

# PLANS AND DETAILS FOR PROPOSED LIGHTING /ELECTRICAL CONSTRUCTION

## NOTES

- 1 AT THESE LOCATIONS, PROVIDE ELECTRICAL DUCT IN ACCORDANCE WITH NEC EQUIRMENTS FOR AN APPROVED RACEWAY FOR ELECTRICAL CIRCUITS. SEE TABLE "C"
- 2 INSTALL ALL BORE PITS OUTSIDE THE CLEAR ZONE, AS DEFINED BY THE 2002 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 2002 AASHTO ROADSIDE DESIGN GUIDE.
- 5 TYPE PC18 JUNCTION BOXES ARE 18" L X 12" W X 18" H.
- 6 TYPE PC30 JUNCTION BOXES ARE 30" L X 17" W X 18" H.
- 7 TYPE PC36 JUNCTION BOXES ARE 36" L X 24" W X 18" H.
- 8 REFER TO LIGHTING SECTION SPECIAL PROVISIONS FOR HIGH MAST POLE AND CONTROL SYSTEM REMOVAL.
- 9 EXISTING HIGH MAST LIGHTING SYSTEM AT THE I-40/I-77 INTERCHANGE IS BASED ON I-2505 PROJECT LIGHTING PLANS DATED 7-30-91.
- 10 POWER TO EXISTING CS "N" TO BE TERMINATED AND CS TO BE REMOVED. UPON REMOVAL OF CS AND PAD, INSTALL JB TO REPLACE EXISTING PRIMARY INCOMING POWER TO EXISTING TELECOM ANTENNA FEEDER CIRCUIT. CONSULT WITH DIVISION TRAFFIC SERVICES PRIOR TO TERMINATING SERVICE TO CS.
- 11 PROVIDE 4" HDPE ELECTRICAL DUCT BY DIRECTIONAL DRILL TO FUNCTION AS PROTECTIVE SLEEVE FOR CABLE RUN UNDER 4TH CREEK ON SHEET E2.
- 12 INSTALL 3" ELECTRICAL DUCT UNDER BRIDGE SLOPE PROTECTION.
- 13 INSTALL JUNCTION BOXES BEHIND CURB AND IN FRONT OF RETAINING WALL. TRENCH CONDUCTORS AROUND RETAINING WALL.
- 14 JUNCTION BOX SYMBOL LOCATIONS SHOWN FOR CLARITY AT THESE LOCATIONS. USE TABLE B FOR PROPOSED INSTALLED LOCATIONS.
- 15 COORDINATE WORK WITH RETAINING WALL CONSTRUCTION TO PLACE JUNCTION BOX JB21. CONDUIT RUNS AND STUB OUTS BEFORE CONCRETE SLAB IS POURED. INSTALL JB1, JB10 AND JB12 ON FINISHED GRADE OUTSIDE OF CONCRETE SLAB.

## SCOPE OF WORK

PLACE ROADWAY LIGHTING SYSTEM INTO SERVICE BY PROVIDING AND INSTALLING 60', 80', & 100' HIGH MOUNT STANDARDS, 45' LIGHT STANDARDS AND UNDERPASS LIGHTING WITH HIGH PRESSURE SODIUM LUMINAIRES, UNDERGROUND CIRCUITRY, CONTROL SYSTEM AND JUNCTION BOXES.

## DESIGN CRITERIA

- 2005 AASHTO ROADWAY LIGHTING DESIGN GUIDE
- 2001 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, AND LATEST INTERIM SPECIFICATIONS VALID AT THE TIME OF LETTING
- FATIGUE CATEGORY II SHALL BE USED IN DESIGN
- DESIGN HIGH MOUNT SUPPORT FOR BASIC WIND SPEED OF 90 MPH AS SHOWN IN AASHTO
- DESIGN HIGH MOUNT STANDARD FOUNDATION FOR BASIC WIND SPEED OF 90 MPH. ANY CONTRACTOR-DESIGNED SITE SPECIFIC FOUNDATION DESIGN SHALL BE DESIGNED FOR THE SAME WIND SPEED
- 2008 NATIONAL ELECTRICAL CODE
- 2002 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 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD NO.	TITLE
1401.01	HIGH MOUNT STANDARD
1402.01	HIGH MOUNT FOUNDATION
1403.01	HIGH MOUNT LUMINAIRES
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
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 2012.

