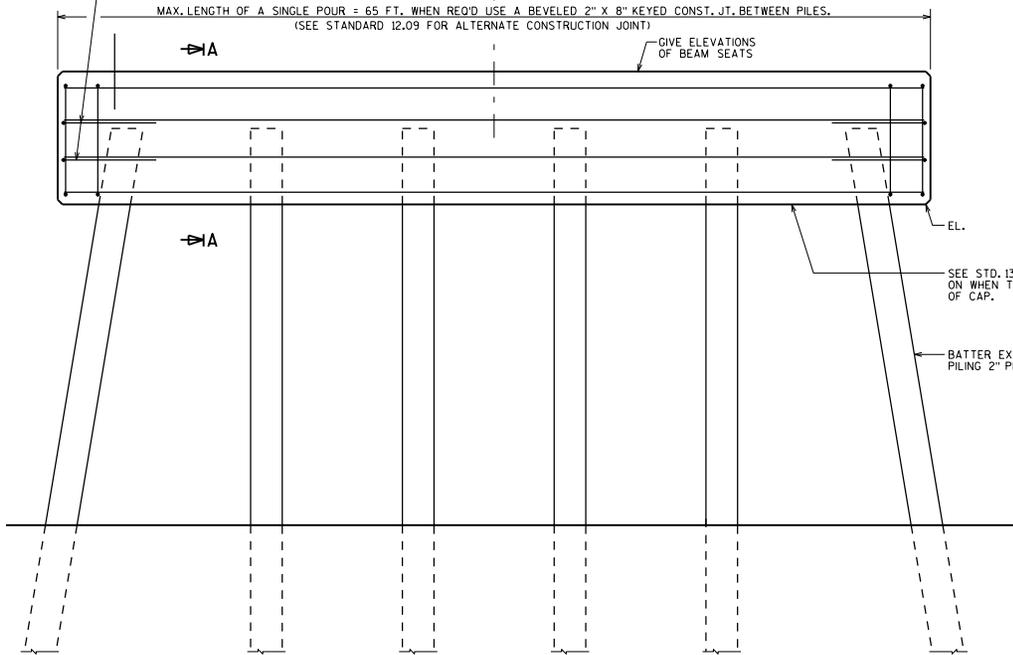


*5 U-BARS
(1'-5" UNCOATED LAP
1'-9" COATED LAP)

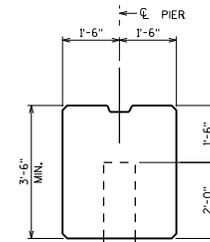
SYM. ABOUT C
OF STRUCTURE

MAX. LENGTH OF A SINGLE POUR = 65 FT. WHEN REQ'D USE A BEVELED 2" X 8" KEYED CONST. JT. BETWEEN PILES.
(SEE STANDARD 12.09 FOR ALTERNATE CONSTRUCTION JOINT)

GIVE ELEVATIONS
OF BEAM SEATS



ELEVATION
LOOKING UP STATION



END VIEW

NOTES

PILES SHALL BE PAINTED IN ACCORDANCE WITH SECTION 550.3.11.3 OF THE STANDARD SPECIFICATIONS.

DESIGNER NOTES

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

BEARING SEAT AREAS SHALL BE LEVEL EXCEPT FOR THE TWO CASES LISTED BELOW:

1. FOR GIRDERS WITH 1/2" ELASTOMERIC BEARING PADS WHEN THE BOTTOM OF THE GIRDERS SLOPE MORE THAN 1%. SEE STANDARD 13.01.
2. FOR CONCRETE SLAB SUPERSTRUCTURES MAKE THE TOP OF THE CAP PARALLEL TO GRADE. SEE STANDARD 18.01.

BEAM SEATS MAY BE ANGLED TO MATCH SKEW AT THE DESIGN ENGINEER'S DISCRETION.

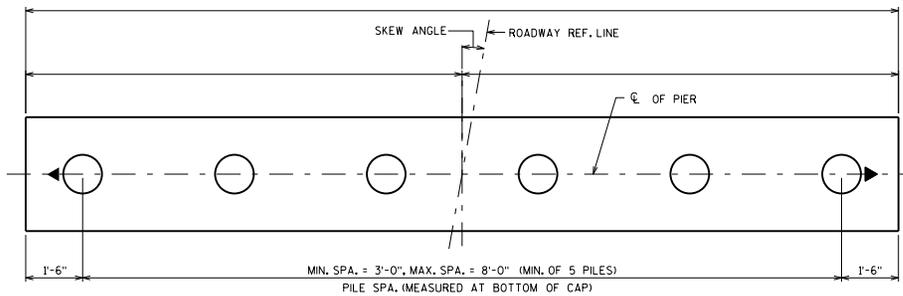
SEE STANDARD 12.01 FOR ADDITIONAL REINFORCING STEEL IN BEARING AREA FOR BEAM SEATS OF NON-SLOPED CAPS THAT ARE 4" OR MORE ABOVE LOWEST BEAM SEAT.

PILES SHALL BE 12 3/4" OR 14" DIAMETER CAST-IN-PLACE WITH MINIMUM WALL THICKNESS OF 3/8".

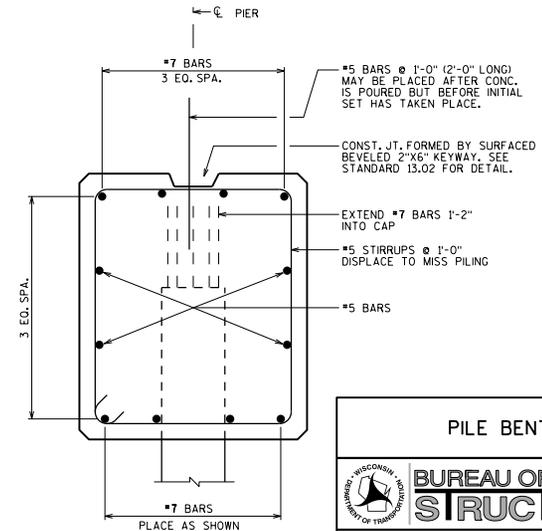
SEE STANDARD 11.01 FOR REQUIRED PILE REINFORCING DETAILS.

H-PILE USE REQUIRES PRIOR APPROVAL DURING DESIGN OF THE STRUCTURES DEVELOPMENT CHIEF, (608) 266-0075.

STABLE
STREAMBED



PLAN



SECTION A-A

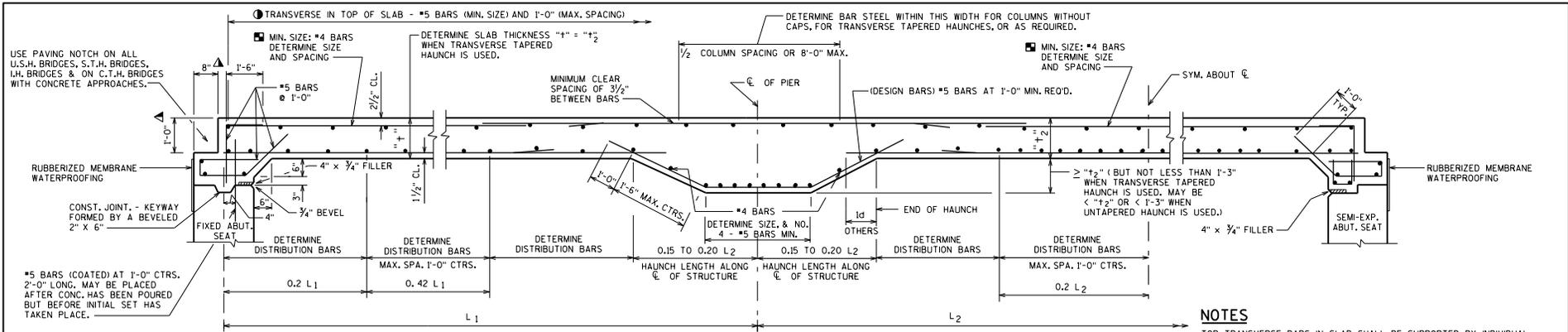
PILE BENT



**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

DATE:
1-23



LONGITUDINAL SECTION

NOTES

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. (FOR NON-STAGED CONSTRUCTION)

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

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 \bar{C} OF ABUTMENTS, THE \bar{C} OF PIERS AND AT 5/10 PTS. TO VERIFY CAMBER. TAKE ELEVATIONS ALONG GUTTER LINES AND CROWN OR \bar{R} . RECORD ELEVATIONS ON AS BUILT PLANS. SEE STD. 18.03

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'-0". SEE STANDARD 18.02 FOR DETAIL.

