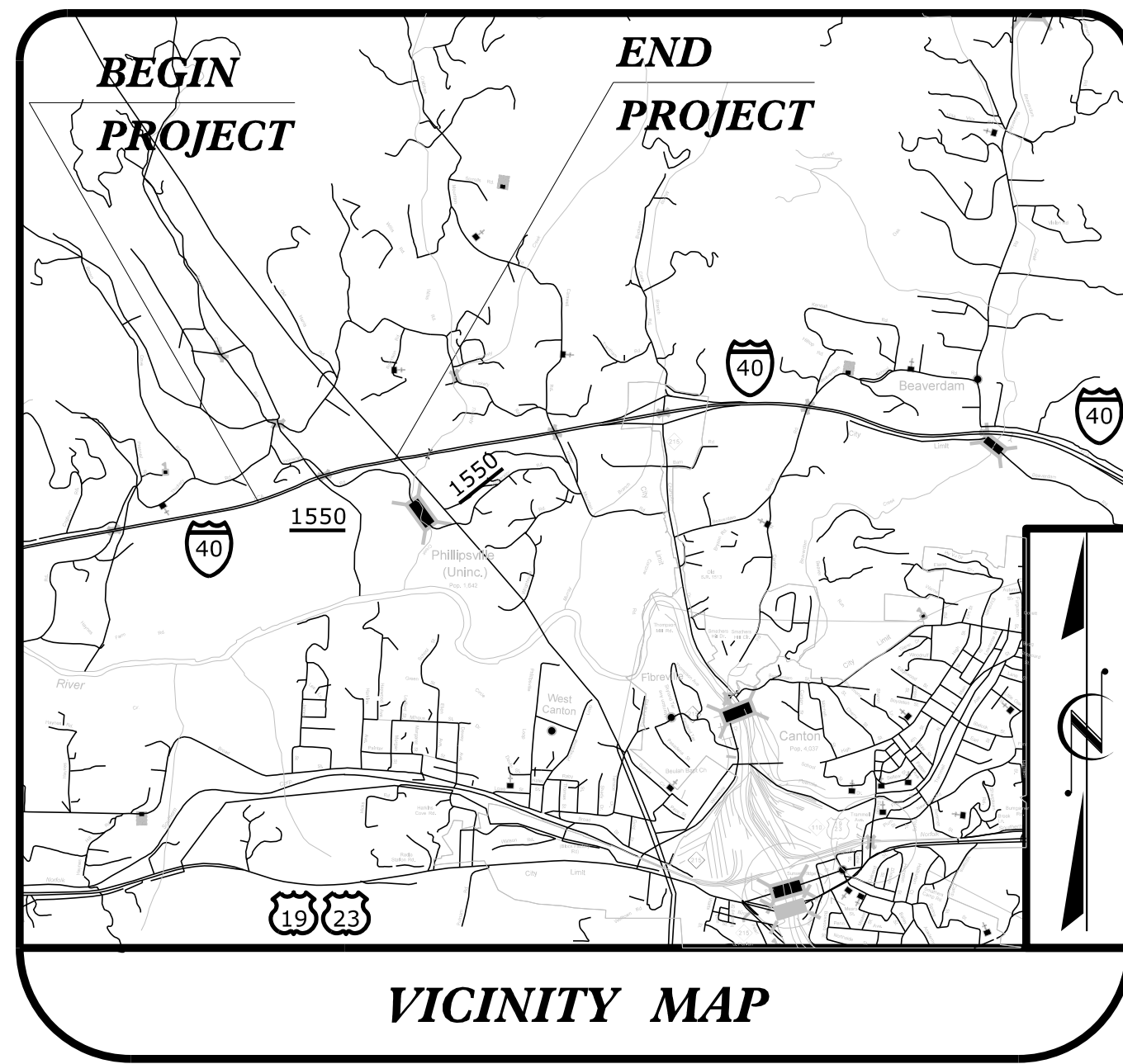


**TIP PROJECT: HB-0003**

**CONTRACT: C204884**



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

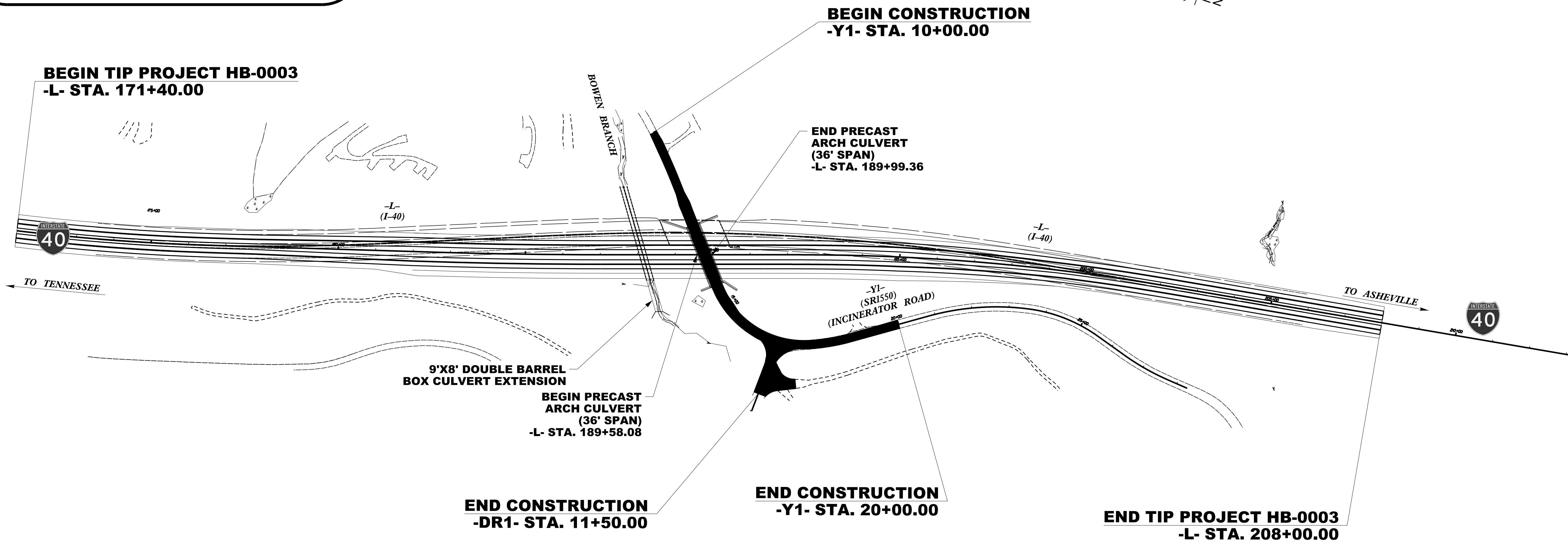
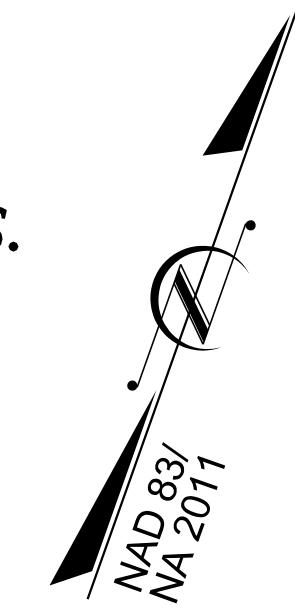
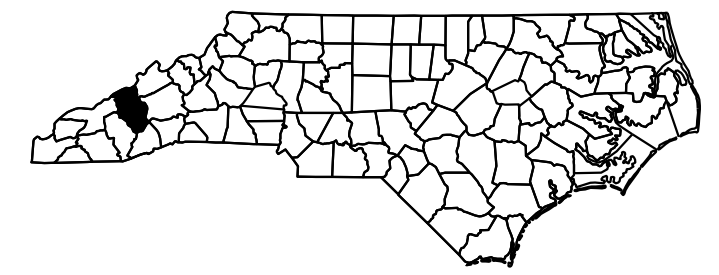
# HAYWOOD COUNTY

**LOCATION:** I-40 FROM 0.348 MILES WEST OF SR-1550 (INCINERATOR ROAD) TO 0.345 MILES EAST OF SR-1550 (INCINERATOR ROAD)

**TYPE OF WORK:** GRADING, DRAINAGE, PAVING, CULVERTS, AND WALLS.

**STRUCTURE PLANS**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HB-0003		
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
49623.1.1		PE	
49623.2.1		RW & UTIL.	
49623.3.1		CONST.	



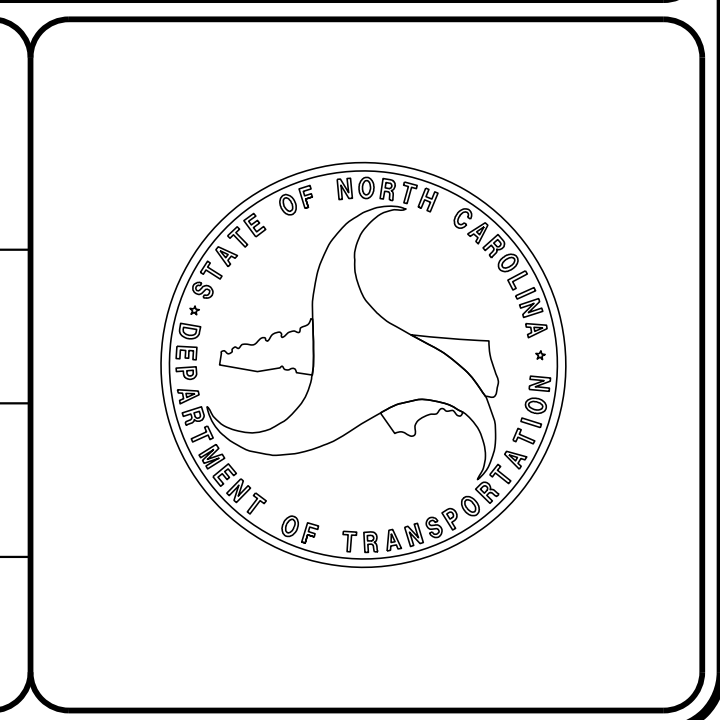
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA	
ADT 2024	= 58,800
ADT 2045	= 82,900
K	= 8 %
D	= 55 %
T	= 18 % *
V	= 70 MPH
* TTST	= 14% DUAL = 4%
FUNC. CLASS	= INTERSTATE

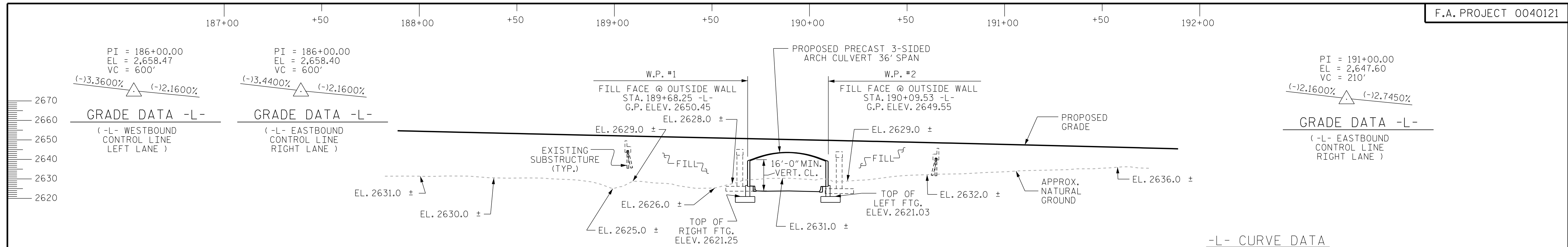
PROJECT LENGTH	
LENGTH ROADWAY TIP PROJECT HB-0003	= 0.685 MILES
LENGTH STRUCTURE TIP PROJECT HB-0003	= 0.008 MILES
TOTAL LENGTH TIP PROJECT HB-0003	= 0.693 MILES

Prepared in the Office of:  
  
 1223 Jones Franklin Rd., Raleigh, N.C. 27606  
 License No. F-0377  
 Bus: 919.851.8077 Fax: 919.851.8107  
 2024 STANDARD SPECIFICATIONS  
**RIGHT OF WAY DATE:**  
 AUGUST 21, 2023  
**LETTING DATE:**  
 JULY 16, 2024  
**NCDOT CONTACT:**

Prepared for:  
**DIVISION OF HIGHWAYS**  
**DIVISION 14**  
 253 Webster Road  
 Sylva, NC, 28779  
**GREG PURVIS, PE**  
 PROJECT ENGINEER  
**THOMAS K KOCH, PE**  
 PROJECT DESIGN ENGINEER  
**ZACH SHULER**  
 BRIDGE PROGRAM MANAGER

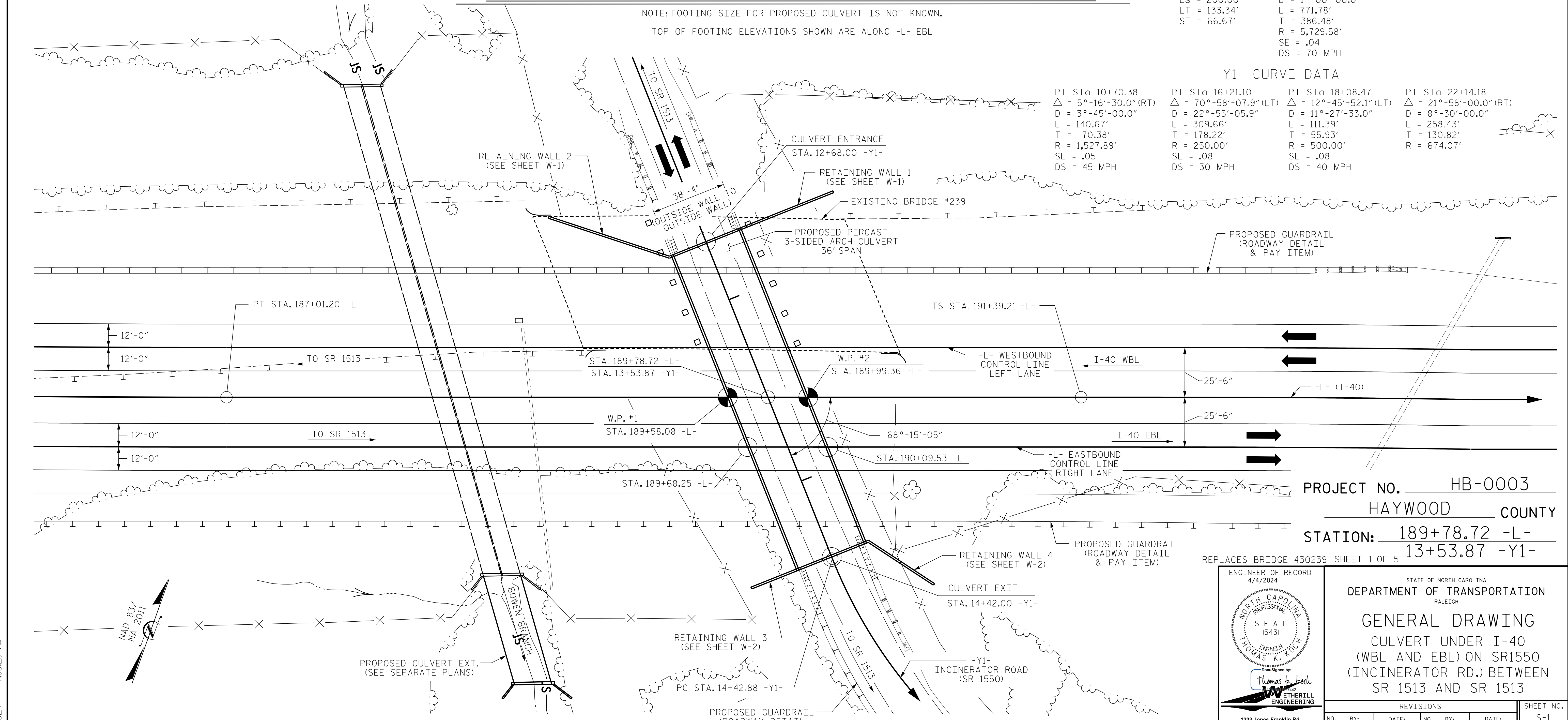


6/10/2024 2:25:46 PM P:\2023\23128.01\HB-0003\Structures\Drawings\PRECAST\_CULVERT\HB0003-PCAST-CUL-TSH.dgn



### SECTION ALONG -L- EASTBOUND CONTROL LINE RIGHT LANE

NOTE: FOOTING SIZE FOR PROPOSED CULVERT IS NOT KNOWN.  
TOP OF FOOTING ELEVATIONS SHOWN ARE ALONG -L- EBL



### PLAN

PROJECT NO. HB-0003  
 HAYWOOD COUNTY  
 STATION: 189+78.72 -L-  
13+53.87 -Y1-  
 REPLACES BRIDGE 430239 SHEET 1 OF 5

ENGINEER OF RECORD  
 4/4/2024  
  
 THOMAS K. KOCH  
 WETHERILL ENGINEERING  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 CULVERT UNDER I-40  
 (WBL AND EBL) ON SR1550  
 (INCINERATOR RD.) BETWEEN  
 SR 1513 AND SR 1513

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

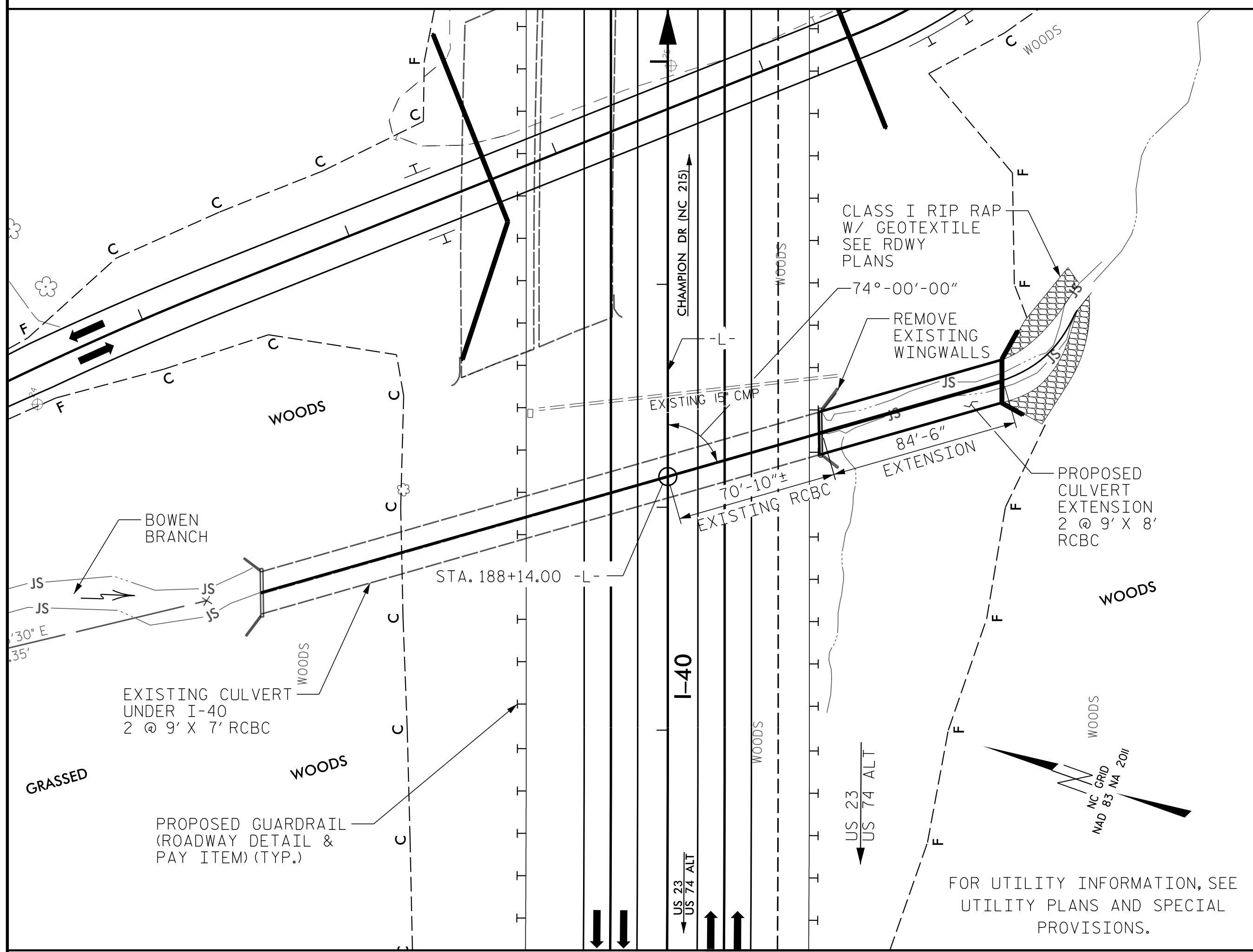
DRAWN BY: D. HODGE DATE: 12/22  
 CHECKED BY: T. KOCH DATE: 9/23

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

P:\2023\2312801\_HB-0003\_Structures\DWG\PRECAST\_CULVERT\HB0003-PRECAST-CUL.dgn 4/4/2024 11:00:26 AM



BM #2, SPIKE SET IN FENCE POST, STA.10+94 -Y1-, 20.4' LT, EL. 2626.87 N678530.5050 E 848302.9860



**LOCATION SKETCH**

**ROADWAY DATA**

GRADE POINT ELEV. @ STA 188+14.00 -L- EB	= 2653.86
BED ELEV. @ STATION 188+14.00 -L-	= 2603.88
ROADWAY SLOPES	= 2:1

**HYDRAULIC DATA**

DESIGN DISCHARGE	= 750 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YEARS
DESIGN HIGH WATER ELEVATION	= 2614.6
DRAINAGE AREA	= 1.87 SQ. MI.
BASE DISCHARGE (Q100)	= 900 CFS
BASE HIGH WATER ELEVATION	= 2615.4

