PROJECT REFERENCE NO.	SHEET NO.
U-2408	E1

METRIC

PLANS AND DETAILS FOR PROPOSED LIGHTING /ELECTRICAL CONSTRUCTION

NOTES

1. LOCATE ALL JUNCTION BOXES OUTSIDE CLEAR ZONE AND IN AN AREA UNLIKELY TO USED BY TRAFFIC.
2. TYPE PC18 JUNCTION BOXES ARE 457mm L X 305mm W X 457mm H.
3. LOCATE ALL BORE PITS OUTSIDE THE CLEAR ZONE AS DEFINED IN THE 2002 AASHTO ROADSIDE DESIGN GUIDE OR AS DIRECTED BY THE ENGINEER.
4. LOCATE PROPOSED ELECTRICAL DUCT BENEATH RAMPS FOR BEST ALIGNMENT OF CIRCUITS.
5. TRENCH CIRCUITRY THROUGH EXISTING PATH IN TREES INSIDE LOOPS. AVOID DISRUPTING EXISTING LANDSCAPING AS MUCH AS POSSIBLE.
6. AT THESE LOCATIONS, PROVIDE ELECTRICAL DUCT IN ACCORDANCE WITH NEC REQUIREMENTS FOR AN APPROVED RACEWAY FOR ELECTRICAL CIRCUITS. SEE TABLE "C".
7. LOCATE PROPOSED CONTROL SYSTEM IN AN AREA ACCESSIBLE FOR MAINTENANCE VEHICLES AND OUTSIDE THE CLEAR ZONE AS DEFINED BY THE 2002 AASHTO ROADSIDE DESIGN GUIDE.
8. SURVEY LINE Y35 EXTENDED FOR REFERENCE ON THESE PLANSHEETS ONLY.

SCOPE OF WORK

PROVIDE ROADWAY LIGHTING BY PROVIDING AND INSTALLING HIGH PRESSURE SODIUM LUMINAIRES ON 30.5m HIGH MOUNT STANDARDS, INCLUDING UNDERGROUND CIRCUITRY, CONTROL SYSTEM AND JUNCTION BOXES.

DESIGN CRITERIA

1984 AASHTO "AN INFORMATIONAL GUIDE FOR ROADWAY LIGHTING"

2002 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS

2002 NATIONAL ELECTRICAL CODE

2002 AASHTO ROADSIDE DESIGN GUIDE

ROADWAY STANDARDS

THE FOLLOWING ROADWAY METRIC STANDARDS AS APPEAR IN THE REFERENCED DETAIL SHEETS AND THE "NCDOT ROADWAY STANDARD DRAWING - METRIC", ROADWAY DESIGN UNIT-N.C. DEPARTMENT OF TRANSPORTATION RALEIGH, N.C., DATED JANUARY 2002 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD NO.	TITLE
1401.01	HIGH MOUNT STANDARD
1402D01	HIGH MOUNT FOUNDATION
1403.01	HIGH MOUNT LUMINAIRE
1407.01	ELECTRIC SERVICE POLE AND LATERAL
1408D01	LIGHT CONTROL SYSTEM
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 2002 AND PROJECT SPECIAL PROVISIONS TITLED "LIGHTING".

LEGEND

- 6 — PROPOSED 30.5M HIGH MAST STANDARD W/ HM FOUNDATION & (6) HM LUMINAIRES 750W HPS MEDIUM, CUTOFF, TYPE V DISTRIBUTION, 90 MPH WINDSPEED
- PROPOSED CONTROL SYSTEM. BREAKER SIZE SHOWN IN LOAD SCHEDULE, SHEET E3
- JB1 — PROPOSED ELECTRICAL JUNCTION BOX TYPE PC18 SEE DETAILS & TABLE B, THIS SHEET
- A1 6 — PROPOSED FEEDER CIRCUIT CONTROL SYSTEM(A), CIRCUIT(1) PLAN SYMBOL (6) SEE TABLE A, THIS SHEET
- 3#1/0 USE TS 2 C — PROPOSED SERVICE POLE AND LATERAL 9.1m CLASS 4 3#1/0 USE CONDUCTORS TS 2 CONDUIT
- 1 — REFERENCE TO CORRESPONDING NOTE AS NUMBERED
- TS 2 (OR TS 3) ELEC. DUCT JA & BD — PROPOSED ELECTRICAL DUCT SIZE TS 2 (OR TS 3) TYPE (JA) OR (BD) LOCATION: SEE TABLE C, THIS SHEET