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

ALL TRANSVERSE BAR STEEL REINFORCEMENT SHALL BE PLACED ON THE SKEW.

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

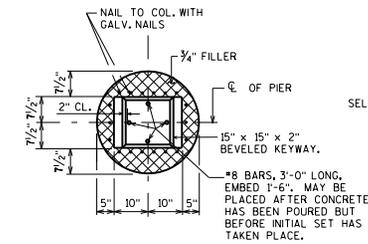
PIER CAP OR WALL TYPE PIERS SHALL BE USED ON MOST STRUCTURES. "COLUMN WITHOUT CAP" TYPE PIERS MAY BE USED WITH THE APPROVAL OF THE STRUCTURES DESIGN SECTION.

ON THE PLANS, PROVIDE CAMBER VALUES AT THE TENTH POINTS OF ALL SPANS. ALSO PROVIDE TOP OF SLAB ELEVATIONS AT THE REFERENCE LINE (OR CROWN AND OUTSIDE EDGES OF SLAB AT TENTH POINTS. SEE STD. 18.03

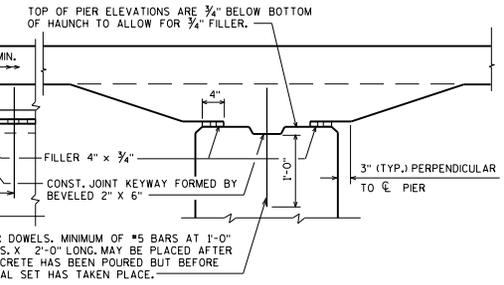
TRANSVERSE TAPERED HAUNCHES MAY BE USED TO ELIMINATE A COLUMN (PROVIDED A MINIMUM OF 3 COLUMNS ARE USED, OR FOR AESTHETICS)

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

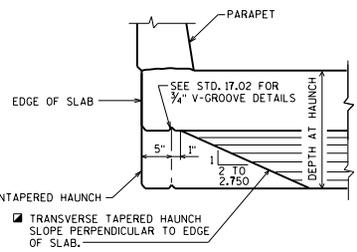
REINFORCEMENT IN SLAB MUST MEET TEMPERATURE AND SHRINKAGE REQUIREMENTS.



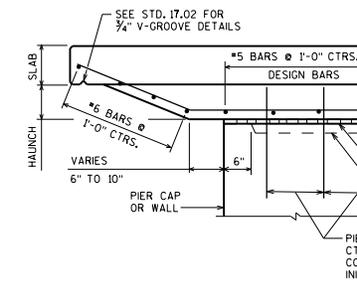
**COLUMN W/O CAP TYPE PIER
DETAIL AT TOP OF COLUMN**