## LEGEND

- PROPOSED 60' HIGH MAST STANDARD W/ HM FOUNDATION & (4) HM LUMINAIRES 400W HPS, MEDIUM, CUTOFF, TYPE V
- PROPOSED 80' HIGH MAST STANDARD W/ HM FOUNDATION & (8) HM LUMINAIRES 400W HPS, MEDIUM, CUTOFF, TYPE V
- PROPOSED 100' HIGH MAST STANDARD W/ HM FOUNDATION & (6) HM LUMINAIRES 750W HPS, MEDIUM, CUTOFF, TYPE V
- PROPOSED LIGHT STANDARD TYPE MTLT 45' WITH 15' SINGLE ARM. INCLUDES STANARD FOUNDATION TYPE R1 OR R2 & 250W HPS FLAT GLASS ROADWAY LUMINAIRE. IES DISTRIBUTION: MEDIUM, CUTOFF, TYPE III
- PROPOSED CONTROL SYSTEM WITH PC36 JUNCTION BOX. BREAKER SIZE SHOWN IN LOAD SCHEDULE, SHEET E2
- EXISTING 100' HIGH MAST STANDARD
- EXISTING CONTROL SYSTEM SHEET E3
- PROPOSED ELECTRICAL JUNCTION BOX SEE DETAILS & TABLE B, THIS SHEET
- REFERENCE TO CORRESPONDING NOTE AS NUMBERED
- PROPOSED UNDERPASS LUMINAIRE, TYPE PM, 100W HPS, LOW BAY WITH SAFTY CHAIN
- PROPOSED UNDERPASS BREAKER PANEL
- 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#1/0 USE CONDUCTORS 2" CONDUIT
- PROPOSED ELECTRICAL DUCT SIZE 2", 3", 4" OR 6" TYPE (JA) OR (BD) LOCATION: SEE TABLE C, THIS SHEET

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

NUMBER	LOCATION	TYPE	SHEET		
JB1	23+78 -Y4RPD- 20' RT	PC30	E2		
JB2	22+25 -Y4RPD- 55' RT	PC18	E2		
JB3	19+78 -Y4RPD- 25' RT	PC18	E2		
JB4	19+15 -Y4RPD- 20' RT	PC18	E2		
JB5	15+90 -Y4RPD- 15' RT	PC18	E2		
JB6	93+75 -L- 10' RT	PC18	E2		
JB7	94+90 -L- 10' RT	PC18	E2		
JB8	97+50 -L- 10' RT	PC18	E2		
JB9	99+90 -L- 10' RT	PC18	E2		
JB10	87+08 -L- 125' LT	PC30	E2		
JB11	DELETED				
JB12	85+60 -L- 125' LT	PC30	E2		
JB13	84+15 -L- 125' LT	PC30	E2		
JB14	84+15 -L- 10' RT	PC30	E2		
JB15	81+16 -L- 10' RT	PC18	E2		
JB16	79+30 -L- 10' RT	PC18	E2		
JB17	76+72 -L- 10' RT	PC18	E2		
JB18	74+36 -L- 10' RT	PC18	E2		
JB19	72+00 -L- 10' RT	PC18	E2		
JB20	70+40 -L- 10' RT	PC18	E2		
JB21	86+75 -L-	PC30	E2		
JB22	NEAR CS"N"	PC36	E3		
JB23	24+15 -Y4- 52' RT	PC18	E2		
JB24	24+15 -Y4- 72' LT	PC18	E2		
TOTALS		16	6	1	

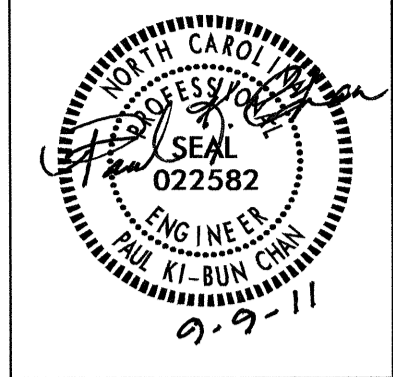
LOCATION	RACEWAY	SHEET	TYPE					
			JACKED (JA) FEET			BURIED (BD) FEET		
			SIZE 3"	SIZE 4"	SIZE 6"	SIZE 2"	SIZE 3"	SIZE 4"
23+78 -Y4RPD-	CS"A"JB - JB1	E2						80
23+78 -Y4RPD-		E2			60			
18+00 -Y4RPD- 20' RT		E2		320				
93+90 -L-		E2	120					
84+15 -L-		E2		110				
84+15 -L-	JB13 - JB14	E2				130		
28+36 -Y4-		E2		115				
28+36 -Y4-	JB12 - JB 13	E2				135		
24+15 -Y4-	JB23 - JB24	E2	145					
86+68 -L-	JB1 - JB21	E2				160		
86+68 -L-	JB21 - JB10	E2				160		
TOTALS			265	545	60	585	80	

