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PLANS AND DETAILS FOR PROPOSED LIGHTING /ELECTRICAL CONSTRUCTION

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DocuSigned by: Paul Chan 4/4/2018

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 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 ADJUST LOCATION OF THESE LIGHT STANDARDS AS REQUIRED TO AVOID OVERHEAD TRANSMISSION LINE EASEMENT.
- 9 AT LIGHT STANDARDS A5-1 THROUGH A5-8, THERE IS LIMITED ROOM BETWEEN THE BACK OF CURB OR SIDEWALK AND THE PROPOSED RIGHT-OF-WAY, RESULTING IN THE SYMBOLOGY ON THE PLANS APPEARING TO SHOW THE LIGHT STANDARD AND/OR JUNCTION BOX OUTSIDE OF THE PROPOSED RIGHT-OF-WAY. THE CONTRACTOR SHALL INSTALL ALL LIGHT STANDARDS, JUNCTION BOXES AND FEEDER CIRCUITS IN THE GRASSY STRIP BETWEEN THE BACK OF CURB AND/OR SIDEWALK AND INSIDE OF THE PROPOSED RIGHT-OF-WAY. THE MINIMUM SETBACK OF ANY POLE SHALL BE 10' FROM THE FACE OF CURB.

SCOPE OF WORK

RENOVATE EXISTING ROADWAY LIGHTING SYSTEM BY RELOCATING EXISTING HIGH MAST LIGHT STANDARDS AND INSTALLING SINGLE ARM LIGHT STANDARDS WITH LIGHT EMITTING DIODE LUMINAIRES, UNDERGROUND CIRCUITRY AND JUNCTION BOXES.

DESIGN CRITERIA

- 0.8 AVERAGE FOOTCANDLE ON TRAVEL LANES
- 4:1 AVERAGE TO MINIMUM UNIFORMITY RATIO ON TRAVEL LANES
- 0.3:1 MAXIMUM VEILING LUMINANCE RATIO
- 2005 AASHTO ROADWAY LIGHTING DESIGN GUIDE
- 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
- 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
1401.01	HIGH MOUNT STANDARD
1404.01	LIGHT STANDARDS
1405.01	STANDARD FOUNDATION
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 2018.

LEGEND

- EXISTING 100' HIGH MAST STANDARD. RETAIN OR REPLACE AS NOTED. REPLACE EXISTING HPS FIXTURES WITH LED FIXTURES. REMOVE OR ABANDON EXISTING FOUNDATION OF RELOCATED STANDARDS.
- RELOCATED 100' HIGH MAST STANDARD W/ HM FOUNDATION, JUNCTION BOX (HMxxJB) & (6) HM LED LUMINAIRES 560W MAX, 54,000 MIN. MAINTAINED DELIVERED LUMENS, TYPE V. MAXIMUM BUG RATING 5-0-5. SEE TABLE C, SHEET E1A.
- PROPOSED LIGHT STANDARD TYPE MLTL 45' WITH 15' SINGLE ARM. INCLUDES STANDARD FOUNDATION TYPE R1 OR R2, JUNCTION BOX (LSxxJB) & 185W MAX LED ROADWAY LUMINAIRE. IES DISTRIBUTION: TYPE II OR III AS REQUIRED. MAXIMUM BUG RATING 3-0-3. SEE TABLE C, SHEET E1A.
- EXISTING CONTROL SYSTEM TO REMAIN IN PLACE. REPLACE/REARRANGE BREAKERS AS SHOWN. INSTALL IG36 JUNCTION BOX WITHIN 2' OF EXISTING CONTROL SYSTEM FOUNDATION.
- EXISTING ELECTRICAL JUNCTION BOX. REMOVE OR RETAIN AS SHOWN IN TABLE "C", SHEET E1A.
- PROPOSED ELECTRICAL JUNCTION BOX SEE DETAILS & TABLE C, SHEET E1A.
- PROPOSED FEEDER CIRCUIT CONTROL SYSTEM(A), CIRCUIT(1) PLAN SYMBOL (6) SEE TABLE A, THIS SHEET.
- EXISTING FEEDER CIRCUIT IN CONDUIT TO BE ABANDONED OR REMOVED.
- EXISTING FEEDER CIRCUIT IN CONDUIT. REMOVE AND DISPOSE OF EXISTING CONDUCTOR. REPLACE WITH NEW CONDUCTOR SIZED AS SHOWN IN THE PLANS.
- REFERENCE TO CORRESPONDING NOTE AS NUMBERED.
- PROPOSED ELECTRICAL DUCT SIZE 2", 3" OR 4" TYPE (JA) OR (BD) LOCATION: SEE TABLE B, SHEET E1A.