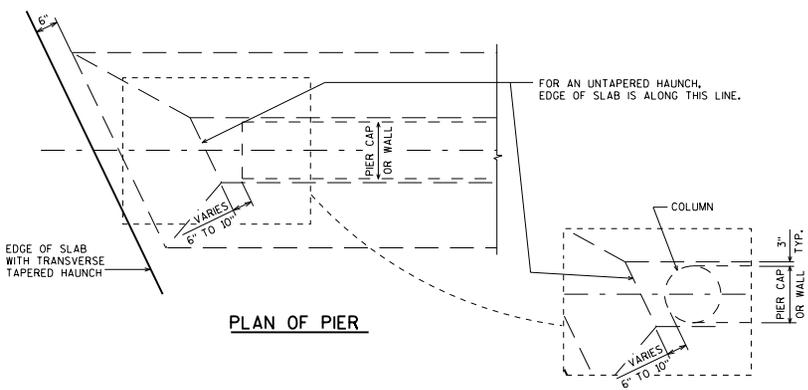
**PIER CAP OR WALL TYPE PIER
SHOWING TRANSVERSE TAPERED HAUNCH**



**TAPERED/UNTAPERED HAUNCH
CROSS SECTION**



**PIER CAP OR WALL TYPE PIER
SHOWING TRANSVERSE TAPERED HAUNCH**



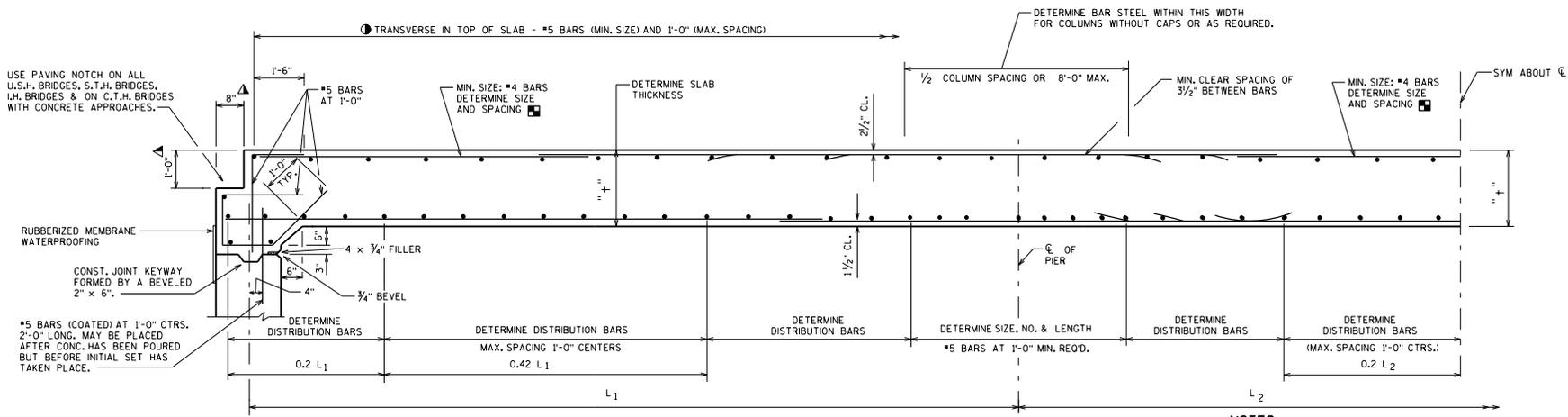
PLAN OF PIER

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

CONTINUOUS HAUNCHED SLAB

DATE: 1-23

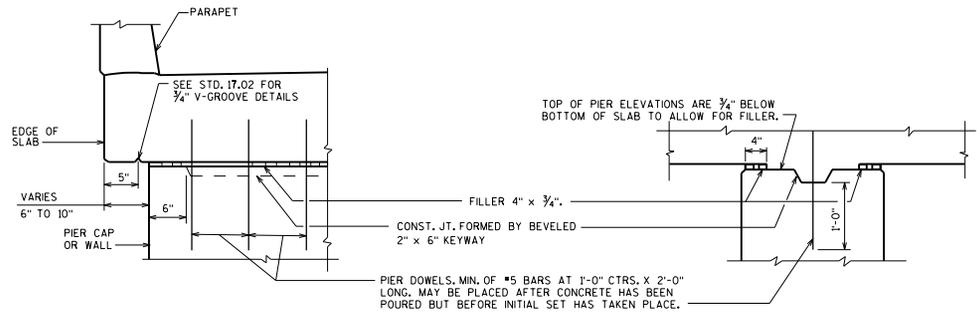
APPROVED: *Laura Shadewald*



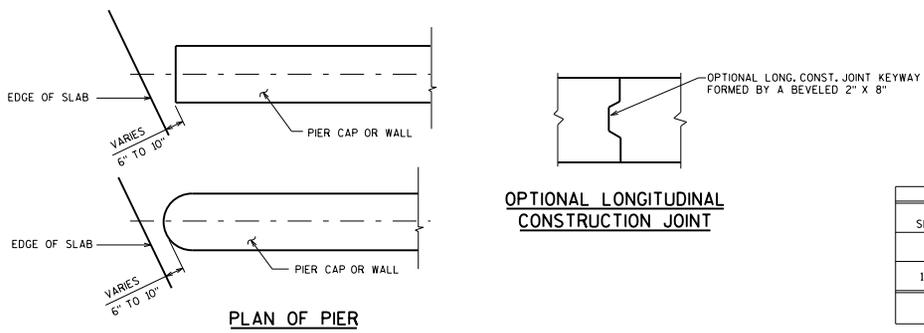
HALF LONGITUDINAL SECTION

NOTES

- 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. (FOR NON-STAGED CONSTRUCTION)
- SLAB-SUPPORTING FALSEWORK SHALL REMAIN IN-PLACE UNTIL ALL STAGES OF THE SUPERSTRUCTURE HAS CURED, FOR DEFLECTION CONTROL BETWEEN STAGES. DO NOT RELEASE ANY FALSEWORK UNTIL PARAPETS, SIDEWALKS, AND MEDIANS HAVE CURED. (FOR STAGED CONSTRUCTION)
- 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 CL OF ABUTMENTS, THE CL OF PIERS AND AT 5/10 PTS. TO VERIFY CAMBER. TAKE ELEVATIONS ALONG GUTTER LINES AND CROWN OR R. RECORD ELEVATIONS ON AS BUILT PLANS. SEE STD. 18.03



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



DESIGNER NOTES

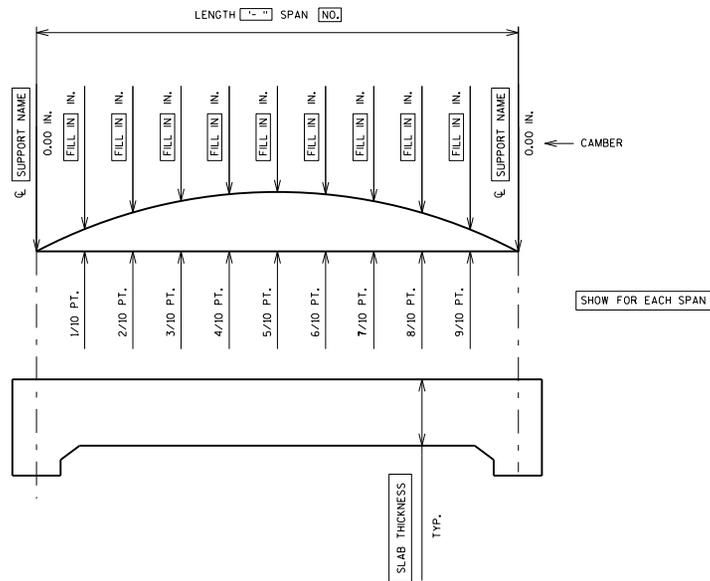
- THE MAXIMUM ALLOWABLE SKEW ANGLE OF STRUCTURE SHALL BE 30°.
- ALL BAR SPLICES TO BE BASED ON "CLASS C" TENSION LAP SPLICE.
- USE OPTIONAL LONGITUDINAL JOINTS WHEN OVERALL SLAB WIDTH IS OVER 52'-0".
- FOR BRIDGES LOCATED IN REMOTE AREAS USE OPTIONAL TRANSVERSE JOINT WHEN POUR EXCEEDS 400 C.Y. PLACE KEYED JOINT NEAR POINT OF DEAD LOAD INFLECTION.
- ALL TRANSVERSE BAR STEEL REINFORCEMENT SHALL BE PLACED ON THE SKEW.
- FLOOR DRAINS ARE TO BE OMITTED FROM SLAB STRUCTURES WHERE POSSIBLE. IF FLOOR DRAINS ARE REQUIRED, PLACE ONLY AT THE 2/10 AND 8/10 PTS. BEND MAIN REBARS PAST DRAINS - DO NOT 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 REFERENCE LINE (OR CROWN) AND OUTSIDE EDGES OF SLAB AT TENTH POINTS. SEE STD. 18.03
- PAVING NOTCH IS 1'-0" WIDE BY 1'-4" DEEP IF STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED.
- REINFORCEMENT IN SLAB MUST MEET TEMPERATURE AND SHRINKAGE REQUIREMENTS.

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

CONTINUOUS FLAT SLAB

BUREAU OF STRUCTURES

APPROVED: Laura Shadewald DATE: 1-23



CAMBER AND SLAB THICKNESS DIAGRAM

CAMBER SHOWN IS BASED ON 3 TIMES DEAD LOAD DEFLECTION.

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

SELECT ONE

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

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

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

- TOP OF SLAB ELEVATION AT FINAL GRADE
 - MINUS..... SLAB THICKNESS
 - PLUS..... CAMBER
 - PLUS..... FORM SETTLEMENT/DEFLECTION DUE TO PLACEMENT OF SLAB CONCRETE (TO BE COMPUTED BY THE CONTRACTOR)
- EQUALS = TOP OF SLAB FALSEWORK ELEVATION

SURVEY TOP OF SLAB ELEVATIONS

SHOW FOR EACH SPAN

	€ BRG. [FILL IN] SUPPORT NAME	5/10 PT.	€ BRG. [FILL IN] SUPPORT NAME
[FILL IN] GUTTER			
[SELECT] CROWN AND/OR R			
[FILL IN] GUTTER			

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

NOTES

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

DESIGNER NOTES

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

INCLUDE THE "SURVEY TOP OF SLAB ELEVATIONS" TABLE ON THE CONTRACT PLANS SO THAT IT MAY BE FILLED IN DURING CONSTRUCTION.

