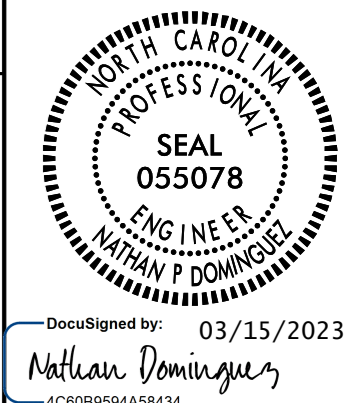


PLANS AND DETAILS FOR PROPOSED LIGHTING /ELECTRICAL CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



03/15/2023
Nathan Dominguez
EC000999468434

NOTES

- 1 AT THESE LOCATIONS, PROVIDE ELECTRICAL DUCT IN ACCORDANCE WITH NEC REQUIREMENTS FOR AN APPROVED RACEWAY FOR ELECTRICAL CIRCUITS. SEE TABLE "C"
- 2 INSTALL ALL BORE PITS OUTSIDE THE CLEAR ZONE, AS DEFINED BY THE 2011 AASHTO ROADSIDE DESIGN GUIDE OR AS DIRECTED BY THE ENGINEER.
- 3 LOCATE ALL JUNCTION BOXES OUTSIDE CLEAR ZONE AND IN AN AREA UNLIKELY TO BE USED BY TRAFFIC.
- 4 LOCATE PROPOSED CONTROL SYSTEM IN AN AREA ACCESSIBLE FOR MAINTENANCE VEHICLES AND OUTSIDE OF CLEAR ZONE AS DEFINED BY THE 2011 AASHTO ROADSIDE DESIGN GUIDE.
- 5 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.
- 6 ALL IN GROUND JUNCTION BOXES SHALL BE 18" HIGH AND ALL BARRIER RAIL AND SIDEWALK JUNCTION BOXES SHALL BE 6" HIGH, UNLESS OTHERWISE NOTED.
- 7 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.
- 8 62 STEP LIGHT LUMINAIRES ARE TO BE ARE POWERED BY TWO CIRCUITS. CIRCUIT A1 WILL POWER THE ODD NUMBERED STEP LIGHT LUMINAIRES (31 TOTAL) (BK,WH). CIRCUIT A2 WILL POWER THE EVEN NUMBERED STEP LIGHT LUMINAIRES (31 TOTAL) (RD, WH).
- 9 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 2018 NCDOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES.
- 10 WHERE A CURRENT TRANSFORMER (CT) CABINET IS REQUIRED, THE CT CABINET AND ASSOCIATED HARDWARE IS INCIDENTAL TO THE PAY ITEM FOR THE LIGHTING CONTROL PANEL.
- 11 RUN 1 1/2" CONDUIT FROM CSA TO JB2 AND 3/4" CONDUIT FROM JB2 TO STEP LIGHT LUMINAIRE IN CONCRETE BARRIER.

SCOPE OF WORK

PLACE PATH LIGHTING SYSTEM INTO SERVICE BY PROVIDING AND INSTALLING STEP LIGHT LIGHT EMITTING DIODE LUMINAIRES INTO CONCRETE BARRIER, UNDERGROUND CIRCUITRY, CONTROL SYSTEM AND JUNCTION BOXES.

DESIGN CRITERIA

- 0.8 AVERAGE FOOTCANDLE ON PEDESTRIAN AND BICYCLE WAYS
- 4:1 AVERAGE TO MINIMUM UNIFORMITY RATIO ON TRAVEL LANES
- 2018 AASHTO ROADSIDE DESIGN GUIDE
- 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 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD NO.	TITLE
1407.01	ELECTRIC SERVICE POLE AND LATERAL
1408.01	LIGHT CONTROL SYSTEM (SHEET 3 ONLY)
1409.01	ELECTRICAL DUCT
1410.01	FEEDER CIRCUITS
1411.01	ELECTRICAL JUNCTION BOXES

UNLESS MODIFIED BY THESE PLANS OR THE PROJECT SPECIAL PROVISIONS, ALL WORK SHALL BE IN CONFORMANCE WITH DIVISION 14 OF THE STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES, DATED JANUARY 2018.

