



PLANS AND DETAILS FOR PROPOSED LIGHTING / ELECTRICAL CONSTRUCTION

| | |
|--|------------------------|
| PROJECT REFERENCE NO. R-5000 | SHEET NO. E1 |
| LIGHTING ENGINEER | |
|  Barry L. Breneman 7/19/2012 | |
| PLANS PREPARED BY: | |
|  RUMMEL, KLEPPER & KAHL, LLP 601 N. CALVERT STREET BALTIMORE, MARYLAND 21202 (410) 728-2900 | |

NOTES

1. AT THESE LOCATIONS, PROVIDE ELECTRICAL DUCT IN ACCORDANCE WITH NEC REQUIREMENTS FOR AN APPROVED RACEWAY FOR ELECTRICAL CIRCUITS. WHEN MORE THAN ONE CIRCUIT IS INSTALLED IN A SINGLE RACEWAY, A SINGLE EQUIPMENT GROUNDING CONDUCTOR SIZED AS REQUIRED FOR THE LARGEST CIRCUIT SHALL BE USED.
2. 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.
3. TYPE PC18 JUNCTION BOX - 18" L X 12" W X 18" H.
4. INSTALL LIGHT POLE AND 10' TRUSS ARM ON BREAKAWAY BASE BEHIND GUARDRAIL AND IN FRONT OF RETAINING WALL.
5. INSTALL LIGHT POLE AND 12' TRUSS ARM BEHIND GUARD RAIL.
6. RELOCATE EXISTING LIGHT POLE AND LUMINAIRE. COMPLETELY REMOVE EXISTING FOUNDATION. SEE SHEET C-10 OF STRUCTURE PLANS FOR NEW FOUNDATION DETAILS AND LOCATIONS.
7. INTERCEPT EXISTING CONDUIT RUN WITH A PC18 JUNCTION BOX. PULL BACK EXISTING CABLE INTO JUNCTION BOX AND COIL DURING CULVERT CONSTRUCTION. AFTER CULVERT CONSTRUCTION IS COMPLETE, RECONNECT EXISTING CABLES TO RELOCATED LIGHT THROUGH NEW CONDUIT.
8. CONTRACTOR TO FIELD VERIFY EXISTING NUMBER AND SIZE OF CONDUIT AND CABLES. PHOTOGRAPHS INSIDE EXISTING JUNCTION BOX SHOW THE FOLLOWING CROSSING THE DRIVEWAY:
 - CONDUIT #1, APPROXIMATE 1½" DIAMETER WITH (4) #8AWG CABLES
 - CONDUIT #2, APPROXIMATE 1½" DIAMETER WITH (7) #8AWG CABLES
 - CONDUIT #3, APPROXIMATE 2" DIAMETER WITH (9) #8AWG CABLES
 REPLACE CONDUITS AND CABLES AS NEEDED IF IMPACTED BY CONSTRUCTION.
9. CONTRACTOR SHALL FIELD VERIFY NUMBER AND SIZE OF CABLES SERVICING EXISTING LIGHTS AND REPLACE IN KIND. LIGHTS SHALL BE WIRED TO THE SAME CIRCUIT AND PHASE AS EXISTING.
10. INTERCEPT EXISTING CONDUIT RUN WITH A PC18 JUNCTION BOX. PULL BACK EXISTING CABLE INTO JUNCTION BOX AND COIL DURING LIGHT STANDARD REMOVAL. AFTER REMOVAL OF THE LIGHT STANDARD IS COMPLETE, RECONNECT EXISTING PARKING LOT LIGHT STANDARDS TO REMAIN TO THE SAME CIRCUIT AND PHASE AS EXISTING. INSTALL NEW CONDUIT AND CABLE AS NEEDED TO ENSURE ALL PARKING LOT LIGHTS ARE OPERATIONAL UPON COMPLETION OF CONSTRUCTION.
11. EXISTING LIGHT STANDARD TO REMAIN.
12. REMOVE EXISTING PARKING LOT LIGHT STANDARD AND FOUNDATION. RETURN LIGHT STANDARD TO THE SOUTHWEST COMMUNITY COLLEGE.
13. EXISTING JUNCTION BOX TO REMAIN.
14. EXISTING JUNCTION BOX TO BE REMOVED AND REPLACED.
15. CONTRACTOR TO FIELD VERIFY EXISTING NUMBER AND SIZE OF CONDUIT AND CABLES. PHOTOGRAPHS INSIDE EXISTING JUNCTION BOX SHOW THE FOLLOWING CROSSING THE DRIVEWAY:
 - CONDUIT #1, APPROXIMATE 1" DIAMETER WITH (3) #8AWG CABLES
 REPLACE CONDUIT AND CABLES AS NEEDED IF IMPACTED BY CONSTRUCTION.
16. EXISTING JUNCTION BOX TO REMAIN OR BE REPLACED AS NEEDED IF IMPACTED BY CONSTRUCTION.

SCOPE OF WORK

PLACE ROADWAY LIGHTING INTO SERVICE BY DESIGNING, FURNISHING AND INSTALLING SINGLE ARM STANDARDS WITH HIGH PRESSURE SODIUM LUMINAIRES, UNDERGROUND CIRCUITRY, CONTROL SYSTEMS AND JUNCTION BOXES.

DESIGN CRITERIA

- 2005 AASHTO ROADWAY LIGHTING DESIGN GUIDE
- 2011 NATIONAL ELECTRIC CODE
- 2011 AASHTO ROADSIDE DESIGN GUIDE
- 2001 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS AND LATEST INTERIM SPECIFICATIONS VALID AT TIME OF LETTING.