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

TOP OF SLAB ELEVATIONS

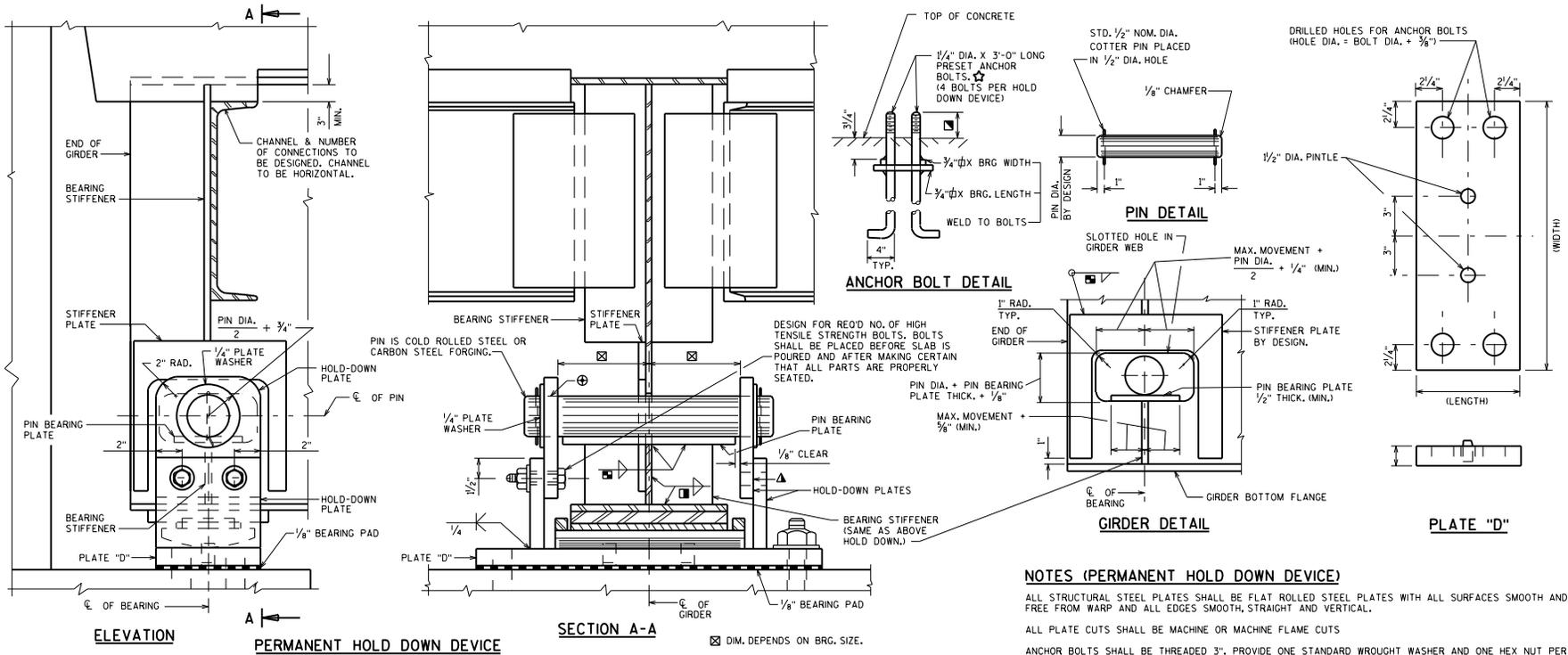
SHOW FOR EACH SPAN

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

CONCRETE SLAB DETAILS



APPROVED: *Laura Shadewald* DATE: 1-23



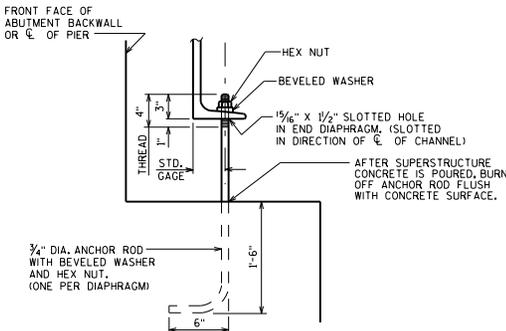
ELEVATION

PERMANENT HOLD DOWN DEVICE

SECTION A-A

⊗ DIM. DEPENDS ON BRG. SIZE.

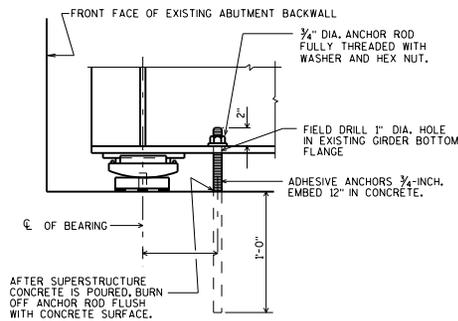
WHEN REQUIRED, HOLD DOWN DEVICES SHALL BE PLACED SYMMETRICALLY ABOUT LONGITUDINAL CL OF FRAMING PLAN. MAXIMUM SPACING OF HOLD DOWNS SHALL BE AT ALTERNATE GIRDERS. HOLD DOWN DEVICE TO BE DESIGNED FOR MINIMUM UPLIFT CAPACITY OF 20 KIPS.



ELEVATION - NEW CONSTRUCTION

TEMPORARY HOLD DOWN DEVICES SHALL BE PLACED AT THAT END OF ALL CONTINUOUS STEEL GIRDER UNITS WHERE THE SLAB POUR TERMINATES, EXCEPT WHERE PERMANENT HOLD DOWN DEVICES ARE PLACED AT THIS LOCATION. LOCATE 1'-6" (NORMAL) OFF CL OF GIRDER. TO BE PAID FOR AS "STRUCTURAL CARBON STEEL".

TEMPORARY HOLD DOWN DEVICE



ELEVATION - DECK REPLACEMENT

PLACE ONE ANCHOR ROD PER GIRDER AT ABUTMENT WHERE SLAB POUR TERMINATES. LOCATE 4" (NORMAL) OFF CL OF GIRDER. ANCHOR ROD, NUT, WASHER, AND DRILLED HOLE IN GIRDER FLANGE SHALL BE PAID FOR AS "ADHESIVE ANCHORS 3/4"-INCH".

NOTES (PERMANENT HOLD DOWN DEVICE)

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

ALL PLATE CUTS SHALL BE MACHINE OR MACHINE FLAME CUTS

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

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

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

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

ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM F1554 GRADE 50 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 B-1".

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 1/2" DIAMETER X 3'-0" LONG AND FULLY THREADED ADHESIVE ANCHORS. ANCHOR BOLTS SHALL BE PAID FOR AS "ADHESIVE ANCHORS 1 1/2-INCH", EMBED IN CONCRETE 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 + 2/4", ABOVE TOP OF CONCRETE.

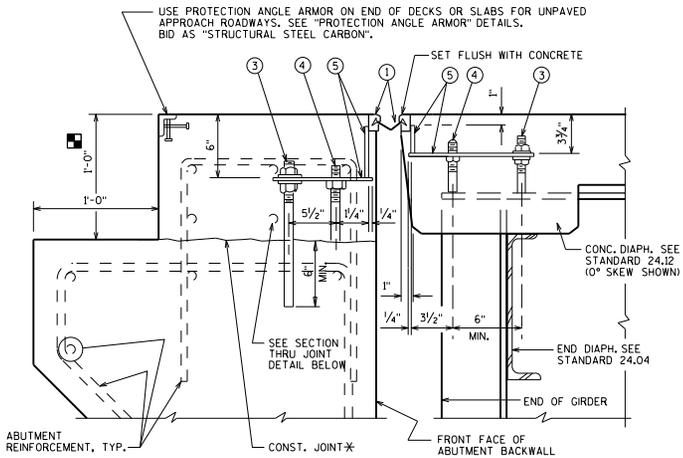
⊕ HOLES FOR PIN IN HOLD-DOWN PLATES AND PLATE WASHERS SHALL BE AS STATED IN STANDARD SPECIFICATION 506.3.17.

HOLD DOWN DEVICES



APPROVED: *Laura Shadewald*

DATE:
1-23

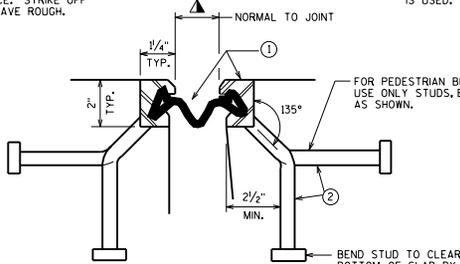


TYPICAL SECTION THRU JOINT AT STEEL GIRDER

NORMAL TO \bar{C} SUBSTRUCTURE

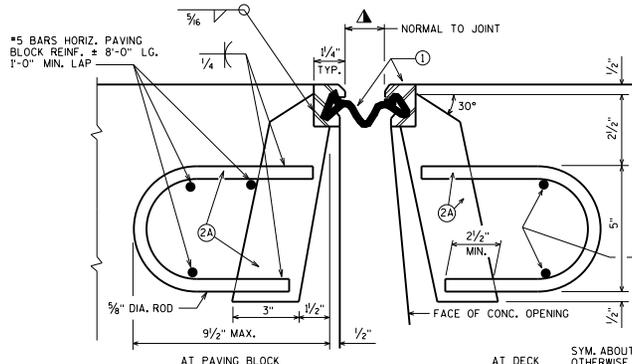
* POUR CONC. ABOVE THIS JOINT AFTER SUPERSTRUCTURE IS IN PLACE. STRIKE OFF AND LEAVE ROUGH.

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



SECTION THRU JOINT

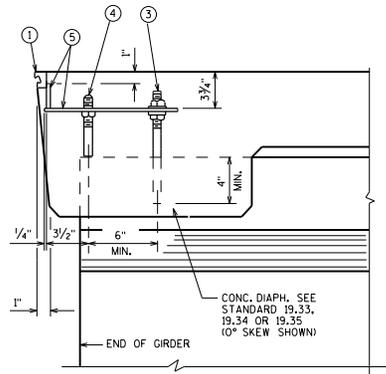
EXTERIOR GIRDER TO EDGE OF DECK, AND AT PARAPETS, MEDIANS AND SIDEWALKS



SECTION THRU JOINT

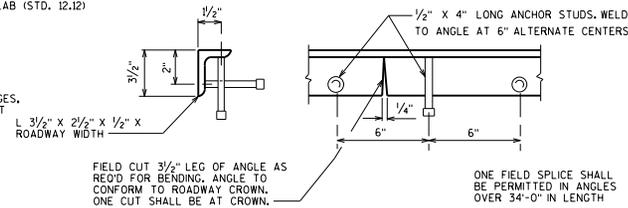
ROADWAY TRAFFIC AREA BETWEEN EXTERIOR GIRDERS.