TABLE "A"
CIRCUITRY CONDUCTOR CONDUIT TYPE & SIZE

PLAN SYMBOL	DESCRIPTION		CONTRACT ITEM
8	2#8 Ø 1 #10G TS 1.5 P	2 AWG SIZE 8 CONDUCTOR (BK & RD) 1 AWG SIZE 10 GROUNDING CONDUCTOR TS 1.5 PVC CONDUIT	2 - 8 W/G FEEDER CIRCUIT IN TS 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
4	2#4 Ø 1 #6G TS 1.5 P	2 AWG SIZE 4 CONDUCTOR (BK & RD) 1 AWG SIZE 6 GROUNDING CONDUCTOR TS1.5 PVC CONDUIT	2 - 4 W/G FEEDER CIRCUIT IN TS 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

TABLE "B"
JUNCTION BOX SUMMARY

NUMBER	LOCATION	TYPE		SHEET
JB1	34+00 -L2- 106M RT	PC18		E2
JB2	33+57 -L2- 86M RT	PC18		E2
JB3	32+92 -L2- 61M RT	PC18		E2
JB4	32+24 -L2- 55M RT	PC18		E2
JB5	31+62 -L2- 50M RT	PC18		E2
JB6	13+19 -Y35- 26M RT	PC18		E2
JB7	13+94 -Y35- 35M RT	PC18		E2
TOTALS		7		

TABLE "C"
ELECTRICAL DUCT SUMMARY
(ESTIMATED LENGTH IN METERS)

			TYPE JACKED (JA)			TYPE BURIED (BD)		
LOCATION	RACEWAY 6	SHEET	SIZE TS 2	SIZE TS 3	SIZE TS 4	SIZE TS 2	SIZE TS 3	SIZE TS 4
LOOP B	JB1 - JB2	E2	29			28		
LOOP B		E2			26			
12+34 -Y35-	JB3 - JB4	E2	54			14		
12+34 -Y35-		E2			57			
LOOP A		E2		20				
TOTALS			83	20	83	42		

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
LT	LIGHT
JA	JACKED
MH	MOUNTING HEIGHT
Ø	PHASE
SER LAT	SERVICE LATERAL
PVC	PVC SCHEDULE 40 CONDUIT
RGC	RIGID GALVANIZED STEEL CONDUIT
C	CONDUIT
CKT	CIRCUIT
N	NEUTRAL
G	GROUND

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USE FOR LIGHTING CONSTRUCTION ONLY

