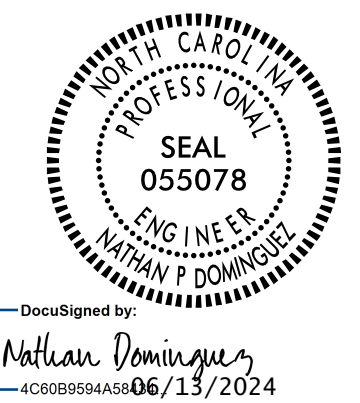


PLANS AND DETAILS FOR PROPOSED LIGHTING /ELECTRICAL CONSTRUCTION

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GENERAL NOTES

- CIRCUIT AND JUNCTION BOX LOCATIONS MAY BE FIELD ADJUSTED AS REQUIRED TO STAY WITHIN THE LIMITS OF CONSTRUCTION, WITHIN RIGHT-OF-WAY, OUT OF DITCH LINES, AWAY FROM FENCE POSTS, GUARDRAILS AND CABLE GUIDERAILS, AND TO CLEAR OBSTRUCTIONS. ADJUSTMENTS RESULTING IN AN OVERALL INCREASE OF 3% OR MORE TO ANY CIRCUIT LENGTH REQUIRES APPROVAL FROM THE ENGINEER.
- LOCATE ALL JUNCTION BOXES OUTSIDE CLEAR ZONE AND IN AN AREA UNLIKELY TO BE USED BY TRAFFIC.
- ALL IN GROUND JUNCTION BOXES DEPTHS SHALL BE 18" UNLESS OTHERWISE NOTED. SEE DETAIL SHEETS FOR FORMED OPENING DEPTHS.
- CONTRACTOR SHALL RECORD THE GPS COORDINATES OF EACH JUNCTION BOX WITHIN 3' ACCURACY, IN THE JUNCTION BOX SUMMARY, TABLE "C". PROVIDE A COPY OF THE JUNCTION BOX SUMMARY WITH THESE COORDINATES TO THE LIGHTING ENGINEER DURING PROJECT INSPECTION. COORDINATES ARE NOT REQUIRED FOR FORMED OPENINGS.
- JUNCTION BOXES SHOWN NEAR LIGHT STANDARDS (LSJB & HMJB) ARE SHOWN FOR CLARITY. THESE JUNCTION BOXES ARE TO BE USED AS A TEE POINT FOR CIRCUITRY TO THE STANDARD, AND SHALL BE INSTALLED FOR BEST ALIGNMENT OF CIRCUITRY WHILE MAINTAINING THE OFFSETS SHOWN IN TABLE "C". SEE STANDARD DRAWINGS 1401.01 AND 1406.01 FOR INSTALLATION DETAILS.
- INSTALL ALL BORE PITS OUTSIDE THE CLEAR ZONE, AS DEFINED BY THE 2011 AASHTO ROADSIDE DESIGN GUIDE OR AS DIRECTED BY THE ENGINEER.
- INSTALL RIGID GALVANIZED CONDUIT (RGC) ABOVE GROUND, AND POLYVINYL CHLORIDE (PVC) SCHEDULE 40 CONDUIT UNDERGROUND, EXCEPT AS MODIFIED ON THESE PLANSHEETS OR IN APPLICABLE SECTIONS OF THE ROADWAY STANDARD DRAWINGS FOR THIS PROJECT.
- POLE NUMBERING CONVENTION: CONTROL SYSTEM-POLE #-CKT # (A-3-2).
- SERVICE POLE SHALL NOT BE INSTALLED PRIOR TO COORDINATION WITH THE LOCAL UTILITY. PROVIDE PROOF OF COORDINATION AND PROOF OF NEED TO THE ENGINEER AFTER CONSULTING WITH THE LOCAL UTILITY. THE SERVICE POLE MAY BE DELETED FROM THE CONTRACT IF NOT REQUIRED. REFER TO ARTICLE 1407-3 OF THE 2024 NCDOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES.
- WHERE A CURRENT TRANSFORMER (CT) CABINET IS REQUIRED, THE CT CABINET AND ASSOCIATED HARDWARE ARE INCIDENTAL TO THE PAY ITEM FOR THE LIGHTING CONTROL PANEL.
- WHEN FIELD ADJUSTMENT TO CONTROL PANEL LOCATION IS REQUIRED, THE CONTRACTOR SHALL LOCATE THE PROPOSED CONTROL SYSTEM IN AN AREA ACCESSIBLE FOR MAINTENANCE VEHICLES AND OUTSIDE OF CLEAR ZONE AS DEFINED BY THE 2011 AASHTO ROADSIDE DESIGN GUIDE.

