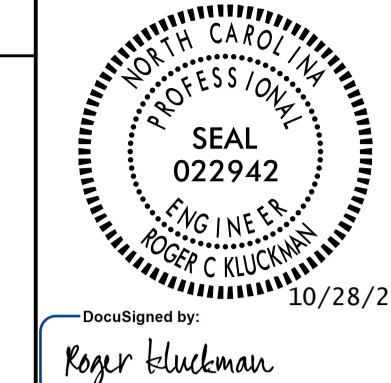


PLANS AND DETAILS FOR PROPOSED LIGHTING /ELECTRICAL CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



10/28/2021
Roger Kluckman
10/28/2021

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 JUNCTION BOXES SHALL BE 18" 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 POLE NUMBERING CONVENTION: CONTROL SYSTEM-POLE #-CKT # (A-3-2).
- 9 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.
- 10 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.

SCOPE OF WORK

PLACE ROADWAY LIGHTING SYSTEM INTO SERVICE BY PROVIDING AND INSTALLING 120' HIGH MASTS, 100' HIGH MASTS, LIGHT STANDARDS WITH LIGHT EMITTING DIODE LUMINAIRES, BRIDGE LIGHTING, 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 ROADSIDE 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 HIGH MOUNT SUPPORT FOR BASIC WIND SPEED OF 90 MPH
- DESIGN HIGH MOUNT STANDARD FOUNDATION FOR BASIC WIND SPEED OF 110 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 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD NO.	TITLE
1401.01	HIGH MOUNT STANDARD
1404.01	LIGHT STANDARDS
1405.01	STANDARD FOUNDATION
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
1412.01	UNDERPASS LIGHTING (USE ATTACHED DETAIL SHEET 1412D01 IN LIEU OF STANDARD DRAWING 1412.01, SHEET 2)

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

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.
- PROPOSED 120' HIGH MAST STANDARD W/ HM FOUNDATION, JUNCTION BOX & 8 HM LED LUMINAIRES. 560W MAX, 54,000 MIN. MAINTAINED DELIVERED LUMENS, TYPE V. MAXIMUM BUG RATING 5-0-5.
- 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.
- PROPOSED UNDERPASS LUMINAIRE, TYPE WM, xxxW LED
- PROPOSED UNDERPASS BREAKER PANEL
- PROPOSED CONTROL SYSTEM WITH JUNCTION BOX. SEE PLANS FOR BREAKER SIZES.
- 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 2", 3" OR 4" TYPE (JA) OR (BD) LOCATION: SEE TABLE B, SHEET E1A.
2", 3" OR 4" ELEC. DUCT JA & BD

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

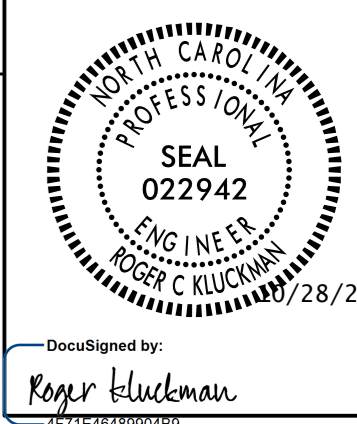
BD	BURIED	PVC	PVC SCHEDULE 40 CONDUIT
LT	LIGHT	RGC	RIGID GALVANIZED STEEL CONDUIT
JA	JACKED	C	CONDUIT
MH	MOUNTING HEIGHT	CKT	CIRCUIT
Ø	PHASE	N	NEUTRAL
SER LAT	SERVICE LATERAL	G	GROUND
IGJB	IN GROUND JUNCTION BOX	HM	HIGH MAST
LED	LIGHT EMITTING DIODE	LSJB	LIGHT STANDARD JUNCTION BOX
HMJB	HIGH MAST JUNCTION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

COMPUTED BY: SGK DATE: 10/28/2021
CHECKED BY: RGH DATE: 10/28/2021

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**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**