TABLE "A"
CIRCUITRY CONDUCTOR CONDUIT TYPE & SIZE

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

ABBREVIATIONS

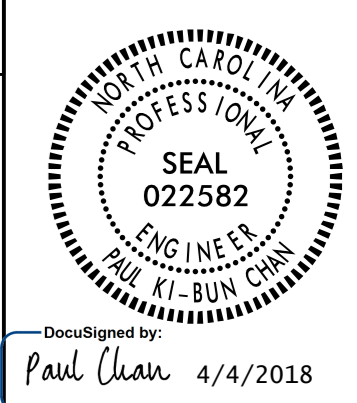
BD	BURIED	PVC	PVC SCHEDULE 40 CONDUIT
LT	LIGHT	RGC	RIGID GALVANIZED STEEL CONDUIT
JA	JACKED	C	CONDUIT
MH	MOUNTING HEIGHT	CKT	CIRCUIT
Ø	PHASE	N	NEUTRAL
SER LAT	SERVICE LATERAL	G	GROUND
IGJB	IN GROUND JUNCTION BOX	HM	HIGH MAST
LED	LIGHT EMITTING DIODE	LSJB	LIGHT STANDARD JUNCTION BOX
HMJB	HIGH MAST JUNCTION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

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**TABLE "C"
JUNCTION BOX SUMMARY**

CONTROL SYSTEM "A"															GPS LOCATION △7 LAT/LONG	
SHEET	LABEL	LOCATION AND OFFSET	IGJB SIZE			LSJB SIZE			HMJB SIZE			CSJB SIZE	BRJB SIZE	SWJB SIZE		
			18"x12"	30"x17"	36"x24"	18"x12"	30"x17"	36"x24"	18"x12"	30"x17"	36"x24"	36"x24"	18"x12"	18"x12"		
E2	JBN1	-RPA- STA. 14+00, 32' RT			X											
E2	JBN2	-RPA- STA. 14+00, 30' LT			X											
E2	JBN3	-L3NB- STA. 819+08, 60' RT			X											
E2	JBN4	-L3SB- STA. 818+59, 60' LT			X											
E2	JBN5	-L3SB- STA. 816+45, 60' LT	X													
E2	JBN6	-L3NB- STA. 817+21, 75' RT	X													
E2	JBN7	-RPC- STA. 22+78, 40' RT	X													
E2	JBN8	-RPC- STA. 22+78, 35' LT	X													
E2	HM1JB	10' FROM HIGH MAST 1						X								
E2	HM2JB	10' FROM HIGH MAST 2								X						
E2	HM5JB	10' FROM HIGH MAST 5						X								
E2	HM6JB	10' FROM HIGH MAST 6						X								
E2	LSA5-1JB	5' FROM LIGHT STANDARD A5-1				X										
E2	LSA5-2JB	5' FROM LIGHT STANDARD A5-2				X										
E2	LSA5-3JB	5' FROM LIGHT STANDARD A5-3				X										
E2	LSA5-4JB	5' FROM LIGHT STANDARD A5-4				X										
E2	LSA5-5JB	5' FROM LIGHT STANDARD A5-5				X										
E2	LSA5-6JB	5' FROM LIGHT STANDARD A5-6				X										
E2	LSA5-7JB	5' FROM LIGHT STANDARD A5-7				X										
E2	LSA5-8JB	5' FROM LIGHT STANDARD A5-8				X										
E2	CSNJB	2' FROM EXISTING CONTROL SYSTEM "N"									X					
	JB1	EXISTING JB - REMOVE														
	JB2	EXISTING JB - REMOVE														
	JB3	EXISTING JB - REMOVE														
	JB4	EXISTING JB - REMOVE														
	JB5	EXISTING JB - RETAIN AND REUSE														
	JB6	EXISTING JB - RETAIN AND REUSE														
	JB7	EXISTING JB - RETAIN AND REUSE														
	JB8	EXISTING JB - RETAIN AND REUSE														
	JB9	EXISTING JB - REMOVE														
	JB10	EXISTING JB - REMOVE														
	JB11	EXISTING JB - REMOVE														
	JB12	EXISTING JB - REMOVE														
	JB13	EXISTING JB - RETAIN AND REUSE														
	JB14	EXISTING JB - REMOVE														
	JB15	EXISTING JB - REMOVE														
	JB16	EXISTING JB - REMOVE														
	JB17	EXISTING JB - REMOVE														
CSA TOTALS*			4	0	4	8	0	0	3	0	1	1	0	0		