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 2012 AND AS MODIFIED BY THE REQUEST FOR PROPOSAL ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

| STD NO. | TITLE |
|---------|---|
| 1404.01 | LIGHT STANDARDS |
| 1405.01 | STANDARD FOUNDATION |
| 1406.01 | LIGHT STANDARD LUMINAIRES |
| 1407.01 | ELECTRIC SERVICE POLE AND LATERAL |
| 1408.01 | LIGHT CONTROL SYSTEM (AS MODIFIED BY DETAILS ON SHEET E3) |
| 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 2012.

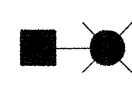
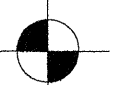




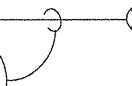
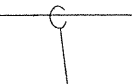
ABBREVIATIONS

| | | | |
|---------|-----------------|-----|--------------------------------|
| LT | LEFT | PVC | PVC SCHEDULE 40 CONDUIT |
| RT | RIGHT | RGC | RIGID GALVANIZED STEEL CONDUIT |
| JA | JACKED | C | CONDUIT |
| MH | MOUNTING HEIGHT | CKT | CIRCUIT |
| ∅ | PHASE | N | NEUTRAL |
| SER LAT | SERVICE LATERAL | G | GROUND |
| AL | ARM LENGTH | USE | UNDERGROUND SERVICE ENTRANCE |
| BD | BURIED | | |

LUMINAIRE SCHEDULE

| TYPE | LAMP | VOLTAGE | DISTRIBUTION | MOUNTING |
|-----------|----------|---------|----------------------|-------------------------------------|
| COBRAHEAD | 150W HPS | 240V | TYPE III FULL CUTOFF | SINGLE TRUSS ARM: ARM LENGTH VARIES |

LEGEND

-  PROPOSED 30' SINGLE-ARM LIGHT STANDARD 150 WATT, HPS, FULL CUTOFF, DISTRIBUTION TYPE III, 15' TRUSS ARM, UNLESS NOTED OTHERWISE
-  EXISTING RELOCATED PARKING LOT LIGHT STANDARD AND LUMINAIRES
-  PROPOSED CONTROL SYSTEM WITH PC36 JUNCTION BOX. BREAKER SIZE SHOWN IN LOAD SCHEDULES
-  JB1 PROPOSED ELECTRICAL JUNCTION BOX SEE NOTES, THIS SHEET AND TABLE B ON SHEET E2
-  REFERENCE TO CORRESPONDING NOTE AS NUMBERED
-  PROPOSED FEEDER CIRCUIT CONTROL SYSTEM(A), CIRCUIT(1) PLAN SYMBOL (6) SEE TABLE A, THIS SHEET
-  PROPOSED SERVICE POLE AND LATERAL 30' CLASS 4 3#10 USE CONDUCTORS 2" CONDUIT
-  PROPOSED ELECTRICAL DUCT SIZE 2", 3", OR 4" TYPE (JA) OR (BD)