LEGEND

- PROPOSED STEP LIGHT W/JUNCTION BOX & 120V LED LUMINAIRE. 8W MAX, 400 MIN. INITIAL DELIVERED LUMENS, TYPE III. TYPICAL DIMENSIONS: 13"W X 4.5"H X 4"D SEE NOTE 8.
- PROPOSED CONTROL SYSTEM WITH JUNCTION BOX. SEE PLANS FOR BREAKER SIZES.
- PROPOSED ELECTRICAL JUNCTION BOX. SEE TABLE C, THIS SHEET.
- REFERENCE TO CORRESPONDING 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 (JA) OR (BD) LOCATION: SEE TABLE B, SHEET E1A.
2", 3" OR 4" ELEC. DUCT JA & BD

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

CONTROL SYSTEM "A"		TYPE							
		JACKED (JA) FEET				BURIED (BD) FEET			
LOCATION	RACEWAY SHEET	SIZE 2"	SIZE 3"	SIZE 4"	SIZE 6"	SIZE 2"	SIZE 3"	SIZE 4"	SIZE 6"
-L- STA. 25+78	E-2		48						
CSA TOTALS			48						

TABLE "A"
CIRCUITRY CONDUCTOR CONDUIT TYPE & SIZE

PLAN SYMBOL	DESCRIPTION		CONTRACT ITEM
8A	1 #8Ø	1 AWG SIZE 8 PHASE CONDUCTOR (BK)	PATH LIGHTING SYSTEM (LS)
	1 #8N	1 AWG SIZE 8 NEUTRAL CONDUCTOR (WH)	
	1 #8G	1 AWG SIZE 8 GROUNDING CONDUCTOR	
8B	1 #8Ø	1 AWG SIZE 8 PHASE CONDUCTOR (RD)	PATH LIGHTING SYSTEM (LS)
	1 #8N	1 AWG SIZE 8 NEUTRAL CONDUCTOR (WH)	
	1 #8G	1 AWG SIZE 8 GROUNDING CONDUCTOR	

TABLE "C"
JUNCTION BOX SUMMARY

		CONTROL SYSTEM "A"							GPS LOCATION
SHEET	LABEL	LOCATION AND OFFSET	TYPE & SIZE					LAT/LONG	
			IN GROUND			CONTROL SYSTEM	BARRIER RAIL		SIDE WALK
			IG18 18"X12"	IG30 30"X17"	IG36 36"X24"	CS36 36"X24"	BR18 18"X12"	SW18 18"X12"	
E-2	JB1	-L- STA. 25+78 27' RT	X						
E-2	JB2	-L- STA. 25+78 15' LT	X						
CSA TOTALS			2						

ABBREVIATIONS

BD	BURIED	PVC	PVC SCHEDULE 40 CONDUIT
LT	LIGHT	RGC	RIGID GALVANIZED STEEL CONDUIT
JA	JACKED	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