SYM. ABOUT \bar{C} JOINT UNLESS OTHERWISE SHOWN OR NOTED



PART SECTION THRU JOINT AT PRESTRESSED GIRDERS

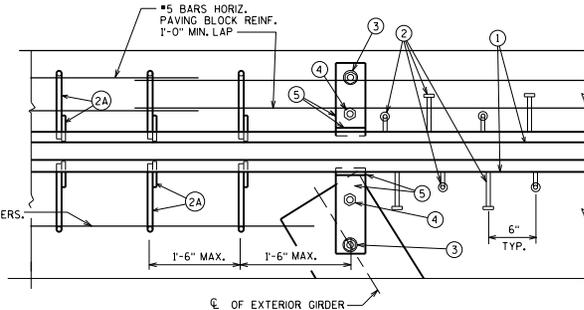
NORMAL TO \bar{C} SUBSTRUCTURE



PROTECTION ANGLE ARMOR

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

■ IF TEMPERATURE TABLE IS SHOWN, PLACE FOLLOWING NOTE ADJACENT TO TABLE: "A SMALL JOINT OPENING DUE TO A HIGH TEMPERATURE AT TIME OF CONSTRUCTION MAY REQUIRE NEOPRENE STRIP SEAL INSTALLATION INTO STEEL EXTRUSIONS PRIOR TO SETTING THE EXPANSION JOINT."



PART PLAN

LEGEND

- ▲ ① NEOPRENE STRIP SEAL (1-INCH) AND STEEL EXTRUSIONS. SET JOINT OPENING AT 1 3/4" WHEN EXPANSION LENGTH < 230'-0". WHEN EXPANSION LENGTH > 230'-0", PREPARE A TEMPERATURE TABLE SHOWING JOINT OPENINGS FROM 5°F TO 85°F IN 10°F INCREMENTS. ACCOUNT FOR PRESTRESSED GIRDER SHRINKAGE DUE TO CREEP WHEN DETERMINING THIS TABLE. JOINT OPENINGS GIVEN NORMAL TO JOINT. ■
- ② STUDS 3/4" DIA. X 6 3/4" LONG AT 6" ALTERNATE CENTERS. WELD TO EXTRUSIONS AND BEND AS SHOWN AFTER WELDING.
- ②A 1/2" THICK ANCHOR PLATE WITH 3/4" DIA. ROD (OR ALTERNATE STRIP SEAL ANCHOR). WELD ROD TO ANCHOR PLATE, WELD ANCHOR PLATE TO NO. 1 AT 1'-6" CENTERS BETWEEN GIRDERS.
- ③ 3/4" DIA. THREADED ROD WITH 2 NUTS AND PLATE WASHERS. FOR PRESTRESSED GIRDERS, GROUT THREADED ROD INTO FIELD DRILLED HOLES ON \bar{C} OF GIRDER. FOR STEEL GIRDERS, WELD THREADED ROD TO TOP FLANGE OR ATTACH BY BOLTING THRU FLANGE. ON ABUTMENT SIDE, GROUT THREADED ROD INTO FIELD DRILLED HOLES IN ABUTMENT BACKWALL AS SHOWN.
- ④ 3/4" DIA. THREADED ROD WITH NUT. TACK WELD NUT TO NO. 5.
- ⑤ FABRICATE SUPPORT FROM 3" X 1/2" BAR AS SHOWN OR EQUIVALENT. ONE PER GIRDER PER SIDE. SHOP OR FIELD WELD TO NO. 1. IF FIELD WELDED, COVER WELDED AREAS WITH EPOXY-COATING MATERIAL. PROVIDE 1/2" DIA. HOLE FOR NO. 3 AND 1" DIA. HOLE FOR NO. 4.
- ⑥ GALVANIZED PLATE 3/4" X 10" X 12'-2" LONG FOR SKEWS TO 45° AND 3'-0" LONG FOR SKEWS > 45° WITH HOLES FOR NO. 7. FOR SINGLE SLOPE PARAPET. FOR SLOPED FACE PARAPET, SEE STANDARD 28.07.
- ⑦ 3/4" DIA. X 1 1/2" STAINLESS STEEL SOCKET FLAT HEAD SCREWS WITH ANTI-SEIZE LUBRICANT. PLACE IN COUNTERSUNK HOLE. RECESS 1/16" BELOW PLATE SURFACE.
- ⑧ 3/4" DIA. X 4" GALVANIZED HEX HEAD BOLT, BEND 45°.
- ⑨ 3/4" DIA. X 2 1/4" GALVANIZED THREADED COUPLING.
- ⑩ SIDEWALK COVER PLATE 3/2" X 12'-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.
- ⑪ 1" X 5" SLOTTED COUNTERSUNK HOLE FOR NO. 7. PLACE SLOT PARALLEL TO DIRECTION OF MOVEMENT.

NOTES

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

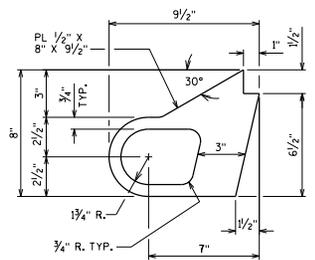
AFTER FABRICATION, BUT BEFORE SHIPMENT, STRAIGHTEN STEEL EXTRUSIONS SUCH THAT THEY SHALL BE FREE FROM WARP, TWIST AND SWEEP.

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

SANDBLAST PLATES, SUPPORTS AND EXTRUSIONS AFTER FABRICATION IN ACCORDANCE WITH SSPC SP. #6 "COMMERCIAL BLAST CLEANING". AFTER BLAST CLEANING, THE PLATES, SUPPORTS AND EXTRUSIONS SHALL BE HOT DIPPED GALVANIZED. SLIP-RESISTANT SURFACE IS APPLIED TO SIDEWALK COVER PLATES BY THE MANUFACTURER AND THEN HOT DIPPED GALVANIZED TO THEIR RECOMMENDATIONS TO MAINTAIN THE INTEGRITY OF THIS SURFACE.