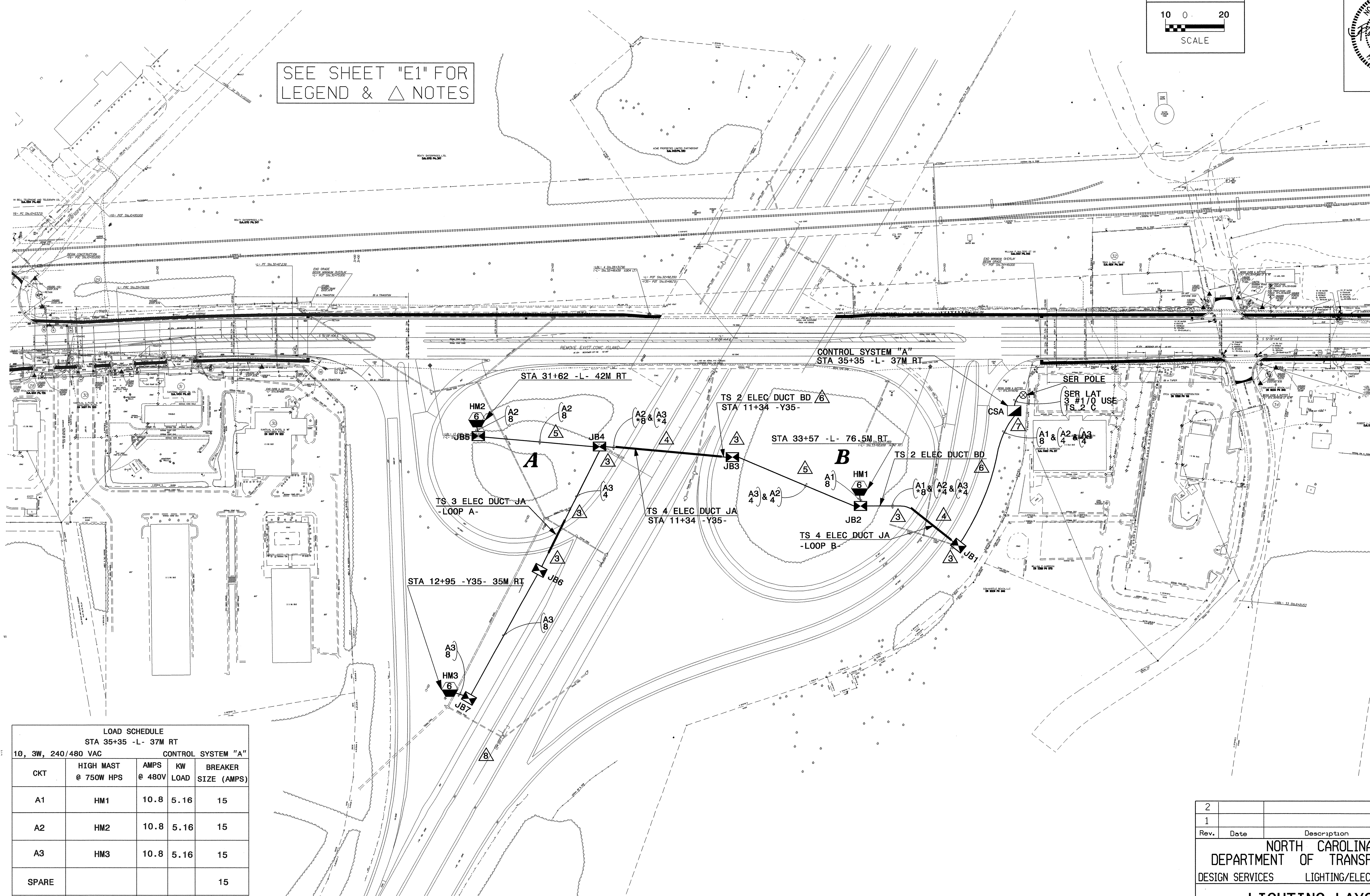
PROJECT REFERENCE NO.	SHEET NO.
U-2408	E2

METRIC

10 0 20
SCALE

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022582 PAUL KI-BUN CHAN 2-8-06

SEE SHEET "E1" FOR LEGEND & △ NOTES



LOAD SCHEDULE				
STA 35+35 -L- 37M RT				
1Φ, 3W, 240/480 VAC		CONTROL SYSTEM "A"		
CKT	HIGH MAST @ 750W HPS	AMPS @ 480V	KW LOAD	BREAKER SIZE (AMPS)
A1	HM1	10.8	5.16	15
A2	HM2	10.8	5.16	15
A3	HM3	10.8	5.16	15
SPARE				15
TOTAL	3	32.4	15.48	

Rev.	Date	Description	Approved
2			
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NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DESIGN SERVICES LIGHTING/ELECTRICAL SECTION

LIGHTING LAYOUT

NC274/I-85 INTERCHANGE

GASTON COUNTY

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

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PROJECT REFERENCE NO.	SHEET NO.
U-2408	E3

LIGHTING

NORTH CAROLINA PROFESSIONAL SEAL 022582 ENGINEER PAUL KI-BUN CHAN 2-8-06

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. 7-06

ENGLISH STANDARD DRAWING FOR
LIGHT CONTROL SYSTEM
SCHEMATIC

SHEET 1 OF 3 **1408D01**

△ NOTES

△1 EQUIPMENT GROUNDS (G) SHALL BE SIZED ACCORDING TO CIRCUIT DESCRIPTION. SEE PLANS.

△2 SYSTEM GROUND (SG) SHALL BE CONTINUOUS FROM THE 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 CONDUIT. CONNECT BONDING JUMPER AS REQUIRED BY NEC.

△6 SEE SHEET 3 OF 3 FOR ENCLOSURE.

△7 THE CONTROL SYSTEM MUST BE LABELED "SUITABLE FOR USE AS SERVICE EQUIPMENT." REFER TO STANDARD SPECIFICATION 1408-2 FOR OTHER REQUIREMENTS.

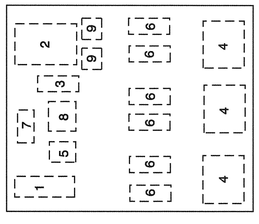
△8 SEE PLANS FOR BREAKER SIZES.

△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.

INTERIOR PANEL
COMPONENT LAYOUT

△6 △10

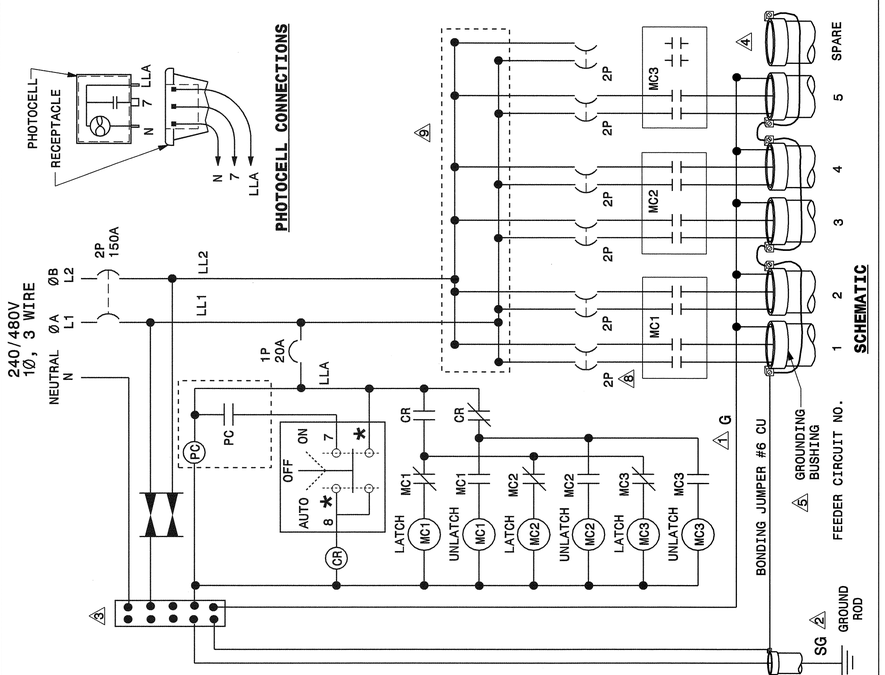


COMPONENT LIST

#	QTY	DESCRIPTION	SPECIFICATIONS
1	1	NEUTRAL BAR	
2	1	SERVICE CIRCUIT BREAKER	2P, 480V, 150A
3	1	CONTROL CIRCUIT BREAKER	1P, 240V, 20A
4	3	MECHANICALLY HELD CONTACTORS	4P, 480V, 60A W/240V COIL
5	1	CONTROL RELAY W/NC & NO CONTACT	240V, 10A, W/240V COIL
6	6	FEEDER CIRCUIT BREAKERS	2P, 480V, 50A MAX
7	1	LIGHTNING ARRESTER	
8	1	SELECTOR SWITCH (ON-OFF-AUTO)	240V, 10A
9	2	POWER DISTRIBUTION LUGS OR BLOCKS	
		MOUNTING BRACKETS OR SCREW STUDS	

PHOTOCELL CONNECTIONS

SCHEMATIC



STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH STANDARD DRAWING FOR **LIGHT CONTROL SYSTEM** SCHEMATIC	SHEET 1 OF 3 **1408D01**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. 1-06

ENGLISH STANDARD DRAWING FOR
HIGH MOUNT FOUNDATION

SHEET 1 OF 1 **1402D01**

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY ANUPAM SHAH, P.E., 029979, ON OCTOBER 12, 2005.