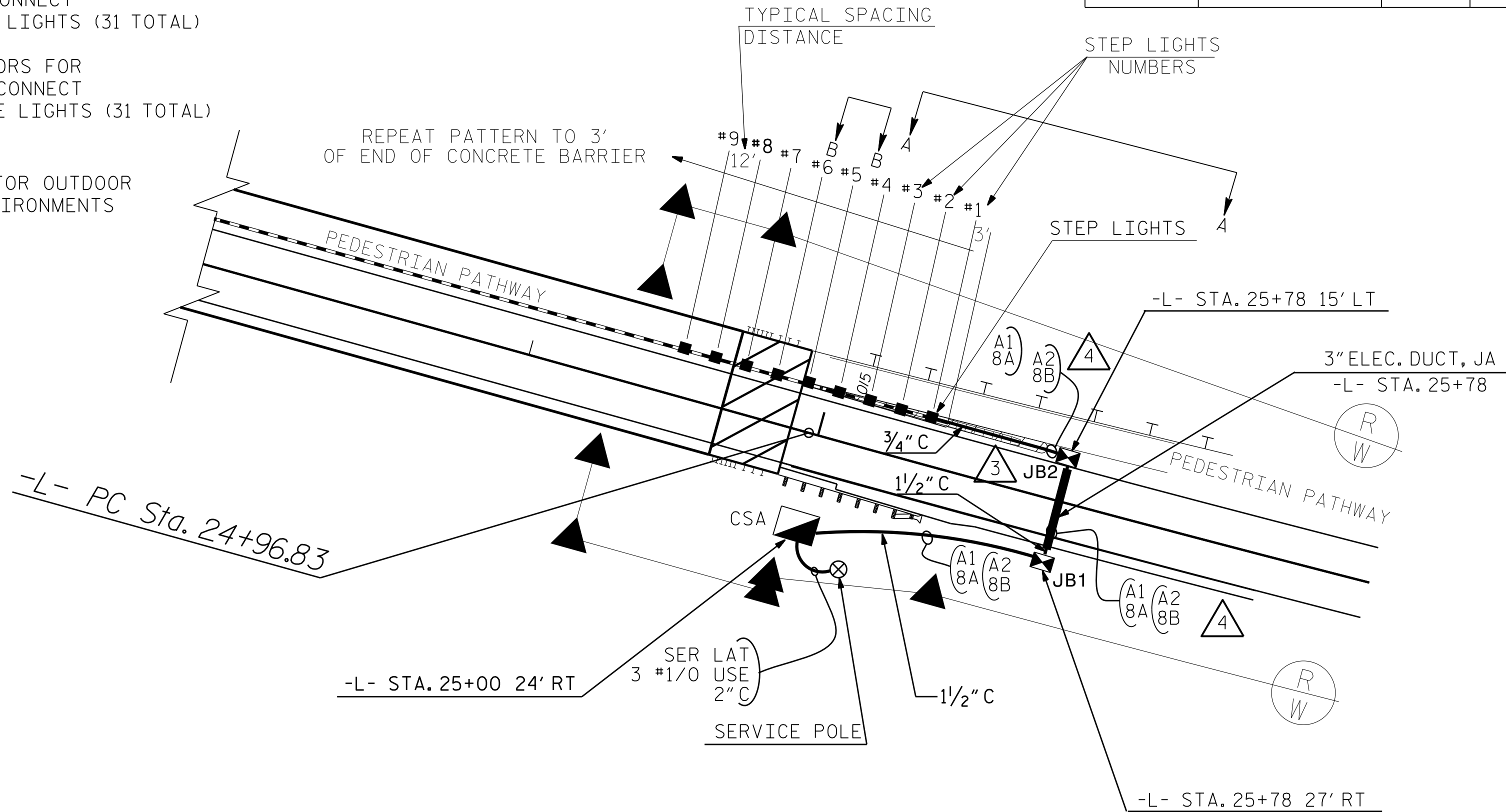
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USE FOR LIGHTING CONSTRUCTION ONLY