ABBREVIATIONS

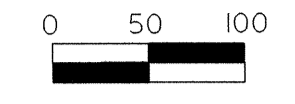
BD	BURIED	PVC	PVC SCHEDULE 40 CONDUIT
LT	LIGHT	RGC	RIGID GALVANIZED STEEL CONDUIT
JA	JACKED	C	CONDUIT
MH	MOUNTING HEIGHT	CKT	CIRCUIT
Ø	PHASE	N	NEUTRAL
SER LAT	SERVICE LATERAL	G	GROUND
		HM	HIGH MAST

COMPUTED BY: AB DATE: 9-9-11  
 CHECKED BY: PKC DATE: 9-9-11

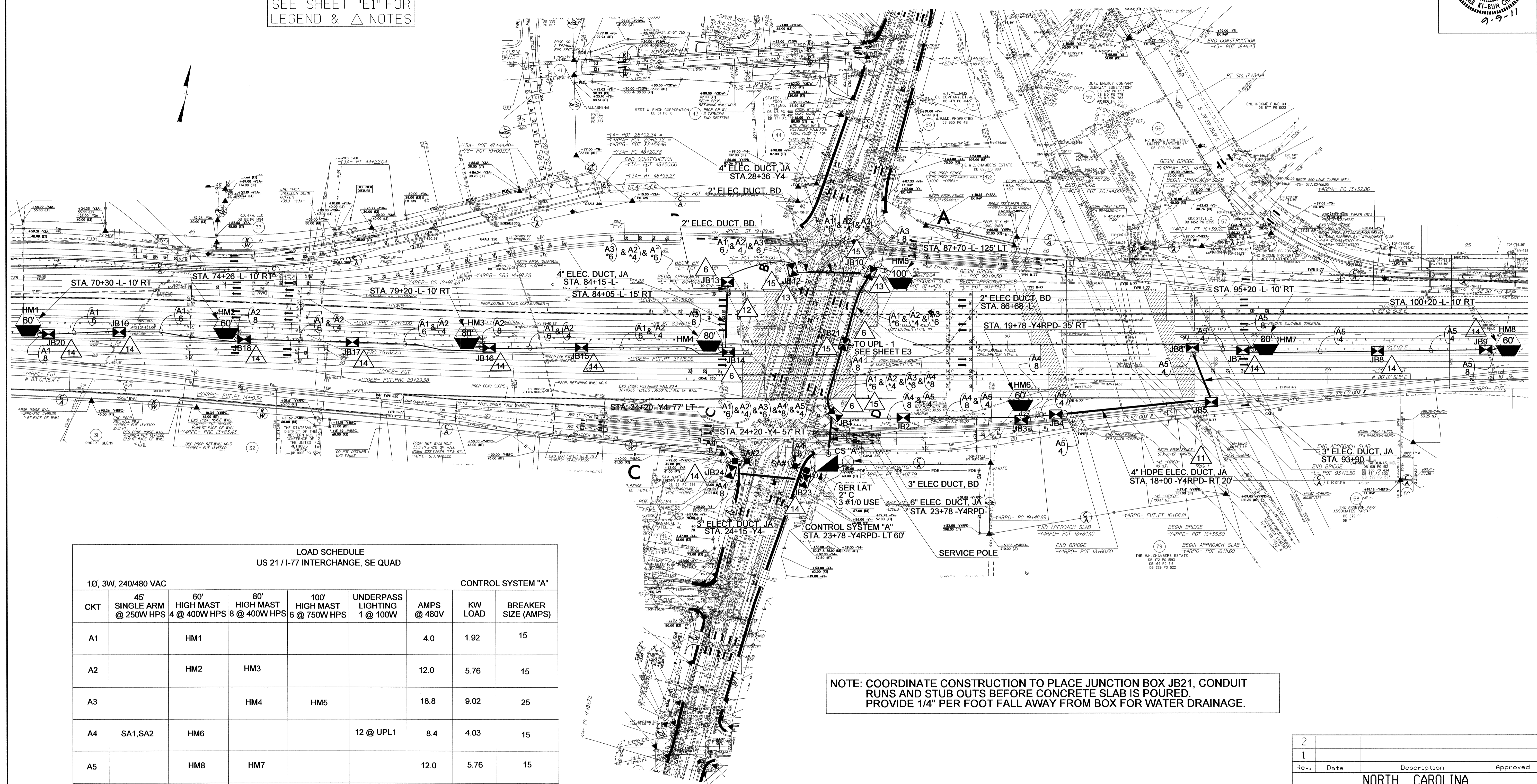
08-SEP-2011 17:00 R:\Lighting\Electrical\Lighting Design\I3819A\_18\_e\_psh\_el.dgn abrown AT RD238351 02/03/06



