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# PLANS AND DETAILS FOR PROPOSED LIGHTING /ELECTRICAL CONSTRUCTION

## NOTES

- 1 PROVIDE FLAG POLE LIGHT AND CONNECTION TO LIGHT. COORDINATE INSTALLATION AND AIMING OF FLAG POLE LIGHT(S) WITH THE ENGINEER.
- 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 JUNCTION BOXES SHALL BE 18" HIGH, UNLESS OTHERWISE NOTED.
- 7 CONTRACTOR SHALL RECORD THE GPS COORDINATES OF EACH JUNCTION BOX 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 POLE NUMBERING CONVENTION: CONTROL SYSTEM-POLE #-CKT # (A-3-2).
- 9 JUNCTION BOXES SHOWN NEAR LIGHT STANDARDS (LSJB) 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.
- 10 AT MANY LOCATIONS ON SHEET E2, THERE IS VERY LITTLE ROOM BETWEEN THE BACK OF PROPOSED SIDEWALK AND RIGHT-OF-WAY. THE SYMBOLOGY ON THE PLANS APPEARS TO SHOW THE LIGHT STANDARD AND/OR JUNCTION BOX OUTSIDE OF THE RIGHT-OF-WAY OR IN THE SIDEWALK. THE CONTRACTOR SHALL INSTALL ALL LIGHT STANDARDS, JUNCTION BOXES AND FEEDER CIRCUITS IN THE GRASSY STRIP BETWEEN THE BACK OF PROPOSED SIDEWALK AND INSIDE OF THE RIGHT-OF-WAY.
- 11 INSTALL LIGHT STANDARDS SO THAT TWIN LUMINAIRES ARE MOUNTED PERPENDICULAR TO THE ROADWAY.
- 12 INSTALL PULL ROPE IN THE CONDUIT IN ACCORDANCE WITH 1400-2(H).
- 13 LOCATION OF EXISTING SERVICE AND PLACEMENT OF JUNCTION BOXES ARE ESTIMATED. CONSULT NCDOT ENGINEER FOR EXACT PLACEMENT.
- 14 MOVE THE EXISTING RED CONDUCTOR TO THE CONTACTOR TERMINAL ADJACENT TO THE EXISTING BLACK CONDUCTOR THEREBY MOVING ALL EXISTING LIGHTING TO CIRCUIT-1 WHICH ALLOWS THE SPARE TO BE USED FOR THE FLAGPOLE LIGHTS

## SCOPE OF WORK

PLACE 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

- 2018 AASHTO ROADWAY LIGHTING DESIGN GUIDE
- FATIGUE CATEGORY II SHALL BE USED IN DESIGN
- 2017 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
1405.01	STANDARD FOUNDATION
1407.01	ELECTRIC SERVICE POLE AND LATERAL LIGHT CONTROL SYSTEM
1408.01	ELECTRICAL DUCT
1409.01	FEEDER CIRCUITS
1410.01	ELECTRICAL JUNCTION BOXES

ALL WORK SHALL BE IN CONFORMANCE WITH DIVISION 14 OF THE STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES, DATED JANUARY 2018.

## LEGEND

- PROPOSED DIRECT BURIED BREAKAWAY LIGHT STANDARD 16' MH WITH 2.5' TWIN ARM AND 120V WEATHERPROOF RECEPTACLE. INCLUDES JUNCTION BOX & 130 W MAX LED ROADWAY LUMINAIRE. IES DISTRIBUTION: TYPE III.
- PROPOSED CONTROL SYSTEM WITH JUNCTION BOX. SIZE BREAKERS AS SHOWN IN LOAD SCHEDULE. SEE SHEET(S) E2.
- EXISTING CONTROL SYSTEM
- PROPOSED ELECTRICAL JUNCTION BOX. SEE TABLE C, SHEET E1A, FOR DETAILS AND TYPE.
- REFERENCE TO CORRESPONDING NOTE AS NUMBERED.
- PROPOSED FEEDER CIRCUIT. CONTROL SYSTEM (A), CIRCUIT NUMBER (1) PLAN SYMBOL (8). SEE TABLE A, THIS SHEET.
- PROPOSED 30' CLASS 4 SERVICE POLE AND LATERAL 3 #1/0 USE CONDUCTORS 2" CONDUIT
- PROPOSED ELECTRICAL DUCT SIZE 3" TYPE (JA) OR (BD) LOCATION: SEE TABLE B, SHEET E1A.