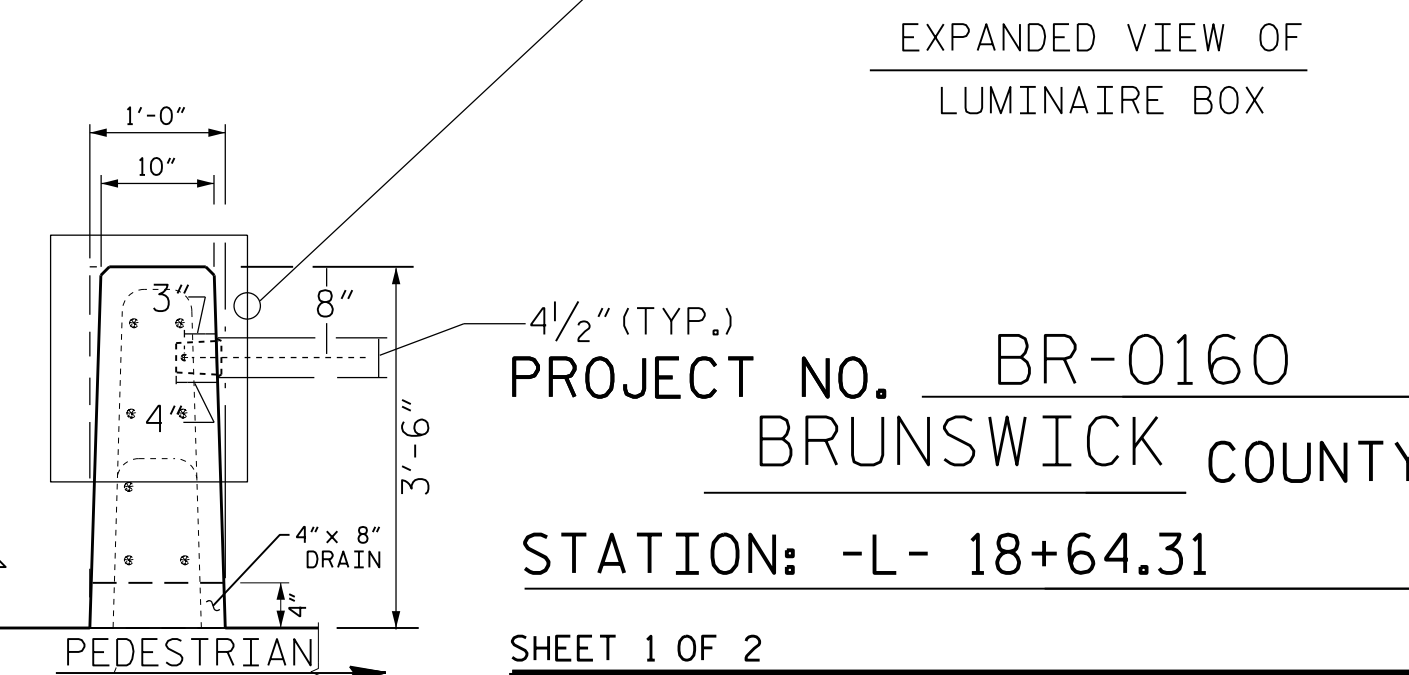
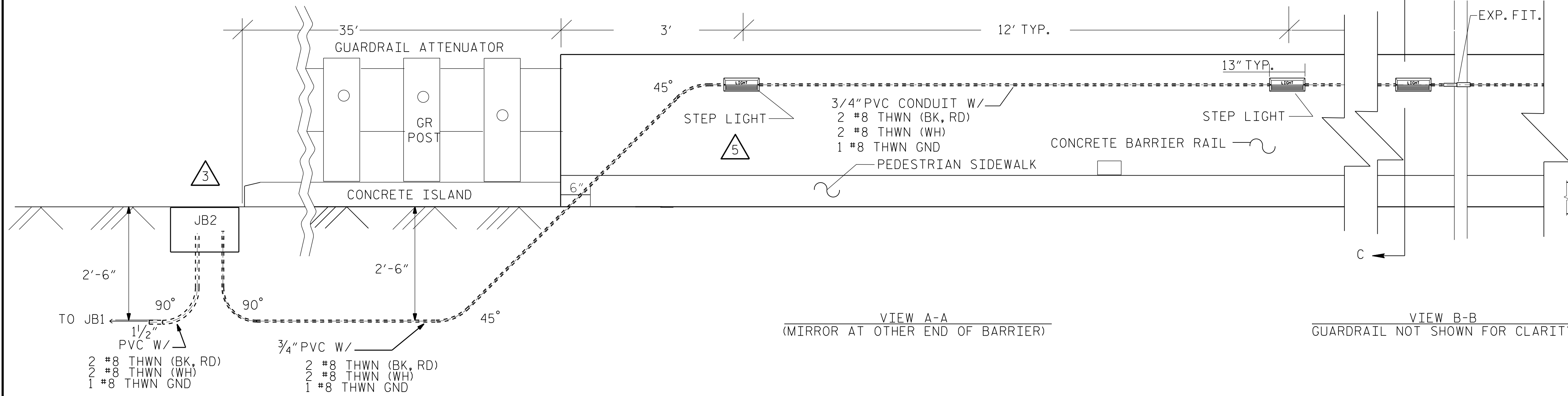
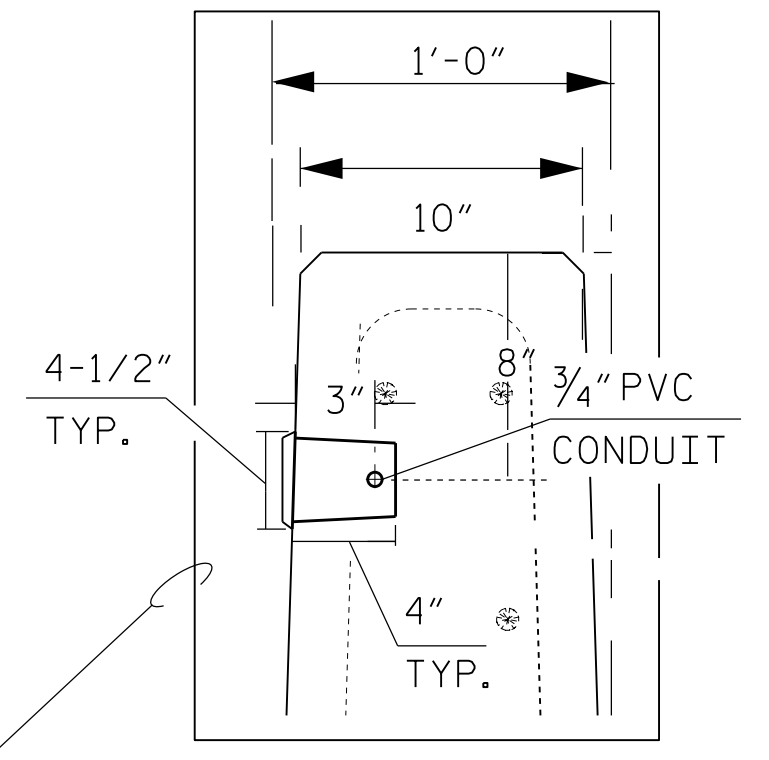
- 1 SEE SHEET E-3 FOR DETAIL. COORDINATE POWER SERVICE CONNECTION TO LIGHT CONTROL SYSTEM WITH LOCAL UTILITY COMPANY.
- 2 POSITION CONTROL SYSTEM "A" A MINIMUM 5 FEET BEHIND GUARDRAIL.
- 3 POSITION JB2 OUTSIDE THE CONCRETE ISLAND. ALLOW SUFFICIENT DISTANCE FOR CONDUIT SWEEPS TO THE STEP LIGHT LUMINAIRE IN CONCRETE BARRIER.
- 4 USE THE BLACK & WHITE CONDUCTORS FOR CIRCUIT A1. CIRCUIT A1 WILL CONNECT ODD NUMBERED STEP LUMINAIRE LIGHTS (31 TOTAL) (e.g. - 1,3,5,7,9,...TO 61). USE THE RED & WHITE CONDUCTORS FOR CIRCUIT A2. CIRCUIT A2 WILL CONNECT EVEN NUMBERED STEP LUMINAIRE LIGHTS (31 TOTAL) (e.g. - 2,4,6,8,10...TO 62).
- 5 STEP LIGHTS SHALL BE RATED FOR OUTDOOR INSTALLATIONS IN MARINE ENVIRONMENTS AND SHALL BE MINIMUM IP66.

LOAD SCHEDULE				
1Ø, 3W, 120/240 VAC				
CONTROL SYSTEM "A"				
CIRCUIT ID	STEP LIGHTS 8 W LED	AMPS @ 120V	KW LOAD	BREAKER SIZE (AMPS)
A1	ALL ODD NUMBERED LUMINAIRES	1.8	.22	15
A2	ALL EVEN NUMBERED LUMINAIRES	1.8	.22	15
TOTAL	62	3.6	.44	

ESTIMATED BILL OF MATERIALS		
UNIT	ITEM	QTY
EA	12"x11"x18" JUNCTION BOX	1
FT	2 - 8 AWG THWN CONDUCTOR (BK RD) 1 - 8 AWG THWN GROUND CONDUCTOR (GR)	1100
FT	1 - 8 AWG THWN CONDUCTOR (N)	2200
FT	3/4" PVC CONDUIT	820
EA	3/4" PVC 90° BELL ELBOW	1
EA	3/4" PVC 45° BELL ELBOW	2
EA	3/4" PVC EXPANSION FITTINGS	5
FT	1 1/2" PVC CONDUIT	170
EA	1 1/2" PVC 90° BELL ELBOW	3
FT	3" PVC CONDUIT - SLEEVE	48

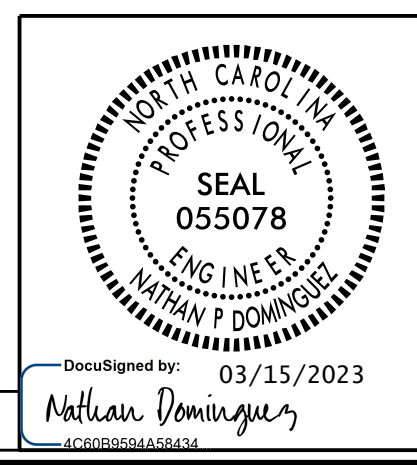


NOT TO SCALE



PROJECT NO. BR-0160
BRUNSWICK COUNTY
STATION: -L- 18+64.31

SHEET 1 OF 2
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
PATH LIGHTING ON
NC179 BRIDGE
OVER THE CALABASH RIVER



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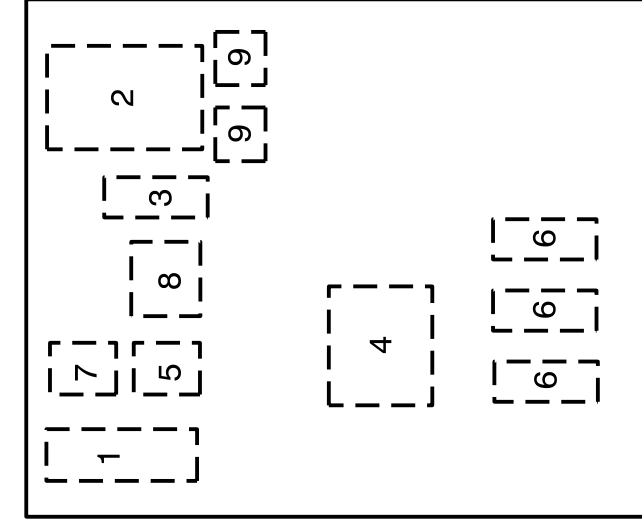
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STATE OF NORTH CAROLINA
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

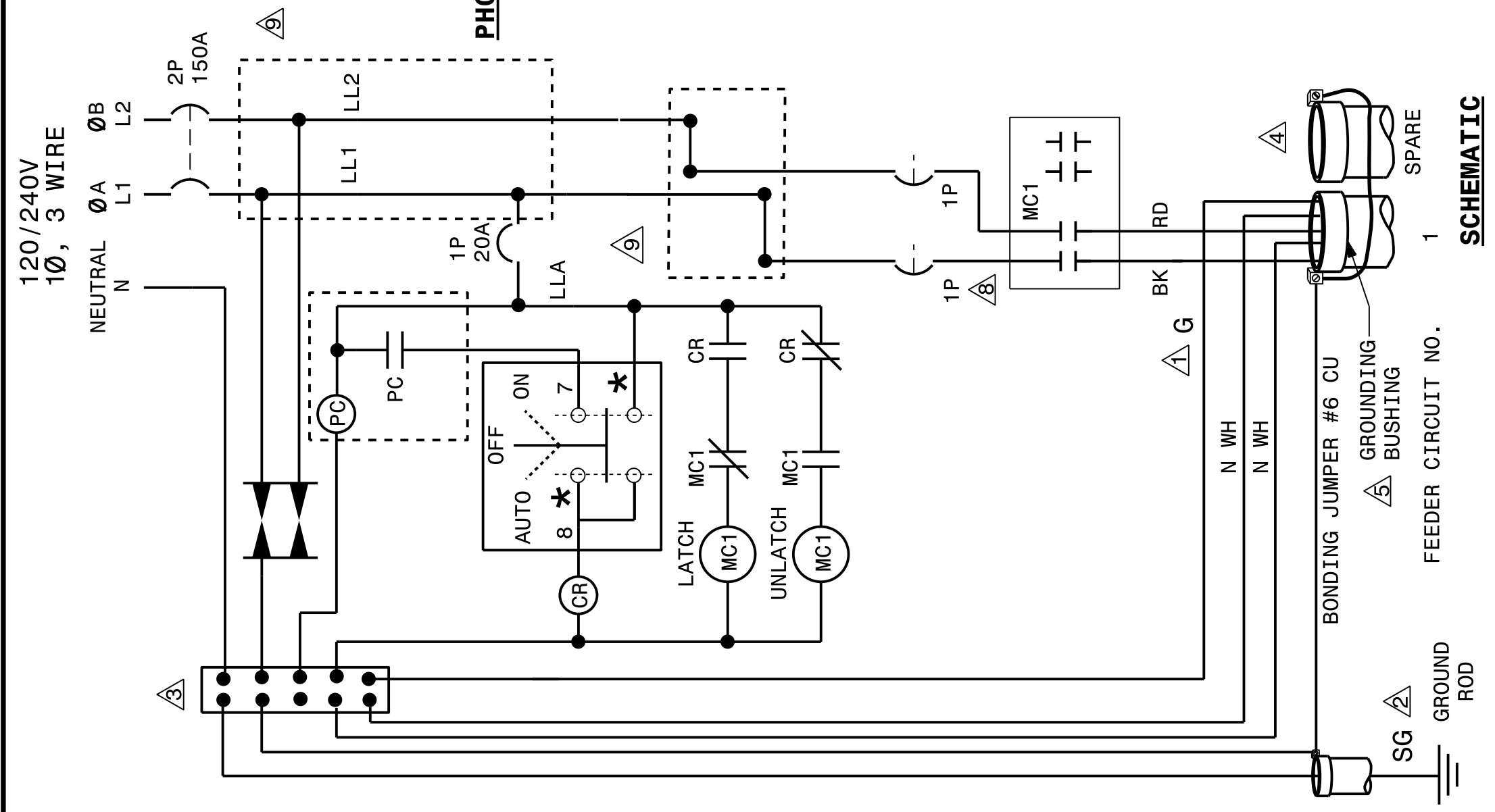
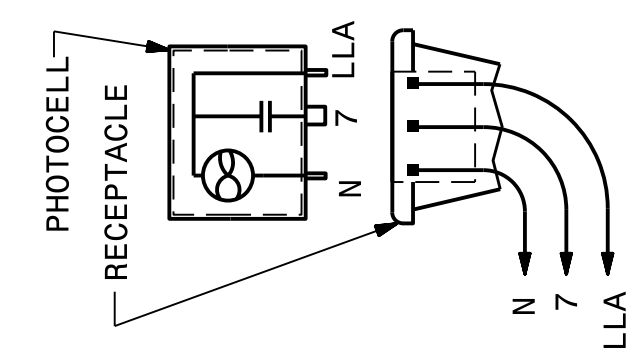
ENGLISH STANDARD DRAWING FOR
LIGHT CONTROL SYSTEM
SCHEMATIC

SHEET 1 OF 3
1408D01

- NOTES**
- 1 EQUIPMENT GROUNDS (G) SHALL BE SIZED ACCORDING TO CIRCUIT DESCRIPTION. SEE PLANS.
 - 2 SYSTEM GROUND (SG) SHALL BE CONTINUOUS FROM THE NEUTRAL BAR TO THE GROUNDING ELECTRODE (GROUND ROD).
 - 3 THE NEUTRAL BAR SHALL BE BONDED TO THE PANEL.
 - 4 SPARE CONDUIT SHALL BE INSTALLED, AND RUN TO NEAREST JUNCTION BOX AND CAPPED.
 - 5 INSTALL A GROUNDING BUSHING ON EACH METAL CONDUIT. CONNECT BONDING JUMPER AS REQUIRED BY NEC.
 - 6 SEE STANDARD DRAWING 1408.01 SHEET 3 OF 3 FOR ENCLOSURE.
 - 7 THE CONTROL SYSTEM MUST BE LABELED "SUITABLE FOR USE AS SERVICE EQUIPMENT." REFER TO STANDARD SPECIFICATION 1408-2 FOR OTHER REQUIREMENTS.
 - 8 SEE PLANS FOR BREAKER SIZES.
 - 9 PROVIDE MULTI-TAP LOAD LUGS OR POWER DISTRIBUTION BLOCKS.
 - 10 PROVIDE MANUFACTURER SUPPLIED MOUNTING BRACKETS OR SCREW STUDS PERMANENTLY ATTACHED TO THE BACK PANEL, FOR MOUNTING COMPONENTS.
 - 11 INSTALL SURGE PROTECTION DEVICE INSIDE CABINET ASSEMBLY.



#	QTY	DESCRIPTION	SPECIFICATIONS
1	1	NEUTRAL BAR	
2	1	SERVICE CIRCUIT BREAKER	2P, 240V, 60A
3	1	CONTROL CIRCUIT BREAKER	1P, 120V, 15A
4	1	MECHANICALLY HELD CONTACTORS	4P, 240V, 60A W/120V COIL
5	1	CONTROL RELAY W/NC & NO CONTACT	120V, 10A, W/120V COIL
6	3	FEEDER CIRCUIT BREAKERS	1P, 120V, 15A
7	1	SURGE PROTECTOR	
8	1	SELECTOR SWITCH (ON-OFF-AUTO)	120V, 10A
9	4	POWER DISTRIBUTION LUGS OR BLOCKS	
		MOUNTING BRACKETS OR SCREW STUDS	



STATE OF NORTH CAROLINA
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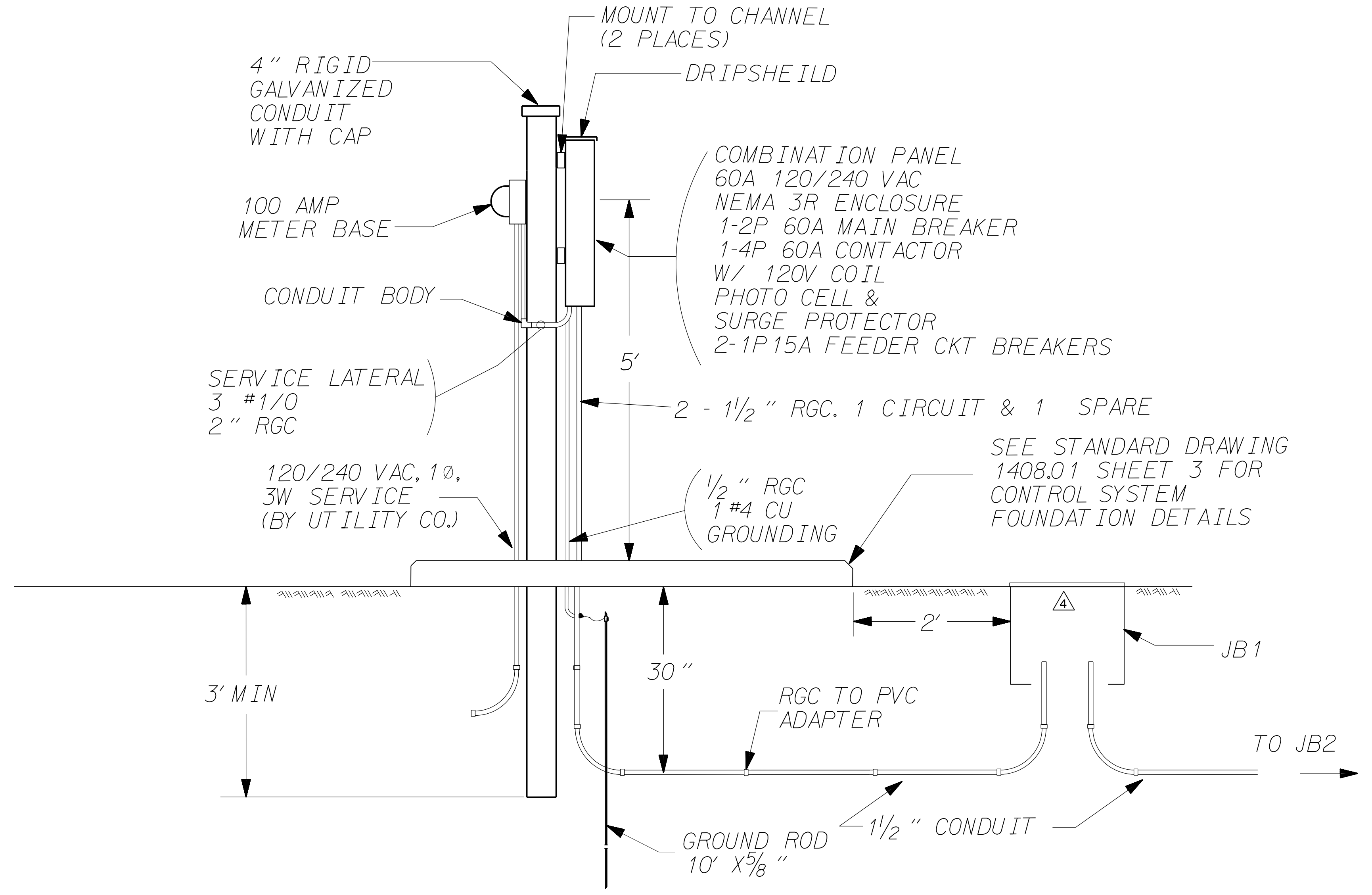
ENGLISH STANDARD DRAWING FOR
LIGHT CONTROL SYSTEM
SCHEMATIC

SHEET 1 OF 3
1408D01

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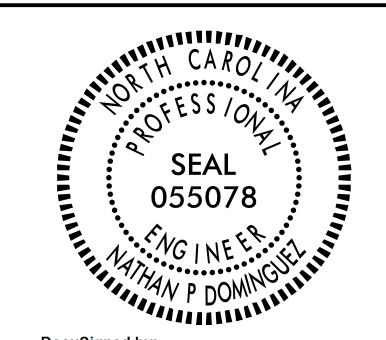


LIGHTING CONTROLLER/SERVICE ENTRANCE EQUIPMENT

PROJECT NO. BR-0160
BRUNSWICK COUNTY
STATION: -L- 18+64.31

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
PATH LIGHTING ON
NC 179 BRIDGE
OVER THE
CALABASH RIVER



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DocuSigned by:
Nathan Dominguez
03/15/2023