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

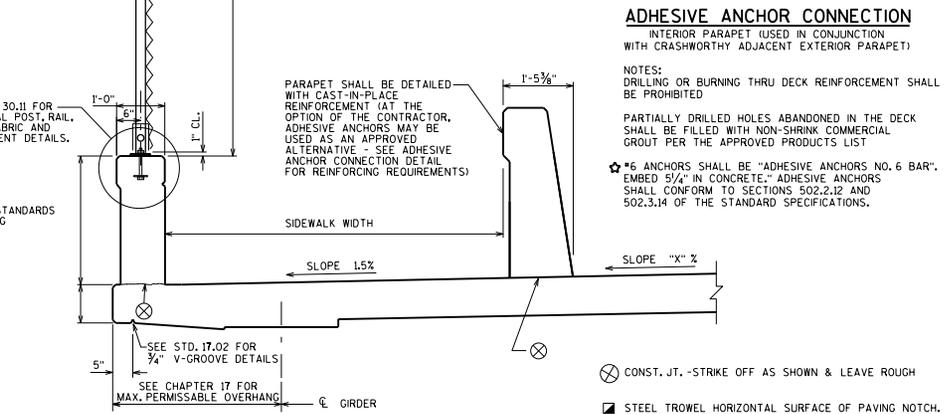
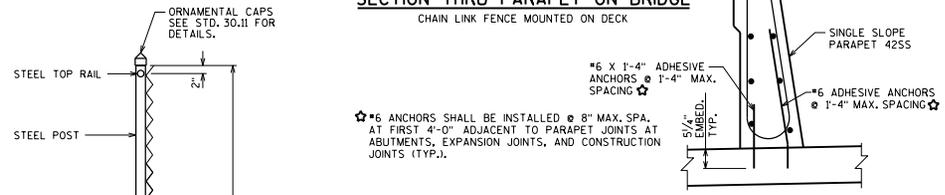
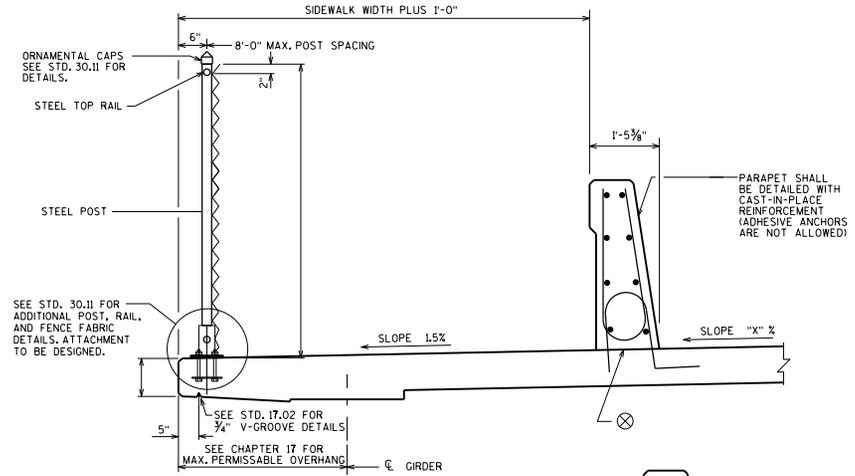
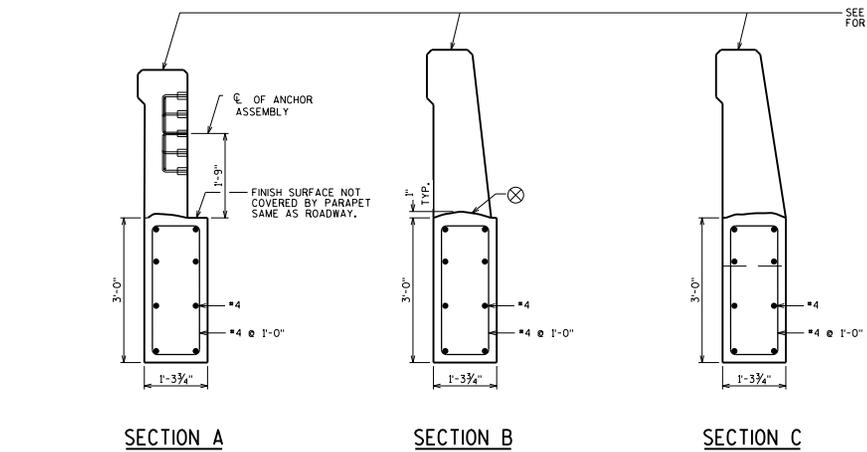
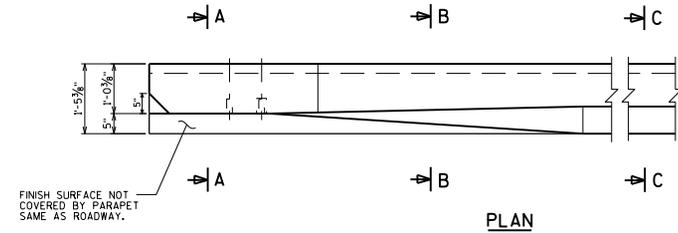
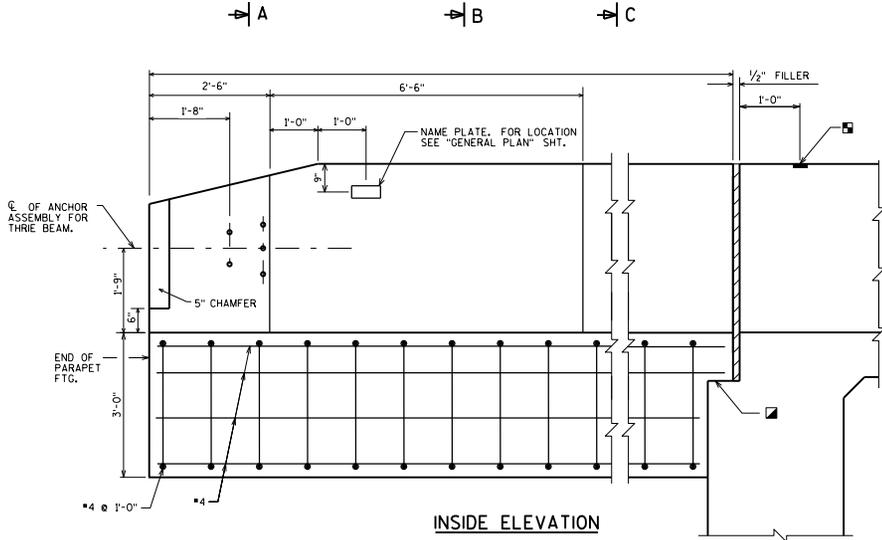
ALL MATERIAL IN THE EXPANSION JOINT ASSEMBLY, INCLUDING ANCHOR STUDS AND HARDWARE SHALL BE PAID AT THE UNIT PRICE BID FOR "EXPANSION DEVICE", L.F.



ALTERNATE STRIP SEAL ANCHOR

STRIP SEAL EXPANSION JOINT DETAILS	
	BUREAU OF STRUCTURES
APPROVED: <i>Laura Shadewald</i>	DATE: 1-23

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



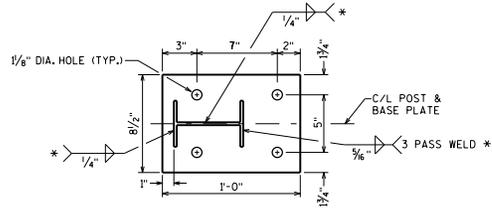
DESIGNER NOTES
 42SS PARAPET SHOWN IN THIS STANDARD. FOR DETAILS, INCLUDING REINFORCING, SEE STANDARD 30.32.
 ALL PARAPET FOOTING BARS SHALL BE EPOXY COATED.
 DO NOT SHOW THE ADHESIVE ANCHOR CONNECTION DETAIL ON THE PLAN. THE CONTRACTOR MAY REQUEST THIS DETAIL IF DESIRED.

ADHESIVE ANCHOR CONNECTION
 INTERIOR PARAPET USED IN CONJUNCTION WITH CRASHWORTHY ADJACENT EXTERIOR PARAPET.
 NOTES:
 DRILLING OR BURNING THRU DECK REINFORCEMENT SHALL BE PROHIBITED.
 PARTIALLY DRILLED HOLES ABANDONED IN THE DECK SHALL BE FILLED WITH NON-SHRINK COMMERCIAL GROUT PER THE APPROVED PRODUCTS LIST.
 *6 ANCHORS SHALL BE "ADHESIVE ANCHORS NO. 6 BAR". EMBED 5/8" IN CONCRETE. ADHESIVE ANCHORS SHALL CONFORM TO SECTIONS 502.2.12 AND 502.3.14 OF THE STANDARD SPECIFICATIONS.

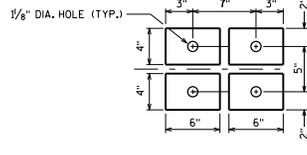
PARAPET FOOTING	
	BUREAU OF STRUCTURES
APPROVED: <i>Laura Shadewald</i>	DATE: 1-23

■ #6 BAR
 LENGTH = 2'-10"
 (ADHESIVE ANCHOR CONNECTION)

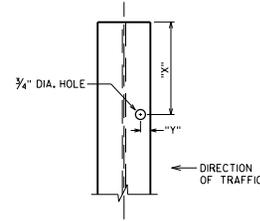
* WELDING IS TO BE COMPLETED USING THE GAS-METAL ARC WELDING (GMAW) PROCESS WITH ERTOS-3 WELDING WIRE AND ARGON-OXYGEN OR CO₂ COVER GAS.