PLAN SYMBOL	DESCRIPTION	CONTRACT ITEM	
8	3 #8 Ø 1 #8 N 1 #10 G 2" P	3 AWG SIZE 8 CONDUCTOR (BK, RD & BL) 1 AWG SIZE 8 NEUTRAL CONDUCTOR 1 AWG SIZE 10 GROUNDING CONDUCTOR 2" PVC CONDUIT	4 - 8 W/G FEEDER CIRCUIT IN 2" CONDUIT
6	3 #6 Ø 1 #6 N 1 #8 G 2" P	3 AWG SIZE 6 CONDUCTOR (BK, RD & BL) 1 AWG SIZE 6 NEUTRAL CONDUCTOR 1 AWG SIZE 8 GROUNDING CONDUCTOR 2" PVC CONDUIT	4 - 6 W/G FEEDER CIRCUIT IN 2" CONDUIT
4	3 #4 Ø 1 #4 N 1 #6 G 2" P	3 AWG SIZE 4 CONDUCTOR (BK, RD & BL) 1 AWG SIZE 4 NEUTRAL CONDUCTOR 1 AWG SIZE 6 GROUNDING CONDUCTOR 2" PVC CONDUIT	4 - 4 W/G FEEDER CIRCUIT IN 2" CONDUIT
2	3 #2 Ø 1 #2 N 1 #4 G 2" P	3 AWG SIZE 2 CONDUCTOR (BK, RD & BL) 1 AWG SIZE 2 NEUTRAL CONDUCTOR 1 AWG SIZE 4 GROUNDING CONDUCTOR 2" PVC CONDUIT	4 - 2 W/G FEEDER CIRCUIT IN 2" CONDUIT