NOTES

- 1** AT THESE LOCATIONS, PROVIDE A COMMON GROUND PER NEC REQUIREMENTS FOR ALL ELECTRICAL CIRCUITS WITHIN THE RACEWAY. RACEWAY SHALL BE INSTALLED WITHIN A PROTECTIVE SLEEVE UNDER THE ROADWAY. SEE TABLE "B" FOR ESTIMATED LENGTHS.
- 2** UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXISTING LIGHT STANDARDS, LUMINAIRES, CONDUCTORS, JUNCTION BOXES AND SERVICE LOCATIONS WILL BE REMOVED AS PART OF THIS PROJECT.

SCOPE OF WORK

REMOVE AND DISPOSE OFF EXISTING LIGHTING EQUIPMENT.

PLACE NEW ROADWAY LIGHTING SYSTEM INTO SERVICE BY PROVIDING AND INSTALLING LIGHT STANDARDS WITH LIGHT EMITTING DIODE LUMINAIRES, UNDERGROUND CIRCUITRY, CONTROL SYSTEM AND JUNCTION BOXES.

DESIGN CRITERIA

0.8 AVERAGE FOOTCANDLE ON TRAVEL LANES

4:1 AVERAGE TO MINIMUM UNIFORMITY RATIO ON TRAVEL LANES

2018 AASHTO ROADWAY LIGHTING DESIGN GUIDE

2013 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, 6TH EDITION AND LATEST INTERIM SPECIFICATIONS VALID AT THE TIME OF LETTING (HANDHOLE SHAFT DIAMETER REQUIREMENT AND HANDHOLE PLACEMENT REQUIREMENT WAIVED)

FATIGUE CATEGORY II SHALL BE USED IN DESIGN

DESIGN LIGHT STANDARD SUPPORT FOR BASIC WIND SPEED OF 70 MPH

DESIGN HIGH MOUNT SUPPORT FOR BASIC WIND SPEED OF 90 MPH

DESIGN HIGH MOUNT STANDARD FOUNDATION FOR BASIC WIND SPEED OF 90 MPH. ANY CONTRACTOR-DESIGNED SITE SPECIFIC FOUNDATION DESIGN SHALL BE DESIGNED FOR THE SAME WIND SPEED

2020 NATIONAL ELECTRICAL CODE

2011 AASHTO ROADSIDE DESIGN GUIDE

ROADWAY STANDARDS

THE FOLLOWING ROADWAY ENGLISH STANDARDS AS APPEAR IN "NCDOT ROADWAY STANDARD DRAWINGS", ROADWAY DESIGN UNIT-N.C. DEPARTMENT OF TRANSPORTATION RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD NO.	TITLE
1401.01	HIGH MOUNT STANDARD
1402.01	HIGH MOUNT FOUNDATION
1403.01	HIGH MOUNT LED LUMINAIRES
1404.01	LIGHT STANDARDS
1405.01	STANDARD FOUNDATION
1406.01	LIGHT STANDARD LUMINAIRES
1407.01	ELECTRIC SERVICE POLE AND LATERAL
1408.01	LIGHT CONTROL SYSTEM
1409.01	ELECTRICAL DUCT
1410.01	FEEDER CIRCUITS
1411.01	ELECTRICAL JUNCTION BOXES

ALL WORK SHALL BE IN CONFORMANCE WITH DIVISION 14 OF THE STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES, DATED JANUARY 2024.

LEGEND

- PROPOSED 100' HIGH MAST STANDARD W/ HM FOUNDATION, JUNCTION BOX & 6 HM LED LUMINAIRES. 560W MAX, 54,000 MIN. MAINTAINED DELIVERED LUMENS, TYPE V. MAXIMUM BUG RATING 5-0-5.
- EXISTING 100' HIGH MAST STANDARD TO BE REMOVED. REMOVE OR ABANDON FOUNDATION. SEE SHEET E-3 FOR EXISTING LIGHTING.
- PROPOSED LIGHT STANDARD TYPE MTLT 45' WITH 15' SINGLE ARM. INCLUDES STANDARD FOUNDATION TYPE R1 OR R2, JUNCTION BOX & 285W MAX LED ROADWAY LUMINAIRE. IES DISTRIBUTION: TYPE II OR III AS REQUIRED. MAXIMUM BUG RATING 3-0-3.
- EXISTING SINGLE ARM LIGHT STANDARD TO BE REMOVED. ABANDON OR REMOVE FOUNDATION. SEE SHEET E-3.
- EXISTING CONTROL PANEL TO BE REMOVED. SEE SHEET E-3.
- PROPOSED CONTROL SYSTEM WITH JUNCTION BOX. SEE PLANS FOR BREAKER SIZES.
- PROPOSED ELECTRICAL JUNCTION BOX. SEE TABLE C FOR DETAILS AND TYPE.
- EXISTING ELECTRICAL JUNCTION BOX. REMOVE UNLESS OTHERWISE NOTED ON THE PLANS. SEE SHEET E-3.
- REFERENCE TO CORRESPONDING DELTA NOTE AS NUMBERED.
- PROPOSED FEEDER CIRCUIT. CONTROL SYSTEM (A), CIRCUIT NUMBER (1) PLAN SYMBOL (6). SEE TABLE A, THIS SHEET.
- PROPOSED 30' CLASS 4 SERVICE POLE AND LATERAL 3 #1/0 USE CONDUCTORS 2" CONDUIT
- PROPOSED ELECTRICAL DUCT SIZE 2", 3" OR 4" TYPE (TL) OR (BD) LOCATION: SEE TABLE B, SHEET E1-A.
- EXISTING FEEDER CIRCUIT IN CONDUIT TO BE REMOVED. REMOVE FEEDER CIRCUIT CONDUCTOR AND ABANDON CONDUIT.

PLAN SYMBOL	DESCRIPTION	CONTRACT ITEM	
8	2 #8 Ø 1 #10G 1.5" P	2 AWG SIZE 8 CONDUCTOR (BK & RD) 1 AWG SIZE 10 GROUNDING CONDUCTOR 1.5" PVC CONDUIT	2 - 8 W/G FEEDER CIRCUIT IN 1.5" CONDUIT
*8	2 #8 Ø 1 #10G	2 AWG SIZE 8 CONDUCTOR (BK & RD) 1 AWG SIZE 10 GROUNDING CONDUCTOR	2 - 8 W/G FEEDER CIRCUIT
4	2 #4 Ø 1 #6G 1.5" P	2 AWG SIZE 4 CONDUCTOR (BK & RD) 1 AWG SIZE 6 GROUNDING CONDUCTOR 1.5" PVC CONDUIT	2 - 4 W/G FEEDER CIRCUIT IN 1.5" CONDUIT
*4	2 #4 Ø 1 #6G	2 AWG SIZE 4 CONDUCTOR (BK & RD) 1 AWG SIZE 6 GROUNDING CONDUCTOR	2 - 4 W/G FEEDER CIRCUIT

ABBREVIATIONS

BD	BURIED	PVC	PVC SCHEDULE 40 CONDUIT
LT	LIGHT	RGC	RIGID GALVANIZED STEEL CONDUIT
TL	TRENCHLESS	C	CONDUIT
MH	MOUNTING HEIGHT	CKT	CIRCUIT
Ø	PHASE	N	NEUTRAL
SER LAT	SERVICE LATERAL	G	GROUND
IGJB	IN GROUND JUNCTION BOX	HM	HIGH MAST
LED	LIGHT EMITTING DIODE	LSJB	LIGHT STANDARD JUNCTION BOX
HMJB	HIGH MAST JUNCTION BOX	CSJB	CONTROL SYSTEM JUNCTION BOX

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TABLE "C"
JUNCTION BOX AND FORMED OPENING SUMMARY (SEE GENERAL NOTE-5 ON SHEET E-1)
CONTROL SYSTEM "A"

SHEET	LABEL	LOCATION AND OFFSET	TYPE, PAY ITEM & SIZE									GPS LOCATION (SEE GENERAL NOTE-6 ON SHEET E-1)
			JUNCTION BOXES						FORMED OPENINGS			
			IN GROUND		LIGHT STANDARD		HIGH MAST		CONTROL SYSTEM	BRIDGE RAIL	MEDIAN BARRIER	
			IG18 18"x12"	IG36 36"x24"	LS18 18"x12"	LS36 36"x24"	HM18 18"x12"	HM36 36"x24"	CS36 36"x24"	F010 10"x12"	F018 18"x12"	
E-2	JBA1	-Y31- STA. 30+43, 81' LT		X								
E-2	JBA2	-Y31- STA. 28+39 72' LT	X									
E-2	JBA3	-Y31RPB- STA. 15+01, 15' RT	X									
E-2	JBA4	-Y31RPB- STA. 15+01, 48' LT	X									
E-2	JBA5	-L- STA. 731+53, 100' LT	X									
E-2	JBA6	-Y31RPA- STA. 15+23, 26' LT	X									
E-2	JBA7	-Y31RPA- STA. 15+23, 48' RT	X									
E-2	JBA8	-Y31- STA. 30+43, 98' RT		X								
E-2	JBA9	-L- STA. 735+64, 103' RT	X									
E-2	JBA10	-Y31RPC- STA. 16+77, 64' RT	X									
E-2	JBA11	-Y31RPD- STA. 18+24, 28' LT	X									
E-2	SA A-1JB	5' FROM SA LIGHT STANDARD A-1			X							
	SA A-2JB	5' FROM SA LIGHT STANDARD A-2			X							
	SA A-3JB	5' FROM SA LIGHT STANDARD A-3			X							
	SA A-4JB	5' FROM SA LIGHT STANDARD A-4			X							
	SA A-5JB	5' FROM SA LIGHT STANDARD A-5			X							
	SA A-6JB	5' FROM SA LIGHT STANDARD A-6			X							
	HM A-7JB	10' FROM HIGH MAST HMA-8					X					
	HM A-8JB	10' FROM HIGH MAST HMA-8					X					
	HM A-9JB	10' FROM HIGH MAST HMA-9					X					
	SA A-10JB	5' FROM SA LIGHT STANDARD A-10			X							
	SA A-11JB	5' FROM SA LIGHT STANDARD A-11			X							
	SA A-12JB	5' FROM SA LIGHT STANDARD A-12			X							
	SA A-13JB	5' FROM SA LIGHT STANDARD A-13			X							
	SA A-14JB	5' FROM SA LIGHT STANDARD A-14			X							
	SA A-15JB	5' FROM SA LIGHT STANDARD A-14			X							
	HM A-16JB	10' FROM HIGH MAST HMA-16					X					
	CSAJB	2' FROM CONTROL SYSTEM 'A'						X				
CSA TOTALS			9	2	12		4		1			

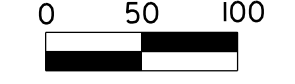
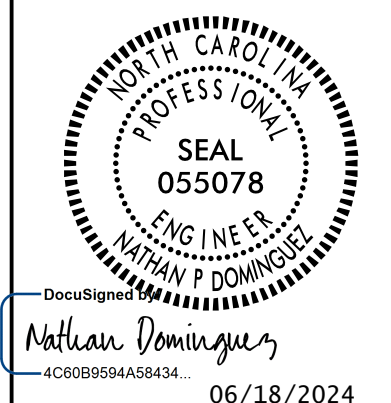
TABLE "B"
ELECTRICAL DUCT SUMMARY
(ESTIMATED LENGTH IN FEET)

LOCATION	RACEWAY Δ	SHEET	TYPE						
			TRENCHLESS (TL) FEET			BURIED (BD) FEET			
			SIZE 2"	SIZE 3"	SIZE 4"	SIZE 2"	SIZE 3"	SIZE 4"	
-Y31RPB- STA. 15+01	--			50					
-Y31RPC- STA. 16+77	--			80					
-L- STA. 731+53	--			175					
-Y31RPA- STA. 15+23	--			60					
-L- STA. 735+64	--			175					
-Y31RPD- STA. 18+24	--			55					
-Y31- STA. 30+43	JBA1-JBA8			160	190				
--	--								
--	--								
--	--								
--	--								
--	--								
CSA TOTALS				595	160	190			

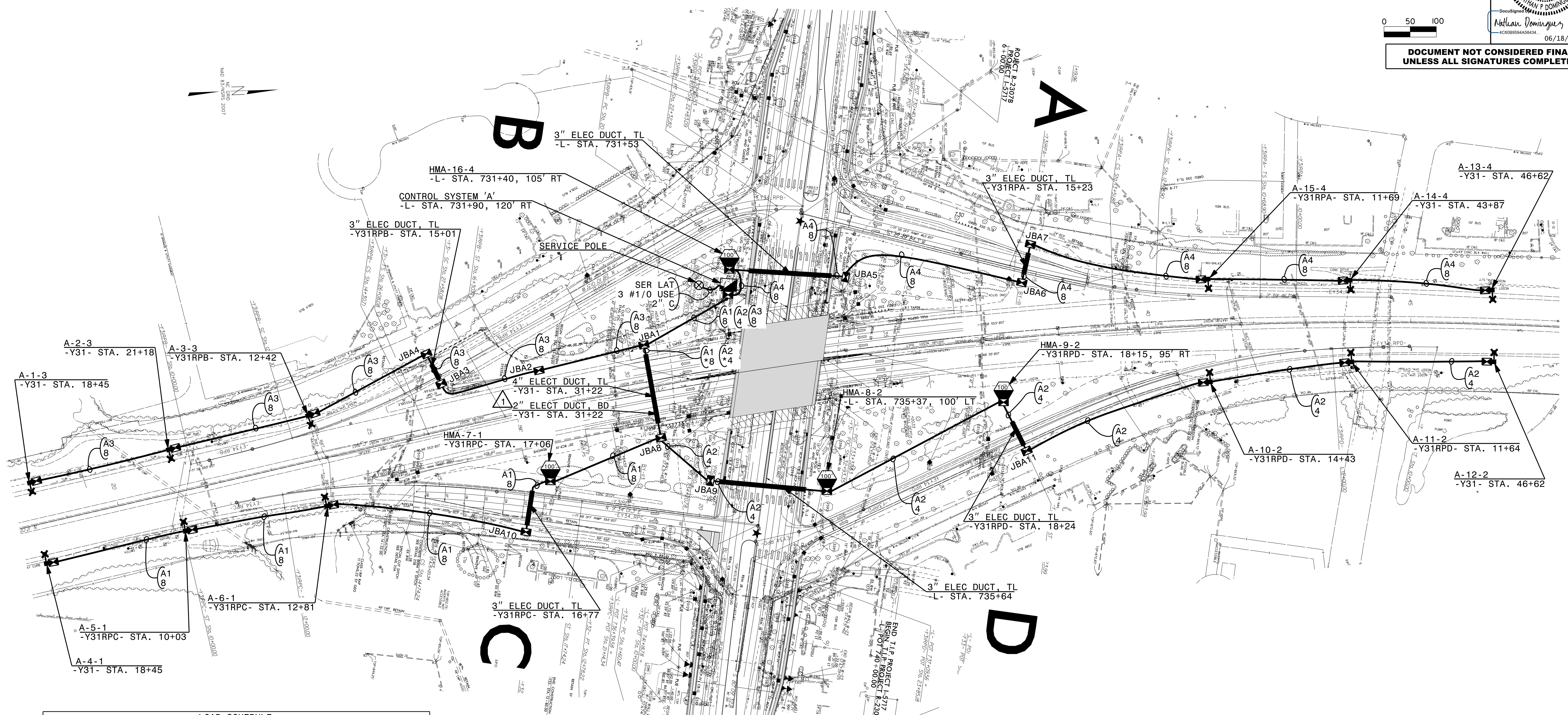
SEE SHEET 'E-1' FOR
LEGEND & Δ NOTES

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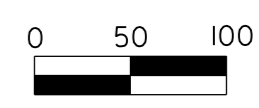
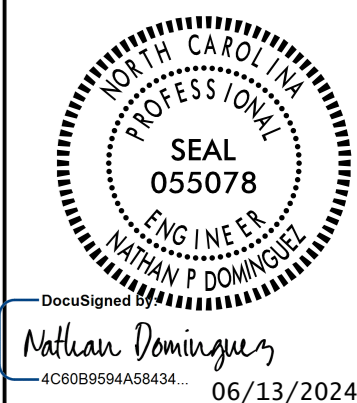
LOAD SCHEDULE
CORNER OF SB EXIT TO I-77 & NC-150
CONTROL SYSTEM "A"

CIRCUIT ID	SINGLE ARM @ 285W MAX. LED	100' HIGH MAST W/ 6 560W MAX. LED LUMINAIRES	AMPS @ 480V	KW LOAD	BREAKER SIZE (AMPS)
A1	A-4, A-5, A-6	HMA-7	8.8	4.2	50
A2	A-10, A-11, A-12	HMA-8, HMA-9	15.8	7.6	50
A3	A-1, A-2, A-3	--	1.8	0.9	50
A4	A-13, A-14, A-15	HMA-16	8.8	4.2	50
SPARE	--	--	--	--	50
--	--	--	--	--	--
TOTAL	12 ON 12 45' SA	24 ON 4 100' HM	35.2	16.9	

SEE SHEET "E-1" FOR LEGEND & △ NOTES

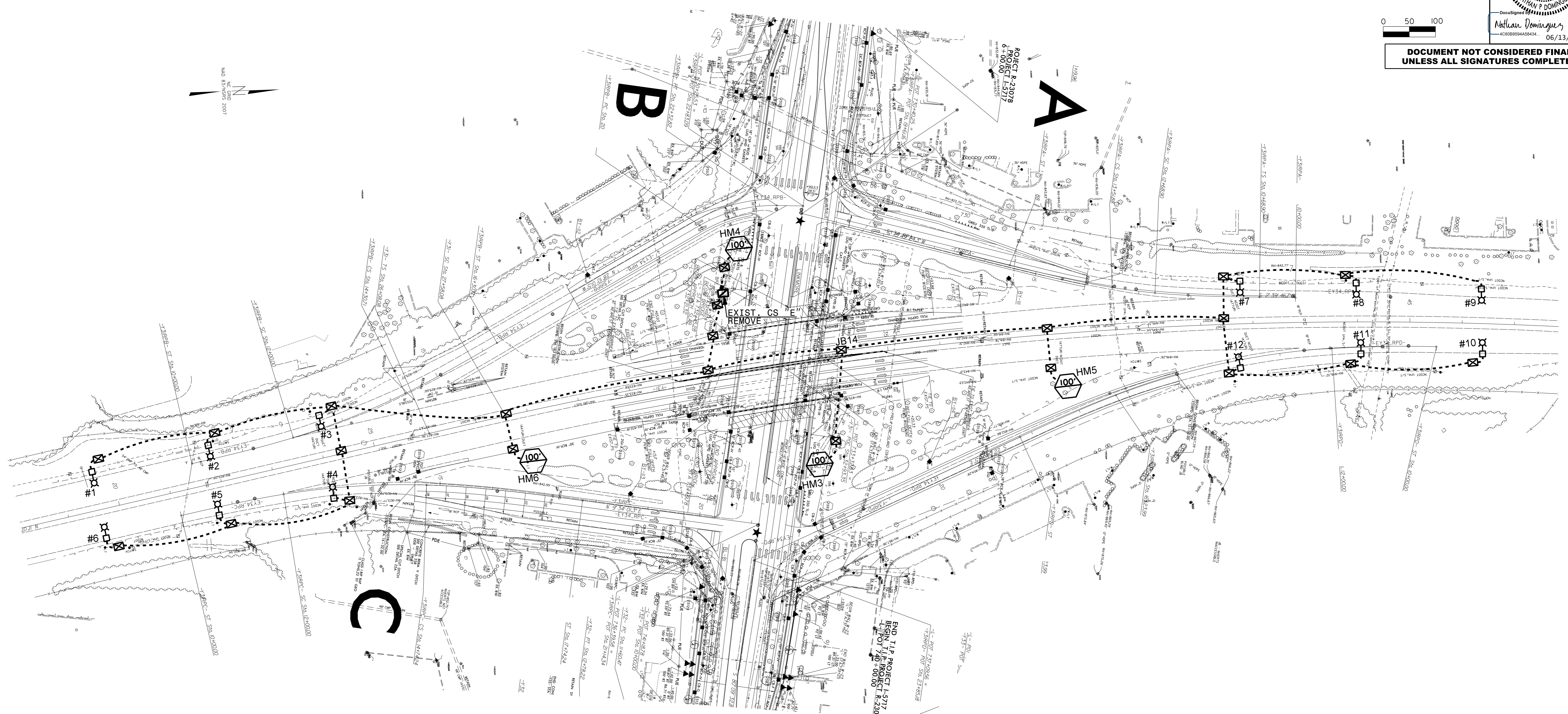
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Rev.	Date	Description	Approved
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN LIGHTING/ELECTRICAL SECTION LIGHTING LAYOUT NC 150/I-77 INTERCHANGE IREDELL COUNTY			
Drawn By	SAM	Approved By	RGH
Dwg No.:			

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LOAD SCHEDULE-FOR EXISTING LIGHTING EQUIPMENT TO BE REMOVED
CS LOCATION: INSIDE THE LOOP, SOUTH BOUND RAMP TO I-77
SERVICE: 120/240V AC 3-WIRE CONTROL SYSTEM "E"

CIRCUIT ID	HIGH MOUNT 1KW HPS	LIGHT STANDARD 250W HPS	AMPS @ 480V	KW LOAD	BREAKER SIZE (AMPS)
E1	4 @ HM3		18.3	4.4	
E2	4 @ HM4		18.3	4.4	
E3		1, 2, 3, 4, 5, 6	8.1	1.9	
E4	4 @ HM6		18.3	4.4	
E5		7, 8, 9, 10, 11, 12	8.1	1.9	
E6	4 @ HM5		18.3	4.4	
TOTAL	16 @ 4 HM	12	89.4	21.4	

SEE SHEET "E-1" FOR LEGEND & △ NOTES

2			
1			
Rev.	Date	Description	Approved
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN LIGHTING/ELECTRICAL SECTION LIGHTING LAYOUT NC 150/I-77 INTERCHANGE EXISTING LIGHTING TO BE REMOVED IREDELL COUNTY			
Drawn By:	Approved By:	Dwg No.:	
SAM	RGH		

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