02/03/98

PROJECT REFERENCE NO.	SHEET NO.
U-5754	E-1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 022942 ENGINEER ROGER C KLUCKMAN

10/1/2021

DocuSigned by: Roger Kluckman

PLANS AND DETAILS FOR PROPOSED LIGHTING /ELECTRICAL CONSTRUCTION

△ 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. 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. REFER TO PLAN SHEETS E-6 & E7 FOR OR THE EXISTING LIGHTING DESIGN.
11. ALL LUMINAIRES REMOVED FROM THE 5 EXISTING HIGH MAST ARE TO BE REUSED ON NEW 120' HM10, HM11 AND HM12 ON CS"V".
12. RUN NEW CONDUCTORS FROM JUNCTION BOX TO THE UNDERPASS LIGHTS DISCONNECT SWITCH.
13. RUN NEW CONDUCTORS WITH CONDUIT FROM CONTROL SYSTEM "W" TO THE EXISTING JUNCTION BOX JB5. INSTALL NEW CONDUCTORS IN EXISTING CONDUIT BETWEEN JB5 AND EXISTING MEDIAN BARRIER RAIL JUNCTION BOX JB4, AND FROM MEDIAN BARRIER RAIL JB4 TO TWIN ARM LIGHT STANDARDS ON MEDIAN BARRIER RAIL.
14. RUN NEW CONDUCTORS WITH CONDUIT FROM CONTROL SYSTEM "W" TO THE EXISTING JUNCTION BOX JB7. INSTALL NEW CONDUCTORS IN EXISTING CONDUIT FROM JB7 TO JB9. CONNECT NEW CONDUCTOR TO EXISTING CONDUCTOR FOR IT CCTV CAMERA IN JB9.
15. EXISTING CONTROL SYSTEM "X" IS TO BE SALVAGED. EXISTING CONTROL SYSTEMS "V" & "W" ARE TO BE DISPOSED OF.
16. REFER TO DETAIL SHEET E-8 FOR CONTROL SYSTEM "V" CONFIGURATION.
17. REFER TO DETAIL SHEET E-9 FOR CONTROL SYSTEM "W" CONFIGURATION.
18. REFER TO DETAIL SHEET E-10 FOR CONTROL SYSTEM "X" CONFIGURATION.
19. CONTROL SYSTEMS "W" AND "X" WILL NOT REQUIRE A LIGHTGRID GATEWAY. ALL EXISTING LUMINAIRES TO BE REUSED FOR CONTROL SYSTEMS "V" "W" "X", WILL BE CONTROLLED FROM THE LIGHTGRID GATEWAY ON CONTROL SYSTEM "V". ALL NEW LUMINAIRES ARE TO BE EQUIPED WITH A PHOTOCELL.
20. SERVICE POLE MAY NOT BE REQUIRED. INSTALL AT THE DIRECTION OF THE ENGINEER.
21. AT THESE LOCATIONS INSTALL CONDUIT FOR BEST ALIGNMENT OF CIRCUITRY.

SCOPE OF WORK

RENOVATE EXISTING ROADWAY LIGHTING SYSTEM BY REPLACING CONTROL SYSTEMS, LIGHT STANDARDS AND HIGH MAST LIGHT STANDARDS. REUSING AND ADDING LIGHT EMITTING DIODE LUMINAIRES. INSTALLING NEW JUNCTION BOXES, CONDUIT AND CIRCUITRY.

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 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

2017 NATIONAL ELECTRICAL CODE

2011 AASHTO ROADSIDE DESIGN GUIDE

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

EQUIVALENTS

TRADE SIZE	METRIC	ENGLISH
½	16mm	½"
¾	21mm	¾"
1	27mm	1"
1.5	41mm	1½"
2	53mm	2"
3	78mm	3"

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
ABN	ABANDON OR REUSE	EX	EXISTING

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
1409.01	ELECTRICAL DUCT
1410.01	FEEDER CIRCUITS
1411.01	ELECTRICAL JUNCTION BOXES
1412.01	UNDERPASS LIGHTING

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

LEGEND

- 120' — PROPOSED 120' HIGH MAST STANDARD W/ HM FOUNDATION, JUNCTION BOX & 8 HM LED LUMINAIRES. REUSE LUMINAIRES FROM REPLACED HM10-HM14. SEE SHEET E-4.
- 100' — PROPOSED 100' HIGH MAST STANDARD W/ HM FOUNDATION, JUNCTION BOX & 6 HM LED LUMINAIRES WITH PHOTOCELLS. 560W MAX,54,000 MIN. MAINTAINED DELIVERED LUMENS, TYPE V.MAXIMUM BUG RATING 5-0-5. SEE SHEETS E-5 & E-6.
- R — PROPOSED LIGHT STANDARD TYPE MTLT 45' WITH 15' SINGLE ARM. INCLUDES STANDARD FOUNDATION TYPE R1 OR R2, JUNCTION BOX & REUSE (R) OF EXISTING LED ROADWAY LUMINAIRE. SEE SHEET E-6.
- N — PROPOSED LIGHT STANDARD TYPE MTLT 45' WITH 15' SINGLE ARM. INCLUDES STANDARD FOUNDATION TYPE R1 OR R2, JUNCTION BOX & 285W MAX LED ROADWAY LUMINAIRE WITH PHOTOCELL("N" NEW). IES DISTRIBUTION:TYPE II OR III AS REQUIRED. MAXIMUM BUG RATING 3-0-3.
- PROPOSED LIGHT STANDARD TYPE MTLT 45' WITH 15' TWIN ARMS. TO BE INSTALLED ON EXISTING STANDARD FOUNDATION IN MEDIAN BARRIER. REUSE LUMINAIRES FROM REMOVED LIGHT STANDARD. SEE SHEET E-6.
- PROPOSED CONTROL SYSTEM WITH JUNCTION BOX. SIZE BREAKERS AS SHOWN IN LOAD SCHEDULE. SEE SHEETS E-4-E-6.
- PROPOSED ELECTRICAL JUNCTION BOX. SEE TABLE C, SHEET E-1A, FOR DETAILS AND TYPE.
- STATION WITH PANEL P1 MAIN CB AND CCTV SERVICE DISCONNECT AT CONTROL SYSTEM "W". SEE SHEET E-9 FOR DETAILS.
- 120' — EXISTING 120' HIGH MAST STANDARD TO BE REMOVED. REMOVE OR ABANDON FOUNDATION. SEE SHEET E-2 FOR EXISTING LIGHTING.
- 100' — EXISTING 100' HIGH MAST STANDARD TO BE REMOVED. REMOVE OR ABANDON FOUNDATION. SEE SHEET E-3 FOR EXISTING LIGHTING.
- EXISTING SINGLE ARM LIGHT STANDARD TO BE REMOVED. ABANDON OR REMOVE FOUNDATION. SEE SHEET E-3.
- LOCATION OF EXISTING SINGLE ARM LIGHT STANDARD THAT HAS BEEN HIT OR REMOVED AND HAS NOT BEEN REPLACED. REMOVE FOUNDATION. SEE SHEET E-3.
- EXISTING TWIN ARM LIGHT STANDARD TO BE REMOVED. SEE SHEET E-3.
- EXISTING CONTROL SYSTEMS "V" AND "W" ARE TO BE REMOVED. REMOVE LIGHTGRID COMPONENTS AND MOVE TO STORAGE TO BE RE-USED. SEE SHEETS E-5 - E-7.
- EXISTING ELECTRICAL JUNCTION BOX. REMOVE UNLESS OTHERWISE NOTED ON THE PLANS.
- 1 — REFERENCE TO CORRESPONDING NOTE AS NUMBERED.
- A1 / 8 — PROPOSED FEEDER CIRCUIT. CONTROL SYSTEM (A), CIRCUIT NUMBER (1) PLAN SYMBOL (6). SEE TABLE A, THIS SHEET.
- SER LAT 3 #1/0 USE 2" C — PROPOSED 30' CLASS 4 SERVICE POLE AND LATERAL 3 #1/0 USE CONDUCTORS 2" CONDUIT
- 2", 3" OR 4" ELEC. DUCT JA & BD — PROPOSED ELECTRICAL DUCT SIZE 2", 3" OR 4" TYPE (JA) OR (BD) LOCATION: SEE TABLE B, SHEET E-1A.
- EXISTING CIRCUITRY. SEE SHEET E-2 & E-3.
- EXISTING CONDUIT TO BE REUSED. SEE SHEET E-5.
- EXISTING PROTECTIVE SLEEVE AND CONDUIT TO BE REUSED. SEE SHEET E-5.
- ITS CCTV CAMERA. SEE SHEET E-5.

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