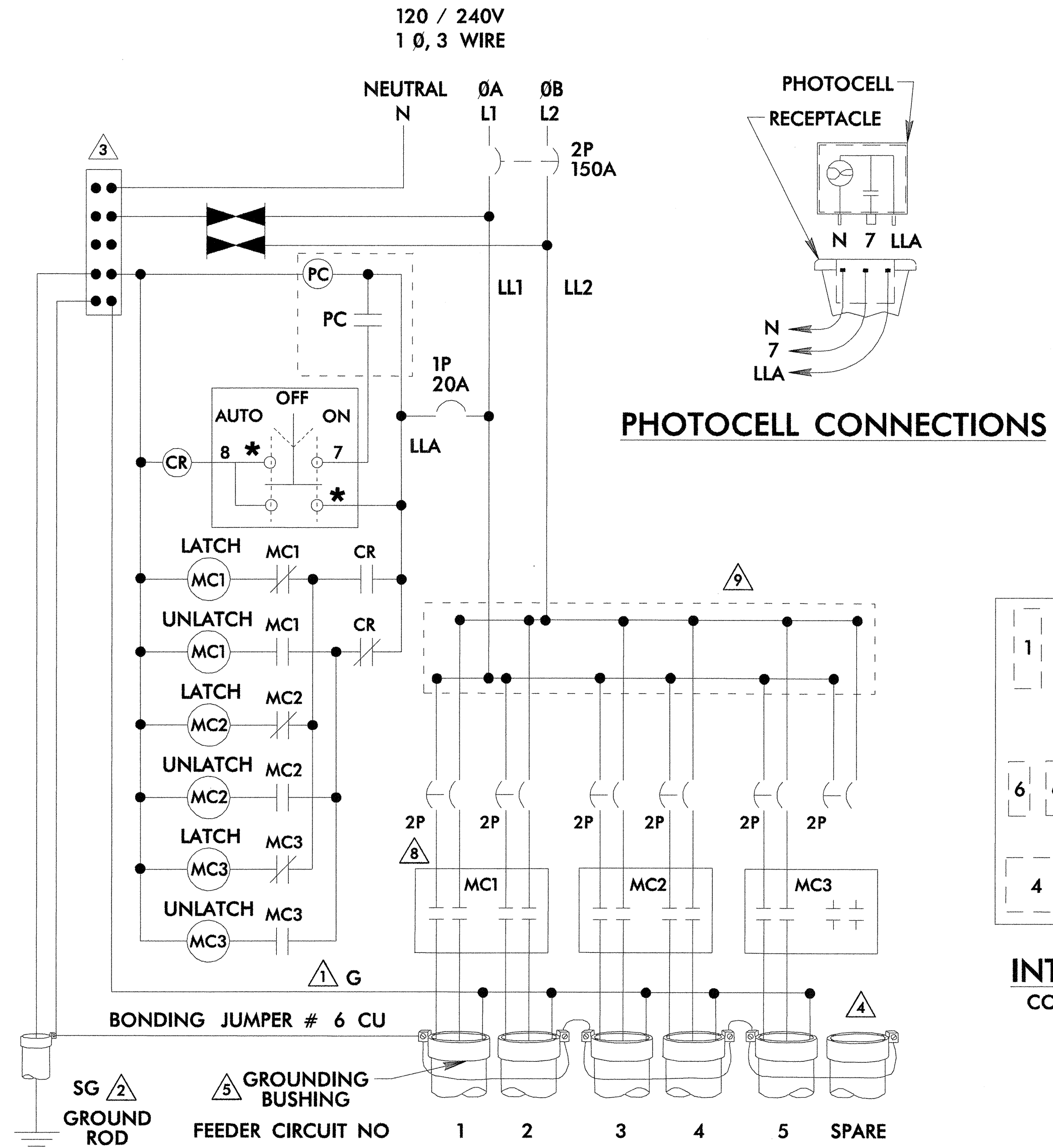
2", 3", OR 4" ELEC. DUCT JA & BD

| PLAN SYMBOL | DESCRIPTION | | CONTRACT ITEM |
|-------------|---------------------------|---|--|
| 8 | 2#8 ∅ 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 ∅ 1 #10G | 2 AWG SIZE 8 CONDUCTOR (BK & RD) 1 AWG SIZE 10 GROUNDING CONDUCTOR | 2 - 8 W/G FEEDER CIRCUIT |

LIGHTING NOTES AND LEGEND

| | | | |
|--------------|----------|---|-----------|
| LOCATION: | | PROPOSED INTERCHANGE OF NC 107 AND NEW CONNECTOR | |
| TIP NO.: | R-5000 | COUNTY: | JACKSON |
| DESIGNED BY: | W. BEBEN | | |
| CHECKED BY: | H. HENCK | DATE: | 7/10/2012 |

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LIGHTING CONTROL SYSTEM SCHEMATIC

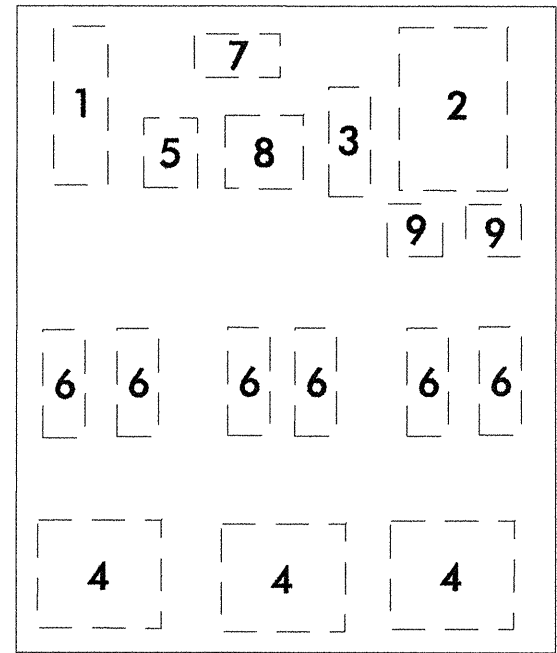
(MODIFICATION TO NC DOT STANDARD DRAWING 1408.01 SHEET 1 OF 3)
NOT TO SCALE

| # | QTY | DESCRIPTION | SPECIFICATIONS |
|---|-----|-----------------------------------|---------------------------|
| 1 | 1 | NEUTRAL BAR | |
| 2 | 1 | SERVICE CIRCUIT BREAKER | 2P, 240V, 150A |
| 3 | 1 | CONTROL CIRCUIT BREAKER | 1P, 120V, 20A |
| 4 | 3 | MECHANICALLY HELD CONTACTORS | 4P, 240V, 60A W/120V COIL |
| 5 | 1 | CONTROL RELAY W/NC & NO CONTACT | 120V, 10A, W/120V COIL |
| 6 | 6 | FEEDER CIRCUIT BREAKERS | 2P, 240V, 50A MAX |
| 7 | 1 | LIGHTING ARRESTER | |
| 8 | 1 | SELECTOR SWITCH (ON-OFF-AUTO) | 120V, 10A |
| 9 | 2 | POWER DISTRIBUTION LUGS OR BLOCKS | |
| | | MOUNTING BRACKETS OR SCREW STUDS | |