### 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

COMPUTED BY: SAM DATE: 02/04/21  
CHECKED BY: RGH DATE: 02/04/21

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02/03/98



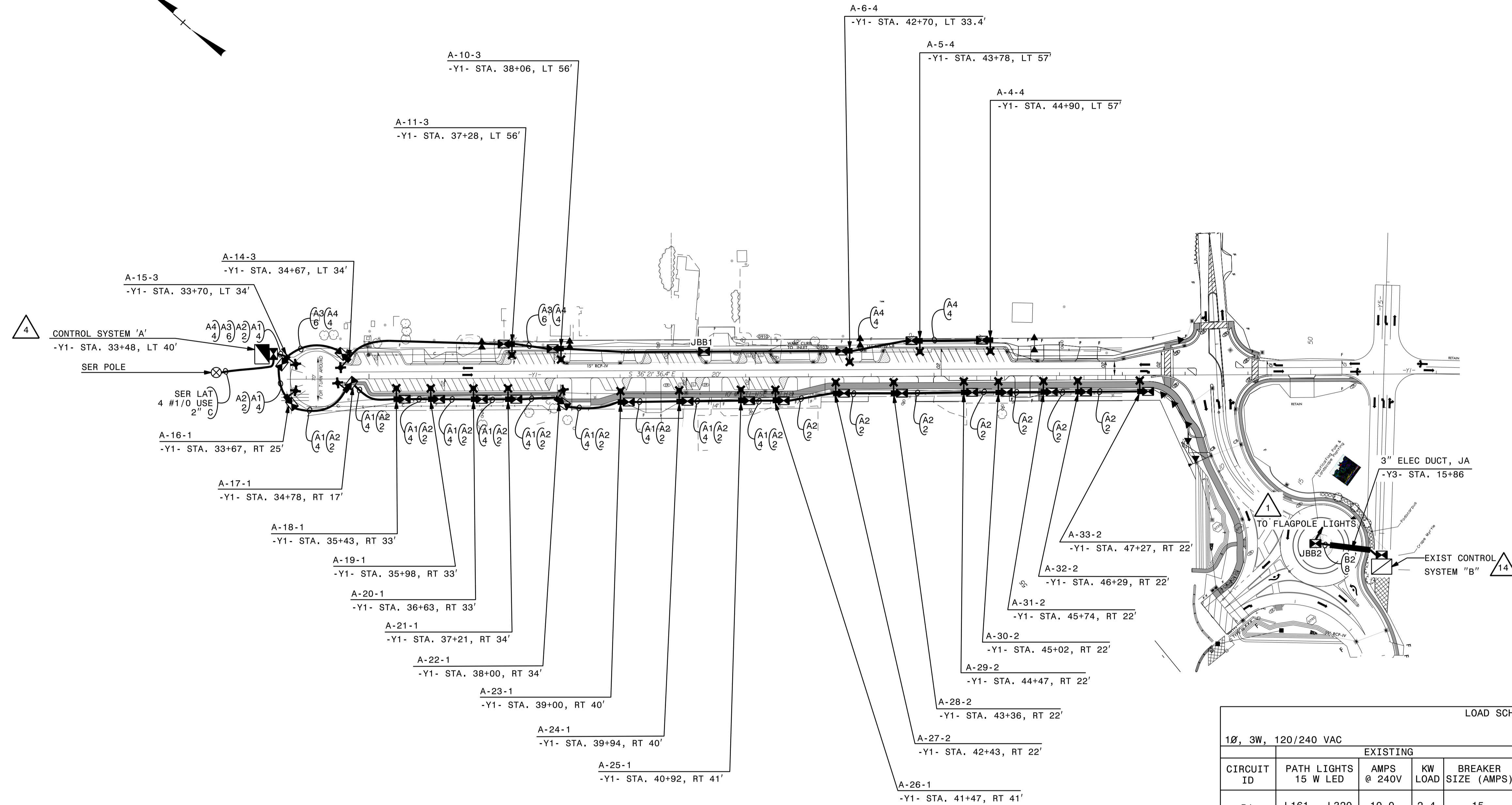




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# USE FOR LIGHTING CONSTRUCTION ONLY



**LOAD SCHEDULE**

1Ø, 3W, 120/240 VAC					EXISTING CONTROL SYSTEM "B"			
CIRCUIT ID	PATH LIGHTS 15 W LED	EXISTING		BREAKER SIZE (AMPS)	PROPOSED			
		AMPS @ 240V	KW LOAD		PATH LIGHTS 15 W LED	FLAGPOLE LIGHTS 200W MAX LED	AMPS @ 240V	KW LOAD
B1	L161 - L320	10.0	2.4	15	L161 - L320		10.0	2.4
*B2				15		FPL1, FPL2	1.67	0.4
<b>TOTAL</b>	<b>160</b>	<b>10.0</b>	<b>2.4</b>		<b>160</b>	<b>2</b>	<b>11.67</b>	<b>2.8</b>

NOTE: USE SPARE BREAKER AS 'B2' IN THE EXISTING CONTROL SYSTEM

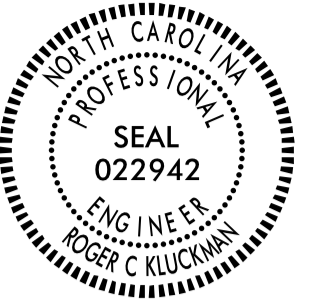
**SITE LIGHTING LOAD SCHEDULE  
ROLAND AVE, SURF CITY**

3Ø, 4W, 120/208 VAC							
CIRCUIT ID	PHASE	DECORATIVE TWIN ARM 130W (MAX) LED	RECEPTACLES	CIRCUIT KVA	AMPS		BREAKER
					A-B	C-N	
A1	A-B	A-16 TO A-26	A-16 TO A-26	2.29	11.00	-	15
	C-N	-					
A2	A-B	A-27 TO A-33	A-27 TO A-33	1.66	8.00	-	15
	C-N	-					
A3	A-B	A-10, A-11, A-14, A-15	A-10, A-11, A-14, A-15	0.83	4.00	-	15
	C-N	-					
A4	A-B	A-4, A-5, A-6	A-4, A-5, A-6	.62	3.00	-	15
	C-N	-					
TOTAL		25	25	5.4	26	-	

SEE SHEET "E1" FOR  
LEGEND & Δ NOTES

2			
1			
Rev.	Date	Description	Approved
<b>NORTH CAROLINA DEPARTMENT OF TRANSPORTATION</b> ROADWAY DESIGN LIGHTING/ELECTRICAL SECTION  <b>DECORATIVE LIGHTING LAYOUT</b>  ROLAND AVE, SURF CITY  PENDER COUNTY			
Drawn By:	SAM	Approved By:	RGH
Dwg No.:			

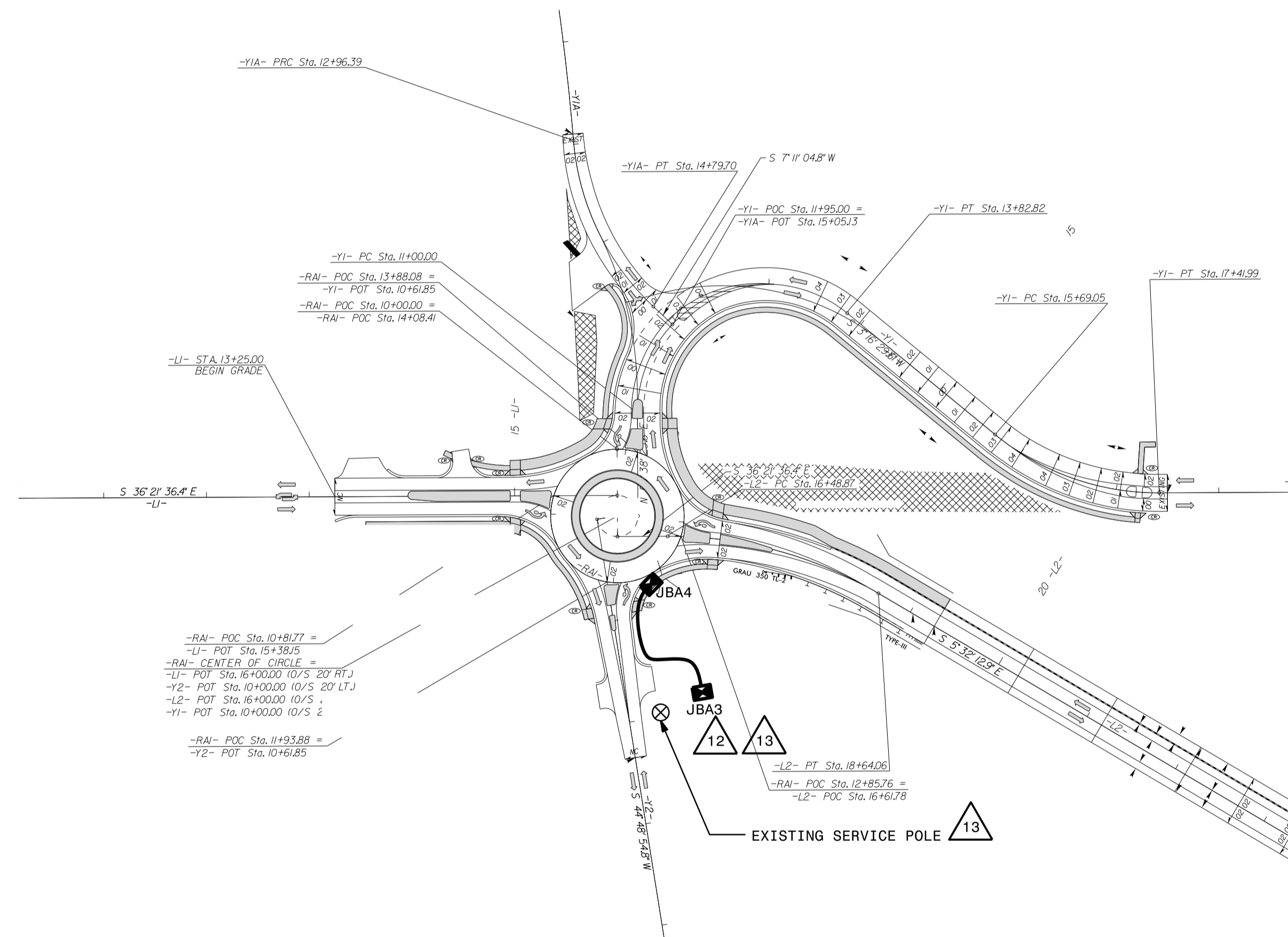
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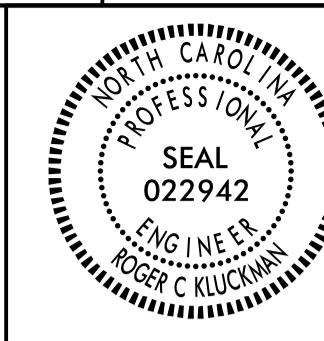
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2			
1			
Rev.	Date	Description	Approved
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<b>LIGHTING LAYOUT</b> ROLAND AVE SURF CITY PENDER COUNTY			
Drawn By:	SAM	Approved By:	RGH
		Dwg No.:	

USE FOR LIGHTING CONSTRUCTION ONLY

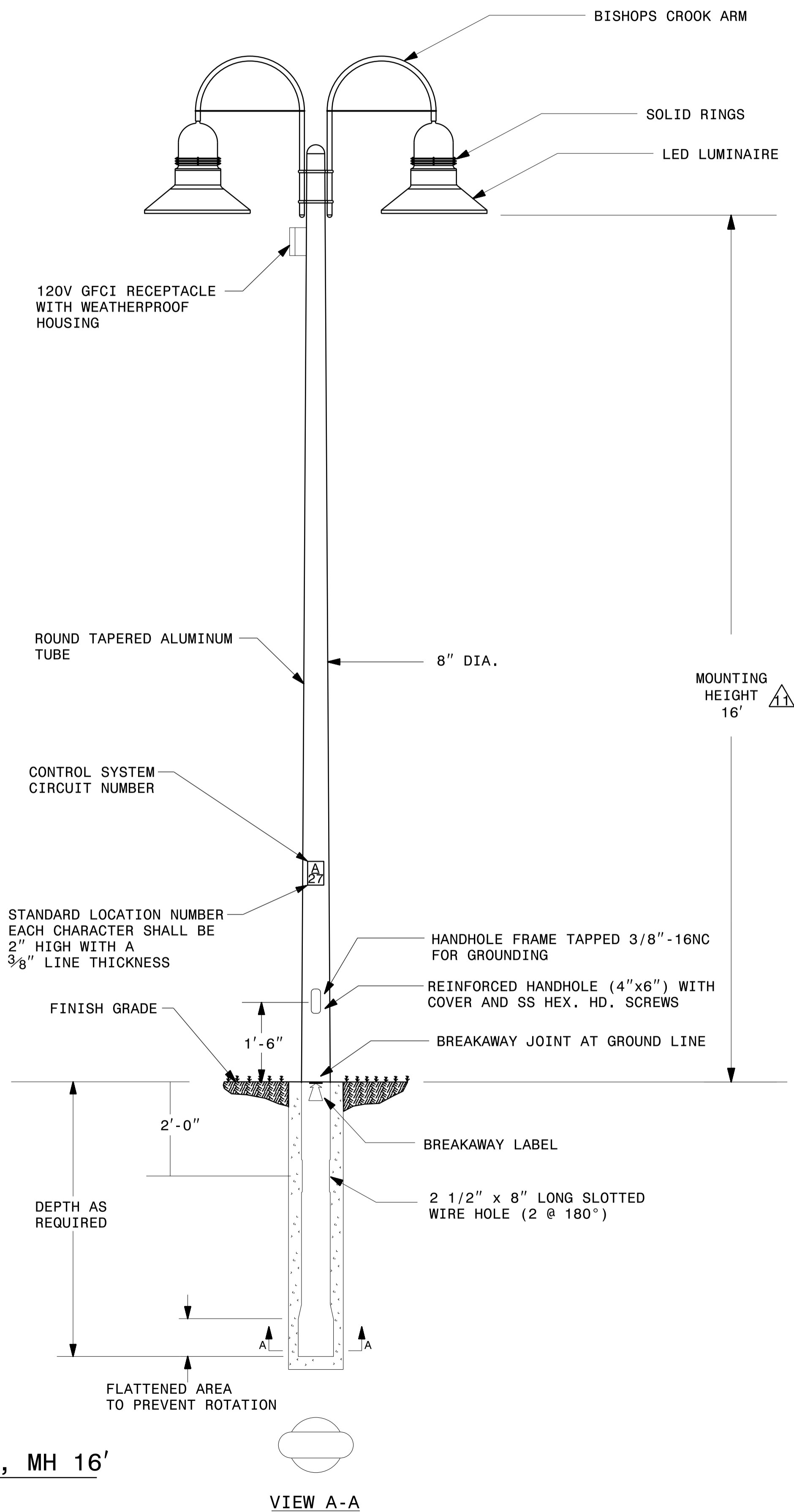
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B-4929 E4



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SEE SHEET "E1" FOR  
LEGEND & △ NOTES

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1			
Rev.	Date	Description	Approved

NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
ROADWAY DESIGN LIGHTING/ELECTRICAL SECTION

LIGHT STANDARD  
DETAILS

ROLAND AVE  
PENDER COUNTY

Drawn By: SAM Approved By: RGH Dwg No.:

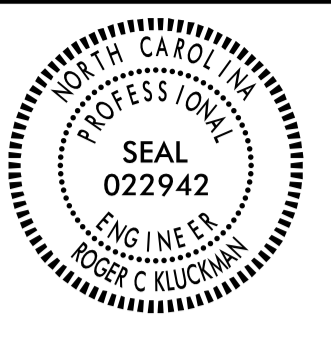
LIGHT STANDARD WITH BISHOPS CROOK TWIN ARMS, MH 16'

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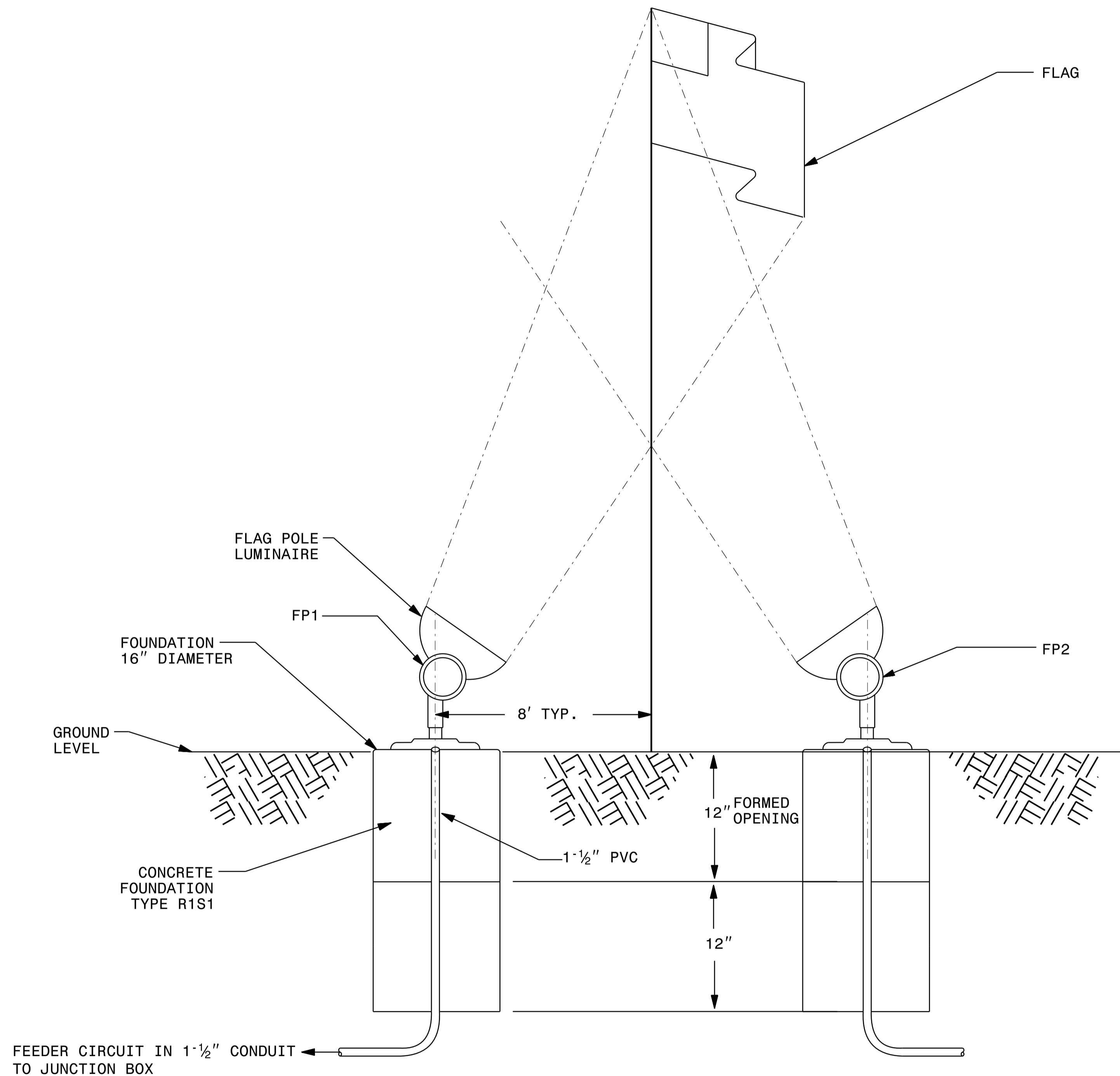
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PROJECT REFERENCE NO. SHEET NO.  
B-4929 E5



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**FLAGPOLE LIGHT DETAILS**

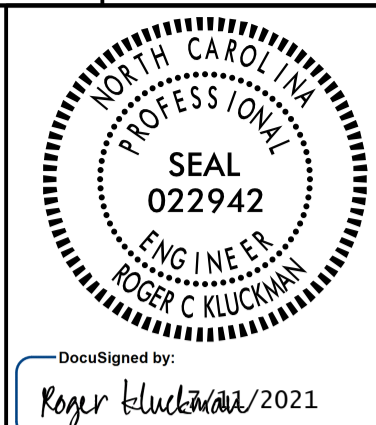
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**NOTE: FLAGPOLE AND FLAG TO BE PROVIDED BY OTHERS**

SEE SHEET "E1" FOR  
LEGEND & △ NOTES

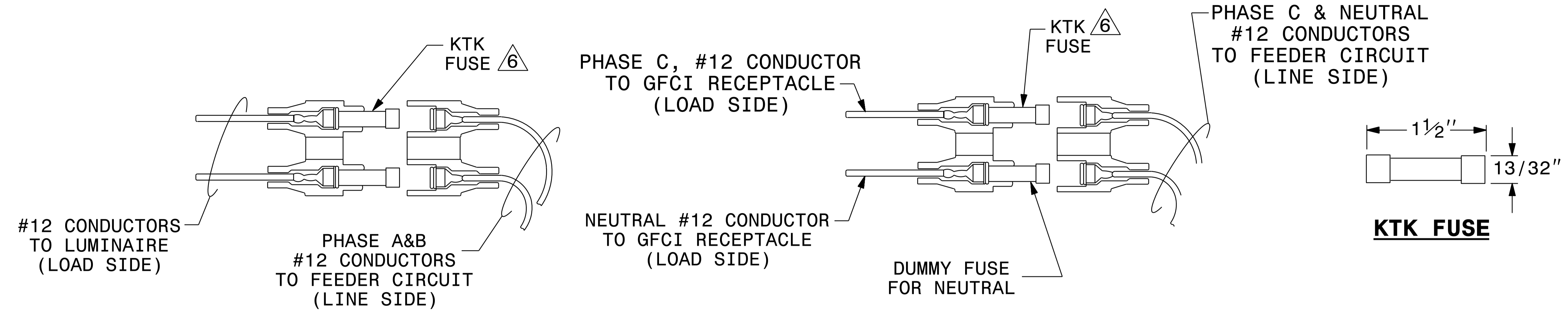
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Drawn By:	SAM	Approved By:	RGH
Dwg No.:			

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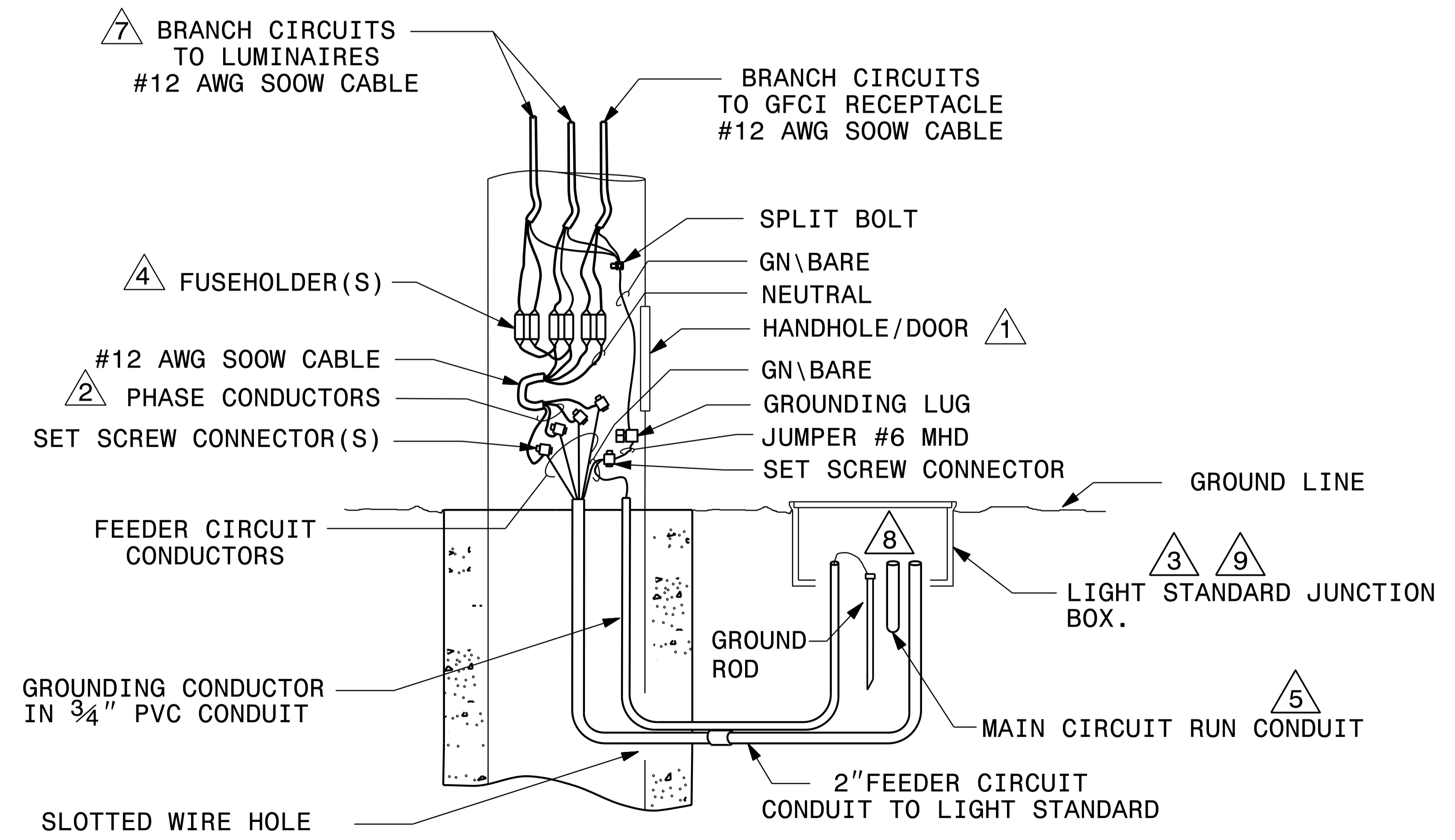


**LUMINAIRE FUSEHOLDER (ONE PER LUMINAIRE)**

**RECEPTACLE FUSEHOLDER**

**NOTES**

- 1 PROVIDE ACCESS TO FUSEHOLDERS FROM HANDHOLE.
- 2 SEE STANDARD SPECIFICATIONS SECTION 1400-4(F) FOR WIRING METHODS. USE TAPE OR HEAT SHRINK TO COLOR CONDUCTORS TO MATCH PHASE COLOR (RED/BLACK/BLUE).
- 3 MAKE SPLICES IN ACCORDANCE WITH SECTION 1400-4(F) OF THE STANDARD SPECIFICATIONS.
- 4 BREAKAWAY FUSEHOLDERS REQUIRED AT ALL LIGHT STANDARDS.
- 5 SIZE FEEDER CIRCUIT CONDUCTORS AS SHOWN IN THE PLANS.
- 6 SEE STANDARD SPECIFICATIONS SECTION 1400-2(E) FOR FUSEHOLDERS.
- 7 SEPARATE SOOW CORD REQUIRED TO EACH LUMINAIRE
- 8 PERMANENTLY ATTACH GROUNDING CONDUCTOR TO GROUND ROD VIA IRREVERSIBLE CLAMP.
- 9 SEE STANDARD DRAWING 1411.01 FOR LIGHT STANDARD JUNCTION BOX REQUIREMENTS.



**WIRING DIAGRAM**  
@ BASE OF LIGHT STANDARD

2			
1			
Rev.	Date	Description	Approved
<b>NORTH CAROLINA DEPARTMENT OF TRANSPORTATION</b> ROADWAY DESIGN      LIGHTING/ELECTRICAL SECTION			
<b>WIRING DIAGRAM</b> ROLAND AVE SURF CITY  PENDER COUNTY			
Drawn By:	Approved By:	Dwg No.:	
SAM	RGH		

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