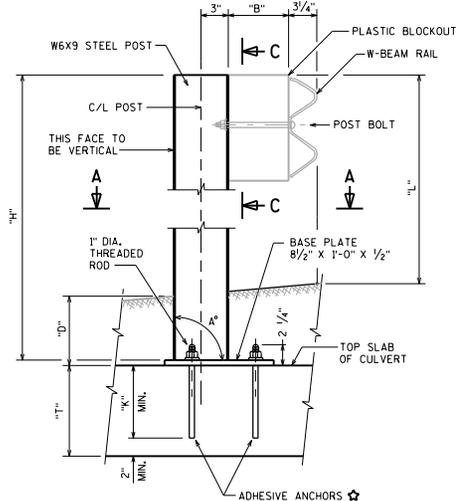
SECTION A-A
POST & BASE PLATE



SECTION B-B
(4)-BOTTOM PLATES



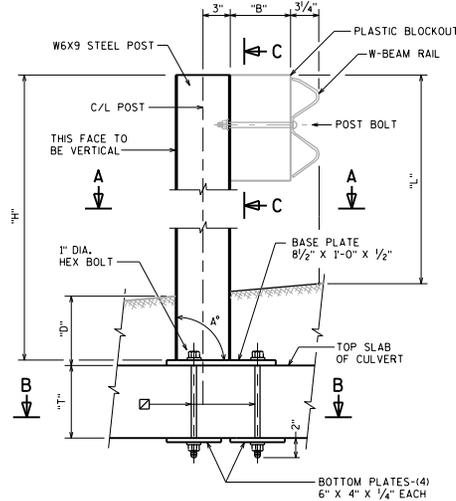
SECTION C-C
HOLE IN POST FLANGE ON APPROACHING TRAFFIC SIDE



ELEVATION

GUARDRAIL POST ANCHORS TYPE 1

USE FOR THICKNESS "T" OF 11-INCHES OR MORE WITH A MINIMUM EMBEDMENT "K" OF 9-INCHES FOR A CONCRETE STRENGTH (f_c) OF 3,500 PSI.
USE FOR THICKNESS "T" OF 10-INCHES OR MORE WITH A MINIMUM EMBEDMENT "K" OF 8-INCHES FOR A CONCRETE STRENGTH (f_c) OF 4,000 PSI.



ELEVATION

GUARDRAIL POST ANCHORS TYPE 2

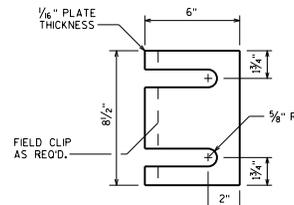
USE FOR THICKNESS "T" OF 8-INCHES OR MORE AND MINIMUM CONCRETE STRENGTH (f_c) OF 3,500 PSI.

GUARDRAIL POST ANCHORAGE SYSTEM

CRITERIA:

USE FOR POSTS WITH "D" EMBEDMENT LESS THAN OR EQUAL TO 4'-0" AND GREATER THAN OR EQUAL TO 9". NOT REQ'D FOR POSTS WITH "D" EMBEDMENT MORE THAN 4'-0". NOT ALLOWED FOR POSTS WITH "D" EMBEDMENT LESS THAN 9".

	"L"	"B"	"X"	"Y"	SOURCE
CLASS "A" GUARDRAIL	2'-4 5/8"	8"	7"	1 3/16"	SDD 14 B 15
MGS GUARDRAIL	2'-7 1/8"	12"	7 7/8"	3/4"	SDD 14 B 42



STEEL SHIM DETAIL

4 PER POST

NOTES

DETAILS SHOWN FOR POSTS, PLATES, ANCHORAGE SYSTEM AND INSTALLATION, BLOCKS, AND GUARDRAIL ARE NOT PART OF THE STRUCTURE CONTRACT, BUT ARE BID PER THE ROADWAY DESIGN PLANS.

POST BASE PLATES (AND BOTTOM PLATES IF USED) SHALL BE FLAT WITH ALL SURFACES SMOOTH AND FREE FROM WARP AND ALL 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 FULLY THREADED PERPENDICULAR TO THE BASE PLATE (AND BOTTOM PLATE IF USED).

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

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

ALL MATERIAL USED IN POSTS AND PLATES SHALL BE MADE FROM MATERIAL CONFORMING TO ASTM DESIGNATION A709 GRADE 50 OR 50S.

HEX BOLTS, THREADED RODS, HEX NUTS AND WASHERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F1554 GRADE 36, AND SHALL BE GALVANIZED. RODS ARE TO BE FULLY THREADED AND BOLTS TO BE THREADED 3", CHAMFER TOP OF BOLTS AND RODS BEFORE THREADING.

★ ADHESIVE ANCHORS (1-INCH DIA. THREADED ROD) EMBED IN CONCRETE AS DETAILED. CHARACTERISTIC BOND STRENGTH SHALL MEET OR EXCEED 1305 PSIFOR UNCRACKED CONCRETE. SEE STANDARD SPECIFICATION 502.3.14 AND APPLY TO THREADED RODS.

☑ THRU-BOLTS (1-INCH DIA. HEX BOLT), DRILL THRU TOP SLAB WHEN THE CONCRETE HAS ACHIEVED ITS DESIGN STRENGTH (f_c).

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

DESIGNER NOTES

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

MGS GUARDRAIL SHOULD BE USED FOR ALL NEW SYSTEMS, CONTACT THE ROADWAY DESIGN SECTION TO VERIFY THAT CONDITIONS AT THE SITE OF THE STRUCTURE WOULD NOT REQUIRE A CLASS "A" GUARDRAIL SYSTEM TO BE USED.

POST SPACING IS 3'-1 1/2" PER FDM SDD 14 B 51. SEE FDM SDD 14 B 51 FOR MINIMUM CLEARANCES FROM EDGES, JOINTS OR OBSTRUCTIONS TO ANCHORAGE SYSTEM FOR TYPE 2 ANCHORAGE. MAKE SURE BOTTOM PLATE IS NOT PLACED AT THE SLOPED HAUNCH BETWEEN THE WALL AND TOP SLAB. SHIFT LOCATION OF POSTS (LONGITUDINALLY ALONG C/L OF POSTS) IF REQUIRED TO MEET SPACING AND CLEARANCE REQUIREMENTS. CHECK WITH ROADWAY DESIGN SECTION TO VERIFY SPACING IS ACCEPTABLE.

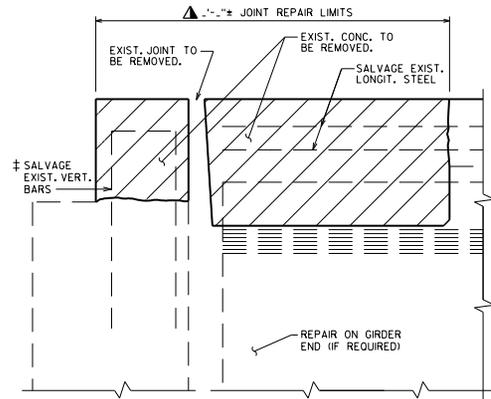
SHOW DETAILS AND PERTINENT NOTES FOUND ON THIS STANDARD ON THE STRUCTURE PLANS FOR THE CHOSEN ANCHOR TYPE.

SHOW LOCATION OF POSTS AND SPACING ALONG C/L OF POST IN PLAN VIEW OF STRUCTURE PLANS. LABEL EACH POST (P1, P2, ETC.). SHOW A TABLE PROVIDING THE ESTIMATED LENGTH "Y" OF EACH POST, AND THE ANGLE A° BETWEEN BASE PLATE AND POST.

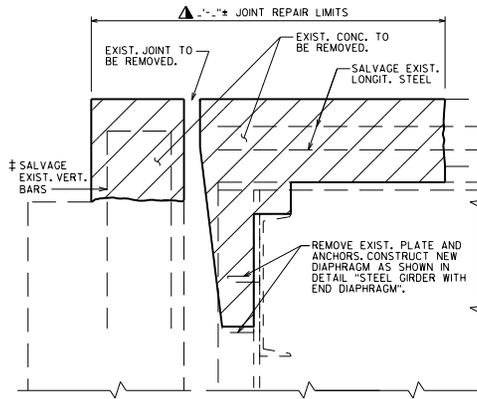
IN THE TOP SLAB PROVIDE A MINIMUM OF #4 BARS AT 1'-0" SPACING IN EACH DIRECTION FOR TOP AND BOTTOM MAT WHEN TYPE 1 OR TYPE 2 ANCHORAGE DETAILS ARE USED.

THIS 'MGS' GUARDRAIL SYSTEM AND ANCHORAGE SYSTEM MEET MASH 2016 EVALUATION CRITERIA FOR TEST LEVEL 3 (TL-3).

GUARDRAIL POST ANCHORAGE SYSTEM	
	BUREAU OF STRUCTURES
APPROVED: <i>Laura Shadewald</i>	DATE: 1-23



**JOINT REPAIR-REMOVAL
PRESTRESSED GIRDER**



**JOINT REPAIR-REMOVAL
STEEL GIRDER**

LEGEND

‡ EXISTING BARS ARE LIKELY TO BE CORRODED AND/OR DAMAGED DURING CONCRETE REMOVAL. SALVAGE AND INCORPORATE AS MUCH REBAR AS PRACTICAL. SUPPLEMENT WITH THE BARS INDICATED BY ☆.