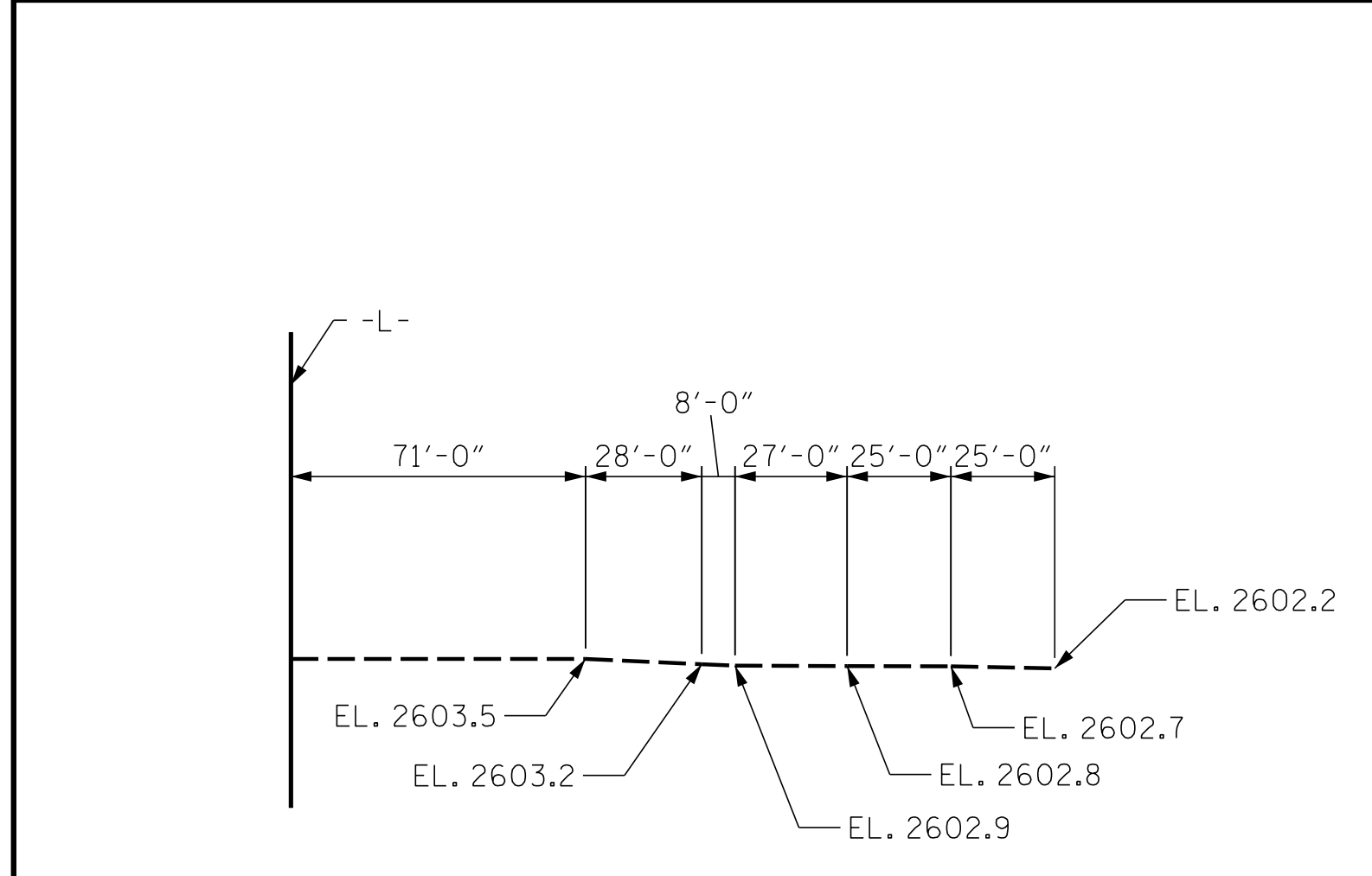
**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE	= 1200+ C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YEARS
OVERTOPPING FLOOD ELEVATION	= 2624 *

\* SR 1550 STA. 07+35  
WS EL. TAKEN @ RIVER STATION 1570

**TOTAL BILL OF MATERIAL**

MATERIAL	ELEMENT	LUMP SUM		
		STAGE I	STAGE II	
FOUNDATION COND. MAT'L (TONS)		83	67	
	TOTAL	150		
	CLASS A CONCRETE (CU. YDS.)	BARREL	122.4	216.7
		EDGE BEAMS	0.5	1.2
		HEADWALL	---	1.0
		SILLS	0.7	0.3
		WINGS	4.9	6.8
END CURTAIN WALL		0.7	0.5	
TOTAL	129.2	226.5		
TOTAL		355.7		
REINFORCING STEEL (LBS.)	BARREL	21,894	27,142	
	WINGS, ETC.	339	435	
	TOTAL	22,233	27,577	
TOTAL		49,810		



**PROFILE ALONG CULVERT**

**SAMPLE BAR REPLACEMENT**

SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

**FOUNDATION NOTES**

FOR CULVERT EXCAVATION, SEE SECTION 414 OF THE STANDARD SPECIFICATIONS.

THE REINFORCED CONCRETE BOX CULVERT SHALL BE PLACED ON THE STANDARD 1.0 FOOT BLANKET OF FOUNDATION CONDITIONING MATERIAL.

UNDERCUT SOFT/VERY LOOSE SOILS THAT MAY BE ENCOUNTERED BENEATH THE BOTTOM OF THE FOUNDATION CONDITIONING MATERIAL. BACKFILL UNDERCUT AREAS WITH FOUNDATION CONDITIONING MATERIAL. IF MORE THAN 1 FT. OF ADDITIONAL UNDERCUT IS REQUIRED, CONTACT THE OPERATIONS ENGINEER FOR APPROVAL.

INSTALL TYPE 2 GEOTEXTILE ON THE SIDES AND TOP OF THE CULVERT. EXTEND GEOTEXTILE 10 FEET IN EACH DIRECTION OF THE JOINT. OVERLAP GEOTEXTILES A MINIMUM OF 18 INCHES. ESTIMATED TYPE 2 GEOTEXTILE QUANTITY - 100 SYDS.

**NOTES**

ASSUMED LIVE LOAD = HL-93.  
DESIGN FILL TO BOTTOM OF TOP SLAB 41.0' (MAX).  
FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE STANDARD NOTES SHEET SN.  
3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:  
STAGE I:  
1. WING FOOTINGS AND FLOOR SLAB AND FLOOR EDGE BEAM AND INCLUDING 4" OF VERTICAL WALLS.  
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT.

STAGE II:  
1. WING FOOTINGS AND FLOOR SLAB AND FLOOR EDGE BEAM AND INCLUDING 4" OF VERTICAL WALLS.  
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY THE ENTIRE ROOF SLAB, ROOF EDGE BEAM AND HEADWALL.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FEET. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.  
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.  
FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

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 SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

DOWELS SHALL BE USED TO CONNECT THE CULVERT EXTENSION TO THE EXISTING CULVERT AS SHOWN. FOR NOTE REGARDING SETTING OF DOWELS, SEE SHEET SN.

IF APPROVED BY THE ENGINEER, THE CONTRACTOR MAY USE THE EXISTING WINGS AS TEMPORARY SHORING FOR THE CONSTRUCTION OF THE CULVERT EXTENSIONS. IN THIS CASE, THE BOTTOM SLAB OF THE EXTENSION SHALL BE POURED AT LEAST 72 HOURS PRIOR TO CUTTING THE WINGS. THE WINGS MAY BE CUT EARLIER PROVIDED THE SLAB CONCRETE STRENGTH HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS CULVERT EXTENSION SHALL BE SUBMITTED. SEE STANDARD NOTES SHEET SN.

THE EXISTING STRUCTURE CONSISTING OF A DOUBLE 9' X 7' REINFORCED CONCRETE BOX CULVERT 262.0'± LONG ALONG CENTERLINE OF CULVERT AND LOCATED AT PROPOSED STRUCTURE SHALL BE RETAINED AND EXTENDED. THE EXISTING CULVERT IS PRESENTLY NOT POSTED FOR LOAD LIMIT.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

RCBC EXTENSION FLOOR SLAB INVERT TO BE CONSTRUCTED 1'-0" BELOW THE INVERT OF THE EXISTING CULVERT FLOOR SLAB. RCBC EXTENSION BOTTOM OF ROOF SLAB SHALL MATCH EXISTING CULVERT BOTTOM OF ROOF SLAB. SEE DETAIL "A" ON SHEET C-3.

PROJECT NO. HB-0003  
HAYWOOD COUNTY  
STATION: 188+14.00 -L-

ENGINEER OF RECORD

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

DOUBLE 9 FT. X 8 FT.  
REINFORCED CONCRETE  
BOX CULVERT  
EXTENSION  
74°-00'-00" SKEW

REVISIONS

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

SHEET NO. C-1  
TOTAL SHEETS 9

15801 Brixham Hill Ave, Suite 530  
Charlotte, N.C. 28277  
Bus: 704.919.1880  
Fax: 919.851.8107  
LICENSE NO. F-0377

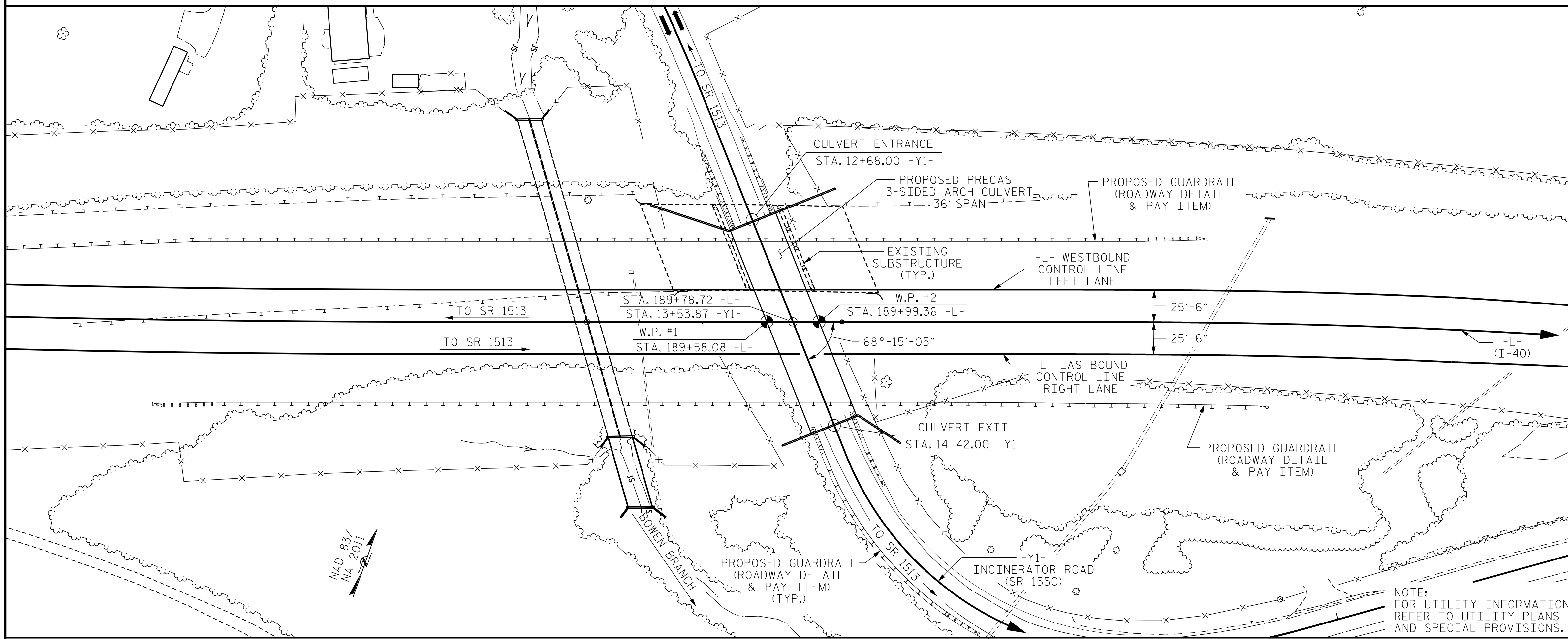
DRAWN BY :D.MOSQUERA/J.PENDERGRAFT DATE : 11/28/23  
CHECKED BY : J.DILWORTH DATE : 11/28/23

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

P:\2023\2312801-HB-0003-Structures\DWG\CULVERT\_EXT\_12-2023\C-1\_HB-003\_SMU\_CU\_GENERAL\_INFORMAT\_I01.dgn  
 6/4/2024 10:05:22 AM



BM2: SPIKE SET IN FENCE POST, STATION 5+55.00 BY1 32' LEFT; N 678531, E 848303, ELEVATION = 2626.87



LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.  
 THIS CULVERT HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.  
 THIS CULVERT IS LOCATED IN SEISMIC ZONE 1.  
 NO CAST-IN-PLACE BARREL OPTION WILL BE ALLOWED.  
 MIN. FILL = 6.8' \* \* = MEASURED TO BOTTOM OF TOP SLAB @ -Y1-  
 MAX. FILL = 7.7' \*  
 FOR PRECAST REINFORCED CONCRETE THREE-SIDED CULVERT, SEE SPECIAL PROVISIONS.  
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.  
 AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF 3 SPANS EACH AT 49', 51', 41' WITH A CONCRETE DECK ON STEEL I-BEAM SUPERSTRUCTURE AND A CLEAR ROADWAY WIDTH OF 66' ON A SUBSTRUCTURE CONSISTING OF A CONCRETE CAP ON CONCRETE POST AND BEAM BENTS AND LOCATED AT THE SITE OF THE PROPOSED CULVERT SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED CULVERT, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.  
 FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.  
 FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.  
 FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.  
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.  
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.  
 A CAST-IN-PLACE REINFORCED CONCRETE FOOTING IS REQUIRED FOR THE PRECAST REINFORCED CONCRETE THREE-SIDED CULVERT FOUNDATION. THE CONTRACTOR SHALL PROVIDE THE FOOTING DESIGN TO THE ENGINEER FOR REVIEW AND APPROVAL.

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 @ STA. 189+78.72 -L-".

THE PRECAST CULVERT SECTIONS SHALL BE DESIGNED TO HANDLE FULL DEPTH HYDROSTATIC PRESSURE IF WEEP HOLES ARE NOT UTILIZED. IF PROVIDED, WEEP HOLES SHALL BE LOCATED A MINIMUM HEIGHT OF 6 INCHES ABOVE THE 4" CIP CONCRETE AND HAVE A MAXIMUM SPACING OF 10 FEET.

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

FOUNDATION NOTES:

FOR CULVERT EXCAVATION, SEE SECTION 414 OF THE STANDARD SPECIFICATIONS.

CULVERT WILL BE CONSTRUCTED IN 2 STAGES. EACH STAGE WILL HAVE SURCHARGE PLACEMENT AND REMOVAL AND SETTLEMENT MONITORING PRIOR TO CULVERT CONSTRUCTION. SEE SURCHARGE DRAWINGS FOR MORE INFORMATION.

PRIOR TO CULVERT CONSTRUCTION VERIFY THE ESTIMATED BEARING RESISTANCE OF 4.5 TSF. IF LOWER BEARING CONDITIONS ARE ENCOUNTERED, CONTACT WRO OPERATION ENGINEER.

THE FACTORED BEARING RESISTANCE FOR THE CULVERT FOOTING DESIGN IS 2 TSF.

SAMPLE BAR REPLACEMENT

SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

NOTE: SAMPLE BAR REPLACEMENT LENGTHS BASED ON 30" (SAMPLE LENGTH) PLUS TWO SPLICE LENGTHS AND  $f_y = 60$  ksi.

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 SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

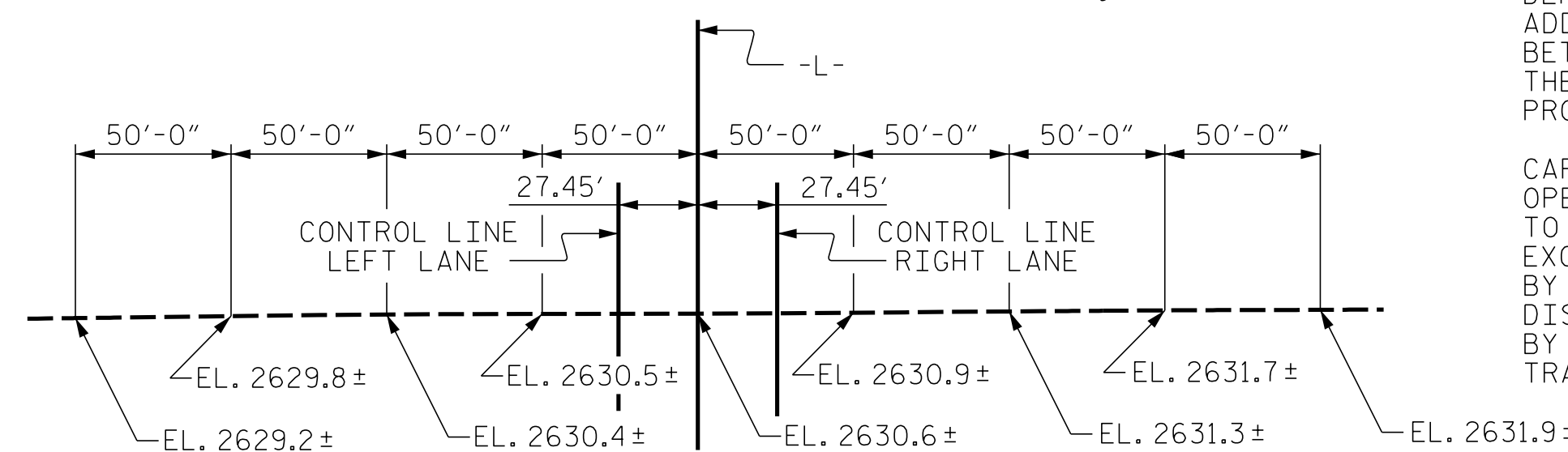
THE LOCATION OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED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

CARE SHALL BE TAKEN DURING BACKFILL AND COMPACTION OPERATION TO MAINTAIN ALIGNMENT AND PREVENT DAMAGE TO THE JOINTS. UNITS WHICH BECOME MISALIGNED, SHOW EXCESSIVE SETTLEMENT, OR HAVE OTHERWISE BEEN DAMAGED BY THE CONTRACTOR'S OPERATION SHALL AT THE DISCRETION OF THE ENGINEER BE REMOVED AND REPLACED BY THE CONTRACTOR AT NO COST TO THE DEPARTMENT OF TRANSPORTATION.

PROJECT NO. HB-0003  
HAYWOOD COUNTY  
 STATION: 189+78.72 -L-

SHEET 2 OF 5

TOTAL STRUCTURE QUANTITIES	
REMOVAL OF EXISTING STRUCTURE @ STA. 189+78.72 -L-	LUMP SUM
PRECAST REINFORCED CONCRETE THREE-SIDED CULVERT @ STA. 189+78.72 -L-	LUMP SUM
CAST-IN-PLACE REINFORCED CONCRETE FOOTING FOR PRECAST CULVERT	LUMP SUM
UNCLASSIFIED STRUCTURE EXCAVATION @ STA. 189+78.72 -L-	LUMP SUM
ASBESTOS ASSESSMENT	LUMP SUM



PROFILE ALONG -Y1-

(EXISTING GRADE SHOWN)

DRAWN BY: D. HODGE DATE: 12/22  
 CHECKED BY: T. KOCH DATE: 9/23

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGINEER OF RECORD  
 4/4/2024  
  
 Described by:  
  
 1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

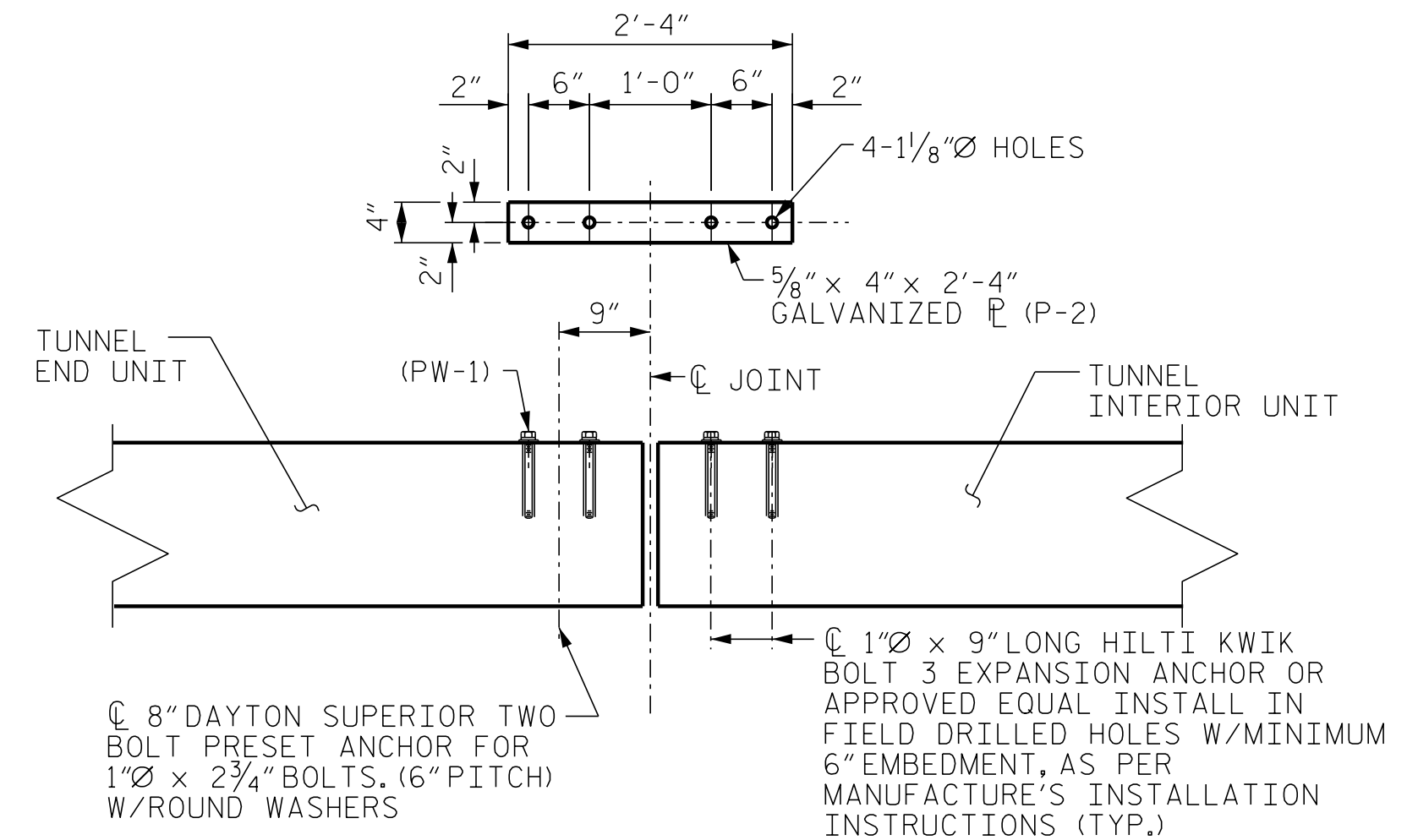
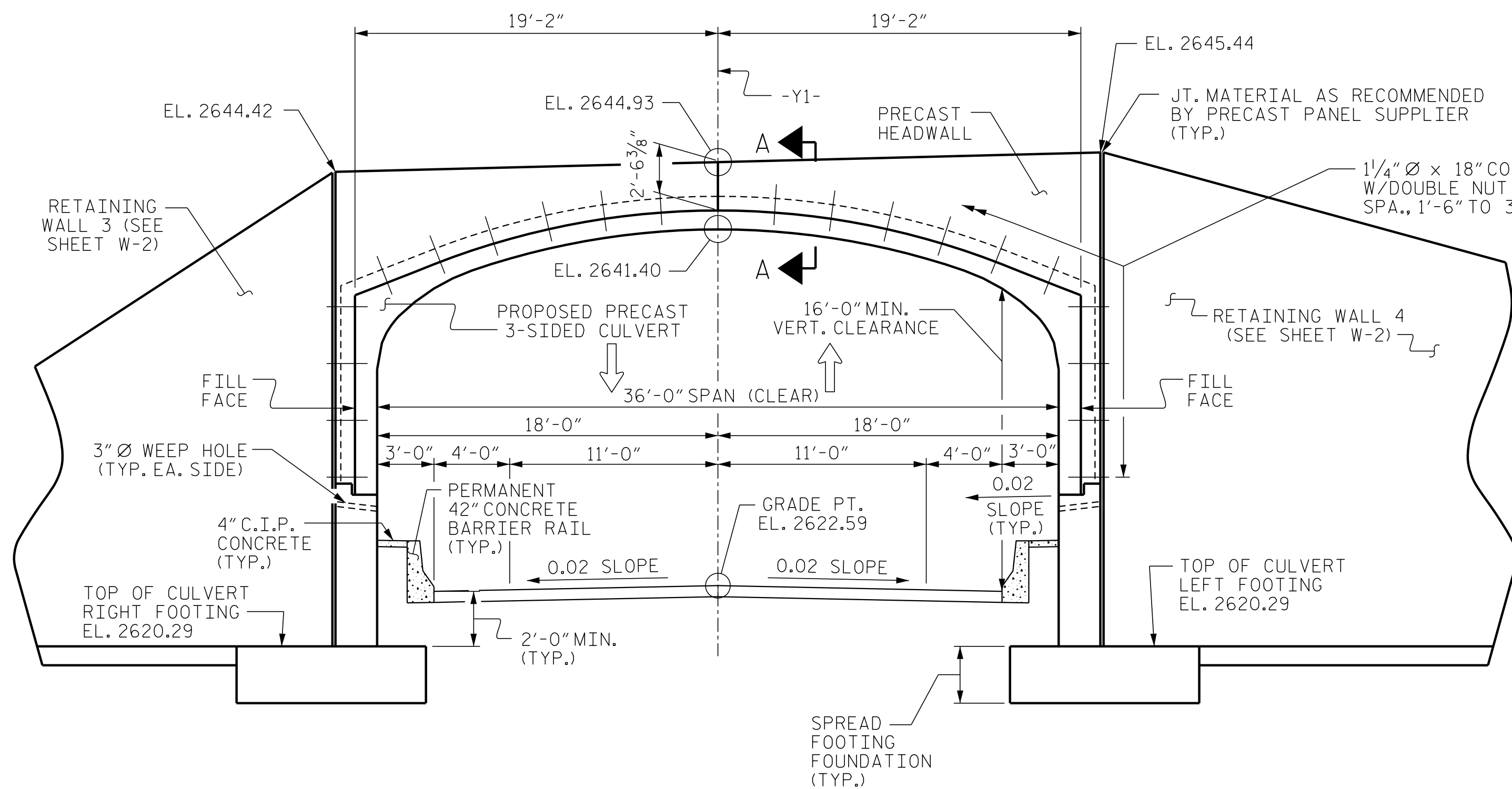
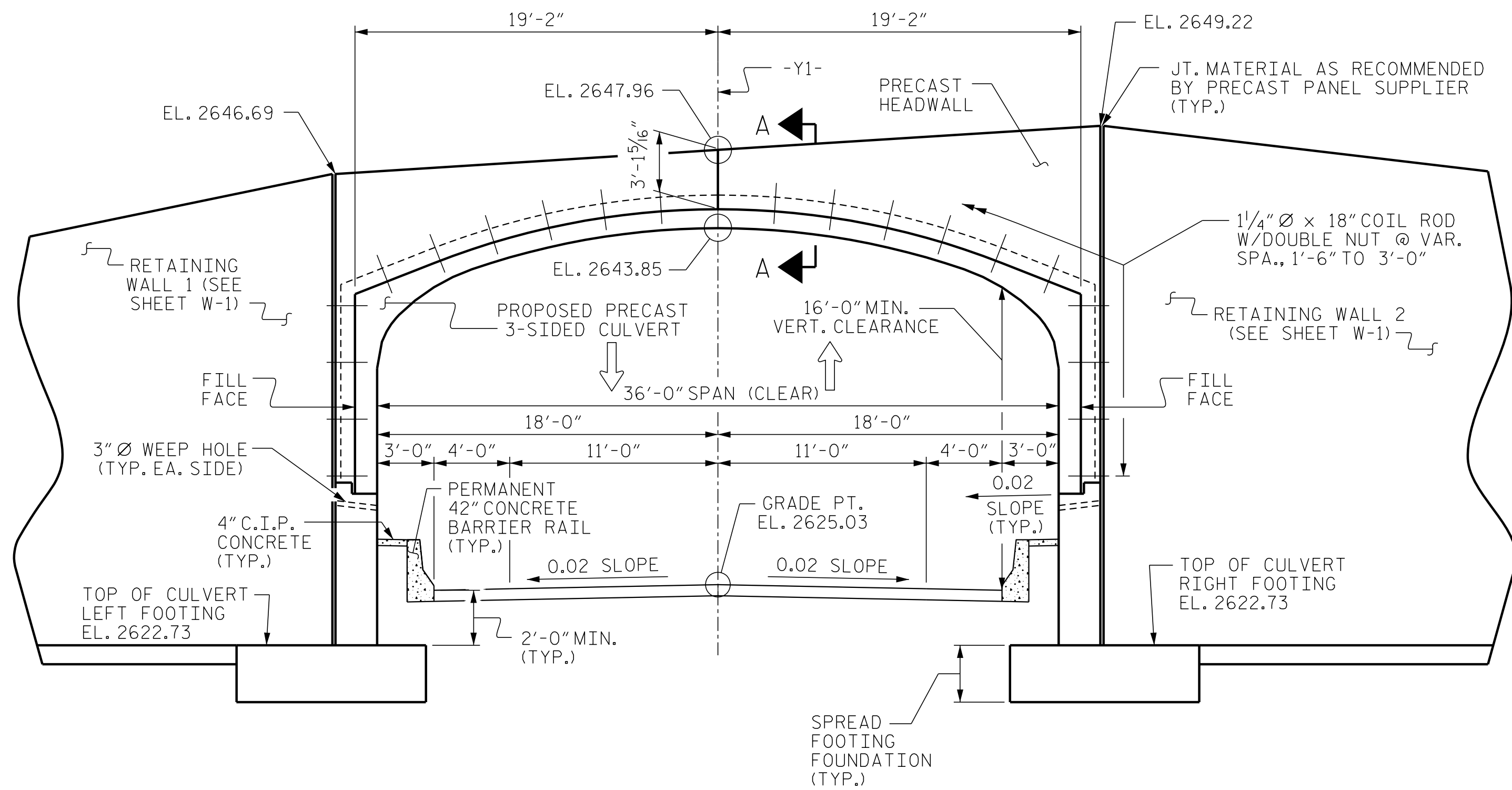
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**PRECAST  
 3-SIDED ARCH  
 CULVERT  
 36'-0" SPAN**

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

SHEET NO. S-2  
 TOTAL SHEETS 5

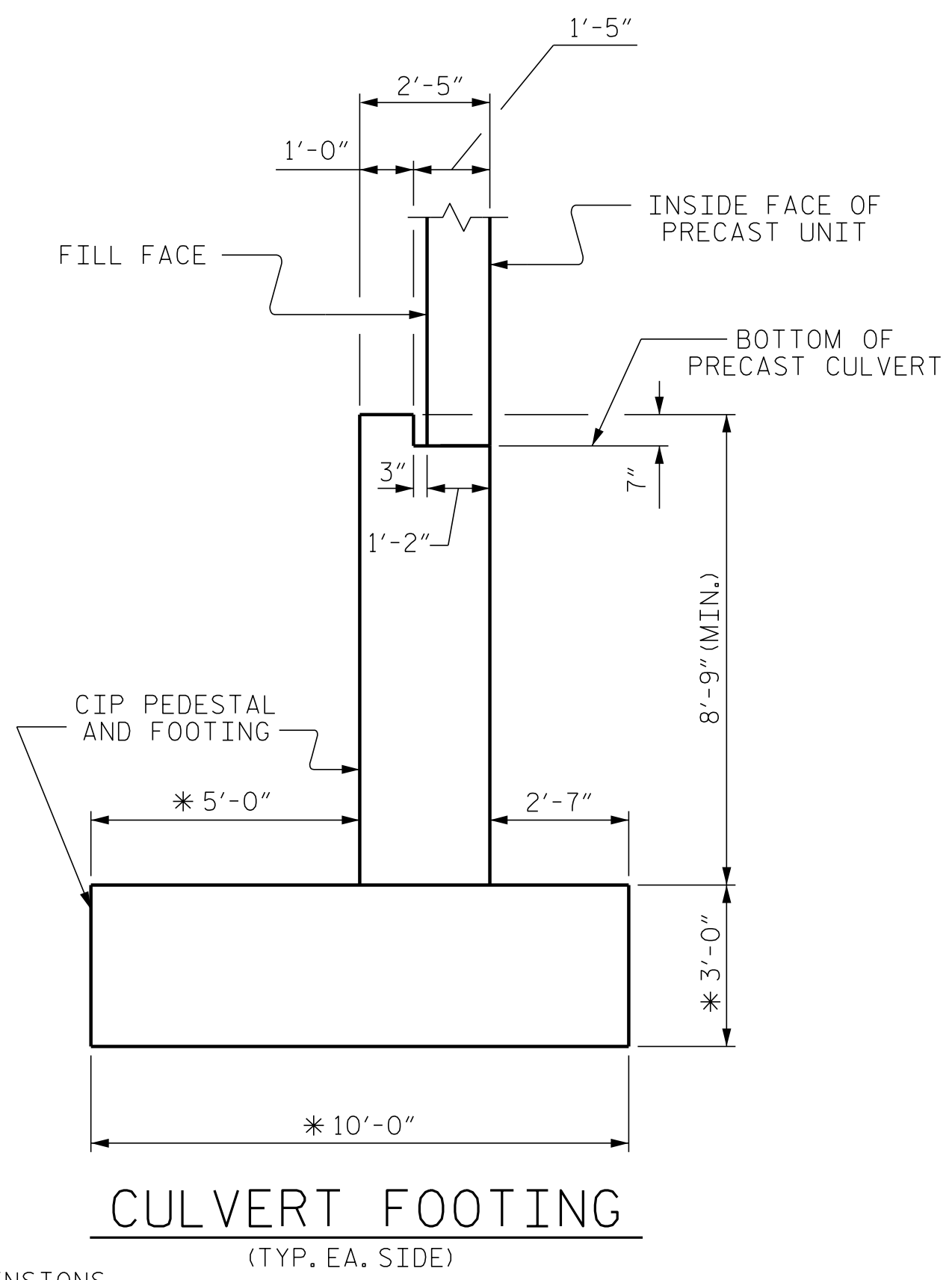
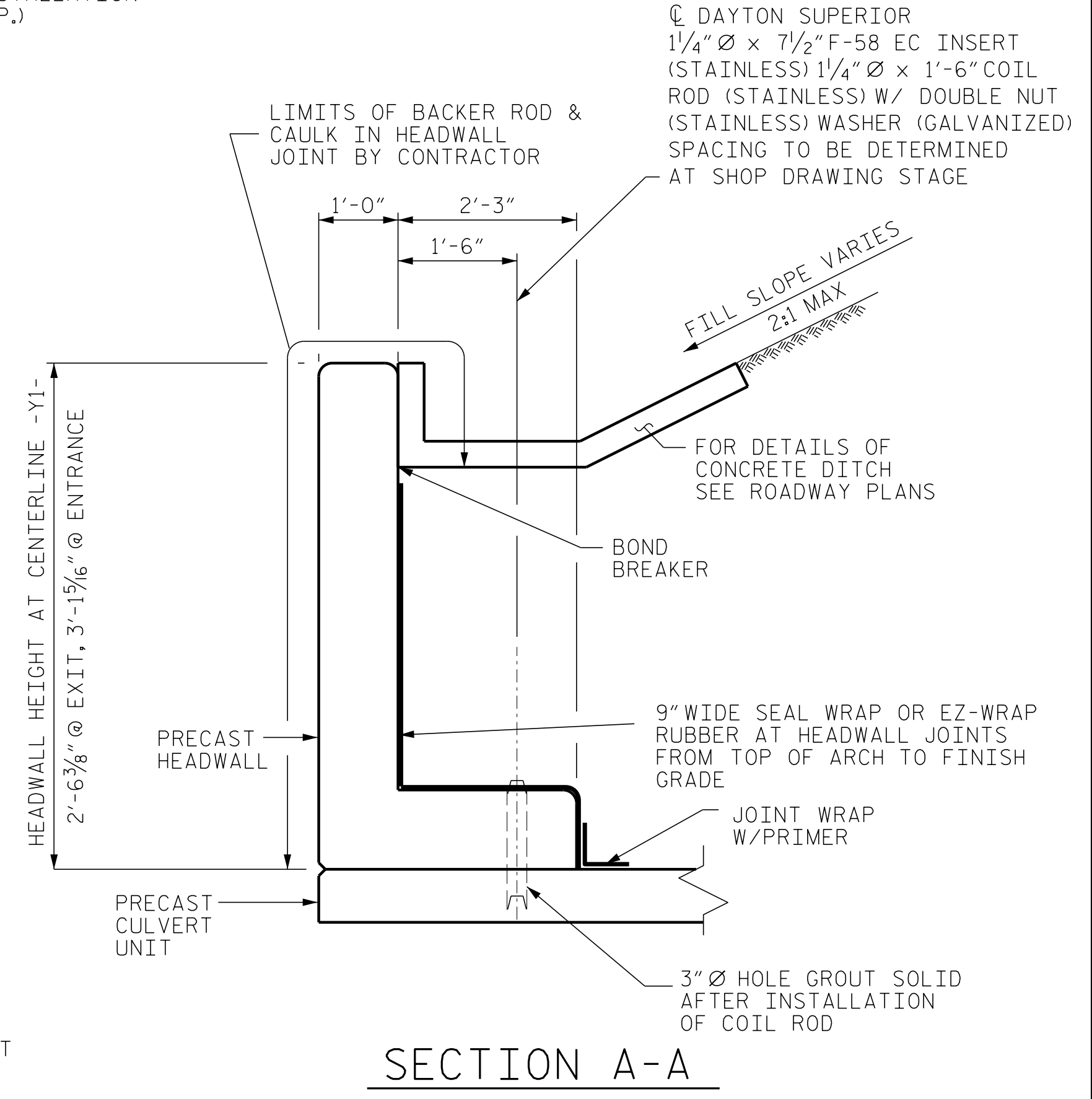
P:\2023\2312801\HB-0003\Structures\DWG\PRECAST\_CULVERT\_VH0003-PCAST-CUL.dgn  
 4/4/2024 11:40:10 AM





ESTIMATED CLASS A CONCRETE QUANTITIES	
CLASS A CONCRETE (LEFT SIDE)	325 CU. YDS.
CLASS A CONCRETE (RIGHT SIDE)	325 CU. YDS.
CLASS A CONCRETE TOTAL	650 CU. YDS.

NOTE: NO SEPARATE PAYMENT WILL BE MADE FOR CLASS A CONCRETE. THE COST OF PROVIDING AND INSTALLING CLASS A CONCRETE IS INCLUDED IN THE LUMP SUM PRICE FOR CAST-IN-PLACE REINFORCED CONCRETE FOOTING FOR PRECAST CULVERT.

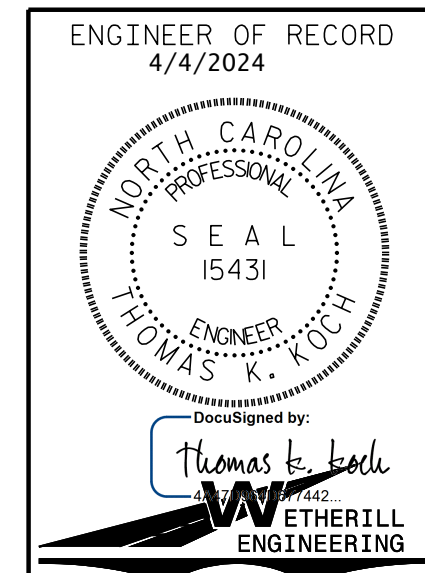


\* THESE DIMENSIONS ARE ESTIMATES FOR BIDDING PURPOSES.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. HB-0003  
HAYWOOD COUNTY  
STATION: 189+78.72 -L-

SHEET 3 OF 5



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
PRECAST  
3-SIDED ARCH  
CULVERT  
36'-0" SPAN  
CULVERT END VIEWS

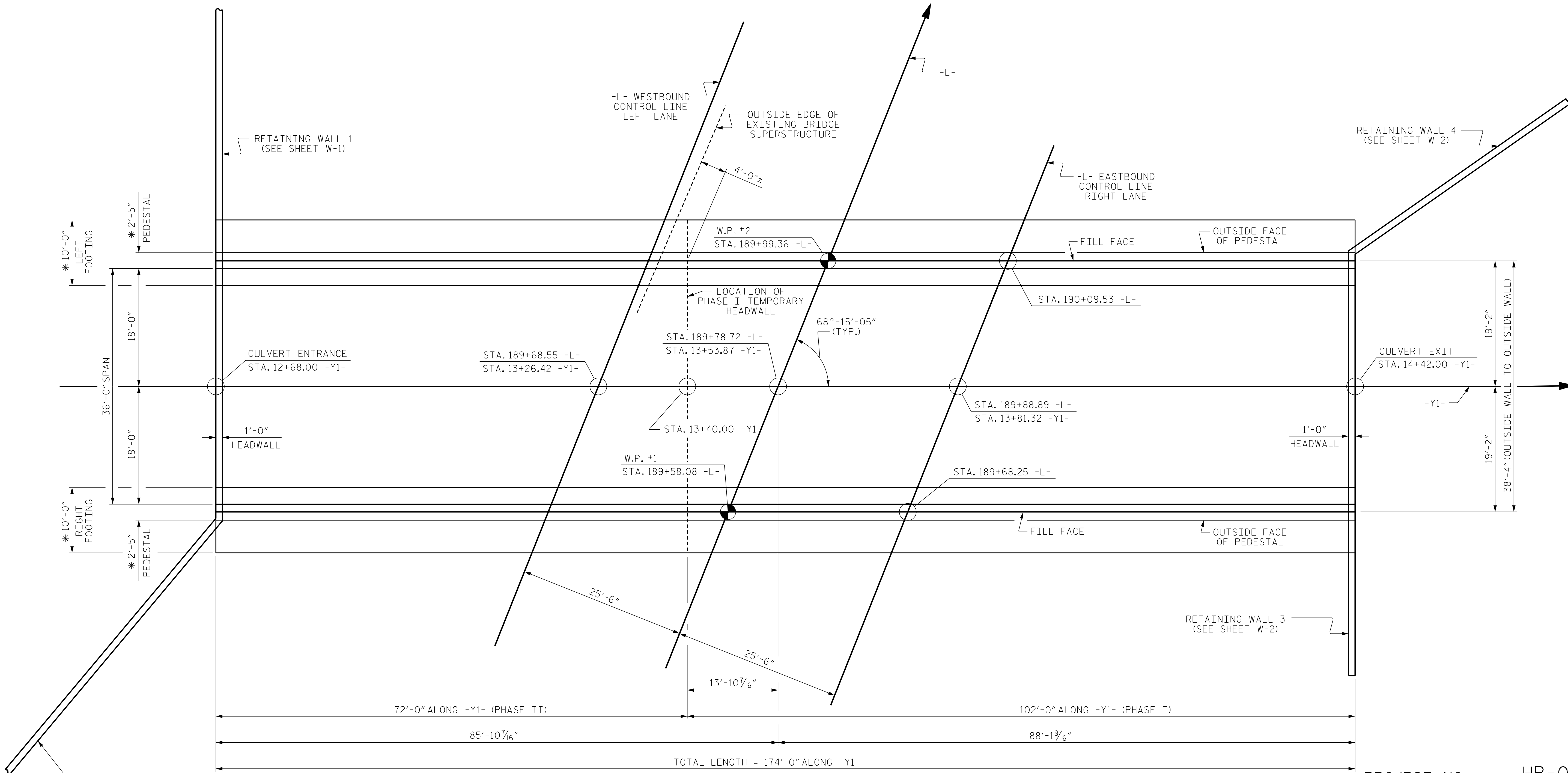
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			5

1223 Jones Franklin Rd.  
Raleigh, N.C. 27606  
Bus: 919 851 8077  
Fax: 919 851 8107  
LICENSE NO. F-0377

PA:2023\2312801\_HB-0003\_Structures\DOM\PRECAST\_CULVERT\HB0003-PCAST-CUL.dgn  
 4/4/2024 11:01:42 AM

DRAWN BY: D. HODGE DATE: 12/22  
CHECKED BY: T. KOCH DATE: 9/23

PA\2023\23128.01\HB-0003\Structures\DOM\PRECAST\_CULVERT\HB0003-PRECAST-CUL.dgn  
4/4/2024 11:02:13 AM



PLAN

NOTE:  
 \* ACTUAL FOOTING AND PEDESTAL DIMENSIONS TO BE DESIGNED BY THE CONTRACTOR. ESTIMATED SIZES SHOWN ARE FOR BIDDING PURPOSES ONLY.

WORK ON THE FOOTINGS SHALL NOT BEGIN UNTIL SURCHARGE IS PLACED AND SETTLEMENT IS MONITORED. FOR SURCHARGE PLANS AND STAGING, SEE SEPARATE PLANS.



PROJECT NO. HB-0003  
HAYWOOD COUNTY  
 STATION: 189+78.72 -L-

SHEET 4 OF 5

DRAWN BY : D. HODGE DATE : 12/22  
 CHECKED BY : T. KOCH DATE : 9/23

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGINEER OF RECORD  
4/4/2024

Thomas K. Koch  
WETHERILL ENGINEERING

1223 Jones Franklin Rd.  
Raleigh, N.C. 27606  
Bus: 919 851 8077  
Fax: 919 851 8107  
LICENSE NO. F-0377

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

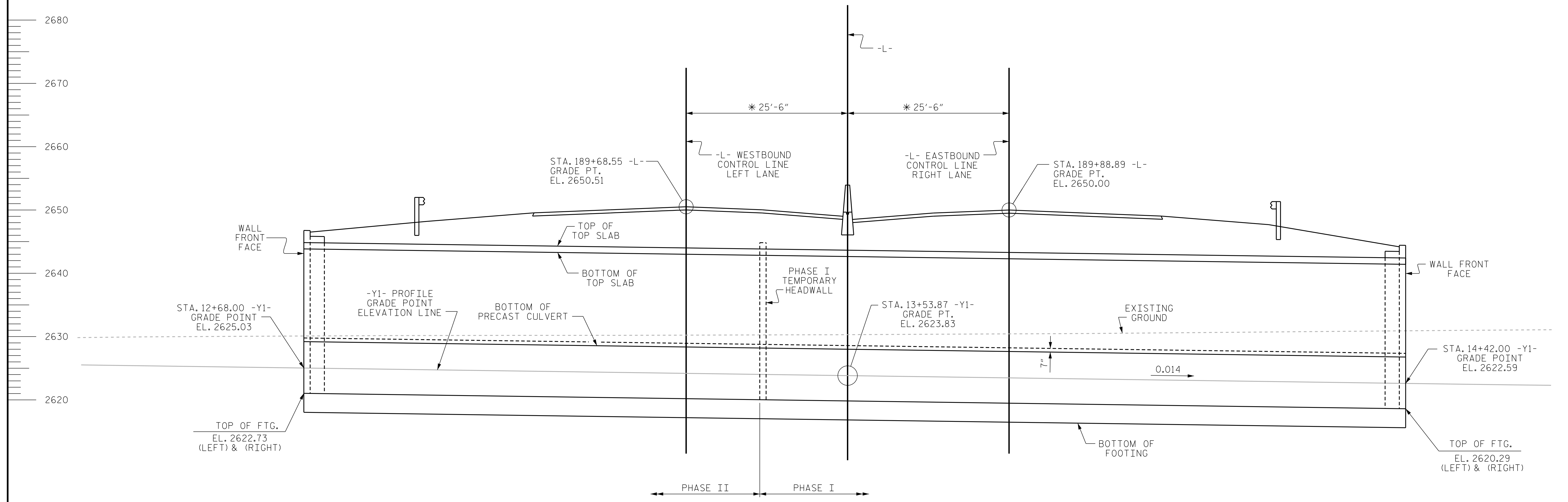
PRECAST  
3-SIDED ARCH  
CULVERT  
36'-0" SPAN

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

TOTAL SHEETS: 5

PI = 10+50.00  
 EL = 2,628.08'  
 VC = 100'  
 (+)1.5000% (-)1.4000%  
 GRADE DATA -Y1-

PI = 15+50.00  
 EL = 2,621.08'  
 VC = 200'  
 (-)1.4000% (+)3.7000%  
 GRADE DATA -Y1-



\* THESE DIMENSIONS ARE PERPENDICULAR TO -L-

SECTION ALONG -Y1-

NOTE: ROADWAY SECTION SHOWN IS APPROXIMATE. SEE ROADWAY PLANS FOR ACTUAL SECTION AT THIS LOCATION.

RETAINING WALLS 1 THRU 4 NOT SHOWN FOR CLARITY.

TEMPORARY SHORING NOT SHOWN. FOR TEMPORARY SHORING AND SURCHARGE LOADING, SEE SURCHARGE DRAWINGS.

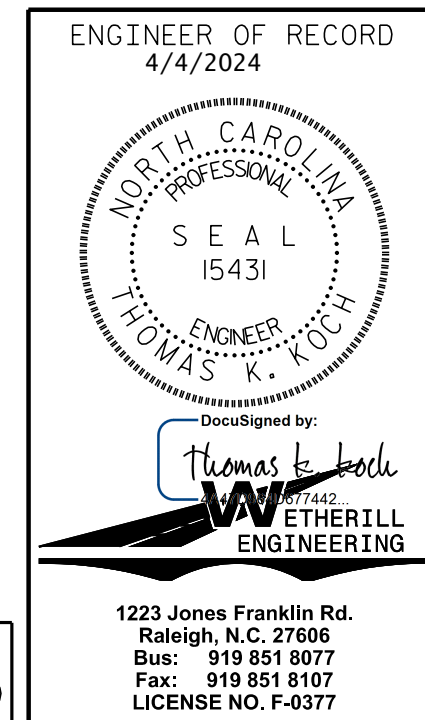
PROJECT NO. HB-0003  
HAYWOOD COUNTY  
 STATION: 189+78.72 -L-

SHEET 5 OF 5

P:\2023\23128.01\_HB-0003\Structures\DWG\PRECAST\_CULVERT\HB0003-PRECAST-CUL.dgn  
 4/4/2024 11:02:40 AM

DRAWN BY: D. HODGE DATE: 12/22  
 CHECKED BY: T. KOCH DATE: 9/23

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**PRECAST  
 3-SIDED ARCH  
 CULVERT  
 36'-0" SPAN**

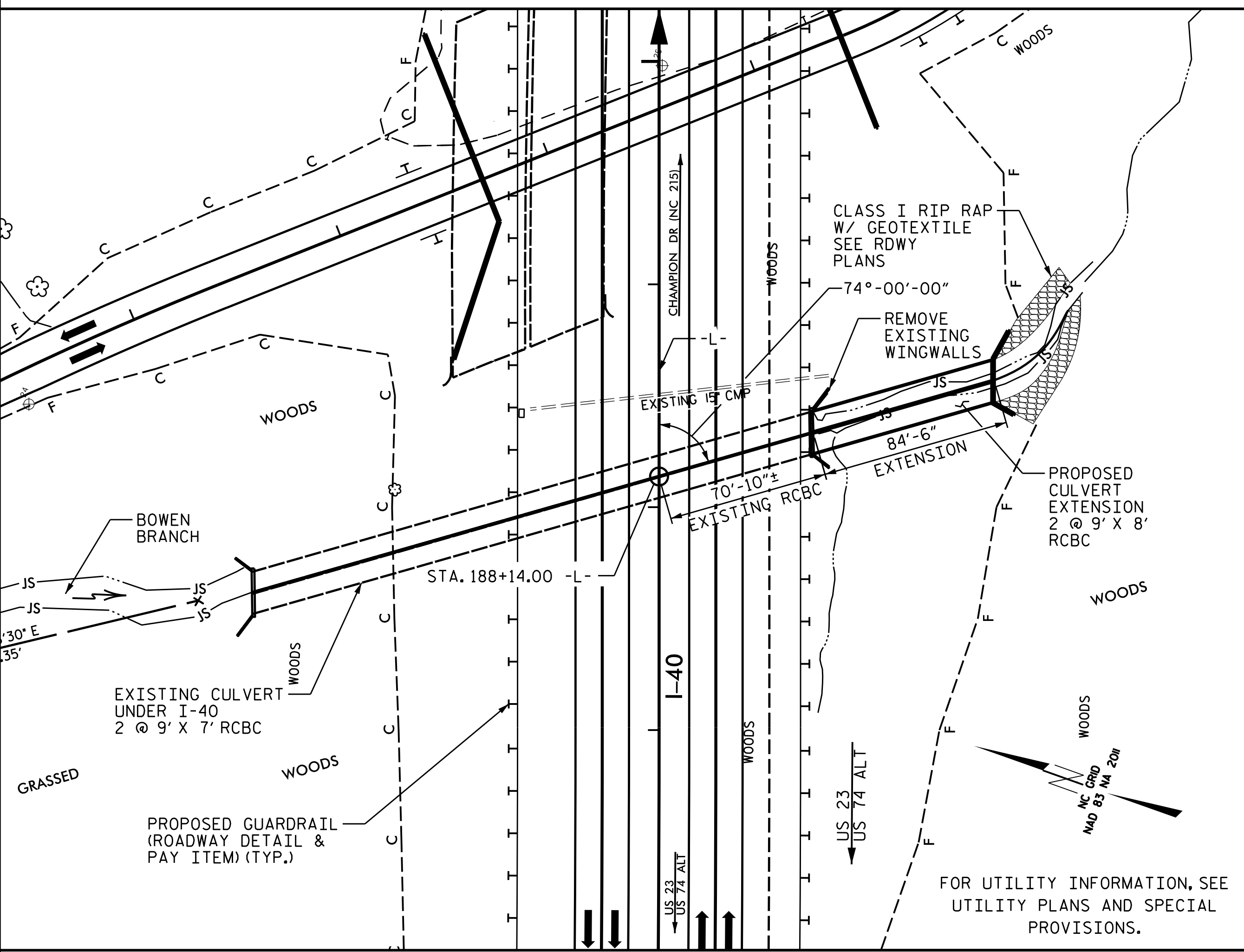
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			5

1223 Jones Franklin Rd.  
 Raleigh, N.C. 27606  
 Bus: 919 851 8077  
 Fax: 919 851 8107  
 LICENSE NO. F-0377



BM #2, SPIKE SET IN FENCE POST, STA.10+94 -Y1-, 20.4' LT, EL. 2626.87 N678530.5050 E 848302.9860

F.A. PROJECT No. 0040121



LOCATION SKETCH

### ROADWAY DATA

GRADE POINT ELEV. @ STA 188+14.00 -L- EB	= 2653.86
BED ELEV. @ STATION 188+14.00 -L-	= 2603.88
ROADWAY SLOPES	= 2:1

### HYDRAULIC DATA

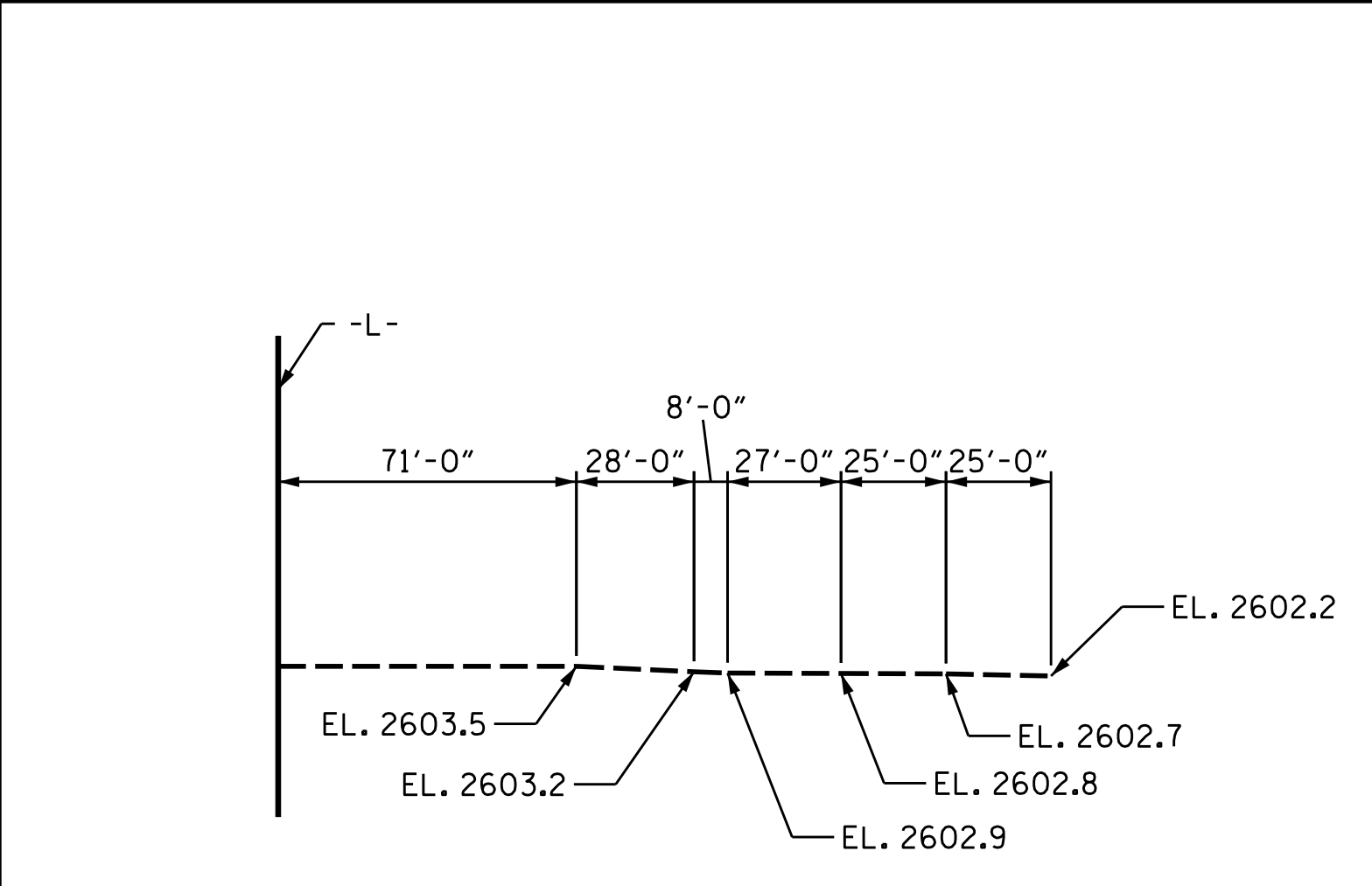
DESIGN DISCHARGE	= 750 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YEARS
DESIGN HIGH WATER ELEVATION	= 2614.6
DRAINAGE AREA	= 1.87 SQ. MI.
BASE DISCHARGE (Q100)	= 900 CFS
BASE HIGH WATER ELEVATION	= 2615.4

### OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 1200+ C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YEARS
OVERTOPPING FLOOD ELEVATION	= 2624 *
* SR 1550 STA. 07+35	
WS EL. TAKEN @ RIVER STATION 1570	

### TOTAL BILL OF MATERIAL

MATERIAL	ELEMENT	LUMP SUM		
		STAGE I	STAGE II	
FOUNDATION COND. MAT'L (TONS)		83	67	
	TOTAL	150		
	CLASS A CONCRETE (CU. YDS.)	BARREL	122.4	216.7
		EDGE BEAMS	0.5	1.2
		HEADWALL	----	1.0
		SILLS	0.7	0.3
		WINGS	4.9	6.8
END CURTAIN WALL		0.7	0.5	
TOTAL	129.2	226.5		
TOTAL		355.7		
REINFORCING STEEL (LBS.)	BARREL	21,894	27,142	
	WINGS, ETC.	339	435	
	TOTAL	22,233	27,577	
TOTAL		49,810		



PROFILE ALONG CULVERT

### SAMPLE BAR REPLACEMENT

SIZE	LENGTH
#3	6'-2"
#4	7'-4"
#5	8'-6"
#6	9'-8"
#7	10'-10"
#8	12'-0"
#9	13'-2"
#10	14'-6"
#11	15'-10"

### FOUNDATION NOTES

FOR CULVERT EXCAVATION, SEE SECTION 414 OF THE STANDARD SPECIFICATIONS.

THE REINFORCED CONCRETE BOX CULVERT SHALL BE PLACED ON THE STANDARD 1.0 FOOT BLANKET OF FOUNDATION CONDITIONING MATERIAL.

UNDERCUT SOFT/VERY LOOSE SOILS THAT MAY BE ENCOUNTERED BENEATH THE BOTTOM OF THE FOUNDATION CONDITIONING MATERIAL. BACKFILL UNDERCUT AREAS WITH FOUNDATION CONDITIONING MATERIAL. IF MORE THAN 1 FT. OF ADDITIONAL UNDERCUT IS REQUIRED, CONTACT THE OPERATIONS ENGINEER FOR APPROVAL.

INSTALL TYPE 2 GEOTEXTILE ON THE SIDES AND TOP OF THE CULVERT. EXTEND GEOTEXTILE 10 FEET IN EACH DIRECTION OF THE JOINT. OVERLAP GEOTEXTILES A MINIMUM OF 18 INCHES. ESTIMATED TYPE 2 GEOTEXTILE QUANTITY - 100 SYDS.

### NOTES

ASSUMED LIVE LOAD = HL-93.  
 DESIGN FILL TO BOTTOM OF TOP SLAB 41.0' (MAX).  
 FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE STANDARD NOTES SHEET SN.  
 3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:  
 STAGE I:  
 1. WING FOOTINGS AND FLOOR SLAB AND FLOOR EDGE BEAM AND INCLUDING 4" OF VERTICAL WALLS.  
 2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT.

STAGE II:  
 1. WING FOOTINGS AND FLOOR SLAB AND FLOOR EDGE BEAM AND INCLUDING 4" OF VERTICAL WALLS.  
 2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY THE ENTIRE ROOF SLAB, ROOF EDGE BEAM AND HEADWALL.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FEET. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

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 SAMPLE BARS SHOULD COME FROM STEEL ACTUALLY USED IN THE PROJECT AND THE SAMPLE BARS SHOULD BE REPLACED BY SPLICED BARS AS SPECIFIED IN THE SAMPLE BAR REPLACEMENT CHART. PAYMENT FOR THE SAMPLE BARS AND REPLACEMENT REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

DOWELS SHALL BE USED TO CONNECT THE CULVERT EXTENSION TO THE EXISTING CULVERT AS SHOWN. FOR NOTE REGARDING SETTING OF DOWELS, SEE SHEET SN.

IF APPROVED BY THE ENGINEER, THE CONTRACTOR MAY USE THE EXISTING WINGS AS TEMPORARY SHORING FOR THE CONSTRUCTION OF THE CULVERT EXTENSIONS. IN THIS CASE, THE BOTTOM SLAB OF THE EXTENSION SHALL BE POURED AT LEAST 72 HOURS PRIOR TO CUTTING THE WINGS. THE WINGS MAY BE CUT EARLIER PROVIDED THE SLAB CONCRETE STRENGTH HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

DETAILED DRAWINGS FOR FALSEWORK AND FORMS FOR THIS CULVERT EXTENSION SHALL BE SUBMITTED. SEE STANDARD NOTES SHEET SN.

THE EXISTING STRUCTURE CONSISTING OF A DOUBLE 9' X 7' REINFORCED CONCRETE BOX CULVERT 262.0'± LONG ALONG CENTERLINE OF CULVERT AND LOCATED AT PROPOSED STRUCTURE SHALL BE RETAINED AND EXTENDED. THE EXISTING CULVERT IS PRESENTLY NOT POSTED FOR LOAD LIMIT.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

RCBC EXTENSION FLOOR SLAB INVERT TO BE CONSTRUCTED 1'-0" BELOW THE INVERT OF THE EXISTING CULVERT FLOOR SLAB. RCBC EXTENSION BOTTOM OF ROOF SLAB SHALL MATCH EXISTING CULVERT BOTTOM OF ROOF SLAB. SEE DETAIL "A" ON SHEET C-3.

PROJECT NO. HB-0003  
HAYWOOD COUNTY  
 STATION: 188+14.00 -L-

P:\2023\2312801-HB-0003-Structures\DWG\CULVERT\_EXT\_12-2023\C-1 HB-003\_SMU\_CU\_GENERAL\_INFORMAT\_IOM.dgn 5/11/2024 3:05:59 PM

DRAWN BY : D. MOSQUERA/J. PENDERGRAFT DATE : 11/28/23  
CHECKED BY : J. DILWORTH DATE : 11/28/23

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

## DOUBLE 9 FT. X 8 FT. REINFORCED CONCRETE BOX CULVERT EXTENSION 74°-00'-00" SKEW

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

TOTAL SHEETS  
9

15801 Brixham Hill Ave, Suite 530  
Charlotte, N.C. 28277  
Bus: 704.919.1880  
Fax: 919.851.8107  
LICENSE NO. F-0377



PERMANENT LOAD FACTORS:

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
WA	1.00	--

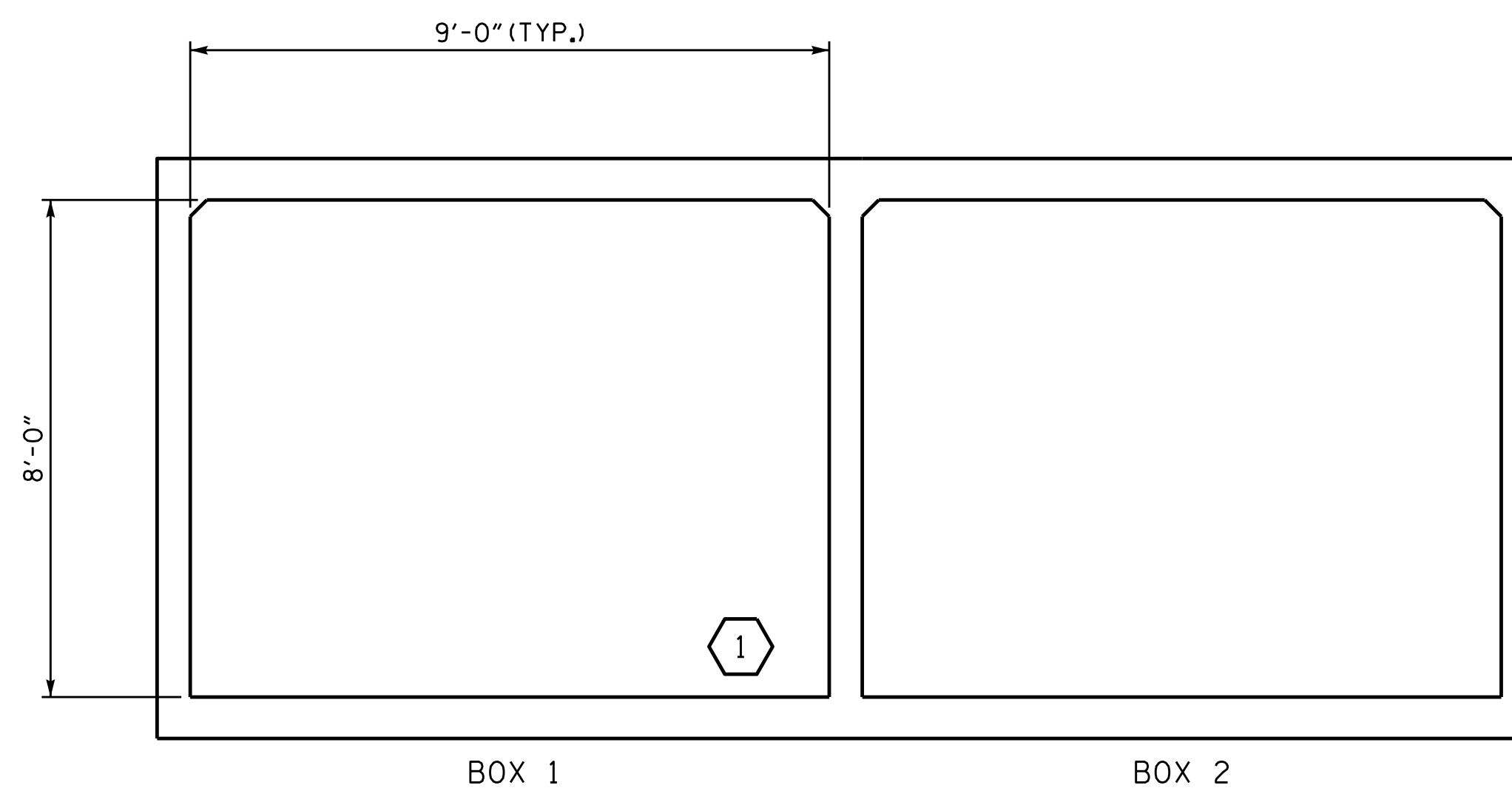
LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS										
	CONTROLLING LOAD RATING	MINIMUM RATING FACTOR (RF)	STRENGTH I LIMIT STATE							
			MOMENT				SHEAR			
			RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM BOTTOM END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)
PERMANENT LOAD RATING	①	1.024	1.154	‡	INTERIOR WALL	9.98	1.024	‡	BOTTOM SLAB	8.48

NOTES:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

THE EFFECTS OF LIVE LOAD ON DESIGN AND LOAD RATING MAY BE NEGLECTED FOR CULVERTS WITH CERTAIN FILL DEPTHS DESCRIBED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

CULVERTS WITH NEGLIGIBLE LIVE LOAD SHOULD BE LOAD RATED FOR PERMANENT LOADS ONLY IN ACCORDANCE WITH THE AASHTO MANUAL FOR BRIDGE EVALUATION.



LRFR SUMMARY

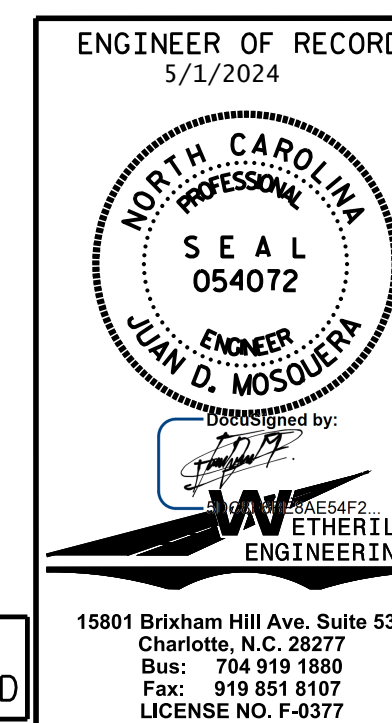
(LOOKING DOWNSTREAM)

PROJECT NO. HB-0003  
HAYWOOD COUNTY  
 STATION: 188+14.00 -L-

P:\2023\2312801-HB-0003-Structures\DWNCULVERT\_EXT\_12-2023\C-2 HB-003\_SNU\_CU\_RAT\_ING.dgn  
 5/11/2024 3:06:55 PM

DRAWN BY : D. MOSQUERA DATE : 11/28/23  
 CHECKED BY : J. DILWORTH DATE : 11/28/23

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

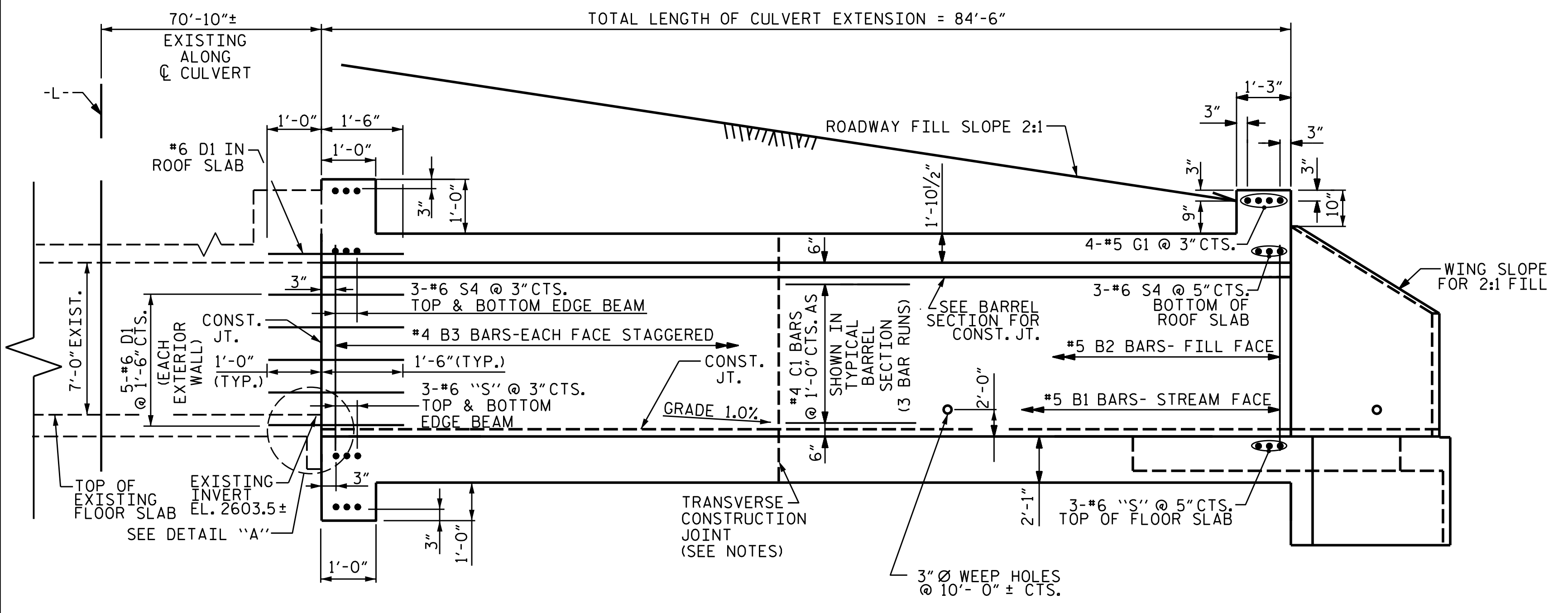


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 LRFR SUMMARY FOR  
 REINFORCED CONCRETE  
 BOX CULVERTS  
 (DEEP FILLS)

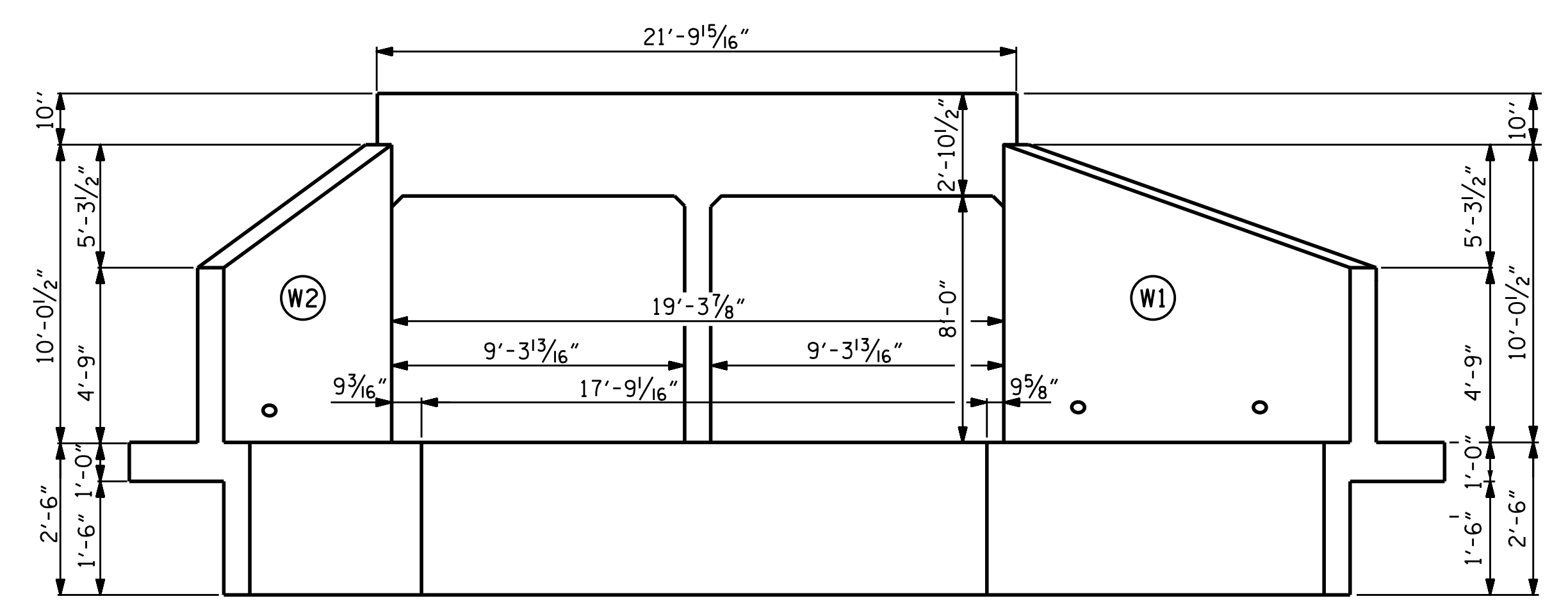
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-2
1			3			TOTAL SHEETS
2			4			9

15801 Brixham Hill Ave, Suite 530  
 Charlotte, N.C. 28277  
 Bus: 704 919 1880  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

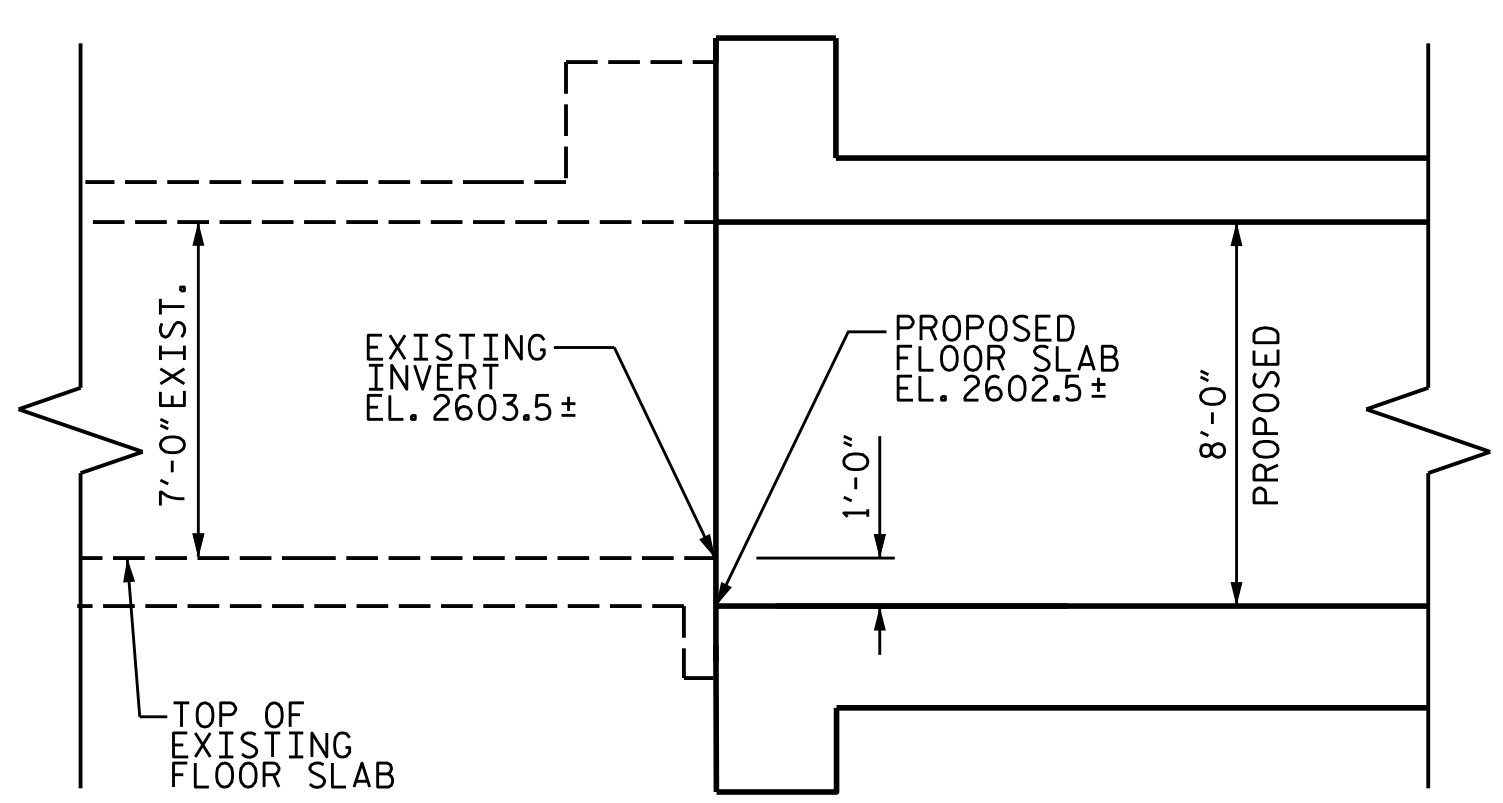




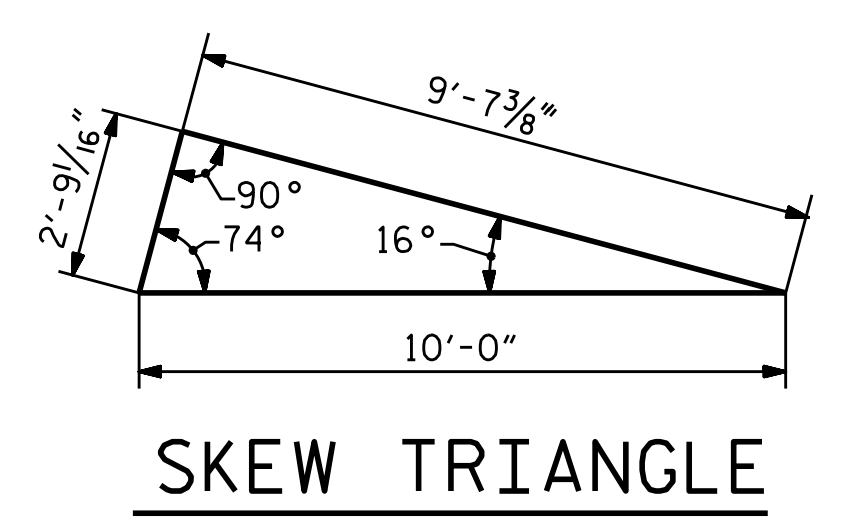
INTERIOR WALL                      EXTERIOR WALL  
CULVERT SECTION NORMAL TO ROADWAY



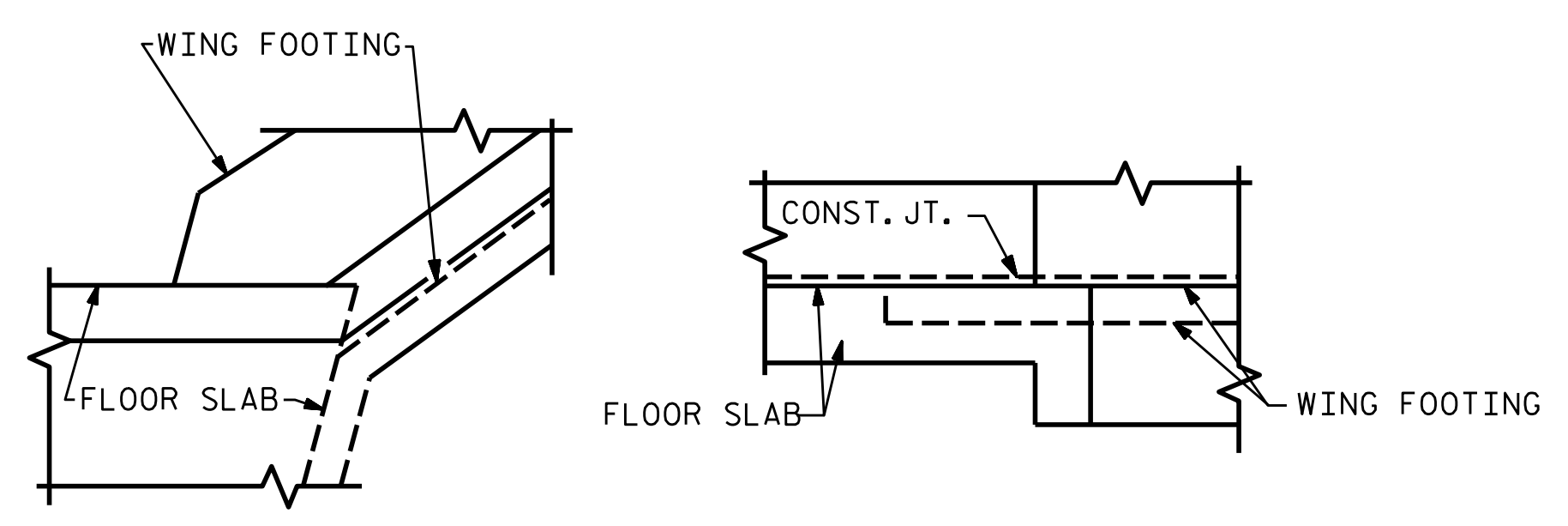
OUTLET END ELEVATION NORMAL TO SKEW  
 LOOKING UPSTREAM



DETAIL "A"



SKEW TRIANGLE



DETAIL  
CONNECTION OF WING FOOTING  
AND FLOOR SLAB WHEN SLAB  
IS THICKER THAN FOOTING

PROJECT NO. HB-0003  
HAYWOOD COUNTY  
 STATION: 188+14.00 -L-

P:\2023\2312801-HB-0003-Structures\DWG\CULVERT\_EXT\_12-2023\C-3 TO C-5 HB-003\_SMU\_CU\_GENERAL\_EXT\_LAYOUT\_AND\_REINF\_PLAN.dgn  
 5/11/2024 3:04:07 PM

DRAWN BY: J. MOSQUERA/J. PENDERGRAFT DATE: 11/28/23  
 CHECKED BY: J. DILWORTH DATE: 11/28/23

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

ENGINEER OF RECORD  
 5/1/2024  
  
 Juan D. Mosquera  
 Registered by:  
  
 Jeffrey Etherill  
 ENGINEERING

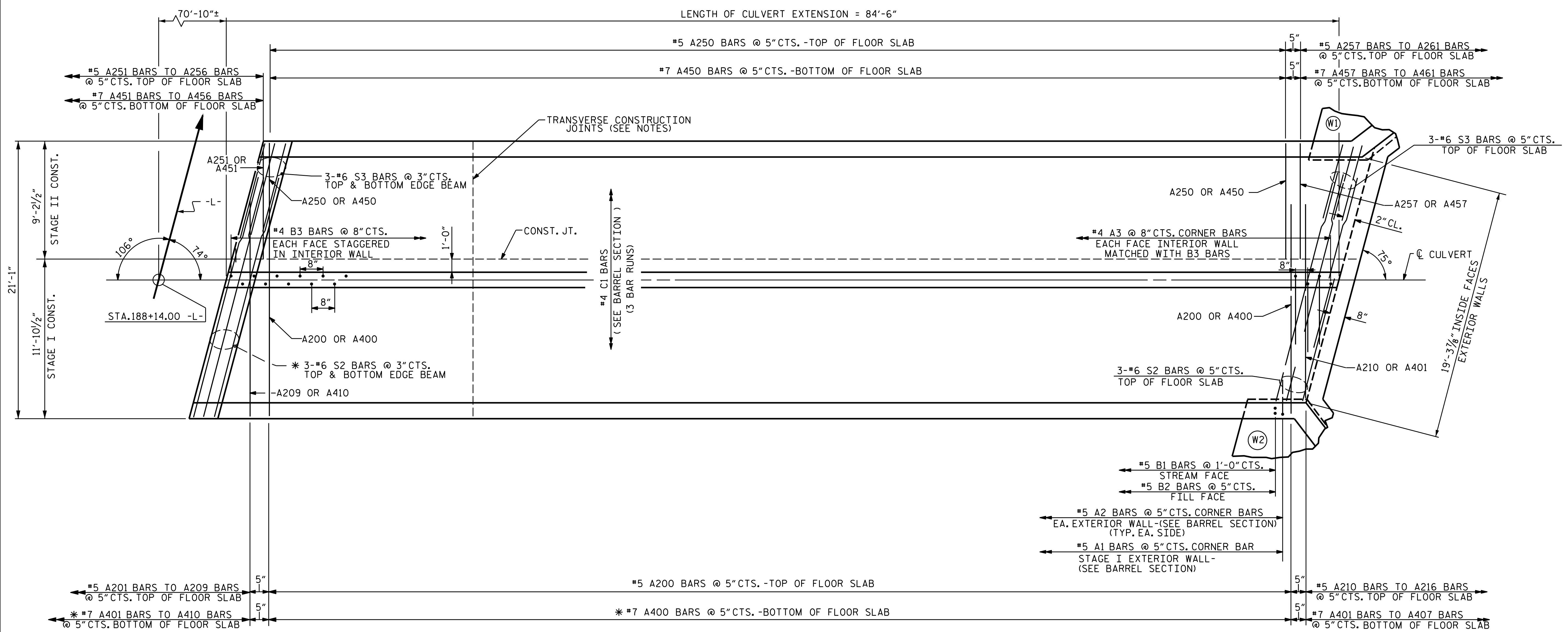
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**DOUBLE**  
**9 FT. X 8 FT.**  
**REINFORCED CONCRETE**  
**BOX CULVERT**  
**EXTENSION**

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

SHEET NO.  
 C-3  
 TOTAL SHEETS  
 9



P:\2023\2312801-HB-0003-Structures\DWG\CULVERT\_EXT\_12-2023\C-3 TO C-5 HB-003\_SMU\_CU\_GENERAL EXT\_LAYOUT AND REINF PLAN.dgn  
5/11/2024 3:10:23 PM



FLOOR SLAB

PROJECT NO. HB-0003  
HAYWOOD COUNTY  
STATION: 188+14.00 -L-

NOTE: \* THE CONTRACTOR HAS THE OPTION TO USE MECHANICAL COUPLERS IN LIEU OF LAP SPLICES IN THE FLOOR SLAB AS NECESSARY TO AVOID POSSIBLE CONFLICTS WITH INSTALLATION OF THE IMPERVIOUS DIKE DURING STAGE I CONSTRUCTION. NO ADDITIONAL PAYMENT WILL BE MADE.

DRAWN BY : J. PENDERGRAFT DATE : 12/4/23  
CHECKED BY : J. DILWORTH DATE : 12/4/23

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

ENGINEER OF RECORD  
5/1/2024

SEAL  
054072  
ENGINEER  
JUAN D. MOSQUERA

Prepared by:

15801 Brixham Hill Ave, Suite 530  
Charlotte, N.C. 28277  
Bus: 704 919 1880  
Fax: 919 851 8107  
LICENSE NO. F-0377

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

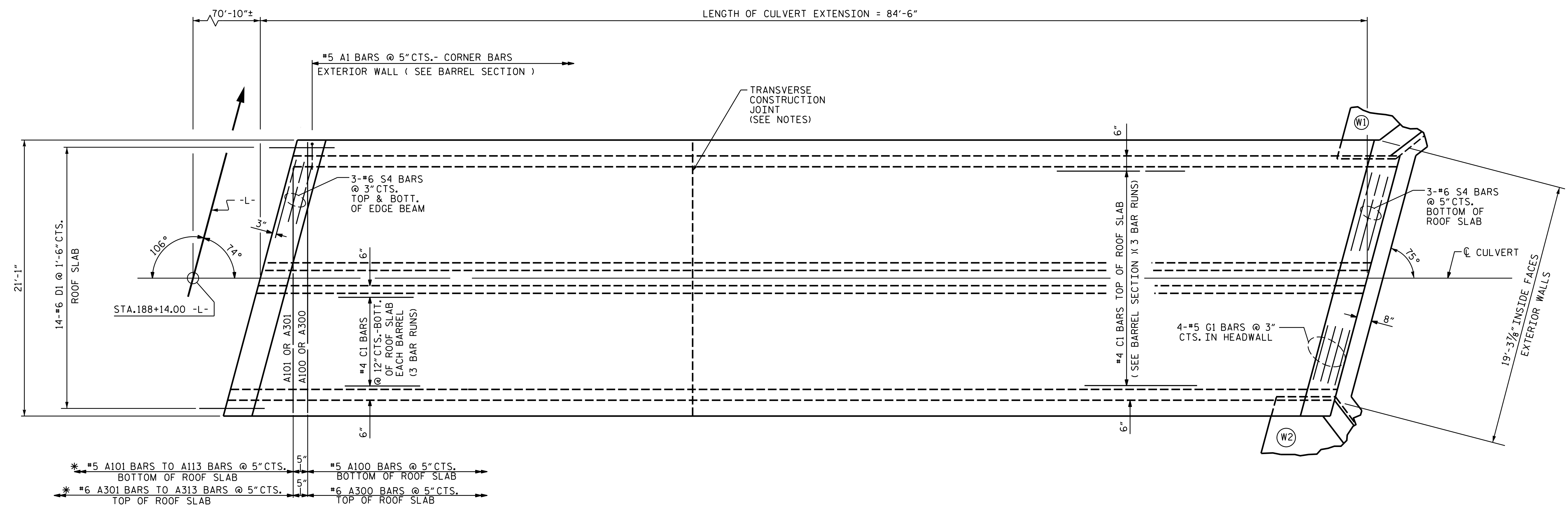
DOUBLE  
9 FT. X 8 FT.  
REINFORCED CONCRETE  
BOX CULVERT  
EXTENSION

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

SHEET NO.  
C-4  
TOTAL SHEETS  
9



P:\2023\2312801-HB-0003-Structures\DWG\CULVERT\_EXT\_12-2023\C-3 TO C-5 HB-003\_SMU\_CU\_GENERAL EXT\_LAYOUT AND REINF PLAN.dgn  
5/11/2024 3:11:05 PM



**ROOF SLAB**  
\* CUT BARS SAME BOTH ENDS

PROJECT NO. HB-0003  
HAYWOOD COUNTY  
 STATION: 188+14.00 -L-

DRAWN BY : J. PENDERGRAFT      DATE : 12-4-23  
 CHECKED BY : J. DILWORTH      DATE : 12-4-23

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

ENGINEER OF RECORD  
 5/1/2024

15801 Brixham Hill Ave, Suite 530  
 Charlotte, N.C. 28277  
 Bus: 704.919.1880  
 Fax: 919.851.8107  
 LICENSE NO. F-0377

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**DOUBLE  
 9 FT. X 8 FT.  
 REINFORCED CONCRETE  
 BOX CULVERT  
 EXTENSION**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS
2			4			9

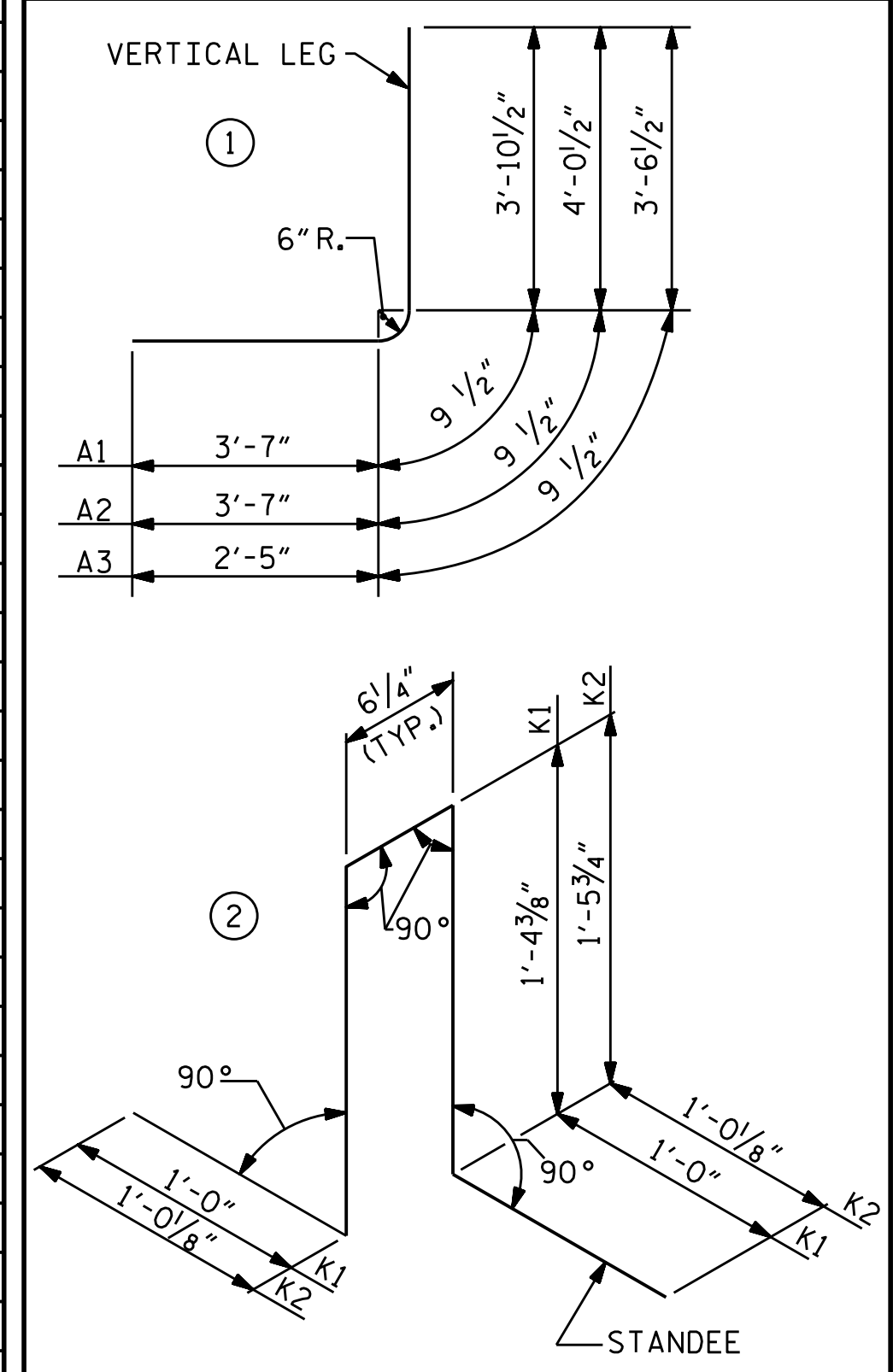
**BARREL REINFORCING STEEL (STAGE I)**

BAR NO	SIZE	TYPE	LENGTH	WEIGHT	
A1	203	5	1	8'-3"	1747
A2	203	5	1	8'-5"	1782
A3	254	4	1	6'-9"	1145
A200	193	5	STR	14'-0"	2818
A201	1	5	STR	12'-11"	13
A202	1	5	STR	11'-6"	12
A203	1	5	STR	10'-1"	11
A204	1	5	STR	8'-7"	9
A205	1	5	STR	7'-2"	7
A206	1	5	STR	5'-8"	6
A207	1	5	STR	4'-3"	4
A208	1	5	STR	2'-9"	3
A209	1	5	STR	1'-4"	1
A210	1	5	STR	12'-7"	13
A211	1	5	STR	11'-2"	12
A212	1	5	STR	9'-8"	10
A213	1	5	STR	8'-3"	9
A214	1	5	STR	6'-9"	7
A215	1	5	STR	5'-4"	6
A216	1	5	STR	3'-10"	4
A400	192	7	STR	15'-10"	6214
A401	2	7	STR	14'-5"	59
A402	2	7	STR	13'-0"	53
A403	2	7	STR	11'-6"	47
A404	2	7	STR	10'-1"	41
A405	2	7	STR	8'-7"	35
A406	2	7	STR	7'-2"	29
A407	2	7	STR	5'-8"	23
A408	1	7	STR	4'-3"	9
A409	1	7	STR	2'-9"	6
A410	1	7	STR	1'-4"	3
B1	85	5	STR	11'-6"	1020
B2	203	5	STR	7'-4"	1553
B3	254	4	STR	11'-6"	1951
C1	129	4	STR	29'-8"	2556
D1	5	6	STR	2'-6"	19
D2	3	6	STR	3'-8"	17
K2	116	4	2	5'-6"	426
S2	9	6	STR	15'-10"	214
A450	196	7	STR	9'-0"	3606
A451	1	7	STR	8'-6"	17
A452	1	7	STR	7'-1"	14
A453	1	7	STR	5'-7"	11
A454	1	7	STR	4'-2"	9
A455	1	7	STR	2'-8"	5
A456	1	7	STR	1'-3"	3
A457	1	7	STR	7'-8"	16
A458	1	7	STR	6'-3"	13
A459	1	7	STR	4'-9"	10
A460	1	7	STR	3'-4"	7
A461	1	7	STR	1'-10"	4

**BARREL REINFORCING STEEL (STAGE II)**

BAR NO	SIZE	TYPE	LENGTH	WEIGHT	
A100	188	5	STR	20'-9"	4069
A101	2	5	STR	19'-9"	41
A102	2	5	STR	18'-4"	38
A103	2	5	STR	16'-10"	35
A104	2	5	STR	15'-5"	32
A105	2	5	STR	13'-11"	29
A106	2	5	STR	12'-6"	26
A107	2	5	STR	11'-0"	23
A108	2	5	STR	9'-7"	20
A109	2	5	STR	8'-2"	17
A110	2	5	STR	6'-8"	14
A111	2	5	STR	5'-3"	11
A112	2	5	STR	3'-9"	8
A113	2	5	STR	2'-4"	5
B1	85	5	STR	11'-6"	1020
B2	203	5	STR	7'-4"	1553
B3	254	4	STR	11'-6"	1951
C1	159	4	STR	29'-8"	3151
D1	19	6	STR	2'-6"	71
D3	3	6	STR	2'-8"	12
G1	4	5	STR	21'-5"	89
K1	203	4	2	5'-3"	712
K2	87	4	2	5'-6"	320
S3	9	6	STR	9'-4"	126
S4	9	6	STR	21'-5"	290
A250	196	5	STR	9'-0"	1840
A251	1	5	STR	8'-6"	9
A252	1	5	STR	7'-1"	7
A253	1	5	STR	5'-7"	6
A254	1	5	STR	4'-2"	4
A255	1	5	STR	2'-8"	3
A256	1	5	STR	1'-3"	1
A257	1	5	STR	7'-8"	8
A258	1	5	STR	6'-3"	7
A259	1	5	STR	4'-9"	5
A260	1	5	STR	3'-4"	3
A261	1	5	STR	1'-10"	2
A300	188	6	STR	20'-9"	5859
A301	2	6	STR	19'-9"	59
A302	2	6	STR	18'-4"	55
A303	2	6	STR	16'-10"	51
A304	2	6	STR	15'-5"	46
A305	2	6	STR	13'-11"	42
A306	2	6	STR	12'-6"	38
A307	2	6	STR	11'-0"	33
A308	2	6	STR	9'-7"	29
A309	2	6	STR	8'-2"	25
A310	2	6	STR	6'-8"	20
A311	2	6	STR	5'-3"	16
A312	2	6	STR	3'-9"	11
A313	2	6	STR	2'-4"	7
A450	196	7	STR	9'-0"	3606
A451	1	7	STR	8'-6"	17
A452	1	7	STR	7'-1"	14
A453	1	7	STR	5'-7"	11
A454	1	7	STR	4'-2"	9
A455	1	7	STR	2'-8"	5
A456	1	7	STR	1'-3"	3
A457	1	7	STR	7'-8"	16
A458	1	7	STR	6'-3"	13
A459	1	7	STR	4'-9"	10
A460	1	7	STR	3'-4"	7
A461	1	7	STR	1'-10"	4

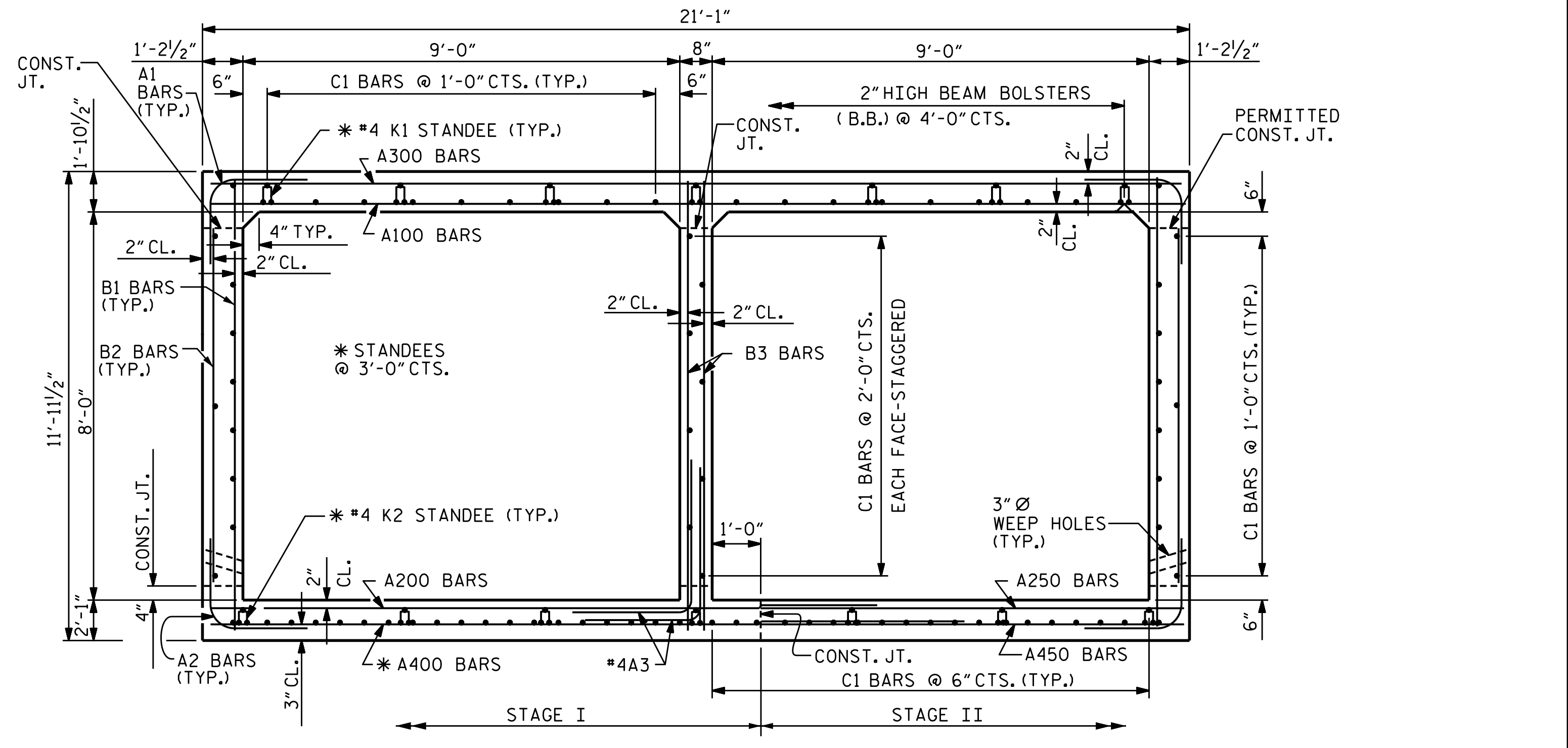
**BAR TYPE**



BAR DIMENSIONS ARE OUT TO OUT

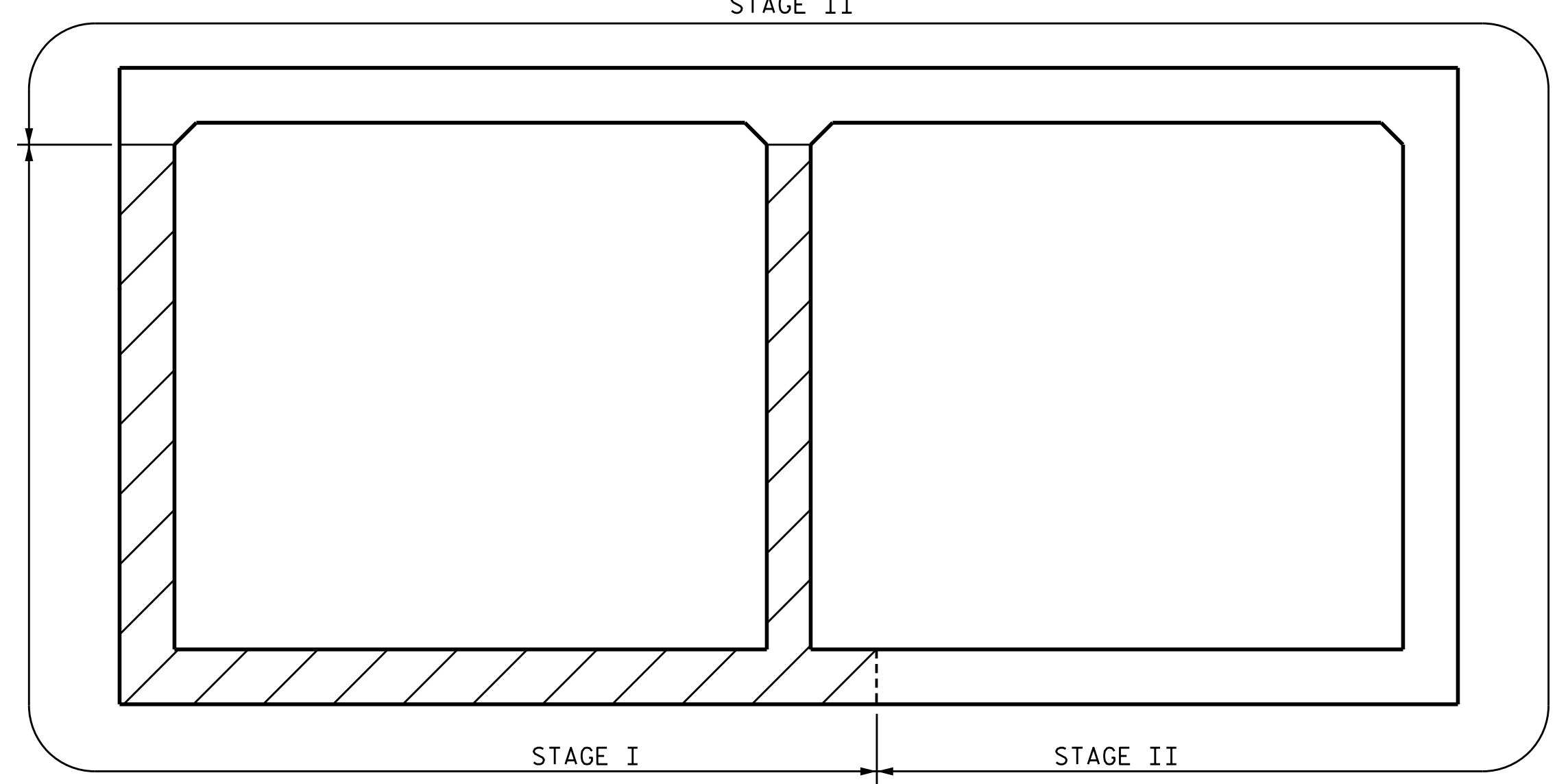
**SPLICE LENGTHS CHART**

BAR	SIZE	SPLICE LENGTH
A200	#5	2'-4"
A400	#7	4'-2"
B1, B3	#4	1'-10"
C1	#4	2'-5"



**RIGHT ANGLE SECTION OF BARREL**

THERE ARE 96 "C" BARS IN SECTION OF BARREL. (LOOKING UPSTREAM)



**CONSTRUCTION SEQUENCE**

(LOOKING UPSTREAM)

NOTE: \* THE CONTRACTOR HAS THE OPTION TO USE MECHANICAL COUPLERS IN LIEU OF LAP SPLICES IN THE FLOOR SLAB AS NECESSARY TO AVOID POSSIBLE CONFLICTS WITH INSTALLATION OF THE IMPERVIOUS DIKE DURING STAGE I CONSTRUCTION. NO ADDITIONAL PAYMENT WILL BE MADE.

PROJECT NO. HB-0003  
HAYWOOD COUNTY  
 STATION: 188+14.00 -L-

ENGINEER OF RECORD  
 5/1/2024  
  
 Juan D. Mosquera  
 REGISTERED PROFESSIONAL ENGINEER  
 15801 Brixham Hill Ave, Suite 530  
 Charlotte, N.C. 28277  
 Bus: 704 919 1880  
 Fax: 919 851 8107  
 LICENSE NO. F-0377

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**DOUBLE  
 9 FT. X 8 FT.  
 REINFORCED CONCRETE  
 BOX CULVERT  
 EXTENSION**

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

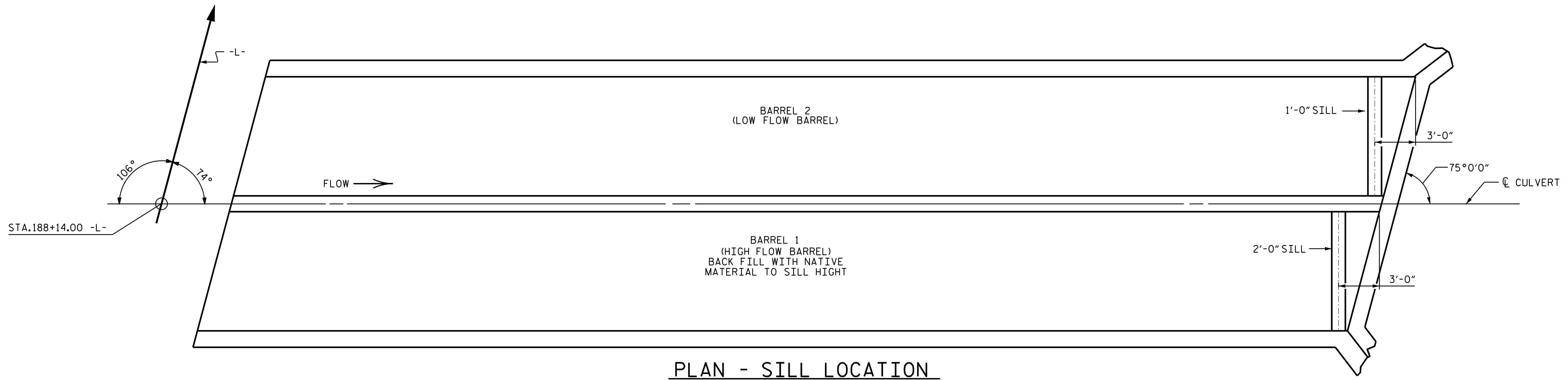
TOTAL SHEETS: 9

DRAWN BY: D. MOSQUERA DATE: 11/28/23  
 CHECKED BY: J. DILWORTH DATE: 11/28/23

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

P:\2023\2312801-HB-0003-Structures\DWG\CULVERT\_EXT\_12-2023\C-6\_HB-003\_SMU\_CU\_TYP\_SECTION\_AND\_BILL\_OF\_MATERIALS.dgn  
 5/11/2024 3:12:12 PM

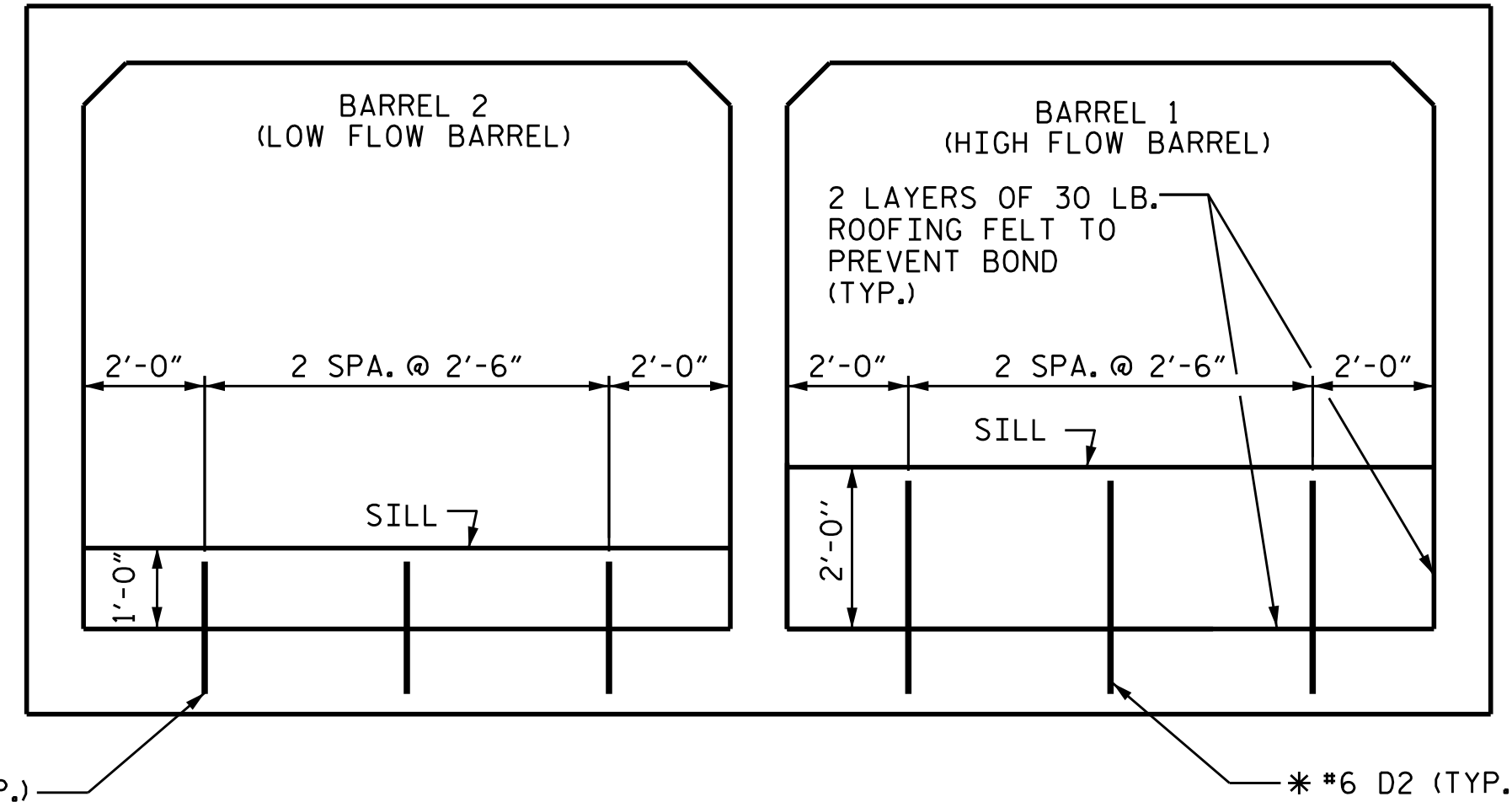




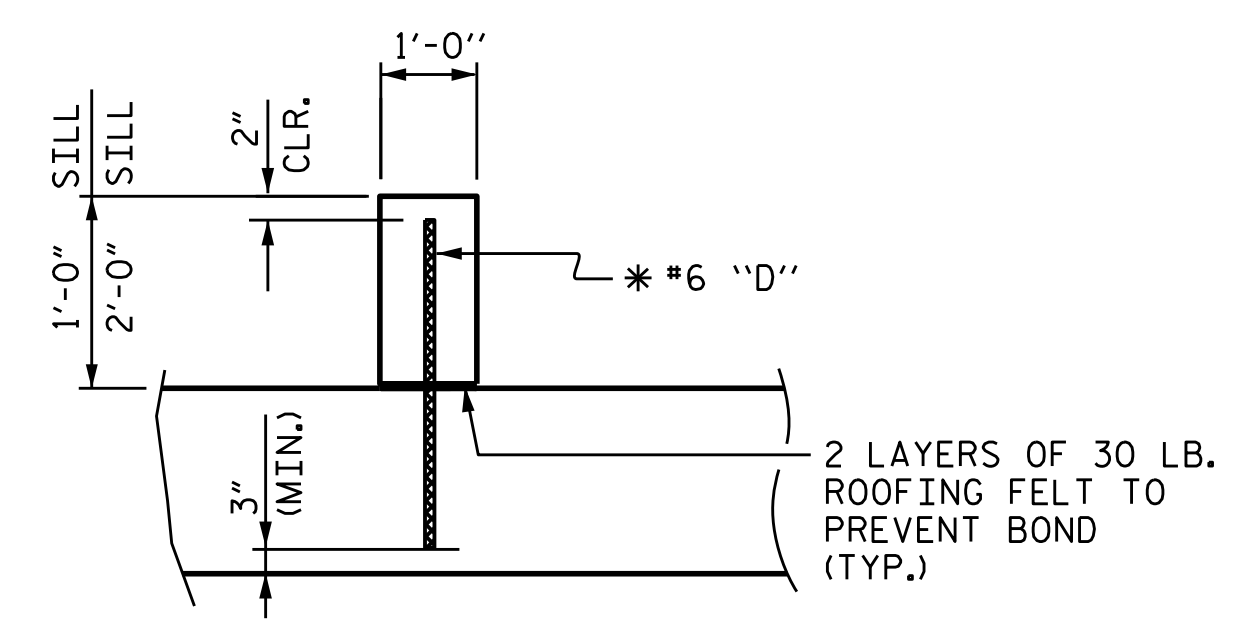
**PLAN - SILL LOCATION**  
SHOWING PLACEMENT OF SILLS

**NOTES:**

- 1) NATIVE MATERIAL IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP-RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL. IF RIP-RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.
- 2) PROPOSED CULVERT EXTENSION WILL BE BURIED 1.0'
- 3) FLOODPLAIN BENCH TO BE INSTALLED AT THE OUTLET OF THE PROPOSED RCBC IN THE RIGHT BARREL.
- 4) SILLS ARE TO BE 1.0' WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.
- 5) TOP OF LOW FLOW SILL SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM (THALWEG).



**INLET ELEVATION**  
LOOKING DOWNSTREAM



**SECTION THROUGH SILL**

\* DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.  
SEE "PLAN - SILL LOCATIONS" FOR SILL LOCATIONS

PROJECT NO. HB-0003  
HAYWOOD COUNTY  
STATION: 188+14.00 -L-

**CULVERT SILL DETAILS**

P:\2023\2312801-HB-0003-Structures\DWG\CULVERT\_EXT\_12-2023\C-7\_HB-003\_SMU\_CU\_SILL.dgn 5/11/2024 3:14:12 PM

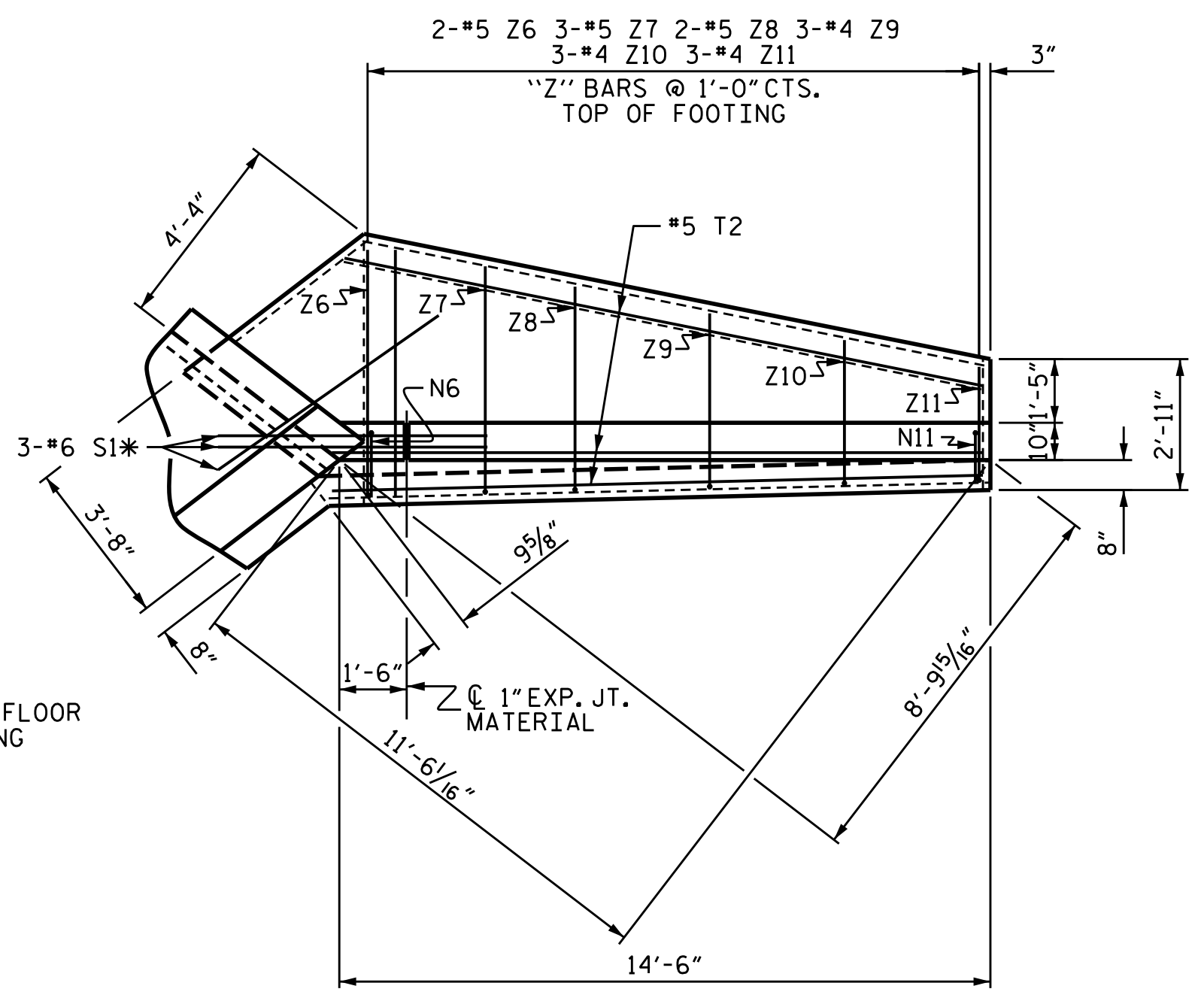
DRAWN BY : J. PENDERGRAFT DATE : 12-3-23  
CHECKED BY : J. DILWORTH DATE : 12-3-23

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

ENGINEER OF RECORD  
5/1/2024  
NORTH CAROLINA PROFESSIONAL SEAL  
054072  
ENGINEER  
JUAN D. MOSQUERA  
REGISTERED BY:  
ETHERILL ENGINEERING  
15801 Brixham Hill Ave, Suite 530  
Charlotte, N.C. 28277  
Bus: 704 919 1880  
Fax: 919 851 8107  
LICENSE NO. F-0377

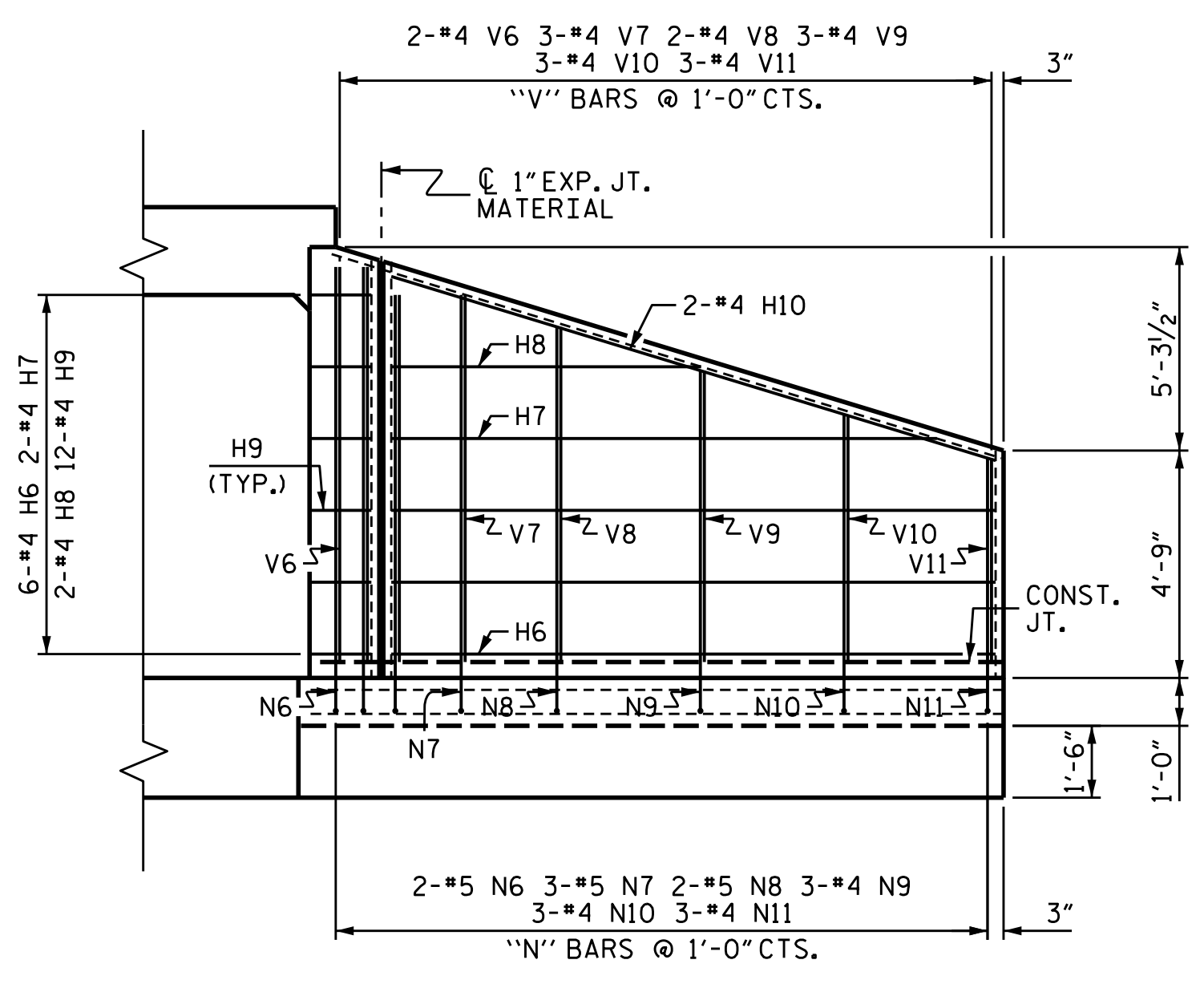
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
**DOUBLE 9 FT. X 8 FT.  
REINFORCED CONCRETE  
BOX CULVERT**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-7
1			3			TOTAL SHEETS
2			4			9

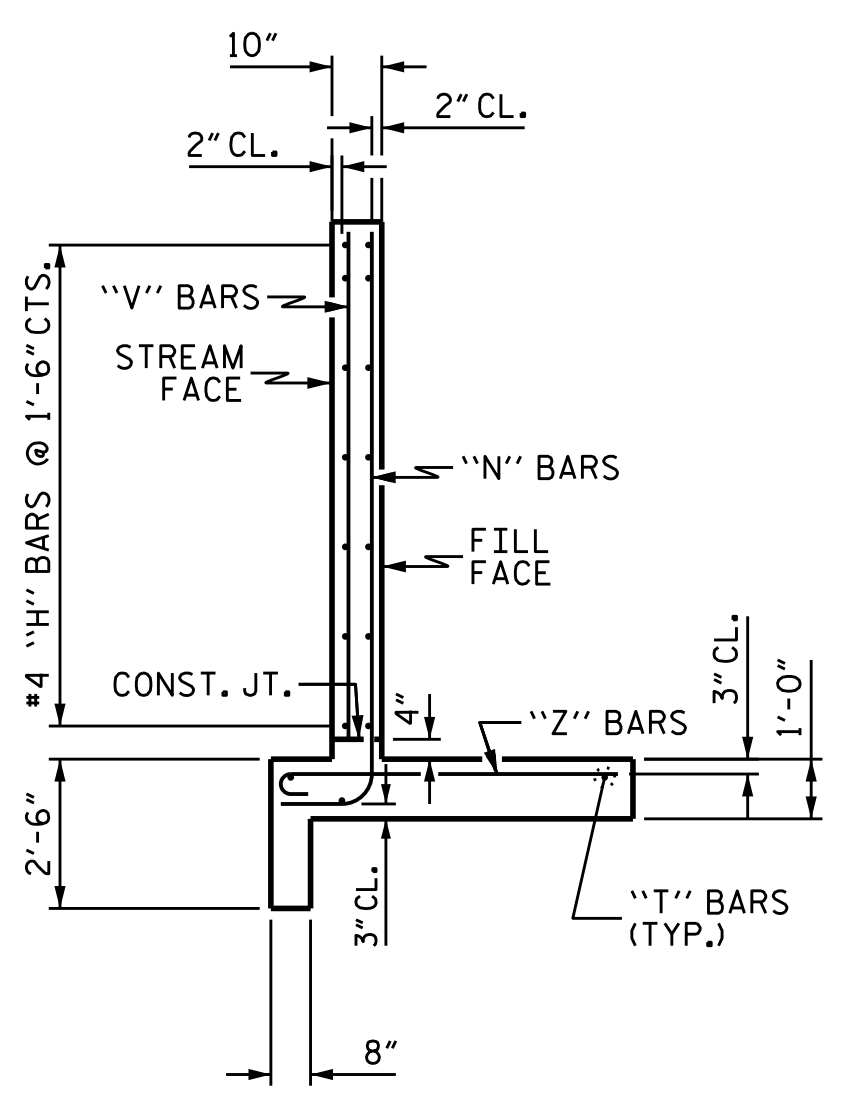


PLAN W1

\* S1 @ BOTTOM OF FLOOR SLAB & FOOTING

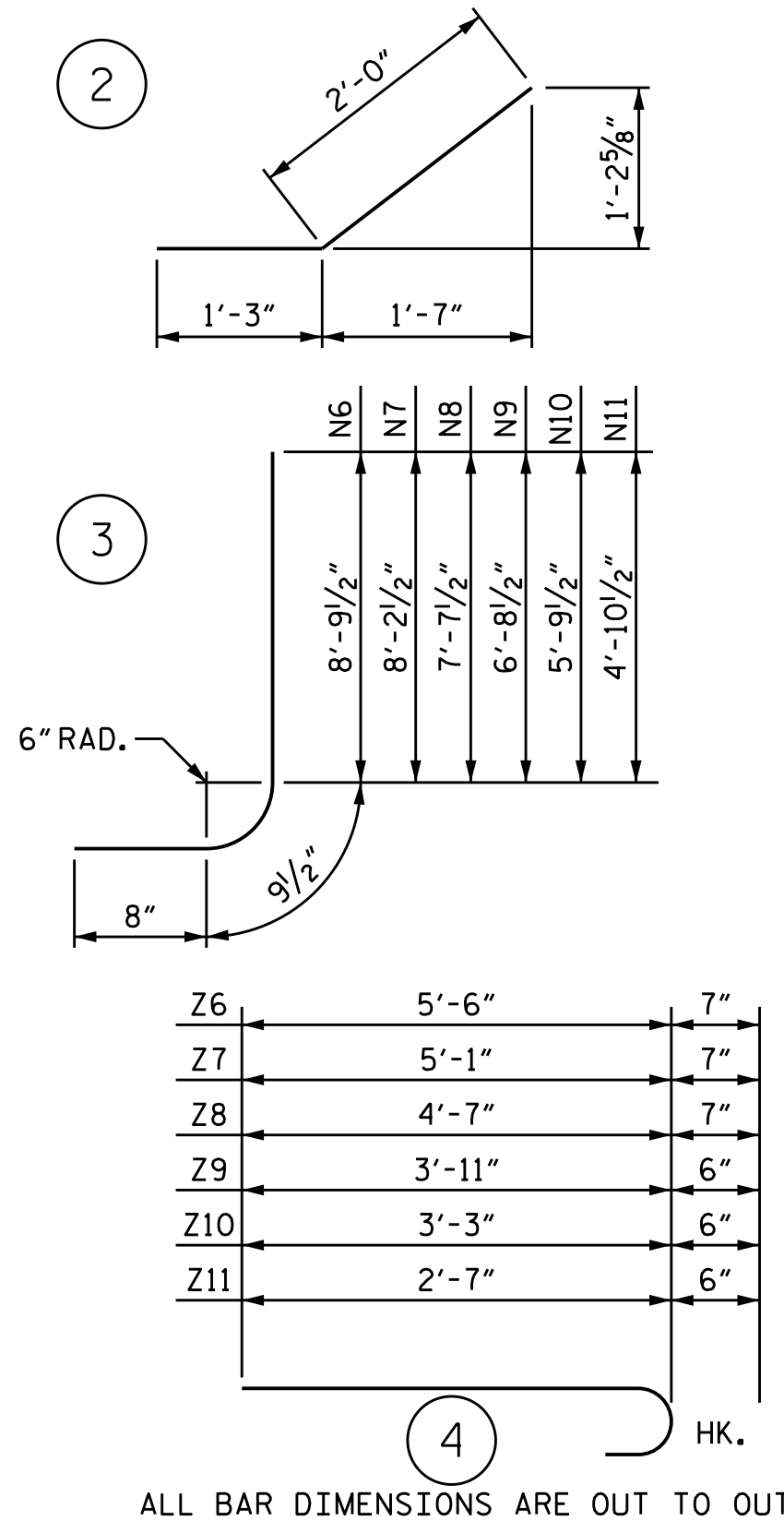


ELEVATION W1



TYPICAL WING SECTION

BAR TYPES



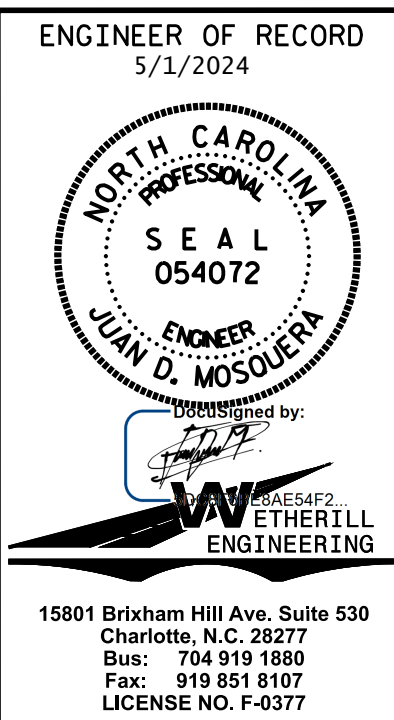
BILL OF MATERIAL FOR W1

BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
H6	6	#4	STR	12'-7"	50
H7	2	#4	STR	11'-4"	15
H8	2	#4	STR	6'-5"	9
H9	12	#4	2	3'-3"	26
H10	2	#4	STR	13'-2"	18
N6	2	#5	3	10'-3"	21
N7	3	#5	3	9'-8"	30
N8	2	#5	3	9'-1"	19
N9	3	#4	3	8'-2"	16
N10	3	#4	3	7'-3"	15
N11	3	#4	3	6'-4"	13
S1	3	#6	STR	6'-0"	27
T2	3	#5	STR	14'-6"	45
V6	2	#4	STR	8'-3"	11
V7	3	#4	STR	7'-8"	15
V8	2	#4	STR	7'-0"	9
V9	3	#4	STR	6'-1"	12
V10	3	#4	STR	5'-2"	10
V11	3	#4	STR	4'-3"	9
Z6	2	#5	4	6'-1"	13
Z7	3	#5	4	5'-8"	18
Z8	2	#5	4	5'-2"	11
Z9	3	#4	4	4'-5"	9
Z10	3	#4	4	3'-9"	8
Z11	3	#4	4	3'-1"	6
REINFORCING STEEL FOR 1 WING					435 LBS
CLASS A CONCRETE FOR 1 WING					6.8 CY

P:\2023\2312801-HB-0003-Structures\DOMCULVERT\_EXT\_12-2023\C-8 TO C-9 HB-003\_SMU\_CU\_WINGWALLS.dgn  
 5/11/2024 3:16:19 PM

ASSEMBLED BY : J. PENDERGRAFT	DATE : 11-28-23
CHECKED BY : J. DILWORTH	DATE : 11-28-23
DRAWN BY : CCJ	01/00
CHECKED BY : RWW	03/00
REV. 6/19	MAA/THC

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



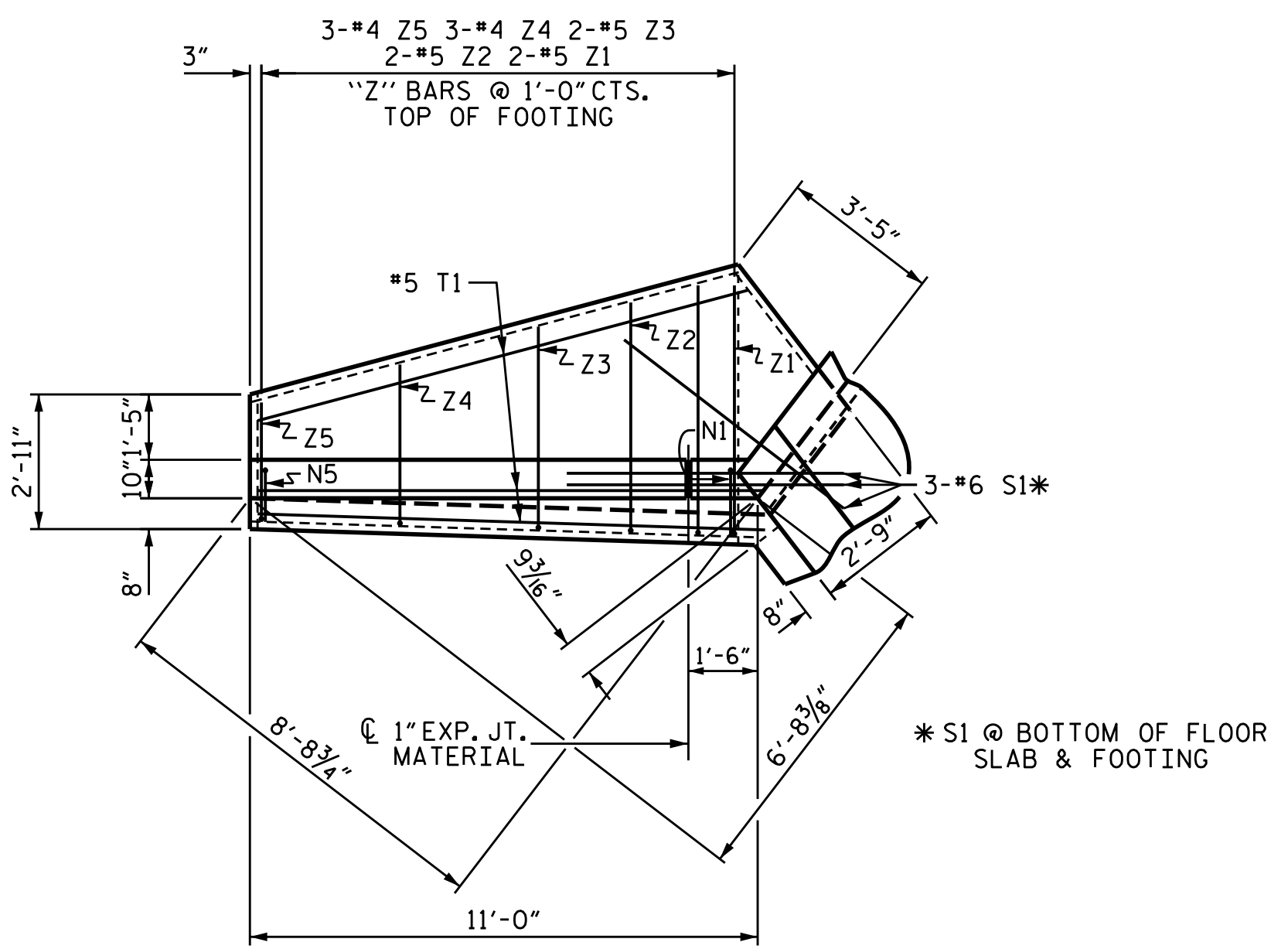
PROJECT NO. HB-0003  
HAYWOOD COUNTY  
 STATION: 188+14.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**STANDARD WINGS  
 FOR W1  
 CONCRETE BOX CULVERT**  
 H = 8'-0" SLOPE = 2:1  
 75° SKEW

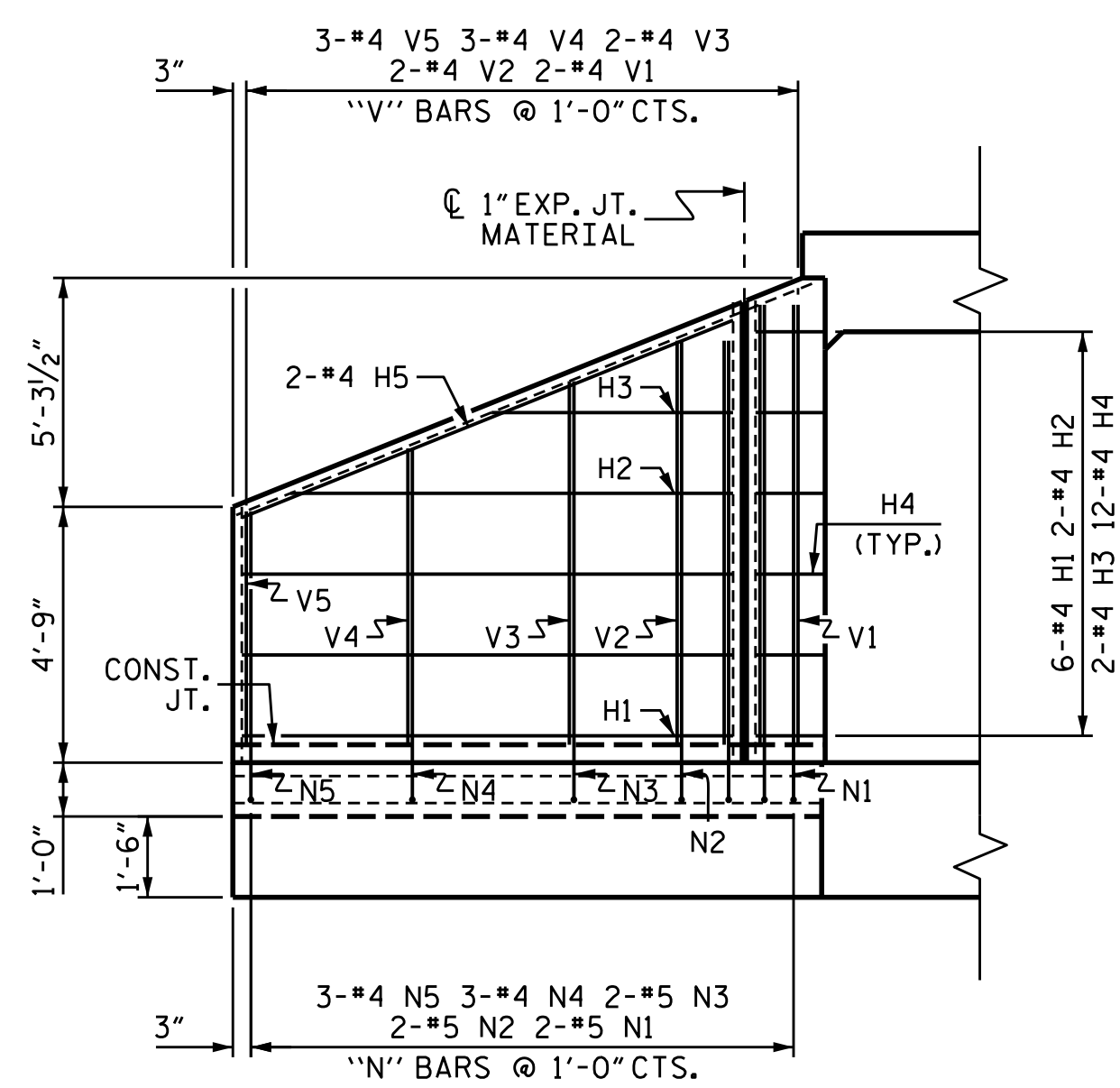
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-8
1			3			TOTAL SHEETS
2			4			9

STD. NO. CW7508

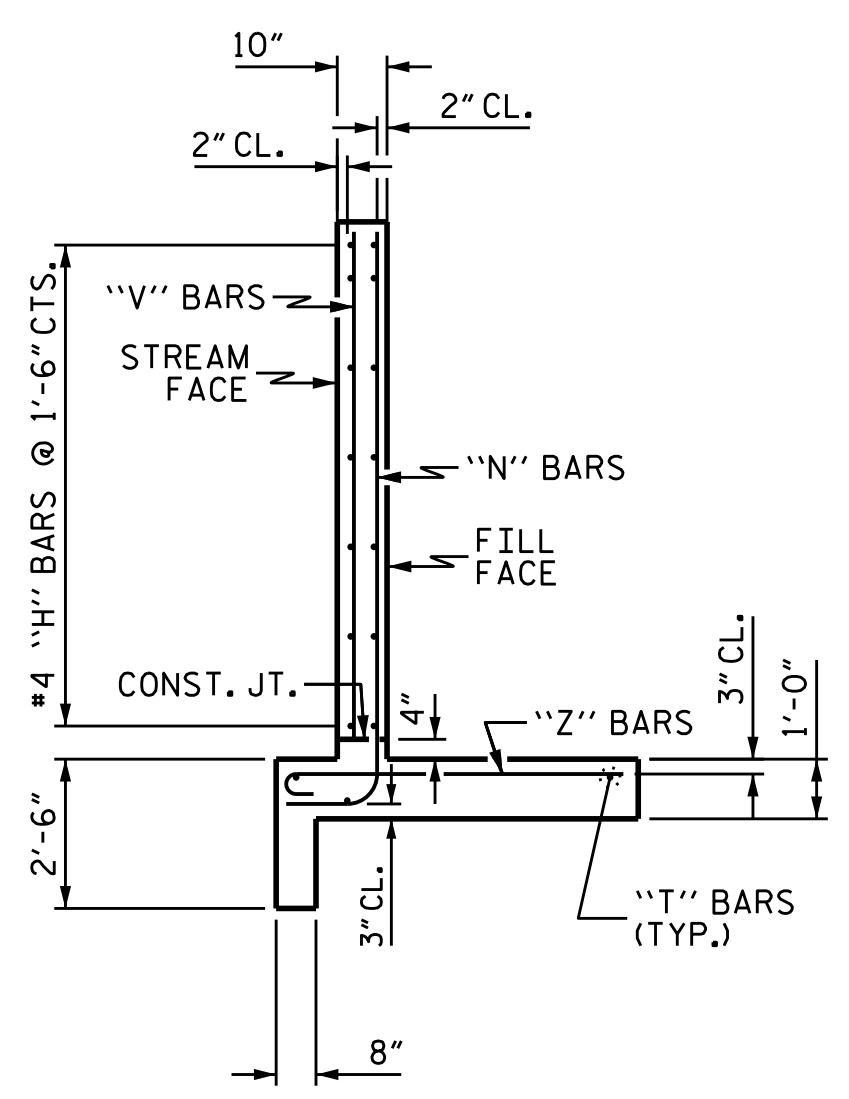




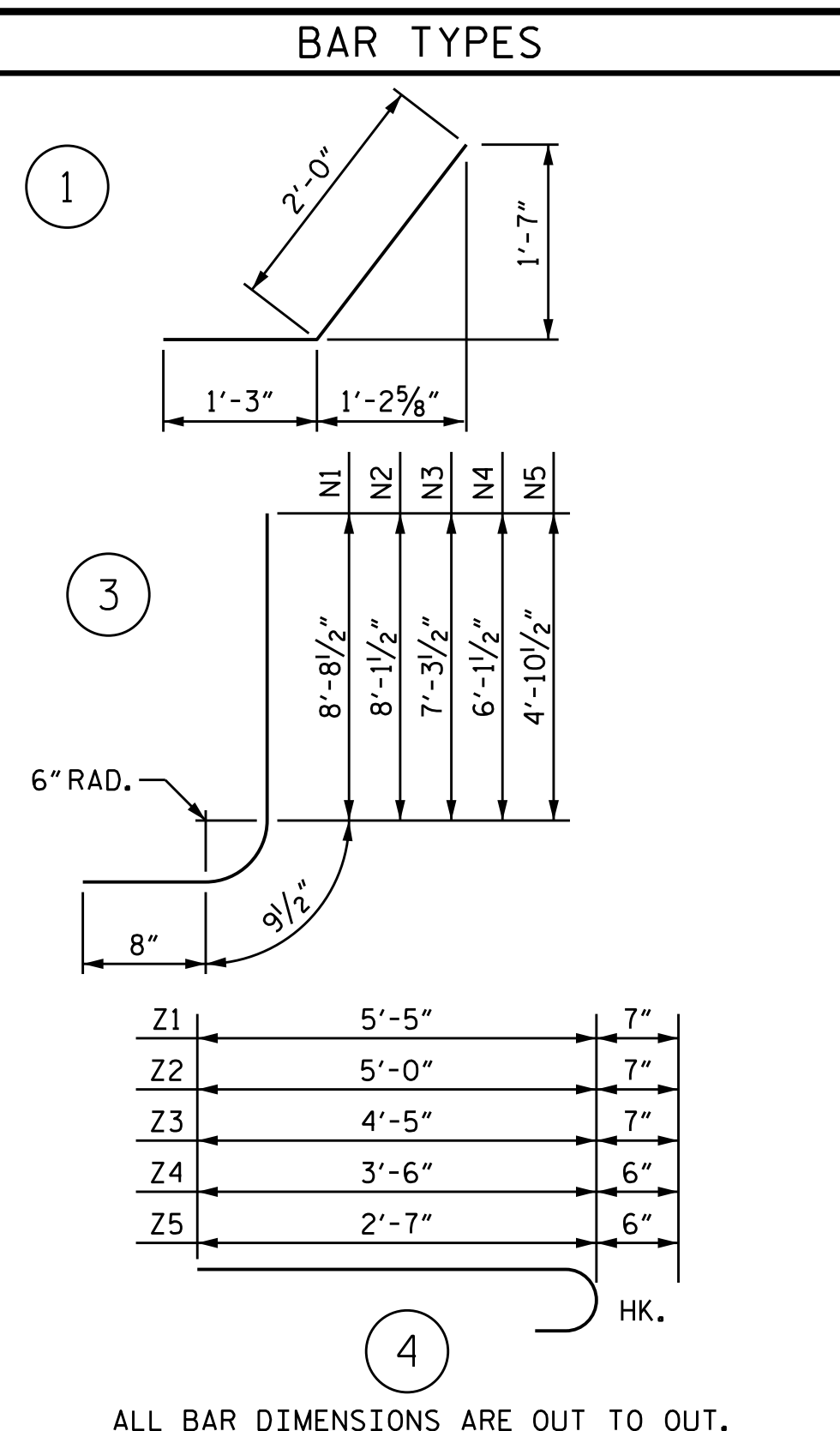
PLAN W2



ELEVATION W2



TYPICAL WING SECTION

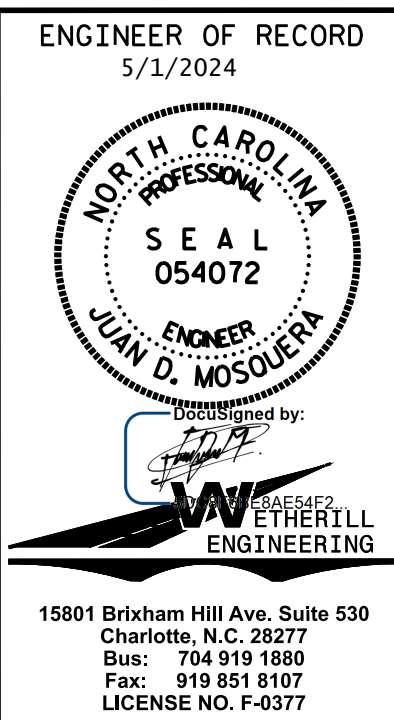


BILL OF MATERIAL FOR W2					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	9'-1"	36
H2	2	#4	STR	8'-2"	11
H3	2	#4	STR	4'-5"	6
H4	12	#4	1	3'-3"	26
H5	2	#4	STR	9'-10"	13
N1	2	#5	3	10'-2"	21
N2	2	#5	3	9'-7"	20
N3	2	#5	3	8'-9"	18
N4	3	#4	3	7'-7"	15
N5	3	#4	3	6'-4"	13
S1	3	#6	STR	6'-0"	27
T1	3	#5	STR	11'-0"	34
V1	2	#4	STR	8'-2"	11
V2	2	#4	STR	7'-6"	10
V3	2	#4	STR	6'-9"	9
V4	3	#4	STR	5'-6"	11
V5	3	#4	STR	4'-4"	9
Z1	2	#5	4	6'-0"	13
Z2	2	#5	4	5'-7"	12
Z3	2	#5	4	5'-0"	10
Z4	3	#4	4	4'-0"	8
Z5	3	#4	4	3'-1"	6
REINFORCING STEEL FOR 1 WING				339	LBS
CLASS A CONCRETE 1 WING				4.9	CY

P:\2023\2312801-HB-0003-Structures\DOMCULVERT\_EXT\_12-2023\C-8 TO C-9 HB-003\_SMU\_CU\_WINGWALLS.dgn  
 5/11/2024 3:17:23 PM

ASSEMBLED BY : J. PENDERGRAFT	DATE : 11-28-23
CHECKED BY : J. DILWORTH	DATE : 11-28-23
DRAWN BY : CCJ	01/00
CHECKED BY : RWW	03/00
REV. 6/19	MAA/THC

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**STANDARD WING FOR W2**  
CONCRETE BOX CULVERT  
H = 8'-0" SLOPE = 2:1  
75° SKEW

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

SHEET NO. C-9  
TOTAL SHEETS 9

PROJECT NO. HB-0003  
HAYWOOD COUNTY  
STATION: 188+14.00 -L-

STD. NO. CW7508

## STANDARD NOTES

### DESIGN DATA:

SPECIFICATIONS	- - - - -	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	- - - - -	SEE PLANS
IMPACT ALLOWANCE	- - - - -	SEE A.A.S.H.T.O.
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 A.A.S.H.T.O.
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  $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO  $1\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A  $\frac{1}{4}$ " 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  $\frac{1}{4}$ " 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  $\frac{7}{8}$ "  $\emptyset$  SHEAR STUDS FOR THE  $\frac{3}{4}$ "  $\emptyset$  STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 -  $\frac{7}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF  $\frac{7}{8}$ "  $\emptyset$  STUDS ALONG THE BEAM AS SHOWN FOR  $\frac{3}{4}$ "  $\emptyset$  STUDS BASED ON THE RATIO OF 3 -  $\frac{7}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  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  $\frac{3}{16}$ " 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  $\frac{1}{16}$ " INCH 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.

# ENGLISH

JANUARY, 1990

STD. NO. SN