USE FOR LIGHTING CONSTRUCTION ONLY



SEE SHEET "E1" FOR LEGEND & △ NOTES



NOTE: COORDINATE CONSTRUCTION TO PLACE JUNCTION BOX JB21, CONDUIT RUNS AND STUB OUTS BEFORE CONCRETE SLAB IS POURED. PROVIDE 1/4" PER FOOT FALL AWAY FROM BOX FOR WATER DRAINAGE.

LOAD SCHEDULE US 21 / I-77 INTERCHANGE, SE QUAD						CONTROL SYSTEM "A"			
CKT	10', 3W, 240/480 VAC	45' SINGLE ARM @ 250W HPS	60' HIGH MAST 4 @ 400W HPS	80' HIGH MAST 8 @ 400W HPS	100' HIGH MAST 6 @ 750W HPS	UNDERPASS LIGHTING 1 @ 100W	AMPS @ 480V	KW LOAD	BREAKER SIZE (AMPS)
A1			HM1				4.0	1.92	15
A2			HM2		HM3		12.0	5.76	15
A3				HM4	HM5		18.8	9.02	25
A4	SA1,SA2		HM6		12 @ UPL1		8.4	4.03	15
A5			HM8		HM7		12.0	5.76	15
SPARE									25
TOTAL	2		4	4	1	12	55.2	26.49	

Rev.	Date	Description	Approved
2			
1			

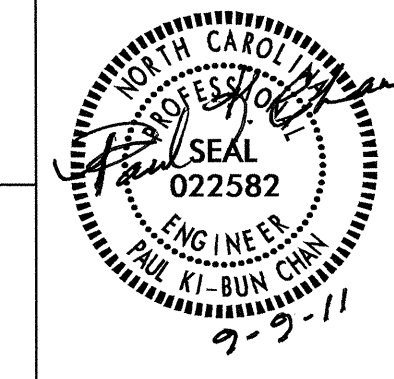
**NORTH CAROLINA**  
 DEPARTMENT OF TRANSPORTATION  
 ROADWAY DESIGN LIGHTING/ELECTRICAL SECTION  
**LIGHTING LAYOUT**  
 I-40/US 21 INTERCHANGE  
 IREDELL COUNTY

Drawn By: **AB**      Approved By: **PKC 9-9-11**      Dwg No.:

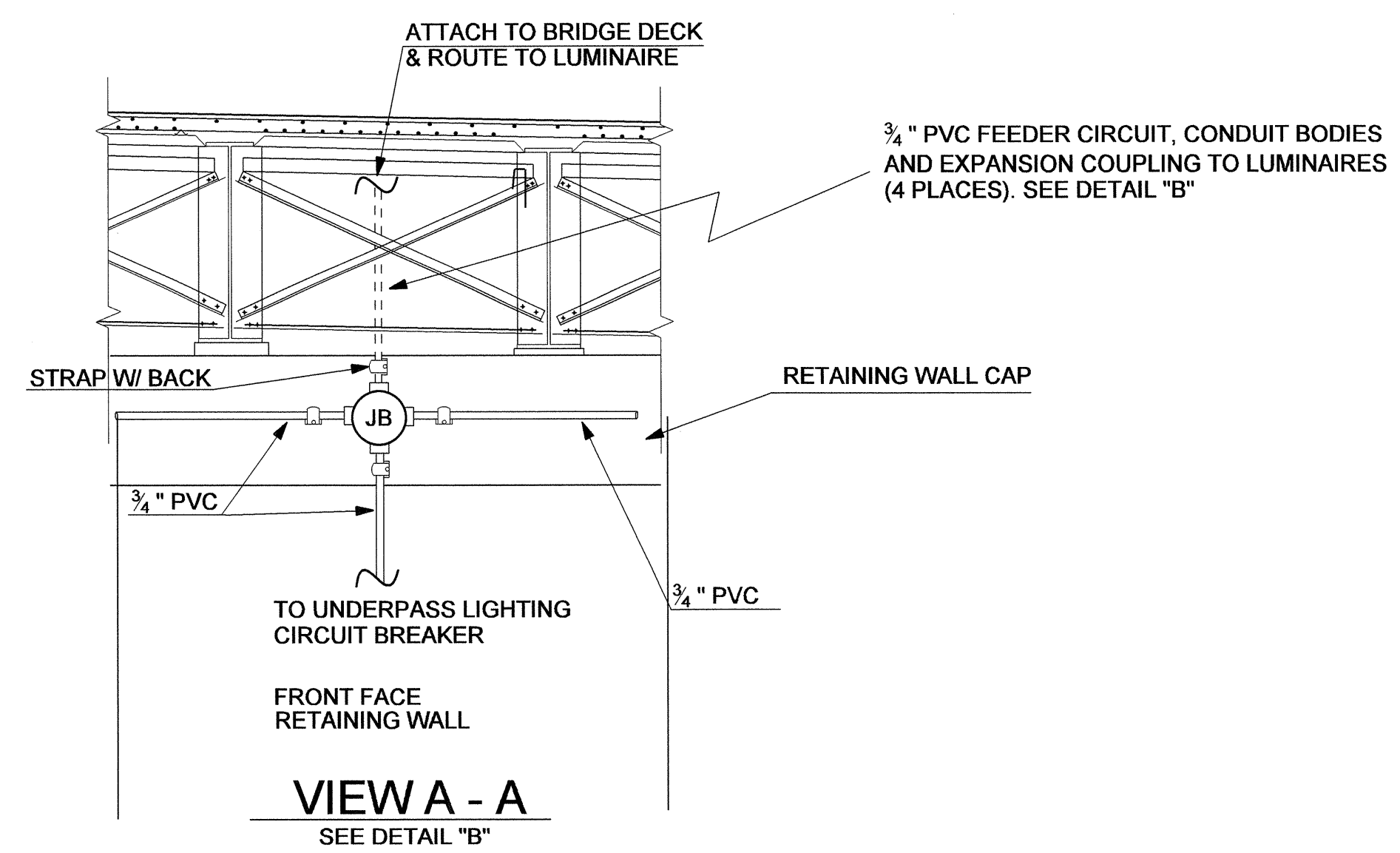
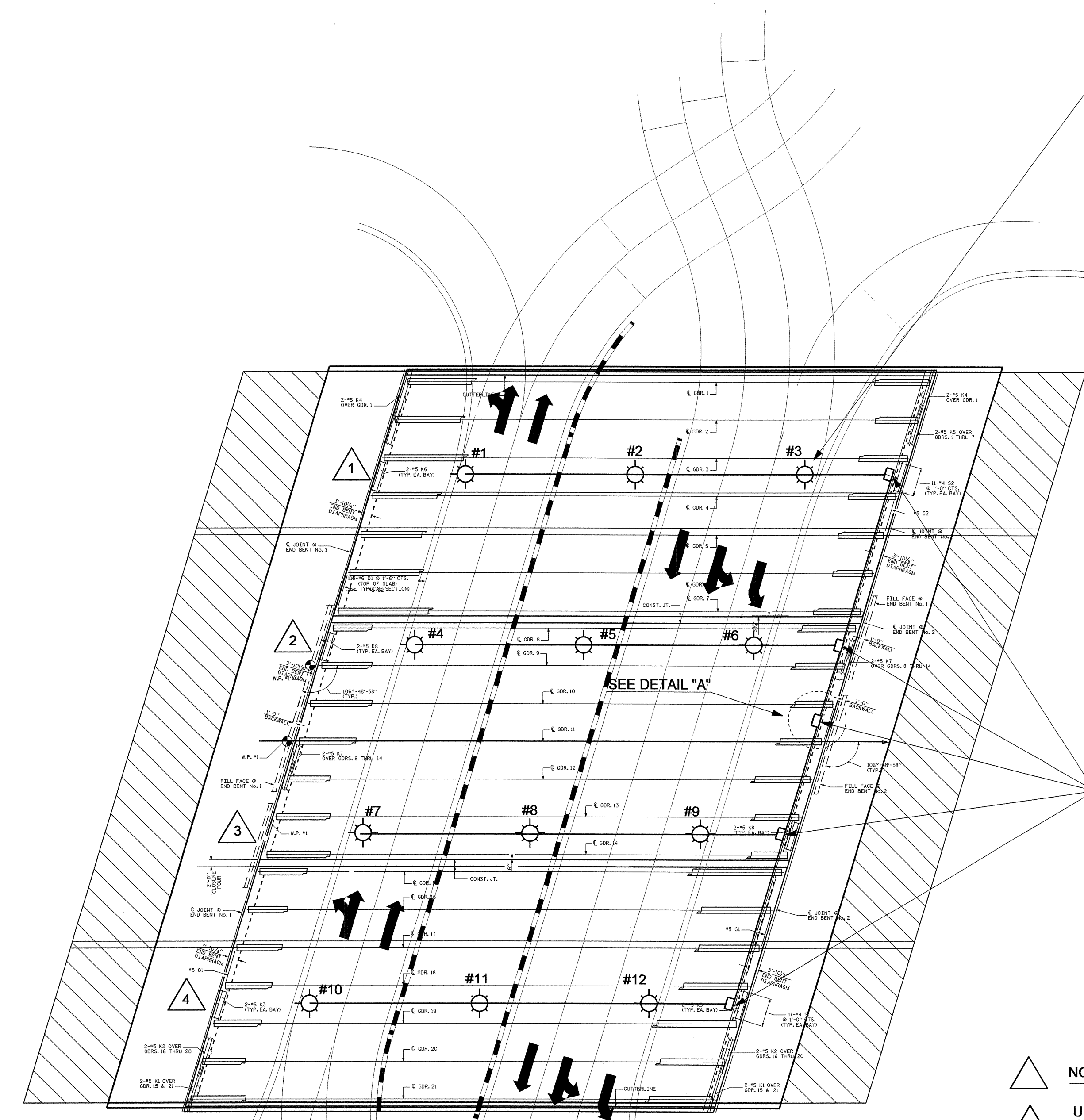
08-SEP-2011 11:49  
 R:\Lighting\electrical\Lighting Design\I3819A\_1\8-e-psb\_e2.dgn  
 sbrown AT RD238331