*EXISTING JUNCTION BOXES ARE NOT INCLUDED IN THESE TOTALS

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

LOCATION	RACEWAY △1	SHEET	TYPE							
			JACKED (JA) FEET				BURIED (BD) FEET			
			SIZE 2"	SIZE 3"	SIZE 4"	SIZE 6"	SIZE 2"	SIZE 3"	SIZE 4"	SIZE 6"
-Y- STA 32+79		E2		195						
-RPA- STA. 14+00	JBN1 - JBN2	E2			50		85			
-L3SB- STA. 818+82	JBN3 - JBN4	E2			260		300			
BEHIND SLOPE PROTECTION I-77 NORTHBOUND		E2	185							
BEHIND SLOPE PROTECTION I-77 SOUTHBOUND		E2	215							
-RPC- STA. 22+78		E2		50						
-Y- STA. 20+81		E2		185						
CSA TOTALS			400	430	310		385			

SEE SHEET "E1" FOR
LEGEND & △ NOTES

LOAD SCHEDULE
I-77/GILEAD ROAD INTERCHANGE, NE QUAD

CIRCUIT ID	EXISTING**		PROPOSED			
	100' HIGH MAST W/ 6 475W LED LUMINAIRES	100' HIGH MAST W/ 6 475W LED LUMINAIRES	SINGLE ARM @ 185W MAX. LED	AMPS @ 480V	KW LOAD	BREAKER SIZE (AMPS)
A1	HM1	HM1		5.9	2.8	15*
A2	HM2, HM3	HM2, HM3		11.8	5.7	30*
A3	HM4	HM6		5.9	2.8	15*
A4	HM5, HM6	HM4, HM5		11.8	5.7	30*
A5			A5-1 THRU A5-8	3.2	1.5	30*
SPARE						
TOTAL	6	6	8	36.8	18.5	

*RETAIN AND REUSE EXISTING BREAKERS. SWAP EXISTING BREAKERS FOR CIRCUITS A3 AND A4. USE EXISTING 30A SPARE BREAKER FOR CIRCUIT A5.

*LIGHTING AT THIS INTERCHANGE ORIGINALLY INSTALLED WITH HIGH PRESSURE SODIUM (HPS) LUMINAIRES UNDER TIP PROJECT I-3311D, LET 1/20/2005. HPS LUMINAIRES UPGRADED TO LED LUMINAIRES IN 2018 AS PART OF STATEWIDE LED CONVERSION VIA GUARANTEED ENERGY SAVINGS PERFORMANCE CONTRACT WITH BRADY/TRANE SERVICES.