△3

TABLE OF FOUNDATION DIMENSIONS AND QUANTITIES

HEIGHT OF HIGH MOUNT FT	DIAMETER "C" FT	STIRRUPS SIZE	STIRRUPS LAP-FT	WIND VELOCITY 90 MPH DEPTH "D" FT	WIND VELOCITY 90 MPH V BARS QTY	WIND VELOCITY 90 MPH V BARS SIZE	WIND VELOCITY 90 MPH REINF.* STEEL LBS	WIND VELOCITY 90 MPH CONCRETE CY	WIND VELOCITY 110 MPH DEPTH "D" FT	WIND VELOCITY 110 MPH V BARS QTY	WIND VELOCITY 110 MPH V BARS SIZE	WIND VELOCITY 110 MPH REINF.* STEEL LBS	WIND VELOCITY 110 MPH CONCRETE CY
80	3.5	#3	1.0	12	8	#8	306	4.3	13	8	#8	331	4.6
100	4.0	#3	1.0	13	8	#9	413	6.1	15	8	#9	477	7.0
120	4.5	#3	1.0	15	8	#10	557	8.2	16	8	#10	636	9.4

* INCLUDES STIRRUPS AND VERTICAL BARS (V BARS)

NOTES

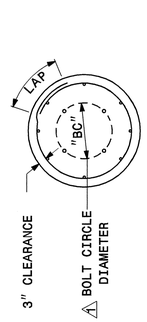
△1 ANCHOR BOLTS
CONFORM NUMBER, SIZE, AND LENGTH OF ANCHOR BOLTS, BOLT CIRCLE DIAMETER "BC", AND ANCHOR BOLT PROJECTION "P" TO APPROVED HIGH MOUNT STANDARD DRAWINGS.

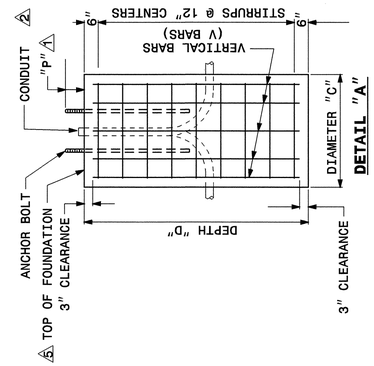
△2 CONDUITS
MATCH ORIENTATION, QUANTITY, TYPE, AND SIZE OF CONDUITS TO THE LAYOUT SHEETS STUB AND CAP ONE SPARE CONDUIT AT EACH FOUNDATION. PROJECT CONDUIT A MAXIMUM OF 2" ABOVE TOP OF FOUNDATION. PLACE CONDUIT 30" BENEATH FINISH GRADE.

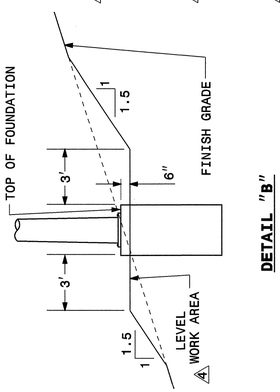
△3 DIMENSIONS & QUANTITIES
DIMENSIONS AND QUANTITIES OF CONCRETE AND REINFORCING STEEL ARE GIVEN FOR THE PURPOSE OF OBTAINING BID PRICES ONLY. SEE STANDARD SPECIFICATIONS SECTION 1402, FOR OTHER STRUCTURAL REQUIREMENTS.

△4 WORK AREA
PROVIDE A LEVEL WORK AREA AROUND EACH FOUNDATION. CUT/FILL SLOPES MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.

△5 ELEVATION
SET TOP OF FOUNDATION AT 6" ABOVE LEVEL WORK AREA. SEE DETAIL "B".







STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.	ENGLISH STANDARD DRAWING FOR **HIGH MOUNT FOUNDATION**	SHEET 1 OF 1 **1402D01**

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

LIGHTING DETAILS
LIGHT CONTROL SYSTEM SCHEMATIC
HIGH MOUNT FOUNDATION

Drawn By: RGH 2-6-06 | Approved By: | Dwg No.: