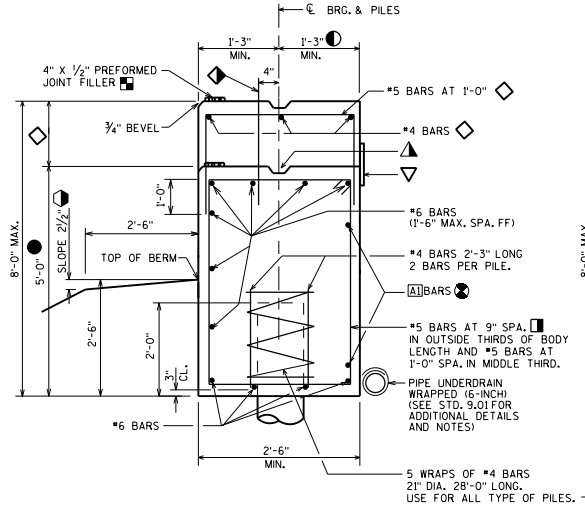
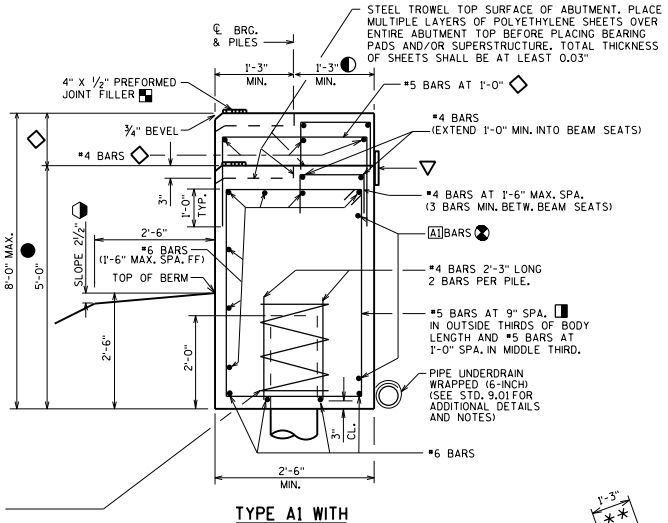


TYPE A1 WITH FIXED SEAT



TYPE A1 WITH SEMI-EXPANSION SEAT

DESIGNER NOTES

LAP LENGTHS FOR HORIZONTAL BARS SHALL BE BASED ON A "CLASS C" TOP TENSION LAP SPLICE.

WING BARS AND DOWEL BARS SHALL BE EPOXY COATED.

PILING SPACING IN ABUTMENT BODY SHALL BE 8'-0" MAX. FOR ALL TYPES OF PILING. THE MAX. PILE SPACING FROM THE END OF THE ABUT. BODY TO THE FIRST PILE SHALL BE THE MINIMUM OF ONE-HALF PILE SPACE OR 2'-6".

TOTAL LENGTH OF A1 BARS SHALL BE ≥ TO WING LENGTH.

CONCRETE POURED UNDER WATER WILL BE ALLOWED AND SHALL BE DONE IN ACCORDANCE WITH SECTION 502.3.5.3 STANDARD SPECIFICATIONS.

THE SEMI-EXPANSION SEAT SHALL BE USED WHEN REQUIRED AS STATED IN CHAPTER 12, FIGURE 12.7-1 OF THE BRIDGE MANUAL OR WHENEVER A WING PILE IS REQUIRED.

THE FIXED SEAT CANNOT BE USED WHEN A WING PILE IS REQUIRED (SEE STD. 12.02 FOR CRITERIA).

WHEN THE BOTTOM OF GIRDER SLOPES MORE THAN 1%, SLOPE THE BEAM SEAT BASED ON ADDING THESE TWO VALUES:
- LONGITUDINAL GRADE OF GIRDER (PERCENT)
- CAMBER EFFECT = 4(RC)/L X 100 (PERCENT), WHERE:
  RC = RESIDUAL CAMBER (INCHES)
  L = GIRDER LENGTH (INCHES)

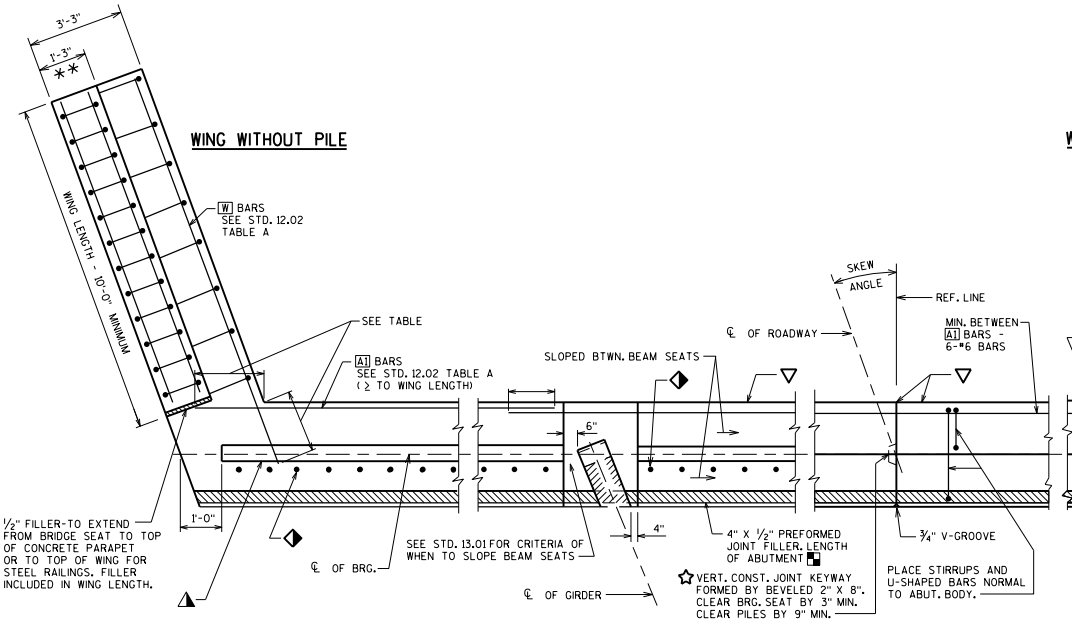
(SEE STANDARD 13.01 FOR SLOPED SEAT DETAILS)

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

USE 3/4" THICK FILLER FOR SLAB STRUCTURES.

LEGEND

- *5 BARS (COATED) AT 1'-0" (2'-0" LONG). THESE BARS MAY BE PLACED AFTER CONCRETE IS POURED BUT BEFORE INITIAL SET HAS TAKEN PLACE.
- WHEN THIS DIMENSION ≥ 4" THIS ADDITIONAL REINFORCEMENT SHALL BE ADDED. MAX. SPA. OF HORIZ. *4 BARS = 1'-0".
- USE 1'-3" FOR SLAB SPANS AND FOR GIRDER SPANS WITH NO PAVING NOTCH.
  USE 1'-6" FOR GIRDER SPANS WITH NO PAVING NOTCH, BUT WHERE 36W", 45W", 54", 54W", 70", 72W" OR 82W" GIRDERS ARE USED, AND SKEW > 25°.
  USE 1'-3" FOR SLAB SPANS WITH A PAVING NOTCH, BUT NO STRUCTURAL APPROACH SLAB.
  USE 1'-11" FOR GIRDER SPANS WITH A PAVING NOTCH, BUT NO STRUCTURAL APPROACH SLAB.
  USE 1'-7" FOR SLAB SPANS WITH A STRUCTURAL APPROACH SLAB. (STD. 12.10)
  USE 2'-3" FOR GIRDER SPANS WITH A STRUCTURAL APPROACH SLAB. (STD. 12.10)
- DIMENSION IS FROM BOTTOM OF ABUTMENT TO LOW BEAM SEAT OR LOW SIDE OF SLAB TYPE SUPERSTRUCTURE.
- 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZONTAL AND VERTICAL JOINTS ON BACKFACE.
- KEYED CONST. JOINT FORMED BY BEVELED 2" x 6".
- ** WINGWALL WIDTH SHALL BE 1'-6" WHEN TYPE "M" RAILING, VERTICAL FACE PARAPET "TX", OR SINGLE SLOPE PARAPET "S6SS" IS USED. WINGWALL WIDTH SHALL BE 1'-9" WHEN TYPE "NY3" OR "NY4" RAILING IS USED.
- USE *5 BARS AT 6" SPA. IN OUTSIDE THIRDS OF BODY LENGTH WHEN THE WING LENGTH > 20'-0" AND WING HEIGHT > 10'-0".
- WHEN BODY SECTION IS > 50'-0"± LONG PROVIDE VERTICAL CONSTRUCTION JOINT. RUN BAR STEEL THRU JOINT AND SEAL JOINT WITH 18" RUBBERIZED MEMBRANE WATERPROOFING. SEE STD. 12.09 FOR ALTERNATE CONSTRUCTION JOINT.
- SHOW ALL BARS FOR CLARITY.
- NO SLOPE FOR HEAVY RIPRAP. SEE STANDARD 12.08 FOR DETAILS.



SLAB SPAN WITH FIXED SEAT | GIRDER SPAN WITH FIXED SEAT | SLAB SPAN WITH SEMI-EXPANSION SEAT | GIRDER SPAN WITH SEMI-EXPANSION SEAT

TABLE

BAR SIZE	DISTANCE*
*5	1'-9"
*6	2'-1"
*7	2'-9"
*8	3'-8"
*9	4'-7"
*10	5'-10"

* OR EQUIVALENT STD. HOOK
USE STRAIGHT BARS WHEN POSSIBLE

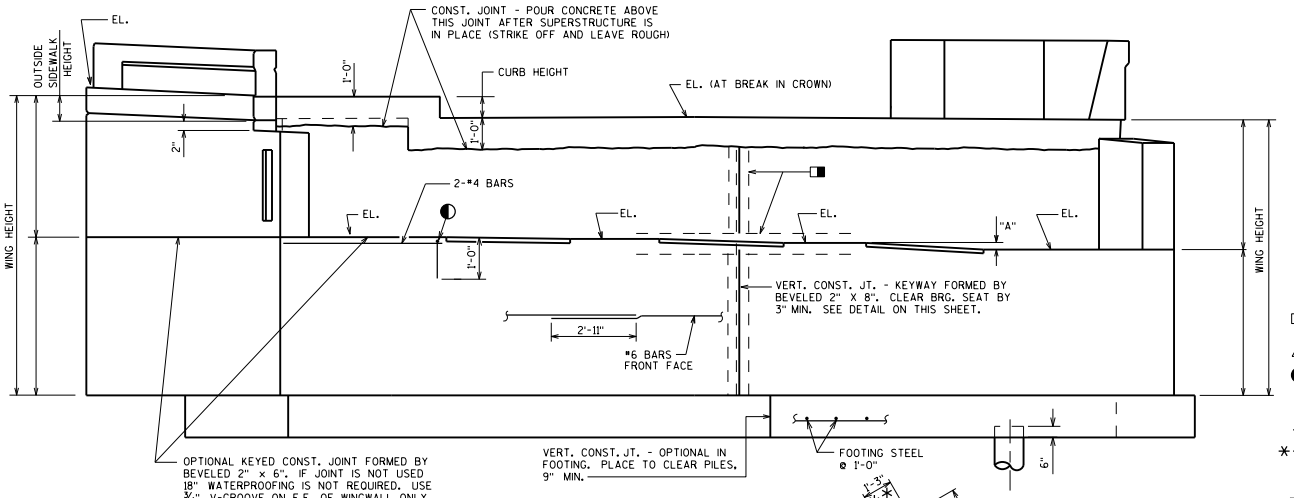
ABUTMENT TYPE A1 (INTEGRAL ABUTMENT)

BUREAU OF STRUCTURES

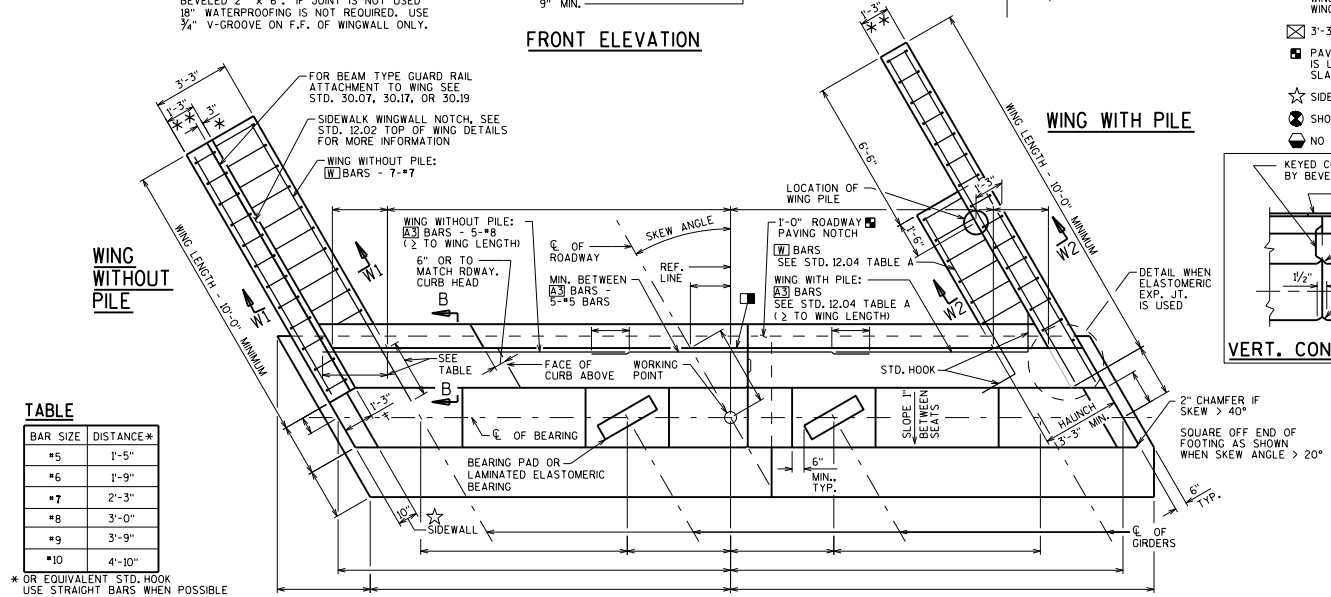
APPROVED: Bill Oliva

DATE: 1-20

STANDARD 12.01



FRONT ELEVATION



WING WITHOUT PILE

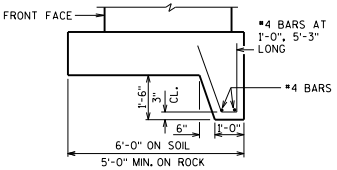
WING WITH PILE

PLAN

TABLE

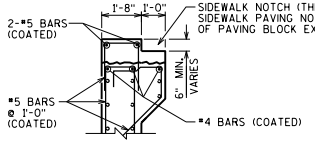
BAR SIZE	DISTANCE*
#5	1'-5"
#6	1'-9"
#7	2'-3"
#8	3'-0"
#9	3'-9"
#10	4'-10"

* OR EQUIVALENT STD. HOOK USE STRAIGHT BARS WHEN POSSIBLE



KEY DETAIL

FOR SILL ABUTMENT WITHOUT PILING PLACED ON SOIL



SECTION B-B

PILE REACTIONS PER FOOT IN KIPS
FRONT ROW = P[(10.22+X/4.25)] + [(h+2.25)³/310] +4.6
BACK ROW = P[(10.78-X/4.25)] - [(h+2.25)³/705] +16.8

NOTES:
h = WING HEIGHT (FT.)
$P = \gamma_{DC}(P_{DC}) + \gamma_{DW}(P_{DW}) + \gamma_{LL}(LL)$ (k/FT.)

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

PILES MUST ALSO BE DESIGNED TO ACCOUNT FOR LATERAL LOADS

P k/FT.	FOOTING STEEL SIZE
20	#6
40	#7
62	#8
75	#9

DESIGNER NOTES

LAP LENGTHS FOR HORIZONTAL BARS SHALL BE BASED ON A "CLASS C" TOP TENSION LAP SPLICE.

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

PILING SPACING IN ABUTMENT FOOTING SHALL BE 8'-0" MAXIMUM.

PILE REACTION EQUATIONS ARE FOR PRELIMINARY PILE LAYOUT PURPOSES ONLY.

TOTAL LENGTH OF A3 BARS SHALL BE ≥ TO WING LENGTH.

WHEN BODY SECTION IS MORE THAN 50'-0"± LONG, PROVIDE VERTICAL CONSTRUCTION JOINT, RUN BAR STEEL THRU JOINT, SEAL JOINT WITH 18" RUBBERIZED MEMBRANE WATERPROOFING. SEE STD. 12.09 FOR ALTERNATE CONSTRUCTION JOINT.

IN "FRONT ELEVATION" VIEW, GIVE ELEVATION OF ALL BEARING AREAS AND ELEVATION AT BOTTOM OF PARAPETS AT EACH END OF WINGS. ALL ELEVATIONS ARE TAKEN AT FRONT FACE OF BACKWALL.

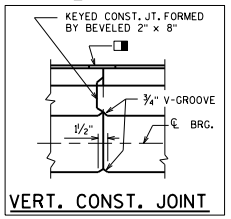
PARAPET NOT SHOWN IN PLAN VIEW FOR CLARITY.

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

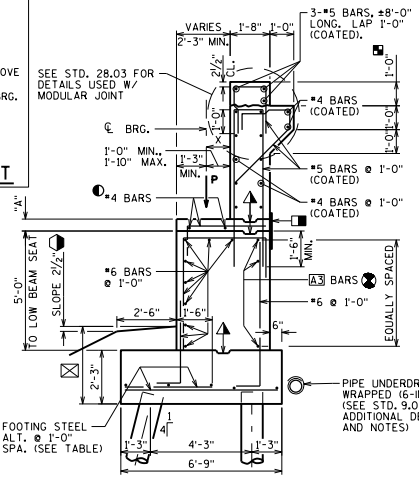
SEE STANDARDS 12.01 AND 13.01 FOR SLOPED BEAM SEAT CRITERIA AND DETAILS.

LEGEND

- 18" RUBBERIZED MEMBRANE WATERPROOFING. SEAL ALL HORIZ. AND VERT. JOINTS ON BACKFACE ABOVE FOOTING.
- KEYED CONSTRUCTION JOINT FORMED BY BEVELED 2" X 6".
- #4 AT 9" BEAM SEAT. SPACE AT 1'-0" BETWEEN SEATS. THIS STEEL IS REQUIRED ONLY IF DIMENSION "A" EXCEEDS 4".
- † 1'-5" WHEN VERTICAL FACE PARAPET TYPE "TX" IS USED.
- * 4" WHEN VERTICAL FACE PARAPET TYPE "TX" IS USED.
- ** WINGWALL WIDTH SHALL BE 1'-6" WHEN TYPE "M" RAILING, VERTICAL FACE PARAPET "TX", OR SINGLE SLOPE PARAPET "56SS" IS USED. "56SS" SHOULD NOT BE USED ON A SIDEWALK. WINGWALL WIDTHE SHALL BE 1'-4" WHEN PARAPET 'A' ON A RAISED SIDEWALK IS USED. WINGWALL WIDTH SHALL BE 1'-9" WHEN TYPE "NY3" OR "NY4" RAILING IS USED.
- 3'-3" (SLOPE PAVING), 4'-6" (HEAVY RIPRAP)
- PAVING NOTCH IS 1'-0" WIDE BY 1'-4" DEEP IF STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED. SHOW NO. 9 STAINLESS STEEL BAR (STD 12.12) FOR STRUCTURAL APPROACH SLAB ON THE ABUTMENT SHEET.
- ☆ SIDEWALL IS 1'-3" WIDE IF STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED.
- SHOW ALL BARS FOR CLARITY.
- NO SLOPE FOR HEAVY RIPRAP. SEE STANDARD 12.08 FOR DETAILS.



VERT. CONST. JOINT



SECTION THRU BODY

ALL FOOTING BARS NOT IDENTIFIED ARE #5 BARS

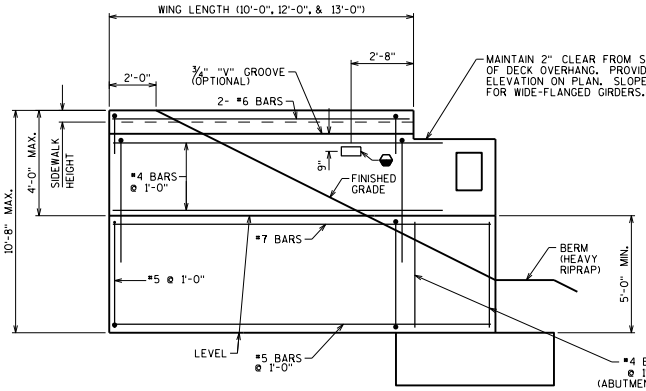
ABUTMENT TYPE A3

BUREAU OF STRUCTURES

APPROVED: Bill Oliva

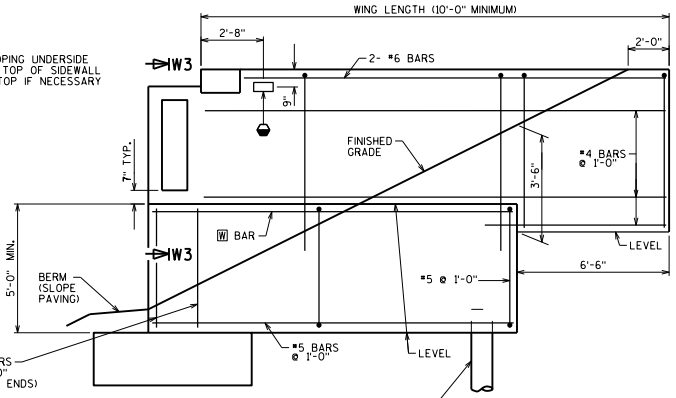
DATE: 1-20

STANDARD 12.03



WING WITHOUT PILE ELEVATION

(FRONT FACE)



WING WITH PILE ELEVATION

(FRONT FACE)

WING PILE REQUIRED IF ANY OF THESE CRITERIA ARE MET:
- WING LENGTH > 13'-0"
- OVERALL HEIGHT > 10'-8"
- H_U > 4'-0" ± OR 36W" PRESTRESSED GIRDER

DESIGNER NOTES

SEE STD. 12.03 FOR ADDITIONAL DESIGER NOTES.

WING WITH PILE & WING WITHOUT PILE CAN BE USED FOR EITHER SIDEWALK OR SLOPED FACE PARAPETS. THE TYPE OF WING TO USE IS BASED ONLY ON THE WING HEIGHT AND WING LENGTH LIMITATIONS SHOWN.

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

FOR MODULAR EXPANSION JOINTS WITH CONCRETE DIAPHRAGMS RUNNING TO EDGE OF DECK: IF SIDEWALL IS USED, FORM SIDEWALL 2" BELOW CONCRETE DIAPHRAGM.

CONSTRUCTION JOINT. LEAVE ROUGH. REQUIRED FOR PRESTRESSED CONCRETE SUPERSTRUCTURES, OPTIONAL FOR OTHERS. POUR CONCRETE ABOVE THIS JOINT AFTER DECK IS IN PLACE.

OPTIONAL CONSTRUCTION JOINT FORMED BY BEVELED 2" X 6" KEYWAY WITH MEMBRANE ON BACKFACE.