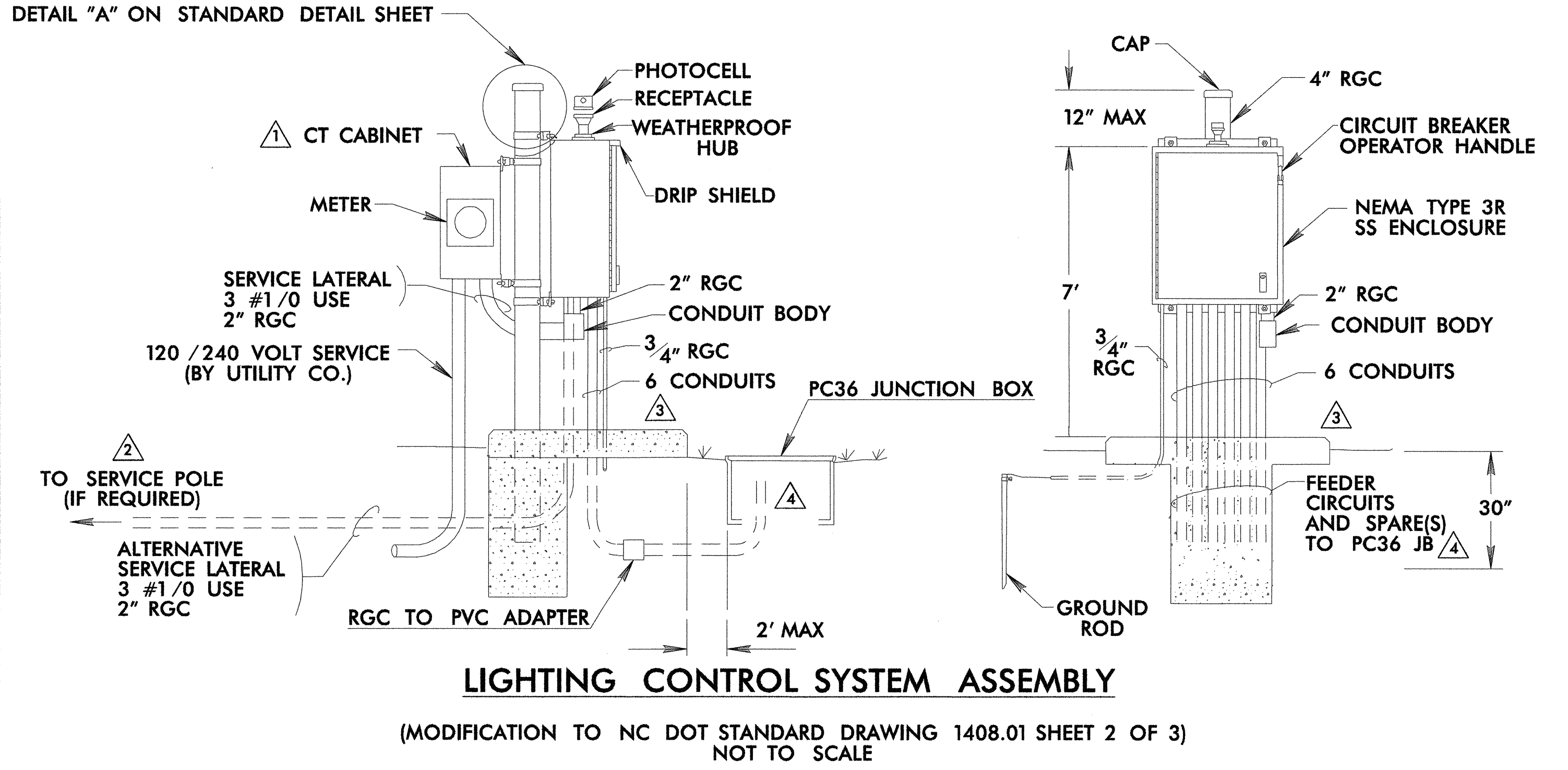
NOTES

- 1. CURRENT TRANSFORMER (CT) CABINET AND METER MAY BE MOUNTED ON SERVICE POLE OR BACK OF CONTROL ENCLOSURE.
- 2. SEE SECTION 1407 OF THE STANDARD SPECIFICATIONS FOR SERVICE POLE AND SERVICE LATERAL.
- 3. SEE DRAWINGS FOR SIZE OF CONDUITS AND/OR ELECTRICAL DUCT.
- 4. STUB FEEDER CIRCUIT CONDUITS INTO JUNCTION BOX. CAP UNUSED CONDUITS. FEEDER CIRCUITS MUST BE MINIMUM 30" BELOW GRADE.

- 5. SEE SECTION 1411 OF THE STANDARD SPECIFICATIONS FOR JUNCTION BOX INSTALLATION.
- 6. ALL ABOVE GROUND CIRCUITRY TO BE INSTALLED IN RIGID GALVANIZED CONDUIT. UNDERGROUND FEEDER CIRCUITS TO BE INSTALLED IN SHC 40 PVC CONDUIT.
- 7. LIGHTING ARRESTOR INSTALLED OUTSIDE OF CABINET. NOT SHOWN FOR CLARITY.