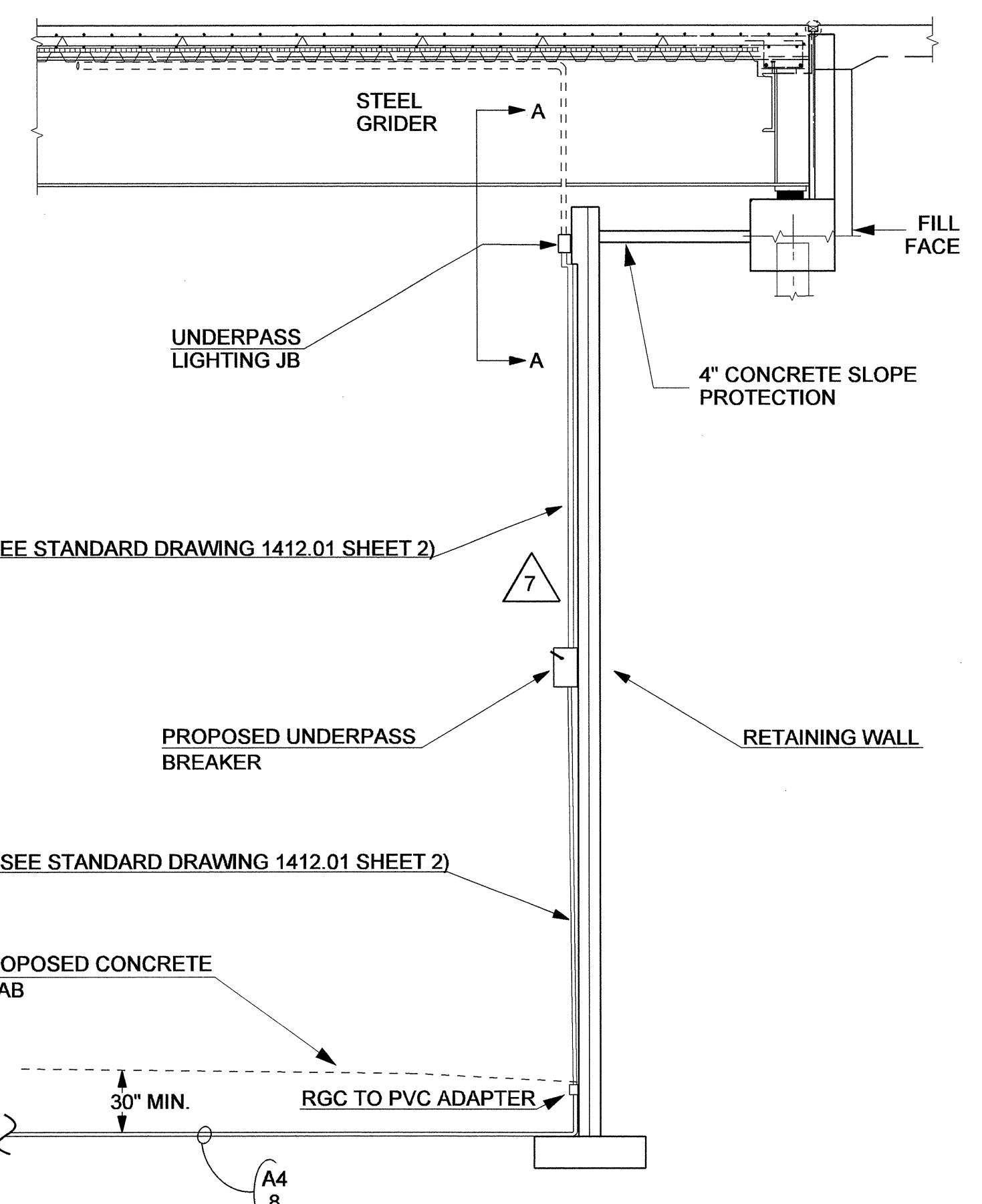
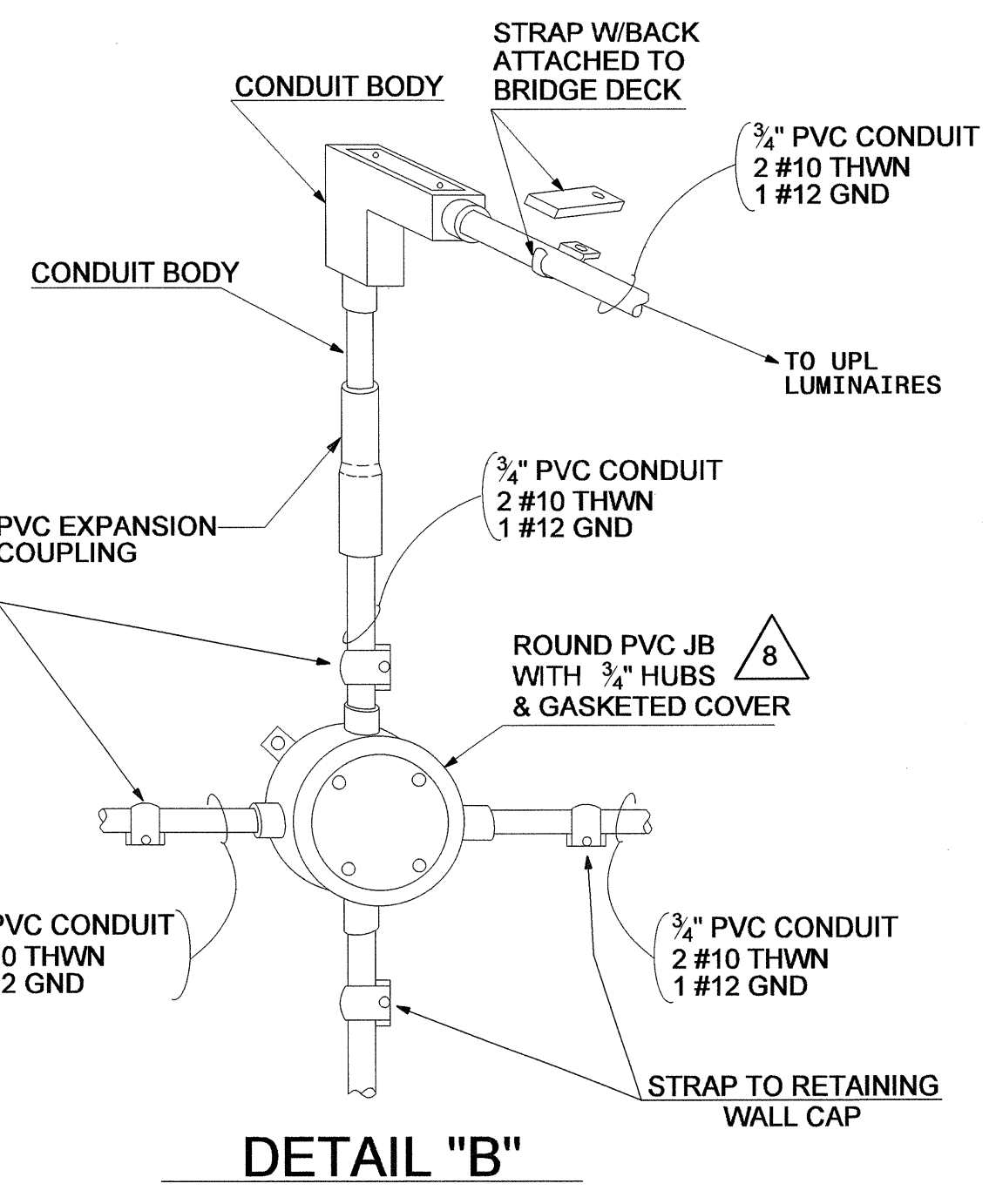
NTS



