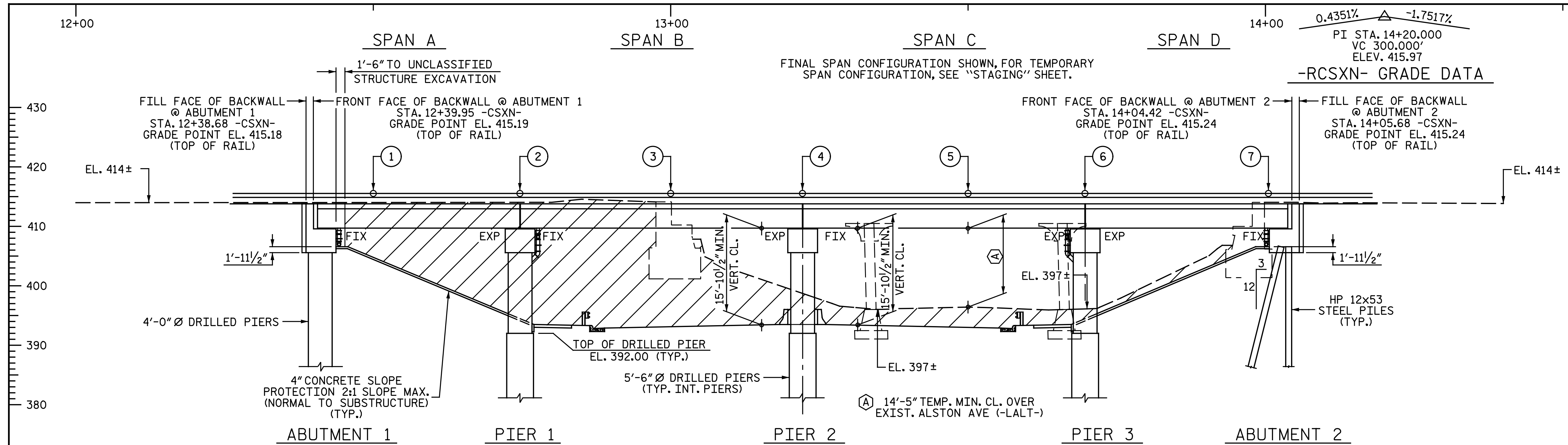


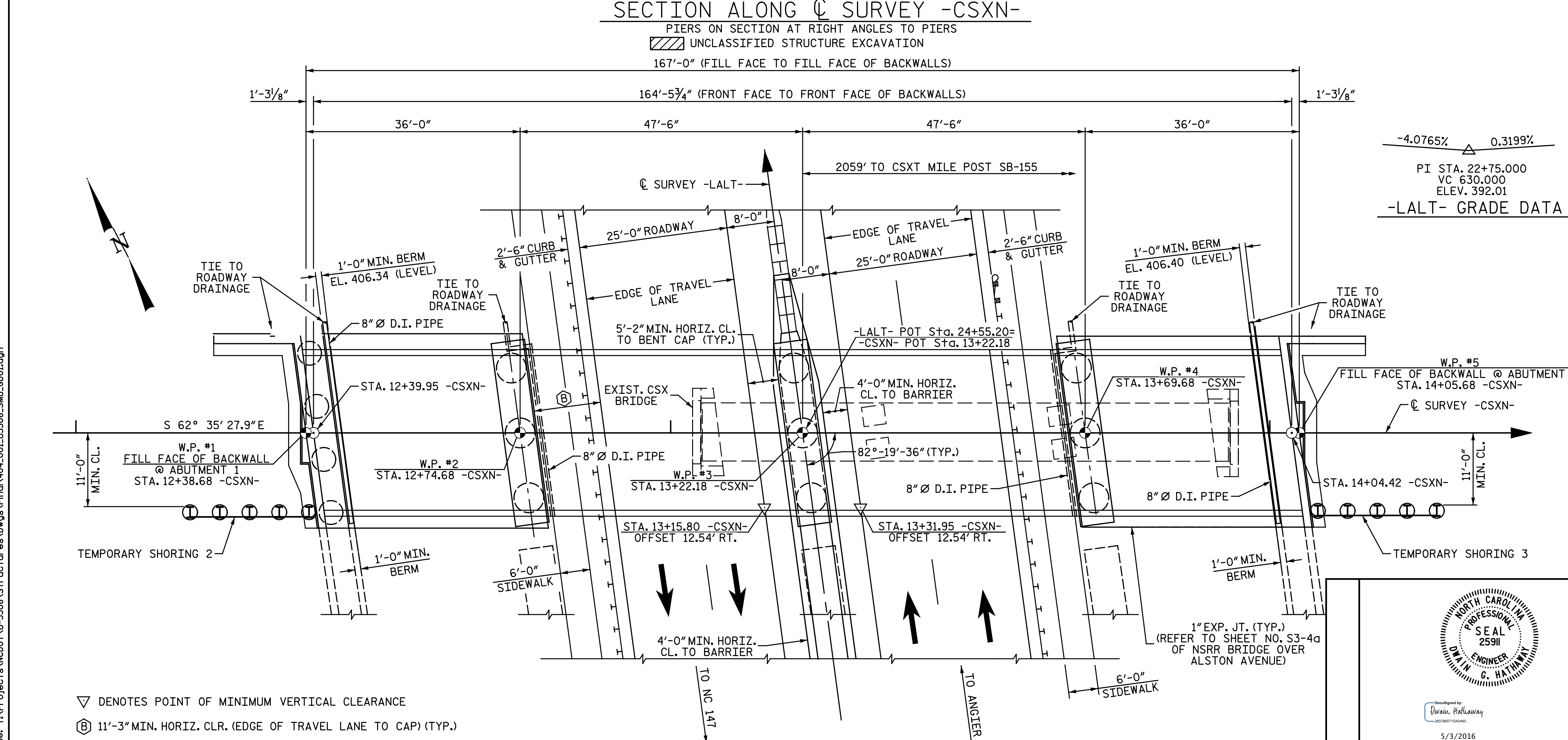
**This electronic collection of documents is provided  
for the convenience of the user  
and is Not a Certified Document –**

**The documents contained herein were originally issued  
and sealed by the individuals whose names and license  
numbers appear on each page, on the dates appearing  
with their signature on that page.**

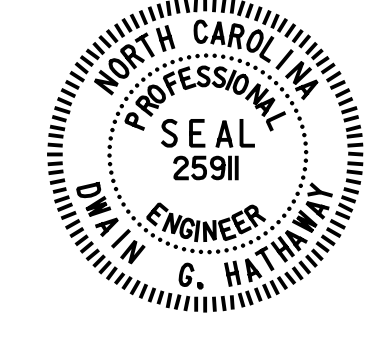
**This file or an individual page  
shall not be considered a certified document.**



TOP OF RAIL ELEV.		
PT.	STA.	T/R ELEV.
①	12+50.00	415.23
②	12+74.68	415.34
③	13+00.00	415.42
④	13+22.18	415.45
⑤	13+50.00	415.43
⑥	13+69.68	415.39
⑦	14+00.00	415.27



PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
 13+22.18 -CSXN-  
 SHEET 1 OF 5 BRIDGE #12 CSXT M.P. SB-154.61



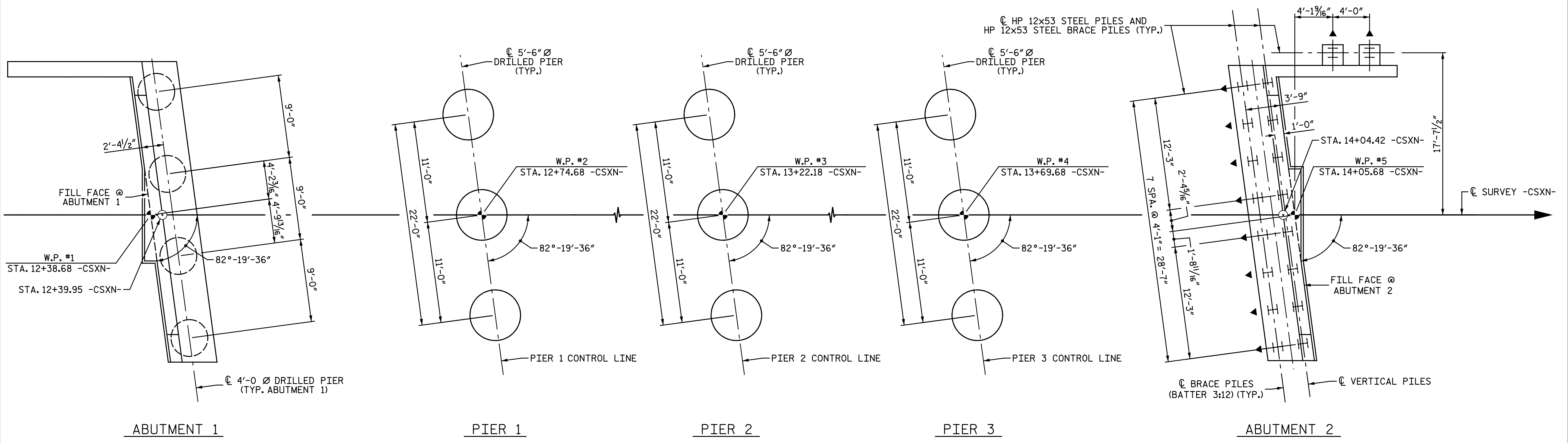
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR BRIDGE ON CSXT RAILWAY  
 OVER ALSTON AVE. BETWEEN  
 NC 147 AND ANGIER AVE.

REVISIONS		SHEET NO.	
NO.	DATE	NO.	DATE
1		3	
2		4	

SHEET NO. S4-1  
 TOTAL SHEETS 68

DRAWN BY: JNA/MDM DATE: 1-7-14  
 CHECKED BY: S. A. DENNEY DATE: 2-24-14

Michael Baker International  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27518  
 NC License No.: F-1084



### FOUNDATION LAYOUT

PIERS AND ABUTMENTS ARE PARALLEL  
 DIMENSIONS SHOWN ARE TO THE CENTERLINE  
 PILE AT THE BOTTOM OF THE CAP  
 ▲ DENOTES DIRECTION OF 3:12 BATTER

#### NOTES:

- FOR PILES, SEE PILES (LFD-ASD) SPECIAL PROVISIONS.
- DRIVE PILES AT ABUTMENT NO. 2 TO A REQUIRED BEARING CAPACITY OF 110 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.
- THE ALLOWABLE BEARING CAPACITY FOR PILES AT ABUTMENT NO. 2 IS 55 TONS PER PILE.
- FOR DRILLED PIERS, SEE LFD DRILLED PIERS SPECIAL PROVISIONS.
- DRILLED PIERS AT ABUTMENT NO. 1 ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 20 TSF.
- DRILLED PIERS AT PIER NO. 1, PIER NO. 2 AND PIER NO. 3 ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 20 TSF.
- DRILLED PIERS AT ABUTMENT NO. 1 ARE DESIGNED FOR AN APPLIED LOAD OF 220 TONS EACH AT THE TOP OF THE COLUMN.
- DRILLED PIERS AT PIER NO. 1, PIER NO. 2 AND PIER NO. 3 ARE DESIGNED FOR AN APPLIED LOAD OF 365 TONS EACH AT THE TOP OF THE COLUMN.
- INSTALL DRILLED PIERS AT ABUTMENT NO. 1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 382 FT AND SATISFY THE REQUIRED END BEARING CAPACITY.
- INSTALL DRILLED PIERS AT PIER NO. 1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 378 FT AND SATISFY THE REQUIRED END BEARING CAPACITY.
- INSTALL DRILLED PIERS AT PIER NO. 2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 372 FT AND SATISFY THE REQUIRED END BEARING CAPACITY.

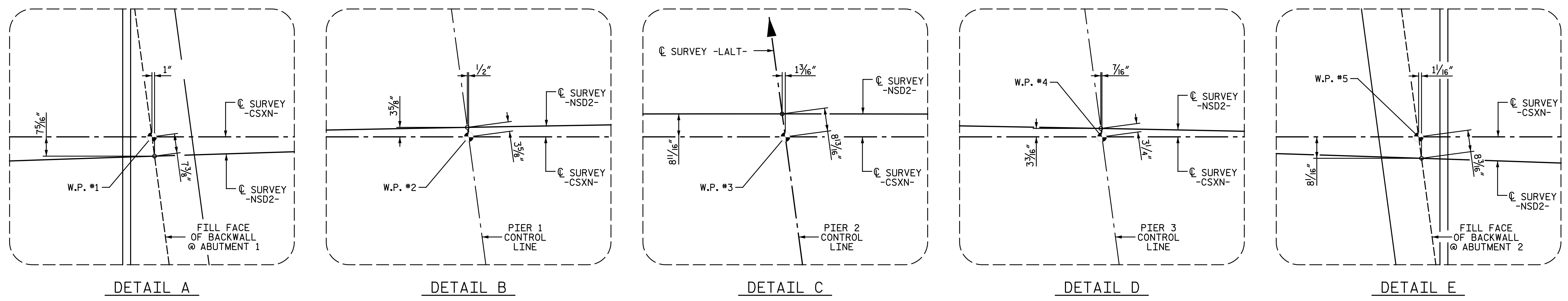
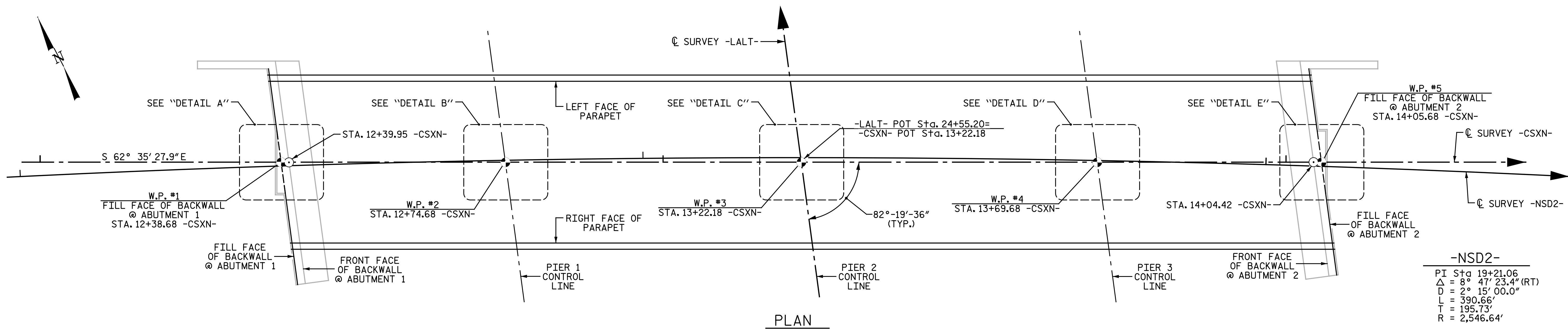
- INSTALL DRILLED PIERS AT PIER NO. 3 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 367 FT (LT, CT) AND 371 FT (RT) AND SATISFY THE REQUIRED END BEARING CAPACITY.
- DRILLED PIER EXCAVATIONS AT ABUTMENT NO. 1 AND PIER NO. 1 THROUGH PIER NO. 3 WILL EXTEND INTO MATERIAL THAT DETERIORATES WHEN EXPOSED TO THE ELEMENTS. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY AND PLACE CONCRETE IMMEDIATELY AFTER THE EXCAVATION IS COMPLETED.
- SPT TESTING IS REQUIRED FOR DRILLED PIERS AT ABUTMENT NO. 1 AND PIER NO. 3.
- SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS.
- CSL TUBES AND TESTING ARE REQUIRED FOR DRILLED PIERS AT ABUTMENT NO. 1 AND PIER NO. 1 THROUGH PIER NO. 3.

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 2 OF 5

cmayhew 5/3/2016 9:36:56 AM  
 File Name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_002\_U3308\_SMU\_6002.dgn

DRAWN BY : M. D. MAYHEW DATE : 12-31-13  
 CHECKED BY : S. A. DENNEY DATE : 2-24-14

		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH <b>GENERAL DRAWING</b>			
		FOR BRIDGE ON CSXT RAILWAY OVER ALSTON AVE. BETWEEN NC 147 AND ANGIER AVE.			
		REVISIONS			
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
			SHEET NO. <b>S4-2</b>		
			TOTAL SHEETS <b>68</b>		

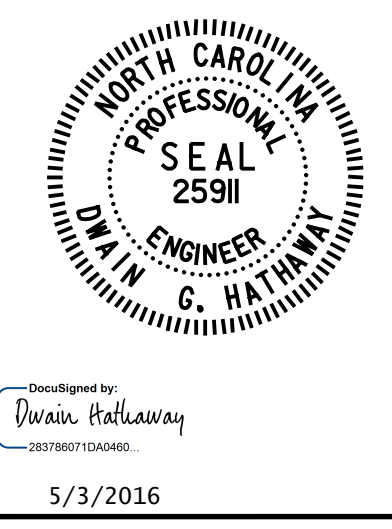


**TEMPORARY DETOUR -NSD2- CURVE OFFSETS**

TEMPORARY DETOUR OFFSETS																	
SPAN A					SPAN B				SPAN C				SPAN D				
TENTH POINTS	-CSXN-STATION	OFFSET -CSXN- TO -NSD2- *	OFFSET FROM C -NSD2- TO LEFT FACE OF PARAPET **	OFFSET FROM C -NSD2- TO RIGHT FACE OF PARAPET **	-CSXN-STATION	OFFSET -CSXN- TO -NSD2- *	OFFSET FROM C -NSD2- TO LEFT FACE OF PARAPET **	OFFSET FROM C -NSD2- TO RIGHT FACE OF PARAPET **	-CSXN-STATION	OFFSET -CSXN- TO -NSD2- *	OFFSET FROM C -NSD2- TO LEFT FACE OF PARAPET **	OFFSET FROM C -NSD2- TO RIGHT FACE OF PARAPET **	-CSXN-STATION	OFFSET -CSXN- TO -NSD2- *	OFFSET FROM C -NSD2- TO LEFT FACE OF PARAPET **	OFFSET FROM C -NSD2- TO RIGHT FACE OF PARAPET **	
	0.0	12+38.68	0.612(RT)	13.612	12.388	12+74.68	0.301(LT)	12.699	13.301	13+22.18	0.726(LT)	12.274	13.726	13+69.68	0.265(LT)	12.735	13.265
0.1	12+42.28	0.498(RT)	13.498	12.502	12+79.43	0.383(LT)	12.617	13.383	13+26.93	0.720(LT)	12.280	13.720	13+73.28	0.194(LT)	12.806	13.194	0.1
0.2	12+45.88	0.389(RT)	13.389	12.611	12+84.18	0.457(LT)	12.543	13.457	13+31.68	0.705(LT)	12.295	13.705	13+76.88	0.118(LT)	12.882	13.118	0.2
0.3	12+49.48	0.285(RT)	13.285	12.715	12+88.93	0.521(LT)	12.479	13.521	13+36.43	0.681(LT)	12.319	13.681	13+80.48	0.037(LT)	12.963	13.037	0.3
0.4	12+53.08	0.186(RT)	13.186	12.814	12+93.68	0.577(LT)	12.423	13.577	13+41.18	0.648(LT)	12.352	13.648	13+84.08	0.049(RT)	13.049	12.951	0.4
0.5	12+56.68	0.092(RT)	13.092	12.908	12+98.43	0.624(LT)	12.376	13.624	13+45.93	0.607(LT)	12.394	13.607	13+87.68	0.141(RT)	13.141	12.859	0.5
0.6	12+60.28	0.003(RT)	13.003	12.997	13+03.18	0.662(LT)	12.338	13.662	13+50.68	0.556(LT)	12.444	13.556	13+91.28	0.237(RT)	13.237	12.763	0.6
0.7	12+63.88	0.080(LT)	12.920	13.080	13+07.93	0.692(LT)	12.309	13.692	13+55.43	0.497(LT)	12.503	13.497	13+94.88	0.339(RT)	13.339	12.661	0.7
0.8	12+67.48	0.159(LT)	12.841	13.159	13+12.68	0.712(LT)	12.288	13.712	13+60.18	0.428(LT)	12.572	13.428	13+98.48	0.446(RT)	13.446	12.554	0.8
0.9	12+71.08	0.232(LT)	12.768	13.232	13+17.43	0.723(LT)	12.277	13.723	13+64.93	0.351(LT)	12.649	13.351	14+02.08	0.557(RT)	13.557	12.443	0.9
1.0	12+74.68	0.301(LT)	12.699	13.301	13+22.18	0.726(LT)	12.274	13.726	13+69.68	0.265(LT)	12.735	13.265	14+05.68	0.674(RT)	13.674	12.326	1.0

\* - NORMAL TO C -CSXN-  
 \*\* - NORMAL TO FACE OF PARAPET  
 (RT) - DENOTES RIGHT OF SURVEY -CSXN-  
 (LT) - DENOTES LEFT OF SURVEY -CSXN-

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 3 OF 5



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**

FOR BRIDGE ON CSXT RAILWAY  
 OVER ALSTON AVE. BETWEEN  
 NC 147 AND ANGIER AVE.

<b>Michael Baker INTERNATIONAL</b>	REVISIONS				SHEET NO. <b>S4-3</b>
	NO.	BY:	DATE:	NO.	
	1			3	TOTAL SHEETS <b>68</b>
	2			4	

DRAWN BY : J. N. AUSTIN DATE : 4-24-13  
 CHECKED BY : D. G. HATHAWAY DATE : 4-25-13

onayhew 5/3/2016 9:36:57 AM  
 File Name: Y:\Projects\NC DOT\U-3308\Structures\Drawings\Final\404\_003\_U3308\_SMU\_003.dgn

GENERAL NOTES :

ASSUMED LIVE LOAD = COOPER E-80 W/ IMPACT OR ALTERNATE LIVE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT A.R.E.M.A. MANUAL, NORFOLK SOUTHERN RAILWAY GUIDELINES FOR DESIGN OF GRADE SEPARATION STRUCTURES, AND CSXT CRITERIA FOR OPEN DECK RAILROAD BRIDGES. IN CASE OF DISCREPANCY THE MORE STRINGENT CRITERIA WILL GOVERN.

ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES", JANUARY, 2012 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (HEREIN CALLED STANDARD SPECIFICATIONS), EXCEPT AS NOTED HEREIN, ELSEWHERE ON PLANS, OR IN THE SPECIAL PROVISIONS". (STRUCTURAL STEEL IN ACCORDANCE WITH CURRENT A.R.E.M.A. SPECIFICATIONS).

CONCRETE SHALL BE 4,500 PSI (SUBSTRUCTURE) OR 5,000 PSI (SUPERSTRUCTURE) CLASS AA CONCRETE WITH NO. 57 COARSE AGGREGATE AND SHALL BE AIR-ENTRAINED. MINIMUM CEMENT CONTENT PER CUBIC YARD OF CONCRETE SHALL BE 6.0 BAGS/CY. NO SUBSTITUTION OF FLY ASH, BLAST FURNACE SLAG OR OTHER MATERIAL WILL BE PERMITTED IN MEETING THIS MINIMUM CEMENT REQUIREMENT. NO RUBBED SURFACE FINISH IS REQUIRED. CHAMFER ALL EXPOSED EDGES AND CORNERS 3/4" INCH EXCEPT AS NOTED. THE USE OF GROUND GRANULATED BLAST FURNACE SLAG IS NOT PERMITTED IN THE STRUCTURE. SEE SPECIAL PROVISIONS FOR CAST-IN-PLACE CONCRETE.

REINFORCING STEEL SHALL BE ASTM DESIGNATION A615, GRADE 60. ALL REINFORCING BARS IN THE CONCRETE DECK AND CURBS SHALL BE EPOXY-COATED IN CONFORMANCE WITH ASTM A775 "STANDARD SPECIFICATION FOR EPOXY-COATED REINFORCING BARS". COMPATIBLE EPOXY-COATED STEEL TIE WIRES SHALL BE USED WITH THE EPOXY-COATED BARS. FABRICATION TO BE IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE" A.C.I. 315-80.

EXPANSION JOINT MATERIAL SHALL BE EITHER RUBBER OR CORK CONFORMING WITH AASHTO SPECIFICATIONS M-153-84 EXCEPT AS SHOWN ON THE PLANS OR IN THE SPECIAL PROVISIONS. CELLULAR AND BULB TYPE WATERSTOPS AND RUBBER JOINT COMPOUNDS SHALL BE AS SHOWN ON THE PLANS AND IN THE SPECIAL PROVISIONS.

STRUCTURE DRAINAGE SYSTEM: METAL DRAINS BEHIND ABUTMENTS AND DUCTILE IRON PIPE COLLECTOR SYSTEM, SHALL BE AS SHOWN ON THE PLANS AND OUTLINED IN THE SPECIAL PROVISIONS. DETAILS OF THE DRAINAGE SYSTEM SHALL BE SUBMITTED TO THE CHIEF ENGINEER-BRIDGES AND STRUCTURES, CSXT, JACKSONVILLE, FL. FOR APPROVAL.

CONTROL OF WORK: ALL WORK INVOLVED IN THE CONSTRUCTION OF THE RAILWAY STRUCTURE SHALL BE PERFORMED SATISFACTORY TO THE ENGINEER AND/OR CSXT. ALL METHODS OF HANDLING WORK AFFECTING THE SAFETY OF RAIL OPERATIONS MUST BE APPROVED BY THE RAILWAY ENGINEER BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. RAIL TRAFFIC SHALL, AT ALL TIMES, BE MAINTAINED AND PROTECTED. THE CONTRACTOR SHALL NOT AT ANY TIME DELAY OR INTERFERE WITH RAIL OPERATIONS.

ALL CONSTRUCTION JOINTS SHOWN ON THESE PLANS SHALL BE REQUIRED UNLESS SHOWN OPTIONAL. CONSTRUCTION JOINTS SHALL NOT BE PERMITTED EXCEPT AS SHOWN ON THE PLANS, OR WHERE WRITTEN APPROVAL HAS BEEN OBTAINED.

DAMPPOOFING: PIER COLUMNS UP TO GROUND LINE, BACK OF BACKWALLS AND ABUTMENT SEATS, AND BACK OF WINGS SHALL BE DAMPPROOFED.

WATERPROOFING: ALL CONSTRUCTION JOINTS AND ANY SHRINKAGE CRACKS WHICH WILL BE COVERED BY FILL SHALL BE WATERPROOFED WITH A TWO PART WATERPROOFING SYSTEM CONSISTING OF A MEMBRANE LAYER AND A PROTECTION COURSE. STRIPS OF WATERPROOFING NO LESS THAN 2 FEET WIDE SHALL BE PLACED SYMMETRICALLY OVER JOINTS OR CRACKS. ADDITIONALLY, THE HORIZONTAL SURFACES OF THE BALLAST TROUGH (EXCLUDING THE END DAM) SHALL BE WATERPROOFED WITH A TWO PART WATERPROOFING SYSTEM CONSISTING OF A MEMBRANE LAYER AND A 1 INCH THICK ASPHALT PLANKING OR OTHER RAILWAY APPROVED PROTECTION MATERIAL. ALL WATERPROOFING MATERIALS SHALL CONFORM TO THE RECOMMENDED PRACTICES IN THE A.R.E.M.A. MANUAL OF RAILWAY ENGINEERING CHAPTER 29.

BACKFILLING AROUND STRUCTURE: SEE SPECIAL PROVISIONS FOR BACKFILL BEHIND ABUTMENTS AND OTHER BACKFILL AROUND THE STRUCTURE.

FOR FOUNDATION RECOMMENDATION NOTES, SEE SHEET 2 OF 5.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE USED. THE BARS FROM THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

A 3/32" THICK BUTYL RUBBER MEMBRANE CONFORMING TO A.R.E.M.A. CHAPTER 8 SECTION 29.9.5 WILL BE INSTALLED ON THE BRIDGE DECK BALLAST RETAINERS. COST OF BUTYL RUBBER MEMBRANE MATERIAL AND INSTALLATION TO BE INCLUDED WITH THE COST OF "WATERPROOFING (RAILROAD STRUCTURES)", FOR "WATERPROOFING (RAILROAD STRUCTURES)", SEE SPECIAL PROVISIONS.

FOR STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

FOR PAINTING STEEL STRUCTURES, SEE SPECIAL PROVISIONS.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR METAL HANDRAIL, SEE SPECIAL PROVISIONS.

FOR GROUT, SEE A.R.E.M.A. CHAPTER 8 ARTICLE 14.4.8 AND ARTICLE 14.5.5. AND SPECIAL PROVISIONS.

FOR SUPERSTRUCTURE CONCRETE, SUBSTRUCTURE CONCRETE, REINFORCING STEEL, EPOXY COATED REINFORCING STEEL, SPIRAL COLUMN REINFORCING STEEL, AND DAMPPROOFING (RAILROAD STRUCTURES), SEE SPECIAL PROVISIONS FOR CAST-IN-PLACE CONCRETE.

THE EXISTING STRUCTURE CONSISTING OF 3 SPAN STRUCTURAL STEEL GIRDERS WITH TIMBER FLOOR ON STEEL TRESTLE BENTS AND LOCATED AT PROPOSED STRUCTURE SITE SHALL BE REMOVED.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 13+22.18 -CSXN-."

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 14 FT (LEFT) AND 16 FT (RIGHT) OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY SPAN FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY SPAN, SEE TEMPORARY SPAN SPECIAL PROVISIONS.

FOR TEMPORARY RAILROAD SHORING SPECIAL PROVISION AND PAY ITEM, SEE STR. #3.

FOR ELASTOMERIC FLASHING, SEE SPECIAL PROVISIONS.

FOR SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE EXISTING ABANDONED BRIDGE SOUTH OF THE PROPOSED -CSXN- BRIDGE. ANY REQUIREMENTS PERTAINING TO THE EXISTING STRUCTURE REMOVAL ARE ALSO APPLICABLE TO THE EXISTING ABANDONED BRIDGE.

DESIGN DATA:

SPECIFICATIONS: CURRENT A.R.E.M.A., CSX TRANSPORTATION, AND NORFOLK SOUTHERN DESIGN CRITERIA FOR GRADE SEPARATION PROJECTS.

LIVE LOAD: COOPERS E-80 + ALTERNATE WITH IMPACT AS PER A.R.E.M.A. SPECIFICATIONS.

STRUCTURAL STEEL: ASTM A709 GRADE 50 (Fy = 50 KSI)

REINFORCED CONCRETE: SUPERSTRUCTURE: f'c = 5000 PSI  
SUBSTRUCTURE: f'c = 4500 PSI

REINFORCING STEEL: ASTM A615 GRADE 60

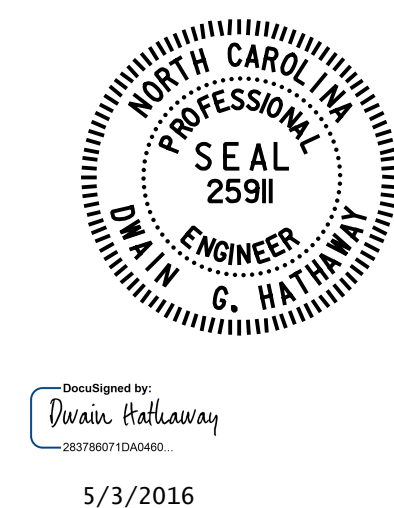
+

+

cmayhew 5/3/2016 9:36:57 AM  
 File Name: Y:\Projects\NCDDOT\U-3308\Structures\Drawings\Final\404\_004\_U3308\_SML\_6D04.dgn

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 4 OF 5

DRAWN BY : J. N. AUSTIN DATE : 1-7-14  
 CHECKED BY : S. A. DENNEY DATE : 2-24-14



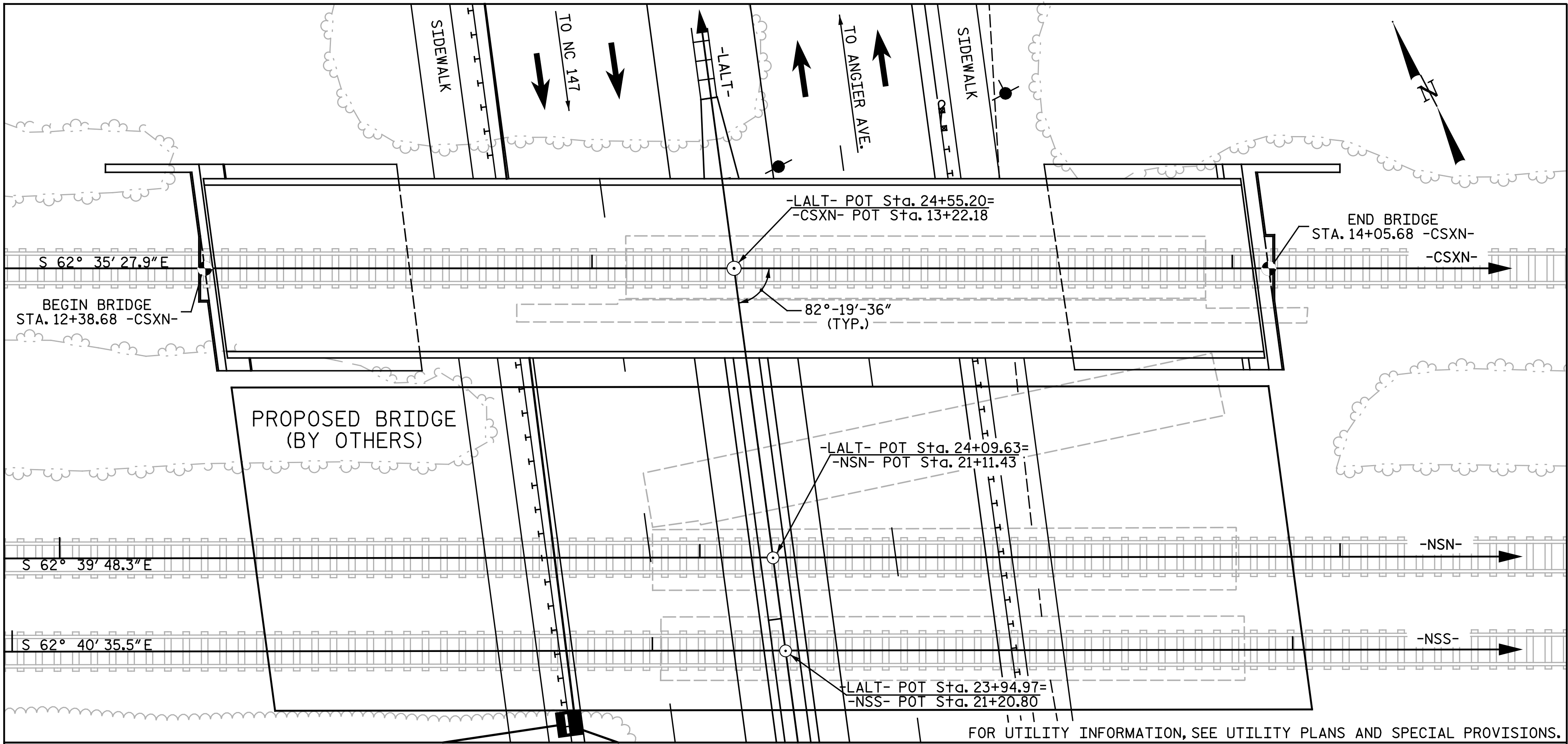
Michael Baker  
INTERNATIONAL

Michael Baker Engineering  
8000 Regency Parkway, Suite 600  
Cary, North Carolina 27618  
NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON CSXT RAILWAY  
 OVER ALSTON AVE. BETWEEN  
 NC 147 AND ANGIER AVE.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-4
1			3			TOTAL SHEETS
2			4			68

B.M. 503 : R.R SPIKE IN 15" PIN OAK STA. 18+79.99 -NSN- OFFSET 45.9 FT. RIGHT EL. 414.78



LOCATION SKETCH

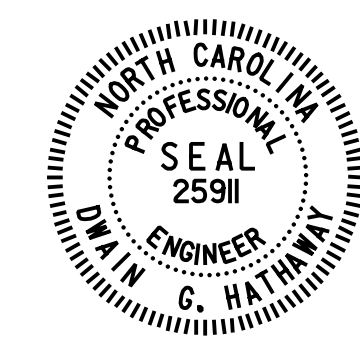
TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE AT STA. 13+22.18 -CSXN-	4'-0" DIA. DRILLED PIERS IN SOIL (LFD)	4'-0" DIA. DRILLED PIERS NOT IN SOIL (LFD)	5'-6" DIA. DRILLED PIERS IN SOIL (LFD)	5'-6" DIA. DRILLED PIERS NOT IN SOIL (LFD)	STD INSPECTIONS (LFD)	SPT TESTING (LFD)	CSL TESTING (LFD)	UNCLASSIFIED STRUCTURE EXCAVATION AT STA. 13+22.18 -CSXN-	REINFORCED CONCRETE DECK SLAB	CLASS AA CONCRETE AS MODIFIED BY RAILROAD	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	EPOXY COATED SPIRAL COLUMN REINFORCING STEEL	APPROX. 564,994 LBS. STRUCTURAL STEEL
	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EA.	EA.	EA.	LUMP SUM	SQ. FT.	CU. YDS.	LBS.	LBS.	LBS.	LBS.	LUMP SUM
SUPERSTRUCTURE										4,601						
ABUTMENT 1		59.5	30.0				4	4			45.7	30,400		4,032		
PIER 1				7	35			3			57.1	5,088	16,449		3,909	
PIER 2				24	36			3			57.4	5,088	18,776		5,010	
PIER 3				45	26		3	3			57.2	5,088	20,147		5,665	
ABUTMENT 2											48.7	9,924				
TOTAL	LUMP SUM	59.5	30.0	76	97	13	7	13	LUMP SUM	4,601	266.1	55,588	55,372	4,032	14,584	LUMP SUM

TOTAL BILL OF MATERIAL

	PAINTING FOR STRUCTURAL STEEL	WATER-PROOFING (RAILROAD STRUCTURES)	DAMP-PROOFING (RAILROAD STRUCTURES)	HP 12x53 STEEL PILES (LFD)	METHOD A WATERPROOFING	METAL HANDRAIL	1'-0" CONCRETE PARAPET	4" SLOPE PROTECTION	SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES	STRUCTURE DRAINAGE SYSTEM AT STA. 13+22.18 -CSXN-	CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY SPAN	ASBESTOS ASSESSMENT
	LUMP SUM	SQ. YDS.	SQ. YDS.	NO. LIN. FT.	SQ. YDS.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE		478				330.0	328.3					
ABUTMENT 1			52.7		10.3	20.1		145				
PIER 1			5.2		11.0							
PIER 2			5.2		11.0							
PIER 3			5.2		11.0							
ABUTMENT 2			52.1	18	540	19.7		143				
TOTAL	LUMP SUM	478	120.4	18	540	369.8	328.3	288	LUMP SUM	LUMP SUM	LUMP SUM	LUMP SUM

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 5 OF 5



Designed by  
 Dwan Hathaway  
 5/3/2016

**Michael Baker INTERNATIONAL**

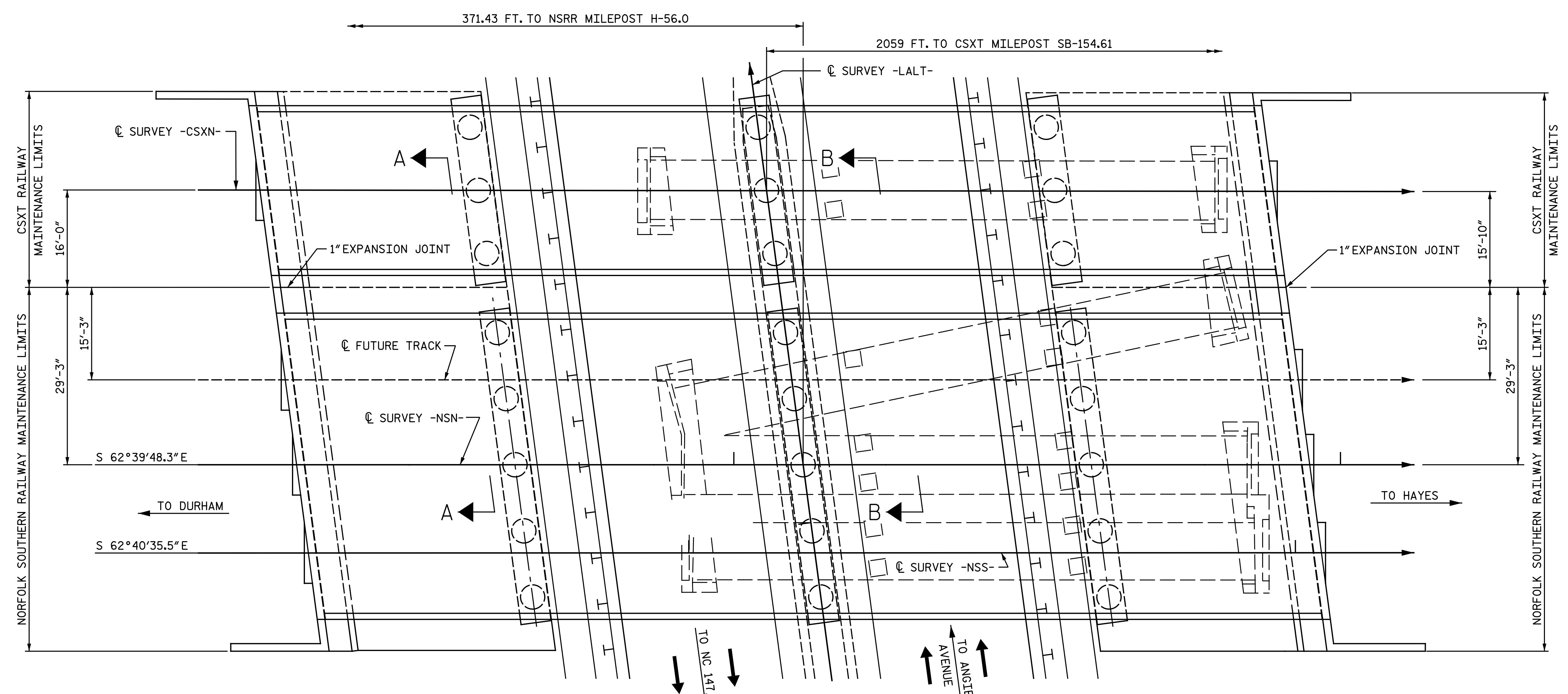
Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE ON CSXT RAILWAY  
 OVER ALSTON AVE. BETWEEN  
 NC 147 AND ANGIER AVE.

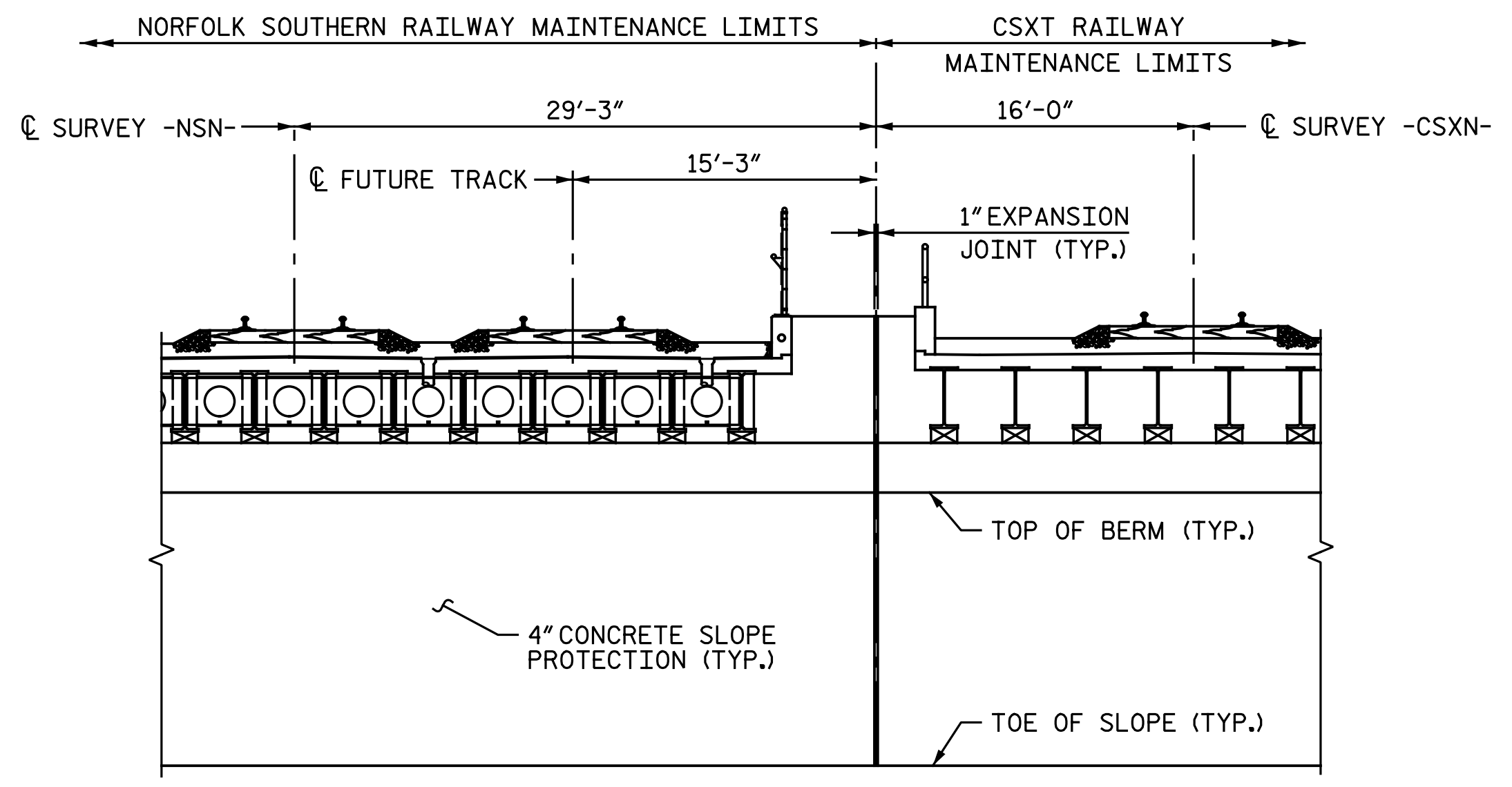
REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-5	
1			3			TOTAL SHEETS 68	
2			4			SITE 4	

DRAWN BY : J. N. A. / M. D. M. DATE : 12-31-13  
 CHECKED BY : S. A. DENNEY DATE : 2-24-14

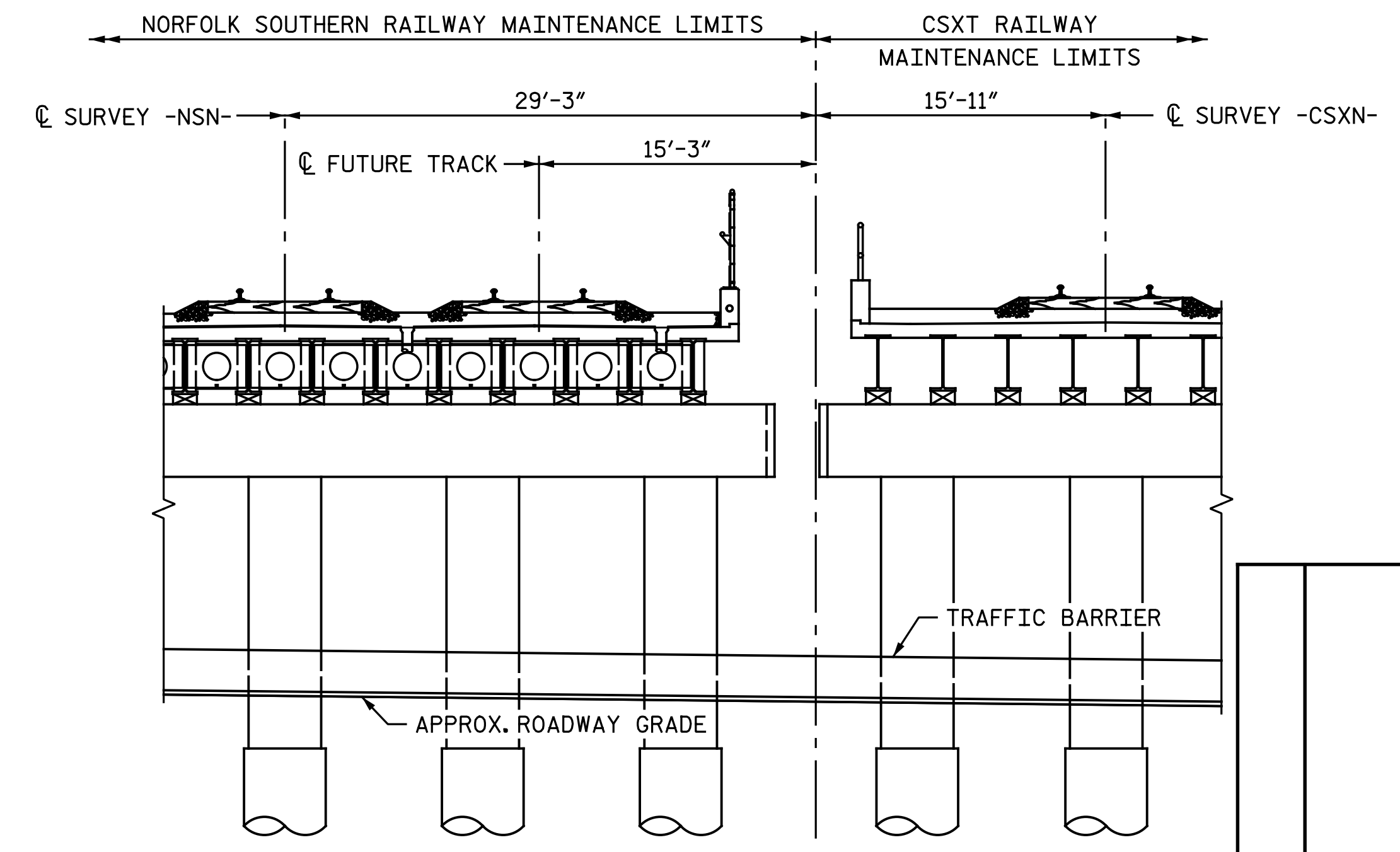
cmayhew 5/3/2016 9:36:58 AM  
 File Name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_005\_U3308\_SML\_6D05.dgn



**PLAN**  
(ABUTMENTS AND PIERS ARE PARALLEL)

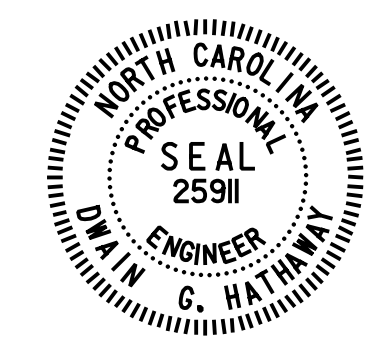


**SECTION A-A**  
SCALE: N.T.S.



**SECTION B-B**  
SCALE: N.T.S.

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-



5/3/2016

**Michael Baker**  
INTERNATIONAL

Michael Baker Engineering  
8000 Regency Parkway, Suite 600  
Cary, North Carolina 276518  
NC License No.: F-1084

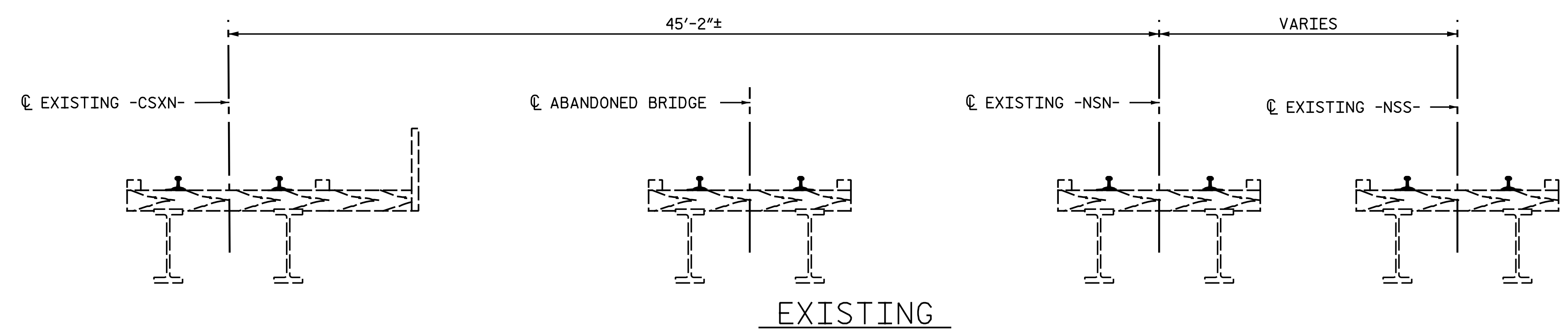
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**MAINTENANCE LIMITS**  
 BRIDGES ON NSRR AND CSXT  
 OVER NC 55 (ALSTON AVE.)  
 BETWEEN NC 147 & ANGIER AVE.

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

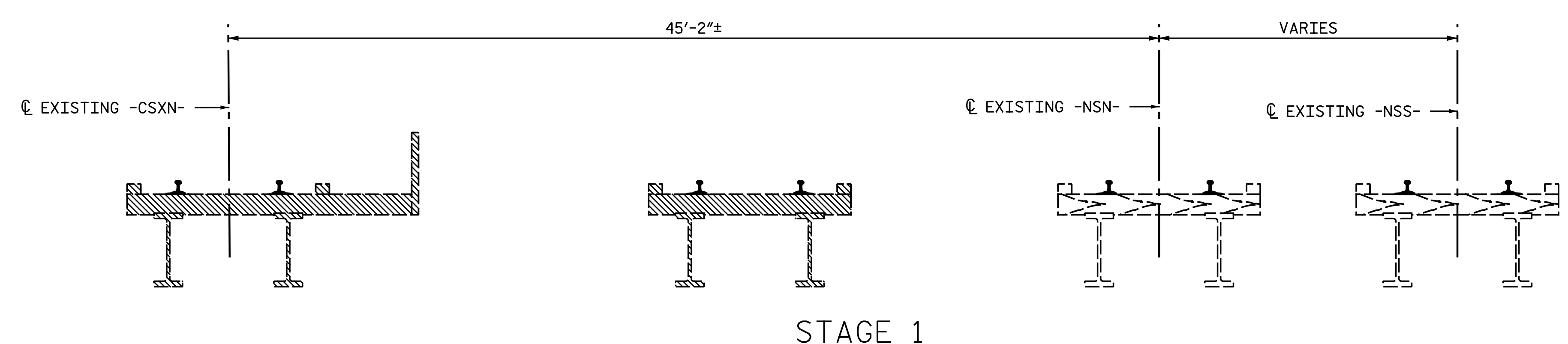
TOTAL SHEETS: 68

cmayhew 5/3/2016 9:36:59 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_006\_U3308\_SMU\_ML.dgn

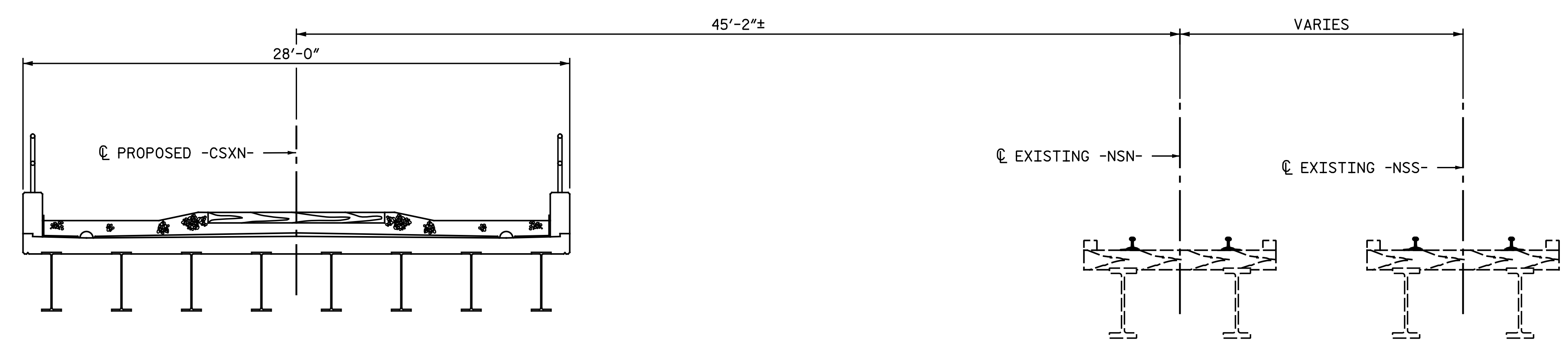
DRAWN BY : NMC DATE : 12-13  
 CHECKED BY : DJM DATE : 12-13



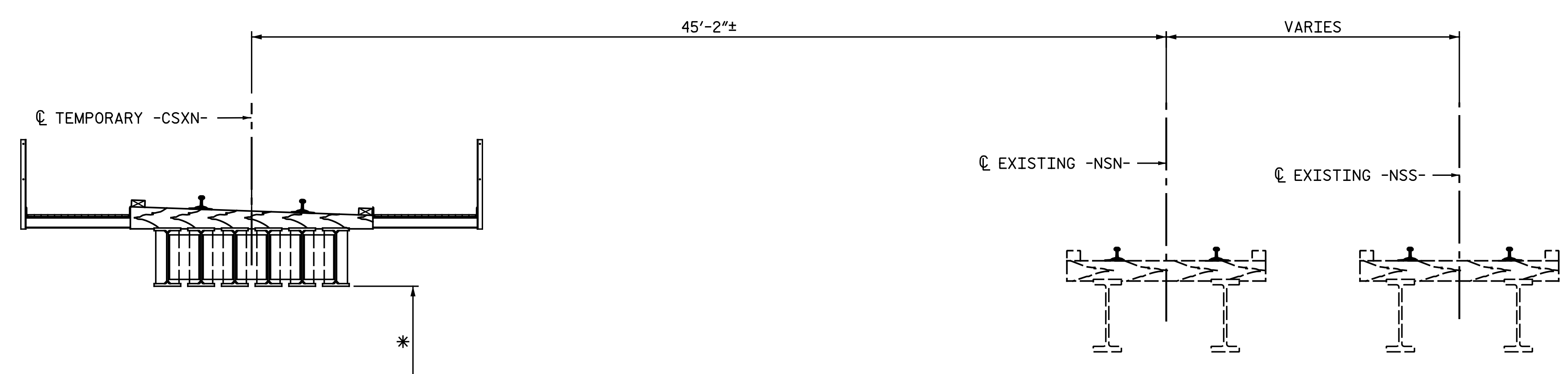
EXISTING



STAGE 1



STAGE 2 (SPANS A, B, & D)



STAGE 2 (SPAN C)

RAIL TRAFFIC STAGING:

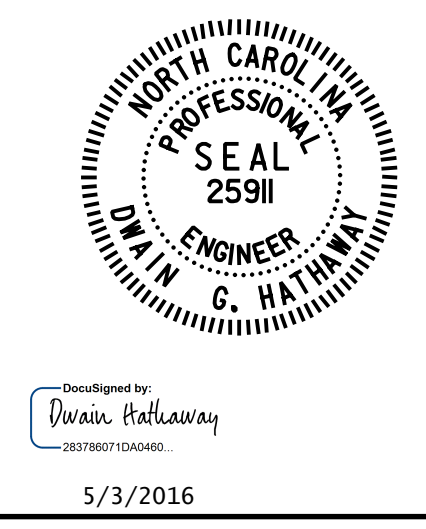
**STAGE 1**  
REMOVE EXISTING -CSXN- BRIDGE AND EXISTING ABANDONED BRIDGE.

**STAGE 2 (SPANS A, B, & D)**  
INSTALL SHORING 1 NEAR EXISTING -NSN- BRIDGE TO FACILITATE CONSTRUCTION OF PROPOSED -CSXN- BRIDGE. SEE TEMPORARY SHORING OF THE -NSN-/-NSS- BRIDGE PLANS FOR LOCATION OF SHORING 1.  
(ADDITIONAL SHORING MAY BE REQUIRED AT PROPOSED PIER 2 TO PROTECT EXISTING ALSTON AVE. AND FOR PROPOSED -NSN-/-NSS- AND -CSXN- BRIDGE CONSTRUCTION.)  
CONSTRUCT PROPOSED -CSXN- BRIDGE SPANS A, B, AND D.

**STAGE 2 (SPAN C)**  
CONSTRUCT PROPOSED TEMPORARY SPAN C OF PROPOSED -CSXN- BRIDGE.

\* TEMPORARY MINIMUM VERTICAL CLEARANCE TO EXISTING ALSTON AVE. = 14'-5"

PROJECT NO. U-3308  
DURHAM COUNTY  
STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
SHEET 1 OF 2



5/3/2016

**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
8000 Regency Parkway, Suite 600  
Cary, North Carolina 27618  
NC License No.: F-1084

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**CONSTRUCTION STAGING**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-7
1			3			TOTAL SHEETS
2			4			68

cmayhew 5/3/2016 9:37:00 AM  
 File Name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_007\_U3308\_SMU\_PC01.dgn

DRAWN BY : J. N. AUSTIN DATE : 8-23-12  
 CHECKED BY : S. A. DENNEY DATE : 8-24-12  
 STV / Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208  
 NC License No. F-0991



### RAIL TRAFFIC STAGING CONT'D:

#### STAGE 3

INSTALL SHORING 2 AND 3 TO MAINTAIN RAIL TRAFFIC ON -NSD2- TRACK.  
SEE TEMPORARY SHORING OF THE -NSN-/-NSS- BRIDGE PLANS FOR LOCATION OF SHORING 2 AND 3.

CONSTRUCT PROPOSED -NSD2- TRACK.

SHIFT ALL RAIL TRAFFIC TO PROPOSED -NSD2- TRACK.

REMOVE EXISTING -NSN- AND -NSS- BRIDGES.

#### STAGE 4

CONSTRUCT PROPOSED -NSN- AND -NSS- BRIDGE.

#### STAGE 5

SHIFT ALL RAIL TRAFFIC TO -NSN- AND -NSS- BRIDGE.  
REMOVE PROPOSED -NSD2- TRACK, AND TEMPORARY SPAN C OF PROPOSED -CSXN- BRIDGE.

COMPLETE CONSTRUCTION OF -CSXN- BRIDGE/TRACK.

#### FINAL

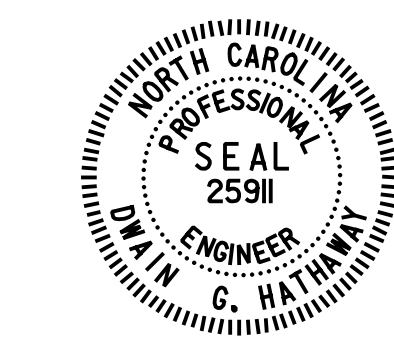
SHIFT -CSXN- RAIL TRAFFIC TO PROPOSED -CSXN- BRIDGE.

PROJECT NO. U-3308

DURHAM COUNTY

STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-

SHEET 2 OF 2



Designed by  
*Dwan Hathaway*  
201708071040400

5/3/2016

**Michael Baker**  
INTERNATIONAL

Michael Baker Engineering  
8000 Regency Parkway, Suite 600  
Cary, North Carolina 27618  
NC License No.: F-1084

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

### CONSTRUCTION STAGING

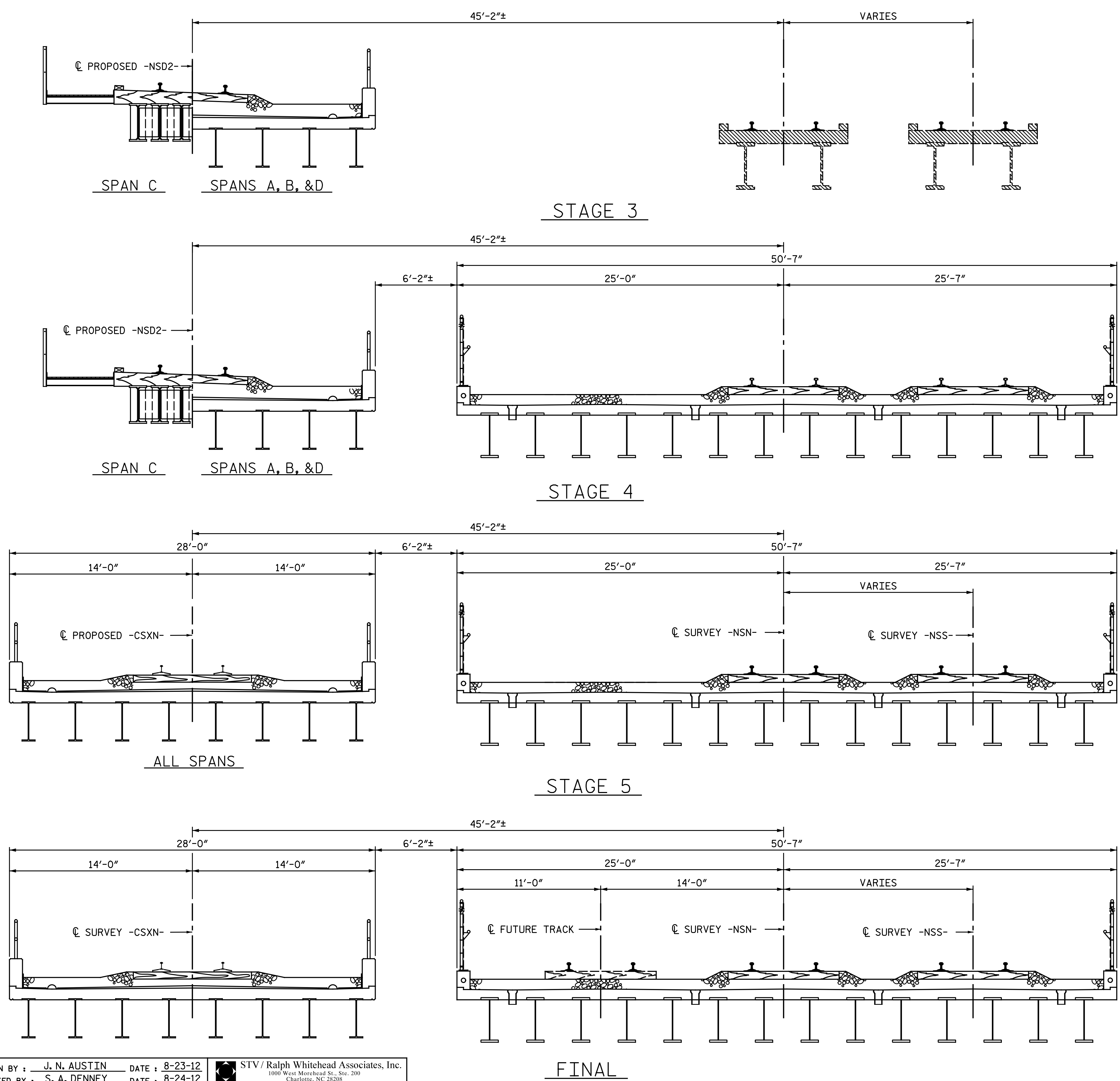
#### REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.  
**S4-8**

TOTAL SHEETS  
**68**

SITE 4



+

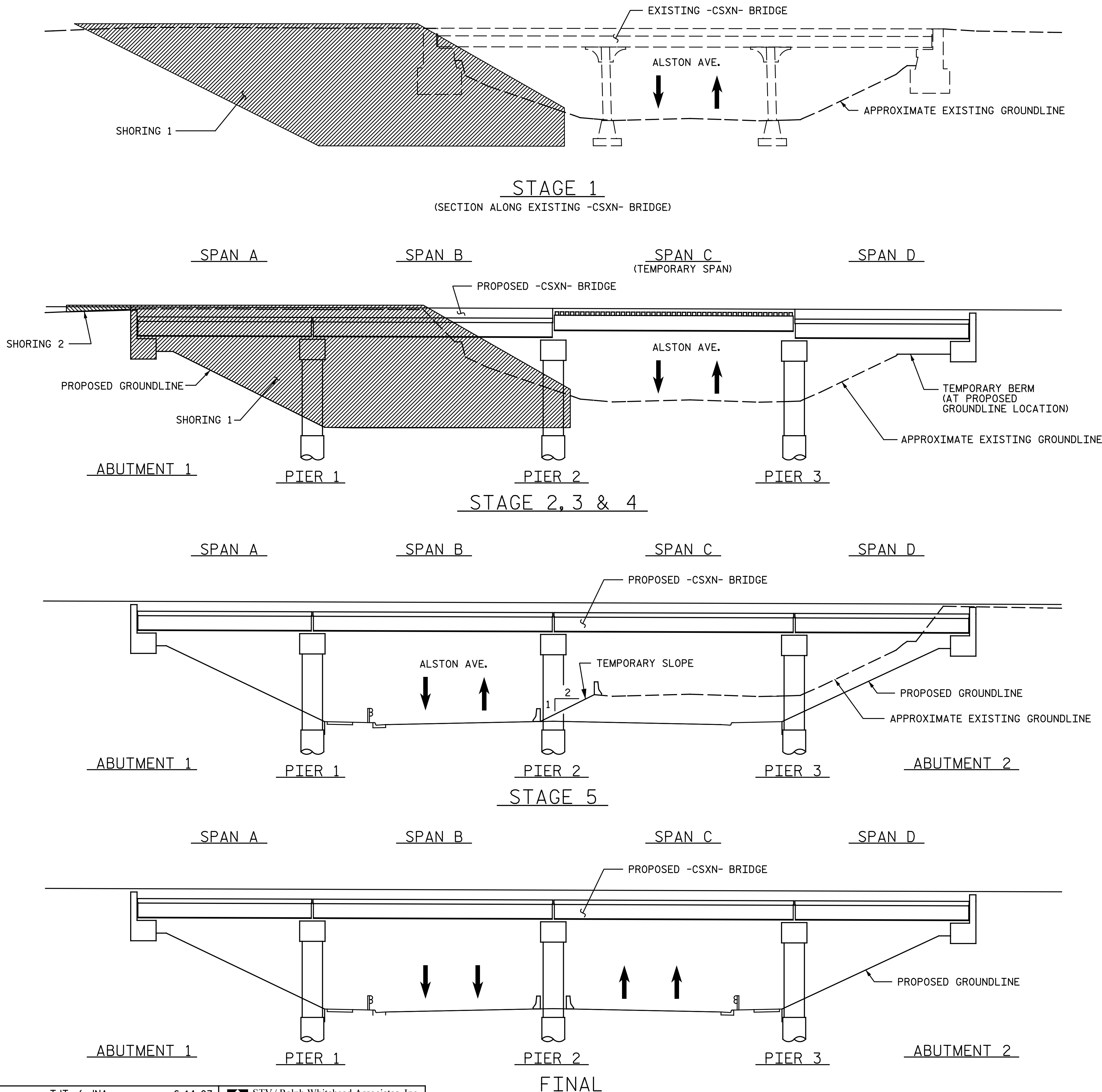
+

cmayhew 5/3/2016 9:37:00 AM  
 File Name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_008\_U3308\_SMU\_PC02.dgn

DRAWN BY : J. N. AUSTIN DATE : 8-23-12  
 CHECKED BY : S. A. DENNEY DATE : 8-24-12

STV / Ralph Whitehead Associates, Inc.  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208  
 NC License No. F-0991

#### FINAL



**TRAFFIC STAGING:**

NOTES: SEE RAIL TRAFFIC STAGING ON "CONSTRUCTION STAGING" SHEETS FOR ADDITIONAL INFORMATION.  
 TRAFFIC STAGING BELOW SHALL BE IN CONJUNCTION WITH TRAFFIC STAGING SHOWN ON PLANS FOR BRIDGE ON NSRR.  
 REFER TO TRACKWORK PLANS FOR TEMPORARY DETOUR PROFILE.

**STAGE 1**

ALSTON AVE. TRAFFIC TO REMAIN IN ORIGINAL POSITION.

REMOVE EXISTING -CSXN- BRIDGE AND EXISTING ABANDONED BRIDGE.

INSTALL SHORING 1 BETWEEN EXISTING -CSXN- BRIDGE AND EXISTING -NSN- BRIDGE. TO FACILITATE CONSTRUCTION OF PROPOSED -CSXN- BRIDGE. SEE TEMPORARY SHORING OF THE -NSN-/-NSS- BRIDGE PLANS FOR SHORING 1 LOCATION.

**STAGE 2, 3 & 4**

EXCAVATE IN SHORING 1 AREA AND CONSTRUCT PROPOSED -CSXN- BRIDGE SPANS A, B AND D. CONSTRUCT TEMPORARY SPAN C.

A TEMPORARY BERM WILL BE REQUIRED AT ABUTMENT 2 TO CONNECT PROPOSED GROUNDLINE TO EXISTING GROUNDLINE.

INSTALL SHORING 2 AND 3 BETWEEN SHORING 1 AND ABUTMENT 1 OF PROPOSED -CSXN- BRIDGE, PRIOR TO SHIFTING RAIL TRAFFIC TO -NSD2- TRACK, TO MAINTAIN RAIL TRAFFIC. SEE TEMPORARY SHORING OF THE -NSN-/-NSS- BRIDGE PLANS FOR SHORING 2 AND 3 LOCATION.

**STAGE 5**

SHIFT ALSTON AVE. TRAFFIC TO CONSTRUCTED ROADWAY UNDER SPAN B OF CONSTRUCTED -CSXN- BRIDGE.

AFTER COMPLETION OF -NSN-/-NSS- BRIDGE AND RAIL TRAFFIC HAS BEEN SHIFTED ONTO COMPLETED -NSN-/-NSS- BRIDGE, REMOVE SHORING 2 AND 3 AND TEMPORARY SPAN C.

EXCAVATE REMAINDER OF EXISTING GROUND AND CONSTRUCT PROPOSED SPANS C OF -CSXN- BRIDGE. CONSTRUCT REMAINDER OF ROADWAY FOR ALSTON AVE.

**FINAL**

SHIFT ALSTON AVE. TRAFFIC TO FINAL POSITIONS.

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-

cmayhew 5/3/2016 9:37:01 AM  
 File Name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_009\_U3308\_SML\_PC03.dgn

DRAWN BY : TJT / JNA DATE : 6-14-07  
 CHECKED BY : KGB / DGH DATE : 6-14-07

**STV / Ralph Whitehead Associates, Inc.**  
 1000 West Morehead St., Ste. 200  
 Charlotte, NC 28208  
 NC License No. F-0991



Disseminated by  
 Duane Hathaway  
 5/3/2016

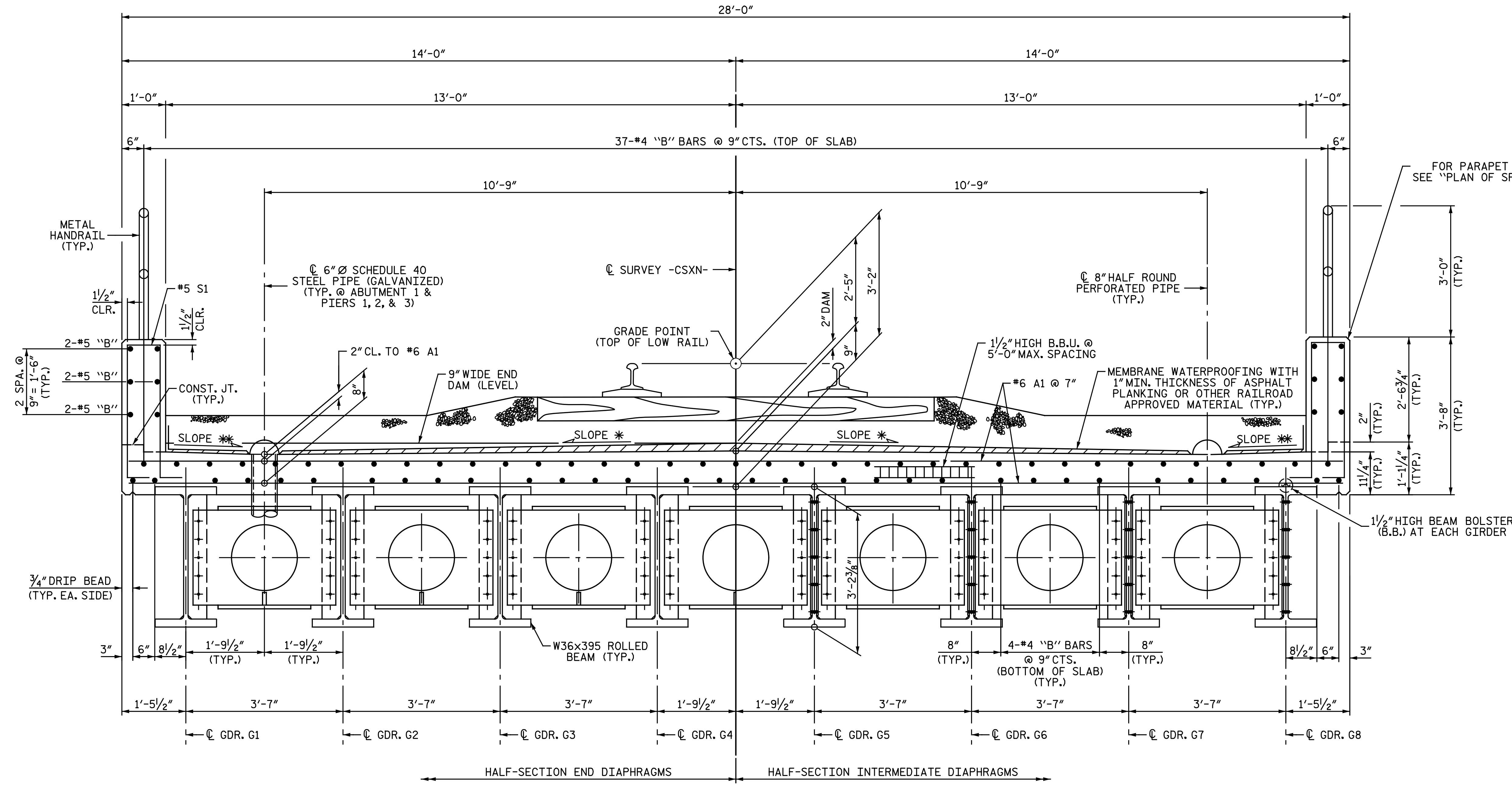
**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

STAGING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			68
2			4			



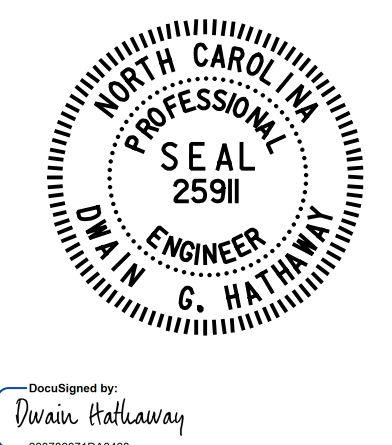
**NOTES:**  
 LONGITUDINAL BARS MAY BE SHIFTED TO AVOID DRAINS IN BRIDGE DECK.  
 ALL REINFORCING STEEL TO BE EPOXY COATED.  
 FOR DIAPHRAGM DETAILS, SEE "STRUCTURAL STEEL DIAPHRAGM DETAILS" SHEET.

FOR PARAPET DETAILS, SEE "PLAN OF SPANS" SHEETS

**PROPOSED TYPICAL SECTION**

\* SLOPE = 0.0078  
 \*\* SLOPE = 0.0370

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 TYPICAL SECTION

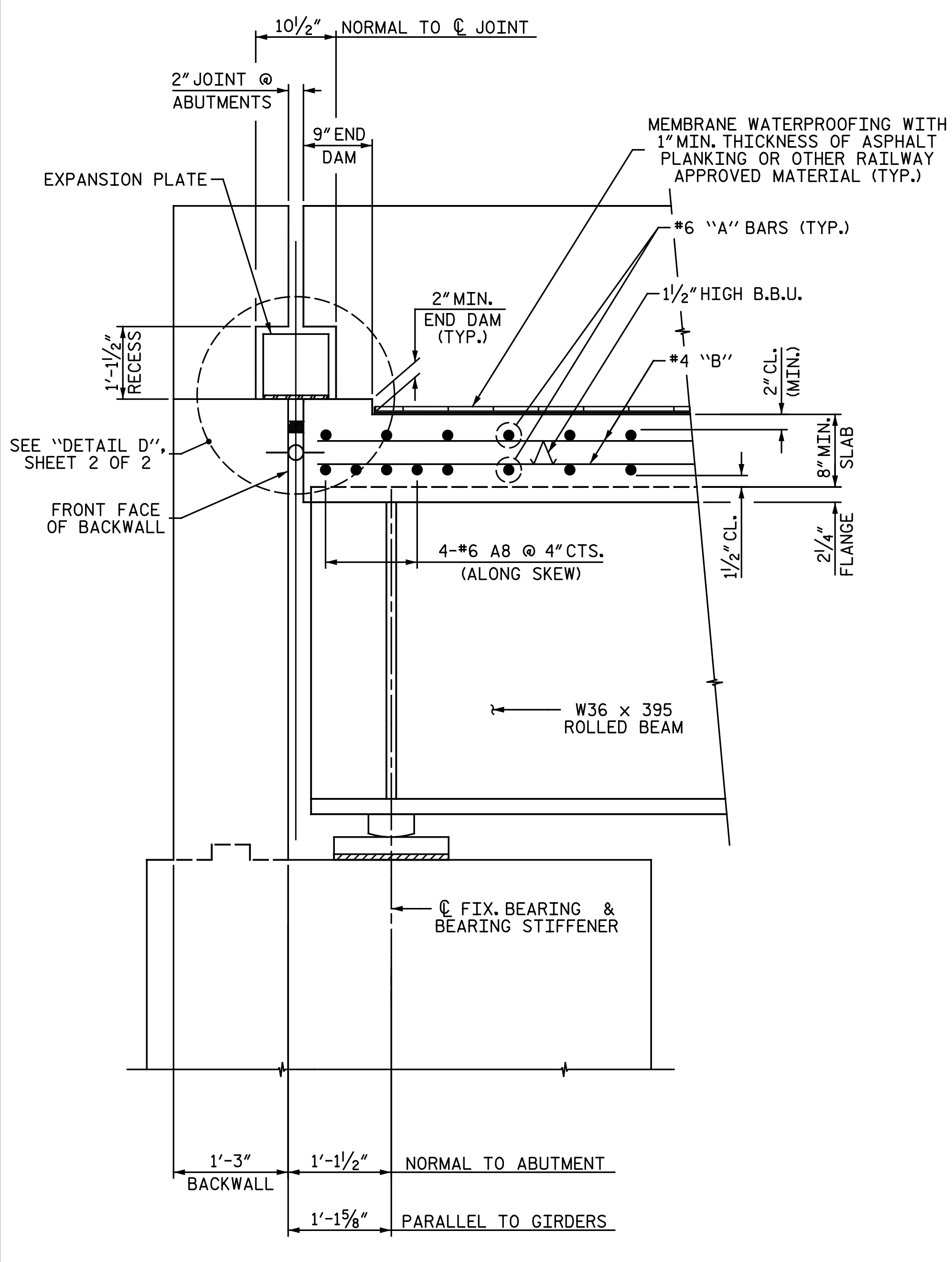
**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

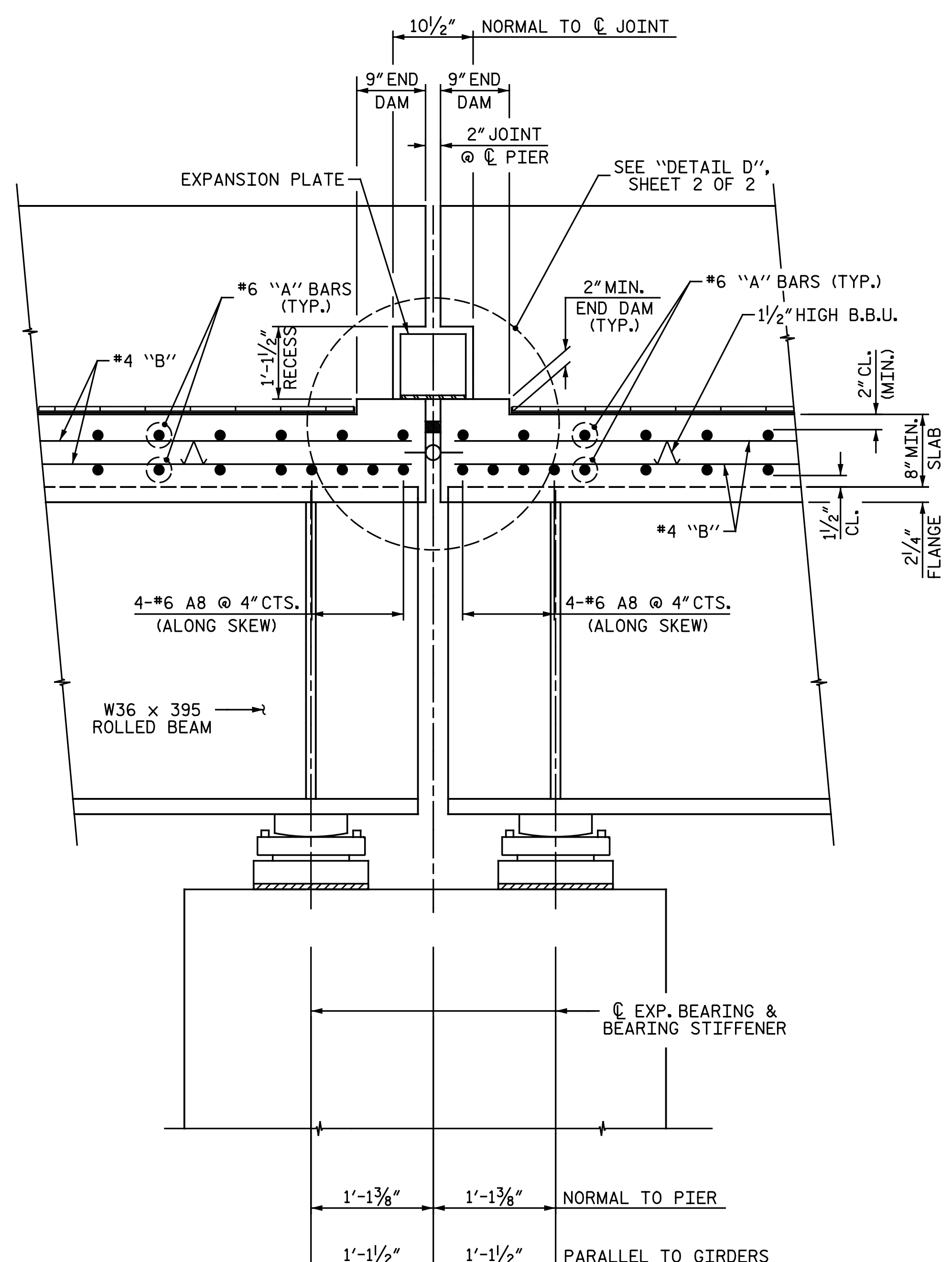
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-10
1			3			TOTAL SHEETS
2			4			68

5/3/2016 9:37:02 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_010\_U3308\_SML.TS.dgn  
 cmayhew

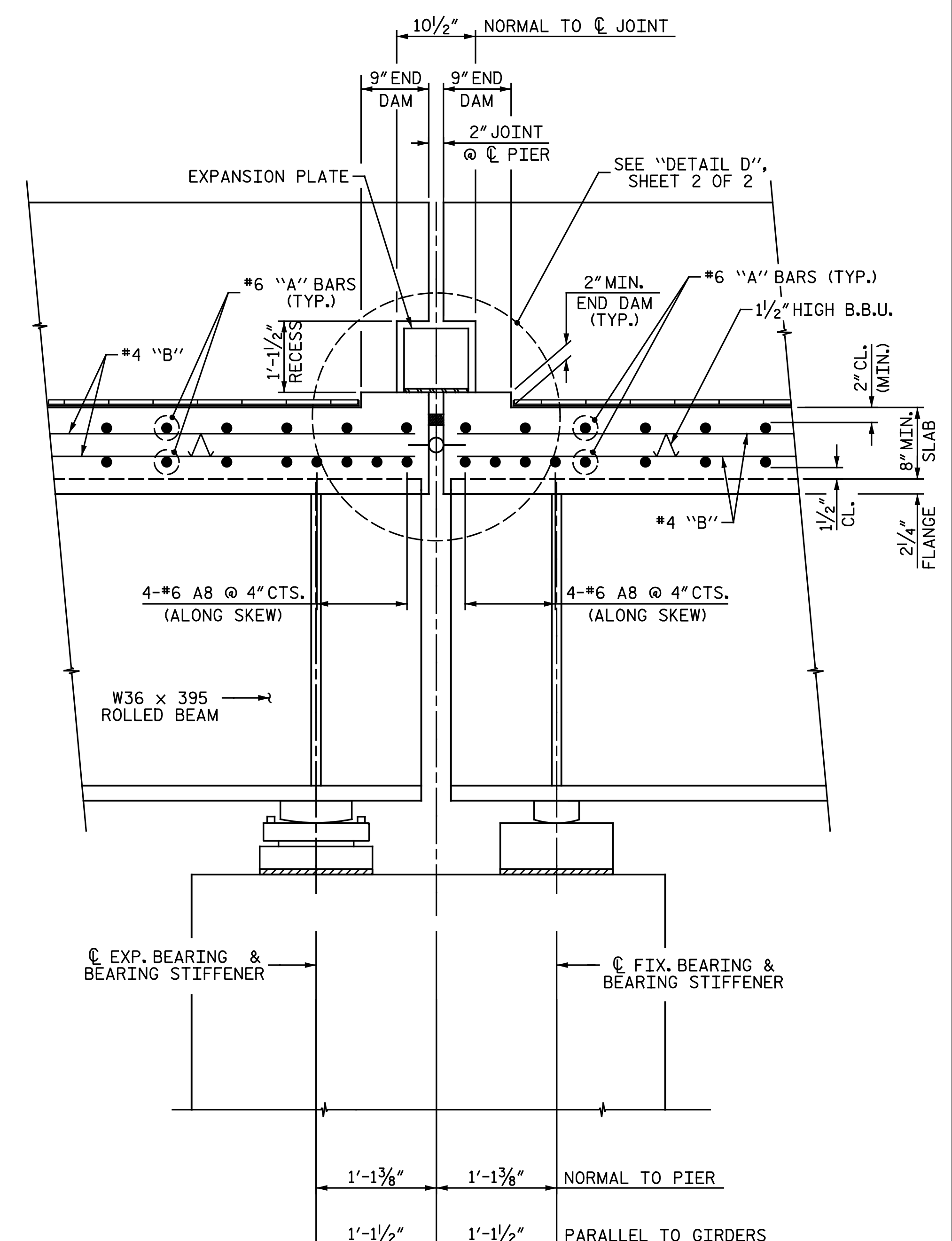
DRAWN BY : M. D. MAYHEW DATE : 12-18-13  
 CHECKED BY : S. A. DENNEY DATE : 12-31-13



SECTION A-A



SECTION B-B

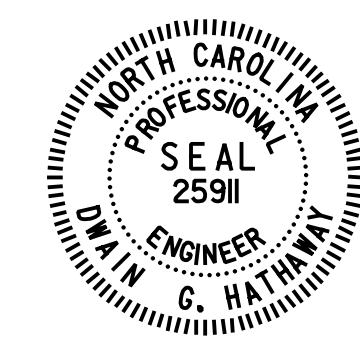


SECTION C-C

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 1 OF 2

cmayhew 5/3/2016 9:37:02 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_011\_U3308\_SML\_CD01.dgn

DRAWN BY : C. E. MAYHEW DATE : 3-13-13  
 CHECKED BY : S. A. DENNEY DATE : 12-31-13



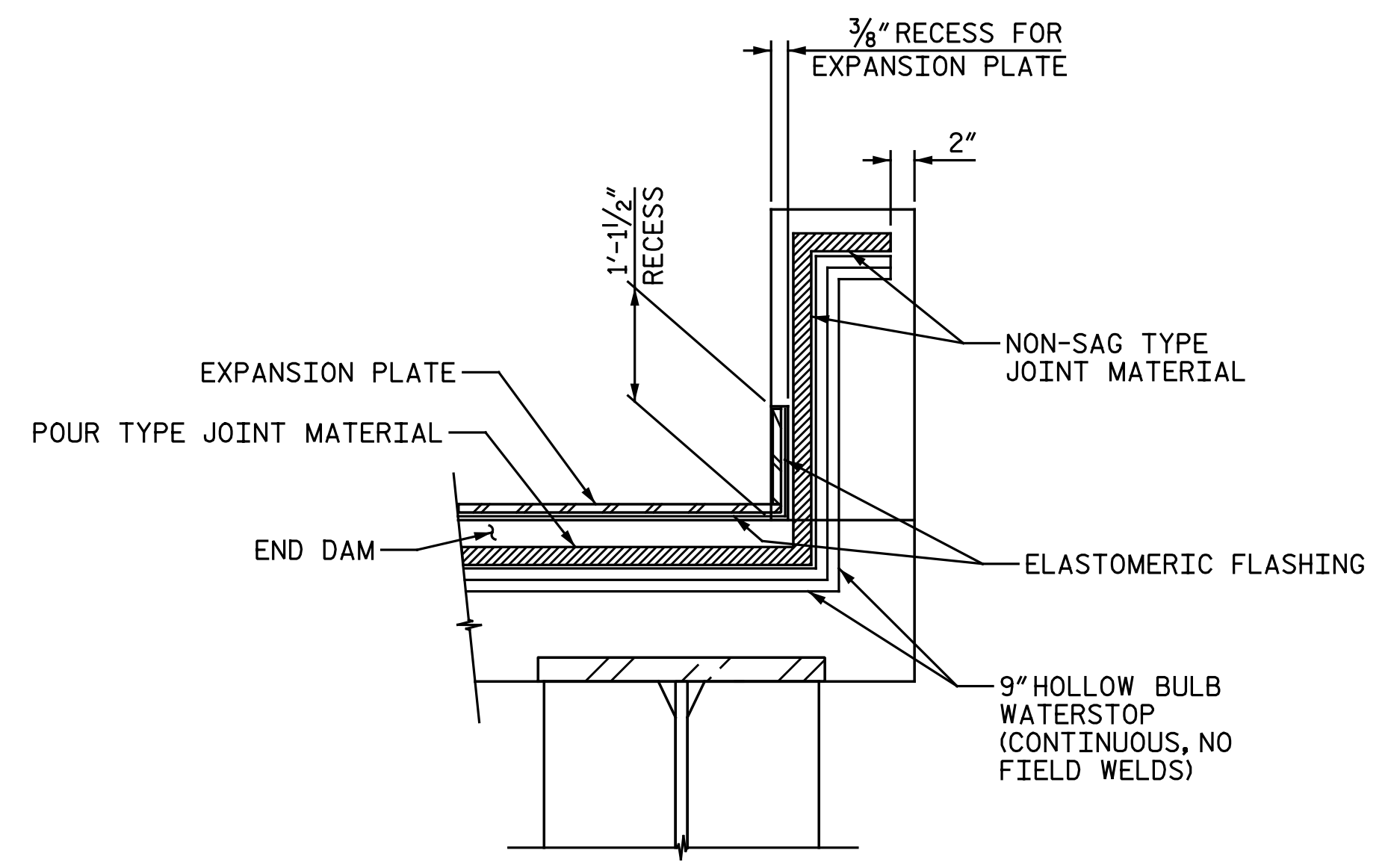
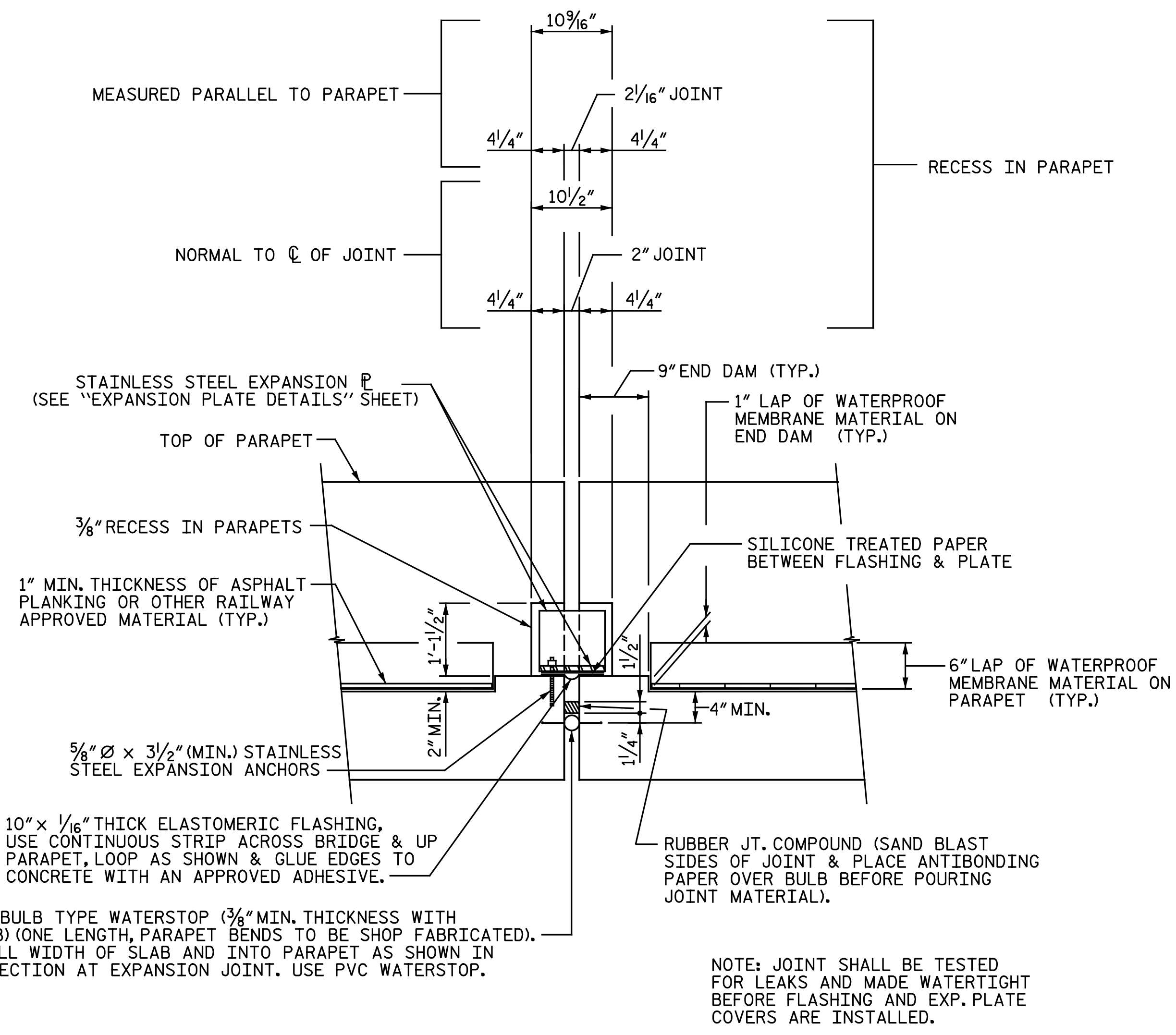
Designed by  
 Duane Holloway  
 5/3/2016

**Michael Baker**  
 INTERNATIONAL

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27518  
 NC License No.: F-1084

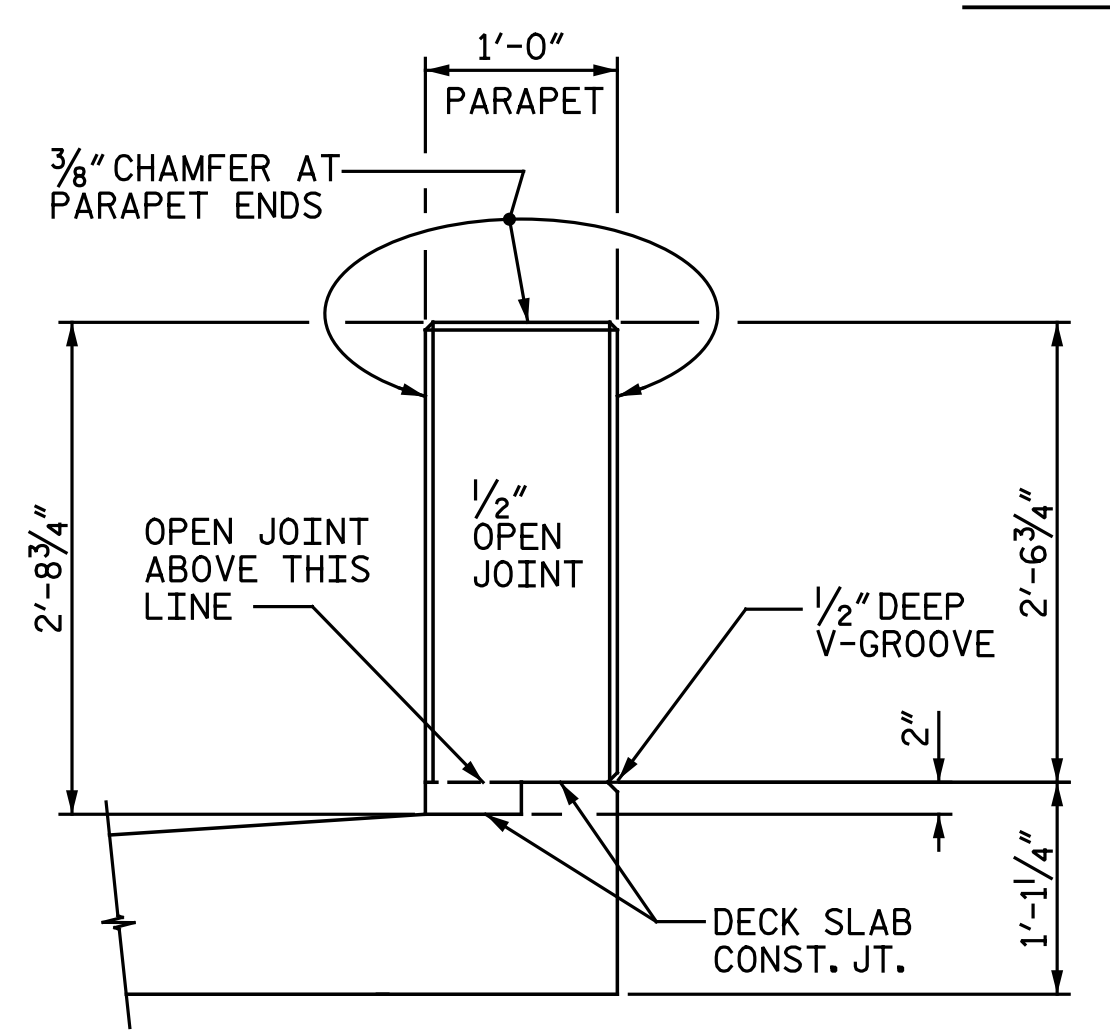
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 CONCRETE DECK  
 DETAILS

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-II	
1			3			TOTAL SHEETS	
2			4			68	



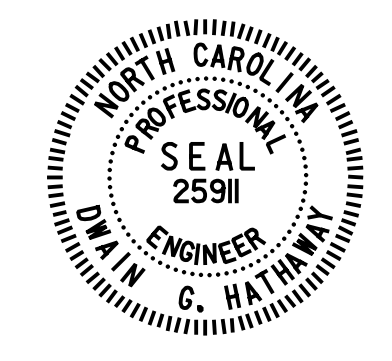
PART SECTION AT EXPANSION JOINT

DETAIL D



SECTION THRU OPEN JOINT IN PARAPET

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 2 OF 2



Designed by  
 Dwan Hathaway  
 20237807 (04/04/05)

5/3/2016

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 CONCRETE DECK  
 DETAILS

**Michael Baker**  
 INTERNATIONAL

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

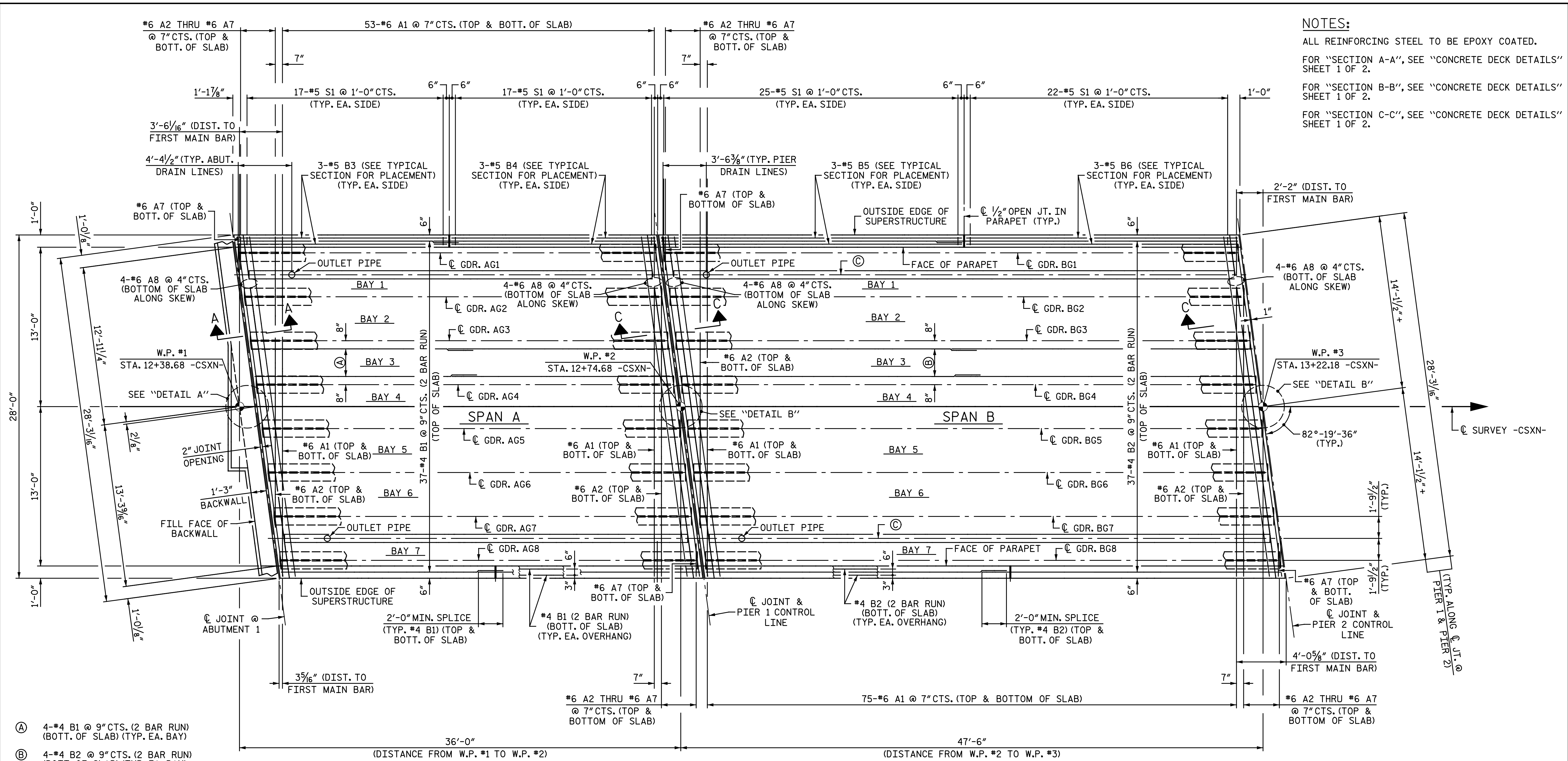
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.  
S4-12  
 TOTAL SHEETS  
 68

DRAWN BY : C. E. MAYHEW DATE : 3-13-13  
 CHECKED BY : S. A. DENNEY DATE : 12-31-13

cmayhew 5/3/2016 9:37:03 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_012\_U3308\_SML\_CD02.dgn

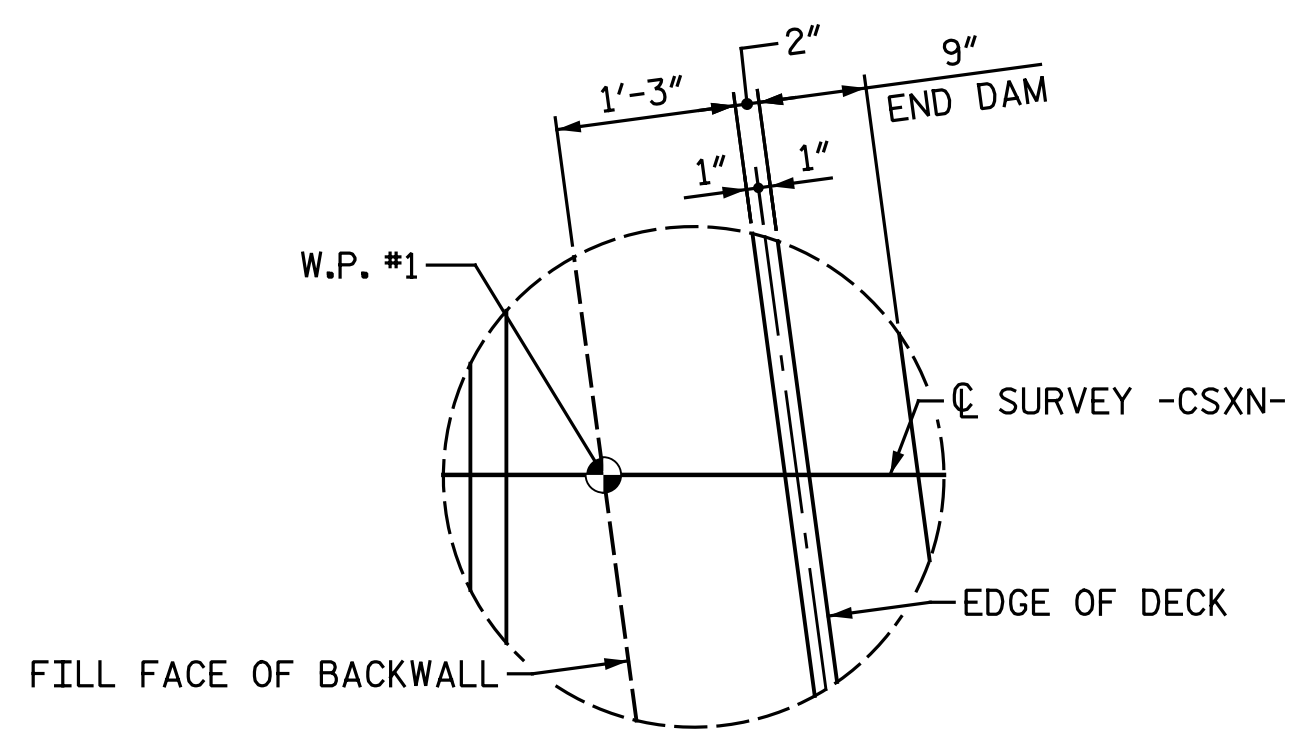
**NOTES:**  
 ALL REINFORCING STEEL TO BE EPOXY COATED.  
 FOR "SECTION A-A", SEE "CONCRETE DECK DETAILS" SHEET 1 OF 2.  
 FOR "SECTION B-B", SEE "CONCRETE DECK DETAILS" SHEET 1 OF 2.  
 FOR "SECTION C-C", SEE "CONCRETE DECK DETAILS" SHEET 1 OF 2.



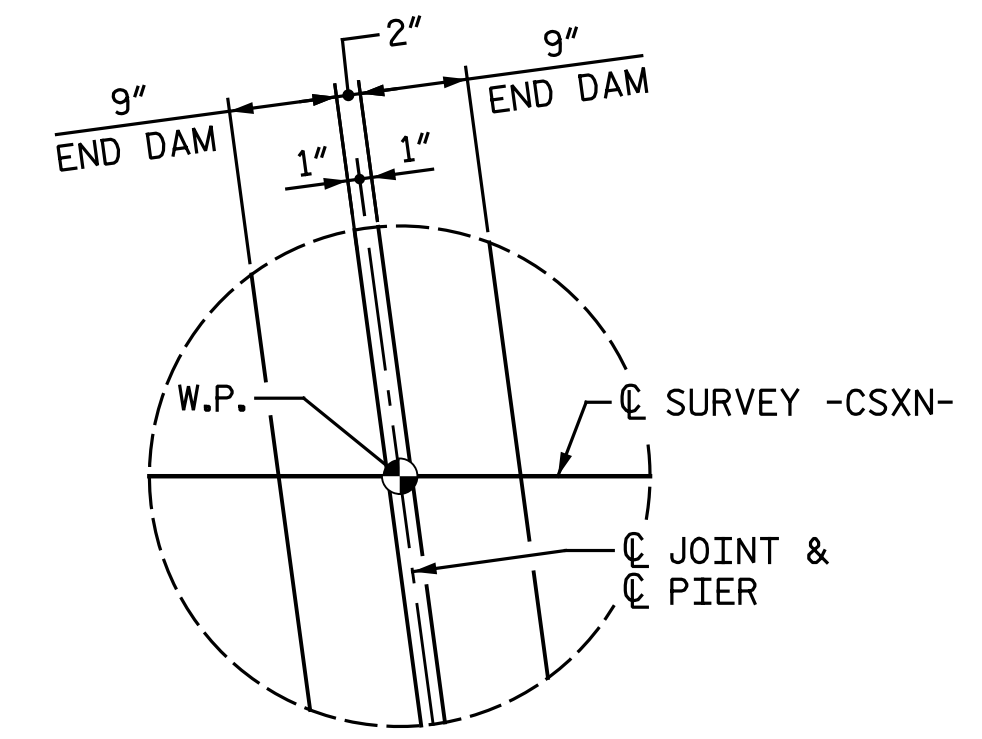
- Ⓐ 4-#4 B1 @ 9" CTS. (2 BAR RUN) (BOTT. OF SLAB) (TYP. EA. BAY)
- Ⓑ 4-#4 B2 @ 9" CTS. (2 BAR RUN) (BOTT. OF SLAB) (TYP. EA. BAY)
- Ⓒ 12 GAUGE STEEL PAN (GALVANIZED & BITUMINOUS COATED)

**PLAN OF SPANS**

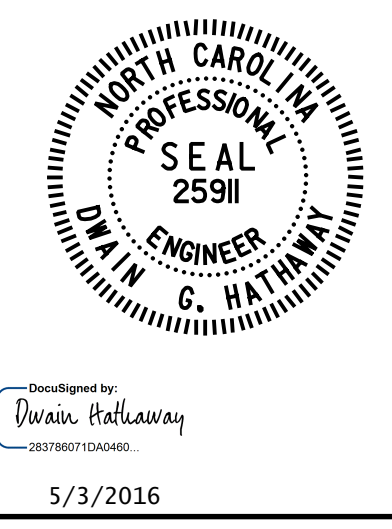
PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 1 OF 2



**DETAIL A**



**DETAIL B**



**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27615  
 NC License No.: F-1084

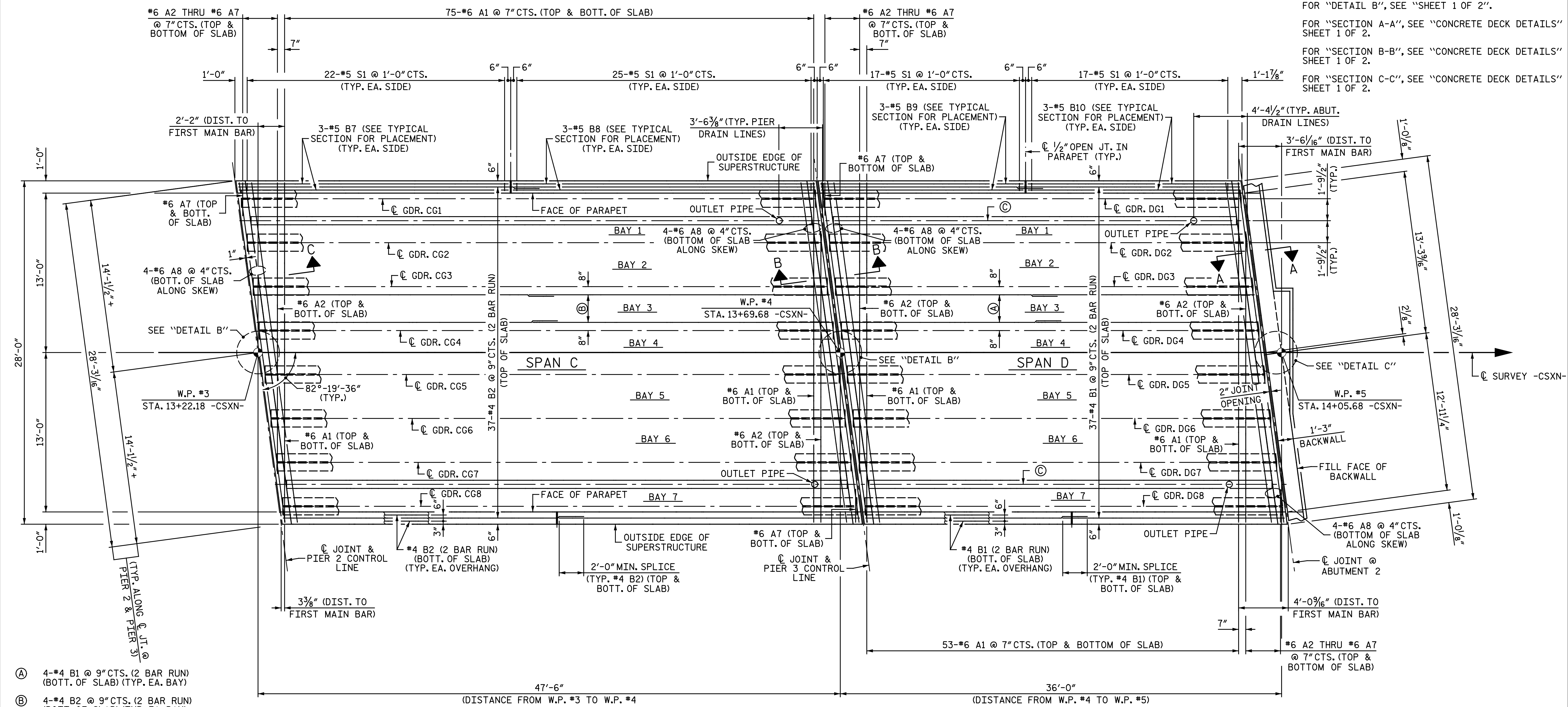
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPANS  
 SPANS A & B

REVISIONS						SHEET NO. S4-13
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 68
2			4			

5/3/2016 9:37:03 AM  
 File Name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_013\_U3308\_SML\_S01.dgn  
 onayhew

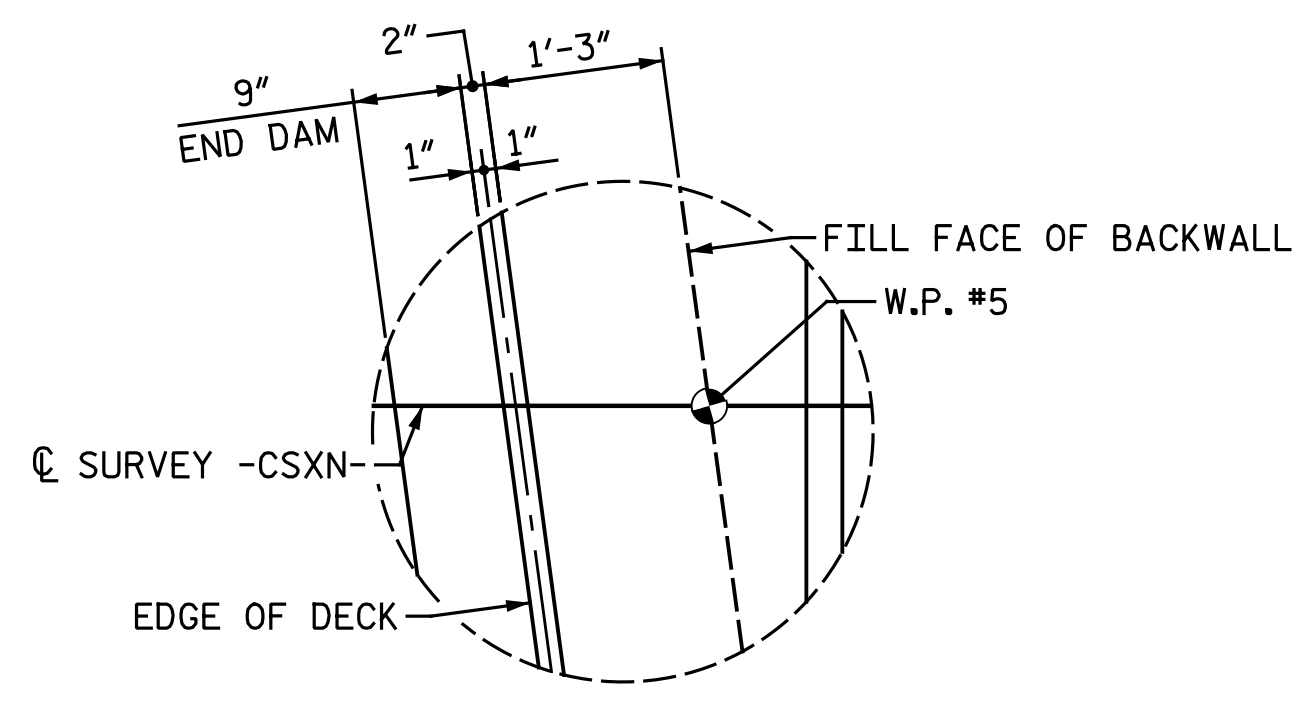
DRAWN BY: M. D. MAYHEW DATE: 12-19-13  
 CHECKED BY: S. A. DENNEY DATE: 12-31-13

**NOTES:**  
 ALL REINFORCING STEEL TO BE EPOXY COATED.  
 FOR "DETAIL B", SEE "SHEET 1 OF 2".  
 FOR "SECTION A-A", SEE "CONCRETE DECK DETAILS" SHEET 1 OF 2.  
 FOR "SECTION B-B", SEE "CONCRETE DECK DETAILS" SHEET 1 OF 2.  
 FOR "SECTION C-C", SEE "CONCRETE DECK DETAILS" SHEET 1 OF 2.



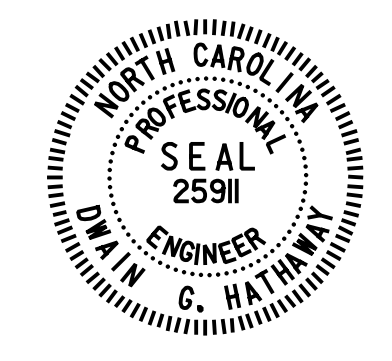
**PLAN OF SPANS**

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 2 OF 2



**DETAIL C**

- Ⓐ 4-#4 B1 @ 9" CTS. (2 BAR RUN) (BOT. OF SLAB) (TYP. EA. BAY)
- Ⓑ 4-#4 B2 @ 9" CTS. (2 BAR RUN) (BOT. OF SLAB) (TYP. EA. BAY)
- Ⓒ 12 GAUGE STEEL PAN (GALVANIZED & BITUMINOUS COATED)



Designed by  
 Duane Hollaway  
 5/3/2016

**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27518  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 PLAN OF SPANS  
 SPANS C & D

REVISIONS						SHEET NO. S4-14
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 68
2			4			

5/3/2016 9:37:04 AM  
 File Name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_014\_U3308\_SML\_502.dgn  
 omayhew

DRAWN BY: M. D. MAYHEW DATE: 1-9-14  
 CHECKED BY: S. A. DENNEY DATE: 2-25-14

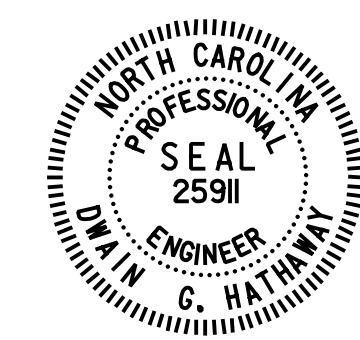
# STRUCTURAL STEEL NOTES

1. SPECIFICATIONS: AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION (A.R.E.M.A.) MANUAL FOR RAILWAY ENGINEERING, 2014 EDITION.  
 CURRENT CSX TRANSPORTATION CRITERIA FOR OPEN DECK RAILROAD BRIDGES.  
 CURRENT NORFOLK SOUTHERN RAILWAY GUIDELINES FOR DESIGN OF GRADE SEPARATION STRUCTURES.
2. LIVE LOADS: COOPER E-80 WITHOUT HAMMER BLOW WITH FULL DESIGN IMPACT AS PER A.R.E.M.A.
3. STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH CSX TRANSPORTATION "SPECIFICATIONS FOR STRUCTURAL STEEL".
4. STRUCTURAL STEEL: ALL STRUCTURAL STEEL FOR FRACTURE CRITICAL MEMBERS (FCM) SHALL BE ASTM A709, GRADE 50F2, Fy = 50,000 PSI. NON-FRACTURE CRITICAL MEMBERS SHALL BE ASTM A709, GRADE 50T2. BEARING ASSEMBLIES SHALL BE ASTM A709 GRADE 50T2. ALL STRUCTURAL STEEL SHALL MEET THE REQUIREMENTS OF THE PROJECT SPECIAL PROVISION FOR STRUCTURAL STEEL FOR RAILROAD BRIDGES AND THE FOLLOWING REQUIREMENTS:
  1. THE MATERIAL SUPPLIED SHALL BE OTHER THAN RIMMED OR CAPPED STEEL.
  2. THE MATERIAL SUPPLIED SHALL BE SILCON-KILLED, FINE GRAIN PRACTICE.
  3. CERTAIN ELEMENTS OF THE STRUCTURE ARE NOTED AS "FRACTURE CRITICAL MEMBERS" (FCM) AND SHALL MEET THE REQUIREMENTS FOR "FRACTURE CONTROL PLAN FOR FRACTURE CRITICAL MEMBERS" OF SECTION 1.14, CHAPTER 15 OF THE A.R.E.M.A. MANUAL. THE IMPACT REQUIREMENTS FOR FRACTURE CRITICAL MEMBERS SHALL BE REQUIRED FOR ZONE 2 SERVICE TEMPERATURE. TEST RESULTS SHALL BE FURNISHED TO THE ENGINEER AND RAILROAD FOR THEIR USE.
  4. ANCHOR BOLTS FOR BEARING DEVICES SHALL CONFORM TO ASTM F1554 GRADE 55. ANCHOR BOLTS, NUT, AND PLATE WASHERS SHALL BE MECHANICALLY GALVANIZED IN ACCORDANCE WITH AASHTO M298.
5. ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED.
6. STRUCTURAL STEEL SHALL BE PAINTED IN ACCORDANCE WITH CSX TRANSPORTATION "SPECIFICATIONS FOR PAINTING STRUCTURAL STEEL".
7. BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.
8. FABRICATION: THE FABRICATOR SHALL BE CERTIFIED IN THE SIMPLE SPAN STEEL BRIDGE CATEGORY, UNDER THE AISC QUALITY CERTIFICATION PROGRAM.
9. FABRICATION OF ALL STEEL MEMBERS SHALL BE ACCORDING TO THE A.R.E.M.A. MANUAL FOR RAILWAY ENGINEERING, CHAPTER 15, PART 3 - FABRICATION.
10. MILL TEST REPORTS: CSX TRANSPORTATION AND NORFOLK SOUTHERN RAILWAY SHALL BE FURNISHED COPIES OF MILL TEST REPORTS FOR ALL MATERIALS EXCEPT MISCELLANEOUS PLATES AND SHAPES. REPORTS SHALL INDICATE COMPLIANCE WITH ALL SPECIFIED REQUIREMENTS.
11. INSPECTION: SHOP INSPECTION BY CSX TRANSPORTATION OR ITS AUTHORIZED AGENT.
12. SHOP DRAWINGS: SHOP DRAWINGS SHALL BE APPROVED BY THE CHIEF-ENGINEER BRIDGES, CSX TRANSPORTATION, JACKSONVILLE, FL.
13. HOLES: OPEN HOLES AS NOTED.
14. BOLTED CONNECTIONS SHALL BE MADE WITH 7/8" DIAMETER, ASTM A325, TYPE 1 HIGH STRENGTH BOLTS WITH HARDENED WASHERS IN ACCORDANCE WITH A.R.E.M.A. SPECIFICATIONS USING THE TURN OF THE NUT METHOD. DIRECT TENSION INDICATORS SHALL NOT BE USED.
15. HIGH STRENGTH BOLTS, NUTS & WASHERS: ASTM DESIGNATION A325. ALL HIGH STRENGTH BOLTS, NUTS & WASHERS SHALL BE MECHANICALLY GALVANIZED. HOT-DIPPED GALVANIZED BOLTS WILL NOT BE ALLOWED.
16. ANCHOR BOLTS: SHALL BE 1/4" Ø IN ACCORDANCE WITH A.R.E.M.A. SPECIFICATIONS AND SHALL BE GROUTED IN FORMED HOLES AFTER GIRDERS ARE ERECTED.
17. BEARING PADS SHALL BE USED WHENEVER STEEL MASONRY PLATE, OR OTHER STEEL BEARING PLATE, BEARS ON CONCRETE. PADS SHALL BE PREFORMED FABRIC BEARING PADS, 1/2" THICK, 31 PLY. PREFORMED FABRIC BEARING PADS SHALL BE SHOCK PAD (MIL-C-882C SPECIFICATIONS) STYLE NO. 15175 AS MANUFACTURED BY ALERT MANUFACTURING AND SUPPLY COMPANY, CHICAGO, ILLINOIS, OR FABREEKA PADS AS MANUFACTURED BY FABREEKA PRODUCTS COMPANY, BOSTON, MASSACHUSETTS, OR SORBTEX PADS AS MANUFACTURED BY VOSS ENGINEERING, INC., CHICAGO, ILLINOIS, OR APPROVED EQUAL.
18. NO CAMBER FOR GIRDERS REQUIRED, TURN NATURAL MILL CAMBER UP.

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-

cmayhew 5/3/2016 9:37:05 AM  
 File Name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_015\_U3308\_SML\_SSN.dgn

DRAWN BY : C. E. MAYHEW DATE : 3-13-13  
 CHECKED BY : S. A. DENNEY DATE : 2-26-14



DocuSigned by:  
 Dwan Hathaway  
 20278071040460

5/3/2016

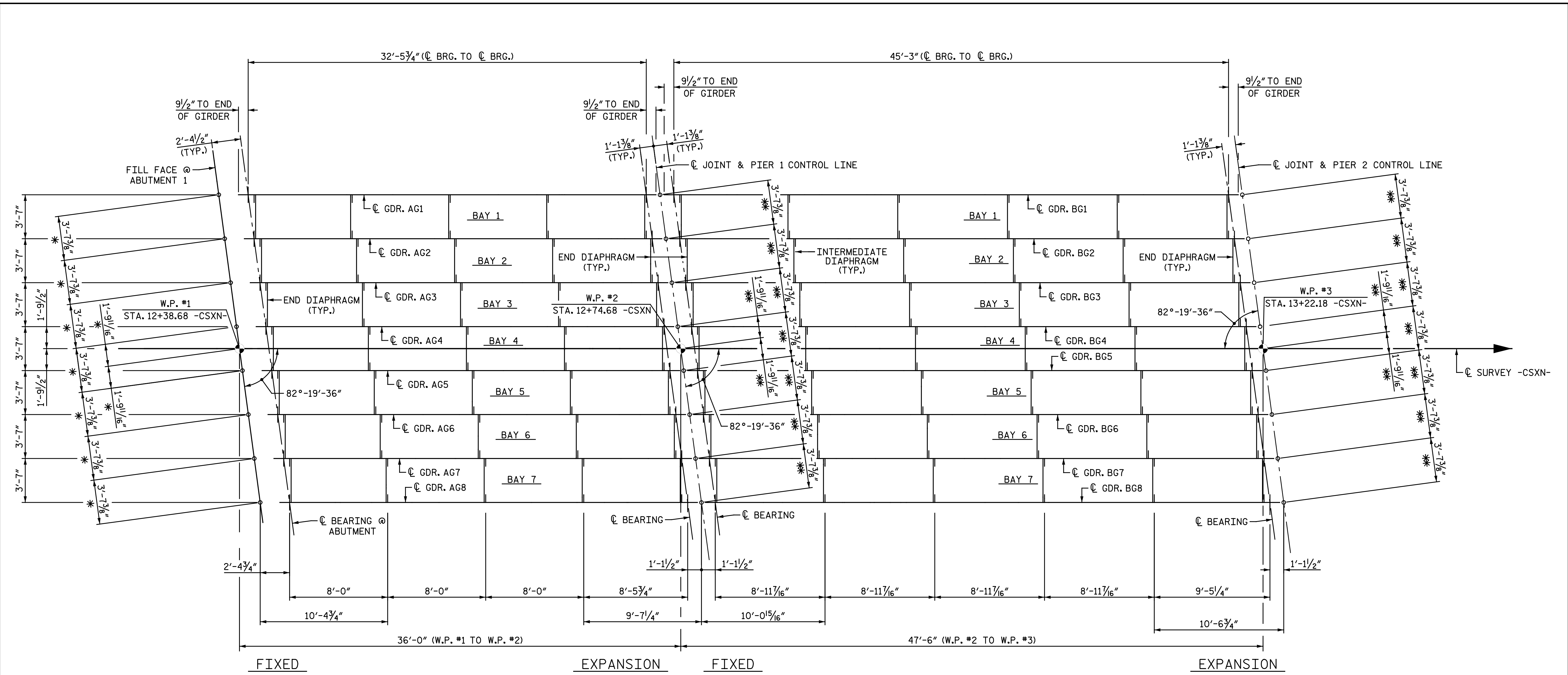
**Michael Baker**  
 INTERNATIONAL

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURAL STEEL  
 NOTES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-15
1			3			TOTAL SHEETS
2			4			68

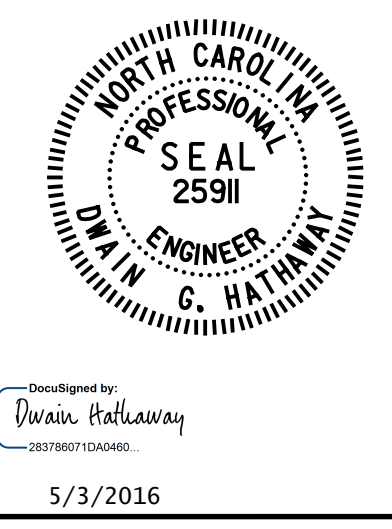




**FRAMING PLAN**

- \* MEASURED ALONG FILL FACE @ ABUTMENT
- \*\* MEASURED ALONG  $\text{C}$  JOINT &  $\text{C}$  PIER

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 1 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 GIRDER LAYOUT  
 SPANS A & B

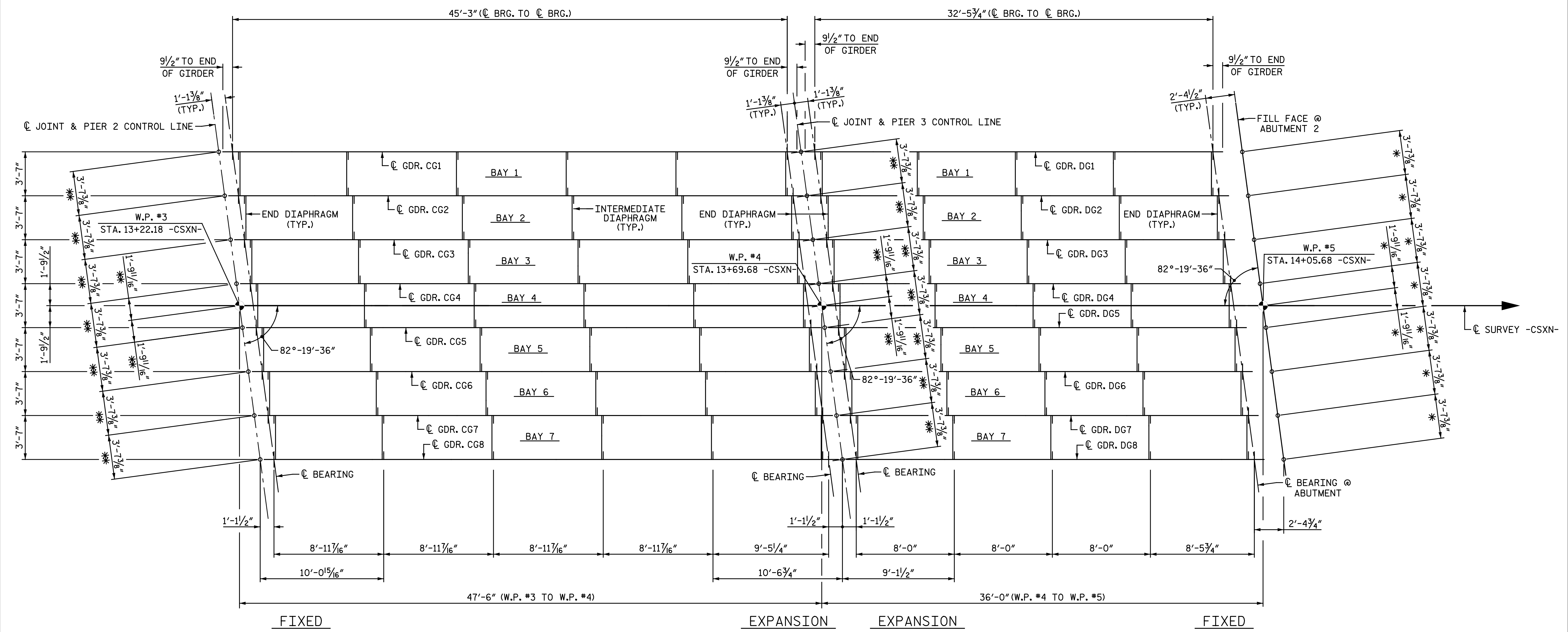
**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-16
1			3			TOTAL SHEETS
2			4			68

cmayhew 5/3/2016 9:37:05 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_016\_U3308\_SML\F01.dgn

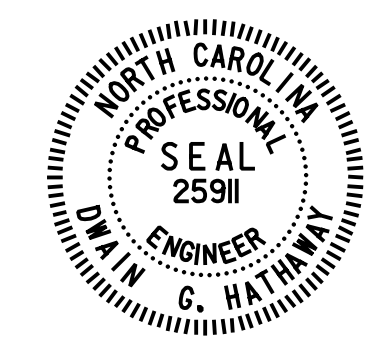
DRAWN BY : M. D. MAYHEW DATE : 12-30-13  
 CHECKED BY : S. A. DENNEY DATE : 12-31-13



**FRAMING PLAN**

- \* MEASURED ALONG FILL FACE @ ABUTMENT
- \*\* MEASURED ALONG CENTERLINE @ JOINT & PIER

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 2 OF 2



Designed by  
 Dwan Hathaway  
 5/3/2016

**Michael Baker INTERNATIONAL**

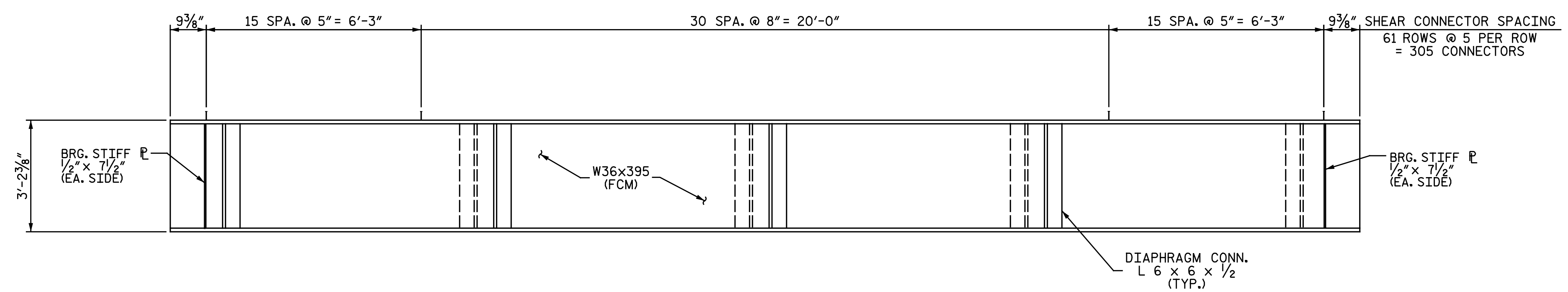
Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 GIRDER LAYOUT  
 SPANS C & D

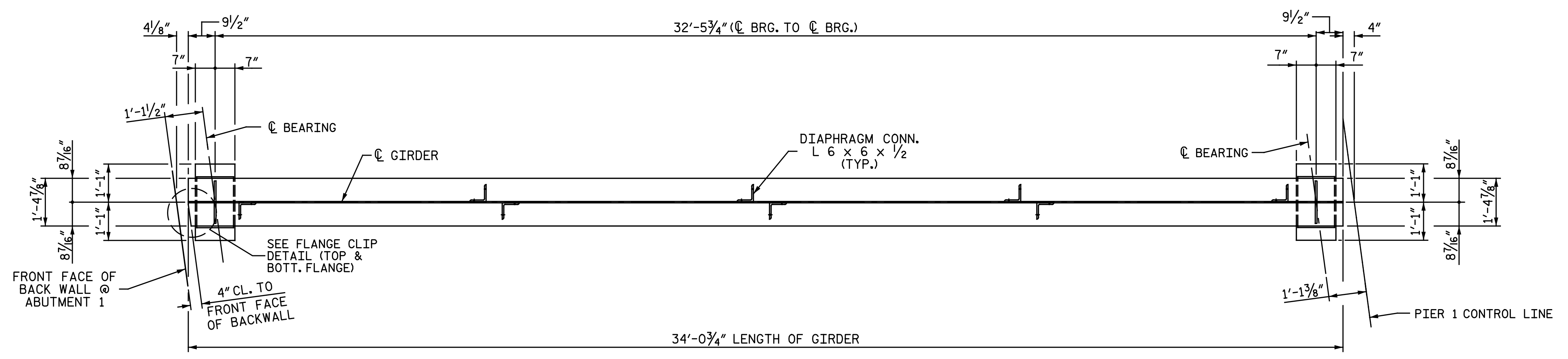
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-17
1			3			TOTAL SHEETS
2			4			68

cmayhew 5/3/2016 9:37:05 AM  
 Filename: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_017\_U3308\_SML\F02.dgn

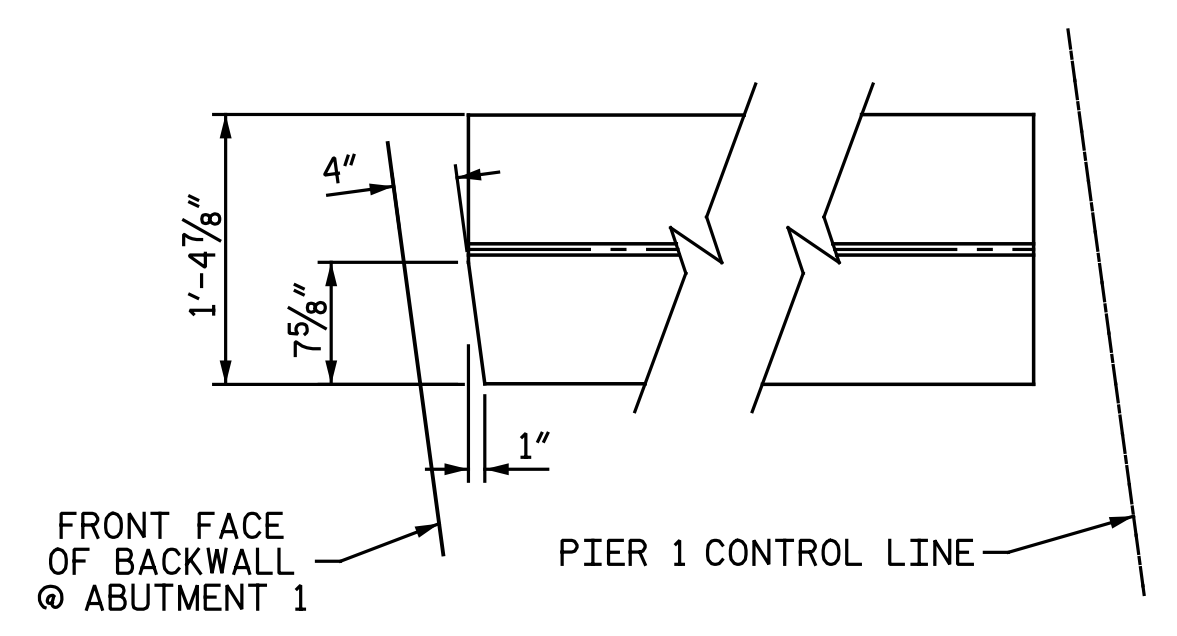
DRAWN BY : M. D. MAYHEW DATE : 1-7-14  
 CHECKED BY : S. A. DENNEY DATE : 2-27-14



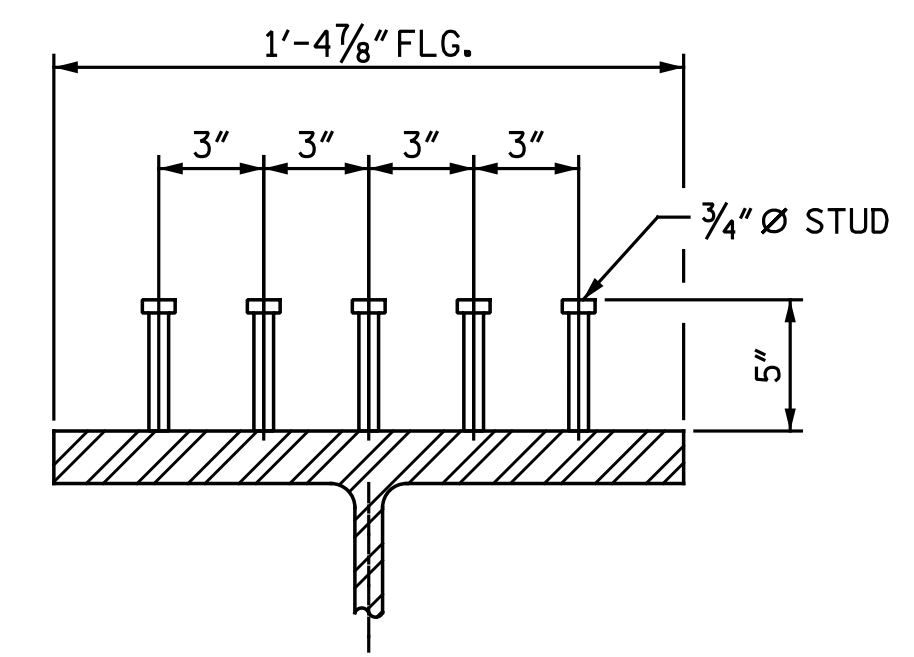
**GIRDER ELEVATION - SPAN A**  
(INTERIOR GIRDER SHOWN, OTHERS SIMILAR)



**BOTTOM FLANGE DETAIL - SPAN A**  
(INTERIOR GIRDER SHOWN, OTHERS SIMILAR)  
DIAPHRAGM CONNECTORS SHALL NOT BE PLACED ON OUTSIDE OF EXTERIOR GIRDERS.

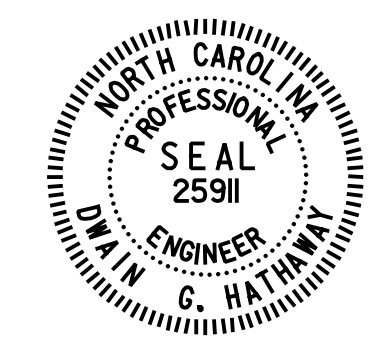


**FLANGE CLIP DETAIL - SPAN A**  
NOTE: CLIP TOP & BOTTOM FLANGES AT EACH END OF GIRDER.



**SHEAR STUD DETAIL**

PROJECT NO. U-3308  
DURHAM COUNTY  
STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
SHEET 1 OF 4



5/3/2016

**Michael Baker INTERNATIONAL**

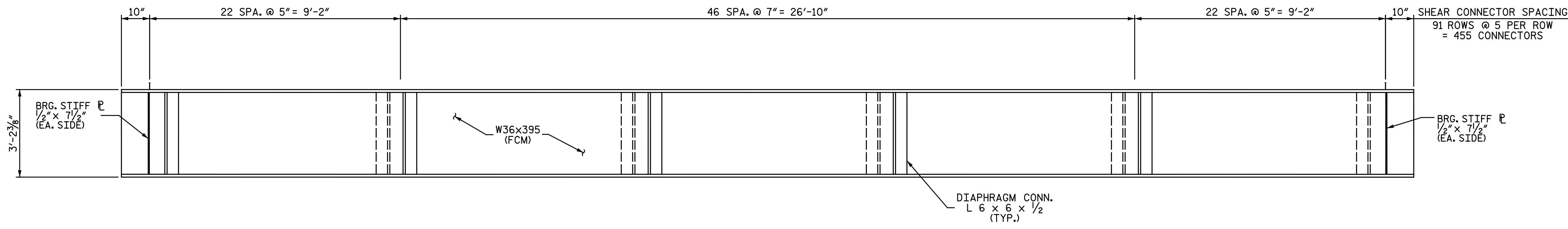
Michael Baker Engineering  
8000 Regency Parkway, Suite 600  
Cary, North Carolina 27618  
NC License No.: F-1084

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
GIRDER DETAILS  
SPAN A

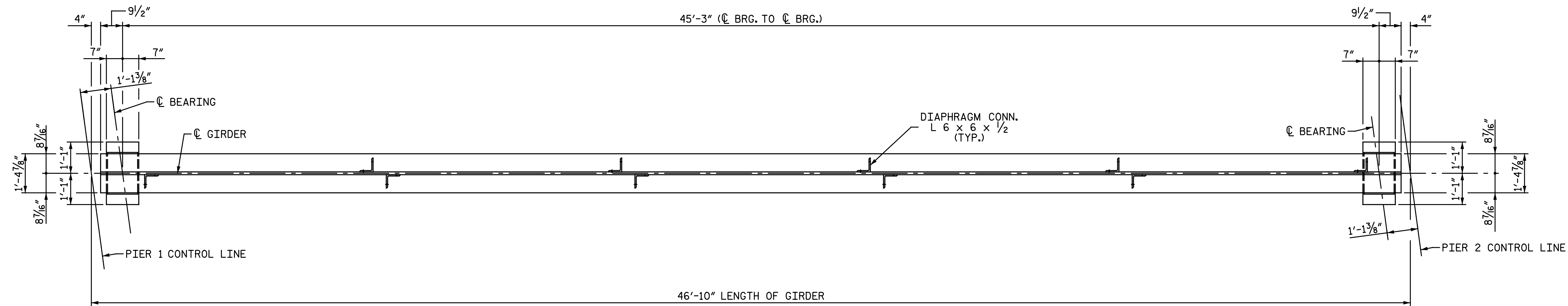
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-18
1			3			TOTAL SHEETS
2			4			68

cmayhew 5/3/2016 9:37:06 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_018\_U3308\_SML\_601.dgn

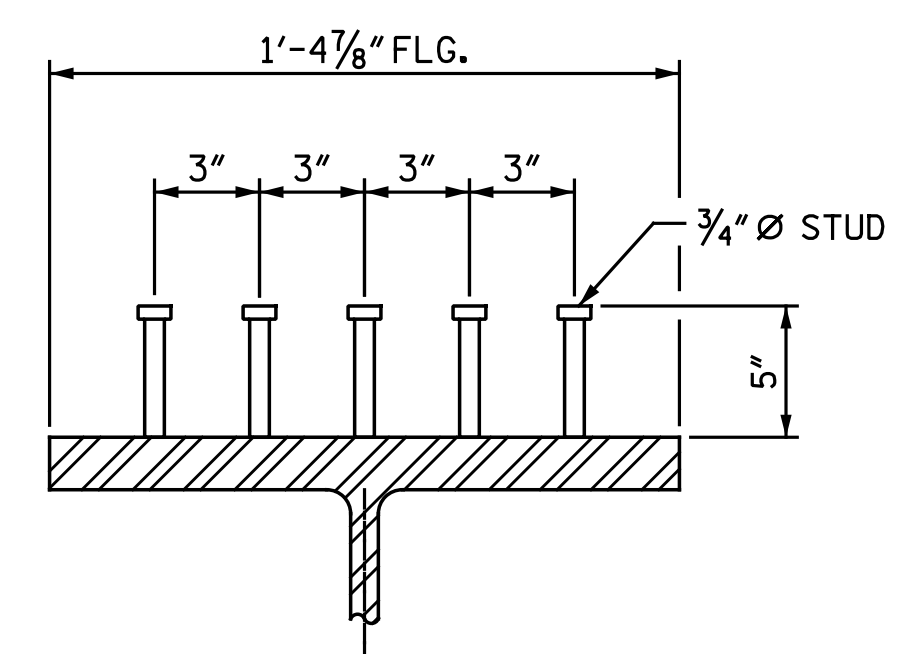
DRAWN BY: C. E. MAYHEW DATE: 3-13-13  
CHECKED BY: S. A. DENNEY DATE: 2-27-14



**GIRDER ELEVATION - SPAN B**  
(INTERIOR GIRDER SHOWN, OTHERS SIMILAR)

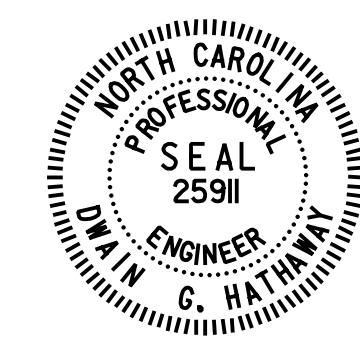


**BOTTOM FLANGE DETAIL - SPAN B**  
(INTERIOR GIRDER SHOWN, OTHERS SIMILAR)  
DIAPHRAGM CONNECTORS SHALL NOT BE PLACED ON OUTSIDE OF EXTERIOR GIRDERS.



**SHEAR STUD DETAIL**

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 2 OF 4



Designed by  
*Dwain Holloway*  
 20237807 (EXPIRES)

5/3/2016

**Michael Baker**  
 INTERNATIONAL

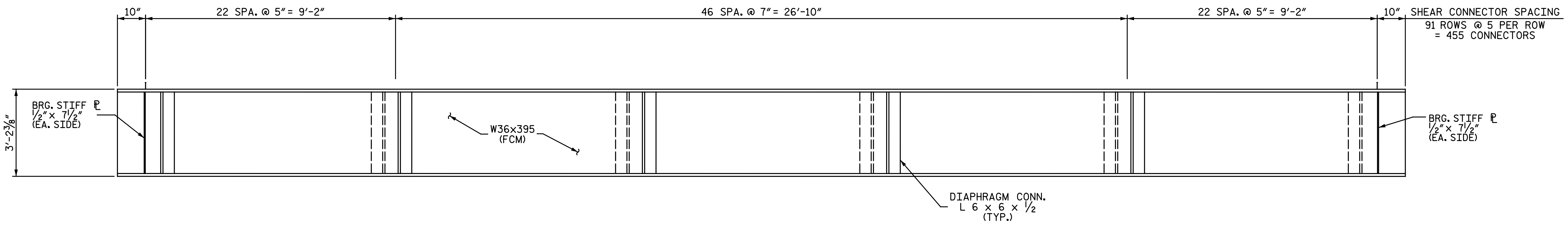
Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27615  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 GIRDER DETAILS  
 SPAN B

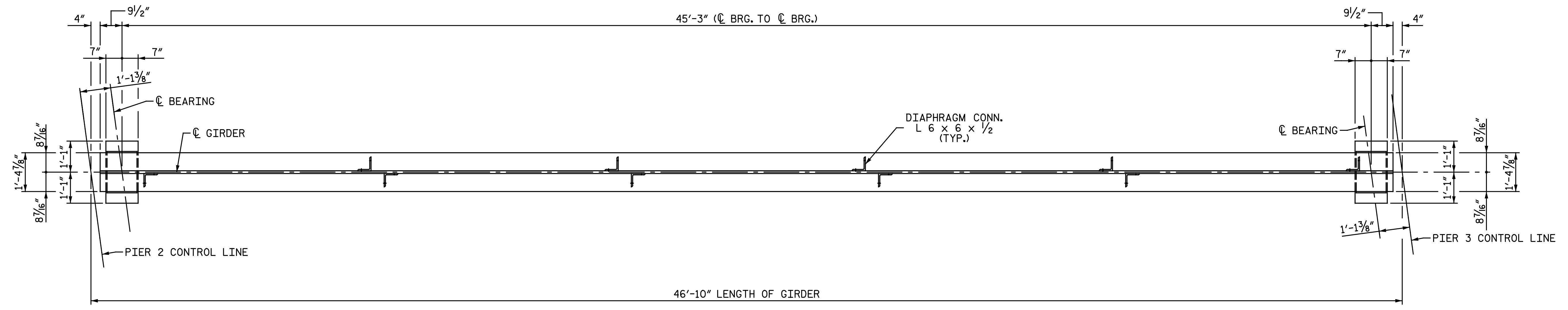
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-19
1			3			TOTAL SHEETS
2			4			68

cmayhew 5/3/2016 9:37:07 AM  
 File Name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_019\_U3308\_SML\_G02.dgn

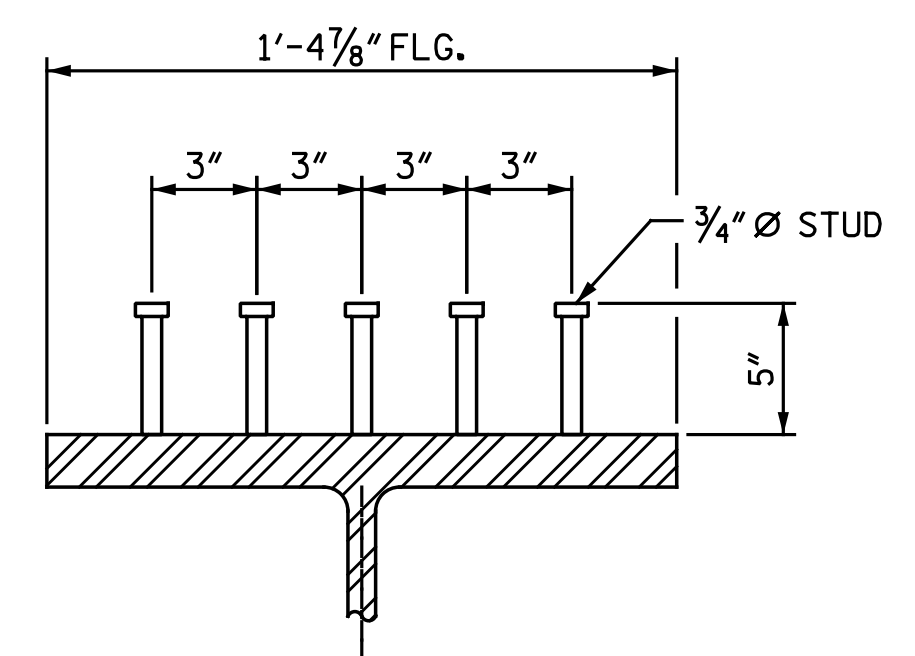
DRAWN BY : C. E. MAYHEW DATE : 3-13-13  
 CHECKED BY : S. A. DENNEY DATE : 2-27-14



**GIRDER ELEVATION - SPAN C**  
(INTERIOR GIRDER SHOWN, OTHERS SIMILAR)

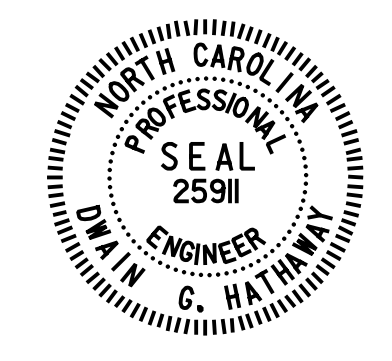


**BOTTOM FLANGE DETAIL - SPAN C**  
(INTERIOR GIRDER SHOWN, OTHERS SIMILAR)  
DIAPHRAGM CONNECTORS SHALL NOT BE PLACED ON OUTSIDE OF EXTERIOR GIRDERS.



**SHEAR STUD DETAIL**

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 3 OF 4



Designed by  
 Dwan Holloway  
 5/3/2016

**Michael Baker INTERNATIONAL**

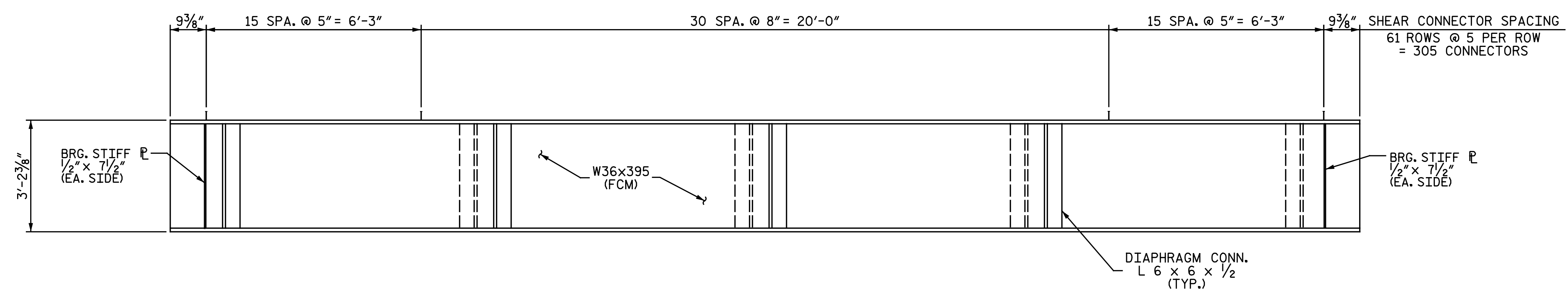
Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 GIRDER DETAILS  
 SPAN C

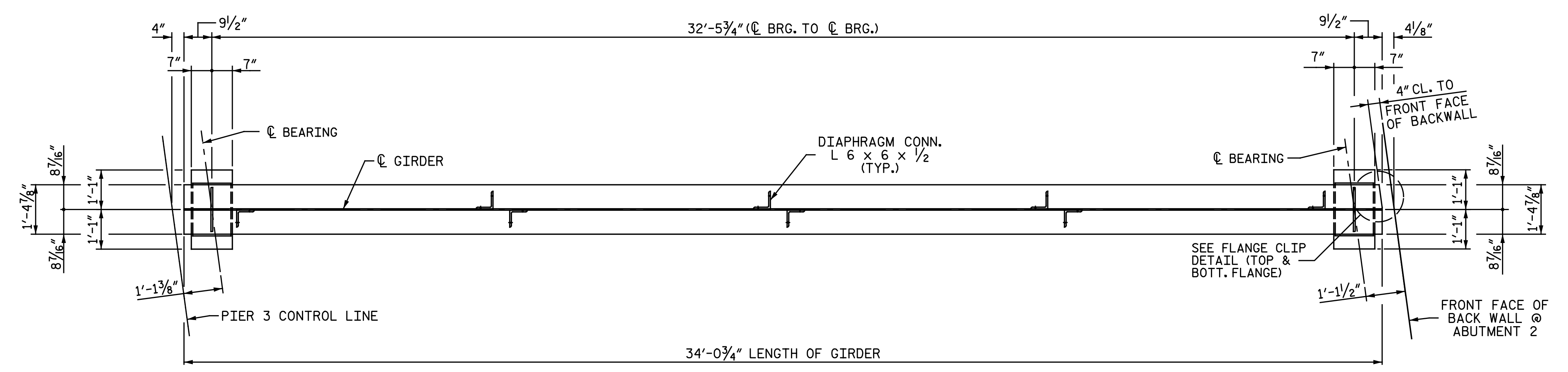
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-20
1			3			TOTAL SHEETS
2			4			68

cmayhew 5/3/2016 9:37:07 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_020\_U3308\_SMU\_603.dgn

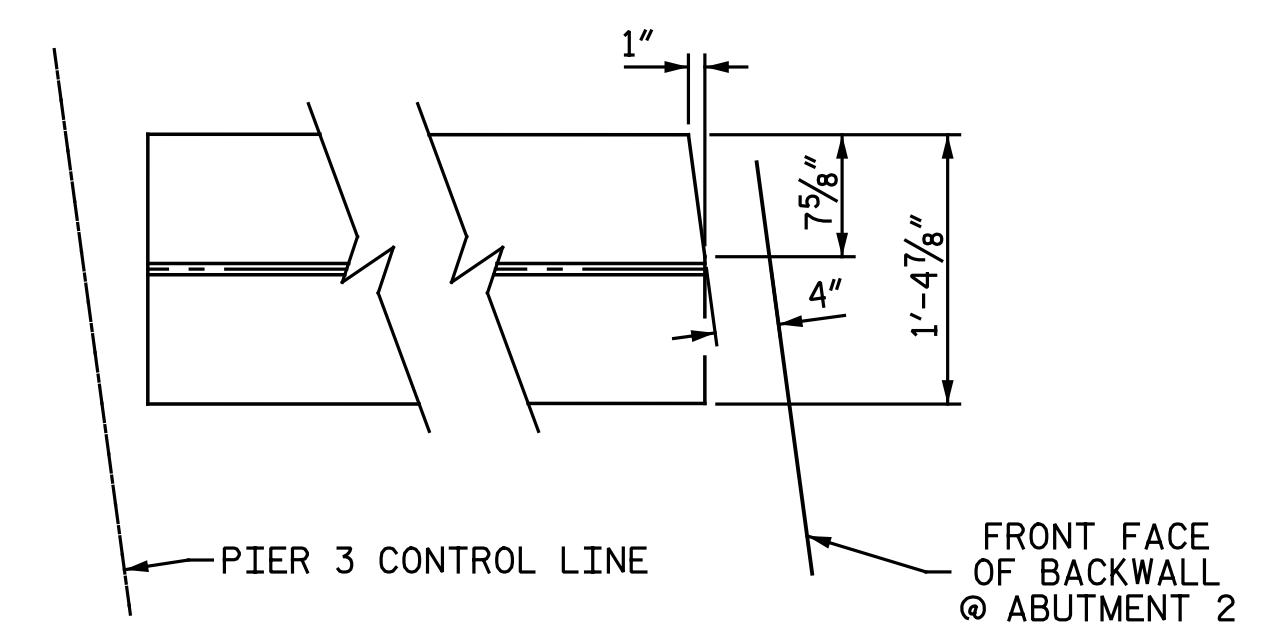
DRAWN BY: M. D. MAYHEW DATE: 3-7-14  
 CHECKED BY: S. A. DENNEY DATE: 3-14-14



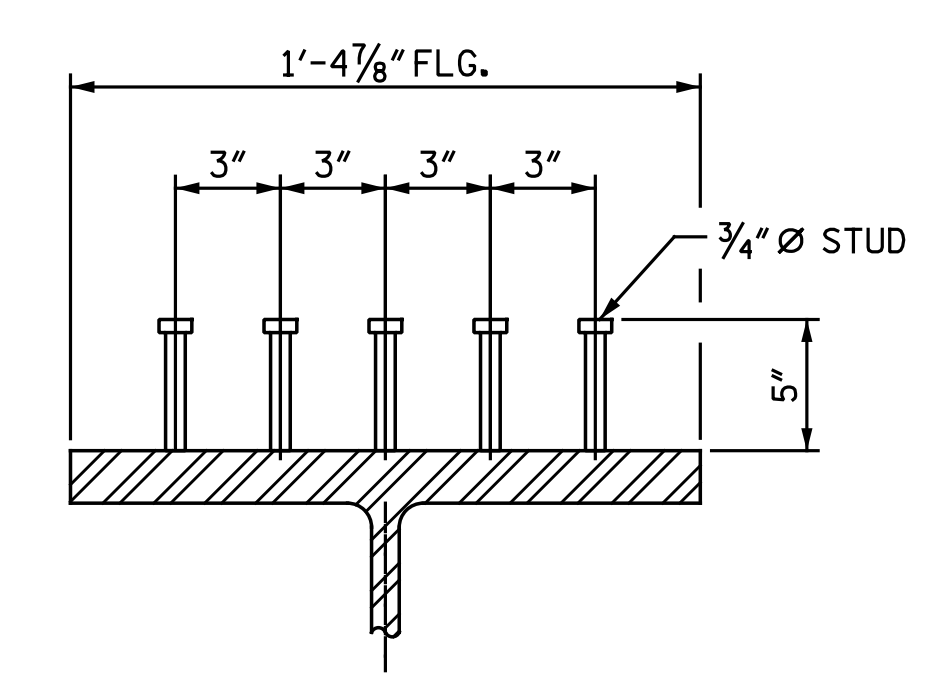
**GIRDER ELEVATION - SPAN D**  
(INTERIOR GIRDER SHOWN, OTHERS SIMILAR)



**BOTTOM FLANGE DETAIL - SPAN D**  
(INTERIOR GIRDER SHOWN, OTHERS SIMILAR)  
DIAPHRAGM CONNECTORS SHALL NOT BE PLACED ON OUTSIDE OF EXTERIOR GIRDERS.

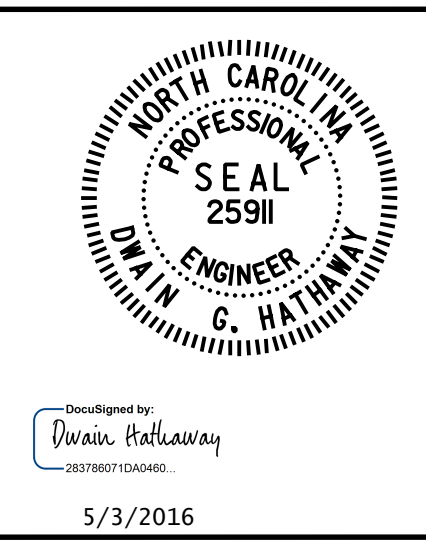


**FLANGE CLIP DETAIL - SPAN D**  
NOTE: CLIP TOP & BOTTOM FLANGES AT EACH END OF GIRDER.



**SHEAR STUD DETAIL**

PROJECT NO. U-3308  
DURHAM COUNTY  
STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
SHEET 4 OF 4



**Michael Baker INTERNATIONAL**

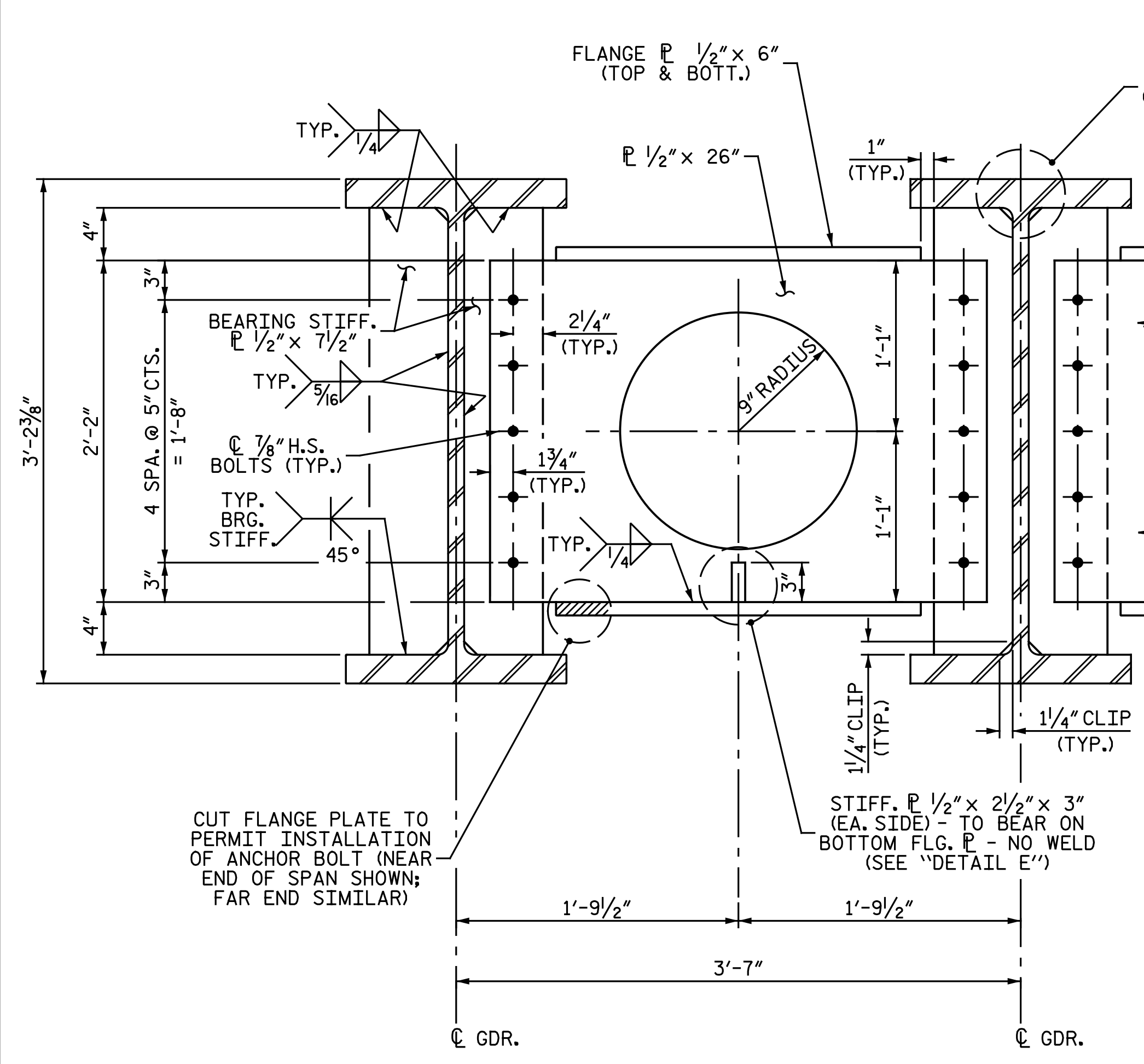
Michael Baker Engineering  
8000 Regency Parkway, Suite 600  
Cary, North Carolina 27618  
NC License No.: F-1084

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUPERSTRUCTURE  
GIRDER DETAILS  
SPAN D

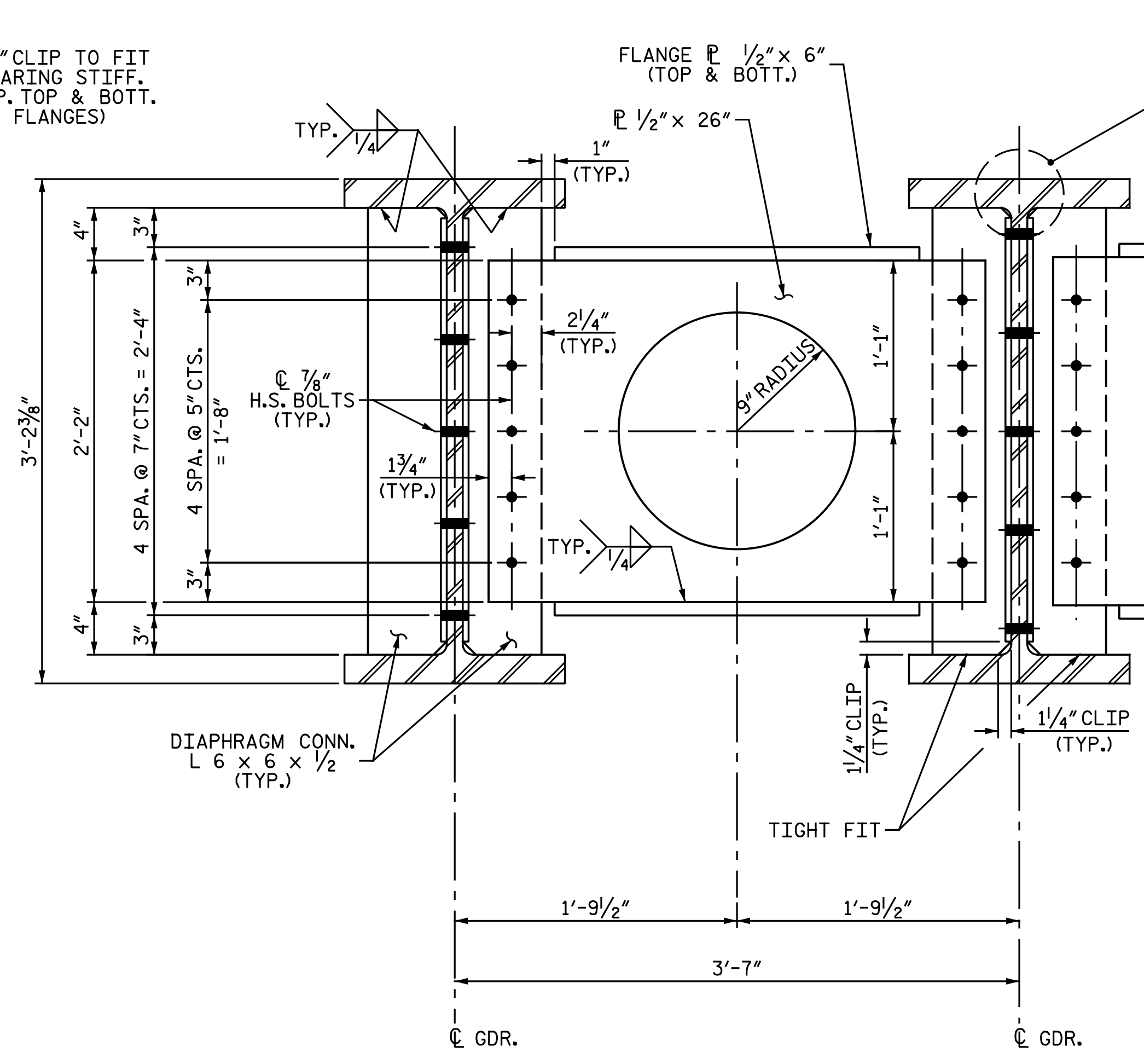
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-21
1			3			TOTAL SHEETS
2			4			68

cmayhew 5/3/2016 9:37:08 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_021\_U3308\_SML\_604.dgn

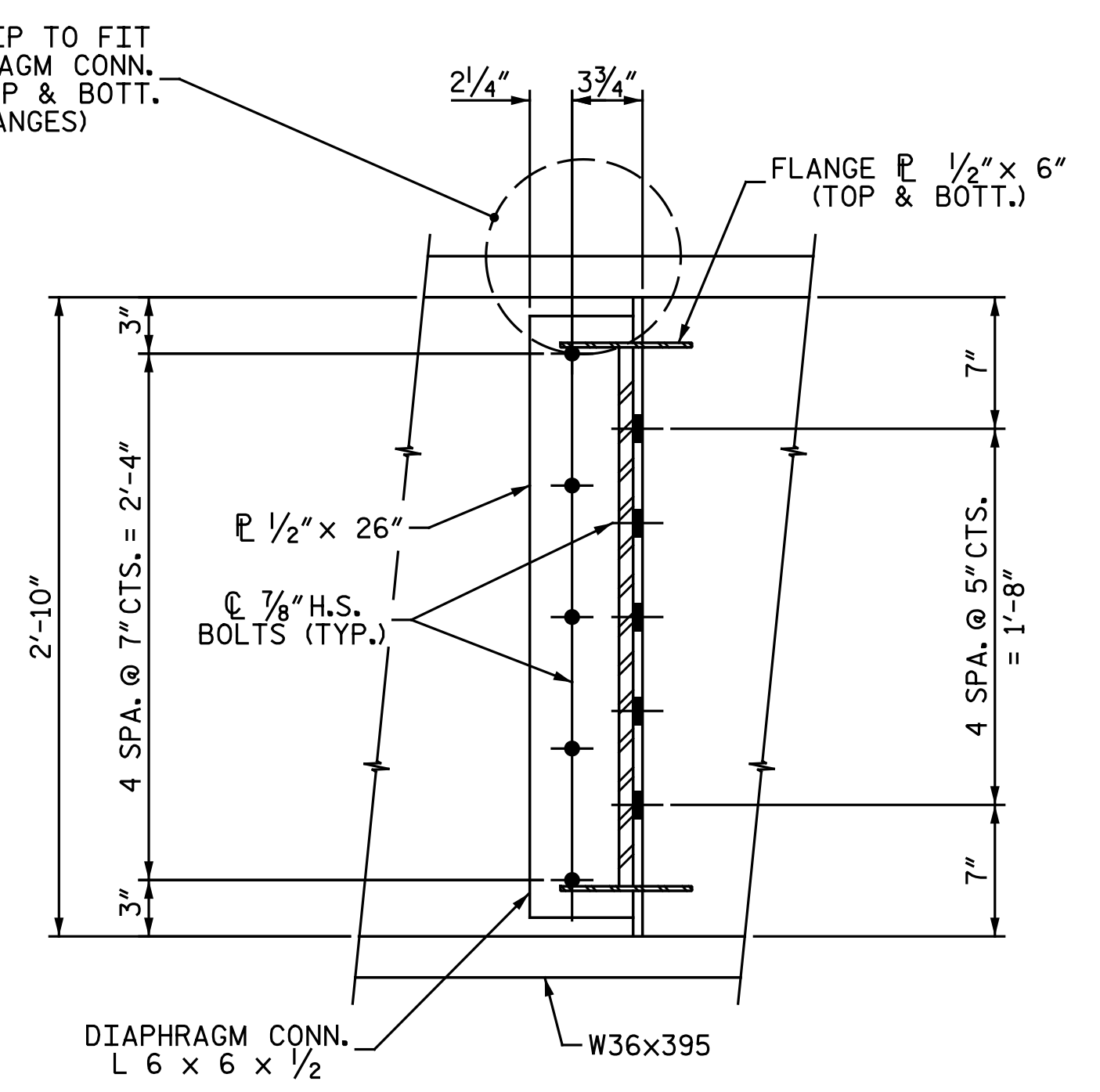
DRAWN BY: C. E. MAYHEW DATE: 3-13-13  
CHECKED BY: S. A. DENNEY DATE: 3-14-14



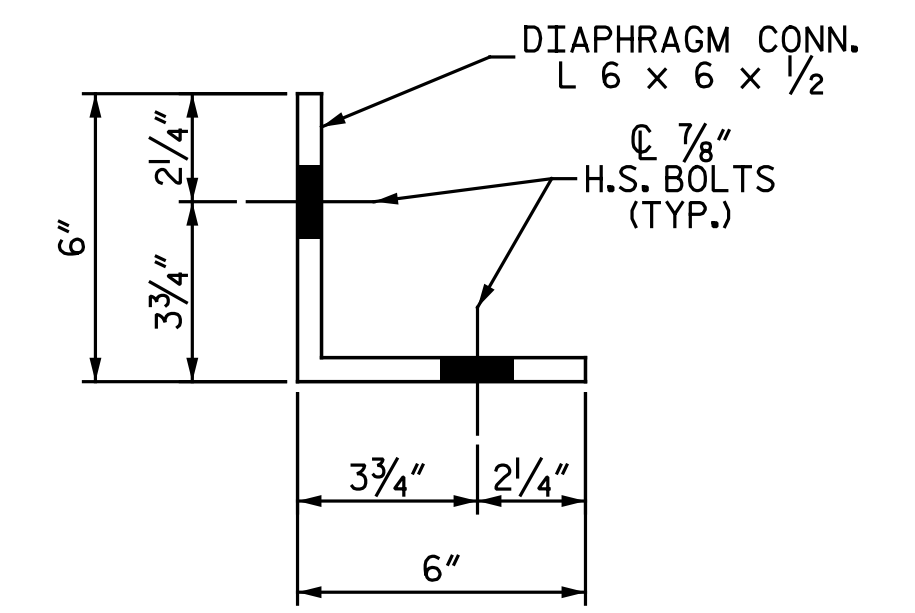
SECTION AT END DIAPHRAGM



SECTION AT INTERMEDIATE DIAPHRAGM

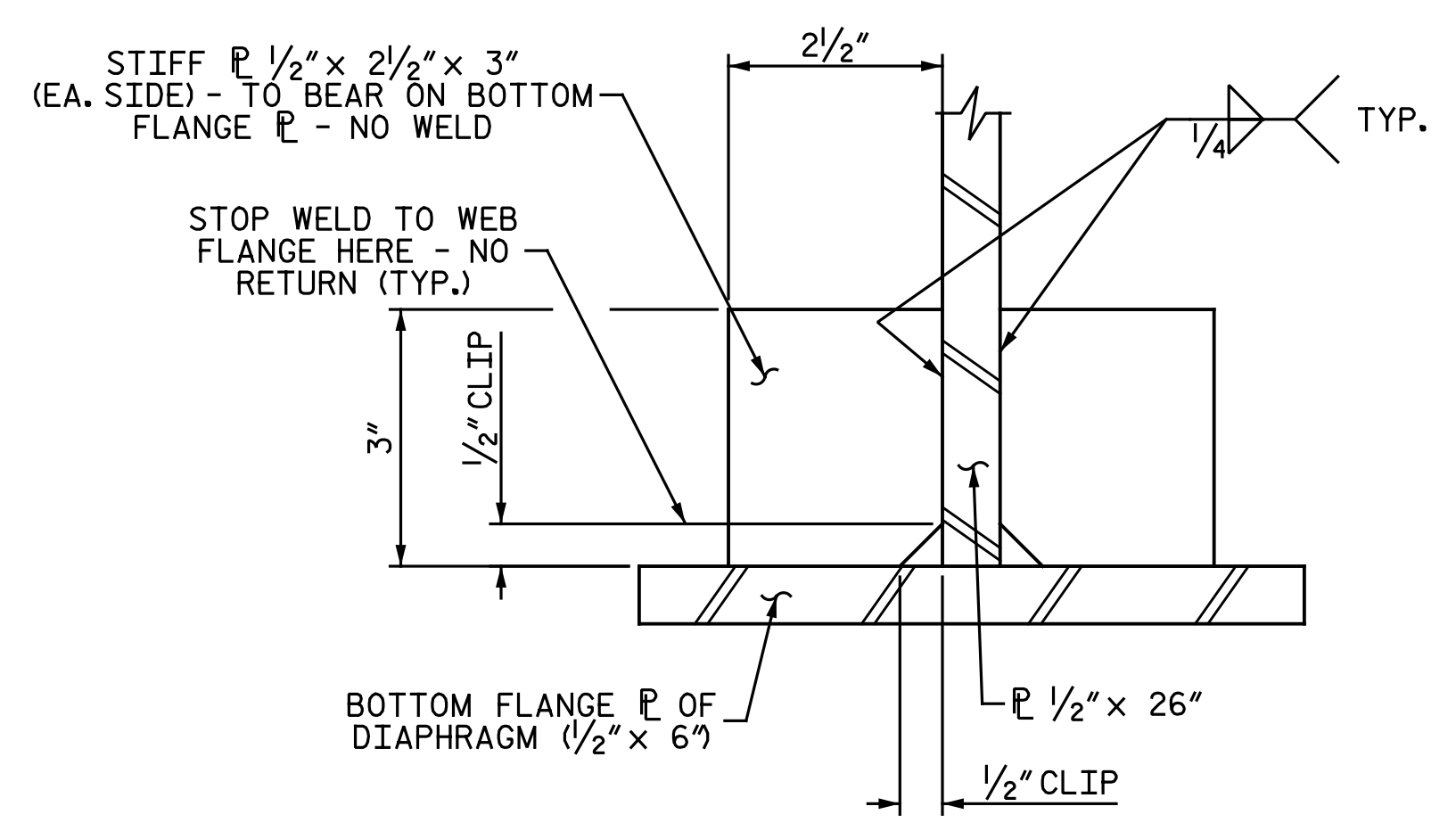


ELEVATION  
L6 x 6 x 1/2

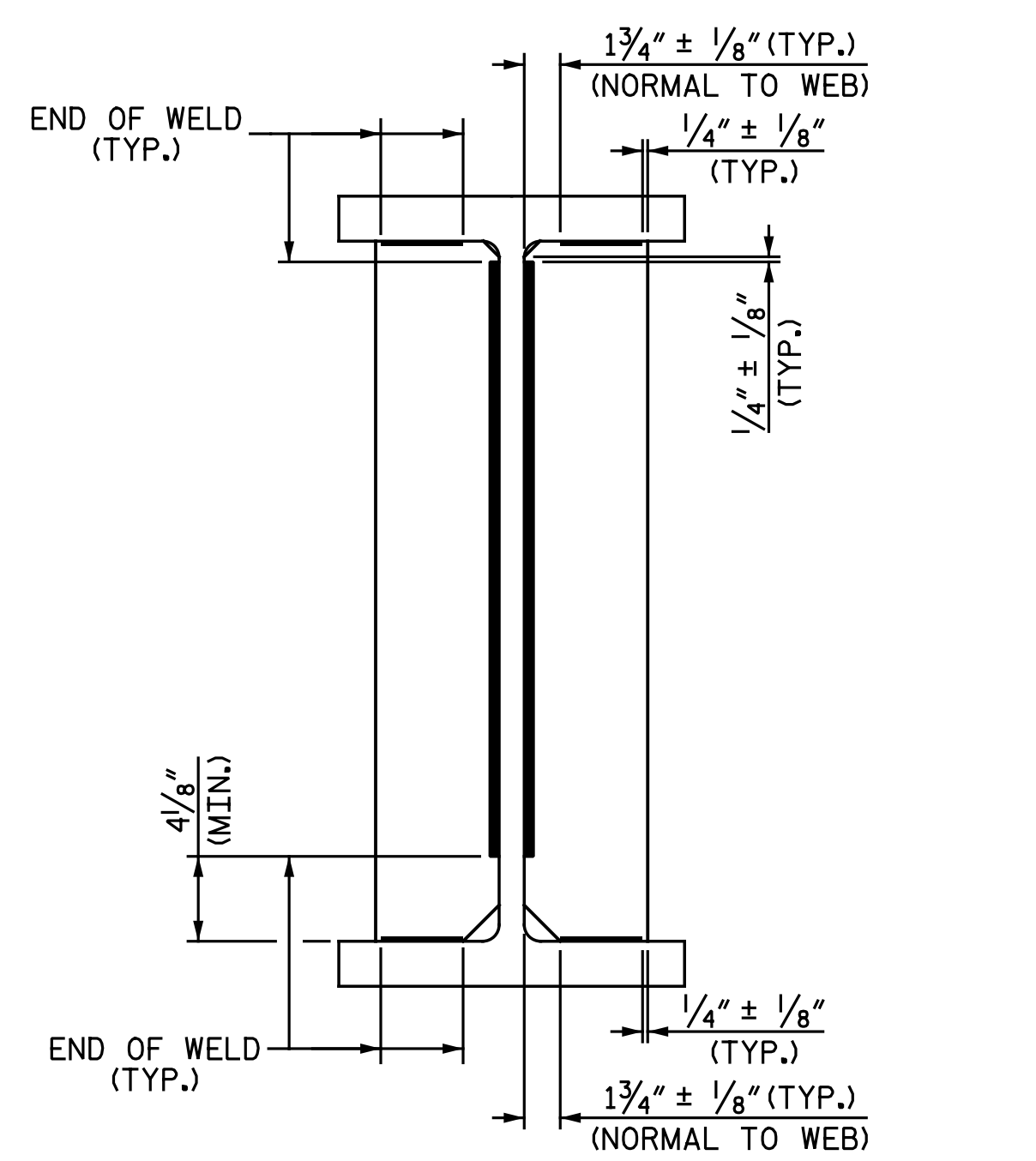


PLAN  
L6 x 6 x 1/2

DIAPHRAGM CONNECTOR DETAILS

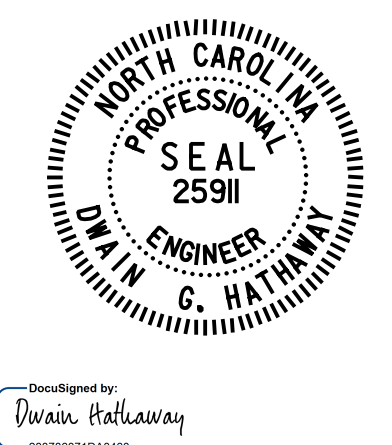


DETAIL E



WELD TERMINATION DETAILS  
(FILLET WELDS ONLY)

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-



**Michael Baker**  
INTERNATIONAL

Michael Baker Engineering  
8000 Regency Parkway, Suite 600  
Cary, North Carolina 27618  
NC License No.: F-1084

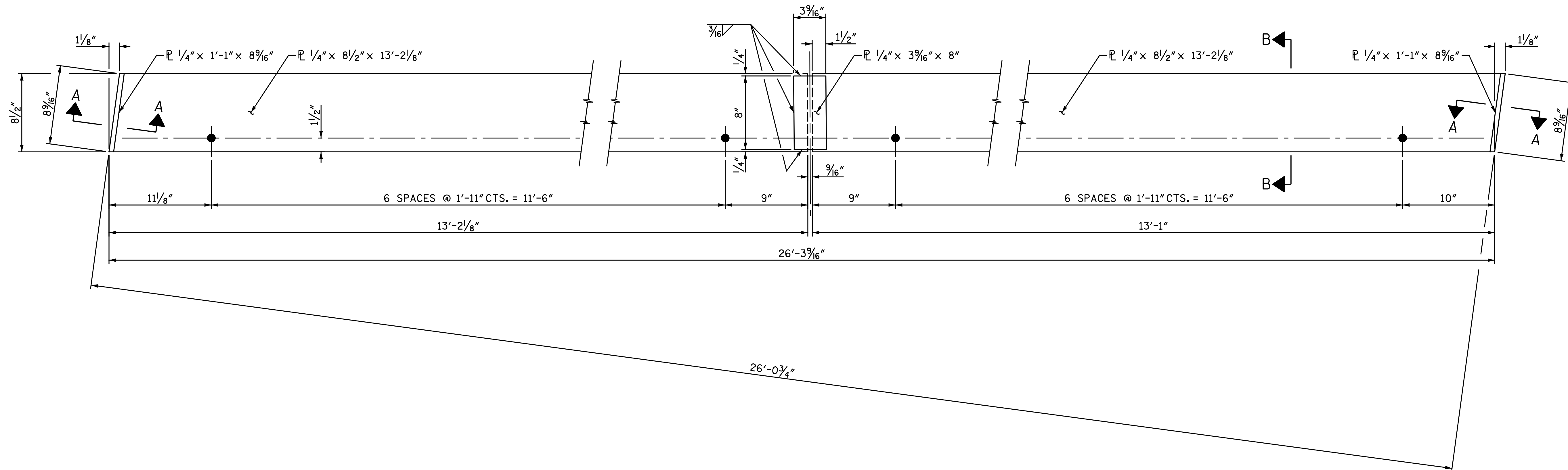
REVISIONS						SHEET NO. S4-22
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 68
2			4			

onayhew 5/3/2016 9:37:09 AM  
 Filename: Y:\Projects\NCDDOT\U-3308\Structures\Drawings\Final\404\_022\_U3308\_SMJL.DD.dgn

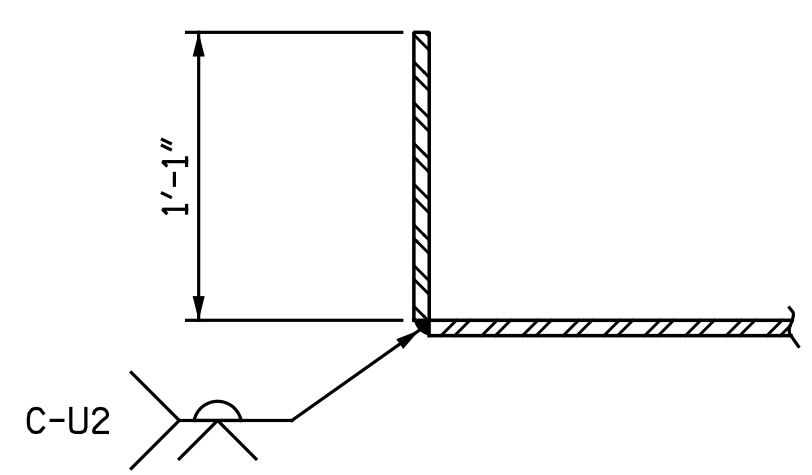
DRAWN BY: M. D. MAYHEW DATE: 12-18-13  
 CHECKED BY: S. A. DENNEY DATE: 12-31-13



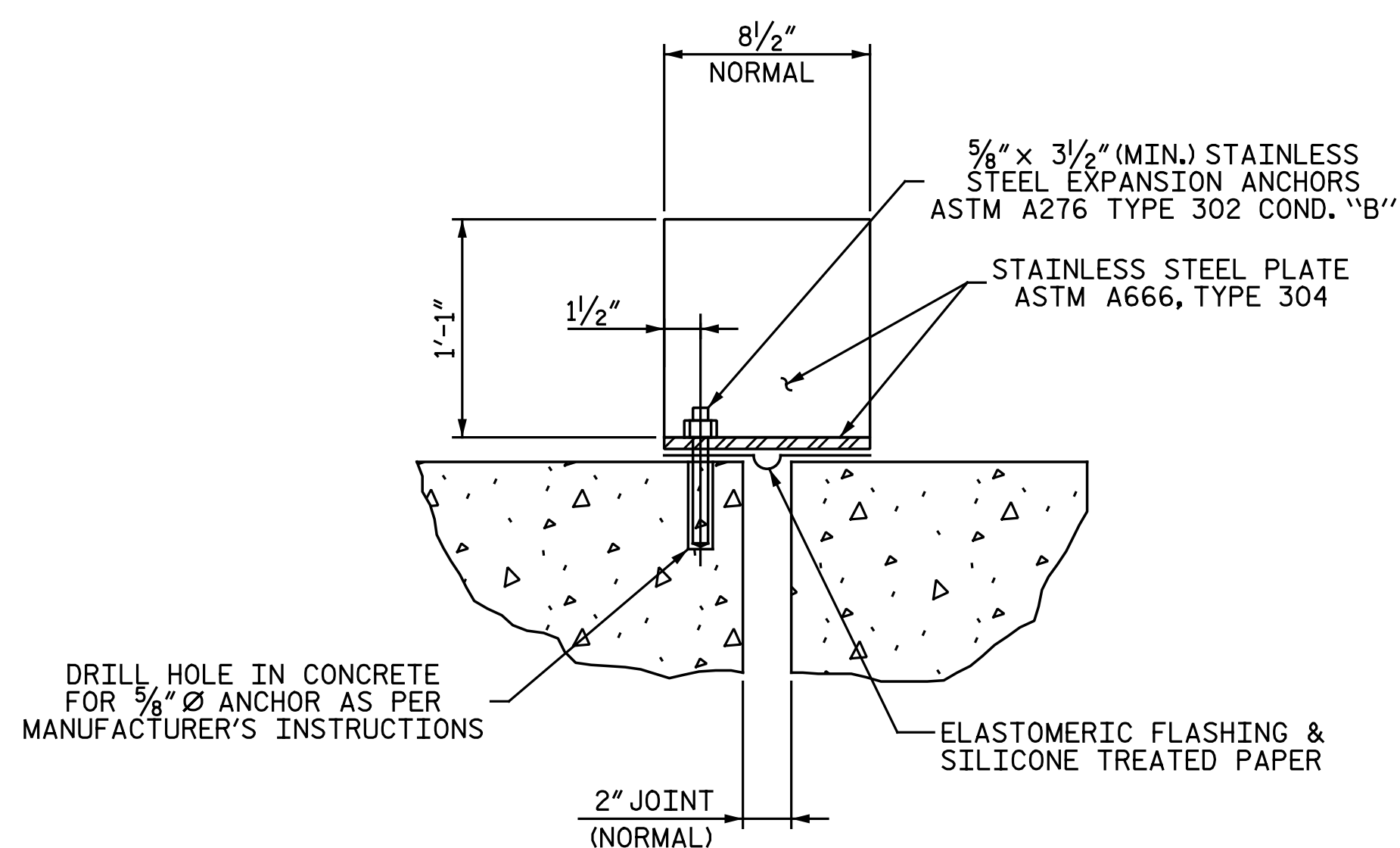




EXPANSION PLATE PLAN



SECTION A-A



SECTION B-B

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-



Designed by  
 Dwan Hathaway  
 202378007 (EXPIRES)

5/3/2016

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

EXPANSION PLATE  
 DETAILS

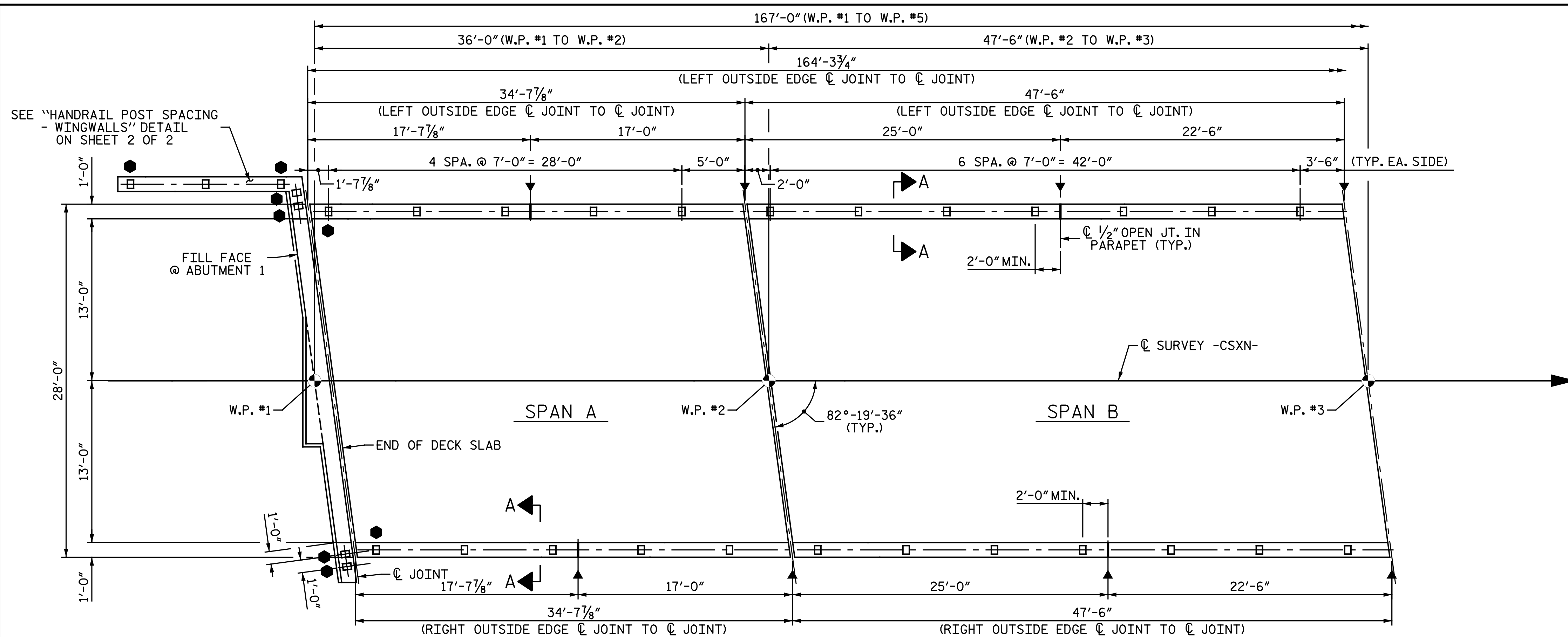
DRAWN BY : M. D. MAYHEW DATE : 1-7-14  
 CHECKED BY : S. A. DENNEY DATE : 3-4-14

**Michael Baker**  
 INTERNATIONAL

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No. : F-1084

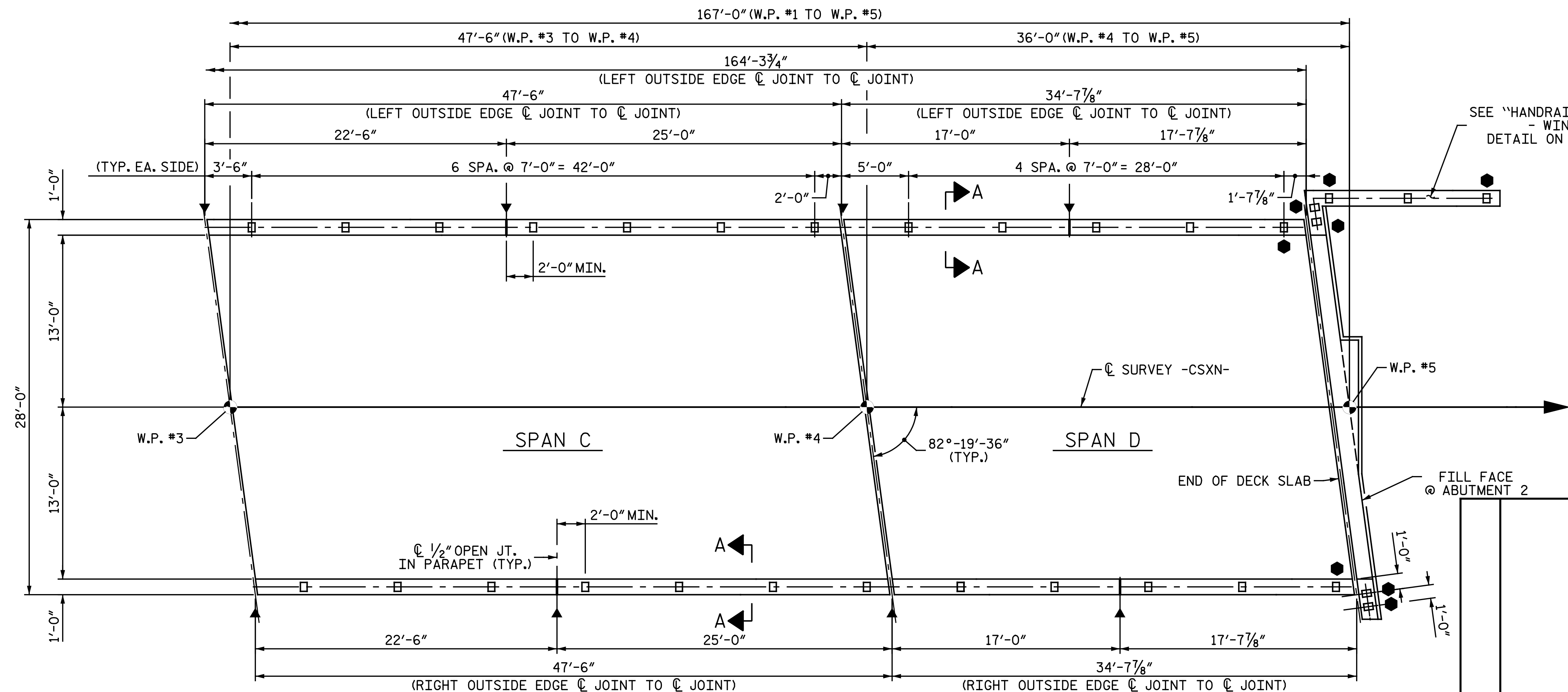
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-24
1			3			TOTAL SHEETS
2			4			68

cmayhew 5/3/2016 9:37:10 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_024\_U3308\_SML\_XPD.dgn



**HANDRAIL POST SPACING - SPANS A & B**  
RAIL NOT SHOWN FOR CLARITY

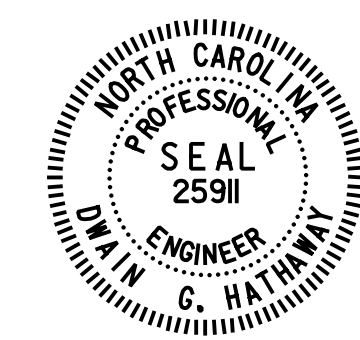
**NOTES:**  
 FOR DETAILS AND NOTES, SEE "HANDRAIL DETAILS" SHEET 2 OF 2.  
 FOR "SECTION A-A", SEE "HANDRAIL DETAILS" SHEET 2 OF 2.  
 ● INDICATES END POST REQUIRED AT THIS LOCATION. SEE "END POST DETAIL" ON SHEET 2 OF 2.  
 ▼ INDICATES RAIL EXPANSION JOINT (SPLICE GAP). SEE "RAIL EXPANSION JOINT DETAIL" ON SHEET 2 OF 2.



**HANDRAIL POST SPACING - SPANS C & D**  
RAIL NOT SHOWN FOR CLARITY

SEE "HANDRAIL POST-SPACING - WINGWALLS" DETAIL ON SHEET 2 OF 2

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 1 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**HANDRAIL AND POST SPACING**

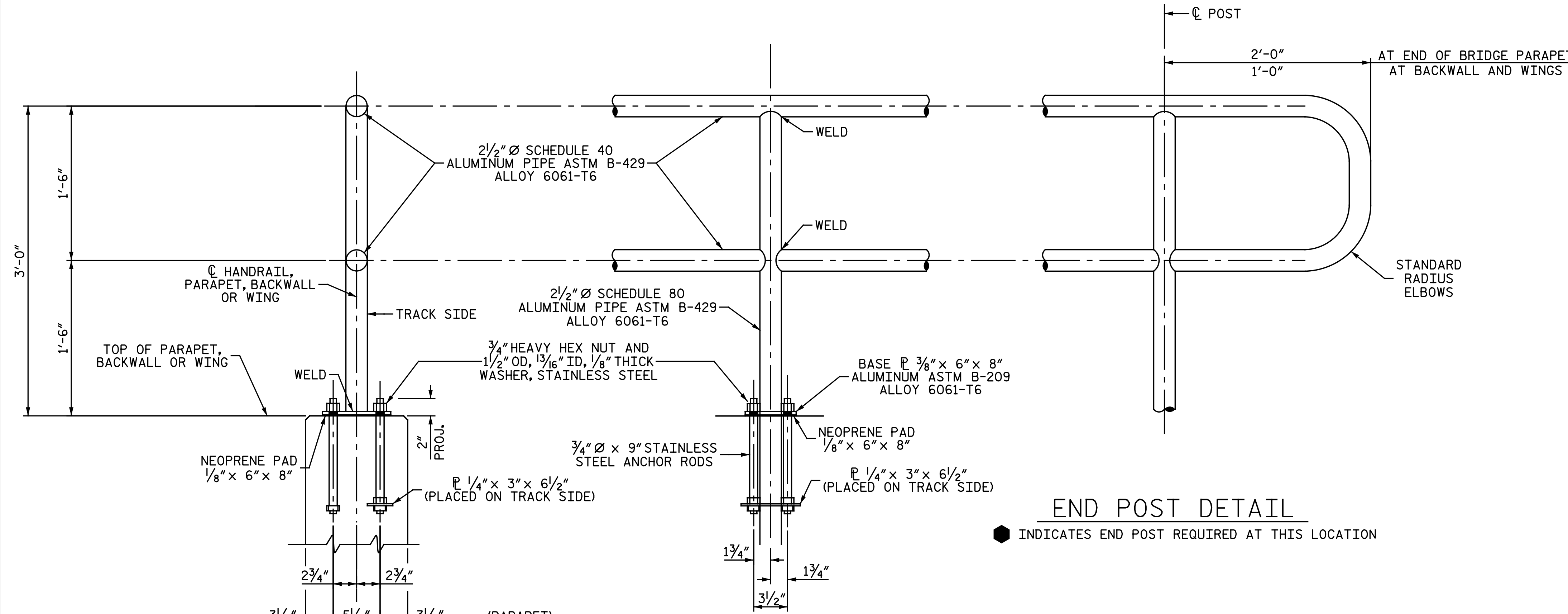
**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

REVISIONS						SHEET NO. S4-25
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 68
2			4			

5/3/2016 9:37:10 AM  
 Filename: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_025\_U3308\_SML\_RL01.dgn  
 omayhew

DRAWN BY: M. D. MAYHEW DATE: 1-2-14  
 CHECKED BY: S. A. DENNEY DATE: 2-25-14

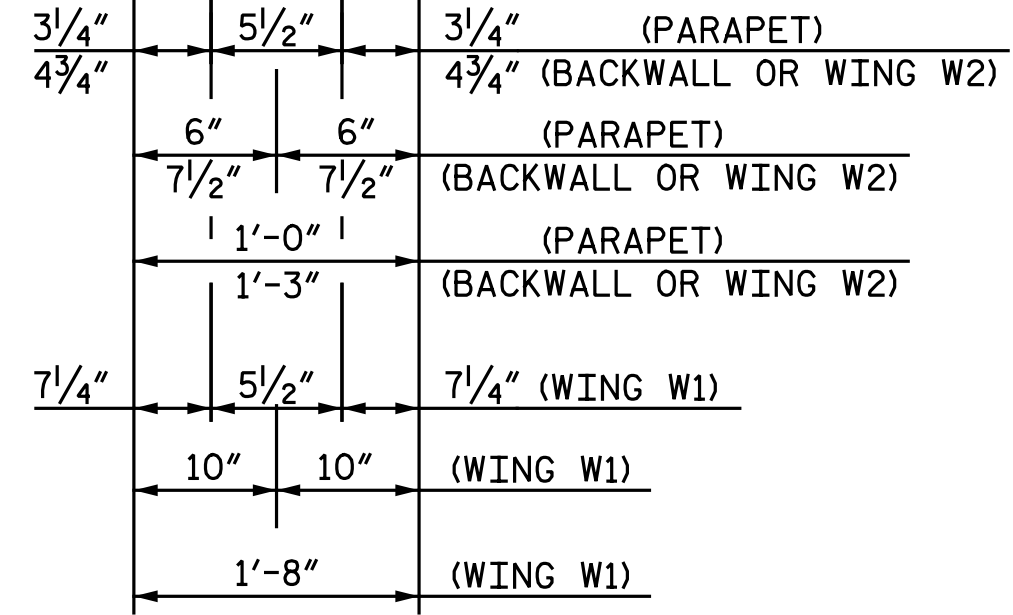


**END POST DETAIL**

● INDICATES END POST REQUIRED AT THIS LOCATION

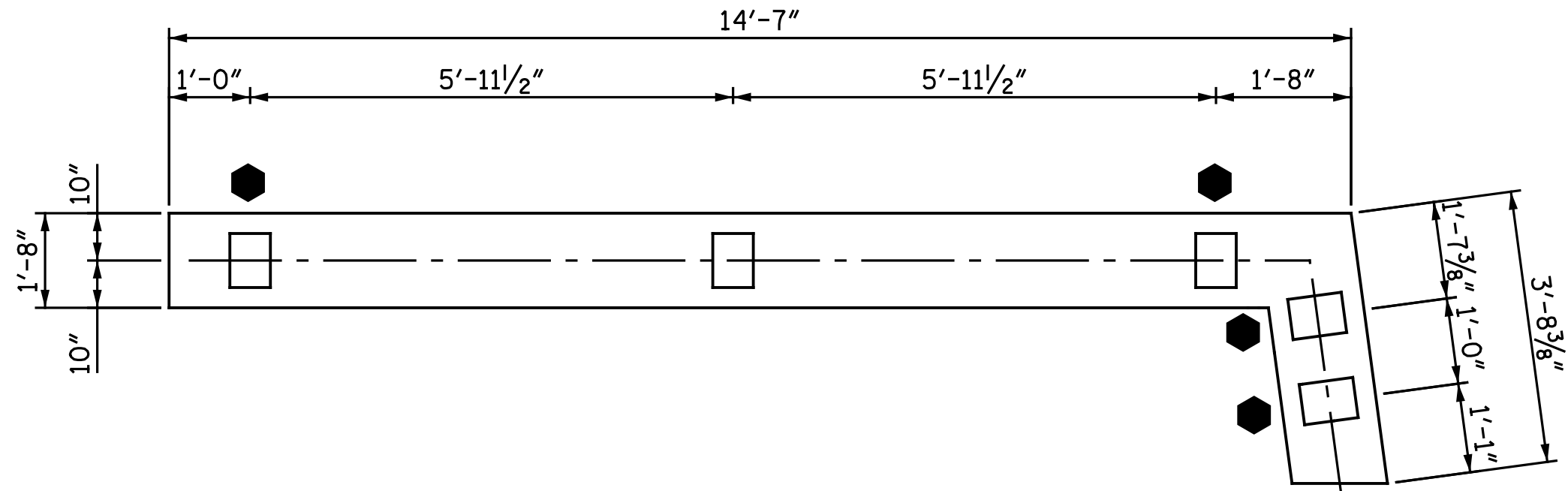
**NOTES:**

- JOINTS IN RAILING (SPLICE GAP) SHALL BE LOCATED AS SHOWN IN HANDRAIL AND POST SPACING PLAN.
- ALUMINUM PIPE TO BE ASTM B-429, ALLOY 6061-T6 AND BASE PLATE TO BE ASTM B-209, ALLOY 6061-T6.
- STAINLESS STEEL BOLTS, CAP SCREWS, AND NUTS TO BE ASTM A-276 TYPE 304. STAINLESS STEEL WASHERS TO BE ASTM A-276 TYPE 302.
- POSTS TO BE SET PERPENDICULAR TO TOP OF PARAPET AND RAILS SHALL BE PLACED PARALLEL TO THE GRADE OF THE BRIDGE.
- CERTIFIED MILL REPORTS ARE REQUIRED FOR RAIL AND POSTS. SHOP INSPECTIONS ARE NOT REQUIRED.
- AFTER ANCHOR ROD NUTS HAVE BEEN TIGHTENED, THREADS SHALL BE NICKED TO LOCK NUTS.
- CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY AT HIS OPTION HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.
- ANCHOR PLATES SHALL BE STEEL CONFORMING TO ASTM SPECIFICATION A36.
- ANCHOR RODS SHALL CONFORM TO ASTM SPECIFICATION A276 TYPE 302 OR 304, STAINLESS STEEL AND THREADS SHALL BE ROLLED, NOT CUT.
- UPPER ANCHOR ROD NUTS SHALL BE HEAVY HEX NUTS, PER ASTM A276 TYPE 302 OR 304 STAINLESS STEEL.
- LOWER ANCHOR ROD NUTS SHALL BE HEAVY HEX STEEL NUTS, PER ASTM A563.
- THE CENTERLINE OF ANY SPLICE AND/OR EXPANSION JOINT IS TO BE LOCATED AT LEAST 2'-0" AWAY FROM CENTERLINE OF POST. EXPANSION AND/OR SPLICE JOINTS FOR EACH RAIL OF TWO RAILINGS ARE TO BE PLACED IN THE SAME LOCATION AND IN THE SAME PANEL.
- WELDING SHALL BE IN ACCORDANCE WITH THE CURRENT AWS STRUCTURAL WELDING CODE - ALUMINUM.
- THE LENGTH OF METAL RAIL TO BE PAID FOR SHALL BE THE CONTINUOUS LENGTH MEASURED FROM END TO END OF RAIL, ALONG THE TOP RAIL.
- SHOP DRAWINGS SHALL BE REQUIRED.
- FOR METAL HANDRAIL, SEE SPECIAL PROVISIONS.
- LENGTH = 369.80 LIN. FT.

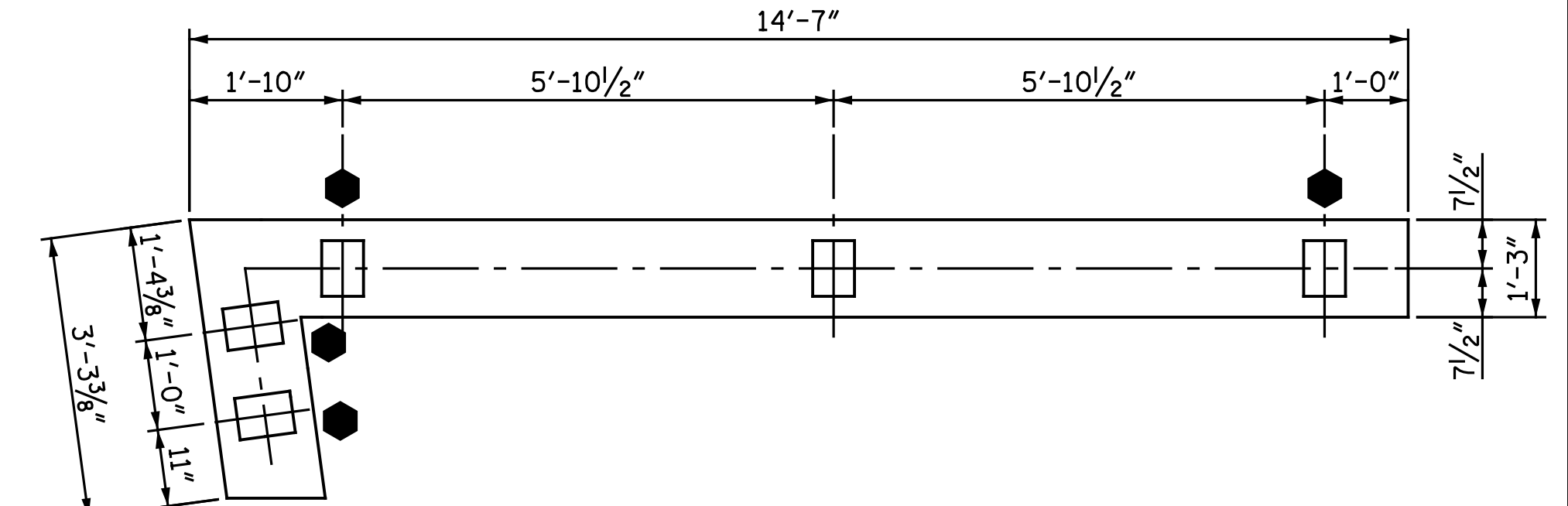


**SECTION A-A**

**FRONT VIEW**

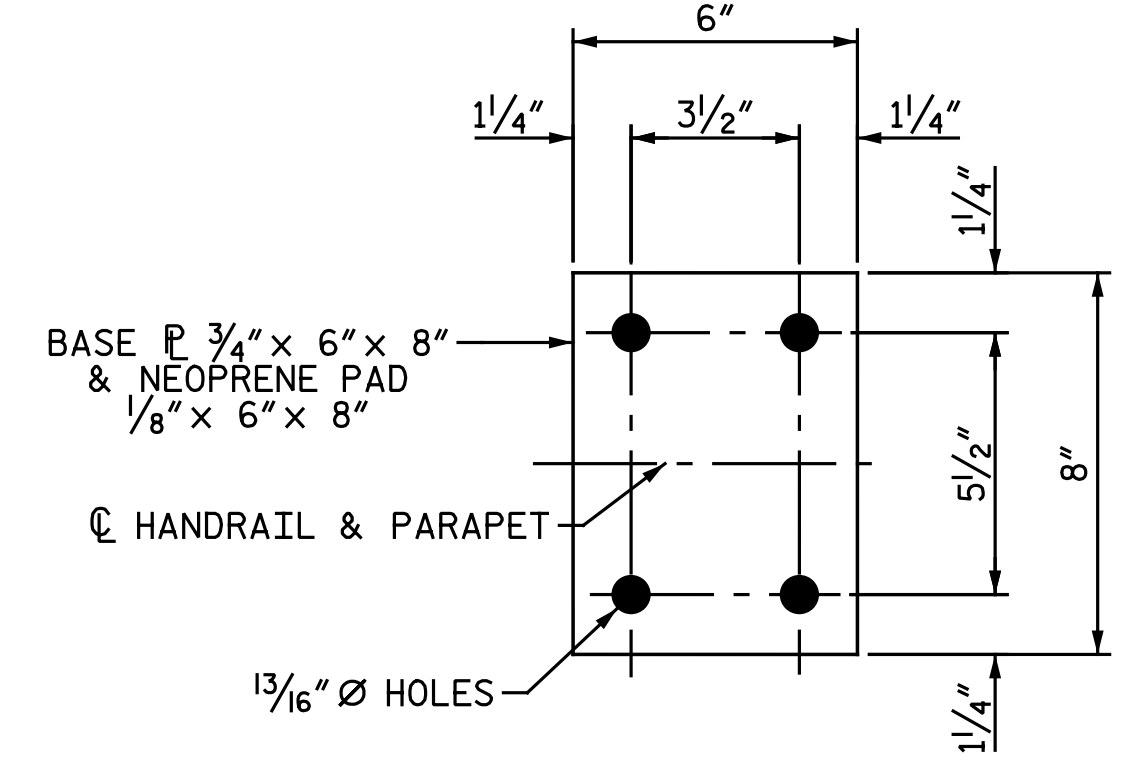


**HANDRAIL DETAIL WING W1**

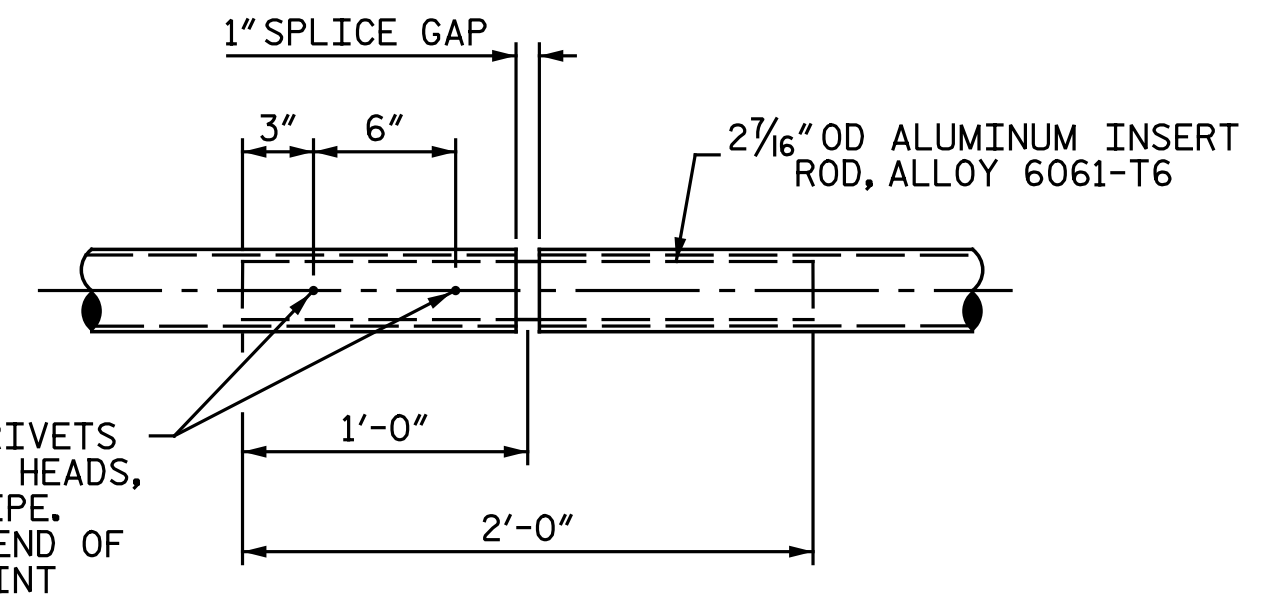


**HANDRAIL DETAIL WING W2**

**HANDRAIL POST SPACING - WINGWALLS**



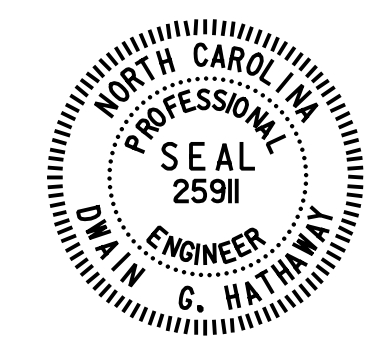
**BASE PLATE & NEOPRENE PAD DETAIL**



**RAIL EXPANSION JOINT DETAIL**

(TYPICAL 14 PLACES)

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 2 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**HANDRAIL DETAILS**



Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-26
1			3			TOTAL SHEETS
2			4			68

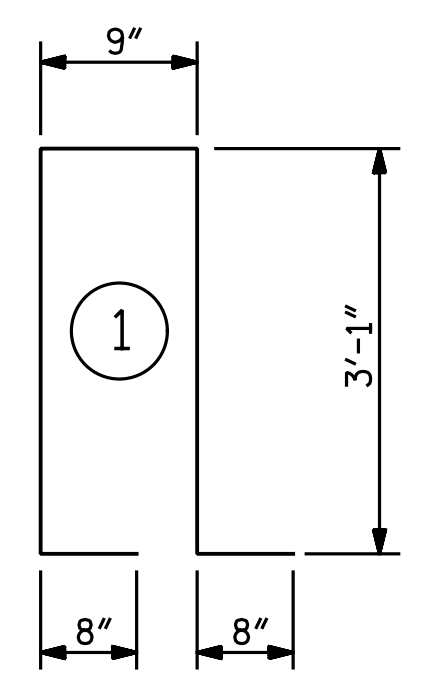
5/3/2016 9:37:11 AM  
 File Name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_026\_U3308\_SMU\_RL02.dgn

DRAWN BY: M. D. MAYHEW DATE: 1-8-14  
 CHECKED BY: S. A. DENNEY DATE: 3-3-14

### REINFORCING STEEL SCHEDULE

SPAN A						SPAN B						SPAN C						SPAN D									
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		BAR NO.	SIZE	TYPE	LENGTH	WEIGHT		BAR NO.	SIZE	TYPE	LENGTH	WEIGHT					
A1	106	6	STR	27' - 8"	4,405	A1	150	6	STR	27' - 8"	6,233	A1	150	6	STR	27' - 8"	6,233	A1	106	6	STR	27' - 8"	4,405				
A2	4	6	STR	23' - 8"	142	A2	4	6	STR	23' - 8"	142	A2	4	6	STR	23' - 8"	142	A2	4	6	STR	23' - 8"	142				
A3	4	6	STR	19' - 4"	116	A3	4	6	STR	19' - 4"	116	A3	4	6	STR	19' - 4"	116	A3	4	6	STR	19' - 4"	116				
A4	4	6	STR	15' - 0"	90	A4	4	6	STR	15' - 0"	90	A4	4	6	STR	15' - 0"	90	A4	4	6	STR	15' - 0"	90				
A5	4	6	STR	10' - 8"	64	A5	4	6	STR	10' - 8"	64	A5	4	6	STR	10' - 8"	64	A5	4	6	STR	10' - 8"	64				
A6	4	6	STR	6' - 4"	38	A6	4	6	STR	6' - 4"	38	A6	4	6	STR	6' - 4"	38	A6	4	6	STR	6' - 4"	38				
A7	4	6	STR	2' - 7"	16	A7	4	6	STR	2' - 7"	16	A7	4	6	STR	2' - 7"	16	A7	4	6	STR	2' - 7"	16				
A8	8	6	STR	27' - 11"	335	A8	8	6	STR	27' - 11"	335	A8	8	6	STR	27' - 11"	335	A8	8	6	STR	27' - 11"	335				
B1	138	4	STR	18' - 1"	1,667	B2	138	4	STR	24' - 6"	2,259	B2	138	4	STR	24' - 6"	2,259	B1	138	4	STR	18' - 1"	1,667				
B3	12	5	STR	17' - 1"	214	B5	12	5	STR	24' - 5"	306	B7	12	5	STR	21' - 11"	274	B9	12	5	STR	16' - 5"	205				
B4	12	5	STR	16' - 7"	208	B6	12	5	STR	22' - 1"	276	B8	12	5	STR	24' - 7"	308	B10	12	5	STR	17' - 3"	216				
S1	68	5	1	8' - 3"	585	S1	94	5	1	8' - 3"	809	S1	94	5	1	8' - 3"	809	S1	68	5	1	8' - 3"	585				
EPOXY COATED REINF. STEEL					LBS.	7,880	EPOXY COATED REINF. STEEL					LBS.	10,684	EPOXY COATED REINF. STEEL					LBS.	10,684	EPOXY COATED REINF. STEEL					LBS.	7,879

### BAR TYPES



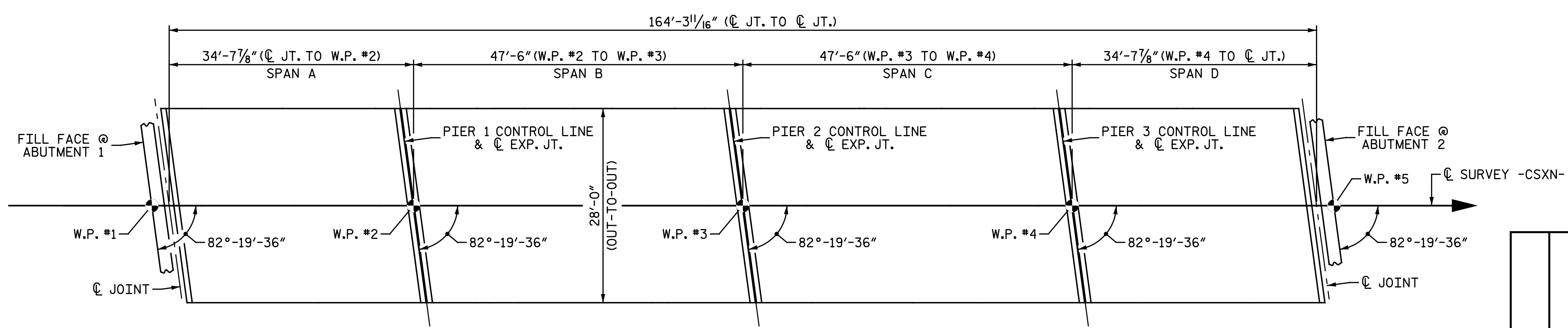
ALL BAR DIMENSIONS ARE OUT TO OUT

### SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE		EPOXY COATED REINFORCING STEEL (LBS.)
	(CU.YDS.)		
	DECK SLAB	PARAPETS	
SPAN "A"	30.1	6.8	7,880
SPAN "B"	41.2	9.3	10,684
SPAN "C"	41.2	9.3	10,684
SPAN "D"	30.1	6.8	7,879
TOTALS	142.6	32.2	37,127

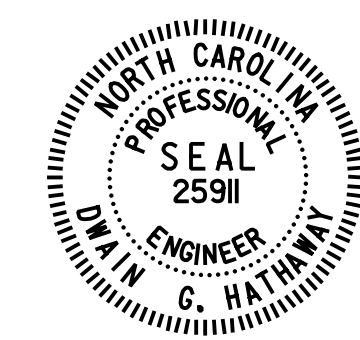
### SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 4,601)

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
 13+22.18 -CSXN-



Disseminated by Dwan Hathaway

5/3/2016

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 BILL OF MATERIAL

**Michael Baker INTERNATIONAL**

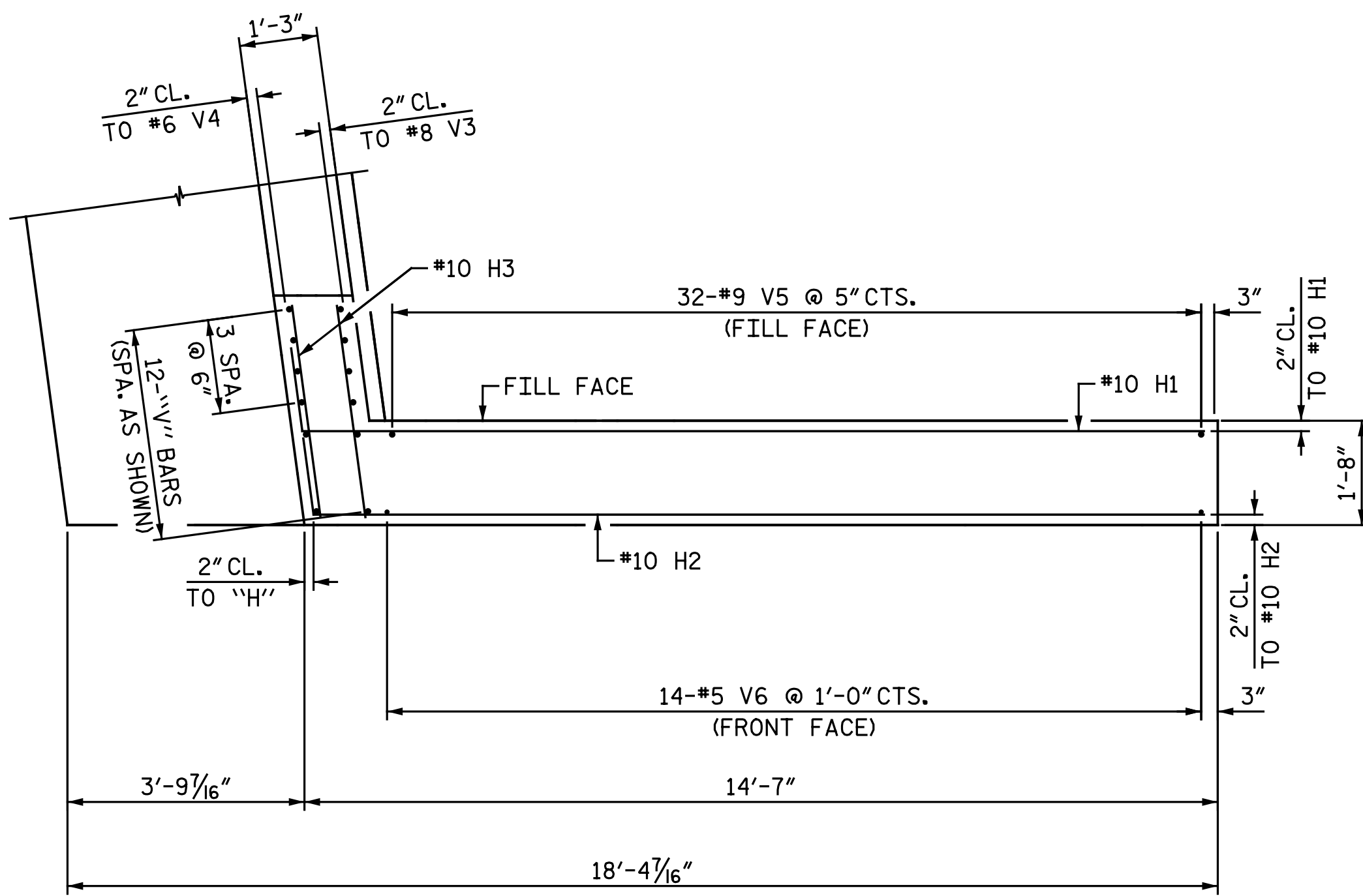
Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

REVISIONS						SHEET NO. S4-27
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 68
2			4			

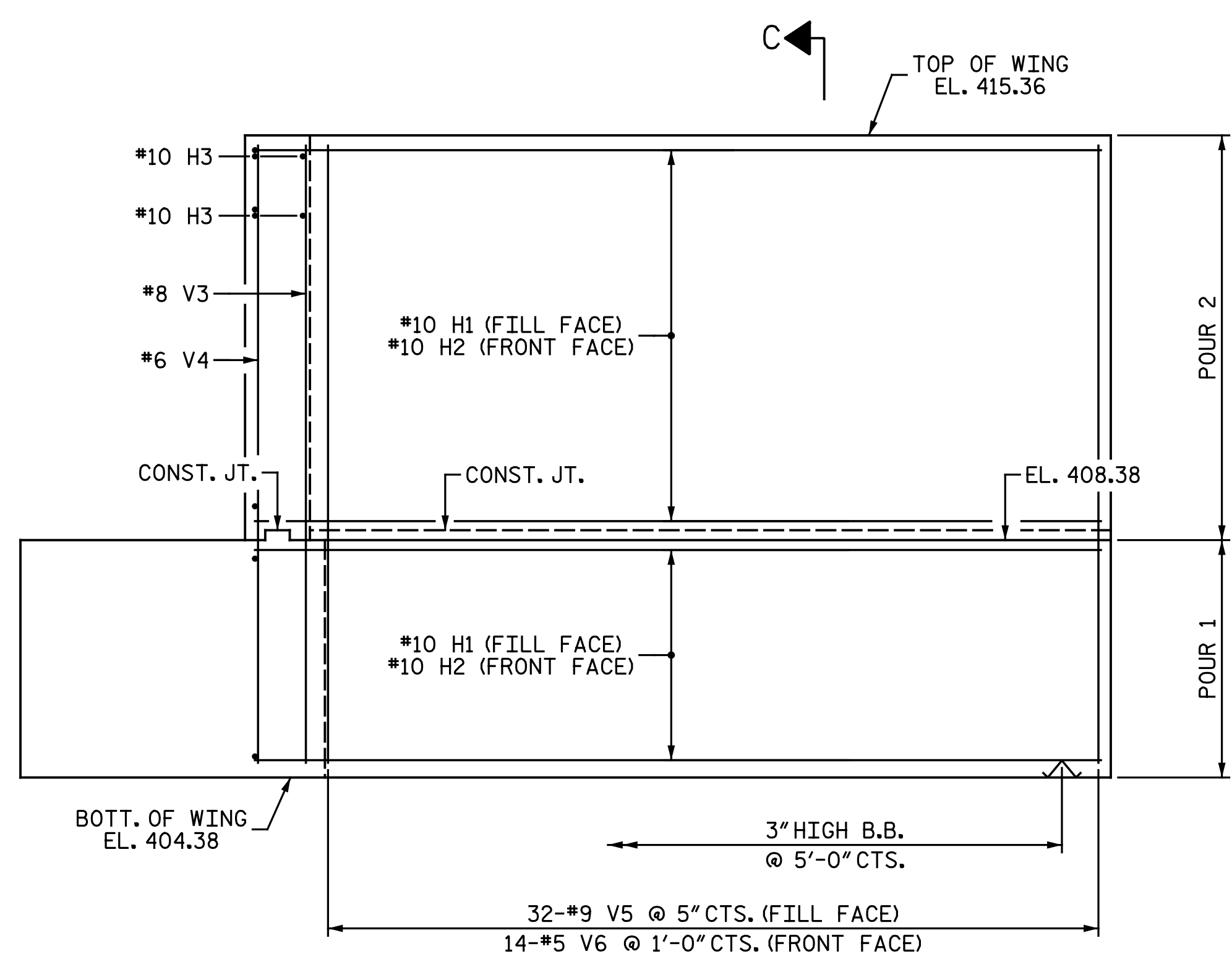
5/3/2016 9:37:12 AM  
 File Name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_027\_U3308\_SMLBOM.dgn

DRAWN BY: M. D. MAYHEW DATE: 3-4-14  
 CHECKED BY: S. A. DENNEY DATE: 3-17-14

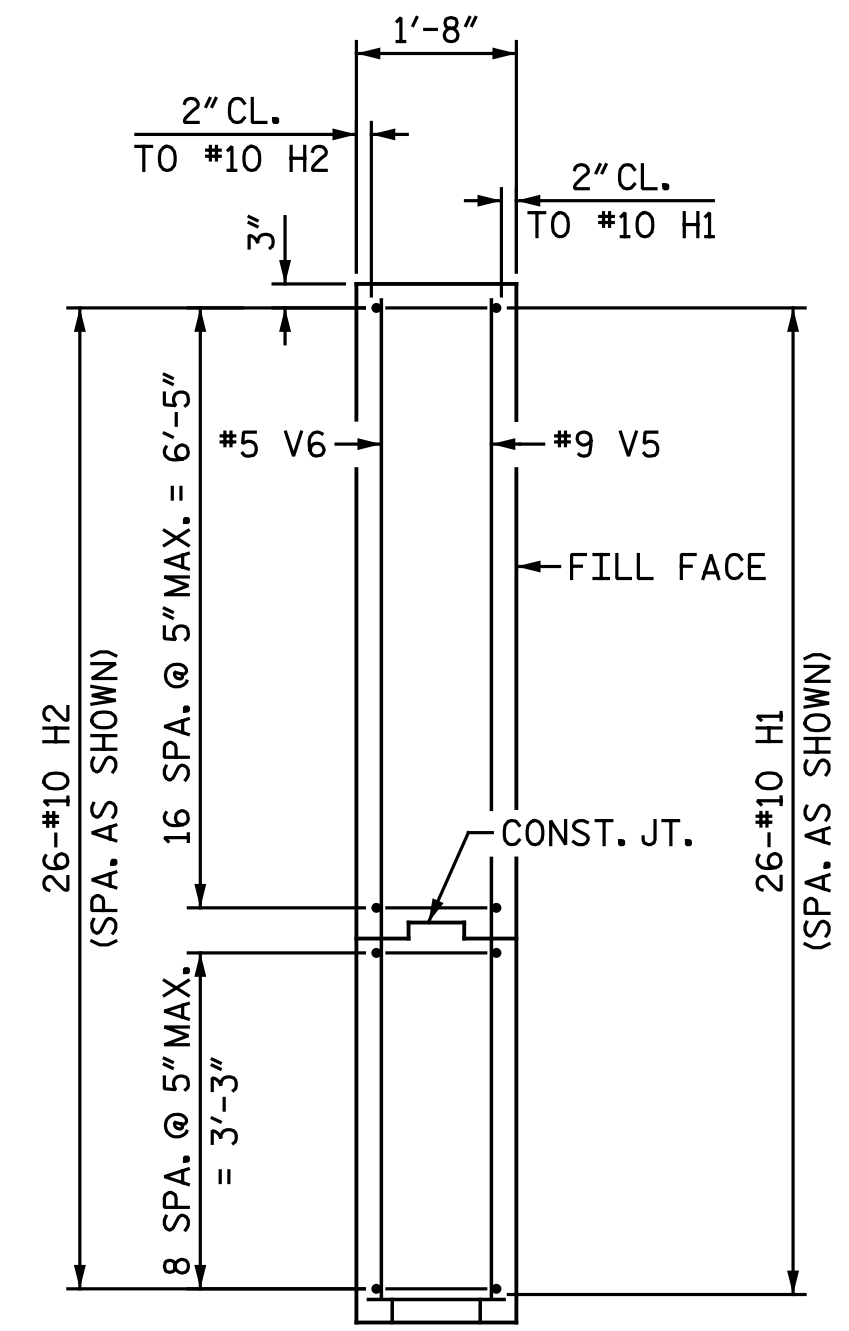




PLAN OF WING WALL (W1)

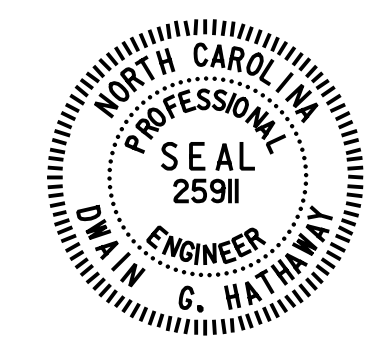


ELEVATION OF WING WALL (W1)



SECTION C-C

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
 13+22.18 -CSXN-  
 SHEET 2 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 ABUTMENT I

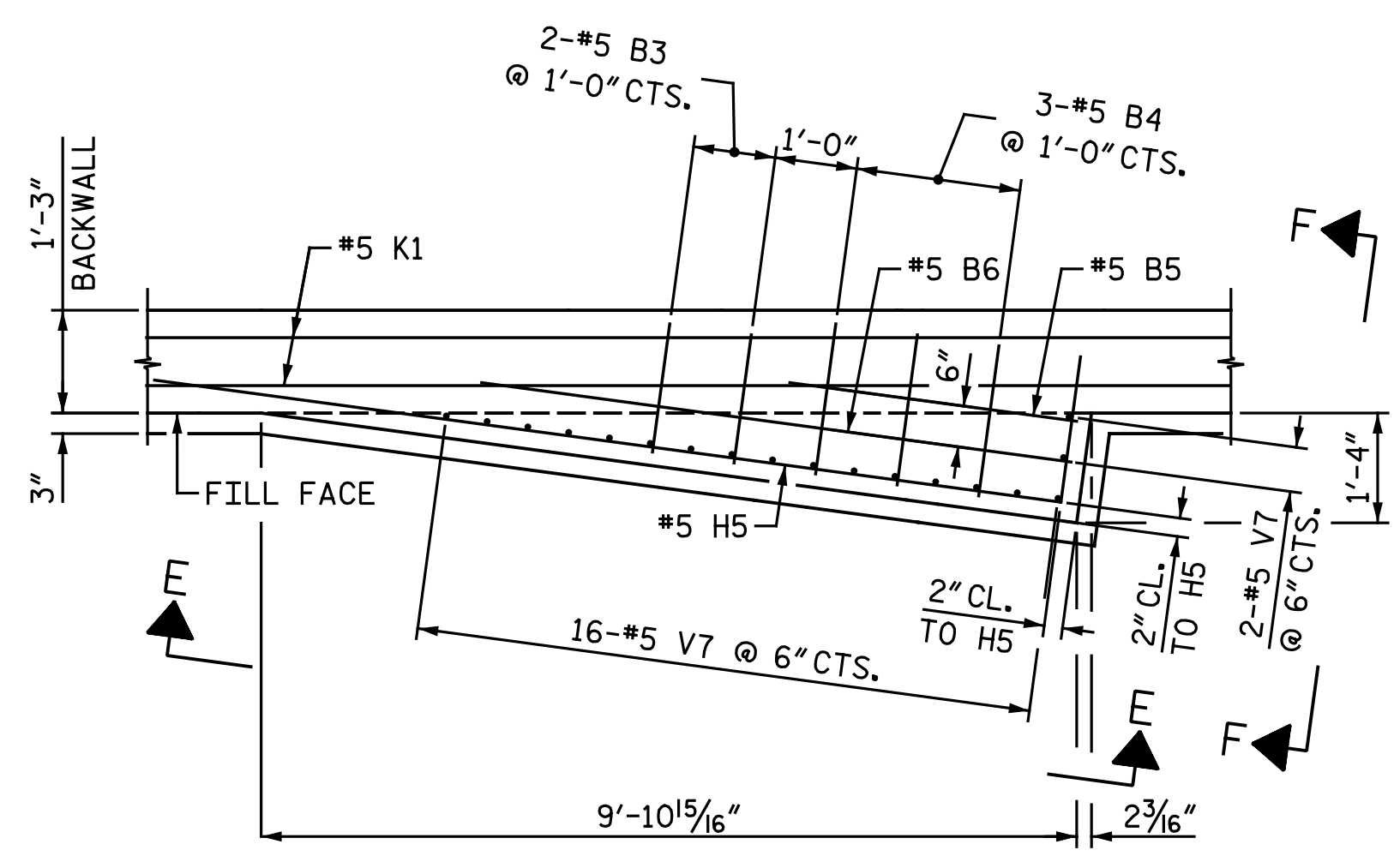
**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

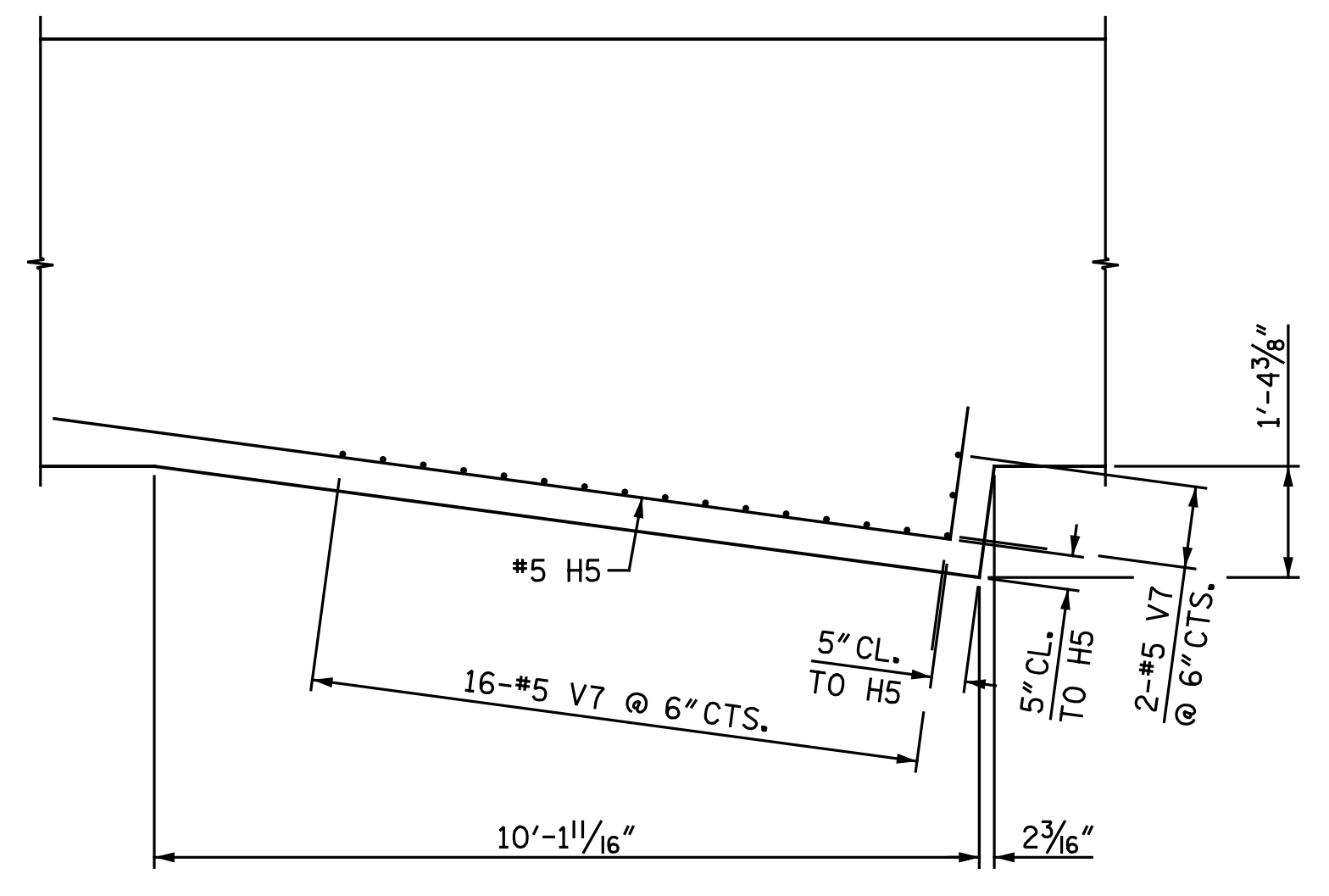
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-29
1			3			TOTAL SHEETS
2			4			68

cmayhew 5/3/2016 9:37:14 AM  
 File Name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_029\_U3308\_SML-AB102.dgn

DRAWN BY: M. D. MAYHEW DATE: 3-6-14  
 CHECKED BY: S. A. DENNEY DATE: 3-11-14

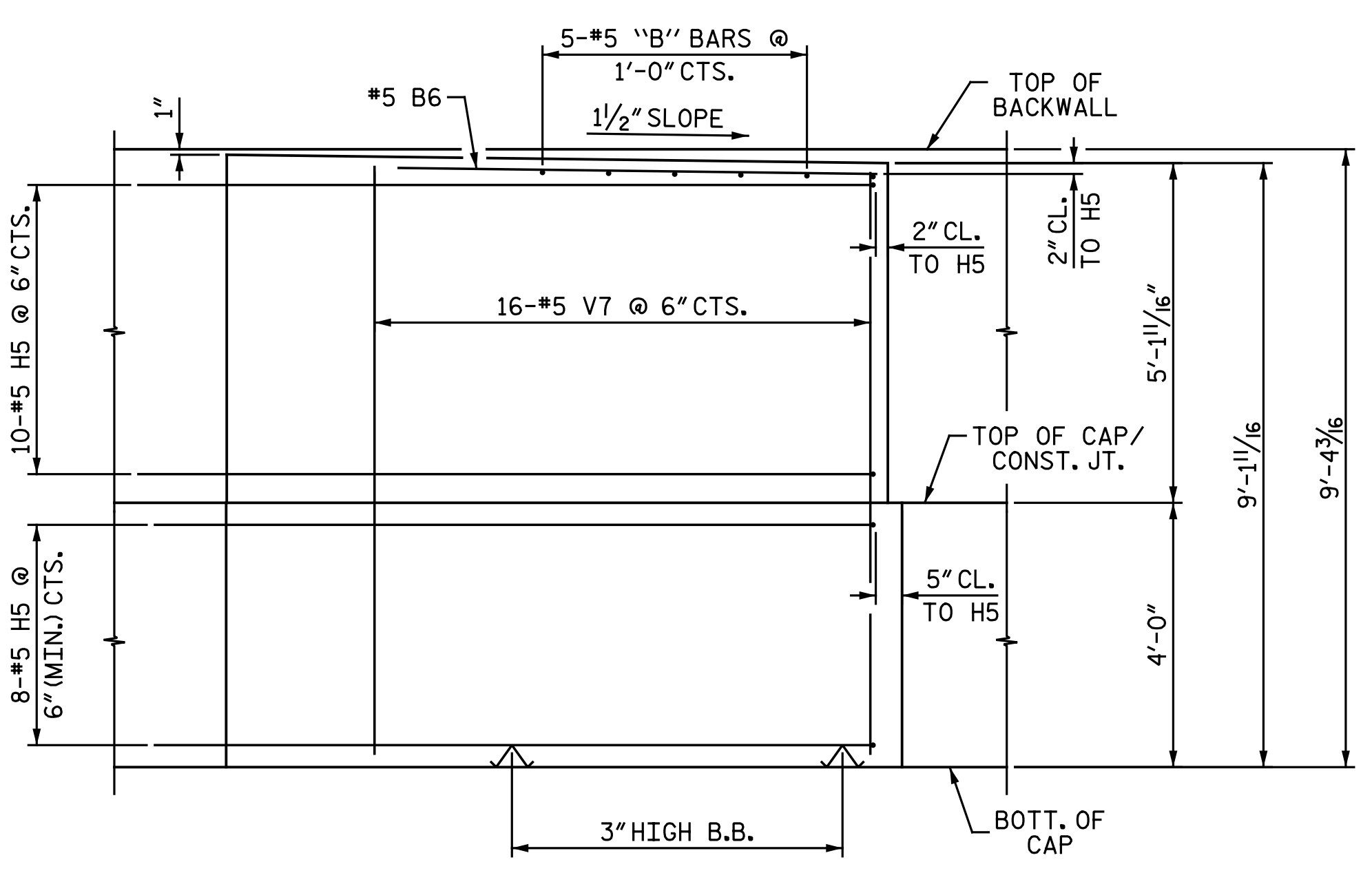


PLAN - BACKWALL EXTENSION DETAIL

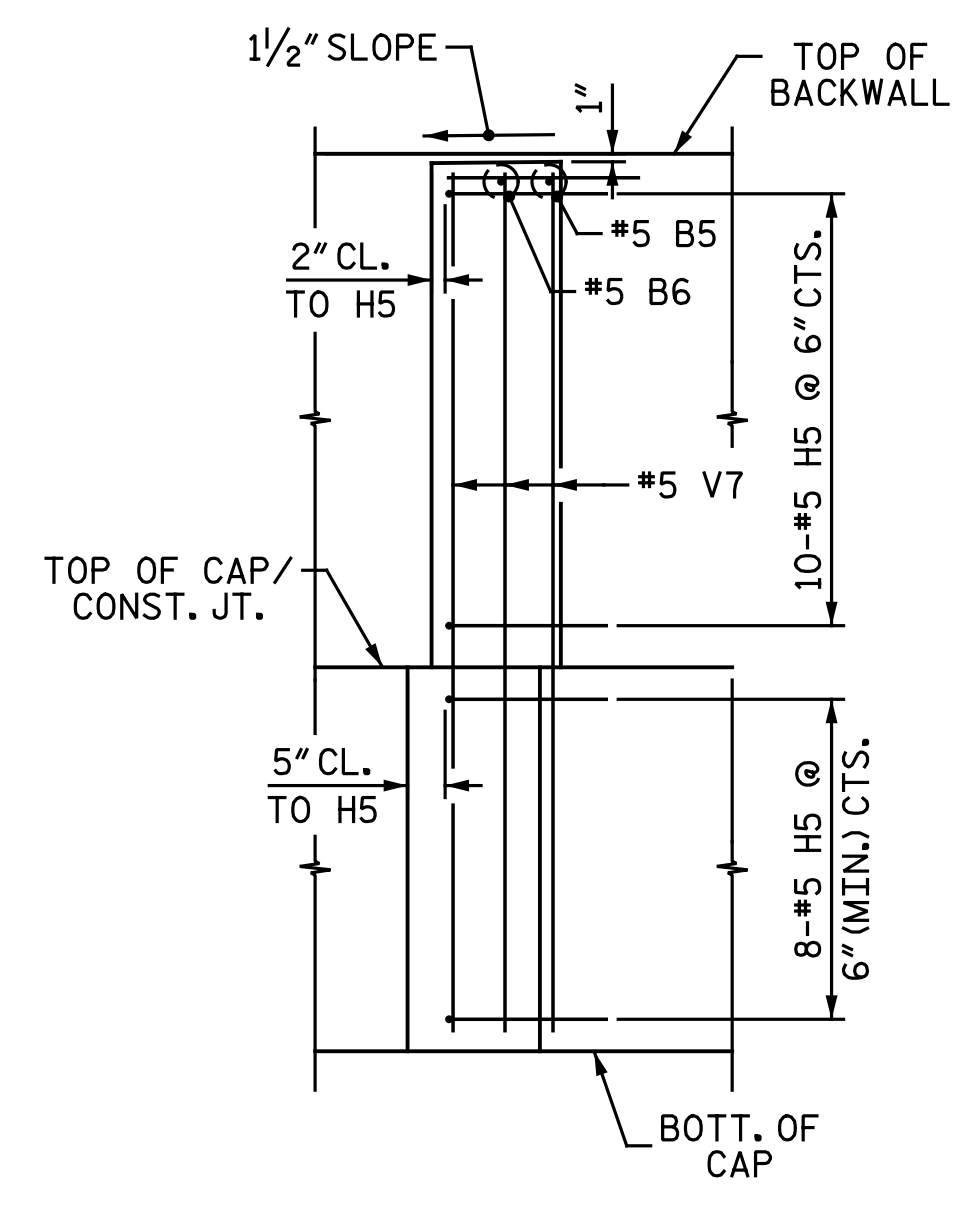


PLAN - CAP EXTENSION DETAIL

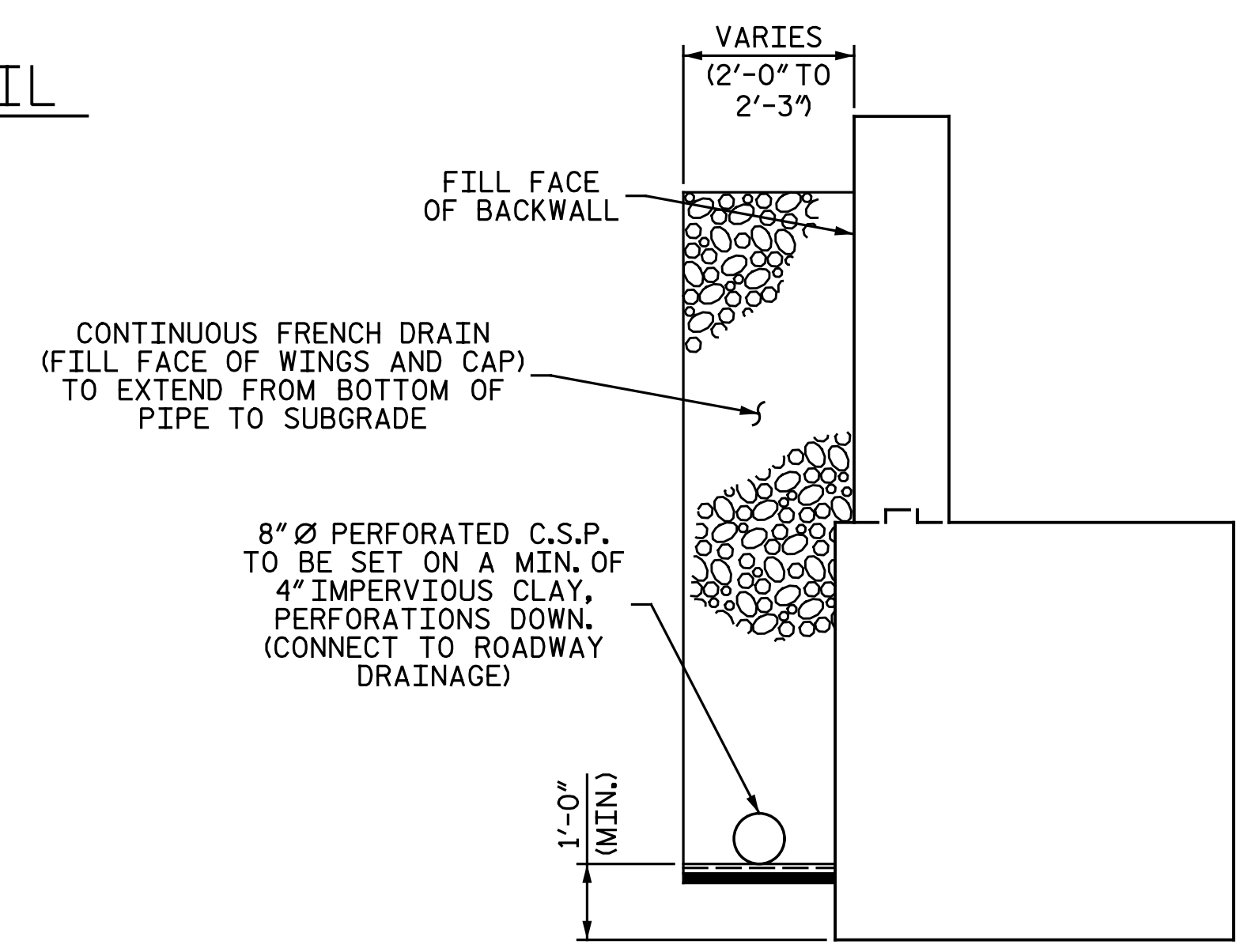
NOTE: BACKWALL NOT SHOWN FOR CLARITY



VIEW E-E

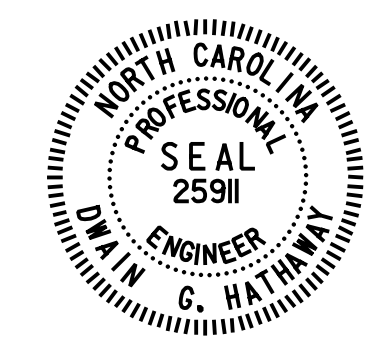


VIEW F-F



DRAINAGE AT ABUTMENT 1

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
 13+22.18 -CSXN-  
 SHEET 3 OF 4



Disseminated by  
 Dorian Hathaway  
 5/3/2016

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 ABUTMENT 1

**Michael Baker**  
 INTERNATIONAL

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

REVISIONS						SHEET NO. S4-30
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 68
2			4			

cmayhew 5/3/2016 9:37:14 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_030\_U3308\_SMU-AB103.dgn

DRAWN BY : M. D. MAYHEW DATE : 3-6-14  
 CHECKED BY : S. A. DENNEY DATE : 3-11-14

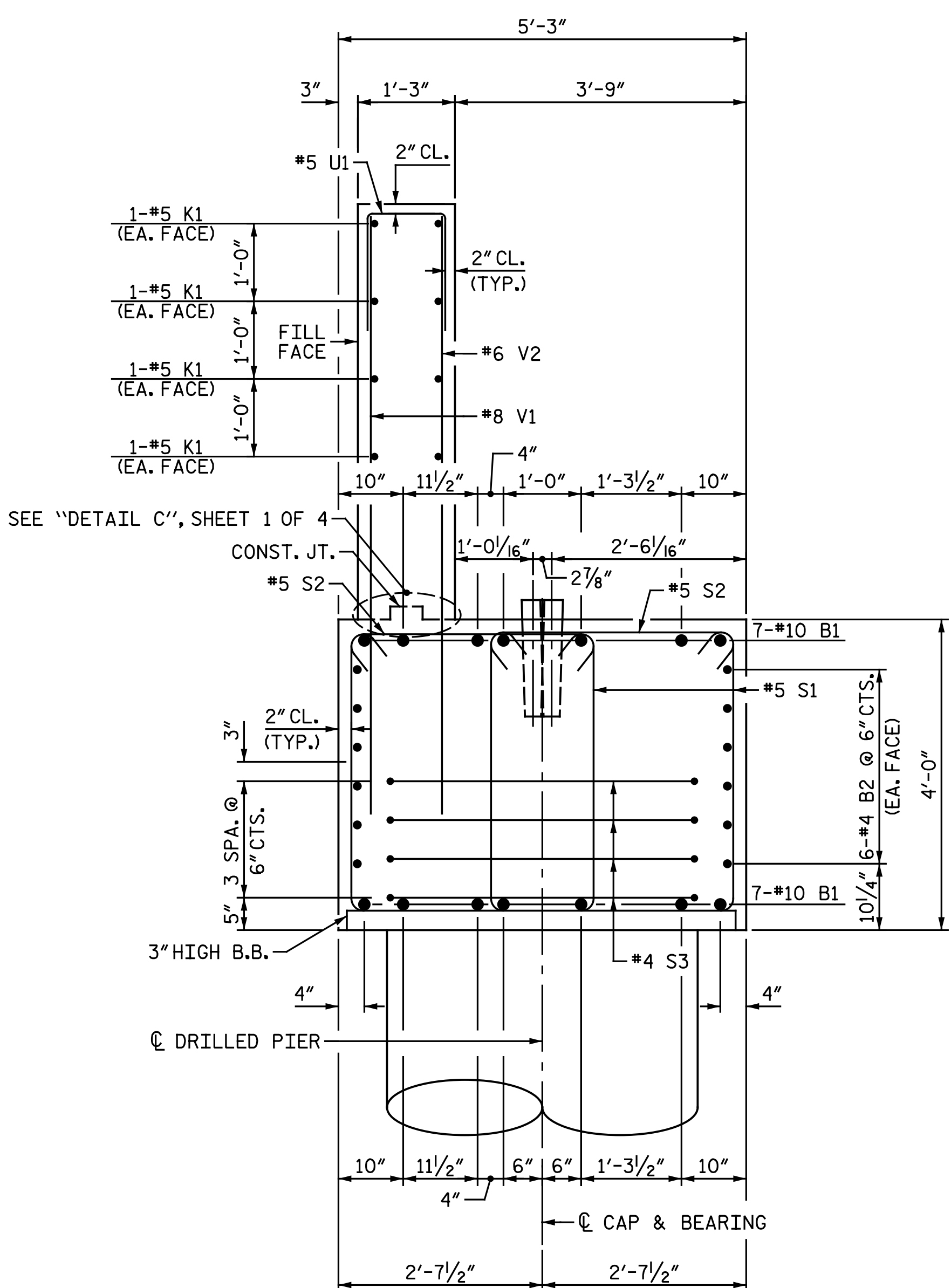
**NOTES:**

BACKWALL SHALL BE PLACED BEFORE APPLYING EPOXY PROTECTIVE COATING.

THE TOP SURFACE AREAS OF THE ABUTMENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

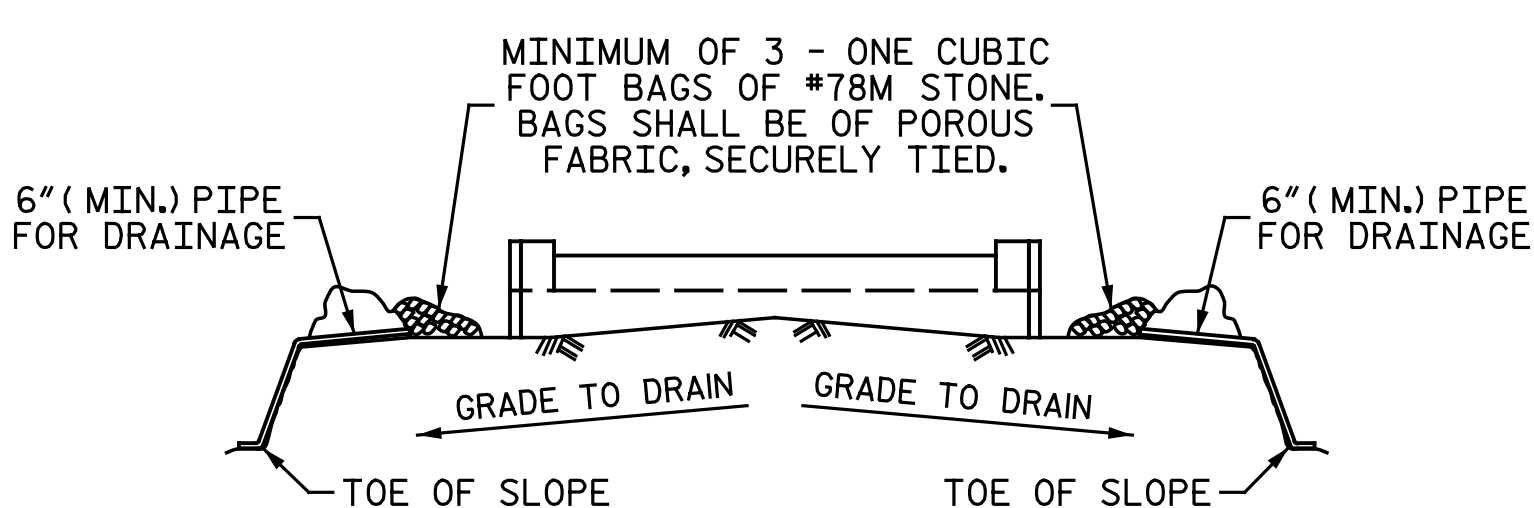
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".



**SECTION A-A**

DRILLED SHAFT REINFORCEMENT NOT SHOWN FOR CLARITY.

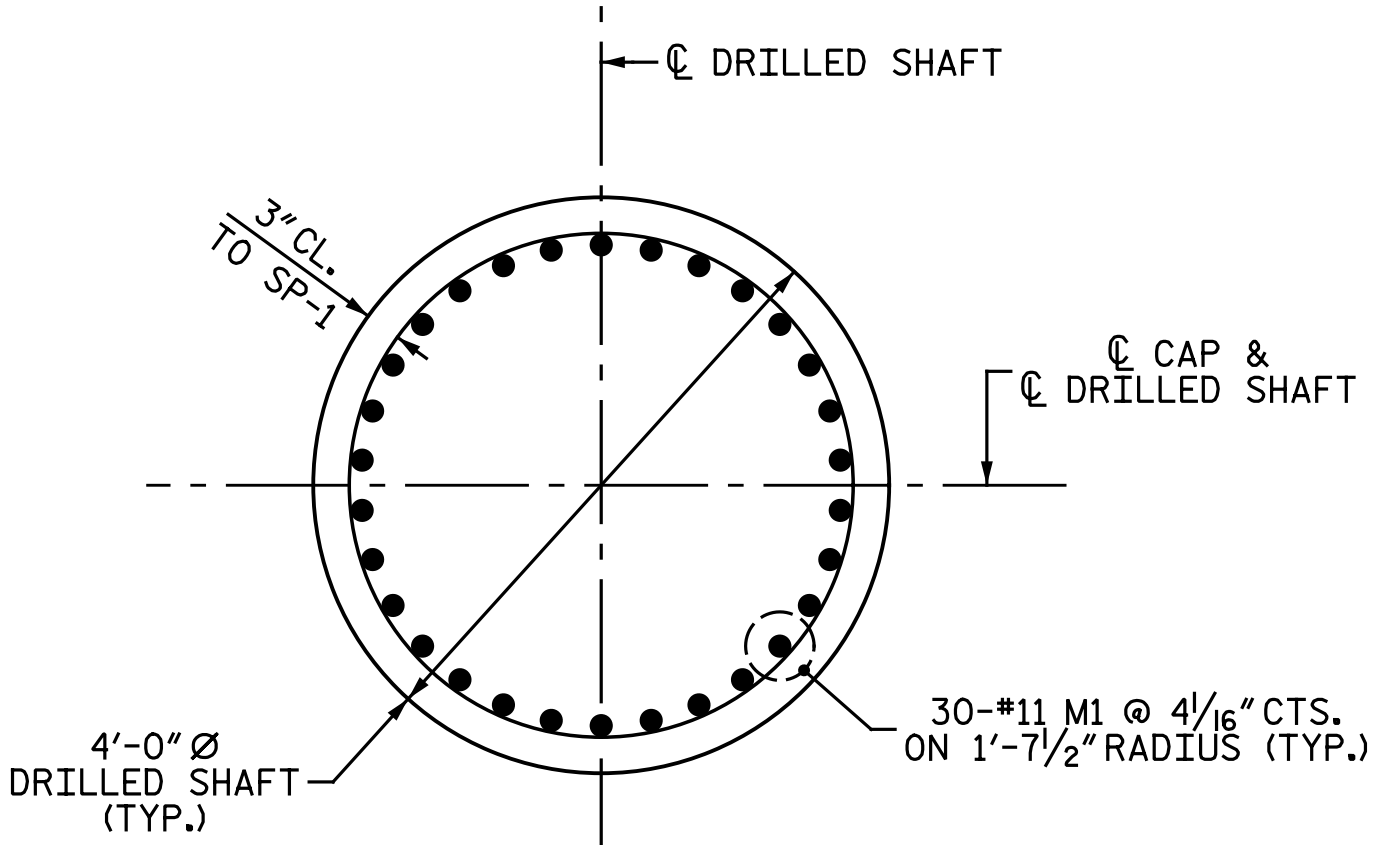


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

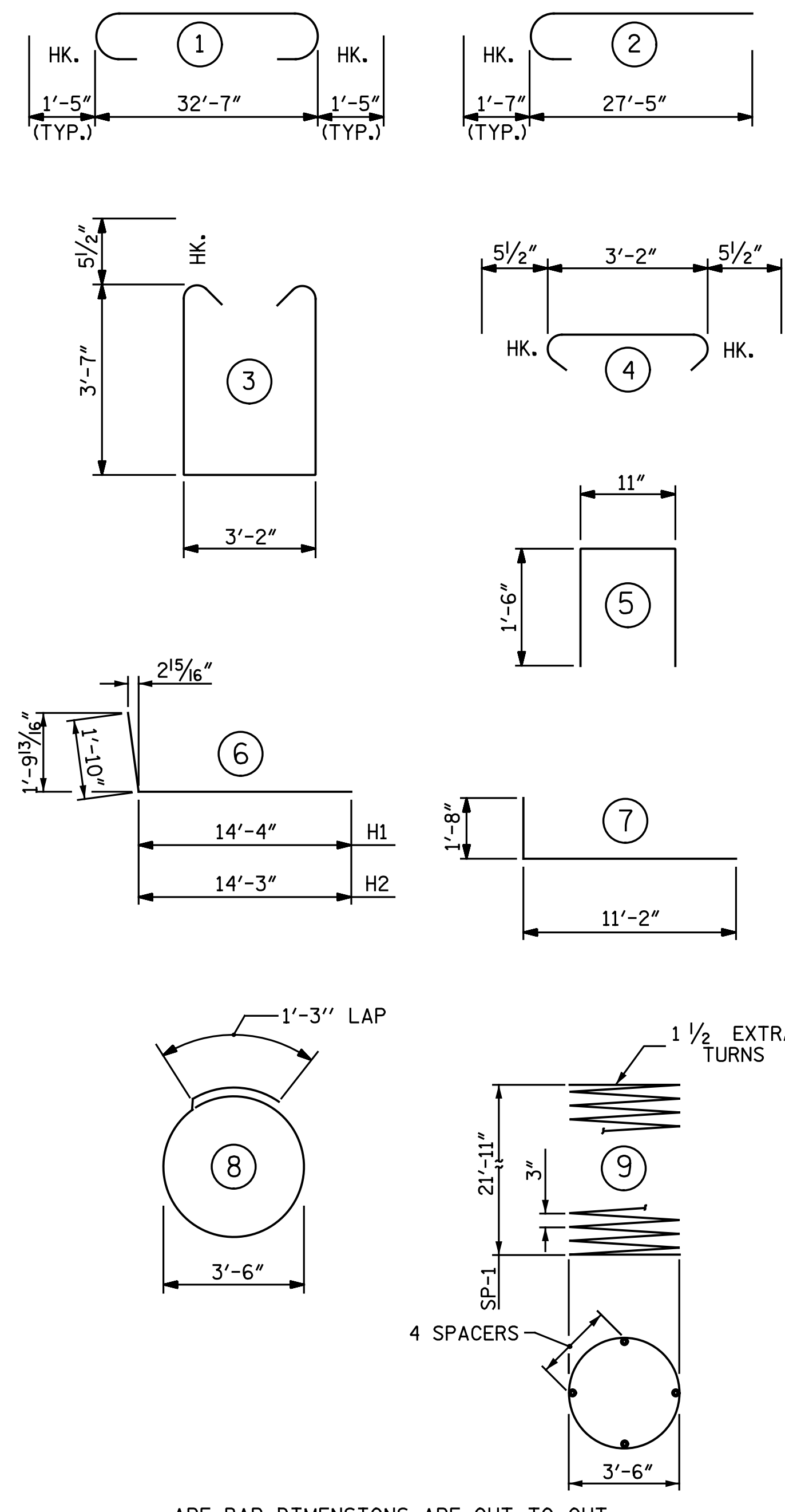
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

**TEMPORARY DRAINAGE AT ABUTMENT**



**SECTION B-B**

**BAR TYPES**

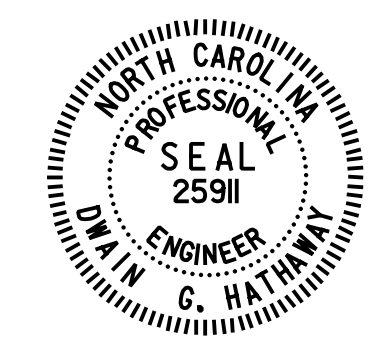


ARE BAR DIMENSIONS ARE OUT TO OUT.  
\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

**BILL OF MATERIAL ABUTMENT I**

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	10	1	35' - 5"	2,134
B2	24	4	STR	17' - 6"	281
B3	2	5	STR	1' - 6"	3
B4	3	5	STR	1' - 10"	6
B5	1	5	STR	3' - 6"	4
B6	1	5	STR	7' - 3"	8
H1	26	10	6	16' - 2"	1,809
H2	26	10	6	16' - 1"	1,799
H3	4	10	STR	3' - 4"	57
H4	4	10	STR	2' - 8"	46
H5	18	5	7	12' - 10"	241
K1	8	5	STR	32' - 7"	272
S1	66	5	3	11' - 3"	774
S2	66	5	4	4' - 1"	281
S3	16	4	8	12' - 3"	131
M1	120	11	2	29' - 0"	18,489
U1	27	5	5	3' - 11"	110
V1	53	8	STR	8' - 11"	1,262
V2	53	6	STR	8' - 11"	710
V3	12	8	STR	10' - 6"	336
V4	12	6	STR	10' - 6"	189
V5	32	9	STR	10' - 6"	1,142
V6	14	5	STR	10' - 6"	153
V7	18	5	STR	8' - 8"	163
SP-1	4	*	9	966' - 1"	4,032
REINFORCING STEEL				LBS.	30,400
SPIRAL COLUMN REINF. STEEL				LBS.	4,032
CLASS "AA" CONCRETE BREAKDOWN					
POUR #2 CAP, LOWER & WING WALLS			C.Y.		30.1
POUR #3 BACKWALL & UPPER WING WALLS			C.Y.		15.6
TOTAL CLASS "AA" CONCRETE			C.Y.		45.7
<b>DRILLED PIERS</b>					
4'-0" DIA. DRILLED PIERS IN SOIL				L.F.	59.5
4'-0" DIA. DRILLED PIERS NOT IN SOIL				L.F.	30.0
DRILLED PIER CONCRETE BREAKDOWN					
POUR #1 DRILLED PIERS			C.Y.		41.7
CSL TUBES				L.F.	382.08

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 4 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 ABUTMENT I

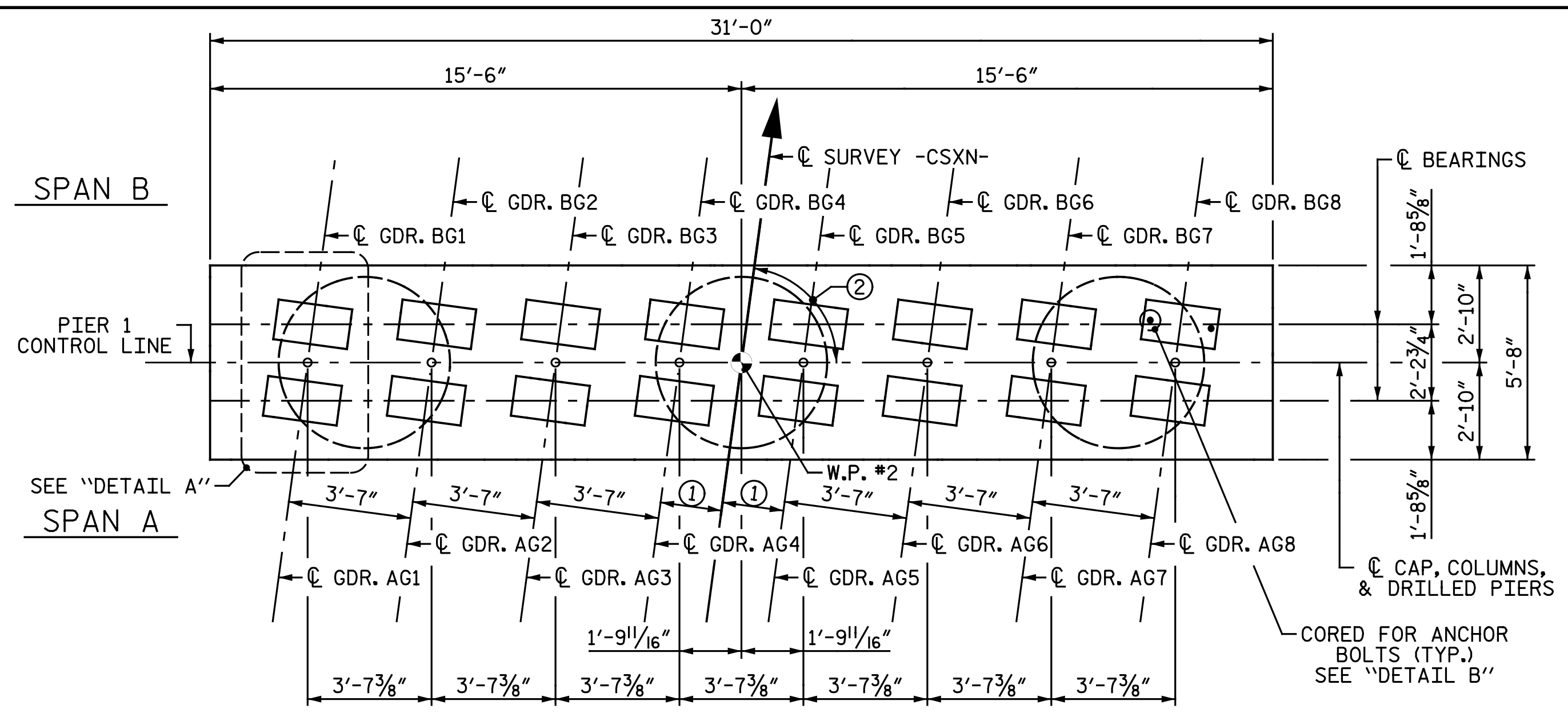
**Michael Baker INTERNATIONAL**  
 Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27518  
 NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-31
1			3			TOTAL SHEETS
2			4			68

5/3/2016 9:37:14 AM  
 File Name: Y:\Projects\NC DOT\U-3308\Structures\Drawings\Final\404\_031\_U3308\_SML\AB104.dgn  
 cmayhew

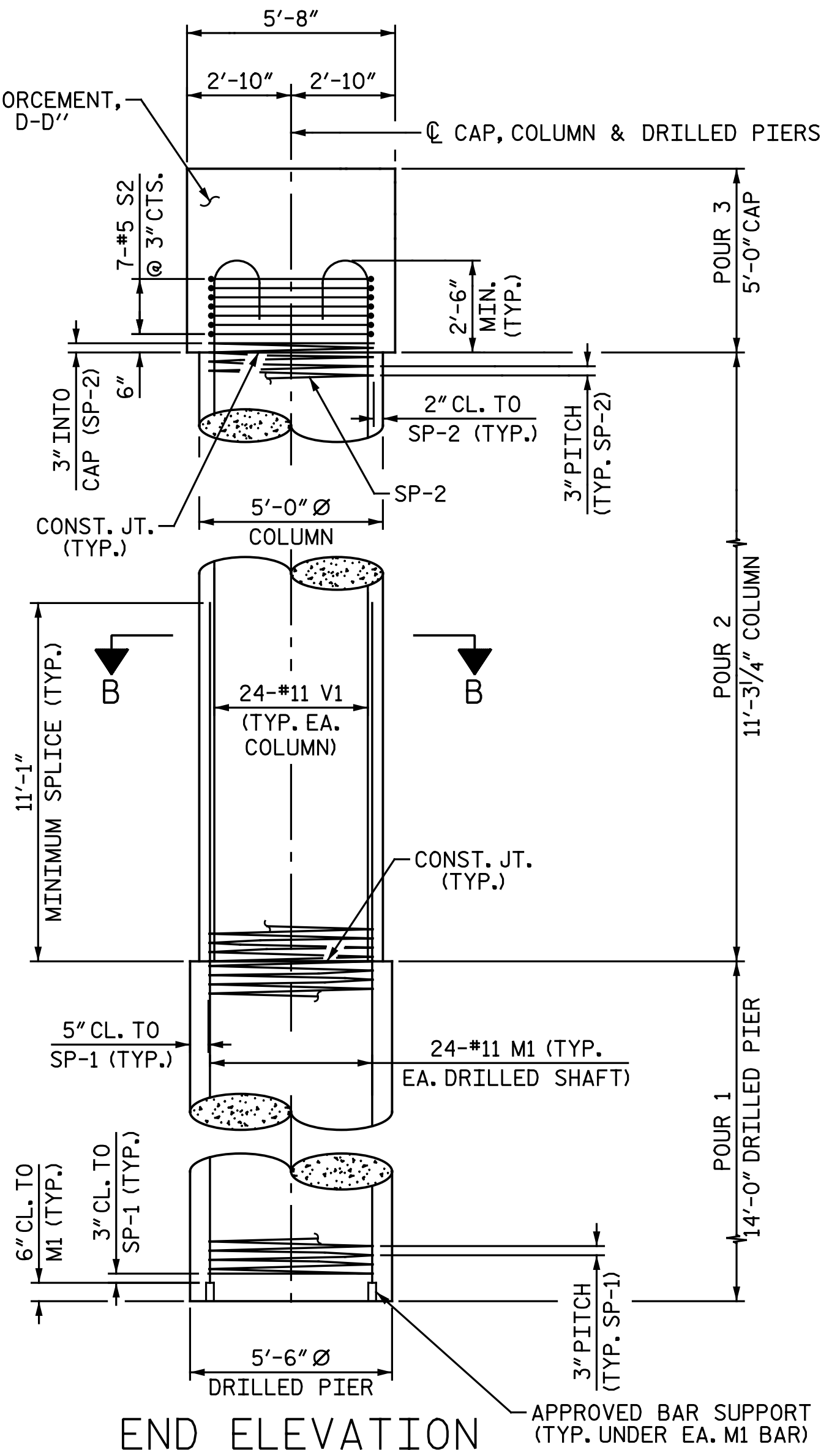
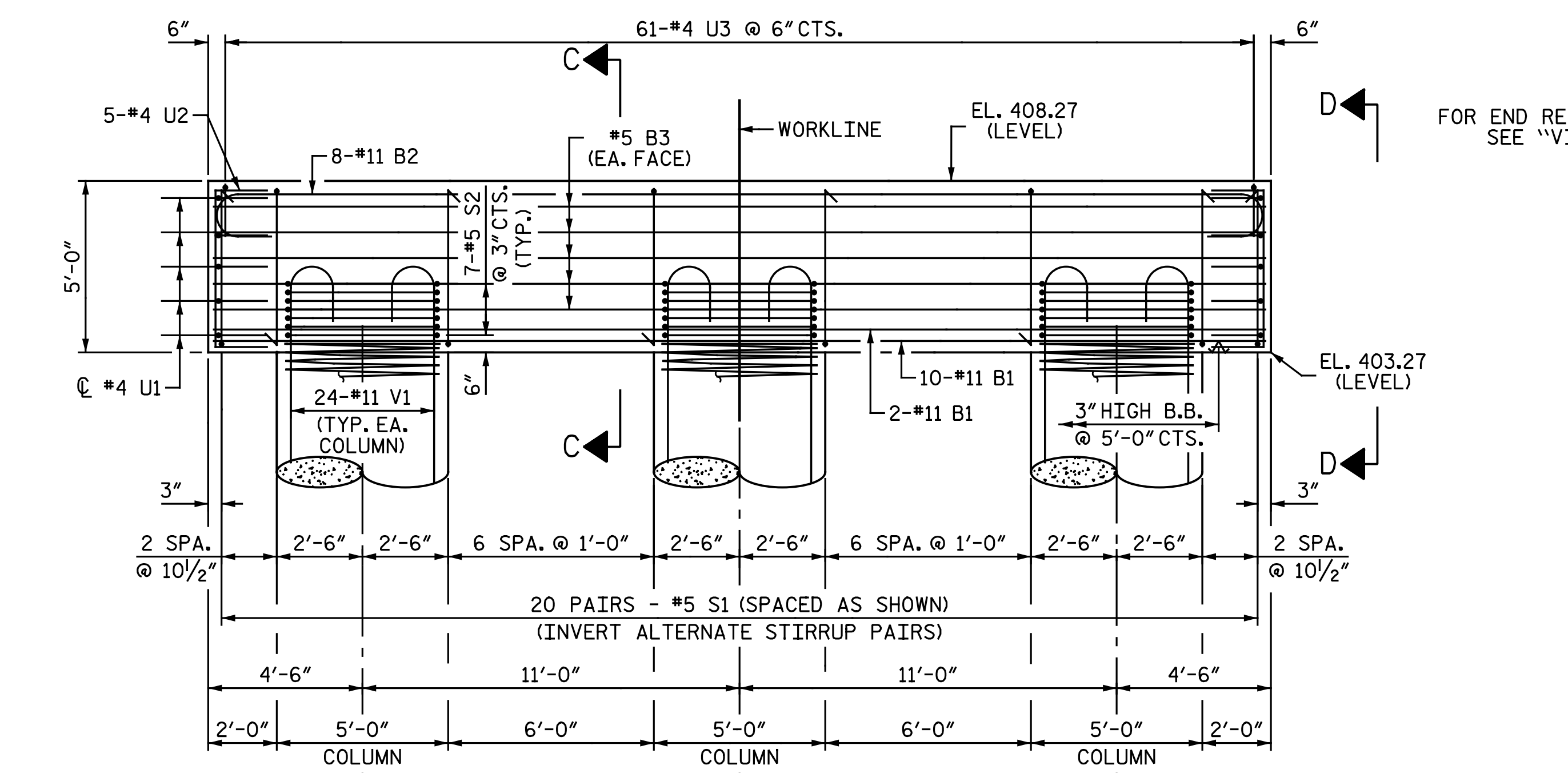
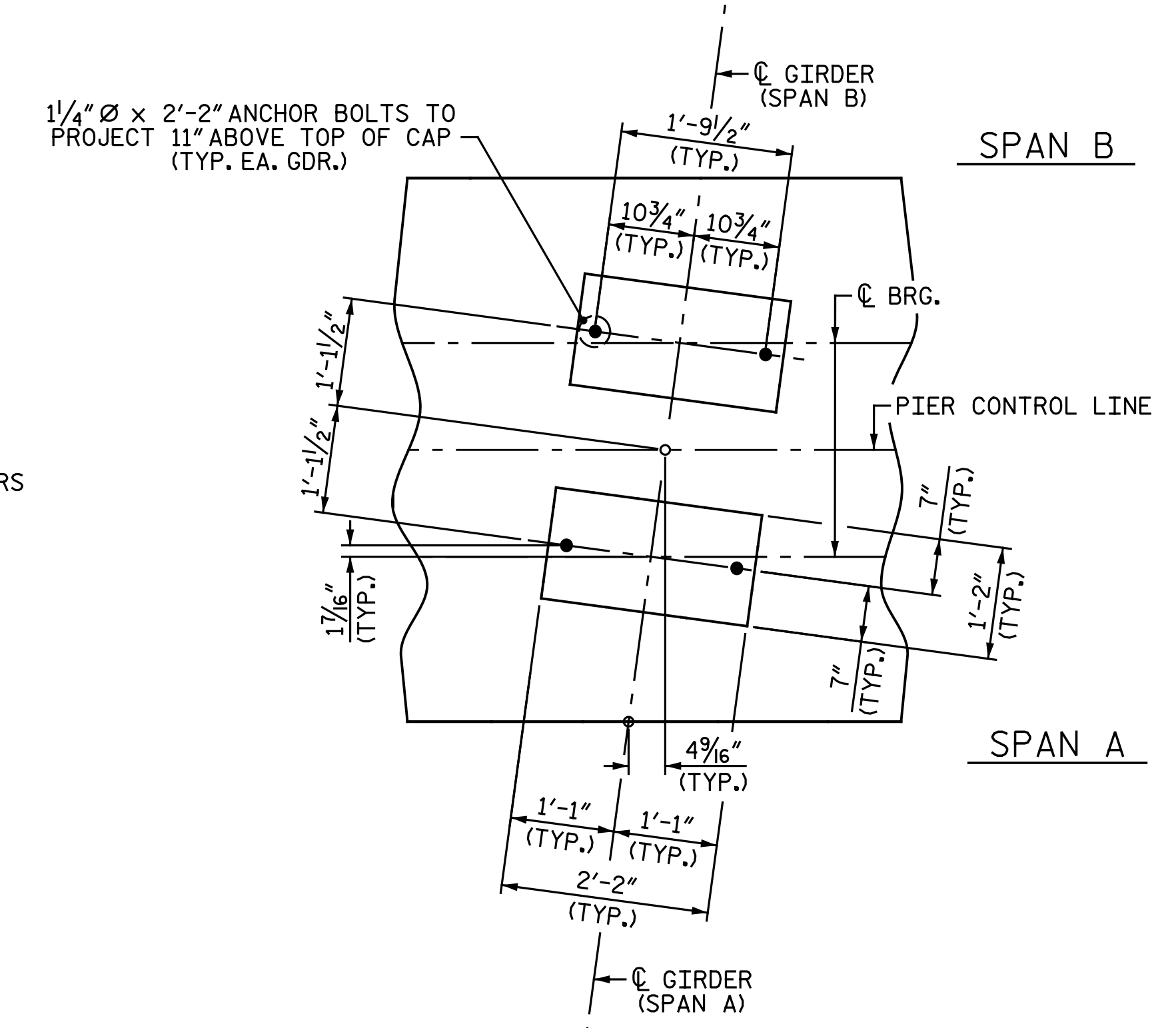
DRAWN BY: M. D. MAYHEW DATE: 3-6-14  
 CHECKED BY: S. A. DENNEY DATE: 3-11-14



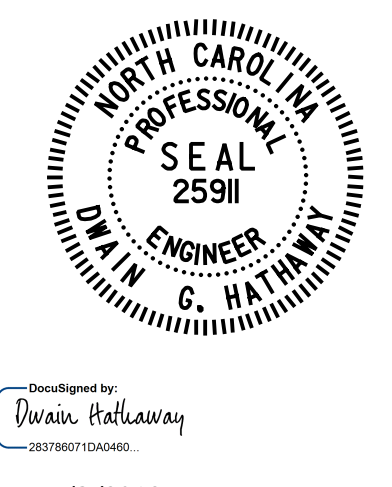


**NOTES:**

- FOR "SECTION A-A", SEE SHEET 2 OF 3.
- FOR "SECTION B-B", SEE SHEET 2 OF 3.
- FOR "SECTION C-C", SEE SHEET 3 OF 3.
- FOR "VIEW D-D", SEE SHEET 3 OF 3.
- FOR "DETAIL B", SEE SHEET 2 OF 3.
- SEE SHEET 3 OF 3 FOR ADDITIONAL NOTES AND DETAILS.
- THE TOP SURFACE OF THE PIER CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.
- THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.
- METHOD A WATERPROOFING SHOULD BE APPLIED AROUND THE CONSTRUCTION JOINT AT THE COLUMN AND DRILLED PIER FOR EACH COLUMN.
- DAMPPOOFING SHOULD BE APPLIED TO ANY PART OF THE COLUMN THAT IS BELOW THE GROUND LINE.



PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 1 OF 3



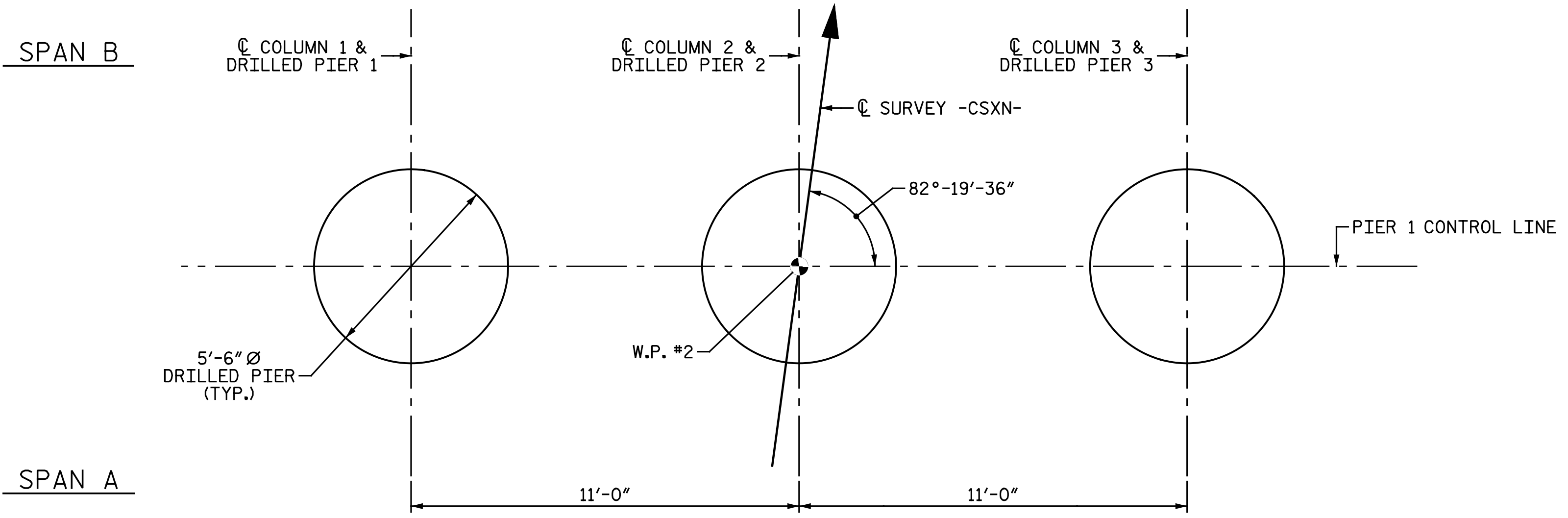
**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27518  
 NC License No.: F-1084

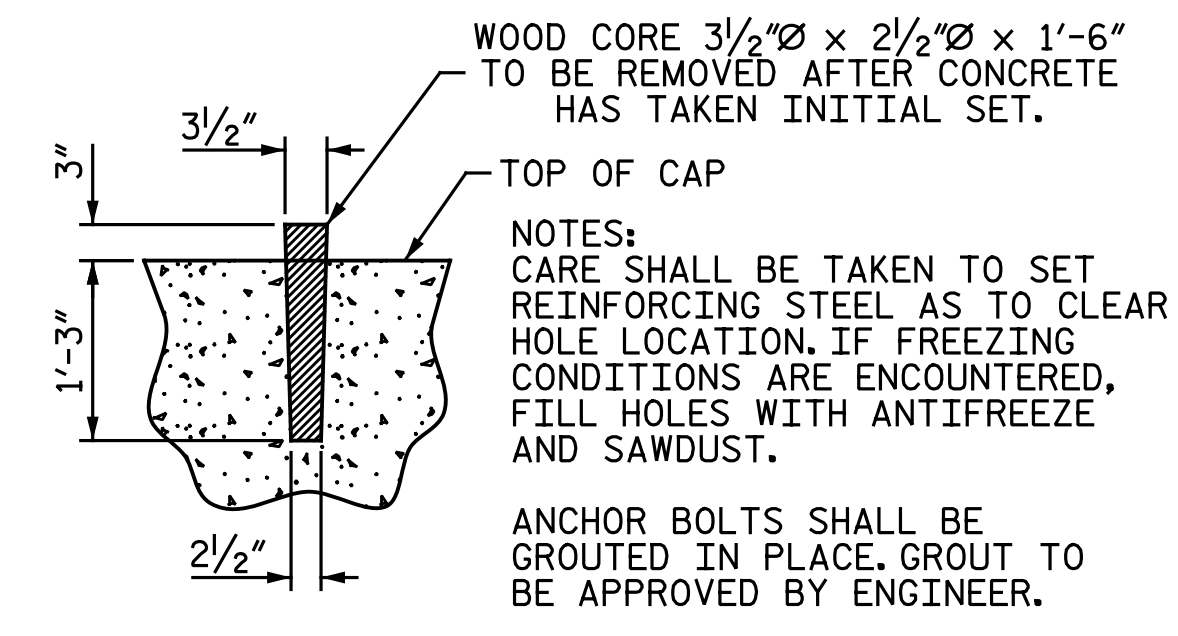
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

5/3/2016 9:37:45 AM  
 File Name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_032\_U3308\_SMU\_P101.dgn  
 onayhew

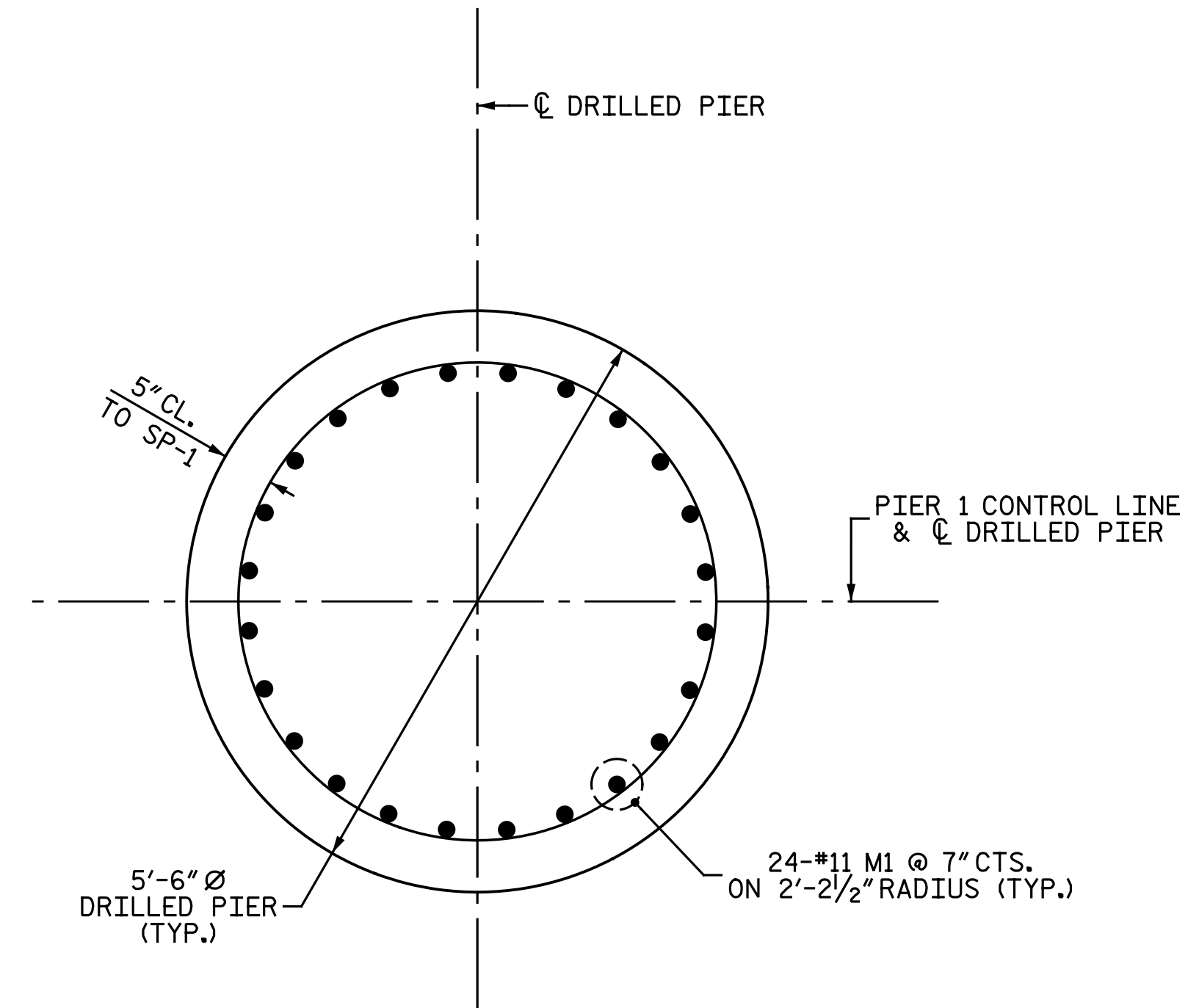
DRAWN BY: M. D. MAYHEW DATE: 5-9-14  
 CHECKED BY: A. L. PHILLIPS DATE: 5-12-14



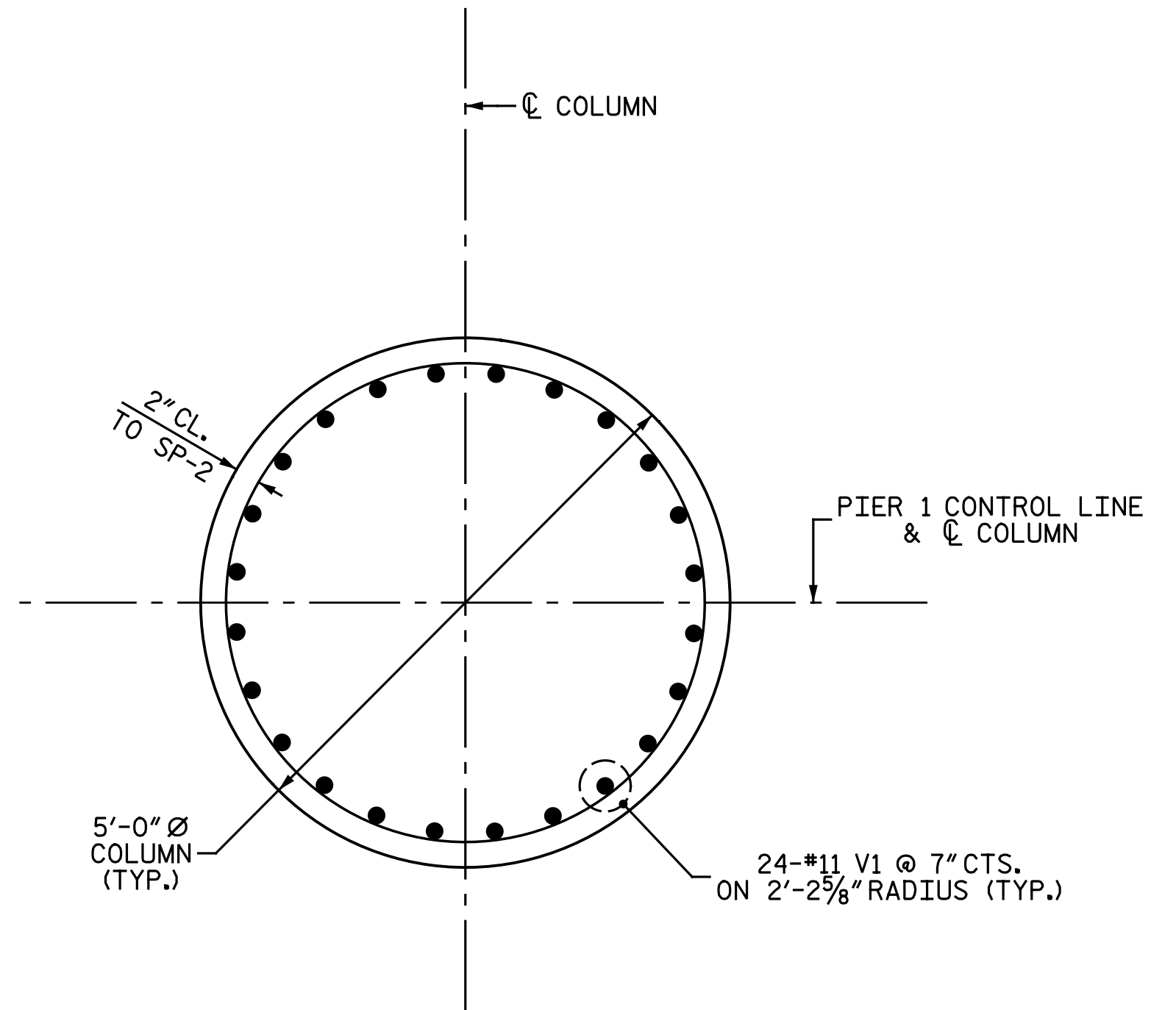
**PLAN OF DRILLED PIERS**  
ALL DIMENSIONS AND DETAILS SHOWN FOR DRILLED PIERS ARE TYPICAL FOR EACH PIER UNLESS OTHERWISE NOTED.



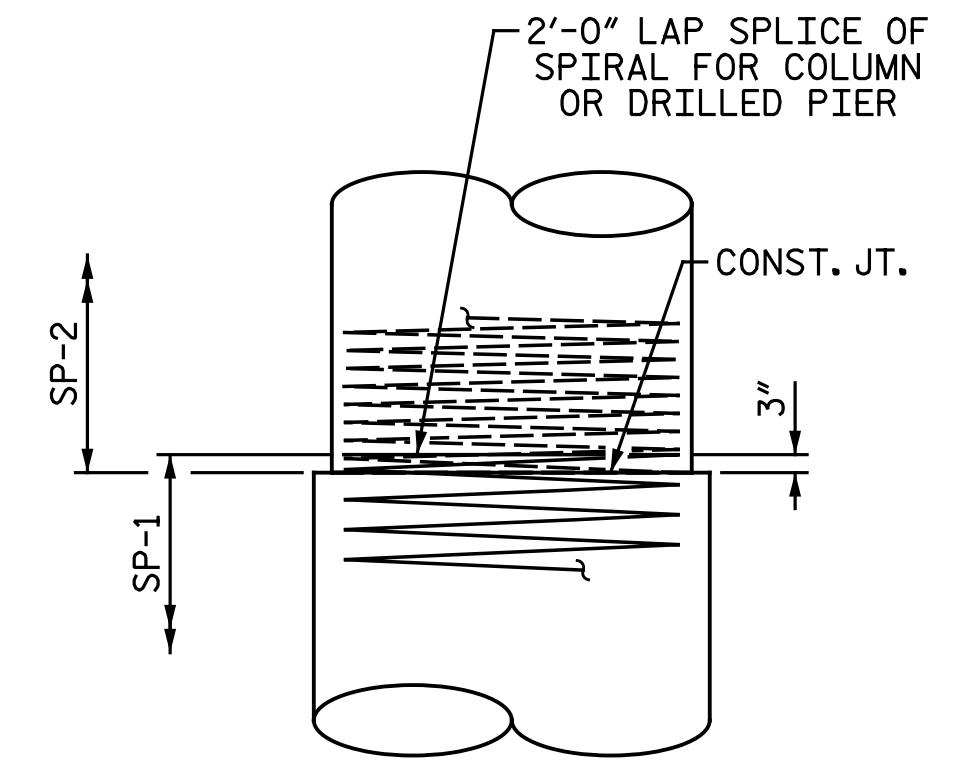
**DETAIL B**  
FOR LOCATION OF "DETAIL B", SEE SHEET 1 OF 3.



**SECTION A-A**

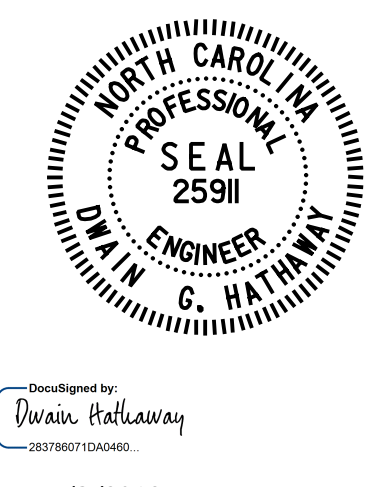


**SECTION B-B**



**CONSTRUCTION JOINT DETAIL**

PROJECT NO. U-3308  
DURHAM COUNTY  
STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
SHEET 2 OF 3



**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
8000 Regency Parkway, Suite 600  
Cary, North Carolina 27618  
NC License No.: F-1084

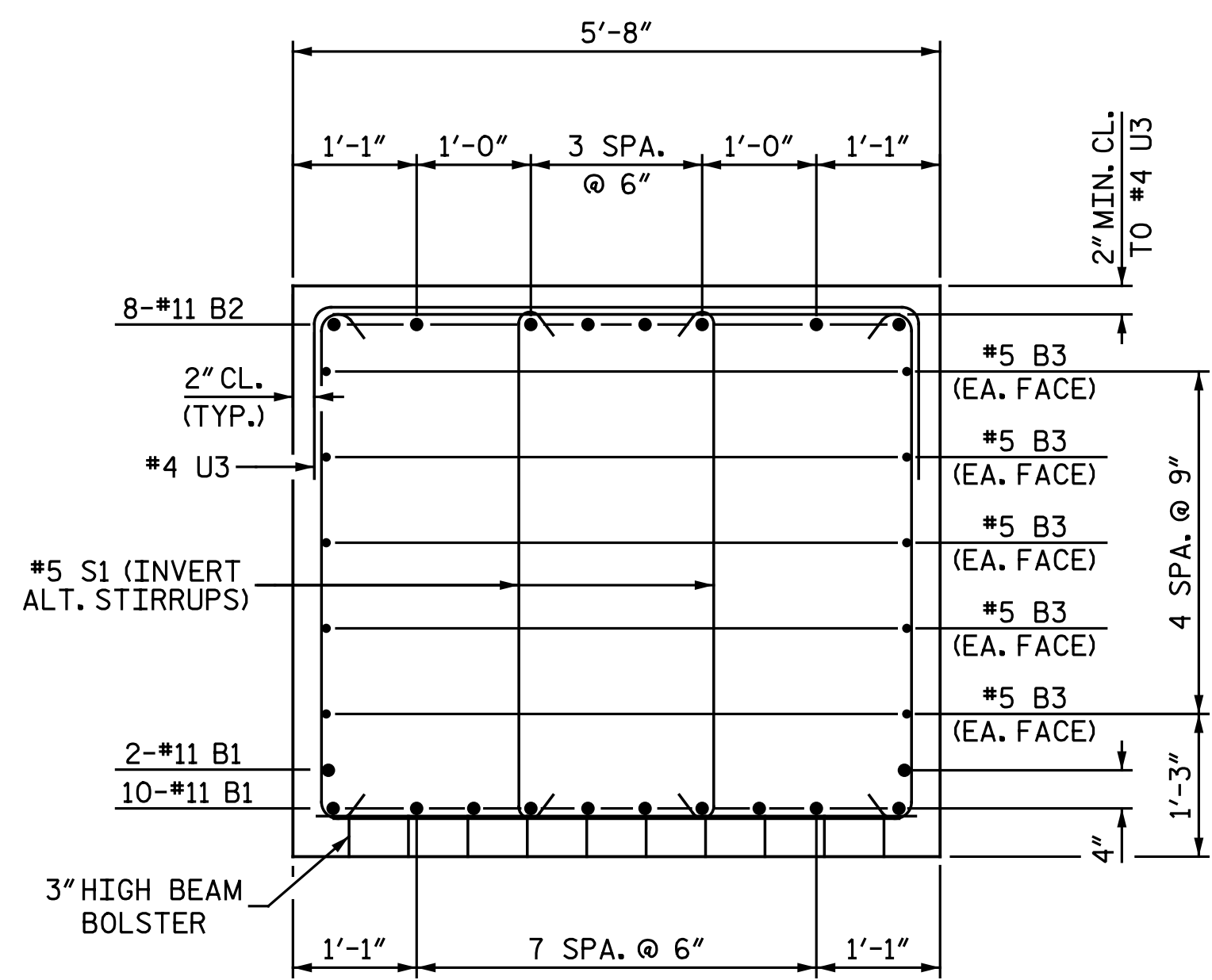
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
**PIER I DETAILS**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-33
1			3			TOTAL SHEETS
2			4			68

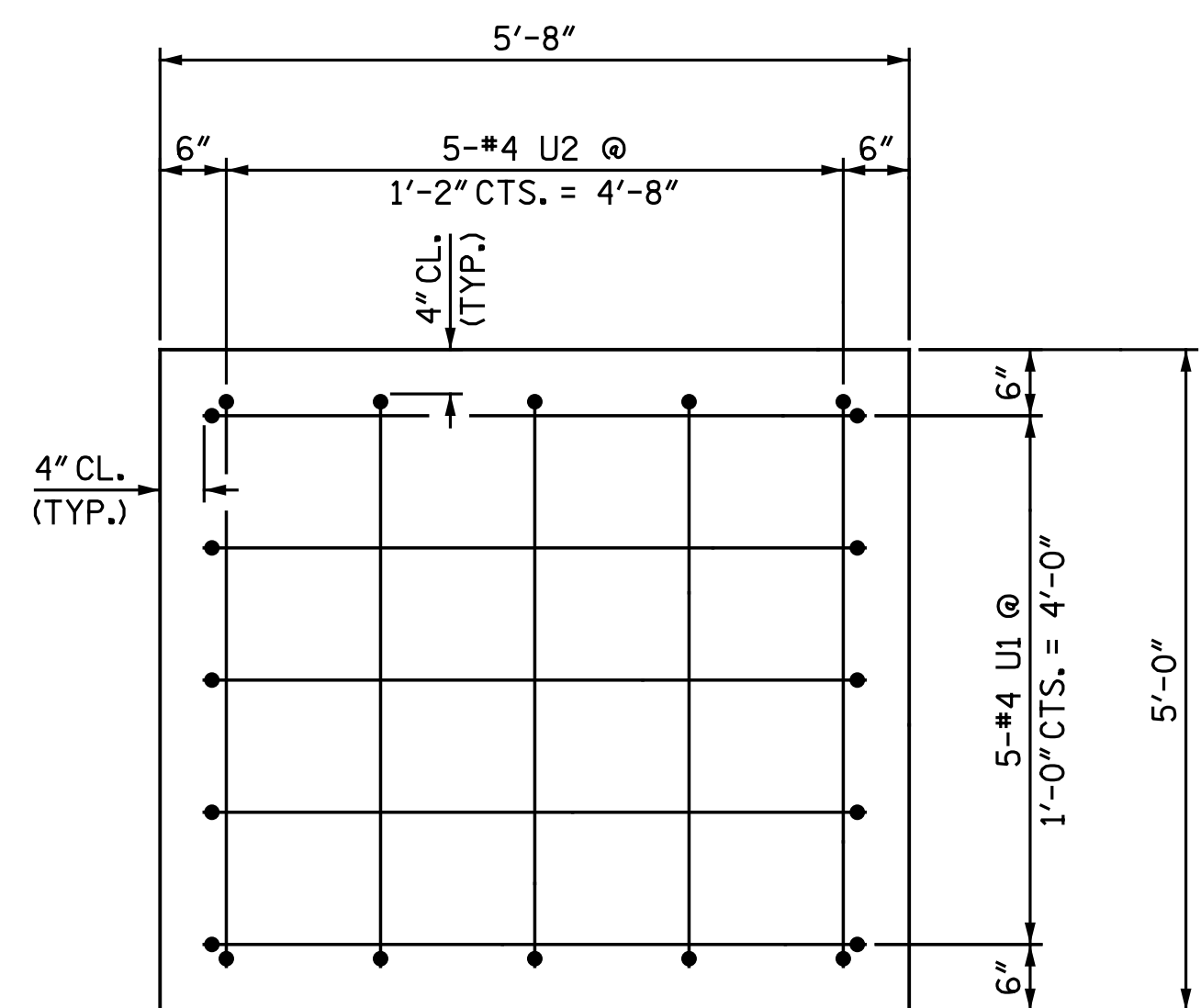
5/3/2016 9:37:16 AM  
 Filename: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_033\_U3308\_SML\_P102.dgn

DRAWN BY: M. D. MAYHEW DATE: 5-9-14  
CHECKED BY: A. L. PHILLIPS DATE: 5-12-14

+



SECTION C-C



VIEW D-D

**NOTES:**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOCS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

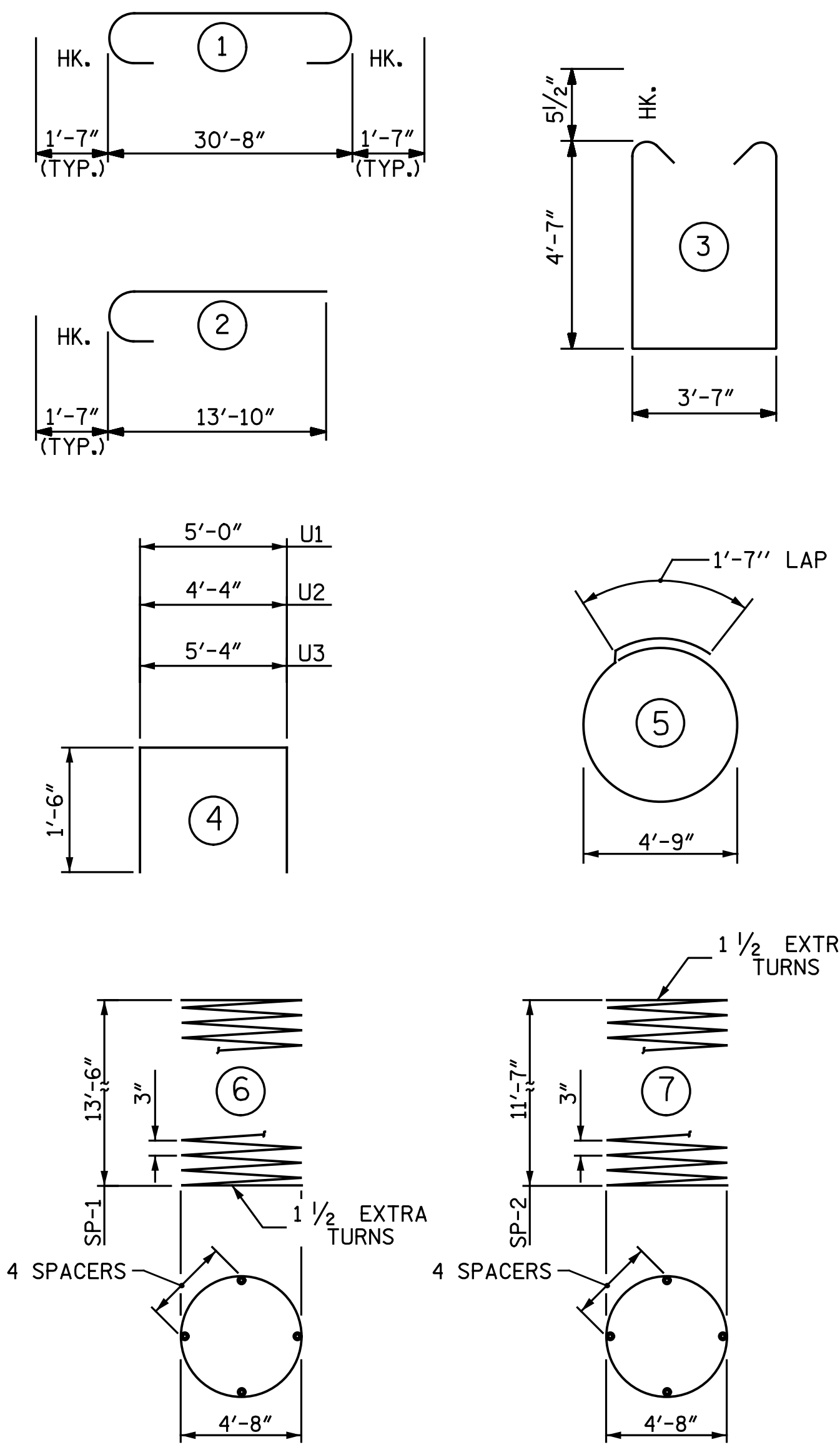
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "EPOXY COATED REINFORCING STEEL" AND "EPOXY COATED SPIRAL COLUMN REINFORCING STEEL".

THE CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

FOR ADDITIONAL FOUNDATION NOTES, SEE "GENERAL DRAWING" SHEET 2 OF 5.

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT.

\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

▲ DENOTES EPOXY COATED REINFORCING STEEL

**BILL OF MATERIAL  
PIER I**

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	11	STR	30' - 8"	1,955
B2	8	11	1	33' - 10"	1,438
B3	10	5	STR	30' - 8"	320
▲ M1	72	11	STR	27' - 7"	10,552
S1	40	5	3	13' - 8"	570
S2	21	5	5	16' - 7"	363
U1	10	4	4	8' - 0"	53
U2	10	4	4	7' - 4"	49
U3	61	4	4	8' - 4"	340
▲ V1	72	11	2	15' - 5"	5,897
▲ SP-1	3	*	6	804' - 9"	2,517
▲ SP-2	3	**	7	695' - 1"	1,392
REINFORCING STEEL				LBS.	5,088
EPOXY COATED REINFORCING STEEL				LBS.	16,449
EPOXY COATED SPIRAL COLUMN REINF. STEEL				LBS.	3,909
CLASS "AA" CONCRETE BREAKDOWN					
POUR #2		COLUMN	C.Y.	24.6	
POUR #3		CAP	C.Y.	32.5	
TOTAL CLASS "AA" CONCRETE			C.Y.	57.1	

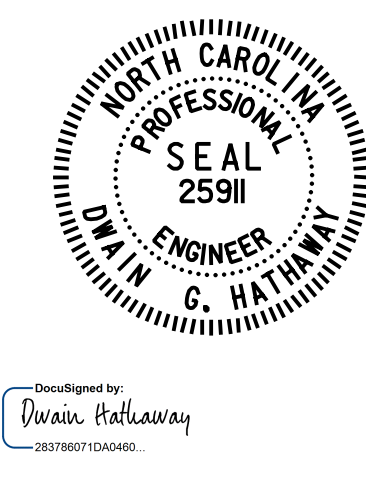
**DRILLED PIERS**

5'-6" DIA. DRILLED PIERS IN SOIL	DRILLED PIERS :	L.F.	7.0
5'-6" DIA. DRILLED PIERS NOT IN SOIL	DRILLED PIERS :	L.F.	35.0
DRILLED PIER CONCRETE BREAKDOWN	POUR #1 DRILLED PIERS	C.Y.	37.0
CSL TUBES		L.F.	232.5

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 3 OF 3

5/3/2016 9:37:17 AM  
 File Name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_034\_U3308\_SML\_P103.dgn

DRAWN BY : M. D. MAYHEW DATE : 5-9-14  
 CHECKED BY : A. L. PHILLIPS DATE : 5-12-14



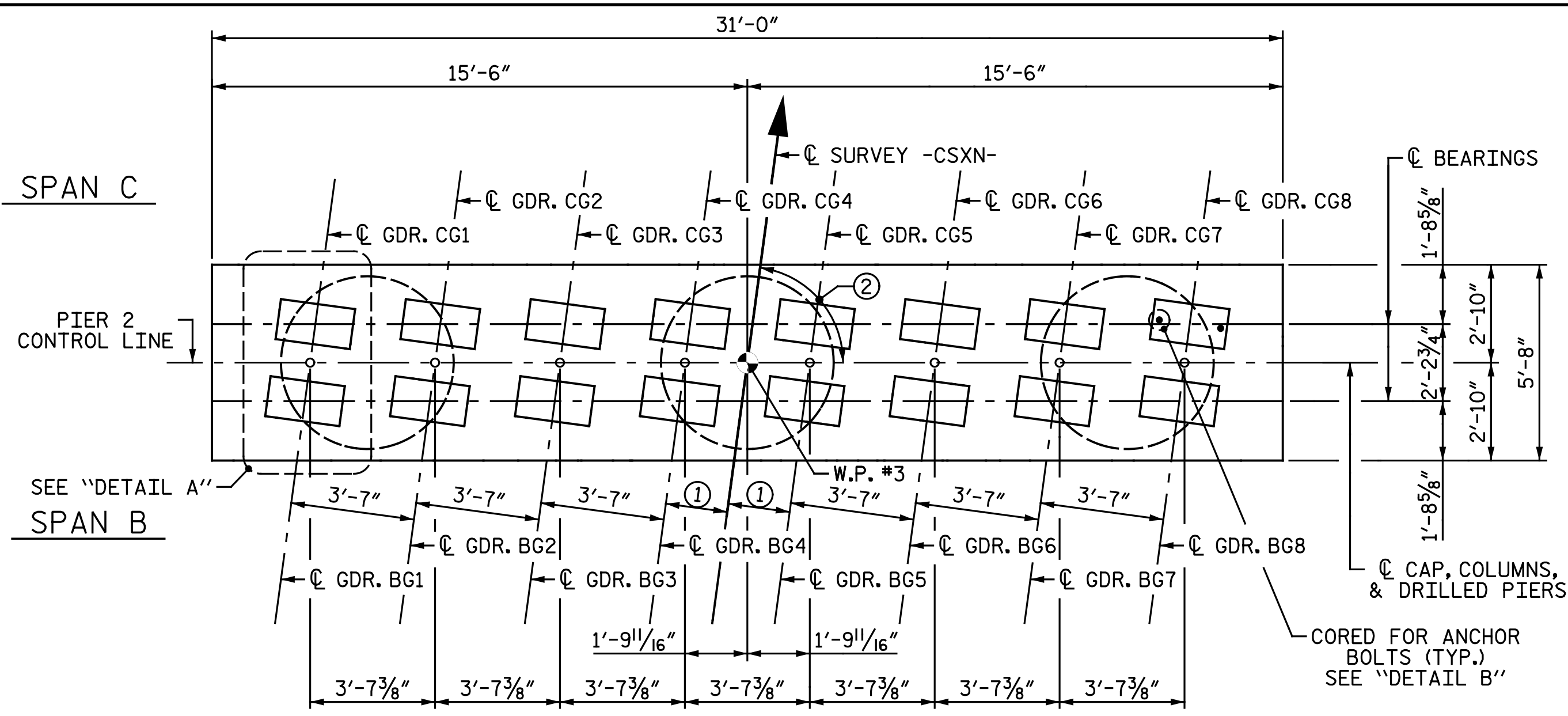
5/3/2016

**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 PIER I DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-34
1			3			TOTAL SHEETS
2			4			68

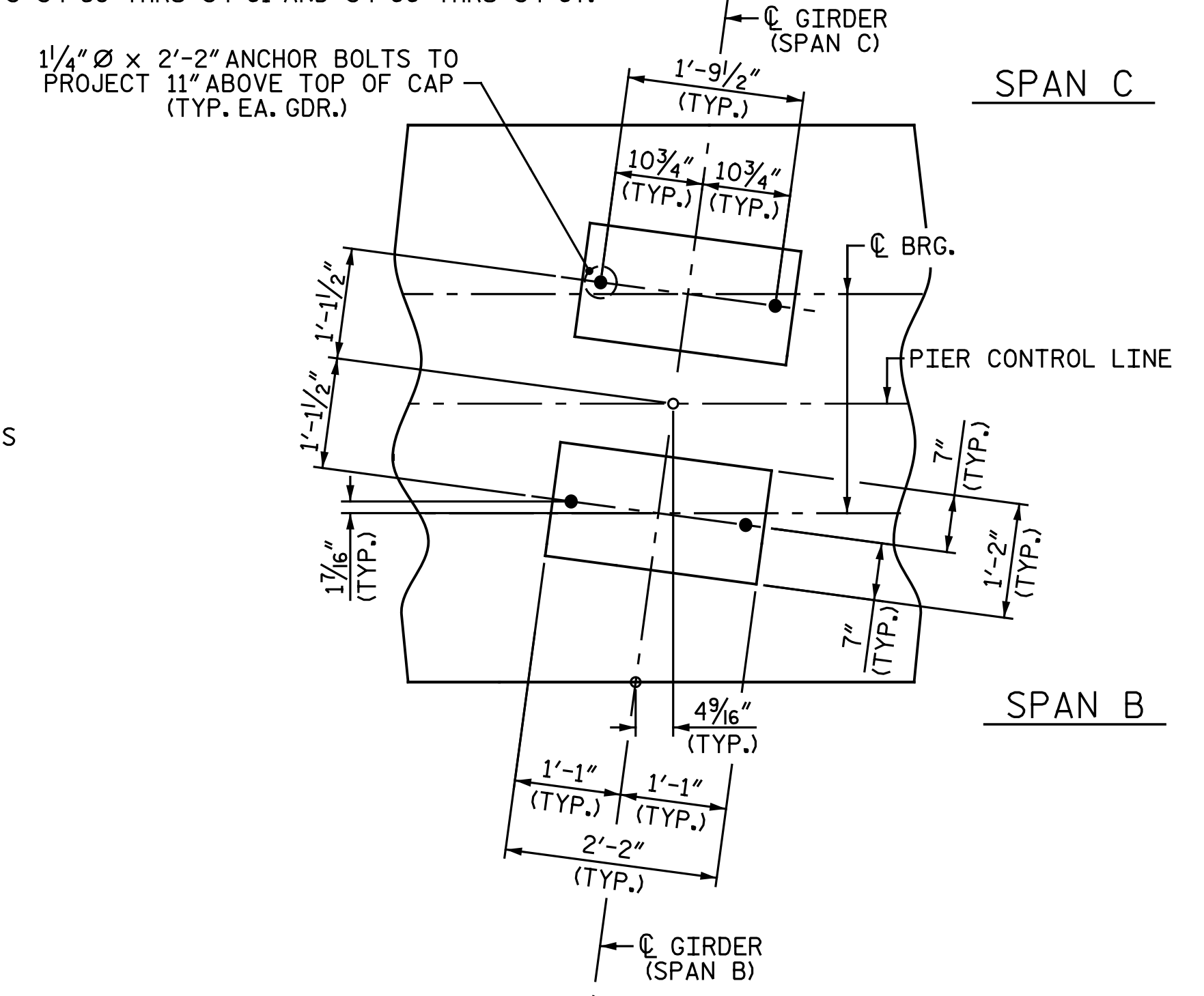


PLAN

- ① 1'-9 1/2"
- ② 82°-19'-36"

**NOTES:**

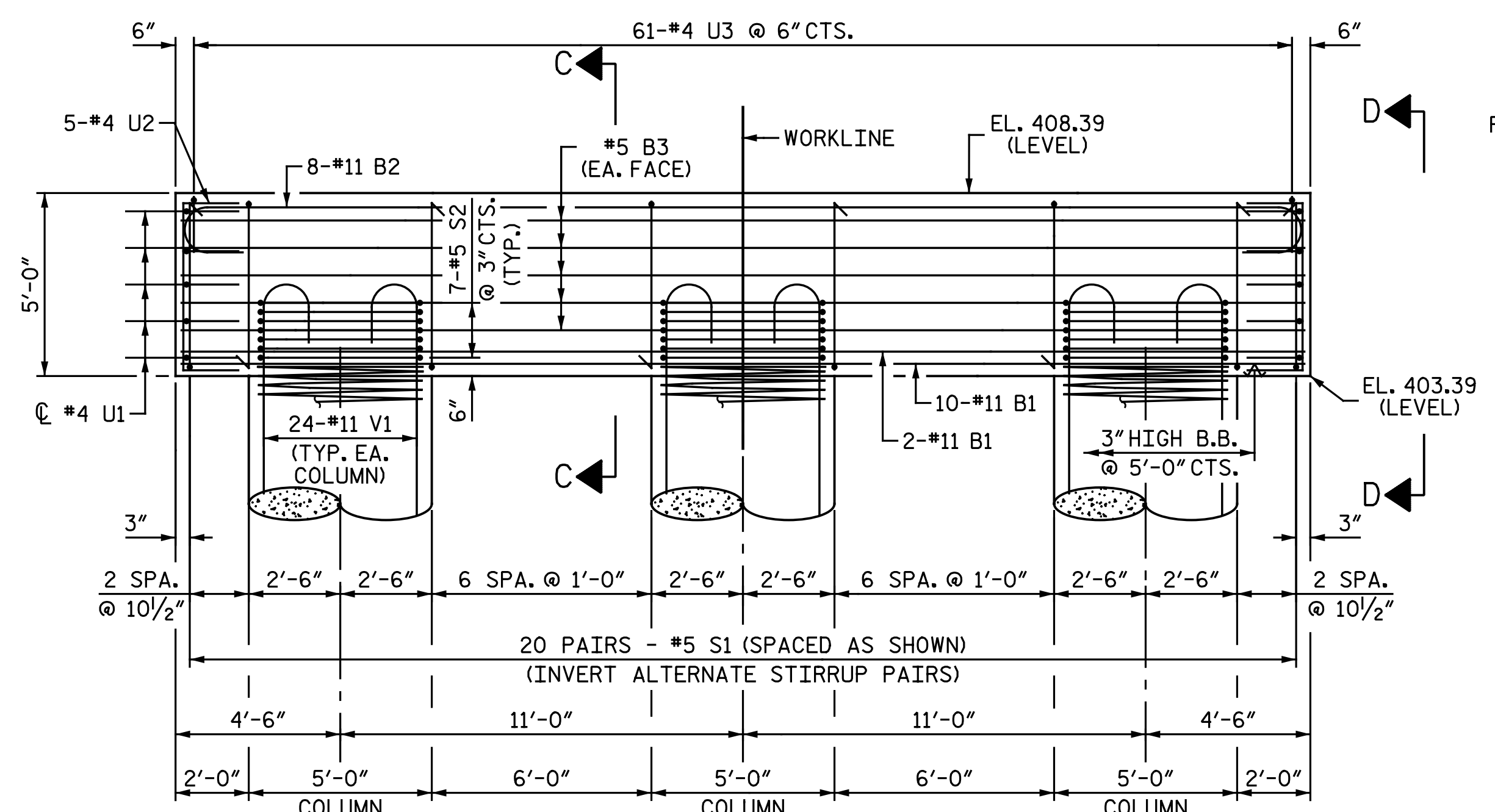
FOR "SECTION A-A", SEE SHEET 2 OF 3.  
 FOR "SECTION B-B", SEE SHEET 2 OF 3.  
 FOR "SECTION C-C", SEE SHEET 3 OF 3.  
 FOR "VIEW D-D", SEE SHEET 3 OF 3.  
 FOR "DETAIL B", SEE SHEET 2 OF 3.  
 SEE SHEET 3 OF 3 FOR ADDITIONAL NOTES AND DETAILS.  
 THE TOP SURFACE OF THE PIER CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND SHALL NOT BE USED.  
 THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.  
 METHOD A WATERPROOFING SHOULD BE APPLIED AROUND THE CONSTRUCTION JOINT AT THE COLUMN AND DRILLED PIER FOR EACH COLUMN.  
 DAMPPROOFING SHOULD BE APPLIED TO ANY PART OF THE COLUMN THAT IS BELOW THE GROUND LINE.  
 FOR TEMPORARY SPAN, REFER TO SHEETS S4-52 THRU S4-67. THE CONTRACTOR'S ATTENTION IS CALLED TO THE NEED FOR ANCHOR BOLT AND STEEL PIPE BLOCKOUTS TO BE INSTALLED IN THE CAP TO ACCOMMODATE THE TEMPORARY SPAN. REFER TO SHEETS S4-58 THRU S4-61 AND S4-66 THRU S4-67.



DETAIL A

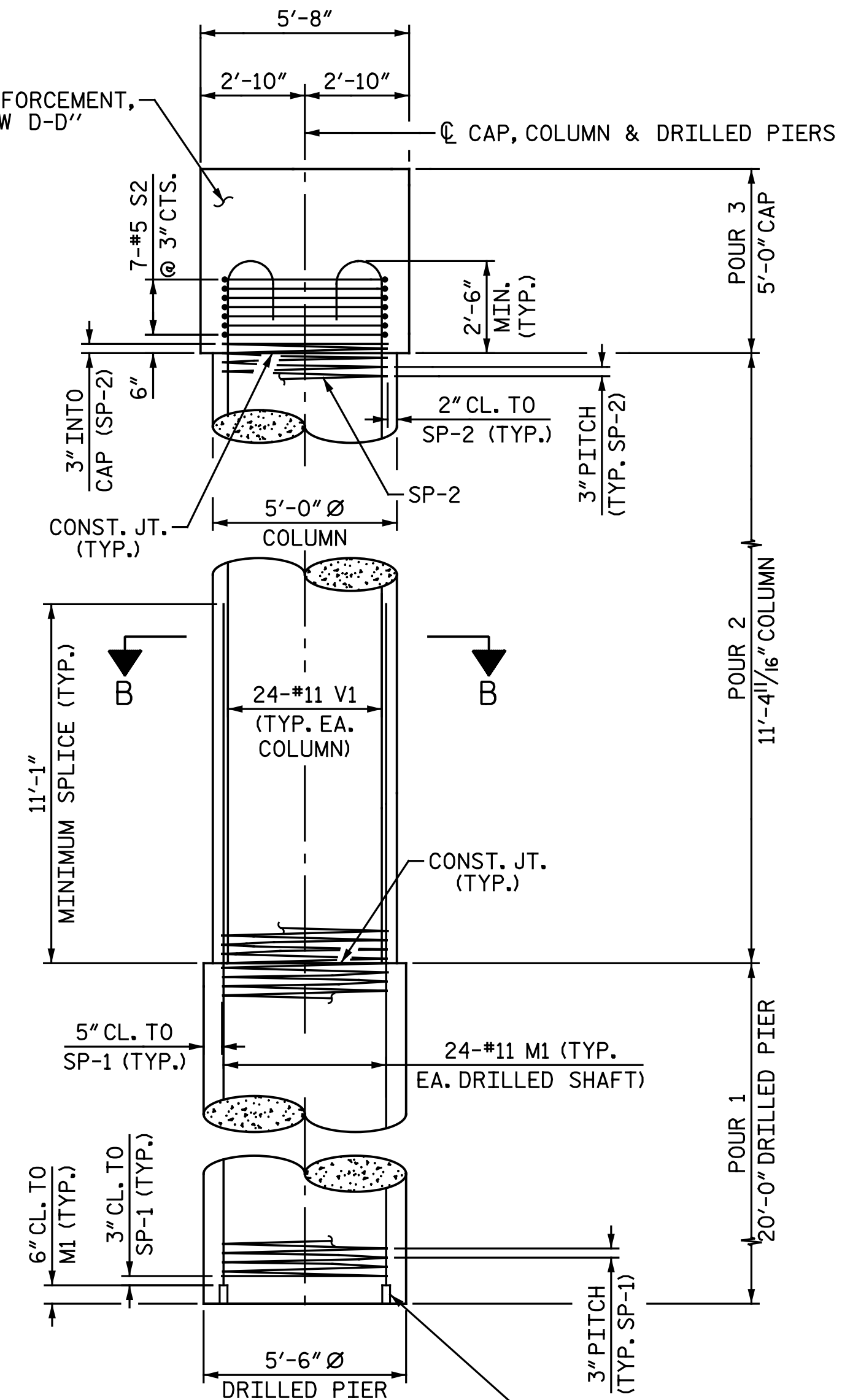
ALL DIMENSIONS AND DETAILS ARE TYPICAL FOR ALL BEARINGS AT EACH GIRDER LOCATION  
 SEE "BEARING DETAILS" SHEET FOR BEARING ASSEMBLY DETAILS

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 1 OF 3



ELEVATION

ALL DIMENSIONS AND DETAILS SHOWN FOR DRILLED PIERS ARE TYPICAL FOR EACH PIER UNLESS OTHERWISE NOTED.



END ELEVATION

CONST. JT. (TYP.), SEE "CONSTRUCTION JOINT DETAIL" SHEET 2 OF 3

24-#11 M1 (TYP. EA. DRILLED SHAFT)

6" CL. TO MI (TYP.) 3" CL. TO SP-1 (TYP.)

EL. 392.00 TOP OF DRILLED PIER 1

EL. 372.00 BOTT. OF DRILLED PIER 1

EL. 392.00 TOP OF DRILLED PIER 2

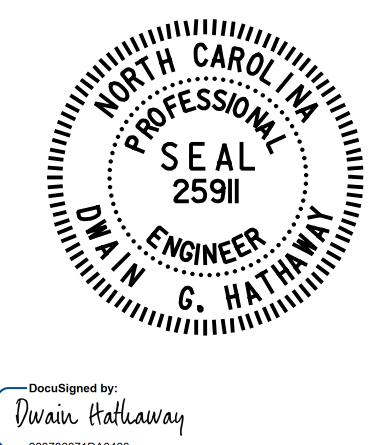
EL. 372.00 BOTT. OF DRILLED PIER 2

EL. 392.00 TOP OF DRILLED PIER 3

EL. 372.00 BOTT. OF DRILLED PIER 3

APPROVED BAR SUPPORT (TYP. UNDER EA. M1 BAR)

DRAWN BY: M. D. MAYHEW DATE: 5-9-14  
 CHECKED BY: S. A. DENNEY DATE: 5-27-14

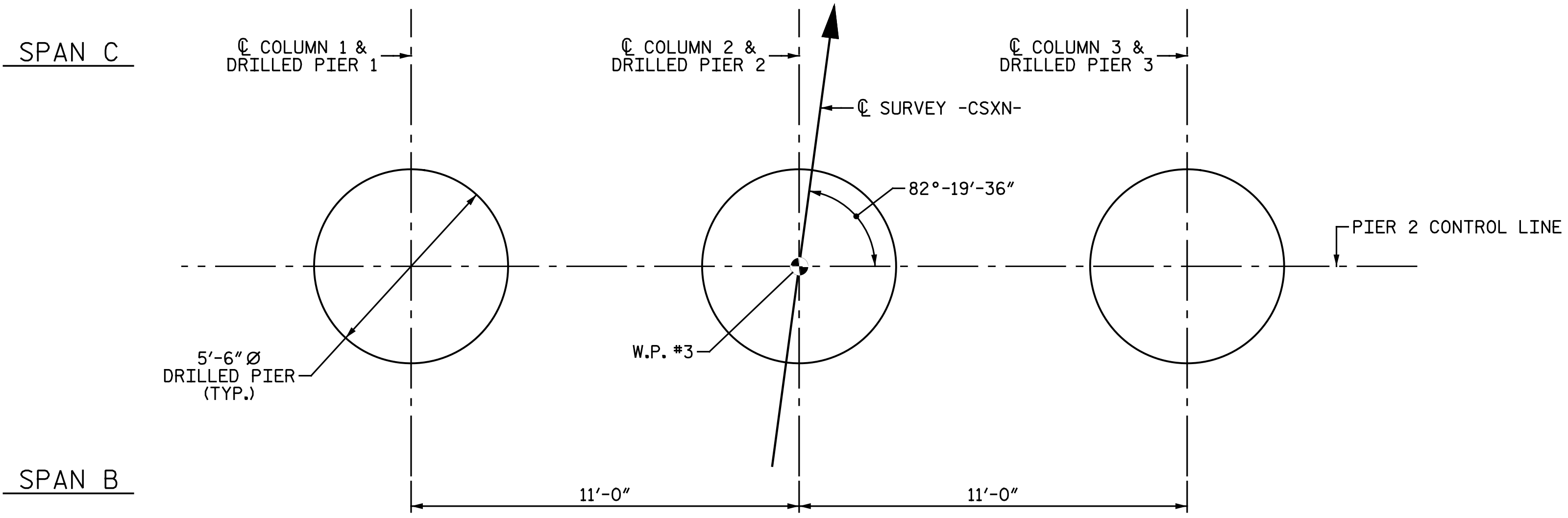


**Michael Baker INTERNATIONAL**

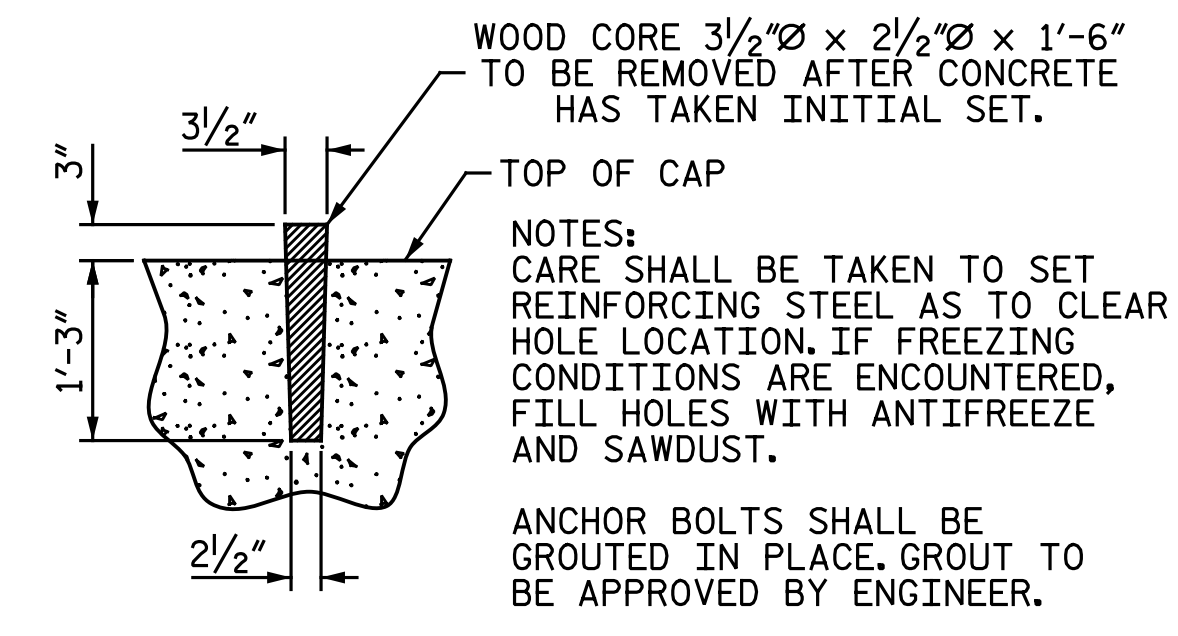
Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

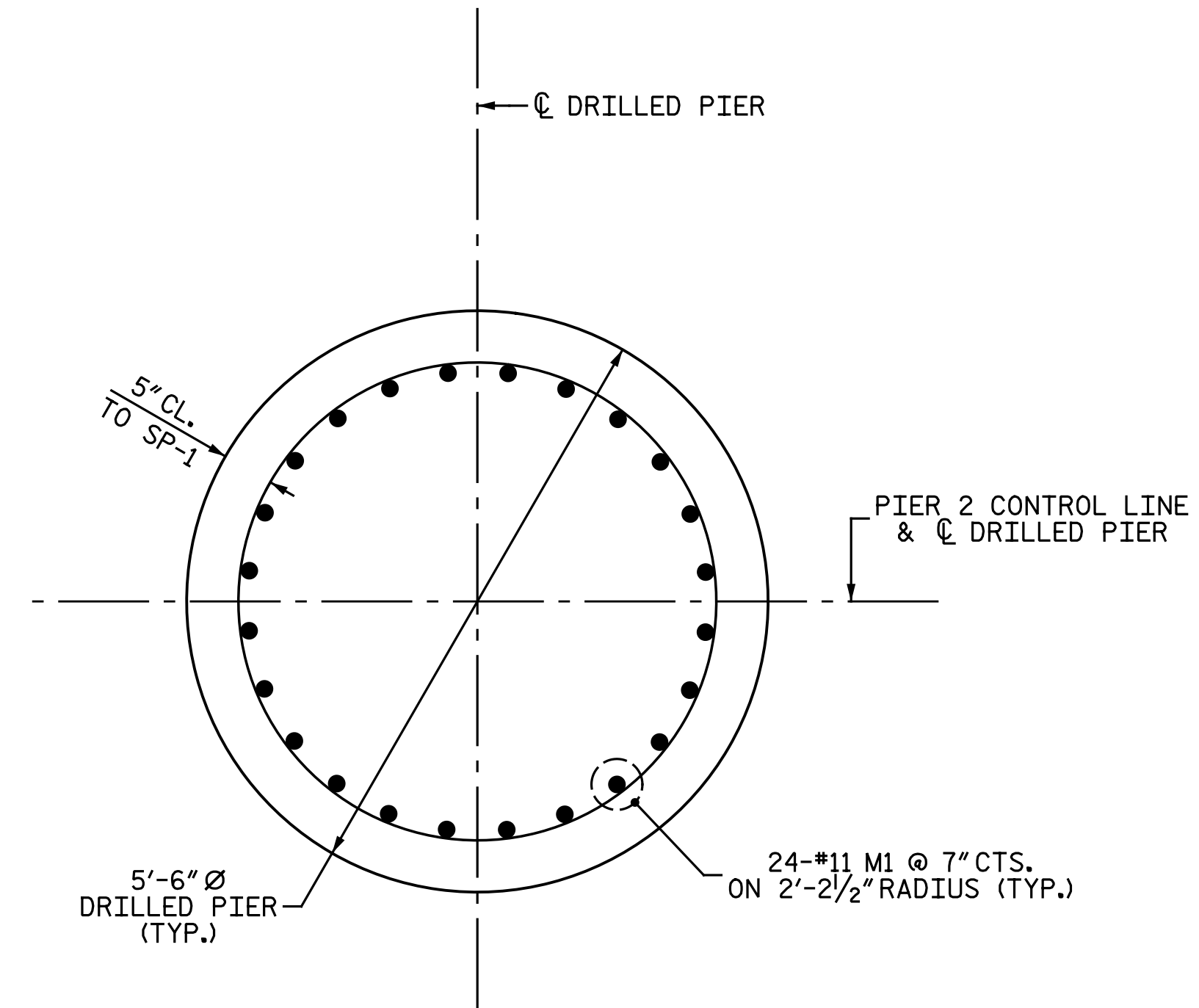
SHEET NO. S4-35  
 TOTAL SHEETS 68



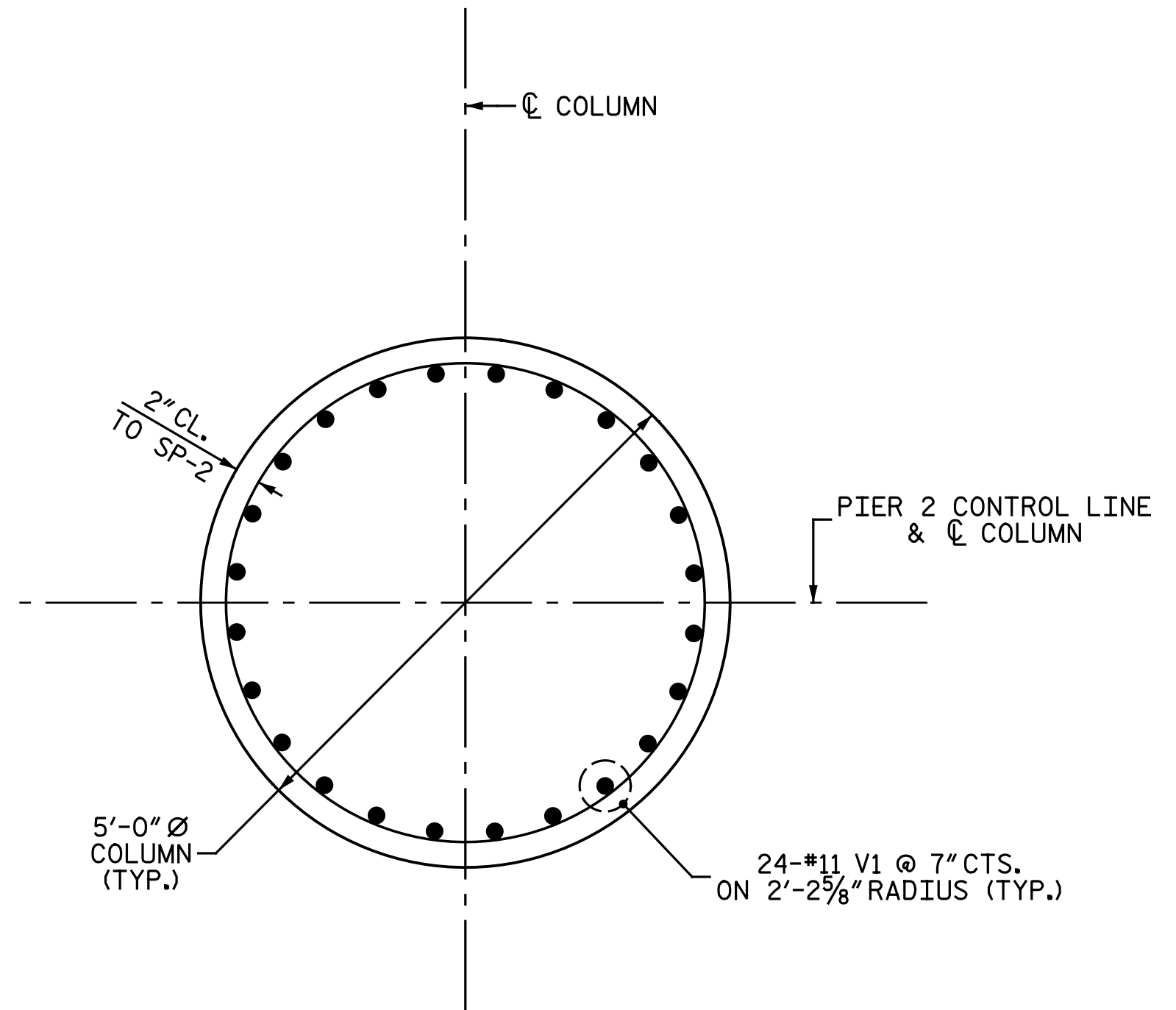
**PLAN OF DRILLED PIERS**  
ALL DIMENSIONS AND DETAILS SHOWN FOR DRILLED PIERS ARE TYPICAL FOR EACH PIER UNLESS OTHERWISE NOTED.



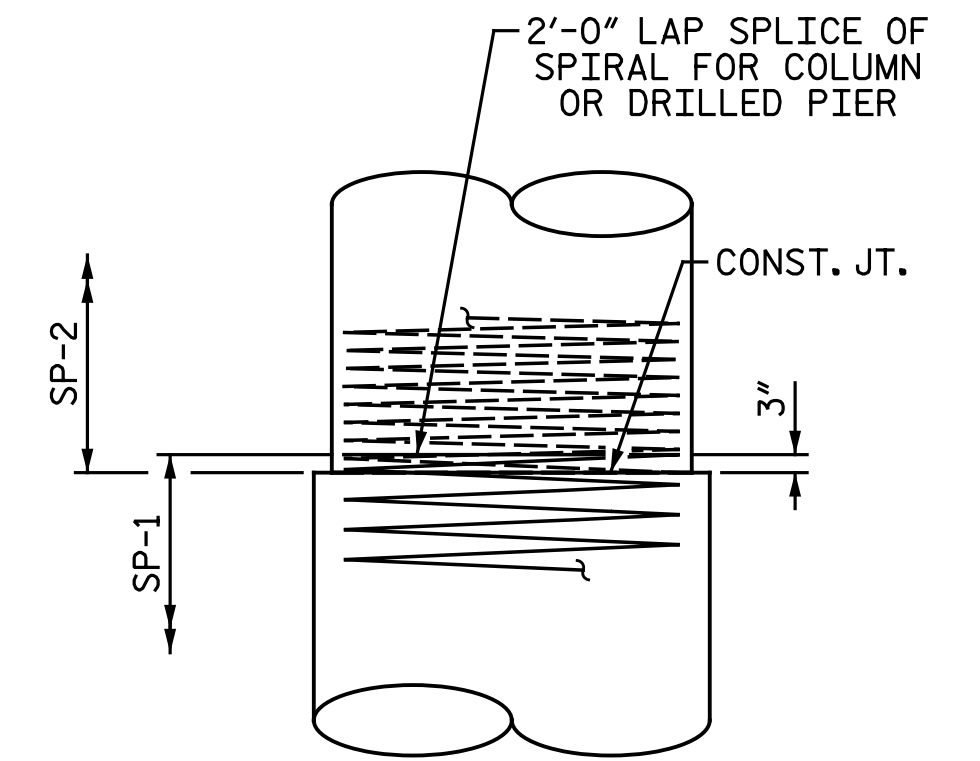
**DETAIL B**  
FOR LOCATION OF "DETAIL B", SEE SHEET 1 OF 3.



**SECTION A-A**

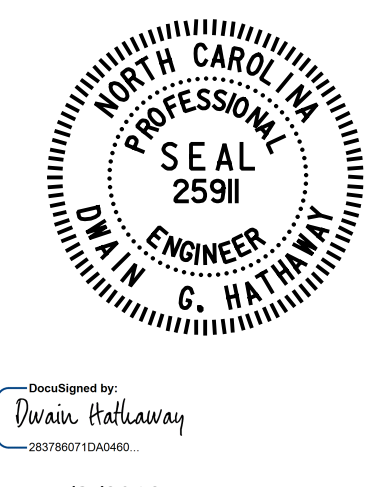


**SECTION B-B**



**CONSTRUCTION JOINT DETAIL**

PROJECT NO. U-3308  
DURHAM COUNTY  
STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
SHEET 2 OF 3



**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
8000 Regency Parkway, Suite 600  
Cary, North Carolina 27618  
NC License No.: F-1084

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH SUBSTRUCTURE PIER 2 DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S4-36					TOTAL SHEETS 68

cmayhew 5/3/2016 9:37:19 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_036\_U3308\_SML\_P202.dgn

DRAWN BY: M. D. MAYHEW DATE: 5-9-14  
CHECKED BY: S. A. DENNEY DATE: 5-27-14

**NOTES:**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

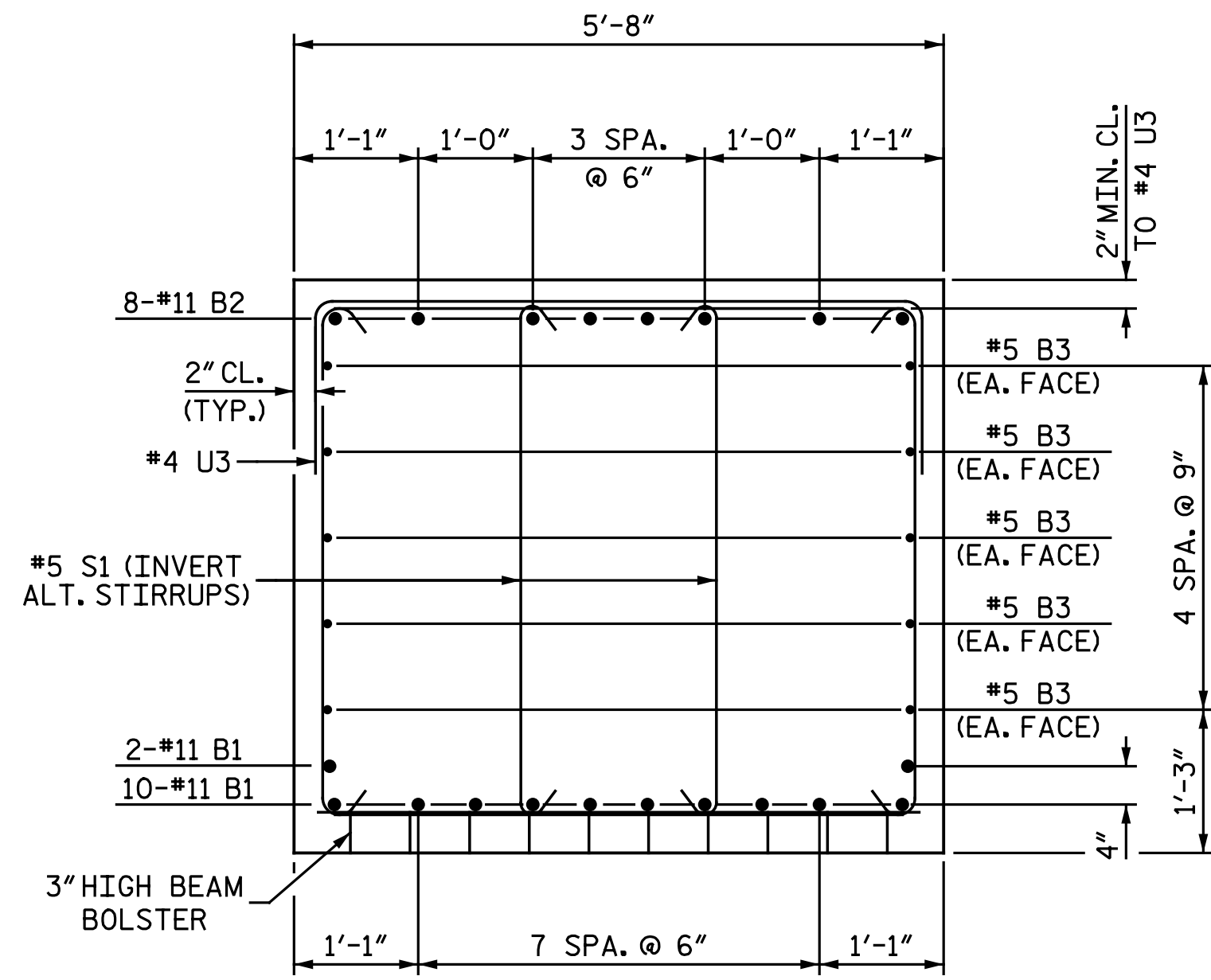
HOOCS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "EPOXY COATED REINFORCING STEEL" AND "EPOXY COATED SPIRAL COLUMN REINFORCING STEEL".

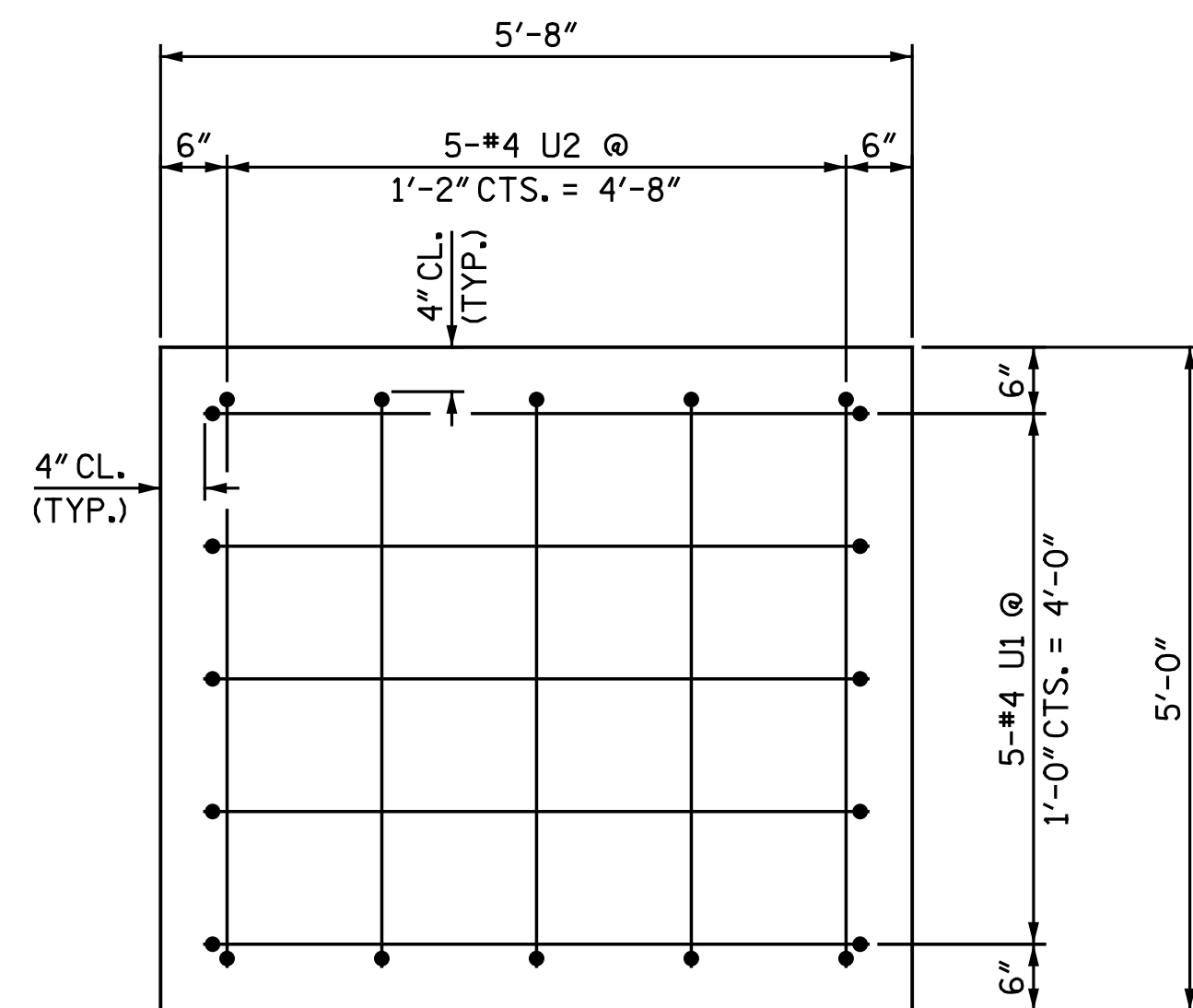
THE CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

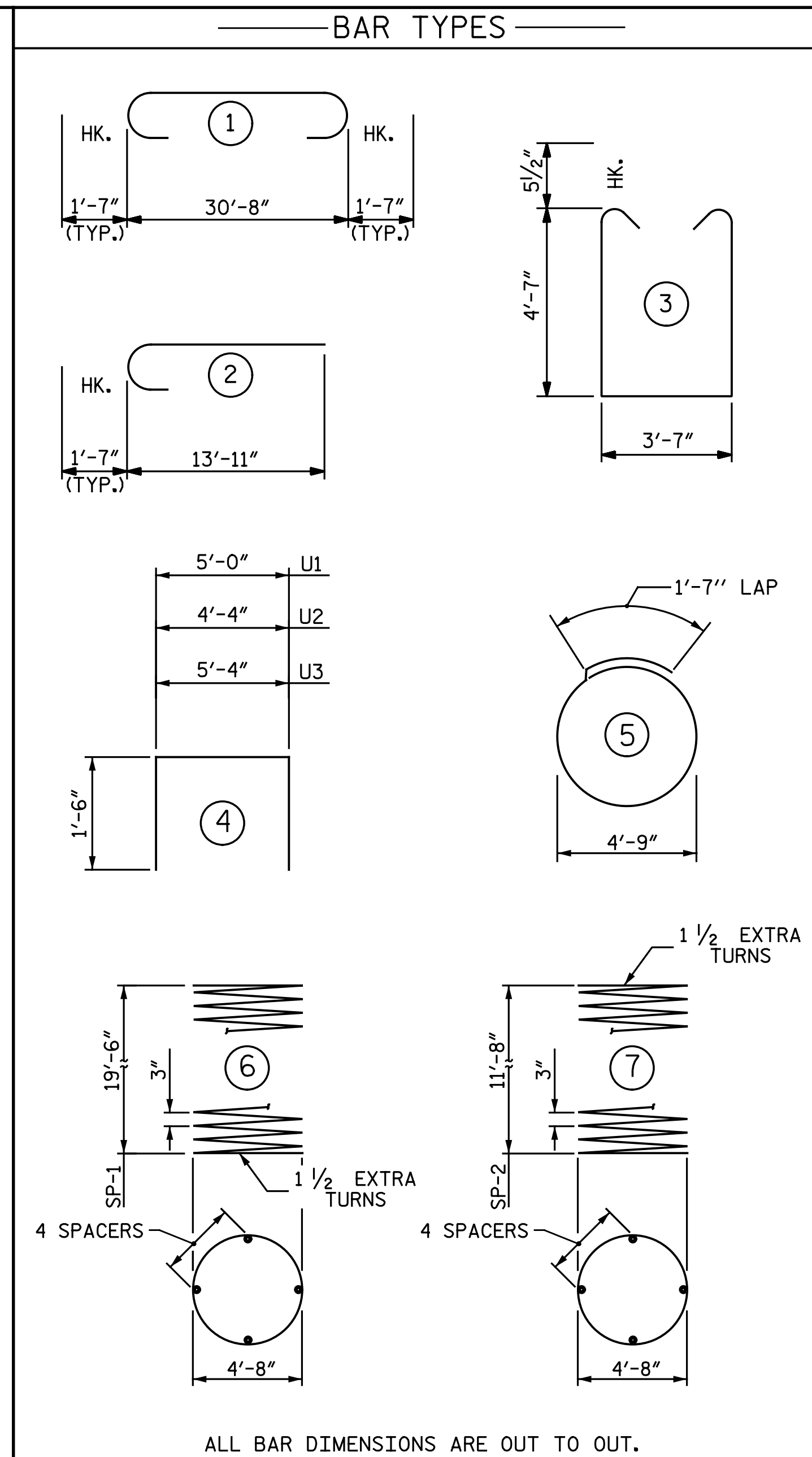
FOR ADDITIONAL FOUNDATION NOTES, SEE "GENERAL DRAWING" SHEET 2 OF 5.



SECTION C-C



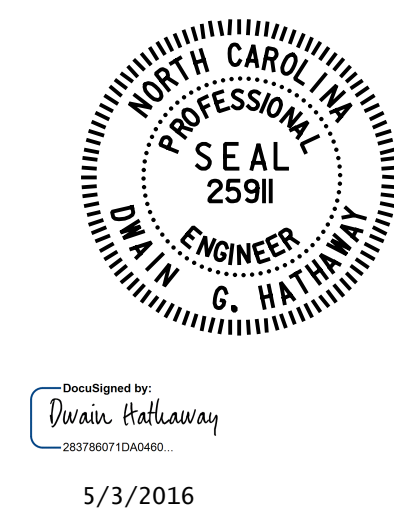
VIEW D-D



- \* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.
- \*\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.
- ▲ DENOTES EPOXY COATED REINFORCING STEEL

BILL OF MATERIAL PIER 2					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	11	STR	30' - 8"	1,955
B2	8	11	1	33' - 10"	1,438
B3	10	5	STR	30' - 8"	320
▲ M1	72	11	STR	33' - 7"	12,847
S1	40	5	3	13' - 8"	570
S2	21	5	5	16' - 7"	363
U1	10	4	4	8' - 0"	53
U2	10	4	4	7' - 4"	49
U3	61	4	4	8' - 4"	340
▲ V1	72	11	2	15' - 6"	5,929
▲ SP-1	3	*	6	1152' - 8"	3,606
▲ SP-2	3	**	7	700' - 0"	1,404
REINFORCING STEEL				LBS.	5,088
EPOXY COATED REINFORCING STEEL				LBS.	18,776
EPOXY COATED SPIRAL COLUMN REINF. STEEL				LBS.	5,010
CLASS "AA" CONCRETE BREAKDOWN					
POUR #2 COLUMN				C.Y.	24.9
POUR #3 CAP				C.Y.	32.5
TOTAL CLASS "AA" CONCRETE				C.Y.	57.4
DRILLED PIERS					
5'-6" DIA. DRILLED PIERS IN SOIL				L.F.	24.0
5'-6" DIA. DRILLED PIERS NOT IN SOIL				L.F.	36.0
DRILLED PIER CONCRETE BREAKDOWN POUR #1 DRILLED PIERS				C.Y.	52.8
CSL TUBES				L.F.	322.5

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 3 OF 3



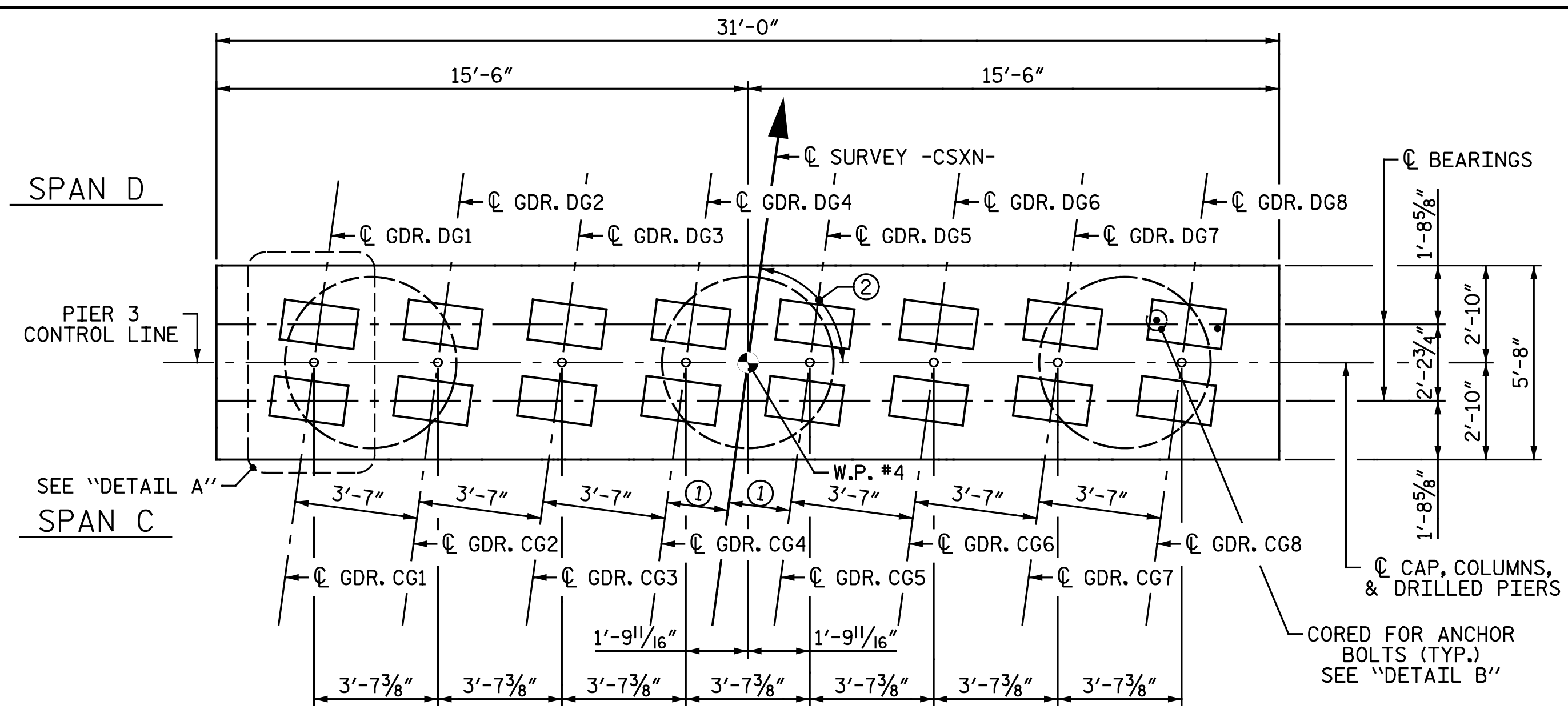
**Michael Baker INTERNATIONAL**  
 Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 PIER 2 DETAILS

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

onayhew 5/3/2016 9:37:19 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_037\_U3308\_SMU\_P203.dgn

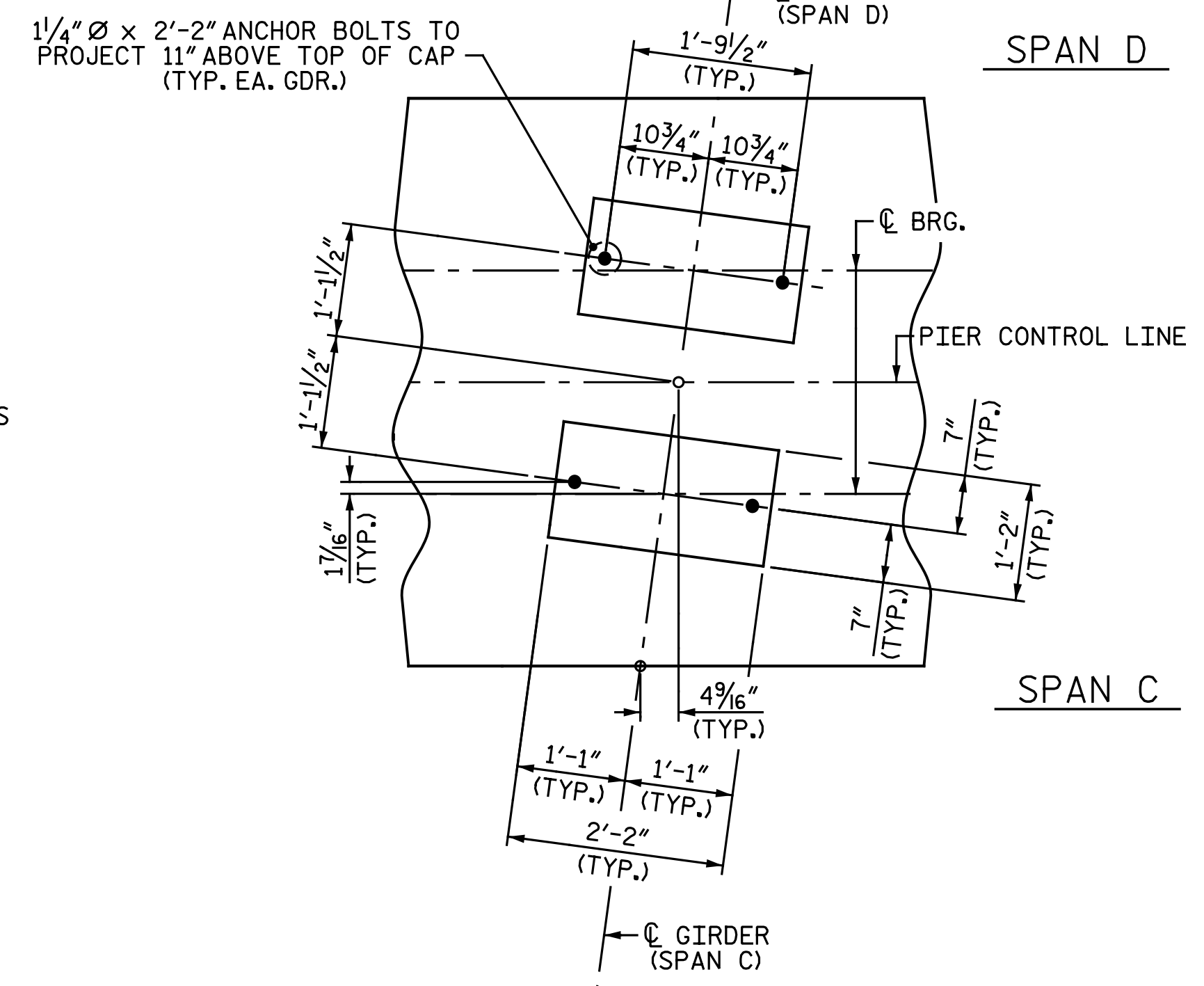
DRAWN BY : M. D. MAYHEW DATE : 5-9-14  
 CHECKED BY : S. A. DENNEY DATE : 5-27-14



**PLAN**  
 ① 1'-9 1/2"  
 ② 82°-19'-36"

**NOTES:**  
 FOR "SECTION A-A", SEE SHEET 2 OF 3.  
 FOR "SECTION B-B", SEE SHEET 2 OF 3.  
 FOR "SECTION C-C", SEE SHEET 3 OF 3.  
 FOR "VIEW D-D", SEE SHEET 3 OF 3.  
 FOR "DETAIL B", SEE SHEET 2 OF 3.

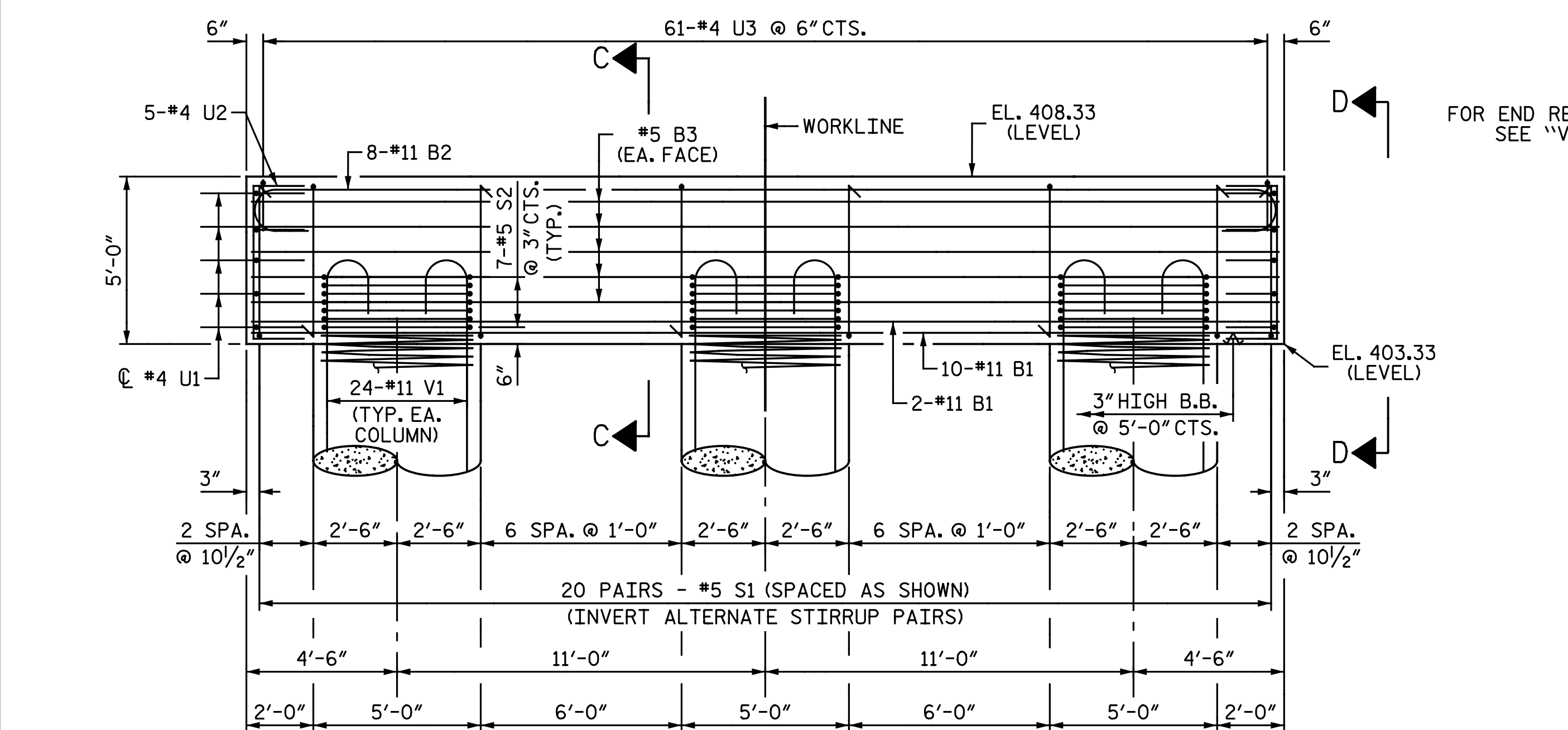
SEE SHEET 3 OF 3 FOR ADDITIONAL NOTES AND DETAILS.  
 THE TOP SURFACE OF THE PIER CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.  
 THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.  
 METHOD A WATERPROOFING SHOULD BE APPLIED AROUND THE CONSTRUCTION JOINT AT THE COLUMN AND DRILLED PIER FOR EACH COLUMN.  
 DAMPPROOFING SHOULD BE APPLIED TO ANY PART OF THE COLUMN THAT IS BELOW THE GROUND LINE.  
 FOR TEMPORARY SPAN, REFER TO SHEETS S4-52 THRU S4-67. THE CONTRACTOR'S ATTENTION IS CALLED TO THE NEED FOR ANCHOR BOLT AND STEEL PIPE BLOCKOUTS TO BE INSTALLED IN THE CAP TO ACCOMMODATE THE TEMPORARY SPAN. REFER TO SHEETS S4-58 THRU S4-61 AND S4-66 THRU S4-67.



**DETAIL A**

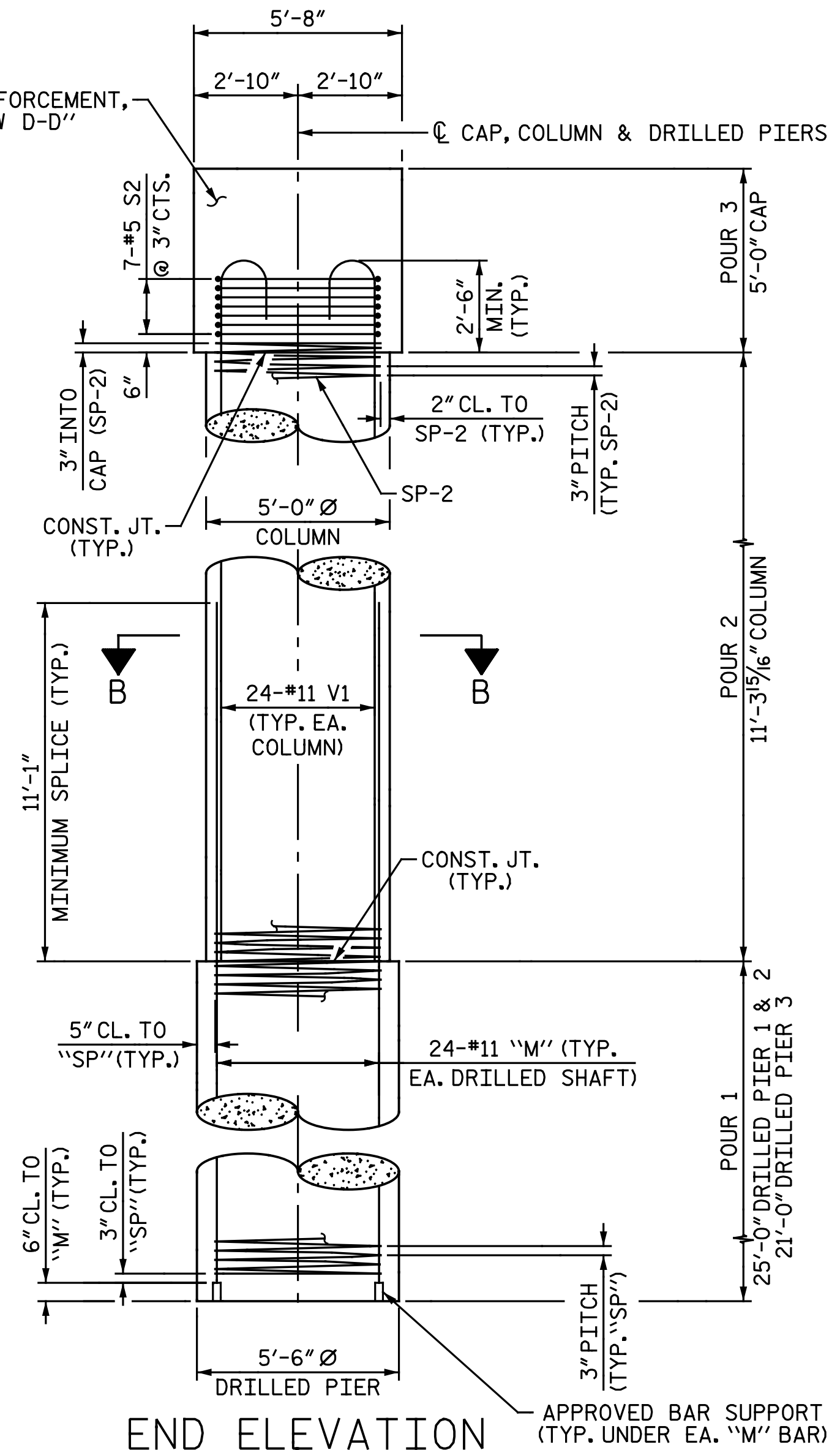
ALL DIMENSIONS AND DETAILS ARE TYPICAL FOR ALL BEARINGS AT EACH GIRDER LOCATION  
 SEE "BEARING DETAILS" SHEET FOR BEARING ASSEMBLY DETAILS

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 1 OF 3

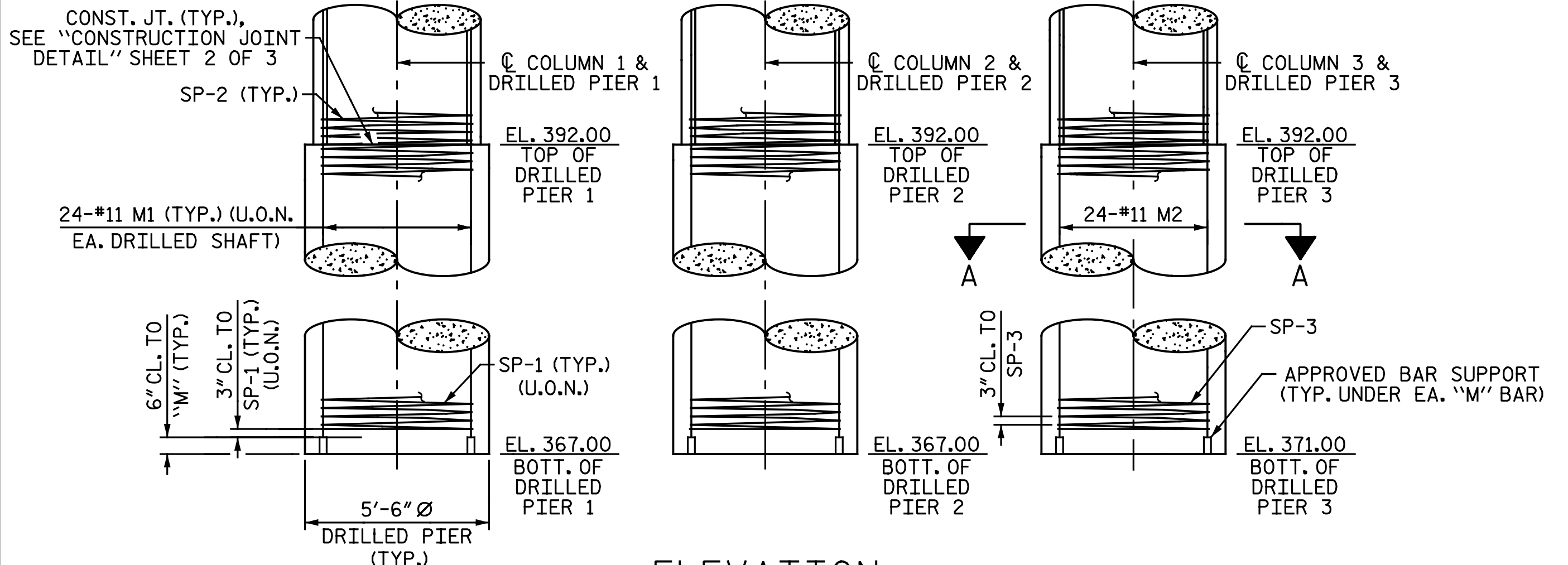


**ELEVATION**

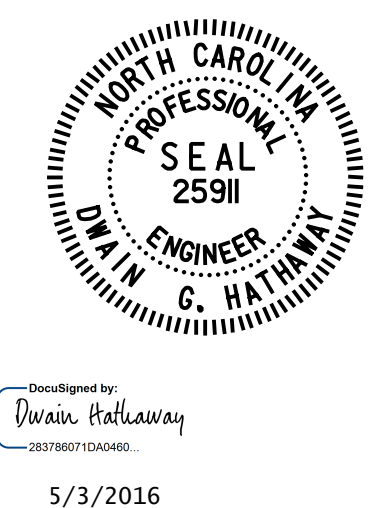
ALL DIMENSIONS AND DETAILS SHOWN FOR DRILLED PIERS ARE TYPICAL FOR EACH PIER UNLESS OTHERWISE NOTED.



**END ELEVATION**



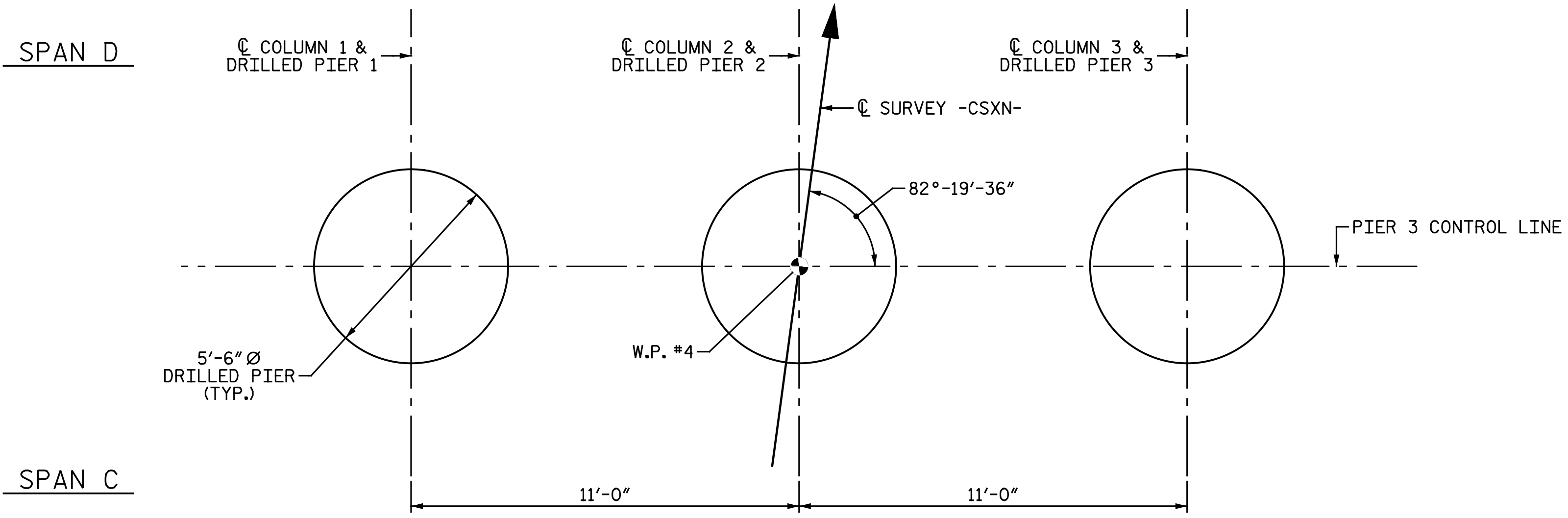
DRAWN BY: M. D. MAYHEW DATE: 5-9-14  
 CHECKED BY: S. A. DENNEY DATE: 5-27-14



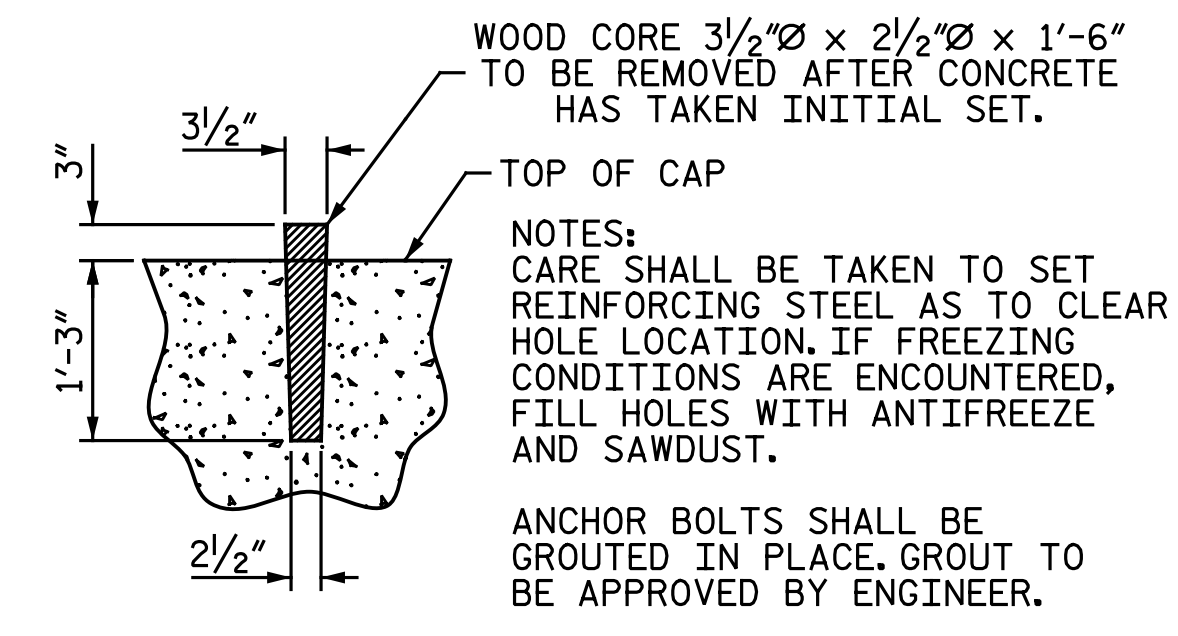
**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27518  
 NC License No.: F-1084

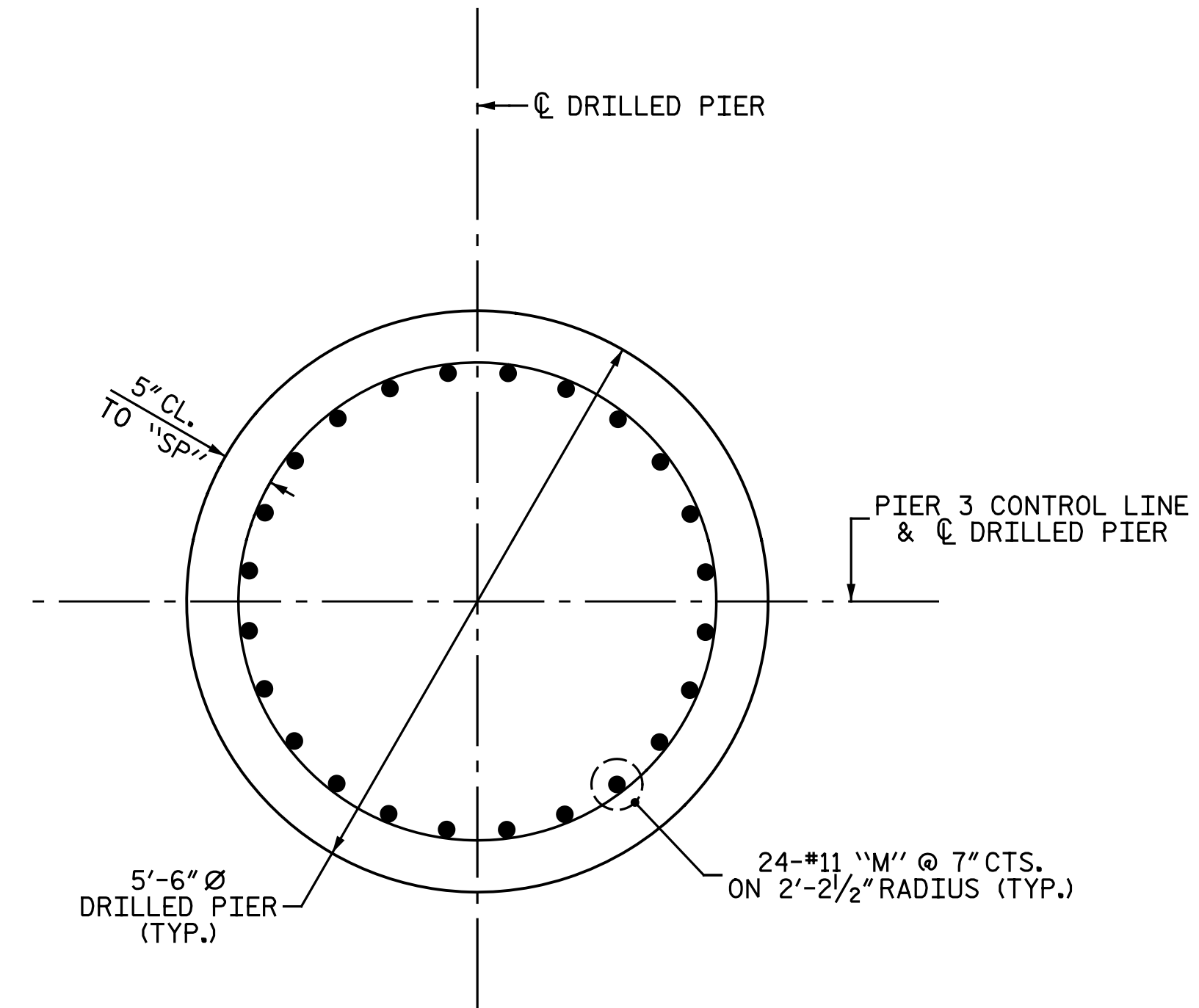
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE PIER 3					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



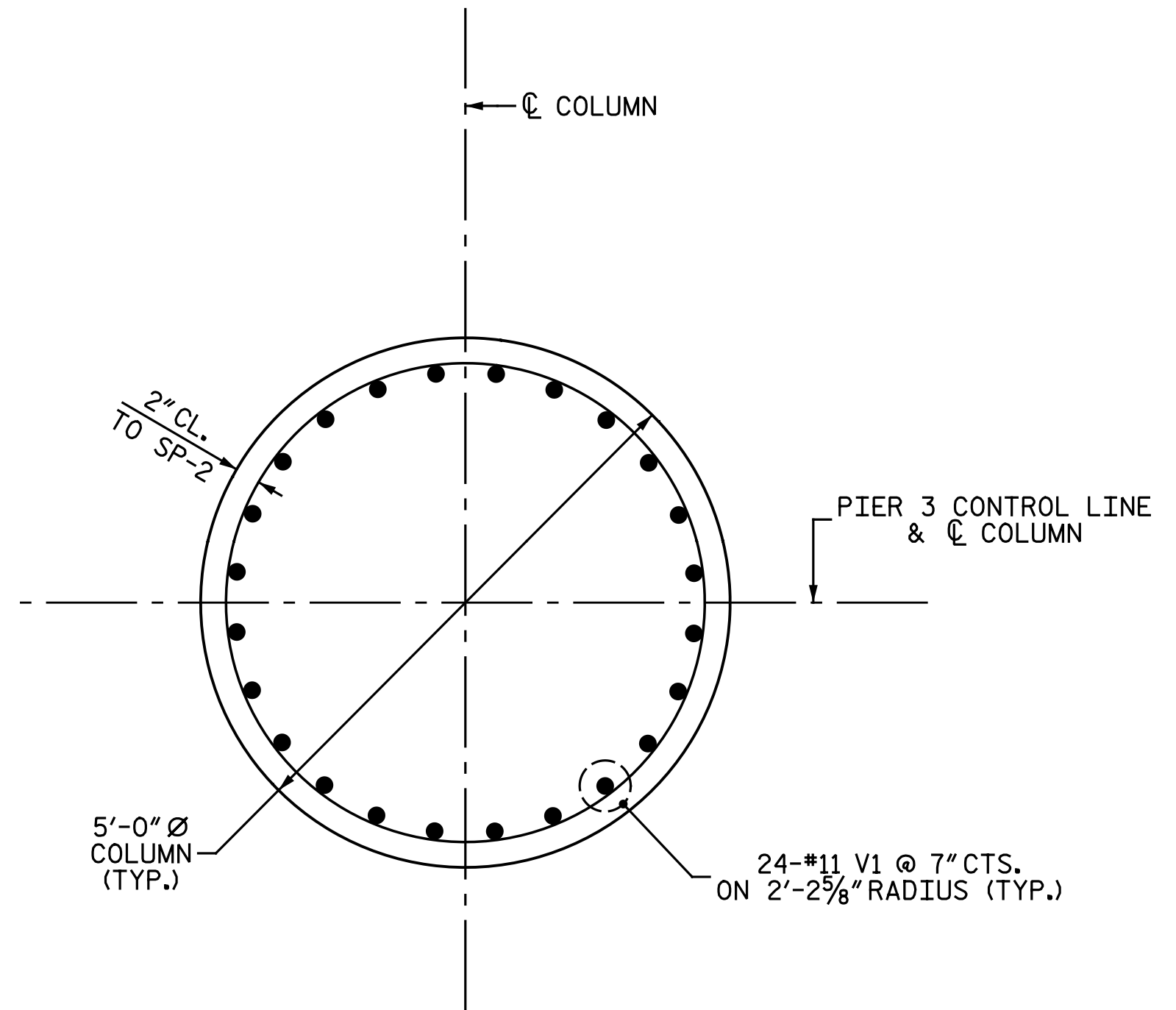
**PLAN OF DRILLED PIERS**  
ALL DIMENSIONS AND DETAILS SHOWN FOR DRILLED PIERS ARE TYPICAL FOR EACH PIER UNLESS OTHERWISE NOTED.



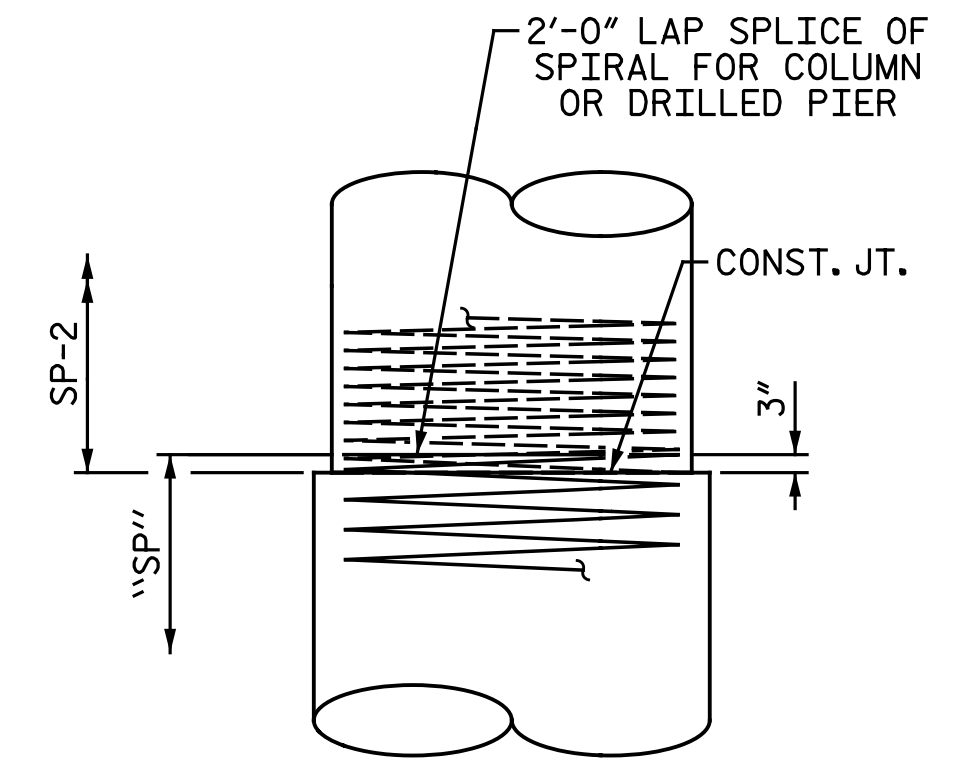
**DETAIL B**  
FOR LOCATION OF "DETAIL B", SEE SHEET 1 OF 3.



**SECTION A-A**

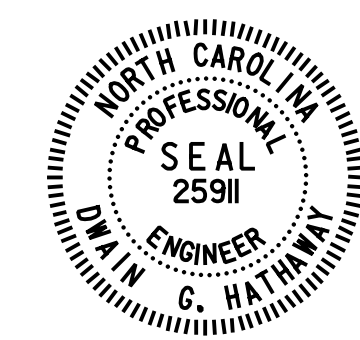


**SECTION B-B**



**CONSTRUCTION JOINT DETAIL**

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 2 OF 3



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
**PIER 3 DETAILS**



Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-39
1			3			TOTAL SHEETS
2			4			68

5/3/2016 9:37:21 AM  
 Filename: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_039\_U3308\_SML\_P302.dgn

DRAWN BY : M. D. MAYHEW DATE : 5-9-14  
 CHECKED BY : S. A. DENNEY DATE : 5-27-14



**NOTES:**

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

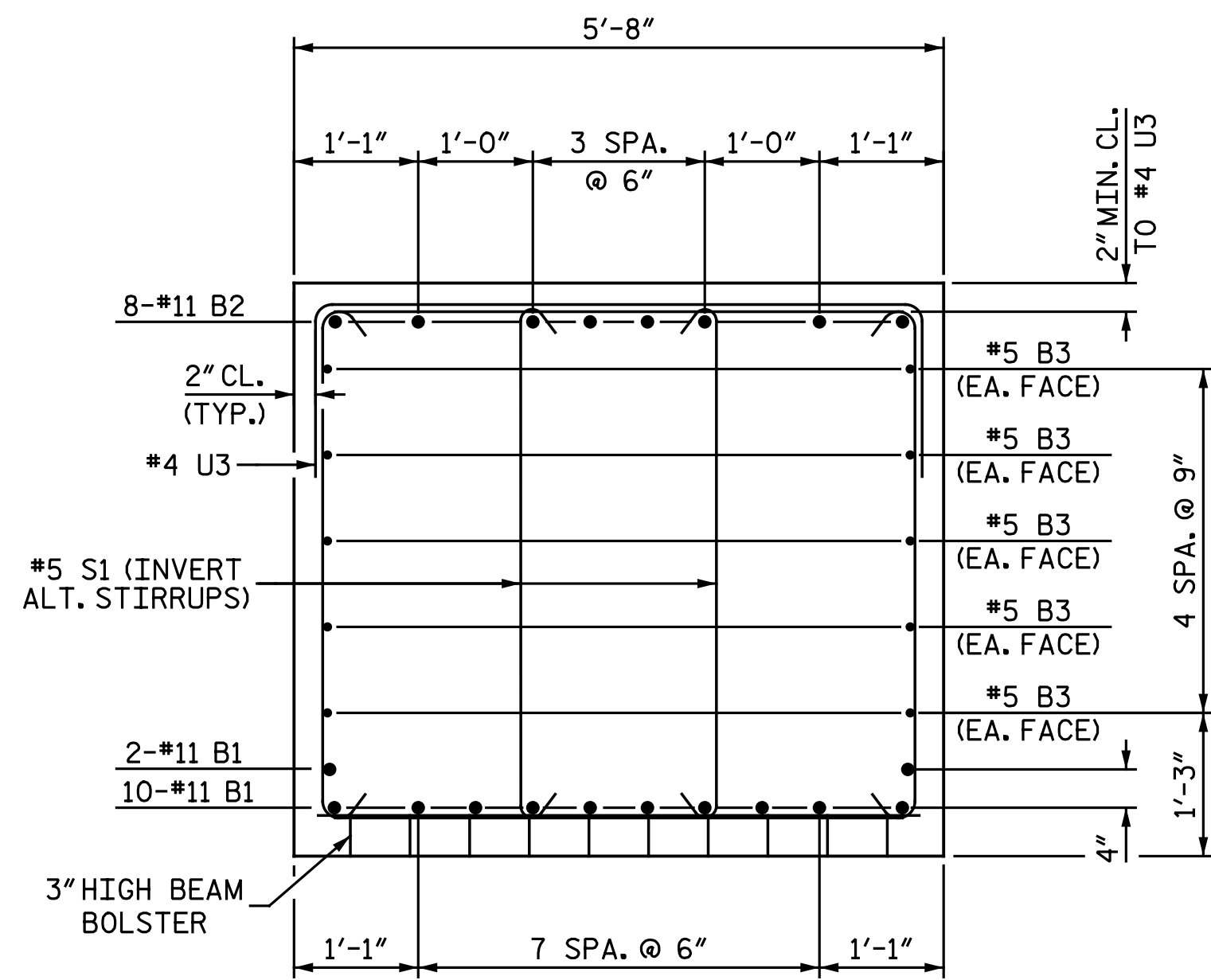
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "EPOXY COATED REINFORCING STEEL" AND "EPOXY COATED SPIRAL COLUMN REINFORCING STEEL".

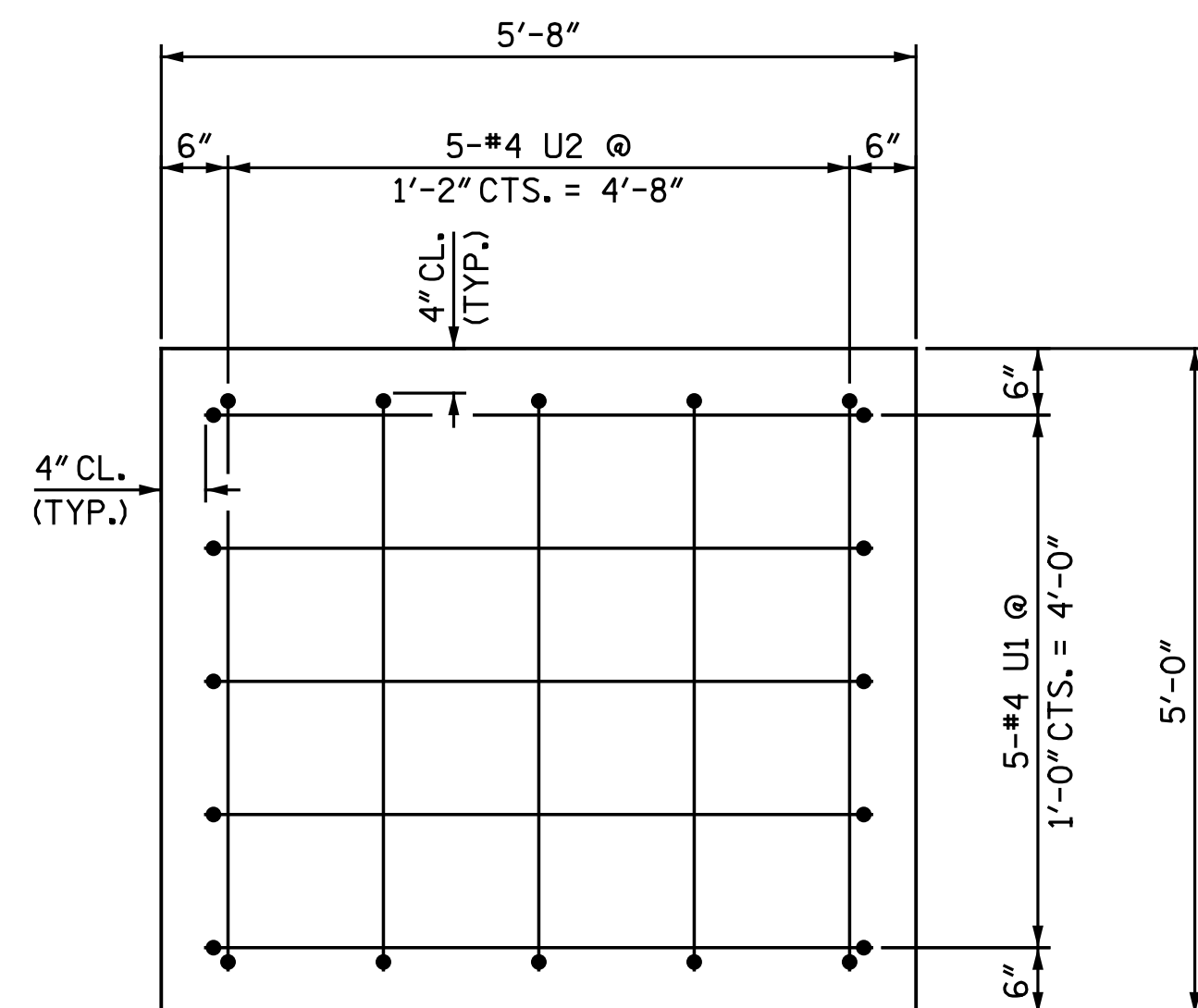
THE CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

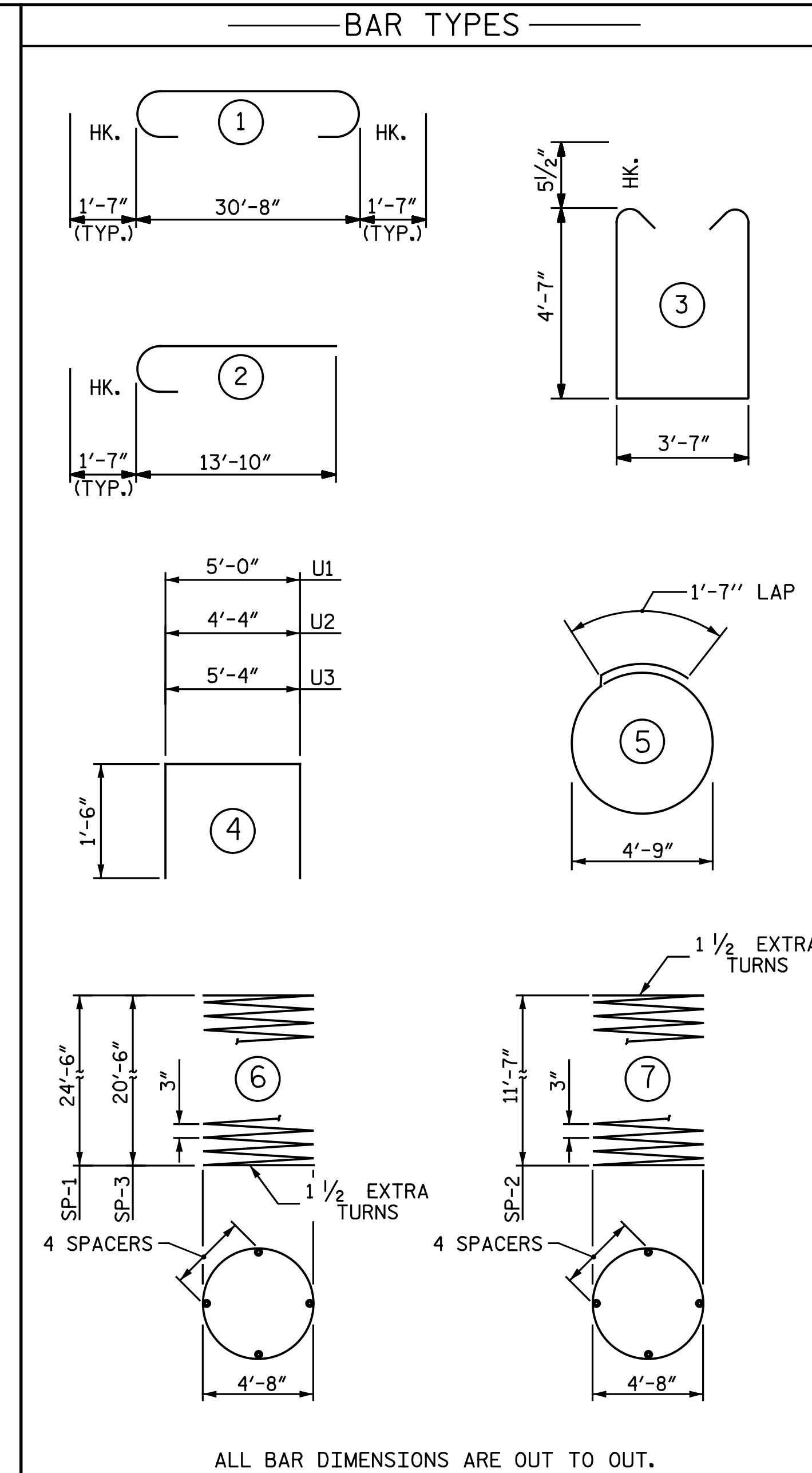
FOR ADDITIONAL FOUNDATION NOTES, SEE "GENERAL DRAWING" SHEET 2 OF 5.



SECTION C-C



VIEW D-D



ALL BAR DIMENSIONS ARE OUT TO OUT.

- \* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.
- \* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.
- ▲ DENOTES EPOXY COATED REINFORCING STEEL

**BILL OF MATERIAL  
PIER 3**

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	11	STR	30' - 8"	1,955
B2	8	11	1	33' - 10"	1,438
B3	10	5	STR	30' - 8"	320
▲ M1	48	11	STR	38' - 7"	9,840
▲ M2	24	11	STR	34' - 7"	4,410
S1	40	5	3	13' - 8"	570
S2	21	5	5	16' - 7"	363
U1	10	4	4	8' - 0"	53
U2	10	4	4	7' - 4"	49
U3	61	4	4	8' - 4"	340
▲ V1	72	11	2	15' - 5"	5,897
▲ SP-1	2	*	6	1442' - 8"	3,010
▲ SP-2	3	**	7	695' - 1"	1,392
▲ SP-3	1	*	6	1210' - 8"	1,263
REINFORCING STEEL				LBS.	5,088
EPOXY COATED REINFORCING STEEL				LBS.	20,147
EPOXY COATED SPIRAL COLUMN REINF. STEEL				LBS.	5,665
CLASS "AA" CONCRETE BREAKDOWN					
POUR #2 COLUMN		C.Y.	24.7		
POUR #3 CAP		C.Y.	32.5		
TOTAL CLASS "AA" CONCRETE		C.Y.	57.2		

**DRILLED PIERS**

5'-6" DIA. DRILLED PIERS IN SOIL	DRILLED PIERS :	L.F.	45.0
5'-6" DIA. DRILLED PIERS NOT IN SOIL	DRILLED PIERS :	L.F.	26.0
DRILLED PIER CONCRETE BREAKDOWN	POUR #1 DRILLED PIERS	C.Y.	62.5
CSL TUBES		L.F.	377.5

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 3 OF 3



DocuSigned by:  
Dwain Holloway

5/3/2016

**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 PIER 3 DETAILS

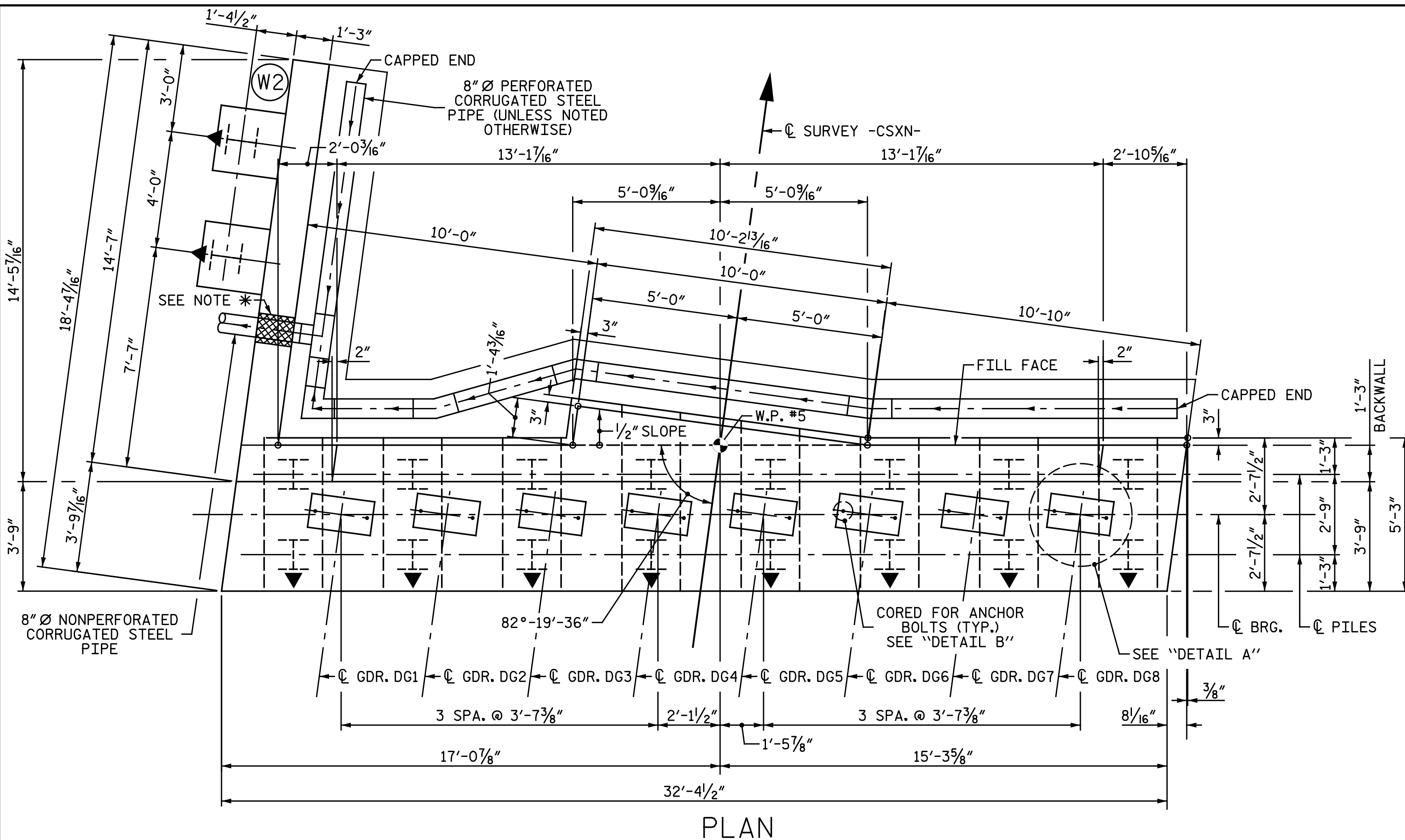
REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

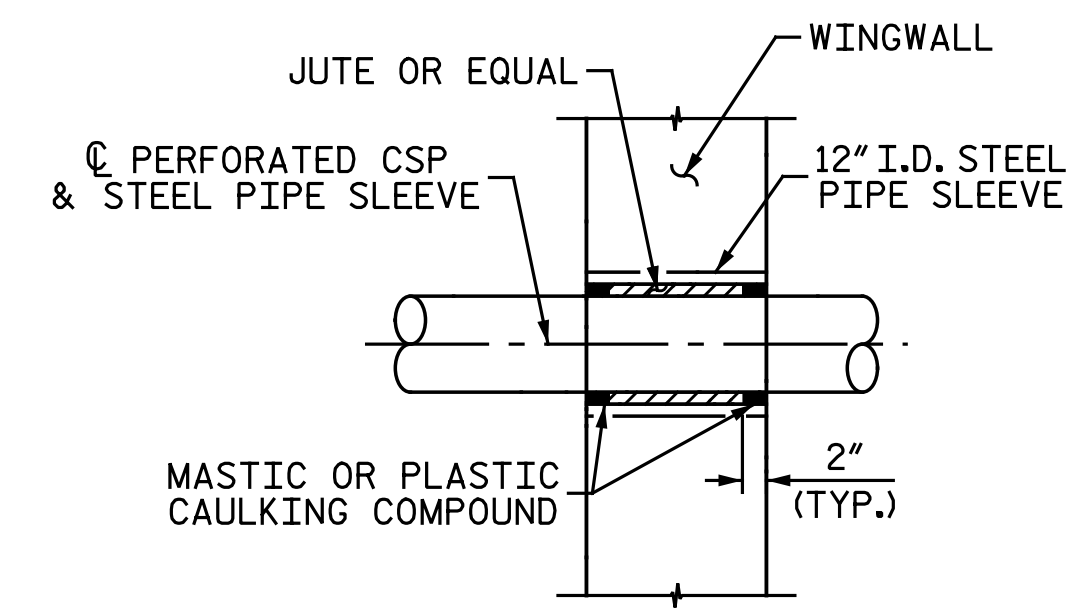
SHEET NO.  
S4-40  
TOTAL SHEETS  
68

cmayhew 5/3/2016 9:37:22 AM  
 File Name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_040\_U3308\_SMU\_P303.dgn

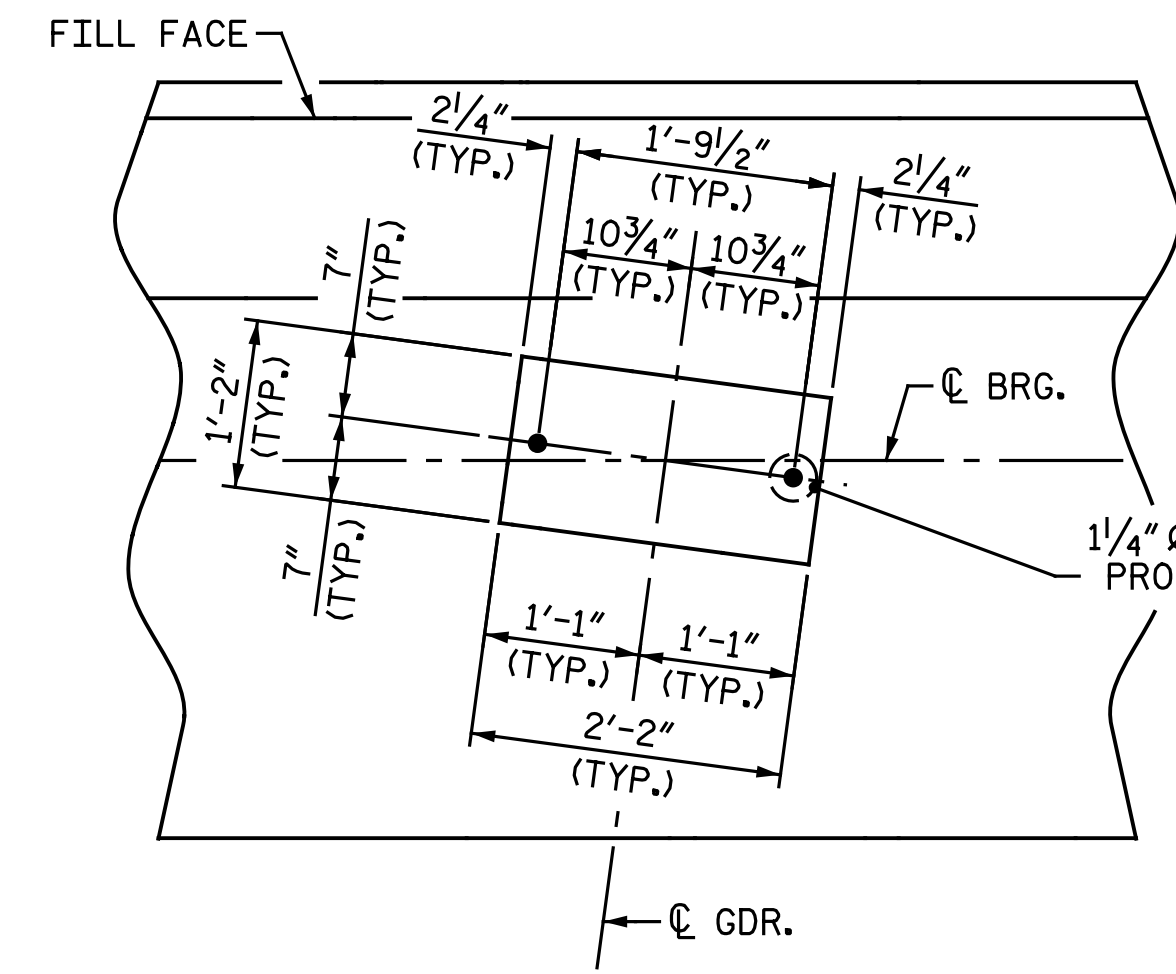
DRAWN BY : M. D. MAYHEW DATE : 5-9-14  
 CHECKED BY : S. A. DENNEY DATE : 5-27-14



PLAN

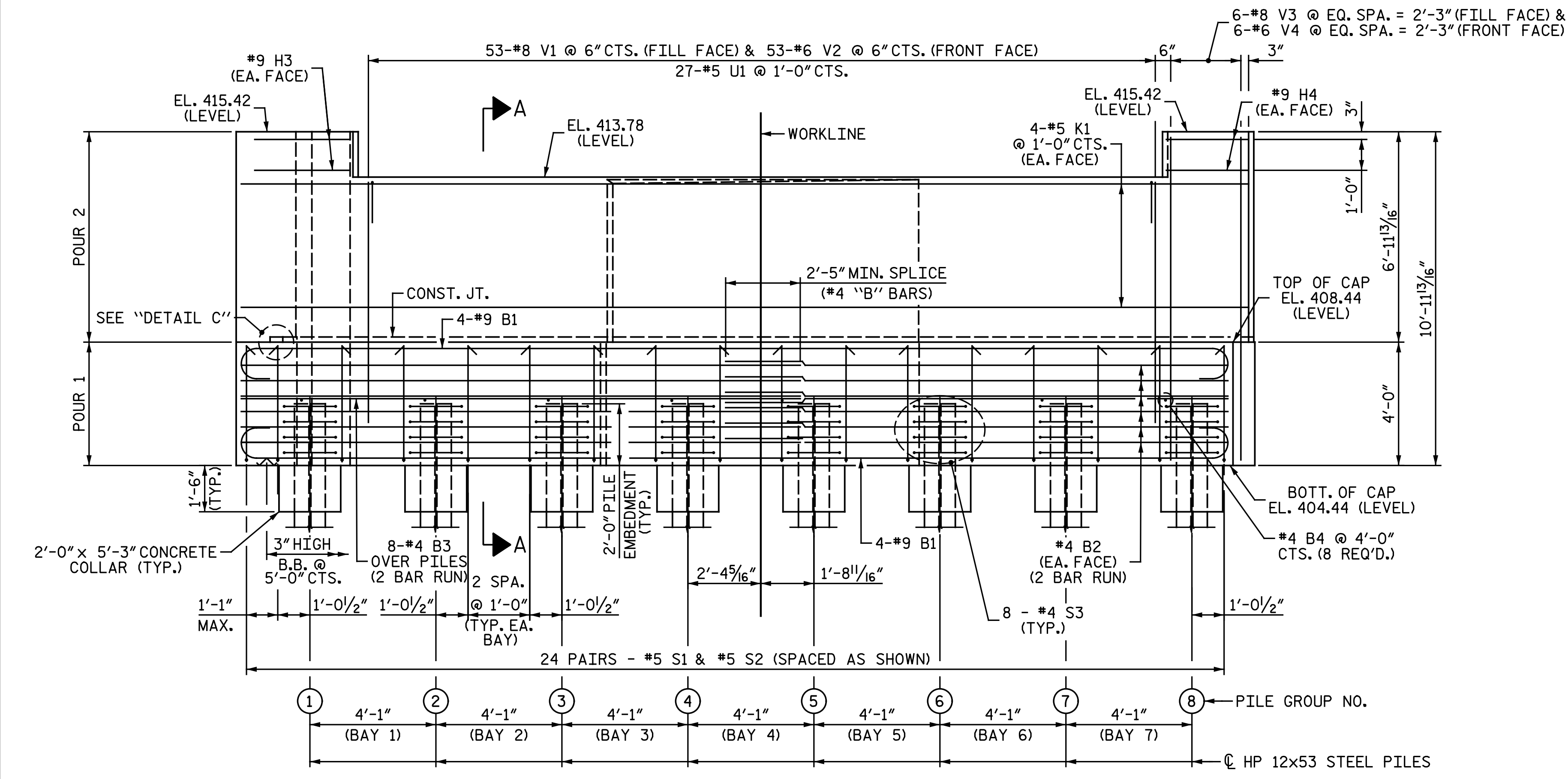


SECTION THRU WING

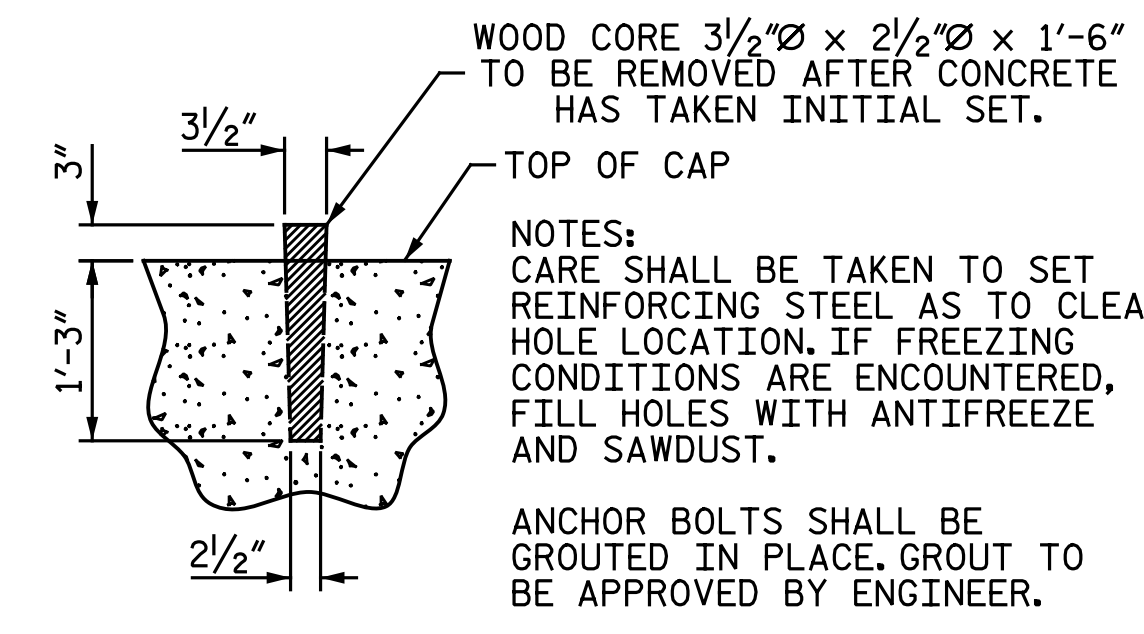


DETAIL A

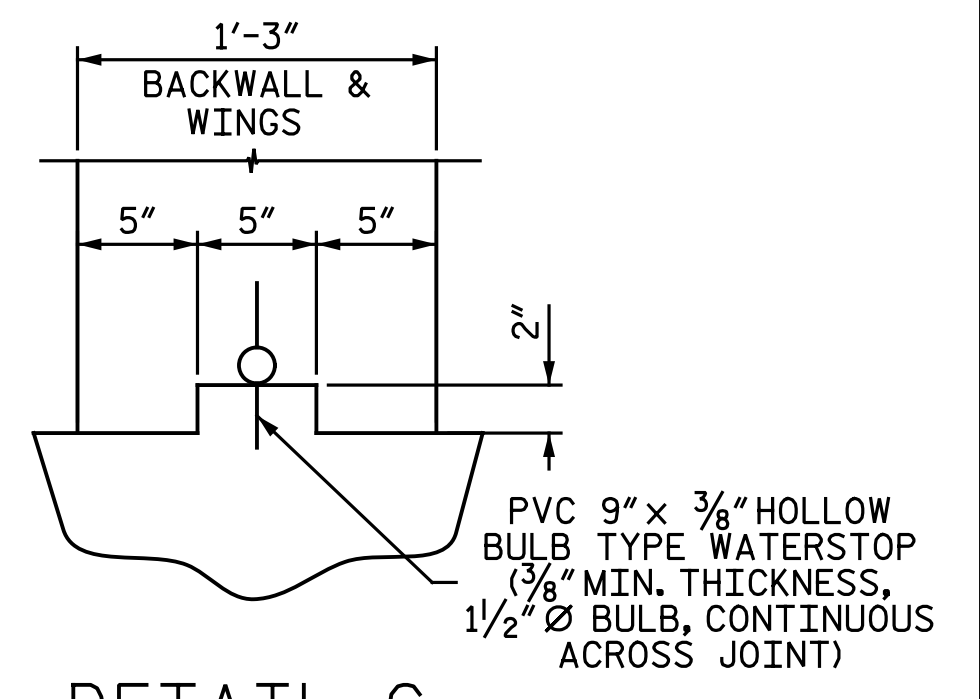
**NOTES:**  
 FOR "SECTION A-A", SEE SHEET 4 OF 4.  
 ▲ DENOTES DIRECTION OF 3:12 BATTER.  
 \* 12" Ø I.D. STEEL PIPE SLEEVE (3/8" WALL THICKNESS) TO BE FLUSH WITH BOTH FACES OF WING. FIELD BEND REINFORCING STEEL AS NECESSARY TO PROVIDE FOR SLEEVE. SEE "SECTION THRU WING" FOR DETAILS. INSTALL CSP WITH A MINIMUM OF 1/8" SLOPE.  
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.  
 PAYMENT FOR PIPE SLEEVE INSERT CONSIDERED INCIDENTAL TO THE CONSTRUCTION OF THE ABUTMENT.  
 DAMPPROOFING LIMITS: BACK OF BACKWALL, BACK OF ABUTMENT SEAT, AND BACK OF WINGWALLS.  
 FOR PIPE SLEEVE INSERTS, SEE SPECIAL PROVISIONS FOR STRUCTURE DRAINAGE SYSTEM.  
 CORRUGATED STEEL PIPE LOCATED IN DRAINAGE AREA BETWEEN WINGS SHALL BE NON-PERFORATED. ALL OTHER CSP SHALL BE NON-PERFORATED.  
 SEE SHEET 4 OF 4 FOR ADDITIONAL NOTES AND DETAILS.  
 FOR ADDITIONAL FOUNDATION NOTES, SEE "GENERAL DRAWING" SHEET 2 OF 5.



ELEVATION

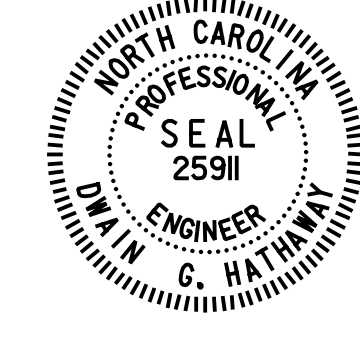


DETAIL B



DETAIL C

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 1 OF 4



**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27615  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 ABUTMENT 2

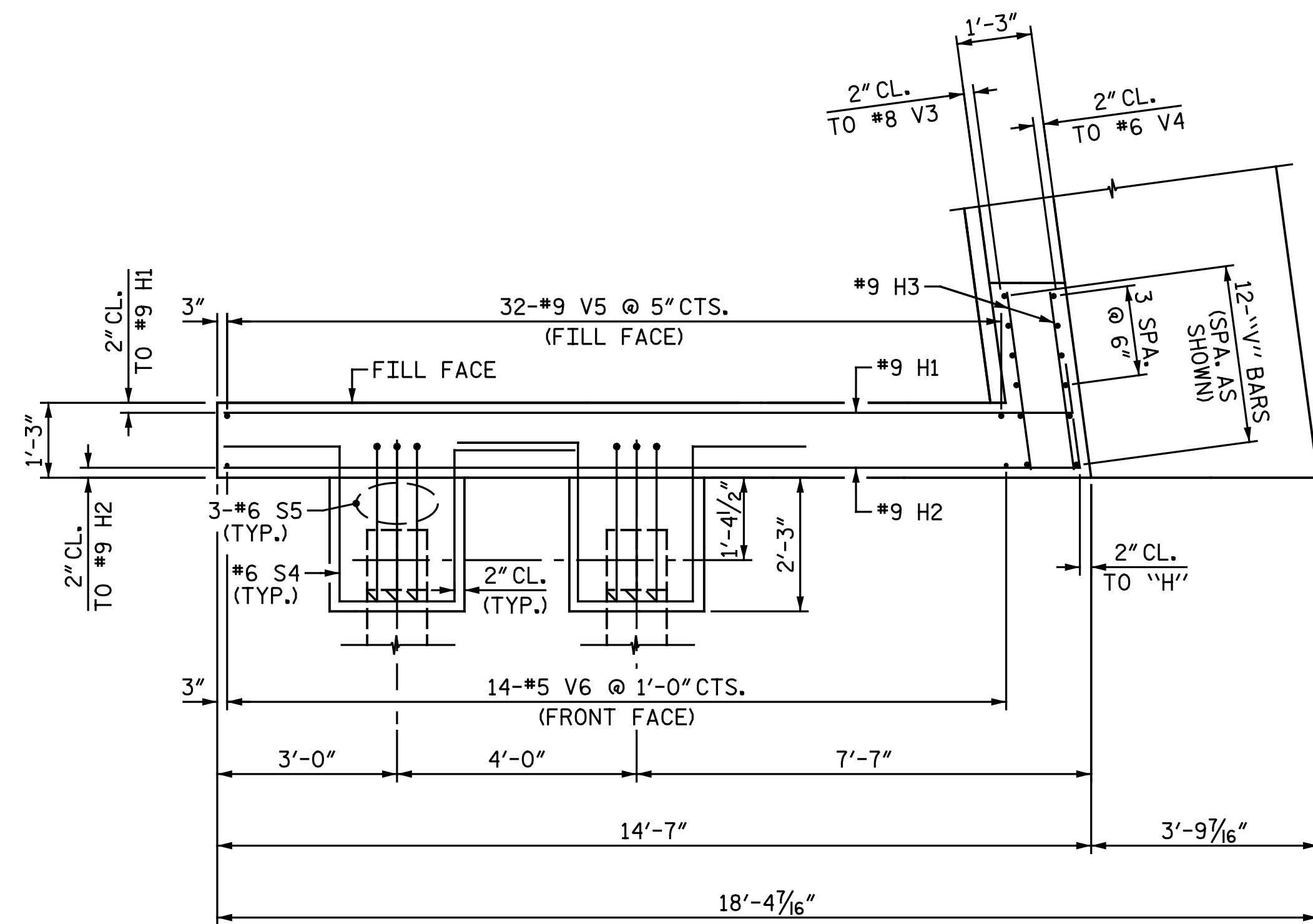
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. **S4-41**  
 TOTAL SHEETS **68**

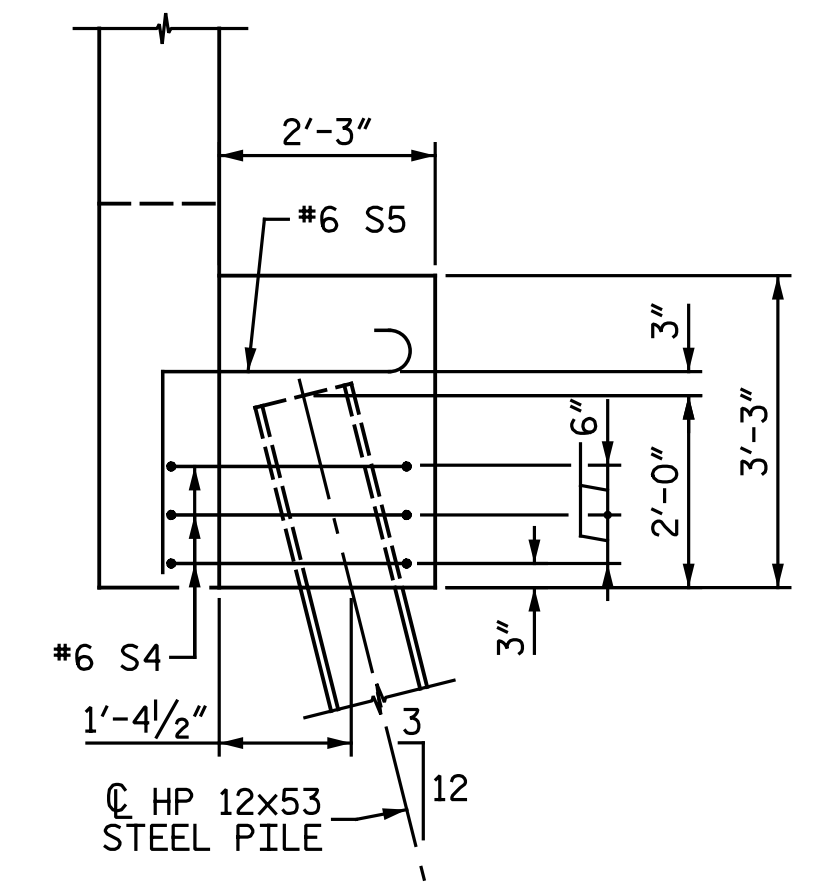
DRAWN BY: M. D. MAYHEW DATE: 2-21-14  
 CHECKED BY: S. A. DENNEY DATE: 3-13-14

8" Ø PERFORATED CORRUGATED PIPE DRAIN NOT SHOWN FOR CLARITY.

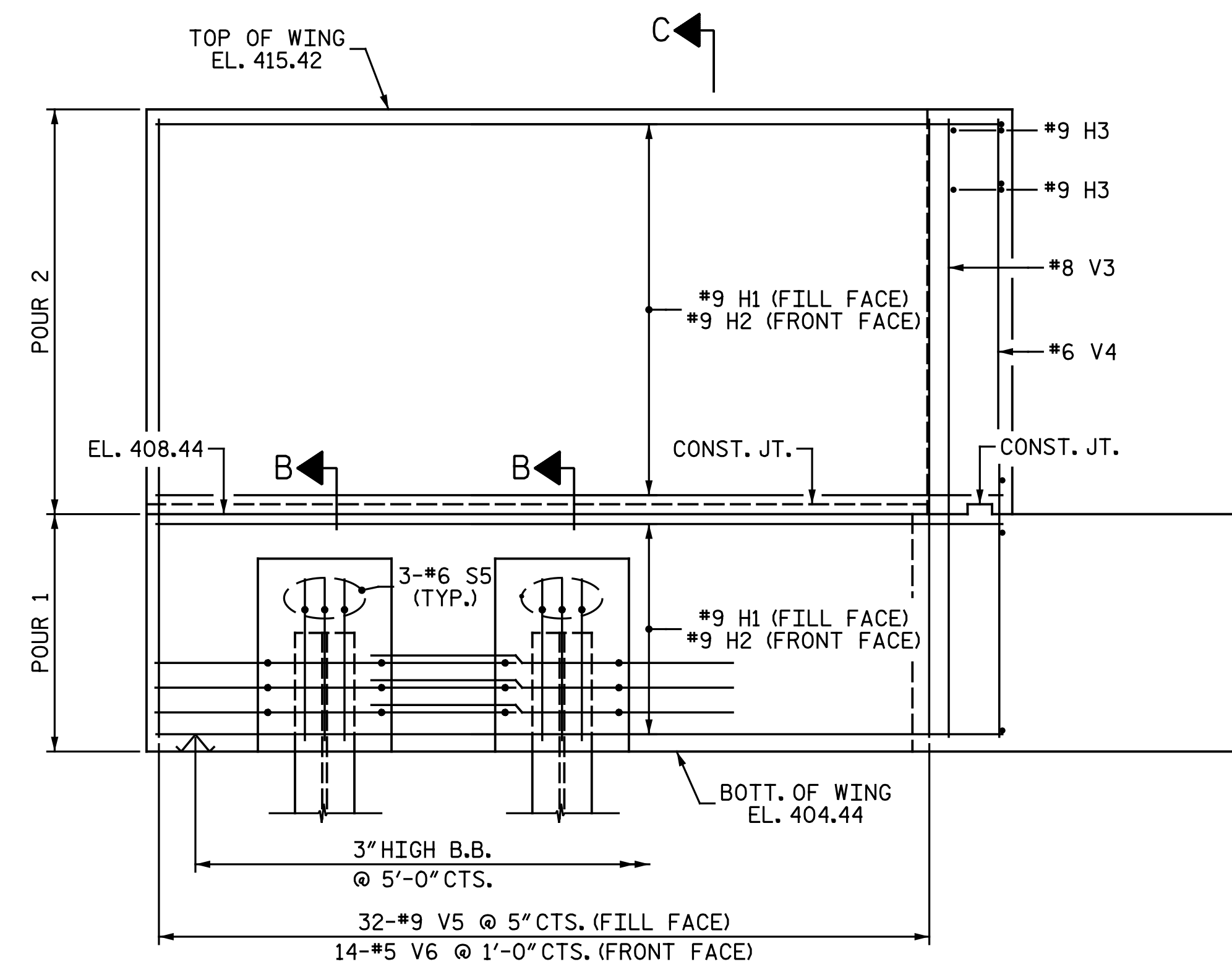
cmayhew 5/3/2016 9:37:23 AM  
 File Name: Y:\Projects\NC DOT\U-3308\Structures\Drawings\Final\404\_041\_U3308\_SML\_AB201.dgn



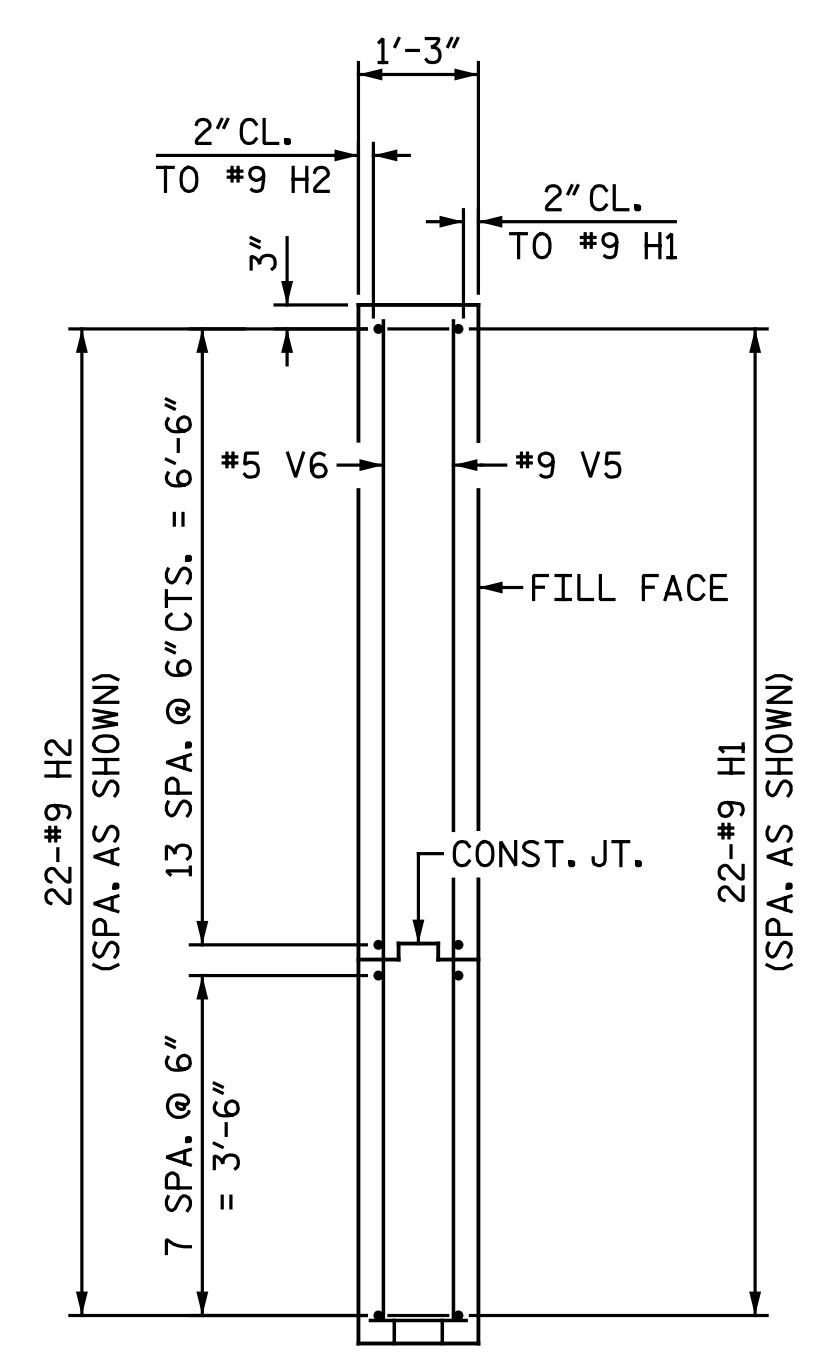
PLAN OF WING WALL (W2)



SECTION B-B



ELEVATION OF WING WALL (W2)



SECTION C-C

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
 13+22.18 -CSXN-  
 SHEET 2 OF 4



5/3/2016

**Michael Baker**  
 INTERNATIONAL

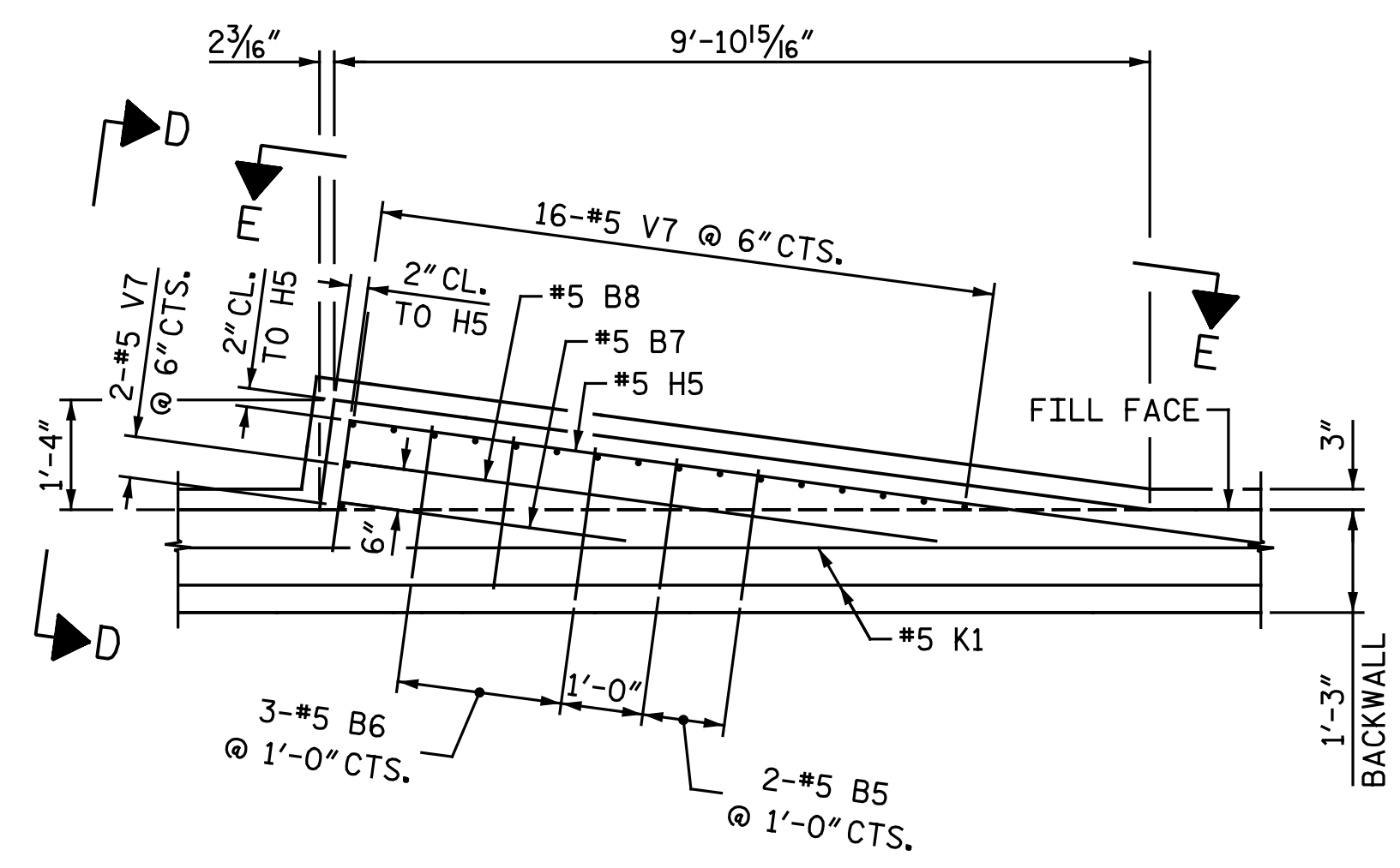
Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 ABUTMENT 2

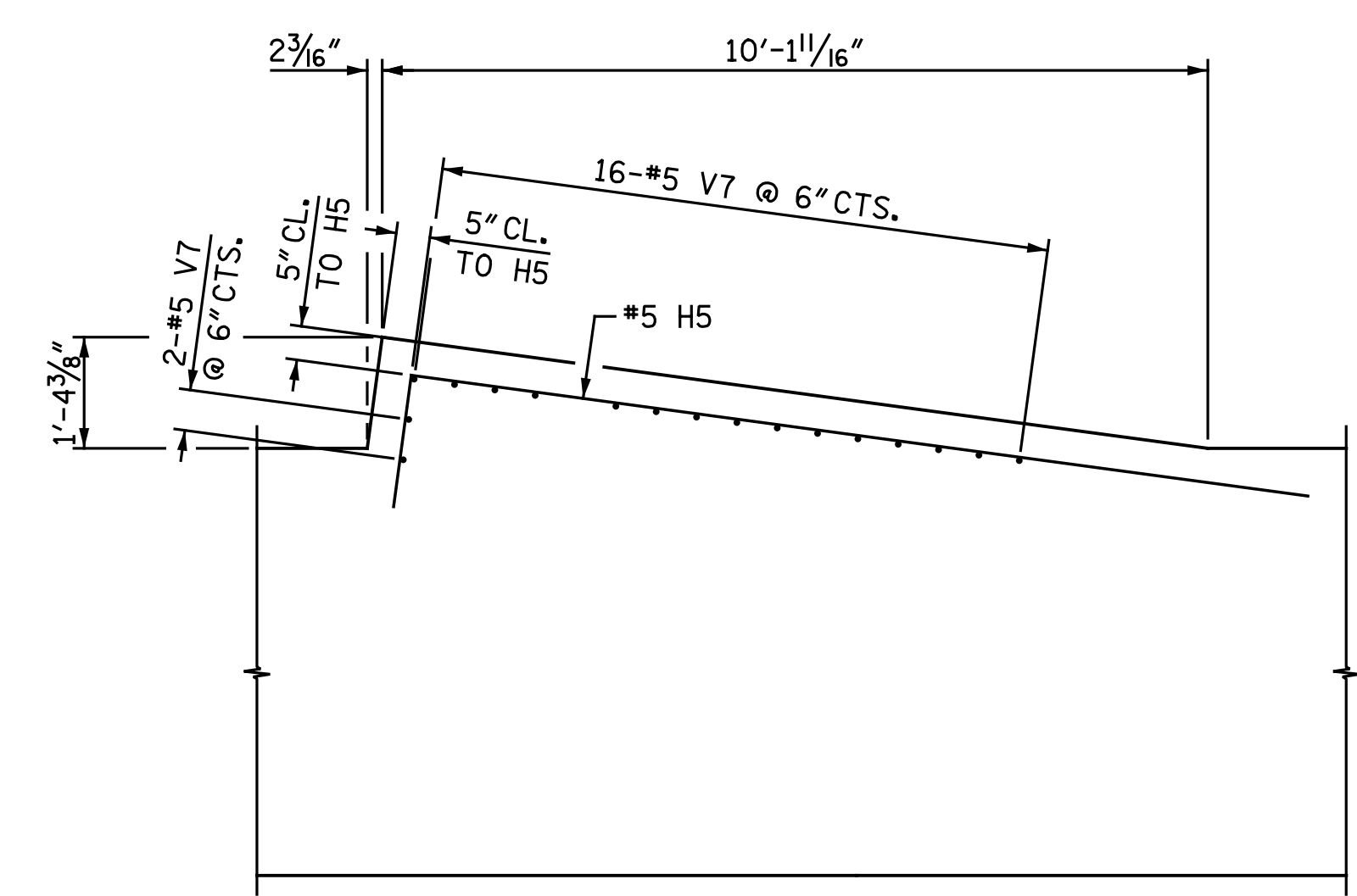
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-42
1			3			TOTAL SHEETS
2			4			68

cmayhew 5/3/2016 9:37:23 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_042\_U3308\_SML\_AB202.dgn

DRAWN BY: M. D. MAYHEW DATE: 3-6-14  
 CHECKED BY: S. A. DENNEY DATE: 3-13-14

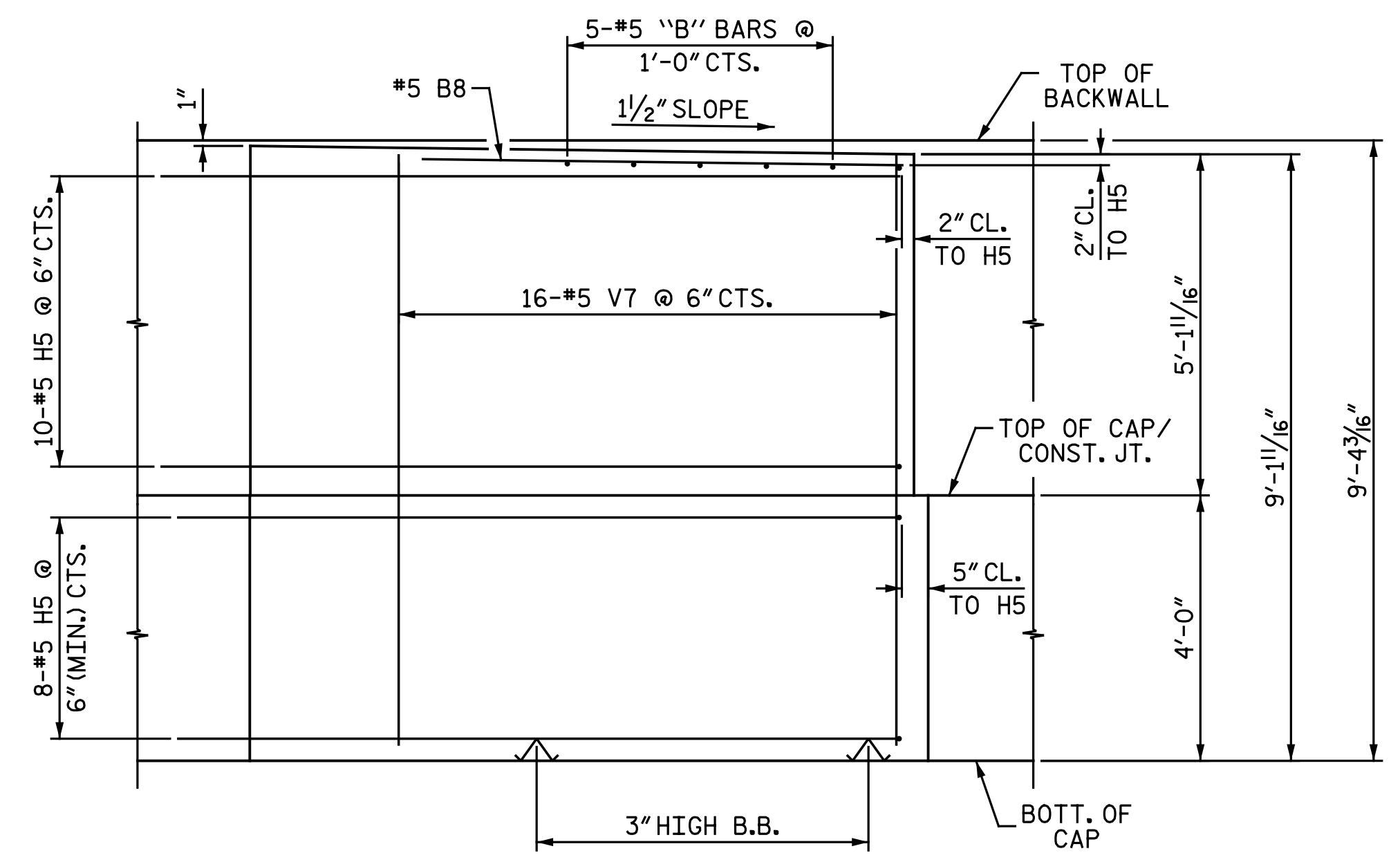


PLAN - BACKWALL EXTENSION DETAIL

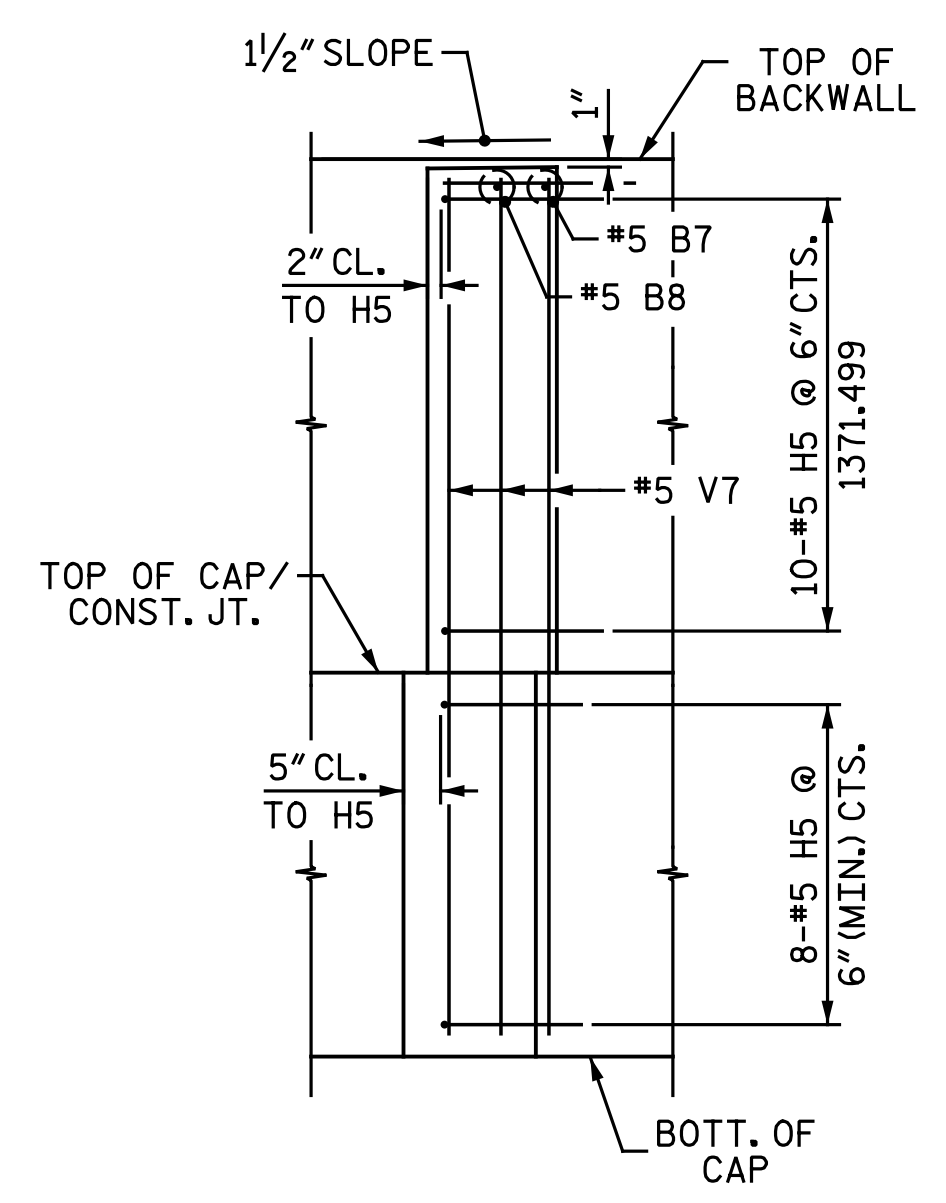


PLAN - CAP EXTENSION DETAIL

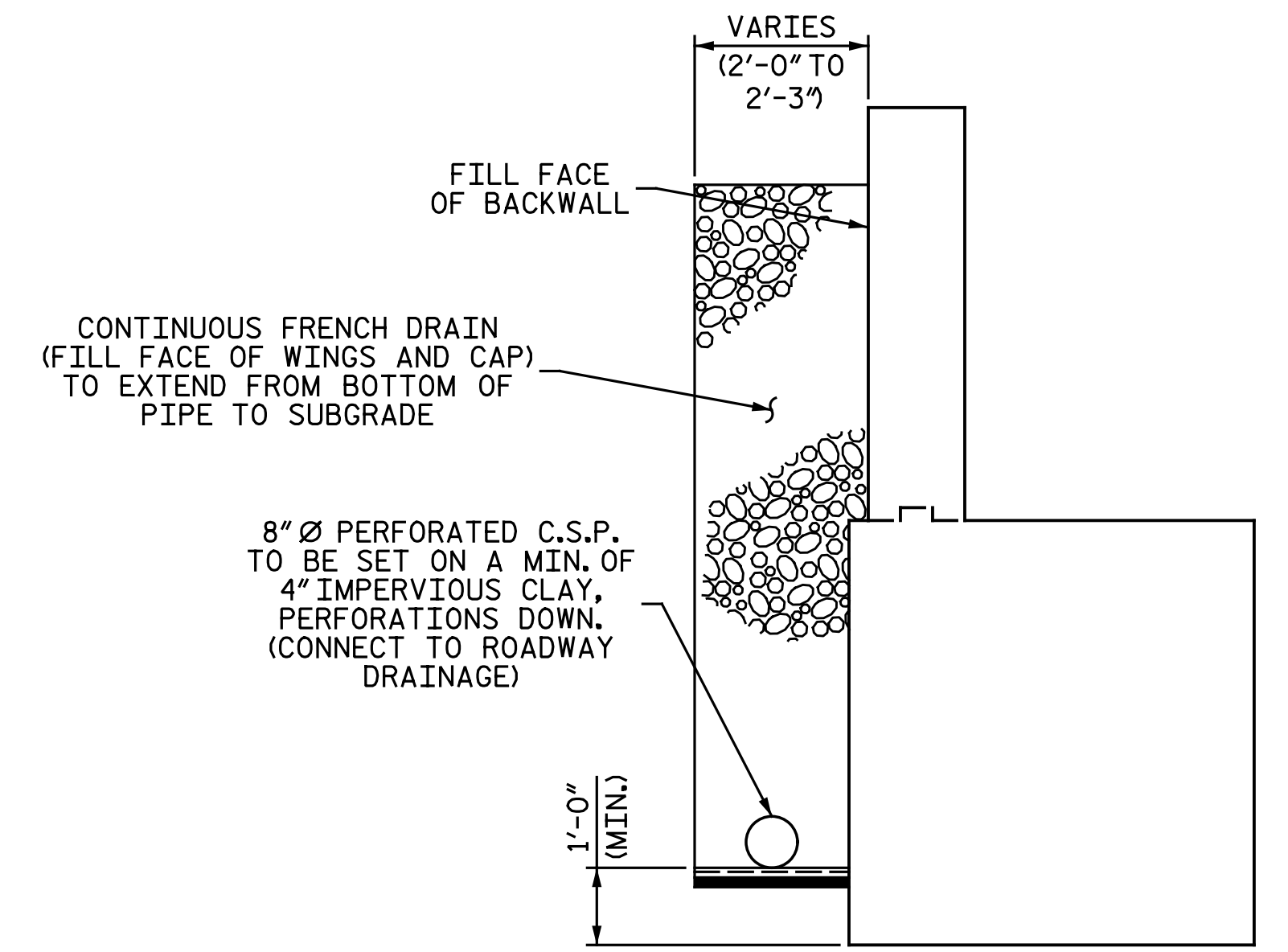
NOTE: BACKWALL NOT SHOWN FOR CLARITY



VIEW E-E

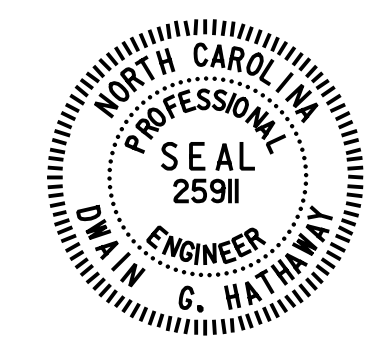


VIEW D-D



DRAINAGE AT ABUTMENT 2

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
 13+22.18 -CSXN-  
 SHEET 3 OF 4



Disseminated by  
 Dwan Hathaway  
 20237807 (04/24/20)

5/3/2016

**Michael Baker**  
 INTERNATIONAL

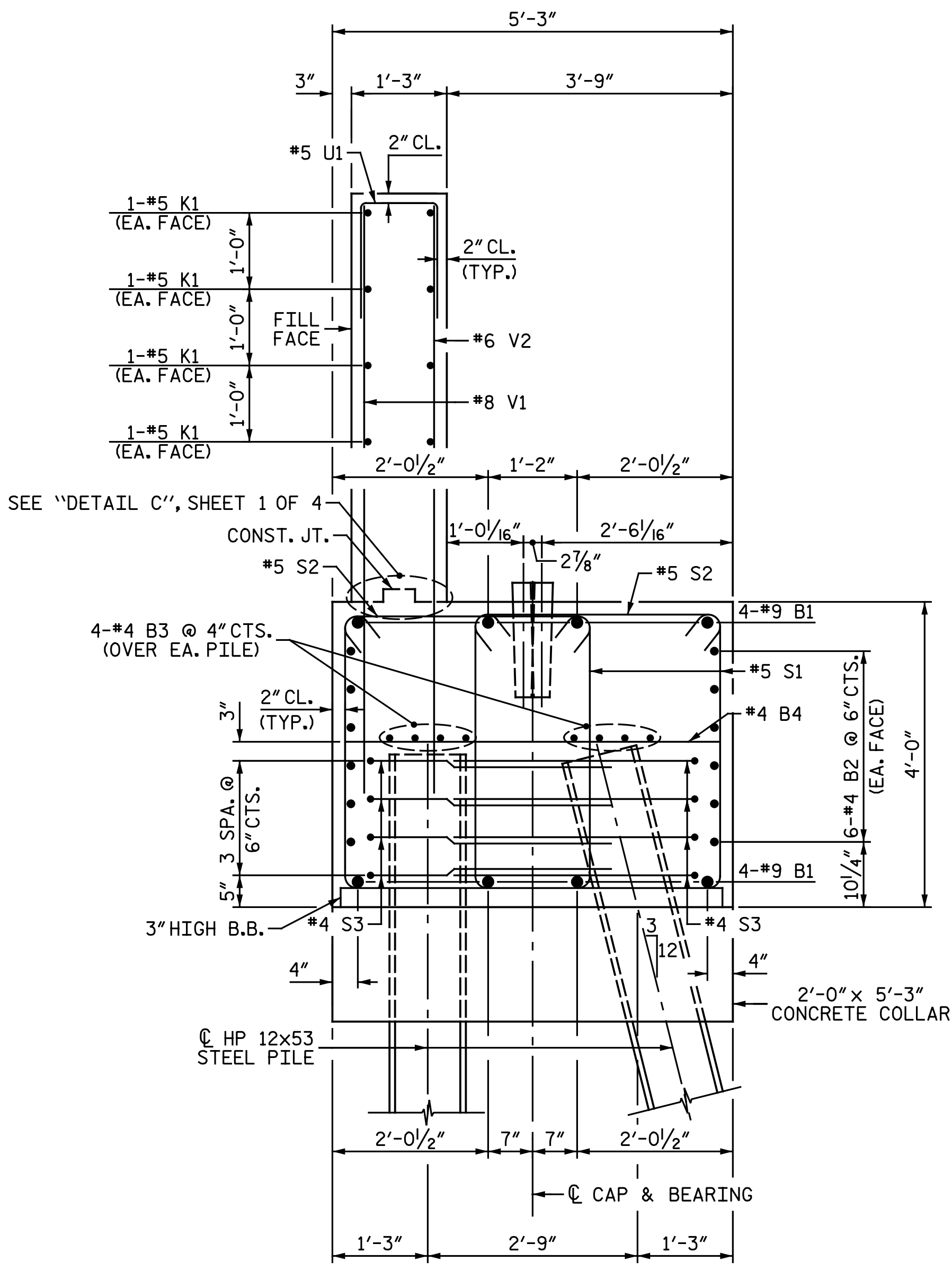
Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 ABUTMENT 2

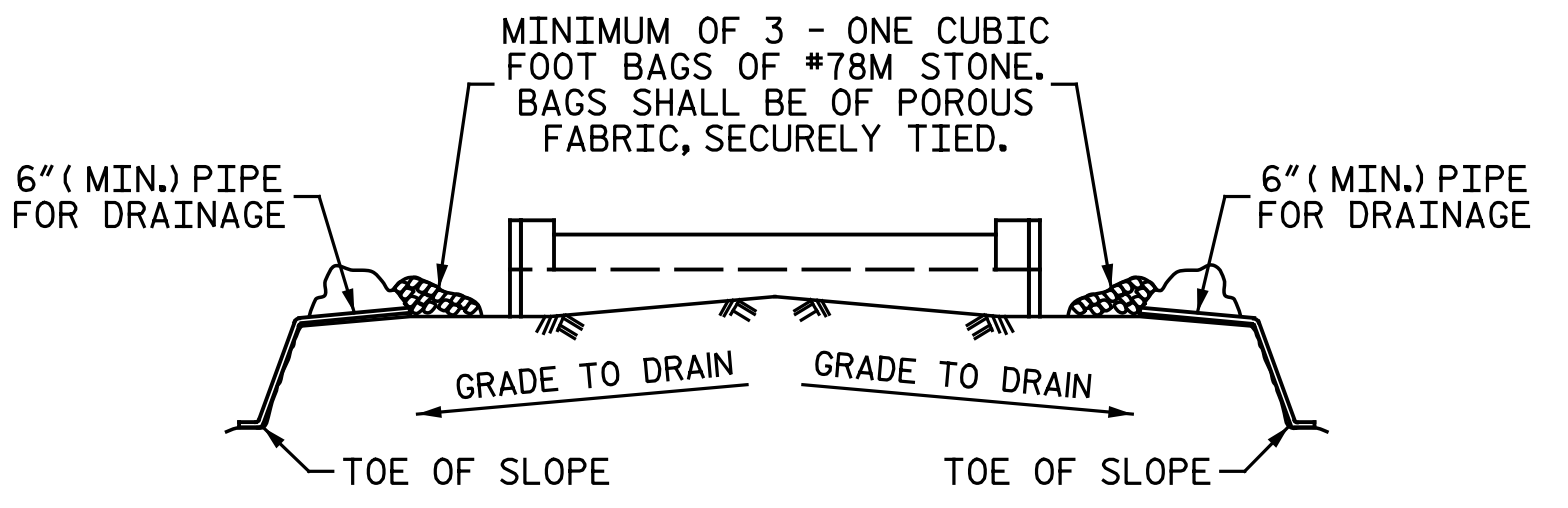
REVISIONS						SHEET NO. S4-43
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 68
2			4			

cmayhew 5/3/2016 9:37:24 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_043\_U3308\_SML\_AB203.dgn

DRAWN BY: M. D. MAYHEW DATE: 3-6-14  
 CHECKED BY: S. A. DENNEY DATE: 3-13-14



SECTION A-A

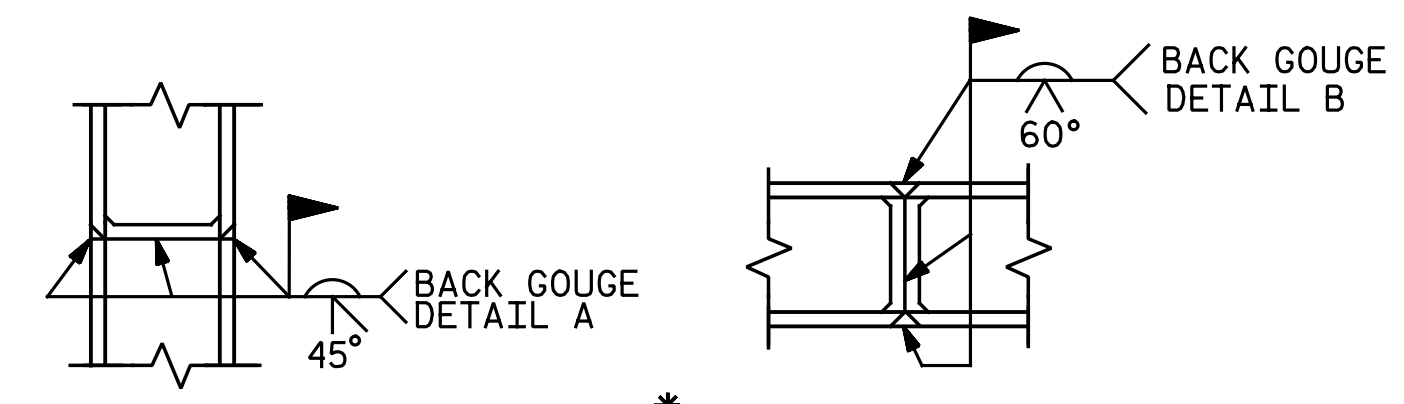


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

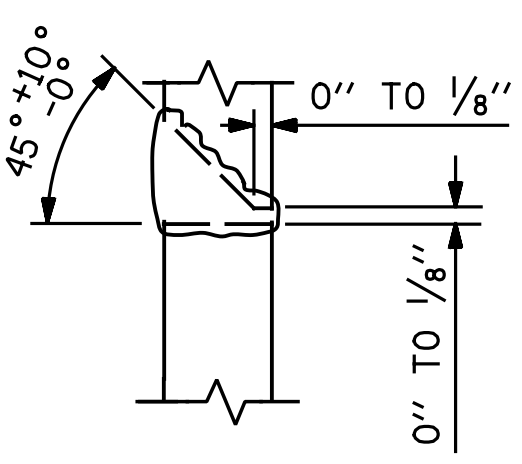
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT ABUTMENT

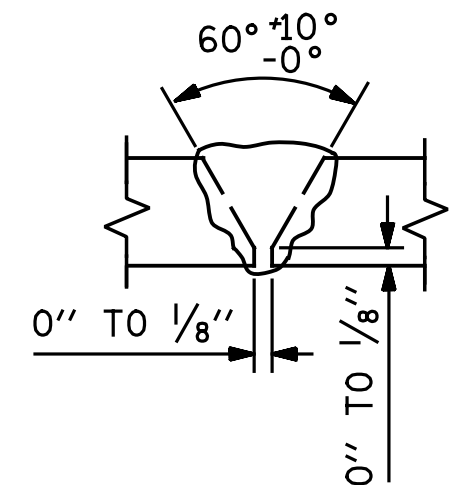


\* PILE VERTICAL

\* PILE HORIZONTAL OR VERTICAL



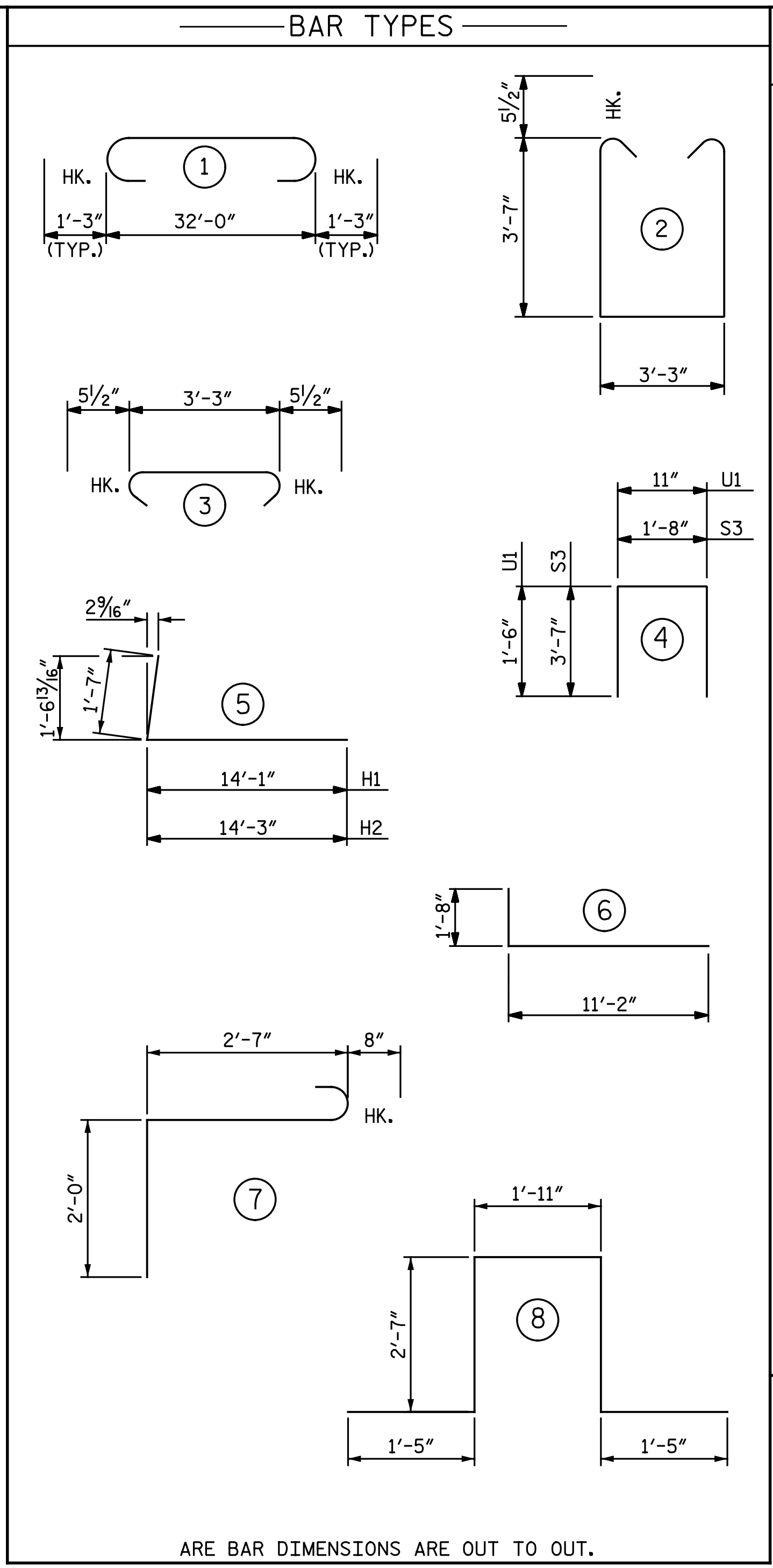
DETAIL A



DETAIL B

PILE SPLICE DETAILS

\* POSITION OF PILE DURING WELDING.



ARE BAR DIMENSIONS ARE OUT TO OUT.

NOTES:

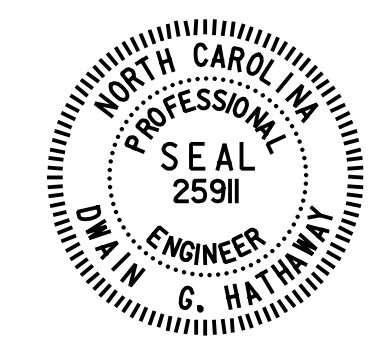
BACKWALL SHALL BE PLACED BEFORE APPLYING EPOXY PROTECTIVE COATING.

THE TOP SURFACE AREAS OF THE ABUTMENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

BILL OF MATERIAL ABUTMENT 2

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	1	34' - 6"	938
B2	24	4	STR	17' - 3"	277
B3	32	4	STR	17' - 3"	369
B4	8	4	STR	4' - 11"	26
B5	2	5	STR	1' - 6"	3
B6	3	5	STR	1' - 10"	6
B7	1	5	STR	3' - 6"	4
B8	1	5	STR	7' - 3"	8
H1	22	9	5	15' - 8"	1,172
H2	22	9	5	15' - 10"	1,184
H3	4	9	STR	2' - 11"	40
H4	4	9	STR	2' - 6"	34
H5	18	5	6	12' - 10"	241
K1	8	5	STR	32' - 0"	267
S1	48	5	2	11' - 4"	567
S2	48	5	3	4' - 2"	209
S3	64	4	4	8' - 10"	378
S4	6	6	8	9' - 11"	89
S5	6	6	7	5' - 3"	47
U1	27	5	4	3' - 11"	110
V1	53	8	STR	8' - 11"	1,262
V2	53	6	STR	8' - 11"	710
V3	12	8	STR	10' - 6"	336
V4	12	6	STR	10' - 6"	189
V5	32	9	STR	10' - 6"	1,142
V6	14	5	STR	10' - 6"	153
V7	18	5	STR	8' - 8"	163
REINFORCING STEEL				LBS.	9,924
CLASS "AA" CONCRETE BREAKDOWN					
POUR #1 CAP, LOWER WING WALLS & CONC. COLLAR				C.Y.	34.8
POUR #2 BACKWALL & UPPER WING WALLS				C.Y.	13.9
TOTAL CLASS "AA" CONCRETE				C.Y.	48.7
HP 12x53 STEEL PILES					
				NO. 18	LIN. FT. 540

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
 13+22.18 -CSXN-  
 SHEET 4 OF 4



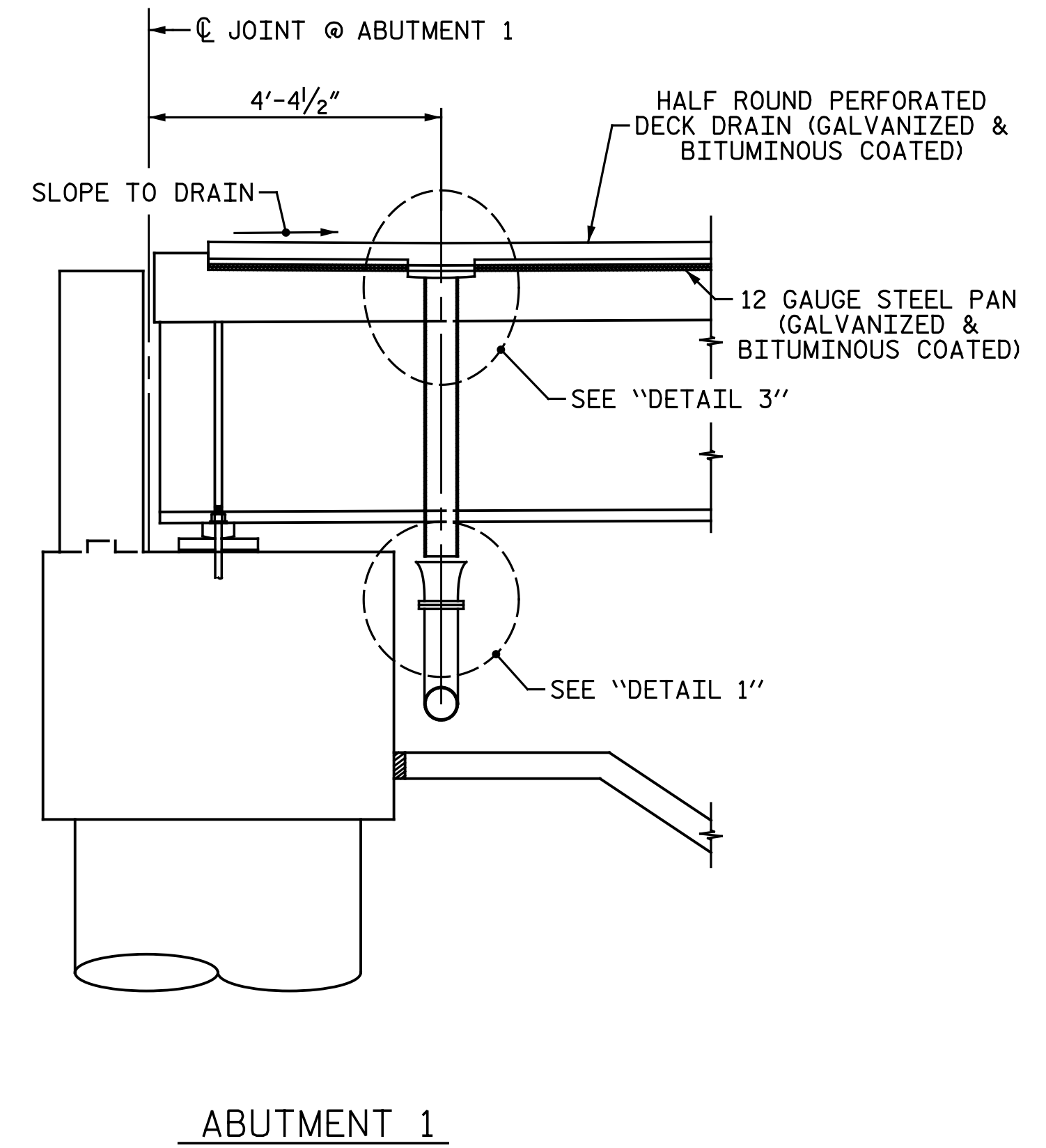
Michael Baker INTERNATIONAL

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27518  
 NC License No.: F-1084

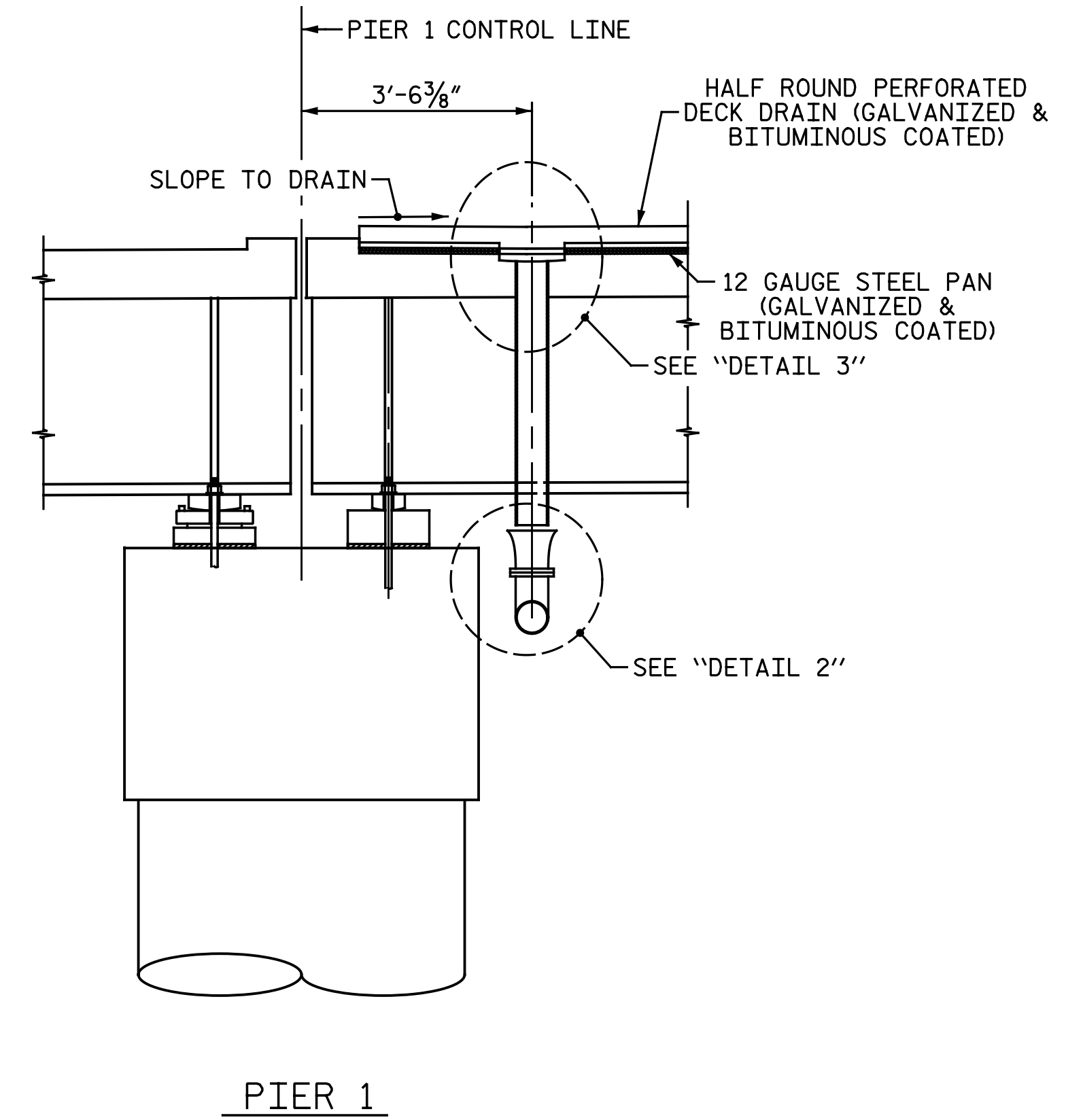
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-44
1			3			TOTAL SHEETS
2			4			68

5/3/2016 9:37:24 AM  
 File Name: Y:\Projects\NCDDOT\U-3308\Structures\Dwg\Final\404\_044\_U3308\_SML\_AB204.dgn

DRAWN BY: M. D. MAYHEW DATE: 3-6-14  
 CHECKED BY: S. A. DENNEY DATE: 3-13-14



ABUTMENT 1

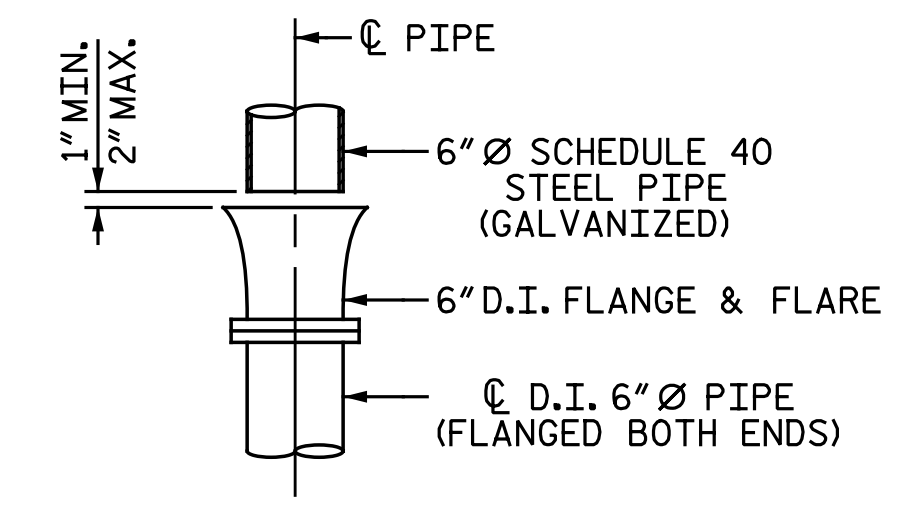


PIER 1

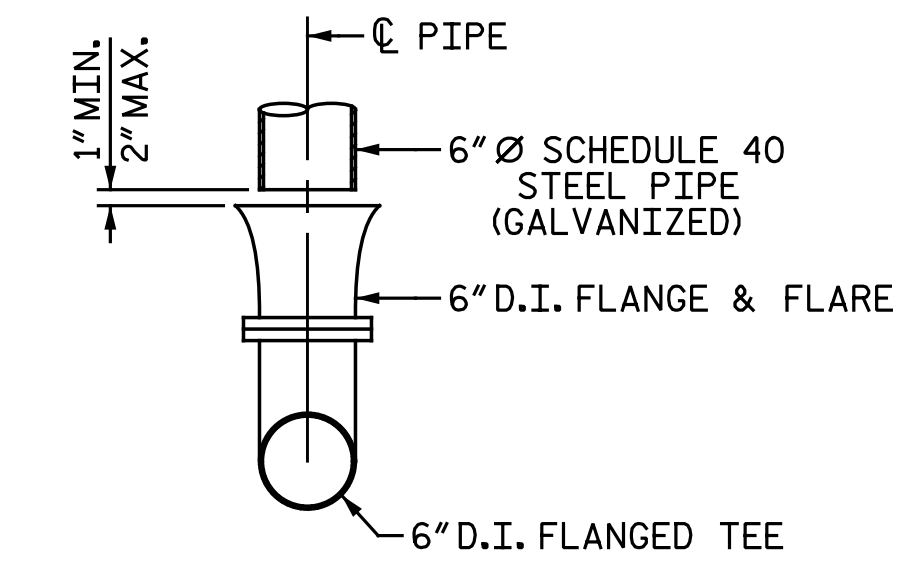
DRAINAGE DETAILS

NOTES:

ALL DIMENSIONS ARE SUBJECT TO ADJUSTMENTS TO FIT MEASUREMENTS TAKEN AFTER DECKS HAVE BEEN POURED.  
 D.I. = DUCTILE IRON  
 6" Ø VERTICAL DECK DRAINS SHALL NOT BE RIGIDLY JOINED TO 6" FLANGE AND FLARE. SEE "DETAIL 1" AND "DETAIL 2" ON THIS SHEET.  
 FOR "DETAIL 3", SEE SHEET 2 OF 7.

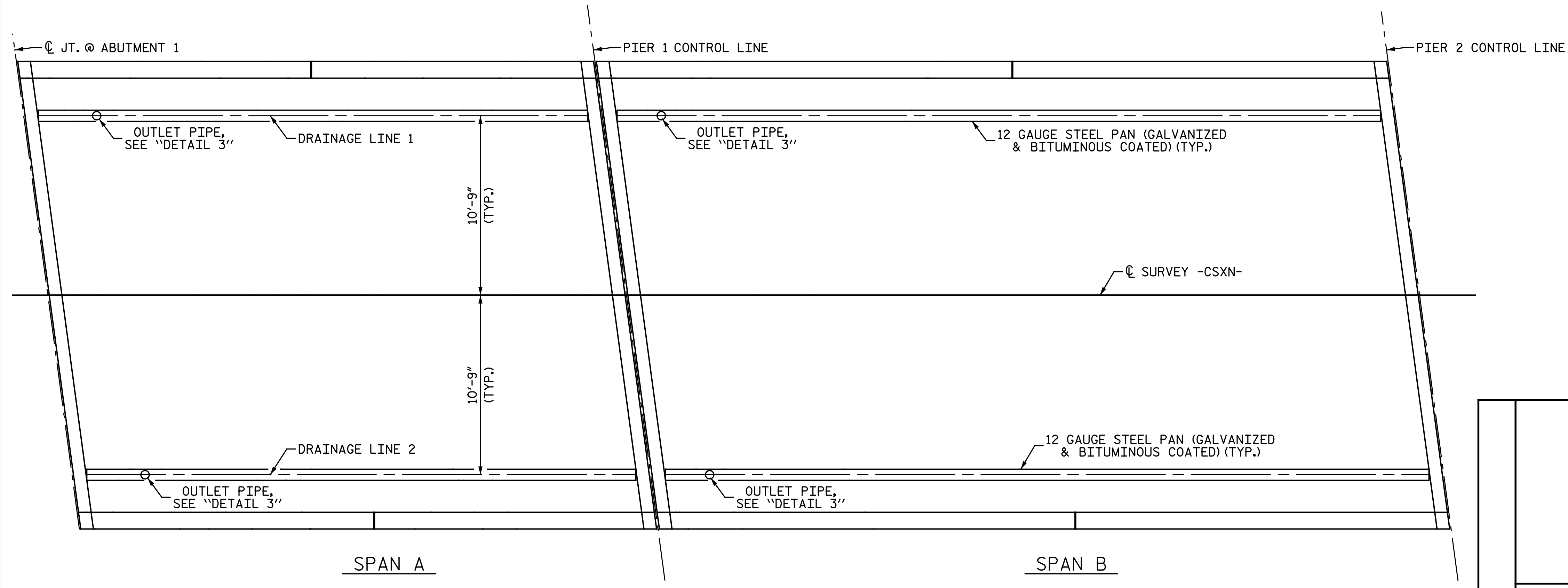


DETAIL 1



DETAIL 2

NOTE: CENTERLINE OF PIPE AND FLANGE AND FLARE LINE UP AT 60° F.



SPAN A

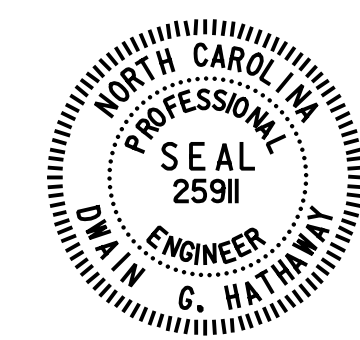
SPAN B

DRAINAGE LAYOUT

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 1 OF 7

cmayhew  
 5/3/2016 9:37:25 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_045\_U3308\_SMU-SD01.dgn

DRAWN BY : M. D. MAYHEW DATE : 1-10-14  
 CHECKED BY : S. A. DENNEY DATE : 3-6-14



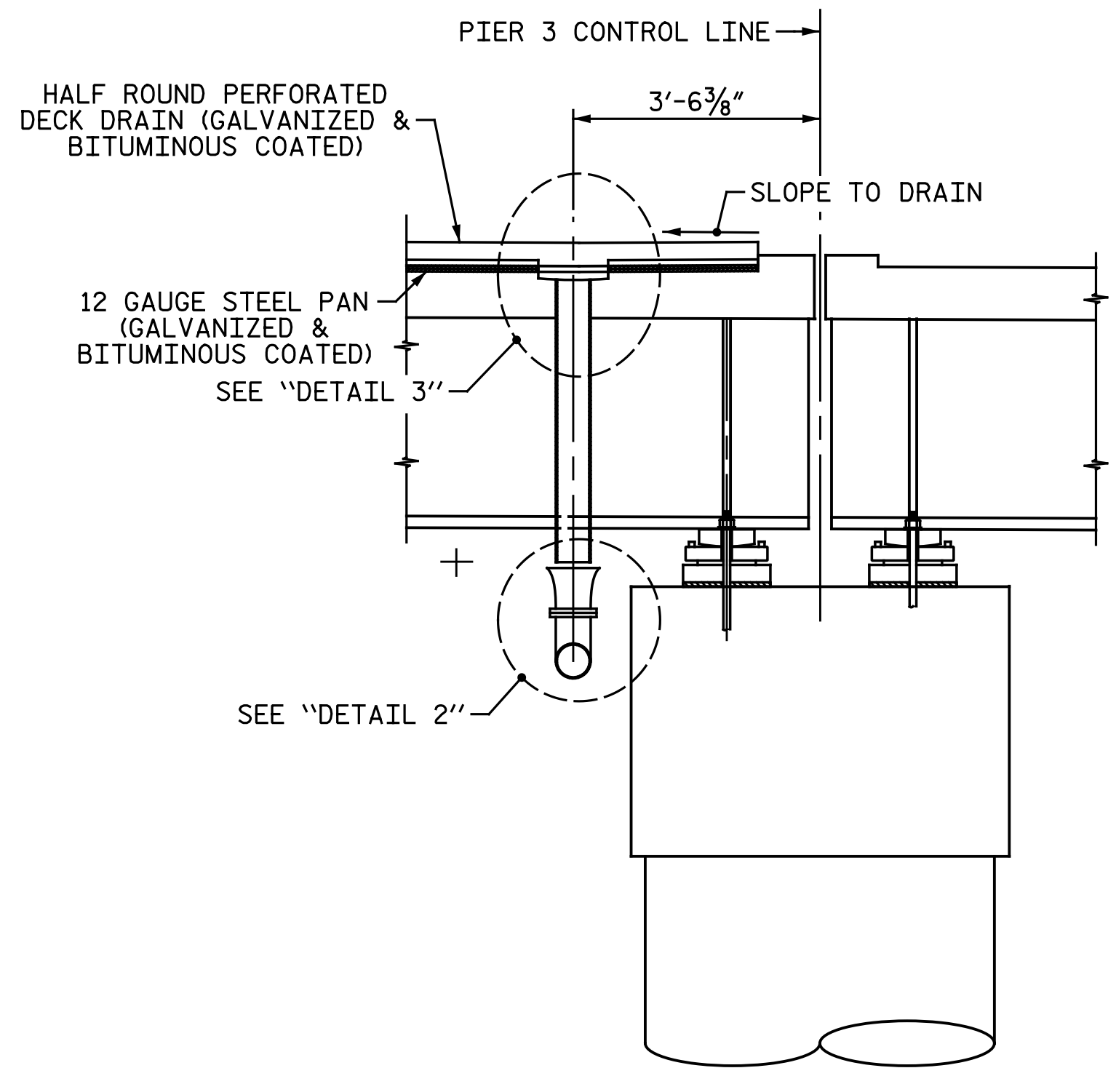
Designed by  
 Duane Holloway  
 202378071040400  
 5/3/2016

**Michael Baker**  
 INTERNATIONAL

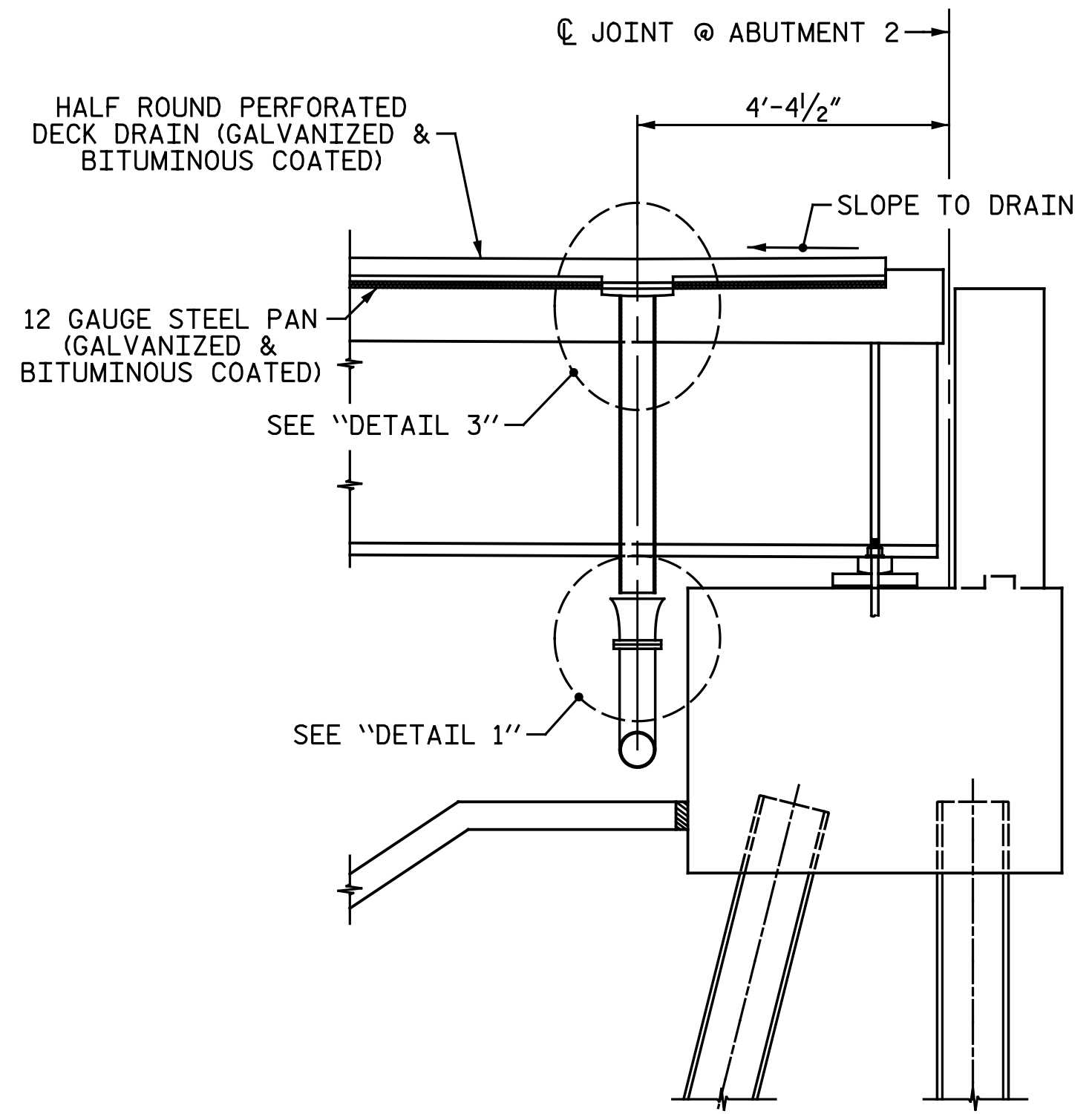
Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 276518  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURE DRAINAGE  
 DETAILS  
 SPANS A & B

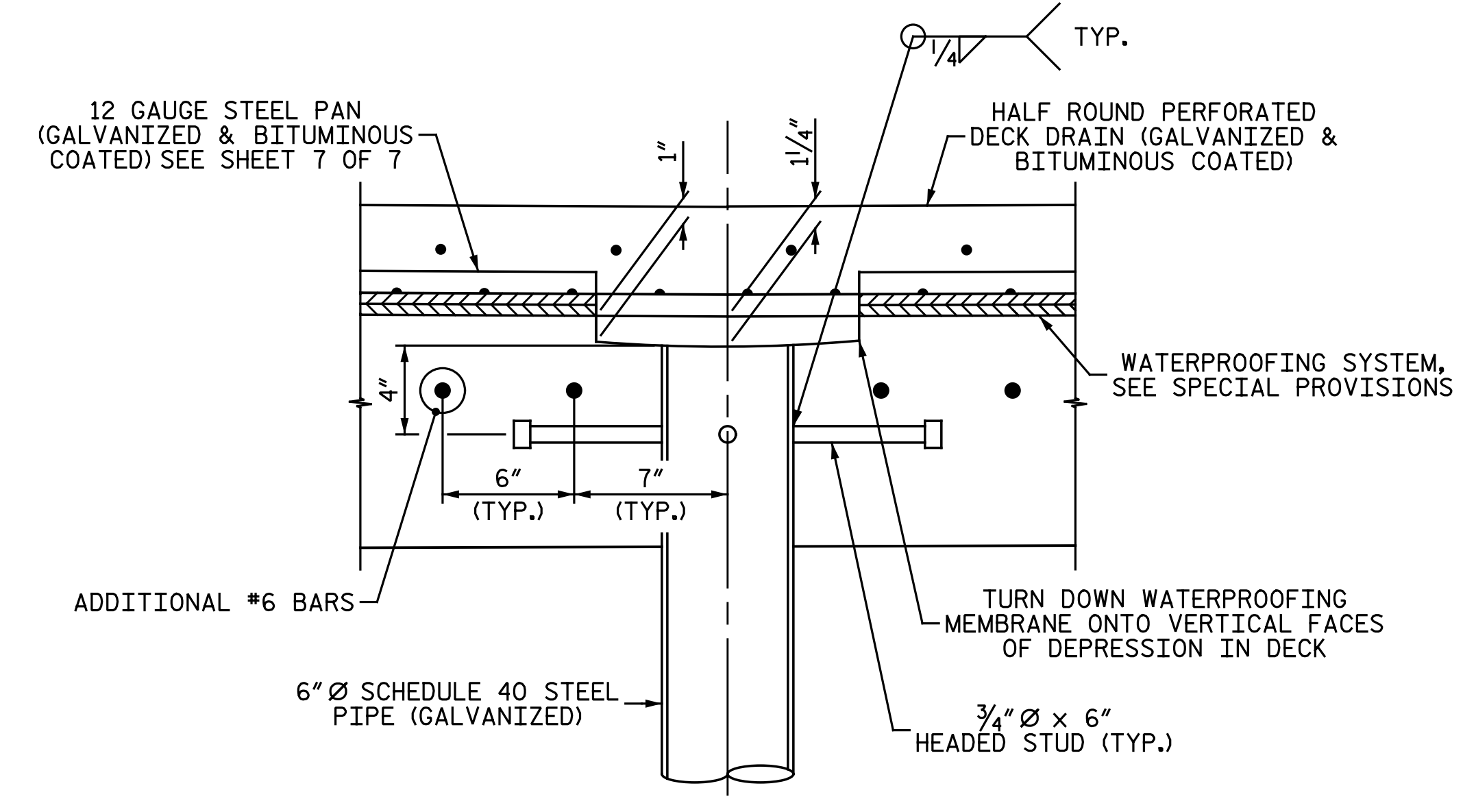
REVISIONS						SHEET NO. S4-45
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 68
2			4			



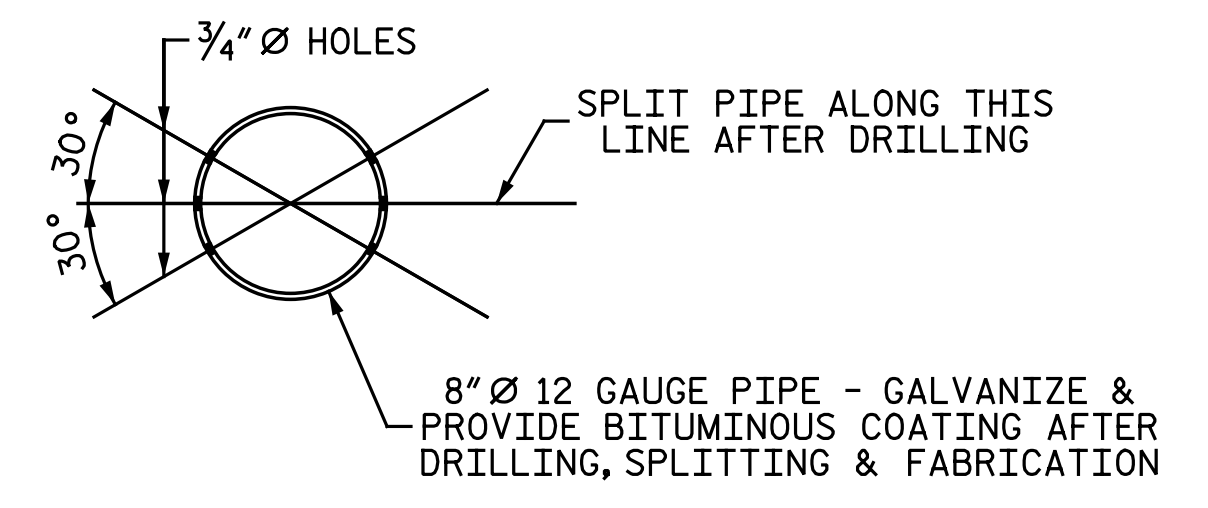
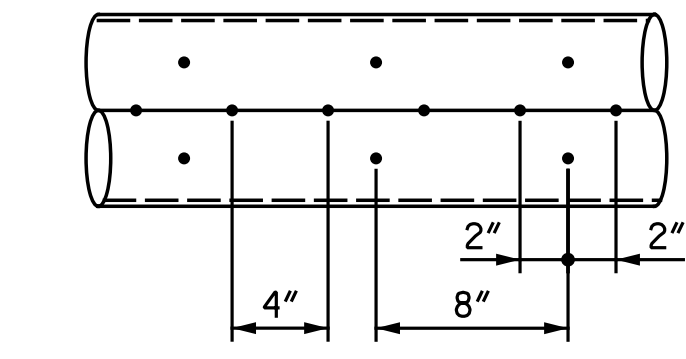
PIER 3



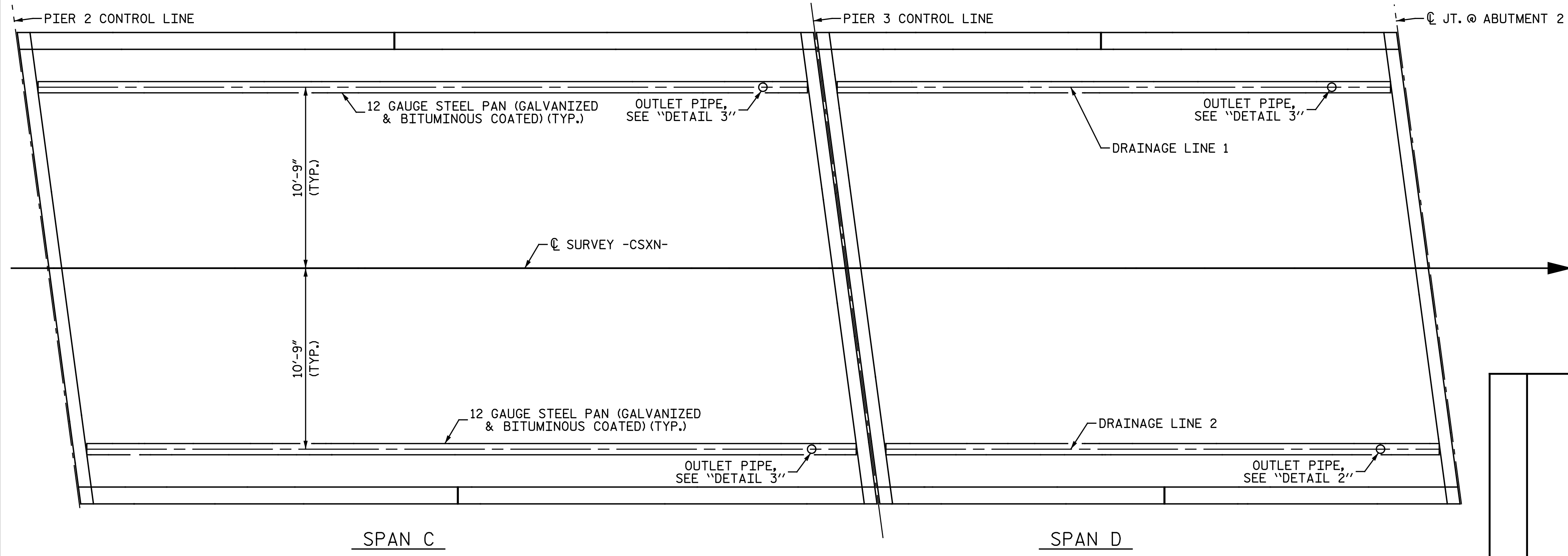
ABUTMENT 2



DETAIL 3



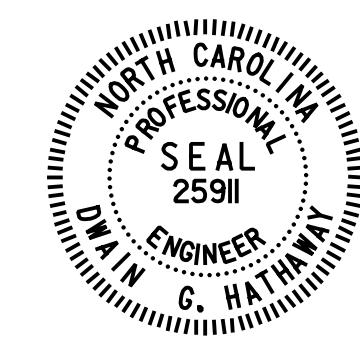
8" Ø PERFORATED PIPE DETAIL



DRAINAGE LAYOUT

**NOTES:**  
 ALL DIMENSIONS ARE SUBJECT TO ADJUSTMENTS TO FIT MEASUREMENTS TAKEN AFTER DECKS HAVE BEEN POURED.  
 6" Ø VERTICAL DECK DRAINS SHALL NOT BE RIGIDLY JOINED TO 6" FLANGE AND FLARE. SEE "DETAIL 1" AND "DETAIL 2" ON SHEET 1 OF 7.  
 FOR "DETAIL 1" AND "DETAIL 2", SEE SHEET 1 OF 7.

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 2 OF 7



Designed by  
 Duane Holloway  
 5/3/2016

**Michael Baker INTERNATIONAL**

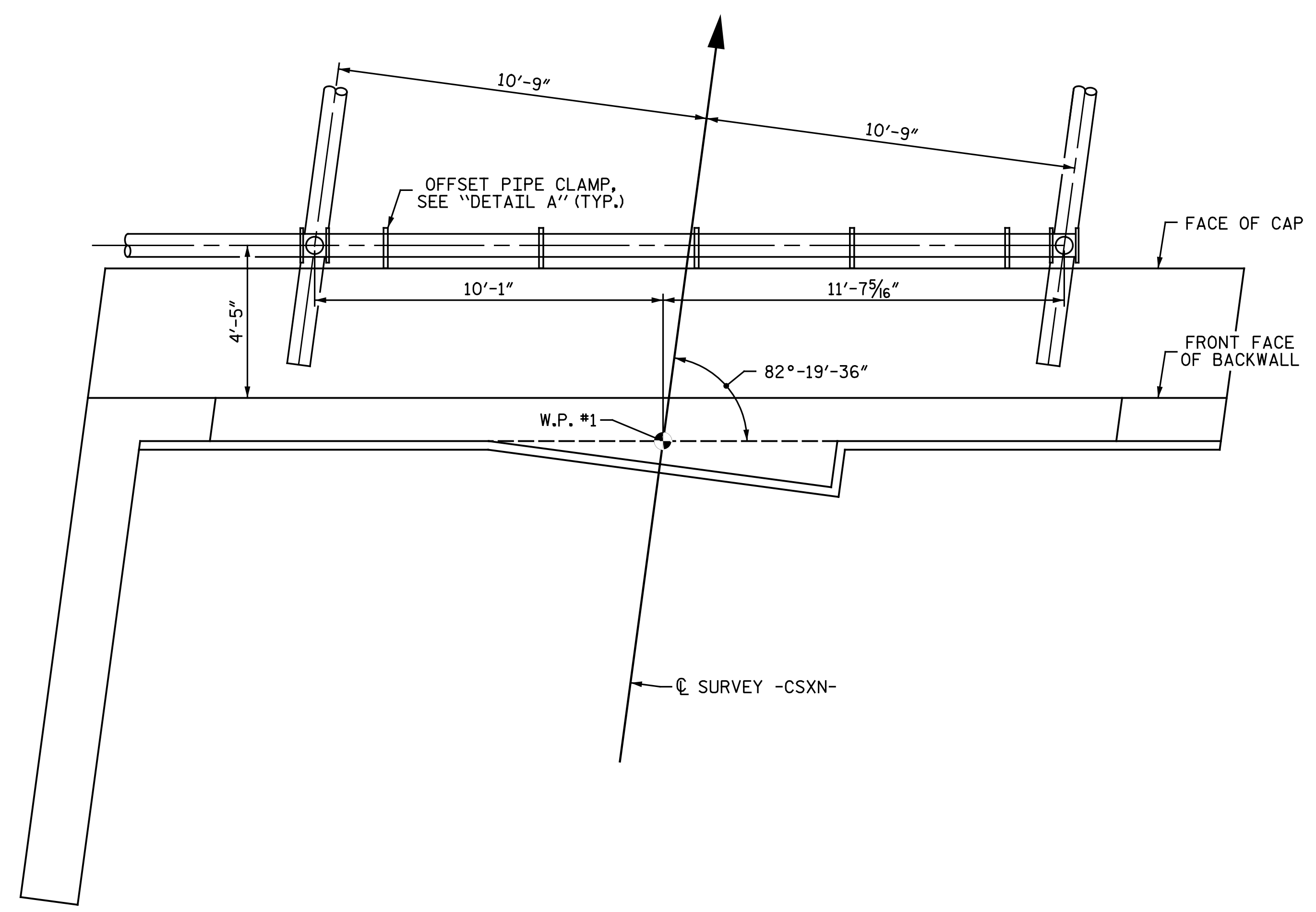
Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURE DRAINAGE  
 DETAILS  
 SPANS C & D

REVISIONS						SHEET NO. S4-46
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 68
2			4			

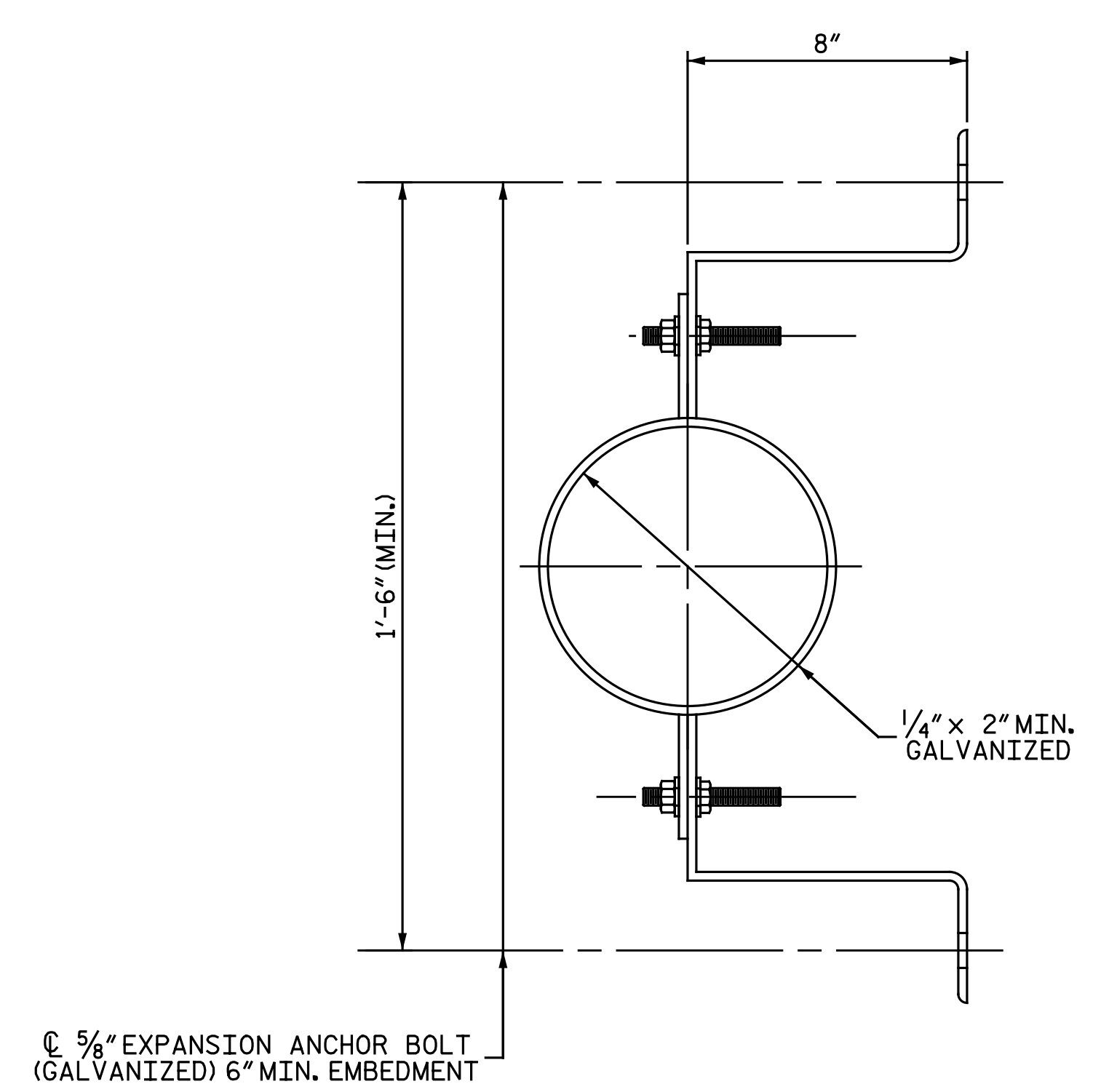
cmayhew 5/3/2016 9:37:26 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_046\_U3308\_SMU\_SD02.dgn

DRAWN BY : M. D. MAYHEW DATE : 1-10-14  
 CHECKED BY : S. A. DENNEY DATE : 3-6-14

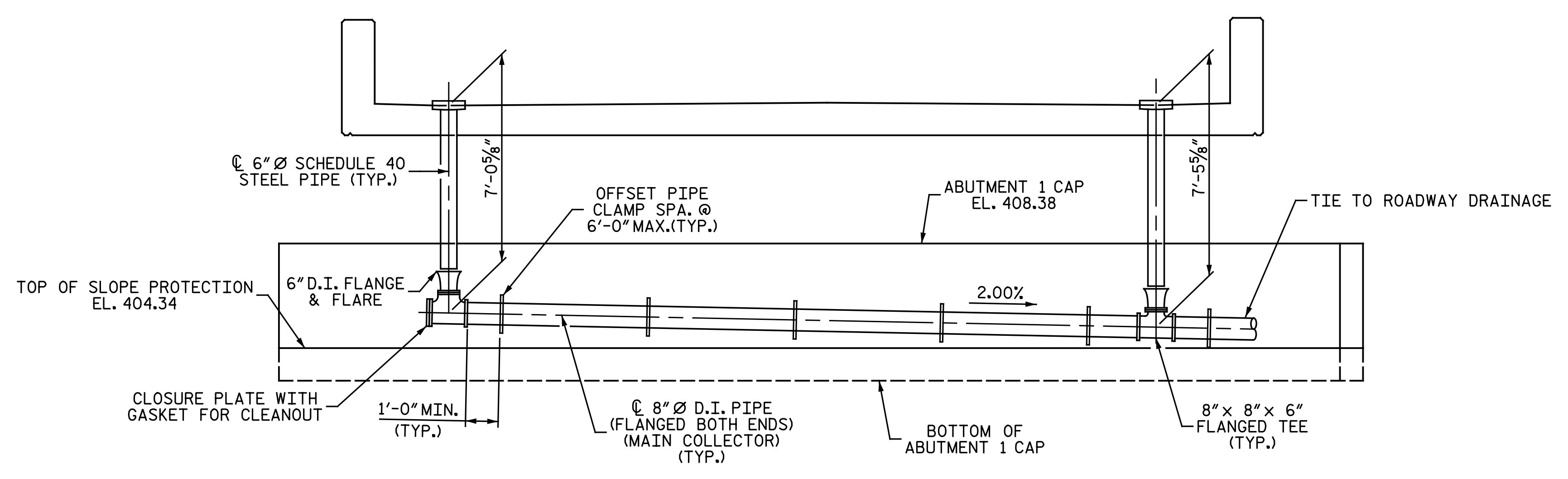


DRAINAGE DETAILS AT ABUTMENT 1

**NOTES:**  
 ALL DIMENSIONS ARE SUBJECT TO ADJUSTMENTS TO FIT MEASUREMENTS TAKEN AFTER DECKS HAVE BEEN POURED.  
 D.I. = DUCTILE IRON

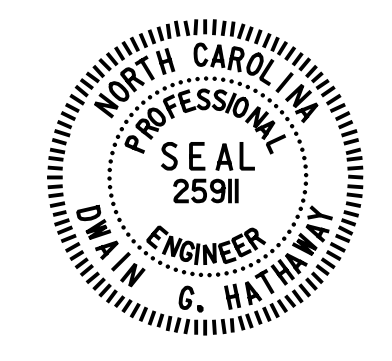


DETAIL A



ELEVATION  
 (LOOKING BACK STATION @ ABUTMENT 1)

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 3 OF 7



Designed by  
 Dwan Hathaway  
 5/3/2016

**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURE DRAINAGE  
 DETAILS  
 ABUTMENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-47
1			3			TOTAL SHEETS
2			4			68

cmayhew 5/3/2016 9:37:26 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_047\_U3308\_SMU\_SD03.dgn

DRAWN BY : M. D. MAYHEW DATE : 1-13-14  
 CHECKED BY : S. A. DENNEY DATE : 3-6-14

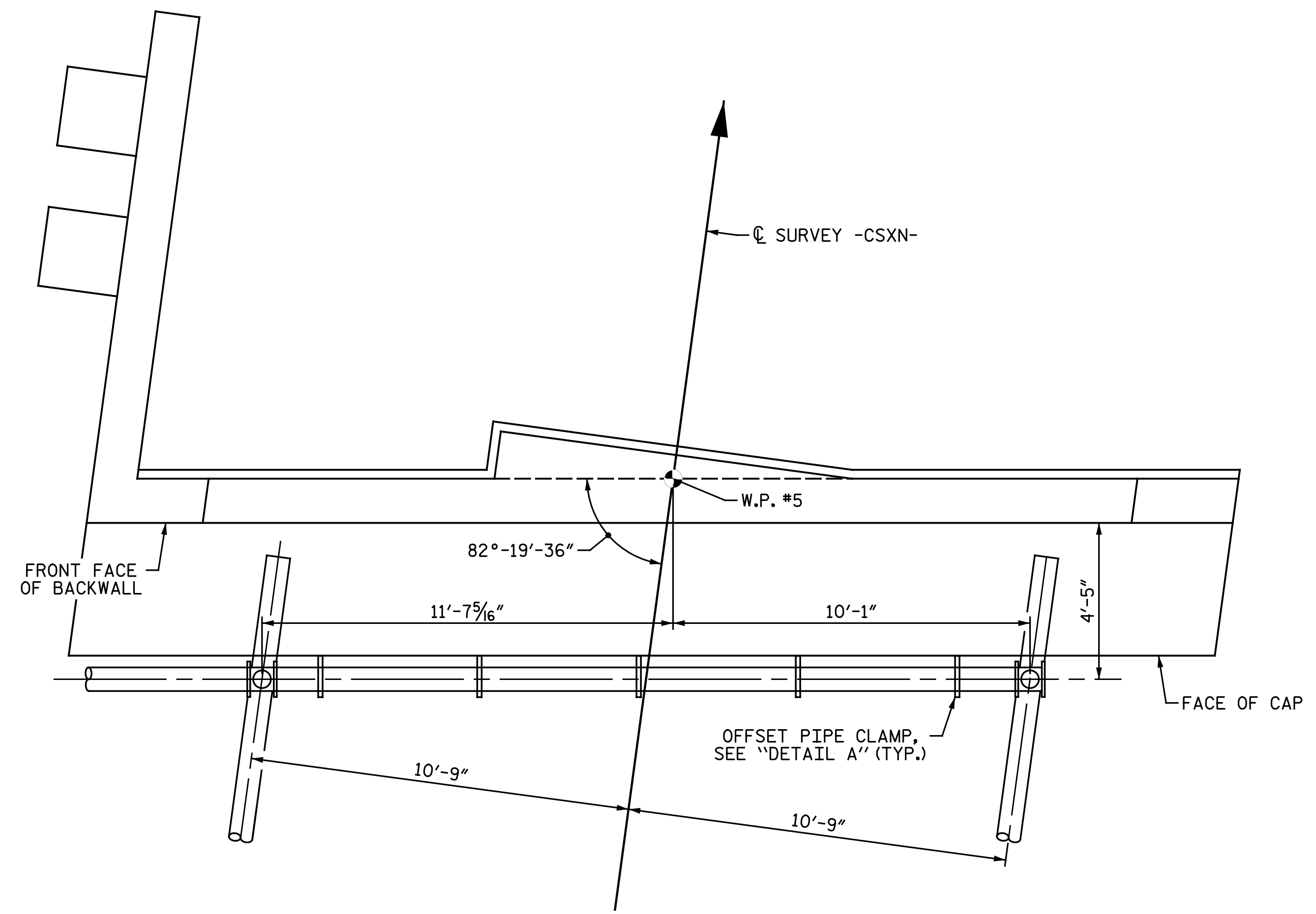


**NOTES:**

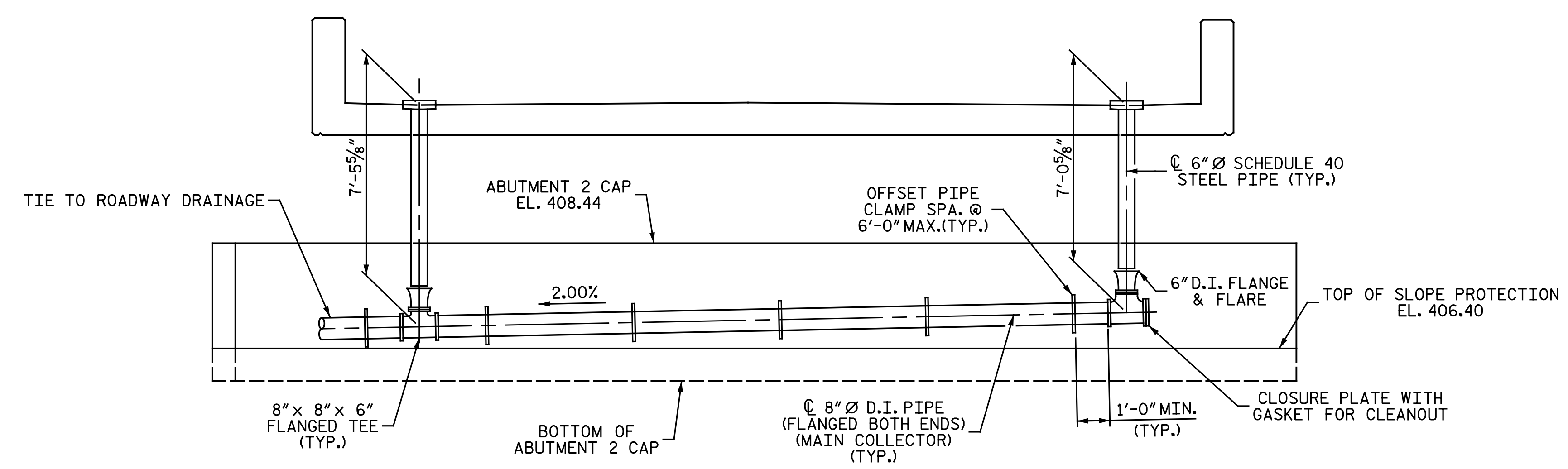
ALL DIMENSIONS ARE SUBJECT TO ADJUSTMENTS TO FIT MEASUREMENTS TAKEN AFTER DECKS HAVE BEEN POURED.

D.I. = DUCTILE IRON

FOR "DETAIL A", SEE SHEET 3 OF 7.

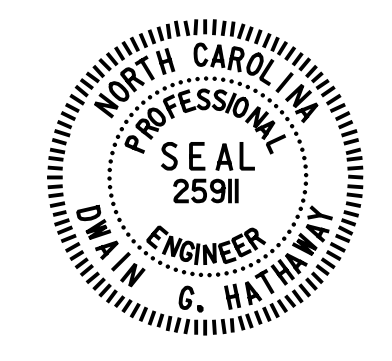


**DRAINAGE DETAILS AT ABUTMENT 2**



**ELEVATION**  
(LOOKING UP STATION @ ABUTMENT 2)

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 4 OF 7



Disseminated by  
Dorian Hathaway

5/3/2016

**Michael Baker INTERNATIONAL**

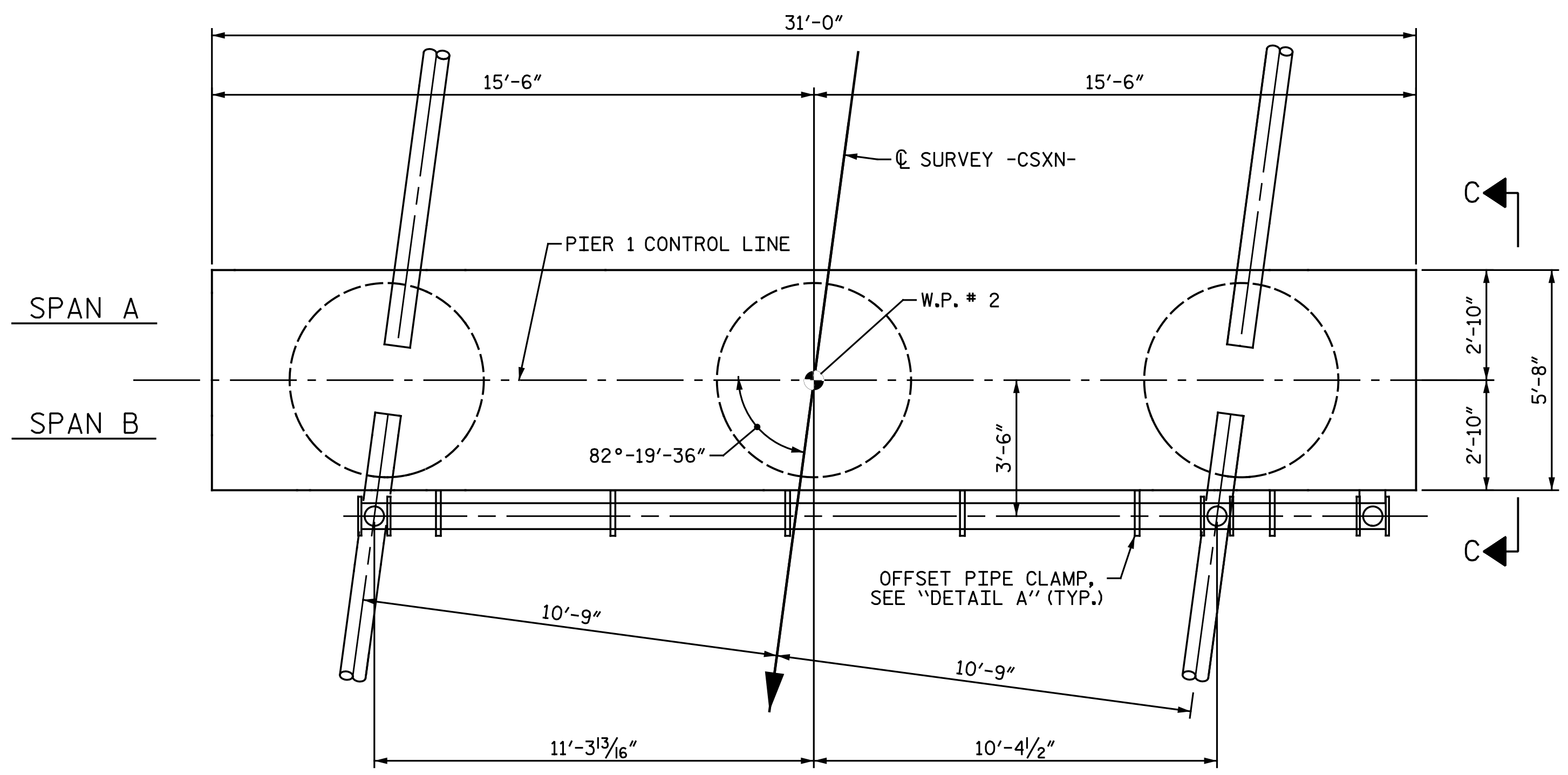
Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURE DRAINAGE  
 DETAILS  
 ABUTMENT 2

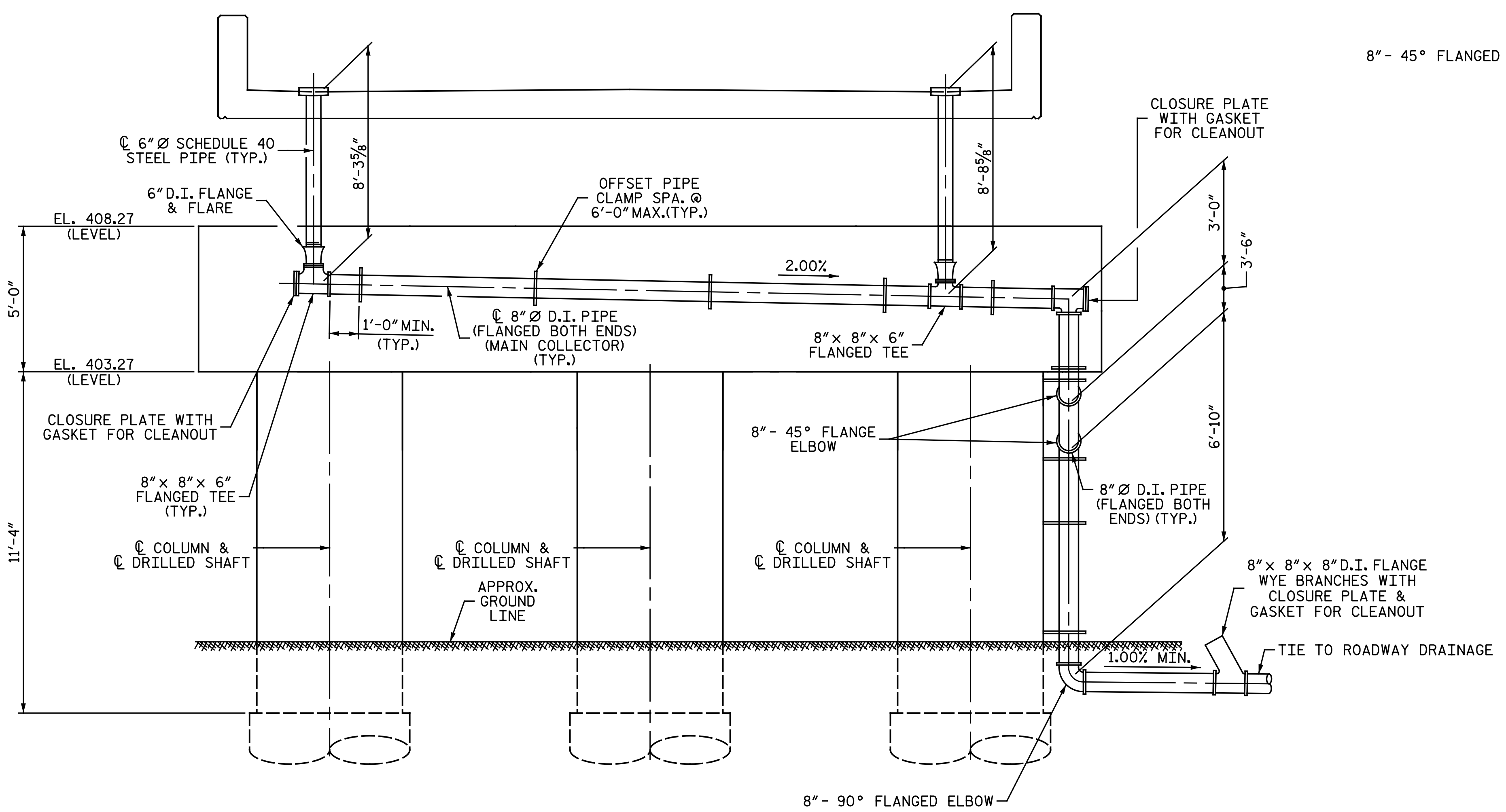
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			68
2			4			

cmayhew 5/3/2016 9:37:27 AM  
 File Name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_048\_U3308\_SMU\_SD04.dgn

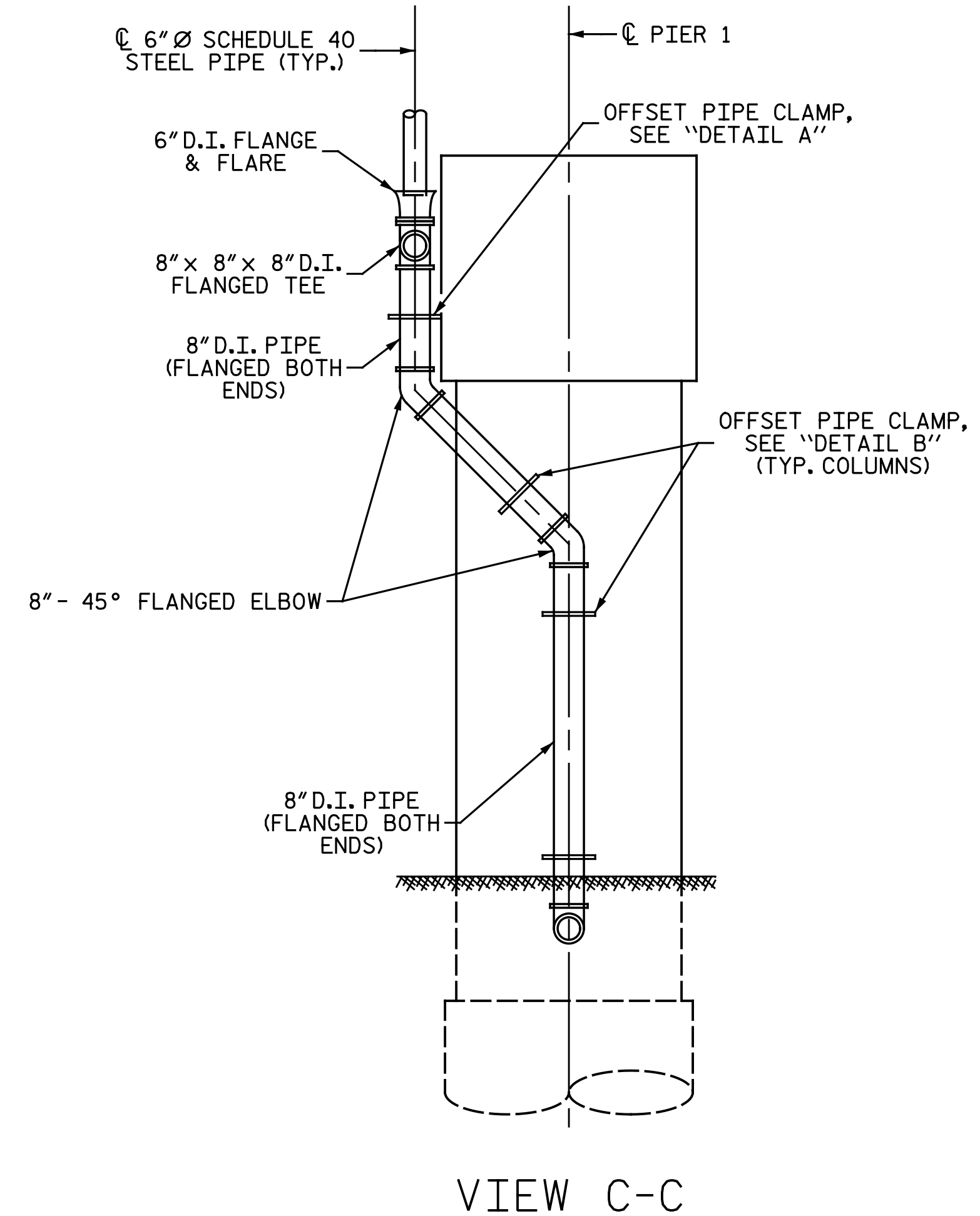
DRAWN BY : M. D. MAYHEW DATE : 1-13-14  
 CHECKED BY : S. A. DENNEY DATE : 3-6-14



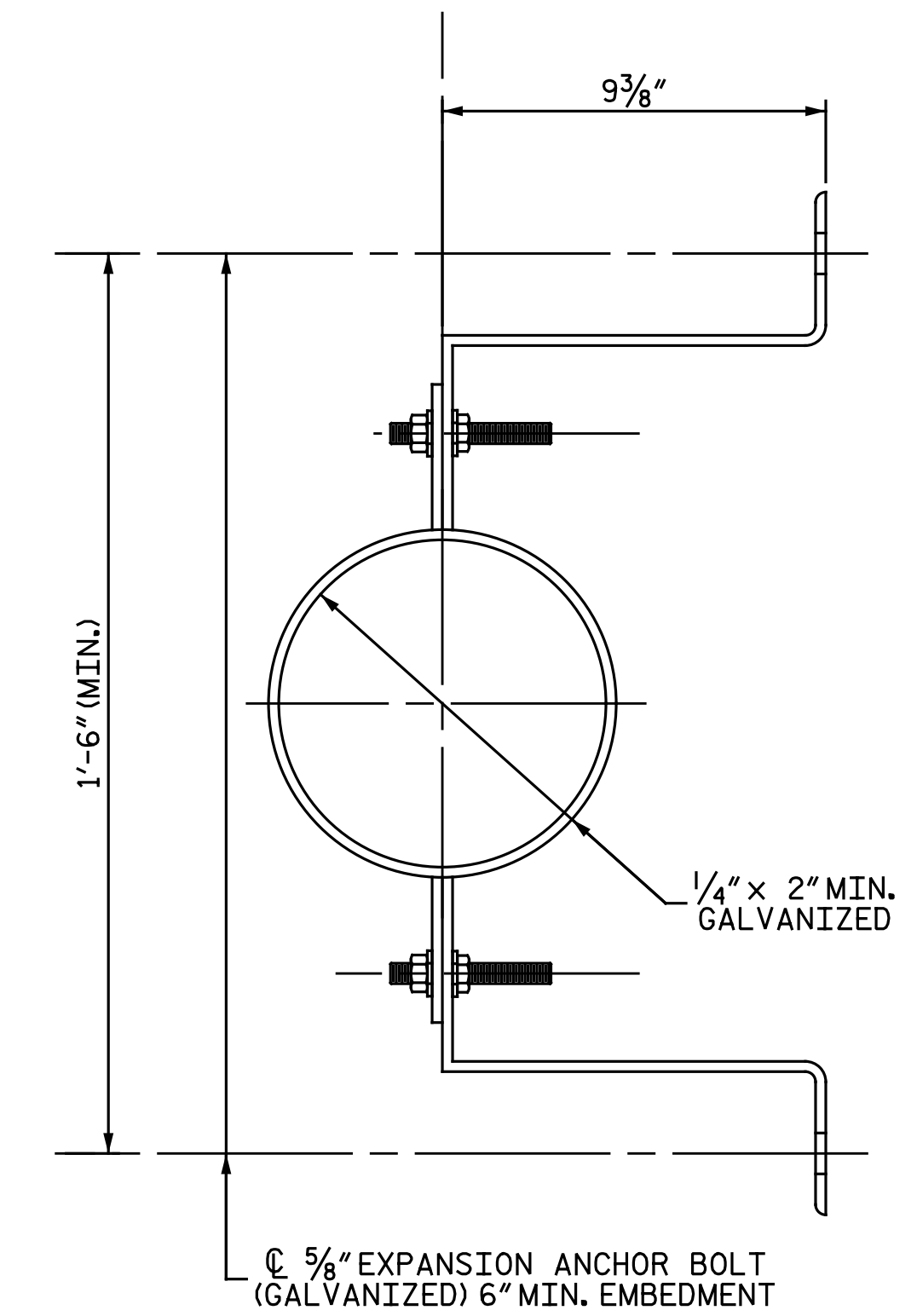
DRAINAGE DETAILS AT PIER 1



ELEVATION  
(LOOKING BACK STATION AT PIER 1)



VIEW C-C



DETAIL B

**NOTES:**  
 ALL DIMENSIONS ARE SUBJECT TO ADJUSTMENTS TO FIT MEASUREMENTS TAKEN AFTER DECKS HAVE BEEN POURED.  
 D.I. = DUCTILE IRON  
 FOR "DETAIL A", SEE SHEET 3 OF 7.

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 5 OF 7



Designed by  
 Duane Hollaway  
 5/3/2016

**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURE DRAINAGE  
 DETAILS

PIER 1

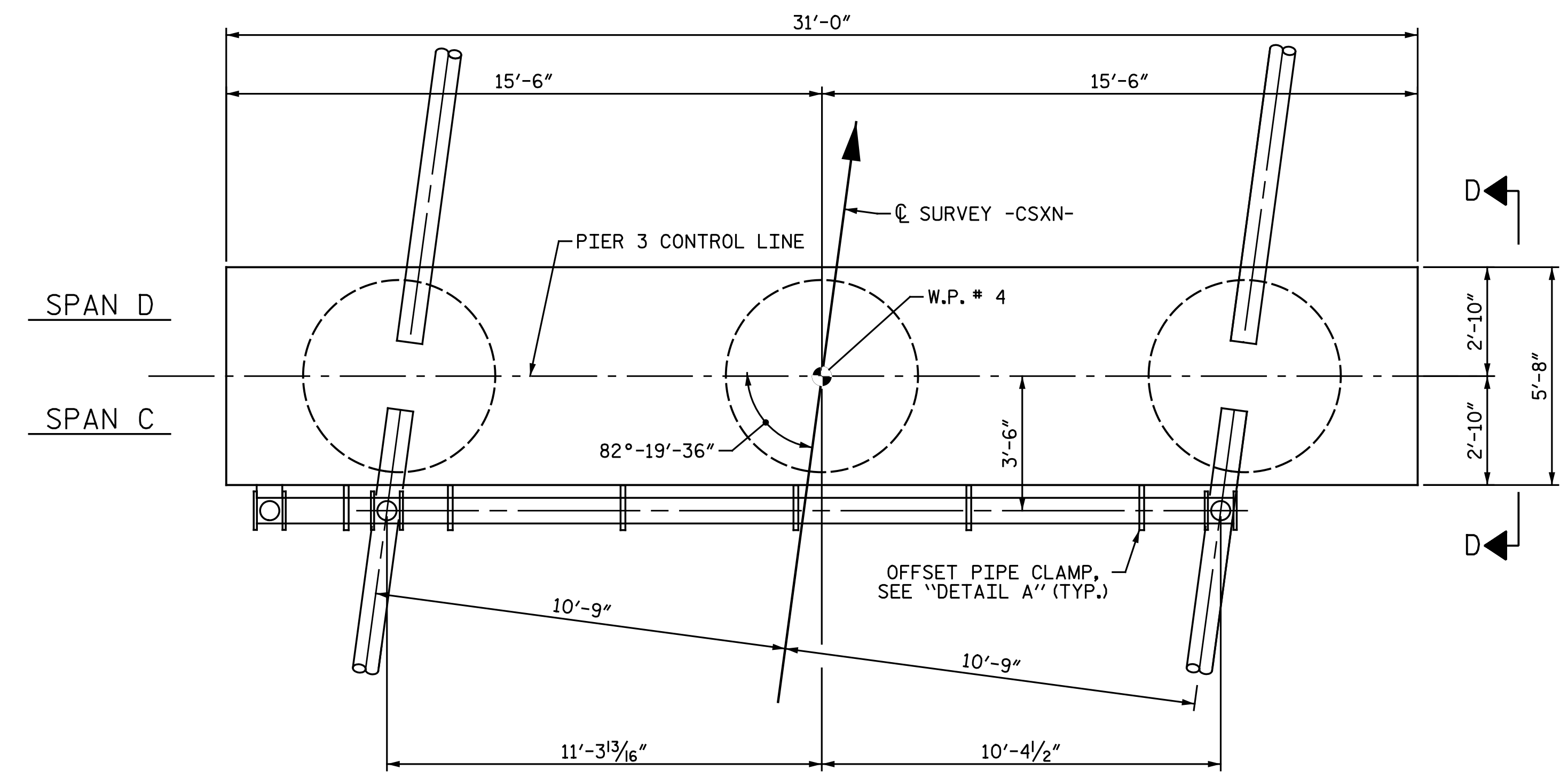
REVISIONS						SHEET NO. S4-49
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 68
2			4			

cmayhew 5/3/2016 9:37:41 AM  
 File name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_049\_U3308\_SMU\_SD05.dgn

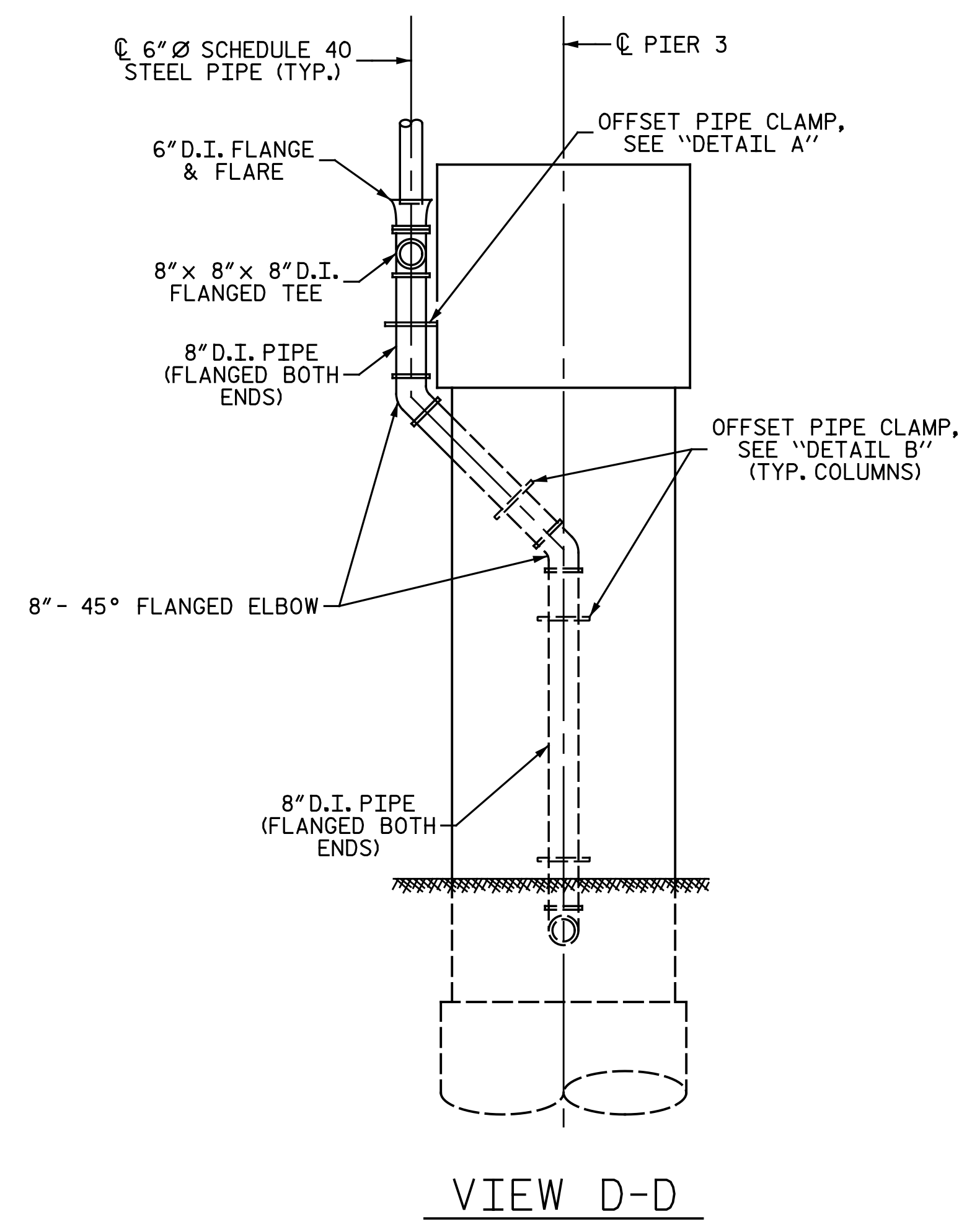
DRAWN BY: M. D. MAYHEW DATE: 1-20-14  
 CHECKED BY: S. A. DENNEY DATE: 3-6-14

**NOTES:**

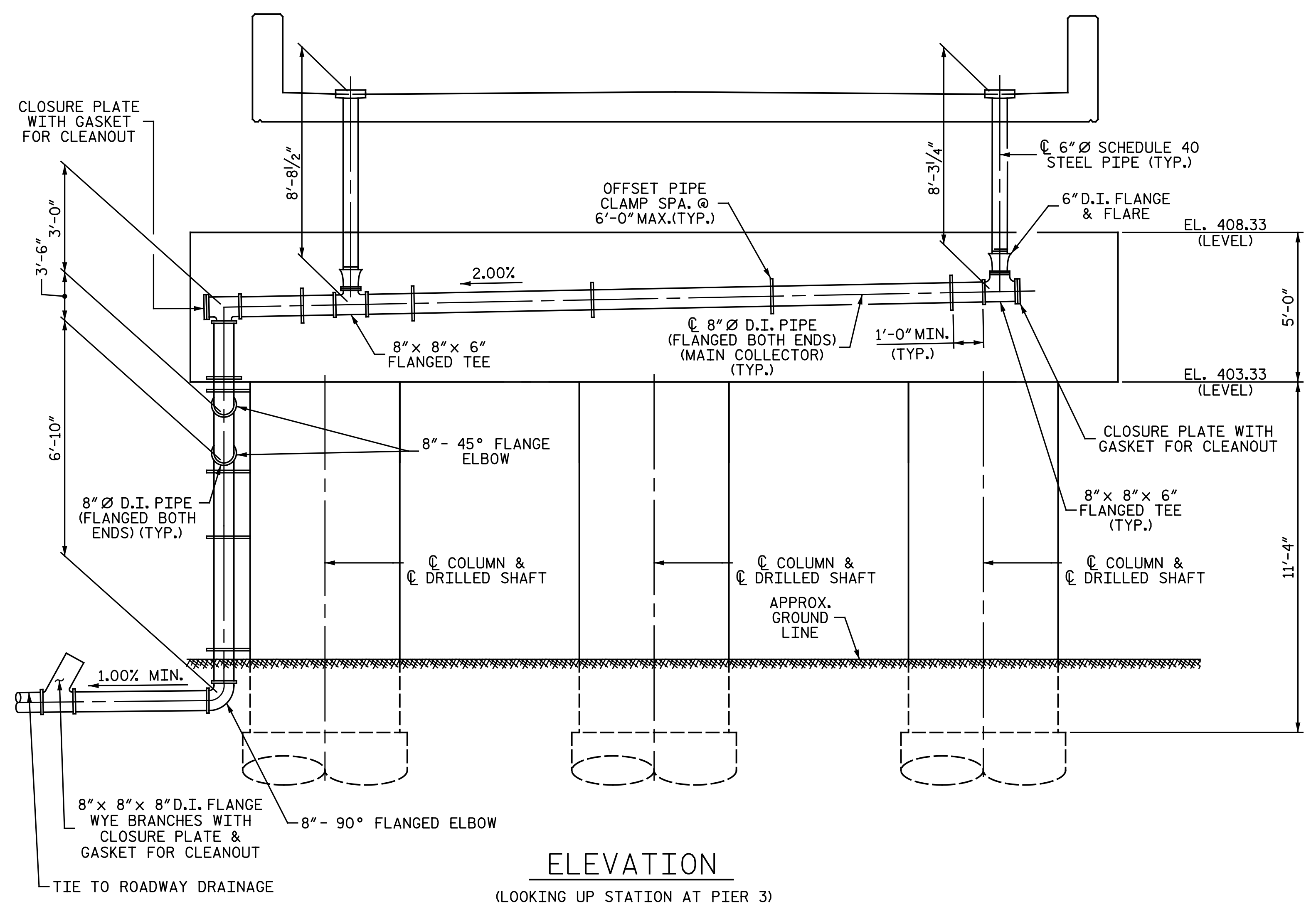
ALL DIMENSIONS ARE SUBJECT TO ADJUSTMENTS TO FIT MEASUREMENTS TAKEN AFTER DECKS HAVE BEEN POURED.  
 D.I. = DUCTILE IRON  
 FOR "DETAIL A", SEE SHEET 3 OF 7.  
 FOR "DETAIL B", SEE SHEET 5 OF 7.



**DRAINAGE DETAILS AT PIER 3**



**VIEW D-D**



**ELEVATION**  
(LOOKING UP STATION AT PIER 3)

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 6 OF 7



Designed by  
 Duane Holloway  
 5/3/2016

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURE DRAINAGE  
 DETAILS

PIER 3

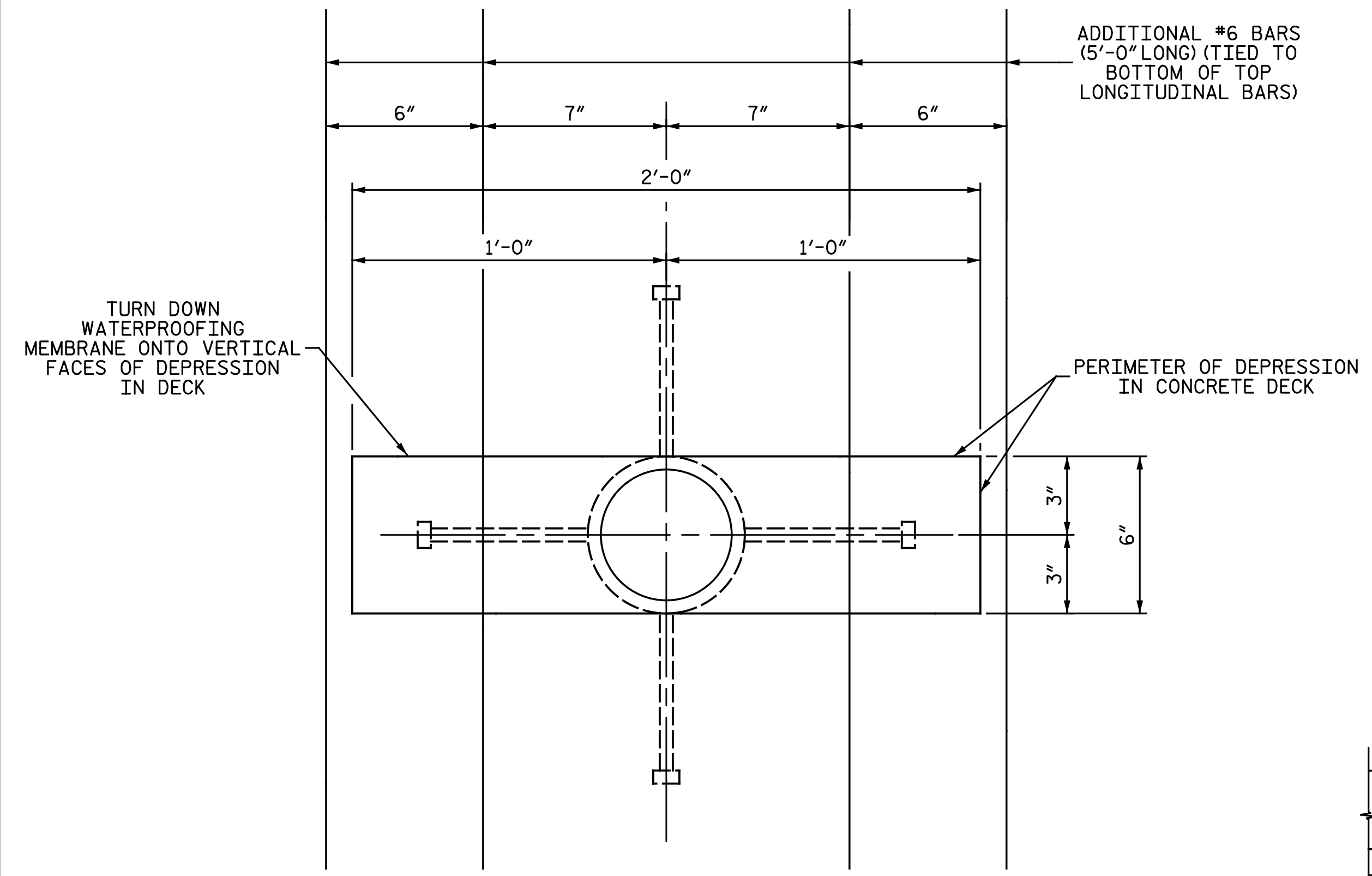
**Michael Baker INTERNATIONAL**

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27615  
 NC License No.: F-1084

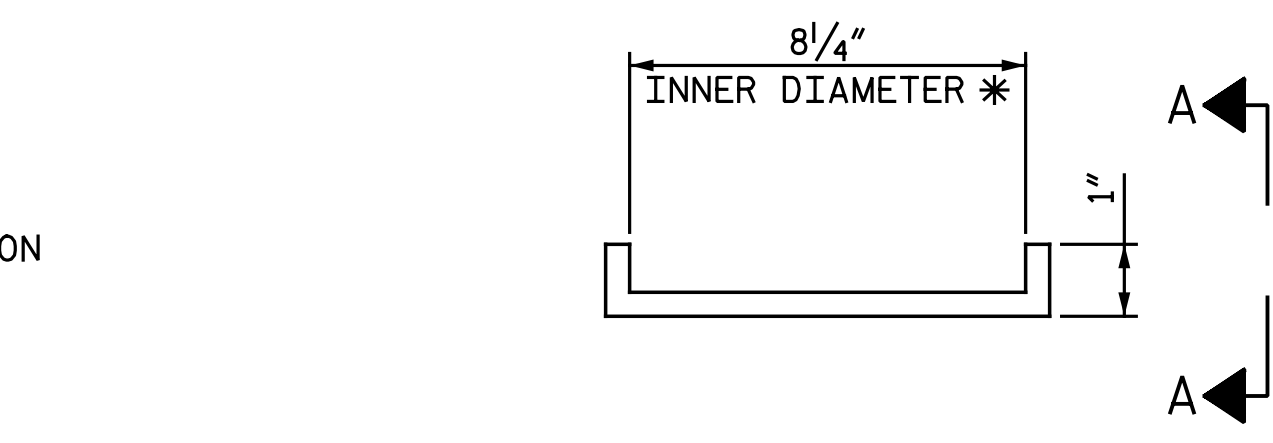
REVISIONS						SHEET NO. S4-50
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 68
2			4			

cmayhew 5/3/2016 9:37:41 AM  
 File Name: Y:\Projects\NCDOT\U-3308\Structures\Drawings\Final\404\_050\_U3308\_SMU\_SD06.dgn

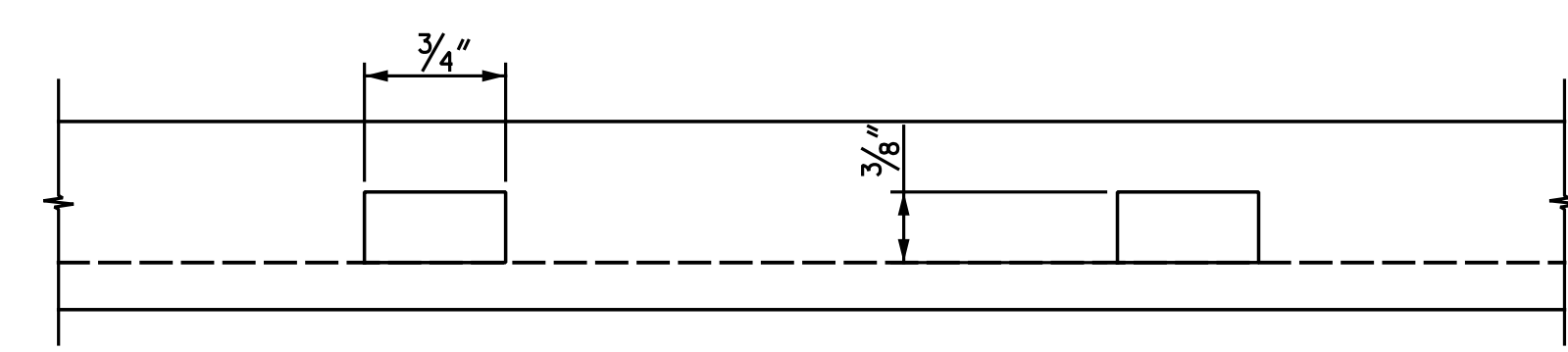
DRAWN BY: M. D. MAYHEW DATE: 1-20-14  
 CHECKED BY: S. A. DENNEY DATE: 3-6-14



PLAN AT DOWNSPOUT



NOTES: PROVIDE 3/8" x 3/4" SLOTS IN LINE WITH HOLES IN PERFORATED PIPE.  
 \* CONFIRM PAN WIDTH AFTER PIPE SUPPLIER PROVIDES OUT-TO-OUT PIPE DIAMETER.



STEEL PAN DETAIL

**NOTES:**

ALL PIPES, FLANGES AND FITTINGS SHALL BE CLASS 53 DUCTILE IRON, UNLESS NOTED OTHERWISE.  
 ALL BENDS TO BE SHORT RADIUS, INCLUDING FLANGE AND FLARE BENDS, UNLESS OTHERWISE NOTED.

MAKE FINAL PIPE ALIGNMENT AND TIGHTEN U-BOLTS AFTER RAILROAD TRACK HAS BEEN LAID ACROSS THE BRIDGE.

PAYMENT FOR ALL MATERIALS, FABRICATION, INSTALLATION AND ADJUSTMENTS RELATED TO STRUCTURE DRAINAGE SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE BID FOR "STRUCTURE DRAINAGE SYSTEM". NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE FOR ANY COMPONENT OF THE STRUCTURE DRAINAGE SYSTEM INCLUDING, BUT NOT LIMITED TO:

- DUCTILE IRON PIPE AND FITTINGS
- STANDARD PIPE
- GASKET AND PVC OR NEOPRENE COATED STRIPS
- STEEL SUPPORT ANGLES AND PLATES
- U-BOLTS AND H.S. BOLTS, WASHERS, AND NUTS
- OFFSET PIPE CLAMPS AND EXPANSION ANCHOR BOLTS

PROVIDE PVC OR NEOPRENE-COATED STRIPS, EPOXY-CEMENTED TO THE U-BOLT OR PIPE FOR STRAY CURRENT PROTECTION.

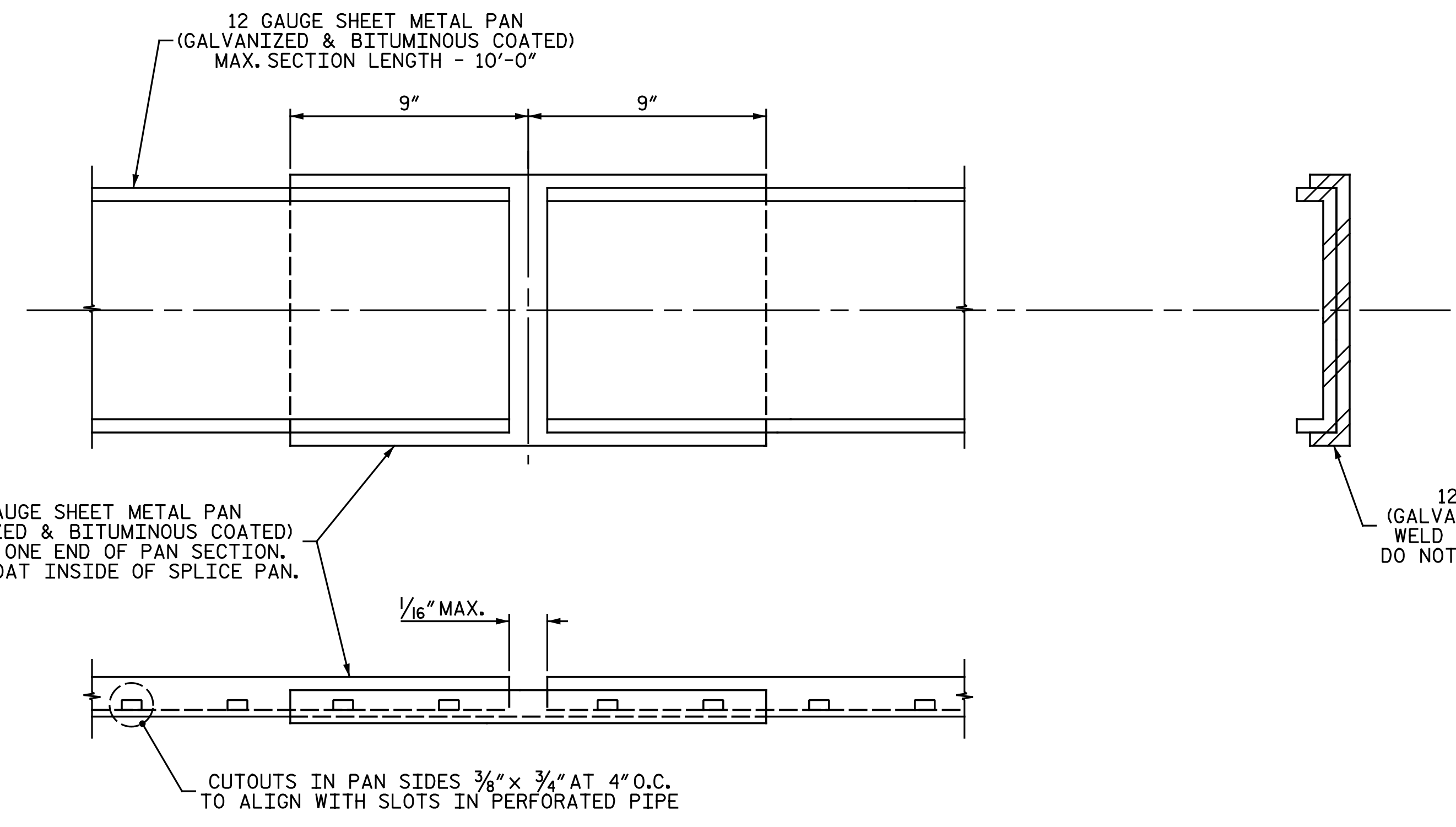
THE OUTSIDE COATING FOR D.I. PIPE MAY BE PAINTED WITH A SHOP PRIME COAT OF INORGANIC ZINC PRIMER AND A FINISH (FIELD) COATING OF VINYL PAINT AS SPECIFIED FOR THE STRUCTURAL STEEL.

FOR STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.

D.I. = DUCTILE IRON

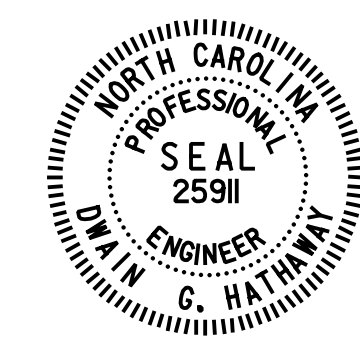
FOR WATERPROOFING SYSTEM, SEE SPECIAL PROVISION "WATERPROOFING (RAILROAD STRUCTURES)".

STRUCTURE DRAINAGE SYSTEM ESTIMATED QUANTITIES		
ITEM	QUANTITY	UNIT
8" I.D. DUCTILE IRON PIPE, CLASS 53 (FLANGED BOTH ENDS)	137.5	FT.
6" Ø STD PIPE (GALVANIZED, WITH 3/4" Ø x 6" HEADED STUDS)	57	FT.
6" & 8" I.D. DUCTILE IRON PIPE FLANGED FITTINGS, 250 P.S.I. P.R.	2760	LBS.
8" I.D. DUCTILE IRON BLIND FLANGES	420	LBS.
8" I.D. PERFORATED HALF ROUND PIPE, (GALVANIZED AND BITUMINOUS COATED)	314.5	FT.
STEEL PAN BELOW HALF ROUND PIPE, (GALVANIZED AND BITUMINOUS COATED)	314.5	FT.
8" I.D. OFFSET PIPE CLAMPS	240	LBS.



PAN SPLICE DETAIL

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 7 OF 7



5/3/2016

**Michael Baker INTERNATIONAL**

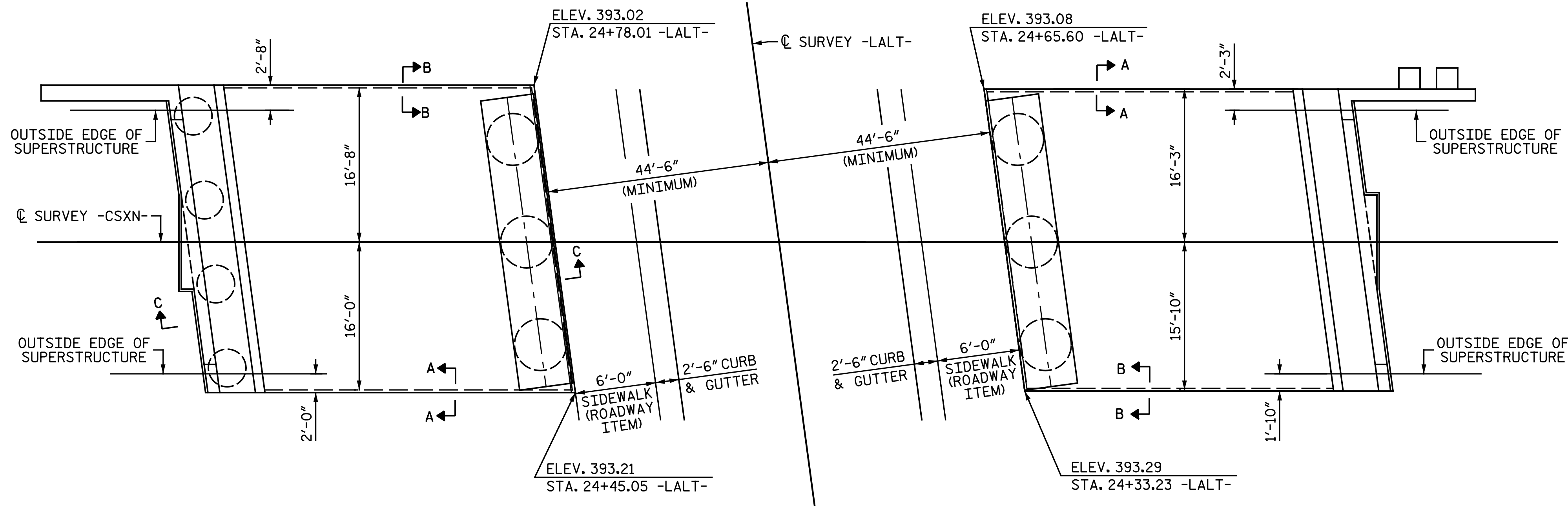
Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUPERSTRUCTURE  
 STRUCTURE DRAINAGE  
 DETAILS

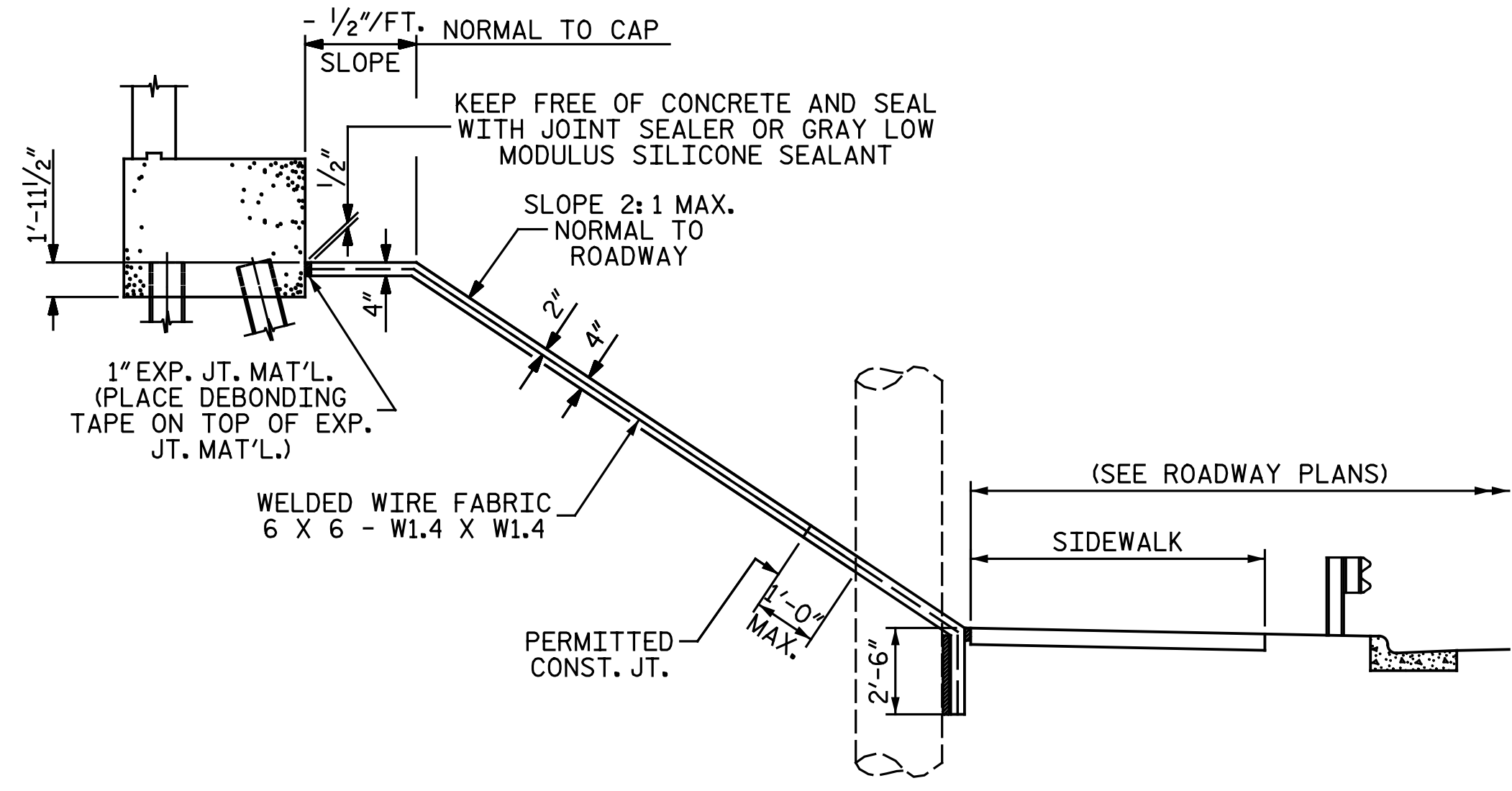
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-51
1			3			TOTAL SHEETS
2			4			68

DRAWN BY : M. D. MAYHEW DATE : 1-20-14  
 CHECKED BY : S. A. DENNEY DATE : 3-6-14

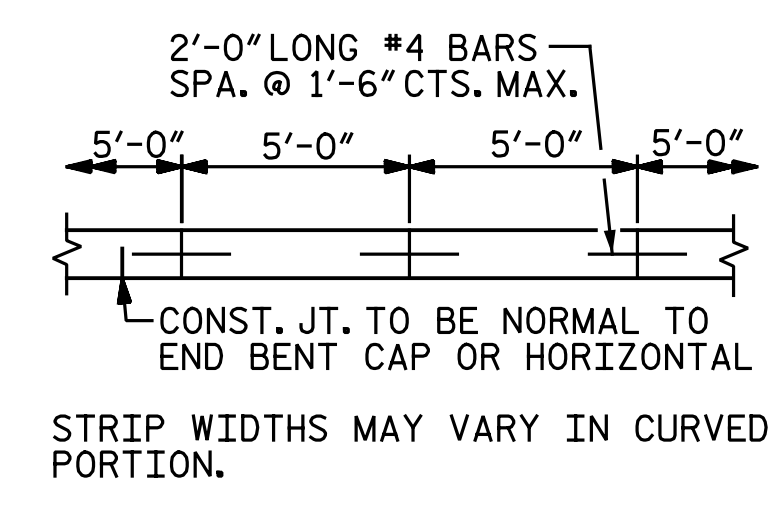
5/3/2016 9:37:42 AM  
 File Name: Y:\Projects\NC DOT\U-3308\Structures\Drawings\Final\404\_051\_LU3308\_SML\_S007.dgn



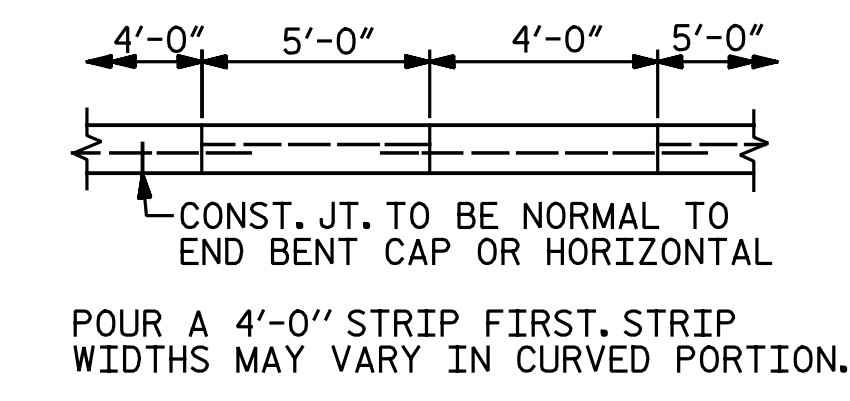
PLAN



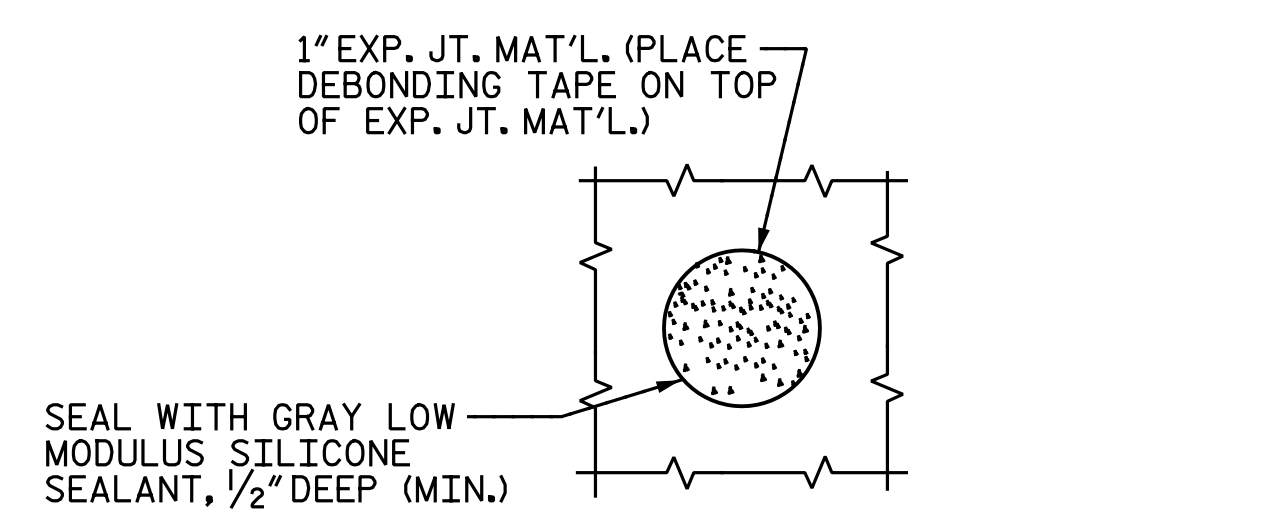
SECTION C-C



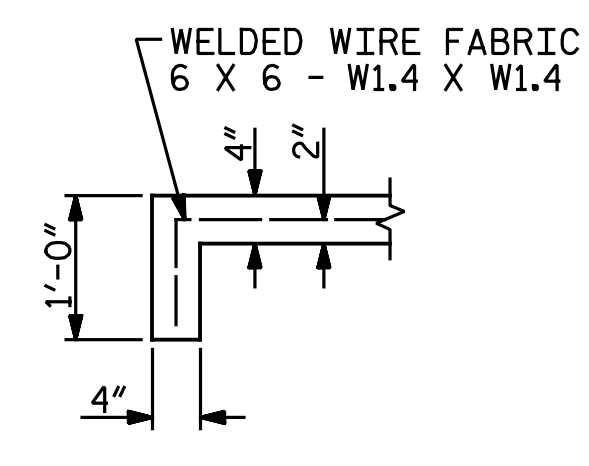
POURING DETAIL



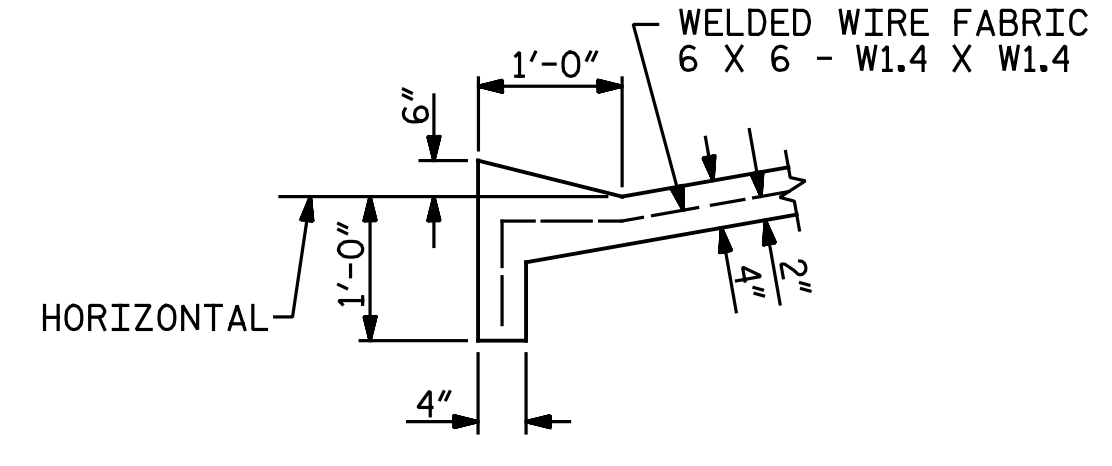
OPTIONAL POURING DETAIL



PLAN WHERE CONCRETE SLOPE PROTECTION MUST BE PLACED AROUND A PIER COLUMN



SECTION A-A



SECTION B-B

GENERAL NOTES:

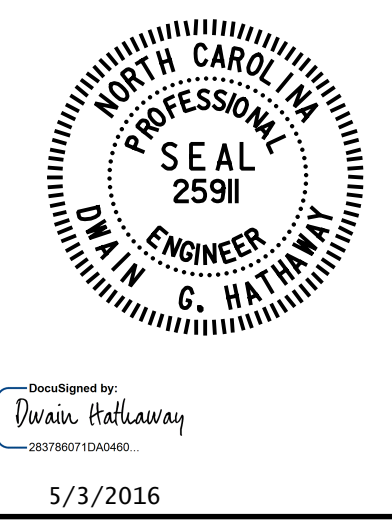
SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 13+22.18 -CSXN-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
ABUTMENT 1	145	290
ABUTMENT 2	143	286

\* QUANTITY SHOWN IS BASED ON 5' POURS.

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SLOPE PROTECTION  
 DETAILS

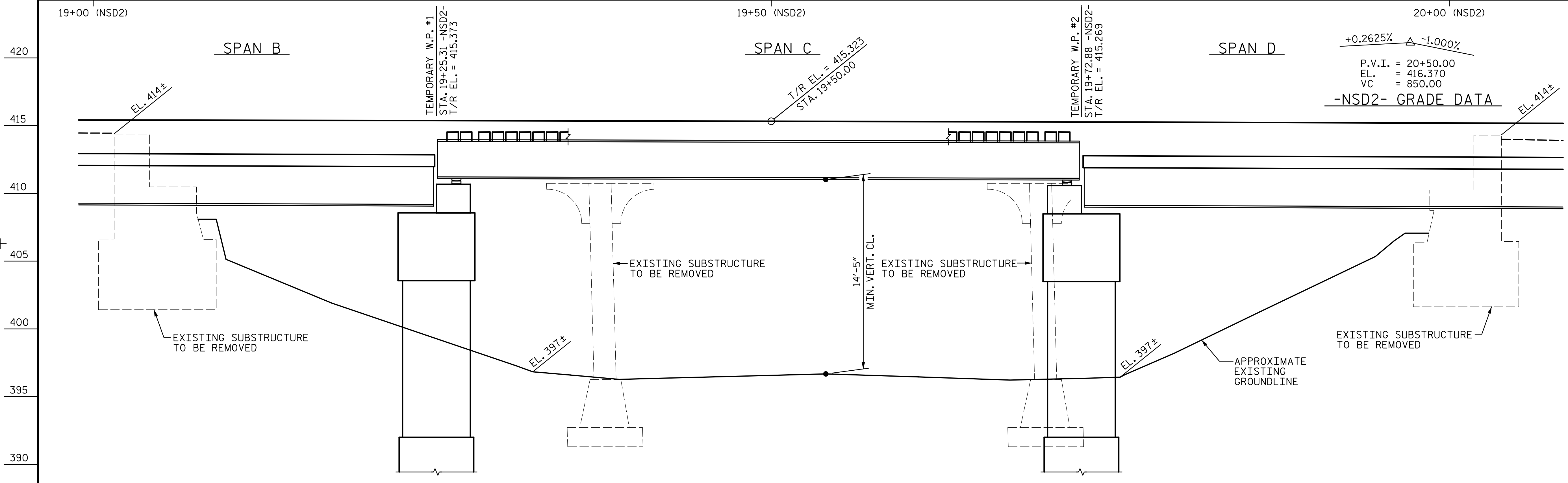
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			68
2			4			

**Michael Baker**  
 INTERNATIONAL

Michael Baker Engineering  
 8000 Regency Parkway, Suite 600  
 Cary, North Carolina 27618  
 NC License No.: F-1084

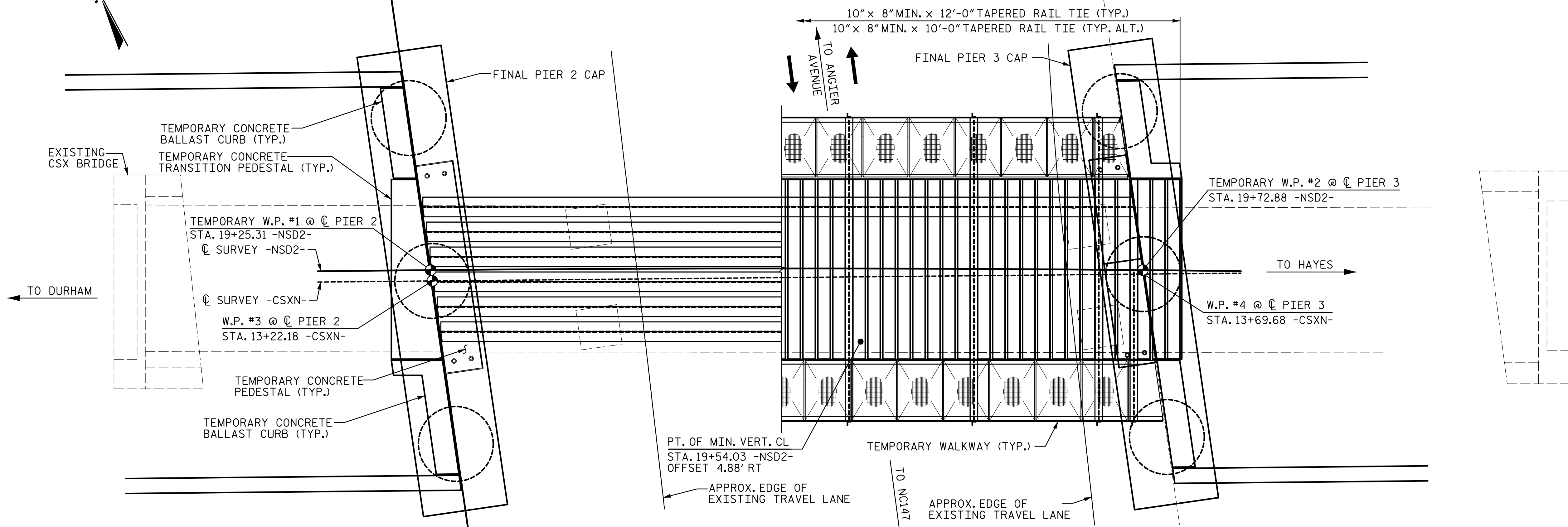
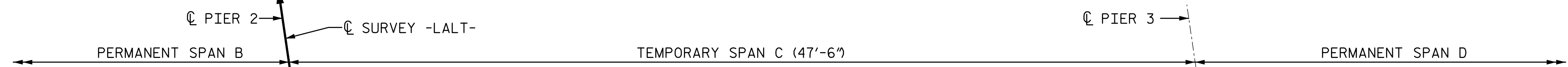
onayhew 5/3/2016 9:37:43 AM  
 File name: Y:\Projects\NC DOT\U-3308\Structures\Drawings\Final\404\_052\_U3308\_SML.SP.dgn

DRAWN BY: M. D. MAYHEW DATE: 1-8-14  
 CHECKED BY: S. A. DENNEY DATE: 3-6-14

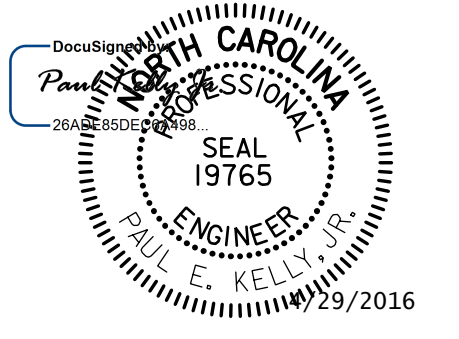


+0.2625%    -1.000%  
 P.V.I. = 20+50.00  
 EL. = 416.370  
 VC = 850.00  
 -NSD2- GRADE DATA

**SECTION ALONG C SURVEY -NSD2-**  
 (SUBSTRUCTURE ON SECTION AT RIGHT ANGLES TO SUBSTRUCTURE)



**PLAN**  
 (PIERS ARE PARALLEL)



PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 1 OF 16

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**TEMPORARY SPAN  
 PLAN AND ELEVATION**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-53
1			3			TOTAL SHEETS
2			4			68

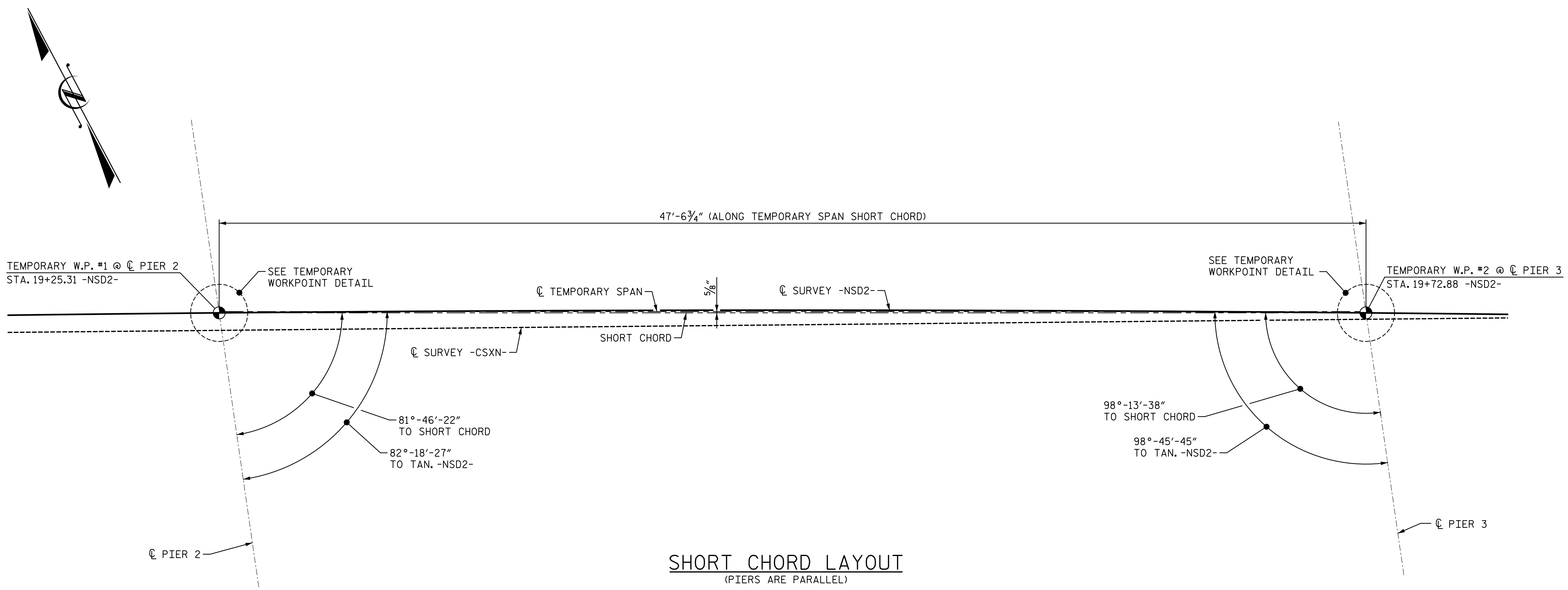
DRAWN BY : MTC    DATE : 06-14  
 CHECKED BY : DJM    DATE : 06-14

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

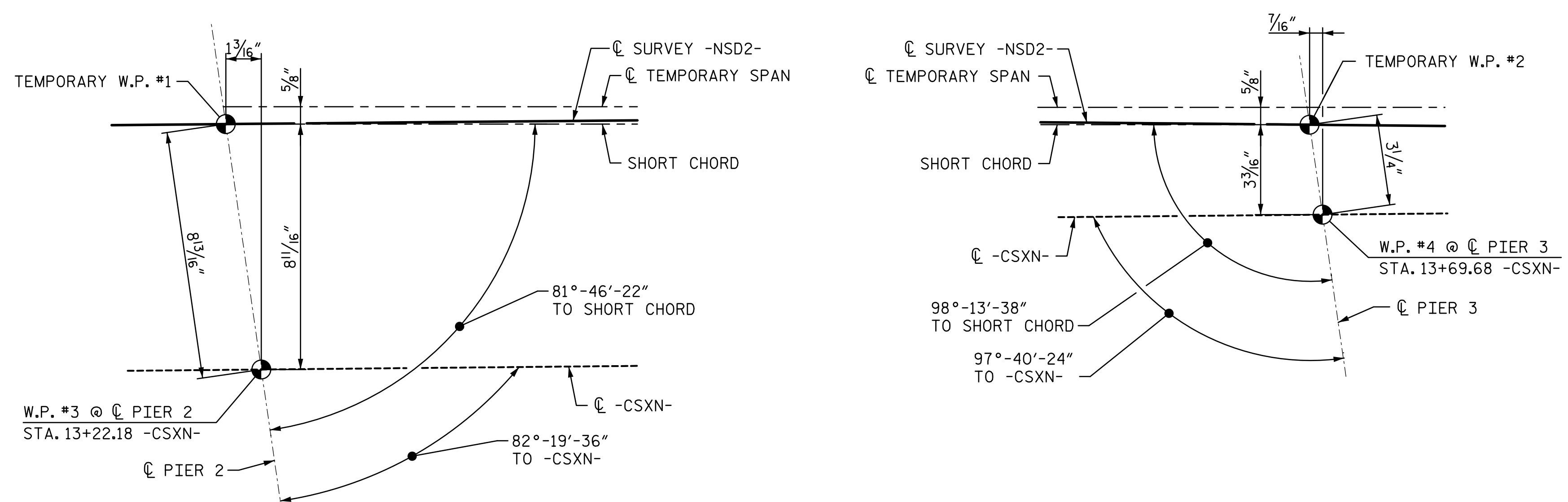
**STV / Ralph Whitehead Associates, Inc.**  
 900 W Trade Street, Suite 715  
 Charlotte, NC 28202  
 NC License No. F-0991

i:\PROJ\251325\ustation\struc\Temporary\_Span\404\_052\_U3308\_SMU\_TSO1.dgn  
 4/29/2016 12:32:31 PM  
 p.kelly

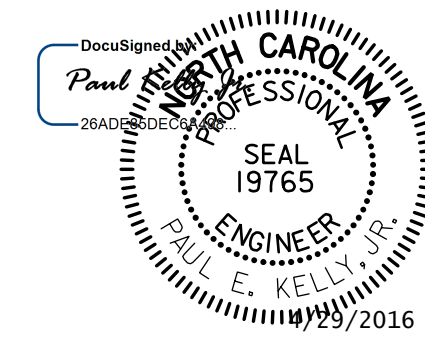
i:\PROJ\251325\ustation\struct\Temporary Span\404\_053\_U3308\_SML\_TS02.dgn 4/29/2016 12:32:34 PM



**SHORT CHORD LAYOUT**  
(PIERS ARE PARALLEL)



**TEMPORARY WORKPOINT DETAIL**  
(PIERS ARE PARALLEL)



PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 2 OF 16

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**TEMPORARY SPAN  
 SHORT CHORD LAYOUT**

DRAWN BY : MTC DATE : 06-14  
 CHECKED BY : DJM DATE : 06-14

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

STV / Ralph Whitehead Associates, Inc.  
 900 W Trade Street, Suite 715  
 Charlotte, NC 28202  
 NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-54
1			3			TOTAL SHEETS
2			4			68

# TEMPORARY SPAN GENERAL NOTES

1. THE TEMPORARY SPAN HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITION OF AREMA'S "MANUAL FOR RAILWAY ENGINEERING, VOL. 2, STRUCTURES", AND NORFOLK SOUTHERN CORPORATION'S "UNDERPASS GRADE SEPARATION CRITERIA".
2. ASSUMED LIVE LOAD: COOPER E80 OR ALTERNATE LIVE LOAD.
3. FOR ADDITIONAL NOTES AND DESIGN DATA SEE SHEET "GENERAL DRAWING SHEET 4 OF 5". IN THE EVENT ANY NOTES CONFLICT, THE NOTES ON THIS SHEET SHALL CONTROL FOR THE TEMPORARY SPAN.
4. THE TEMPORARY SPAN HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES FOR SEISMIC ZONE 1.
5. REINFORCING STEEL SHALL BE ASTM 615, GRADE 60. ALL DIMENSIONS RELATING TO BAR SPACING ARE TO BAR CENTERS UNLESS NOTED OTHERWISE. FABRICATION IS TO BE IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE", ACI 315 (CURRENT EDITION). ALL REINFORCING IN THE CONCRETE DECK SLAB AND PARAPETS SHALL BE EPOXY COATED.
6. THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.
7. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES", JANUARY 2012, NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (HEREIN CALLED STANDARD SPECIFICATIONS), EXCEPT AS NOTED HEREIN, ELSEWHERE ON PLANS, OR IN THE SPECIAL PROVISIONS. STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH CURRENT AREMA SPECIFICATIONS AND NORFOLK SOUTHERN'S "SPECIFICATIONS FOR STEEL".
8. ALL CONCRETE USED FOR THE TEMPORARY SPAN (DECK AND CURBS) SHALL BE MIN. 5,000 PSI CONCRETE, WITH NO.57 OR 67 COARSE AGGREGATE AND SHALL BE AIR-ENTRAINED. MINIMUM CEMENT PER CUBIC YARD OF CONCRETE SHALL BE 6.5 BAGS. NO SUBSTITUTION OF FLY ASH, BLAST FURNACE SLAG OR OTHER MATERIAL WILL BE PERMITTED IN MEETING THIS MINIMUM CEMENT REQUIREMENT. CHAMFER ALL EXPOSED EDGES AND CORNERS  $\frac{3}{4}$ " EXCEPT AS NOTED ON THE PLANS. THE USE OF GROUND GRANULATED BLAST FURNACE SLAG IS NOT PERMITTED IN THIS STRUCTURE.
9. CONTROL OF WORK: ALL WORK INVOLVED IN THE CONSTRUCTION OF THE RAILWAY STRUCTURE SHALL BE PERFORMED SATISFACTORY TO THE ENGINEER AND/OR NORFOLK SOUTHERN RAILWAY COMPANY. ALL METHODS OF HANDLING THE WORK AFFECTING THE SAFETY OF RAIL OPERATIONS MUST BE APPROVED BY THE RAILWAY COMPANY BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. RAIL TRAFFIC SHALL, AT ALL TIMES, BE MAINTAINED AND PROTECTED. THE CONTRACTOR SHALL NOT AT ANY TIME DELAY OR INTERFERE WITH RAIL OPERATIONS.
10. NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.
11. FOR PORTLAND CEMENT, SEE SPECIAL PROVISIONS.
12. FOR FINE AND COARSE AGGREGATE, SEE SPECIAL PROVISIONS.
13. SEE "TEMPORARY SPAN STRUCTURAL STEEL NOTES" SHEET FOR ADDITIONAL NOTES.
14. FOR RAILROAD TRACKWORK, SEE RAILROAD TRACKWORK PLANS.
15. FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
16. FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
17. FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
18. FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
19. FOR CAST-IN-PLACE CONCRETE, SEE SPECIAL PROVISION FOR NORFOLK SOUTHERN SPECIFICATIONS FOR CAST-IN-PLACE CONCRETE.
20. FOR PAINTING STRUCTURAL STEEL, SEE SPECIAL PROVISION FOR NORFOLK SOUTHERN SPECIFICATIONS FOR PAINTING SHOP FABRICATED BRIDGE STEEL.
21. FOR PROTECTION OF RAILWAY INTERESTS, SEE SPECIAL PROVISIONS.
22. FOR RAILROAD ROADBED, SEE RAILROAD ROADBED SPECIAL PROVISIONS.
23. FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.
24. SHOCK PADS SHALL BE PREFORMED FABRIC BEARING PADS,  $\frac{1}{2}$ " THICK, AND SHALL BE EITHER SHOCK PAD STYLE 15175, AS MANUFACTURED BY THE ALERT MANUFACTURING AND SUPPLY COMPANY, CHICAGO, IL; OR FABREEKA PADS, AS MANUFACTURED BY THE FABREEKA PRODUCTS COMPANY, BOSTON, MA; OR SORBTEX PADS, AS MANUFACTURED BY VOSS ENGINEERING, INC., CHICAGO, IL; OR AN APPROVED EQUAL.
25. ALL CONSTRUCTION JOINTS SHOWN ON THESE PLANS SHALL BE REQUIRED UNLESS SHOWN OPTIONAL. CONSTRUCTION JOINTS SHALL NOT BE PERMITTED EXCEPT AS SHOWN ON THE PLANS, OR WHERE WRITTEN APPROVAL HAS BEEN OBTAINED.
26. BENCHMARK: SEE LOCATION SKETCH.
27. DIRECT TENSION INDICATORS (DTI) WILL NOT BE PERMITTED. USE THE TURN-OF-NUT METHOD FOR INSTALLING AND TIGHTENING HIGH STRENGTH BOLTS.
28. THE RAILROAD TRACK TOP OF RAIL ELEVATIONS ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS AND REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.
29. THE CONTRACTOR IS REMINDED THAT WORK ON THIS PROJECT REQUIRES WORKING NEAR EXISTING STRUCTURES. EVERY EFFORT HAS BEEN MADE TO IDENTIFY DISCREPANCIES AND ENSURE THAT THE DETAILS ARE DEPICTED CORRECTLY. HOWEVER, SINCE THE PROJECT INVOLVES WORKING NEAR EXISTING STRUCTURES, THE CONTRACTOR CAN EXPECT AND SHOULD PLAN ON ENCOUNTERING VARIANCES AND DEVIATIONS BETWEEN THE INFORMATION FOUND IN THESE DRAWINGS AND THE EXISTING CONDITIONS. ACTUAL FIELD CONDITIONS MAY REQUIRE MODIFICATIONS IN CONSTRUCTION DETAILS AND QUANTITIES. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL DETAILS INCLUDING GEOMETRY AND ELEVATIONS PRIOR TO THE INSTALLATION OF ANY MATERIAL. THE CONTRACTOR SHALL SUBMIT TO NCDOT AND NORFOLK SOUTHERN COPIES OF FIELD SURVEYS AND VERIFICATIONS FOR INCLUSION INTO THE CONSTRUCTION RECORDS FOR THE PROJECT.
30. ALL COSTS ASSOCIATED WITH THE TEMPORARY SPAN, INCLUDING BUT NOT LIMITED TO ERECTION, DEMOLITION/REMOVAL, PEDESTALS AND BALLAST CURBS, ALL MATERIALS (INCLUDING BUT NOT LIMITED TO STRUCTURAL STEEL, CONCRETE, REINFORCING STEEL, DECK GRATING, TRACK, TIES, MECHANICAL ANCHORS AND ANCHOR BOLTS, ETC.) AND LABOR SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR THE "CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY SPAN". NO ADDITIONAL PAYMENT WILL BE MADE.

I:\PROJ\2513251\ustation\struc\Temporary\_Span\404\_054\_U3308\_SML\_TS03.dgn

12:32:37 PM

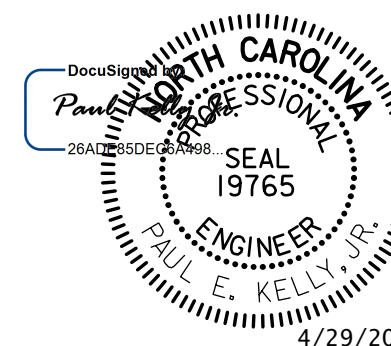
4/29/2016

pkelly

DRAWN BY : MTG DATE : 06-14  
 CHECKED BY : DJM DATE : 06-14

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

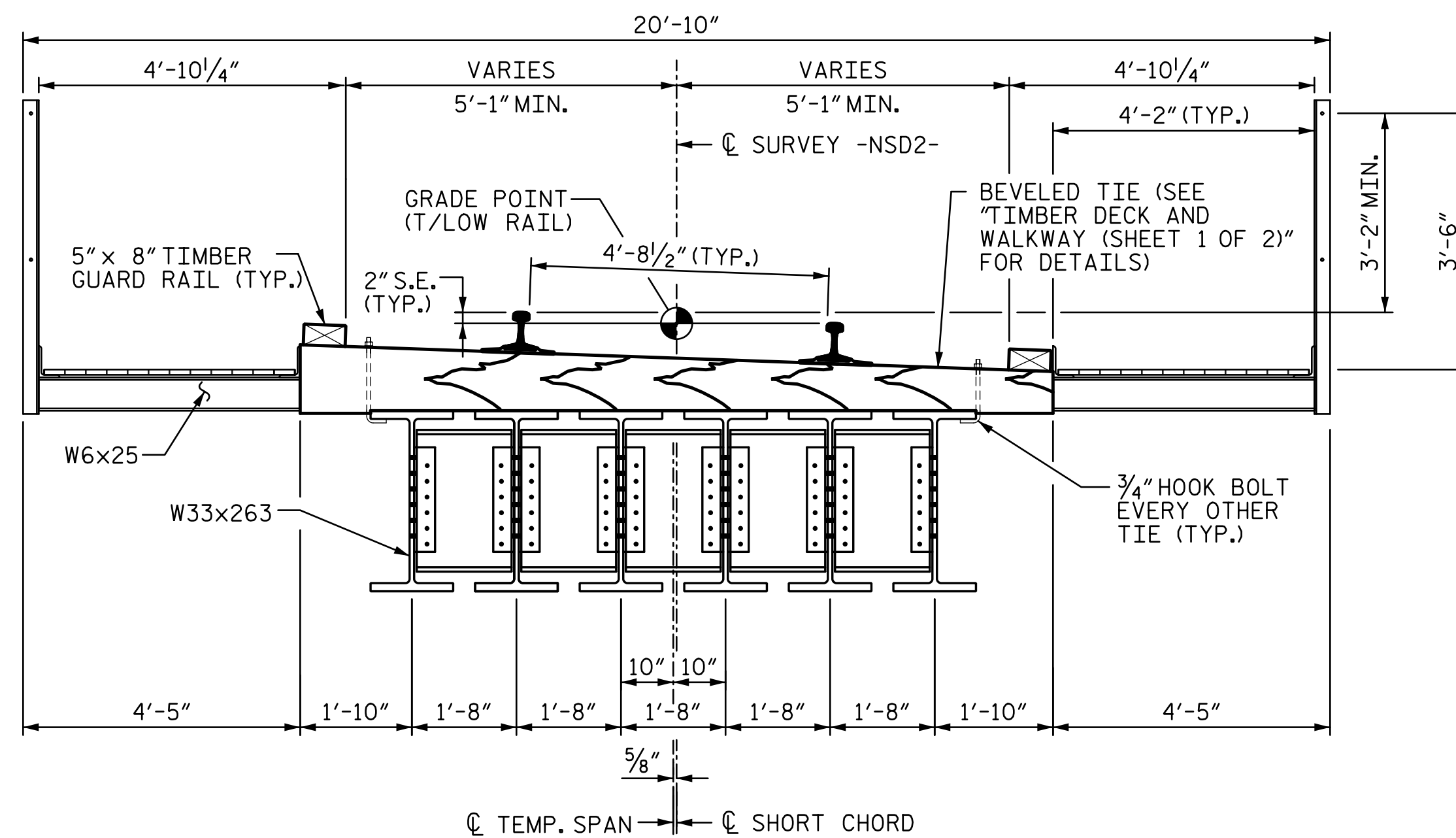
 STV / Ralph Whitehead Associates, Inc.  
 900 W Trade Street, Suite 715  
 Charlotte, NC 28202  
 NC License No. F-0991



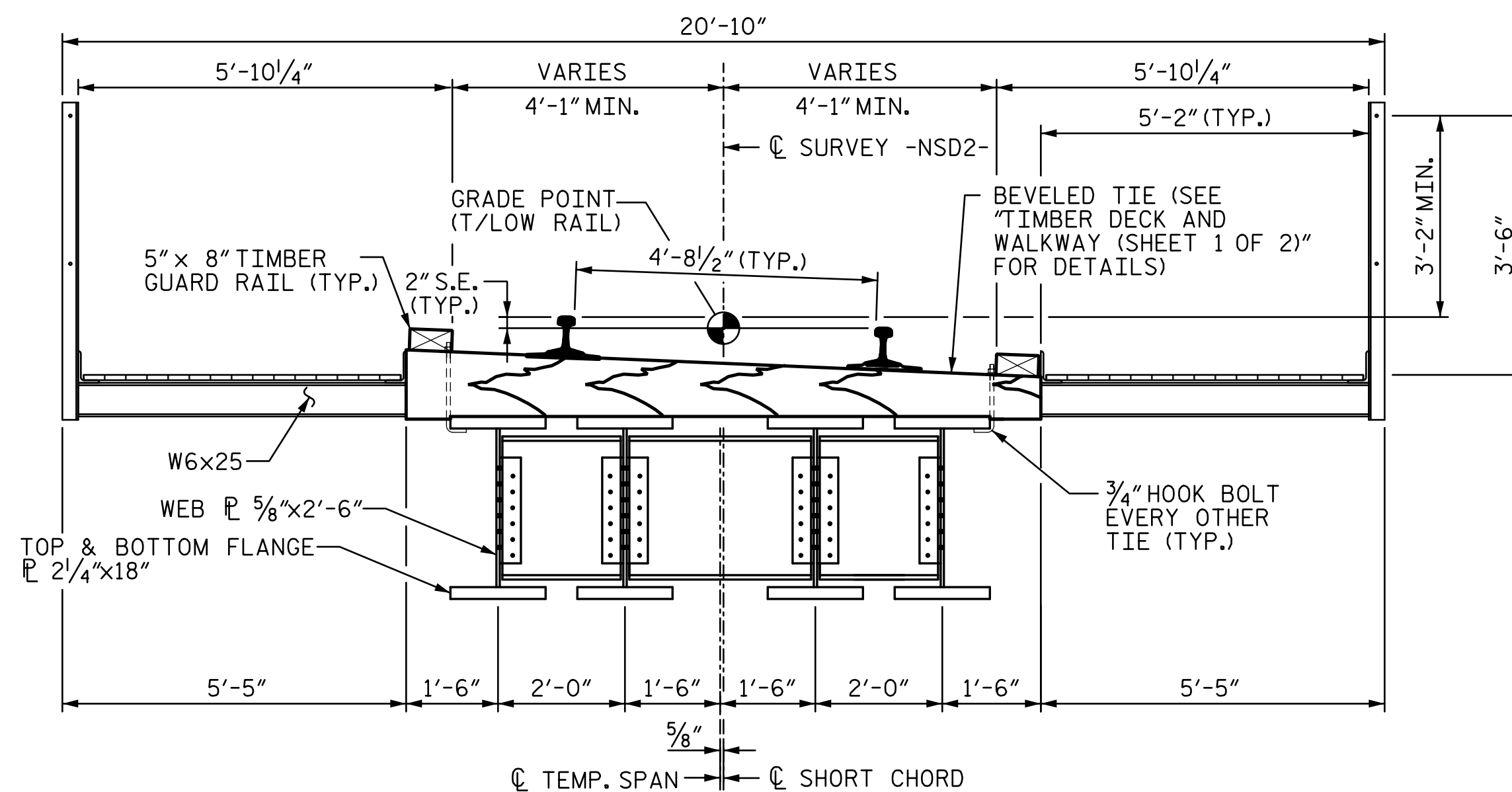
PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 3 OF 16

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
TEMPORARY SPAN GENERAL NOTES					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					68
					S4-55





**TEMPORARY SPAN TYPICAL SECTION**  
 (FOR TEMPORARY SPAN ALONG -NSD2- TRACK)  
 (SIMPLE SPAN NON-COMPOSITE ASTM A-709 GRADE 50 W33x263 ROLLED BEAMS)



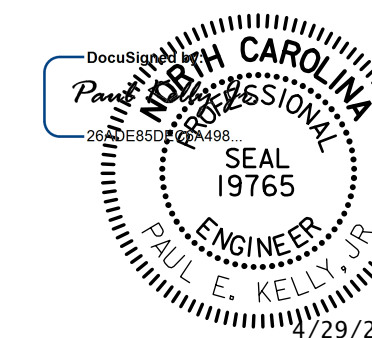
**TEMPORARY SPAN TYPICAL SECTION - ALTERNATE**  
 (FOR TEMPORARY SPAN ALONG -NSD2- TRACK)  
 (SIMPLE SPAN NON-COMPOSITE ASTM A-709 GRADE 50 PLATE GIRDERS)

NOTE: THE ALTERNATE CONFIGURATION HAS BEEN PROVIDED AS AN ACCEPTABLE ALTERNATIVE TO THE TEMPORARY SPAN AS DETAILED IN THESE PLANS. SHOULD THE CONTRACTOR CHOOSE TO USE THE ALTERNATE, THE APPLICABLE TEMPORARY SPAN PLAN SHEETS SHALL BE UPDATED, SIGNED AND SEALED BY A LICENSED AND REGISTERED ENGINEER AND SUBMITTED FOR APPROVAL TO THE DEPARTMENT AND RAILROADS PRIOR TO BEGINNING CONSTRUCTION. ALL COSTS ASSOCIATED WITH THE ALTERNATE DESIGN AND PLAN SUBMITTAL SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR THE TEMPORARY SPAN. NO ADDITIONAL MEASUREMENT OR PAYMENT WILL BE MADE.

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 4 OF 16

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**TEMPORARY SPAN  
 TYPICAL SECTIONS**



REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

S4-56
TOTAL SHEETS
68

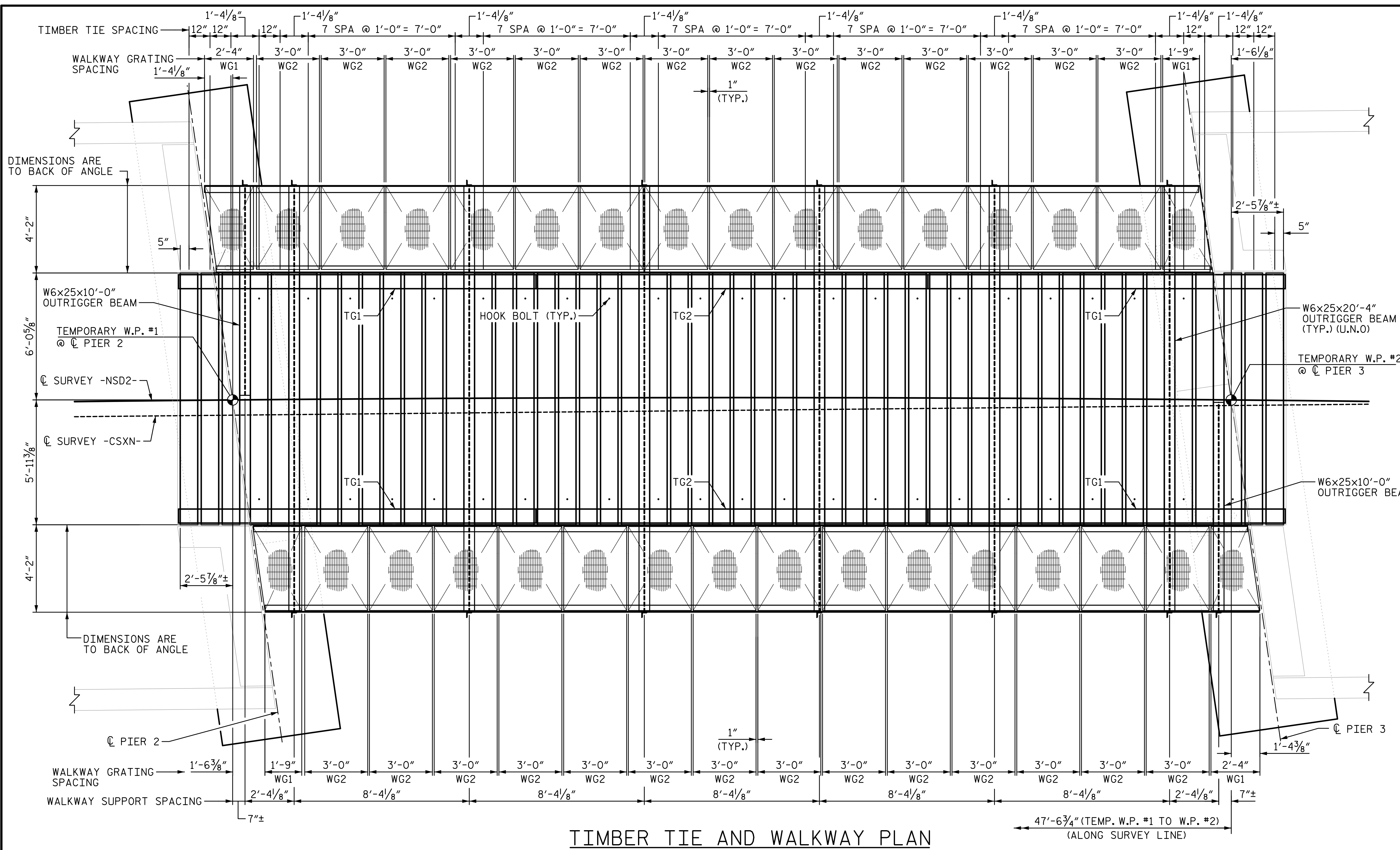
STV / Ralph Whitehead Associates, Inc.  
 900 W Trade Street, Suite 715  
 Charlotte, NC 28202  
 NC License No. F-0991

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

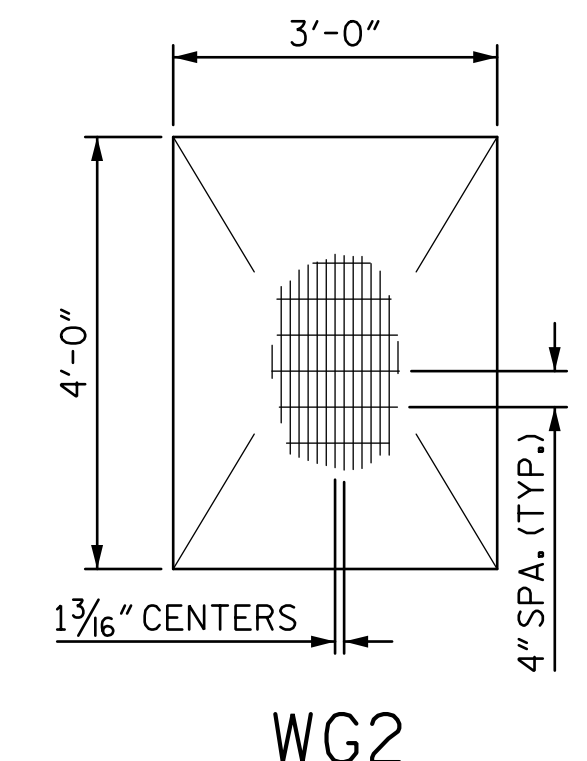
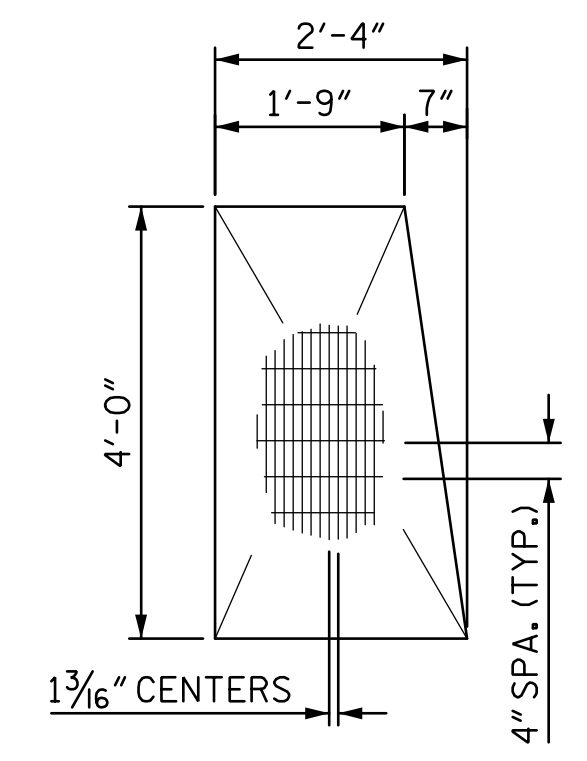
4/29/2016 12:32:40 PM I:\PROJ\251325\ustation\structure\Temporary Span\404\_055\_U3308\_SMU\_TS04.dgn

DRAWN BY : MTC DATE : 06-14  
 CHECKED BY : DJM DATE : 06-14

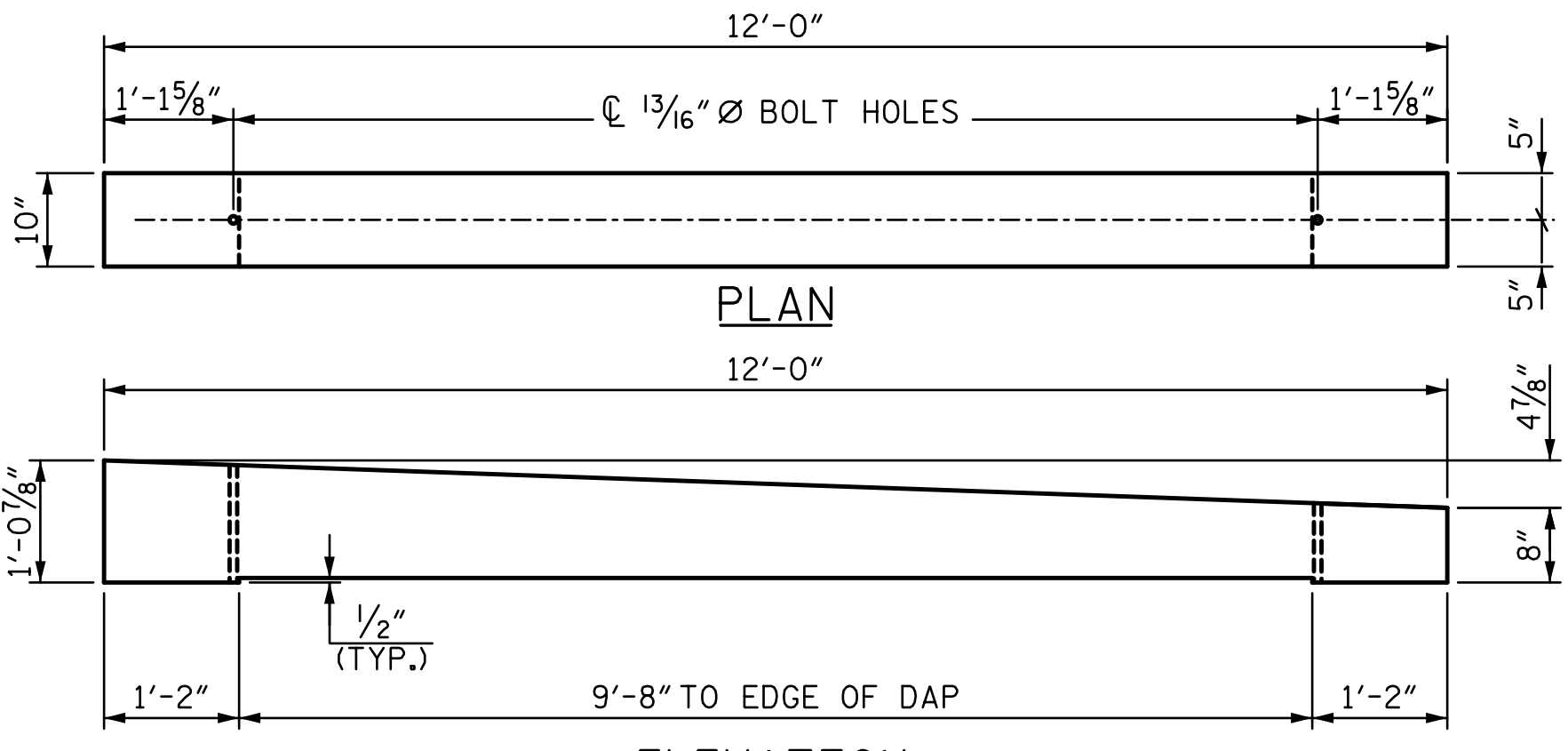
i:\PROJ\251325\ustation\struct\Temporary Span\404\_056\_U3308\_SMU\_TS05.dgn 4/29/2016 12:32:43 PM



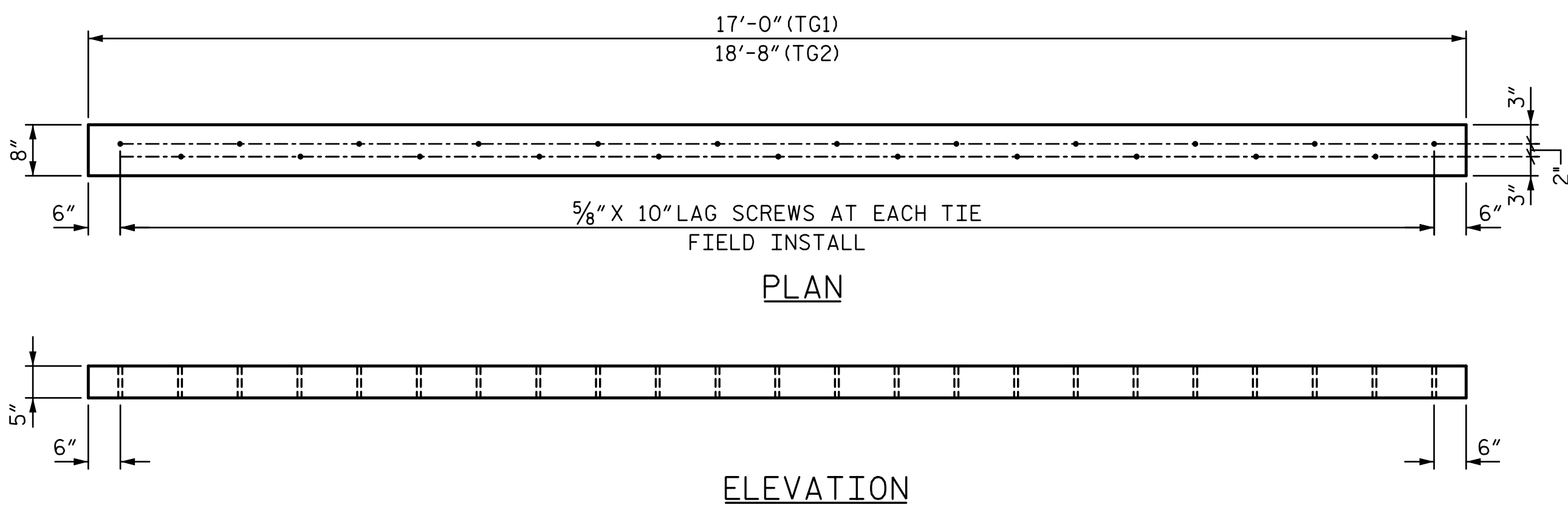
- NOTES:**
1. FOR TEMPORARY SPAN GENERAL NOTES, SEE SHEET TITLED 'TEMPORARY SPAN GENERAL NOTES'.
  2. FOR TEMPORARY SPAN STRUCTURAL STEEL DETAILS, SEE SHEETS TITLED 'TEMPORARY SPAN STRUCTURAL STEEL DETAILS'.
  3. FOR ADDITIONAL NOTES AND DETAILS, SEE SHEET TITLED 'TIMBER DECK AND WALKWAY DETAILS (SHEET 2 OF 2)'
  4. FOR ALTERNATE TEMPORARY SPAN, USE 10' X 8' MIN. X 10'-0" TIES WITH 5'-0" GRATING.



**TIMBER TIE AND WALKWAY PLAN**

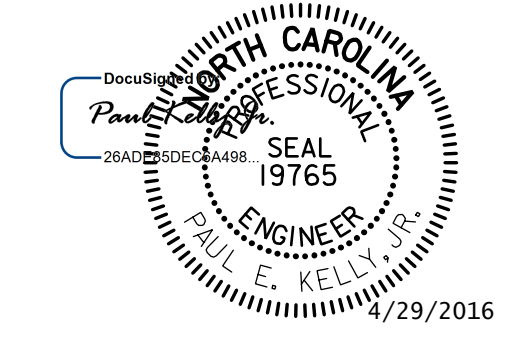


**TIMBER BRIDGE TIE**



**ELEVATION  
TIMBER GUARDRAIL**

- NOTES TO TIMBER FABRICATOR:**
1. TIMBERS ARE TO BE FRAMED TO DIMENSIONS AND DETAILS AS SHOWN BEFORE TREATING AND MARKED AS SHOWN.
  2. TIMBER TIES ARE TO BE LAID OFF FROM THE SQUARE END AND MARKED ON SAME END.
  3. TIMBER TIES MUST BE STRAIGHT AND TRUE.



PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 5 OF 16

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**TIMBER DECK AND WALKWAY DETAILS  
 (SHEET 1 OF 2)**

DRAWN BY: NMC DATE: 06-14  
 CHECKED BY: DJM DATE: 06-14

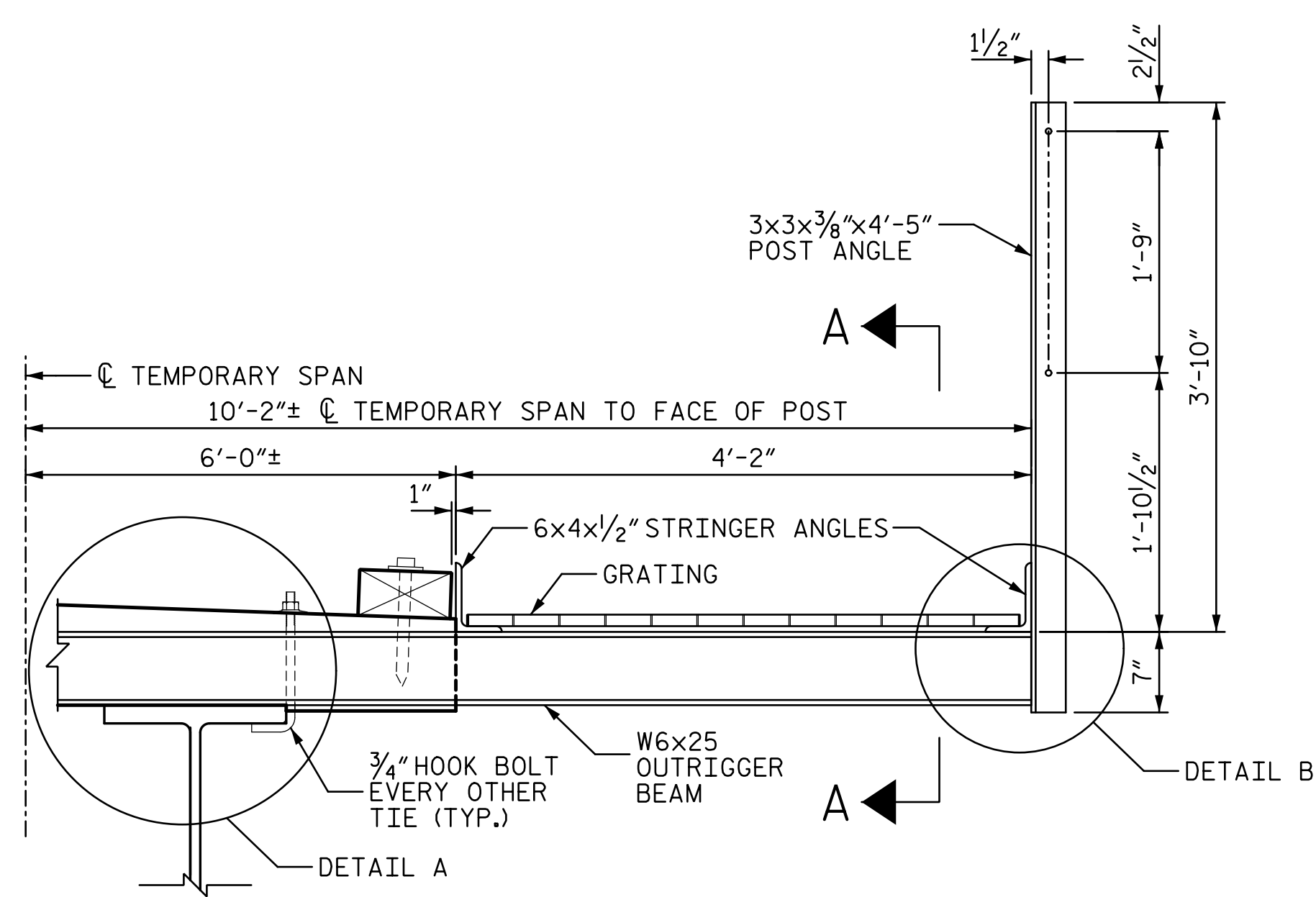
DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

STV / Ralph Whitehead Associates, Inc.  
 900 W Trade Street, Suite 715  
 Charlotte, NC 28202  
 NC License No. F-0991

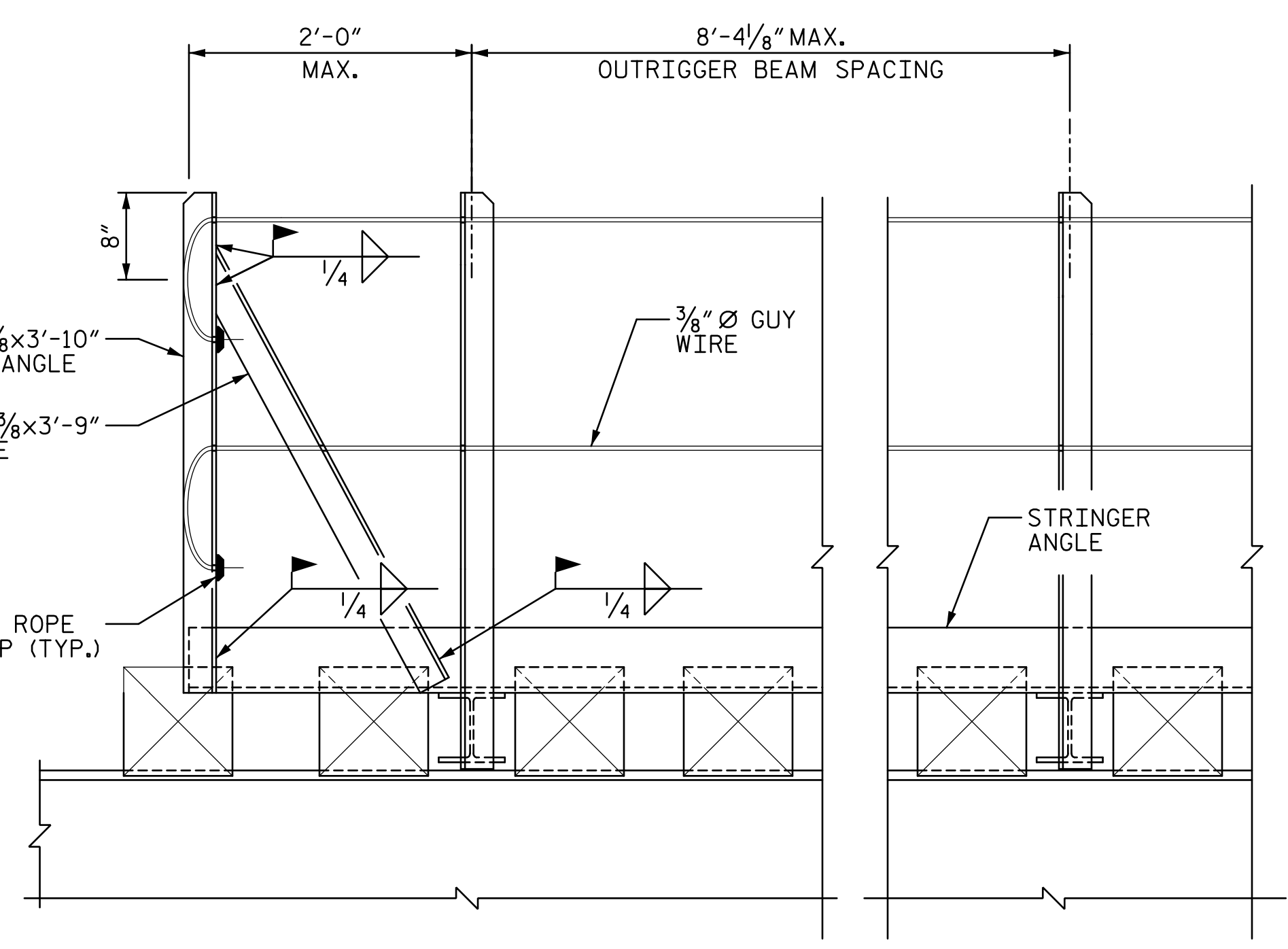
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 68

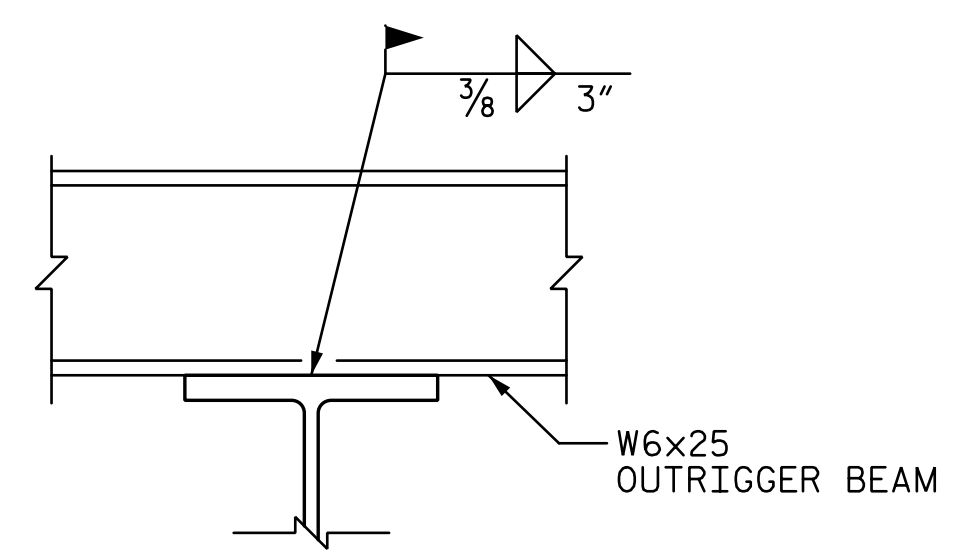
i:\PROJ\2513251\ustation\struct\Temporary Span\404\_057\_U3308\_SML\_TS06.dgn 4/29/2016 12:32:45 PM p.kelly



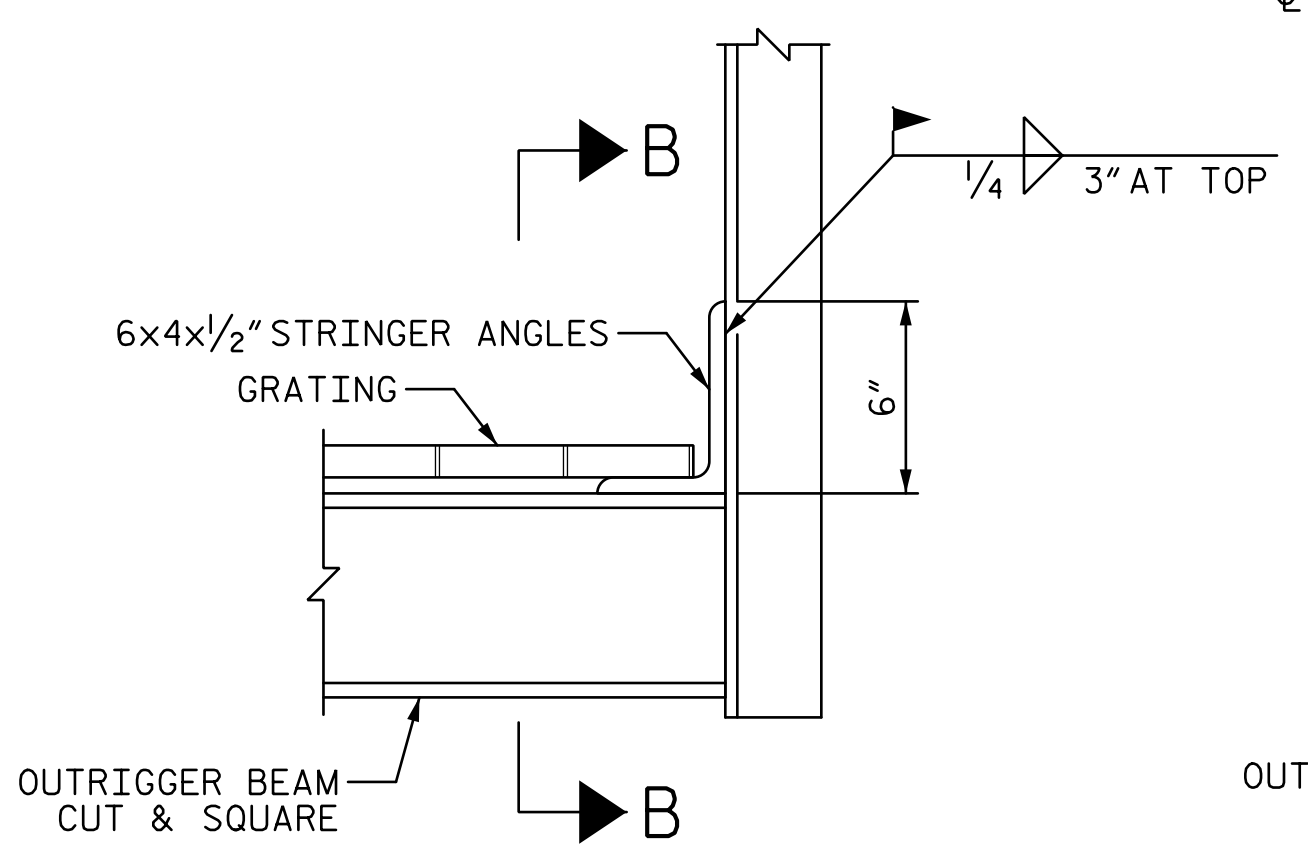
TYPICAL WALKWAY SECTION



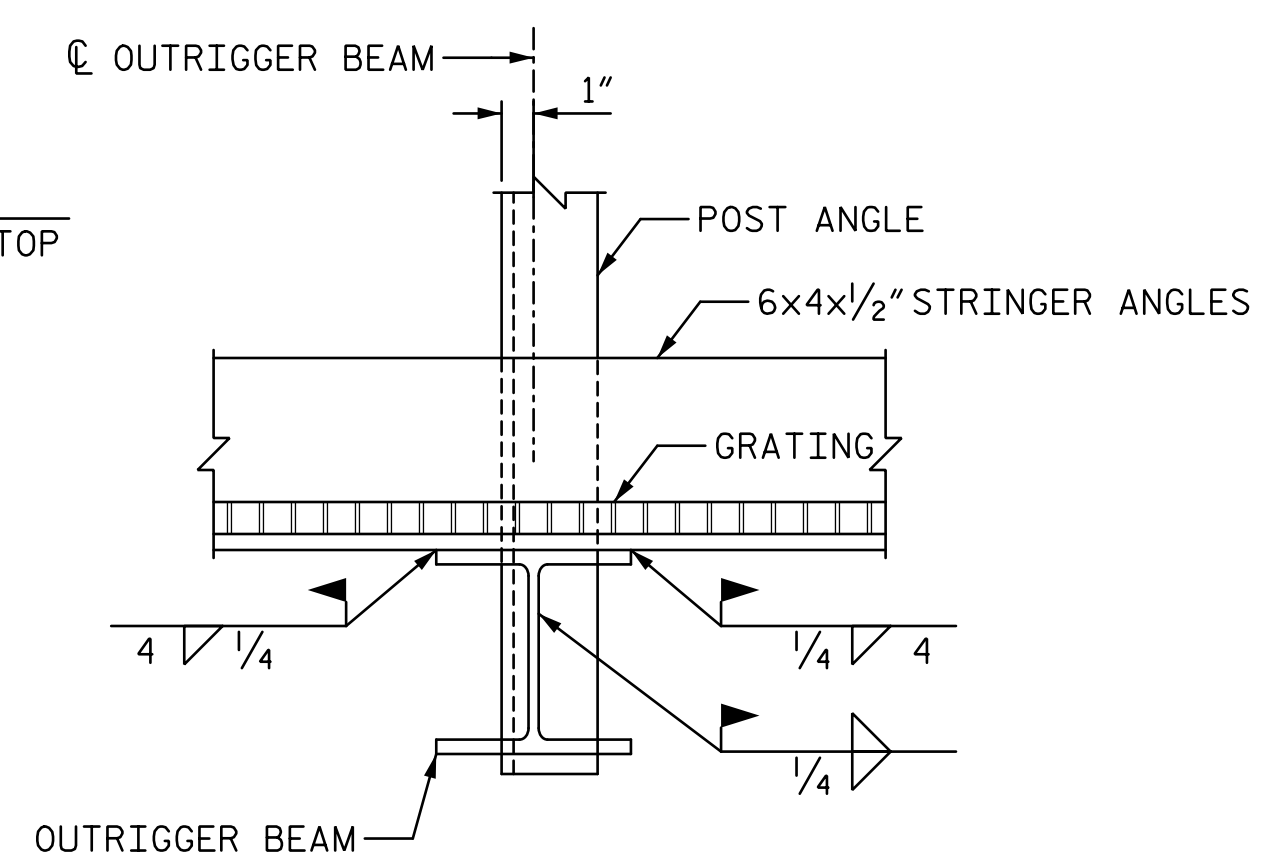
ELEVATION AT TEMPORARY SPAN ENDS



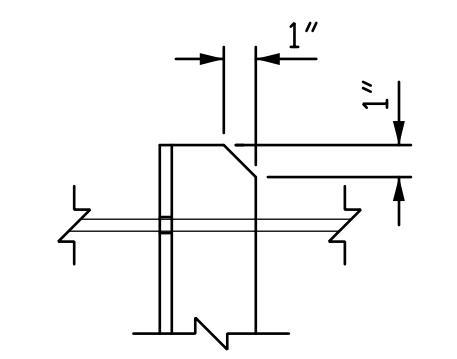
DETAIL A



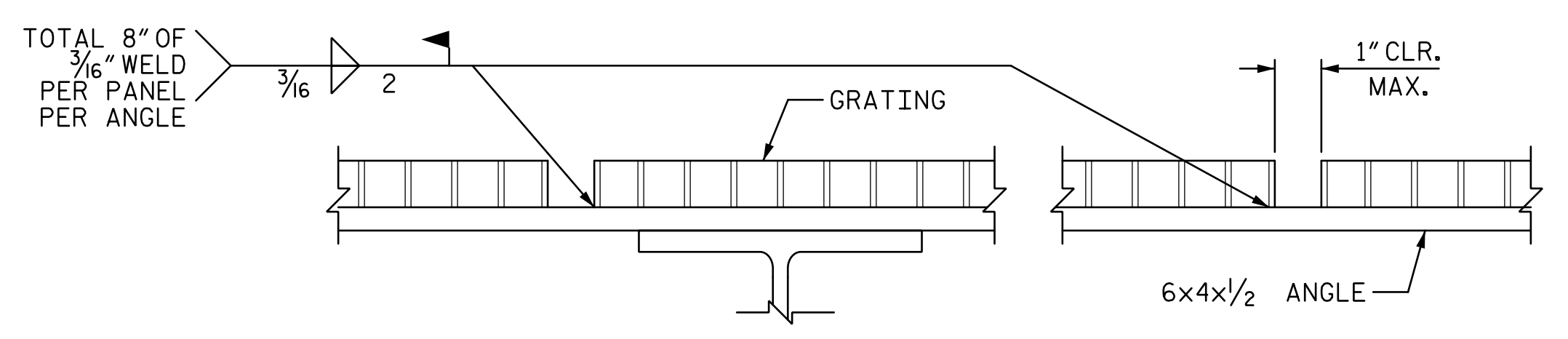
DETAIL B



SECTION B-B



TYPICAL POST ANGLE CLIP

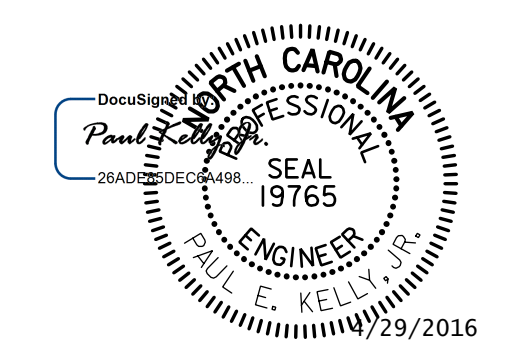


SECTION A-A

TIMBER DECK AND WALKWAY QUANTITIES		
ITEMS	UNIT	QUANTITY
W6X25 OUTRIGGER BEAM	LBS.	3550
L6X4X1/2 STRINGER	LBS.	3176
L3X3X3/8 POSTS AND END BRACE	LBS.	664
WALKWAY GRATING	LBS.	2775
8" MIN. X 10" X 12'-0" TIE	EA.	27
8" MIN. X 10" X 12'-0" TIE W/ HOOK BOLT	EA.	23
5" X 8" TIMBER GUARD RAIL	LF.	105.3

TIMBER DECK AND WALKWAY QUANTITIES - ALTERNATE		
ITEMS	UNIT	QUANTITY
W6X25 OUTRIGGER BEAM	LBS.	3550
L6X4X1/2 STRINGER	LBS.	3176
L3X3X3/8 POSTS AND END BRACE	LBS.	664
WALKWAY GRATING	LBS.	3440
8" MIN. X 10" X 10'-0" TIE	EA.	27
8" MIN. X 10" X 12'-0" TIE W/ HOOK BOLT	EA.	23
5" X 8" TIMBER GUARD RAIL	LF.	105.3

- NOTES:
- FOR TEMPORARY SPAN GENERAL NOTES, SEE SHEET TITLED "TEMPORARY SPAN GENERAL NOTES".
  - FOR TEMPORARY SPAN STRUCTURAL STEEL DETAILS, SEE SHEETS TITLED "TEMPORARY SPAN STRUCTURAL STEEL DETAILS".
  - FOR ADDITIONAL NOTES AND DETAILS, SEE SHEET TITLED "TIMBER DECK AND WALKWAY DETAILS (1 OF 2)".
  - FOR ALTERNATE TEMPORARY SPAN, SEE SHEET TITLED "TEMPORARY SPAN TYPICAL SECTION".



**TIMBER TIE DECK GENERAL NOTES:**

**SPECIFICATIONS:** AREMA CHAPTER 7, "TIMBER STRUCTURES" AND ANY CSXT OR NORFOLK SOUTHERN STANDARD PROCEDURES, AND AS AMENDED OR MODIFIED ON THESE PLANS.

**DESIGN LOADS:** COOPER E80 LIVE LOAD

**TIMBER:** TIMBER TIES AND GUARDRAIL SHALL BE CREOSOTE TREATED SOUTHERN YELLOW PINE, DENSE STRUCTURAL 65, LUMBER OF THE SOUTHERN PINE INSPECTION BUREAU.

**FASTENERS:** BOLTS, WASHERS, LAG SCREWS, ETC. SHALL BE IN ACCORDANCE WITH AREMA 7.1.6 "SPECIFICATION OF FASTENERS FOR TIMBER TRETTLES".

**TIMBER GUARDRAIL:** GUARDRAILS SHALL BE FASTENED TO EACH TIMBER BRIDGE TIE.

**TIE ANCHORAGE:** THE TIMBER TIES SHALL BE FASTENED TO THE BEAM FLANGES WITH 3/4" DIA. HOOK BOLTS, OR EQUAL AT EVERY OTHER TIE. TIMBER TIES SHALL BE DAPPED TO FIT TOP FLANGES OF BEAM AS SHOWN ON SHEET TITLED "TIMBER DECK AND WALKWAY DETAILS (1 OF 2)".

**WALKWAY:** WALKWAY GRATING SHALL BE RECTANGULAR WELDED GRATING MADE OF ASTM A569 STEEL, HOT DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 AFTER FABRICATION. BEARING BARS ARE TO BE 1" X 1/8" AT 1 1/2" CENTERS, AND TWISTED SQ. BARS AT 4" CENTERS. HANDRAIL POST SHALL BE MADE OF ASTM A36 STEEL, HOT DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 AFTER FABRICATION. GUY WIRE SHALL BE 3/8" DIA. GALVANIZED WIRE ROPE ANCHORED WITH GALVANIZED WIRE ROPE CLIPS (GALV. MALLEABLE IRON HEAVY DUTY CROSBY CLIPS AND ROPE THIMBLE).

PROJECT NO. U-3308  
 DURHAM COUNTY

STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 6 OF 16

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**TIMBER DECK AND WALKWAY DETAILS (SHEET 2 OF 2)**

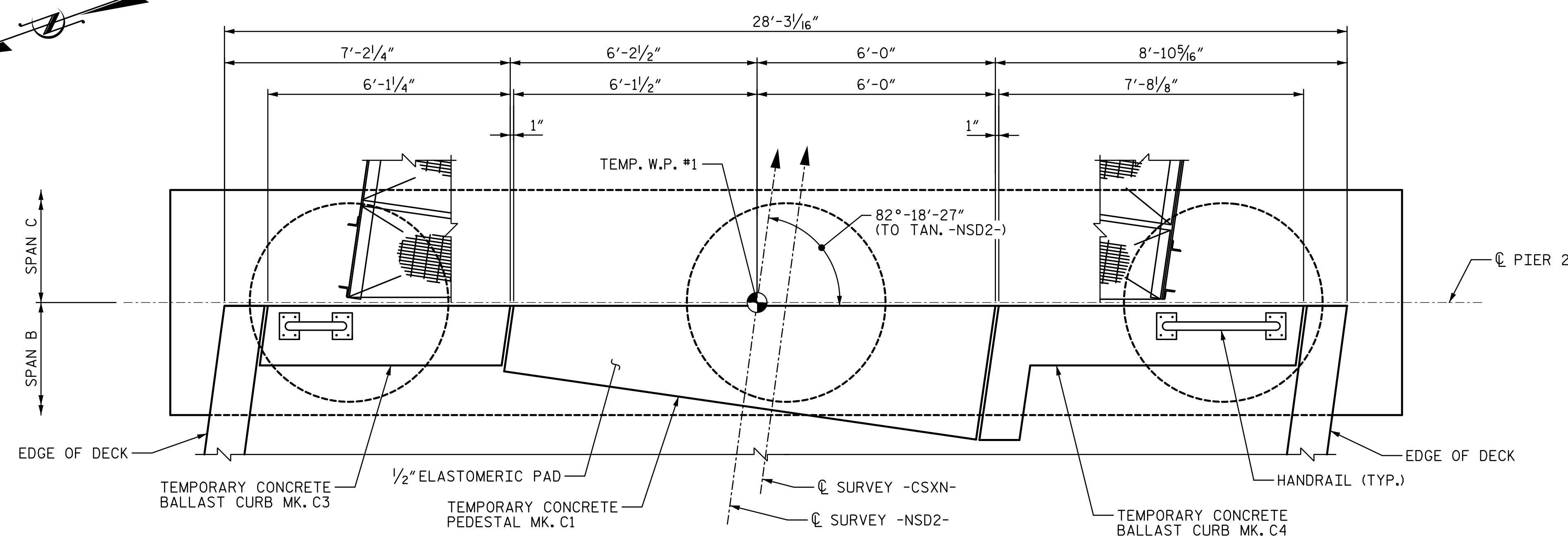
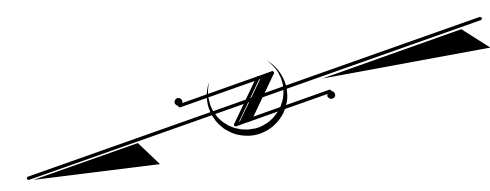
DRAWN BY : NMC DATE : 06-14  
 CHECKED BY : DJM DATE : 06-14

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

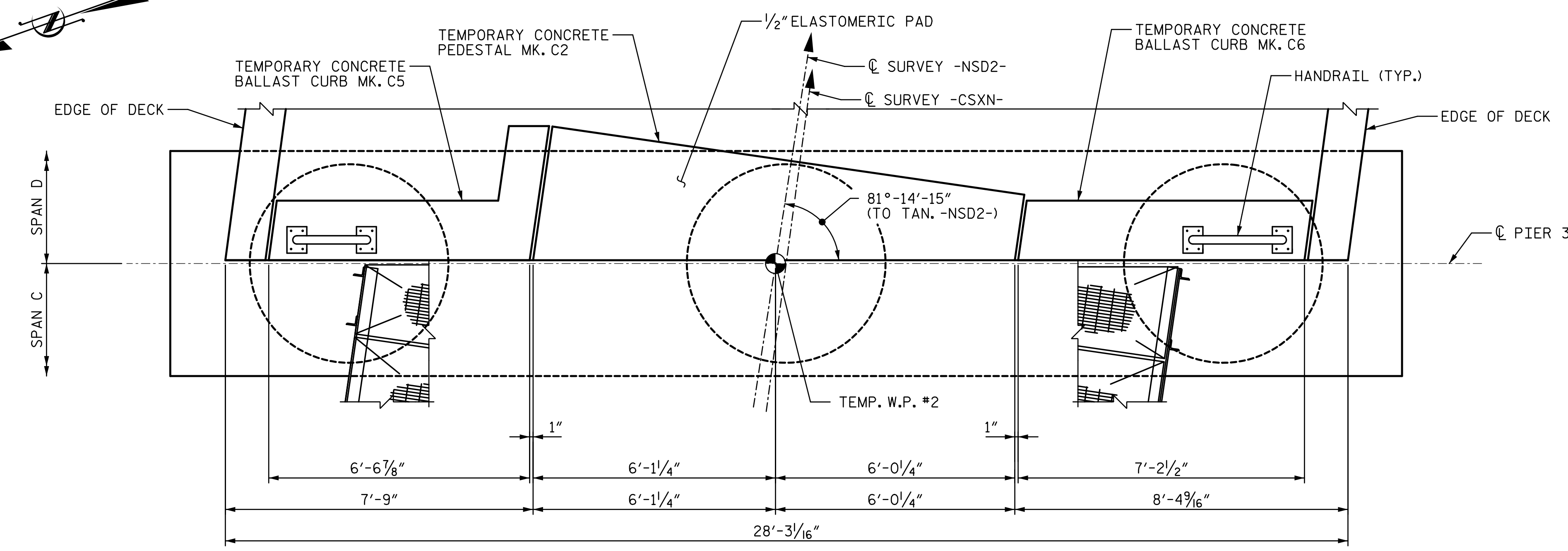
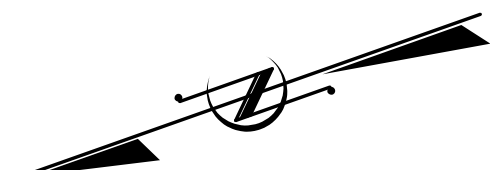
STV / Ralph Whitehead Associates, Inc.  
 900 W Trade Street, Suite 715  
 Charlotte, NC 28202  
 NC License No. F-0991

REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	

S4-58  
 TOTAL SHEETS 68



**PLAN VIEW - TEMPORARY CONCRETE PEDESTAL AND BALLAST RETAINER AT PIER 2**



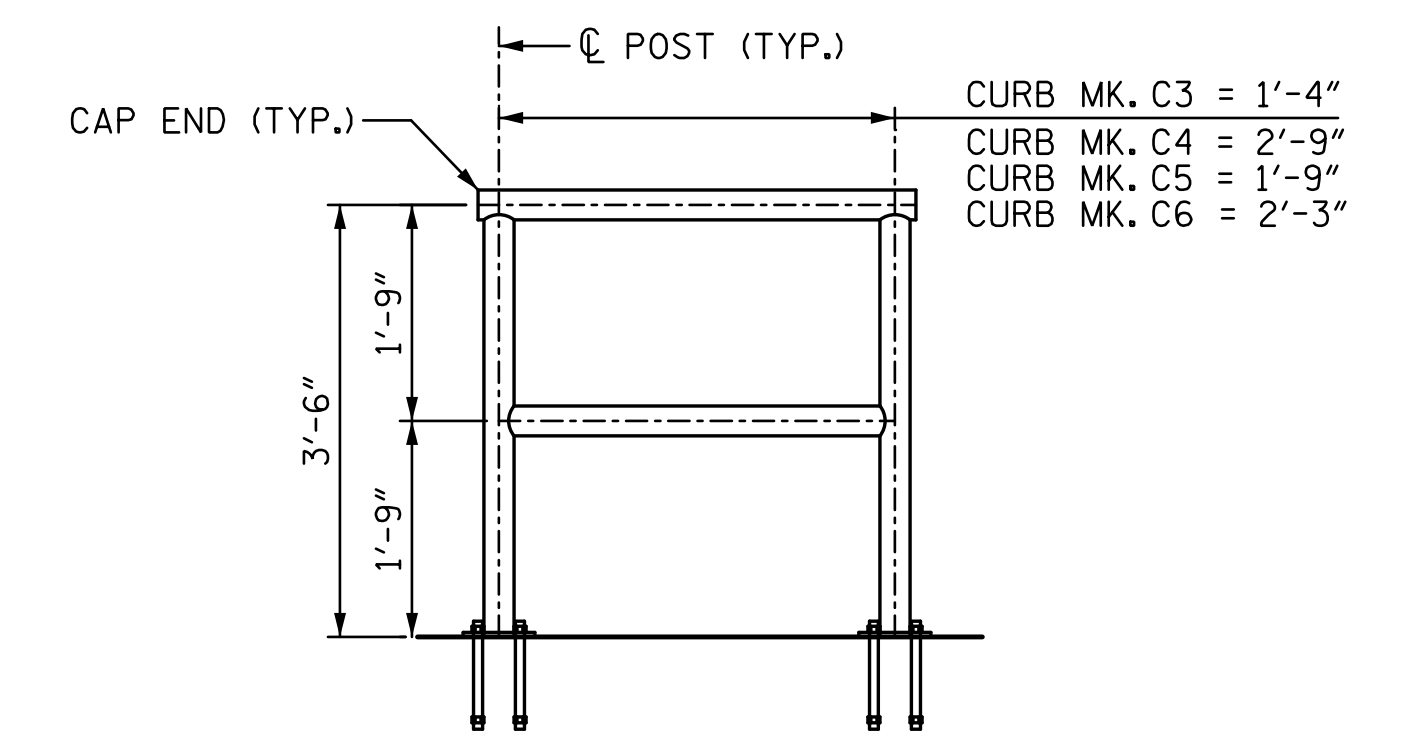
**PLAN VIEW - TEMPORARY CONCRETE PEDESTAL AND BALLAST RETAINER AT PIER 3**

**NOTES:**

1. FOR ADDITIONAL HANDRAIL DETAILS, SEE SHEET TITLED "HANDRAIL DETAILS".
2. FOR LOCATION OF HANDRAIL, SEE SHEETS TITLED "TEMPORARY CONCRETE PEDESTAL AND BALLAST RETAINER".
3. 1/2" ELASTOMERIC PAD SHALL BE SIZED TO THE FULL PLAN DIMENSIONS OF THE TEMPORARY CONCRETE PEDESTAL (MK. C1 AND C2).

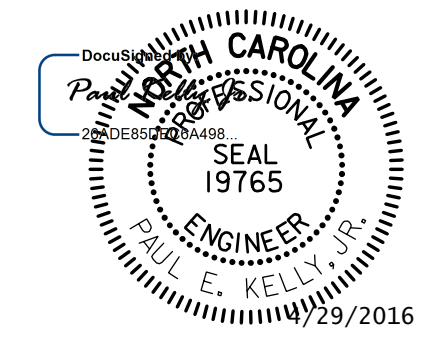
**CIP CONCRETE PEDESTAL & BALLAST CURB INSTALLATION SEQUENCE**

1. PLACE FELT FABRIC ON EXISTING PIER CAP.
2. INSTALL MECHANICAL ANCHORS AND ANCHOR BLOCKOUT, SEE ANCHOR BOLT DETAIL ON SHEET TITLED "TEMPORARY CONCRETE PEDESTAL AND BALLAST RETAINER (4 OF 4)" FOR ANCHOR INFORMATION.
3. FORM CIP CONCRETE PEDESTAL, BALLAST CURB, BLOCKOUTS, ETC.
4. PLACE CONCRETE AND FINISH TO SPECIFIED ELEVATIONS AND INSTALL ANCHOR BOLTS.
5. REMOVE FORMS.
6. INSTALL HANDRAILS ON TEMPORARY CONCRETE BALLAST CURBS.
7. PLACE 1/2" ELASTOMERIC PAD ON TEMPORARY CONCRETE PEDESTAL.
8. INSTALL TEMPORARY SPAN AND TRACK.
9. AFTER COMPLETION OF NSRR BRIDGE, REMOVE TEMPORARY SPAN AND TRACK.
10. REMOVE ANCHOR BOLTS, CIP COMPONENTS AND FELT FABRIC.



**TEMPORARY BALLAST CURB HANDRAIL DETAIL**

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 7 OF 16



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**TEMPORARY CONCRETE PEDESTAL AND BALLAST RETAINER (1 OF 4)**

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

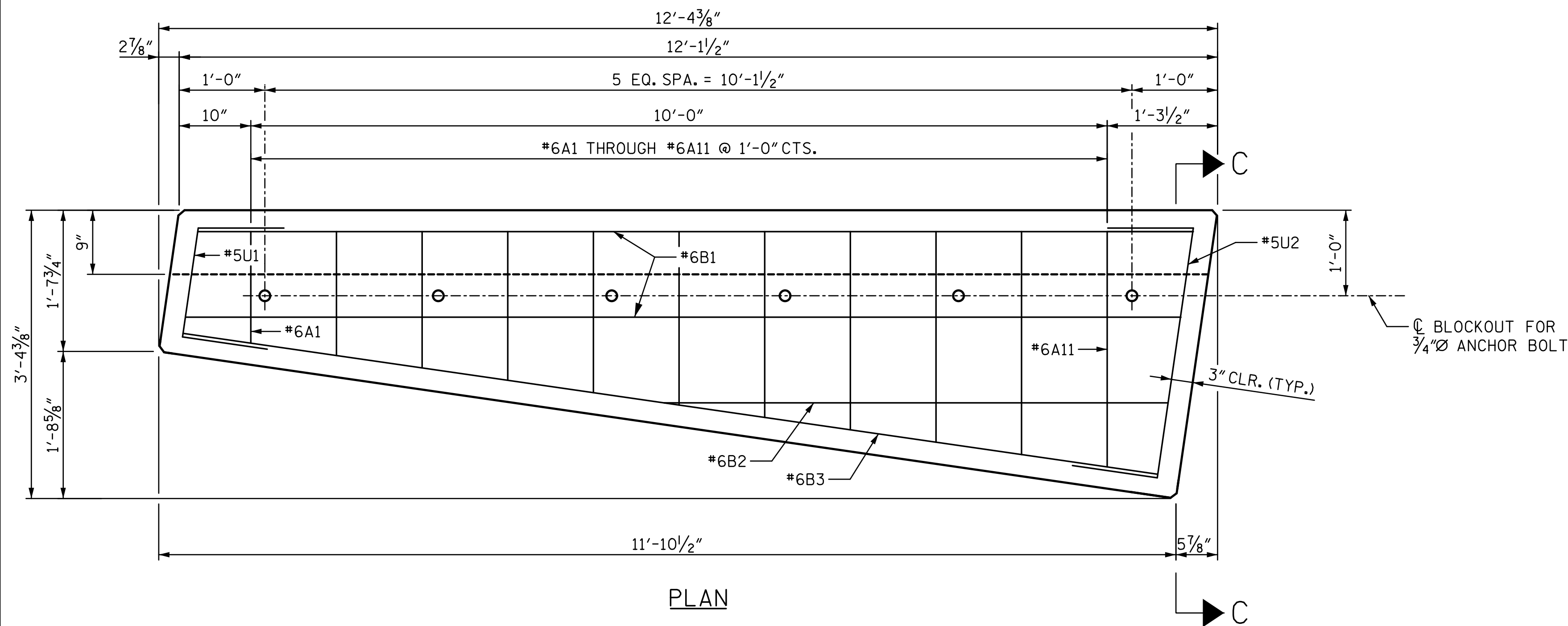
TOTAL SHEETS	68
SHEET NO.	S4-59

STV / Ralph Whitehead Associates, Inc.  
 900 W Trade Street, Suite 715  
 Charlotte, NC 28202  
 NC License No. F-0991

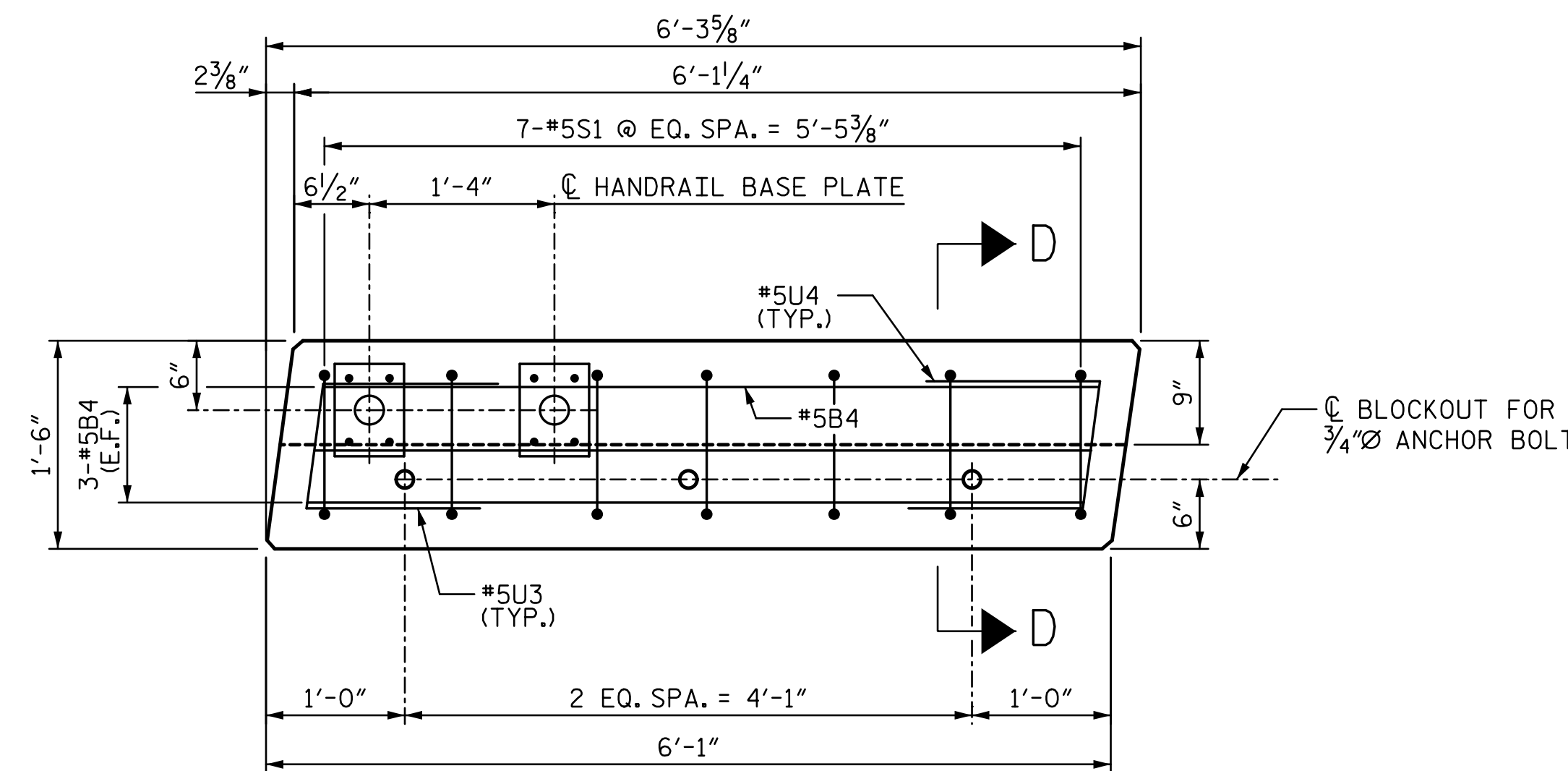
DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

4/29/2016 12:32:48 PM I:\PROJ\251325\ustation\structure\Temporary\_Span\404\_058\_U3308\_SMU\_TS07.dgn

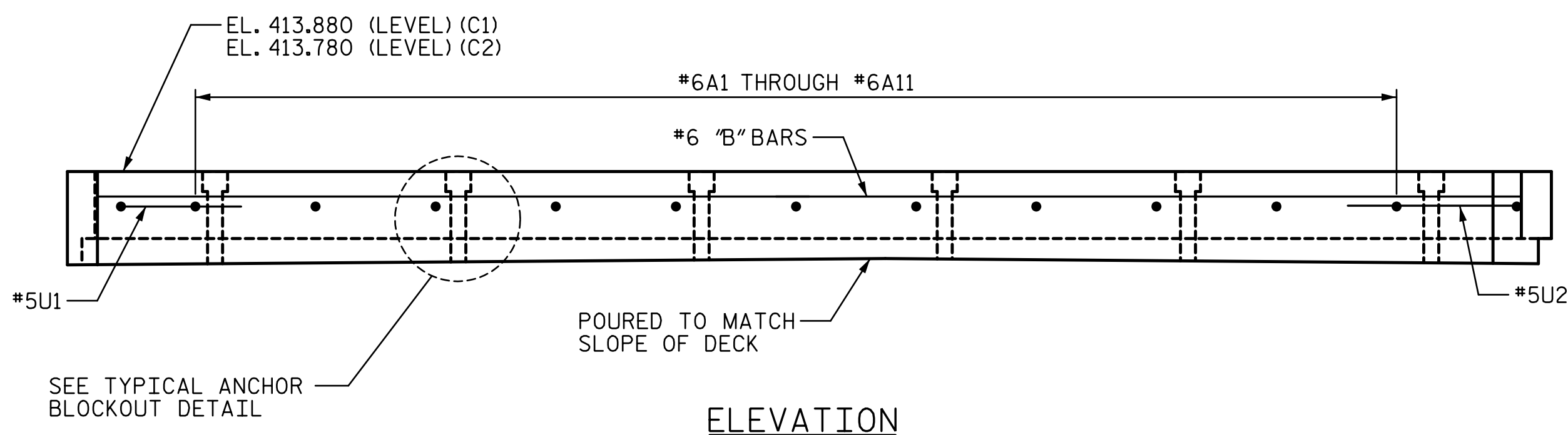
DRAWN BY : MTC DATE : 06-14  
 CHECKED BY : DJM DATE : 06-14



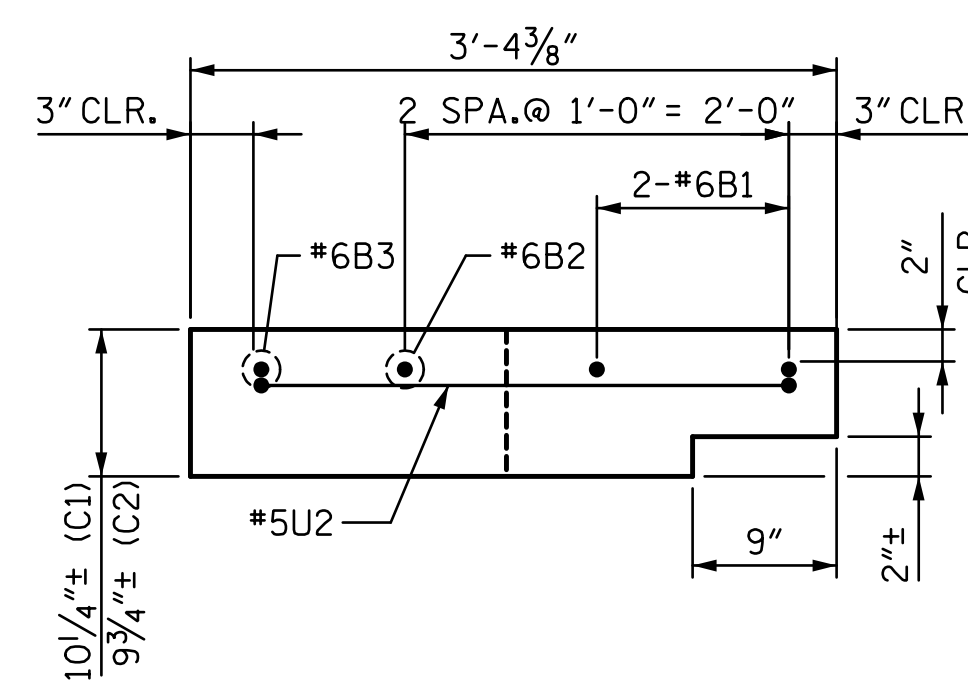
PLAN



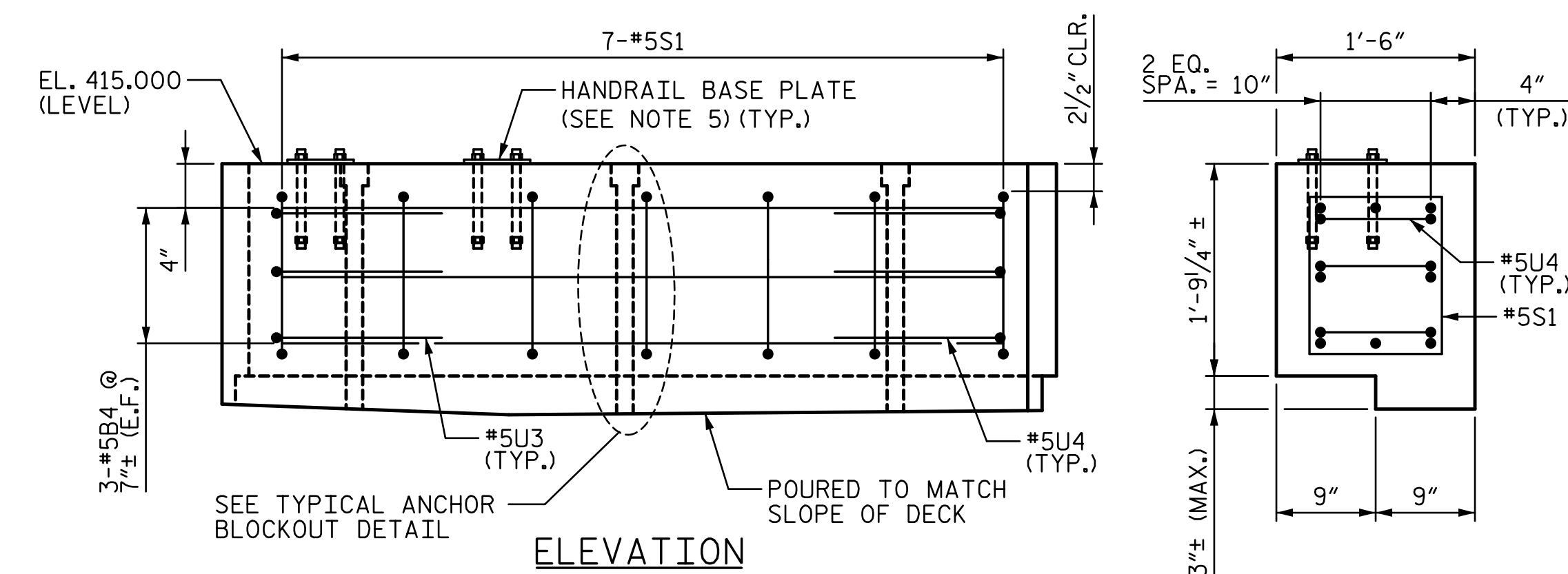
PLAN



ELEVATION



SECTION C-C

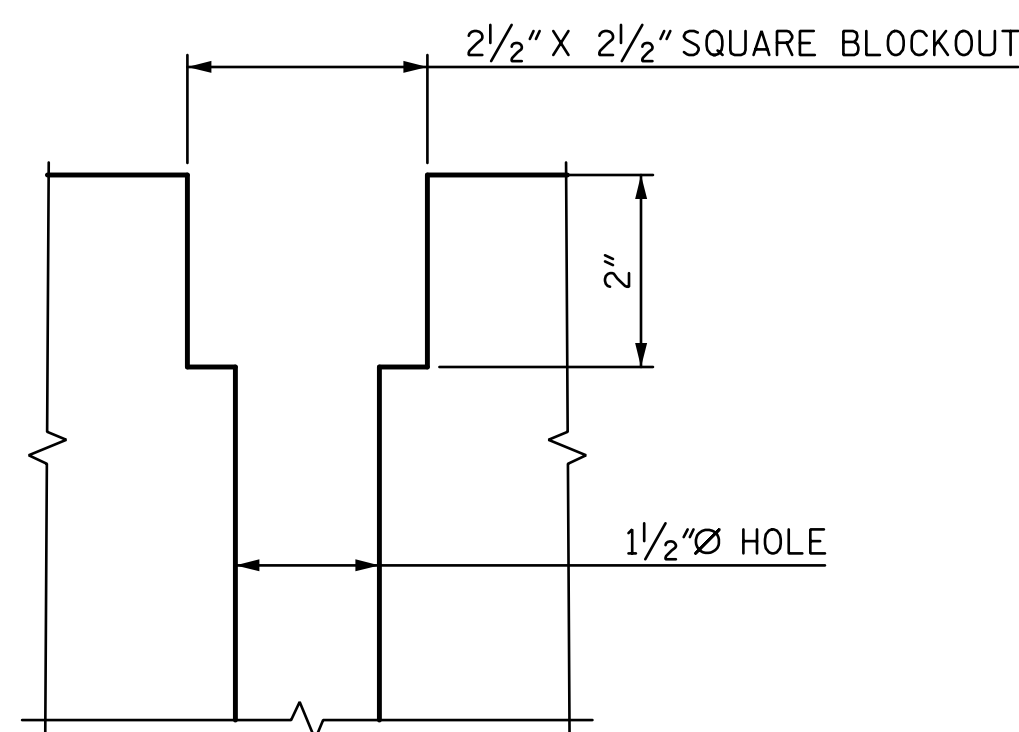


ELEVATION

SECTION D-D

TYPICAL CONCRETE PEDESTAL MK. C1 & C2

CONCRETE BALLAST CURB MK. C3



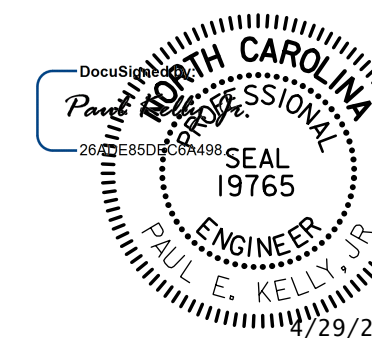
TYPICAL ANCHOR BLOCKOUT DETAIL

**NOTES:**

1. ALL BLOCKOUT HOLES PASS THROUGH FULL DEPTH OF PEDESTAL OR BALLAST CURB.
2. PREFORMED 1/2" Ø HOLES FOR ANCHOR BOLTS SHALL BE FORMED WITH PERMANENT CORRUGATED METAL DUCTS MADE FROM 26 GAUGE STRIP STEEL CONFORMING TO ASTM A 65M, G90 COATING WEIGHT, OR APPROVED EQUAL.
3. SEE SHEET TITLED "TEMPORARY CONCRETE PEDESTAL AND BALLAST RETAINER (4 OF 4) FOR ANCHOR BOLT DETAIL.
4. CONTRACTOR MAY ADJUST REINFORCEMENT SLIGHTLY AS NECESSARY TO AVOID BLOCKOUTS AND HANDRAIL BASE PLATE/ANCHOR BOLTS.
5. ANCHOR RODS FOR BASE PLATE SHALL BE CAST-IN-PLACE WITH THE BALLAST CURB. FOR BASE PLATE AND ANCHOR ROD DETAILS, SEE SHEET TITLED "HANDRAIL DETAILS".
6. FOR HANDRAIL DETAILS, SEE SHEETS TITLED "TEMPORARY CONCRETE PEDESTAL AND BALLAST RETAINER (1 OF 4)" AND "HANDRAIL DETAILS".
7. CHAMFER EDGES 3/4" X 3/4".
8. 3" COVER U.N.O.
9. FOR ADDITIONAL NOTES, SEE SHEET TITLED "TEMPORARY CONCRETE PEDESTAL AND BALLAST RETAINER (1 OF 4)".

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 8 OF 16

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 TEMPORARY CONCRETE  
 PEDESTAL AND BALLAST  
 RETAINER (2 OF 4)



REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

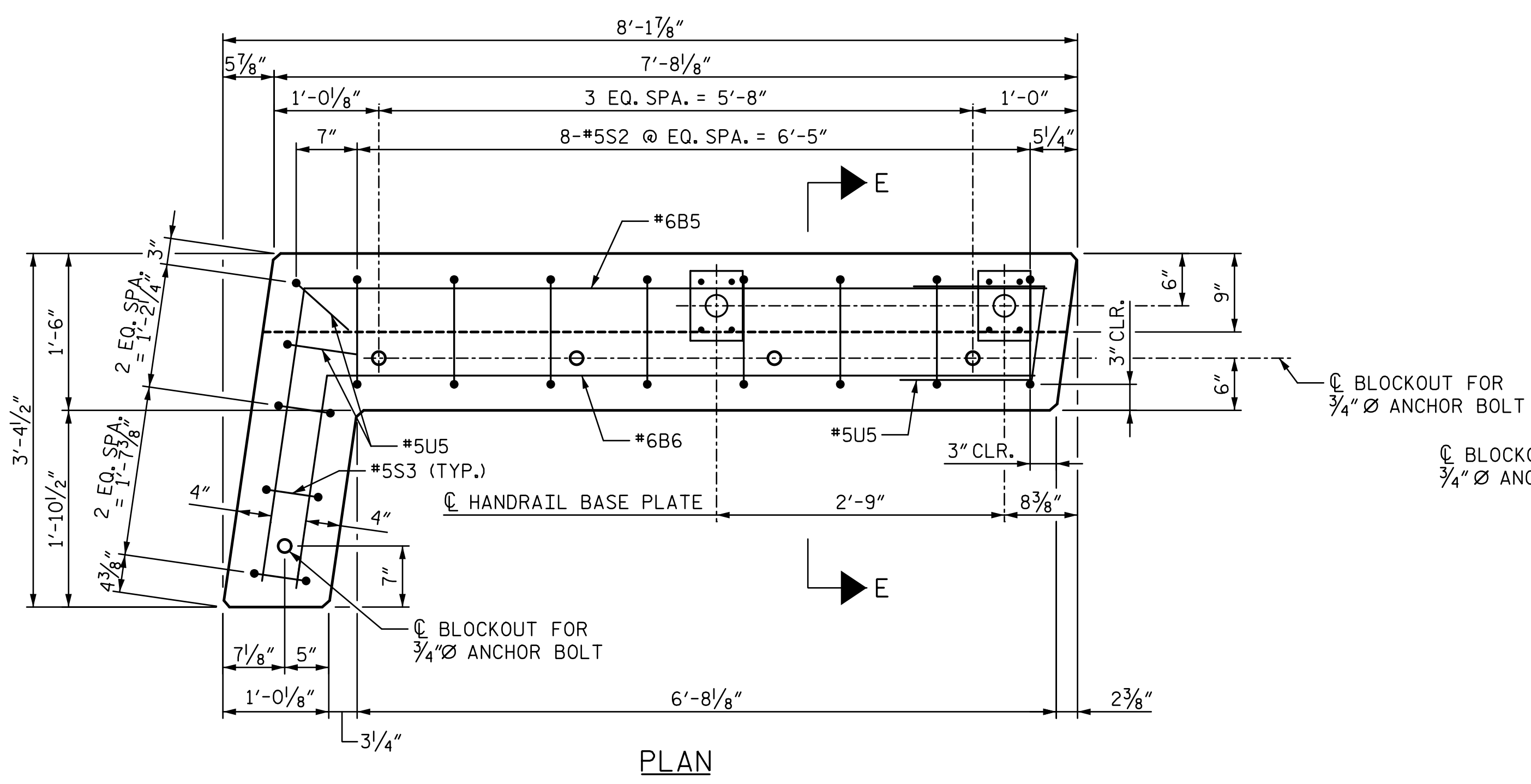
S4-60	TOTAL SHEETS
68	

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

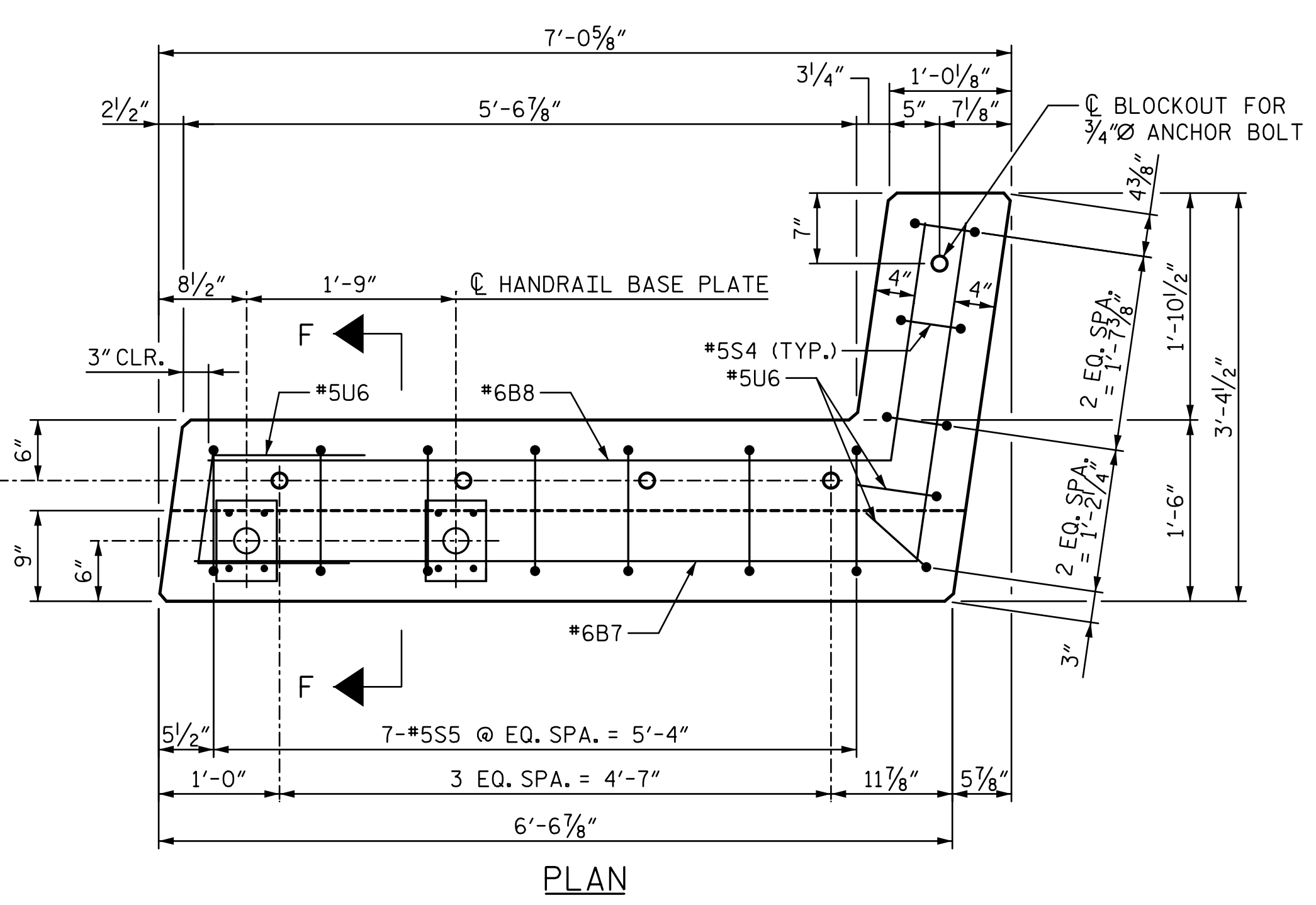
STV / Ralph Whitehead Associates, Inc.  
 900 W Trade Street, Suite 715  
 Charlotte, NC 28202  
 NC License No. F-0991

4/29/2016 12:32:50 PM I:\PROJ\251325\ustation\struc\Temporary Span\404\_059\_U3308\_SML\_TS08.dgn pKelly

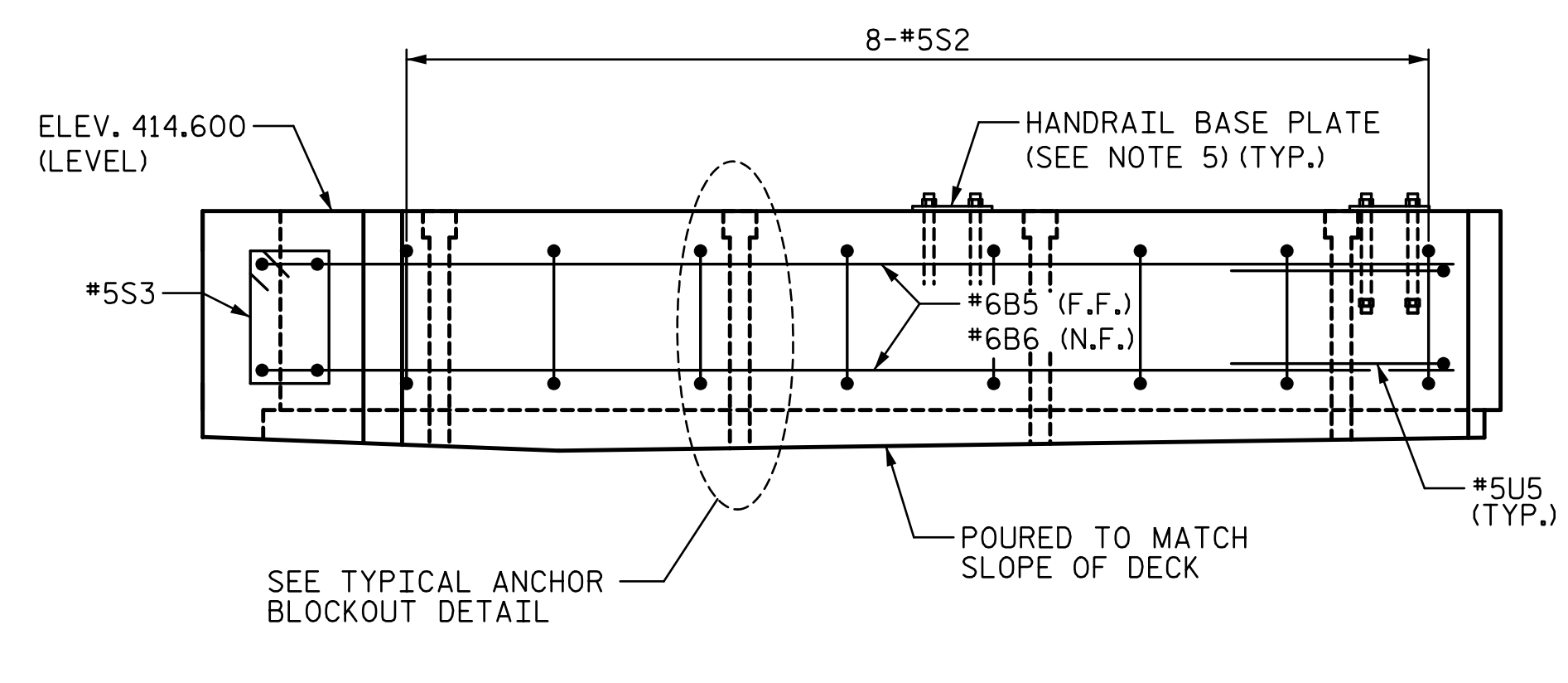
I:\PROJ\251325\ustation\struct\Temporary\_Span\404\_060\_U3308\_SMU\_T509.dgn  
 4/29/2016 12:32:53 PM  
 pkelly



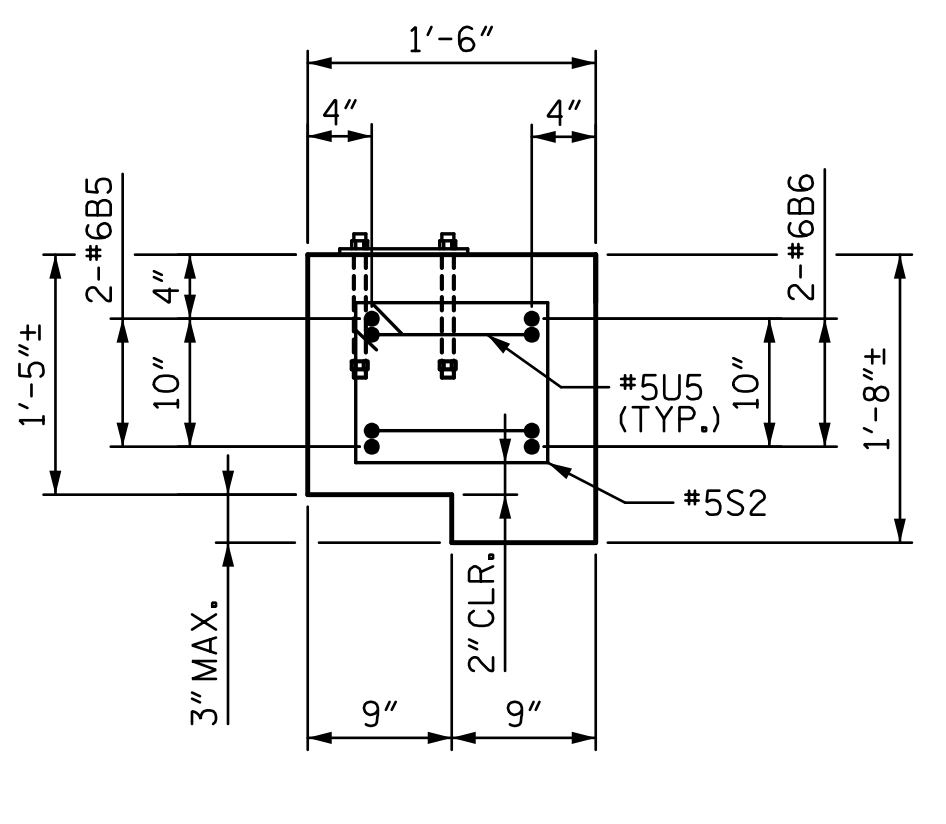
PLAN



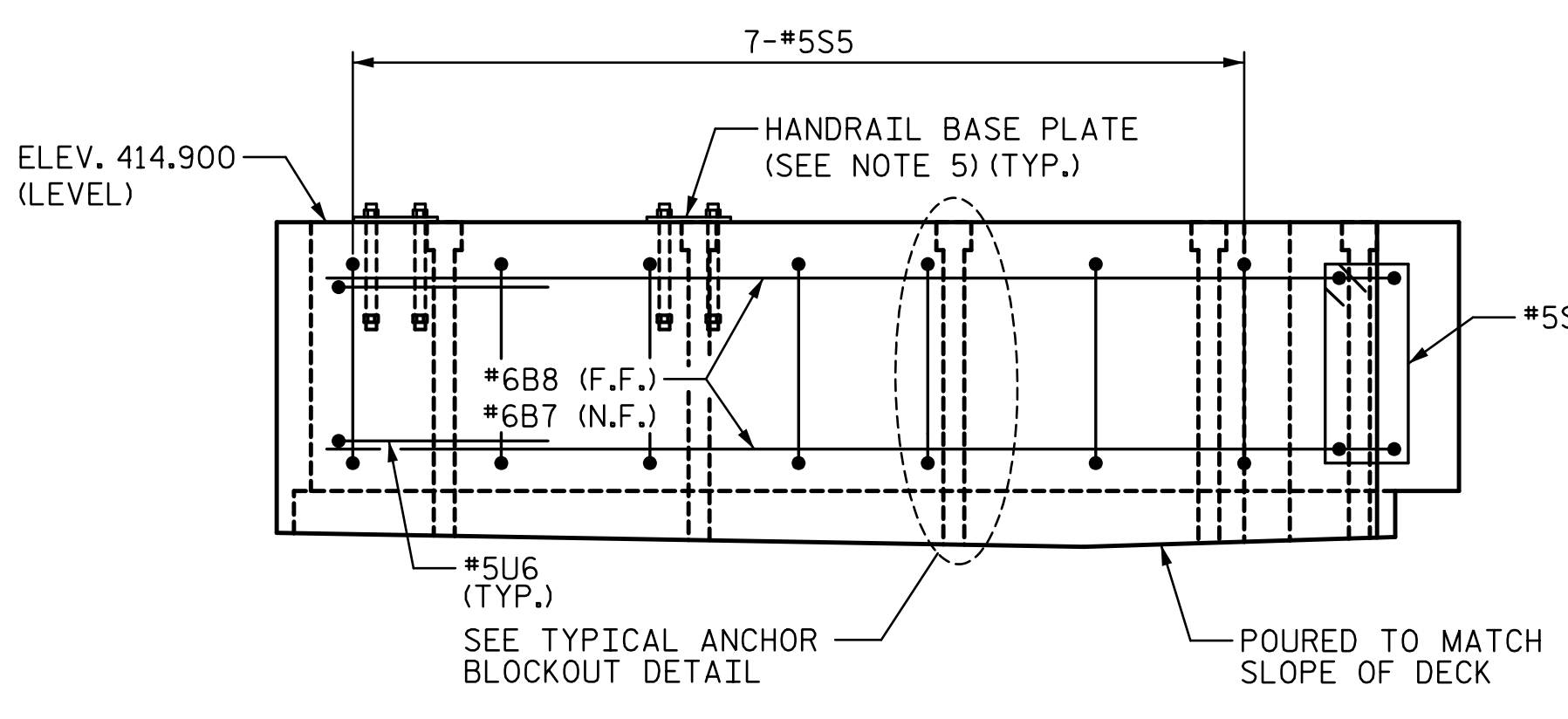
PLAN



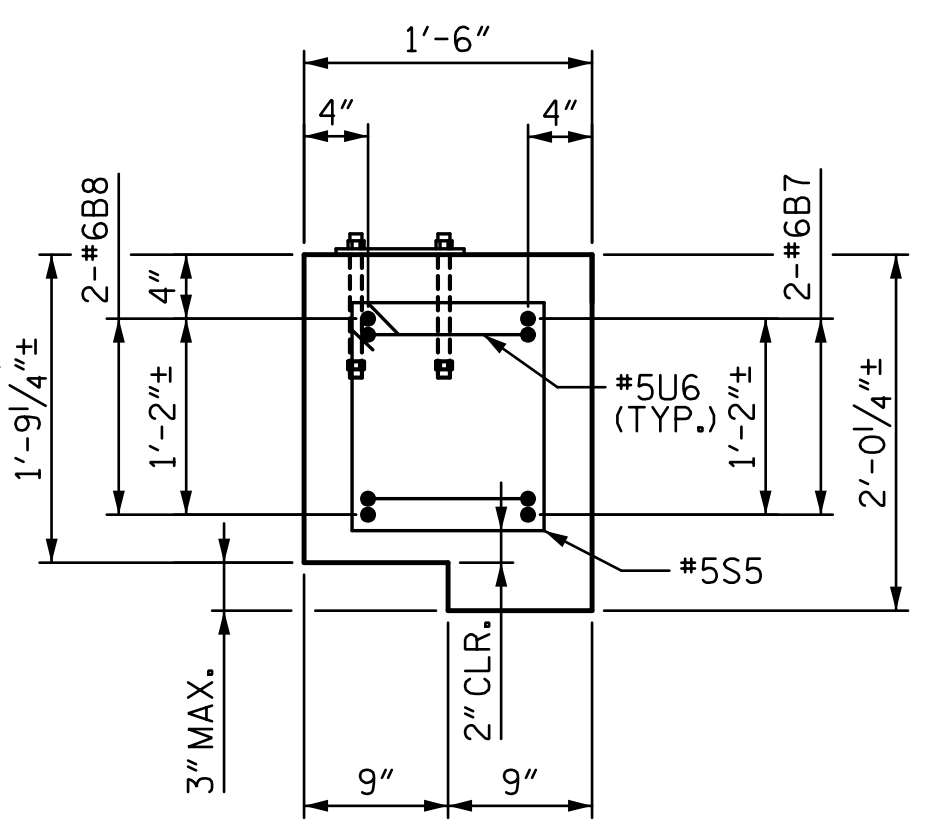
ELEVATION  
(SOME REINFORCEMENT NOT SHOWN FOR CLARITY)



SECTION E-E



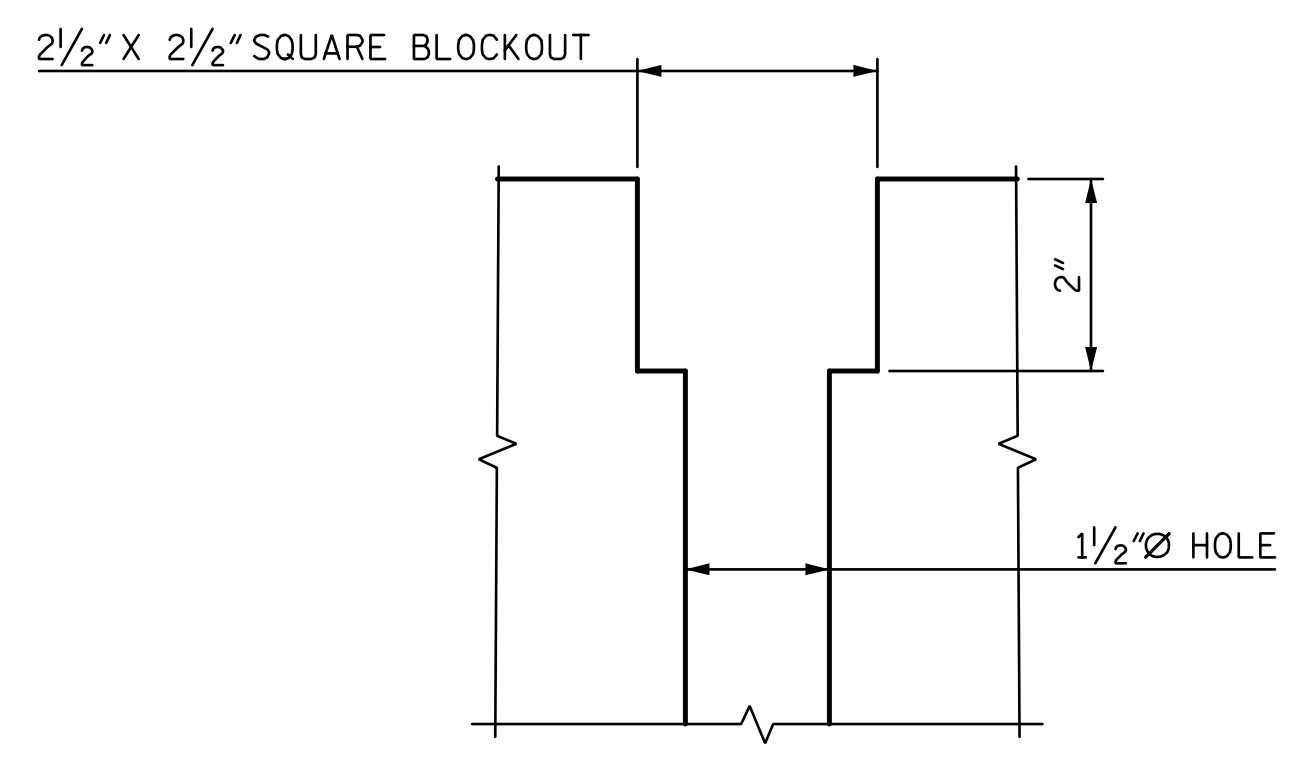
ELEVATION  
(SOME REINFORCEMENT NOT SHOWN FOR CLARITY)



SECTION F-F

CONCRETE BALLAST CURB MK. C4

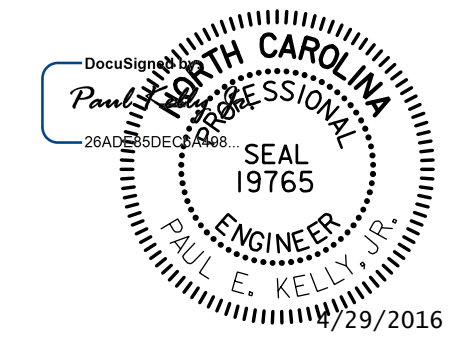
CONCRETE BALLAST CURB MK. C5



TYPICAL ANCHOR BLOCKOUT DETAIL

NOTES:

- ALL BLOCKOUT HOLES PASS THROUGH FULL DEPTH OF PEDESTAL OR BALLAST CURB.
- PREFORMED 1/2" Ø HOLES FOR ANCHOR BOLTS SHALL BE FORMED WITH PERMANENT CORRUGATED METAL DUCTS MADE FROM 26 GAUGE STRIP STEEL CONFORMING TO ASTM A 65M, G90 COATING WEIGHT, OR APPROVED EQUAL.
- SEE SHEET TITLED "TEMPORARY CONCRETE PEDESTAL AND BALLAST RETAINER (4 OF 4) FOR ANCHOR BOLT DETAIL.
- CONTRACTOR MAY ADJUST REINFORCEMENT SLIGHTLY AS NECESSARY TO AVOID BLOCKOUTS AND HANDRAIL BASE PLATE/ANCHOR BOLTS.
- ANCHOR RODS FOR BASE PLATE SHALL BE CAST-IN-PLACE WITH THE BALLAST CURB. FOR BASE PLATE AND ANCHOR RODS DETAILS, SEE SHEET TITLED "HANDRAIL DETAILS".
- FOR HANDRAIL DETAILS, SEE SHEETS TITLED "TEMPORARY CONCRETE PEDESTAL AND BALLAST RETAINER (1 OF 4)" AND "HANDRAIL DETAILS".
- CHAMFER EDGES 3/4" X 3/4".
- 3" COVER U.N.O.
- FOR ADDITIONAL NOTES, SEE SHEET TITLED "TEMPORARY CONCRETE PEDESTAL AND BALLAST RETAINER (1 OF 4)".



PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 9 OF 16

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 TEMPORARY CONCRETE  
 PEDESTAL AND BALLAST  
 RETAINER (3 OF 4)

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

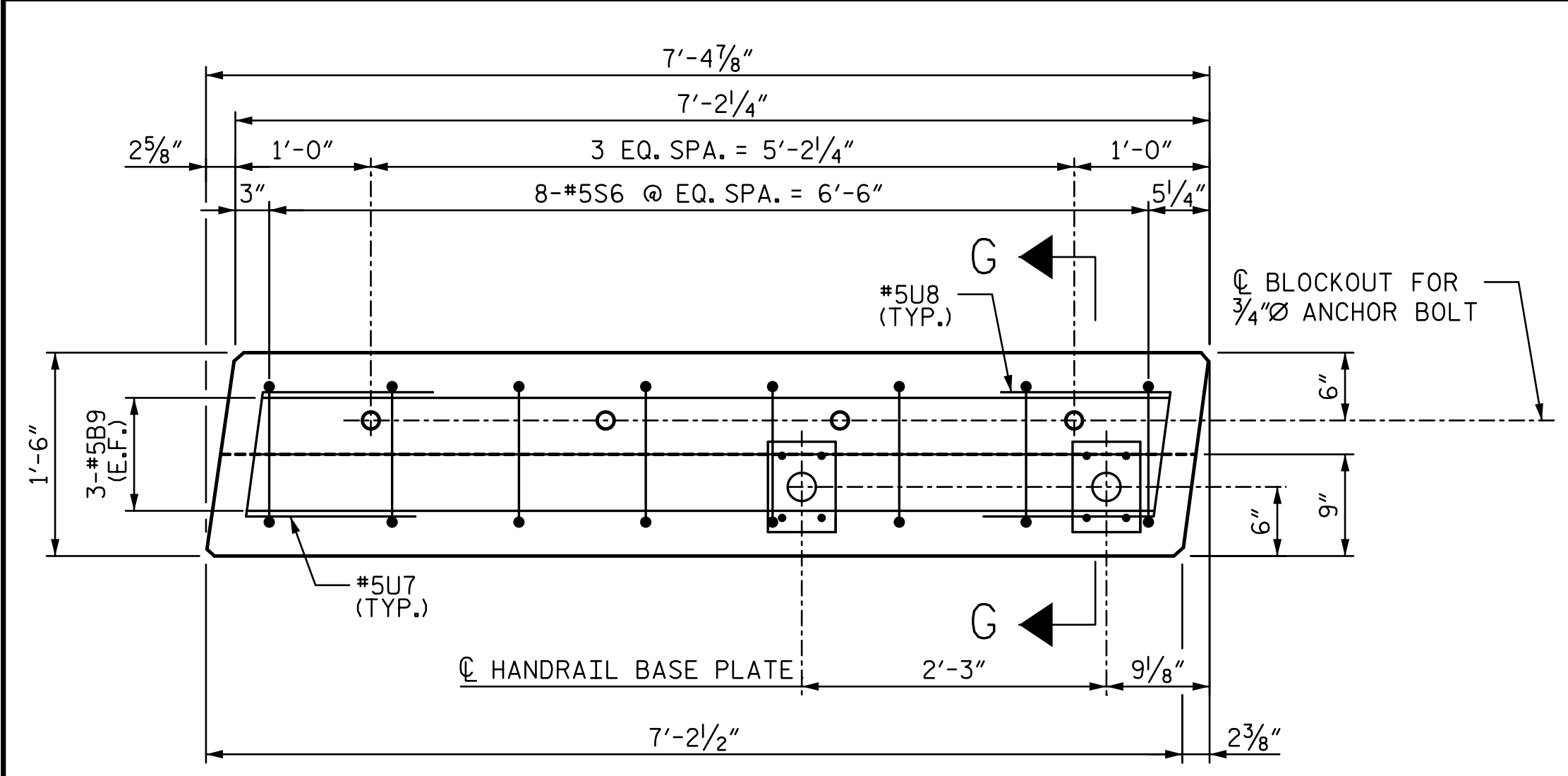
TOTAL SHEETS: 68

DRAWN BY: MTC DATE: 06-14  
 CHECKED BY: DJM DATE: 06-14

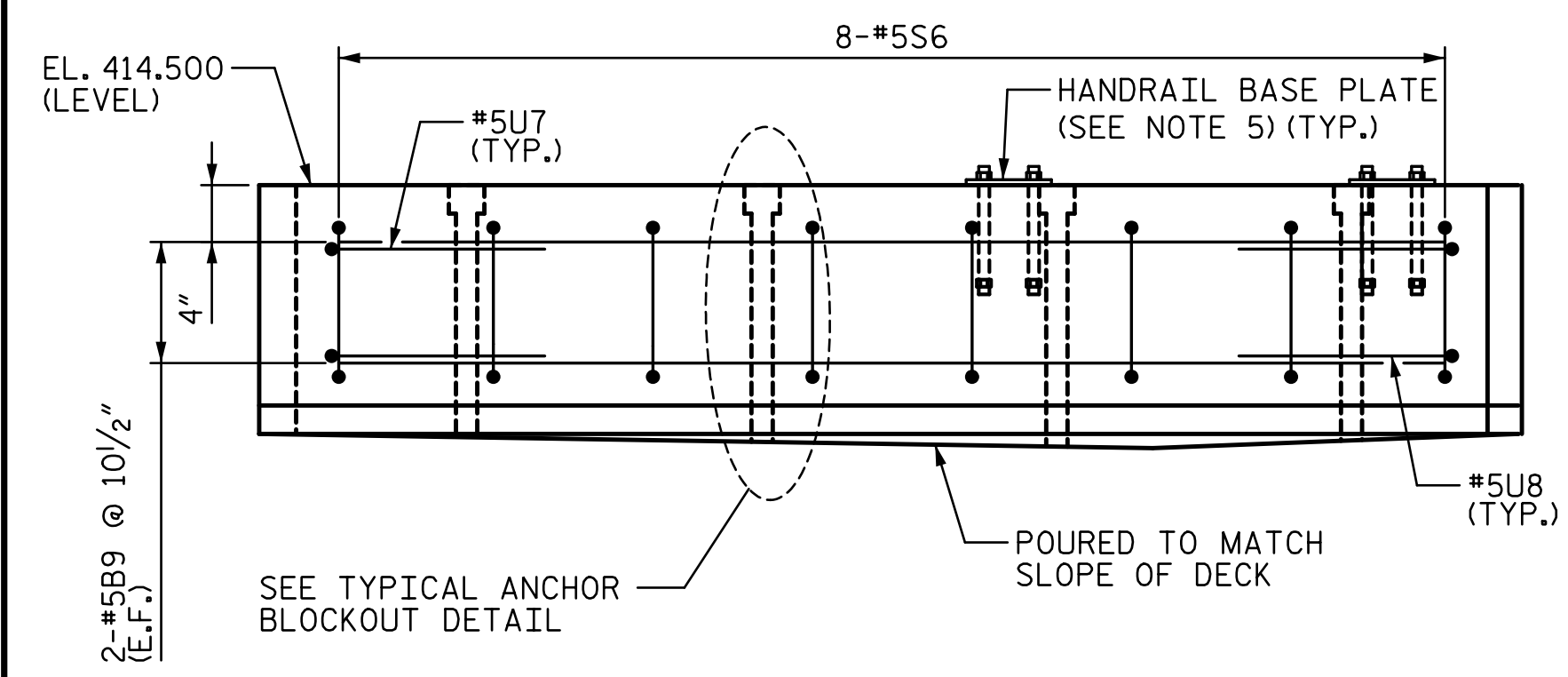
DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

STV / Ralph Whitehead Associates, Inc.  
 900 W Trade Street, Suite 715  
 Charlotte, NC 28202  
 NC License No. F-0991

i:\PROJ\251325\ustation\struc\Temporary\_Span\404\_06L\U3308\_SML\_TS10.dgn 4/29/2016 12:32:56 PM pKelly

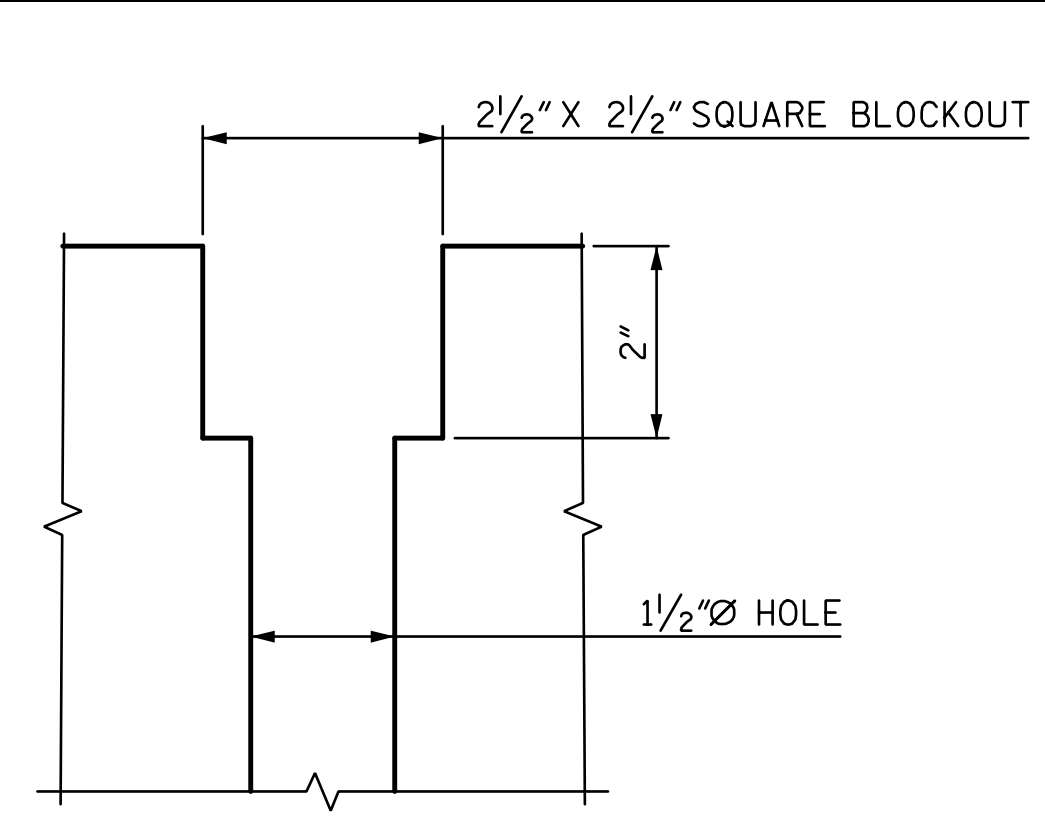


PLAN

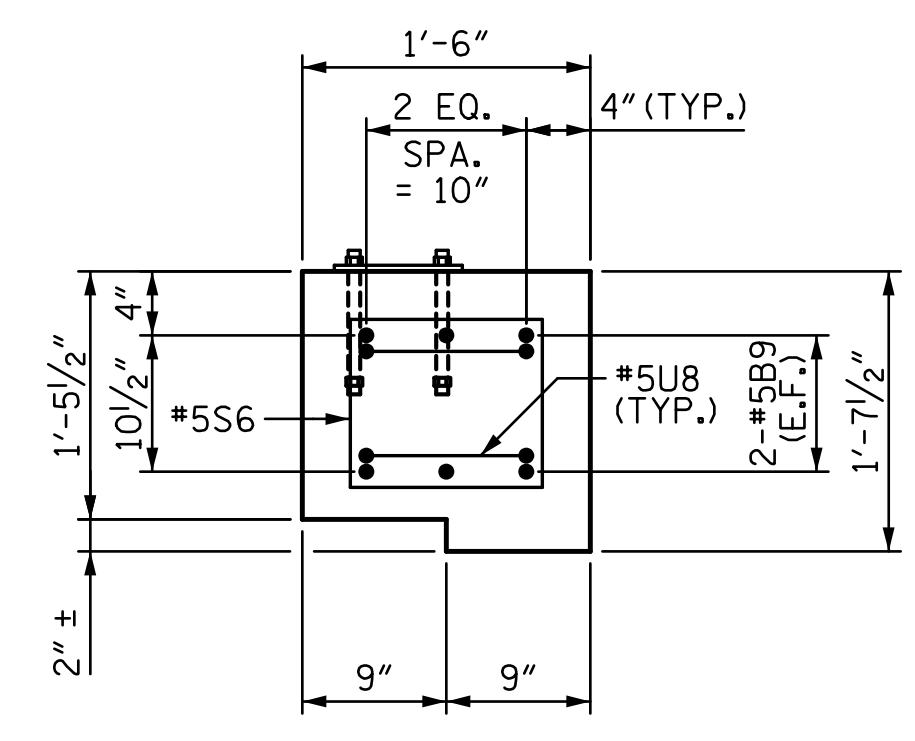


ELEVATION

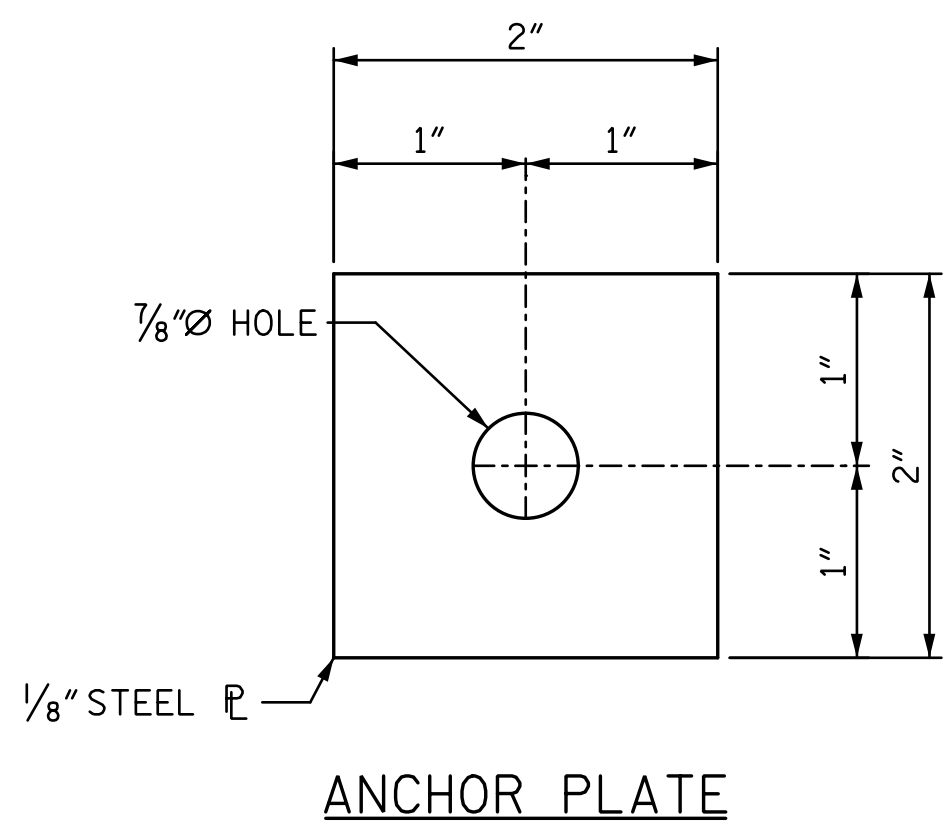
CONCRETE BALLAST CURB MK. C6



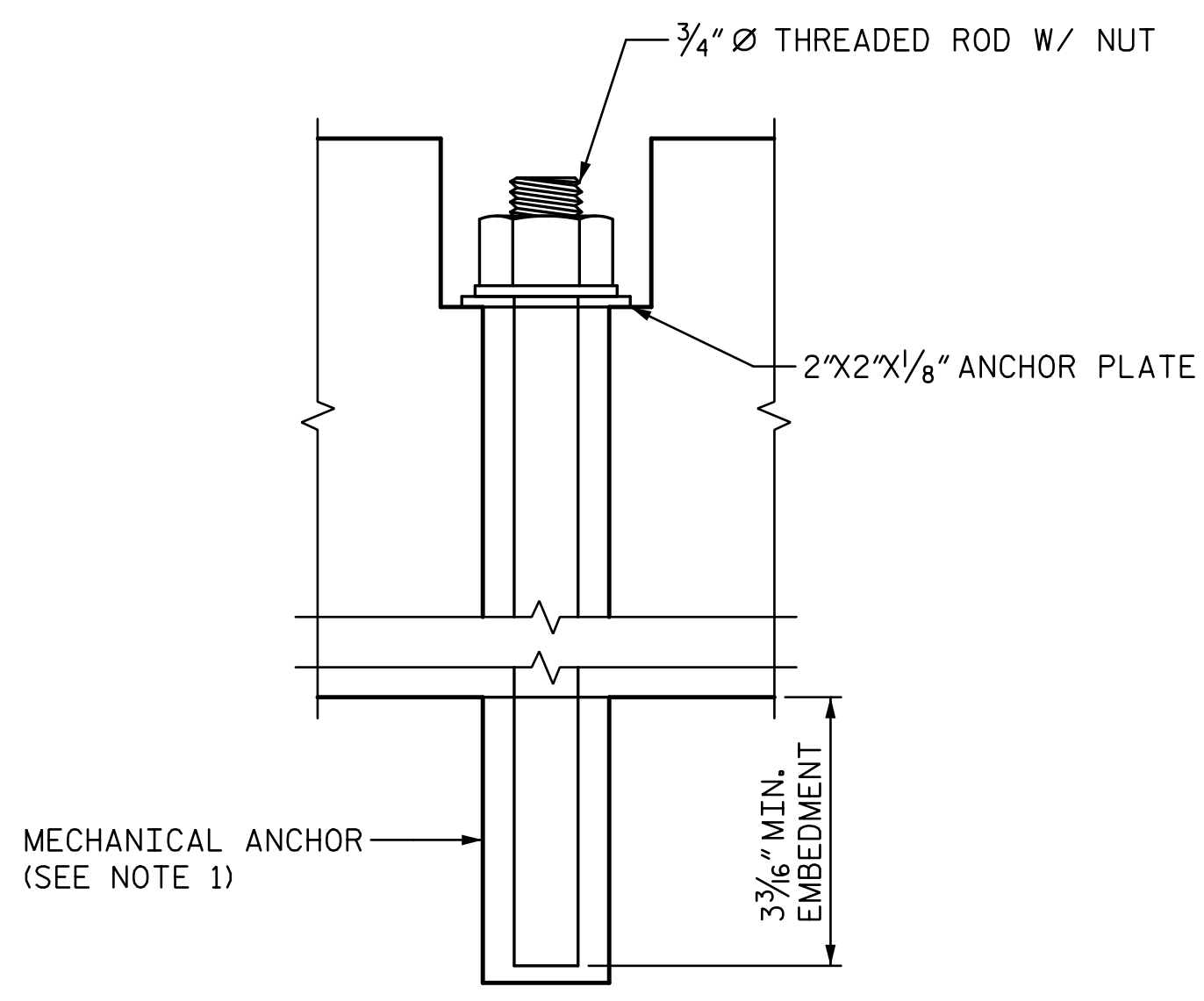
TYPICAL ANCHOR BLOCKOUT DETAIL



SECTION G-G



ANCHOR PLATE



ANCHOR BOLT DETAIL

NOTES:

1. ALL BLOCKOUT HOLES PASS THROUGH FULL DEPTH OF PEDESTAL OR BALLAST CURB.
2. PREFORMED 1/2" Ø HOLES FOR ANCHOR BOLTS SHALL BE FORMED WITH PERMANENT CORRUGATED METAL DUCTS MADE FROM 26 GAUGE STRIP STEEL CONFORMING TO ASTM A 65M, G90 COATING WEIGHT, OR APPROVED EQUAL.
3. SEE SHEET TITLED "TEMPORARY CONCRETE PEDESTAL AND BALLAST RETAINER (4 OF 4) FOR ANCHOR BOLT DETAIL.
4. CONTRACTOR MAY ADJUST REINFORCEMENT SLIGHTLY AS NECESSARY TO AVOID BLOCKOUTS AND HANDRAIL BASE PLATE/ANCHOR BOLTS.
5. ANCHOR RODS FOR BASE PLATE SHALL BE CAST-IN-PLACE WITH THE BALLAST CURB. FOR BASE PLATE AND ANCHOR RODS DETAILS, SEE SHEET TITLED "HANDRAIL DETAILS".
6. FOR HANDRAIL DETAILS, SEE SHEETS TITLED "TEMPORARY CONCRETE PEDESTAL AND BALLAST RETAINER (1 OF 4)" AND "HANDRAIL DETAILS".
7. CHAMFER EDGES 3/4" X 3/4".
8. 3" COVER U.N.O.
9. FOR MECHANICAL ANCHOR, USE 3/4" Ø RED HEAD MULTI-STEP II DROP-IN ANCHOR, OR APPROVED EQUAL. MECHANICAL ANCHORS SHALL BE INSTALLED PER MANUFACTURER RECOMMENDATIONS.

REINFORCING BAR SCHEDULE

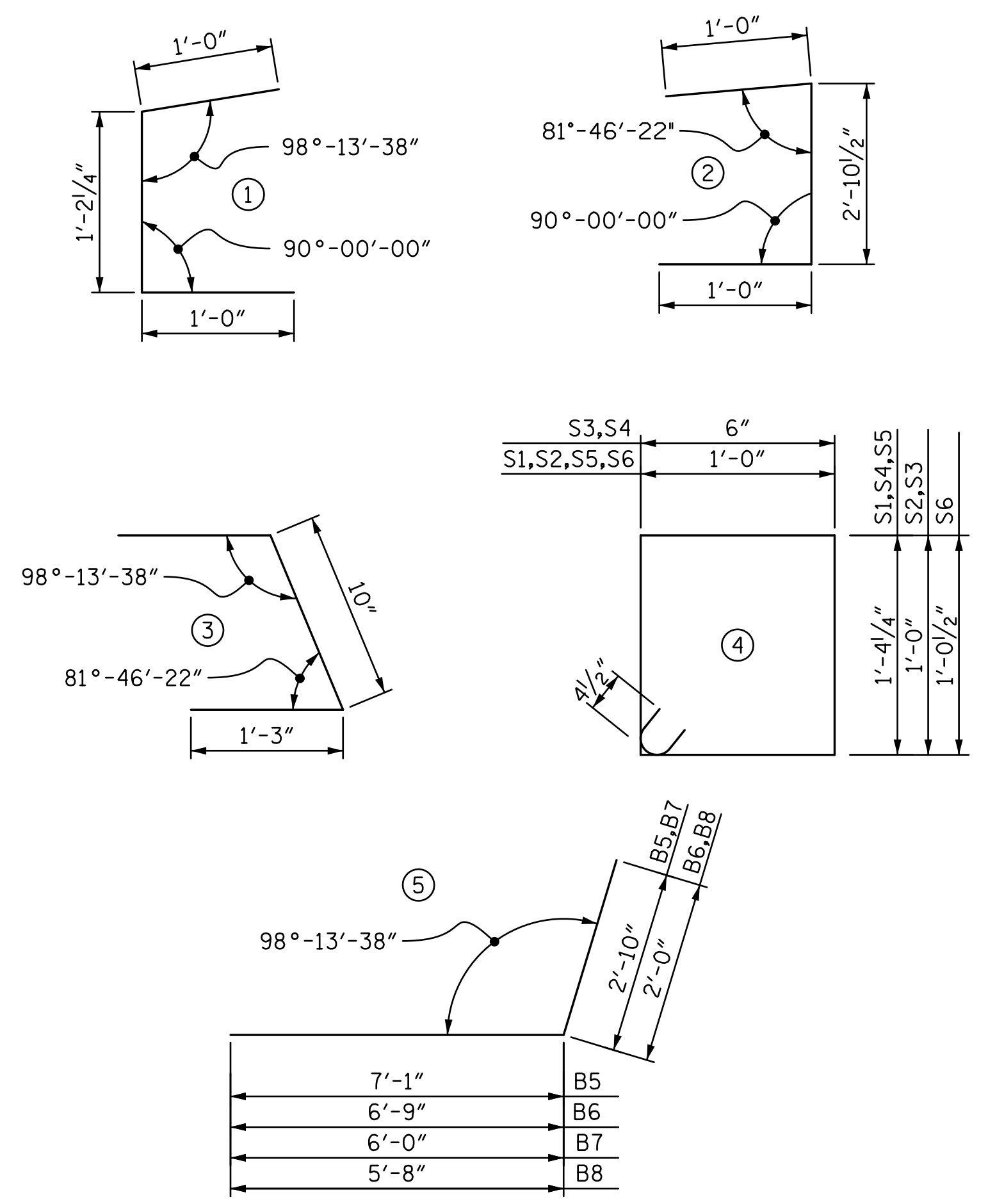
TEMPORARY BALLAST RETAINER

MARK	NO.	SIZE	TYPE	LENGTH (ft. in.)	WEIGHT (lb.)
A1	2	6	STR.	1'-4"	4
A2	2	6	STR.	1'-5"	4
A3	2	6	STR.	1'-7"	5
A4	2	6	STR.	1'-9"	5
A5	2	6	STR.	1'-11"	6
A6	2	6	STR.	2'-0"	6
A7	2	6	STR.	2'-2"	7
A8	2	6	STR.	2'-3"	7
A9	2	6	STR.	2'-6"	7
A10	2	6	STR.	2'-7"	8
A11	2	6	STR.	2'-9"	8
B1	4	6	STR.	11'-8"	71
B2	2	6	STR.	5'-11"	18
B3	2	6	STR.	11'-6"	35
B4	8	5	STR.	5'-7"	47
B5	2	6	5	9'-11"	30
B6	2	6	5	8'-9"	26
B7	2	6	5	8'-10"	27
B8	2	6	5	7'-8"	23
B9	6	5	STR.	6'-8"	42
S1	7	5	4	5'-6"	40
S2	8	5	4	4'-9"	40
S3	3	5	4	3'-9"	12
S4	3	5	4	4'-6"	14
S5	7	5	4	5'-6"	40
S6	8	5	4	4'-10"	40
U1	2	5	1	3'-2"	7
U2	2	5	2	4'-11"	10
U3	3	5	3	3'-4"	10
U4	3	5	3	3'-4"	10
U5	2	5	3	3'-4"	7
U6	2	5	3	3'-4"	7
U7	2	5	3	3'-4"	7
U8	2	5	3	3'-4"	7

BILL OF MATERIAL

COMPONENT MK.	CIP CONCRETE (C.Y.)	REINFORCING STEEL (LBS.)
C1	0.9	104
C2	0.9	104
C3	0.7	107
C4	0.8	115
C5	0.8	111
C6	0.7	96
TOTAL	4.8	637

BAR TYPES

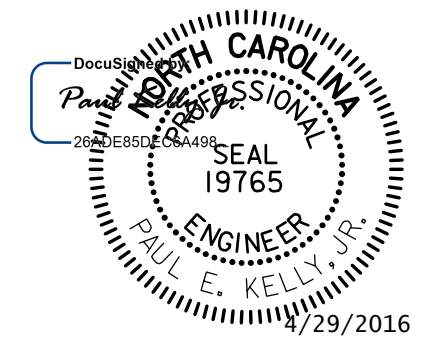


ALL BAR DIMENSIONS ARE OUT TO OUT.

TOTAL QUANTITIES

ITEMS	UNIT	QUANTITY
CIP CONCRETE (5,000 PSI)	C.Y.	4.8
REINFORCING STEEL (60,000 PSI)	LBS.	637
1/8" STEEL PLATE	EA.	29
3/4" Ø THREADED ROD AND MECHANICAL ANCHOR ASSEMBLY	EA.	29
HANDRAIL	LIN. FT.	8.3
HANDRAIL BASE PLATE ASSEMBLY	EA.	8
1/2" ELASTOMERIC PAD	SQ. FT.	60.8

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 10 OF 16



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 TEMPORARY CONCRETE PEDESTAL AND BALLAST RETAINER (4 OF 4)

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS	68
--------------	----

DRAWN BY: MTC DATE: 06-14  
 CHECKED BY: DJM DATE: 06-14

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

STV / Ralph Whitehead Associates, Inc.  
 900 W Trade Street, Suite 715  
 Charlotte, NC 28202  
 NC License No. F-0991

# TEMPORARY SPAN STRUCTURAL STEEL NOTES

FOR ADDITIONAL NOTES, SEE SHEET TITLED "TEMPORARY SPAN GENERAL NOTES"

STRUCTURAL STEEL: ALL STRUCTURAL STEEL SHAPES, PLATES AND BARS SHALL BE ASTM A709, GRADE 50 OR 50W, UNLESS NOTED OTHERWISE. FRACTURE CRITICAL MEMBERS SHALL BE ASTM A709, GRADE 50F2 OR 50WF2 (SUPPLEMENTAL REQUIREMENT S84 AND S29 SHALL APPLY). NON-FRACTURE CRITICAL MEMBERS SHALL BE ASTM A709, GRADE 50T2 OR 50WT2 (SUPPLEMENTAL REQUIREMENTS S83 SHALL APPLY). ALL STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND THE FOLLOWING REQUIREMENTS:

1. THE MATERIAL SUPPLIED SHALL BE OTHER THAN RIMMED OR CAPPED STEEL.
2. THE MATERIAL SUPPLIED SHALL BE SILICONE KILLED, FINE GRAIN PRACTICE.
3. CERTAIN ELEMENTS OF THE STRUCTURE ARE NOTED AS "FRACTURE CRITICAL MEMBERS" (FCM) AND SHALL MEET THE REQUIREMENTS FOR "FRACTURE CONTROL PLAN FOR FRACTURE CRITICAL MEMBERS" (AREMA CHAPTER 15, SECTION 1.14.) THE IMPACT REQUIREMENTS FOR FRACTURE CRITICAL MEMBERS SHALL BE AS REQUIRED FOR ZONE 2 SERVICE TEMPERATURE. TEST RESULTS SHALL BE FURNISHED TO THE ENGINEER OR AUTHORIZED REPRESENTATIVE.
4. ALL NON-FRACTURE CRITICAL MEMBERS OF THE STRUCTURE SHALL CONFORM TO THE SUPPLEMENTAL REQUIREMENTS FOR NON-FRACTURE CRITICAL IMPACT TEST NOTED IN AREMA CHAPTER 15, SECTION 1.2.1, TABLE 15-1-2 FOR ZONE 2 SERVICE TEMPERATURE. TEST RESULTS SHALL BE FURNISHED TO ENGINEER OR AUTHORIZED REPRESENTATIVE.

ALL STEEL MATERIAL SHALL BE STRAIGHT AND FREE FROM SHARP KINKS AND BENDS. ANY STEEL MATERIAL EXHIBITING SUCH DEFICIENCIES SHALL BE CAUSE FOR THE REJECTION OF THE MATERIAL. STRAIGHTENING OF THE MATERIAL SHALL NOT BE ACCEPTABLE.

MATERIAL AND WORKMANSHIP: EXCEPT AS MAY OTHERWISE BE SPECIFIED ON THE PROJECT PLANS OR SPECIFICATIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION (AREMA) MANUAL FOR RAILWAY ENGINEERING. PROJECT SHALL ALSO ADHERE TO STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) STRUCTURE DESIGN UNIT DESIGN MANUAL, 2007 REVISION. IN THE EVENT OF CONFLICTS THE MORE STRINGENT SHALL APPLY.

SPECIFICATIONS: AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION (AREMA) MANUAL FOR RAILWAY ENGINEERING, 2014 EDITION, NORFOLK SOUTHERN UNDERPASS GRADE SEPARATION DESIGN CRITERIA, STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STRUCTURE DESIGN UNIT DESIGN MANUAL, STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.

ALL W-SHAPE BEAMS SHALL BE FABRICATED WITH THE NATURAL CAMBER OF THE BEAM "UP".

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED.

MILL TEST REPORTS: NORFOLK SOUTHERN RAILWAY COMPANY SHALL BE FURNISHED COPIES OF MILL TEST REPORTS FOR ALL MATERIALS EXCEPT MISCELLANEOUS PLATES AND SHAPES. REPORTS SHALL INDICATE COMPLIANCE WITH ALL SPECIFIED REQUIREMENTS.

INSPECTION: SHOP INSPECTION BY NORFOLK SOUTHERN RAILWAY COMPANY OR ITS AUTHORIZED AGENT, SEE SPECIAL PROVISIONS FOR ADDITIONAL WELDING INSPECTION OF FLANGE PLATE TO WEB PLATES WELDS.

SHOP AND FIELD PAINT: ALL NEW STRUCTURAL STEEL MEMBERS, EXCEPT FAYING SURFACES, SHALL BE PAINTED IN ACCORDANCE WITH THE CURRENT NORFOLK SOUTHERN CORPORATION SPECIFICATIONS. THE SYSTEM TO BE USED SHALL BE AN INORGANIC ZINC-ACRYLIC SYSTEM. TOP COAT SHALL BE APPLIED IN THE FIELD.

SHOP DRAWINGS: SHOP DRAWINGS SHALL BE APPROVED BY THE CHIEF ENGINEER BRIDGES & STRUCTURES, NORFOLK SOUTHERN CORPORATION, ATLANTA, GEORGIA. MATERIAL SHALL NOT BE FABRICATED UNTIL DRAWINGS HAVE BEEN APPROVED. COPIES OF APPROVED SHOP DRAWINGS ARE TO BE FURNISHED TO NCDOT. SHOP DRAWINGS SHALL BE LABELED "NORFOLK SOUTHERN M.P. H-56.10".

HOLES: OPEN HOLES AS NOTED.

ANCHOR BOLTS SHALL BE GROUTED IN FORMED HOLES AFTER GIRDERS ARE ERECTED.

BEARING PADS SHALL BE USED WHENEVER STEEL MASONRY PLATE, OR OTHER STEEL BEARING PLATE, BEARS ON CONCRETE. PADS SHALL BE PREFORMED FABRIC BEARING PADS, 1/2" THICK. PREFORMED BEARING PADS SHALL BE SHOCK PAD STYLE 15175, AS MANUFACTURED BY THE ALERT MANUFACTURING AND SUPPLY COMPANY, CHICAGO, IL; OR FABREEKA PADS, AS MANUFACTURED BY THE FABREEKA PRODUCTS COMPANY, BOSTON, MA; OR SORBTX PADS, AS MANUFACTURED BY VOSS ENGINEERING, INC., CHICAGO, IL; OR AN APPROVED EQUAL.

FOR PROTECTION OF PAINTED STEEL, SEE STANDARD SPECIFICATIONS FOR PAINTING STEEL STRUCTURES.

FOR STRUCTURAL STEEL, SEE SPECIAL PROVISION "NORFOLK SOUTHERN SPECIFICATIONS FOR STRUCTURAL STEEL".

WELDING: WELDING SHALL BE IN ACCORDANCE WITH AASHTO/ AWS-D1.5M:2012 AND AMERICAN NATIONAL STANDARD, INCLUDING INTERIMS, AS MODIFIED OR SUPPLEMENTED BY THE AREMA MANUAL FOR RAILWAY ENGINEERING.

ALL WELDS SHALL BE MADE WITH E7018 ELECTRODES. WELDING SHALL BE PERFORMED WITH THE SUBMERGED ARC WELDING (SAW) OR SHIELDED METAL ARC WELDING (SMAW) PROCESS. FRACTURE-CRITICAL MEMBER FLANGE TO WEB WELDS SHALL BE MADE BY THE SUBMERGED ARC WELDING (SAW) PROCESS.

ALL WELDS ARE TO BE SHOP WELDS, UNLESS NOTED OTHERWISE. WELDING PROCEDURE AND SIZES SHALL BE AS SHOWN IN THE PROJECT PLANS.

THERE SHALL BE THOROUGH FUSION BETWEEN WELD METAL AND BASE METAL AND BETWEEN SUCCESSIVE PASSES OF THE WELD. ALL CRATERS SHALL BE FILLED TO THE FULL CROSS SECTION OF THE WELD.

PRIOR TO WELDING, EACH WELDER SHALL HAVE BEEN CERTIFIED IN ACCORDANCE WITH AWS REQUIREMENTS DURING A PERIOD OF ONE (1) YEAR PRIOR TO WORK ON THE BRIDGE. THE FABRICATOR SHALL FURNISH THE ENGINEER OR AUTHORIZED REPRESENTATIVE WITH AN AWS CERTIFICATE FOR EACH WELDER, COVERING THEIR ABILITY TO MAKE A COMPLETE AND SATISFACTORY WELD OF EACH KIND TO BE USED ON THE PROJECT.

SURFACES AND EDGES TO BE WELDED SHALL BE SMOOTH, UNIFORM AND FREE FROM FINS, TEARS, CRACKS, OR OTHER DEFICIENCIES WHICH WOULD ADVERSELY AFFECT THE QUALITY OR STRENGTH OF THE WELD. SURFACES TO BE WELDED AND SURFACES ADJACENT TO A WELD SHALL ALSO BE FREE OF ANY SCALE, SLAG, RUST, MOISTURE, GREASE OR OTHER FOREIGN MATERIAL THAT WILL INHIBIT PROPER WELDING.

NON-DESTRUCTIVE TESTING OF THE FRACTURE CRITICAL MEMBERS IS TO BE PERFORMED BY AN INDEPENDENT TESTING COMPANY APPROVED BY THE ENGINEER AND CONTRACTED BY THE FABRICATOR. PERSONAL QUALIFICATIONS AND CERTIFICATION ARE TO BE IN ACCORDANCE WITH THE CURRENT AREMA MANUAL CHAPTER 15 FOR FRACTURE CRITICAL MEMBERS. COPIES OF THE TEST ARE TO BE FURNISHED TO THE ENGINEER OR AUTHORIZED REPRESENTATIVE FOR INCLUSION IN THEIR PROJECT FILE.

THERE SHALL BE NO FIELD WELDING ON THIS PROJECT OTHER THAN AS DIRECTLY DETAILED IN THESE PLANS, UNLESS APPROVED BY THE ENGINEER OR AUTHORIZED REPRESENTATIVE IN WRITING.

BOLTS: ALL BOLTED CONNECTIONS SHALL BE MADE WITH 7/8" DIA. ASTM A325, TYPE 3 BOLTS UNLESS NOTED OTHERWISE. NUTS AND WASHER SHALL BE A563, GRADE C3, AND F436, TYPE 3 RESPECTIVELY. ALL BOLTS, NUTS, AND WASHERS SHALL BE MECHANICALLY GALVANIZED UNLESS NOTED OTHERWISE. OPEN HOLES SHALL BE 1 5/16" DIA. UNLESS NOTED OTHERWISE. ALL BOLTS, NUTS, AND WASHERS WILL BE SUPPLIED FROM A SINGLE SOURCE WITH DOCUMENTATION OF THEIR SOURCE AND QUALITY CERTIFICATION. ALL HIGH STRENGTH BOLTS SHALL BE TIGHTENED BY THE "TURN-OF-NUT METHOD" IN ACCORDANCE WITH AREMA MANUAL CHAPTER 15, SECTION 3.2.3 - INSTALLATION OF HIGH STRENGTH BOLTS. ANY BOLTS THAT REQUIRE REMOVAL AFTER BEING TIGHTENED SHALL BE DISCARDED AND A NEW BOLT INSTALLED, UNLESS OTHERWISE NOTED.

ALL BOLT HOLES SHALL BE SUB-DRILLED AND REAMED OR DRILLED FROM THE SOLID. AT NO TIME ARE HOLES TO BE SUB-PUNCHED AND REAMED OR PUNCHED FULL SIZE.

ALL HOLES SHALL BE 1/16" LARGER THAN THE SPECIFIED BOLT SIZE UNLESS OTHERWISE NOTED IN THE PROJECT PLANS.

BOLTS SHALL BE INSTALLED WITH THE BOLT HEADS EXPOSED TO THE WEATHER. THE SPECIFIED WASHERS SHALL BE INSTALLED BENEATH THE TURNING ELEMENT. VERTICALLY POSITIONED BOLTS WHICH HAVE BOTH THE HEAD AND NUT EXPOSED TO WEATHER SHALL HAVE THE HEAD PLACED ABOVE THE NUT. HORIZONTAL POSITIONED NUTS SHALL HAVE THE HEADS ON THE VISIBLE SIDE OF THE CONNECTION.

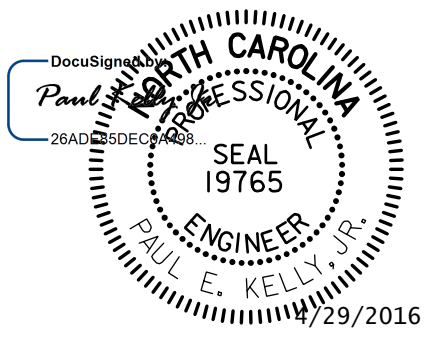
SWEDGED ANCHOR BOLTS SHALL CONFORM TO ASTM F1554, GRADE 55, AS DESIGNATED IN THE PROJECT PLANS. SWEDGED ANCHOR BOLTS SHALL NOT BE PAINTED. ANCHOR BOLT NUTS AND WASHER SHALL CONFORM TO ASTM A563, GRADE C3 HEAVY HEX WITH NYLON INSERT AND ASTM F436, TYPE 3 CIRCULAR WASHERS, RESPECTIVELY. ANCHOR BOLTS AND ALL ASSOCIATED HARDWARE SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A153, CLASS C.

NO SALVAGED MATERIALS WILL BE ALLOWED FOR THE CONSTRUCTION OF THE TEMPORARY SPAN.

APPROX. STRUCTURAL STEEL QUANTITIES		
ITEMS	UNIT	QUANTITY
TEMPORARY SPAN APPROX. STRUCTURAL STEEL	LBS.	90,200
TEMPORARY SPAN APPROX. STRUCTURAL STEEL - ALTERNATE	LBS.	77,000

I:\PROJ\2513251\ustation\struc\Temporary Span\404\_062\_U3308\_SML\_TSil.dgn  
 4/29/2016 12:32:59 PM  
 pkelly

PROJECT NO. U-3308  
DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 11 OF 16



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

## TEMPORARY SPAN STRUCTURAL STEEL NOTES

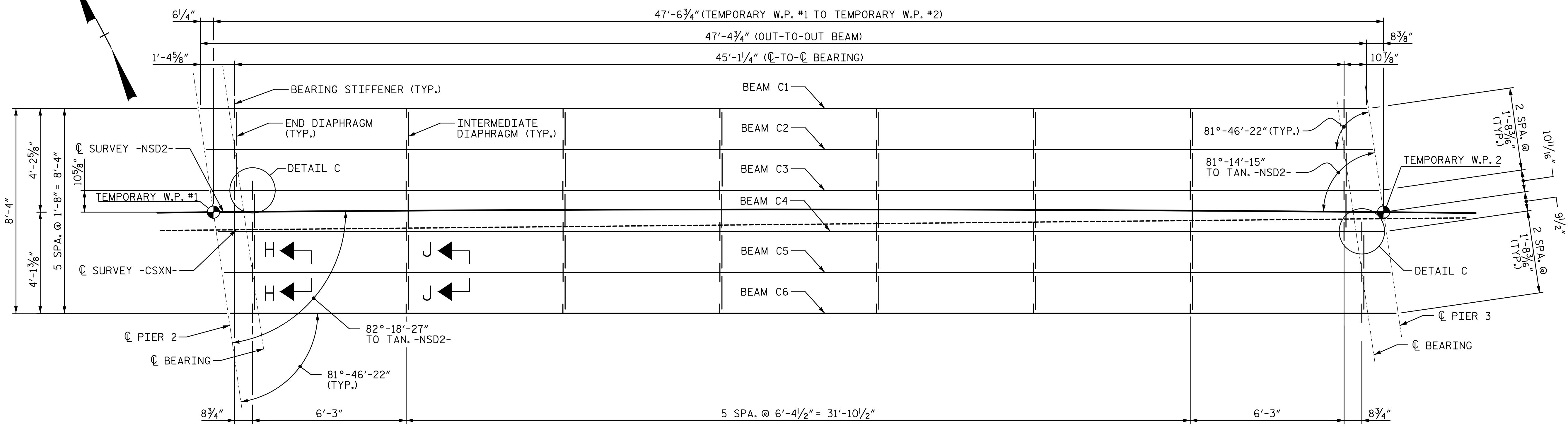
DRAWN BY : NMC DATE : 06-14  
 CHECKED BY : DJM DATE : 06-14

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

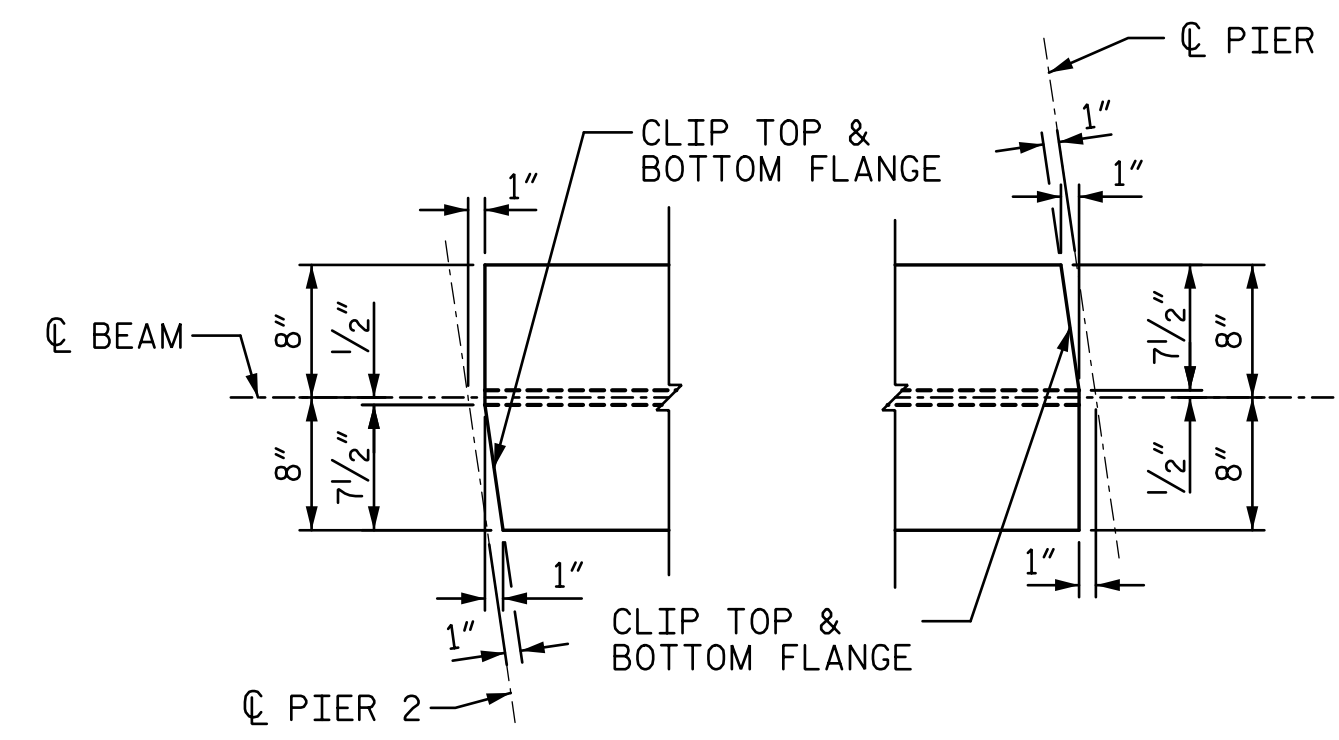
STV / Ralph Whitehead Associates, Inc.  
 900 W Trade Street, Suite 715  
 Charlotte, NC 28202  
 NC License No. F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4-63
1			3			TOTAL SHEETS
2			4			68

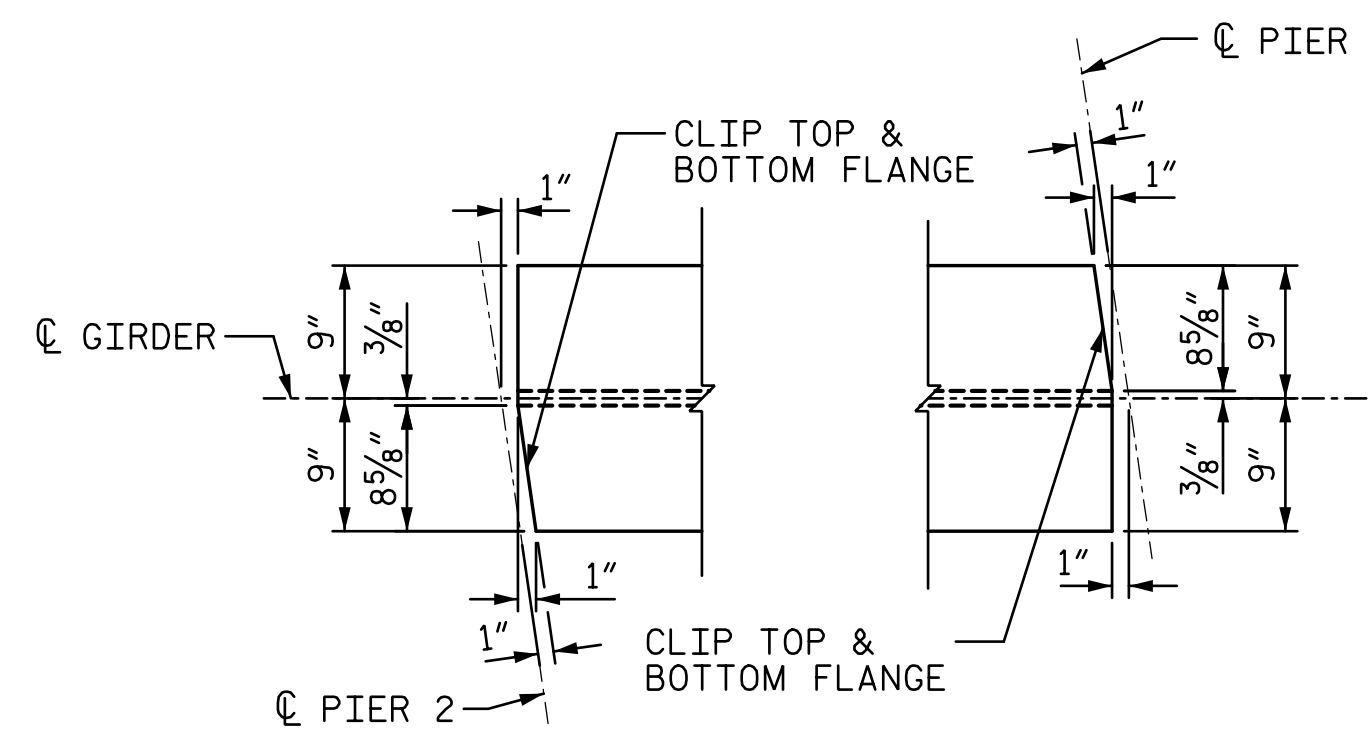




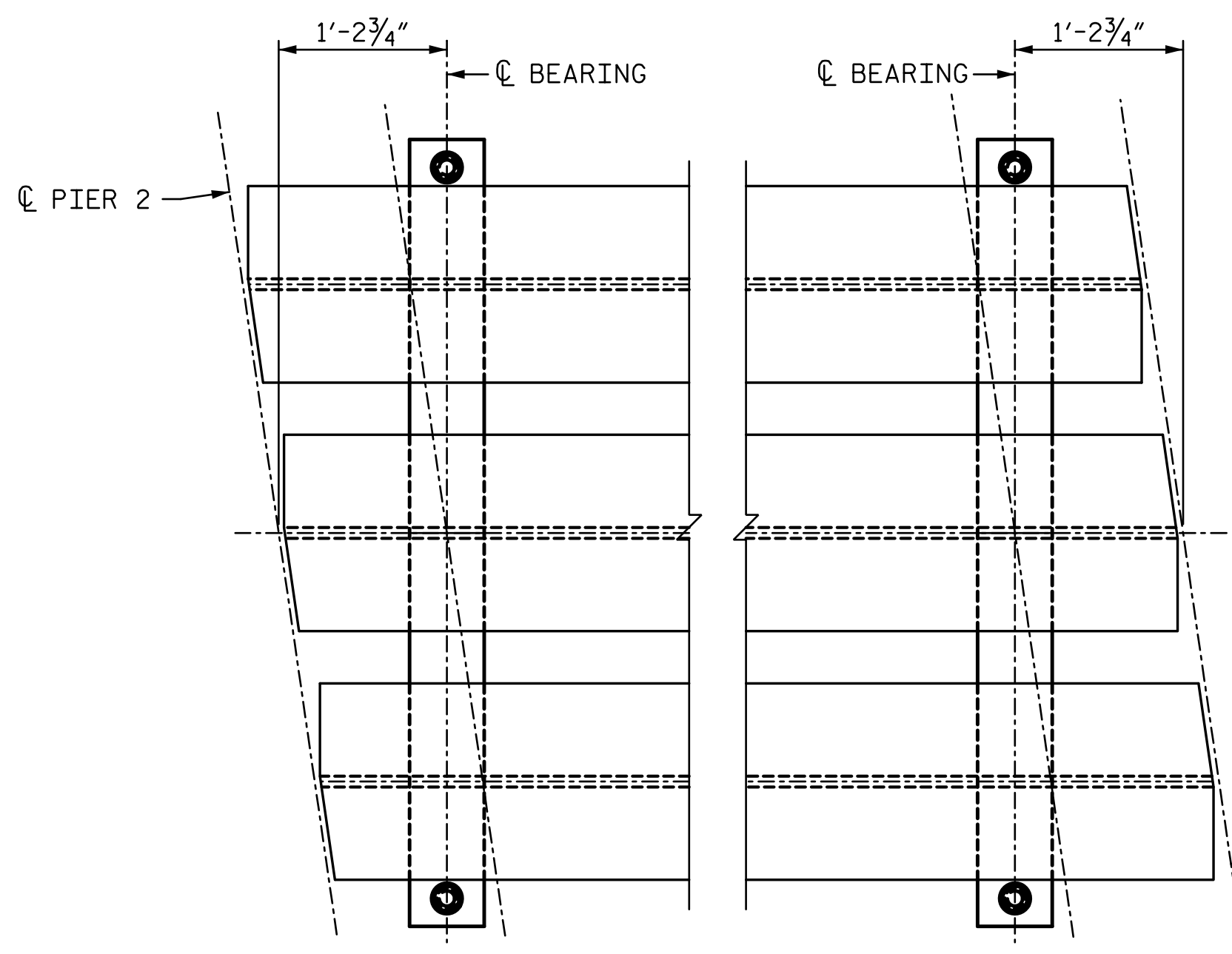
**PLAN - TEMPORARY SPAN C**  
(PIERS ARE PARALLEL)



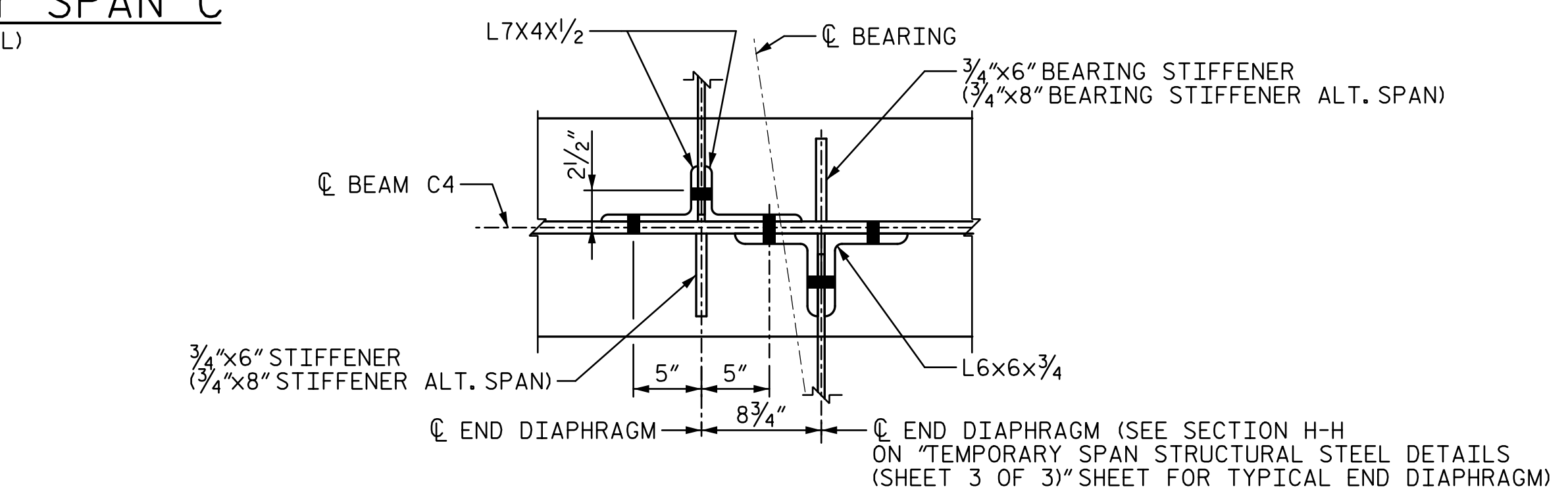
**BEAM END CLIP DETAIL**  
(TOP AND BOTTOM FLANGE)



**GIRDER END CLIP DETAIL - ALTERNATE**  
(TOP AND BOTTOM FLANGE)

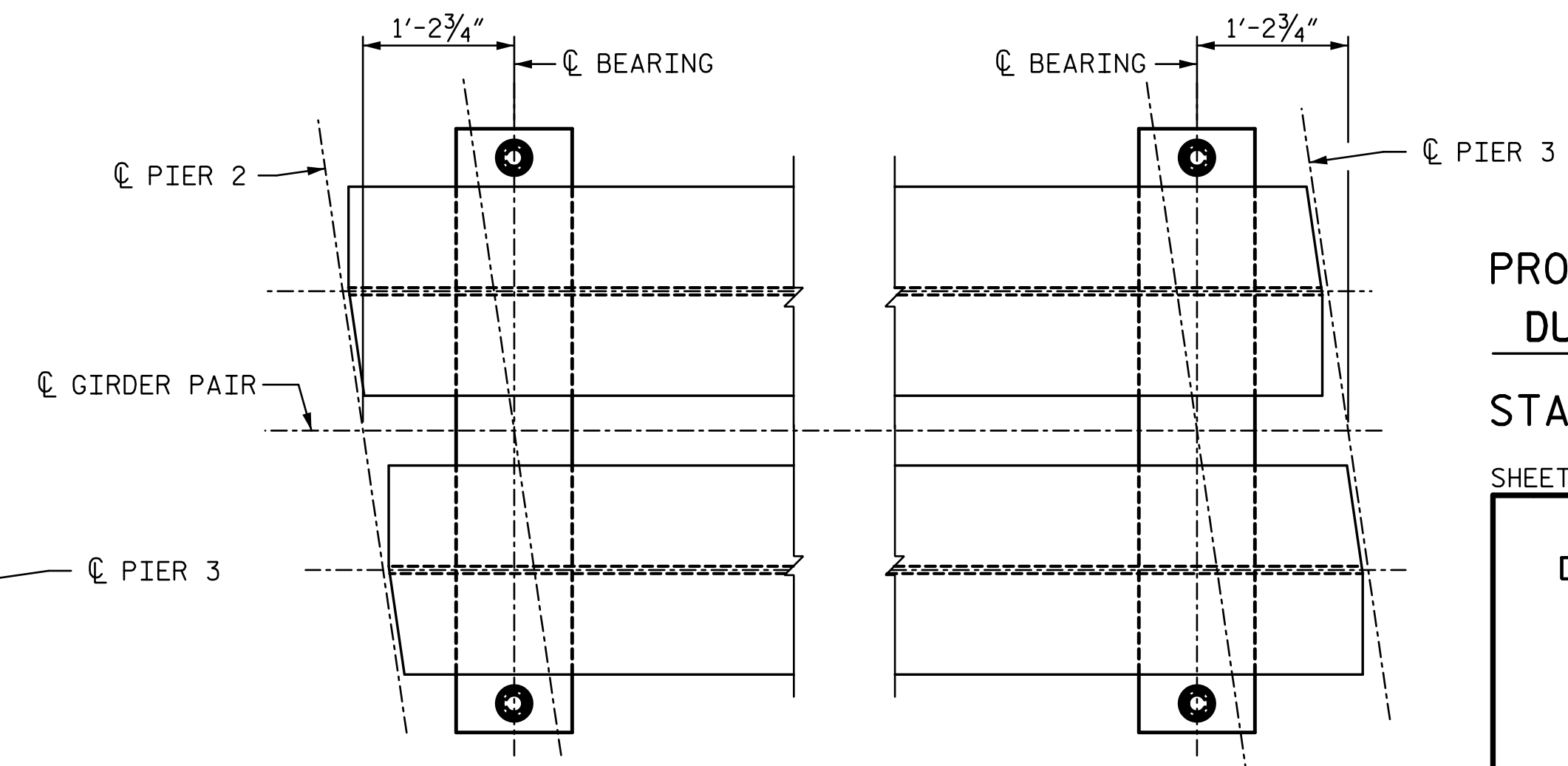


**BEARING LOCATION DETAIL**

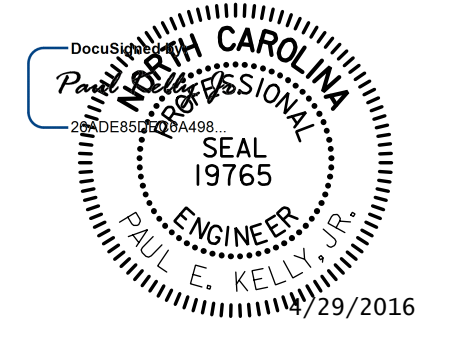


**DETAIL C**

END DIAPHRAGM AT PIER 3 SHOWN, PIER 2 SIMILAR.



**BEARING LOCATION DETAIL - ALTERNATE**



PROJECT NO. **U-3308**  
**DURHAM** COUNTY  
 STATION: **24+55.20 -LALT-**  
**13+22.18 -CSXN-**  
 SHEET 12 OF 16

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**TEMPORARY SPAN  
 STRUCTURAL STEEL  
 DETAILS (1 OF 3)**

**NOTES:**

- FOR ALTERNATE 4-GIRDER SPACING SEE SHEET TITLED "TEMPORARY SPAN TYPICAL SECTION".
- FOR SECTION H-H AND J-J, SEE SHEET TITLED "TEMPORARY SPAN STRUCTURAL STEEL DETAILS (3 OF 3)".

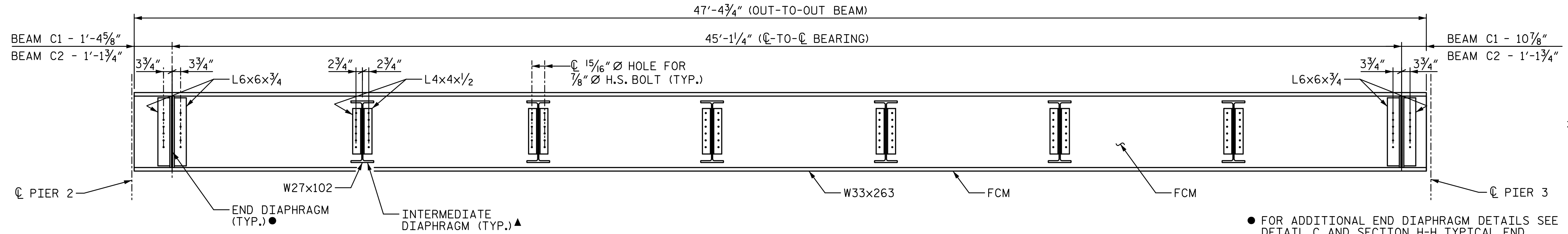
DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

**STV / Ralph Whitehead Associates, Inc.**  
 900 W Trade Street, Suite 715  
 Charlotte, NC 28202  
 NC License No. F-0991

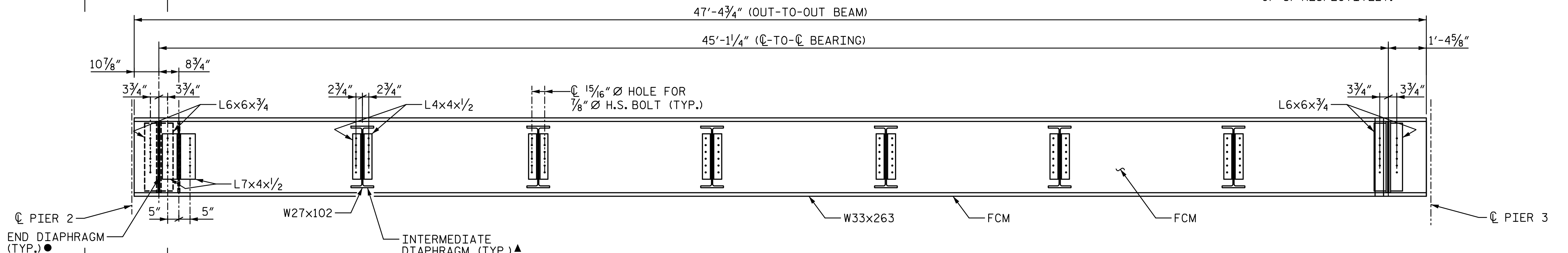
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

S4-64  
 TOTAL SHEETS: 68

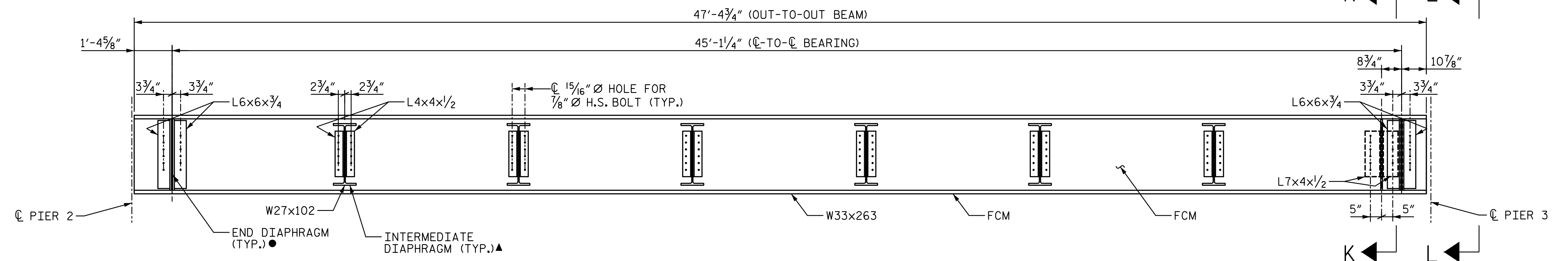
4/29/2016 12:33:02 PM I:\PROJ\2513251\ustation\struct\Temporary Span\404\_063\_U3308\_SMU\_TS12.dgn pKelly



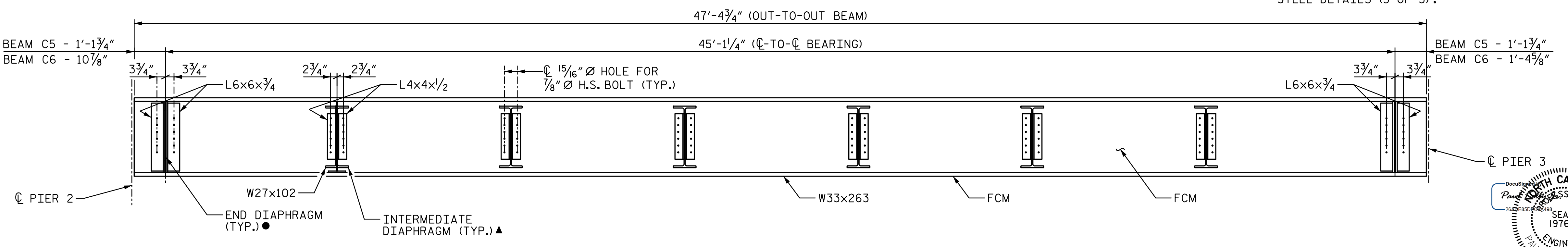
ELEVATION - TEMPORARY SPAN C @ BEAM C1, C2



ELEVATION - TEMPORARY SPAN C @ BEAM C3



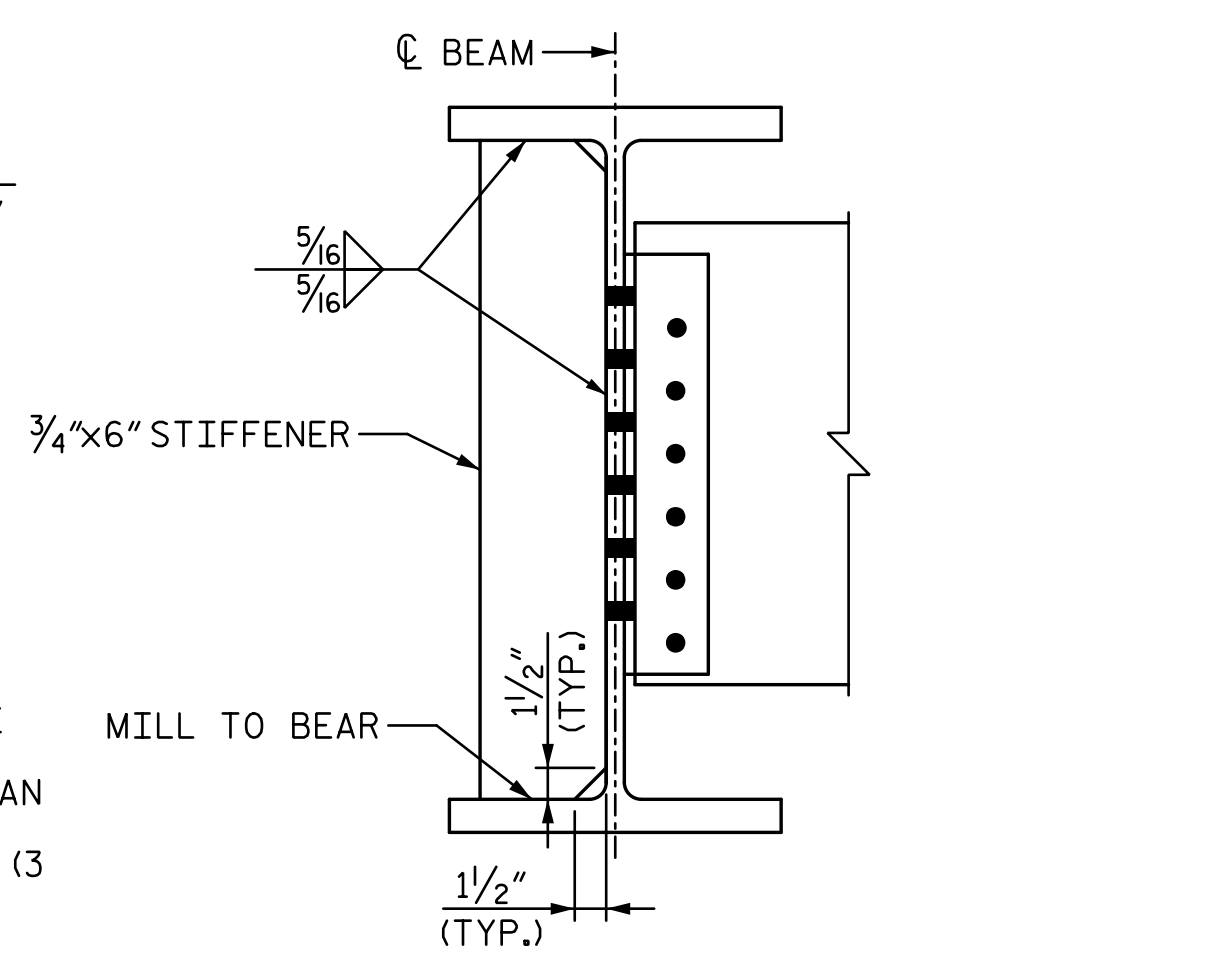
ELEVATION - TEMPORARY SPAN C @ BEAM C4



ELEVATION - TEMPORARY SPAN C @ BEAM C5 & C6

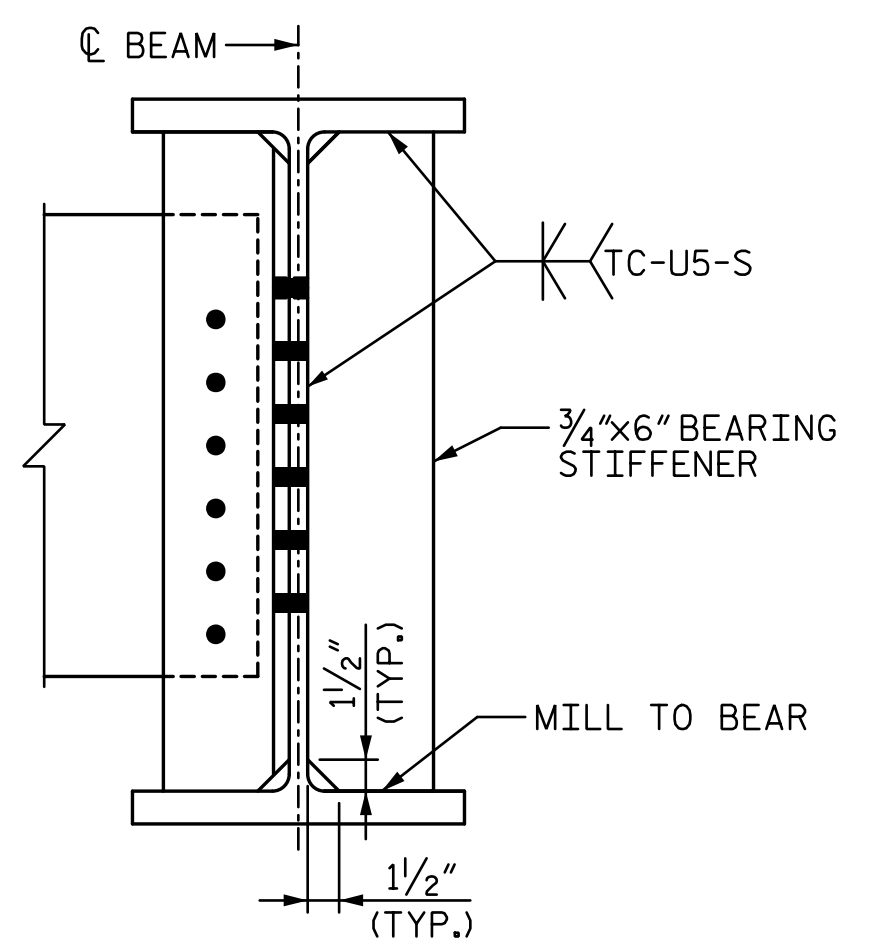
● FOR ADDITIONAL END DIAPHRAGM DETAILS SEE DETAIL C AND SECTION H-H TYPICAL END DIAPHRAGM ON SHEETS TITLED "TEMPORARY SPAN STRUCTURAL STEEL DETAILS (1 OF 3)" & "TEMPORARY SPAN STRUCTURAL STEEL DETAILS (3 OF 3)" RESPECTIVELY.

▲ FOR ADDITIONAL INTERMEDIATE DIAPHRAGM DETAILS, SEE SECTION J-J TYPICAL INTERMEDIATE DIAPHRAGM ON SHEET TITLED "TEMPORARY SPAN STRUCTURAL STEEL DETAILS (3 OF 3)".



SECTION K-K

FOR ADDITIONAL DIAPHRAGM AND CONNECTION DETAILS, SEE SECTION J-J ON SHEET TITLED "TEMPORARY SPAN STRUCTURAL STEEL DETAILS (3 OF 3)".



SECTION L-L

FOR ADDITIONAL DIAPHRAGM AND CONNECTION DETAILS, SEE SECTION H-H ON SHEET TITLED "TEMPORARY SPAN STRUCTURAL STEEL DETAILS (3 OF 3)".

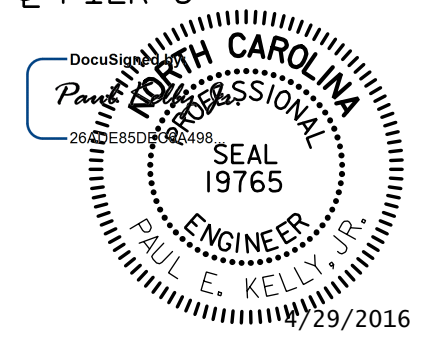
NOTES:

1. FOR ALTERNATE 4 GIRDER SPACING SEE TITLED "TEMPORARY SPAN TYPICAL SECTION".
2. FOR END DIAPHRAGM AND INTERMEDIATE DIAPHRAGM DETAILS, SEE SHEET TITLED "TEMPORARY SPAN STRUCTURAL STEEL DETAILS (3 OF 3)".
3. FOR WELD TERMINATION DETAILS, SEE SHEET TITLED "STRUCTURAL STEEL DIAPHRAGM DETAILS".

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 13 OF 16

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

TEMPORARY SPAN  
 STRUCTURAL STEEL  
 DETAILS (2 OF 3)



i:\PROJ\251325\ustation\struct\Temporary\_Span\404\_064\_U3308\_SML\_TS13.dgn 4/29/2016 12:33:05 PM pKelly

DRAWN BY: MTC DATE: 06-14  
 CHECKED BY: DJM DATE: 06-14

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

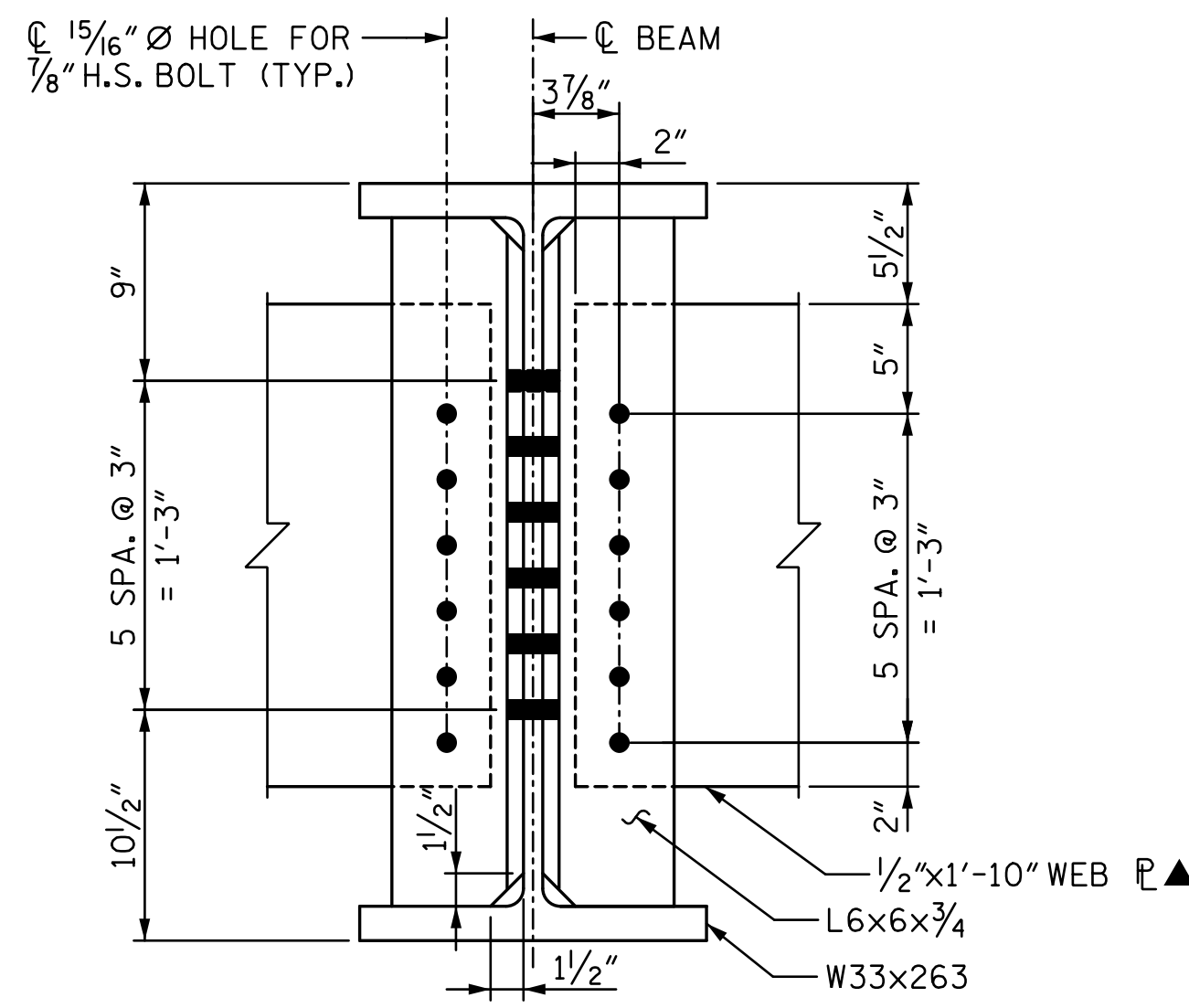
STV / Ralph Whitehead Associates, Inc.  
 900 W Trade Street, Suite 715  
 Charlotte, NC 28202  
 NC License No. F-0991

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

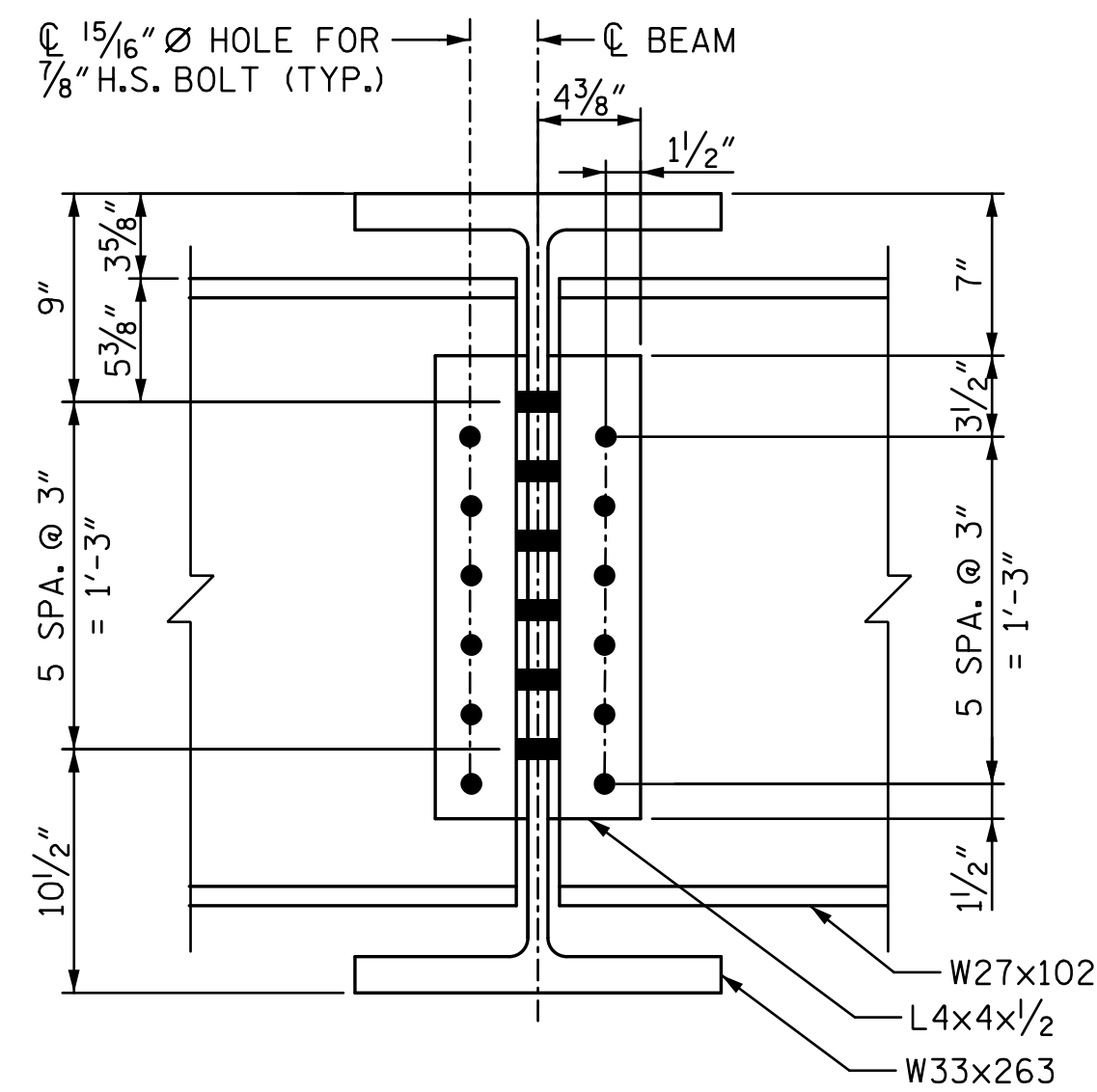
S4-65	TOTAL SHEETS
68	

▲ FOR OUTSIDE FACE OF EXTERIOR GIRDER/BEAM  
PROVIDE 1/2"x8"x1'-10" FILLER PLATE BETWEEN ANGLES.

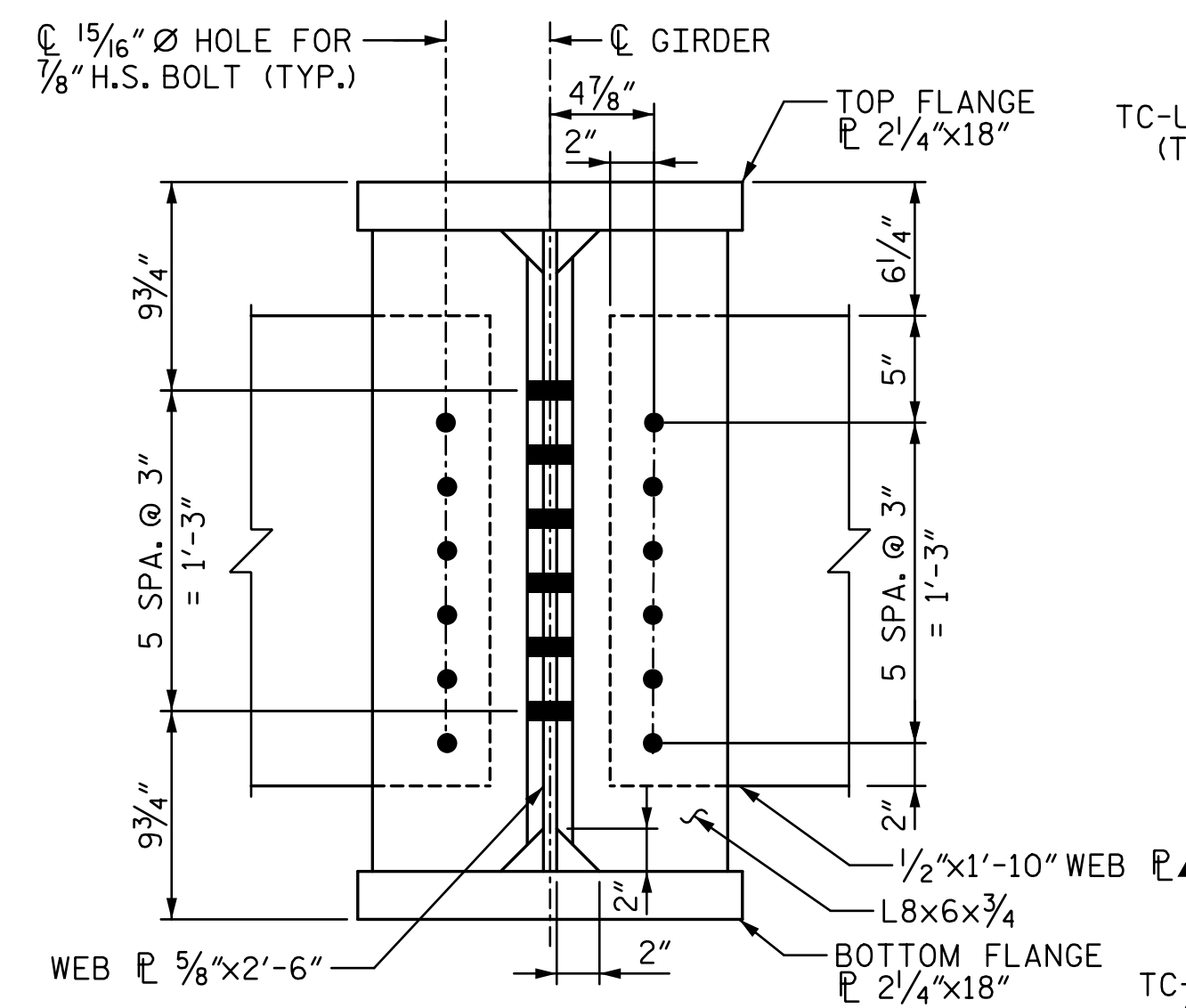
NOTE: FOR WELD TERMINATION DETAILS, SEE SHEET TITLED  
"STRUCTURAL STEEL DIAPHRAGM DETAILS".



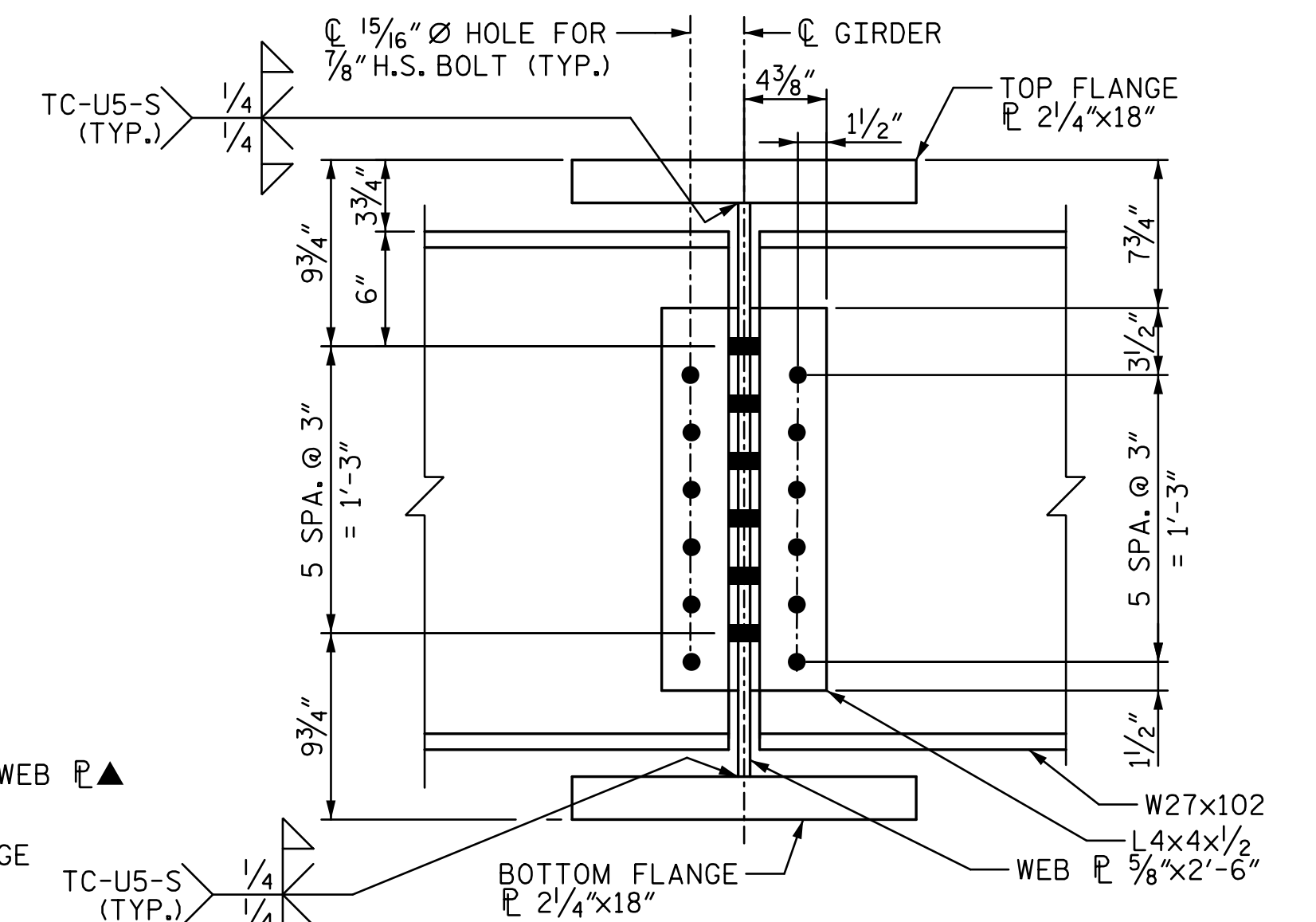
SECTION H-H  
TYPICAL END DIAPHRAGM



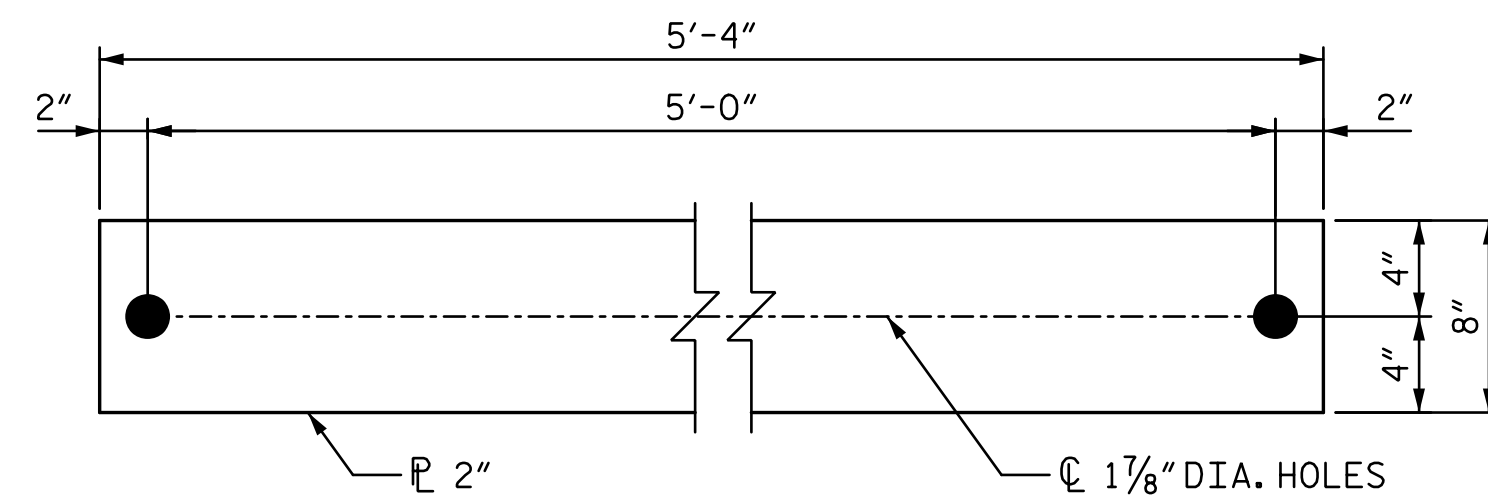
SECTION J-J  
TYPICAL INTERMEDIATE DIAPHRAGM



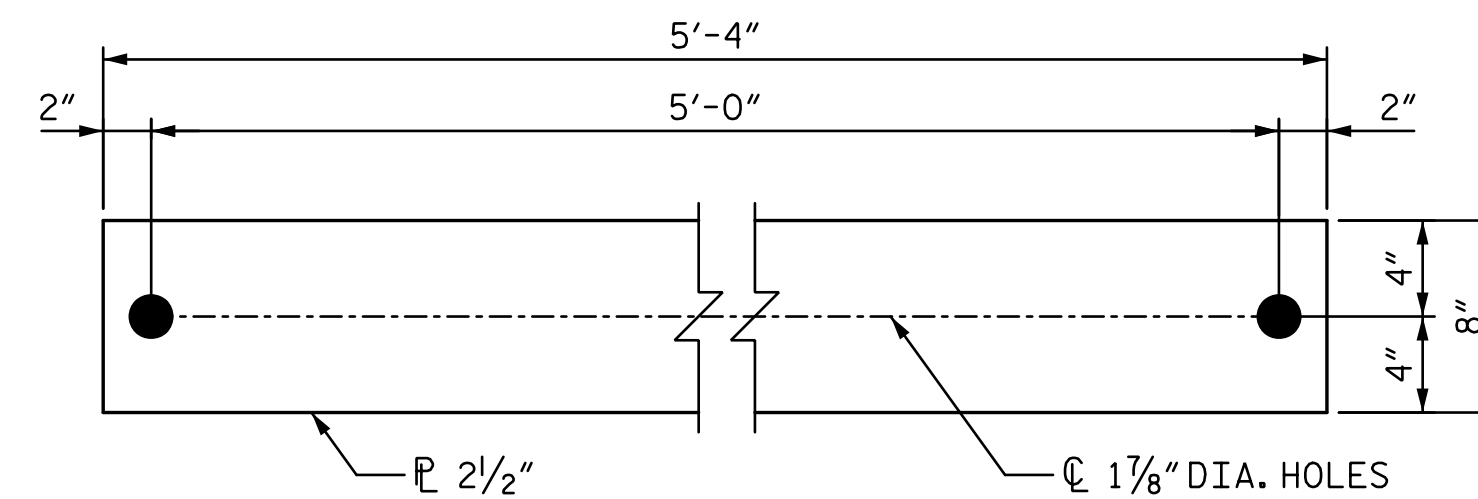
SECTION H-H - ALTERNATE  
TYPICAL END DIAPHRAGM



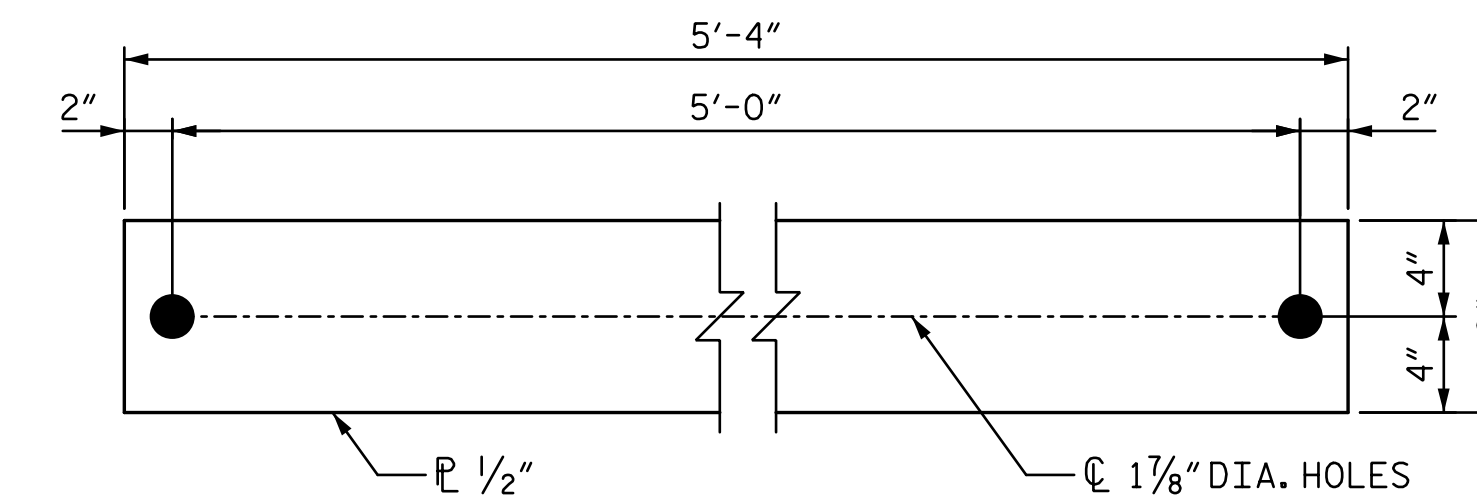
SECTION J-J - ALTERNATE  
TYPICAL INTERMEDIATE DIAPHRAGM



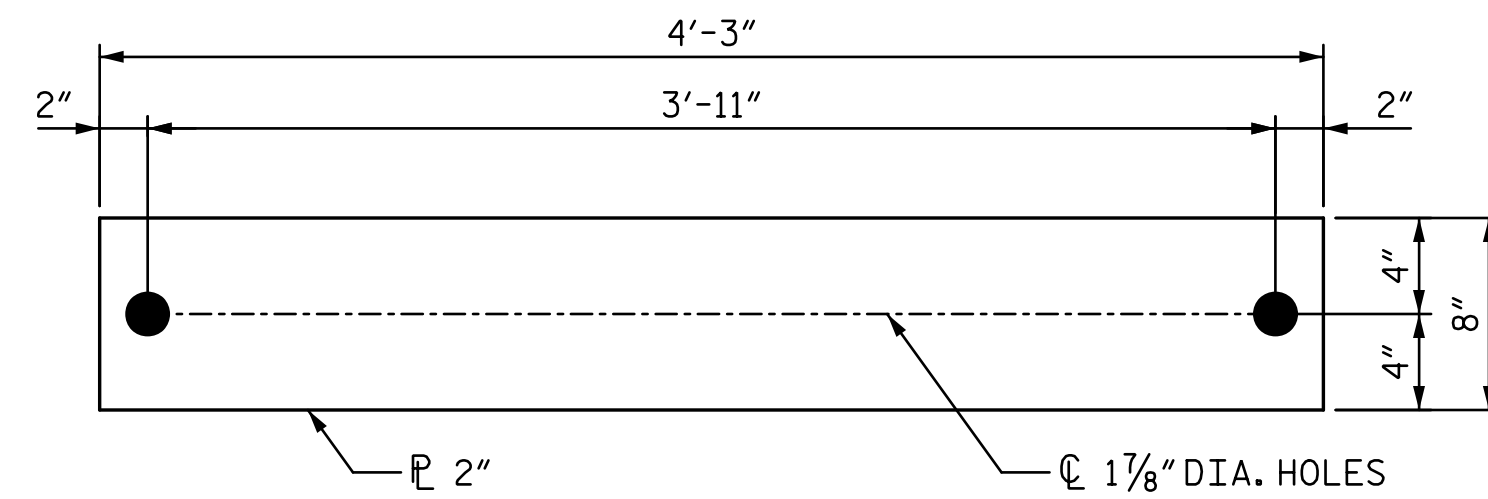
SOLE PLATE



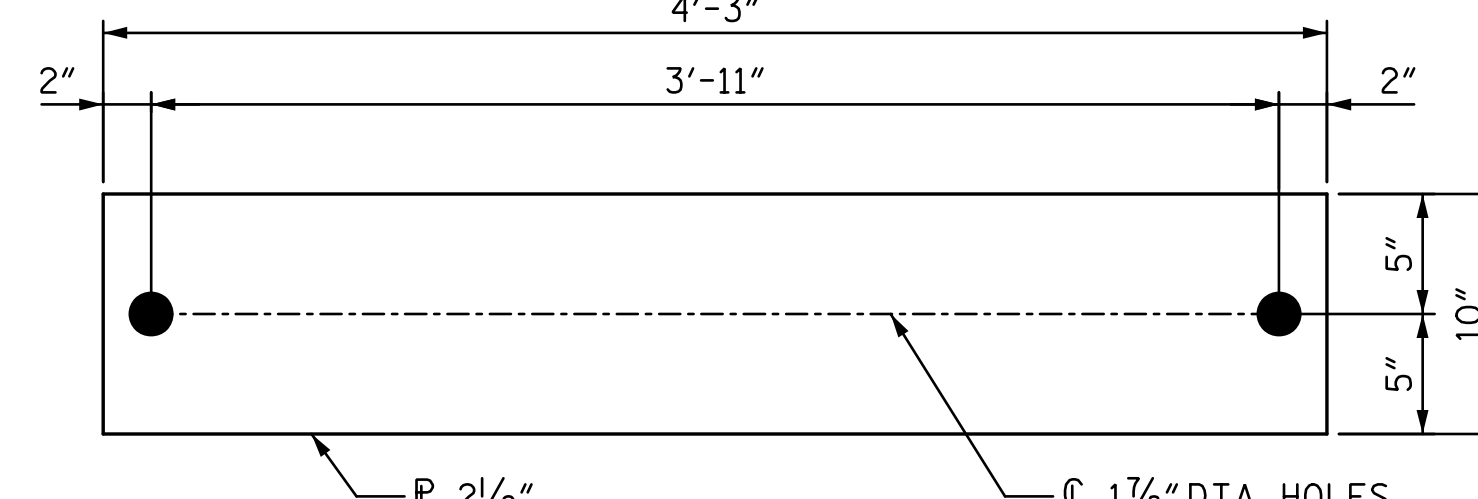
MASONRY PLATE



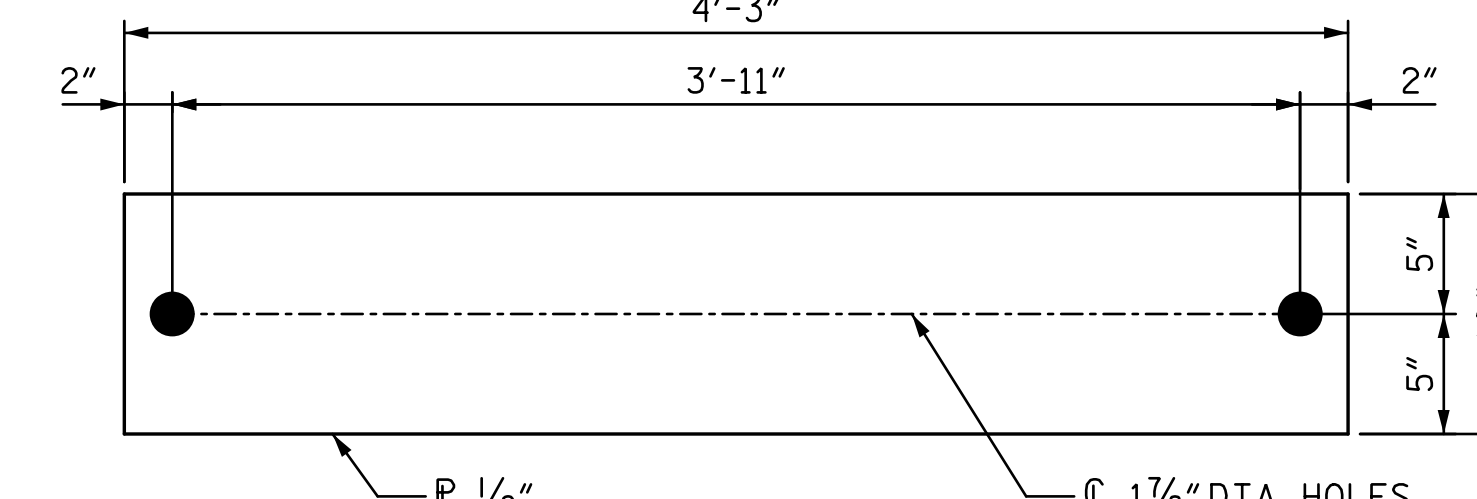
SHOCK PAD



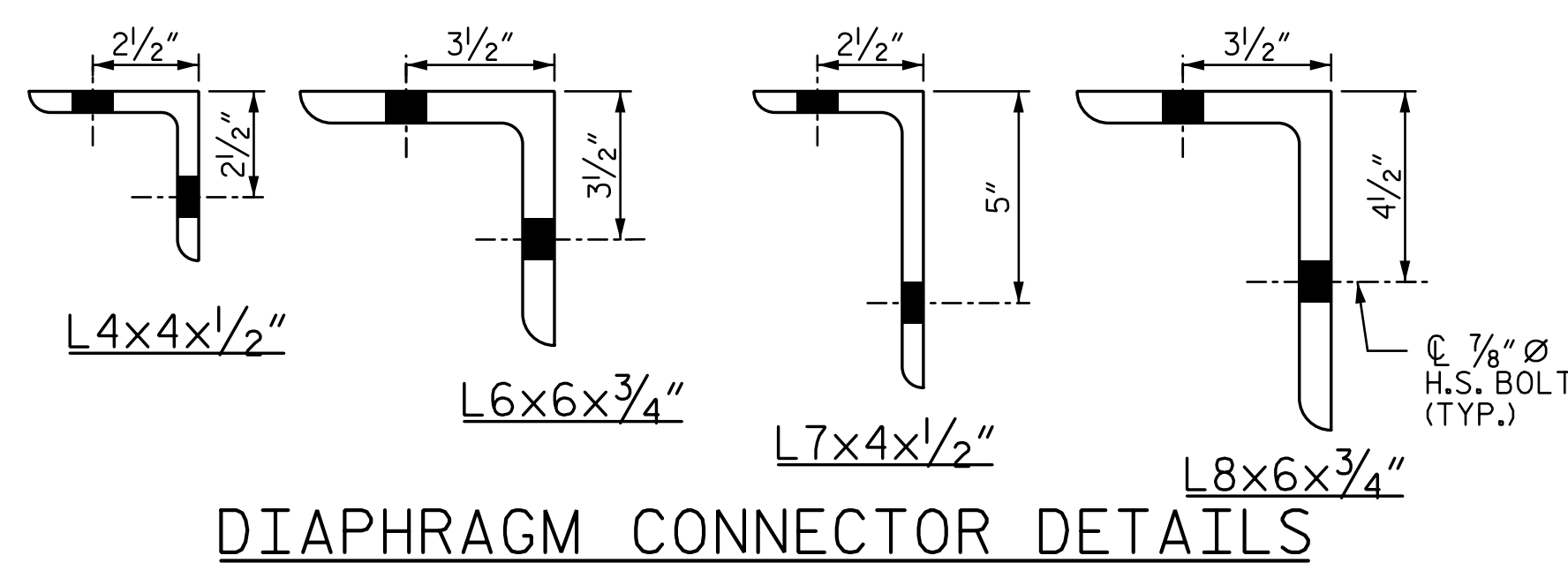
SOLE PLATE (ALTERNATE)



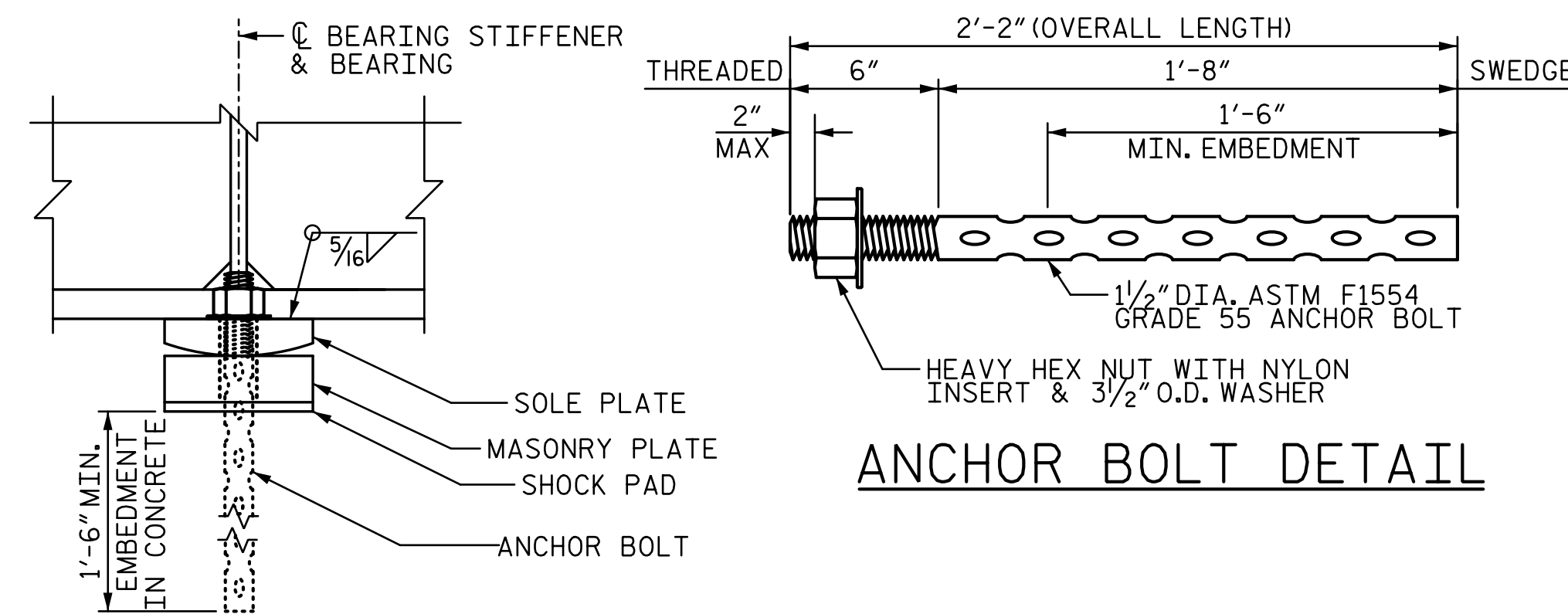
MASONRY PLATE (ALTERNATE)



SHOCK PAD (ALTERNATE)



DIAPHRAGM CONNECTOR DETAILS

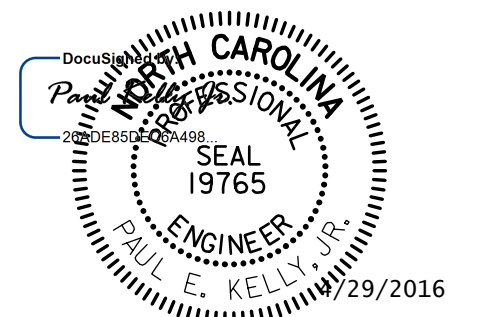


ANCHOR BOLT DETAIL

**ANCHOR BOLT  
INSTALLATION NOTES**

1. PLACE BEARING ASSEMBLY IN THE PLAN LOCATIONS AS SHOWN ON SHEETS TITLED "TEMPORARY SPAN STRUCTURAL STEEL (1 OF 3)", "PIER 2 TEMPORARY PEDESTAL" AND "PIER 3 TEMPORARY PEDESTAL".
2. INSTALL WASHER AND HEAVY HEX NUT ON ANCHOR BOLT IN ACCORDANCE WITH DIMENSIONS ON THIS SHEET.
3. FILL THE ANCHOR BLOCKOUT SHOWN ON SHEETS TITLED "PIER 2 TEMPORARY PEDESTAL" AND "PIER 3 TEMPORARY PEDESTAL" WITH EPOXY GROUT.
4. PLACE ANCHOR BOLT IN PREFORMED HOLE.
5. ALLOW EPOXY GROUT TO SET PRIOR TO SETTING GIRDERS ON BEARING ASSEMBLIES.

BEARING ASSEMBLY



PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 14 OF 16

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

TEMPORARY SPAN  
 STRUCTURAL STEEL  
 DETAILS (3 OF 3)

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

S4-66  
 TOTAL SHEETS  
 68

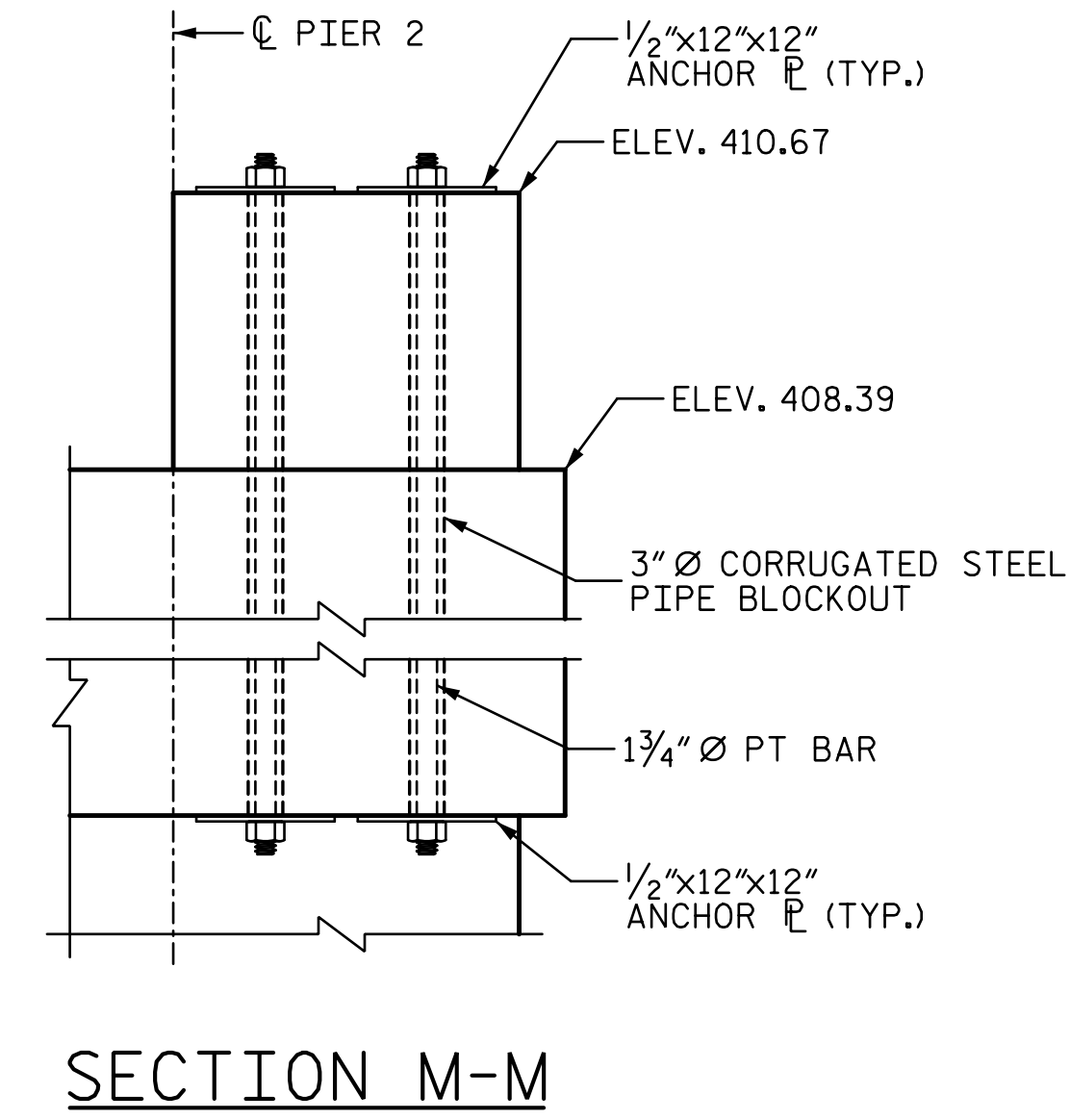
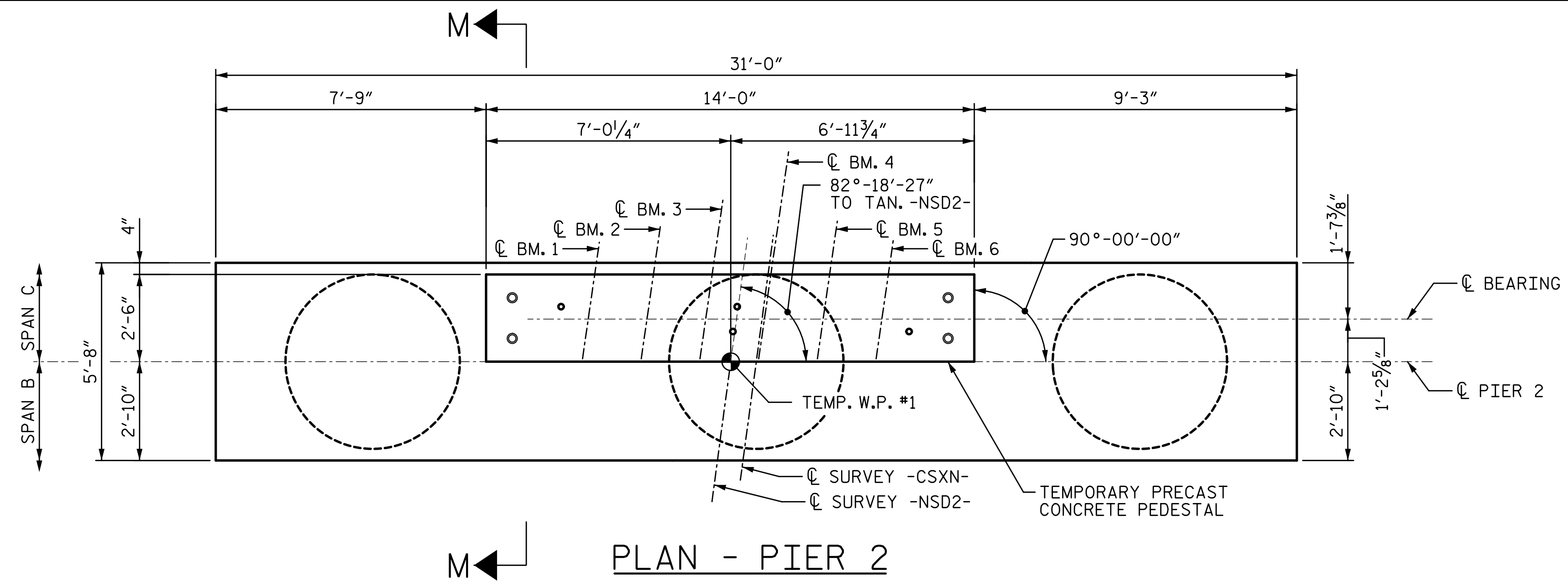
DRAWN BY: NMC DATE: 06-14  
 CHECKED BY: DJM DATE: 06-14

SECTION THROUGH BEARING

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

STV / Ralph Whitehead Associates, Inc.  
 900 W Trade Street, Suite 715  
 Charlotte, NC 28202  
 NC License No. F-0991

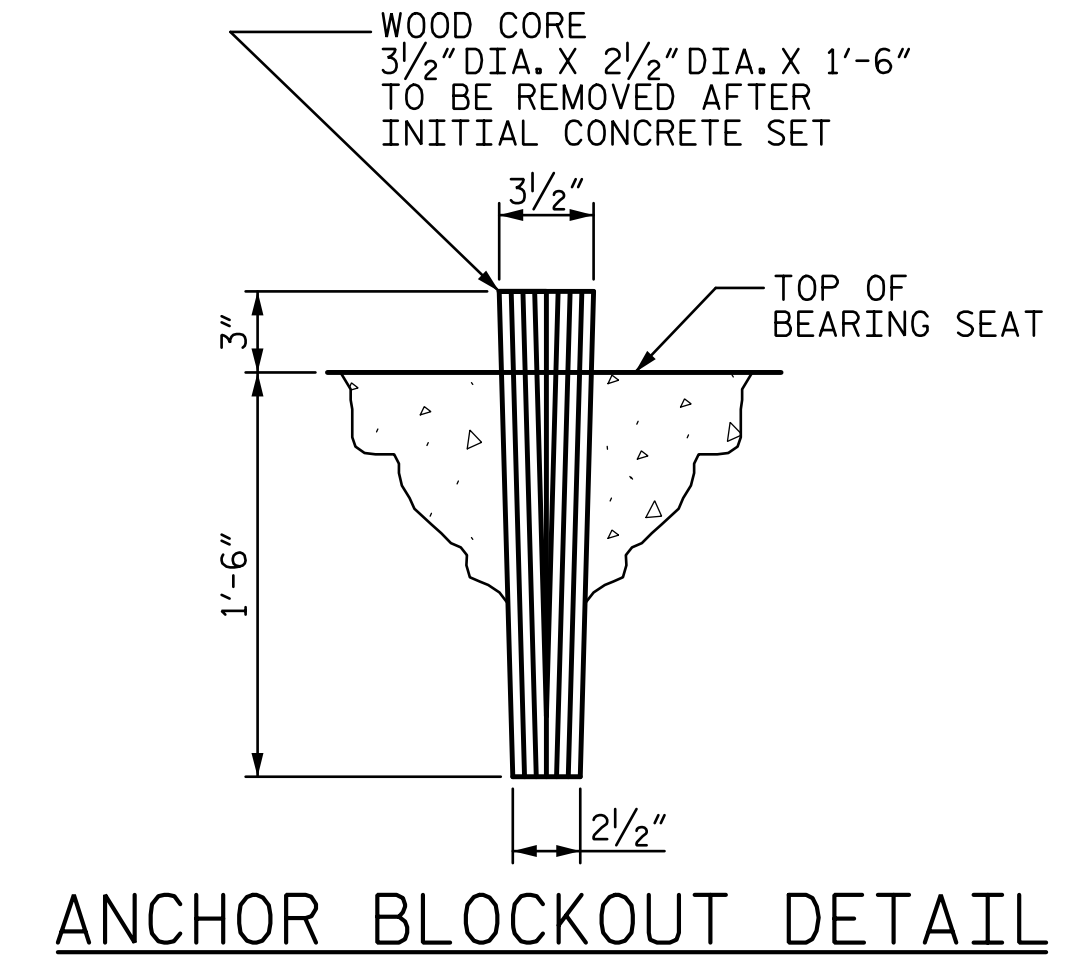
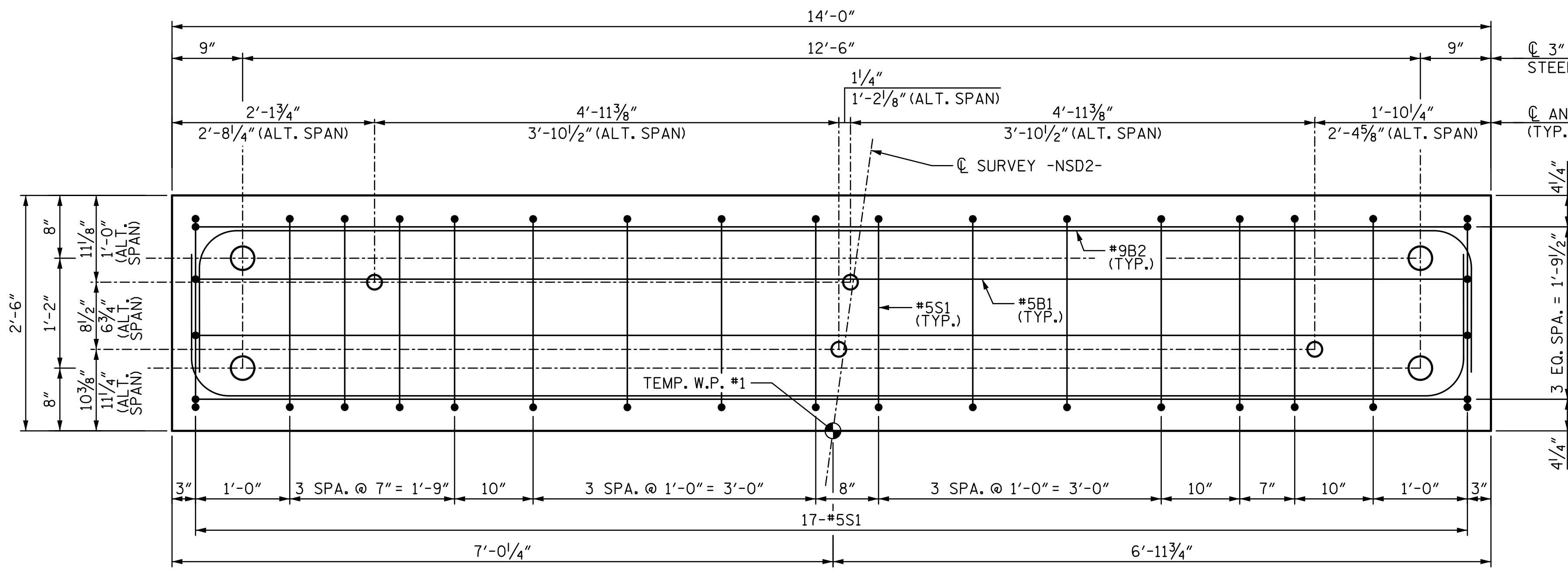
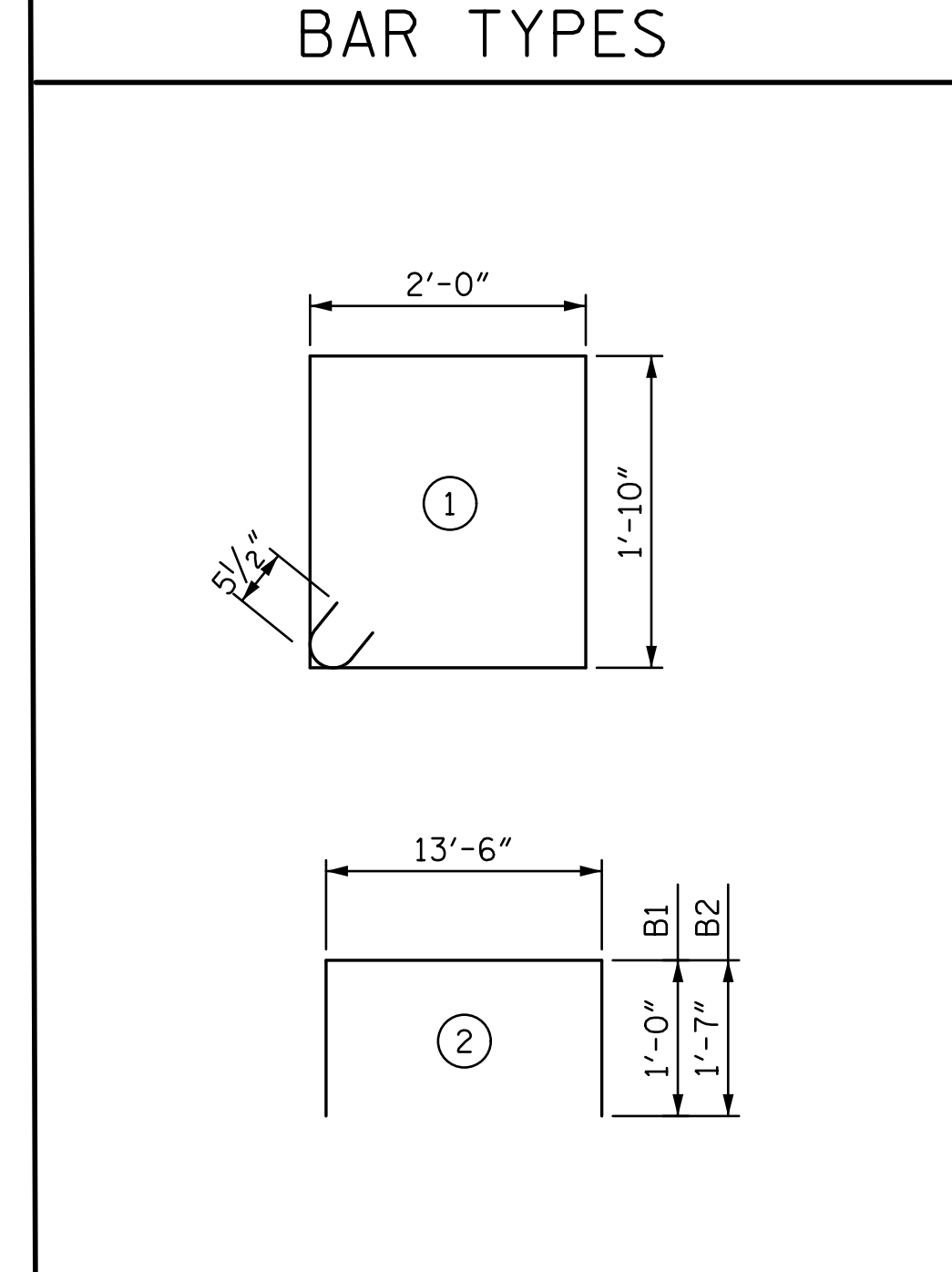
I:\PROJ\251325\ustation\struct\Temporary Span\404\_065\_U3308\_SMU\_TSI4.dgn  
 12:33:09 PM  
 4/29/2016  
 p.kelly



### REINFORCING BAR SCHEDULE

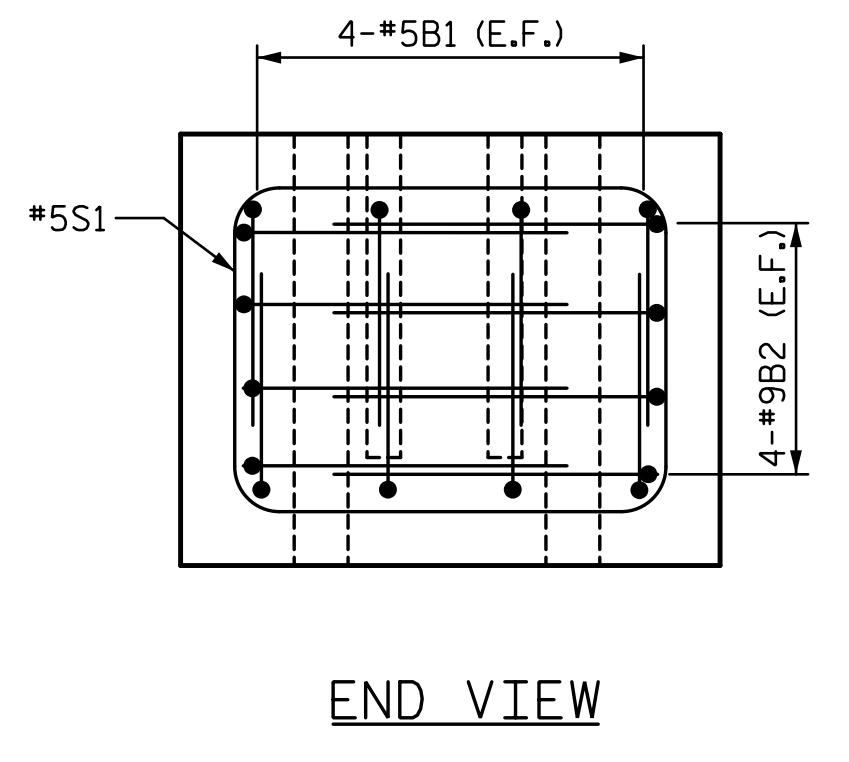
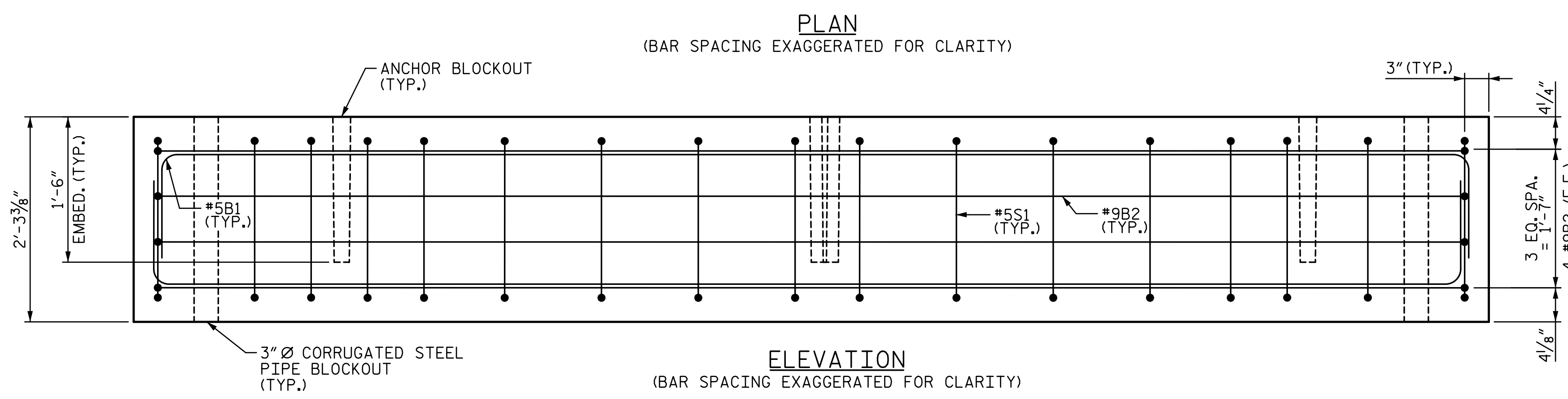
#### PIER 2 TEMPORARY PEDESTAL

MARK	NO.	SIZE	TYPE	LENGTH (ft. in.)	WEIGHT (lb.)
B1	8	5	2	15'-6"	130
B2	8	9	2	16'-8"	454
S1	17	5	1	8'-7"	152



### QUANTITIES - PIER 2 TEMPORARY PEDESTAL

ITEMS	UNIT	QUANTITY
PRECAST CONCRETE (5,000 PSI)	C.Y.	3.0
REINFORCING STEEL (60,000 PSI)	LBS.	736
1/2" PLATE	LBS.	163
1 3/4" DIA. PT BAR	LF	31.2



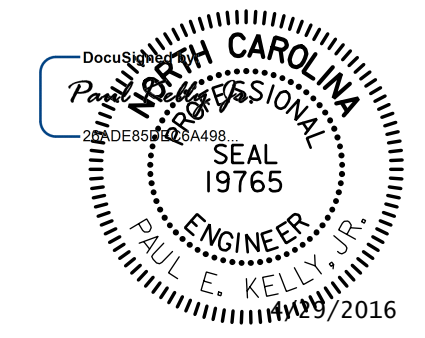
## PIER 2 TEMPORARY PRECAST CONCRETE PEDESTAL

- NOTES:**
- FOR TEMPORARY PEDESTAL CONSTRUCTION SEQUENCE, SEE SHEET TITLED "PIER 3 TEMPORARY PEDESTAL".
  - FOR TEMPORARY SPAN GENERAL NOTES, SEE SHEET TITLED "TEMPORARY SPAN GENERAL NOTES".
  - CONTRACTOR MAY ADJUST REINFORCING SLIGHTLY AS NECESSARY TO AVOID PREFORMED HOLES AND BLOCKOUTS.
  - FOR PT BAR, ASSEMBLY, AND ANCHOR PLATE DETAILS AND NOTES, SEE SHEET TITLED "PIER 3 TEMPORARY PEDESTAL".
  - CHAMFER 3/4" X 3/4" (TYP.).
  - PT = POST TENSIONED

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 15 OF 16

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

### PIER 2 TEMPORARY PEDESTAL



REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

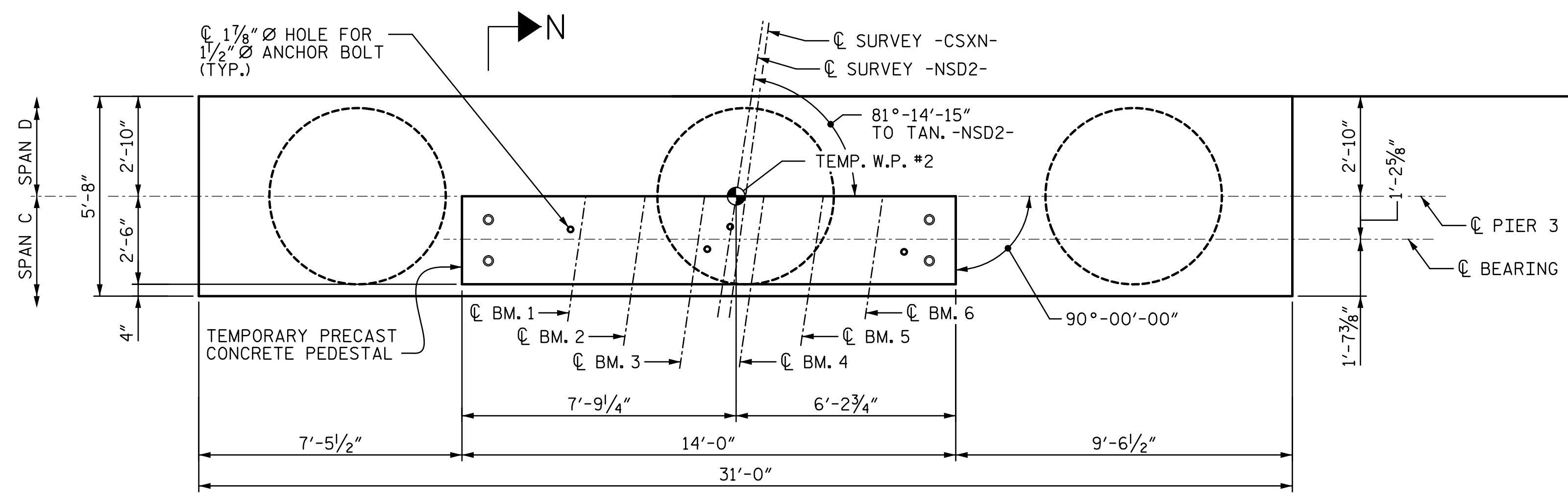
TOTAL SHEETS: 68

DRAWN BY: MTC DATE: 06-14  
 CHECKED BY: DJM DATE: 06-14

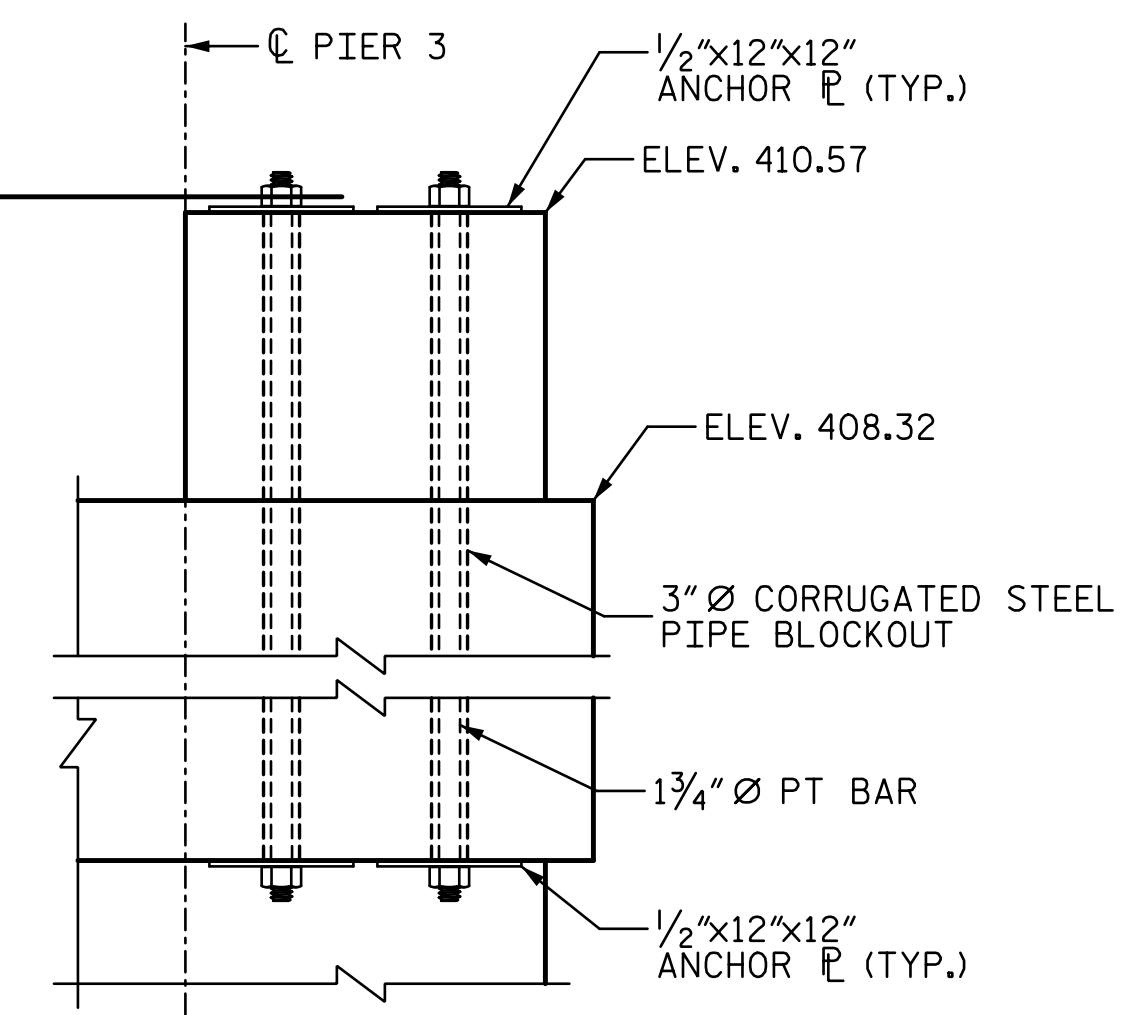
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV / Ralph Whitehead Associates, Inc.  
 900 W Trade Street, Suite 715  
 Charlotte, NC 28202  
 NC License No. F-0991

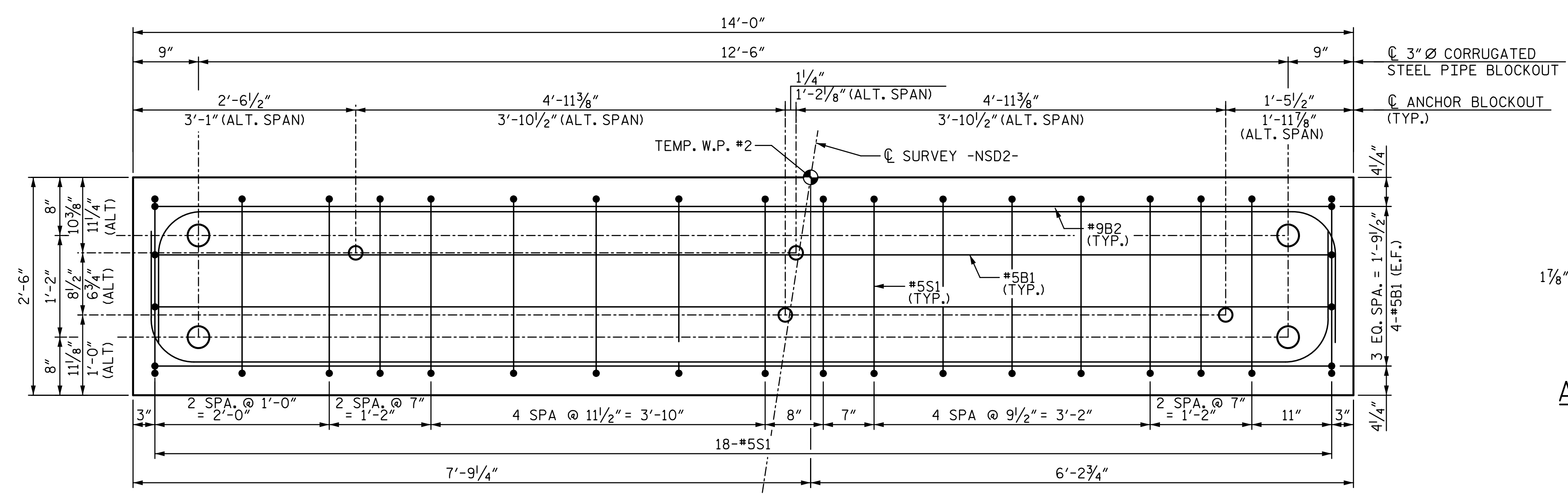
4/29/2016 12:33:45 PM I:\PROJ\251325\ustation\struct\Temporary\_Span\404\_066\_U3308\_SMU\_T515.dgn



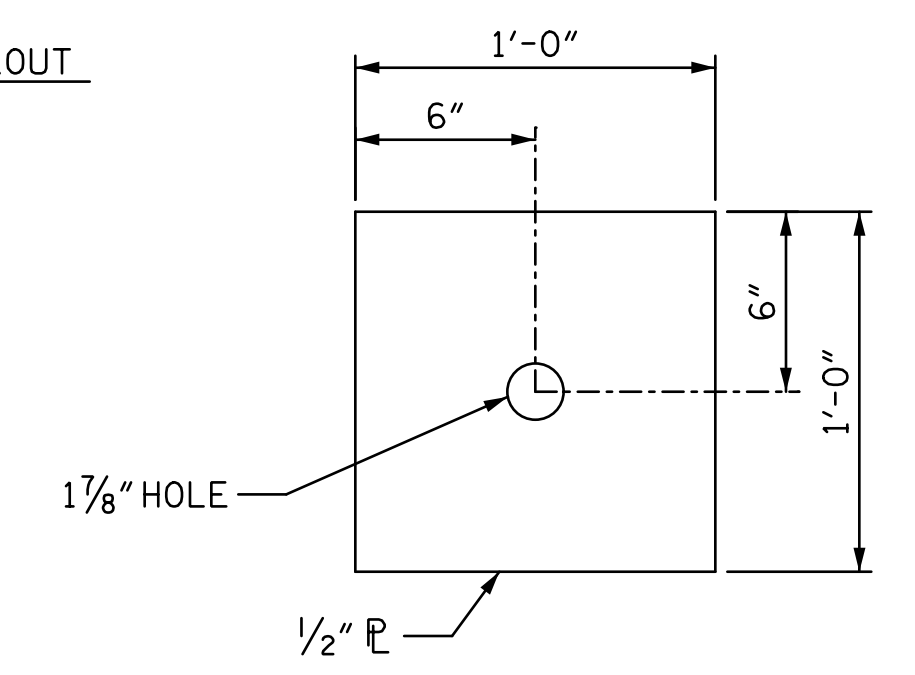
PLAN - PIER 3



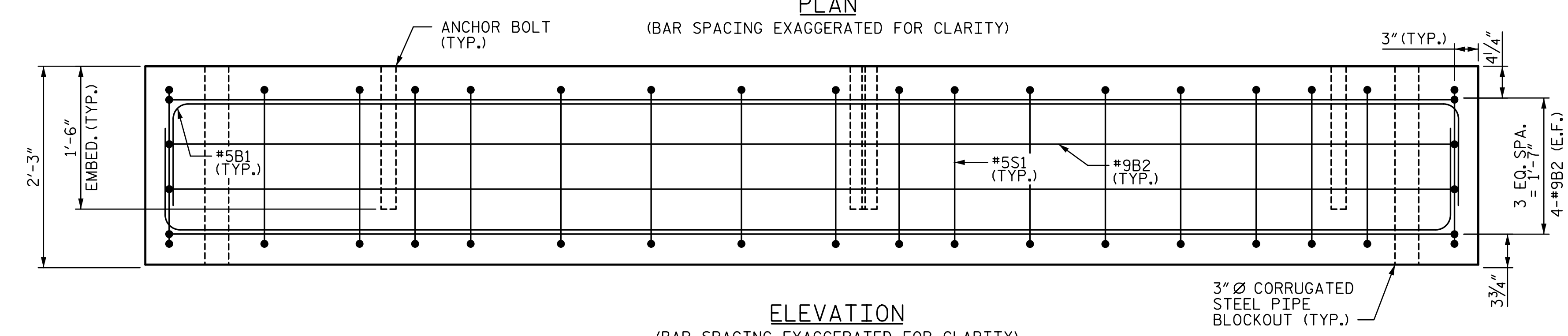
SECTION N-N



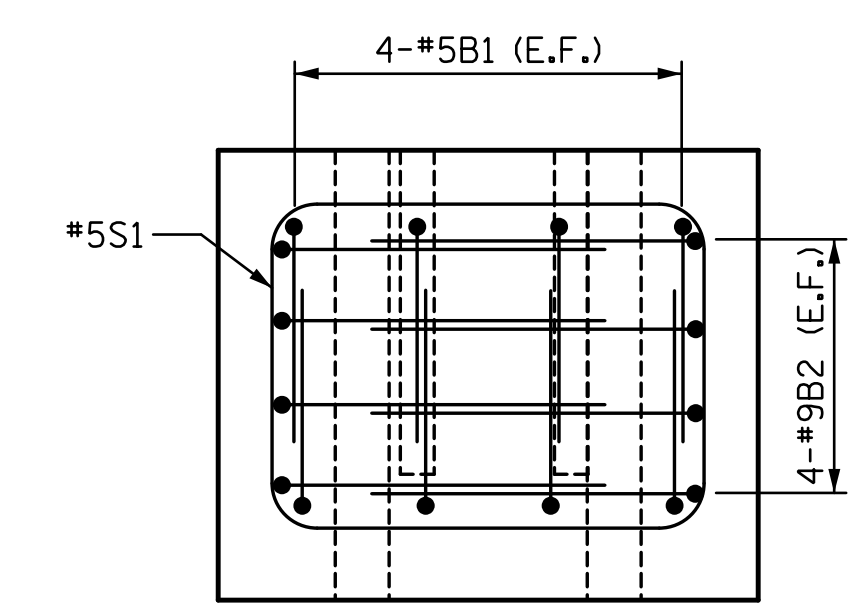
PLAN



ANCHOR PLATE DETAIL  
(QTY. 8 EA. PEDESTAL)



ELEVATION



END VIEW

PIER 3 TEMPORARY PRECAST CONCRETE PEDESTAL

TEMPORARY PEDESTAL CONSTRUCTION PROCEDURE:

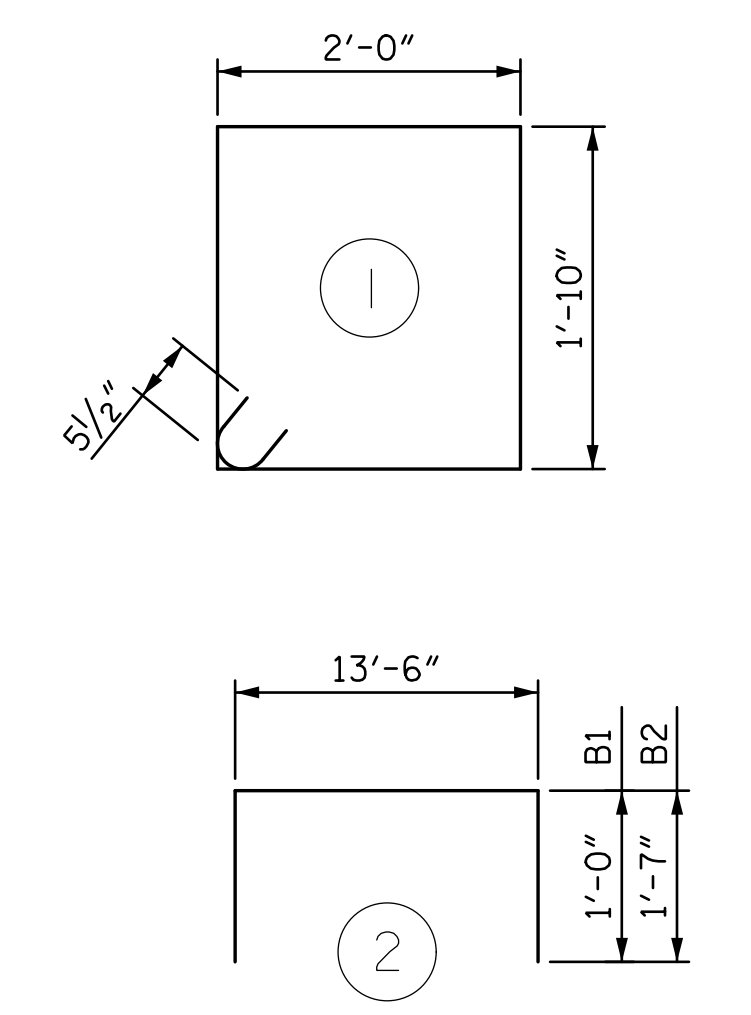
1. PLACE TEMPORARY PRECAST CONCRETE PEDESTAL ON PIER CAP.
2. INSTALL 1 3/4" DIA. PT BAR AND TENSION TO A FINAL FORCE OF 120 KIPS.
3. INSTALL BEARINGS AND ANCHORS FOR TEMPORARY SPAN.
4. UPON REMOVAL OF TEMPORARY SPAN, REMOVE TEMPORARY PEDESTAL AND PT BARS. GROUT 3" DIA. CORRUGATED BLOCKOUT IN PIER CAP USING NON-SHRINK GROUT.

NOTES:

1. FOR ANCHOR BLOCKOUT DETAIL, SEE SHEET TITLED "PIER 2 TEMPORARY PEDESTAL".
2. FOR TEMPORARY SPAN GENERAL NOTES, SEE SHEET TITLED "TEMPORARY SPAN GENERAL NOTES".
3. CONTRACTOR MAY ADJUST REINFORCING SLIGHTLY AS NECESSARY TO AVOID PREFORMED HOLES AND BLOCKOUTS.
4. FOR PT BAR, USE WILLIAMS FORM ENGINEERING CORP., "150-KSI ALL-THREAD-BAR" OR APPROVED EQUAL.
5. PT BAR ASSEMBLY AND PROTECTION SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
6. CHAMFER 3/4" X 3/4" (TYP.)
7. PT = POST TENSIONED

REINFORCING BAR SCHEDULE					
PIER 3 TEMPORARY PEDESTAL					
MARK	NO.	SIZE	TYPE	LENGTH (ft. in.)	WEIGHT (lb.)
B1	8	5	2	15'-6"	130
B2	8	9	2	16'-8"	454
S1	18	5	1	8'-7"	161

BAR TYPES



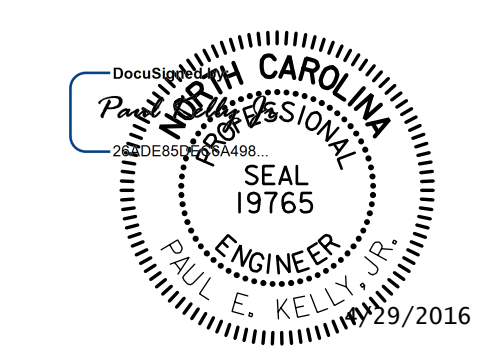
QUANTITIES - PIER 3 TEMPORARY PEDESTAL

ITEMS	UNIT	QUANTITY
PRECAST CONCRETE (5,000 PSI)	C.Y.	2.9
REINFORCING STEEL (60,000 PSI)	LBS.	745
1/2" PLATE	LBS.	163
1 3/4" DIA. PT BAR	LF	31.2

PROJECT NO. U-3308  
 DURHAM COUNTY  
 STATION: 24+55.20 -LALT-  
13+22.18 -CSXN-  
 SHEET 16 OF 16

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

PIER 3 TEMPORARY PEDESTAL



REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 68

4/29/2016 12:33:18 PM I:\PROJ\251325\ustation\struct\Temporary Span\404\_067\_U3308\_SMU\_TSI6.dgn

DRAWN BY: MTC DATE: 06-14  
 CHECKED BY: DJM DATE: 06-14

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

STV / Ralph Whitehead Associates, Inc.  
 900 W Trade Street, Suite 715  
 Charlotte, NC 28202  
 NC License No. F-0991