INTERIOR PANEL COMPONENT LAYOUT
6, 7, 8, 9, 10, 11

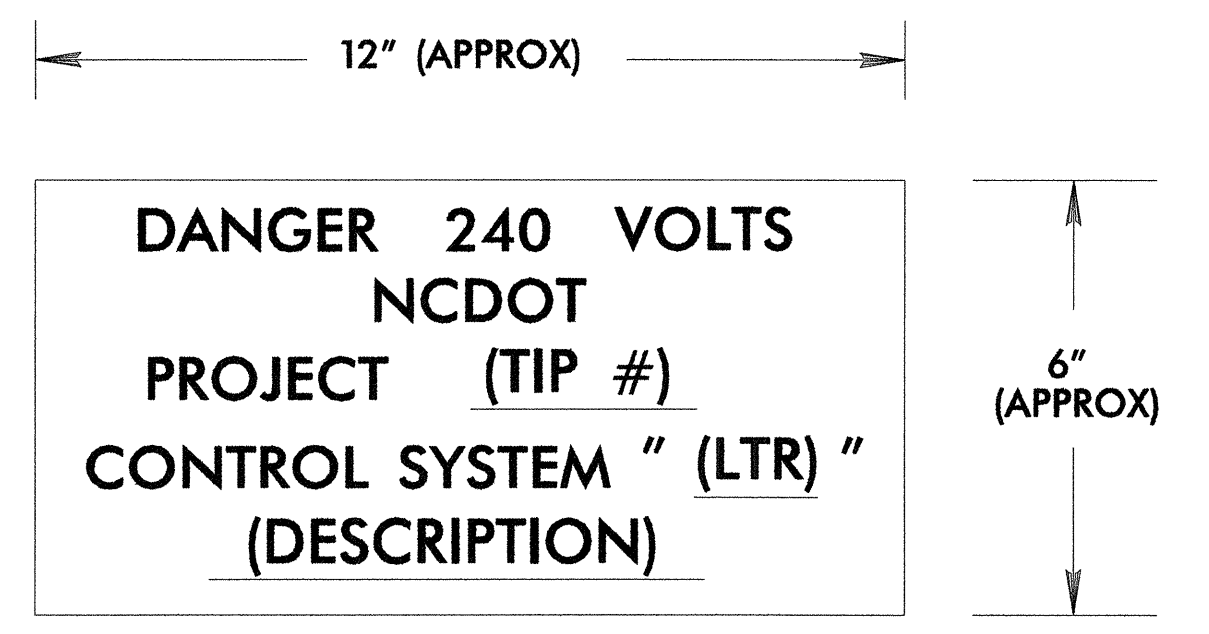


LIGHTING CONTROL SYSTEM ASSEMBLY

(MODIFICATION TO NC DOT STANDARD DRAWING 1408.01 SHEET 2 OF 3)
NOT TO SCALE

NOTES

- 1. EQUIPMENT GROUNDS (G) SHALL BE SIZED ACCORDING TO CIRCUIT DESCRIPTION. SEE PLANS.
- 2. SYSTEM GROUND (SG) SHALL BE CONTINUOUS FROM NEUTRAL BAR TO THE GROUNDING ELECTRODE (GROUND ROD).
- 3. THE NEUTRAL BAR SHALL BE BONDED TO THE PANEL.
- 4. FEEDER CIRCUITS NOT SHOWN ON THE PLANS SHALL NOT BE INSTALLED, BUT CONDUIT SHALL BE INSTALLED AND CAPPED.
- 5. INSTALL A GROUNDING BUSHING ON EACH METAL CONDUIT. CONNECT BONDING JUMPER AS REQUIRED BY NEC.
- 6. SEE NC DOT STANDARD SHEET 3 OF 3 DRAWING 1408.01 FOR ENCLOSURE.
- 7. THE CONTROL SYSTEM MUST BE LABELED "SUITABLE FOR USE AS SERVICE EQUIPMENT." REFER TO NC DOT STANDARD SPECIFICATION 1408-2 FOR OTHER REQUIREMENTS.
- 8. SEE DRAWINGS 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 LIGHTING ARRESTOR ON OUTSIDE OF CABINET ASSEMBLY.



NEMA TYPE 3R STAINLESS STEEL ENCLOSURE LABEL

(MODIFICATION TO NC DOT STANDARD DRAWING 1408.01 SHEET 3 OF 3)
NOT TO SCALE

LIGHTING ELECTRICAL CONSTRUCTION DETAILS

| | | |
|--------------|--|-----------------|
| LOCATION: | PROPOSED INTERCHANGE OF NC 107 AND NEW CONNECTOR | |
| TIP NO.: | R-5000 | COUNTY: JACKSON |
| DESIGNED BY: | W. BEBEN | |
| CHECKED BY: | H. HENCK | DATE: 7/10/2012 |

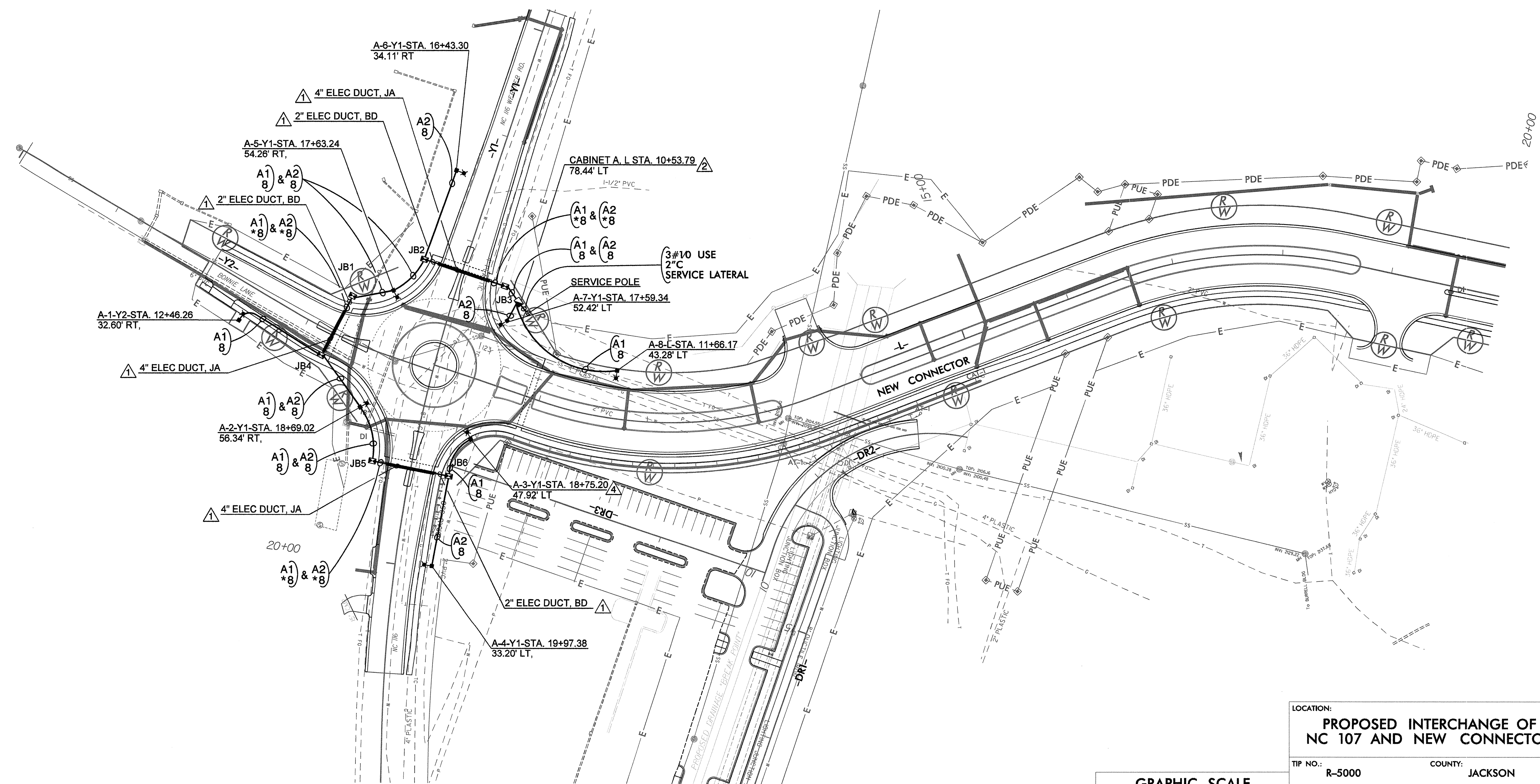
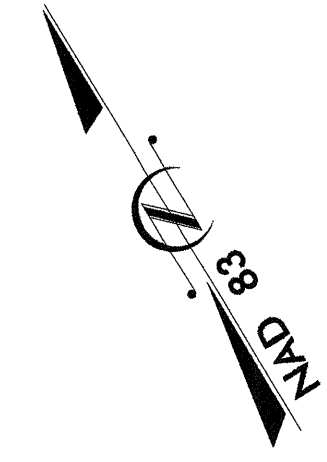
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SEE SHEET "E1" FOR
LEGEND & △ NOTES

USE FOR LIGHTING CONSTRUCTION ONLY

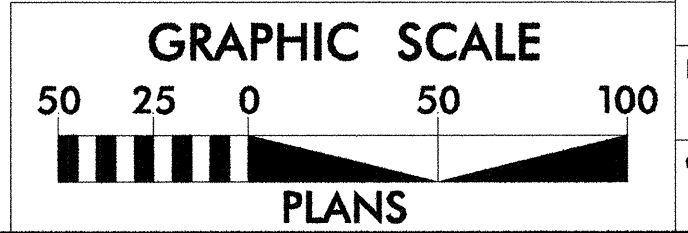
| LOAD SCHEDULE | | | | |
|--|-------------------------|---------------|------------|------------------------|
| NC-116 - NEW CONNECTOR ROAD CONTROL SYSTEM "A" | | | | |
| 1Ø, 3W, 120/240 VAC | | | | |
| CKT | SINGLE ARM 1@150WATT | AMPS @240V | KW LOAD | BREAKER SIZE (AMPS) |
| A1 | A-1, A-3 A-5, A-8 | 3.6 | 0.9 KW | 20 |
| A2 | A-2, A-4 A-6, A-7 | 3.6 | 0.9 KW | 20 |
| SPARE | - | - | - | 20 |
| SPARE | - | - | - | 20 |
| SPARE | - | - | - | 20 |
| TOTAL | 8 | 7.2 | 1.8 | |

| | |
|--|------------------------|
| PROJECT REFERENCE NO. R-5000 | SHEET NO. E4 |
| LIGHTING ENGINEER | |
| | |
| 7/19/2012 | |
| PLANS PREPARED BY: RK&K RUMMEL, KLEPPER & KAHL, LLP 601 N. CALVERT STREET BALTIMORE, MARYLAND 21202 (410) 728-2900 | |



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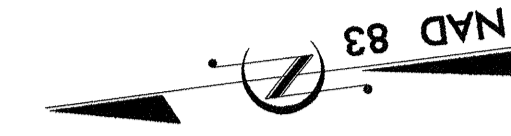
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| TIP NO.: R-5000 | COUNTY: JACKSON |
| DESIGNED BY: W. BEBEN | |
| CHECKED BY: H. HENCK | DATE: 7/10/2012 |