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

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

LRFD DESIGN LOADS

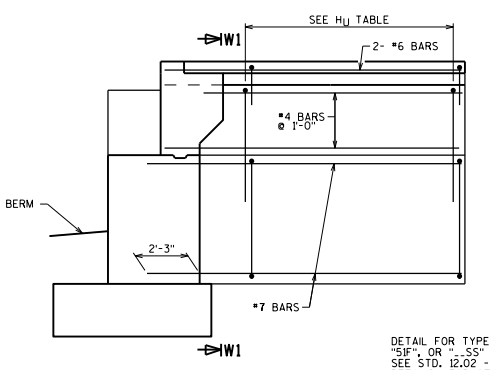
LIVE LOAD = 2'-0" SURCHARGE
LOAD FACTORS:
- γ_{DC} = 1.25
- γ_{DW} = 1.50
- γ_{EH} = 1.50
- γ_{EH} MIN. = 0.90
- γ_{EV} = 1.35
- γ_{LL} = 1.75

EXPOSURE CLASS 2, χ_E = 0.75
f_y = 60,000 P.S.I.
$f'c$ = 3,500 P.S.I
HORIZONTAL EARTH LOAD BASED ON:
35 P.C.F. EQUIVALENT FLUID UNIT WEIGHT OF SOIL

TABLE A

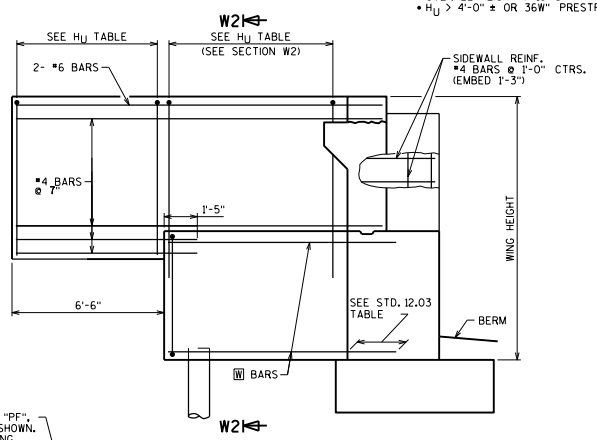
WING 2 LENGTH	WING 2 HEIGHT				
	10'-0"	11'-6"	13'-0"	14'-6"	BARS
12'-0"		6-#6's			W
		7-#5's			A3
16'-0"	8-#6's	7-#7's	8-#7's		W
	7-#6's	5-#8's	7-#7's		A3
20'-0"	8-#7's	9-#7's	9-#8's	10-#8's	W
	5-#9's	6-#9's	7-#9's	8-#9's	A3
24'-0"	9-#8's	10-#8's	10-#9's	8-#10's +	W
	9-#8's	9-#9's	9-#10's	10-#10's	A3
26'-0"	9-#9's	10-#9's	9-#9's +	10-#9's +	W
	7-#10's	9-#10's	9-#10's ##	10-#10's ##	A3

+ USE 4'-6" FOR LOWER WING POUR WIDTH
USE 3'-3" MIN. FOR BEARING SEAT WIDTH



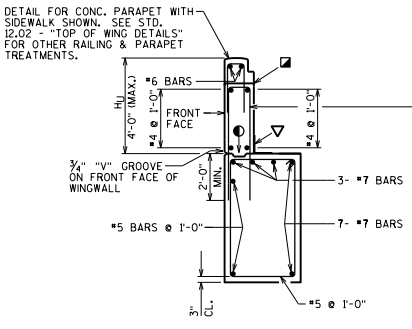
WING WITHOUT PILE ELEVATION

(BACK FACE)



WING WITH PILE ELEVATION

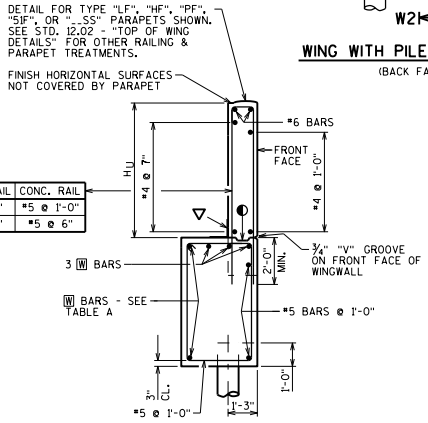
(BACK FACE)



SECTION W1

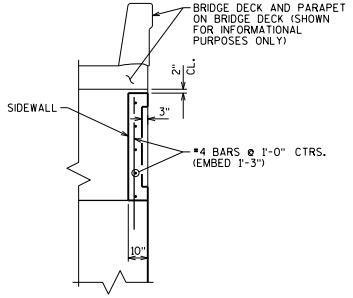
(WING WITHOUT PILE)

H_U	STEEL RAIL	CONC. RAIL
≤ 7'-0"	#6 @ 9"	#5 @ 1'-0"
7'-0" - 9'-6"	#6 @ 9"	#5 @ 6"



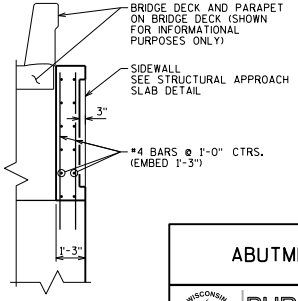
SECTION W2

(WING WITH PILE)



SECTION W3

(WITHOUT STRUCTURAL APPROACH SLAB)



SECTION W3

(WITH STRUCTURAL APPROACH SLAB)

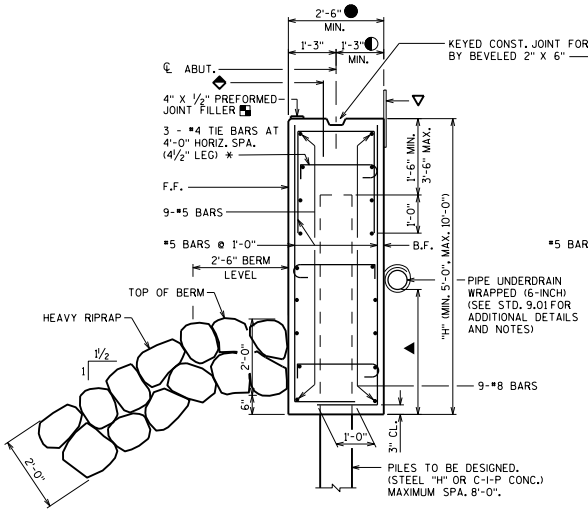
ABUTMENT TYPE A3

BUREAU OF STRUCTURES

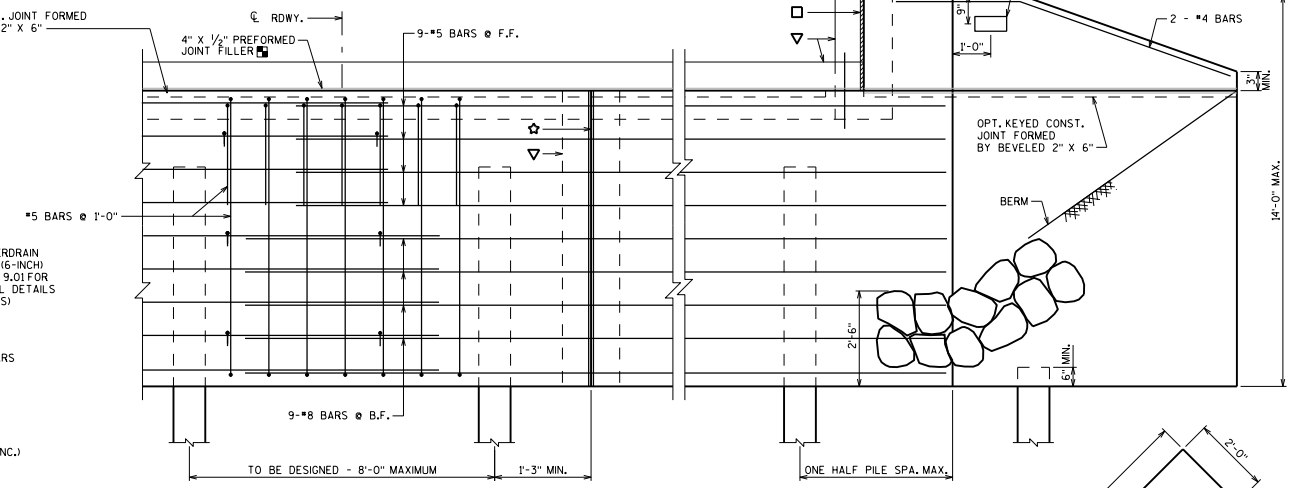
APPROVED: Bill Oliva

DATE: 1-20

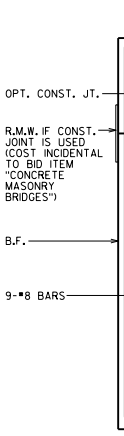
STANDARD 12.04



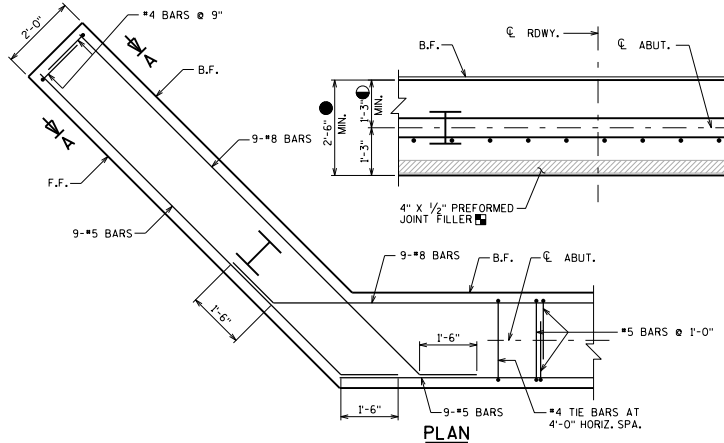
TYP. SECTION THRU ABUTMENT BODY



ELEVATION

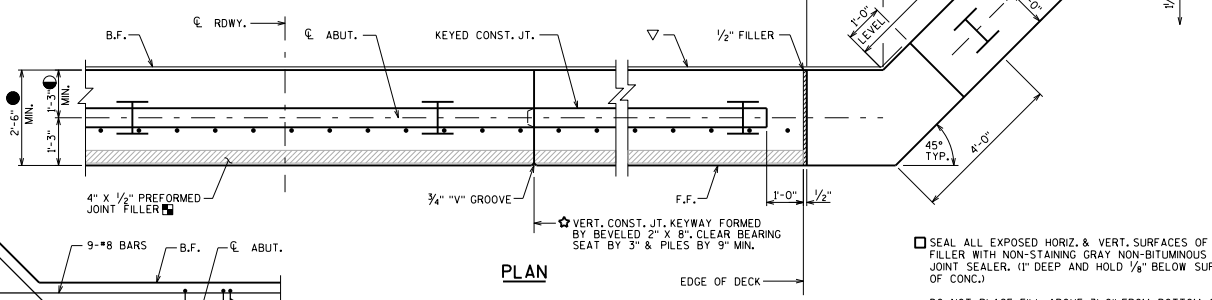


SECTION A-A

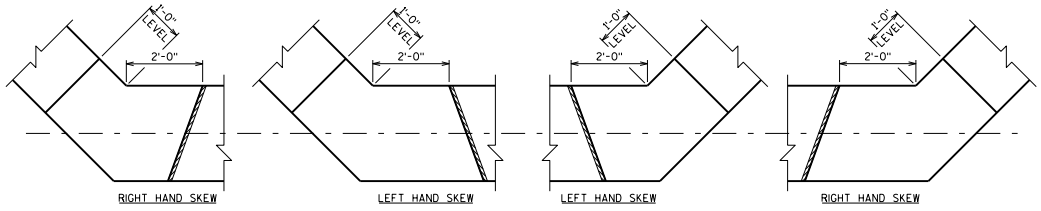


PLAN

SHOWING BAR STEEL REINFORCEMENT



PLAN



WING DETAIL FOR SKEWED STRUCTURES

DESIGNER NOTES

FOR SLAB AND PRESTRESSED GIRDER SPANS L < 200'-0" & FOR STEEL GIRDER SPANS L < 150'-0" WHERE L = LENGTH OF CONTINUOUS SUPERSTRUCTURE BETWEEN ABUTMENTS.

WHEN GIRDERS WITH SEMI-EXPANSION SEAT OR FIXED SEAT, OR SLAB SPAN WITH SEMI-EXPANSION SEAT ARE USED, MAKE BEAM SEATS SIMILAR TO THAT SHOWN ON STANDARD 12.01.

WING BARS AND DOWEL BARS SHALL BE EPOXY COATED.

✿ WHEN BODY SECTION IS > ± 50'-0" LONG, PROVIDE VERT. CONST. JOINT. RUN BAR STEEL THRU JOINT. BEVEL EXPOSED EDGES ¾" AND SEAL JOINT. SEE STD. 12.09 FOR ALTERNATE CONSTRUCTION JOINT.

◐ USE 1'-3" FOR SLAB SPANS AND FOR GIRDER SPANS WITH NO PAVING NOTCH.
USE 1'-6" FOR GIRDER SPANS WITH NO PAVING NOTCH, BUT WHERE 36W", 45W", 54", 54W", 70", 72W" OR 82W" GIRDERS ARE USED, AND SKEW > 25°.
USE 1'-3" FOR SLAB SPANS WITH A PAVING NOTCH, BUT NO STRUCTURAL APPROACH SLAB.
USE 1'-11" FOR GIRDER SPANS WITH A PAVING NOTCH, BUT NO STRUCTURAL APPROACH SLAB.
USE 1'-7" FOR SLAB SPANS WITH A STRUCTURAL APPROACH SLAB. (STD. 12.10)
USE 2'-3" FOR GIRDER SPANS WITH A STRUCTURAL APPROACH SLAB. (STD. 12.10)

▲ FOR BOTTOM OF ABUTMENTS LOCATED ABOVE NORMAL WATER, PLACE UNDERDRAIN NEAR THE BOTTOM OF ABUTMENT AS SHOWN IN STANDARD 12.01. FOR BOTTOM OF ABUTMENTS LOCATED BELOW NORMAL WATER, PLACE UNDERDRAIN ABOVE NORMAL WATER. SEE BRIDGE MANUAL 12.6.1 FOR ADDITIONAL GUIDANCE.

□ SEAL ALL EXPOSED HORIZ. & VERT. SURFACES OF ½" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD ⅛" BELOW SURFACE OF CONC.)

DO NOT PLACE FILL ABOVE 3'-0" FROM BOTTOM OF ABUTMENT UNTIL SUPERSTRUCTURE IS IN PLACE.

▽ 18" RUBBERIZED MEMBRANE WATERPROOFING.

● WHEN ABUTMENT WIDTH > 2'-10" FIXED POINT OF WING ROTATION SHALL BE ON F.F. OF ABUTMENT (0° SKEW ONLY).

◆ THESE BARS MAY BE PLACED AFTER CONCRETE IS POURED, BUT BEFORE INITIAL SET HAS TAKEN PLACE. SEE STD. 12.01 & 27.05

▪ USE 3/4" THICK FILLER FOR SLAB STRUCTURES.

* ALTERNATE THE POSITION OF THE 90° AND 180° HOOKS AT EACH VERTICAL LAYER OF TIES.

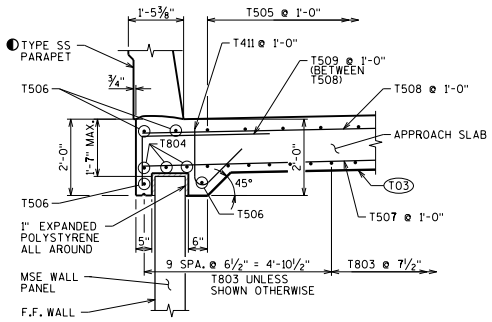
ABUTMENT A5 (INTEGRAL, PILE ENCASED ABUTMENT)

BUREAU OF STRUCTURES

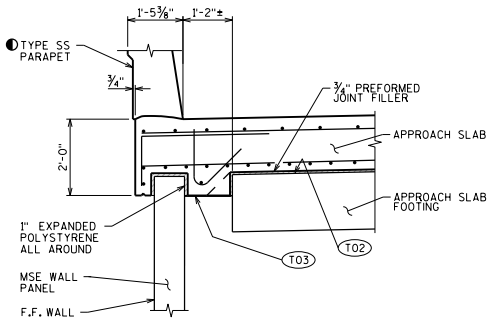
APPROVED: Bill Oliva

DATE: 1-20

STANDARD 12.08



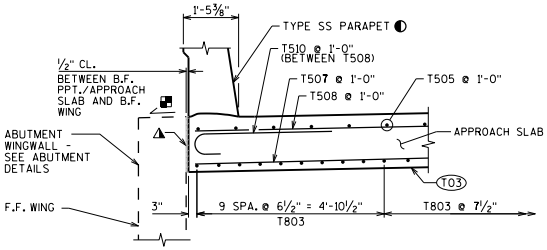
SECTION A-A
(AT MSE WINGWALLS)



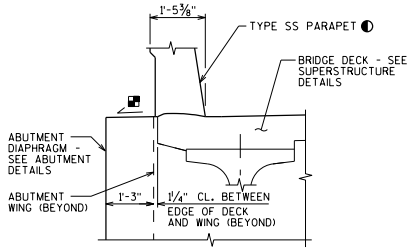
SECTION B-B
(AT MSE WINGWALLS)

LEGEND

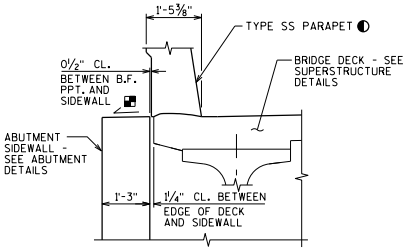
- (T02) STEEL TROWEL TOP SURFACE OF FOOTING AND PLACE MULTIPLE LAYERS (0.03" MIN. TOTAL THK.) OF POLYETHYLENE SHEETS OVER THE ENTIRE TOP OF FOOTING.
- (T03) PLACE MULTIPLE LAYERS (0.03" MIN. TOTAL THK.) OF POLYETHYLENE SHEETS OVER THE ENTIRE TOP OF SUBGRADE BENEATH SLAB.
- ◭ SEAL ALL EXPOSED HORIZONTAL AND VERTICAL SURFACES OF ½" FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD ⅛" BELOW SURFACE OF CONCRETE).
- ◐ SEE PARAPET STANDARD DETAILS FOR REINFORCEMENT, LOCATION OF NAME PLATE AND BENCH MARK WITH RESPECT TO THE END OF PARAPET, ETC.
- ▨ CONST. JOINT-STRIKE OFF AS SHOWN AND LEAVE ROUGH. FOR DECK POUR MATCH BRIDGE X-SLOPE.
- ▪ SLOPE TO DRAIN
- ✳ SECTION REPRESENTATIVE OF SIMILAR LOCATION AS SHOWN ON STANDARD 12.10 FOR DIFFERENT APPLICATION.



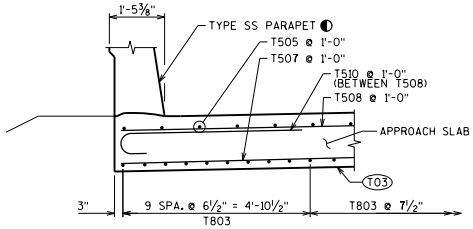
SECTION C-C
(AT WINGWALLS PARALLEL TO BRIDGE)



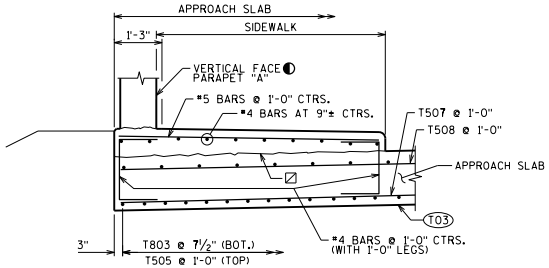
SECTION D-D
(AT WINGWALLS PARALLEL TO BRIDGE - A1 ABUT.)



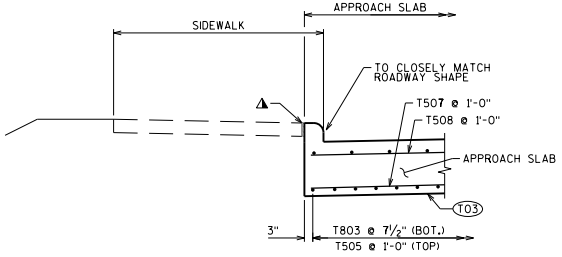
SECTION D-D ✳
(AT WINGWALLS PARALLEL TO BRIDGE - A3 ABUT.)



SECTION C-C ✳
(AT WINGWALLS PARALLEL TO ABUT.)



SECTION C-C ✳
(AT WINGWALLS PARALLEL TO ABUT.)



SECTION C-C ✳
(AT WINGWALLS PARALLEL TO ABUT.)

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

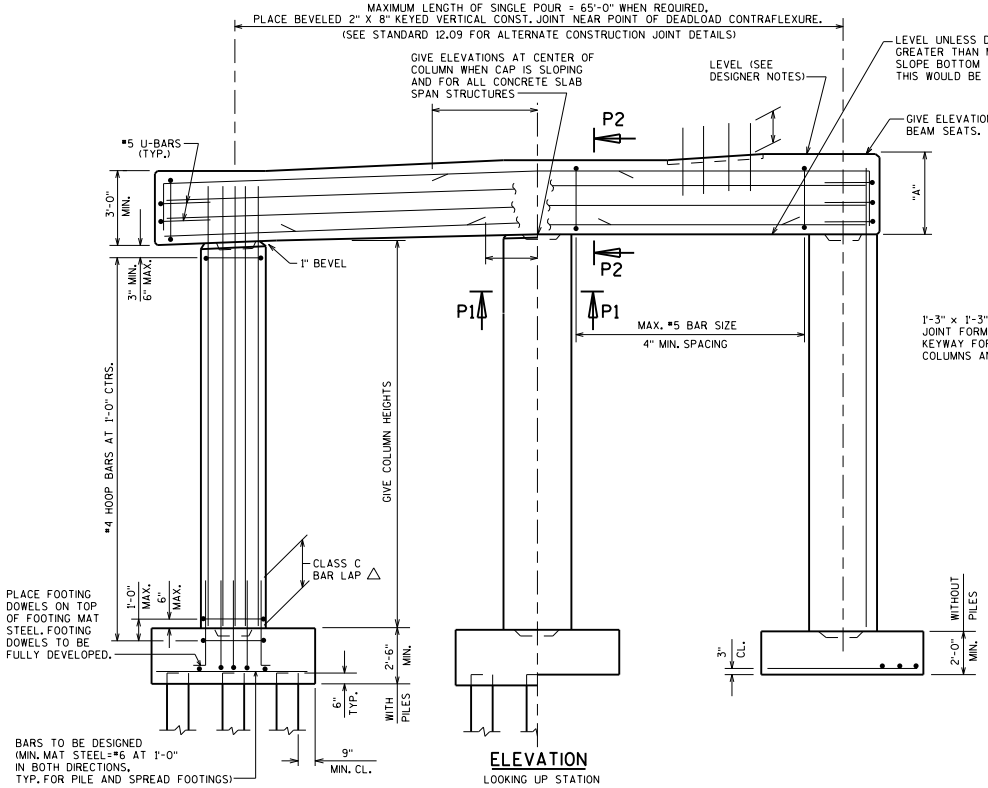
STRUCTURAL APPROACH SLAB DETAILS 1

BUREAU OF STRUCTURES

APPROVED: Bill Oliva

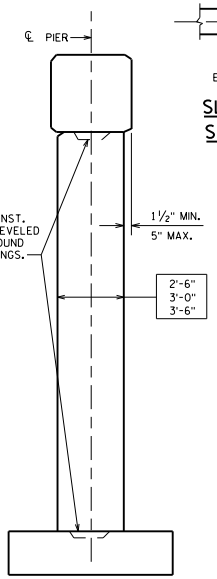
DATE: 1-20

STANDARD 12.11

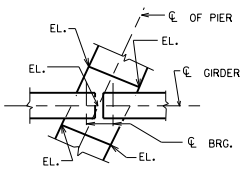


ELEVATION

LOOKING UP STATION



END VIEW



SLOPING BEAM SEAT DETAILS

DESIGNER NOTES

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

SLOPE TOP OF COLUMNS TO MATCH CAP WHEN THE BOTTOM OF THE CAP IS SLOPED. DETAIL BOTTOM OF CAP REINFORCEMENT TO CLEAR VERTICAL COLUMN REINFORCEMENT.

CAPS MAY BE MORE THAN 3" WIDER THAN COLUMNS IF THE EXTRA WIDTH IS NECESSARY TO SATISFY THE MINIMUM EDGE DISTANCE CRITERIA ADJACENT TO BEARINGS.

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

1. FOR GIRDERS WITH ½" ELASTOMERIC BEARING PADS AND THE GIRDER BOTTOM SLOPES MORE THAN 1%. ADD THESE TWO VALUES TO DETERMINE THE GIRDER SLOPE:
   - LONGITUDINAL GRADE OF GIRDER (PERCENT)
   - CAMBER EFFECT = 4(RC)/L X 100 (PERCENT), WHERE:
     RC = RESIDUAL CAMBER (INCHES)
     L = GIRDER LENGTH (INCHES)

2. WHEN A CAP IS USED 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.

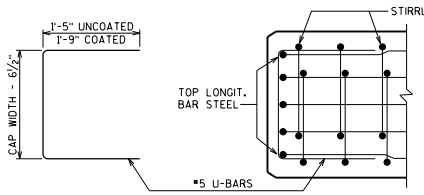
SEE STANDARD 12.01 FOR ADDITIONAL REINFORCING STEEL IN BEARING AREA FOR BEAM SEATS OF NON-SLOPED CAPS THAT ARE 4" OR MORE ABOVE LOWEST BEAM SEAT.

EPOXY COAT BAR STEEL DOWN TO TOP OF FOOTINGS IN ALL PIERS UNDER EXPANSION JOINTS AND ON ALL PIERS AT GRADE SEPARATIONS.

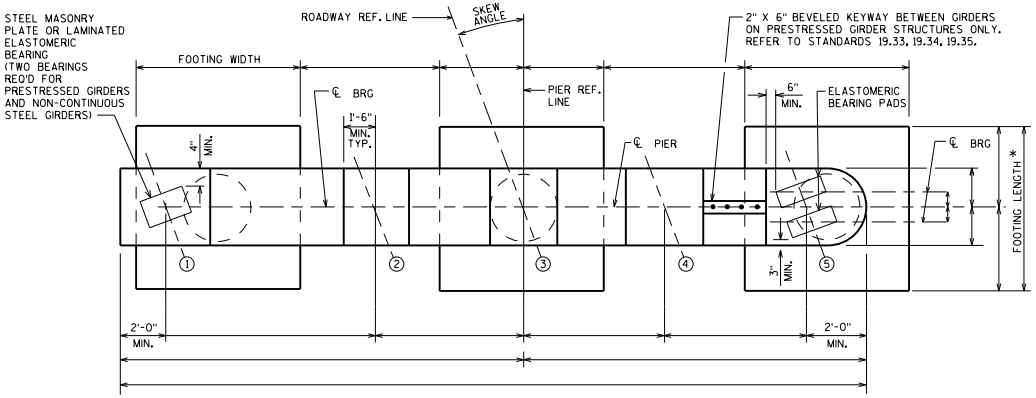
BAR STEEL REQUIRED FOR BENDING IN PIER CAP SHALL BE DETAILED IN LENGTHS AS REQUIRED FOR CONSTRUCTIBILITY AND BY DESIGN SPECIFICATIONS. MAXIMUM REQUIRED BAR STEEL IN THE TOP OF THE PIER CAP (NEGATIVE MOMENT STEEL) MAY BE DETAILED FULL LENGTH IF A MINOR COST INCREASE.

SEE BRIDGE MANUAL 13.4.10 FOR MULTI-COLUMNED PIER DESIGN REGARDING VEHICULAR COLLISON FORCE. THE PIER OPTIONS REPRESENTED ON THIS STANDARD DO NOT MEET THE REQUIREMENTS OF AASHTO LRFD 3.6.5. FOR VEHICULAR COLLISION FORCE.

△ NORMALLY THIS LAP IS OMITTED AND FOOTING DOWELS EXTENDED INTO THE CAP IF THE LAP IS GREATER THAN ONE-HALF THE COLUMN HEIGHT.



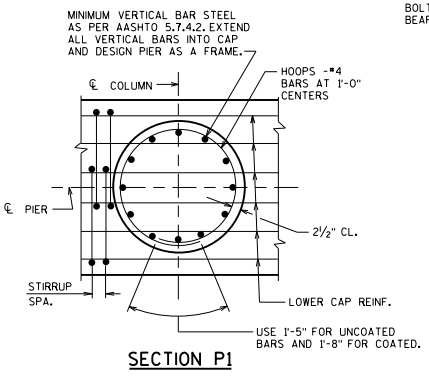
PLAN VIEW SHOWING END OF CAP REINF.



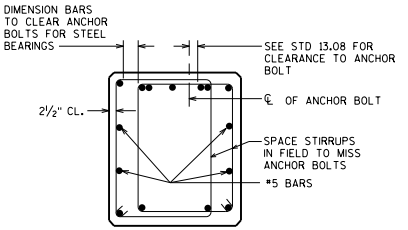
PLAN

SHOWING BOTH SQUARE AND ROUND ENDED CAP

*MAKE ALL FOOTING LENGTHS THE SAME WITHIN A GIVEN PIER.



SECTION P1



SECTION P2

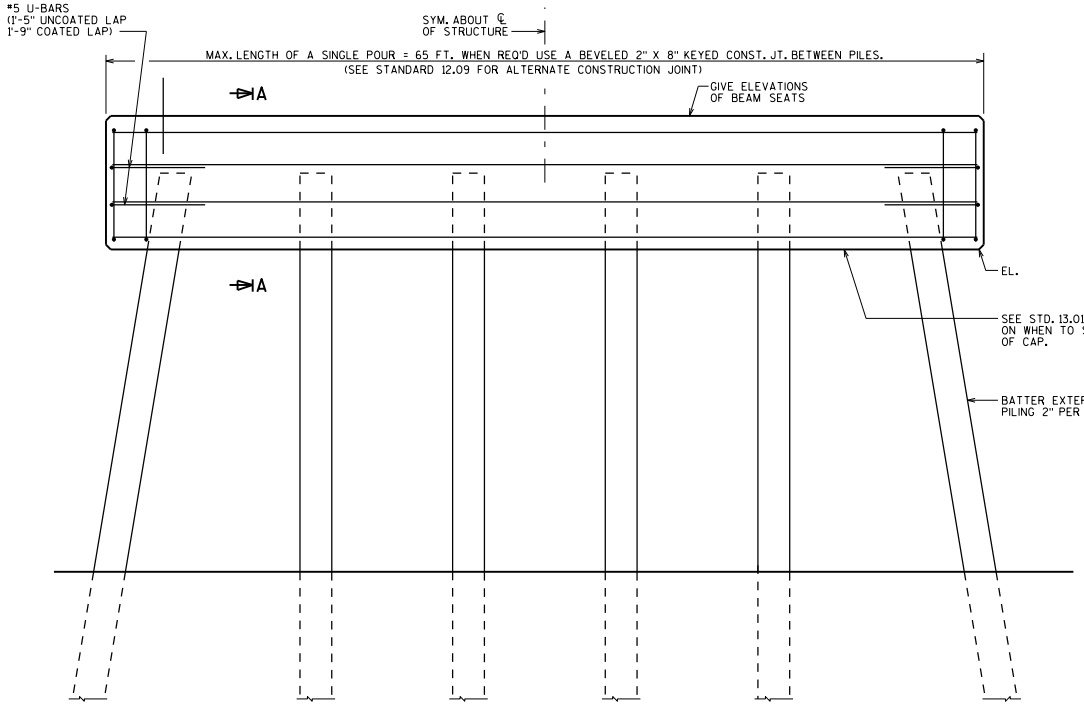
MULTI-COLUMNED PIER

BUREAU OF STRUCTURES

APPROVED: Bill Oliva

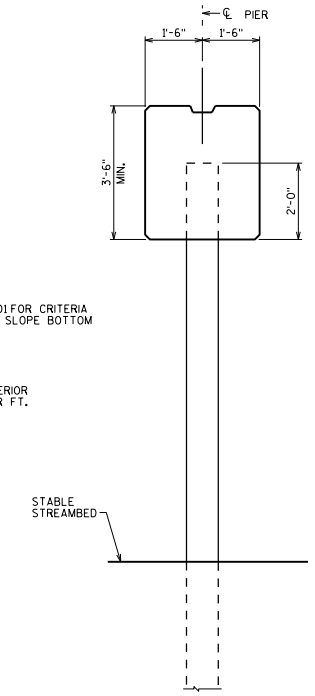
DATE: 1-20

STANDARD 13.01



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 ½" ELASTOMERIC BEARING PADS WHEN THE BOTTOM OF THE GIRDERS SLOPE MORE THAN 1%. SEE STANDARD 13.01.

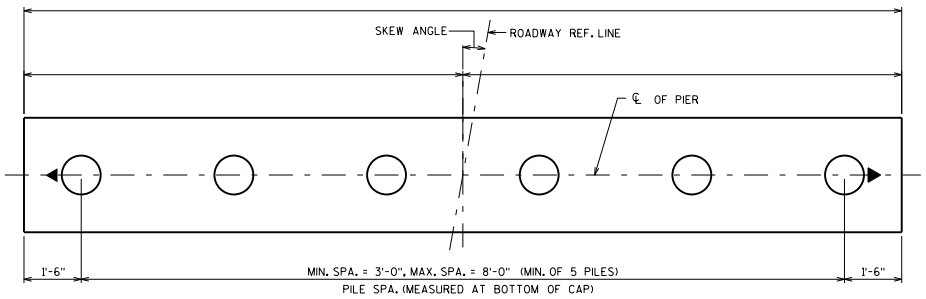
2. FOR CONCRETE SLAB SUPERSTRUCTURES MAKE THE TOP OF THE CAP PARALLEL TO GRADE. SEE STANDARD 18.01.

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

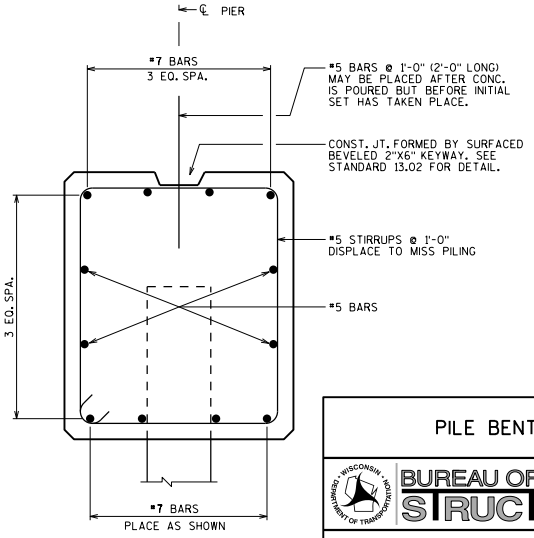
SEE STANDARD 12.01 FOR ADDITIONAL REINFORCING STEEL IN BEARING AREA FOR BEAM SEATS OF NON-SLOPED CAPS THAT ARE 4" OR MORE ABOVE LOWEST BEAM SEAT.

PILES SHALL BE 12¾" OR 14" DIAMETER CAST-IN-PLACE WITH MINIMUM WALL THICKNESS OF ⅜".

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



PLAN



SECTION A-A

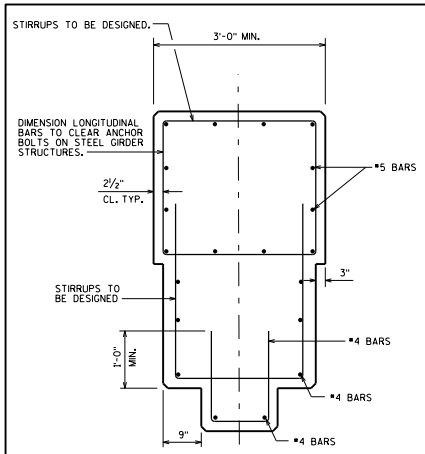
PILE BENT

BUREAU OF STRUCTURES

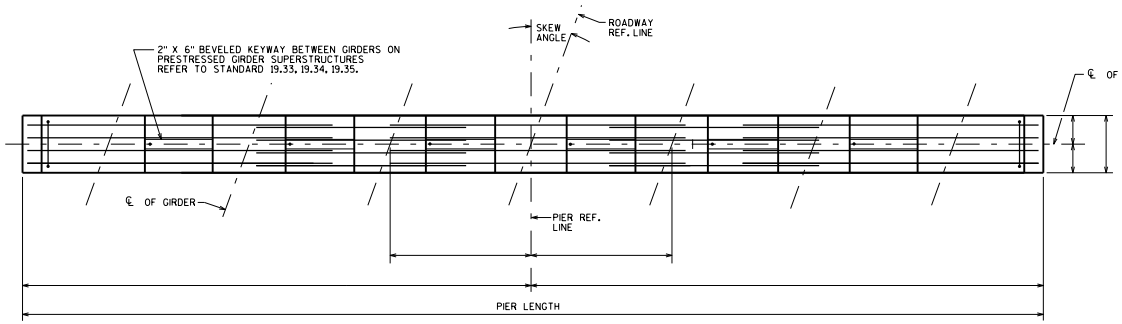
APPROVED: Bill Oliva

DATE: 1-20

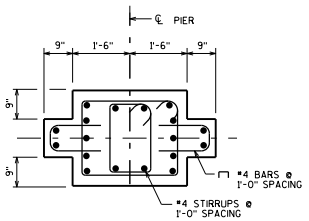
STANDARD 13.04



SECTION P1



PLAN OF PIER CAP



SECTION P2

DESIGNER NOTES

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

OPTIONAL KEYED CONSTRUCTION JOINTS IN COLUMNS (IF USED) AND REQUIRED KEYED JOINTS FOR FOOTINGS SHALL BE FORMED BY A BEVELED KEYWAY 2" DEEP x 1'-3" X 1'-3". EXPOSED EDGES OF CONSTRUCTION JOINTS SHALL BE FLUSH AND NOT BEVELED IN COLUMNS.

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

1. FOR GIRDERS WITH ½" 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 THAT ARE 4" OR MORE ABOVE LOWEST BEAM SEAT.

EPOXY COAT BAR STEEL DOWN TO TOP OF FOOTINGS IN ALL PIERS UNDER EXPANSION JOINTS AND ON ALL PIERS AT GRADE SEPARATIONS.

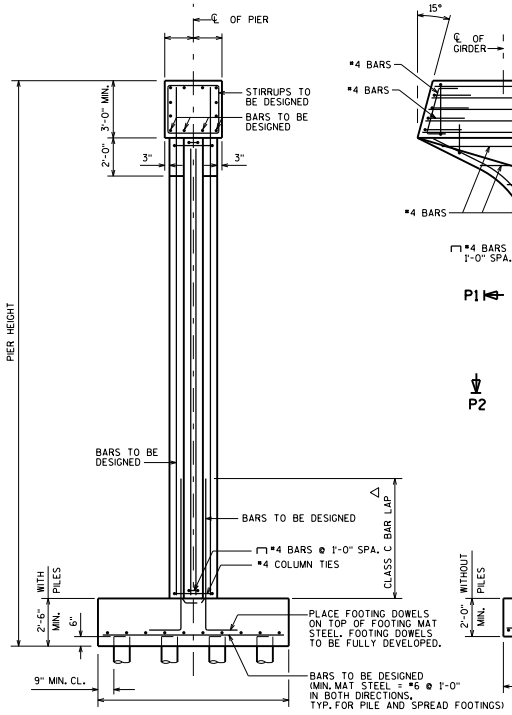
BAR STEEL REQUIRED FOR BENDING IN PIER CAP SHALL BE DETAILED IN LENGTHS AS REQUIRED FOR CONSTRUCTIBILITY AND BY DESIGN SPECIFICATIONS. MAXIMUM REQUIRED BAR STEEL IN THE TOP OF THE PIER CAP (NEGATIVE MOMENT STEEL) MAY BE DETAILED FULL LENGTH IF A MINOR COST INCREASE.

SEE STANDARD 13.01 FOR MINIMUM OFFSETS FROM BEARINGS TO SIDES OF CAP AND TO ADJACENT BEARING SEAT STEPS.

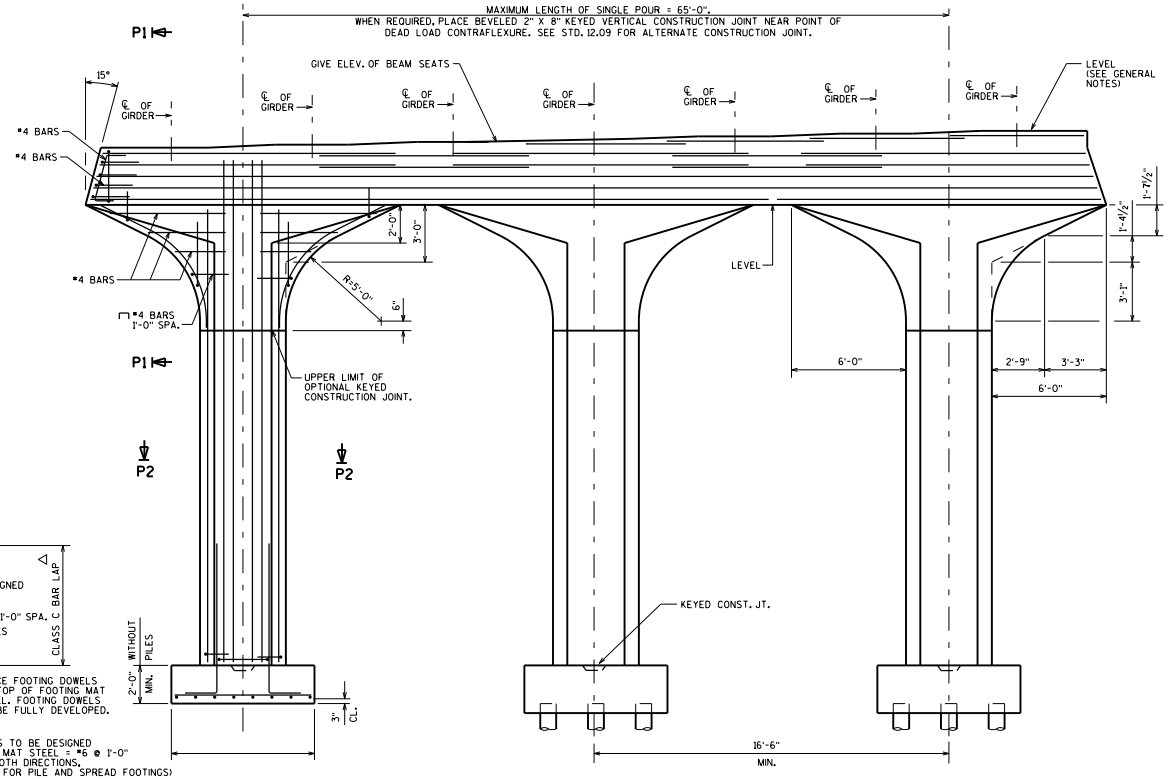
FOR CASES WITH CRASH WALLS, DEFER TO NON-AESTHETIC TYPE MULTI-COLUMNED PIERS.

SEE BRIDGE MANUAL 13.4.10 FOR MULTI-COLUMNED PIER DESIGN REGARDING VEHICULAR COLLISON FORCE.

△ NORMALLY THIS LAP IS OMITTED AND FOOTING DOWELS EXTENDED INTO THE CAP IF THE LAP IS GREATER THAN ONE-HALF THE COLUMN HEIGHT.



END VIEW



ELEVATION
LOOKING UP STATION

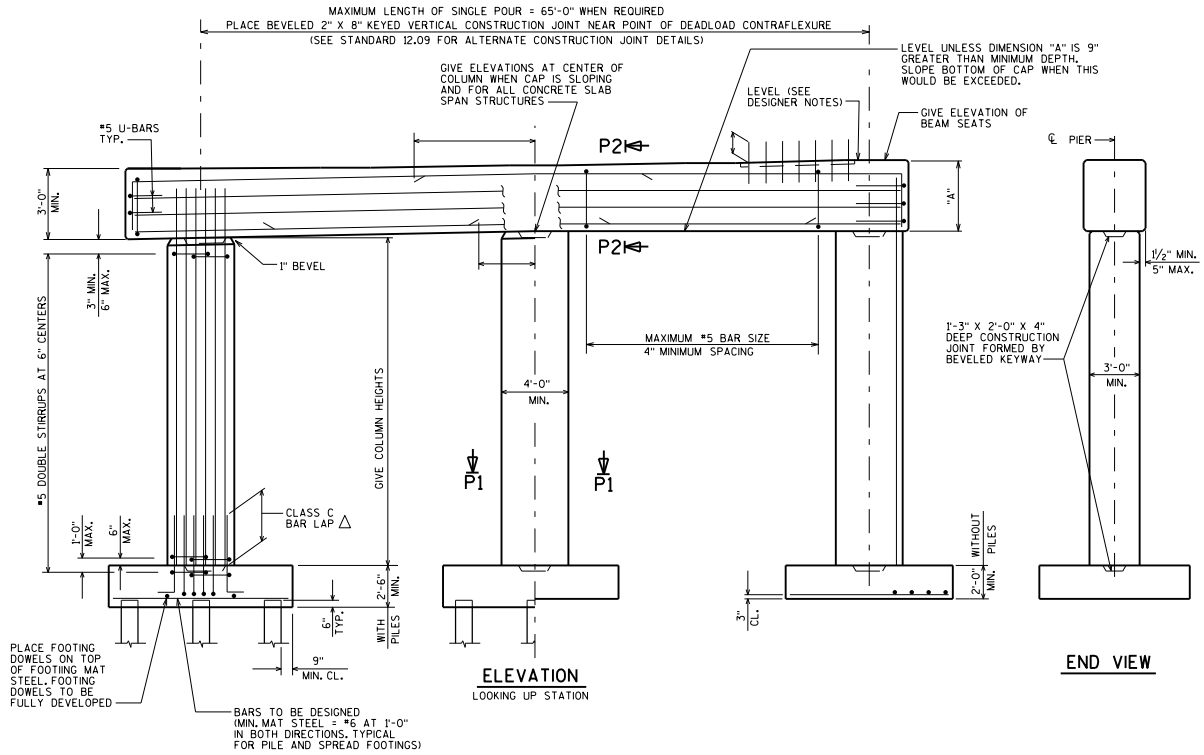
MULTI-COLUMNED
PIER TYPE 2

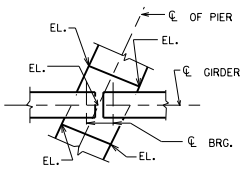
BUREAU OF STRUCTURES

APPROVED: *Bill Oliva*

DATE: 1-20

STANDARD 13.05





SLOPING BEAM SEAT DETAILS

DESIGNER NOTES

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

SLOPE TOP OF COLUMNS TO MATCH CAP WHEN THE BOTTOM OF THE CAP IS SLOPED. DETAIL BOTTOM OF CAP REINFORCEMENT TO CLEAR VERTICAL COLUMN REINFORCEMENT.

CAPS MAY BE MORE THAN 3" WIDER THAN COLUMNS IF THE EXTRA WIDTH IS NECESSARY TO SATISFY THE MINIMUM EDGE DISTANCE CRITERIA ADJACENT TO BEARINGS

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

1. FOR GIRDERS WITH ½" ELASTOMERIC BEARING PADS WHEN THE BOTTOM OF THE GIRDERS SLOPE MORE THAN 1%. SEE STANDARD 13.01.

2. WHEN A CAP IS USED 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.

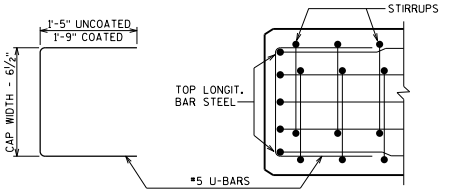
SEE STANDARD 12.01 FOR ADDITIONAL REINFORCING STEEL IN BEARING AREA FOR BEAM SEATS OF NON-SLOPED CAPS THAT ARE 4" OR MORE ABOVE LOWEST BEAM SEAT.

EPOXY COAT BAR STEEL DOWN TO TOP OF FOOTINGS IN ALL PIERS UNDER EXPANSION JOINTS AND ON ALL PIERS AT GRADE SEPARATIONS.

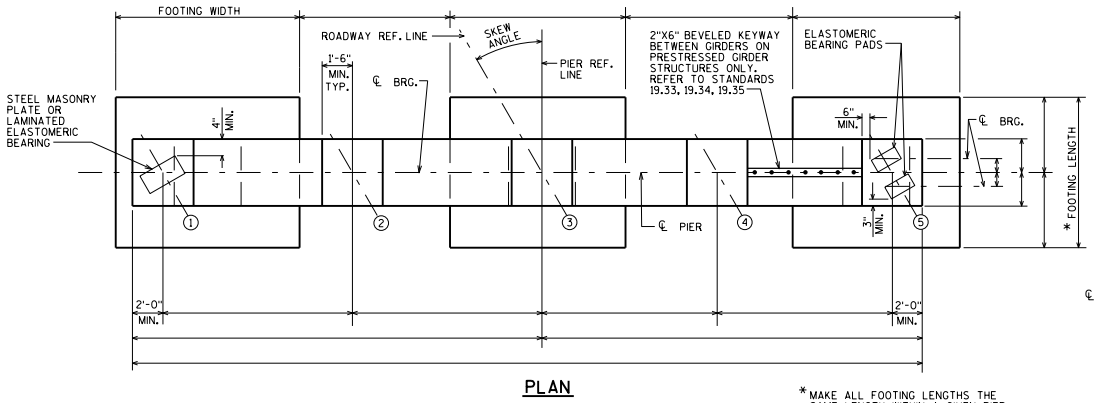
BAR STEEL REQUIRED FOR BENDING IN PIER CAP SHALL BE DETAILED IN LENGTHS AS REQUIRED FOR CONSTRUCTIBILITY AND BY DESIGN SPECIFICATIONS. MAXIMUM REQUIRED BAR STEEL IN THE TOP OF THE PIER CAP (NEGATIVE MOMENT STEEL) MAY BE DETAILED FULL LENGTH IF A MINOR COST INCREASE.

SEE BRIDGE MANUAL 13.4.10 FOR MULTI-COLUMNED PIER DESIGN REGARDING VEHICULAR COLLISON FORCE. THE PIER AS DETAILED ON THIS STANDARD IS ADEQUATE TO RESIST THE REQUIREMENTS OF AASHTO LRFD 3.6.5 FOR VEHICULAR COLLISION FORCE PROVIDED THAT RUSTICATIONS DO NOT EXEED 1½ INCH.

△ NORMALLY THIS LAP IS OMITTED AND FOOTING DOWELS EXTENDED INTO THE CAP IF THE LAP IS GREATER THAN ONE-HALF THE COLUMN HEIGHT.

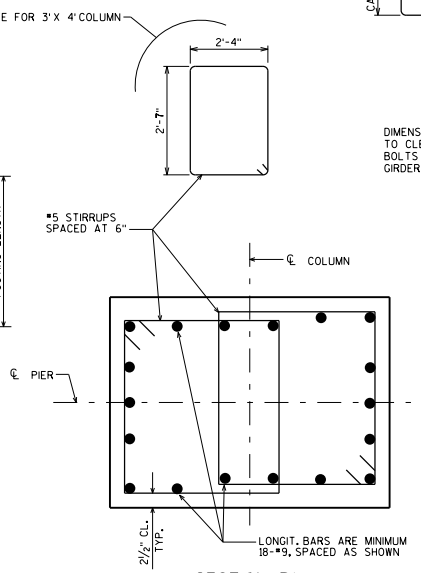


PLAN VIEW SHOWING END OF CAP REINF.

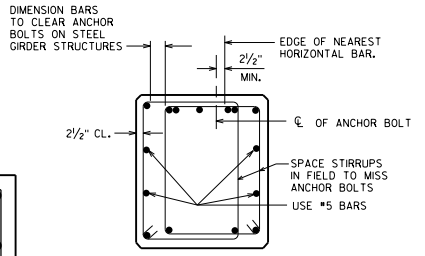


PLAN

*MAKE ALL FOOTING LENGTHS THE SAME LENGTH WITHIN A GIVEN PIER



SECTION P1



SECTION P2

MULTI-COLUMNED PIER WITH RECTANGULAR COLUMNS

BUREAU OF STRUCTURES

APPROVED: Bill Oliva

DATE: 1-20

STANDARD 13.07

DESIGNER NOTES

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

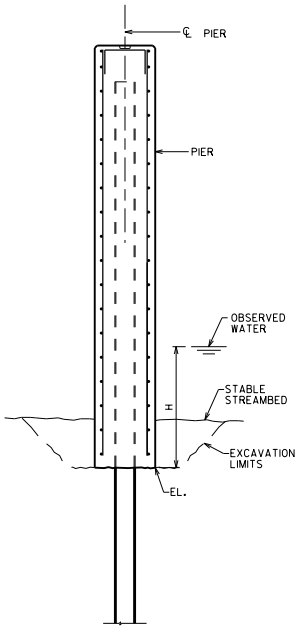
PILE ENCASED PIER TYPES:

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

TYPE 2 - COFFERDAM AND UNDERWATER INSPECTION BID ITEMS REQUIRED.

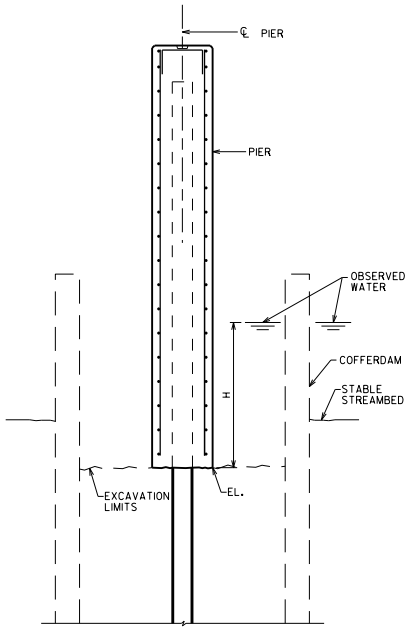
TYPE 3 - COFFERDAM AND SEAL BID ITEMS REQUIRED.

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



END VIEW

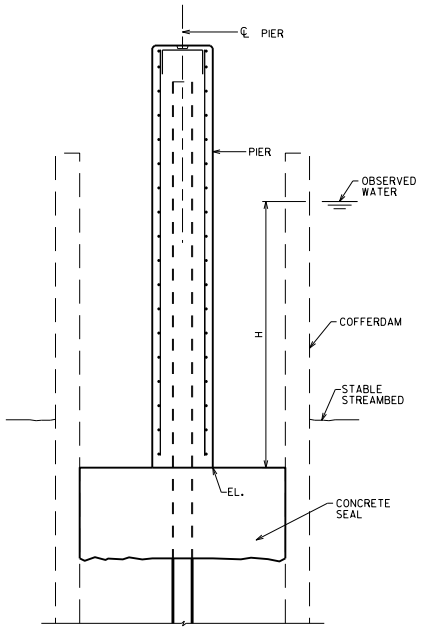
PILE ENCASED PIER - TYPE 1
(H ≤ 5.0 FEET)



END VIEW

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

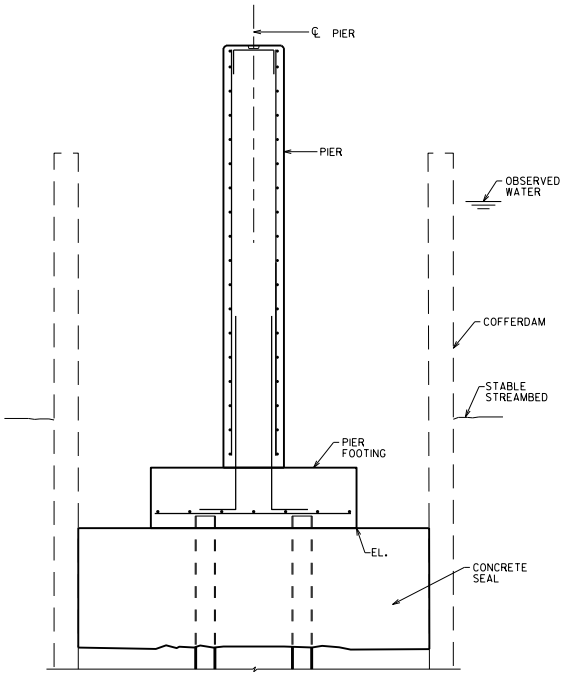
ITEM NUMBER	BID ITEM	UNIT
206.5000	COFFERDAMS (STRUCTURE)	LS
502.9000.S	UNDERWATER SUBSTRUCTURE INSPECTION (STRUCTURE)	EACH



END VIEW

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

ITEM NUMBER	BID ITEM	UNIT
206.5000	COFFERDAMS (STRUCTURE)	LS
502.1100	CONCRETE MASONRY SEAL	CY



END VIEW

SOLID WALL PIER
(PILE ENCASED PIER ALTERNATIVE)

ITEM NUMBER	BID ITEM	UNIT
206.5000	COFFERDAMS (STRUCTURE)	LS
502.1100	CONCRETE MASONRY SEAL	CY

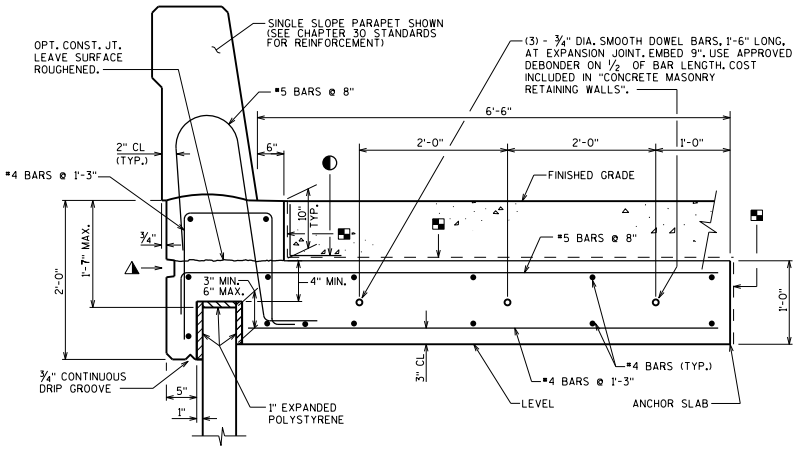
PILE ENCASED PIER (TYPES)

BUREAU OF STRUCTURES

APPROVED: Bill Oliva

DATE: 1-20

STANDARD 13.09



CAST-IN-PLACE CONCRETE TRAFFIC BARRIER DETAIL FOR PRECAST WALL PANELS

OPTIONAL CONSTRUCTION JOINTS IN THE PARAPET AND ANCHOR SLAB BETWEEN EXPANSION JOINTS MAY BE USED. RUN BAR REINFORCEMENT THRU THE JOINT. SEE STANDARDS 30.07, 30.12, 30.13 & 30.30-30.32 FOR MINIMUM LAP LENGTHS IN PARAPET BARS. DEFINE CONSTRUCTION JOINT WITH A ¾" "V" GROOVE.

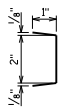
LAP LONGITUDINAL #4 BARS A MINIMUM OF 1'-0".

ALL BAR STEEL SHALL BE EPOXY COATED.

CONCRETE QUANTITY BASED ON 3" PANEL EMBEDMENT.

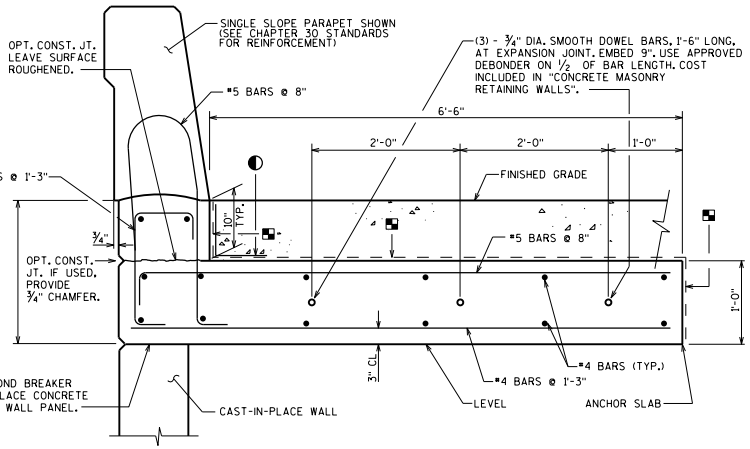
■ 18" RUBBERIZED MEMBRANE WATERPROOFING TO BE PLACED ON THESE SURFACES AT EACH JOINT.

◐ IF THE OPT. CONST. JOINT IS USED, PLACE 18" MEMBRANE WATERPROOFING ALONG THE ENTIRE LONGITUDINAL JOINT. THE MEMBRANE WATERPROOFING SEALING THE OPTIONAL CONST. JOINT IS INCIDENTAL TO THE CONRETE MASONRY BID ITEM.



RUSTICATION DETAIL

⚠ PROVIDE RUSTICATION IF OPT. CONST. JOINT IS USED.

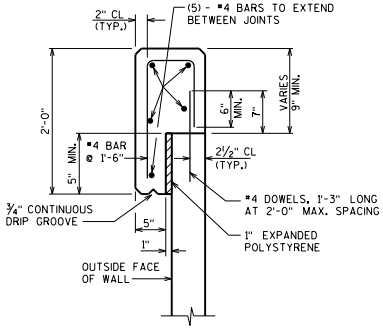


CAST-IN-PLACE CONCRETE TRAFFIC BARRIER DETAIL FOR CAST-IN-PLACE WALL PANELS

OPTIONAL CONSTRUCTION JOINTS IN THE PARAPET AND ANCHOR SLAB BETWEEN EXPANSION JOINTS MAY BE USED. RUN BAR REINFORCEMENT THRU THE JOINT. SEE STANDARDS 30.07, 30.12, 30.13 & 30.30-30.32 FOR MINIMUM LAP LENGTHS IN PARAPET BARS. DEFINE CONSTRUCTION JOINT WITH A ¾" "V" GROOVE.

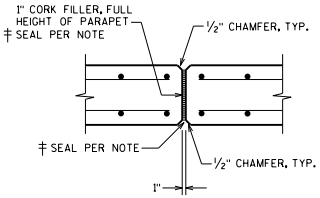
LAP LONGITUDINAL #4 BARS A MINIMUM OF 1'-0".

ALL BAR STEEL SHALL BE EPOXY COATED.

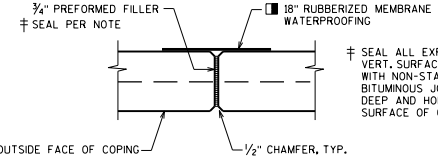


CAST-IN-PLACE CONCRETE COPING DETAIL

NOTE: CONCRETE COPING REINFORCING STEEL SHALL BE DESIGNED AT LOCATIONS WHERE RAILING, FENCING, OR ANY OTHER ATTACHMENTS ARE MADE.



⊛ TRAFFIC BARRIER EXPANSION JOINT DETAIL

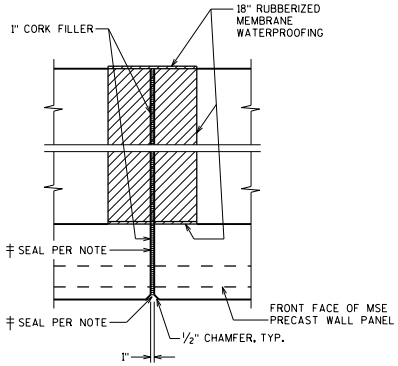


‡ SEAL ALL EXPOSED HORIZ. & VERT. SURFACES OF FILLER WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER. (1" DEEP AND HOLD ⅛" BELOW SURFACE OF CONC.)

COPING EXPANSION JOINT

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

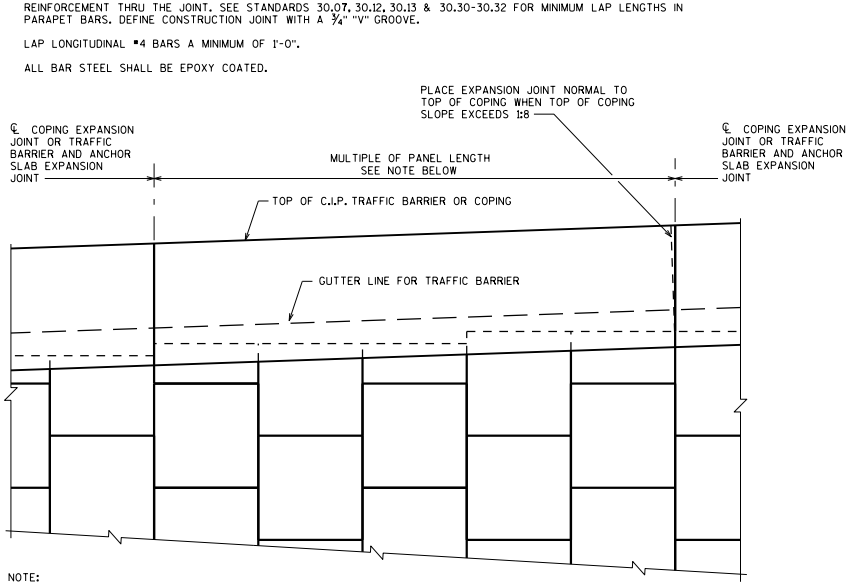
■ MEMBRANE WATERPROOFING TO EXTEND FROM TOP OF COPING TO 6" BELOW TOP OF PANELS.



⊛ ANCHOR SLAB EXPANSION JOINT DETAIL

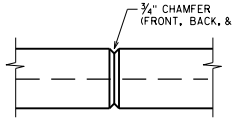
⊛ EXPANSION JOINTS TO BE SPACED AT A MINIMUM OF 20' AND A MAXIMUM OF 30'. LOCATE EXPANSION JOINTS OVER WALL JOINTS. DO NOT RUN BAR STEEL THRU JOINT, EXCEPT FOR DOWEL BARS. JOINT TO EXTEND FULL DEPTH OF PARAPET AND ANCHOR SLAB.

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



NOTE:
ALL JOINTS SHALL BE LOCATED AS SHOWN ON WALL ELEVATIONS AND MUST COINCIDE WITH PANEL JOINT ON FRONT FACE.

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



COPING CONTRACTION JOINT

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

DESIGNER NOTES

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

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

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

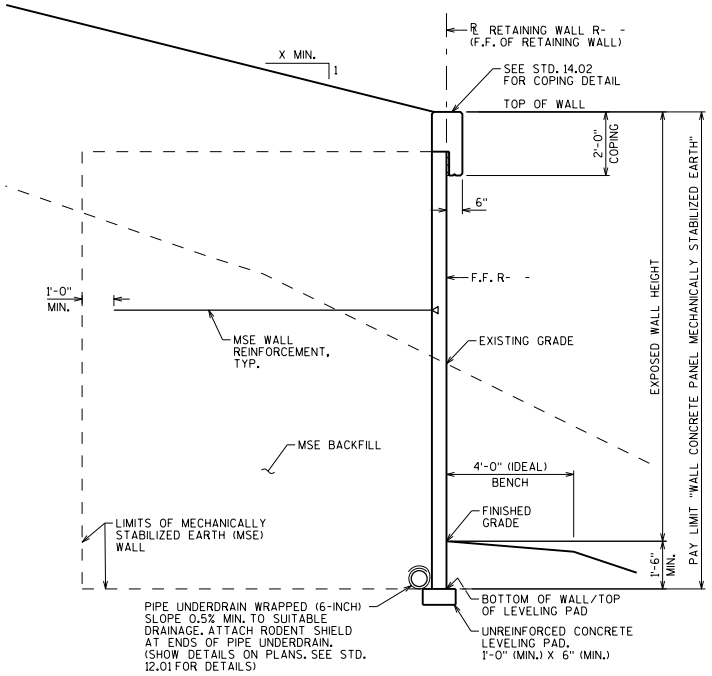
MSE RETAINING WALL DETAILS

WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURES

APPROVED: Bill Oliva

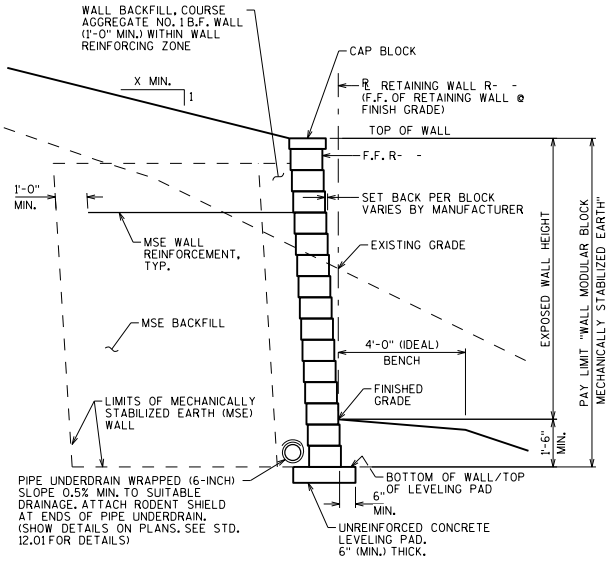
DATE: 1-20

STANDARD 14.02



TYPICAL SECTION

(MSE WALL WITH CONCRETE PANEL FACING)



TYPICAL SECTION

(MSE WALL WITH MODULAR BLOCK FACING)

DESIGNER NOTE

SEE STANDARD 14.02 FOR ADDITIONAL INFORMATION

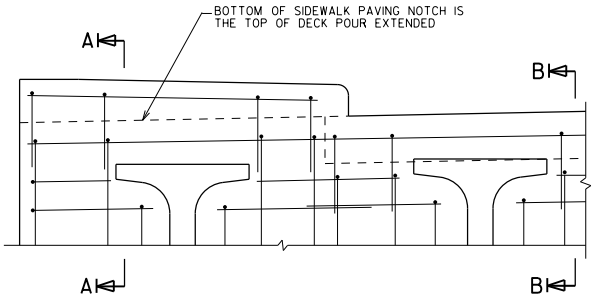
MSE WALL PANEL
AND BLOCK FACING

BUREAU OF STRUCTURES

APPROVED: *Bill Oliva*

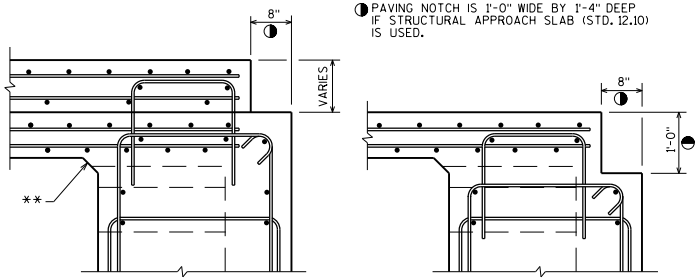
DATE: 1-20

STANDARD 14.11



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.)

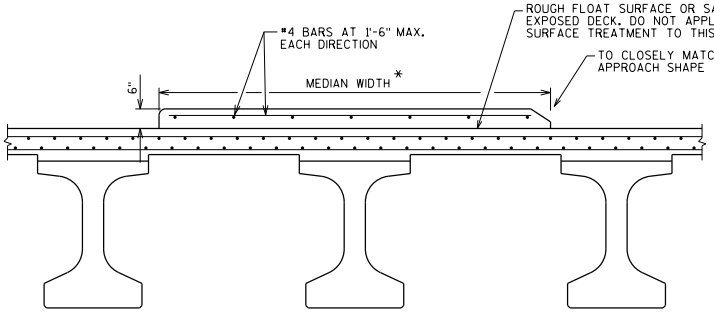


SECTION A-A

SECTION B-B

** 3" X 3" BEVEL ENDS AT EDGE OF BRIDGE DECK

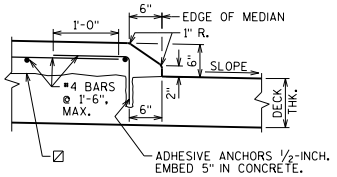
- SEE STANDARDS 19.33, 19.34, 19.35 FOR REINFORCEMENT DETAILS
- DETAILS SHOWN ARE FOR GIRDER STRUCTURES. SIMILAR REINFORCEMENT FOR SLAB STRUCTURES SHALL BE USED WITH A REMINDER THAT THE TRANSVERSE AND LONGITUDINAL REINFORCMENT LAYERS ARE REVERSED.



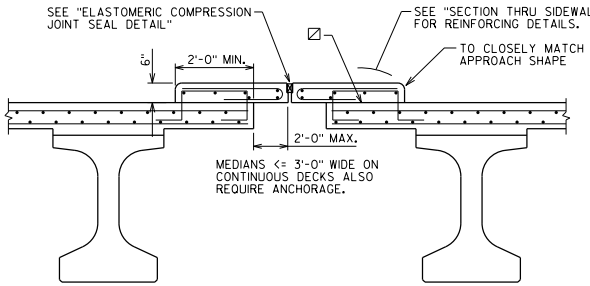
CROSS SECTION THRU UNANCHORED MEDIAN

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

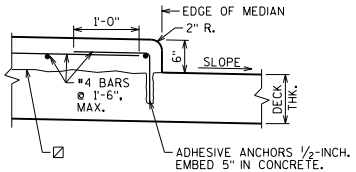
NOTE: CLEAN ALL LOOSE MATERIAL ON THE DECK AT THE MEDIAN LOCATION PRIOR TO MEDIAN PLACEMENT USING HIGH PRESSURE WATER OR AIR, ENSURING ALL FREE-STANDING WATER IS REMOVED PRIOR TO MEDIAN PLACEMENT. NEAT CEMENT IS REQUIRED AS PER 509.3.9.2 OF THE STANDARD SPECIFICATIONS UNLESS THE MEDIAN IS POURED WITHIN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



ANCHORED MEDIAN CURB DETAIL

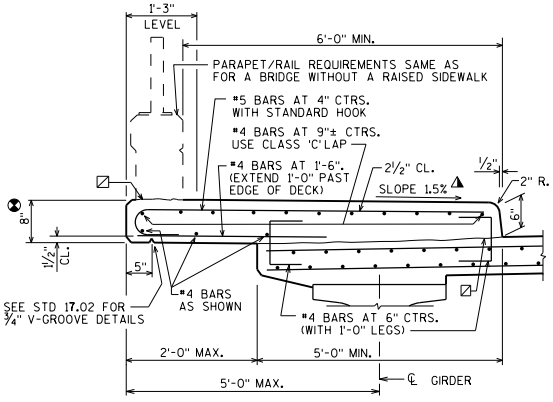


CROSS SECTION THRU MEDIAN WITH A JOINT

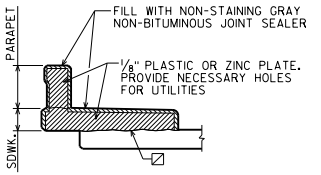


ANCHORED MEDIAN CURB DETAIL

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



SECTION THRU SIDEWALK



DEFLECTION JOINT DETAIL

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

1. GIRDER STRUCTURES AND SLAB STRUCTURES WITH A RAISED SIDEWALK SHOULD HAVE A DEFLECTION JOINT IN THE SIDEWALK AND PARAPET OVER THE PIER. FOR SKEWS GREATER THAN 20°, DETAIL THE JOINT NORMAL TO THE SIDEWALK AND PARAPET WITH THE JOINT APPROX. CENTERED OVER ℄ PIER.
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 ⅛" ZINC OR PLASTIC PLATE CUT AS SHOWN IN THE "DEFLECTION JOINT DETAIL". IF CONSTRUCTION JOINTS IN PARAPETS ARE USED AT THE DEFLECTION JOINTS, ONE SIDE OF JOINT SHALL BE COATED WITH AN APPROVED LIQUID BOND BREAKER AND PLATE SEPARATORS MAY BE OMITTED.

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

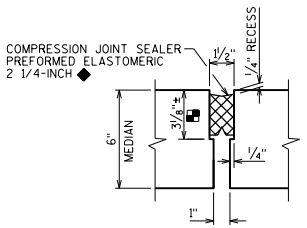
8" MIN. SIDEWALK THICKNESS ALSO REQ'D AT EDGE OF DECK/SLAB.

▲ ±0.5% CONSTRUCTION TOLERANCE IN SIDEWALK CROSS SLOPE. THE SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

DESIGNER NOTES

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

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



ELASTOMERIC COMPRESSION SEAL DETAIL

▪ VARIES BASED ON JOINT MANUFACTURER

◆ MANUFACTURER SHALL LABEL TOP OF SEAL

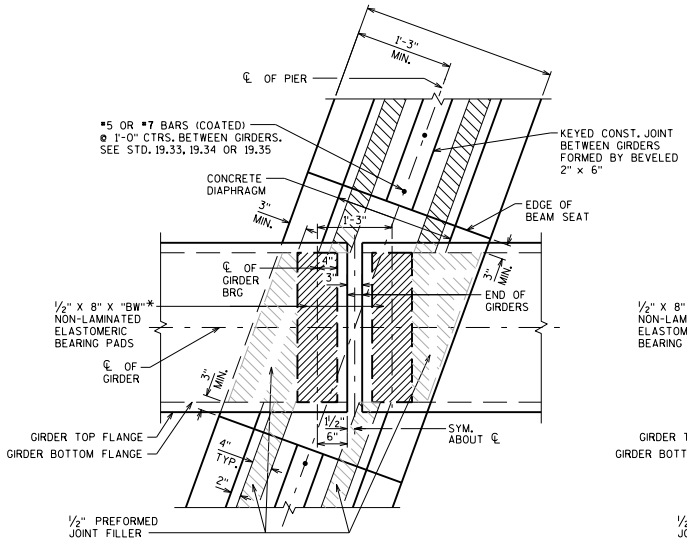
MEDIAN AND RAISED SIDEWALK DETAILS

BUREAU OF STRUCTURES

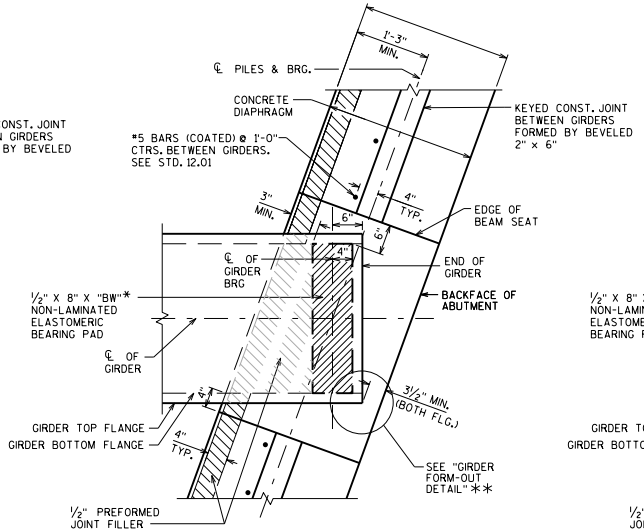
APPROVED: Bill Oliva

DATE: 1-20

STANDARD 17.01

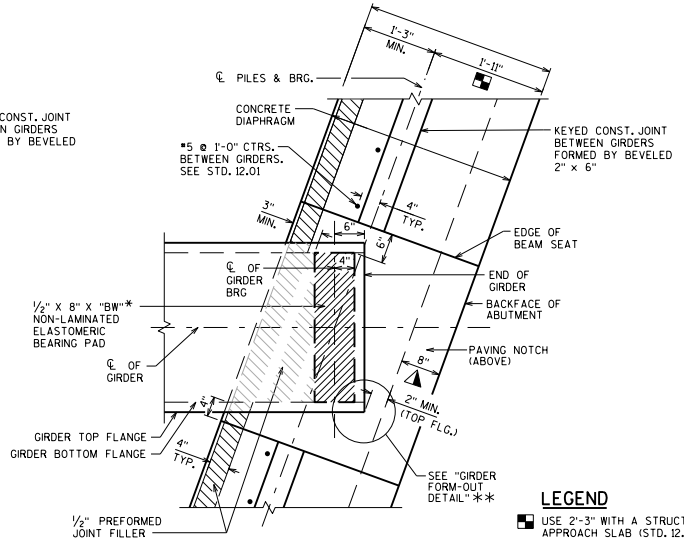


AT PIER



AT ABUTMENT

ABUTMENT: TYPE "A1 FIXED" AND "A5" W/O PAVING NOTCH

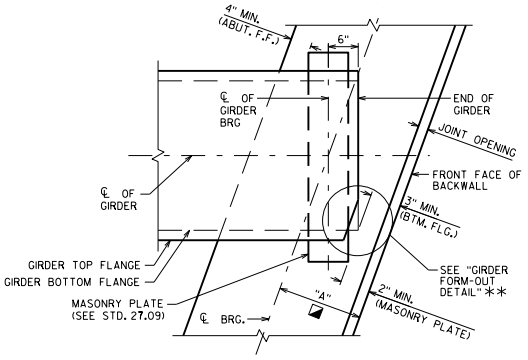


AT ABUTMENT

ABUTMENT: TYPE "A1 FIXED" AND "A5" WITH PAVING NOTCH.

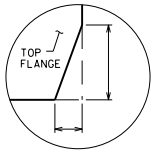
LEGEND

- USE 2'-3" WITH A STRUCTURAL APPROACH SLAB (STD. 12.10)
- PAVING NOTCH IS 1'-0" WIDE IF STRUCTURAL APPROACH SLAB (STD. 12.10) IS USED.
- 1'-6" FOR 36W", 45W", 54", 54W", 70", 72W" & 82W" GIRDERS WITH SKEWS >25°.



AT ABUTMENT WITH STEEL BRGS

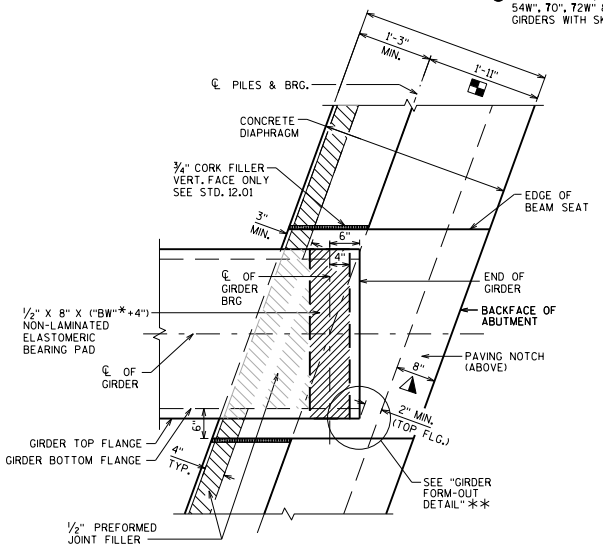
ABUTMENT: TYPE "A3"
SEE TABLE FOR MIN. "A" VALUES REQ'D. TO MEET MIN. CLEARANCE CRITERIA ABOVE.



GIRDER FORM-OUT DETAIL**

AT ABUTMENT

ABUTMENT: TYPE "A1 SEMI-EXP." W/O PAVING NOTCH



AT ABUTMENT

ABUTMENT: TYPE "A1 SEMI-EXP." WITH PAVING NOTCH.

MIN. "A" DIMENSION IN INCHES FOR A3 ABUTMENTS WITH STEEL BEARINGS AS SHOWN ON STD. 27.09.

◪"A" DIMENSION BASED ON BOTTOM FLANGE CLEARANCE IS CALCULATED USING 6" OFFSET FROM ℄ BRG. TO END OF GIRDER AND 3" MIN. OFFSET BETWEEN FLANGE AND BACKWALL TO ACCOMMODATE EXPANSION. IF CONDITIONS REQUIRE OFFSETS OTHER THAN THESE, THE "A" DIMENSION MUST BE CALCULATED. "A" DIMENSION BASED ON MASONRY PLATE CLEARANCE IS CALCULATED ASSUMING A 10" LONG PLATE. IF LONGER PLATE IS REQUIRED, RECALCULATE "A".

SKEW ANGLE (DEG.)	GIRDER DEPTHS									
	28"	36"	36W"	45"	45W"	54"	54W"	70"	72W"	82W"
0-5	12"	12"	12"	12"	12"	12"	12"	12"	12"	12"
> 5-15	12"	12"	13"	12"	13"	12.5"	13"	13"	13"	13"
> 15-25	12.5"	12.5"	15"	13"	15"	14"	15"	15"	15"	15"
> 25-35	(14")	(14")	(17.5")	(15")	(17.5")	(16.5")	(17.5")	16.5"	(17.5")	(17.5")
> 35-45	(15.5")	(15.5")	(20")	(17")	(20")	(18.5")	(20")	(18.5")	(20")	(20")
> 45-55	(17")	(17")	(21.5")	(18.5")	(21.5")	(20")	(21.5")	(20")	(21.5")	(21.5")

VALUES IN PARENTHESIS ARE CONTROLLED BY 2" CLR. CRITERIA AT EDGE OF MASONRY PLATE. VALUES MAY BE ADJUSTED IF MASONRY PLATE IS CLIPPED PER STANDARD 27.02.

PRESTRESSED GIRDER FLANGE WIDTH TABLE										
GIRDER DEPTH	28"	36"	36W"	45"	45W"	54"	54W"	70"	72W"	82W"
TOP FLANGE WIDTH	18"	12"	34"	16"	34"	20"	48"	30"	48"	48"
BOTTOM FLANGE WIDTH "BW"*	18"	18"	30"	22"	30"	26"	30"	26"	30"	30"

DESIGNER NOTES

SEE PRESTRESSED GIRDER DETAILS FOR ADDITIONAL INFORMATION. BEARING PAD DETAILS FOR 45W" GIRDER SHOWN ON THIS SHEET. DETAILS FOR OTHER GIRDERS TYPES SIMILAR.

**WHEN NEEDED, FORM-OUT TOP FLANGE ON 36W", 45W", 54W", 70", 72W" & 82W" PRESTRESSED GIRDERS TO MEET MIN. CLR. REQ'D (SEE STD. 19.34, 19.35 OR 28.03). BOTTOM FLANGE FORM-OUT NOT ALLOWED.

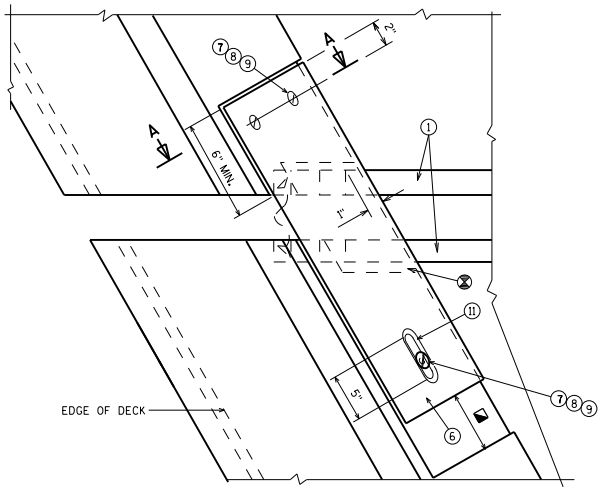
BEARING PAD DETAILS FOR PRESTRESSED CONCRETE GIRDERS

BUREAU OF STRUCTURES

APPROVED: Bill Oliva

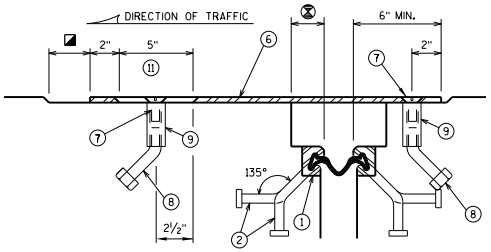
DATE: 1-20

STANDARD 19.31

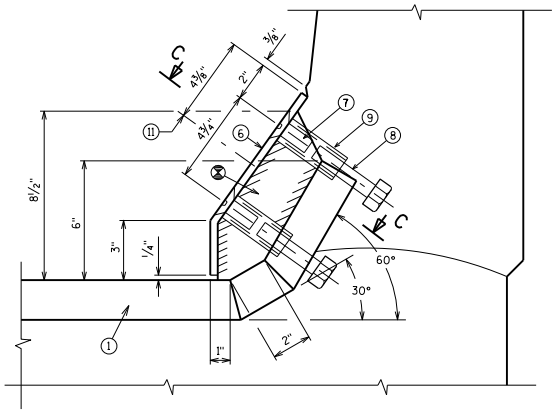


PLAN AT PARAPET

SLOPED FACE PARAPET



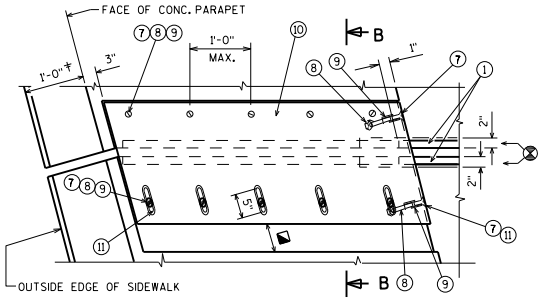
SECTION C-C



SECTION A-A

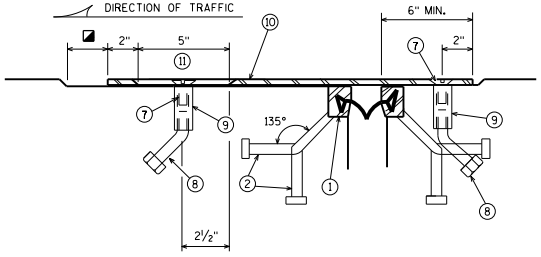
SLOPED FACE PARAPET

⑥ GALVANIZED PLATE ⅜" × 10½" × (2'-2" LONG FOR SKEWS TO 45° AND 3'-0" LONG FOR SKEWS ≥ 45°) WITH HOLES FOR NO. 7. BEND AS SHOWN.

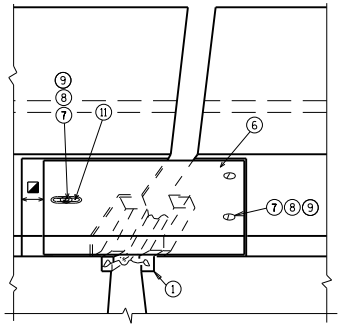


PLAN AT SIDEWALK

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

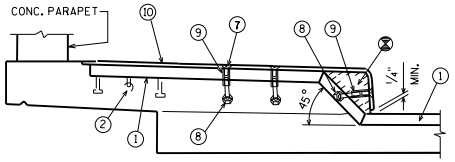


SECTION B-B

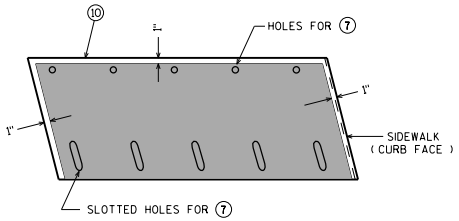


VIEW OF PARAPET PLATES FROM ROADWAY

SLOPED FACE PARAPET



SECTION AT SIDEWALK



PLAN OF SIDEWALK COVER PLATE WITH SLIP-RESISTANT SURFACE

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

DESIGNER NOTES

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.

⊗ BLOCK OUT CONCRETE 2" EACH SIDE OF JOINT OPENING

◪ JOINT OPENING DIM. ALONG SKEW PLUS ½"

APPROVED SLIP-RESISTANT 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

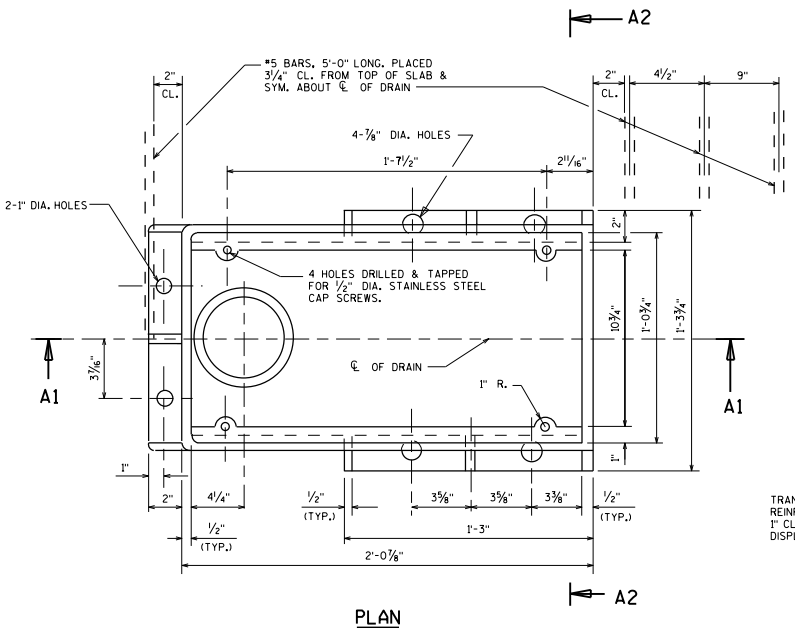
STRIP SEAL COVER PLATES
SLOPED FACE PARA./SDWK.

BUREAU OF STRUCTURES

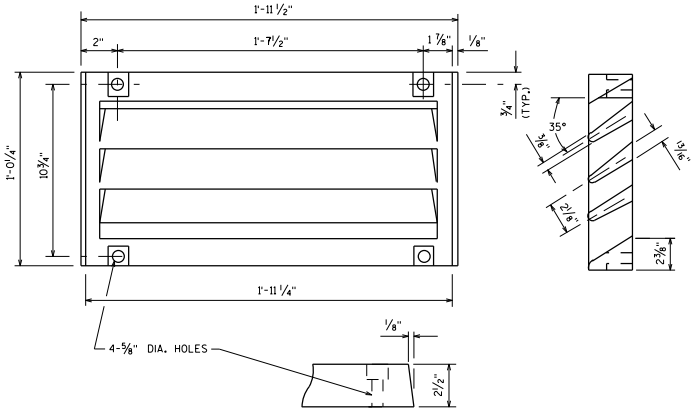
APPROVED: Bill Oliva

DATE: 1-20

STANDARD 28.07



PLAN



GRATE CASTING DETAIL

ATTACH GRATE TO FRAME FOR SHIPMENT

TRANS. AND LONGIT. SLAB BAR REINF. TO BE CUT A MAX. OF 1" CL. FROM DRAIN FRAME. DISPLACE BARS WHERE POSSIBLE.

NOTES

ALL MATERIAL FOR TYPE "GC" CASTING, EXCLUDING GRATE HOLD DOWN SCREWS, SHALL BE GRAY IRON CONFORMING TO ASTM A48, CLASS 30. (APPROXIMATE WEIGHT = 225#)

MATERIAL FOR BRACKETS SHALL CONFORM TO ASTM A36.

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

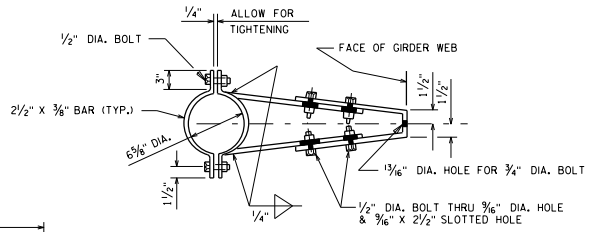
ALL MATERIAL FOR DOWNSPOUTS, DOWNSPOUT CONNECTIONS, AND BRACKETS TO BE INCLUDED IN THE BID ITEM "DOWNSPOUT 6-INCH".

ALTERNATE BRACKETS ARE NOT ALLOWED.

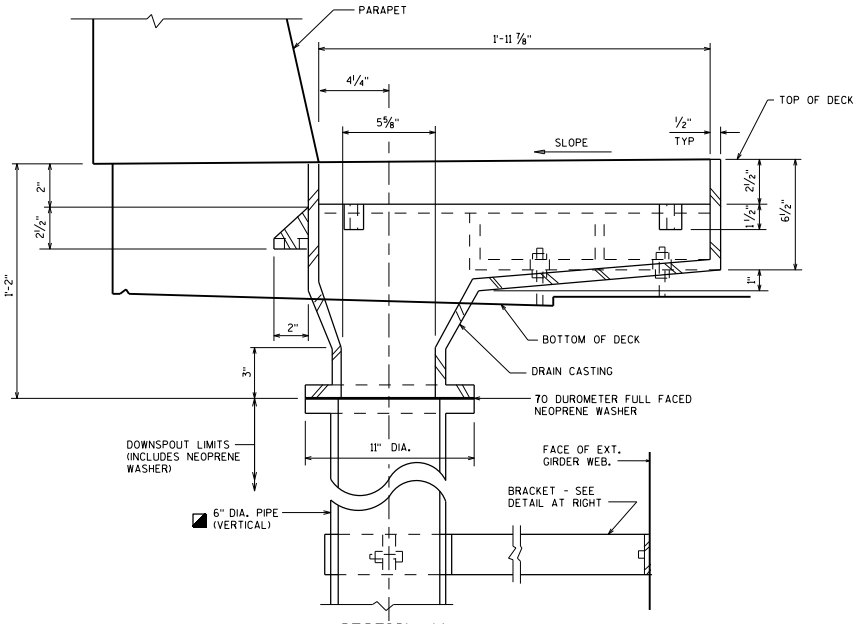
◪ FLANGED 6" DIA. DOWNSPOUTS SHALL BE REINFORCED THERMOSETTING RESIN PIPE (RTRP) OR GALVANIZED STANDARD PIPE CONFORMING TO ASTM A53.

DESIGNER NOTE

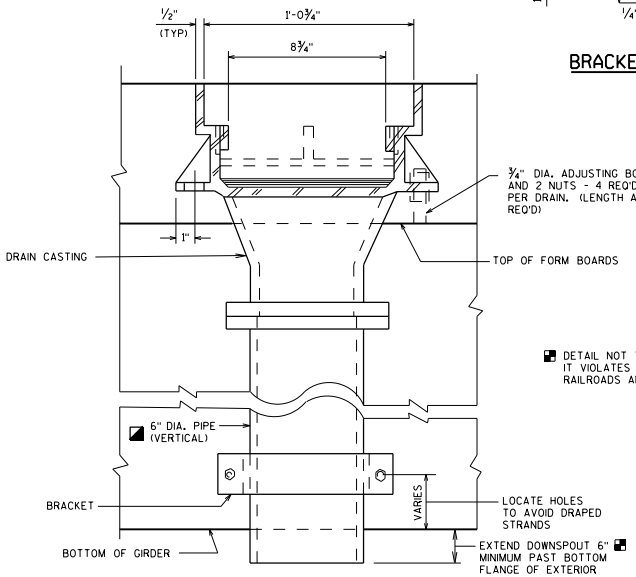
ON THE PRESTRESSED GIRDER SHEET, SHOW LOCATION OF HOLES FOR BRACKET ANCHORAGE FROM TOP/BOTTOM AND END OF GIRDER.



BRACKET DETAIL



SECTION A1



SECTION A2

◪ DETAIL NOT TO BE USED OVER RAILROADS BECAUSE IT VIOLATES CLEARANCE REQUIREMENTS. CONTACT RAILROADS AND HARBORS SECTION FOR GUIDANCE.

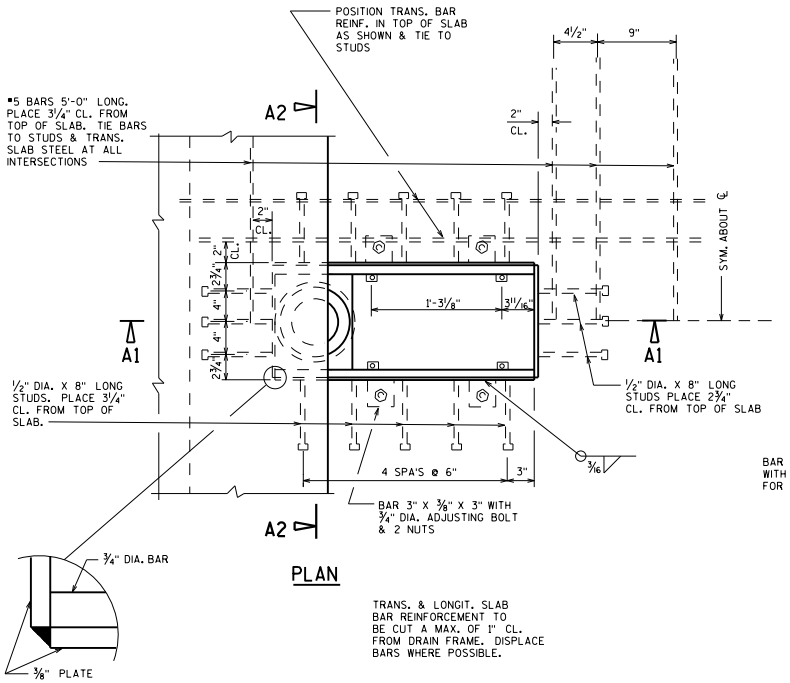
FLOOR DRAIN TYPE 'GC'

BUREAU OF STRUCTURES

APPROVED: Bill Oliva

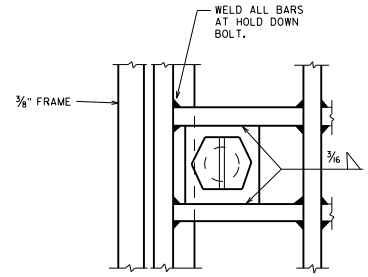
DATE: 1-20

STANDARD 29.01

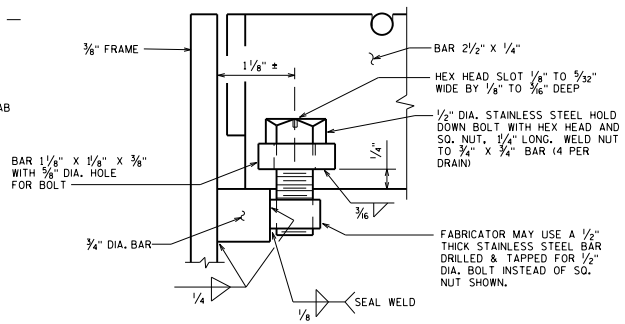


PLAN

TRANS. & LONGIT. SLAB BAR REINFORCEMENT TO BE CUT A MAX. OF 1" CL. FROM DRAIN FRAME. DISPLACE BARS WHERE POSSIBLE.



PART PLAN



SECTION AT HOLD DOWN BOLT

NOTES

ALL DRAIN MATERIAL INCLUDING GRATE, EXCLUDING PIPE & GRATE HOLD DOWN BOLTS, SHALL BE ASTM A36 STEEL.

MATERIAL FOR BRACKETS SHALL CONFORM TO ASTM A36.

ALTERNATE BRACKETS ARE NOT ALLOWED.

ALL STEEL SHALL BE GALVANIZED. WELDS SHALL BE MADE WITH LOW HYDROGEN ELECTRODES.

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

ALL MATERIAL FOR DOWNSPOUTS, DOWNSPOUT CONNECTIONS, AND BRACKETS TO BE INCLUDED IN THE BID ITEM "DOWNSPOUT 6-INCH".

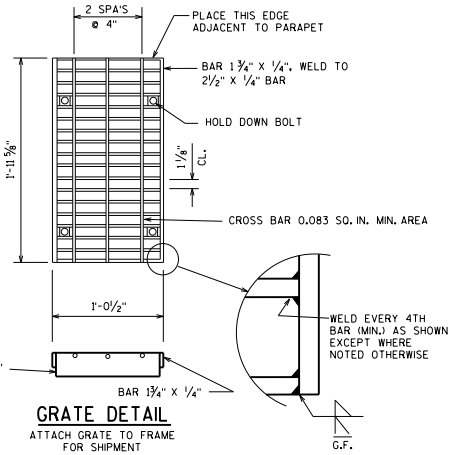
SEAL WELD INSIDE OF DRAIN.

PRIOR TO GALVANIZING A NO. 6 BLAST CLEANING IS REQ'D.

◪ FLANGED 6" DIA. DOWNSPOUTS SHALL BE REINFORCED THERMOSETTING RESIN PIPE (RTRP) OR GALVANIZED STANDARD PIPE CONFORMING TO ASTM A53.

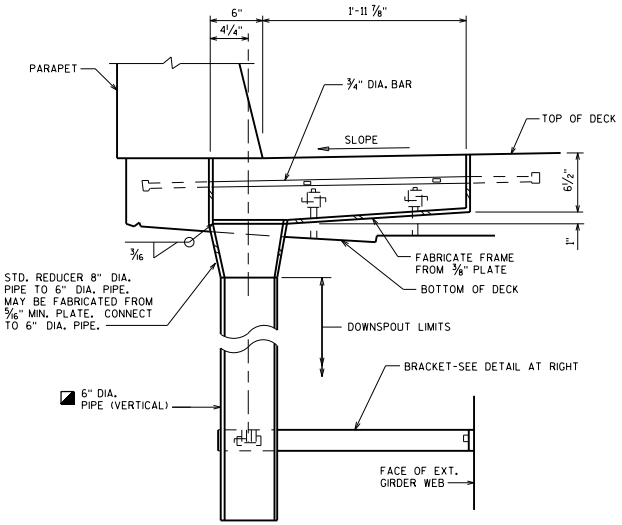
DESIGNER NOTE

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

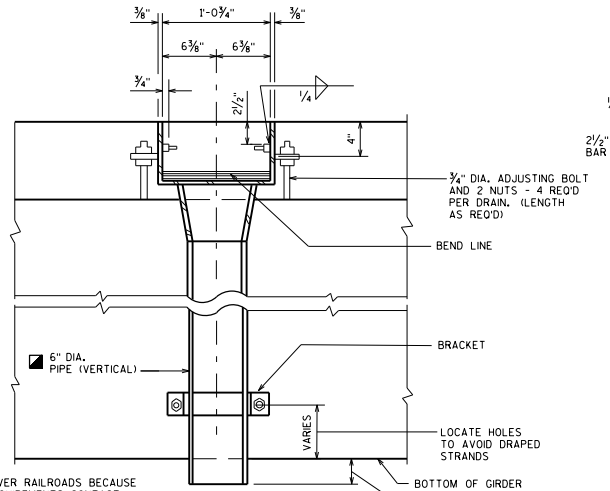


GRATE DETAIL

ATTACH GRATE TO FRAME FOR SHIPMENT

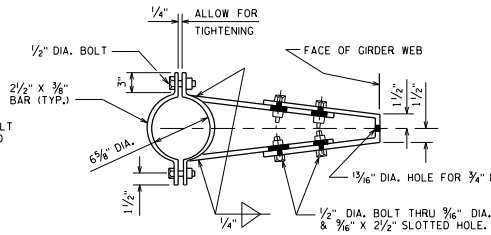


SECTION A1



◪ DETAIL NOT TO BE USED OVER RAILROADS BECAUSE IT VIOLATES CLEARANCE REQUIREMENTS. CONTACT RAILROADS AND HARBORS SECTION FOR GUIDANCE.

SECTION A2



BRACKET DETAIL

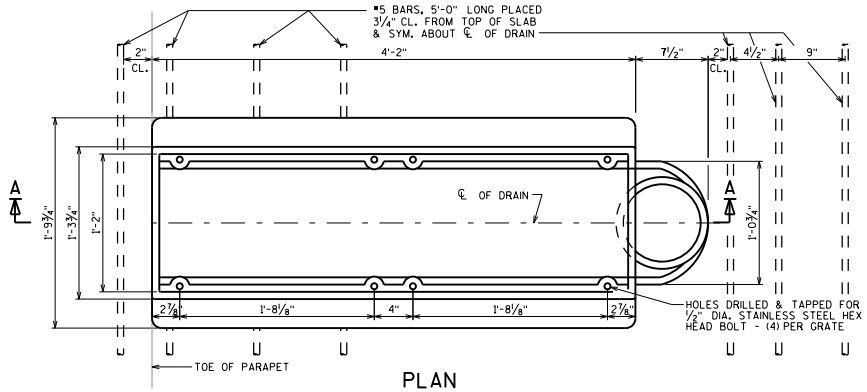
FLOOR DRAIN TYPE 'H'

BUREAU OF STRUCTURES

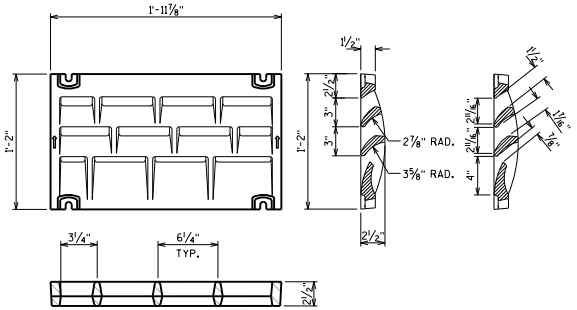
APPROVED: Bill Oliva

DATE: 1-20

STANDARD 29.02



PLAN



GRATE CASTING DETAILS

ATTACH GRATES TO FRAME FOR SHIPMENT

NOTES

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

MATERIAL FOR BRACKETS SHALL CONFORM TO ASTM A36.

ALTERNATE BRACKETS ARE NOT ALLOWED.

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

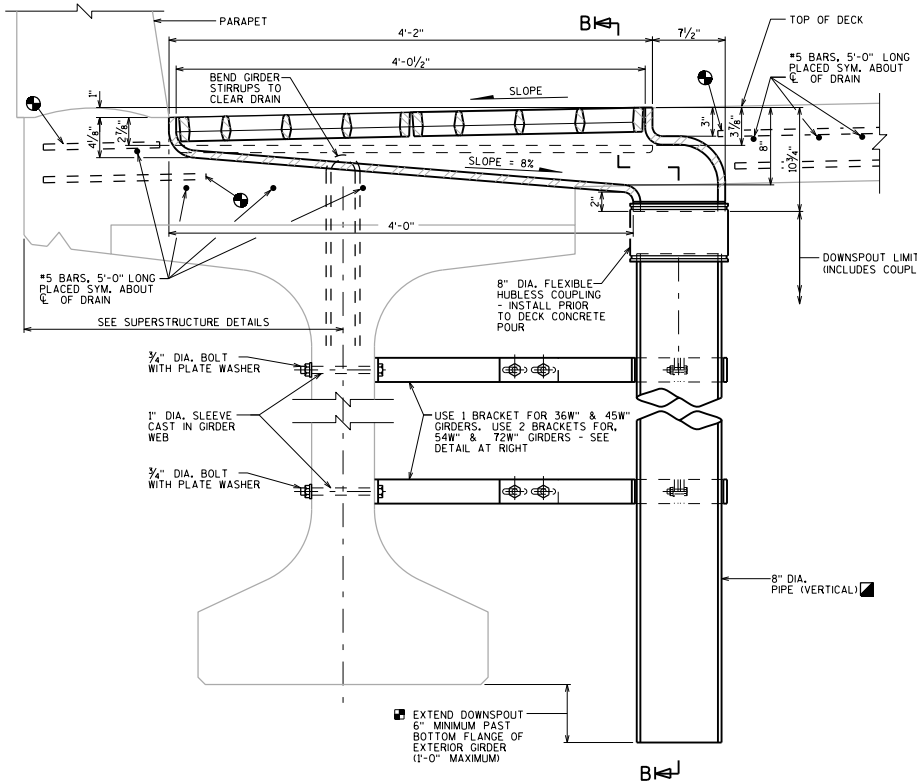
ALL MATERIAL FOR DOWNSPOUTS, DOWNSPOUT CONNECTIONS, AND BRACKETS TO BE INCLUDED IN THE BID ITEM "DOWNSPOUT 8-INCH".

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

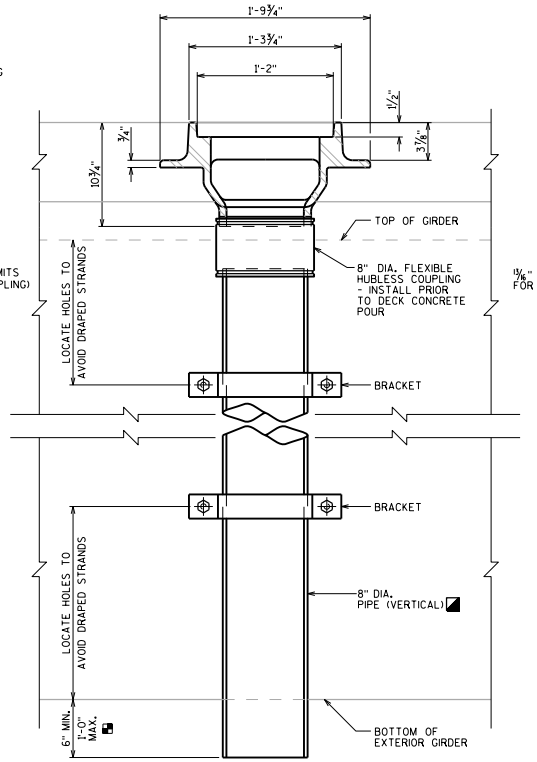
◔ TRANSVERSE & LONGITUDINAL SLAB BAR REINFORCEMENT TO BE CUT A MAXIMUM OF 1" CLEAR FROM DRAIN FRAME. DISPLACE BARS WHERE POSSIBLE.

DESIGNER NOTE

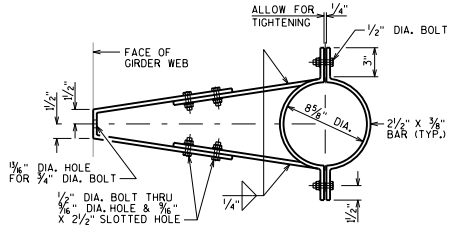
ON THE PRESTRESSED GIRDER SHEET, SHOW LOCATION OF HOLES FOR BRACKET ANCHORAGE FROM TOP/BOTTOM AND END OF GIRDER.



SECTION A-A



SECTION B-B



BRACKET DETAIL

◪ DETAIL NOT TO BE USED OVER RAILROADS BECAUSE IT VIOLATES CLEARANCE REQUIREMENTS. CONTACT RAILROADS AND HARBORS SECTION FOR GUIDANCE.

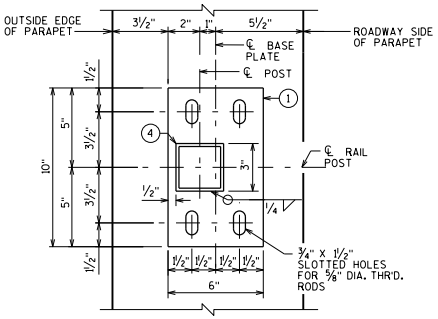
FLOOR DRAIN TYPE 'WF'

BUREAU OF STRUCTURES

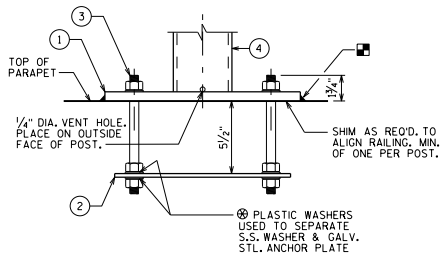
APPROVED: Bill Oliva

DATE: 1-20

STANDARD 29.03

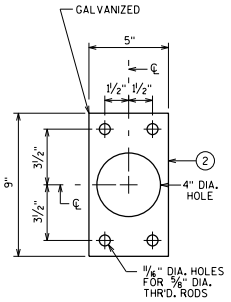


TYPICAL RAIL POST BASE PLATE

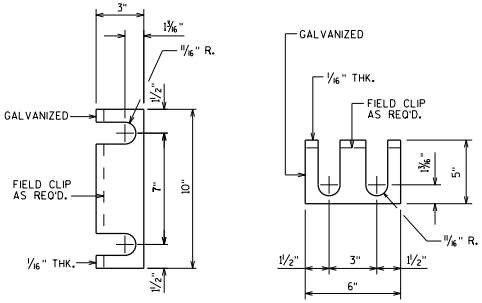


ANCHORAGE FOR RAIL POSTS

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

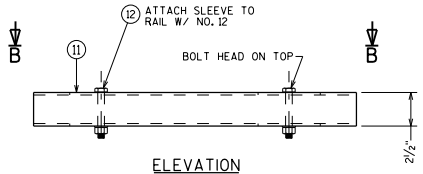


ANCHOR PLATE



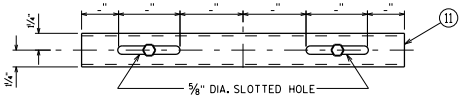
RAIL POST SHIM DETAIL

(2 SETS PER POST)



ELEVATION

(USE FOR EACH RAIL MEMBER)

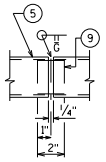


SECTION B-B

SLEEVE DETAIL

(AT MODULAR EXP. JT.)

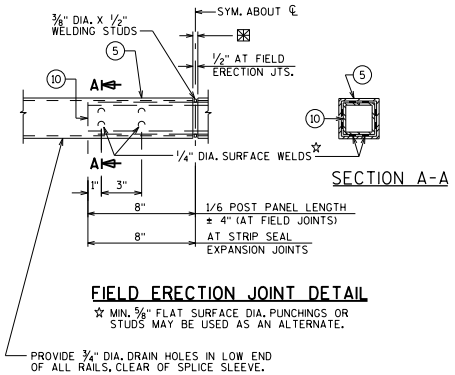
NOTE: CONSTRUCT BOTTOM RAIL AND SLEEVE CONNECTION FIRST, THEN MIDDLE RAIL, AND THEN TOP RAIL, TO ALLOW EASE IN PLACEMENT OF BOLT NO. 12.



SHOP RAIL SPLICE DETAIL

(LOCATION MUST BE SHOWN ON SHOP DRAWINGS)

RDWY. OPENING OR 2½" MIN. FOR STRIP SEAL EXP. JOINT AND ½" OPENING FOR A1 ABUTMENTS



SECTION A-A

FIELD ERECTION JOINT DETAIL

☆ MIN. ⅝" FLAT SURFACE DIA. PUNCHINGS OR STUDS MAY BE USED AS AN ALTERNATE.

LEGEND

(1) BASE PLATE ⅝" X 6" X 10" WITH ¾" X 1½" SLOTTED HOLES FOR THR'D RODS NO. 3. WELD TO NO. 4 AS SHOWN. SLOTS PARALLEL TO LONG SIDE OF PLATE.

(2) ¼" X 5" X 9" ANCHOR PLATE (GALVANIZED) WITH 11/16" DIA. HOLES FOR THR'D. RODS NO. 3.

(3) ⅝" DIA. X 9" LONG, TYPE 316 STAINLESS STEEL THREADED RODS (MIN. TENSILE STRENGTH = 70 KSI) WITH NUT AND WASHERS OF SAME ALLOY GROUP. ✪

(4) STRUCTURAL TUBING 3" X 3" X 3/16" 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 3/16" RAILS, WITH 11/16" DIA. HOLES (FRONT AND BACK) FOR BOLT NO. 6. BOLT TO NO. 4.

(6) ⅝" DIA. A325 SLOTTED ROUND HEAD BOLT WITH HEX NUT, 3/16" X 1½" X 1½" WASHER, AND LOCK WASHER.

(9) RECTANGULAR SLEEVE FABRICATED FROM 3/16" PLATES. PROVIDE "SLIDING FIT".

(10) RECTANGULAR SLEEVE FABRICATED FROM 3/16" PLATES. (1'-4" ✪ FIELD ERECTION JTS.) (1'-4" ✪ STRIP SEAL EXP. JTS.)

(11) SLEEVE FABRICATED FROM STRUCTURAL TUBING 2½" X 2½" X 3/16" X '- " LONG. SLOTTED HOLES IN TOP AND BOTTOM.

(12) ½" DIA. STAINLESS STEEL BOLT WITH NUT AND LOCKWASHER.

✪ ALTERNATIVE ANCHORAGE: 4 EQUIVALENT STAINLESS STEEL CONCRETE ADHESIVE ANCHORS ⅝-INCH, EMBED 7" IN CONCRETE. ADHESIVE ANCHORS SHALL CONFORM TO SECTIONS 502.2.12 AND 502.3.14 OF THE STANDARD SPECIFICATIONS.

NOTES

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

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

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

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

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

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

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

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

ALL JOINTS IN CONCRETE PARAPET ARE TO BE VERTICAL.

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

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

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

WHEN PAINTING REQ'D: (ADD)

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

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

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

COMBINATION RAILING TYPE '3T' DETAILS

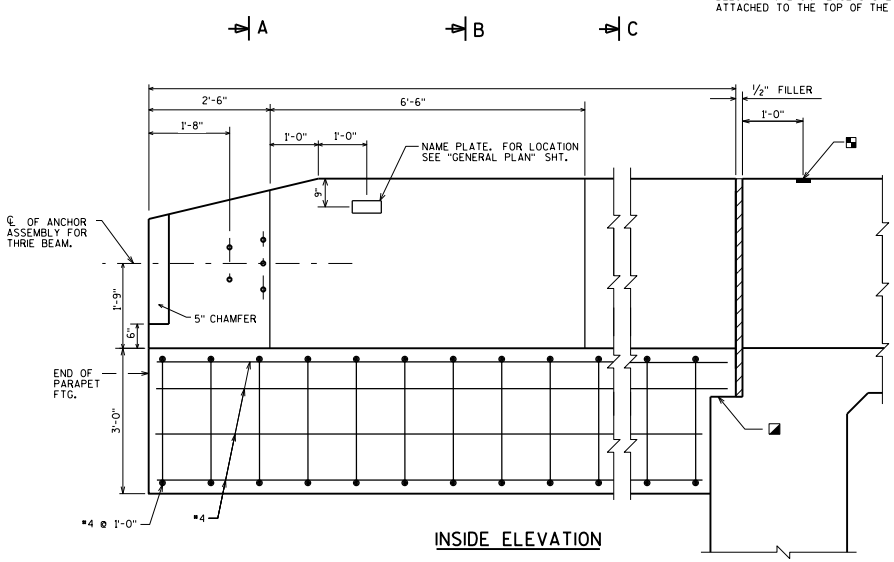
BUREAU OF STRUCTURES

APPROVED: Bill Oliva

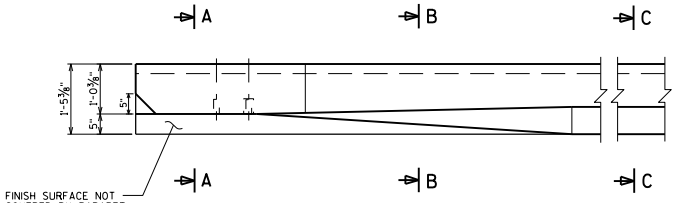
DATE: 1-20

STANDARD 30.09

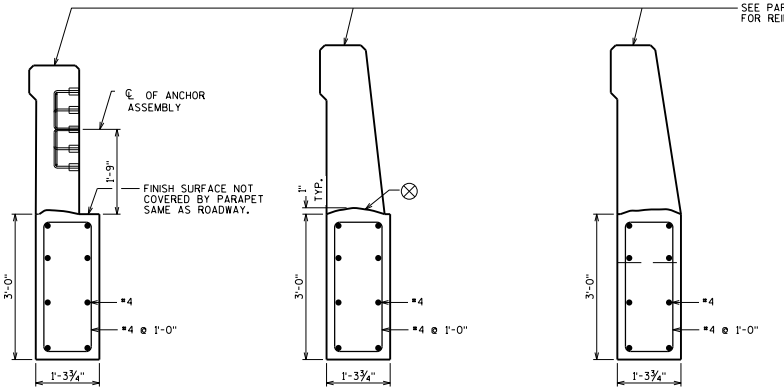
BENCHMARK (WHEN SUPPLIED). AVOID PLACING BELOW A RAIL OR FENCE SYSTEM THAT IS ATTACHED TO THE TOP OF THE PARAPET.



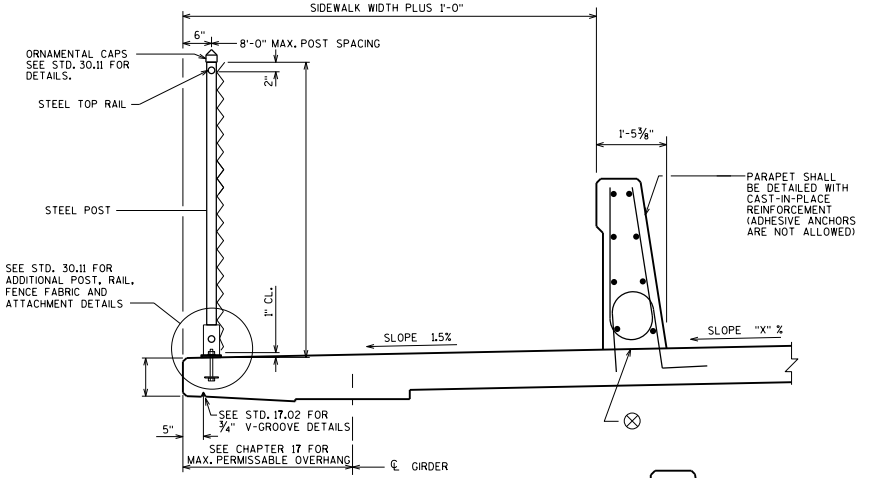
INSIDE ELEVATION



PLAN

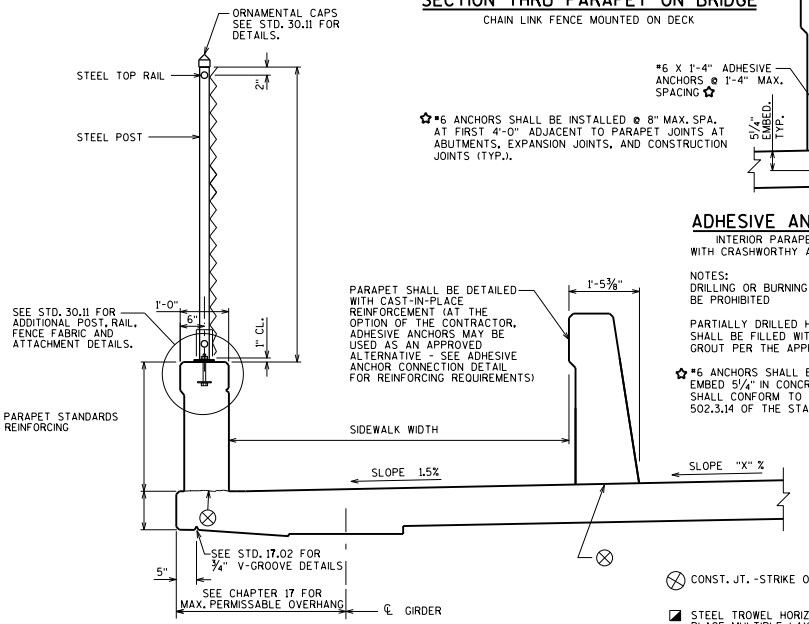


SECTION A SECTION B SECTION C



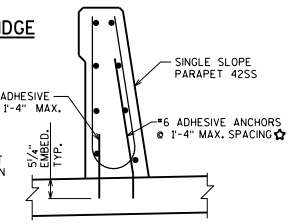
SECTION THRU PARAPET ON BRIDGE

CHAIN LINK FENCE MOUNTED ON DECK



SECTION THRU PARAPET ON BRIDGE

CHAIN LINK FENCE MOUNTED ON PARAPET



✿ #6 ANCHORS SHALL BE INSTALLED @ 8" MAX. SPA. AT FIRST 4'-0" ADJACENT TO PARAPET JOINTS AT ABUTMENTS, EXPANSION JOINTS, AND CONSTRUCTION JOINTS (TYP.).

ADHESIVE ANCHOR CONNECTION

INTERIOR PARAPET (USED IN CONJUNCTION WITH CRASHWORTHY ADJACENT EXTERIOR PARAPET)

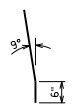
NOTES:
DRILLING OR BURNING THRU DECK REINFORCEMENT SHALL BE PROHIBITED

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 ¾-INCH". EMBED 5¼" IN CONCRETE." ADHESIVE ANCHORS SHALL CONFORM TO SECTIONS 502.2.12 AND 502.3.14 OF THE STANDARD SPECIFICATIONS.

⊗ CONST. JT. -STRIKE OFF AS SHOWN & LEAVE ROUGH

◪ STEEL TROWEL HORIZONTAL SURFACE OF PAVING NOTCH. PLACE MULTIPLE LAYERS OF POLYETHLENE SHEETS BETWEEN PARAPET FOOTING AND HORIZONTAL SURFACE OF PAVING NOTCH. TOTAL THICKNESS OF SHEETS SHALL BE AT LEAST 0.03".



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

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.

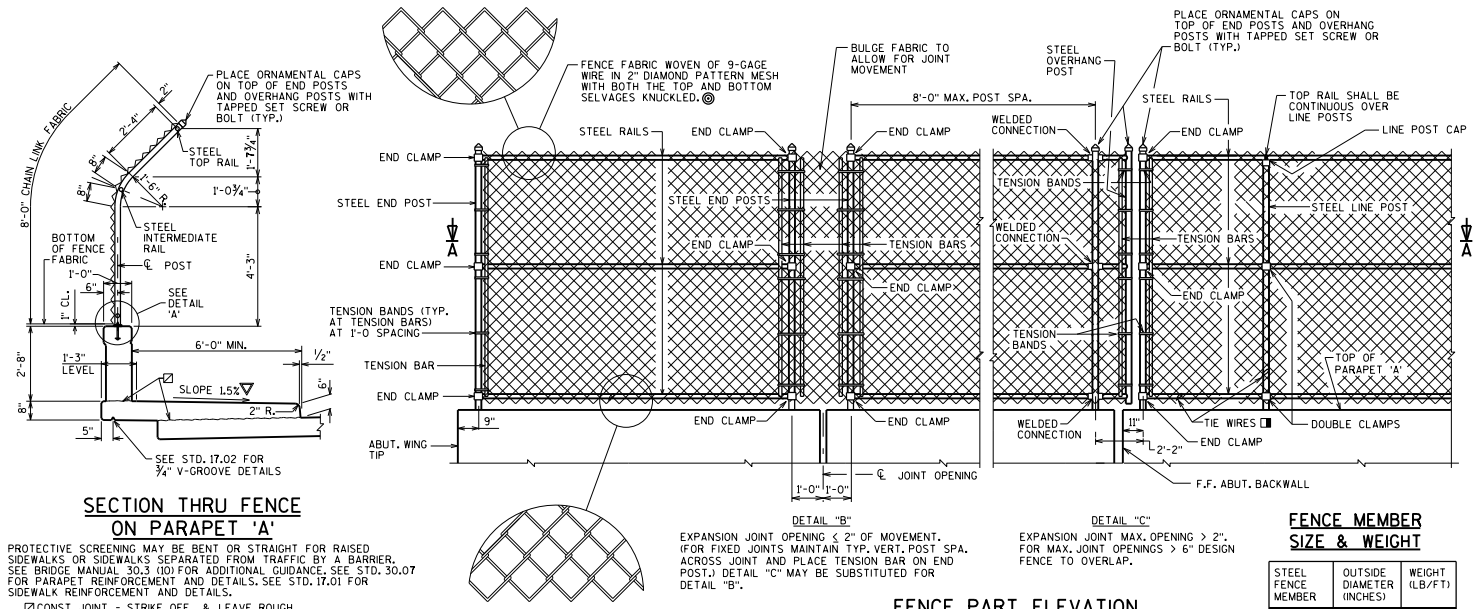
PARAPET FOOTING

BUREAU OF STRUCTURES

APPROVED: Bill Oliva

DATE: 1-20

STANDARD 30.10



SECTION THRU FENCE ON PARAPET 'A'

PROTECTIVE SCREENING MAY BE BENT OR STRAIGHT FOR RAISED SIDEWALKS OR SIDEWALKS SEPARATED FROM TRAFFIC BY A BARRIER. SEE BRIDGE MANUAL 30.3 (10) FOR ADDITIONAL GUIDANCE. SEE STD. 30.07 FOR PARAPET REINFORCEMENT AND DETAILS. SEE STD. 17.01 FOR SIDEWALK REINFORCEMENT AND DETAILS.

☑CONST. JOINT - STRIKE OFF & LEAVE ROUGH

▽ ±0.5% CONSTRUCTION TOLERANCE IN SIDEWALK CROSS SLOPE. THE SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

DETAIL "B"

EXPANSION JOINT OPENING ≤ 2" OF MOVEMENT. (FOR FIXED JOINTS MAINTAIN TYP. VERT. POST SPA. ACROSS JOINT AND PLACE TENSION BAR ON END POST.) DETAIL "C" MAY BE SUBSTITUTED FOR DETAIL "B".

DETAIL "C"

EXPANSION JOINT MAX. OPENING > 2". FOR MAX. JOINT OPENINGS > 6" DESIGN FENCE TO OVERLAP.

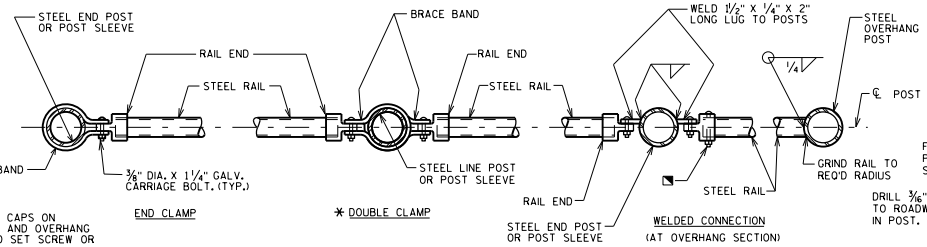
FENCE PART ELEVATION

(OUTSIDE VIEW OF PARAPET 'A')

FENCE MEMBER SIZE & WEIGHT

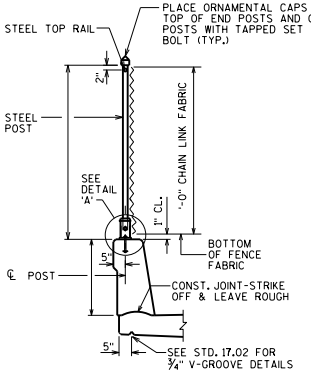
STEEL FENCE MEMBER	OUTSIDE DIAMETER (INCHES)	WEIGHT (LB/FT)
RAILS	1.660	2.27
END POST	2.875	5.80
OVERHANG POST	2.875	5.80
LINE POST	2.375	3.65
POST SLEEVE	4.000	9.12

WEIGHT OF CHAIN LINK FENCE: (BASED ON 8 FT. POST SPACING)
6 FT. HIGH FENCE = 18 LB / FT
8 FT. HIGH FENCE = 21 LB / FT



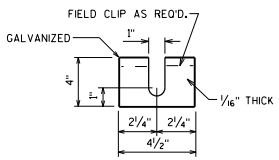
SECTION A-A

NOTE: PLACE ALL BOLT HEADS ON SIDE OF FENCE ADJACENT TO PEDESTRIANS



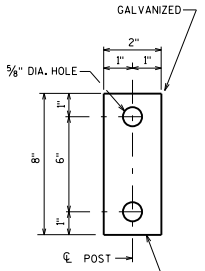
SECTION THRU FENCE ON SINGLE SLOPE PARAPET

FOR TRAFFIC BARRIER APPLICATION, USE VERTICAL POST (NO BEND)



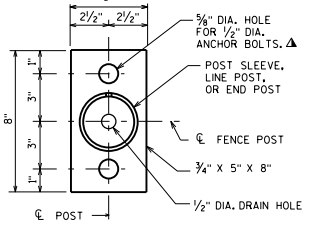
POST SHIM DETAILS

SHIMS REQUIRED ONLY WHEN END POSTS AND LINE POSTS ARE WELDED TO BASE PLATES. PROVIDE 4 SHIMS PER POST. USE WHERE REQUIRED FOR ALIGNMENT.

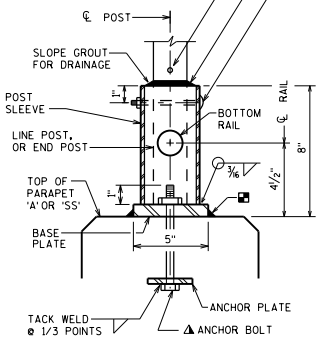


ANCHOR PLATE

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



BASE PLATE



DETAIL 'A'

UNIT SHALL BE GALVANIZED AFTER FABRICATION

NOTE: IN LIEU OF USING THE POST SLEEVE, THE FENCE POST MAY BE WELDED TO THE BASE PLATE.

NOTES

POSTS ARE TO BE SET VERTICAL.

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

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

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

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

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

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

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

COMPLETE ANY REQUIRED WELDING OF COMPONENTS BEFORE GALVANIZING.

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

BASE PLATES, ANCHOR PLATES AND SHIMS SHALL BE ASTM A709, GRADE 36.

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

◪ CAULK AROUND PERIMETER OF BASE PLATE AND FILL PORTION OF SLOTTED HOLE AROUND ANCHOR BOLT IN SHIM WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

✱ ALTERNATE TO DOUBLE CLAMP: USE LINE RAIL CLAMP (BOULEVARD) OR 180° BRACE BAND, WHICH MAY BE USED WHEN THE POSTS ARE EITHER BOLTED TO THE POST SLEEVES OR DIRECTLY WELDED TO THE BASE PLATE.

◭ ANCHOR BOLTS, NUTS AND WASHERS SHALL BE EITHER STAINLESS STEEL OR ASTM 307. IF 307 IS USED, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED.✪

✪ ALTERNATIVE ANCHORAGE: CONCRETE ADHESIVE ANCHORS ⅝-INCH. EMBED 7" IN CONCRETE. ADHESIVE ANCHORS SHALL CONFORM TO SECTIONS 502.2.12 AND 502.3.14 OF THE STANDARD SPECIFICATIONS.

◨ ATTACH FABRIC TO RAILS, AND TO POSTS WITHOUT TENSION BANDS, WITH TIE WIRES (ROUND, 9-GAGE) SPACED AT 1'-0".

◹ BOLT RAIL TO RAIL END TO SECURE OVERHANG SECTION. ALTERNATE IS TO WELD RAIL DIRECTLY TO END POST.

MINIMUM LENGTH OF TOP RAIL BETWEEN SPLICES SHALL BE 20'-0". LOCATE SPLICES NEAR ¼ POINT OF POST SPACING.

DESIGNER NOTES

THE CHAIN LINK FENCE SYSTEM SELECTED FOR THE STRUCTURE SHALL BE A "METALLIC-COATED FENCE SYSTEM" OR A "POLYMER-COATED FENCE SYSTEM".

◎ A 1" MESH MAY BE USED ON PROTECTIVE SCREENING IN HIGHLY VULNERABLE AREAS, OR AS STATED IN FDM PROCEDURE 11-35-1 FOR PROTECTIVE SCREENING.

PEDESTRIAN RAILING MAY BE USED ON WINGWALL PARAPETS IF CHAIN LINK FENCE DOES NOT CONTINUE BEYOND BRIDGE.

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

THE DESIGN ENGINEER SHALL DESIGN THE SUPERSTRUCTURE TO ACCOUNT FOR THE MAXIMUM 2% SIDEWALK CROSS SLOPE.

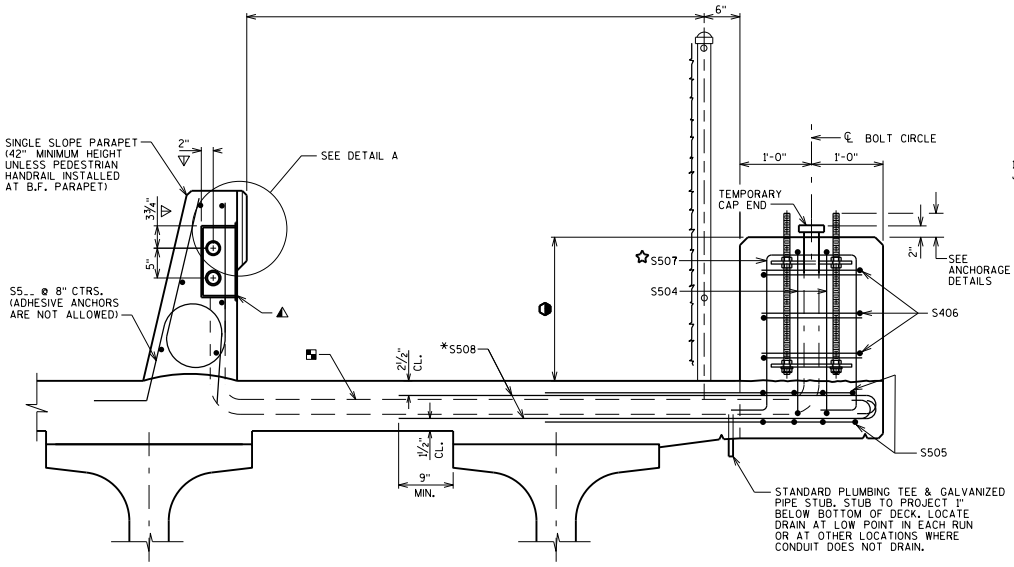
CHAIN LINK FENCE DETAILS

BUREAU OF STRUCTURES

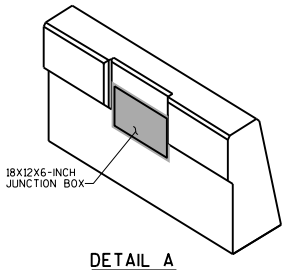
APPROVED: Bill Oliva

DATE: 1-20

STANDARD 30.11

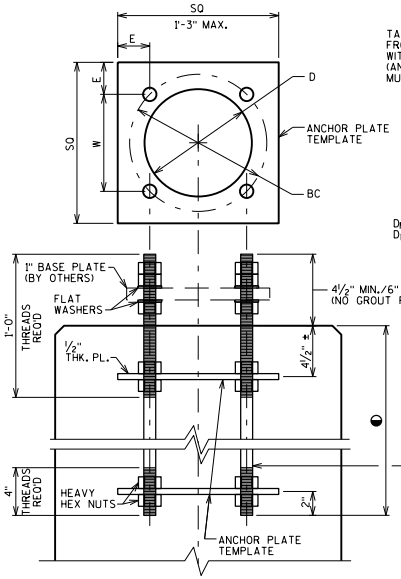


SECTION A-A



DETAIL A

SHOWING B.F. OF PARAPET WITH BLOCK OUT FOR JUNCTION BOX.

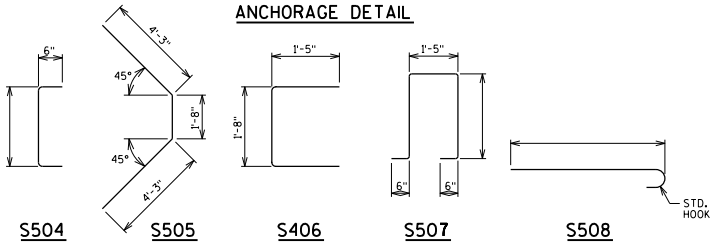


ANCHORAGE DETAIL

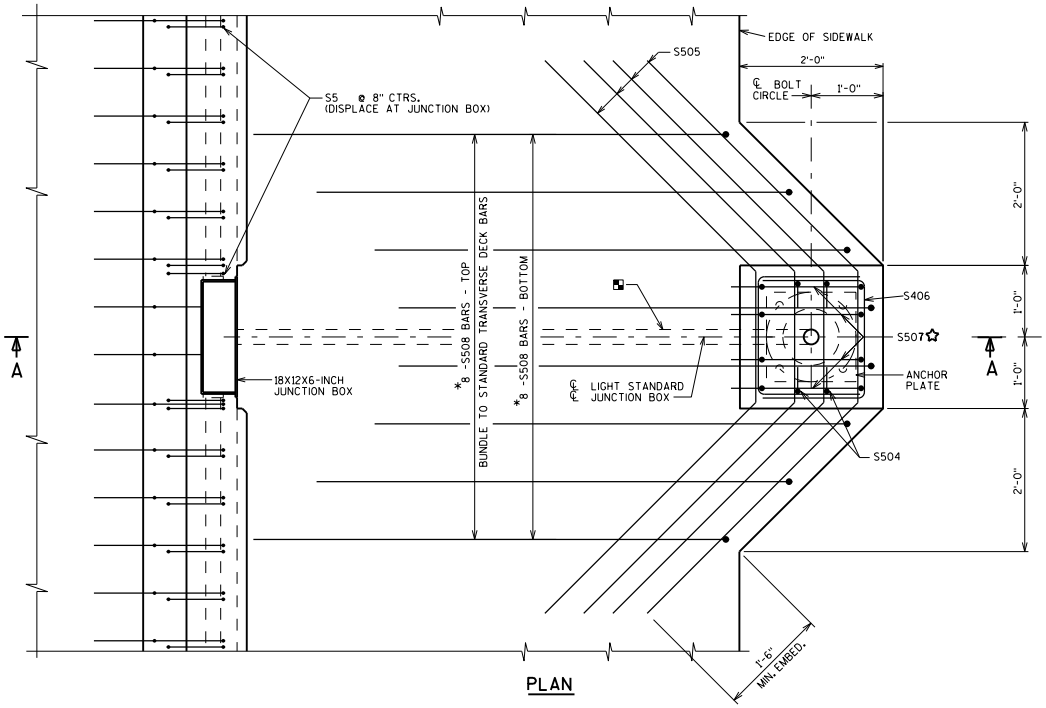
TABLE FOR "TYPE 5 LIGHT POLE" FROM FACILITIES DEV. MANUAL WITH 1" DIA. ANCHOR BOLTS. (ANY OTHER LIGHT POLE TYPE MUST BE DESIGNED FOR.)

SQ	1'-1½"
E	2 11/16"
W	8⅛"
BC	11½"
D	9½"

W = 0.707 x BC
SQ = BC + 2d
d = ANCHOR BOLT DIA.
E = (SQ-W)/2
$D_{MAX.}$ = BC - 2d
$D_{MIN.}$ = 2 X CONDUIT DIA. + 1"



S504 S505 S406 S507 S508



PLAN

- STAND-ALONE PEDESTAL
  - 1" DIA. ANCHOR BOLTS = 2'-0"
  - < 1" DIA. ANCHOR BOLTS = 1'-3"
- STAND-ALONE PEDESTAL
  - 1" DIA. ANCHOR BOLTS = 1'-11"
  - < 1" DIA. ANCHOR BOLTS = 1'-2"

  PARAPET BLISTER
  - SEE STANDARD 30.21
- ◭ CUT OUT ± 1" OF GASKET AT BOTTOM OF JUNCTION BOX COVER TO ALLOW FOR DRAINAGE.
- ▽ LOCATION OF CONDUIT IS MEASURED FROM OUTSIDE EDGE OF JUNCTION BOX.
- ☆ TIE IN PLACE AFTER ANCHOR BOLT ASSEMBLY LOCATED.
- * THESE BARS ARE IN ADDITION TO STANDARD TRANSVERSE BARS IN DECK.
- ▪ CONDUIT SIZE (SELECT ONE):
  FOR DECK THICKNESS < 8½" - 1¼" DIA. RIGID NONMETALLIC CONDUIT. (DESIGNER TO VERIFY CONDUIT SIZE BASED ON SERVICE NEEDS)

  FOR DECK THICKNESS > 8½" - 2" DIA. RIGID NONMETALLIC CONDUIT.

BILL OF BARS

BAR MARK	COAT	NO. REQ'D.	LENGTH	BENT	LOCATION
S504	X			X	LIGHT STD., VERT.
S505	X		10-2	X	LIGHT STD., HORIZ. IN DECK
S406	X		4-4	X	LIGHT STD., HORIZ.
S507	X			X	LIGHT STD., VERT.
S508	X			X	LIGHT STD., TRANSV. IN DECK

NOTE

BID ITEM SHALL BE "ANCHOR ASSEMBLIES LIGHT POLES ON STRUCTURES", EACH

DESIGNER NOTES

ANCHORAGE DETAIL FOR "TYPE 5 LIGHT POLE". ANCHORAGE FOR OTHER LIGHT POLE TYPES MUST BE DESIGNED.

SEE STD. 30.11 FOR FENCE DETAILS.

SEE STD. 30.21 FOR
- ADDITIONAL NOTES
- END OF BRIDGE DETAILS

THIS STANDARD IS NOT INTENDED TO BE USE WITH TRANSFORMER BASES.

THIS STANDARD ACCOMMODATES A MAXIMUM 15" DIA. BOLT HOLE CIRCLE AND A MAXIMUM 15" X 15" SQUARE ANCHOR PLATE WITH (4) - 1" DIA. ANCHOR BOLTS. THIS STANDARD IS BASED ON A 8" MIN. DECK THICKNESS.

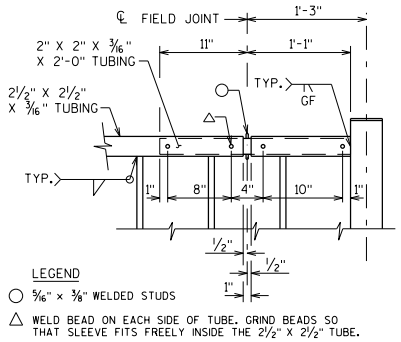
LIGHTING DETAIL

BUREAU OF STRUCTURES

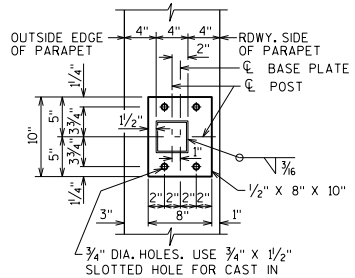
APPROVED: Bill Oliva

DATE: 1-20

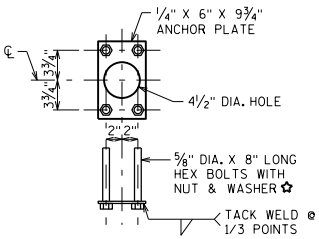
STANDARD 30.14



RAILING EXPANSION JOINT DETAIL



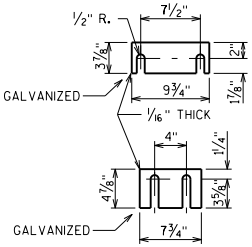
BASE PLATE



ANCHORAGE DETAIL

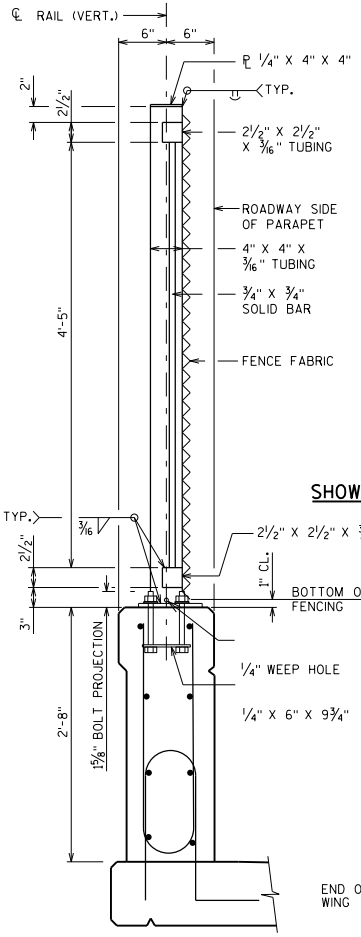
✿ ALTERNATIVE ANCHORAGE: ADHESIVE ANCHORS ⅝-INCH. EMBED 7" IN CONCRETE. ADHESIVE ANCHORS SHALL CONFORM TO SECTIONS 502.2.12 AND 502.3.14 OF THE STANDARD SPECIFICATIONS.

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



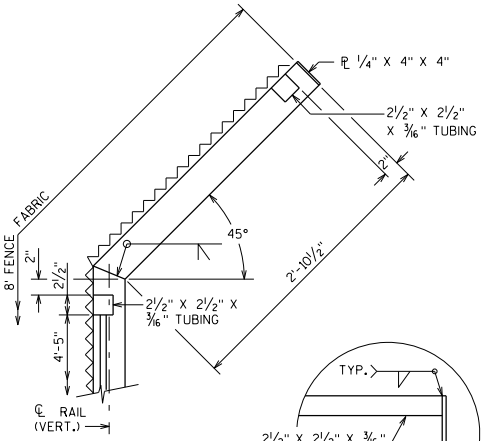
SHIM PLATE DETAILS

TWO SHIMS OF EACH SIZE REQUIRED PER POST

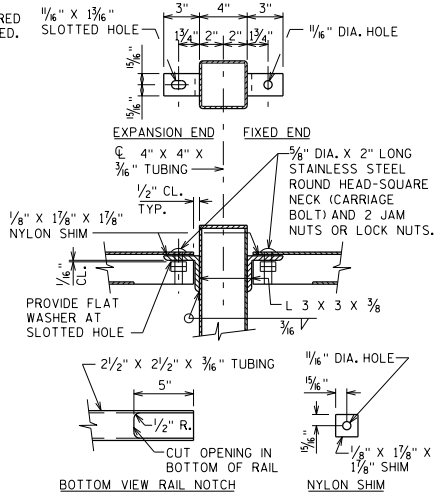


SECTION THRU RAILING

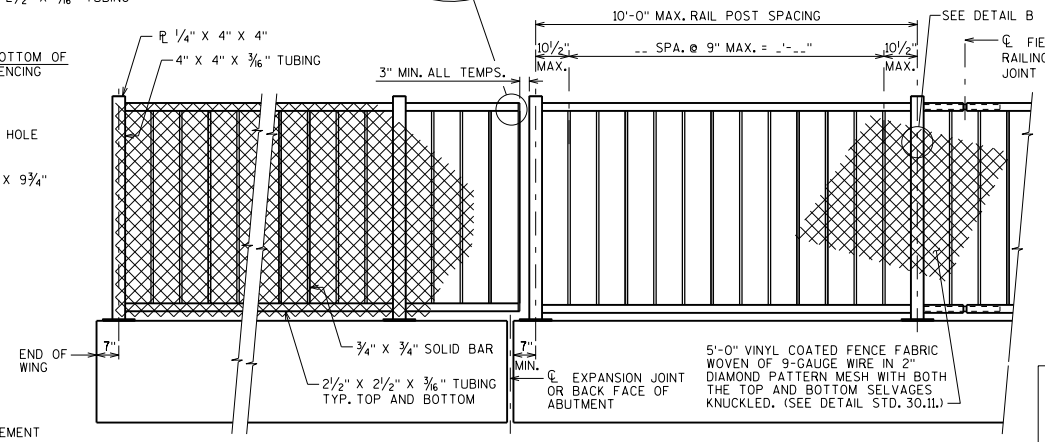
(SEE STD. 30.07 FOR PARAPET REINFORCEMENT AND DETAILS)



SECTION THRU FENCE SHOWING DETAILS FOR BENT TOP



TOP RAIL CONNECTION FOR FENCE W/ BENT TOP



INSIDE ELEVATION OF RAILING

WEIGHT = 35 LB/FT (W/O BENT SECTION @ TOP)
WEIGHT = 45 LB/FT (W/ BENT SECTION @ TOP)

NOTES

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

STRUCTURAL TUBING SHALL CONFORM TO ASTM A500, GRADE B. PLATES, ANGLES, BARS AND SHIMS SHALL CONFORM TO ASTM A709, GRADE 36. FENCE FABRIC SHALL CONFORM TO ASTM F668, CLASS 2B.

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

ALL POST SPACINGS ARE TAKEN HORIZONTAL ALONG CENTERLINE OF RAILING AT BASE OF POST.

STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATES WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED.

CAULK AROUND PERIMETER OF BASE PLATES AND FILL PORTION OF SLOTTED HOLES AROUND ANCHOR BOLTS WITH NON-STAINING GRAY NON-BITUMINOUS JOINT SEALER.

CUT BOTTOM OF POST TO MAKE VERTICAL IN TRANSVERSE DIRECTION.

ANCHOR BOLTS, NUTS AND WASHERS SHALL BE EITHER STAINLESS STEEL OR ASTM 307. IF 307 IS USED, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED.✿

THE BID ITEM SHALL BE "RAILING TUBULAR SCREENING" WHICH SHALL INCLUDE ALL ITEMS SHOWN.

RAILING SHALL BE FABRICATED IN LENGTHS THAT INCLUDE NOT MORE THAN 3 POSTS.

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

ALL RAILING MATERIAL SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING THE STEEL RAILING SHALL BE GIVEN A NO. 6 BLAST CLEANING PER SSPC SPECIFICATIONS. PAINT OVER GALVANIZING WITH AN APPROVED TIE COAT AND TOP COAT AS SPECIFIED IN THE CONTRACT DOCUMENTS. THE RAILING SHALL BE PAINTED AMS STD. COLOR NO. ☐, ☐ (FILL IN COLOR NAME). FENCE FABRIC AND TIES TO BE VINYL-COATED. COLOR SHALL BE (SPECIFY: DARK GREEN, BROWN OR BLACK) IN ACCORDANCE WITH ASTM F934.

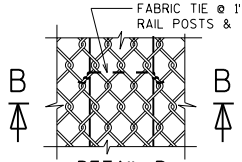
THE END OF THE FABRIC SHALL BE ATTACHED TO THE POST BY MEANS OF A TENSION BAR THREADED THROUGH THE END LOOPS OF THE FABRIC AND SECURED TO THE POST WITH CLAMPS & BOLT. THE FABRIC SHALL BE STRETCHED TO REMOVE ALL SLACK.

DESIGNER NOTES

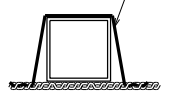
TUBULAR SCREENING MAY BE USED ON STRUCTURES WITH A 45 M.P.H. DESIGN SPEED OR LESS, OR WHEN THE SIDEWALK IS SEPARATED FROM THE ROADWAY BY A PARAPET.

THIS RAILING MAY BE MOUNTED DIRECTLY TO A BRIDGE SIDEWALK OR RETAINING WALL PROVIDED THE SIDEWALK IS SEPARATED FROM THE ROADWAY BY A TRAFFIC BARRIER. USE 6" CLEAR SPACING BETWEEN VERTICAL MEMBERS IF CHAIN LINK FENCE IS NOT USED.

FENCE HEIGHT, CURVED OR STRAIGHT, MESH SIZE, COATING AND COLOR SHOULD BE COORDINATED WITH THE REGION. SEE BRIDGE MANUAL 30.3 (8) FOR ADDITIONAL GUIDANCE.



DETAIL B



SECTION B-B

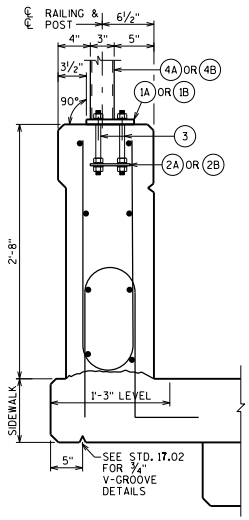
TUBULAR STEEL RAILING SCREENING

BUREAU OF STRUCTURES

APPROVED: Bill Oliva

DATE: 1-20

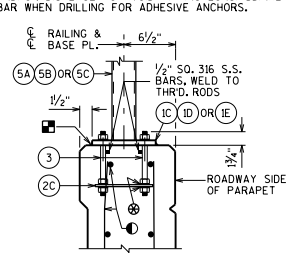
STANDARD 30.15



SECTION THRU PARAPET ON BRIDGE

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

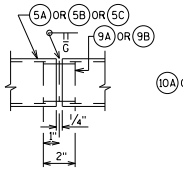
◐ WHEN ADHESIVE ANCHORS ARE USED, FIELD BEND AND/OR DISPLACE TO AVOID HITTING LONGITUDINAL BAR WHEN DRILLING FOR ADHESIVE ANCHORS.



ANCHORAGE FOR END RAIL

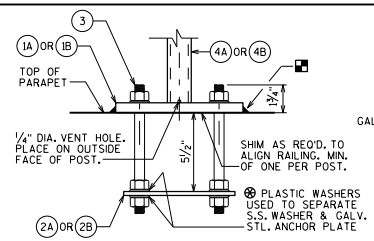
NOTE: USE 8" THR'D. ROD AT PLATE 1D WHEN ADJ. TO BEAM GUARD ANCHOR ASSEMBLY

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



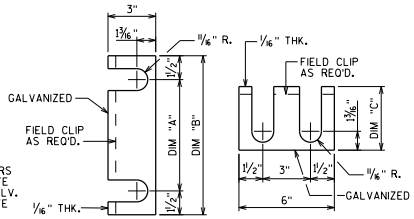
SHOP RAIL SPLICE DETAIL

(LOCATION MUST BE SHOWN ON SHOP DRAWINGS)



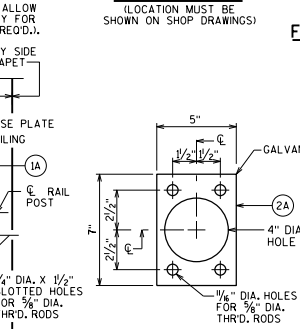
ANCHORAGE FOR RAIL POSTS

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



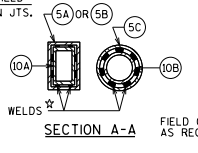
RAIL POST SHIM DETAIL

6" X 8" BASE PLATE (1A) DIM "A" = 5", DIM "B" = 8", DIM "C" = 4"
6" X 10" BASE PLATE (1B) DIM "A" = 7", DIM "B" = 10", DIM "C" = 5"
(2 SETS PER POST)

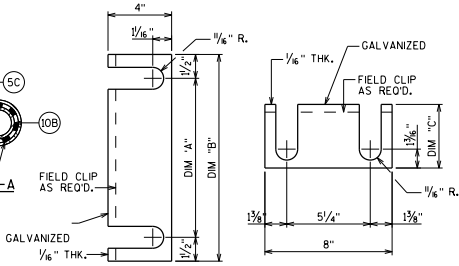


FIELD ERECTION JOINT DETAIL

☆ MIN. ⅝" FLAT SURFACE DIA. PUNCHINGS OR STUDS MAY BE USED AS AN ALTERNATE.



SECTION A-A



END RAIL SHIM DETAIL

8" X 1'-1" BASE PLATE (1C) DIM "A" = 10", DIM "B" = 1'-1", DIM "C" = 6½"
8" X 1'-6" BASE PLATE (1D) DIM "A" = 1'-3", DIM "B" = 1'-6", DIM "C" = 9"
8" X 1'-3" BASE PLATE (1E) DIM "A" = 1'-0", DIM "B" = 1'-3", DIM "C" = 7½"
(2 SETS PER POST)

LEGEND

(1A) PLATE ⅝" X 6" X 8" WITH ¾" X 1½" SLOTTED HOLES.
(1B) PLATE ⅝" X 6" X 10" WITH ¾" X 1½" SLOTTED HOLES
(1C) PLATE ⅝" X 8" X 1'-1" WITH ¾" X 1½" SLOTTED HOLES.
(1D) PLATE ⅝" X 8" X 1'-6" WITH ¾" X 1½" SLOTTED HOLES
(1E) PLATE ⅝" X 8" X 1'-3" WITH ¾" X 1½" SLOTTED HOLES
(2A) ¼" X 5" X 7" ANCHOR PLATE WITH 11/16" DIA. HOLES FOR THR'D. RODS NO. 3.
(2B) ¼" X 5" X 9" ANCHOR PLATE WITH 11/16" DIA. HOLES FOR THR'D. RODS NO. 3.
(2C) ¼" X 2½" X 7¼" ANCHOR PLATE WITH 11/16" DIA. HOLES FOR THR'D. RODS NO. 3.
(3) ⅝" DIA. X 9" LONG, TYPE 316 STAINLESS STEEL THREADED RODS (MIN. TENSILE STRENGTH = 70 KSI) WITH NUT AND WASHERS OF SAME ALLOY GROUP. ALTERNATIVE ANCHORAGE: CONCRETE ADHESIVE ANCHORS ⅝-INCH. EMBED 7" IN CONCRETE FOR RAIL POSTS. EMBED 5" IN CONCRETE FOR END RAILS. ADHESIVE ANCHORS SHALL CONFORM TO SECTIONS 502.2.12 AND 502.3.14 OF THE STANDARD SPECIFICATIONS.
(4A) STRUCTURAL TUBING 3" X 1½" X 3/16". PLACE VERTICAL. WELD TO NO. 1 & 5.
(4B) STRUCTURAL TUBING 3" X 3" X 3/16". PLACE VERTICAL. WELD TO NO. 1 & 5.
(5A) STRUCTURAL TUBING 3" X 1½" X 3/16" RAILS. WELD TO NO. 1 & NO. 4. INSIDE OF TUBE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.
(5B) STRUCTURAL TUBING 3" X 2" X 3/16" RAILS. WELD TO NO. 1 & NO. 4. INSIDE OF TUBE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.
(5C) STRUCTURAL TUBING 2½" DIA. (STANDARD SIZE) (2.875" O.D.). WELD TO NO. 1 & 4. INSIDE OF TUBE TO BE PAINTED AT ALL FIELD ERECTION & EXPANSION JOINTS.
(6A) BAR 1" X 1" PICKETS. WELD TO NO. 5. (SPACE AT 6" MAX. ℄ TO ℄ SPACING). PLACE VERTICAL.
(6B) BAR 1" X 1½" PICKETS. WELD TO NO. 5. (SPACE AT 6" MAX. ℄ TO ℄ SPACING). PLACE VERTICAL.
(6C) BAR 1" X 1½" PICKETS. WELD TO NO. 11. PLACE VERTICAL.
(7) BAR 1" X 1" . BEND TO REQUIRED RADIUS. WELD TO NO. 4 & 5.
(8) STRUCTURAL TUBING 5" DIA. (STANDARD SIZE) (5.563" O.D.) 1½" LONG SLICES. WELD TO NO. 5A.
(9A) RECTANGULAR SLEEVE FABRICATED FROM 3/16" PLATES. PROVIDE "SLIDING FIT".
(9B) CIRCULAR SLEEVE FABRICATED FROM STRUCTURAL TUBING 2" DIA. (STANDARD SIZE) (2.375" O.D.)
(10A) RECTANGULAR SLEEVE FABRICATED FROM 3/16" PLATES. (1'-4" ⌀ FIELD ERECTION JTS.) (1'-4" ⌀ STRIP SEAL EXP. JTS.)
(10B) CIRCULAR SLEEVE FABRICATED FROM STRUCTURAL TUBING 2" DIA. (STANDARD SIZE) (2.375" O.D.) (1'-4" ⌀ FIELD ERECTION JTS.) (1'-4" ⌀ STRIP SEAL EXP. JTS.)
(11A) BAR 2½" X 1" X '- ".
(11B) BAR 2½" X 1½" X '- ".
(11C) STRUCTURAL TUBING 2" DIA. (STANDARD SIZE) (2.375" O.D.) X '- ".
(12) ½" DIA. STAINLESS STEEL BOLT WITH NUT AND LOCKWASHER.

NOTES

BID ITEM SHALL BE "RAILING STEEL TYPE C(1-6)", WHICH SHALL INCLUDE ALL STEEL ITEMS SHOWN.

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

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

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

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

STEEL SHIMS SHALL BE PROVIDED & USED UNDER BASE PLATES WHERE REQUIRED FOR ALIGNMENT, AND SHALL BE GALVANIZED.

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

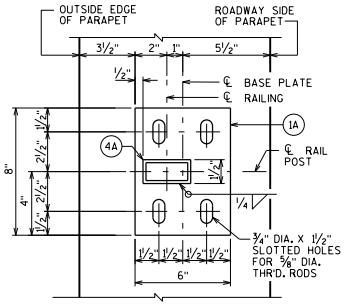
ALL JOINTS AND RECESSES IN CONCRETE PARAPET ARE TO BE VERTICAL.

ALL MATERIAL (EXCEPT NO. 3 & 12) SHALL BE GALVANIZED AFTER FABRICATION. PRIOR TO GALVANIZING, THE STEEL RAILING SHALL BE GIVEN A NO. 6 BLAST CLEANING PER SSPC SPECIFICATIONS. PAINT OVER GALVANIZING WITH AN APPROVED TIE COAT AND TOP COAT AS SPECIFIED IN THE CONTRACT DOCUMENTS. THE RAILING SHALL BE PAINTED AMS STD. COLOR NO. ☐, ☐ (FILL IN COLOR NAME).

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

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

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

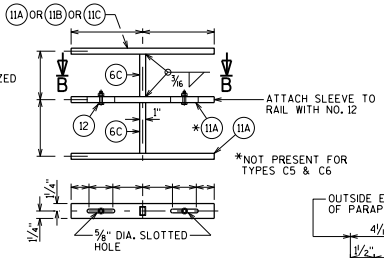


TYPICAL RAIL POST BASE PLATE

FOR 3" X 1½" X 3/16" POSTS (4A)

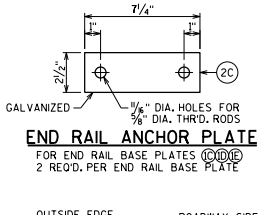
ANCHOR PLATE

FOR 3" X 1½" X 3/16" POSTS (4A)



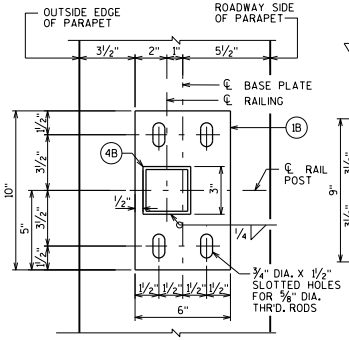
SECTION B-B

MODULAR JOINT SLEEVE DETAIL



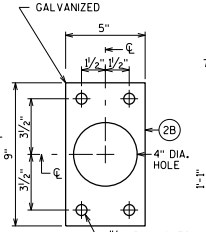
END RAIL ANCHOR PLATE

FOR END RAIL BASE PLATES (1C)(1D)(1E)
2 REQ'D. PER END RAIL BASE PLATE



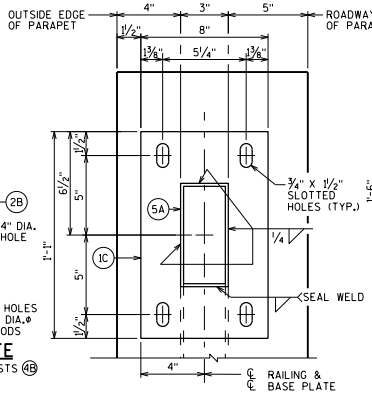
TYPICAL RAIL POST BASE PLATE

FOR 3" X 3" X 3/16" POSTS (4B)



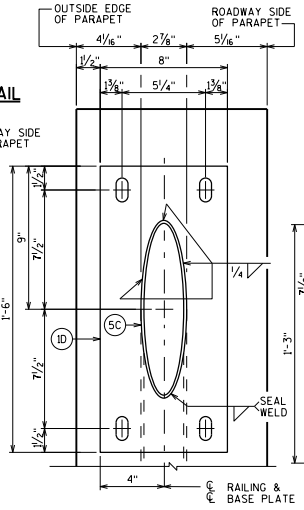
ANCHOR PLATE

FOR 3" X 3" X 3/16" POSTS (4B)



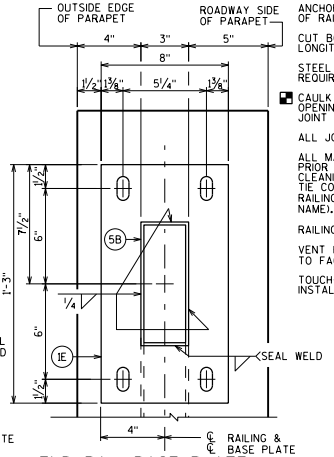
END RAIL BASE PLATE

FOR 3" X 1½" X 3/16" RAIL (5A)



END RAIL BASE PLATE

FOR 2½" DIA. STANDARD PIPE RAIL (5C)



END RAIL BASE PLATE

FOR 3" X 2" X 3/16" RAIL (5B)

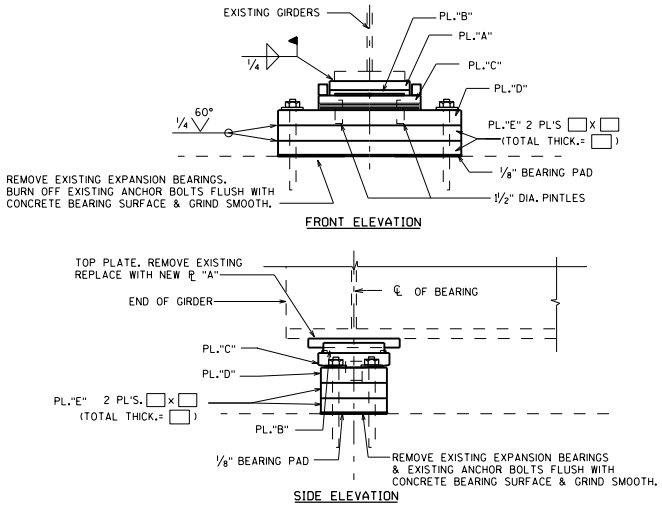
COMBINATION RAILING DETAILS

BUREAU OF STRUCTURES

APPROVED: Bill Oliva

DATE: 1-20

STANDARD 30.18



EXPANSION BEARING REPLACEMENT - STEEL GIRDERS
STEEL BEARINGS

SEE STANDARD 27.08 FOR BEARING DETAILS

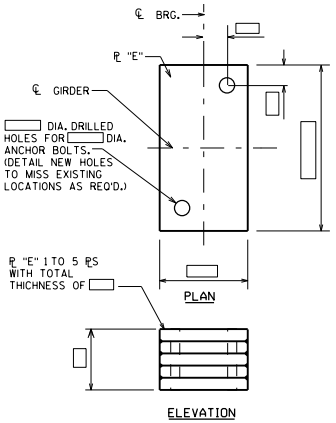
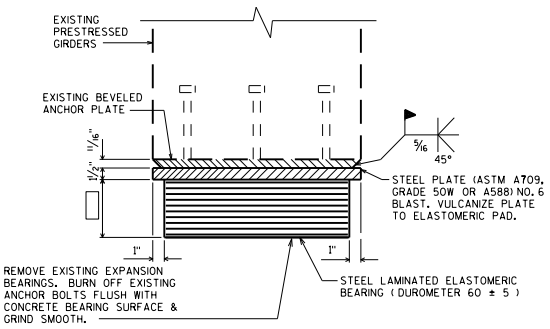
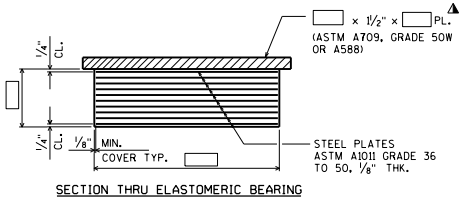
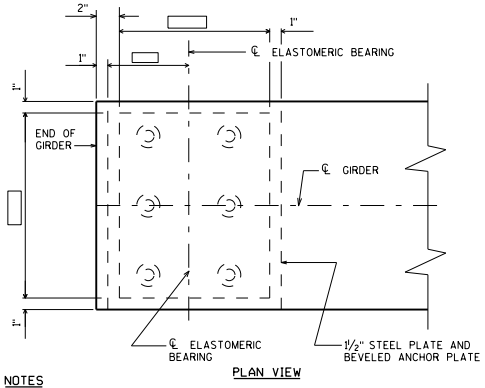


PLATE 'E' DETAILS

(SEE STD. 40.10 FOR CONCRETE BLOCK ALTERNATE)







NOTES

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

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

DESIGNER NOTES

THE STEEL TOP PLATE THICKNESS MAY BE REDUCED (¾" MIN.) TO MATCH THE OVERALL EXISTING BEARING HEIGHT. WHEN THE THICKNESS IS REDUCED, THE FOLLOWING NOTE SHALL BE LOCATED ON THE PLANS:

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

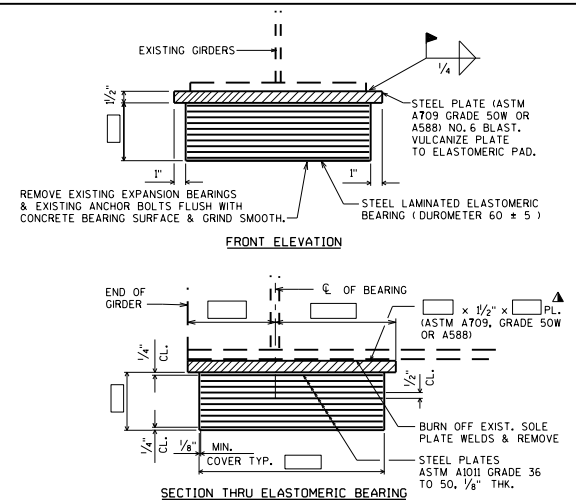
TOP STEEL PLATE MAY NOT BE OMITTED.

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

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

SEE STANDARD 27.07 FOR ADDITIONAL INFORMATION.

EXPANSION BEARING REPLACEMENT - PRESTRESSED GIRDERS
ELASTOMERIC BEARINGS



EXPANSION BEARING REPLACEMENT - STEEL GIRDERS
ELASTOMERIC BEARINGS

NOTES & DESIGNER NOTES

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

EXPANSION BEARING
REPLACEMENT DETAILS

BUREAU OF STRUCTURES

APPROVED: Bill Oliva

DATE: 1-20

STANDARD 40.08