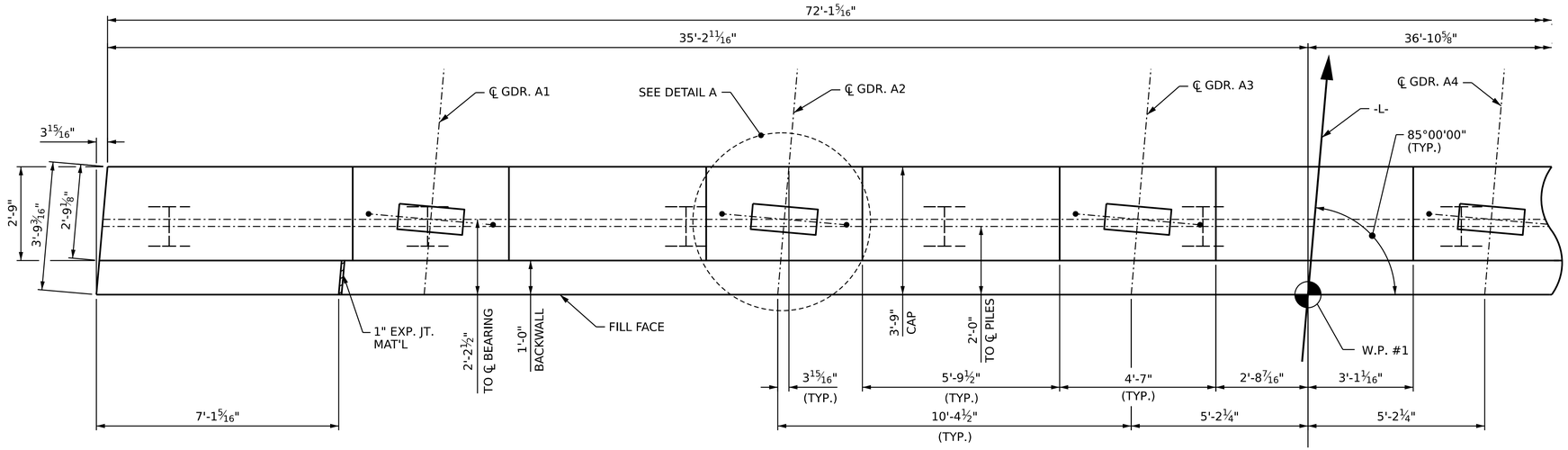
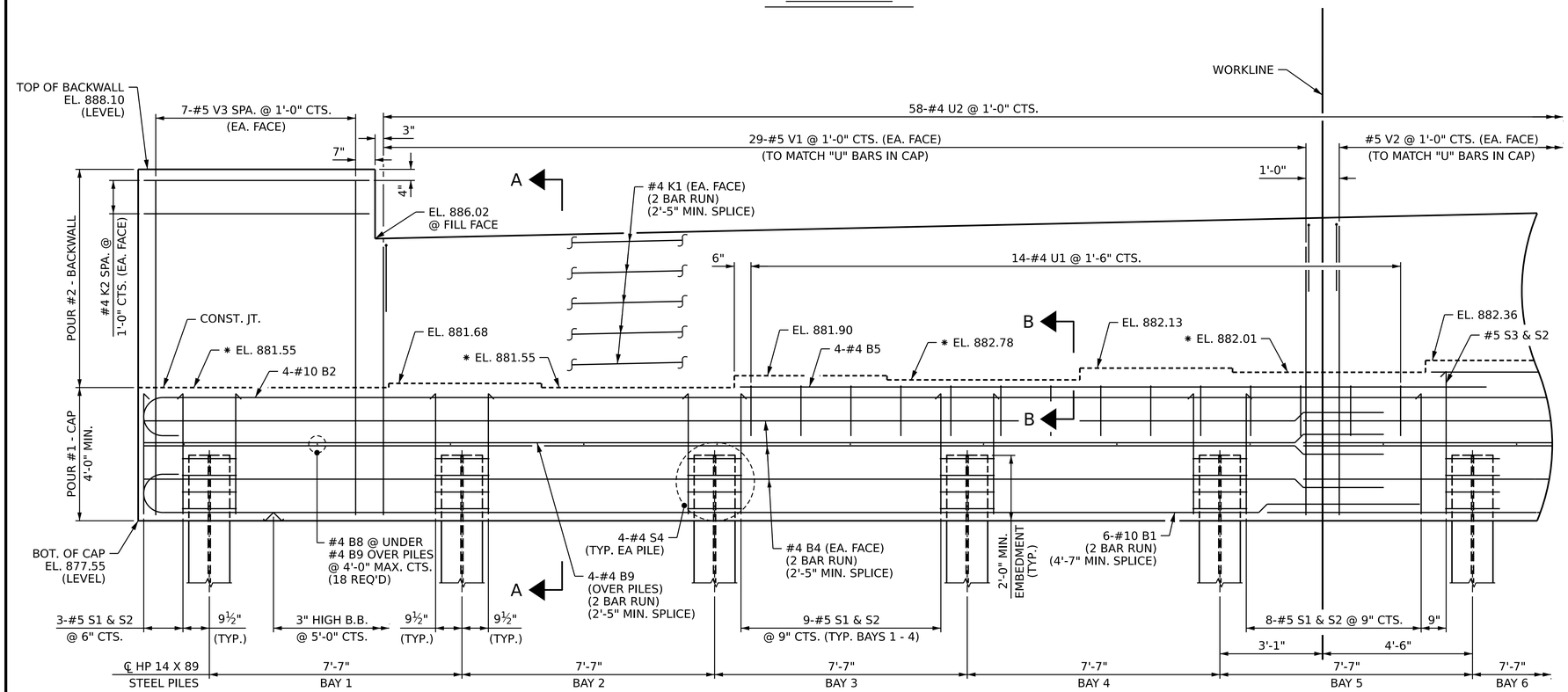
8/26/21

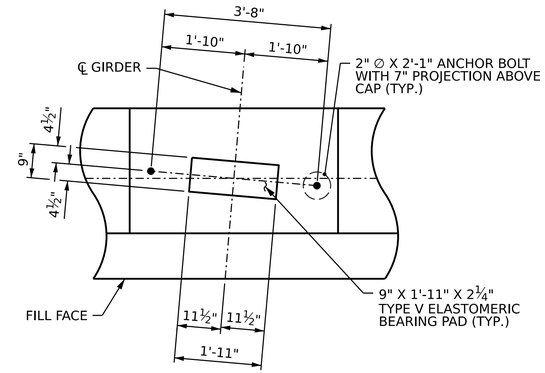


PLAN



ELEVATION

* FOR LOCATION ON CAP, SEE SHEET 3 OF 3.



DETAIL A

NOTES:

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

THE CAP AND BACKWALL ARE DETAILED TO FIT WITH MSE WALL COPING DETAIL A AS SHOWN ON THE SLOPE PROTECTION DETAIL SHEET. END BENT DIMENSIONS SHALL BE COORDINATED WITH FINAL WALL DETAILS AND DIMENSIONS ADJUSTED ACCORDINGLY. BAR LENGTHS AND POSITIONS SHALL BE ADJUSTED TO FIT FINAL LENGTHS.

PROJECT NO. U-5899

FORSYTH COUNTY

STATION: 32+73.75 -L-

SHEET 1 OF 3

PREPARED BY

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NORTH CAROLINA PROFESSIONAL SEAL 039313 ENGINEER KEVIN M. ROBINSON
31-Mar-2025

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-25
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : N. K. KAVANI DATE : 10-2023
CHECKED BY : J. M. ROBINSON DATE : 10-2023
DESIGN ENGINEER OF RECORD: R. L. DICKE DATE : 10-2023

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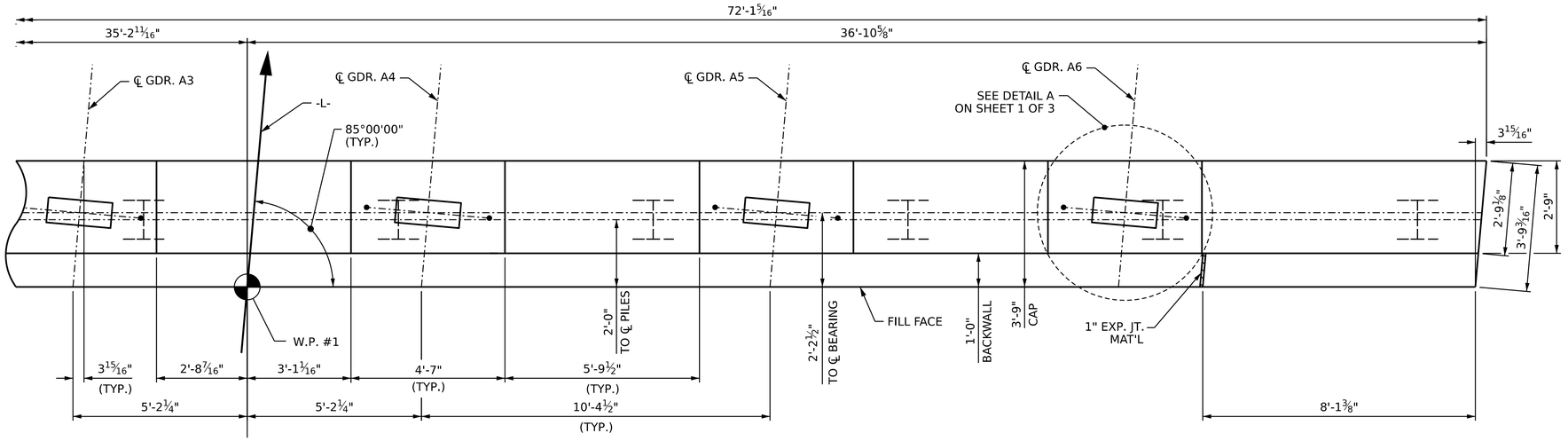
W1157077

8/26/21



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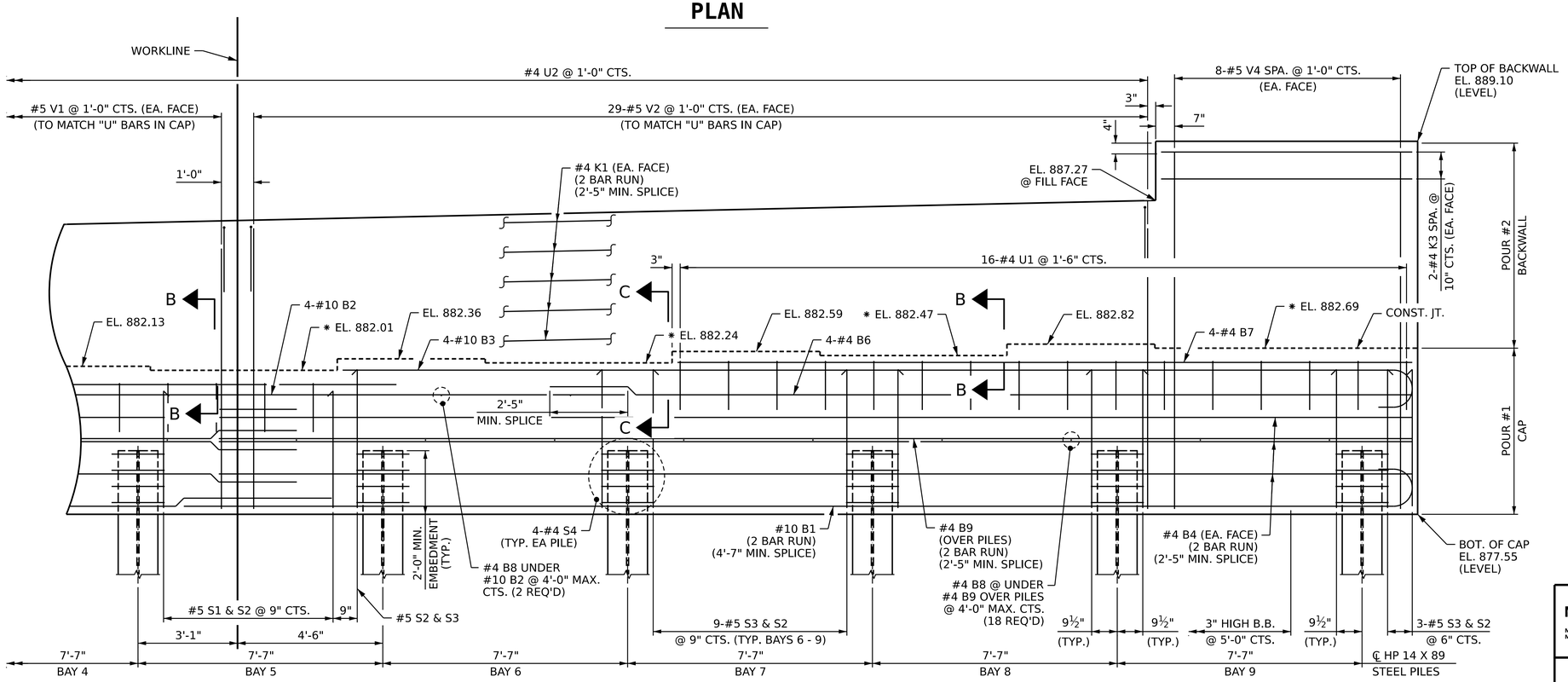

ELEVATION

* FOR LOCATION ON CAP, SEE SHEET 3 OF 3.

PROJECT NO. U-5899

FORSYTH COUNTY

STATION: 32+73.75 -L-

SHEET 2 OF 3

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Joshua M. Robinson
31-Mar-2025

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-26
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : N. K. KAVANI DATE : 10-2023
CHECKED BY : J. M. ROBINSON DATE : 10-2023
DESIGN ENGINEER OF RECORD: R. L. DICKE DATE : 10-2023

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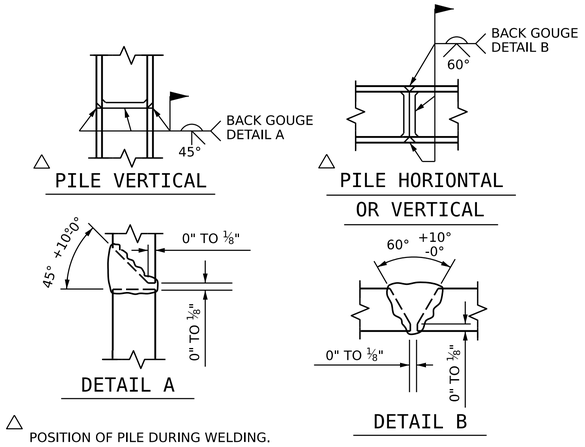
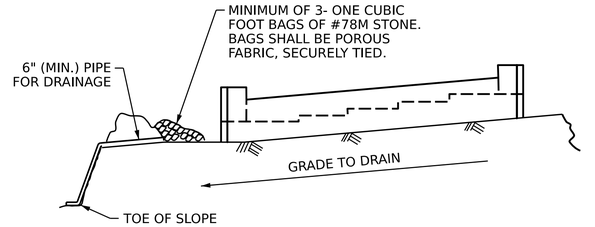
8/26/21



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



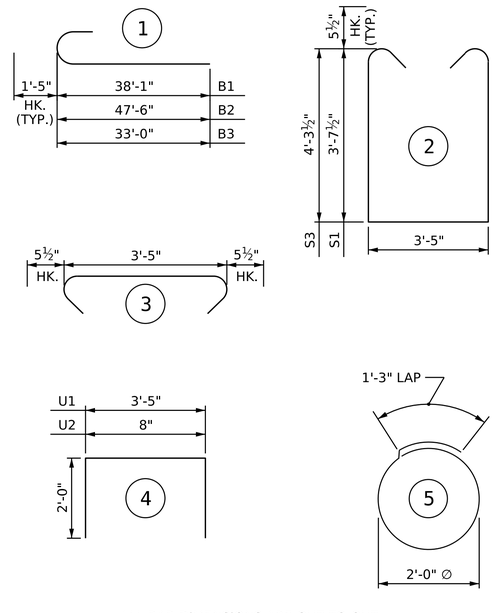
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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 END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

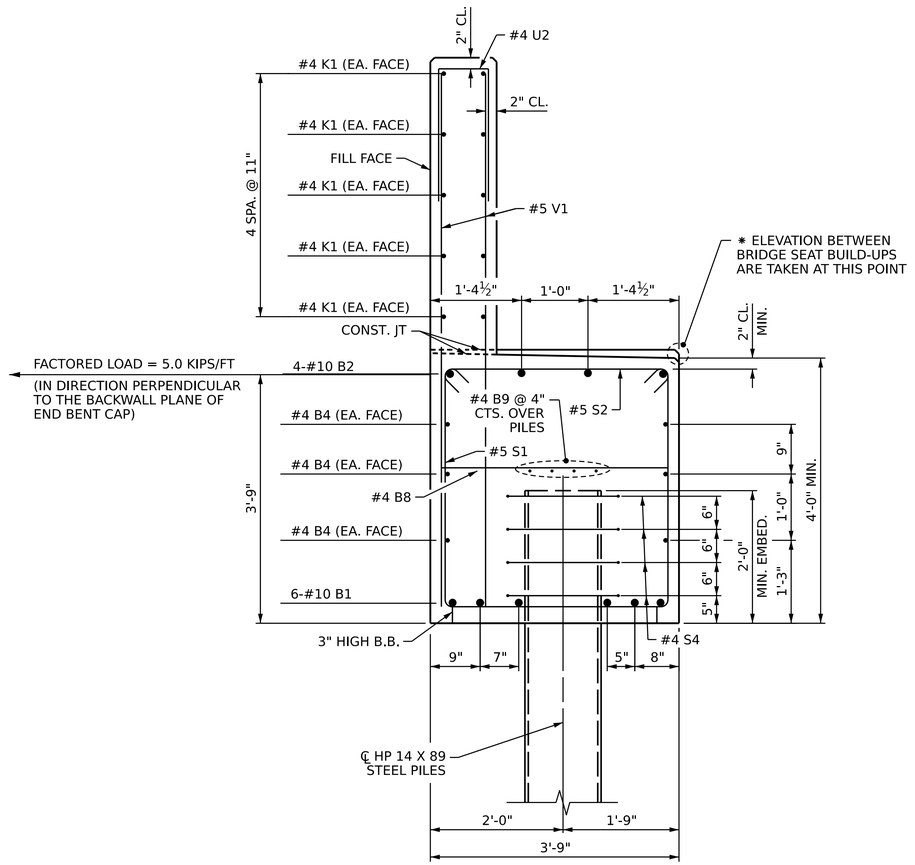
END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	1	39'-6"	2040
B2	4	#10	1	48'-11"	842
B3	4	#10	1	34'-5"	592
B4	12	#4	STR	37'-3"	299
B5	4	#4	STR	20'-7"	55
B6	2	#4	STR	26'-9"	36
B7	4	#4	STR	22'-9"	61
B8	20	#4	STR	3'-5"	46
B9	8	#4	STR	37'-1"	198
K1	20	#4	STR	37'-2"	497
K2	4	#4	STR	6'-9"	18
K3	4	#4	STR	7'-9"	21
S1	47	#5	2	11'-7"	568
S2	87	#5	3	4'-4"	393
S3	40	#5	2	12'-11"	539
S4	40	#4	5	7'-7"	203
U1	30	#4	4	7'-5"	149
U2	58	#4	4	4'-8"	181
V1	58	#5	STR	8'-2"	494
V2	58	#5	STR	8'-9"	529
V3	14	#5	STR	9'-11"	145
V4	16	#5	STR	11'-1"	185

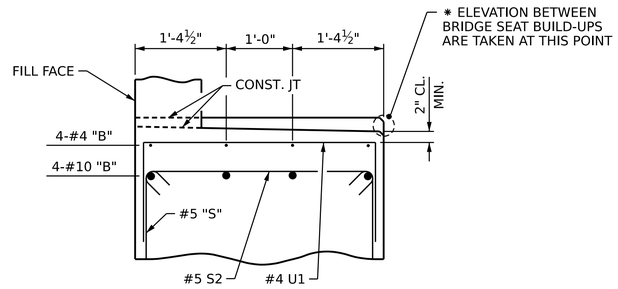
REINFORCING STEEL = 8,091 LBS

CLASS A CONCRETE BREAKDOWN: (FOR END BENT 1)

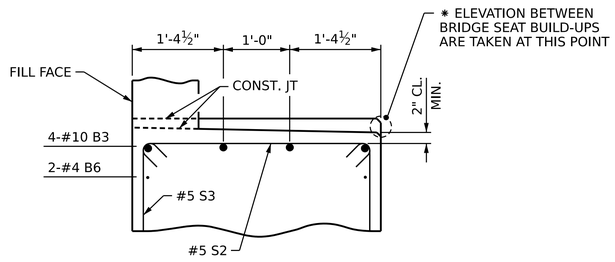
POUR #1 (CAP)	46.3 C.Y.
POUR #2 (BACKWALL)	12.7 C.Y.
TOTAL CLASS A CONCRETE	59.0 C.Y.



SECTION A-A



SECTION B-B



SECTION C-C

PROJECT NO. U-5899

FORSYTH COUNTY

STATION: 32+73.75 -L-

SHEET 3 OF 3

PREPARED BY

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NORTH CAROLINA PROFESSIONAL SEAL 039313 ENGINEER JOSHUA M. ROBINSON
Digitally signed by Joshua M. Robinson
31-Mar-2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 1 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-27
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : N. K. KAVANI DATE : 10-2023
CHECKED BY : J. M. ROBINSON DATE : 10-2023
DESIGN ENGINEER OF RECORD: R. L. DICKE DATE : 10-2023

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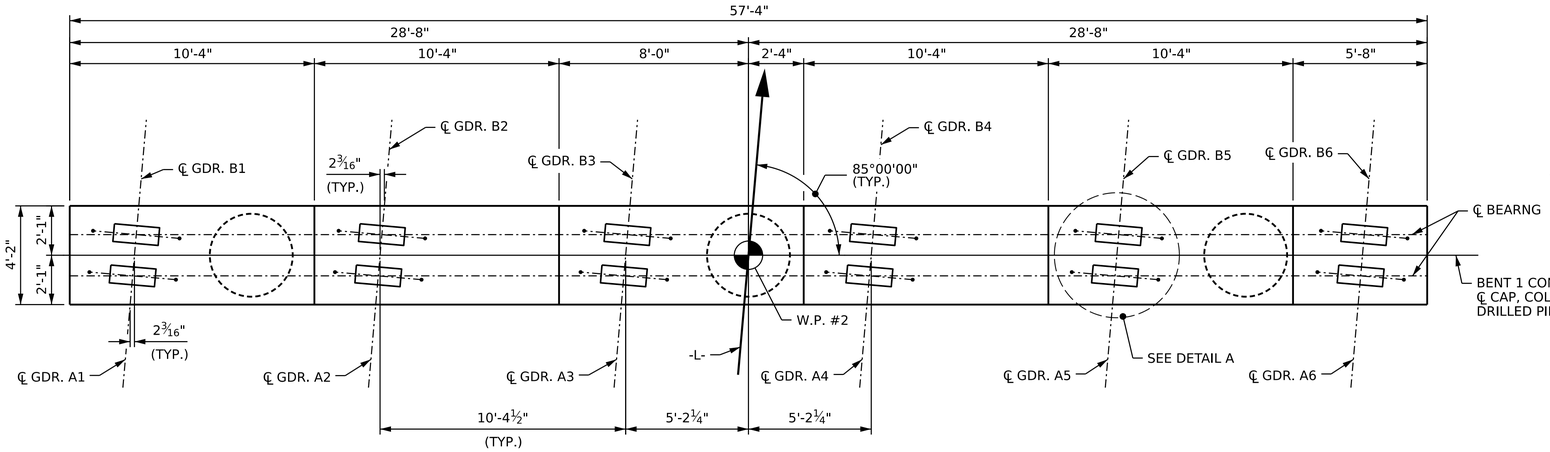
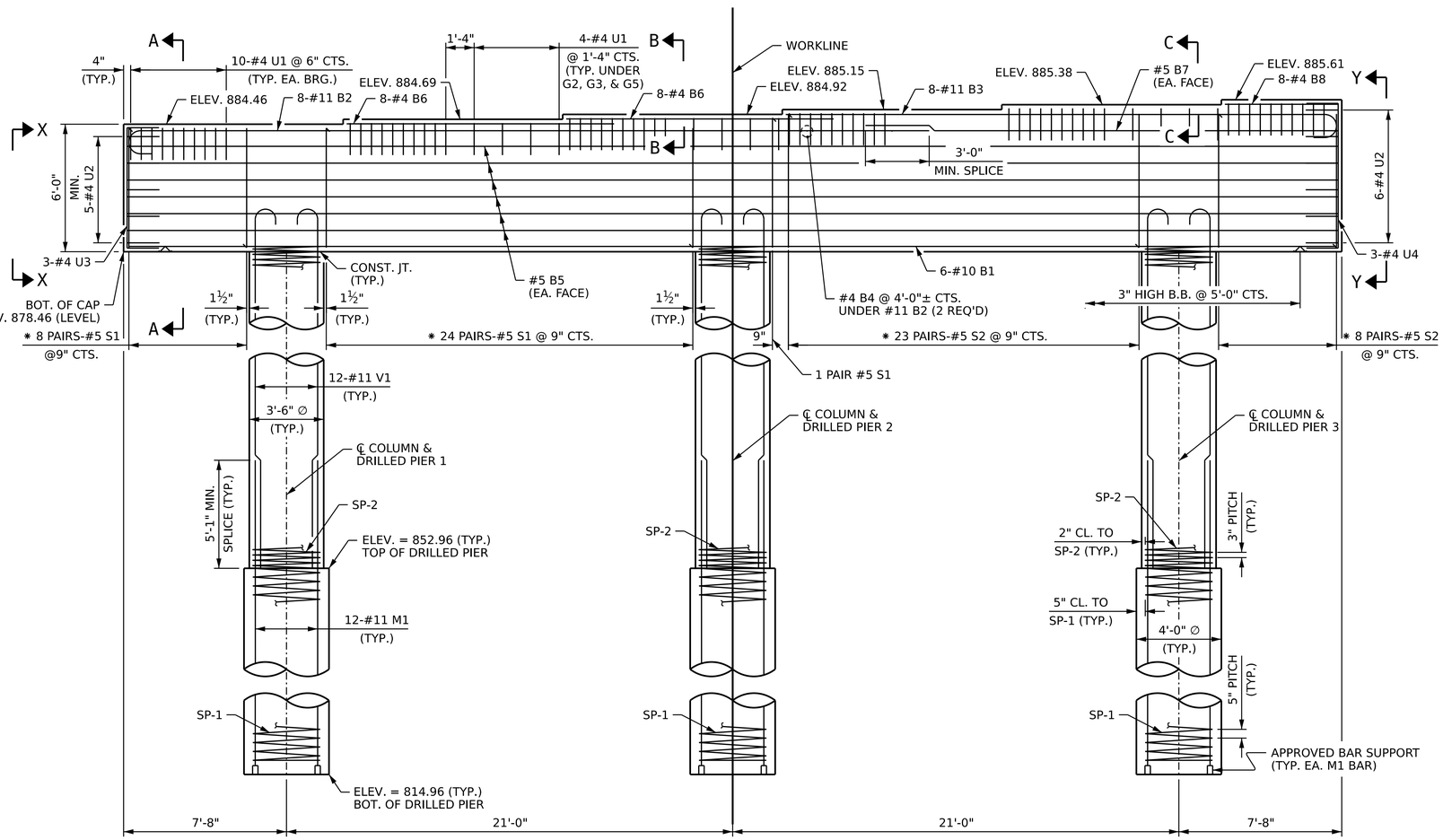
8/26/21



PLAN



ELEVATION

NOTES:

STIRRUPS & U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

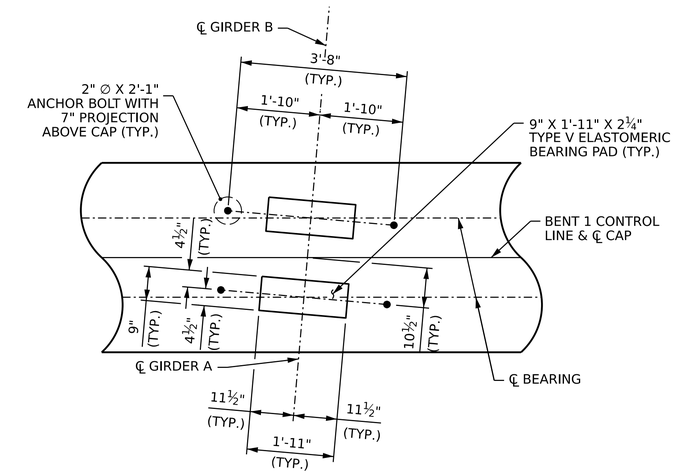
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

∗ INVERT ALTERNATE #5 S1 & S2 STIRRUP PAIRS.

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.

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

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



DETAIL A

PROJECT NO. U-5899

FORSYTH COUNTY

STATION: 32+73.75 -L-

SHEET 1 OF 2

PREPARED BY

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NORTH CAROLINA PROFESSIONAL SEAL 039313 ENGINEER JOSEPH M. ROBINSON
31-Mar-2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-28
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : N. K. KAVANI DATE : 10-2023
CHECKED BY : J. M. ROBINSON DATE : 10-2023
DESIGN ENGINEER OF RECORD: R. L. DICKE DATE : 10-2023

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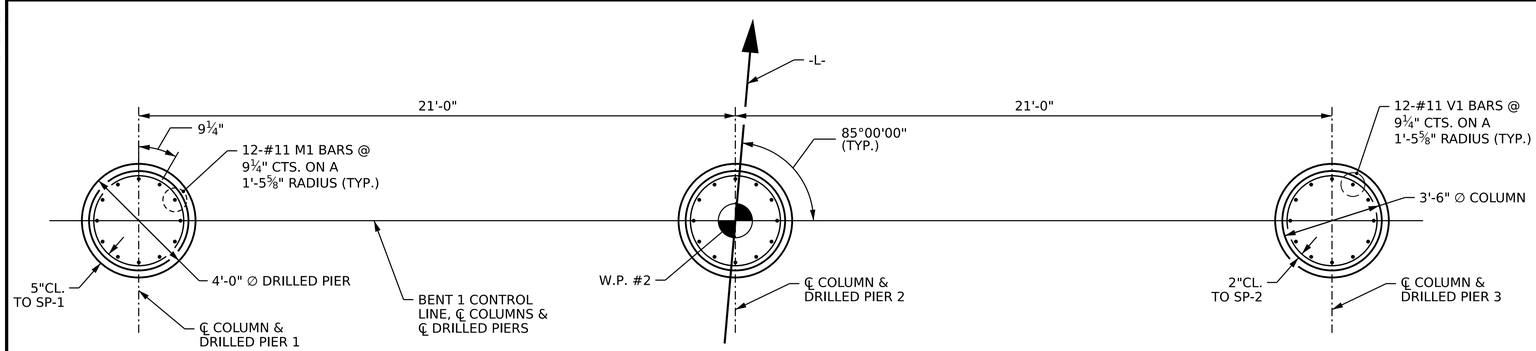
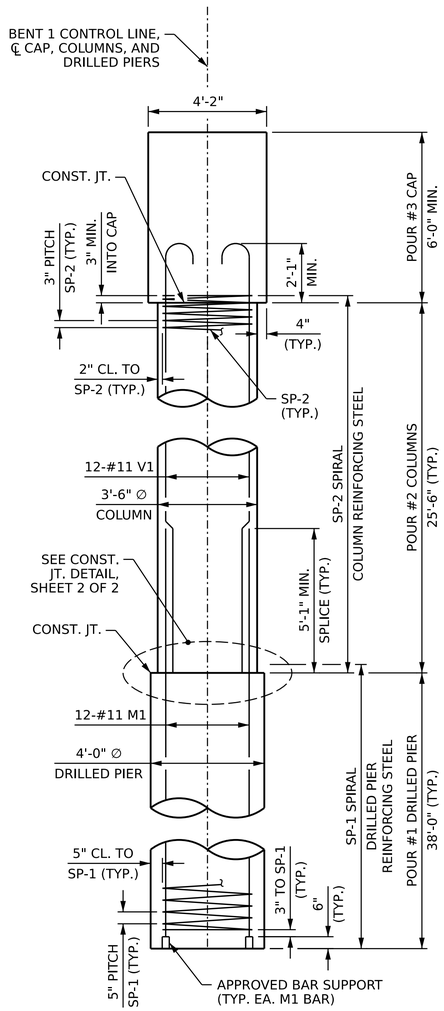
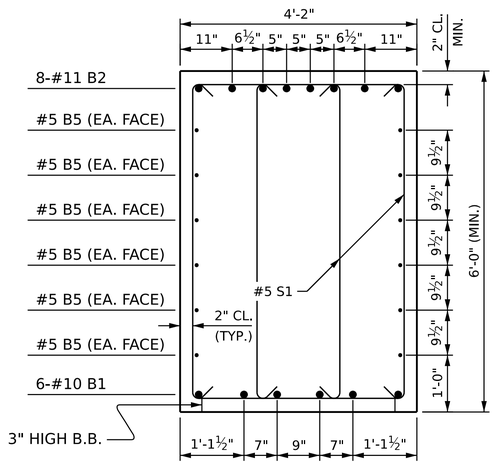
8/26/21



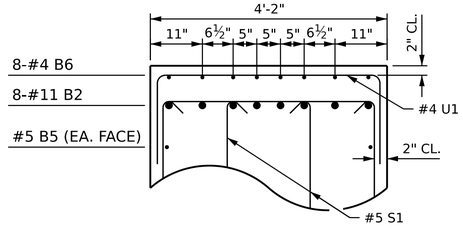
PLAN OF DRILLED SHAFT & COLUMNS



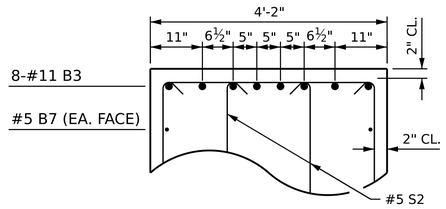
END ELEVATION



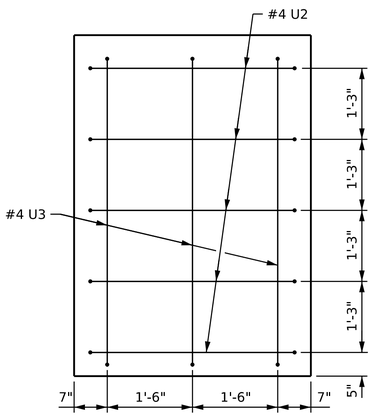
SECTION A-A



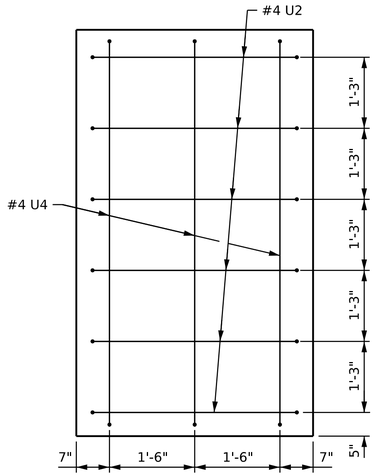
SECTION B-B



SECTION C-C

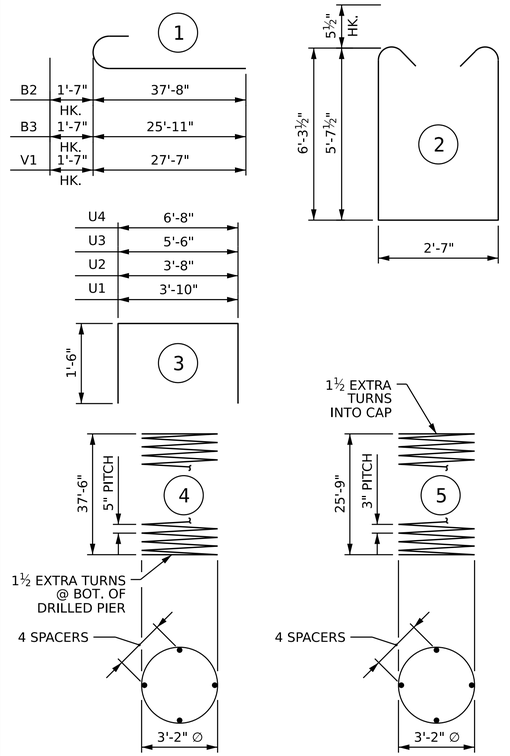


VIEW X-X



VIEW Y-Y

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	STR	57'-0"	1472
B2	8	#11	1	39'-3"	1668
B3	8	#11	1	27'-6"	1169
B4	2	#4	STR	3'-10"	5
B5	12	#5	STR	57'-0"	713
B6	16	#4	STR	12'-7"	134
B7	2	#5	STR	22'-4"	47
B8	8	#4	STR	5'-4"	29
M1	36	#11	STR	45'-7"	8719
S1	66	#5	2	14'-9"	1015
S2	62	#5	2	16'-1"	1040
U1	72	#4	3	6'-10"	329
U2	11	#4	3	6'-8"	49
U3	3	#4	3	8'-6"	17
U4	3	#4	3	9'-8"	19
V1	36	#11	1	29'-2"	5579
REINFORCING STEEL =					22,004 LBS
SP-1	3	✳	4	896'-2"	2804
SP-2	3	✳✳	5	1026'-4"	2057

SPIRAL COLUMN REINFORCING STEEL = 4,861 LBS

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

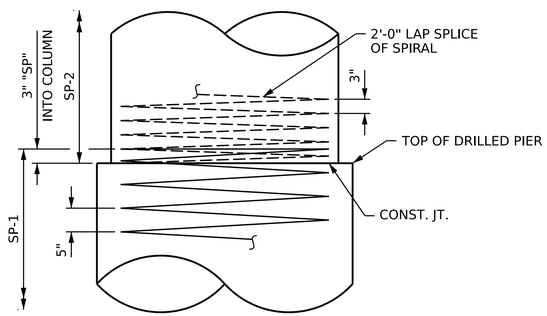
✳✳ THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

CLASS A CONCRETE BREAKDOWN: (FOR BENT 1)

POUR #2 (COLUMNS)	27.3 C.Y.
POUR #3 (CAP)	57.8 C.Y.
TOTAL CLASS A CONCRETE	85.1 C.Y.

DRILLED PIERS: (FOR BENT 1)

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	53.1 C.Y.



CONSTRUCTION JT. DETAIL

PROJECT NO. U-5899

FORSYTH COUNTY

STATION: 32+73.75 -L-

SHEET 2 OF 2

PREPARED BY

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NORTH CAROLINA PROFESSIONAL SEAL 039313 ENGINEER N. K. KAVANI
31-MAR-2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT 1 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-29
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : N. K. KAVANI DATE : 10-2023
CHECKED BY : J. M. ROBINSON DATE : 10-2023
DESIGN ENGINEER OF RECORD: R. L. DICKE DATE : 10-2023

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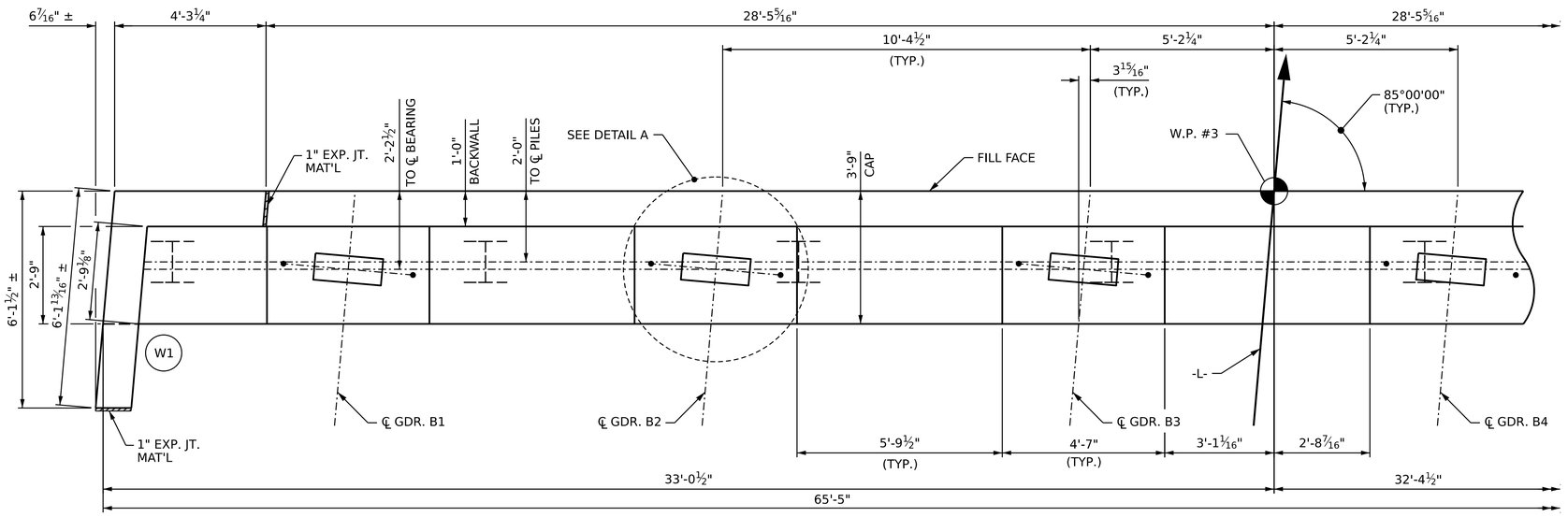
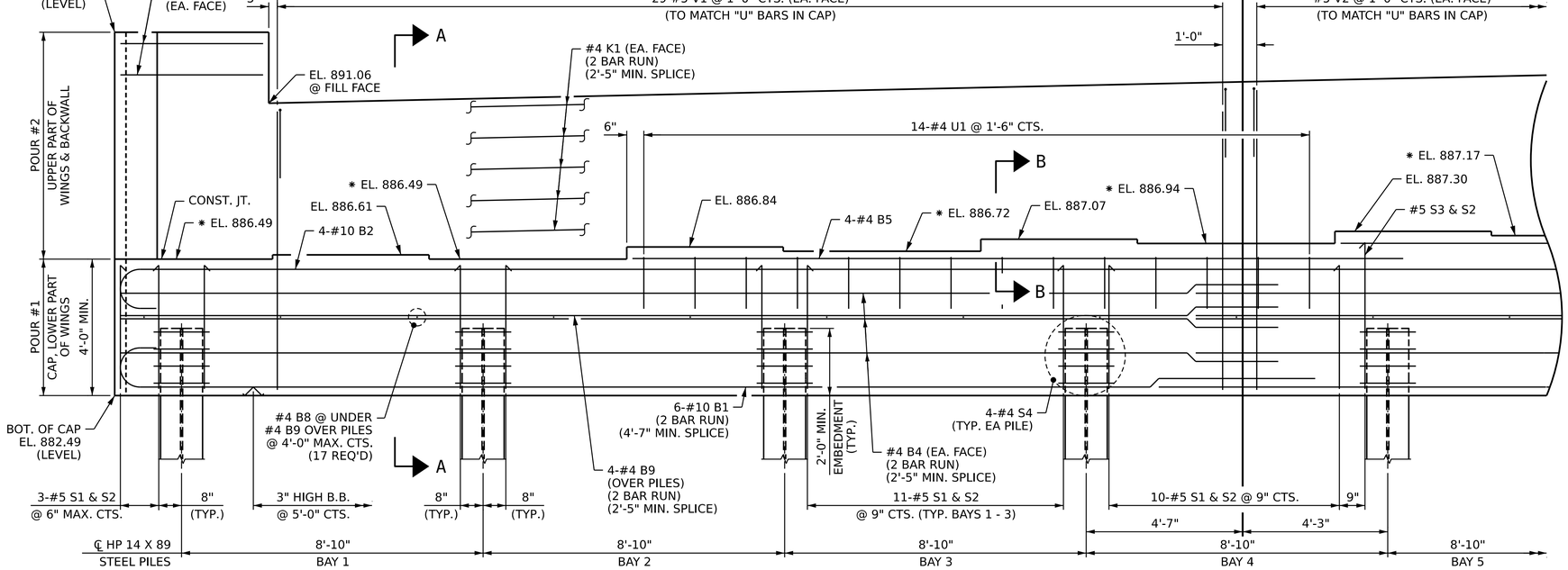
8/26/21



PLAN



ELEVATION

∗ FOR LOCATION ON CAP, SEE SHEET 4 OF 4.

NOTES:

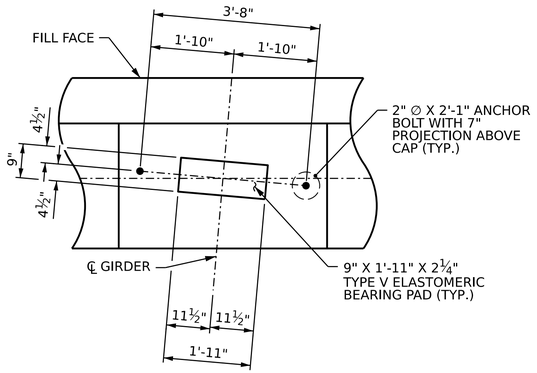
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

THE CAP AND BACKWALL ARE DETAILED TO FIT WITH MSE WALL COPING DETAIL A AS SHOWN ON THE SLOPE PROTECTION DETAIL SHEET. IF MSE WALL COPING DETAIL B IS USED, WING WALLS SHALL BE SHORTENED TO FIT. COORDINATE WITH THE MSE WALL FABRICATOR FOR COPING DETAIL TO BE USED. H BAR LENGTHS AND V BAR POSITIONS SHALL BE ADJUSTED TO FIT FINAL WINGWALL LENGTHS.



DETAIL A

PROJECT NO. U-5899

FORSYTH COUNTY

STATION: 32+73.75 -L-

SHEET 1 OF 4

PREPARED BY

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039313 JOHN MICHAEL ROBINSON
31-Mar-2025

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-30
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : N. K. KAVANI DATE : 10-2023
CHECKED BY : J. M. ROBINSON DATE : 10-2023
DESIGN ENGINEER OF RECORD: R. L. DICKE DATE : 10-2023

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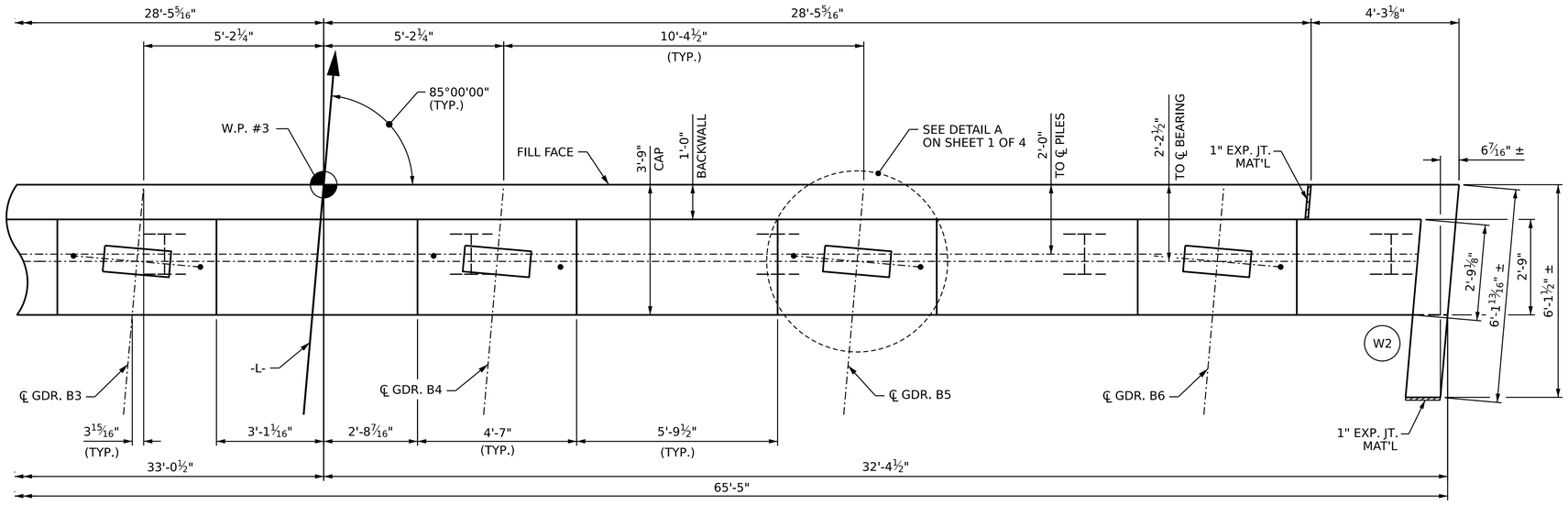
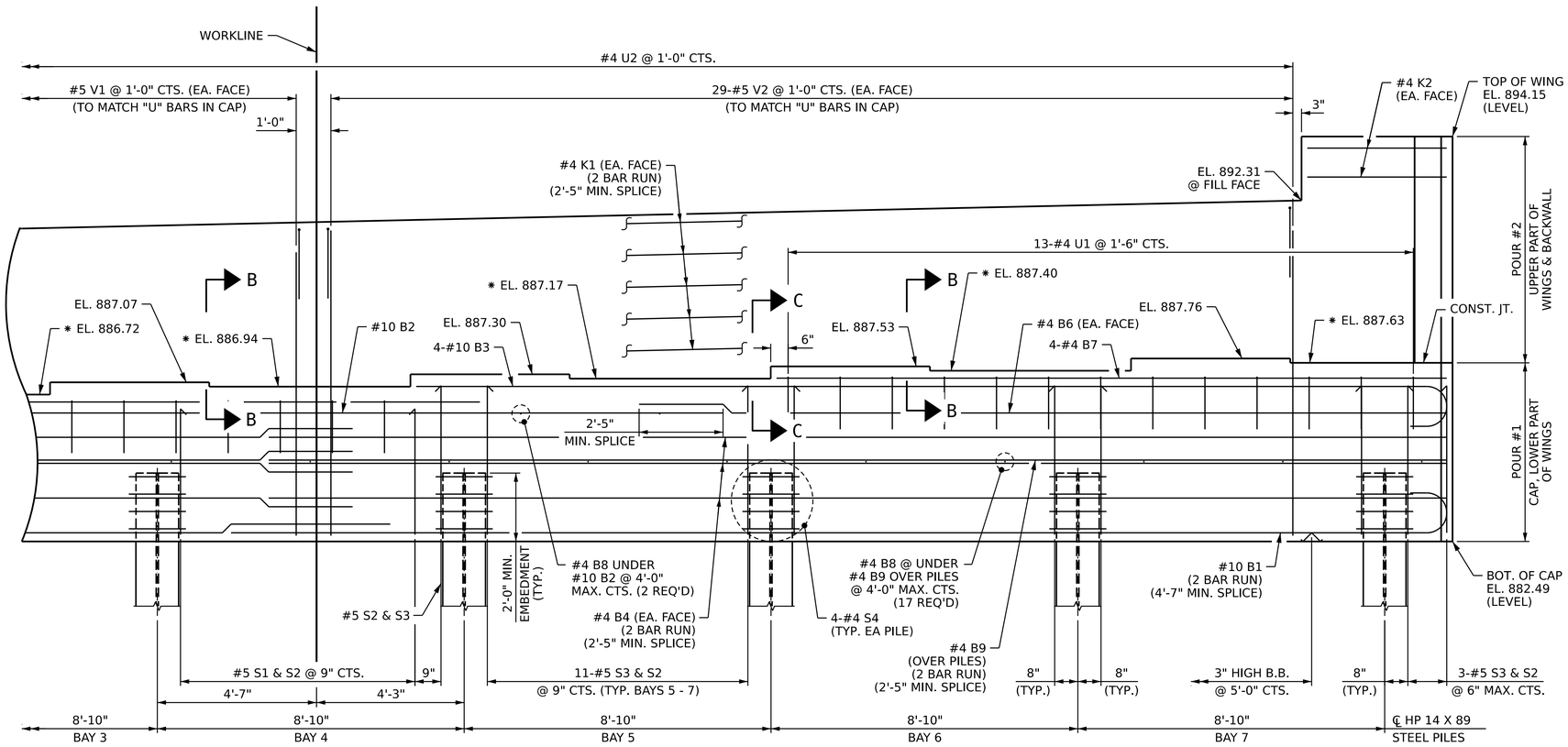
8/26/21



PLAN



ELEVATION

* FOR LOCATION ON CAP, SEE SHEET 4 OF 4.

DRAWN BY : N. K. KAVANI DATE : 10-2023
CHECKED BY : J. M. ROBINSON DATE : 10-2023
DESIGN ENGINEER OF RECORD: R. L. DICKE DATE : 10-2023

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PROJECT NO. U-5899
FORSYTH COUNTY
STATION: 32+73.75 -L-
SHEET 2 OF 4

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NORTH CAROLINA PROFESSIONAL SEAL 039313 ENGINEER JOSHUA M. ROBINSON
31-Mar-2026

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-31
1			3			TOTAL SHEETS
2			4			36

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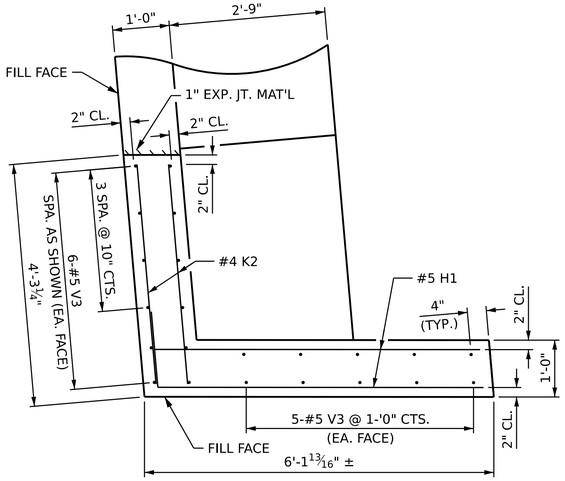
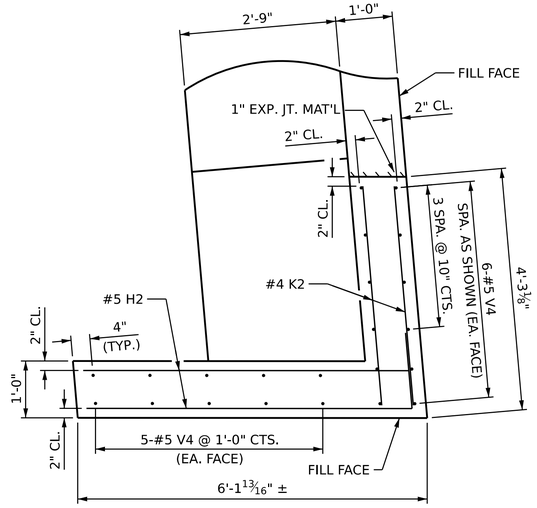


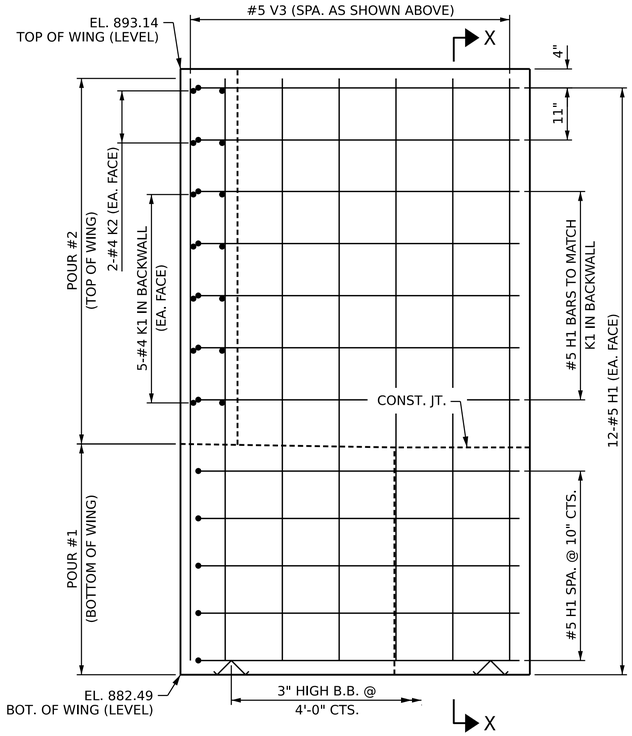
PLAN OF WING W1

SEE NOTES ON SHEET 1 OF 4

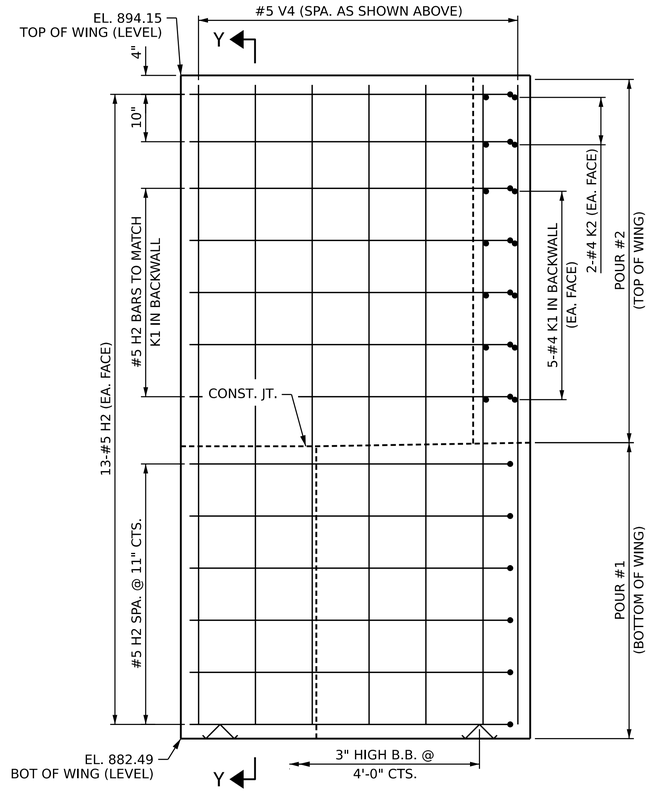


PLAN OF WING W2

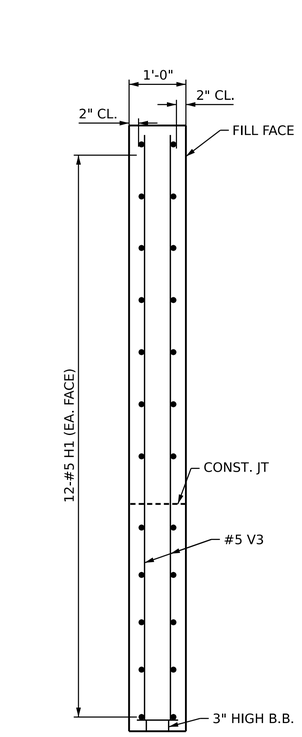
SEE NOTES ON SHEET 1 OF 4



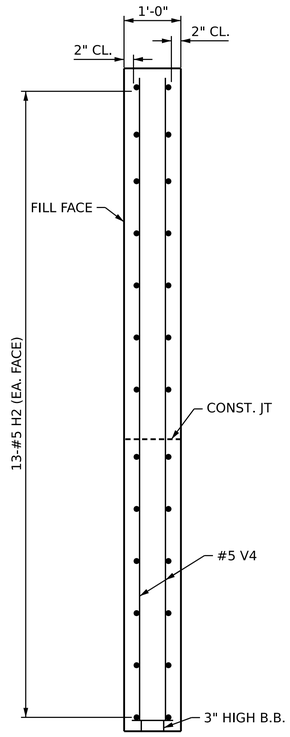
ELEVATION OF WING W1



ELEVATION OF WING W2



SECTION X-X



SECTION Y-Y

PROJECT NO. U-5899

FORSYTH COUNTY

STATION: 32+73.75 -L-

SHEET 3 OF 4

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31-MAR-2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
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2			4			36

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DESIGN ENGINEER OF RECORD: R. L. DICKE DATE : 10-2023

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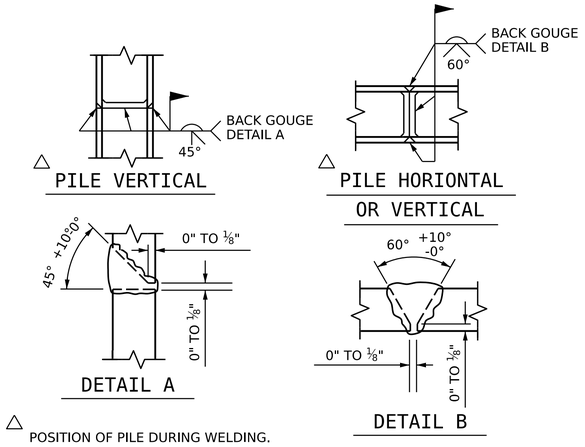
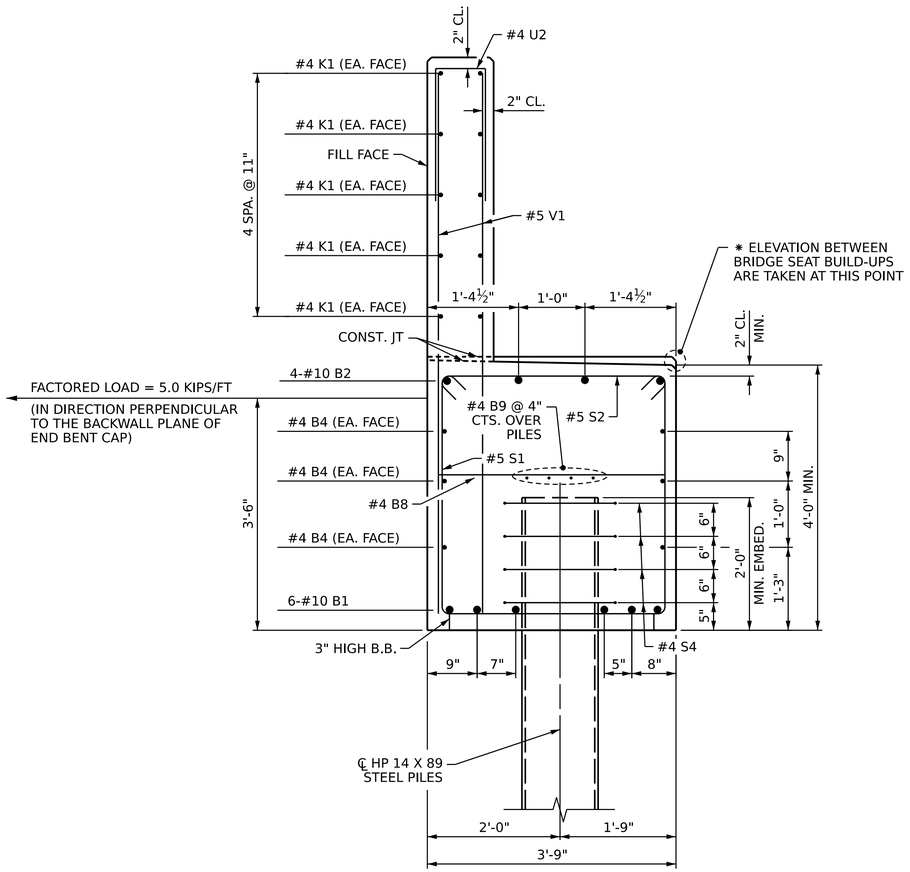
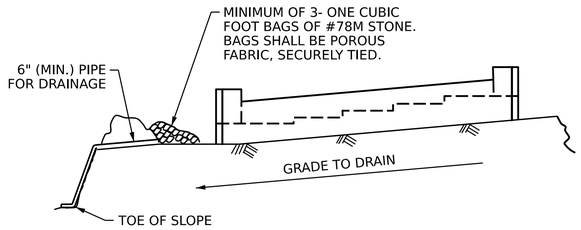


PILE SPLICE DETAILS



SECTION A-A

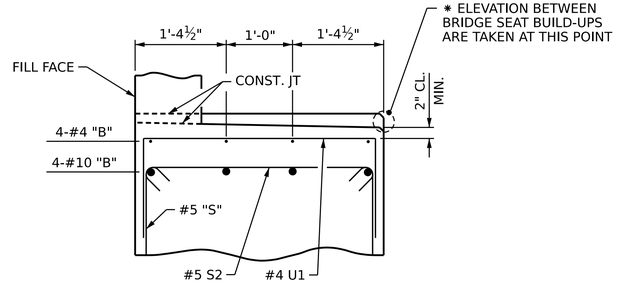


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

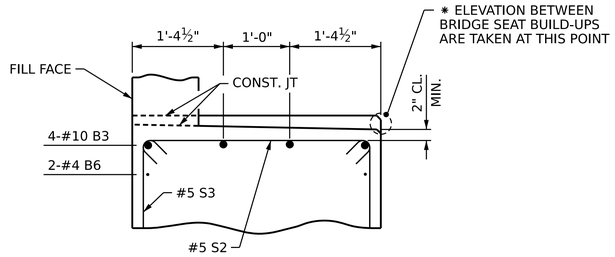
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

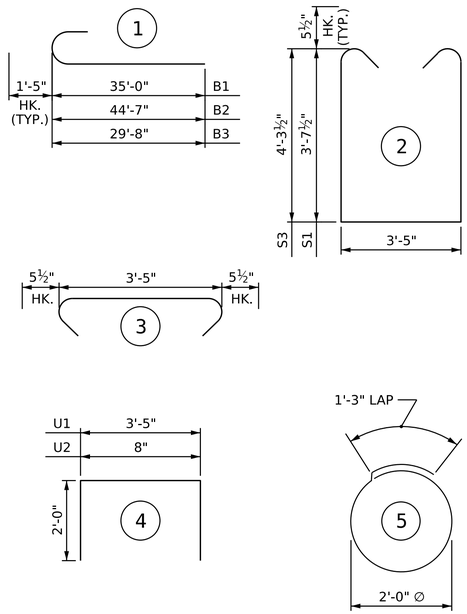


SECTION B-B



SECTION C-C

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	1	36'-5"	1880
B2	4	#10	1	46'-0"	792
B3	4	#10	1	31'-1"	535
B4	12	#4	STR	33'-11"	272
B5	4	#4	STR	22'-7"	60
B6	2	#4	STR	23'-3"	31
B7	4	#4	STR	19'-3"	51
B8	19	#4	STR	3'-5"	43
B9	8	#4	STR	33'-11"	181
K1	20	#4	STR	33'-11"	453
K2	8	#4	STR	3'-11"	21
S1	46	#5	2	11'-7"	556
S2	83	#5	3	4'-4"	375
S3	37	#5	2	12'-11"	498
S4	32	#4	5	7'-7"	162
U1	27	#4	4	7'-5"	134
U2	58	#4	4	4'-8"	181
V1	58	#5	STR	8'-2"	494
V2	58	#5	STR	8'-10"	534
V3	22	#5	STR	10'-3"	235
V4	22	#5	STR	11'-3"	258

REINFORCING STEEL = 7,746 LBS

CLASS A CONCRETE BREAKDOWN: (FOR END BENT 2)

POUR #1 (CAP, & LOWER PART OF WINGS)	42.6 C.Y.
POUR #2 (UPPER PART OF WINGS, & BACKWALL)	14.3 C.Y.
TOTAL CLASS A CONCRETE	56.9 C.Y.

DRAWN BY : N. K. KAVANI DATE : 10-2023
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NORTH CAROLINA PROFESSIONAL SEAL 039313 ENGINEER JOHN M. ROBINSON
31-Mar-2026

PROJECT NO. U-5899
FORSYTH COUNTY
STATION: 32+73.75 -L-
SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-33
1			3			TOTAL SHEETS
2			4			36

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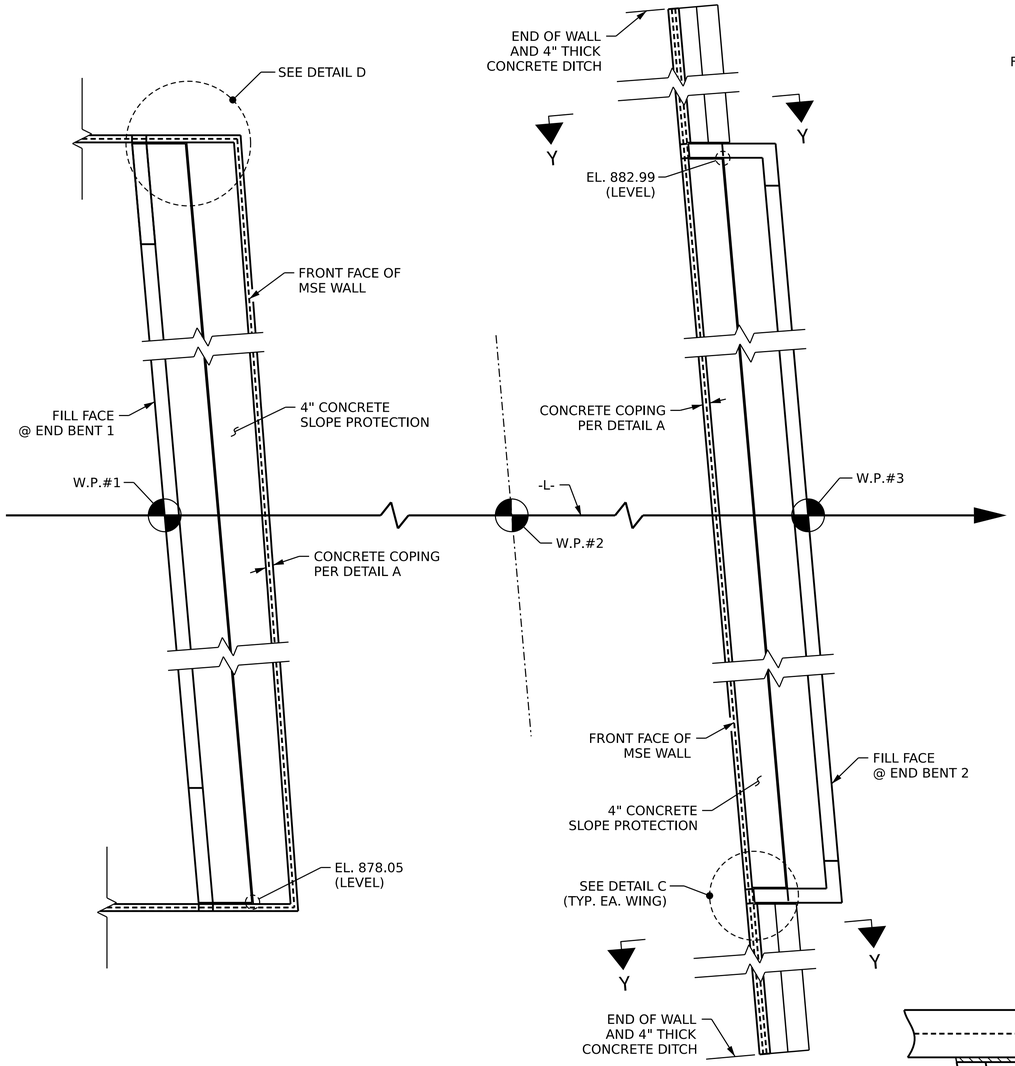
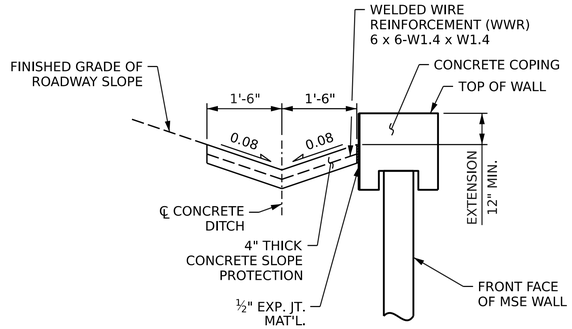


PLAN

ELEVATIONS SHOWN ARE AT TOP OF SLOPE PROTECTION AT FACE OF END BENT



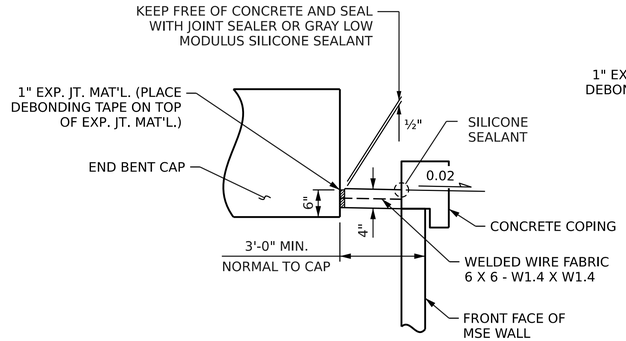
SECTION Y-Y

NOTES:

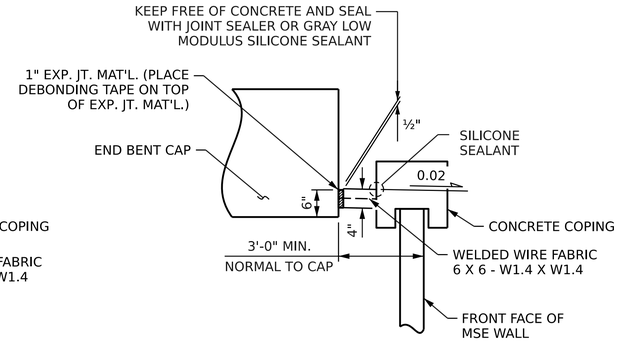
SLOPE PROTECTION SHALL CONSIST OF 4'' POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS ''B''. THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

THE SLOPE PROTECTION IS DETAILED TO FIT WITH THE MSE WALL COPING DETAIL A. IF MSE WALL COPING DETAIL B IS USED, SLOPE PROTECTION SHALL BE ADJUSTED TO FIT. COORDINATE WITH THE MSE WALL FABRICATOR FOR ACTUAL WALL THICKNESS AND COPING TO BE USED. ADJUST SLOPE PROTECTION QUANTITIES AS NECESSARY TO FIT COPING USED.

BRIDGE @ 32+73.75 -L-	4 INCH SLOPE PROTECTION	WELDED WIRE FABRIC (48" WIDE)
	SQUARE YARDS	APPROX. L.F.
END BENT 1	24	73
END BENT 2	63	203



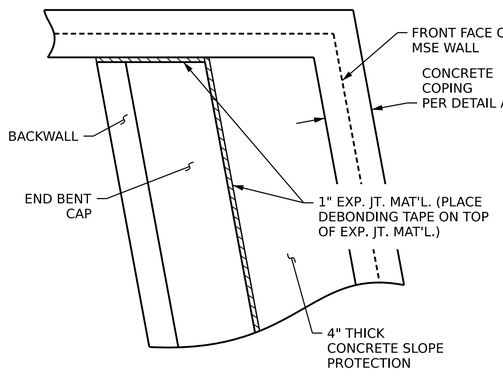
DETAIL A



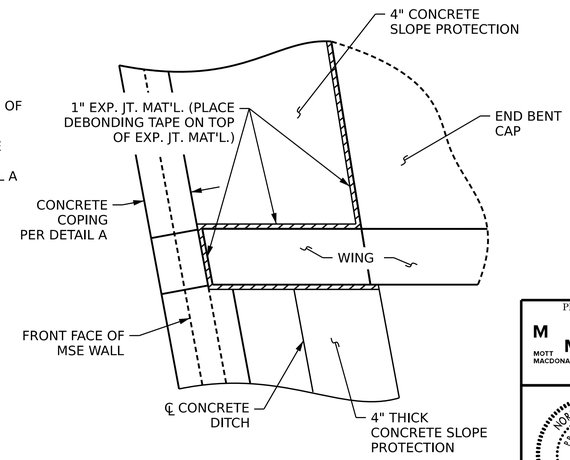
DETAIL B

COPING DETAILS

THE CONTRACTOR HAS THE OPTION OF USING COPING IN DETAILS A OR B



DETAIL D



DETAIL C

PROJECT NO. U-5899

FORSYTH COUNTY

STATION: 32+73.75 -L-

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31-Mar-2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE SLOPE PROTECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-34
1			3			TOTAL SHEETS
2			4			36

DRAWN BY : N. K. KAVANI DATE : 10-2023
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DESIGN ENGINEER OF RECORD: R. L. DICKE DATE : 10-2023

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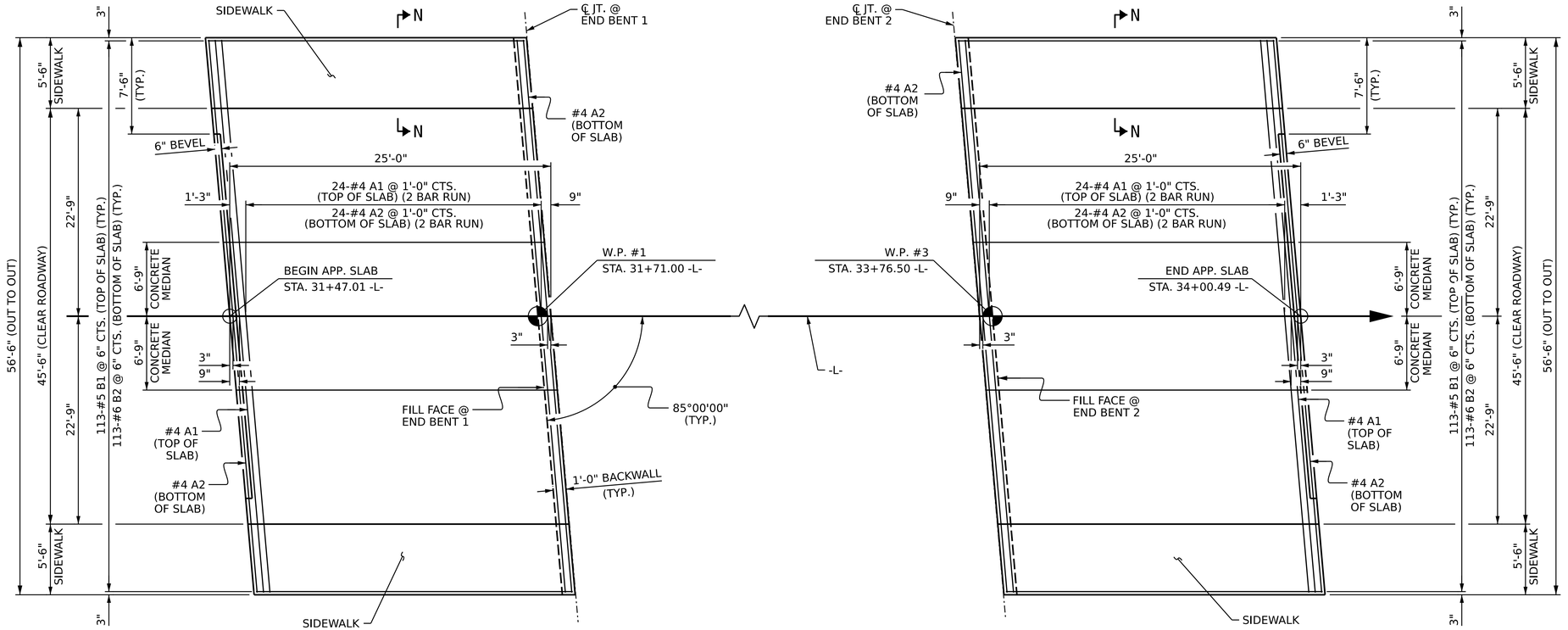
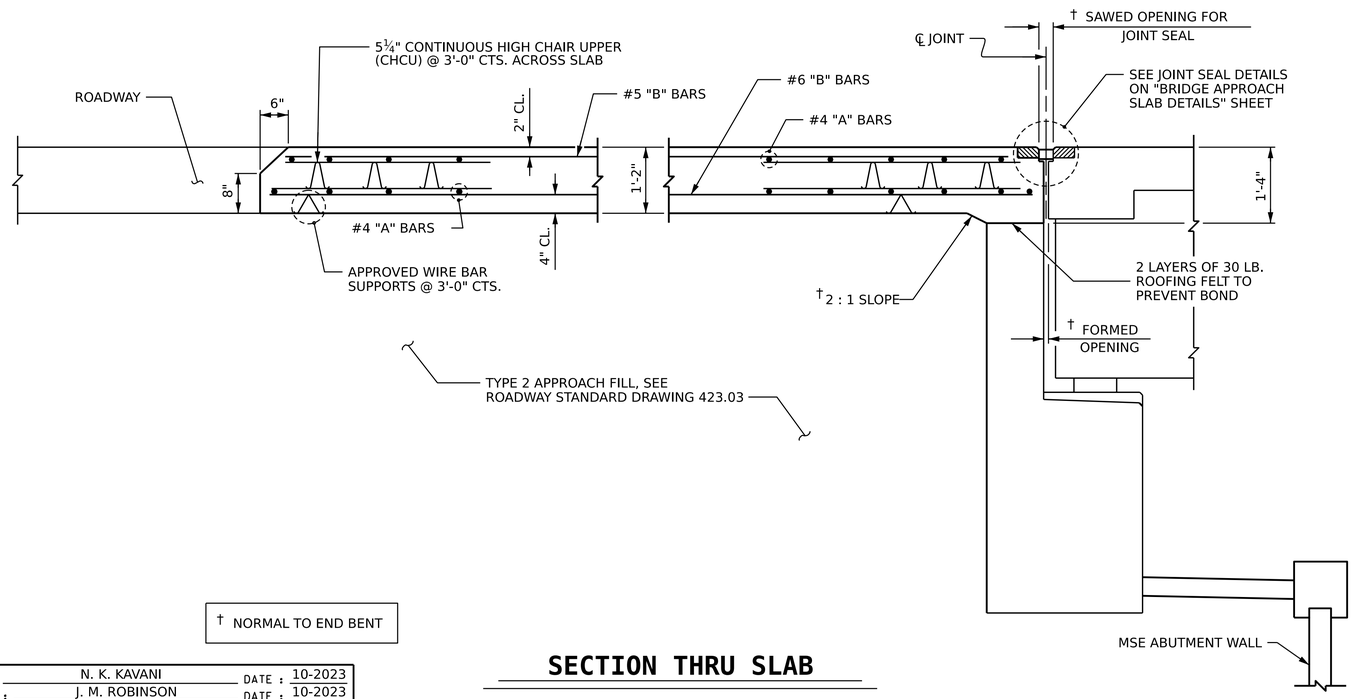


PLAN @ END BENT 1

PLAN @ END BENT 2



† NORMAL TO END BENT

SECTION THRU SLAB

NOTES:

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF END POST.

FOR THE 4" ∅ DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

NOTES CONT'D:

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

FOR APPROACH SLAB SIDEWALK DETAILS, SEE SHEET 2 OF 2.

FOR APPROACH SLAB MEDIAN DETAILS, SEE SHEET "CONCRETE MEDIAN DETAILS".

WITH FOAM JOINT SEAL

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2'' FOR END BENT 1 AND 2.

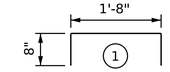
FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	50	#4	STR	29'-2"	973
A2	52	#4	STR	29'-0"	1009
* A4	17	#4	STR	12'-0"	136
* B1	113	#5	STR	24'-2"	2848
B2	113	#6	STR	24'-8"	4187
* B3	8	#4	STR	24'-8"	132
* B10	9	#4	STR	23'-5"	141
* G1	52	#4	STR	5'-0"	174
* U1	16	#4	1	3'-0"	32

REINFORCING STEEL	=	5,196 LBS
* EPOXY COATED REINFORCING STEEL	=	4,436 LBS
*** CLASS AA CONCRETE	=	71.3 C.Y.



ALL BAR DIMENSIONS ARE OUT TO OUT

*** INCLUDES SIDEWALK AND MEDIAN CONCRETE

SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"

PROJECT NO. U-5899

FORSYTH COUNTY

STATION: 32+73.75 -L-

SHEET 1 OF 2

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NORTH CAROLINA PROFESSIONAL SEAL 039313 ENGINEER
Signed for the State Board of Examiners for Engineers and Surveyors
31-MAR-2023

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-35
1			3			TOTAL SHEETS
2			4			36

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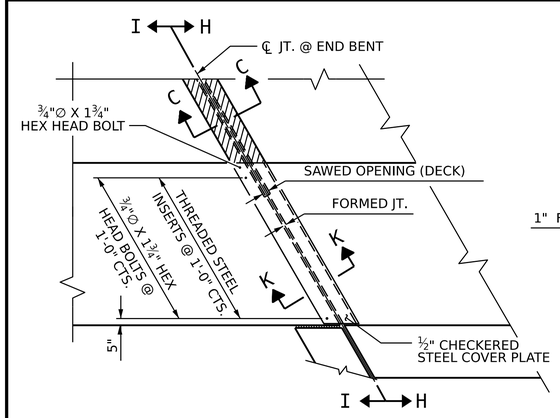
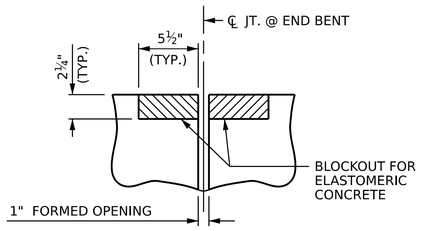
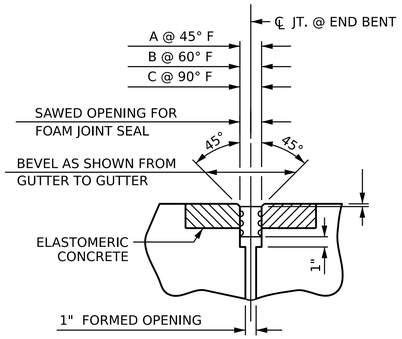


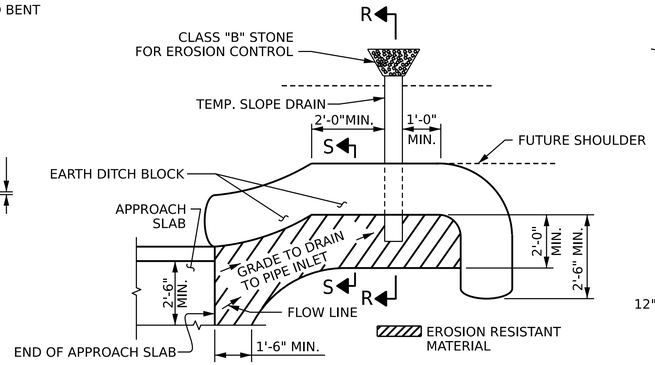
PLAN VIEW OF FOAM JOINT SEAL @ END BENT FOR SIDEWALK



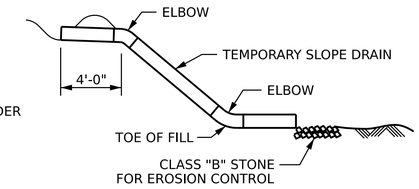
SECTION C-C
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



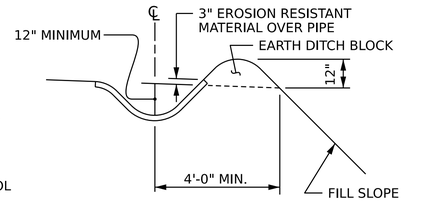
SECTION C-C
FOAM JOINT SEAL
(EXPANSION)



NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.



SECTION R-R

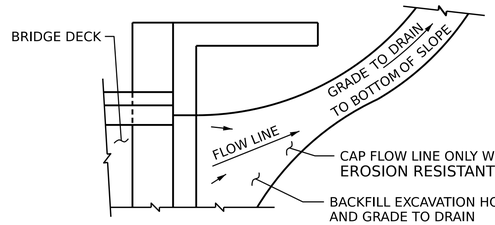


SECTION S-S

PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

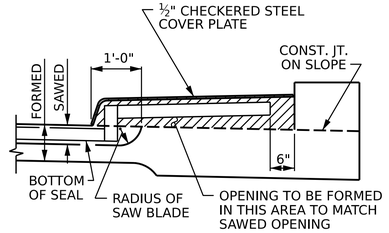


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

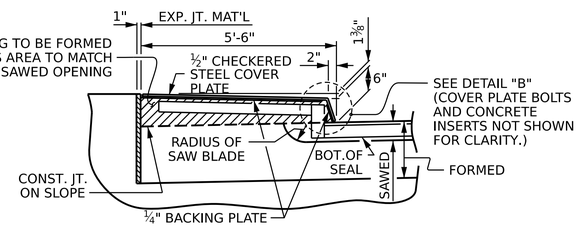
ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	9.7
2	9.7
TOTAL	19.4

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

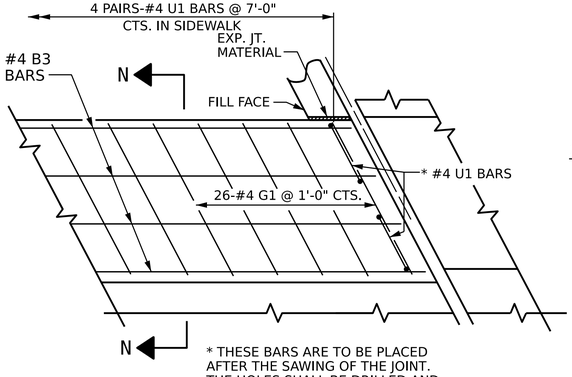
OPENING WIDTH		
	END BENT NO. 1	END BENT NO. 2
A	$1\frac{11}{16}$"	$1\frac{11}{16}$"
B	$1\frac{9}{16}$"	$1\frac{9}{16}$"
C	$1\frac{5}{16}$"	$1\frac{3}{8}$"



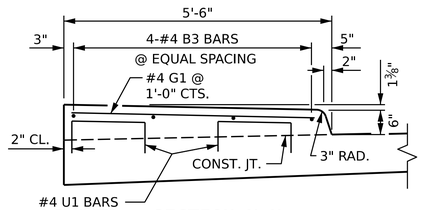
SECTION H-H



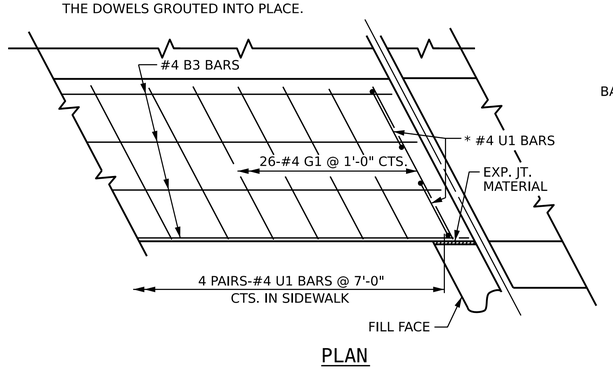
SECTION I-I



* THESE BARS ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE DOWELS GROUTED INTO PLACE.



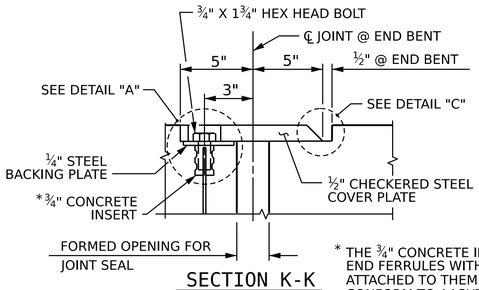
SECTION N-N



PLAN

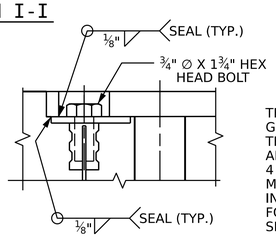
DETAILS OF SIDEWALK ON APPROACH SLAB

SIDEWALK DETAILS

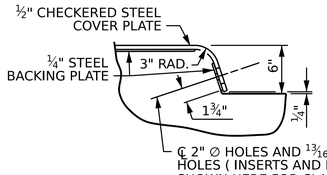


SECTION K-K

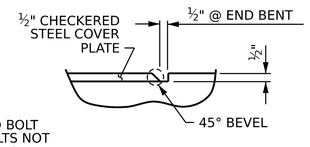
* THE ¾" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14 AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LBS.



DETAIL "A"



DETAIL "B"



DETAIL "C"

JOINT SEAL DETAILS @ END BENT

TEMPORARY DRAINAGE DETAIL

THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL. AFTER FABRICATION, THE PLATES SHALL BE COMMERCIALLY BLAST CLEANED AND EITHER COATED WITH A MINIMUM THICKNESS OF 4 MILS (DRY) OF ZINC-RICH PAINT, GALVANIZED OR METALLIZED TO A MINIMUM THICKNESS OF 6 MILS INACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE ¾" DIAMETER HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR "FOAM JOINT SEALS".

PROJECT NO. U-5899
FORSYTH COUNTY
STATION: 32+73.75 -L-

SHEET 2 OF 2

DRAWN BY : N. K. KAVANI DATE : 10-2023
CHECKED BY : J. M. ROBINSON DATE : 10-2023
DESIGN ENGINEER OF RECORD: R. L. DICKE DATE : 10-2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PREPARED BY
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NORTH CAROLINA PROFESSIONAL SEAL 039313 ENGINEER RICHARD L. DICKE
31-Mar-2025

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S01-36
1			3			TOTAL SHEETS
2			4			36

1/27/2025 6:04:06 PM
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WILSTOTT

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	AASHTO (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE AASHTO
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE AASHTO
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2024 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞" ∅ SHEAR STUDS FOR THE ¾" ∅ STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" ∅ STUDS FOR 4 - ¾" ∅ STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" ∅ STUDS ALONG THE BEAM AS SHOWN FOR ¾" ∅ STUDS BASED ON THE RATIO OF 3 - ⅞"∅ STUDS FOR 4 - ¾" ∅ STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16" OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.