

GENERAL NOTES

1.

THIS PROJECT IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE DELAWARE DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS", DATED JUNE 2022, AND THE DELAWARE DEPARTMENT OF TRANSPORTATION "STANDARD CONSTRUCTION DETAILS", DATED 2022, INCLUDING ALL REVISIONS UP TO THE DATE OF ADVERTISEMENT.
2.

ELECTRONIC PROJECT FILES THAT WILL BE MADE AVAILABLE TO THE BIDDERS INCLUDE:

( )	NONE
( X )	ASCII DATA FILES WITH COORDINATES AND ELEVATIONS FOR PROPOSED POINTS AS SELECTED BY THE ENGINEER.
( )	DESIGN FILE, IN .DGN FILE FORMAT, THAT CONTAINS 3D TRIANGLES REPRESENTING THE EXISTING SURFACE.
( )	DESIGN FILE, IN .DGN FILE FORMAT, THAT CONTAINS 3D FEATURE LINES FOR THE PROPOSED DESIGN. 3D FEATURE LINES ARE FOR THE PROPOSED TOP SURFACE ELEVATION ONLY.
- NOTE: THE DOCUMENT ENTITLED "ELECTRONIC FILE SHARING RELEASE" MUST BE SIGNED BY ALL PARTIES PRIOR TO THE DELIVERY OF ANY ELECTRONIC PROJECT FILES.
- NOTE: THERE MAY BE SOME AREAS OF THE PROJECT NOT INCLUDED IN THE ELECTRONIC DESIGN DATA FILE(S). IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE DESIGN DATA FILE AND DETERMINE THE LIMITS OF THE PROJECT INCLUDED.
3.

PROJECT FILES THAT WILL BE MADE AVAILABLE TO THE CONTRACTOR, INCLUDE:

( X )	CROSS SECTIONS
( X )	RIGHT-OF-WAY PLANS

PROJECT NOTES

SECTION 200

1.

REMOVAL OF STRUCTURES AND OBSTRUCTIONS:  
REMOVE AND PROPERLY DISPOSE OFF SITE THE FOLLOWING ITEMS UNDER ITEM #211000 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS ASSOCIATED WITH BRIDGE NUMBER 3164 036:  
A. CONTROL HOUSE  
B. SWING SPAN SUPERSTRUCTURE INCLUDING BRIDGE RAILING  
C. SWING SPAN OPERATING MACHINERY  
D. SWING SPAN ELECTRICAL SYSTEM  
E. APPROACH SPAN SUPERSTRUCTURE INCLUDING BRIDGE RAILING  
F. PIVOT PIER INCLUDING SUPPORTING PILES  
G. REST PIER INCLUDING SUPPORTING PILES  
H. FENDER SYSTEM INCLUDING SUPPORTING PILES  
I. WEST AND EAST ABUTMENTS INCLUDING SUPPORTING PILES AND EXISTING ANCHOR RODS  
J. PORTIONS OF WEST AND EAST BULKHEADS  
K. FOR MORE INFORMATION SEE DWG. S-07
2.

HAZARDOUS MATERIAL (timber):  
BE ADVISED THAT THE EXISTING STRUCTURE OVER THE CEDAR CREEK CANAL MAY CONTAIN CREOSOTED TIMBER. HANDLE ALL HAZARDOUS MATERIALS (i.e. creosote timber) IN ACCORDANCE WITH SPECIAL PROVISION 202560. PAYMENT INCIDENTAL TO ITEM #211000 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS.
3.

HAZARDOUS MATERIAL (steel only):  
BE ADVISED THAT THE EXISTING STRUCTURE OVER THE CEDAR CREEK CANAL DOES CONTAIN LEAD BASED PAINT. AS A RESULT, DETAIL METHODS OF CUTTING THE BEAMS AND/OR DIAPHRAGMS, IF REQUIRED, IN THE CONTRACTOR'S PROPOSED DEMOLITION PLAN AND HOW THOSE PERSONS PERFORMING SUCH WORK WILL BE PROTECTED IN ACCORDANCE WITH APPLICABLE OSHA REGULATIONS. ADDITIONALLY, DETAIL WHEN AND HOW THE LEAD BASED PAINT WILL BE REMOVED FROM THE STRUCTURAL STEEL AND ALL RELATED BRIDGE COMPONENTS. IF THE WORK IS PERFORMED ON SITE, THEN INCLUDE PROPER PROTECTION, CONTAINMENT, AND FINAL LEAD PAINT DISPOSAL IN THE PROPOSED PLAN. IF THE BEAMS WILL BE TRANSPORTED WITH THE PAINT STILL INTACT, THEN DETAIL HOW THE STRUCTURAL COMPONENTS WILL BE PROTECTED DURING TRANSPORT, WHERE AND HOW THE PAINT WILL BE REMOVED, AND THE LOCATION OF FINAL PAINT DISPOSAL, AGAIN IN ACCORDANCE WITH OSHA REGULATIONS. PROVIDE WRITTEN DOCUMENTATION TO THE ENGINEER, PRIOR TO FINAL CONTRACT ACCEPTANCE, NOTING WHEN AND WHERE THE LEAD BASED PAINT WAS REMOVED, AND THE LOCATION OF FINAL PAINT DISPOSAL. ALL COSTS INVOLVED WITH THE ABOVE LISTED WORK IS INCIDENTAL TO ITEM #211000 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS.
4.

SIGNING:  
TO AVOID DAMAGE, SIGNS WITHIN PROJECT LIMITS MAY BE REMOVED DURING CONSTRUCTION IF NEEDED, BUT MUST BE REPLACED TO MATCH EXISTING CONDITIONS BEFORE REOPENING THE ROADWAY. INCLUDE PAYMENT FOR ALL WORK RELATED TO MOVING AND REINSTALLING THE SIGN IN ITEM #211000 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS. IF THE SIGN IS DAMAGED DURING CONSTRUCTION, REPLACE THE SIGN AT THE CONTRACTOR'S EXPENSE.
5.

TEMPORARILY REMOVE EXISTING RUBBLE RIP RAP AND/OR CONCRETE DEBRIS ON THE CHANNEL BOTTOM THAT INTERFERES WITH INSTALLATION OF NEW BRIDGE FOUNDATIONS AND/OR SHEET PILE BULKHEADS. ANY REMOVAL, STORAGE AND/OR RELOCATION OF EXISTING RIP RAP IS TO BE DONE IN COMPLIANCE WITH ALL ENVIRONMENTAL AND PERMITTING REQUIREMENTS. REMOVED RUBBLE RIP RAP MAY BE REINSTALLED TOGETHER WITH NEW RUBBLE RIP RAP. WORK TO BE PAID FOR UNDER ITEM 707013.

SECTION 600

6.

SEE DEMOLITION PLAN FOR ADDITIONAL INFORMATION.
7.

PORTLAND CEMENT CONCRETE:  
USE PORTLAND CEMENT CONCRETE FOR CAST-IN-PLACE ELEMENTS AS FOLLOWS:  
(f'c = 28-DAY COMPRESSIVE STRENGTH)  
CLASS A - ABUTMENT CAPS, BASCULE PIER CAP, REST PIER CAP, MAINTENANCE PLATFORM SLABS, FENDER PILE CAPS, PARAPET/BARRIER CONCRETE (f'c = 4.5 ksi)  
CLASS B - STEEL PIPE PILE CONCRETE FILL (f'c = 3.0 ksi)  
CLASS D - BRIDGE DECK, CURBS, COUNTERWEIGHT CONCRETE, APPROACH SLAB (f'c = 4.5 ksi)  
UHPc - PRESTRESSED SOLID SLAB SHEAR KEYWAYS AND CAVITIES (f'c = 22.0 ksi)  
  
CHAMFER ALL EXPOSED EDGES 3/4" x 3/4" UNLESS NOTED OTHERWISE.  
  
SUPPLY THE CONCRETE FOR THE BRIDGE DECK, BARRIER, APPROACH SLAB, AND CONCRETE CURBS THAT INCLUDES A SHRINKAGE-REDUCING/COMPENSATING ADMIXTURE. THE ADMIXTURE MAY BE SUPPLIED BY ONE PRODUCT THAT PROVIDES BOTH EXPANSION AND PORE WATER SURFACE TENSION OR TWO SEPARATE PRODUCTS EACH ADDED AT DOSAGE RECOMMENDED BY MANUFACTURER'S TECHNICAL DATA SHEETS AND HAVING THE FOLLOWING CHARACTERISTICS:  
  
(A) DESIGNED TO PROVIDE BOTH OF THE FOLLOWING CHARACTERISTICS:  
(i.) EXPANDS AT A RATE THAT CLOSELY COMPENSATES FOR THE SHRINKAGE OF THE CONCRETE MIX.  
(ii.) REDUCES THE CAPILLARY SURFACE TENSION OF THE CONCRETE PORE WATER.  
(B) PROVIDES AT LEAST 80% SHRINKAGE REDUCTION AS MEASURED AND DOCUMENTED BY FIELD PERFORMANCE.  
(C) FORMULATED FOR USE IN FREEZING AND THAWING WEATHER.

USE ADMIXTURES THAT ARE COMPATIBLE WITH ALL OTHER CONCRETE-MIX DESIGN CONSTITUENTS. CALCIUM CHLORIDE IS NOT PERMITTED; NO CHEMICAL ADMIXTURES WHICH CONTAIN MORE THAN 0.1% CHLORIDE BY WEIGHT, WILL BE PERMITTED FOR USE. DOSAGE RATE AND MIXING SEQUENCE WILL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

USE PORTLAND CEMENT CONCRETE FOR PRECAST ELEMENTS AS FOLLOWS:  
(f'c = 28-DAY COMPRESSIVE STRENGTH)  
(f'ci = COMPRESSIVE STRENGTH AT INITIAL PRESTRESS)  
FOR ALL PRESTRESSED CONCRETE SOLID SLAB BEAMS AND CONCRETE PIER CAPS:  
f'c = 8.0 ksi; f'ci = 6.4 ksi  
THE PRESTRESSED CONCRETE SOLID SLAB BEAMS WERE DESIGNED FOR SEVERE CORROSIVE CONDITIONS AS PER A5.9.2.3.2b.

CONCRETE SEALER:  
REFER TO TYPICAL DECK SECTIONS ON SHEETS S-41 AND S-42 FOR LIMITS OF CONCRETE SEALER. PAYMENT FOR SEALER SHALL BE UNDER ITEM 613003.

8.

CONCRETE DECK SLAB:  
THE 5" DECK SLAB THICKNESS INCLUDES 1/2" INTEGRAL WEARING SURFACE.

9.

BAR REINFORCEMENT:  
-PROVIDE REINFORCING STEEL CONFORMING TO AASHTO M31 (ASTM A615), GRADE 60.  
-PROVIDE A 3" CLEAR COVER FOR ALL REINFORCING STEEL PLACED IN CONCRETE CAST AGAINST EARTH OR A 2" CLEAR COVER ELSEWHERE, UNLESS OTHERWISE SPECIFIED ON THE PLANS.  
-WHERE A SUFFIX IS INCLUDED IN BAR MARKS, PROTECT ALL REINFORCING STEEL WITH THE MATERIAL DENOTED.  
SUFFIX 'E' DENOTES EPOXY COATED BAR REINFORCEMENT  
SUFFIX 'G' DENOTES GALVANIZED BAR REINFORCEMENT  
SUFFIX 'S' DENOTES STAINLESS STEEL BAR REINFORCEMENT  
-WITH APPROVAL OF THE BRIDGE DESIGN ENGINEER, GALVANIZED REINFORCING STEEL MAY BE SUBSTITUTED FOR EPOXY-COATED REINFORCING STEEL AT NO ADDITIONAL COST TO THE DEPARTMENT.

10.

STRUCTURAL STEEL:  
PROVIDE STRUCTURAL STEEL CONFORMING TO AASHTO M270, GRADE 50 (ASTM A709, GRADE 50) DESIGNATION, EXCEPT WHEN NOTED OTHERWISE. THE ADDITIONAL REQUIREMENTS FOR CHARPY V-NOTCH TESTING OF AASHTO M270 ARE MANDATORY FOR PRIMARY LOAD CARRYING MEMBERS. USE TESTING PARAMETERS FOR TEMPERATURE ZONE 2. PRIMARY LOAD CARRYING MEMBERS THAT SHALL BE SUBJECTED TO THE REQUIREMENTS FOR CHARPY V-NOTCH TESTING INCLUDE: ORTHOTROPIC STEEL DECK, FLOORBEAMS, KNEE BRACES, BASCULE GIRDERS, BALANCE FRAME GIRDERS, TRUNNION STRUT, CRANK ARM, TRUNNION TOWERS, CONNECTION PLATES, AND SPLICE PLATES.  
  
STRUCTURAL MEMBERS LABELED WITH 'FCM' DENOTES FRACTURE CRITICAL MEMBERS. ALL CONNECTION MATERIAL FOR THESE MEMBERS, INCLUDING SPLICE PLATES, CONNECTION PLATES AND ANGLES, AND STIFFENERS USED AS CONNECTION PLATES SHALL ALSO BE CONSIDERED FRACTURE CRITICAL MEMBERS. ALL MEMBERS DESIGNATED AS FCM SHALL MEET THE REQUIREMENTS FOR CHARPY V-NOTCH TESTING OF AASHTO M270. USE TESTING PARAMETERS FOR TEMPERATURE ZONE 2.  
  
ALL FASTENERS ARE 7/8" DIAMETER ASTM F3125 HIGH STRENGTH BOLTS, TYPE 1 GRADE A325 UNLESS OTHERWISE NOTED. HEAVY HEX NUTS SHALL BE ASTM F563 GRADE DH AND HARDENED WASHERS SHALL BE ASTM F436. ALL HIGH STRENGTH BOLTS, AND ACCOMPANYING HARDWARE, SHALL BE MECHANICALLY GALVANIZED IN ACCORDANCE WITH ASTM B695 CLASS 50, TYPE 1, AND PAINTED AFTER INSTALLATION.  
  
HSS SHAPES (LINK ARMS, FORWARD STRUT, AND INTERMEDIATE STRUT) SHALL BE ASTM A1085 GRADE 50 (OR APPROVED EQUIVALENT). THE TRUNNION STRUT SHALL BE API 5L GRADE X46 PSL2 (OR APPROVED EQUIVALENT).

REAM SUBDRILLED or SUBPUNCHED HOLES FOR END CONNECTIONS AND FIELD SPLICES IN THE FABRICATION SHOP.

THE FAYING SURFACE CLASSIFICATION IS CLASS B.

WELDING:  
-MAKE TACK WELDS WITH THE SAME TYPE OF ELECTRODE AND INCORPORATE IN THE FINAL WELD. NO OTHER TACK WELDING WILL BE PERMITTED.  
-OVERHEAD WELDING IS NOT PERMITTED IN THE FIELD UNLESS OTHERWISE SPECIFIED ON THE PLANS.  
-DO NOT MAKE WELDS BY MANUAL SHIELDED METAL ARC PROCESS FOR PRIMARY GIRDER WELDS SUCH AS FLANGE TO WEB WELDS OR FOR SHOP SPLICES OF WEB AND FLANGES.

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SECTION 600 (CONTINUED)

10. STRUCTURAL STEEL (CONTINUED):  
SHOP ASSEMBLE AND ALIGN EACH ENTIRE STEEL BASCULE LEAF, BALANCE FRAME, AND A-FRAME SUBASSEMBLIES USING ERECTION PROCEDURES AND SUPPORT CONDITIONS THAT WILL ACHIEVE PROPER FIT-UP AND ALIGNMENT OF PRIOR TO DRILLING FROM SOLID OR REAMING SUBPUNCHED OR SUBDRILLED BOLT HOLES FOR SPLICES AND CONNECTION PLATES. SHOP ASSEMBLY OF THE ENTIRE BASCULE SPAN IS NOT REQUIRED (I.E., IT IS NOT REQUIRED TO SHOP ASSEMBLE THE BALANCE FRAME ON TOP OF THE A-FRAME TOWERS, SHOP CONNECT THE BASCULE LEAF TO THE A-FRAME TOWERS, OR CONNECT THE BASCULE LEAF TO THE BALANCE FRAME WITH THE LINK ARMS.)

SET ANCHOR BOLTS TO TEMPLATE OR IN PRE-FORMED HOLES. DO NOT DRILL UNLESS SPECIFICALLY INDICATED ON PLANS. FILL THE PRE-FORMED HOLES WITH NON-SHRINK GROUT. IN MASONRY PLATES, FILL THE CLEARANCE BETWEEN ANCHOR BOLTS AND HOLES WITH APPROVED NON-HARDENING CAULKING COMPOUND UNLESS OTHERWISE NOTED.

ALL ANCHOR BOLTS SHALL BE ASTM F1554 GRADE 105 UNLESS OTHERWISE NOTED. HEAVY HEX NUTS SHALL BE ASTM A563 GRADE DH AND HARDENED WASHERS SHALL BE ASTM F436. UNLESS OTHERWISE NOTES, HIGH STRENGTH ANCHOR BOLTS, AND ACCOMPANYING HARDWARE, SHALL BE MECHANICALLY GALVANIZED IN ACCORDANCE WITH ASTM B695 CLASS 50, TYPE 1, AND PAINTED AFTER INSTALLATION.

STAINLESS STEEL ANCHOR BOLTS SHALL BE ASTM F593H TYPE 316. NUTS SHALL BE ASTM F594H TYPE 316 AND WASHERS SHALL BE TYPE 316. STAINLESS STEEL ANCHOR BOLTS, AND ASSOCIATED HARDWARE, SHALL BE PAINTED AFTER INSTALLATION.

- THE FOLLOWING PROTECTIVE COATING SYSTEMS SHALL BE UTILIZED FOR EACH OF THE VARIOUS STRUCTURAL STEEL MEMBERS:
- ORTHOTROPIC STEEL DECK = METALLIZED, SEAL COAT, AND TOP COAT
  - BASCULE GIRDERS = METALLIZED, SEAL COAT, AND TOP COAT
  - BALANCE ARMS & TRUNNION STRUT = METALLIZED, SEAL COAT, AND TOP COAT (TOP COAT EXTERIOR ONLY)
  - COUNTERWEIGHT BOX = METALLIZED, SEAL COAT, AND TOP COAT (TOP COAT EXTERIOR ONLY)
  - CRANK ARMS = METALLIZED, SEAL COAT, AND TOP COAT
  - A-FRAME TOWERS = METALLIZED, SEAL COAT, AND TOP COAT (TOP COAT EXTERIOR ONLY)
  - LINK ARMS = HOT-DIP GALVANIZED, INTERMEDIATE COAT, AND TOP COAT (INTERMEDIATE AND TOP COAT EXTERIOR ONLY)
  - INTERMEDIATE STRUT = HOT-DIP GALVANIZED, INTERMEDIATE COAT, AND TOP COAT (INTERMEDIATE AND TOP COAT EXTERIOR ONLY)
  - FORWARD STRUT = HOT-DIP GALVANIZED, INTERMEDIATE COAT, AND TOP COAT (INTERMEDIATE AND TOP COAT EXTERIOR ONLY)
  - BRIDGE RAILING = HOT-DIP GALVANIZED
  - STEEL CURB = HOT-DIP GALVANIZED

THE COLOR OF THE FINISHED PAINT COAT SHALL CONFORM TO FEDERAL STANDARD NO. 595 COLOR NO. 25183 (BLUE) UNLESS NOTED OTHERWISE. THE COLOR OF THE FINISHED PAINT COAT SHALL CONFORM TO FEDERAL STANDARD NO. 595B COLOR NO. 17925 (WHITE) FOR THE LINK ARMS, TRUNNION STRUT, CRANK ARMS, AND HYDRAULIC CYLINDERS. THE BRIDGE RAILING AND STEEL CURB SHALL NOT RECIEVE THE FINISHED PAINT COAT.

SECTION 800

11. MAINTENANCE OF TRAFFIC:  
MAINTAIN TRAFFIC AS PER DETOUR PLAN. ALL MOT ITEMS WILL BE INCLUDED IN THE FOLLOWING PAY ITEMS: ITEM #803001 PORTABLE CHANGEABLE MESSAGE SIGNS, ITEM #810001 TEMPORARY WARNING SIGNS AND PLAQUES, AND ITEM #813001 TEMPORARY BARRICADES, TYPE III.

MISCELLANEOUS

12. DESIGN SPECIFICATIONS:  
(A) DELDOT BRIDGE DESIGN MANUAL, 2021 EDITION  
(B) AASHTO LRFD BRIDGE SPECIFICATIONS, 2020, 9TH EDITION, CUSTOMARY U.S. UNITS.  
(C) AASHTO LRFD MOVABLE HIGHWAY BRIDGE DESIGN SPECIFICATIONS, 2007, 2ND EDITION, CUSTOMARY U.S. UNITS INCLUDING 2008, 2010, 2011, 2012, 2014, AND 2015 INTERIM REVISIONS.
13. LOADING:  
-DEAD LOADS CONSERVATIVELY INCLUDE 25 PSF FOR FUTURE WEARING SURFACE ON DECK SLAB. THIS ADDITIONAL DEAD LOAD WAS NOT USED IN DETERMINING THE SPAN BALANCE.  
-DESIGN LIVE LOADS INCLUDE HL-93 LOADING.  
-FATIGUE DESIGN IS BASED ON THE FOLLOWING ONE DIRECTIONAL TRAFFIC VOLUMES: ADTT = 237 (2020).  
-LIVE LOAD DISTRIBUTION FACTOR FOR BASCULE GIRDER IS 1.26.  
-THERMAL LOADS AND MOVEMENTS ARE BASED ON THE MODERATE TEMPERATURE RANGE AS STIPULATED IN THE AASHTO LRFD DESIGN SPECIFICATIONS AS 0 TO 120 DEGREES FAHRENHEIT. THE NORMAL TEMPERATURE WILL BE CONSIDERED TO BE 68° F.  
-LIVE LOAD DEFLECTION LIMIT IS L/800.  
-FOR SEISMIC LOADS, CONSIDER SEISMIC PERFORMANCE ZONE 1, WITH A SITE CLASS = D AND OPERATIONAL CATEGORY = CRITICAL.  
-TRAFFIC BARRIERS HAVE BEEN DESIGNED FOR MASH TEST LEVEL 4 (TL-4) UNLESS NOTED OTHERWISE. THE THREE STRAND TUBE RAIL BARRIER END POST AND MOMENT SLAB HAVE BEEN DESIGNED FOR MASH TEST LEVEL 3 (TL-3).
14. EXISTING CONDITIONS:  
-ALL EXISTING DIMENSIONS AND ELEVATIONS SHOWN ARE BASED ON THE BEST AVAILABLE INFORMATION AND ARE APPROXIMATE ONLY. FIELD VERIFY ALL EXISTING DIMENSIONS, GEOMETRY, AND ELEVATIONS AS NECESSARY PRIOR TO ORDERING ANY MATERIALS AND COMMENCING CONSTRUCTION TO ENSURE PROPER FIT OF THE PROPOSED CONSTRUCTION. PAYMENT UNDER ITEM #763501 - CONSTRUCTION ENGINEERING.  
-DO NOT CONSIDER ANY OF THE DATA ON THE EXISTING STRUCTURE SUPPLIED IN THE ORIGINAL DESIGN DRAWINGS OR MADE AVAILABLE BY THE DEPARTMENT OR ITS AUTHORIZED AGENTS AS ACCURATE REPRESENTATIONS OF ANY OF THE CONDITIONS THAT WILL BE ENCOUNTERED IN THE FIELD.

MISCELLANEOUS (CONTINUED)

15. HYDRAULIC DATA:  
DESIGN FREQ.: 100 YEARS  
100-YEAR DISCHARGE: 6100 cfs  
PROPOSED (DESIGN STORM) WSE: 11.4 ft  
PROPOSED (DESIGN STORM) VELOCITY: 5.7 fps  
PROPOSED 100-YEAR WSE: 11.4 ft  
PROPOSED 100-YEAR VELOCITY: 5.7 fps  
PROPOSED WATERWAY OPENING: 2050 sq. ft
- MEAN HIGH WATER ELEVATION: 2.06 ft  
MEAN LOW WATER ELEVATION: -2.57 ft  
VERTICAL UNDER CLEARANCE: 4.04 ft (FROM MHW TO BASCULE LEAF)
16. SCOUR ANALYSIS:  
SCOUR DESIGN FREQUENCY: \*  
SCOUR DESIGN FLOOD DISCHARGE: 6100 cfs  
SCOUR DESIGN FLOOD VELOCITY: 5.7 fps (AT BRIDGE OUTLET)  
WATER SURFACE ELEVATION: 4.5 ft (IMMEDIATELY UPSTREAM OF BRIDGE)  
CALCULATED SCOUR DEPTH AT EACH SUBSTRUCTURE UNIT: \*  
\*FOR ADDITIONAL INFORMATION REFER TO THE COASTAL HYDRAULIC AND SCOUR STUDY PERFORMED BY AECOM.
- SCOUR COUNTERMEASURES HAVE BEEN DESIGNED FOR THE SCOUR DESIGN FLOOD IN ACCORDANCE WITH HEC 23 - BRIDGE SCOUR AND STREAM INSTABILITY COUNTERMEASURES and/or HEC 14 - HYDRAULIC DESIGN OF ENERGY DISSIPATORS FOR CULVERTS AND CHANNELS.
17. ROADWAY CLEARANCES:  
MAINTAIN A MINIMUM OF 16'-6" ABOVE ALL ROADWAYS.

LOAD RATING SUMMARY					
VEHICLE TYPE	RATING FACTOR	RATING WEIGHT (TONS)	CONTROLLING MEMBER	CONTROLLING POINT	LOAD EFFECT
HL-93 TRUCK (INVENTORY)	1.40	50.49	EXTERIOR (SPAN 1)	106	SERVICE III
HL-93 TANDEM (INVENTORY)	1.16	28.96	EXTERIOR (SPAN 1)	105	SERVICE III
HS20 (INVENTORY)	1.66	59.73	EXTERIOR (SPAN 1)	106	SERVICE III
HL-93 TRUCK (OPERATING)	2.22	79.89	EXTERIOR (SPAN 1)	103	STRENGTH I
HL-93 TANDEM (OPERATING)	1.98	49.53	EXTERIOR (SPAN 1)	105	STRENGTH I
HS20 (OPERATING)	2.57	92.47	EXTERIOR (SPAN 1)	103	STRENGTH I
DE S220	2.42	48.34	EXTERIOR (SPAN 1)	106	SERVICE III
DE S335	1.25	43.60	EXTERIOR (SPAN 1)	105	SERVICE III
DE S437	1.19	43.58	EXTERIOR (SPAN 1)	105	SERVICE III
DE T330	2.24	67.21	EXTERIOR (SPAN 1)	105	SERVICE III
DE T435	1.68	58.85	EXTERIOR (SPAN 1)	105	SERVICE III
DE T540	1.60	63.96	EXTERIOR (SPAN 1)	105	SERVICE III
EV2	1.73	49.75	EXTERIOR (SPAN 1)	106	SERVICE III
EV3	1.08	46.65	EXTERIOR (SPAN 1)	105	SERVICE III
SU4	1.64	44.37	EXTERIOR (SPAN 1)	105	SERVICE III
SU5	1.51	46.71	EXTERIOR (SPAN 1)	105	SERVICE III
SU6	1.38	47.85	EXTERIOR (SPAN 1)	105	SERVICE III
SU7	1.33	51.57	EXTERIOR (SPAN 1)	105	SERVICE III
NOTE: LOAD RATING INCLUDES FUTURE WEARING SURFACE, SEE NOTE 13 THIS DRAWING.					

ANCHOR BOLT PROPERTIES				
LOCATION	DIA.	GRADE	FINISH	REQUIRED TENSION (KIPS)
BARRIER GATE RECEIVER PLATE	¾"	ASTM F1554 GR. 105	GALVANIZED	10
3 STRAND TUBE RAIL	7⁄8"	ASTM F1554 GR. 105	GALVANIZED	15
CENTERING DEVICE	1"	ASTM F1554 GR. 105	GALVANIZED	20
BASCULE GIRDER BEARING	1¼"	ASTM F1554 GR. 105	GALVANIZED	35
FORWARD TOWER BASEPLATE	1½"	ASTM F1554 GR. 105	GALVANIZED	50
REAR TOWER BASEPLATE	1½"	ASTM F1554 GR. 105	GALVANIZED	50
AERIAL CABLE POLE	2¼"	ASTM F1554 GR. 105	GALVANIZED	105
PRECAST SLAB SPAN FIXED BEARING	1"	ASTM F593H TYPE 316	STAINLESS STEEL	10
PRECAST SLAB SPAN EXPANSION BEARING	1"	ASTM F593H TYPE 316	STAINLESS STEEL	10

BRIDGE 3-164 QUANTITIES

ITEM NO.	ITEM TITLE	UNIT	QUANTITY
207000	PIPE, CULVERT, AND STRUCTURAL EXCAVATION	CY	1476
207021	STRUCTURAL BACKFILL (BORROW, TYPE C)	CY	2509
208000	FLOWABLE FILL	CY	340
211000	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LS	1
301001	GABC	CY	25
302005	DELAWARE NO. 57 STONE	TON	272
604002	COFFERDAMS	LS	1
605032	PROVIDE STEEL PIPE PILE 36"	LF	333
605033	PROVIDE STEEL PIPE PILE 48"	LF	187
605041	PROVIDE PRECAST PRESTRESSED CONCRETE PILES, 14"x14"	LF	700
605083	PROVIDE STEEL PIPE INDICATOR OR TEST PILES, 48"	LF	393
605091	PROVIDE PRECAST PRESTRESSED CONCRETE TEST PILES, 14"x14"	LF	110
605132	INSTALL STEEL PIPE PILE 36"	LF	333
605133	INSTALL STEEL PIPE PILE 48"	LF	187
605141	INSTALL PRECAST PRESTRESSED CONCRETE PILES, 14"x14"	LF	700
605183	INSTALL STEEL PIPE INDICATOR OR TEST PILES, 48"	LF	393
605191	INSTALL PRECAST PRESTRESSED CONCRETE TEST PILES, 14"x14"	LF	110
605200	PILE RESTRIKE	EA	4
605201	DYNAMIC PILE TESTING BY CONTRACTOR FOR TEST PILE INITIAL DRIVE	EA	6
605202	DYNAMIC PILE TESTING BY CONTRACTOR FOR RE-STRIKE OR PRODUCTION PILE	EA	6
605515	VIBRATION MONITORING	LS	1
608030	SHEET PILE WALL TIE-BACK SYSTEM	LS	1
608049	STEEL SHEET PILES, NZ 42	SF	16,201
610005	PCC MASONRY, SUBSTRUCTURE, CLASS A	CY	368
610008	PCC MASONRY, PARAPET, CLASS A	CY	13
610017	PCC MASONRY, SUPERSTRUCTURE, CLASS D	CY	58
610018	PCC MASONRY, APPROACH SLAB, CLASS D	CY	26
610500	ULTRA HIGH PERFORMANCE CONCRETE	CF	105
611001	BAR REINFORCEMENT, EPOXY COATED	LB	117,407
612020	PRESTRESSED REINFORCED CONCRETE MEMBERS, SOLID SLAB	LS	1
612500	PRECAST CONCRETE PIER CAP	CY	165
613003	HIGH MOLECULAR WEIGHT METHACRYLATE CONCRETE SEALER	SF	2,213
615001	STEEL STRUCTURES	LS	1
615503	BRIDGE MECHANICAL SYSTEM	LS	1
615504	BRIDGE ELECTRICAL SYSTEM	LS	1
615512	BRIDGE SCUPPERS	EA	8
624000	PREFABRICATED EXPANSION JOINT SYSTEM, 3"	LF	145
626010	ALUMINUM PEDESTRIAN RAILING	LF	314
626501	THREE STRAND TUBE RAIL PARAPET	LF	184
707013	RIPRAP, R7	CY	900
708001	GEOTEXTILES, STABILIZATION	SY	1473
708003	GEOTEXTILES, RIPRAP	SY	281
763501	CONSTRUCTION ENGINEERING	LS	1
763522	COAST GUARD SPECIFIC CONDITIONS	LS	1
763537	INTEGRAL FENDER SYSTEM	LS	1
909004	TURBIDITY CURTAIN, FLOATING	LF	728

					S-02			
ADDENDA / REVISIONS			NOT TO SCALE	REPLACEMENT OF BR 3-164 ON SR 36 CEDAR BEACH ROAD	CONTRACT	BRIDGE NO.	3-164	BRIDGE PROJECT NOTES - 2
		T202007301			DESIGNED BY: D. NEELY			
		COUNTY			CHECKED BY: G. PATTON			
		SUSSEX						

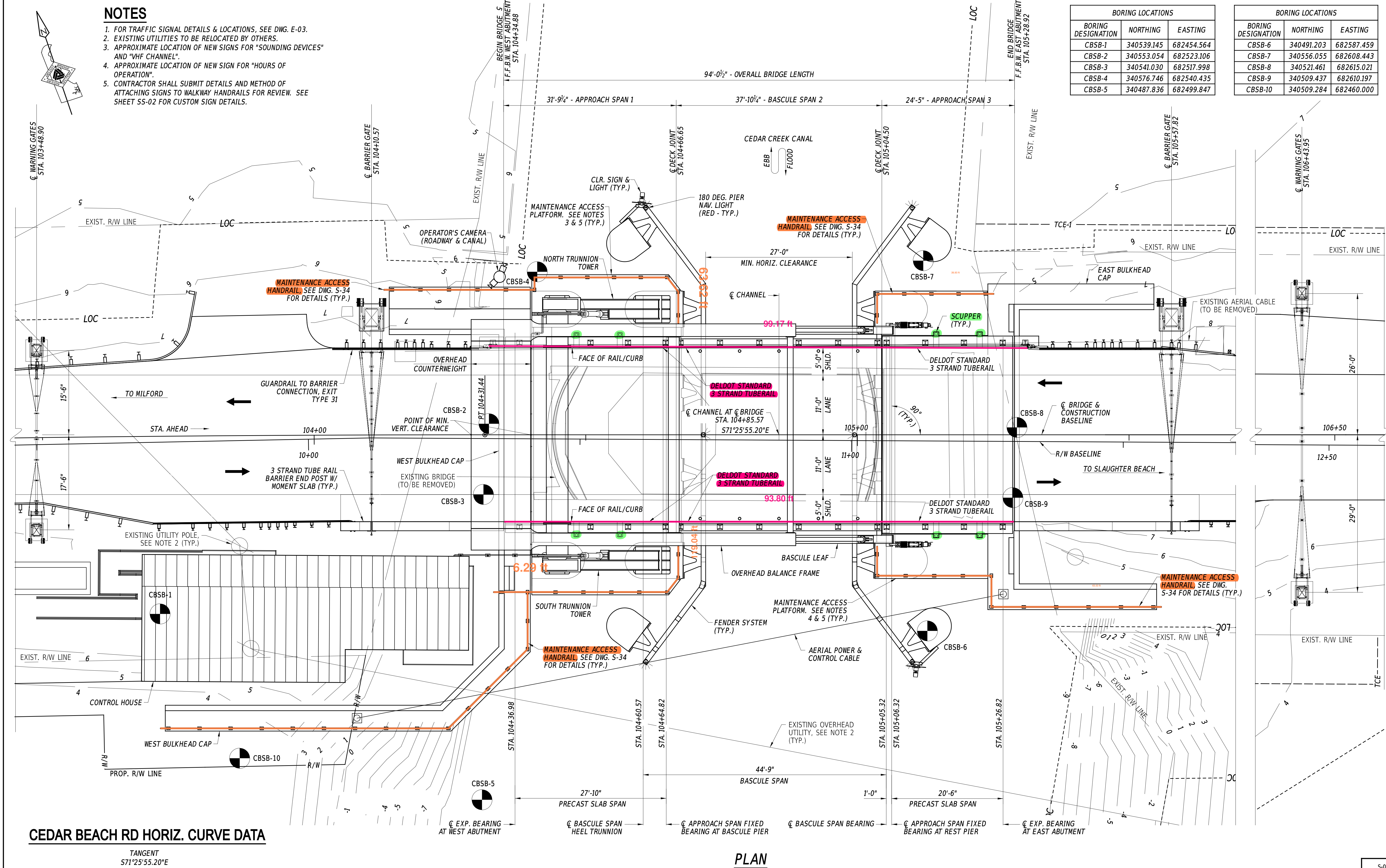


NOTES

1. FOR TRAFFIC SIGNAL DETAILS & LOCATIONS, SEE DWG. E-03.
2. EXISTING UTILITIES TO BE RELOCATED BY OTHERS.
3. APPROXIMATE LOCATION OF NEW SIGNS FOR "SOUNDING DEVICES" AND "VHF CHANNEL".
4. APPROXIMATE LOCATION OF NEW SIGN FOR "HOURS OF OPERATION".
5. CONTRACTOR SHALL SUBMIT DETAILS AND METHOD OF ATTACHING SIGNS TO WALKWAY HANDRAILS FOR REVIEW. SEE SHEET SS-02 FOR CUSTOM SIGN DETAILS.

BORING LOCATIONS		
BORING DESIGNATION	NORTHING	EASTING
CBSB-1	340539.145	682454.564
CBSB-2	340553.054	682523.106
CBSB-3	340541.030	682517.998
CBSB-4	340576.746	682540.435
CBSB-5	340487.836	682499.847

BORING LOCATIONS		
BORING DESIGNATION	NORTHING	EASTING
CBSB-6	340491.203	682587.459
CBSB-7	340556.055	682608.443
CBSB-8	340521.461	682615.021
CBSB-9	340509.437	682610.197
CBSB-10	340509.284	682460.000



CEDAR BEACH RD HORIZ. CURVE DATA

TANGENT  
S71°25'55.20"E

PLAN



REPLACEMENT OF BR 3-164 ON  
SR 36 CEDAR BEACH ROAD

CONTRACT	BRIDGE NO.	3-164
T202007301	DESIGNED BY:	A. MILLER
COUNTY	CHECKED BY:	D. NEELY
SUSSEX		

BRIDGE GENERAL PLAN

S-03
SECTION
H&H
SHEET NO.
12



ADDENDA / REVISIONS	

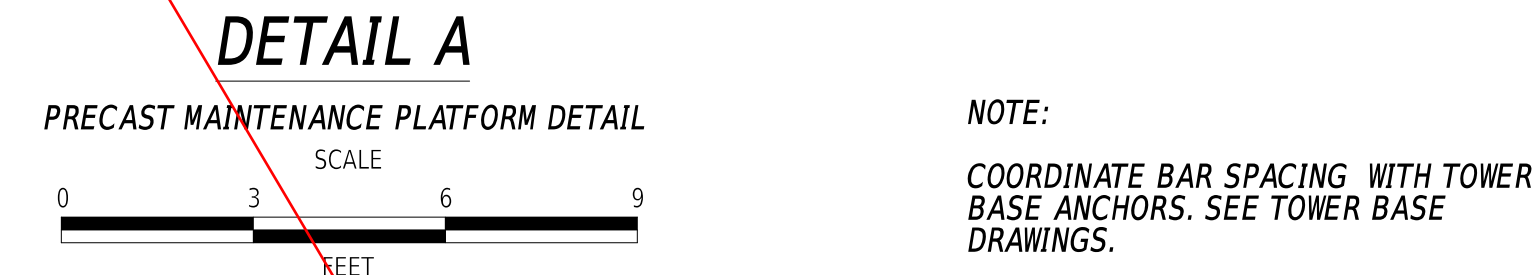
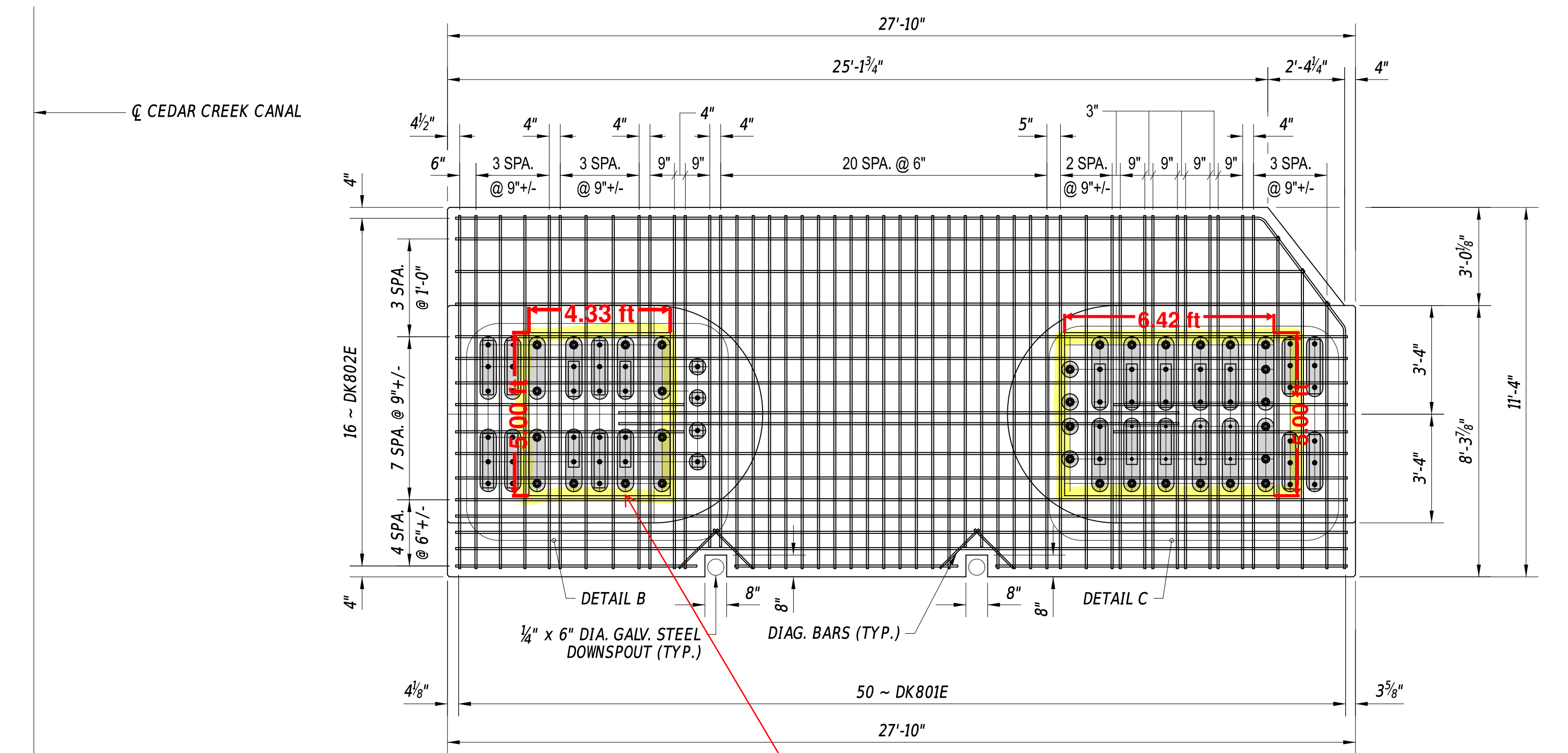
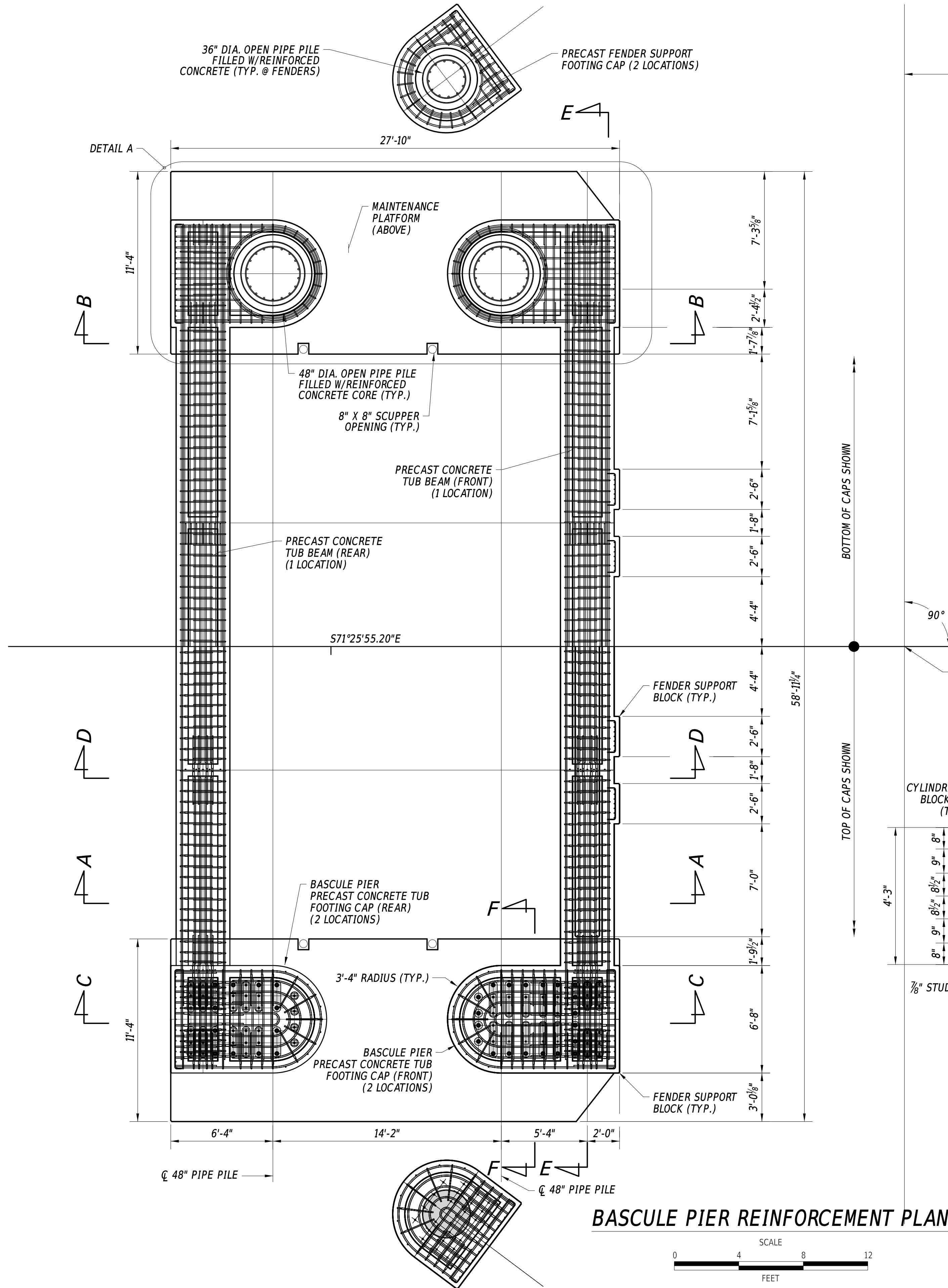
SCALE AS NOTED

REPLACEMENT OF BR 3-164 ON  
SR 36 CEDAR BEACH ROAD

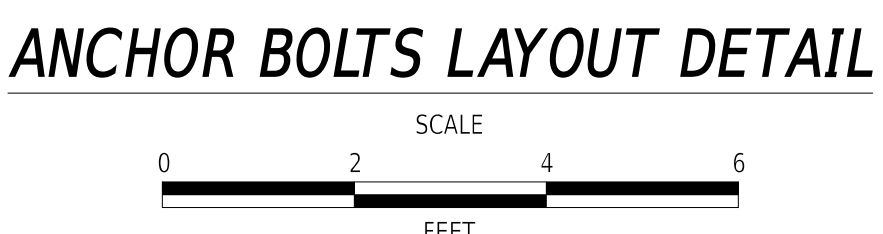
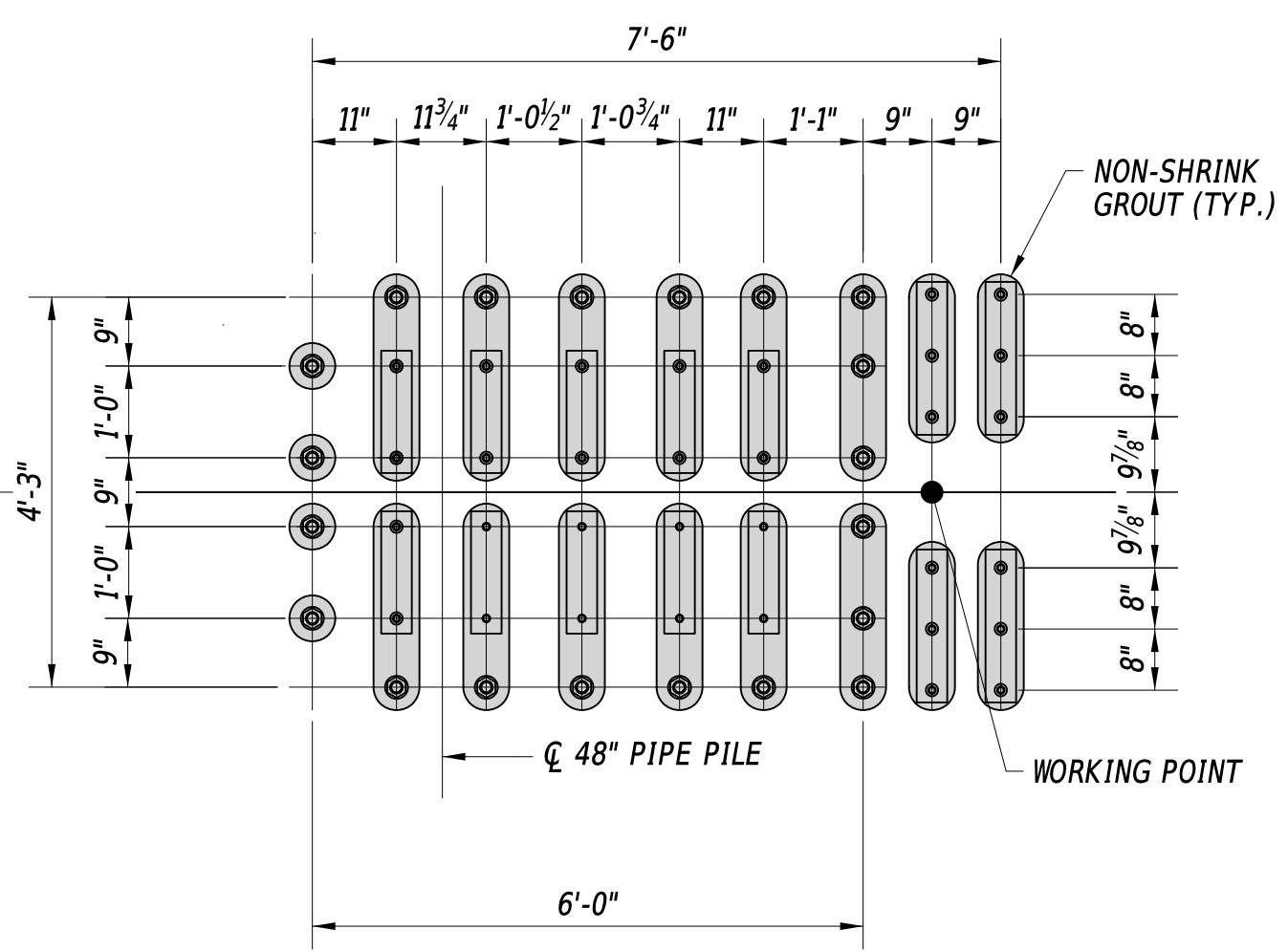
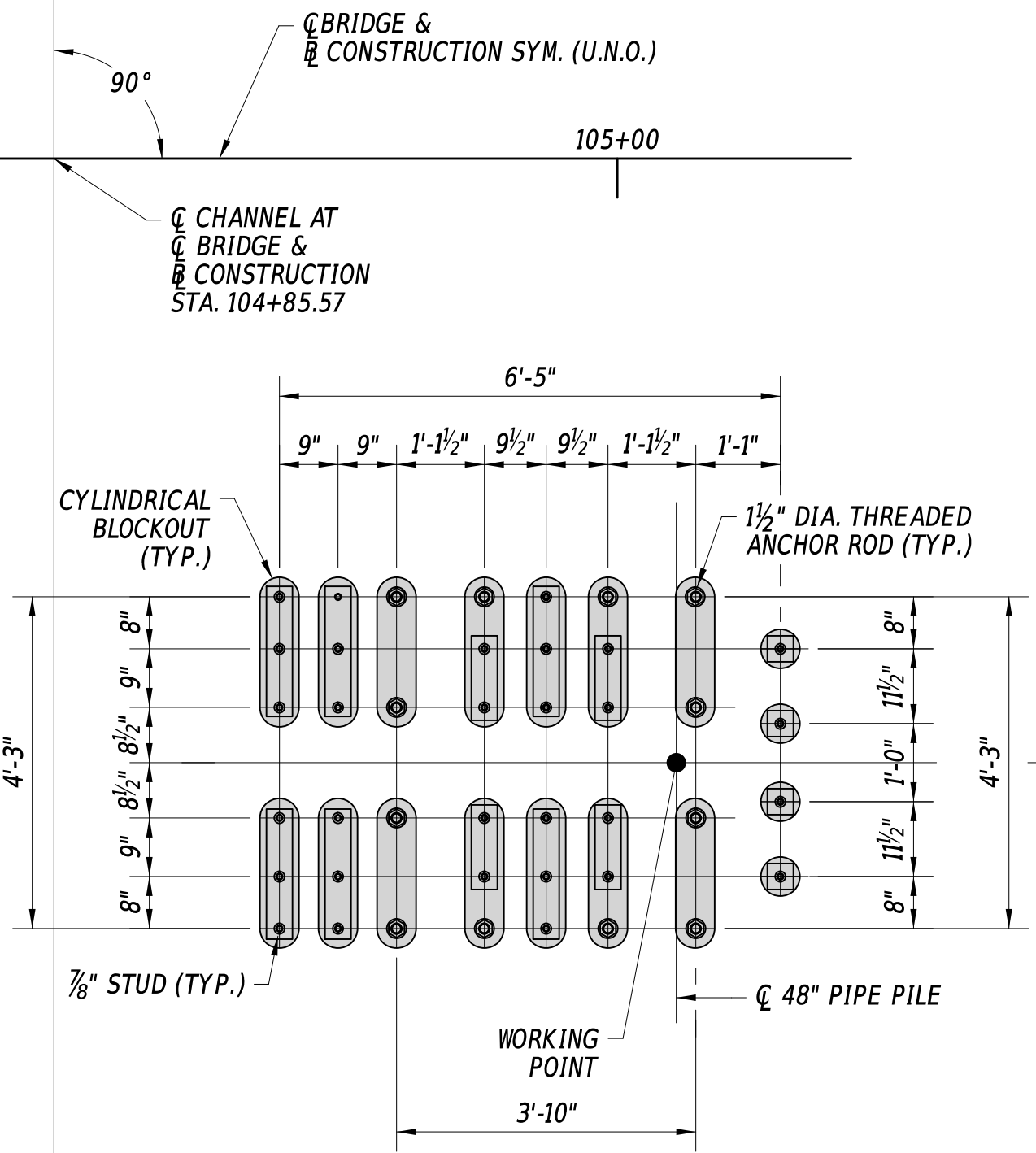
CONTRACT	BRIDGE NO.	3-164
T202007301	DESIGNED BY:	J. SOTO
COUNTY	CHECKED BY:	C. GRANADOS
SUSSEX		

BASCULE PIER DETAILS - 1

S-24
SECTION
H&H
SHEET NO.
33

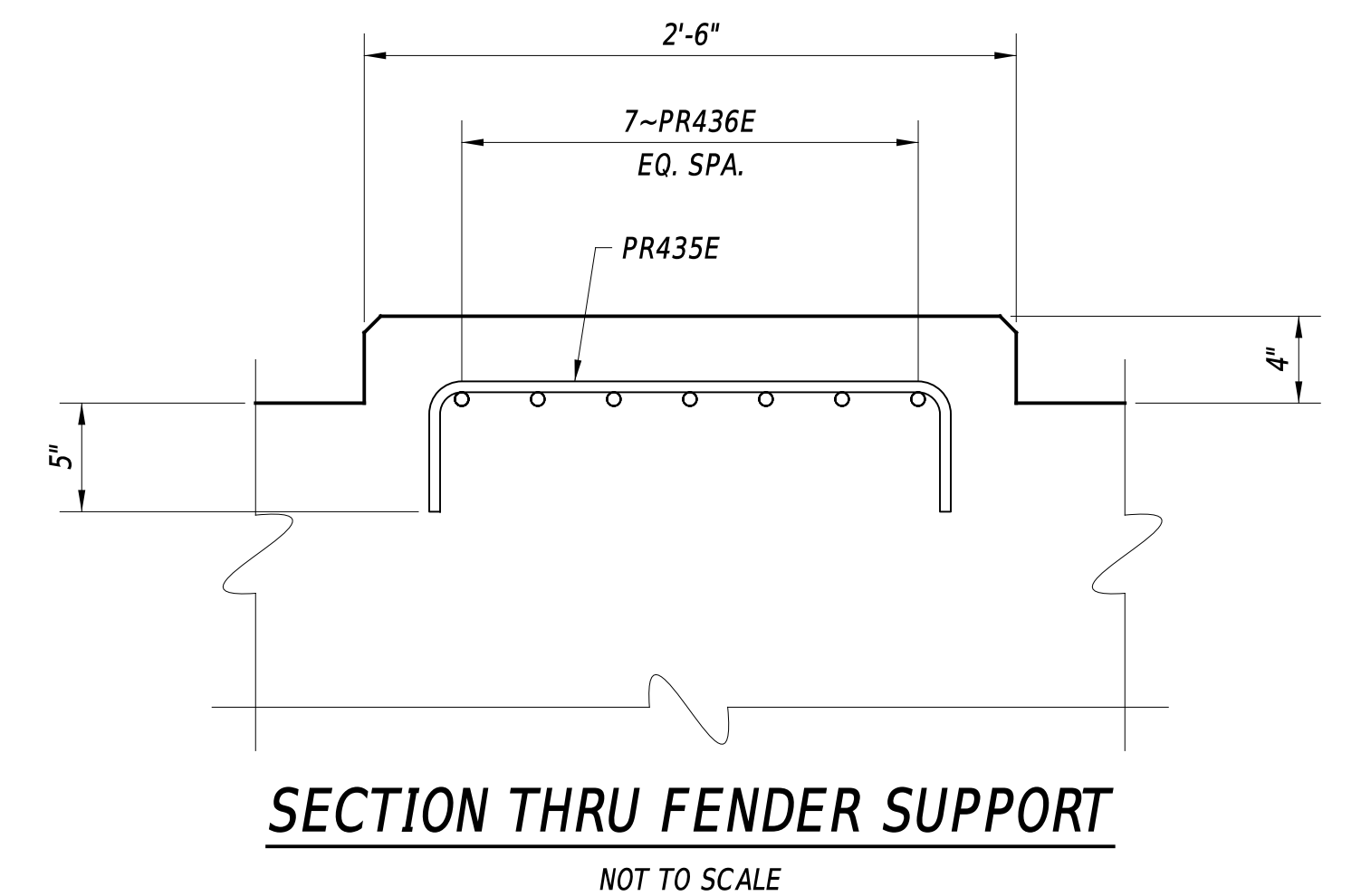
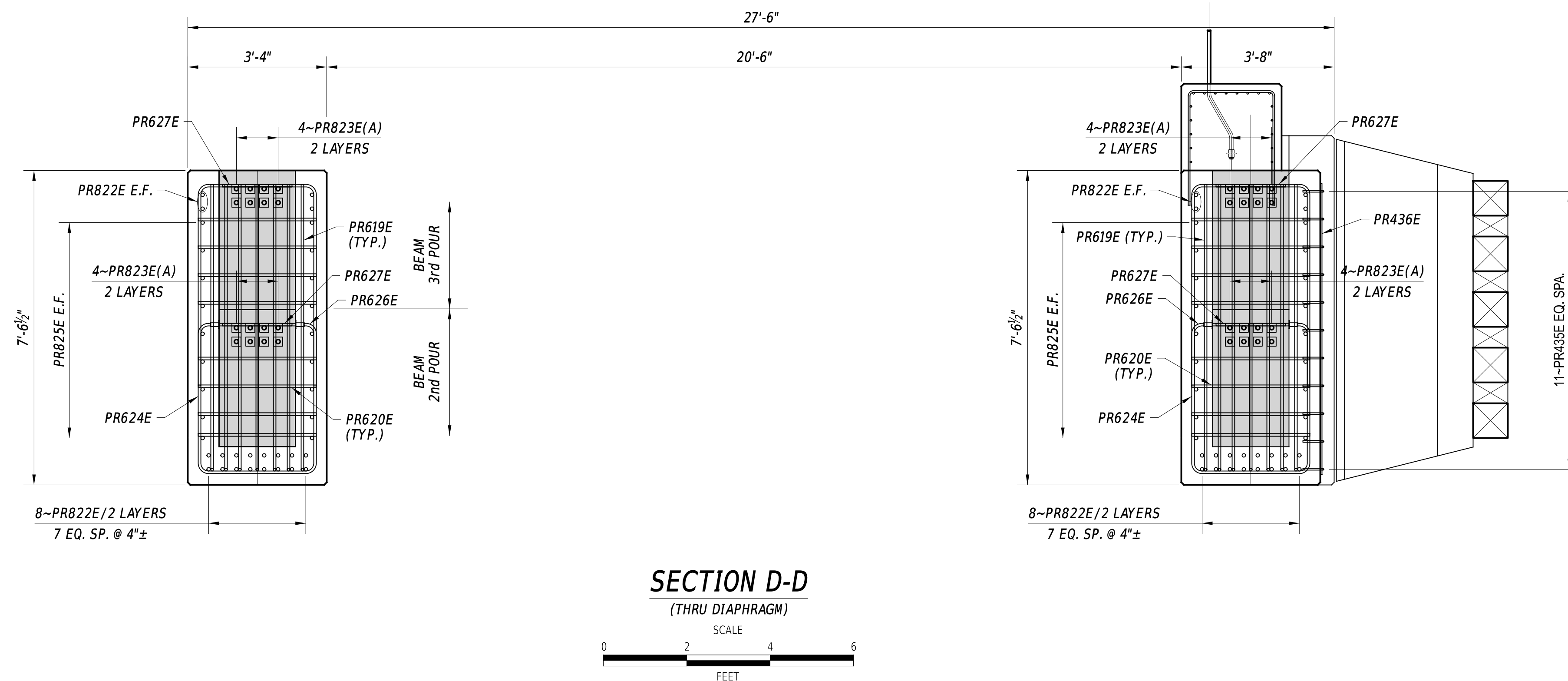
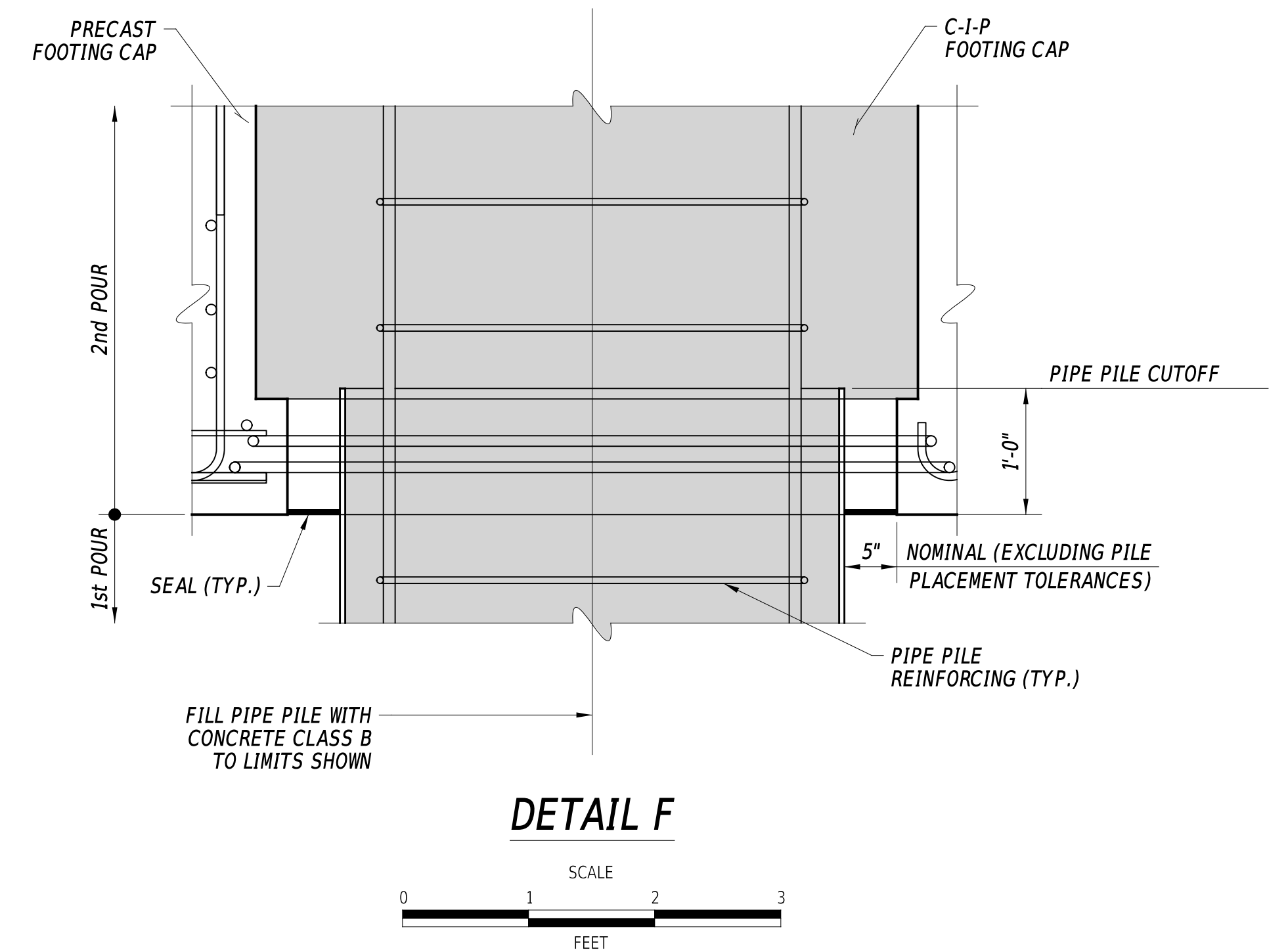
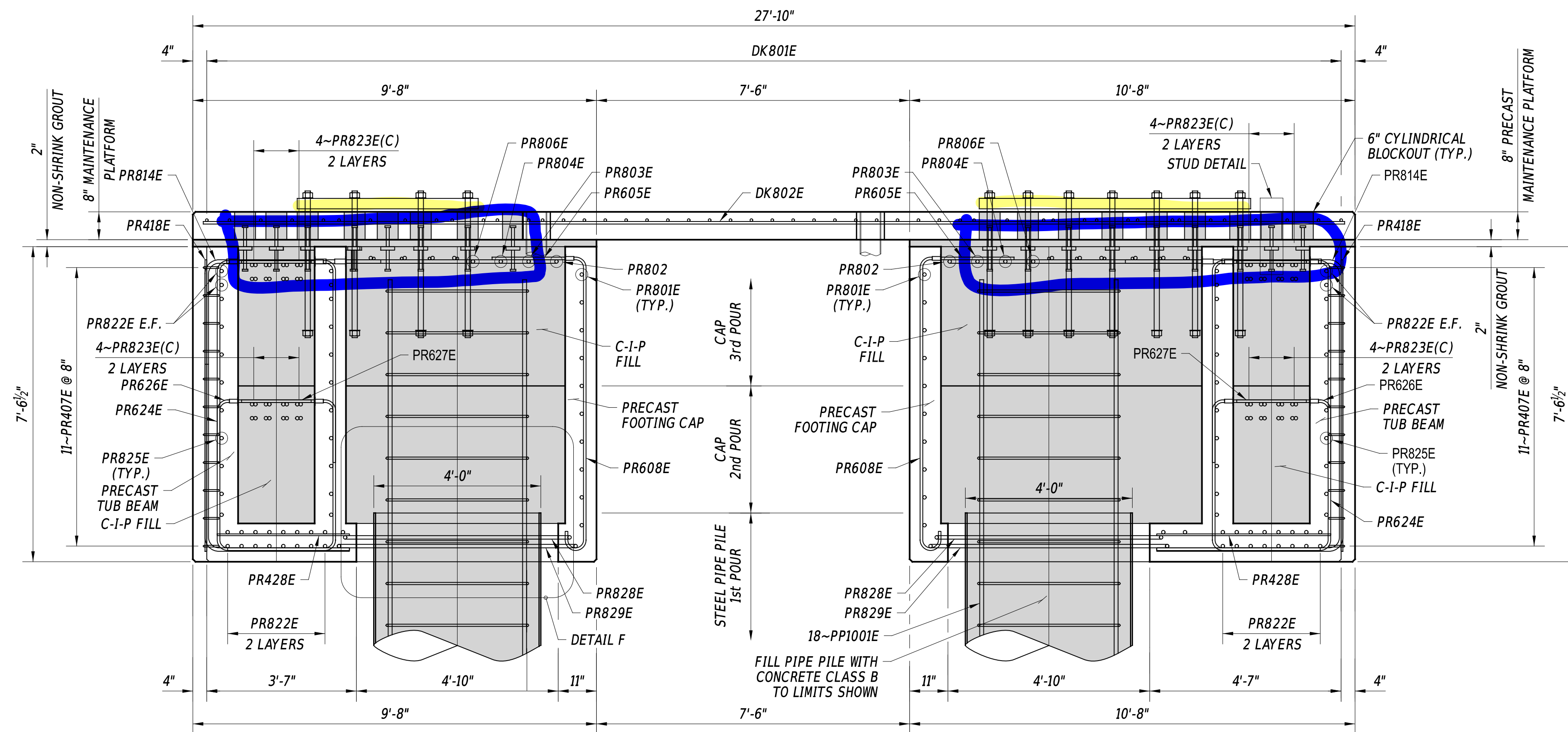


PLATES SHOWN ON  
SHEET S-27 IN  
ELEVATION VIEW



- NOTES:
- FOR SECTIONS A-A, B-B, C-C, D-D, E-E,  
AND F-F, SEE DWG NOS. S-26 THRU S-28.
  - FOR SCUPPER DETAILS, SEE DWG. NO. S-41.
  - FOR STUD DETAIL, SEE DWG. NO. S-28.





**LEGEND:**

- ☐ PRECAST
- ☒ CAST IN PLACE

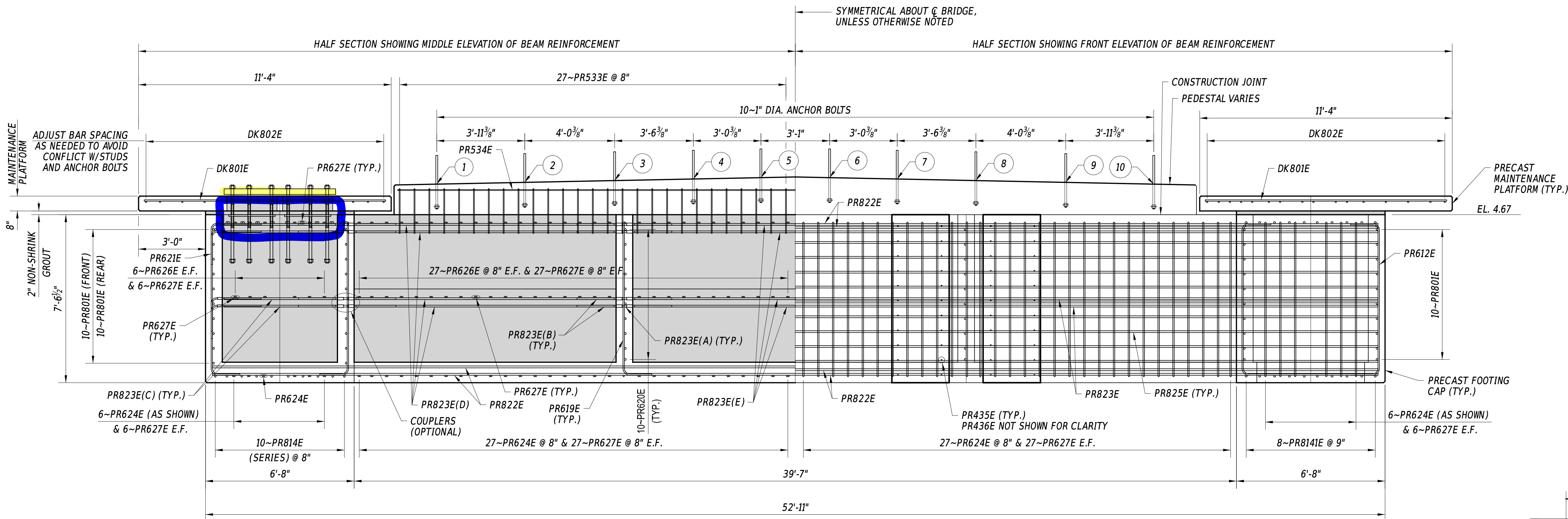
NOTES:

1. FOR SECTIONS C-C AND D-D, SEE SHEET NO. S-24.
2. COORDINATE ANCHOR BOLT LAYOUT WITH DWG. NO. S-24 AND MECHANICAL DWGS.
3. FOR STUD DETAIL, SEE DWG. NO. S-28.

ADDENDA / REVISIONS		SCALE AS NOTED	REPLACEMENT OF BR 3-164 ON SR 36 CEDAR BEACH ROAD	CONTRACT	BRIDGE NO.	3-164	BASCULE PIER DETAILS - 4	SECTION
				T202007301	DESIGNED BY:	J.SOTO		H&H
				COUNTY	CHECKED BY:	C. GRANADOS		SHEET NO.
				SUSSEX				36



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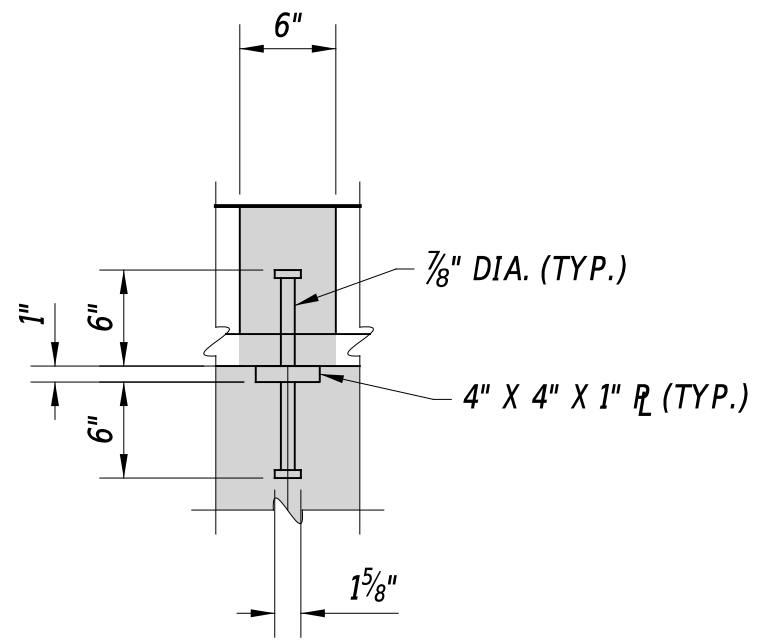


SECTION E-E  
NOT TO SCALE

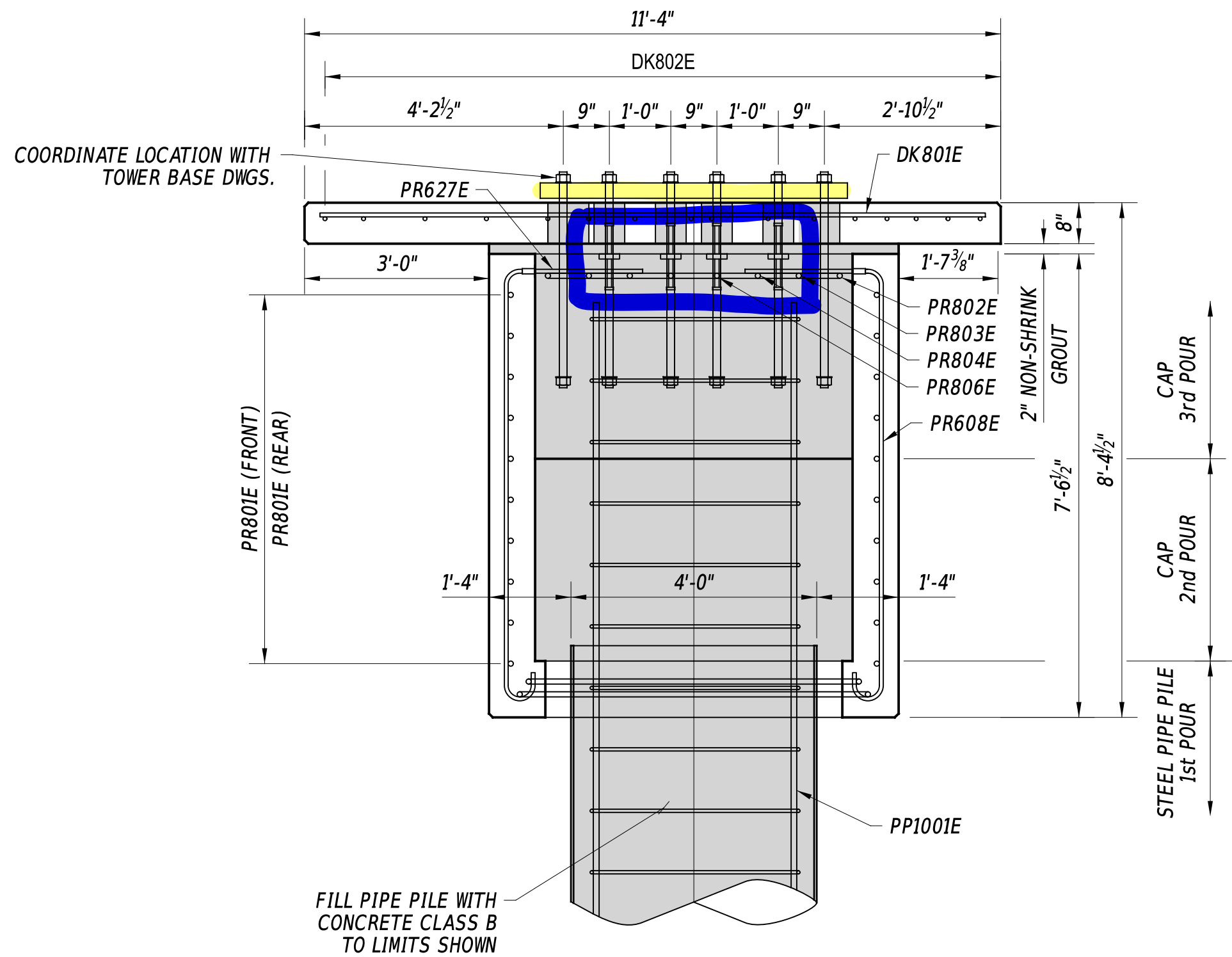
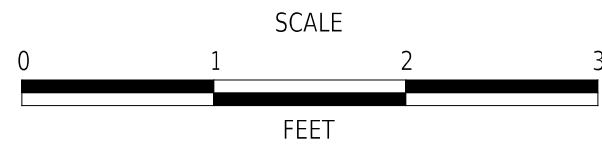
BEARING ELEVATIONS	
MARK	ELEV.
1	6.04
2	6.12
3	6.20
4	6.27
5	6.33
6	6.33
7	6.27
8	6.20
9	6.12
10	6.04

LEGEND:

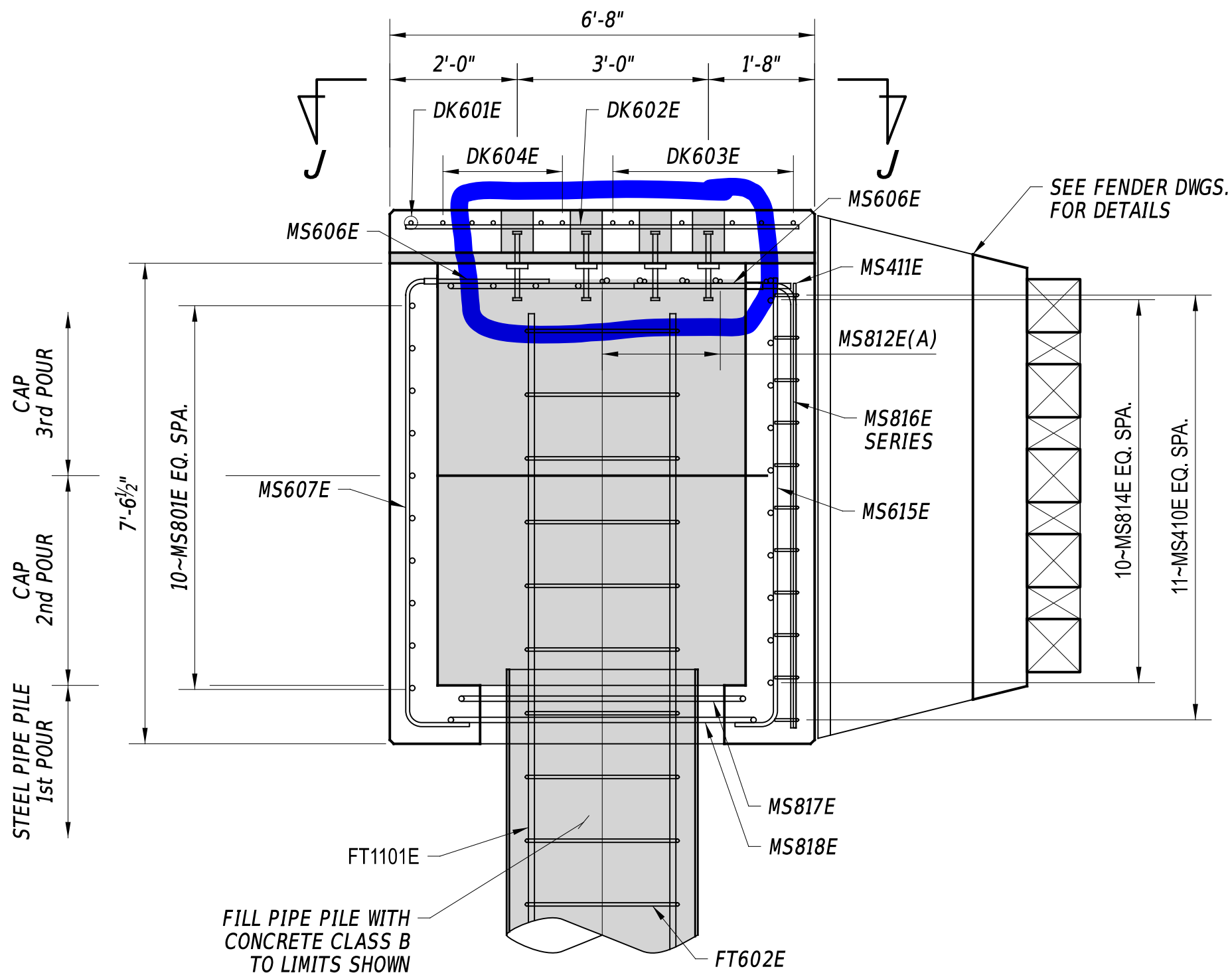
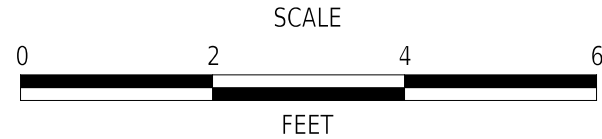
- PRECAST
- CAST IN PLACE



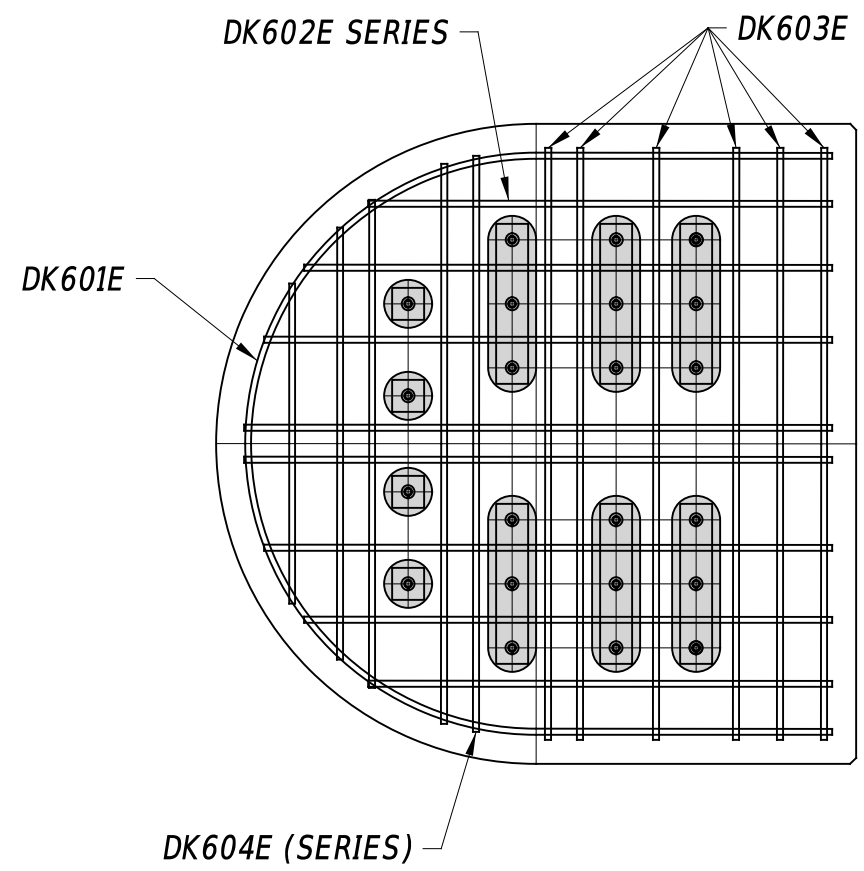
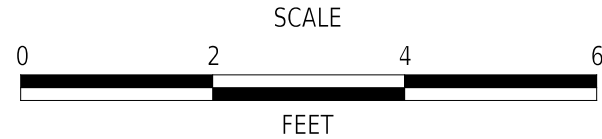
STUD DETAIL



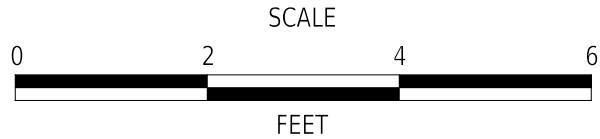
SECTION F-F



SECTION AT FENDER SUPPORT



SECTION J-J



NOTES:

- FOR SECTION E-E AND F-F, SEE DWG. NO. S-24.
- FOR STUD DETAIL LOCATION, SEE DWG. NO. S-27.

ADDENDA / REVISIONS

SCALE AS NOTED

REPLACEMENT OF BR 3-164 ON  
SR 36 CEDAR BEACH ROAD

CONTRACT  
T202007301  
COUNTY  
SUSSEX

BRIDGE NO.  
3-164  
DESIGNED BY: J. SOTO  
CHECKED BY: C. GRANADOS

BASCULE PIER DETAILS - 5

S-28

SECTION

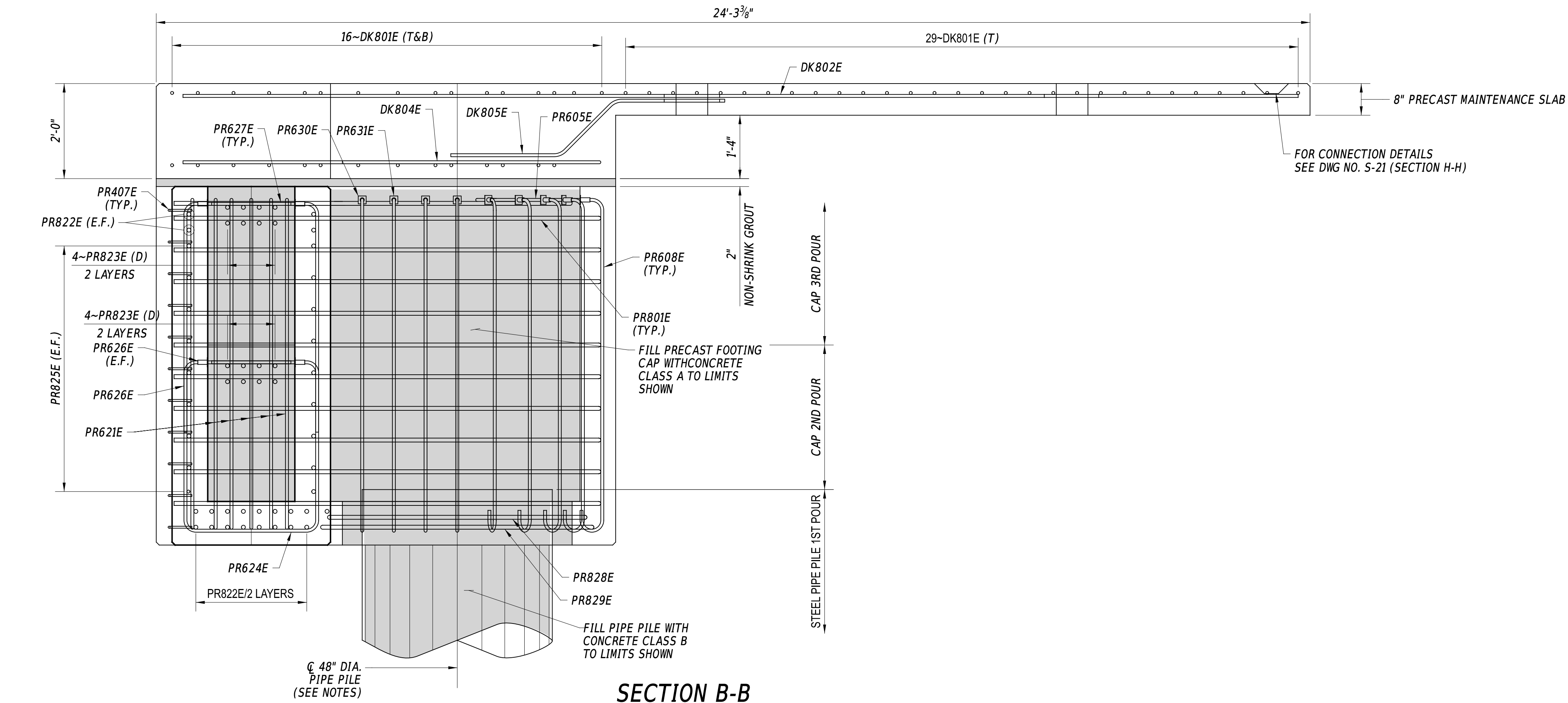
H&H

SHEET NO.

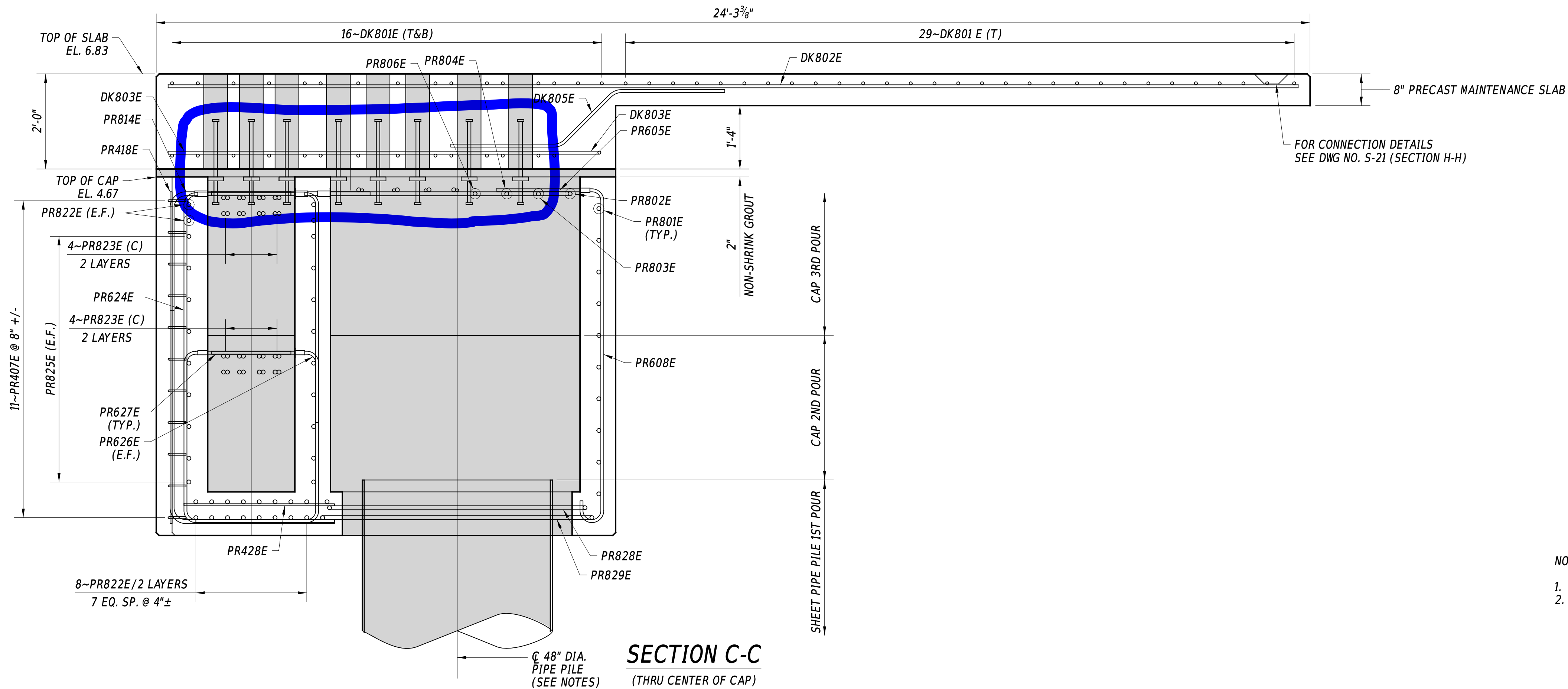
37



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SECTION B-B



SECTION C-C  
(THRU CENTER OF CAP)

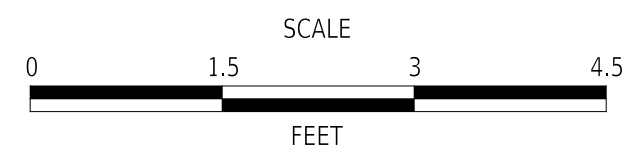
LEGEND:

- PRECAST
- CAST IN PLACE

NOTES:

- FOR SECTIONS B-B AND C-C, SEE DWG. NO. S-30.
- FINISH TOP SURFACE OF MAINTENANCE PLATFORMS SIMILAR TO PEDESTRIAN WALKWAYS.

ADDENDA / REVISIONS



REPLACEMENT OF BR 3-164 ON  
SR 36 CEDAR BEACH ROAD

CONTRACT	BRIDGE NO.	3-164
T202007301	DESIGNED BY:	D. CASTILLO
COUNTY	CHECKED BY:	C. GRANADOS
SUSSEX		

REST PIER DETAILS - 3

S-32

SECTION

H&H

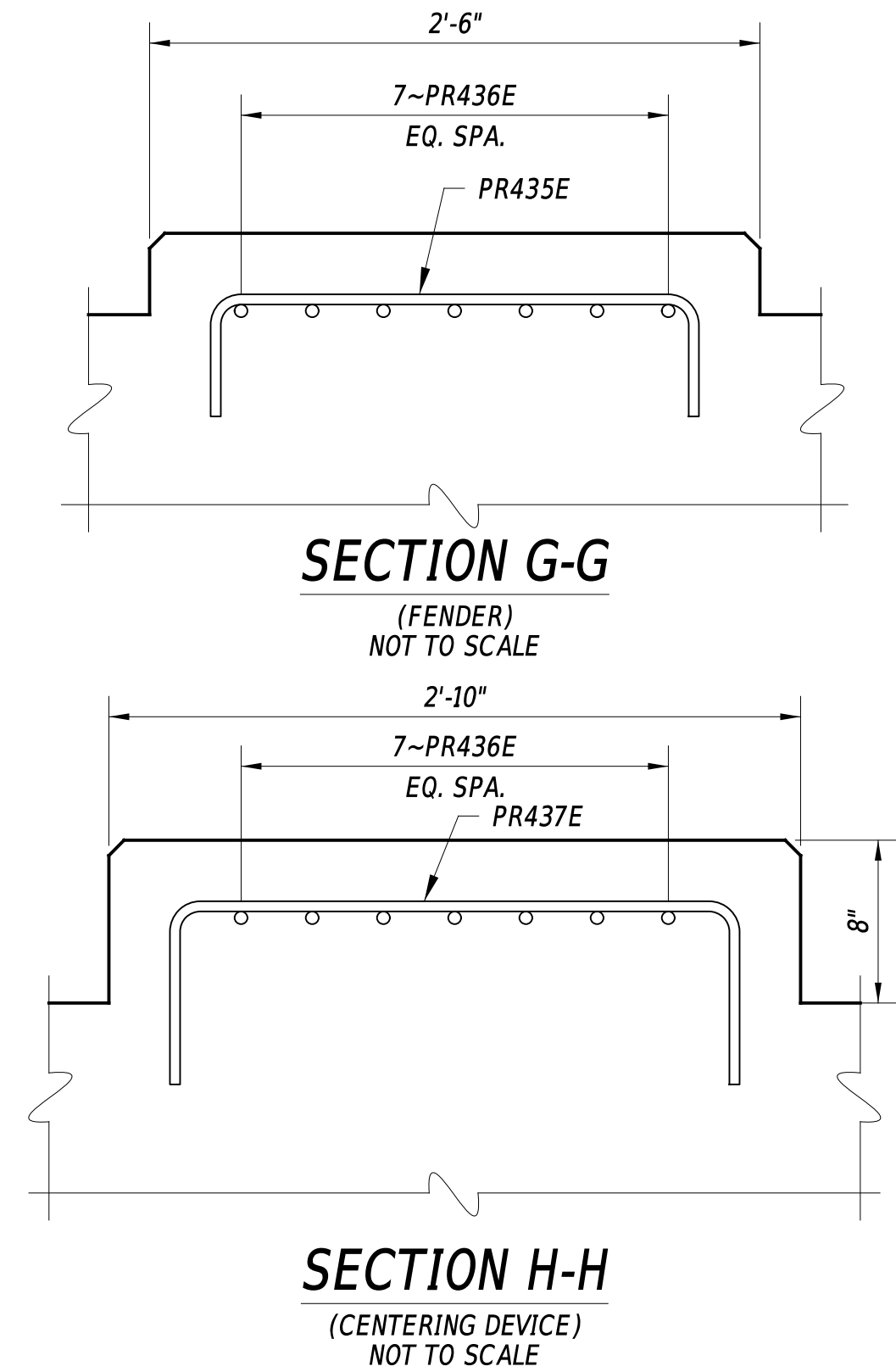
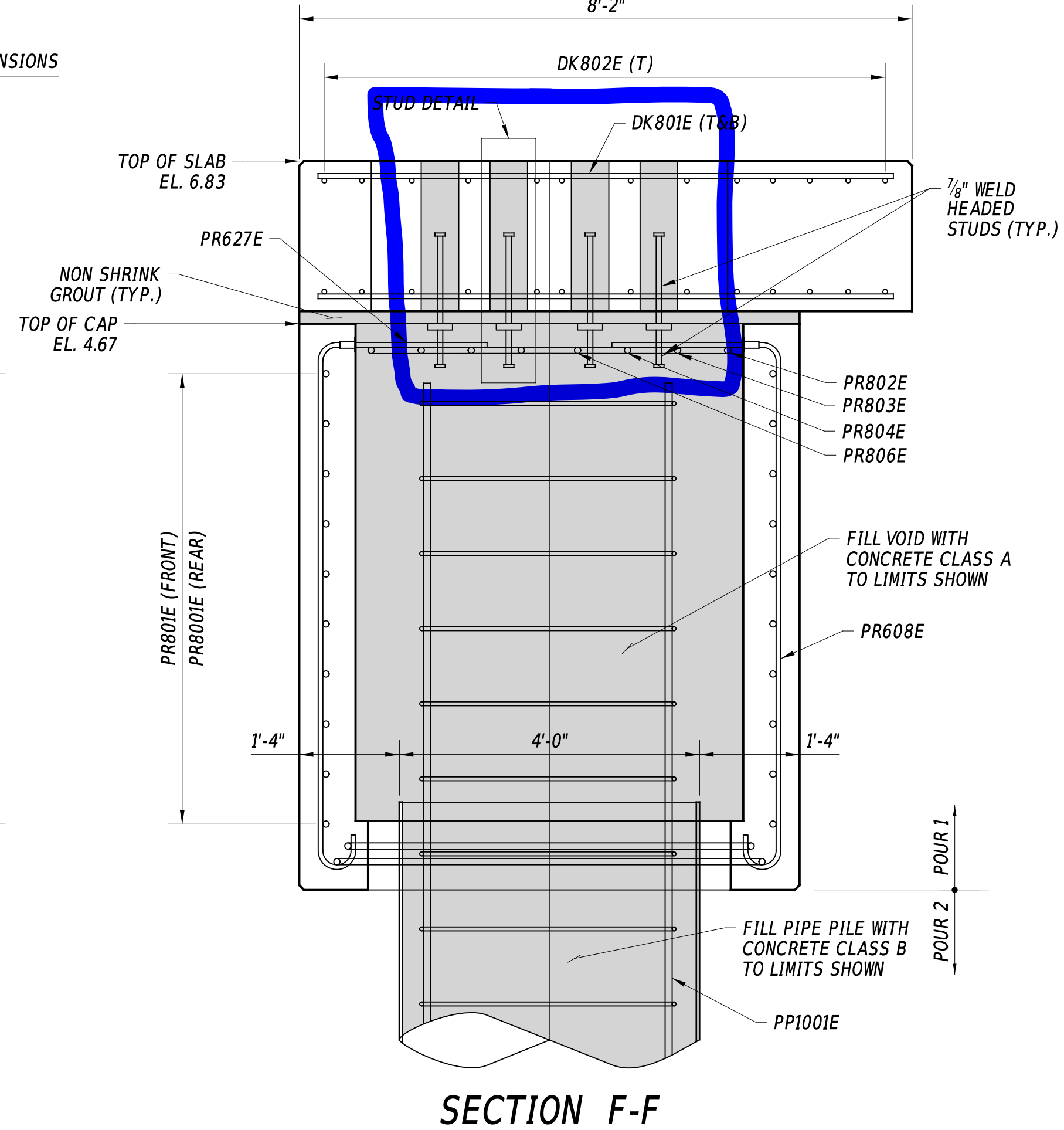
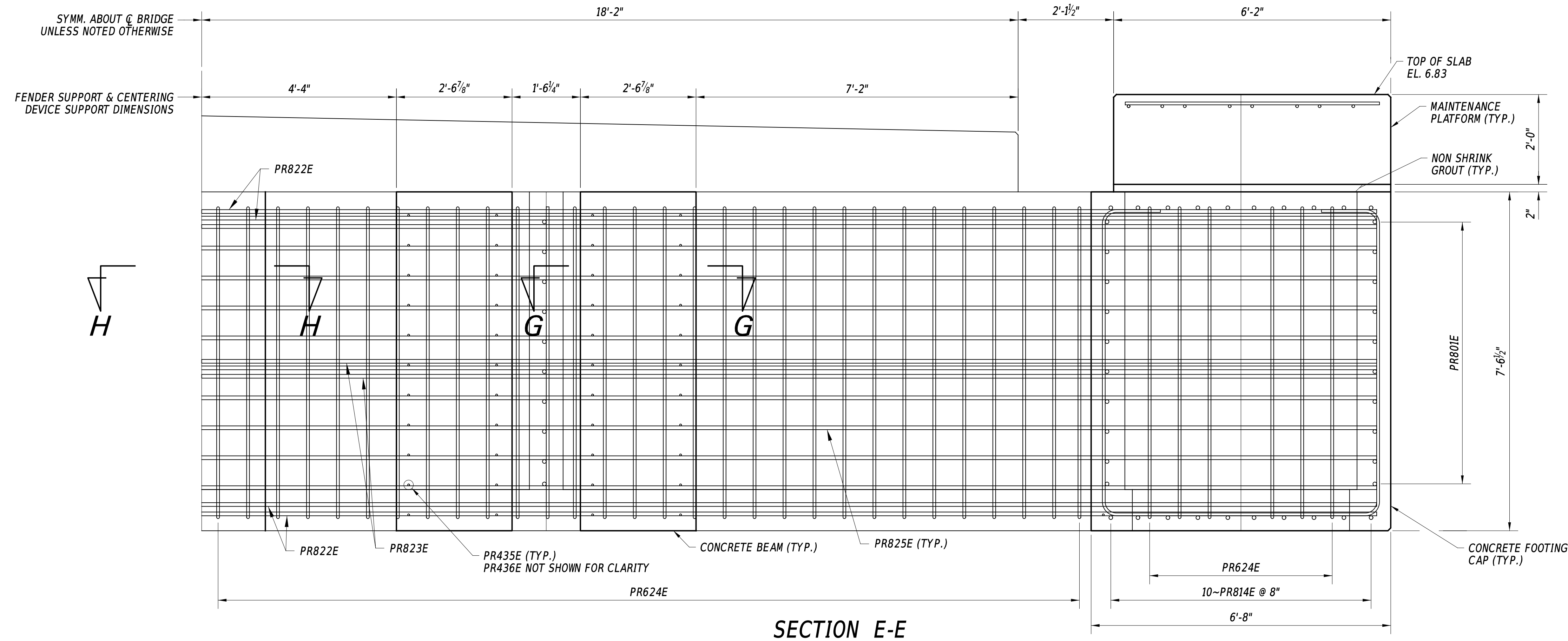
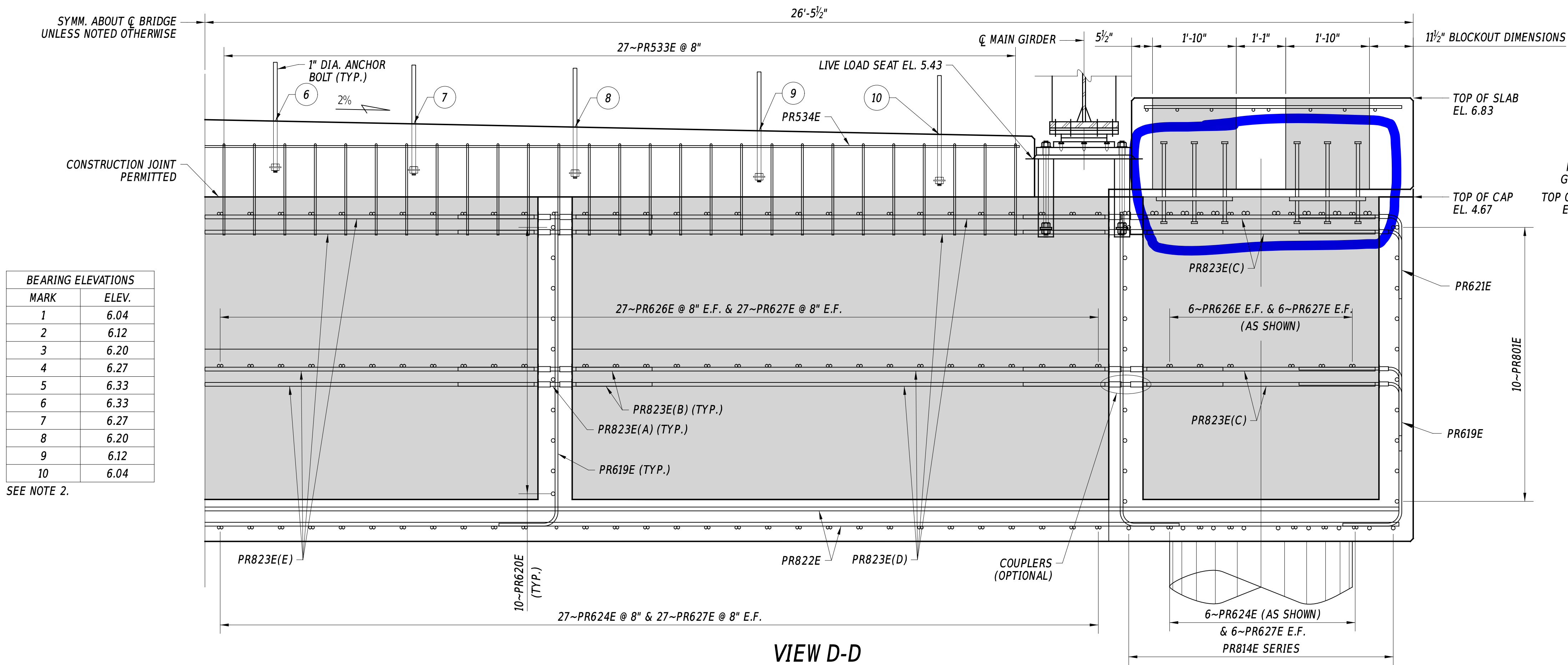
SHEET NO.

41



BEARING ELEVATIONS	
MARK	ELEV.
1	6.04
2	6.12
3	6.20
4	6.27
5	6.33
6	6.33
7	6.27
8	6.20
9	6.12
10	6.04

SEE NOTE 2.



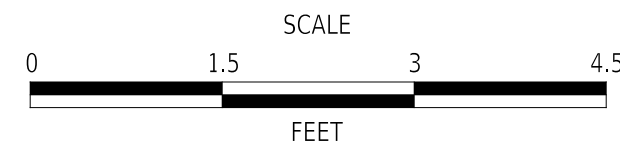
NOTES:

- FOR STUD DETAIL, SEE DWG. NO. S-31.
- BEARINGS 1 THRU 5 ARE NOT SHOWN BUT ARE SYMMETRICAL ABOUT THE BRIDGE CENTERLINE.

LEGEND:

- PRECAST
- CAST IN PLACE

ADDENDA / REVISIONS



REPLACEMENT OF BR 3-164 ON  
SR 36 CEDAR BEACH ROAD

CONTRACT	BRIDGE NO.	3-164
T202007301	DESIGNED BY:	D. CASTILLO
COUNTY	CHECKED BY:	C. GRANADOS
SUSSEX		

REST PIER DETAILS - 4

S-33

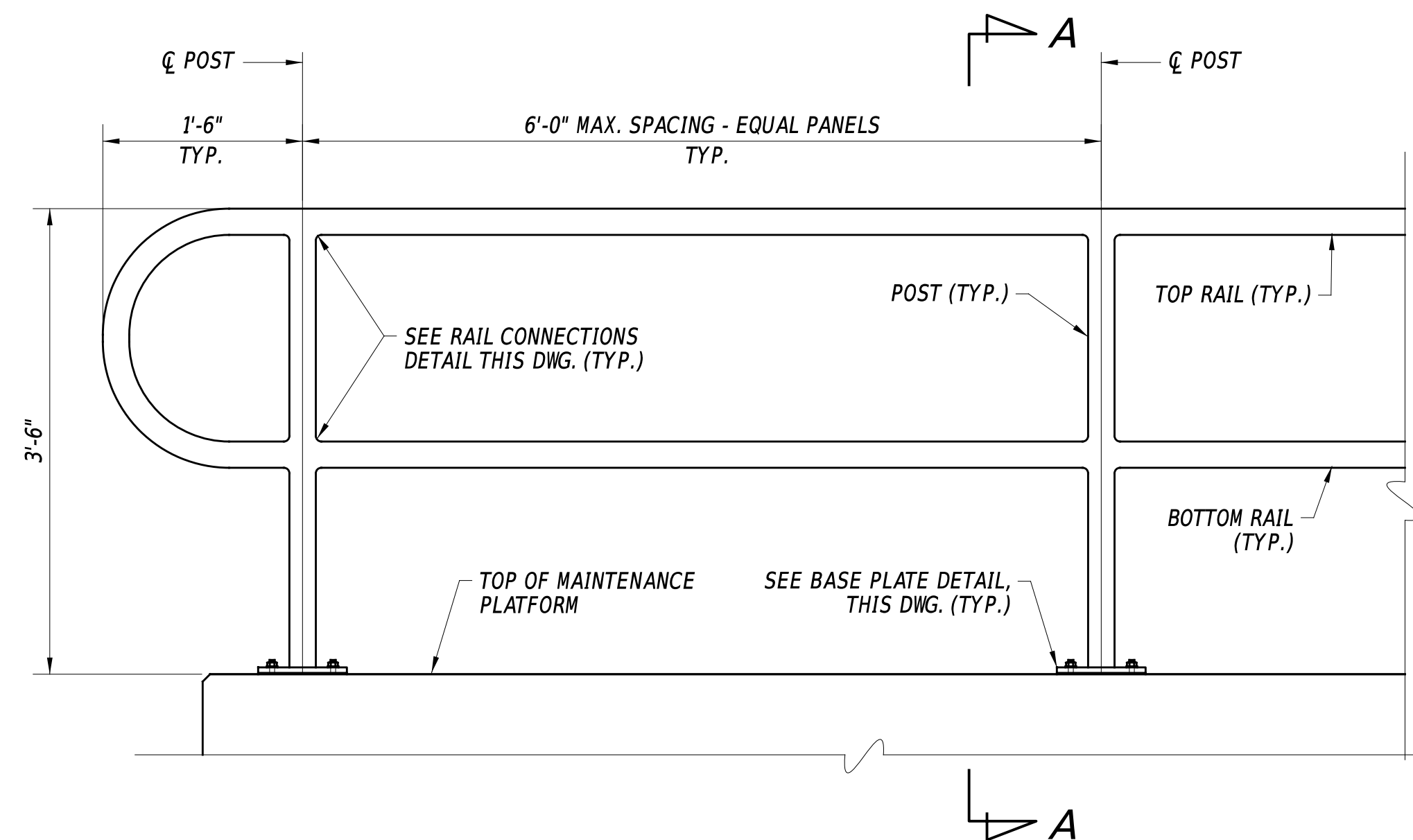
SECTION

H&H

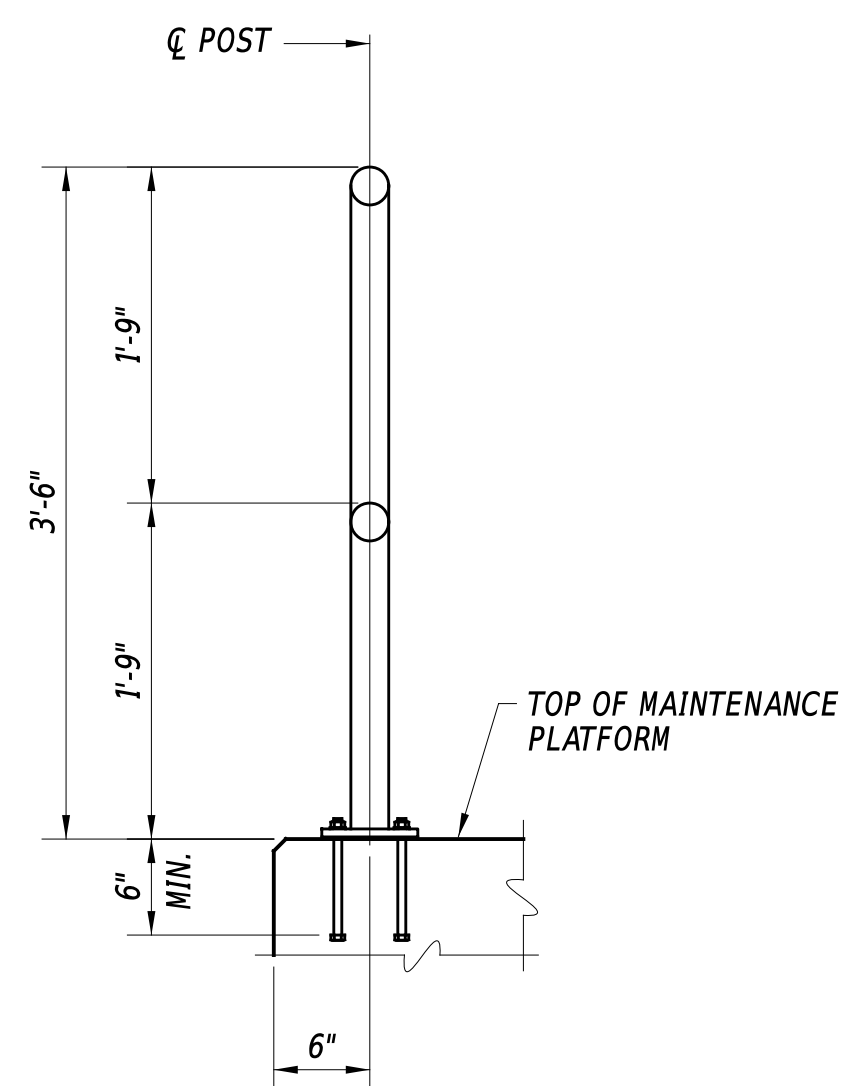
SHEET NO.

42

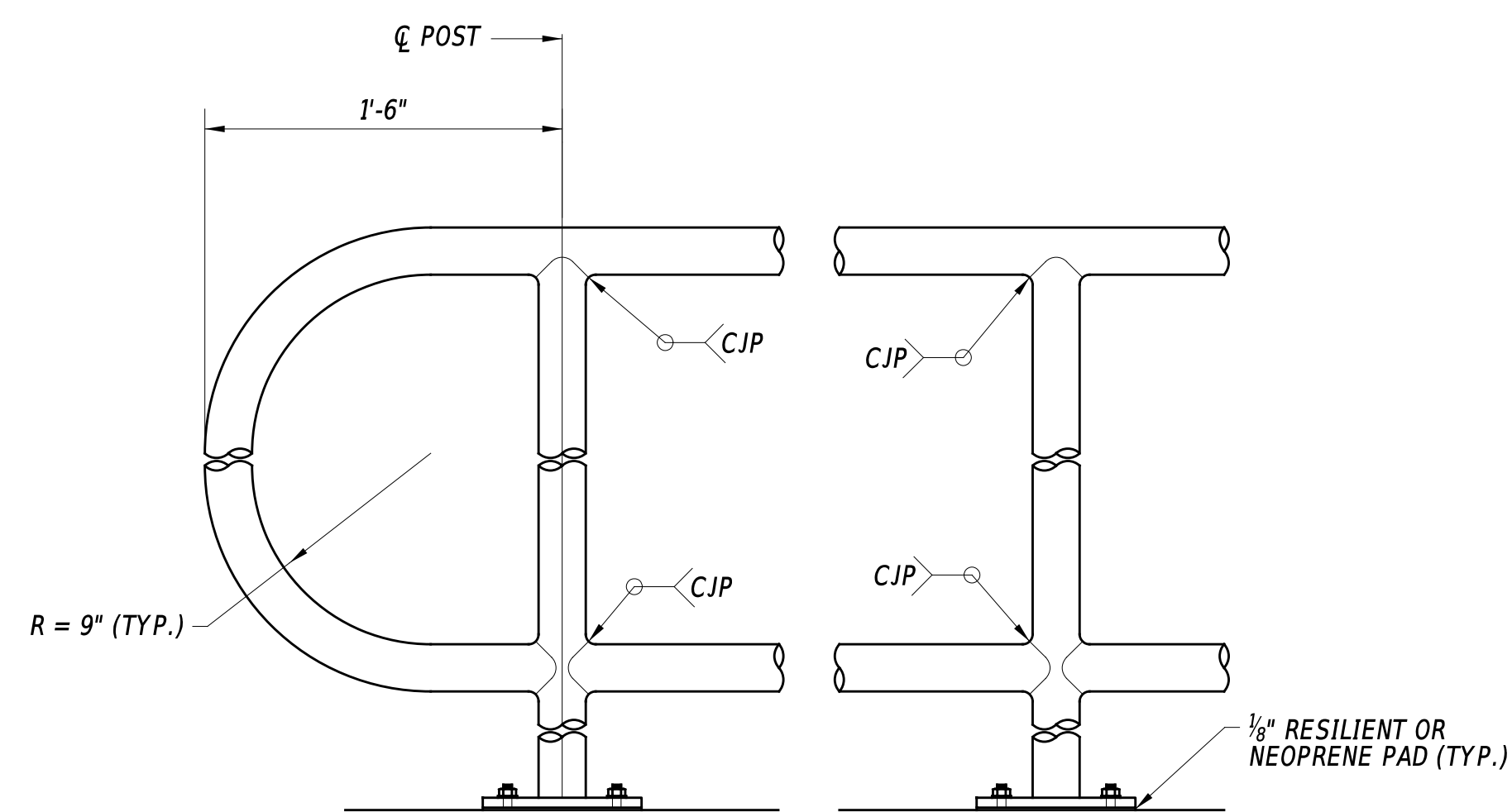




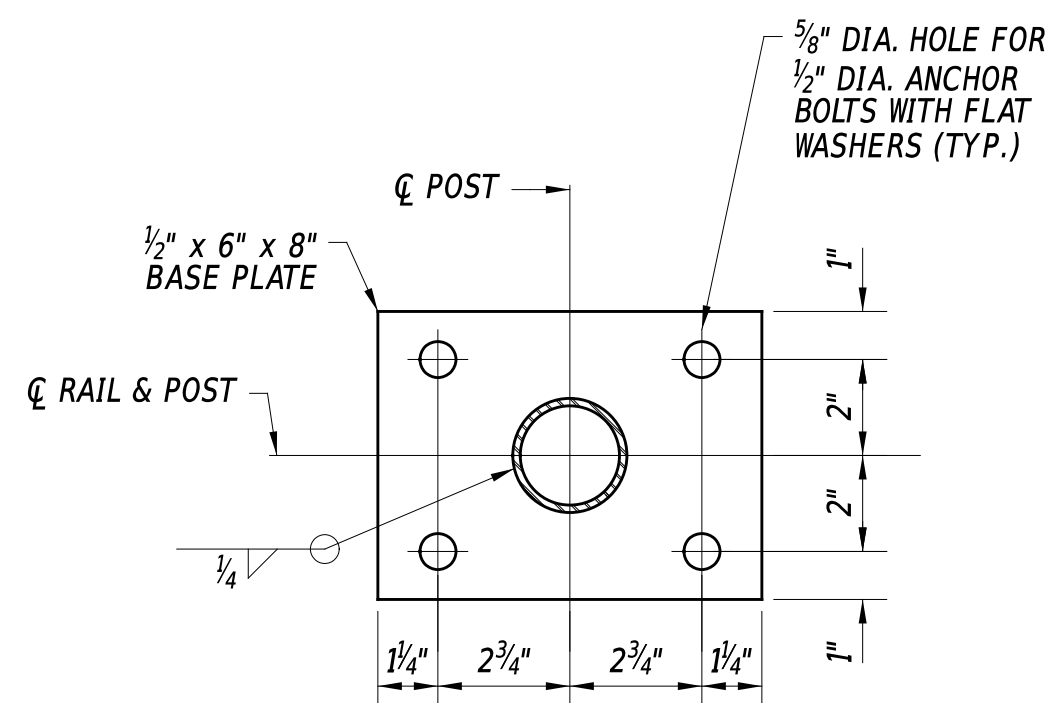
**TYPICAL HANDRAIL DETAIL**



**SECTION A-A**



## RAIL CONNECTIONS DETAIL



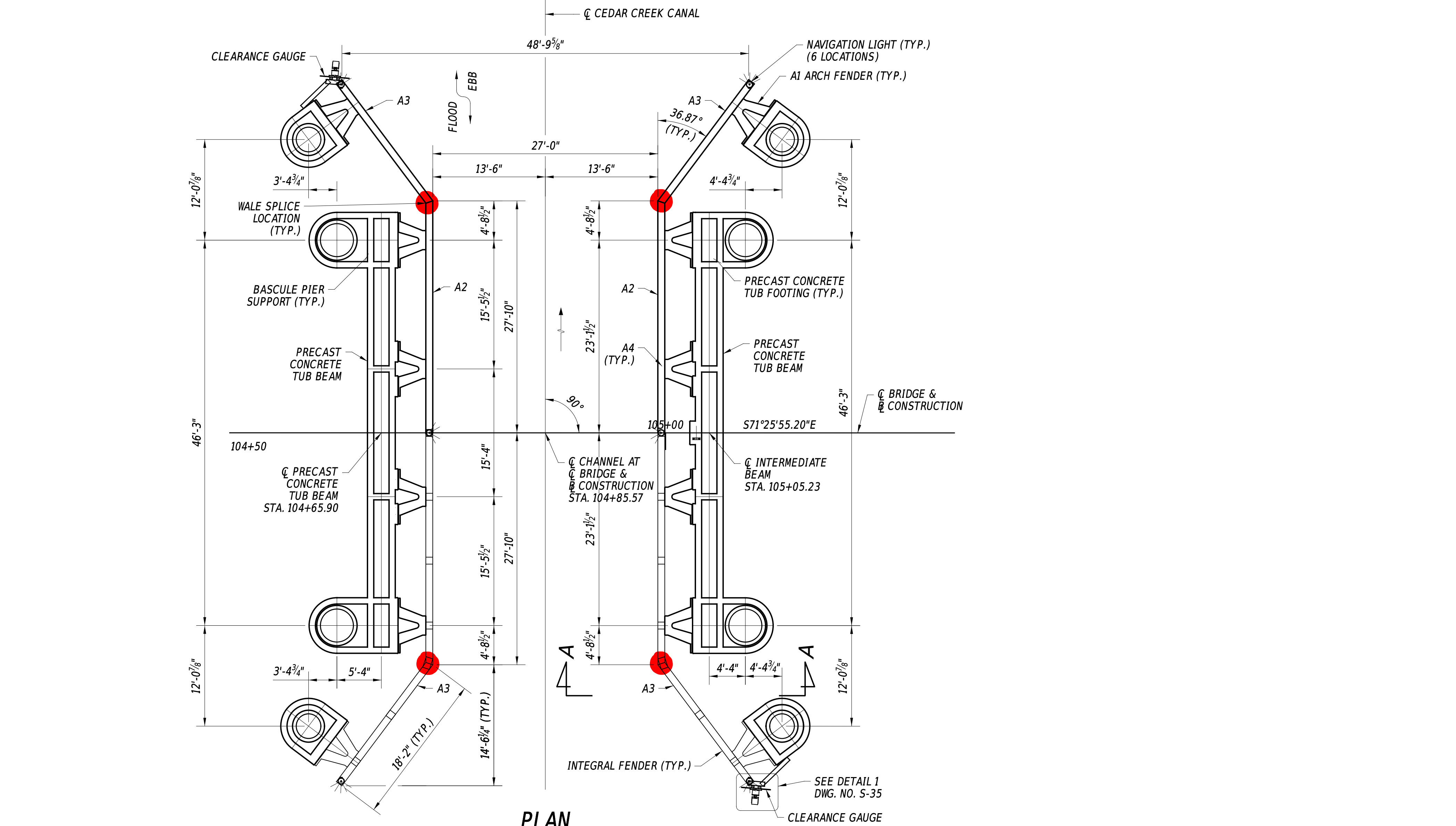
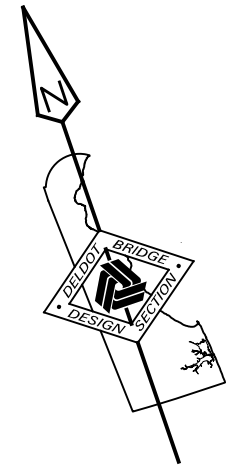
### BASE PLATE DETAIL



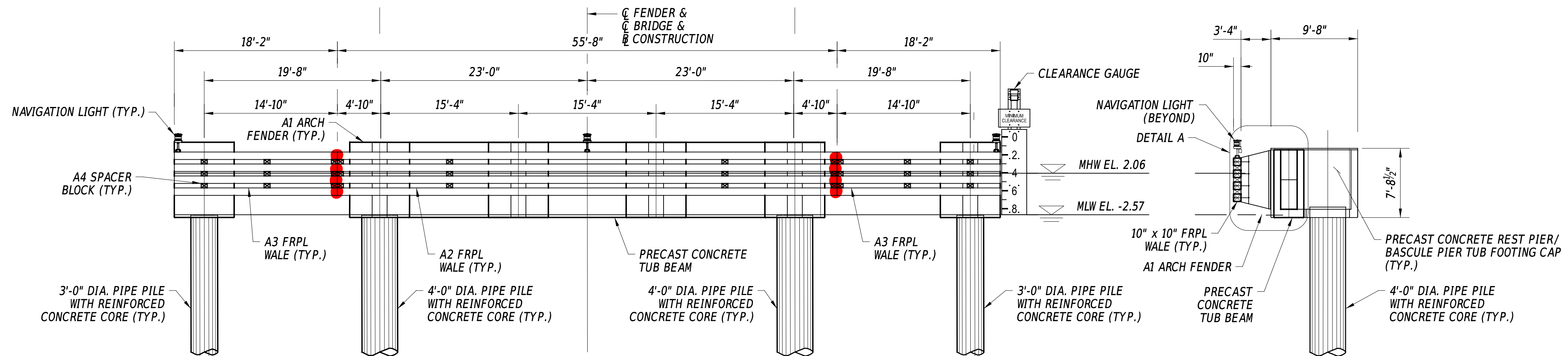
## NOTES

1. POSTS AND RAILS SHALL BE 2" NOMINAL PIPE SIZE (SCH. 40) ASTM B221, ALLOY 6061-T6.
2. BASE PLATES SHALL BE ASTM B209, ALLOY 6061-T6.
3. ANCHOR BOLTS SHALL BE ASTM F1554 GRADE 36 WITH ASTM A563 HEX NUTS AND ASTM F436 FLAT WASHERS. ALL STEEL FASTENERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
4. ALL HANDRAIL COMPONENTS AND FASTENERS SHALL BE PAID FOR UNDER ITEM #626010 - ALUMINUM PEDESTRIAN RAILING.

ADDENDA / REVISIONS		SCALE AS NOTED	REPLACEMENT OF BR 3-164 ON SR 36 CEDAR BEACH ROAD	CONTRACT	BRIDGE NO.	3-164	MAINTENANCE PLATFORM ACCESS DETAILS	S-34
				T202007301	DESIGNED BY:	A. MILLER		SECTION
				COUNTY	CHECKED BY:	D. NEELY		H&H
				SUSSEX				SHEET NO.
								43



PLAN

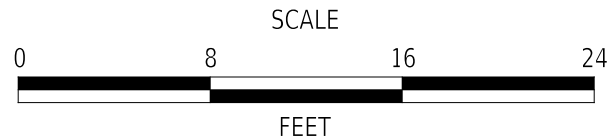


DEVELOPED ELEVATION  
(REST PIER SHOWN, BASCULE PIER SIMILAR)

SECTION A-A  
(REST PIER SHOWN, BASCULE PIER SIMILAR)

6-NOV-2023  
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ADDENDA / REVISIONS	



REPLACEMENT OF BR 3-164 ON  
SR 36 CEDAR BEACH ROAD

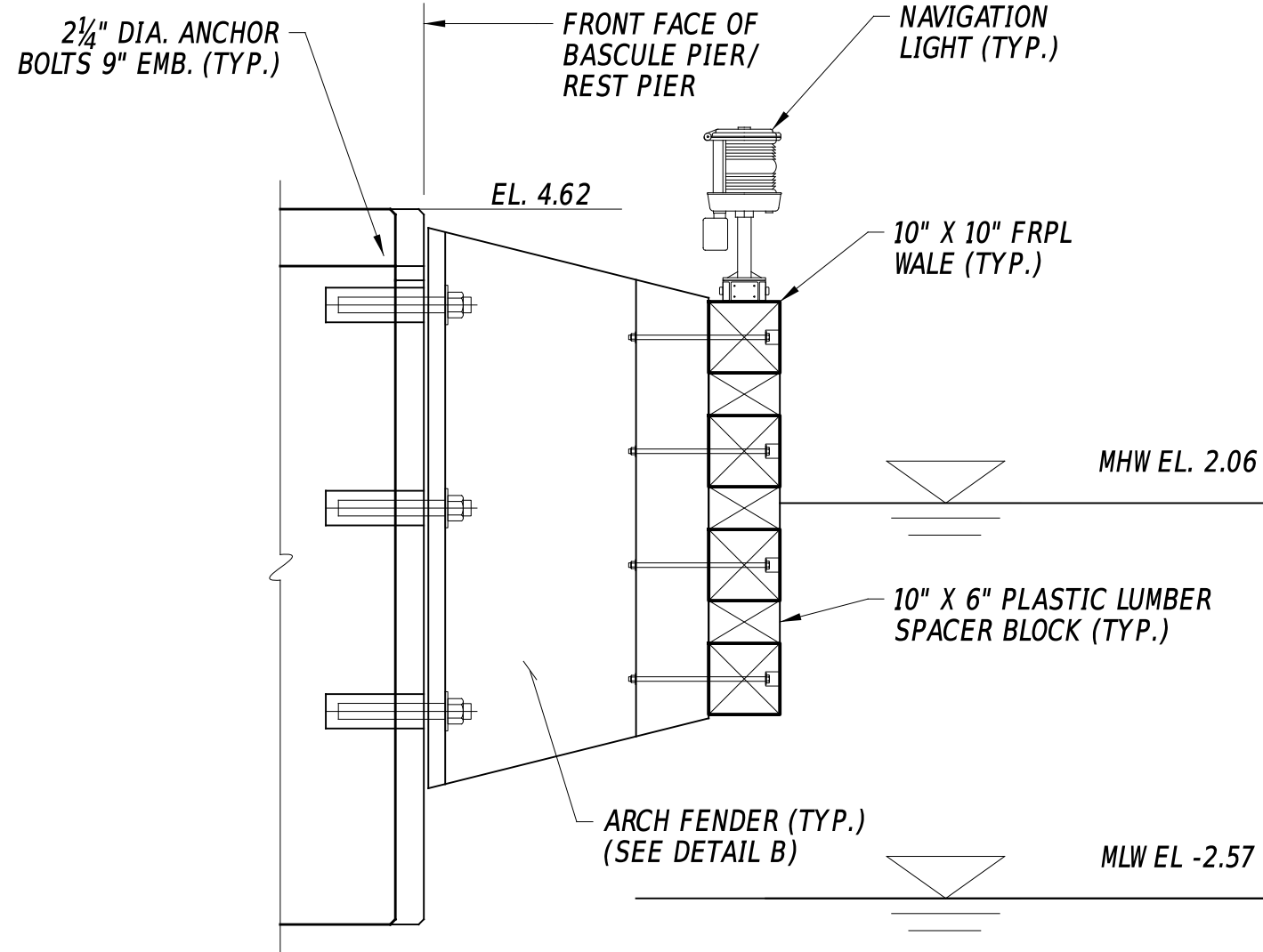
CONTRACT	BRIDGE NO.	3-164
T202007301	DESIGNED BY:	C. GRANADOS
COUNTY	CHECKED BY:	J. SOTO
SUSSEX		

FENDER PLAN,  
ELEVATION & SECTION

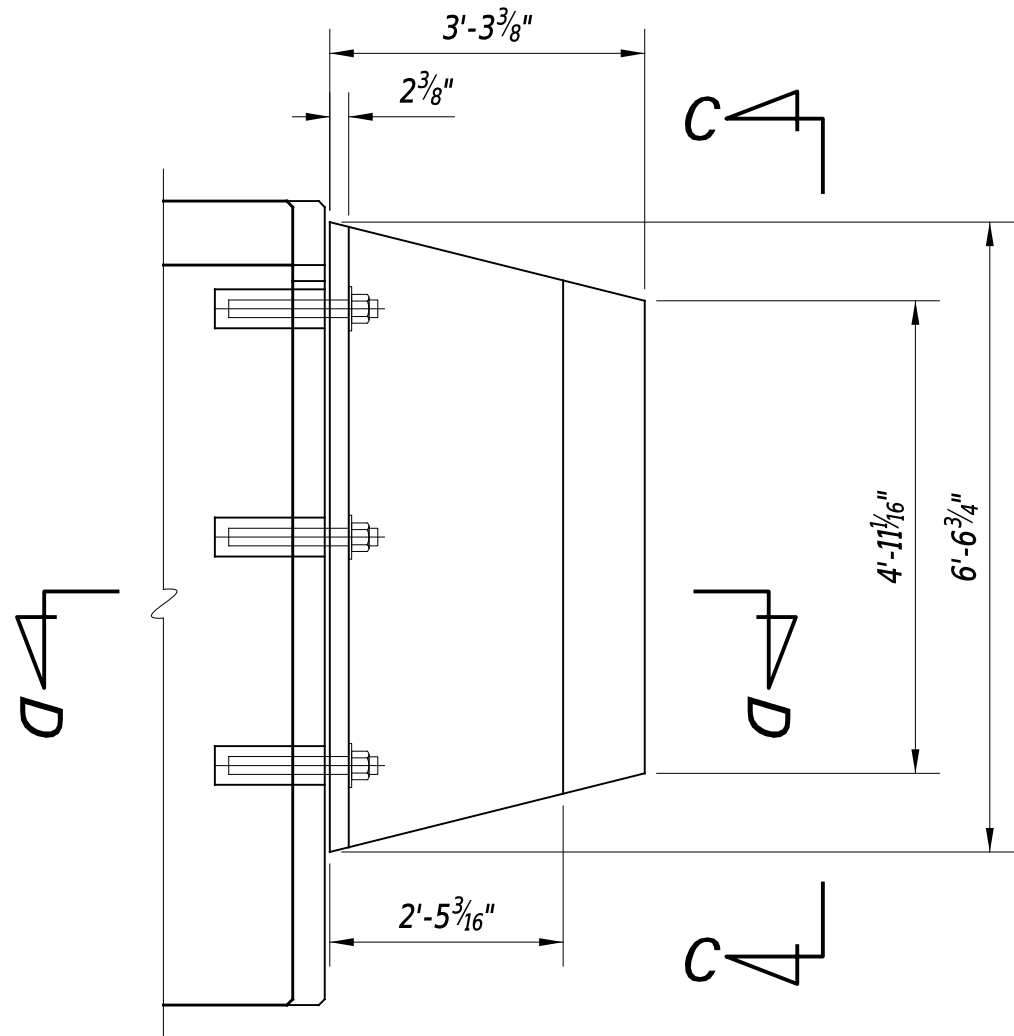
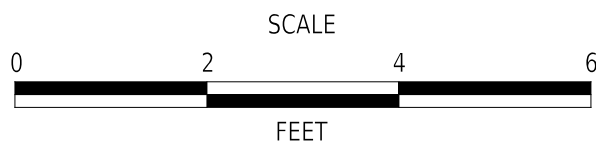
S-36
SECTION
H&H
SHEET NO.
45



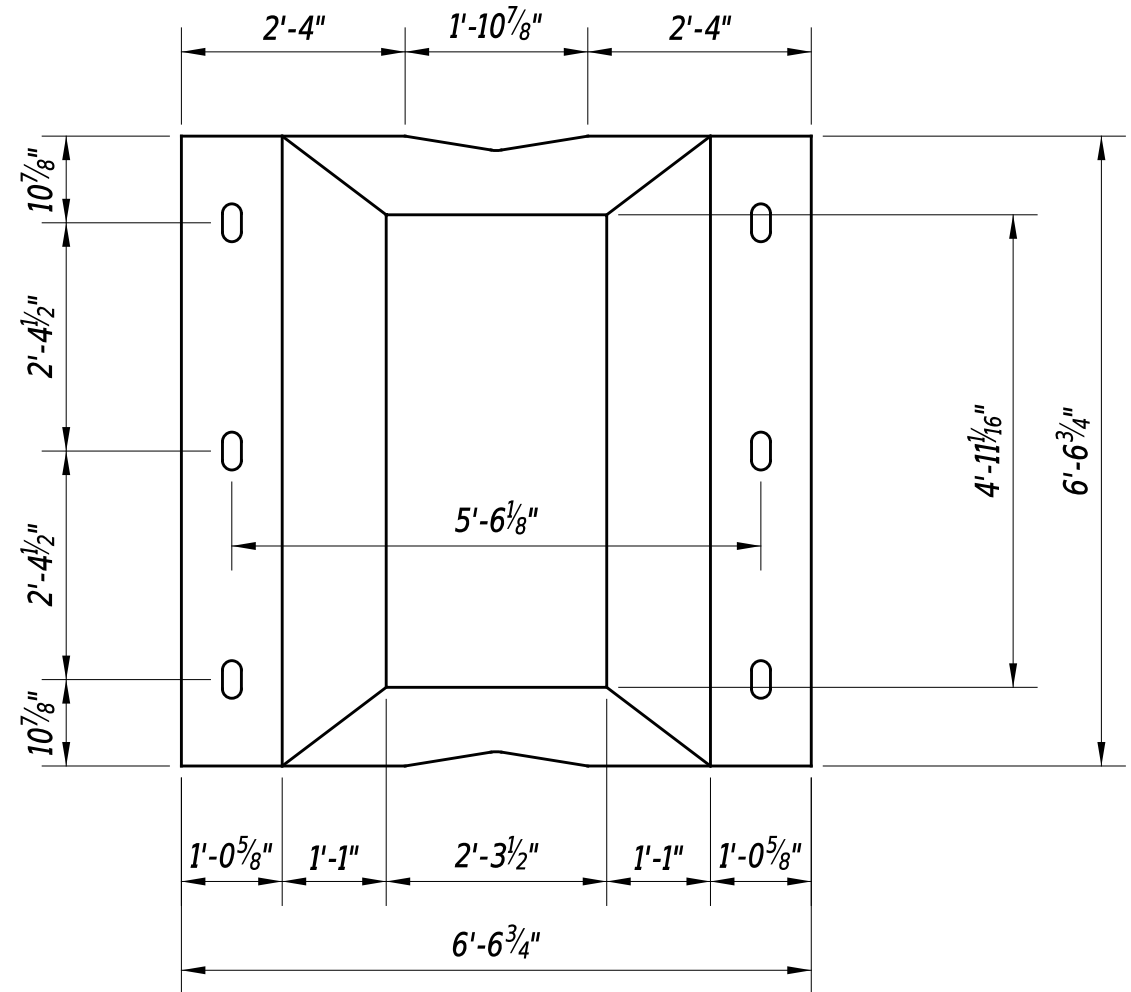
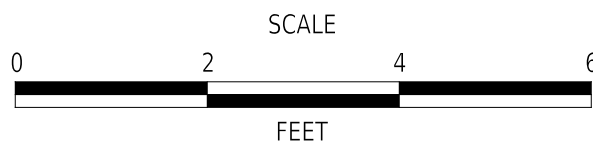
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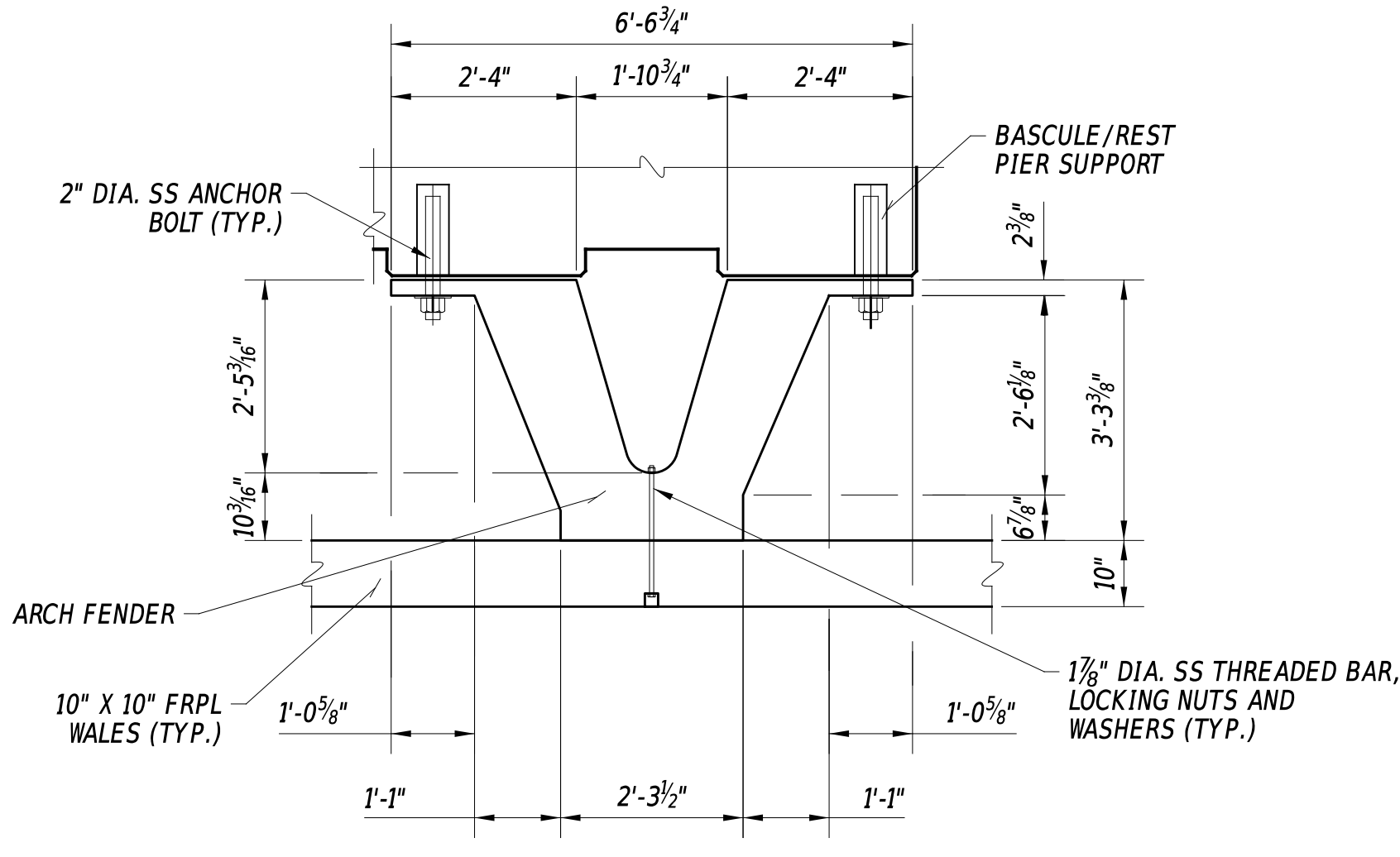
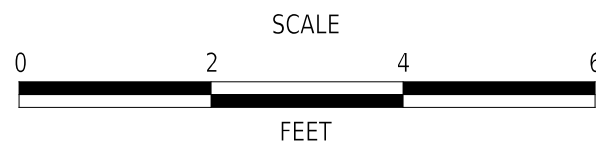
DETAIL A



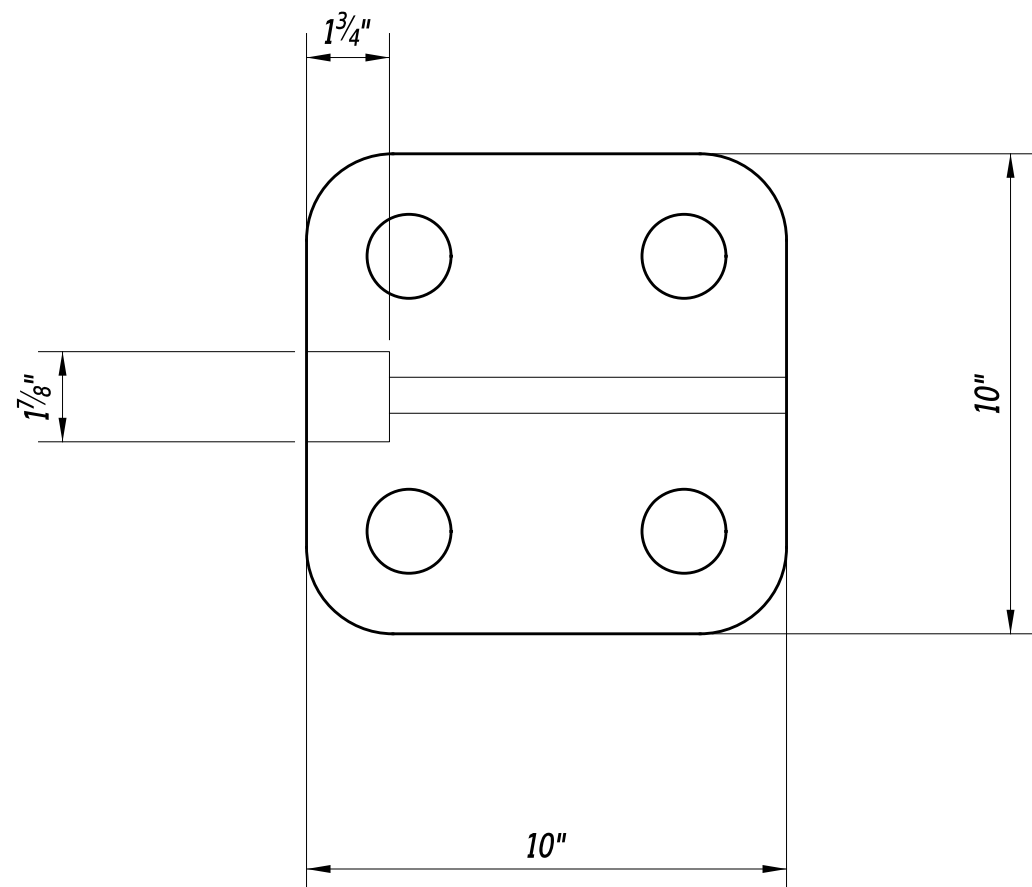
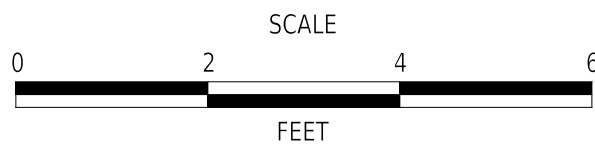
DETAIL B



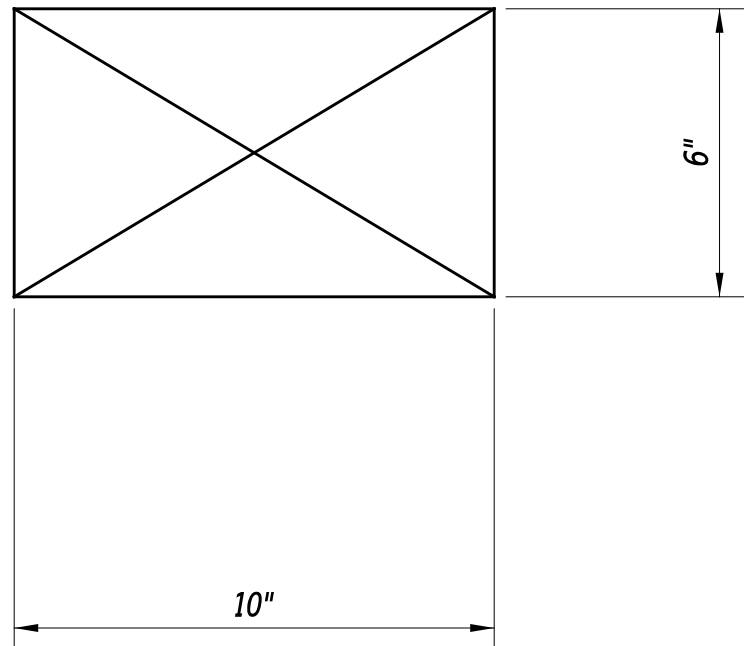
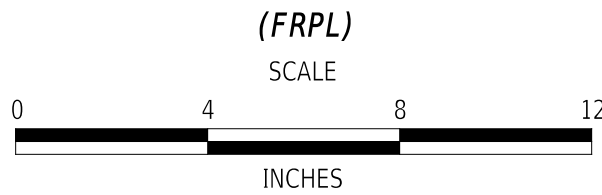
VIEW C-C



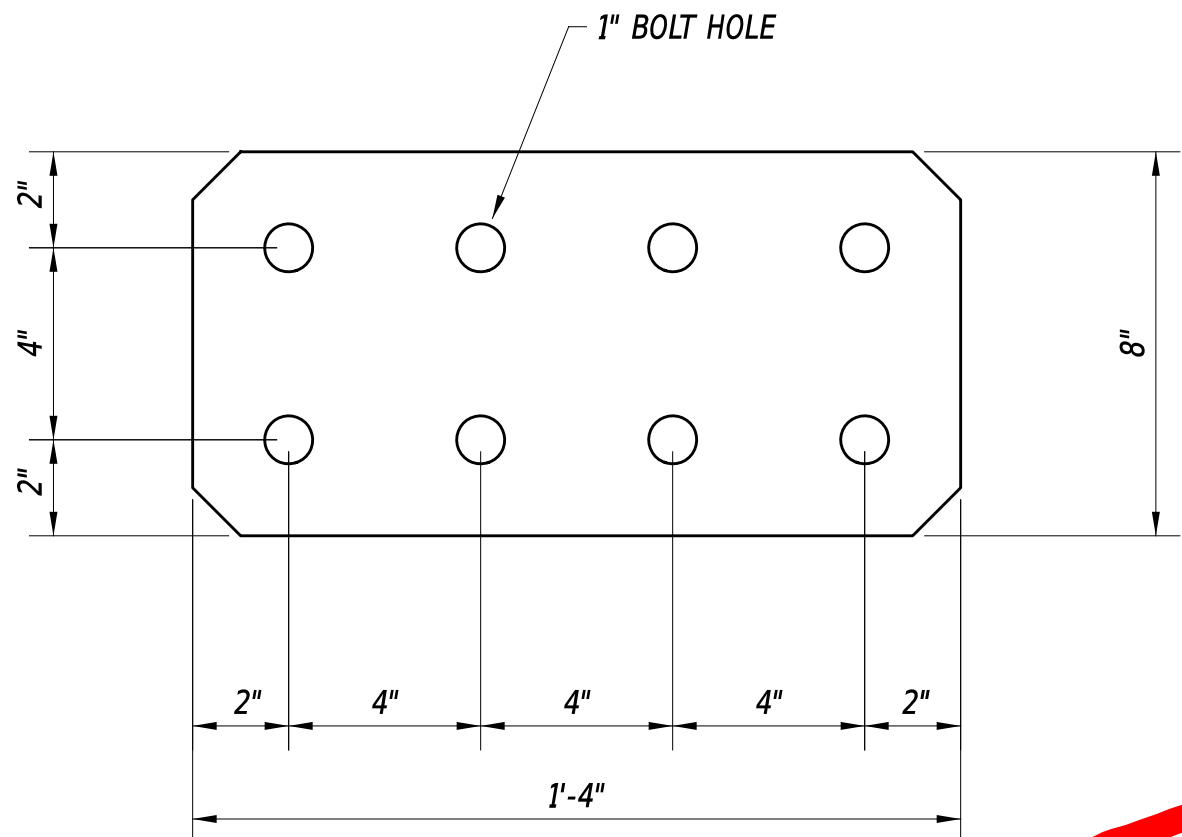
SECTION D-D



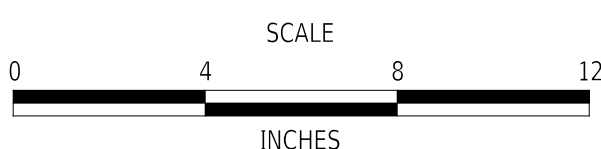
COMPOSITE LUMBER WALE DETAIL



SPACER BLOCK DETAIL



SPLICE PLATE DETAIL 1



NOTES:

1. SPLICE PLATES: FURNISH SPLICE PLATES IN ACCORDANCE WITH ASTM A240, TYPE 316.
2. ARCH FENDERS ARE BASED ON TRELLEBORG SAN 1000 E1.0 SUPER ARCH FENDER OF DIMENSIONS SHOWN, WITH 60.4 FT-KIP/FT ENERGY AND 43.8 KIP/FT REACTION RATED PERFORMANCE DATA (RPD). OTHER ARCH FENDERS OF SIMILAR DIMENSIONS AND RPD, FROM A DIFFERENT MANUFACTURER, MAY BE USED, PROVIDED THAT THE ALTERNATIVE ARCH FENDER INCLUDES PUBLISHED PRODUCT DATA BASED ON TESTING PROTOCOLS THAT MEET THE REQUIREMENTS OF THE 2002 PIANC GUIDELINES FOR THE DESIGN OF FENDER SYSTEMS, APPENDIX A, PROCEDURE TO DETERMINE AND REPORT THE PERFORMANCE OF MARINE FENDERS, PUBLISHED BY THE INTERNATIONAL NAVIGATION ASSOCIATION.
3. SEE INTEGRAL FENDER SYSTEM SPECIAL PROVISIONS FOR ADDITIONAL FIBERGLASS REINFORCED PLASTIC LUMBER WALE REQUIREMENTS.

WALE PROPERTIES								
NOMINAL SECTION	ACTUAL HEIGHT	ACTUAL WIDTH	REBAR QUANTITY	REBAR SIZE (IN)	M.O.R. PSI	FLEX. MODULUS PSI	FLEX. RIGIDITY LB-IN <sup>2</sup>	MOMENT CAPACITY KIP-FT
10" X 10"	9 7/8"	9 7/8"	4	1 3/4"	9.790	560,000	4.13E+08	121.4
								37-45

ADDENDA / REVISIONS

SCALE AS NOTED

REPLACEMENT OF BR 3-164 ON  
SR 36 CEDAR BEACH ROAD

CONTRACT	BRIDGE NO.	3-164
T202007301	DESIGNED BY:	C. GRANADOS
COUNTY	CHECKED BY:	J. SOTO
SUSSEX		

FENDER DETAILS

S-37

SECTION

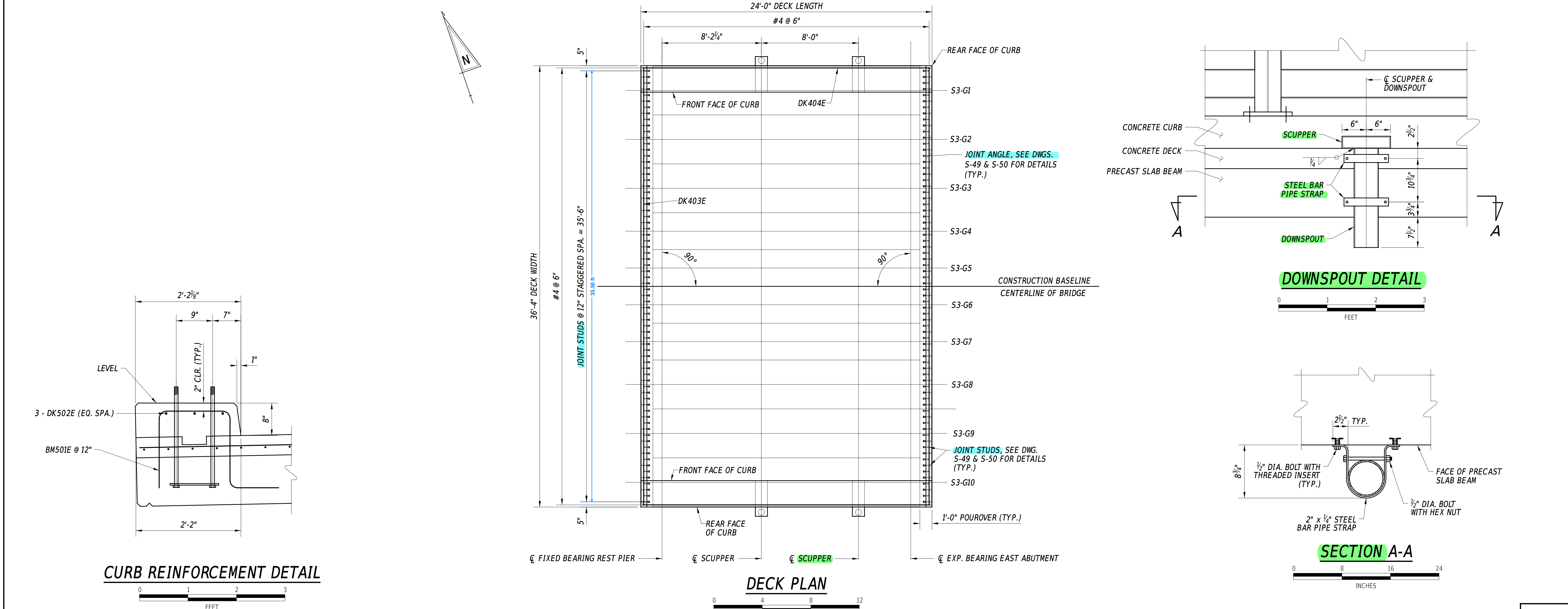
H&H



SHEET NO.

46

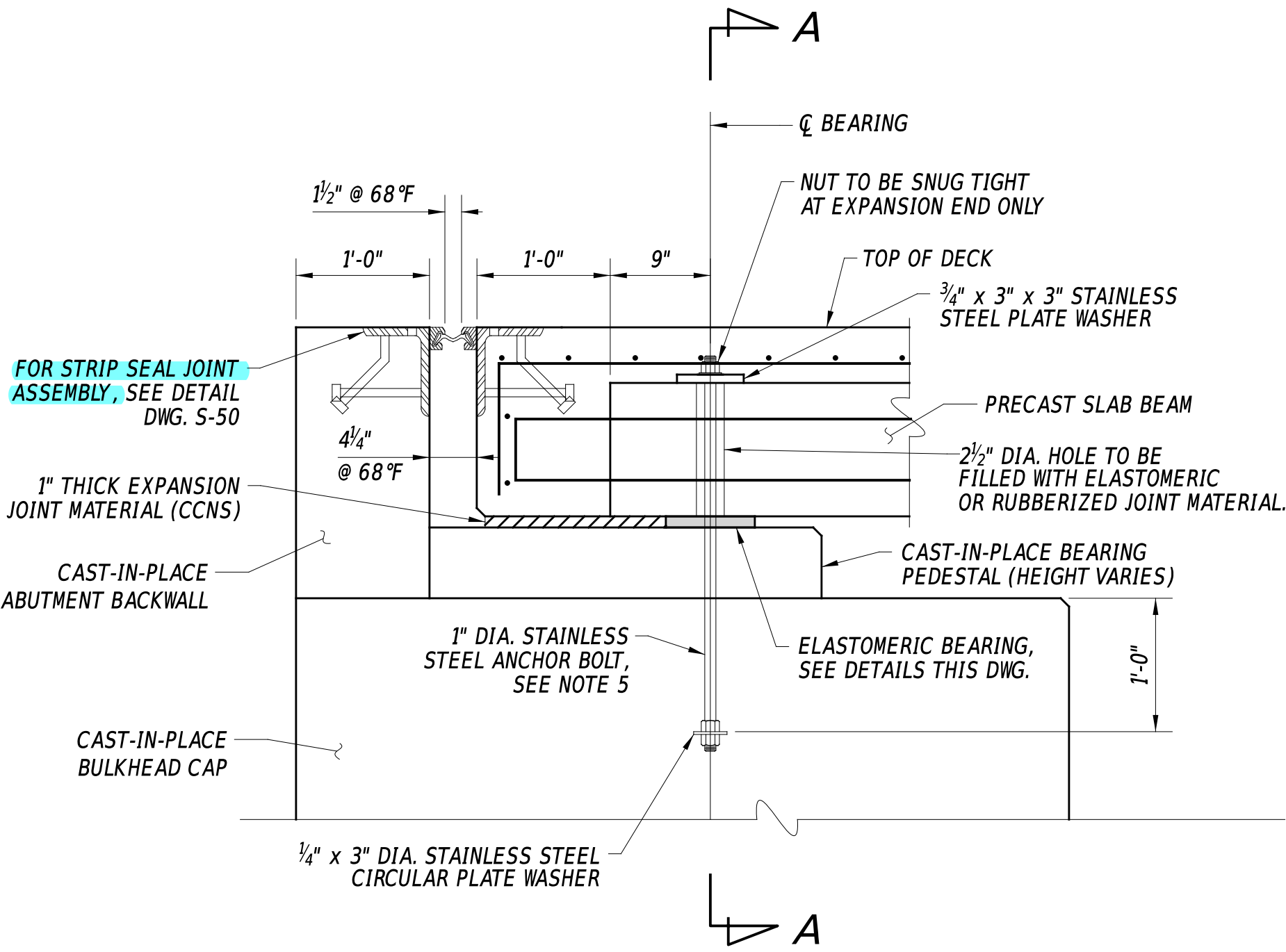






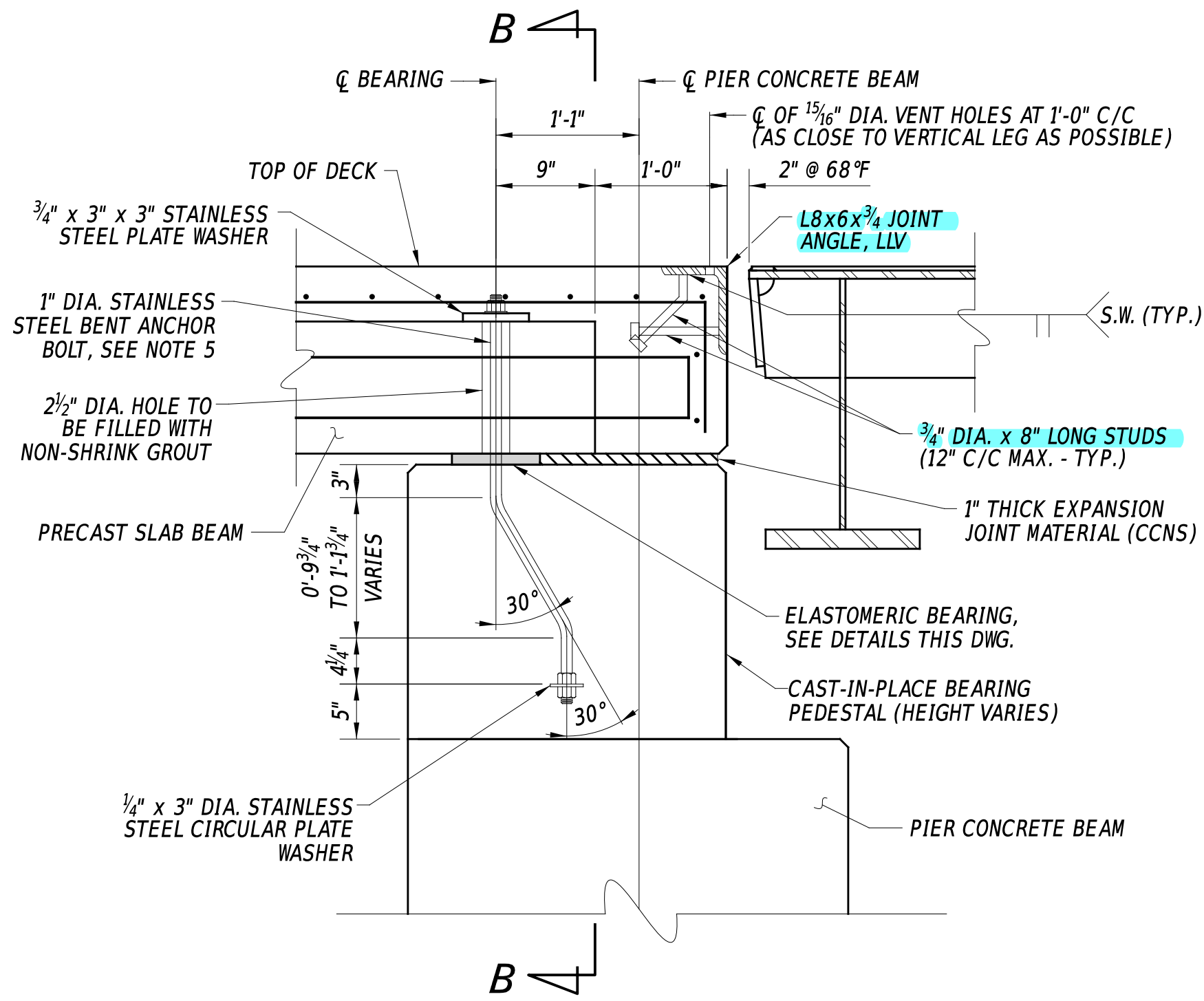
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ADDENDA / REVISIONS		SCALE AS NOTED		REPLACEMENT OF BR 3-164 ON SR 36 CEDAR BEACH ROAD		CONTRACT	BRIDGE NO.	3-164	DECK DETAILS SPAN 3		SECTION	
						T202007301	DESIGNED BY:				A. MILLER	H&H
						COUNTY	CHECKED BY:				D. NEELY	SHEET NO.
						SUSSEX					51	

6-NOV-2023 18:18 p:\w\aecom-ria-pw.bentley.com\AECOM\_D521\_NA\_2020\Documents\60646484-DeIDOT AGR 1966F-01 BR 3-164 Cedar Beach Rd\900-CAD GIS\910\_CAD\10\_REFERENCE\H & H\Structures\BB01.dgn



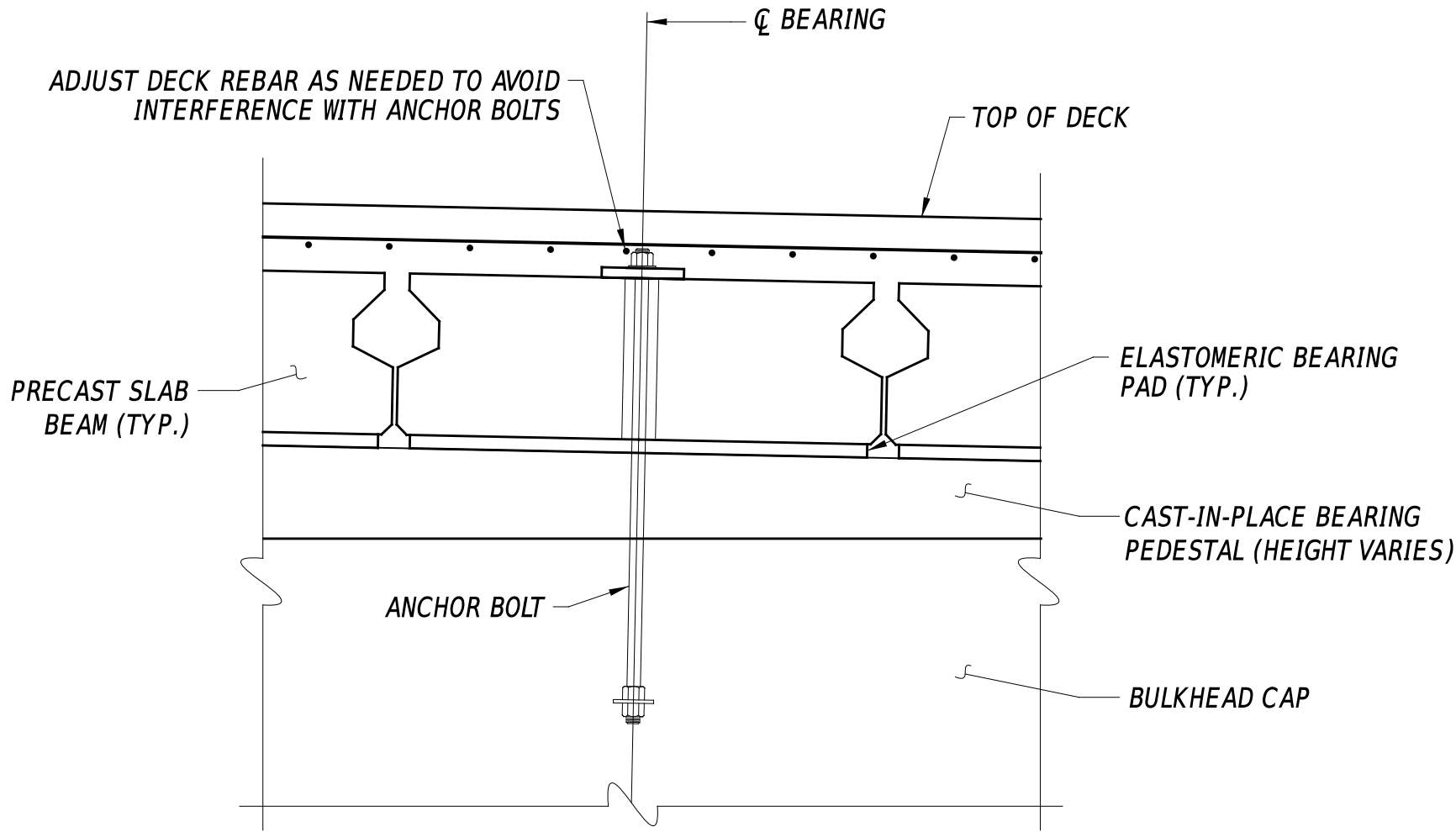
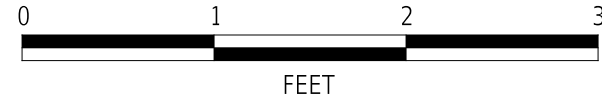
**TYPICAL SUPERSTRUCTURE SECTION  
AT EXPANSION BEARING**

(WEST ABUTMENT SHOWN, EAST ABUTMENT OPPOSITE HAND)

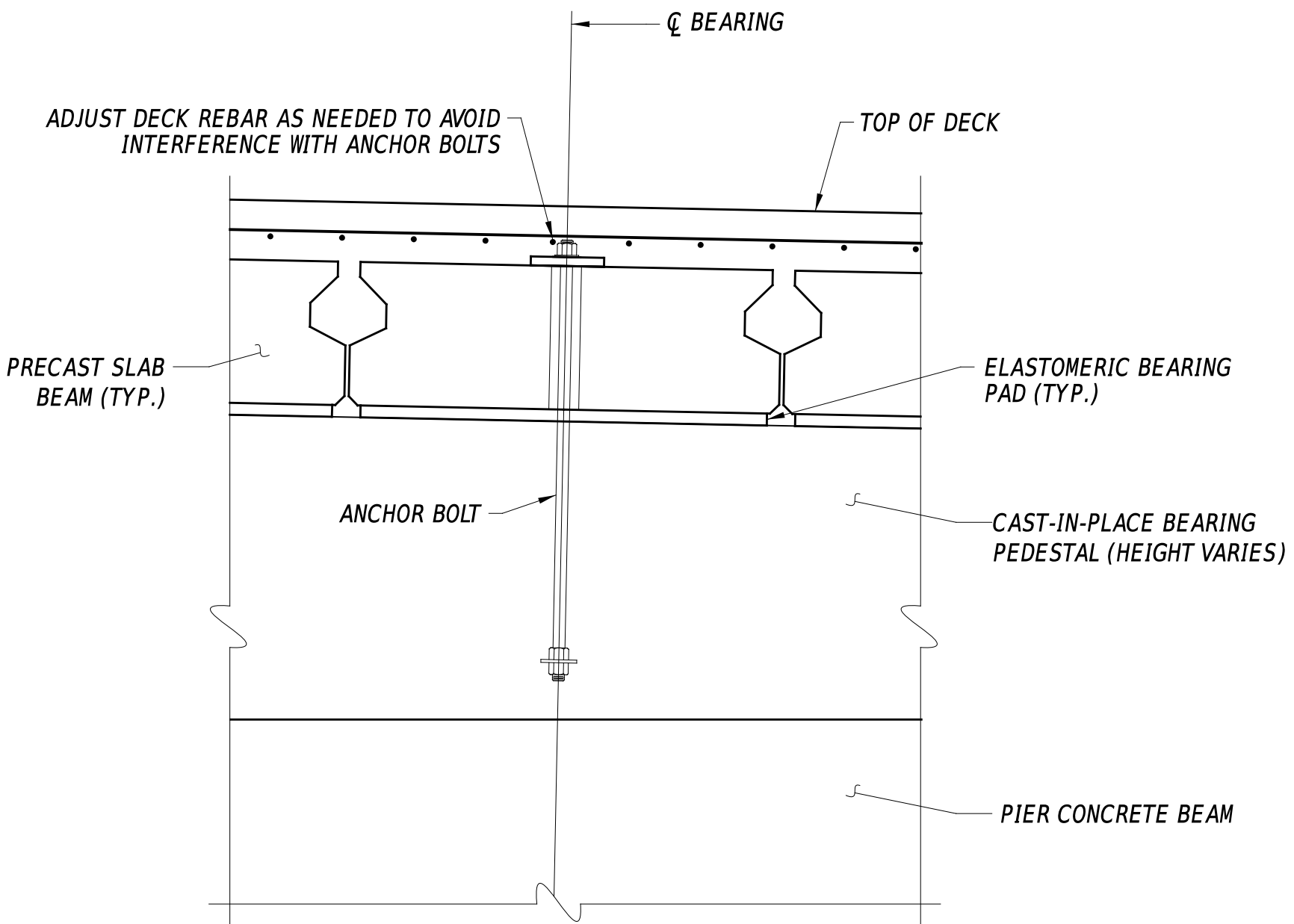


**TYPICAL SUPERSTRUCTURE SECTION  
AT FIXED BEARING**

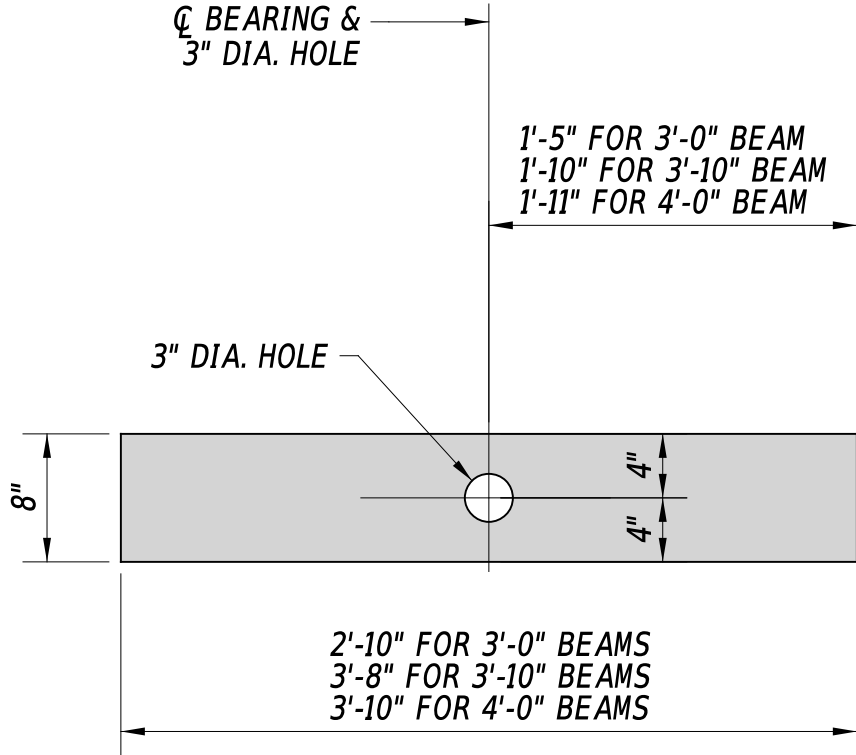
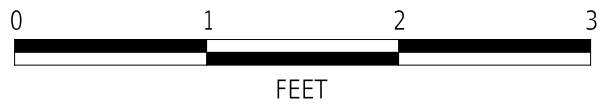
(BASCULE PIER SHOWN; REST PIER SIMILAR, OPPOSITE HAND)



**SECTION A-A**

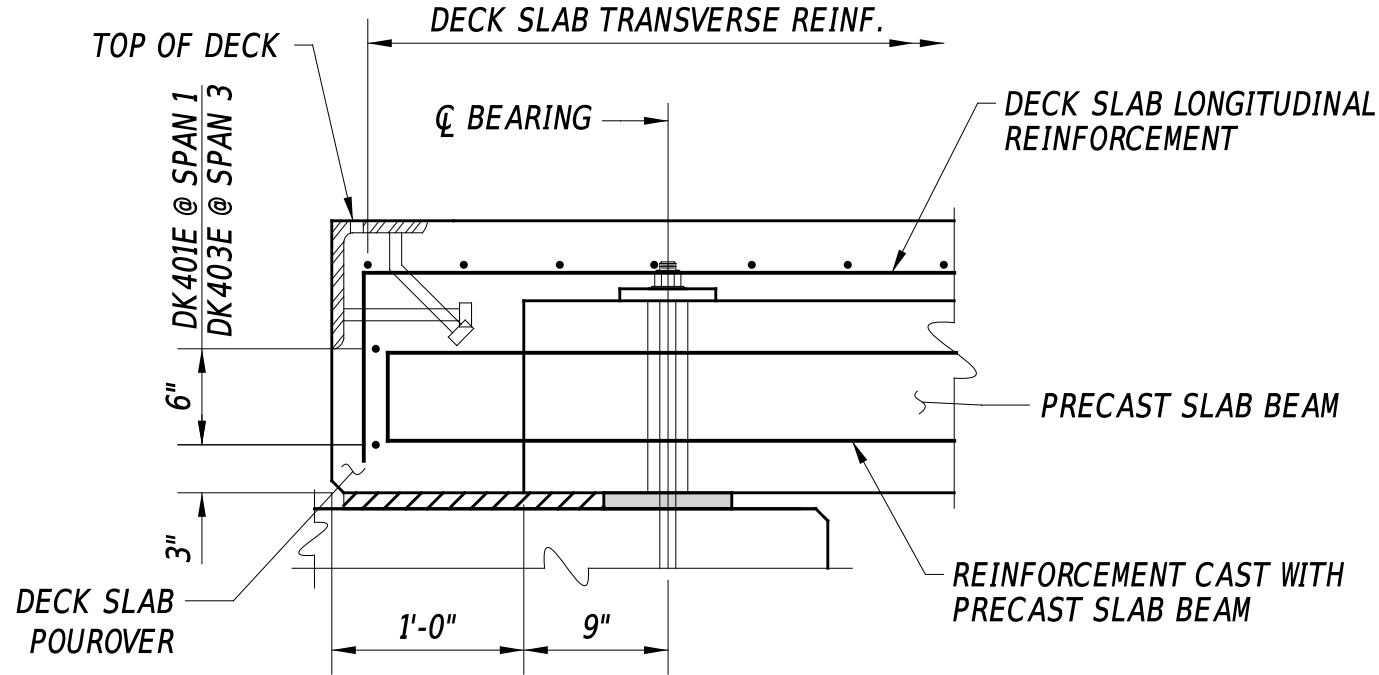


**SECTION B-B**



**1" THICK 50 MIN. DUROMETER  
ELASTOMERIC BEARING DETAILS**

NOT TO SCALE



**DECK SLAB POUROVER DETAIL**



**ELASTOMERIC BEARING NOTES**

- 40 TOTAL ELASTOMERIC BEARINGS REQUIRED. 16 - 2'-10" BEARING PADS, 4 - 3'-8" BEARING PADS, AND 20 - 3'-10" BEARINGS PADS REQUIRED.
- ALL ELASTOMERIC BEARINGS SHALL BE 50 MIN. DUROMETER IN ACCORDANCE WITH REQUIREMENTS SPECIFIED IN SECTION 623 OF THE STANDARD SPECIFICATIONS.
- ELASTOMERIC BEARINGS SHALL BE ATTACHED TO THE TOP OF ABUTMENT SEAT AND/OR TOP OF PIER CAP WITH AN APPROVED EPOXY ADHESIVE IN ACCORDANCE WITH SECTION 623.3.D.4 OF THE STANDARD SPECIFICATIONS IN SUCH A WAY THAT VISIBLE CONCRETE SURFACES WILL NOT BE STAINED. ENSURE THE EPOXY ADHESIVE HAS SET PRIOR TO PLACEMENT OF BEAMS.
- PAYMENT FOR FABRICATION AND INSTALLATION OF ELASTOMERIC BEARINGS SHALL BE INCIDENTAL TO ITEM #612020 - PRESTRESSED REINFORCED CONCRETE MEMBERS, SOLID SLABS.
- FOR ANCHOR BOLT PROPERTIES AND REQUIRED TENSION, REFERENCE DWG. S-02.
- PAYMENT FOR PRESTRESSED SOLID SLAB ANCHORAGES & ANCHORAGE HOLE FILL MATERIAL SHALL BE INCIDENTAL TO ITEM #612020 - PRESTRESSED REINFORCED CONCRETE MEMBERS, SOLID SLABS.

ADDENDA / REVISIONS	

SCALE AS NOTED

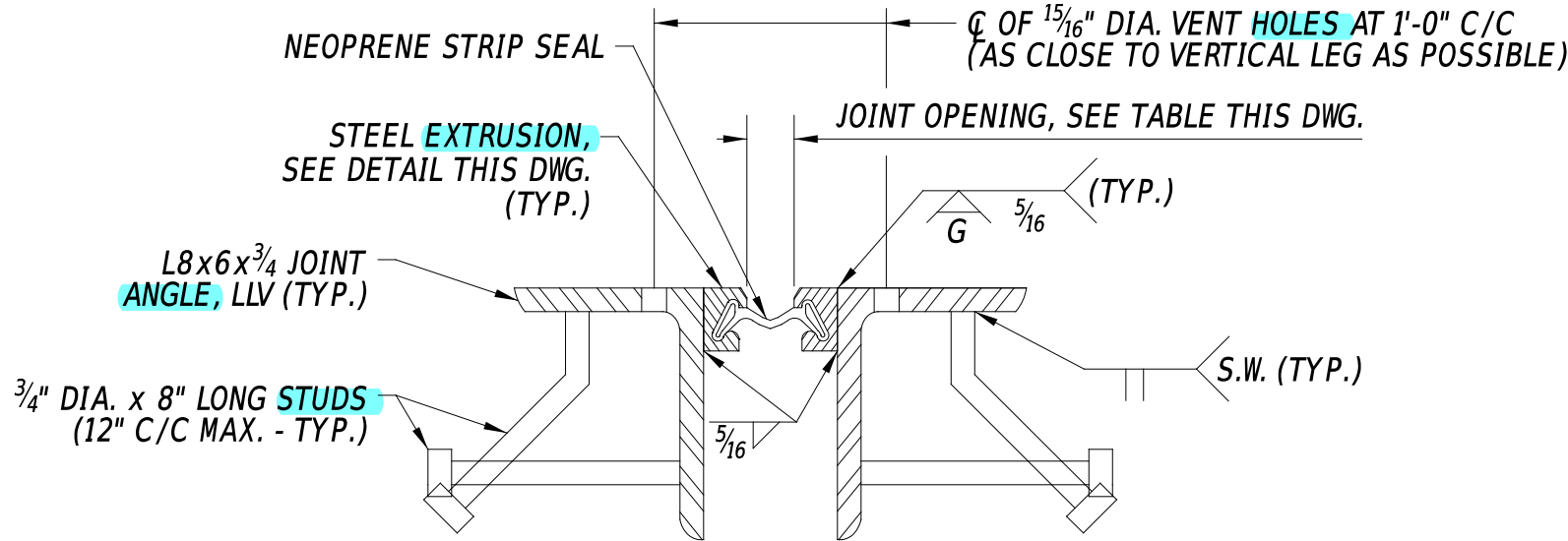
REPLACEMENT OF BR 3-164 ON  
SR 36 CEDAR BEACH ROAD

CONTRACT	BRIDGE NO.	3-164
T202007301	DESIGNED BY:	A. MILLER
COUNTY	CHECKED BY:	D. NEELY
SUSSEX		

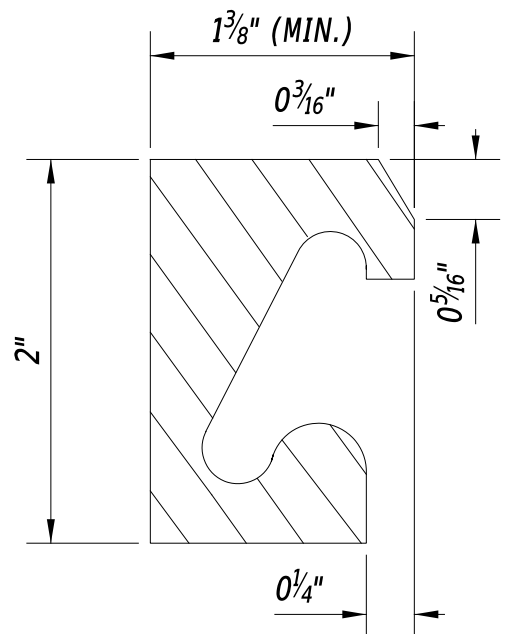
PRECAST SLAB SPAN  
BEARING & JOINT DETAILS - 1

S-49
SECTION
H&H
SHEET NO.
58

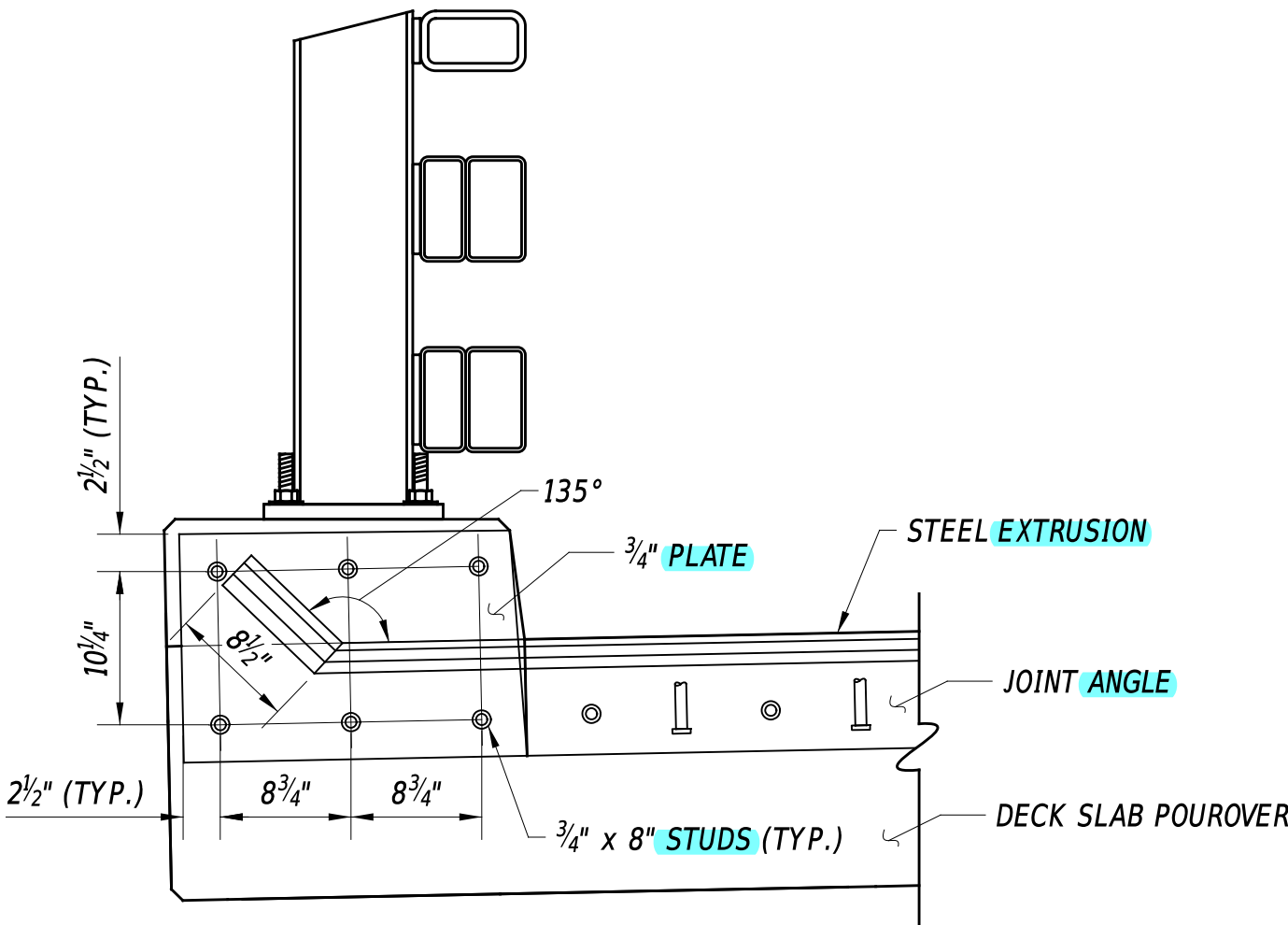




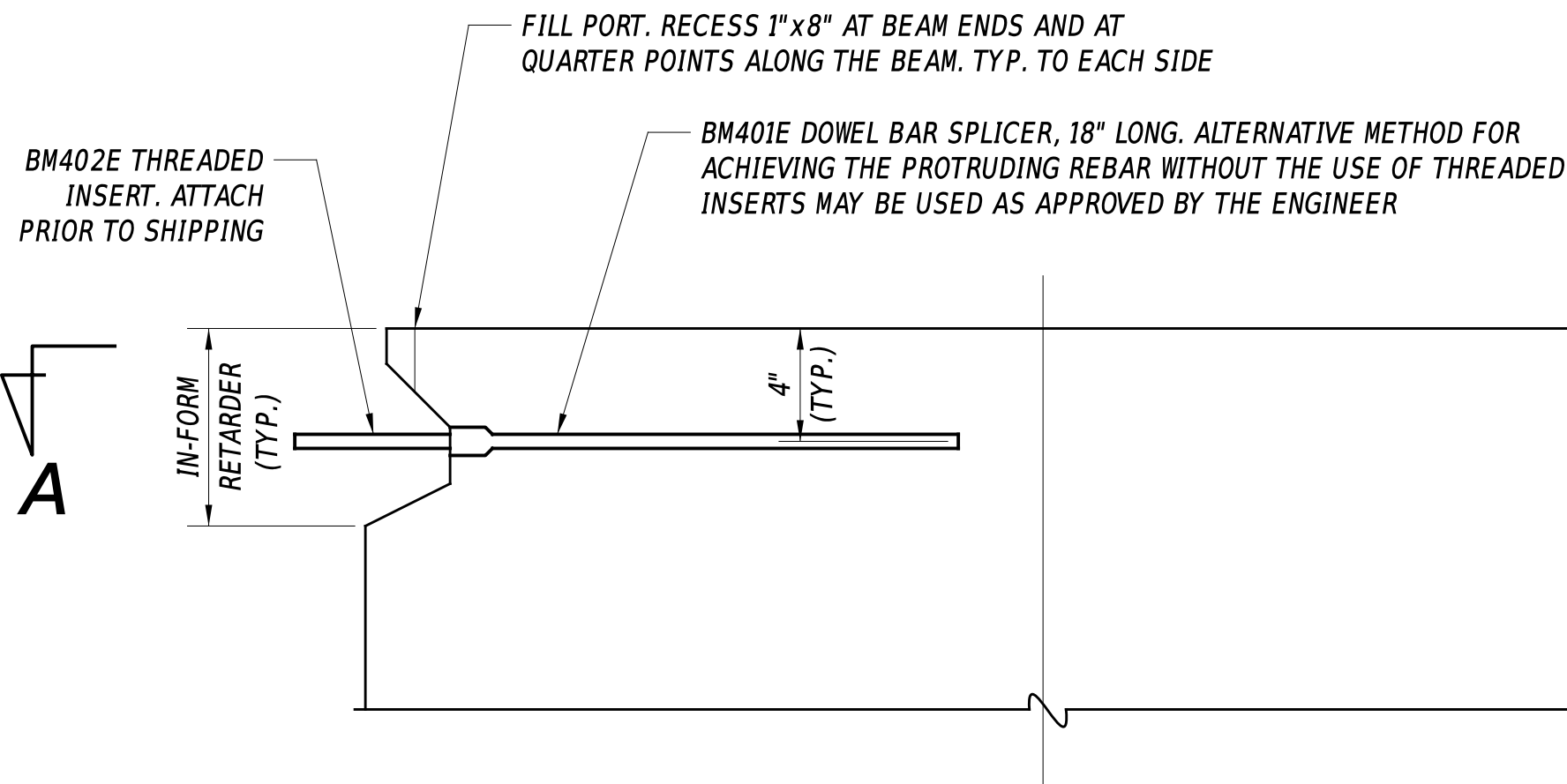
STRIP SEAL JOINT ASSEMBLY DETAIL



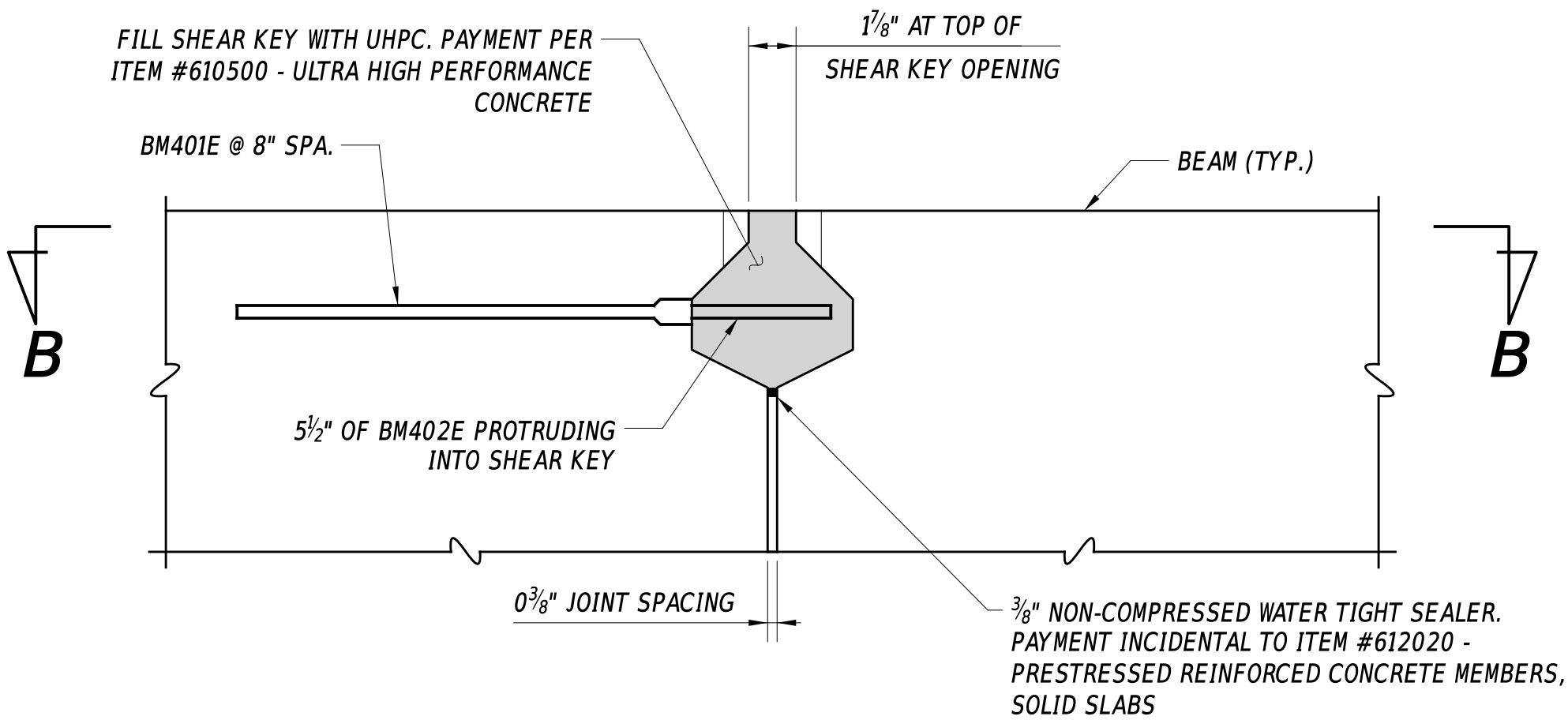
STEEL EXTRUSION DETAIL



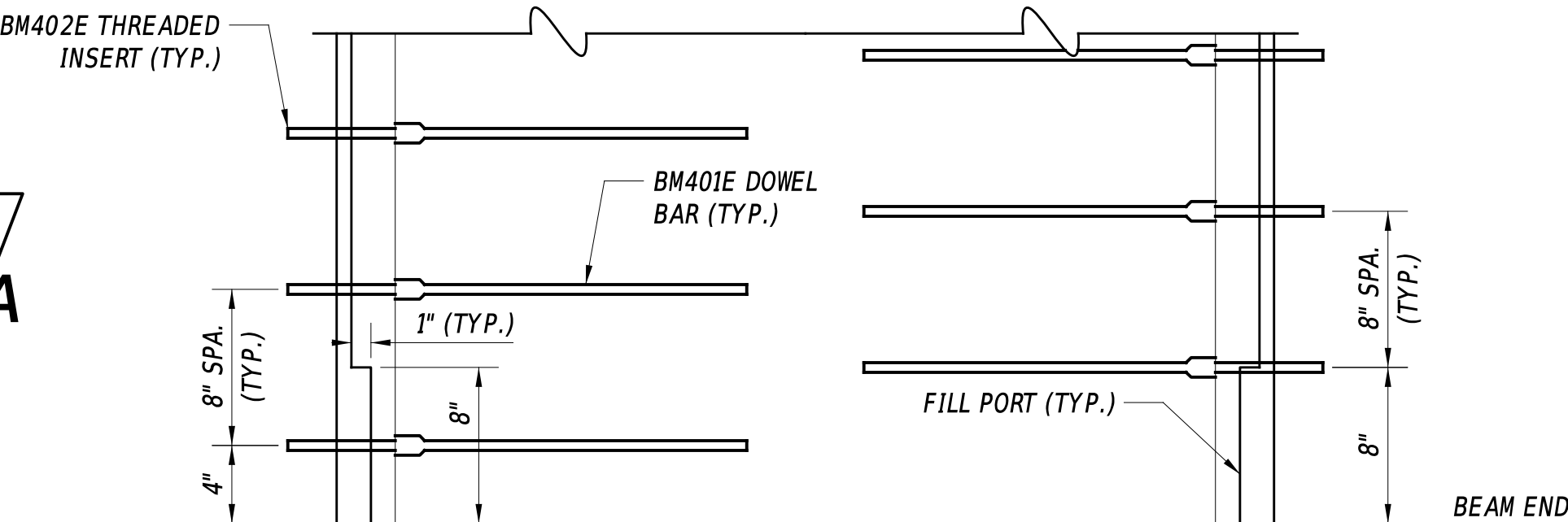
JOINT DETAILS AT BARRIER END



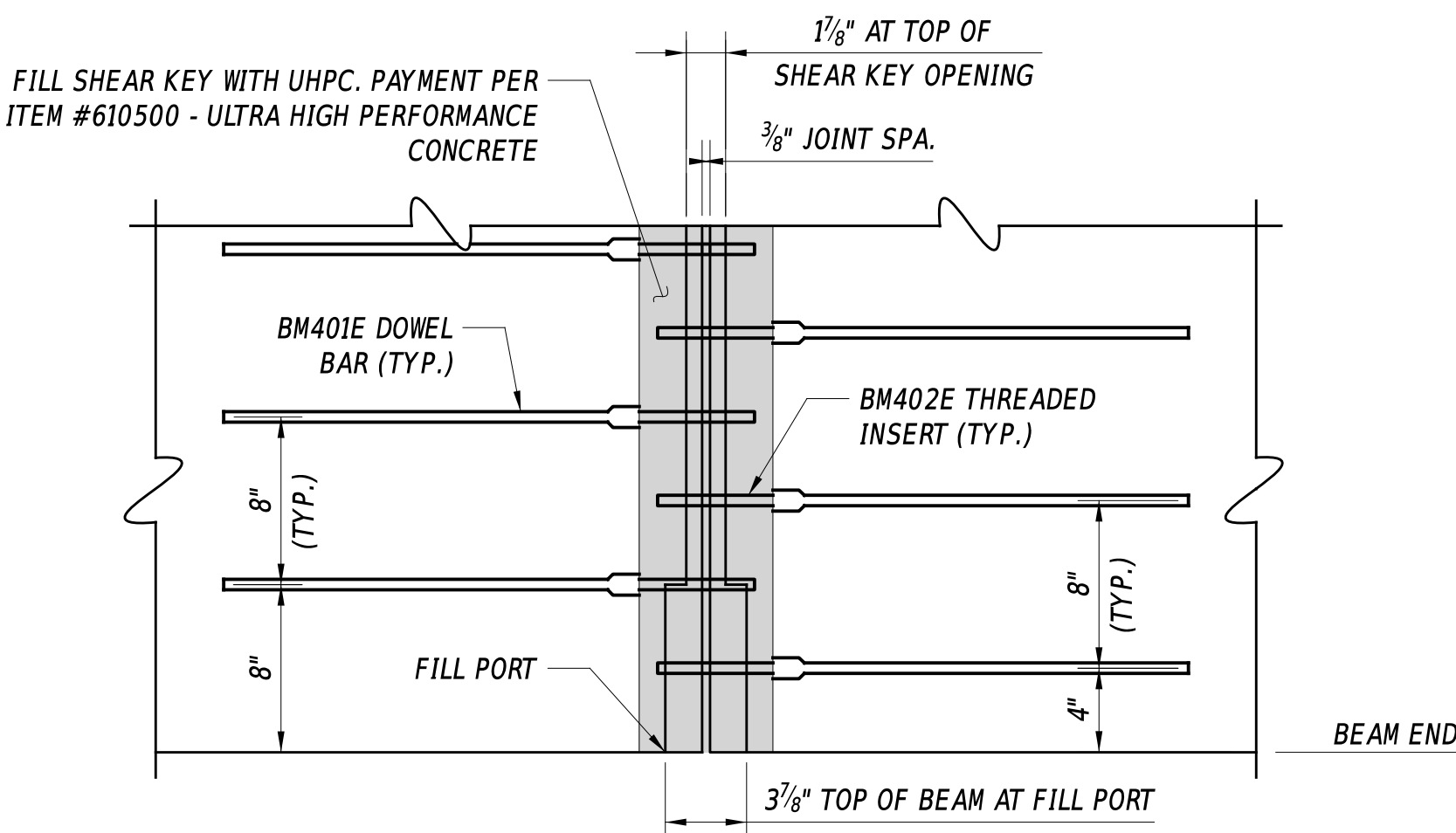
SHEAR KEY SECTION



SHEAR KEY DETAIL



SECTION A-A



SECTION B-B



JOINT OPENING (INCH)

LOCATION	TEMPERATURE ( °F )					MOVEMENT CLASSIFICATION
	10	30	50	70	90	
WEST ABUTMENT	1 9/16	1 1/2	1 1/2	1 7/16	1 7/16	3"
EAST ABUTMENT	1 9/16	1 1/2	1 1/2	1 7/16	1 7/16	3"

STRIP SEAL EXPANSION JOINT NOTES

- STEEL FOR DECK JOINTS AND STEEL EXTRUSIONS SHALL BE AASHTO M270, GR. 50 (ASTM A709, GRADE 50).
- NEOPRENE STRIP SEAL TO MEET ASTM D2628-91 MODIFIED, (RECOVERY TESTS EXCLUDED).
- THE EXPANSION JOINT SHALL BE CAPABLE OF SEALING THE DECK TO PREVENT MOISTURE AND OTHER CONTAMINANTS FROM DESCENDING THROUGH THE JOINT.
- THE CONTRACTOR SHALL ADJUST THE OPEN JOINT AS REQUIRED BY THE WIDTH OF THE STEEL EXTRUSION USED SO AS TO PROVIDE A 1 1/2" JOINT OPENING AT 68°F.
- THE STRIP SEAL SHALL BE INSTALLED IN ONE PIECE ACROSS THE BRIDGE WIDTH. SPLICING OF THE STRIP SEAL IS NOT PERMITTED.
- THE EXPANSION JOINT SYSTEM IS PAID FOR UNDER ITEM #624000 - PREFABRICATED EXPANSION JOINT SYSTEM, 3".
- ENTIRE EXPANSION DAM SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 624 OF THE STANDARD SPECIFICATIONS.
- LUBRICANT-ADHESIVE FOR USE IN INSTALLING AND BONDING NEOPRENE SEAL ELEMENTS TO STEEL JOINT COMPONENTS SHALL BE A ONE QUART MOISTURE-CURING POLYURETHANE AND HYDROCARBON SOLVENT MIXTURE HAVING THE FOLLOWING PHYSICAL PROPERTIES:
  - AVERAGE WEIGHT, POUNDS PER GALLON 8± 10%
  - SOLIDS CONTENT 65%
  - ADHESIVE SHALL REMAIN LIQUID FROM 5°F TO 120°F
  - FILM STRENGTH, AS PER ASTM D-412 2,000 PSI
  - ELONGATION 250%
- STEEL EXTRUSION SHALL BE WELDED TO BE WATERTIGHT AT CONSTRUCTION JOINTS. PAYMENT INCIDENTAL TO ITEM #624000 - PREFABRICATED EXPANSION JOINT SYSTEM, 3".
- WHERE TRAFFIC BARRIER PLATES ARE USED:
  - SUCH BARRIERS ARE REQUIRED WHERE THE OPEN JOINT AS DESCRIBED IN NOTE 4 IS FOUR INCHES OR WIDER.
  - USE TYPE 316 STAINLESS STEEL COUNTERSUNK FLATHEAD SCREWS WITH ASTM A108 CONCRETE THREADED ANCHOR or THREADED INSERT.
  - THE HEAD OF SCREWS SHALL BE FLUSH WITH FACE OF STEEL PLATE.
  - THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS OF TRAFFIC BARRIER PLATES FOR APPROVAL.
- AT AREAS WHERE STEEL MEMBERS ARE TO BE SPLICED, USE OF COMPLETE JOINT PENETRATION (CJP) AND PARTIAL JOINT PENETRATION (PJP) WELD ARE BOTH PERMITTED. THE THICKNESS OF PJP WELD MUST BE MINIMUM HALF OF THE STEEL MEMBER THICKNESS.

SHEAR KEY NOTES

- TO CREATE AN EXPOSED AGGREGATE SURFACE WITHIN THE SHEAR KEY, APPLY AN IN-FORM RETARDER FROM THE TOP OF BEAM TO BOTTOM OF THE SHEAR KEY ALONG THE FULL LENGTH OF BEAM ON BOTH SIDES. DO NOT ALLOW STAINS FROM OIL, GREASE OR OTHER CONTAMINATES TO BE PRESENT WITHIN THE SHEAR KEY. OMIT THE SHEAR KEY DETAIL, IN-FORM RETARDER, AND BM401E AND BM402E BARS ON THE EXTERIOR FACE OF THE FASCIA BEAMS.
- INSTALL THE BM402E BARS PRIOR TO DELIVERING BEAMS TO THE CONSTRUCTION SITE. AN ALTERNATIVE METHOD TO THREADED BM402E BAR PROTRUDING INTO THE SHEAR KEY SPACE MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.
- STAGGER THE BM401E AND BM402E BARS ACCORDING TO THE DETAILS PROVIDED ON THIS SHEET TO FORM A NON-CONTACT LAP SPLICE ALONG THE LENGTH OF THE SHEAR KEY.
- TO CREATE A FILL PORT, RECESS THE SHEAR KEY 1" x 8". PLACE THE FILL PORTS AT BEAM ENDS AND AT QUARTER POINTS ALONG THE BEAM.
- VALUE ENGINEERING PROPOSALS ELIMINATING THE USE OF UHPC WILL NOT BE CONSIDERED.

ADDENDA / REVISIONS

SCALE AS NOTED

REPLACEMENT OF BR 3-164 ON  
SR 36 CEDAR BEACH ROAD

CONTRACT

T202007301

COUNTY

SUSSEX

BRIDGE NO.

3-164

DESIGNED BY: A. MILLER

CHECKED BY: D. NEELY

PRECAST SLAB SPAN  
BEARING & JOINT DETAILS - 2

S-50

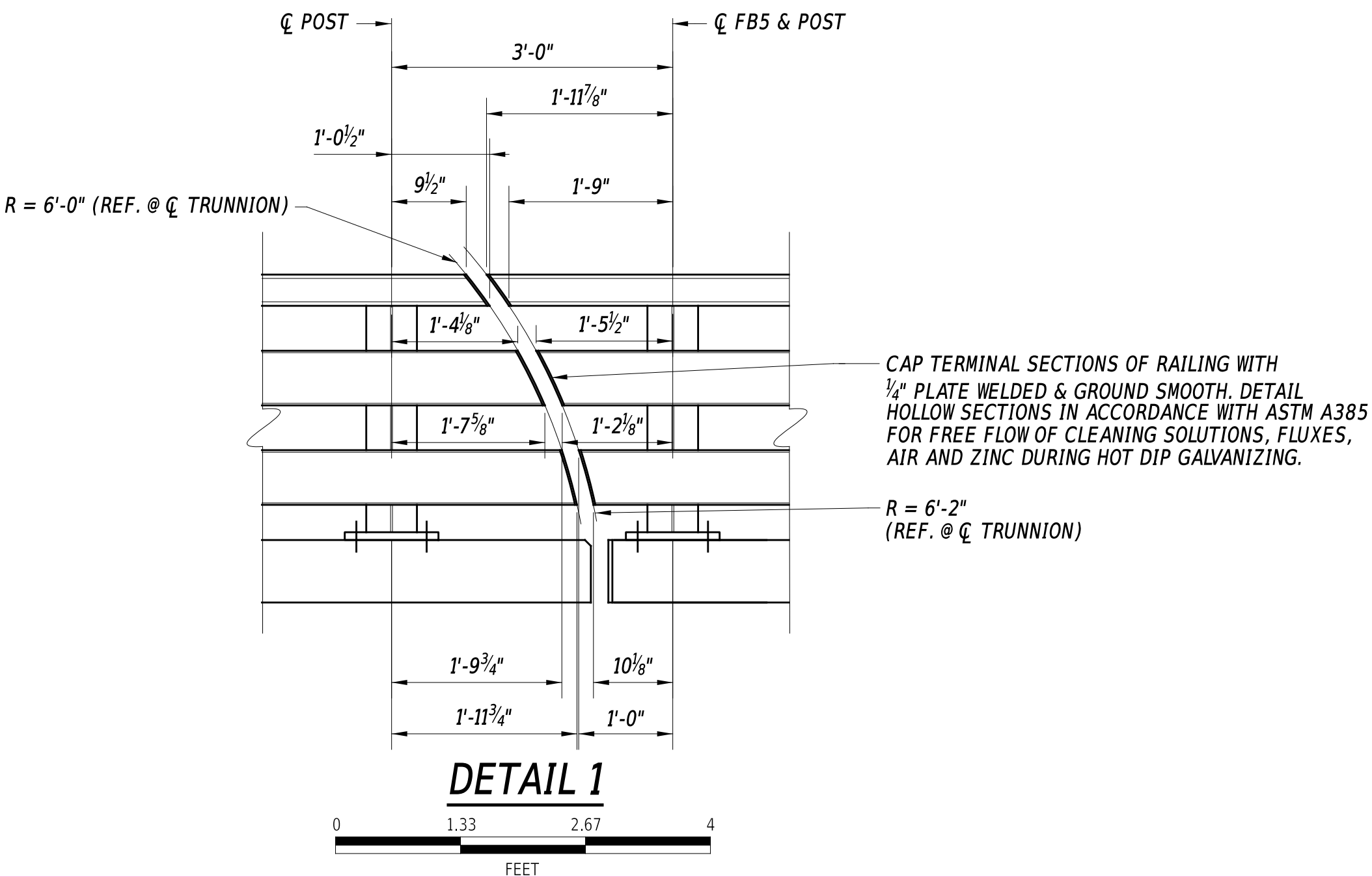
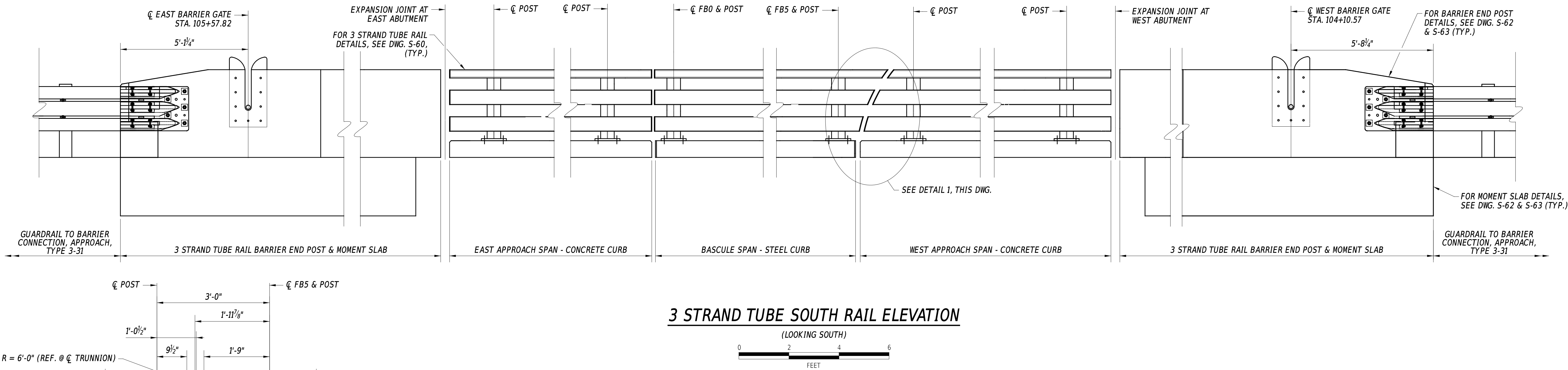
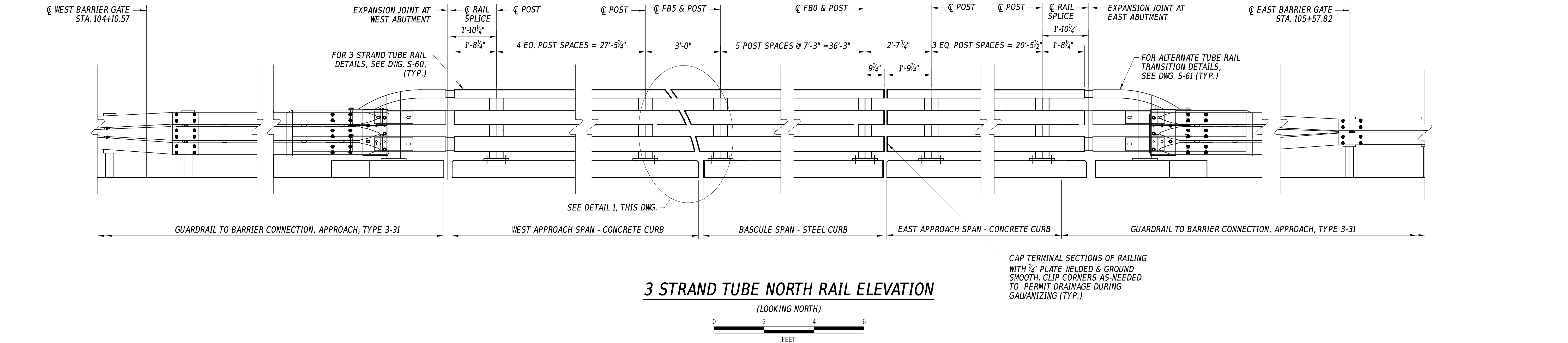
SECTION

H&H

SHEET NO.

59

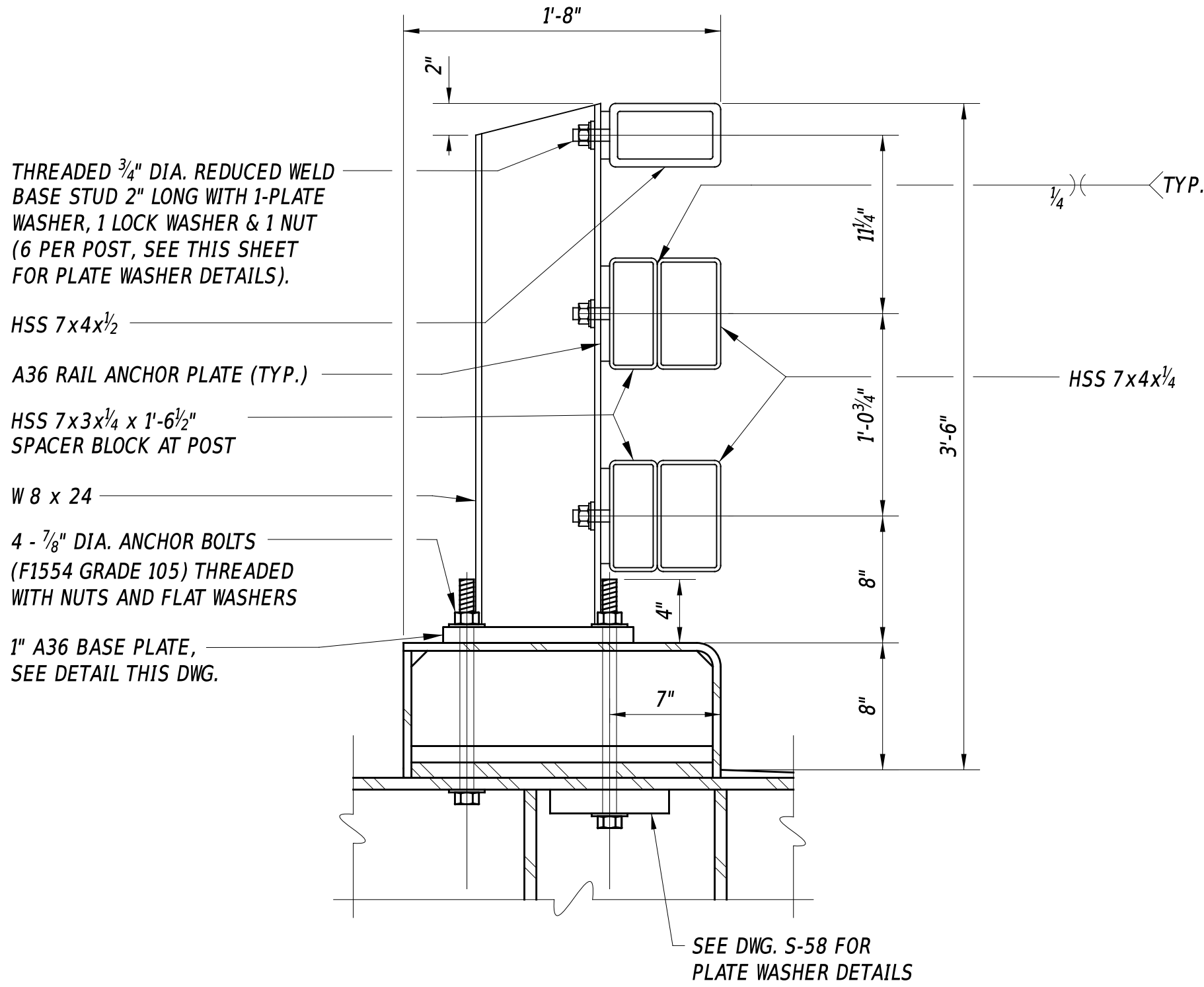
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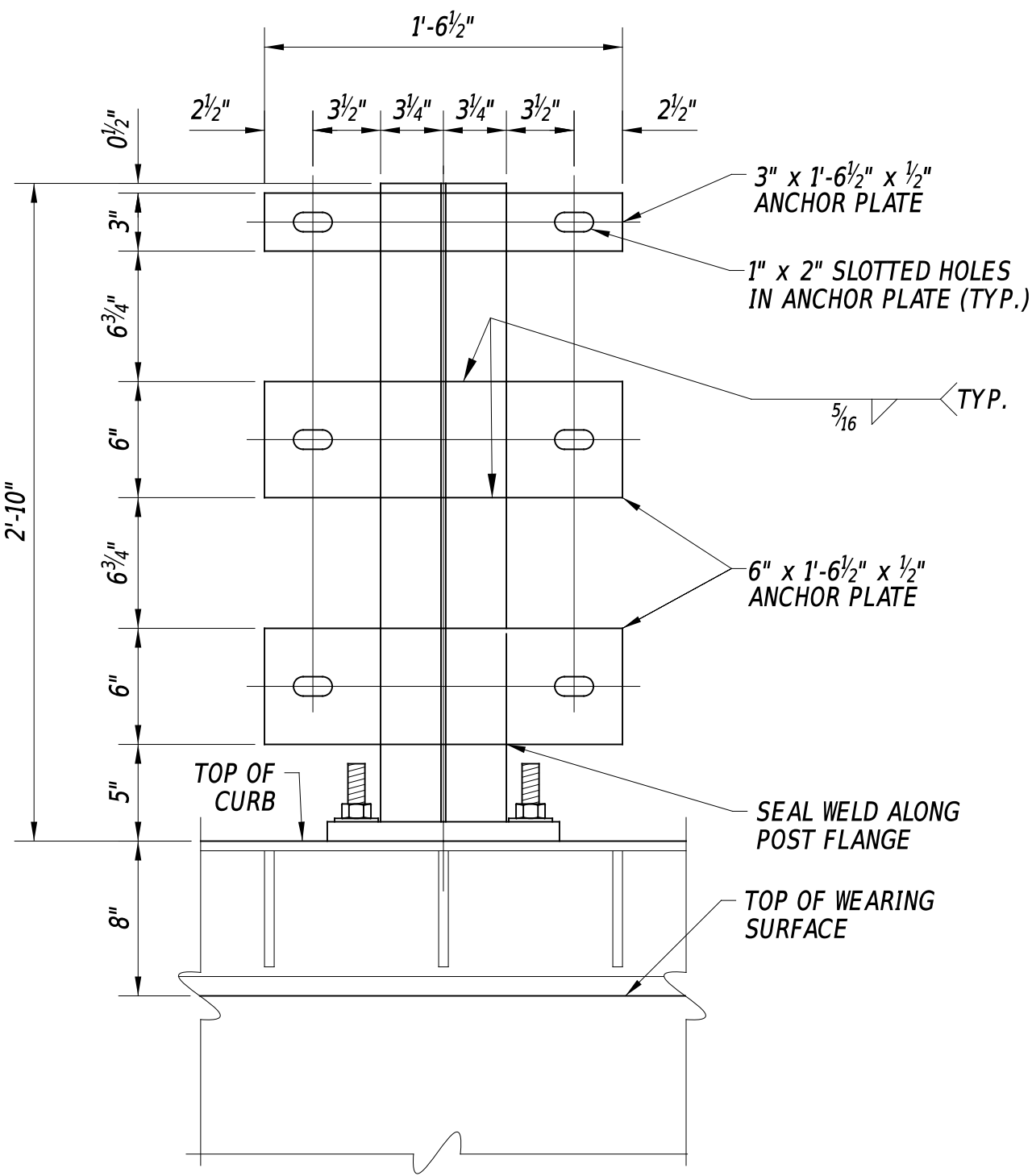
- NOTES**
1. BARRIER GATE ANCHORAGES AND RECEIVER SHALL BE PAID FOR UNDER ITEM #615504 - BRIDGE ELECTRICAL SYSTEM.
  2. FOR 3 STRAND TUBE RAIL NOTES, SEE DWG. S-60.
  3. FOR ALTERNATE TUBE RAIL TRANSITION NOTES, SEE DWG. S-61.

ADDENDA / REVISIONS				SCALE AS NOTED	REPLACEMENT OF BR 3-164 ON SR 36 CEDAR BEACH ROAD	CONTRACT	BRIDGE NO.	3-164	RAIL DETAILS - 1	S-59
						T202007301	DESIGNED BY:	A. MILLER		SECTION
						COUNTY	CHECKED BY:	D. NEELY		SHEET NO.
						SUSSEX				68

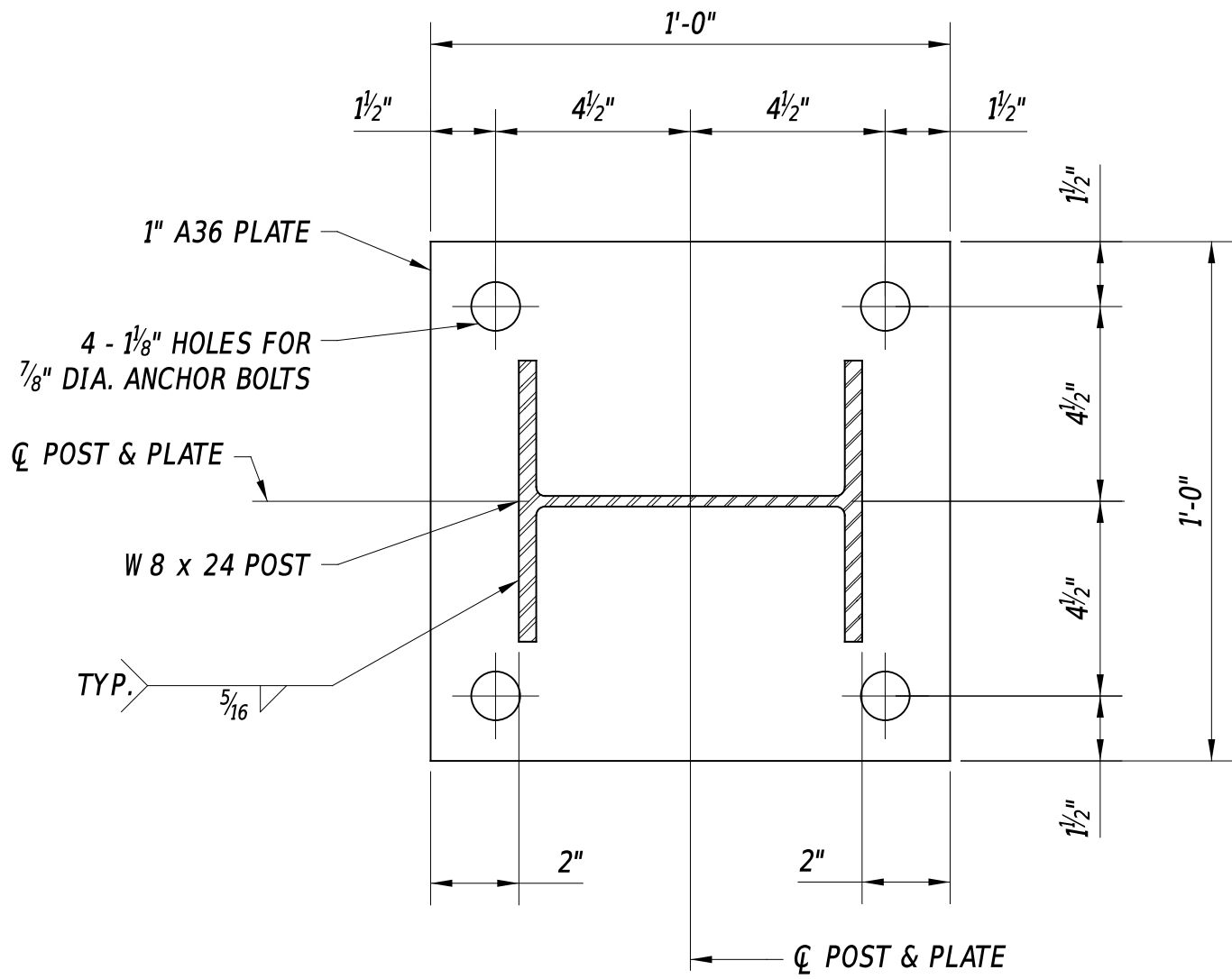




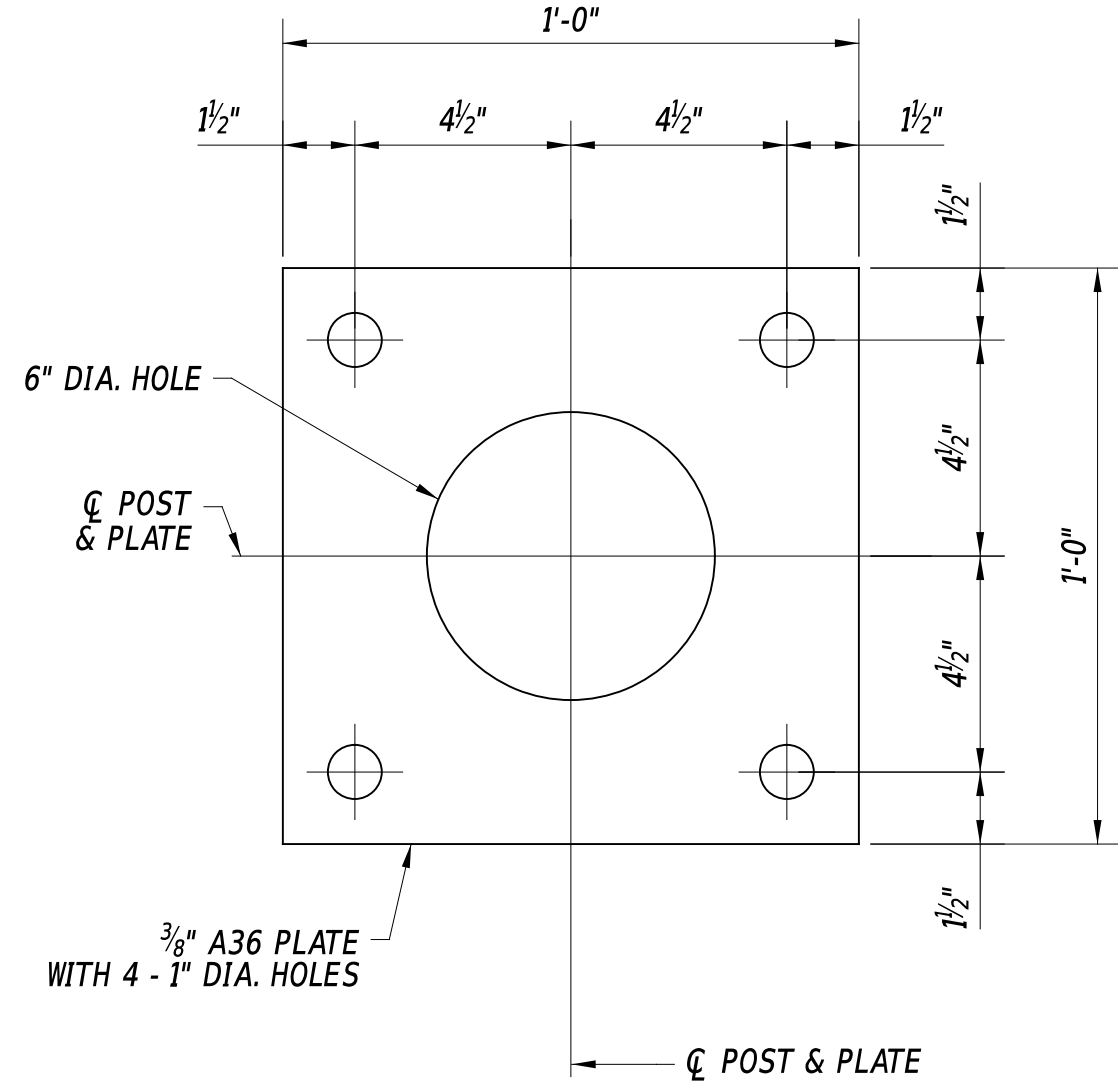
**3 STRAND TUBE RAIL PARAPET SECTION**



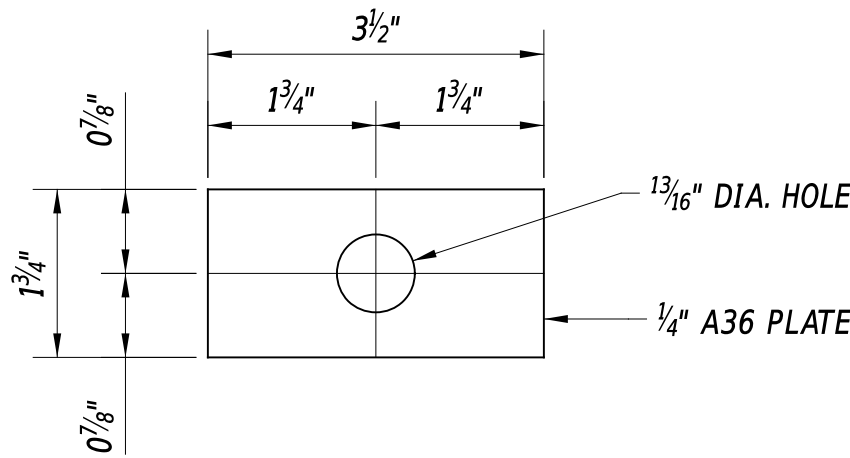
**RAIL ANCHOR PLATE ELEVATION**



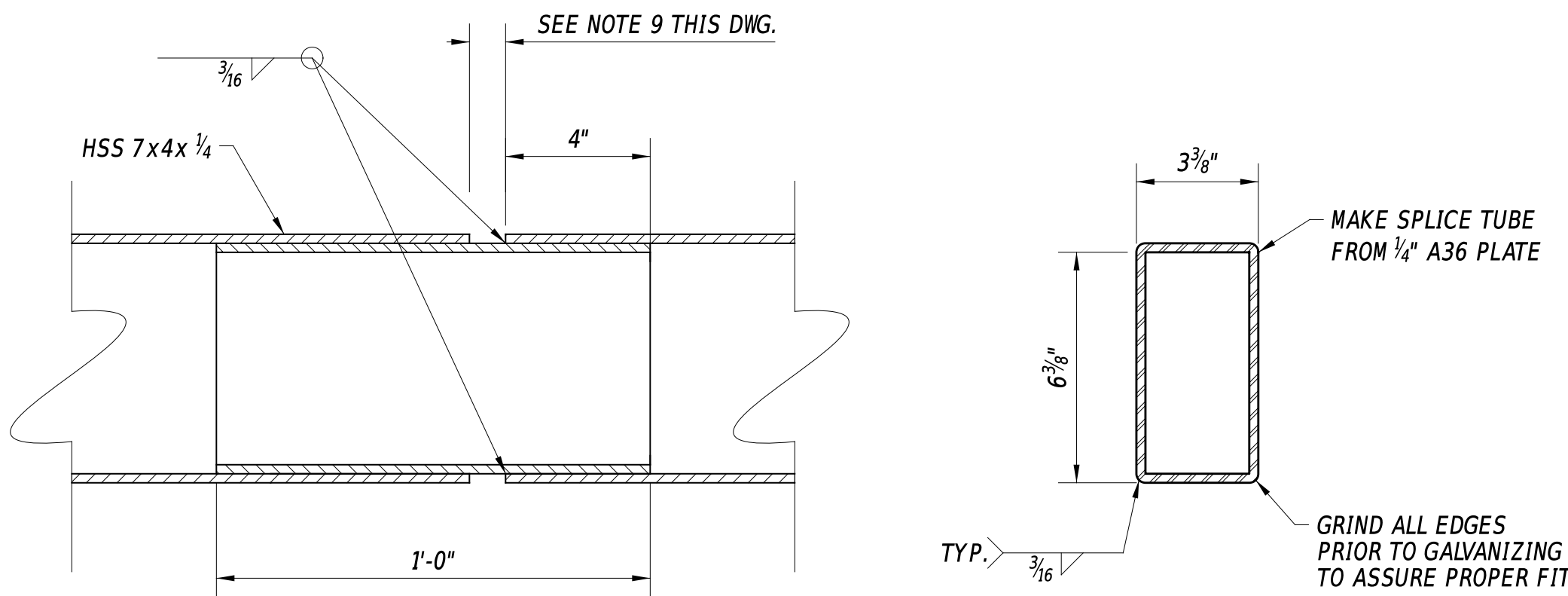
**BASE PLATE DETAIL**



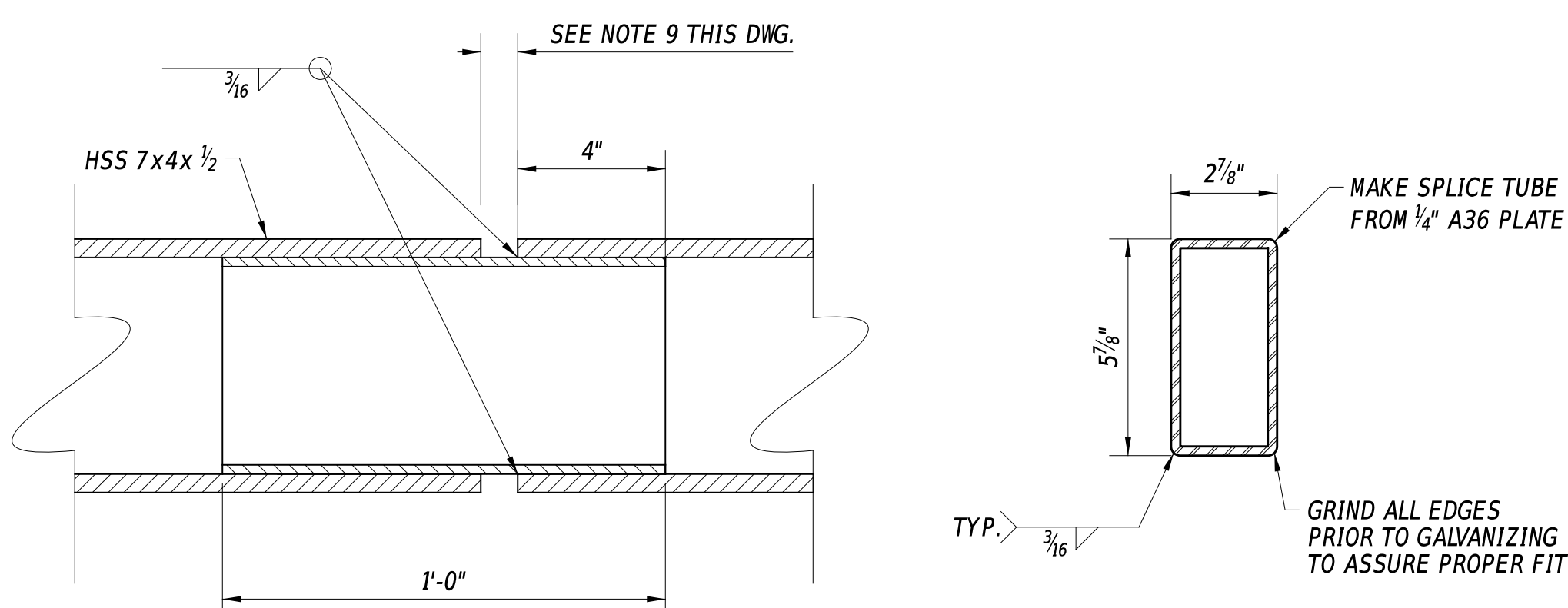
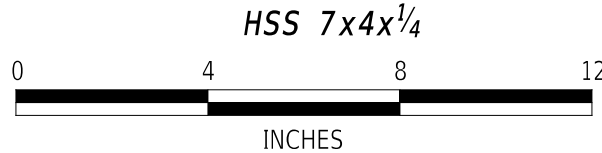
**ANCHOR PLATE DETAIL**



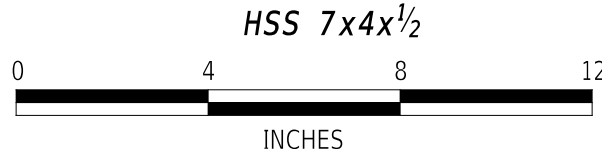
**PLATE WASHER DETAIL**



**RAIL SPLICE DETAILS**



**RAIL SPLICE DETAILS**

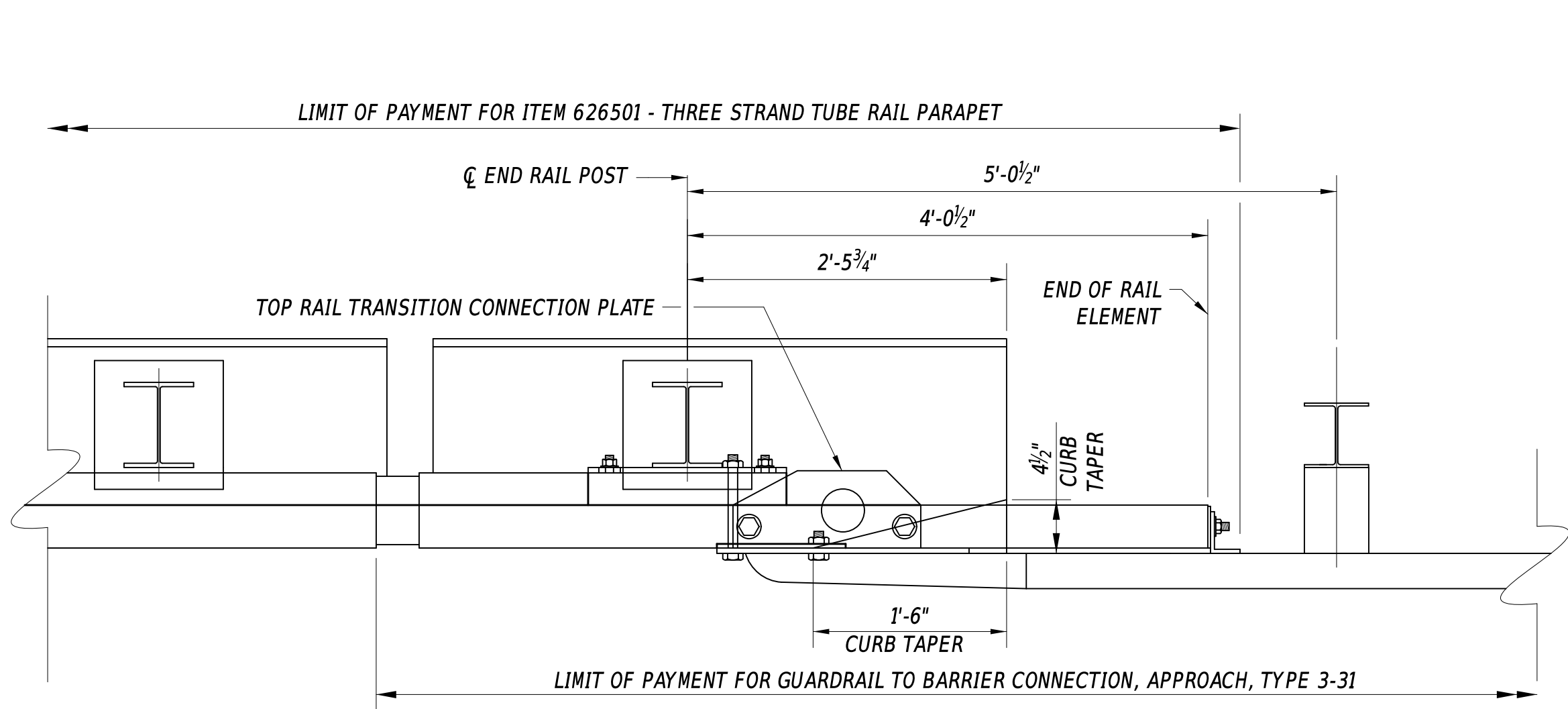


**GENERAL 3 STRAND TUBE RAIL PARAPET NOTES**

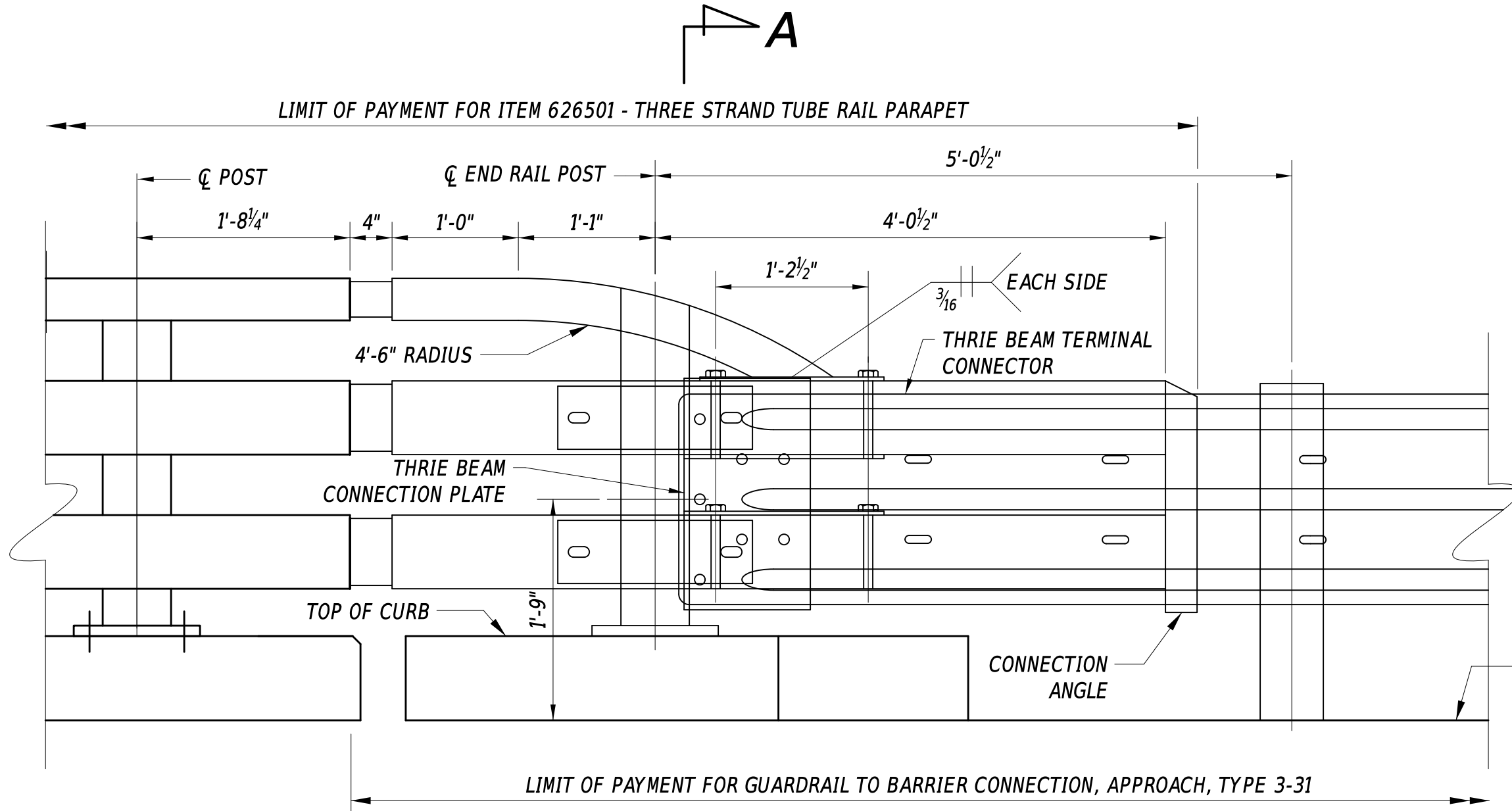
- RAILS SHALL BE PARALLEL TO THE GRADE OF THE ROADWAY. RAIL SECTIONS SHALL BE ATTACHED TO AS MANY POSTS AS POSSIBLE, BUT NOT LESS THAN TWO.
- THE CENTER LINE OF ANY SPLICE AND/OR CONTRACTION JOINT SHALL BE LOCATED AT LEAST 2'-0" AWAY FROM CENTER LINE OF A POST. CONTRACTION AND/ OR SPLICE JOINTS FOR EACH STRAND OF THREE STRAND RAILING SHALL BE PLACED IN THE SAME LOCATION AND IN THE SAME PANEL.
- RAIL ELEMENTS SHALL BE STRUCTURAL TUBING IN ACCORDANCE WITH ASTM A500 GRADE C.
- STEEL POSTS SHALL CONFORM TO ASTM A769. STEEL PLATES SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE NOTED.
- POSTS SHALL BE SET VERTICAL. MAXIMUM POST SPACING IS 10'-0".
- ALL STRUCTURAL STEEL COMPONENTS SHALL BE HOT-DIP GALVANIZED AS PER ASTM A123 AFTER FABRICATION, EXCEPT AS NOTED. ALL ANCHOR PLATES SHALL BE ATTACHED BEFORE GALVANIZING. FASTENERS, INCLUDING ASSOCIATED HARDWARE, SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM F2329.
- ANCHOR BOLTS MUST BE SET SO THAT AT LEAST 4" OF THREAD FROM THE BOLT IS EXPOSED ABOVE THE TOP OF THE CURB.
- PLATE WASHERS SHALL BE POSITIONED TO COMPLETELY COVER SLOTTED HOLES.
- TUBE RAIL SPLICE JOINTS SHALL BE SPLICED AT 1-INCH. PROVIDE TUBE RAIL SPLICING AT 4-INCH OVER DECK EXPANSION JOINTS.
- FABRICATION AND INSTALLATION OF THE 3 STRAND TUBE RAIL PARAPET SYSTEM SHALL BE PAID FOR UNDER ITEM #626501 - THREE STRAND TUBE RAIL PARAPET.

												S-60		
ADDENDA / REVISIONS				SCALE AS NOTED	REPLACEMENT OF BR 3-164 ON SR 36 CEDAR BEACH ROAD	CONTRACT		BRIDGE NO.		3-164		RAIL DETAILS - 2	SECTION	
						T202007301		DESIGNED BY:		J. HEWKO			H&H	
						COUNTY		CHECKED BY:		D. NEELY			SHEET NO.	
						SUSSEX							69	

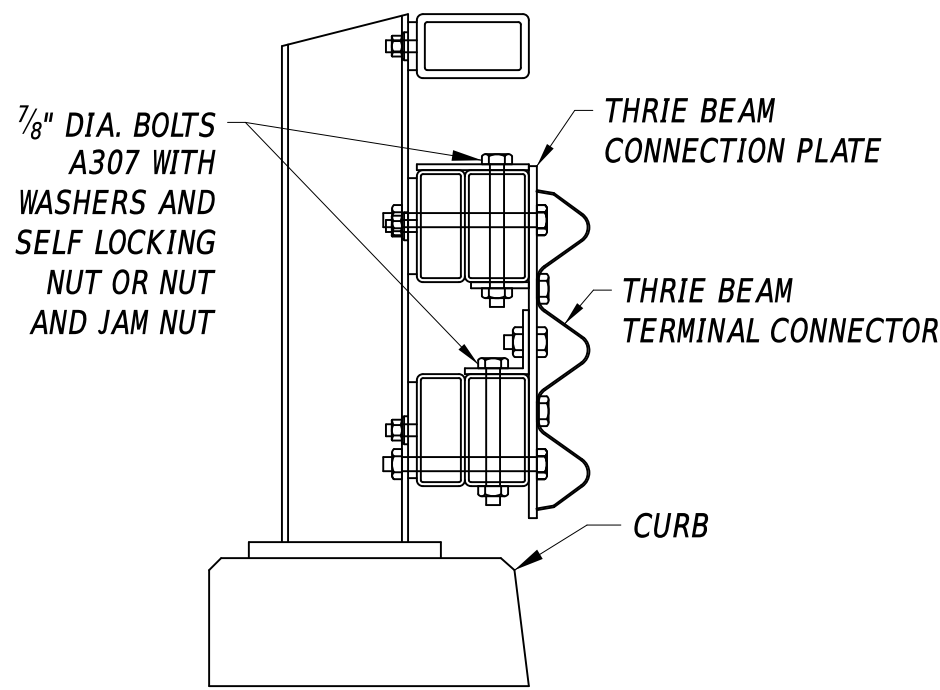
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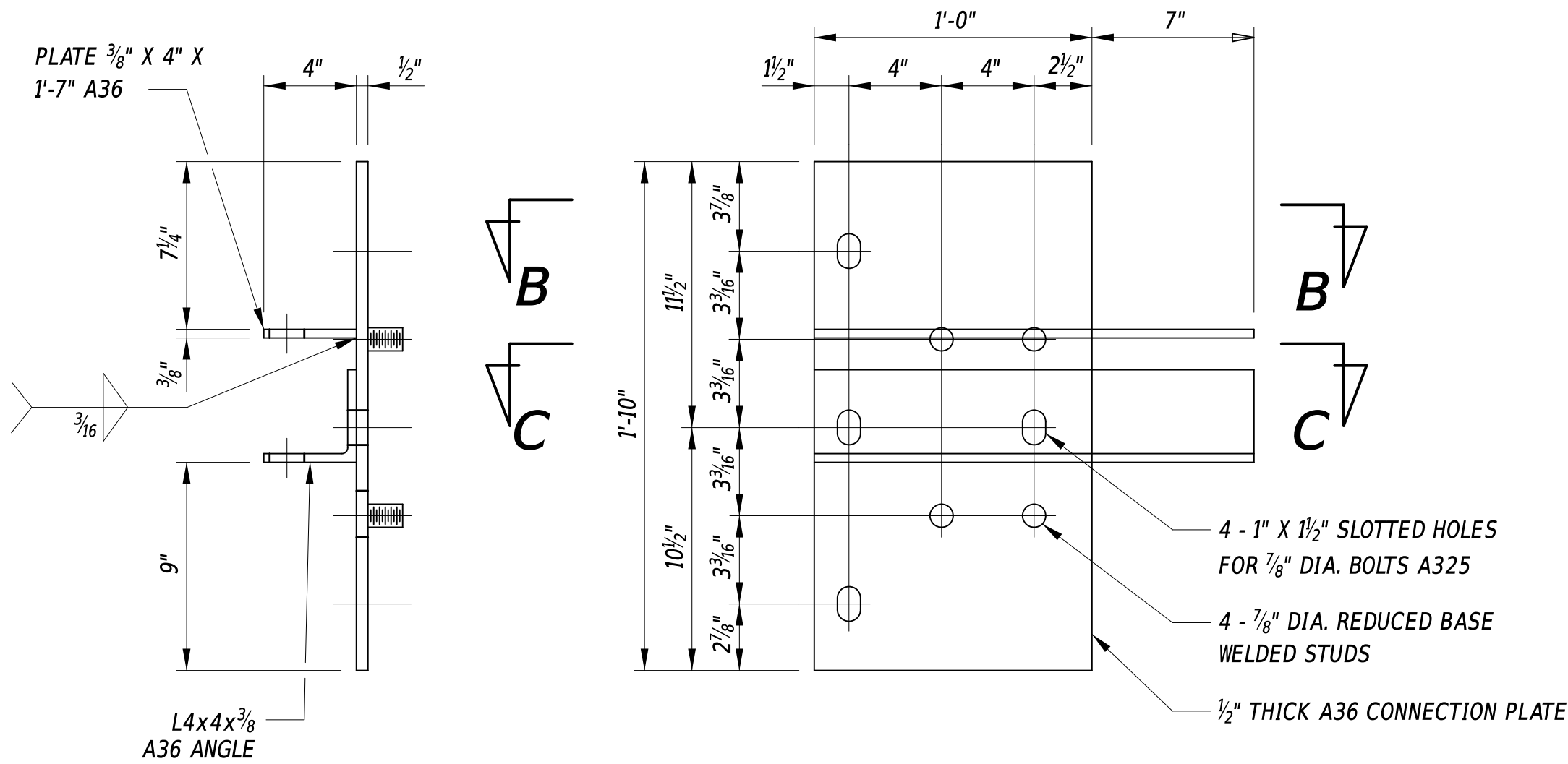
**ALTERNATE TUBE RAIL TRANSITION PLAN**



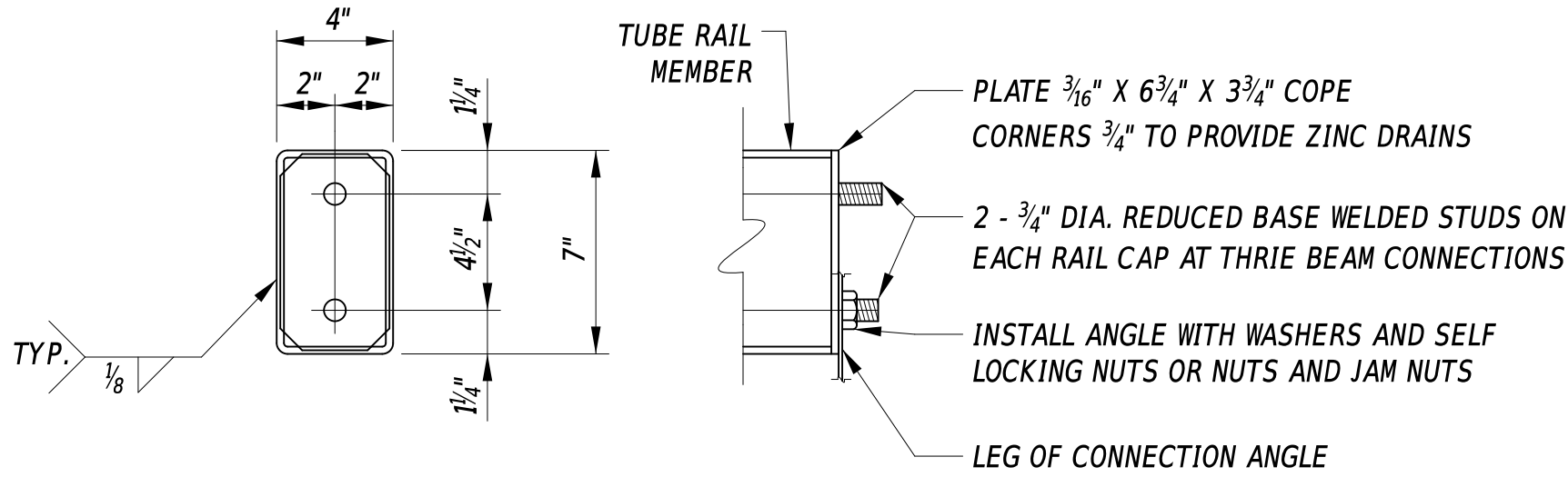
**ALTERNATE TUBE RAIL TRANSITION ELEVATION**



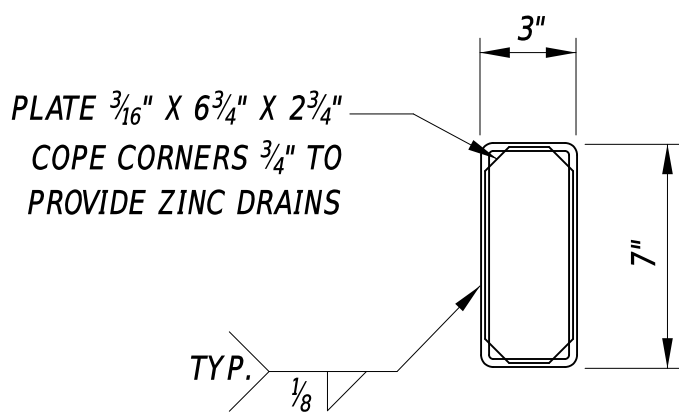
**SECTION A-A**



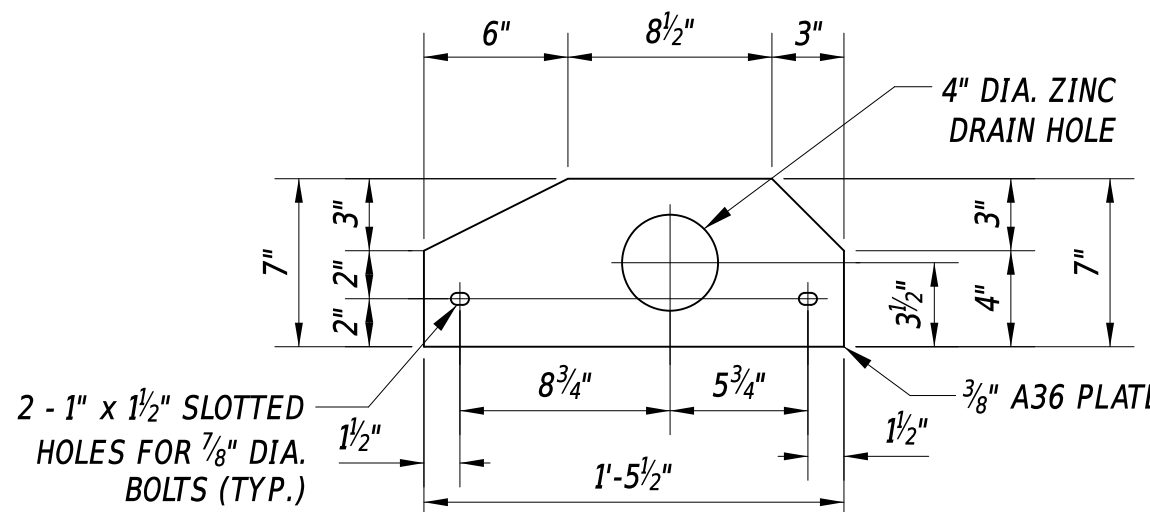
**THRIE BEAM CONNECTION PLATE DETAIL**



**RAIL CAP DETAIL**



**RAIL CAP FOR SPACER BLOCK DETAIL**

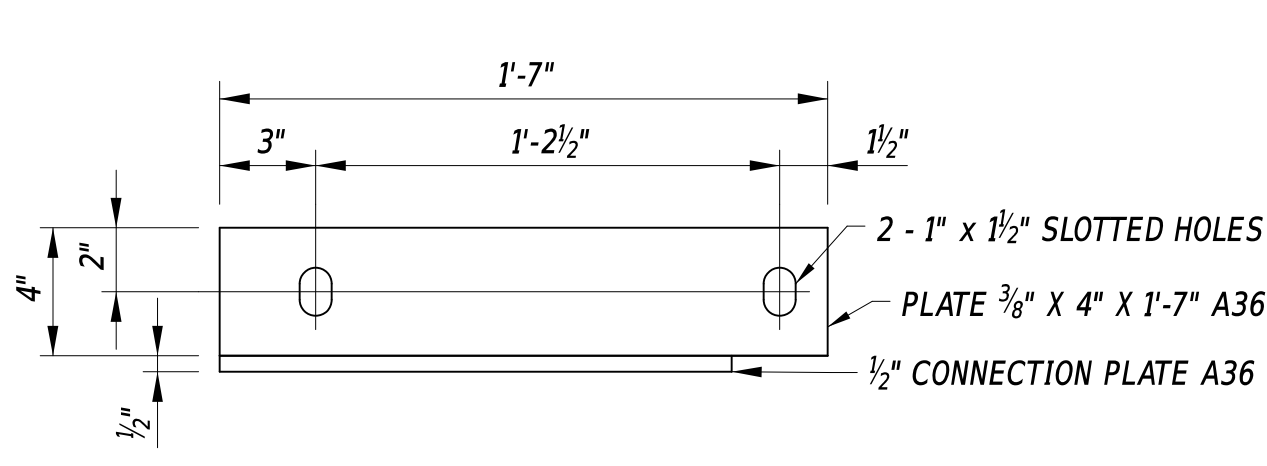


**TOP RAIL TRANSITION PLATE**

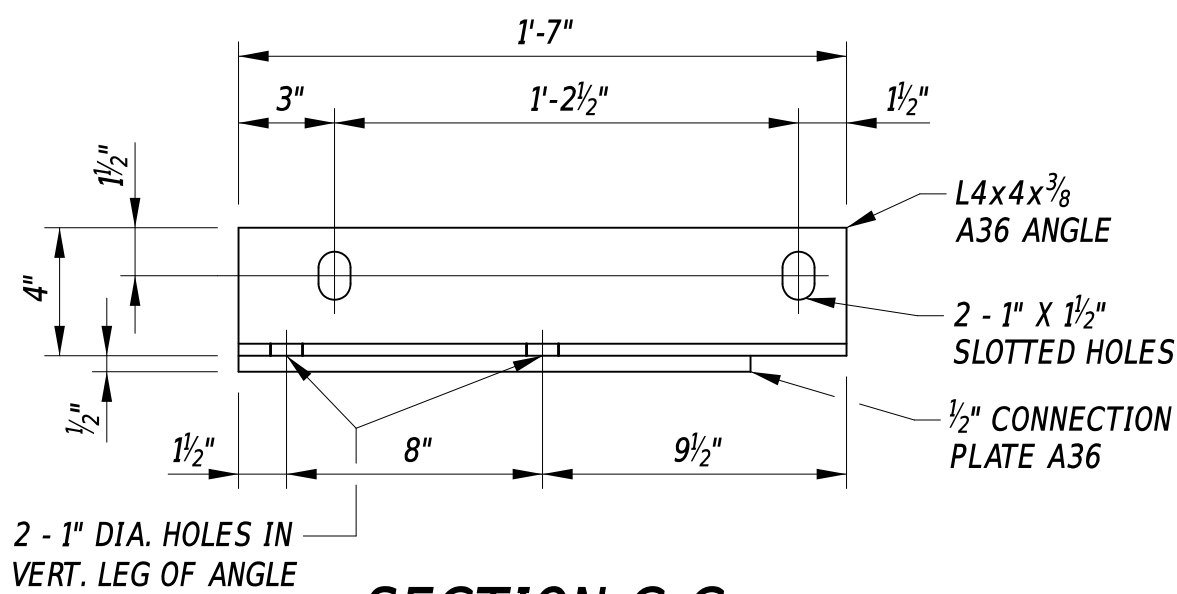


**ALTERNATE TUBE RAIL TRANSITION**

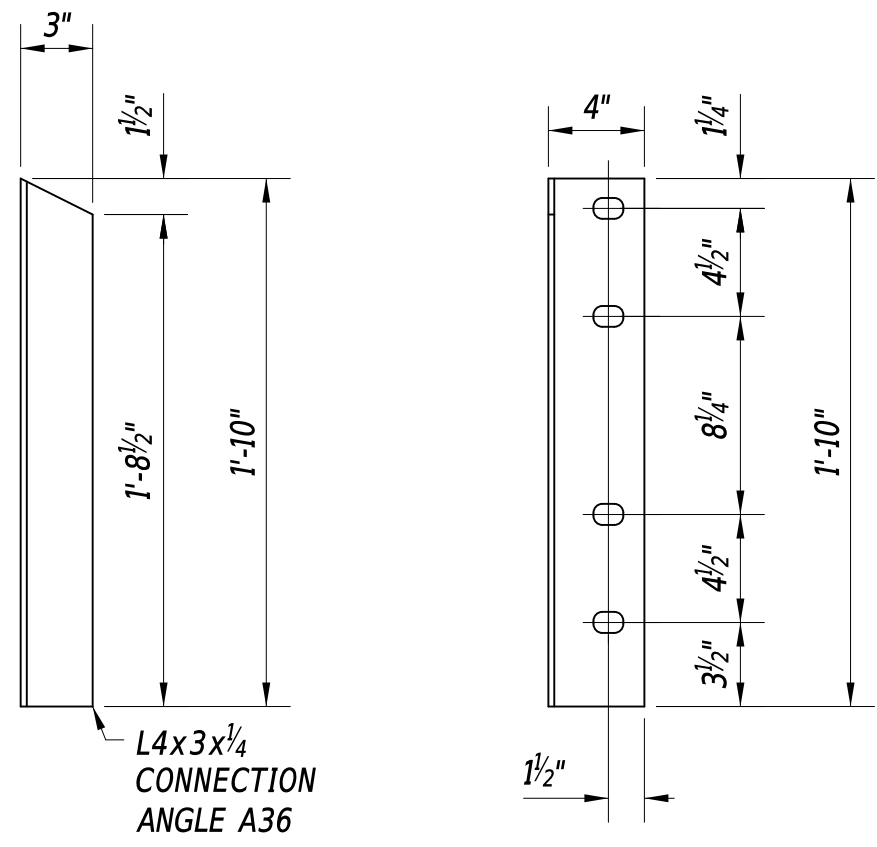
- SEE DELDOT STANDARD CONSTRUCTION DETAIL NO. B-10 FOR ADDITIONAL INFORMATION ON POST SIZING, POST SPACING, AND PAY LIMITS FOR ATTACHING APPROACH BARRIER TO GUARDRAIL CONNECTION. MOUNT THE THRIE BEAM GUARDRAIL TO THE BRIDGE RAIL END AT 31" AND SUBSTITUTE THE SYMMETRIC W-BEAM TO THRIE-BEAM TRANSITION WITH THE ASYMMETRIC TRANSITION SHOWN IN DELDOT STANDARD CONSTRUCTION DETAIL NO. B-13 SHEET 6. THRIE BEAM TERMINAL CONNECTOR SHALL BE PAID FOR UNDER THE GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 3-31.
- ALL HARDWARE REQUIRED TO CONNECT THE THRIE BEAM TRANSITION TO THE PARAPET END SHALL BE PAID FOR UNDER ITEM 626501 - THREE STRAND TUBE RAIL PARAPET.
- LAP APPROACH GUARDRAIL TO PREVENT SNAGS FROM ONCOMING TRAFFIC.
- PLACE GUARDRAIL REFLECTOR AS PER THE DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.



**SECTION B-B**



**SECTION C-C**



**CONNECTION ANGLE DETAIL**



SCALE AS NOTED

REPLACEMENT OF BR 3-164 ON  
SR 36 CEDAR BEACH ROAD

CONTRACT  
T202007301  
COUNTY  
SUSSEX

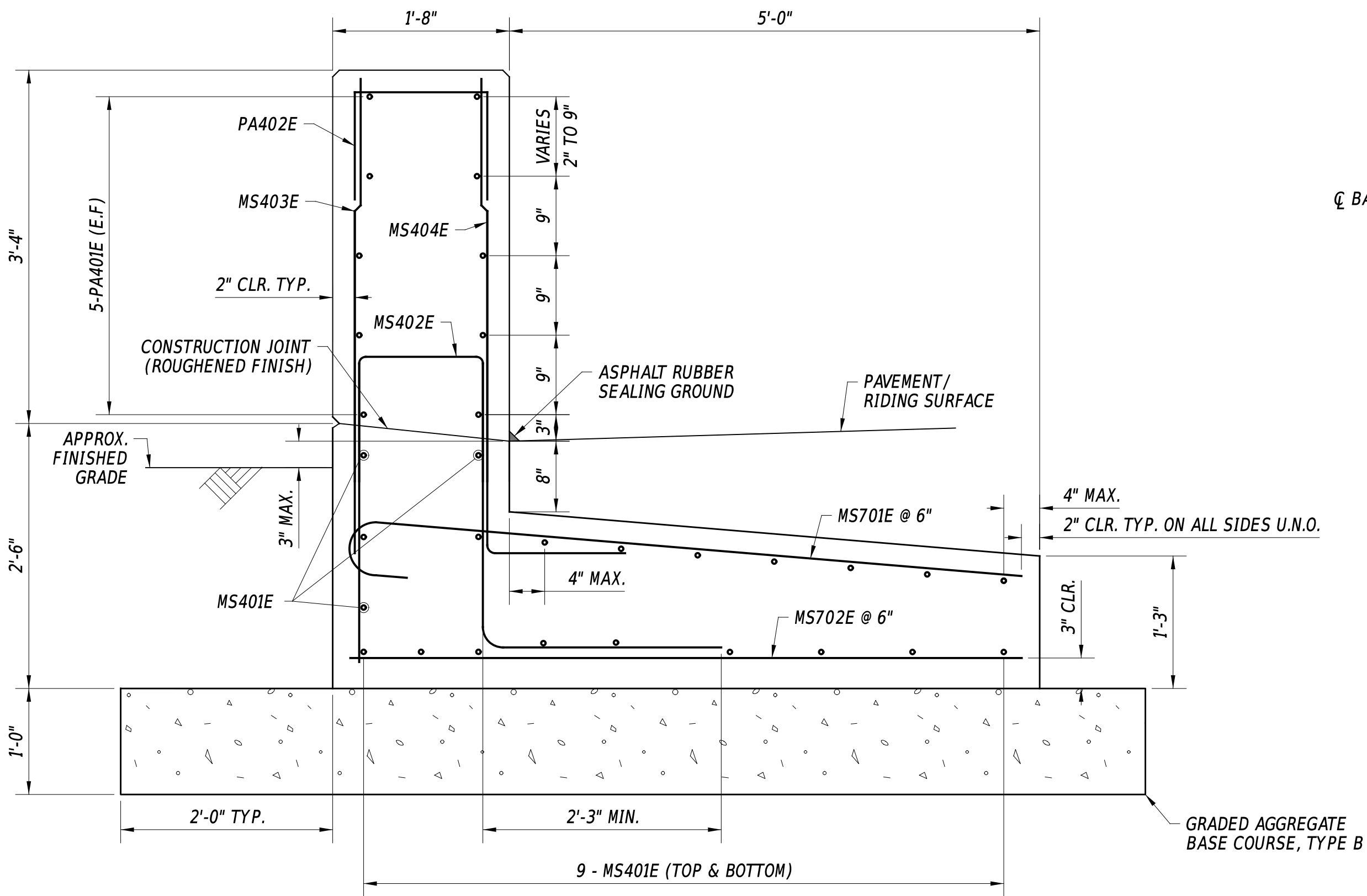
BRIDGE NO.  
3-164  
DESIGNED BY: A. MILLER  
CHECKED BY: D. NEELY

RAIL DETAILS - 3

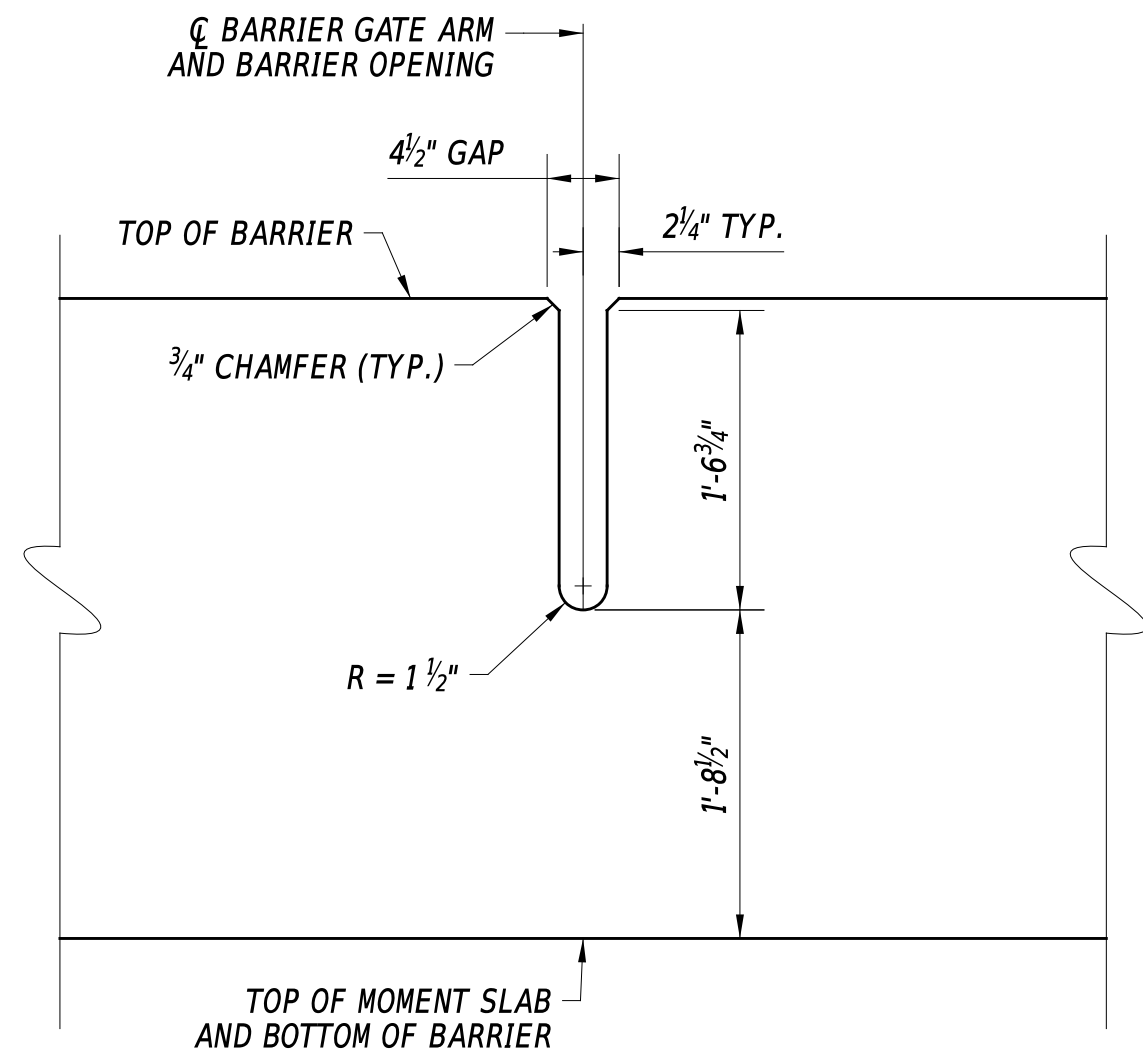
S-61  
SECTION  
H&H  
SHEET NO.  
70



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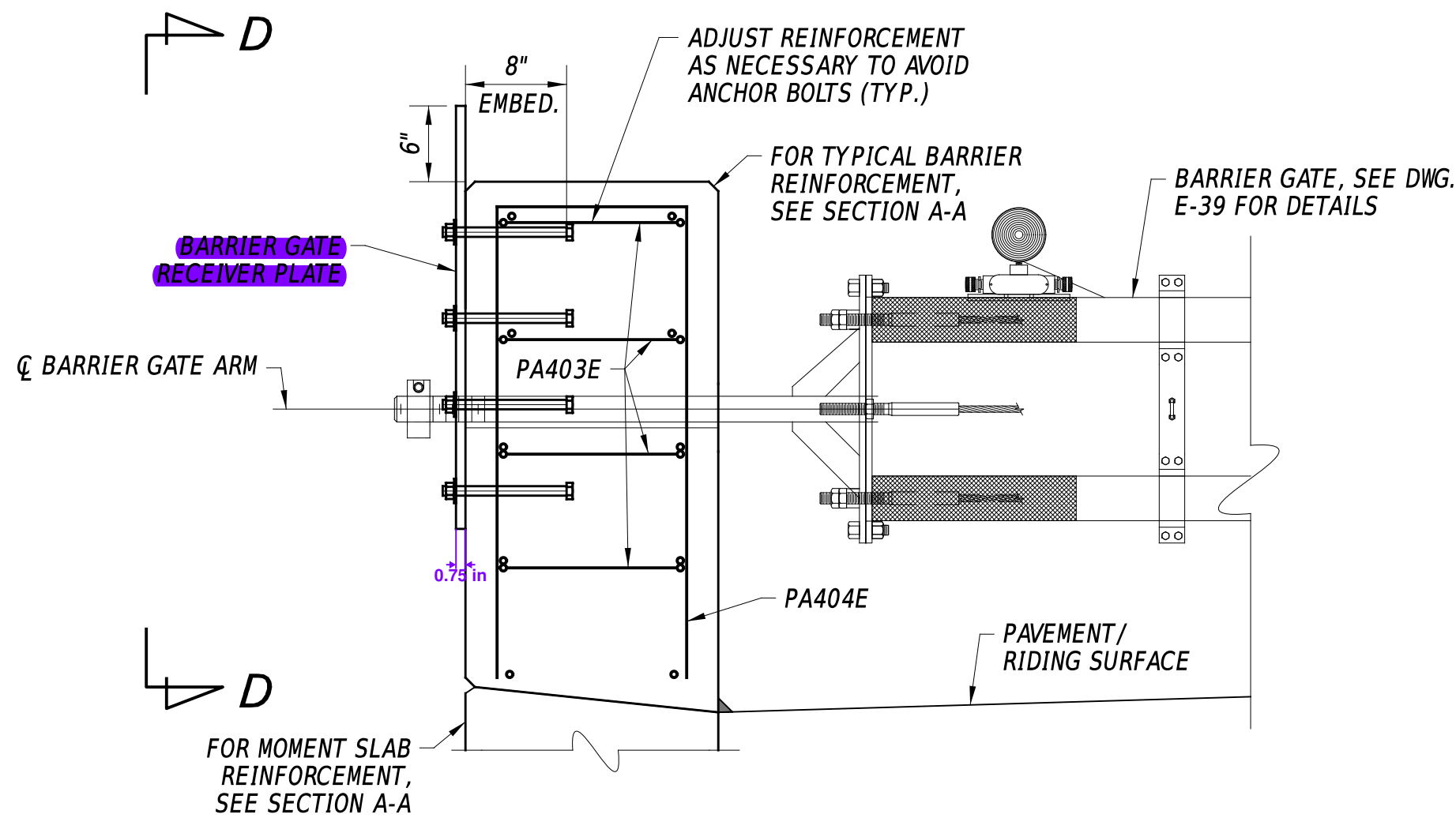
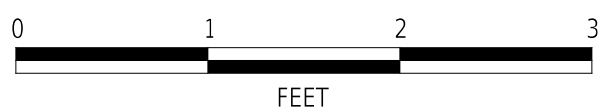


SECTION A-A

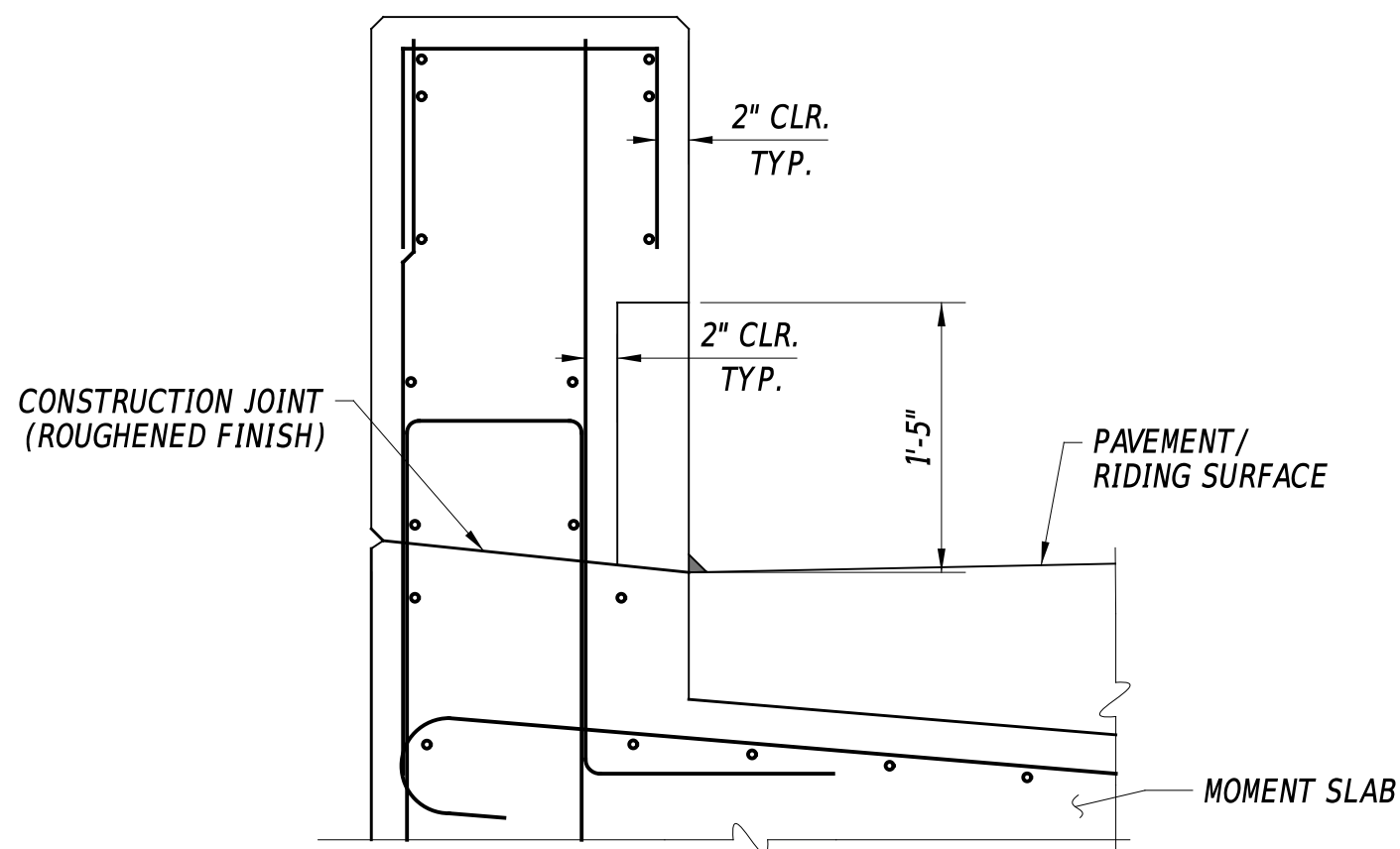
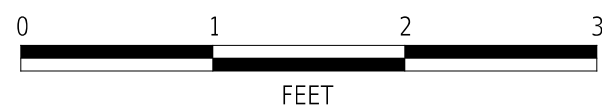


VIEW D-D

(BARRIER GATE RECEIVER PLATE NOT SHOWN FOR CLARITY)

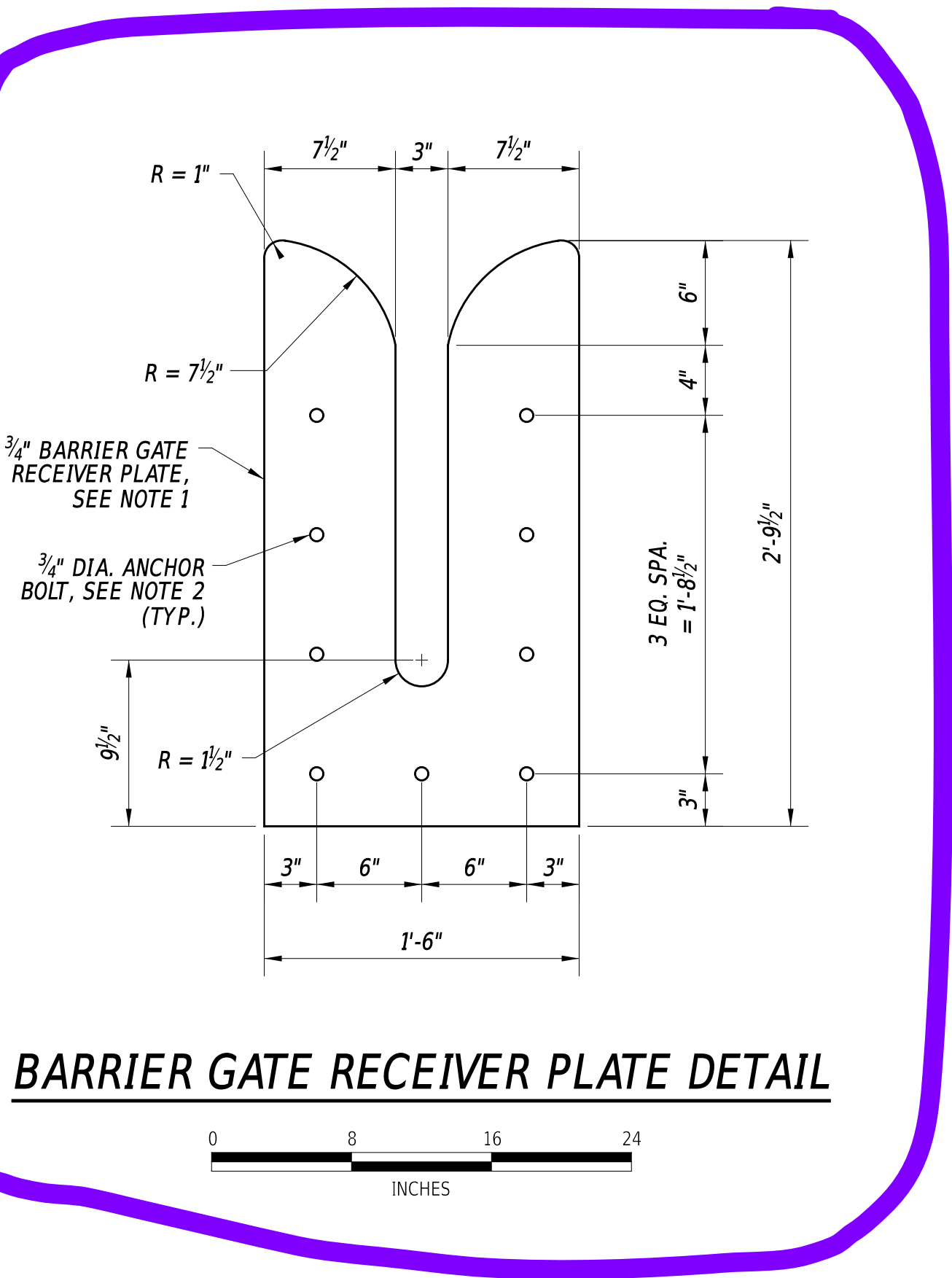


SECTION B-B

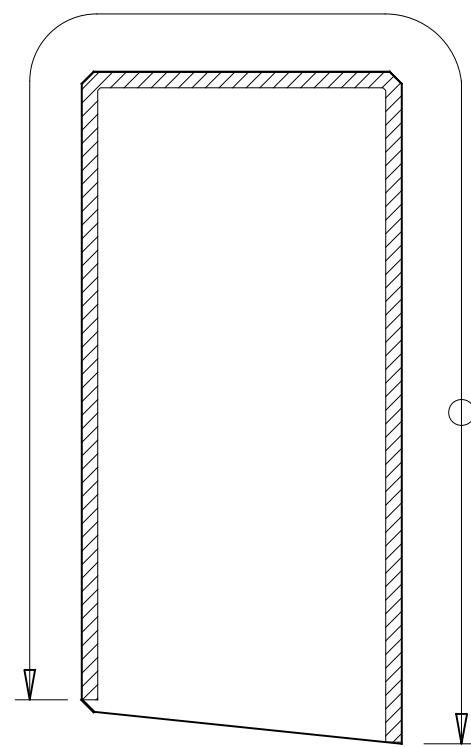


SECTION C-C

(SEE NOTE 6)

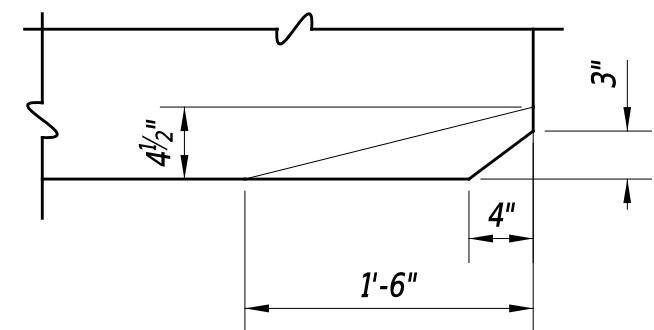


BARRIER GATE RECEIVER PLATE DETAIL



BARRIER CONTROL JOINT DETAIL

NOT TO SCALE



CHAMFER DETAIL



## NOTES

1. BARRIER GATE RECEIVER PLATE SHALL BE ASTM A709 GR. 50 AND SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.
2. FOR ANCHOR BOLT PROPERTIES AND REQUIRED TENSION, REFERENCE DWG. S-02.
3. VERTICAL FACE BARRIER END POST SHALL BE PAID FOR UNDER ITEM #610008 - PCC MASONRY, PARAPET, CLASS A.
4. MOMENT SLAB SHALL BE PAID FOR UNDER ITEM #610018 - PCC MASONRY, APPROACH SLAB, CLASS D.
5. GRADED AGGREGATE BASE COURSE SHALL BE PAID FOR UNDER ITEM #301001 - GRADED AGGREGATE BASE COURSE, TYPE B.
6. LONGITUDINAL REINFORCING SHALL BE FIELD BENT AROUND END CHAMFERS. VERTICAL REINFORCING SHALL BE SPACED TO PROVIDE A 2" CLEAR MINIMUM BETWEEN THE REINFORCING STEEL AND THE CONCRETE FACE.

ADDENDA / REVISIONS

SCALE AS NOTED

REPLACEMENT OF BR 3-164 ON  
SR 36 CEDAR BEACH ROAD

CONTRACT

T202007301

COUNTY

SUSSEX

BRIDGE NO.

3-164

DESIGNED BY: A. MILLER

CHECKED BY: D. NEELY

RAIL DETAILS - 5

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SECTION

H&H

SHEET NO.

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