**TABLE "C"
 JUNCTION BOX SUMMARY**

SHEET	LABEL	LOCATION AND OFFSET	CONTROL SYSTEM "A"													GPS LOCATION	
			TYPE, PAY ITEM & SIZE														
			IN GROUND			LIGHT STANDARD			HIGH MAST			CONTROL SYSTEM	BARRIER RAIL	SIDE WALK			
IG18 18"X12"	IG30 30"X17"	IG36 36"X24"	LS18 18"X12"	LS30 30"X17"	LS36 36"X24"	HM18 18"X12"	HM30 30"X17"	HM36 36"X24"	CS36 36"X24"	BR18 18"X12"	SW18 18"X12"	LAT/LONG					
E2	CSAJB	2' FROM CONTROL SYSTEM "A"												X			
E2	JBA1	-RPA- STA. 23+11, 20' LT			X												
E2	A-1-1JB	10' FROM HIGH MAST A-1								X							
E2	JBA2	-Y- STA. 15+46, 66' LT			X												
E2	JBA3	-L- STA. 27+81, 123' LT	X														
E2	JBA4	-RPA- STA. 15+22, 20' LT	X														
E2	JBA5	-RPA- STA. 15+28, 40' RT	X														
E2	A-2-1JB	5' FROM LIGHT STANDARD A-2				X											
E2	A-3-1JB	5' FROM LIGHT STANDARD A-3				X											
E2	A-4-1JB	5' FROM LIGHT STANDARD A-4				X											
E2	JBA6	-Y- STA. 15+45, 68' LT			X												
E2	JBA7	-L- STA. 20+61, 100' LT	X														
E2	A-5-2JB	10' FROM HIGH MAST A-5							X								
E2	JBA8	-L- STA. 22+46, 58' LT	X														
E2	JBA9	-L- STA. 22+46, 65' RT	X														
E2	JBA10	-L- STA. 19+86, 78' RT	X														
E2	JBA11	-RPC- STA. 16+21, 36' LT	X														
E2	JBA12	-RPC- STA. 16+18, 33' RT	X														
E2	A-6-3JB	5' FROM LIGHT STANDARD A-6				X											
E2	A-7-3JB	5' FROM LIGHT STANDARD A-7				X											
E2	A-8-4JB	10' FROM HIGH MAST A-8							X								
E2	JBA13	-L- STA. 31+60, 55' RT	X														
E2	A-9-5JB	10' FROM HIGHT MAST A-9							X								
E2	JBA14	-RPD- STA. 18+01, 20' RT	X														
E2	JBA15	-RPD- STA. 18+22, 49' LT	X														
E2	A-10-5JB	5' FROM LIGHT STNADARD A-10				X											
E2	A-11-5JB	5' FROM LIGHT STANDARD A-11				X											
E2	A-12-5JB	5' FROM LIGHT STANDARD A-12				X											
CSA TOTALS			12	3	8				3		1	1					