☆ ADHESIVE ANCHORS NO. 5 BAR, EMBED 1'-0" IN CONCRETE. SPACE AT 1'-0". TURN 10° LEG AS NECESSARY TO FIT.

◊ OPT. CONST. JT. 1" MIN. BELOW EXIST. REINF.

▲ DIMENSIONS GIVEN ARE NORMAL TO CL OF SUBSTRUCTURE UNIT. INCORPORATE EXISTING REINFORCEMENT.

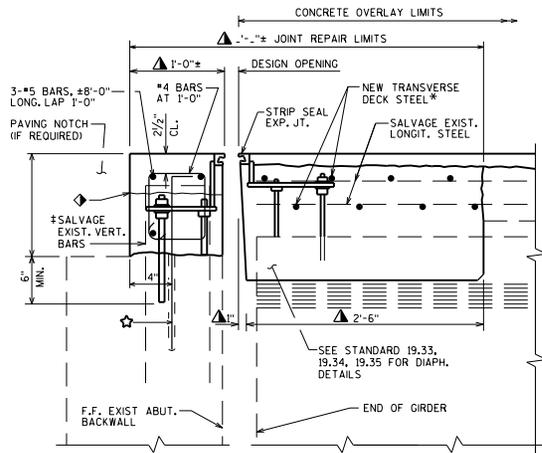
DESIGNER NOTES

SEE STANDARD 28.01 FOR SUPPORTS USED FOR STRIP SEAL STEEL EXTRUSIONS.

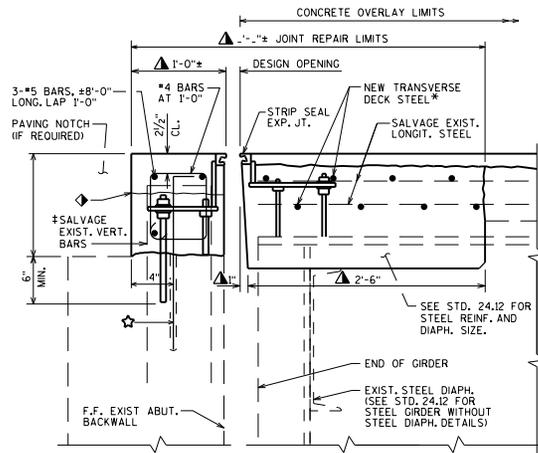
* FOR SKEWS > 20°, WHERE ORIGINAL TRANSVERSE DECK REINFORCEMENT WAS PLACED NORMAL TO THE GIRDERS, SAVE AND INCORPORATE 1'-6" MIN. OF TRANSVERSE REINFORCING BARS. NEW TRANSVERSE BARS ARE PLACED ALONG THE SKEW.

BARS IN JOINT REPAIR SHALL MATCH EXISTING REINFORCEMENT TYPE (COATED OR UNCOATED).

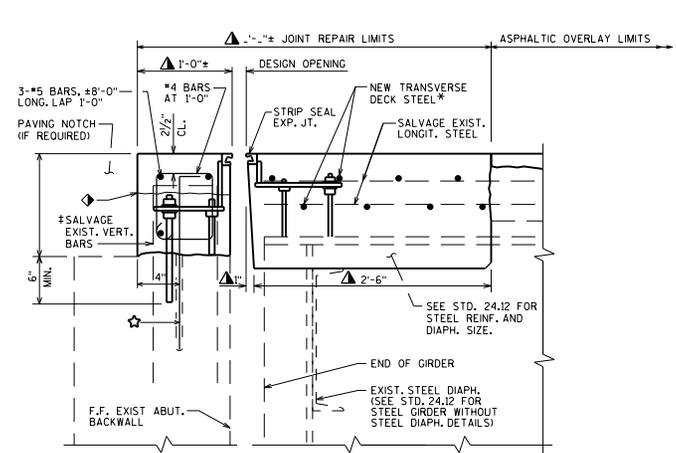
ALL REPLACEMENT PAVING BLOCK DIMENSIONS SHALL MATCH EXISTING PLAN DIMENSIONS UNLESS DESIGNER DETERMINES OTHERWISE. TYP. FOR ALL SECTIONS SHOWN ON THIS STANDARD.



**SECTION THRU PROPOSED JOINT
PRESTRESSED GIRDER WITH END DIAPHRAGM
CONCRETE OVERLAY**



**SECTION THRU PROPOSED JOINT
STEEL GIRDER WITH END DIAPHRAGM
CONCRETE OVERLAY**



**SECTION THRU PROPOSED JOINT
STEEL GIRDER WITH END DIAPHRAGM
ASPHALTIC OVERLAY**

TOTAL ESTIMATED QUANTITIES

BID ITEM NUMBER	BID ITEMS	UNIT	TOTAL
502.3101	EXPANSION DEVICE	LF	
502.4205	ADHESIVE ANCHORS NO. 5 BAR	EACH	
509.1000	JOINT REPAIR	LF	
509.2100.S	CONCRETE MASONRY DECK REPAIR	CY	
POSSIBLE ADDITIONAL BID ITEMS			
505.0400	BAR STEEL REINFORCEMENT HS STRUCTURES	LB	
505.0600	BAR STEEL REINFORCEMENT HS COATED STRUCTURES	LB	
509.2500	CONCRETE MASONRY OVERLAY DECKS	CY	

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

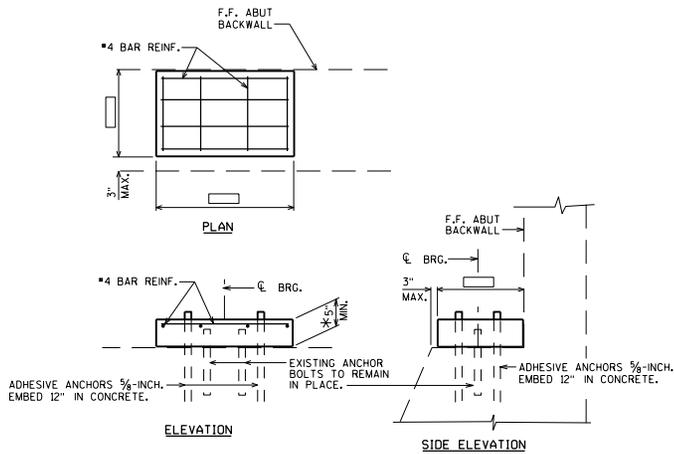
**STRIP SEALS & DIAPH.
DETAILS FOR OVERLAYS**



APPROVED: *Laura Shadewald*

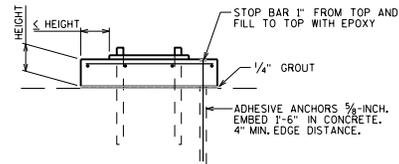
DATE:

1-23



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" *

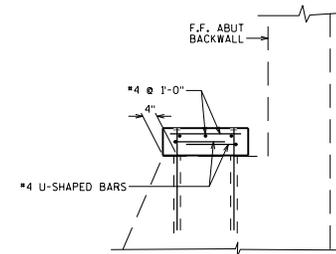
ANCHOR IN AT LEAST 4 LOCATIONS (ANCHORS INCLUDE ADHESIVE ANCHORS, ANCHOR BOLTS OR COMBINATION).

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

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

BURN EXISTING ANCHOR BOLTS OFF FLUSH WITH BEAM SEAT.



* ALTERNATE DETAIL

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

GIRDER REACTIONS AT BEARINGS (KIPS)

		CL BRG. SUPPORT NAME	CL BRG. SUPPORT NAME	CL BRG. SUPPORT NAME
INTERIOR GIRDER	DL			
	LL			
EXTERIOR GIRDER	DL			
	LL			

NOTES

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

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

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

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

DESIGNER NOTES

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

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

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

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

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

CONCRETE BEARING BLOCK DETAILS



BUREAU OF STRUCTURES

APPROVED: Laura Shadewald

DATE:
1-23