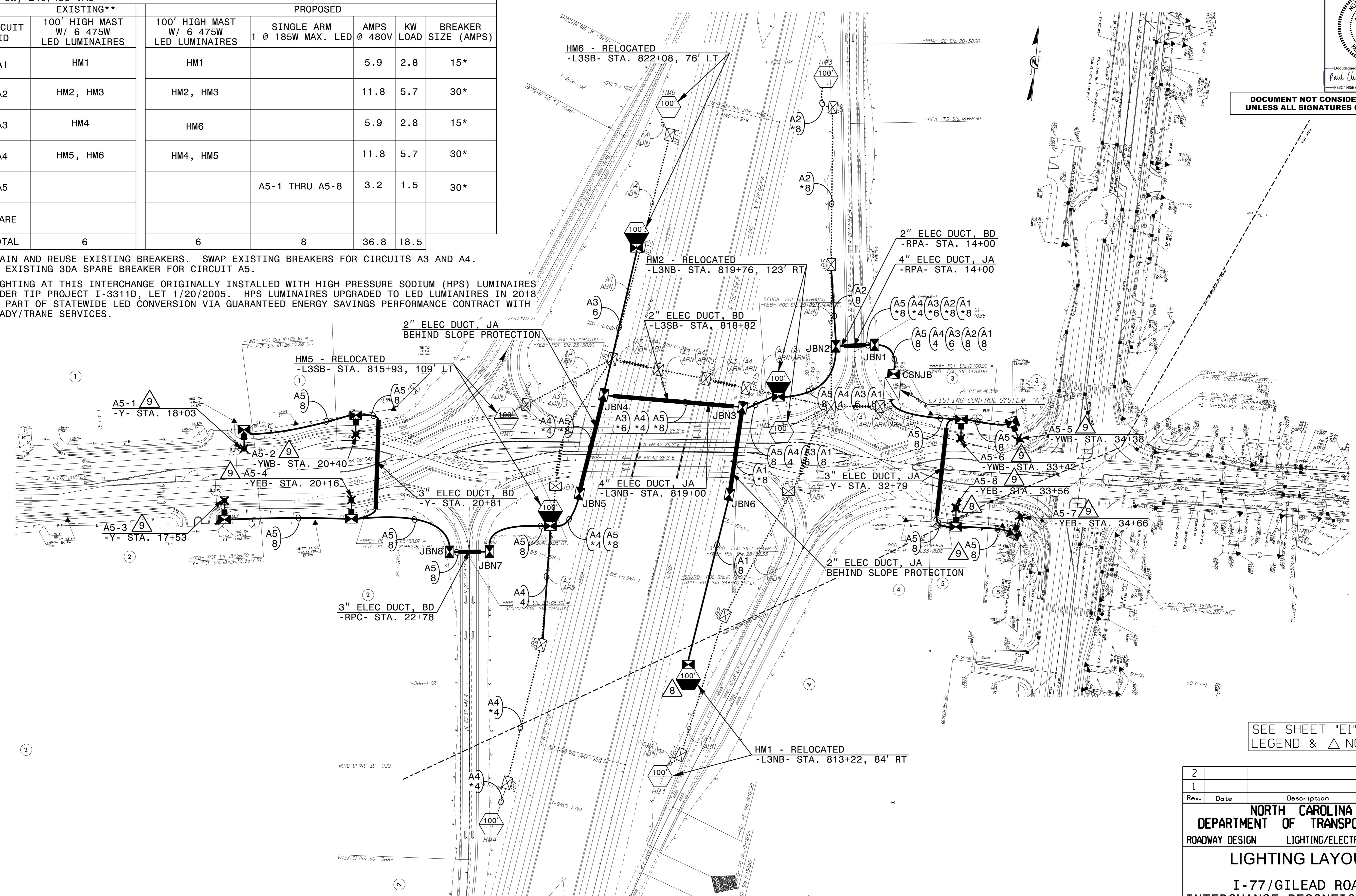
USE FOR LIGHTING CONSTRUCTION ONLY

PROJECT REFERENCE NO. 1-5714 SHEET NO. E2



Designed by: Paul Chan 4/4/2018
PSC#498EEFHAD

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SEE SHEET "E1" FOR LEGEND & △ NOTES

Rev.	Date	Description	Approved
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN LIGHTING/ELECTRICAL SECTION

LIGHTING LAYOUT
I-77/GILEAD ROAD INTERCHANGE RECONFIGURATION

MECKLENBURG COUNTY

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