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

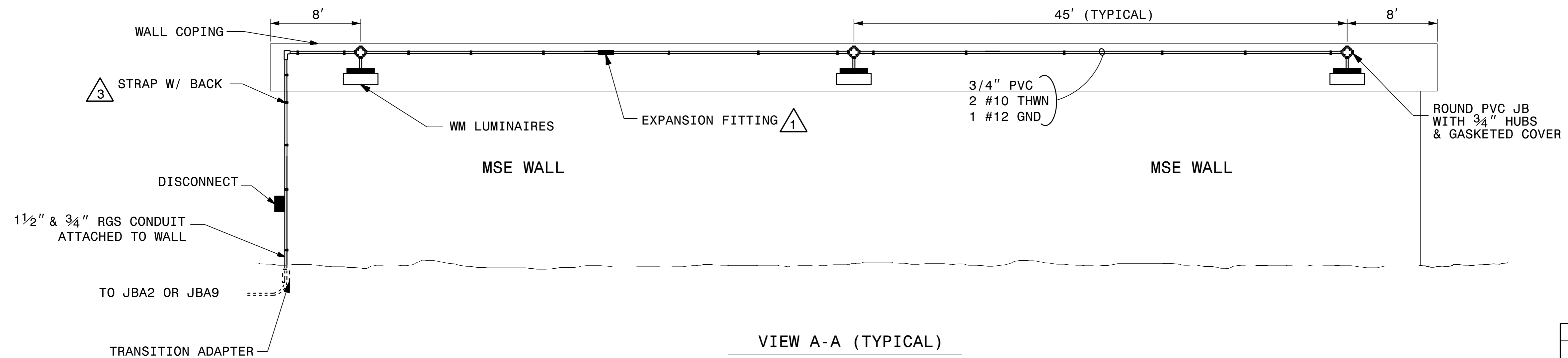
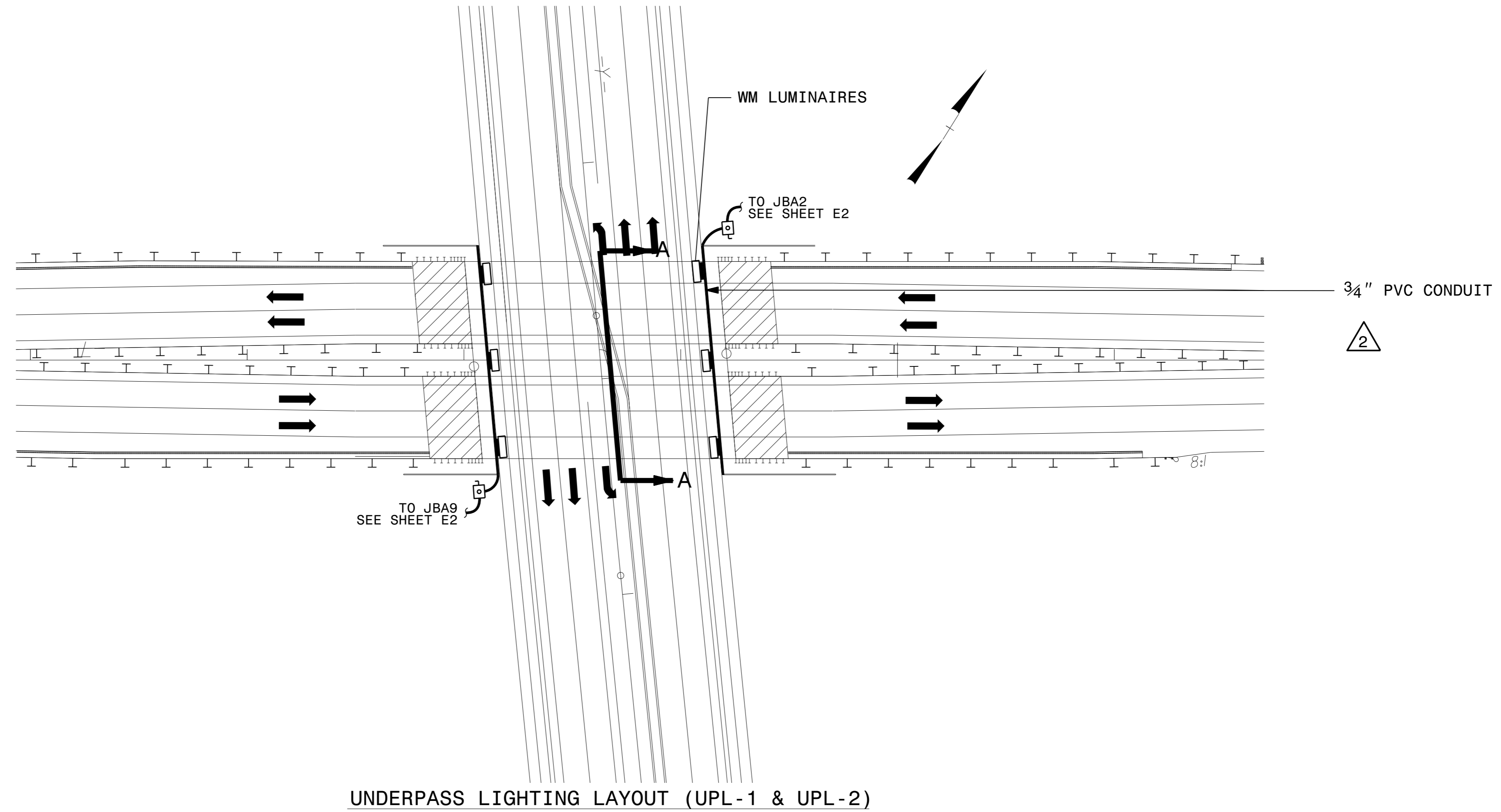
LOCATION	RACEWAY	SHEET	TYPE									
			JACKED (JA) FEET				BURIED (BD) FEET					
			SIZE 2"	SIZE 3"	SIZE 4"	SIZE 6"	SIZE 2"	SIZE 3"	SIZE 4"	SIZE 6"		
-RPA- STA. 23+11	CSAJB - JBA1	E2			60			90				
-RPA- STA. 15+25		E2		55								
-Y- STA. 15+45	JBA2 - JBA6	E2			120			165				
-L- STA. 22+46	JBA8 - JBA9	E2			120			125				
-RPC- STA. 16+20		E2		60								
-L- STA. 31+60		E2		120								
-RPD- STA. 18+06		E2		50								
CSA TOTALS				285	300			380				

SEE SHEET "E-1" FOR
 LEGEND & NOTES

02/03/98

USE FOR LIGHTING CONSTRUCTION ONLY

PROJECT REFERENCE NO. U-5896	SHEET NO. E-3
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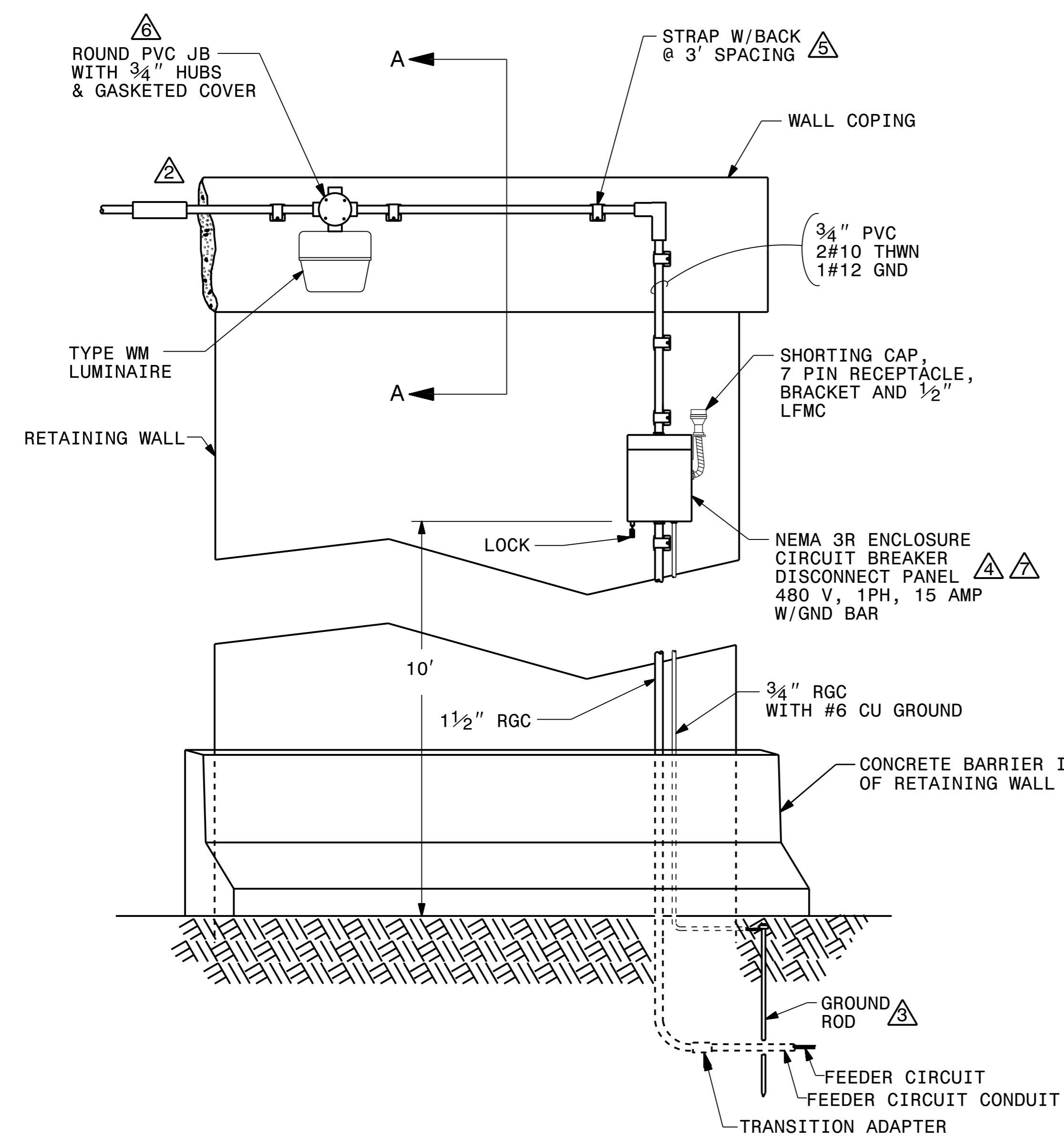
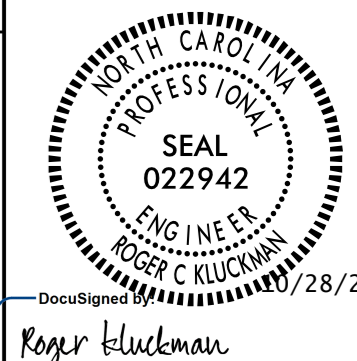
- 1 PROVIDE EXPANSION FITTINGS IN EACH SECTION OF CONDUIT THAT IS GREATER THAN 20' LONG BETWEEN TERMINALS AT JUNCTION BOXES ON PIER CAP.
- 2 SEE SHEET E4, FOR FURTHER INSTALLATION DETAILS.
- 3 PROVIDE CONDUIT CLAMPS, SPACERS AND ANCHORS PER NEC RECOMMENDATIONS.

2			
1			
Rev.	Date	Description	Approved
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN LIGHTING/ELECTRICAL SECTION ELECTRICAL CONDUIT SYSTEM US-29/US-70/BUS 85 AT US 311 (S. MAIN ST) INTERCHANGE GUILDFORD COUNTY			
Drawn By:	Approved By:	Dwg No.:	
SGK			

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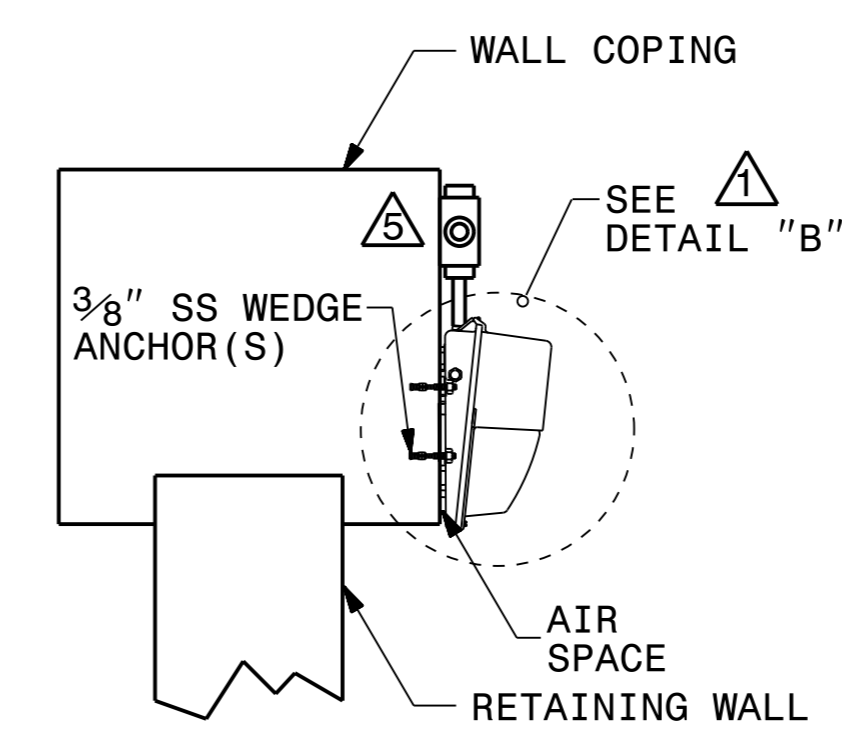
USE FOR LIGHTING CONSTRUCTION ONLY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

