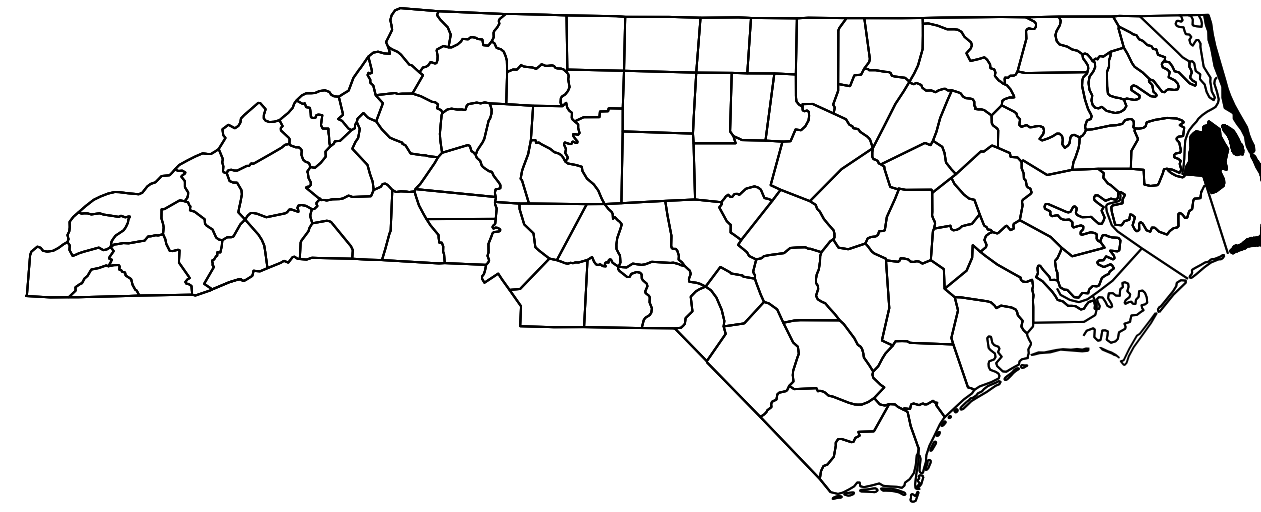


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CONTRACT: DA00454 PROJECT: ISP.10281.28

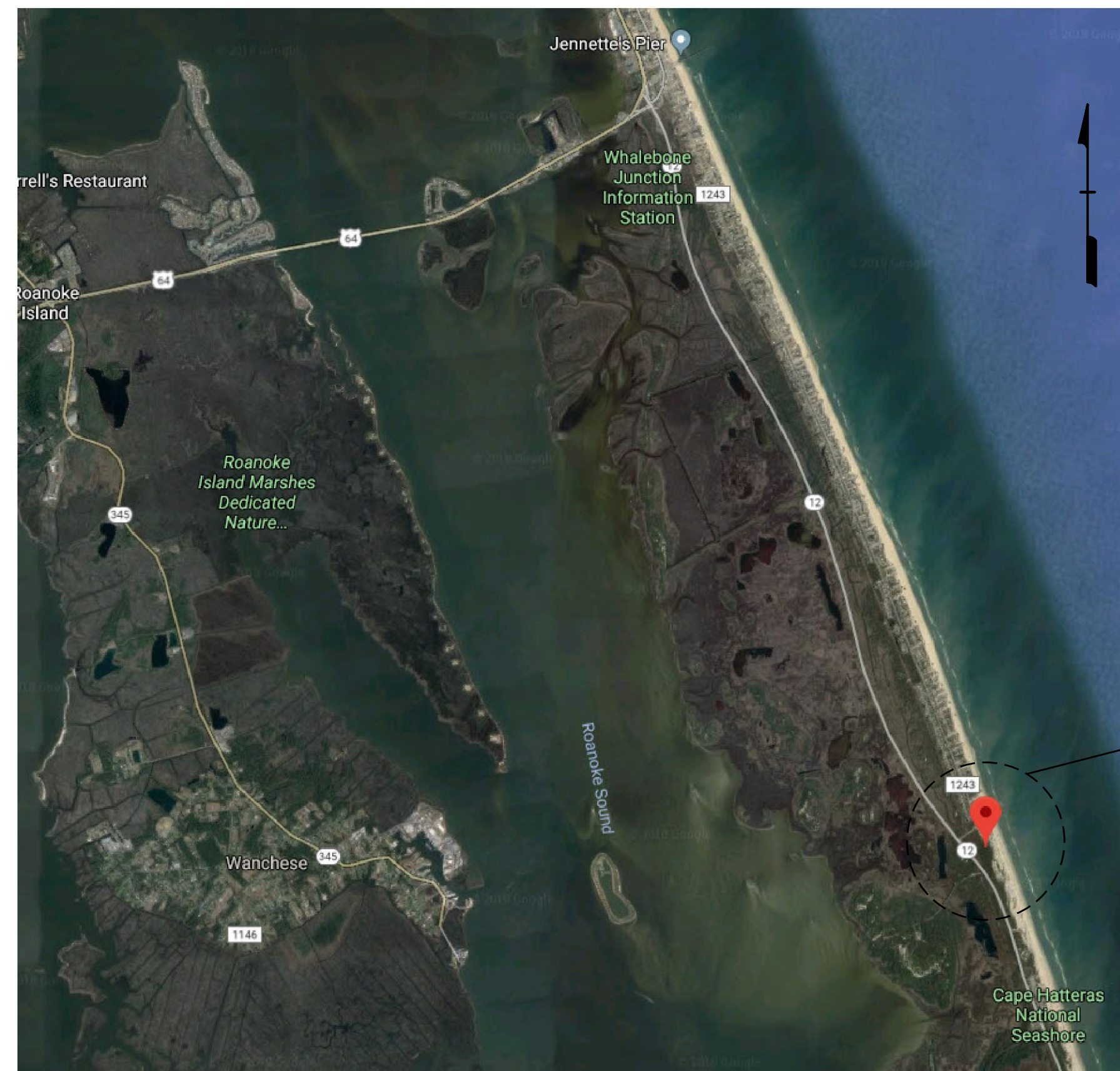


STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

DARE COUNTY

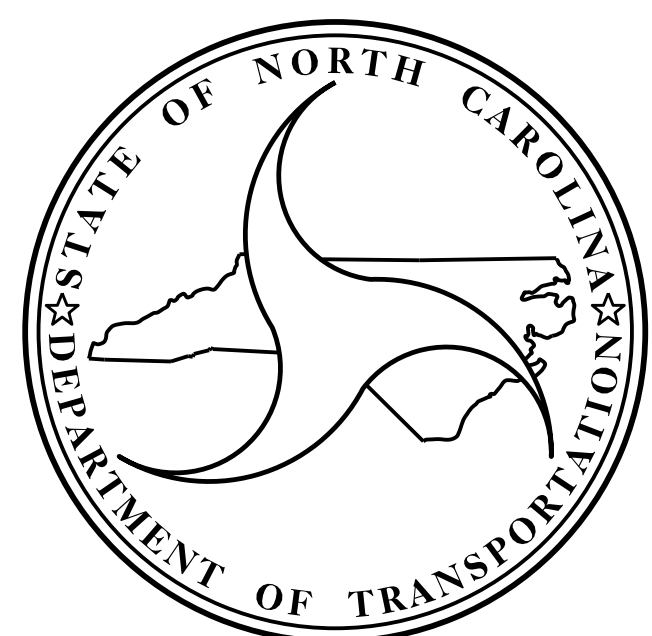
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	ISP.10281.28	A1	5
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

LOCATION: CAPE HATTERAS NATIONAL PARK STORMWATER OUTFALL.
TYPE OF WORK: EXTENSION OF EXISTING STORMWATER PIPE.



PROJECT LOCATION

VICINITY MAP



DESIGN DATA

PROJECT LENGTH

Prepared in the Office of:
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

STRUCTURES MANAGEMENT UNIT
 1000 BIRCH RIDGE DR. RALEIGH, N.C. 27610

KRISTY W. ALFORD, P.E.
 PROJECT ENGINEER

2018 STANDARD SPECIFICATIONS

LETTING DATE:

P. KOREY NEWTON, P.E.
 PROJECT DESIGN ENGINEER

NOTES

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 N.C. DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES."

EXISTING PIPE AND PIPE EXTENSION DETAILS INDICATED ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. 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 PIPING AND EXTENSION DETAILS SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THE DISTANCES AND ELEVATIONS ARE DERIVED FROM THE THE BEST INFORMATION AVAILABLE. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE DIAMETER, SPACING, SLOPE AND ELEVATION OF THE EXISTING PIPES.

THE CONTRACTOR SHALL VERIFY THAT THE PROPOSED PIPE EXTENSION LENGTH IS ADEQUATE TO ACCOMODATE THE PROPOSED WIDTH OF THE SHORELINE.

THE CONTRACTOR SHALL VERIFY THAT THE PROPOSED PIPE IS ALIGNED PARALLEL WITH AND ON A SIMILAR SLOPE TO THE EXISTING PIPE PRIOR TO CASTING THE PIPE COLLAR. SECURE THE PIPES BEFORE CONCRETE PLACEMENT TO PROHIBIT PIPE MOVEMENT.

THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THE PRECAST PIPE COLLARS WILL FIT THE PROPOSED PIPES.

ALL REINFORCING STEEL SHALL BE GRADE 60 EPOXY COATED.

ALL BAR SUPPORTS USED SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

MAINTAIN 3" MIN. CL. TO ALL REINFORCING STEEL UNLESS OTHERWISE SPECIFIED.

CHAMFER ALL CORNERS 3/4".

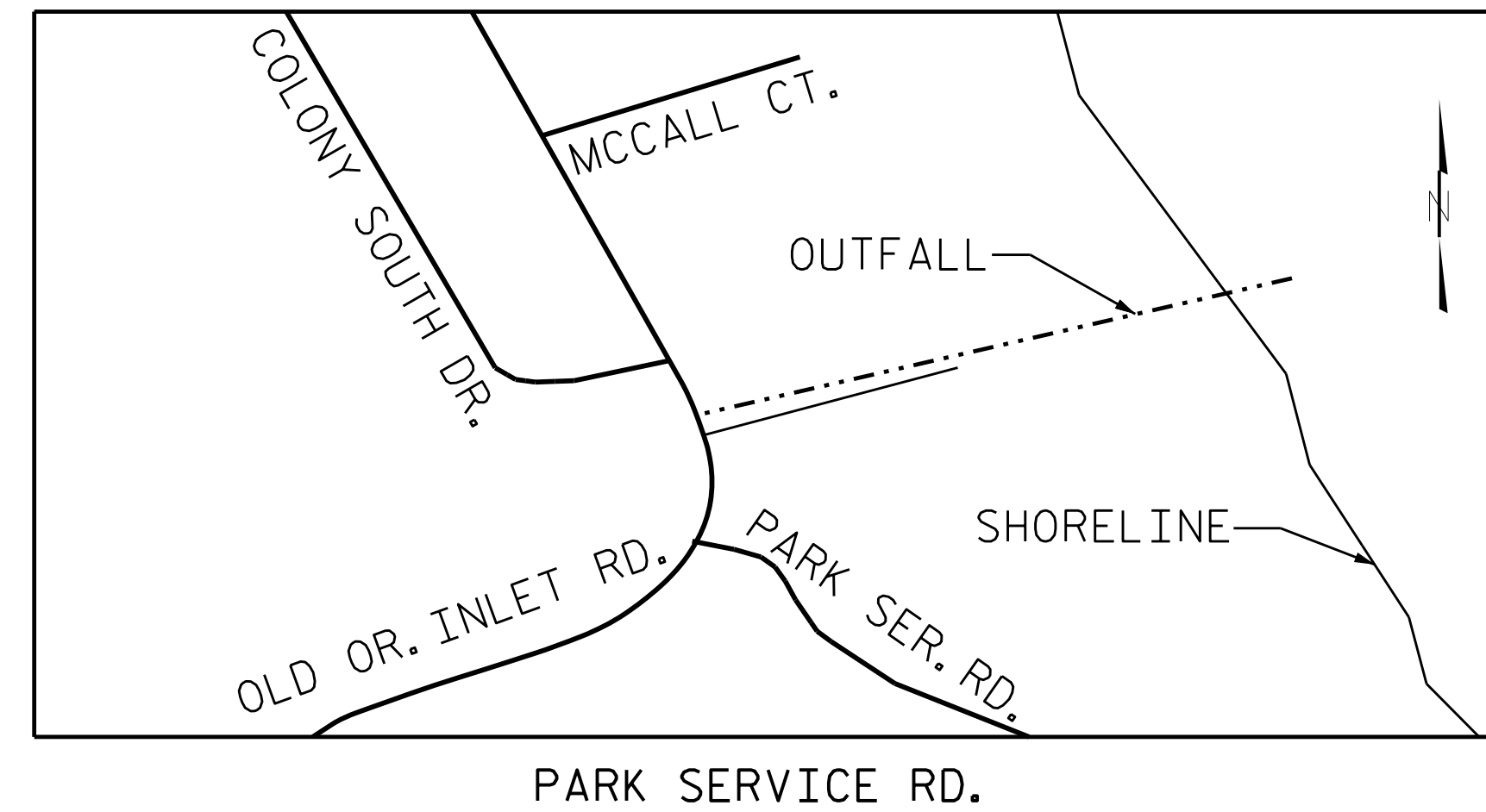
PROPOSED POLYETHYLENE PIPE TO BE ISCO SNAP-TITE PIPE OR EQUIVALENT.

PLACE PILES SO AS TO MAINTAIN SLOPE OF THE EXISTING PIPE.

CONTRACTOR SHALL SUPPLY PILE COLLAR TO MAINTAIN GROUT VOID BETWEEN PRE-CAST CAP AND PILE.

STAINLESS STEEL ROD ASSEMBLIES SHALL BE GRADE 316; TIGHTEN ALL ASSEMBLIES TO SNUG-TIGHT CONDITION AND BURR THREADS AFTER INSTALLATION.

THE CONCRETE IN THE PIPE COLLARS SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB OF CEMENT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE PRECAST PILE CAPS.



VICINITY MAP

GROUT NOTES

USE GROUT THAT IS A COMMERCIALY MANUFACTURED NON-SHRINK, NON-METALLIC MATERIAL MEETING THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS WHEN WATER OR WATER AND AGGREGATE IS ADDED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

THE GROUT SHALL BE FREE OF SOLUBLE CHLORIDES AND CONTAIN LESS THAN 1% SOLUBLE SULFATE.

INITIAL SETTING TIME SHALL NOT BE LESS THAN 10 MINUTES WHEN TESTED IN ACCORDANCE WITH ASTM C266.

COMPRESSIVE STRENGTH SHALL BE AT LEAST 5000 PSI AT 3 DAYS.

COMPRESSIVE STRENGTH IN THE LABORATORY WILL BE DETERMINED IN ACCORDANCE WITH ASTM C109 EXCEPT THAT THE TEST MIX SHALL CONTAIN ONLY WATER AND THE DRY MANUFACTURED MATERIAL. COMPRESSIVE STRENGTH WILL BE DETERMINED IN THE FIELD BY MOLDING AND TESTING 4" X 8" CYLINDERS IN ACCORDANCE WITH AASHTO T22.

WHEN TESTED IN ACCORDANCE WITH ASTM C666, PROCEDURE A, THE DURABILITY FACTOR OF THE GROUT SHALL NOT BE LESS THAN 80.

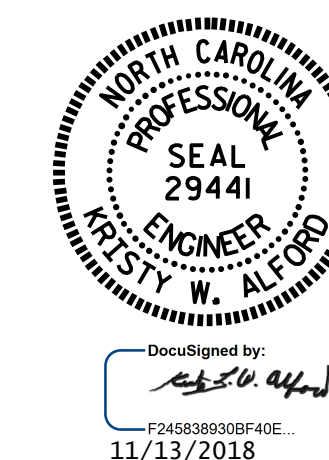
THE QUALITY OF WATER ADDED TO THE MIX SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

AGGREGATE MAY BE ADDED TO THE MIX ONLY WHERE RECOMMENDED OR PERMITTED BY THE MANUFACTURER. THE QUANTITY AND GRADATION OF THE AGGREGATE WILL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

FURNISH A TYPE 4 MATERIAL CERTIFICATION SHOWING RESULTS OF TESTS CONDUCTED TO DETERMINE THE PROPERTIES LISTED IN THE STANDARD SPECIFICATIONS AND TO ASSURE THAT THE MATERIAL IS NON-SHRINK.

THE ENGINEER RESERVES THE RIGHT TO REJECT MATERIAL BASED ON UNSATISFACTORY PERFORMANCE.

DARE COUNTY



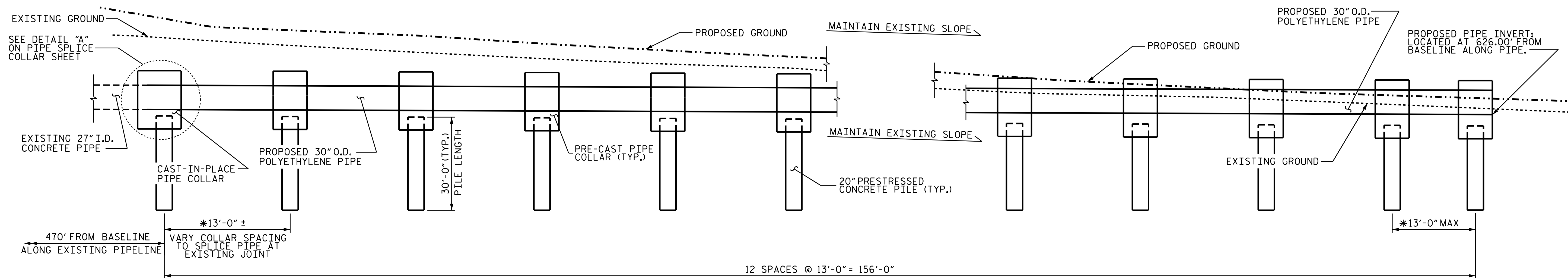
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**GENERAL NOTES
AND
VICINITY MAPS**

DRAWN BY : G.W. DICKEY DATE : 4/18
CHECKED BY : T. SHERRILL DATE : 4/18

DOCUMENT NOT CONSIDERED
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			5



ELEVATION AT PARK SERVICE RD. OUTFALL

* REDUCE SPACING IF NEEDED TO MAINTAIN PROPOSED PIPE INVERT. PIPE MAY EXTEND A MAXIMUM OF 2'-0" BEYOND FACE OF COLLAR.

DARE COUNTY

SHEET 2 OF 2



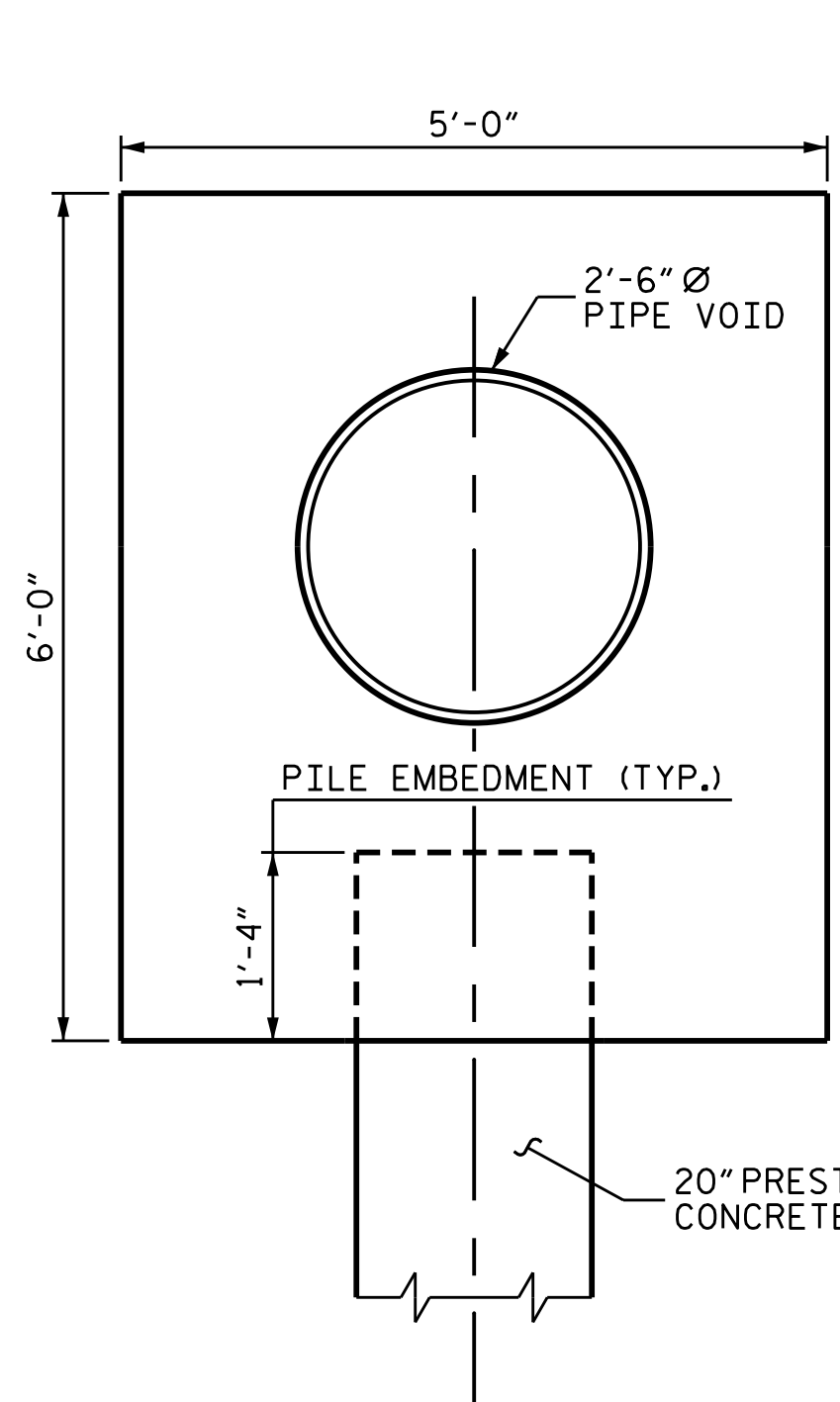
DocuSigned by:
11/13/2018

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
LAYOUT
AND
ELEVATION

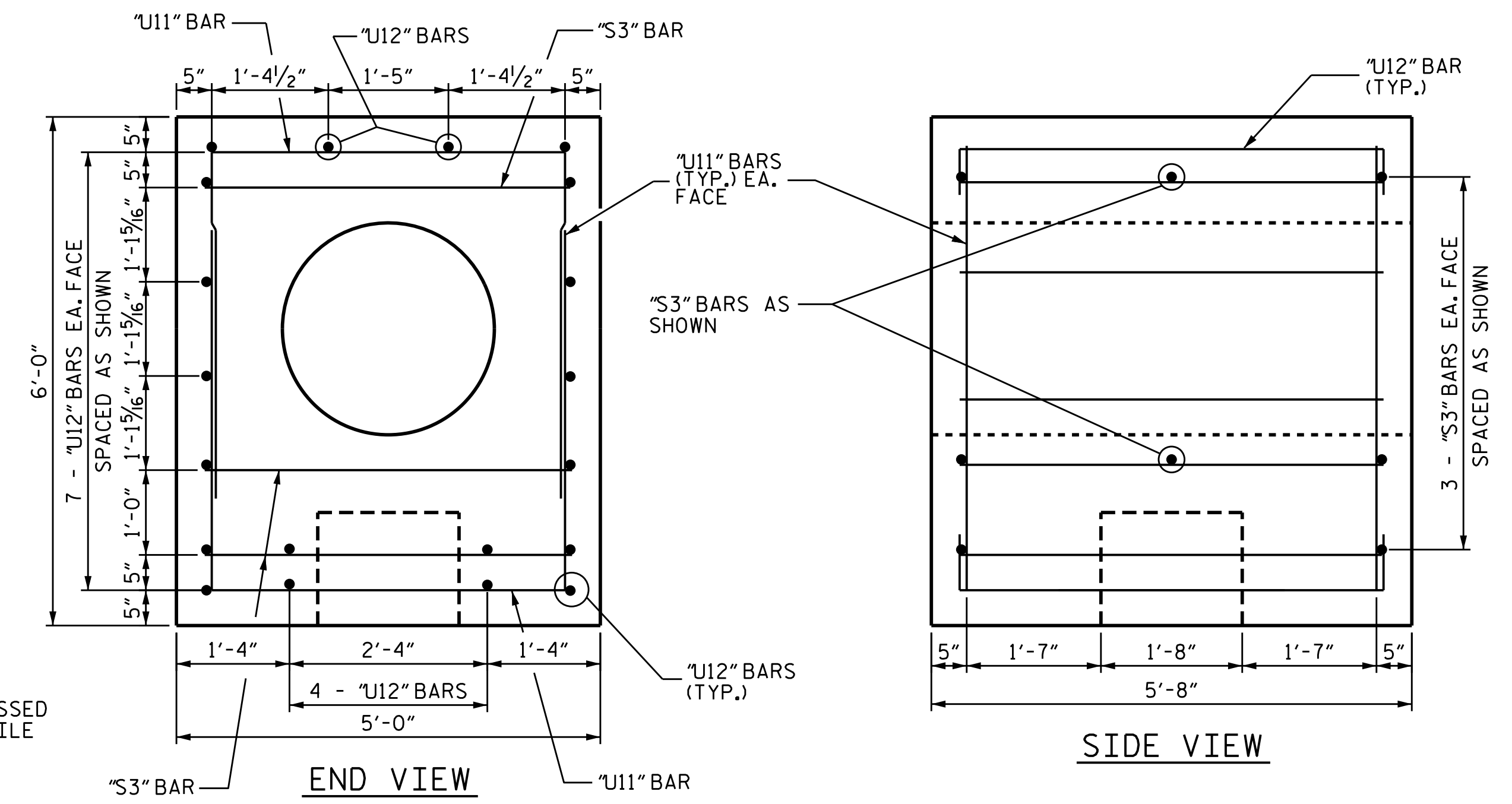
DRAWN BY : G.W. DICKEY DATE : 4/18
CHECKED BY : T. SHERRILL DATE : 4/18

DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			5

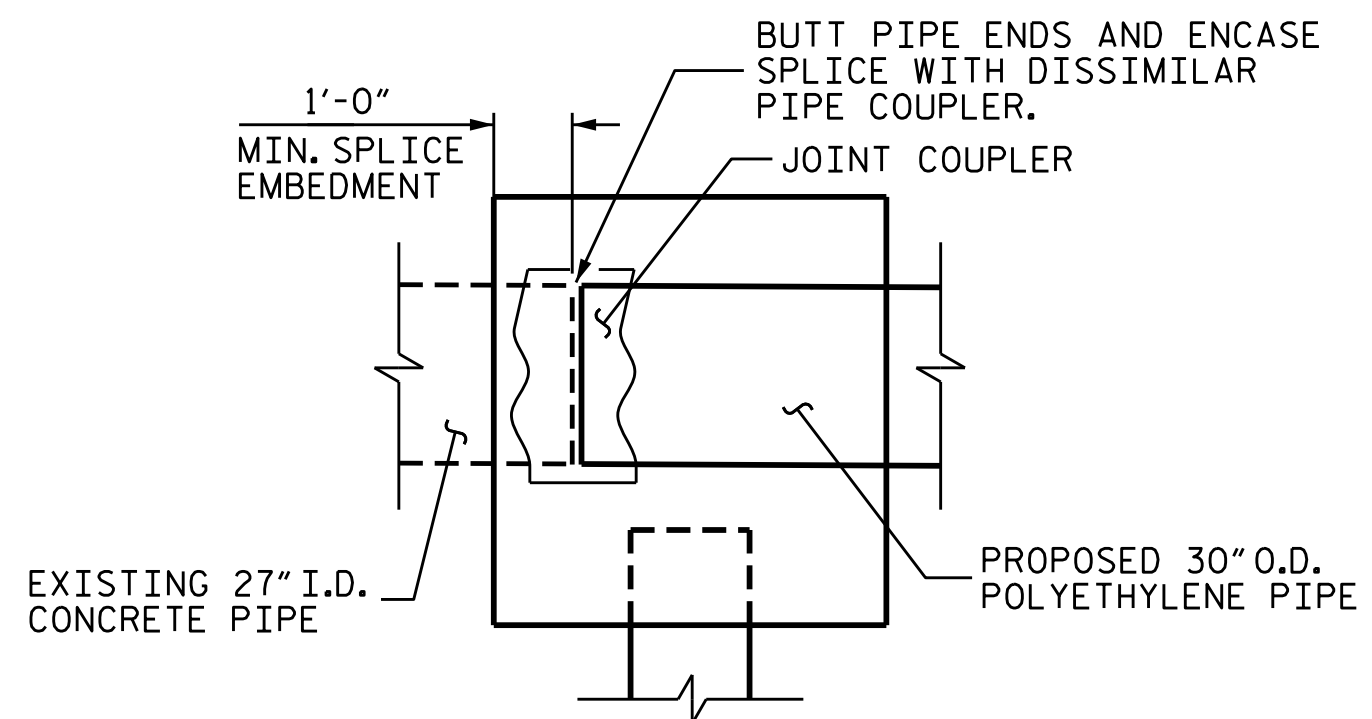


CAST-IN-PLACE PIPE COLLAR



REINFORCING DETAILS

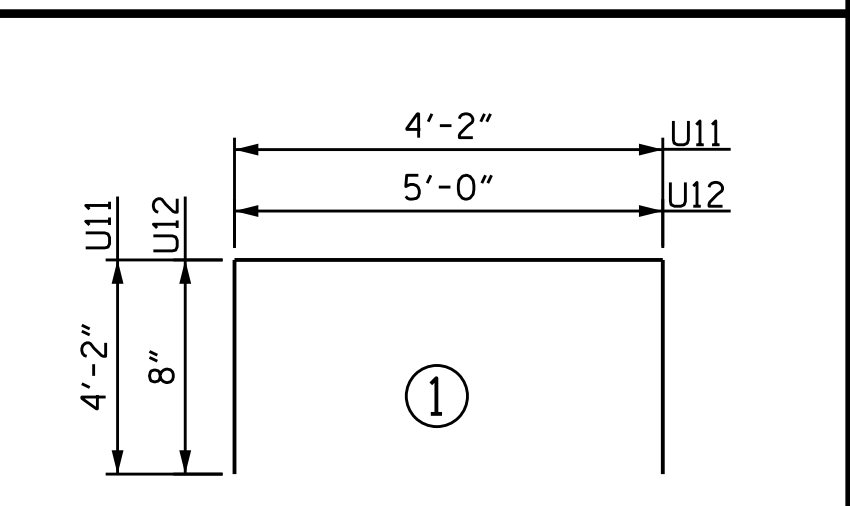
SINGLE PIPE SPLICE
(1 REQ'D @ PARK SERVICE RD. LOCATION)



DETAIL "A": CAST-IN-PLACE SPLICE COLLAR

SINGLE SPLICE COLLAR

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

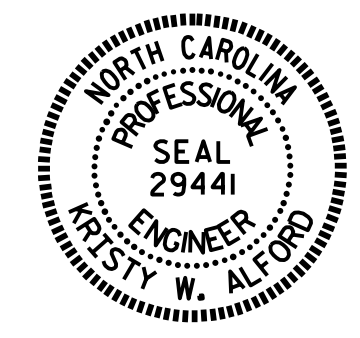
BILL OF MATERIAL
1 COMPLETE ASSEMBLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S3	8	#6	STR	4'-4"	52
* U11	4	#8	1	12'-6"	134
* U12	20	#4	1	6'-4"	85

EPOXY COATED REINF. STEEL = 271 LBS

CLASS AA CONCRETE = 5.1 C.Y.

DARE COUNTY



DocuSigned by:
Kesty W. Alford
11/13/2018

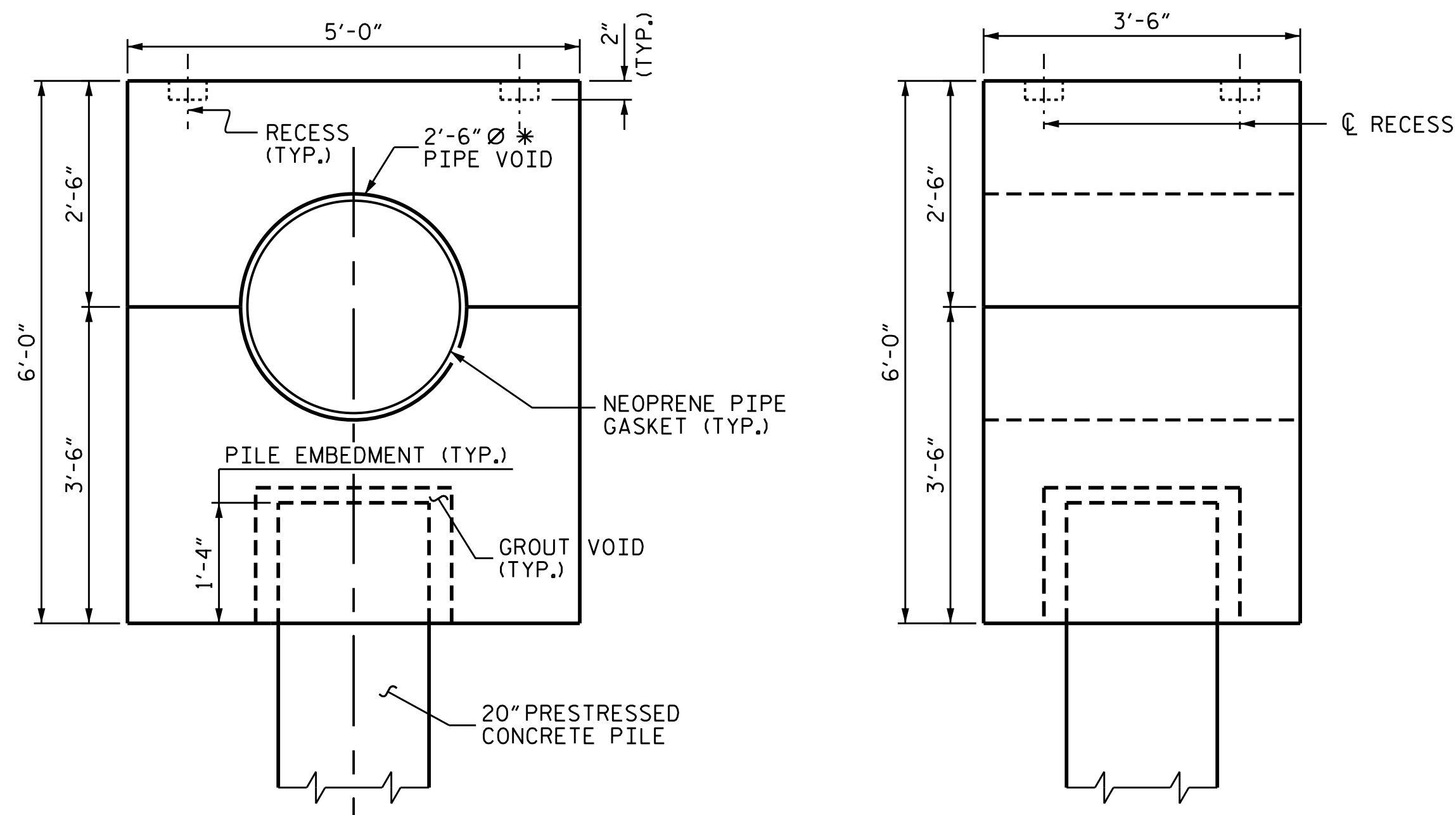
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PIPE SPLICE COLLAR

DRAWN BY : G.W. DICKEY DATE : 4/18
CHECKED BY : T. SHERRILL DATE : 4/18

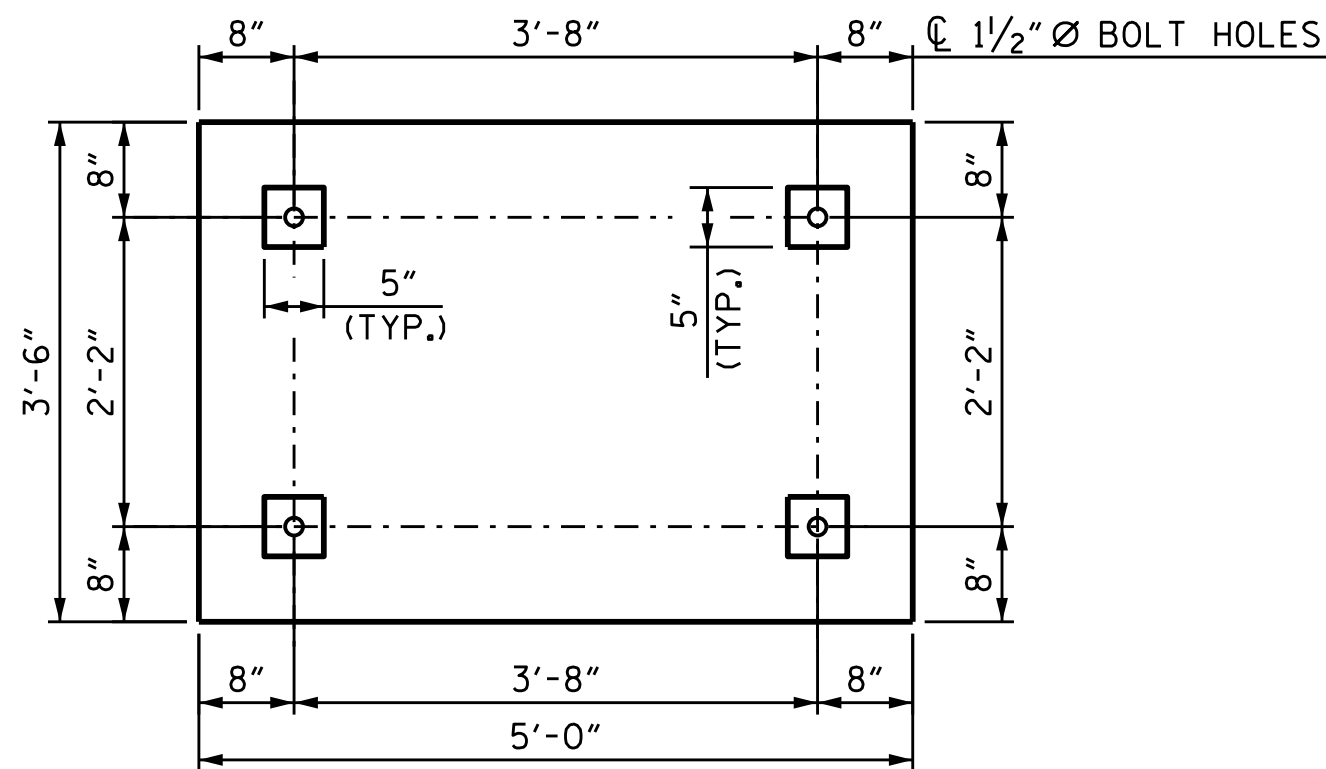
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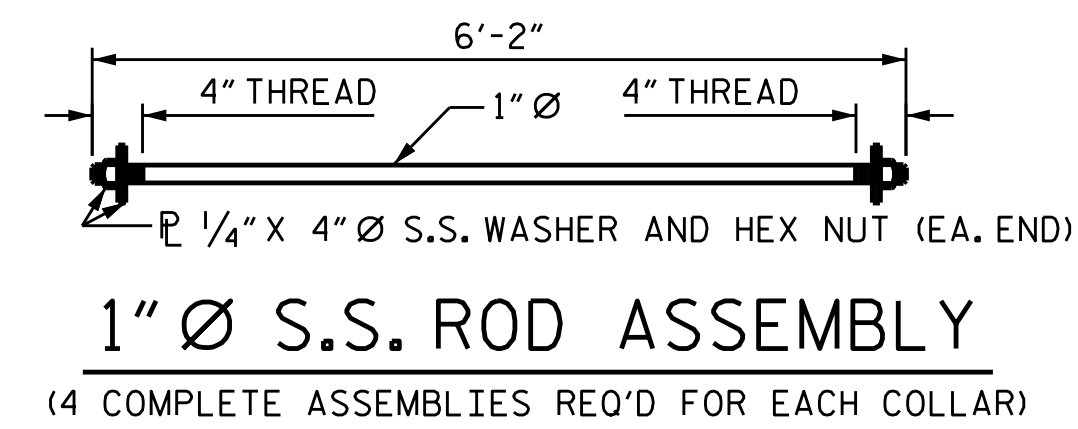


PRECAST PIPE COLLAR

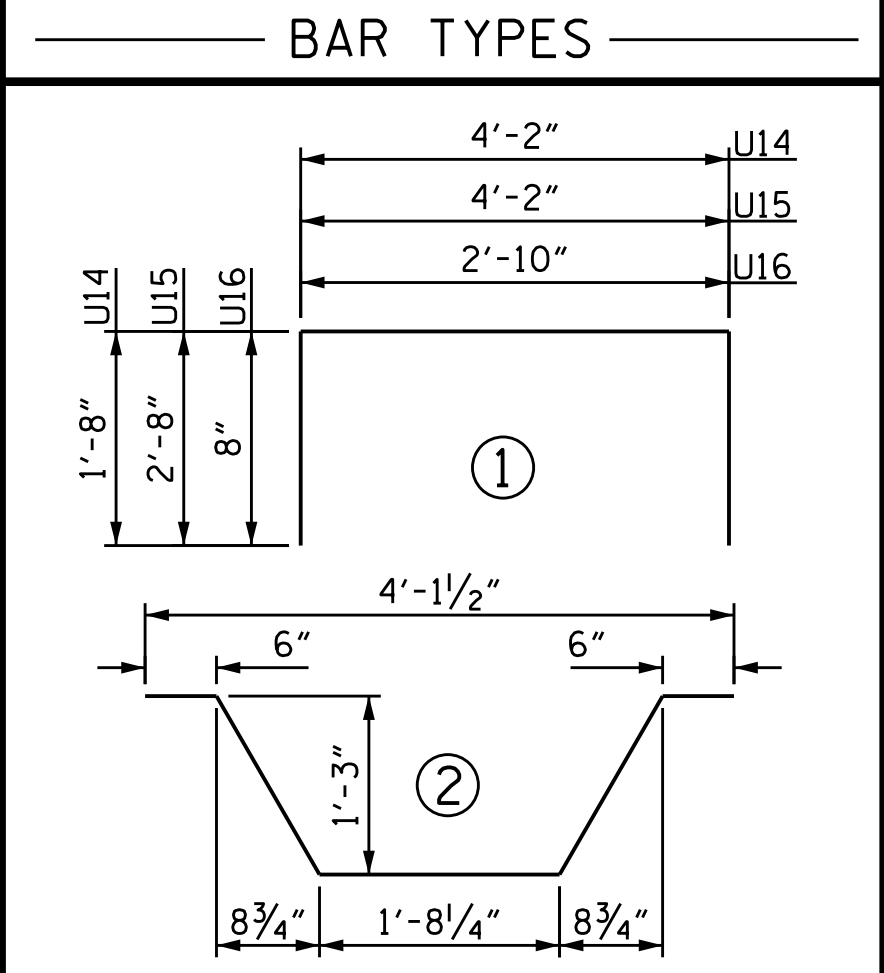
* CONSTRUCT VOID SIZE BASED UPON O.D. OF PIPE



TOP VIEW



1" Ø S.S. ROD ASSEMBLY
(4 COMPLETE ASSEMBLIES REQ'D FOR EACH COLLAR)



ALL BAR DIMENSIONS ARE OUT TO OUT.

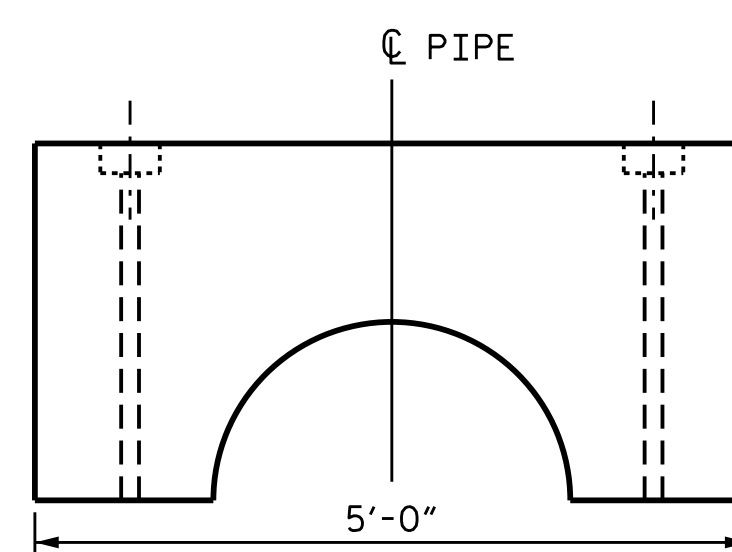
BILL OF MATERIAL

1 COMPLETE ASSEMBLY

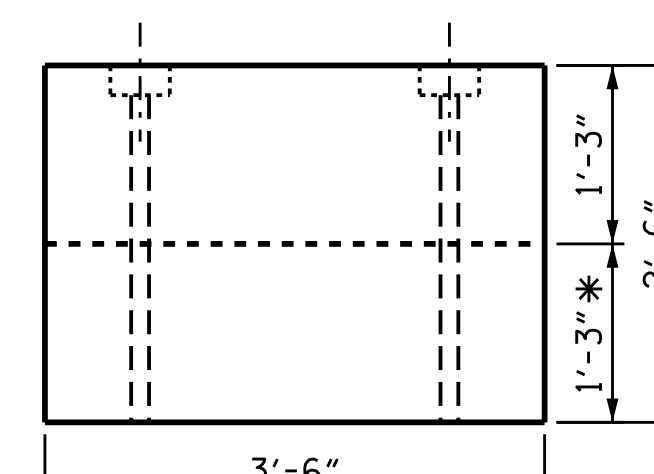
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S4	8	#6	STR	4'-4"	52
* U14	2	#8	1	7'-6"	40
* U15	2	#8	1	9'-6"	51
* U16	20	#4	1	4'-2"	56
* U17	6	#6	2	5'-7"	50

EPOXY COATED REINF. STEEL = 249 LBS

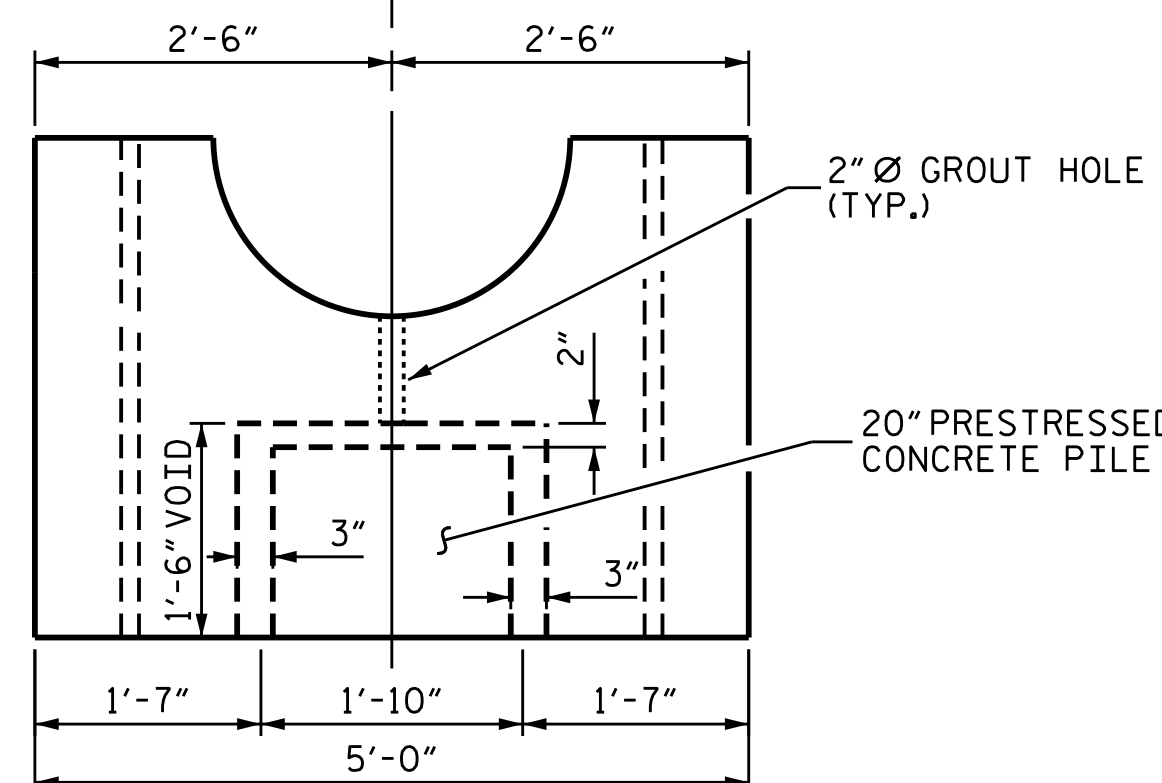
CLASS AA CONCRETE = 3.0 C.Y.



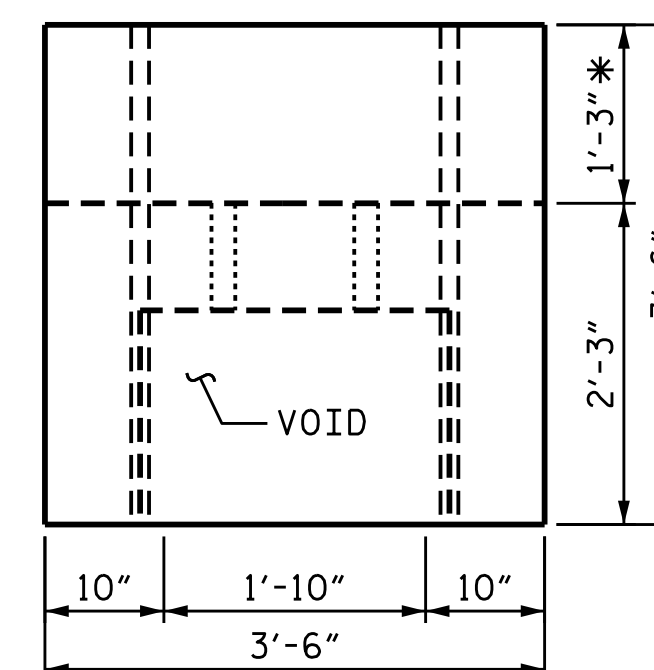
UPPER SECTION



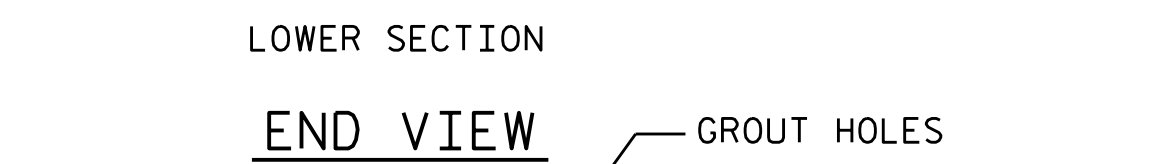
UPPER SECTION



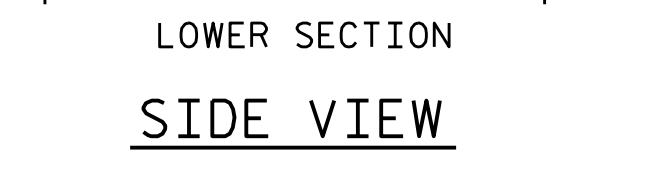
LOWER SECTION



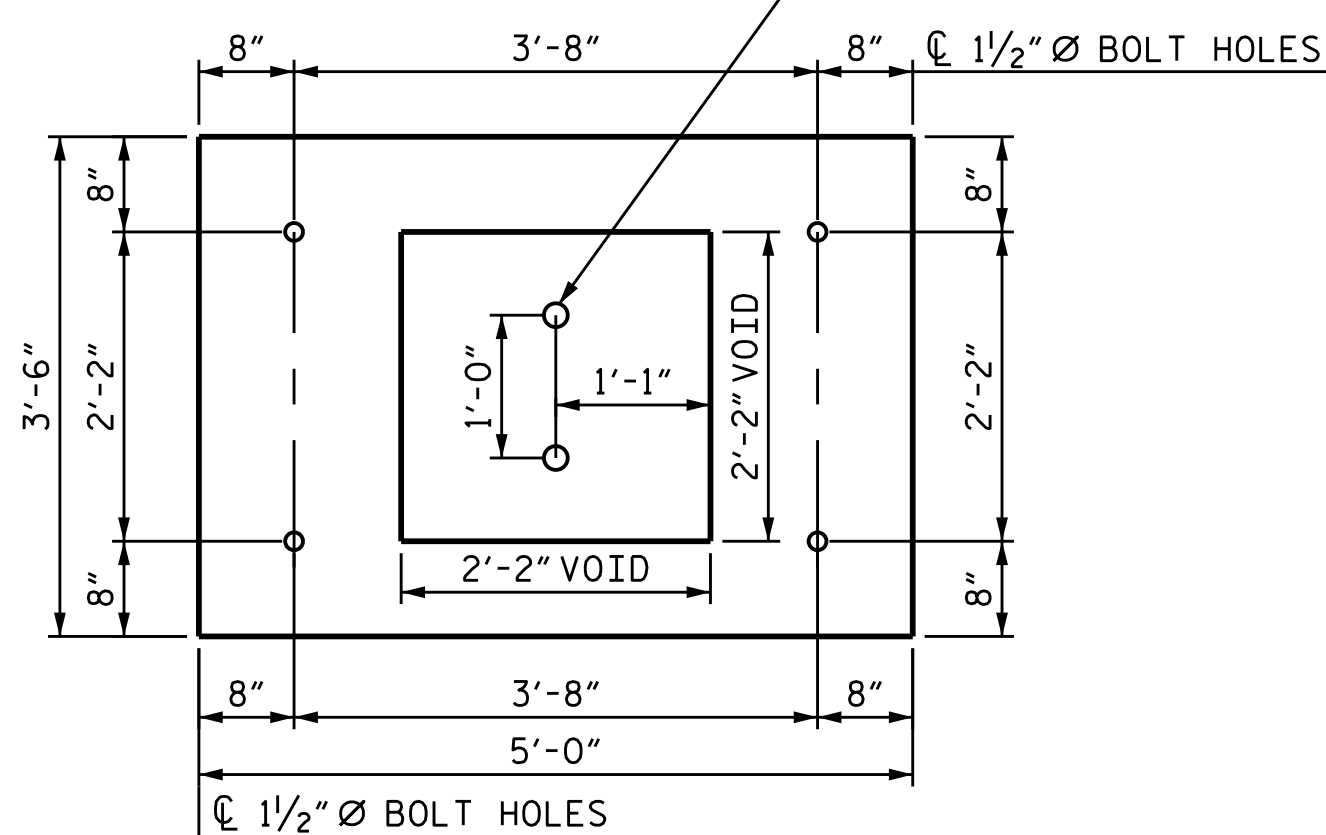
LOWER SECTION



END VIEW



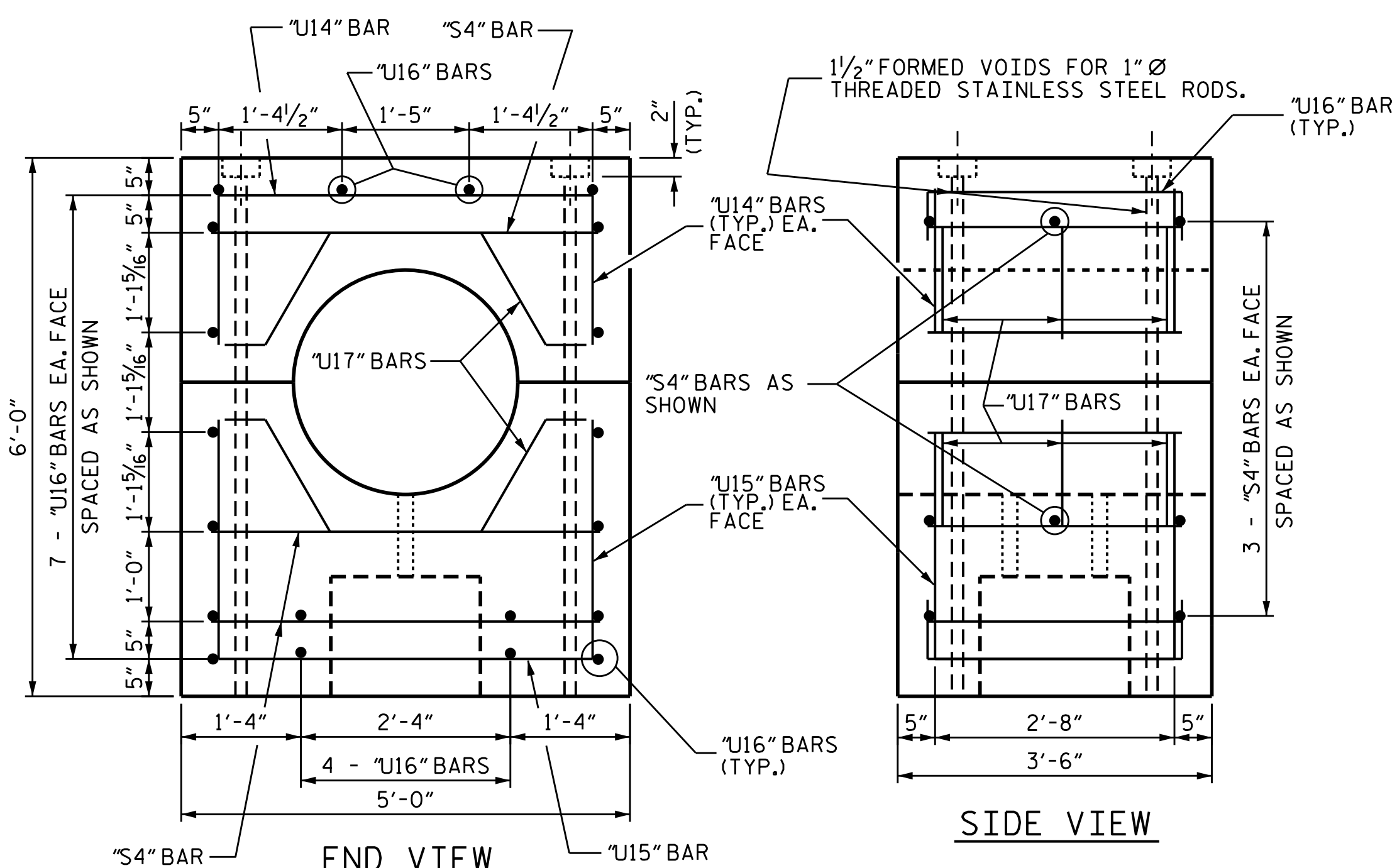
SIDE VIEW



BOTTOM VIEW

(TOP VIEW SIMILAR WITH THE EXCEPTION OF PILE VOID)

PIPE COLLAR DETAILS



REINFORCING DETAILS

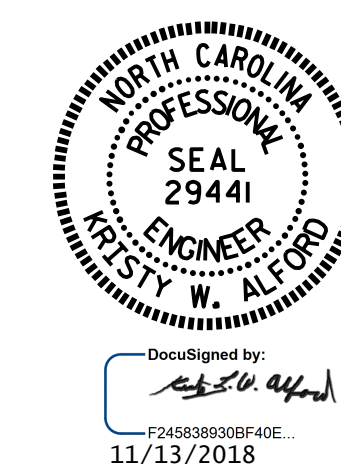
* CONSTRUCT VOID SIZE BASED ON O.D. OF PIPE.

DARE COUNTY

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

OCEAN OUTFALL

PRECAST PILE CAP
SINGLE PIPE



DocuSigned by:
Kesty W. Alford
11/13/2018

DRAWN BY: G.W. DICKEY DATE: 4/18
CHECKED BY: T. SHERRILL DATE: 4/18

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			5

NOTES

PRESTRESSED CONCRETE STRENGTH : $f'_c = 7,500$ PSI

BUILD-UP CONCRETE STRENGTH : $f'_c = 7,500$ PSI

STRAND DATA:

SIZE	GRADE	AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS FORCE
1/2"	270 L.R.	0.153	41,300* PER STRAND	30,980* PER STRAND
0.6"	270 L.R.	0.217	58,600* PER STRAND	43,940* PER STRAND

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS CONFORMING TO AASHTO M203. STRAND SAMPLING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

AT THE CONTRACTOR'S OPTION, 1/2" OR 0.6" STRANDS MAY BE USED IN THE STRAND CONFIGURATION SHOWN IN THE TYPICAL SECTION DETAIL. MIXING OF STRAND SIZE IS NOT ALLOWED.

THE SLIP-FORM METHOD OF CASTING PILES WILL NOT BE PERMITTED.

TRANSFER THE LOAD FROM THE ANCHORAGES TO THE PILE AFTER THE CONCRETE HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.

IF STRAND STRESS IS RELIEVED BY BURNING, THE STRANDS SHALL BE BURNED IN OPPOSITE PAIRS AS INDICATED IN THE TYPICAL PATTERN SHOWN. FOR ANY NUMBER OF STRANDS, BURN IN OPPOSITE PAIRS AND SYMMETRICALLY ABOUT BOTH THE VERTICAL AND HORIZONTAL AXES. STRANDS 1-1 SHALL BE BURNED BEFORE 2-2, ETC. NOT MORE THAN 4 STRANDS, SAY 5-5 AND 6-6, MAY BE BURNED AT ANY ONE SECTION BEFORE THESE SAME PAIRS OF STRANDS ARE BURNED AT BOTH ENDS OF THE BED AND BETWEEN EACH PAIR OF PILES IN THE BED.

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

WHERE CAST-IN-PLACE LIFTING DEVICES ARE NOT USED, PICK-UP POINTS ARE TO BE INDICATED WITH A 2" WIDE BLACK MARK.

DRIVE PILES USING A METHOD APPROVED BY THE ENGINEER, WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED.

DRIVING OF THE BUILT-UP PILE WILL NOT BE PERMITTED UNTIL THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF 5,000 PSI AND UNTIL A PERIOD OF SEVEN DAYS HAS ELAPSED SINCE CASTING OF THE BUILD-UP.

DOWEL INSTALLATION FOR OPTIONAL BUILD-UP

GROUT COMPRESSIVE STRENGTH: $f'_c = 5,000$ PSI

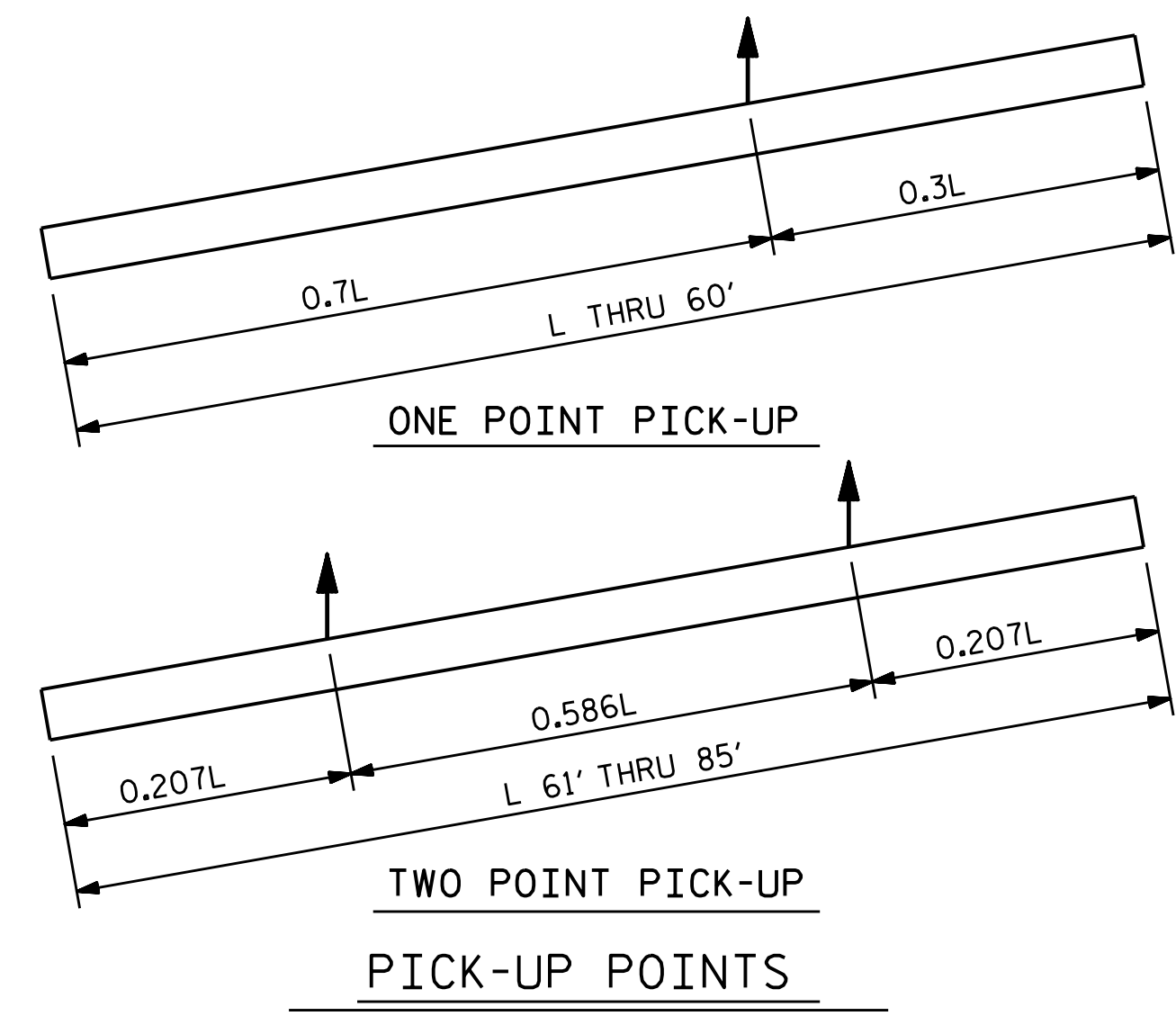
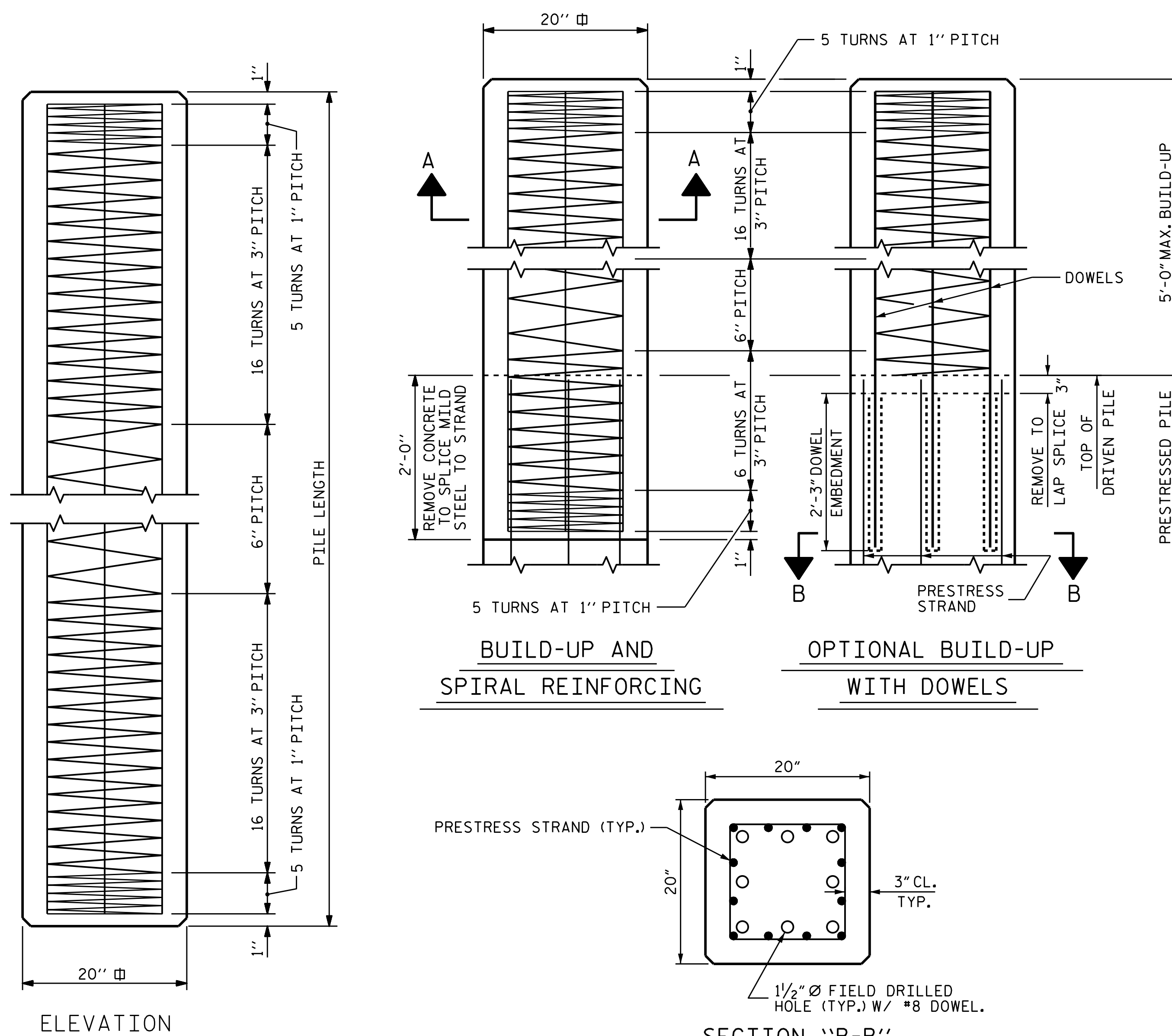
BEFORE DRILLING DOWEL HOLES, REMOVE THE UPPER 3" OF CONCRETE FROM THE TOP OF THE PILE WITHOUT DAMAGE TO THE REINFORCING STEEL. THE REMOVAL PLANE SHOULD BE NORMAL TO THE EDGE OF THE PILE.

DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN 1/2" CLEAR TO ALL EXISTING PRESTRESSING STRANDS IN THE CONCRETE PILE.

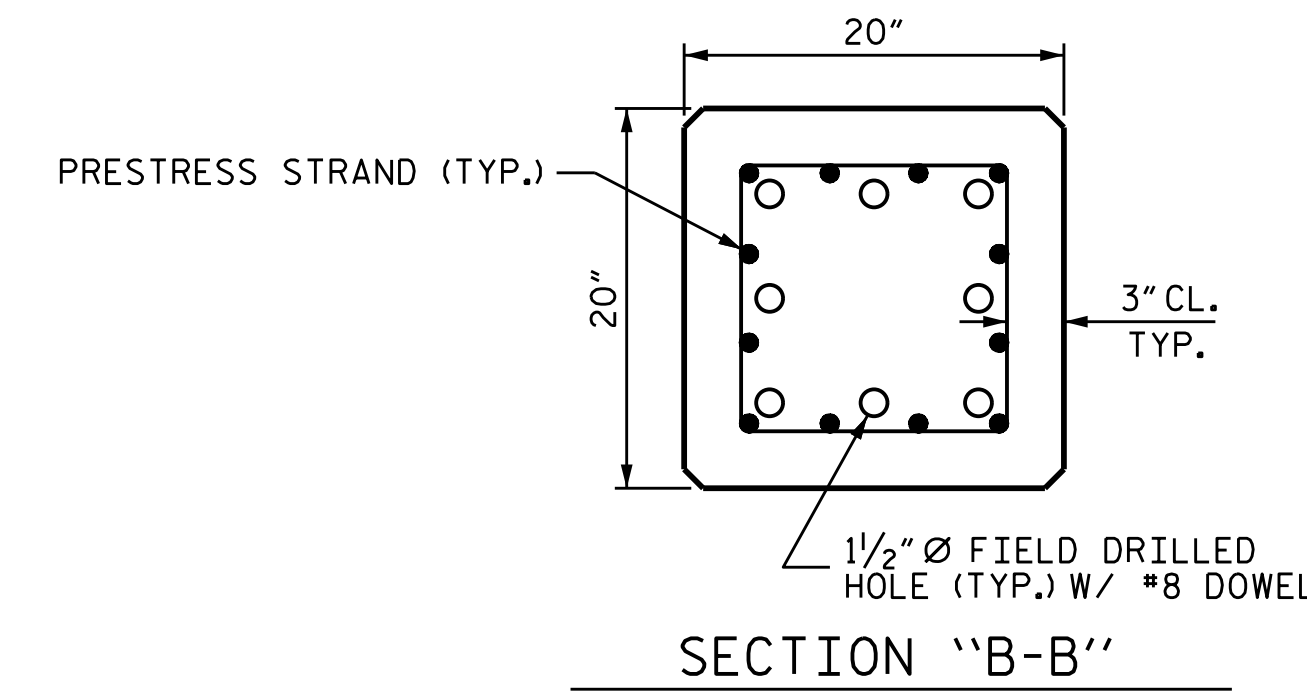
FIELD DRILLED HOLES SHALL BE CLEAN AND FREE OF ANY OBSTRUCTIONS BEFORE GROUTING OF DOWELS. DOWEL BARS SHALL BE INSTALLED AND GROUTED WITH AN APPROVED NON-SHRINK GROUT.

THE SPIRAL REINFORCING IN ALL BUILD-UPS SHALL BE W4.0 COLD DRAWN WIRE WHICH SHALL BE SECURED TO THE LONGITUDINAL REINFORCEMENT TO MAINTAIN PITCH.

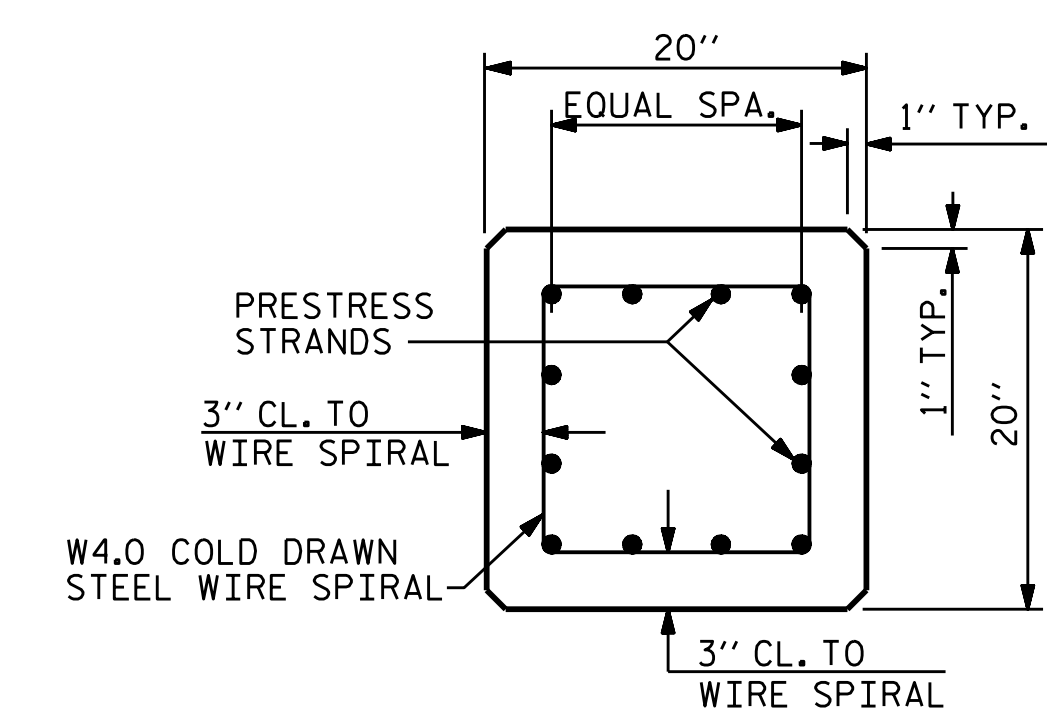
THE SPIRAL REINFORCING IN THE BUILD-UP AND THE PRESTRESSED CONCRETE PILE SHALL BE SPLICED BY OVERLAPPING A MIN. OF ONE TURN.



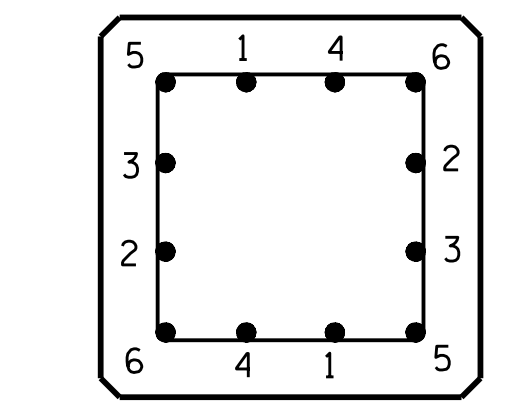
LENGTH	CONCRETE CU. YDS.	PILE WT. TONS	ONE POINT PICK-UP		TWO POINT PICK-UP	
			0.3L	0.7L	0.207L	0.586L
25'-0"	2.56	5.18	7'-6"	17'-6"		
30'-0"	3.07	6.22	9'-0"	21'-0"		
35'-0"	3.58	7.26	10'-6"	24'-6"		
40'-0"	4.09	8.29	12'-0"	28'-0"		
45'-0"	4.61	9.33	13'-6"	31'-6"		
50'-0"	5.12	10.36	15'-0"	35'-0"		
55'-0"	5.63	11.40	16'-6"	38'-6"		
60'-0"	6.14	12.44	18'-0"	42'-0"		
65'-0"	6.65	13.47			13'-5 1/2"	38'-1"
70'-0"	7.17	14.51			14'-6"	41'-0"
75'-0"	7.68	15.55			15'-6 1/2"	43'-11"
80'-0"	8.19	16.58			16'-6 1/2"	46'-11"
85'-0"	8.70	17.62			17'-7"	49'-10"



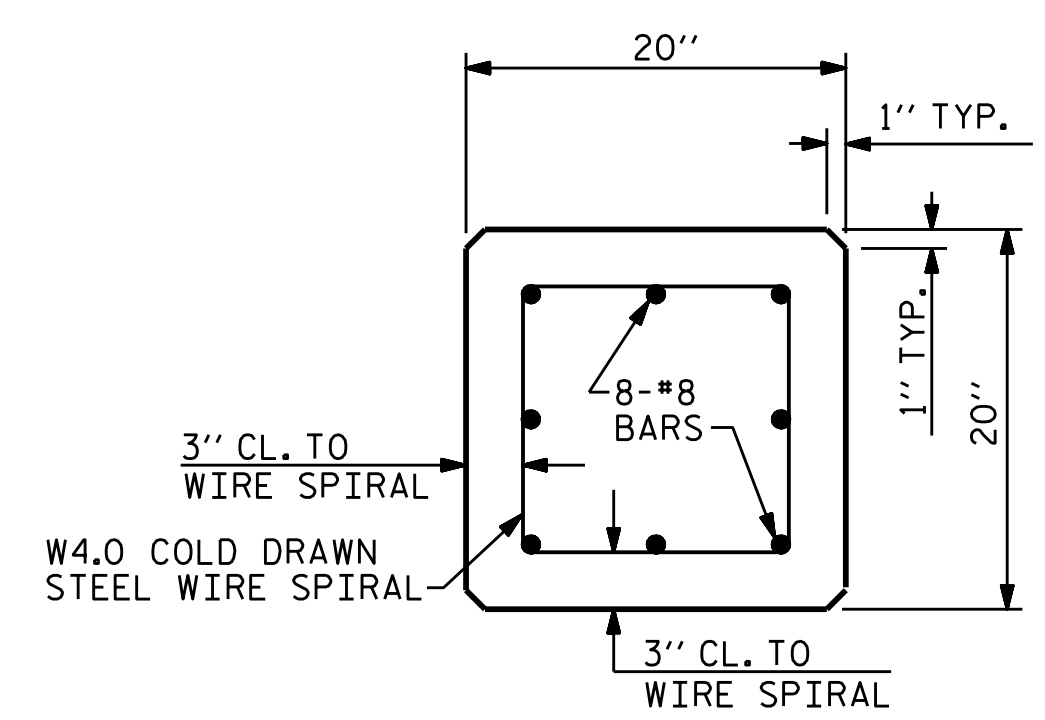
(AT THE CONTRACTOR'S OPTION, PILE BUILD-UP MAY BE CONSTRUCTED WITH DOWELS.)



TYPICAL SECTION



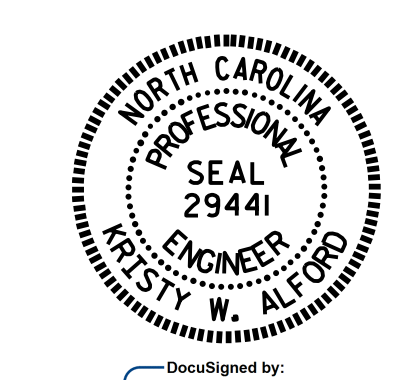
TYPICAL PATTERN FOR BURNING STRANDS



SECTION A-A

* PRESTRESSED CONCRETE PILES SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

DARE COUNTY



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
20" PRESTRESSED
CONCRETE PILE

ASSEMBLED BY : G. W. DICKEY	DATE : 4/18
CHECKED BY : T. SHERRILL	DATE : 4/18
DRAWN BY : WJH 1/89	REV. 8/16/99R RAL/LES
CHECKED BY : CRK 3/89	REV. 5/1/06R TLA/GM
	REV. 11/30/10 WMC/GM

NO.	REVISIONS		NO.	REVISIONS		SHEET NO.
	BY:	DATE:		BY:	DATE:	
1			3			S-5
2			4			TOTAL SHEETS 5