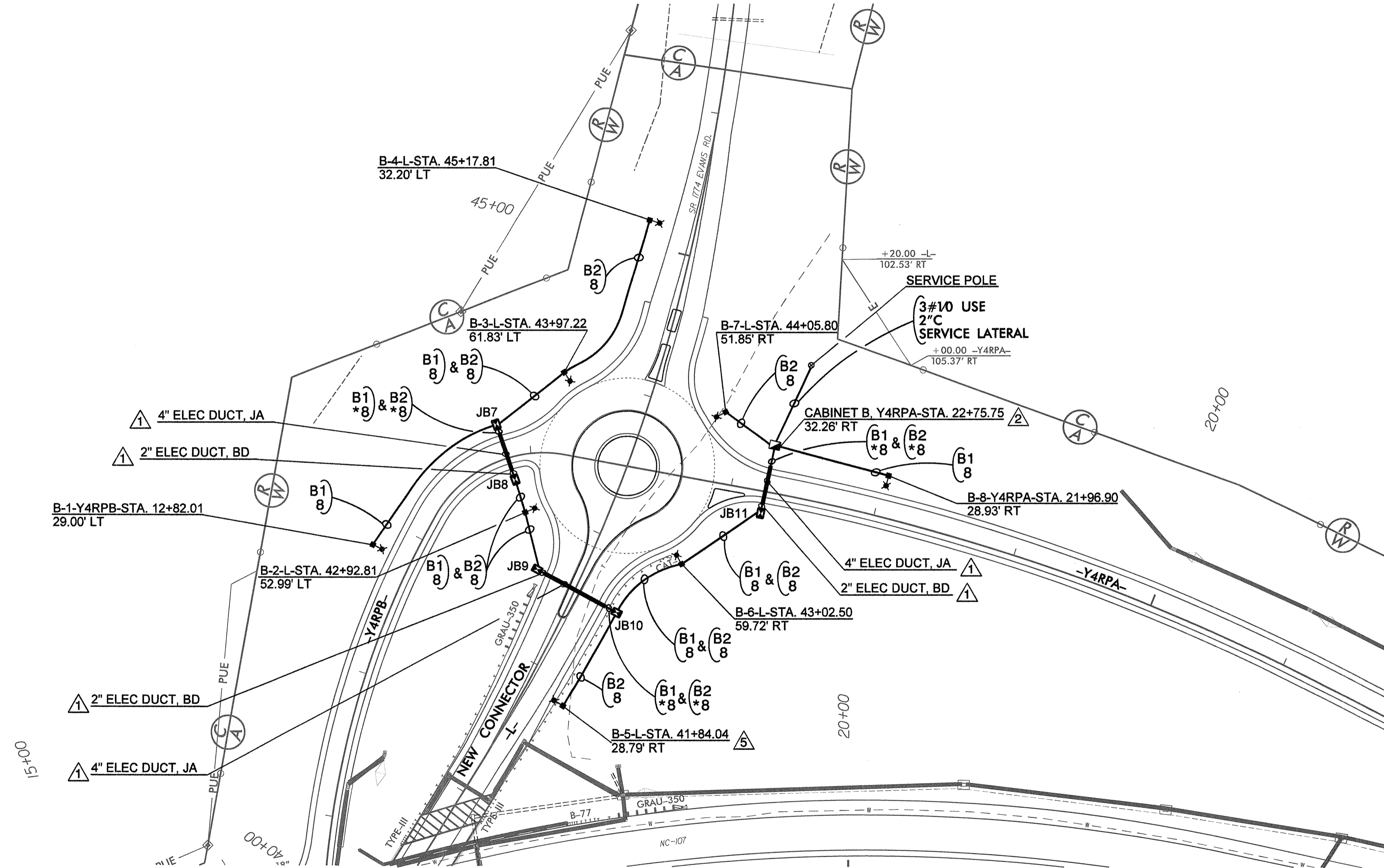
SEE SHEET "E1" FOR
LEGEND & △ NOTES

| LOAD SCHEDULE | | | | |
|--|-------------------------|---------------|------------|------------------------|
| NC-116 - NEW CONNECTOR ROAD | | | | |
| 1Ø, 3W, 120/240 VAC CONTROL SYSTEM "B" | | | | |
| CKT | SINGLE ARM 1@150WATT | AMPS @240V | KW LOAD | BREAKER SIZE (AMPS) |
| B1 | B-1, B-3 B-6, B-8 | 3.6 | 0.9 KW | 20 |
| B2 | B-2, B-4 B-5, B-7 | 3.6 | 0.9 KW | 20 |
| SPARE | - | - | - | 20 |
| SPARE | - | - | - | 20 |
| SPARE | - | - | - | 20 |
| TOTAL | 8 | 7.2 | 1.8 | |

USE FOR LIGHTING CONSTRUCTION ONLY

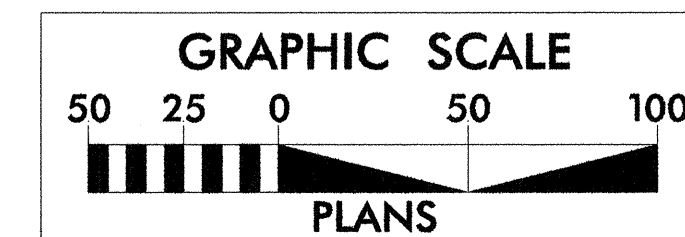


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|---|------------------------|
| PROJECT REFERENCE NO. R-5000 | SHEET NO. E5 |
| LIGHTING ENGINEER | |
| | |
| 7/19/2012 | |
| PLANS PREPARED BY: | |
| | |
| <small>RUMMEL, KLEPPER & KAHL, LLP 601 N. CALVERT STREET BALTIMORE, MARYLAND 21202 (410) 728-2900</small> | |