USE FOR LIGHTING CONSTRUCTION ONLY



100W HPS PM  
(12 PLACES)



- NOTES
- 1 UNDERPASS LIGHT #1, #3 & #4 SHOULD LOCATED BETWEEN GRIDERS 2 & 3. UNDERPASS LIGHTS SHOULD BE SPACED 50' APART AND 20' FROM RETAINING WALL.
  - 2 UNDERPASS LIGHT #4, #5 & #6 SHOULD LOCATED BETWEEN GRIDERS 8 & 9. UNDERPASS LIGHTS SHOULD BE SPACED 50' APART AND 20' FROM RETAINING WALL.
  - 3 UNDERPASS LIGHT #7, #8 & #9 SHOULD LOCATED BETWEEN GRIDERS 13 & 14. UNDERPASS LIGHTS SHOULD BE SPACED 50' APART AND 20' FROM RETAINING WALL.
  - 4 UNDERPASS LIGHT #10, #11 & #12 SHOULD LOCATED BETWEEN GRIDERS 18 & 19. UNDERPASS LIGHTS SHOULD BE SPACED 50' APART AND 20' FROM RETAINING WALL.
  - 5 SEE STANDARD DRAWING SECTION 1412.01 FOR OTHER INSTALLATION DETAILS.
  - 6 PROVIDE EXPANSION FITTINGS AT BRIDGE EXPANSION JOINTS, AND IN EACH SECTION OF CONDUIT THAT IS GREATER THAN 20' LONG BETWEEN TERMINALS AT JUNCTION BOXES ON RETAINING WALL AND UNDER BRIDGE DECK.
  - 7 ATTACH CONDUIT TO FACE OF RETAINING WALL CAP USING STRAPS WITH BACKS.
  - 8 PLUG ANY UNUSED PORTS IN JUNCTION BOX.

US 21 / I-77  
UPL 1

Rev.	Date	Description	Approved
2			
1			

NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
ROADWAY DESIGN LIGHTING/ELECTRICAL SECTION

**LIGHTING DETAILS**

UNDERPASS LIGHTING

IREDELL COUNTY

Drawn By: AB Approved By: PKC 9-9-11 Dwg No.: