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TIP PROJECT: W-5714E

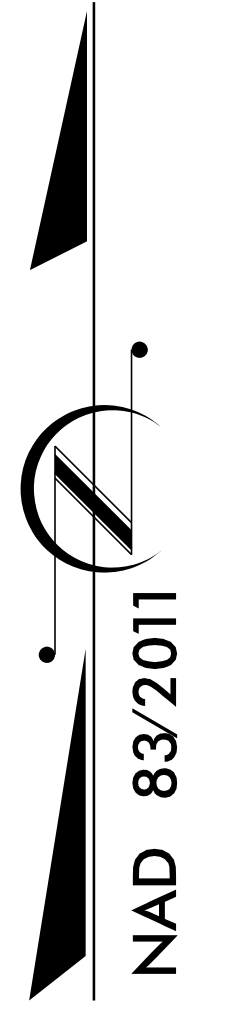
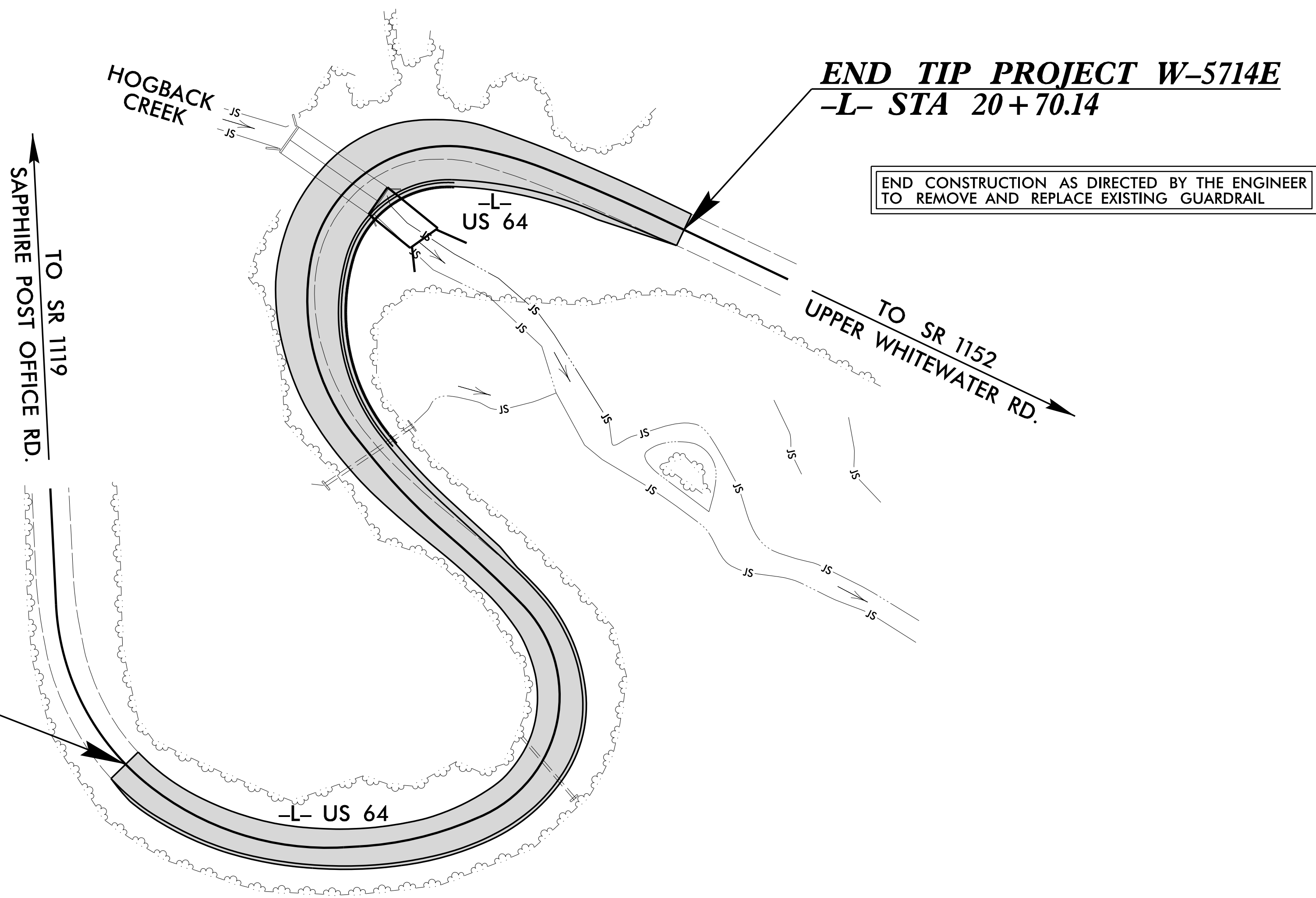
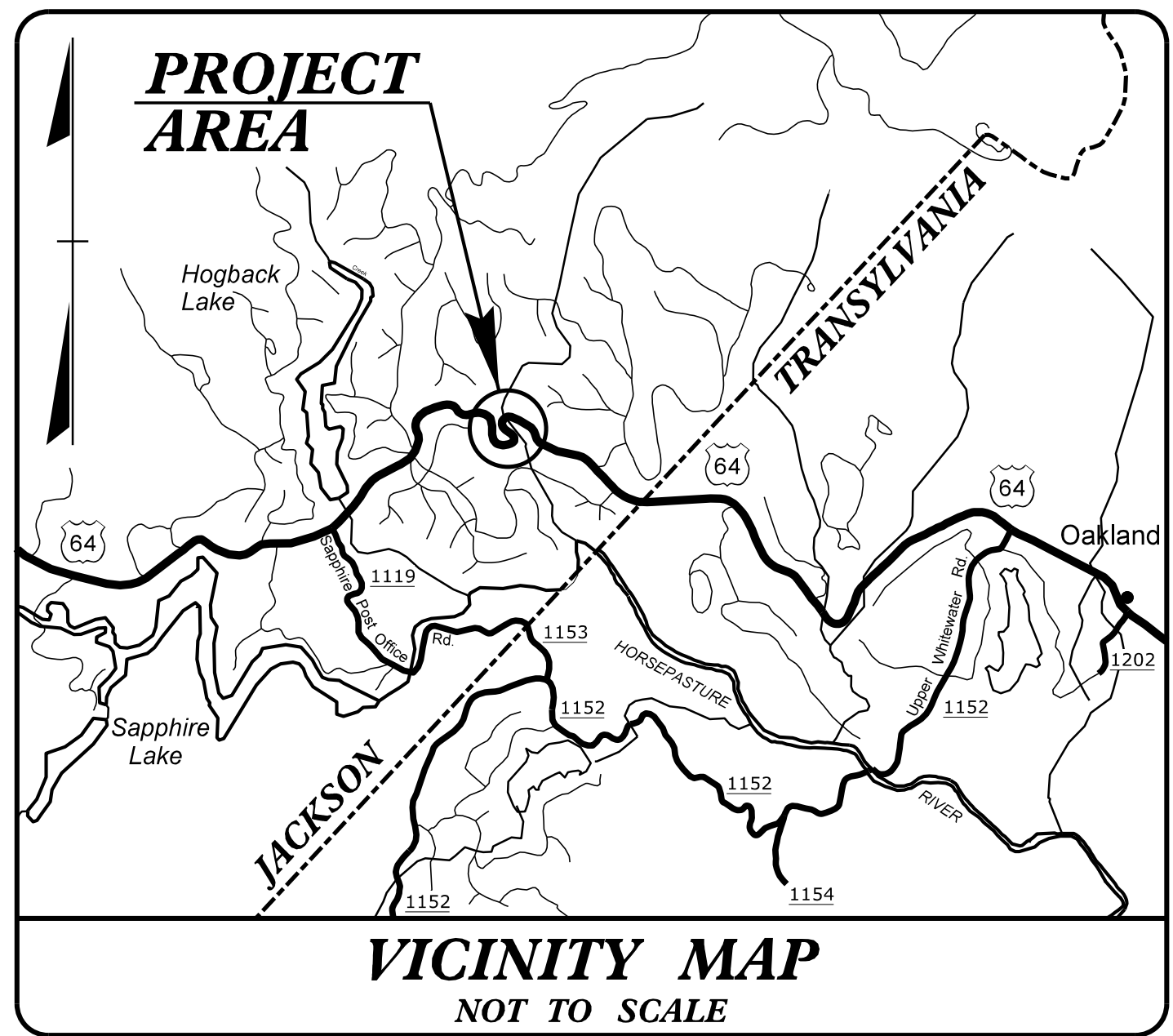
CONTRACT: DN01057

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

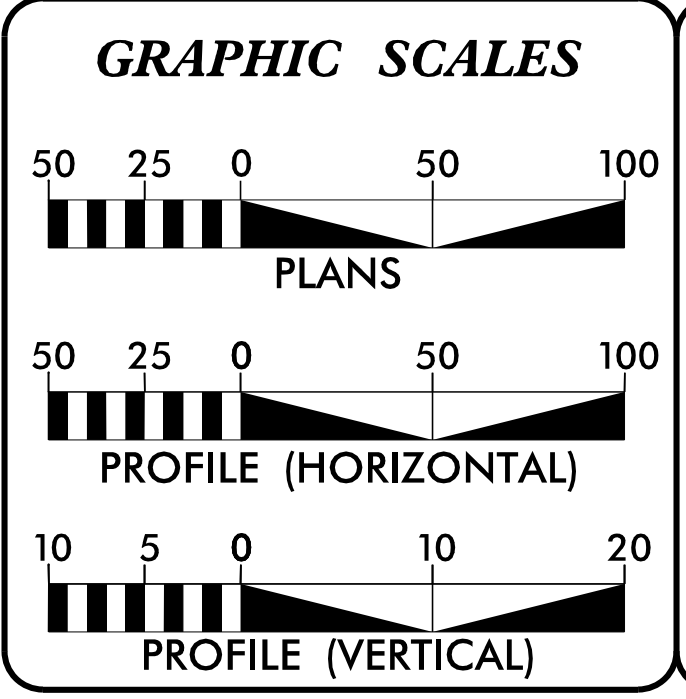
JACKSON COUNTY

LOCATION: US 64 APPROXIMATELY 0.8 MILE EAST OF SR 1119 (SAPPHIRE POST OFFICE RD.) AT "CHRYSLER CURVE" NEAR SAPPHIRE
TYPE OF WORK: GRADING, PAVING, DRAINAGE AND CULVERT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5714E	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
44862.1.5	HSIP-0064(197)	PE	
44862.2.5	HSIP-0064(197)	RW & UTILITIES	
44862.3.5	HSIP-0064(197)	CONSTR.	



STRUCTURE



DESIGN DATA

ADT 2020 = 3,400
ADT 2040 = 6,800

T = 7 % *
V = 15 MPH**
* TTST = 1 DUAL = 6
FUNC CLASS =
MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT W-5714E = 0.170 MILES
TOTAL LENGTH PROJECT W-5714E = 0.170 MILES

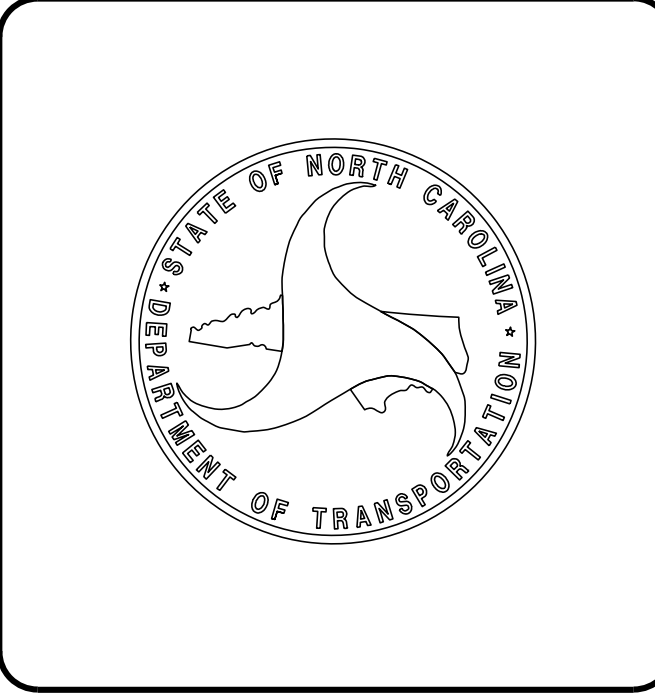
Plans Prepared By:
ms consultants, inc.
544 Wade Park Blvd.
Suite 100
Raleigh, NC 27607
NC License Number - C-3239

Plans Prepared For:
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION 14
253 WEBSTER ROAD
SYLVIA, NC 28779

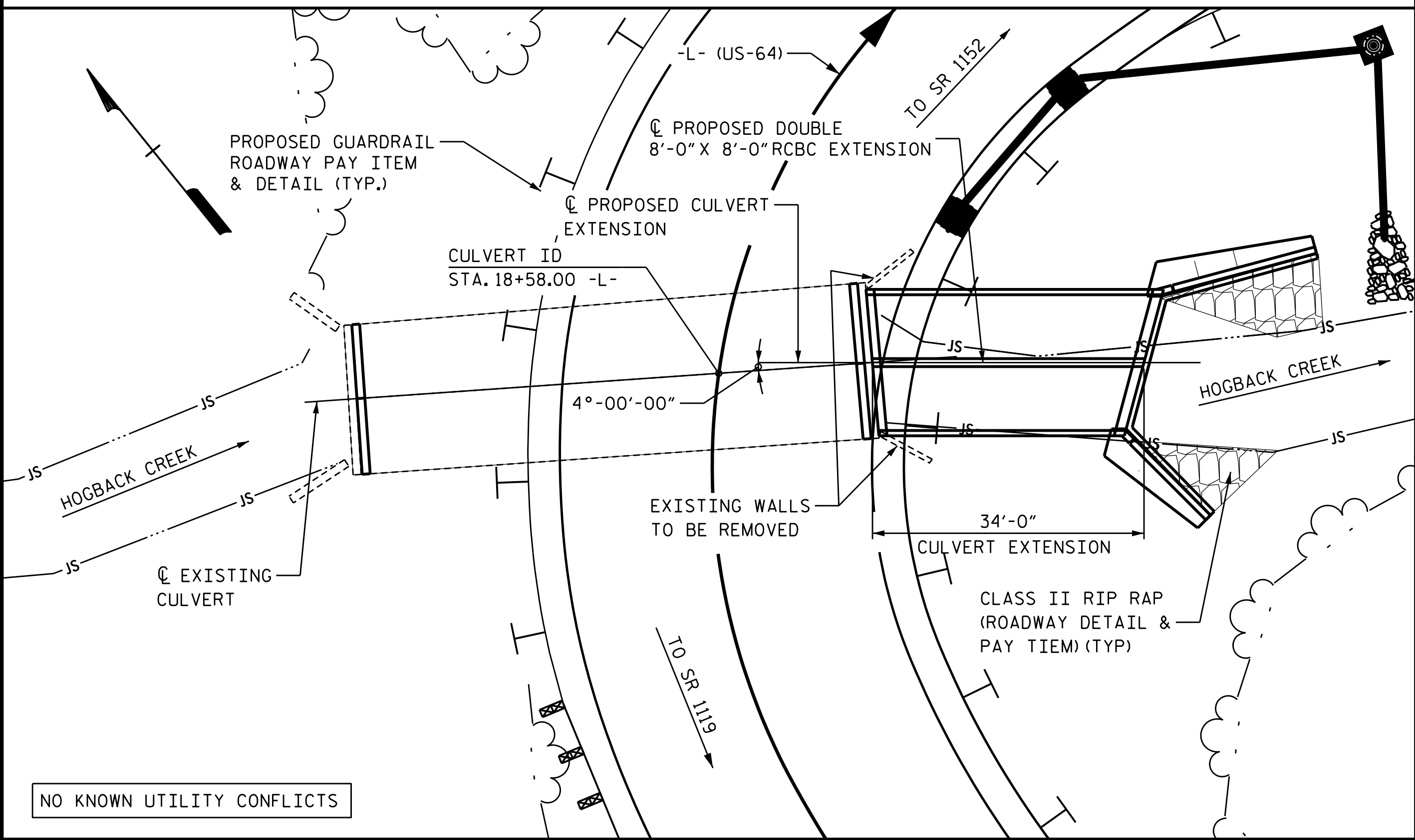
2018 STANDARD SPECIFICATIONS

LETTING DATE:
JULY 23, 2024

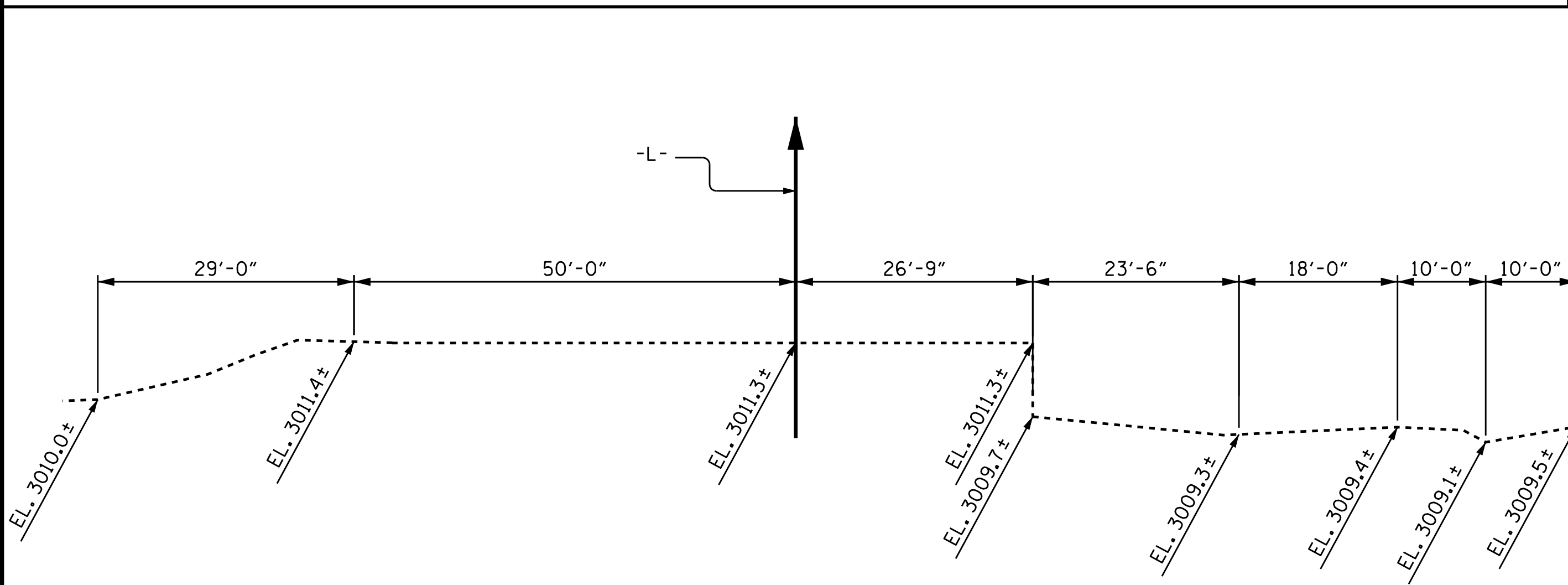
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UNLESS ALL SIGNATURES COMPLETED



BM. #1 - 8" SPIKE IN SET IN BASE OF CUT OFF POLE, 40.00' RT. OF -L- STA. 11+86 EL. 3071.53



LOCATION SKETCH



PROFILE ALONG Q CULVERT

NOTES

ASSUMED LIVE LOAD = HL-93
DESIGN FILL ----- MAX. 9.00', MIN. 8.50'
FOR OTHER DESIGN DATA AND NOTES, SEE SHEET SN.
3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.
CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:
1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALL.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.
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.
AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.
OVEREXCAVATE LOOSE/SOFT MATERIAL IF PRESENT TO SUITABLE BEARING MATERIALS AND REPLACE WITH ADDITIONAL CLASS V OR VI FOUNDATION CONDITIONING MATERIAL.
STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES WILL BE PAID FOR BY THE CONTRACTOR.
THE ENTIRE COST OF WORK REQUIRED TO PLACE EXCAVATED OR SUPPLEMENTAL MATERIAL AS SHOWN ON THE PLANS SHALL BE INCLUDED IN THE LUMP SUMP PRICE FOR CULVERT EXCAVATION.
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.
THE EXISTING STRUCTURE CONSISTING OF A 2 @ 8'-0" X 8'-0" REINFORCED CONCRETE BOX CULVERT 66'-0"± LONG ALONG THE CENTERLINE OF CULVERT SHALL BE RETAINED AND EXTENDED. THE EXISTING CULVERT IS NOT PRESENTLY POSTED FOR LOAD LIMIT.
EXCAVATE FOUNDATION TO A MINIMUM OF 1'-0" BELOW CULVERT BEARING ELEVATION. PLACE 1'-0" OF CLASS V OR VI FOUNDATION CONDITION MATERIAL IN ACCORDANCE WITH SECTION 414 OF THE STANDARD SPECIFICATION.

F.A. PROJECT NO. HSIP-0064(197)

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.
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 STRENGTH OF 1500 PSI.
ONE PERMITTED CONSTRUCTION JOINT WILL BE ALLOWED IN THE END CURTAIN WALL.
DOWELS SHALL BE USED TO CONNECT THE CULVERT EXTENSION TO THE EXISTING CULVERT AS SHOWN. FOR NOTE REGARDING SETTING OF DOWELS, SEE SHEET SN.
FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.
FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

TOTAL STRUCTURE QUANTITIES	
CLASS A CONCRETE	
BARREL @	1.94 CY/FT = 66.1 C.Y.
WING ETC.	17.5 C.Y.
SILLS	3.9 C.Y.
TOTAL	87.50 C.Y.
REINFORCING STEEL	
BARREL	11555 LBS.
WING ETC.	1825 LBS.
SILLS	86 LBS.
TOTAL	13466 LBS.
CULVERT EXCAVATION @ STA. 18+58.00 -L- LUMP SUM	
REMOVAL OF EXISTING STRUCTURE LUMP SUM	
FOUNDATION COND. MAT'L.	54 TONS
EPOXY RESIN INJECTION	16 LIN. FT.
SHOTCRETE REPAIRS	17 C.F.

ROADWAY DATA

GRADE PT. ELEV. @ STATION 18+58.00 -L- = 3030.56
BED ELEV. @ STATION 18+58.00 = 3011.30
ROADWAY SLOPES = 2:1

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"

HYDRAULIC DATA

DESIGN DISCHARGE = 530 C.F.S.
FREQUENCY OF DESIGN DISCHARGE = 50 YRS.
DESIGN HIGH WATER ELEVATION = 3018.0
DRAINAGE AREA = 0.76 SQ. MI.
BASE DISCHARGE (0100) = 640 C.F.S.
BASE HIGH WATER ELEVATION = 3018.7

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE = 2,300 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD = 500(+). YRS.
OVERTOPPING FLOOD ELEVATION = 3031.7
LOCATION @ STA. 18+91 -L- (LT. SHOULDER)

PROJECT NO. W-5714E
JACKSON COUNTY
STATION: 18+58.00 -L-

SHEET 1 of 8



DEPARTMENT OF TRANSPORTATION
RALEIGH
DOUBLE 8'-0" X 8'-0"
CONCRETE BOX CULVERT
EXTENSION
75° SKEW

DRAWN BY : J.M. KEPICH DATE : 03/21
CHECKED BY : L.M. SAMPLES DATE : 05/21
DESIGN ENGINEER OF RECORD : J.M. KEPICH DATE : 04/22

ms consultants, inc.
5444 Wade Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

4/21/2022
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	DATE:	C-1
1			3		TOTAL SHEETS
2			4		09

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LEVEL	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING #	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE								COMMENT NUMBER		
						MOMENT				SHEAR						
						LIVE-LOAD FACTORS (γ _L)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (FT)	RATING FACTOR	BOX NO.	ELEMENT TYPE		DISTANCE FROM LEFT END OF ELEMENT (FT)	
DESIGN LOAD RATING	HL-93 (INVENTORY)	N/A	1	1.44	--	1.75	2.15	1	TOP SLAB	7.67	1.44	1	TOP SLAB	7.67	1	
	HL-93 (OPERATING)	N/A	--	1.87	--	1.35	2.79	1	TOP SLAB	7.67	1.87	1	TOP SLAB	7.67		
	HS-20 (INVENTORY)	36.000	2	1.51	54.36	1.75	2.24	1	TOP SLAB	7.67	1.51	1	TOP SLAB	7.67	1	
	HS-20 (OPERATING)	36.000	--	1.96	70.56	1.35	2.91	1	TOP SLAB	7.67	1.96	1	TOP SLAB	7.67		
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.99	53.87	1.40	5.53	1	TOP SLAB	7.67	3.99	1	TOP SLAB	7.67	
		SNGARBS2	20.000	--	3.59	71.80	1.40	4.67	1	TOP SLAB	7.67	3.59	1	TOP SLAB	7.67	
		SNAGRIS2	22.000	--	3.73	82.06	1.40	4.47	1	TOP SLAB	7.67	3.73	1	TOP SLAB	7.67	
		SNCOTTS3	27.250	--	1.79	48.78	1.40	2.65	1	TOP SLAB	7.67	1.79	1	TOP SLAB	7.67	
		SNAGGRS4	34.925	--	1.79	62.52	1.40	2.47	1	TOP SLAB	7.67	1.79	1	TOP SLAB	7.67	
		SNS5A	35.550	--	1.77	62.92	1.40	2.48	1	TOP SLAB	7.67	1.77	1	TOP SLAB	7.67	
		SNS6A	39.950	--	1.75	69.91	1.40	2.35	1	TOP SLAB	7.67	1.75	1	TOP SLAB	7.67	
	SNS7B	42.000	3	1.75	73.50	1.40	2.30	1	TOP SLAB	7.67	1.75	1	TOP SLAB	7.67	1	
	TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	2.56	84.48	1.40	3.10	1	TOP SLAB	7.67	2.56	1	TOP SLAB	7.67	
		TNT4A	33.075	--	2.07	68.47	1.40	2.84	1	TOP SLAB	7.67	2.07	1	TOP SLAB	7.67	
		TNT6A	41.600	--	1.86	77.38	1.40	2.60	1	TOP SLAB	7.67	1.86	1	TOP SLAB	7.67	
		TNT7A	42.000	--	1.99	83.58	1.40	2.67	1	TOP SLAB	7.67	1.99	1	TOP SLAB	7.67	
		TNT7B	42.000	--	1.83	76.86	1.40	2.54	1	TOP SLAB	7.67	1.83	1	TOP SLAB	7.67	
		TNAGRIT4	43.000	--	2.01	86.43	1.40	2.57	1	TOP SLAB	7.67	2.01	1	TOP SLAB	7.67	
TNAGT5A		45.000	--	2.01	90.45	1.40	2.57	1	TOP SLAB	7.67	2.01	1	TOP SLAB	7.67		
TNAGT5B	45.000	--	1.98	89.10	1.40	2.42	1	TOP SLAB	7.67	1.98	1	TOP SLAB	7.67			

LOAD FACTORS:

DESIGN LOAD RATING 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
LS	1.75	--
WA	1.00	--

NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

1. CONTROLLING RATINGS BASED ON MAX. FILL (9'-0")
- 2.
- 3.
- 4.

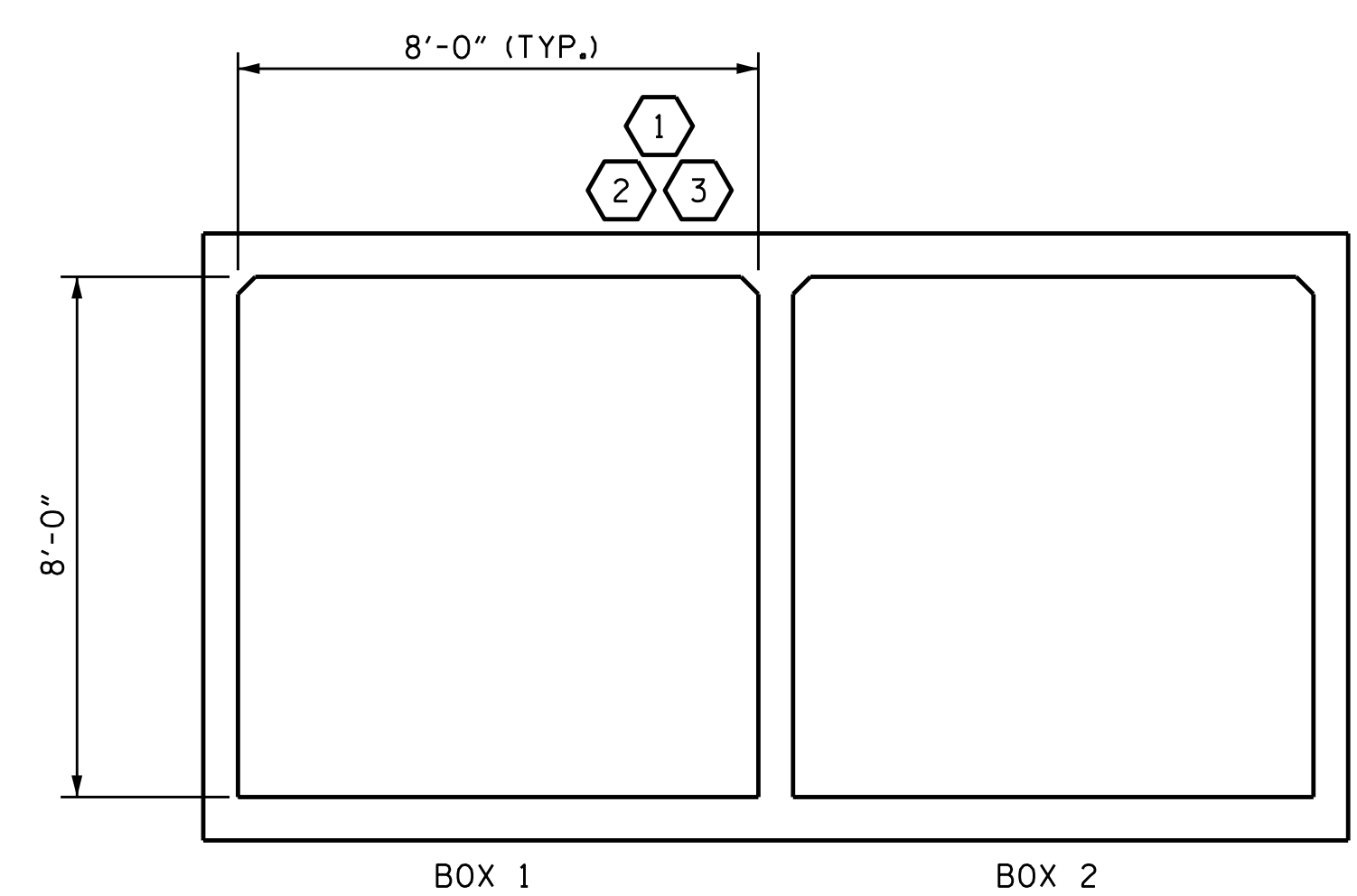
CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. W-5714E
JACKSON COUNTY
STATION: 18+58.00 -L-

SHEET 2 of 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

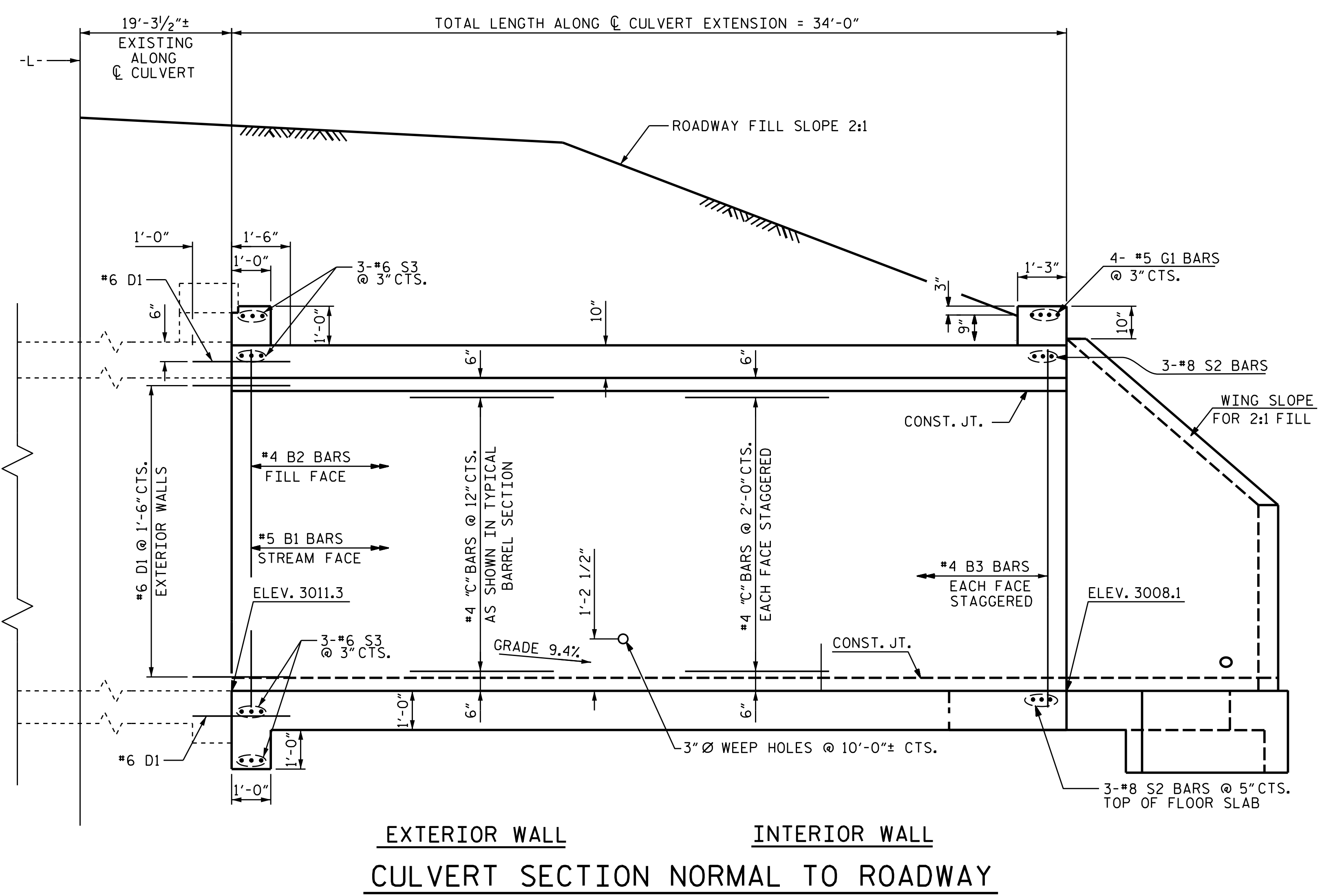
STANDARD
LRFR SUMMARY FOR
REINFORCED CONCRETE
BOX CULVERTS
(NON-INTERSTATE TRAFFIC)



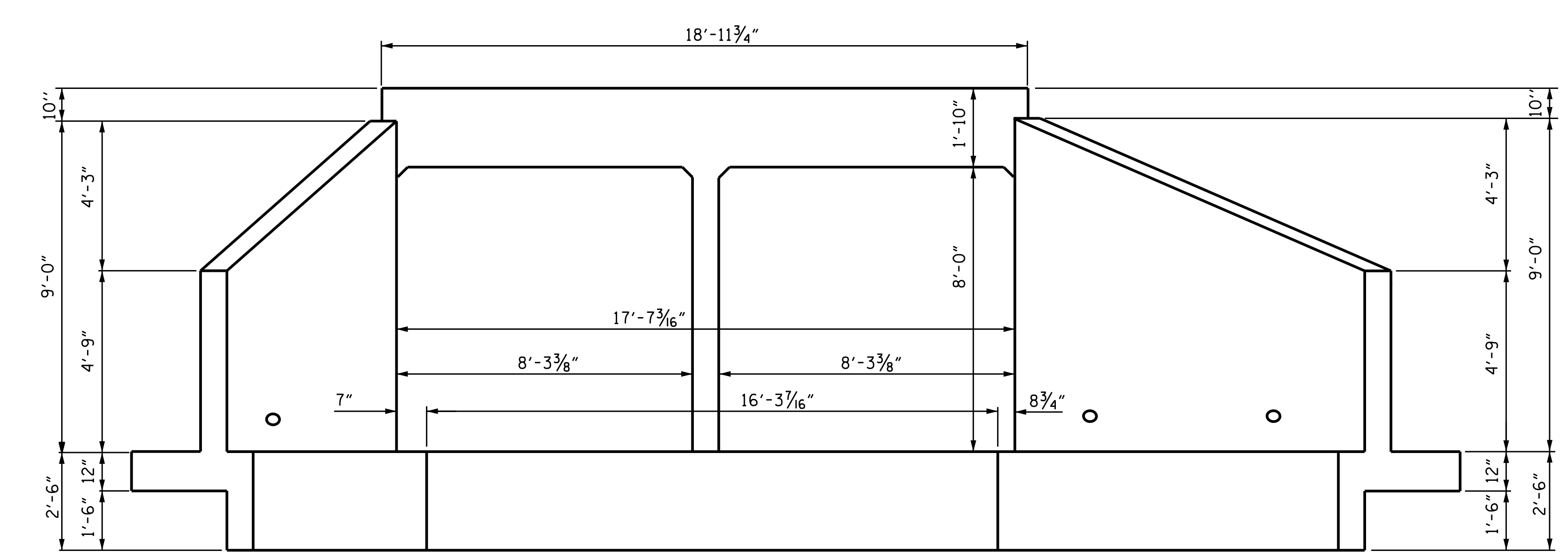
ms consultants, inc.
5444 Wade Park Blvd.
Suite 160
Raleigh, NC 27607
NC License Number : C-3239

ASSEMBLED BY : J.M. KEPICH DATE : 03/21
CHECKED BY : L.M. SAMPLES DATE : 05/21
DRAWN BY : WMC 7/11 REV. 10/11 MAA/GM
CHECKED BY : GM 7/11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-2
1			3			TOTAL SHEETS 09
2			4			



CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION NORMAL TO SKEW

PROJECT NO. W-5714E
JACKSON COUNTY
 STATION: 18+58.00 -L-
 SHEET 3 of 8

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 DOUBLE 8'-0" X 8'-0"
 CONCRETE BOX CULVERT
 EXTENSION
 75° SKEW

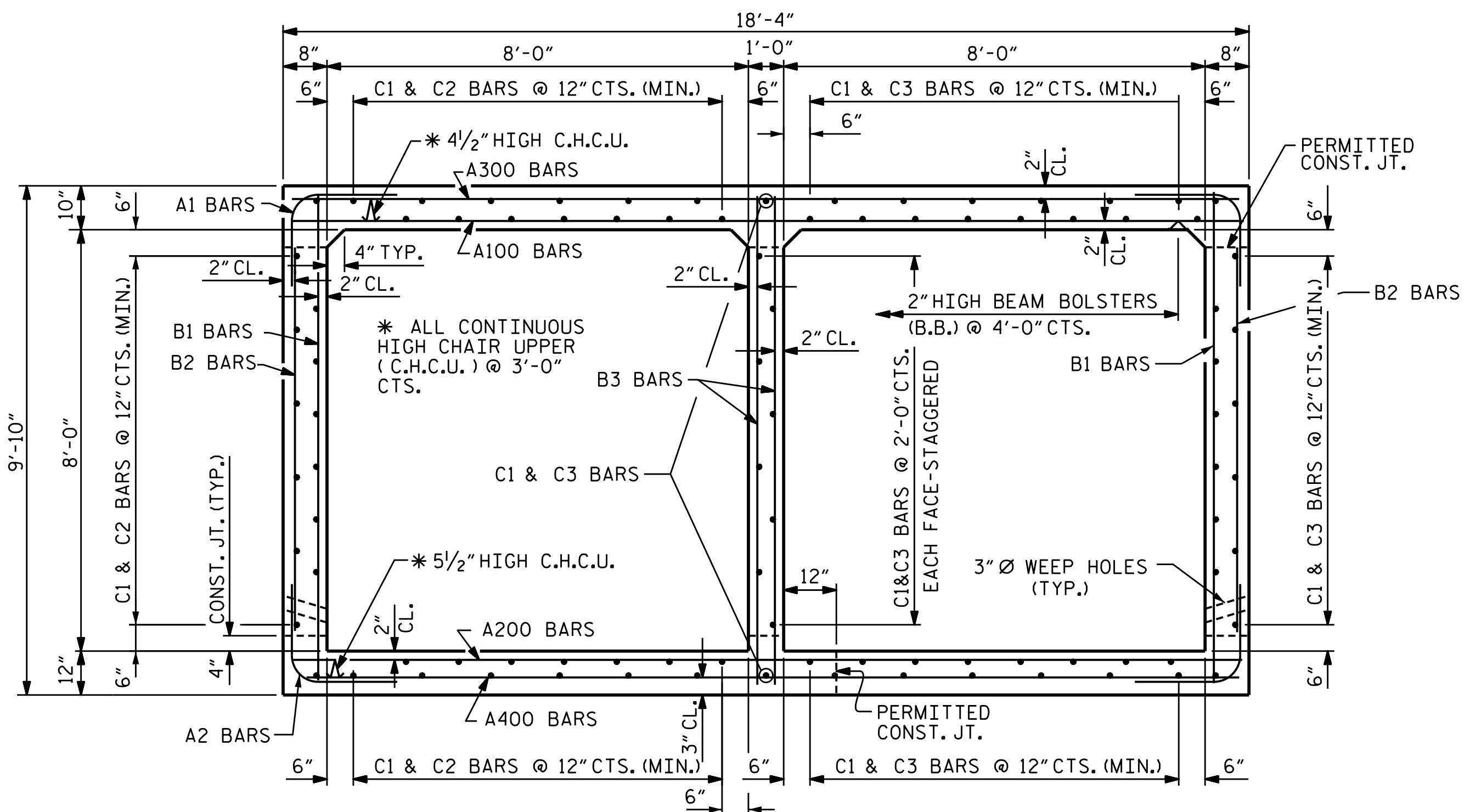


REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-3
1			3			TOTAL SHEETS
2			4			09

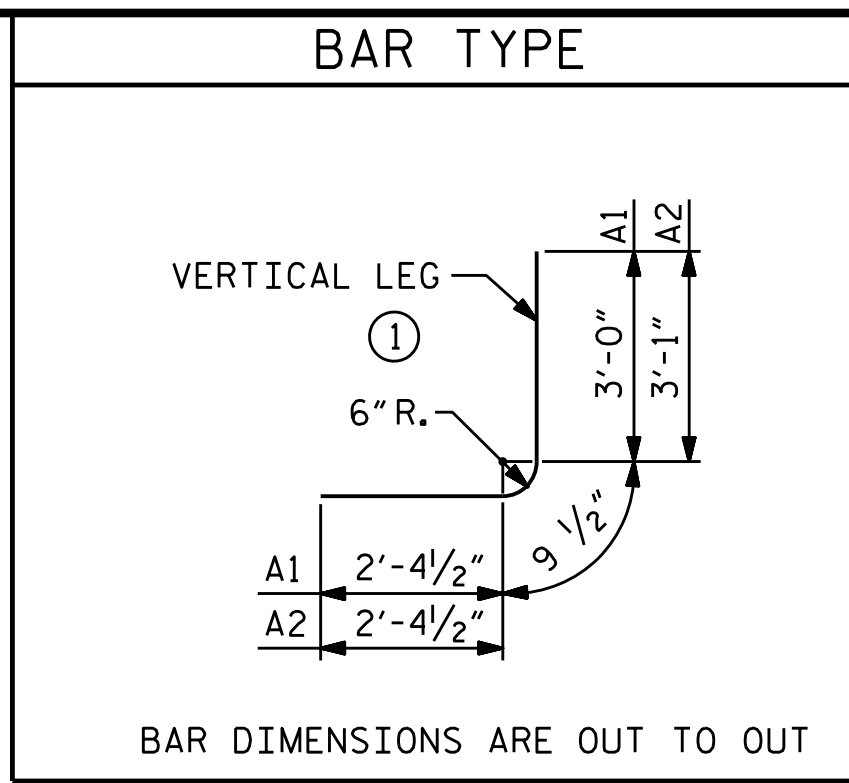
DRAWN BY :	J.M. KEPICH	DATE :	03/21
CHECKED BY :	L.M. SAMPLES	DATE :	05/21
DESIGN ENGINEER OF RECORD :	J.M. KEPICH	DATE :	04/22

ms consultants, inc.
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 Suite 160
 Raleigh, NC 27607
 NC License Number : C-3239

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RIGHT ANGLE SECTION OF BARREL
(LOOKING DOWNSTREAM)
THERE ARE 94 "C" BARS (2 BAR RUNS) IN SECTION OF BARREL



BAR NO.		SIZE	TYPE	LENGTH	WEIGHT	BAR NO.		SIZE	TYPE	LENGTH	WEIGHT
A1	134	#5	1	6'-2"	862	A400	62	#5	STR	18'-0"	1164
A2	134	#5	1	6'-3"	874	A401	1	#5	STR	16'-2"	17
A100	62	#5	STR	18'-0"	1164	A402	1	#5	STR	14'-3"	15
A101	1	#5	STR	16'-2"	17	A403	1	#5	STR	12'-5"	13
A102	1	#5	STR	14'-3"	15	A404	1	#5	STR	10'-6"	11
A103	1	#5	STR	12'-5"	13	A405	1	#5	STR	8'-8"	9
A104	1	#5	STR	10'-6"	11	A406	1	#5	STR	6'-10"	7
A105	1	#5	STR	8'-8"	9	A407	1	#5	STR	4'-11"	5
A106	1	#5	STR	6'-10"	7	A408	1	#5	STR	3'-1"	3
A107	1	#5	STR	4'-11"	5	A409	1	#5	STR	1'-3"	1
A108	1	#5	STR	3'-1"	3	A410	1	#5	STR	12'-4"	13
A109	1	#5	STR	1'-3"	1	A411	1	#5	STR	6'-9"	7
A110	1	#5	STR	12'-4"	13	B1	134	#5	STR	9'-5"	1316
A111	1	#5	STR	6'-9"	7	B2	134	#4	STR	7'-3"	649
						B3	69	#4	STR	9'-5"	434
A200	62	#5	STR	18'-0"	1164						
A201	1	#5	STR	16'-2"	17	C1	94	#4	STR	20'-0"	1256
A202	1	#5	STR	14'-3"	15	C2	43	#4	STR	19'-3"	553
A203	1	#5	STR	12'-5"	13	C3	51	#4	STR	16'-2"	551
A204	1	#5	STR	10'-6"	11						
A205	1	#5	STR	8'-8"	9	G1	4	#5	STR	18'-6"	77
A206	1	#5	STR	6'-10"	7						
A207	1	#5	STR	4'-11"	5	S2	6	#8	STR	18'-6"	296
A208	1	#5	STR	3'-1"	3	S3	12	#6	STR	18'-0"	324
A209	1	#5	STR	1'-3"	1						
A210	1	#5	STR	12'-4"	13	D1	36	#6	STR	2'-6"	135
A211	1	#5	STR	6'-9"	7	D2	12	#6	STR	2'-7"	47
						D3	12	#6	STR	1'-7"	29
A300	62	#5	STR	18'-0"	1164	D4	6	#6	STR	1'-1"	10
A301	1	#5	STR	16'-2"	17						
A302	1	#5	STR	14'-3"	15						
A303	1	#5	STR	12'-5"	13						
A304	1	#5	STR	10'-6"	11						
A305	1	#5	STR	8'-8"	9						
A306	1	#5	STR	6'-10"	7						
A307	1	#5	STR	4'-11"	5						
A308	1	#5	STR	3'-1"	3						
A309	1	#5	STR	1'-3"	1						
A310	1	#5	STR	12'-4"	13						
A311	1	#5	STR	6'-9"	7						

NOTES:

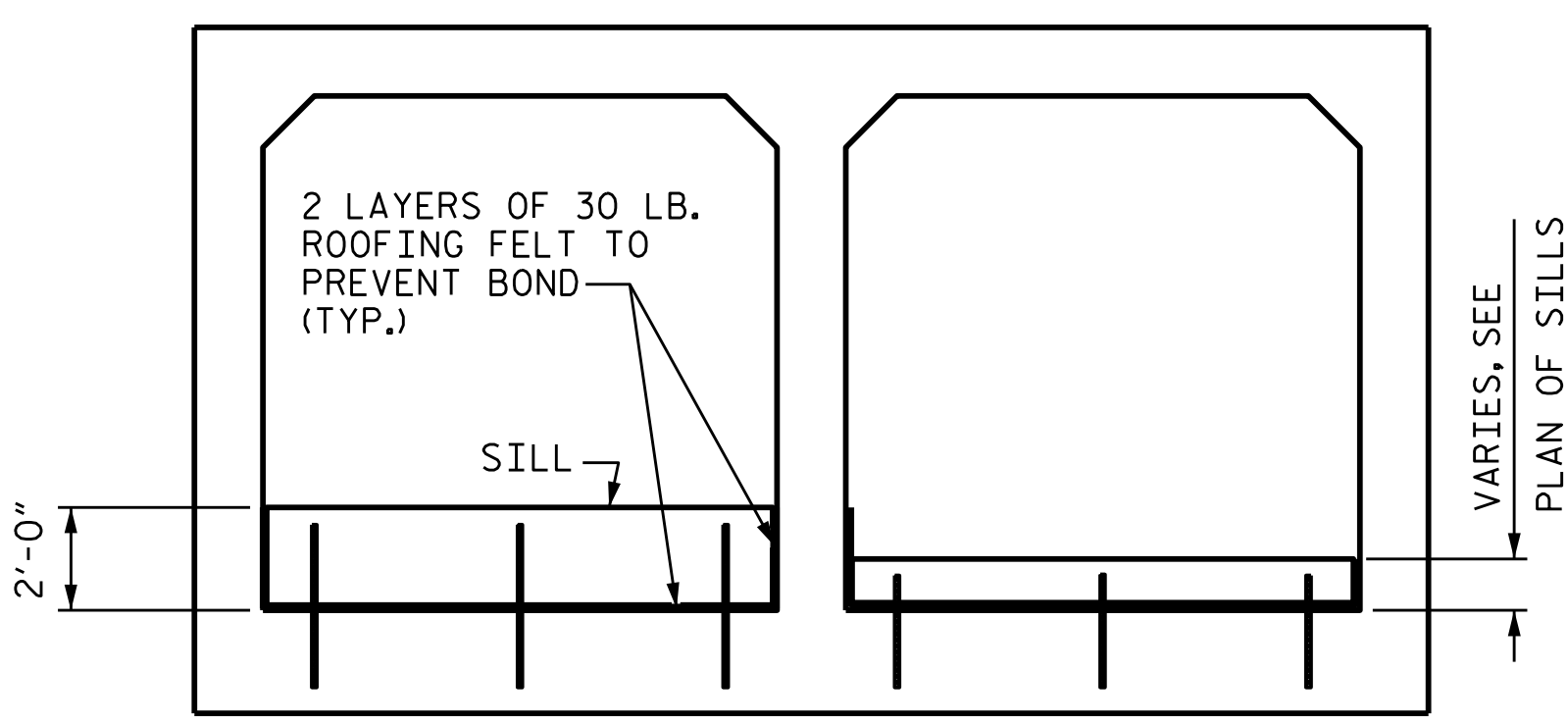
NATIVE MATERIAL BETWEEN SILLS/BAFFLES IN THE CULVERT SHALL PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL CONSISTS ON MATERIAL THAT IS EXCAVATED FROM THE STREAM OR FLOODPLAIN AT THE PROJECT SITE DURING CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP-RAP MAY BE USED TO SUPPLEMENT THE NATIVE BED 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.

TOP OF LOW FLOW SILLS/BAFFLES SHOULD MATCH BED ELEVATION IN LOW FLOW CHANNEL OF STREAM. (THALWEG)

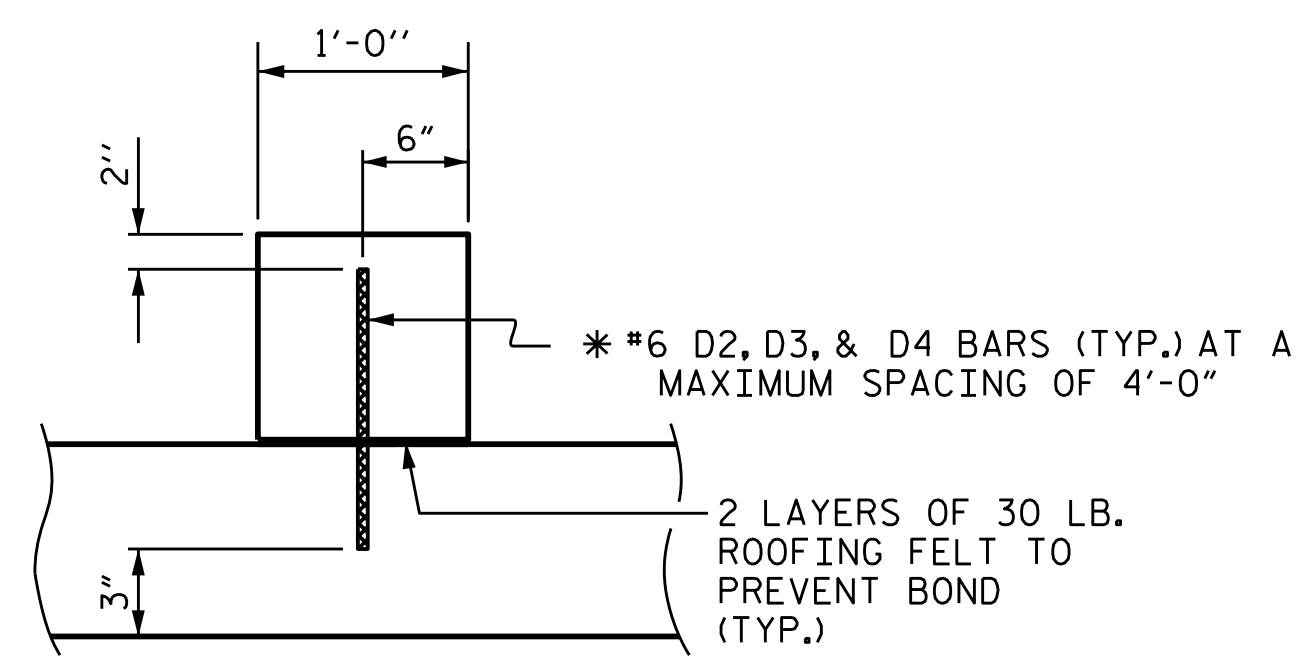
DO NOT SET ELEVATION OF HIGH SILL/BAFFLES ABOVE BANK FILL.

SPLICE LENGTH CHART		
BAR	SIZE	SPLICE LENGTH
C2	#4	2'-5"
C3	#4	2'-5"

REINFORCING STEEL	
BARREL	11555 LBS.
SILLS	85 LBS.
ETC.	833 LBS.
CLASS A CONCRETE	
2 BARRELS	66.1 CU.YDS.
SILLS	3.9 CU.YDS.

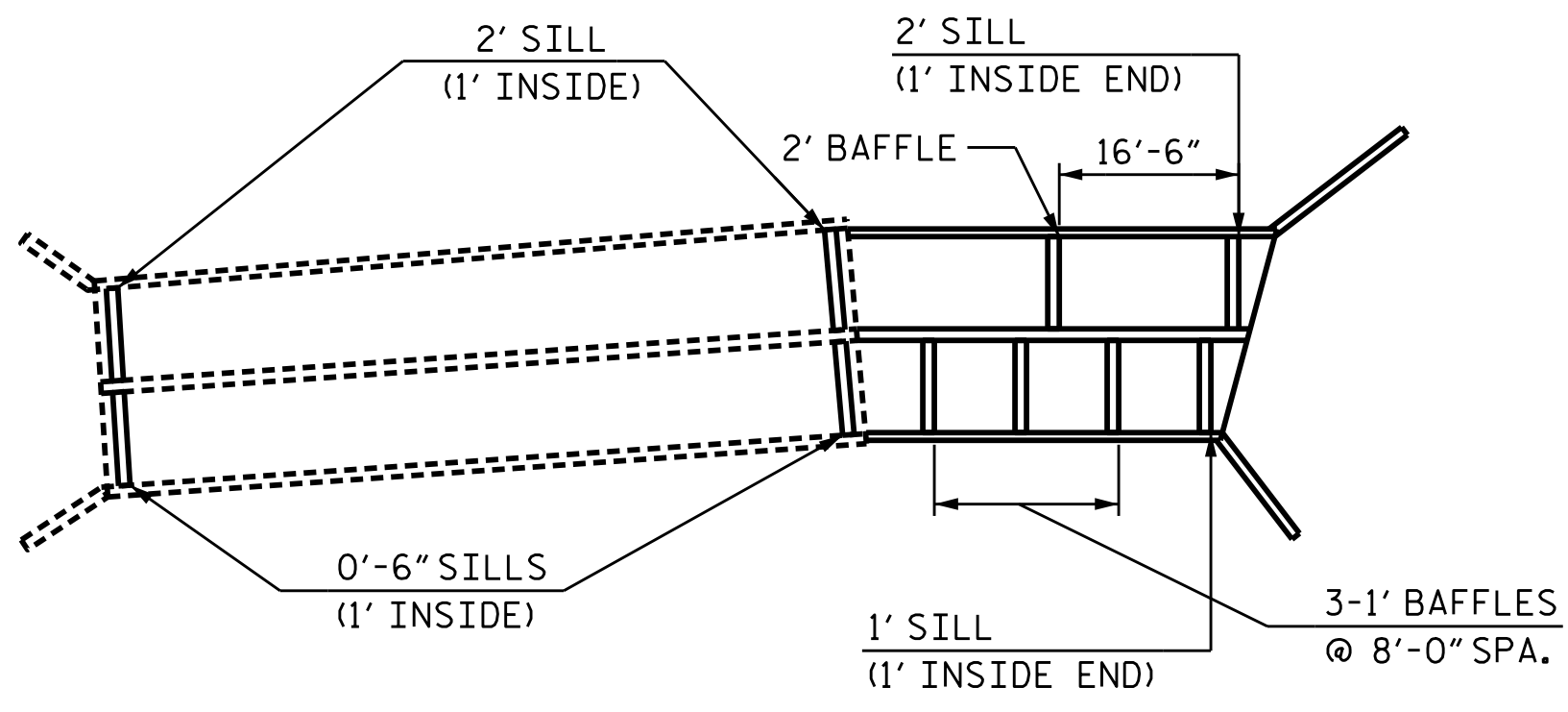


ELEVATION
(LOOKING DOWNSTREAM)



SECTION THROUGH SILL

* DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.



PLAN OF SILLS

SILL/BAFFLE BARS	
BAR	SILL/BAFFLE HEIGHT
D2	2'-0"
D3	1'-0"
D4	0'-6"

CULVERT SILL DETAILS

PROJECT NO. W-5714E
JACKSON COUNTY
STATION: 18+58.00 -L-

SHEET 6 of 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8'-0" X 8'-0" CONCRETE BOX CULVERT EXTENSION 75° SKEW



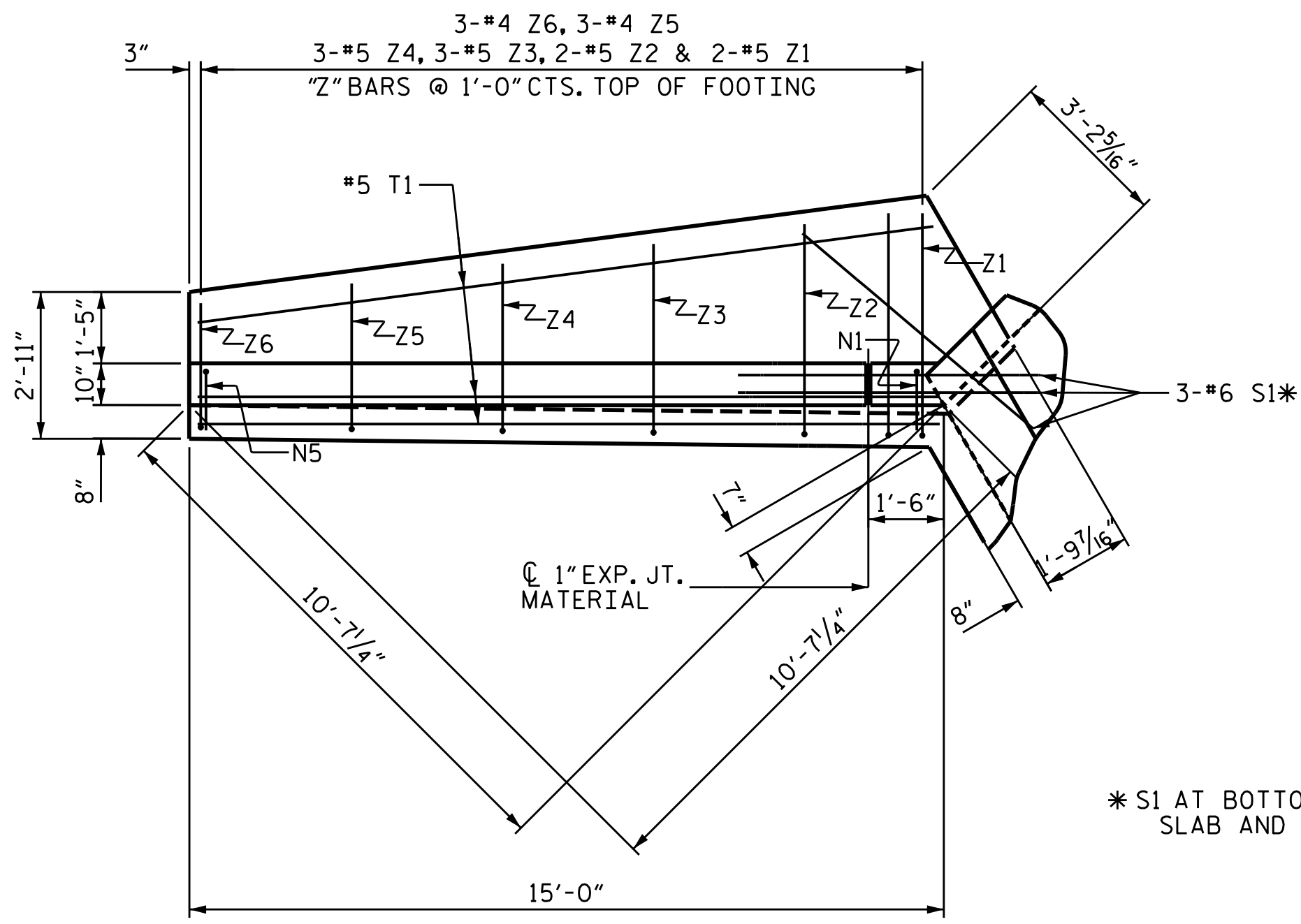
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 09

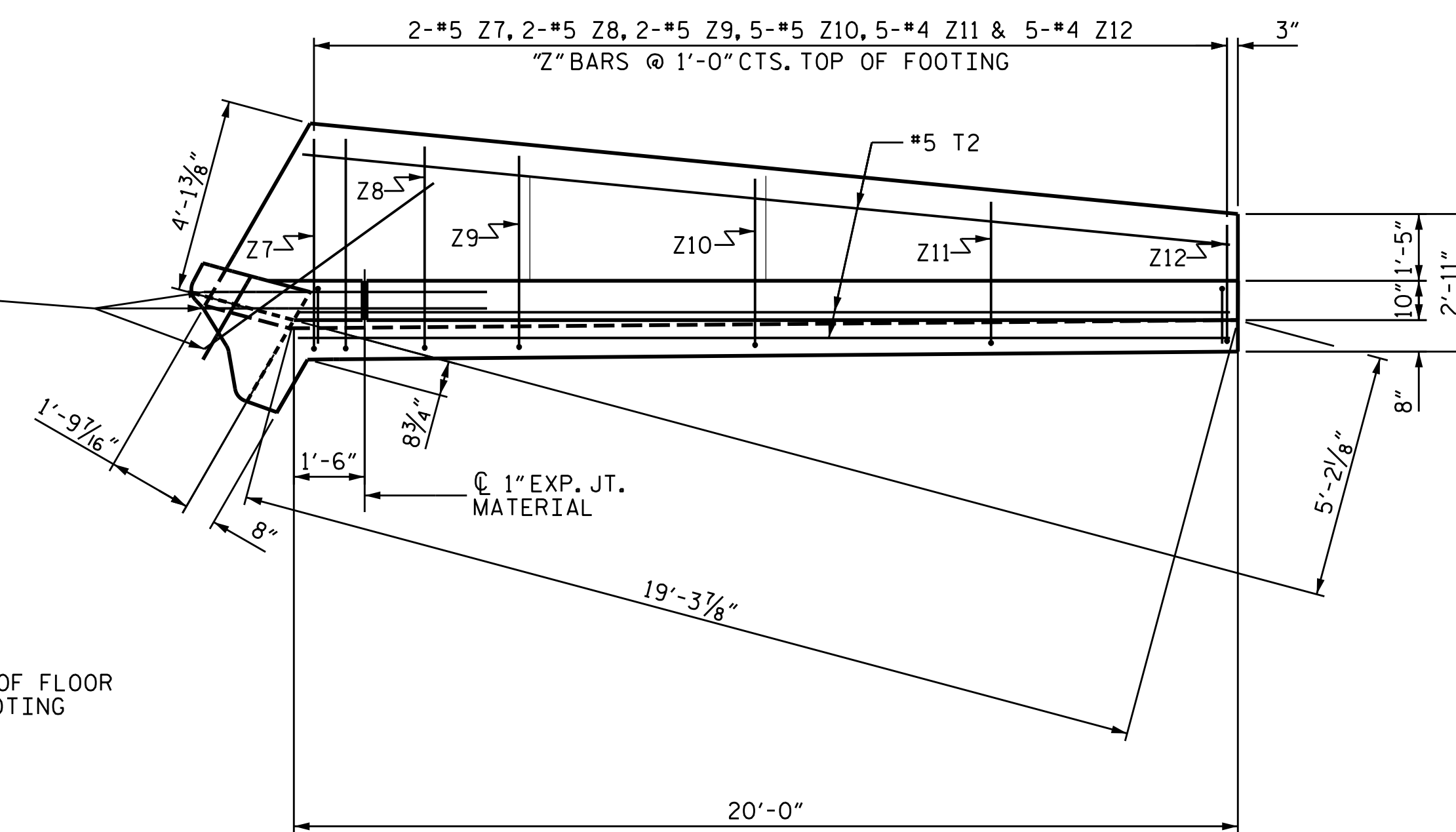
DRAWN BY : J.M. KEPICH DATE : 03/21
CHECKED BY : L.M. SAMPLES DATE : 05/21
DESIGN ENGINEER OF RECORD : J.M. KEPICH DATE : 04/22

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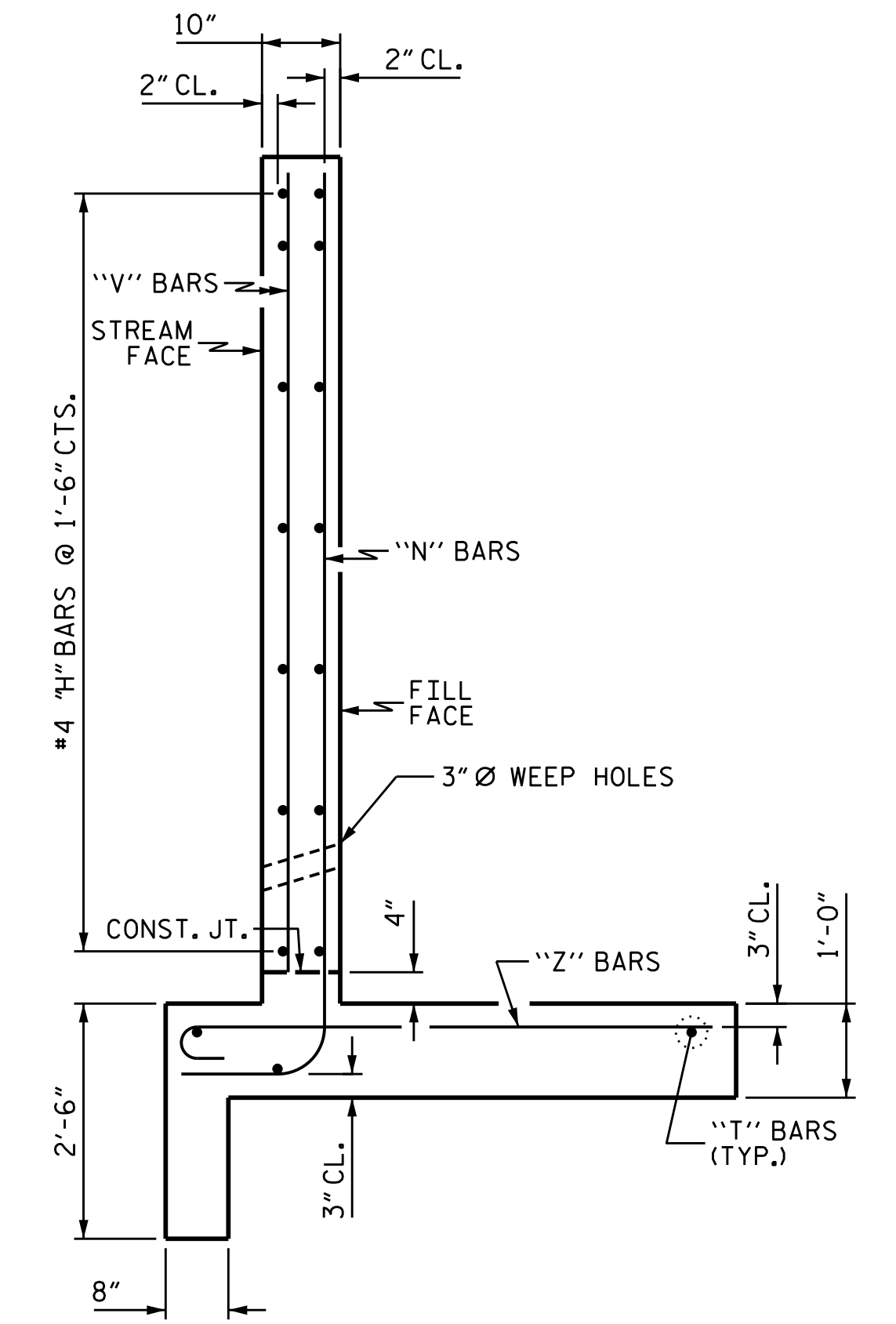
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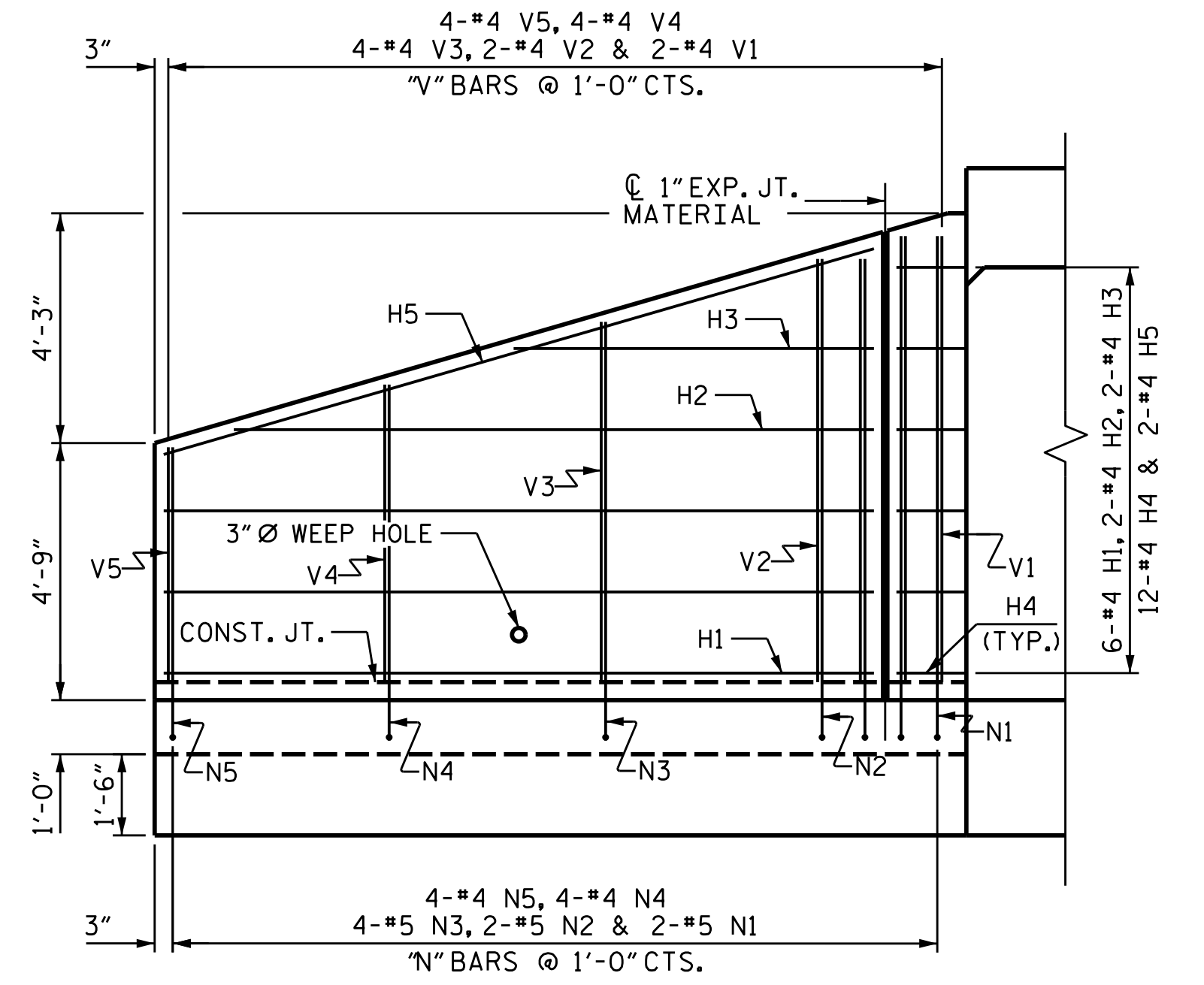
PLAN W2



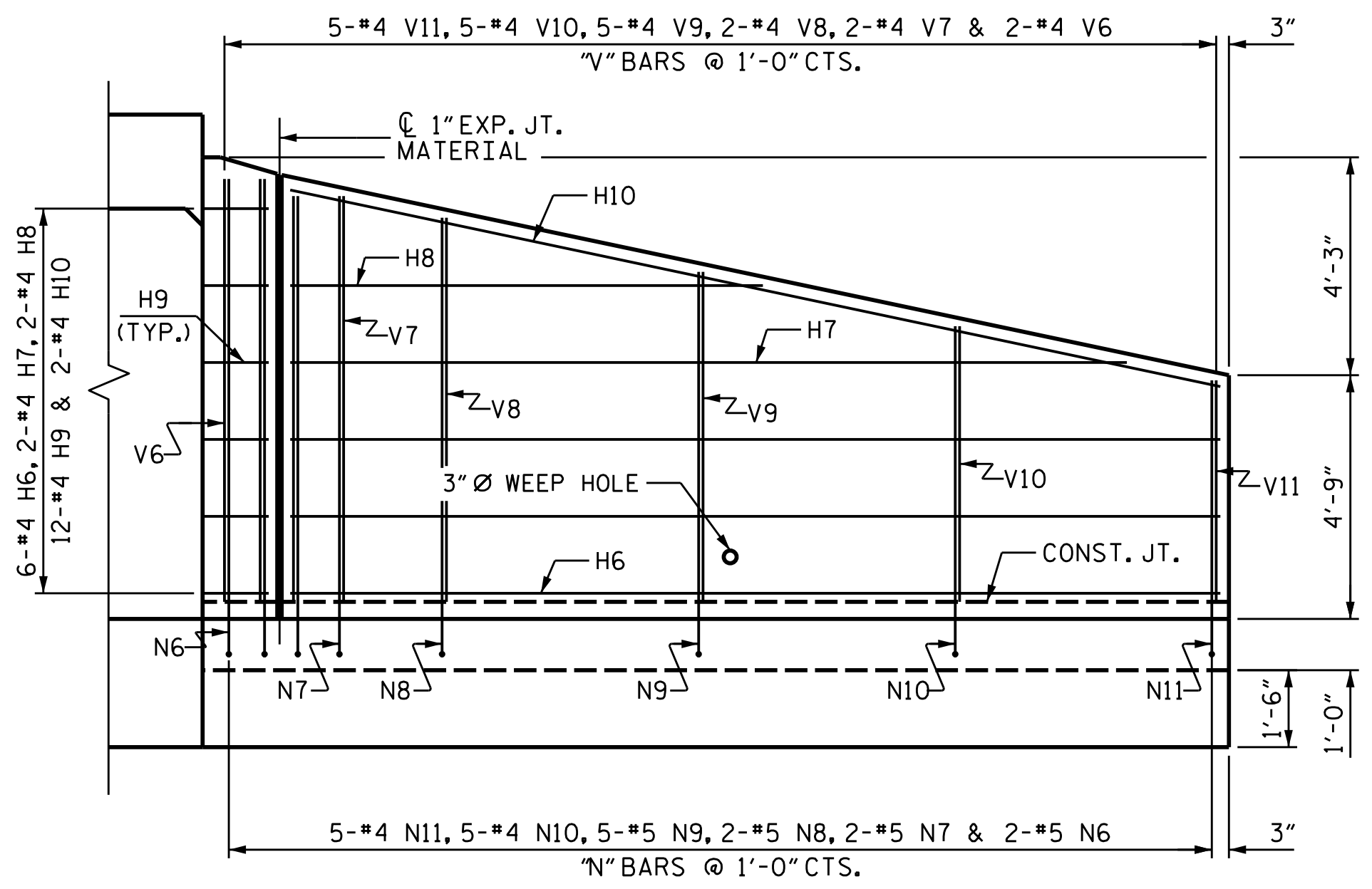
PLAN W1



TYPICAL WING SECTION



ELEVATION W2



ELEVATION W1

PROJECT NO. W-5714E

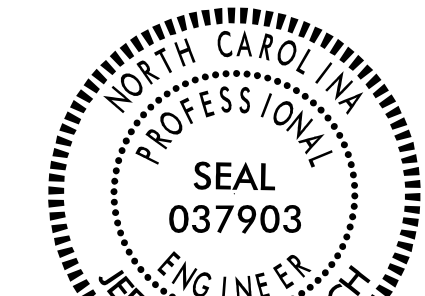
JACKSON COUNTY

STATION: 18+58.00 -L-

SHEET 7 of 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8'-0" X 8'-0" CONCRETE BOX CULVERT EXTENSION WING WALLS



DRAWN BY: J.M. KEPICH DATE: 03/21
CHECKED BY: L.M. SAMPLES DATE: 05/21
DESIGN ENGINEER OF RECORD: J.M. KEPICH DATE: 04/22

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4/21/2022
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REVISIONS				SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 09
2			4			

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*****DO NOT WRITE IN THESE SPACES*****
*****USER NAME*****

NOTES

THE CONTRACTOR SHALL REMOVE SURFACE CONCRETE TO VERIFY THAT SAWCUT DEPTH WILL NOT DAMAGE EXISTING REINFORCING STEEL.

THE CONTRACTOR SHALL SAW CUT TO A NOMINAL DEPTH OF 1/2" BUT REINFORCING STEEL SHALL NOT BE DAMAGED.

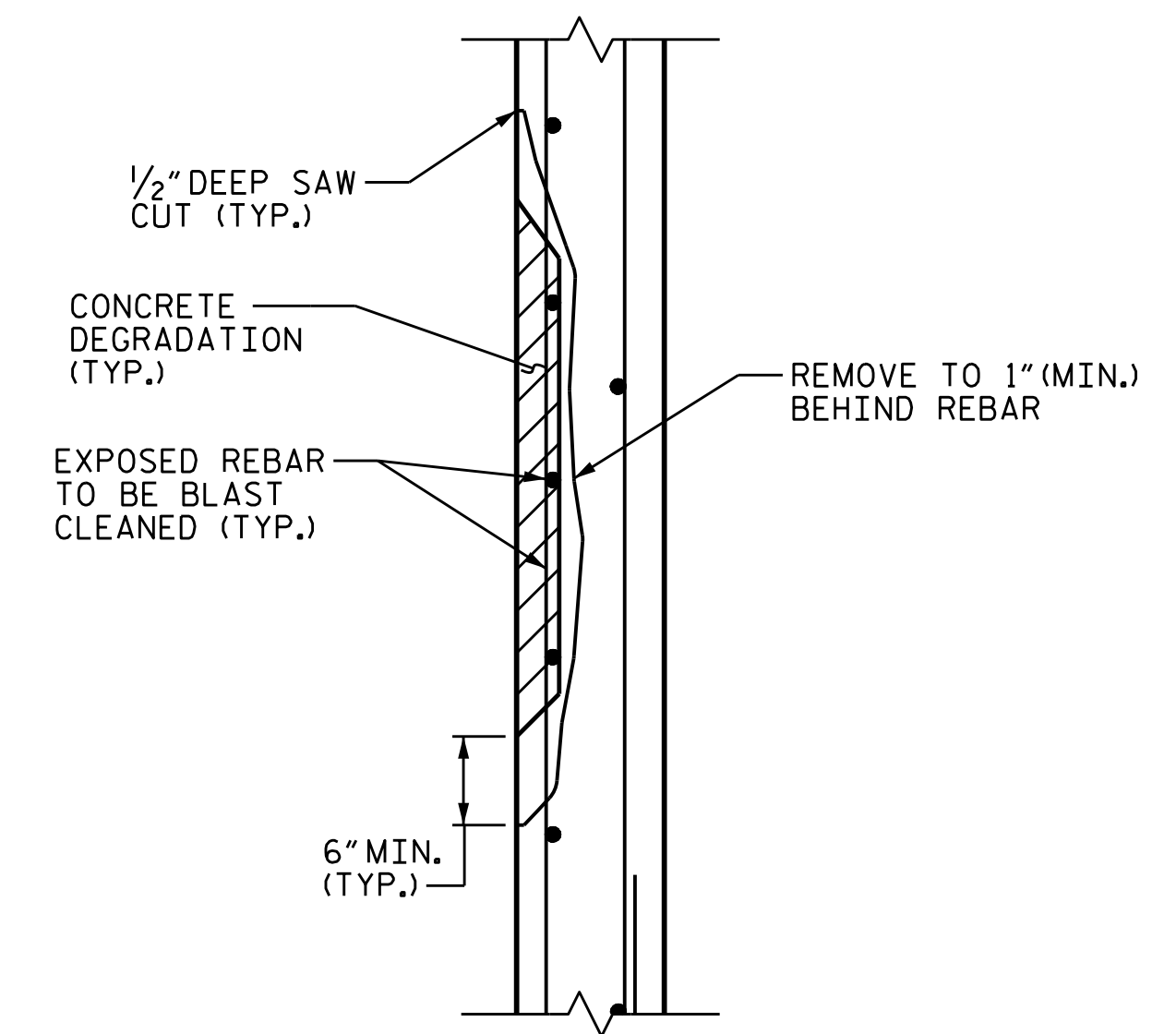
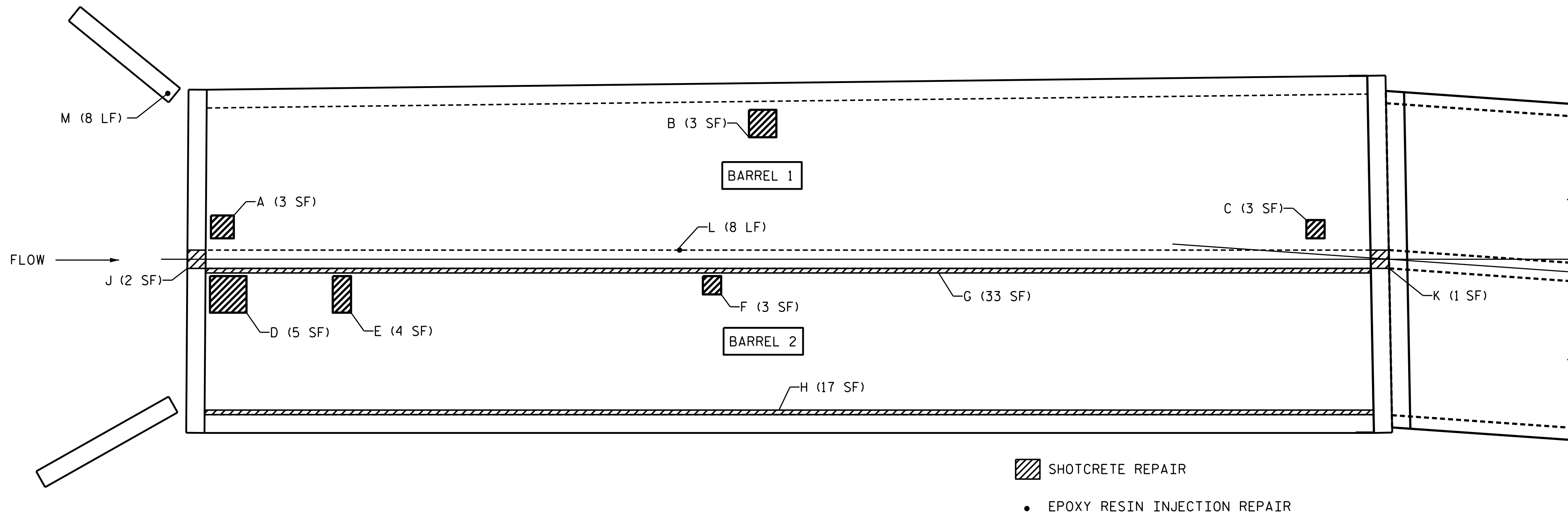
CONTRACTOR SHALL SAW CUT THE REPAIR AREAS SO THAT THE CORNERS ARE SQUARE AS INDICATED ON THE DETAILS.

CONCRETE REPAIRS MAY BE SUBSTITUTED IN LIEU OF SHOTCRETE REPAIRS WITH THE APPROVAL OF THE ENGINEER.

FOR SHOTCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR EPOXY RESIN INJECTION, SEE SPECIAL PROVISIONS.

PROVIDED LOCATIONS ARE ESTIMATED; EXISTING INLET HEADWALL CRUMBLING AND TO BE EVALUATED IN THE FIELD. FINAL LIST OF REPAIRS TO BE DETERMINED AS PER THE ENGINEER.



EXISTING CULVERT ESTIMATED REPAIRS

ESTIMATED CULVERT REPAIR QUANTITIES					
SHOTCRETE REPAIRS					
LABEL	BARREL	LOCATION	DISTANCE FROM INLET	EST. AREA (SF)	EST. VOLUME (CF)
A	1	TOP SLAB	0'-0"	3.00	1.50
B	1	TOP SLAB	31'-3"	3.00	1.50
C	1	TOP SLAB	61'-6"	3.00	1.50
D	2	TOP SLAB	0'-0"	4.00	2.00
E	2	TOP SLAB	8'-6"	4.00	2.00
F	2	TOP SLAB	28'-9"	3.00	1.50
G	2	BTM. INT. WALL	THROUGHOUT	33.00	2.74
H	2	BTM. EXT. WALL	THROUGHOUT	17.00	2.13
J	INLET	BTM. INT. WALL	N/A	2.00	1.17
K	OUTLET	BTM. INT. WALL	N/A	1.00	0.33
				TOTAL	17.00
EPOXY RESIN INJECTION REPAIRS					
LABEL	BARREL	LOCATION	DISTANCE FROM INLET	EST. LIN. FT.	
L	1	INT. WALL	26'-9"	8.00	
M	1	INLET WINGWALL JT.	N/A	8.00	
				TOTAL	16.00

TYPICAL SHOTCRETE REPAIR ON EXISTING SLAB OR WALLS

PROJECT NO. W-5714E
JACKSON COUNTY
 STATION: 18+58.00 -L-

SHEET 8 of 8

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

DOUBLE 8'-0" X 8'-0"
 CONCRETE BOX CULVERT
 EXISTING BARREL
 REPAIR DETAILS

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

SHEET NO. C-9
 TOTAL SHEETS 09



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DRAWN BY : J.M. KEPICH DATE : 03/21
 CHECKED BY : L.M. SAMPLES DATE : 05/21
 DESIGN ENGINEER OF RECORD : J.M. KEPICH DATE : 04/22

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 2018 "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 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 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 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 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø 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 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 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