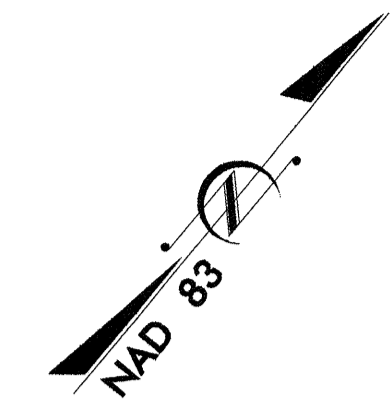
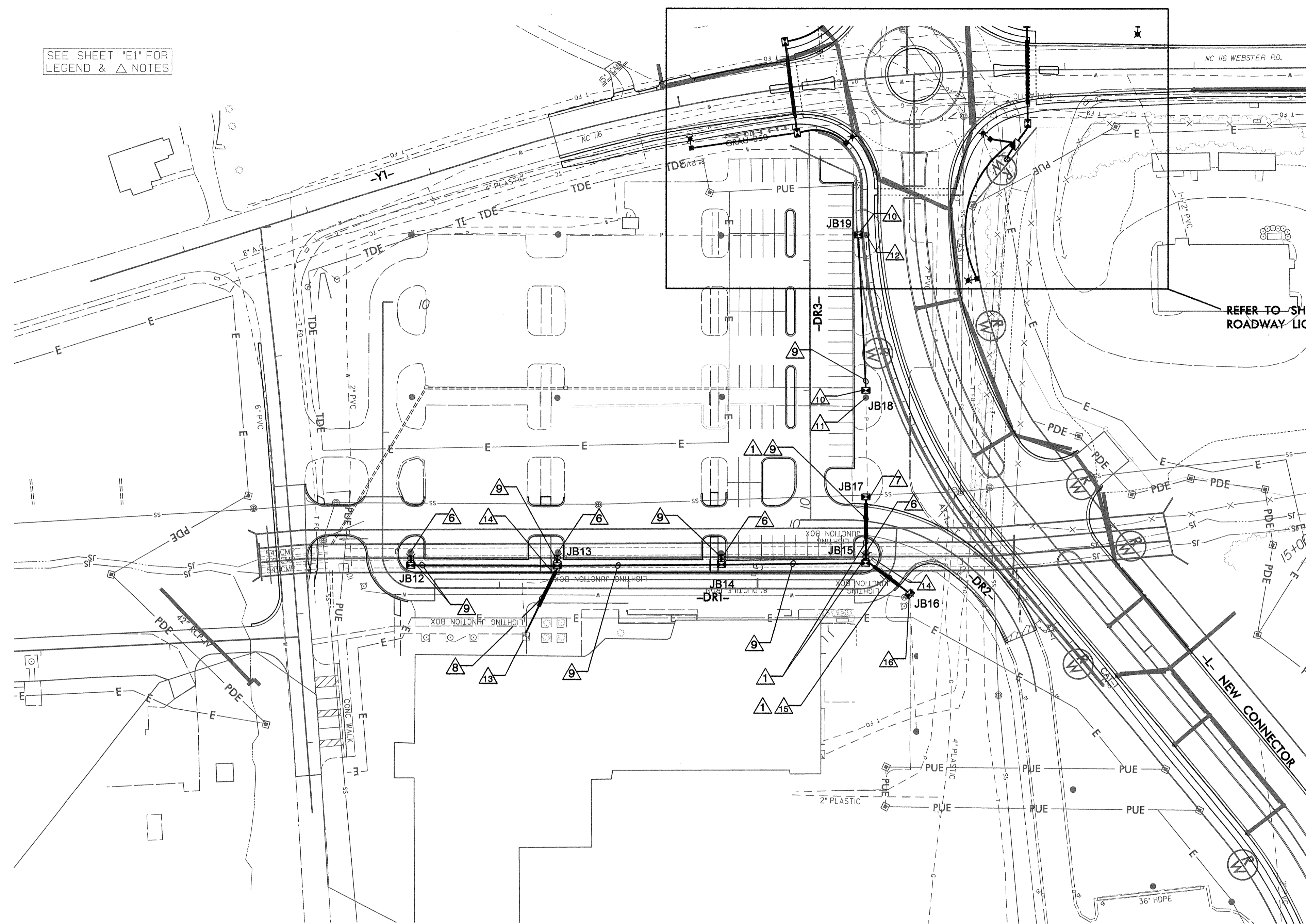
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| TIP NO.: R-5000 | COUNTY: JACKSON |
| DESIGNED BY: W. BEBEN | |
| CHECKED BY: H. HENCK | DATE: 7/10/2012 |



SEE SHEET "E1" FOR
LEGEND & Δ NOTES

USE FOR LIGHTING CONSTRUCTION ONLY

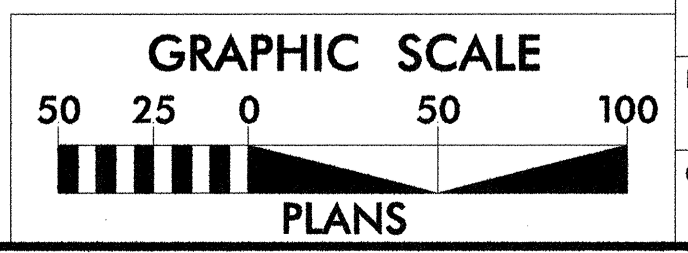


REFER TO SHEET E4 FOR
ROADWAY LIGHTING PLAN.

| | |
|---|------------------------|
| PROJECT REFERENCE NO. R-5000 | SHEET NO. E6 |
| LIGHTING ENGINEER | |
| | |
| 7/19/2012 | |
| PLANS PREPARED BY: | |
| | |
| <small>RUMMEL, KLEPPER & KAHL, LLP 601 N. CALVERT STREET BALTIMORE, MARYLAND 21202 (410) 728-2900</small> | |

NOTES:

1. ALL WORK SHOWN ON THIS PLAN SHEET SHALL BE PAID FOR UNDER THE LUMP SUM ITEM "REMOVE AND RELOCATE LIGHT STANDARDS".
2. EXISTING UNDERGROUND ELECTRIC SERVICING THE PARKING LOT LIGHT STANDARDS IS UNKNOWN. THIS PLAN SHOWS A REPRESENTATION OF THE TYPE OF WORK ANTICIPATED TO REMOVE AND RESET THE EXISTING PARKING LOT LIGHT STANDARDS.
3. THE CONTRACTOR IS REQUIRED TO FIELD VERIFY THE EXISTING UNDERGROUND ELECTRIC SERVICING THE LIGHTS, INCLUDING NUMBER AND SIZE OF CONDUITS AND CABLES. CABLES SHALL BE REPLACED IN KIND AND INSTALLED IN CONDUIT SIZED PER NEC REQUIREMENTS.
4. ALL EXISTING LIGHTING TO REMAIN SHALL BE OPERATIONAL AT THE COMPLETION OF CONSTRUCTION. ALL LIGHTS SHALL BE CONNECTED TO THE SAME CIRCUIT AND PHASE AS EXISTING.



| | | |
|--------------|---|-----------------|
| LOCATION: | PROPOSED INTERCHANGE OF NC 107 AND NEW CONNECTOR | |
| TIP NO.: | R-5000 | COUNTY: JACKSON |
| DESIGNED BY: | W. BEBEN | |
| CHECKED BY: | H. HENCK | DATE: 7/10/2012 |

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