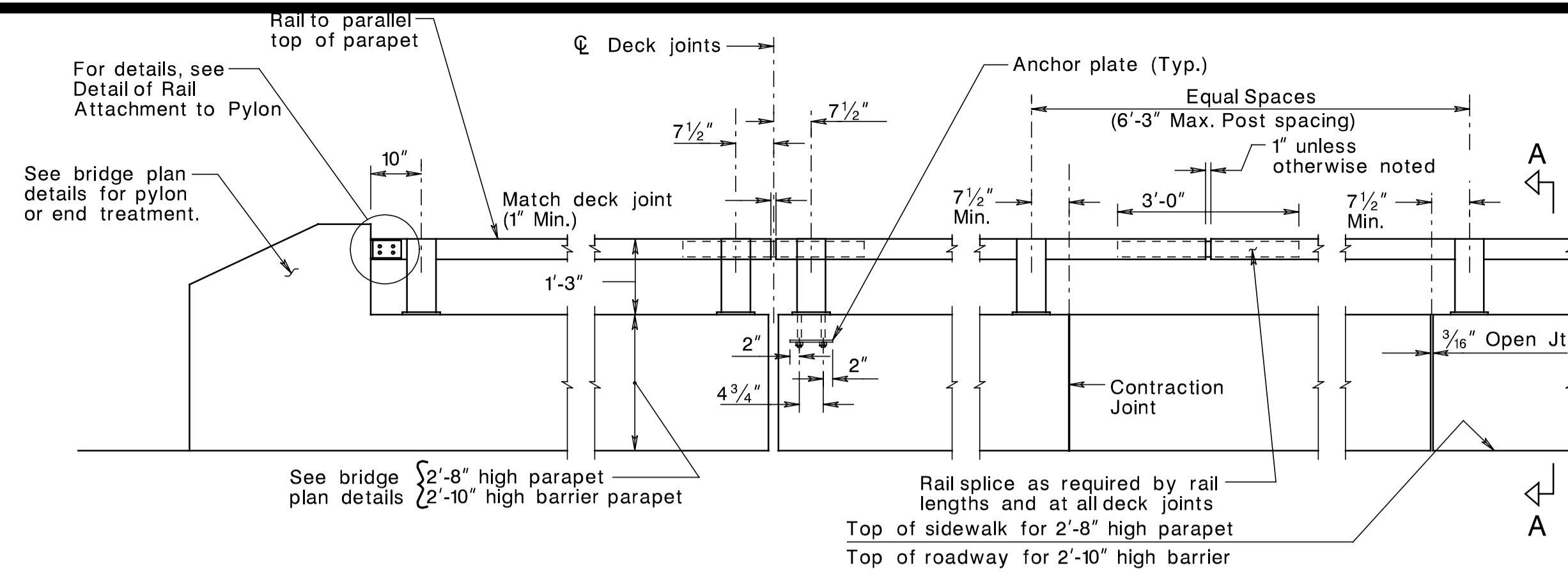
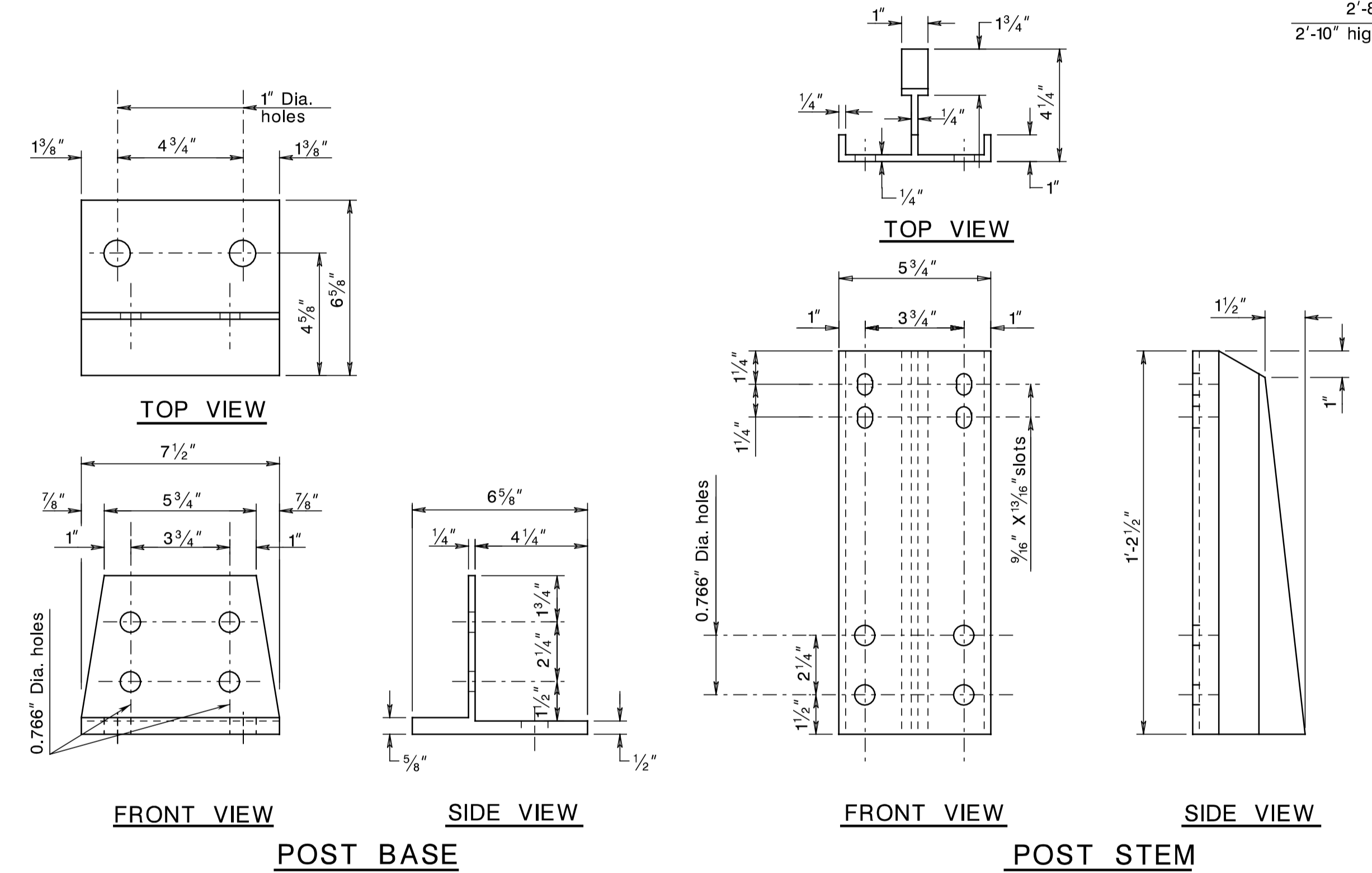


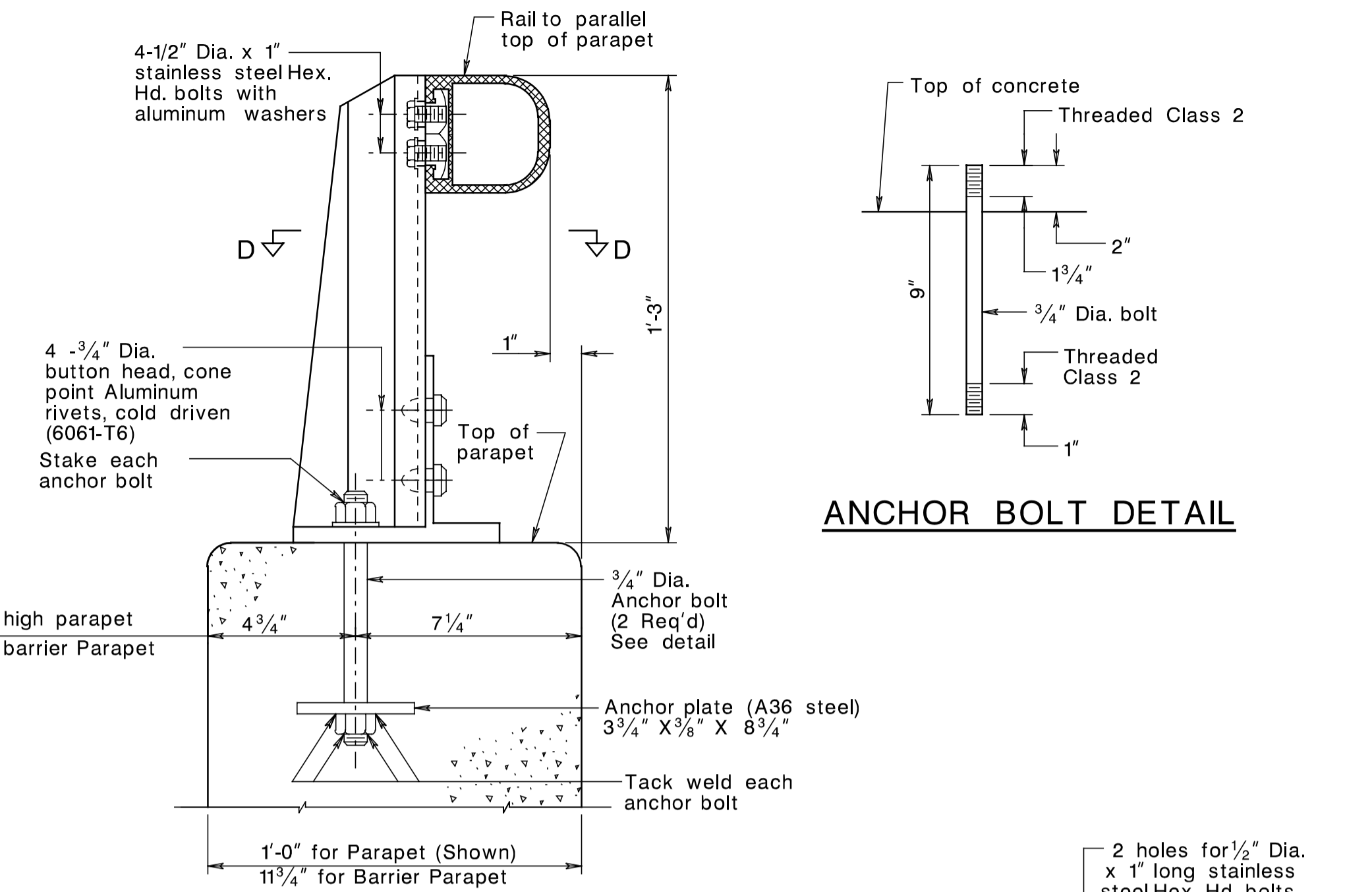
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N. J.			
STRUCTURE NO.			
STRUCTURE NAME			



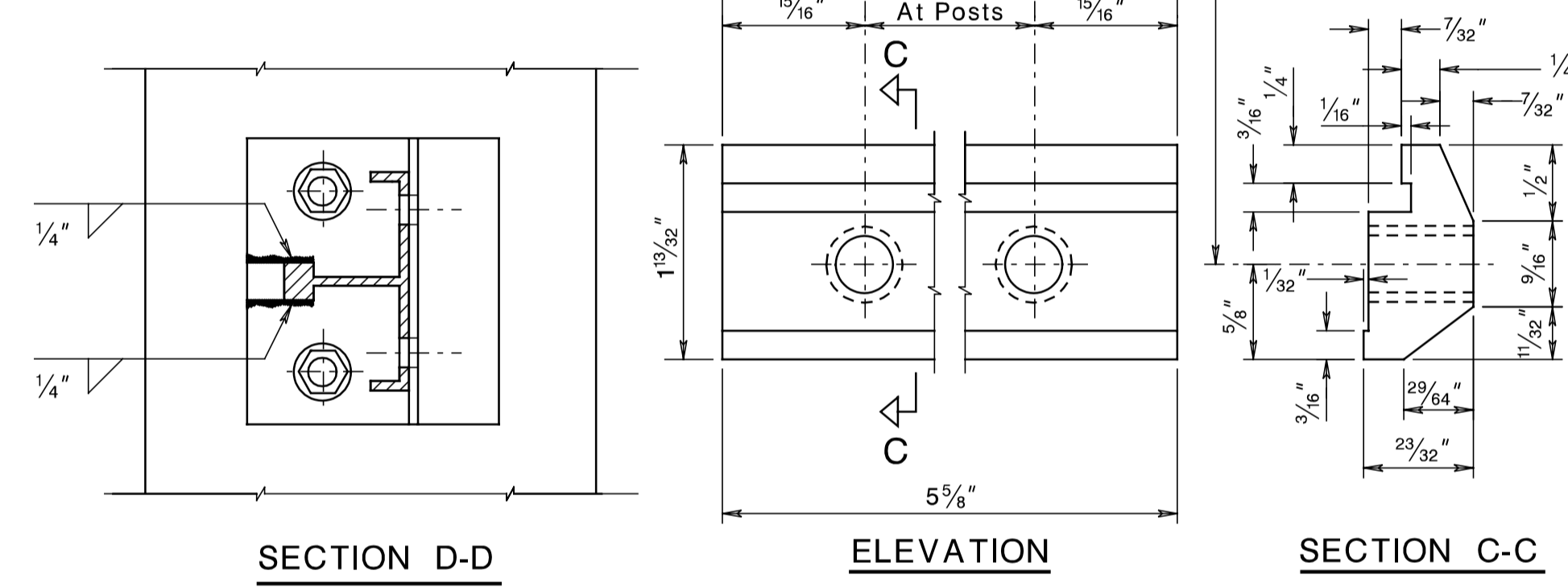
TYPICAL EXTERIOR ELEVATION OF CONTINUOUS RAILING SYSTEM



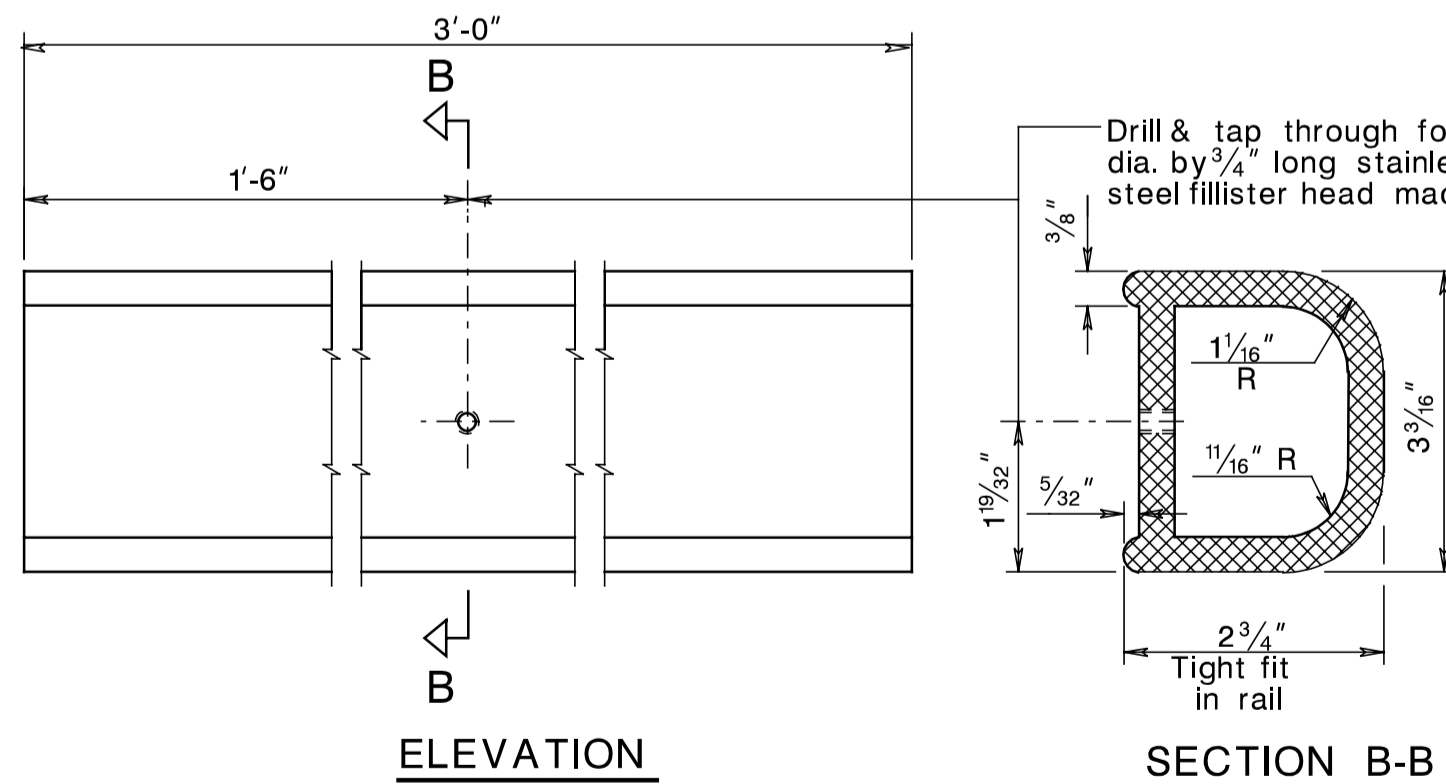
ANCHOR BOLT DETAIL



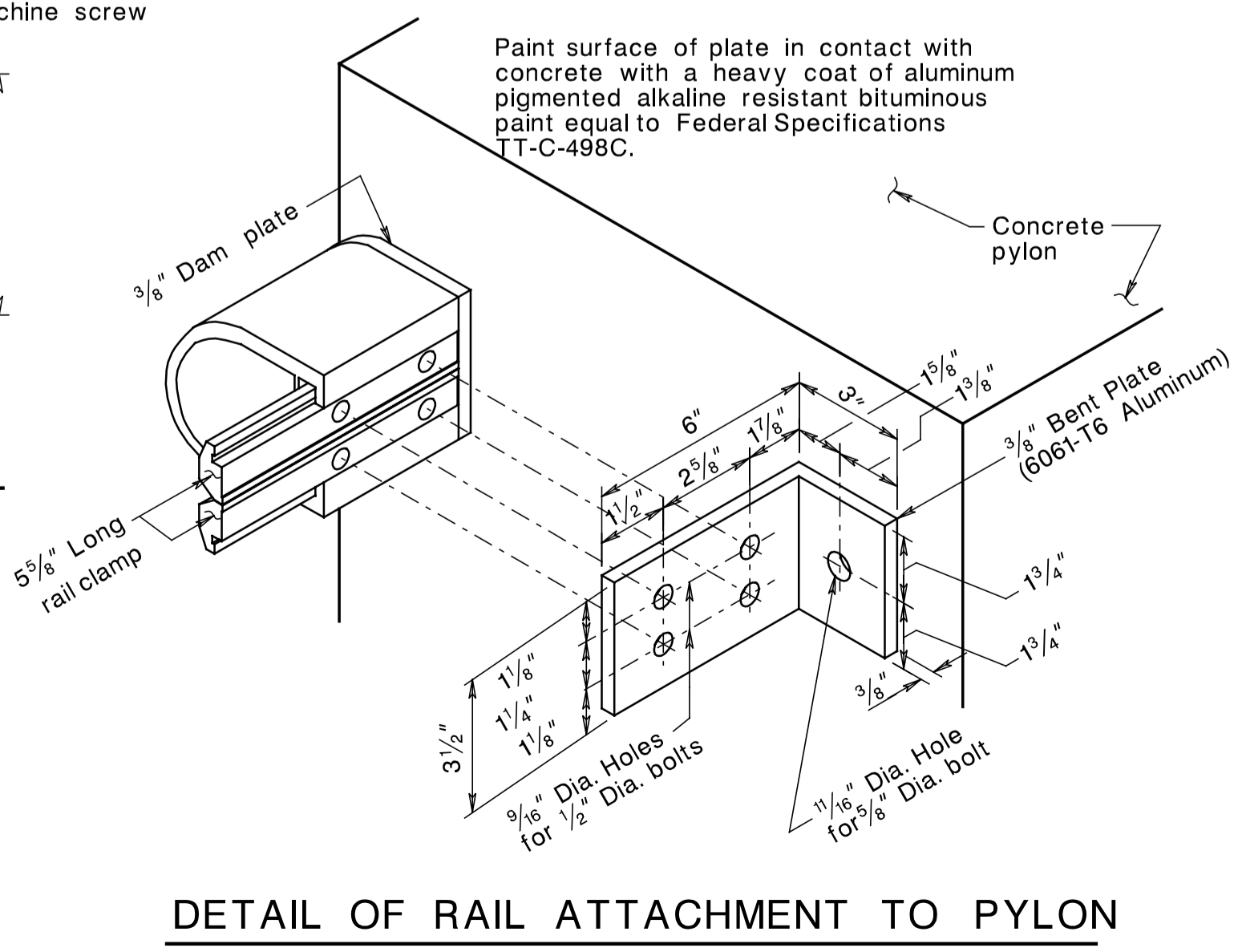
SECTION A-A



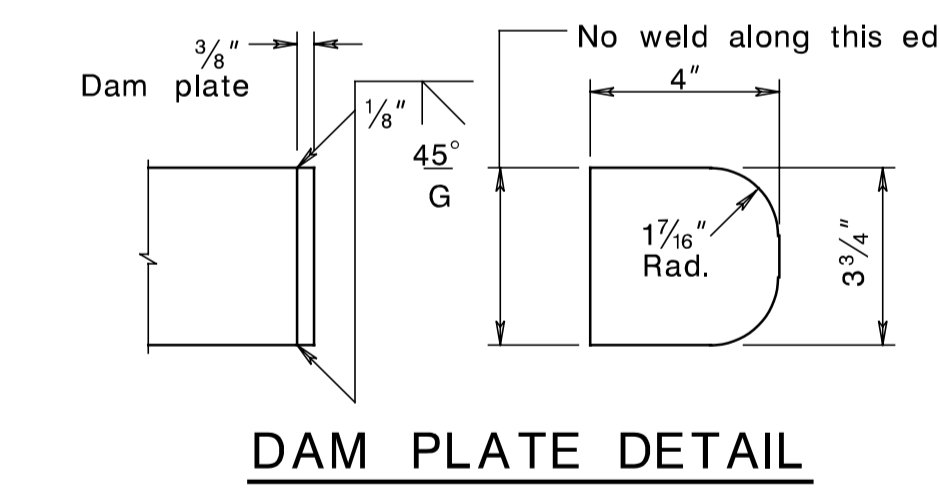
DETAILS OF RAIL CLAMP



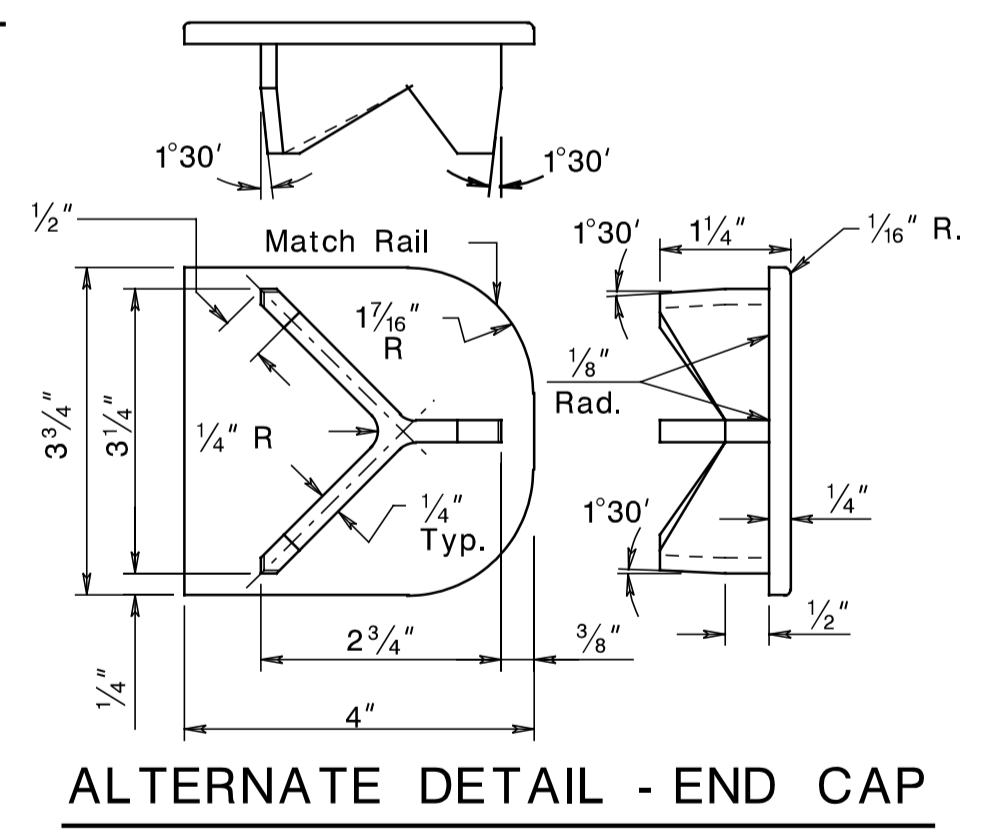
DETAIL OF RAIL SPLICE



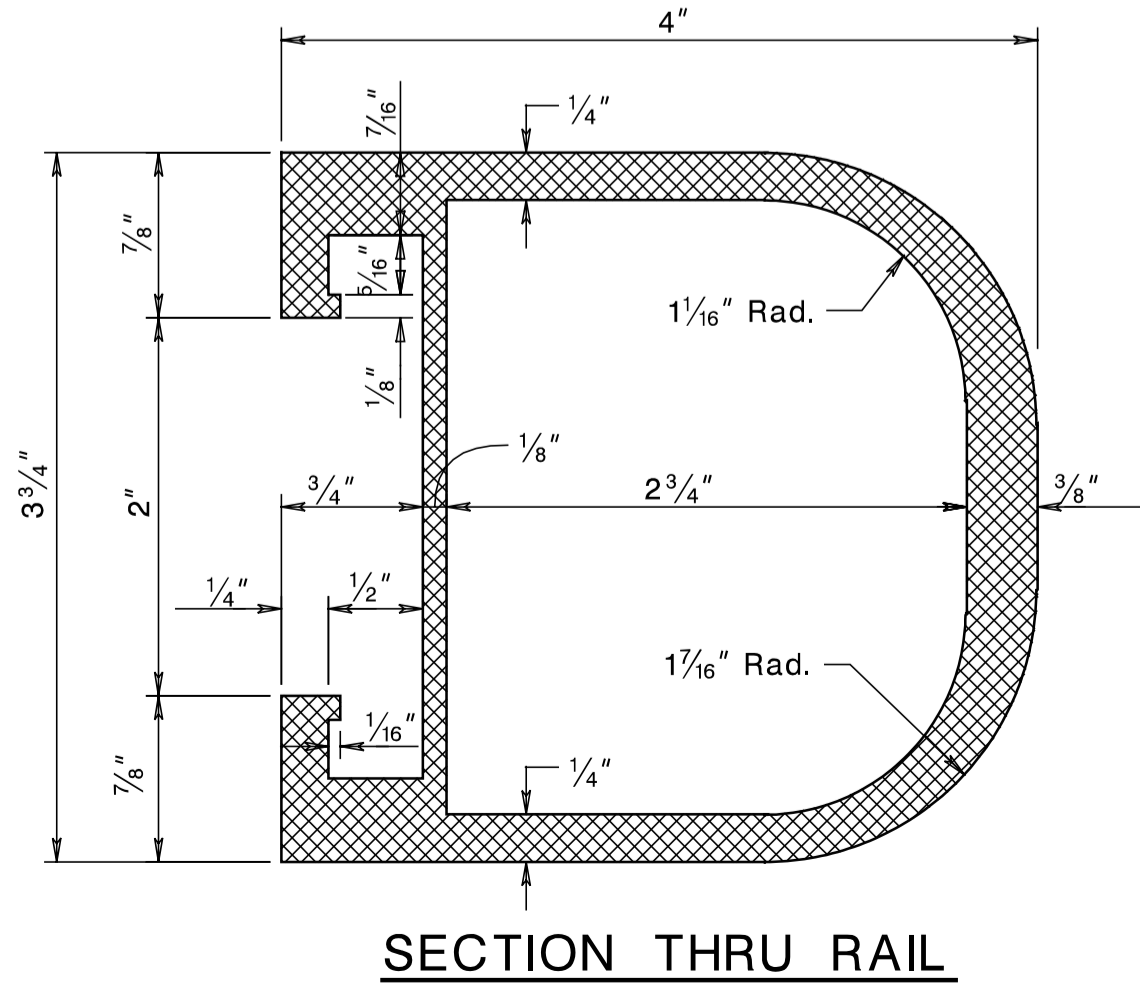
DETAIL OF RAIL ATTACHMENT TO PYLON



DAM PLATE DETAIL



ALTERNATE DETAIL - END CAP



SECTION THRU RAIL

GENERAL NOTES

1. Material for posts, bases, and rail clamps shall be ASTM B221 Aluminum Alloy 6061-T6.
2. Washers shall be ASTM B209 Alclad 2024-T3 and nuts shall be ASTM B211 Aluminum Alloy 6061-T6.
3. Anchor bolts shall be ASTM A276 stainless steel, Type 302, Type 304 or Type 430. Top nuts shall be Aluminum thick nuts ASTM B211 or B316 Alloy 6061-T6 Class 2 thread. Bottom nuts shall be ASTM A325.
4. Dam Plates shall be used to close all open railing ends. Material shall be ASTM B209 Aluminum Alloy 6061-T6. As an alternate, drive-in end caps may be used. Caps shall be aluminum alloy sand mold castings complying with ASTM B26, Alloy SG 356.6-T6.
5. End caps shall be welded to the rails.
6. Where necessary for post alignment, Aluminum Alloy shim material shall be used where required by the Engineer. Shim material shall be ASTM B209, Alloy 1100-0.
7. Paint underside of base with a heavy coat of Aluminum pigmented bituminous paint complying with ASTM D2824, Type I.
8. All anchor bolt holes and spaces between base plates and concrete shall be thoroughly caulked with a caulking compound conforming to Federal Specifications A-A-272A, Type III or Type IV.

STANDARD DRAWING PLATE 2.1-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

1-RAIL RAILING

ROUTE: SECTION:

SCALE : NONE
BRIDGE SHEET NO. OF B.

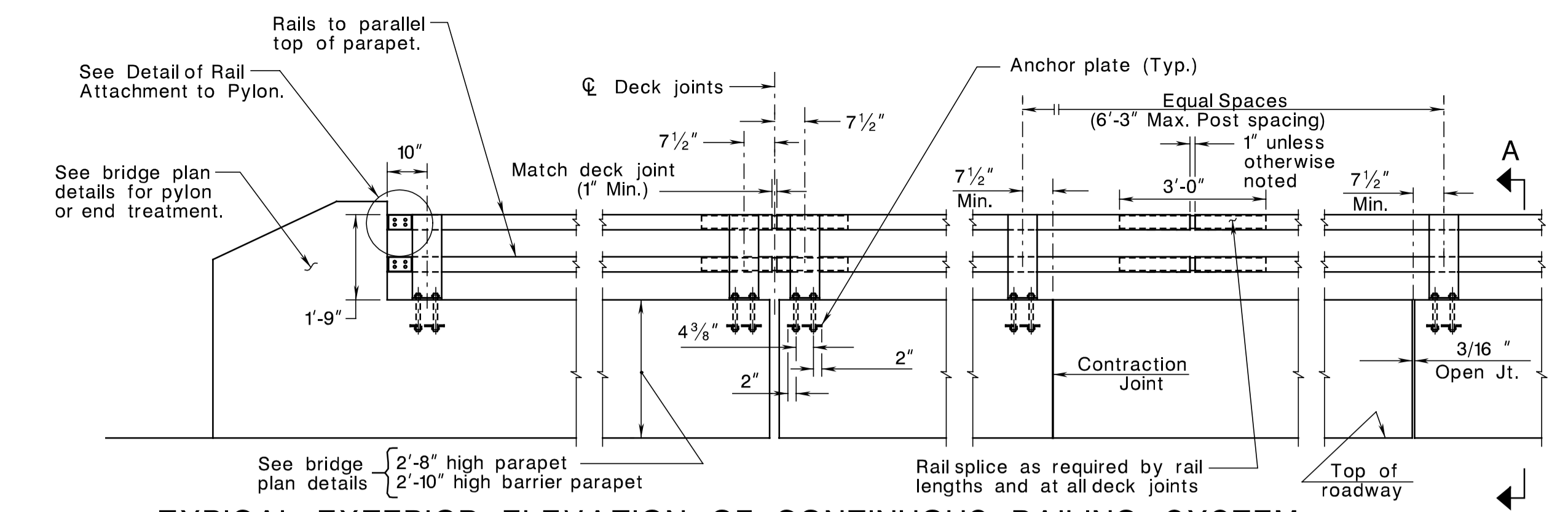
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CONTROL SECTION		JOB NO.	
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DWN. BY		CHK. BY	
EST. BY		CHK. BY	
SPECS. BY			
IN CHARGE OF			

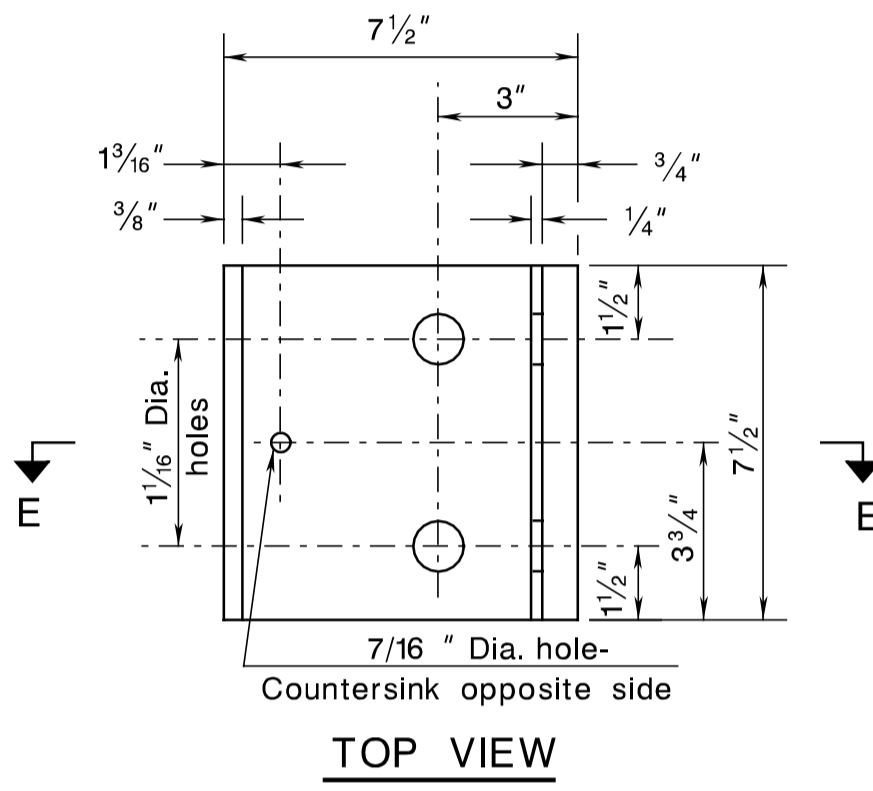
STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			

GENERAL NOTES

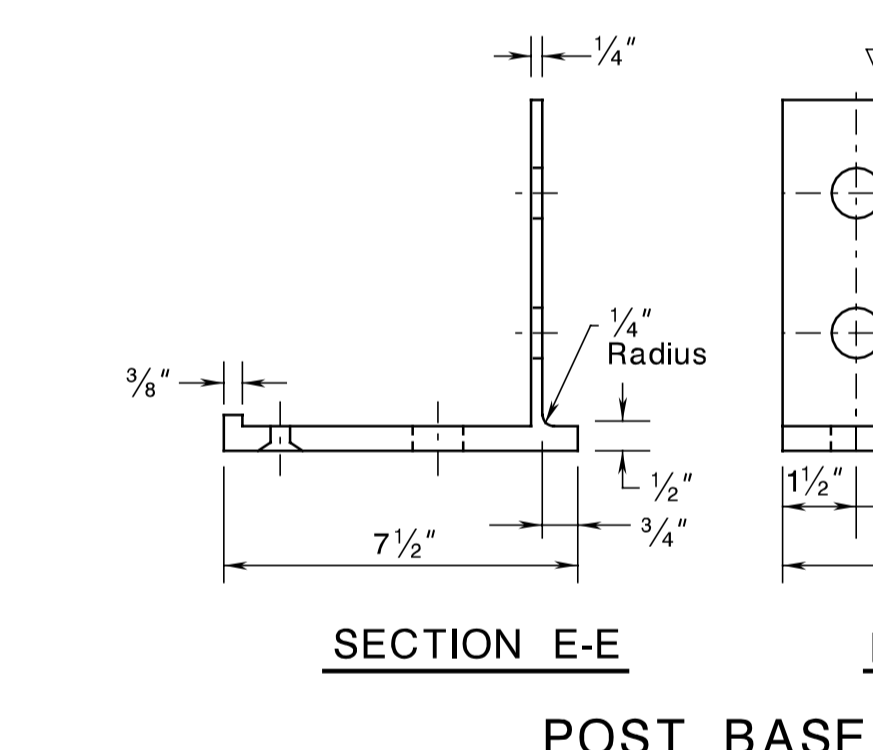
- Material for posts, bases, rails, and rail clamps shall be ASTM B221 Aluminum Alloy 6061-T6.
- Washers shall be ASTM B209 Alclad 2024-T3 and nuts shall be ASTM B211 Aluminum Alloy 6061-T6.
- Anchor bolts shall be ASTM A276 stainless steel, Type 302, Type 304 or Type 430. Top nuts shall be Aluminum thick nuts ASTM B211 or B316 Alloy 6061-T6 Class 2 thread. Bottom nuts shall be ASTM A325.
- Dam Plates shall be used to close all open railing ends. Material shall be ASTM B209 Aluminum Alloy 6061-T6. As an alternate, drive-in end caps may be used. Caps shall be aluminum alloy sand mold astings complying with ASTM B26, Alloy SG 356.6-T6.
- End caps shall be welded to the rails.
- Where necessary for post alignment, Aluminum shim material shall be used where required by the Engineer. Shim material shall be ASTM B209, Alloy 1100-0.
- Paint underside of base with a heavy coat of Aluminum pigmented bituminous paint complying with ASTM D2824, Type I.
- All anchor bolt holes and spaces between base plates and concrete shall be thoroughly caulked with a caulking compound conforming to Federal Specifications A-A-272A, Type III or Type IV.



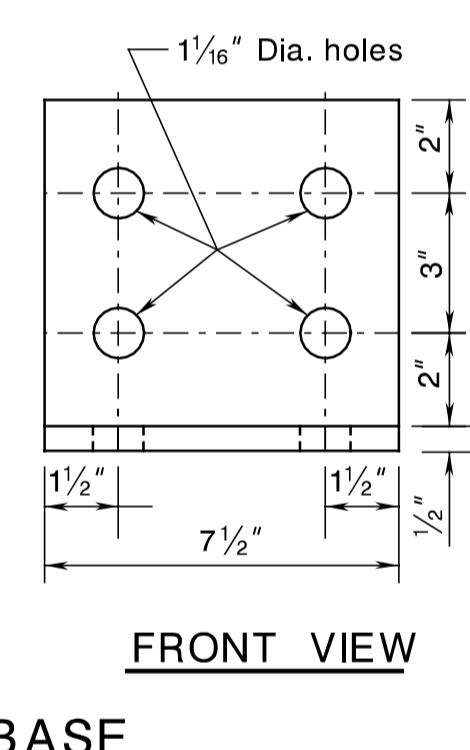
TYPICAL EXTERIOR ELEVATION OF CONTINUOUS RAILING SYSTEM



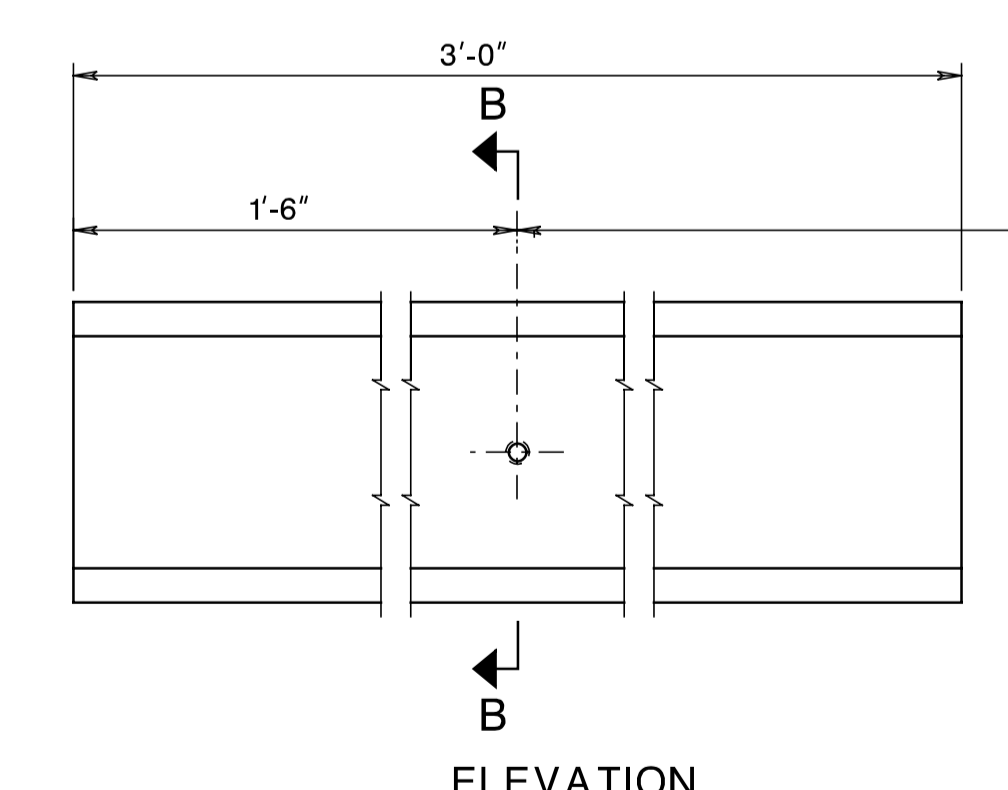
TOP VIEW



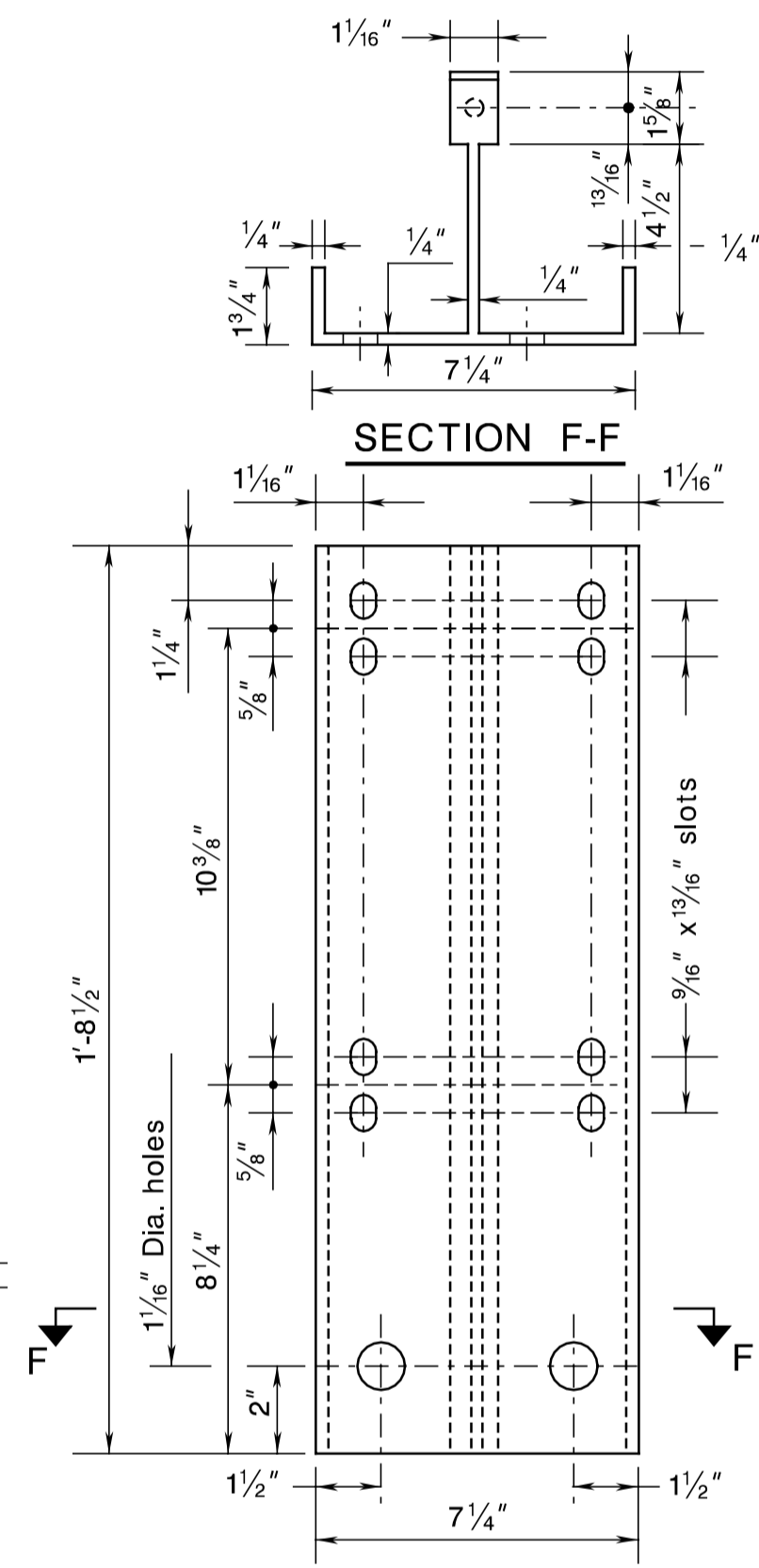
SECTION E-E



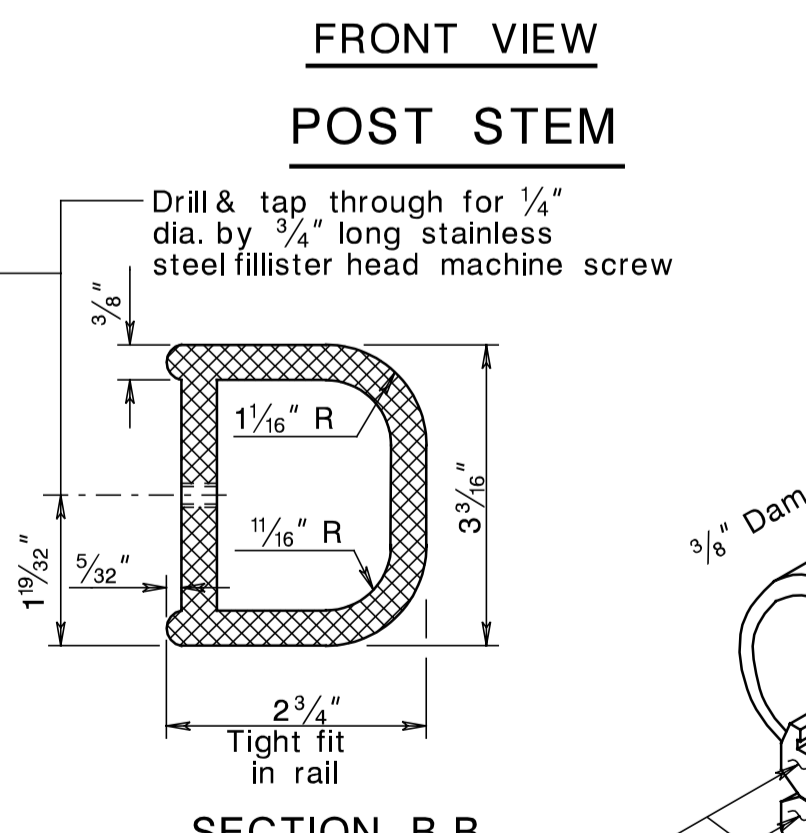
FRONT VIEW



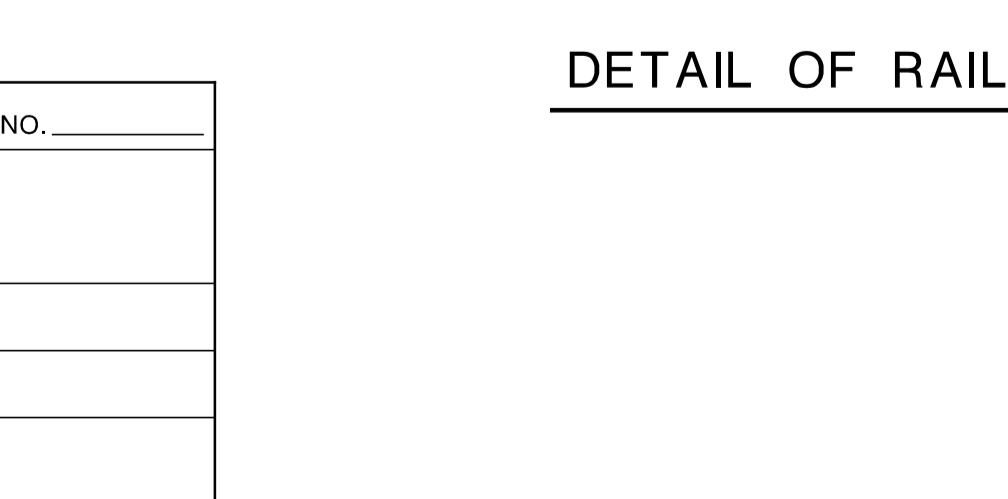
POST BASE



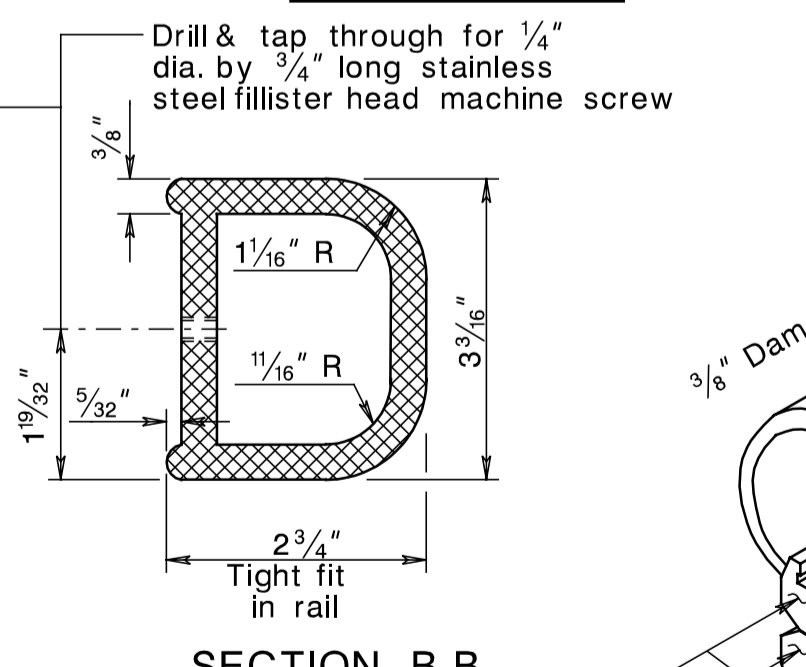
SECTION F-F



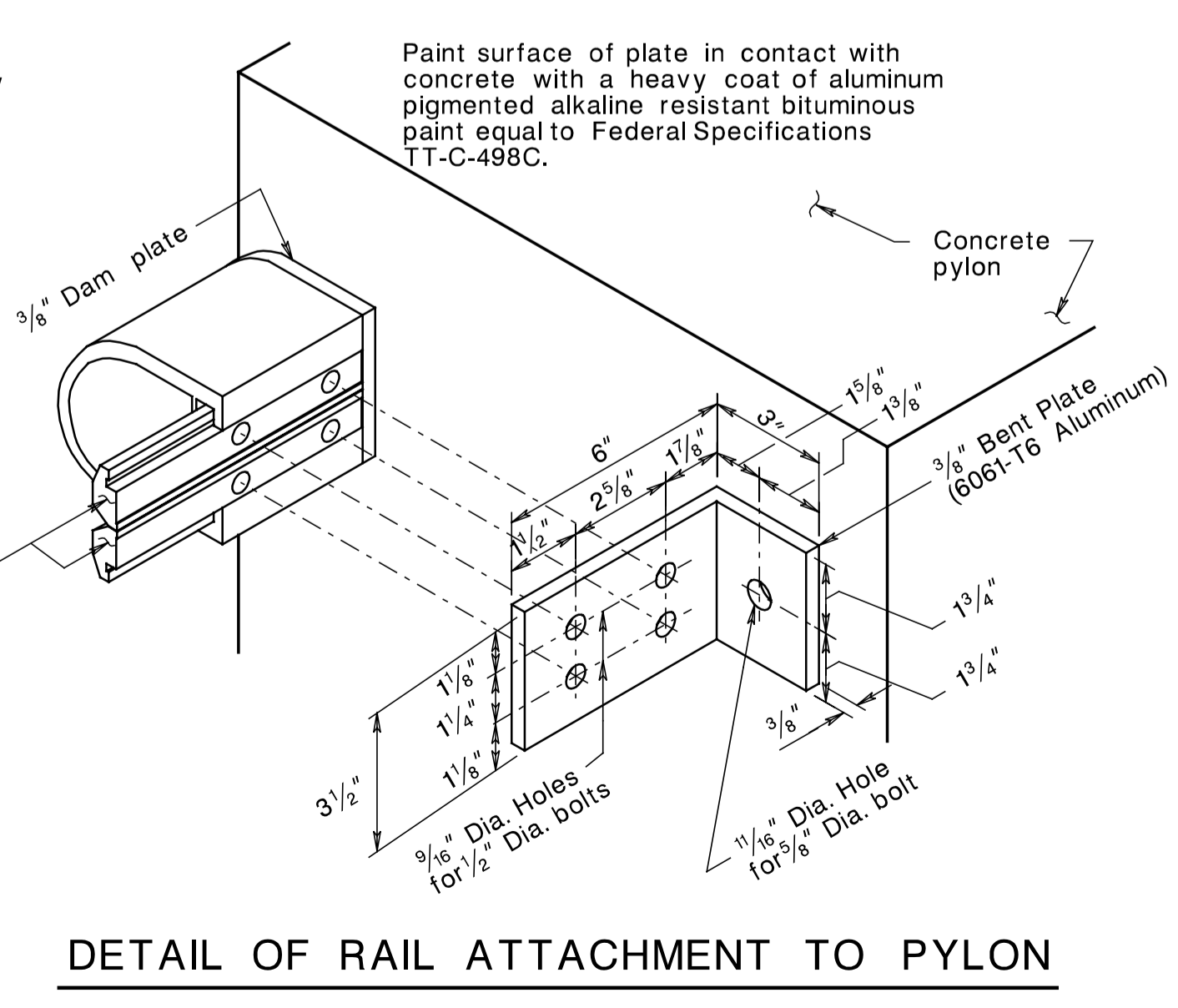
POST STEM



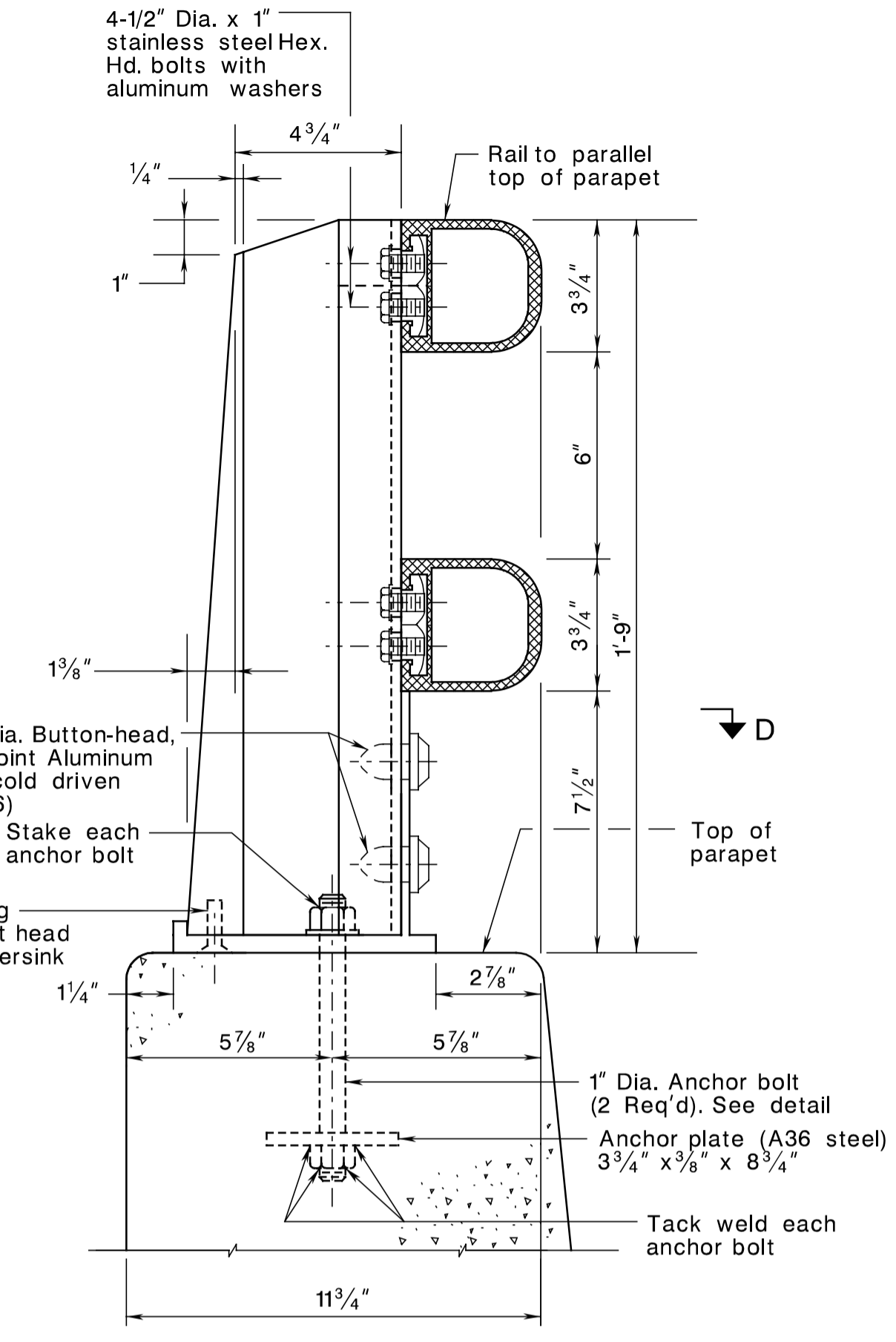
DETAIL OF RAIL SPLICE



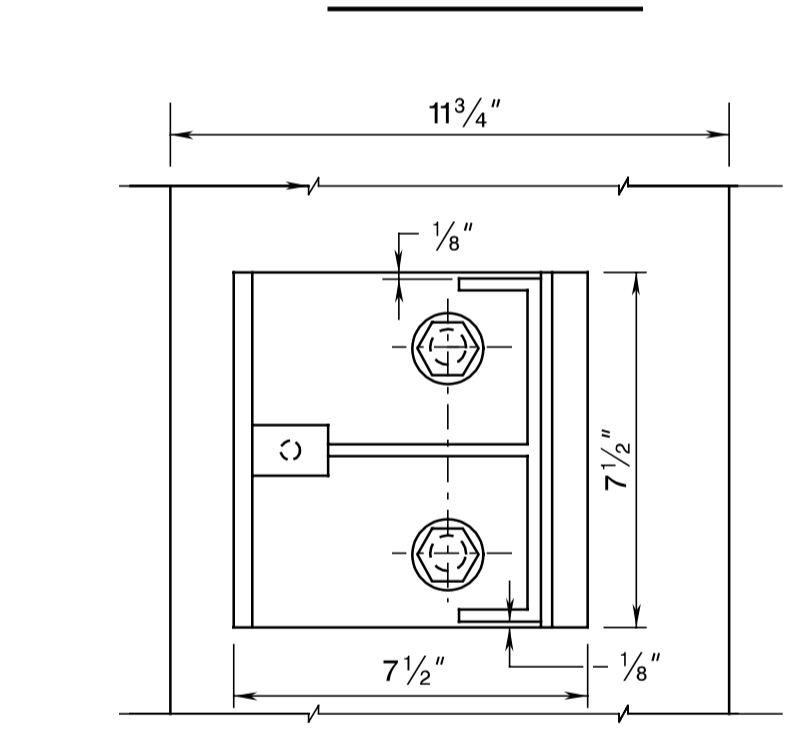
SECTION B-B



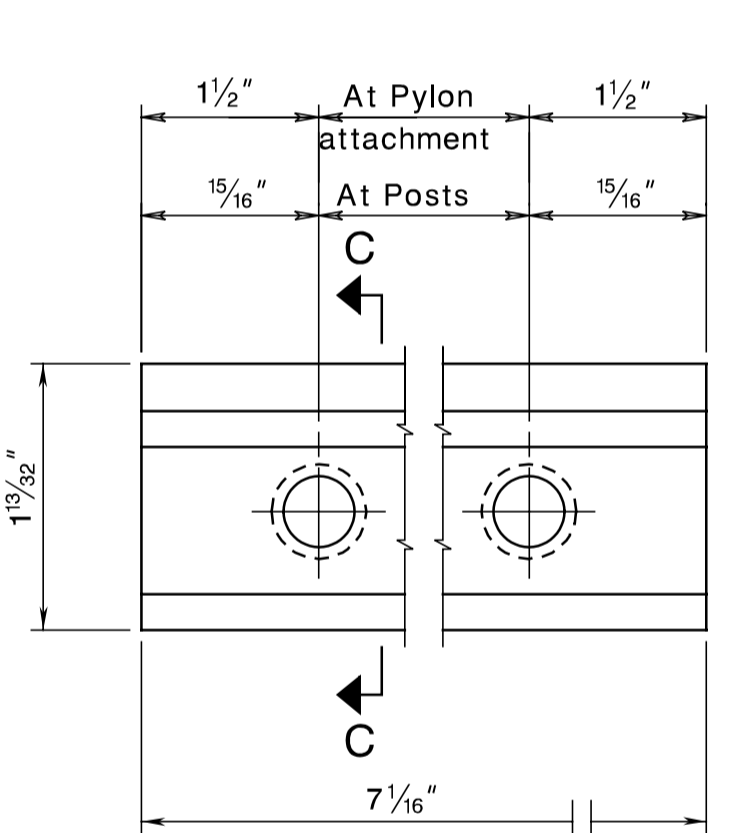
DETAIL OF RAIL ATTACHMENT TO PYLON



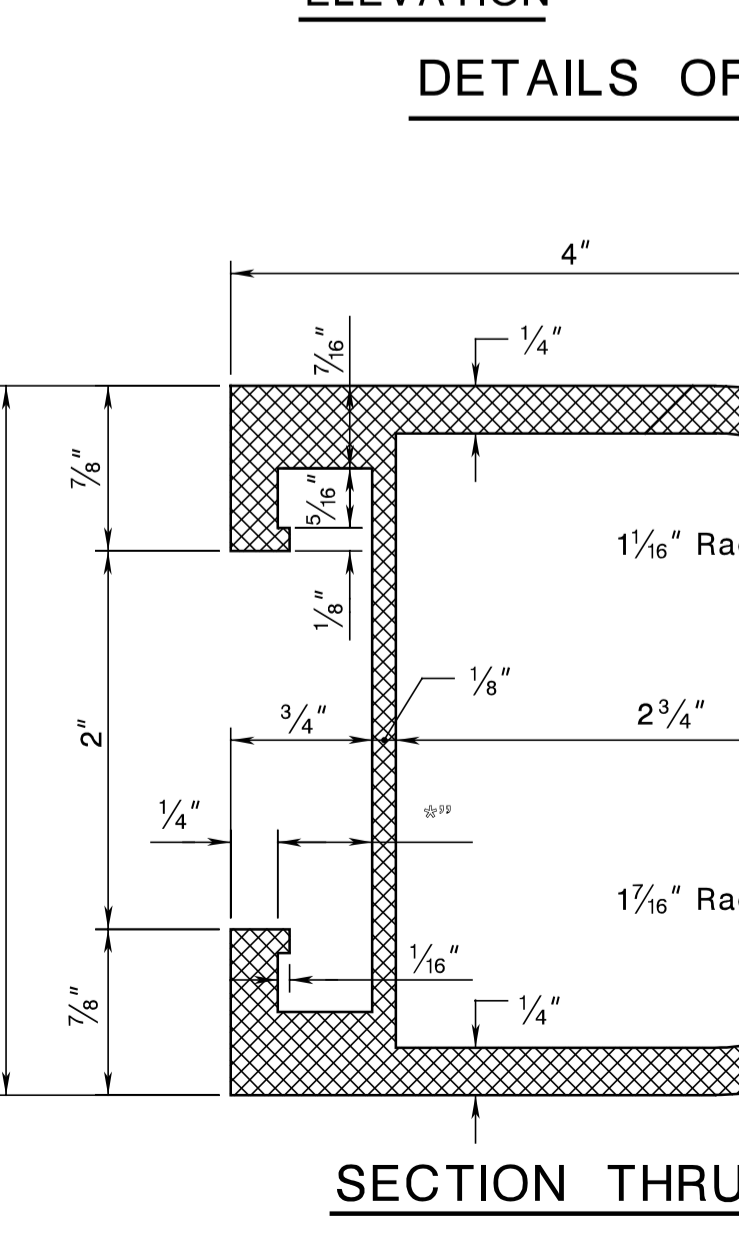
SECTION A-A



SECTION D-D



ELEVATION



SECTION THRU RAIL

ANCHOR BOLT DETAIL

DETAILS OF RAIL CLAMP

DETAILS OF RAIL CLAMP

DETAILS OF RAIL CLAMP

DETAILS OF RAIL CLAMP

DETAILS OF RAIL CLAMP

DETAILS OF RAIL CLAMP

DETAILS OF RAIL CLAMP

DETAILS OF RAIL CLAMP

DETAILS OF RAIL CLAMP

DETAILS OF RAIL CLAMP

DETAILS OF RAIL CLAMP

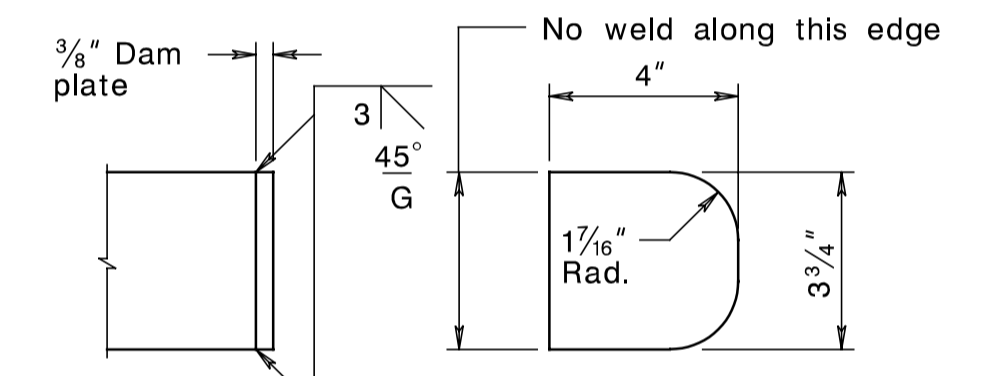
DETAILS OF RAIL CLAMP

DETAILS OF RAIL CLAMP

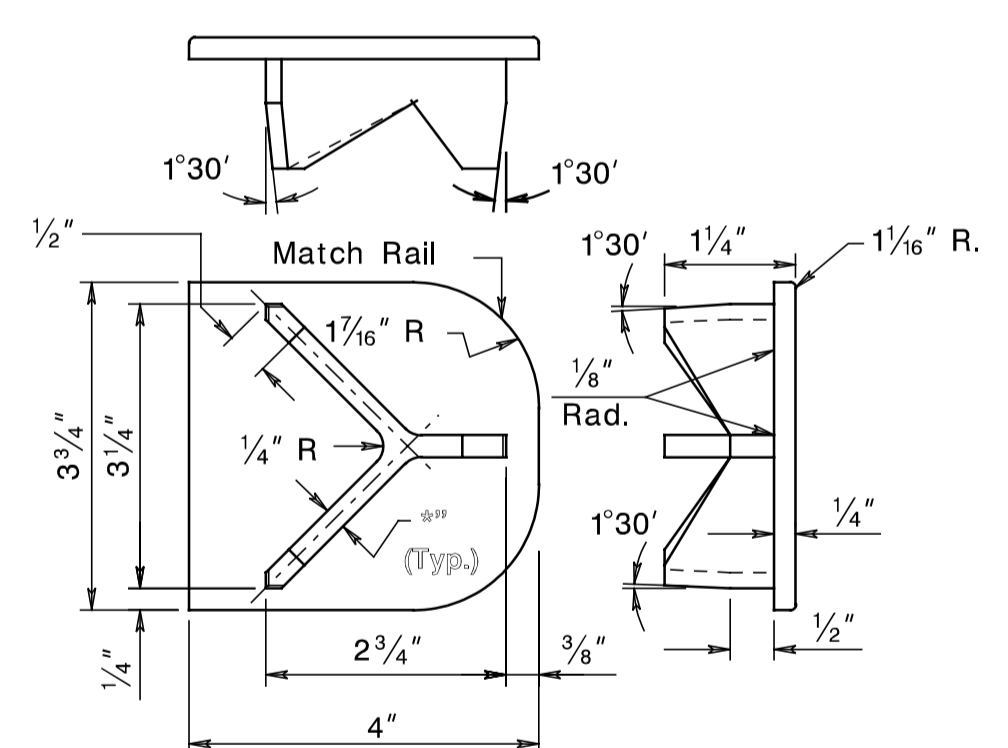
DETAILS OF RAIL CLAMP

DETAILS OF RAIL CLAMP

DETAILS OF RAIL CLAMP



DAM PLATE DETAIL



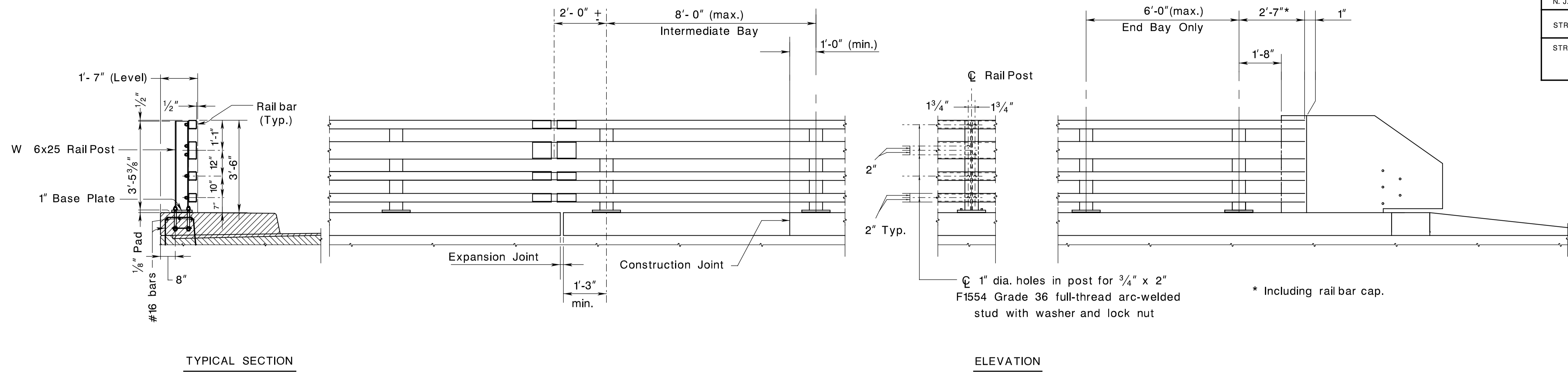
ALTERNATE DETAIL - END CAP

STANDARD DRAWING PLATE 2.1-2	
NEW JERSEY DEPARTMENT OF TRANSPORTATION BUREAU OF STRUCTURAL ENGINEERING	
2-RAIL RAILING	
ROUTE:	SECTION:
SCALE: NONE	
BRIDGE SHEET NO. B OF B	

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CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	
IN CHARGE OF	

STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			

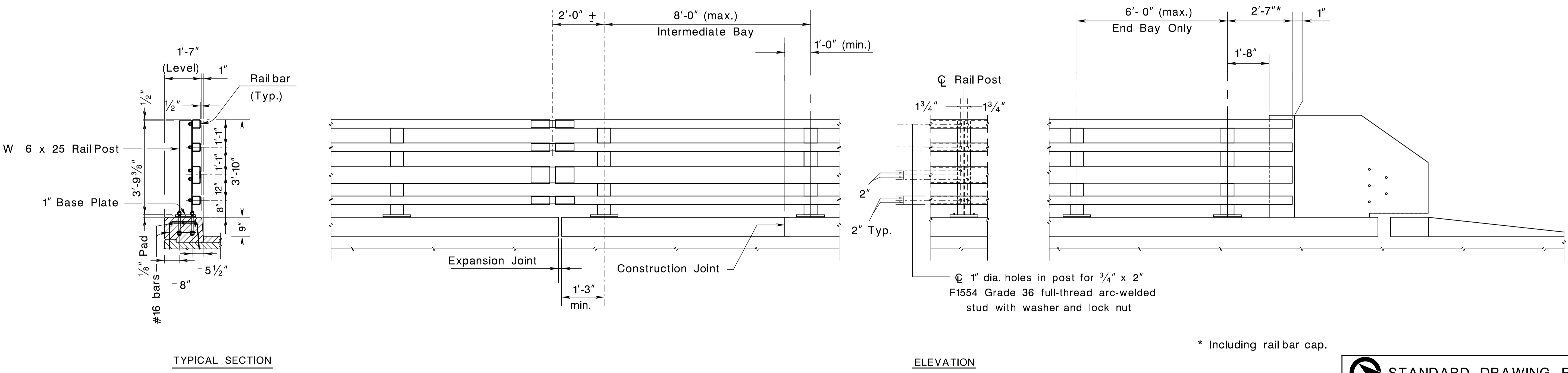


TYPICAL SECTION

ELEVATION

Rail Bars
 TS 8 x 4 x 5/16" (1)
 TS 4 x 4 x 1/4" (3)

4 - Bar Traffic/ Pedestrian Railing
STEEL BRIDGE RAILING



TYPICAL SECTION

ELEVATION

4 - Bar Traffic/ Bicycle Railing
STEEL BRIDGE RAILING

CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	
IN CHARGE OF	

BDC04MB-01

STANDARD DRAWING PLATE 2.2-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION
 BUREAU OF STRUCTURAL ENGINEERING

4 - BAR OPEN STEEL BRIDGE RAILING
 TYPICAL SECTION AND ELEVATION

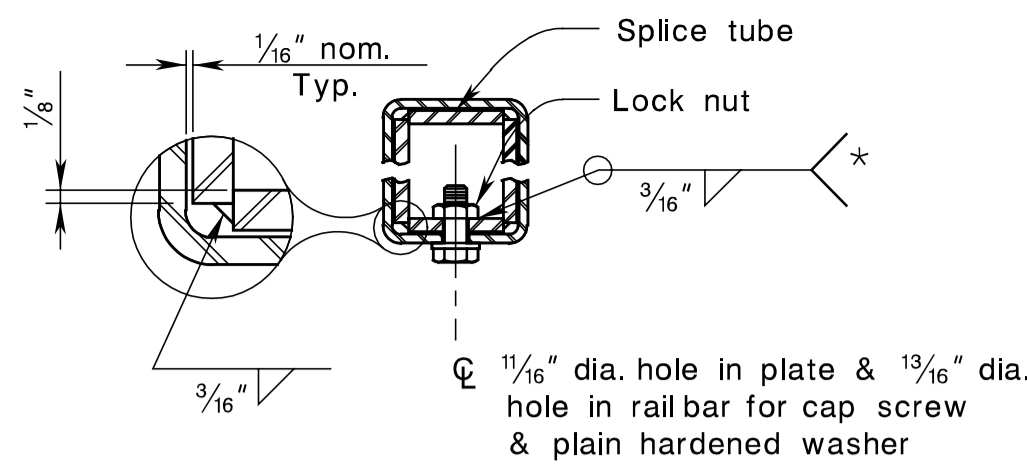
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MUNICIPALITY _____ COUNTY _____

SCALE : NONE

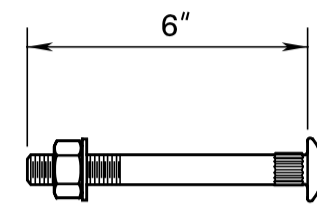
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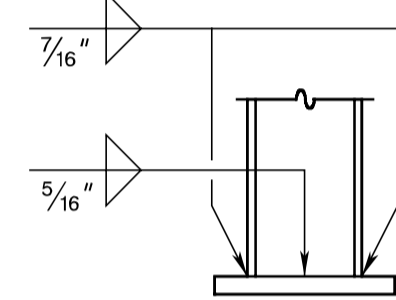


* Weld nuts to plate before assembling splice tube

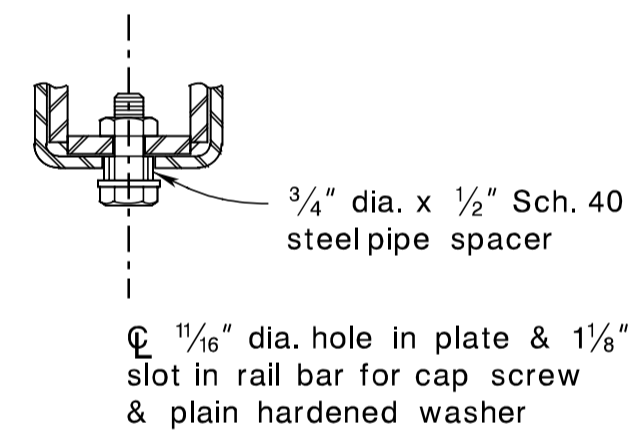
RAIL BAR SPLICE SECTION



RIBBED NECK BOLT
(with washer & lock nut)
(See Note No. 9)

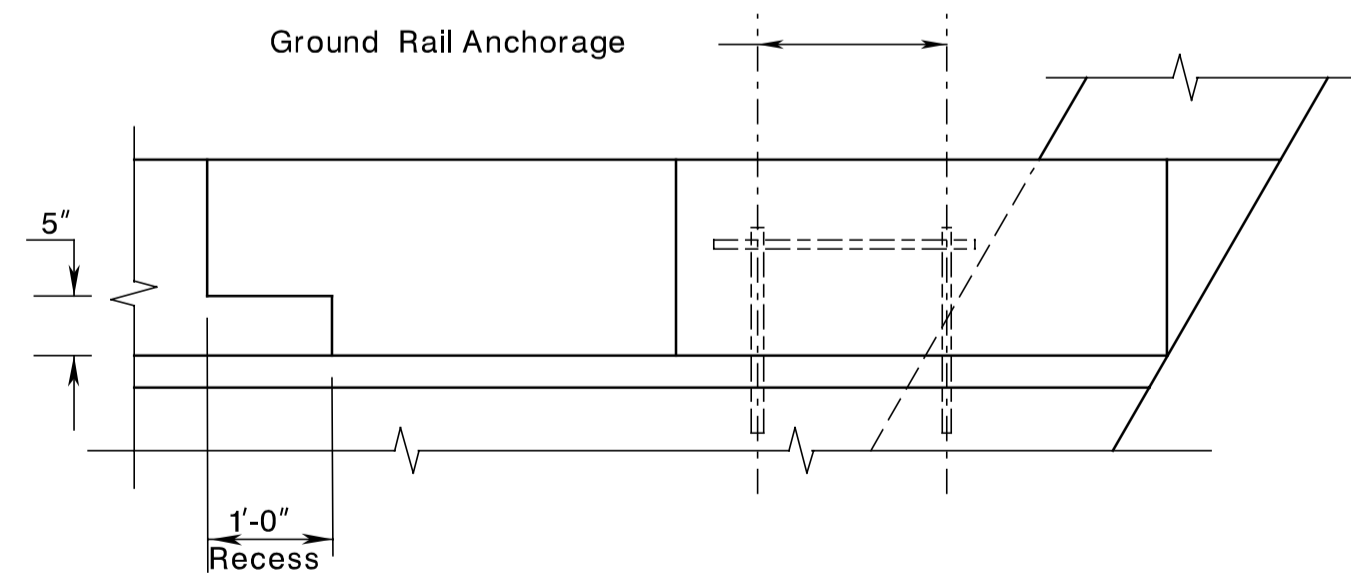


BASE WELD DETAIL

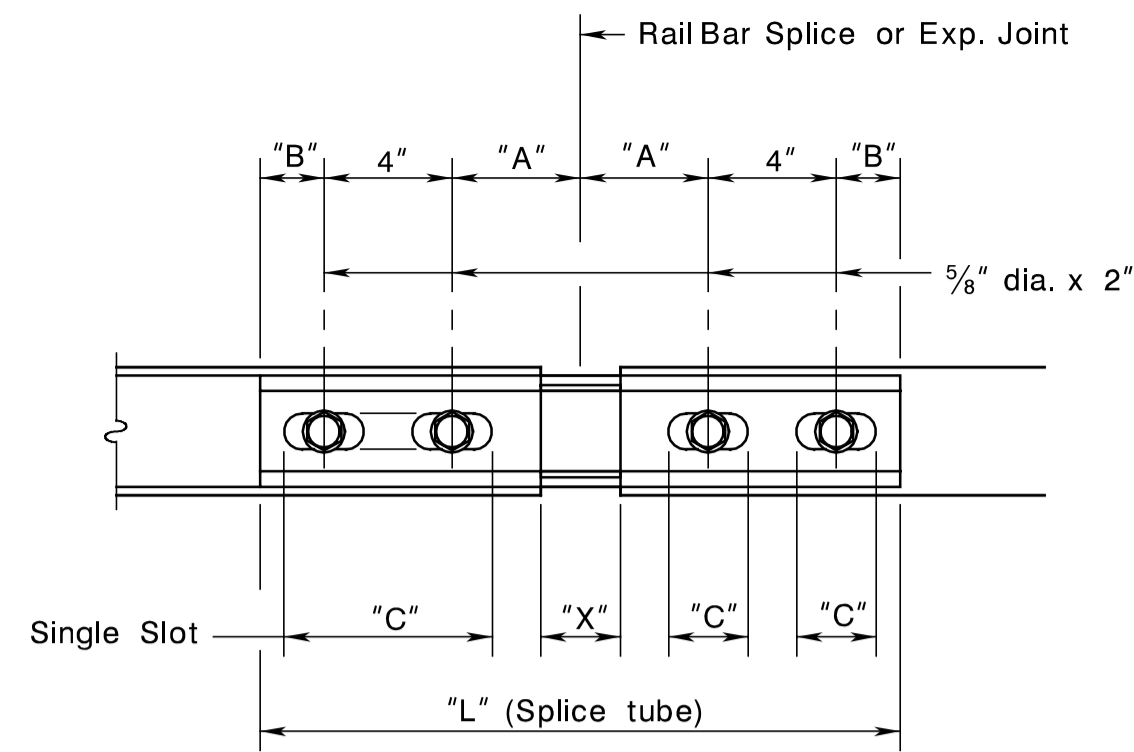


EXPANSION JOINT SECTION

For details not shown, see "Rail Bar Splice Section"



TRANSITION BARRIER PLAN
(Typical all transition barrier types)

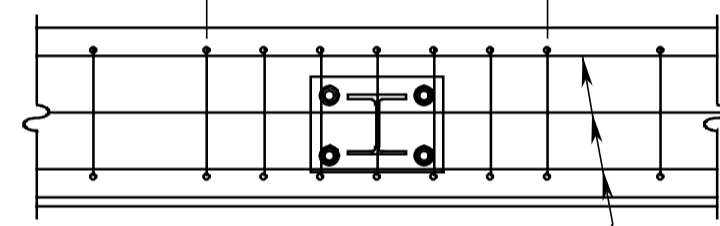
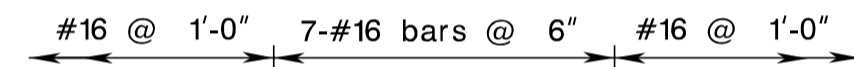


RAIL BAR SPLICE & EXPANSION JOINT DETAIL
(Bottom View)

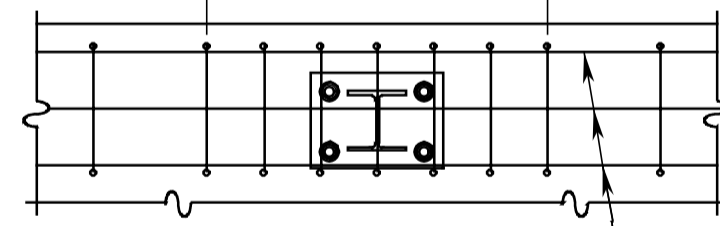
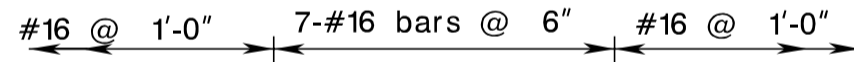
SPLICE TUBE DIMENSIONS			
	TS 8" X 4"	TS 4" X 4"	
Top & Bot. Plates	2 1/2" X 3 3/8" "L"	2 3/8" X 3 3/8" "L"	
Side Plates	6 3/4" X 3 3/8" "L"	2 7/8" X 3 3/8" "L"	

SPLICE & EXPANSION JOINT TABLE					
"T"	"A"	"B"	"C"	"L"	"X"
Splice	4"	2"	--	1'-8"	3/4"
≤ 4"	4"	2"	2 1/2"	1'-8"	2 1/2"
> 4" ≤ 6 1/2"	5 1/2"	2 1/2"	3 1/2"	2'-0"	3 3/4"
> 6 1/2" ≤ 9"	6 1/2"	3 1/2"	9" *	2'-4"	5"
> 9" ≤ 13"	8 1/2"	4 1/2"	11" *	2'-10"	7"

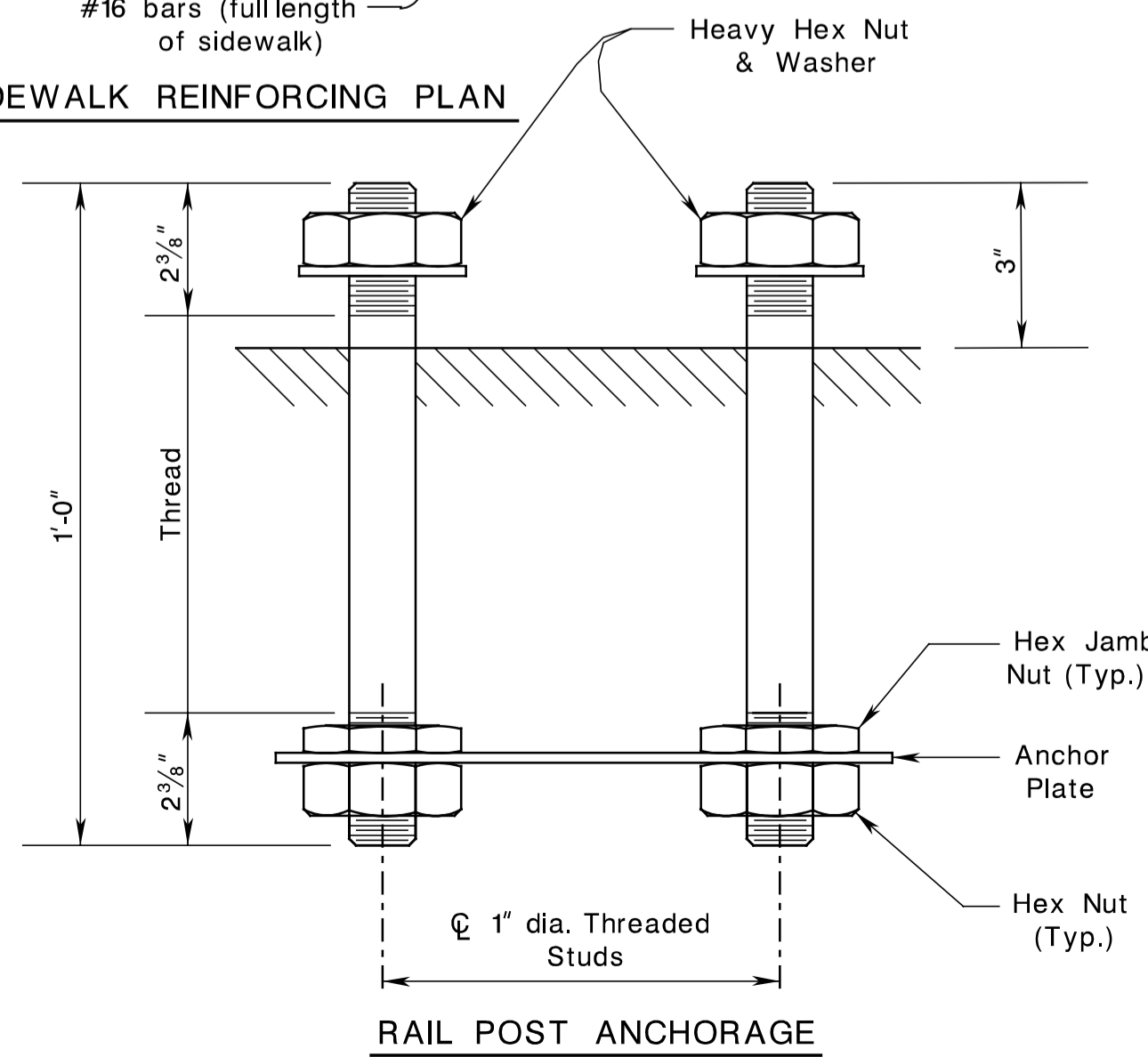
T = Total Movement * = Single Slot



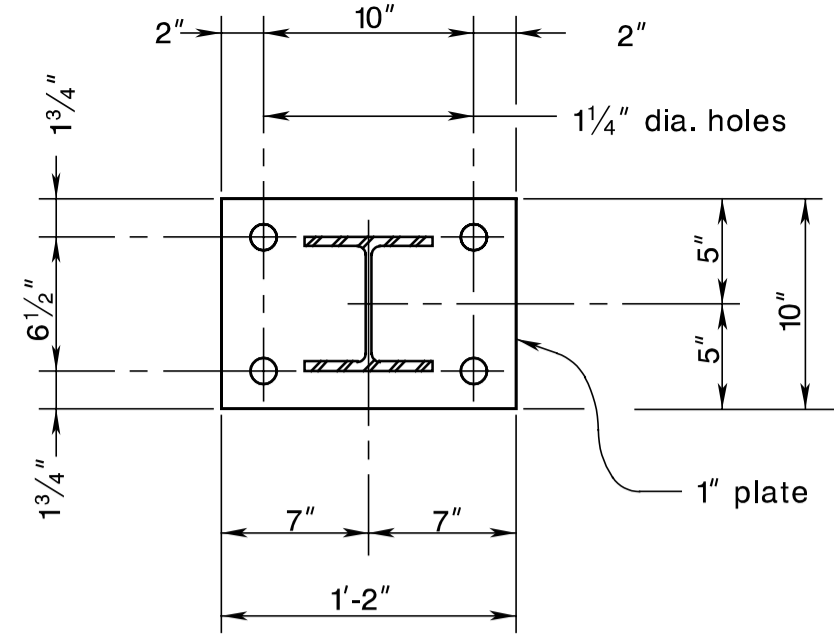
CURB REINFORCING PLAN



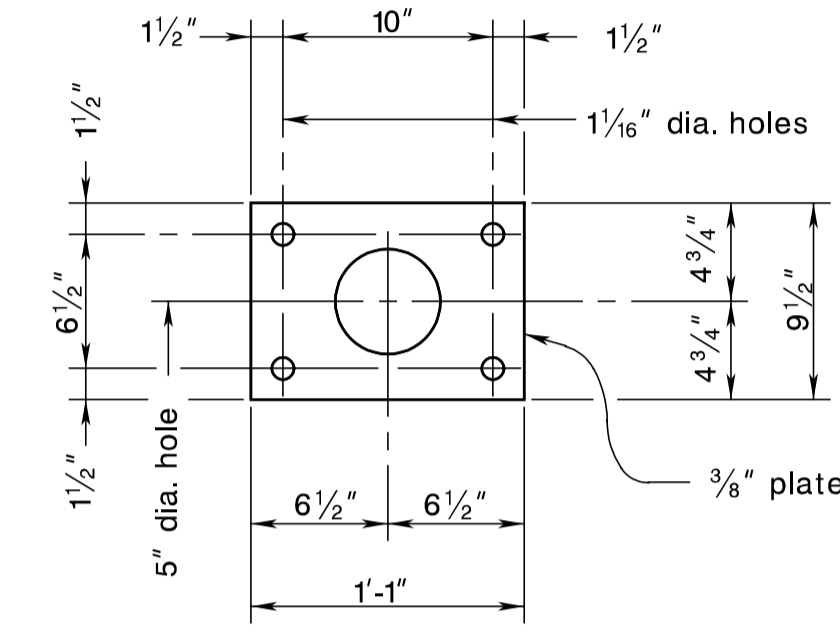
SIDEWALK REINFORCING PLAN



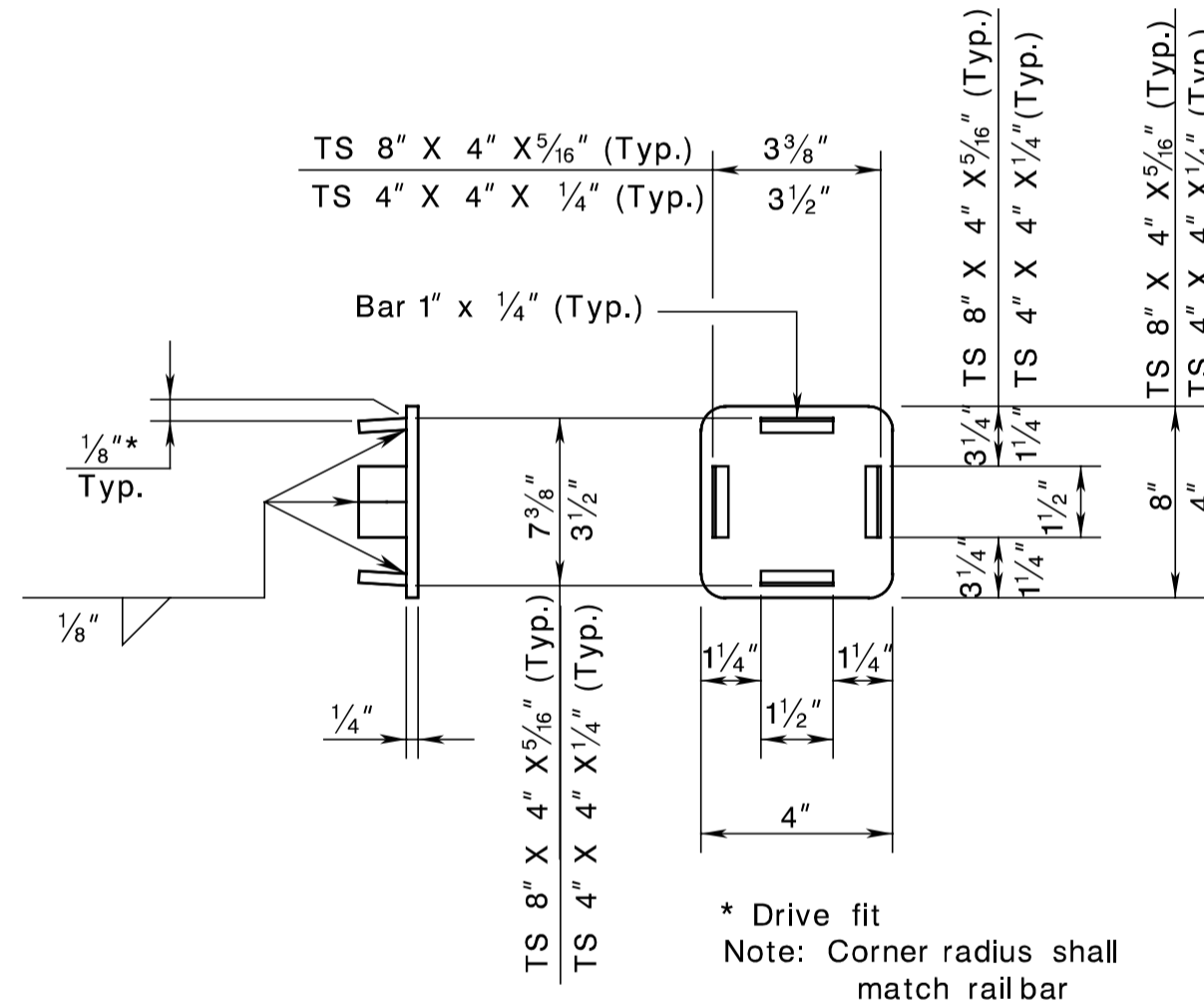
RAIL POST ANCHORAGE



POST & BASE PLATE PLAN



ANCHOR PLATE PLAN



RAIL BAR CAP

MATERIALS:

- Rail bars ----- ASTM A500, Grade B
- Rail posts ----- AASHTO M223 (ASTM A572), Grade 50
- All other shapes & plates ----- AASHTO M270 (ASTM A709), Grade 36
- Anchor studs, washers & exposed nuts ---- ASTM F1554, Grade 55
- All other bolts & nuts (unless noted) ----- ASTM F1554, Grade 36

NOTES:

- All work and materials shall conform to the provisions of Section 508 - Metal Bridge Railing and Function of the Standard Specifications for Road and Bridge Construction.
- Twenty five percent of the post-to-base welds in a production lot shall be tested by the Magnetic Particle Method. If rejectable discontinuities are found, another twenty five percent of that production lot shall be tested. If rejectable discontinuities are found in the second twenty five percent, all post-to-base welds in that lot shall be tested. Acceptance criteria shall be in accordance with the latest edition of the AWS D1.5, Bridge Welding Code.
- All exposed cut or sheared edges shall be rounded and free of burrs. The inside weld flash of tubing shall be removed at splices and expansion joints.
- Rail posts shall be set normal to grade unless otherwise shown.
- Lengths of rail bar shall be attached to a minimum of two rail posts and to at least four posts whenever possible.
- Rail bar expansion joints shall be provided in any rail bay spanning a superstructure expansion joint. Expansion joint width shall be "X" at 45° F and will be adjusted in the field by the Engineer. Refer to detail and table for dimension "X".
- All parts shall be galvanized after fabrication in accordance with AASHTO M111, except that hardware shall meet the requirements of either ASTM A153 or ASTM B695, Class 50, Type 1. Parts except hardware shall be blast-cleaned prior to galvanizing in accordance with SSPC - SP6.
- Anchor bolts or anchor bolt sleeves shall be set with a template and shall be securely placed in their final position prior to the placement of the embedding concrete. Post anchor assemblies shall be installed to within 3/16 inch of theoretical horizontal and vertical location. Post bearing areas shall be dressed smooth and true to grade. Prior to post erection, each rail post location shall be finished to the theoretical elevation determined from profile grade, cross slope and curb height and will not be acceptable until it is within 3/16 inch of theoretical elevation, as measured at the top of concrete. Preformed pads shall be used to adjust the rail posts for height and alignment. The number of preformed pads supplied shall be 10 % in excess of the theoretical minimum number required. Nuts securing the post base plate shall be tightened to a snug fit and given an additional 1/8 turn. After erection of the railing, the contractor shall clean the whole assembly, to present a neat and uniform appearance.
- Rail bars shall alternatively be attached to posts using 5/8 inch dia. - ASTM F1554, Grade 36 bolts (5/8 inch dia. - ASTM A325 bolts may be substituted) inserted through the face of the rail bar. Bolts shall be round or dome head and may be rib neck, slotted, wrench head or tension control (TC or twist-off). Holes in posts shall be 1/16 inch larger than the diameter of the bolt. Holes in rail bars shall be drilled to size as follows:

Slotted, wrench head or TC bolts ----- 1/16 inch larger than bolt diameter
Rib neck bolts ---- size appropriate to accommodate an interference fit
- All bolts for fastening the rail bars to the posts shall be 6 inch in length and shall include a flat washer under the nut.
- Holes in rail bars shall be field - drilled and shall be coated with an approved zinc-rich paint prior to erection.
- Bolts in expansion joints shall be tightened only to a point that will allow rail movement.
- If there is a conflict between these Standard Details and the Shop Drawings, the contractor shall notify the Engineer immediately.
- 1/8 inch pads under post base plate shall be fabric pads conforming to Subsection 919.02.B of the Standard Specifications.

CONTROL SECTION		JOB NO.	
DES. BY	CHK. BY		
DWN. BY	CHK. BY		
EST. BY	CHK. BY		
SPECS. BY	CHK. BY		
IN CHARGE OF			

STANDARD DRAWING PLATE 2.2-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

**4 - BAR OPEN STEEL BRIDGE RAILING
DETAILS**

ROUTE : SECTION :

MUNICIPALITY COUNTY

SCALE : NONE
BRIDGE SHEET NO. OF

BDC04MB-01

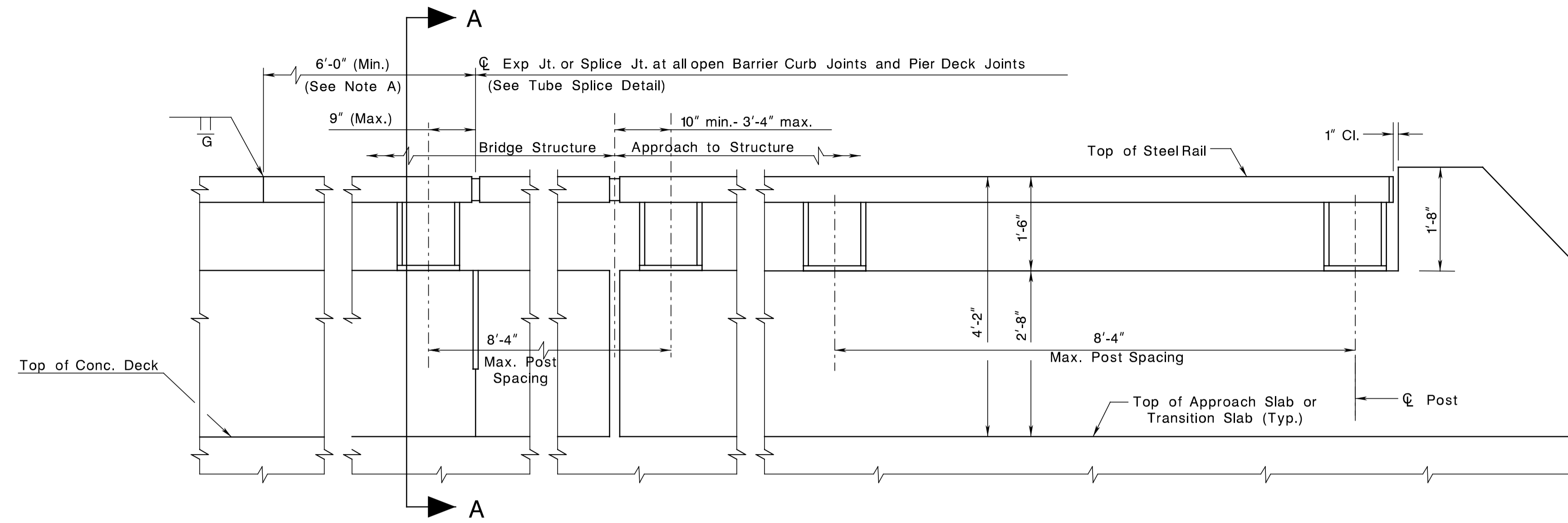
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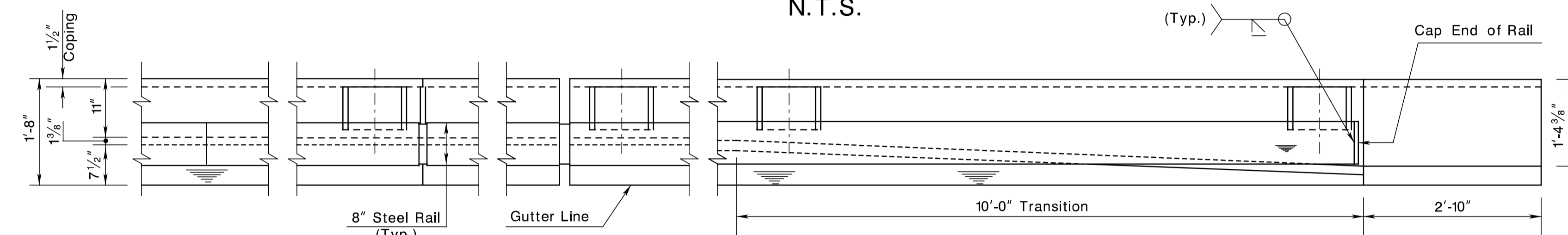
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STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			



PARAPET ELEVATION VIEW

N.T.S.



PARAPET PLAN VIEW

NOTE:

A. One shop splice per panel permitted with minimum 85 percent penetration. Weld flaws resulting in no less than 60 percent penetration are permissible in the upper and lower 90 degree quadrants of the members. The weld may be square groove, double vee groove, or single groove and shall be ground smooth.

GENERAL NOTES:

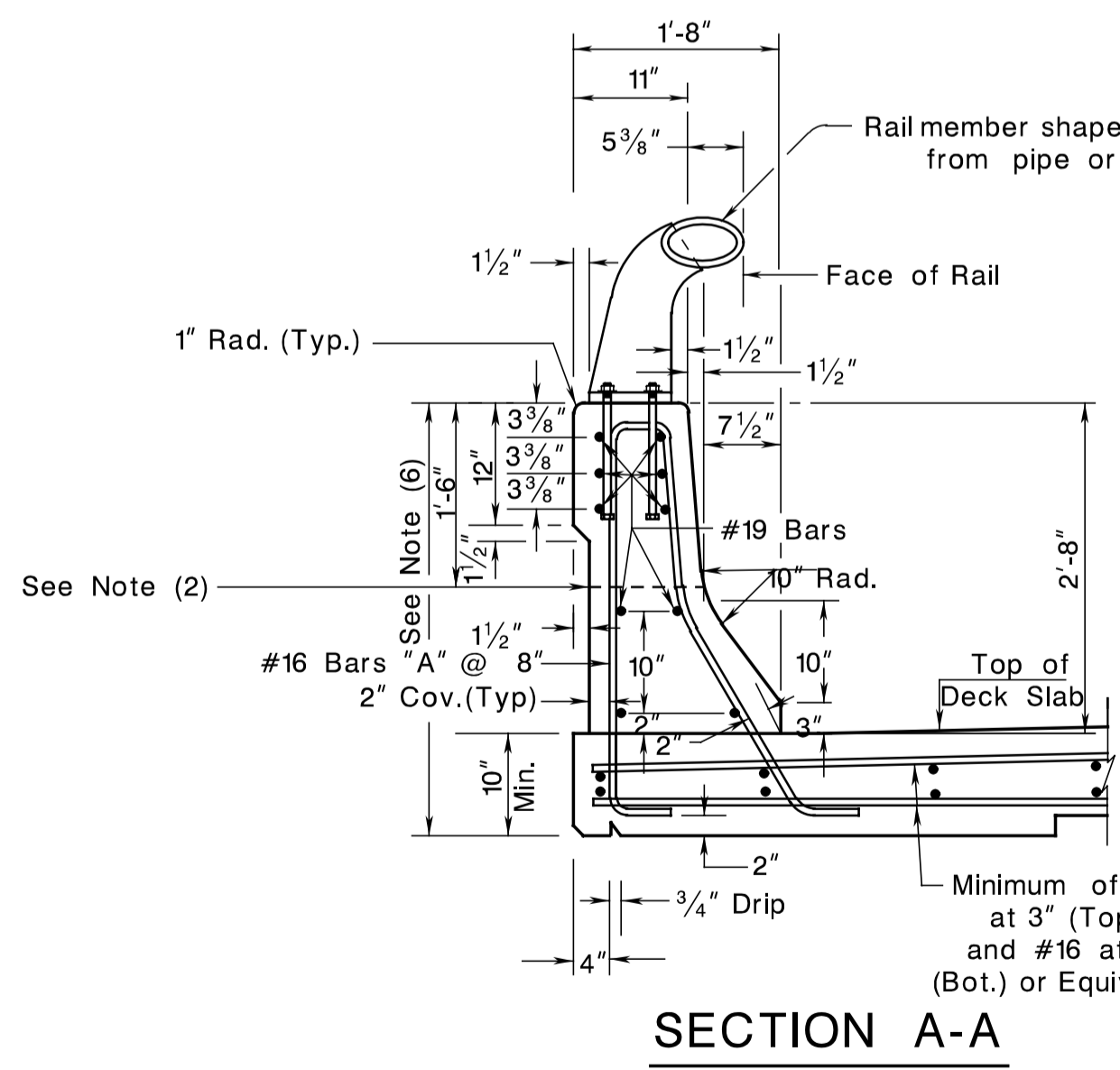
- 3/16" open deflection joint shall be provided in parapets at intervals not exceeding 20'-0" and contraction joints shall be provided at the midpoint between the open joints.
- The 3/16" open joint shall stop at the line indicated and a contraction joint shall be provided below that line.
- Full depth joints shall be provided at the transverse deck joint opening width. The full depth joint opening width shall equal the transverse deck joint opening width.
- All reinforcement bars in parapet shall be corrosion protected. (Refer to section 26 of this manual for types of corrosion protected reinforcement steel that can be used)
- Permanent metal stay-in-place forms not permitted in the deck overhang area.
- Fascia rustication and/or configuration as per specifications.
- For additional reinforcement that is required to prevent concrete cracking in the overhang portions of the deck slab see Detail 1 in Standard Drawing 2.2-4.
- All steel components including bolts, nuts, and washers shall be galvanized unless otherwise shown on the plans.
- Anchor bolts shall be 7/8" dia. ASTM F1554 bolts with one hex nut and one 2 1/4" O.D. washer (3/16" min. thickness) plus one 1 3/4" O.D. hardened steel washer (1/8" Min. thickness) at each bolt. Nuts shall conform to A563 requirements.
- The pipe may be slotted to fit plates in lieu of cutting plates to fit pipe, except plates adjacent to tube splice.
- The plates shall be AASHTO M 270, Grade 36.
- The payment for the railing shall be made under the pay item "HEAVY TRUCK PARAPET STEEL RAILING".

TUBE & SLEEVE MEMBERS

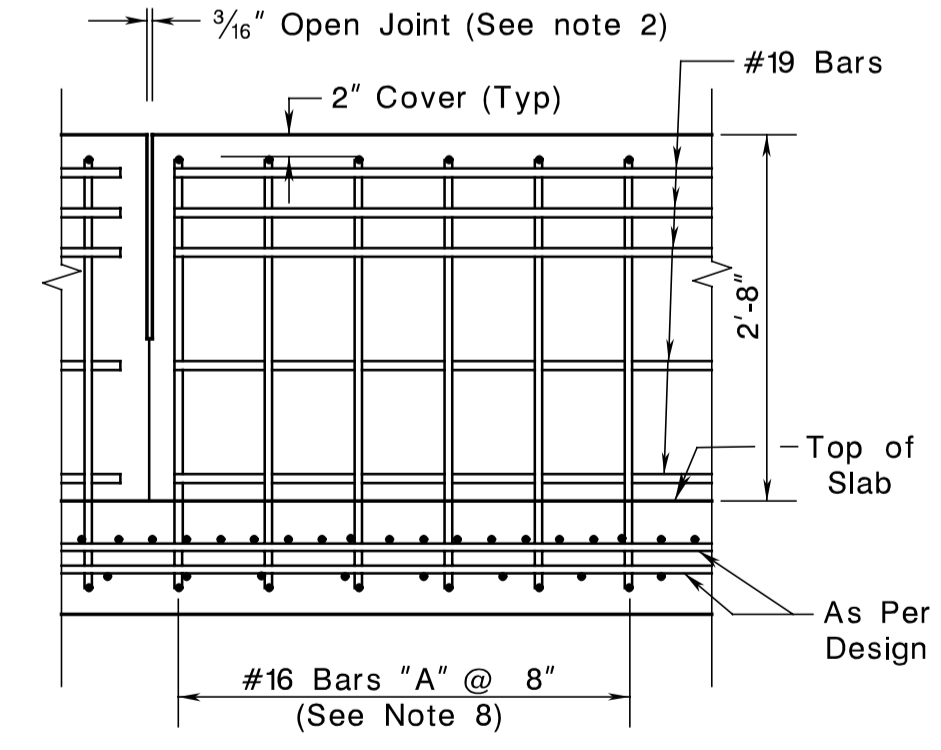
8" x 4 7/8" Ellipse	Splice Member	
Material	Material	Thickness
6" Dia Std Pipe ASTM-A53 E or S Gr B)	ASTM-A53-B	0.353"
	A36 or A500 Gr B	0.339"
6 7/8" O.D. x 0.188" Tube API-5LX52	API-5LX52	0.224"
	ASTM-A53-B	0.339"
	A36 or A500 Gr B	0.325"
	API-5LX52	0.216"

NOTES:

- Other sections of equal or greater strength are acceptable for sleeves.
- The major and minor diameters of the rail member may vary +/- 0.1875 inches from plan dimension. However, the difference between the outside diameters of the sleeve and the inside diameters of the rail shall not exceed 0.125 inches along the major or minor axis. Gaps exceeding this amount up to 0.25 inches are permissible along the 45° axes of the sleeves.

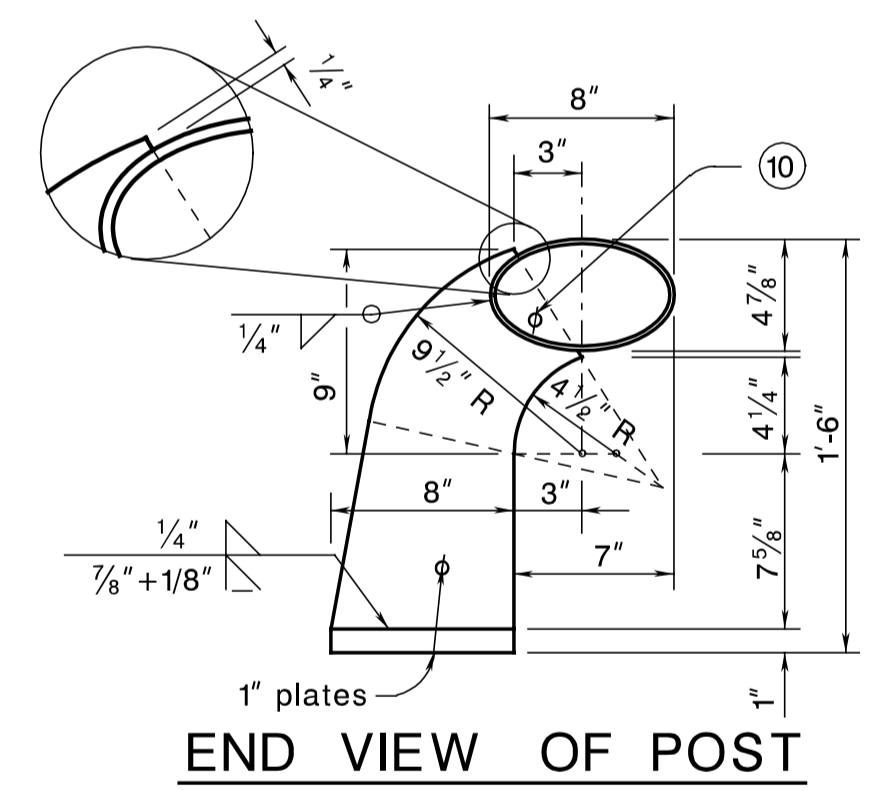


SECTION A-A

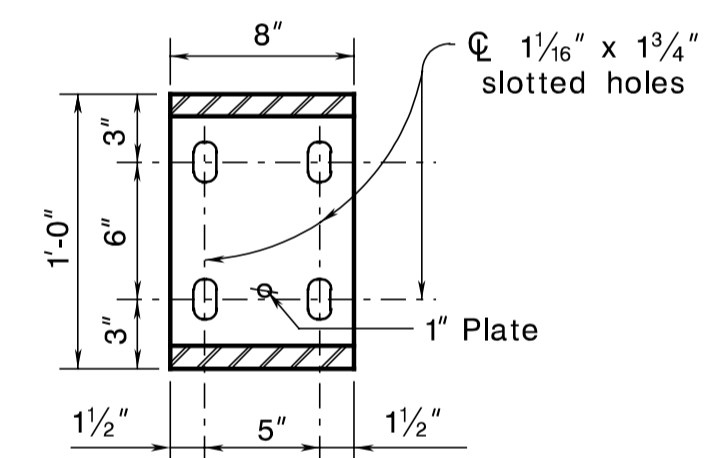


ELEVATION

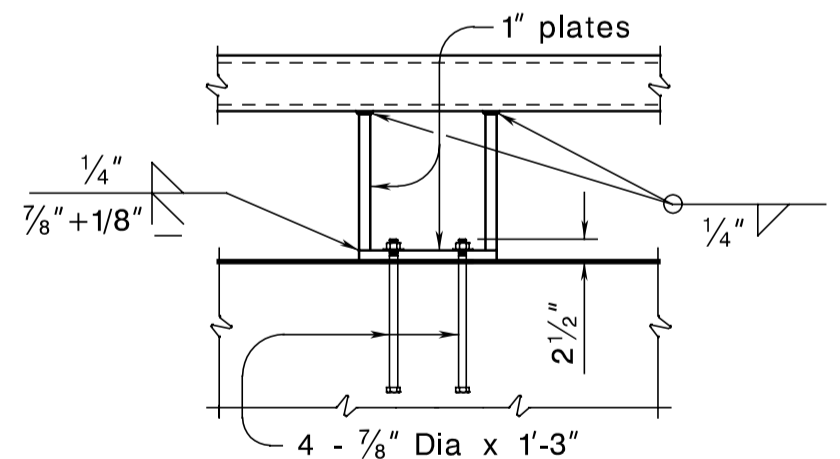
(Showing Reinforcement)



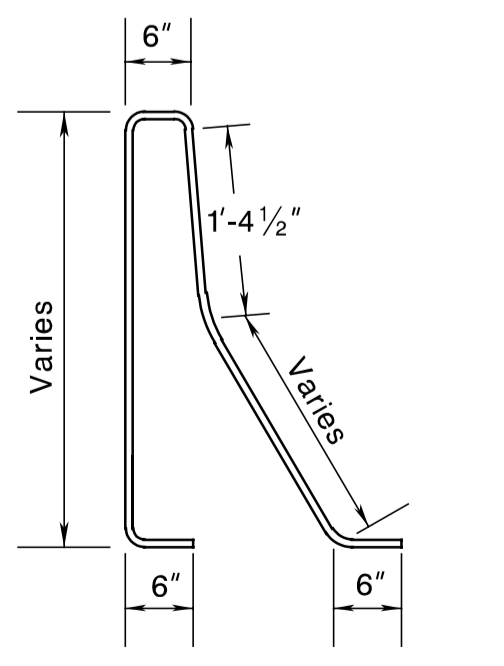
END VIEW OF POST



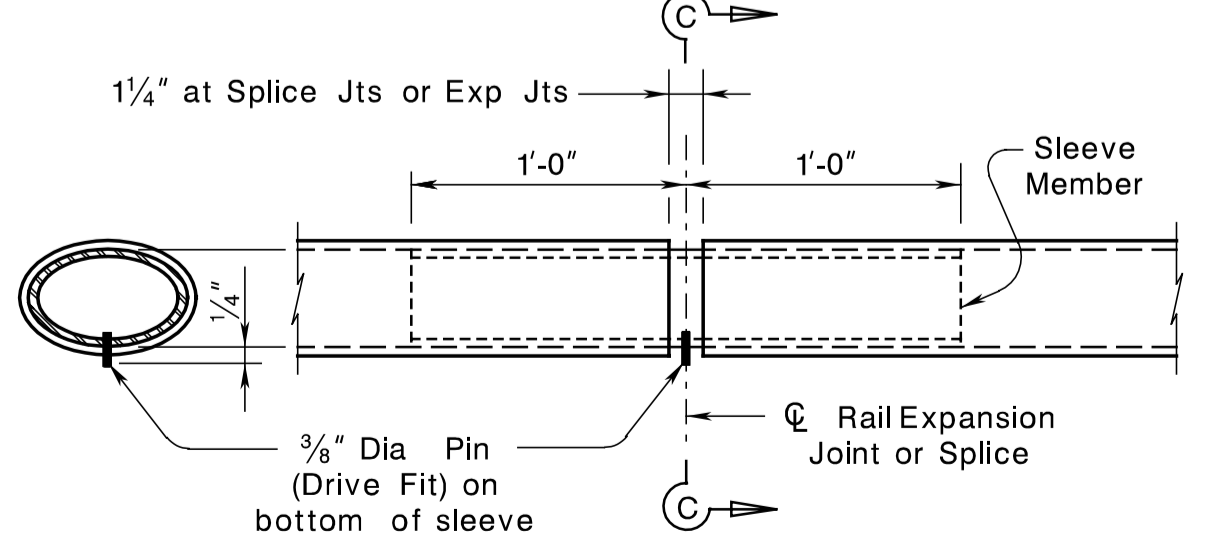
BASE PLATE DETAIL



POST ELEVATION



BAR "A" BENDING DETAIL



SECTION C-C AT SPLICE OR EXP JTS

TUBE SPLICE DETAIL

CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	CHK. BY
IN CHARGE OF	

BDC04MB-01

STANDARD DRAWING PLATE 2.2-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

**4'-2" HIGH
HEAVY TRUCK PARAPET**

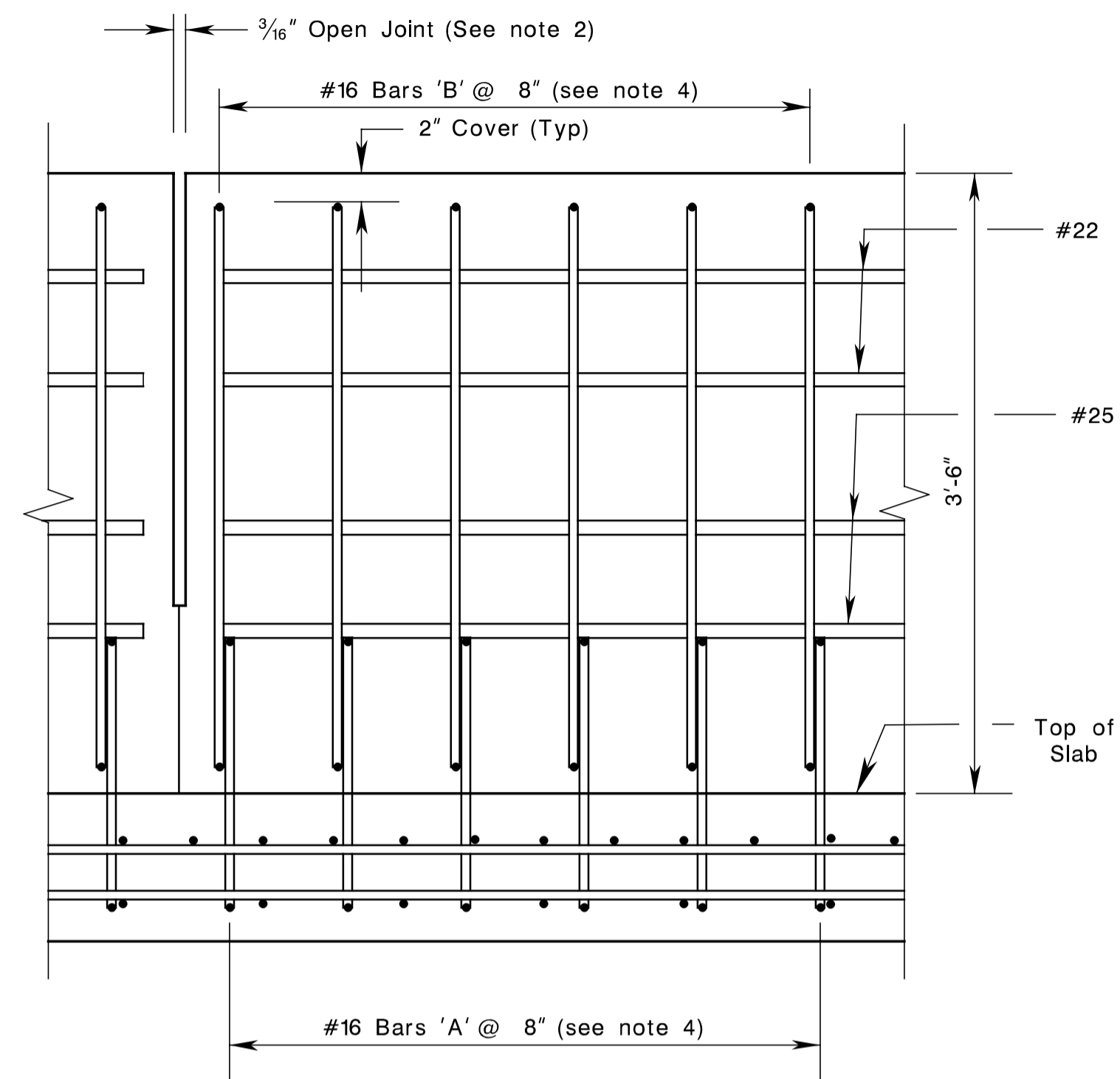
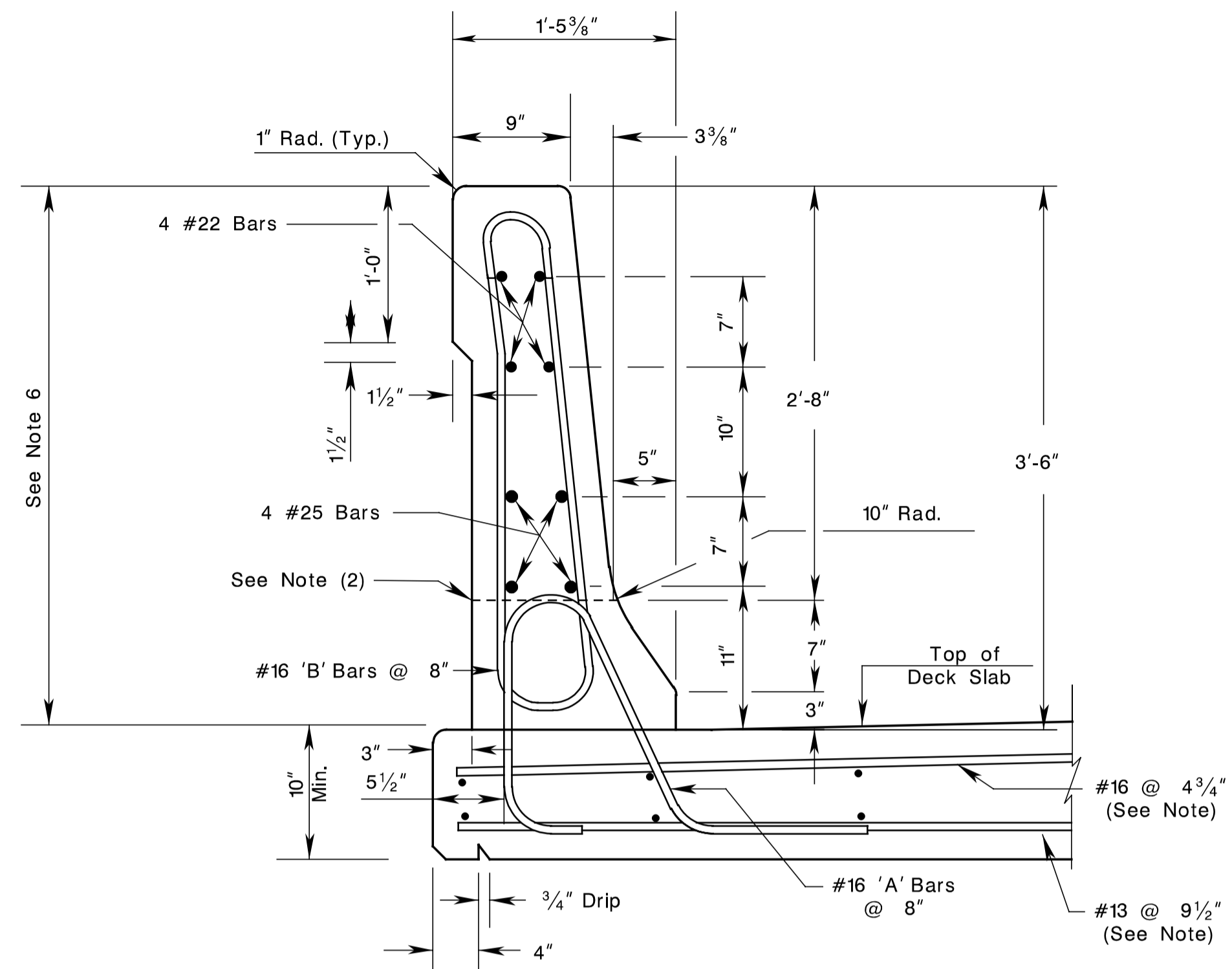
ROUTE: SECTION:

SCALE : NONE

BRIDGE SHEET NO. B OF B

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ID = 1641230

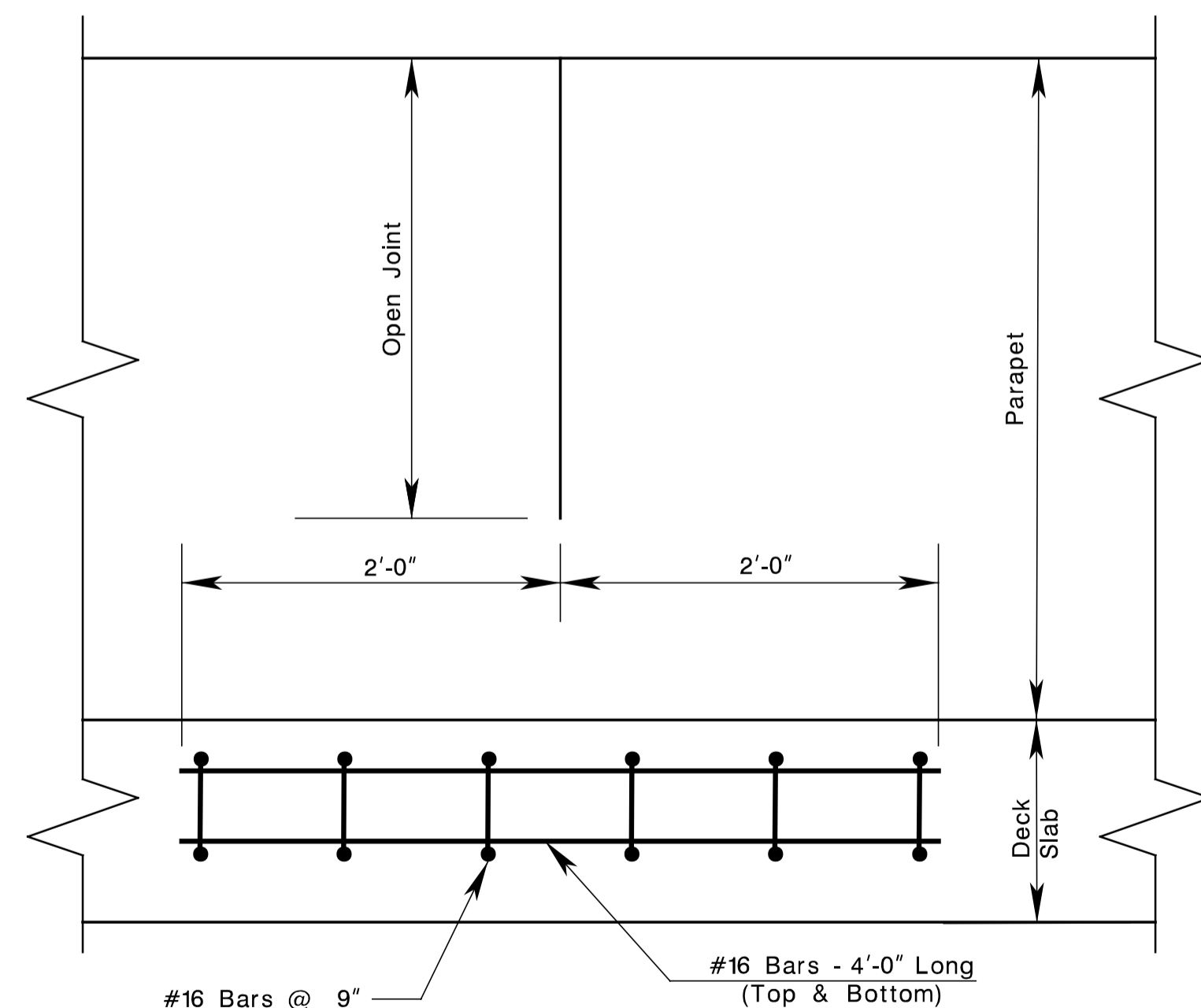
STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			



GENERAL NOTES:

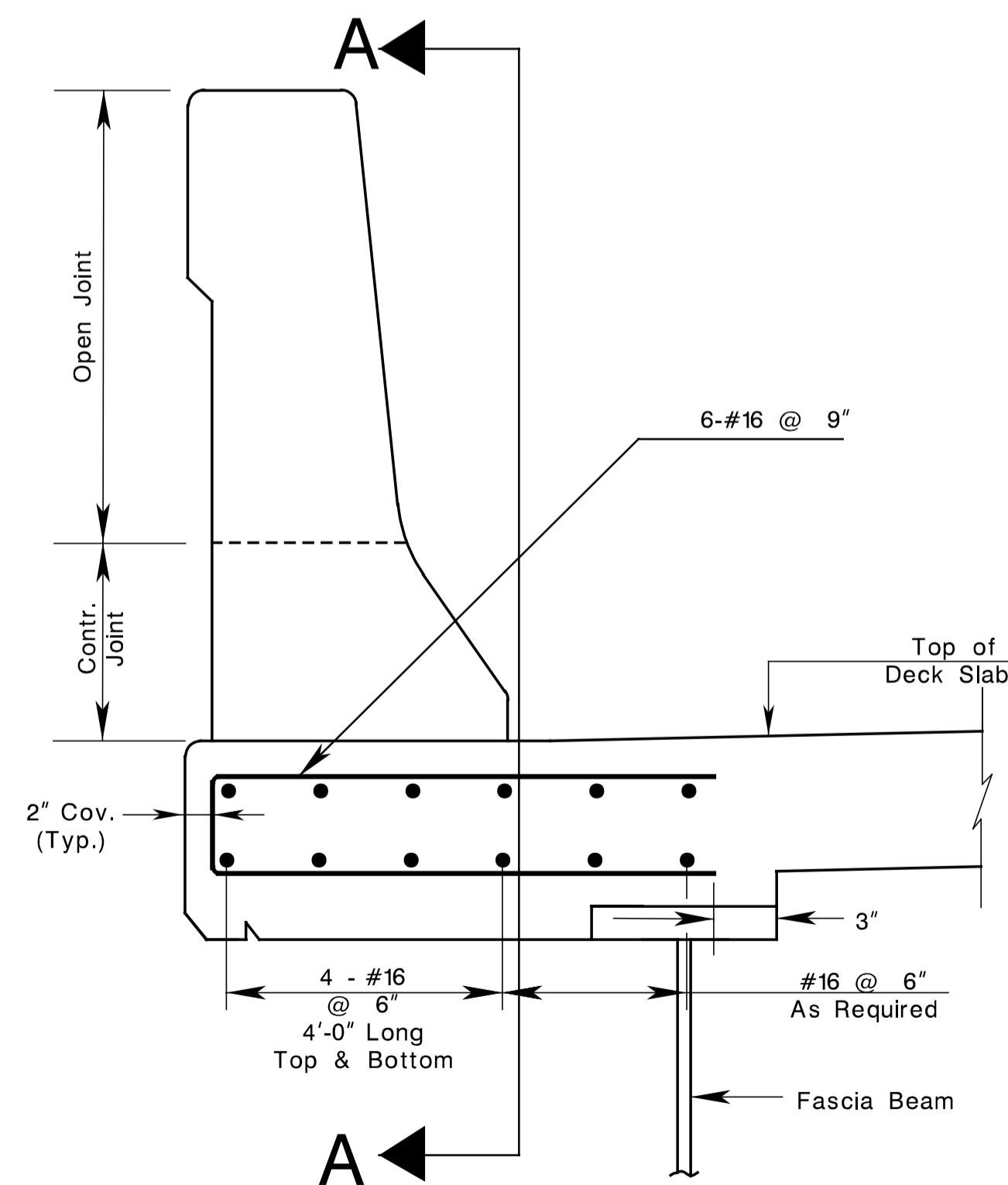
- 3/16" open deflection joint shall be provided in parapets at intervals not exceeding 20'-0" and contraction joints shall be provided at the midpoint between the open joints.
- The 3/16" open joint shall stop at the line indicated and a contraction joint shall be provided below that line.
- Full depth joints shall be provided at location of transverse deck joints. The full depth joint opening width shall equal the transverse deck joint opening width.
- All reinforcement bars in parapet shall be corrosion protected. (Refer to section 26 of this manual for types of corrosion protected reinforcement steel that can be used)
- Permanent metal stay-in-place forms not permitted in the deck overhang area.
- Fascia rustication and configuration as per Specifications.
- For additional reinforcement that is required in the vicinity of parapet joints to prevent concrete cracking in the overhang portions of the deck slab see Detail 1.

3'-6" HIGH F-SHAPE PARAPET

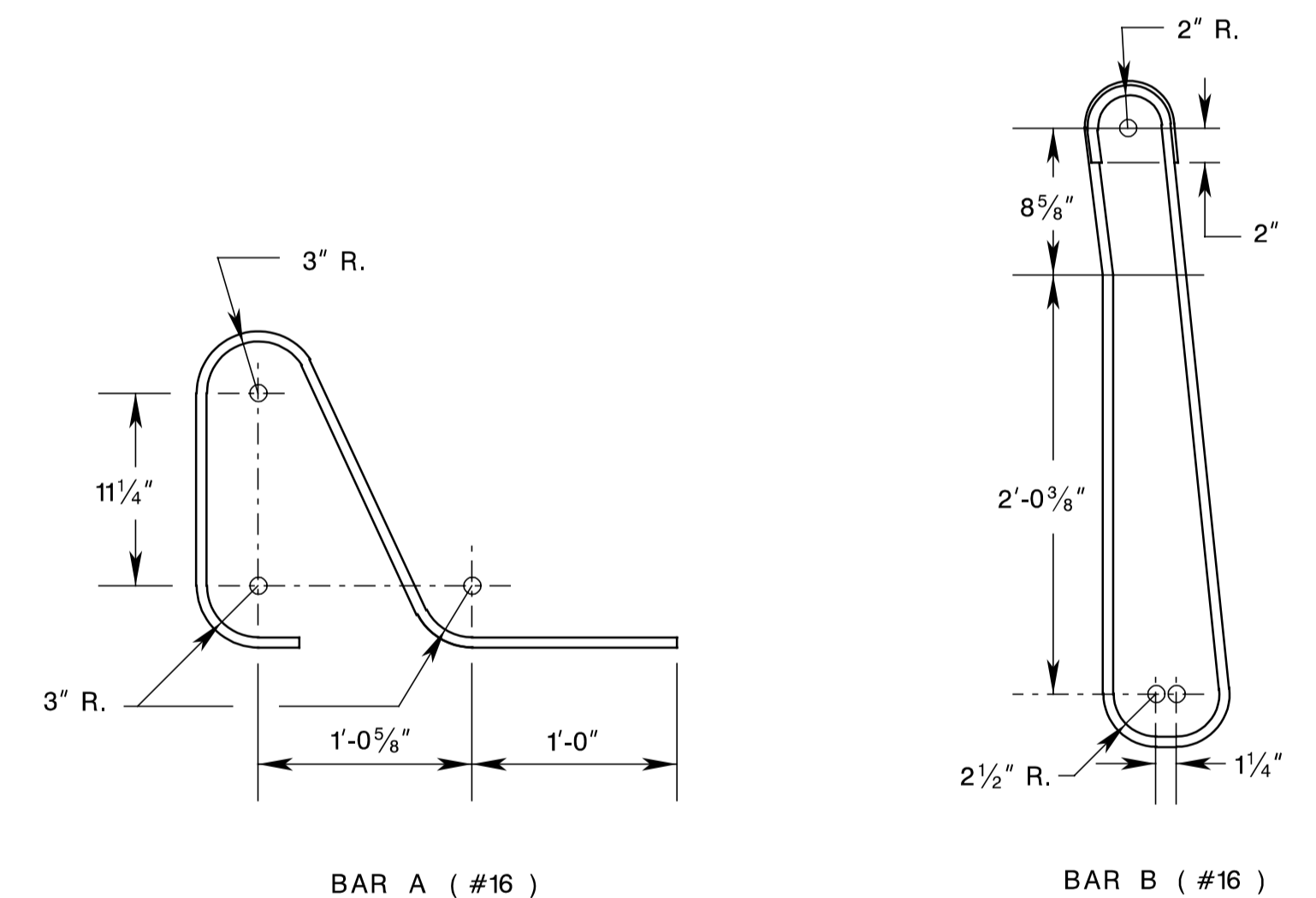


SECTION A-A

ELEVATION (Showing Reinforcement)



**DETAIL 1
DECK REINFORCEMENT AT
PARAPET JOINTS**



BAR BENDING DETAILS

CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	CHK. BY
IN CHARGE OF	

BDC04MB-01

STANDARD DRAWING PLATE 2.2-4

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

**3'-6" HIGH F-SHAPE
PARAPET DETAILS**

ROUTE: SECTION:

SCALE : NONE

BRIDGE SHEET NO. B OF B

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ID = 16412300

STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			

NOTES TO DESIGNER:

- THE DESIGNER SHALL COMPLETE ALL TITLE BLOCK INFORMATION AND ITEMS DESIGNATED WITH (D) PRIOR TO INCLUDING ANY OF PLATES 2.4-1 THROUGH 2.4-5 INTO THE CONTRACT PLANS.
- END DIAPHRAGMS SHALL BE PLACED PARALLEL TO THE SKEW ANGLE.
- FOR INTERMEDIATE DIAPHRAGM spacings and details see Standard Drawing Plate 2.4-5.
- END DIAPHRAGM WIDTH SHALL BE 9" AND 8" RESPECTIVELY FOR THE 45" AND 54" PRESTRESSED CONCRETE I BEAMS.
 - END DIAPHRAGM WIDTH SHALL BE 12" AND 10" RESPECTIVELY FOR THE 63" AND 72" PRESTRESSED CONCRETE I BEAMS.
- MILD STEEL REINFORCEMENT DESIGNATED AS BAR NUMBERS R4 AND R6 AT THE ENDS OF THE BEAM SHALL BE PER DESIGN REQUIREMENTS AND SHALL BE A MINIMUM OF #16 BARS. MILD STEEL REINFORCEMENT LOCATIONS AND SPACINGS SHALL BE VERIFIED FOR EACH BEAM TO INSURE REQUIRED CONCRETE CLEAR COVER AND TO AVOID CONFLICTS WITH PRESTRESSING STEEL.
- STANDARD PLATES 2.4-1 THROUGH 2.4-5 APPLY TO SIMPLY SUPPORTED NON-CONTINUOUS BEAMS. ADDITIONAL REINFORCEMENT, INCLUDING SHEAR REINFORCEMENT, MAY BE REQUIRED FOR CONTINUOUS AND FOR LIVE LOAD CONTINUOUS APPLICATIONS AND SHALL BE DESIGNED ACCORDINGLY.
- A CAMBER DIAGRAM, FIG. 1, AND AN ESTIMATED CAMBER TABLE FIG. 2, SHALL BE SHOWN ON THE FRAMING PLAN OR THE BEAM DETAILS SHEET. ALL CAMBERS SHOWN SHALL BE IN INCHES. THE FOLLOWING CAMBER VALUES SHALL BE PROVIDED AT QUARTER POINTS ALONG THE BEAM SPAN LENGTH:

A_{REL} = ESTIMATED PRESTRESS CAMBER AT RELEASE LESS DEFLECTION DUE TO DEAD LOAD OF BEAM TIMES CREEP FACTOR.

A_{EREC} = ESTIMATED PRESTRESS CAMBER AT RELEASE LESS DEFLECTION DUE TO DEAD LOAD OF BEAM.

B = DEFLECTION DUE TO DEAD LOAD OF SLAB, PERMANENT STEEL BRIDGE DECK FORMS, PARAPETS, SIDEWALKS, MEDIANS, RAILING, UTILITIES AND FUTURE PAVING.

C = NET FINAL CAMBER (A_{EREC} -B)

CAMBER IN PRESTRESS BEAMS ARE TIME DEPENDENT AND THEREFORE ARE APPROXIMATE. A, B, AND C ARE THEORETICAL VALUES AND MAY VARY WITH ACTUAL CONCRETE STRENGTH, VARIOUS PRESTRESSING CONDITIONS, CREEP FACTOR AND PRESTRESS LOSSES.

THE FOLLOWING STATEMENTS SHALL BE INCLUDED ALONG WITH THE CAMBER DIAGRAM AND THE ESTIMATED CAMBER TABLE:

- "THE ERECTION CAMBER SHALL BE CHECKED BY THE CONTRACTOR IN THE FIELD TO ESTABLISH PROPER CONCRETE HAUNCH AND DECK ELEVATIONS."
- "SHOP DRAWINGS SHALL INCLUDE CALCULATIONS OF PRESTRESS LOSSES FOR THE ENGINEER'S REVIEW AND APPROVAL."

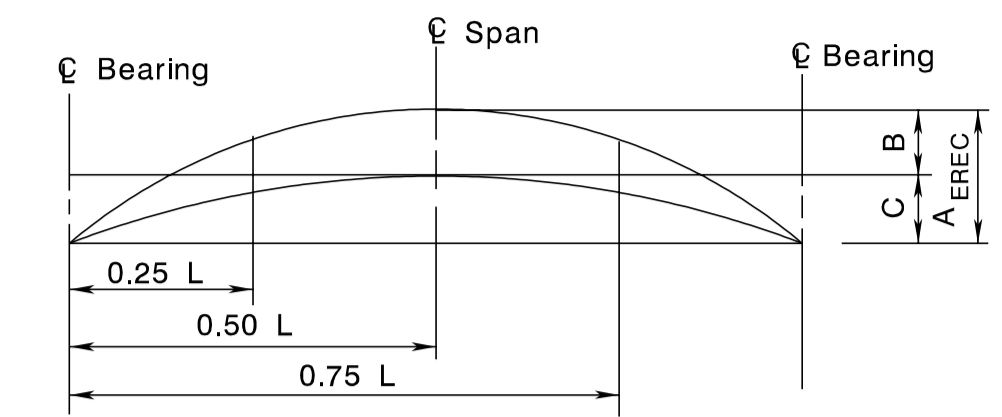
- PRESTRESSED CONCRETE I-BEAMS SHALL BE TREATED WITH AN EPOXY WATER-PROOFING SEAL COAT, FIG. 3, CONFORMING TO SUBSECTION 912.12 OF THE NJDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WITH CURRENT SUPPLEMENTAL SPECIFICATIONS, AS MODIFIED BY THE SPECIAL PROVISIONS. THE LIMITS FOR SEALER APPLICATION SHALL BE SHOWN ON THE CONSTRUCTION PLANS FOR BEAMS SUBJECTED TO DECK JOINT LEAKAGE AND SHALL CONFORM TO THE FOLLOWING:

AREAS TO BE TREATED	APPLICATION LIMITS*
ENDS, SIDES, AND BOTTOMS	4'-0" AND 8" LENGTH MEASURED FROM THE BEAM ENDS FOR EXTERIOR FACES OF FASCIAS AND INTERIOR FACES RESPECTIVELY.

DIAPHRAGM CONNECTION AREA NEED NOT BE EPOXY WATERPROOFING SEAL COATED. EPOXY WATERPROOFING SEAL COAT SHALL BE OMITTED FROM THE BEARING CONTACT AREAS FOR VARIOUS TYPES OF BEARINGS, CHECK BEARING MANUFACTURER'S RECOMMENDATIONS.

* IF THE STRUCTURE IS LOCATED IN A SEVERE SALT INTRUSION ZONE OR A SALT SPLASH ZONE (ZONE 3A OR 3B, SEE CHART TITLED "ZONAL AREAS OF NEW JERSEY AFFECTED BY SALINITY" IN SUBSECTION 1.24.18 OF THE DESIGN MANUAL FOR BRIDGES AND STRUCTURES) AND IS LOCATED LESS THAN 15 FEET ABOVE THE MEAN HIGH SALT WATER MARK, THE ENTIRE BEAM, INCLUDING BOTH SIDES, BOTTOM AND ENDS SHALL BE TREATED WITH AN EPOXY WATERPROOFING SEAL COAT.

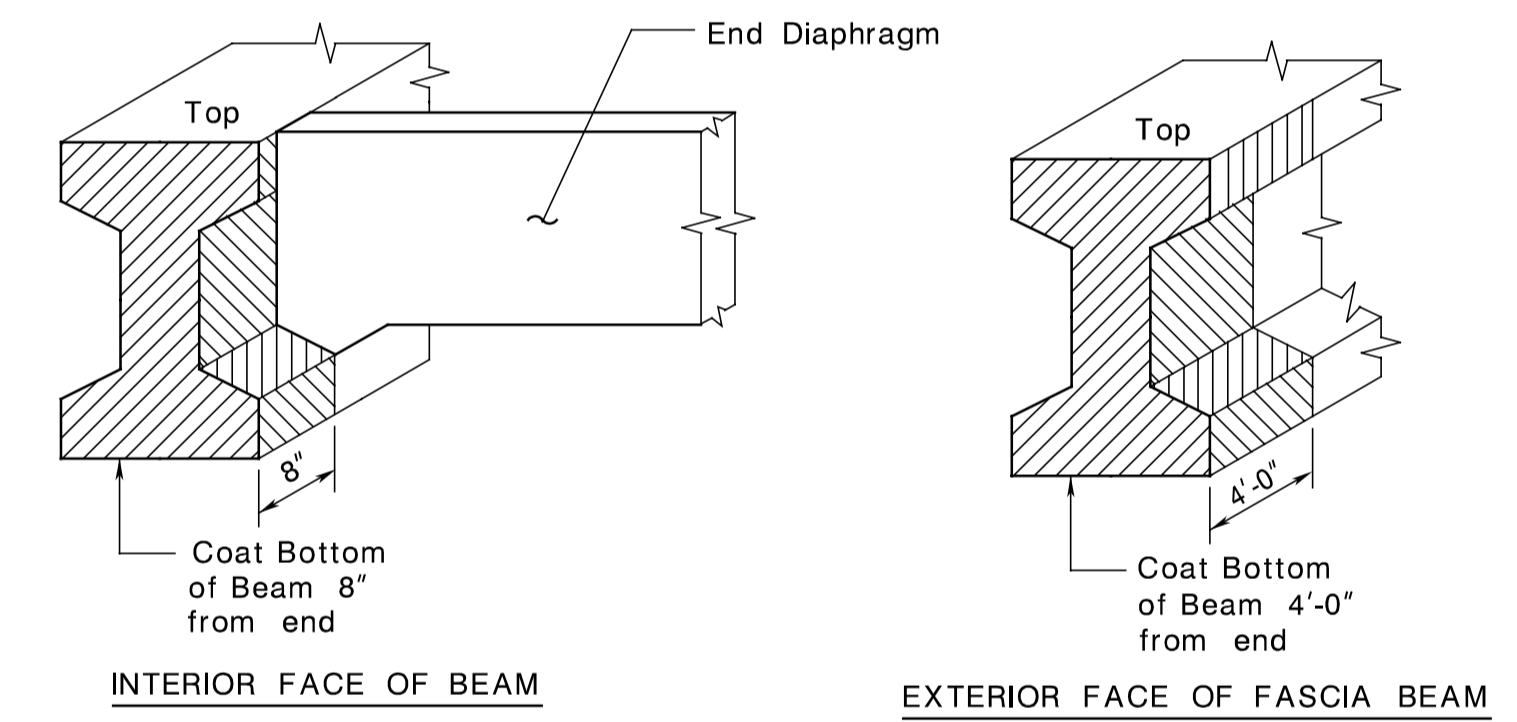
- ALL MILD STEEL REINFORCEMENT USED FOR SHEAR CONNECTORS AND CAST-IN-PLACE DIAPHRAGMS SHALL BE CORROSION PROTECTED. (REFER TO SECTION 26 OF THIS MANUAL FOR TYPES OF CORROSION PROTECTED REINFORCEMENT STEEL THAT CAN BE USED)
- HEIGHT OF SHEAR CONNECTOR STIRRUPS ABOVE THE TOP OF THE BEAMS SHOULD BE VERIFIED FOR ADEQUACY FOR EACH BRIDGE BASED UPON HAUNCH REQUIREMENTS.
- SPACINGS OF SOLE PLATE STRAPS FOR BEARING ATTACHMENT SHOULD BE VERIFIED FOR ADEQUACY FOR EACH BRIDGE BASED UPON THE STRAND ARRANGEMENT.
- DRAPED, STRAIGHT AND STRAIGHT/UNBONDED STRAND PATTERNS OF PRESTRESSING STEEL ARE PERMITTED. ALTERNATIVE PATTERNS MAY BE PROPOSED DURING FABRICATION.



CAMBER DIAGRAM
FIG. 1

ESTIMATED BEAM CAMBER (INCHES)					
BEAM No.	LOCATION	A_{REL}	A_{EREC}	B	C
	0.25 L				
	0.50 L				
	0.75 L				

CAMBER TABLE
FIG. 2



EPOXY WATERPROOFING LIMITS
FIG. 3

STANDARD DRAWING PLATE No.	INDEX
	DESCRIPTION
2.3-1	NOTES TO DESIGNER
2.4-1	45" PRETENSIONED PRESTRESSED CONCRETE BEAMS
2.4-2	54" PRETENSIONED PRESTRESSED CONCRETE BEAMS
2.4-3	63" PRETENSIONED PRESTRESSED CONCRETE BEAMS
2.4-4	72" PRETENSIONED PRESTRESSED CONCRETE BEAMS
2.4-5	DETAILS OF INTERMEDIATE STEEL DIAPHRAGMS FOR PRESTRESSED CONCRETE BEAMS

CONTROL SECTION		JOB NO.	
DES. BY		CHK. BY	
DWN. BY		CHK. BY	
EST. BY		CHK. BY	
SPECS. BY			
IN CHARGE OF _____			

REVISION	BY	CKD	DATE

THIS SHEET IS FOR DESIGN INFORMATION ONLY. DO NOT INCLUDE IN CONTRACT PLANS.

STANDARD DRAWING PLATE 2.3-1
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

PRETENSIONED PRESTRESSED CONCRETE BEAMS
NOTES TO DESIGNER

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GENERAL NOTES

- DESIGN SPECIFICATIONS**
(D) The AASHTO LRFD Bridge Design Specifications, with current interims, as modified by Section 3 of the NJDOT Design Manual for Bridges and Structures.
- LIVE LOAD**
HL-93 or NJDOT Permit Vehicle, whichever governs.
- PRESTRESSING STEEL**
The prestressing strands shall be 1/2" dia. or 0.6" dia., 7-wire uncoated steel strands conforming to current AASHTO M203 Grade 270 and shall be low relaxation strands. Each strand shall be given an initial tension of 0.75 f's x A's as specified in applicable sections of the PCI Design Handbook - Precast and Prestressed Concrete. Any change in the system of prestressing must be accompanied by complete calculations for approval by the Engineer.

CONCRETE DESIGN STRESSES

- Design compressive strength (f'c) = _____ psi, class _____ concrete,
- Compressive strength at prestress (f'ci) = _____ psi.

CONCRETE

- All exposed corners shall be chamfered 3/4" or rounded to 3/4" radius. Angles of intersection between webs and flanges shall be rounded to not less than 3/4" radius. Top surface of beams shall be roughened to the satisfaction of the Engineer. At approximate time of initial set all laitance shall be removed with a stiff wire brush.

SOLE PLATES

- Cost of Sole Plates shall be included in price bid for Prestressed Concrete Beams. Sole Plates shall be galvanized as per Specifications.

DIAPHRAGMS

- For the angle θ between the center line of beam and center line of diaphragms or bearings reference the Framing Plan.

MILD STEEL REINFORCEMENT

- Reinforcement bars shall conform to ASTM A615, Grade 60. Minimum clear cover shall be 1/2" unless otherwise noted. Cost of furnishing and placing reinforcement steel shall be included in the price bid for Prestressed Concrete Beams.

(D) **9. For camber diagram see sheet No. B_____**

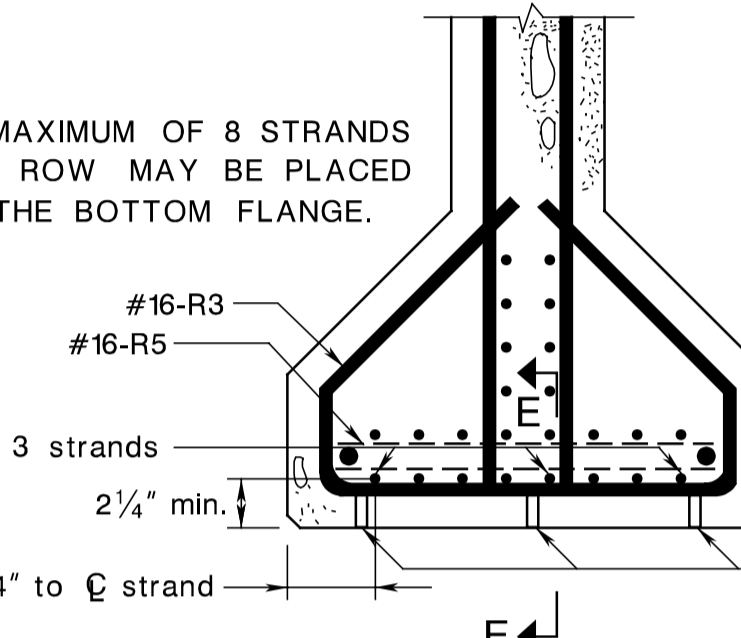
BEAM NO.	\bar{Y} MIDSPAN	\bar{Y} ENDS	NO. OF STRANDS
(D)			

NO.	MARK	SIZE	LENGTH	TYPE	A	B	C	D
(D)	*R1	#16	8'-3"	1	4'-1/2"	4"	-	-
(D)	R2	#16	3'-3"	3	6"	6"	5"	1'-1"
(D)	R3	#16	2'-8"	4	8"	8"	5"	1'-4"
(D)	*R4	(D)	8'-0"	2	6'-6"	1'-6"	-	-
(D)	*R5	#16	11'-0"	2	4'-9"	1'-6"	4'-9"	-
(D)	*R6	(D)	14'-0"	2	6'-6"	1'-0"	6'-6"	-
(D)	R7	#16	(D)	STR	-	-	-	-

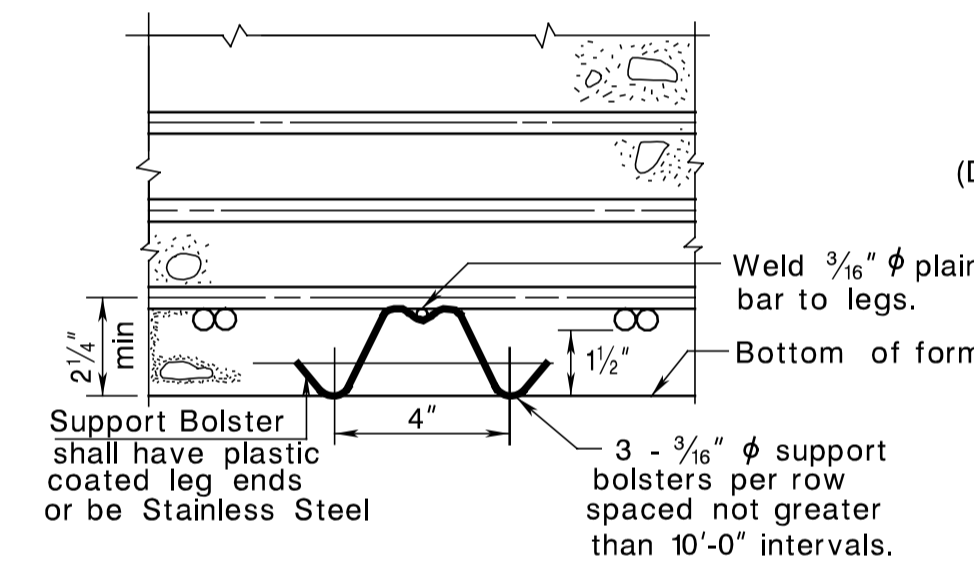
* CORROSION PROTECTED BARS (REFER TO SECTION 26 OF THIS MANUAL FOR TYPES OF CORROSION PROTECTED REINFORCEMENT STEEL THAT CAN BE USED)

NOTE:
DEBONDED STRAIGHT STRANDS MAY BE UTILIZED AS AN ALTERNATE TO DRAPED STRANDS. ONE PIECE STIRRUPS MAY BE UTILIZED AS AN ALTERNATE TO TWO PIECE STIRRUPS.

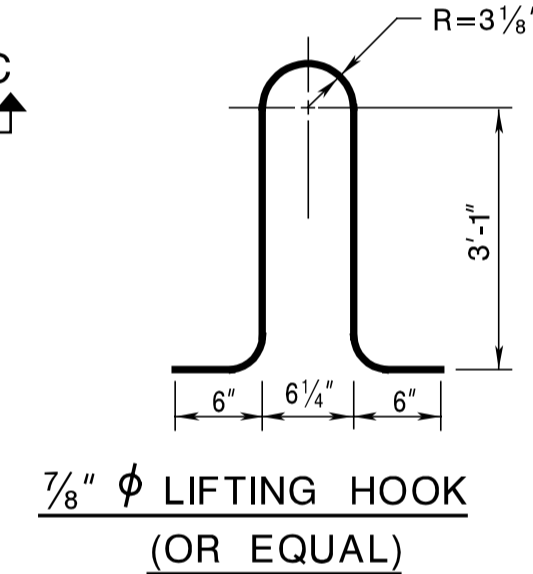
A MAXIMUM OF 8 STRANDS PER ROW MAY BE PLACED IN THE BOTTOM FLANGE.



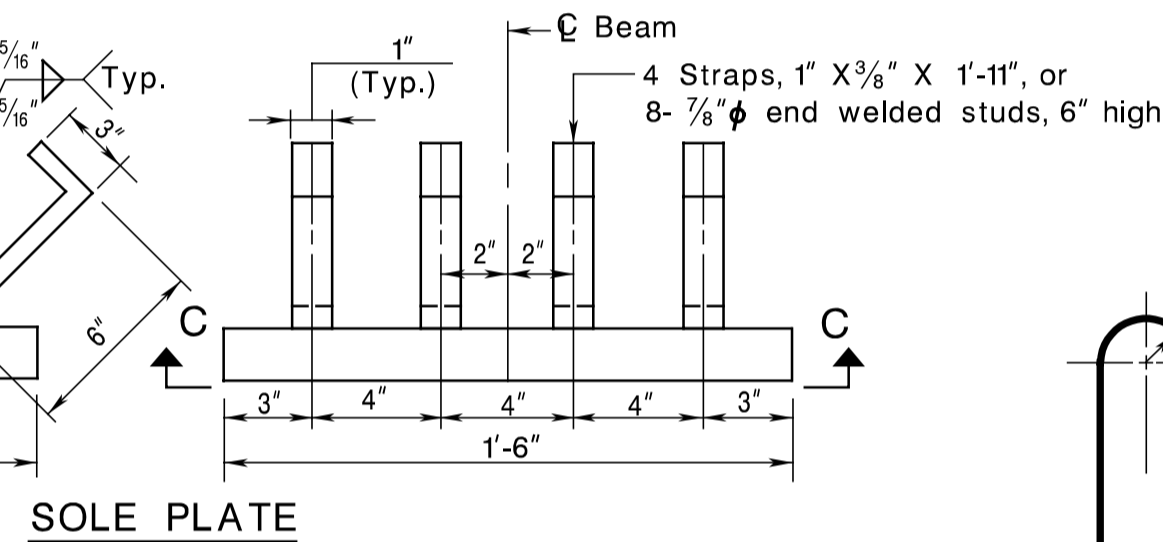
STRAND SUPPORT BOLSTER



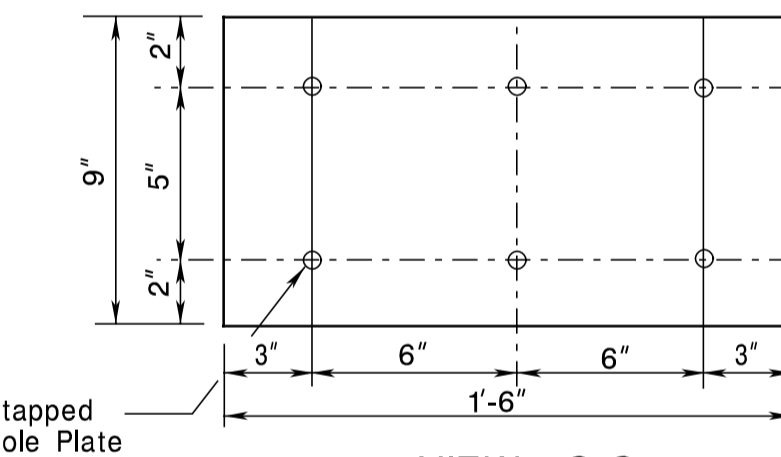
SECTION E-E



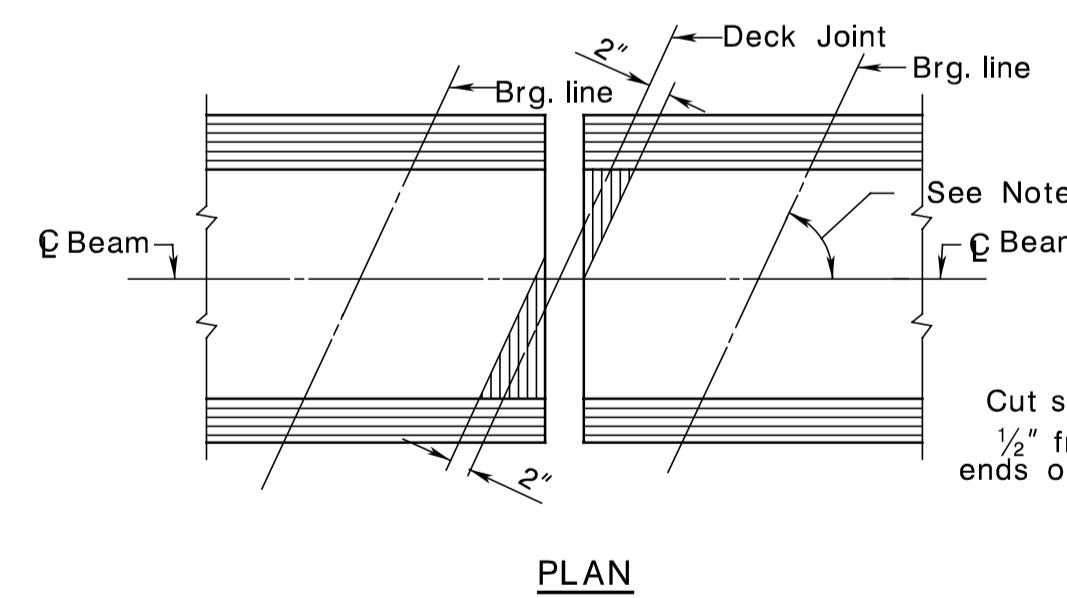
7/8" ϕ LIFTING HOOK (OR EQUAL)



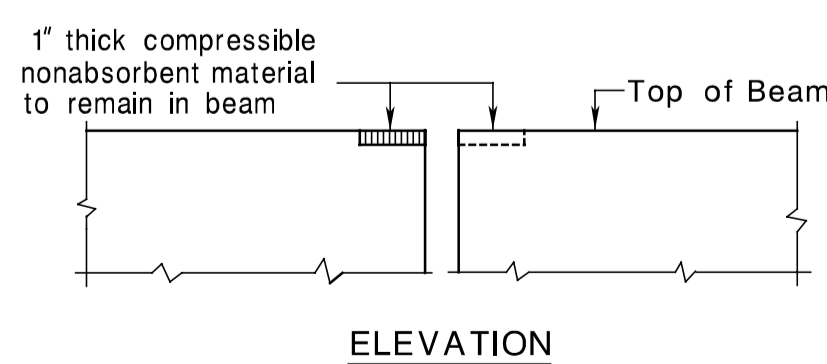
SOLE PLATE



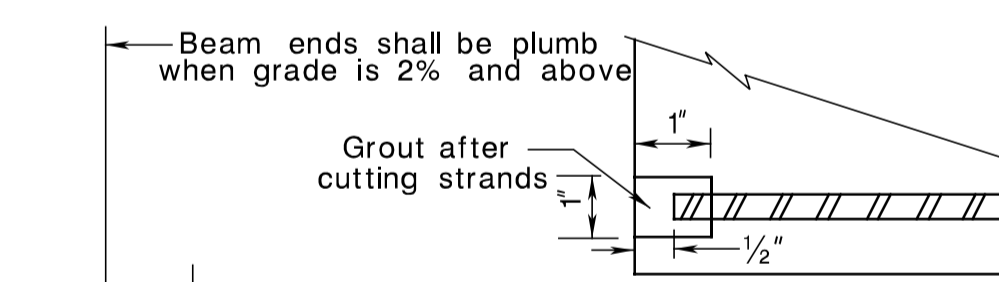
VIEW C-C



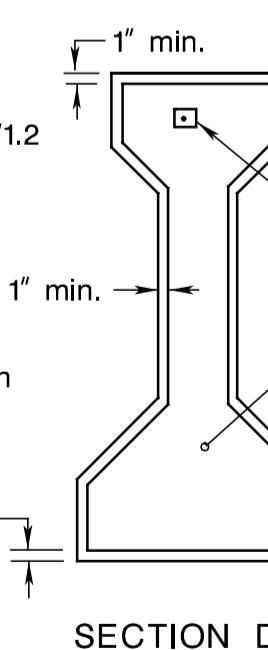
PLAN



ELEVATION
BEAMS AT PIERS

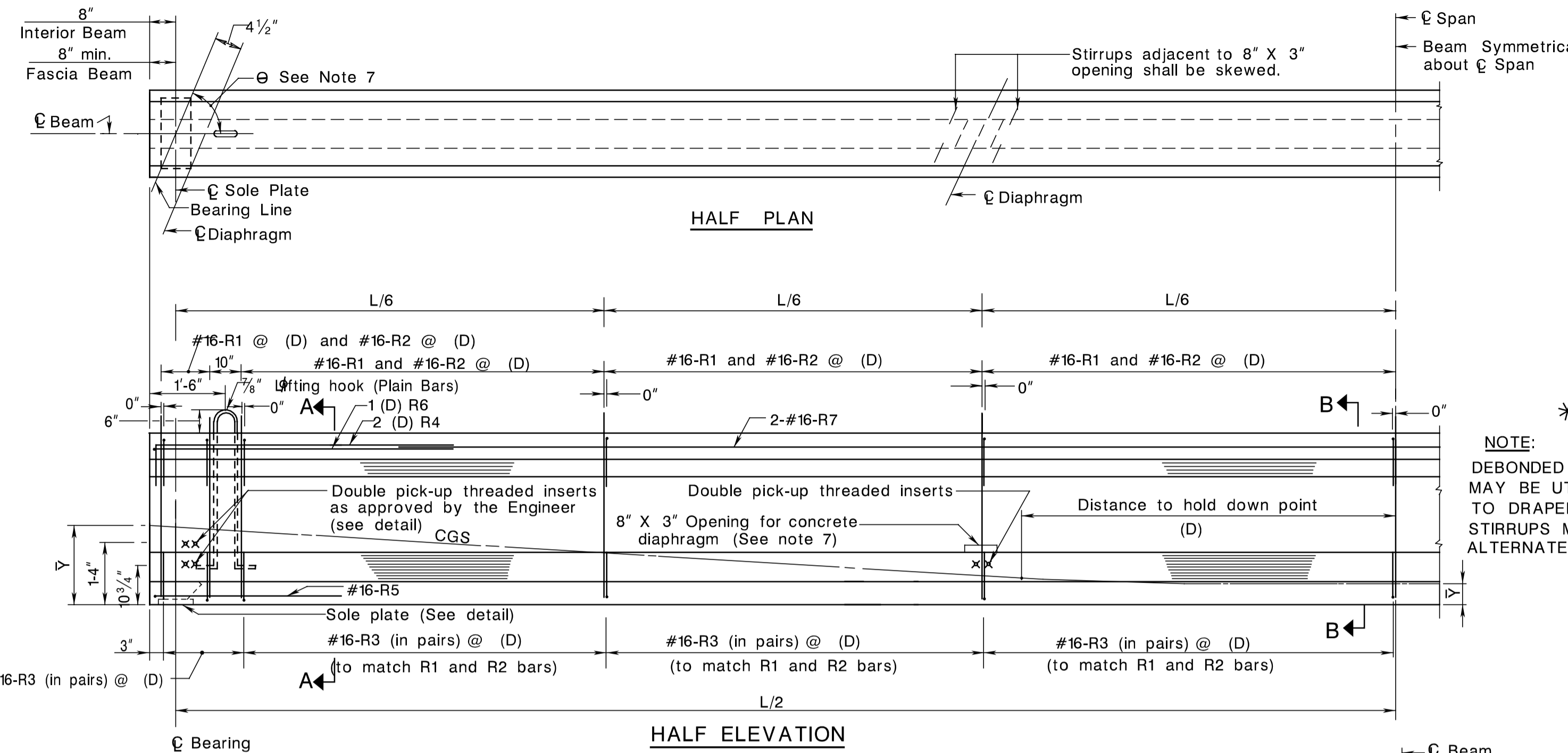


END ELEVATION



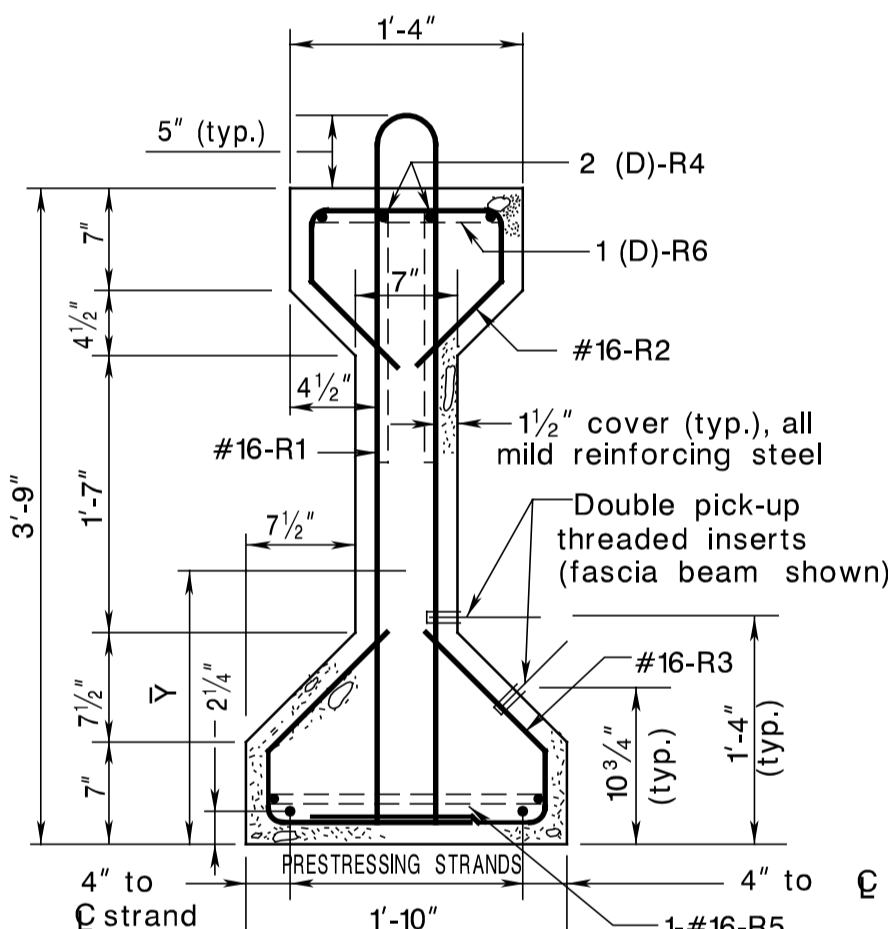
SECTION D-D

GRAUTED RECESS FOR STRAND AT BEAM ENDS

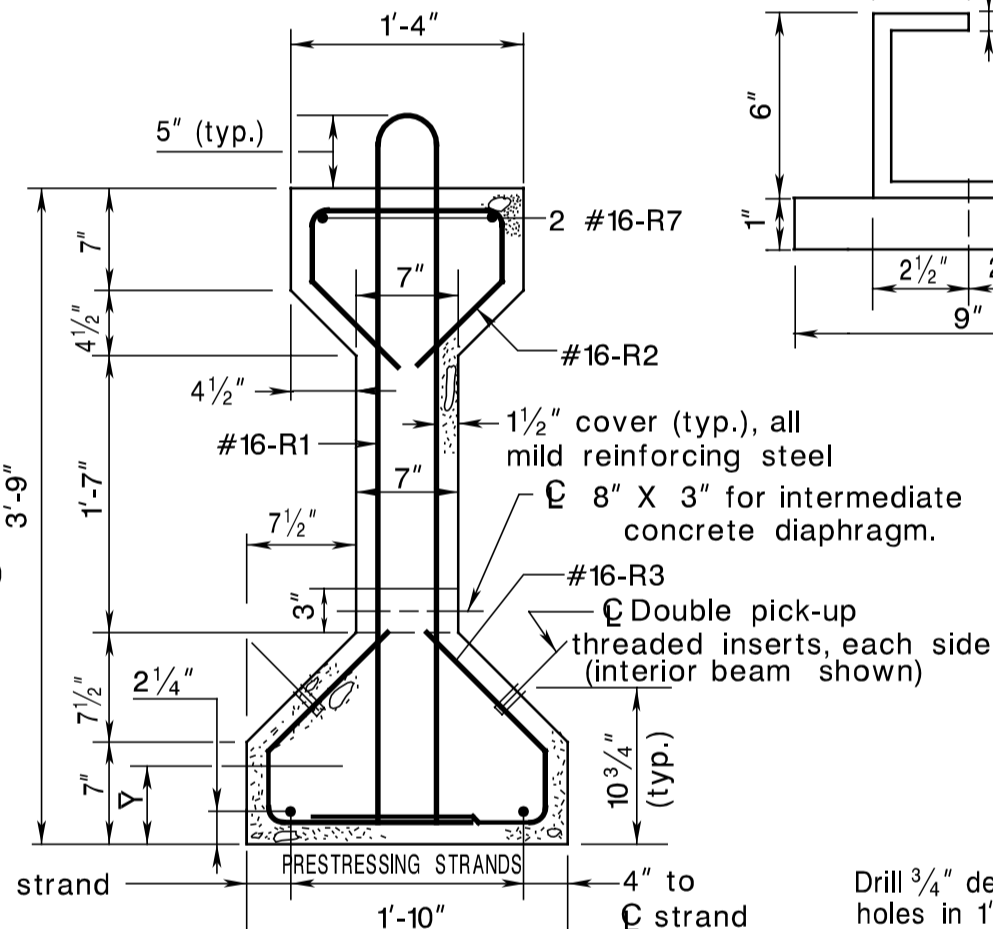


HALF PLAN

HALF ELEVATION

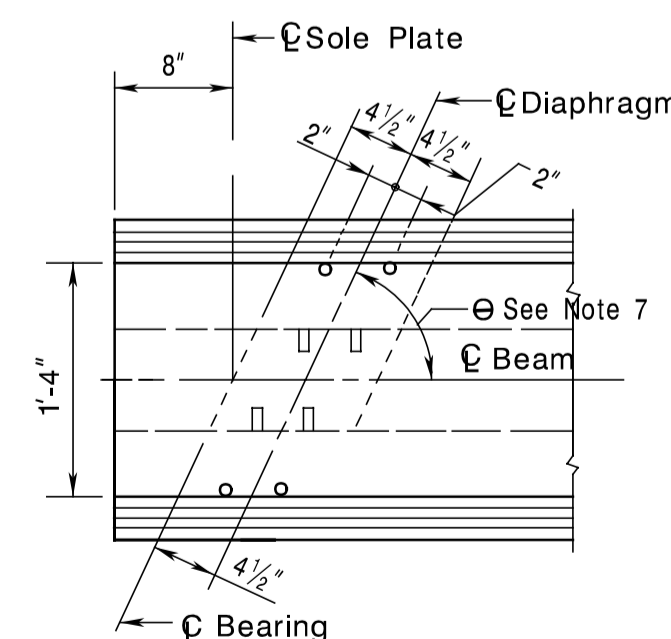


SECTION A-A
END



SECTION B-B
MIDSPAN

TYPICAL BEAM SECTIONS



PLAN AT ABUTMENT
END OF BEAM

LOCATION PLAN OF THREADED INSERTS

NOTE: \bar{Y} LOCATES CENTROID OF STEEL PRESTRESSING GROUP.

NOTE: OMIT THREADED INSERTS ON OUTSIDE FACE OF FASCIA BEAM

CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	CHK. BY

(D)

QUANTITIES				
PAY ITEM NO.	STANDARD ITEM NO.	DESCRIPTION	UNIT	CONTRACT QUANTITY
(D)		PRETENSIONED PRESTRESSED CONCRETE BEAMS, 45"	L.F.	

BDC04MB-01
STANDARD DRAWING PLATE 2.4-1
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

45" PRETENSIONED PRESTRESSED CONCRETE BEAMS

ROUTE (D) SECTION

REVISION	BY	CKD	DATE

SCALE: NONE
BRIDGE SHEET NO. B OF B

STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
(D)	STRUCTURE NO.		
	STRUCTURE NAME		

GENERAL NOTES

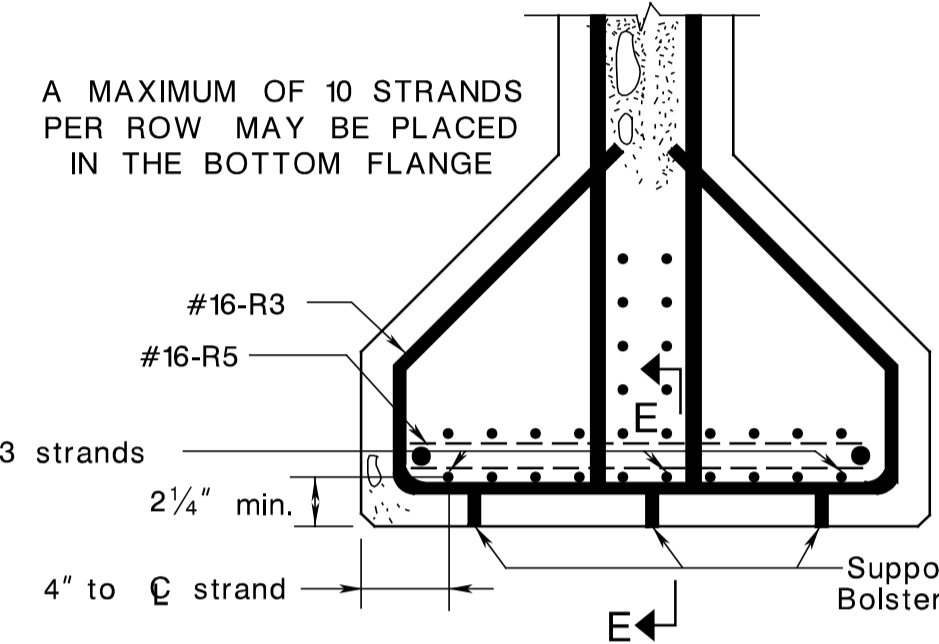
- DESIGN SPECIFICATIONS**
(D) The AASHTO LRFD Bridge Design Specifications, with current interims, as modified by Section 3 of the NJDOT Design Manual for Bridges and Structures.
- LIVE LOAD**
HL-93 or NJDOT Permit Vehicle, whichever governs.
- PRESTRESSING STEEL**
The pretensioning strands shall be 1/2" dia., or 0.6" dia., 7-wire uncoated steel strands conforming to current AASHTO M203 Grade 270 and shall be low relaxation strands. Each strand shall be given an initial tension of 0.75 f's x A_s as specified in applicable sections of the PCI Design Handbook - Precast and Prestressed Concrete. Any change in the system of prestressing must be accompanied by complete calculations for approval by the Engineer.
- CONCRETE DESIGN STRESSES**
(D) Design compressive strength (f'_c) = _____ psi, class _____ concrete,
(D) Compressive strength at prestress (f'_{ci}) = _____ psi.
- CONCRETE**
All exposed corners shall be chamfered 3/4" or rounded to 3/4" radius. All angles of intersection between web and flanges shall be rounded to not less than 3/4" radius. Top surface of beams shall be roughened to the satisfaction of the Engineer. At approximate time of initial set all laitance shall be removed with a stiff wire brush.
- SOLE PLATES**
Cost of Sole Plates shall be included in price bid for Prestressed Concrete Beams. Sole Plates shall be galvanized as per Specifications.
- DIAPHRAGMS**
For the angle θ between the center line of beam and center line of diaphragms or bearings reference the Framing Plan.
- MILD STEEL REINFORCEMENT**
Reinforcement bars shall conform to ASTM A615, Grade 60. Minimum clear cover shall be 1 1/2" unless otherwise noted. Cost of furnishing and placing reinforcement steel shall be included in the price bid for Prestressed Concrete Beams.
- (D) 9. For camber diagram see sheet No. B _____

SCHEDULE OF MILD STEEL REINFORCEMENT									
No.	MARK	SIZE	LENGTH	TYPE	A	B	C	D	
(D)	*R1	#16	9'-10"	1	4'-9 1/2"	5"	-	-	
(D)	R2	#16	4'-1"	3	7 1/8"	7 1/8"	6"	1'-5"	
(D)	R3	#16	3'-0"	4	9 3/4"	9 3/4"	5 1/4"	1'-5"	
(D)	*R4	(D)	9'-0"	2	7'-6"	1'-6"	-	-	
(D)	*R5	#16	13'-10"	2	6'-0"	1'-10"	6'-0"	-	
(D)	*R6	(D)	16'-4"	2	7'-6"	1'-4"	7'-6"	-	
(D)	R7	#16	(D)	STR	-	-	-	-	

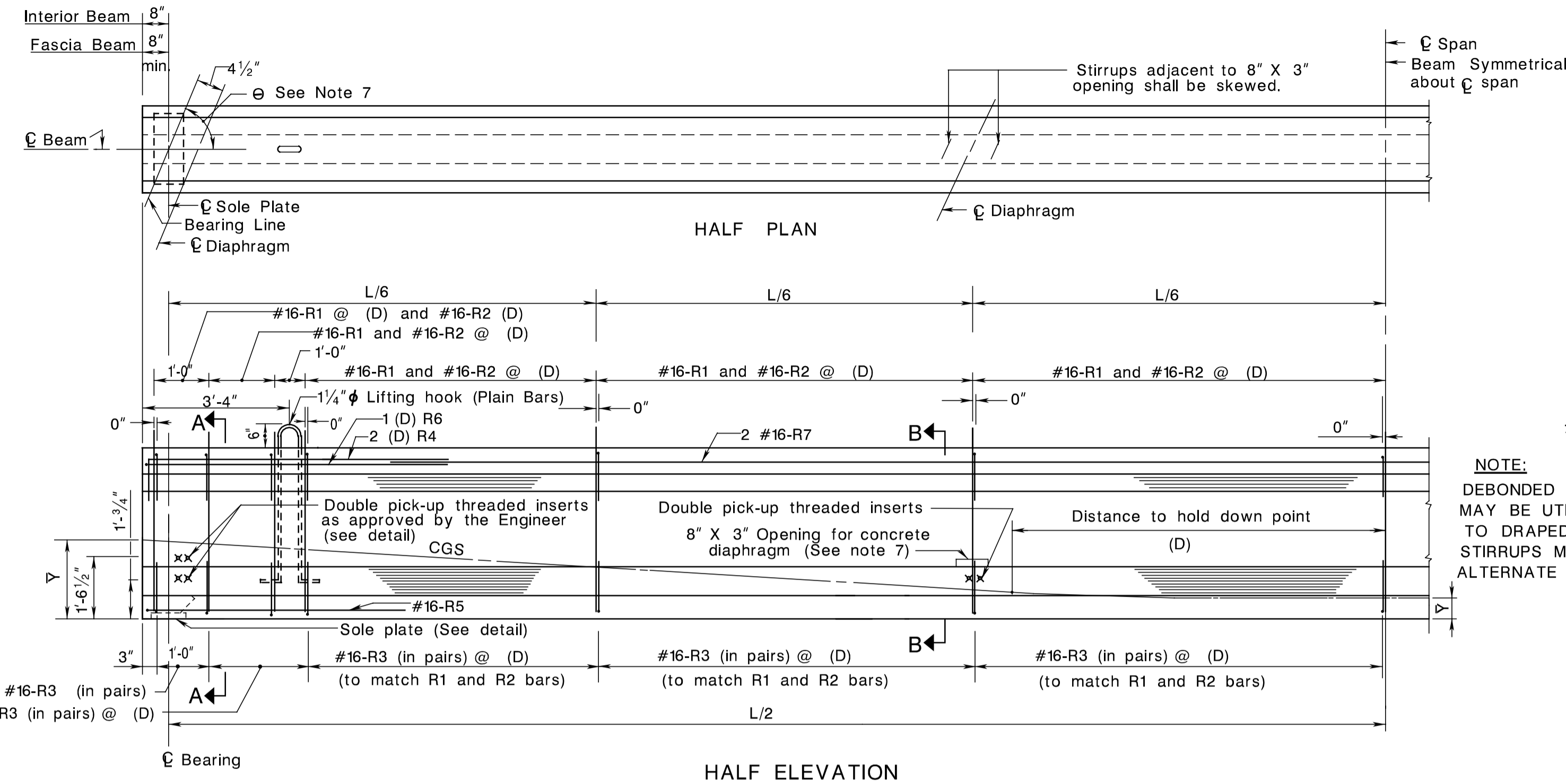
*CORROSION PROTECTED BARS (REFER TO SECTION 26 OF THIS MANUAL FOR TYPES OF CORROSION PROTECTED REINFORCEMENT STEEL THAT CAN BE USED)

NOTE:
DEBONDED STRAIGHT STRANDS MAY BE UTILIZED AS AN ALTERNATE TO DRAPED STRANDS. ONE PIECE STIRRUPS MAY UTILIZED AS AN ALTERNATE TO TWO PIECE STIRRUPS

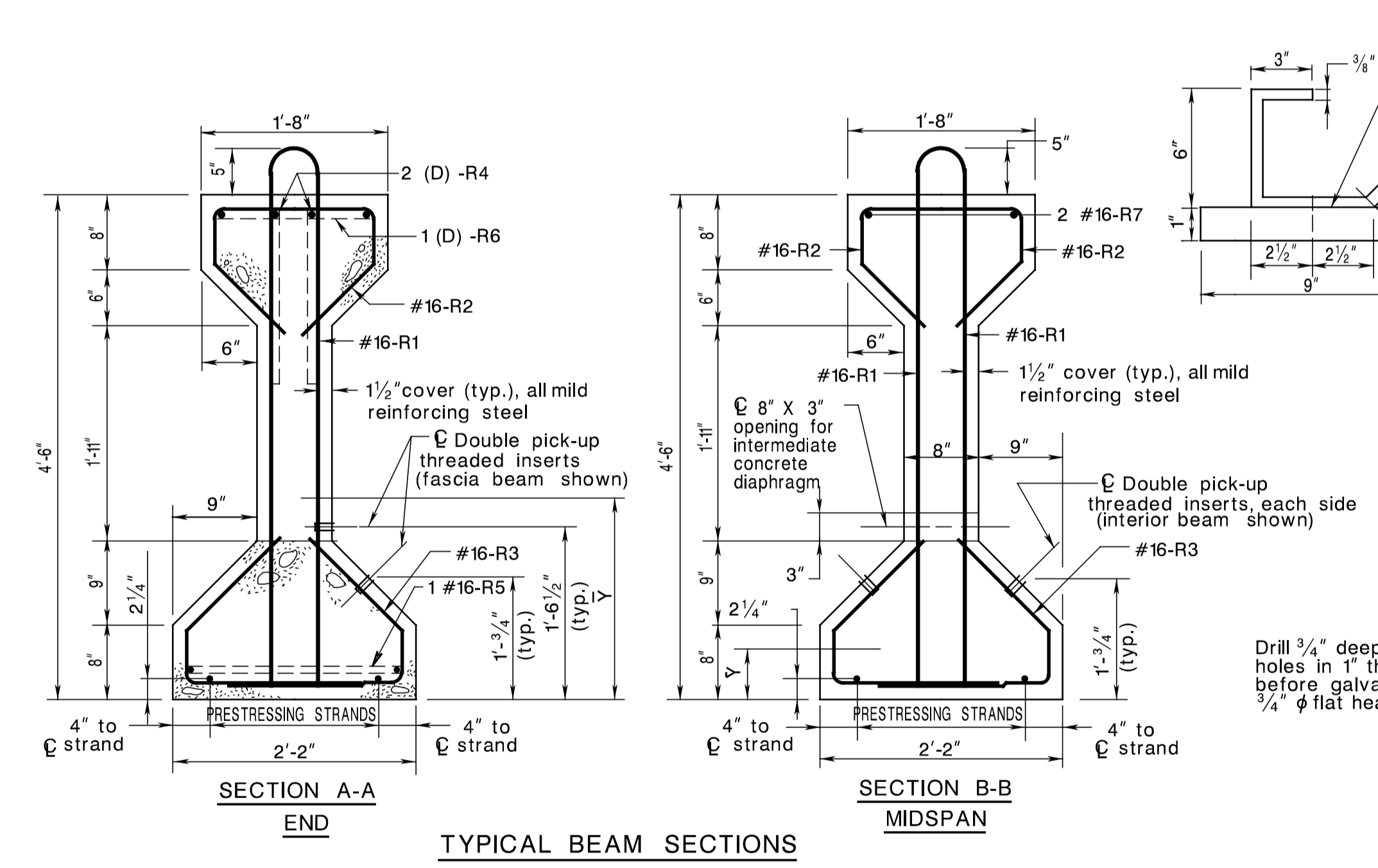
A MAXIMUM OF 10 STRANDS PER ROW MAY BE PLACED IN THE BOTTOM FLANGE



STRAND SUPPORT BOLSTER



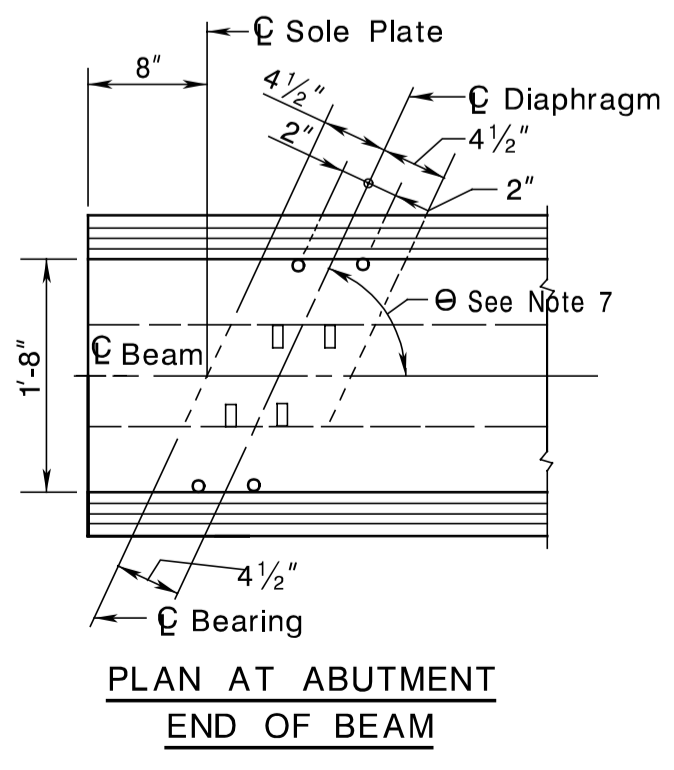
HALF ELEVATION



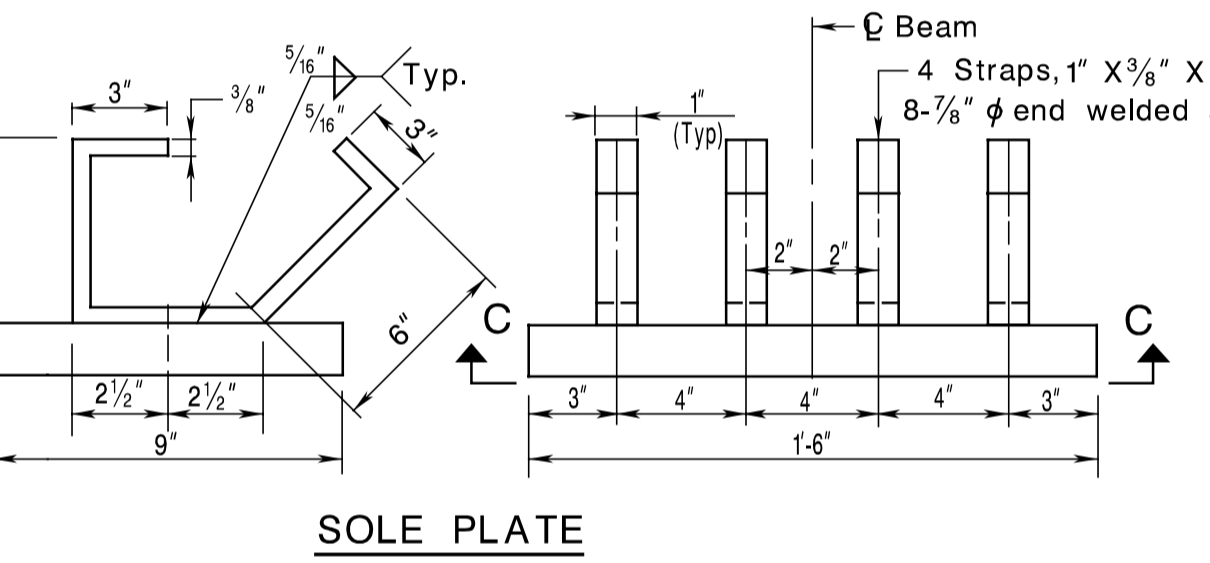
TYPICAL BEAM SECTIONS

NOTE: \bar{Y} LOCATES CENTROID OF STEEL PRESTRESSING GROUP.

NOTE: OMIT THREADED INSERTS ON OUTSIDE FACE OF FASCIA BEAM

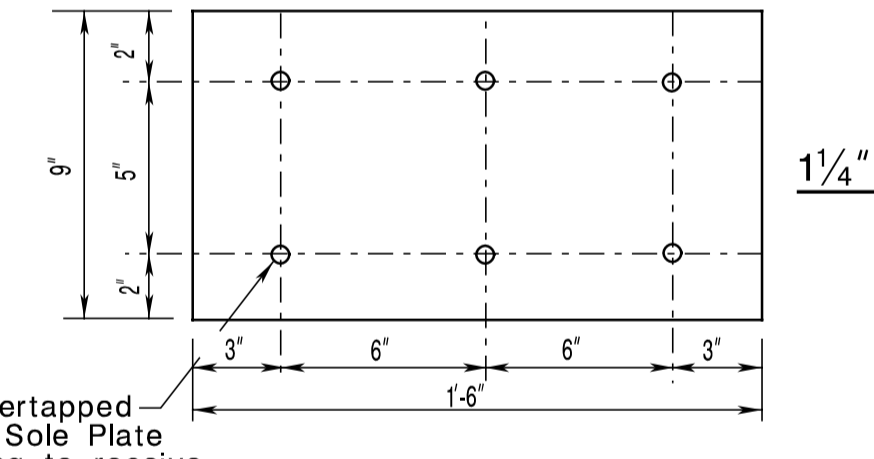


LOCATION PLAN OF THREADED INSERTS

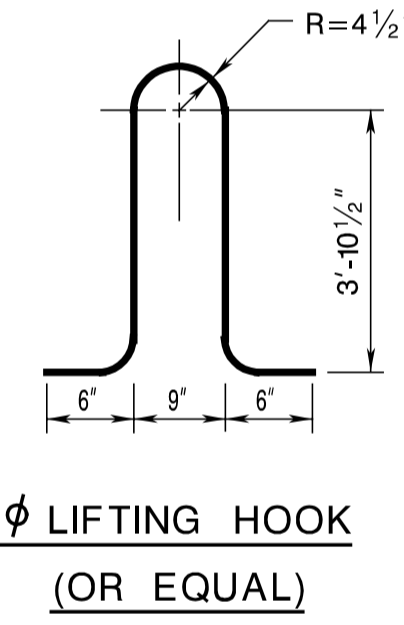


SOLE PLATE

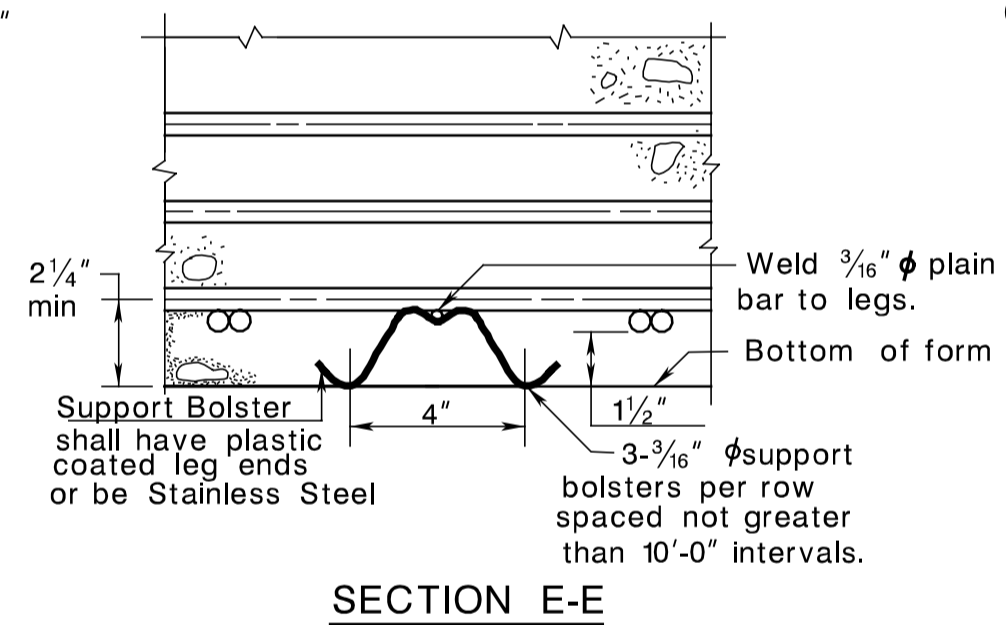
Drill 3/4" deep overlapped holes in 1" thick Sole Plate before galvanizing to receive 3/4" flat head cap screws.



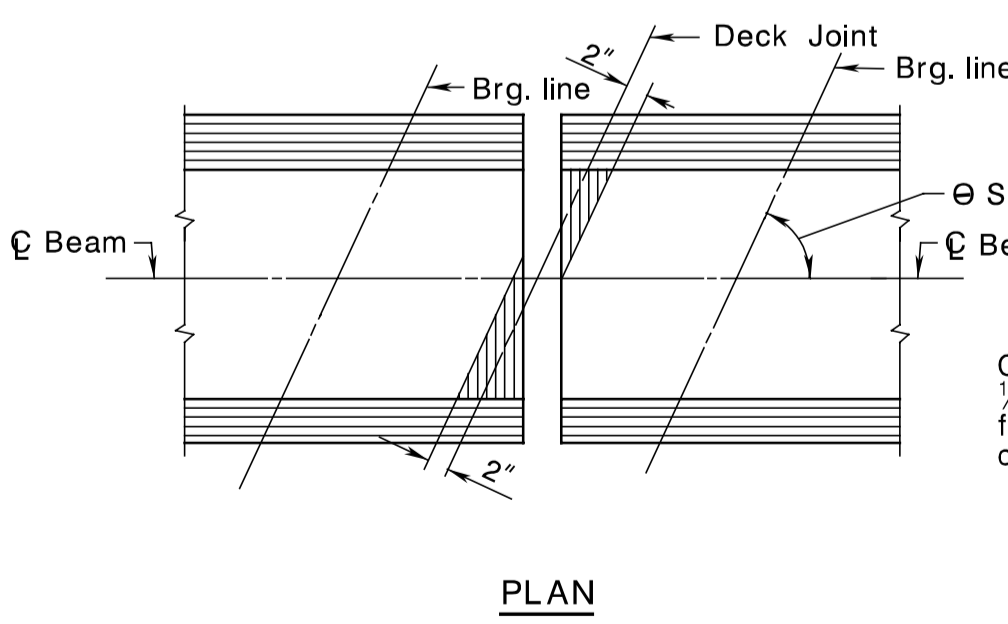
VIEW C-C



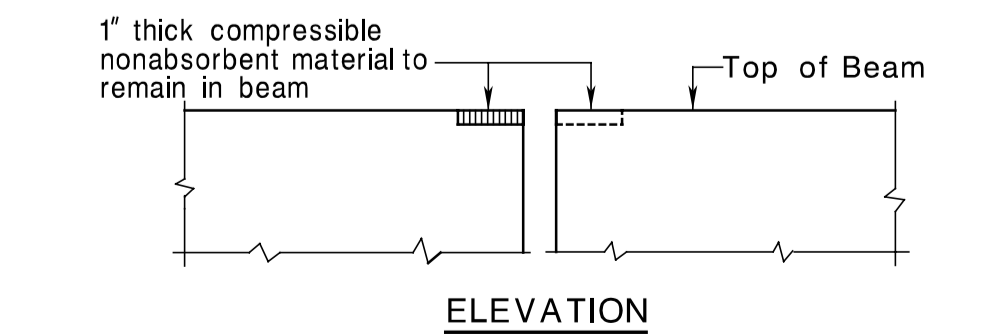
1/4" LIFTING HOOK (OR EQUAL)



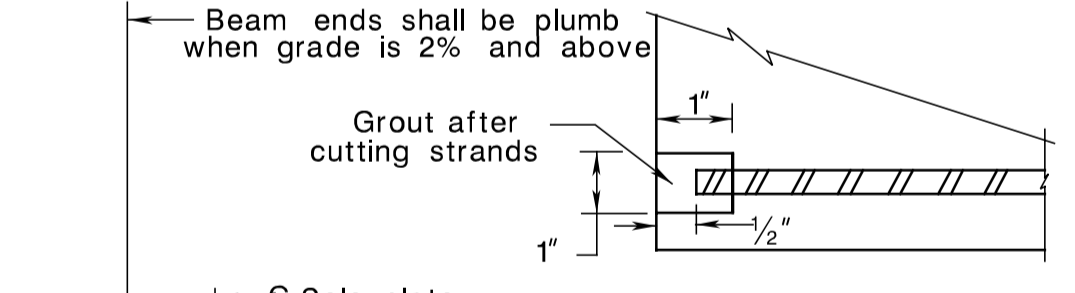
SECTION E-E



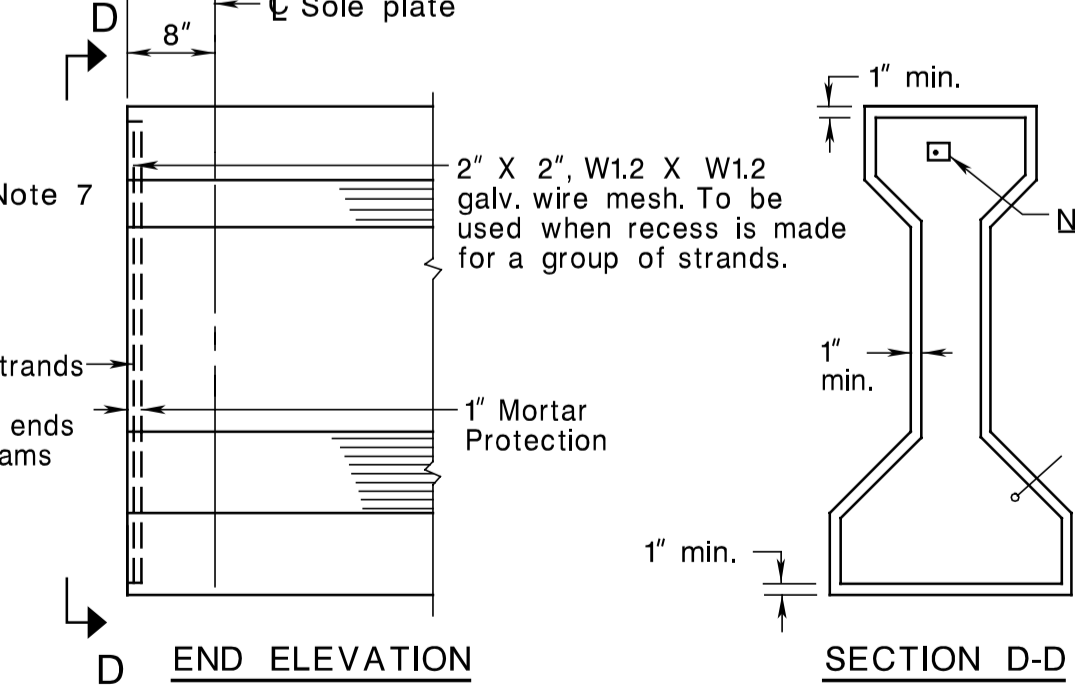
PLAN



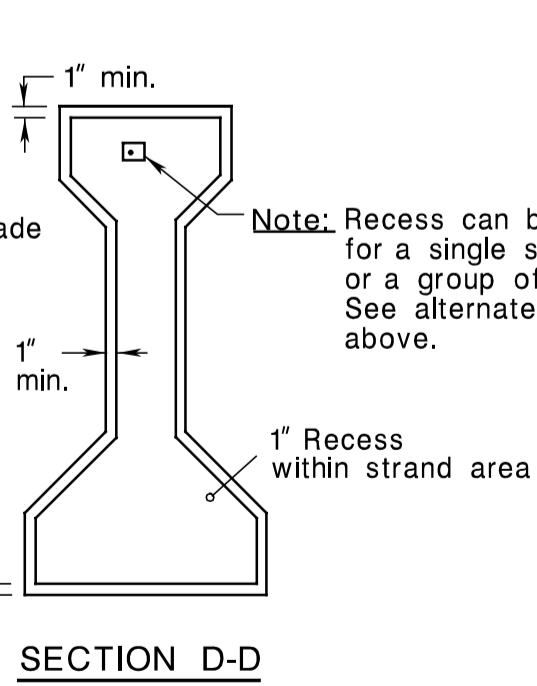
ELEVATION



GRADED RECESS FOR STRAND AT BEAM ENDS



END ELEVATION



SECTION D-D

QUANTITIES				
PAY ITEM NO.	STANDARD ITEM NO.	DESCRIPTION	UNIT	CONTRACT QUANTITY
(D)		PRETENSIONED PRESTRESSED CONCRETE BEAMS, 54"	L.F.	

STANDARD DRAWING PLATE 2.4-2
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

54" PRETENSIONED PRESTRESSED CONCRETE BEAMS

ROUTE (D) SECTION

CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	CHK. BY
IN CHARGE OF _____	

REVISION	BY	CKD	DATE

SCALE: _____ NONE _____
BRIDGE SHEET NO. B _____ OF B _____

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STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
(D)	STRUCTURE NO.		
	STRUCTURE NAME		

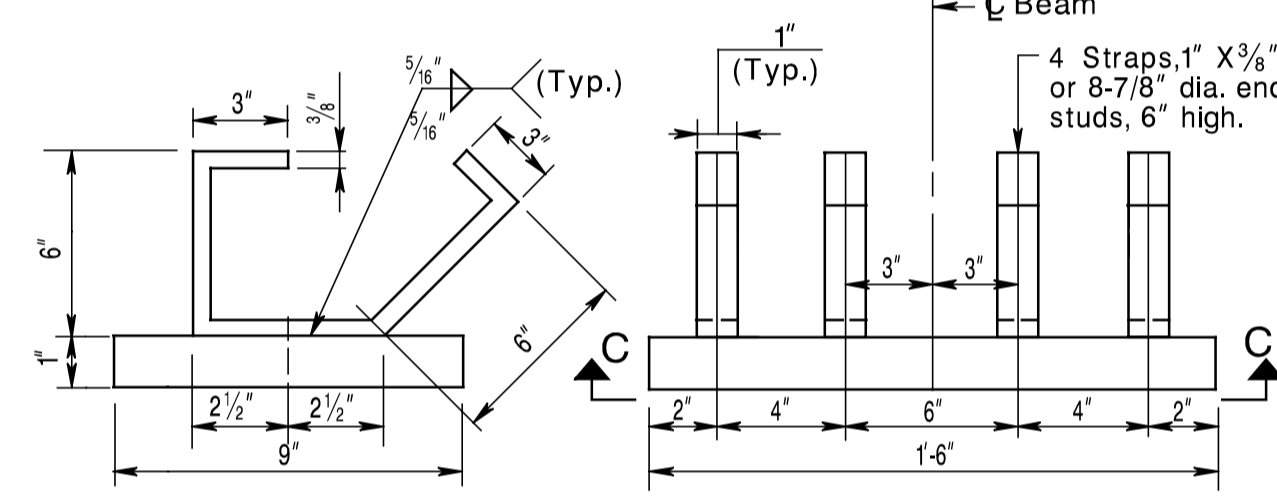
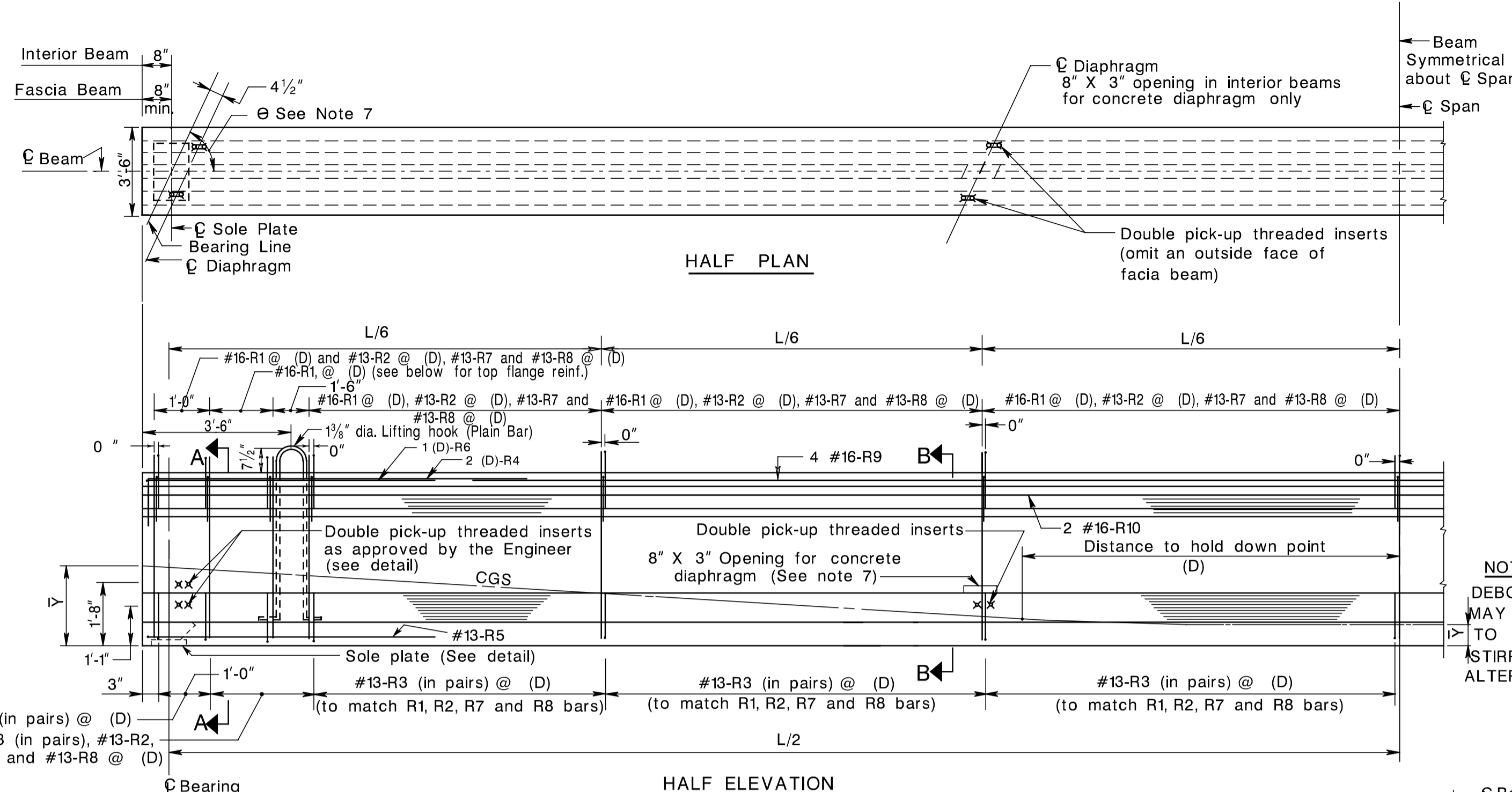
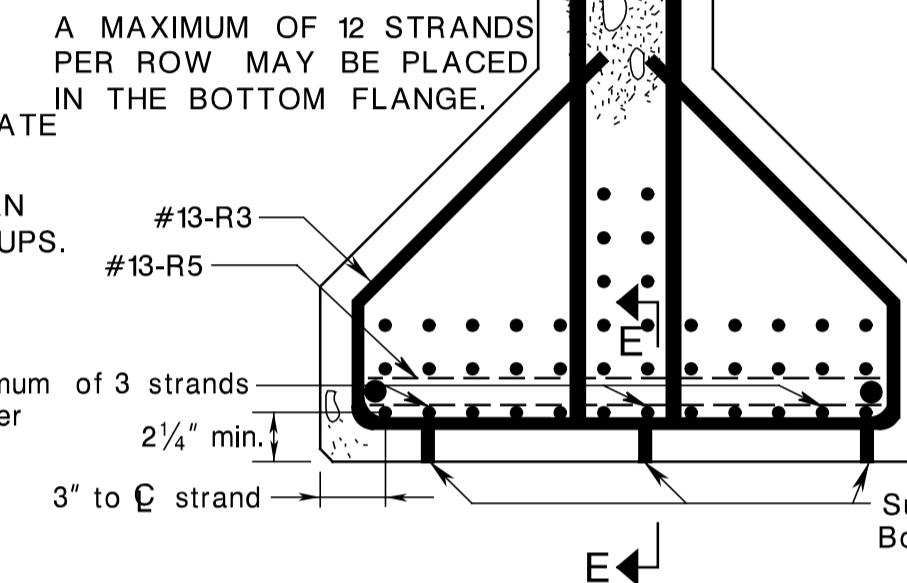
GENERAL NOTES

- DESIGN SPECIFICATIONS**
(D) The AASHTO LRFD Design Specifications, with current interims, as modified by Section 3 of the NJDOT Design Manual for Bridges and Structures.
- LIVE LOAD**
HL-93 or NJDOT Permit Vehicle, whichever governs.
- PRESTRESSING STEEL**
The prestressing strands shall be 1/2" dia. or 0.6" dia., 7-wire uncoated steel strands conforming to current AASHTO M203 Grade 270 and shall be low relaxation strands. Each strand shall be given an initial tension of 0.75 f's x A's as specified in applicable sections of the PCI Design Handbook - Precast and Prestressed Concrete. Any change in the system of prestressing must be accompanied by complete calculations for approval by the Engineer.
- CONCRETE DESIGN STRESSES**
(D) Design compressive strength (f'c) = _____ psi, class _____ concrete,
(D) Compressive strength at prestress (f'ci) = _____ psi.
- CONCRETE**
All exposed corners shall be chamfered 3/4" or rounded to 3/4" radius. Angles of intersection between webs and flanges shall be rounded to not less than 3/4" radius. Top surface of beams shall be roughened to the satisfaction of the Engineer. At approximate time of initial set all laitance shall be removed with a stiff wire brush.
- SOLE PLATES**
Cost of Sole Plates shall be included in price bid for Prestressed Concrete Beams. Sole Plates shall be galvanized as per Specifications.
- DIAPHRAGMS**
For the angle θ between the center line of beam and center line of diaphragms or bearings reference the Framing Plan.
- MILD STEEL REINFORCEMENT**
Reinforcement bars shall conform to ASTM A615, Grade 60. Minimum clear cover shall be 1/2" unless otherwise noted. Cost of furnishing and placing reinforcement steel shall be included in the price bid for Prestressed Concrete Beams.
(D) 9. For camber diagram see sheet No. B _____

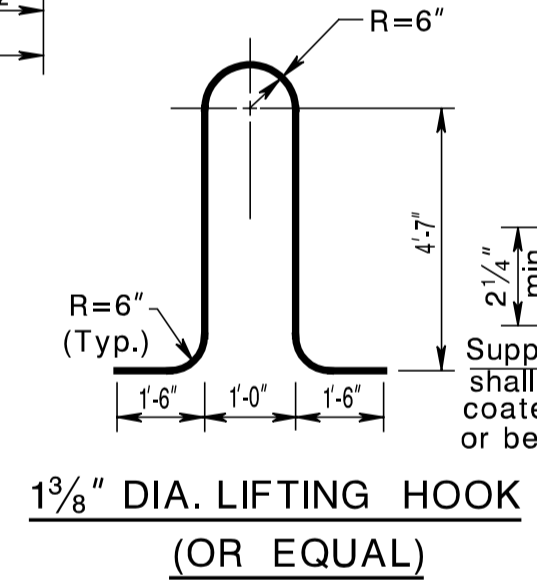
SCHEDULE OF MILD STEEL REINFORCEMENT										
NO.	MARK	SIZE	LENGTH	TYPE	A	B	C	D	SHAPE	
(D)	*R1	#16	11'-6 3/4"	1	5'-6"	5 5/8"	-	-	1	
(D)	*R2	#13	6'-7 3/4"	5	1'-7"	4"	2 1/2"	3'-3"	2	
(D)	R3	#13	3'-5 3/8"	3	10 3/4"	10 3/4"	6"	1'-8"	3	
(D)	*R4	(D)	10'-6"	2	9'-0"	1'-6"	-	-	4	
(D)	*R5	#13	17'-0"	2	7'-6"	2'-0"	7'-6"	-	5	
(D)	*R6	(D)	20'-11"	2	9'-0"	3'-0"	9'-0"	-	6	
(D)	R7	#13	2'-1"	4	5"	6 1/2"	6 1/2"	-		
(D)	*R8	#13	6'-7"	6	-	-	-	-		
(D)	*R9	#16	(D)	STR.	-	-	-	-		
(D)	R10	#16	(D)	STR.	-	-	-	-		

* CORROSION PROTECTED BARS (REFER TO SECTION 26 OF THIS MANUAL FOR TYPES OF CORROSION PROTECTED REINFORCEMENT STEEL THAT CAN BE USED)

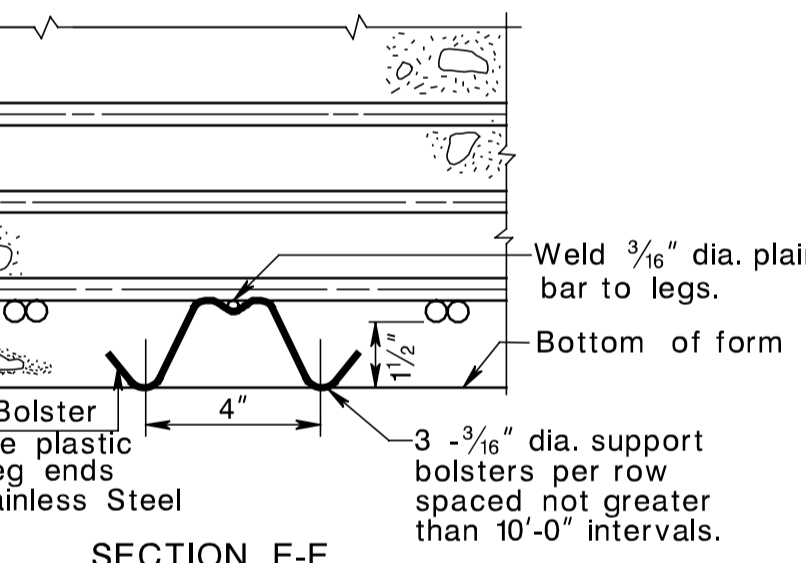
NOTE:
DEBONDED STRAIGHT STRANDS MAY BE UTILIZED AS AN ALTERNATE TO DRAPED STRANDS, ONE PIECE STIRRUPS MAY BE UTILIZED AS AN ALTERNATE TO TWO PIECE STIRRUPS.



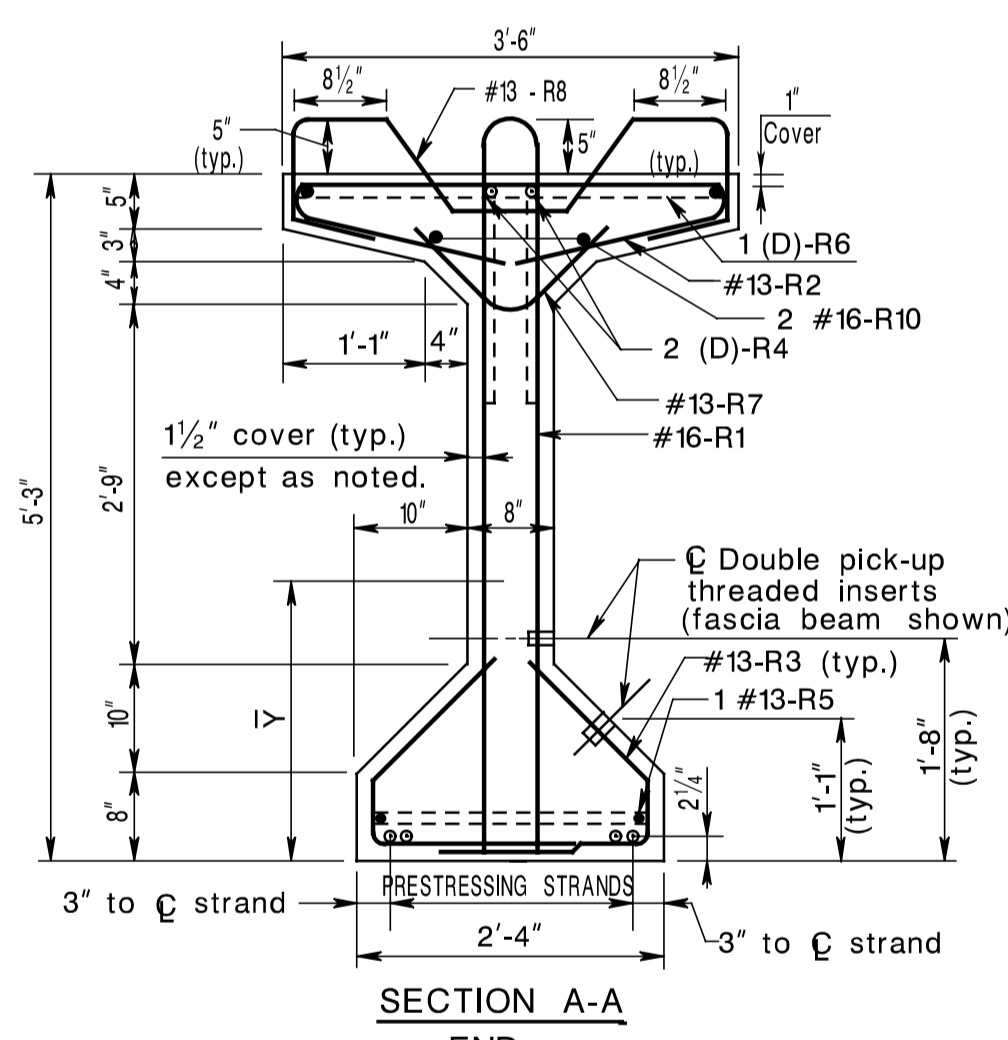
SOLE PLATE



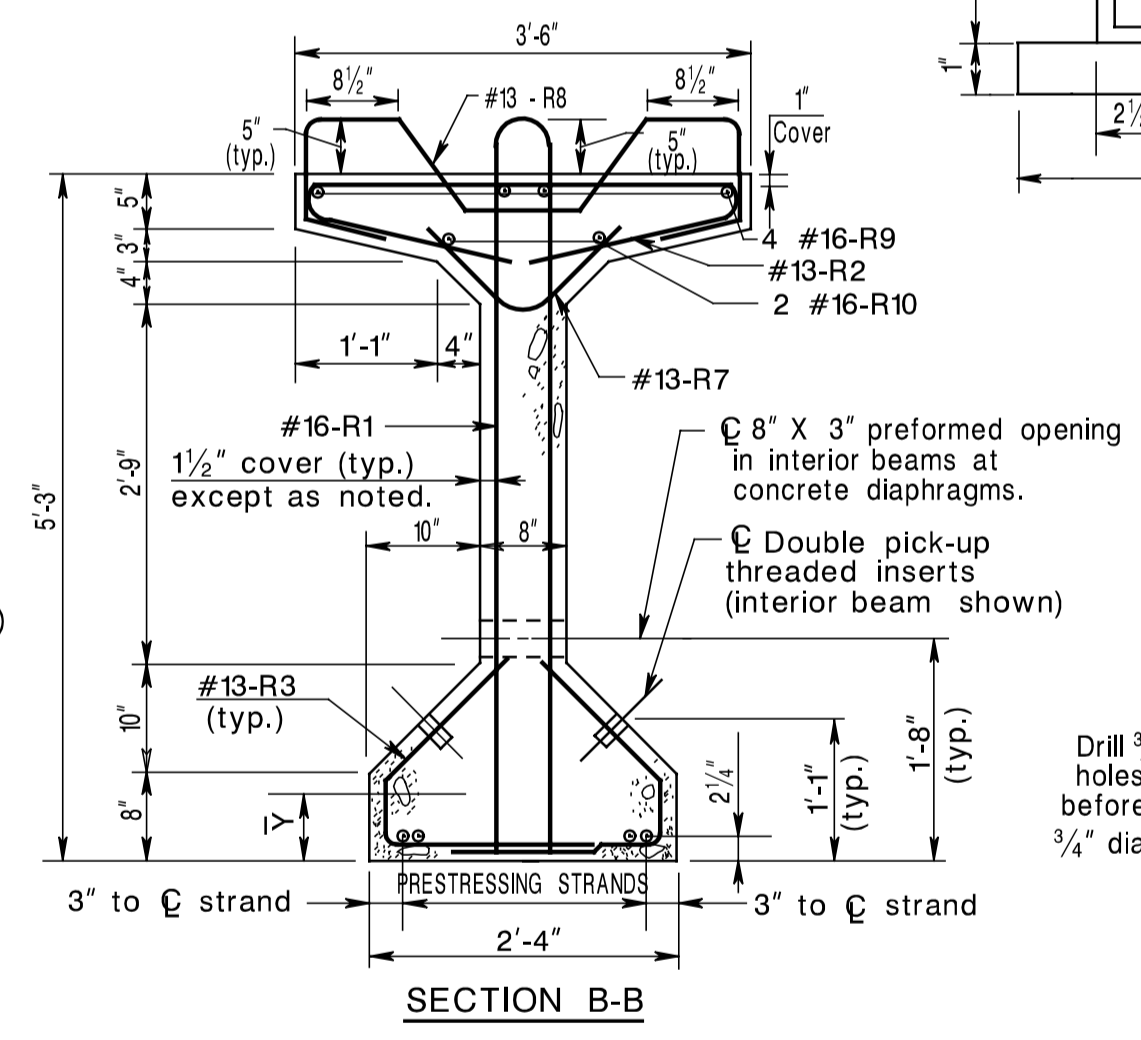
1 3/8" DIA. LIFTING HOOK (OR EQUAL)



SECTION E-E



SECTION A-A END



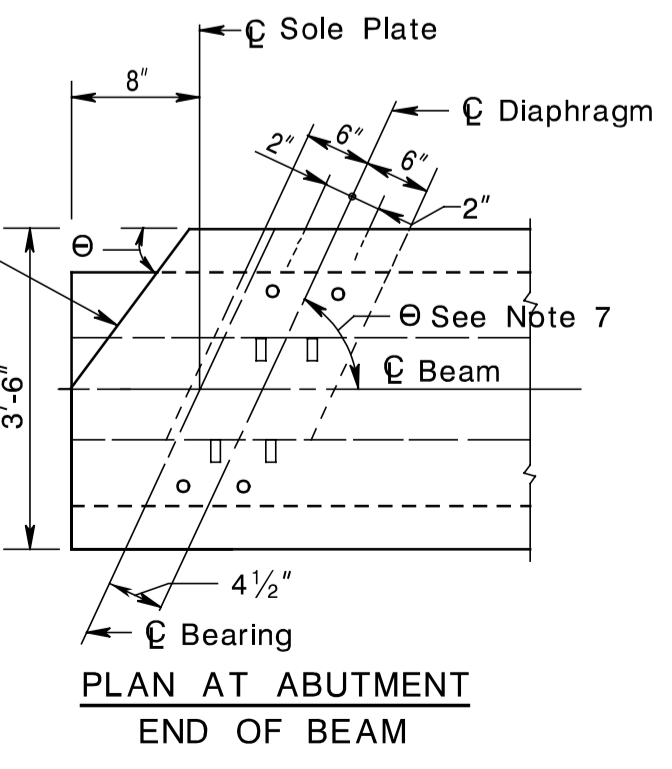
SECTION B-B MIDSPAN

TYPICAL BEAM SECTIONS

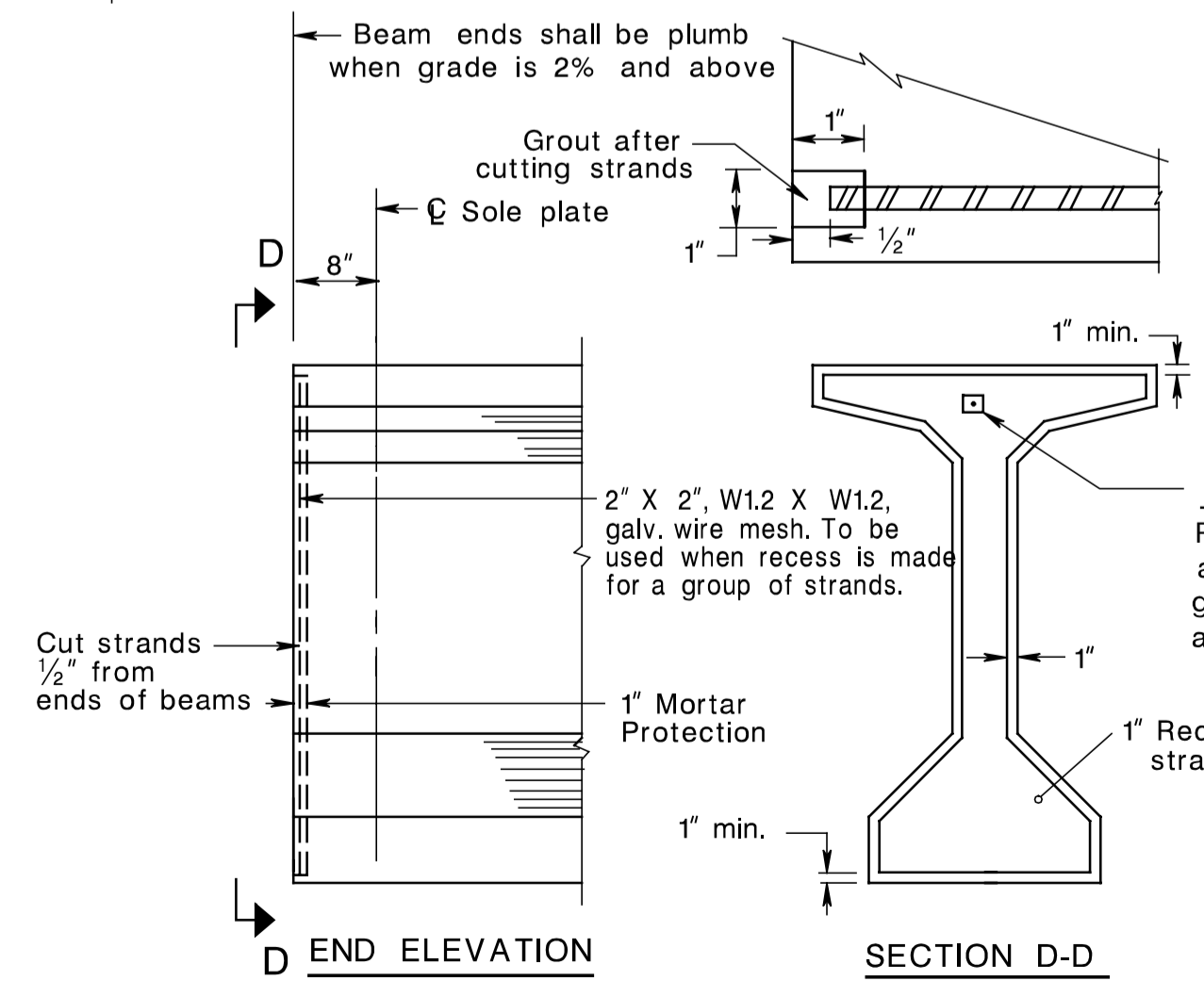
NOTE: \bar{Y} LOCATES CENTROID OF STEEL PRESTRESSING GROUP

NOTE: OMIT THREADED INSERTS ON OUTSIDE FACE OF FASCIA BEAM

NOTE: ON MODERATE TO HIGH SKEWS, IT MAY BE NECESSARY TO FORM THE TOP FLANGE AS SHOWN HERE



PLAN AT ABUTMENT END OF BEAM



GRouted RECESS FOR STRAND AT BEAM ENDS

PAYSTANDARD ITEM NO.	QUANTITIES		CONTRACT QUANTITY
	DESCRIPTION	UNIT	
(D)	PRETENSIONED PRESTRESSED CONCRETE BEAMS, 63"	L.F.	

STANDARD DRAWING PLATE 2.4-3
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

63" PRETENSIONED PRESTRESSED CONCRETE BEAMS

ROUTE (D) SECTION

CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	
IN CHARGE OF _____	

REVISION	BY	CKD	DATE

SCALE: _____ NONE _____
BRIDGE SHEET NO. B OF B

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BDC04MB-01

STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
(D)	STRUCTURE NO.		
	STRUCTURE NAME		

GENERAL NOTES

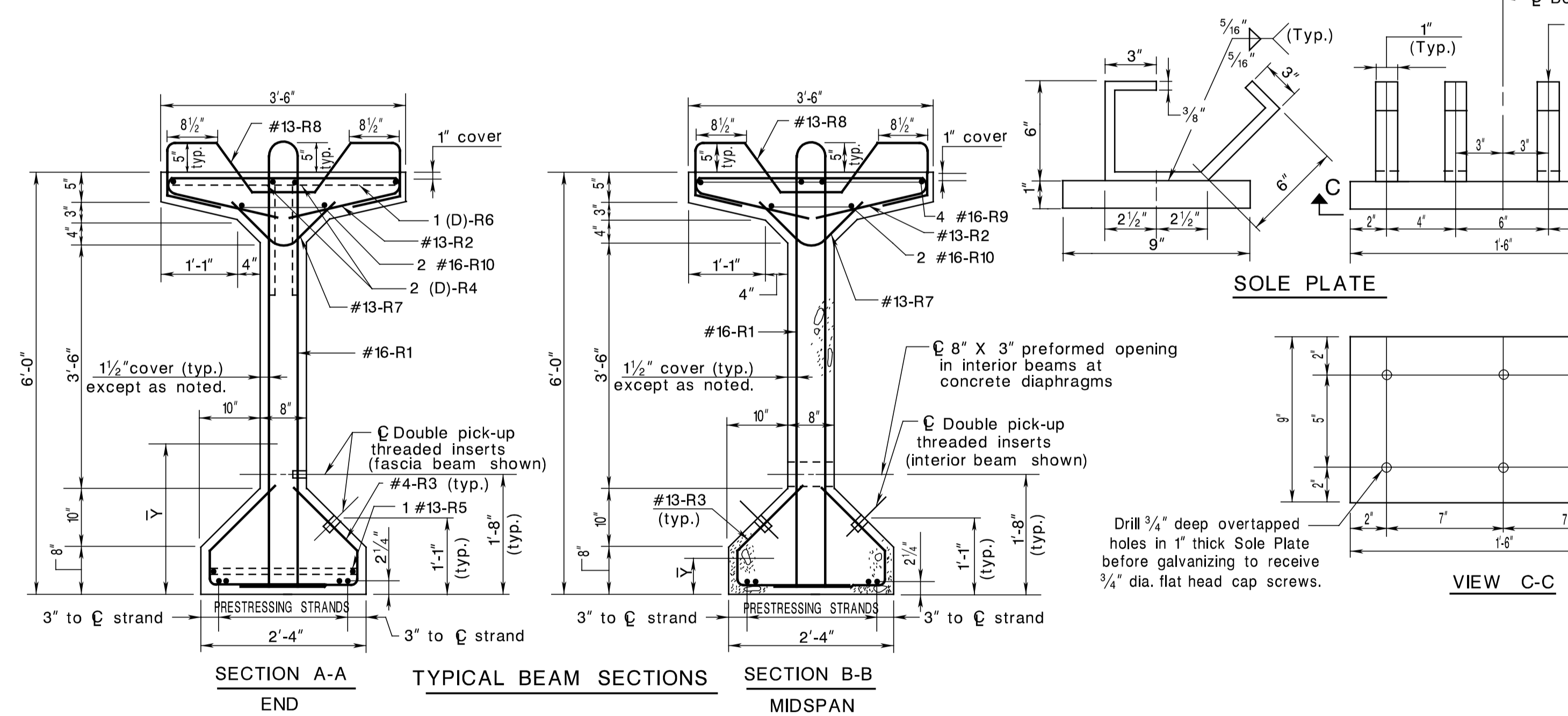
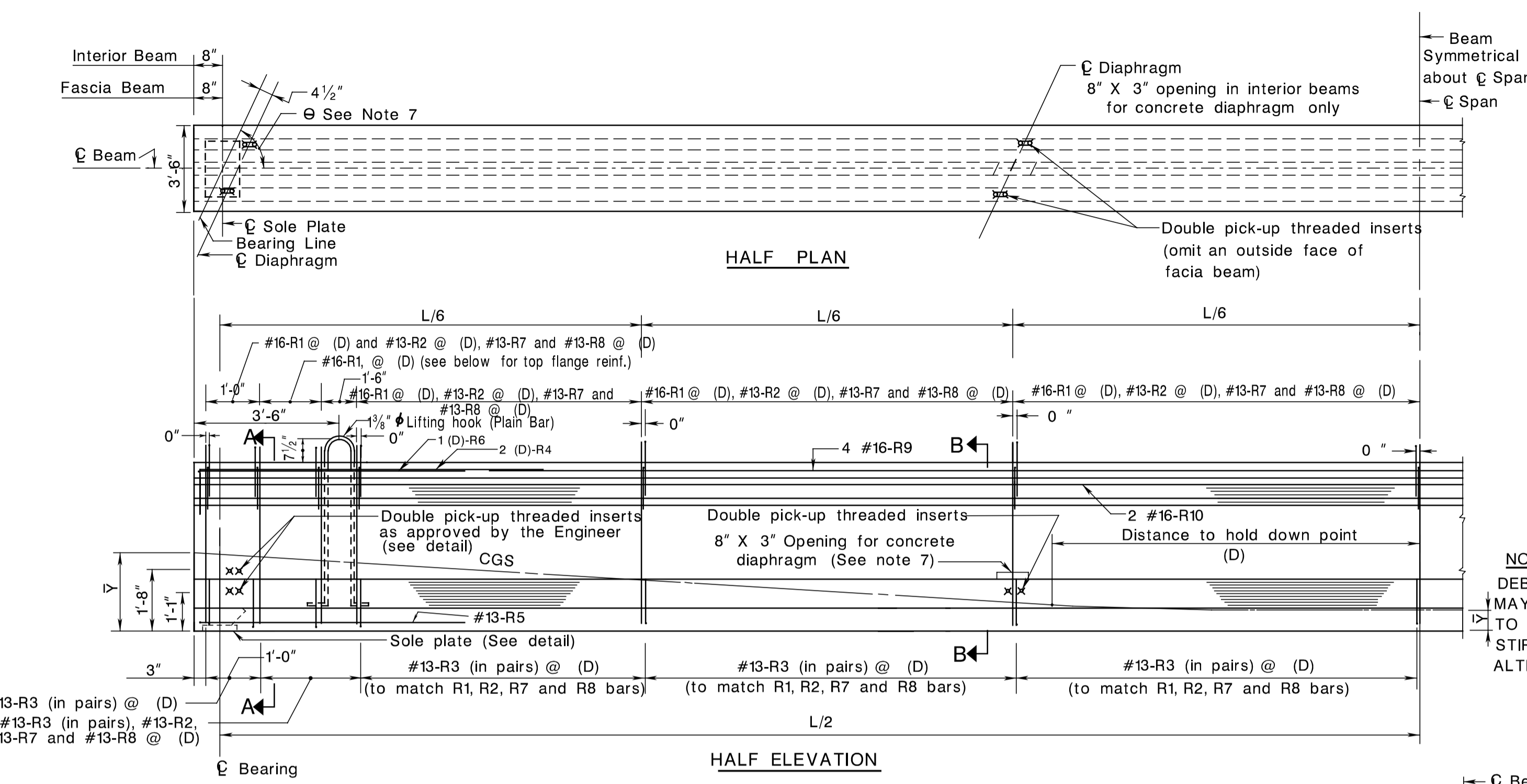
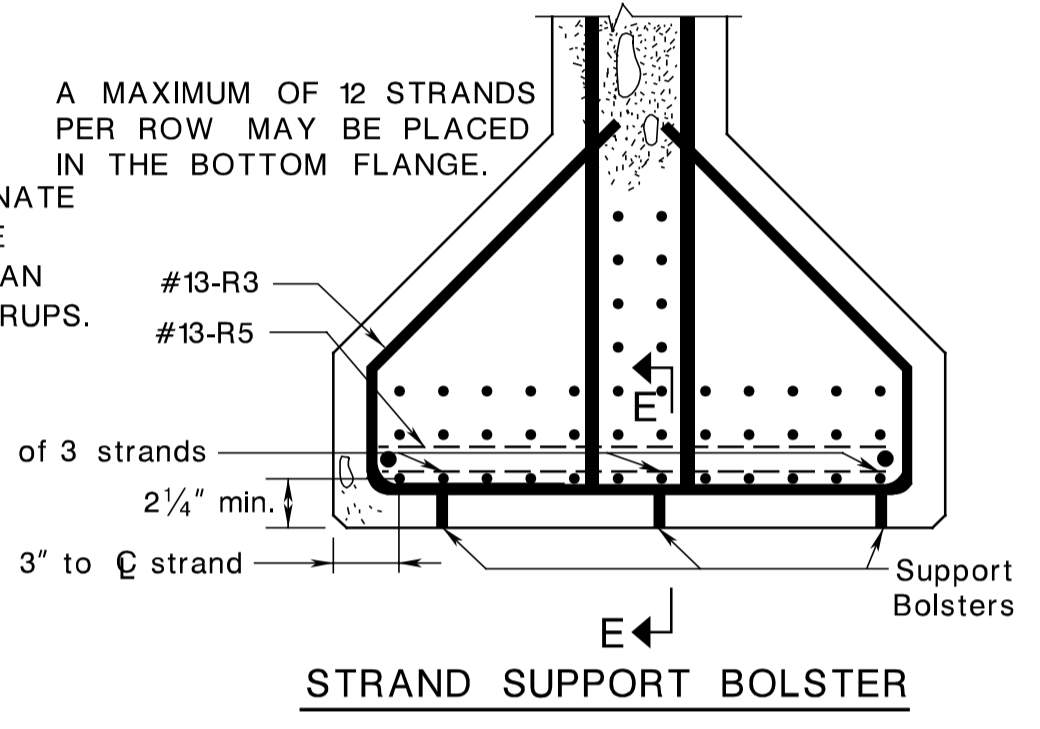
- DESIGN SPECIFICATIONS**
(D) The AASHTO LRFD Bridge Design Specifications, with Corrections, as modified by Section 3 of the NJDOT Design Manual for Bridges and Structures.
- LIVE LOAD**
HL-93 or NJDOT Permit Vehicle, whichever governs.
- PRESTRESSING STEEL**
The prestressing strands shall be 1/2"φ or 0.6"φ, 7 wire uncoated steel strands conforming to current AASHTO M203, Grade 270 and shall be low relaxation strands. Each strand shall be given an initial tension of 0.75 f_sA_s, as specified in applicable sections of the PCI Design Handbook - Precast and Prestressed Concrete. Any change in the precast and prestressing must be accompanied by complete calculations for approval by the Engineer.
(D) CONCRETE DESIGN STRESSES
(D) Design compressive stresses (f'_c) = _____ psi, class _____ concrete.
(D) Compressive strength at prestress (f'_{ci}) = _____ psi.
- CONCRETE**
All exposed corners shall be chamfered 3/4" or rounded to 3/4" radius. Angles of intersection between webs and flanges shall be rounded to not less than 3/4" radius. Top surface of beams shall be roughened to the satisfaction of the Engineer. At approximate time of initial set all laitance shall be removed with a stiff wire brush.
- SOLE PLATES**
Cost of Sole Plates shall be included in price bid for Prestressed Concrete Beams. Sole Plates shall be galvanized as per Specifications.
- DIAPHRAGMS**
For the angle θ between the center line of beam and center line of diaphragms or bearings reference the Framing Plan.
- MILD STEEL REINFORCEMENT**
Reinforcement bars shall conform to ASTM A615, Grade 60. Minimum clear cover shall be 1/2" unless otherwise noted. Cost of furnishing and placing reinforcement steel shall be included in the price bid for Prestressed Concrete Beams.
(D) 9. For camber diagram see sheet No. B _____

SCHEDULE OF MILD STEEL REINFORCEMENT

No.	MARK	SIZE	LENGTH	TYPE	A	B	C	D
(D) *	R1	#16	13'-1 1/2"	1	6'-3 3/8"	5 5/8"	-	-
(D) *	R2	#13	6'-7 3/4"	5	1'-7"	4"	2 1/2"	3'-3"
(D)	R3	#13	3'-5 3/4"	3	10 3/4"	10 3/4"	6"	1'-8"
(D) *	R4	(D)	10'-6"	2	9'-0"	1'-6"	-	-
(D) *	R5	#13	17'-0"	2	7'-6"	2'-0"	7'-6"	-
(D) *	R6	(D)	20'-11"	2	9'-0"	3'-0"	9'-0"	-
(D)	R7	#13	2'-1"	4	5"	6 1/2"	6 1/2"	-
(D) *	R8	#13	6'-7"	6	-	-	-	-
(D) *	R9	#16	(D)	STR.	-	-	-	-
(D)	R10	#16	(D)	STR.	-	-	-	-

*CORROSION PROTECTED BARS (REFER TO SECTION 26 OF THIS MANUAL FOR TYPES OF CORROSION PROTECTED REINFORCEMENT STEEL THAT CAN BE USED)

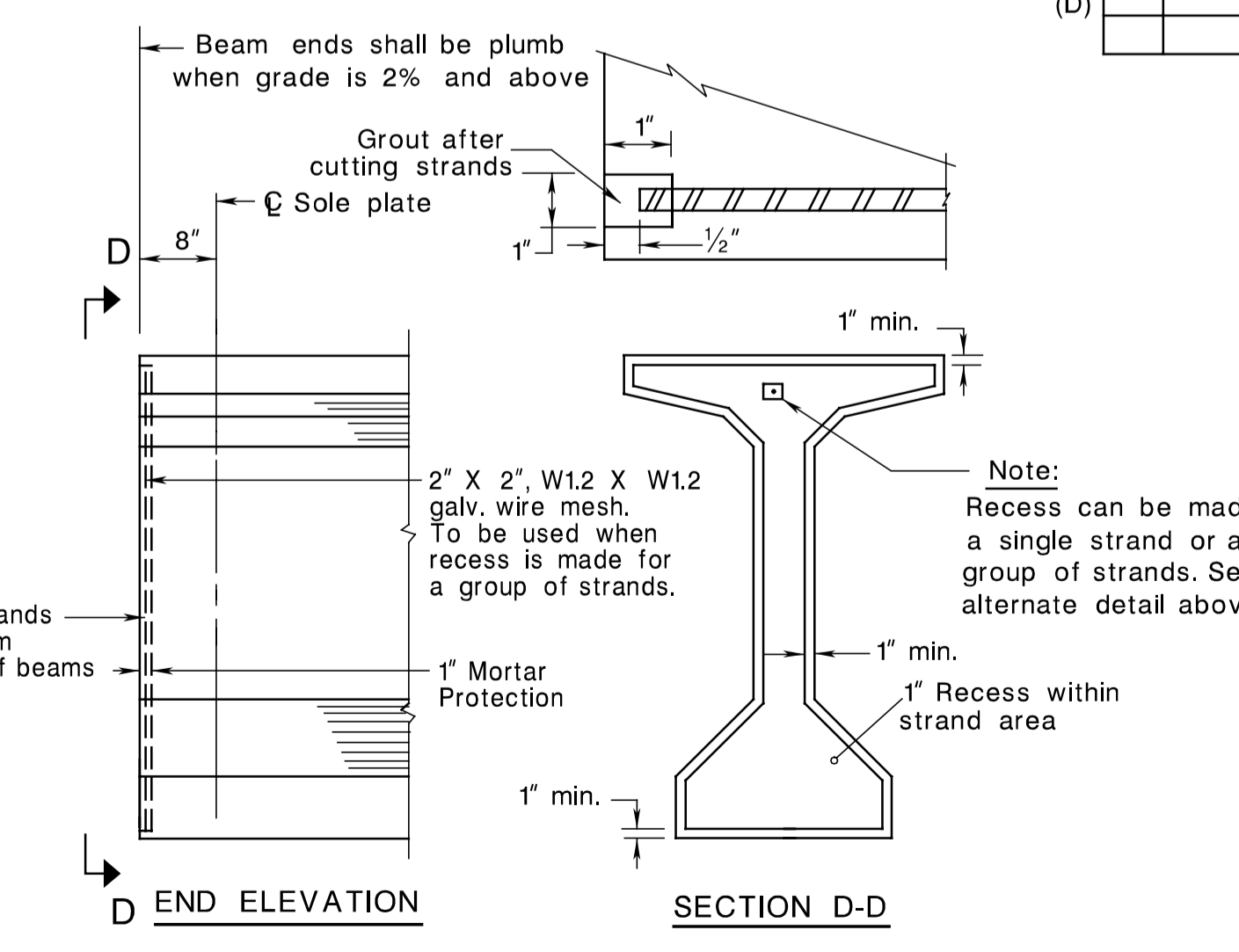
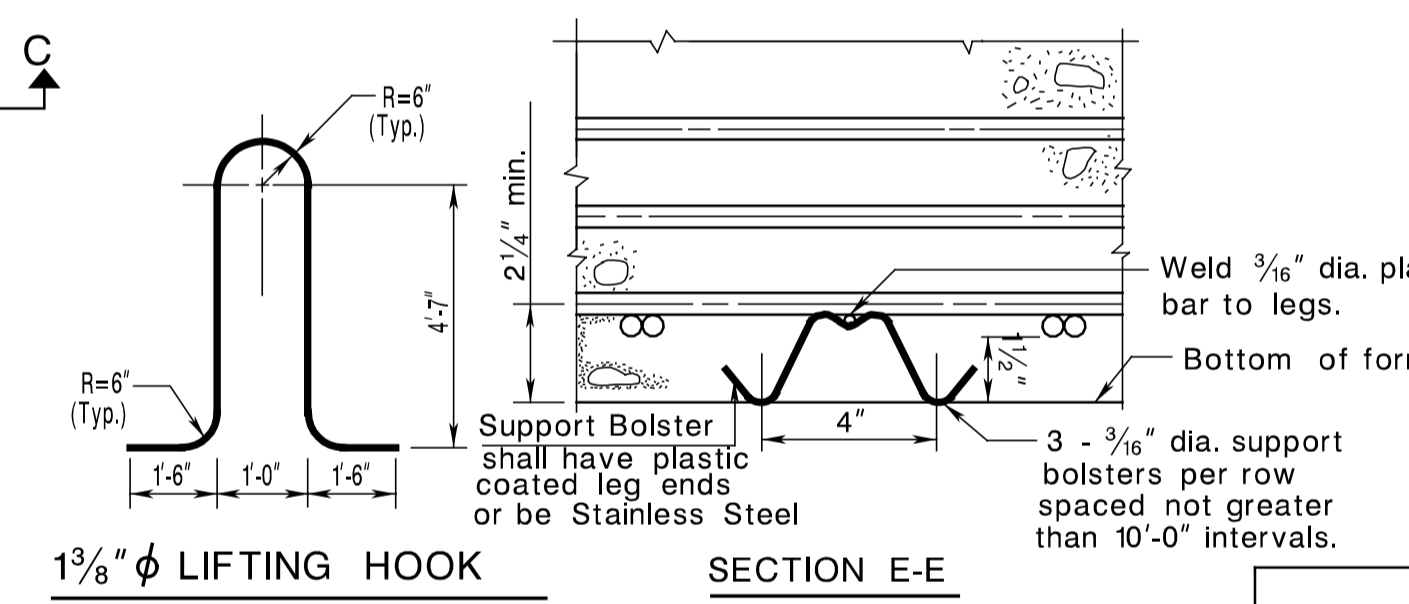
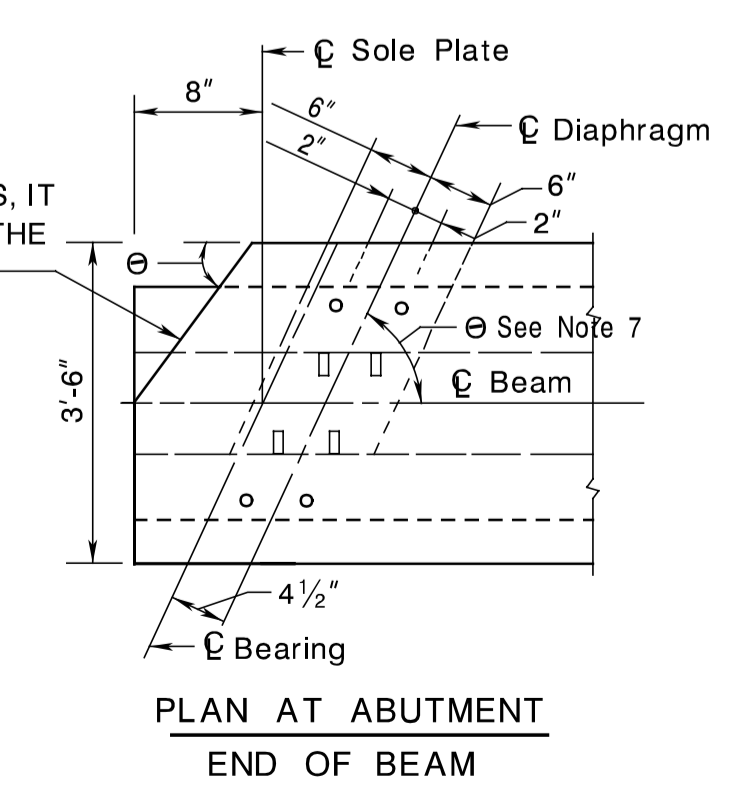
NOTE:
DEBOND STRAIGHT STRANDS MAY BE UTILIZED AS AN ALTERNATE TO DRAPED STRANDS. ONE PIECE STIRRUPS MAY BE UTILIZED AS AN ALTERNATE TO TWO PIECE STIRRUPS.



NOTE : Ȳ LOCATES CENTROID OF STEEL PRESTRESSING GROUP

NOTE : OMIT THREADED INSERTS ON OUTSIDE FACE OF FASCIA BEAM

NOTE : ON MODERATE TO HIGH SKEWS, IT MAY BE NECESSARY TO FORM THE TOP FLANGE AS SHOWN HERE



PAY ITEM NO.	STANDARD ITEM NO.	QUANTITIES		
		DESCRIPTION	UNIT	CONTRACT QUANTITY
(D)		PRETENSIONED PRESTRESSED CONCRETE BEAMS, 72"	L.F.	

CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	CHK. BY
IN CHARGE OF _____	

REVISION	BY	CKD	DATE

BDC04MB-01

STANDARD DRAWING PLATE 2.4-4

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

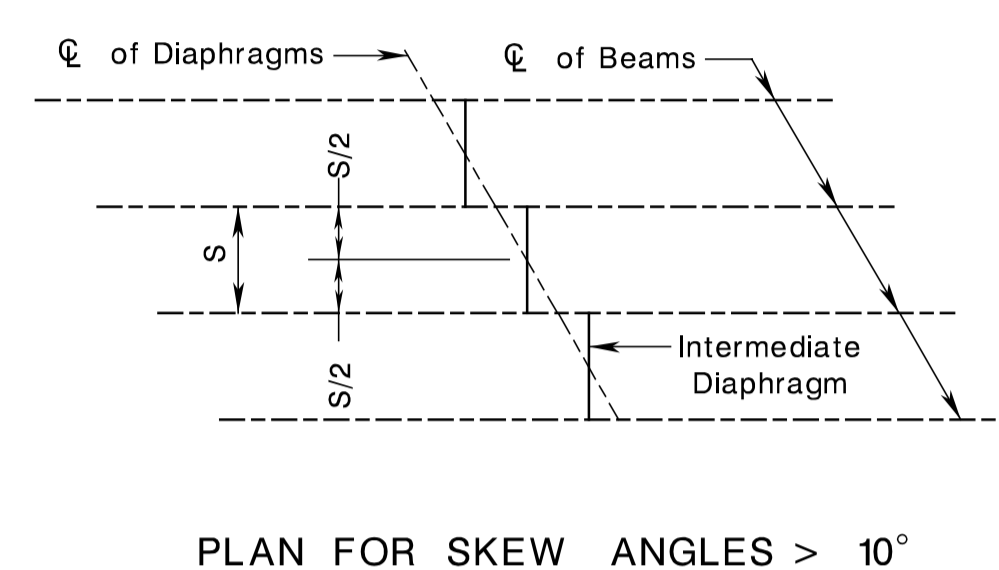
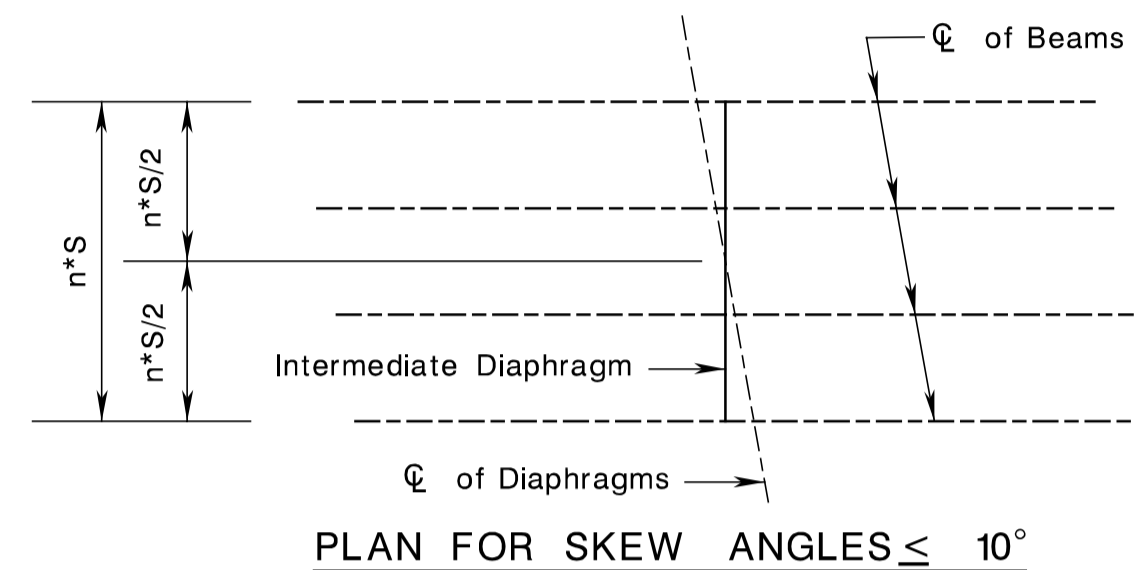
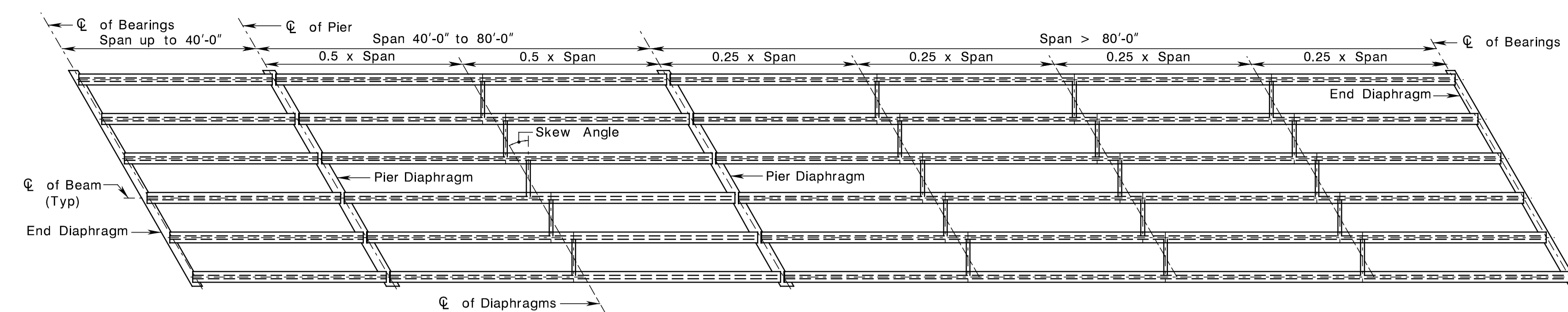
72" PRETENSIONED PRESTRESSED CONCRETE BEAMS

ROUTE (D) SECTION

SCALE : _____ NONE _____

BRIDGE SHEET NO. B OF B

STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
(D) STRUCTURE NO.			
STRUCTURE NAME			

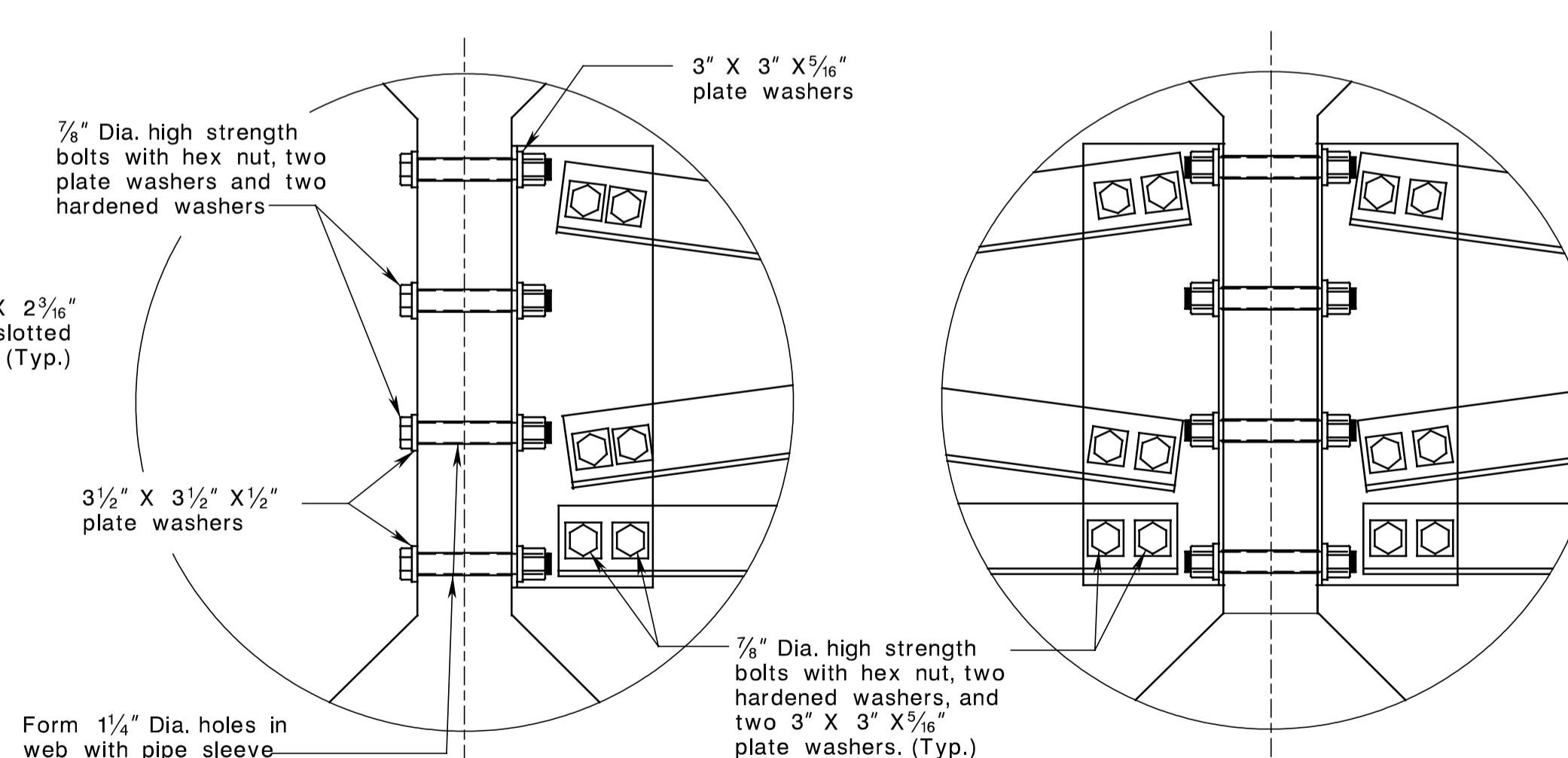
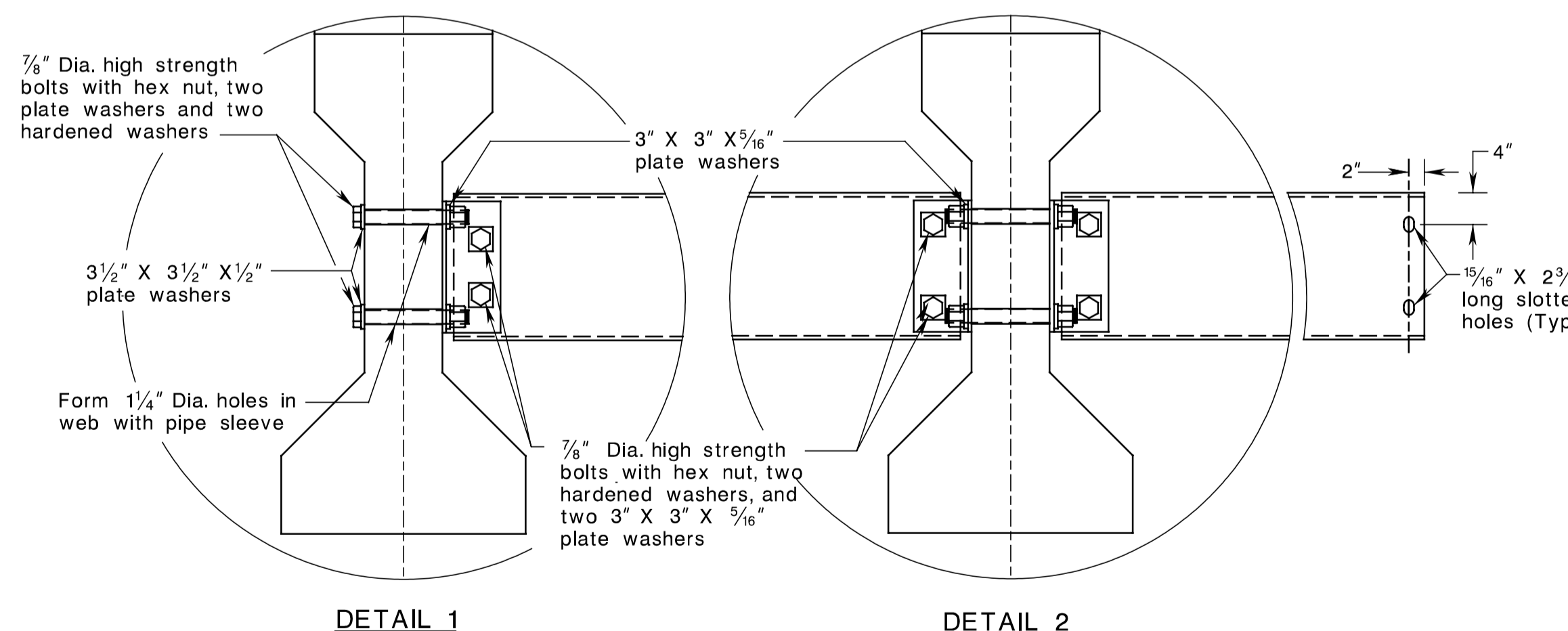
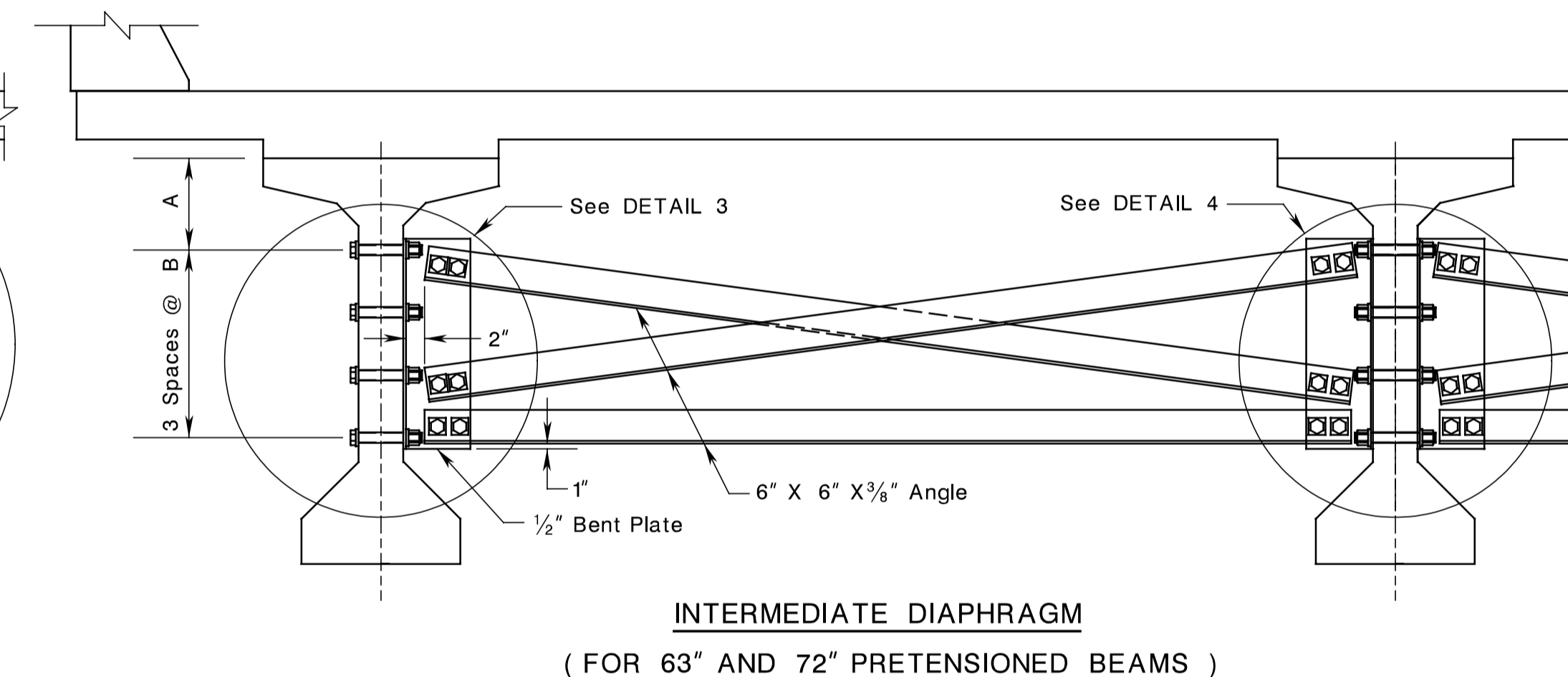
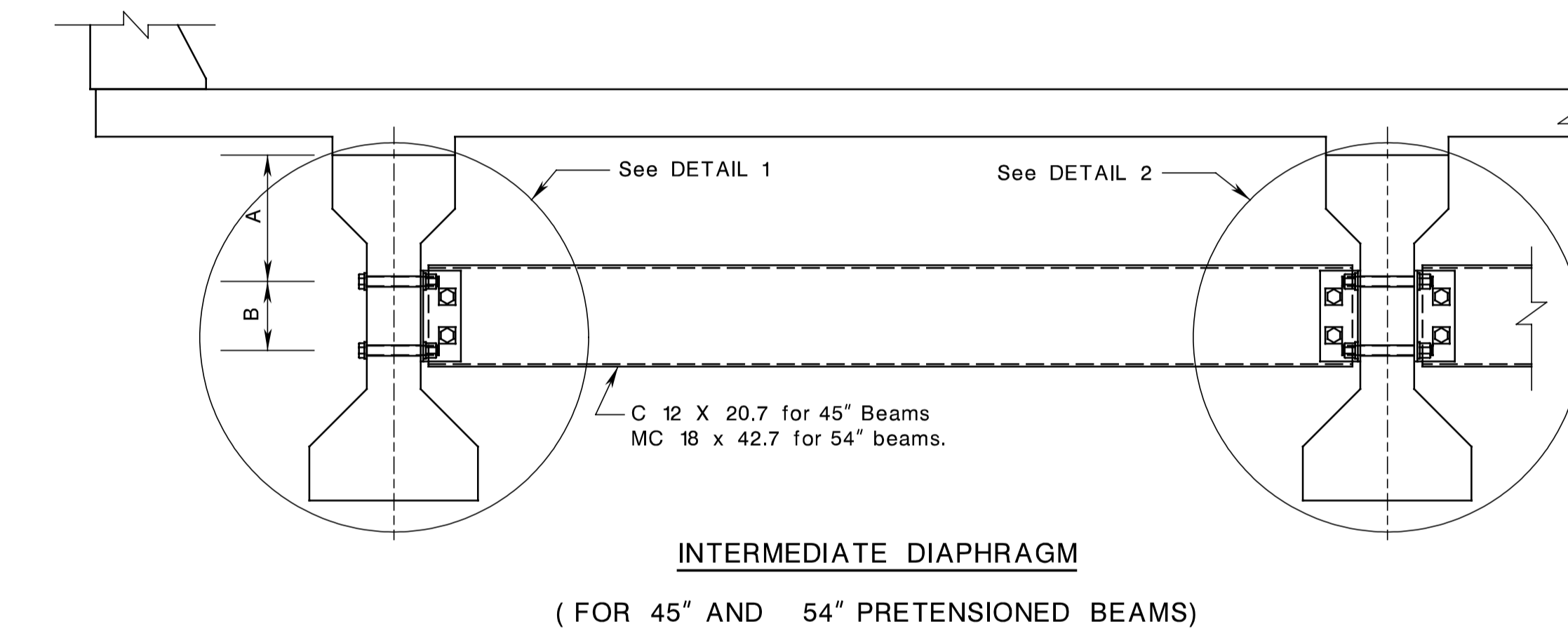
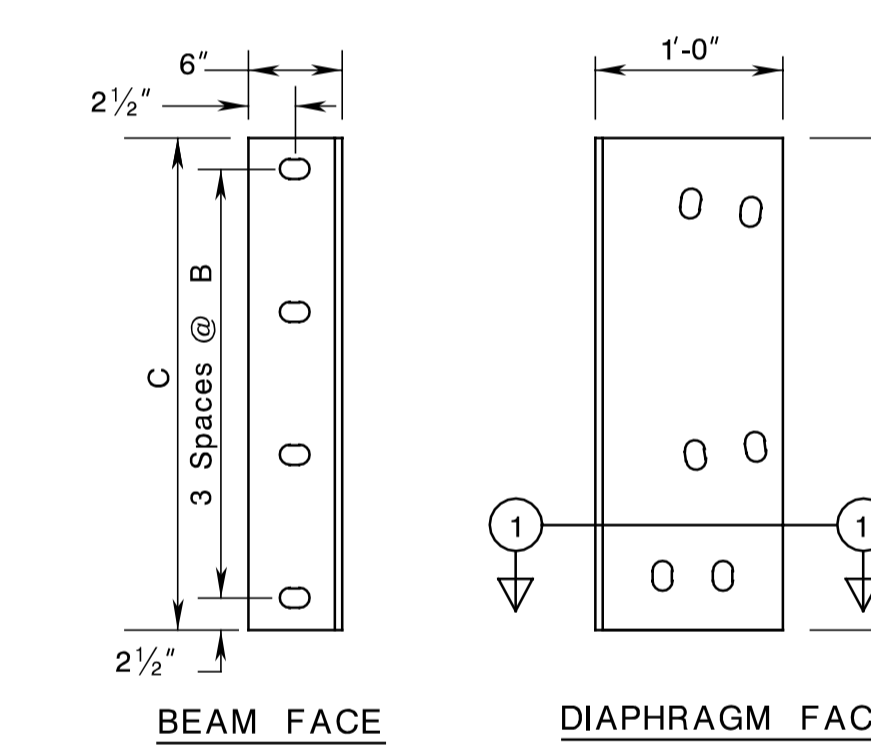
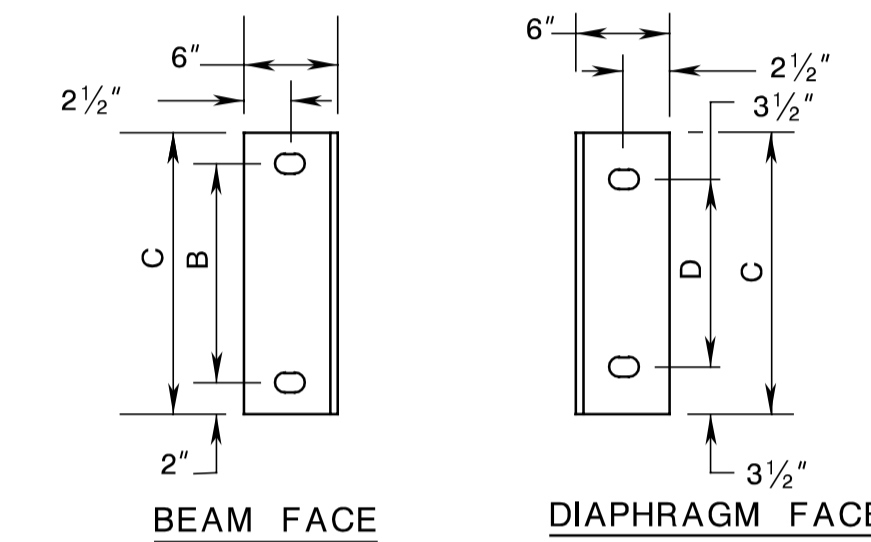


DIAPHRAGM SUPPORT DIMENSIONS

BEAM HEIGHT	A	B	C	D
45"	1'-2 1/2"	1'-1"	1'-5"	10"
54"	1'-5"	1'-5"	1'-9"	1'-2"
63"	1'-1/2"	11"	3'-2"	-
72"	1'-1/2"	1'-1"	3'-8"	-

GENERAL NOTES

- This standard drawing provides steel diaphragm details for prestressed concrete I-Beam bridges. The details in this standard are applicable to structures with beam spacings less than 14'-0" and skew angles less than 45°.
 - End and pier diaphragms shall be cast-in-place. The design plans show the centerline location of each intermediate diaphragm. All intermediate diaphragm details and associated prestressed beam details shall be included on the fabricator's shop drawings. Only one type of intermediate diaphragm may be used per structure.
 - The sizes of steel diaphragm and accessories provided are for information only. Actual sizes shall be based on design requirements in accordance with the AASHTO LRFD Bridge Design Specifications, with current interims, as modified by Section 3 of the NJDOT Design Manual for Bridges and Structures.
 - All structural steel, including bolts, nuts and washers shall be in accordance with the NJDOT Standard Specifications for Road and Bridge Construction with current Supplemental Specifications, as modified by the Special Provisions.
 - All structural steel shall be ASTM A36, galvanized as per ASTM A153, Class C.
 - All bolts are 7/8" dia. ASTM A325, Type 1. All bolts, nuts and washers shall be galvanized as per ASTM A153, Class C.
 - Bolt holes in the I-beam webs shall be located to avoid prestressing strands.
 - The placement of deck concrete shall not proceed until all intermediate diaphragms have been properly installed.
- * The note should be modified to reflect applicable year and updated Specifications



SECTION 1-1

THIS SHEET IS FOR DESIGN INFORMATION ONLY. DO NOT INCLUDE IN CONTRACT PLANS.

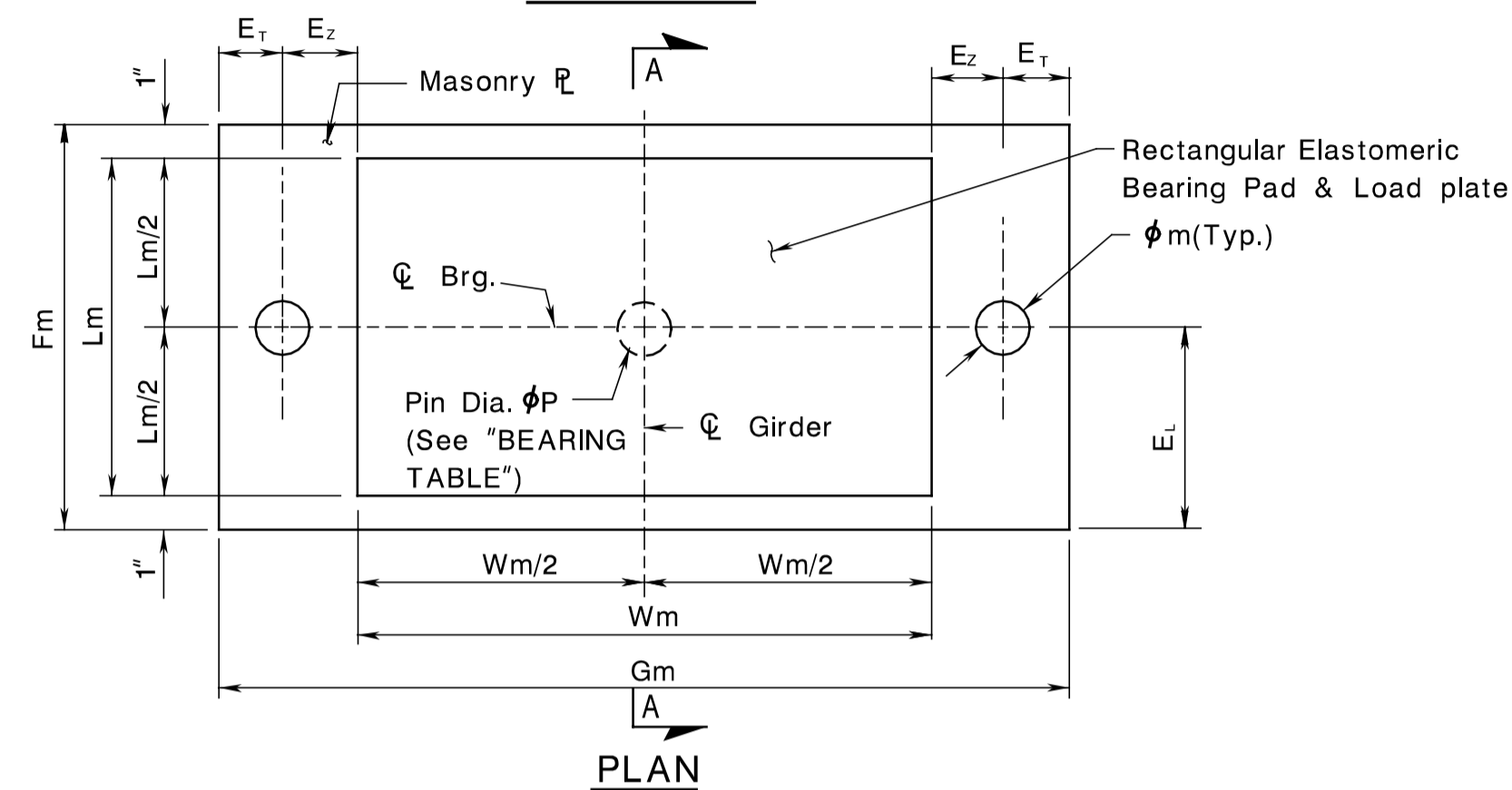
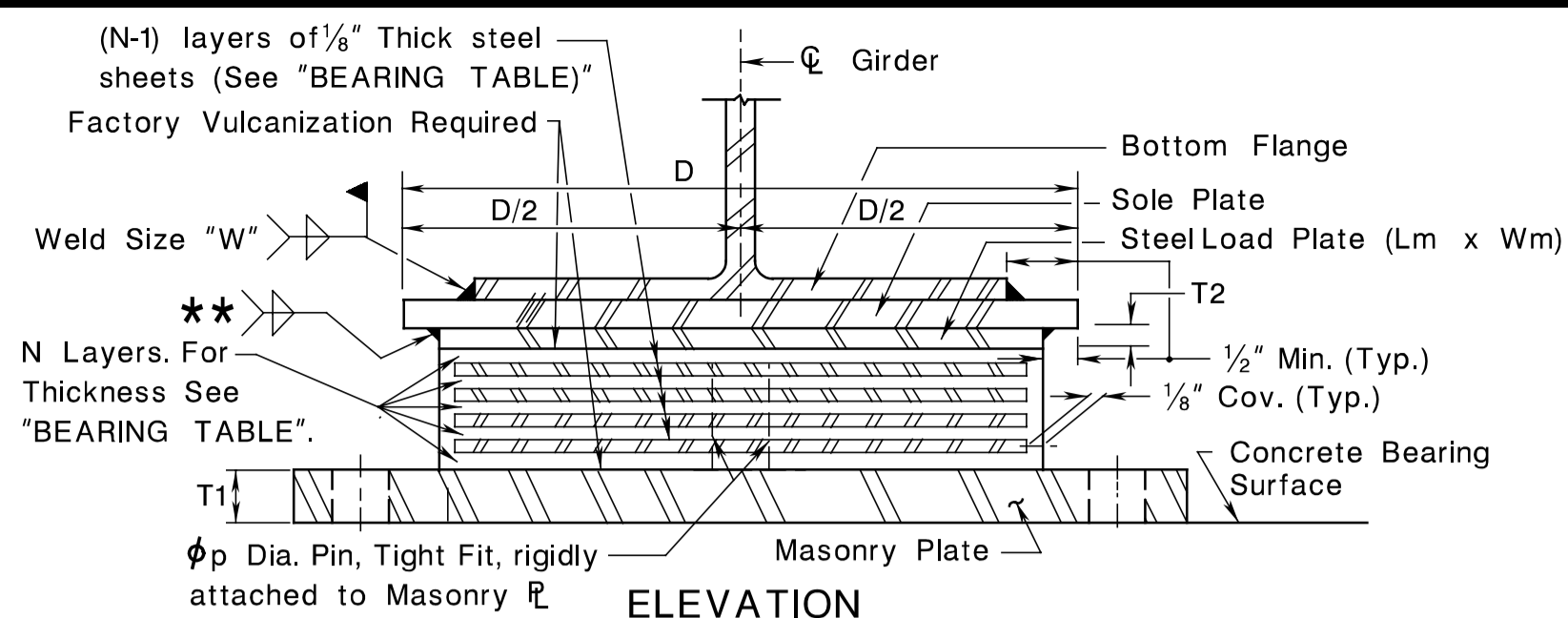
STANDARD DRAWING PLATE 2.4-5
NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

DETAILS OF INTERMEDIATE STEEL DIAPHRAGMS FOR PRESTRESSED CONCRETE BEAMS
ROUTE SECTION

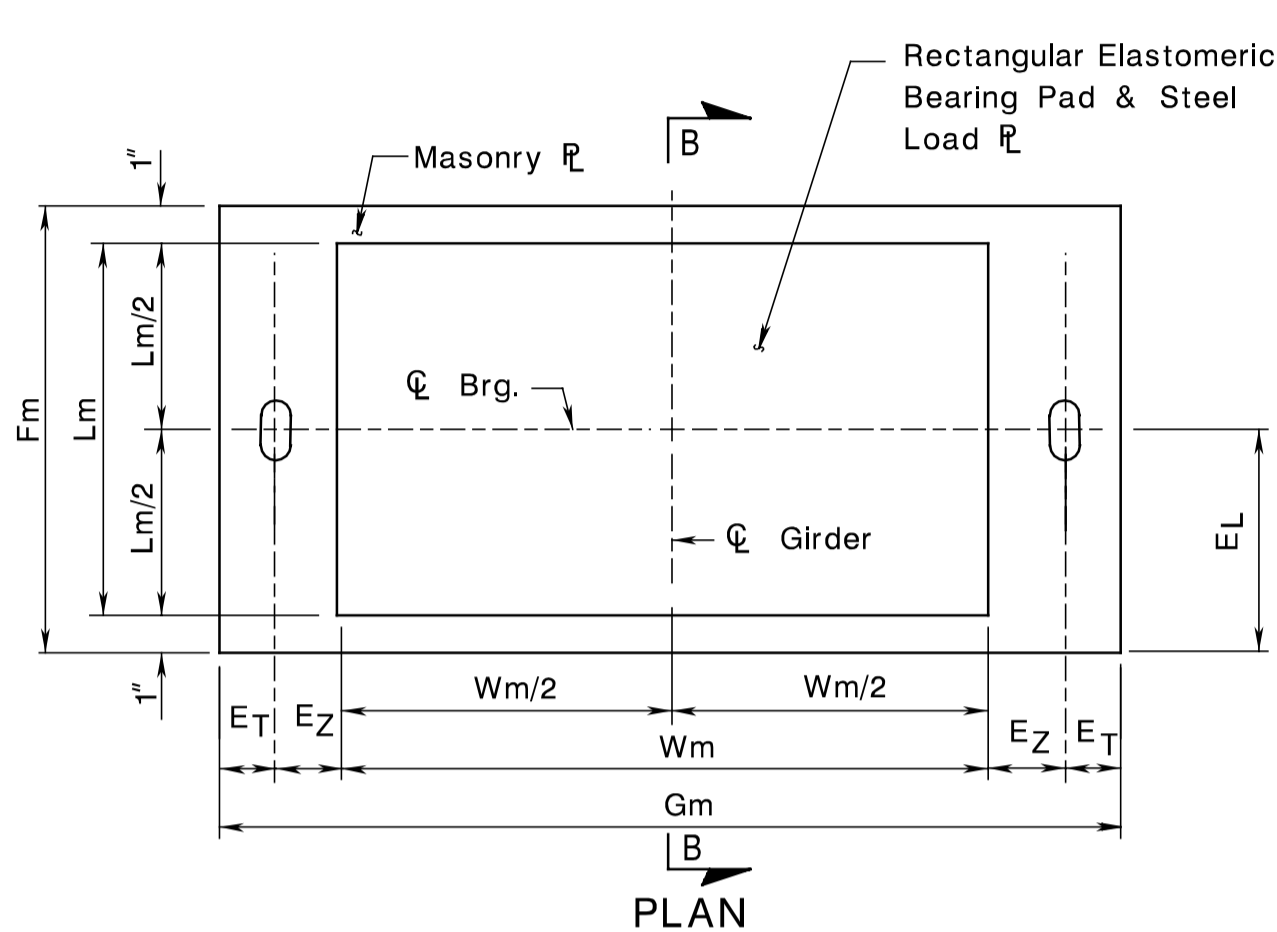
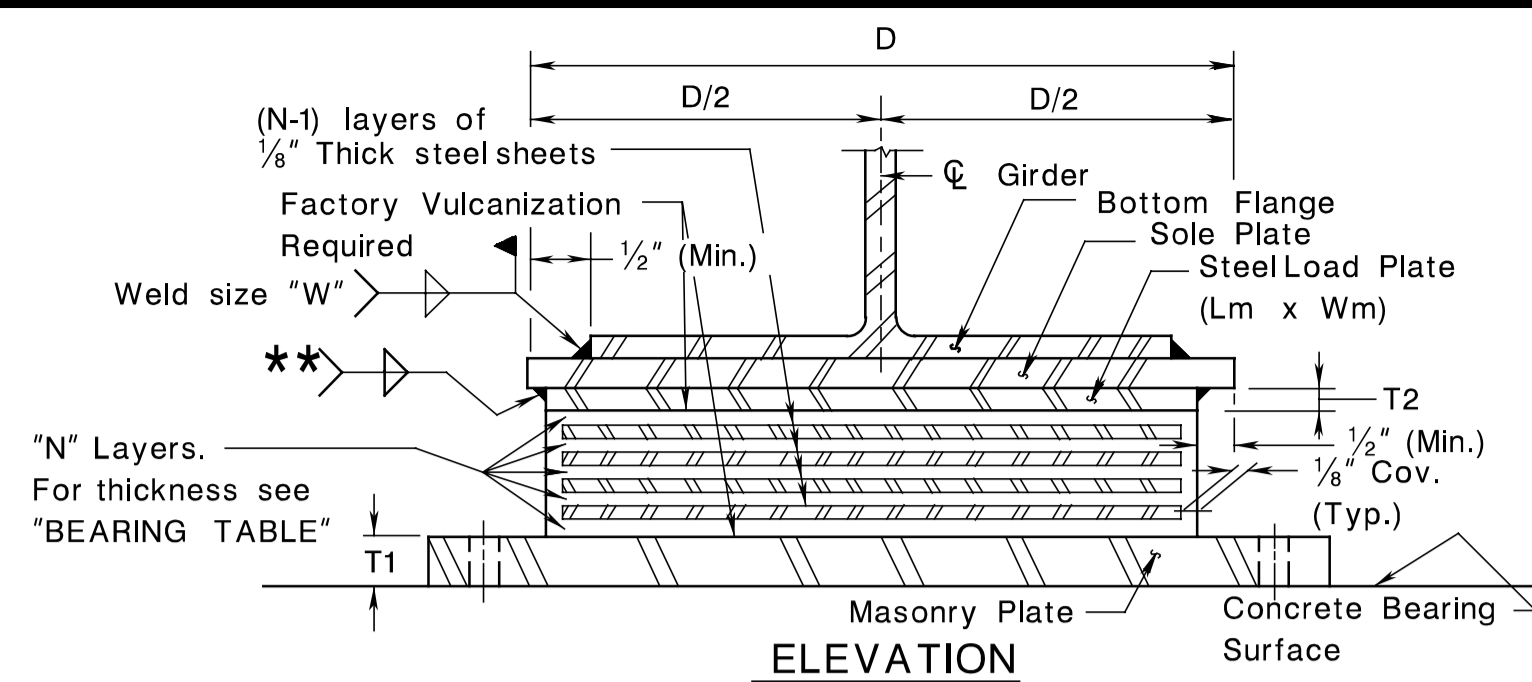
CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	
IN CHARGE OF	

REVISION	BY	CKD	DATE

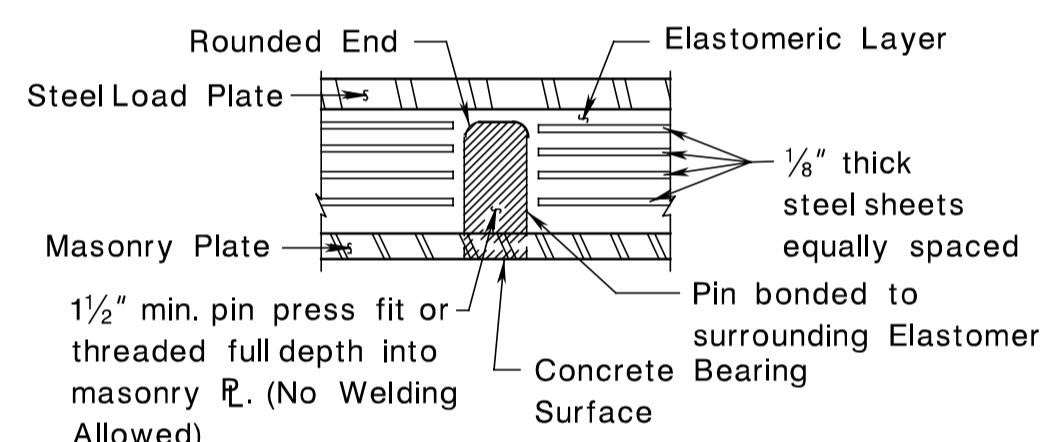
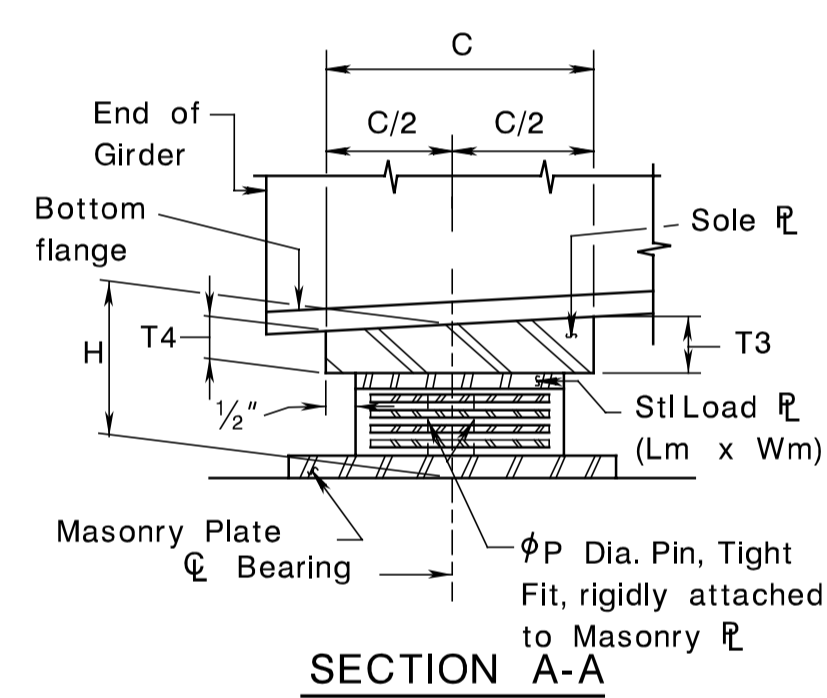
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BRIDGE SHEET NO. B OF B



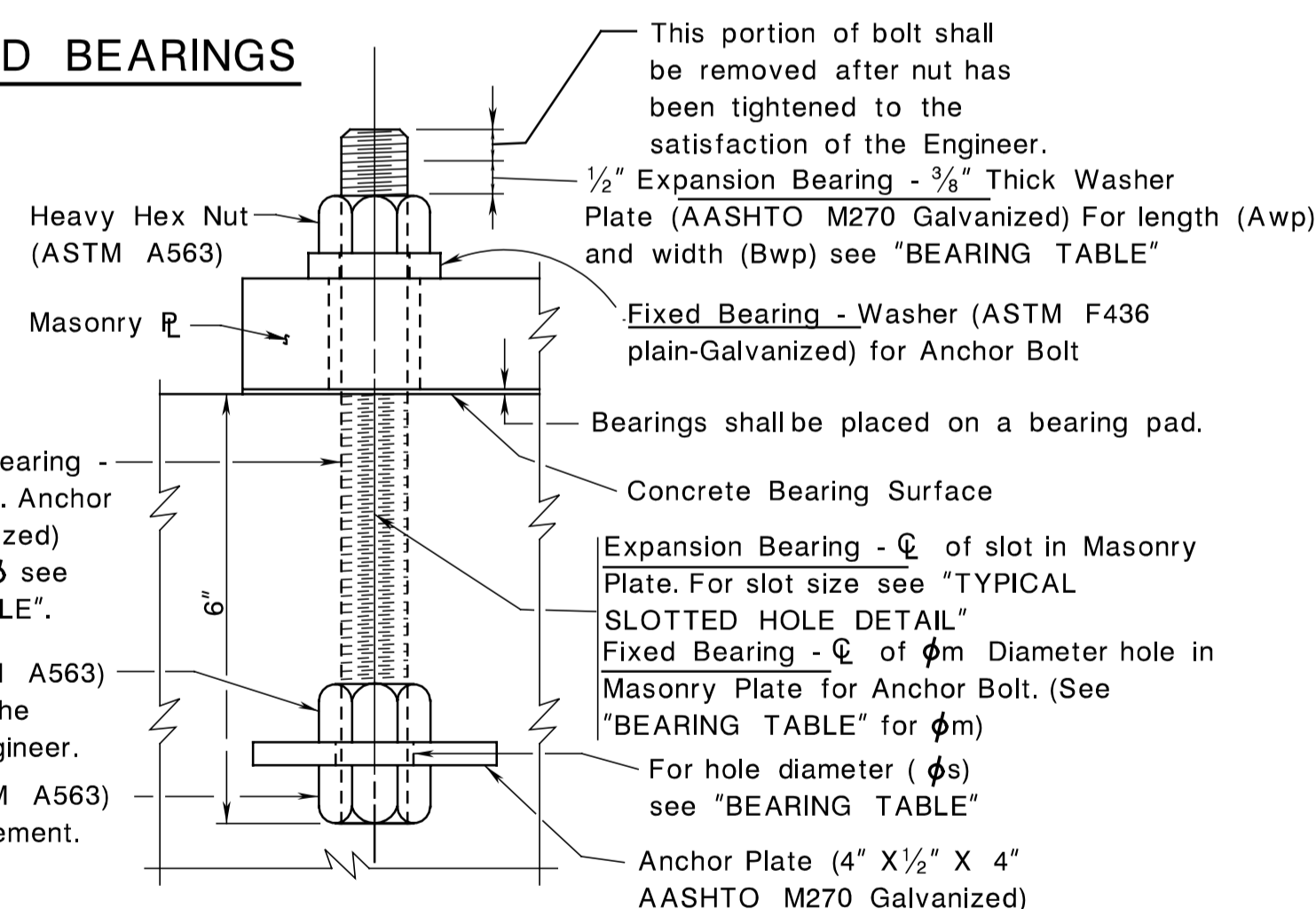
FIXED BEARINGS



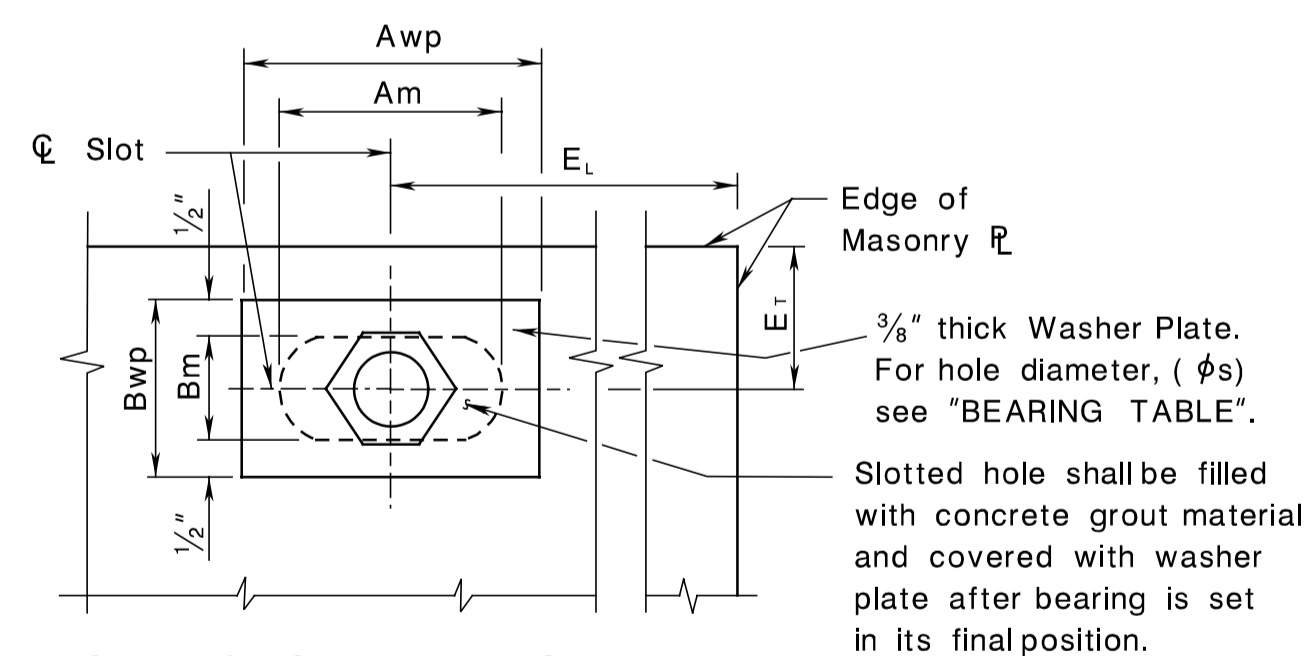
EXPANSION BEARINGS



PIN DETAIL FOR FIXED BEARINGS



ANCHOR BOLT DETAIL FOR ALL BEARINGS



TYPICAL SLOTTED HOLE DETAIL MASONRY PLATE (FOR EXPANSION BEARINGS ONLY)

NOTE TO DESIGNER:

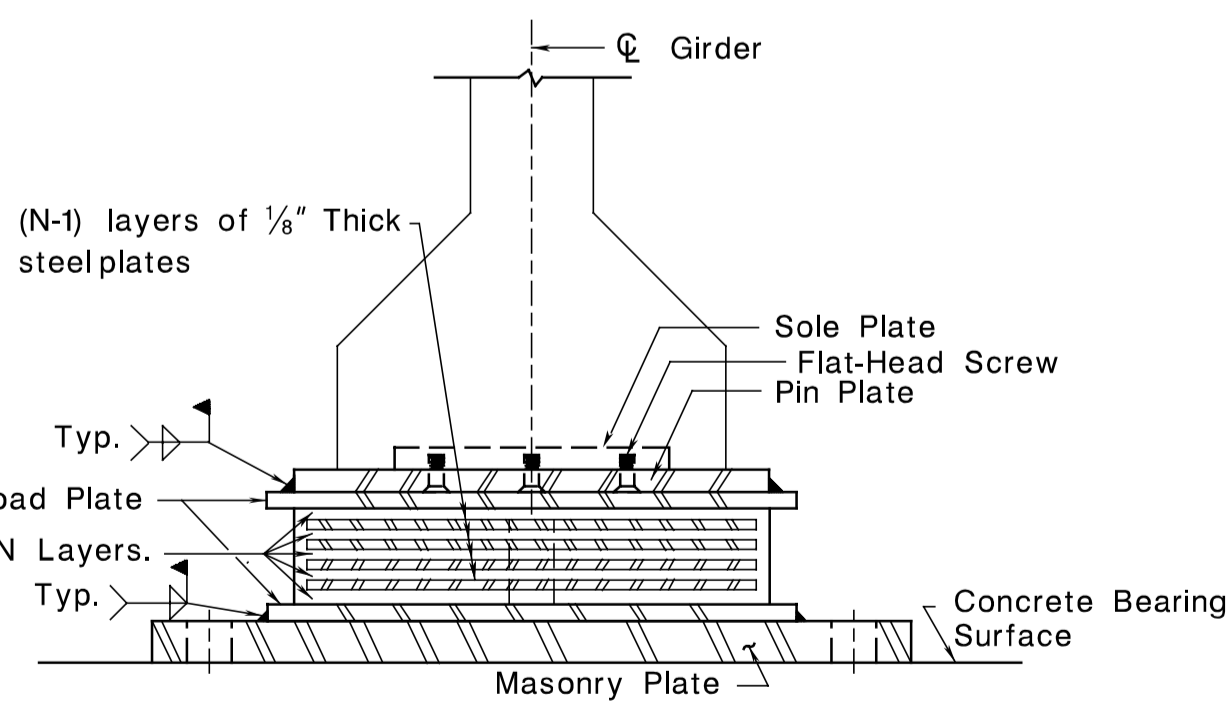
THIS SHEET IS NOT TO BE PLACED INTO THE CONTRACT SET OF PLANS AS IS. HOWEVER, INDIVIDUAL DETAILS MAY BE UTILIZED FOR SHOP DRAWING REVIEW.

GENERAL NOTES:

- * 1. Elastomeric Bearings shall be designed in conformance with the AASHTO LRFD Bridge Design Specifications, with current interims, as modified by Section 3 of the NJDOT Design Manual for Bridges and Structures, and the NJDOT Standard Specifications for Road and Bridge Construction with current Supplemental Specifications, as modified by the Special Provisions.
- 2. Tapered sole plates may be required when the bottom of the beam and the top of the bearings are not parallel to each other. A tapered sole plate shall be placed between the beam and the external load plate if either of the following conditions exist:
 - a. Longitudinal grade of the bottom flange is one percent or more.
 - b. The required taper is 1/16 inch or more.
- 3. The top of pedestals shall be level.
- 4. Indicate the maximum design reactions (DL + LL) at the supports.
- 5. The continuous weld connecting the load plate to the sole plate shall be allowed to cool after each pass. However the temperature of the steel adjacent to the elastomer shall not exceed 200° F Temperature shall be controlled by the welding procedure.
- 6. The size of weld (W) shall be determined by the designer. Minimum weld size shall be 5/16 inch.
- 7. Anchor Bolt shall be threaded as shown in "ANCHOR BOLT DETAIL FOR ALL BEARINGS". The nut shall be tightened to the satisfaction of the Engineer and the Anchor Bolt tip shall be removed 1/2 inch above the top of the nut. Anchor Bolts, Plates, Washer Plates and Nuts shall conform to the requirements of NJDOT Standard Specifications for Road and Bridge Construction.
- 8. This drawing represents straight simple span bridge structure. For clarity purposes no lateral bracings are shown.
- 9. All anchor bolts shall be cast-in-place.
- 10. If the design indicates that there will be no tension under any loading condition, the plate and nuts are not required.
- 11. The furnishing of Reinforced Elastomeric Bearings shall conform to the provisions of Subsection 503.08 of the Standard Specifications.
- 12. The Designer shall reference the criteria of Subsection 1.24.20 of the Bridges and Structures Design Manual for submission of final plans.

* The note should be modified to reflect applicable year and updated Specifications.

** Manufacturer shall provide the weld size (minimum size of weld shall be 5/16 inch).



ELEVATION

LOCATION	FIX / EXP.	ITEM NO.	QUANTITY REQUIRED	MAX. DESIGN REACTION (KIPS)	SHAPE FACTOR	LOAD R THICKNESS T2 (IN)	ONE WAY* LONG. MOVEMENT (IN)	ELASTOMER LAYERS				MASONRY						BRG. ANCHOR BOLTS PER BRG.	WELDED SIZE W (IN)	WASHER C (IN)	SOLE PLATE				LL W/O IMP (KIPS)	phi s HOLE DIA. FOR PIN (IN)	phi P PIN DIA. (IN)				
								THICKNESS (IN)	N LAYERS	Lm (IN)	Wm (IN)	T1 (IN)	Fm (IN)	Gm (IN)	Am (IN)	Bm (IN)	E1 (IN)				E2 (IN)	Ez (IN)	phi m (IN)	H (IN)				phi (IN)	DL+SDL (KIPS)	T3 (IN)	T4 (IN)

* One way longitudinal movement is the maximum movement (Expansion or Contraction) of the Superstructure when bearings are set at 68° F. This includes 1 inch of tolerance. When the bearings are to be set at temperatures other than 68°, reference AASHTO LRFD Bridge Design Specifications, Articles 3.12.2.1 and 3.12.2.2 for guidance for setting temperatures and bearing movement.

CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	
IN CHARGE OF	

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ID=16412300

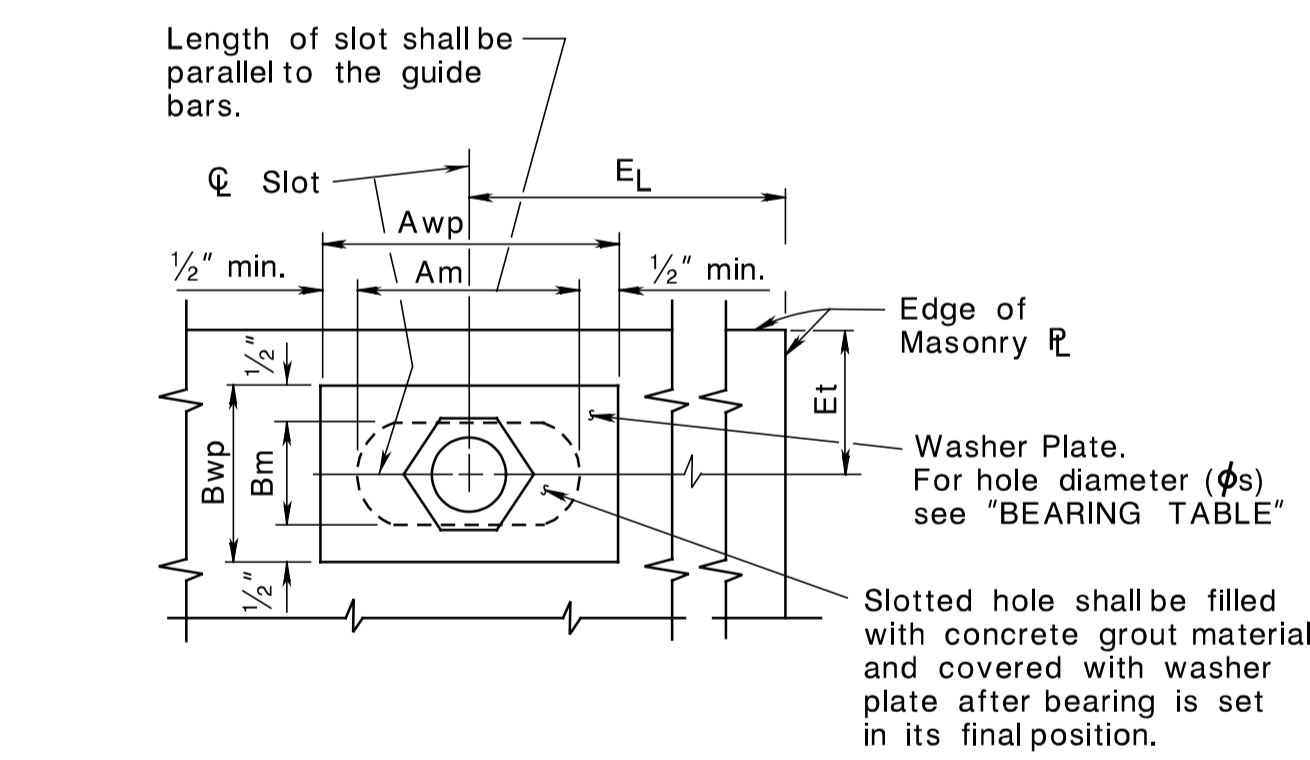
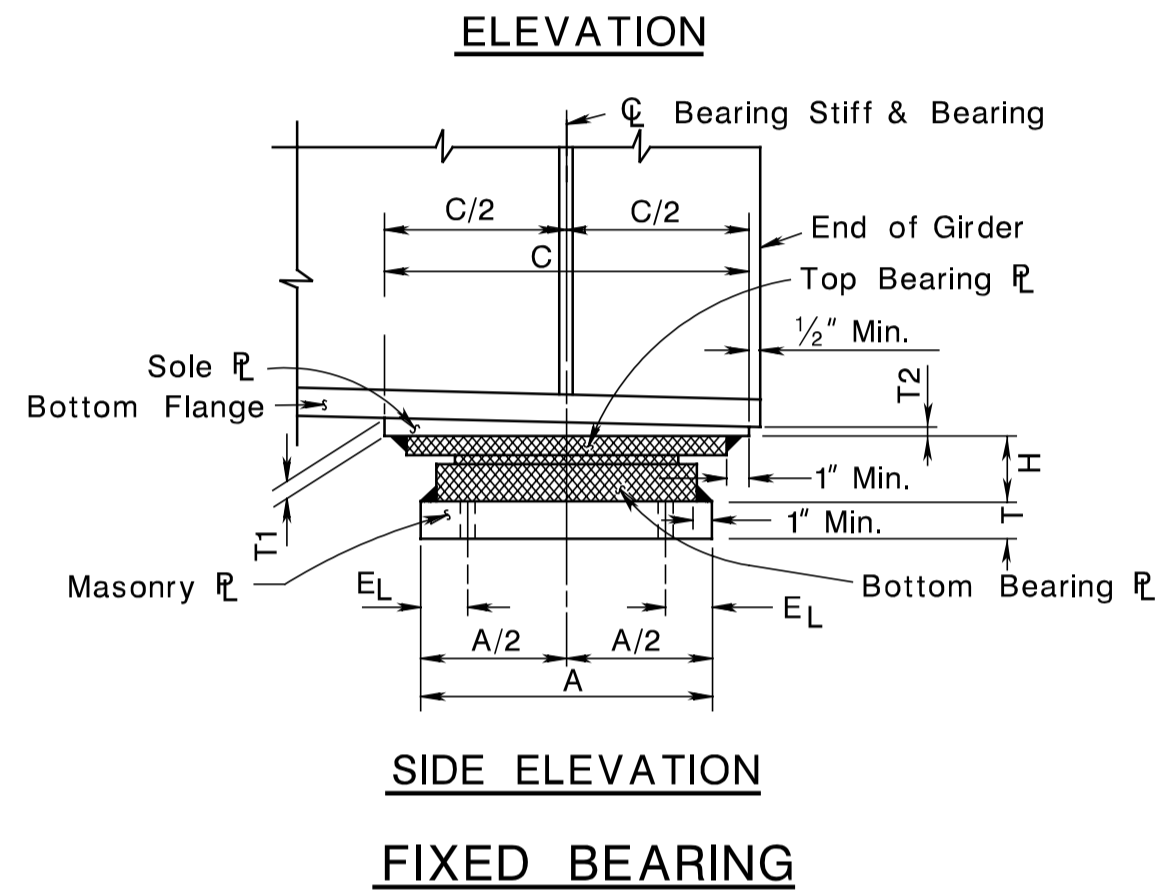
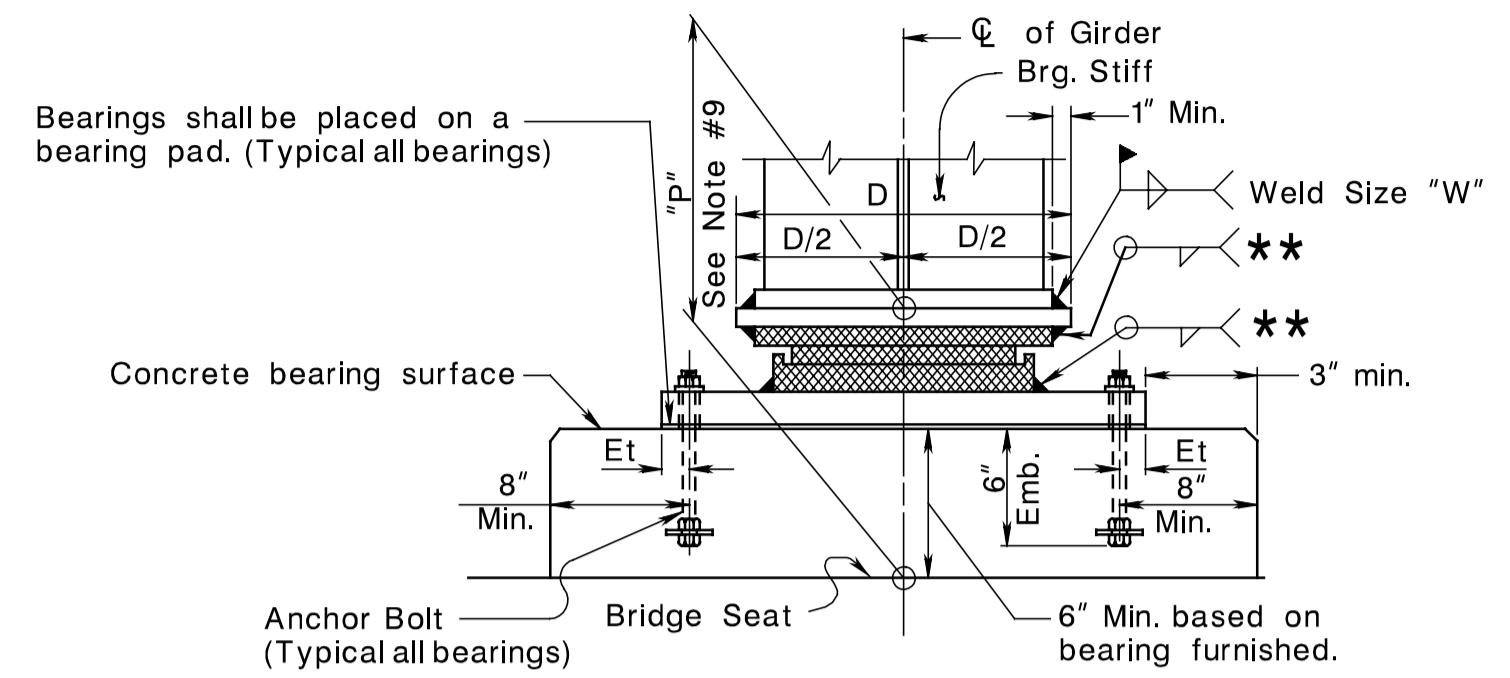
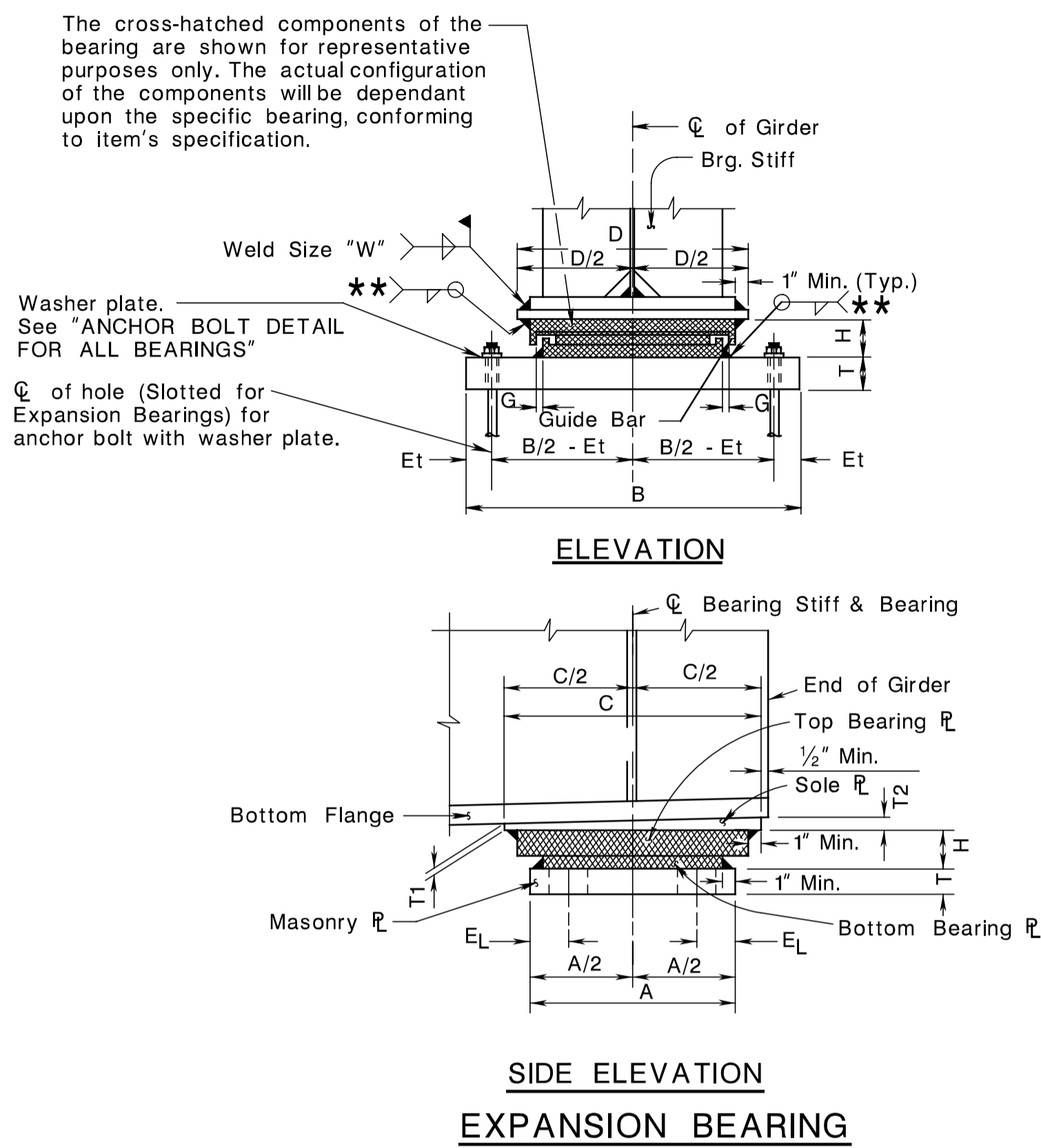
NOTE TO DESIGNER:

THIS SHEET IS NOT TO BE PLACED INTO THE CONTRACT SET OF PLANS AS IS. HOWEVER, INDIVIDUAL DETAILS MAY BE UTILIZED FOR SHOP DRAWING REVIEW.

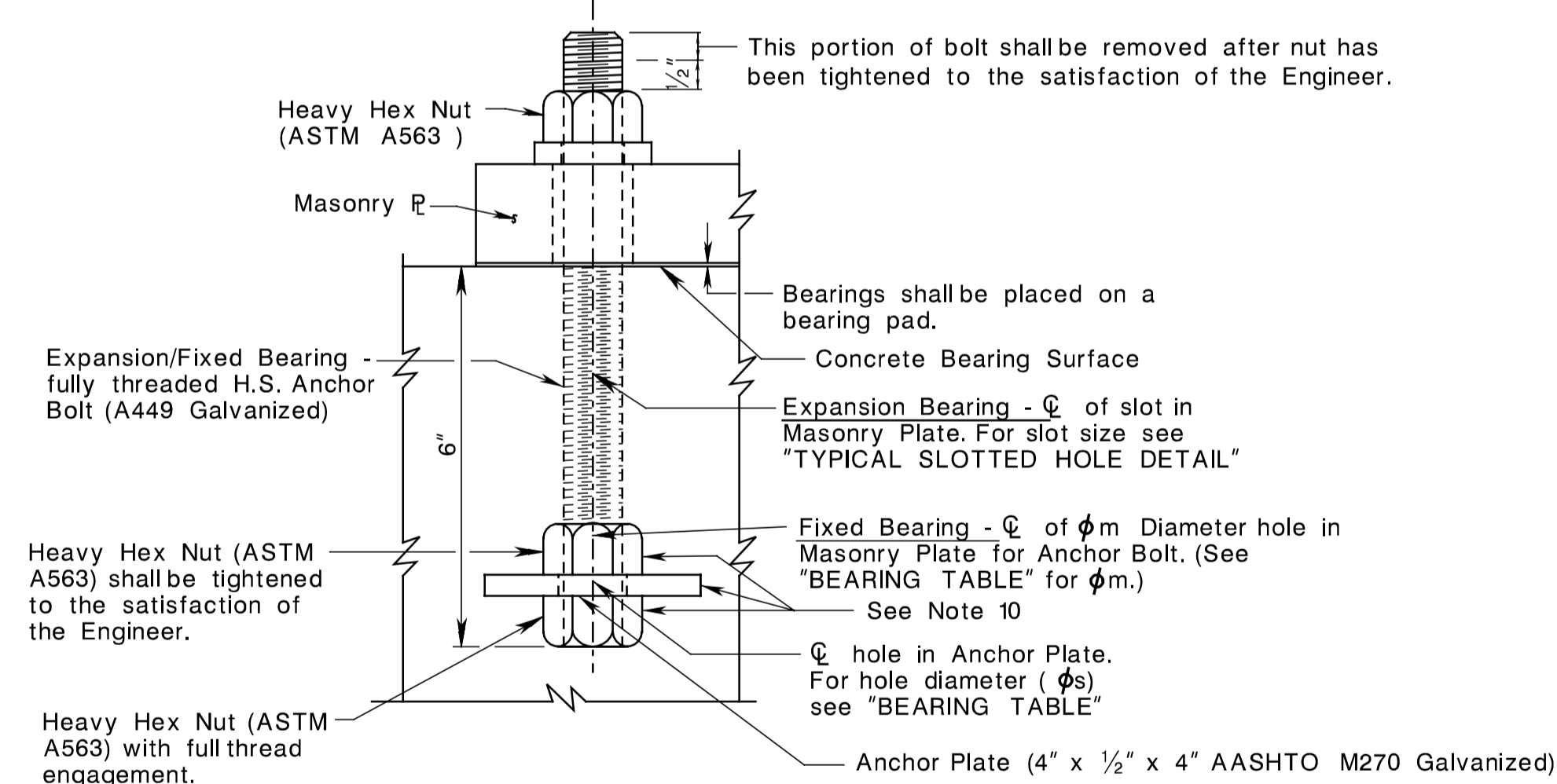
GENERAL NOTES:

- ★ 1. High Load Pot Bearings shall be designed in conformance with the AASHTO LRFD Bridge Design Specifications, with current Interims, as modified by Section 3 of the NJDOT Design Manual for Bridges and Structures, and the NJDOT Standard Specifications for Road and Bridge Construction with current Supplemental Specifications, as modified by the Special Provisions.
- 2. The furnishing of Pot Bearings shall conform to the provisions of Subsection 503.08 of the Standard Specifications.
- 3. The Designer shall reference the criteria of Subsection 1.24.20 of the Bridges and Structures Design Manual for submission of final plans.
- 4. Generally the sole plate shall be made 2" on each side of the flange for a downward weld attachment to the sole plate. The length of the sole plate shall be 2" longer than the top bearing plate. The minimum thickness of the sole plate shall be 3/4". When the slope of the bottom flange exceeds 0.5 percent, a tapered sole plate shall be used.
- 5. The width of the masonry plate will be dependent on the anchor bolt location. The length of the masonry plate shall be at least 2" greater than the bottom bearing plate. Thickness of the masonry plate shall be determined by the Designer.
- 6. Top and bottom bearing plates shall be welded to the sole plate and masonry plate respectively. The size of weld (W) shall be determined by the designer. Minimum weld size shall be 5/16".
- 7. On skewed structures, especially large skew, the designer shall investigate that there is no interference between the bearing components and any of the bracing members (bottom laterals, diaphragms, connection plates, etc.). A detail shall be shown on the plans for each significantly different configuration.
- 8. Anchor Bolt shall be threaded as shown in "ANCHOR BOLT DETAIL FOR ALL BEARINGS". The nut shall be tightened to the satisfaction of the Engineer and the Anchor Bolt tip shall be removed 1/2" above the top of the nut. Anchor Bolts, Plates, Washer Plates and Nuts shall conform to the requirements of NJDOT Standard Specification for Road and Bridge Construction.
- 9. This drawing represents simple span bridge structure. For clarity purposes no lateral bracing are shown.
- 10. If the design indicates that there will be no tension under any loading condition, the plate and nuts are not required.

★ The note should be modified to reflect applicable year and updated Specifications.



TYPICAL SLOTTED HOLE DETAIL MASONRY PLATE
(FOR EXPANSION BEARINGS ONLY)



ANCHOR BOLT DETAIL FOR ALL BEARINGS

LOCATION	FIX/EXP.	ITEM NO.	QUANTITY REQUIRED	CAPACITY (KIPS)	ONE WAY LONGIT. MOVEMENT (IN)	(G) GUIDE CLEARANCE (IN)	MASONRY PLATE							BRG.	ANCHOR BOLTS		WELDER			SOLE PLATE																			
							A	B	T	Am	Bm	Et	EL		φm	H	φ	BOLTS PER BRG.	W	Aw	Bwp	C	D	T1	T2	φs													
							(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)		(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)												

★ One way longitudinal movement is the maximum movement (Expansion or Contraction) of the Superstructure when bearings are set at 68° F. This includes 1" of tolerance. When the bearings are to be set at temperatures other than 68°, reference AASHTO LRFD Bridge Design Specifications, Articles 3.12.2.1 and 3.12.2.2 for guidance for setting temperatures and bearing movement.

★★ Manufacturer shall provide the weld size. Minimum size of weld shall be 5/16".

CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	
IN CHARGE OF	

BDC04MB-01

STANDARD DRAWING PLATE 2.5-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

POT BEARING

ROUTE : SECTION :

MUNICIPALITY : COUNTY :

SCALE : NONE

BRIDGE SHEET NO. OF

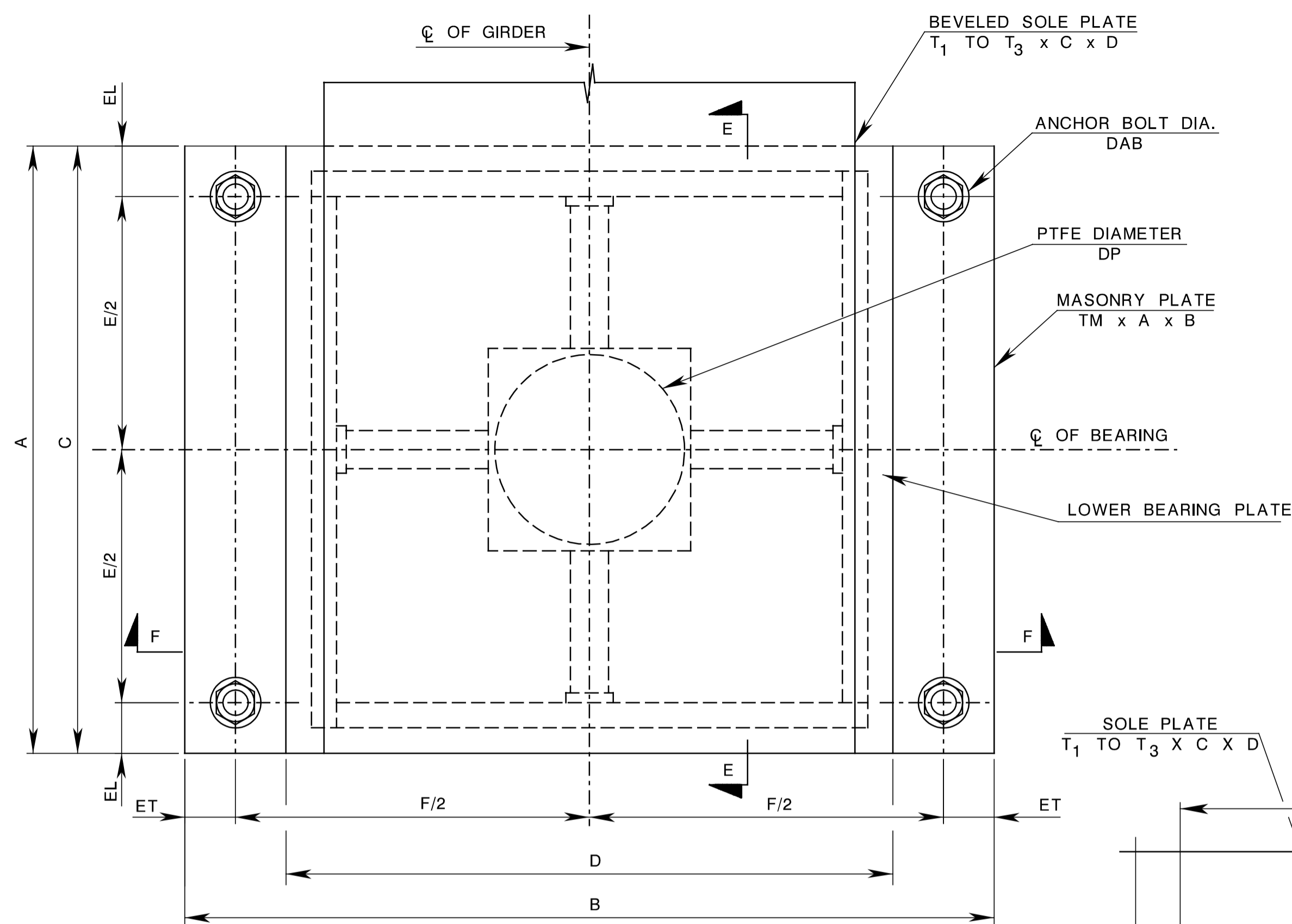
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N. J.			
STRUCTURE NO.			
STRUCTURE NAME			

NOTE TO DESIGNER:

THIS SHEET IS NOT TO BE PLACED INTO THE CONTRACT SET OF PLANS AS IS. HOWEVER, INDIVIDUAL DETAILS MAY BE UTILIZED FOR SHOP DRAWING REVIEW.

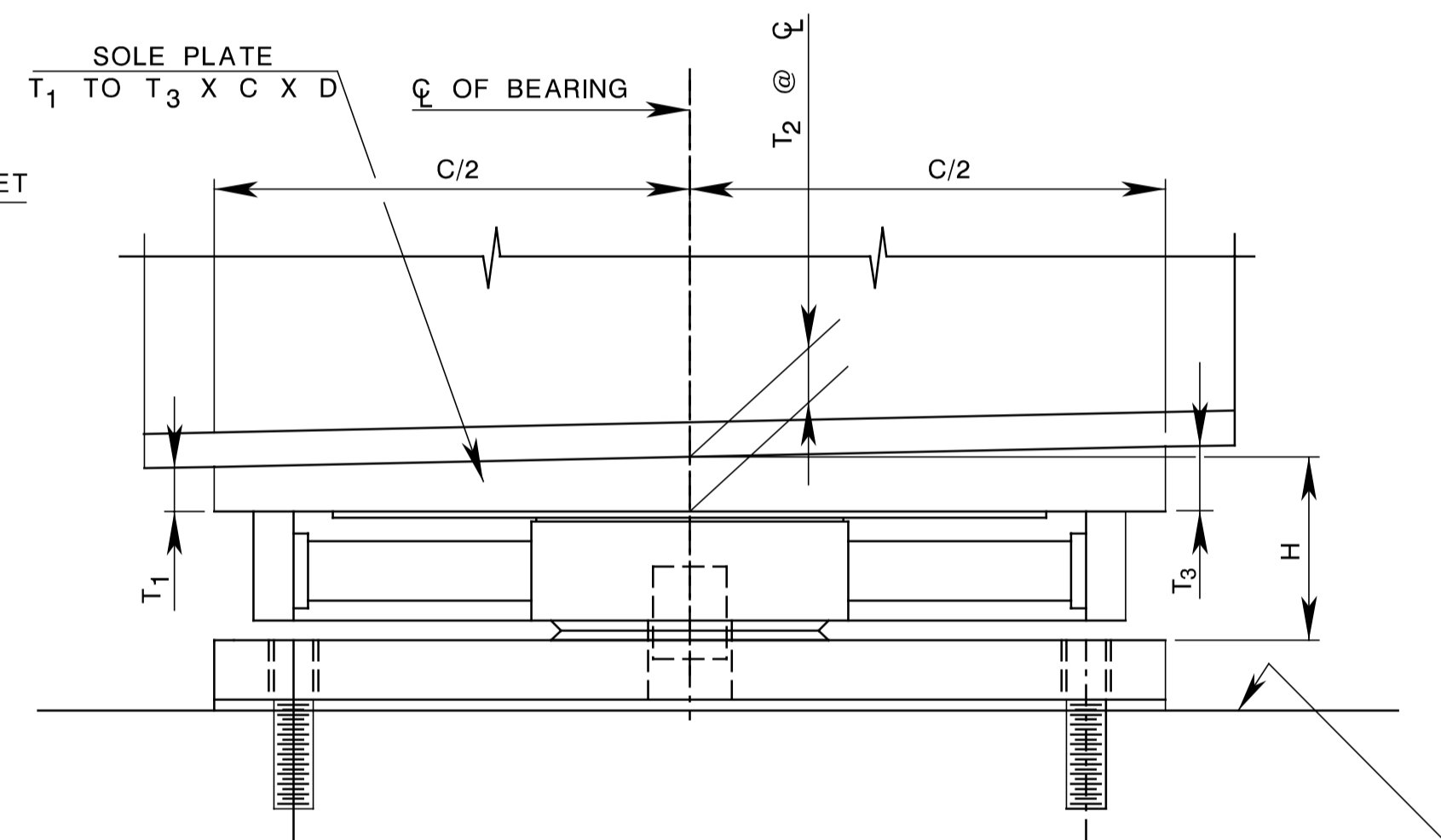
GENERAL NOTES:

- SEISMIC ISOLATION BEARINGS SHALL BE DESIGNED IN CONFORMANCE WITH THE AASHTO GUIDE SPECIFICATIONS FOR SEISMIC ISOLATION DESIGN, AND THE CURRENT NJDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION WITH CURRENT SUPPLEMENTAL SPECIFICATIONS, AS MODIFIED BY THE SPECIAL PROVISIONS.
- ALL STEEL PLATES SHALL CONFORM TO AASHTO M270 GR. 50 EXCEPT AS NOTED.
- ALL STEEL PLATES SHALL CONFORM TO THE FLATNESS REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES DIV. II, SEC. 18.
- ANCHOR BOLTS SHALL CONFORM TO ASTM A449, THE HEX NUTS SHALL CONFORM TO ASTM A563, AND THE FLAT WASHERS SHALL CONFORM TO ASTM F436. THE BOLTS, NUTS AND WASHERS SHALL BE HOT-DIP GALVANIZED PER ASTM A153 (AASHTO M232). FOR DETAILS OF ANCHOR BOLTS SEE STANDARD PLATES 2.5-1 AND 2.5-2.
- ANCHOR BOLT WASHERS SHALL CONFORM TO AASHTO M270 GR. 36 OR 50, AND SHALL BE GALVANIZED PER ASTM A123.
- THE POLYETHER ELEMENT SHALL BE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES DIV. II, SEC. 18.
- PTFE IS TO BE VIRGIN, AND ETCHED ON ONE SIDE FOR BONDING INTO MACHINED RECESS THE MAXIMUM COEFFICIENT OF FRICTION SHALL NOT EXCEED THE DESIGN VALUE.
- THE STAINLESS STEEL SHEET SHALL CONFORM TO ASTM A240, TYPE 316, SHALL BE 12 GAUGE AND SHALL RECEIVE A NO. 8 BRIGHT MIRROR FINISH AS PER SPECIFICATION.
- ALL WELDING SHALL BE PERFORMED IN ACCORDANCE WITH ANSI/AASHTO/ AWS D1.5 BRIDGE WELDING CODE.
- ORIENTATION, MODEL, LOCATION AND DATE OF FABRICATION IS TO BE MARKED ON EACH INDIVIDUAL BEARING AND ALSO ON THE SHOP DRAWINGS.
- PTFE AND STAINLESS STEEL SURFACES SHALL BE PROTECTED FROM DAMAGE AS WELL AS AIRBORN DEBRIS AND CONTAMINANTS AT ALL TIMES PRIOR TO FINAL ASSEMBLY. THESE SURFACES SHALL BE INSPECTED FOR SUCH DAMAGE AND DEBRIS BEFORE FINAL ASSEMBLY.
- COMPLETED BEARINGS SHALL BE INDIVIDUALLY STEEL BANDED FOR SHIPPING AND HANDLING.
- BEARINGS SHALL BE STORED IN A CLEAN, DRY, LEVEL, UPRIGHT POSITION.
- TESTING SHALL BE CONDUCTED AS PER THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES DIV. II, SEC. 18.
- AT NO TIME, MAY ANY BEARING BE DISASSEMBLED WITHOUT AUTHORIZATION FROM THE BEARING MANUFACTURER.
- ALL MILL SCALE TO BE REMOVED FROM BEARING PLATES VIA SANDBLASTING (SSPC-SP6)
- CONTRACTOR IS TO ADJUST BEARING SEAT ELEVATIONS TO ACCOMMODATE FINISHED BEARING HEIGHT.
- THE FURNISHING OF SEISMIC ISOLATION BEARINGS SHALL CONFORM TO THE PROVISIONS OF SUBSECTION 503.08 OF THE STANDARD SPECIFICATIONS.
- THE DESIGNER SHALL REFERENCE THE CRITERIA OF SUBSECTION 1.24.20 OF THE BRIDGES AND STRUCTURES DESIGN MANUAL FOR SUBMISSION OF FINAL PLANS.

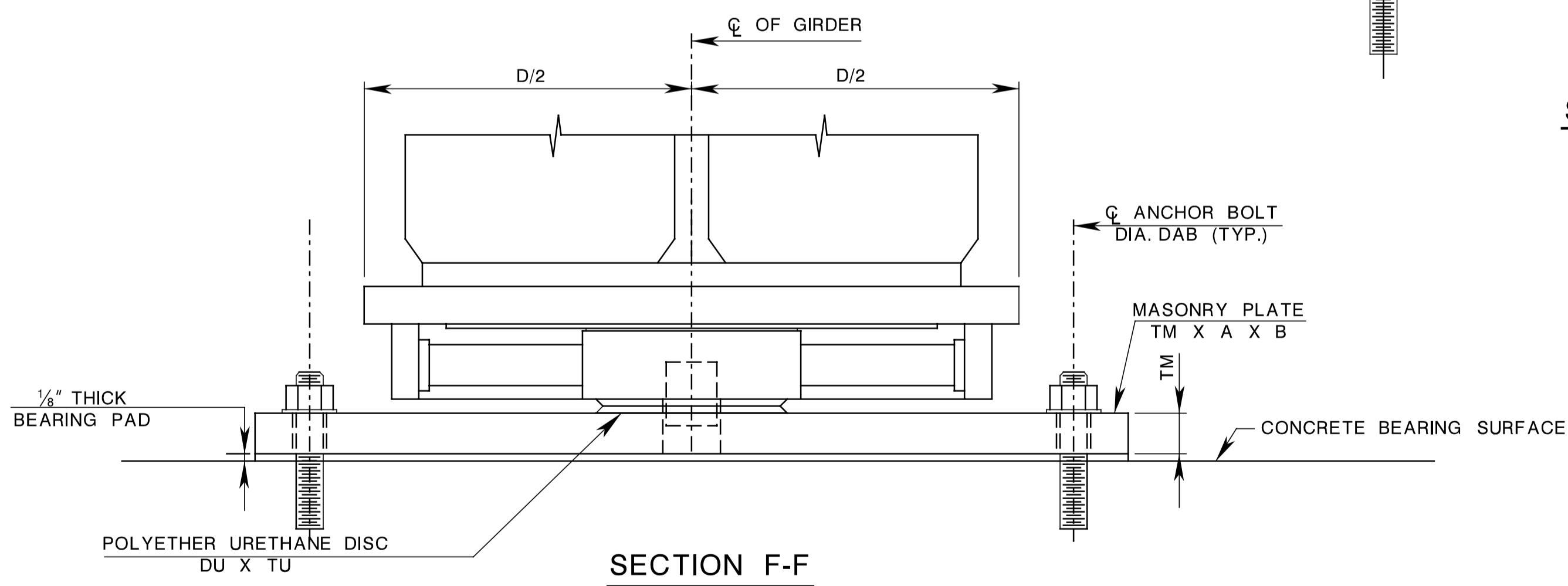


NOTE:
FOR CLARITY PTFE AND STAINLESS STEEL SHEET NOT SHOWN ON PLAN & SIDE VIEWS.

PLAN VIEW - SEISMIC ISOLATION BEARING



SECTION E-E



NOTE TO DESIGNER:
THE BEARING PARAMETERS SHOWN ARE CONCEPTUAL. DIMENSIONS SHALL BE BASED ON ACTUAL DESIGN.

SECTION F-F

TYPE	BEARING HEIGHT INCLUDING T ₂ H (IN)	PTFE DIAMETER DP (IN)	POLYETHER URETHANE			SOLE PLATE			MASONRY PLATE			ANCHOR BOLTS						
			DIA. DU (IN)	THICK TU (IN)	TM (IN)	LENGTH C (IN)	WIDTH D (IN)	THICKNESS T ₁ (IN)	THICKNESS T ₂ (IN)	THICKNESS T ₃ (IN)	LENGTH A (IN)	WIDTH B (IN)	THICKNESS TM (IN)	NO. OF BOLTS	DIA. DAB (IN)	EDGE ET (IN)	DIST EL (IN)	MIN. EMBED. DEPTH (IN)

CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	
IN CHARGE OF	

BDC04MB-01

STANDARD DRAWING PLATE 2.5-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

SEISMIC ISOLATION BEARING

ROUTE : _____ SECTION : _____

MUNICIPALITY _____ COUNTY _____

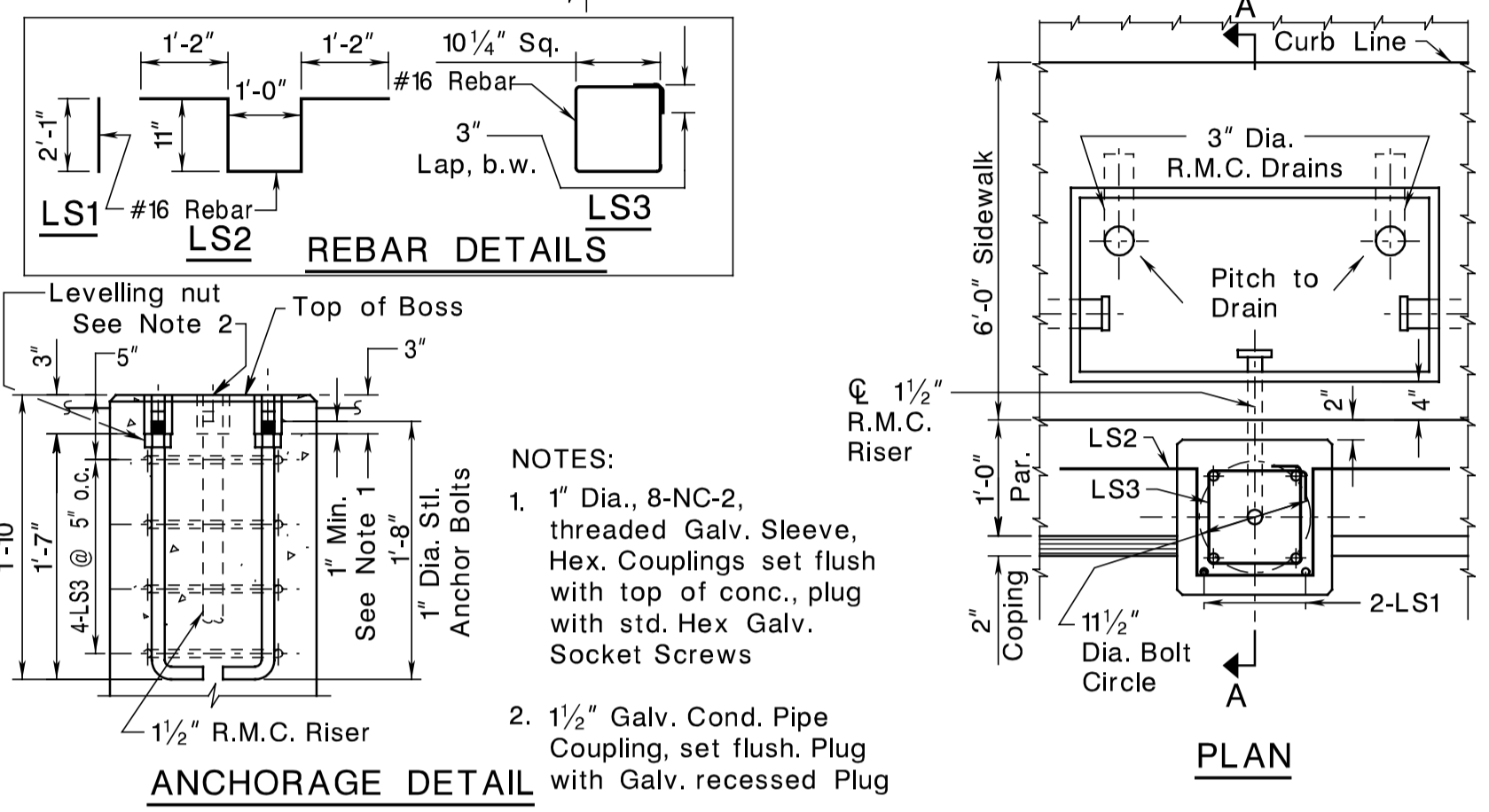
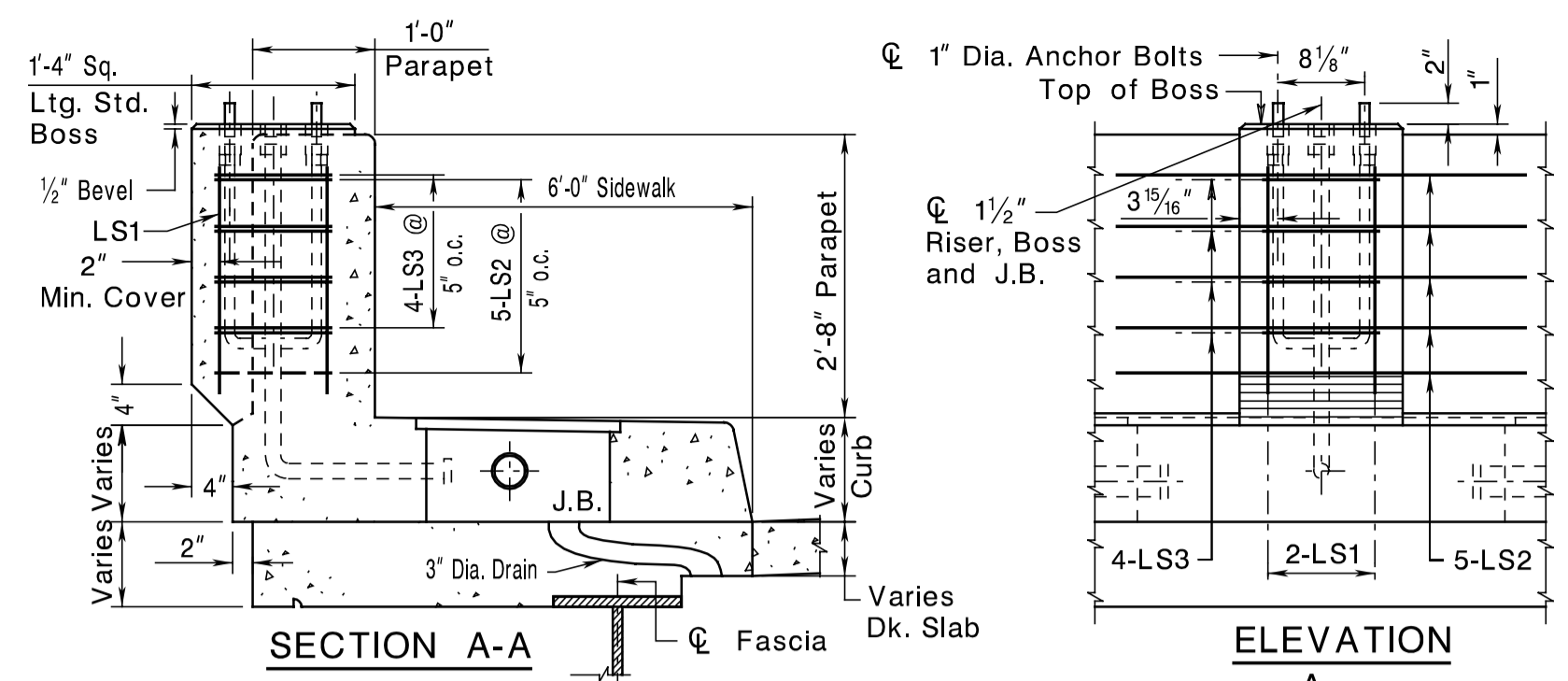
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BRIDGE SHEET NO. _____ OF _____

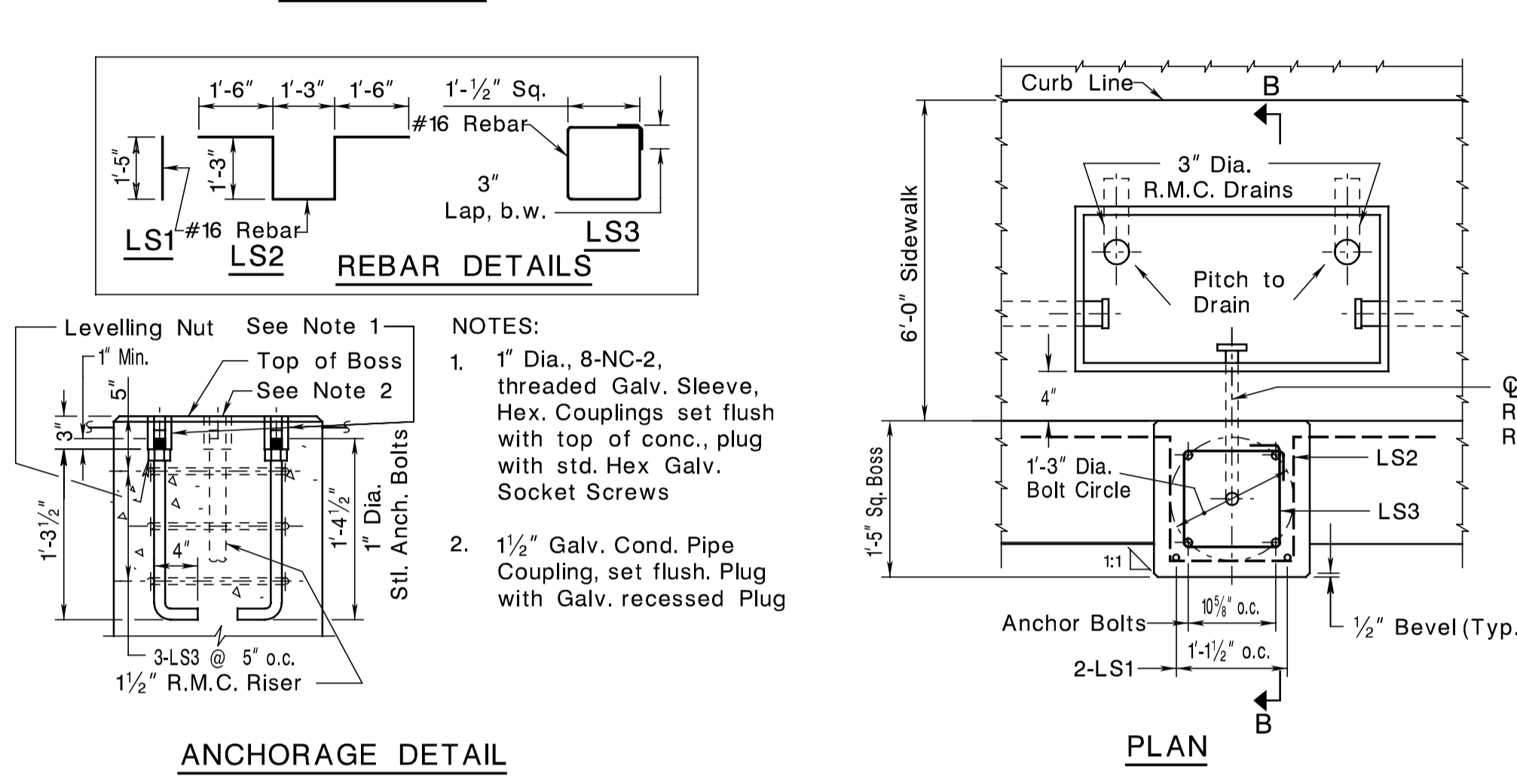
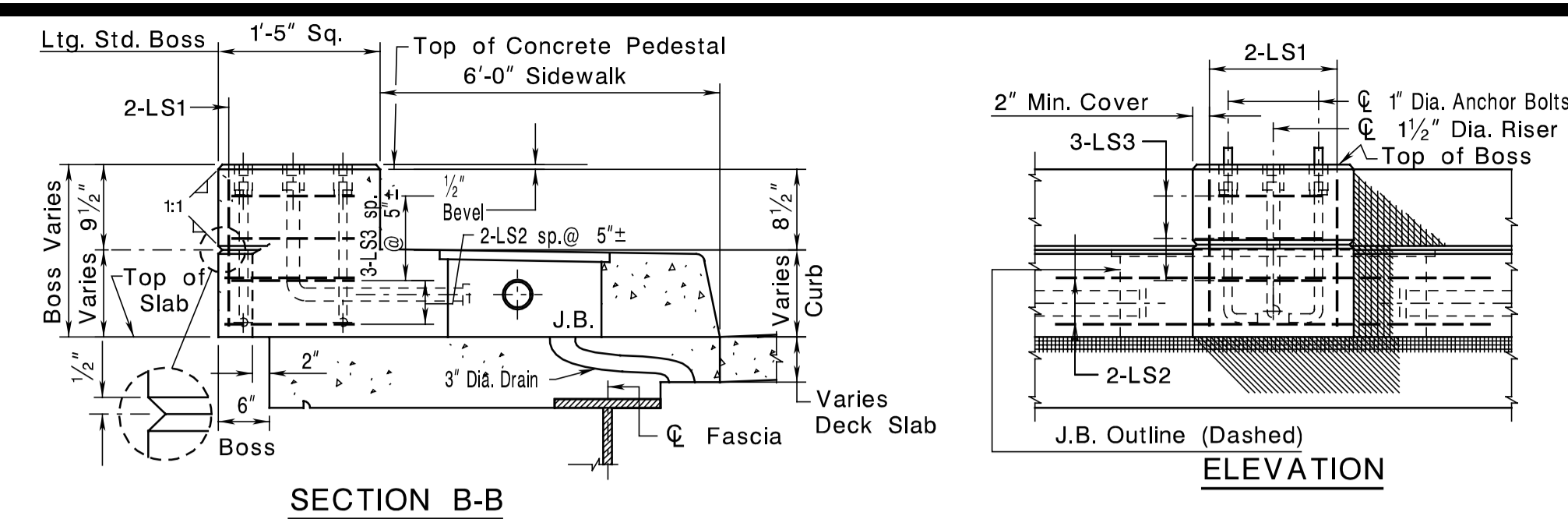
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STRUCTURE NO.			
STRUCTURE NAME			

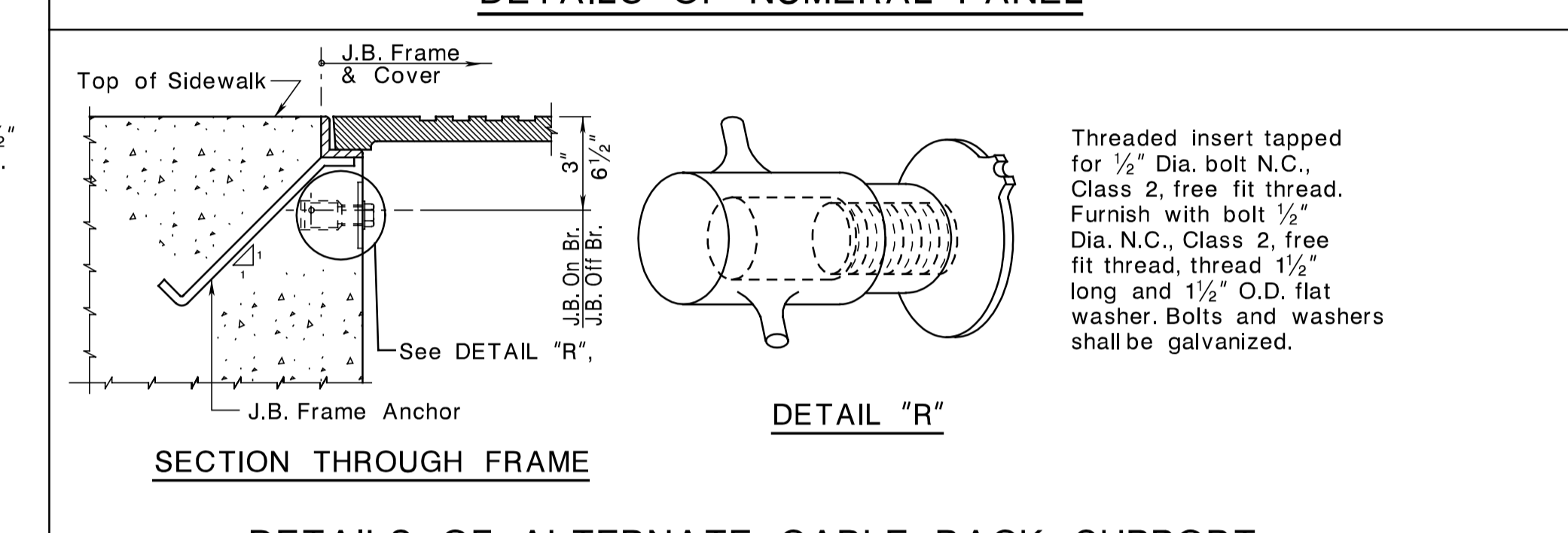
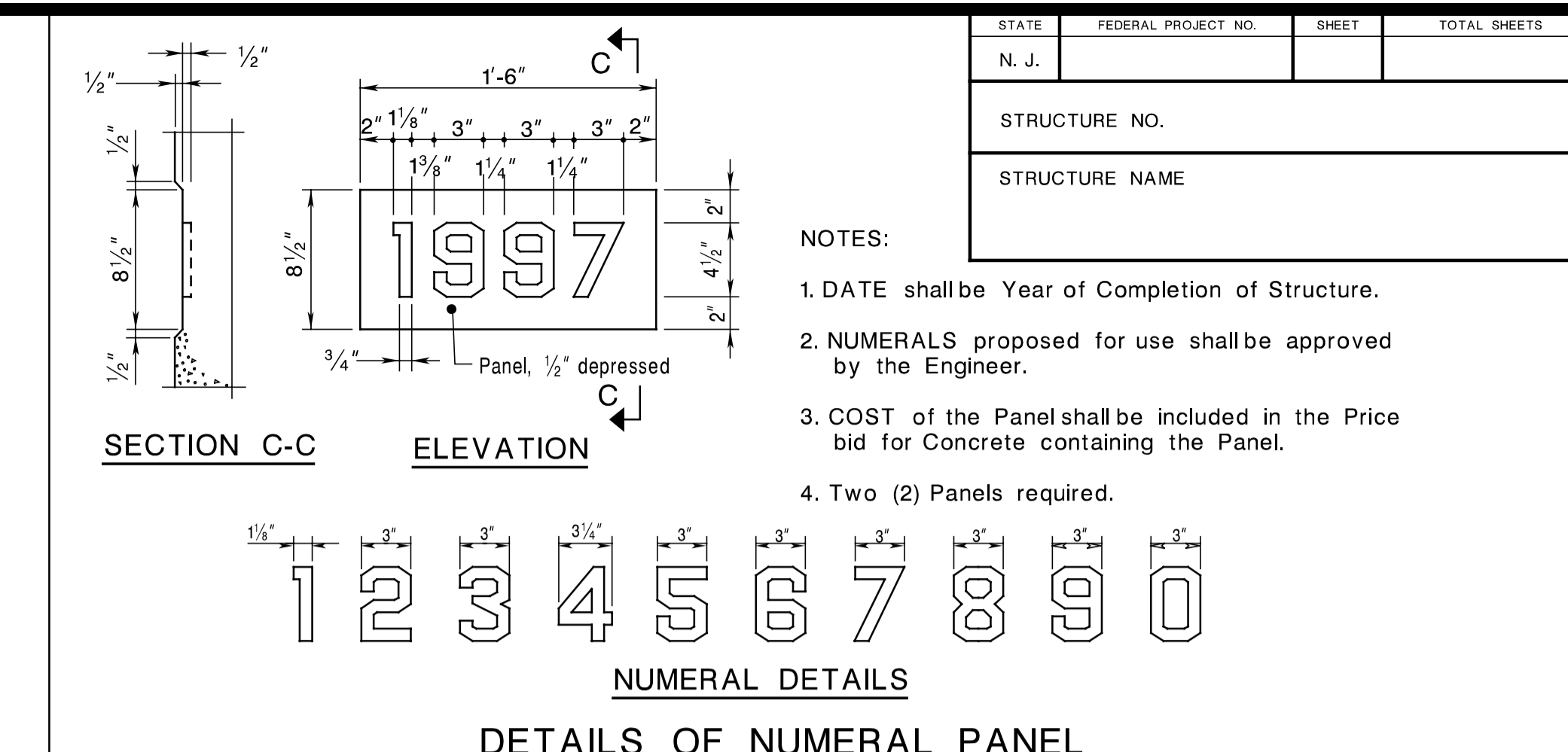
- NOTES:
- DATE shall be Year of Completion of Structure.
 - NUMERALS proposed for use shall be approved by the Engineer.
 - COST of the Panel shall be included in the Price bid for the Panel containing the Panel.
 - Two (2) Panels required.



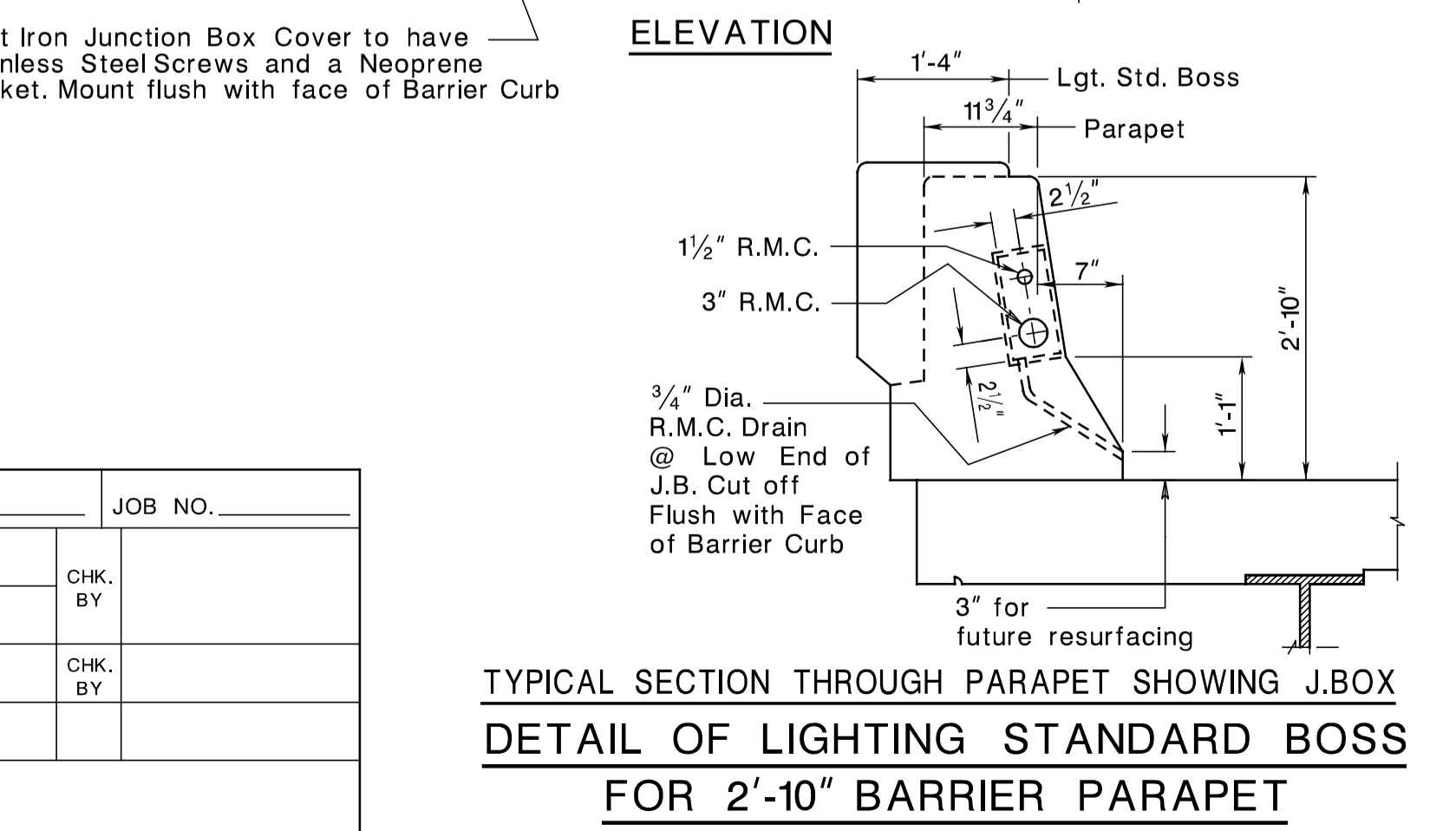
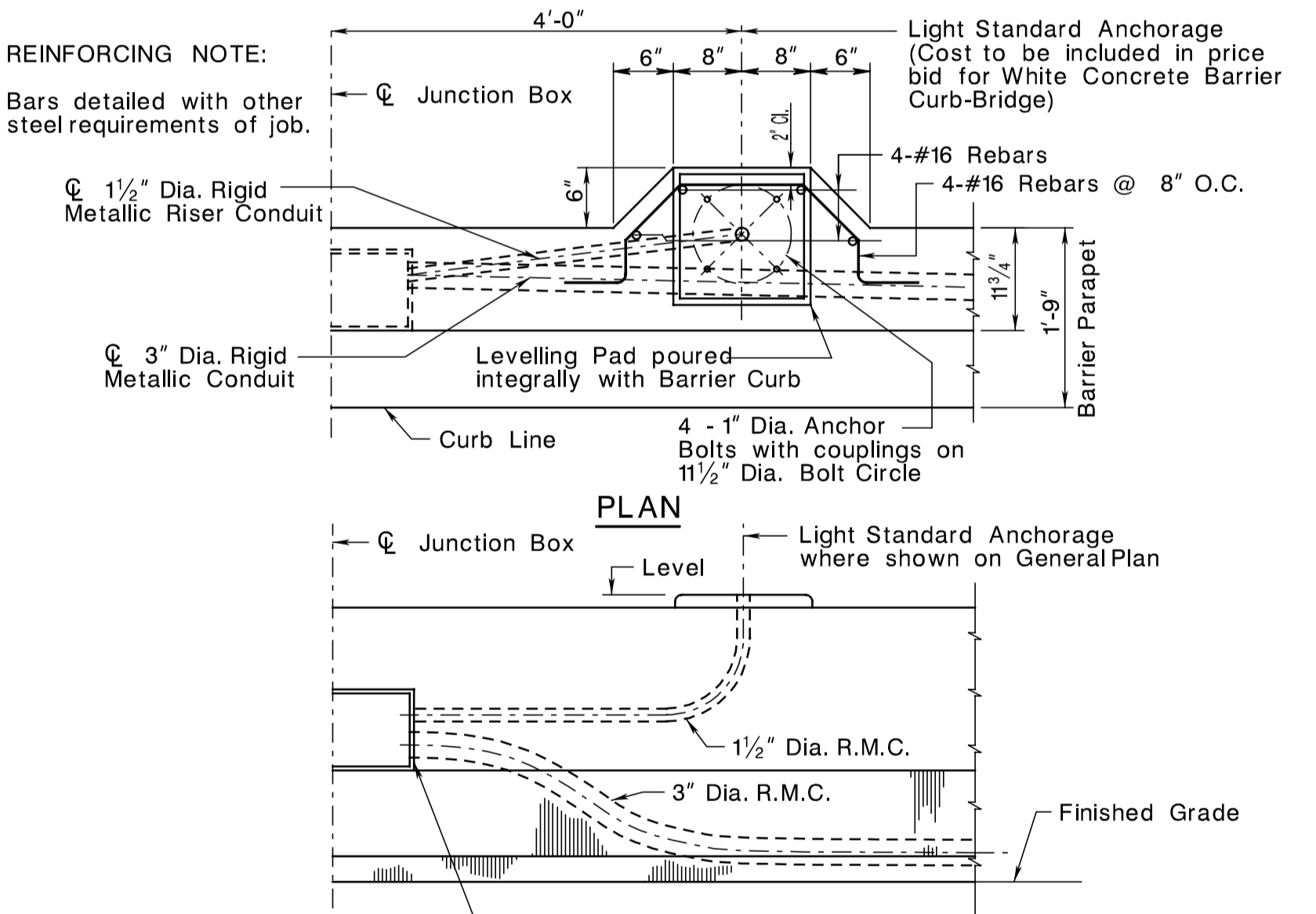
DETAILS OF LIGHTING STANDARD BOSS ON 2'-8" PARAPET



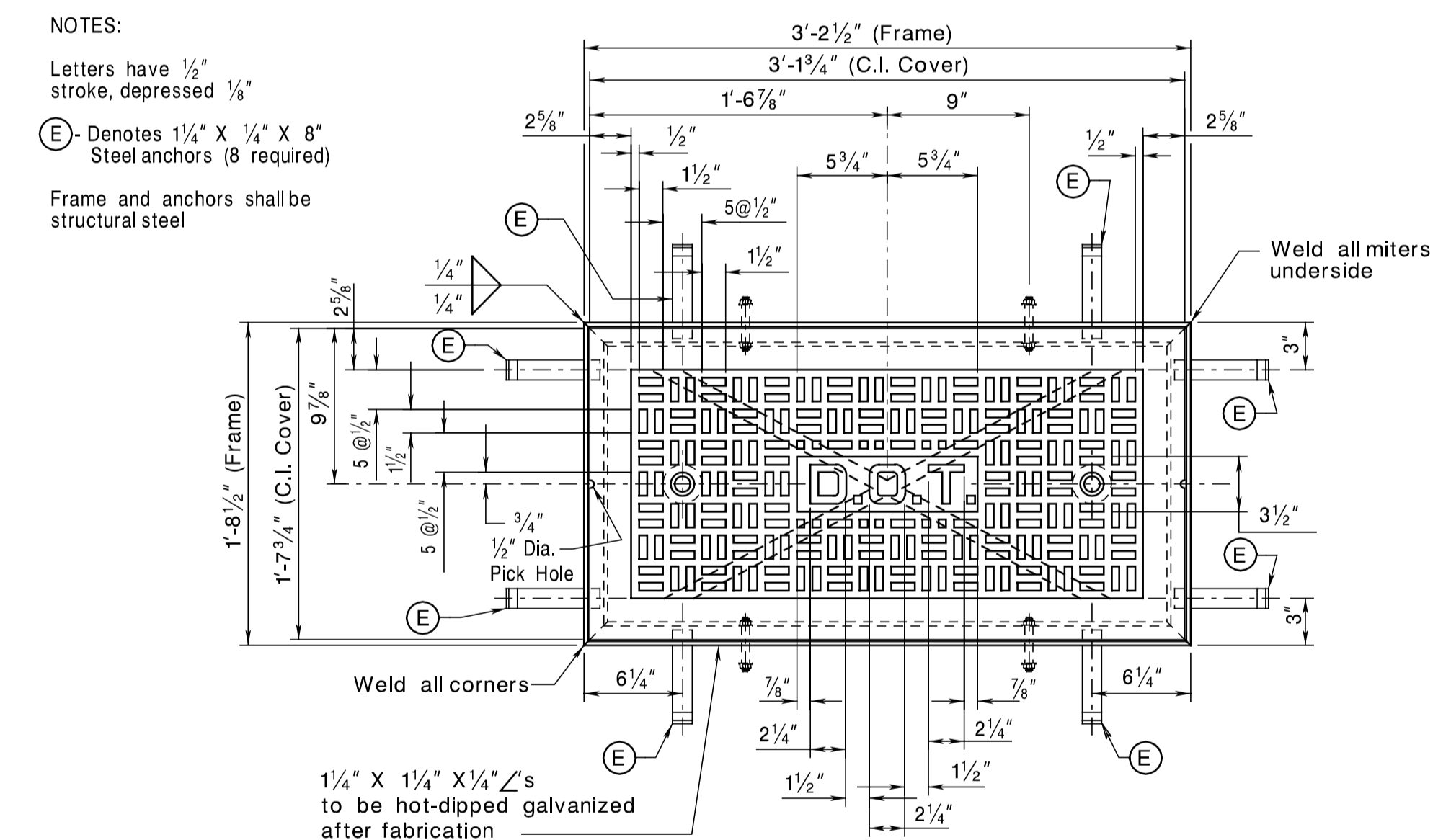
DETAILS OF LIGHTING STANDARD BOSS ON 8 1/2" PEDESTAL



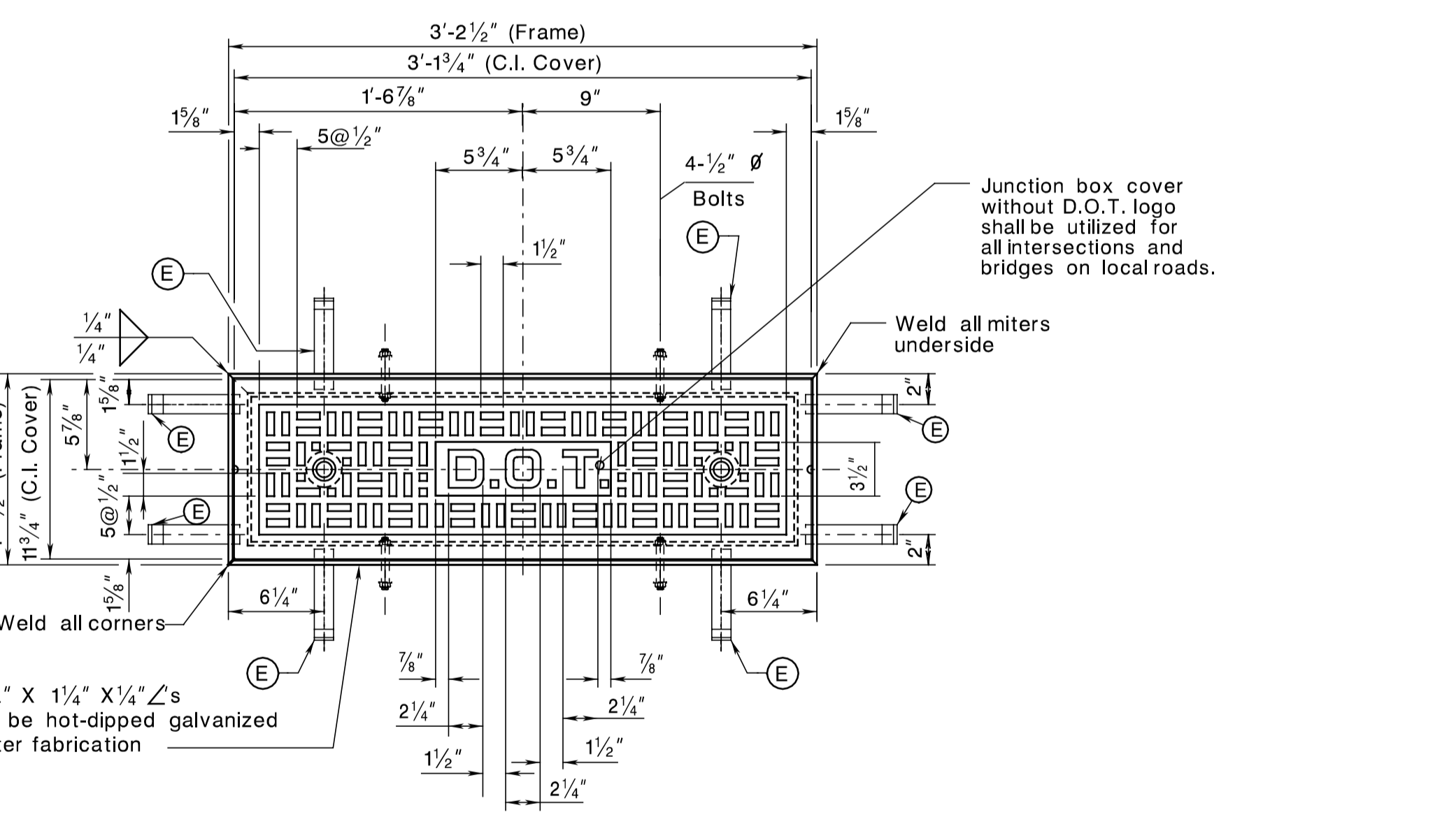
DETAILS OF ALTERNATE CABLE RACK SUPPORT



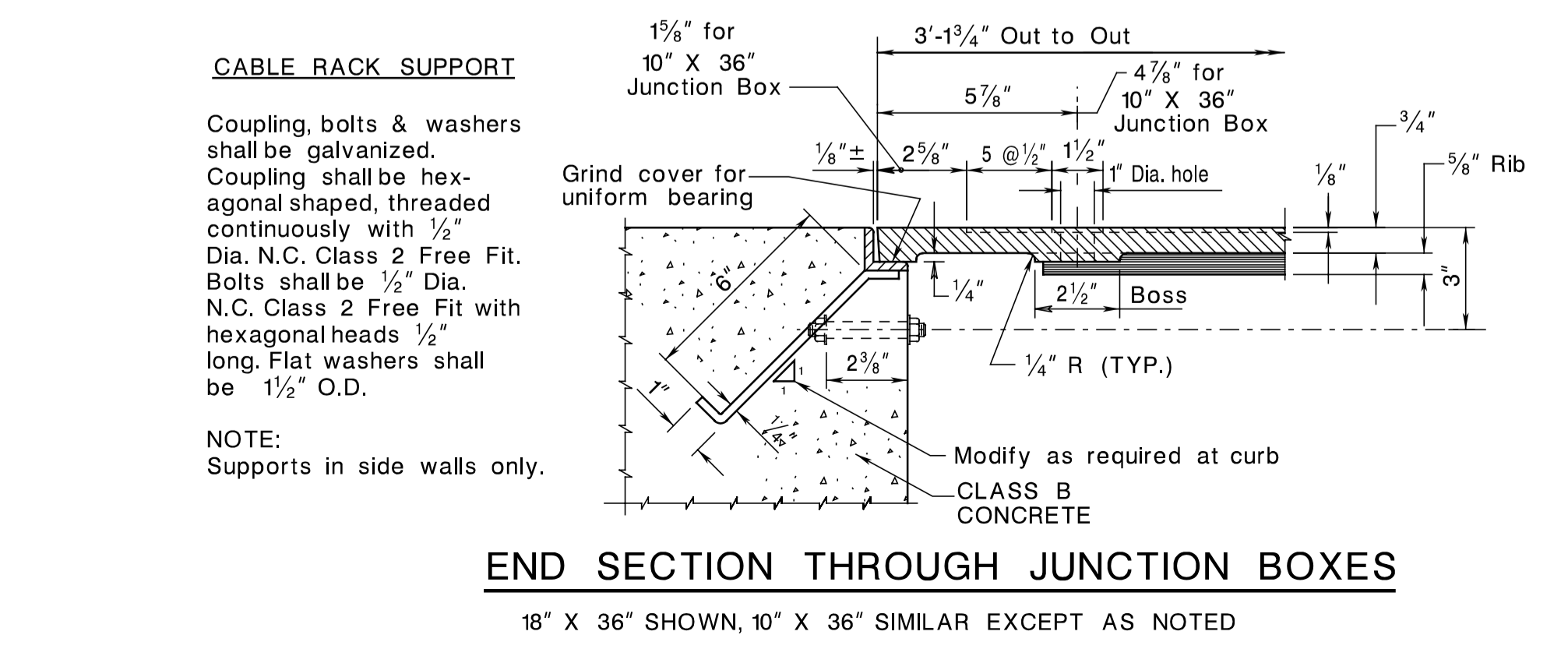
TYPICAL SECTION THROUGH PARAPET SHOWING J.BOX DETAIL OF LIGHTING STANDARD BOSS FOR 2'-10" BARRIER PARAPET



PLAN-FRAME AND COVER FOR 18" X 36" JUNCTION BOX



PLAN-FRAME AND COVER FOR 10" X 36" JUNCTION BOX



END SECTION THROUGH JUNCTION BOXES
18" X 36" SHOWN, 10" X 36" SIMILAR EXCEPT AS NOTED

BDC04MB-01

STANDARD DRAWING PLATE 2.6-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

TYPICAL DETAILS NO. 2

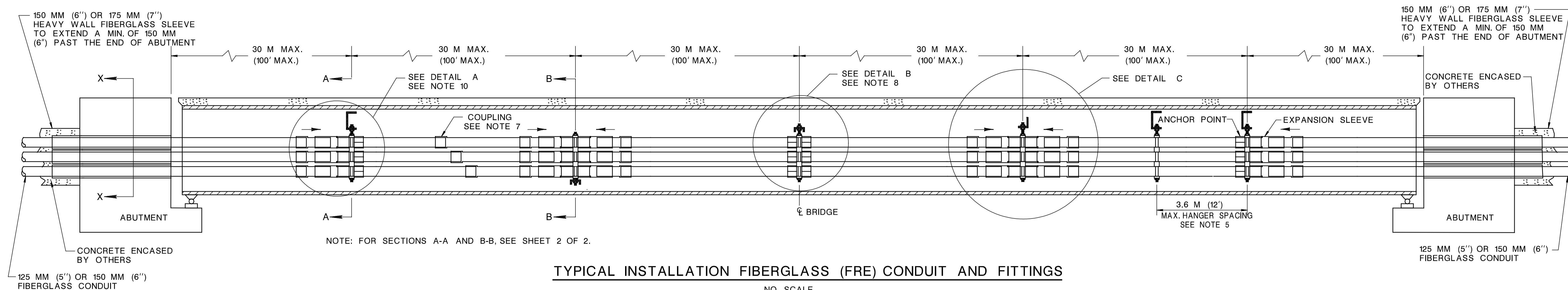
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BRIDGE SHEET NO. B OF B

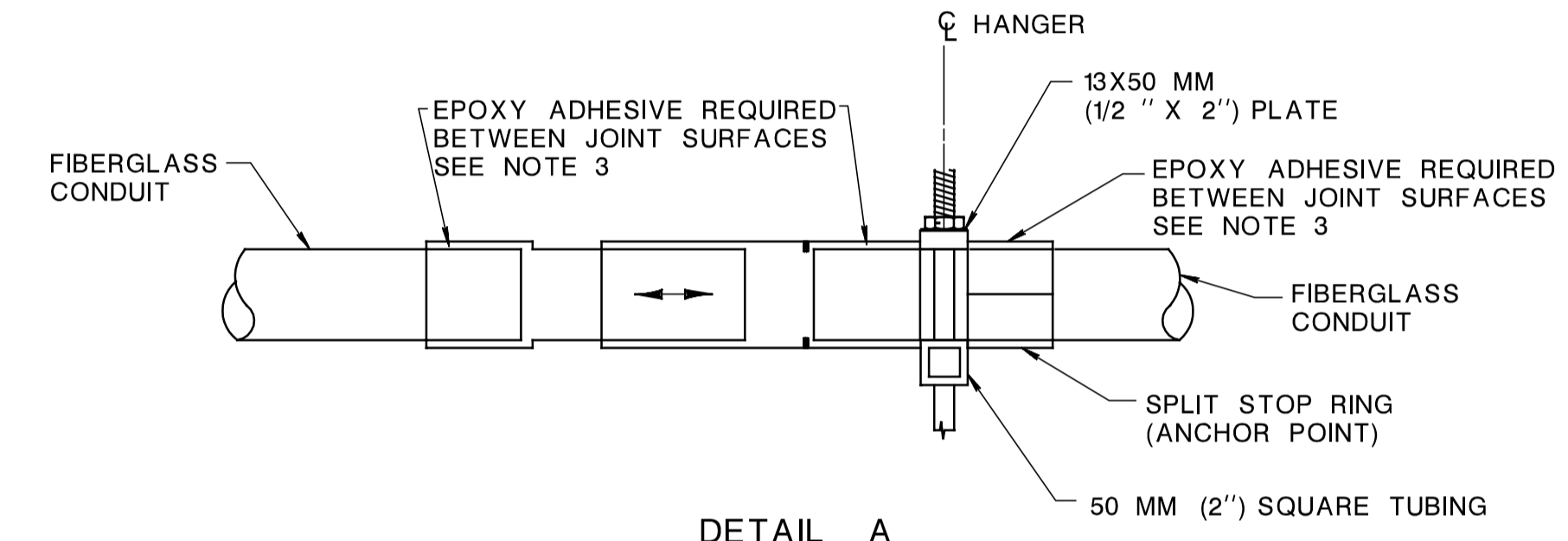
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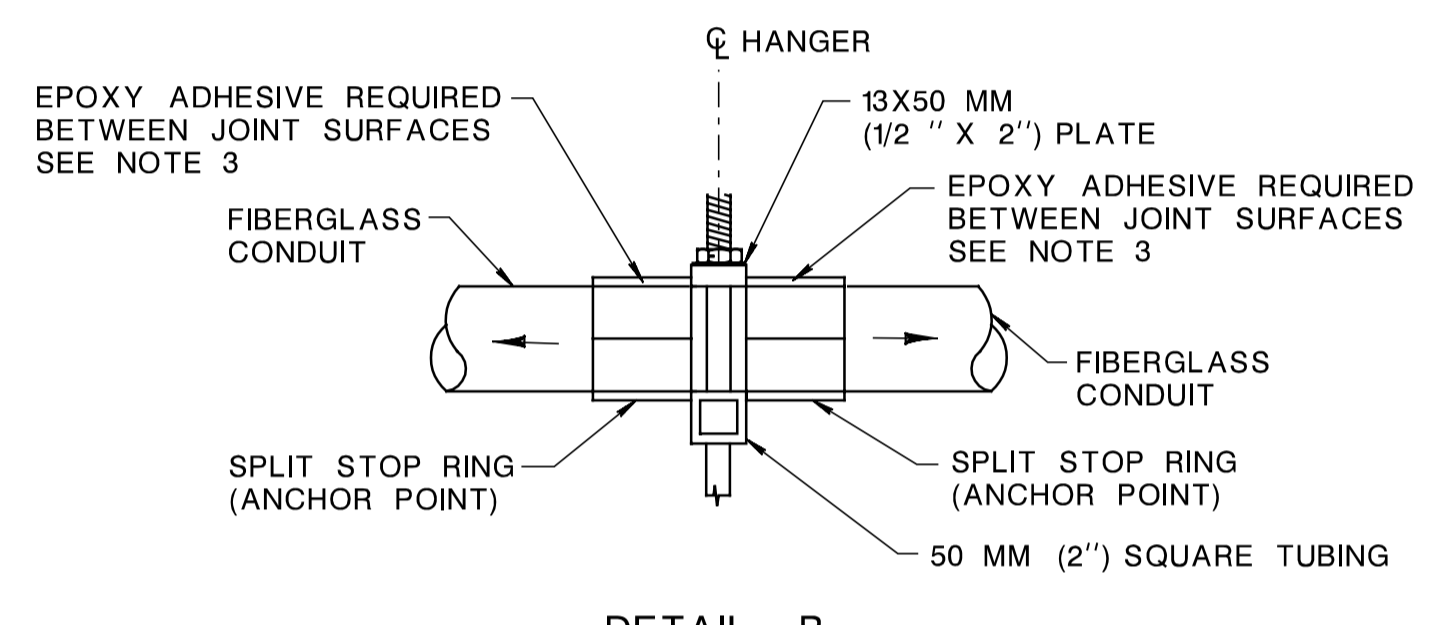


TYPICAL INSTALLATION FIBERGLASS (FRE) CONDUIT AND FITTINGS

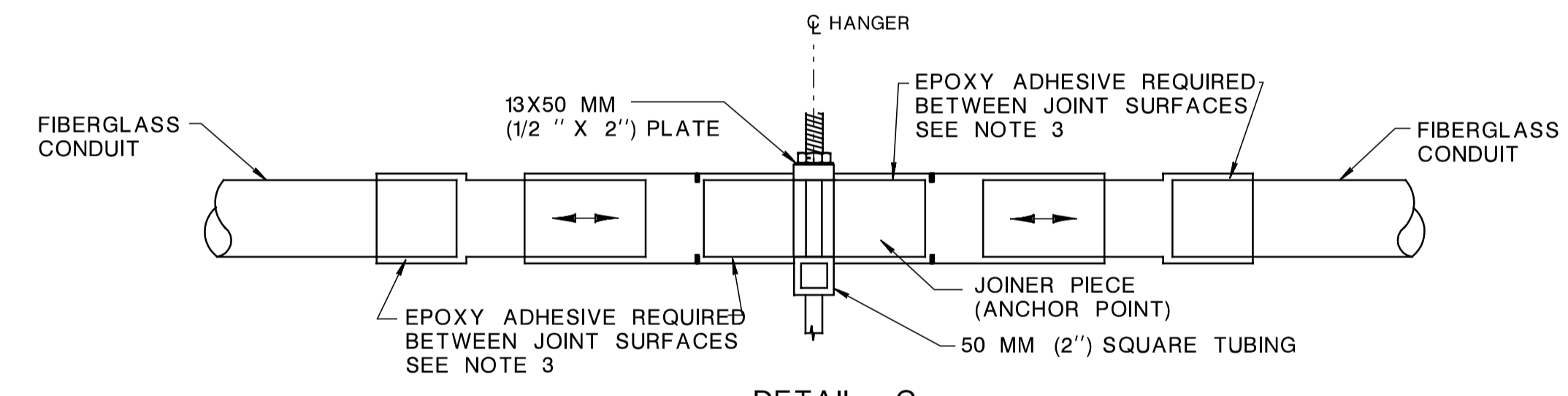
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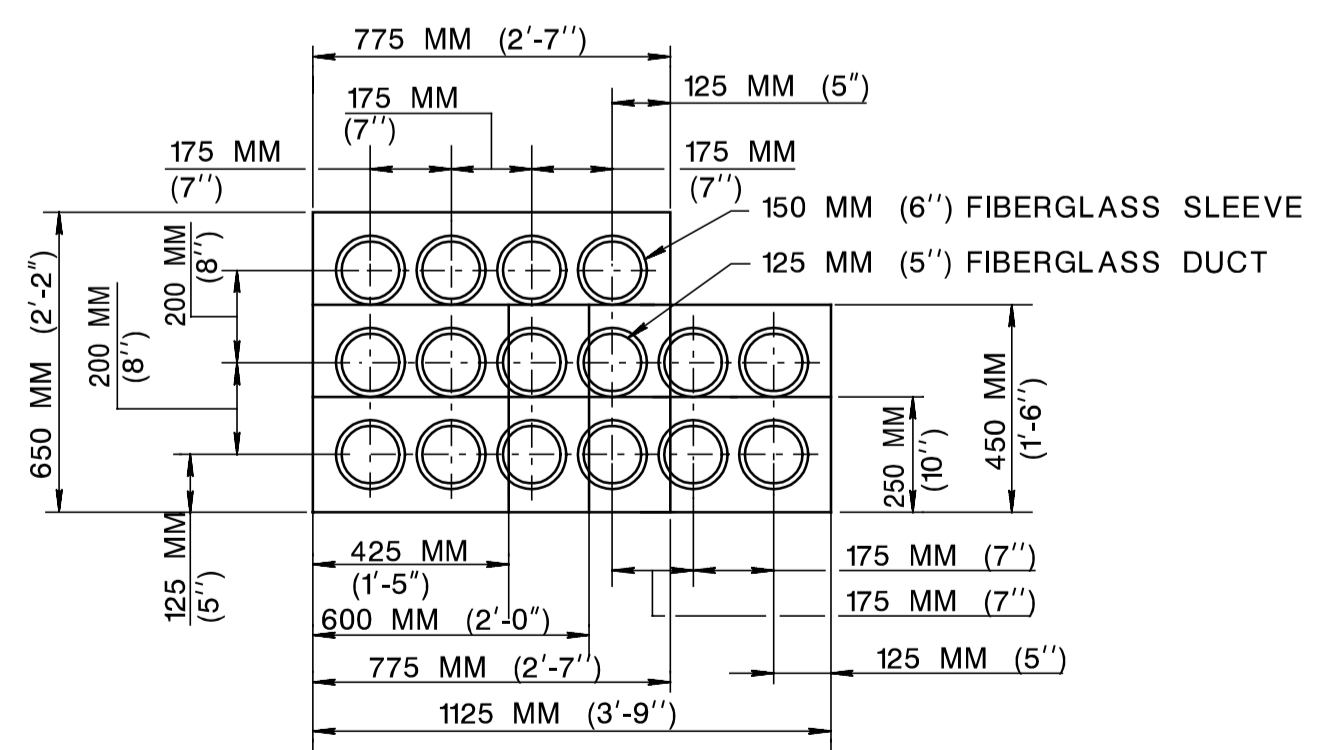
DETAIL A
SINGLE EXPANSION JOINT
TYPICAL BOTH SIDES



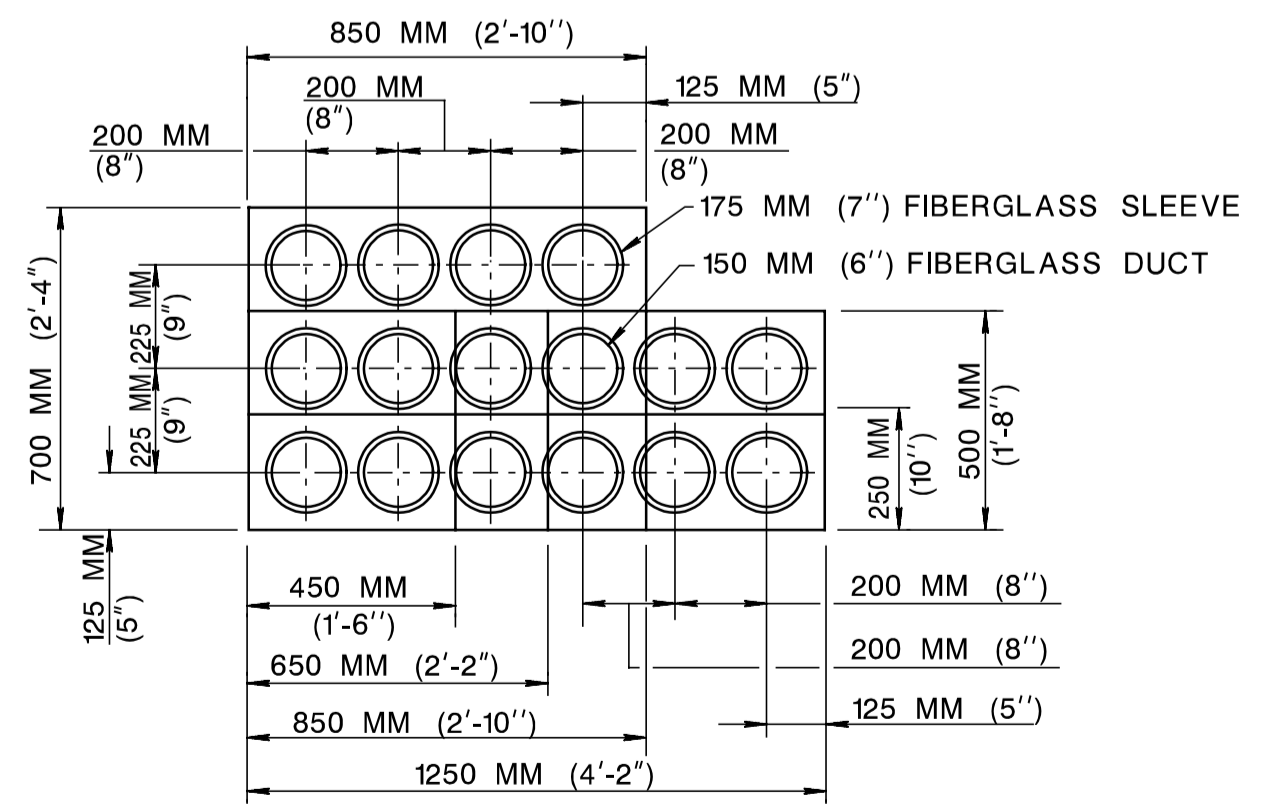
DETAIL B
ANCHOR POINT



DETAIL C
BACK TO BACK EXPANSION JOINT
OPTIONAL



SECTION X-X
SPACING OF DUCTS THRU ABUTMENTS
FOR VARIOUS NUMBER OF CONDUITS FROM
ONE TO THREE CONDUITS HIGH AND FROM
TWO TO SIX CONDUITS WIDE



SECTION X-X
SPACING OF DUCTS THRU ABUTMENTS
FOR VARIOUS NUMBER OF CONDUITS FROM
ONE TO THREE CONDUITS HIGH AND FROM
TWO TO SIX CONDUITS WIDE

SUGGESTED INSTALLATION PROCEDURES AND DESIGN DATA

NOTES:

- FIBERGLASS CONDUIT AND FITTINGS TO BE FIBER REINFORCED EPOXY (FRE) MANUFACTURED IN ACCORDANCE WITH NEMA SPECIFICATIONS TC-14.
- CONDUIT SHALL BE MANUFACTURED TO DIMENSIONS BASED ON IRON PIPE SIZE (I.P.S.) OUTSIDE DIAMETERS
 - 125 MM (5") CONDUIT 141 MM (5.563") O.D. WT. 1.55 KG/M (1.04#/FT.)
 - 150 MM (6") CONDUIT 168 MM (6.625") O.D. WT. 1.86 KG/M (1.25#/FT.)
- CEMENTING OF CONDUITS SHALL BE IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. WHEN JOINING CONDUITS AND FITTINGS, AVOID THE USE OF EXCESSIVE EPOXY ADHESIVE WHICH CAN BUILD UP, AND WHEN HARDENED REDUCE THE INTERNAL DIAMETER.
- EXPANSION JOINTS TO BE INSTALLED IN THE VICINITY OF BRIDGE EXPANSION JOINTS AND NOT MORE THAN 30 M (100 FOOT) SPACING BETWEEN JOINTS.
- MAXIMUM SPACING BETWEEN HANGERS IS 3.6 M (12 FEET).
- MAXIMUM CABLE WEIGHT 29.8 KG/M (20#/FT.)
- SELECT CONDUIT LENGTHS SO THAT COUPLINGS WILL NOT COINCIDE WITH HANGER LOCATIONS.
- CEMENT SPLIT STOP RINGS ON CONDUIT AND BUTT TO BOTH SIDES OF HANGER FOR ANCHOR POINT. (DETAIL B)
- INSTALL EXPANSION JOINTS AND STOP RINGS AS DETAILED.
- INSTALL SPLIT STOP RING ANCHOR POINTS OPPOSITE EXPANSION SLEEVES.

APPROVED VENDORS FOR BRIDGE MATERIAL

AMERICAN U-TEL INC.
9760 SMITH ROAD
WILLOUGHBY OHIO 44094
MIKE WEISS (216) 946 - 6027

METRA INDUSTRIAL CORP.
P. O. BOX 30845
COLUMBUS OHIO 43230
JIM WEAVER (614) 475 - 7755

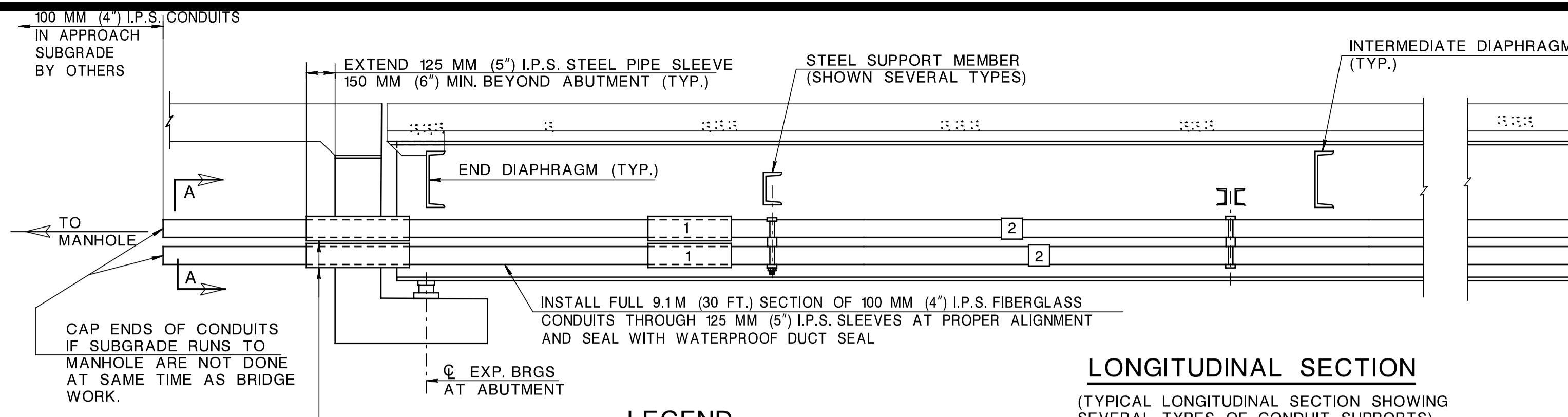
P & C INC.
4838 E. 355 TH. ST.
WILLOUGHBY OHIO 44094
ALEX MCKENZIE (404) 388 - 0428

THIS SHEET FOR DESIGN
INFORMATION ONLY.
NOT TO BE INCLUDED
IN CONTRACT PLANS

PLATE 2.7 - 1

SUBJECT		TYPICAL HANGER INSTALLATION OF 125 MM (5") OR 150 MM (6") FIBERGLASS CONDUITS FOR STEEL GIRDER BRIDGES			
LOCATION		DRAWN BY	C. FUEHRER	CHECKED	R.P.
DATE		DATE	1JUNE92	SCALE	NONE
AUTH NUMBER		APPROVED Original Signed By B. Cornwell		TITLE Mgr. O.P. Engr. & Design	
REVISIONS		PUBLIC SERVICE ELECTRIC AND GAS COMPANY		DRAWING NUMBER	
		DISTRIBUTION SYSTEMS/ELECTRIC BUSINESS UNIT		DU-24-S-15346-2	
				SHEET 1 OF 2 SHEETS	

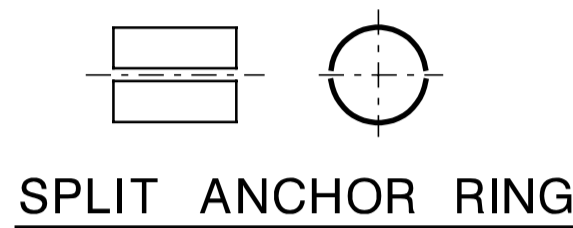
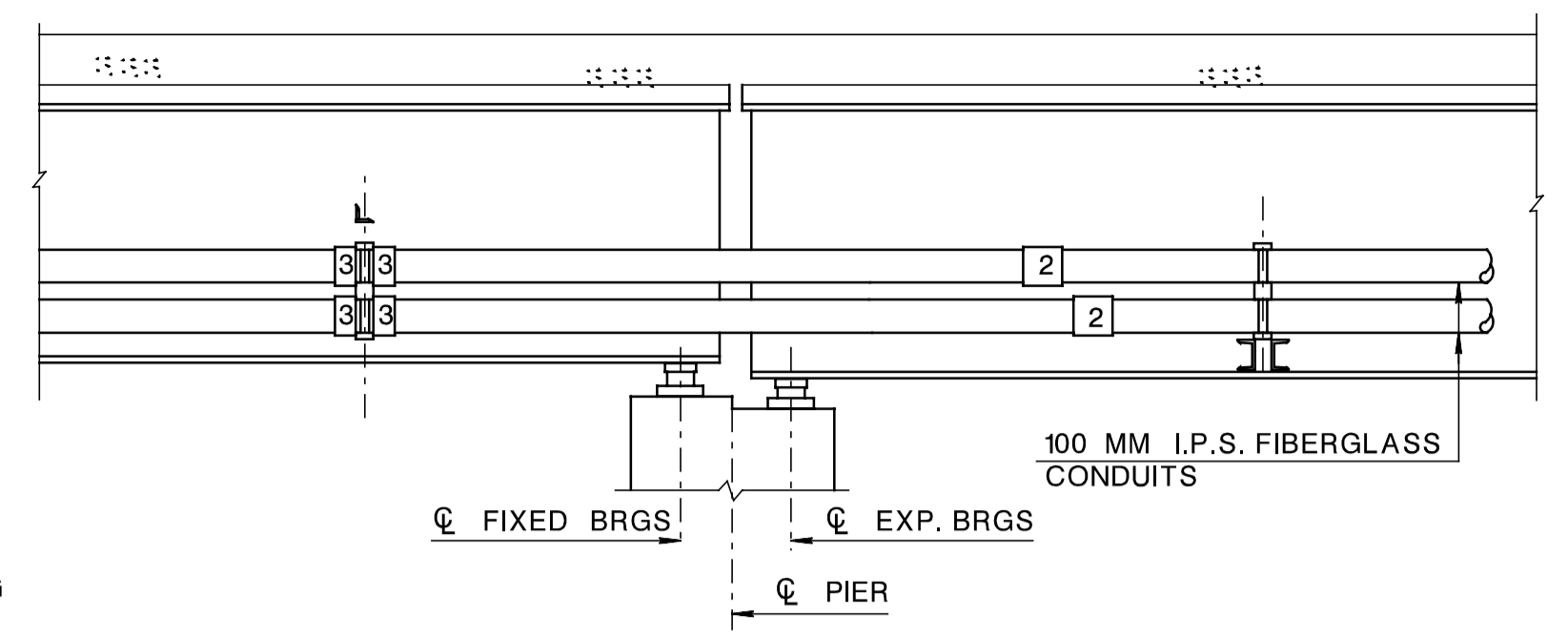
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 BD02MB-02 - ORIGINAL SHEET



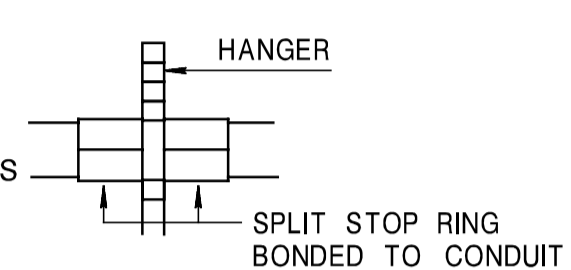
LONGITUDINAL SECTION
(TYPICAL LONGITUDINAL SECTION SHOWING SEVERAL TYPES OF CONDUIT SUPPORTS)

LEGEND

- 1 100 MM (4 inch) I.P.S. GASKETTED EXPANSION JOINT
- 2 BELL AND SPIGOT JOINT
- 3 ANCHOR POINT



NOTE: WHEN USING MORE THAN ONE EXPANSION JOINT, AN ANCHOR MUST POSITIVELY RESTRAIN THE MOVEMENT OF THE CONDUIT AGAINST ALL APPLIED FORCES. ANCHORING IS DONE BY BONDING SPLIT STOP RINGS ON THE EXTERIOR OF THE CONDUIT ON BOTH SIDES OF THE SUPPORT HANGER THAT ENDS OR COVERS THE DISTANCE OR LENGTH OF CONDUIT FOR THAT PARTICULAR EXPANSION JOINT.

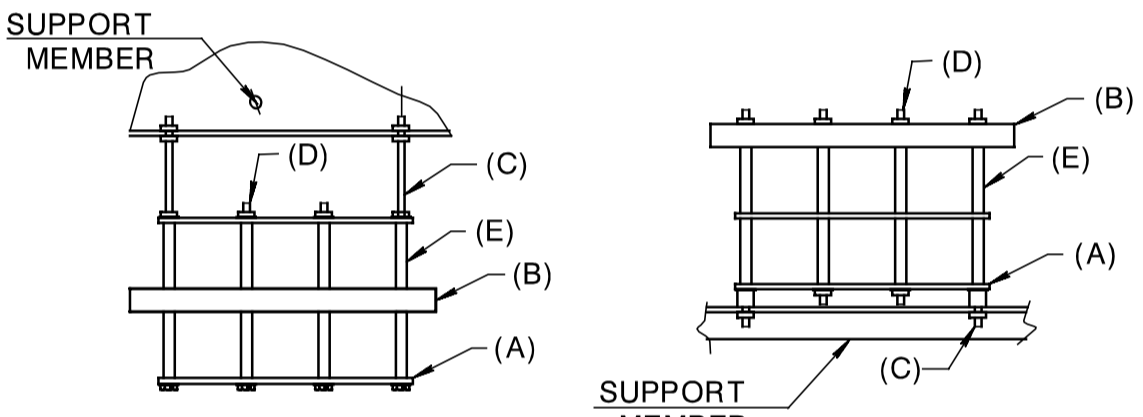


ANCHOR

STANDARD SUPPORT HANGERS IPS SIZE 100 MM (4 inch) TEL

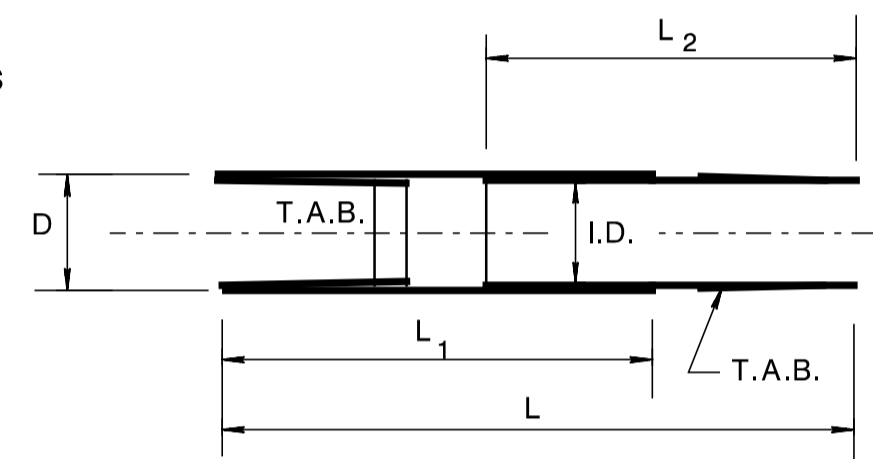
HANGING: HANGERS EXTEND FROM BRIDGE ABOVE TOP ATTACHMENT PLATE (ITEM C) EXTEND AS REQUIRED ABOVE TOP HANGER PLATE. TWO ATTACHMENT RODS (C) ARE INCLUDED UP THRU 4 DUCTS WIDE WITH THREE INCLUDED FOR 5 AND 6 DUCTS WIDE.

BASE MOUNT: MOUNTS IN TOP TO STRUCTURAL MEMBER. THREADED ATTACHMENT RODS (C) EXTEND AS REQUIRED BELOW HANGER. TWO ATTACHMENT RODS ARE INCLUDED UP THRU 5 DUCTS WIDE WITH THREE INCLUDED FOR 6 DUCTS WIDE.



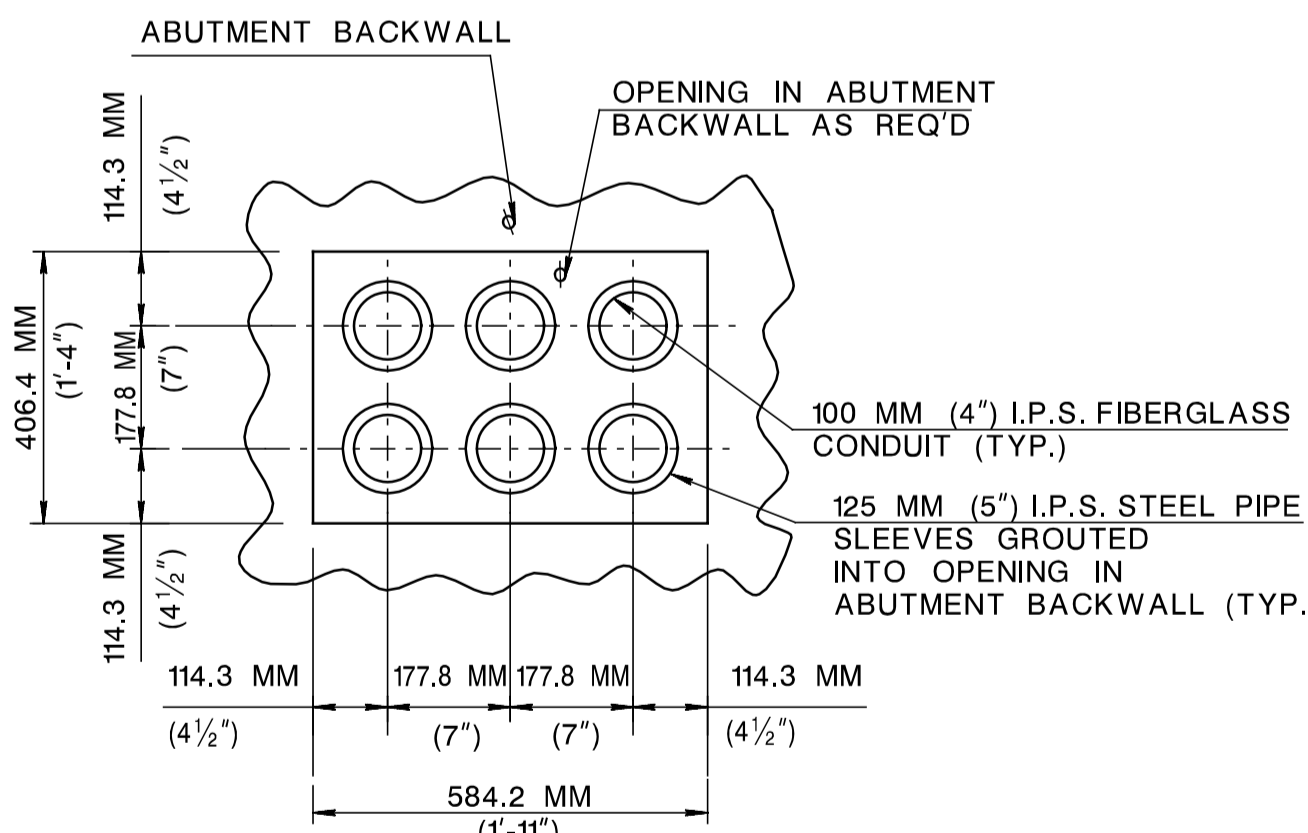
HANGING
3 WIDE x 2 HIGH

BASE
3 WIDE x 2 HIGH



NOMINAL SIZE MM (in)	D MM (in)	L ₁ MM (in)	L ₂ MM (in)	L _{min.} MM (in)	L _{max.} MM (in)	I.D. MM (in)
100 (4)	26.24 (4.97)	318 (12.50)	279 (11)	381 (15)	533 (21)	110.74 (4.36)

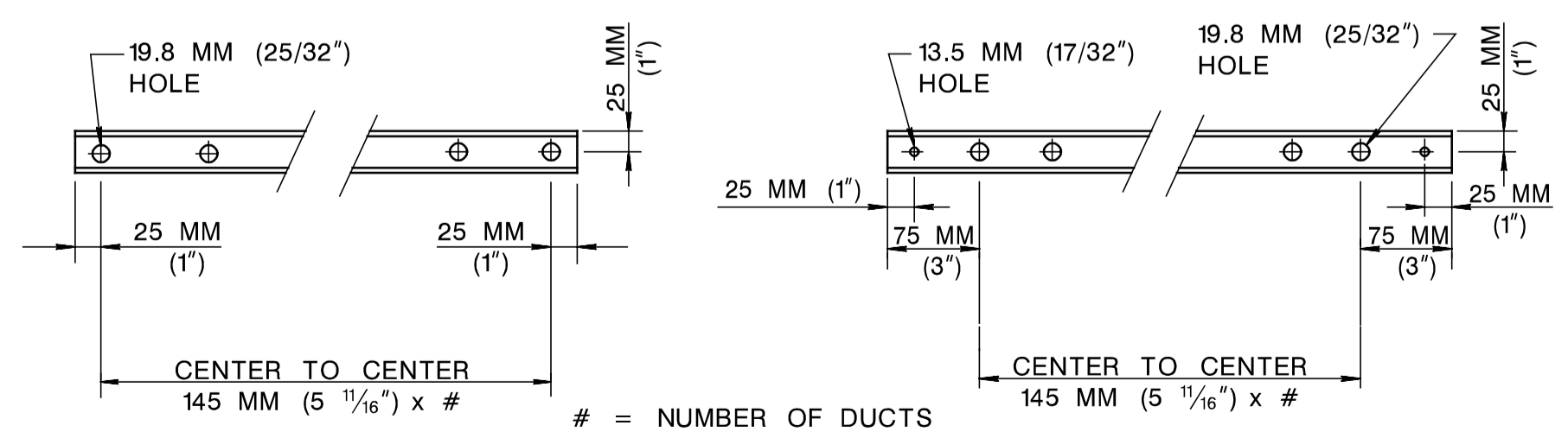
EXPANSION JOINT



SECTION A-A

FIBERGLASS HANGER

- PART (A) 13 x 50 MM (1/2" x 2") FIBERGLASS PLATE
- PART (B) 50 x 50 MM (2" x 2") FIBERGLASS SQUARE TUBING.
- PART (C) 19 MM (3/4") 10NC THREADED STEEL ATTACHMENT RODS, NUTS AND WASHERS (PLATED).
- PART (D) SPACER RODS: 19 MM (3/4") 10NC THREADED STEEL RODS, NUTS AND WASHERS (PLATED)
- PART (E) 19 MM (3/4") FIBERGLASS SPACER TUBES [25.4 MM O.D. x 19.2 MM I.D. x 119.13 MM LONG (1.0" O.D. x 0.755" I.D. x 4.69" LONG)]



PART (A)
PLATE 13 x 50 MM (1/2"x2")

PART (B)
SQ. TUBE 50 x 50 MM (2"x2")

CENTER TO CENTER HANGER ROD DIMENSIONS

TABLE 1

Support Spacing for Interior Spans at 24°C (75°F)

At 38°C (100°F) apply factor of 0.96 - Based on Midspan Deflection not exceeding 16 MM (5/8 inch)

CONDUIT IPS SIZE	CABLE WT. KG/M (LBS. per ft.)	Moment of Inertia MM ⁴ (in ⁴)	Span M (Ft.)
100 MM (4 Inch)	4.46 (3) 11.91 (8)	9.88 x 10 ⁵ (2,374)	6.5 (21.2) 5.2 (17.2)

For other cable Weights use formula below:

For 16 MM Deflection, Span = $\sqrt[4]{\frac{1.0367 \times 10^{13} \times \text{Moment of Inertia}}{(Wt_{Cable} + Wt_{Conduit}) / 1000}} = \frac{MM}{1000} = M$

(For 5/8" Deflection, Span = $\sqrt[4]{\frac{576\,000\,000 \times \text{Moment of Inertia}}{(Wt_{Cable} + Wt_{Conduit}) / 12}} = \frac{inches}{12} = Ft.$)

Property - Physical	Test Method	Value at 24° C	Value at 75° F
Ultimate Tensile Strength	ASTM-D2105	72.4 MPa	10,500 psi
Design Tensile Stress	-	18.1 MPa	2,625 psi
Tensile Modulus of Elasticity	ASTM-D2105	12203.7 MPa	1.77 X 10 ⁶ psi
Ultimate Compressive Strength	ASTM-D695	122.7 MPa	17,800 psi
Design Compressive Stress	-	30.7 MPa	4,450 psi
Compressive Modulus of Elasticity	ASTM-D695	9652.7 MPa	1.4 X 10 ⁶ psi
Ultimate Beam Bending Strength	AOSI-TM	115.1 MPa	16,700 psi
Design Beam Bending Stress	-	34.5 MPa	5,000 psi
Coefficient of Thermal Expansion	AOSI-TM 16-3	2.02 X 10 ⁻⁵ mm/mm/°C	1.12 X 10 ⁻⁵ in/in/°F
Thermal Conductivity	AOSI-TM 16-15	0.37 W/m*°K	2.6 Btu*in/ft ² *F*hr
Specific Gravity	ASTM-D792	1.85	1.85

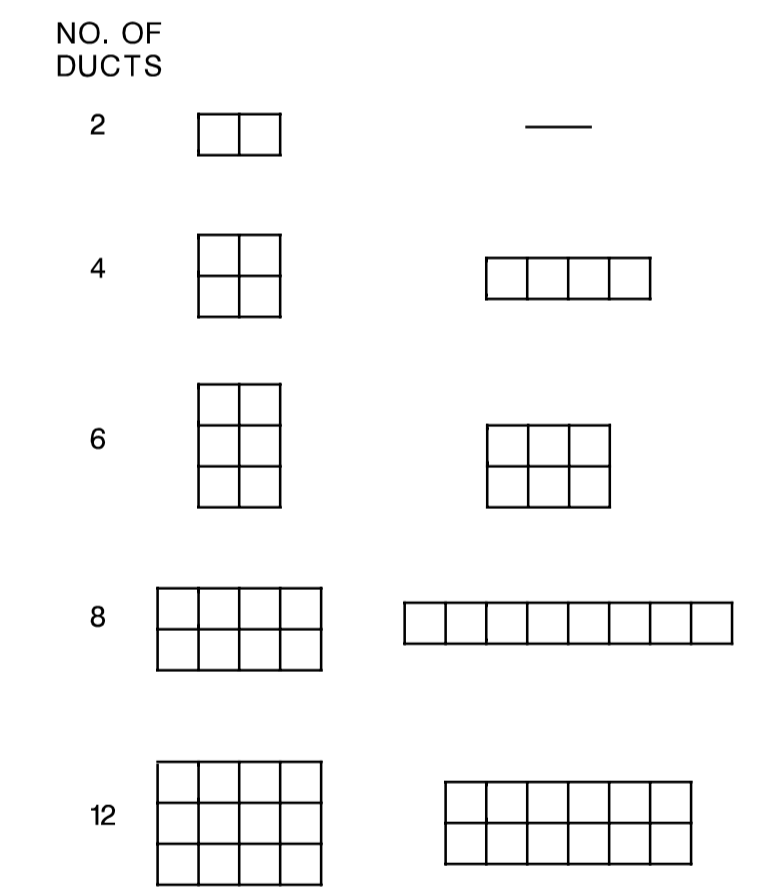
Property - Electrical	Test Method	Value at 24° C	Value at 75° F
Volume Resistivity	ASTM-D150	7.6 X 10 ¹⁵ ohm-cm	7.6 X 10 ¹⁵ ohm-cm
Surface Resistivity	ASTM-D257	2.4 X 10 ⁸ megohm	2.4 X 10 ⁸ megohm
Dielectric Constant	ASTM-D150	4.2 (at 10 ³ cps)	4.2 (at 10 ³ cps)
Dissipation Factor	ASTM-D150	0.06 (at 10 ³ cps)	0.06 (at 10 ³ cps)
Dielectric Strength	ASTM-D348	1800 volts/mm	440 volts/mil

TABLE 2

CONDUIT IPS SIZE	O.D. MM (in)	I.D. MM (in)	WALL MM (in)	LENGTHS ±150 MM (±6") M (Ft.)
100 MM (4 Inch)	114.3 (4.50)	110.74 (4.36)	1.78 (0.070)	9.1 (30)

DESIGN NOTES:

- WEIGHT OF 100 MM (4 inch) IPS DIAMETER FIBERGLASS CONDUIT/DUCT = 1.19 KG/M (0.80 LBS/FT).
- STEEL SUPPORT MEMBERS AND STEEL PIPE: REFER TO APPROPRIATE DESIGN MANUALS AND SPECIFICATIONS AS DESIGNATED BY THE GOVERNING AGENCY.
- FIBERGLASS DUCTS TO BE 100 MM (4 inch) - 114.3 MM (4.5 inch) O.D. x 110.74 MM (4.36 inch) I.D. x 1.78 MM (0.070 inch) WALL - POLISHED BORE 9.14 M (30 FT.) LENGTHS WITH THREADED MALE AND FEMALE ENDS WITH 13.34 KN (3000 LBS.) UNBONDED PULLOUT STRENGTH.
- SELECT CONDUIT LENGTHS SO THAT COUPLING LOCATIONS DO NOT COINCIDE WITH SUPPORT LOCATIONS.
- THE NUT ON ALL HANGER BOLTS TO BE TIGHTENED FOR A SNUG ASSEMBLY ONLY AND LOCKED.
- SUBJECT TO DESIGN THE MAXIMUM DISTANCE BETWEEN GASKETED EXPANSION JOINTS CAN BE UP TO 91.4 M (300 FT.)
- THE EXPANSION JOINTS ARE TO BE SET ACCORDING TO THE AMBIENT TEMPERATURE AT TIME OF INSTALLATION AS PER GAUGE ON EXPANSION JOINT.
- FOR DIMENSIONS AND PROPERTIES OF DUCT, REFER TO TABLE 1.
- ALL ATTACHMENT RODS, NUTS, LOCK AND FLAT WASHERS UTILIZED IN THE DUCT HANGERS ARE TO BE ZINC PLATED UNLESS OTHERWISE SPECIFIED.
- WHEN CEMENTING FIBERGLASS TO FIBERGLASS, A FIBERGLASS ADHESIVE SHALL BE USED.
- ONE DUCT EXPANSION JOINT TO BE PROVIDED BETWEEN ANCHOR POINTS.
- EVERY BRIDGE REQUIRES AT LEAST 1 DUCT EXPANSION JOINT.
- SPECIAL DUCT EXPANSION JOINTS AT THE BRIDGE EXPANSION JOINTS MAY BE REQUIRED.
- DO NOT LOCATE DUCT EXPANSION JOINTS WITHIN DRIP ZONE OF BRIDGE EXPANSION JOINTS.
- THIS DRAWING IS FOR A TYPICAL BRIDGE. SINCE BRIDGE DESIGNS VARY, CONTACT BELL ATLANTIC - N.J. FOR DESIGN APPROVAL ON EACH JOB. 908-390-9982, 83, OR 84. (908 CHANGES TO 732 AFTER 06-01-97)



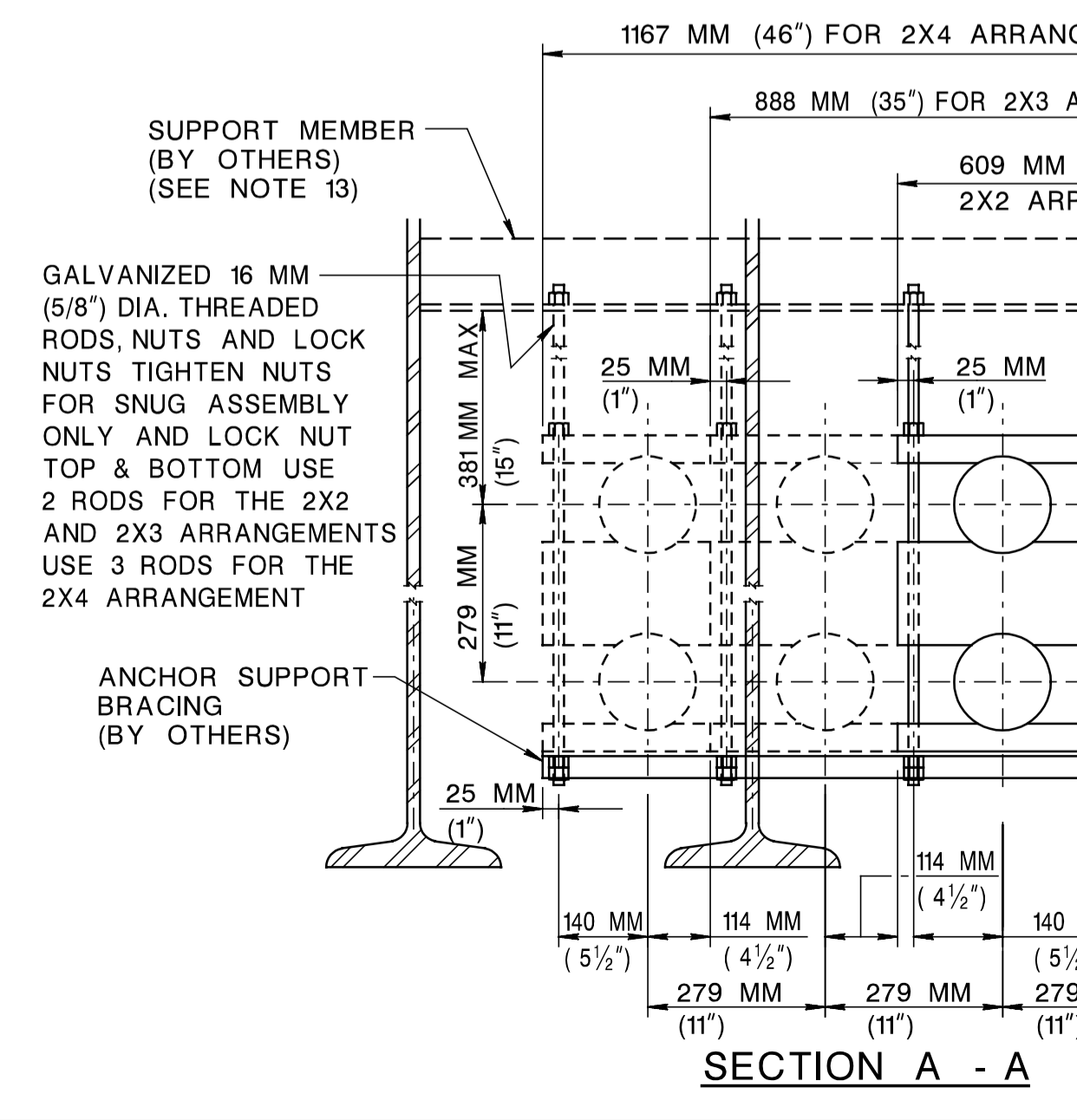
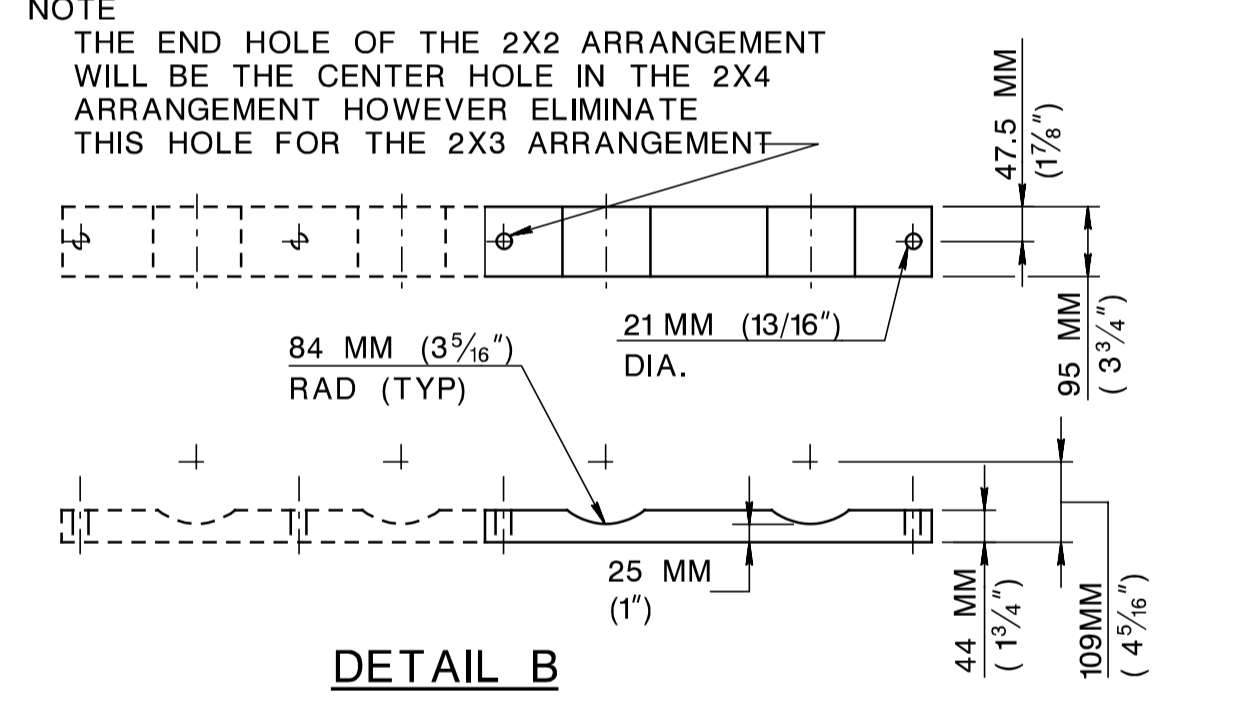
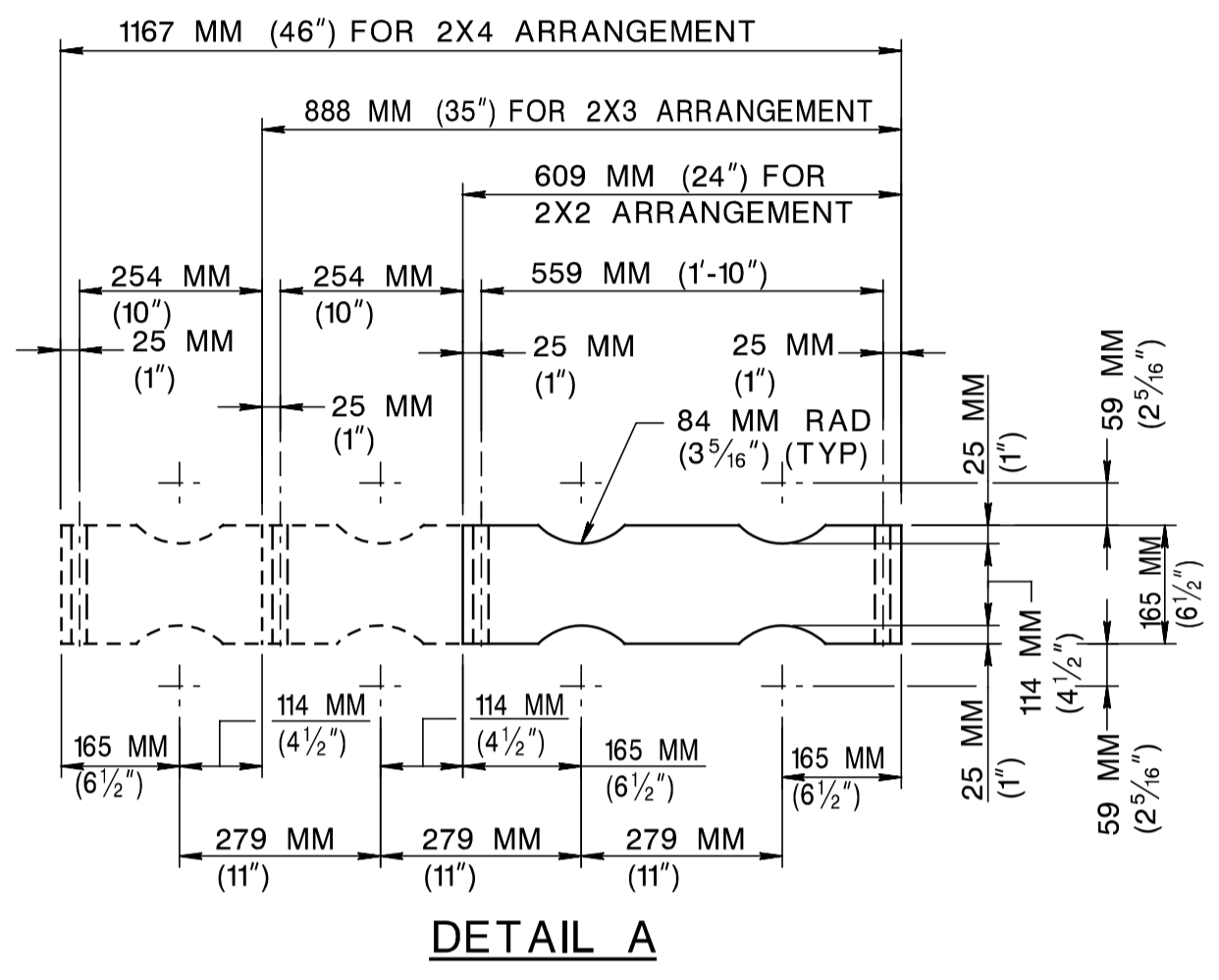
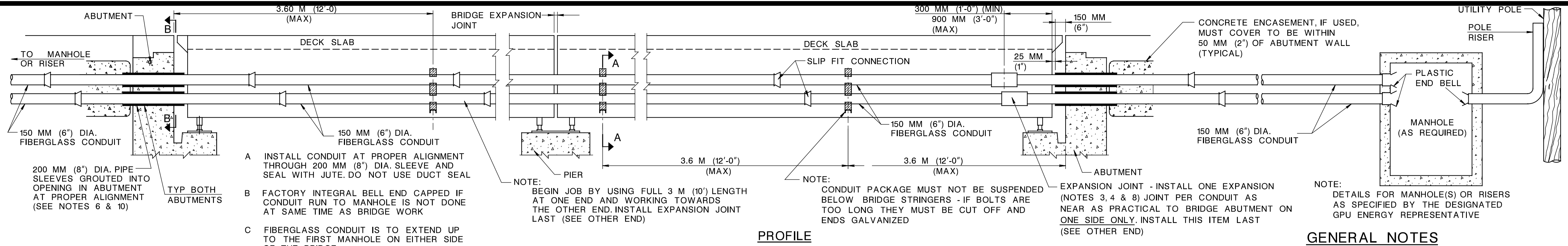
SUGGESTED DUCT FORMATION

THIS SHEET FOR DESIGN INFORMATION ONLY. NOT TO BE INCLUDED IN CONTRACT PLANS

PLATE 2.7 - 3

A	REMOVE COPYRIGHT 1996	VV	12-18-96
DATE	REVISION	BY	DATE
BELL ATLANTIC - NJ STANDARD			
TYPICAL INSTALLATION OF 100 MM (4 inch) I.P.S. FIBERGLASS DUCTS ON BRIDGES			
OWNER: BELL ATLANTIC - NJ			
JOHN S. DEERKOSKI, P.E. AND ASSOCIATES WARWICK, NEW YORK			
CHECKED BY: A.E.	DATE: 7-26-96		
DRAWN BY: V.V.	DATE: 7-9-96		
DRAWING NO. 9652-1	SHT. OF		

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BD02MB-02 - ORIGINAL SHEET



NOTE: UTILITY CROSSARMS MAY BE USED AS SEPARATORS, PROVIDED SEPARATION DISTANCES ARE MAINTAINED, SEE NOTE 5

DETAIL "A" CAN BE MADE BY USING TWO 89 X 114 MM (3 1/2" X 4 1/2") CROSSARMS MOUNTED BACK TO BACK

DETAIL "B" CAN BE MADE BY USING A SINGLE 89 X 114 MM (3 1/2" X 4 1/2") CROSSARM

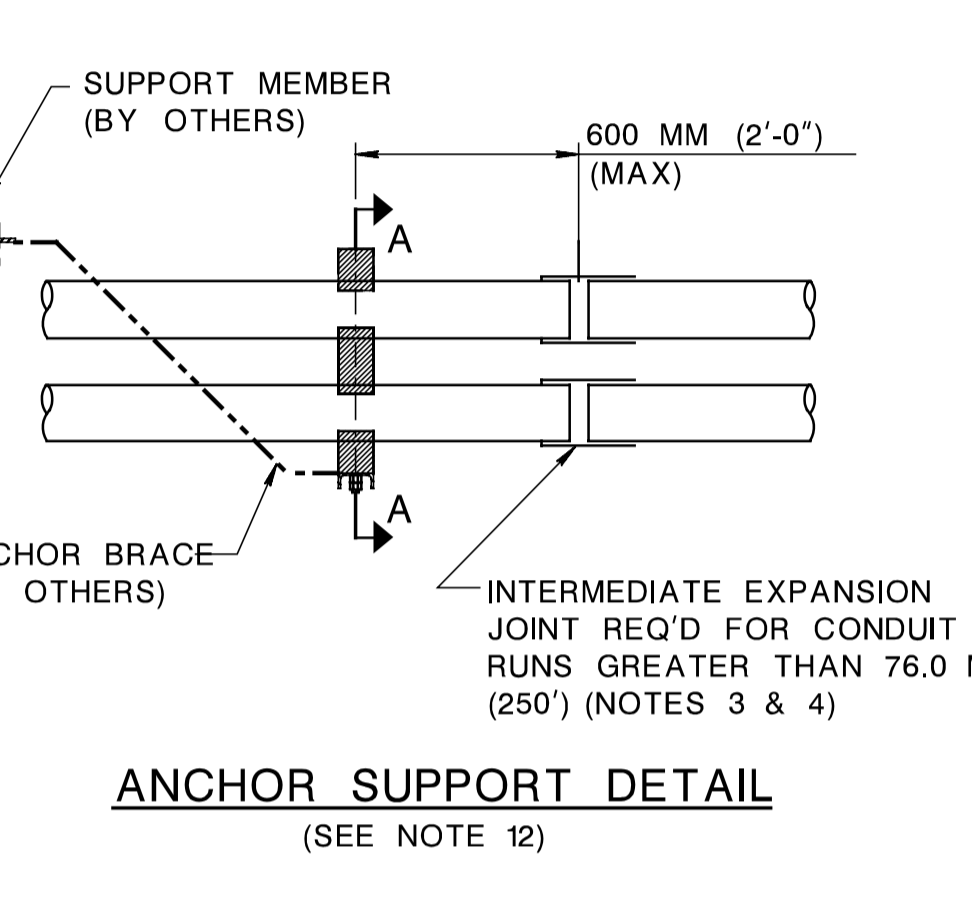
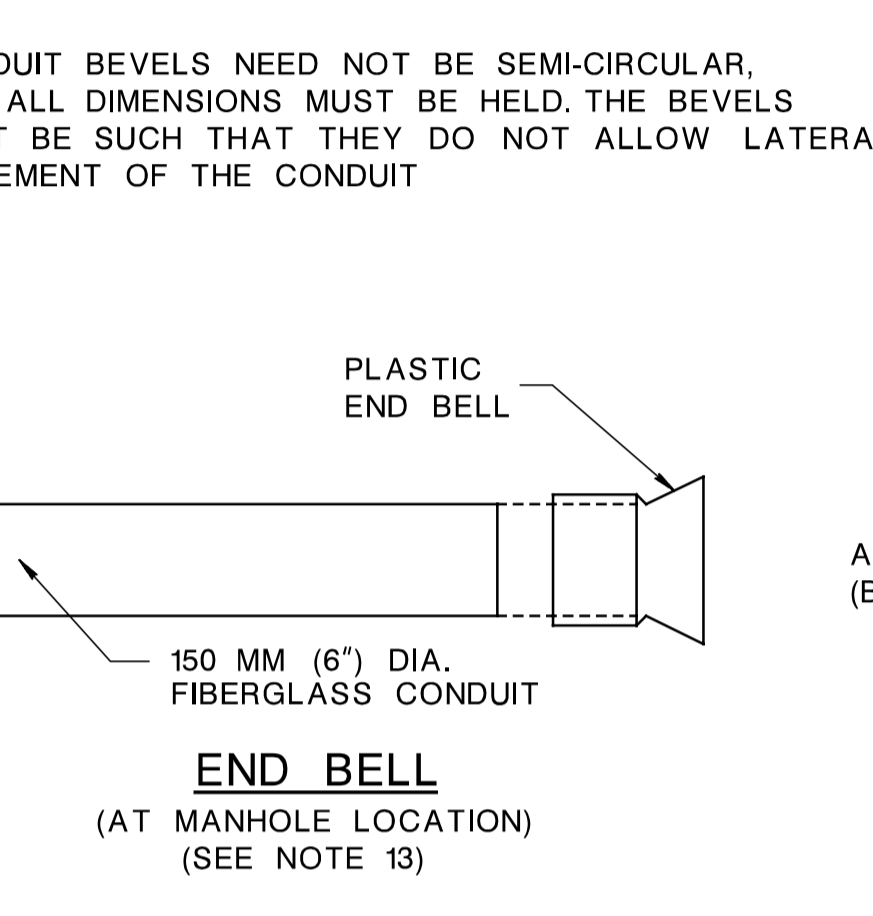
CONDUIT BEVELS CAN THEN BE CUT TO MAINTAIN DESIRED SEPARATIONS

NOTE: MANUFACTURED CONDUIT SUPPORT SYSTEMS MAY BE SUBSTITUTED FOR THE PRESSURE TREATED WOOD SYSTEM SHOWN. THESE ARE AVAILABLE FROM:

CONDUX INTERNATIONAL - BOX 247
MANKATO, MINNESOTA 56001
800-533-2077

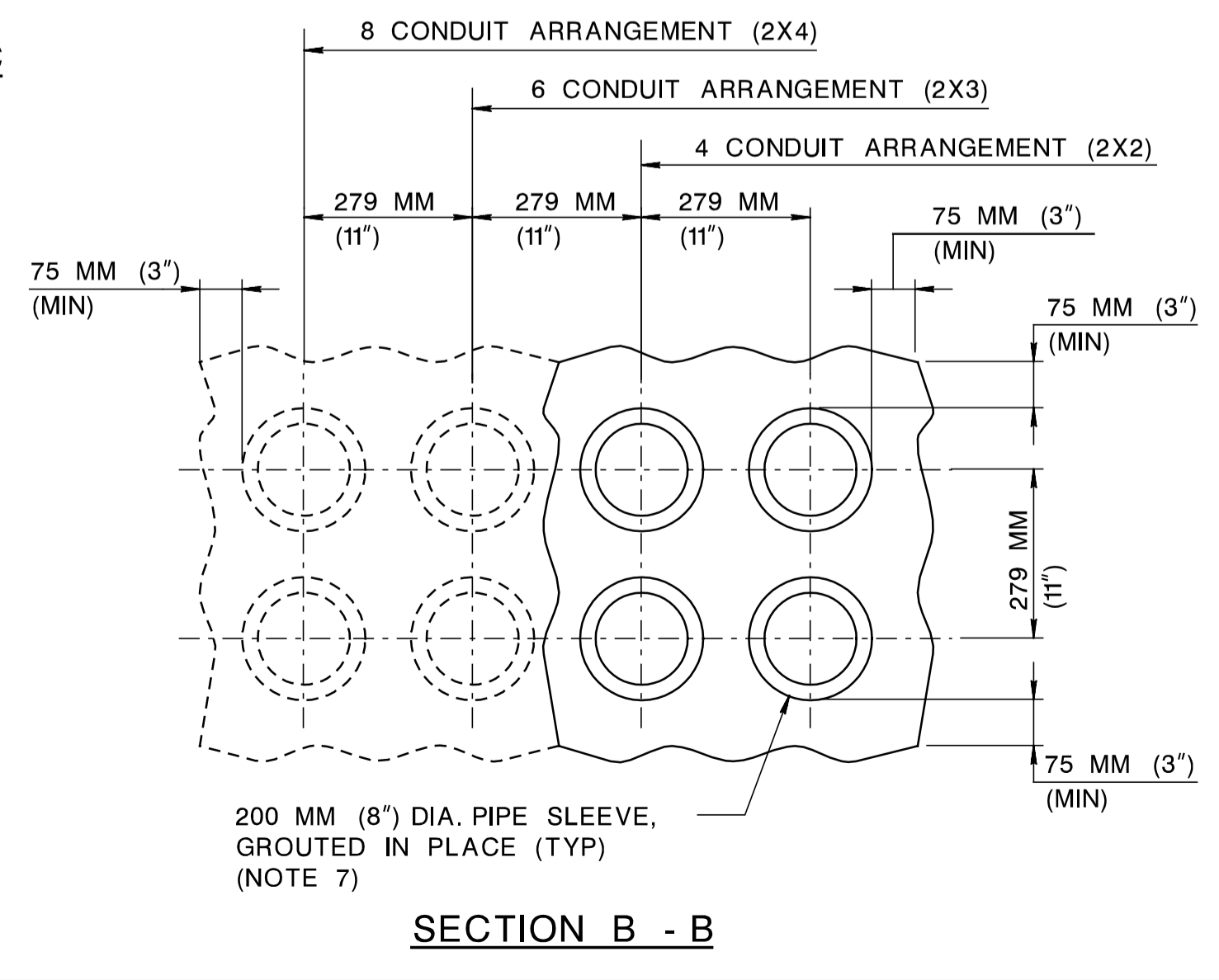
GEORGE-INGRAHAM CORP - PO BOX 1869
STONE MOUNTAIN, GEORGIA
30086-1869
800-631-6283
800-631-6283
FAX 404-296-0952

METRA INDUSTRIAL CORP - METRA INDUSTRIAL CORP
P O BOX 30845
COLUMBUS, OHIO 43230
800-872-3828
800-872-3828
FAX 614-475-7759



BILL OF MATERIALS

ITEM NO	DESCRIPTION	QUANTITY OF ITEMS NEEDED FOR			
		2 conduits	4 conduits	6 conduits	8 conduits
1	150 MM (6") AIRTIGHT EXPANSION JOINTS	AS REQUIRED SEE NOTES 3, 4, & 13			
2	150 MM (6") DIA. FIBERGLASS CONDUIT	NOMINAL 3 M (10') LENGTHS			
3	STAINLESS STEEL OR ALUMINUM PIPE SLEEVES	4	8	12	16
4	FLANGE END BELL, PLASTIC	AS REQUIRED			
5	CONDUIT SUPPORT SYSTEMS	AS REQUIRED			
6	EPOXY CEMENT	AS REQUIRED			



- GENERAL NOTES**
- THE JOINING SYSTEM FOR THE FIBERGLASS CONDUIT SHALL BE NON-ADHESIVE, NON-MECHANICAL SLIP-FIT TYPE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS AND GOOD WORK PRACTICE.
 - WHENEVER FIBERGLASS CONDUIT IS CUT, SMOOTH THE ROUGH (INSIDE AND OUTSIDE) BY SANDING WITH EMORY CLOTH.
 - INSTALL ONE EXPANSION JOINT PER 38 M (125') OF CONDUIT RUN. EXPANSION JOINTS SHALL BE CAPABLE OF LONGITUDINAL MOVEMENTS OF 75 MM (3") ± (MIN) FOR RUNS OF 76 M (250') OR LESS. INSTALL BOTH EXPANSION JOINTS NEAR ABUTMENTS AND INSTALL ONE ANCHOR SUPPORT NEAR MIDPOINT BETWEEN EXPANSION JOINTS (SEE NOTE 11)
 - THE MANUFACTURER WILL AT THE REQUEST OF THE CONTRACTOR, COMPLETELY ASSEMBLE AN EXPANSION JOINT AND INCORPORATE IT INTO A FULL LENGTH OF CONDUIT.
 - PRESSURE TREATED WOOD SEPARATORS SHALL BE MADE FROM "DENSE STRUCTURAL SOUTHERN PINE" OR "DENSE SELECT STRUCTURAL FIR" AND SEPARATORS SHALL BE TREATED WITH PENTACHLOROPHENOL PRESERVATIVE. SIMILARLY TREATED UTILITY CROSSARMS ARE SUITABLE PROVIDED ALL DIMENSIONS SHOWN IN DETAILS "A" AND "B" ARE MAINTAINED.
 - 200 MM (8") DIA. PIPE SLEEVES WILL BE MADE OF ALUMINUM, SCH 40 (MIN) OR NON - MAGNETIC STAINLESS STEEL, SCH 40 (MIN)
 - CONDUITS AND EXPANSION JOINTS MUST BE INSTALLED SO AS TO MAINTAIN AIRTIGHT INTEGRITY FOR PNEUMATIC LINES.
 - HANGER ASSEMBLY DESIGN AND CONDUIT SUPPORT SPACINGS WERE BASED ON A COMBINED W/M (WEIGHT/FOOT) OF CONDUIT AND CABLE OF 16.7 KG/M (11.2 LBS/FT)
 - ALL STRUCTURAL STEEL SHALL MEET THE REQUIREMENTS OF ASTM A36/ A36M-94 UNLESS OTHERWISE NOTED. ALL STRUCTURAL STEEL PLATES, SHAPES, HANGERS AND APPURTENANCES SHALL BE HOT - DIP GALVANIZED
 - DISTRIBUTOR FOR ALUMINUM & NON - MAGNETIC STAINLESS STEEL PIPE SLEEVES JOSEPH T RYERSON & SON INC , PHILADELPHIA, PA. 215-724-0700
 - TO CONTROL CONDUIT MOVEMENTS DUE TO TEMPERATURE CHANGES AND CABLE PULLING, INSTALL ONE ANCHOR SUPPORT PER 38 M (125') OF CONDUIT. ANCHOR SUPPORTS SHALL BE DESIGNED FOR A 2669 N (600 POUND) FORCE IN EITHER DIRECTION OF CONDUIT RUN. THE ANCHOR SUPPORT SHALL USE CLAMPS, CABLE TIES, ETC TO PREVENT LONGITUDINAL MOVEMENTS OF THE CONDUIT AT THIS LOCATION AND SHALL BE APPROVED BY THE DESIGNATED GPU ENERGY REPRESENTATIVE (SEE ANCHOR DETAIL)
 - THE USE OF CAST-IN-PLACE OR DRILLED-IN ANCHORS IN THE DECK SLAB OR PRECAST BEAMS IS STRICTLY PROHIBITED BY THE NEW JERSEY DOT
 - REFER TO ANY SPECIFIC REQUIREMENTS OF THE MANUFACTURER USED, FOR INSTALLATION DETAILS

THIS SHEET FOR DESIGN INFORMATION ONLY. NOT TO BE INCLUDED IN CONTRACT PLANS.

PLATE 2.7-4

FIBERGLASS CONDUIT MANUFACTURERS (AS OF 2 - 97)

CHAMPION FIBERGLASS, INC
P O BOX 699
SPRING, TEXAS 77383-0699
713-353-5052

CONTRACTORS TO VERIFY WITH SHOP DRAWINGS THAT ALL CONDUITS HAVE THE FOLLOWING MINIMUM PROPERTIES:

PIPE ID = 162.05 MM (6.380") IPS-TYPE HW
WALL THICKNESS = 2.3 mm (0.09")
TENSILE STRENGTH = 62 MPA (9.0)KSI
IMPACT RESISTANCE = 140 NM @ 21°C (140 FT-LBS AT 70°F)
TEMPERATURE RATING OF CONDUIT
50°C OPERATING
100°C EMERGENCY
STIFFNESS = 345 KPA (50 LBF/IN²)
HEAT DISTORTION = PER ASTM-D648

SUPERCEDED BY:		WORK ORDER NO.:	
4	7-13-92	UPDATE TO NEW SPEC	JD JH
3	3-3-97	REVISED NOTE 8	AMD JH
2	8/86	REDRAWN	MS DB
1	10/82	CHANGED MANUFACTURER REP.	WW KK
NO	DATE	REVISION	BY CK AUT

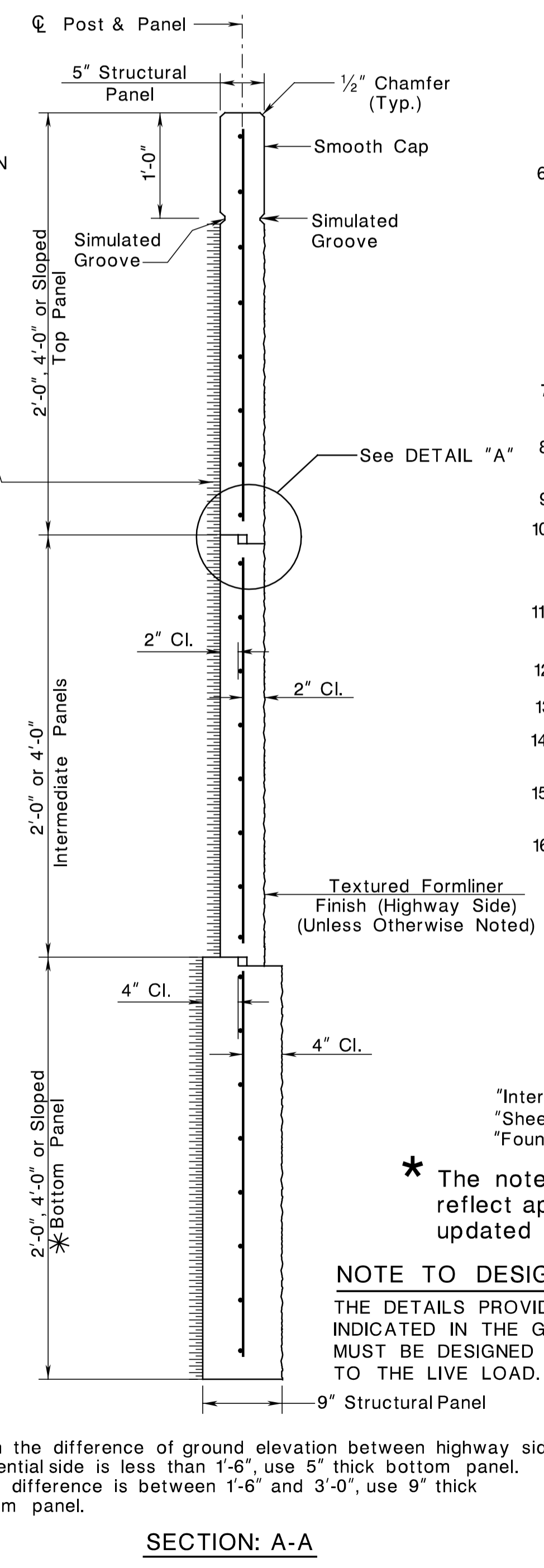
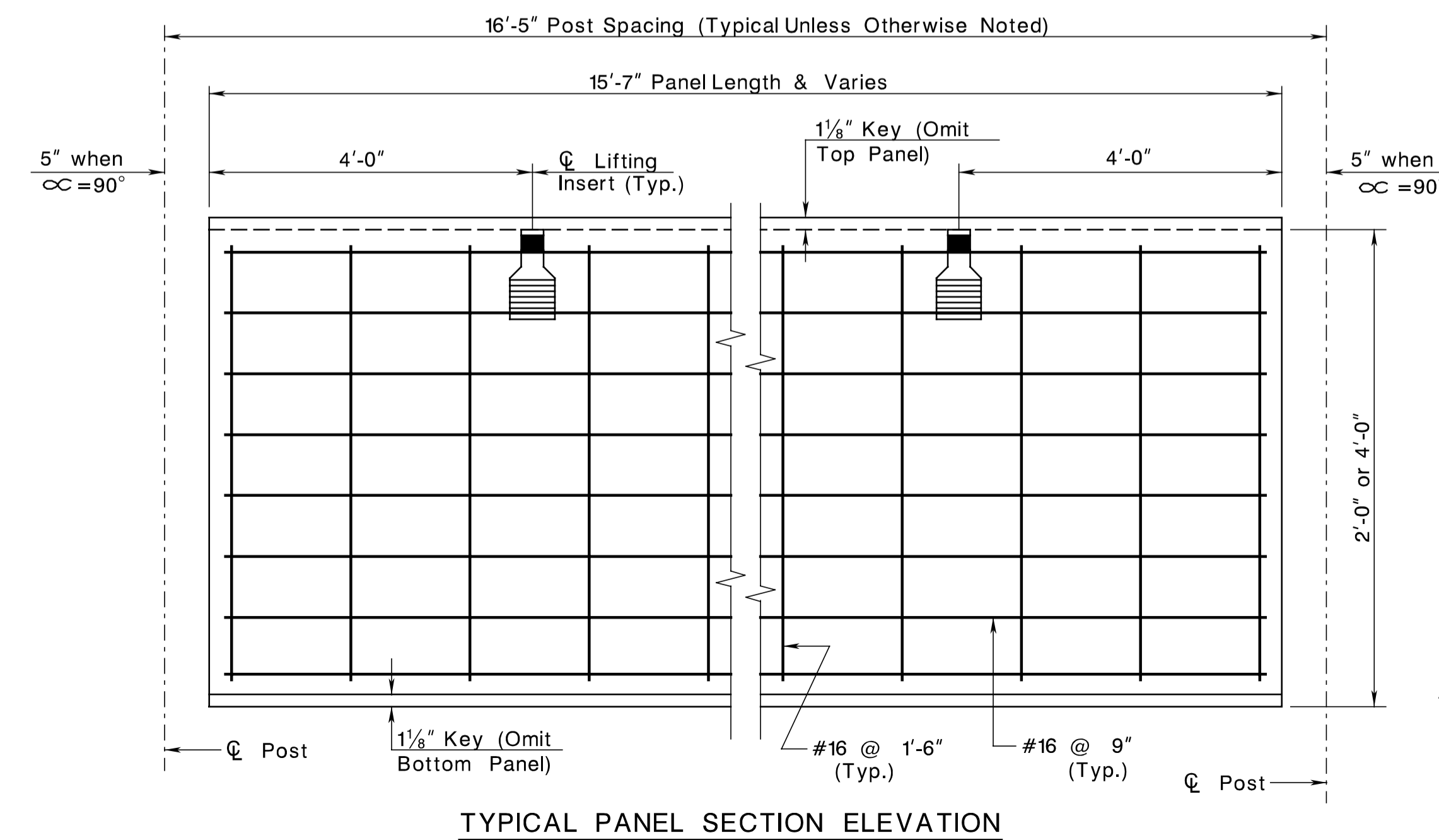
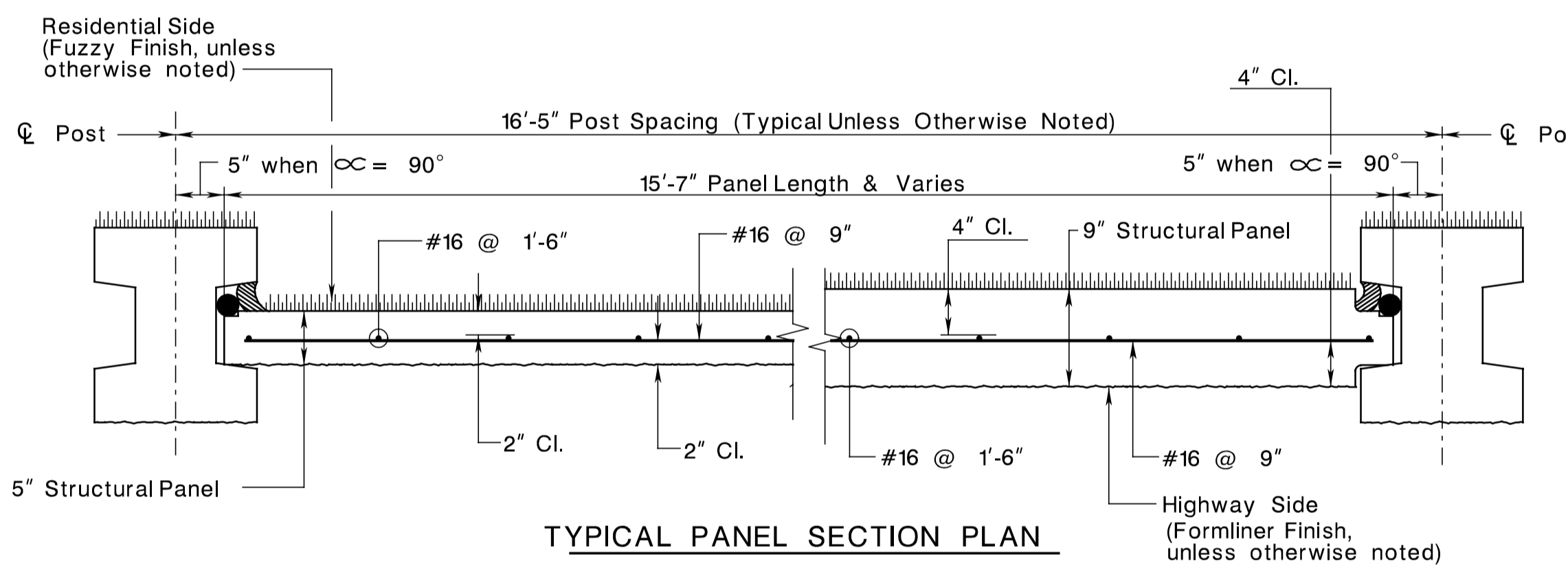
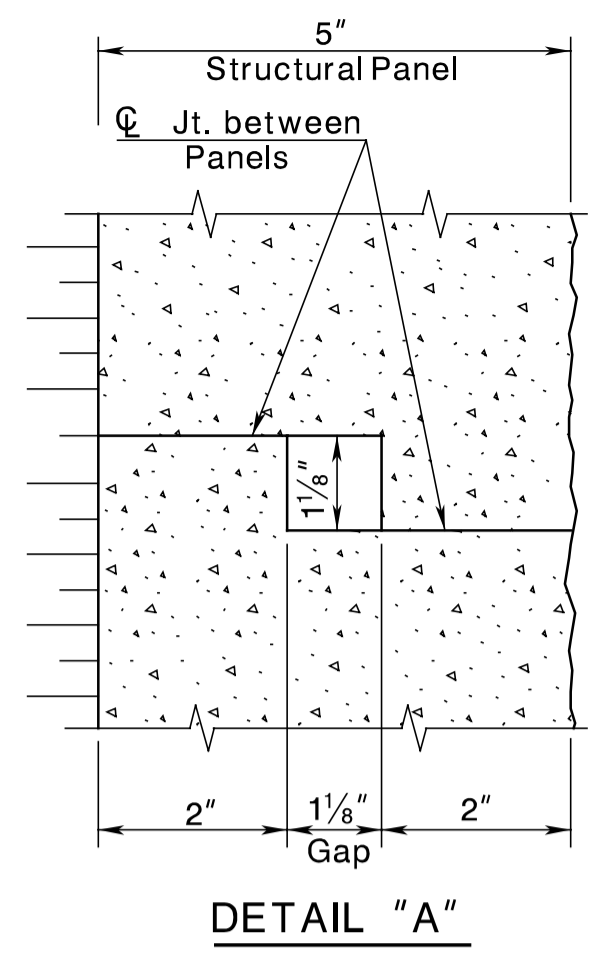
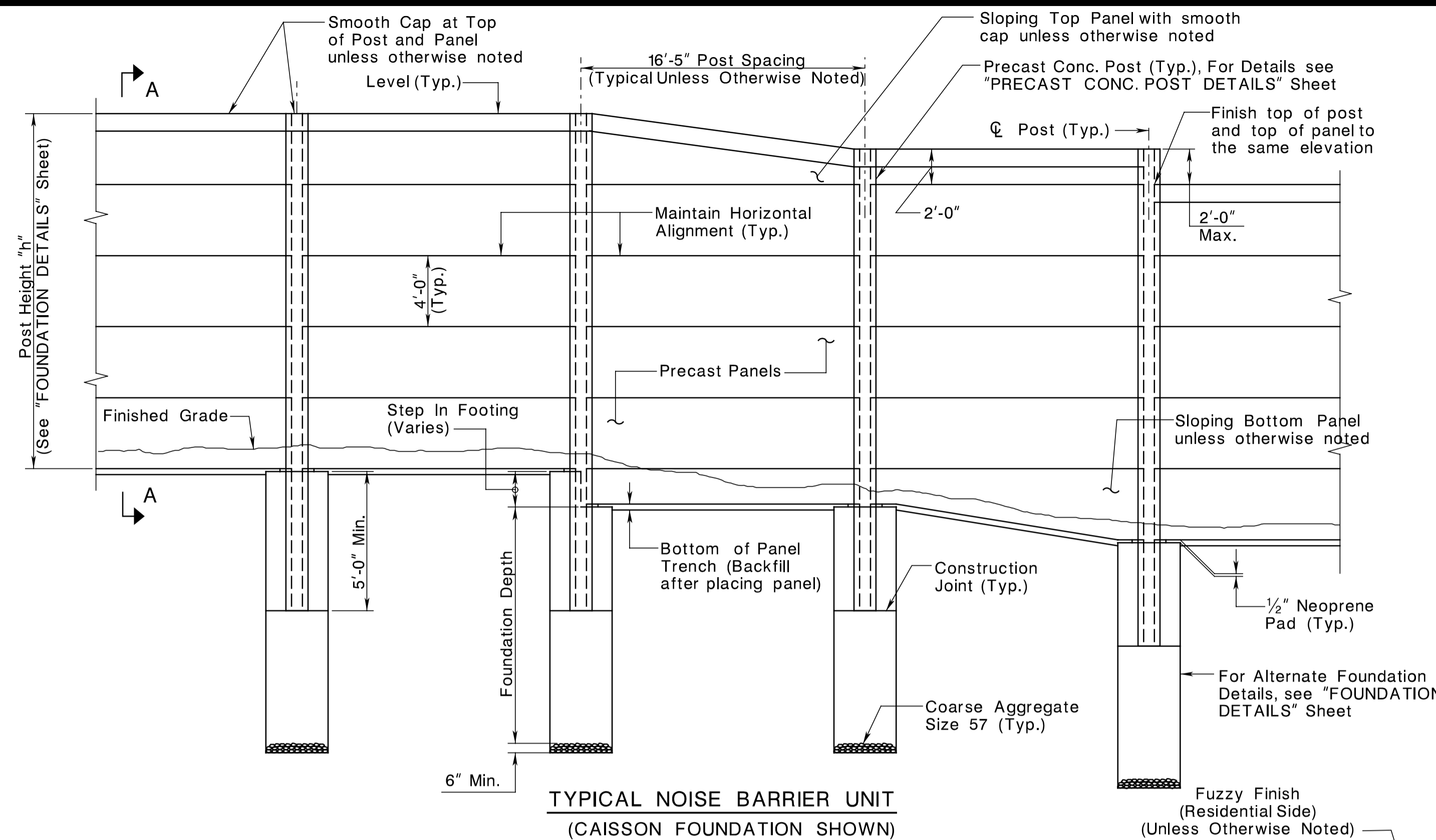
Reading, PA

DISTRIBUTION STANDARD

STANDARD INSTALLATION OF 150 MM (6") FIBERGLASS CONDUIT UNDER HIGHWAY BRIDGES

DRAWN BY:	DATE:	SCALE:
GFG	12/22/75	NONE
CHECKED BY:	DATE:	SHT 1 OF 1
J. L. KANE, JR.		
APPROVED BY:	DATE:	DRAWING NO.
J. M. HOLMES		D-68289

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BD02MB-02 - ORIGINAL SHEET



GENERAL NOTES

- DESIGN SPECIFICATIONS**
1996 AASHTO Standard Specifications for Highway Bridges (with interims) as modified by Section 3A of NJDOT Design Manual for Bridges and Structures and 1989 AASHTO Guide Specifications for Structural Design of Sound Barriers (with Interims).
- CONSTRUCTION SPECIFICATIONS**
The NJDOT Standard Specifications for Road and Bridge Construction with current Supplemental Specifications, as modified by the Special Provisions.
- LIVE LOAD**
Wind pressure: 33 PSF corresponding to a wind velocity of 80 mph, as specified in Table 47.2 of Section 4 of NJDOT Design Manual for Bridges and Structures.
Ice Load: 47 PSF
Seismic Load for Seismic Performance Category (SPC) 'B', Maximum Value of 'A' (Acceleration Coefficient) = _____, Soil Profile = _____.
- CONCRETE DESIGN STRESSES**
 - Precast Members (Post and Panels):
Specified Compressive Strength $f'_c = 5,000$ PSI
Extreme Fiber in Compression $f_c = 2,000$ PSI
 - Cast-In-Place Members:
Specified Compressive Strength $f'_c = 3,000$ PSI
Extreme Fiber in Compression $f_c = 1,200$ PSI
- REINFORCEMENT STEEL**
Deformed Bars (ASTM A615, Grade 60)
Allowable Tensile Stress $f_s = 24,000$ PSI
Deformed Welded Wire Fabric may be used as an alternate. The Welded Wire designation and spacing shall meet the minimum area of steel as determined by design. Refer to Section 915.01 (F) of the 1996 NJDOT Standard Specifications for Road and Bridge Construction for guidance concerning corrosion protection of the welded wire reinforcement.
- CLASSES OF CONCRETE**
 - Class of Concrete Used:
Class P Concrete for Posts and Panels
Class B Concrete for Foundations and Pedestals
 - Class Design Strengths (Mix Design Requirements)
(In accordance with Section 914 of Specifications)
Class P = 5,500 PSI
Class B = 3,700 PSI
- Position panels using recessed lifting inserts as shown. Recessed insert holes in top panels and in posts shall be sealed with non-shrink cement mortar tinted to match color of panels and posts.
- All concrete posts and panels shall be tinted utilizing an integral color in accordance with the Special Provisions.
- All panels and posts shall be installed to true vertical (i.e. Faces of panels shall be flush).
- Horizontal panel joints on each side of the post shall line up within 1" tolerance, providing that the first matching joint from the ground shall have zero tolerance and the last matching joint shall have 1" tolerance.
- All precast members shall be fabricated to plan dimensions within the tolerances specified in Section 522 of the NJDOT Standard Specifications for Road and Bridge Construction.
- Excavation and caissons shall be kept dry during placement of crushed concrete.
- Spread footing and caissons shall be designed by the Designer based on actual subsurface conditions.
- Shop drawings shall show complete noise barrier plan and elevations, including all steps and details and dimensions necessary for fabrication and erection.
- The Contractor shall verify locations of all existing utilities prior to construction in the vicinity of the proposed noise barrier.
- The concrete posts and panels shall be precast or prestressed utilizing a formliner. The formliner shall be as indicated in the NJDOT Standard Specifications for Road and Bridge Construction as modified by the Special Provisions.

SUMMARY OF QUANTITIES

PAY ITEM NO.	STANDARD ITEM NO.	DESCRIPTION	UNIT	CONTRACT QUANTITY
		NOISE BARRIER, ROADWAY	S.F.	
		NOISE BARRIER, FOUNDATION	UNIT	
		TEMPORARY SHEETING	S.F.	

"Integral Coloring Pigment" shall be included in the bid price for "Noise Barrier, Roadway".
"Sheeting In Place" shall be included in the bid price for "Noise Barrier, Foundation".
"Foundation Excavation" shall be included in the bid price for "Noise Barrier, Foundation".

* The note should be modified to reflect applicable year and updated Specifications.

NOTE TO DESIGNER

THE DETAILS PROVIDED ARE FOR THE LIVE LOAD INDICATED IN THE GENERAL NOTES. THE DETAILS MUST BE DESIGNED FOR ANY MODIFICATIONS TO THE LIVE LOAD.

* When the difference of ground elevation between highway side and residential side is less than 1'-6", use 5" thick bottom panel. If the difference is between 1'-6" and 3'-0", use 9" thick bottom panel.

CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	
IN CHARGE OF _____	

REVISION	BY	CKD	DATE

STANDARD DRAWING PLATE 2.8-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

**NOISE WALL BARRIERS
PRECAST CONCRETE PANEL DETAILS**

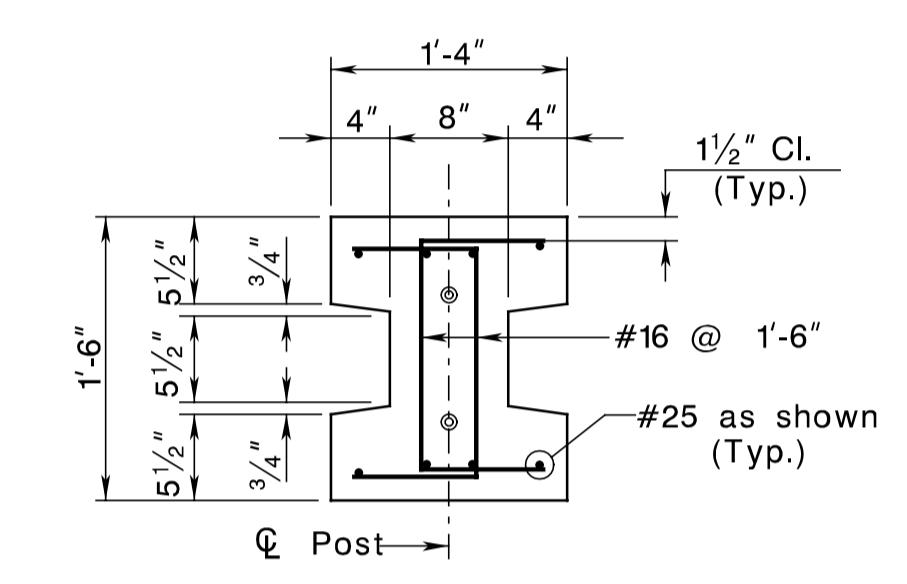
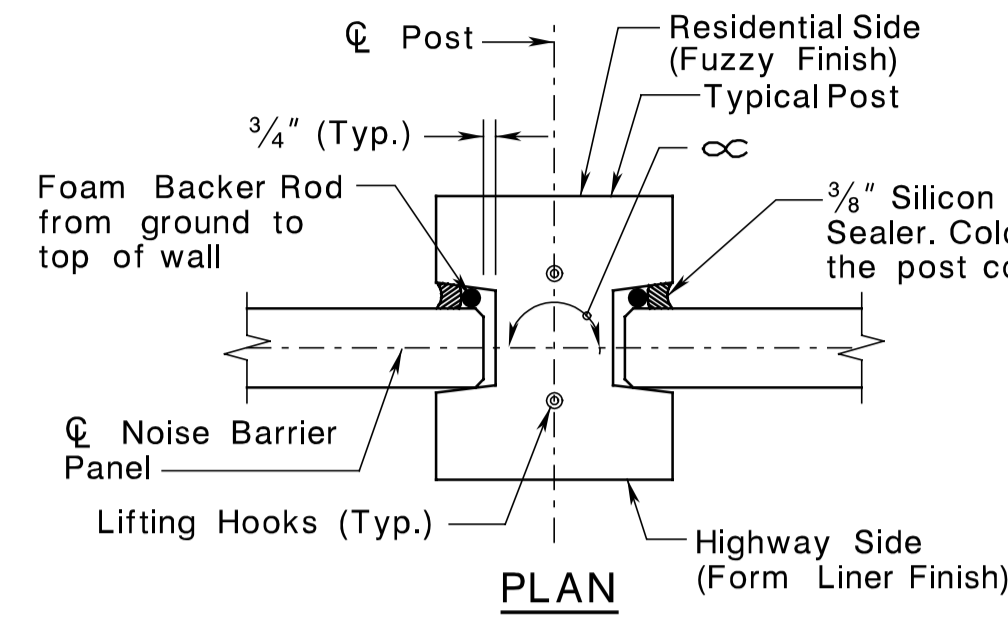
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MUNICIPALITY _____ COUNTY _____

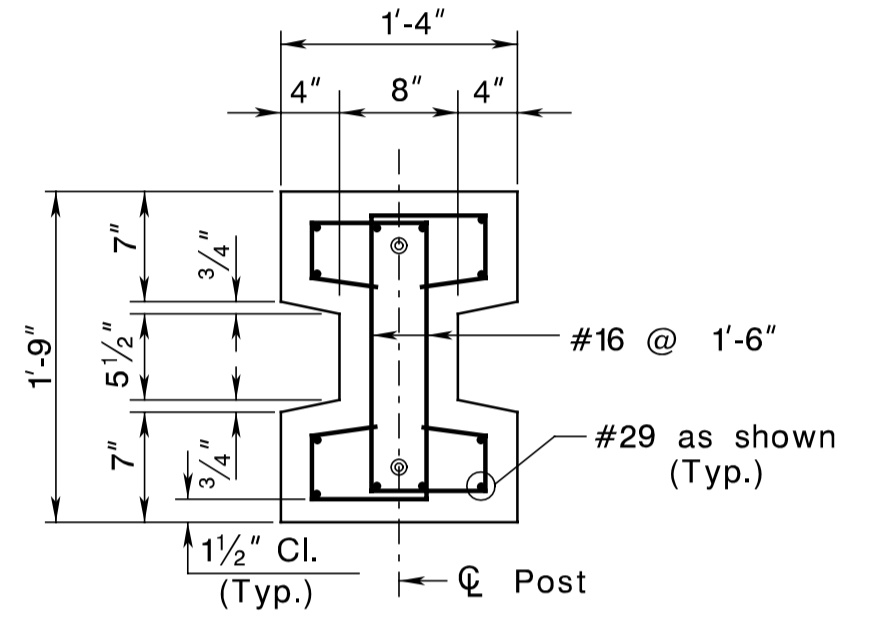
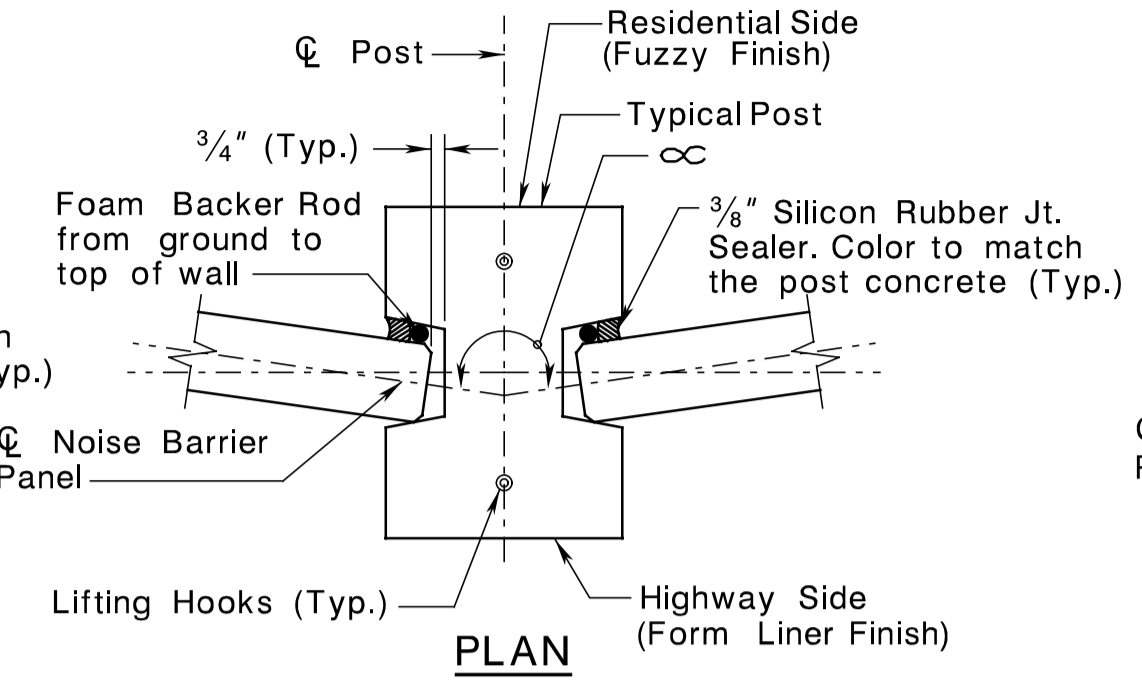
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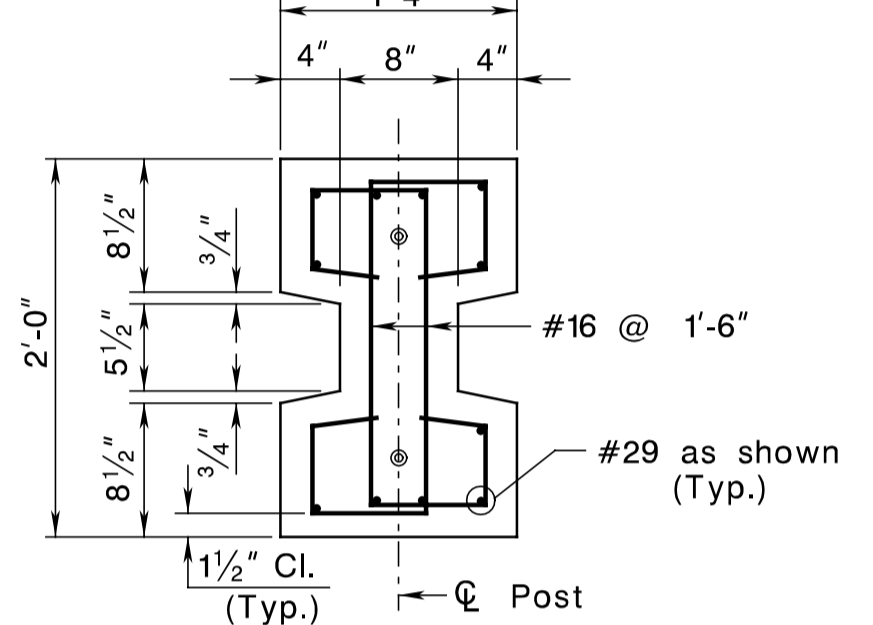
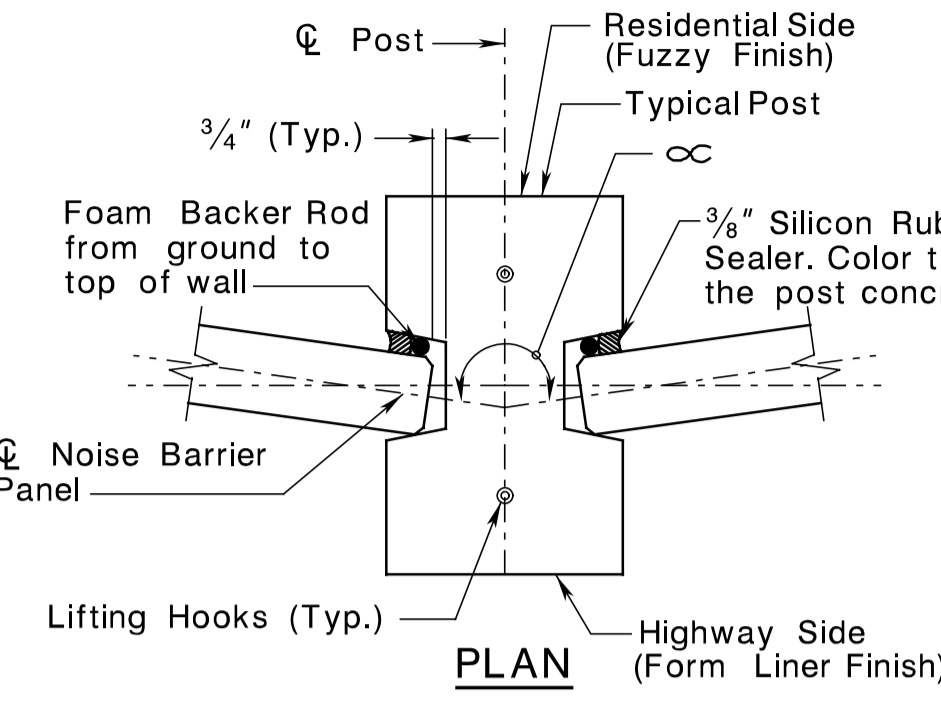
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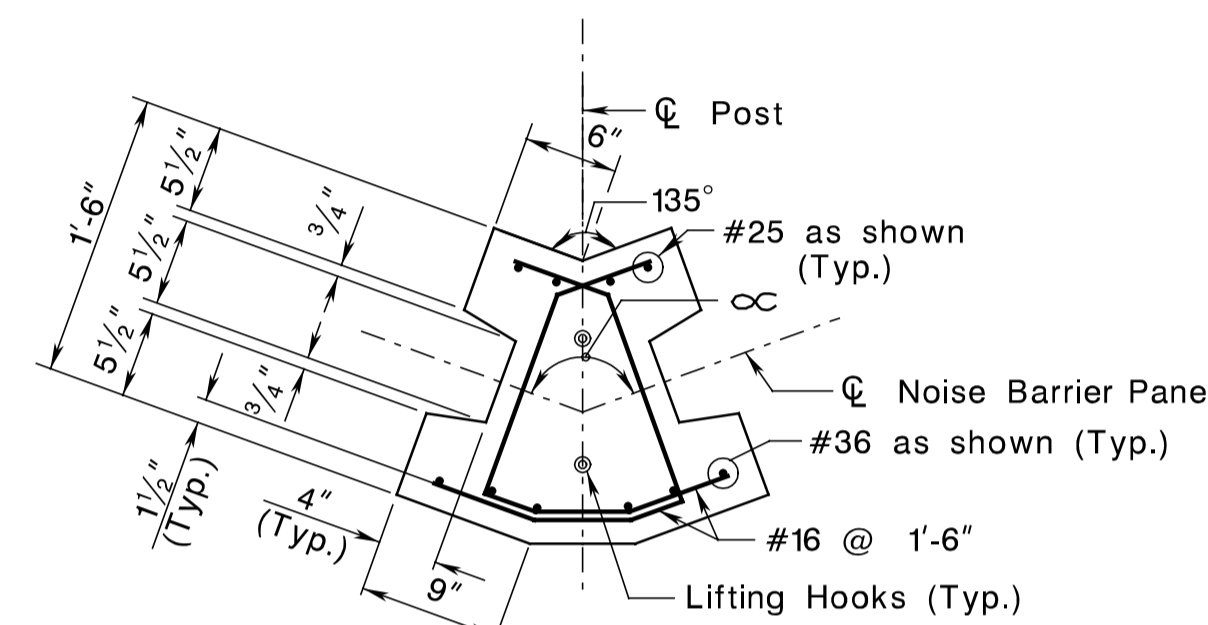
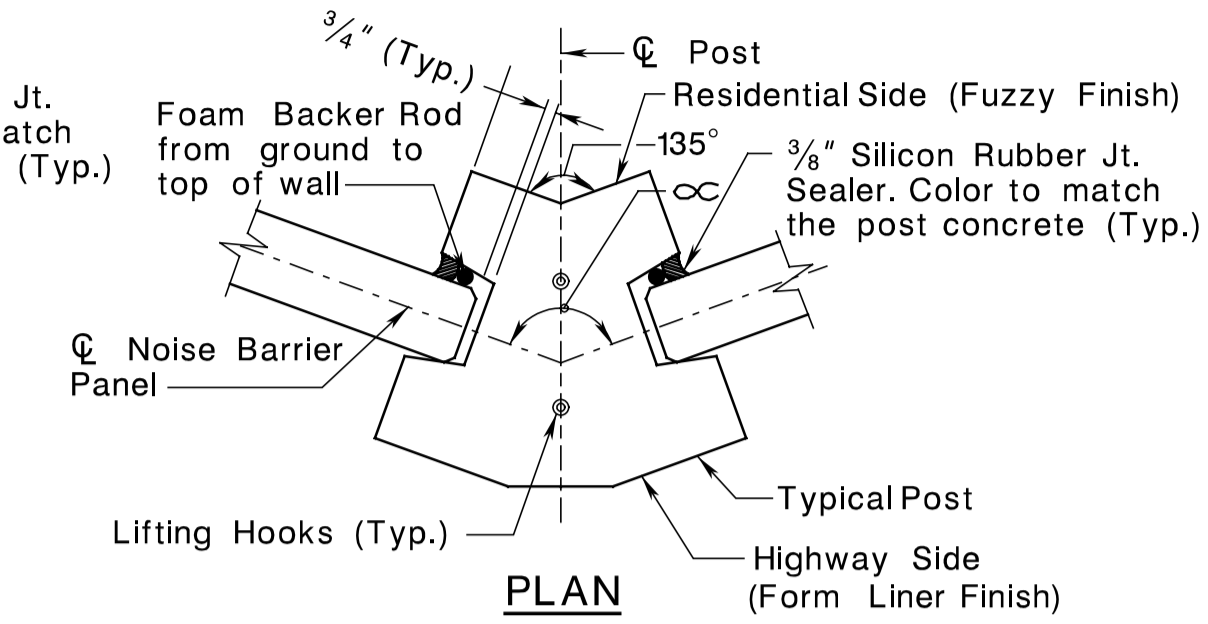
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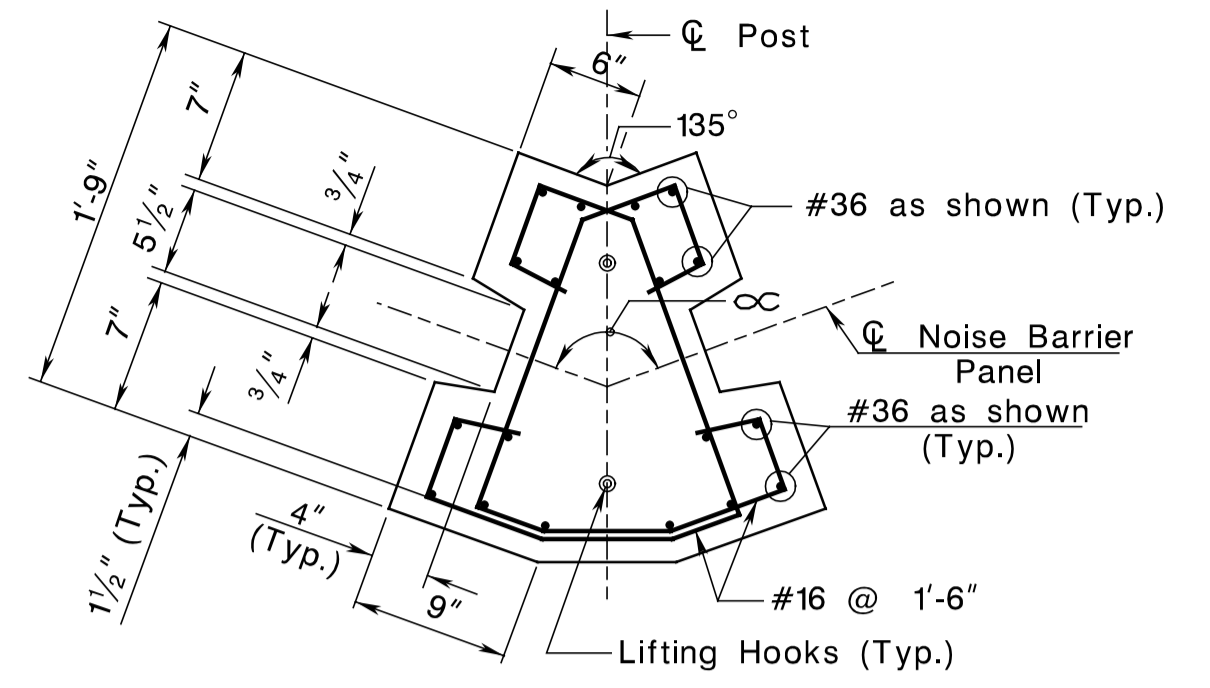
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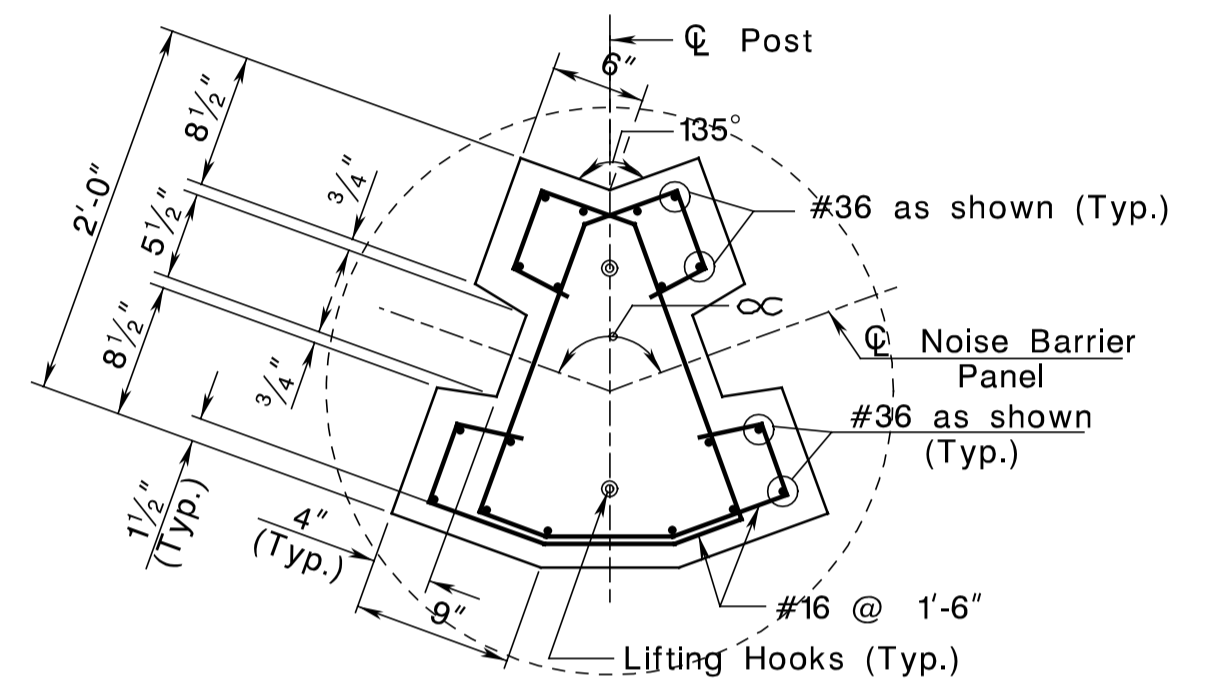
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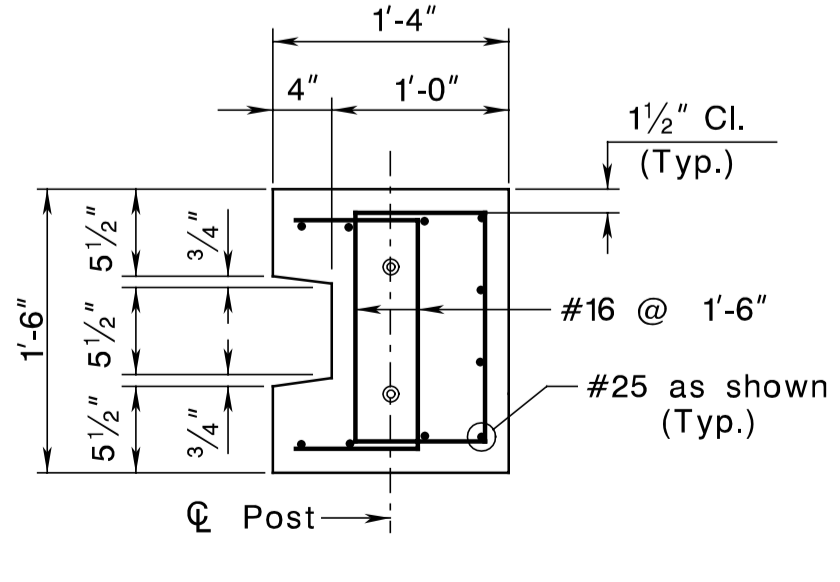
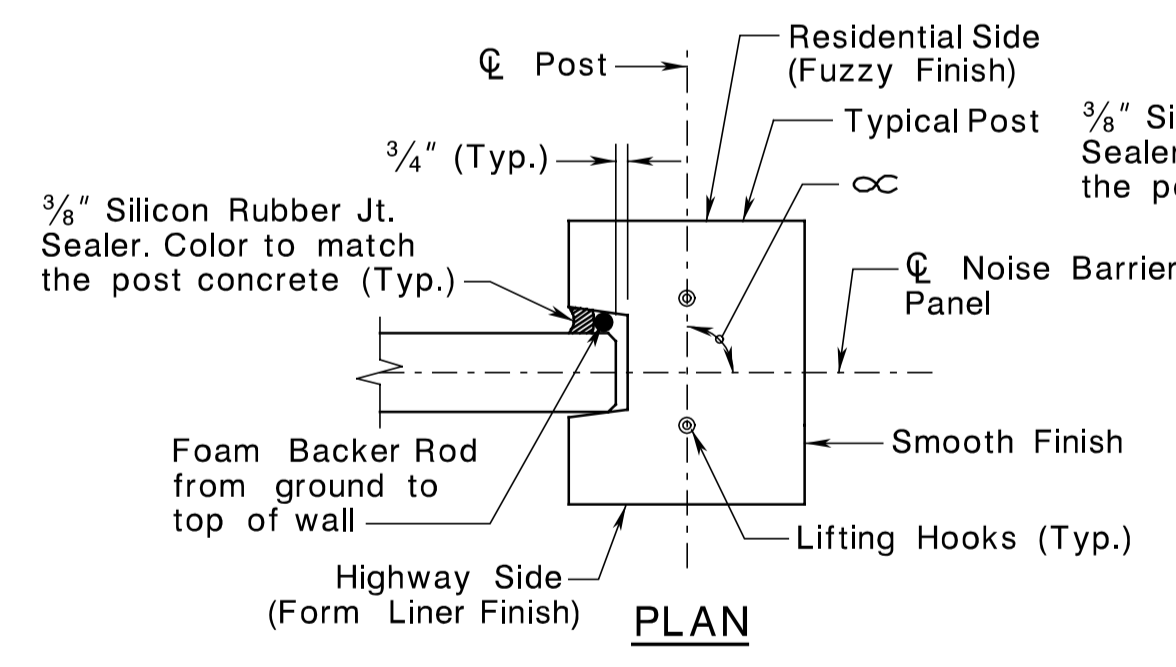
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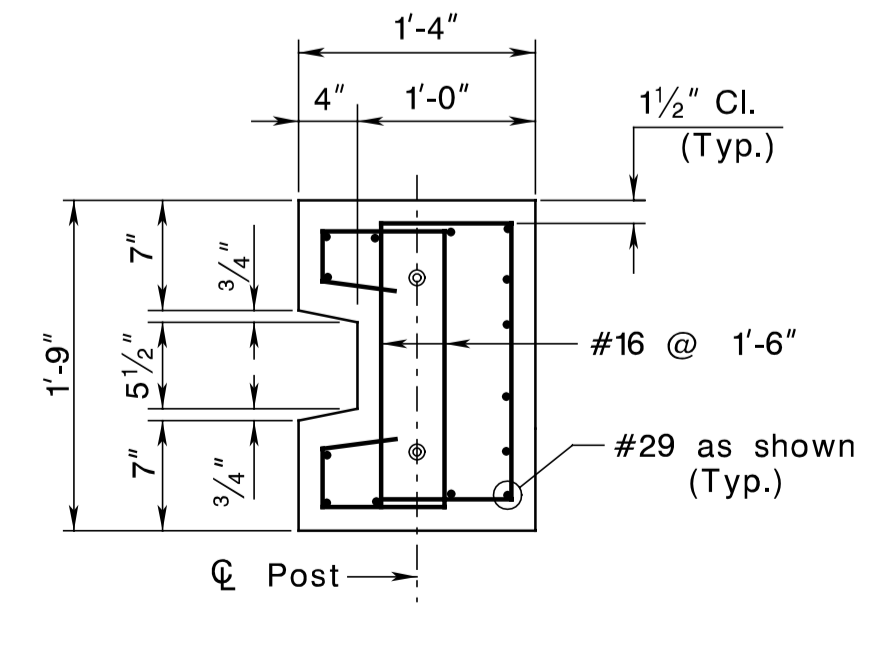
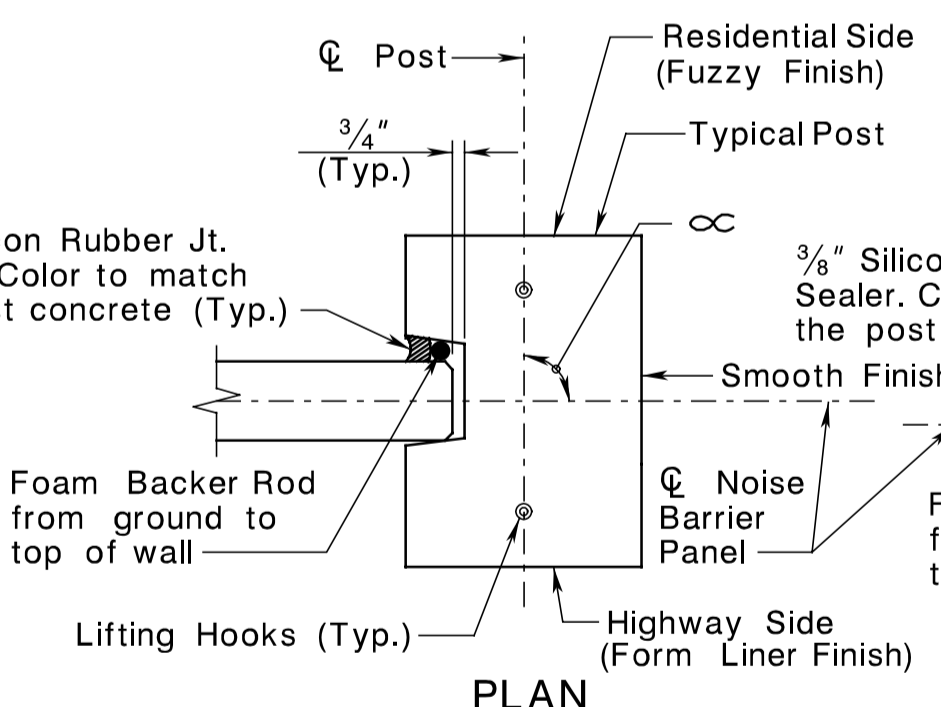
SECTION OF POST TYPE "KB"
 $16'-5" < POST HEIGHT \leq 21'-4"$ & $110^\circ < \infty < 160^\circ$



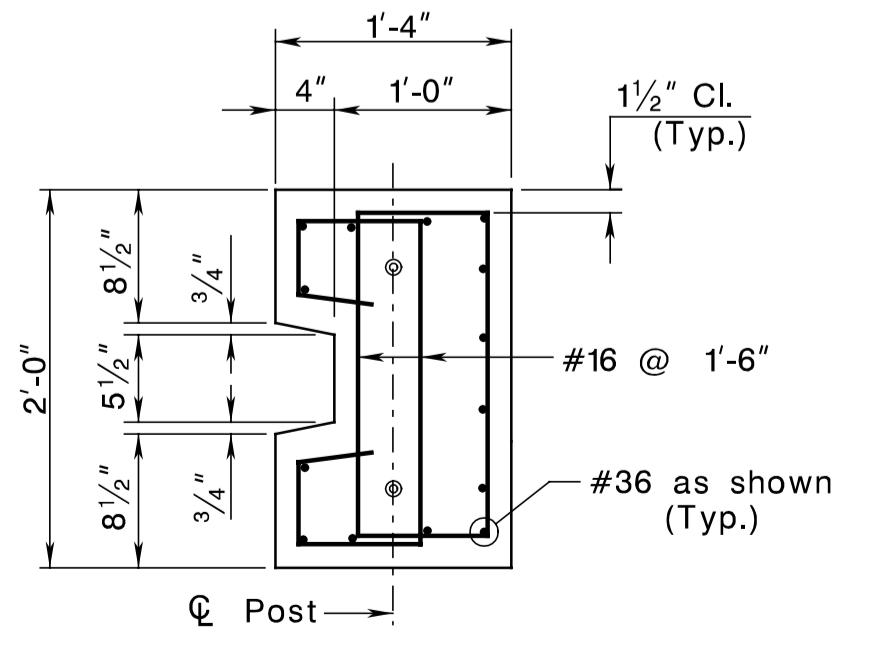
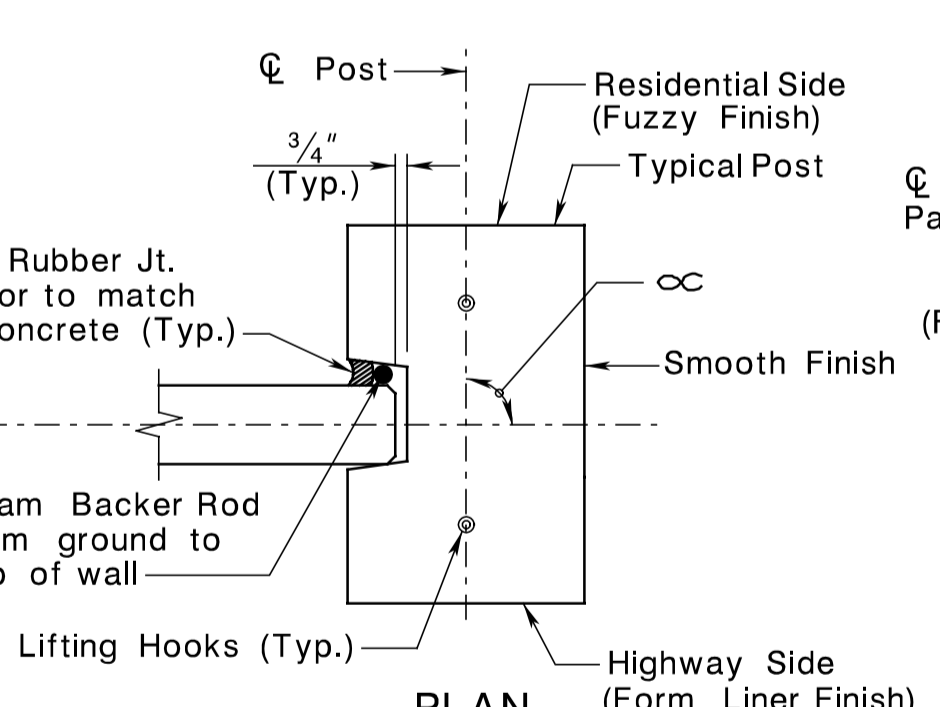
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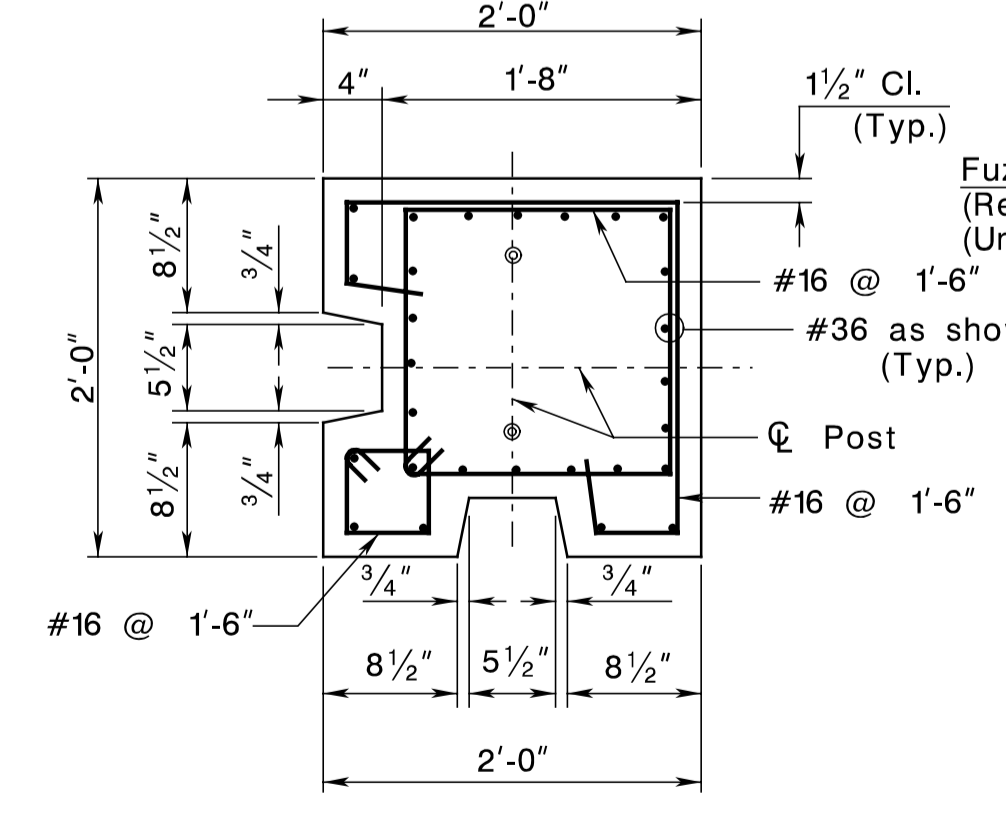
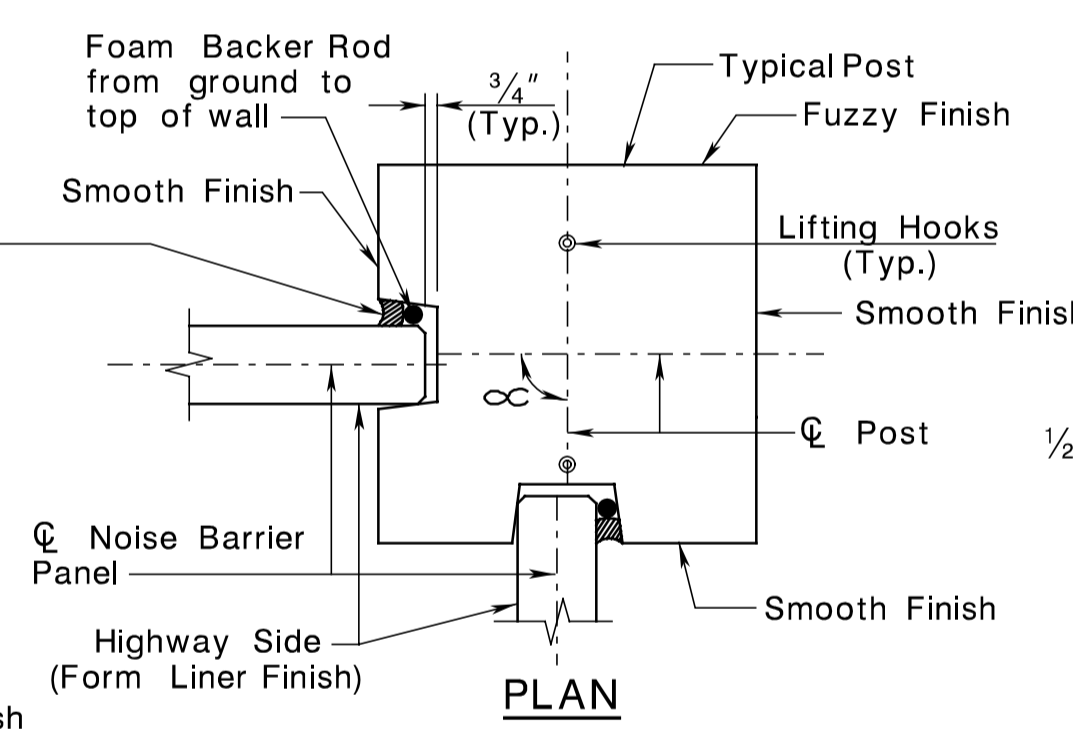
SECTION OF END POST TYPE "D"
 POST HEIGHT $\leq 16'-5"$ & $70^\circ \leq \infty \leq 110^\circ$



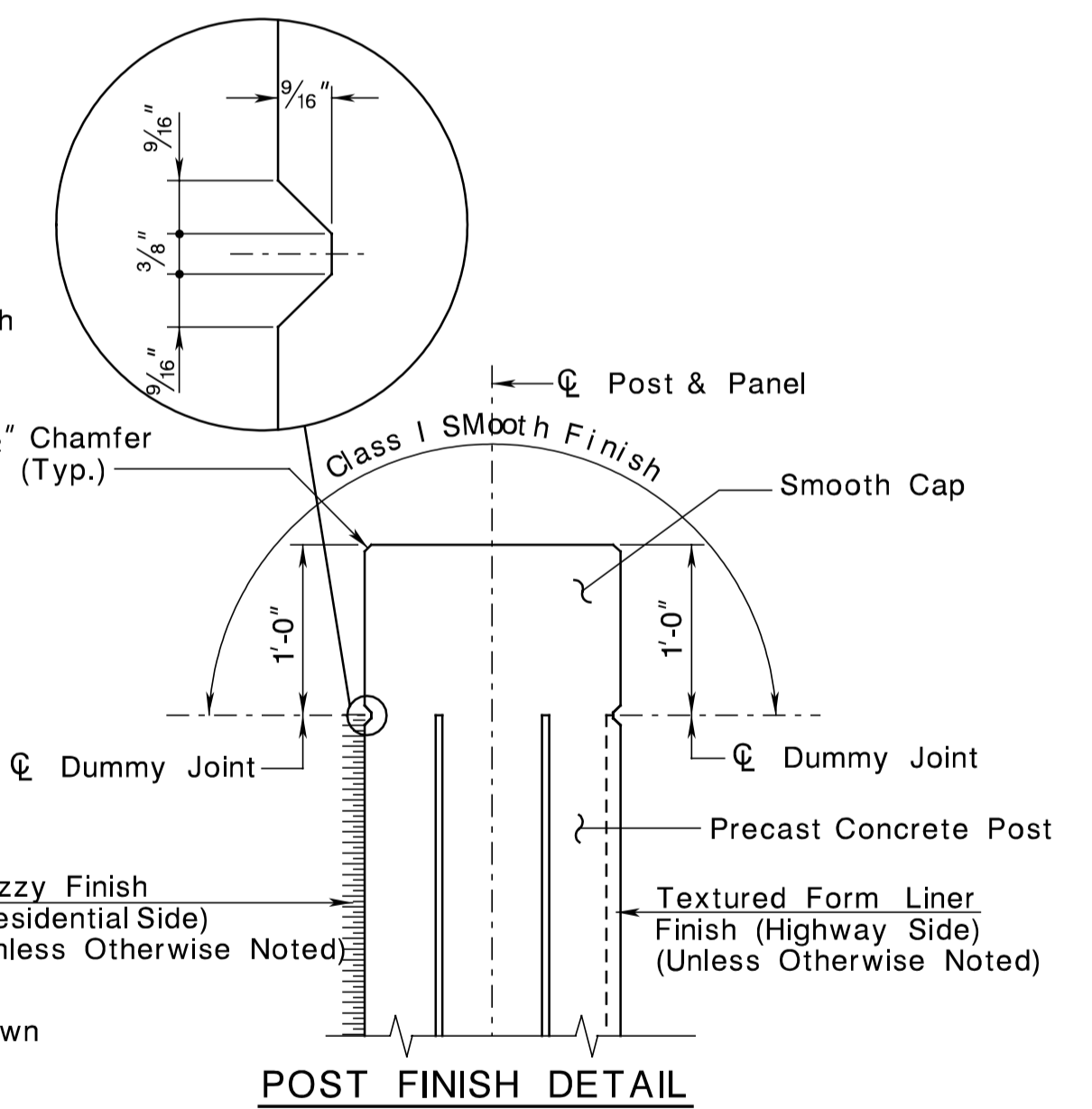
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 $16'-5" < POST HEIGHT \leq 21'-4"$ & $70^\circ \leq \infty \leq 110^\circ$



SECTION OF END POST TYPE "F"
 $21'-4" < POST HEIGHT \leq 26'-3"$ & $70^\circ \leq \infty \leq 110^\circ$



SECTION OF CORNER POST TYPE "LA"
 POST HEIGHT $\leq 26'-3"$ & $70^\circ \leq \infty \leq 110^\circ$



STANDARD DRAWING PLATE 2.8-2
 NEW JERSEY DEPARTMENT OF TRANSPORTATION
 BUREAU OF STRUCTURAL ENGINEERING

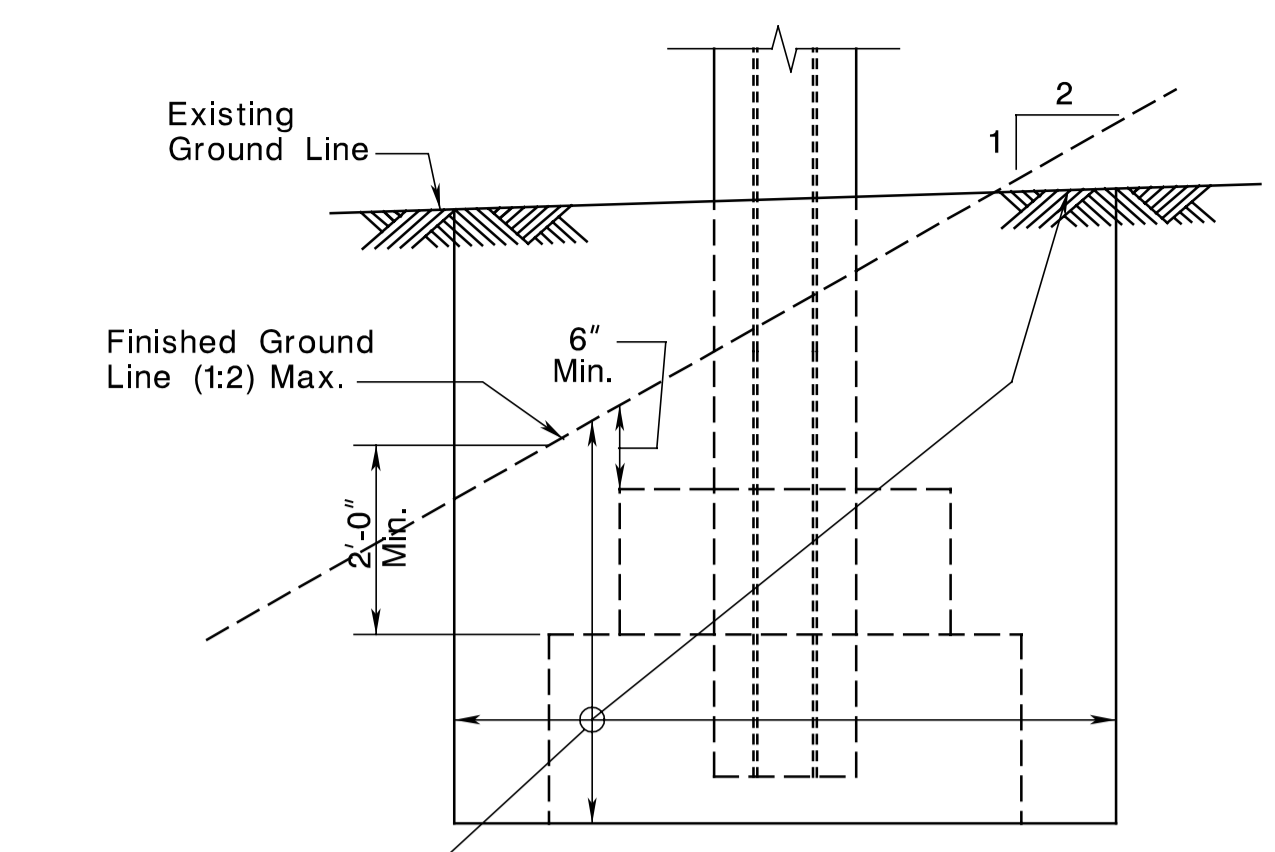
NOISE WALL BARRIERS
 PRECAST CONCRETE POST DETAILS

ROUTE _____ SECTION _____
 MUNICIPALITY _____ COUNTY _____

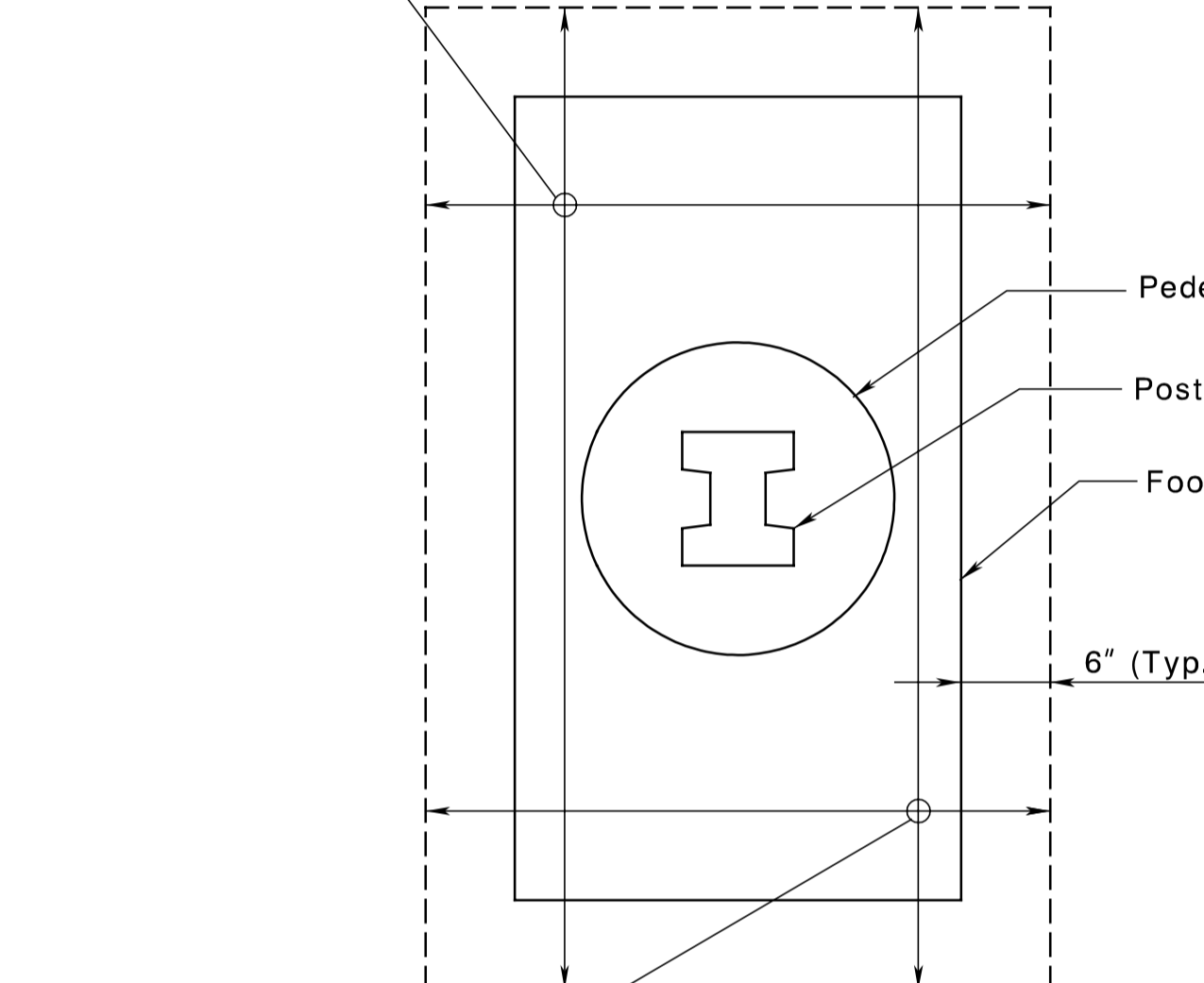
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DES. BY	CHK. BY		
DWN. BY	CHK. BY		
EST. BY	CHK. BY		
SPECS. BY			
IN CHARGE OF _____			

REVISION	BY	CKD	DATE

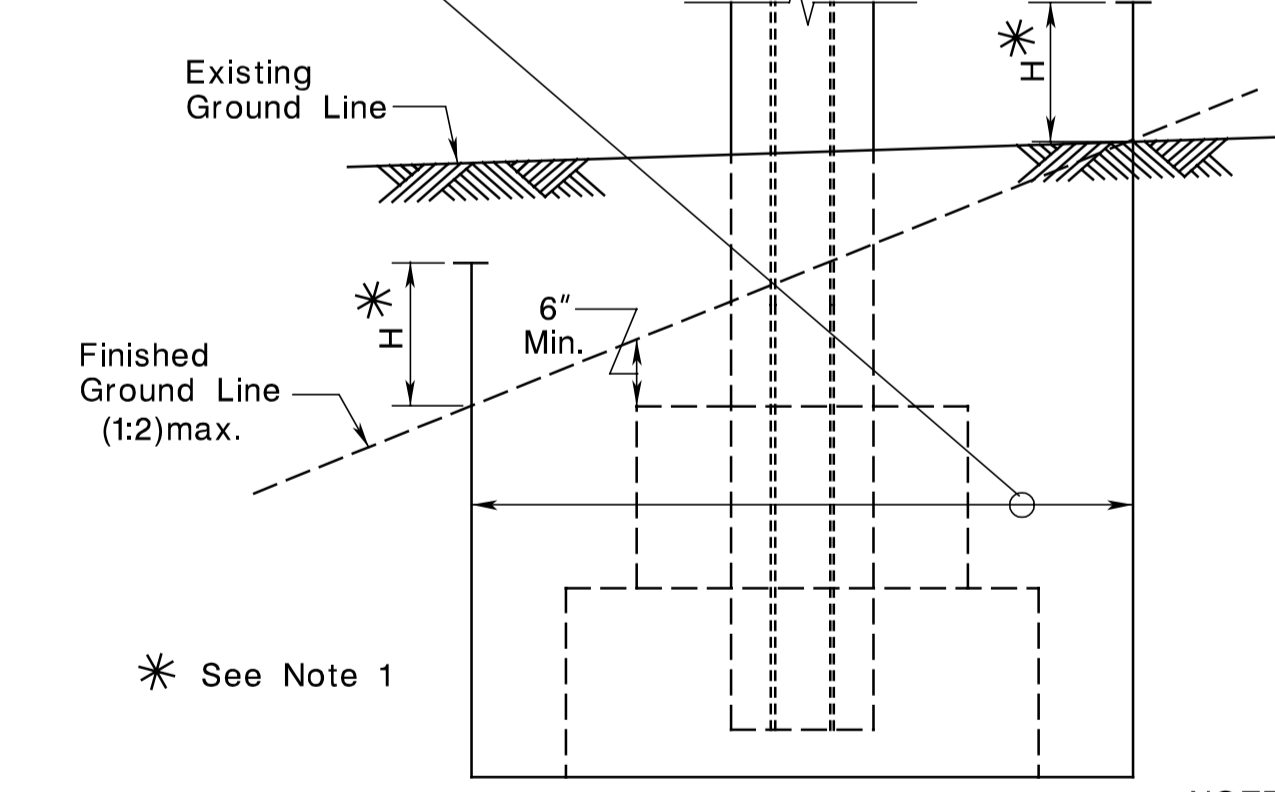
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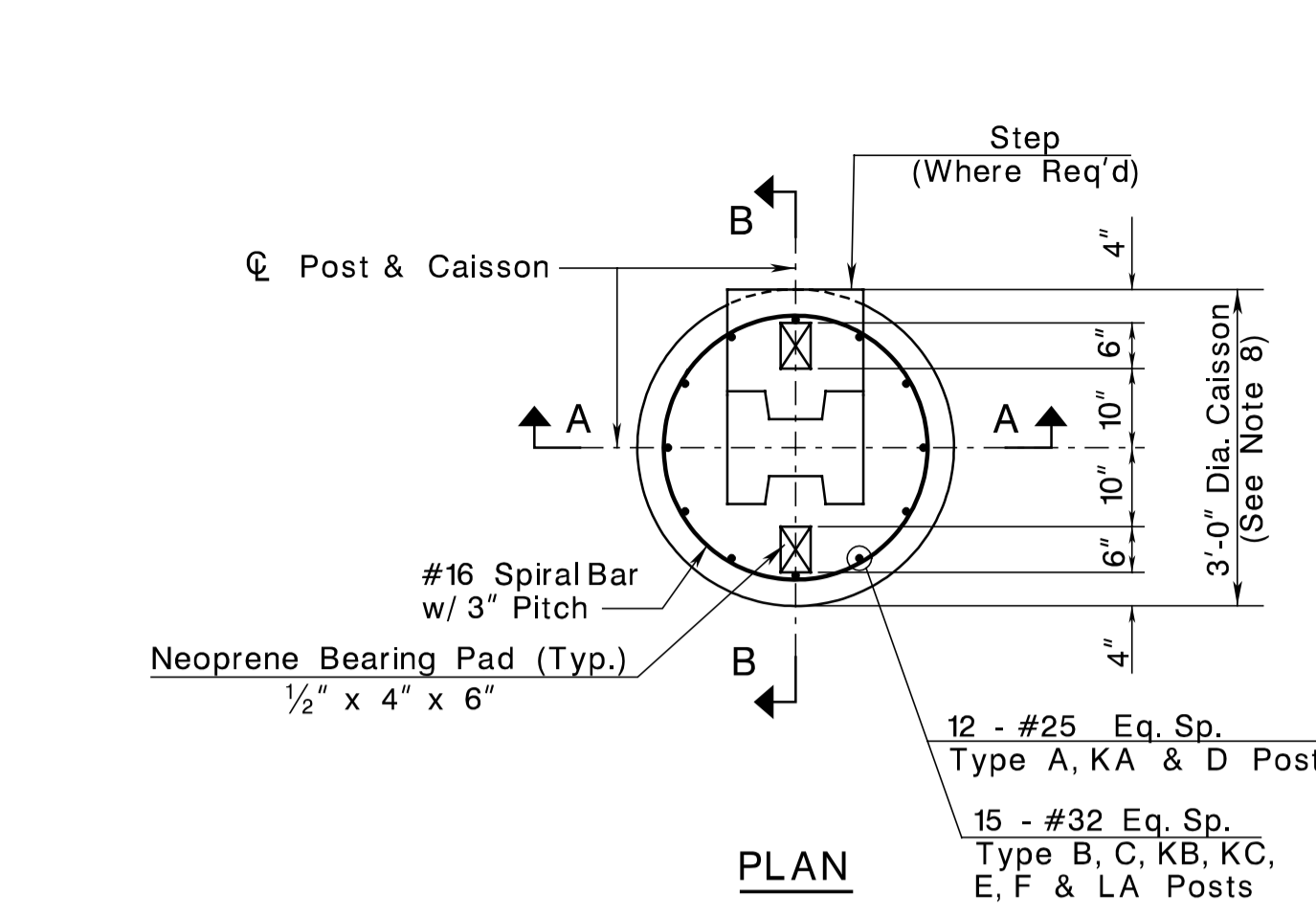
FOUNDATION EXCAVATION ELEVATION



FOUNDATION EXCAVATION PLAN

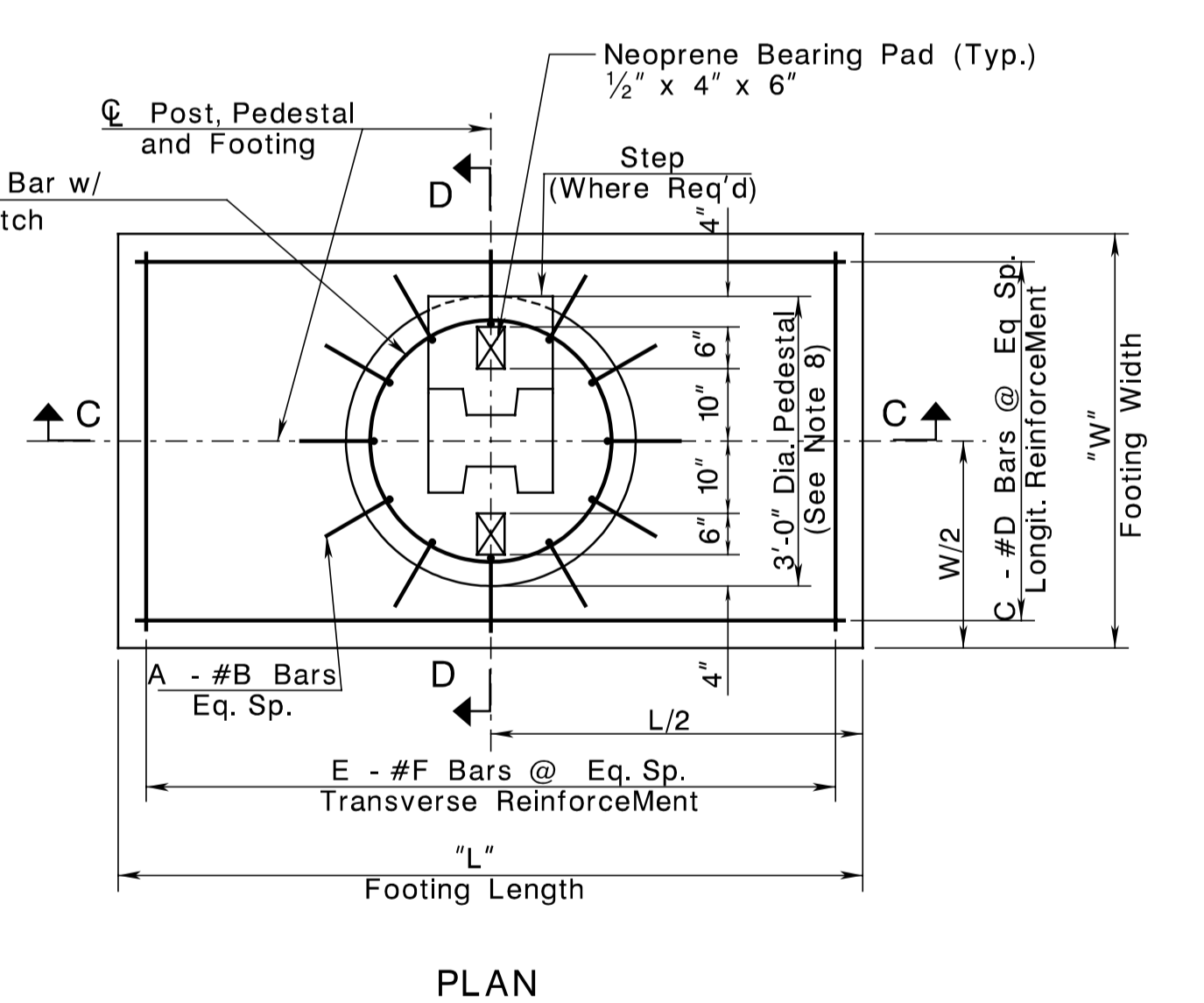


TEMPORARY SHEETING ELEVATION



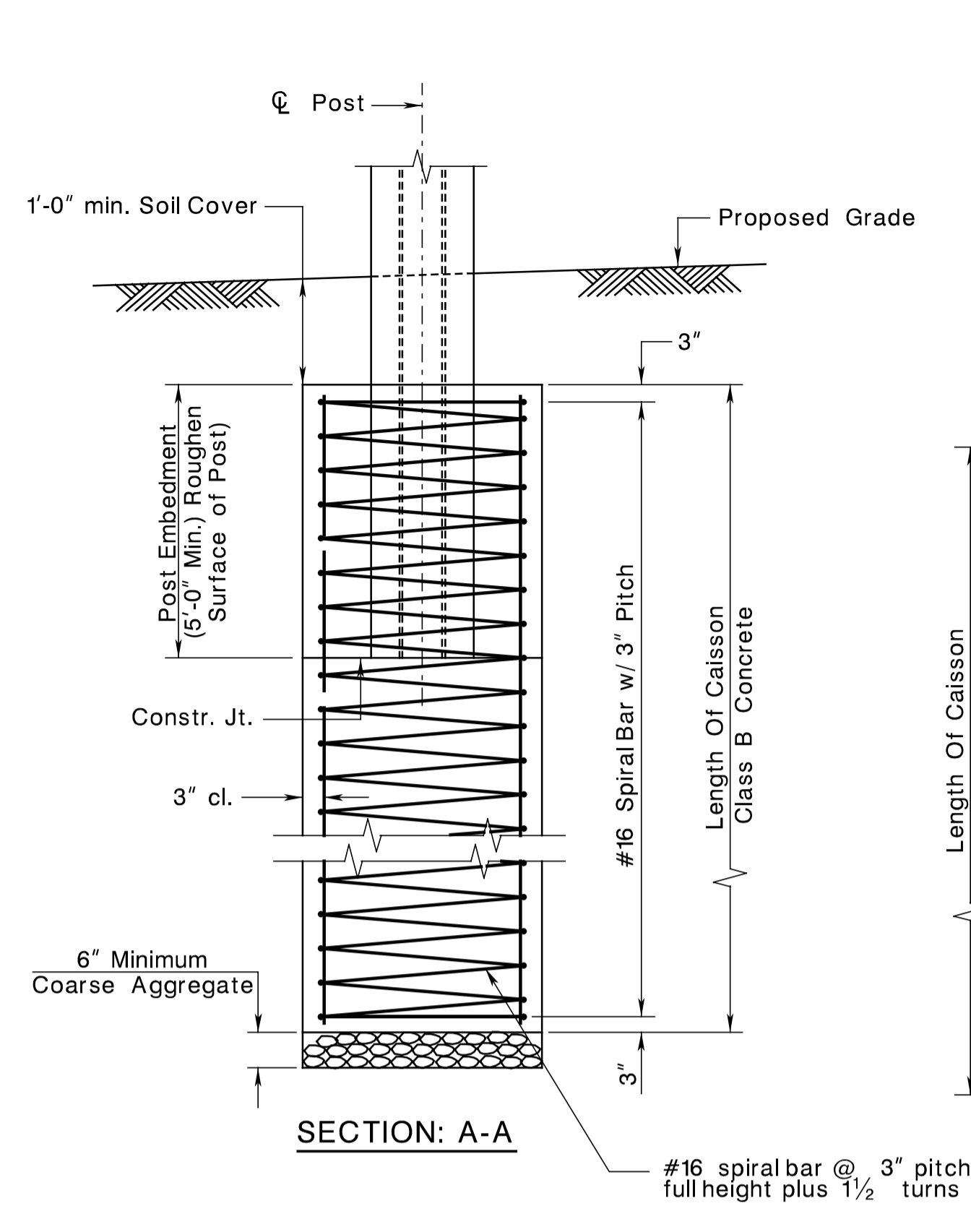
SPREAD FOOTING PLAN

FOUND. TYPE	BAR SCHEDULE						DIMENSION SCHEDULE			
	NO. OF BARS "A"	BAR SIZE "B"	NO. OF BARS "C"	BAR SIZE "D"	NO. OF BARS "E"	BAR SIZE "F"	WIDTH "W"	LENGTH "L"	THICK. "T"	HEIGHT "H"
I										
II										
III										
IV										
V										
VI										
VII										
VIII										
IX										
X										

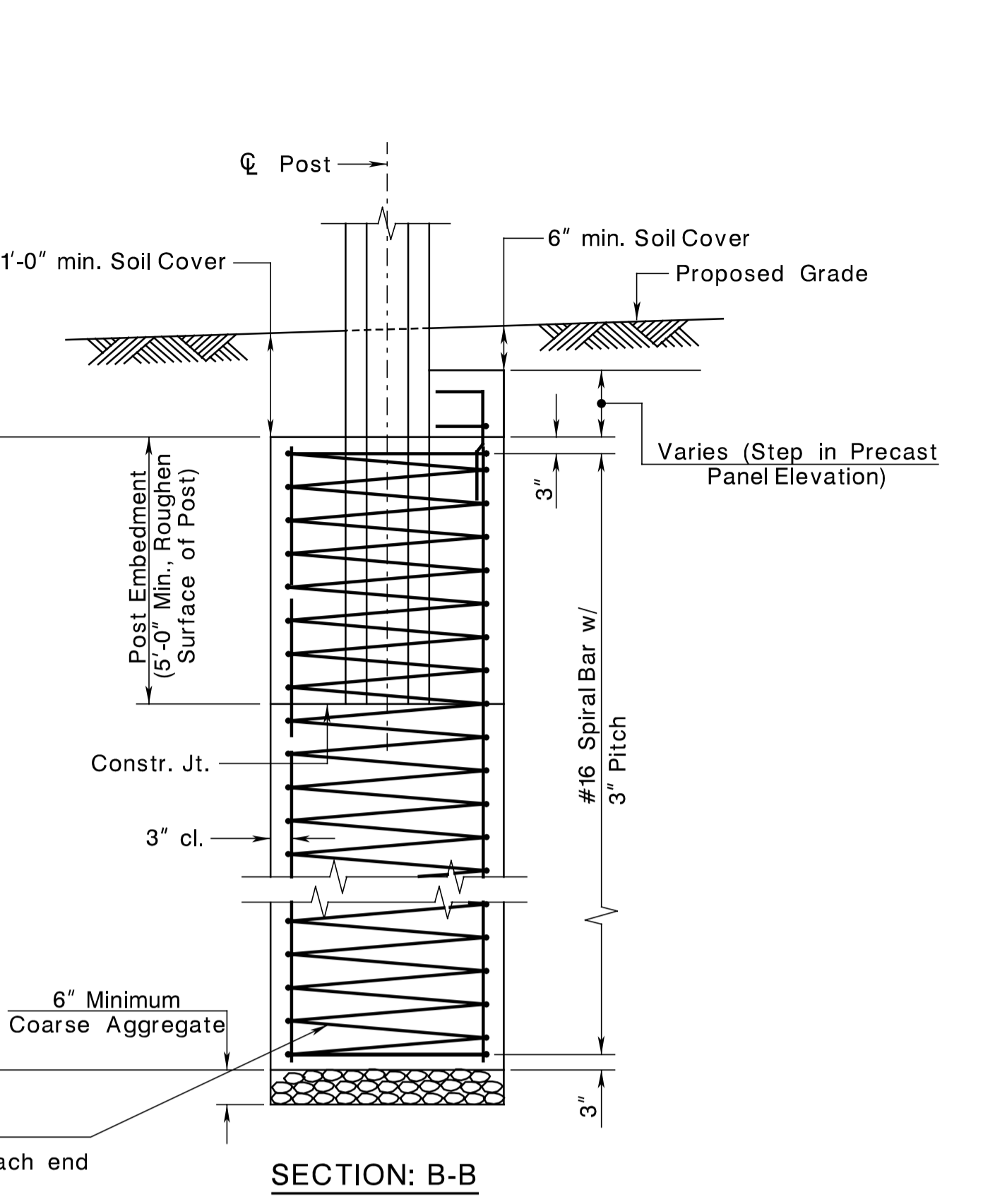


SPREAD FOOTING PLAN (Detailed)

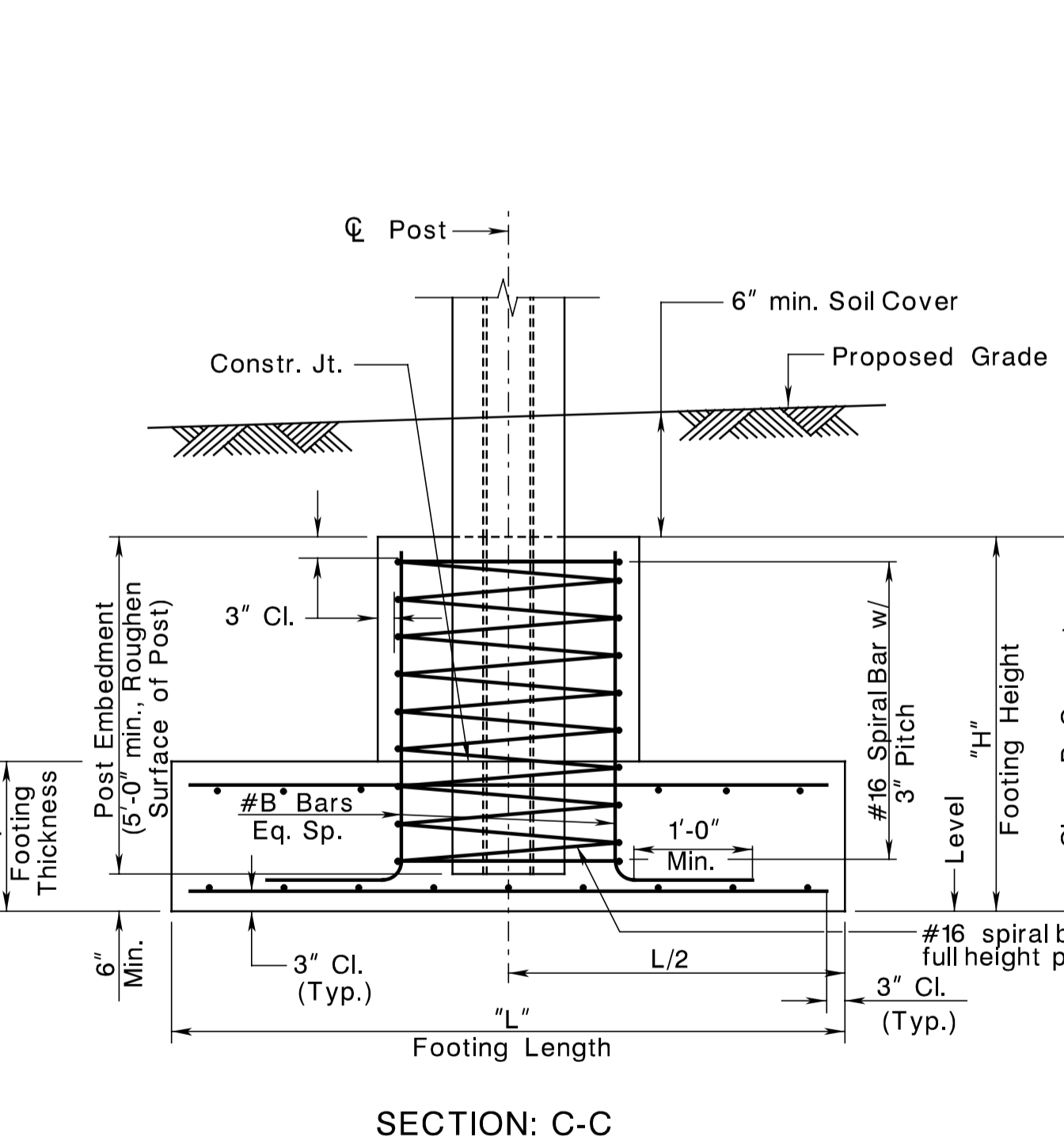
- NOTES:**
- When temporary sheeting is required, H is 3'-0" when adjacent to pedestrian or vehicular traffic and 1'-0" minimum for all others.
 - If temporary sheeting is left in place, the upper portion shall be removed to 3'-0" minimum below finished ground.
 - Payment for temporary sheeting's upper limit shall be from the finished grade if grading is required and from the existing ground line if grading is not required and lower limit shall be bottom of excavation.
 - Caisson or spread footing is paid for under the item "NOISE BARRIER, FOUNDATION".
 - Coarse aggregate is paid for under the item, "NOISE BARRIER, FOUNDATION".
 - Size of the spread footing, reinforcement and depth of post embedment and length of caisson shall be designed by the designer on a project by project basis as determined the height of the wall and soil conditions.
 - "Foundation Excavation" is paid for under the item, "NOISE BARRIER, FOUNDATION".
 - "Sheeting Left in Place" is paid for under the item, "NOISE BARRIER, FOUNDATION".
 - Increase diameter to accommodate Type 'KC' and larger size posts.



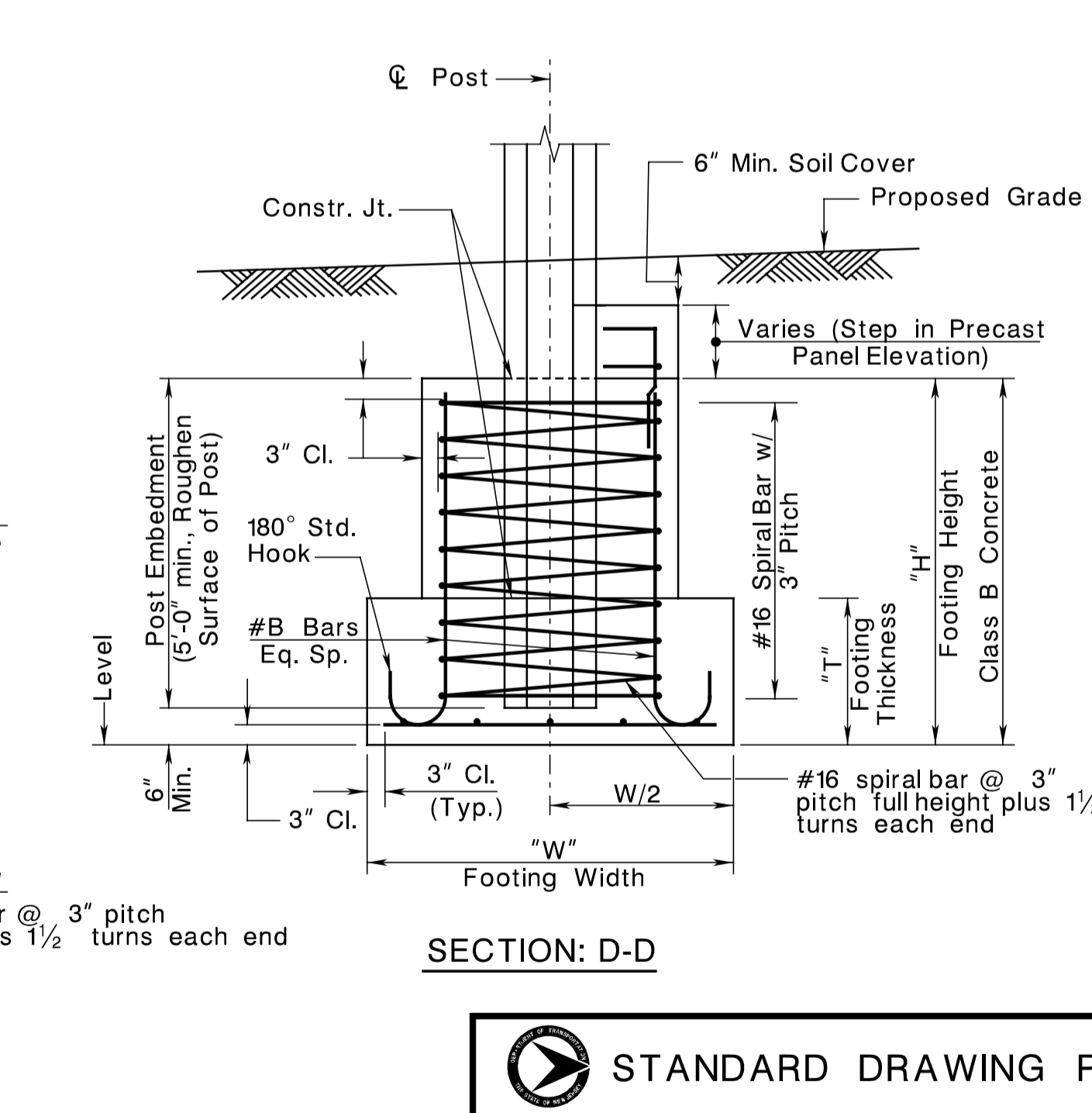
TYPICAL CAISSON DETAILS SECTION: A-A



TYPICAL CAISSON DETAILS SECTION: B-B



TYPICAL SPREAD FOOTING DETAILS SECTION: C-C



TYPICAL SPREAD FOOTING DETAILS SECTION: D-D

CONTROL SECTION		JOB NO.	
DES. BY	CHK. BY		
DWN. BY	CHK. BY		
EST. BY	CHK. BY		
SPECS. BY	CHK. BY		
IN CHARGE OF _____			

REVISION	BY	CKD	DATE

STANDARD DRAWING PLATE 2.8-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

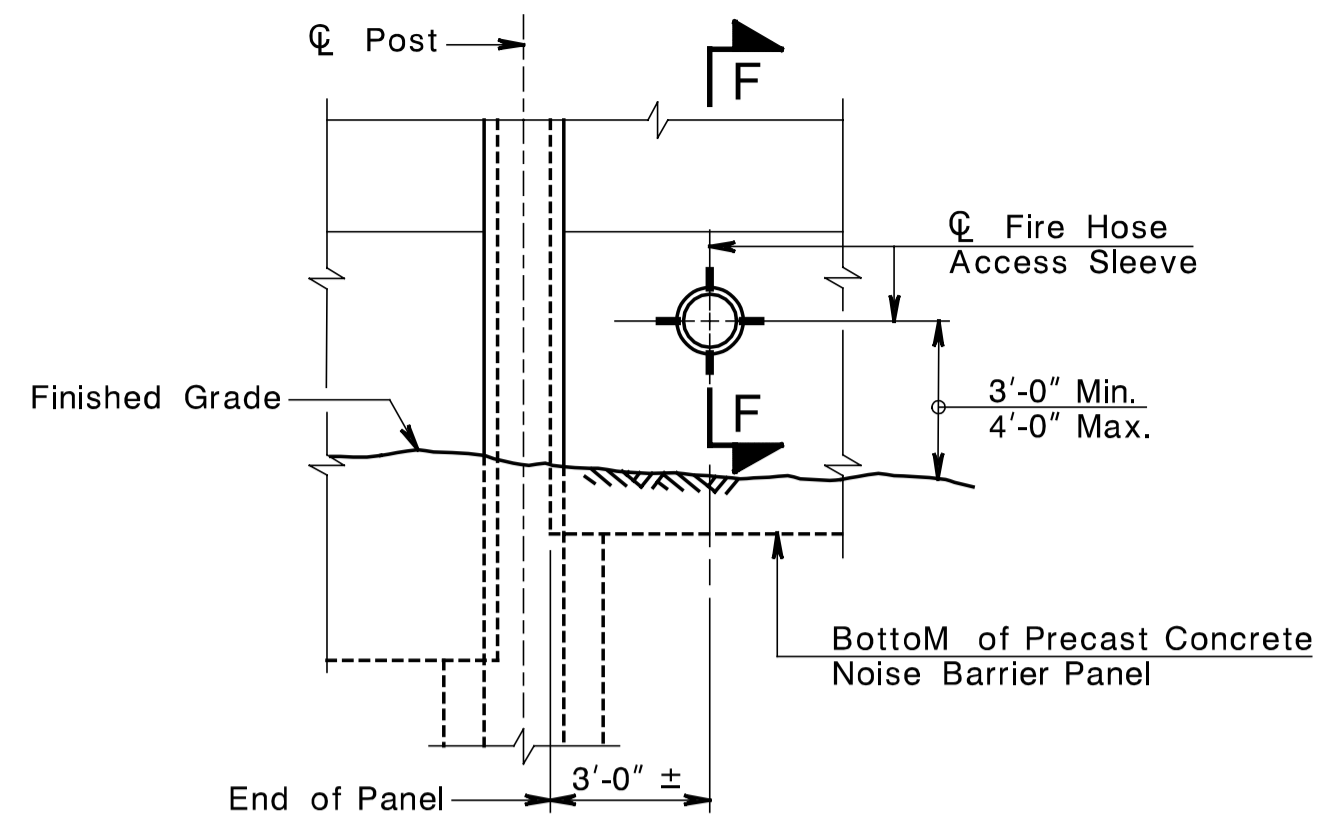
**NOISE WALL BARRIERS
FOUNDATION DETAILS**

ROUTE _____ SECTION _____

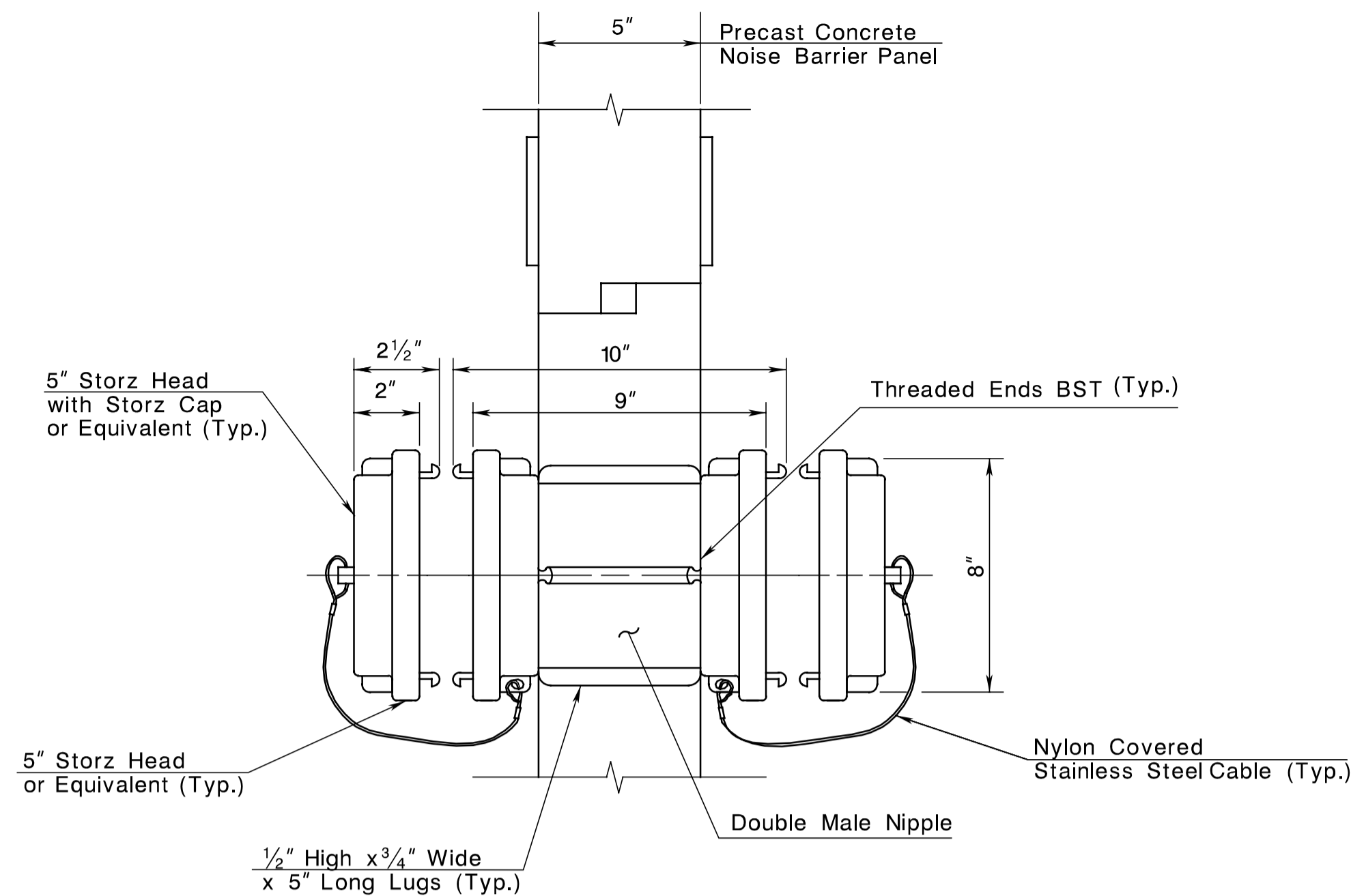
MUNICIPALITY _____ COUNTY _____

SHEET NO. _____ OF _____

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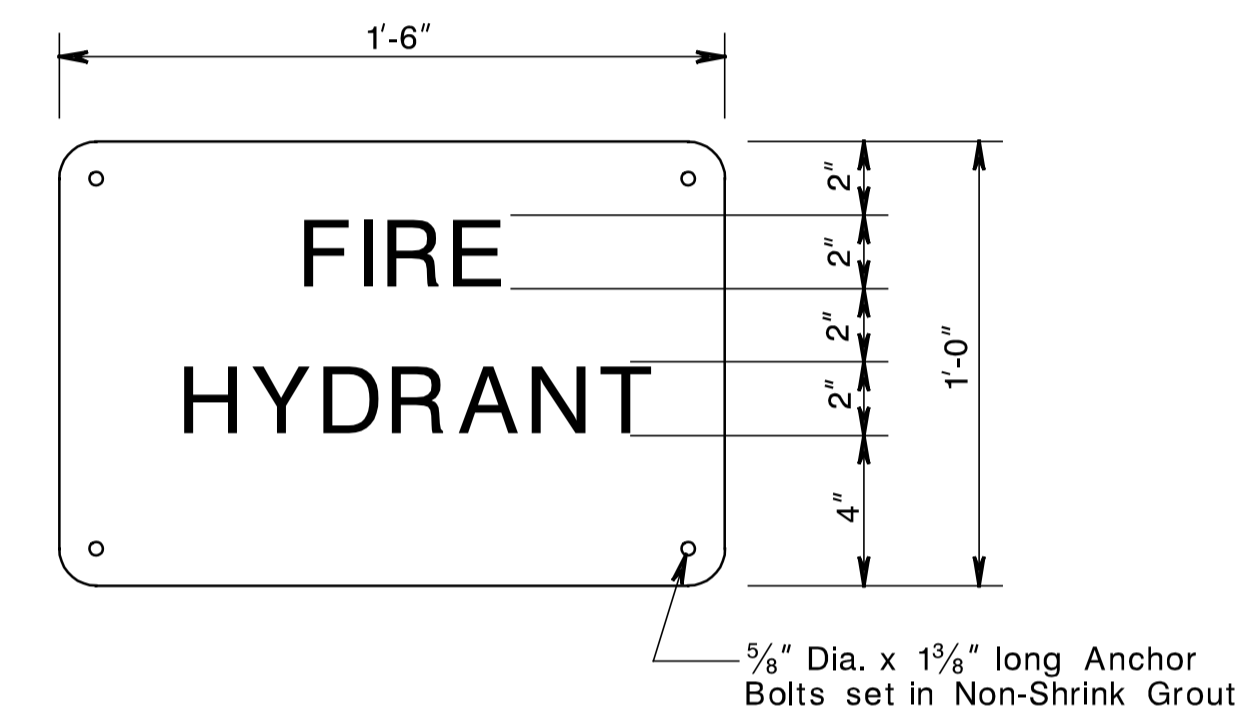
FIRE HOSE ACCESS SLEEVE ELEVATION



SECTION: F-F

NOTES:

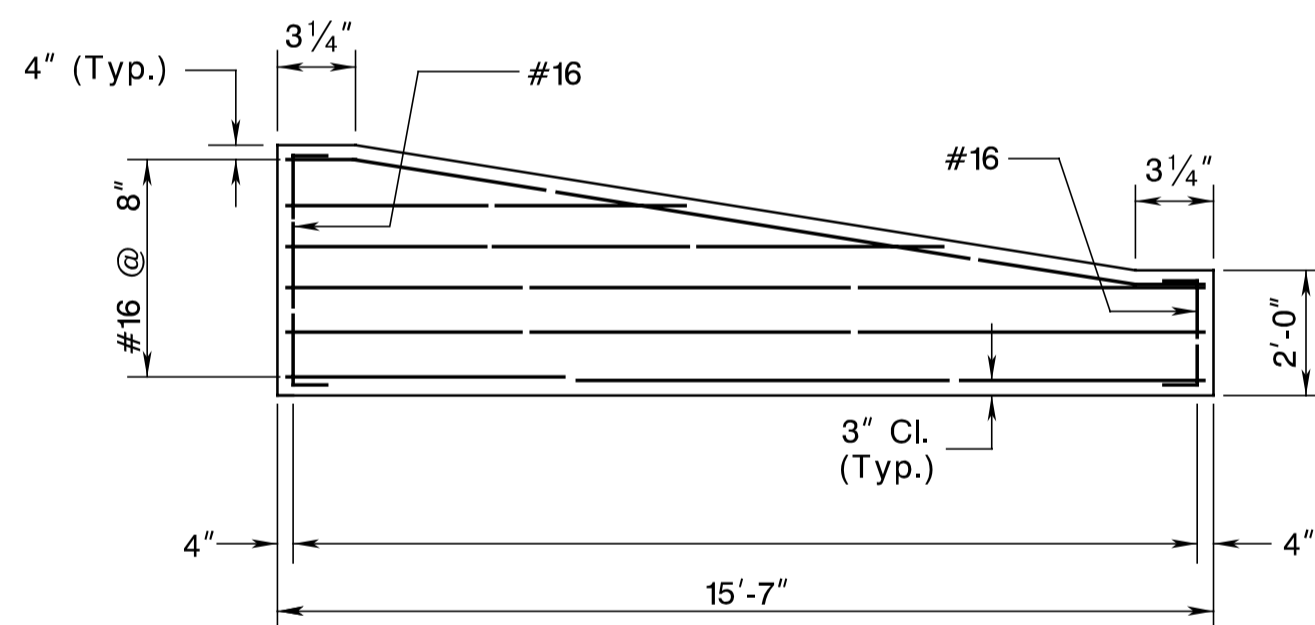
1. Fire Hose Access Sleeves must be free of burrs, and sharp corners and edges.
2. Fire Hose Access Sleeves shall be Aluminum Alloy and conform to A.S.T.M. Alloy 6061-T6. Finish shall be Hard Coat per MIL-H-8625.
3. Locations of Fire Hose Access Sleeves are indicated on Structural Plans. Cost shall be included in cost of Noise Barrier, Roadway.
4. The cost of Signs and their placement shall be included in the cost of "Noise Barrier, Roadway."
5. Location could change at discretion of the Engineer.
6. Reinforcing bars in affected panels shall be positioned so as to provide a clear opening for fire hose access sleeves.



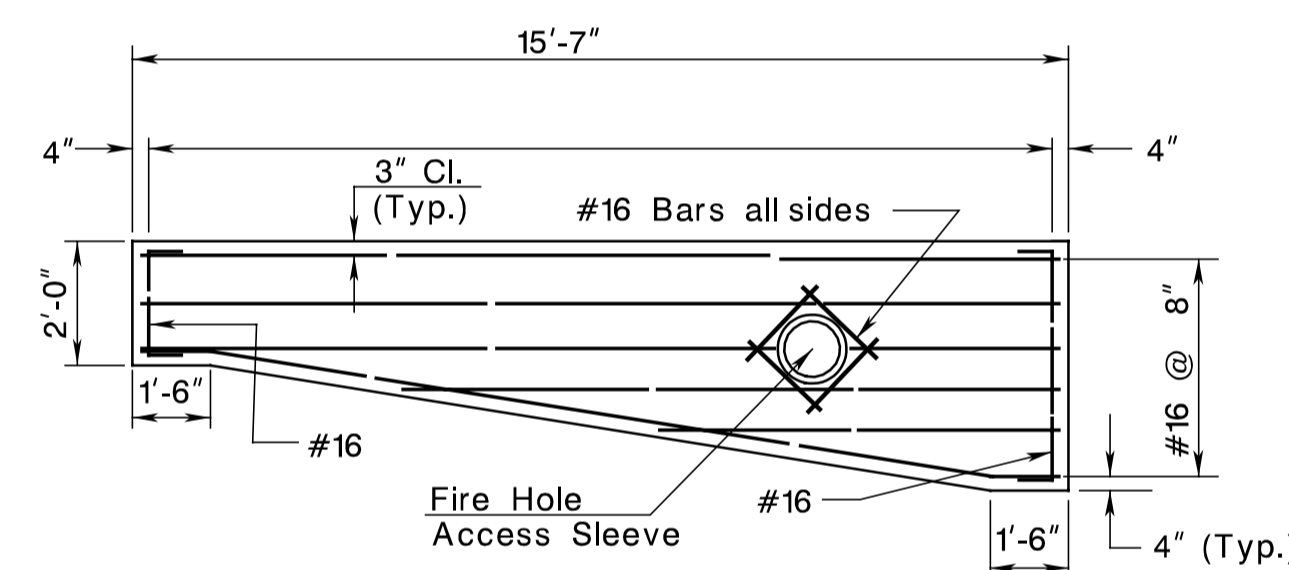
FIRE HYDRANT SIGN

INSTALLATION OF SIGNS BY FIRE DEPARTMENTS ON THE INTERSTATE SYSTEM

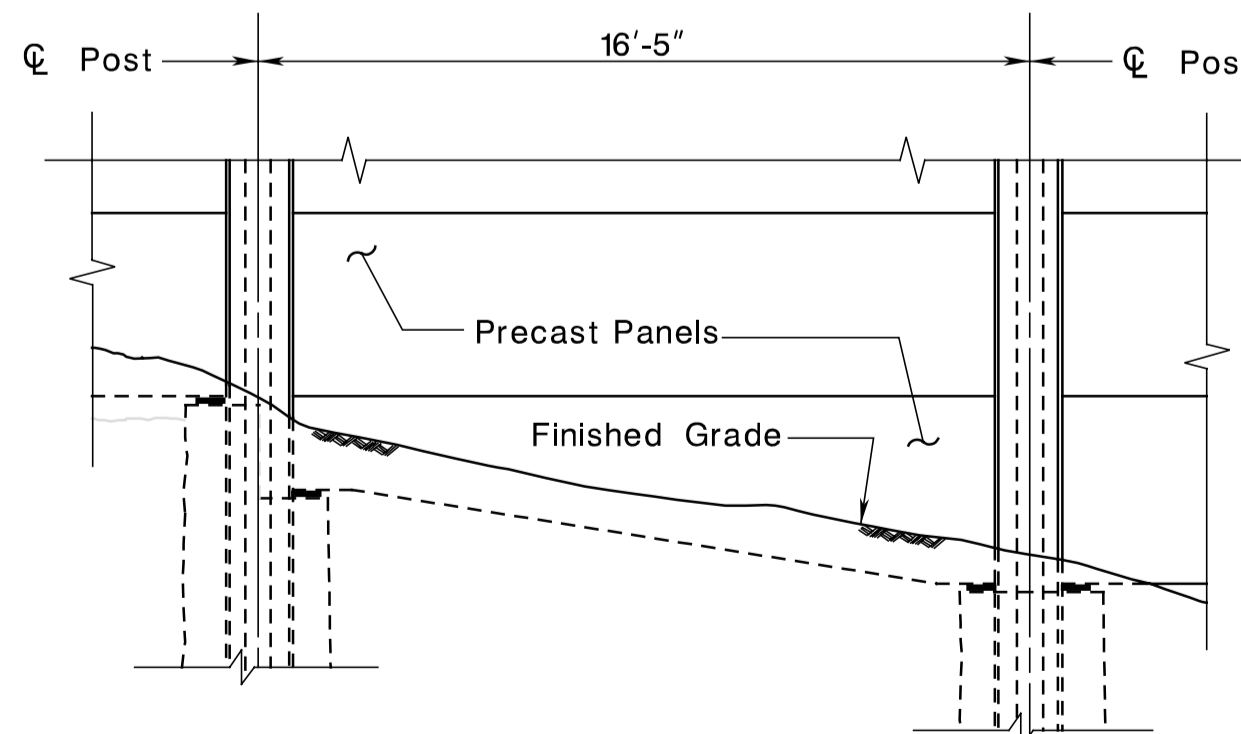
1. The signs shall be installed as far from the travelled lanes as possible, still being visible to the firemen looking for them.
2. Signs should be affixed to existing chain link fencing.
3. Where fencing does not exist or where it is not visible from the travelled way, the signs shall be installed on standard sign supports as far from the travelled way as possible but so that they can be seen by the firemen.
4. The signs shall be installed parallel to traffic flow so that they will not be directly visible to the motoring public.
5. The standard signs shall be 1'-0" x 1'-6".
6. The signs shall have a white reflectorized background with red letters and/or figures.
7. The message on the sign may either be code numbers or letters or the symbol of a fire hydrant.



TYPICAL SLOPED PANEL ELEVATION (TOP PANEL ONLY)



TYPICAL CLIPPED PANEL ELEVATION (BOTTOM PANEL ONLY, 5" or 9" THICKNESS)



NOISE BARRIER - CLIPPED PANEL

Cost to be included in Item, "Noise Barrier, Roadway"

CONTROL SECTION		JOB NO.	
DES. BY		CHK. BY	
DWN. BY		CHK. BY	
EST. BY		CHK. BY	
SPECS. BY			
IN CHARGE OF _____			

REVISION	BY	CKD	DATE

STANDARD DRAWING PLATE 2.8-4	
NEW JERSEY DEPARTMENT OF TRANSPORTATION BUREAU OF STRUCTURAL ENGINEERING	
NOISE WALL BARRIERS PRECAST CONCRETE PANEL DETAILS	
ROUTE	SECTION
MUNICIPALITY	COUNTY
SHEET NO. ____ OF ____	

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STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			

INTEGRAL ABUTMENT CONSTRUCTION PROCEDURE

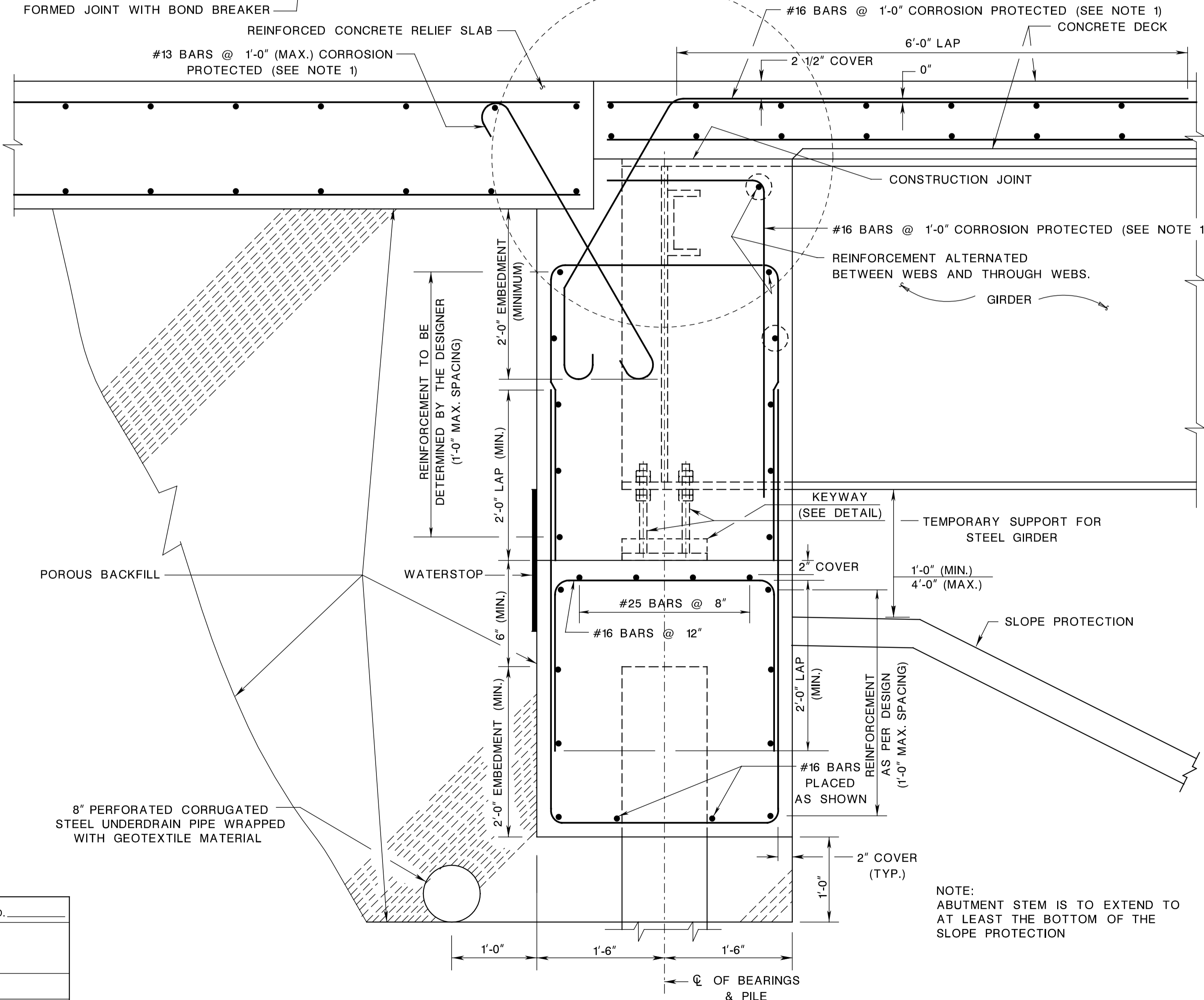
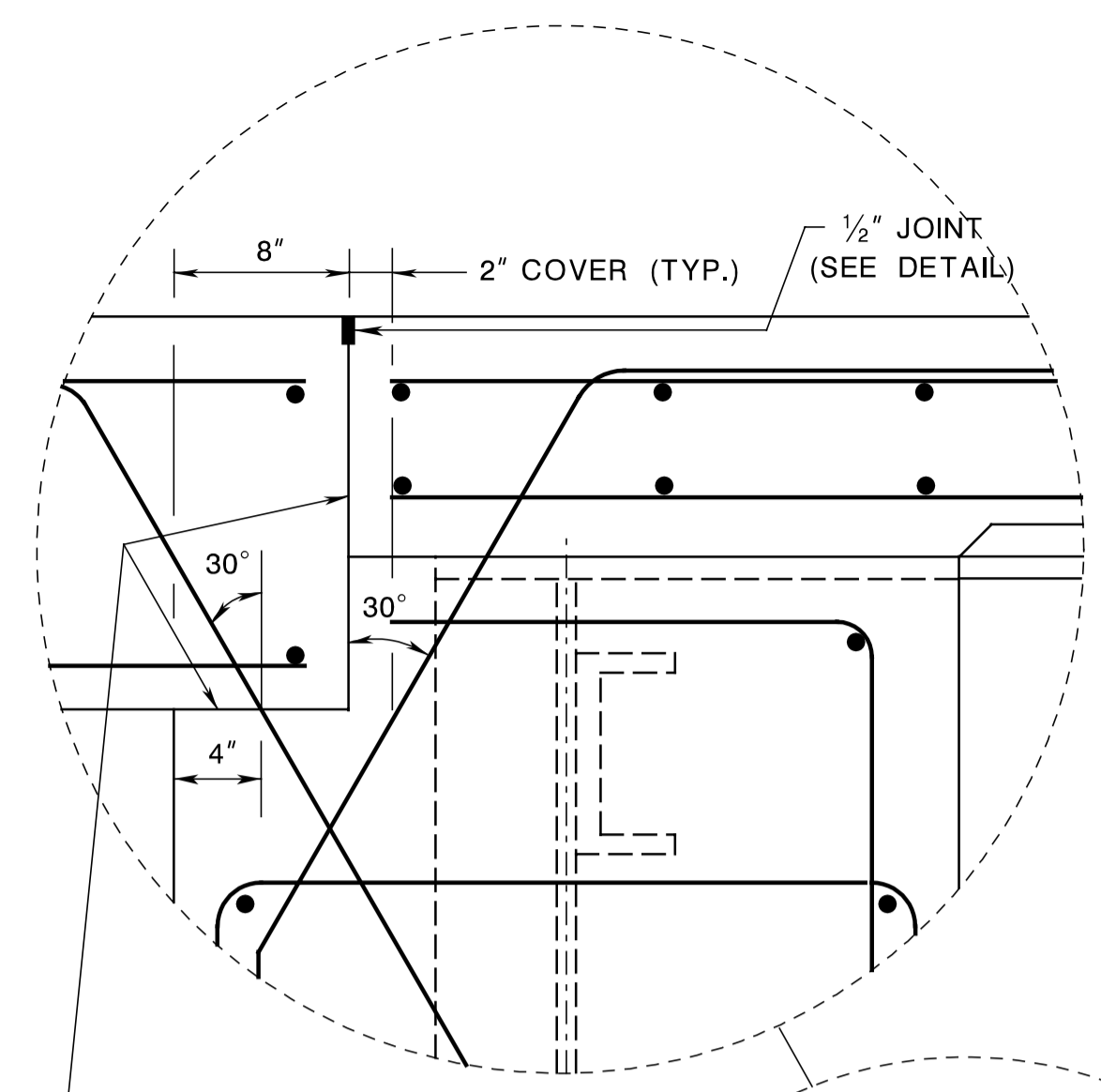
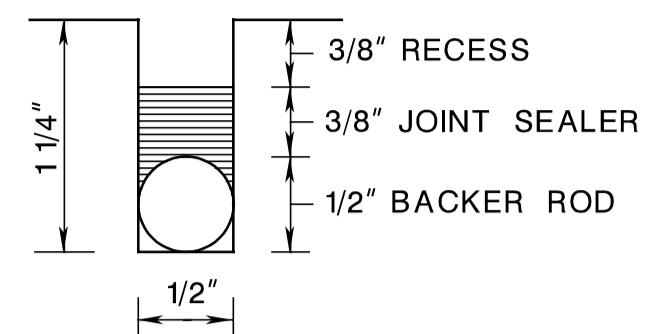
- FOR BRIDGE LENGTHS OVER 100 FT. PRE-EXCAVATE HOLES TO A DEPTH OF 8 FT. BELOW THE STEM AT THE DIAMETER SPECIFIED IN THE FOUNDATION DESIGN REPORT.
- DRIVE THE PILES AND CUT OFF PILES AT ELEVATIONS SHOWN.
- BACKFILL HOLES WITH DESIGNATION I-8 SAND. IF CIP PILES ARE USED, FILL THE SHELL WITH CONCRETE.
- PLACE THE ABUTMENT STEM CONCRETE TO REQUIRED BRIDGE SEAT ELEVATION.
- BACKFILL ABUTMENT STEM TO 6" BELOW THE BRIDGE SEAT ELEVATION AFTER THE ABUTMENT STEM IS CURED.
- ERECT GIRDERS AND INSTALL ALL DIAPHRAGMS.
- PLACE ABUTMENT STEM CONCRETE TO TOP OF GIRDERS.
- BACKFILL ABUTMENT BACKWALLS AFTER THE CONCRETE IS CURED.
- AFTER THE ABUTMENT CONCRETE IS CURED, POUR DECK IN PROPER SEQUENCE EXCLUDING THE BACKWALL DIAPHRAGM AND A PORTION OF THE DECK SLAB THAT IS EQUAL TO THE BACKWALL DIAPHRAGM WIDTH.
- TIGHTEN THE ANCHOR NUTS AND POUR THE BACKWALL/DIAPHRAGM FULL HEIGHT AND THE REMAINDER OF THE DECK SLAB. THE WINGWALLS MAY ALSO BE POURED CONCURRENTLY.
- PLACE CONCRETE FOR RELIEF SLABS.

NOTE TO DESIGNER:

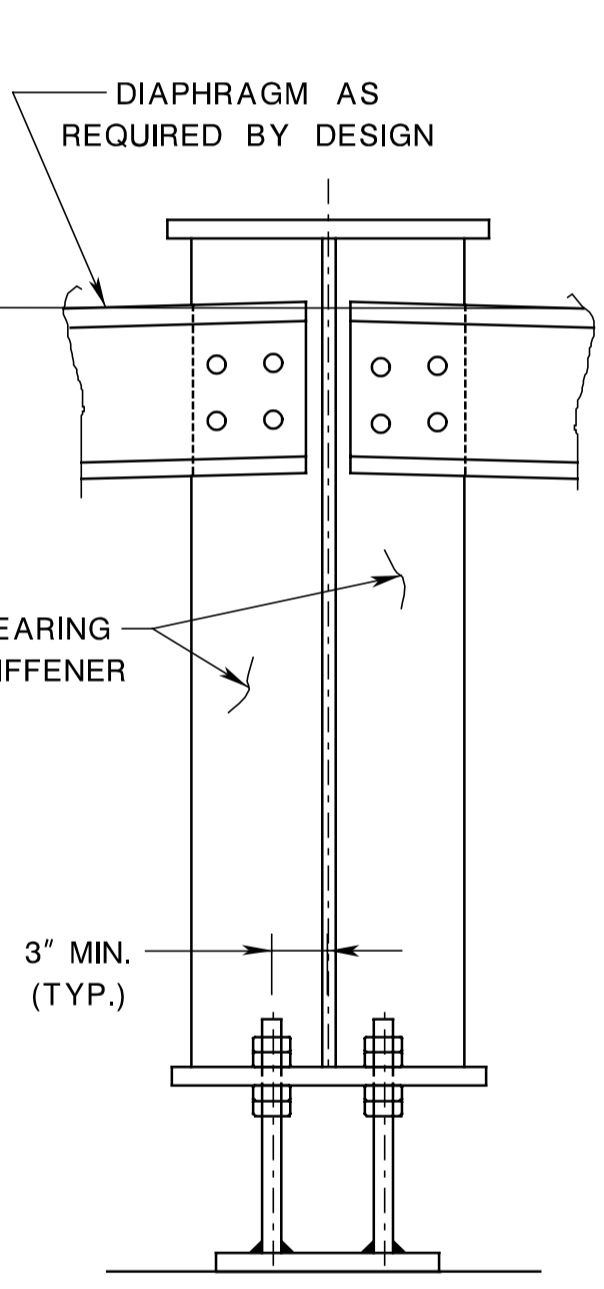
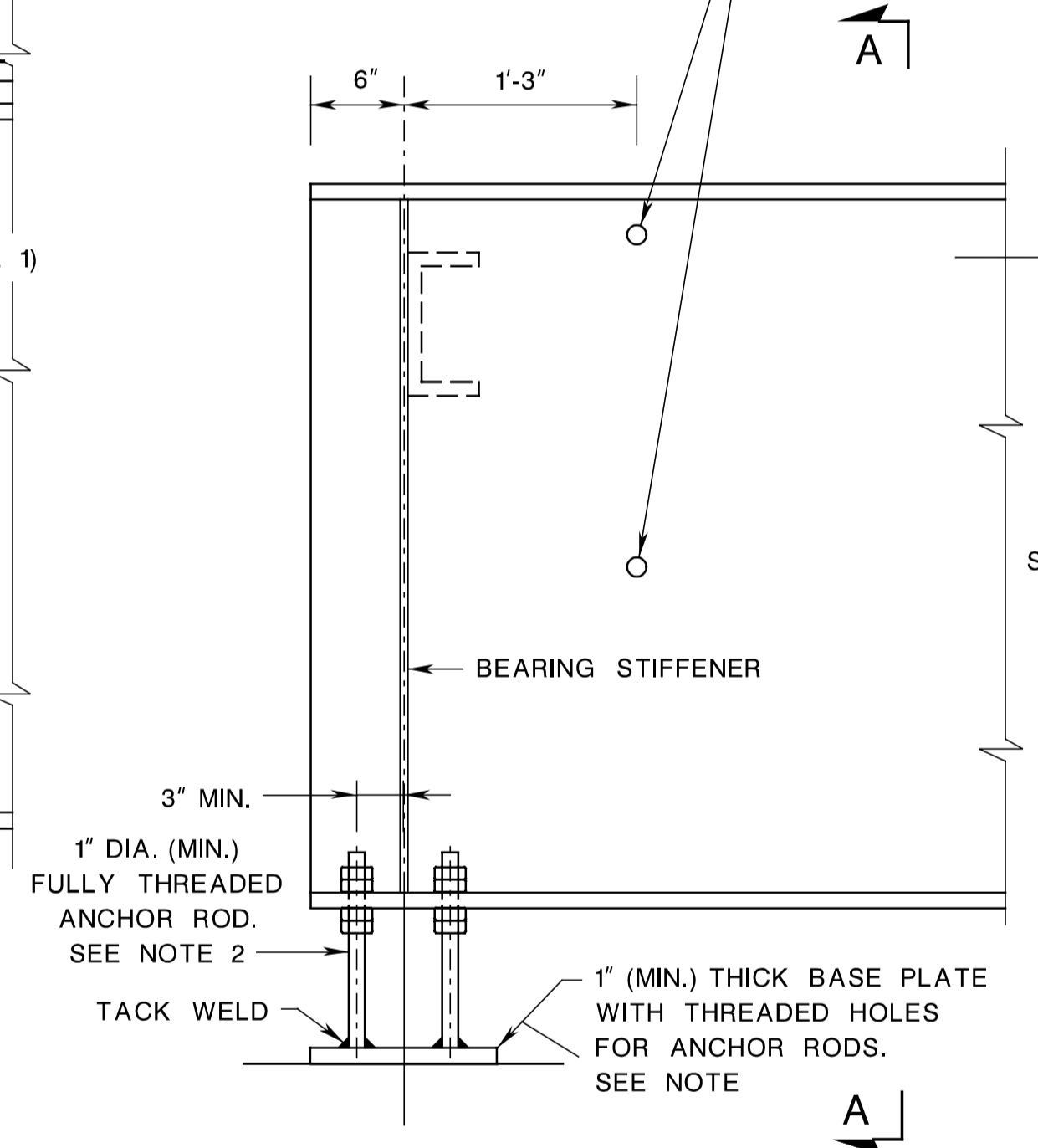
DETAILING INCLUDED WITHIN THIS DRAWING MAY BE UTILIZED IN PREPARING CONTRACT PLANS. HOWEVER, IN CONFORMANCE WITH THE PROVISIONS OF SECTION 15 OF THIS MANUAL, ALTERNATIVE DETAILING MAY BE PROVIDED.

NOTES:

- ALL REBARS IN THE ABUTMENT ARE TO BE CORROSION PROTECTED. (REFER TO SECTION 26 OF THIS MANUAL FOR TYPES OF CORROSION PROTECTED REINFORCEMENT STEEL THAT CAN BE USED)
- THE ANCHOR RODS AND BASE PLATE TO BE DESIGNED TO SUPPORT THE DEAD LOAD OF THE GIRDERS, DIAPHRAGMS AND UTILITIES.

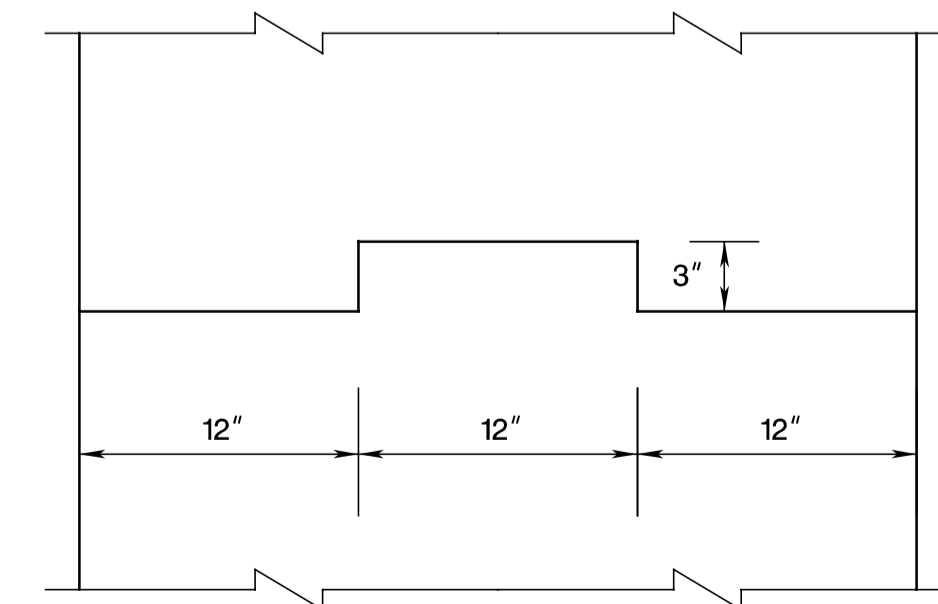


HOLE IN WEB FOR ABUTMENT STEM REINFORCEMENT. ADJUST AS NECESSARY FOR REQUIRED DIA. REINFORCING BARS AND SKEW ANGLE 1/4" MIN. (TYP.)



TYPICAL INTERIOR GIRDER ELEVATION

SECTION A-A



NOTE: KEYWAY TO STOP 4" FROM SUPPORT PLATE OR CONSTRUCTION JOINT

NOTE: ABUTMENT STEM IS TO EXTEND TO AT LEAST THE BOTTOM OF THE SLOPE PROTECTION

CONTROL SECTION		JOB NO.	
DES. BY		CHK. BY	
DWN. BY		CHK. BY	
EST. BY		CHK. BY	
SPECS. BY			
IN CHARGE OF _____			

BDC04MB-01

STANDARD DRAWING PLATE 2.9-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

INTEGRAL ABUTMENTS FOR STEEL SUPERSTRUCTURE - 1 OF 2

ROUTE : _____ SECTION : _____

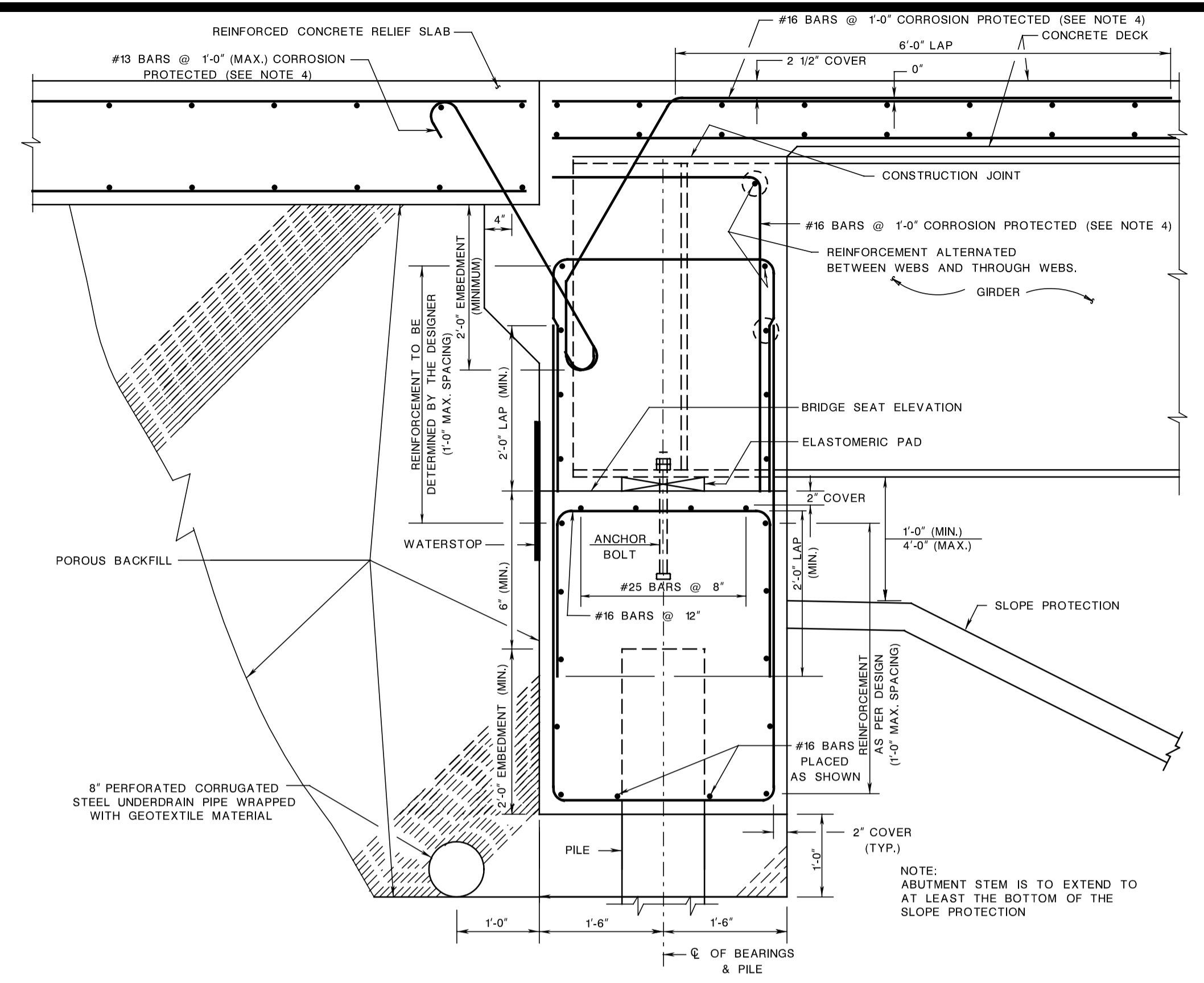
MUNICIPALITY _____ COUNTY _____

SCALE : NONE

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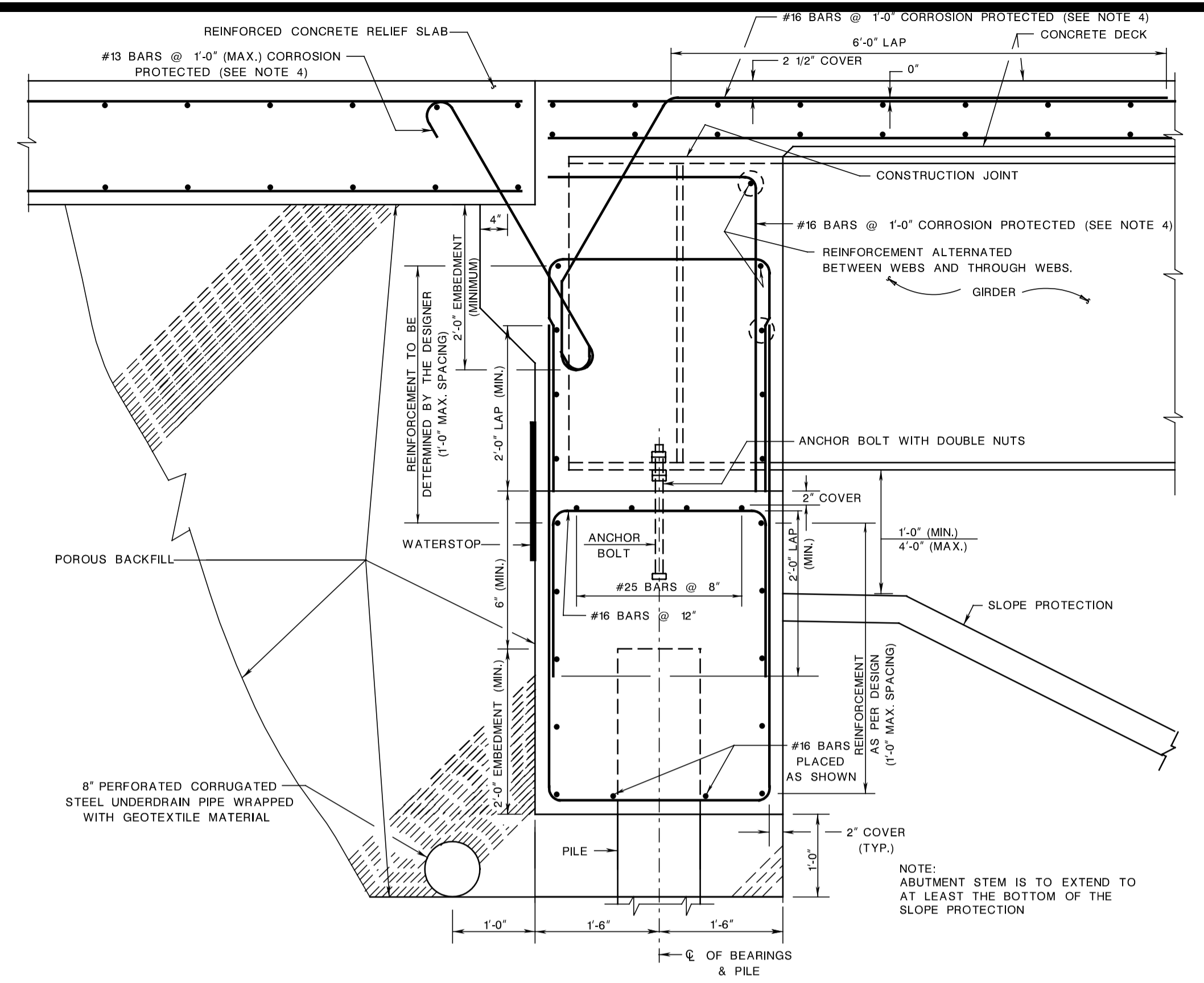
STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			



**INTEGRAL ABUTMENT DETAIL
STEEL GIRDER ANCHORED TO PILE CAP
AND RESTING ON ELASTOMERIC PAD**

INTEGRAL ABUTMENT CONSTRUCTION PROCEDURE

- FOR BRIDGE LENGTHS OVER 100 FT. PRE-EXCAVATE TO A DEPTH OF 8 FT. BELOW THE STEM AT THE DIAMETER SPECIFIED IN THE FOUNDATION DESIGN REPORT.
- DRIVE THE PILES AND CUT OFF PILES AT ELEVATIONS SHOWN.
- BACKFILL HOLES WITH DESIGNATION I-8 SAND.
- IF CIP PILES ARE USED, FILL THE SHELL WITH CONCRETE.
- PLACE THE ABUTMENT STEM CONCRETE TO REQUIRED BRIDGE SEAT ELEVATION WITH ANCHOR BOLTS IN PLACE. POUR THE PILE CAPS FOR THE WING WALLS CONCURRENTLY.
- SET THE ELASTOMERIC PAD ON THE ABUTMENT WITH THE ANCHOR BOLTS PASSING THROUGH THEM. SET THE BEAMS AND ANCHOR THEM TO THE ABUTMENT USING SLOTTED HOLES IN THE BOTTOM FLANGE. DO NOT FULLY TIGHTEN THE ANCHOR NUTS AT THIS TIME.
- POUR THE BRIDGE DECK EXCLUDING THE ABUTMENT BACKWALL/DIAPHRAGM AND THE LAST PORTION OF THE BRIDGE DECK EQUAL TO THE BACKWALL/DIAPHRAGM WIDTH.
- TIGHTEN THE ANCHOR NUTS AND POUR THE ABUTMENT BACKWALL/DIAPHRAGM FULL HEIGHT AND THE REMAINDER OF THE DECK SLAB. THE WING WALLS MAY ALSO BE POURED CONCURRENTLY.
- PLACE THE DRAIN SYSTEM AND BACKFILL IN 6" LIFTS UNTILL THE DESIRED SUBGRADE ELEVATION IS REACHED.
- POUR THE RELIEF SLAB STARTING AT THE END AWAY FROM THE ABUTMENT AND PROGRESSING TOWARD THE BACKWALL.



**INTEGRAL ABUTMENT DETAIL
STEEL GIRDER ANCHORED TO PILE CAP
AND RESTING ON NUTS**

INTEGRAL ABUTMENT CONSTRUCTION PROCEDURE

- FOR BRIDGE LENGTHS OVER 100 FT. PRE-EXCAVATE HOLES TO A DEPTH OF 8 FT. BELOW THE STEM AT THE DIAMETER SPECIFIED IN THE FOUNDATION DESIGN REPORT.
- DRIVE THE PILES AND CUT OFF PILES AT ELEVATIONS SHOWN.
- BACKFILL HOLES WITH DESIGNATION I-8 SAND.
- IF CIP PILES ARE USED, FILL THE SHELL WITH CONCRETE.
- PLACE THE ABUTMENT STEM CONCRETE TO REQUIRED BRIDGE SEAT ELEVATION WITH ANCHOR BOLTS IN PLACE. POUR THE PILE CAPS FOR THE WING WALLS CONCURRENTLY.
- SET THE BEAMS ON NUTS AT THE DESIRED LEVELS AND ANCHOR THEM TO THE ABUTMENT USING SLOTTED HOLES IN THE BOTTOM FLANGE. DO NOT FULLY TIGHTEN THE ANCHOR NUTS AT THIS TIME.
- POUR THE BRIDGE DECK EXCLUDING THE ABUTMENT BACKWALL/DIAPHRAGM AND THE LAST PORTION OF THE BRIDGE DECK EQUAL TO THE BACKWALL/DIAPHRAGM WIDTH.
- TIGHTEN THE ANCHOR NUTS AND POUR THE ABUTMENT BACKWALL/DIAPHRAGM FULL HEIGHT AND THE REMAINDER OF THE DECK SLAB. THE WING WALLS MAY ALSO BE POURED CONCURRENTLY.
- PLACE THE DRAIN SYSTEM AND BACKFILL IN 6" LIFTS UNTILL THE DESIRED SUBGRADE ELEVATION IS REACHED.
- POUR THE RELIEF SLAB STARTING AT THE END AWAY FROM THE ABUTMENT AND PROGRESSING TOWARD THE BACKWALL.

GENERAL NOTES

- DIAMETER OF AUGERED HOLE SHALL BE TWICE THE SIZE OF THE PILE.
- CUSHION SAND SHALL BE DESIGNATION I-8 SAND ACCORDING TO SUBSECTION 901.09 OF THE STANDARD SPECIFICATIONS.
- COST OF PREBORING, USE OF CASING IF REQUIRED TO SHORE UP HOLES AND PROVISION OF CUSHION SAND SHALL BE INCLUDED IN THE UNIT PRICE OF THE PILE ITEM.
- REFER TO SECTION 26 OF THIS MANUAL FOR TYPES OF CORROSION PROTECTED REINFORCEMENT STEEL THAT CAN BE USED)

NOTE TO DESIGNER:

DETAILS INCLUDED WITHIN THIS DRAWING MAY BE UTILIZED IN PREPARING CONTRACT PLANS. HOWEVER, IN CONFORMANCE WITH THE PROVISIONS OF SECTION 15 OF THIS MANUAL, ALTERNATIVE DETAILING MAY BE PROVIDED.

CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	
IN CHARGE OF	

BDC04MB-01

STANDARD DRAWING PLATE 2.9-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

**INTEGRAL ABUTMENTS FOR
STEEL SUPERSTRUCTURE - 2 OF 2**

ROUTE : SECTION :

MUNICIPALITY COUNTY

SCALE : NONE

BRIDGE SHEET NO. OF

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STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			

INTEGRAL ABUTMENT CONSTRUCTION PROCEDURE

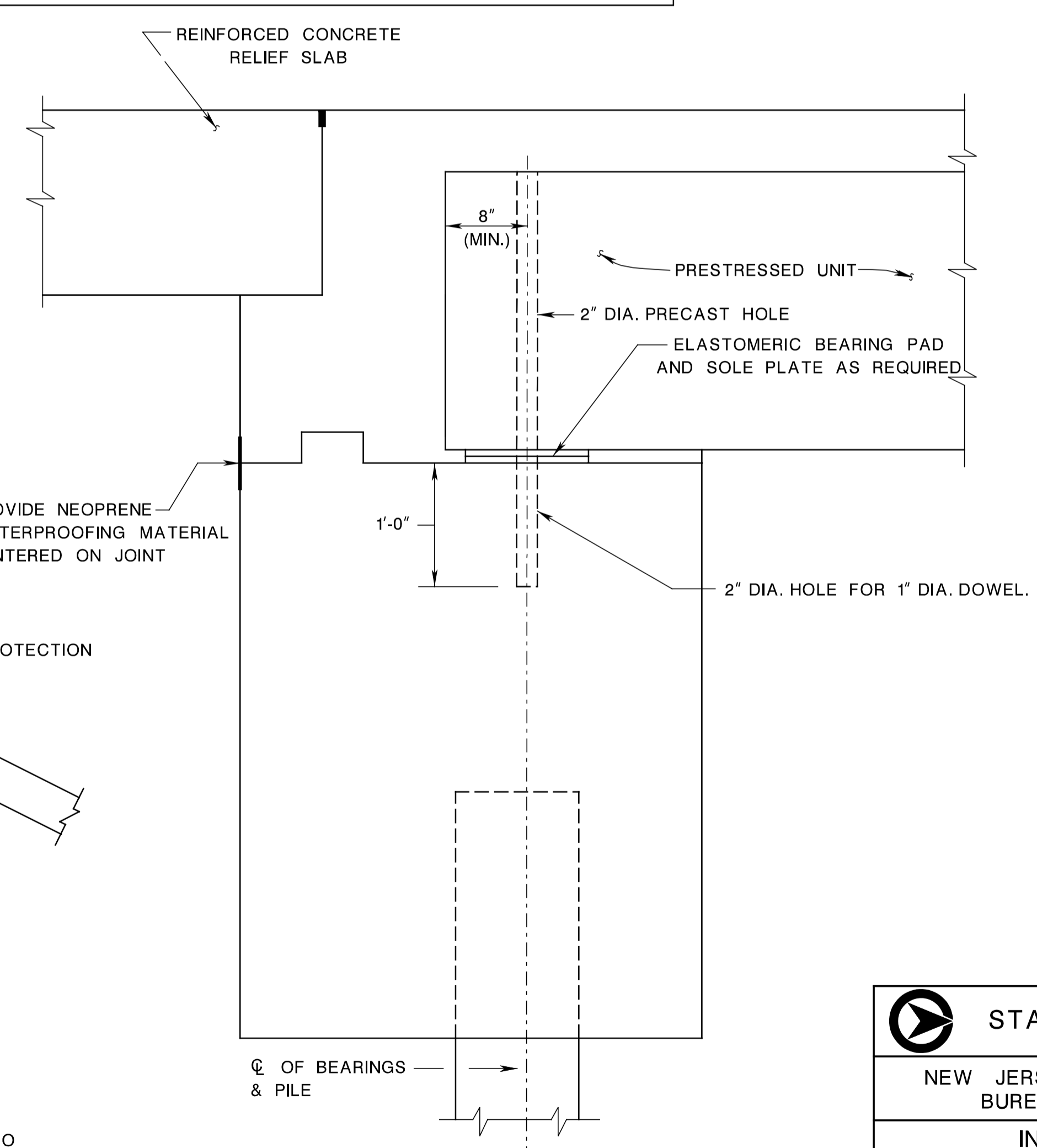
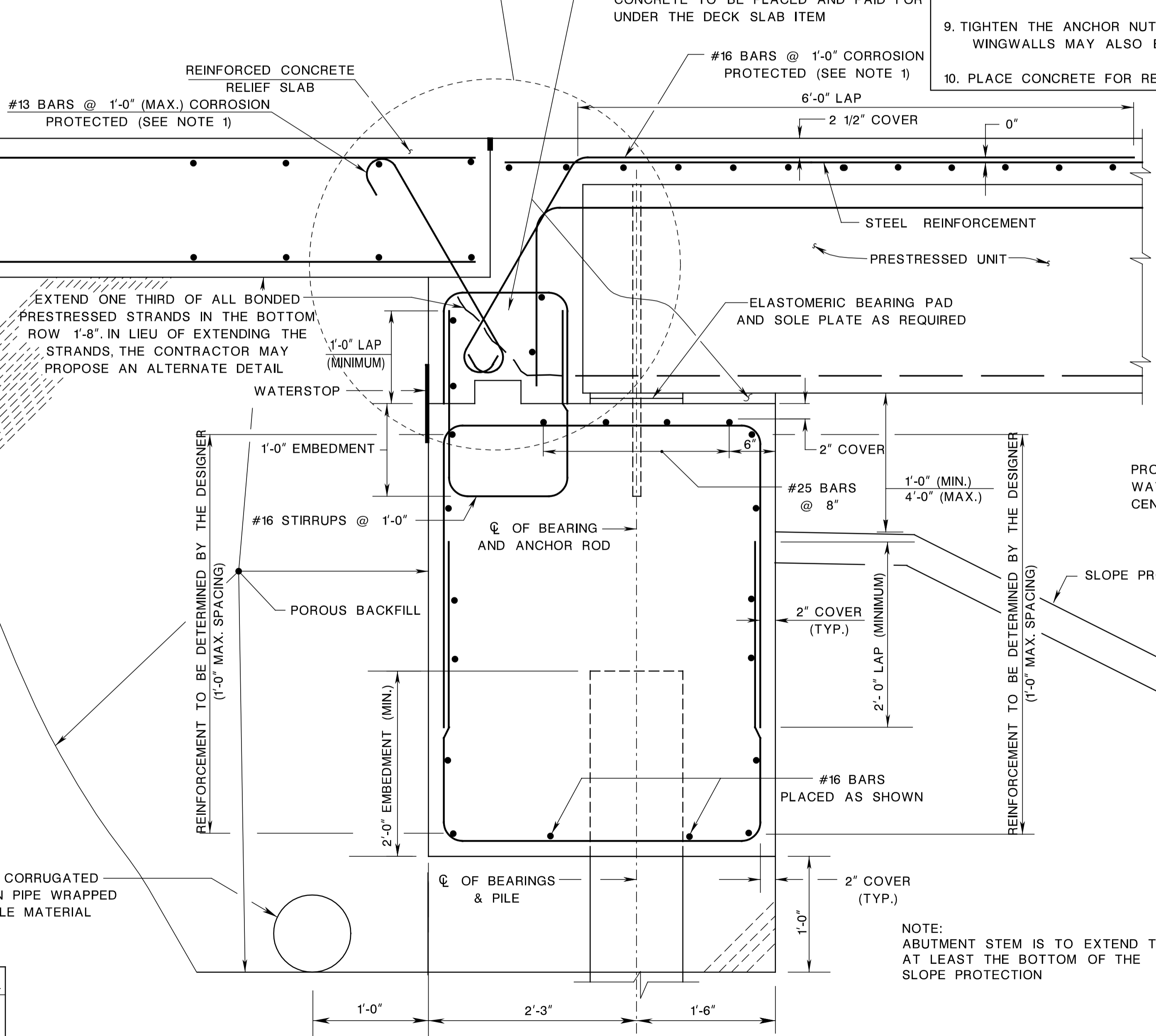
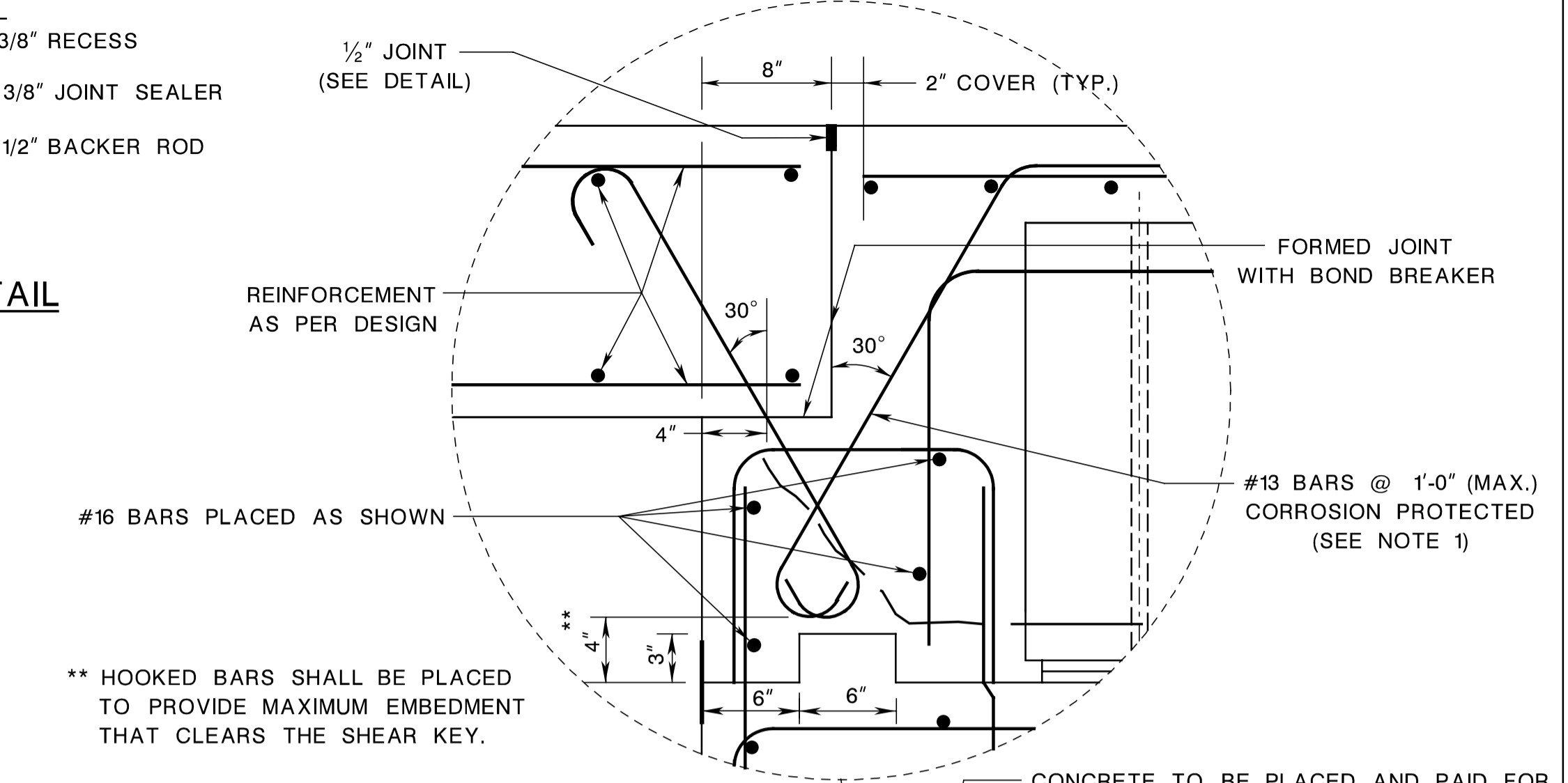
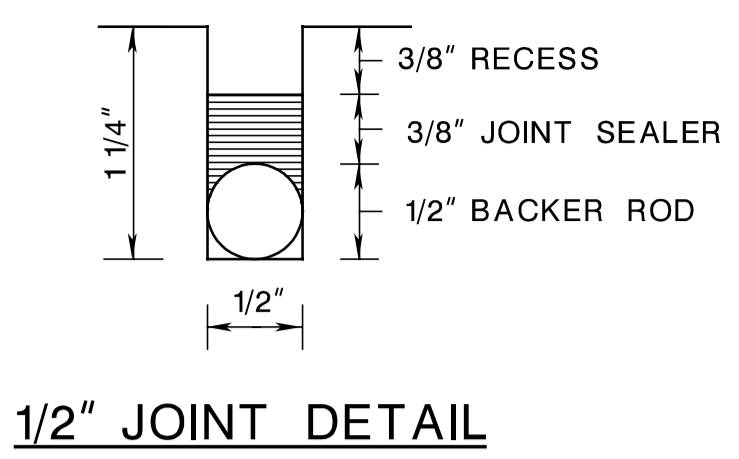
- FOR BRIDGE LENGTHS OVER 100 FT. PRE-EXCAVATE HOLES TO A DEPTH OF 8 FT. BELOW THE STEM AT THE DIAMETER SPECIFIED IN THE FOUNDATION DESIGN REPORT.
- DRIVE THE PILES AND CUT OFF PILES AT ELEVATIONS SHOWN.
- BACKFILL HOLES WITH DESIGNATION I-8 SAND.
- IF CIP PILES ARE USED, FILL THE SHELL WITH CONCRETE. PLACE THE ABUTMENT STEM CONCRETE TO REQUIRED BRIDGE SEAT ELEVATION.
- ERECT PRESTRESSED GIRDERS ON BEARING PADS AND SOLE PLATE AS REQUIRED.
- PLACE AND GROUT ANCHOR DOWELS.
- ERECT BOTH ABUTMENT STEMS TO 6" BELOW THE BRIDGE SEAT ELEVATION AFTER THE ABUTMENT STEM IS CURED. BACKFILL SHALL BE CONDUCTED SUCH THAT THE MAXIMUM DIFFERENCE IN FILL HEIGHT BETWEEN THE TWO STEMS AS MEASURED FROM THE BOTTOM OF THE STEM DOES NOT EXCEED 2'-0".
- PLACE CONCRETE ABOVE BRIDGE SEAT ELEVATION FOR ABUTMENT BACKWALL AND DECK SLAB. TO FACILITATE COMPLETE CONSOLIDATION OF CONCRETE BETWEEN THE TOP OF THE BRIDGE SEAT AND THE BOTTOM OF THE BEAM, VENT HOLES SHALL BE PROVIDED FOR THE INSERTION OF A 1" DIAMETER VIBRATOR IN THE FRONT FORM FROM UNDER EACH BEAM.
- AFTER THE ABUTMENT CONCRETE IS CURED, POUR DECK IN PROPER SEQUENCE EXCLUDING THE BACKWALL DIAPHRAGM AND A PORTION OF THE DECK SLAB THAT IS EQUAL TO THE BACKWALL DIAPHRAGM WIDTH.
- TIGHTEN THE ANCHOR NUTS AND POUR THE BACKWALL/DIAPHRAGM FULL HEIGHT. THE WINGWALLS MAY ALSO BE POURED CONCURRENTLY.
- PLACE CONCRETE FOR RELIEF SLABS.

NOTE TO DESIGNER:

DETAILING INCLUDED WITHIN THIS DRAWING MAY BE UTILIZED IN PREPARING CONTRACT PLANS. HOWEVER, IN CONFORMANCE WITH THE PROVISIONS OF SECTION 15 OF THIS MANUAL, ALTERNATIVE DETAILING MAY BE PROVIDED.

NOTES:

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- THE ANCHOR RODS AND BASE PLATE TO BE DESIGNED TO SUPPORT THE DEAD LOAD OF THE GIRDERS, DIAPHRAGMS AND UTILITIES.



TYPICAL INTERIOR GIRDER ELEVATION

INTEGRAL ABUTMENT DETAIL (PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE)

CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	
IN CHARGE OF	

BDC04MB-01

STANDARD DRAWING PLATE 2.9-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

INTEGRAL ABUTMENTS FOR PRESTRESSED CONCRETE SUPERSTRUCTURE

ROUTE : SECTION :

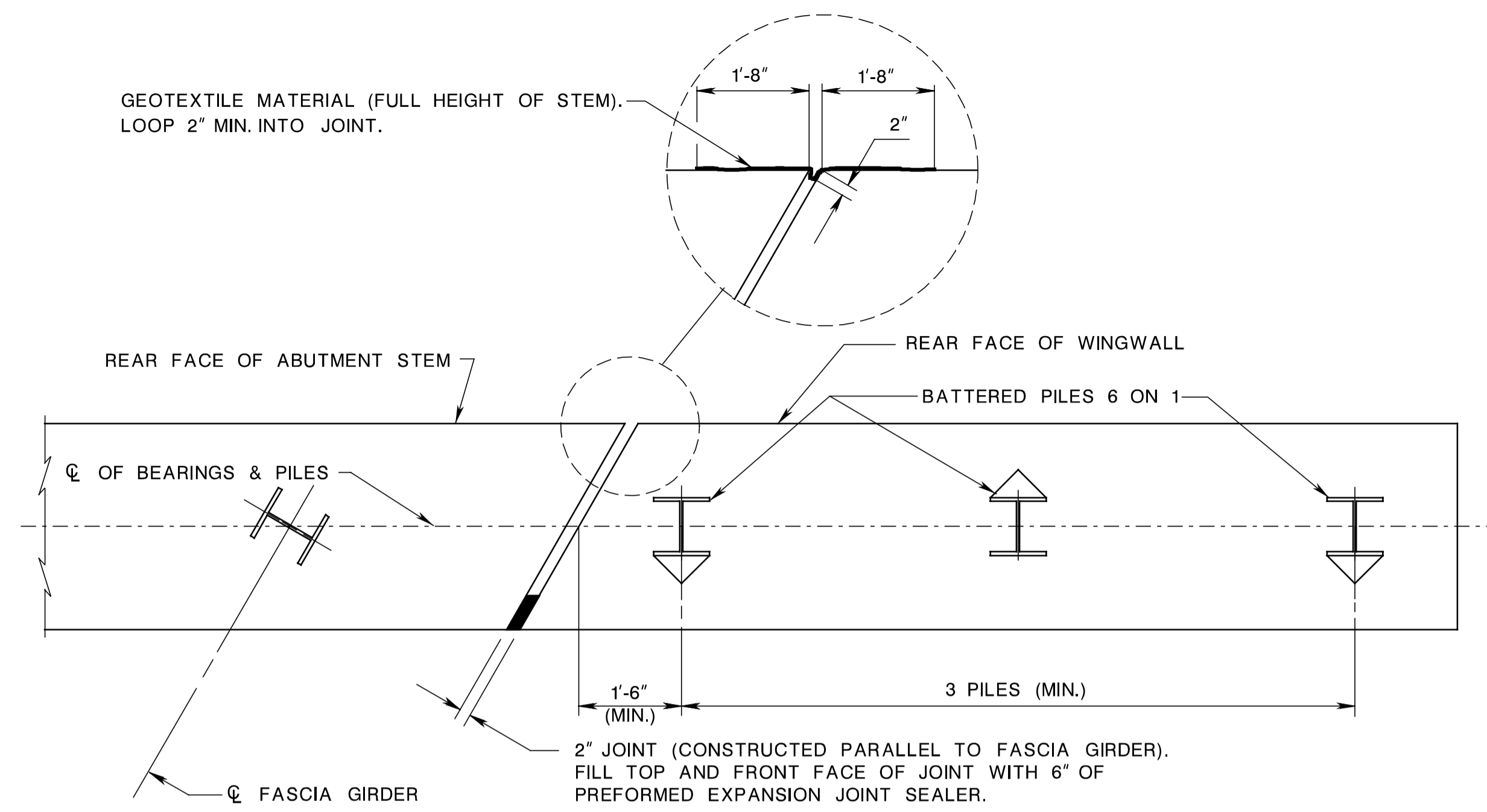
MUNICIPALITY COUNTY

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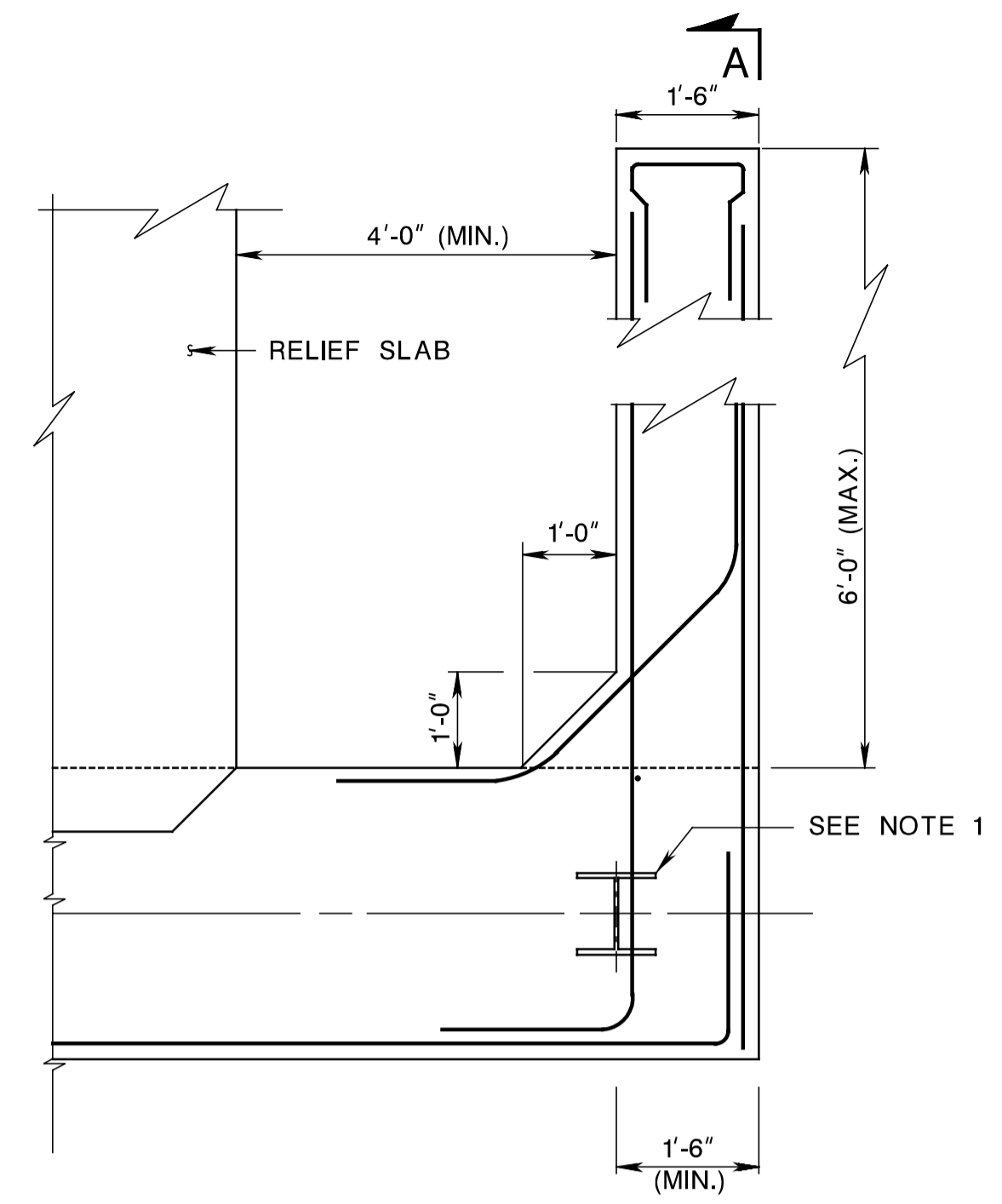
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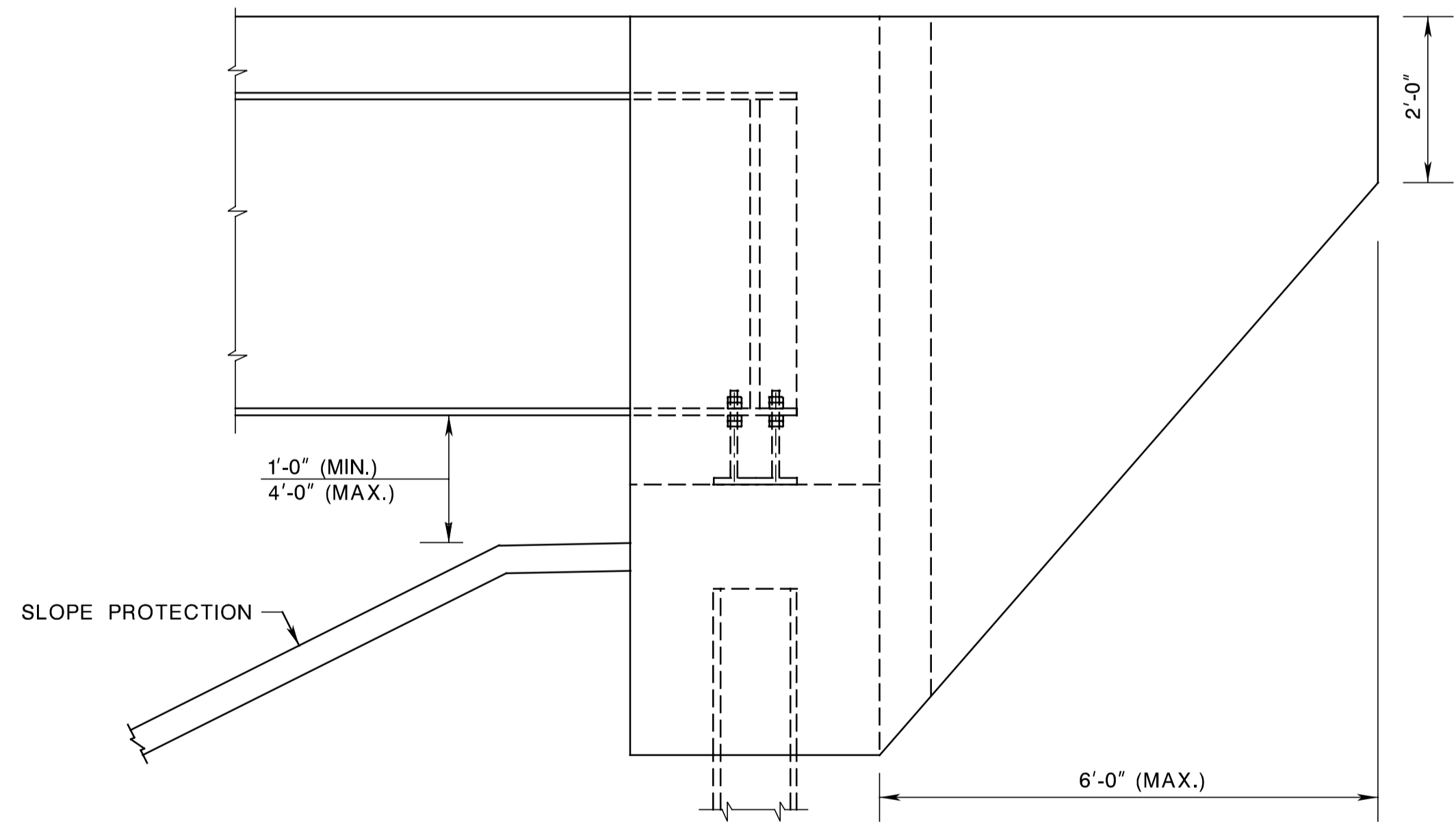
STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			



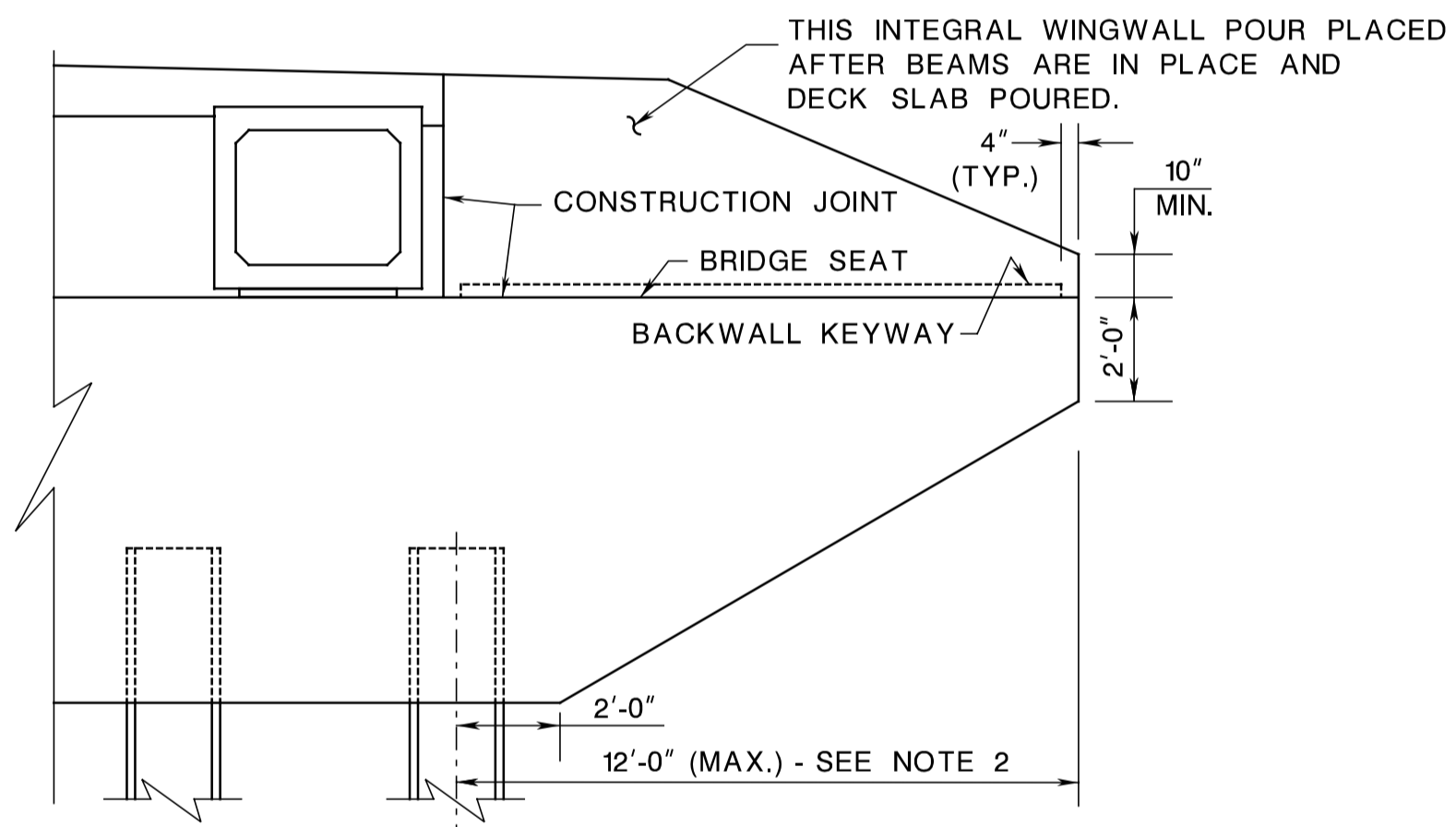
PLAN
TYPICAL LAYOUT FOR SEPARATED WINGWALLS



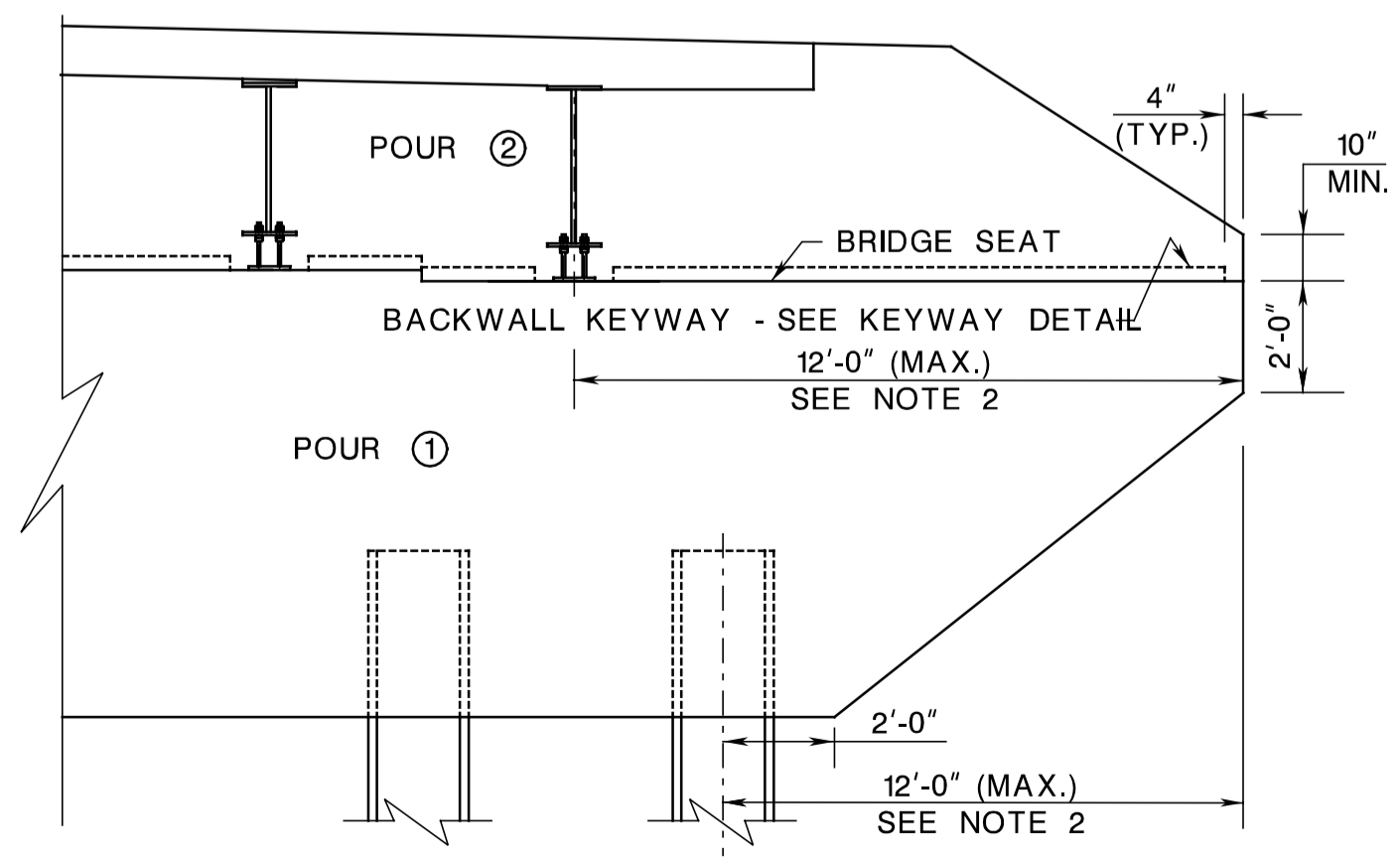
PLAN
U WALLS



SECTION A-A



INTEGRAL WINGWALL ELEVATION
PRESTRESSED CONCRETE SUPERSTRUCTURE



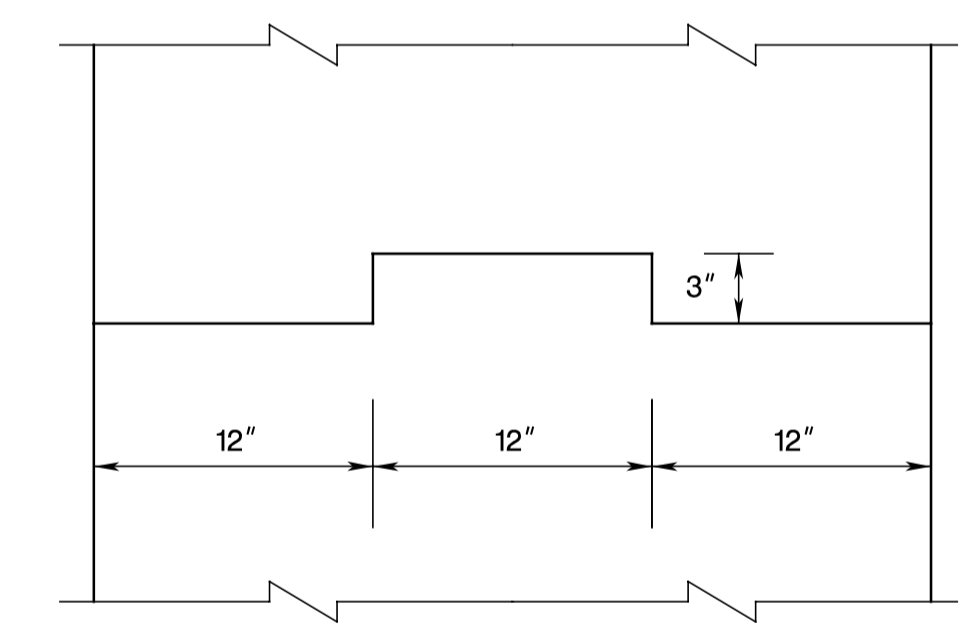
INTEGRAL WINGWALL DETAIL FOR STEEL SUPERSTRUCTURE

NOTE TO DESIGNER:

DETAILING INCLUDED WITHIN THIS DRAWING MAY BE UTILIZED IN PREPARING CONTRACT PLANS. HOWEVER, IN CONFORMANCE WITH THE PROVISIONS OF SECTION 15 OF THIS MANUAL, ALTERNATIVE DETAILING MAY BE PROVIDED.

NOTES:

- FOR ABUTMENTS WITH INTEGRAL U-WINGWALLS, THE CORNER PILE SHOULD BE ORIENTED WITH THE STRONG AXIS PERPENDICULAR TO THE INTEGRAL U-WINGWALLS.
- THE 12'-0" MAXIMUM DIMENSION FOR THE PROJECTION OF INTEGRAL WINGWALLS IS MEASURED TO EITHER THE CENTERLINE OF THE FASCIA GIRDER FOR STEEL GIRDERS, OR THE EDGE OF THE FASCIA BEAM FOR PRESTRESSED BOX BEAM.
- WHEN SEPARATED WINGWALLS ARE NECESSARY, A SINGLE LINE OF PILES, AS SHOWN IS PREFERABLE. IT IS ALSO ACCEPTABLE TO USE A CONVENTIONAL CANTILEVER WALL WITH A PILE FOOTING.



NOTE:
KEYWAY TO STOP 4" FROM SUPPORT PLATE OR CONSTRUCTION JOINT

KEYWAY DETAIL FOR STEEL SUPERSTRUCTURE

CONTROL SECTION		JOB NO.	
DES. BY	CHK. BY		
DWN. BY	CHK. BY		
EST. BY	CHK. BY		
SPECS. BY	CHK. BY		
IN CHARGE OF _____			

BDC04MB-01

STANDARD DRAWING PLATE 2.9-4

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

WINGWLL DETAILS FOR INTEGRAL ABUTMENTS

ROUTE : _____ SECTION : _____

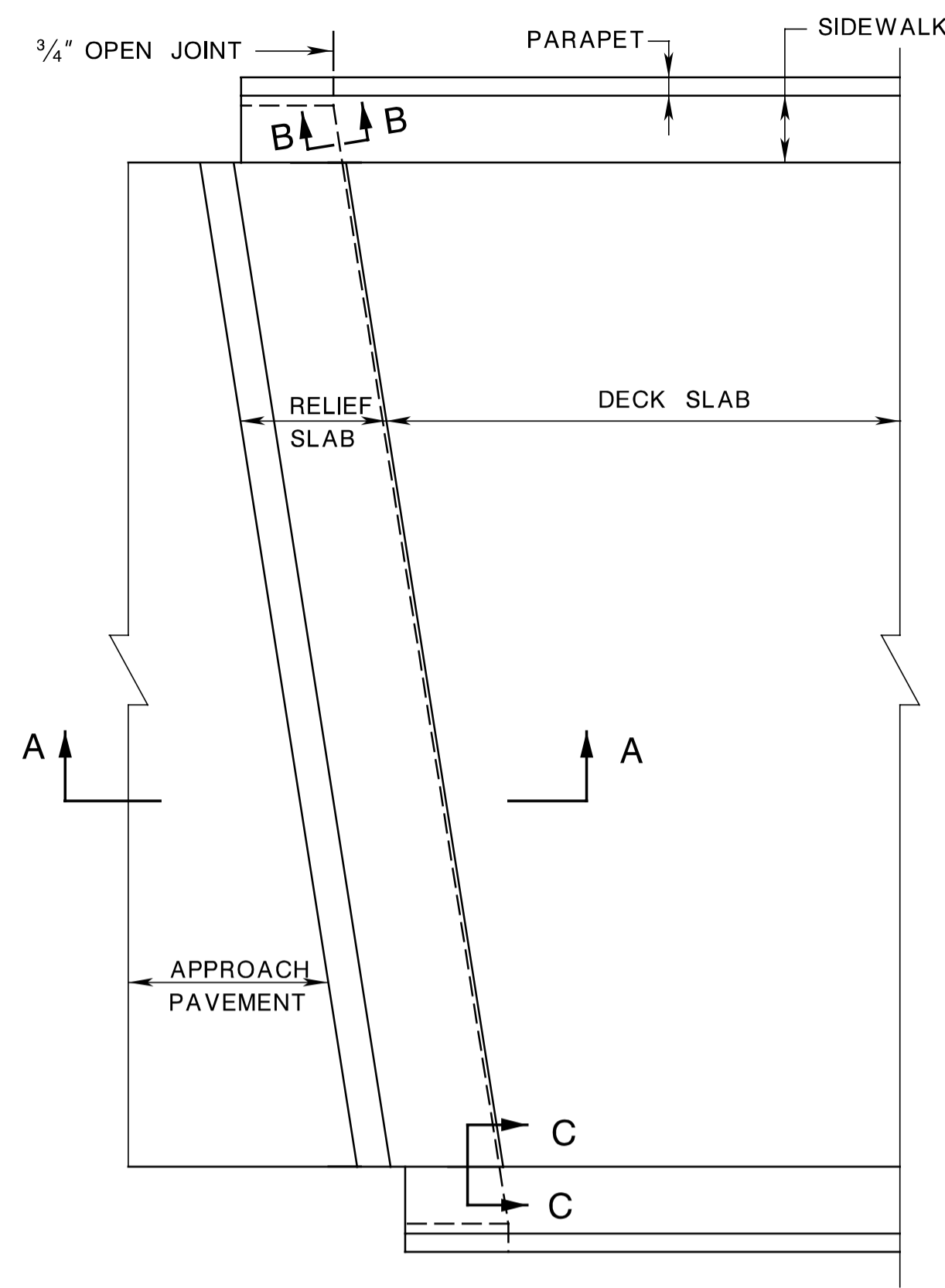
MUNICIPALITY _____ COUNTY _____

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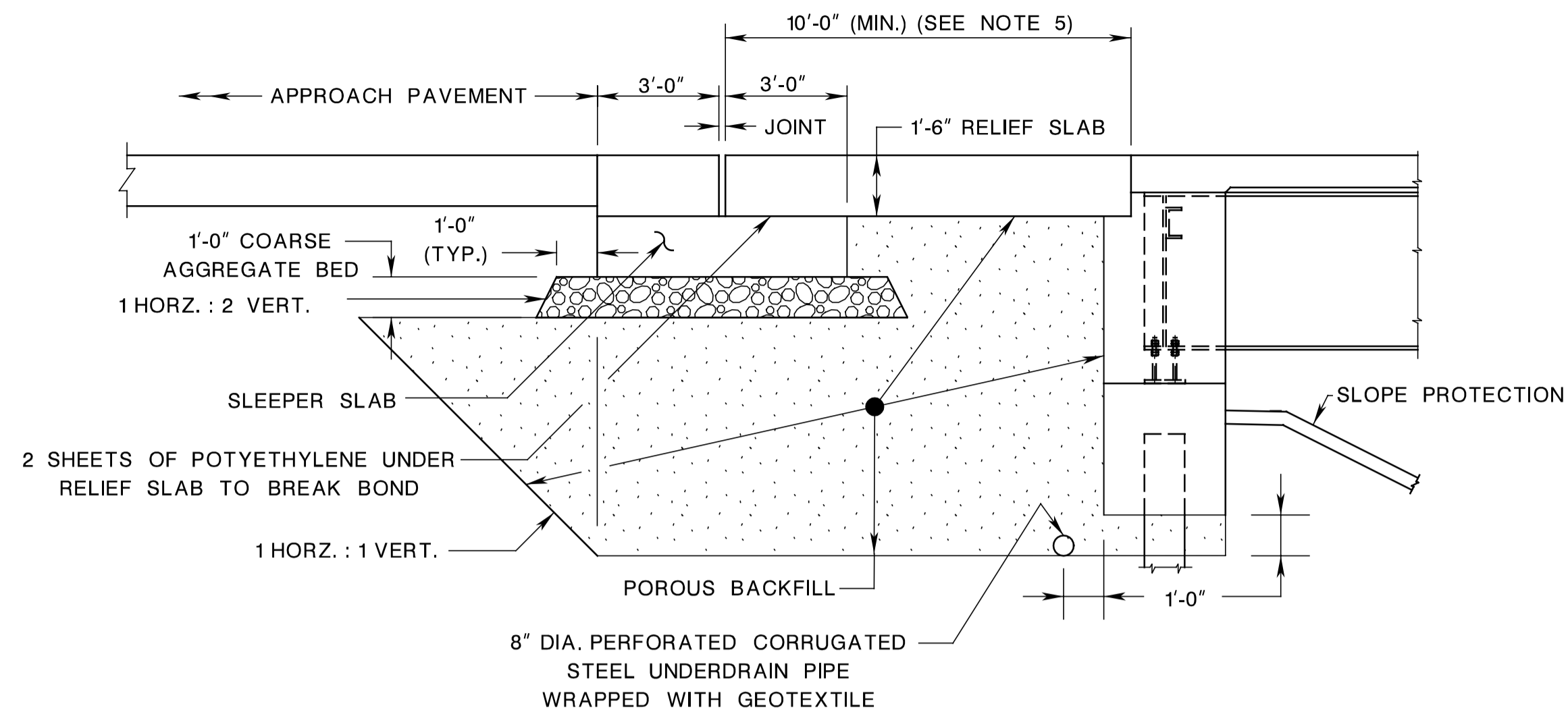
BRIDGE SHEET NO. _____ OF _____

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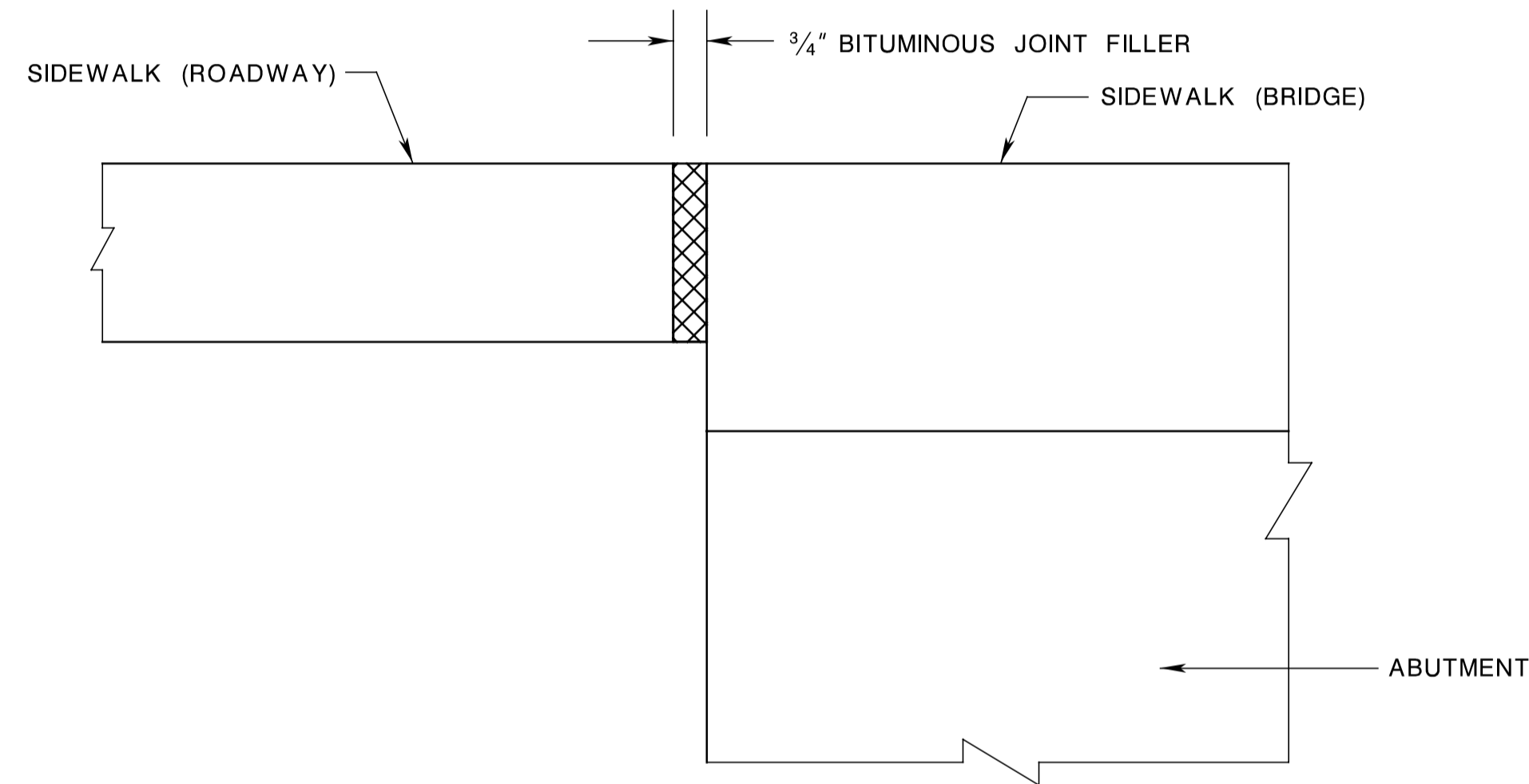
STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			



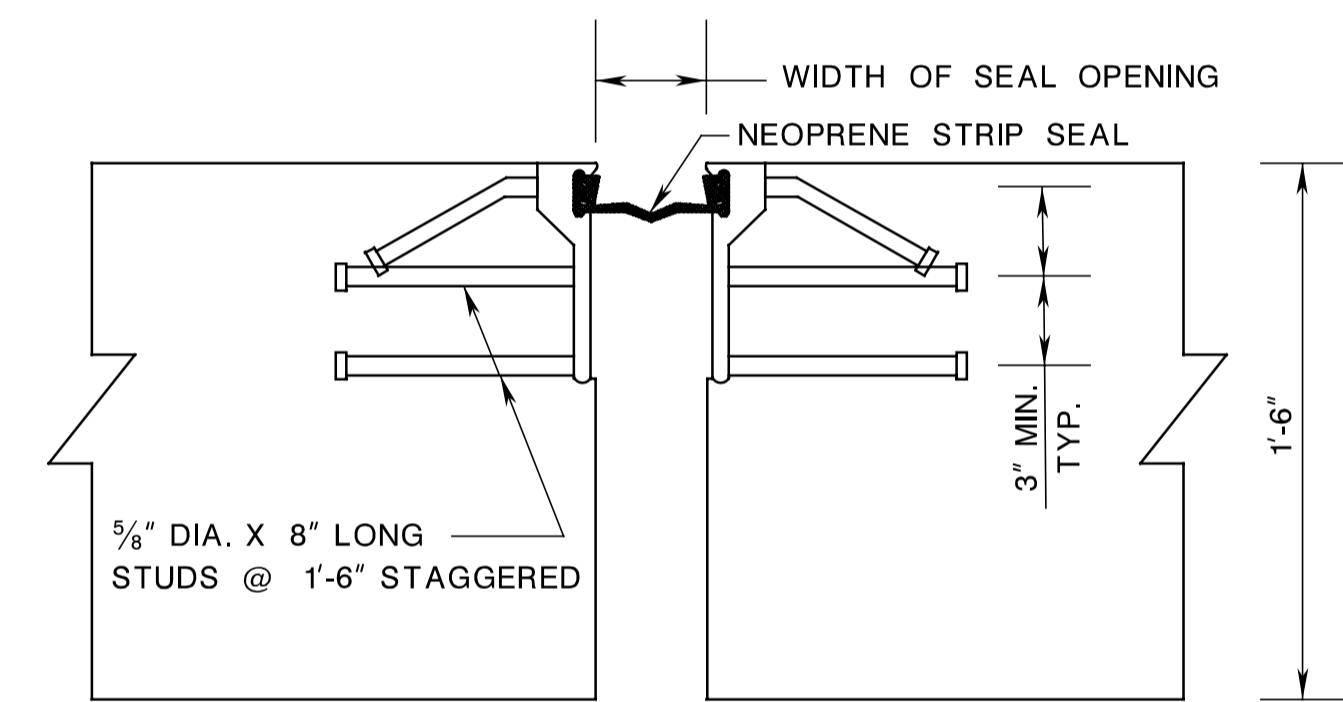
PLAN



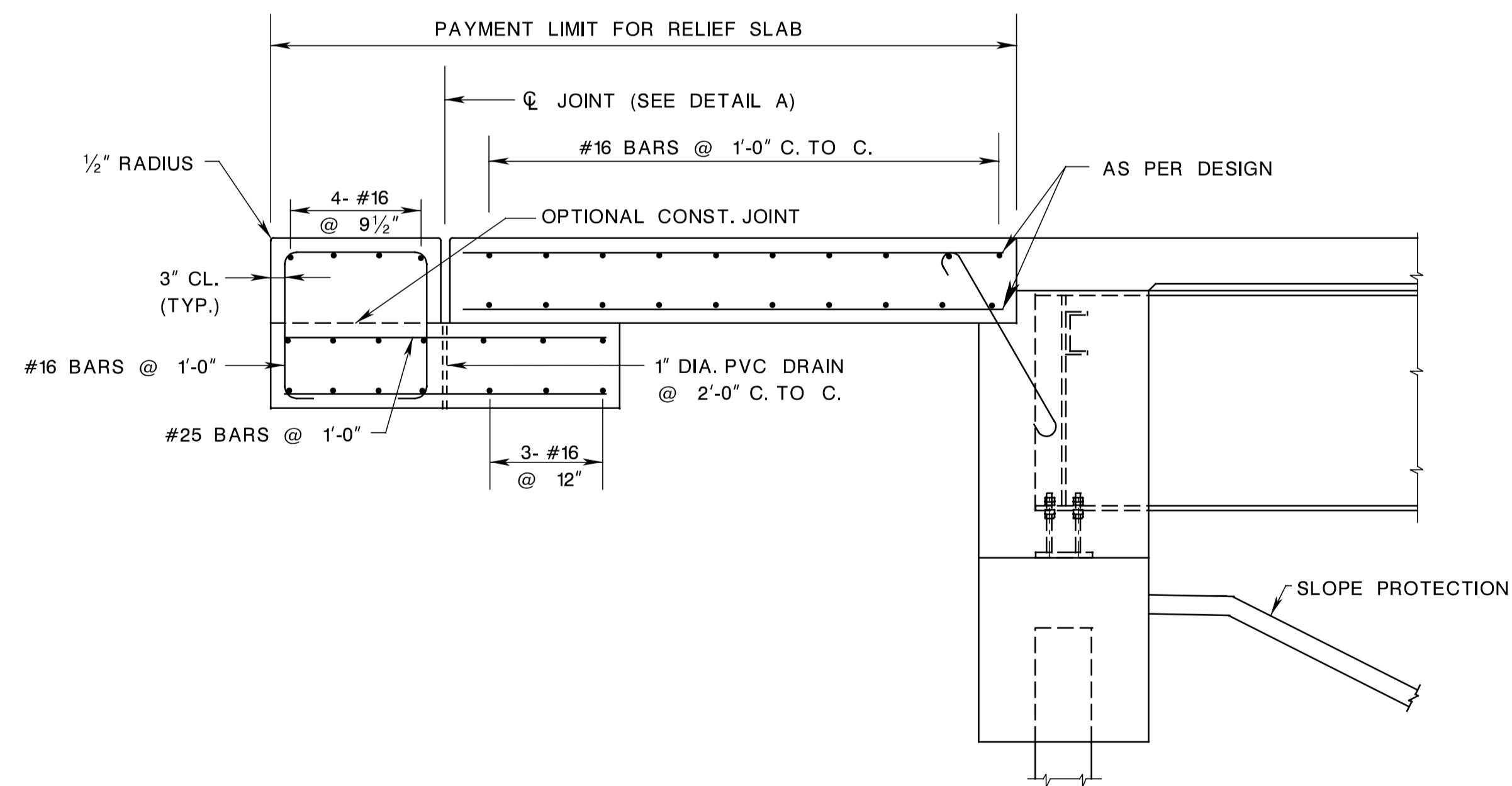
SECTION A-A



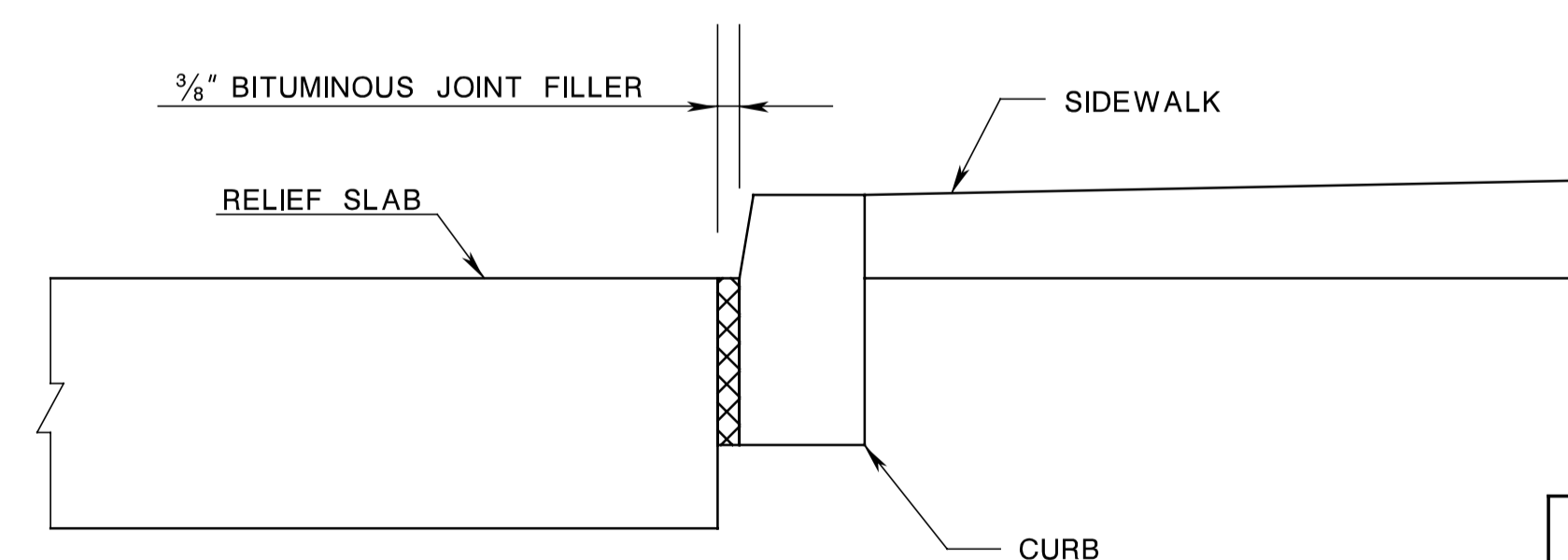
SECTION B-B



DETAIL A



SLEEPER SLAB DETAILS



SECTION C-C

NOTE TO DESIGNER:

DETAILING INCLUDED WITHIN THIS DRAWING MAY BE UTILIZED IN PREPARING CONTRACT SECTIONS. HOWEVER, IN CONFORMANCE WITH THE PROVISIONS OF SECTION 15 OF THIS MANUAL, ALTERNATIVE DETAILING MAY BE PROVIDED.

RELIEF AND SLEEPER SLAB NOTES

- (1) ALL REINFORCING BARS SHALL BE 2 1/2" CLEAR FROM CONCRETE SURFACE, EXCEPT AS NOTED.
- (2) REINFORCING STEEL SHALL BE ASTM A615 (GRADE 60) AND CORROSION PROTECTED. (REFER TO SECTION 26 OF THIS MANUAL FOR TYPES OF CORROSION PROTECTED REINFORCEMENT STEEL THAT CAN BE USED)
- (3) ANY EPOXY COATED BARS THAT ARE CUT TO FIT AND EXTERIOR BARS THAT ARE WELDED WHEN ATTACHING THE RAIL ANCHORAGE ASSEMBLIES SHALL BE TOUCHED UP WITH AN APPROVED EPOXY COATING MATERIAL.
- (4) CONCRETE FOR RELIEF AND SLEEPER SLABS SHALL BE PAID UNDER THE ITEM " CONCRETE IN SUPERSTRUCTURE, DECK SLABS ".
- (5) REFER TO SUBSECTION 1.15.2.A FOR GUIDANCE ON REQUIRED LENGTH OF RELIEF SLAB.
- (6) REFER TO SUBSECTION 1.15.2.B FOR EXPANSION PROVISIONS MEASURES.

CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	
IN CHARGE OF	

BDC04MB-01

STANDARD DRAWING PLATE 2.9-5

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

RELIEF SLAB AND JOINT DETAILS FOR
INTEGRAL ABUTMENTS

ROUTE : SECTION :

MUNICIPALITY COUNTY

SCALE : NONE

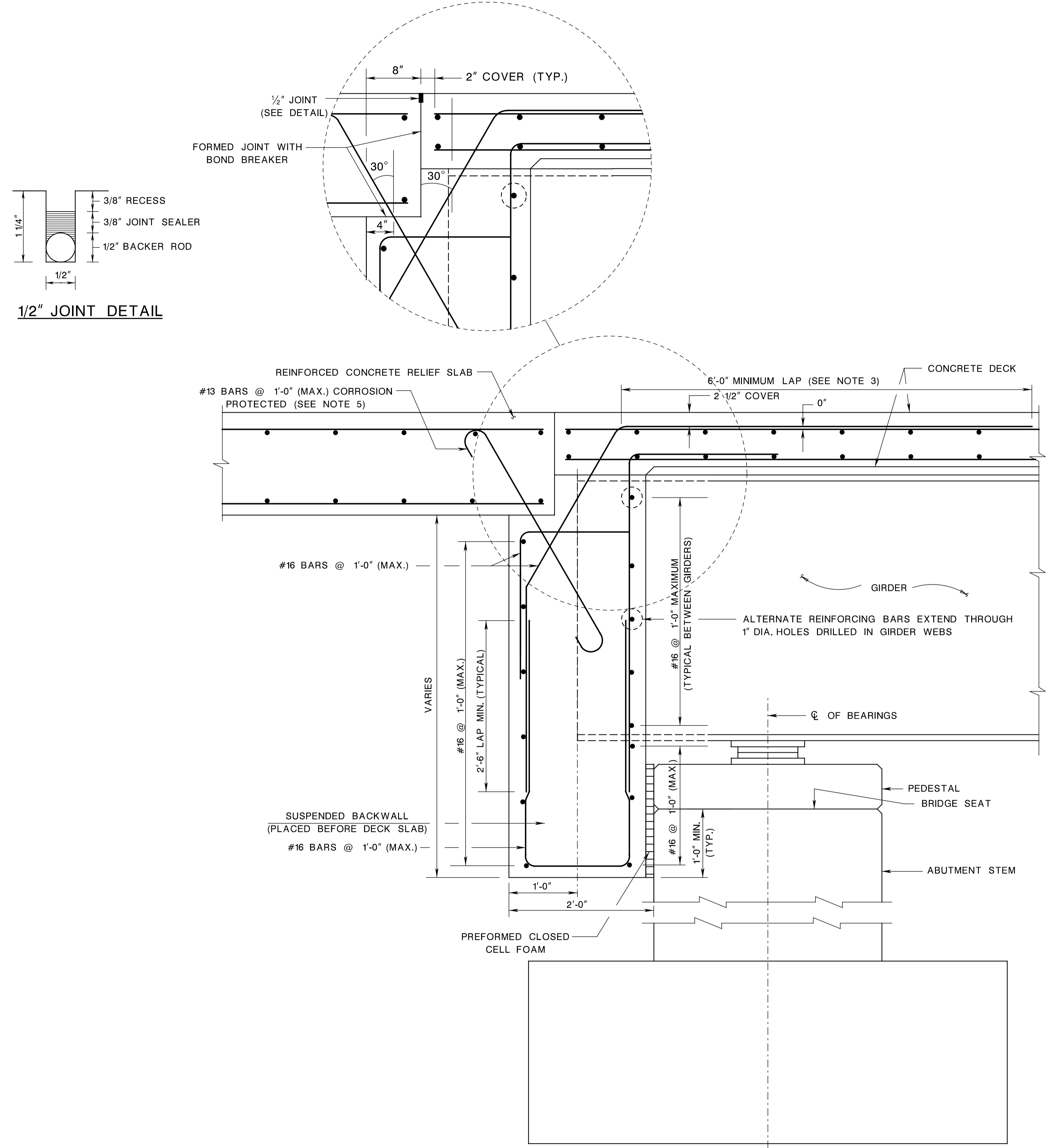
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STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			

NOTE TO DESIGNER:

DETAILING INCLUDED WITHIN THIS DRAWING MAY BE UTILIZED IN PREPARING CONTRACT PLANS. HOWEVER, IN CONFORMANCE WITH THE PROVISIONS OF SECTION 15 OF THIS MANUAL, ALTERNATIVE DETAILING MAY BE PROVIDED.



- NOTES TO DESIGNER**
1. THE GAP BETWEEN THE ABUTMENT STEM AND BACKWALL SHALL BE SET AT 2" PLUS THE EXPECTED MOVEMENT FOR STEEL STRUCTURES FOR TEMPERATURE EFFECTS
 2. BEARING STIFFENERS AND DIAPHRAGMS ARE REQUIRED AT THE ϕ OF BEARINGS.
 3. TOP DECK REINFORCEMENT SHOULD BE DESIGNED FOR NEGATIVE MOMENT DEVELOPED FROM BACKWALL AND RELIEF SLAB.
 4. EXCAVATION AND EMBANKMENT DETAILS FOR SEMI-INTEGRAL ABUTMENTS ARE GENERALLY THE SAME AS FOR CONVENTIONAL ABUTMENTS.
 5. ALL REINFORCING BARS IN DECK SLAB, RELIEF SLAB AND SUSPENDED BACKWALL SHALL BE CORROSION PROTECTED. (REFER TO SECTION 26 OF THIS MANUAL FOR TYPES OF CORROSION PROTECTED REINFORCEMENT STEEL THAT CAN BE USED)

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date = 18-FEB-2005 15:42
ID = 16412300

CONTROL SECTION		JOB NO.	
DES. BY		CHK. BY	
DWN. BY		CHK. BY	
EST. BY		CHK. BY	
SPECS. BY			
IN CHARGE OF _____			

**SEMI-INTEGRAL ABUTMENT DETAIL
(SECTION AT ABUTMENT)**

BDC04MB-01

STANDARD DRAWING PLATE 2.9-6

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

SEMI-INTEGRAL ABUTMENT DETAILS

ROUTE : SECTION :

MUNICIPALITY COUNTY

SCALE : NONE

BRIDGE SHEET NO. _____ OF _____

STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			

NOTE TO DESIGNER:

THIS SHEET IS NOT TO BE PLACED INTO THE CONTRACT SET OF PLANS AS IS. HOWEVER, INDIVIDUAL DETAILS SHALL BE UTILIZED IN PROVIDING PROJECT SPECIFIC REQUIREMENTS.

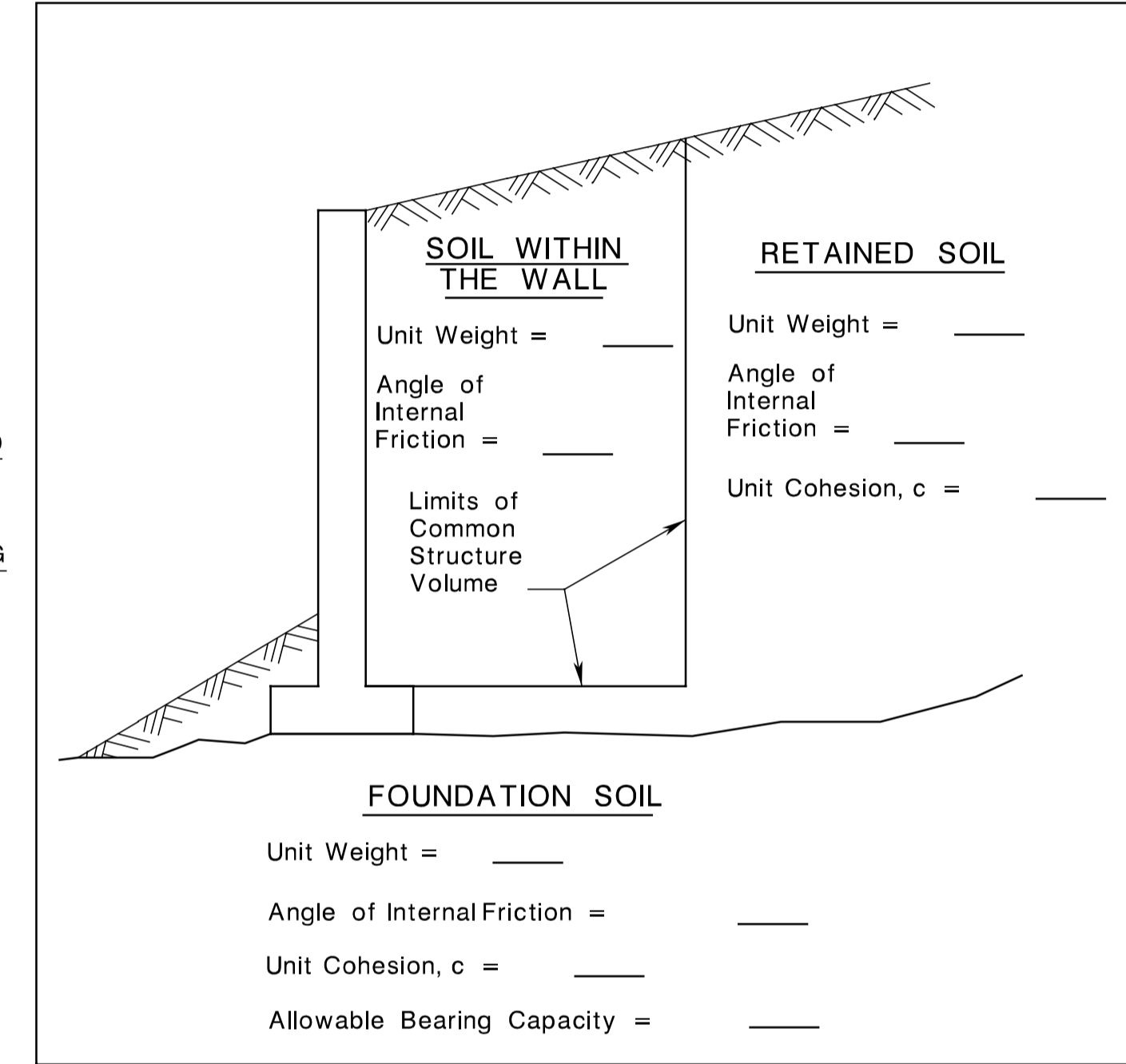
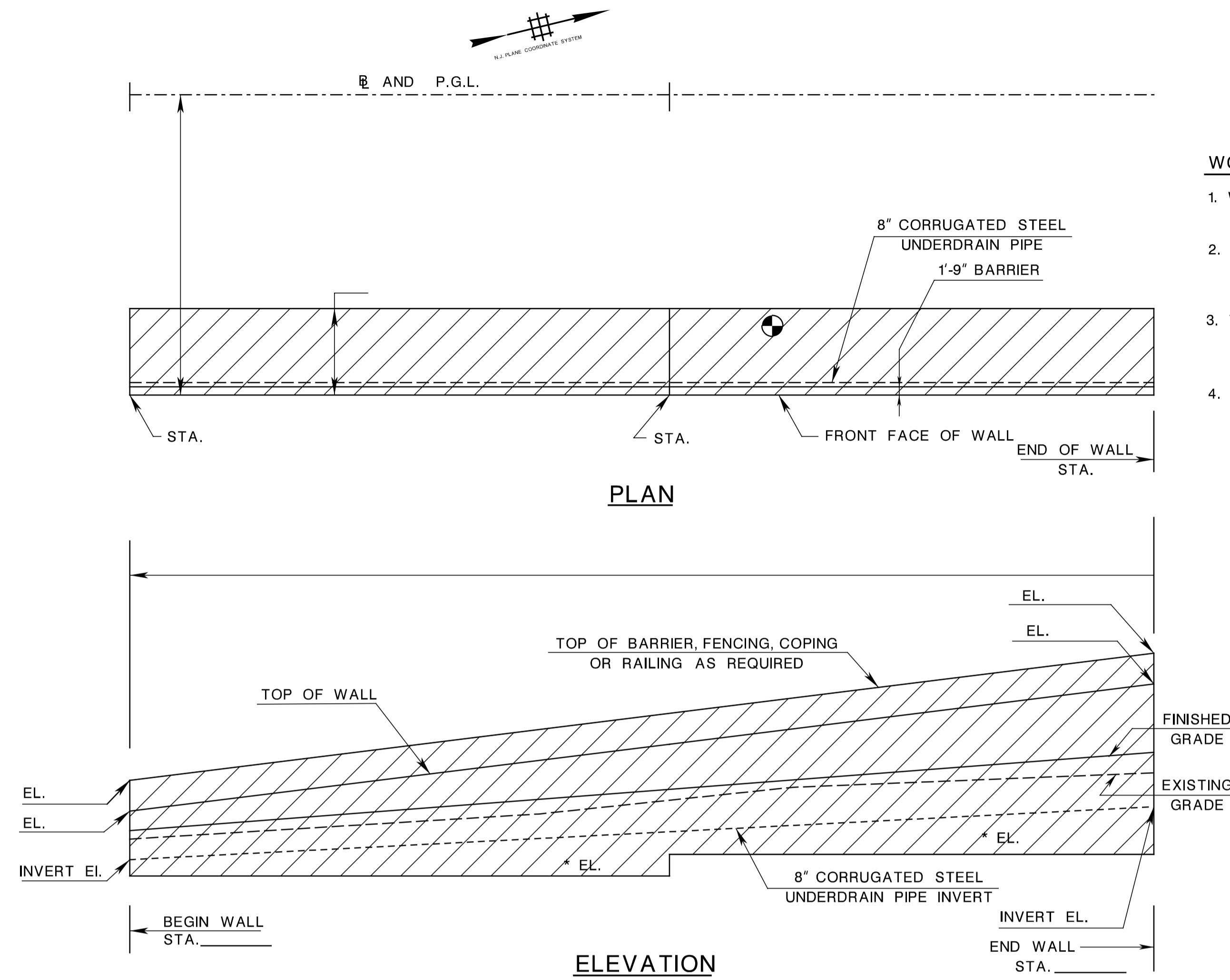
WORKING ITEMS:

1. WORK ITEMS WILL BE GOVERNED BY THE APPROPRIATE SECTIONS OF THE SPECIFICATIONS.
2. ALL ITEMS OF WORK TO COMPLETE THE COMMON STRUCTURE VOLUME SHALL BE FULLY DETAILED ON THE SHOP DRAWINGS AND SHALL BE CONSISTENT WITH THE DETAILS SHOWN ON THESE PLANS AND SPECIFICATIONS.
3. TEMPORARY SHEETING DESIGN AND INSTALLATION, IF REQUIRED, BE INCLUDED AS A SEPARATE ITEM AND ON A SEPARATE WORKING DRAWING FROM THE RETAINING WALL.
4. ROADWAY EXCAVATION IS NOT INCLUDED AS A WORK ITEM AND IS PAID FOR SEPARATELY.

GENERAL NOTES:

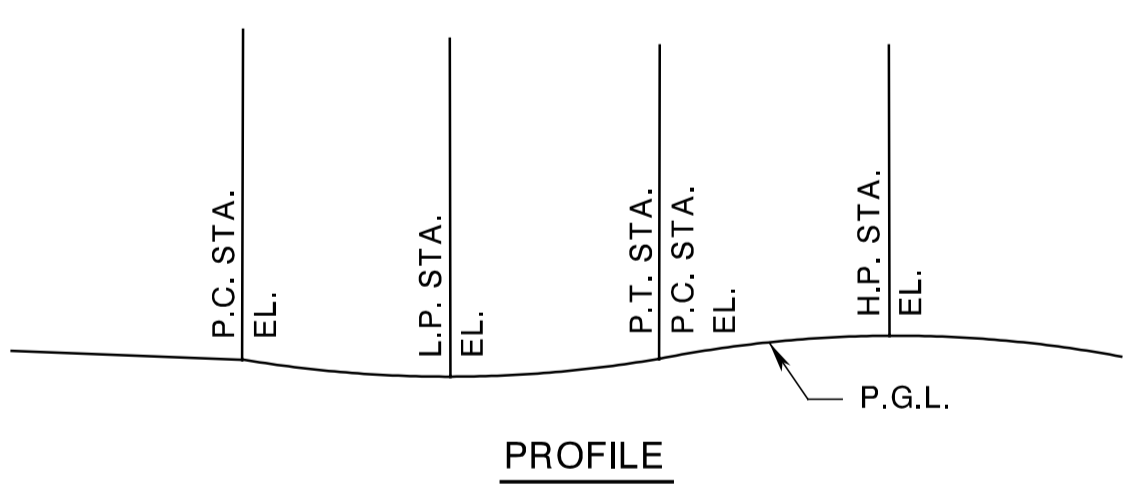
1. DESIGN SPECIFICATIONS
 - (A) 1996 (16TH EDITION) AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES (WITH CURRENT INTERIMS) AS MODIFIED BY SECTION 3A OF NJDOT DESIGN MANUAL FOR BRIDGES AND STRUCTURES.
 - (B) SEISMIC PERFORMANCE CATEGORY (SPC) = B.
ACCELERATION COEFFICIENT "A" = _____
SOIL PROFILE = _____
2. CONSTRUCTION SPECIFICATIONS
THE NJDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION WITH CURRENT SUPPLEMENTAL SPECIFICATIONS, AS MODIFIED BY THE SPECIAL PROVISIONS.
3. LIVE LOADINGS
LIVE LOAD SURCHARGE EQUAL TO 2'-0" OF EARTH PRESSURE.
4. LIVE LOAD DESIGN STRESSES
 - (A) SPECIFIED DESIGN COMPRESSIVE STRENGTHS (f'c)
CLASS A CONCRETE (PARAPETS) -----4,000 PSI
CLASS B CONCRETE (FOOTINGS, LEVELING PADS) -----3,000 PSI
CLASS P CONCRETE (PRECAST UNITS)-----5,000 PSI
 - (B) CLASS DESIGN STRENGTHS
CLASS A CONCRETE (PARAPETS) -----4,600 PSI
CLASS B CONCRETE (FOOTINGS, LEVELING PADS)-----3,700 PSI
CLASS P CONCRETE (PRECAST UNITS)-----5,500 PSI
 - (C) ALLOWABLE STRENGTHS, EXTREME FIBER IN COMPRESSION (fc)
CLASS A CONCRETE (PARAPETS) -----1,600 PSI
CLASS B CONCRETE (FOOTINGS, LEVELING PADS) -----1,200 PSI
CLASS P CONCRETE (PRECAST UNITS)-----2,000 PSI
5. REINFORCEMENT STEEL
ASTM A615 (GRADE 60) (Fs) = 24,000 PSI
6. BORINGS
 - INDICATES LOCATION OF BORINGS
 - LOG NO. _____
7. PREAPPROVED ALTERNATES:
AT THIS LOCATION, ALTERNATE WALL TYPES ARE PERMITTED. LISTED BELOW ARE THE WALL TYPES THAT MAY BE USED
 - PREFABRICATED MODULAR WALLS
 - MECHANICALLY STABILIZED EARTH WALL
 - ALTERNATE RETAINING WALL
8. WALLS SHALL BE DESIGNED USING THE FOLLOWING PARAMETERS :
 SLIDING FACTOR OF SAFETY1.5
 OVERTURNING FACTOR OF SAFETY2.0

* The note should be modified to reflect applicable year and updated Specifications.

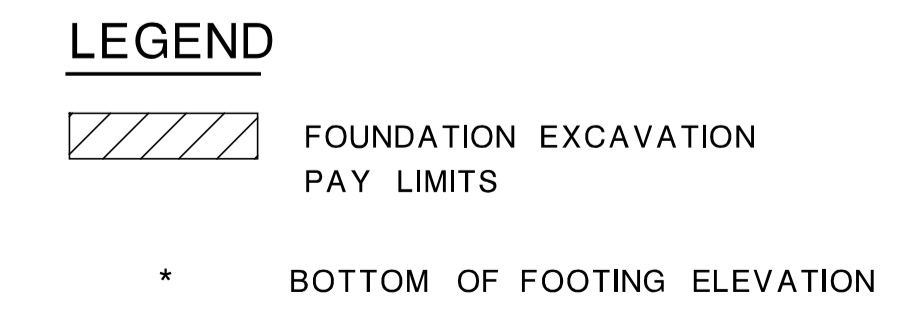


WORK ITEMS - WALL 1				
FOR INFORMATION ONLY (Price to be included in Wall Items)				
DESCRIPTION	UNIT	APPROXIMATE QUANTITY		
		**	**	**
FOUNDATION EXCAVATION	C.Y.			
CONCRETE LEVELING PAD	L.F.			
CONCRETE IN STRUCTURES, FOOTINGS	C.Y.			
CONCRETE IN SUPERSTRUCTURES, PARAPET (BARRIER CURB)	L.F.			
POROUS FILL I-9	C.Y.			
8" CORRUGATED STEEL UNDERDRAIN PIPE	L.F.			
SPECIFIED BACKFILL	C.Y.			
PRECAST WALL ELEMENT	S.F.	***	***	***
BORROW EXCAVATION, ZONE-3	C.Y.			
(1)				
(1)				

(1) ADD ITEMS AS REQUIRED ** INSERT THE NAMES OF ALL FEASIBLE WALL TYPES
 *** THE LIMIT OF THIS QUANTITY EXTENDS FROM TOP OF THE LEVELING PAD TO THE BOTTOM OF THE CONCRETE BARRIER



CURVE DATA			
CURVE NO. 1	P.C.	P.I.	P.T.
STATION			
BEARING			
COORDINATES			



ESTIMATE OF QUANTITIES - WALL 1				
PAY ITEM NO.	STANDARD ITEM NO.	DESCRIPTION	UNIT	CONTRACT QUANTITY
		RETAINING WALL, LOCATION NO.	S.F.	
		NO ITEM		
		NO ITEM		
		NO ITEM		

CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	
IN CHARGE OF _____	

BDC04MB-01

STANDARD DRAWING PLATE 2.10-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

WALL 1
SAMPLE CONTROL PLAN (SHEET 1)

ROUTE : SECTION :

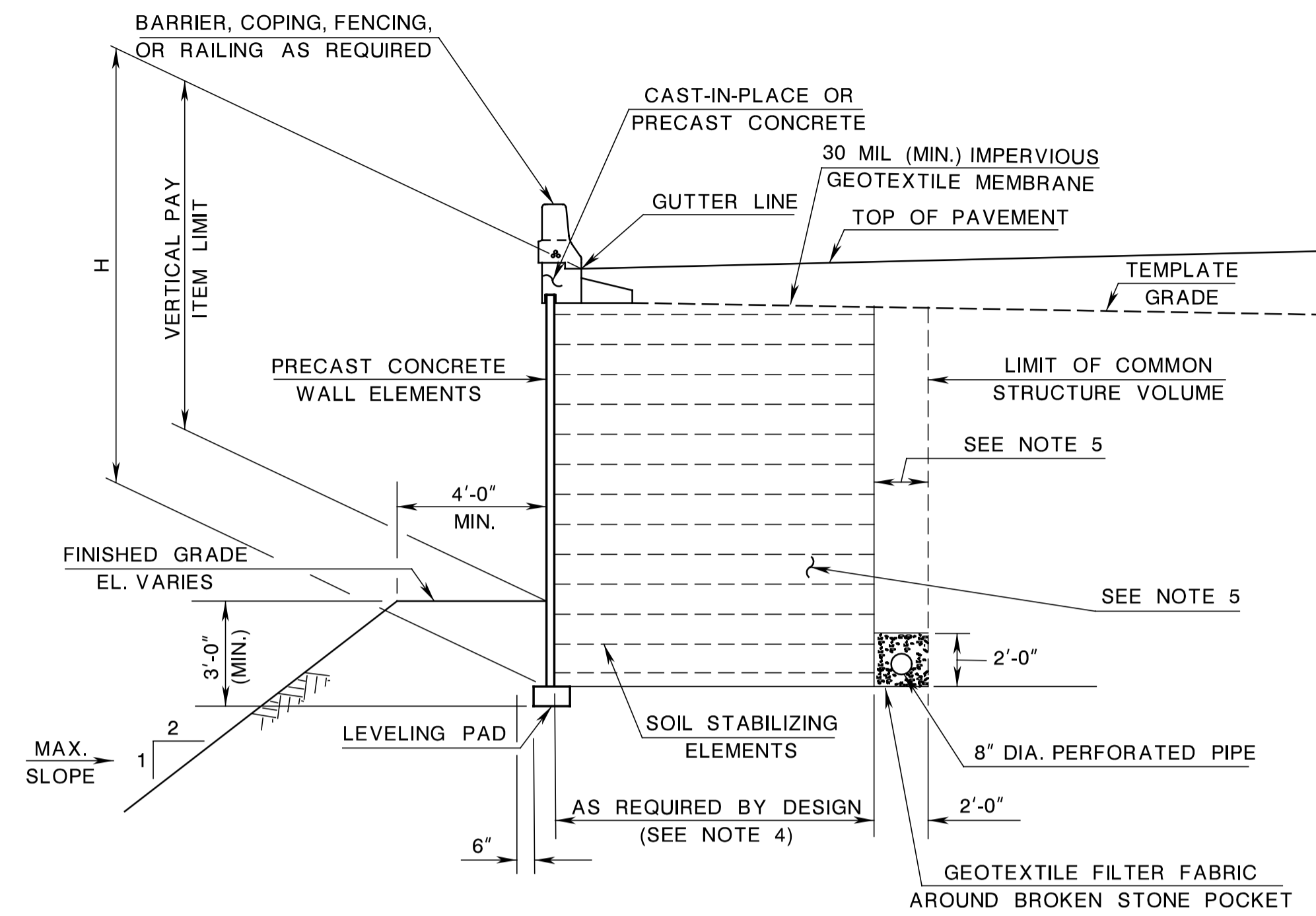
MUNICIPALITY COUNTY

SCALE : NONE

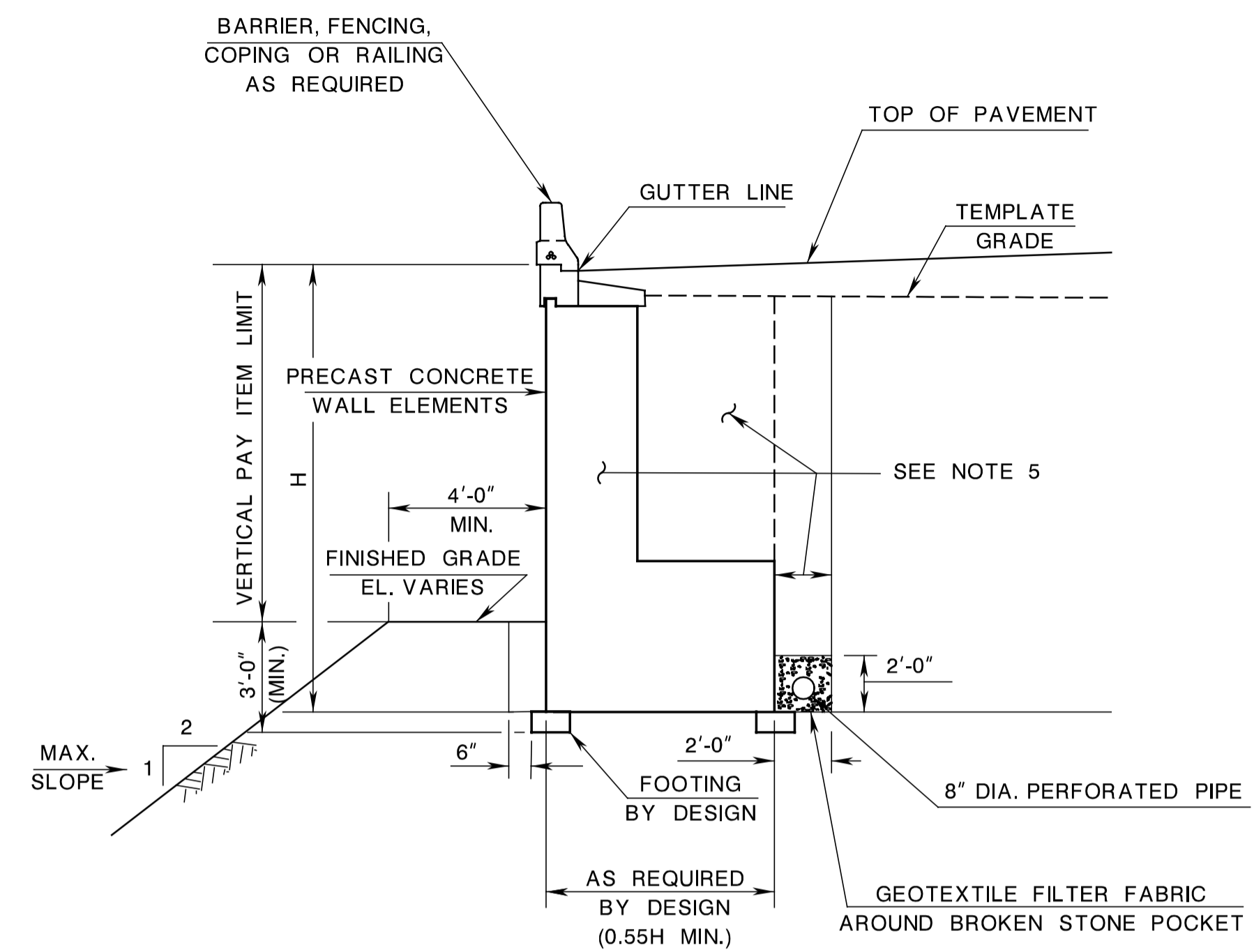
BRIDGE SHEET NO. OF

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 ID= 16412300

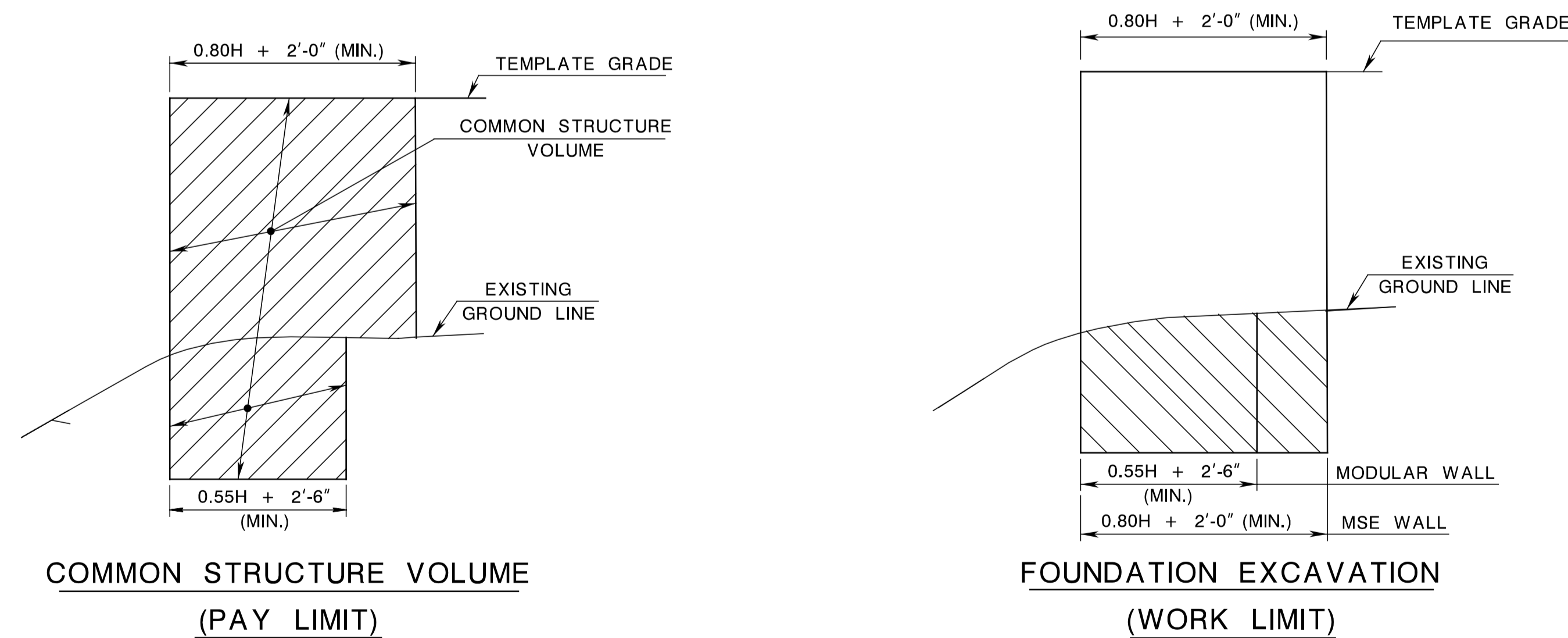
STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			



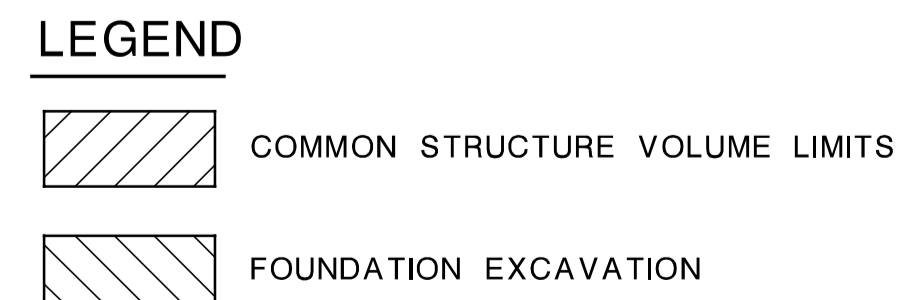
TYPICAL SECTION
MECHANICALLY STABILIZED EARTH WALL



TYPICAL SECTION
PREFABRICATED MODULAR WALL



LIMITS FOR PROPRIETARY WALL
IN CUT AND FILL SECTION



NOTES:

- PAYMENT FOR REINFORCEMENT IN FOOTINGS, BARRIER, COPING, AND PARAPETS SHALL BE INCLUDED IN THE RESPECTIVE WORK ITEMS. THE REINFORCEMENT STEEL IN BARRIER, COPING AND PARAPETS SHALL BE CORROSION PROTECTED. (REFER TO SECTION 26 OF THIS MANUAL FOR TYPES OF CORROSION PROTECTED REINFORCEMENT STEEL THAT CAN BE USED)
- FOR MSE WALLS, PROVISION OF AN IMPERVIOUS MEMBRANE UPON COMPLETION OF THE SPECIFIED BACKFILL PLACEMENT OR PROVISION OF FILLER MATERIAL OR FILTER FABRIC AT THE LOCATION OF VERTICAL AND HORIZONTAL JOINTS BETWEEN PANELS SHOULD BE VERIFIED BY THE MANUFACTURER. REFER TO SUBSECTION 520.02 OF THE SPECIFICATIONS FOR GUIDANCE.
- REFER TO SUBSECTION 520.02 OF THE STANDARD SPECIFICATIONS FOR DIRECTION ON THE TYPE OF GEO-MEMBRANE THAT SHALL BE INSTALLED. THE MEMBRANE SHALL BE PLACED SO THAT IT DRAINS AWAY FROM THE FACE OF THE WALL.
- AS REQUIRED BY DESIGN, A MINIMUM OF 0.7H SHALL BE USED TO SATISFY REINFORCEMENT LENGTH REQUIREMENTS. 0.8H PLUS 2'-0" SHALL BE USED TO SATISFY COMMON STRUCTURE VOLUME REQUIREMENTS.
- POROUS FILL OR BROKEN STONE MAY BE USED AS BACKFILL MATERIAL. (REFER TO SUBSECTION 520.02.6 OF THE SPECIFICATIONS).

THIS SHEET FOR DESIGN
INFORMATION ONLY.
NOT TO BE INCLUDED
IN CONTRACT PLANS
PLATE 2.10-2

CONTROL SECTION	JOB NO.
DES. BY	CHK. BY
DWN. BY	CHK. BY
EST. BY	CHK. BY
SPECS. BY	
IN CHARGE OF	

BDC04MB-01

STANDARD DRAWING PLATE 2.10-2

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

WALL 1
SAMPLE CONTROL PLAN (SHEET 2)

ROUTE : SECTION :

MUNICIPALITY COUNTY

SCALE : NONE

BRIDGE SHEET NO. OF

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ID = 16412300

STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			

INDEX OF DRAWINGS	
SHEET NO.	DESCRIPTION
B1	GENERAL PLAN & ELEVATION
B2	CULVERT DETAILS
B3	POST-TENSIONING DETAILS
B4	CAST-IN-PLACE CONCRETE APRON, EXCAVATION & GUIDERAIL DETAILS
B5	CAST-IN-PLACE GUTTERWALL & FOOTING DETAILS

HYDRAULIC AND HYDROLOGIC DATA	
DRAINAGE AREA (MI ²)	
DESIGN DISCHARGE (FT ³ /S)	
DESIGN WATER SURFACE ELEVATION (FT)	
ENERGY LINE ELEVATION (FT)	
FREQUENCY	50 YR, 100 YR.

GENERAL NOTES

- DESIGN SPECIFICATIONS:

1996 AASHTO Specifications for Highway Bridges (with current interims) as modified by Section 3A of NJDOT Design Manual for Bridges and Structures
- CONSTRUCTION SPECIFICATIONS:

The NJDOT Standard Specifications for Road and Bridge Construction with current Supplemental Specifications, as modified by the Special Provisions.
- LIVE LOAD:

AASHTO HS20 + 25% (HS 25) or tandem 24 KIPS axles at 4'-0" centers, whichever governs.
- CONCRETE DESIGN STRESSES:

(a) Specified Design Compressive Strength (f'c)

(In accordance with the Retest Limit for Pay-adjustment Item as specified in Table 914-4 of the NJDOT Standard Specifications and as modified by the Bridge Special Provisions)

Class A.....4,000 PSI
 Class B.....3,000 PSI
 Class P.....5,000 PSI

(The retest limit for non-pay-adjustment shall be as specified on the last line of Table 914-4 of the NJDOT Standard Specifications and as modified by Bridge Supplementary Specifications.)

(b) Class Design Strengths:

(In accordance with Table 914-3 of the NJDOT Standard Specifications)

Class A.....4,600 PSI
 Class B.....3,700 PSI
 Class P.....5,500 PSI

(c) Allowable Stress, Extreme Fiber in Compression (fc)

Class A.....1,600 PSI
 Class B.....1,200 PSI
 Class P.....2,000 PSI
- REINFORCEMENT STEEL:

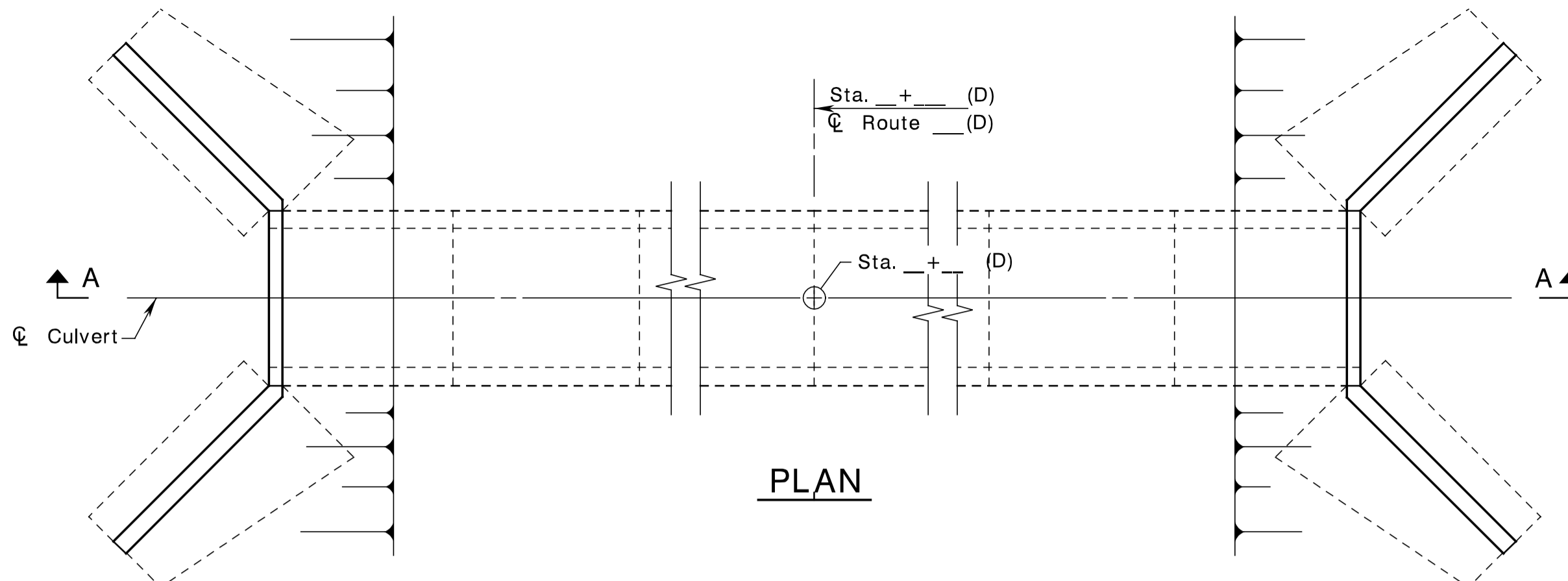
(a) ASTM A615 (Grade 60) (fs) = 24,000 PSI

Top mat of rebars shall be corrosion protected if earth fill over the precast unit is less than 2'-0". (Refer to section 26 of this manual for types of corrosion protected reinforcement steel that can be used)
- Provide 1/2" Dia. 7 wire Grade 270 conforming to AASHTO M203 or 3/4" Dia. high tensile strength steelbars conforming to AASHTO M275. No splices to be permitted.
- Install strands in precast sections. Stress each strand to a tension of 30 KSI over the cross section of any section.
- BORINGS:

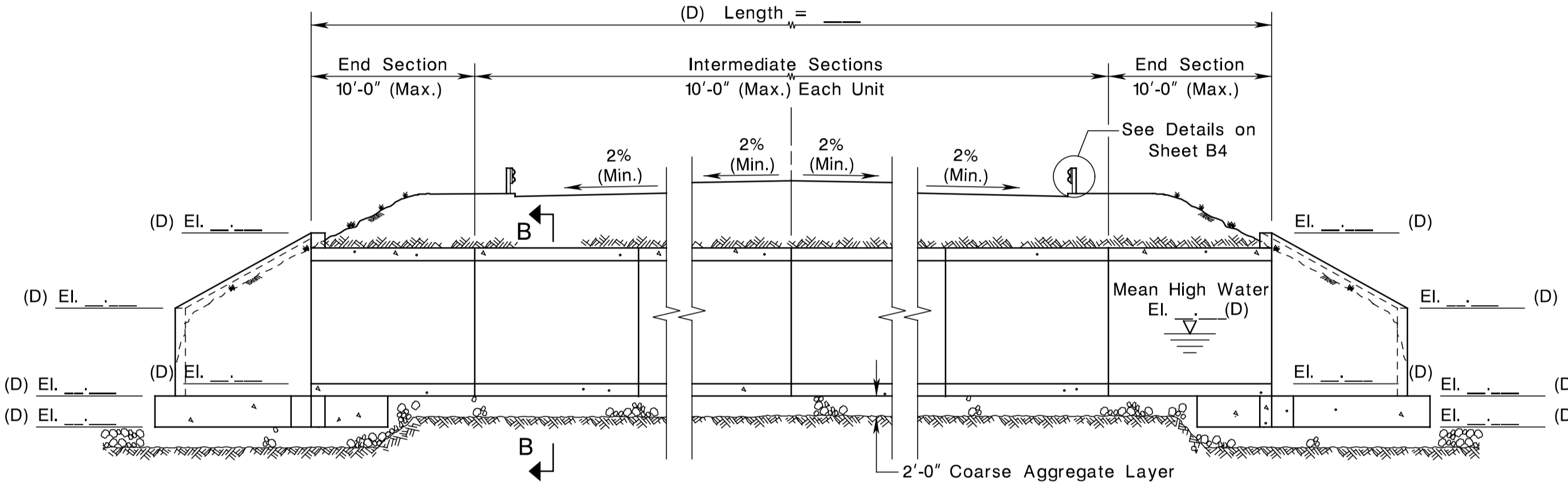
(a) Indicates location of borings
 Log No.
- FOUNDATION DESIGN CRITERIA

(Summary on Project to Project Basis)
- Estimated Cost \$ (D) Based on (Insert Year) prices.

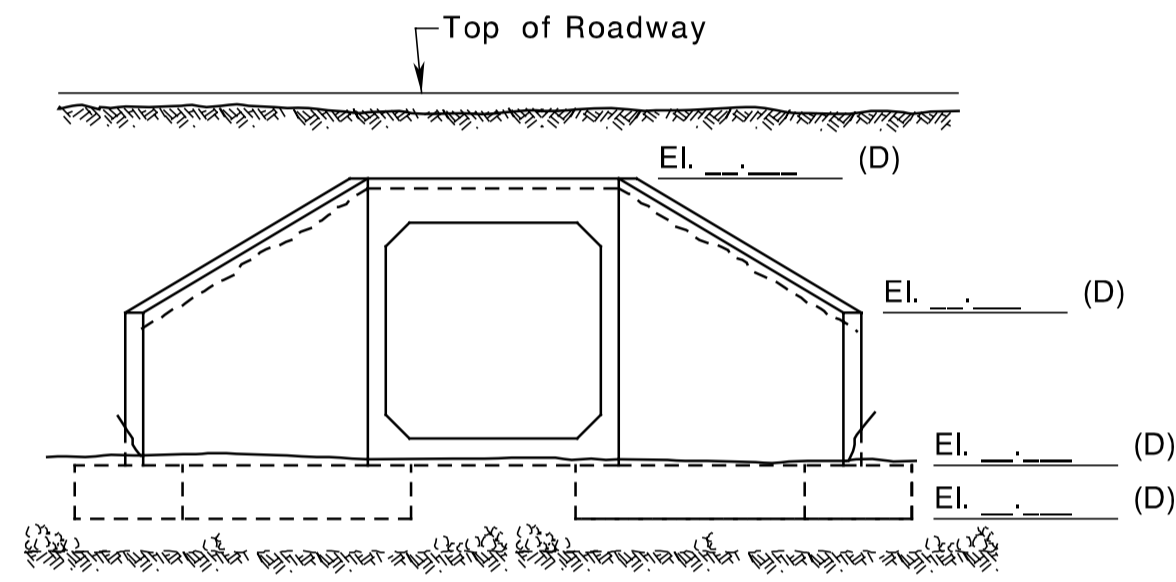
* The note should be modified to reflect applicable year and updated Specifications.
 ** Remove this note at final submission.



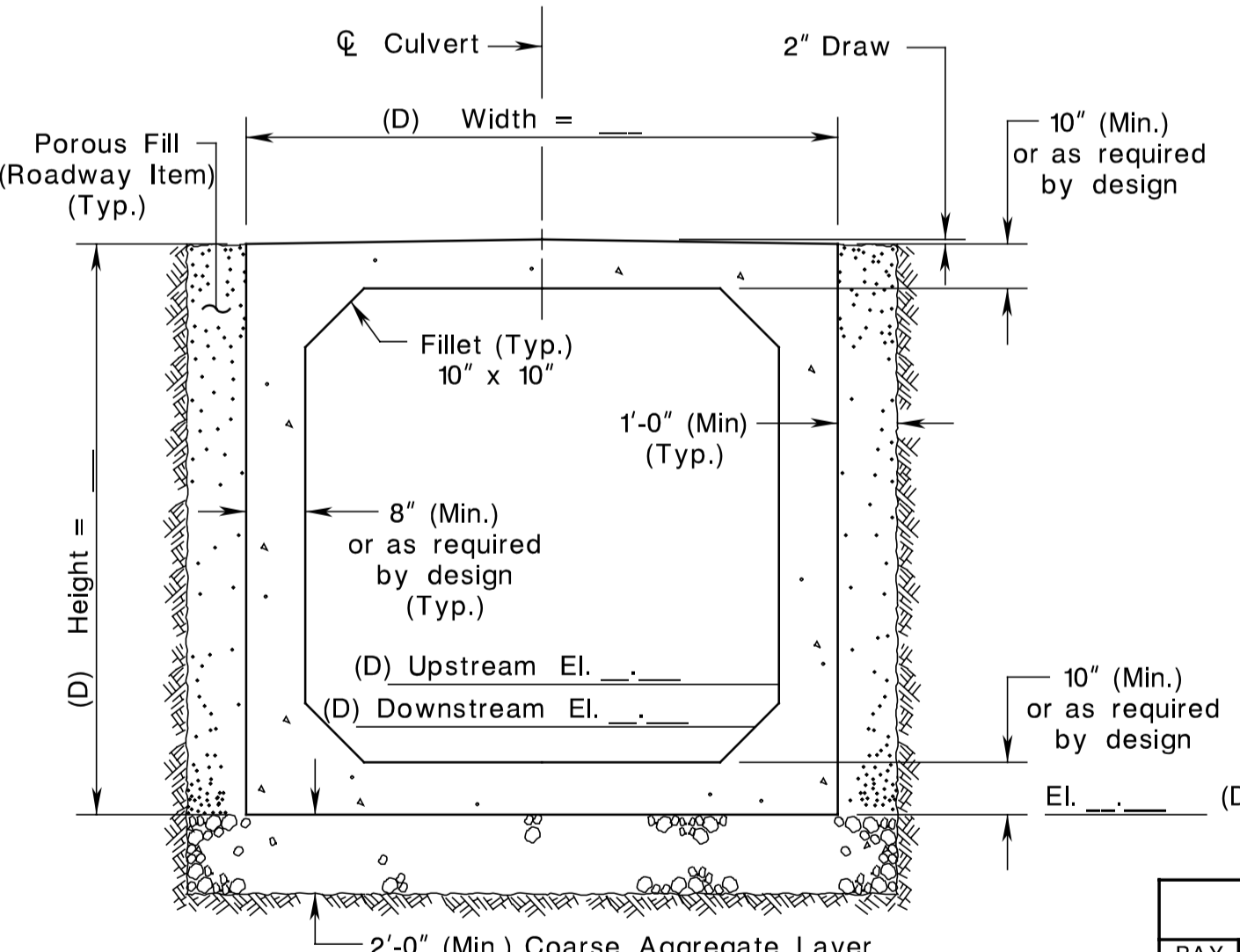
PLAN



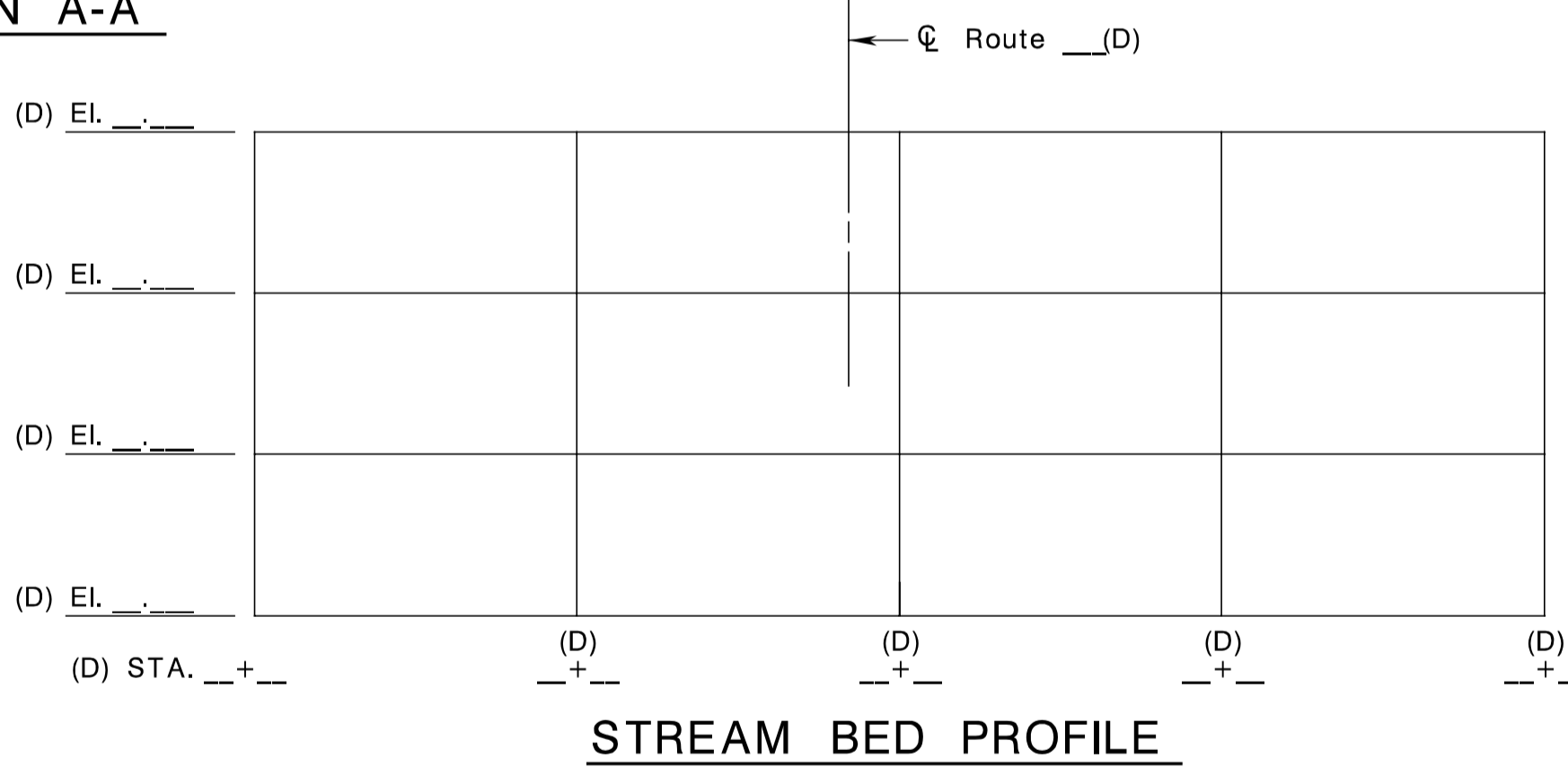
SECTION A-A



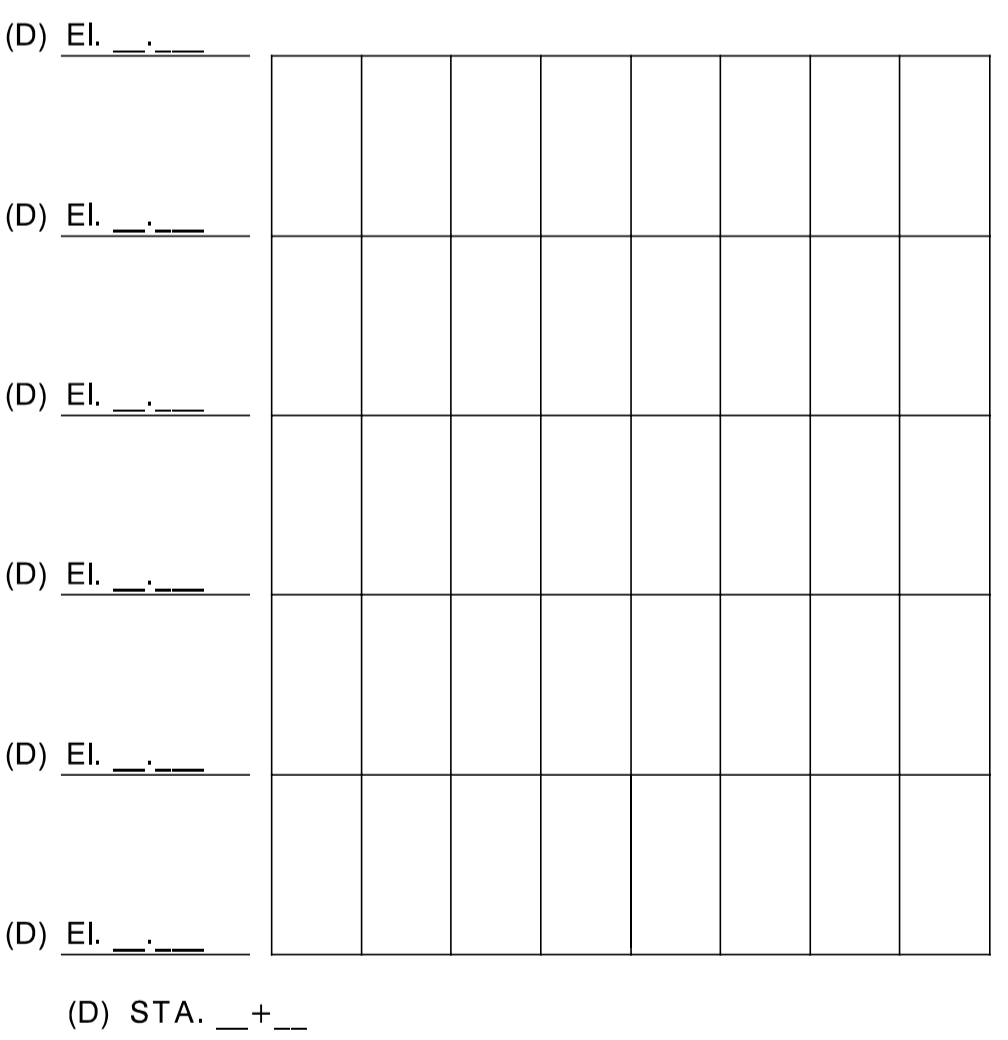
SIDE ELEVATION



SECTION B-B



STREAM BED PROFILE



PROPOSED PROFILE

SUMMARY OF QUANTITIES				
PAY ITEM NO.	STANDARD ITEM NO.	DESCRIPTION	UNIT	CONTRACT QUANTITY
		CLEARING SITE, STRUCTURE (CULVERT)	LUMP SUM	
		COARSE AGGREGATE LAYER	C.Y.	
		BRIDGE EXCAVATION	C.Y.	
		FOUNDATION EXCAVATION	C.Y.	
		COFFERDAMS	LUMP SUM	
		REINFORCED CONCRETE BOX CULVERT, PRECAST	L.F.	
		CONCRETE IN STRUCTURES, FOOTINGS	C.Y.	
		CONCRETE IN STRUCTURES, RETAINING WALLS	C.Y.	
		REINFORCEMENT STEEL IN STRUCTURES	LBS.	
		REINFORCEMENT STEEL IN STRUCTURES, EPOXY COATED	LBS.	

- NOTE TO THE DESIGNER:**
- The designer shall complete all the title block information and items designated with (D) for including any PLATES into the contract plans.
 - Insert or delete Pay Items as required.

CONTROL SECTION		JOB NO.	
DES. BY	CHK. BY		
DWN. BY	CHK. BY		
EST. BY	CHK. BY		
SPECS. BY	CHK. BY		
IN CHARGE OF			

BDC04MB-01

STANDARD DRAWING PLATE 2.11-1

NEW JERSEY DEPARTMENT OF TRANSPORTATION
 BUREAU OF STRUCTURAL ENGINEERING

**SINGLE CELL PRECAST R.C. BOX CULVERT
 GENERAL PLAN & ELEVATION**

ROUTE _____ SECTION _____

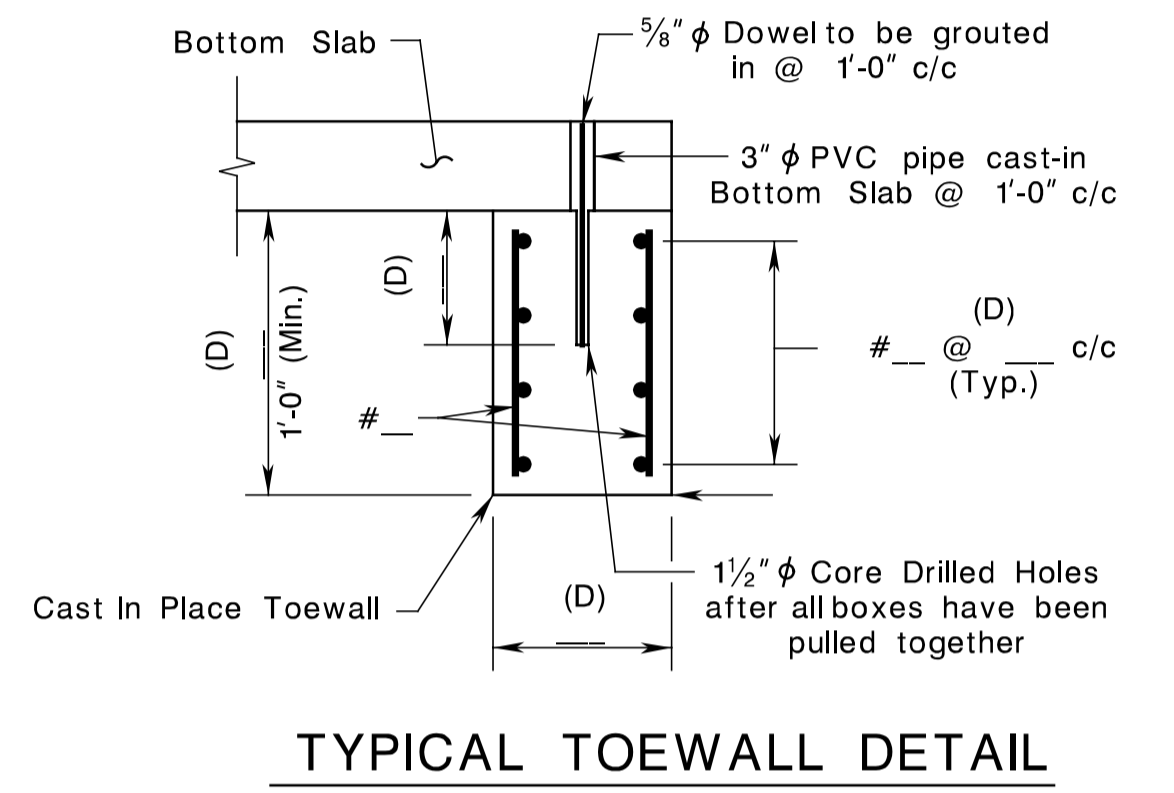
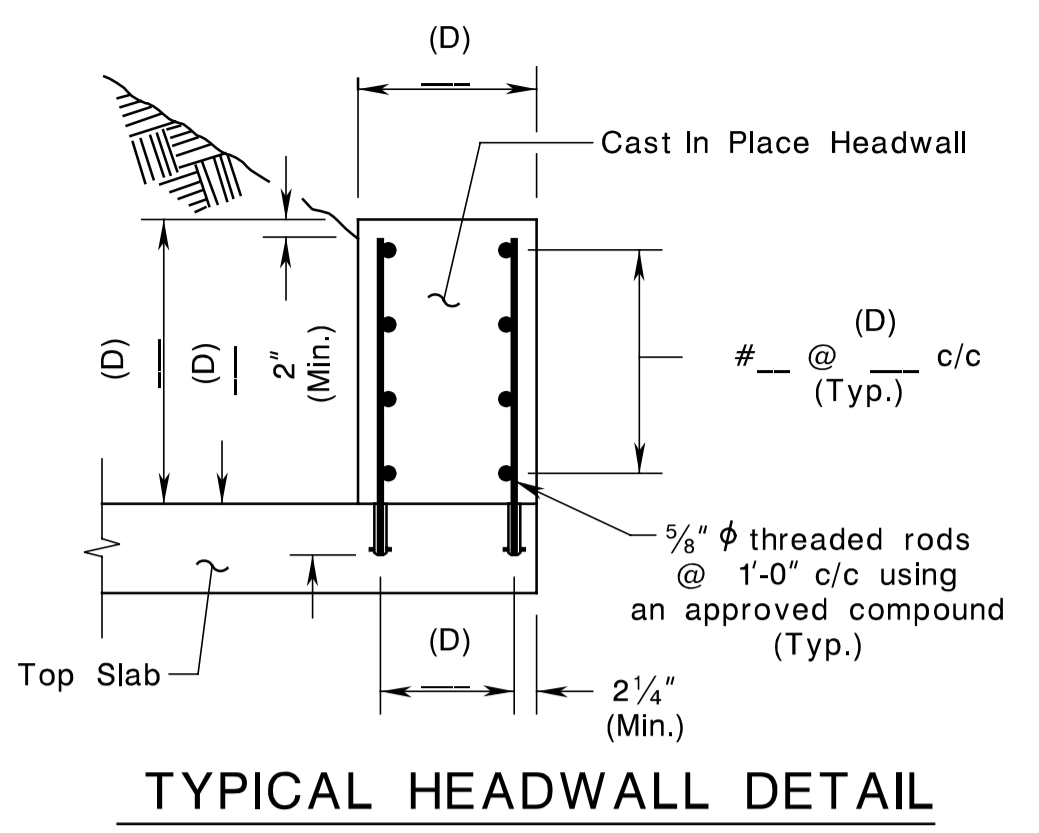
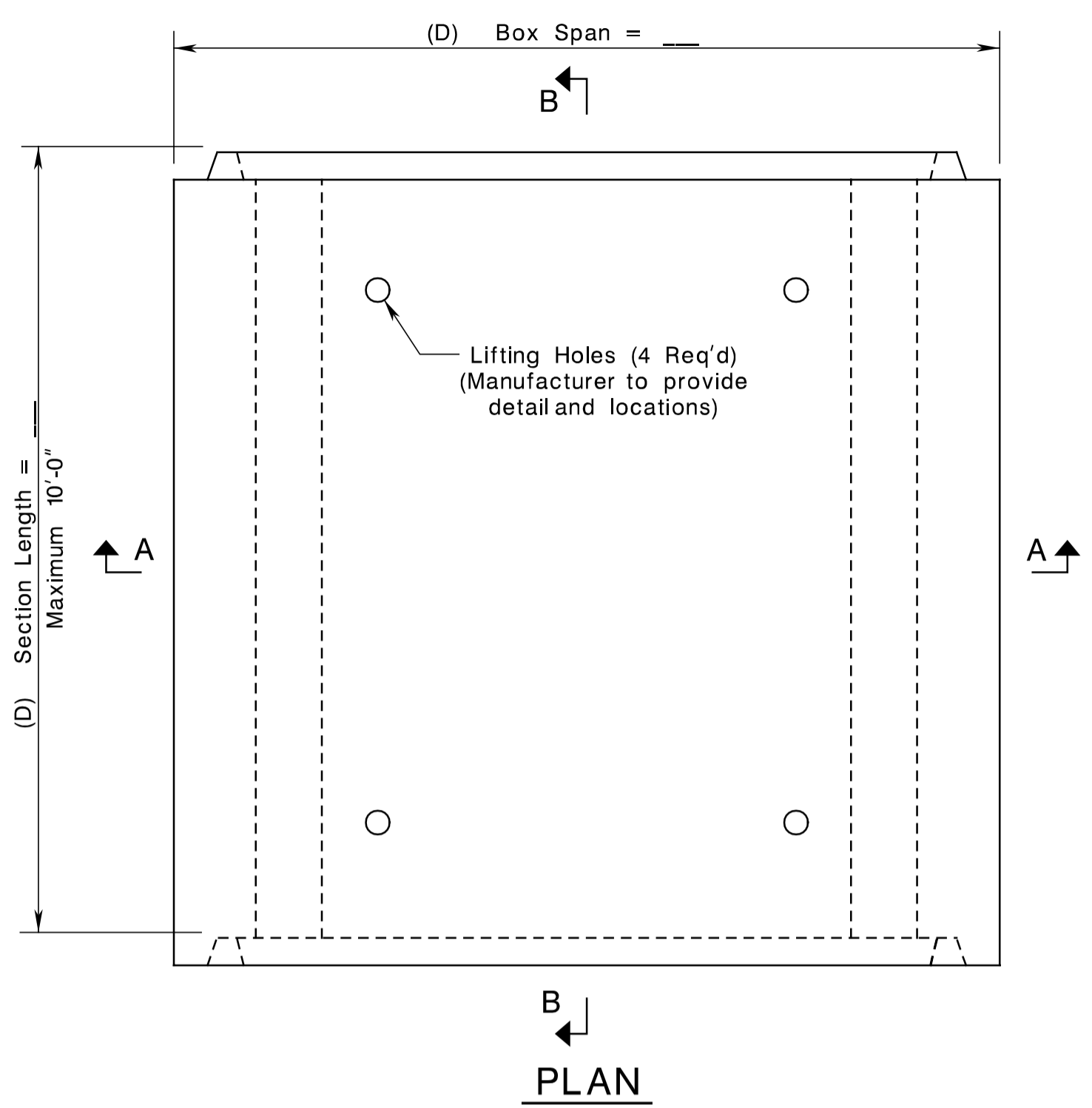
MUNICIPALITY _____ COUNTY _____

SCALE: _____

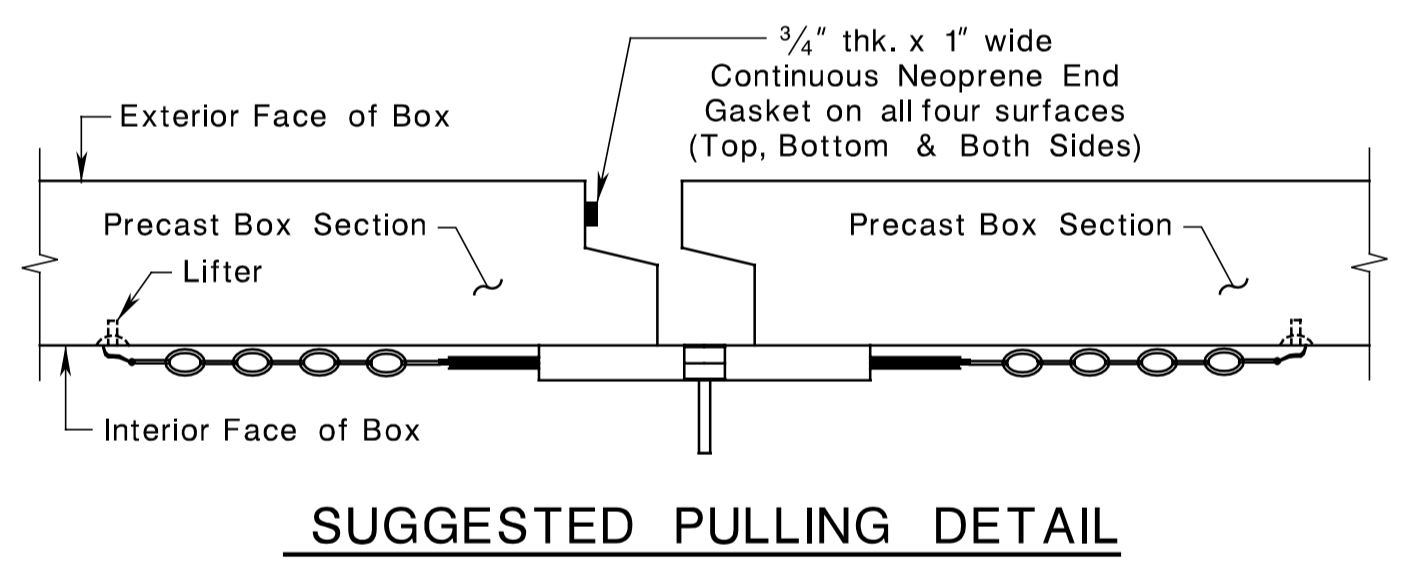
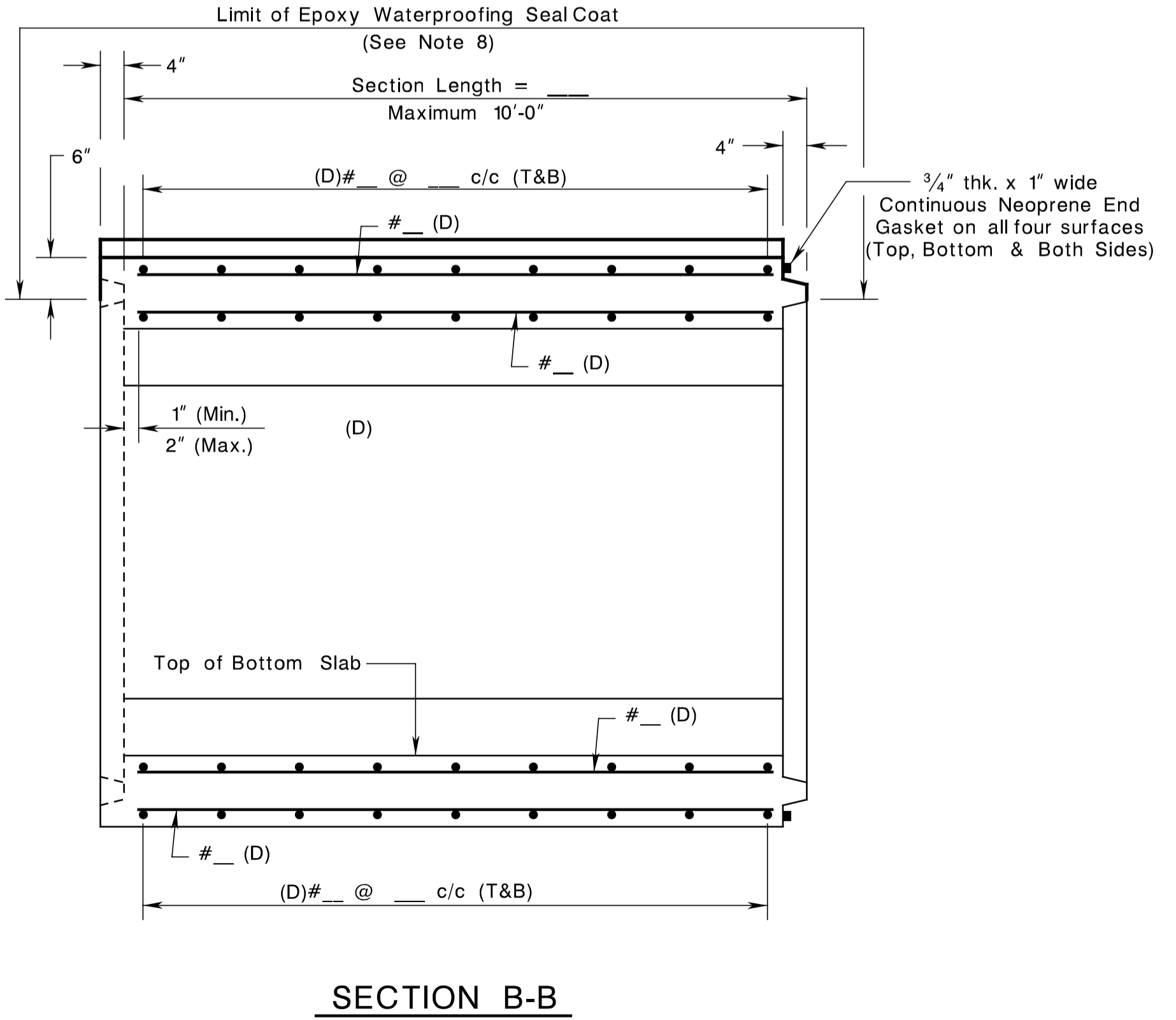
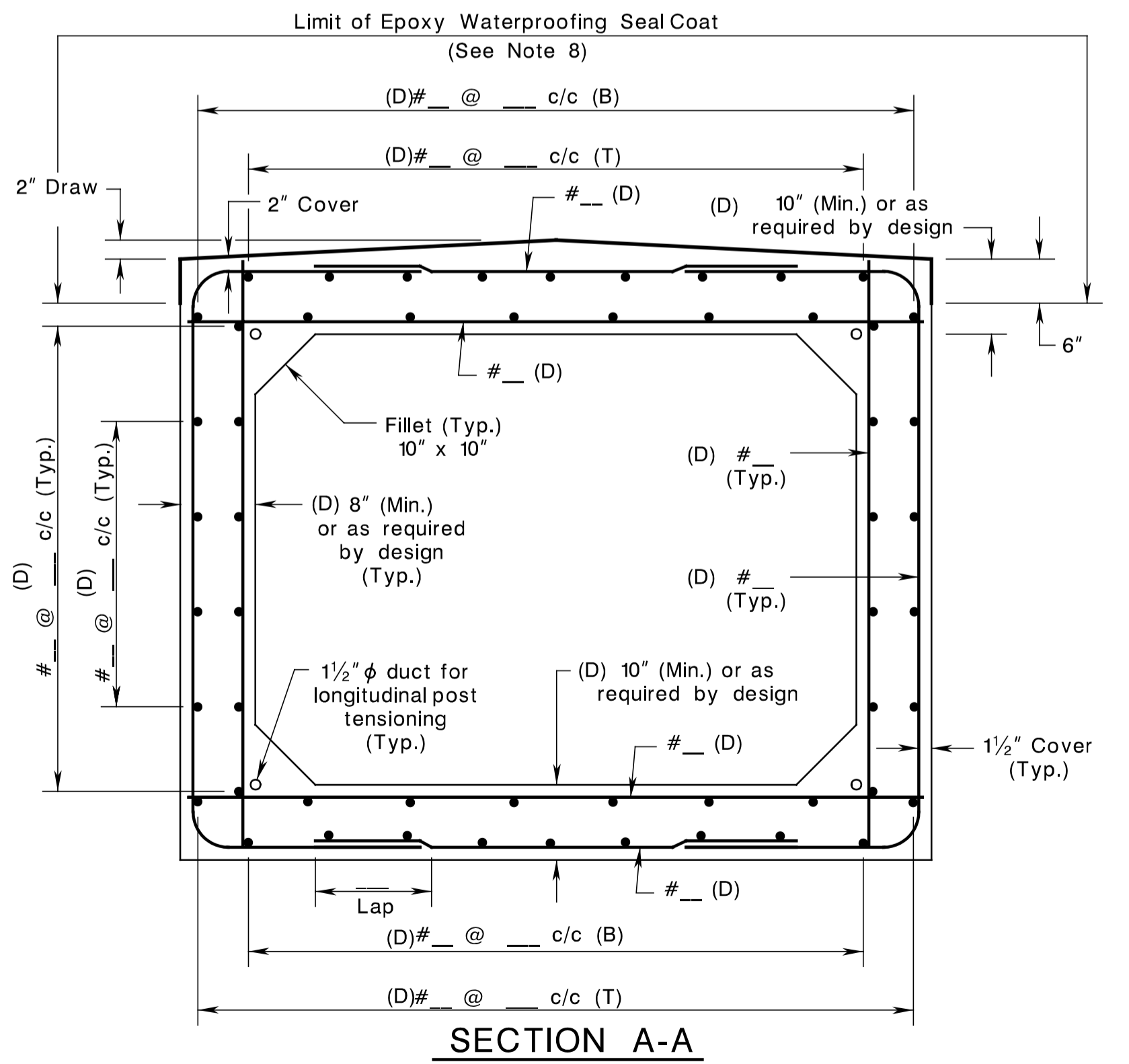
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STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			



- NOTES:**
1. Precast reinforced concrete box sections shall not be used where the top slab is to be used as a riding surface.
 2. Size and spacing of rebars shall be provided by the box culvert manufacturer and be submitted for approval. Manufacturer shall provide calculations signed and sealed by a Licensed Engineer in the State of New Jersey.
 3. Lap slices and development lengths shall be determined by the designer in accordance with current AASHTO design criteria. The top mat of reinforcement in the top slab shall be corrosion protected when the earth fill over the precast culvert is less than 2'-0". (Refer to section 26 of this manual for types of corrosion protected reinforcement steel that can be used)
 4. All lifting holes shall be filled with non-shrink grout. After the grout has cured, the area shall be coated with an epoxy waterproofing seal coat.
 5. A plastic waterstop shall be provided to prevent water from entering vertical joints between the end of precast culvert sections and any cast in place appurtenances such as wingwalls, cut off walls, aprons and cast in place culvert end sections.
 6. Precast end sections shall be approved on project to project basis. Short wall of the end section shall not be less than 3'-0".
 7. The cost of shop and field applied waterproofing seal coat shall be included in the price bid for the item, "Reinforced Concrete Box Culvert, Precast".
- (D) 8. If Cast-In-Place end sections are used, provide two rows of threaded inserts in the precast unit to facilitate the attachment of end section.
- * Designer shall provide connection details.



NOTE TO THE DESIGNER:
The designer shall complete all the title block information and items designated with (D) prior to including any PLATES into the contract plans.

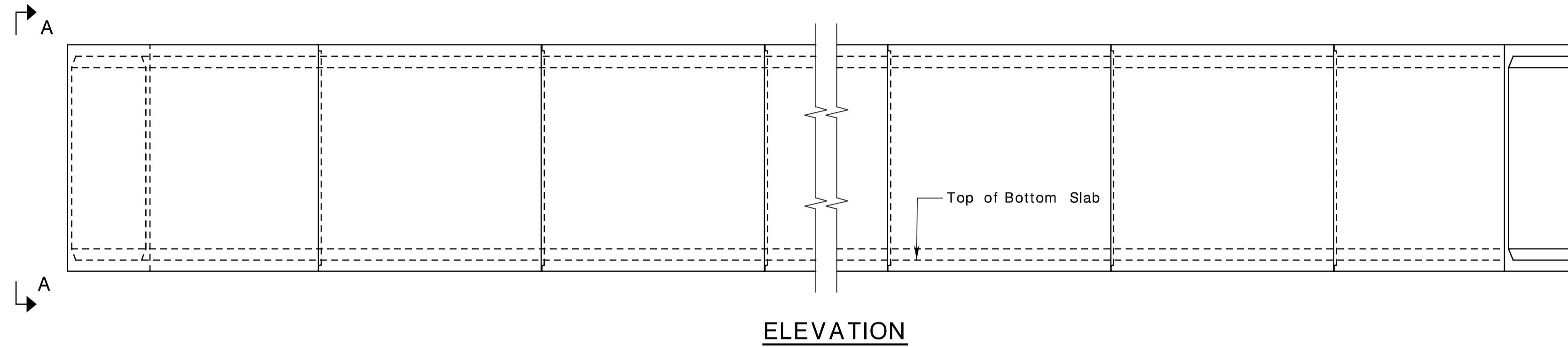
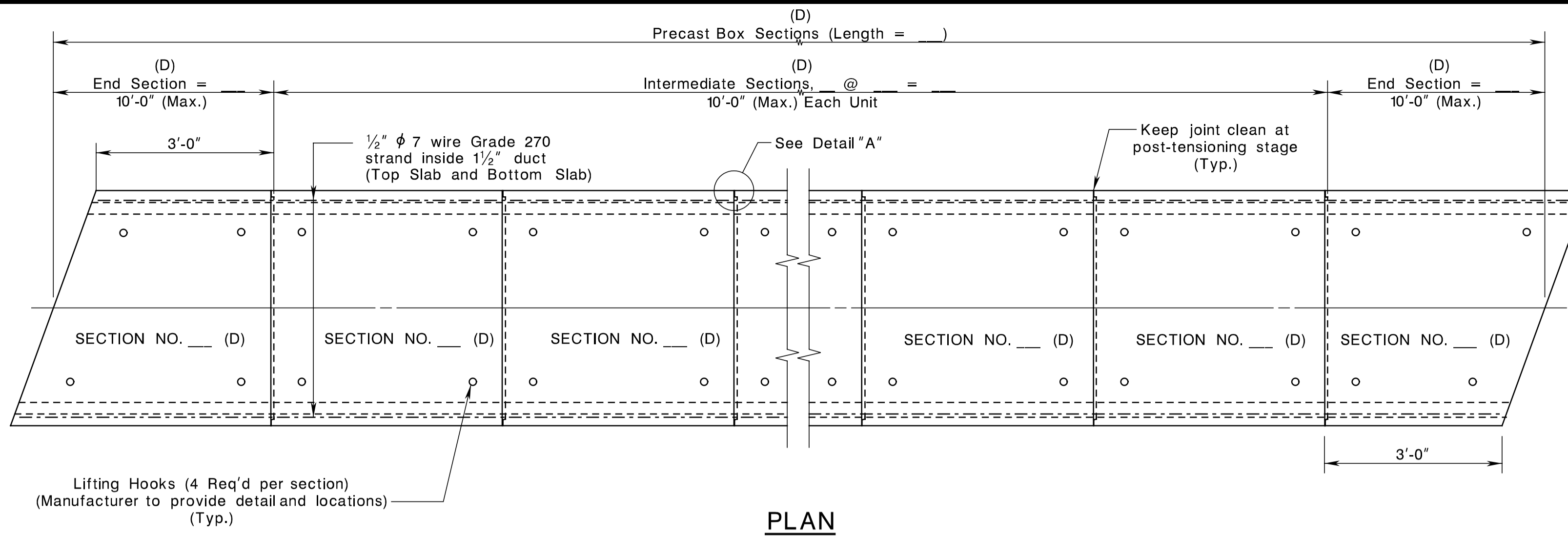
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STANDARD DRAWING PLATE 2.11-2	
NEW JERSEY DEPARTMENT OF TRANSPORTATION BUREAU OF STRUCTURAL ENGINEERING	
SINGLE CELL PRECAST R.C. BOX CULVERT CULVERT DETAILS	
ROUTE	SECTION
MUNICIPALITY	COUNTY
SCALE: _____	
SHEET NO. _____ OF _____	

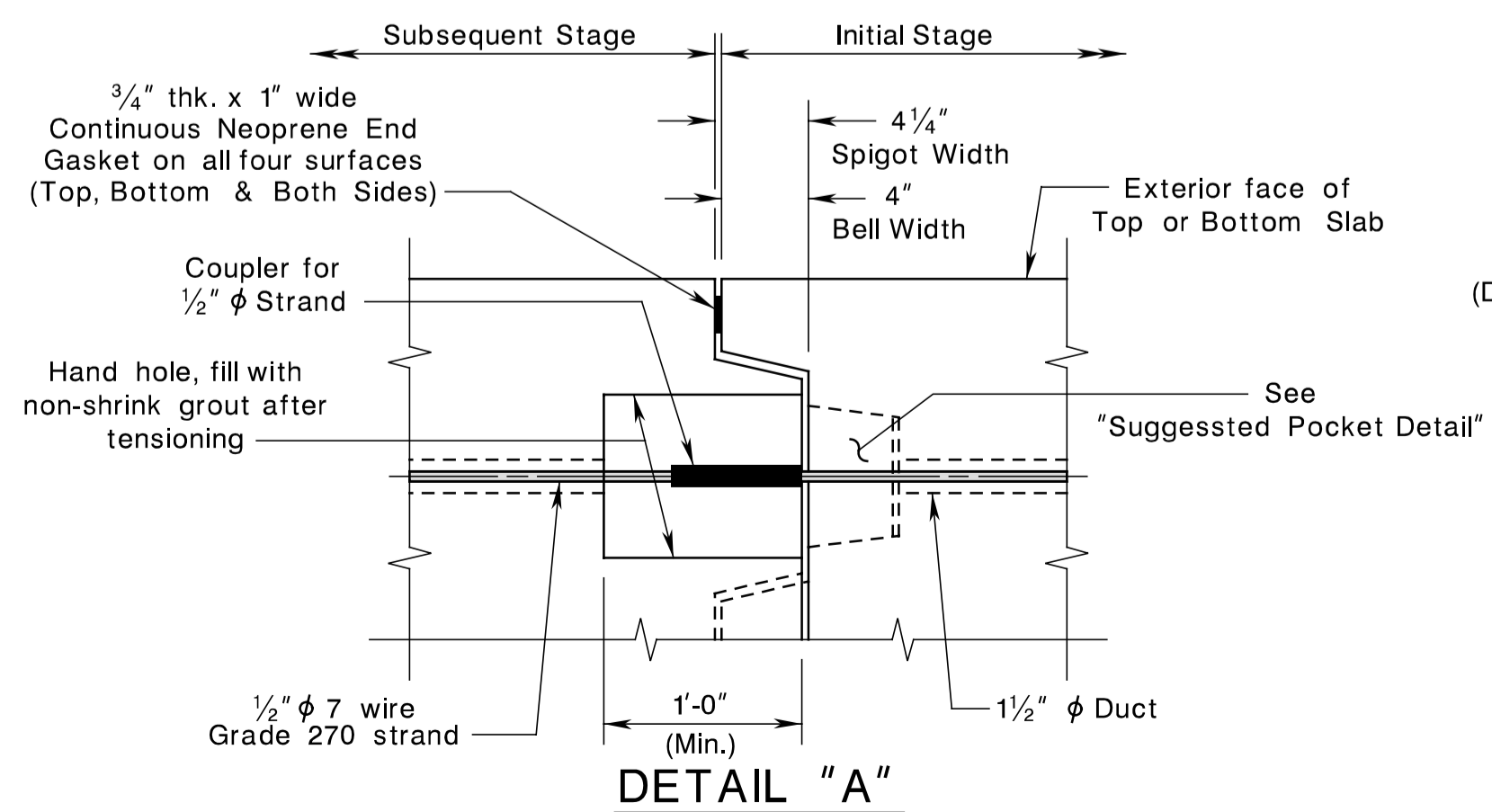
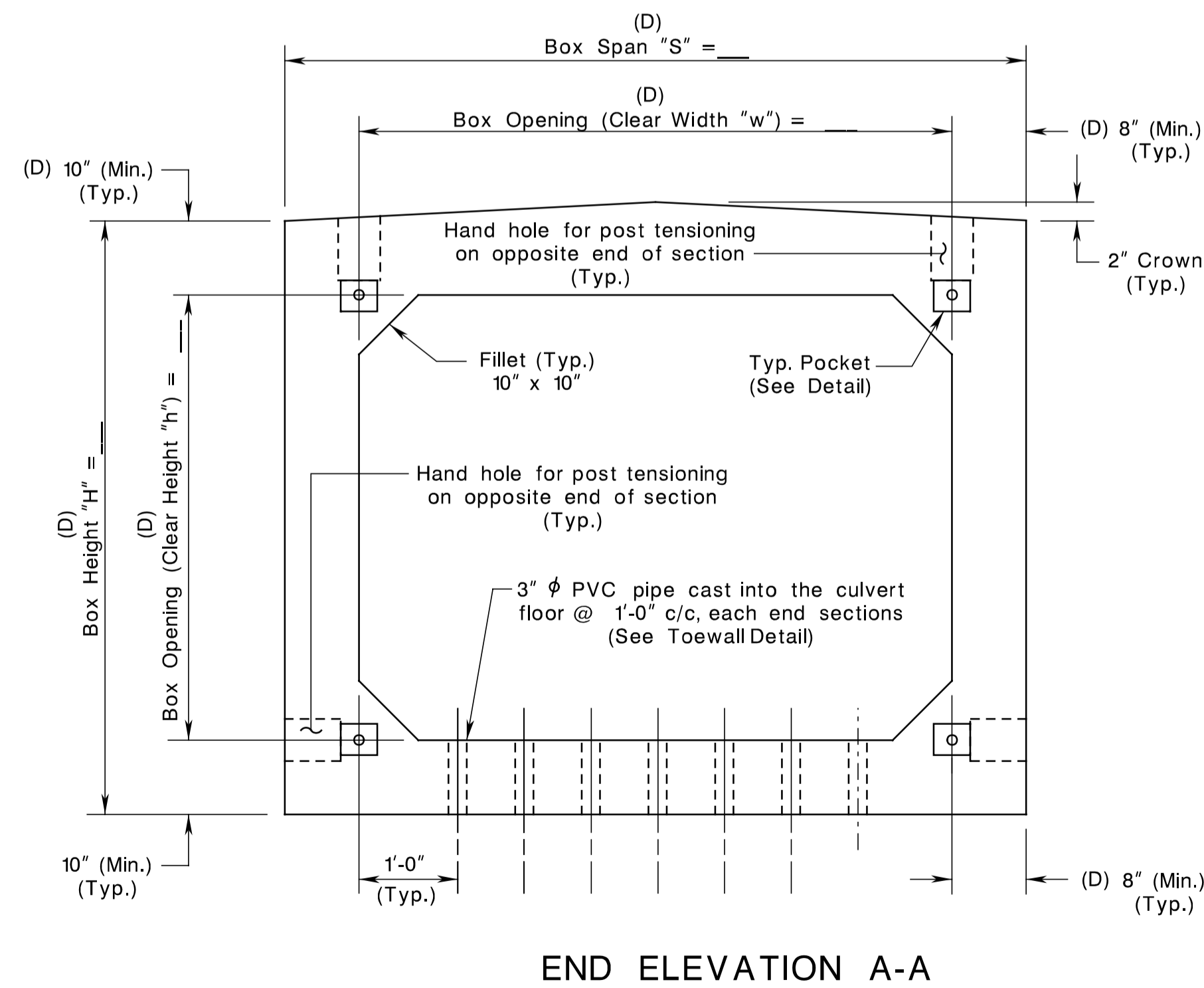
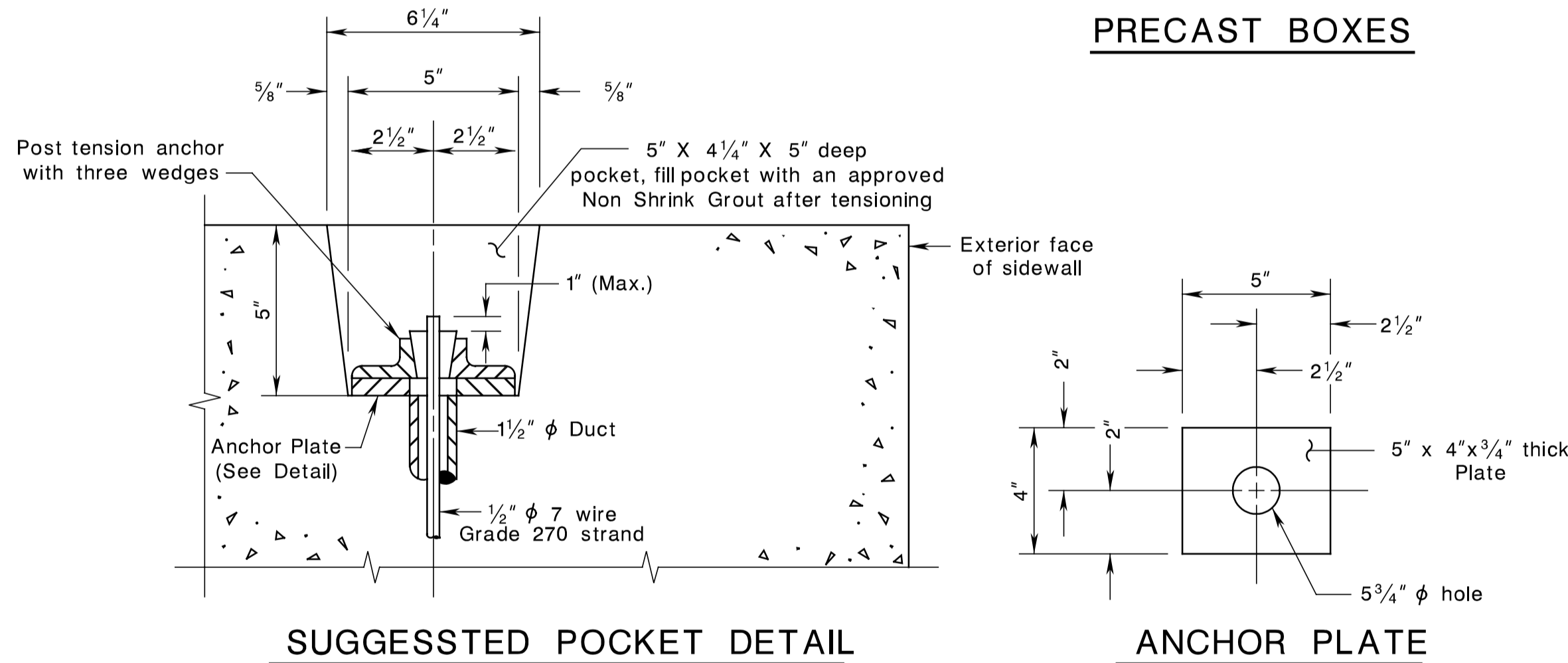
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STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			



PRECAST BOXES



NOTES:

1. Fabricator shall provide all details for post-tension connections.
2. Fabricator shall show post-tensioning procedures including stressing sequence steps.
3. Snug fit all joints before post-tensioning.
4. After tensioning, the exposed ends of the ties shall be removed so that no part of the ties, or of the end fittings, extend beyond a point 1" inside the anchorage pocket.
5. After stressing, grout all strand voids using an approved compound.
6. Provide seals or gaskets around the ducts at the joints to make the joints grout.
7. All post-tensioning must be witnessed and approved by the Engineer.
8. After post-tensioning is approved, cut strands to provide a minimum of 2 1/4" clear from outside face of concrete, coat anchorage and strands with coal tar epoxy and coat recess with epoxy bonding compound and fill with non-shrink grout. The use of epoxy bonding compound shall be in conformance with NJDOT Standard Specifications, Subsection 518.04 Subpart 2(a).
9. Post-tension and grout before backfilling and placing traffic over the box. Allow grout to achieve minimum strength before backfilling.

SECTION SCHEDULE

SECTION NO.	NO. REQUIRED	Q DIMENSION	TOTAL LENGTH	WEIGHT LBS	CUBIC YARDS
1					
2					
3					
4					
5					
6					
TOTAL					

NOTE TO THE DESIGNER:

The designer shall complete all the title block information and items designated with (D) prior to including any PLATES into the contract plans.

STANDARD DRAWING PLATE 2.11-3

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

SINGLE CELL PRECAST R.C. BOX CULVERT
POST-TENSIONING DETAILS

ROUTE _____ SECTION _____

MUNICIPALITY _____ COUNTY _____

SCALE: _____

SHEET NO. _____ OF _____

BD0202MB-02 - ORIGINAL SHEET

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EST. BY	CHK. BY
SPECS. BY	

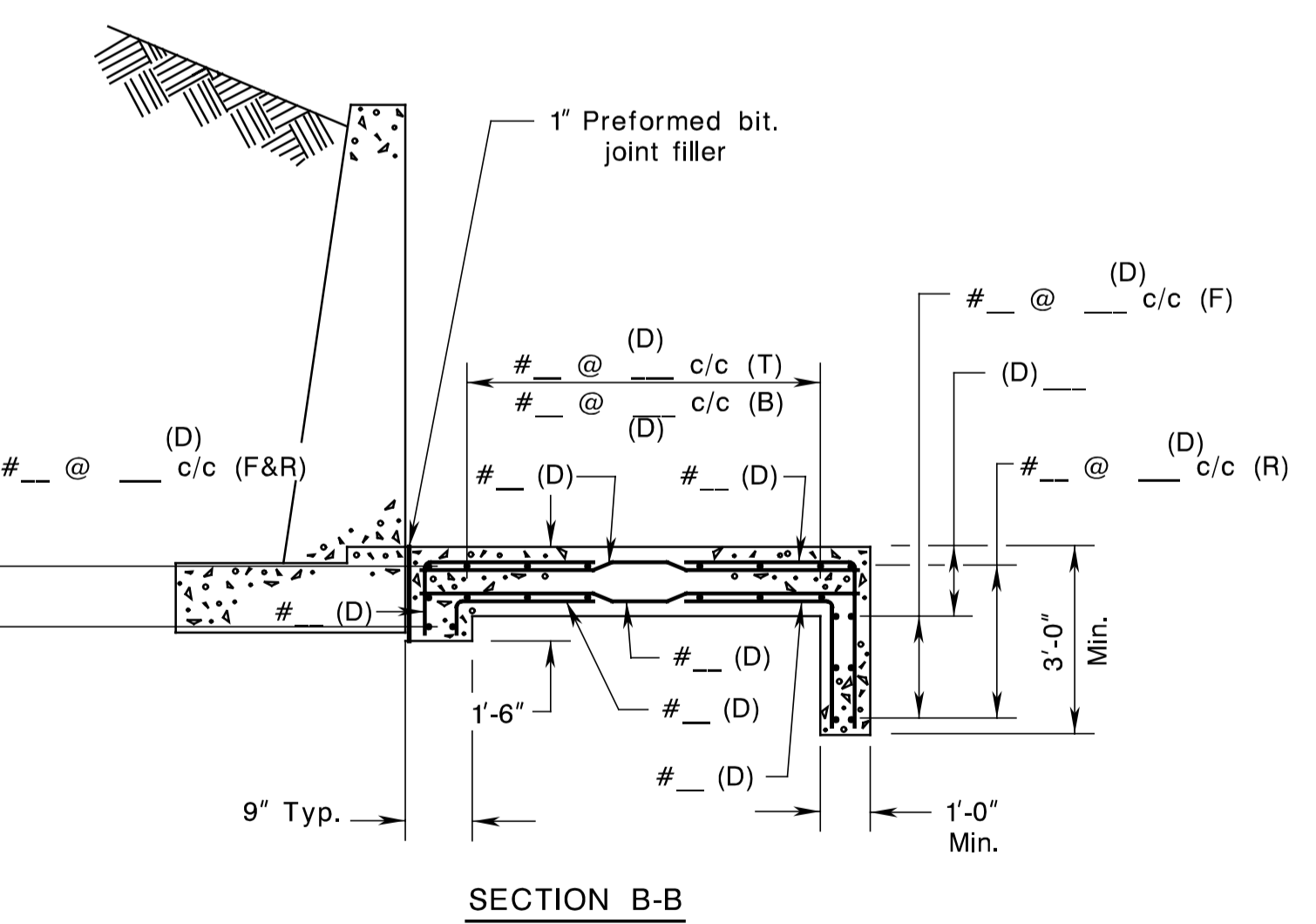
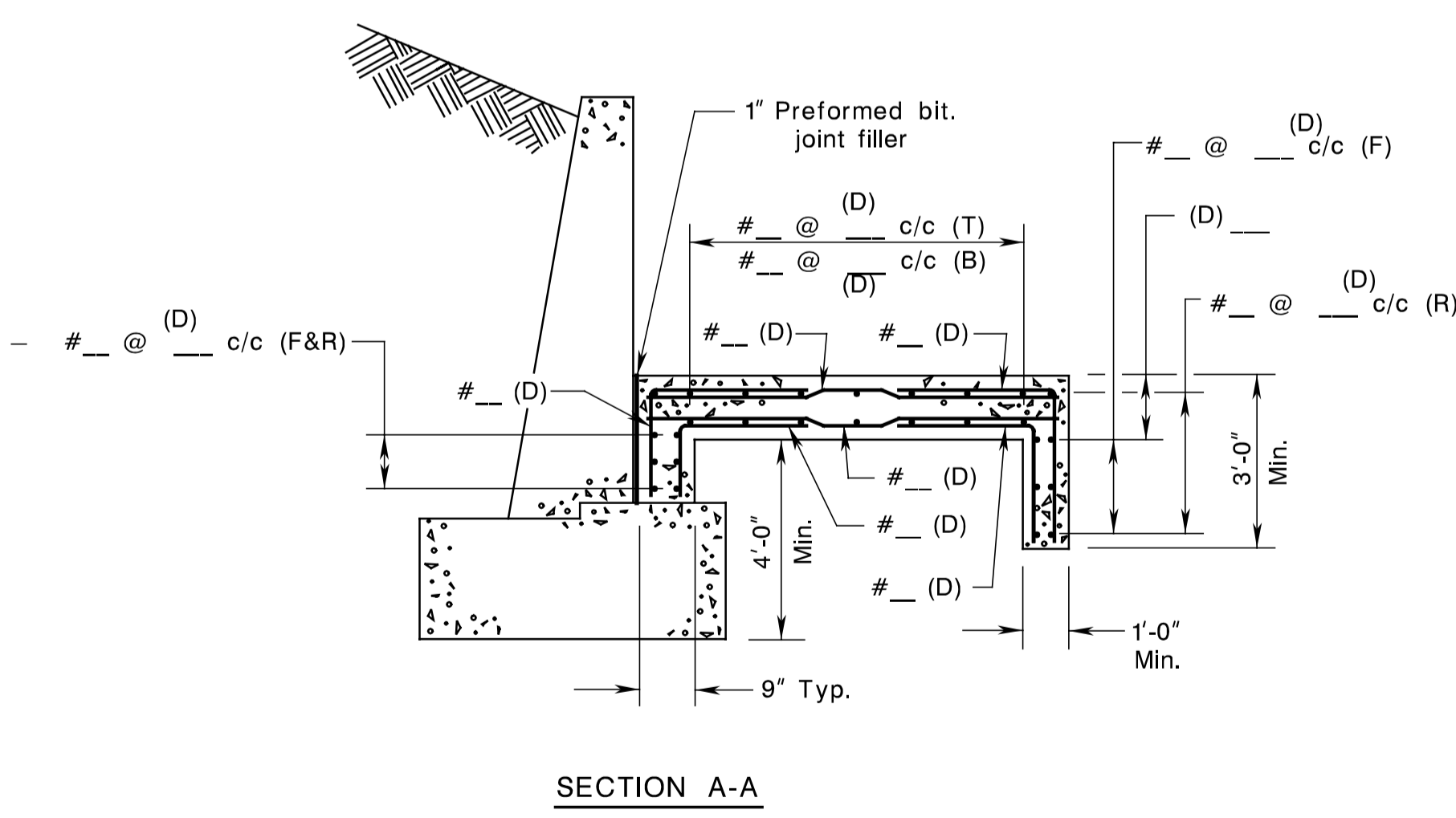
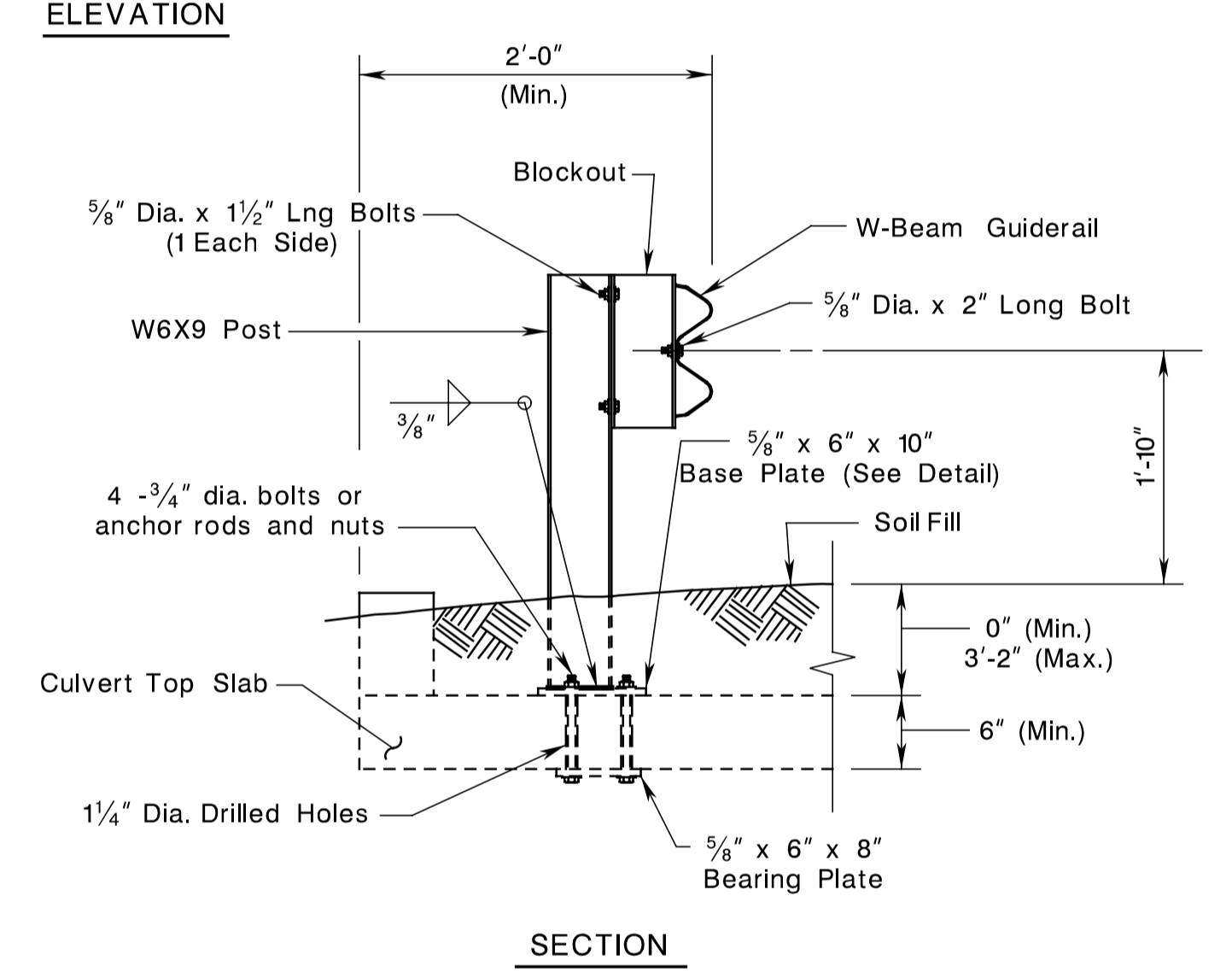
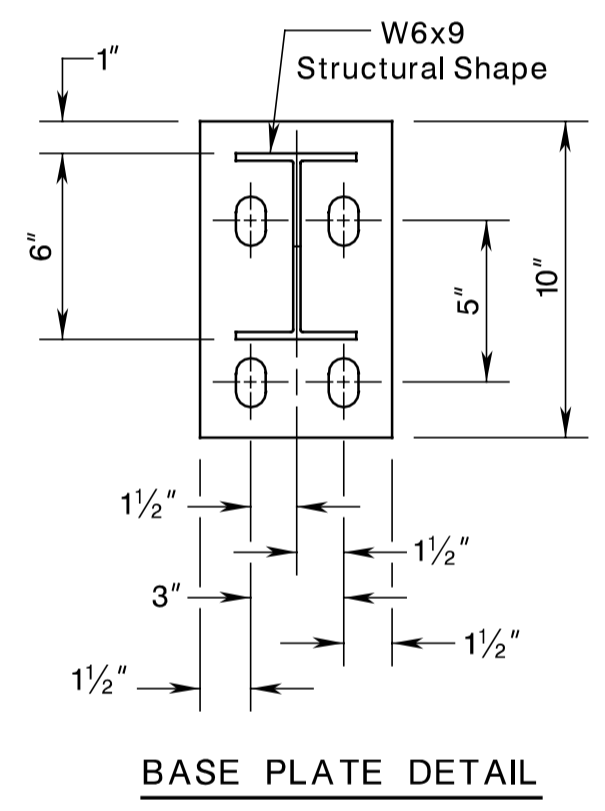
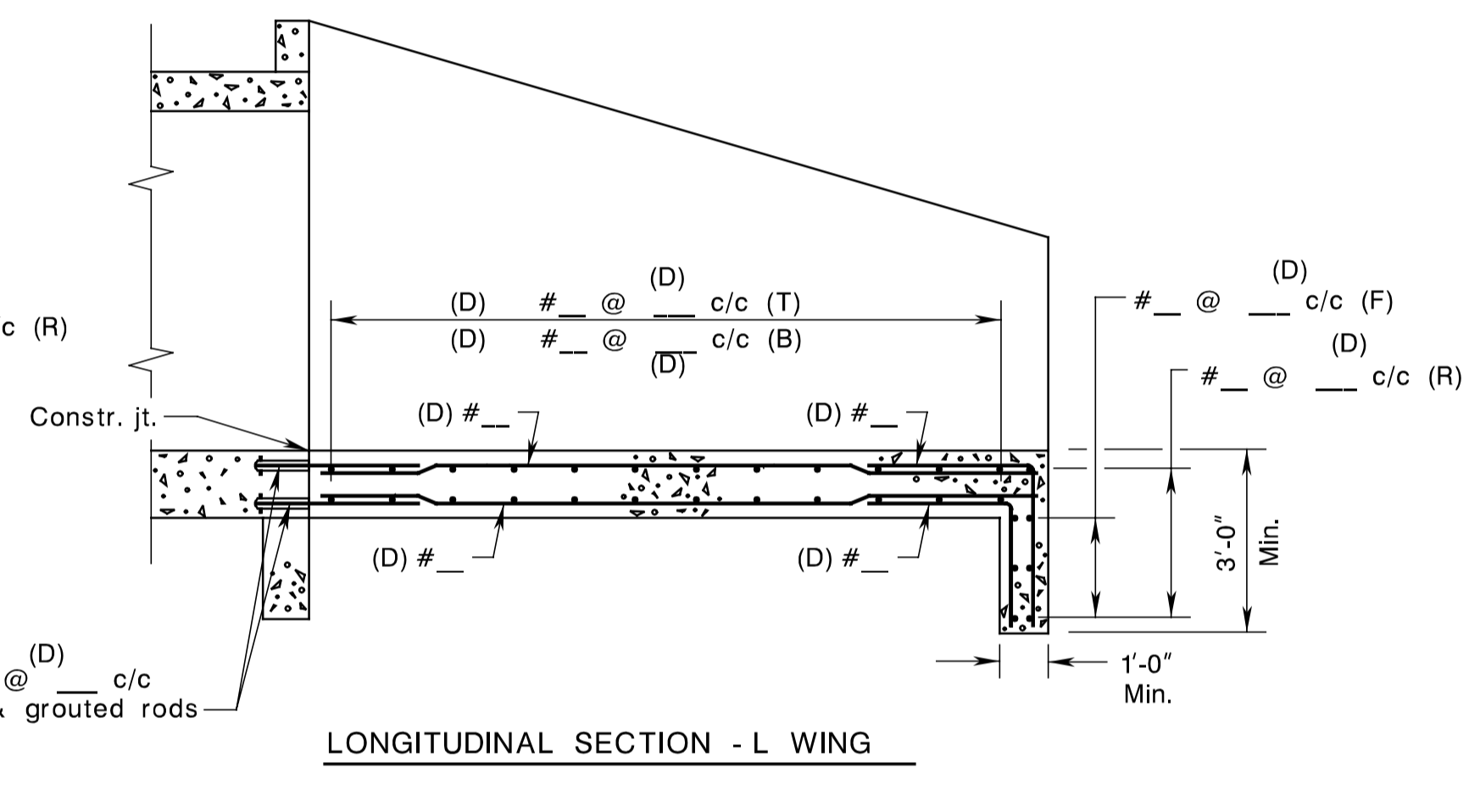
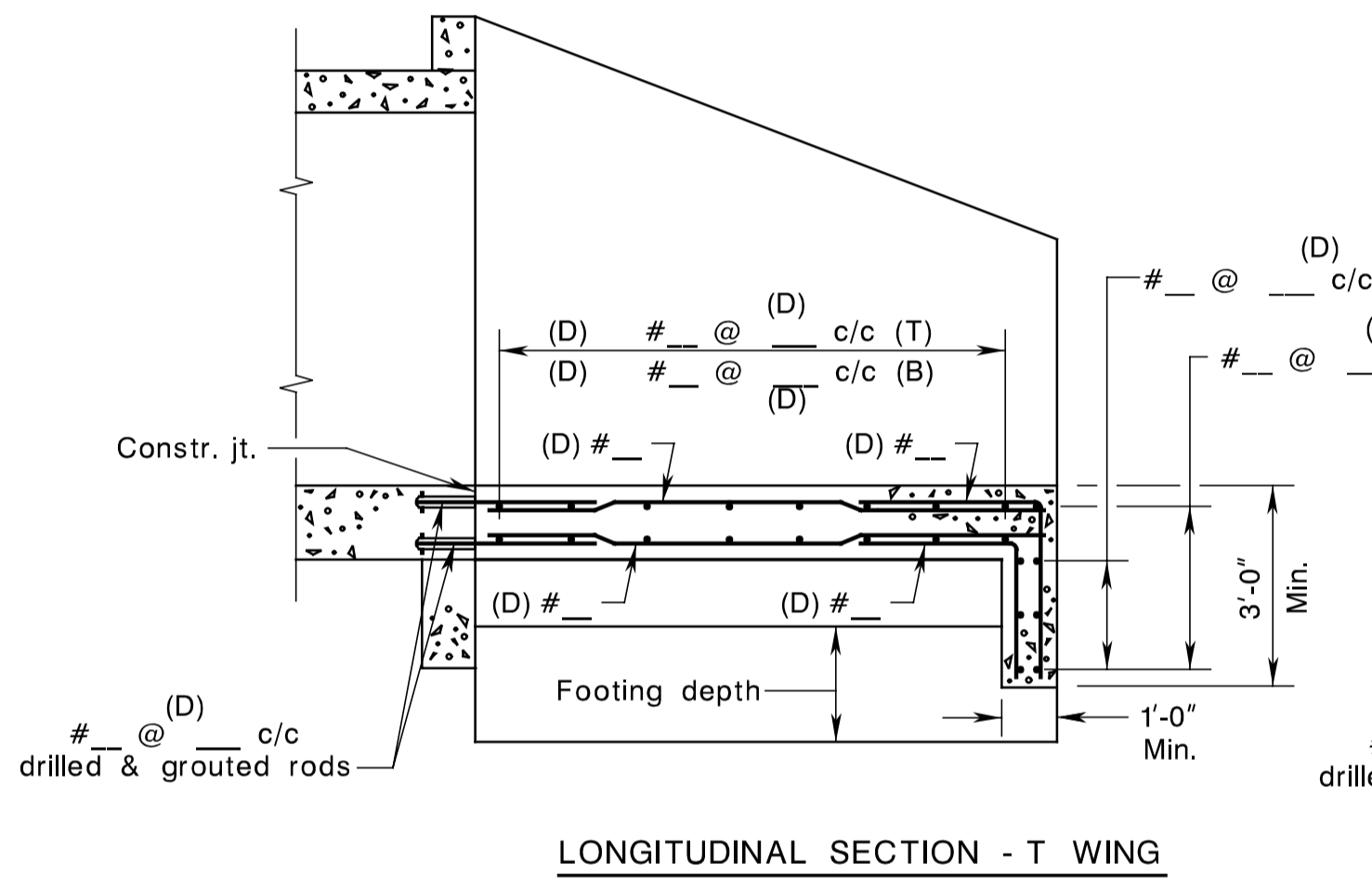
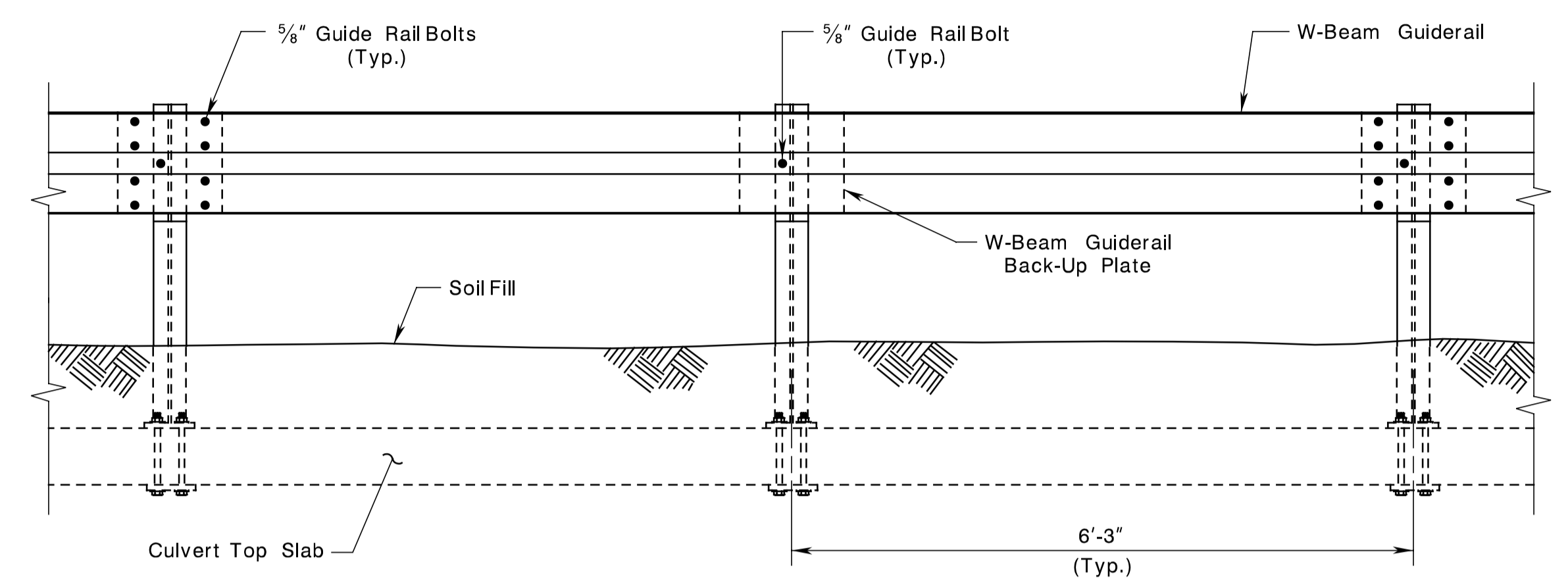
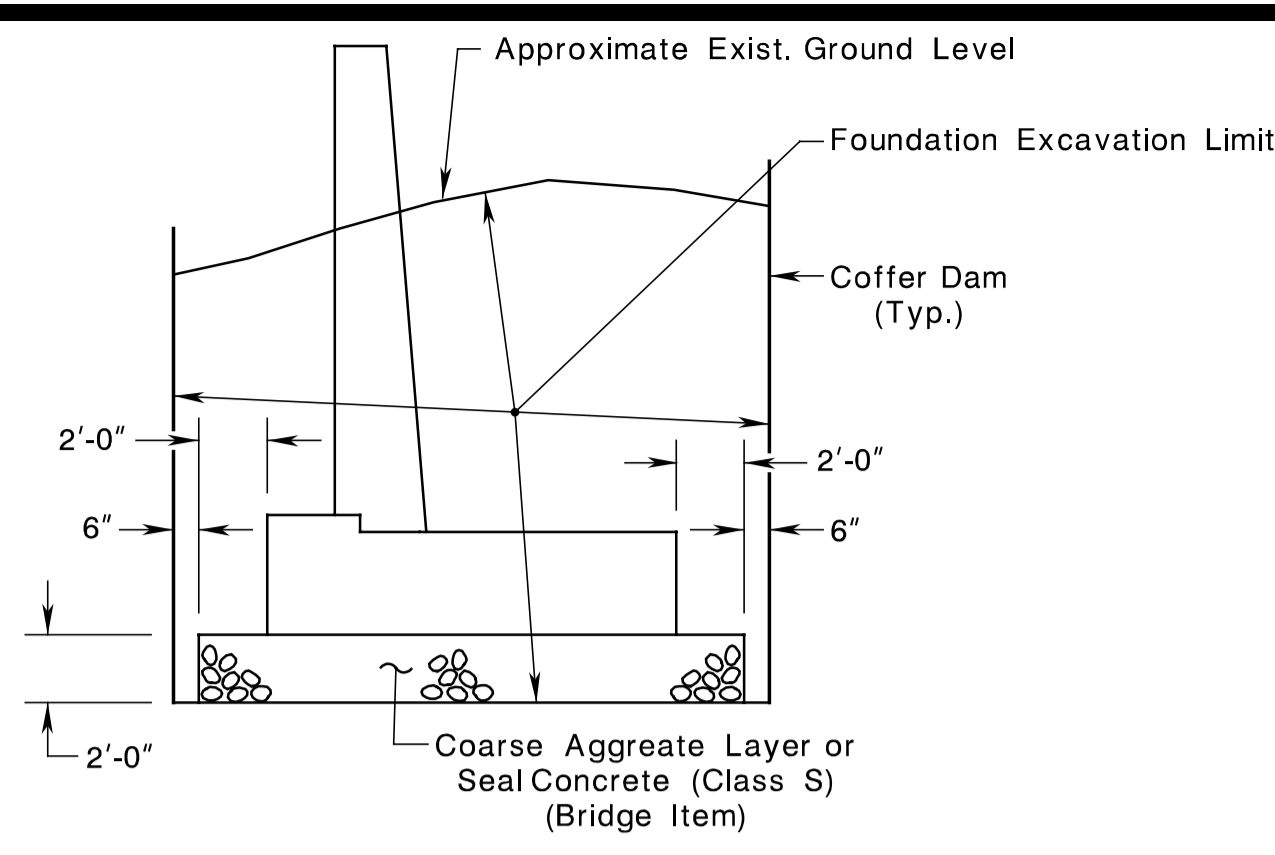
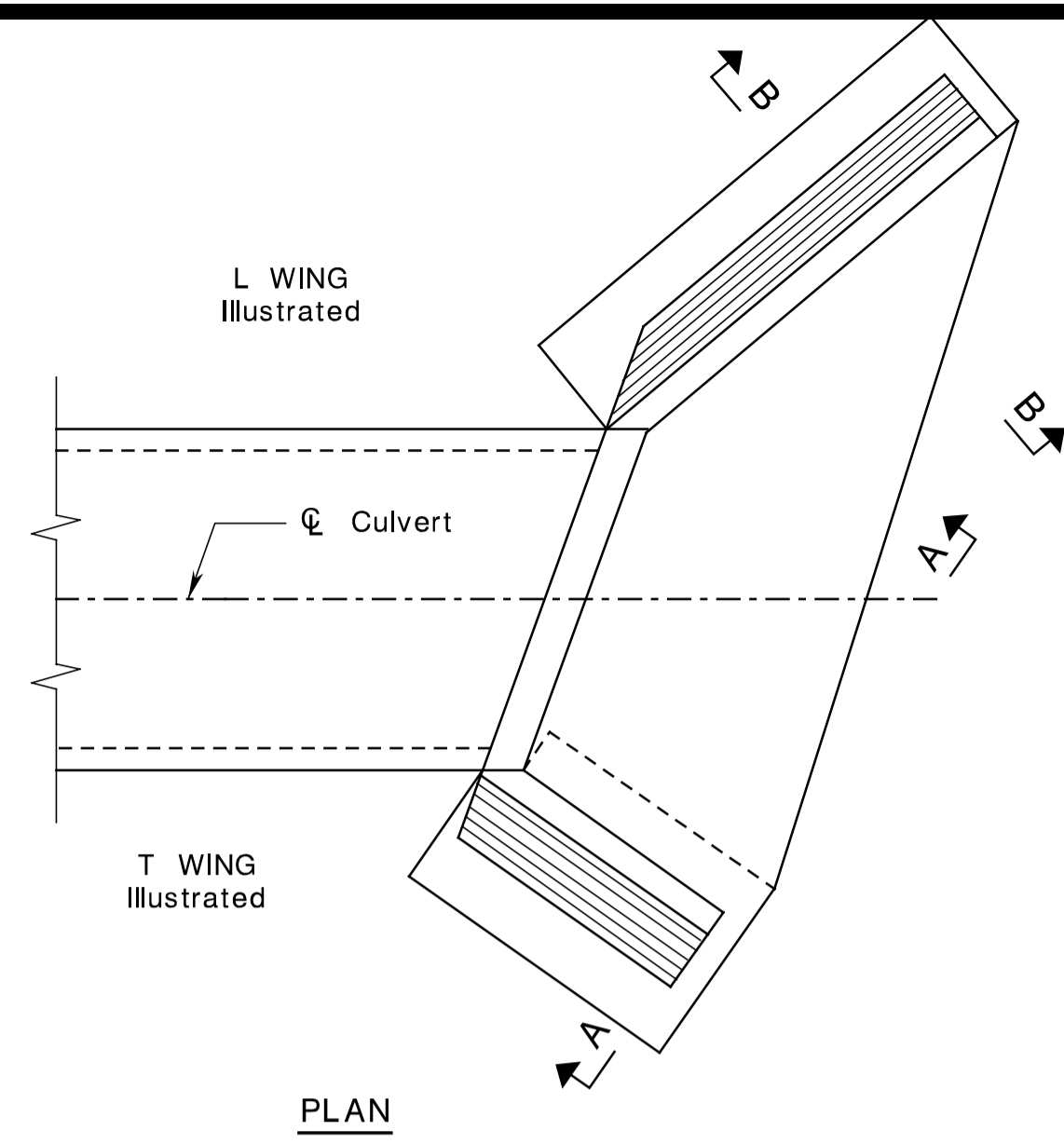
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STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			



CONCRETE APRON DETAILS

GUIDERAIL ATTACHMENT DETAILS

- NOTES:
- A minimum 3'-0" deep cut off wall (curtain wall) is required when culvert does not have a concrete apron.
 - Designer shall review the roadway plans to determine that excavation payment limits for road and bridge work are compatible.

NOTE TO THE DESIGNER:
The designer shall complete all the title block information and items designated with (D) prior to including any PLATES into the contract plans.

STANDARD DRAWING PLATE 2.11-4

NEW JERSEY DEPARTMENT OF TRANSPORTATION
BUREAU OF STRUCTURAL ENGINEERING

SINGLE CELLPRECAST R. C. BOX CULVERT
CAST-IN-PLACE CONCRETE APRON,
EXCAVATION & GUIDERAIL DETAILS
ROUTE SECTION

MUNICIPALITY COUNTY

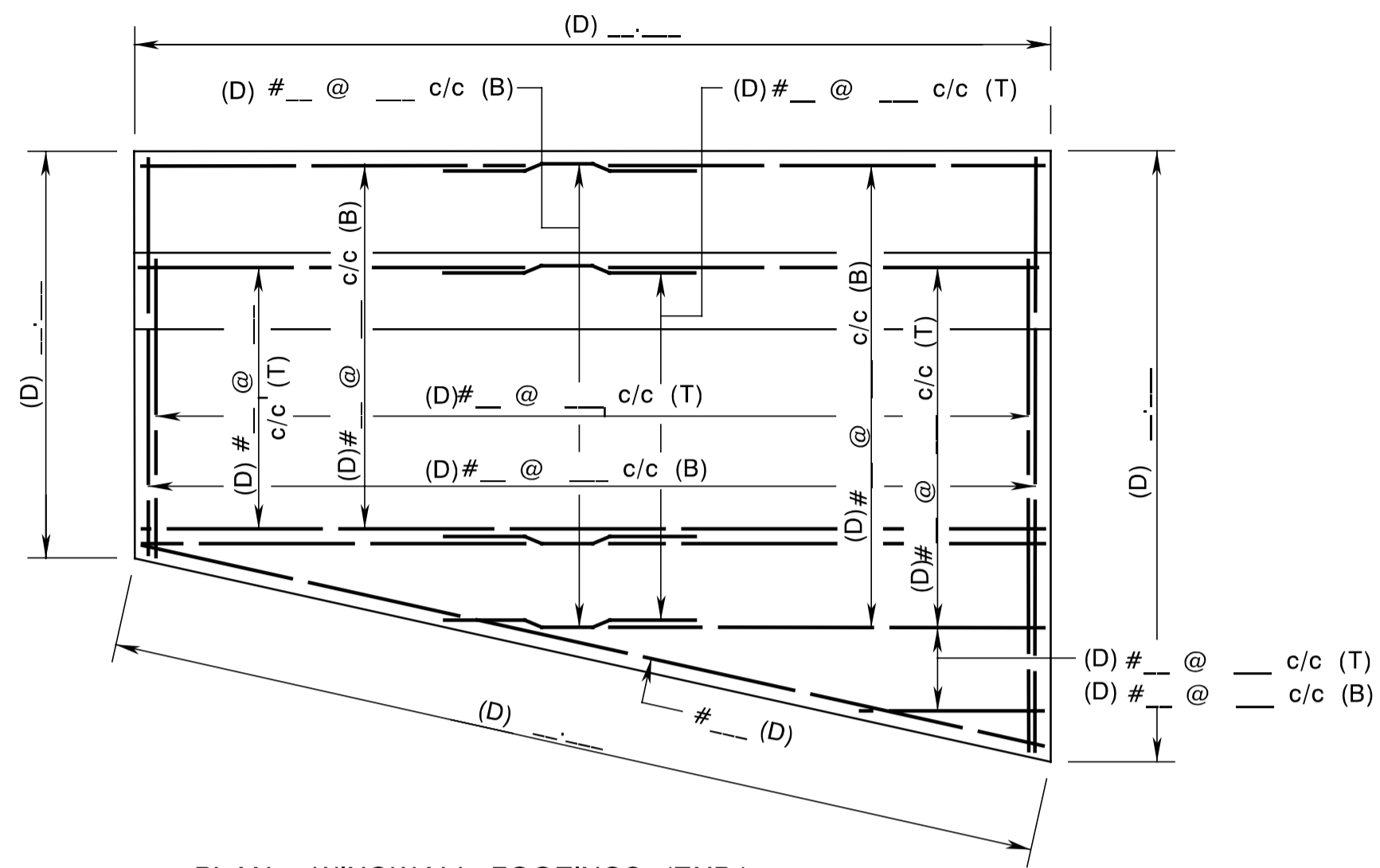
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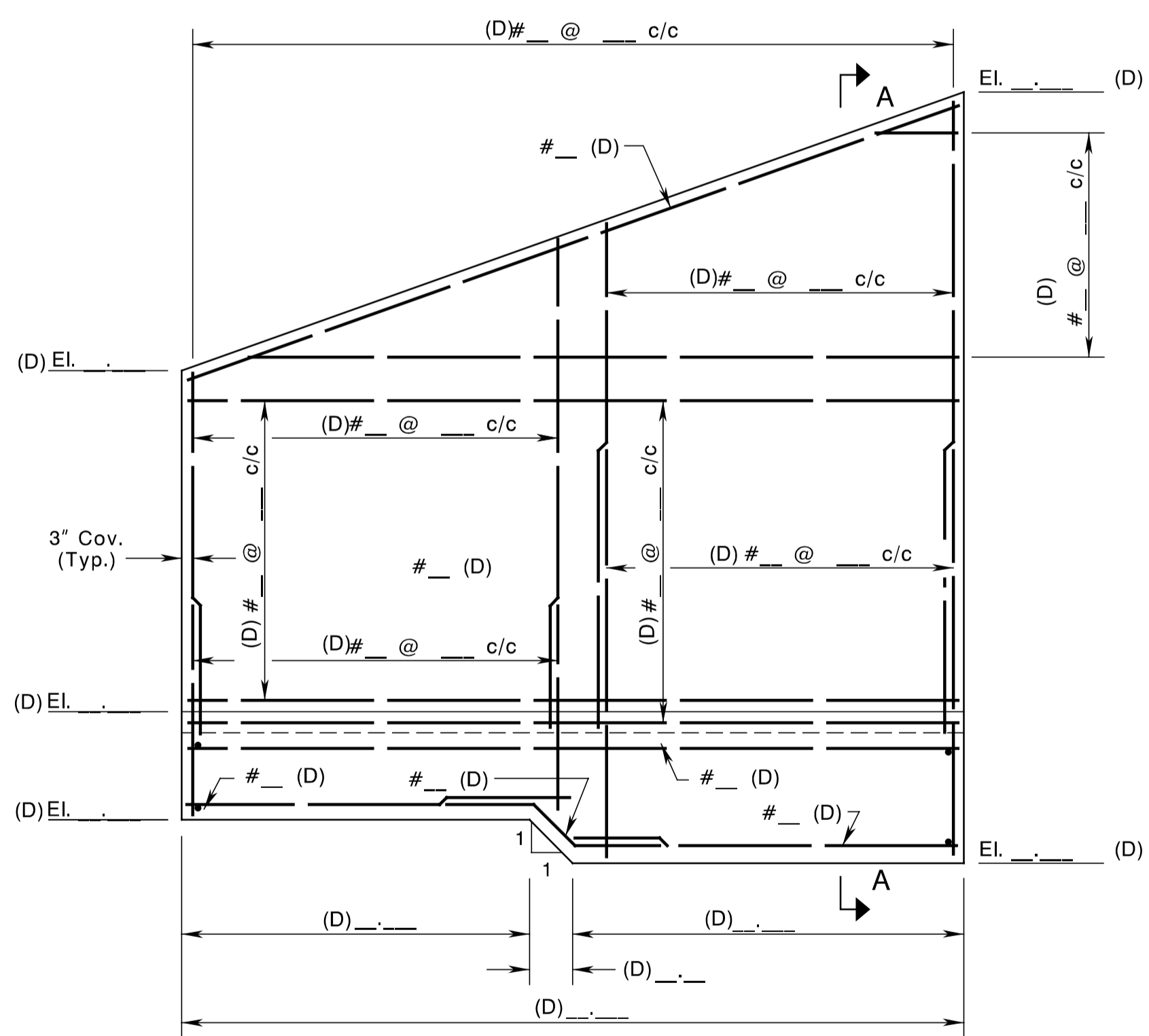
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EST. BY		CHK. BY	
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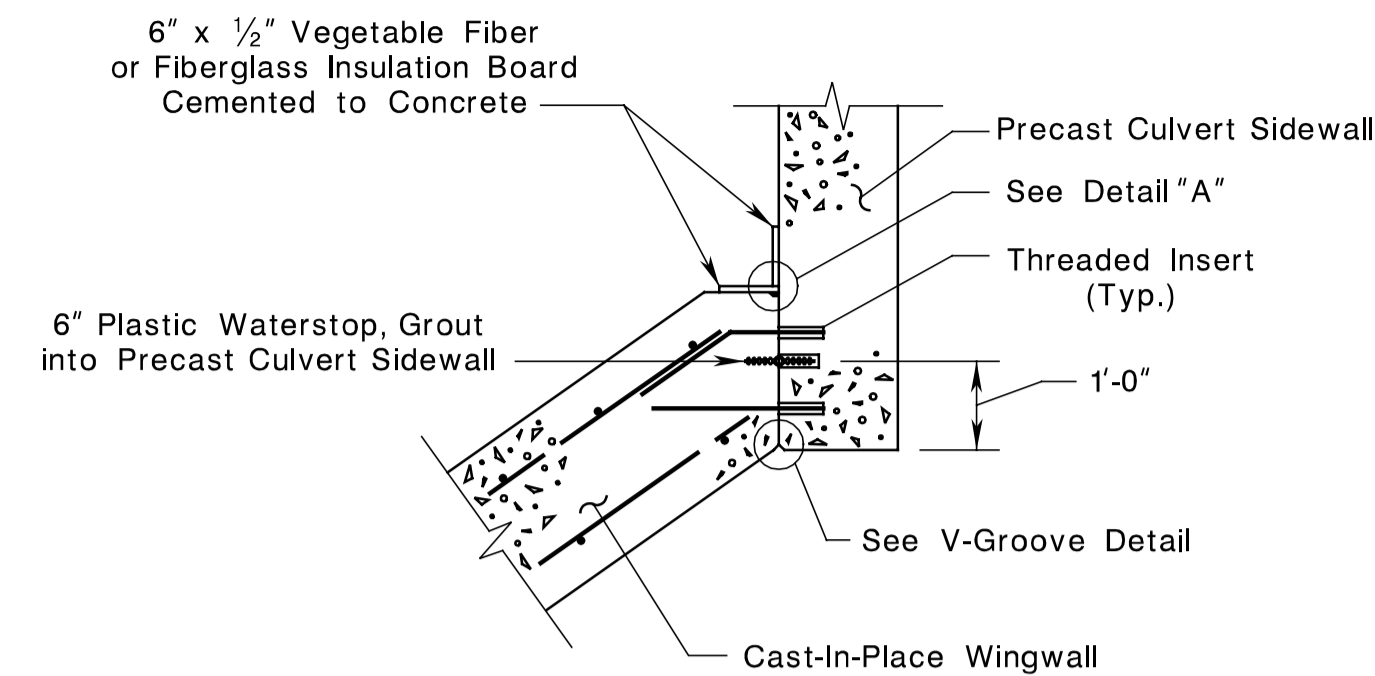
STATE	FEDERAL PROJECT NO.	SHEET	TOTAL SHEETS
N. J.			
STRUCTURE NO.			
STRUCTURE NAME			



PLAN - WINGWALL FOOTINGS (TYP.)



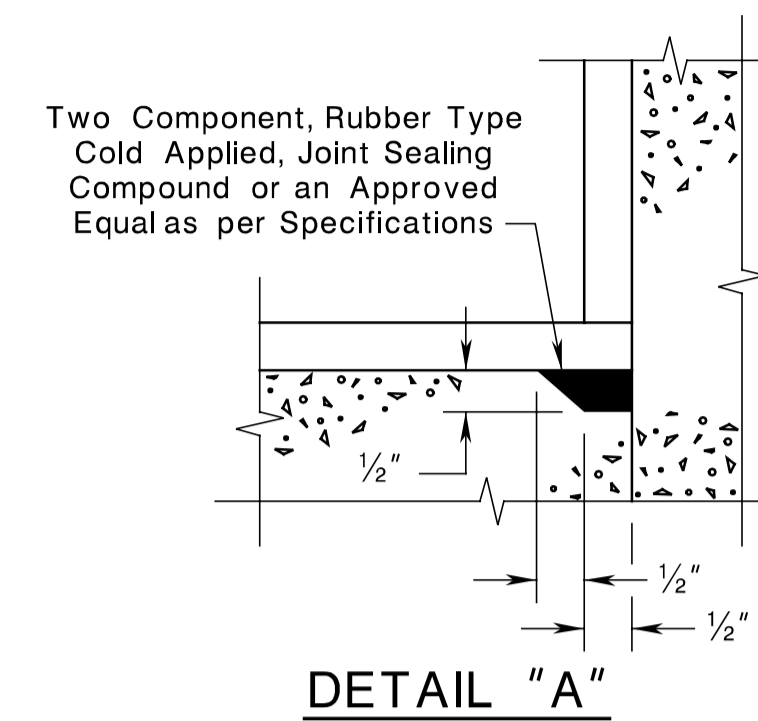
ELEVATION - WINGWALL



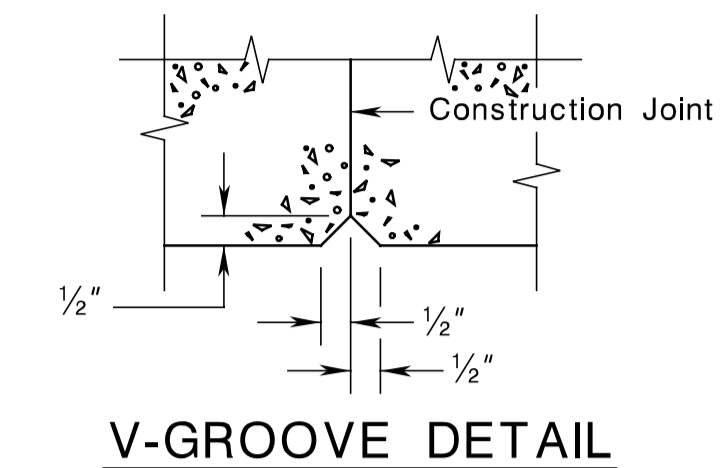
NOTE:

1. A water stop shall be provided in the contraction joint in the wingwall.

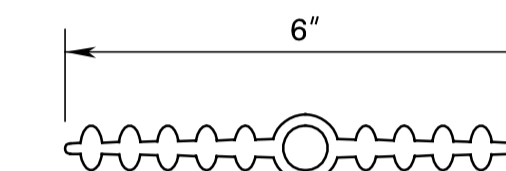
WINGWALL/CULVERT CONSTRUCTION JOINT DETAIL



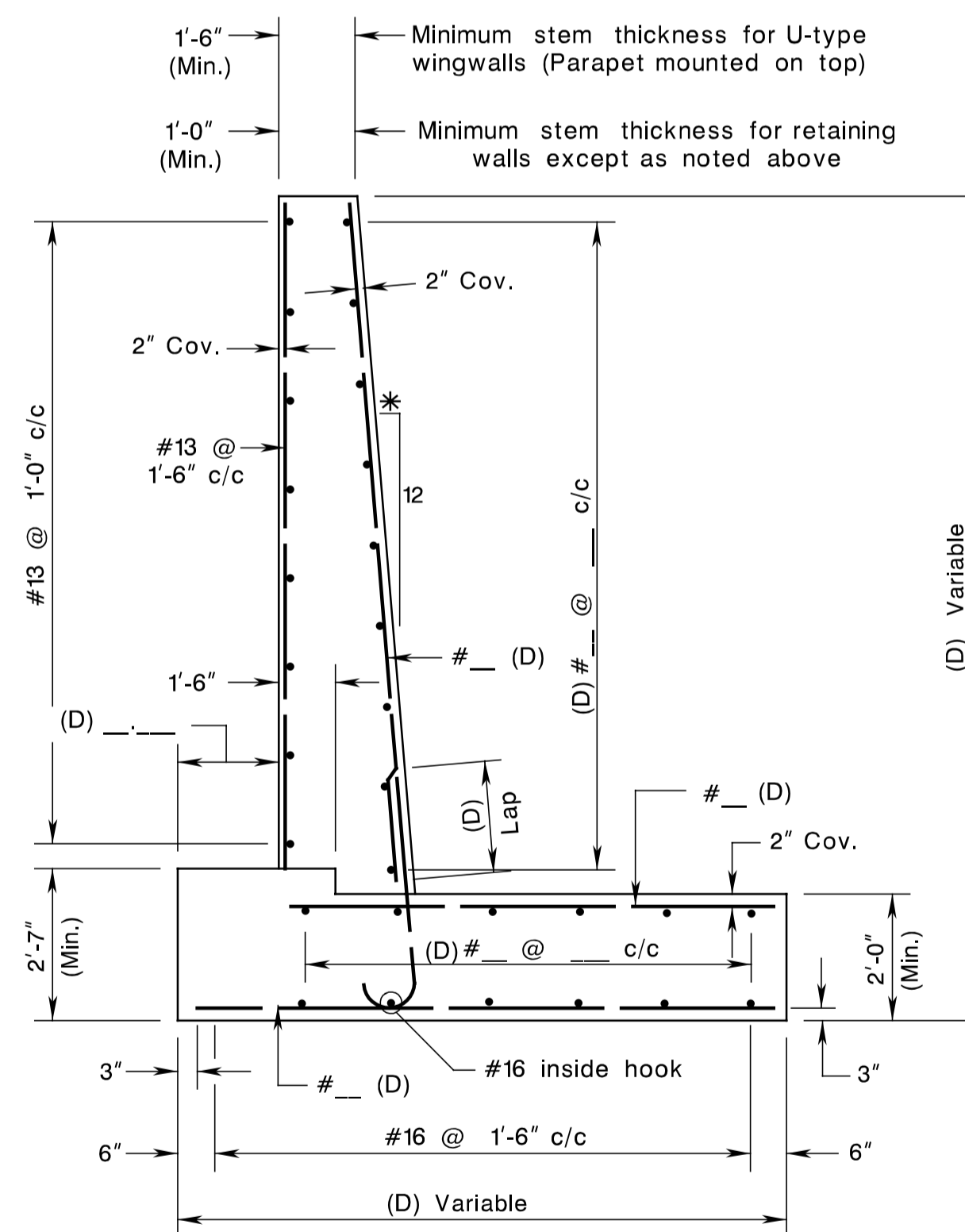
DETAIL "A"



V-GROOVE DETAIL

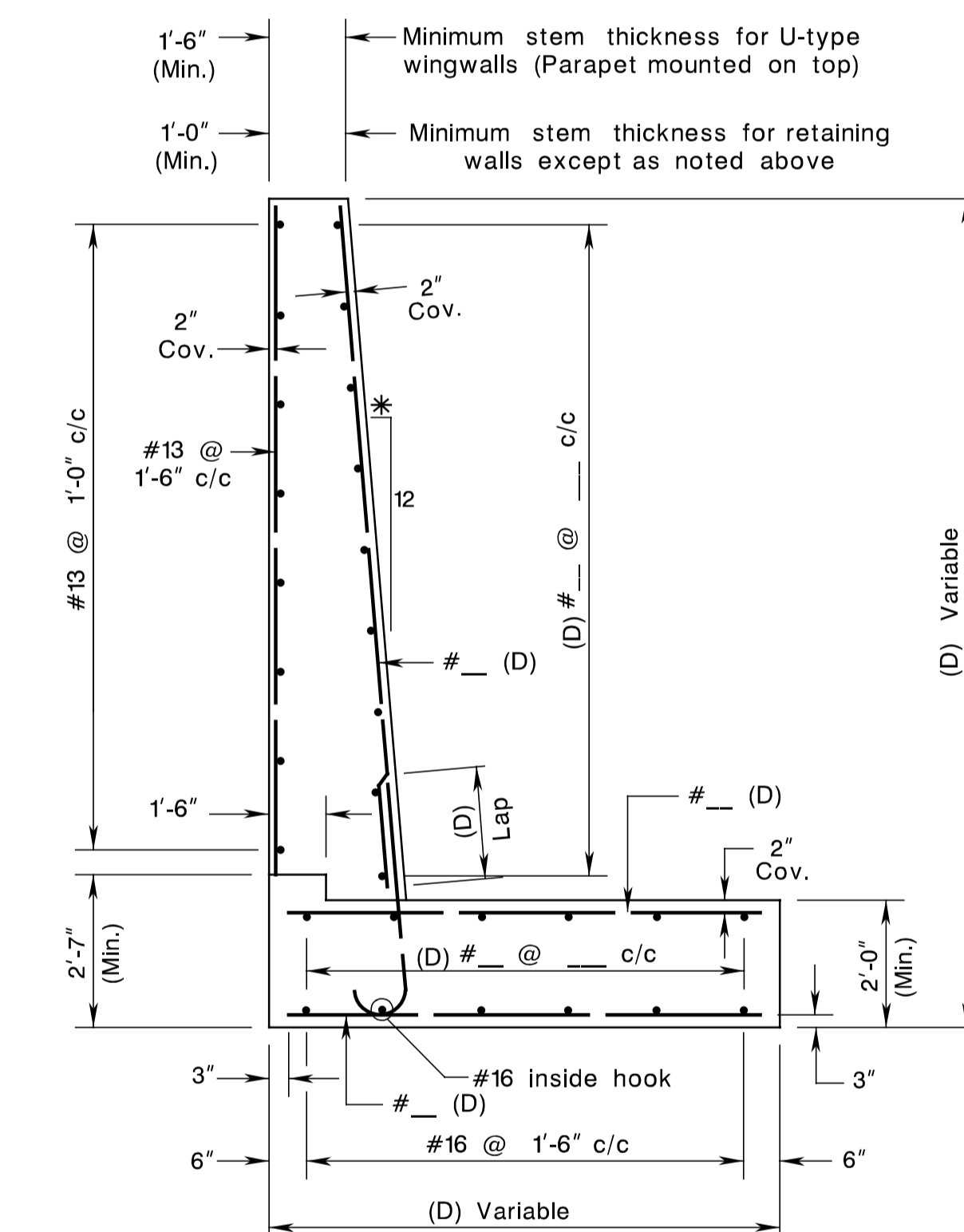


DETAIL OF PLASTIC WATERSTOP



SECTION: A-A FOR T-WING

- * Designer shall verify the need for batter for wall under 10'-0" high. Walls over 10'-0" shall have a minimum batter of 12:1. The height of the wall shall be measured from the top of the heel of the footing.



SECTION: A-A FOR L-WING

- * Designer shall verify the need for batter for wall under 10'-0" high. Walls over 10'-0" shall have a minimum batter of 12:1. The height of the wall shall be measured from the top of the heel of the footing.

NOTE TO THE DESIGNER:

The designer shall complete all the title block information and items designated with (D) prior to including any PLATES into the contract plans.

WINGWALL & FOOTING DETAILS

CONTROL SECTION		JOB NO.	
DES. BY	CHK. BY		
DWN. BY	CHK. BY		
EST. BY	CHK. BY		
SPECS. BY			
IN CHARGE OF _____			

STANDARD DRAWING PLATE 2.11-5	
NEW JERSEY DEPARTMENT OF TRANSPORTATION BUREAU OF STRUCTURAL ENGINEERING	
SINGLE CELL PRECAST R. C. BOX CULVERT CAST-IN-PLACE WINGWALL & FOOTING DETAILS	
ROUTE _____	SECTION _____
MUNICIPALITY _____	COUNTY _____
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