EXTERNAL & OVERALL STABILITY EVALUATION

DIMENSIONS	EVALUATED LOCATIONS
WALL HEIGHT (FEET)	
EXPOSED WALL HEIGHT (FEET)	
MINIMUM LENGTH OF REINFORCEMENT (FEET)	
WALL STATION	
BORING USED	
CAPACITY TO DEMAND RAT	10 (CDR)
SLIDING (CDR>LO)	
ECCENTRICITY (CDR>LO)	
OVERALL STABILITY (CDR>1.0) 🏠	
BEARING RESISTANCE (CDR>1.0)	
FACTORED BEARING RESISTANCE (PSF)	

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

# SOIL PARAMETERS

STRATUM LOCATIONS & SOIL DESCRIPTIONS	TOTAL UNIT WEIGHT (PCF)	FRICTION ANGLE (DEGREES)	COHESION (PCF)
GRANULAR BACKFILL (REINFORCING ZONE OR BACKFILL)			
(INSERT SOIL TYPE) RETAINED SOIL *			
(INSERT SOIL TYPE) FILL  EL EL			
(INSERT SOIL TYPE) (A) EL EL			
(INSERT SOIL TYPE) ( EL EL			

# \* DESIGN WALL FOR THESE VALUES

# DESIGN DATA

THE CONTRACTOR SHALL PROVIDE COMPLETE DESIGN, PLANS, DETAILS, SPECIFICATIONS, AND SHOP DRAWINGS FOR THE RETAINING WALLS IN ACCORDANCE WITH THE SPECIAL 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 WILL CONFORM TO THE REQUIRED ALLIGNMENTS 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.

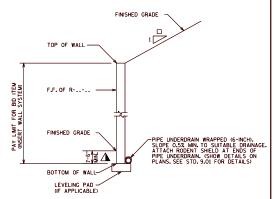
DESIGNPEREALAINING VISADAS FORR AA ENTHELOADT SEARCHARGE TOF WANSERT VALUE).

DESIGN RETAINING WALL FOR A LIVE LOAD SURCHARGE OF INSERT HERE MAYMING VALUE OF THE ANGLE OF INTERNAL FRICTION OF THE WALL BACKFILL MATERIAL IN THE REINFORCED ZONE SHALL BE ASSUMED TO BE 30° MITHOUT CHARGE OF THE ST. YALUES TON THE MAXMIN VALUE OF THE ANALYMINE OF THE WALL BACKFILL MATERIAL IN THE REINFORCED ZONE SHALL BE ASSUMED TO BE 30° WITHOUT CERTIFED TEST VALUES.

# DESIGNER NOTES

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

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



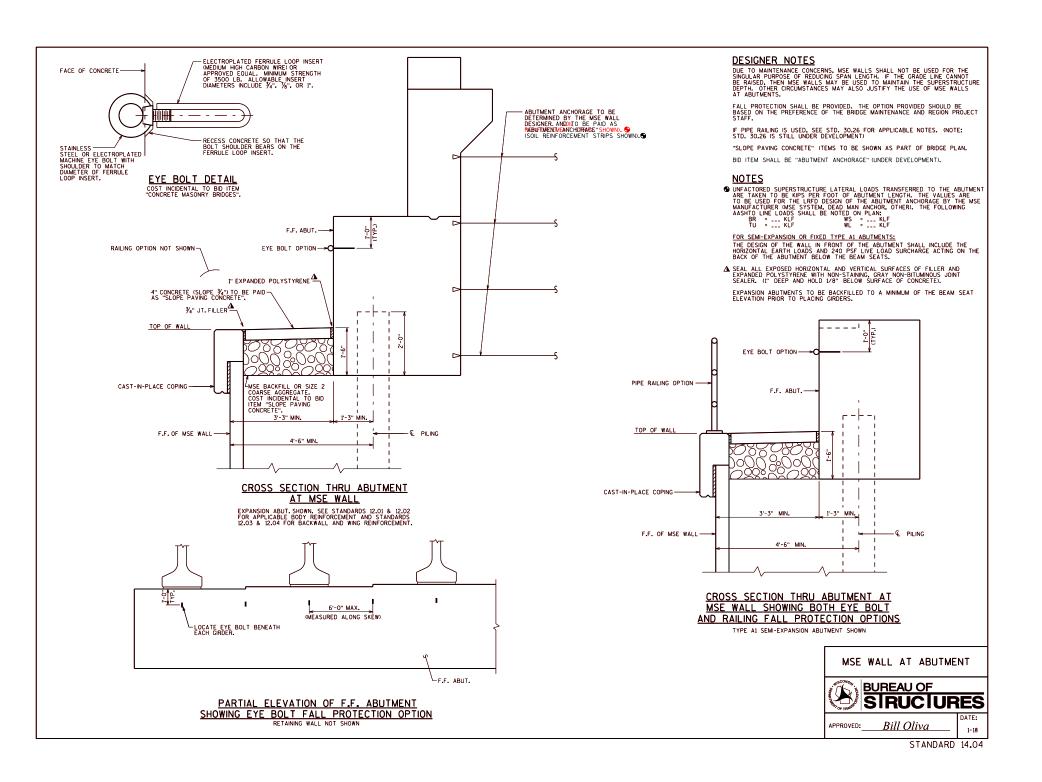
# TYP. CROSS SECT. OF RETAINING WALL

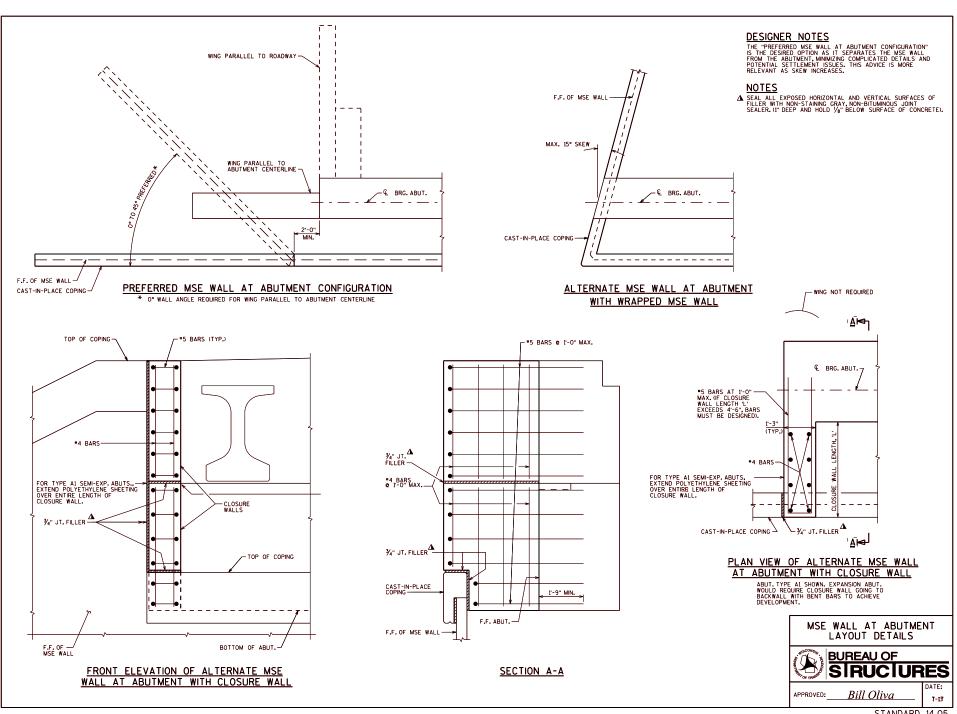
LIST OF DRAWINGS

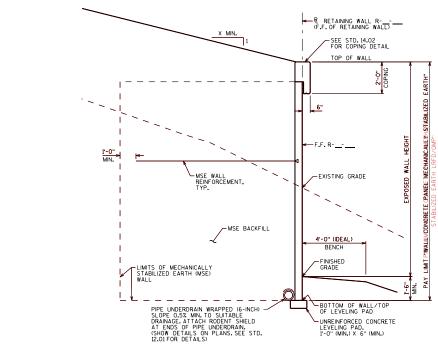
1. (INSERT WALL SYSTEM)
2. SUBSURFACE EXPLORATION

LRFD PROPRIETARY RETAINING WALLS (GENERAL PLAN)

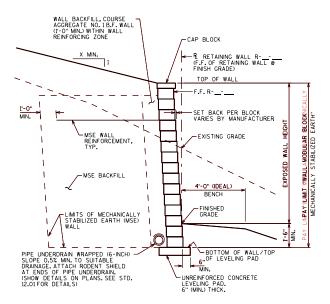








TYPICAL SECTION
(MSE WALL WITH CONCRETE PANEL FACING)

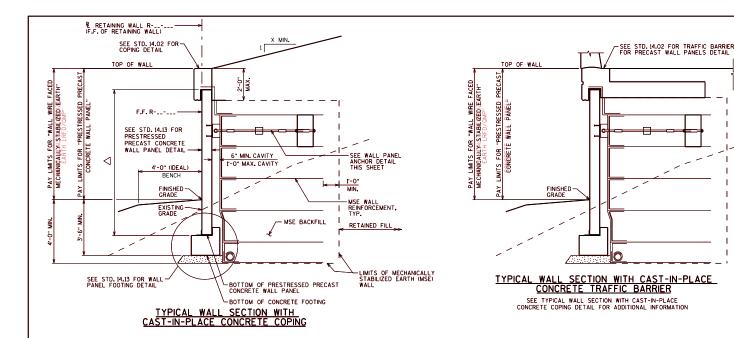


TYPICAL SECTION
(MSE WALL WITH MODULAR BLOCK FACING)

DESIGNER NOTE
SEE STANDARD 14.02 FOR ADDITIONAL INFORMATION

MSE WALL PANEL AND BLOCK FACING





# 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  $1/\!\!/_{\!\!4}$  DIAMETER ROD.

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

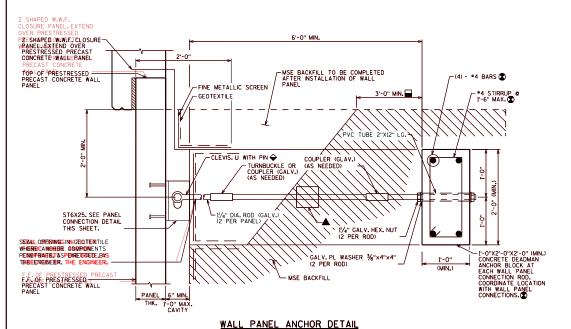
FORCES APPLIED TO THE DEADMAN ANCHOR MUST BE ACCOUNTED FOR IN THE DESIGN OF MSE REINFORCEMENT WHEN SATISIFYING FORCE AND MOMENT EQUILIBRIUM.

# DESIGNER NOTES

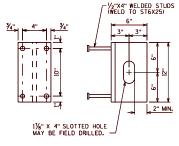
- SHOW BAR SIZE AND SPACING ONLY, DO NOT PROVIDE BILL OF BARS, BAR STEEL RENFORCEMENT AND CONCRETE INCLUDED IN BID ITEM "PRESTRESSED PRECAST CONCRETE WALL PANEL".
- WALL PANEL HEIGHT IS DEFINED AS THE LENGTH FROM THE TOP OF THE WALL PANEL TO THE TOP OF THE CONCRETE FOOTING. THE MAXIMUM ALLOWABLE WALL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

# **LEGEND**

- CONTRACTOR TO DESIGN LENGTH TO PROVIDE REQUIRED HORIZONTAL CAPACITY OF ANCHOR ASSEMBLY. MINIMUM OF 3'-0" OF COMPACTED FILL IN FRONT OF DEADMAN ANCHOR PRIOR TO WALL PAREL ERECTION. 11/4" ROD TO BE 2'-0" MIN. BELOW TOP OF REINFORCED SOIL ZONE.
- CLEVIS TO BE INSTALLED TOWARDS THE TOP OF THE SLOTTED HOLE, TO ALLOW FOR SETTLEMENT OF THE WIRE FACED MSE WALL.
- OPTIONAL MULTIDIRECTIONAL CONNECTOR MAY BE USED TO FACILITATE ALIGNMENT AT THE CONNECTION.
- MINCLUDES 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.

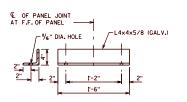
ST6X25 MAY BE WELDED TO 34" THICK PLATE WITH (41-1/2/24" STUDS ANCHORED IN PRECAST CONCRETE PANEL. RESTORE ZINC COATING AROUND ANY WELDED AREAS, SUBMIT DETAILS FOR APPROVAL BY THE ENGINEER

MSE WALL WIRE FACING 1



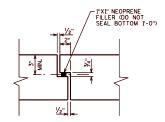
APPROVED:

Bill Oliva

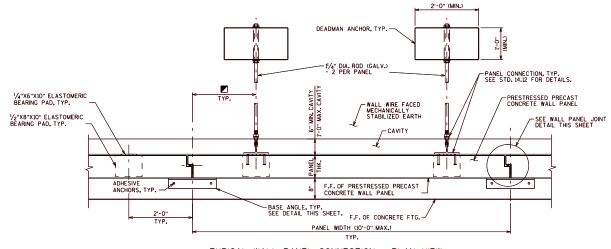


# BASE ANGLE DETAIL

CENTERED ON PANEL JOINT OR AT EACH FOOTING END OR STEP ELEVATION.

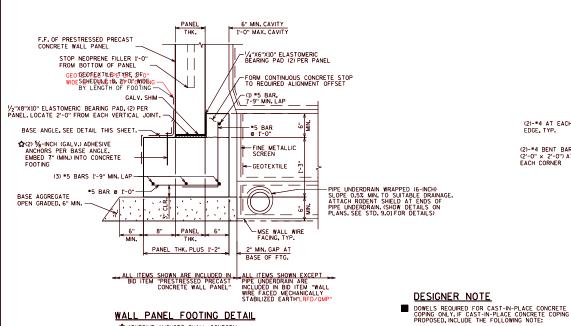


# WALL PANEL JOINT DETAIL

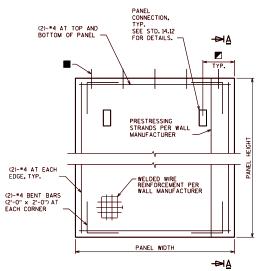


# TYPICAL WALL PANEL CONNECTION - PLAN VIEW

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



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



# **ELEVATION PRESTRESSED** PRECAST CONCRETE WALL PANEL

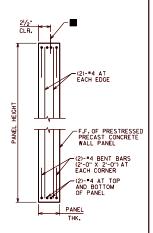
DO NOT PROVIDE BILL OF BARS. BAR STEEL REINF, AND CONCRETE ARE INCLUDED IN BID ITEM "PRESTRESSED PRECAST CONCRETE WALL PANEL.

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

# **LEGEND**

\*4 DOWELS, 1'-3" LONG AT 2'-0" MAX. SPACING ALTERNATE ANCHORAGE: ½" DIA. ELECTROPLATED FERRULE LOOP INSERT (MÉDIUM HIGH CARBON WIRE) OR APPROVED EQUAL.

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



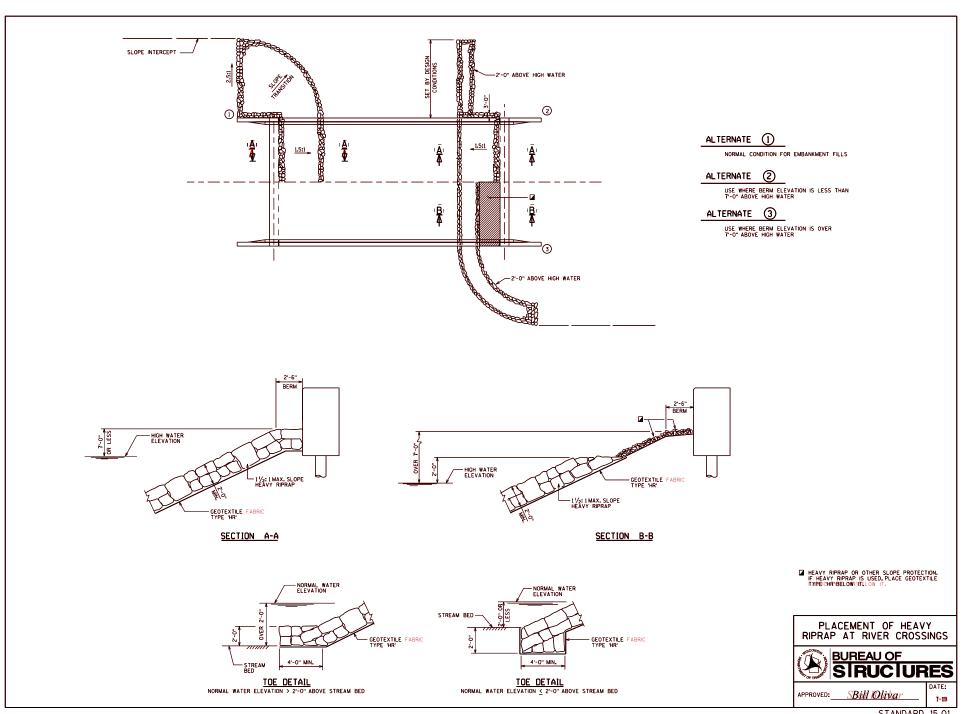
# SECTION A-A

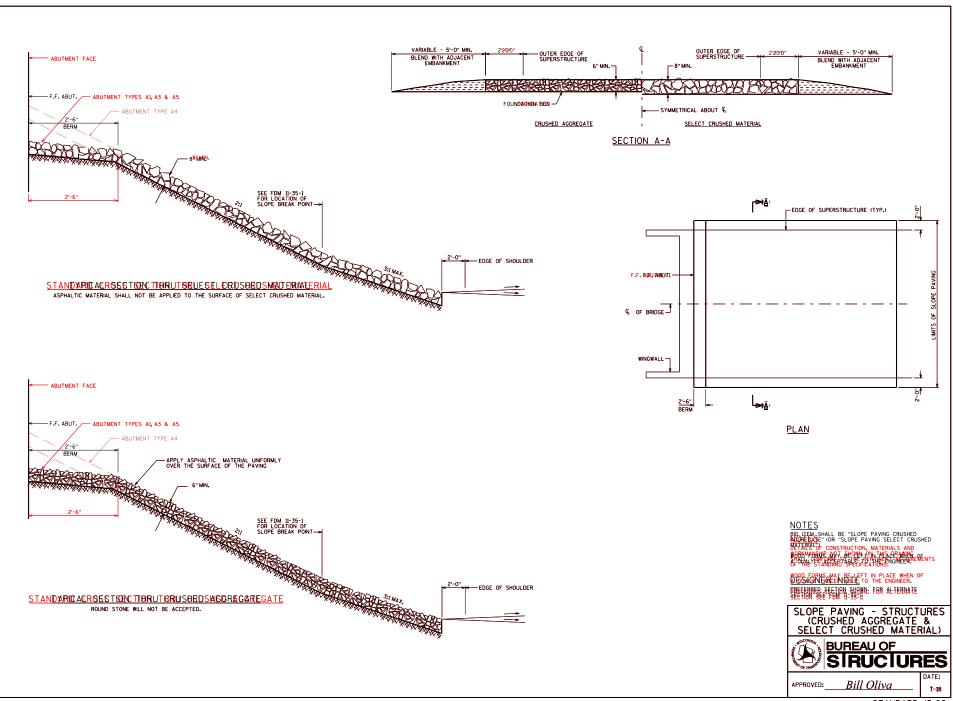
PRESTRESSING STRANDS NOT SHOWN FOR CLARITY.

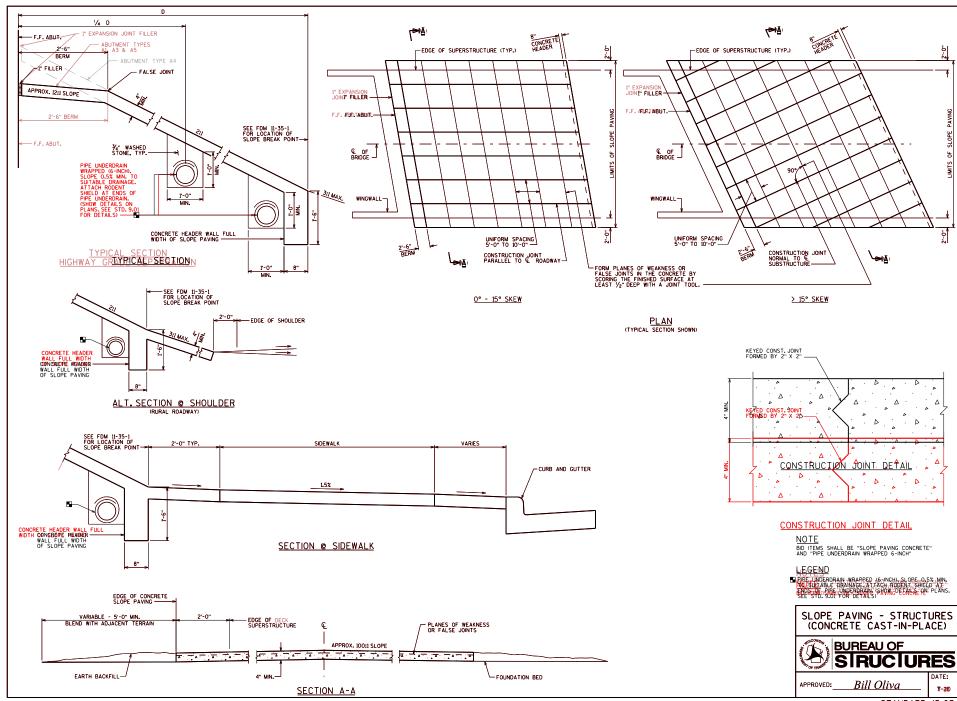
MSE WALL WIRE FACING 2

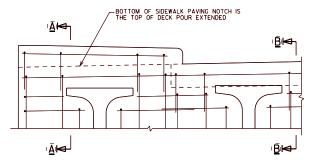


APPROVED: Bill Oliva



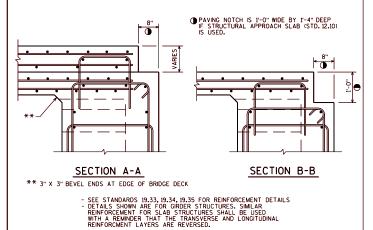






# PART TRANSVERSE SECTION AT ABUTMENT TYPE A1 DIAPHRAGM WITH A RAISED SIDEWALK

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

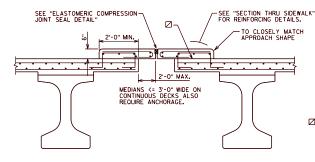


ROUGH FLOAT SURFACE OR SAME FINISH AS EXPOSED DECK. DO NOT APPLY PROTECTIVE SURFACE TREATMENT TO THIS AREA. \*4 BARS AT 1'-6" MAX. EACH DIRECTION TO CLOSELY MATCH APPROACH SHAPE MEDIAN WIDTH

# CROSS SECTION THRU UNANCHORED MEDIAN

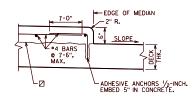
\* (ANCHORAGE TO DECK NOT REQUIRED FOR WIDTHS > 3'-0", EXCEPT ALL MEDIAN SECTIONS ON TOP OF PAVING BLOCK MUST BE ANCHORED)

NOTE: CLEAN ALL LOOSE MATERIAL ON THE DECK AT THE MEDIAN LOCATION PRIOR TO MEDIAN PLACEMENT USING HIGH PRESSURE WATER OR AIR, ENSURING ALL FREE-STANDING WATER IS REMOVED PRIOR TO MEDIAN PLACEMENT. NEAT CEMENT IS REQUIRED AS PER 509.3-9.2 OF THE STANDARD SPECIFICATIONS UNLESS THE MEDIAN IS POURED WITHIN 45 DAYS OF COMPLETING THE DECK POUR.



# ANCHORED MEDIAN CURB DETAIL

#4 BARS



EDGE OF MEDIAN - 1" R.

ADHESIVE ANCHORS 1/2-INCH. EMBED 5" IN CONCRETE.

# ANCHORED MEDIAN CURB DETAIL

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

# COMPRESSION JOINT SEALER PREFORMED ELASTOMERIC 2 1/4-INCH ◆

# ELASTOMERIC COMPRESSION SEAL DETAIL

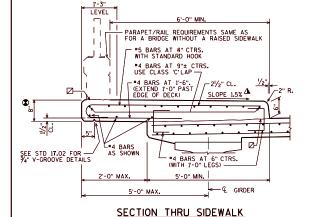
NARIES BASED ON JOINT MANUFACTURER

◆ MANUFACTURER SHALL LABEL TOP OF SEAL

SEE STD. 24.11 FOR DECK JOINT DETAIL FOR LONGITUDINAL AND



# CROSS SECTION THRU MEDIAN WITH A JOINT



# DEFLECTION JOINT DETAIL

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

JOEANAR SING THE FOLCOMER CHIEFLY.

I 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 IN THE JOINT
APPROX. CENTERED OVER © PIER.

-FILL WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER

-1/8" PLASTIC OR ZINC PLATE. PROVIDE NECESSARY HOLES

FOR UTILITIES

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

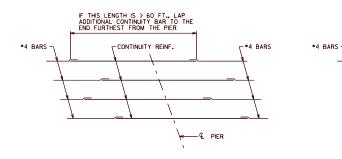
# NOTES

WHEN PARAPETS ARE POURED CONTINUOUSLY FROM END TO END, THEY SHALL BE SEPARATED AT THE DEFLECTION JOINTS BY A PIECE OF 76" ZINC OR PLASTIC PLATE CUT AS SHOWN IN THE "DEFLECTION JOINT SHALL". IF CONSTRUCTION JOINTS IN PARAPETS ARE USED AT THE DEFLECTION JOINTS ON PARAPETS ARE USED AT THE DEFLECTION JOINTS ON PARAPETS ARE USED AT THE DEFLECTION JOINTS ON SIDE OF JOINT SHALL BE COATED WITH AN ABPROVED LOUD BOWN FRARER AND PLATE SPRARATORS MAY BE OMITTED.

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



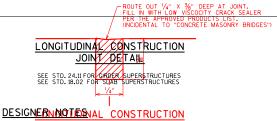
# IF THIS LENGTH IS > 60 FT., LAP ADDITIONAL CONTINUITY BAR TO THE END FURTHEST FROM THE PIER -CONTINUITY REINF. #4 BARS HALF SPA( € PIER

# 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)



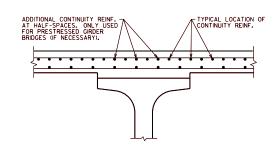
DETAIL REQUIRED WHEN JOIN OF DEAT ENGEDS 90 FEET FOR GIRDER SUPERSTRUCTURES AND SET FOR SUPERSTRUCTURES. DETAIL SHOULD BE USED FOR STAGED CONSTRUCTION AND FOR OTHER COLD JOINT APPLICATIONS DESIGNED HINDSEDECK. OPTIONAL (CONTRACTOR) JOINTS ARE TO BE APPROVED BY

DESIGNEWHHINDHEDECK. OPTIONAL (CONTRACTOR) JOINTS ARE TO BE APPROVED BY THE ENRINGEN.

DETAIL REQUIRED WHEN WIDTH OF DECK EXCEEDS 90 FEET FOR GIRDER SUPERSTRUCTURES AND 52 FEED JOINTS SHOULSDHERFELAGEDURANTSLEASTHIE SWICHES HEADWISTEFFENGET GREED-TO-CONTROL AND FOR OTHER AND PROMETER AND PR

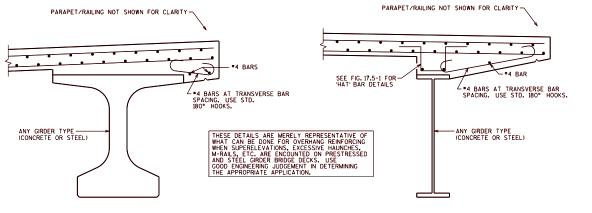
CROSS SECTION THRU EDGE OF DECK

(SHOWING ADDITIONAL OVERHANG REINFORCEMENT)



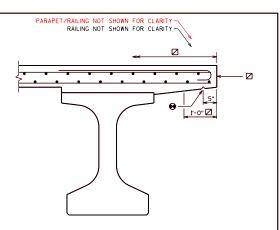
# CROSS SECTION THRU DECK

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



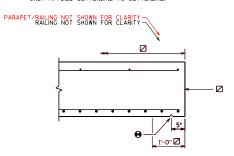
CROSS SECTION THRU EDGE OF DECK

(SHOWING ADDITIONAL OVERHANG REINFORCEMENT)



# CROSS SECTION THRU EDGE OF DECK

(SBOWWNGCDRRPCRROUNTEFORRAWLLPARRRPTTAMBORAWINGS, AND PROTECTIVE SURFACE TREATMENT FOR OPEN RAILINGS) FOR PARAPETS, PROTECTIVE SURFACE TREATMENT IS ONLY APPLIED GUTTERLINE TO GUTTERLINE)



# CROSS SECTION THRU EDGE OF SLAB

(SBOWNSCORRPCROODEFFORRALLPARAPETAMBORALINGSS, AND PROTECTIVE SURFACE TREATMENT FOR OPEN RAILINGS) FOR PARAPETS, PROTECTIVE SURFACE TREATMENT IS ONLY APPLIED GUTTERLINE TO GUTTERLINE)

# **DESIGNER NOTES**

₹4" V-GROOVE. TERMINATE 2'-0" FROM FRONT FACE OF ABBAMEION BODYMEOR'S.
DORFMODTMENTS/EWITH ONPANSION BECARIFSS.

3/4" V-GROOVE. EXTEND V-GROOVE TO 6" FROM FRONT FACE OF ABUTMENT DIAPHRAGM FOR TYPE AI FIXED AND SEMI-EXPANSION ABUTMENTS.

-GROOVES ARE REQUIRED.

FOR OPEN RAILINGS, COAT WITH
"PROTECTIVE SURFACE TREATMENT"
AS PER THE STANDARD SPECIFICATIONS.
PROTECTIVE SURFACE TREATMENT
TO BE APPLIED TO THE TOP AND
EXTERIOR EXPOSED FACE OF WINGS,
AND THE END 1-0" OF THE FRONT
FACE OF ABUTMENT.

USE "PIGMENTED SURFACE SEALER" FOR INSIDE & TOP FACES OF PARAPETS.

# **NOTES**

₹4" V-GROOVE REO'D. EXTEND TO 2'-0" FROM F.F. OF ABUT. BODY

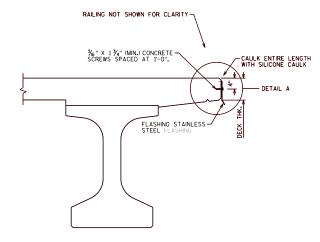
¾" V-GROOVE REO'D. EXTEND TO 6" FROM F.F. OF ABUT. DIAPH.

COAT WITH "PROTECTIVE SURFACE TREATMENT" AS PER THE STANDARD SPECIFICATIONS.

DECK AND SLAB DETAILS



# RAILING NOT SHOWN FOR CLARITY CAULK ENTIRE LENGTH WITH SILICONE CAULK WITH SILICONE CAULK WITH SILICONE CAULK FLASHING STAINLESS STEEL PLASHING 2" PROTRUSION BENT AT 30" EACH ROW, STAGGER ROWS.



RAILING NOT SHOWN FOR CLARITY-

# FLASHING DETAIL FOR NEW BRIDGES WITH OPEN RAILING

THEHEIBIDT ITEM (PPUASHING: STAINLESS: STEEL (PISHALLWINGLUDE INCLUDE PIPROVIDING) AND INSTALLUNG FEHE STAINLESS: STEEL (PISAHING, LICONE SISLICONE: CAULK); 76° CONGRETE FISGREWS NAND I CLEANING FEHE HE BEECK PRIOR I TO TATTACHMENT FOR THE IFLASHING.

# **DESIGNER NOTES**

EDGE OF DECK FLASHING IS FOR OPEN RAIL BRIDGES AND MAY BE USED FOR REHABILITATION OR NEW CONSTRUCTION. CONTACT THE REGION BRIDGE MAINTENANCE ENCINEER 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.

# **NOTES**

THE CONTINUATION THE STAINLESS THEELESS AREELINCLUDE PROVIDING AND INSTALLING THE STAINLESS STEEL FLASHING, SILICONE CAULK AND 3/16" CONCRETE SCREWS.

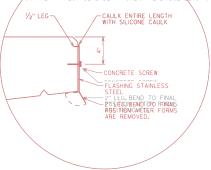
FLASHING TO BE INSTALLED AFTER PROTECTIVE SURFACE TREATMENT APPLICATION.

CONCRETE SCREWS SHALL BE 410 STAINLESS STEEL.

EXTEND FLASHING TO B.F. OF ABUTMENT DIAPHRAGM.

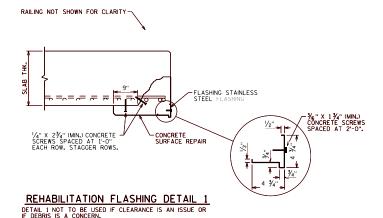
TOP OF PLASHING TO BEGIN APPROX. 1-INCH BELOW TOP OF DECK/SLAB SURFACE.

THE FLASHING IS TO BE A CONSTANT HEIGHT BASED ON THE THINNEST SLAB DEPTH OVER THE BRIDGE LENGTH.



# DETAIL A

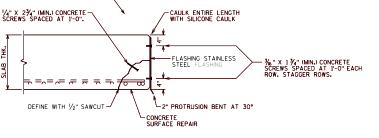
DETAIL FOR CONCRETE SLAB BRIDGE SIMILAR



THE BID ITEM "FLASHING STAINLESS STEEL" ISHALUMINCEUDE I PROVIDING IANDDINSTALULINGS THE STAINLESS STEELS FLASHING AND CONCRETE (SCREWS, INCLUDING ITHE 1/½" (SCREWS) USED TO SECURE ITHE CONCRETE SURFACE REPAIR, RF ACE REPAIR

# REHABILITATION FLASHING DETAIL 2

THE BID ITEM "FLASHING STAINLESS STEEL" ISHALIMINGCUDE PROVIDING AND UNSTALLUNG INTHEMSTAINLESS STEEL FEASHING, SILCONDECAULK, % "AND 1/4" CONCRETE SCREWS, AND ICLEANING DITHE LEDGE OF HITHED DECK PRIORED CHATTACHMEND OF THE HELASHING. THE FLASHING.

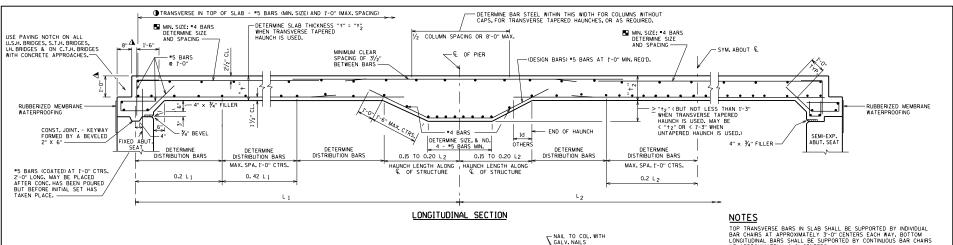


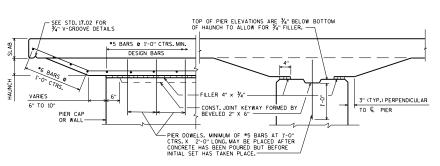
EDGE OF DECK FLASHING



APPROVED:

Bill Oliva





EDGE OF SLAB WITH TRANSVERSE

TAPERED HAUNCH

PLAN OF PIER

PIER CAP OR WALL TYPE PIER

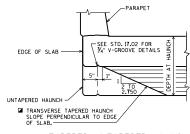
SHOWING TRANSVERSE TAPERED HAUNCH

FOR AN UNTAPERED HAUNCH, EDGE OF SLAB IS ALONG THIS LINE.

- COLUMN

# -¾" FILLER BEVELED KEYWAY. \*8 BARS. 3'-0" LONG. EMBED 1'-6". MAY BE PLACED AFTER CONCRETE HAS BEEN POURED BUT BEFORE INITIAL SET HAS 10" TAKEN PLACE.

# COLUMN W/O CAP TYPE PIER DETAIL AT TOP OF COLUMN



TAPERED/UNTAPERED HAUNCH CROSS SECTION

TOP TRANSVERSE BARS IN SLAB SHALL BE SUPPORTED BY INDIVIDUAL BAR CHAIRS AT APPROXIMATELY 3"-0" CENTERS EACH WAY. BOTTOM LONGITUDINAL BARS SHALL BE SUPPORTED BY CONTINUOUS BAR CHAIRS AT APPROXIMATELY 4"-0" CENTERS,

ALL SLAB THICKNESS DIMENSIONS ARE MINIMUM. ANY TOLERANCES NECESSARY TO CORRECT CONSTRUCTION DISCREPANCIES ARE TO BE PLUS (+).

PARAPETS, SIDEWALKS AND MEDIANS PLACED ON TOP OF THE SLAB SHALL BE POURED AFTER FALSEWORK HAS BEEN RELEASED, EXCEPT

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  $\mathfrak C$  OF ABUTMENTS, THE  $\mathfrak C$  OF PIERS AND AT 5/10 PTS, TO VERHEY CAMBER. TAKE ELEVATIONS ALONG GUTTER LINES AND CROWN OR  $\mathfrak C$ .

# DESIGNER NOTES

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

ALL BAR SPLICES TO BE BASED ON "CLASS C" TENSION LAP SPLICE.

USE OPTIONAL LONGITUDINAL JOINTS WHEN OVERALL SLAB WIDTH IS OVER 52'-O". SEE STANDARD 18.02 FOR DETAIL.

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

ALL TRANSVERSE BAR STEEL REINFORCEMENT SHALL BE PLACED ON THE

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 CUT.

PIER CAP OR WALL TYPE PIERS SHALL BE USED ON MOST STRUCTURES. "COLUMN WITHOUT CAP" TYPE PIERS MAY BE USED WITH THE APPROVAL OF THE STRUCTURES DESIGN SECTION.

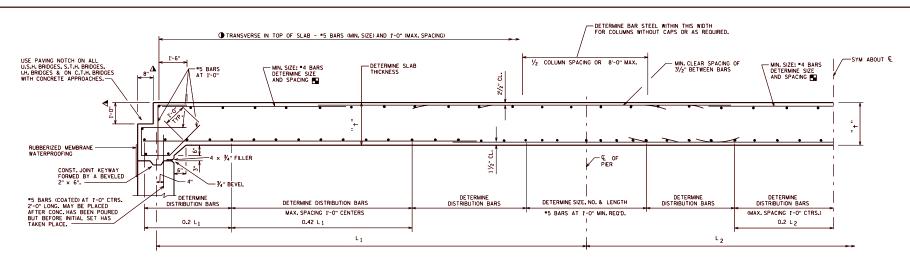
ON THE PLANS, PROVIDE CAMBER VALUES AT THE TENTH POINTS OF ALL SPANS, ALSO PROVIDE TOP OF SLAB ELEVATIONS AT THE CENTERLINE (AND/OR CROWN) AND OUTSIDE EDGES OF SLAB AT TENTH POINTS.

- TRANSVERSE TAPERED HAUNCHES MAY BE USED TO ELIMINATE A COLUMN (PROVIDED A MINIMUM OF 3 COLUMNS ARE USED), OR FOR AESTHETICS.
- $\blacksquare$  REINFORCEMENT IN SLAB MUST MEET TEMPERATURE AND SHRINKAGE
- REQUIREMENTS.

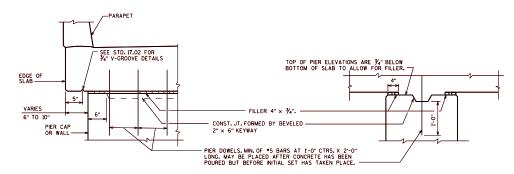
[	TOP TRANSVERSE REINF. FOR RAILINGS/PARAPETS					
	SINGLE SLOPE OR SLOPED FACE PARAPETS	SHORT BARS PLACED BETWEEN MAIN BARS AT EDGE OF SLAB				
	SLAB THICK. ≥ 15" (=5 @ 1'-0")		(#5 @ 1'-0") 5'-0" LONG NO HOOK REO'D, AT END			
	13" <u>&lt;</u> SLAB THICK. < 15"	(#5 <b>@</b> 10")	(#5 @ 10") 5'-0" LONG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



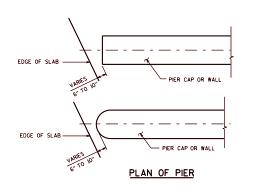
APPROVED: Bill Oliva

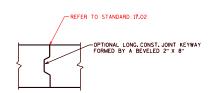


# HALF LONGITUDINAL SECTION



# PIER CAP OR WALL TYPE PIER





# OPTIONAL LONGITUDINAL CONSTRUCTION JOINT

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

TOP TRANSVERSE BARS IN SLAB SHALL BE SUPPORTED BY INDIVIDUAL BAR CHAIRS AT APPROXIMATELY 3'-0' CENTERS EACH WAY. BOTTOM LONGTUDINAL BARS SHALL BE SUPPORTED BY CONTINUOUS BAR CHAIRS AT APPROXIMATELY 4'-0" CENTERS.

ALL SLAB THICKNESS DIMENSIONS ARE MINIMUM. ANY TOLERANCES NECESSARY TO CORRECT CONSTRUCTION DISCREPANCIES ARE TO BE PLUS (+).

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

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 VERIFY CAMBER. TAKE ELEVATIONS ALONG GUTTER LINES AND CROWN OR  ${\mathfrak L}$ 

# DESIGNER NOTES

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

ALL BAR SPLICES TO BE BASED ON "CLASS C" TENSION LAP SPLICE.

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 INFLECTION.

ALL TRANSVERSE BAR STEEL REINFORCEMENT SHALL BE PLACED ON THE

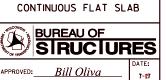
FLOOR DRAINS ARE TO BE OMITTED FROM SLAB STRUCTURES WHERE POSSIBLE. IF FLOOR DRAINS ARE REQUIRED, PLACE ONLY AT THE 2/10 AND 8/10 PTS. BEND MAIN REBARS PAST DRAINS - 0 NOT CUT.

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 CENTERLINE (AND/OR CROWN) AND OUTSIDE EDGES OF SLAB AT TENTH POINTS.

- A PAVING NOTCH IS 1'-0" WIDE BY 1'-4" DEEP IF STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED.
- E REINFORCEMENT IN SLAB MUST MEET TEMPERATURE AND SHRINKAGE REQUIREMENTS.

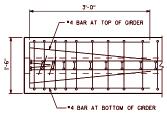




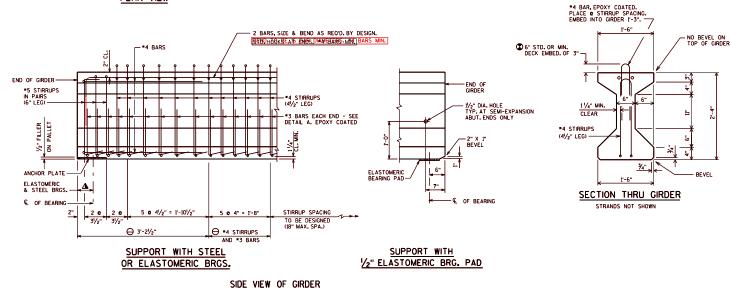
# CENTER OF GRAVITY OF DRAPED STRANDS 12% SLOPE MAX. --HOLD DOWN POINT ← € OF GIRDER GIRDER BOTTOM OF GIRDER 1/4 PT. (0.25 L) RECORD DIMENSIONS "A" TO BE GIVEN TO THE NEAREST 1" "B" = $\frac{1}{4}$ ("A" + 3 "C") MIN. "B" = 1/4("A" + 3 "C") + 3" MAX. ON FINAL PLANS.

# LOCATION OF DRAPED STRANDS

# $\Phi | \Phi$ EPOXY COATED 11/4" CL. MIN. 1'-2" MIN. LAP DETAIL



PLAN VIEW



# NOTES

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

ALL GIRDERS SHALL BE CAST FULL LENGTH AS SHOWN.

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

AN EQUIVALENT IOF INVELOED WIREIFABRIC KOWEF ASTM. A1064 MAY. A1064 BE SUBSTITUTED FOR THE STRENPIRENFORCEMENT ISAGOWN, OPON IPON ACCEPTANCE FOR THE STRENDINESS WANTENANCESSET WIN. FUSED, WIT SUBSTITUTION DETAILS SHALL BE SUBMITTED EER RONCALLY TO THE WISDOMERSMICATION LIBRARYL, AND ACCEPTED PRIOR TO SPORP CROWNERS.

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

# DESIGNER L NOTESTRESSED GIRDER TYPE I 28-INCH".

BIDENTEM CSHAIRE BE SPRESTRESSED RENDERD TYPE DE 28 MINION A MAX. OF 8.000 PSI, MAXIMUM RELEASE

MINIMUM OF 5,000 PS 10 A MAX, OF 5,000 PS, MAXIMUM RELEASE SPECIFY! CONCRETE STRENGTH'AS! REQUIRED BY\*OBSIGNIFEROM ARAPED MINIMUM! OF 16,000 PS 11 TO 1 A MAX; IOP 18,000 PS 14. MAXIMUM! RELEASE STRENGTH'S 6800 PS 11 TO 1 A MAX; IOP 18,000 PS 14. MAXIMUM! RELEASE STRENGTH'S 6800 PS 11 TO 1 A MAXIMUM! STRANG FOR THE DRAPED PATTERN. THE MAX. NUMBER FOR THAT PAATERN, UNILESS NUX. POS. 10 A WORK FOR KEEPING! STRESSES AT MCCEPTABLE FLEVELSE! THE GROER IS BASED ON THE STRANGTH PATTERN, USES NUX. POS. 10 A WORK FOR NOT THE STRANGTH PATTERN. STRESSES AT MCCEPTABLE FLEVELSE! THE GROER IS BASED ON THE STRANGTH PATTERNS. LISTED ON STANDARD 19,02 AND

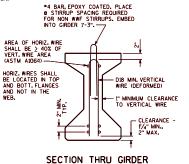
ON THE STANDARD STRAND PATTERNS LISTED ON STANDARD 19.02 AND REINFORCEMENT WIS STANDARD LEADING COUNTY OF THE GIRGER YE BASED! ON THE "STANDARD STRAND PATTERNS LISTED ON STANDARD SIDOZIAND DESTANDARD STRAND PATTERNS LISTED ON STANDARD SIDOZIAND PATTERNS OR LONGER SPANS WILL REQUIRE A COMPLETE DESIGN OF THIS REINFORCEMENT, WHICH REQUIRES PRIOR APPROVAL FROM THE BURREAU FOR STROCTURES. BROS. (STD. 27.07) AND STEEL BROS. (STD. 27.07)

M VARIES FÖR ELASTOMERIC BRGS. (STD. 27.07) AND STEEL BRGS. (STD. 27.09)

ET THE THE SECOND STREET AND SET OF STREET OF

THE IDES OF SERVICE ASSOCIATE PROFILE CARD ETM. AND CLATED AT THE THE SERVICE PROFILE CARD ETM. AND CLATED AT THE COSE OF GROBER Y. SLOPE; PROFILE CARDE; LINE, AND CALCULATED! THE SERVICE PROFILE CARDE LINE, AND CALCULATED! THE SERVICE CARD YARY AND SHOULD BE GROWN FOR HE PROFILE CARD. THE CARDEN BE THE CARD THE CARDEN BE THE CARD THE CARDEN BE THE

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



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

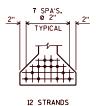
28" PRESTRESSED GIRDER DETAILS



APPROVED: Bill Oliva







14 STRANDS





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

\* NEEDS BOND BREAKERS AT ENDS. SEE BOND BREAKER DETAIL.

INDICATES STRAND
 TO BE DEBONDED

# STANDARD ARRANGEMENTS TO RAISE CENTER OF GRAVITY TO AVOID DRAPING OF O.6" DIA. STRANDS

(0.5" DIA. STRANDS MAY ALSO BE USED)







10 STRANDS



12 STRANDS



16 STRANDS

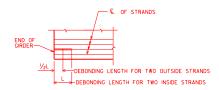


ARRANGEMENT AT & SPAN - FOR GIRDERS WITH DRAPED 0.5" DIA. STRANDS

### 28" GIRDER PRE-TENSION A = 312 SQ. IN. f's = 270,000 P.S.I f<sub>s</sub> = 0.75 × 270,000 = 202,500 P.S.I $r^2 = 91.95 \text{ IN.}^2$ for low relaxation strands y<sub>T</sub> = 14.58 IN. Pi PER 0.5" DIA. STRAND = 0.1531 X 202,500 = 31.00 KIPS y<sub>B</sub> = -13.42 IN. Pi PER 0.6" DIA. STRAND = 0.217 X 202,500 = 43.94 KIPS I = 28,687 IN.4 $\frac{y_B}{r^2} = \frac{-13.42}{91.95} = -0.1459 \text{ IN./IN.}^2$ $f_B \text{ (ini+.)} = \frac{A_S f_S}{A} \text{ (1+} \frac{e_S y_B}{r^2} \text{ )}$ S<sub>T</sub> = 1,968 IN.<sup>3</sup> $S_B = -2,138 \text{ IN.}^3$

# (COMPRESSION IS

			POSITIVE
NO. STRANDS	e <sub>s</sub> (inches)	P(init.)=A <sub>s</sub> f <sub>s</sub> (KIPS)	f <sub>B</sub> (init.) (K/sq.in.)
STANDARD STRAN	D PATTERNS FO	R UNDRAPED ST	RANDS (O.6" DIA.)
8	-10.40	352	2.841
10	-9.80	439	3.419
12	-8.73	527	3.841
14	-7.97	615	4.264
*16	-9.4	703	5.345
*18	-9.6	791	6.087
STANDARD STRA	ND PATTERNS F	OR DRAPED STR	ANDS (0.5" DIA.)
8	-10.4	248	2.001
10	-10.6	310	2.531
12	-10.4	3 <b>7</b> 2	3.002
14	-10.0	434	3.421
16	-9.4	496	3.771
18	-9.6	558	4,294



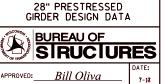
# **BOND BREAKER DETAIL**

SHOWING LENGTHS OF DEBONDING FROM END OF GIRDER, DEBOND LENGTHS TO BE DESIGNED, STRAND TRANSFER LENGTH IS 60 X STRAND DIAMETER.

# **DESIGNER NOTES**

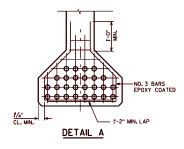
ON THE STRAND PATTERN SHEET, PLACE A BOX AROUND EACH STRAND PATTERN THAT APPLIES TO THE DESIGNED STRUCTURE. AND LABEL THE SPAN IT IS USED IN.

WT. = 325 #/FT.

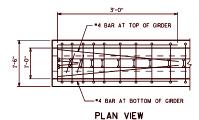


# 12% SLOPE MAX. -HOLD DOWN POINT (0.25 L) GIRDER BOTTOM OF GIRDER-CENTER OF GRAVITY OF DRAPED STRANDS. "A" TO BE GIVEN TO THE NEAREST 1" RECORD DIMENSIONS "A", "B" & "C" ON FINAL PLANS. "B" = 1/4("A" + 3 "C") MIN. "B" = 1/4("A" + 3 "C") + 3" MAX.

# LOCATION OF DRAPED STRANDS

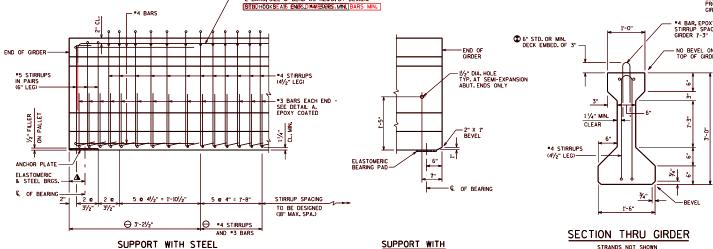


STRANDS NOT SHOWN





OR ELASTOMERIC BRGS.



1/2" ELASTOMERIC BRG. PAD

SIDE VIEW OF GIRDER

# NOTES

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

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

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

STRANDS SHALL BE FLUSH MITH 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 SURFACES WITHIN 2 FEET OF THE GIRDER ENDS WITH A NON-PICINEMINED EPOXY CONFORMING TO ASSITT OF THE GIRDER ENDS WITH A NON-PICINEMINED EPOXY CONFORMING TO ASSITT OF LEAST 3 DAYS AFTER MOIST CURRING 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 COWET ASIM A1064 MAY, A1064 BE SUBSTITUTED FOR THE STRRIPF REINFORCEMENT SHOWN, BOOK OF ALEST ALLEY OF THE STRUCTURES MANIFAKEE SECTION. IF USED WHE STRUCTURES WELDER SHOWN THE STRUCTURE TO THE WISDOT-FABRICATION LIBERARY, AND ACCEPTED PRIOR TO SHOP DRAWING SUBMITTS WITH AN ULTIMATE STRENGTH OF

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

DESIGNER NOTESTRESSED GIRDER TYPE I 36-INCH".

BIDE (TEM (SHAULE BE SPRESTRESSED REGIRDER) TYPEDE SIGNINGHUM A MINIMIM OF 6,000 PS TO A MAX OF 8,000 PS; MAXIMUM RELEASE SPECERY; CONCRETE \$ STRENGTH-AS-REQUIRED, BYDESIGNIFROM ARRAPED MINIMUM, OF 16,000, PSILED; A MAXIMOFE 8,000 PSI, MAXIMUM RELEASE STRENGTH 18, 8000 PSILED; COLUME, 10,510 MAX. STRAND FOR THE DRAFED; RAFFED; RAFFED; AND STRENGTH 18, 3MAX. NUMBERS ON LIVE, 05,50 MA. STRANDS IS B. USE OF DIA. FOR THE STRAIGHT PATTERN, UNLESS ONLY, 05-70 MA. WORK FOR KEEPINGCETIRESSES SATANACCEP TABLES LEVELSOF THE GIRDER

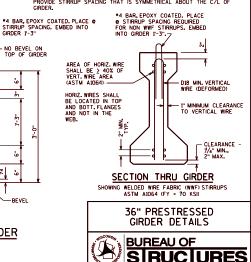
ON THE STANDARD STRAND PATTERNS LISTED ON STANDARD 19.04 AND REMPFOREWEN; INSTEADARD 19.05 STRANDARD 19.04 STRANDARD 19.05 STRAND PATTERNS OF LOWERS SANS WILL REQUIRE A COMPLETE DESIGN OF THIS REMPORCEMENT, WHICH REQUIRES PRIOR APPROVAL FROM THE BUREAU 19.6 STRUYTMERS BRGS. (STD. 27.07) AND STEEL BRGS. (STD. 27.09)

MARIES FOR (ELIASTOMERIC BRGS. (STD. 27.07) AND STEEL BRGS. (STD. 27.09)

THIS VALUE BASED ON 2" MIN. HAUNCH

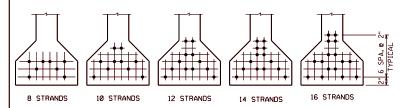
THE DESIGN ENGINEER PROFITS THE WALLES AS DO A 25 MB, HADNON AS THE DESIGN ENGINEER PROFITS THE WALLES AS DO A 25 MB, HADNON AS THE COOK OF CROOKERS AS LOPE, PROFILE CRADE LINE AND CALCULATED BESIDELL ERRORE PCANNER, INCLUDING THE WALLES AND CALCULATED BESIDELL ERRORE PCANNER, INCLUDING THE WALLES AND CALCULATED BESIDELL ERRORE PCANNER, INCLUDING THE WALLES AND CALCULATED BESIDELL ERROR THE WARM AND SHOULD BEIGHT FOR EACH FULL OF THE WALLES AND THE WAL

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

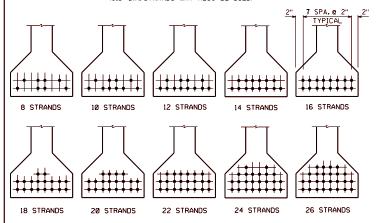


Bill Oliva

APPROVED:



(0.5" DIA. STRANDS MAY ALSO BE USED)



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

# 36" GIRDER

A = 369 SQ. IN.  $r^2$  = 138.15 IN.<sup>2</sup>  $y_T$  = 20.17 IN.  $y_B$  = -15.83 IN. I = 50.979 IN.<sup>4</sup>  $S_T$  = 2.527 IN.<sup>3</sup>  $S_B$  = -3.220 IN.<sup>3</sup> WT. = 384 \*/FT.