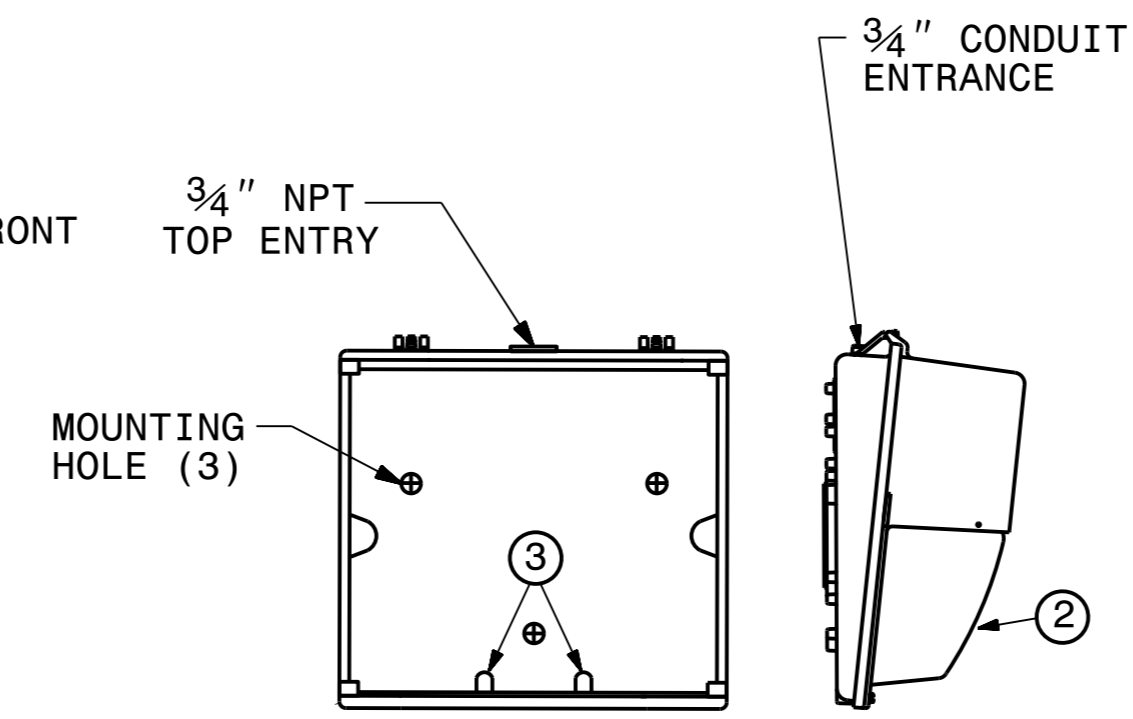


TYPE WM LED LUMINAIRE AND CIRCUITRY

- NOTES**
- ▲ MOUNT WM LED LUMINAIRE AT VERTICAL CENTER OF BENT CAP.
 - ▲ PROVIDE EXPANSION FITTINGS IN EACH SECTION OF CONDUIT THAT IS GREATER THAN 20' LONG BETWEEN TERMINALS AT JUNCTION BOXES ON PIER CAP.
 - ▲ EXTEND AWAY FROM WALL TO AVOID CONFLICT WITH FOOTING.
 - ▲ INSTALL INSULATED GROUNDING BUSHING FOR INCOMING FEEDER CIRCUIT IN RGS CONDUIT.
 - ▲ ATTACH CONDUIT AND HUBS TO FACE OF BENT CAP USING 1/4" SS WEDGE ANCHORS.
 - ▲ CAP ANY UNUSED PORTS FROM ROUND GASKETED HUB.
 - ▲ MOUNT DISCONNECT WITHIN 18" OF WALL CORNER.

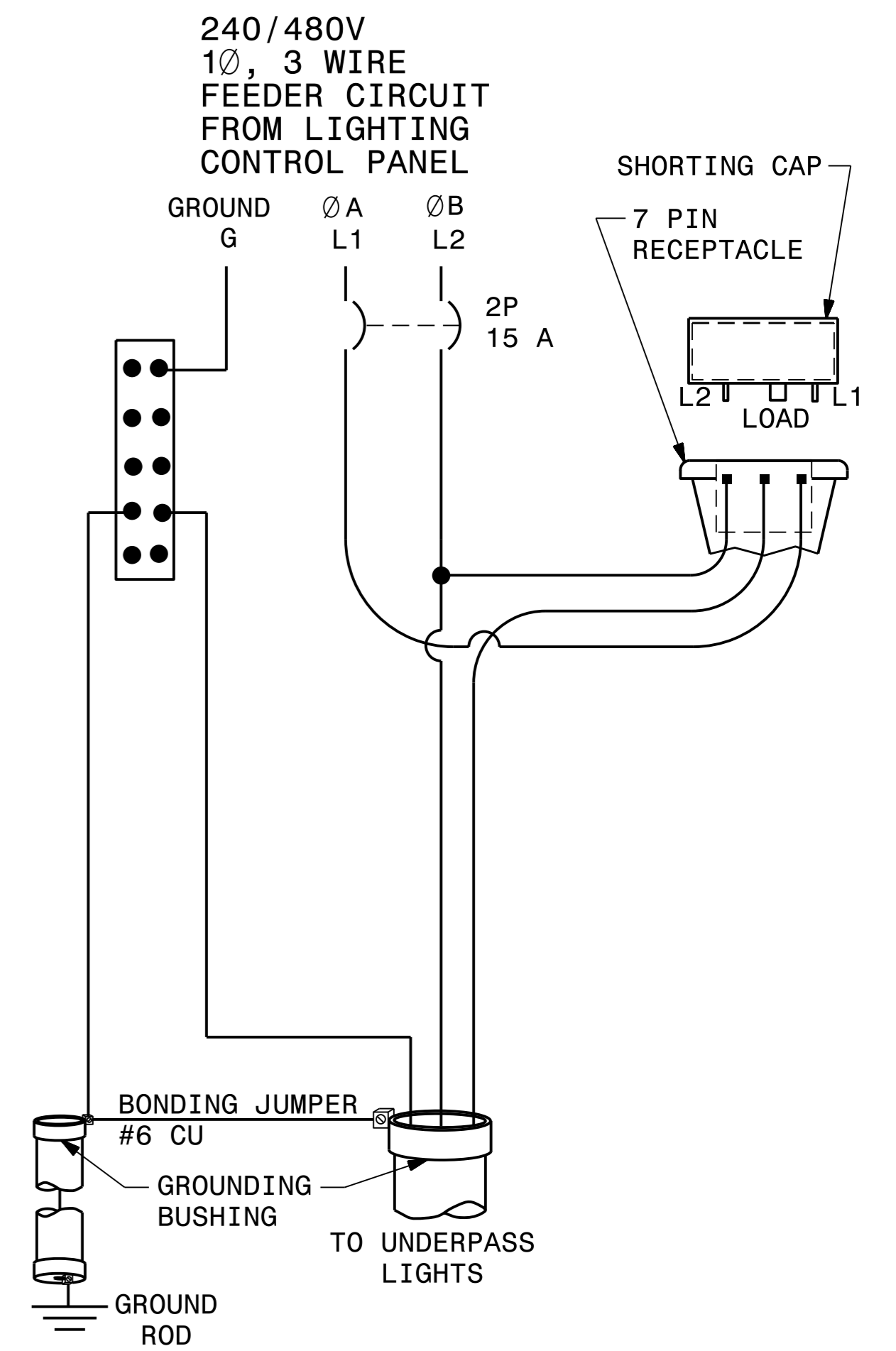


SECTION A-A



**BACK SIDE
DETAIL "B"**

- COMPONENTS**
- ① DIE CAST ALUMINUM HOUSING, DOOR & HINGE
 - ② PRISMATIC REFRACTOR
 - ③ TWO SCREW LATCH



DISCONNECT SCHEMATIC

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2			
1			
Rev.	Date	Description	Approved
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN LIGHTING/ELECTRICAL SECTION LIGHTING DETAILS 1412D01, SHEET 1 UNDERPASS LIGHTING INSTALLED ON RETAINING WALL COPING GUILFORD COUNTY			
Drawn By:	Approved By:	Dwg No.:	
SGK			