# PRE-TENSION

 $\begin{aligned} &f_S^* = 270,000 \text{ P.S.I} \\ &f_S = 0.75 \text{ X } 270,000 = 202,500 \text{ P.S.I} \\ &for low relaxation strands \end{aligned}$  Pi PER 0.5" DIA. STRAND = 0.1531 X 202,500 =  $\frac{31.00 \text{ KIPS}}{43.94 \text{ KIPS}}$  Pi PER 0.6" DIA. STRAND = 0.217 X 202,500 =  $\frac{43.94 \text{ KIPS}}{43.94 \text{ KIPS}}$ 

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

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

# (COMPRESSION IS

			POSITIVE
NO. STRANDS	e <sub>s</sub> (inches)	P(init.)=A <sub>S</sub> f <sub>S</sub> (KIPS)	f <sub>B</sub> (init.) (K/sq.in.)
STANDARD STRAM	ID PATTERNS FO	R UNDRAPED ST	RANDS (O.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 STR	AND PATTERNS F	OR DRAPED	STRANDS (0.5" DIA.)
8	-12.83	248	1.660
10	-13.03	310	2.094
12	-13.16	372	2.528
14	-12.97	434	2.924
16	-12.83	496	3.320
18	-12.50	558	3.678
20	-12.23	620	4.034
22	-12.01	682	4.392
24	-11.66	744	4.710
26	-11.37	806	5.030

# DESIGNER NOTES

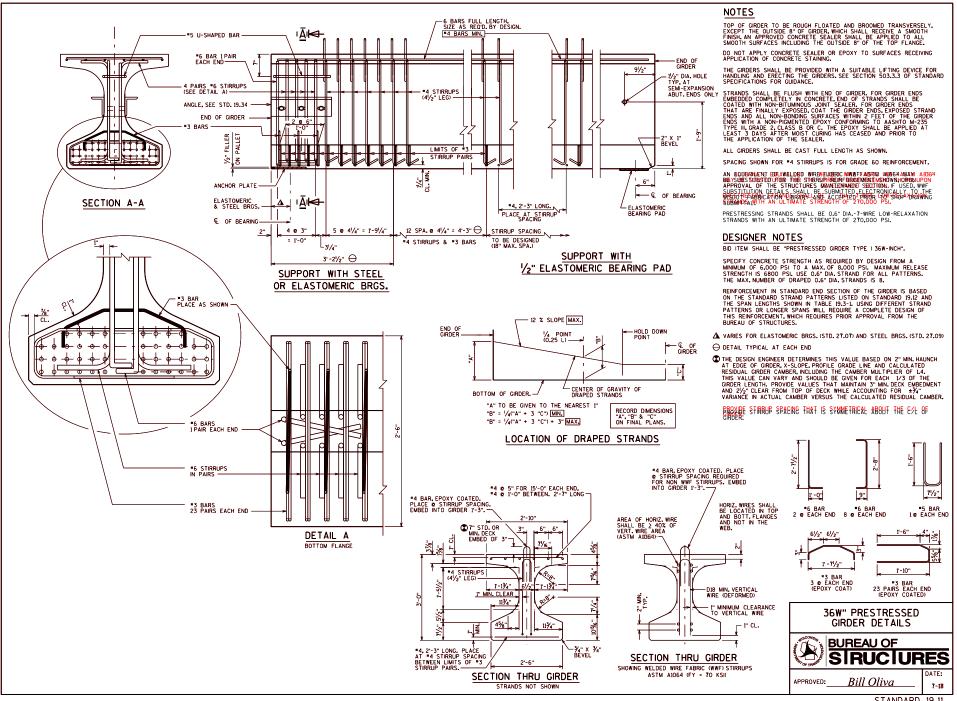
ON THE STRAND PATTERN SHEET, PLACE A BOX AROUND EACH STRAND PATTERN THAT APPLIES TO THE DESIGNED STRUCTURE. AND LABEL THE SPAN IT IS USED IN.

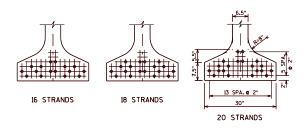
36" PRESTRESSED GIRDER DESIGN DATA

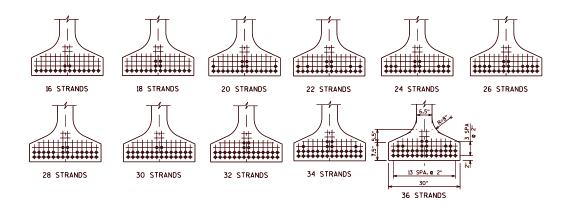


APPROVED: <u>Bill Oliva</u>

iva\_\_\_







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

# 36W" GIRDER

A = 632 SQ. IN.

 $r^2 = 158.20 \text{ IN.}^2$ 

y<sub>T</sub> = 19.37 IN.

 $y_B = -16.63 \text{ IN.}$ 

I = 99,980 IN.4

S<sub>T</sub> = 5,162 IN.3

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

WT. = 658 \*/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 0.6" DIA. STRAND = 0.217 X 202,500 = 43.94 KIPS

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

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

# (COMPRESSION IS

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

# DESIGNER NOTES

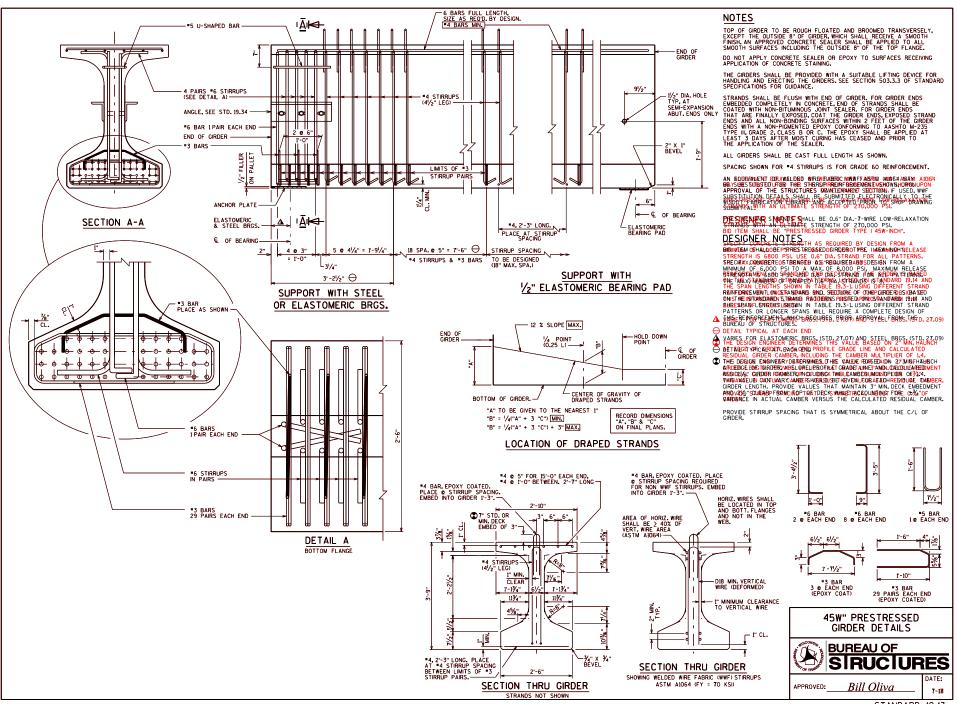
ON THE STRAND PATTERN SHEET, PLACE A BOX AROUND EACH STRAND PATTERN THAT APPLIES TO THE DESIGNED STRUCTURE. AND LABEL THE SPAN IT IS USED IN.

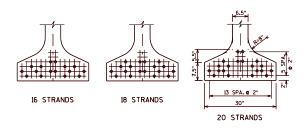
36W" PRESTRESSED GIRDER DESIGN DATA

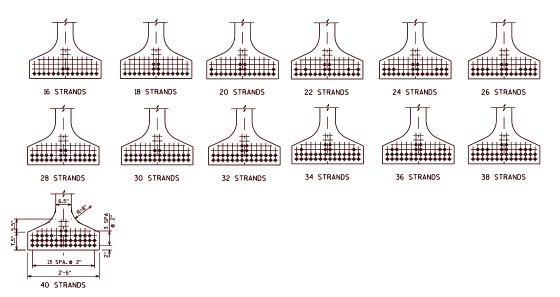


APPROVED:

Bill Oliva







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

# PRE-TENSION

A = 692 SQ. IN. f; = 270,000 P.S.I.

 $r^2 = 258.70 \text{ IN.}^2$ f<sub>s</sub> = 0.75 X 270,000 = 202,500 P.S.I. for low relaxation strands

y<sub>T</sub> = 24.26 IN.

 $y_B = -20.74$  IN.

45W" GIRDER

I = 178,971 IN.4

 $S_T = 7.377 \text{ IN.}^3$  $S_B = -8,629 \text{ IN.}^3$ 

WT. = 721 \*/FT.

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

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

# (COMPRESSION IS

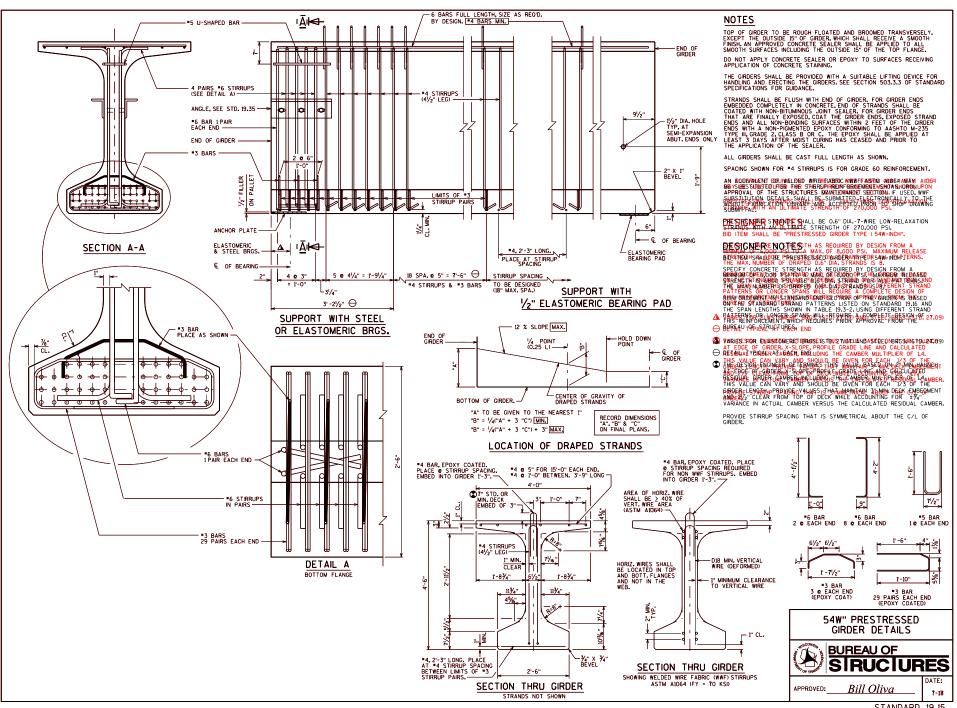
			POSITIVE)		
NO. STRANDS	e <sub>s</sub> (inches)	P(init.)=A <sub>s</sub> f <sub>s</sub> (KIPS)	f <sub>B</sub> (init.) (K/sq.in.)		
STANDARD	STANDARD STRAND PATTERNS FOR UNDRAPED STRANDS				
16	-16.24	703	2.339		
18	-15.85	791	2.596		
20	-15.14	879	2.812		
STANDARD	STRAND PATTER	RNS FOR DRAPED	STRANDS		
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		

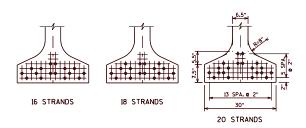
# **DESIGNER NOTES**

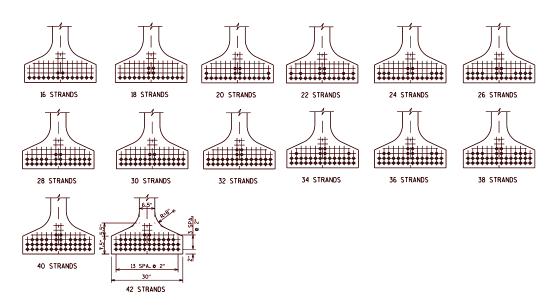
ON THE STRAND PATTERN SHEET, PLACE A BOX AROUND EACH STRAND PATTERN THAT APPLIES TO THE DESIGNED STRUCTURE. AND LABEL THE SPAN IT IS USED IN.

45W" PRESTRESSED GIRDER DESIGN DATA









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 SO. IN.

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

y<sub>T</sub> = 27.70 IN.

 $y_{B} = -26.30 \text{ IN.}$ I = 321,049 IN.4

S<sub>T</sub> = 11,592 IN.3

 $S_B = -12,205 \text{ IN.}^3$ 

WT. = 831 \*/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

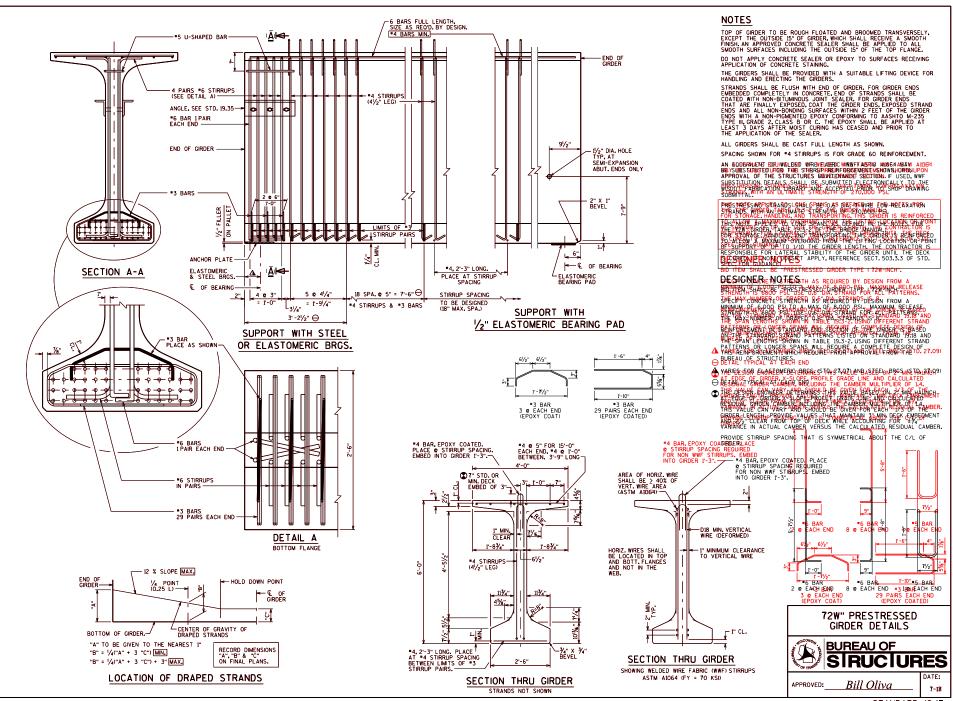
 $\frac{y_B}{r^2} = \frac{-26.30}{402.41} = -0.06536 \text{ in/in}^2$ 

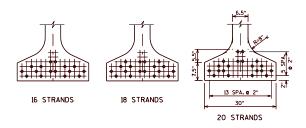
 $f_B (init.) = \frac{A_S f_S}{\Delta} (1 + \frac{e_S y_B}{r^2})$ 

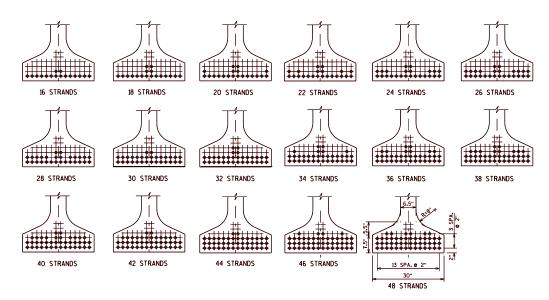
			POSITIVE)
NO. STRANDS	e <sub>s</sub> (inches)	P(init.)=A <sub>S</sub> f <sub>S</sub> (KIPS)	f <sub>B</sub> (init.) (K/sq.in.)
STANDARD S	TRAND PATTER	NS FOR UNDRAP	D STRANDS
16	-21.80	703	2.136
18	-21.41	791	2.378
20	-20.70	879	2.592
STANDARD S	TRAND PATTER	NS FOR DRAPED	STRANDS
16	-24.05	703	2.266
18	-23.63	791	2.522
20	-23.50	879	2 <b>.7</b> 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









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.

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

 $y_{T} = 37.13 \text{ IN.}$ 

 $y_B = -34.87$  IN.

I = 656,426 IN.4

S<sub>T</sub> = 17,680 IN.3

 $S_B = -18.825 \text{ IN.}^3$ 

WT. = 953 \*/FT.

# PRE-TENSION

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

f<sub>s</sub> = 0.75 X 270,000 = 202,500 P.S.I. for low relaxation strands

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

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

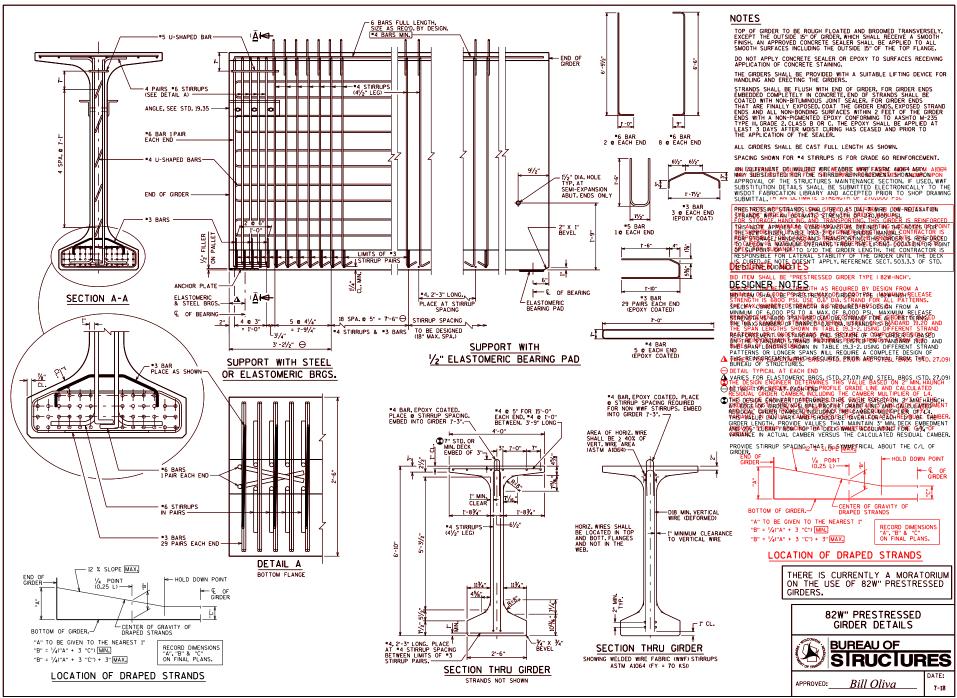
 $f_B (init_*) = \frac{A_S f_S}{A} (1 + \frac{e_S y_B}{r^2})$ 

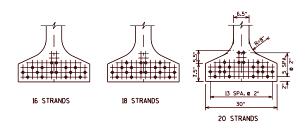
(COMPRESSION IS

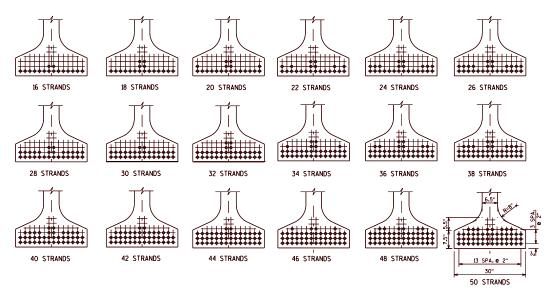
			POSITIVE)
NO. STRANDS	e <sub>s</sub> (inches)	P(init.)=A <sub>S</sub> f <sub>S</sub> (KIPS)	f <sub>B</sub> (init.) (K/sq.in.)
STANDARD	STRAND PATTER	NS FOR UNDRAP	ED STRANDS
16	-30.37	703	1.902
18	-29.98	791	2.124
20	-29.27	879	2.328
STANDARD	STRAND PATTER	RNS FOR DRAPED	STRANDS
16	-32.62	703	1.986
18	-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









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.

GIRDERS.

# 82W GIRDER

A = 980 SQ. IN.

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

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

 $y_{B} = -39.68 \text{ IN.}$ 

I = 905,453 IN.4

S<sub>T</sub> = 21,396 IN.<sup>3</sup>

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

WT. = 1021 \*/FT.

# PRE-TENSION

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

f<sub>s</sub> = 0.75 X 270,000 = 202,500 P.S.I.

for low relaxation strands

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

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

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

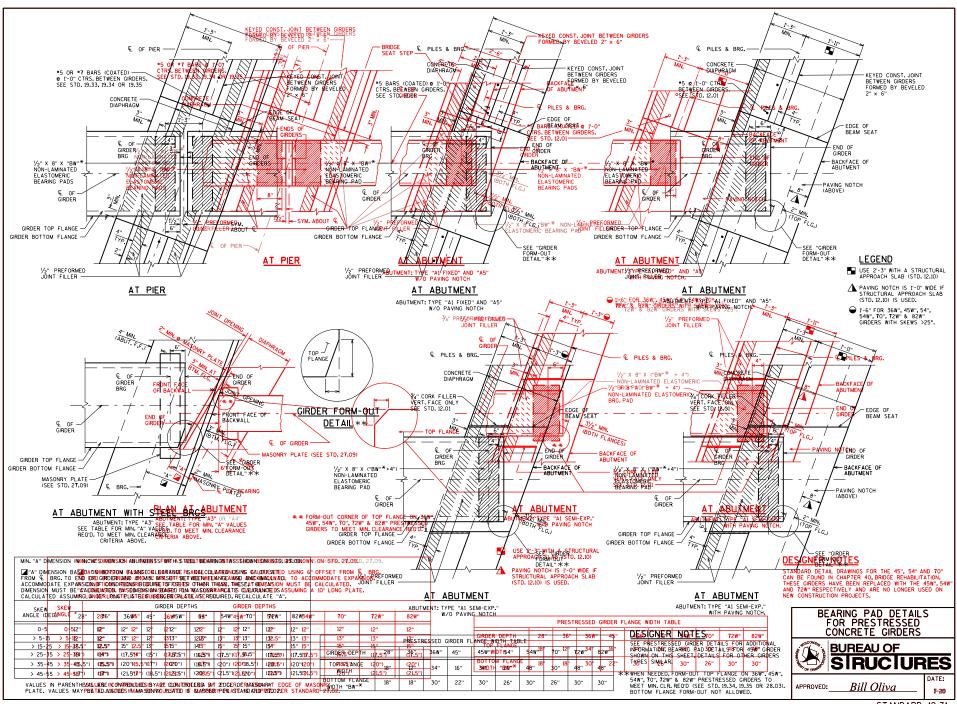
			(COMPRESSION I POSITIVE)
NO. STRANDS	e <sub>s</sub> (inches)	P(init.)=A <sub>S</sub> f <sub>S</sub> (KIPS)	f <sub>B</sub> (init.) (K/sq.in.)
STANDARD	STRAND PATTER	NS FOR UNDRAP	D STRANDS
16	-35.18	703	1.801
18	-34.79	791	2.013
20	-34.08	879	2.209
STANDARD	STRAND PATTER	RNS FOR DRAPED	STRANDS
16	-37.43	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	2.772
26	-36.60	1143	3.000
28	-36.54	1230	3.224
30	-36.48	1318	3.451
32	-36.18	1406	3.664
34	-36.03	1494	3.883
36	-35.90	1582	4.104
38	-35.79	1670	4.323
40	-35.68	1758	4.542
42	-35.58	1846	4.762
44	-35.50	1933	4.978
46	-35.33	2021	5.191
48	-35.18	2109	5.404
50	-35.04	2197	5.616

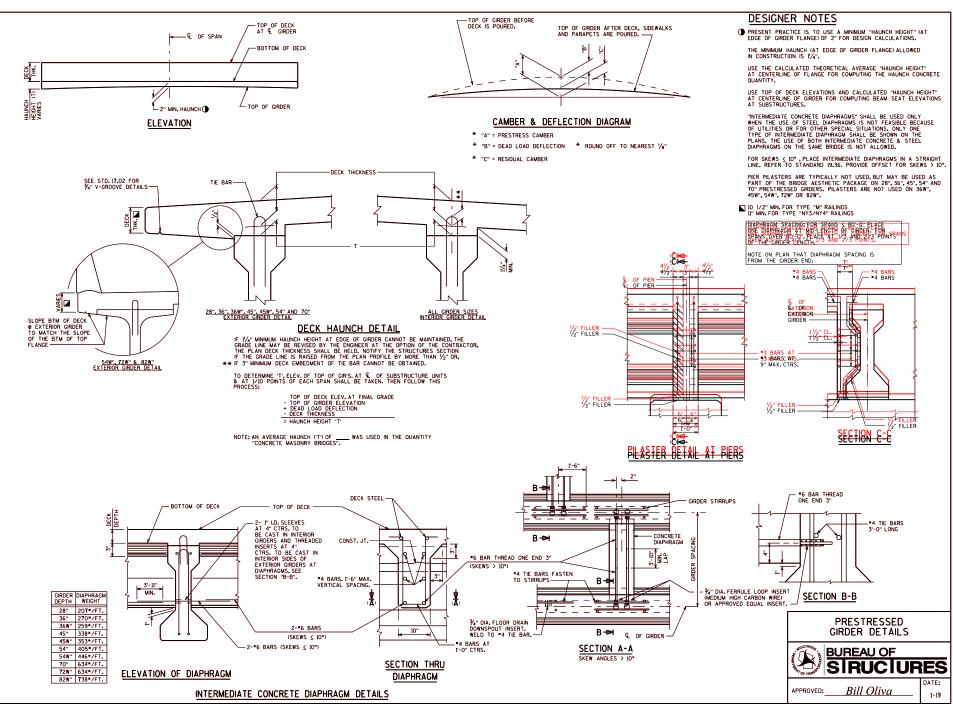
82W" PRESTRESSED GIRDER DESIGN DATA

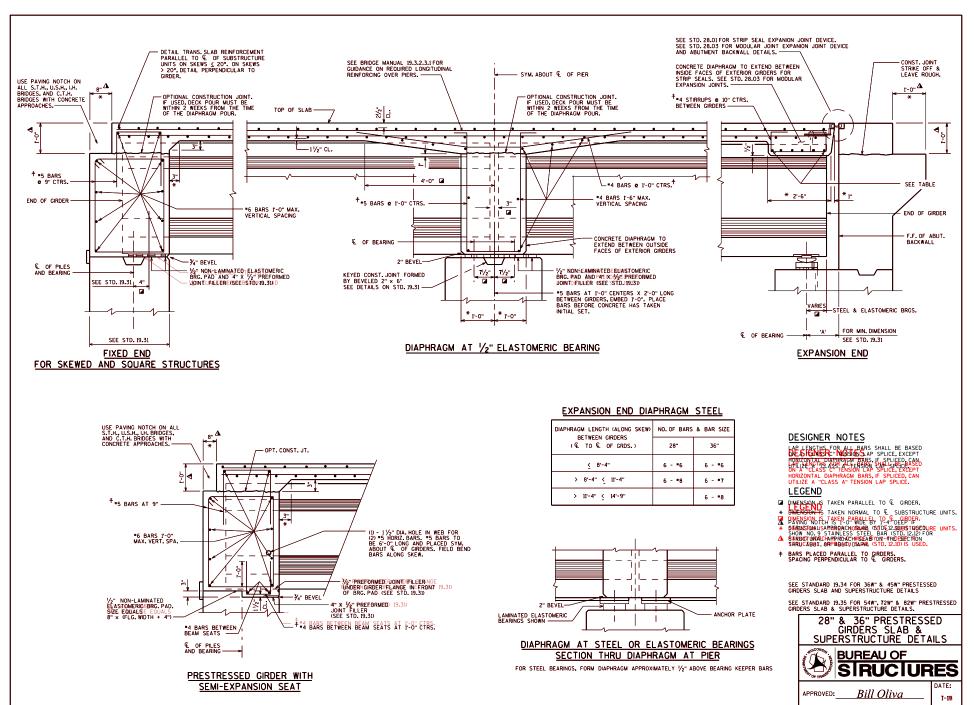


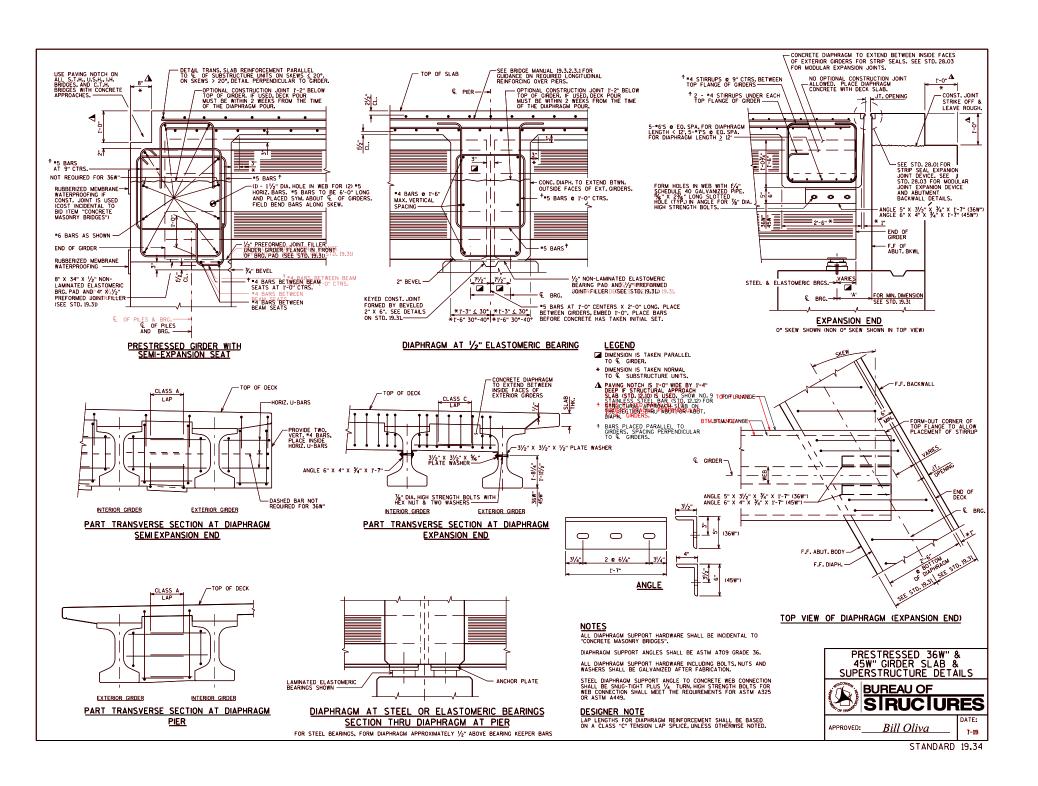
THERE IS CURRENTLY A MORATORIUM ON THE USE OF 82W" PRESTRESSED

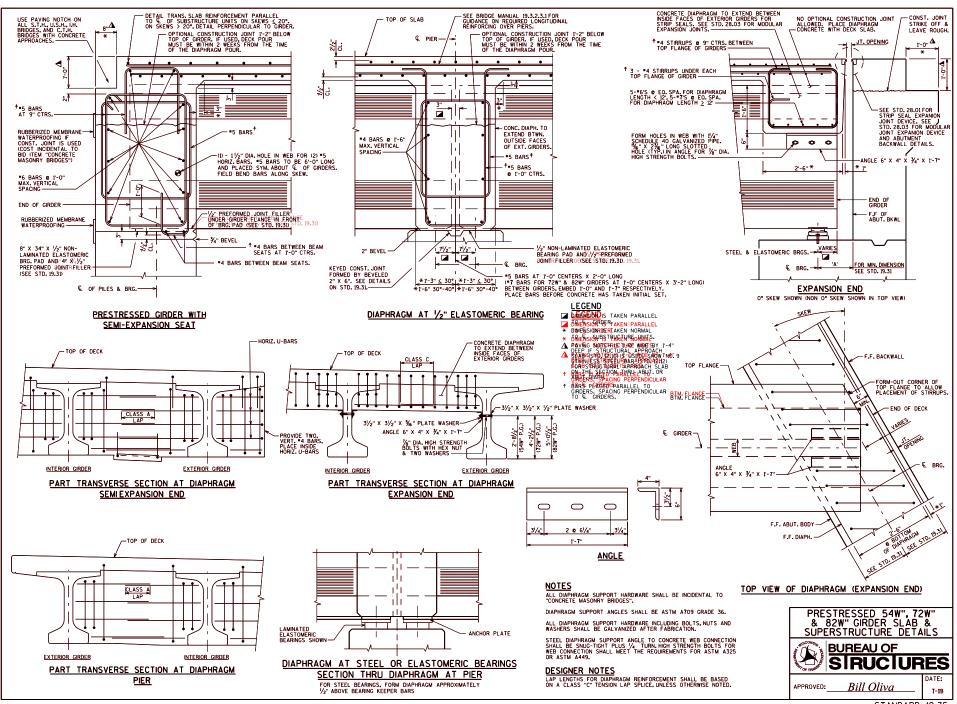
> APPROVED: Bill Oliva

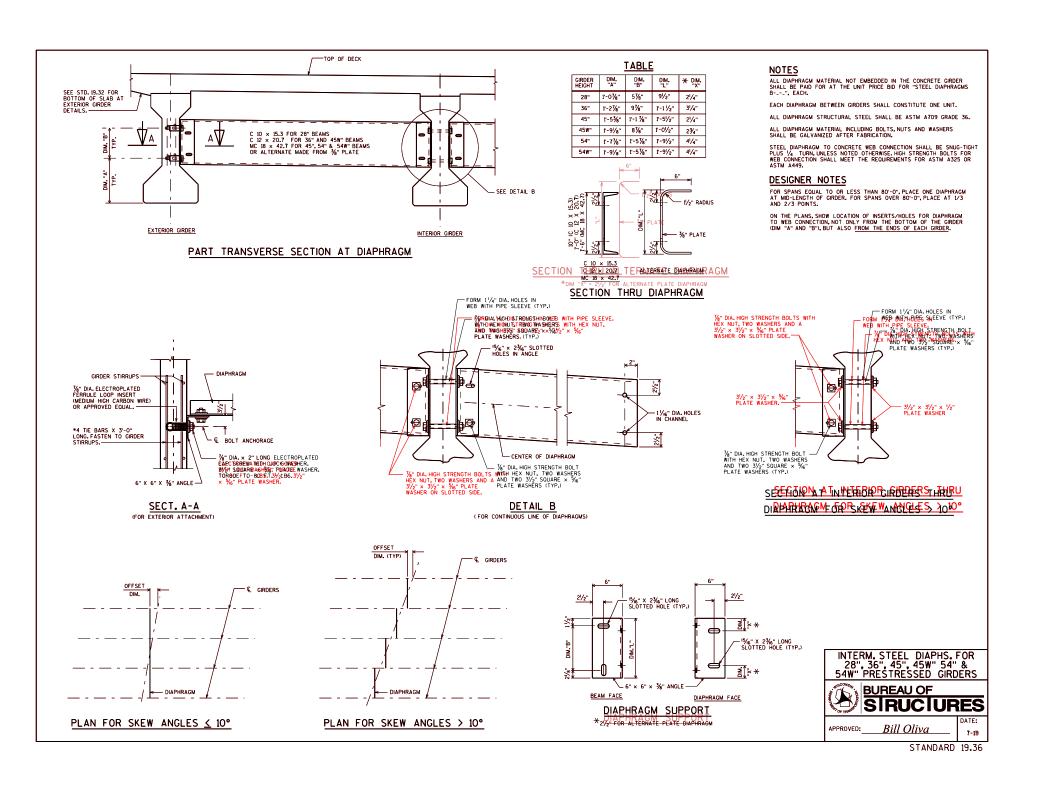


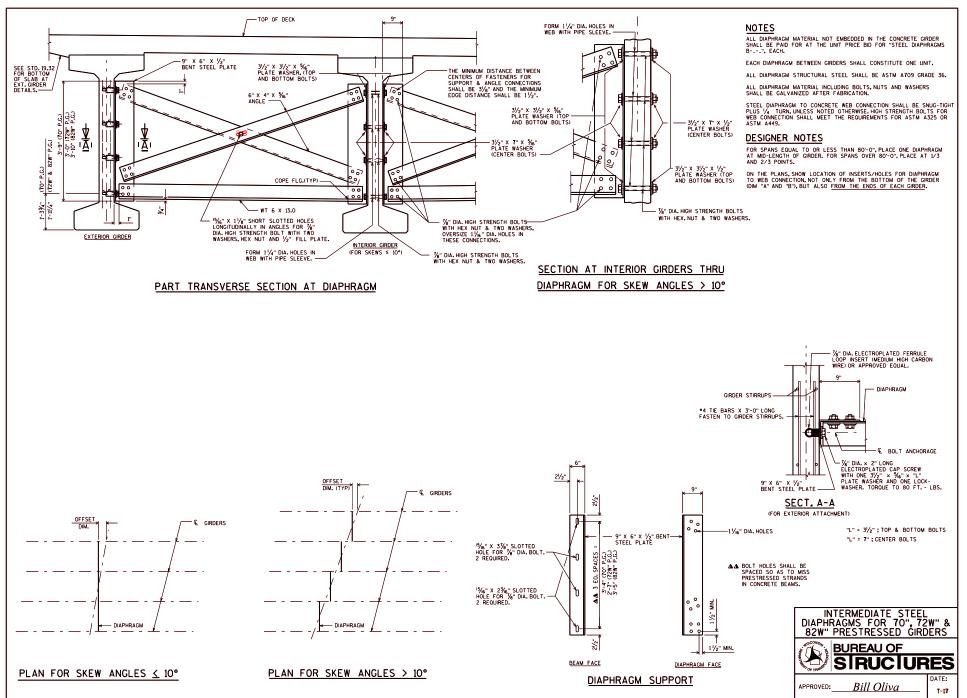


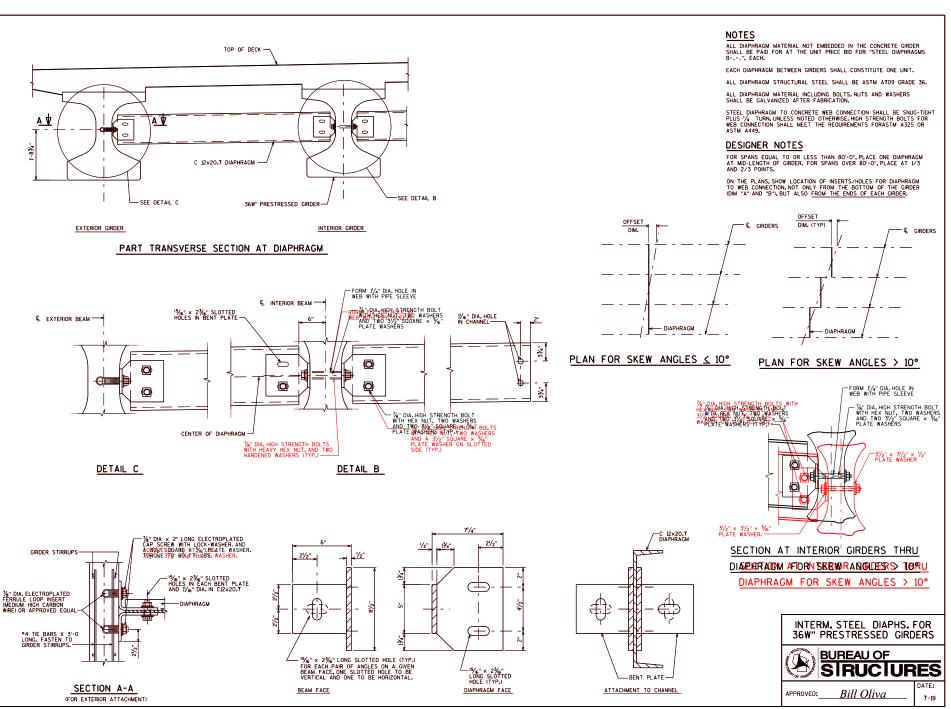


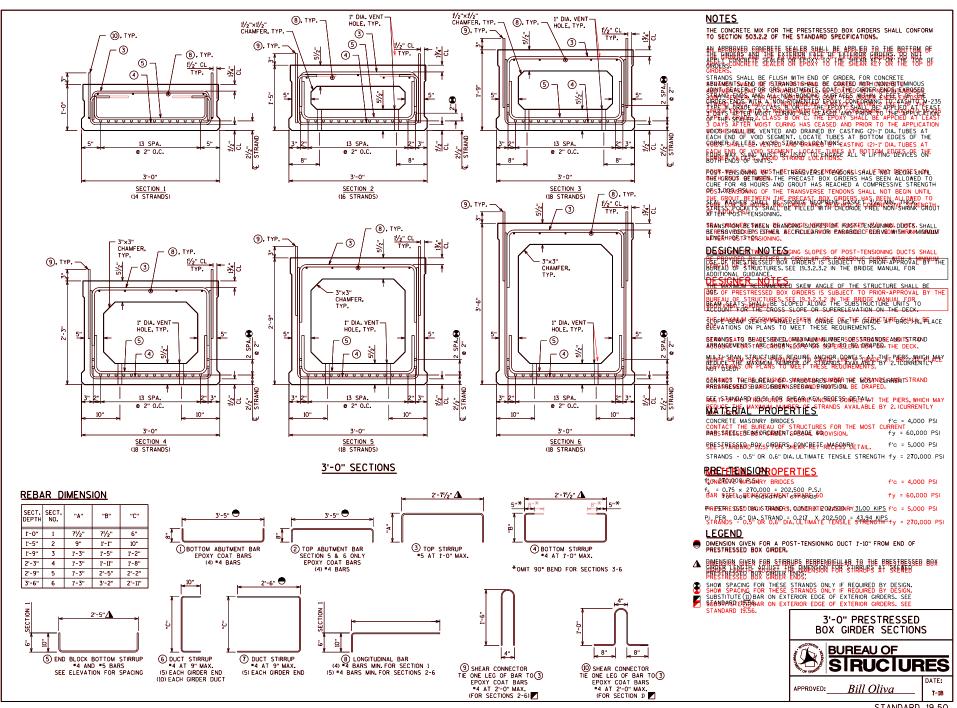


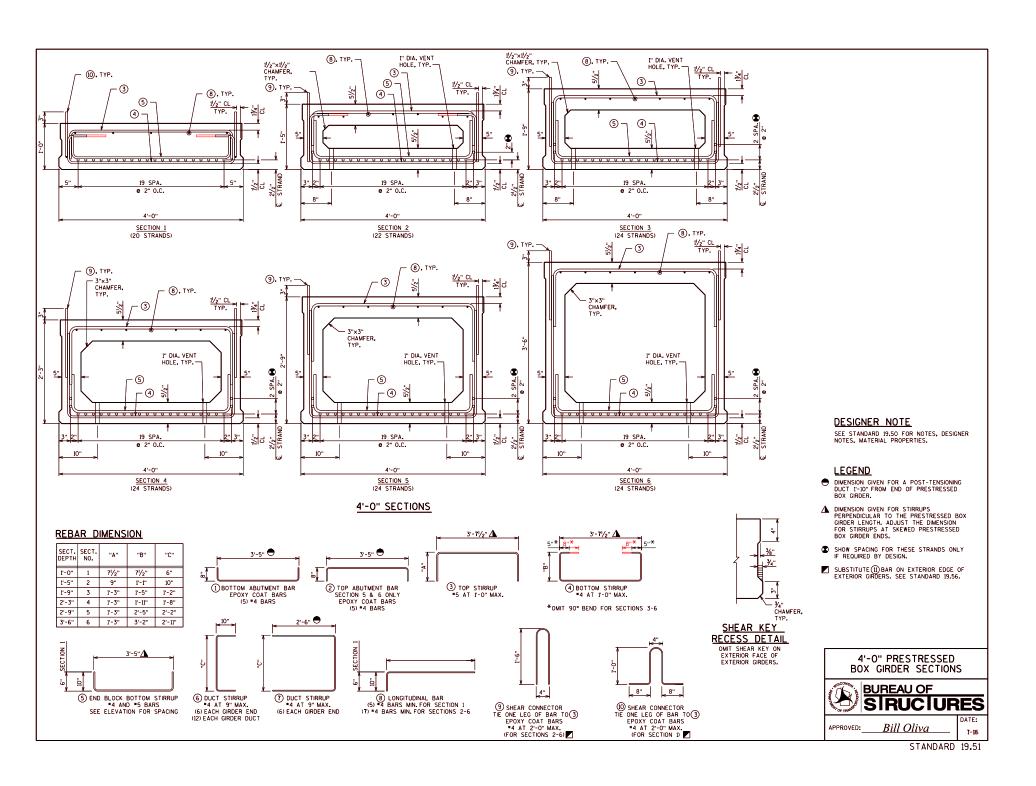


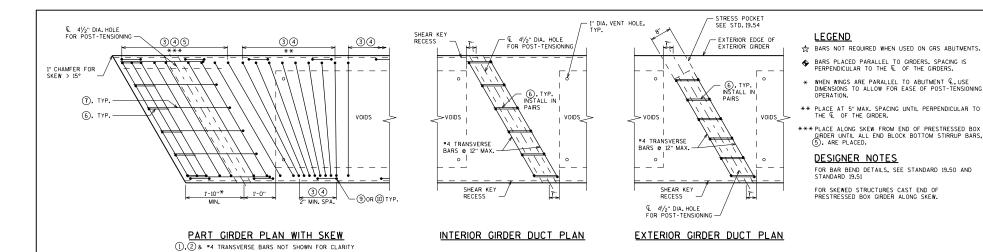


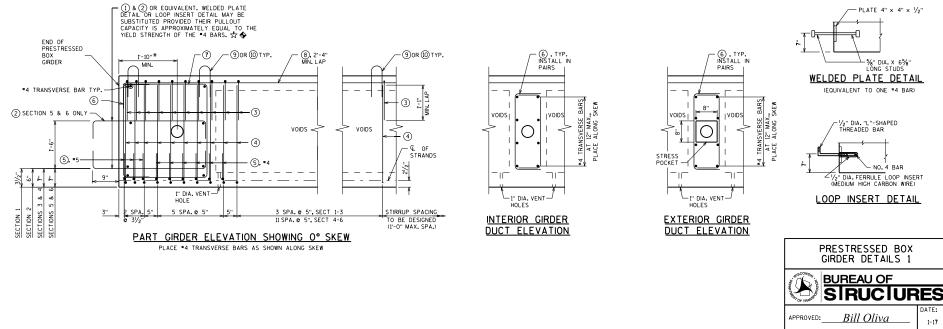


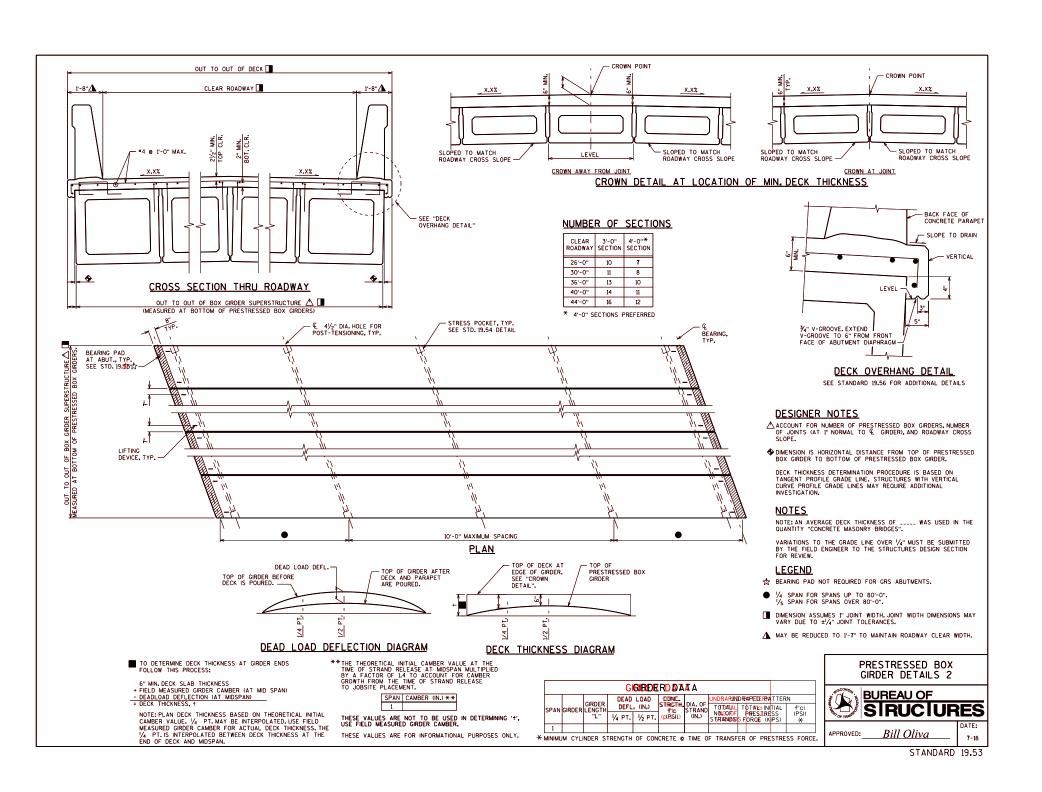


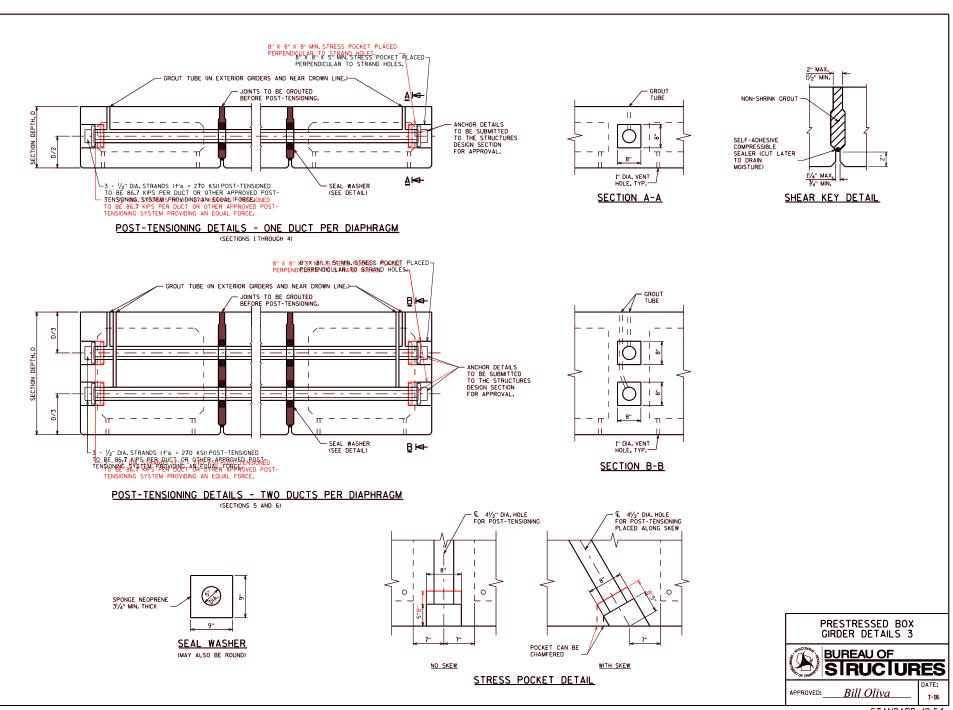


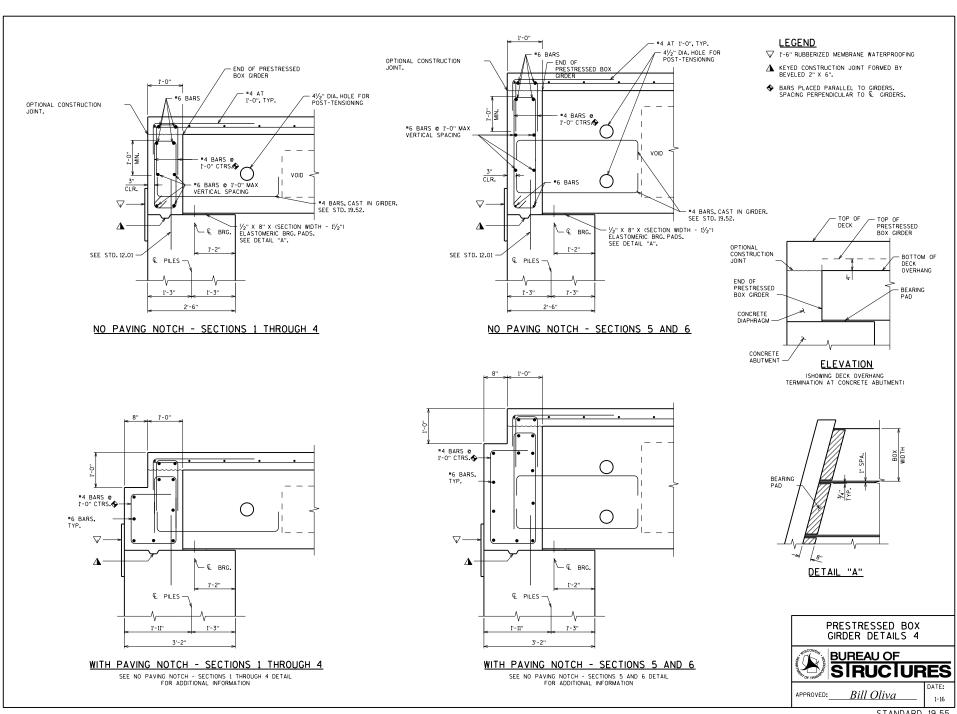


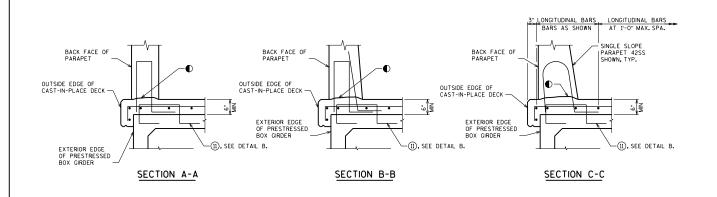


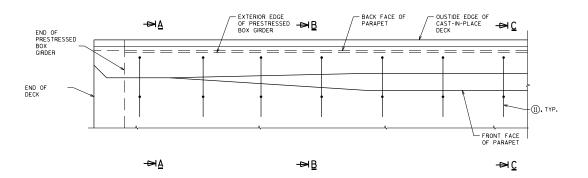




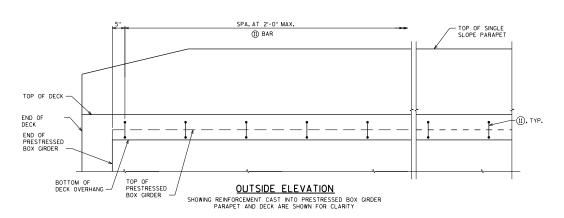


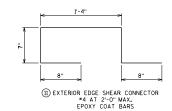


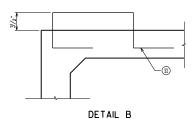




PLAN SHOWING REINFORCEMENT CAST INTO PRESTRESSED BOX GIRDER PARAPET AND DECK ARE SHOWN FOR CLARITY







#### **LEGEND**

CONST. JOINT - STRIKE OFF AS SHOWN.

#### <u>NOTE</u>

BAR (1) TO BE PAID AS PART OF BID ITEM "PRESTRESSED BOX GIRDER TYPE XX-INCH".

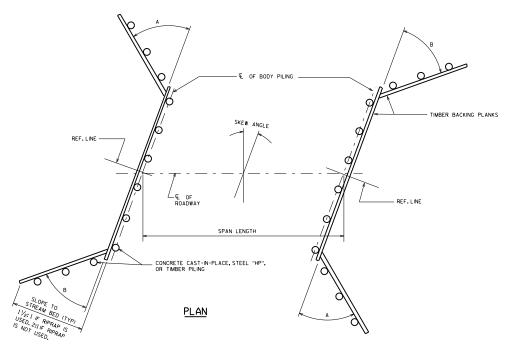
#### **DESIGNER NOTES**

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





#### <u>NOTES</u>

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

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

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

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

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

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

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

ALTERNATE DETAILS MAY BE SUBMITTED USING EITHER GALVANIZED STEEL BRIDGE PLANK OR PRECAST CONCRETE PLANK IN LIEU OF TIMBER BACED 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
	3
6"	BODY PLANKS
Min. 2'-6"	2½" DIA. SPLIT RING CONNECTOR.
MAX.	4

CORNER DI	

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

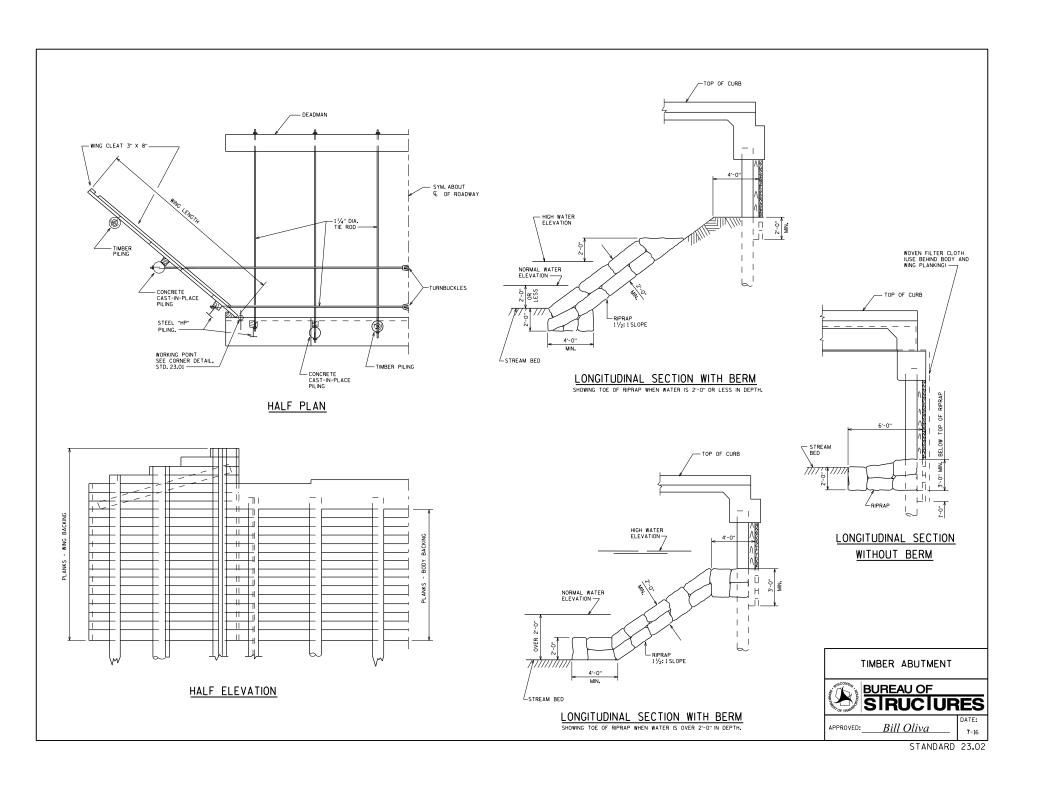
- \* USE TIE RODS ON WING PILING
- USE TIE RODS WITH A DEADMAN ON WING PILING.

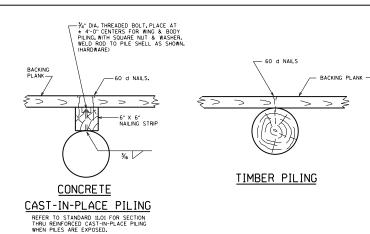
SECTION	MOMENT CAPACITY (INCH - KIPS/FT,)
10 GAGE (6' x 2') GRADE A * ARMCO	22.9 (fb = 18 K.S.I.)
7 GAGE (6' × 2') GRADE A * ARMCO	30.0 (f <sub>b</sub> = 18 K.S.I.)

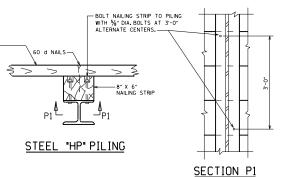
<sup>\*</sup>ASTM A446

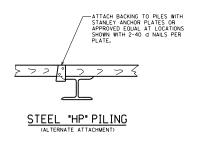
TIMBER ABUTMENTS GENERAL



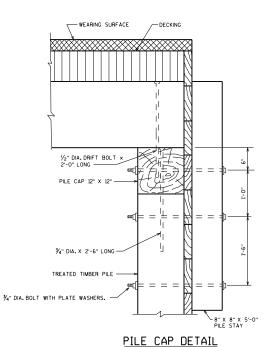




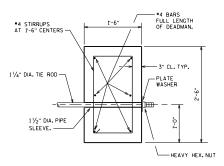




**BODY & WING PLANK CONNECTION DETAILS** 



(TIMBER GIRDER)



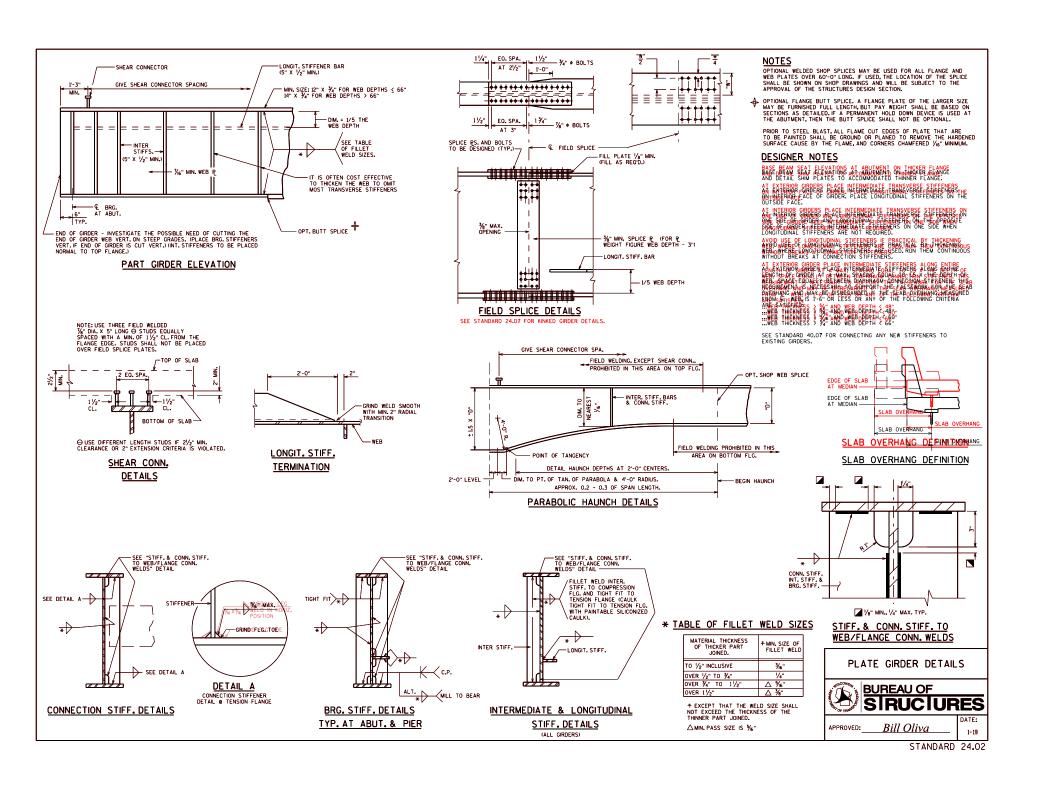
SECTION THRU DEADMAN

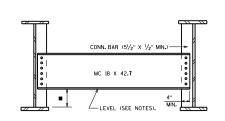
TIMBER ABUTMENT DETAILS



APPROVED:

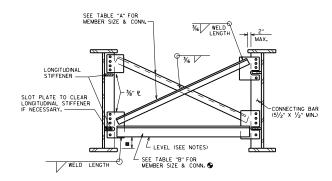
Bill Oliva





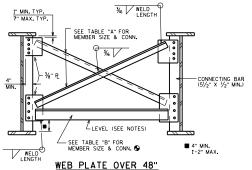
WEB PLATE < 48"

TYP. IN SPAN & AT PIER



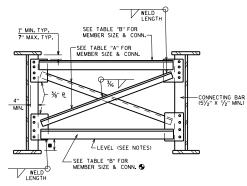
WEB PLATE OVER 48" WITH LONGITUDINAL STIFFENERS

TYP. IN SPAN & AT PIER

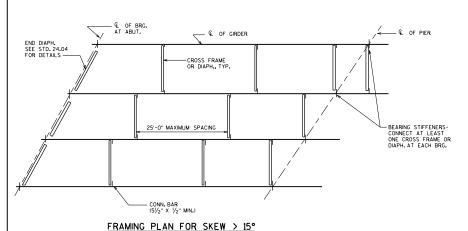


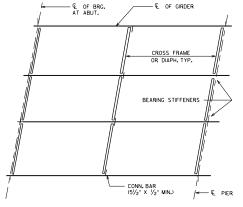
WEB PLATE OVER 48"

TYP. IN SPAN & AT PIER



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





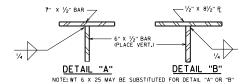
FRAMING PLAN FOR SKEW < 15°

#### TABLE "A"

SIZE	MAX.LENGTH OF MEMBER	WELD LENGTH	NO.OF ¾" Ø 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" ¢ BOLTS	WEIGHT PER FT.
L 5 X 5 X 3/6	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*
½" T SECTION SEE DETAIL "B"	22'-0"	3/8"	13"	7	18.5=



#### <u>NOTES</u>

ALL BOLTED CONNECTIONS SHALL BE FRICTION TYPE USING  $\frac{7}{4}$ "  $\phi$  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**

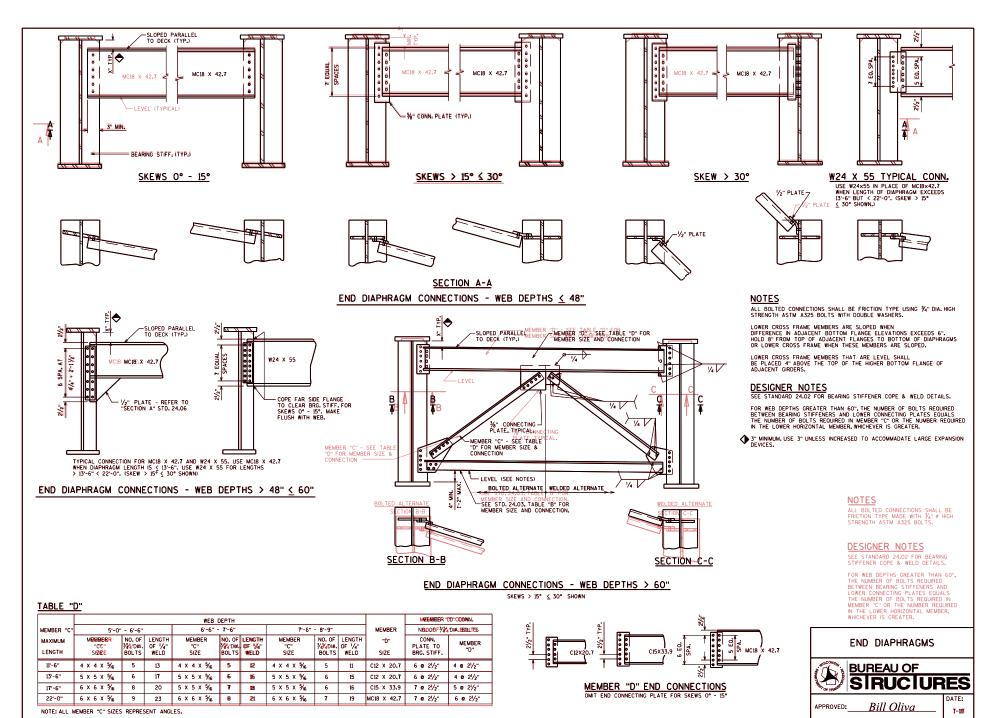
SEE STD. 24.02 FOR CONNECTION BAR CORNER COPE & WELD DETAILS.

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

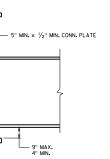
♦ HORIZONTAL CROSSFRAME MEMBER TO HAVE HORIZONTAL LEG TOP (AS SHOWN) WHEN NO LOWER LATERALS ARE USED, WHEN LOWER LATERALS ARE USED THE HORIZONTAL LEG SHALL BE ON THE BOTTOM, THAS IS TO ALLOW FRAMING INTO THE LOWER LATERAL CUSSET, CURRENT PRACTICE IS TO AVOID THE USE OF LOWER LATERALS, HOWEVER.

PLATE GIRDER DIAPHRAGMS AND CROSS FRAMES





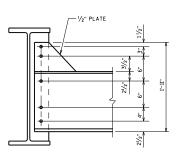
#### INTERMEDIATE DIAPHRAGM SIZES



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

	NIERMEDIA IE ONNECTIONS
GIRDER DEPTH	INTERMEDIATE DIAPHRAGMS
36"	MC18 X 42.7
33"	MC18 X 42.7
30"	C15 X 33.9
2 <b>7</b> "	C15 X 33.9
24"	C12 X 20.7
21"	C10 X 15.3
18"	C8 X 11.5

36" W. GIRDER



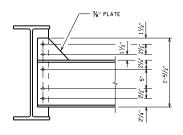
- KNEE BRACE 1:1 SLOPE (TYPICAL) %" PLATE I" MAX.  $A \longrightarrow$ 27" W. GIRDER

33" W. GIRDER

KNEE BRACE.

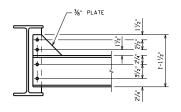
SECTION A

30" W. GIRDER



24" W. GIRDER

3/8" PLATE



21" W. GIRDER

18" W. GIRDER

## **NOTES**

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

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

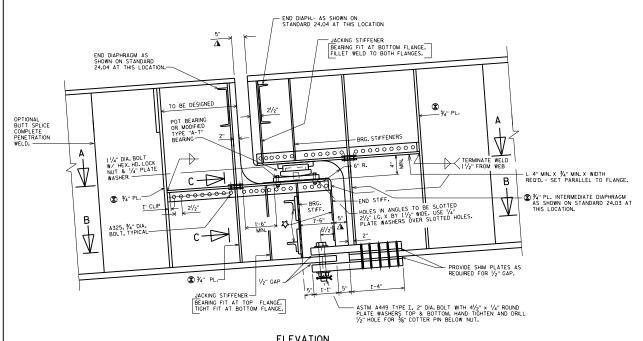
ALL BOLTED CONNECTIONS SHALL BE MADE WITH  $\sp{3/4}"$   $\phi$  HIGH STRENGTH ASTM A325 BOLTS.

#### DESIGNER NOTES

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

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

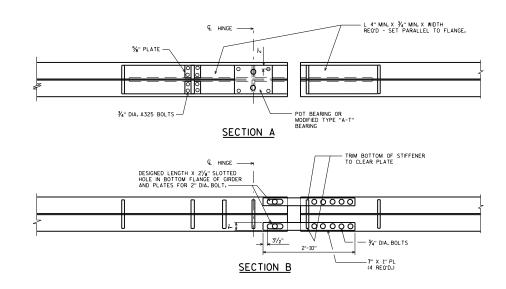
SIZE AND LENGTH OF ANGLES, NUMBER OF BOLTS THRU ANGLES, THICKNESS OF WEB PLATE, AND SIZE OF BEARING STIFFENERS AND JACKING STIFFENERS SHALL BE DETERMINED FROM AN ANALYSIS USING THE VERTICAL AND HORIZONTAL FORCES ACTING AT THE HINGE.

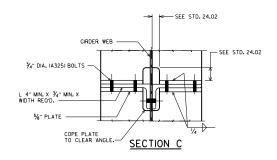
SLOTTED HOLES OF 6" IN THE FLANGES AND CONNECTING BARS WILL ACCOMMODATE A TOTAL TEMPERATURE MOVEMENT OF 8" (± 4" FROM 45° F). THE DESIGNER MAY NEED TO INCREASE OR DECREASE THE LENGTH OF THE SLOT TO MEET SPECIFIC JOB REQUIREMENTS.

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

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





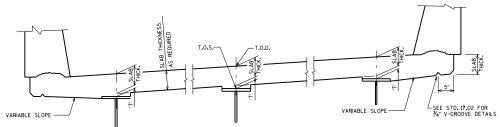


**EXPANSION HINGE** JOINT DETAILS

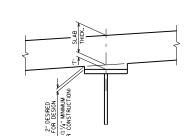


APPROVED:

Bill Oliva



SECTION THRU SLAB



HAUNCH DETAIL

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

#### <u>NOTES</u>

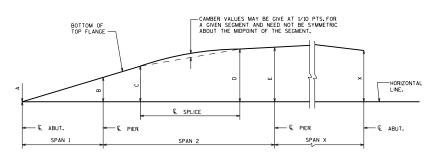
'T' = HAUNCH HEIGHT AT CENTERLINE OF GIRDER.

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.I 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.)

	1			1		1					$\vdash$	
		W. ABUT.	0.1 SPAN	0.2 SPAN	0.3 SPAN		€ PIER	€ SPLICE				€ 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
GIRDER 2	T.O.D.	860.62	860.58	860.53	860.49 ∠	ے ا	860.45		_	ے ا	/ 1	860.16
SINDEN 2	T.O.S.	859.93					859.80	859.80				859.59
GIRDER X	T.O.D.											
	T.O.S.											

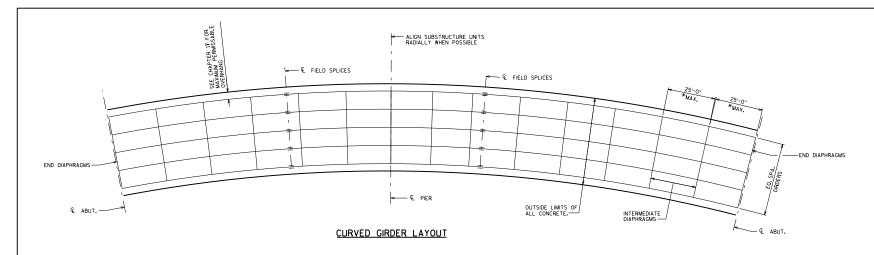
THESE ELEVATIONS ARE TO TOP OF STEEL (SPLICE AND COVER PLATE THICKNESS, IF APPLICABLE, ARE ACCOUNTED FOR AND THEY ARE FOR THE MATERIAL AS ERECTED. THE ELEVATION OF THE 10P STEEL AT THE FIELD SPLICE POINTS SHALL BE CHECKED, AND CORRECTED, IF POSSIBLE, AFTER ERECTION AND BEFORE PERMANENTLY BOLTING THE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

BLOCKING & SLAB HAUNCH DETAILS

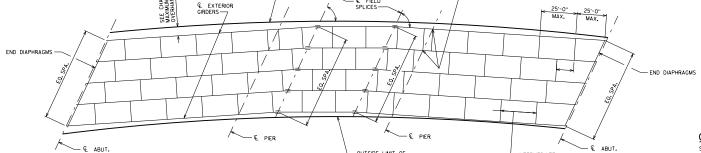


APPROVED: <u>Bill Oliva</u>

DATE: 1-12



### SEE CHAPTER 17 FOR MAXIMUM PERMISSABLE OVERHANG - BEARING STIFFENERS-CONNECT AT LEAST ONE CROSS FRAME OR DIAPH, AT EACH BEARING OUTSIDE LIMIT OF ALL CONCRETE - & FIELD SPLICES — € EXTERIOR GIRDERS —



#### KINKED GIRDER LAYOUT

OUTSIDE LIMIT OF ALL CONCRETE

— INTERMEDIATE DIAPHRAGMS

#### **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  $\widehat{\mathbb{Q}}$  OF SUBSTRUCTURE UNITS AND  $\widehat{\mathbb{Q}}$  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: <u>Scot Becker</u>

#### (OPTIONAL OR REQUIRED) \*\* TRANSVERSE JOINT, TYP. INDICATES POUR NUMBER AND DIRECTION OF POUR (1) S = TOTAL NUMBER OF SPANS L = LENGTH OF END SPAN n = INTERIOR SPAN END SPAN 0.575 0.425 ABUT. ABUT. IDEAL DECK POUR SEQUENCE (CONTINOUS STEEL GIRDER - 2 SPANS SHOWN) L( 1.35 n - 0.4) L (1- 0.35 n) (1) L (1 - 0.35 n) 0.35nl L(n- 0.4) 0.4L ABUT. PIER 2 ABUT. IDEAL DECK POUR SEQUENCE (CONTINOUS STEEL GIRDER - 3 SPANS SHOWN) NO. SPANS AT DL L (1.4 n -0.4) L(1-0.4 n) (OPTIONAL OR REQUIRED) \*\* TRANSVERSE JOINT, TYP. L(1-0.4 n) 0.6 nL 0.4 nL 0.6 ol 0.4 nt L(n-0.4) 0.4 L nL PIER 1 ABUT. 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 € OF PIER-EDGE OF TRAFFIC LANE EDGE OF SLAB ь THEORETICAL POUR LINE NOTE: STEP TRANSVERSE JOINT SO THAT "G", "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

#### OTES

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

IF OPTIONAL JOINTS ARE PROVIDED, TWO OR MORE SEQUENTIAL POURS MAY BE ORDINATED HOLD THE OR MAY BE LETTENATE DECK POURS (E.G. 1 & 3) MAY BE PLACED ON THE SAME DAY.

THE NEXT DECKKPOURRCANNBEEMADEENOOLESSSTHANN722HOURSSARTERRTHEE PREVIOUS POUR

THE CONTRACTOR MAY SUBMIT AN ALTERNATE POURING SEQUENCE SUBJECT TO THE APPROVAL OF THE STRUCTURES DESIGN SECTION. (MOTE: 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 POURNOS COURNES SUBJECT TO THE APPROVAL OF THE STRUCTURES DESIGN SECTION. WOTER REQUIRED WHEN REQUIRED TRANSVERSE CONTRUCTION JOINTS ARE SHOWN)

#### **DESIGNER NOTES**

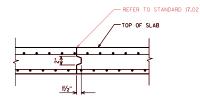
\* THE DESIGNER SHALL DETERMINE IF TRANSVERSE JOINTS ARE OPTIONAL OR REQUIRED.

OPTIONAL TRANSVERSE CONSTRUCTION JOINTS SHALL BE DETAILED ON THE PLANS TO LIMIT THE VOLUME OF POUR TO < 600 CU, YDS, IN OTHER AREAS, GENERALLY FOR STEEL GIRDER SUPERSTRUCTURES LOCATE THE TRANSVERSE JOINTS AT THE 0.6 POINT (CONCRETE IN 60% OF SPAN) AND FOR PRESTRESS GIRDER SUPERSTRUCTURES LOCATE JOINTS NEAR THE 0.75 POINT. (CONCRETE IN 75% OF SPAN) CONSIDER CUT-OFF POINTS OF CONTINUITY REINFORCING STEEL HIPEN LOCATING JOINTS FOR PRESTRESS GIRDER SUPERSTRUCTURES. LOCATING OF JOINTS IN STEEL HIPEN HIMBES OF LOCATING JOINTS IN STEEL HIPEN HIMBES OF LOCATING JOINTS IN STEEL HIPEN HIMBES OF LOCATING JOINTS IN STEEL HIPEN HIMBES OF LOCATION OF JOINTS IN STEEL HIPEN HIMBES OF LOCATION OF JOINTS IN STEEL HIPEN HIMBES OF LOURS JULIES FOR 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  ${\mathfrak C}$  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 SHARDESCHIS AGREATERANTHAN PEROL FEETONGLIOBOTALDINAL CONSTRUCTION JOINT SHALL BE DETAILED. EORADECKOMISTHEINBEITHEIN GONARRHUZORESBUNNINGLAND TORBERDAMELORING SHALLARS BENTHES. EBOWITE DORNORF LUDONGET RICC TROBE BOINT A LONG EDGE OF LANE LINE AND AT LEAST 6 INCHES FORM EDGE OF TOP FLANGE OF GIRDER. FOR GRADES OVER 3X THE PREFERRED DIRECTION OF POUR IS UPHILL. FOR GRADES OVER 3X THE PREFERRED DIRECTION OF POUR IS UPHILL. AN ALTERNATE POURNO SCOUENCE IS TO POUR THE DL POSTITIVE MOMENT AREAS TARDET AT THE PROPERRIED DIRECTION OF THE DL POSTITIVE MOMENT AREAS SAARDOT TENDWIRBED DANIGHT OF THE DROBE OWNER TO THE DROBE OWNER THE DROBE OWNER TO THE DROBE OWNER THE DROBE OWNER TO THE DROBE OWNER THE DROBE OWNER TO THE DROBE OWNER TO



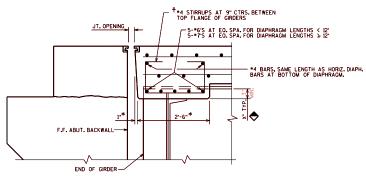
SECTION THRU TRANSVERSE OR LONGITUDINAL JOINT

SLAB POURING SEQUENCE



APPROVED:

Bill Oliva

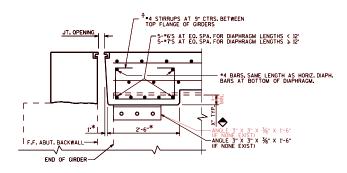


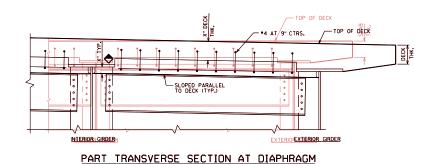
# SECTION AT PIER

- SEE BRIDGE MANUAL 17.5.3.2 FOR GUIDANCE ON REQUIRED LONGITUDINAL REINFORCING OVER PIERS.

#### SECTION THRU EXPANSION END

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





**EXPANSION END** 

### SECTION THRU EXPANSION END OF NEW DECK SHOWING EXISTING STEEL GIRDER WITHOUT EXISTING STEEL DIAPHRAGM

(SEE STD. 40.04 FOR ADDITIONAL DETAILS)

#### **NOTES**

FOR REHABILITATION PROJECTS:

DIAPHRAGM SUPPORT ANGLES SHALL BE ASTM A709 GRADE 36.
BOETS: MARE 34" DIAT ALLIGBOLTS; MUTSIAND: WASHERS ISHALL BE
ASTM: (A325) TIYPE IND WASHERS SHALL BE ASTM A325 TYPE I.

ALL SUPPORT ANGLES SHALL BE HOT-DPPED GALVANIZED.
ALL BOLTS, MUTS AND WASHERS SHALL BE HOT-DPPED GALVANIZED IN ACCORDANCE WITH ASTM AISS CLASS. C. GALVANIZED NOTS SHALL BE TAPPED OVERSIZED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM ASSG AND SHALL MEET THE REQUIREMENTS OF OVERSIZED AND SHALL MEET THE REQUIREMENTS OF OVERSIZED WITS.

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

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

#### **DESIGNER NOTE**

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

#### **LEGEND**

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

STEEL GIRDER SLAB & SUPERSTRUCTURE DETAILS



Bill Oliva 7-18

#### PLATE C PLATE D LENGTH OF PLATE "C" HEIGHT FEET LOAD Z 215 5" 23/8" 10" 8" 13/4" 1'-7" 0.354 260 5" 23%" 1'-0" 9" 13/4" 1'-9" 0.354 12" 280 5" 23/8" 1'-0" 10" 23/8" 1'-9" 0.406 280 5" 11%" 1-2" 9" 17/4" 1'-11" 0.318 335 5" 2%" 1'-2" 11" 2%" 1'-11" 0.406 385 5" 23/8" 1'-2" 1'-1" 2 1 1 - 11 | 0.448 410 5" 23%" 1'-2" 1'-3" 27%" 2'-0" 0.448 275 5" 11%" 1'-4" 8" 1¾" 2'-1" 0.318 330 5" 115%" 11-4" 10" 23%" 2'-1" 390 5" 238" 1'-4" 1'-0" 238" 2'-1" 0.406 465 5" 23/8" 1'-4" 1'-2" 23/8" 2'-2" 0.448 490 5" 23%" 1'-4" 1'-4" 33%" 2'-2" 0.490 325 5" 11%" 1'-6" 9" 13/4" 2'-3" 390 5" 11%" 1'-6" 11" 23%" 2'-3" 0.370 465 5" 23%" 1'-6" 1'-1" 23%" 2'-4" 0.448 495 5" 2%" 1-6" 1-2" 2%" 2'-4" 0.448 560 5" 238" 1-6" 1-4" 338" 2'-4" 0.490 350 5" 11%6" 1'-8" 9" 1¾4" 2'-5" 0.318 380 5" 11%" 11-8" 10" 23%" 21-5" 0.370 460 5" 23/8" 1'-8" 1'-0" 23/8" 2'-6" 20" 530 5" 23/8" 1'-8" 1'-2" 27/8" 2'-6" 0.448 600 5" 23%" 1-8" 1-4" 33%" 2'-6" 0.490 640 5" 23%" 1'-8" 1'-6" 33%" 2'-6" 0.531 405 5" 11%6" 1'-10" 10" 23%" 2'-7" 0.370 490 5" 11%" 1'-10" 1'-0" 23%" 2'-8" 0.370 565 5" 23/8" 1'-10" 1'-2" 27/8" 2'-8" 0.448 22" 635 5" 238" 1-10" 1-4" 338" 2'-8" 0.490 705 5" 23%" 1-10" 1-6" 33%" 2'-8" 0.531 720 5" 23/8" 1'-10" 1'-8" 33/8" 2'-8" 0.531

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

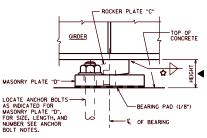
FOR SPAN LENGTHS FROM 100'-0" UP TO 150'-0": USE A TYPE I MASONRY PLATE "D" WITH

(2) - 1/2" DIA. x 1'-10" LONG ANCHOR BOLTS.

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

CHECK THAT ANCHOR BOLTS PROVIDE ADEQUATE HORIZONTAL CAPACITY.

### € OF BEARING-€ OF BEARING € OF BEARING ⊕-l-⊕ Ф Φ 21/4" € OF GIRDER Φ -1/2" DIA. PINTLES + DRILLED HOLES FOR ANCHOR BOLTS. — TYPE I TYPE I ROCKER PLATE "C"



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

# MASONRY PLATE "D" € OF BEARING LOCATION OF EXISTING ₽₹ + DRILLED HOLES FOR NEW ANCHOR BOLTS.

MASONRY PLATE "D"

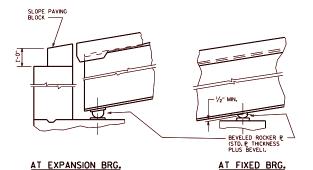
MASONRY PLATE "D"

### MIN. DISTANCE FROM EDGE OF STEP TO MASONRY PLATE — - F.F. OF BACKWALL MASONRY **Q** OF BEARING PLATE "D" € OF € OF PIER MASONRY - PAD CORNERS MAY BE CLIPPED TO LIMIT CAP WIDTH, OR REDUCE WIDTH OF PLATE "D" PROVIDING ALLOWABLE CONCRETE BEARING STRESS IS NOT EXCEEDED.

AT SKEWED PIER

AT SKEWED ABUTMENTS

CLEARANCE DIAGRAM



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  $\pm 2/4$ ", ABOVE TOP OF CONCRETE.

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

STEEL PINTLES SHALL CONFORM TO ASTM A449 OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

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

CHAMFER TOP OF PINTLES  $\slash\!/_8$  . DRILL HOLES FOR ALL PINTLES IN MASONRY PLATE "D" FOR A DRIVING FIT.

PROVIDE  ${\it V_8}"$  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 A709 GRADE 36, OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153, CLASS  $\mathbf{C}_{\bullet}$ 

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  $\frac{1}{2}$ " LARGER THAN ANCHOR BOLT.
- $\ensuremath{\Re}$  Finish these surfaces to ansi250 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 GIRGER BOTTOM FLANGE WIDTH TO ALLOW FOR FIELD WELDING OFE THE BOTTOM FLANGE TO THE TOP OF PLATE "C".

CALCULATE THE REACTION AT THE SEARINGS DUE 10 "101AL LANS".

OBECUBAL TEASH GEREROING FUNCTIONE LEASH MORE DELATED.

DEST THE AMASHAO LIBER SERVICIONE LOADS COMBINANCION, IL CONSIDEROING MORE SERVICIONE LANGUA LICENSE PROVINCIONE LA 333 DYNAMIC LOAD ALLOWANCE (IM).

THE VALUES IN THE TABLES ARE THE BEARING CAPACITIES FOR "TOTAL THE VALUES IN THE TABLES ARE THE BEARING CAPACITIES FOR "TOTAL THE VALUES IN THE TABLES ARE THE BEARING CAPACITIES FOR "TOTAL THE VALUES IN THE TABLES ARE THE BEARING CAPACITIES FOR "TOTAL THE VALUES IN THE TABLES ARE THE BEARING CAPACITIES FOR "TOTAL THE VALUES IN THE TABLES ARE THE BEARING CAPACITIES FOR "TOTAL THE VALUES IN THE TABLES ARE THE BEARING CAPACITIES FOR "TOTAL THE VALUES IN THE TABLES ARE THE BEARING CAPACITIES FOR "TOTAL THE VALUES ARE THE SEARING CAPACITIES FOR "TOTAL THE VALUES ARE THE BEARING CAPACITIES FOR "TOTAL THE VALUES ARE THE SEARING CAPACITIES FOR "TOTAL THE VALUES ARE THE SEARING CAPACITIES FOR "TOTAL THE PROVINCIAL THE VALUES ARE THE SEARING CAPACITIES FOR "TOTAL THE PROVINCIAL THE VALUES ARE THE SEARING CAPACITIES FOR "TOTAL THE VALUES ARE THE THE VALUES ARE THE THE VALUES ARE THE SEARING CAPACITIES FOR "TOTAL THE VALUES ARE THE SEARING ARE THE VALUES ARE THE VALUE THE V INC. YALUGS MI HE BLASES MAR THE BEARING CAPACITIES FOR "TOTAL LOAD" (IC + DW + LL + MM).

LOAD" (IC + DW + LL + MA).

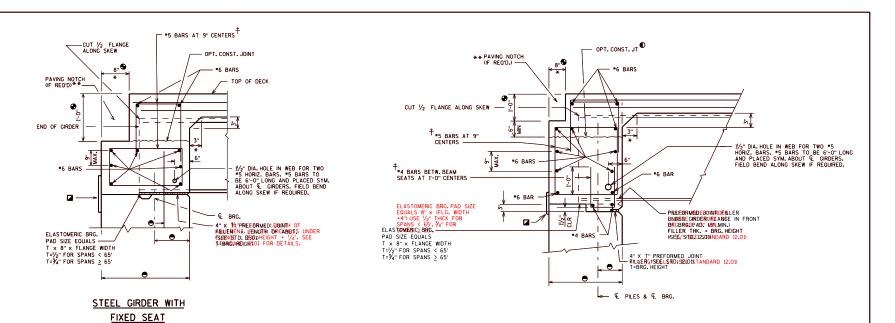
SELECT A BEARING THAT HAS A CAPACITY GREATER THAN OR EQUAL TO THE CALCULATED REACTION FOR "TOTAL CABA

> FIXED BEARING DETAILS TYPE 'A' - STEEL GIRDERS

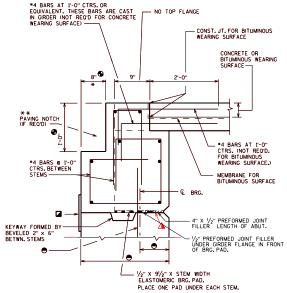


APPROVED:

Bill Oliva



#### STEEL GIRDER WITH SEMI-EXPANSION SEAT



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

#### NOTES

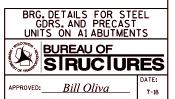
FOR SKEWED STRUCTURES CAST END OF PRECAST TEE ALONG SKEW.

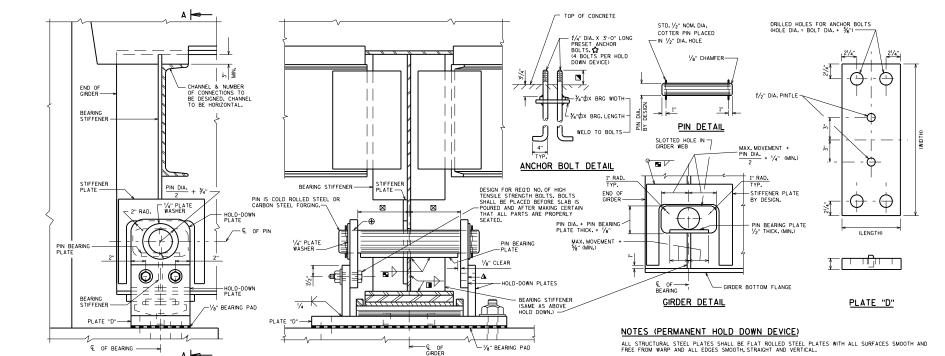
- MINENSKONFILS. EFAKEN. ENORMALDFT Q BÛT. SRIBSGIRUCTURE BETWEEN BRG. PAD AND
- 1'-6" RUBBERIZED MEMBRANE WATERPROOFING
- \*\* DIMENSION IS TAKEN NORMAL TO € SUBSTRUCT + BMRS.PLACED PARALLEL TO GIRDERS. SPACING PERPENDICULAR TO € GIRDERS. 1'-6" RUBBERIZED MEMBRANE WATERPROOFING SUBSTRUCTURE
- + DESIGNERPANOTIES GIRDERS. SPACING
- PERPENDICULAR TO TE. SINDERS.
  SEE STANDARD 19.55 FOR PRESTRESSED BOX
  GIRDER BEARING DETAILS.

  DESCRIPEN NOT TEST STANDARD TO SEE OF THE OPT THE OPT TEST STANDARDED FOR STANDARD TO THE OPT TH
- \*\* USE BANING NOTSHOON, ALONSIS, HOLBRIDSENOTS, T.H.
  BRIDDENS NDED BRIDGESK BW SONVER, HS BRIDGESL WINTE
  DONORGIO BRORGACHESON IS ANTICIPATED.
- BANINO WOOTCHOISCH-ON WIDE BXS.H-@FIDEEPSJFS.T.H.
  SRRIMETURAL AMPRIXACIA SOMBCISTO FIDEODEIS WSED.
  CONCRETE APPROACHES.

  SEE STD. 12.01
  PAVING NOTCH IS T-O" WIDE BY T-4" DEEP IF
  STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED.

- SEE STD. 12.01





☑ DIM. DEPENDS ON BRG. SIZE.

WHEN REQUIRED, HOLD DOWN DEVICES SHALL BE PLACED SYMMETRICALLY ABOUT LONGITUDINAL © OF FRAMING PLAN, MAXIMUM SPACING OF HOLD DOWN'S SHALL BE AT A LIERNATE GIRDERS. HOLD DOWN DEVICE TO BE DESIGNED FOR MINIMUM UPLIET CAPACITY OF 20 KIPS.

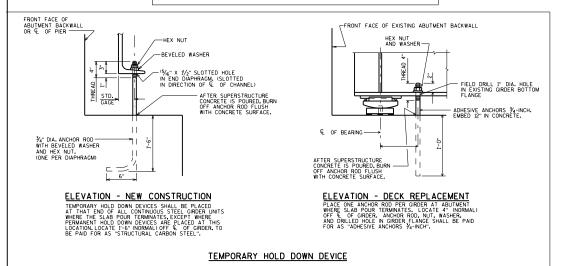
PERMANENT HOLD DOWN DEVICE

SECTION A-A

€ OF BEARING

**ELEVATION** 

Δ 📥



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

ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS

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

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

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

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

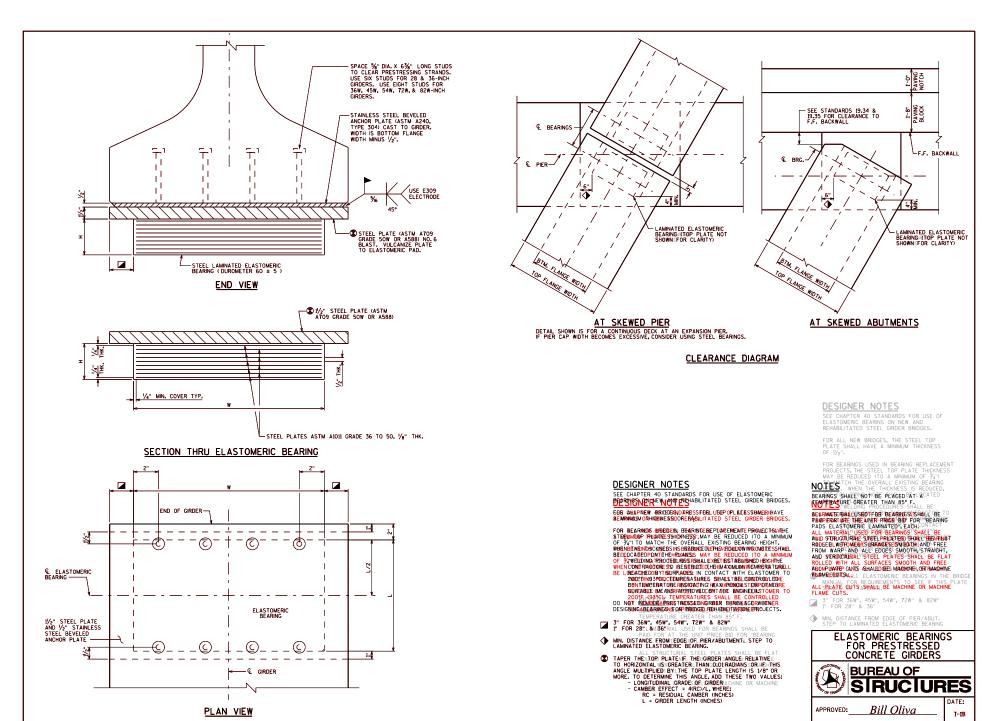
ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A709 GRADE 36 OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

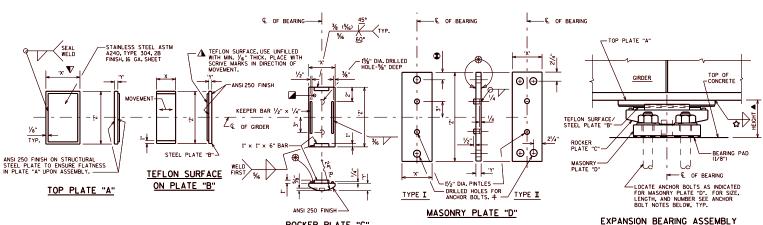
ALL MATERIAL IN HOLD DOWN DEVICES, WHICH INCLUDES HOLD-DOWN PLATES, HIGH TENSILE STRENGTH BOLTS, PINS AND ANCHOR BOLTS, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "BEARING ASSEMBLIES EXPANSION

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

- ☆ FOR REPLACEMENT BEARINGS, ANCHOR BOLTS SHALL BE 1½° DIAMETER X 3°-0° LONG AND FULLY THREADED ADHESIVE ANCHORS. ANCHOR BOLTS SHALL BE PAID FOR AS "ADHESIVE ANCHORS 11/2-INCH". EMBED IN CONCRETE AS DETAILED.
- ⚠ SHOP DRILL HOLES IN HOLD-DOWN PLATE ATTACHED TO PLATE "D", FIELD DRILL HOLES IN UPPER HOLD-DOWN PLATE AFTER ALIGNING IN THE FIELD.
- SEE STANDARD 24.02 FOR TABLE OF FILLET WELD SIZES.
- SEE STANDARD 24.02 FOR WELD DETAILS SHOWING BEARING STIFFENER CONNECTION TO WEB AND FLANGE.
- PROJECT ANCHOR BOLTS, PLATE "D" THICKNESS + 21/4", ABOVE TOP OF CONCRETE.
- $\bigoplus$  HOLES FOR PIN IN HOLD-DOWN PLATES AND PLATE WASHERS SHALL BE AS STATED IN STANDARD SPECIFICATION 506.3.17.

HOLD DOWN DEVICES **BUREAU OF** SIRUCIURES APPROVED: Bill Oliva 7-16





# ROCKER PLATE "C" EXPANSION BEARING

#### 10" BEARING

TOTAL LOAD	PLA	TE .	4	PLATE B			PLATE C			PL	HEIGHT		
(KIPS)	х	Y	Z	х	Υ	Z	х	Υ	Z	х	Y	Z	FEET
100	9"	5∕8"	10"	5"	1/2"	10"	7"	17/6"	1'-0'/4"	8"	11/2"	1'-8"	0.360
180	r-r	5%°	10"	9"	1/2"	10"	11"	2¾"	1'-0'/4"	8"	11/2"	1'-8"	0.438
260	1'-5"	5%"	10"	1'-1"	1/2"	10"	1'-3"	3%"	1'-0'/4"	11"	2"	1'-8"	0.604

#### 14" BEARING

TOTAL	PLAT	E A		PLATE B			PLATE C			Pι	HEIGHT		
(KIPS)	х	Y	Z	х	Υ	Z	х	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"	r-r	1/2"	1'-2"	1'-3"	3%"	1-41/4"	1'-2"	2%"	2'-0"	0.677
500	1"-9"	<b>%</b> "	1'-2"	1'-5"	1/2"	1'-2"	r-7"	4%"	1'-4'/4"	1'-5"	3%"	2"-1"	0.802

#### 18" BEARING

TO:	TAL	PLATE A			PLATE B			PLATE C			PLATE D			HEIGHT
(KIF		х	Υ	z	х	Υ	Z	×	Υ	Z	х	Υ	Z	FEET
21	80	11"	%"	1'-6"	7"	1/2"	1'-6"	9"	115%;"	1'-8'/4"	9"	2"	2'-4"	0.443
30	60	r-r	%"	1'-6"	9"	1/2"	1'-6"	11"	2%"	1'-8'/4"	11"	2"	2'-4"	0.479
61	00	1'-7"	%"	1'-6"	1'-3"	1/2"	1'-6"	1'-5"	3%"	1'-8'/4"	1'-5"	3%"	2"-5"	0.719
6	50	1'-11"	%"	1'-6"	1'-7"	1/2"	1'-6"	1'-9"	4%"	1'-8'/4"	1'-10"	3%"	2"-5"	0.844

#### 12" BEARING

TOTAL LOAD	PLAT	E A		PL	ATE	В	PL	ATE	С	PL	ATE	D	HEIGHT
(KIPS)	х	Υ	Z	х	Υ	Z	х	Υ	Z	x	Y	Z	FEET
125	9"	%"	1'-0"	5"	1/2"	1'-0"	7"	1%6"	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"	%"	1'-0"	11"	1/2"	1'-0"	1'-1"	2%"	1'-2'/4"	11"	2"	1'-10"	0.521

#### 16" BEARING

TOTAL	Pι	ATE	Α	PLA	TE	В	Pl	ATE	С	린	ATE	D	HEIGHT
(KIPS)	х	Υ	Z	х	Υ	Z	х	Y	Z	х	Υ	Z	FEET
245	11"	%"	1'-4"	7"	<b>½</b> "	1'-4"	9"	115%;"	1'-6'/4"	8	11/2"	2'-2"	0.401
370	1'-3"	%"	1'-4"	11"	1/2"	1'-4"	1'-1"	2%"	1'-6'/4"	1'-0"	23/8"	2'-3"	0.552
525	1-7"	<b>%</b> "	1'-4"	1'-3"	1/2"	1'-4"	1'-5"	3%"	1'-6'/4"	r-4"	3%"	2'-3"	0.719
575	1'-9"	<b>%</b> "	1'-4"	1'-5"	1/2"	1'-4"	1'-7"	4%"	1'-6'/4"	1'-6"	3%"	2'-3"	0.844

#### 20" BEARING

TOTAL	PLATE A			PLATE B			PLATE C			PL	ATE	D	HEIGHT	
(KIPS)	х	Y	Z	х	Y	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	
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	1'-11"	%"	1'-8"	1'-7"	1/2"	1'-8"	1'-9"	4%"	1'-10'/4"	r-11"	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 1/4" DIA. ANCHOR BOLTS ARE USED AND 21/4" WHEN 1/2" 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 1/8" THICK BEARING PAD THE SAME SIZE AS MASONRY PLATE "D" FOR EACH BEARING.

ANCHOR BOLTS SHALL BE THREADED 3". PROVIDE ONE STANDARD WROUGHT WASHER AND ONE HEX NUT PER BOLT. PROJECT ANCHOR BOLTS, MASONRY PLATE "D" THICKNESS + 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 MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A709 GRADE 36, OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND FLONGATION.

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

- $\hfill \square$  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 FINISM SPECIFIED AND ARE CLEAN AND FREE OF ALL DUST, MOISTURE, OR ANY OTHER FOREION MATTER.

### DESIGNER NOTES

HEIGHT OF BEARINGS GIVEN IN TABLES INCLUDES  $V_8$ " BEARING PAD, 16 GAGE STAINLESS STEEL SHEET AND  $V_{16}$ " TEFLON SURFACE.

(SEE "DESIGNER NOTES" FOR BEARING REPLACEMENTS)

DETAIL SHIM PLATES AS DESCRIBED IN NOTES ON STANDARD 24.02.

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

AT ABUTMENTS, WHEN THE 'X' DIMENSION OF PLATE "A" EXCEEDS 11", INCREASE STANDARD DISTANCE FROM  $\widehat{\mathbb{Q}}$  OF BEARING TO END OF GIRDER.

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

FOR BEARING REPLACEMENTS, DESIGNER SHALL UTILIZE A WIDER BEARING THAN THE EXISTING GIRDER BOTTOM FLANGE WIDTH TO ALLOW FOR FIELD WELDING CEETHNEEDE OF THE BOTTOM FLANGE TO THE TOP OF PLATE "C". SEE STANADAD 4.00.8 FOR DETAILS, FOR BEARING REPLACEMENTS, SSEE STD, 27.02 FOR MINIMUM ANCHOR BOOT BEAGARAMEEPUNESMENTSUNSEE STD, 27.02 FOR MINIMUM ANCHOR BOLT CLEARANCE INFORMATION.

BOLT CLEARANCE INFORMATION.

BOLT CLEARANCE INFORMATION.

DISCORPENSION OF THE TRANSPORT OF

CALCULATE THE REACTIONS AT THE BEARINGS DUE TO "TOTAL LOADS" AND ALSO "DEAD LOADS" ONLY. USE THE AASHTO LRFD SERVICE I LOAD COMBINATION. CONSIDER ONLY DEAD LOAD 10C + D0W AND HL-93 LIVE LOADS (LL). INCLUDING A 33% DYNAMIC LOAD ALLOVANCE (MIX.)

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

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

#### ANCHOR BOLT NOTES

FOR SPAN LENGTHS UP TO 100'-0": USE A TYPE I MASONRY PLATE "D" WITH (2) -  $1^1\!/_4$  " 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) - 1/2" DIA. X 1'-10" LONG ANCHOR BOLTS.

FOR SPAN LENGTHS GREATER THAN 150'-0": USE A TYPE II MASONRY PLATE "D" WITH (4) - 11/2" DIA. X 1'-10" LONG ANCHOR BOLTS.

CHECK THAT ANCHOR BOLTS PROVIDE ADEQUATE HORIZONTAL CAPACITY.

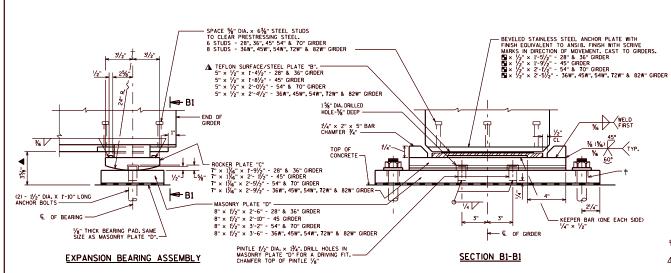
STAINLESS STEEL - TFE EXPANSION BEARING DETAILS TYPE 'A-T'

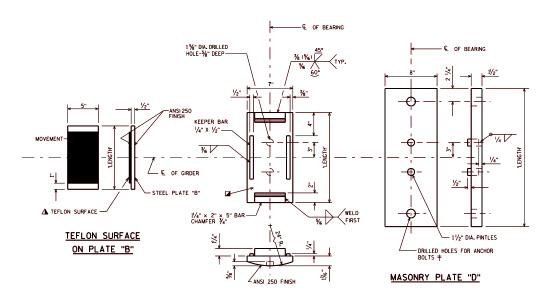


APPROVED:

Bill Oliva

DATE: 1-19





ROCKER PLATE "C"

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 MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A709 GRADE 36, 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 +  $2^{\prime}/4$ ", ABOVE 10P 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 PANITED, 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,

- $\ddef$  DRILLED HOLES FOR ANCHOR BOLTS IN MASONRY PLATE "D" SHALL HAVE A DIAMETER  $\ddef{masonry}$  Larger than anchor bolt.
- $\Delta$  TEFLON SURFACE, USE UNFILLED WITH MINIMUM  $/\!/_{6}"$  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, ENGURESS ANNESSSSTEELS SUDDING FACE OF TIME LUPPER ELEMENT AND THE TER SLIDING FACE OF THE LOWER ELEMENT HAVE THE SURFACE FINISH SPECIFIED AND ARE CLEAN AND FREE OF TALL 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 AASHTO 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 (M).

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 ANSI 250 FINISH TO TOP AND BOTTOM SURFACE OF THESE PLATES.

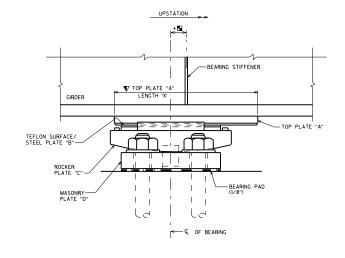
APPROVED:

	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

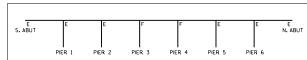
STEEL BEARINGS FOR PRESTRESSED CONCRETE GIRDERS



Bill Oliva



EXPANSION BEARING ASSEMBLY FOR STEEL GIRDER (SHOW ON PLANS)



BELOW SHOWS AN EXAMPLE BEARING OFFSET TABLE BASED ON THE SAMPLE BRIDGE SHOWN ABOVE. SUCH A TABLE SHOULD BE PROVIDED FOR STEEL GROER BRIDGES. THE OFFSET TABLE MAY BE OMITED AT THE JOSCRETION OF THE DESIGN ENGINEER IF THE VALUES ARE NEGLIGIBLE. (THE BRIDGE SCHEMATIC SHOULD NOT BE SHOWN ON THE PLANS)

°F	S. ABUT	PIER 1	PIER 2	PIER 5	PIER 6	N. ABUT
30	0.7	0.5	0.3	-0.3	-0.5	-0.7
45	0	0	0	0	0	0
60	-0.7	-0.5	-0.3	0.3	0.5	0.7
75	-1.6	-1.1	-0.7	0.7	1.1	1.6
an	-2.4	-17	-1.0	1.0	1.7	2.4

# BEARING OFFSET TABLE

ALL DIMENSIONS IN INCHES
AMBIENT TEMPERATURE DURING GIRDER INSTALLATION

#### **NOTES**

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

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

#### DESIGNER NOTES

THIS STANDARD SHOULD ONLY BE USED FOR STEEL BEARINGS.

▼ TOP PLATE "A" FOR STEEL GROER 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.

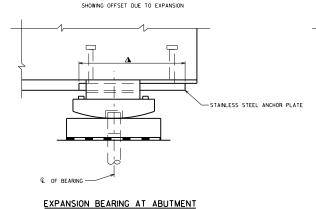
PROCEDURE FOR SIZING ANCHOR PLATE:

- 2½ INCHES = ½ TEFLON PLATE LENGTH + THERMAL MOVEMENT (USE 60-5-55 DEGREES) + SHRINKAGE = 0,003'/' + I' CONSTRUCTION TOLERANCE

= 1/2 ANCHOR PLATE LENGTH (DOUBLE THIS FOR ANCHOR PLATE LENGTH)

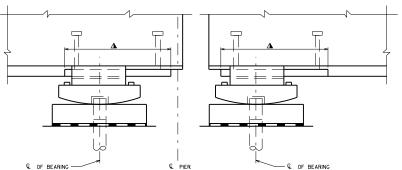
ACCORDING TO AASHTO, THE LOAD FACTOR FOR TU IS 1.20 FOR DEFORMATIONS. THE PROCEDURE OUTLINED ABOVE SHOULD BE USED WITH A LOAD FACTOR OF 1.0, WITH THE IT CONSTRUCTION TOLERANCE BEING USED IN LIEU OF THE HIGHER LOAD FACTOR.

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.



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

SHOWING OFFSET DUE TO EXPANSION OR CONTRACTION



EXPANSION BEARINGS AT PIER

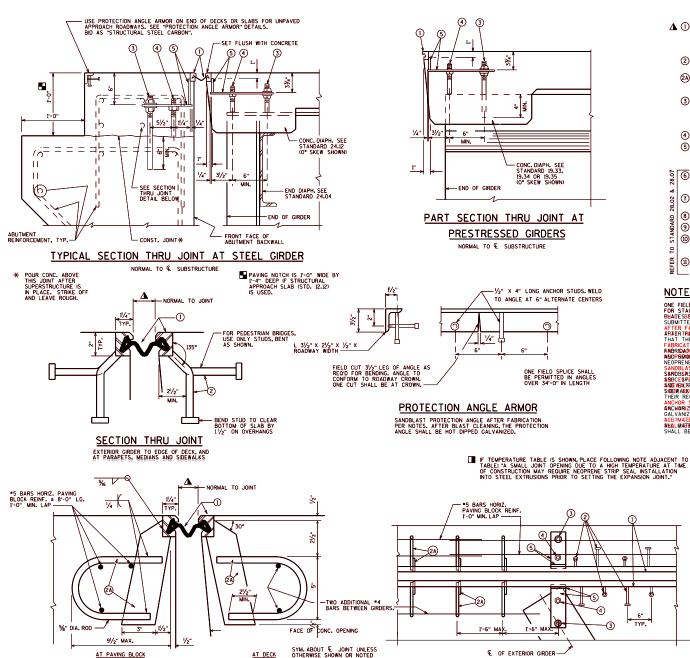
PRESTRESSED GIRDER (CONC. DIAPHS, NOT SHOWN FOR CLARITY) FOR DESIGNER INFORMATION, ONLY
(DO NOT PUT ON THE PLANS)

STEEL EXPANSION BEARING DETAILS



APPROVED:

Bill Oliva



SECTION THRU JOINT

ROADWAY TRAFFIC AREA BETWEEN EXTERIOR GIRDERS.

#### 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 O'PENINGS FROM 5'F TO 85'F IN 10'F ROREWEYTS. ACCOUNT FOR PRESTRESSED GROBER SHRINKAGE DUE TO CREEP WHEN DETERMINING THIS TABLE. JOINT O'PENINGS GIVEN NORMAL TO JOINT.
  - (2) STUDS 5%" DIA. X 63%" LONG AT 6" ALTERNATE CENTERS. WELD TO EXTRUSIONS AND BEND AS SHOWN AFTER WELDING.
  - $\slash\hspace{-0.6em} 2$  /2" THICK ANCHOR PLATE WITH %" DIA, ROD (OR ALTERNATE STRIP SEAL ANCHOR). WELD ROD TO ANCHOR PLATE, WELD ANCHOR PLATE TO NO. 1 AT 1-6" CENTERS BETWEEN GROERS.
  - $rac{N}{4}$ " DIA. THREADED ROD WITH 2 NUTS AND PLATE WASHERS, FOR PRESTRESSED GIRDERS, GROUT THREADED ROD INTO FIELD DRILLED HOLES ON  $rac{N}{2}$  OF GIRDER, FOR STEEL GIRDERS, WELD THREADED ROD TO TOP FLANGE OR ATTACH BY BOLTING THRU FLANGE. ON ABUTINENT SIDE, GROUT THREADED ROD INTO FIELD DRILLED HOLES IN ABUTINETS BACKWALL AS SHOWN.
  - 4 34" DIA. THREADED ROD WITH NUT. TACK WELD NUT TO NO. 5.
  - (3) FABRICATE SUPPORT FROM 3" X ½" BAR AS SHOWN OR EQUIVALENT. ONE PER GIRCER PER SIDE. SHOP OR FIELD WELD TO NO. 1. IF FIELD WELDED, COVER WELDED AREAS WITH EPOXY-COATING MATERIAL. PROVIDE ½" DIA. HOLE FOR NO. 3 AND 1" DIA. HOLE FOR NO. 4.
- 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. SEE STANDARD 28.07.
- 7 %," DIA. X 1½," STAINLESS STEEL SOCKET FLAT HEAD SCREWS WITH ANTI-SEIZE LUBRICANT. PLACE IN COUNTERSUNK HOLE. RECESS  $V_{16}$ " BELOW PLATE SURFACE.
- (8) 3/4" DIA. X 4" GALVANIZED HEX HEAD BOLT, BEND 45°.
- (ii) SIDEWALK COVER PLATE %" X (2'-0" WIDE FOR SKEWS TO 45" AND 3'-0" WIDE FOR SKEWS > 45") X LIMITS SHOWN. BEND DOWN FACE OF SIDEWALK WITH HOLES FOR NO. 7. GALVANIZE PLATE AFTER SLIP-RESISTANT SURFACE IS APPLIED.
- (1) 1" X 5" SLOTTED COUNTERSUNK HOLE FOR NO. 7. PLACE SLOT PARALLEL TO DIRECTION OF MOVEMENT.

#### NOTES

PART PLAN

NOTES

NOR FIELD SPLICE PERMITTED IN STEEL EVTRUSIONS UNLESS MORE ARE REQUIRED

FOR STAGED CONSTRUCTION, HANDLING OR GALVANIZING REQUIREMENTS, IF USED, BERMOR

FOR STAGED CONSTRUCTION, HANDLING OR GALVANIZING REQUIREMENTS, IF USED, BERMOR

BHAIF SAGNIMENEST HERMORE PEPRORAM, AND SPLICING PERMITTED IN NEOPRENE STRIP SEAL.

AFTER FABRICATION, BUT BEFORE SHIPMENT, STRAIGHTER STEEL EXTRUSIONS SUCH

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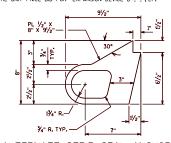
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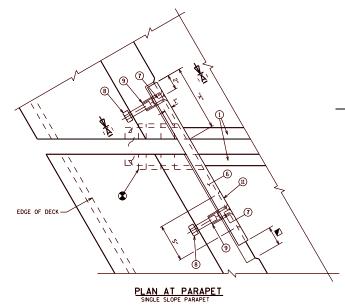
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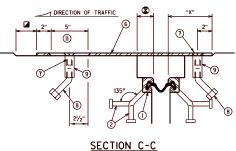


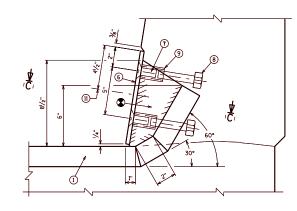
ALTERNATE STRIP SEAL ANCHOR

STRIP SEAL EXPANSION JOINT DETAILS



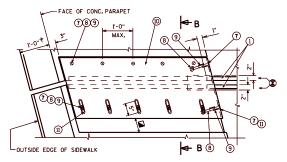






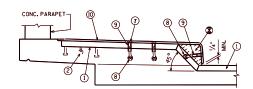
SECTION A-A
SINGLE SLOPE PARAPET

"X" - \	/ALUES IN	INCHES				ı	JSE "X" =	61/2" FOF	R O° SKE	٧			
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

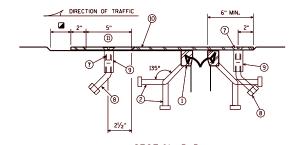


#### PLAN AT SIDEWALK

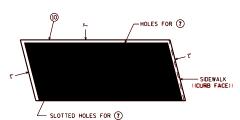
† 1'-2" WHEN "VERTICAL FACE PARAPET TYPE 'TX'IS USED



SECTION AT SIDEWALK



SECTION B-B



# PLAN OF SIDEWALK COVER PLATE WITH SLIP-RESISTANT SURFACE

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

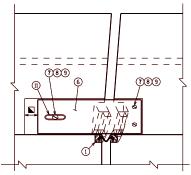
### DESIGNER NOTES

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

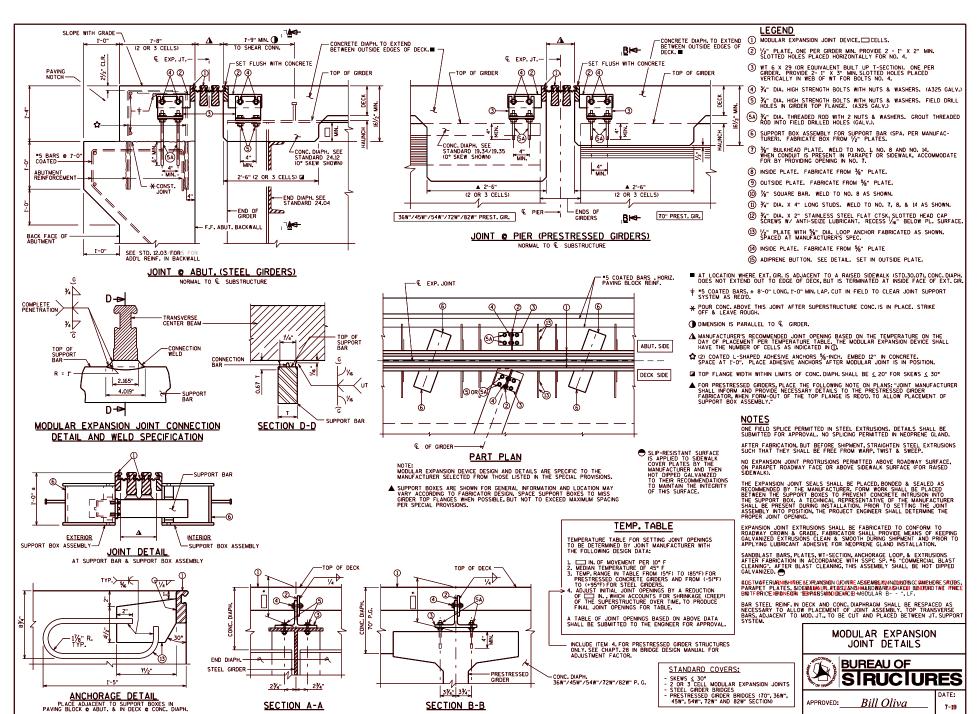
FROM ROADWAY
SINGLE SLOPE PARAPET

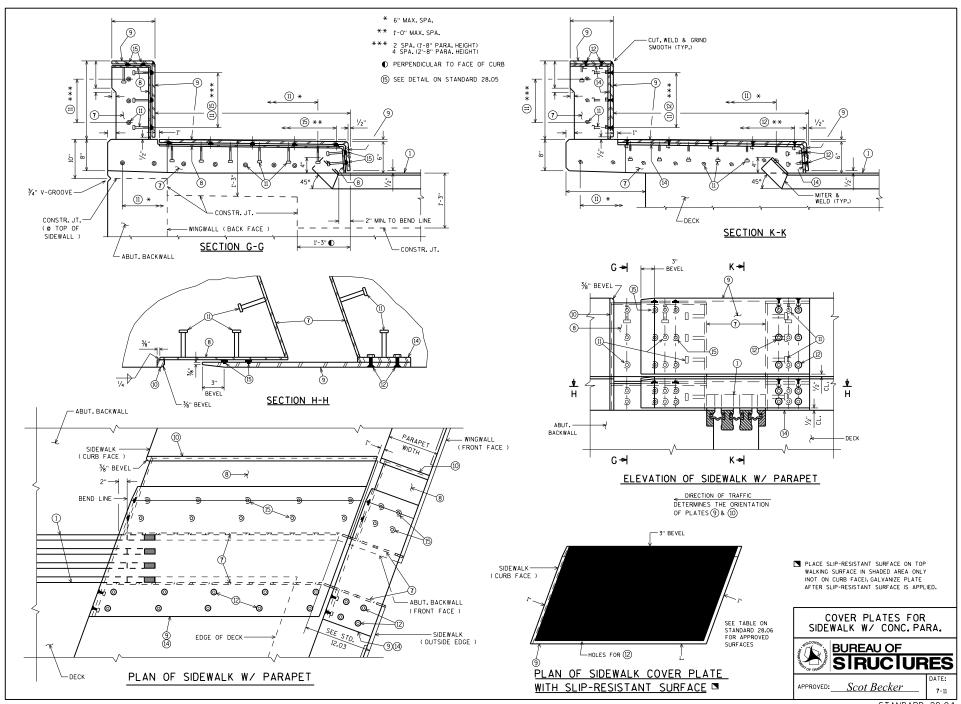
- BLOCK OUT CONCRETE 2" EACH SIDE OF JOINT OPENING
- ✓ JOINT OPENING DIM. ALONG SKEW PLUS 1/2"

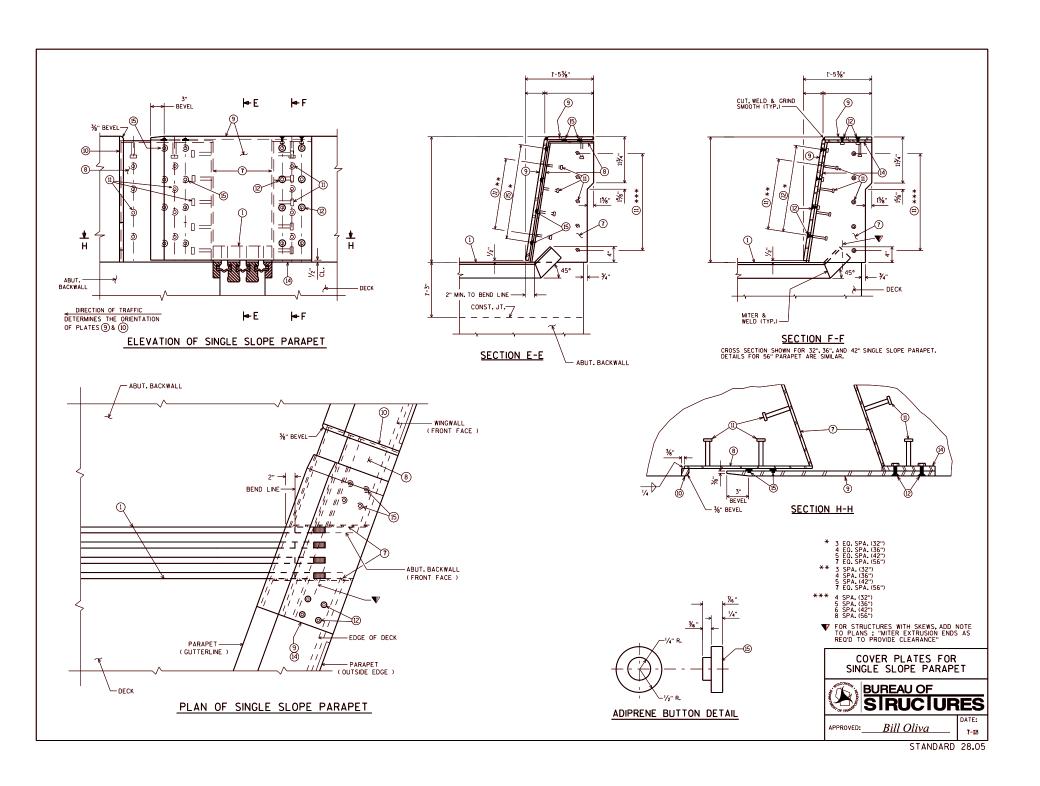
STRIP SEAL COVER PLATES SINGLE SLOPE PARA./SDWK.

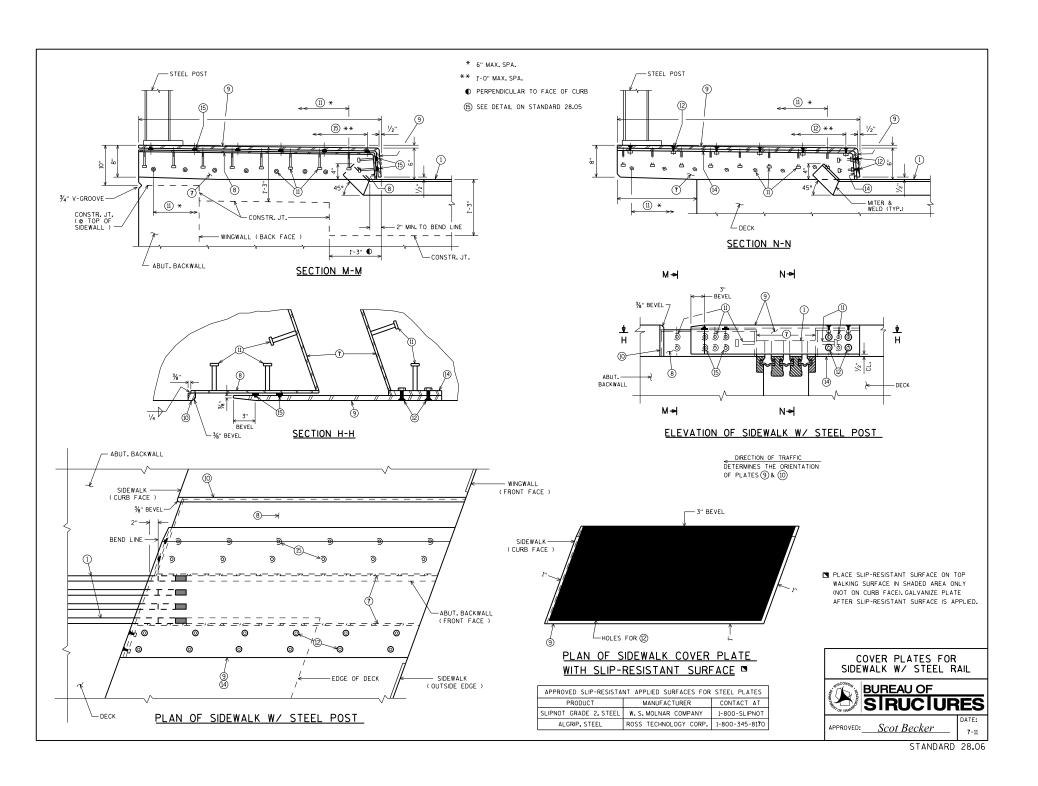


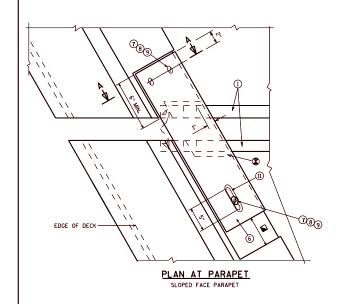
1 B

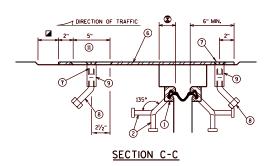


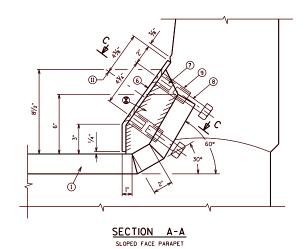




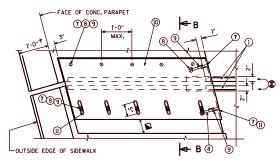






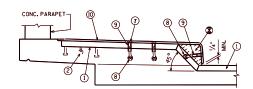


(6) GALVANIZED PLATE  $\frac{7}{3}$ " ×  $10\frac{1}{2}$ " ×  $(2^{\circ}-2^{\circ})$  LONG FOR SKEWS TO 45° AND 3'-0" LONG FOR SKEWS  $\geq$  45°) WITH HOLES FOR NO. 7. BEND AS SHOWN.

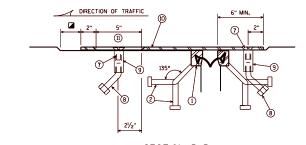


#### PLAN AT SIDEWALK

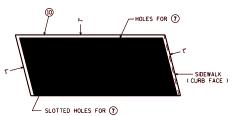
† 1'-2" WHEN "VERTICAL FACE PARAPET TYPE 'TX' IS USED



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

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.

000
VIEW OF DADADET DIATES

#### VIEW OF PARAPET PLATES

#### FROM ROADWAY

SLOPED FACE PARAPET

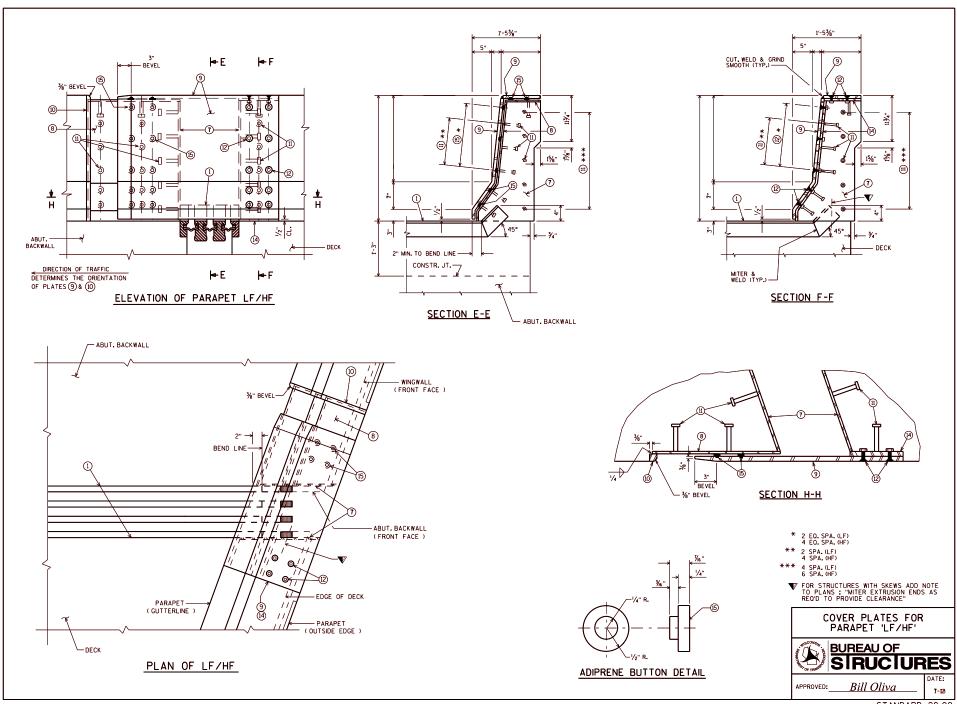
- BLOCK OUT CONCRETE 2" EACH SIDE OF JOINT OPENING
- ✓ JOINT OPENING DIM. ALONG SKEW PLUS 1/2"

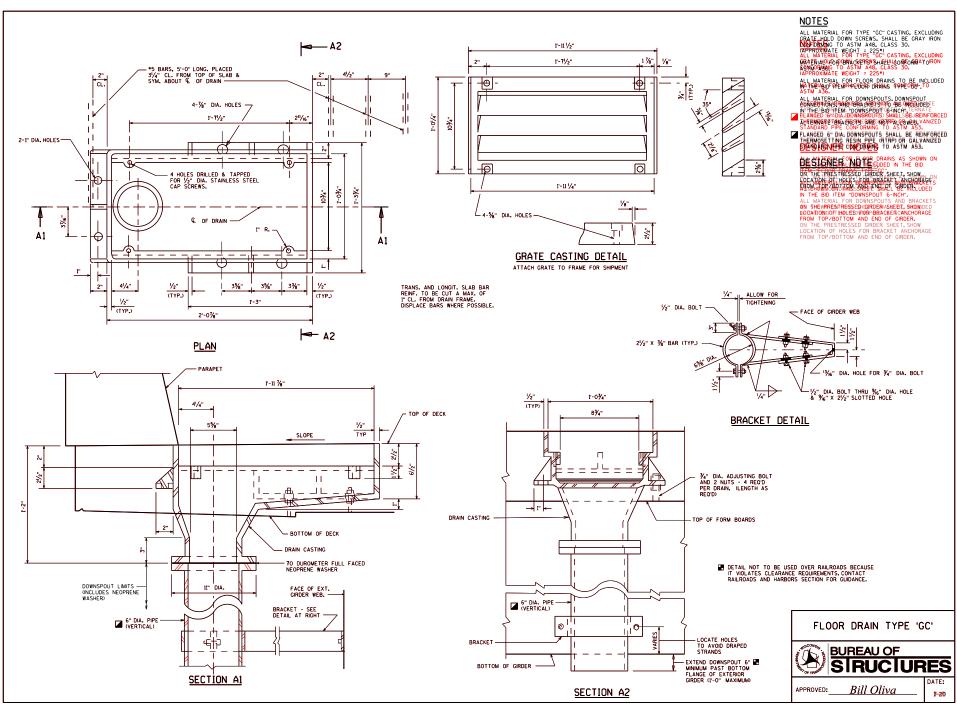
STRIP SEAL COVER PLATES SLOPED FACE PARA./SDWK.

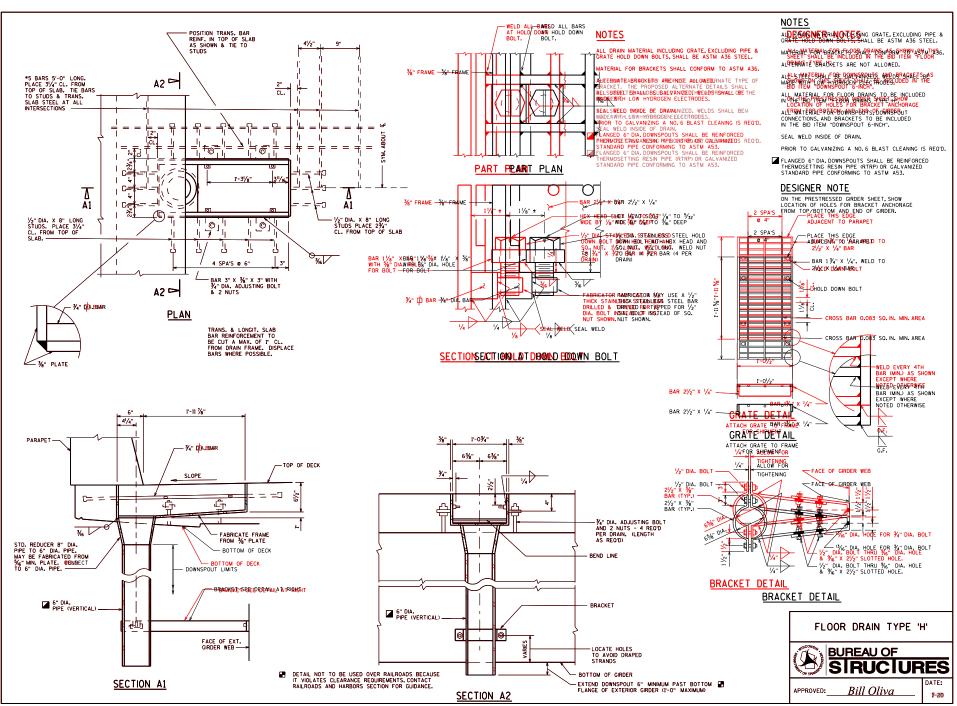


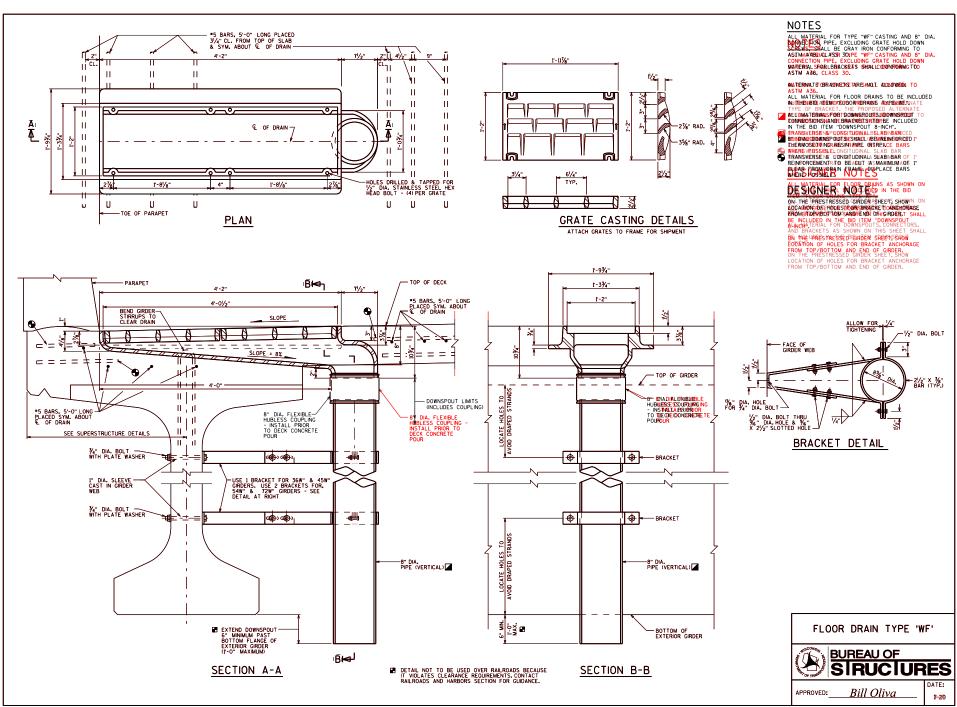
APPROVED: <u>Bill Oliva</u>

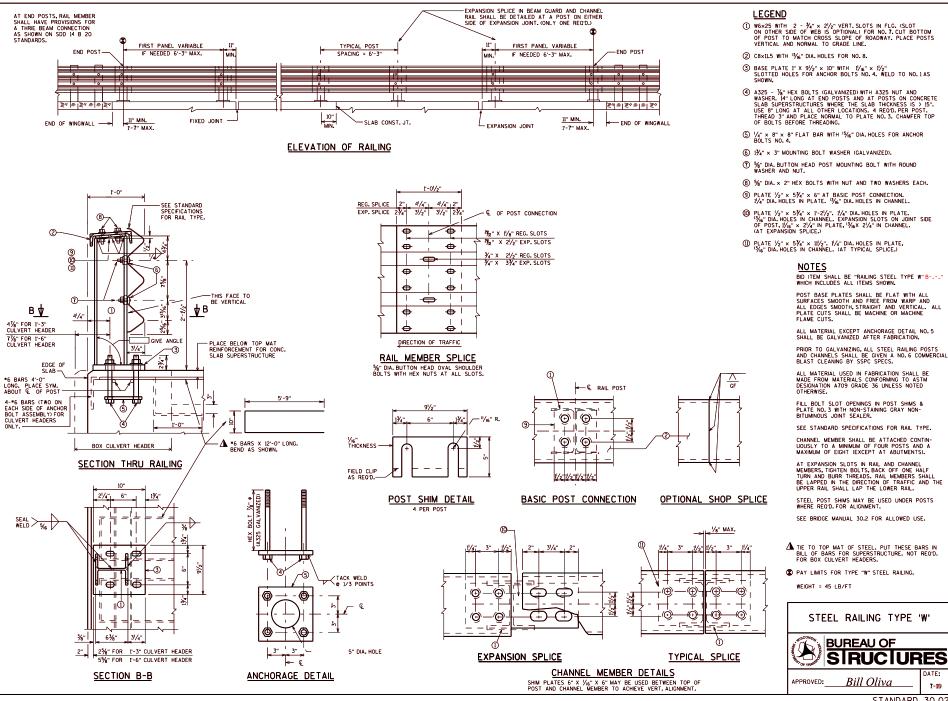
<u>r-20</u>

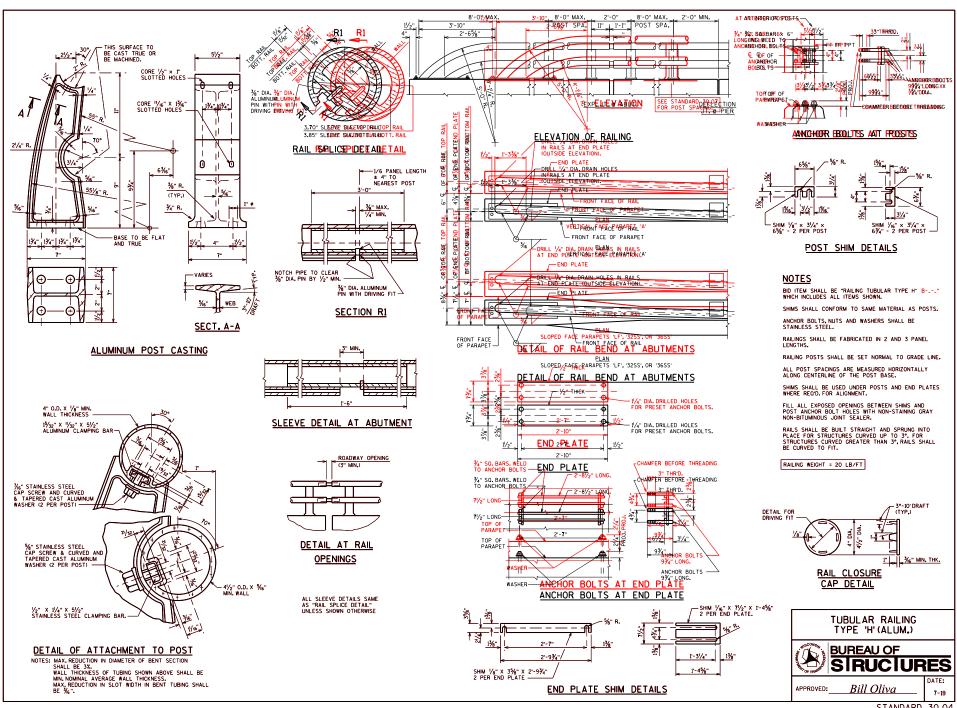


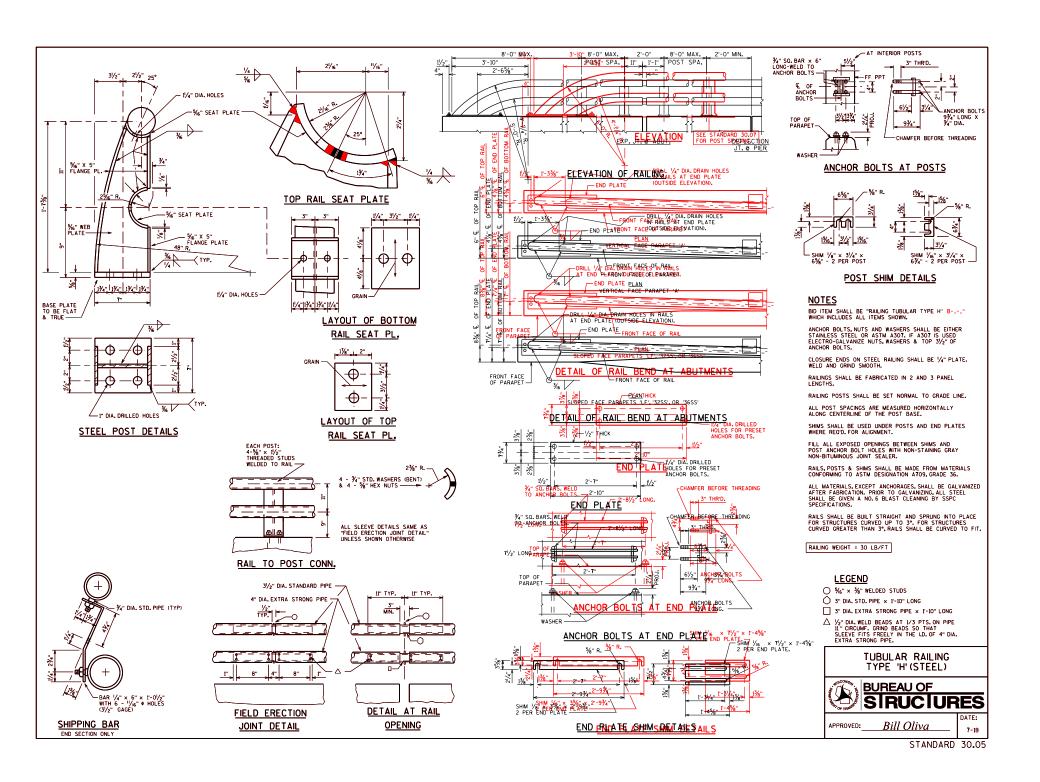


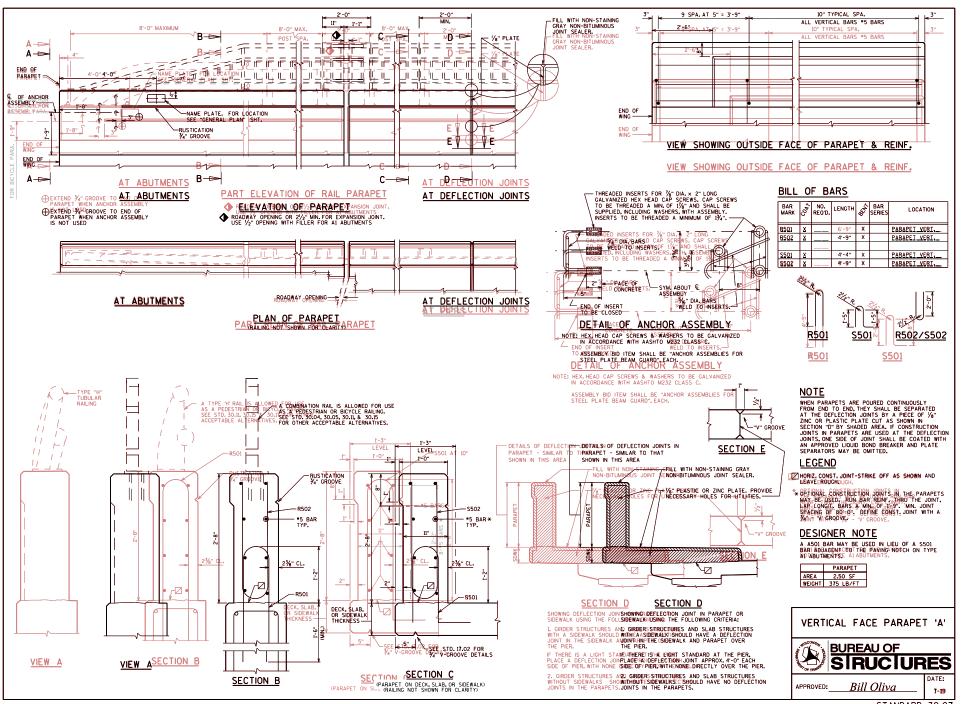


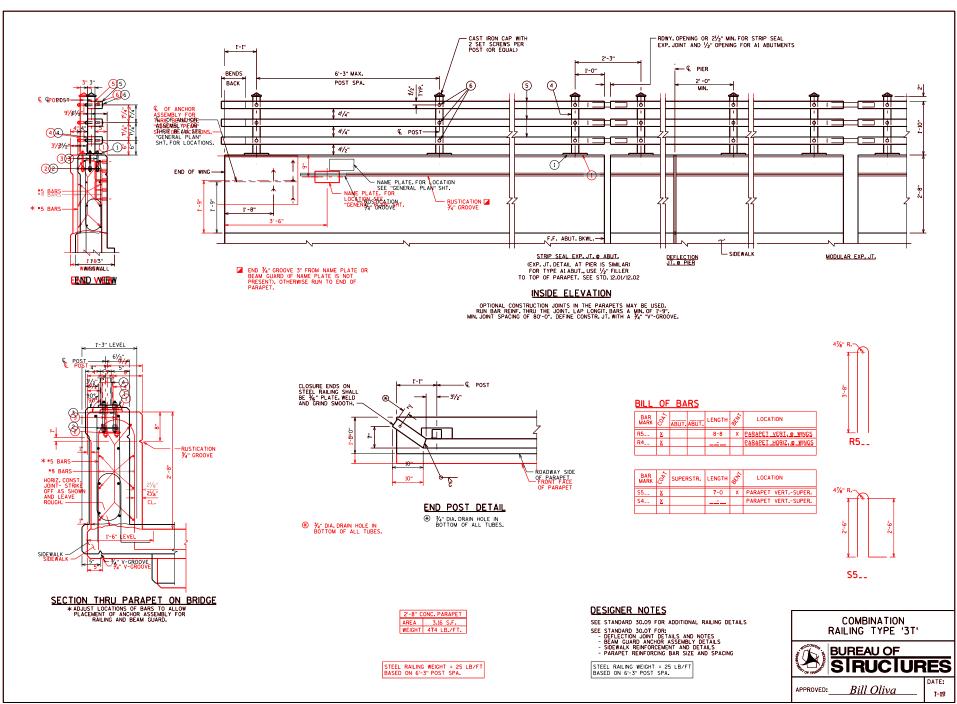


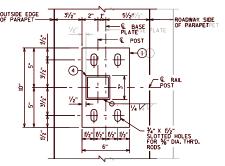




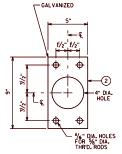




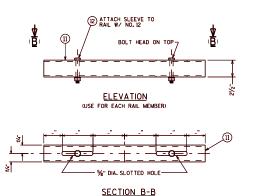




TYPICAL RAIL POST BASE PLATE

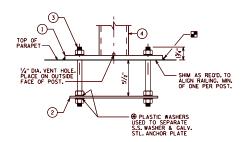


ANCHOR PLATE



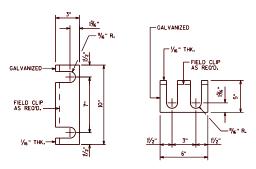
SLEEVE DETAIL
(AT MODULAR EXP. JT.)

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

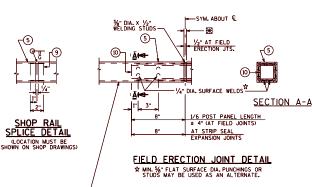


ANCHORAGE FOR RAIL POSTS

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



RAIL POST SHIM DETAIL
(2 SETS PER POST)



PROVIDE ¾" DIA. DRAIN HOLES IN LOW END OF ALL RAILS, CLEAR OF SPLICE SLEEVE.

RDWY. OPENING OR 2½" MIN. FOR STRIP SEAL EXP. JOINT AND ½" OPENING FOR AL ABUTMENTS

## **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 1/4" DIA. HOLES FOR THR'D. RODS NO. 3.
- (3) 5/8" 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  $\cancel{3}_{16}$ " POSTS, PLACE VERTICAL. WELD TO NO. 1, AND USE 1" DIA, HOLES (FRONT AND BACK) FOR BOLT NO. 6.
- (5) STRUCTURAL TUBING 3" X 3" X 3% " RAILS, WITH 1% " DIA, HOLES (FRONT AND BACK) FOR BOLT NO, 6, BOLT TO NO, 4.
- 6 %" DIA. A325 SLOTTED ROUND HEAD BOLT WITH HEX NUT, 1/2" X 1/2" X 1/2" WASHER, AND LOCK WASHER.
- (9) RECTANGULAR SLEEVE FABRICATED FROM 36" 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 21/2" X 21/2" X 3/6" 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 COMPORM TO SECTIONS560222205NDH50273MO.HD THE SITUNDARDS. SPECIFICATIONS.

### NOTES

BID ITEM SHALL BE "RAILING STEEL TYPE 3T", BWHICH, SHALL SNGLUDE (CALLDE 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 OF MACHINE FLAME CUT.

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

ALL PLATES, AND RECTANGULAR SLEEVES SHALL CONFORM TO ASTM ATOS GRADE 35, ALL STRUCTURAL TUBING SHALL CONFORM TO ASTM ASOO GRADE B. ANCHORAGES SHALL BE ACCURATELY PLACED TO PROVIDE CORRECT ALIGNMENT OF RALING, 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.

 $\blacksquare$  Caulk around perimeter of base plates, no. 1, and fill bolt slot openings in shims and base plates with non-staining gray non-bituminous joint sealer.

ALL JOINTS IN CONCRETE PARAPET ARE TO BE VERTICAL.

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

WHEN 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 PANTED AMS: \$1D. COLOR NO.

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.

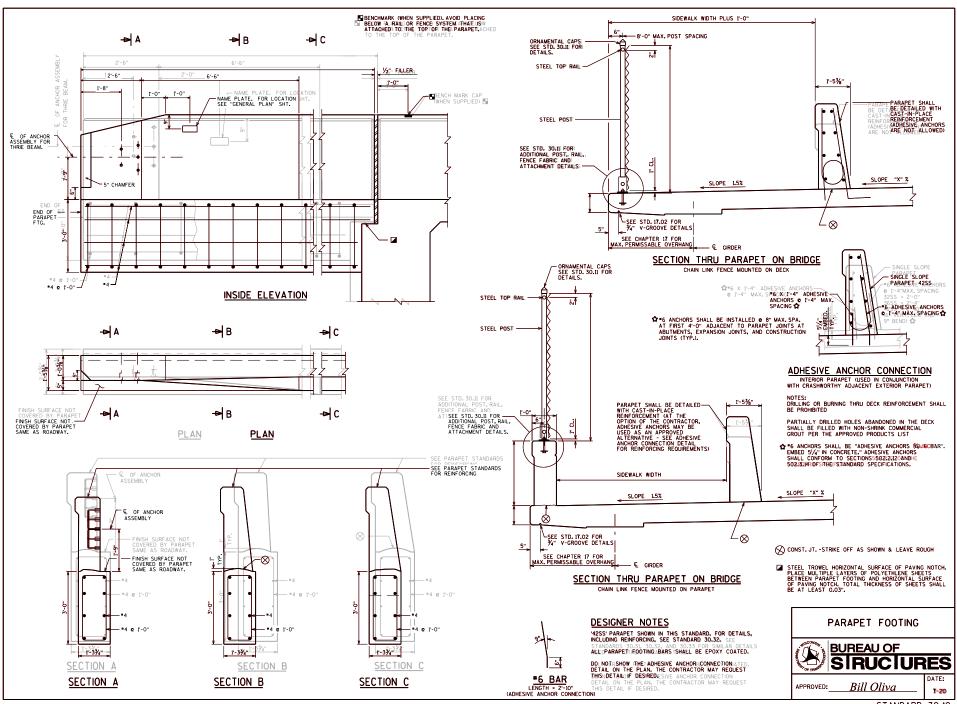
COMBINATION RAILING
TYPE '3T' DETAILS

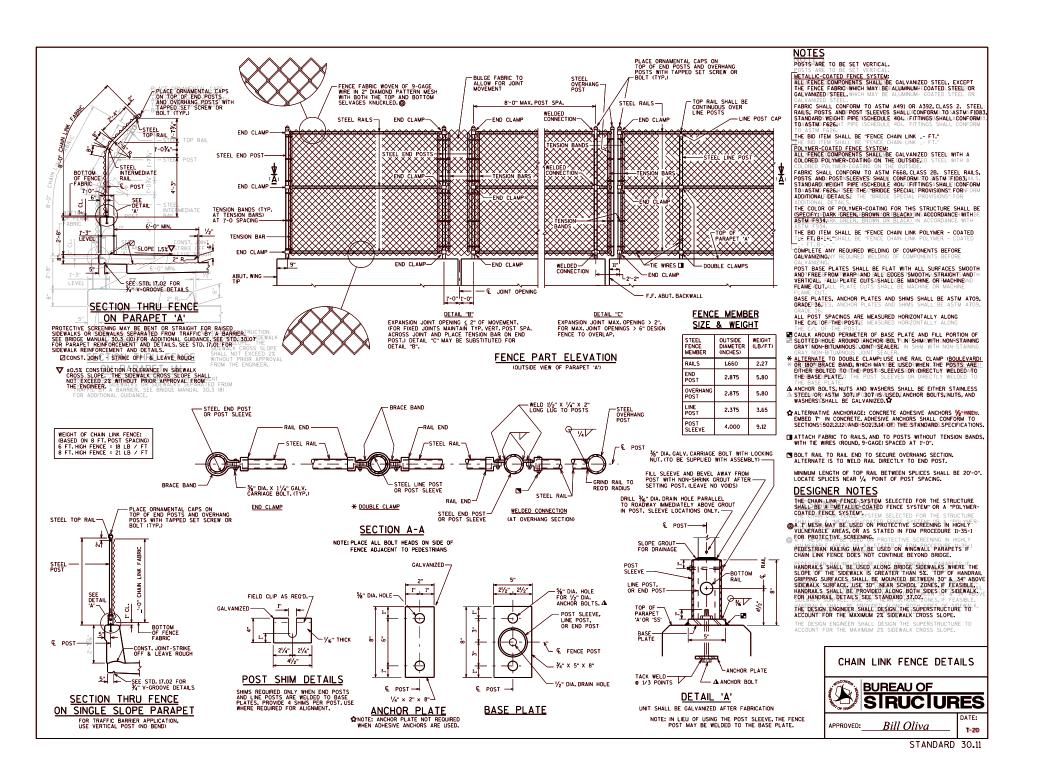


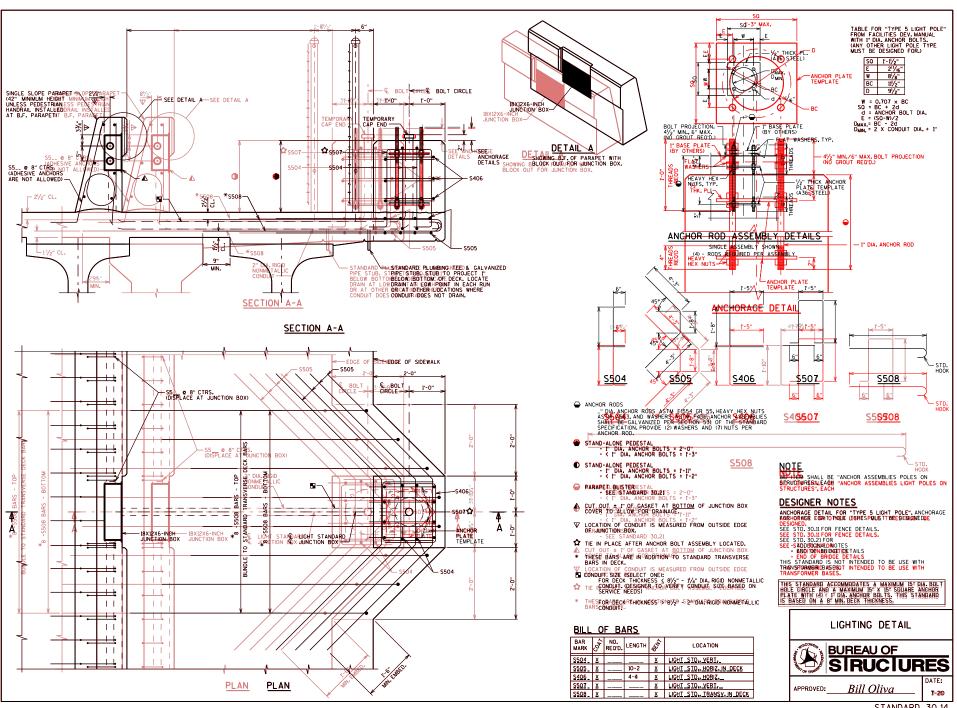
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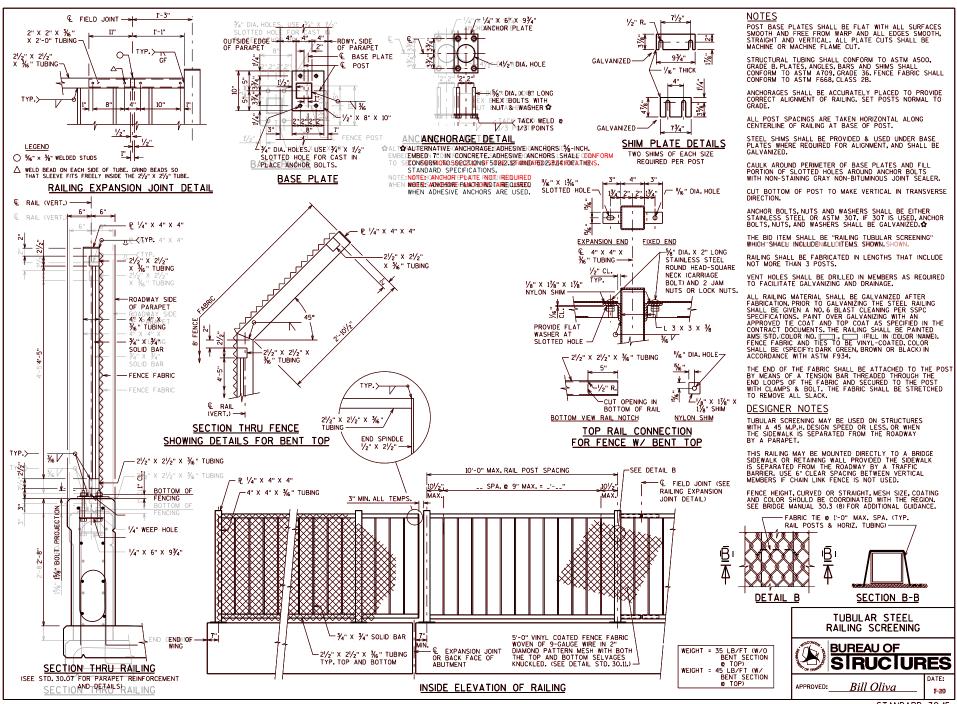
Bill Oliva

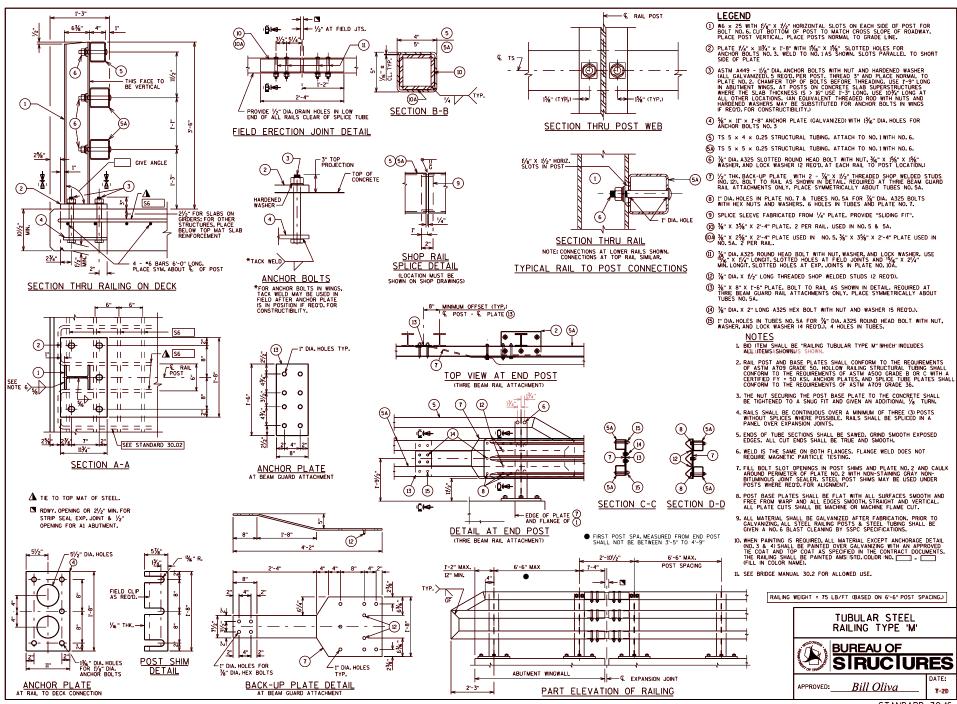
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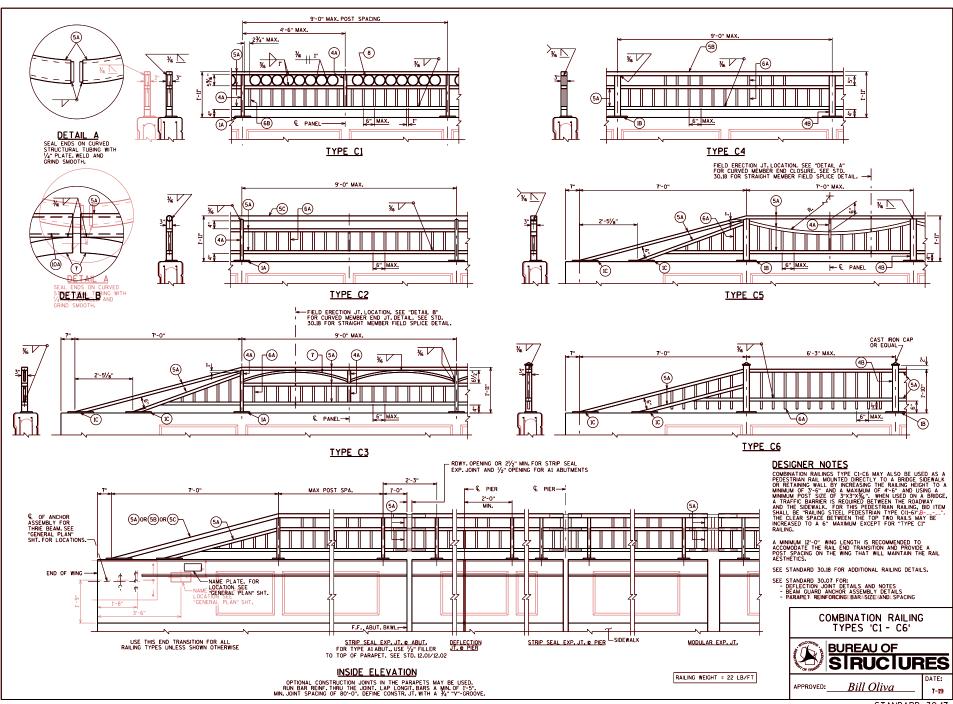


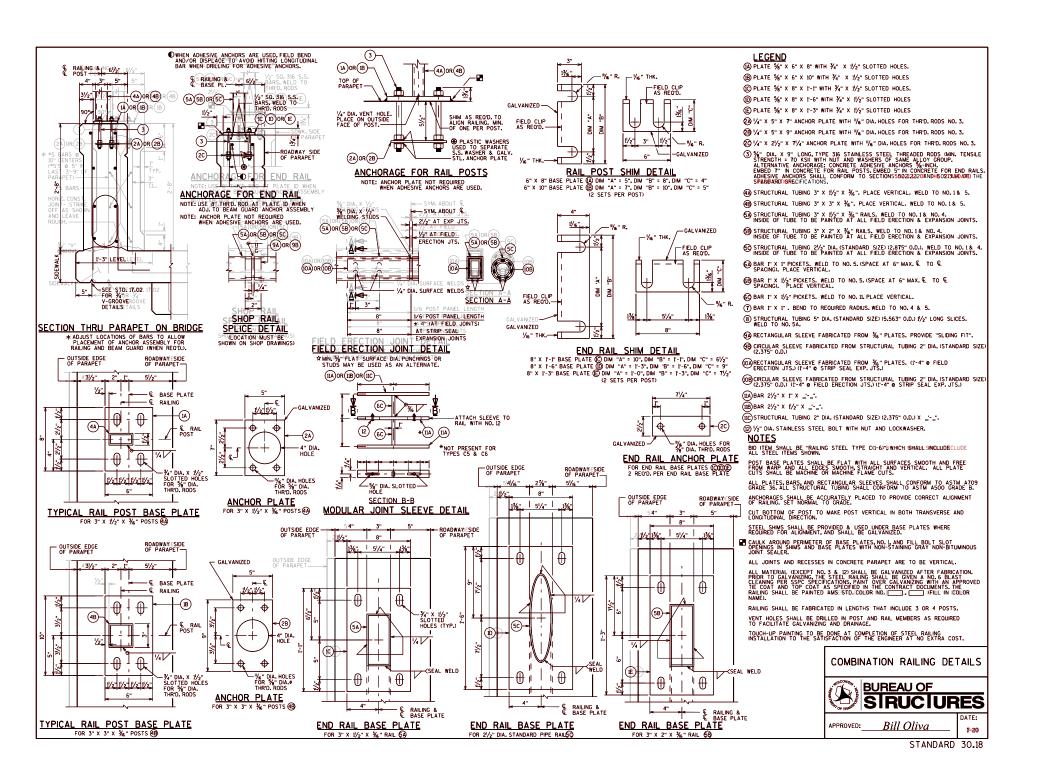


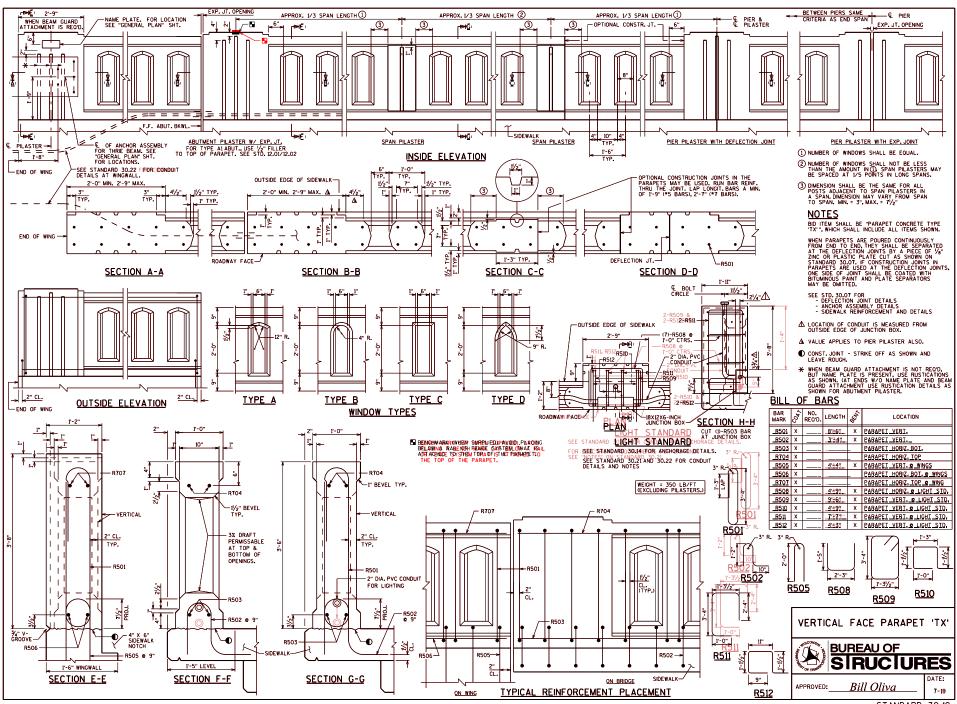


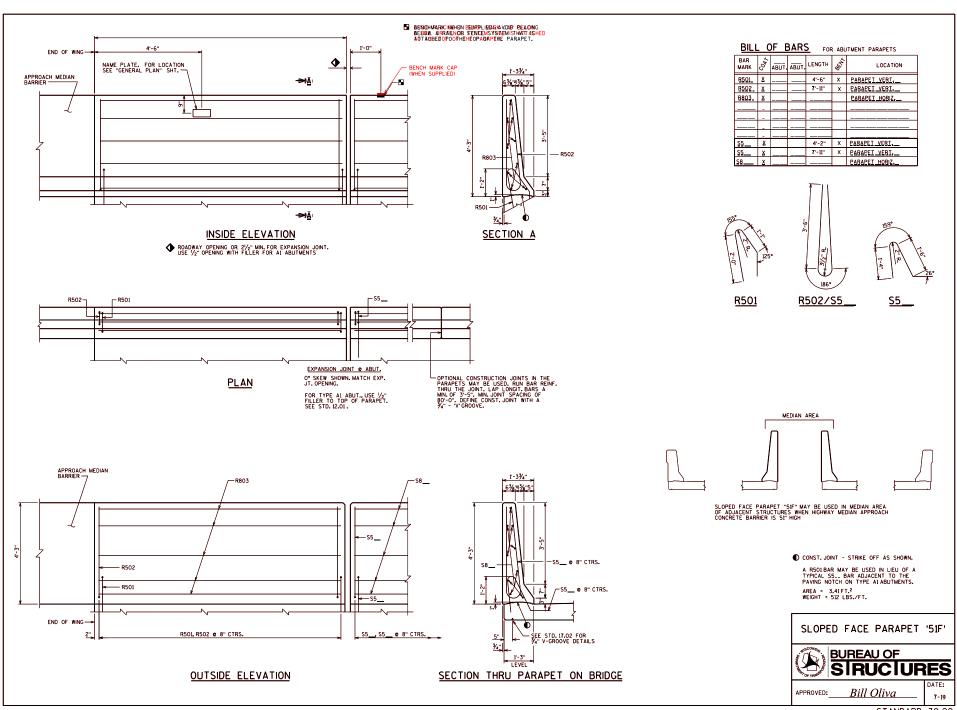


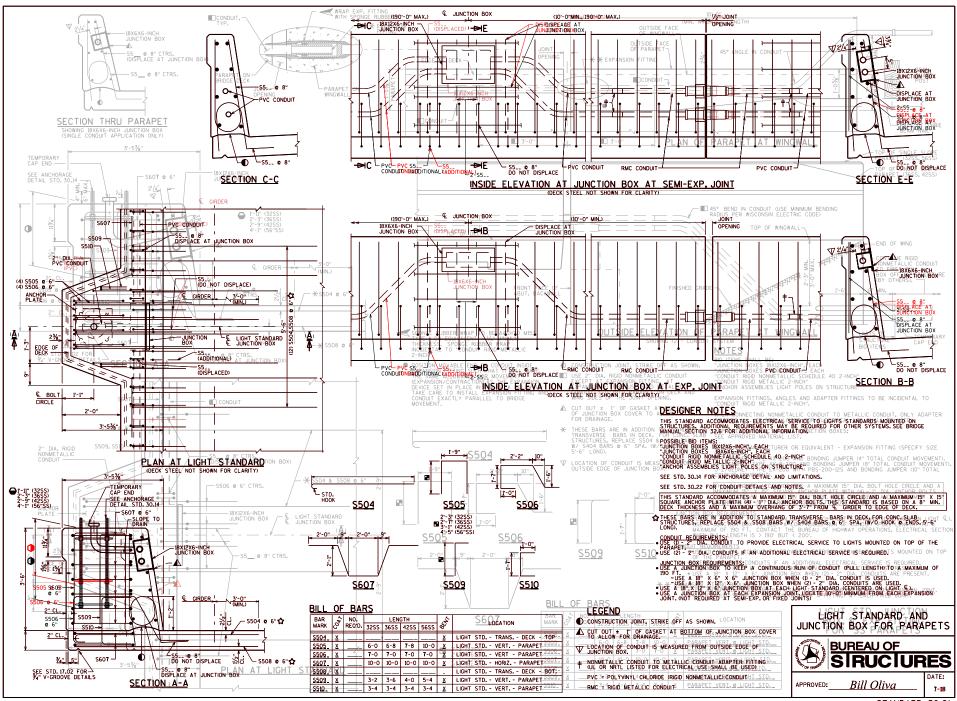


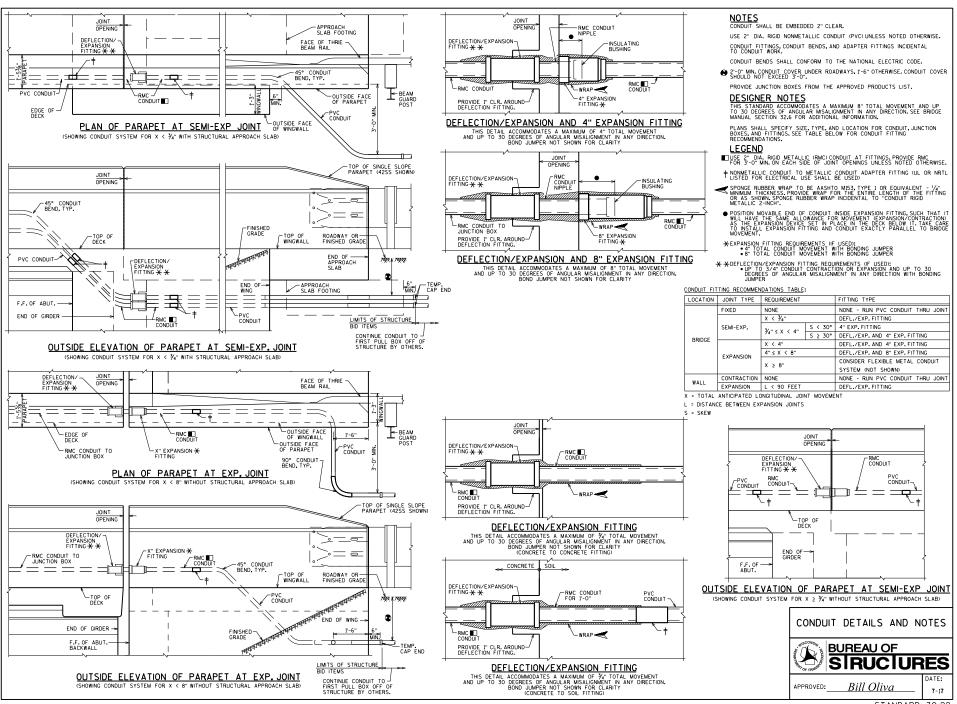


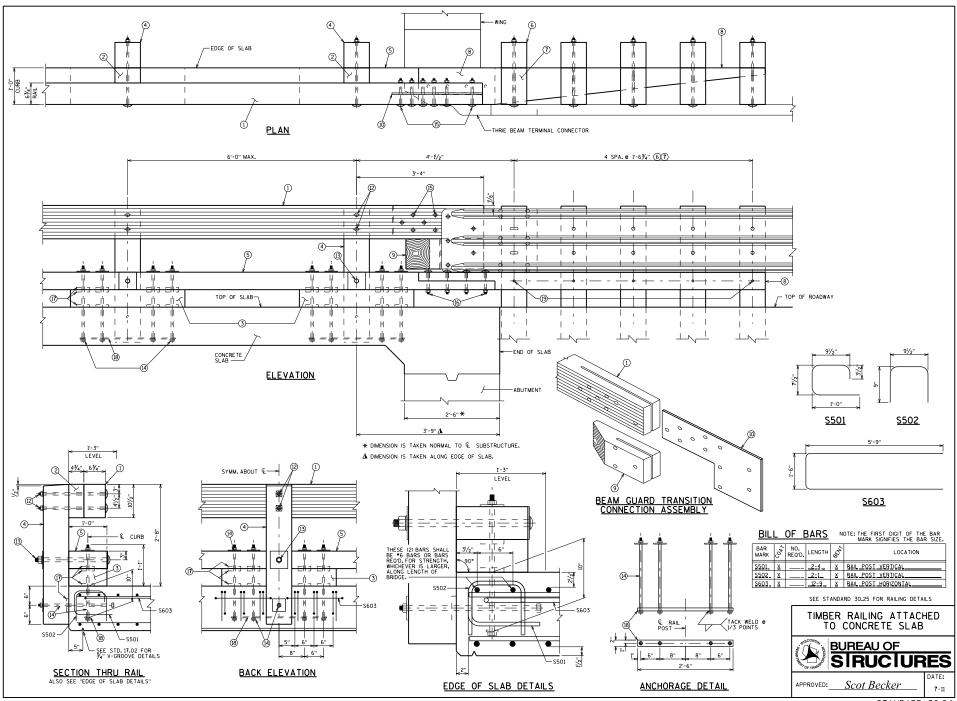


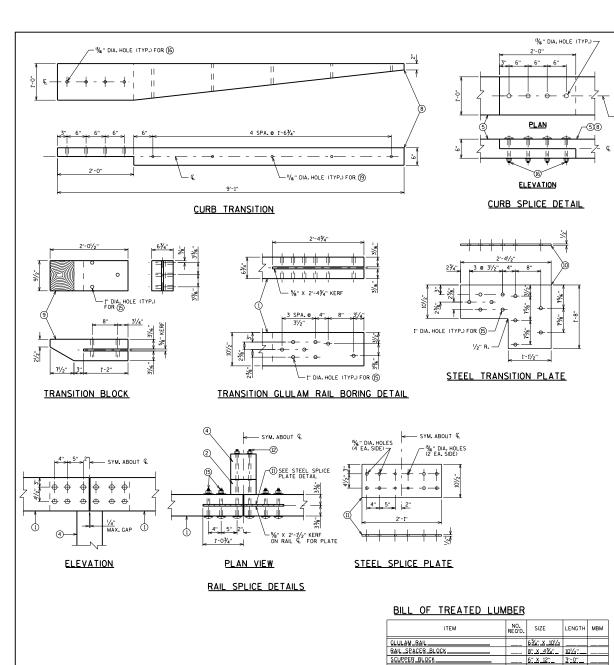












RAIL POST

IOIAL\_MBM.

CURB\_TRANSITION\_ TRANSITION\_BLOCK

CURB

# **LEGEND**

- 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"
- (5) CURB 6" X 12
- 6 RAIL POST @ BEAM GUARD 8" X 8"
- (7) RAIL SPACER BLOCK @ BEAM GUARD 8" X 111/2" X 1'-101/2'
- (8) CURB TRANSITION @ BEAM GUARD
- (9) TRANSITION BLOCK @ BEAM GUARD
- (10) STEEL TRANSITION PLATE, ASTM A36.
- (1) 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).
- 13 1/4" DIA. X 1'-10" LONG ASTM A325, DOME-HEAD BOLT W/ 2 51/2" X 51/2" X 1/4" PLATE WASHERS, W/ 13/4" DIA. HOLE. (1 REO'D. @ EACH CURB TO POST CONNECTION.)
- (4)  $\frac{1}{2}$  Dia. x I:-II" LONG ASTM A325 BOLT. 1 4" X 4" X  $\frac{1}{2}$  Y 4" X  $\frac{1}{2}$  WASHER REO'D. AT CURB TO SLAB CONNECTION. 1 4" X 4" X  $\frac{1}{2}$  PLATE WASHER REO'D. 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) ¾4" 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 TREOD. @ EACH POST TO SLAB CONNECTION. MALLEABLE IRON MEETING REQUIRENTS OF ASTM 447, GRADE 32510.
- (B) 2" x 2"-6" x  $\frac{5}{6}$ " anchor plate with 4  $^{13}\!\!/_{16}$ " dia.holes for anchor bolts no. 14 (CURB TO SLAB CONNECTION).
- $\ensuremath{^{(9)}}$   $\ensuremath{^{\%}}$  DIA, ASTM A325 DOME-HEAD BOLT W/ 1-PLATE WASHER PER BOLT. (1REO'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 CULLIAM RAILS BE CONTINUOUS OVER THE LENGTH OF THE BRIDGE.
- SAWN LUMBER AND GLULAM SHALL COMPLY WITH THE REQUIREMENTS OF AASHTO MIGB AND SHALL BE PRESSURE TREATED WITH WOOD PRESERVATIVES IN ACCORDANCE WITH AASHTO MIGB AND STANDARD SPECIFICATIONS.
- 6. BRIDGE RAIL SHALL BE HORIZONTALLY LAMINATED GLULAM, VISUALLY GRADED WESTERN SPECIES COMBINATION NO. 2, OR VISUALLY GRADED SOUTHERN PINE COMBINATION NO. 48. OTHER SPECIES AND GRADES OF GLULAM MAY BE USED, PROVIDED THE MINIMUM TABULATED VALUES ARE NOT LESS THAN THE FOLLOWING:
  - F<sub>byy</sub> = 1,800 LB/IN<sup>2</sup> E = 1,800,000 LB/IN<sup>2</sup>
- 7. POSTS, CUBBS, SCUPPERS, TRANSTION 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 SRADED NO.1 DOUGLAS FIR-LARCH, GLULAM AND OTHER SPECIES AND CRADES OF SAWN LUMBER MAY BE USED, PROVIDED THE MINIMUM TABULATED VALUES ARE NO.1ESS THAN THE FOLLOWING:
  - F<sub>b</sub> = 1,350 LB/IN<sup>2</sup> E = 1,500,000 LB/IN<sup>2</sup>
- 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.
- 10. UNLESS NOTED, MALLEABLE IRON WASHERS SHALL BE PROVIDED UNDER BOLT HEADS AND UNDER NUTS THAT ARE IN CONTACT WITH WOOD, WHEN THE SIZE AND STRENGTH OF THE HEAD ARE SUFFICIENT TO DEVELOP CONNECTION STRENGTH WITHOUT WOOD CRUSHING, WASHERS MAY BE OMNITED UNDER HEADS OF DOME-HEAD TIMBER BOLTS.
- 11. TOPS OF RAIL POSTS AND TOP OF THE RAIL SPLICE PLATE KERF SHALL BE SEALED WITH ROOFING CEMENT OR OTHERWISE PROTECTED FROM DIRECT EXPOSURE TO WEATHER.
- 12. DESTROY THREADS ON ALL BOLTS WITH A CENTER PUNCH AFTER TIGHTENING NUT. EXPOSED BOLT PROJECTION OVER 1" SHALL BE CUT OFF. REPAIR END OF BOLT BY PAINTING WITH ZINC RICH PRIMER.
- 13. WHEN PLACING OVERLAY (FWS) ON TOP OF EXISTING SLAB, THE THICKNESS OF THE OVERLAY MUST BE TAPERED NEAR THE VICINITY OF THE RAILING TO MAINTAIN THE REO'D, (CRASH TESTED) DISTANCE FROM TOP OF SLAB TO TOP OF RAIL TO 32 INCHES.
- 14. THIS RAILING MEETS NCHRP REPORT 350 EVALUATION CRITERIA FOR TEST LEVEL 2 (TL-2).

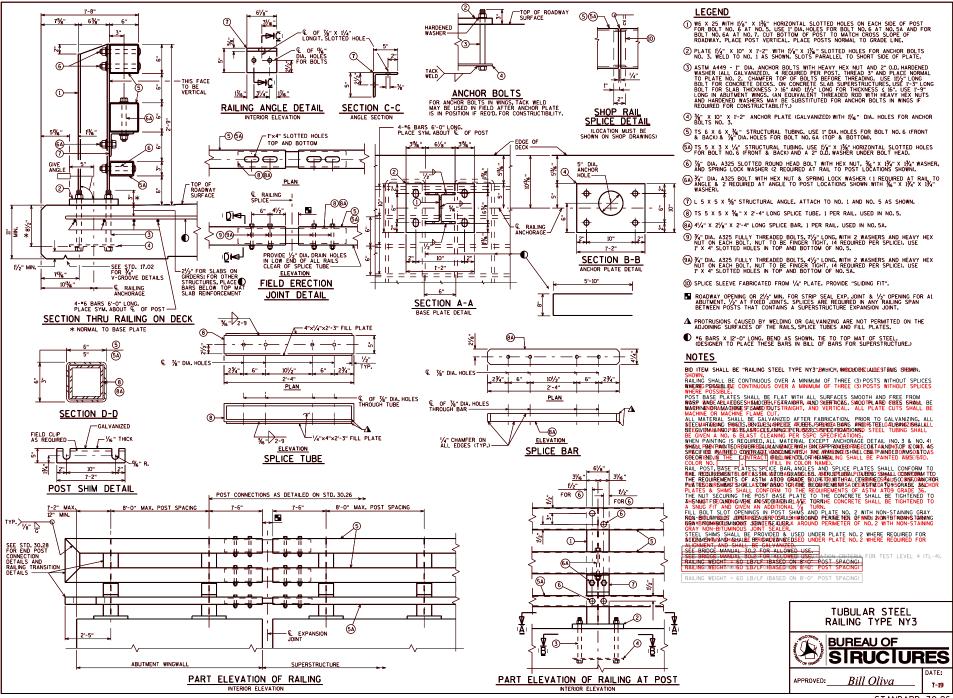
THESE RAILING DETAILS MAY BE USED WITH CONCRETE SLAB SUPERSTRUCTURES (SLAB DEPTH > 14") THAT HAVE AI ABUTMENTS WITH WINGS PARALLEL TO & OF ABUTMENT OR HAVE A5 ABUTMENTS.

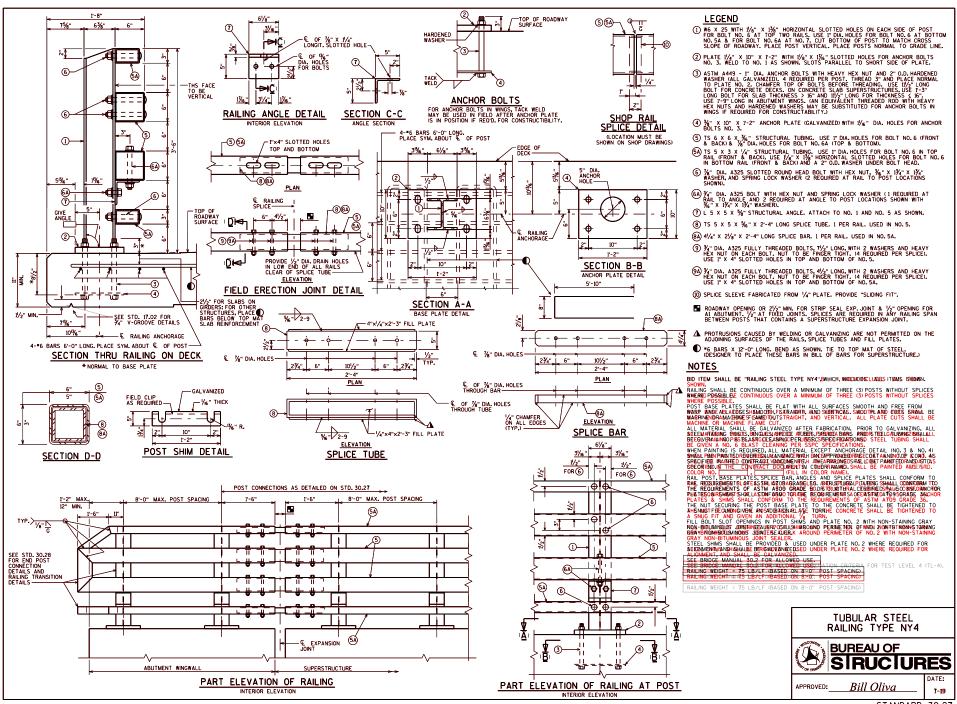
TIMBER RAILING ATTACHED TO CONCRETE SLAB DETAILS

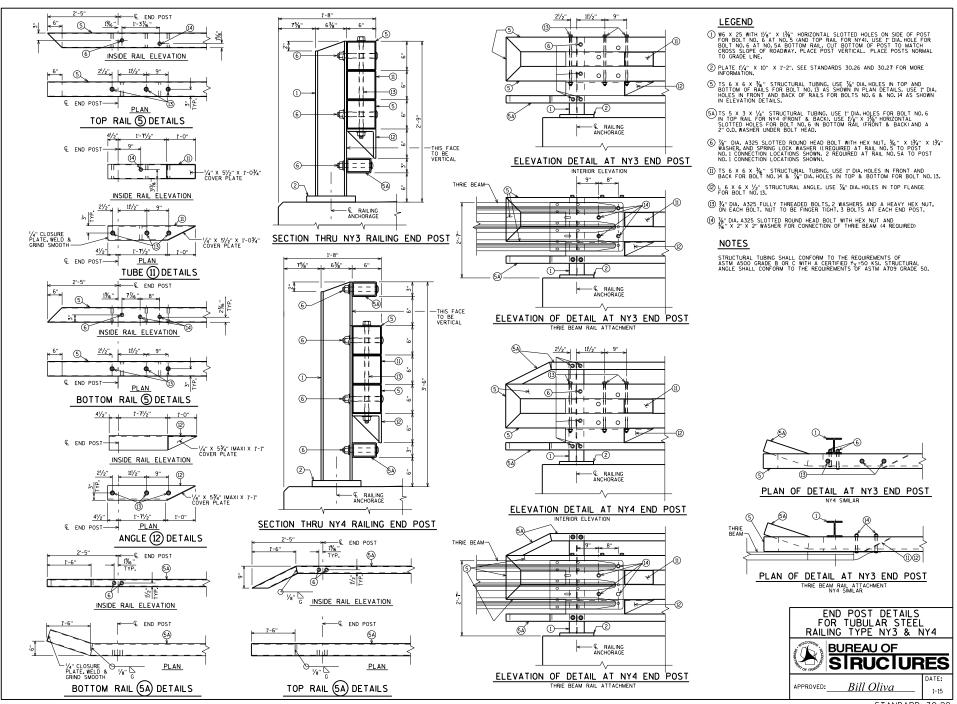


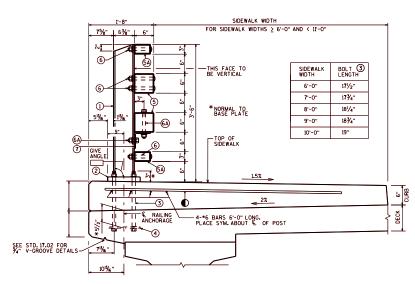
APPROVED: Bill Oliva

7-16

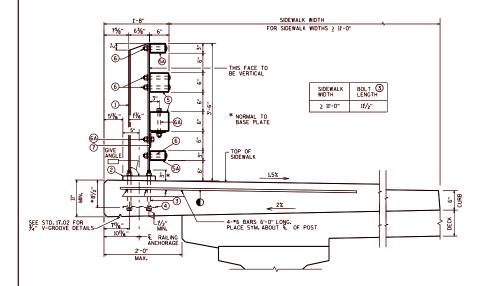








# SECTION THRU RAILING ON SIDEWALK



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 11/16" 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 DALVANIZED). 4 REQUIRED PER POST, THREAD, 3" AND PLACE NORMAL TO BOLT FOR CONCRETE SIDEWALKS 2" OF "WIDE AND SEE HABLE OT THE LEFT FOR CONCRETE SIDEWALKS 2" OF "WIDE AND SEE HABLE OT THE LEFT FOR CONCRETE SIDEWALKS 2" OF "WOS LAND SEE HABLE OT THE LEFT FOR CONCRETE SIDEWALKS 2" OF "WOS LAND SEE FOR PROPER BOLT LENGTHS, USE 1"-9" LONG IN ABDITMENT WINDS. (AN EQUIVALENT THREADED ROD WITH HEAVY HEX NUTS AND HARDENED WASHERS MAY BE SUBSTITUTED FOR ANCHOR BOLTS IN WINDS IF REQUIRED FOR CONSTRUCTABILITY.)
- 4 % " X 10" X 1'-2" ANCHOR PLATE (GALVANIZED) WITH  $1/\!\!/_6$  " DIA. HOLES FOR ANCHOR BOLTS NO. 3.
- (5) TS 6 X 6 X % " STRUCTURAL TUBING. USE I" DIA. HOLES FOR BOLT NO. 6 (FRONT & BACK) & %" DIA. HOLES FOR BOLT NO. 6A (TOP & BOTTOM).
- (A) 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 13/4" HORIZONTAL SLOTTED HOLES FOR BOLT NO. 6 IN BOTTOM RAIL (FRONT & BACK) AND A 2" OLD, MSAFIER HUNDER BOLT HEAD.
- (6) 1/8" DIA. A325 SLOTTED ROUND HEAD BOLT WITH HEX NUT, 1/8" X 1/4" X 1/4" WASHER, AND SPRING LOCK WASHER (2 REQUIRED AT RAIL TO POST LOCATIONS SHOWN).
- (a) %" DIA. A325 BOLT WITH HEX NUT AND SPRING LOCK WASHER (1 REQUIRED AT RAIL TO ANGLE AND 2 REQUIRED AT ANGLE TO POST LOCATIONS SHOWN WITH %" X 194" WASHER).
- (7) L 5 X 5 X 5%" STRUCTURAL ANGLE. ATTACH TO NO. 1 AND NO. 5 AS SHOWN.
- $\bullet$  5 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.

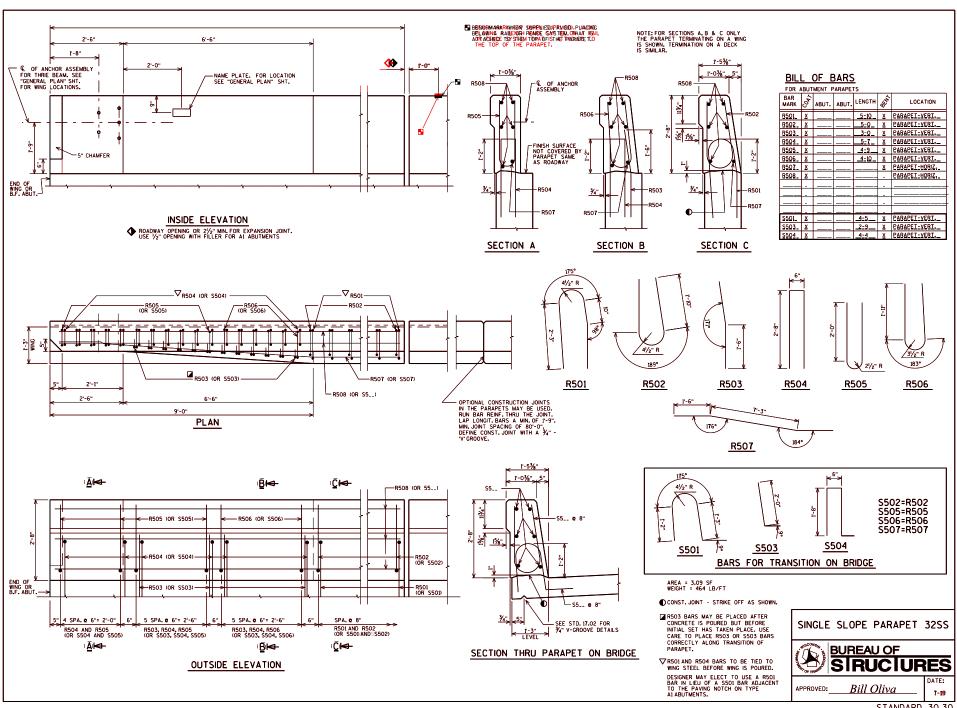


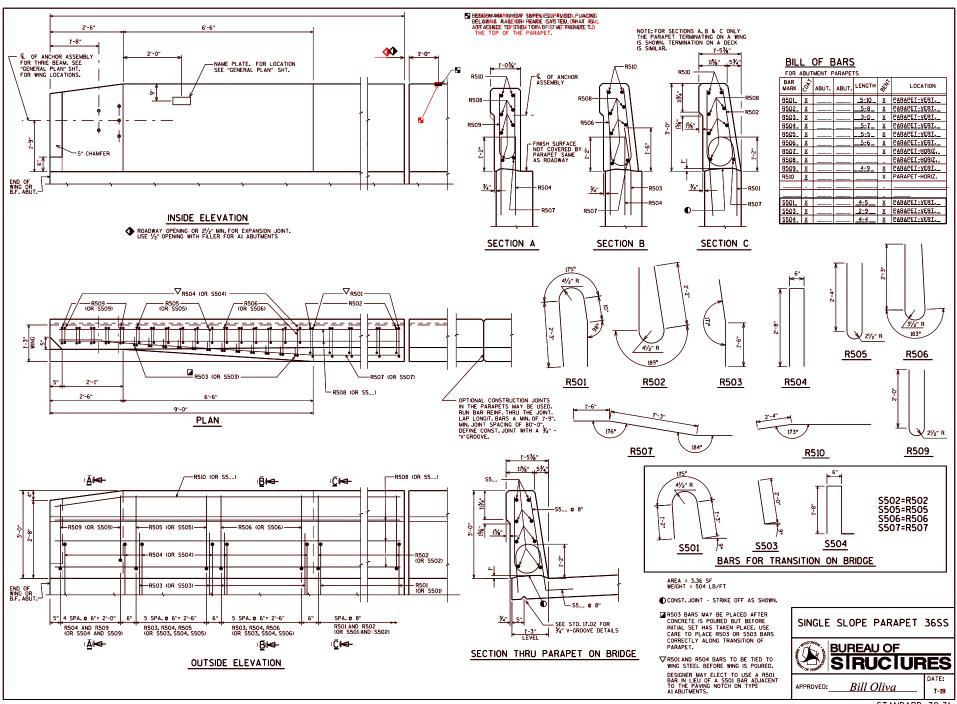


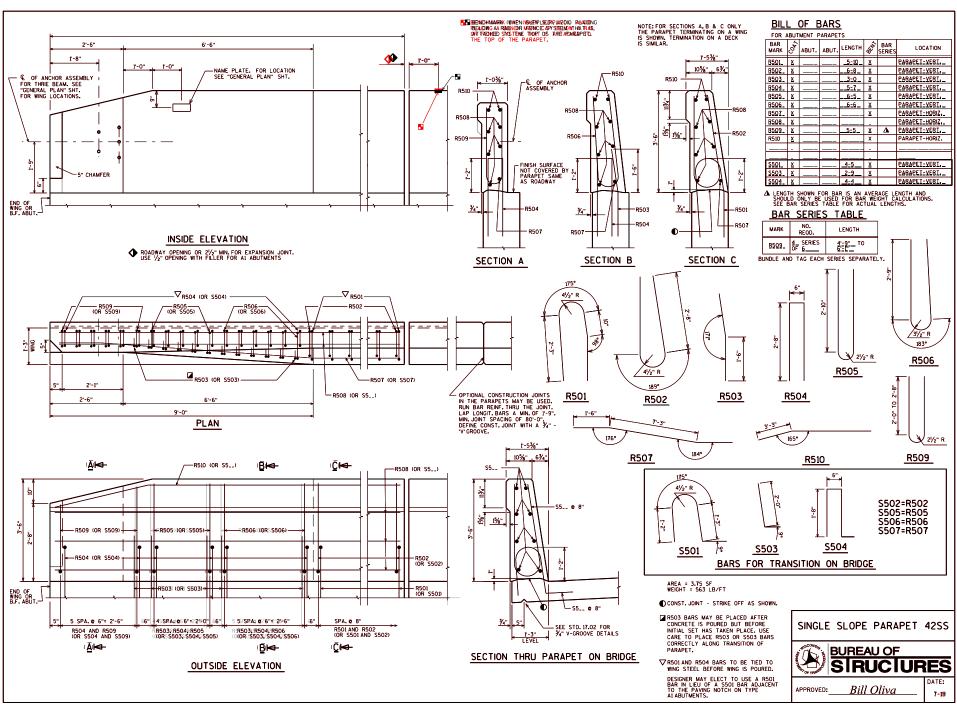
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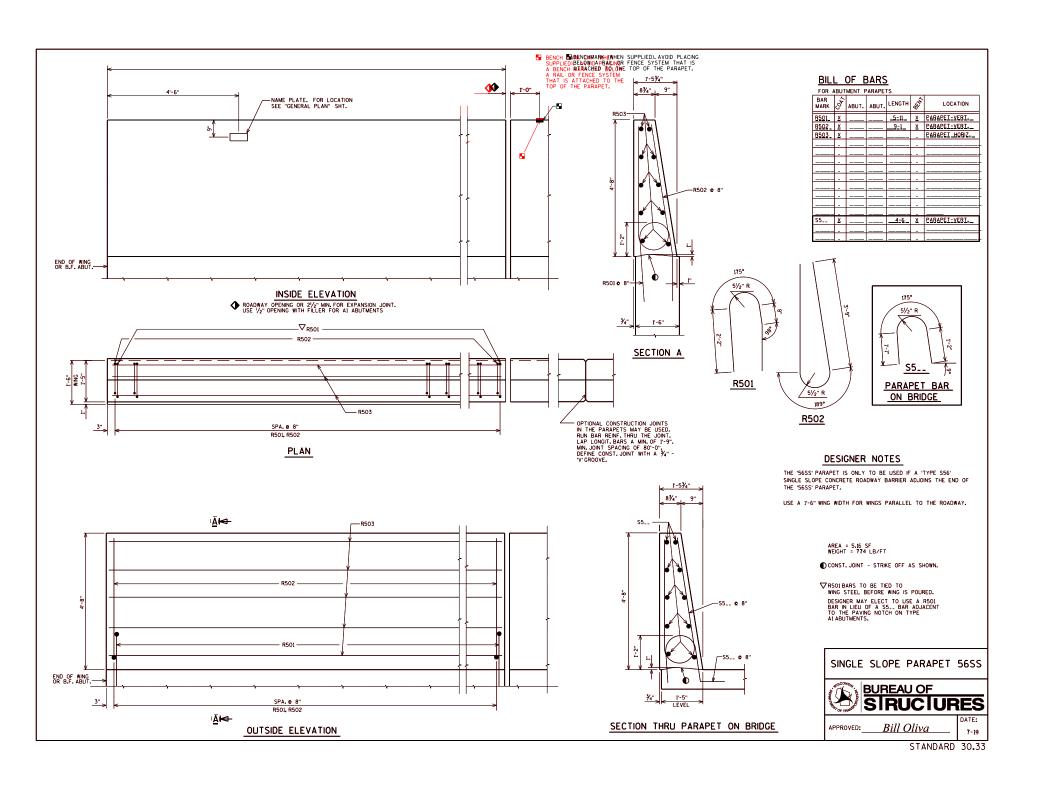
Bill Oliva

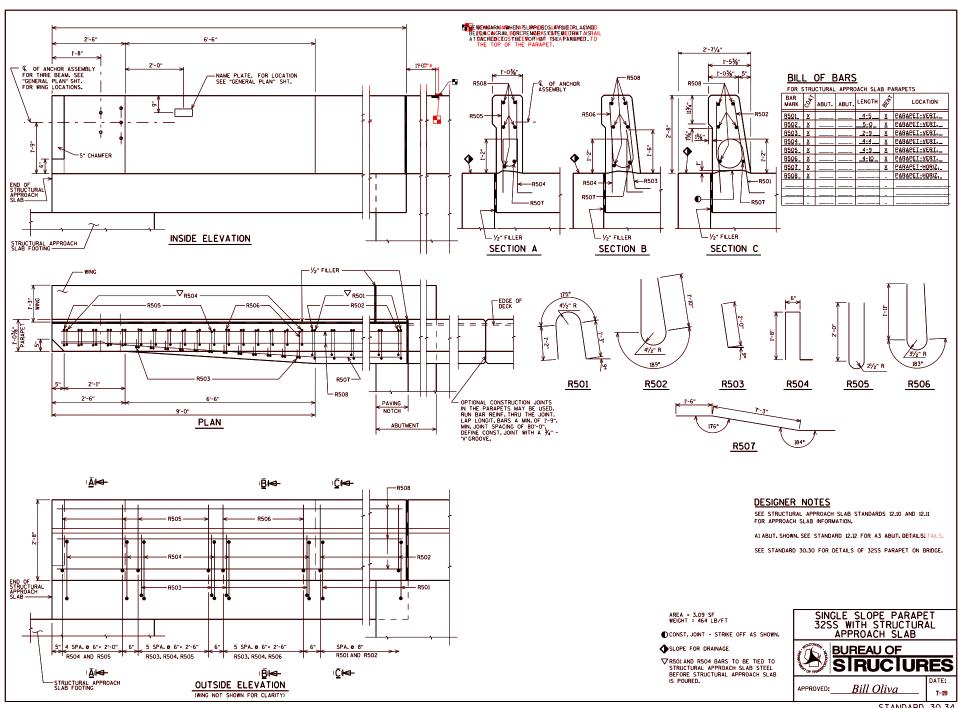
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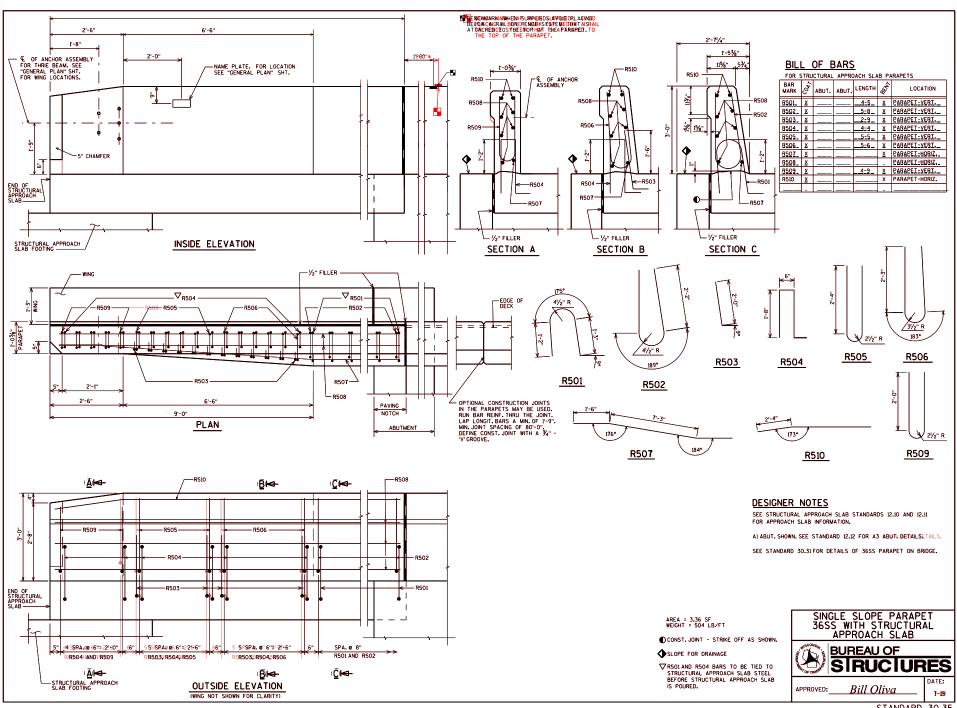


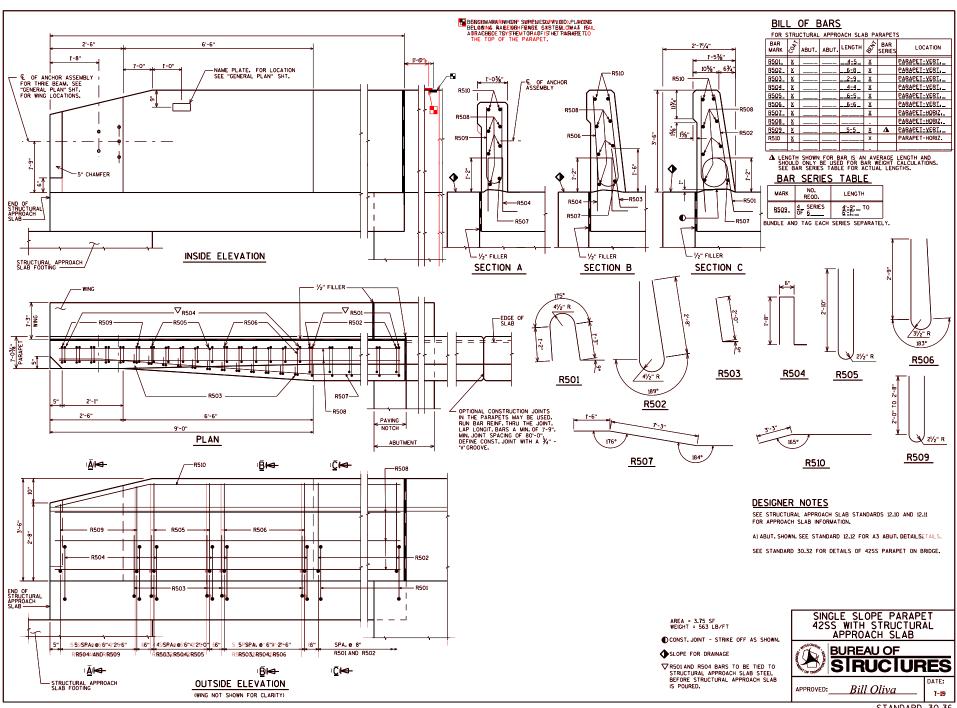


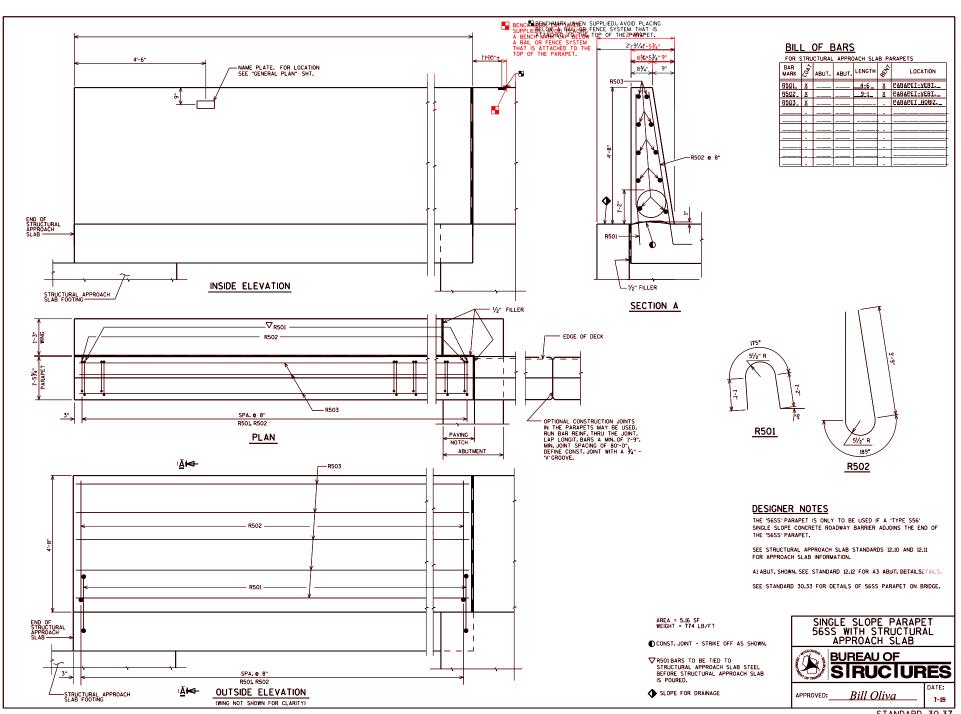


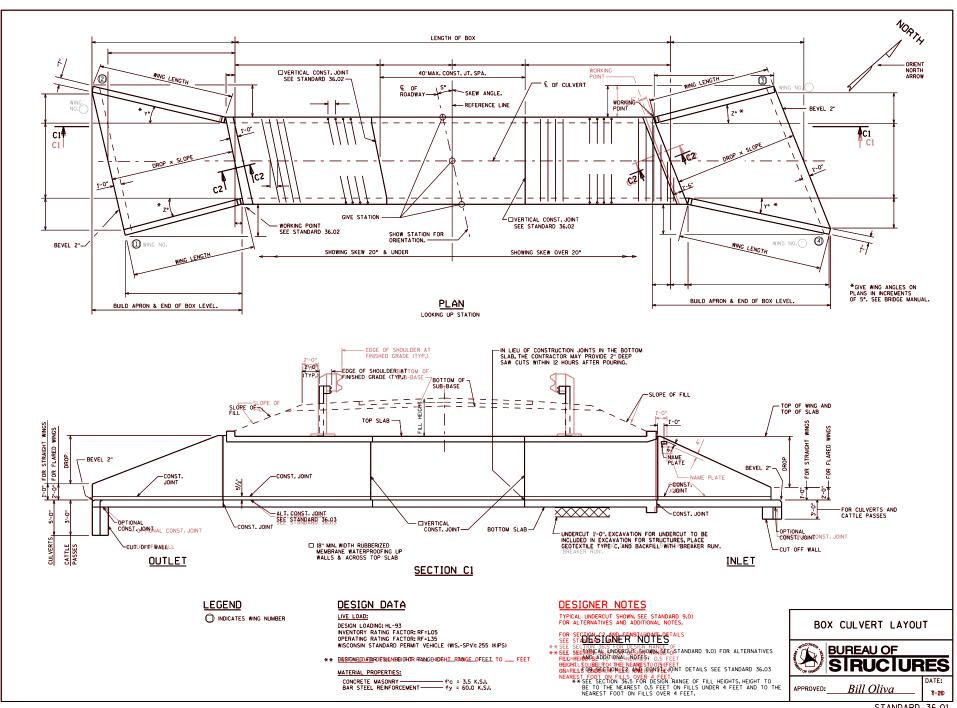


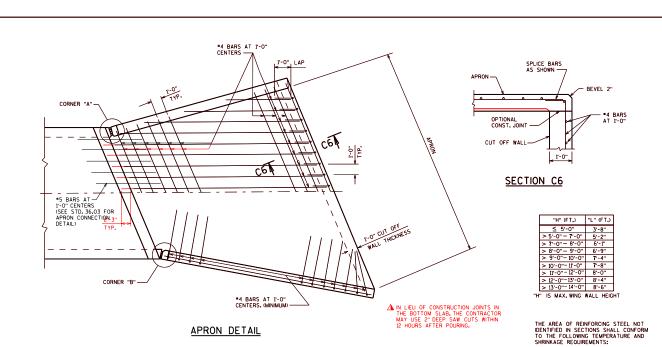












#### NOTES

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 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.

THE CONTRACTOR MAY FURNISH A PRECAST CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE BOX CULVERT WITH THE ACCEPTANCE OF THE SHOP DRAWINGS BY THE STRUCTURES DESIGN SECTION. THE PRECAST DOKCRETE BOX CULVERT SHALL CONFORM TO PRECAST DETAILS IN CHAPTER 36 STANDARDS OF THE CURRENT WISCONSIN DOT BRIDGE MANUAL, PAYMENT FOR THE PRECAST CULVERT SHALL BE BASED ON THE QUANTITIES AND PRICES BID FOR THE ITEMS LISTED IN THE "TOTAL ESTIMATED QUANTITIES".

#### **DESIGNER NOTES**

SEE STANDARD 9.01 FOOR ADDITIONAL NOTES.

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 SLAS.

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.



-¾" FILLER TO EXTEND FROM HORIZONTAL CONSTRUCTION JOINT TO TOP OF WING

1" REVEL

\* DIMENSION "T" TO BE DETERMINED FROM BARREL DESIGN

LEVEL

1" BEVEL

- ¾" FILLER TO EXTEND FROM HORIZONTAL CONSTRUCTION JOINT TO TOP OF WING

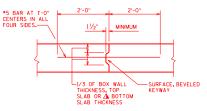
R.M.W. EXTEND FROM HORIZ. CONST. JT. TO TOP OF WALL. (FLUSH WITH FACE OF CONCRETE)-

LEVEL

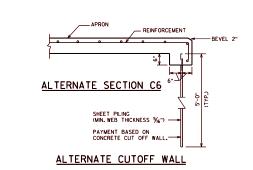
CORNER "A"

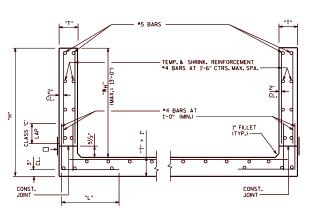
WORKING POINT

CORNER "B"



#### VERTICAL CONSTRUCTION JOINT





THICKNESS T&S REINF.

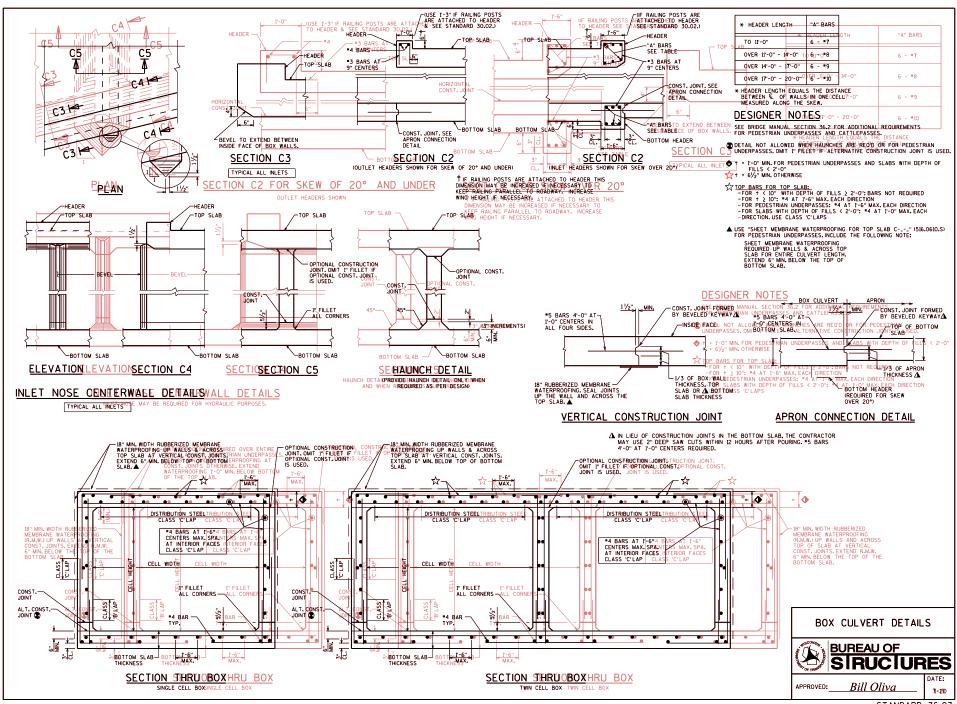
≤ 12" #4 @ 18"

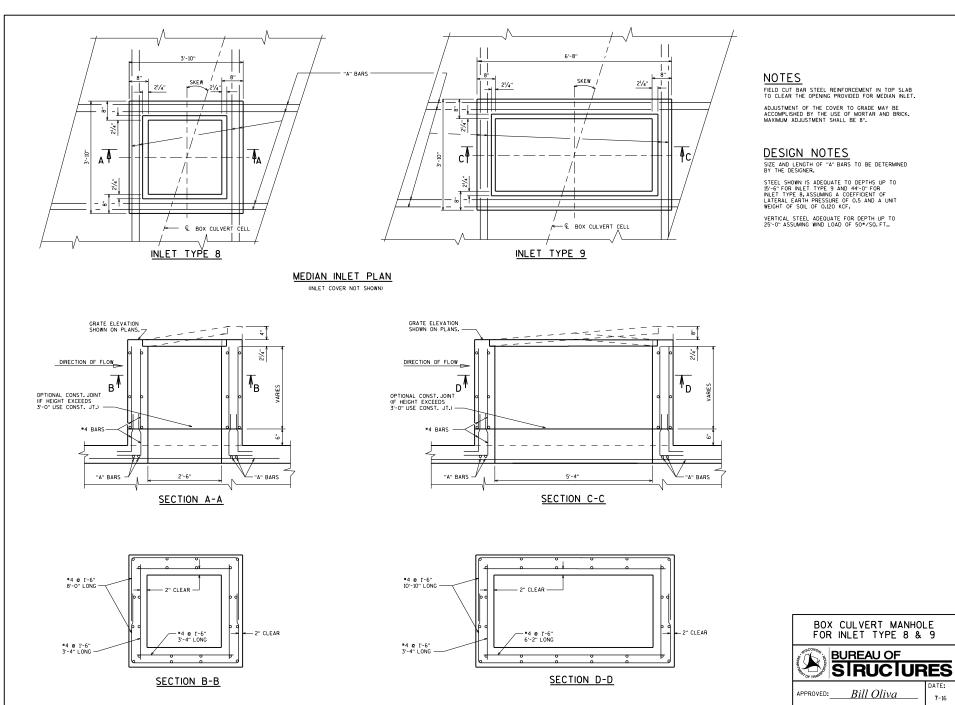
> 12" - 18" #4 @ 12"

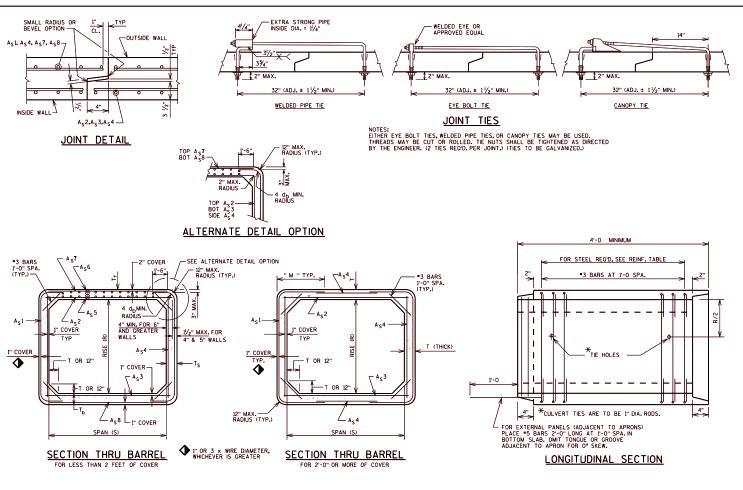
#### SECTION THRU WINGWALLS

☐ 18" MIN. WIDTH RUBBERIZED MEMBRANE WATERPROOFING ALONG HORIZ. CONSTR. JT. IN WING. BOX CULVERT APRON DETAILS









#### NOTES

DETAILS FOR MATERIALS, FABRICATION, CONSTRUCTION AND DESIGN OF PRECAST BOX CULVERTS NOT SHOWN OR STATED ON THIS DRAWING SHALL BE IN ACCORDANCE WITH THE CURRENT ASTIM SPECIFICATION, CISTT; AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, WISCONSIN DOT STANDARD CONSIDERATION OF STANDARD CONSTRUCTION OF S PER CUBIC YARD.

THE DESIGN OF PRECAST BOX CULVERTS WITH ALL FILL HEIGHTS SHALL BE AS STATED IN ASTM C1577.

ALL PRECAST BOX SECTIONS SHALL BE PLACED ON A BEDDING OF "STRUCTURE BACKFILL" OF 6" MINIMUM DEPTH.

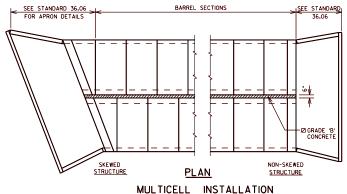
THE COVER OF CONCRETE OVER THE REINFORCEMENT SHALL BE 1 INCH OR 2 INCHES AS SHOWN WITH AN ALLOWABLE VARIATION OF -3/8" TO  $\pm 1/2$  INCH.

THE SPACING CTR. TO CTR. OF THE CIRCUMFERENTIAL WIRES SHALL NOT BE LESS THAN 2 INCHES NOR MORE THAN 4 INCHES. THE SPACING CTR. TO CTR. OF THE LONGIT. WIRES SHALL NOT BE MORE THAN 8 INCHES.

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

THE JOINT ON THE BOTTOM OF THE CULVERT & THE SIDES OF THE CULVERT FROM THE BOTTOM TO A POINT 1-0" FROM THE CELING SHALL BE SEALED WITH A PREFORMED MASTIC. PREFORMED MASTIC MUST CONFORM TO AASHTO MATERIALS SPEC. MIGH. TYPE B. A 2"O" STRIP OF GEOTETHIE FABRE OF SBREUDE RL. SHBALL DEEPTIACEDONMEN OTHER HONTON GNOTHER SHOP WITH SHORT OF THE HONTON GNOTHER CONFORMENT OF THE HONTON GNOTHER SHALL SHBALL CONFORMED CONFORMED THE CONFORMED CO SPECIFIC SIONE RELABRIC. NO/TBREONIREDRIOVEREINSIDERIVANSIDE WOINT SJOORT MUDE IO BUILT IN SULAUNA TION. A TION.

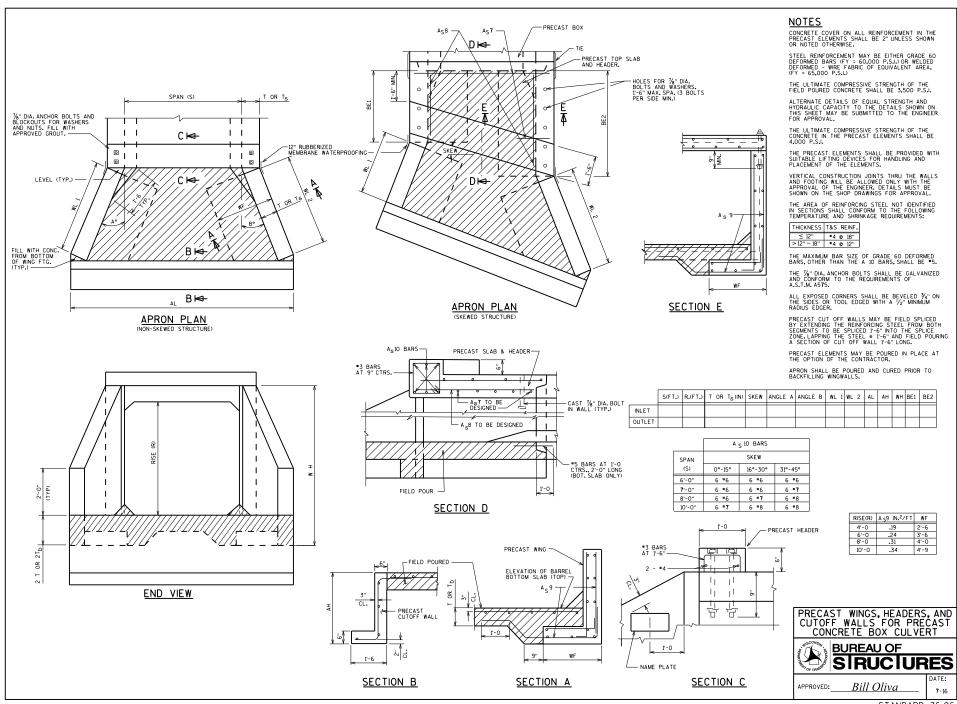
WHEN TWO OR MORE BARRELS ARE UTILIZED IN PARALLEL IZ FOR MULTICELL INSTALLATIONS THE CLEAR SPACING BETWEEN BARRELS SHALL BE 6 INCHES AND THE SPACE BETWEEN ADJACENT BARRELS FROM TOP OF BEDDING TO TOP OF TOP SLAB SHALL BE FILLED WITH GRADE "B"



#### BOX CULVERT DATA DIMENSIONS EARTH COVER (FT.) S (FT.) R(FT.) T OR Ts, Tb, Tt (IN. REINFORCEMENT AREA/FT. LENGTH AREA/FT. LENGTH M AREA/FT. LENGTH A<sub>s</sub>1 A<sub>S</sub>2 A<sub>S</sub>3 A<sub>S</sub>4 A 5 A<sub>S</sub>6 A <sub>5</sub> 7 A <sub>8</sub> 8 TOTAL BARREL OR PANEL LENGTH

PRECAST CONCRETE BOX CULVERT BARREL DETAILS

**BUREAU OF** APPROVED: Bill Oliva

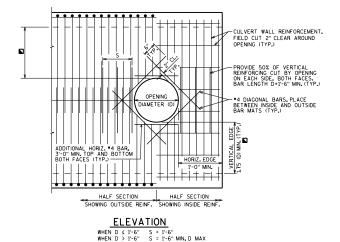


# <u>NOTES</u>

ALL BAR STEEL REINFORCEMENT SHALL BE CUT 2" CLEAR AROUND OPENING.

### **DESIGNER NOTES**

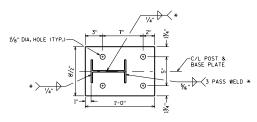
DETAILS SHOWN ARE FOR CAST-IN-PLACE CULVERTS. PRECAST CULVERT DETAILS TO BE SIMILAR.



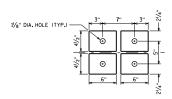
PIPE OPENING IN CULVERT WALL



\* WELDING IS TO BE COMPLETED USING THE GAS-METAL ARC WELDING (GMAW) PROCESS WITH ERTOS-3 WELDING WIRE AND ARGON-OXYGEN OR CO<sub>2</sub> COVER GAS.



SECTION A-A POST & BASE PLATE



W6X9 STEEL POST

C/L POST

BE VERTICAL

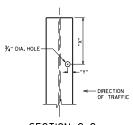
SECTION B-B (4)-BOTTOM PLATES

"B"

- PLASTIC BLOCKOUT

-W-BEAM RAIL

- POST BOLT



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

NOTES

DETAILS SHOWN FOR POSTS, PLATES, ANCHORAGE SYSTEM AND INSTALLATION, BLOCKS, AND GUARD RAIL ARE NOT PART OF THE STRUCTURE CONTRACT, BUT ARE BID PER THE ROADWAY

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

CUT BOTTOM OF POST SO THAT POST WILL BE VERTICAL WHEN POST ASSEMBLY IS PLACED ON TOP OF THE CULVERT. ALONG THE ROADWAY THE POST WILL BE NORMAL TO GRADE LINE. HEX BOLTS AND THREADED RODS ARE TO BE PLACED PERPENDICULAR TO THE BASE PLATE.

POST, BASE PLATE (AND BOTTOM PLATE IF USED), AND SHIMS SHALL BE GALVANIZED AFTER FABRICATION.

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

ALL MATERIAL USED IN POSTS AND PLATES SHALL BE MADE FROM MATERIAL CONFORMING TO ASTM DESIGNATION A709

HEX BOLTS, THREADED RODS, HEX NUTS AND WASHERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM FISS4 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 THREADNED.

♠ ADHESIVE ANCHORS 1-INCH.EMBED IN CONCRETE AS DETAILED. CHARACTERISTIC BOND STRENGTH SHALL MEET OR EXCEED 1305 PSI FOR UNCRACKED CONCRETE.

STEEL SHIMS MAY BE USED BETWEEN PLATES AND SLAB WHERE REQUIRED FOR ALIGNMENT.

#### DESIGNER NOTES

CHECK CRITERIA TO SEE IF POST ANCHORAGE SYSTEM IS REQUIRED BASED ON FILL HEIGHT "D" AT POSTS, IF REQUIRED, THEN SELECT WHICH TYPE OF ANCHORAGE (TYPE 1 OR TYPE 2)

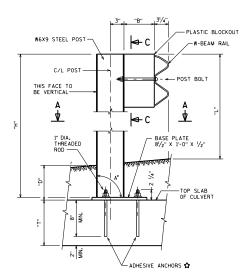
CONTACT THE ROADWAY DESIGN SECTION TO VERIFY IF CLASS 'A' OR 'MGS' GUARDRAIL SYSTEM WILL BE USED.

POST SPACING IS 3"-1/2" PER FDM SDD 14 B 51-1. SEE FDM SDD 14 B 51-1 FOR MINNIUM CLEARANES FROM EDDES OR OBSTRUCTIONS TO ANCHORAGE SYSTEM. FOR TYPE 2 ANCHORAGE, MAKE SURE BOTTOM PLATE IS NOT PLACED AT THE SLOPED HAUNCH BETWEEN THE WALL AND TOP SLAB. SHIFT LOCATION OF POSTS (LONGIUDINALLY ALONG C/L OF POSTS) IF REQUIRED TO MEET SPACING AND CLEARANCE REQUIREMENTS.

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 (PL.P.2.ETC.). SHOW A TABLE PROVIDING BETWEEN BASE PLATE AND POST. AND THE ANGLE AF BETWEEN BASE PLATE AND POST.

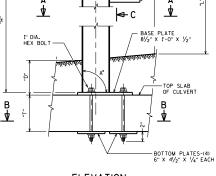
IN THE TOP SLAB PROVIDE A MINIMUM OF \*4 BARS AT 1'-O" IN EACH DIRECTION WHEN TYPE 1 OR TYPE 2 DETAILS ARE USED.



**ELEVATION** 

#### GUARDRAIL POST ANCHORS TYPE 1

USE FOR THICKNESS "T" OF 10 INCHES OR MORE AND MINIMUM CONCRETE STRENGTH ( $f_c'$ ) OF 4,000 PSI



### **ELEVATION**

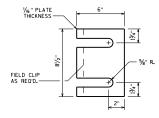
#### GUARDRAIL POST ANCHORS TYPE 2

USE FOR THICKNESS "T" OF 8 INCHES OR MORE AND MINIMUM CONCRETE STRENGTH ( $\mathbf{f}_{c}^{\prime}$ ) OF 3,500 PSI

# GUARDRAIL POST ANCHORAGE SYSTEM

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

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



STEEL SHIM DETAIL 4 PER POST

THIS RAILING AND ANCHORAGE SYSTEM MEET NCHRP 350 EVALUATION CRITERIA FOR TEST LEVEL 3 (TL-3).

GUARDRAIL POST ANCHORAGE SYSTEM



APPROVED: Bill Oliva

#### 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-YHLLDING FOUNDATION MATERIAL, HOWEVER, ALLOWABLE OFFERENTIAL SETTLEMENT FOR FOOTING ON SOIL SUPPORTING THE STRUCTURE: 0.002 FT.PER FT. MAX.) OF INFORMATION 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 S.D.D. 14 B 15-6 PLUS 6°.

FOR SHORTER SPAN CULVERTS, WHERE BEAM GUARD CROSSES THE LENGTH OF THE STRUCTURE, CONSIDERATION SHALL BE GIVEN TO THE DETAILS SHOWN ON S.D.D. 14 B 43-3 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 S.D.D. 14 B 32-1 AND S.D.D. 14 B 34-1 FOR CONCRETE BARRIER DETAILS.

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

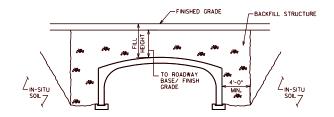
PLACE FOOTINGS BELOW SCOUR AND FROST DEPTHS, PLACE BOTTOM OF FOOTING AT A MINIMUM DEPTH EQUAL TO PREVAILING FROST DEPTH OR SCOUR DEPTH BUT NOT LESS THAN 4'-O" BELOW GROUND ELEVATION UNLESS CONSTRUCTED ON ROCK FOUNDATION OR OTHERWISE MOICATED.

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

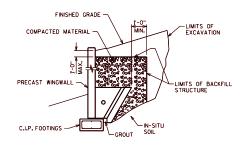
BENDING OF REINFORCEMENT FOR PRECAST BRIDGE UNITS - THE OUTSIDE AND INSIDE CIRCUMFERENTIAL REINFORCING STEEL FOR THE CONNERS OF THE BRIDGE SHALL BE BENT TO SUCH AN ANGLE THAT IS APPROXIMATELY EQUAL TO THE CONFIGURATION OF THE BRIDGE'S OUTSIDE CORNER.

### LRFD DESIGN LOADS

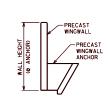
LIVE LOAD: HL-93 HORIZONTAL EARTH PRESSURE: UNIT WEIGHT = 125 PCF VERTICAL EARTH PRESSURE: UNIT WEIGHT = 120 PCF



#### **BACKFILL REQUIREMENTS**



#### WALL BACKFILL REQUIREMENTS

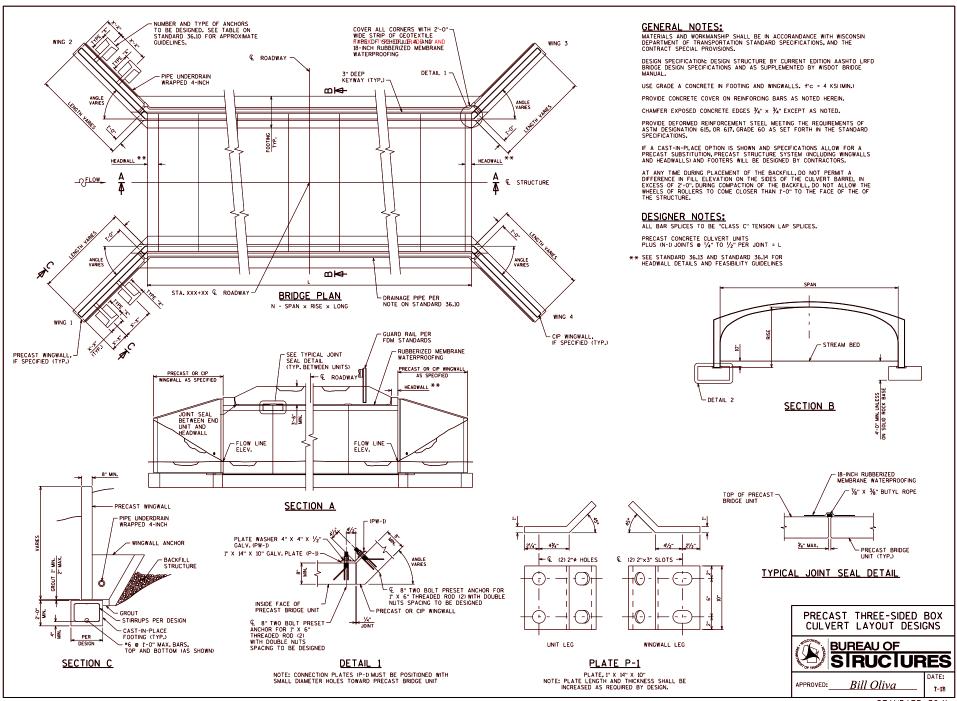


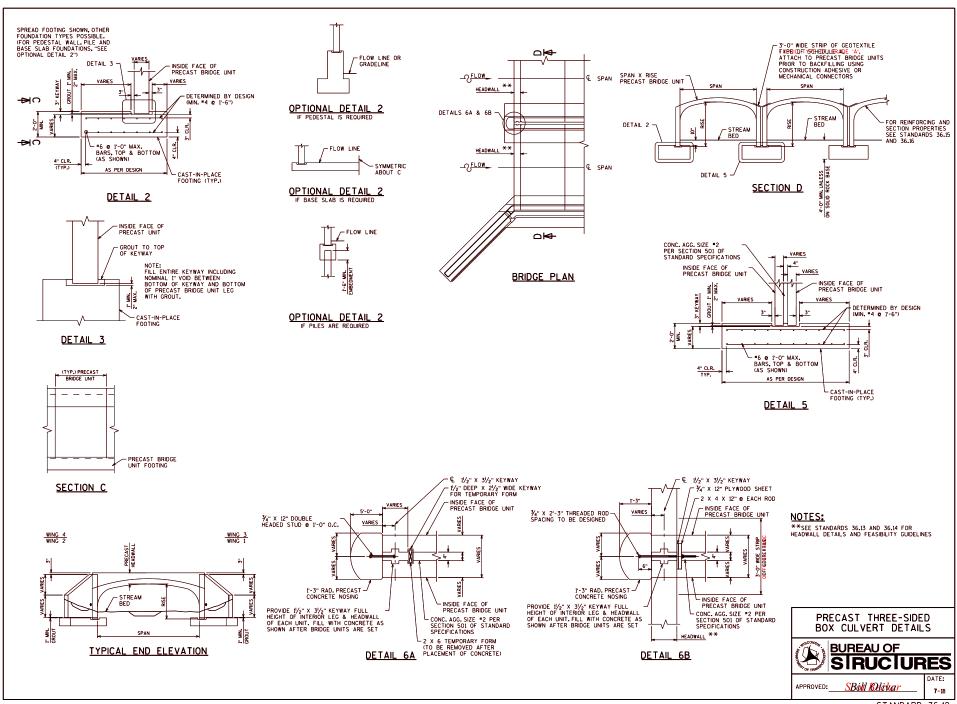
APPROXIMATE/ NUMBER OF ANCHO	
LENGTH OF WALL	NO. ANCHORS
L = 14'-0"	2
L = 20'-0"	3
L = 24'-0"	4
24'-0" < L	MULTIPLE-PIECE WINGWALL*

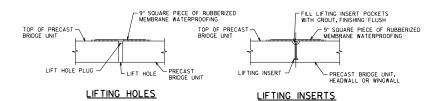
\*NOTE: ADJACENT SEGMENTS SHALL BE ATTACHED TO EACH OTHER TO KEEP FRONT FACES IN ALIGNMENT, PLACE A FILLER AT THESE JOINTS WITH A MEMBRANE ALONG THE JOINT AT THE BACK FACE.

PRECAST THREE-SIDED BOX CULVERT DESIGN NOTES

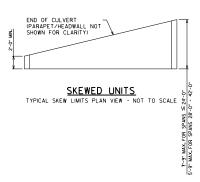


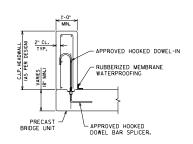




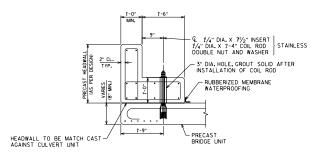


TYPICAL LIFT POINT SEALING DETAIL





CAST-IN-PLACE HEADWALL DETAIL



# PRECAST HEADWALL DETAIL WITH COLLAR

# 20'-0" - 28'-0 7'-0" 10'-0" 36'-0" 6'-0" 10'-6" 10"-0"

MAX.HEIGHT @ CROWN TO T/HEADWALL (NO LIVE LOAD SURCHARGE

8'-0"

UNIT SPAN

14'-0"

H2 MΔX.

MAX. APPROXIMATE HEIGHT & EDGE OF SPAN

9'-6¾"

- LRFD COLLAR/HEADWALL DESIGN NOTES:

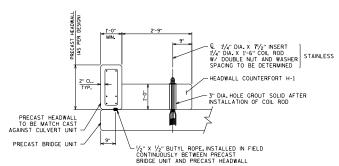
   HEADWALL DETAILS SHOWN HERE HAVE ONLY BEEN DESIGNED FOR THE FOLLOWING 2 LOAD CASES:

  DEARTH PRESSURE ONLY
  2 PEARTH PRESSURE + LIVE LOAD SURCHARGE
  THESE DETAILS ARE NOT TO BE USED WHERE A VEHICLE LOAD CAN BE TRANSMITED THROUGH A BARRIER TO THE HEADWALL.

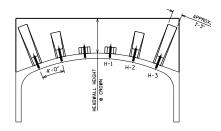
  1-0" HEADWALL THICKNES:
  1-0" COLLAR THICKNESS
   SOIL BEHIND HEADWALL IS AT SAME ELEVATION AS TOP OF HEADWALL ADDITIONAL HIM HEIGHT MAY BE ACHIEVED WITH ADDITIONAL STEEL RINFORCEMENT OR THICKNES COLLAR
  FRINFORCEMENT OR THICKNES COLLAR
  FRINFORCEMENT OR THICKNES COLLAR
  FRINFORCEMENT OR THICKNED COLLAR
  FRINFORCEMENT OR THICKNED COLLAR
  FOR DETACHED HEADWALL DESIGNS ONLY

PRECAST THREE-SIDED BOX CULVERT HEADWALL DETAILS





PRECAST HEADWALL TYPE H-1 COUNTERFORT NOT TO SCALE



SAMPLE ELEVATION

NOTE:
THE ACTUAL NUMBER AND TYPE OF
PRECAST HEADWALL COUNTERFORTS
IS TO BE DESIGNED, HOWEVER, USE
THE FOLLOWING CHART AS A
GENERAL QUIDE TO FEASIBILITY OF
COUNTERFORT USE.

	COUNTERFORT	MAX HEADWALL HEIGHT @ COUNTERFORT LOCATION			
	COUNTERFORT	NO SURCHARGE	W/ 2'-0" SURCHARGE		
	H-1	7'-0"	5'-0"		
14'-0" SPAN	H-2	7'-0"	5'-0"		
	H-3	8'-0"	6'-0"		
	H-1	8'-0"	6'-0"		
20'-0" - 42'-0" SPANS	H-2	10'-0"	7'-0"		
	H-3	10'-0"	8'-0"		

#### LRFD HEADWALL COUNTERFORTS

LRID HEADWALL COUNTERFORTS

\*\*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 BARRIER TO THE HEADWALL.

\*\*ASSUMED 4-0" SPACING OF COUNTERFORTS

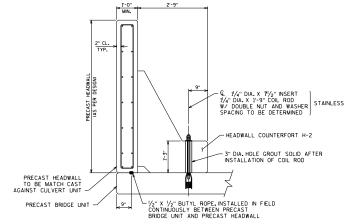
1-0" HEADWALL THICKNESS MIN.

\*\*SOIL BEHIND HEADWALL IS AT SAME ELEVATION AS TOP OF HEADWALL

ADDITIONAL HEADWALL HEIGHT MAY BE ACHIEVED WITH CLOSER

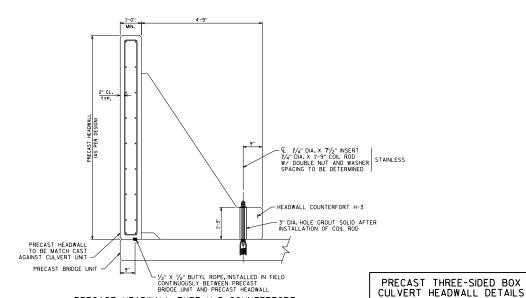
COUNTERFORT SPACING

FOR DETACHED HEADWALL DESIGNS ONLY



PRECAST HEADWALL TYPE H-2 COUNTERFORT

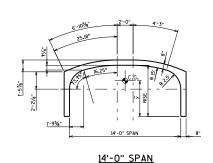
NOT TO SCALE

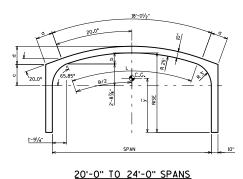


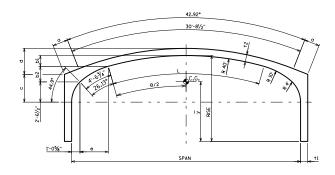
PRECAST HEADWALL TYPE H-3 COUNTERFORT NOT TO SCALE

**BUREAU OF** 

APPROVED: <u>Scot Becker</u>







28'-0" TO 42'-0" SPANS

<u>  - (</u>	<u>)                                    </u>	PAN	12

	CEN	TER (	OF GR	AVITY	Ÿ	
RISE			SPAN	- FT		
FT	14	20	24	28	36	
						П

9 6.5 6.6 6.6 6.7 6.5 7.3 7.3 7.4 7.2 6.9 8.0 7.9 7.7 8.6 8.4 9.3 9.1

5 3.9

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

GEOMETRIC PROPERTIES (FT.) (NOT SHOWN ON DRAWING)								
			PAN - F	T				
	20	24	28	36	42			
ө	38.43°	48.29°	25.30°	3 <b>7.</b> 93°	4 <b>7.</b> 86°			
L	16.77	21.07	17.66	26.48	33.41			
а	2.13	4.25	0.00	4.48	4.48			
b 1.39		2.19						
ы			0.97	2.17	3.50			
ь2			1.96	2.40	2 <b>.7</b> 5			
С	2.68	2 <b>.7</b> 5	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" SPA 0" TO 10'-0		5'-	20'-0" SP# 0" TO 10'-0		24'-0" SPAN 28'-0" SPAN SE 6'-0" TO 10'-0" RISE <b>7</b> '-0" TO 11'-0" RISE					36'-0" SPAN 8'-0" TO 13'-0" RISE			42'-0" SPAN 10'-0" TO 13'-0" RISE			
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 <b>.7</b> 2	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 <b>①</b>	0.96	1.80	6000 ①	1.50	3.00	6000 <b>①</b>	1.44	2.16	6000 ①

⊕SHEAR REINFORCEMENT REQUIRED

②SHEAR REINFORCEMENT REQUIRED FOR 6'-0" & 7'-0" RISE

③SHEAR REINFORCEMENT REQUIRED FOR 8'-0" & 9'-0" RISE

⑤SHEAR REINFORCEMENT REQUIRED FOR 10'-0" & 11'-0" RISE

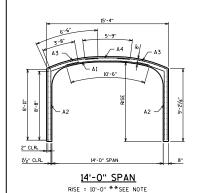
⑤MINIMUM PRECAST UNIT WIDTH = 3'-11¾4"

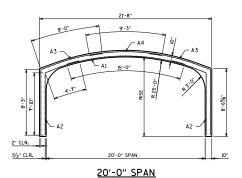
NOTE: THESE STEEL AREAS ARE SHOWN FOR COVER OF 12'-0" OR LESS.

PRECAST THREE-SIDED BOX CULVERT CROSS SECTIONS



APPROVED: <u>Scot Becker</u>





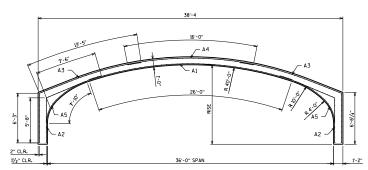
RISE = 10'-0" \*\*SEE NOTE

Α3 A2 2" CLR. 11/2" CLR. 24'-0" SPAN

24'-0" SPAN

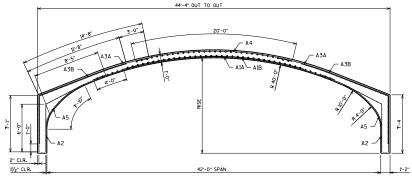
RISE = 10'-0" \*\*SEE NOTE

# 37'-6" 5-074 Α3 Α2 2" CLR. 11/2" CLR. 28'-0" SPAN



#### 28'-0" SPAN RISE = 10'-0"

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



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

ARCH UNIT LONGITUDINAL REINFORCEMENT (MINIMUM)									
1	4'-0" SPAN		20'-0" SPAN			24'-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		42'-0" SPAN				
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	CIRCUMF. AREA REO'D SO.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  $1^{\prime}\!/_{2}$  INCHES MINIMUM.

THE CLEAR DISTANCE OF THE END CIRCUMFERENTIAL WIRES SHALL NOT BE LESS THAN 1" NOR MORE THAN 2" FROM THE ENDS OF EACH SECTION.
AN ALTERNATE EQUIVALENT OF WELDED WIRE FABRIC (WWF) ASTM A997 MAY BE SUBSTITUTED FOR THE REINFORCEMENT SHOWN UPON APPROVAL OF THE STRUCTURES DEVELOPMENT SECTION.

MINIMUM COVER FOR WILDED WIRE FABRIC: 1-INCH

#### **DESIGN DATA:**

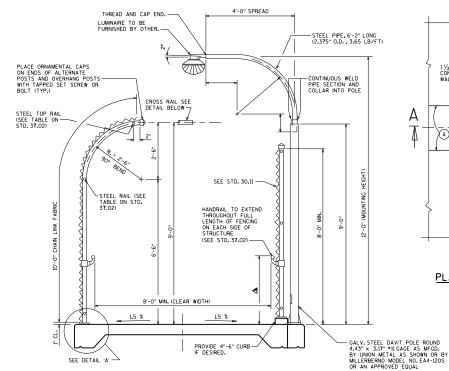
f'c = 5000 PSI MINIMUM FOR CONCRETE fy = 60,000 PSIFOR STEEL REINFORCING BARS fy = 65,000 PSIFOR WELDED WIRE FABRIC (IN FLAT SHEET)

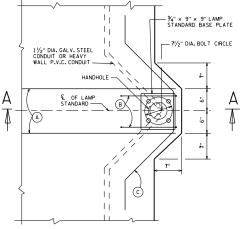
SPAN FT	APPROX. MAX. COVER
14'	50'
20' - 24'	30'
28' - 36'	20'
42'	15'

PRECAST THREE-SIDED BOX CULVERT REINFORCEMENT



APPROVED: Bill Oliva



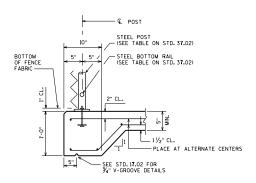


#### PLAN AT LAMP STANDARD

BAR STEEL REINFORCEMENT AT EACH LAMP STANDARD.

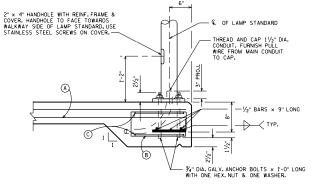
- A 4 \*5 BARS 4'-6" LONG
- (B) 2 - #4 BARS 4'-3" LONG
- 2 #4 BARS 5'-9" LONG

SECTION THRU PEDESTRIAN STRUCTURE



DETAIL 'A'

SEE STANDARD 30.11 FOR BASE PLATE, ANCHOR PLATE, SHIM, POST SLEEVE AND ANCHORAGE DETAILS. SEE THIS STANDARD ALSO FOR FENCE FABRIC REQUIREMENTS.



SECTION A-A

#### NOTES

STEEL RAILS, POSTS, HANDRAILS AND SLEEVES SHALL CONFORM TO ASTM F1083, STANDARD WEIGHT PIPE (SCHEDULE 40).

ALL POSTS, INCLUDING LIGHT POLES, SHALL BE SET VERTICAL. SPACE ALL POSTS OF 9'-0" HIGH FENCE OPPOSITE EACH OTHER TO PERMIT SQUARE PLACEMENT OF CROSS RAILS.

MAXIMUM SPACING FOR CROSS RAILS SHALL BE AT ALTERNATE POSTS. ALL END POSTS SHALL HAVE CROSS RAILS.

HANDRAILS SHALL BE CONTINUOUS EXCEPT AT EXPANSION JOINTS WHERE ENDS SHALL BE CAPPED.

WASHERS, HEX NUTS AND ANCHOR BOLTS FOR LIGHT POLES SHALL BE GALVANIZED AND SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "STRUCTURAL STEEL CARBON".

GALVANIZED STEEL SHIMS OF  $V_{\theta}$ " THICKNESS SHALL BE USED UNDER LAMP STANDARD BASE PLATE WHERE REQUIRED FOR ALIGNMENT. CAULK AROUND PERMETER OF THIS PLATE AND FILL PORTION OF SLOTTED HOLE AROUND ANCHOR BOLT IN SHIM WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALEY.

FOR GALVANIZED CONDUIT PROVIDE GROUNDING LUG IN HAND-HOLE. GROUND WIRE FROM LUG TO CONDUIT SHALL BE NUMBER 6 AWG BARE OR WEATHER-PROOF COPPER, SINGLE CONDUCTOR.

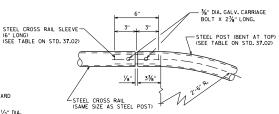
SEE STANDARD 30.11 FOR ADDITIONAL "NOTES".

#### DESIGNER NOTES

 $\Delta$  TOP OF HANDRAIL GRIPPING SURFACES SHALL BE MOUNTED BETWEEN 30" AND 34" ABOVE WALKING SURFACE. USE 30" NEAR SCHOOL ZONES.

FENCE HEIGHT, CURVED OR STRAIGHT, MESH SIZE, COATING AND COLOR SHOULD BE COORDINATED WITH THE REGION AND ALL OTHER APPLICABLE AGENCIES. SEE BRIDGE MANUAL SECTION 30.3 FOR ADDITIONAL GUIDANCE.

SEE STANDARD 30.11 FOR ADDITIONAL "DESIGNER NOTES".

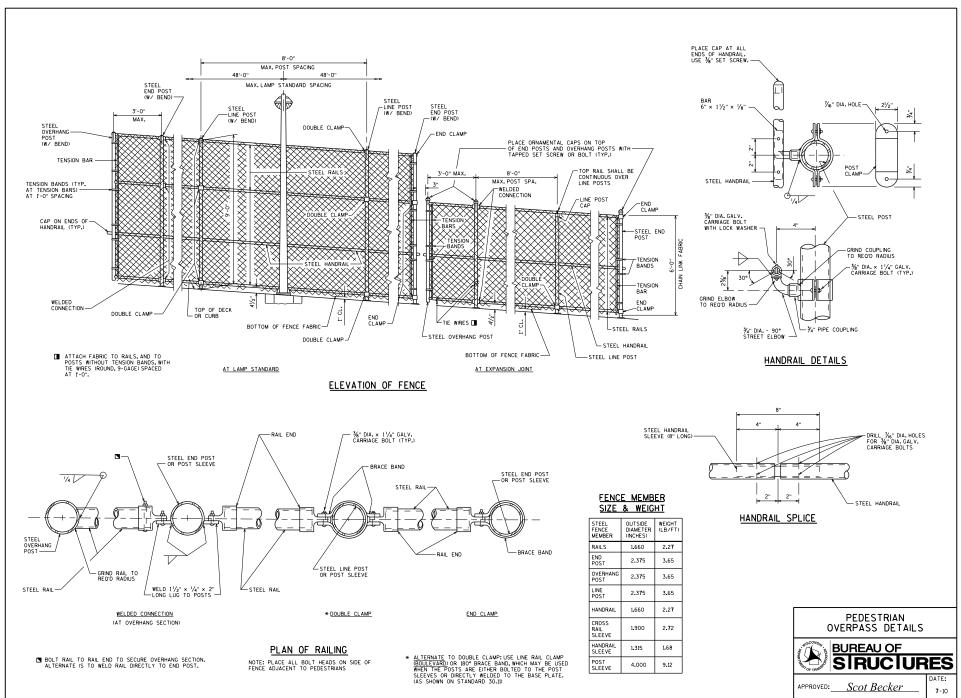


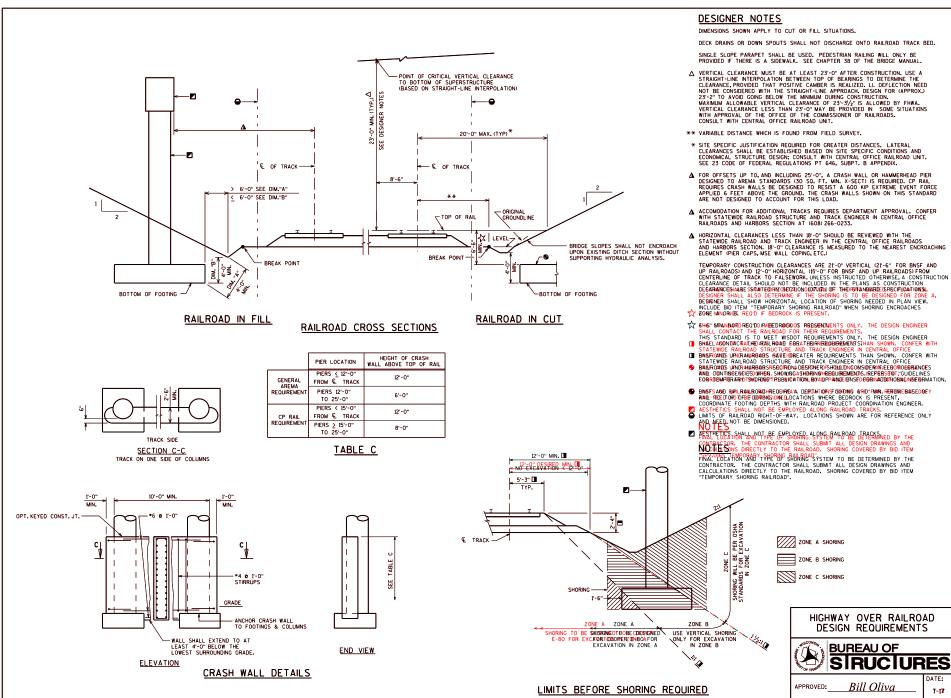
DETAIL OF CROSS RAIL AT TOP

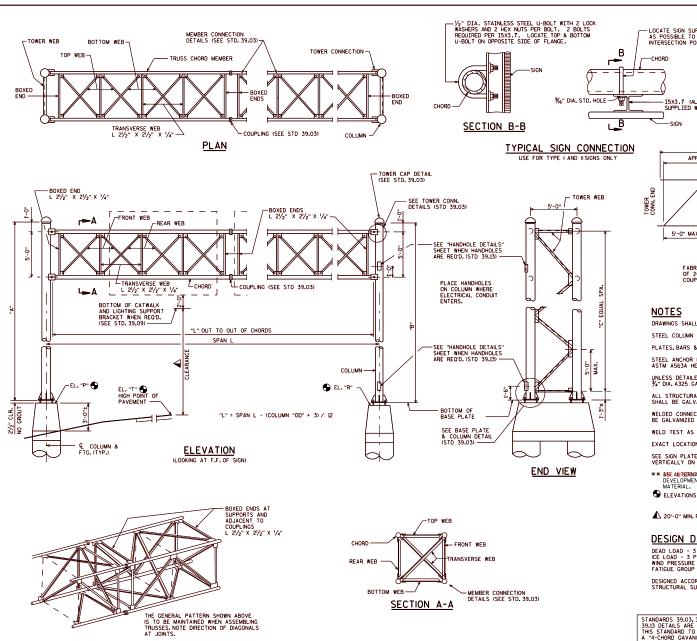
PEDESTRIAN OVERPASS



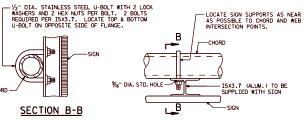
STANDARD 37.01

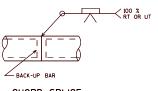




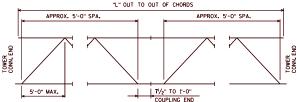


TYPICAL TRUSS SECTION





CHORD SPLICE



#### TRUSS ARRANGEMENT

FABRICATOR MAY MAKE TRUSSES ANY LENGTH KEEPING A SECTION A MINIMUM OF 20'-0" & A MULTPLE OF 5'-0". CHORD FIELD SPLICES SHALL BE MADE WITH COUPLINGS. CHORD SHOP SPLICE SHALL BE THE WELDED SPLICE SHOWN ABOVE.

DRAWINGS SHALL NOT BE SCALED.

STEEL COLUMN AND CHORD PIPES SHALL BE API SPEC. 5L GRADE X42 Fy = 42,000 PSI \*\* PLATES, BARS & STRUCTURAL ANGLES SHALL BE ASTM A709 GRADE 36 Fy = 36,000 PSI

STEEL ANCHOR RODS SHALL MEET THE REQUIREMENTS OF ASTM F1554 GRADE 55, ASTM A563A HEAVY HEX NUTS, AND ASTM F436 WASHERS.

UNLESS DETAILED OTHERWISE IN THE PLANS, ALL H.S. BOLTED CONNECTIONS SHALL BE MADE WITH  $\frac{1}{2}$ 4" DIA. A325 GALVANIZED BOLTS. FIELD CONNECTIONS SHALL BE INSTALLED WITH DTI WASHERS.

ALL STRUCTURAL STEEL MEMBERS, PLATES, ANCHOR RODS, H.S. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED PER SECTION 641 OF THE WISDOT STANDARD SPECIFICATIONS.

WELDED CONNECTIONS CAN BE USED IN LIEU OF BOLTED CONNECTIONS, IF A TRUSS UNIT CAN BE GALVANIZED IN ONE PIECE.

EXACT LOCATION OF SIGN BRIDGE SHALL BE DETERMINED BY THE REGION TRAFFIC ENGINEER. SEE SIGN PLATE NO. A4-6 OF THE SIGN PLATE MANUAL FOR INSTRUCTION ON CENTERING SIGN VERTICALLY ON TRUSS.

\*\* AND ANTIGERNA TERMINATERIMAL MAYSEBETION BS913 UTGE, NPOSP ARTHROWALTED AT RECTURES DEVELOPMENT SECTION. SEE SECTION 39.3 IN THE BRIDGE MANUAL FOR ACCEPTABLE

• ELEVATIONS TO BE SHOWN ON "GENERAL LAYOUT" SHEET.

▲ 20'-0" MIN. FOR OSOW HIGH CLEARANCE ROUTE, 18'-3" MIN. FOR ALL OTHERS.

#### DESIGN DATA

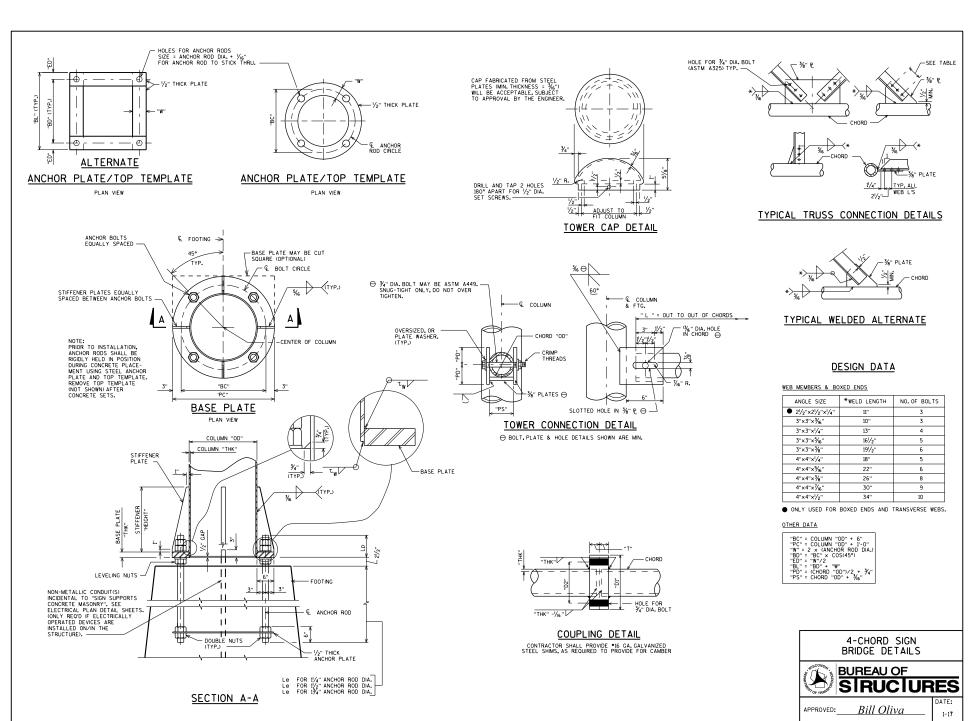
DEAD LOAD - 3 PSF OF SIGN, WT. OF SUPPORTING STRUCTURE, CATWALK, LIGHTS AND RAILINGS. ICE LOAD - 3 PSF TO IFACE OF SIGN & AROUND SURFACE OF MEMBERS. WIND PRESSURE - 90 MPH 3-SECOND GUST SPEED TO SIGN AREA & EXPOSED MEMBERS. FATIGUE GROUP LOAD IS APPLIED PER SECTION 39.4.2 OF THE WISDOT BRIDGE MANUAL.

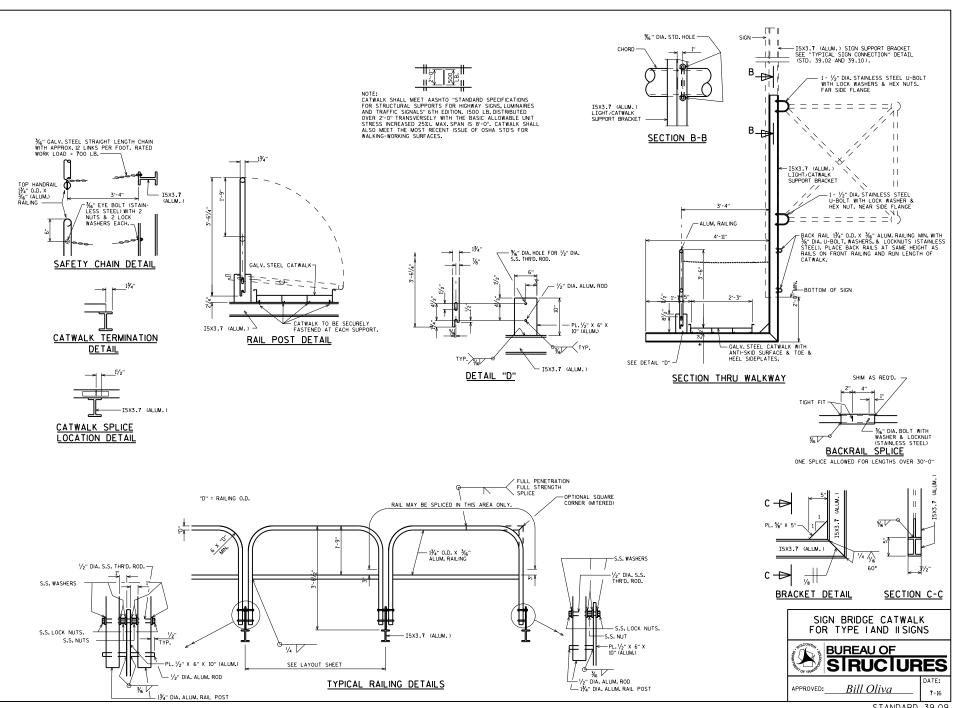
DESIGNED ACCORDING TO THE 6TH EDITION OF AASHTO "STANDARD SPECIFICTIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS."

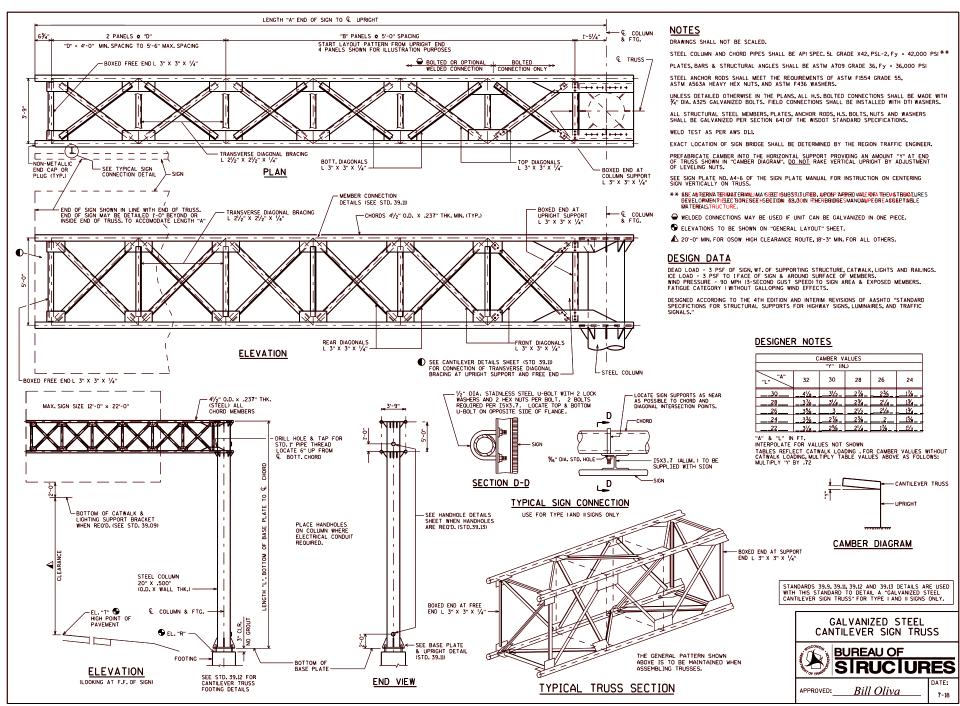
STANDARDS 39.03, 39.09, AND 39.13 DETAILS ARE USED WITH THIS STANDARD TO DETAIL A "4-CHORD GAVANIZED STEEL SIGN BRIDGE" FOR TYPE I AND II SIGNS ONLY.

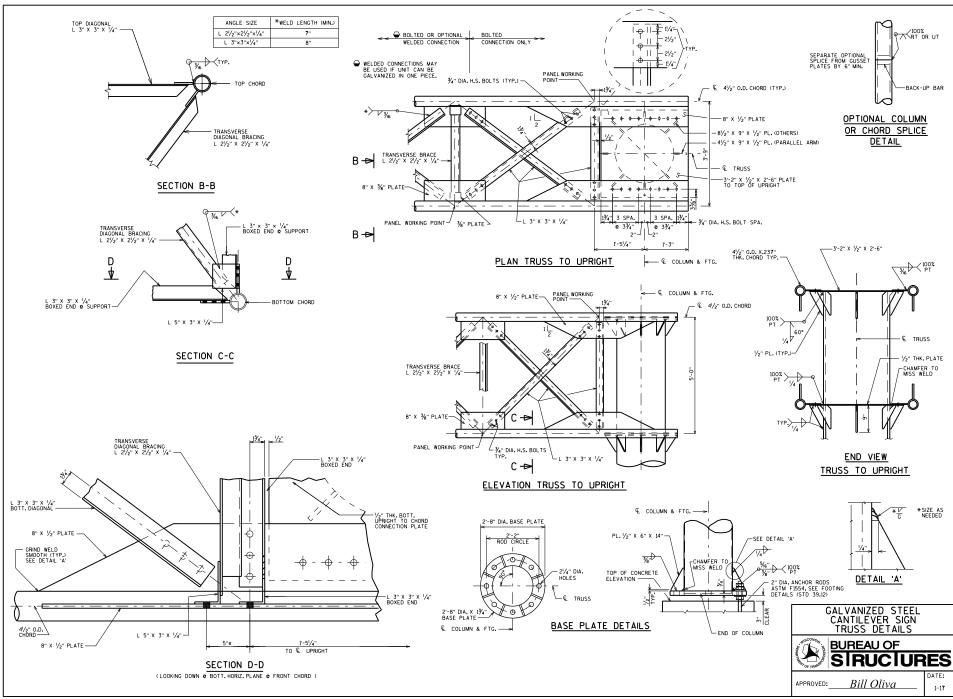
4-CHORD GALVANIZED STEEL SIGN BRIDGE

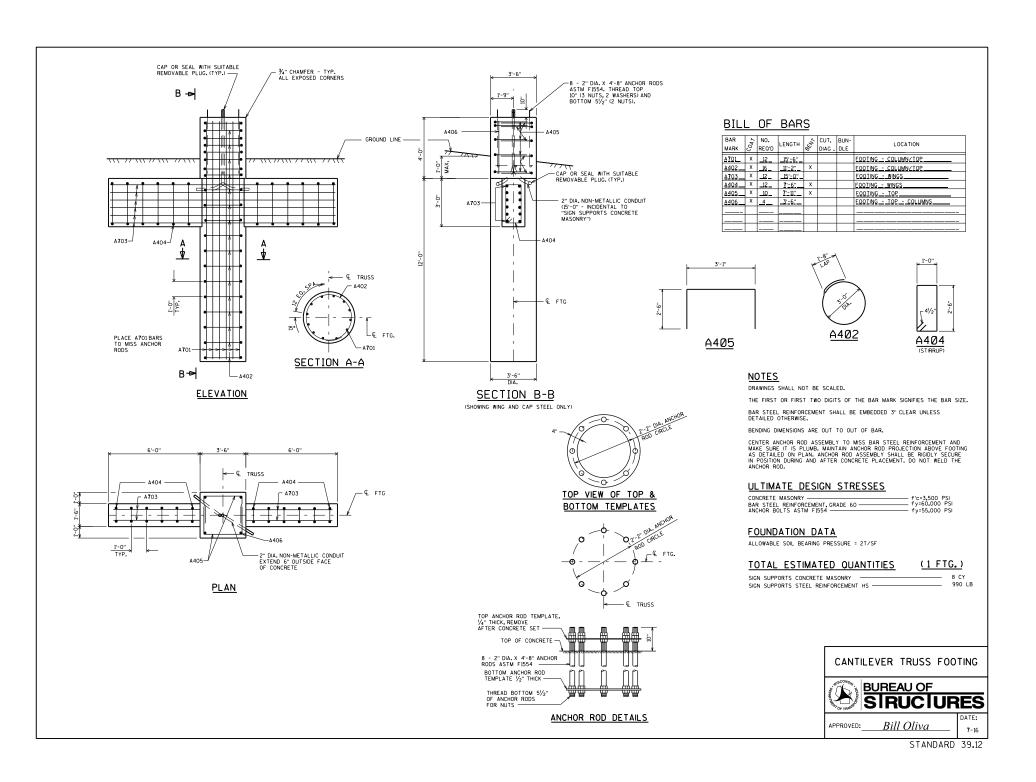


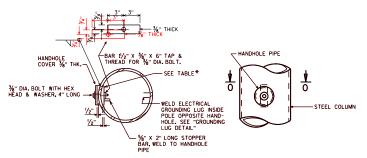














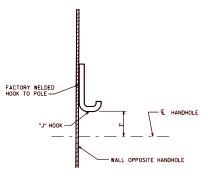
#### HANDHOLE DETAILS

#### **HANDHOLE NOTES**

HANDHOLES SHALL BE LOCATED IN ONE COLUMN OF THE SIGN BRIDGE STRUCTURE IF ELECTRICALLY OPERATED DEVICES ARE INSTALLED ON/IN THE STRUCTURE. COLUMNS WITH HANDHOLES SHALL BE NEAR THE ELECTRICAL SERVICE. THE CONTRACTOR SHALL VERFY THE LOCATION OF THE ELECTRICAL SERVICE ENTRACE WITH THE REGION TRAFFIC SECTION PRIOR TO FABRICATION OF THE SIGN BRIDGE COLUMNS AND MEMBERS. CONDUIT (AS RECO). SHALL BE LOCATED, PLACED AND SIZED AS SHOWN ON THE ELECTRICAL PLAN DETAIL SHEETS.

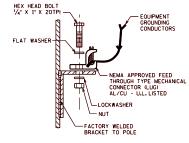
UNLESS NOTED OTHERWISE, ALL HANDHOLE ELEMENTS TO BE GALVANIZED PER SECTION 641 OF THE WISDOT STANDARD SPECIFICATIONS.

*	COLUMN SIZE O.D. X THK.	HANDHOLE PIPE O.D. X MIN. THK.
	UP TO AND INCLUDING 16" X 0.375"	5.562" X 0.500"
	GREATER THAN 16" X 0.375" TO AND INCLUDING 24" X 0.562"	6.625" X 0.562"

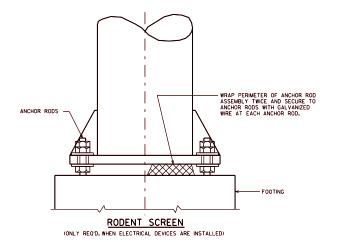


TYPICAL "J" HOOK LOCATION

THE "J" HOOK SHALL BE FACTORY WELDED TO THE INSIDE OF ALL COLUMNS CONTAINING ELECTRICAL WRING, THE "J" HOOK SHALL BE ATTACHED ABOYET THE CENTERLINE OF THE UPPER HANDHOLE AND MOUNTED INECTLY O'PPOSITE THE HANDHOLE AS SHOWN IN THE DRAWNG.



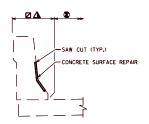
# GROUNDING LUG DETAIL NUT, BOLT AND WASHERS SHALL BE STAINLESS STEEL







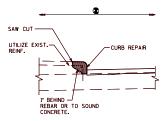
- ▲ "PIGMENTED SURFACE SEALER" LIMITS
- PROTECTIVE SURFACE TREATMENT" LIMITS



# PARAPET REPAIR DETAIL

502.3200 502.3210 509.1500 509.9050.5

PROTECTIVE SURFACE TREATMENT PIGMENTED SURFACE SEALER CONCRETE SURFACE REPAIR CLEANING PARAPETS



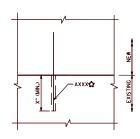
#### CURB REPAIR DETAIL

PROTECTIVE SURFACE TREATMENT CURB REPAIR

# **DESIGNER NOTES**

DETAILS MAY BE SHOWN ON PLANS IF NECESSARY FOR CLARITY.

INCLUDE APPLICABLE CONCRETE MASONRY BID ITEM TO FILL REPAIRS.



#### NOTE

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

CHOOSE ONE OF THE FOLLOWING AND PLACE ON PLAN)

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

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

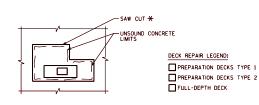
#### ANCHOR DETAIL (EXAMPLE)

ADHESIVE ANCHORS .-INCH ADHESIVE ANCHORS NO.\_BAR BAR STEEL REINFORCEMENT HS COATED STRUCTURES

**DESIGNER NOTES** 

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

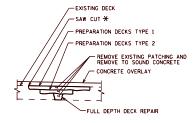
ANCHOR DETAIL EXAMPLE APPLICABLE FOR ADHESIVE ANCHORS LOCATED IN UNCRACKED CONCRETE. SEE CHAPTER 40,16 FOR ADDITIONAL GUIDANCE.



### DECK REPAIR DETAIL - PLAN

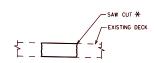
509.0301 509.0302 \*\*509.0000\$ \$\$509.2600 £509.2500

PREPARATION DECKS TYPE 1
PREPARATION DECKS TYPE 2
SWINNGEPAWEWENT BEEKIFPREPARATION AREAS
EUBLIFIERT IN ADEDOR REPAIRLAY DECKS COMORE TEA WEASONRYDEOVERINEY ADECKION AREAS



# DECK REPAIR DETAIL - SECTION

FOR DESIGNER INFORMATION ONLY (DO NOT PLACE ON PLANS)



#### FULL-DEPTH DECK REPAIR DETAIL

FOR DESIGNER INFORMATION ONLY (DO NOT PLACE ON PLANS)

₹509.0000S 1509.2600 1509.2600 SAMINOEPAVEMENT BEEKKIPPREPARATION AREAS EUNCHBEIRT MADEONR REBAIRL AY DECKS GOWGRE TEA WASSONRYDEOVERREP ABBOOKSN AREAS

#### DESIGNER NOTES

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

- \* "SAWING PAVEMENT DECK PREPARATION AREAS" NOT REQUIRED FOR CONCRETE OVERLAYS.
- ▲ USE "CONCRETE MASONRY DECK REPAIR" (509,200055F09RDDEEKRREPAIRSUUNDERPBOLWMBR, ASPHALTIC, OR POLYMER MOD, ASPHALTIC OVERLAYS, USE "CONCRETE MASONRY DECK REPAIR" FOR DECK REPAIR "HOTO OVERLAYS.

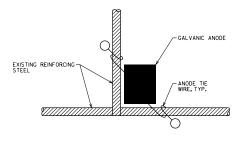
RESTRICTIONS ON REMOVAL ITEMS SHALL BE PLACED ON THE PLANS TO PREVENT DAMAGE TO REINFORCING STEEL.

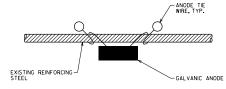
CONCRETE REPAIR DETAILS



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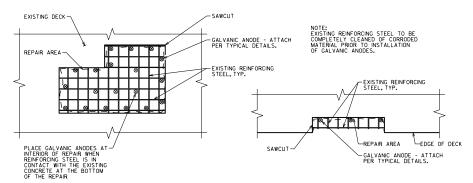
Bill Oliva





TYPICAL INSTALLATION AT BAR STEEL INTERSECTION

TYPICAL INSTALLATION FOR BAR STEEL



### PART. PLAN TYPICAL REPAIR DETAIL

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

### 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.

### **NOTES**

SEE SPECIAL PROVISION "EMBEDDED GALVANIC ANODES" FOR DESCRIPTION, MATERIALS, CONSTRUCTION, MEASUREMENT, AND PAYMENT INFORMATION.

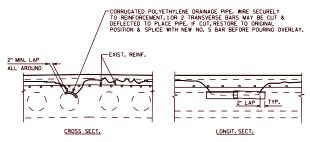
ANODES NEAREST TO EDGE OF REPAIR TO BE WITHIN 6" OF EDGE. AFTER PLACEMENT, GALVANIC ANODES SHOULD MAINTAIN A MINIMUM TOP COVER OF  $1\!\!/\!\!/_2$  AND A MINIMUM BOTTOM COVER OF  $3\!\!/\!\!/_4$  .

CATHODIC PROTECTION

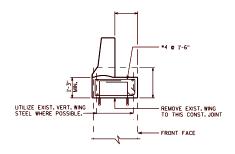


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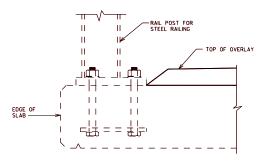
Bill Oliva



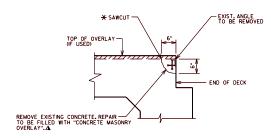
RUPTURED VOID REPAIR



SECTION THRU PARAPET ON WING



SECTION THRU RAILING



### SECTION AT END OF SLAB

509.0301 509.0302 <del>X</del> 509.00003 4509.2600	PREPARATION DECKS TYPE 1 PREPARATION DECKS TYPE 1 PREPARATION DECKS TYPE 1 SAWINGEPAWEMERY BECKIPPREPARATION AREAS EONICHEDIET HIADDIST REPAIRIL AY DECKS SONNOR THA MASSIONITY DOUGH THERY PAROMSNIN AREAS	S' S' S'
<b>3</b> 4509.2500	SONORE TEAWASONRYDEDVERINEY ADDICKSN AREAS	C
J# 30 310 200	CONTRACT TO MANAGEMENT POPONICAL AND	•

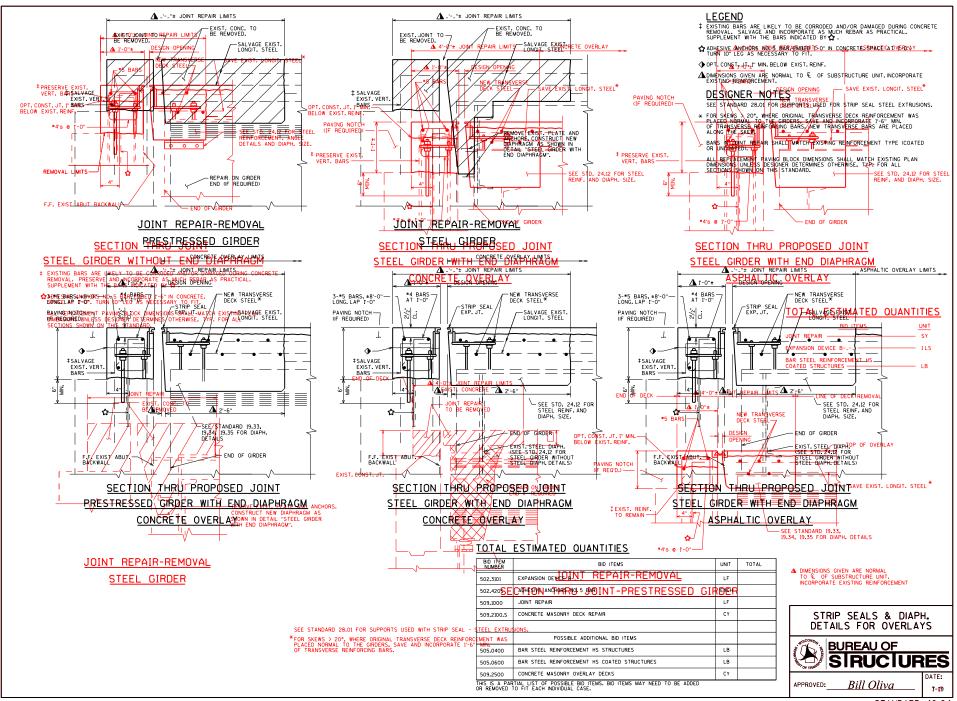
# **DESIGNER NOTES**

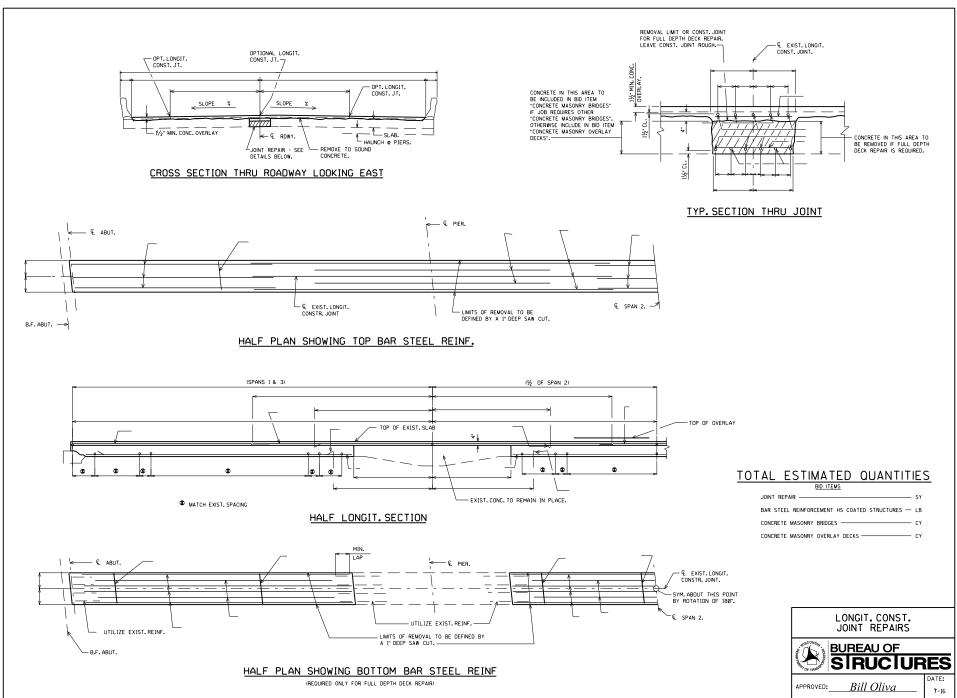
- \* "SAWING PAVEMENT DECK PREPARATION AREAS" NOT REQUIRED FOR CONCRETE OVERLAYS.
- $\Delta$  USE "CONCRETE MASONRY DECK REPAIR" (SPV.0035) FOR DECK REPAIRS UNDER POLYMER, ASPHALTIC, OR POLYMER MOD. ASPHALTIC OVERLAYS. USE "CONCRETE MASONRY DECK REPAIR" FOR DECK REPAIRS WITHOUT OVERLAYS.

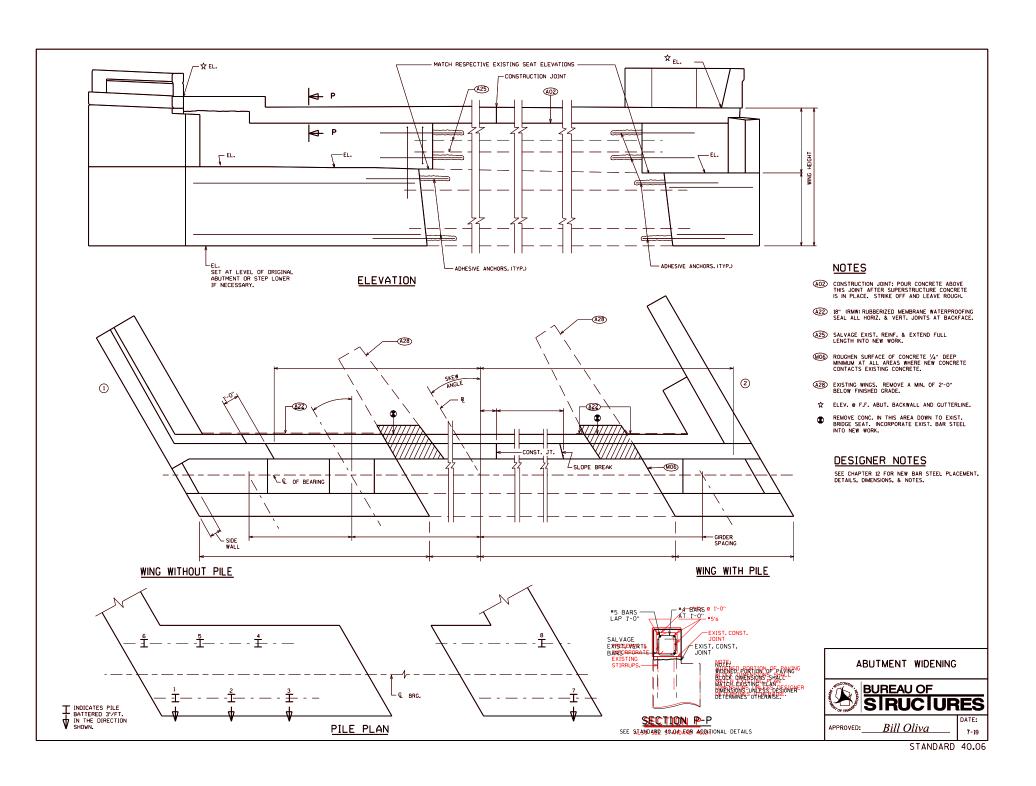
ATTACHING PARAPETS OR RAILINGS TO BRIDGE DECKS WITH EPOXY ANCHORS IS NOT ALLOWED BY FHWA.

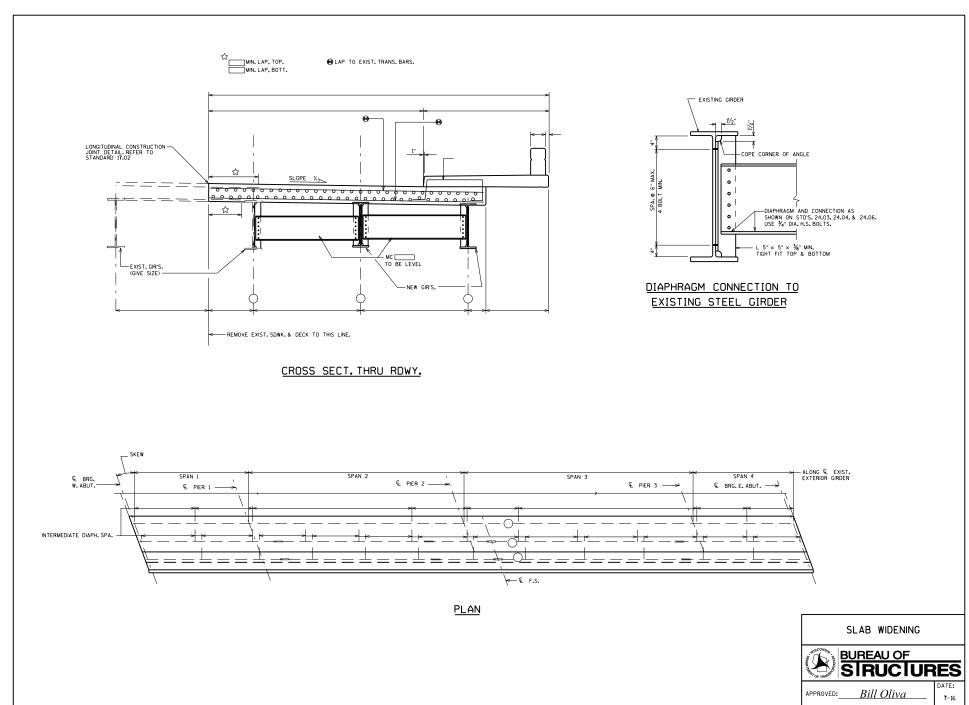
OVERLAY DETAILS

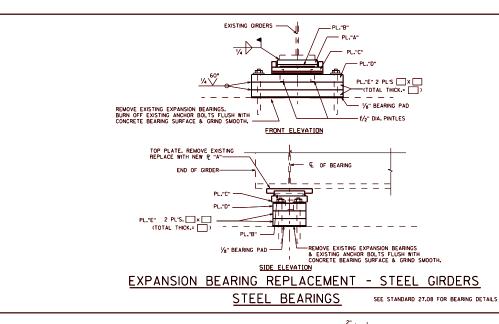


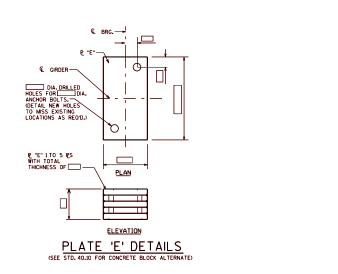


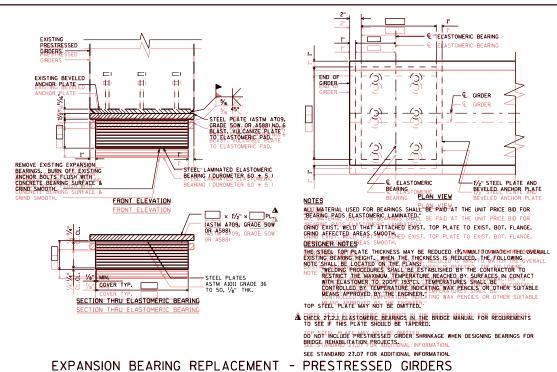




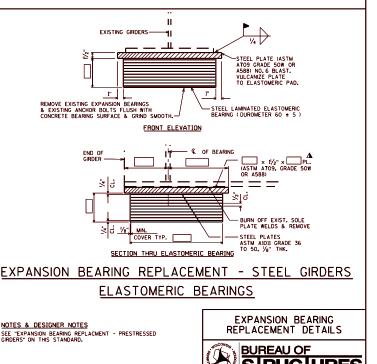








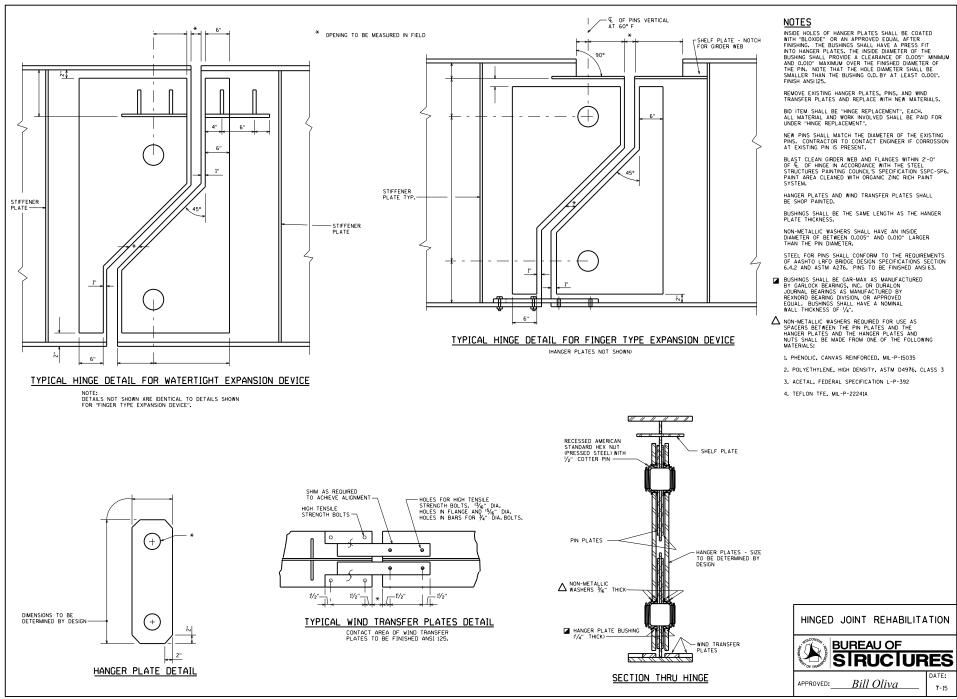
**ELASTOMERIC BEARINGS** 

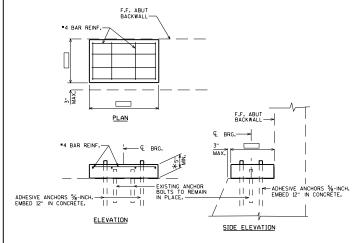


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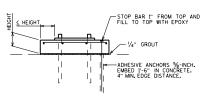
Bill Oliva





# CONCRETE BEARING BLOCK DETAILS

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



# PRECAST CONCRETE BLOCK DETAIL

DEPTH = MIN. 5". MAX. 1'-0" \*

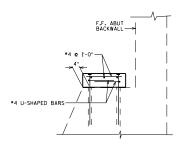
ANCHOR IN AT LEAST 4 LOCATIONS (ANCHORS INCLUDE ADHESIVE ANCHORS, ANCHOR BOLTS OR COMBINATION).

GROUT  $^{1}\!\!\!/_{\!4}"$  BENEATH PRECAST ELEMENT - ELIMINATE STRESS CONCENTRATION AND REDUCE CRACKING.

PRECAST BLOCK (OR ANY CONCRETE BLOCK) MUST EXTEND BEYOND BEARING A DISTANCE EQUAL TO, OR CREATER THAN, THE HEIGHT OF THE CONCRETE BLOCK  $\bigstar$ . THIS IS TO ACCOUNT FOR 45-BCORED OWNWARD AND QUTWARD STRESS DISTRBUTION. THIS PROVISION CAN BE DISTRBUTION IF A FULL-DEPTH CONCRETE DIAPHRADM IS USED IN CONJUNCTION WITH A  $2\gamma$ -THICK ELASTOMERIC PAD (FIXED SEAT).

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

BURN EXISTING ANCHOR BOLTS OFF FLUSH WITH BEAM SEAT.

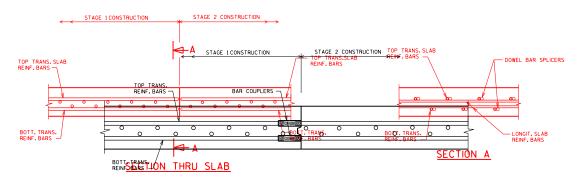


\*\* ALTERNATE DETAIL

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

CONCRETE BEARING BLOCK DETAILS





#### SECTION THRU DECK ONE-PIECE THREADED COUPLER SHOWN

#### DOWEL BAR SPLICER LAP LENGTHS CONCRETE UNDER BAR BAR SIZE 4 5 6 7 8 9 10 11

12" OR LESS MORE THAN 12	f'c = 3500	
BAR LENGTH COMP COUPLER MANUFAC	PUTED TO & LONGIT, JOINT AND SHALL BE MODIFIED IF REC'D. TO BAR CTURER RECOMMENDATIONS, PAY BASED ON BARSEAS CONSTRUBETION	* STAGE 2 CONSTRUCTION >>>
	DOWEL-IN BAR  STAGE 1 CONSTRUGRIGGED BAR  STAGE 2 CONSTRUCTION	DOWEL-IN BAR  SPLICED BAR
LONGIT. SUBSTRUCTURE REINFORCEMENT —	STAGE 2 I	BAR COUPLER  OWEL SCREWS INTO  LACED IN STAGE 1  THREADED SPLICERS  LONGITUDINAL SUBSTRUCTURE RENFORCEMENT
STIRRUPS —	STAGE 1 CONSTRUCTION	STAGE 2-CONSTRUCTION
	Can name	
	ONE-PIECE	THREADED COUPLER  LONGIT. SUBSTRUCTURE  SECTION B

BAR COUPLER ALTERNATIVES

SECT. THRU SUBSTRUCTURE UNIT

### **NOTES**

EGREDOWELICBAR GUNNHARKS SHIND POWSHARARS SHAVAP AREON OF THE SPLICED REINFORCEMENT BARS.

DOWEL BAR SPICERS SHALL BE OF MINIMUM 60 KBI YIELD STRENGTH, AND HAVE TENSILE DESIGNER ENO DE STEATER THAN THAT OF THE LAPPED REINFORCEMENT BARS.

DWIELESBRANSLRICHORDESBEDCATION, STAGINGS SIEZA AND GRANTEMEREGOTOBO SNORDENE SERGIFEE INTERTWAN FROM FECKARDINGAREME COUPLER AS THIS IS COVERED BY THE BID ITEM "BAR COUPLES (SIZE)".
FOR DOWEL BAR SPLICERS, ALL REINFORCEMENT BARS SHALL BE LAPPED AND TIED TO THE GNITCHE BLANDS SHOW DETAILS SIMILAR TO "SECTION THRU DECK" AND "BAR COUPLER ALTERNATIVES".

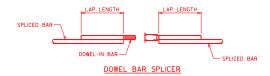
ALTERNATIVES".

SPICIER (COUPLER) ASSEMBLY IN THE SLAB SHALL BE EPOXY COATED IN ACCORDANCE WITH ARE TREOBRANCEBURS OFFERARS/INBICRATED/WHICH/REARS REQUIRE BAR COUPLERS BY USE OF A SYMBOL, USING THE SAME SYMBOL, AND A NOTE STATUS THAT A BAR COUPLER IS REGISTED/SBARS, ENCIS THAT LATE AND A NOTE STATUS THAT A BAR COUPLER IS REGISTED/SBARS, ENCIS THAT LATE AND A NOTE STATUS THAT A BAR COUPLER IS REGISTED/SBARS, ENCIS THAT LATE AND A NOTE STATUS THAT LATE AND A NOTE STATUS THAT LATE AND A NOTE OF SECONDARY AND

 $\bigcirc$  MINIMUM CAPACITY = 1.25 X fy X AREA OF SPLICED REINFORCEMENT BAR.

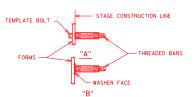
WHERE fy = YIELD STRENGTH OF SPLICED REINFORCEMENT BARS

ON 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 (SIZE)".





SPLICER ALTERNATIVES



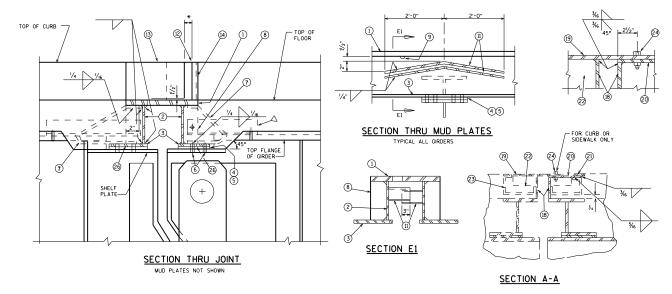
#### INSTALLATION AND SETTING METHODS

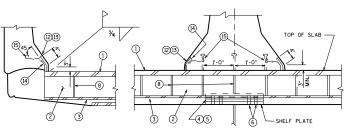
"A" SET SPLICER BY MEANS OF A TEMPLATE BOLT "B" SET SPLICER BY NAILING TO WOOD FORMS OR CEMENTING TO STEEL FORMS.

BAR SPLICER (COUPLER) DETAILS AT STAGE CONSTRUCTION

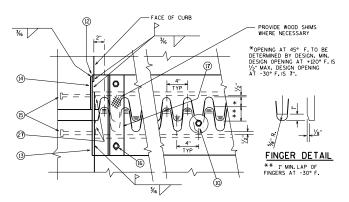


APPROVED: SBöltl Belirkar





DETAIL AT PARAPET DETAIL AT MEDIAN



PART PLAN OF FINGER PLATE AT BRUSH CURB

TOP FLANGE GROER

1-3'

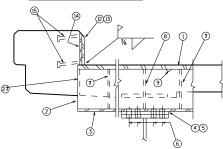
3 2 3 4 3/6

SHELF PLATE

MIN.

© OF EXTERIOR GIRDER

## SECTION THRU SIDEWALK



SECTION THRU JOINT AT BRUSH CURB

 $\triangle \begin{tabular}{llll} MUD PLATES NOT SHOWN \\ \triangle & ANGLE & 31/2" \times & 31/2" \times & \%_6" & FIELD DRILL & 3/4" DIA. ERECTION \\ BOLT HOLES OR WELD TO STIFFENER OR TOP FLG. \\ \end{tabular}$ 

#### LEGEND

- 1. FINGER PLATE. SIZE TO BE DETERMINED BY DESIGN.
- 2. WEB PLATE, SIZE TO BE DETERMINED BY DESIGN.
- 3. FLANGE PLATE. SIZE TO BE DETERMINED BY DESIGN.
- 4. BEVELED SHIM PLATE 3/8" THICK. 15/16" DIA. HOLES FOR NO. 6.
- 5. 34" LAMINATED SHIM WITH SLOTTED OPENINGS
- 6.  $\frac{3}{4}$ " DIA. ERECTION BOLTS. DRILL HOLES IN SHELF PLATE IN THE FIELD.
- 7. ANCHOR BAR 5%" DIA. AT 1'-0" CENTERS. BEND AS SHOWN.
- 8. STIFFENER BAR  $\frac{1}{4}$ " THICK.  $\frac{1}{4}$ " FILLET WELD ALL AROUND. PLACE AT  $\frac{1}{4}$ . OF GIRDER AND AT +2'-0" CENTERS BETWEEN GIRDERS.
- 9. %" VENT HOLES AT 3'-0" CENTERS.
- 10.  $\frac{1}{3}$ " DIA. ADJUSTING BOLT AT APPROX. 4'-0" CENTERS WITH TWO  $\frac{1}{6}$  DIA. X  $\frac{3}{6}$ " PLATE WASHERS. ONE ON EACH SIDE OF FINGER PLATE.
- 11. MUD PLATE 1/4" THICK
- 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. 34" 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  $2\frac{1}{2}$ " IN ONE END OF ANGLE AS SHOWN, FOR BOLT NO.16.
- 18. CLOSING PLATE 3/8" CUT AS SHOWN. SEE WELD DETAIL
- 19. 3/8" PLATE. BEND AS SHOWN.
- 20. 36" PLATE, BEND AS SHOWN.
- 21. 3/8" PLATE. BEND AS SHOWN.
- 22. %" PLATE. WELD ALL AROUND,  $\slash_4"$  FILLET WELD TO PLATES NO. 18, 19, & 20.
- 23.  $\mbox{\%}\mbox{"}$  DIA. STUDS X  $6\mbox{\%}\mbox{6"}$  LONG. BEND AFTER WELD.
- 24.  $\frac{7}{4}$ " DIA, BOLT WITH SO. NUT. GREASE FOR EASY REMOVAL,  $\frac{7}{6}$ " X  $1\frac{7}{4}$ " SLOTTED HOLE IN PL. NO. 19, LONG DINENSION OF HOLE PARALLEL TO  $\mathbb Q$ . OF ROADMAY, TACK WELD NUT TO PLATE NO. 20 + 2-0" SPA.
- 25.  $\frac{5}{8}"$  DIA. STUDS X  $6\frac{5}{16}"$  LONG. WELD TO PLATE NO. 20.
- 26. FLANGE PLATE. SAME THICKNESS AS PLATE NO. 3 AND SAME WIDTH AS SHELF PLATE. SHOP BUTT WELD TO PLATE NO. 3.
- 27. 38" CLOSING PLATE. WELD TO PLATES NO. 1 AND NO. 2.

#### <u>NOTES</u>

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.

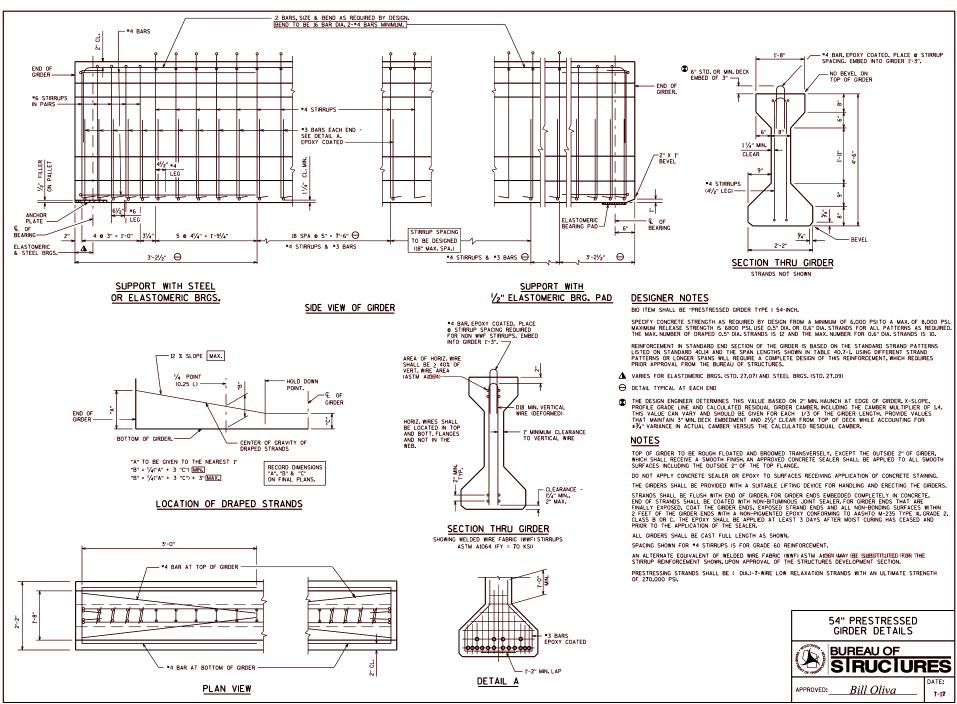
IN SOME CASES THE GIRDER FLANCES AND WEB PLATES DO NOT HAVE TO BE OUT TO ACCOMMODATE THE FINGER JOINT SECTION, THE SLAB DEPTH MAY BE UTILIZED EFFECTIVELY.

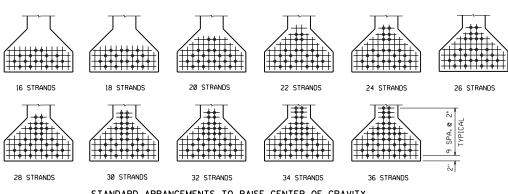
FINGER TYPE EXPANSION JOINT - PLATE GIRDER



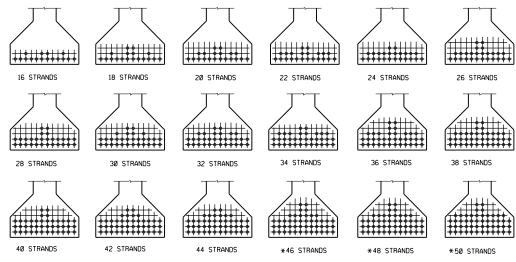
APPROVED:

Bill Oliva





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



# 54" GIRDER

A = 789 SQ. IN.

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

y<sub>T</sub> = 29.27 IN.

 $y_{R} = -24.73 \text{ IN.}$ 

I = 260,730 IN.4

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

 $S_{R} = -10,543 \text{ IN.}^{3}$ WT. = 822 #/FT.

#### PRE-TENSION

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

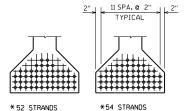
f<sub>s</sub> = 0.75 X 270,000 = 202,500 P.S.I for low relaxation strands.

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<sub>•</sub>)=  $\frac{(4)}{(3)}$  $\frac{y_B}{r^2} = \frac{-24.73}{330.46} = -0.07484 \text{ IN./IN.}^2$ (K/Sq. In.)

(COMPRESSION IS POSITIVE)

	N	(1)	(2)	(3)	(4)	(4)	(5)	(5)
			е, ч,		P(Init.) = A. f.	P(Init.) = A <sub>s</sub> f <sub>s</sub>	f <sub>a</sub> (Ini t <sub>•</sub> )=(4)/(3)	f <sub>a</sub> (Ini t <sub>•</sub> )=(4)/(3)
	NO.	e <sub>S</sub>	$(1+\frac{e_S y_B}{r^2})$	(A/(2))	0.5" DIA. STRANDS	O.6" DIA. STRANDS	O.5" DIA. STRANDS	O.6" DIA. STRANDS
	STRANDS	(h)	r٠	( sq. in.)		(KIPS)	(K/Sq. In.)	(K/Sq. In.)
-	STRHINDS	(Inches)		1 Sq. 111.7	(KIF 3)	(KIF 3)	(K7 3Q, III.)	(K7 5Q, III.)
			STANDARD	PATTE	RNS FOR UNDR	APED STRANDS		
	16	-20.23	2.514	313.84	496	703	1.580	2.240
L	18	-19.84	2.485	317.51	558	791	1.757	2491
L	20	-19.13	2.432	324.42	620	879	1.911	2 <b>.7</b> 09
L	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
L	26	-17.18	2.286	345.14	806	1143	2.335	3.312
L	28	-17.02	2.274	346.97	868	1230	2.502	3.545
L	30	-16.33	2.222	355.09	930	1318	2.619	3.712
L	32	-16.23	2.215	356.21	992	1406	2 <b>.7</b> 85	3.947
L	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
П			STANDARD	PATTF	RNS FOR DRAP	ED STRANDS		
-	16	00.07					4.075	0.374
-		-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	
Į.	54	-19.03	2.424	325.50	1674		5.143	

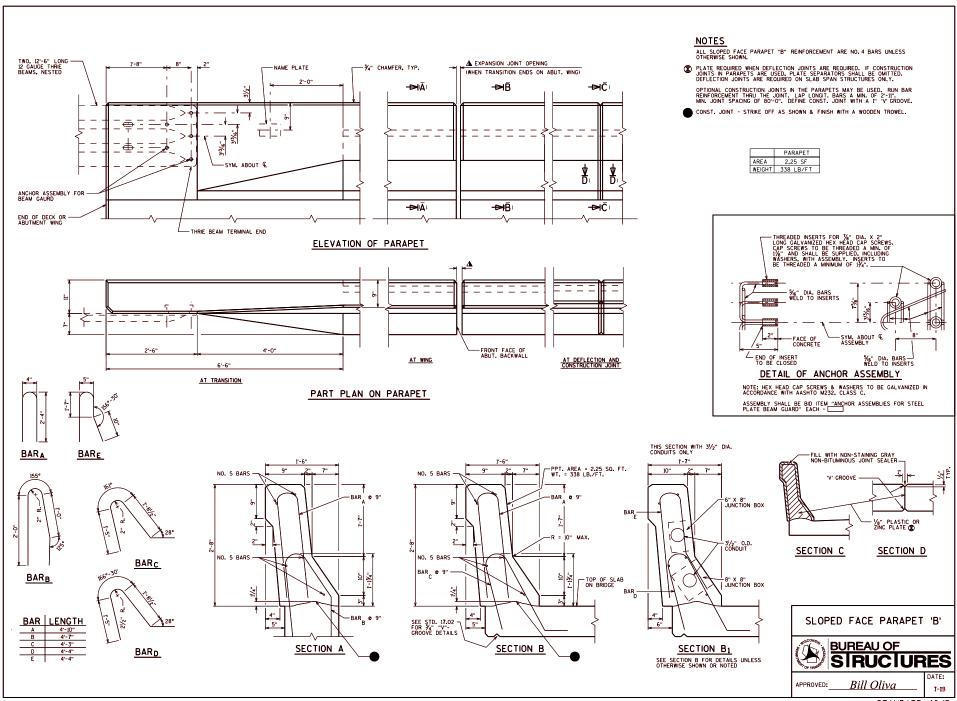


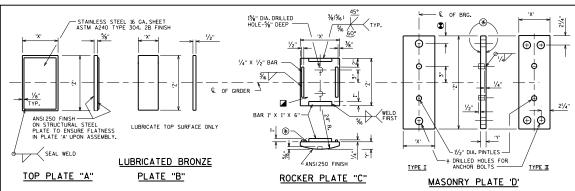
ARRANGEMENT AT & SPAN - FOR GIRDERS WITH DRAPED 0.5" DIA. AND 0.6" DIA. STRANDS

\*0.5" DIA. STRANDS ONLY

54" PRETENSIONED GIRDER DESIGN DATA **BUREAU OF** 

APPROVED: Bill Oliva





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

# GIRDER BEARING PAD (1/8") ← C OF BEARING LINCATE ANCHOR BOLTS AS INDICATED

# FOR MASONRY PLATE "D". FOR SIZE, LENGTH, AND NUMBER SEE ANCHOR BOLT NOTE BELOW. EXPANSION BEARING ASSEMBLY

PLATE "B"-

PLATE "C"-

PLATE "D"-

.396

.432

.516

.354

.375

.396

.474

.547

.630

.672

.838

#### NOTES

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

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

ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANZED AS REQUIRED BY ASTM DESIGNATION ALIS, CLASS, CT., PLATE "C". & "D" SHALL BE GALVANIZED, FOR LUMPAINTED STRUCTURES PLATE "C" & "D" SHALL BE SHOP PAINTED ATTER GALVANIZING, PLATE "A" SHALL BE SHOP PAINTED ATTER GALVANIZING, PLATE "A" SHALL BE SHOP PAINTED. ATTER GALVANIZING, PLATE "A" SHALL BE SHOP PAINTED. ATTER 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 50W.

- \* WELD SIZE, REFER TO STANDARD 24.2.
- ADJUST HEIGHT IF TAPERED BEARINGS ARE REQUIRED.

FABRICATOR MAY INCREASE PLATE "A" OR PLATE "D" THICKNESS AS AN ALTERNATE TO SHIMS.

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

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

#### 14" BEARING

CAP.	PLAT	EΑ	PLATE	В	F	LATE	С	P	LATE	D	HEIGHT
KIPS	Х	Z	X	Z	х	Y	Z	X	Y	Z	FEET
105	9"	1'-2"	5"	1'-2"	7"	11/16"	1'-41/4"	8"	11/2"	2'-0"	.354
145	11"	1'-2"	7"	1'-2"	9"	1"/16"	1'-41/4"	8"	11/2"	2'-0"	.375
185	1'-1"	1'-2"	9"	1'-2"	11"	115/16"	1'-41/4"	8"	11/2"	2'-0"	.396
225	1'-3"	1'-2"	11"	1'-2"	1'-1"	23/8"	1'-41/4"	10"	13/4"	2'-0"	.453
270	1'-5"	1'-2"	1'-1"	1'-2"	1'-3"	2%"	1'-41/4"	1'-0"	2"	2'-0"	.516
310	1'-7"	1'-2"	1'-3"	1'-2"	1'-5"	3%"	1'-41/4"	1'-1"	23/8"	2'-0"	.630
350	1'-9"	1'-2"	1'-5"	1'-2"	1'-7"	3%"	1'-41/4"	1'-3"	21/8"	2'-1"	.672
390	1'-11"	1'-2"	1'-7"	1'-2"	1'-9"	41/8"	1'-41/4"	1'-4"	21/8"	2'-1"	.755
435	2'-1"	1'-2"	1'-9"	1'-2"	1'-11"	41/8"	1'-41/4"	1'-6"	31/4"	2'-1"	.838

CAP.	PLAT	EΑ	PLATE	: В	P	LATE	С	P	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'-41/4"	8"	11/2"	2'-0"	.354
145	11"	1'-2"	7"	1'-2"	9"	111/16"	1'-41/4"	8"	11/2"	2'-0"	.375
185	1'-1"	1'-2"	9"	1'-2"	11"	115/16"	1'-41/4"	8"	11/2"	2'-0"	.396
225	1'-3"	1'-2"	11"	1'-2"	1'-1"	23/8"	1'-41/4"	10"	13/4"	2'-0"	.453
270	1'-5"	1'-2"	1'-1"	1'-2"	1'-3"	2%"	1'-41/4"	1'-0"	2"	2'-0"	.516
310	1'-7"	1'-2"	1'-3"	1'-2"	1'-5"	3%"	1'-41/4"	1'-1"	23/8"	2'-0"	.630
350	1'-9"	1'-2"	1'-5"	1'-2"	1'-7"	3%"	1'-41/4"	1'-3"	21/8"	2'-1"	.672
390	1'-11"	1'-2"	1'-7"	1'-2"	1'-9"	41/8"	1'-41/4"	1'-4"	21/8"	2'-1"	.755
435	2'-1"	1'-2"	1'-9"	1'-2"	1'-11"	4%"	1'-41/4"	1'-6"	31/8"	2'-1"	.838

#### 20" BEARING

CAP.	PLAT		PLATE	В	F	LATE	С		LATE	D	HEIGHT
KIPS	x	Z	Х	Z	X	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"	1"/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"	13/4"	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"	21/8"	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"	21/8"	2'- <b>7</b> "	.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

#### 10" BEARING

CAP. KIPS	PLAT X	E A	PLATE X	B Z	X	LATE	C Z	X	LATE	D Z	HEIGHT FEET
<b>7</b> 5	9"	10"	5"	10"	7"	11/16"	1'-0'/4"	8"	11/2"	1'-8"	.354
105	11"	10"	7"	10"	9"	1"/16"	1'-01/4"	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'-01/4"	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'-01/4"	1'-1"	2%"	1'-8"	.630
280	1'-11"	10"	1'-7"	10"	1'-9"	4%"	1'-01/4"	1'-3"	2 1/8"	1'-8"	.755
310	2'-1"	10"	1'-9"	10"	1'-11"	41/8"	1'-01/4"	1'-4"	21/8"	1'-8"	.755

#### 16" BEARING

CAP. KIPS	PLAT X	E A	PLATE X	B	X	LATE	C Z	X P	LATE	D Z	HEIGHT FEET
120	9"	1'-4"	5"	1'-4"	7"	11/16"	1'-61/4"	8"	11/2"	2'-2"	.354
165	11"	1'-4"	7"	1'-4"	9"	1"/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"	23/8"	1'-6'/4"	11"	2"	2'-2"	.474
310	1'-5"	1'-4"	1'-1"	1'-4"	1'-3"	2%"	1'-61/4"	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"	41/8"	1'-6'/4"	1'-7"	31/8"	2'-3"	.838

#### ANCHOR BOLT NOTES:

FOR SPAN LENGTHS UP TO 100'-0", USE A TYPE I MASONRY PLATE 'D'

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)  $1^1\!/_2$ " DIA. X 1'-10"LONG ANCHOR BOLTS.

 $\pm$  DRILLED HOLES FOR ANCHOR BOLTS IN MASONRY PLATE "D" SHALL HAVE A DIAMETER  $\%_{8}$  LARGER THAN ANCHOR BOLT.

12" BEARING

230 | 1'-5" | 1'-0" | 1'-1" | 1'-0" | 1'-3" | 27/8" | 1'-21/4" | 11" | 2" | 1'-10"

265 | 1-7" | 1-0" | 1-3" | 1-0" | 1-5" | 37%" | 1-21/4" | 1-1" | 23%" | 1-10" 300 | 1-9" | 1-0" | 1-5" | 1-0" | 1-7" | 37%" | 1-21/4" | 1-2" | 23%" | 1-10" 370 2'-1" 1'-0" 1'-9" 1'-0" 1'-11" 47%" 1'-21/4" 1'-5" 27%" 1'-11" .755

350 | 1-5" | 1-6" | 1-1" | 1-6" | 1-3" | 21/6" | 1-81/4" | 1-1" | 23/6" | 2'-5"

400 1'-7" 1'-6" 1'-3" 1'-6" 1'-5" 37%" 1'-81/4" 1'-2" 23%" 2'-5"

455 | 1-9" | 1-6" | 1-5" | 1-6" | 1-7" | 3%" | 1-81/4" | 1-4" | 2%" | 2'-5"

560 2'-1" 1'-6" 1'-9" 1'-6" 1'-11" 47%" 1'-8"/4" 1'-8" 37%" 2'-5"

18" BEARING

PLATE C

7" 1'-6" 9" 1"/6" 1'-81/4" 8" 11/2" 2'-4"

9" 1'-6" 11" 1"%; " 1'-8"/4" 9" 11/2" 2'-4"

11" 1'-6" 1'-1" 23%" 1'-81/4" 11" 2" 2'-4"

7" 11/6" 1'-81/4" 8" 11/2" 2'-4"

5" 1'-0" 7" 11/6" 1'-21/4" 8" 11/2" 1'-10" 7" I'-0" 9" I<sup>11</sup>/<sub>16</sub>" I'-2<sup>1</sup>/<sub>4</sub>" 8" I<sup>1</sup>/<sub>2</sub>" I'-10"

9" 1"-0" 11" 15% " 1"-21/4" 8" 11/2" 1"-10"

11" I'-0" I'-I" 23%" I'-21/4" 9" 11/2" I'-10"

Z

9" ['-0"

CAP. PLATE A PLATE B

x Z X Z 9" 1'-6"

5" 1'-6"

125 | 11" | 1'-0" | 160 1'-1" 1'-0"

195 1'-3" 1'-0"

185 11" 1'-6"

240 1'-1" 1'-6"

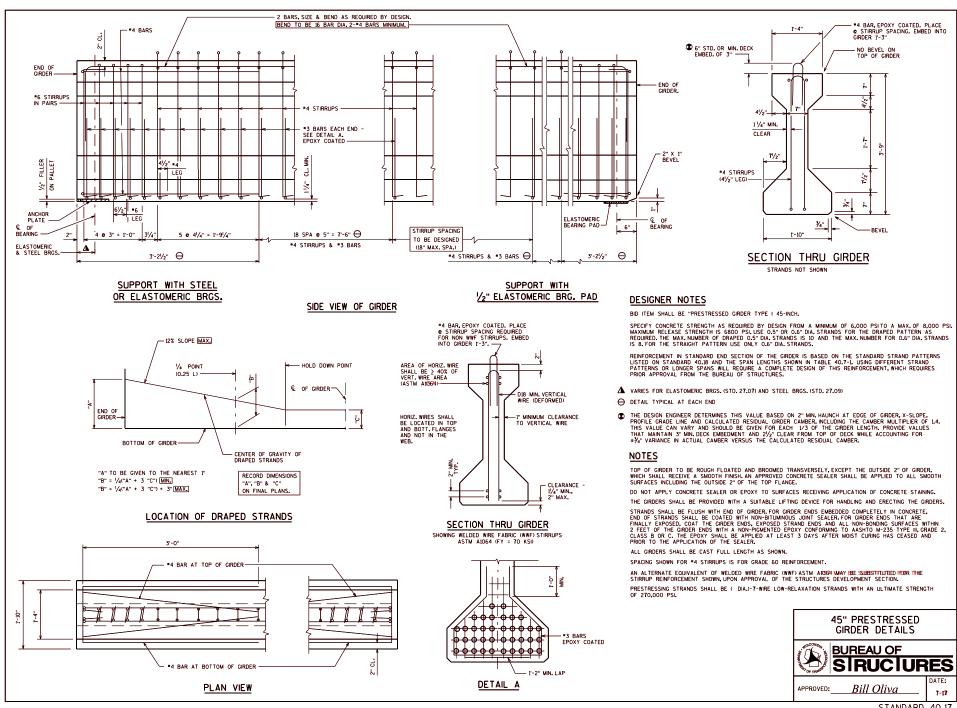
295 1'-3" 1'-6"

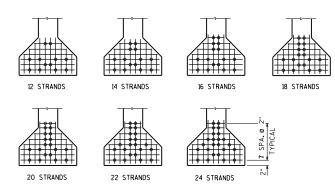
PLATE D

PLATE D

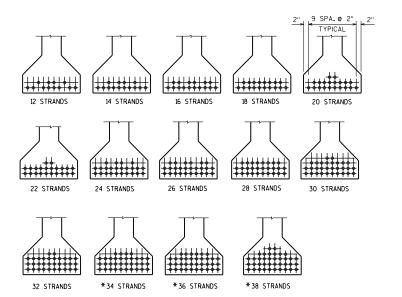
EXPANSION BEARING DETAILS TYPE 'A' - STEEL GIRDERS







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



#### 45" GIRDER PRE-TENSION

A = 560 SQ. IN. f's = 2**7**0,000 P.S.I

f<sub>s</sub> = 0.75 X 270,000 = 202,500 P.S.I for low relaxation strands.  $r^2 = 223.91 \, \text{IN.}^2$ 

 $y_{T} = 24.73 \text{ IN.}$ Pi PER 0.5" DIA. STRAND = 0.1531 X 202,500 = 31.00 KIPS Pi PER 0.6" DIA. STRAND = 0.217 X 202,500 = 43.94 KIPS

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

 $S_{\tau} = 5.070 \text{ IN.}^3$ 

S<sub>B</sub> = -6,186 IN.3 WT. = 583 #/FT.

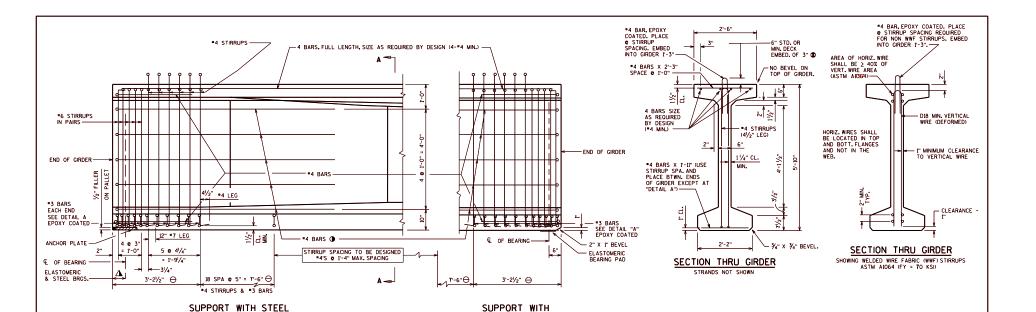
(COMPRESSION IS POSITIVE)

N	(1)	(2)	(3)	(4)	(4)	(5)	(5)
NO.	es	$(1 + \frac{e_s}{r^2})$	(A/(2))	P(Init.) = A <sub>s</sub> f <sub>s</sub> 0.5" DIA. STRANDS	P(Init.) = A <sub>s</sub> f <sub>s</sub> 0.6" DIA. STRANDS	f <sub>B</sub> (Ini t.)=(4)/(3) 0.5" DIA. STRANDS	f <sub>B</sub> (Ini t.)=(4)/(3) 0.6" DIA. STRANDS
STRANDS	(inches)	'	(sq.in.)	(KIPS)	(KIPS)	(K/Sq. In.)	(K/Sq. In.)
		STA	NDARD PATTE	RNS FOR UND	RAPED STRANI	OS	
12	-14.94	2.352	238.10		52 <b>7</b>		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
		STA	NDARD PATTE	RNS FOR DRAI	PED STRANDS		
12	-17.60	2.593	215.97	372	527	1.722	2,440
14	-17.70	2,602	215.22	434	615	2.017	2.858
16	-17.52	2.586	216.55	496	703	2.290	3.246
18	-17.38	2.573	21 <b>7.</b> 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	22 <b>7.</b> 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

GIRDER DESIGN DATA **BUREAU OF** APPROVED: Bill Oliva

45" PRESTRESSED

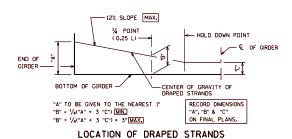


# 3'-0" "4 BAR AT TOP & BOTTOM OF GIRDER "4 BARS © I'-0" VARIES: I'-0" TO 3'-6" TO BE DETERMINED BY FABRICATOR

OR ELASTOMERIC BRGS.

SIDE VIEW OF GIRDER

#### 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 PS:1TO A MAX. OF 8,000 PS:1 MAXIMUM RELEASE STRENGTH IS 6800 PS:1 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 40,20 AND THE SPAN LENGTHS SHOWN IN TABLE 40,7-1. USIND DIFFERENT STRAND PATTERNS OR LONGER SPANS WILL REQUIRE A COMPLETE DESIGN OF THIS RENFORCEMENT, WHICH REQUIRES PRIOR APPROVAL FROM THE BUREAU OF STRUCTURES.

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

- O DETAIL TYPICAL AT EACH END
- INCREASE THE SIZE OF THESE BARS IF REQUIRED BY AASHTO LRFD 5.8.3.5
- THE DESIGN ENGINEER DETERMINES THIS VALUE BASED ON 2" MIN, HAUNCH AT EDGE OF GROER, X-SLOPE, PROFILE GRADE LINE AND CALCULATED RESIDUAL GROER CAMBER, INCLUDING THE CAMBER MULTIPLEIR OF 1.4. THIS VALUE CAN VARY AND SHOULD BE GIVEN FOR EACH 1/3 OF THE GIRDER LENGTH, PROVIDE VALUES THAT MAINTAIN 3" MIN, DECK EMBEDMENT AND 2½" CLEAR FROM TOP OF DECK WHILE ACCOUNTING FOR ±¾" VARIANCE IN ACTUAL CAMBER VERSUS THE CALCULATED RESIDUAL CAMBER.

#### NOTES

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

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

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

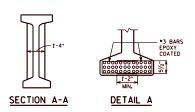
STRANDS SHALL BE FLUSH WITH END OF CROER, FOR CIRDER ENDS EMBEDDED COMPLETELY IN CONCRETE, END OF STRANDS SHALL BE COATED WITH NON-BITUMINOUS, JOINT SEALER, FOR CROER ENDS. THAT ARE FRAILLY EXPOSED, COAT THE GRORE ENDS, EXPOSED STRAND ENDS AND ALL NON-BONDING SURFACES WITHIN 2 FEET OF THE GRORE RIDGS WITH A NON-PICKMENTED FEONY CORORIMON TO ASHITO M-235 TYPE III, CRADE 2, CLASS B OR C. THE EPOXY SHALL BE APPLIED AT LEAST 3 DAYS AFTER MOIST CURNO HAS CLASED AND PRIOR TO THE APPLICATION OF THE SEALER.

ALL GIRDERS SHALL BE CAST FULL LENGTH AS SHOWN.

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

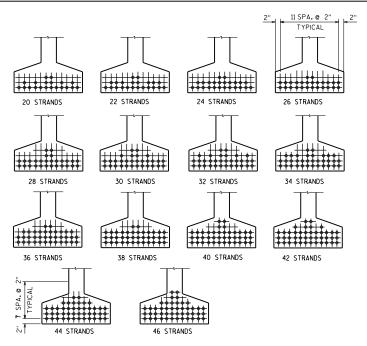
AN ALTERNATE EQUIVALENT OF WELDED WIRE FABRIC (WWF) ASTM A1084 MMAY BE SUBSTITUTED FOR THE STIRRUP REINFORCEMENT SHOWN, UPON APPROVAL OF THE STRUCTURES DEVELOPMENT SECTION.

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

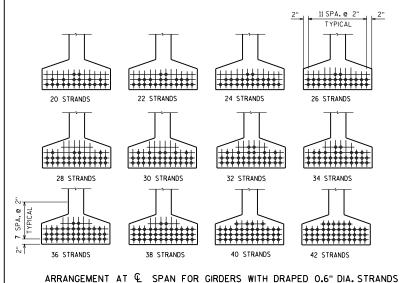


70" PRESTRESSED GIRDER DETAILS





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



#### (COMPRESSION IS NEGATIVE)

N	(1)	(2)	(3)	(4)	(5)
NO. STRANDS	e <sub>s</sub> 0.5" DIA. STRANDS (inches)	$(1 + \frac{e_s  y_B}{r^2}$ 0.5" DIA. STRANDS	(A/(2)) 0.5" DIA. STRANDS (sq. 10.)	P(Init.) = A <sub>s</sub> f <sub>s</sub> 0.5" DIA. STRANDS (KIPS)	f <sub>B</sub> (Ini+.)=(4)/(3) 0.5" DIA. STRANDS (K/Sq.In.)

STAND	ARD PAT	TERNS -	<b>0.</b> 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 <b>.</b> 54 <b>7</b>
26	-31.39	2.647	292,410	806	2 <b>.7</b> 56
28	-31.05	2.629	294.410	868	2.948
30	-30.89	2.621	295.310	930	3.149
32	-30.75	2.614	296.100	992	3.350
34	-30.62	2.607	296.890	1054	3.550
36	-30.51	2.601	29 <b>7.</b> 580	1116	3 <b>.7</b> 50
38	-30.41	2.596	298.150	1178	3.951
40	-30.12	2.581	299.880	1240	4.135
42	-29.95	2.572	300.930	1302	4.327
44	-29.80	2.564	301.870	1364	4.519
46	-29.49	2.548	303.770	1426	4.694

#### 70" GIRDER

A = 774 SQ. IN.

r2 = 659.70 IN.2

 $y_{\tau} = 35.38$  IN.

 $y_p = -34.62$  IN.

I = 510,613 IN.4

S, = 14,430 IN. 3

S<sub>R</sub> = -14,750 IN. 3

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

(COMPRESSION IS NEGATIVE)

N	(1)	(2)	(3)	(4)	(5)
NO. STRANDS	e <sub>s</sub> 0.6" DIA. STRANDS (inches)	$(1 + \frac{e_s}{r^2} \frac{y_B}{r^2}$ 0.6" DIA. STRANDS	(A/(2)) 0.6" DIA. STRANDS (sq. 10.)	P(Init.) = A <sub>s</sub> f <sub>s</sub> 0.6" DIA. STRANDS (KIPS)	f <sub>B</sub> (Ini +.)=(4)/(3) 0.6" DIA. STRANDS (K/Sq. In.)

#### STANDARD PATTERNS - 0.6" DIA. DRAPED STRANDS

0			<u> </u>		0
20	-31.62	2.659	291.090	879	3.020
22	-31.53	2.655	291.530	967	3.317
24	-31.45	2.650	292.080	1055	3.612
26	-31.39	2.647	292.410	1143	3.909
28	-31.19	2.637	293.520	1230	4.191
30	-31.02	2.628	294.520	1318	4.475
32	-30.74	2.614	296.100	1406	4.748
34	-30.62	2.607	296.890	1494	5.032
36	-30.51	2.601	297.580	1582	5.316
38	-30.41	2.596	298.150	1670	5.601
40	-30.22	2.586	299.300	1758	5.874
42	-30.05	2.577	300.350	1846	6.146

#### 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 0.5" DIA. STRAND

= 0.1531 X 202,500 = 31.00 KIPS

Pi PER 0.6" DIA. STRAND

= 0.217 X 202,500 = 43.94 KIPS

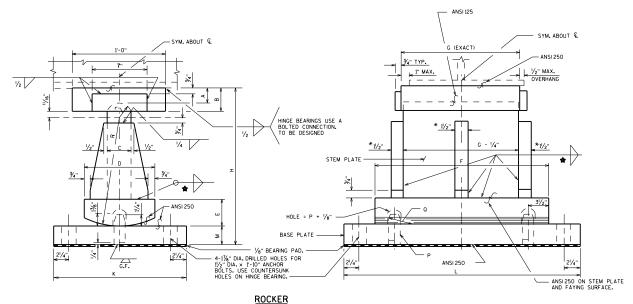
 $\frac{y_B}{r^2} = \frac{-34.62}{659.70} = -0.05248 \text{ IN./IN.}^2$ 

70" PRESTRESSED GIRDER DESIGN DATA



APPROVED:

Bill Oliva



RUCK

 $\spadesuit$  400 K  $\leq$  REACTION < 1000 K. USE  $\frac{5}{8}$ " WELD. 1000 K  $\leq$  REACTION  $\leq$  1500 K. USE  $\frac{3}{2}$ 4" WELD.

\* FOR REACTION > 1000 KIPS USE 2" STIFFENERS.

#### TABLE OF DIMENSIONS

											G	VALUE	ES									Ι.	-	PINTL	F
REACTION (KIPS)	A	В	С	D	E	G=1	r- <b>7</b> "	G=1	-9"	G=1'	-11"	G=2	?'-1"	G=	2'-3"	G=2	"-5"	н	K	М	R				_
(Kir 3)						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'-71/2"	1'-6"	21/8"	1'-1"	111/16."	1% "	2"	31/2"
500-599	115/16"	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	115/16	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"	3%"	_	_	_	_	2'-6"	3'-10"	2'-6"	3'-10"	2'-8"	3'-10"	2'-10"	3'-10	1'-111/2"	1'-10"	3%"	1'-4"	115/16"	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"	115/16"	161/64 "	2"	31/2"
900-999	2¾6"	31/16"	31/2"	1'-4"	33/8"	_		_	_	2'-11'	4'-0"	2'-11"	4'-0"	2'-11"	4'-0"	2"-11"	4'-0"	2'-11/2"	2'-2"	3%"	1'-6"	115/16"	161/64 "	2"	31/2"
1000-1099	21/16"	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%"	213/64 "	21/2"	33/4"
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"	3%"	1'-8"	2%"	213/64 "	21/2"	33/4"
1200-1299	21/16"	315% "	4"	1'-6"	31/8"	_	-	_	_	_	_	_	_	3'-5"	4'-4"	3'-5"	4'-4"	2'-51/2"	2"- <b>7</b> "	3%"	1'-9"	2%"	213/64 "	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"	3%"	1'-10"	2%"	213/64 "	21/2"	33/4"
1400-1500	21/16"	315/16"	4"	1'-6"	31/8"	_	_	_	_	_	_	_	_	3'-9"	4'-9"	3'-9"	4'-9"	2'- <b>7</b> 1/2"	2"-9"	3%"	1'-11"	2%"	213/64 "	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"	23/8"	11"	111/16"	14%4 "	2"	31/2"

#### NOTE

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".PROVIDE ONE STANDARD WROUGHT WASHER AND ONE HEX MUIT FER BOLT. PROJECT ANCHOR BOLTS "M" PLATE THICKNESS + 2/4" ABOVE TOP OF CONCRETE MASONRY, CHAMFER ANCHOR BOLTS PRIOR TO THREADING.

RADIAL SURFACES ON ROCKER SHALL BE MACHINE FINISHED AFTER WELDING.

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 BEARINGS.

FOR UNPAINTED STRUCTURES THE UPPER 6" OF ANCHOR BOLTS. NUTS AND WASHERS SHALL BE CALVANIZED 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

TEMPERATURE TIME OF SETTING - °F	(+) <del>&gt;</del> ₹	-	TICAL S	Ş-(-)
<u> </u>	PIER	PIER	PIER	PIER
120				
100				
80				
60				
40				
20				
0				
-20				

ROCKER BEARING SHALL BE SET VERTICAL AT 45° F.

ROCKER BEARING SHALL BE USED WITH A MINIMUM FRICTION VALUE OF 2% AND A MAXIMUM FRICTION VALUE OF 4%.

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

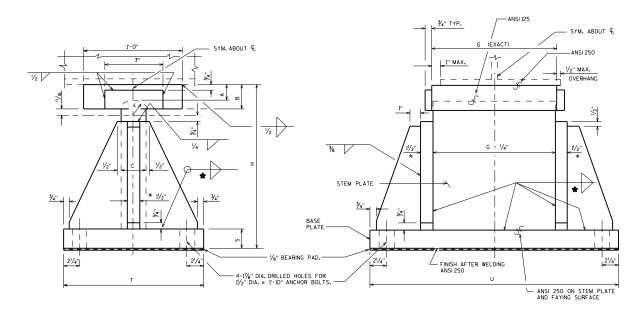
OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

ROCKER BEARING TYPE 'B' - STEEL GIRDERS



APPROVED:

Bill Oliva



#### FIXED SHOE

400 K  $\leq$  REACTION < 1000 K, USE  $\frac{5}{8}$ " WELD. 1000 K ≤ REACTION ≤ 1500 K, USE ¾" WELD

\* FOR REACTIONS > 1000 KIPS USE 2" STIFFENERS.

#### TABLE OF DIMENSIONS

REACTION				G VALUES					-					
(KIPS)	Ι Δ Ι	В	С	G=1'-7"	G=1'-9"	G=1'-11"	G=2'-1"	G=2'-3"	G=2'-5"	н			s	т
		J		U	U	U	٥	٥	U		STEM	PLATE		Ľ
400-499	1151/16"	215/6"	3"	2'-8"	2'-8"	2'-10"	3'-0"	_	_	1'-6"	1"/16"	1% "	23/8"	1'-4"
500-599	1151/16"	215//6"	3"	3'-0"	3'-0"	3'-0"	3'-0"	_	_	1'-7"	1"/16"	1% "	23/8"	1'-5"
600-699	115/16 "	215/6"	3"	_	3'-3"	3'-3"	3'-3"	3'-3"	_	1'-9"	1"/16"	1% "	23/8"	1'-6"
700-799	2¾6"	31/16"	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"	3 1/16 "	31/2"	_	_	3'-10"	3'-10"	3'-10"	3'-10"	2'-1"	115/16"	161/4	21/8"	1'-10'
1000-1099	21/16"	315/16"	4"	-		_	4'-0"	4'-0"	4'-0"	2'-3"	2%"	213/64 "	3%"	1'-11"
1100-1199	21/6"	315//6"	4"	_	_	_	4'-2"	4'-2"	4'-2"	2'-4"	2%"	211/64 "	3%"	2'-0'
1200-1299	21/16"	315%;"	4"	_	_	_	_	4'-4"	4'-4"	2'-5"	2%"	213/4 "	3%"	2'-1"
1300-1399	21/16"	315‰"	4"	_	_	_	_	4'-6"	4'-6"	2'-6"	2¾"	213/64 "	3%"	2'-2'
1400-1500	21/16"	315% "	4"	_	_	_	_	4'-8"	4'-8"	2'-7"	2%"	213/64 "	3%"	2'-3'
														$\vdash$

#### <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 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 STANDABD WROUGHT WASHER AND ONE HEX NUT PER BOLT. PROJECT ANCHOR BOLTS "S" PLATE THICKNESS + 2½" ABOYE 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.

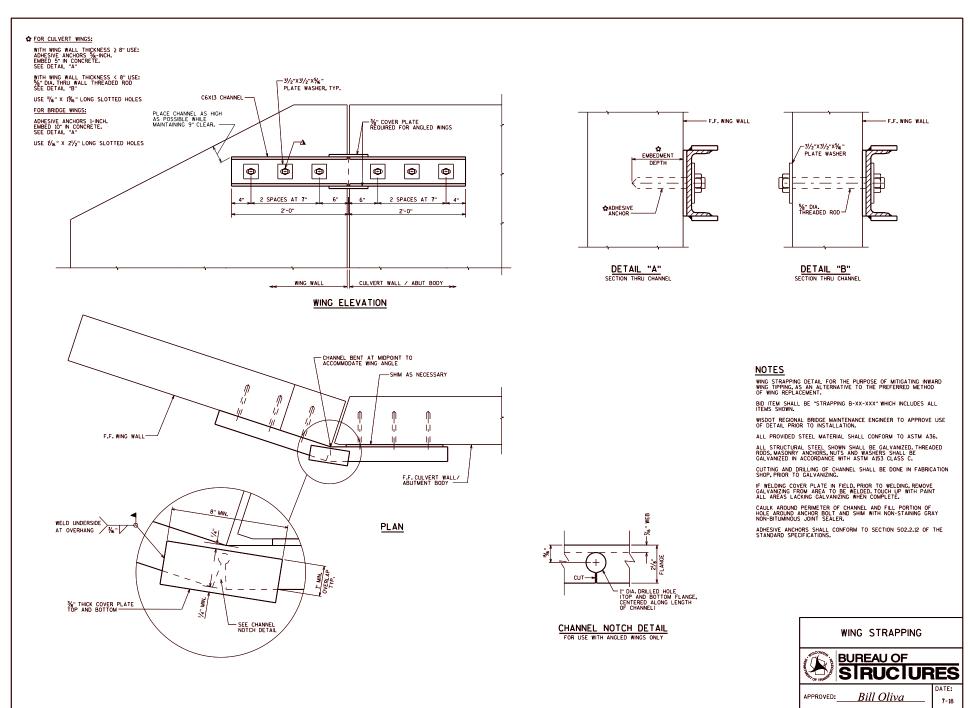
ALL MATERIALS IN TYPE "B" FIXED SHOE BEARINGS, INCLUDING SHIMS, SHALL BE PAID FOR AT THE UNIT PRICE BID FOR "BEARING ASSEMBLIES FIXED B-\_-.".

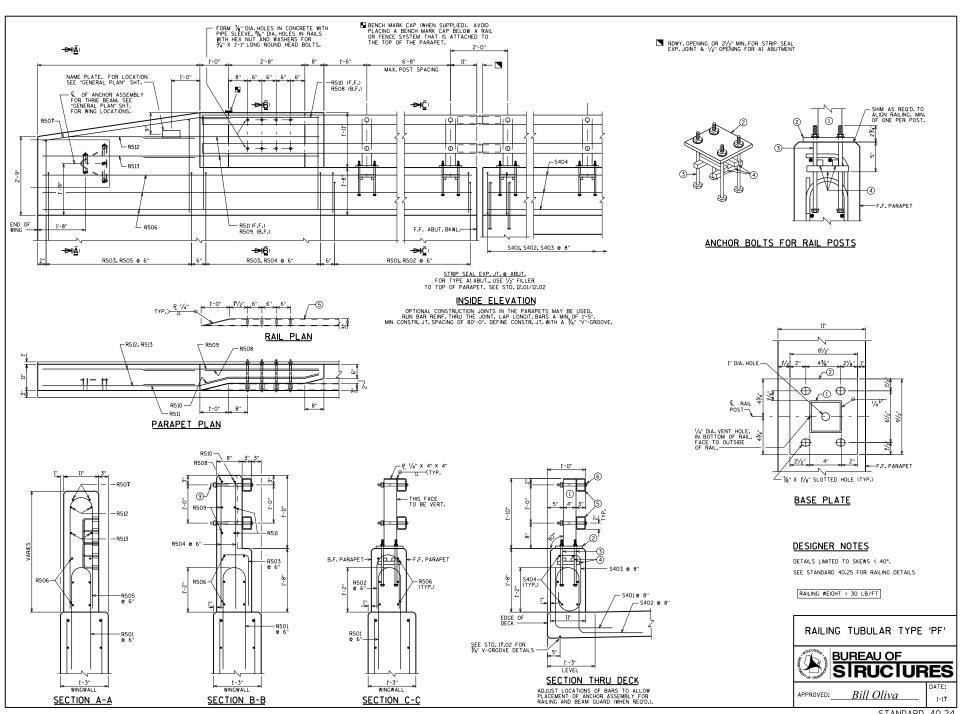
OR MATERIAL OF EQUIVALENT YIELD STRENGTH AND ELONGATION.

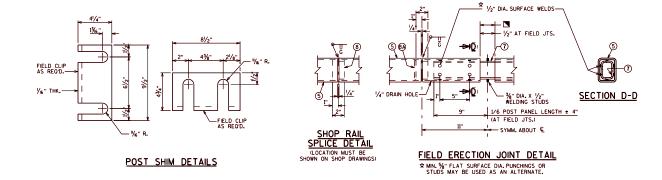
USE AASHTO LRFD SERVICE ILOADS FOR BEARING SELECTION. CONSIDER ONLY DEAD LOAD AND HL-93 LIVE LOADS INCLUDING 33% DYNAMIC LOAD ALLOWANCE. THE BEARINGS ON THIS STANDARD WERE DESIGNED USING THE STANDARD SPECIFICATION.

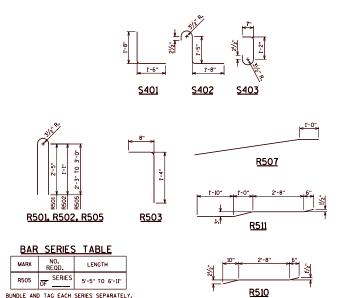
TYPE 'B' - STEEL GIRDERS FIXED SHOE











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

BAR MARK	8	NO. REO'D.	LENGTH	8	BAR SERIES	LOCATION
\$401	X		3'-0"	X	-	PARAPEI_YERI,
\$402	X		4'-1"	X		PARAPEI_VERI,
\$403	X		2'-9"	X		PARAPEI_VERI,
\$404_	X			-		PARAPET_HORIZ
B501_	X		5'-9"	X		PARAPEI_VEBI
R502	X		3'-1"	X	-	PARAPET VERT.
R503	X		1'-11"	X	-	PARAPET VERT,
R504	X		3'-4"			PARAPET VERT,
R505	X		6'-2"	X	Δ	PARAPEI VERI,
R506	X					PARAPET_HORIZ,
R507	X			X		PARAPET_HORIZ,
R508	X		4'-0"	-		PARAPET_HORIZ,
B509_	X		5'-8"			PARAPET_HORIZ
B510_	X		4'-0"	X		PARAPEI_HOBIZ
B511	X		6'-0"	X		PARAPEI_HQBIZ
R512	X					PARAPET HORIZ,
R513	X					PARAPET HORIZ,

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

#### **NOTES**

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

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

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

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

CUT BOTTOM OF POST TO MAKE POST VERTICAL IN TRANSVERSE DIRECTION.
STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATES WHERE REQUIRED FOR ALIGNMENT.

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

ALL JOINTS IN CONCRETE PARAPET ARE TO BE VERTICAL.

AFTER FABRICATION, ALL MATERIAL, EXCEPT ANCHORAGE NO. 3 & 4 & SHIMS SHALL BE PAINTED WITH A THREE COAT ZINC-RICH EPOXY SYSTEM PER WISDOT STANDARD SPECIFICATION, SECTION 517, FPOXY SYSTEM, SHIMS SHALL BE GIVEN ONE COAT OF ZINC RICH PRIMER PAINT. THE FINISH COLOR SHALL BE MASE #40.10010FR NO.

1/4" DIA. VENT HOLES TO BE LOCATED AT LOW END OF RAILS.

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

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

SEE STD. 30.07 FOR BEAM GUARD ANCHOR ASSEMBLY DETAILS.

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

■ RDWY. OPENING OR 21/2" MIN. FOR STRIP SEAL EXP. JOINT & 1/2" OPENING FOR A1

#### **LEGEND**

- TS 4 X 4 X 0.25 X 1-91/4" STRUCTURAL TUBING WITH 5%" DIA. HOLES FOR BOLT NO. 6. PLACE POSTS VERTICAL IN TRANSVERSE DIRECTION. WELD TO NO. 2. PLACE POSTS NORMAL TO GRADE LINE.
- (2) PLATE \$4" X 81/2" X 91/2" WITH \$6" X 11/6" SLOTTED HOLES FOR ANCHOR BOLTS NO. 3. WELD TO NO. 1AS SHOWN. SLOTS PARALLEL TO SHORT SIDE OF PLATE.
- ③ %" DIA. X I'-I" LONG ASTM A325 HEX BOLTS (GALVANZED) WITH A325 NUT AND WASHER, 4 REOD, PER POST, THREAD 3" AND PLACE NORMAL TO PLATE NO. 2. EMBED A MIN. OF 10". CHAMFER TOP OF BOLTS BEFORE THREADING.
- (4) BAR 34" SO. X 7" LONG. WELD TO ANCHOR BOLTS NO. 3 (GALVANIZED).
- (5) TS 4 X 3 X 0.25 STRUCTURAL TUBING. ATTACH TO NO.1WITH BOLTS NO.6. PROVIDE  $\frac{10}{3}$  DIA. HOLE FOR NO.6.
- (6) ¾" DIA. X 9" LONG ROUND HEAD BOLTS, ASTM A307, WITH HEX. NUT AND WASHERS AND LOCK WASHER. (1 REO'D. AT EACH RAIL TO POST LOCATION.)
- 7 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  $31\!\!/_2$ " x  $21\!\!/_2$ ".
- RECTANGULAR SLEEVE FABRICATED FROM ¼\* PLATES. PROVIDE "SLIDING FIT" WITH
   MIN. OUT TO OUT DIMENSION OF 3½\* "X 2½\* WITH ½6" PLATE AT ONE END
   WELDED ALL AROUND TO BLOCK WATER. 
   X
   TO BLOCK WATER. 
   X
   TO BLOCK WATER. 
   X
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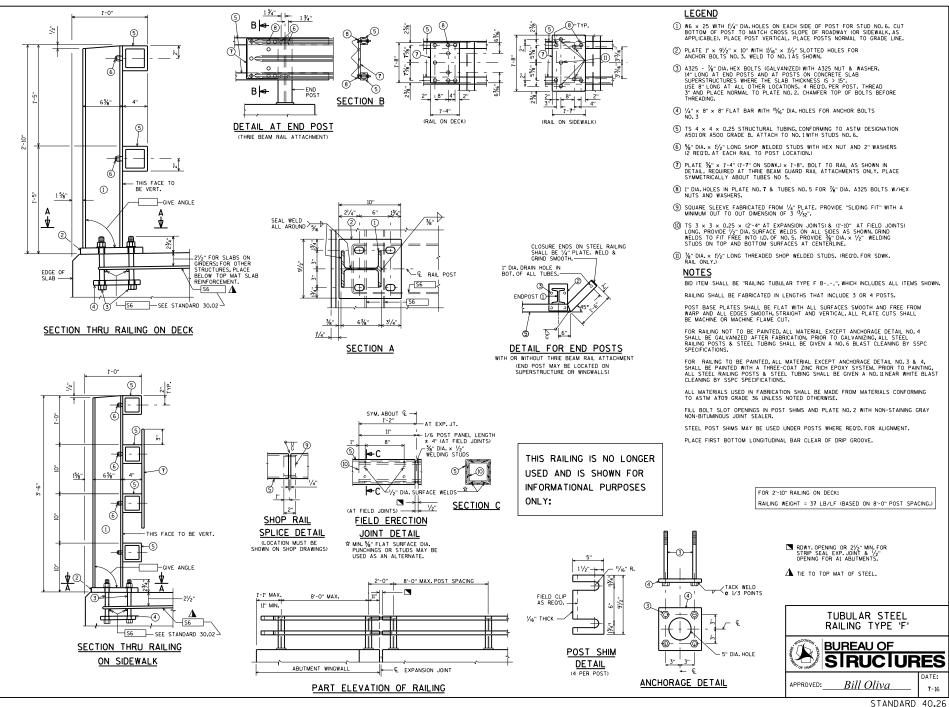
   TO BLOCK WATER. 

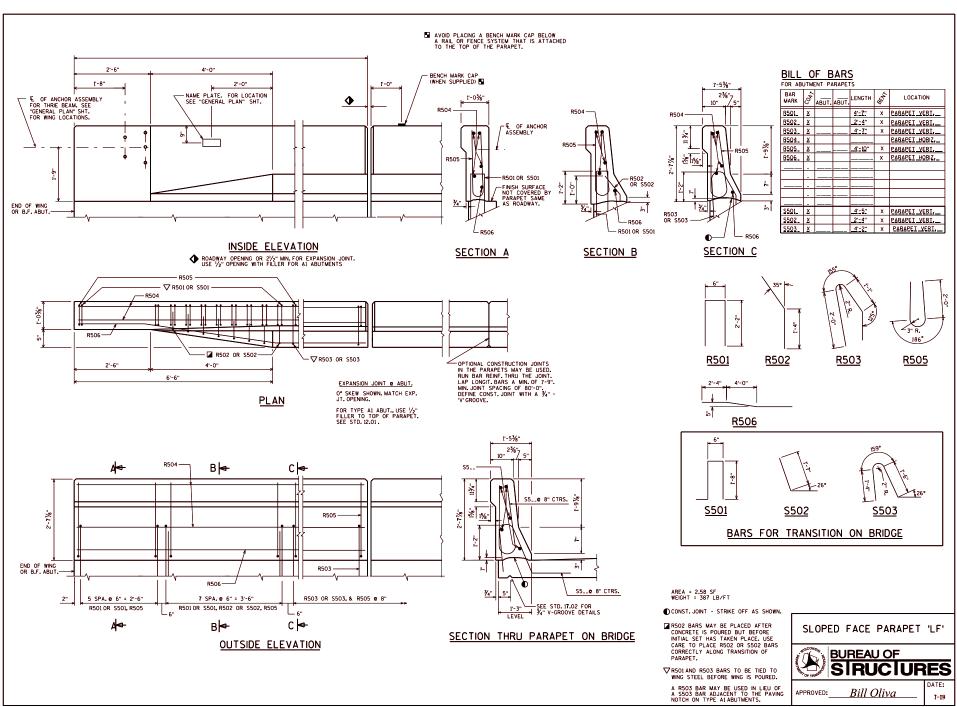
   TO BLOCK WATE
- ③ ¾" DIA. X 1'-1" LONG ROUND HEAD BOLTS, ASTM A307, WITH HEX NUT AND WASHERS

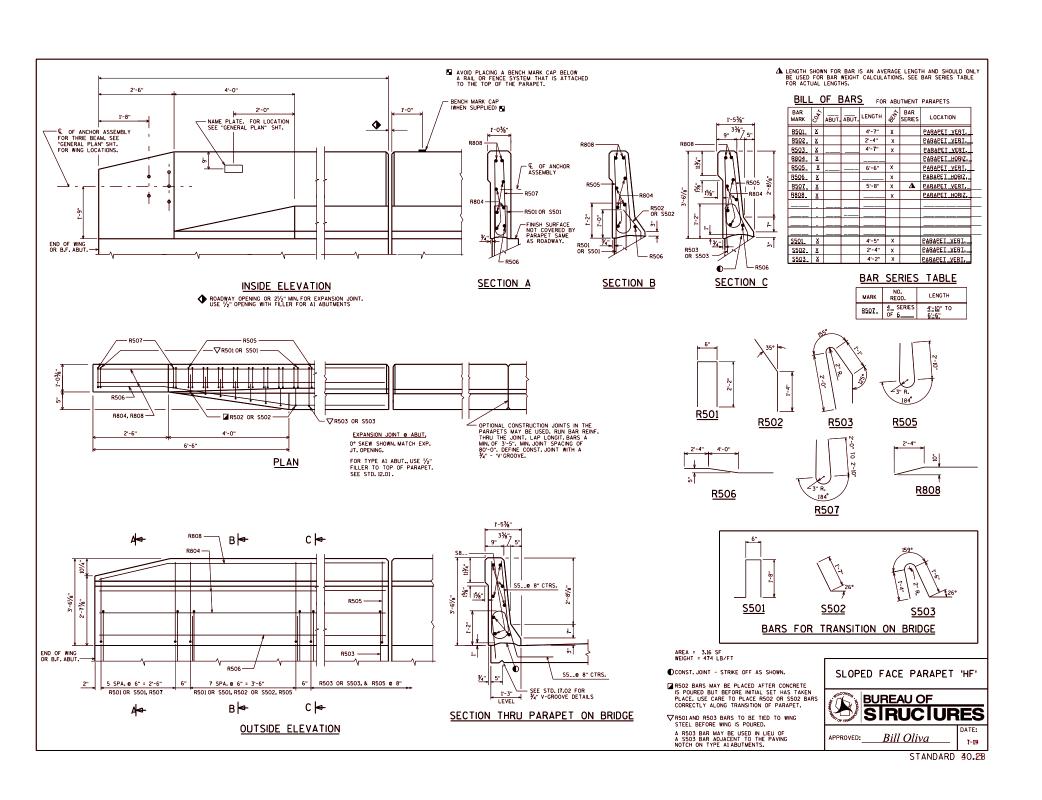
RAILING TUBULAR TYPE 'PF' DETAILS

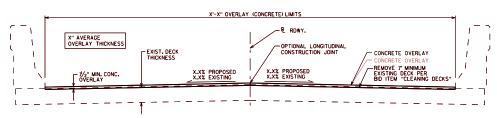
BUREAU OF SIRUCIURES

APPROVED: Bill Oliva DATE: 1-15



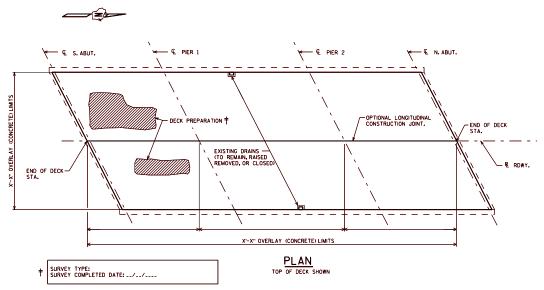






### CROSS SECTION THRU ROADWAY

LOOKING NORTH



#### **DESIGN DATA**

LIVE LOAD:

INVENTORY
OPERATING: HSWISCOMSINSS TANDORDOPERMIT VERHICEEL OND-SPYLE KJEPSIPS

MATERIAL PROPERTIES:

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

#### NOTES

DRAWINGS SHALL NOT BE SCALED.

DIMENSIONS SHOWN ARE BASED ON THE ORIGINAL STRUCTURE PLANS.

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

SEAUNOVERLAY ICONSTRUCTION: FIGURE STANDARD SPECIFICATIONS. COSTBINCIDENTALL FLOURD DEEMS" CONCRETE MASONRY OVERLAY DECKS"

ARMINIATION CHANCH OFFICIANCE TEISHAUL BECREUWED FROM THE LENTRE-BRIDGE (BECRUINDERS HE BID-TERMOCEANING) EXCENSES ALL BE FILLED WITH "CONCRETE MASONRY OVERLAY DECKS", THE AVERAGE OVERLAY THICKNESS IS BASED ON THE MINIMUM OVERLAY DECKS", THE AVERAGE OVERLAY THICKNESS IS BASED ON THE MINIMUM OVERLAY DECKS", THE AVERAGE OVERLAY THICKNESS IS DIESTED ON THE MINIMUM OVERLAY DECKS", THE AUTHORIS OF THE AVERAGE OVERLAY DECKS "PREPARATION DECKS TYPE 1, PREPARATION DECKS TYPE 1, PREPARATION DECKS TYPE 2, AND FULL-OPPTH DECK REPAIR RESARRES ARE AS REPEASED INCIDENTAL TO THE BID THEM "CONCRETE MASONRY OVERLAY DECKS".

PREPARATION DECKS TYPE 1, PREPARATION DECKS TYPE 2, AND FULL-OPPTH DECK REPAIR RESARRES AS AND LIST DETERMINED BY THE ENOMER-DECKS PREPARATION AND FULL-OPPTH DECK REPAIR AND AND FULL-OPPTH DECK REPAIR AND AND STREET OF THE AVERAGE FOR A MANY EXCENTION OF THE PROPERTY OF THE AVERAGE AND AND ANY EXCENTION OF THE PROPERTY OF THE OVERLAY DECKS "IN CONCRETE MASONRY OVERLAY DECKS".

PROFILE GRADE LINE SHALL BE DETERMINED IN THE FIELD BASED ON A MINIMUM OVERLAY PICKAS", PROFILE GRADE LINE SHALL BE DETERMINED IN THE FIELD BASED ON A MINIMUM OVERLAY PICKASES IS 2" OR AS GIVEN ON THE FLANS), IF EXPECTED AVERAGE OVERLAY THICKNESS IS 2" OR AS GIVEN ON THE PLANS), IF EXPECTED AVERAGE OVERLAY THICKNESS IS 2" OR AS GIVEN ON THE PLANS), IF EXPECTED AVERAGE OVERLAY THICKNESS IS 2" OR AS GIVEN ON THE PLANS), IF EXPECTED AVERAGE OVERLAY THICKNESS IS 2" OR AS GIVEN ON THE PLANS), IF EXPECTED AVERAGE OVERLAY THICKNESS IS 2" OR AS GIVEN ON THE PLANS), IF EXPECTED AVERAGE OVERLAY THICKNESS IS 2" OR AS GIVEN ON THE PLANS), IF EXPECTED AVERAGE OVERLAY THICKNESS IS 2" OR AS GIVEN ON THE PLANS), IF EXPECTED AVERAGE OVERLAY THICKNESS IS 2" OR AS GIVEN ON THE PLANS), IF EXPECTED AVERAGE OVERLAY THICKNESS IS 2" OR AS GIVEN ON THE PLANS), IF EXPECTED AVERAGE OVERLAY THICKNESS IS 2" OR AS GIVEN ON THE PLANS).

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

DO NOT PROVIDE A PROFILE GRADE LINE ON THE PLANS.

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

- \* REMOVAL OF 1" OF EXISTING DECK UNDER BID ITEM "CLEANING DECKS" IS NOT INTENDED FOR PREVIOUSLY OVERLAID DECKS. EXISTING CONCRETE COVER I" MINJ SHALL BE MAINTAINED AND CONSIDERED WHEN DETERMING CONCRETE REMOVALS. INCLUDE THE BID ITEM! "CLEANING-NDECKS. CTO" REAPPLY-CONGRETE MASONRY (DVERLAY." WHEN REMOVING EXISTING OVERLAY.
- † PROVIDE (IF AVAILABLE) DECK CONDITION ASSESSMENT SURVEY ON PLANS, INCLUDE SURVEY TYPE AND DATE COMPLETED.

JOINT REPAIR AREAS SHOULD NOT BE INCLUDED IN DECK REPAIR AREAS OR OVERLAY QUANTITES. 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.

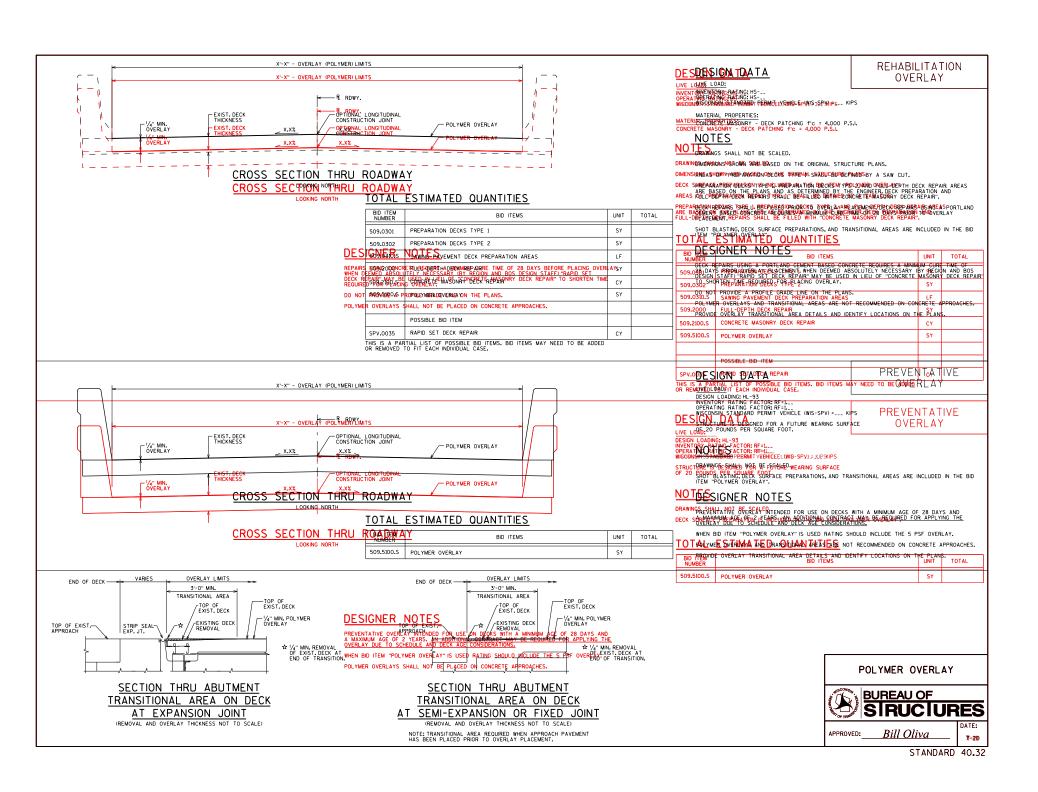
#### TOTAL ESTIMATED QUANTITIES

BID ITEM NUMBER	BID ITEMS	UNIT	TOTAL
502.3200	PROTECTIVE SURFACE TREATMENT	SY	
509.0301	PREPARATION DECKS TYPE 1	SY	
509.0302	PREPARATION DECKS TYPE 2	SY	
509.0500	CLEANING DECKS	SY	
509.2000	FULL-DEPTH DECK REPAIR	SY	
509.2500	CONCRETE MASONRY OVERLAY DECKS	CY	
	POSSIBLE ADDITIONAL BID ITEMS		
502.3210	PIGMENTED SURFACE SEALER	SSY	
509.0505.S	GEE/ANING DECKS:ETIG REARPLEY/ CONCRETE MASONRY/(OVERLIAY	SY	
50919005.S	REMOVING CONCRETERMASONRY DECK OVERLAY (STRUCTURE)	E <b>S</b> /CH	
TEIA ONO PAR	TIAD HE THE TOO BE ADDED	EACH	
	TIAL LIST OF POSSIBLE BID ITEMS. BID ITEMS MAY NEED TO BE ADDED TO FIT EACH INDIVIDUAL CASE.		

CONCRETE OVERLAY



APPROVED: <u>Bill Oliva</u>



#### CROSS SECTION THRU ROADWAY

#### 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 1/2" TO ACCOUNT FOR VARIATIONS IN THE DECK SURFACE, OUANITIES 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.

#### TOTAL ESTIMATED QUANTITIES

BID ITEM NUMBER	BID ITEMS	UNIT	TOTAL
509.0301	PREPARATION DECKS TYPE 1	SY	
509.0302	PREPARATION DECKS TYPE 2	SY	
509.0310.5	SAWING PAVEMENT DECKIPPREPARATION AREAS	6F	
509,2000	EULICFDERTHI DECKREPAIR REPAIR	SY	
<b>509.2100.</b> S	CONCRETE MASONRYDDECK REPAIR TION AREAS	CF	
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	

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-...
WISCOUNSINS \$ AND ARD PERMIT VEHICEEL OND-\$PY) = KJPSKIPS

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

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

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

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

#### X'-X" OVERLAY (ASPHALTIC) LIMITS RDWY. X" AVERAGE OVERLAY THICKNESS TIONAL LONGITUDINAL - EXIST. DECK THICKNESS CONSTRUCTION JOINT. ASPHALTIC OVERLAY X.X% PROPOSED X.X% EXISTING X.X% PROPOSED X.X% EXISTING - 2" MIN. ASPHALTIC OVERLAY

#### CROSS SECTION THRU ROADWAY

#### DESIGNER NOTES

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

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

COORDINATE WITH REGION/BRIDGE/MAINTENANCERAND ROADWAY/ENGINEERS (FOR ATHE MASPHARTIC DESIGN

RESTRICTIONS CONBREMOVAL (ATEMS CSHALLE RBE YPLIACED NON) THE CREAMS YTO RPREVENTUDAMAGE TO

THE PLAN QUANTITY FOR THE BID ITEM "ASPHALTIC MATERIAL PGXX-XX" IS BASED ON (INSERT VALUE)  $\hat{x}$  OF BID ITEM "HMA PAVEMENT TYPE E-X". ASSUME 6% IF NO ADDITIONAL INFORMATION IS PROVIDED.

THE PLAN QUANTITY FOR THE BID ITEM "TACK COAT" IS BASED ON AN APPLICATION RATE OF 0.05 TO 0.07 GALLONS/SY, ASSUME 0.07 GALLONS/SY IF PLACING OVER MILLED HMA OR CONCRETE.

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

#### TOTAL ESTIMATED QUANTITIES

NUMBER	BID ITEMS	UNIT	TOTAL
455.0605	TACKACOAT MATERIAL PGXX-XX	GAN	
460.1XXX	HMAK PAVEMENT (INSERT TYPE)	TON	
509.0301	PREPARATION DECKSETYPE 1	1S)N	
509.0302	PREPARATION DECKS TYPE 2	SY	
509.0310.5	SAWING PAVEMENT DECK PREPARATION AREAS	6F	
509.2000	FULL-DEPTH DECK REPAIR	SY	
509.2100.S	CONCRETE MASONRY DECK REPAIR	CY	
SPV.0090	SAWING PAVEMENT DECK PREPARATION AREAS	LF	
	POSSIBLE ADDITIONAL BID ITEMS		
509.9005.5	REMOVING CONCRETE MASONRY DECK OVERLAY (STRUCTURE)	SY	
509.9010.S	REMOVING ASPHALTIC CONCRETE DECK OVERLAY (STRUCTURE)	SY	

THIS IS A MARTIAL 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--WISCOMS(NS) XANDARDOPERAMITY VEHICEEL OMS-SPY) = JUPSKIPS

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 I 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 MASONNY DECK REPAIR".

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

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

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

POLYMER MODIFIED ASPHALTIC AND ASPHALTIC OVERLAYS

ASPHALTIC OVERLAY

POLYMER MODIFIED

ASPHALTIC OVERLAY



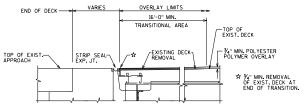
APPROVED:

Bill Oliva

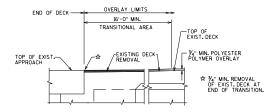
T-18

#### X'-X" OVERLAY (POLYESTER POLYMER CONCRETE) LIMITS X'-X" SHLD. X'-XX'(XI'EBANE (POLYESTER POLYMER CONCRATEX"(DVANE AY) LIMITS X'-X" SHLD. X" AVERAGE OVERLAY THICKNESS OPTIONAL LONGITUDINAL CONSTRUCTION JOINT. EXISTEMISTIC DECK REMOVE TO OF MEXISTING DECK PER BID ITEM "CLEANING DECKS" X.X% PROPOSED X.X% EXISTING X.X% PROPOSED X.X% EXISTING - ¾" MIN. POLYESTER POLYMER OVERLAY

# CROSS SECTION THRU ROADWAY



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.

#### DEDESIGNADATA

L(MED:LOAD:

NINVENTORYNRATING: HS-... ROPERATING: RATING: HS-... NWISCONSIND STANDARD TPERMITL VEHICLE (WIS-SRV)S=... KIPS

#### NONOSES

DRAWDRAWINGS ISHALL NOTS BE ISCALED.

DIMENDIMENSIONS//SHOWN FARE BASEDTION (THEIRORIGINAL)/STRUCTURE/PLANS.

—INCH OF CONCRETE SHALL BE REMOVED FROM THE ENTIRE BRIDGE DECK UNDER THE BID ITEM "CLEANING DECKS".

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

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

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

SHOT BLASTING, OVERLAY PRIME COAT, DECK DEUR AGEFREPARAFIONSTIAND ARANSITIONALD AREASE ARE INCOMPETER PRODUCTION OF THE PRODUCTION OF THE

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 MODER OF THE LANE, WHEEL PATHS DURING TEMPORARY TRAFFIC STAGING NEED NOT BE CONSIDERED.

DESIGNER YMNOTE'S OVERLAYS ARE LIMITED, SEE 40.5 IN THE BRIDGE MANUAL FOR USEP OF VPROVOVERLAYS A AREDEIMITED. SEET 40.5 HIN SHELBRIDGER MANUALO FOR VADDITIONAL GUIDANCE.

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

RPENOXERBAYS SANBATRANSHIONAE ORBAS, BRE NOZSBEODMMENDHERON ROONCREME TAPEROACAES. SHALL BEARS STANEL ROPECTOR TRANSHIONAL ARBANSENORM AREA SERONGAETHEE PROXIDED STRANSHIONAL BROOML. AS ESBORNOON THIS INSHEE RIJE. BASEDHON VERYA OVERLITEMENTEKKESS, PROVIDE OVERLAY TRANSITIONAL AREA DETAILS AND IDENTIFY LOCATIONS ON THE PLANS. SEE 40.5.6 FOR ADDITIONAL GUIDANCE. WHEN IN TIME TO SEND THE REMOVAL LOSPERE ENTINE REMOVED BEORVIS WARRANTED, USE BID ITEM "CLEANING DECKS". PLANS SHALL SPECIFY THE REQUIRED REMOVAL DEPTH.

DO NOT PROVIDE A PROFILE GRADE LINE ON THE PLANS.

DO NOT PROVIDE A PROFILE GRADE LINE ON THE PLANS.

## OVERLAY LIMITS END OF DECK-REMOVE 3/4" OF EXISTING DECK PER BID ITEM TOP OF EXIST. DECK "CLEANING DECKS" TOP OF EXIST. ¾" MIN. POLYESTER POLYMER OVERLAY

#### SECTION THRU ABUTMENT

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

#### TOTAL ESTIMATED QUANTITIES

BID ITEM NUMBER	BID ITEMS	UNIT	TOTAL
509.0301	PREPARATION DECKS TYPE 1	SY	
509.0302	PREPARATION DECKS TYPE 2	SY	
509.0310.5	SAWING PAVEMENT DECK PREPARATION AREAS	LF	
509.2000	FULL-DEPTH DECK REPAIR	SY	
SPV.0035	RAPID SET DECK REPAIR	CY	
SPV.0180	POLYESTER POLYMER CONCRETE OVERLAY	SY	
	POSSIBLE ADDITIONAL BID ITEMS		
	POSSIBLE ADDITIONAL BID ITEMS		
HIS IS A PAR 509.0500D	THAL LIST OF POSSIBLE BID ITEMS. BID ITEMS MAY NEED TO BE ADDED OCEEANINGHDECKSDUAL CASE.	SY	

OR REMOVED TO FIT EACH INDIVIDUAL CASE.

POLYESTER POLYMER CONCRETE OVERLAY



APPROVED: Bill Oliva

