PLANS FOR THE CONSTRUCTION OF
PAVING, BRIDGE, STORM SEWER, WATER, SANITARY SEWER
SIGNALIZATION AND STREETSCAPE IMPROVEMENTS FOR

ARAPAHO ROAD - PHASE III

FROM SURVEYOR BOULEVARD TO ADDISON ROAD

STATION 34+07.75 TO STATION 87+88.00 (LENGTH = 5381 FT = 1.02 MILES)

PROJECT RECORD COPY I

TOWN OF
ADDISON

R. SCOTT WHEELER
MAYOR

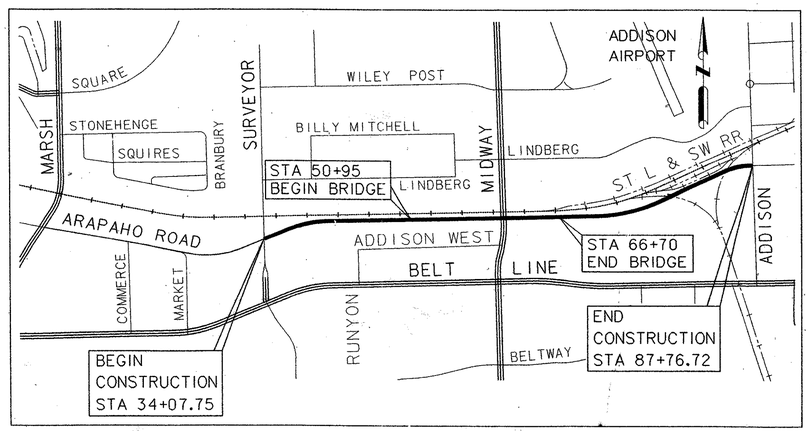
DIANE MALLORY — GLYNDA TURNER
JIMMY NIEMANN — GREGORY S. HIRSH
COUNCIL MEMBERS

FREDERICK M. SILVER
MAYOR PRO TEMPORE

JOE CHOW
DEPUTY MAYOR PRO TEMPORE

RON WHITEHEAD
CITY MANAGER

MIKE MURPHY
DIRECTOR OF PUBLIC WORKS



LOCATION MAP
NOT TO SCALE

OWNER:

TOWN OF ADDISON
DEPARTMENT OF PUBLIC WORKS
16801 WESTGROVE
P.O. BOX 144
ADDISON, TEXAS 75001
(972) 450-2886

ENGINEER:

HNTB CORPORATION
5910 WEST PLANO PARKWAY, SUITE 200
DALLAS, TEXAS 75093
(972) 661-5626

JERRY D. HOLDER, JR.
87171
REGISTERED PROFESSIONAL ENGINEER
07-29-04

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

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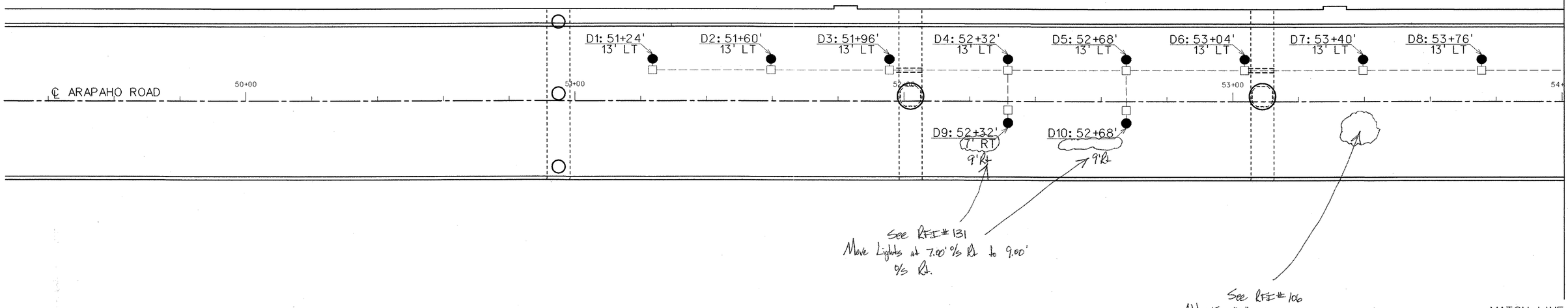

LEGEND:

- TYPE A-1: NORTH ARCH FLOOD
- TYPE A-2: SOUTH ARCH FLOOD
- TYPE B: DIAPHRAGM LED
- TYPE C: PEDESTRIAN HANDRAIL LED
- TYPE D: DECK UNDERSIDE FLOOD
- GROUND BOX
- JUNCTION BOX
- TYPE F: NORTH AND SOUTH ROADWAY LIGHTS (20')
  TYPE G: NORTH ROADWAY LIGHTS (35')
- RMC CONDUIT - SIZE PER CONDUIT & CABLE SCHEDULE
- PVC CONDUIT - SIZE PER CONDUIT & CABLE SCHEDULE
- 2" PVC SCH 80 CONDUIT SLEEVE

PS "X": PEDESTAL SERVICE "X"

- FUSED DISCONNECT SWITCH

GENERAL NOTES:

1. PROVIDE LUMINAIRES, POLES, BASES, CONCRETE FOUNDATIONS AND CIRCUITRY AT EACH LOCATION SHOWN. REFER TO ILLUMINATION SUMMARY AND CONDUIT & CABLE SCHEDULE FOR ADDITIONAL INFORMATION.
2. SEE LIGHT POLE DETAILS IN STRUCTURAL SECTION PLANS.
3. ALL SPLICES SHALL BE MADE IN THE POLE BASE, FIXTURE BASE, IN THE GROUND BOX, OR JUNCTION BOX.
4. ALL METAL CONDUITS, METAL ENCLOSURES, BOXES, POLE BASES AND LUMINAIRE HOUSING SHALL BE GROUNDED.
5. ALL EXISTING UTILITY LOCATIONS ARE APPROXIMATE, CONTRACTOR SHALL VERIFY EXACT LOCATIONS.
6. ALL STATION AND OFFSETS ARE FROM CENTERLINE OF ARAPAHO ROAD, AND ASSOCIATED MARKINGS.
7. ALL STREET POLES SHALL BE CONTINUOUSLY GROUNDED TO THE ELECTRICAL SERVICE GROUND CONDUCTOR SYSTEM.

0 20 40 60

SCALE: 1" = 30'

STATE OF TEXAS
EDWARD F. BURKE
25837
REGISTERED
PROFESSIONAL ENGINEER
7/04/04

322

NO.	DATE	REVISION	APPROV.

URS
GREYSTONE CENTRE
3010 LBJ FREEWAY, SUITE 1300
DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

BRIDGE LIGHTING PLAN
240 AND 120 V

SHEET 1 OF 4

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-1

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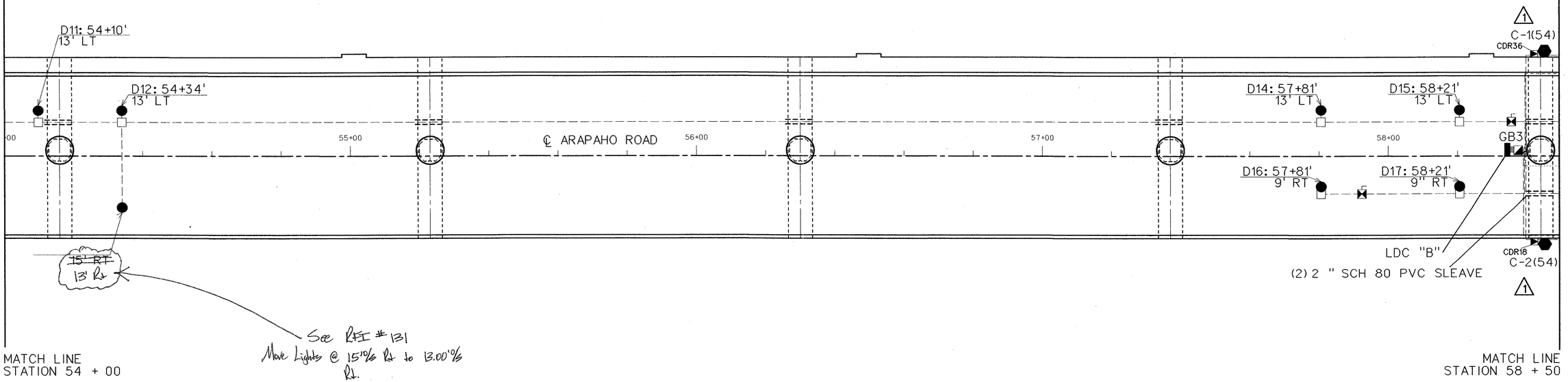


LEGEND:

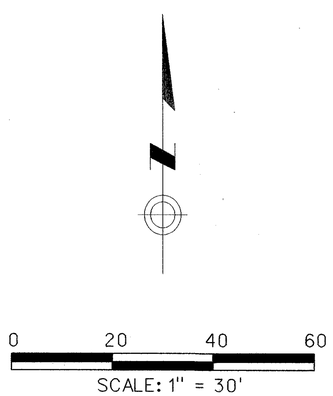
- TYPE A-1: NORTH ARCH FLOOD
- TYPE A-2: SOUTH ARCH FLOOD
- TYPE B: DIAPHRAGM LED
- TYPE C: PEDESTRIAN HANDRAIL LED
- TYPE D: DECK UNDERSIDE FLOOD
- GROUND BOX
- JUNCTION BOX
- TYPE F: NORTH AND SOUTH ROADWAY LIGHTS (20')
  TYPE G: NORTH ROADWAY LIGHTS (35')
- RMC CONDUIT - SIZE PER CONDUIT & CABLE SCHEDULE
- PVC CONDUIT - SIZE PER CONDUIT & CABLE SCHEDULE
- 2" PVC SCH 80 CONDUIT SLEEVE

LDC "X": LOAD DISTRIBUTION CENTER "X"

- FUSED DISCONNECT SWITCH
- LED DRIVER LOCATION

GENERAL NOTES:

1. PROVIDE LUMINAIRES, POLES, BASES, CONCRETE FOUNDATIONS AND CIRCUITRY AT EACH LOCATION SHOWN. REFER TO ILLUMINATION SUMMARY AND CONDUIT & CABLE SCHEDULE FOR ADDITIONAL INFORMATION.
2. SEE LIGHT POLE DETAILS IN STRUCTURAL SECTION PLANS.
3. ALL SPLICES SHALL BE MADE IN THE POLE BASE, FIXTURE BASE, IN THE GROUND BOX, OR JUNCTION BOX.
4. ALL METAL CONDUITS, METAL ENCLOSURES, BOXES, POLE BASES AND LUMINAIRE HOUSING SHALL BE GROUNDED.
5. ALL EXISTING UTILITY LOCATIONS ARE APPROXIMATE, CONTRACTOR SHALL VERIFY EXACT LOCATIONS.
6. ALL STATION AND OFFSETS ARE FROM CENTERLINE OF ARAPAHO ROAD, AND ASSOCIATED MARKINGS.
7. ALL STREET POLES SHALL BE CONTINUOUSLY GROUNDED TO THE ELECTRICAL SERVICE GROUND CONDUCTOR SYSTEM.
8. PROVIDE TRANSIENT VOLTAGE SURGE SUPPRESSOR (TVSS) DEVICE FOR EACH DRIVER BOX FOR FIXTURE TYPE "C-1" AND "C-2" AND FOR EACH FIXTURE TYPE "B". (SEE NEC CODE SECTION 285)



323

NO.	DATE	REVISION	APPROV.
1	05/24/04	ADDENDUM CHANGES	CRH

URS GREYSTONE CENTRE
3010 LBJ FREEWAY, SUITE 1300
DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

BRIDGE LIGHTING PLAN
240 AND 120 V

SHEET 2 OF 4

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-2

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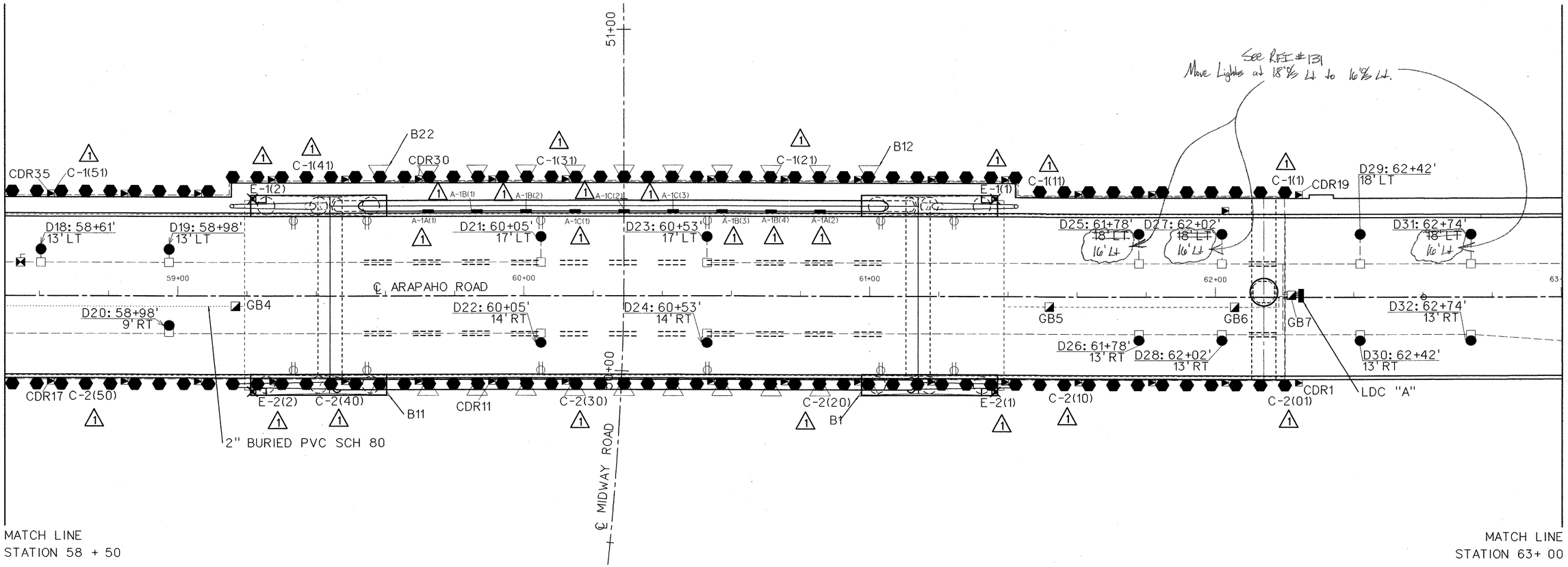

MATCH LINE
STATION 58 + 50

MATCH LINE
STATION 63+ 00

LEGEND:

- TYPE A-1: NORTH ARCH FLOOD
- TYPE A-2: SOUTH ARCH FLOOD
- TYPE B: DIAPHRAGM LED
- TYPE C: PEDESTRIAN HANDRAIL LED
- TYPE D: DECK UNDERSIDE FLOOD
- TYPE E: STINGER FLOOD
- GROUND BOX
- JUNCTION BOX
- TYPE F: NORTH AND SOUTH ROADWAY LIGHTS (20')
  TYPE G: NORTH ROADWAY LIGHTS (35')
- RMC CONDUIT - SIZE PER CONDUIT & CABLE SCHEDULE
- PVC CONDUIT - SIZE PER CONDUIT & CABLE SCHEDULE
- 2" PVC SCH 80 CONDUIT SLEEVE

PS "X": PEDESTAL SERVICE "X"

- FUSED DISCONNECT SWITCH
- LED DRIVER LOCATION
- RECEPTACLE

GENERAL NOTES:

1. PROVIDE LUMINAIRES, POLES, BASES, CONCRETE FOUNDATIONS AND CIRCUITRY AT EACH LOCATION SHOWN. REFER TO ILLUMINATION SUMMARY AND CONDUIT & CABLE SCHEDULE FOR ADDITIONAL INFORMATION.
2. SEE LIGHT POLE DETAILS IN STRUCTURAL SECTION PLANS.
3. ALL SPLICES SHALL BE MADE IN THE POLE BASE, FIXTURE BASE, IN THE GROUND BOX, OR JUNCTION BOX.
4. ALL METAL CONDUITS, METAL ENCLOSURES, BOXES, POLE BASES AND LUMINAIRE HOUSING SHALL BE GROUNDED.
5. ALL EXISTING UTILITY LOCATIONS ARE APPROXIMATE, CONTRACTOR SHALL VERIFY EXACT LOCATIONS.
6. ALL STATION AND OFFSETS ARE FROM CENTERLINE OF ARAPAHO ROAD, AND ASSOCIATED MARKINGS.
7. ALL STREET POLES SHALL BE CONTINUOUSLY GROUNDED TO THE ELECTRICAL SERVICE GROUND CONDUCTOR SYSTEM.
8. FIXTURES ARE NUMBERED SEQUENTIALLY BY TYPE; ALL NUMBERS ARE NOT MARKED ON THIS SHEET DUE TO OVERCROUDING. REFER TO ROADWAY ILLUMINATION SUMMARY FOR COMPLETE LISTING.
9. PROVIDE TRANSIENT VOLTAGE SURGE SUPPRESSOR (TVSS) DEVICE FOR EACH DRIVER BOX FOR FIXTURE TYPE "C-1" AND "C-2" AND FOR EACH FIXTURE TYPE "B". (SEE NEC CODE SECTION 285)

0 20 40 60
SCALE: 1" = 30'

STATE OF TEXAS
EDWARD F. BURKE
25837
REGISTERED
PROFESSIONAL ENGINEER
5/24/04

324

NO.	DATE	REVISION	APPROV.
1	05/24/04	ADDENDUM CHANGES	CRH

URS
GREYSTONE CENTRE
5010 LBJ FREEWAY, SUITE 1500
DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

BRIDGE LIGHTING PLAN
240 AND 120 V

SHEET 3 OF 4

TOWN OF ADDISON, TEXAS

Design	EFB	Drawn	DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check		Check		05-07-04		25768	BL-3

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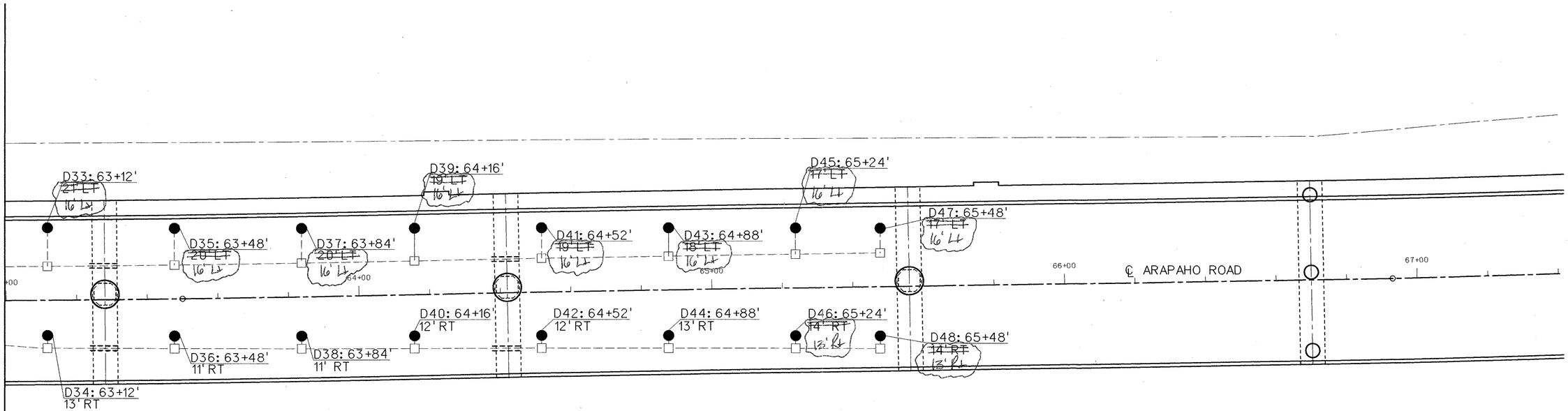

MATCH LINE
STATION 63 + 00

See RFI #131
① Move Lights at 21'⅝ Lt, 20'⅝ Lt, 19'⅝ Lt, 18'⅝ Lt, and 17'⅝ Lt to 16'⅝ Lt.
② Move Lights at 14'⅝ Rt to 13'⅝ Rt.

LEGEND:

- TYPE A-1: NORTH ARCH FLOOD
- TYPE A-2: SOUTH ARCH FLOOD
- TYPE B: DIAPHRAGM LED
- TYPE C: PEDESTRIAN HANDRAIL LED
- TYPE D: DECK UNDERSIDE FLOOD
- GROUND BOX
- JUNCTION BOX
- TYPE F: NORTH AND SOUTH ROADWAY LIGHTS (20')
  TYPE G: NORTH ROADWAY LIGHTS (35')
- RMC CONDUIT - SIZE PER CONDUIT & CABLE SCHEDULE
- PVC CONDUIT - SIZE PER CONDUIT & CABLE SCHEDULE
- 2" PVC SCH 80 CONDUIT SLEEVE

PS "X": PEDESTAL SERVICE "X"

- FUSED DISCONNECT SWITCH

GENERAL NOTES:

1. PROVIDE LUMINAIRES, POLES, BASES, CONCRETE FOUNDATIONS AND CIRCUITRY AT EACH LOCATION SHOWN. REFER TO ILLUMINATION SUMMARY AND CONDUIT & CABLE SCHEDULE FOR ADDITIONAL INFORMATION.
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7. ALL STREET POLES SHALL BE CONTINUOUSLY GROUNDED TO THE ELECTRICAL SERVICE GROUND CONDUCTOR SYSTEM.

0 20 40 60
SCALE: 1" = 30'

STATE OF TEXAS
EDWARD F. BURKE
25837
REGISTERED
PROFESSIONAL ENGINEER
7/6/04

325

NO.	DATE	REVISION	APPROV.

URS GREYSTONE CENTRE
3010 LBJ FREEWAY, SUITE 1200
DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

BRIDGE LIGHTING PLAN
240 AND 120 V

SHEET 4 OF 4

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-4

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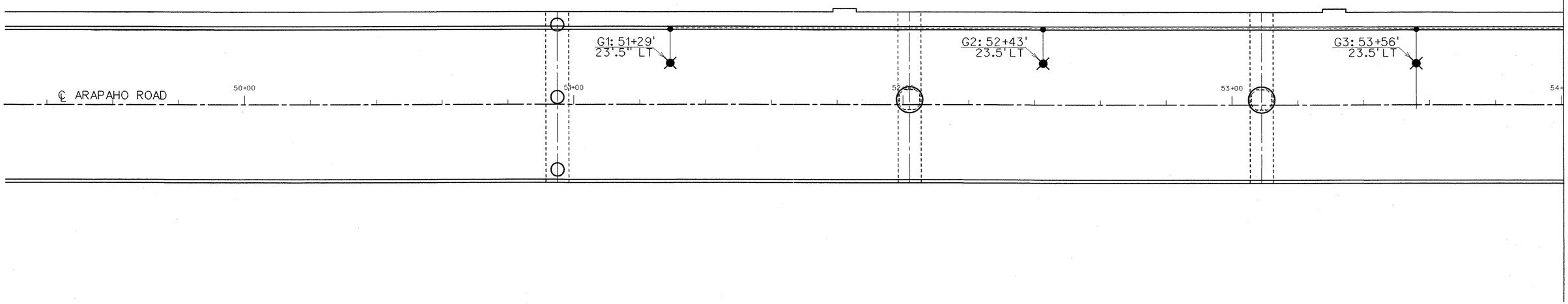

MATCH LINE
STATION 54 + 00

LEGEND:

- TYPE A-1: NORTH ARCH FLOOD
- TYPE A-2: SOUTH ARCH FLOOD
- TYPE B: DIAPHRAGM LED
- TYPE C: PEDESTRIAN HANDRAIL LED
- TYPE D: DECK UNDERSIDE FLOOD
- GROUND BOX
- JUNCTION BOX

TYPE F: NORTH AND SOUTH ROADWAY LIGHTS (20')
TYPE G: NORTH ROADWAY LIGHTS (35')

RMC CONDUIT - SIZE PER CONDUIT & CABLE SCHEDULE

PVC CONDUIT - SIZE PER CONDUIT & CABLE SCHEDULE

LDC "X": LOAD DISTRIBUTION CENTER "X"

FUSED DISCONNECT SWITCH

GENERAL NOTES:

1. PROVIDE LUMINAIRES, POLES, BASES, CONCRETE FOUNDATIONS AND CIRCUITRY AT EACH LOCATION SHOWN. REFER TO ILLUMINATION SUMMARY AND CONDUIT & CABLE SCHEDULE FOR ADDITIONAL INFORMATION.
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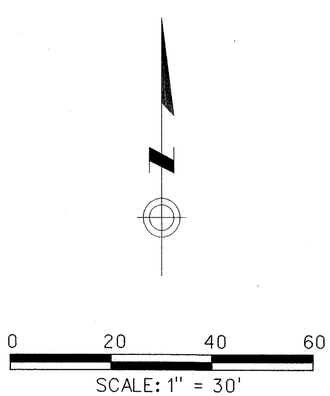
7. ALL STREET POLES SHALL BE CONTINUOUSLY GROUNDED TO THE ELECTRICAL SERVICE GROUND CONDUCTOR SYSTEM.



STATE OF TEXAS
EDWARD F. BURKE
25837
REGISTERED
PROFESSIONAL ENGINEER
5/6/04

326

NO.	DATE	REVISION	APPROV.

URS
GREYSTONE CENTRE
5010 LBJ FREEWAY, SUITE 1500
DALLAS, TX 75244

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

BRIDGE LIGHTING PLAN
480 V

SHEET 1 OF 4

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-5

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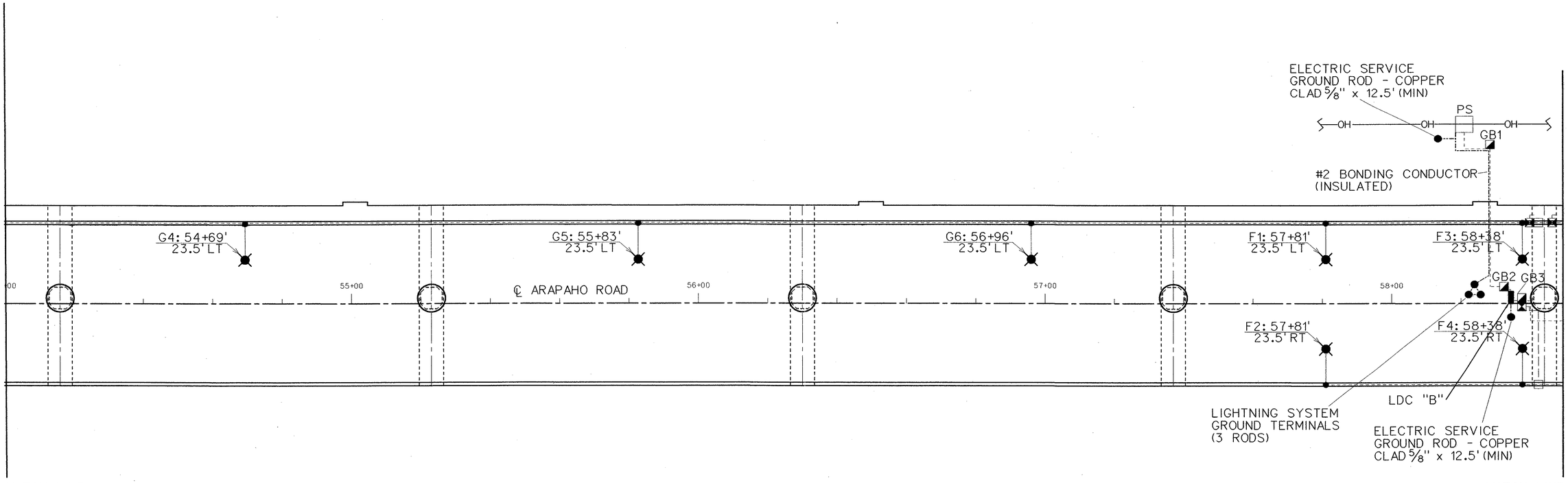

MATCH LINE
STATION 54 + 00

MATCH LINE
STATION 58 + 50

LEGEND:

- TYPE A-1: NORTH ARCH FLOOD
- TYPE A-2: SOUTH ARCH FLOOD
- TYPE B: DIAPHRAGM LED
- TYPE C: PEDESTRIAN HANDRAIL LED
- TYPE D: DECK UNDERSIDE FLOOD
- GROUND BOX
- JUNCTION BOX
- TYPE F: NORTH AND SOUTH ROADWAY LIGHTS (20')
  TYPE G: NORTH ROADWAY LIGHTS (35')
- RMC CONDUIT - SIZE PER CONDUIT & CABLE SCHEDULE
- PVC CONDUIT - SIZE PER CONDUIT & CABLE SCHEDULE
- LDC "X": LOAD DISTRIBUTION CENTER "X"
- FUSED DISCONNECT SWITCH
- PS: PEDESTAL SERVICE FROM POWER UTILITY

GENERAL NOTES:

1. PROVIDE LUMINAIRES, POLES, BASES, CONCRETE FOUNDATIONS AND CIRCUITRY AT EACH LOCATION SHOWN. REFER TO ILLUMINATION SUMMARY AND CONDUIT & CABLE SCHEDULE FOR ADDITIONAL INFORMATION.
2. SEE LIGHT POLE DETAILS IN STRUCTURAL SECTION PLANS.
3. ALL SPLICES SHALL BE MADE IN THE POLE BASE, FIXTURE BASE, IN THE GROUND BOX, OR JUNCTION BOX.
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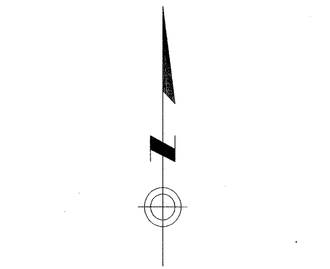
7. ALL STREET POLES SHALL BE CONTINUOUSLY GROUNDED TO THE ELECTRICAL SERVICE GROUND CONDUCTOR SYSTEM.



0 20 40 60

SCALE: 1" = 30'

327

NO.	DATE	REVISION	APPROV.

URS GREYSTONE CENTRE
3010 LBJ FREEWAY, SUITE 1300
DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

BRIDGE LIGHTING PLAN
480V

SHEET 2 OF 4

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-6

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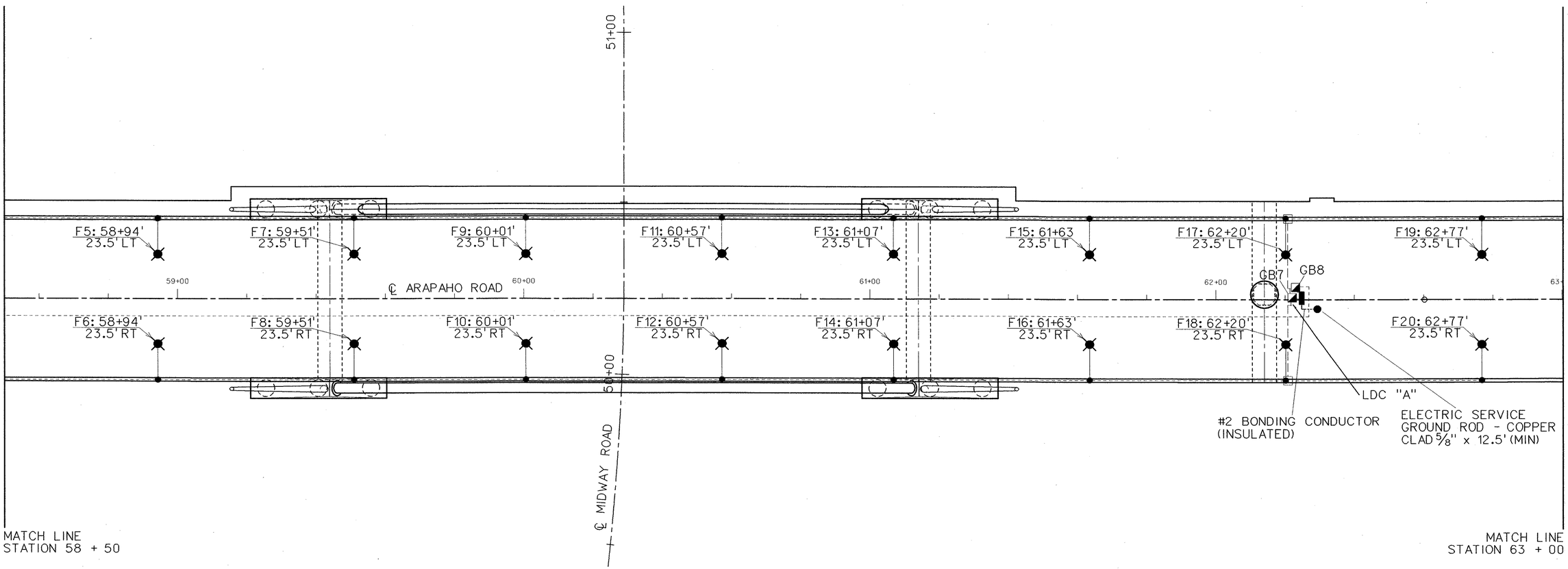

LEGEND:

- TYPE A-1: NORTH ARCH FLOOD
- TYPE A-2: SOUTH ARCH FLOOD
- TYPE B: DIAPHRAGM LED
- TYPE C: PEDESTRIAN HANDRAIL LED
- TYPE D: DECK UNDERSIDE FLOOD
- GROUND BOX
- JUNCTION BOX
- TYPE F: NORTH AND SOUTH ROADWAY LIGHTS (20')
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- RMC CONDUIT - SIZE PER CONDUIT & CABLE SCHEDULE
- PVC CONDUIT - SIZE PER CONDUIT & CABLE SCHEDULE
- LDC "X": LOAD DISTRIBUTION CENTER "X"
- FUSED DISCONNECT SWITCH

GENERAL NOTES:

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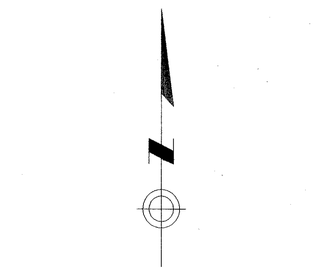

NO.	DATE	REVISION	APPROV.

328

URS GREYSTONE CENTRE
3010 LBJ FREEWAY, SUITE 1500
DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

BRIDGE LIGHTING PLAN
480V

SHEET 3 OF 4

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-7

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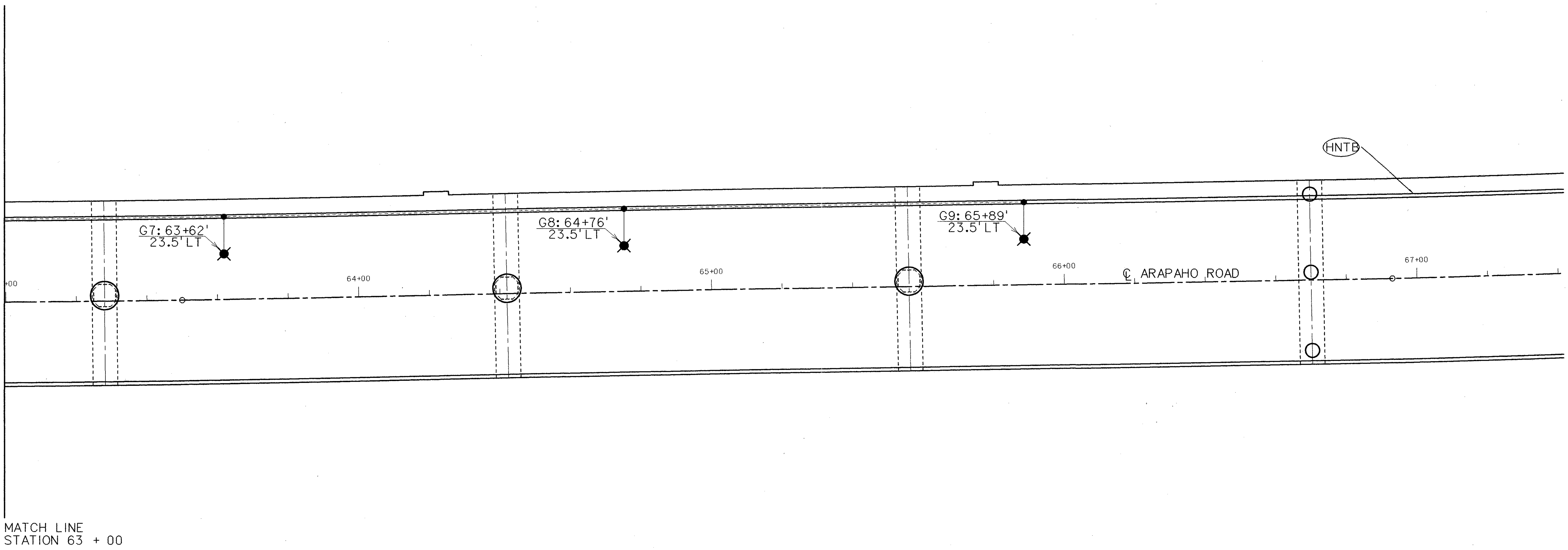

LEGEND:

- ▬ TYPE A-1: NORTH ARCH FLOOD
- ▬ TYPE A-2: SOUTH ARCH FLOOD
- △ TYPE B: DIAPHRAGM LED
- ⬢ TYPE C: PEDESTRIAN HANDRAIL LED
- ● TYPE D: DECK UNDERSIDE FLOOD
- ◪ GROUND BOX
- □ JUNCTION BOX
- TYPE F: NORTH AND SOUTH ROADWAY LIGHTS (20')
- TYPE G: NORTH ROADWAY LIGHTS (35')
- ——— RMC CONDUIT - SIZE PER CONDUIT & CABLE SCHEDULE
- - - - - PVC CONDUIT - SIZE PER CONDUIT & CABLE SCHEDULE
- LDC "X": LOAD DISTRIBUTION CENTER "X"
- FUSED DISCONNECT SWITCH

GENERAL NOTES:

1. PROVIDE LUMINAIRES, POLES, BASES, CONCRETE FOUNDATIONS AND CIRCUITRY AT EACH LOCATION SHOWN. REFER TO ILLUMINATION SUMMARY AND CONDUIT & CABLE SCHEDULE FOR ADDITIONAL INFORMATION.
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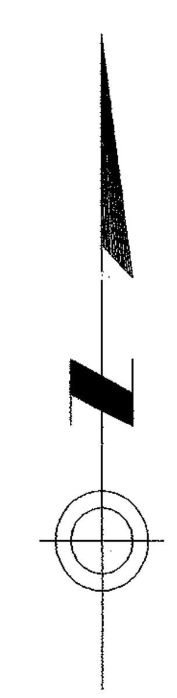
6. ALL STATION AND OFFSETS ARE FROM CENTERLINE OF ARAPAHO ROAD, AND ASSOCIATED MARKINGS.
7. ALL STREET POLES SHALL BE CONTINUOUSLY GROUNDED TO THE ELECTRICAL SERVICE GROUND CONDUCTOR SYSTEM.



SCALE: 1" = 30'

STATE OF TEXAS
EDWARD F. BURKE
25837
REGISTERED PROFESSIONAL ENGINEER

329

NO.	DATE	REVISION	APPROV.

URS
GREYSTONE CENTRE
5010 LBJ FREEWAY, SUITE 1300
DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

BRIDGE LIGHTING PLAN

480 V

SHEET 4 OF 4

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-8

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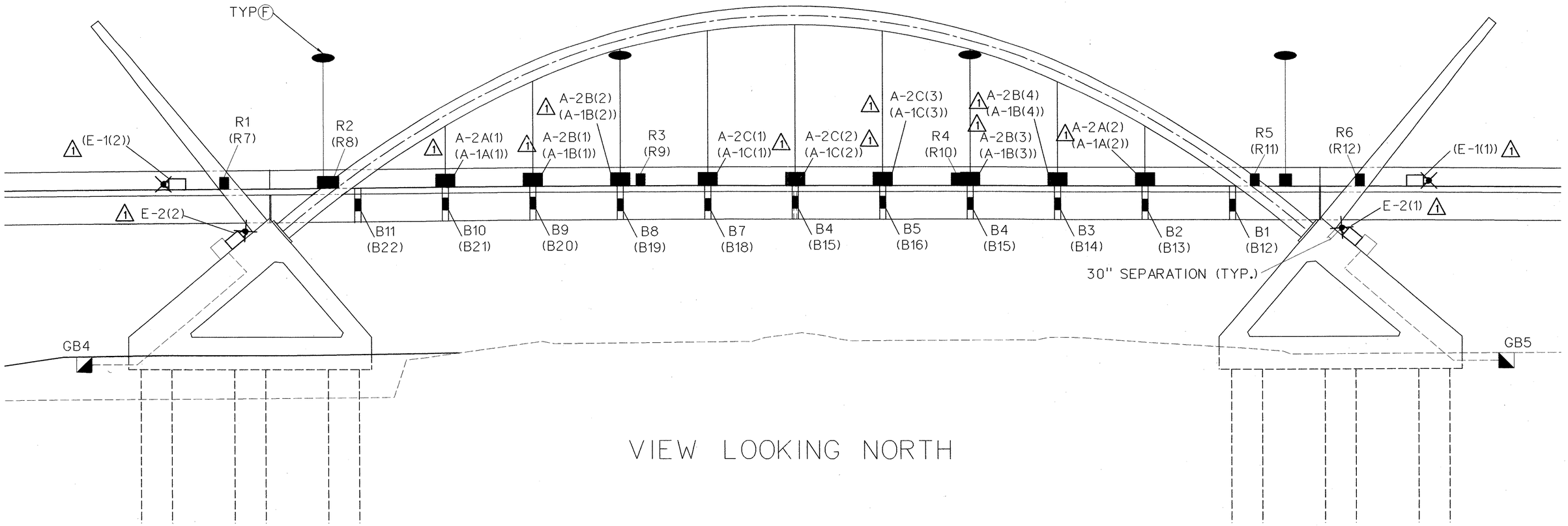

VIEW LOOKING NORTH

RECEPTACLE LOCATIONS:		
SOUTH SIDE (STA ↓)		
R1	59+36.98	14' WEST OF POLE F8
R2	59+53.98	3' EAST OF POLE F8
R3	60+03.57	3' EAST OF POLE F10
R4	60+54.23	3' WEST OF POLE F12
R5	61+03.82	3' EAST OF POLE F14
R6	61+20.82	14' EAST OF POLE F14
NORTH SIDE		
R1	59+36.98	14' WEST OF POLE F7
R2	59+53.98	3' EAST OF POLE F7
R3	60+03.57	3' EAST OF POLE F9
R4	60+54.23	3' WEST OF POLE F11
R5	61+03.82	3' EAST OF POLE F13
R6	61+20.82	14' EAST OF POLE F13

NOTES:

1) ALL RECEPTACLE LOCATIONS ARE APPROXIMATE. RECEPTACLES WILL BE LOCATED ON THE OUTSIDE OF TRAFFIC BARRIER (i.e. OUTSIDE OF ROADWAY). RECEPTACLES WILL BE LOCATED APPROXIMATELY HALF DISTANCE FROM ROADWAY TO TOP OF BARRIER, EVEN WITH CONNECTING CONDUIT RUN.

2) XXX LOCATED ON SOUTH SIDE OF BRIDGE
(XXX) LOCATED ON NORTH SIDE OF BRIDGE

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ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

BRIDGE LIGHTING
MAIN SPAN

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-9

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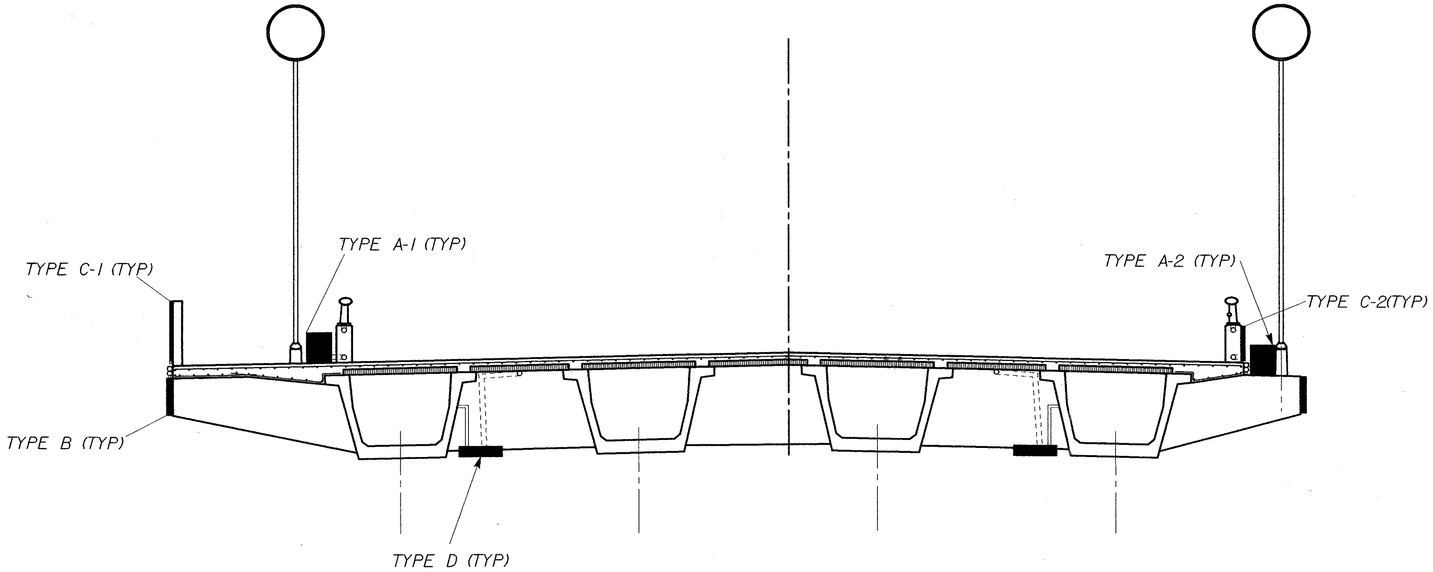
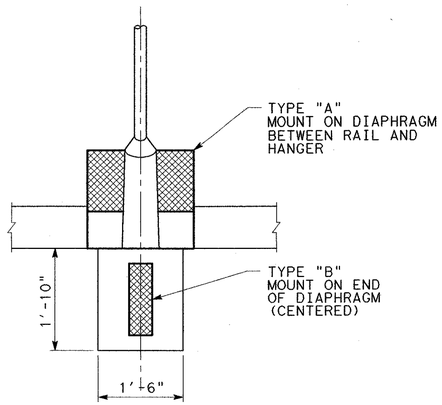
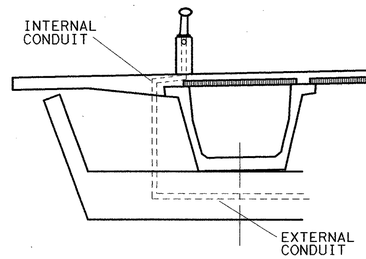
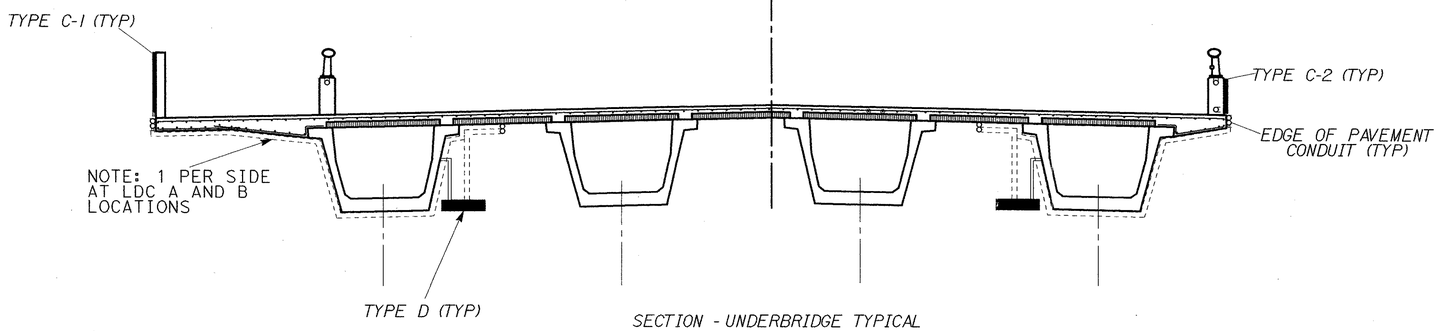


SECTION - CENTERSPAN UNDERBRIDGE TYPICAL





CUTAWAY - UNDERBRIDGE
TYPICAL SECTION
(BENTS 8 & 11)



SECTION - UNDERBRIDGE TYPICAL

STATE OF TEXAS
EDWARD F. BURKE
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PROFESSIONAL ENGINEER

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NO.	DATE	REVISION	APPROV.

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3010 LBJ FREEWAY, SUITE 1500
DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

BRIDGE LIGHTING CONDUIT LOCATIONS

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-10

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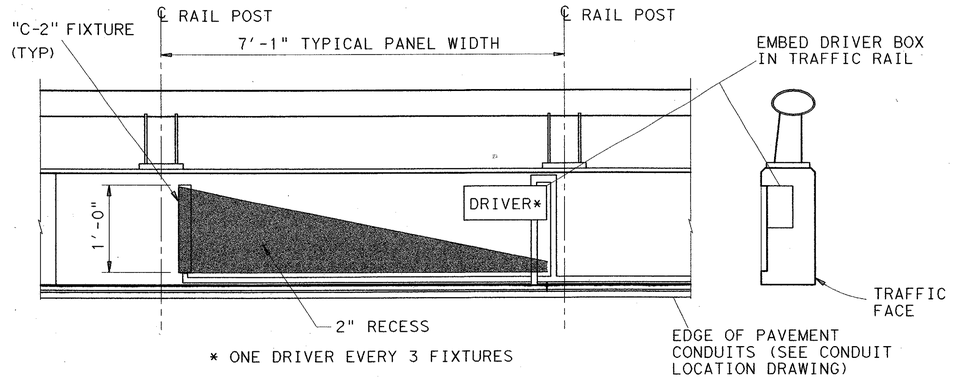
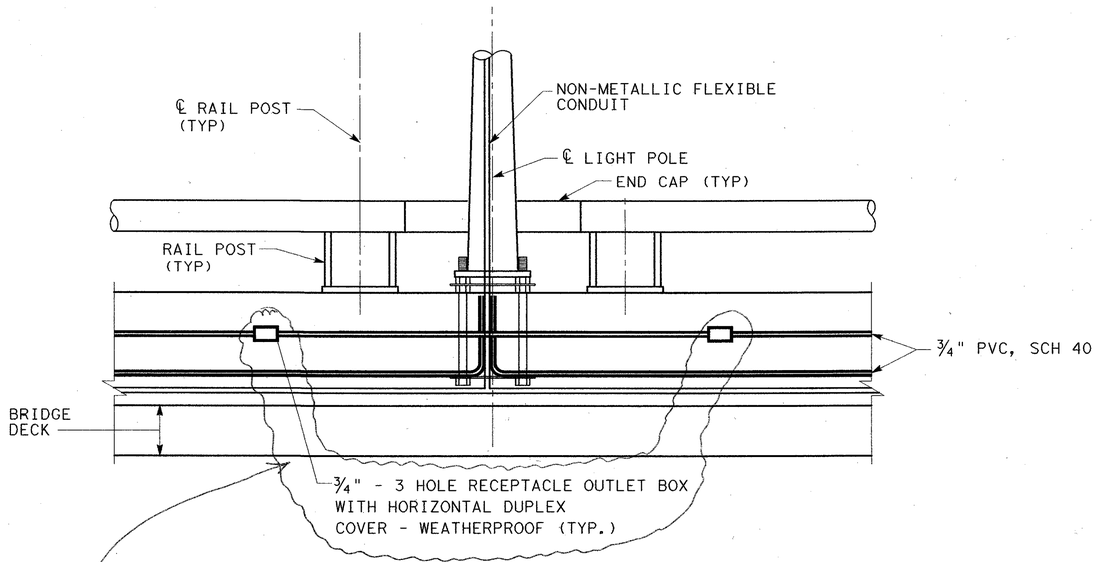


TYPICAL RAIL ELEVATION TYPE T4(S) MOD A

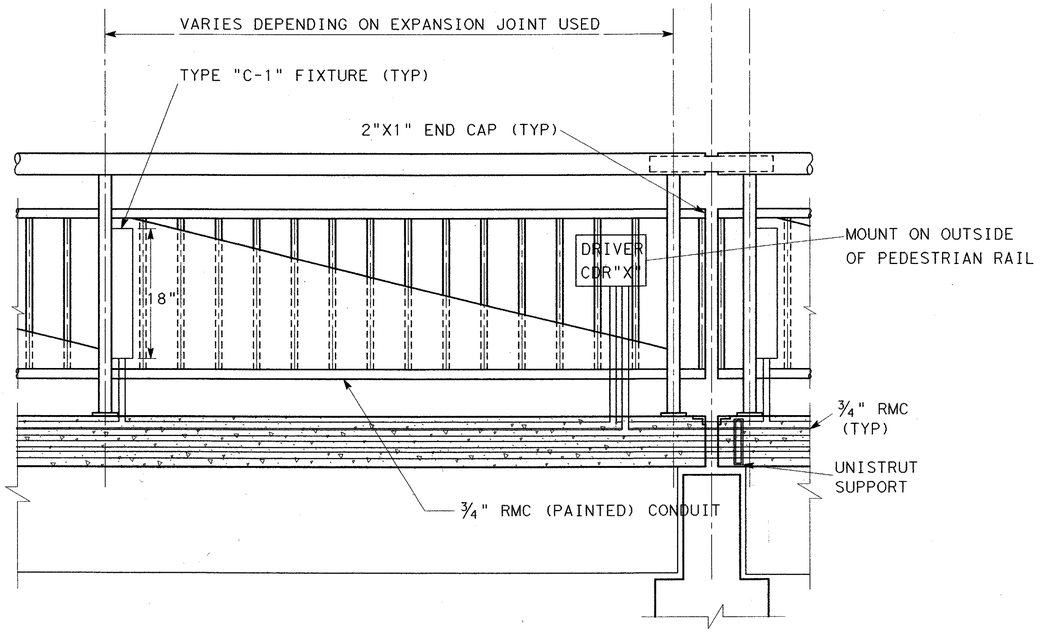


ROADWAY LIGHT POLE & RECEPTACLE DETAIL

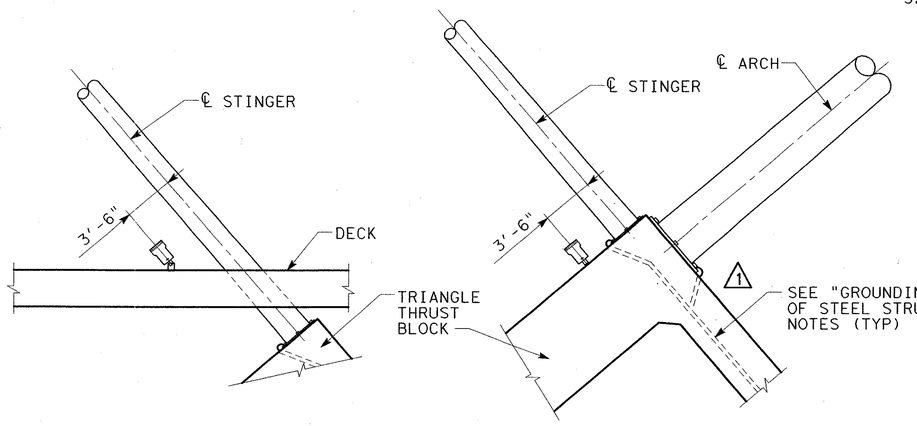
See RFI # 061
The Receptacles Outlet Boxes will be recessed into the concrete rail and flush mounted.

⚠1 GROUNDING OF STEEL STRUCTURES

1. STINGER & ARCH SHALL BE GROUNDED USING A #4 GREEN INSULATED CONDUCTOR ATTACHED TO THE BASE PLATE, AND A ⅝"x10' COPPER CLAD STEEL GROUND ROD ADJACENT TO EACH TRIANGULAR PIER (FOUR TOTAL)
2. ALL ITEMS ASSOCIATED WITH GROUNDING OF THE ARCH & STINGER INCLUDING CONDUIT, CONDUCTOR, CONNECTORS AND RODS SHALL BE CONSIDERED AS "GROUNDING OF STEEL STRUCTURES".
3. CONNECTIONS TO BASE PLATES SHALL BE SUBMITTED FOR APPROVAL.



TYPICAL PEDESTRIAN RAIL LIGHTING



FIXTURE "E-1"

FIXTURE "E-2"

STINGER LIGHT MOUNTING DETAILS

STATE OF TEXAS
EDWARD F. BURKE
25837
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8/26/04

332

NO.	DATE	REVISION	APPROV.
1	06/01/04	ADDENDUM CHANGES	CRH

URS
GREYSTONE CENTRE
5910 LBJ FREEWAY, SUITE 1300
DALLAS, TX 75254

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

BRIDGE LIGHTING DETAILS

SHEET 1 OF 3

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-11

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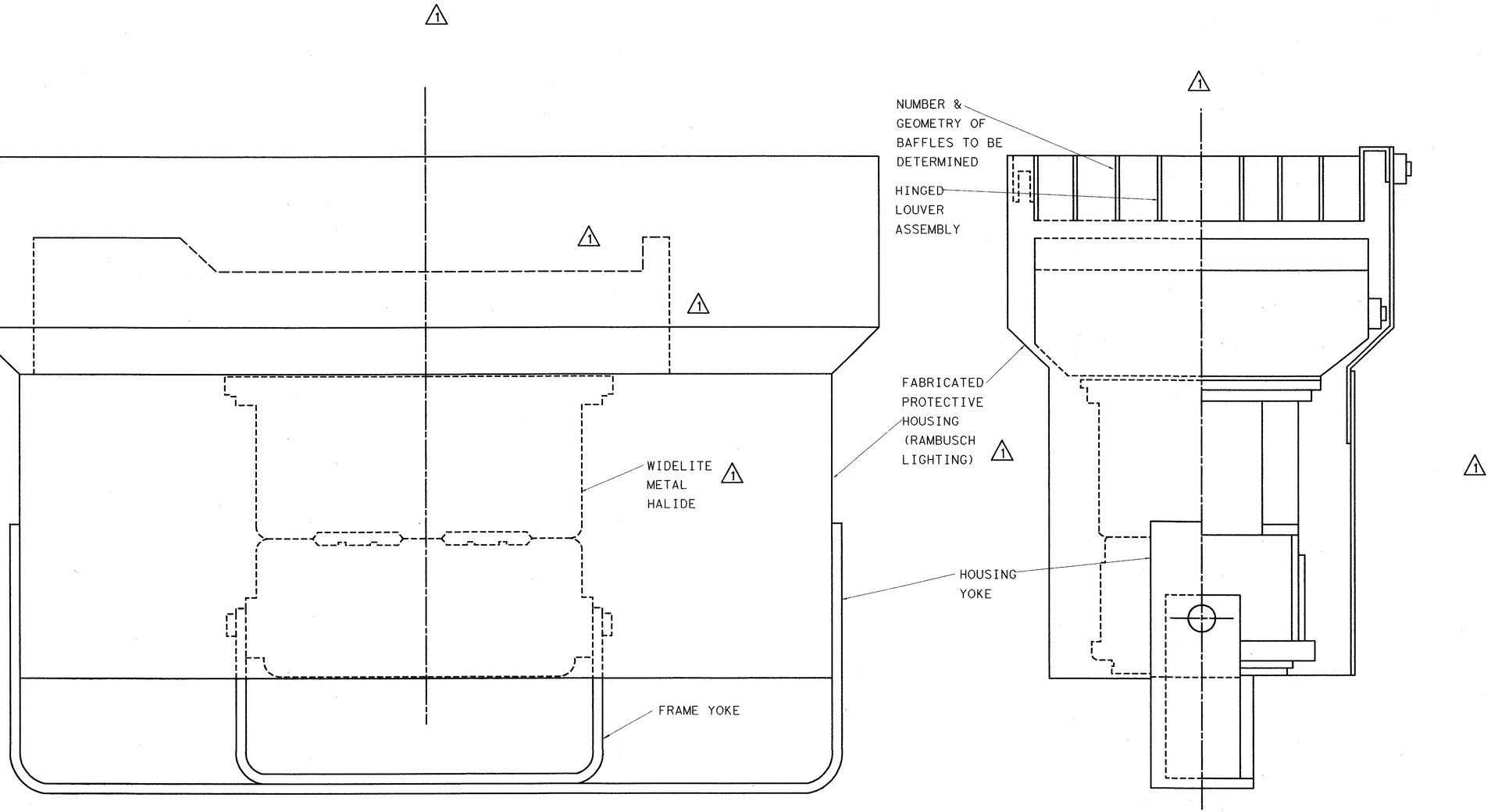

FIXTURE A-1A, A-1B, & A-1C 1
BAFFLED ENCLOSURE

EDWARD F. BURKE
25837
REGISTERED PROFESSIONAL ENGINEER
STATE OF TEXAS
7/16/04

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NO.	DATE	REVISION	APPROV.
1	05/24/04	ADDENDUM CHANGES	CRH

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GREYSTONE CENTRE
3010 LBJ FREEWAY, SUITE 1300
DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

BRIDGE LIGHTING DETAILS

SHEET 2 OF 3

TOWN OF ADDISON, TEXAS

Design	Drawn	DATE	SCALE	PROJECT NO.	SHEET NO.
EFB	DT	05-07-04		25768	BL-12
Check	Check				

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PLEASE REFER ALL INQUIRIES TO OUR SHOP ORDER NUMBER ESI-Ø4-15Ø

MYERS POWER PRODUCTS

725 E. HARRRISON ST., CORONA, CA. 92879

CAT. NO. _____

SEE DRAWING _____ FOR WIRING DIAGRAM

240/480 V 1 Ø 3 W 70 AMPS

UTILITY _____ 14.000 AIC

DISTRIBUTOR ELECTROL SYSTEM

CONTRACTOR _____

FINISH COLOR ■ LT. GREEN ☐ WHITE ☐ DK. GREEN ☐ OTHER

CALTRANS ☐ YES ☐ NO

U.L. LABEL ☐ SERVICE EQUIPMENT ■ INDUSTRIAL CONTROL ☐ CABINET & BOXES

NAMEPLATES PHENOLIC ☐ ☐ BREAKER I.D. ☐ CONTRACT NO. _____ ☐ LOCATION _____ ☐ POWER POLE NO. _____

PHOTOCELL REQUIRED ■ YES ☐ NO | PHOTOCELL PROVISIONS ■ YES ☐ NO

MYERS METERED UNDERGROUND SERVICE PEDESTAL

NEMA 3R CONSTRUCTION- STAINLESS STEEL HARDWARE
12 GAUGE STEEL CONSTRUCTION.
ALL FACTORY WIRING CODE GAUGE COPPER CONDUCTORS WITH 600V INSULATION
SERVICE TERMINATIONS NO. 6 AWG TO 250 MCM CU/AL

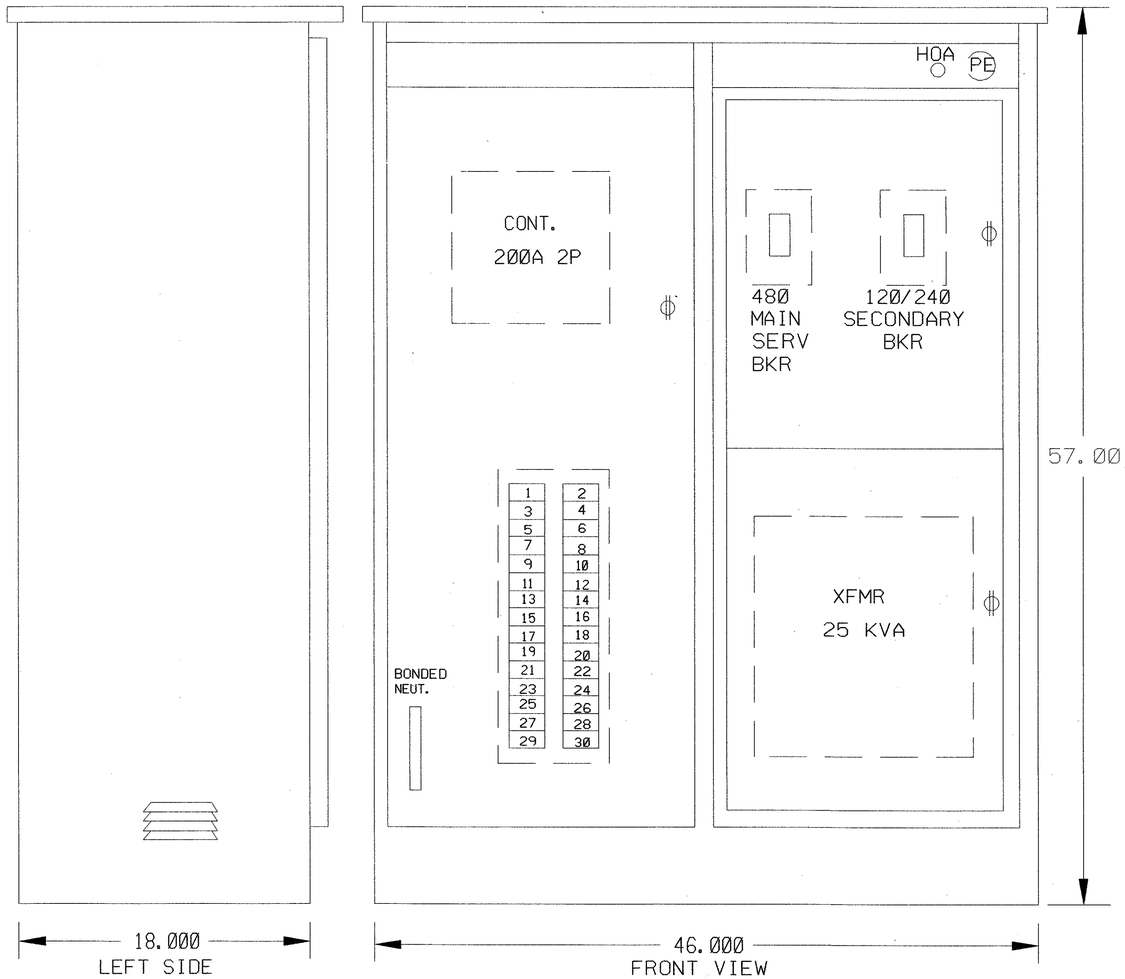
MATERIAL LIST

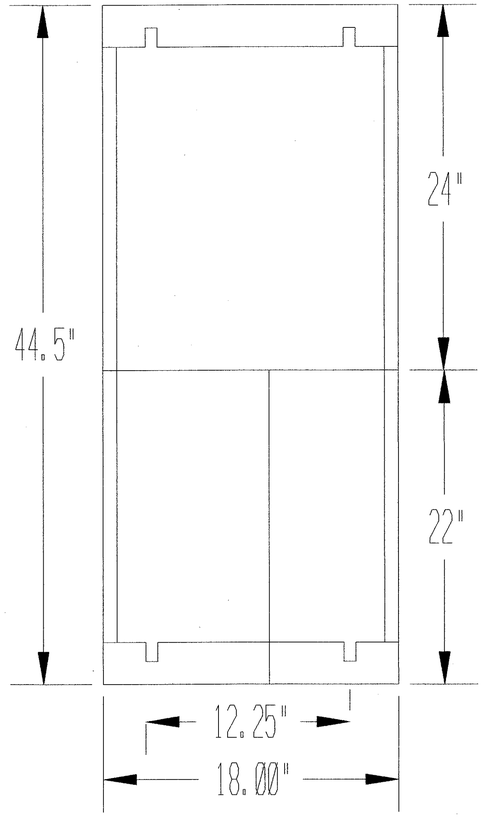
NO	DESCRIPTION	QTY	AMP	POLE	KAIC		MYERS P/N
	SERV. DISC.	1	70	2	14K	EHD2070L	
			SUB-BREAKERS AS INDICATED				
INT	PLUG-IN INTERIOR	1	200	30	240V	CUTLER-HAMMER	
	TRANSFORMER	1	25KVA 1PH 480V			ACME	
	HOA SWITCH	1	10	SPST	120V	TELEMECANIQUE	
	EH CONTACTOR	1	200	2	120V	GE# CR360L	
	PE RECEPT.	1	15		120V		

DATE: 04/06/04 | BY: JLT | S/O #

NOTE 1) PROVIDE PEDESTAL SUPPORT FOR CABINET, REFER TO ED(8)-Ø3 FOR FOUNDATIØN NOTES AND CONCEPT.

NOTE 2) SEE PANEL SCHEDULE LDC "A" AND "B" FOR ADDITIONAL INFORMATION.





MOUNTING SLOT DETAIL

334

NO.	DATE	REVISION	APPROV.

URS GREYSTONE CENTRE 3010 LBJ FREEWAY, SUITE 1300 DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

BRIDGE LIGHTING DETAILS

SHEET 3 of 3

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-13

CONTRACTOR: URS CORP.	FILE: M:\DWG002004	REVISION: NO REVISION	REVISION DATE:
DATE: 6 APRIL 04	PROJECT: ARAPAHO ROAD - LOAD DISTRIBUTION CENTERS A & B	TITLE: CUSTOM PANEL	REFERENCE # ESI-Ø4-15Ø-11
DRAWN BY: LCV			
SCALE: NTS			

ELECTROL SYSTEMS, INC.
10623 SENTINEL DRIVE
SAN ANTONIO, TX 78217 [210] 599-6485

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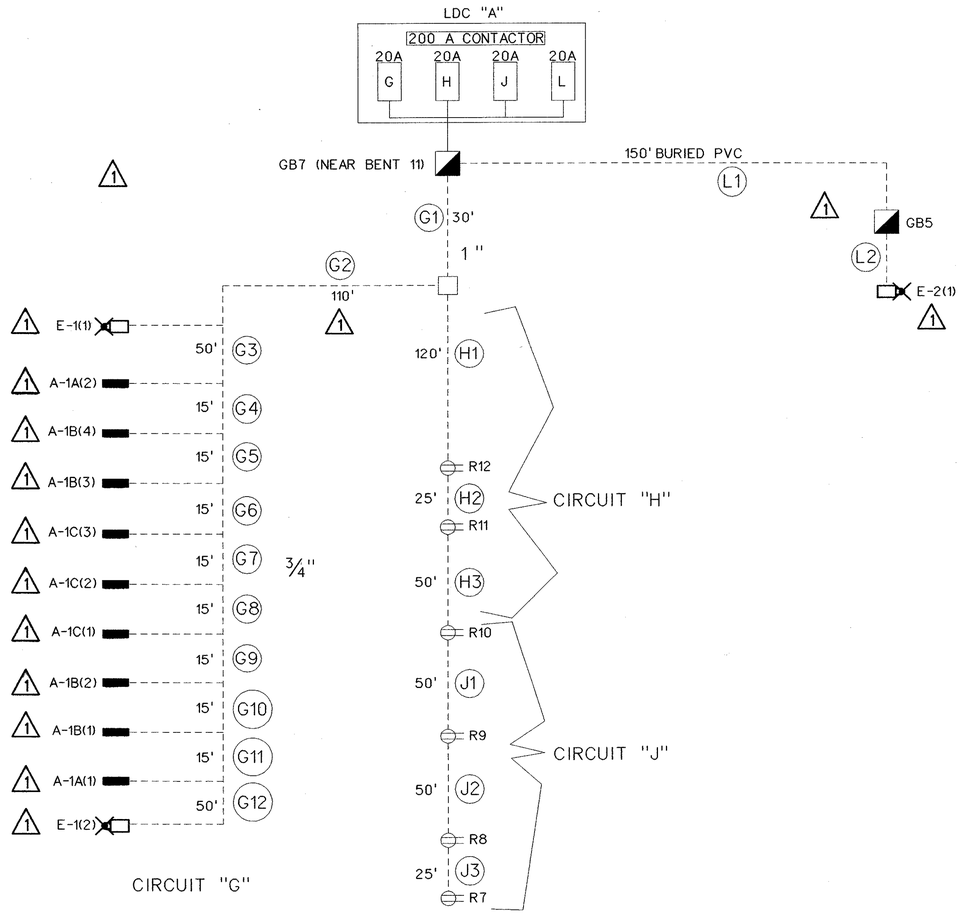

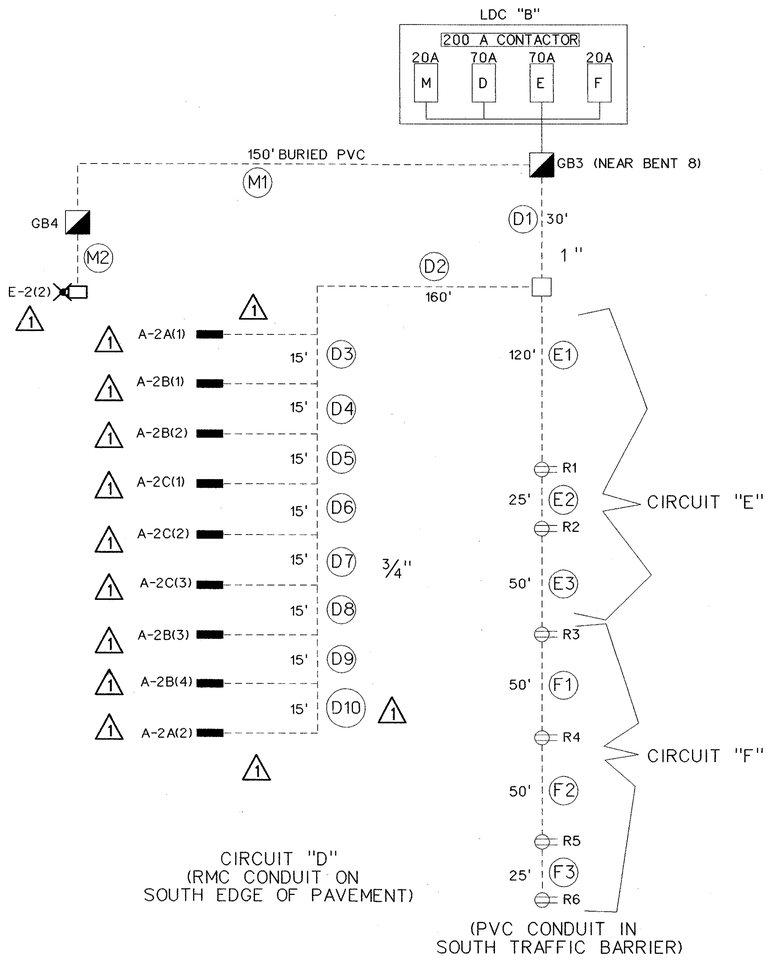

LEGEND:

- GROUND BOX
- JUNCTION BOX
- TYPE A FLOODLIGHT
- TYPE E STINGER FLOODLIGHT
- DUPLEX RECEPTACLE
- CONDUIT - SEE CONDUIT SUMMARY FOR SIZE/TYPE

STATE OF TEXAS
EDWARD F. BURKE
25837
REGISTERED PROFESSIONAL ENGINEER

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1	05/24/04	ADDENDUM CHANGES	CRH

URS GREYSTONE CENTRE
3010 LBJ FREEWAY, SUITE 1500
DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

WIRING DIAGRAM: 240/120V
FLOODLIGHTS & RECEPTICLES

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-14

7/1/2004
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CONDUIT & CONDUCTOR SCHEDULE

	GROUND CONDUCTOR			CONDUCTOR			CONDUIT			
	#10 AWG			#10 AWG			3/4" SCH 40 (PVC)	3/4" RMC	1" RMC	2" SCH 80 (PVC)
RUN	LENGTH FT.	QTY.	SUM LENGTH	LENGTH FT.	QTY.	SUM LENGTH	LENGTH FT.	LENGTH FT.	LENGTH FT.	LENGTH FT.
G1	30	3	90	30	8	240			30	
G2	1 110	1	1 110	1 110	2	1 220	1 110			
G3	1 50	1	1 50	1 50	2	1 100	1 50			
G4	15	1	15	15	2	30	15			
G5	15	1	15	15	2	30	15			
G6	15	1	15	15	2	30	15			
G7	15	1	15	15	2	30	15			
G8	15	1	15	15	2	30	15			
G9	15	1	15	15	2	30	15			
G10	15	1	15	15	2	30	15			
1 G11	15	1	15	15	2	30	15			
1 G12	50	1	50	50	2	100	50			
H1	120	2	240	120	6	720	120			
H2	25	2	50	25	6	150	25			
H3	50	2	100	50	6	300	50			
J1	50	1	50	50	3	150	50			
J2	50	1	50	50	3	150	50			
J3	25	1	25	25	3	75	25			
D1	30	3	90	30	8	240			30	
D2	1 160	1	1 160	1 160	2	1 320		1 160		
1 D3	15	1	15	15	2	30		15		
1 D4	15	1	15	15	2	30		15		
1 D5	15	1	15	15	2	30		15		
1 D6	15	1	15	15	2	30		15		
1 D7	15	1	15	15	2	30		15		
1 D8	15	1	15	15	2	30		15		
1 D9	15	1	15	15	2	30		15		
1 D10	15	1	15	15	2	30		15		
E1	120	2	240	120	6	720	120			
E2	25	2	50	25	6	150	25			
E3	50	2	100	50	6	300	50			
F1	50	1	50	50	3	150	50			
F2	50	1	50	50	3	150	50			
F3	25	1	25	25	3	75	25			
L1	150	1	150	150	2	300				150
M1	150	1	150	150	2	300				150
L2	50	1	50	50	2	100	50			
M2	50	1	50	50	2	100	50			
TOTALS	SUM OF G CONDUCTORS		2220	SUM OF CONDUCTORS		5590	1 1070	1 280	60	300

ROADWAY ILLUMINATION SUMMARY

POLE OR FIXTURE	STATION	TYPE	REMARKS
1 A-1A(1)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-1A"	ARCH FLOODLIGHTING W/ENCLOSURE
1 A-1A(2)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-1A"	ARCH FLOODLIGHTING W/ENCLOSURE
1 A-2A(1)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-2A"	ARCH FLOODLIGHTING 1
1 A-2A(2)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-2A"	ARCH FLOODLIGHTING 1
1 A-1B(1)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-1B"	ARCH FLOODLIGHTING W/ENCLOSURE
1 A-1B(2)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-1B"	ARCH FLOODLIGHTING W/ENCLOSURE
1 A-1B(3)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-1B"	ARCH FLOODLIGHTING W/ENCLOSURE
1 A-1B(4)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-1B"	ARCH FLOODLIGHTING W/ENCLOSURE
1 A-2B(1)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-2B"	ARCH FLOODLIGHTING 1
1 A-2B(2)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-2B"	ARCH FLOODLIGHTING 1
1 A-2B(3)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-2B"	ARCH FLOODLIGHTING 1
1 A-2B(4)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-2B"	ARCH FLOODLIGHTING 1
1 A-1C(1)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-1C"	ARCH FLOODLIGHTING W/ENCLOSURE
1 A-1C(2)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-1C"	ARCH FLOODLIGHTING W/ENCLOSURE
1 A-1C(3)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-1C"	ARCH FLOODLIGHTING W/ENCLOSURE
1 A-2C(1)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-2C"	ARCH FLOODLIGHTING 1
1 A-2C(2)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-2C"	ARCH FLOODLIGHTING 1
1 A-2C(3)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "A-2C"	ARCH FLOODLIGHTING 1
R1	SHEET 3	WEATHERPROOF DUPLEX RECETACLE	WEATHERPROOF DUPLEX RECEPTACLE 1
R2	SHEET 3	WEATHERPROOF DUPLEX RECETACLE	WEATHERPROOF DUPLEX RECEPTACLE 1
R3	SHEET 3	WEATHERPROOF DUPLEX RECETACLE	WEATHERPROOF DUPLEX RECEPTACLE 1
R4	SHEET 3	WEATHERPROOF DUPLEX RECETACLE	WEATHERPROOF DUPLEX RECEPTACLE 1
R5	SHEET 3	WEATHERPROOF DUPLEX RECETACLE	WEATHERPROOF DUPLEX RECEPTACLE 1
R6	SHEET 3	WEATHERPROOF DUPLEX RECETACLE	WEATHERPROOF DUPLEX RECEPTACLE 1
R7	SHEET 3	WEATHERPROOF DUPLEX RECETACLE	WEATHERPROOF DUPLEX RECEPTACLE 1
R8	SHEET 3	WEATHERPROOF DUPLEX RECETACLE	WEATHERPROOF DUPLEX RECEPTACLE 1
R9	SHEET 3	WEATHERPROOF DUPLEX RECETACLE	WEATHERPROOF DUPLEX RECEPTACLE 1
R10	SHEET 3	WEATHERPROOF DUPLEX RECETACLE	WEATHERPROOF DUPLEX RECEPTACLE 1
R11	SHEET 3	WEATHERPROOF DUPLEX RECETACLE	WEATHERPROOF DUPLEX RECEPTACLE 1
R12	SHEET 3	WEATHERPROOF DUPLEX RECETACLE	WEATHERPROOF DUPLEX RECEPTACLE 1
1 E-1(1)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "E-1"	STINGER FLOODLIGHTING
1 E-1(2)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "E-1"	STINGER FLOODLIGHTING
1 E-2(1)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "E-2"	STINGER FLOODLIGHTING
1 E-2(2)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "E-2"	STINGER FLOODLIGHTING

ESTIMATED QUANTITIES

ITEM	UNIT	ESTIMATED QUANTITY	FINAL QUANTITY
CONDUIT (PVC) (SCH 40) (3/4")	LF	1070 1	
CONDUIT (RMC) 3/4"	LF	280 1	
CONDUIT (RMC) 1"	LF	60	
CONDUIT (PVC) (SCH 80) (2")	LF	300	
ELECTRICAL CONDUCTOR (NO. 10) BARE	LF	2220	
ELECTRICAL CONDUCTOR (NO. 10) INSULATED	LF	5590	
GROUND BOX, GB	EA	3	
RECEPTACLES	EA	12	
FIXTURE, TYPE (A-1A)	EA	2	
FIXTURE, TYPE (A-1B)	EA	4	
FIXTURE, TYPE (A-1C)	EA	3	
FIXTURE, TYPE (A-2A)	EA	2	
FIXTURE, TYPE (A-2B)	EA	4	
FIXTURE, TYPE (A-2C)	EA	3	
FIXTURE, TYPE (E-1)	EA	2	
FIXTURE, TYPE (E-2)	EA	2	

STATE OF TEXAS
EDWARD F. BURKE
25837
REGISTERED PROFESSIONAL ENGINEER

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NO.	DATE	REVISION	APPROV.
1	05/24/04	ADDENDUM CHANGES	CRH

URS
GRETSTONE CENTRE
3010 LBJ FREEWAY, SUITE 1300
DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

CONDUIT & CONDUCTOR SUMMARY
FLOODLIGHTS & RECEPTACLES

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-15

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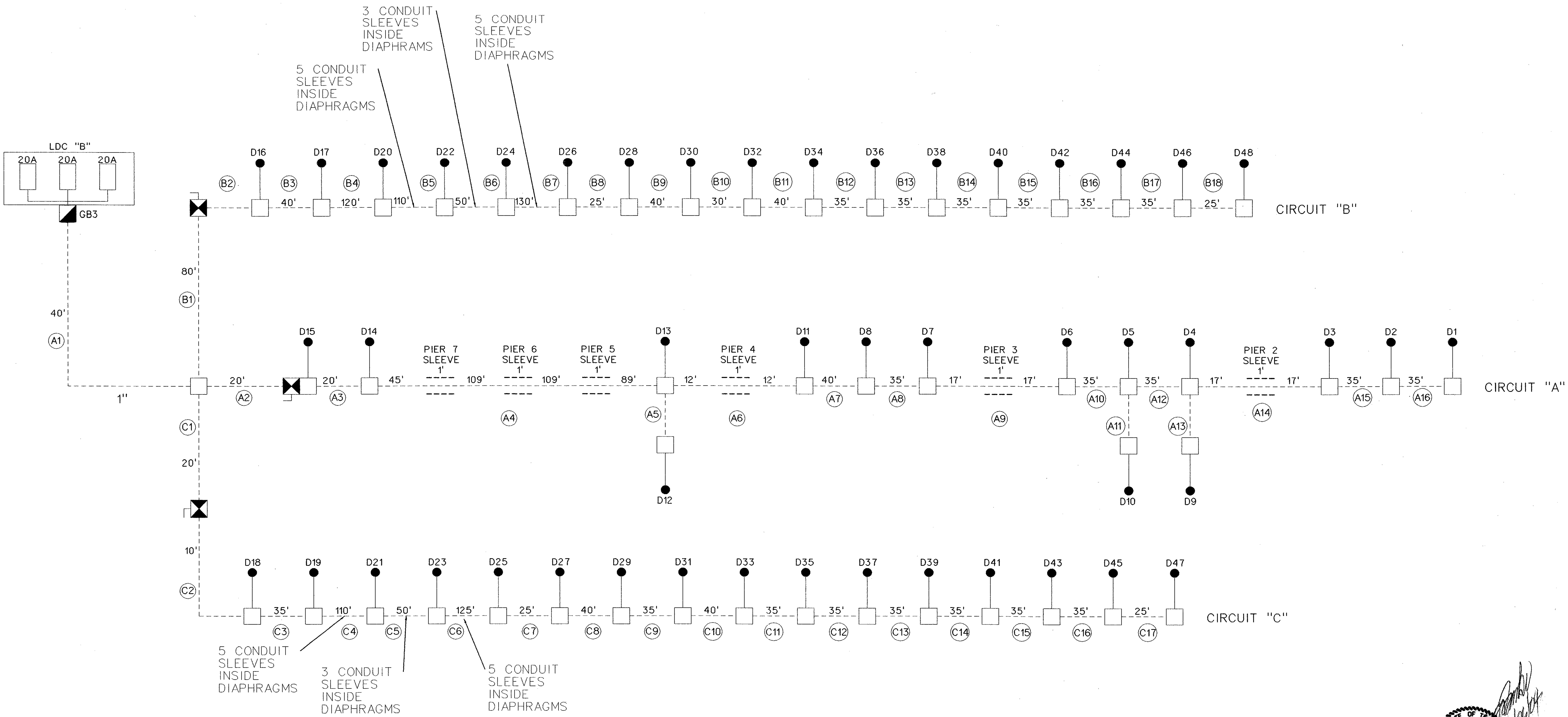

STATE OF TEXAS
EDWARD F. BURKE
25837
REGISTERED PROFESSIONAL ENGINEER

LEGEND:

- GROUND BOX
- JUNCTION BOX
- LIGHT FIXTURE WITH TYPE INICATION
- CONDUIT: SEE CONDUIT SCHEDULE FOR SIZE
- 2" PVC, SCH 80 CONDUIT SLEEVE
- FUSED DISCONNECT SWITCH

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NO.	DATE	REVISION	APPROV.

URS GREYSTONE CENTRE 5010 LBJ FREEWAY, SUITE 1300 DALLAS, TX 75254

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

WIRING DIAGRAM (240/120V)
TYPE "D" UNDER BRIDGE LIGHTS

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-16

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CONDUIT & CONDUCTOR SCHEDULE

	Ground Conductors				Conductors						Conduit Sizing	
	#6 AWG		#8 AWG		#6 AWG			#8 AWG			1" RMC	3/4" RMC
RUN	Sum LENGTH FT.	QTY.	Sum LENGTH FT.	QTY.	Length	Sum LENGTH FT.	QTY.	Length	Sum LENGTH FT.	QTY.	LENGTH FT.	LENGTH FT.
A1	40	1			40	80	2	40	160	4	40	
A2			20	1				20	40	2		20
A3			20	1				20	40	2		20
A4			355	1				355	710	2		355
A5			25	1				25	50	2		25
A6			25	1				25	50	2		25
A7			40	1				40	80	2		40
A8			35	1				35	70	2		35
A9			35	1				35	70	2		35
A10			35	1				35	70	2		35
A11			10	1				10	20	2		10
A12			35	1				35	70	2		35
A13			10	1				10	20	2		10
A14			35	1				35	70	2		35
A15			35	1				35	70	2		35
A16			35	1				35	70	2		35
B1	80	1			80	160	2					80
B2	10	1			10	20	2					10
B3	40	1			40	80	2					40
B4	120	1			120	240	2					120
B5	110	1			110	220	2					110
B6	50	1			50	100	2					50
B7	130	1			130	260	2					130
B8	25	1			25	50	2					25
B9	40	1			40	80	2					40
B10	30	1			30	60	2					30
B11	40	1			40	80	2					40
B12	35	1			35	70	2					35
B13	35	1			35	70	2					35
B14	35	1			35	70	2					35
B15	35	1			35	70	2					35
B16	35	1			35	70	2					35
B17	35	1			35	70	2					35
B18	35	1			35	70	2					35
C1			20	1				20	40	2		20
C2			10	1				10	20	2		10
C3			35	1				35	70	2		35
C4			110	1				110	220	2		110
C5			50	1				50	100	2		50
C6			125	1				125	250	2		125
C7			25	1				25	50	2		25
C8			40	1				40	80	2		40
C9			35	1				35	70	2		35
C10			40	1				40	80	2		40
C11			35	1				35	70	2		35
C12			35	1				35	70	2		35
C13			35	1				35	70	2		35
C14			35	1				35	70	2		35
C15			35	1				35	70	2		35
C16			35	1				35	70	2		35
C17			35	1				35	70	2		35
TOTALS	960		1485			1920			3130		40	2405

ROADWAY ILLUMINATION SUMMARY

POLE OR FIXTURE	STATION	TYPE	REMARKS
D1	SHEET 1	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D2	SHEET 1	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D3	SHEET 1	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D4	SHEET 1	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D5	SHEET 1	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D6	SHEET 1	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D7	SHEET 1	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D8	SHEET 1	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D9	SHEET 1	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D10	SHEET 1	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D11	SHEET 2	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D12	SHEET 2	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D13	SHEET 2	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D14	SHEET 2	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D15	SHEET 2	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D16	SHEET 2	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D17	SHEET 2	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D18	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D19	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D20	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D21	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D22	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D23	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D24	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D25	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D26	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D27	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D28	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D29	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D30	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D31	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D32	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D33	SHEET 4	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D34	SHEET 4	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D35	SHEET 4	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D36	SHEET 4	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D37	SHEET 4	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D38	SHEET 4	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D39	SHEET 4	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D40	SHEET 4	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D41	SHEET 4	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D42	SHEET 4	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D43	SHEET 4	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D44	SHEET 4	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D45	SHEET 4	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D46	SHEET 4	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D47	SHEET 4	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS
D48	SHEET 4	TECH SPEC SECT. BELF, FIXTURE "D"	UNDER-ROADWAY PARKING LIGHTS

STATE OF TEXAS
EDWARD F. BURKE
25837
REGISTERED
PROFESSIONAL ENGINEER
7/6/04

ESTIMATED QUANTITIES

ITEM	UNIT	ESTIMATED QUANTITY	FINAL QUANTITY
CONDUIT (RMC) (SCH 40) (1")	LF	40	
CONDUIT (RMC) (SCH 40) (3/4")	LF	2405	
ELECTRICAL CONDUCTOR (NO. 6) BARE	LF	960	
ELECTRICAL CONDUCTOR (NO. 6) INSULATED	LF	1920	
ELECTRICAL CONDUCTOR (NO. 8 BARE	LF	1485	
ELECTRICAL CONDUCTOR (NO. 8) INSULATED	LF	3130	
GROUND BOX, GB4	EA	1	
JUNCTION BOXES	EA	49	
FUSED DISCONNECTS	EA	3	
FIXTURE, TYPE "D"	EA	48	

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NO.	DATE	REVISION	APPROV.

URS GREYSTONE CENTRE
3010 LBJ FREEWAY, SUITE 1300
DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

CONDUIT & CONDUCTOR SUMMARY
TYPE D UNDERBRIDGE LIGHTS

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-17

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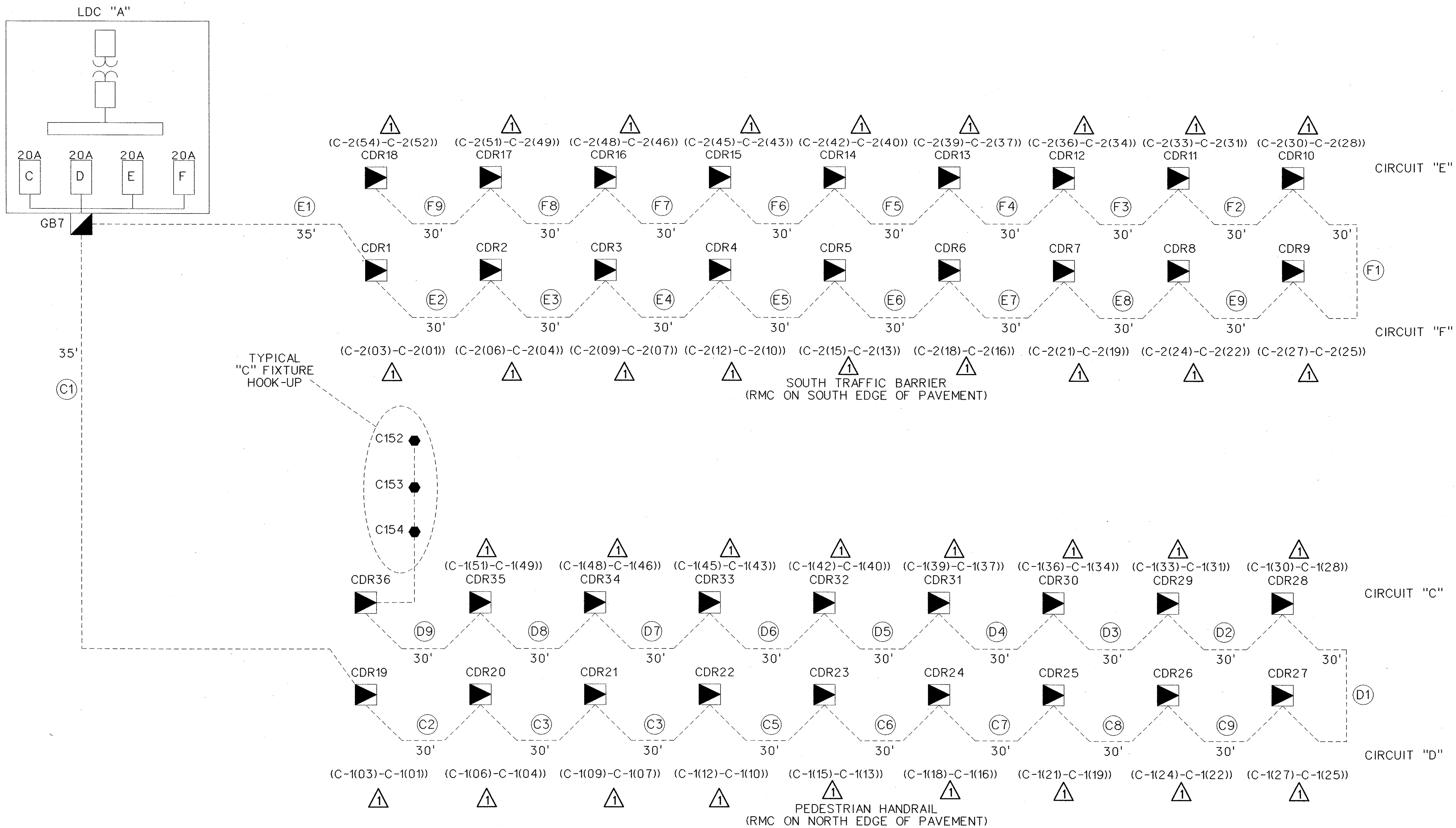

LEGEND:

- GROUND BOX
- TYPE C: PEDESTRIAN HANDRAIL LED
- -------- CONDUIT: SEE CONDUIT SCHEDULE FOR SIZE
- FUSED DISCONNECT SWITCH

STATE OF TEXAS — EDWARD F. BURKE — 25837 — REGISTERED PROFESSIONAL ENGINEER

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NO.	DATE	REVISION	APPROV.
1	05/24/04	ADDENDUM CHANGES	CRH

URS — GREYSTONE CENTRE, 5010 LBJ FREEWAY, SUITE 1300, DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

WIRING DIAGRAM
TYPE "C" LED DRIVERS

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-18

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ROADWAY ILLUMINATION SUMMARY

POLE OR FIXTURE	STATION	TYPE	REMARKS
C-1 (1)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (2)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (3)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (4)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (5)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (6)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (7)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (8)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (9)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (10)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (11)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (12)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (13)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (14)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (15)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (16)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (17)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (18)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (19)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (20)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (21)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (22)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (23)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (24)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (25)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (26)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (27)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (28)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (29)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (30)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (31)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (32)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (33)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (34)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (35)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (36)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (37)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (38)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (39)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (40)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (41)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (42)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (43)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (44)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (45)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (46)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (47)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (48)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (49)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (50)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (51)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (52)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (53)	SHEET 2	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-1 (54)	SHEET 2	TECH SPEC SECT. BELF, FIXTURE "C-1"	NORTH PEDESTRIAN HANDRAIL
C-2 (1)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (2)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (3)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (4)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (5)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (6)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (7)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (8)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (9)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (10)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (11)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (12)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (13)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (14)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (15)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER

ROADWAY ILLUMINATION SUMMARY (CONT.)

POLE OR FIXTURE	STATION	TYPE	REMARKS
C-2 (16)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (17)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (18)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (19)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (20)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (21)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (22)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (23)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (24)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (25)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (26)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (27)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (28)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (29)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (30)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (31)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (32)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (33)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (34)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (35)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (36)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (37)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (38)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (39)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (40)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (41)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (42)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (43)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (44)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (45)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (46)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (47)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (48)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (49)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (50)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (51)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (52)	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (53)	SHEET 2	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER
C-2 (54)	SHEET 2	TECH SPEC SECT. BELF, FIXTURE "C-2"	SOUTH T4 TRAFFIC BARRIER

CONDUIT & CONDUCTOR SCHEDULE

RUN	GROUND CONDUCTOR #12 AWG LENGTH FT.	GROUND CONDUCTOR #12 AWG QTY.	GROUND CONDUCTOR #12 AWG SUM LENGTH	CONDUCTOR #12 AWG LENGTH FT.	CONDUCTOR #12 AWG QTY.	CONDUCTOR #12 AWG SUM LENGTH	CONDUIT 3/4" RMC LENGTH FT.
C1	35	2	70	35	4	140	35*
C2	30	2	60	30	4	120	30
C3	30	2	60	30	4	120	30
C4	30	2	60	30	4	120	30
C5	30	2	60	30	4	120	30
C6	30	2	60	30	4	120	30
C7	30	2	60	30	4	120	30
C8	30	2	60	30	4	120	30
C9	30	2	60	30	4	120	30
D1	30	1	30	30	2	60	30
D2	30	1	30	30	2	60	30
D3	30	1	30	30	2	60	30
D4	30	1	30	30	2	60	30
D5	30	1	30	30	2	60	30
D6	30	1	30	30	2	60	30
D7	30	1	30	30	2	60	30
D8	30	1	30	30	2	60	30
D9	30	1	30	30	2	60	30
E1	35	2	70	35	4	140	35
E2	30	2	60	30	4	120	30
E3	30	2	60	30	4	120	30
E4	30	2	60	30	4	120	30
E5	30	2	60	30	4	120	30
E6	30	2	60	30	4	120	30
E7	30	2	60	30	4	120	30
E8	30	2	60	30	4	120	30
E9	30	2	60	30	4	120	30
F1	30	1	30	30	2	60	30
F2	30	1	30	30	2	60	30
F3	30	1	30	30	2	60	30
F4	30	1	30	30	2	60	30
F5	30	1	30	30	2	60	30
F6	30	1	30	30	2	60	30
F7	30	1	30	30	2	60	30
F8	30	1	30	30	2	60	30
F9	30	1	30	30	2	60	30
TOTALS	SUM OF G CONDUCTORS		1640	SUM OF CONDUCTORS		3280	1090

ESTIMATED QUANTITIES

ITEM	UNIT	ESTIMATED QUANTITY	FINAL QUANTITY
CONDUIT (PVC) (SCH 40) (3/4")	LF	1090	
ELECTRICAL CONDUCTOR (NO. 12) BARE	LF	1640	
ELECTRICAL CONDUCTOR (NO. 12) INSULATED	LF	3280	
GROUND BOX, GB7	EA	1	
DRIVERS (CDR1-CDR36)	EA	36	
FIXTURES TYPE "C-1"	EA	54	
FIXTURES TYPE "C-2"	EA	54	
TRANSIENT VOLTAGE SURGE SUPPRESSOR	EA	36	

* THIS RUN IS RMC FROM GROUND BOX UP TO TRAFFIC BARRIER

STATE OF TEXAS
EDWARD F. BURKE
25837
REGISTERED
PROFESSIONAL ENGINEER

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NO.	DATE	REVISION	APPROV.
1	05/24/04	ADDENDUM CHANGES	CRH

URS
GREYSTONE CENTRE
5010 LBJ FREEWAY, SUITE 1300
DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

CONDUIT & CONDUCTOR SUMMARY
TYPE C LED

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-19

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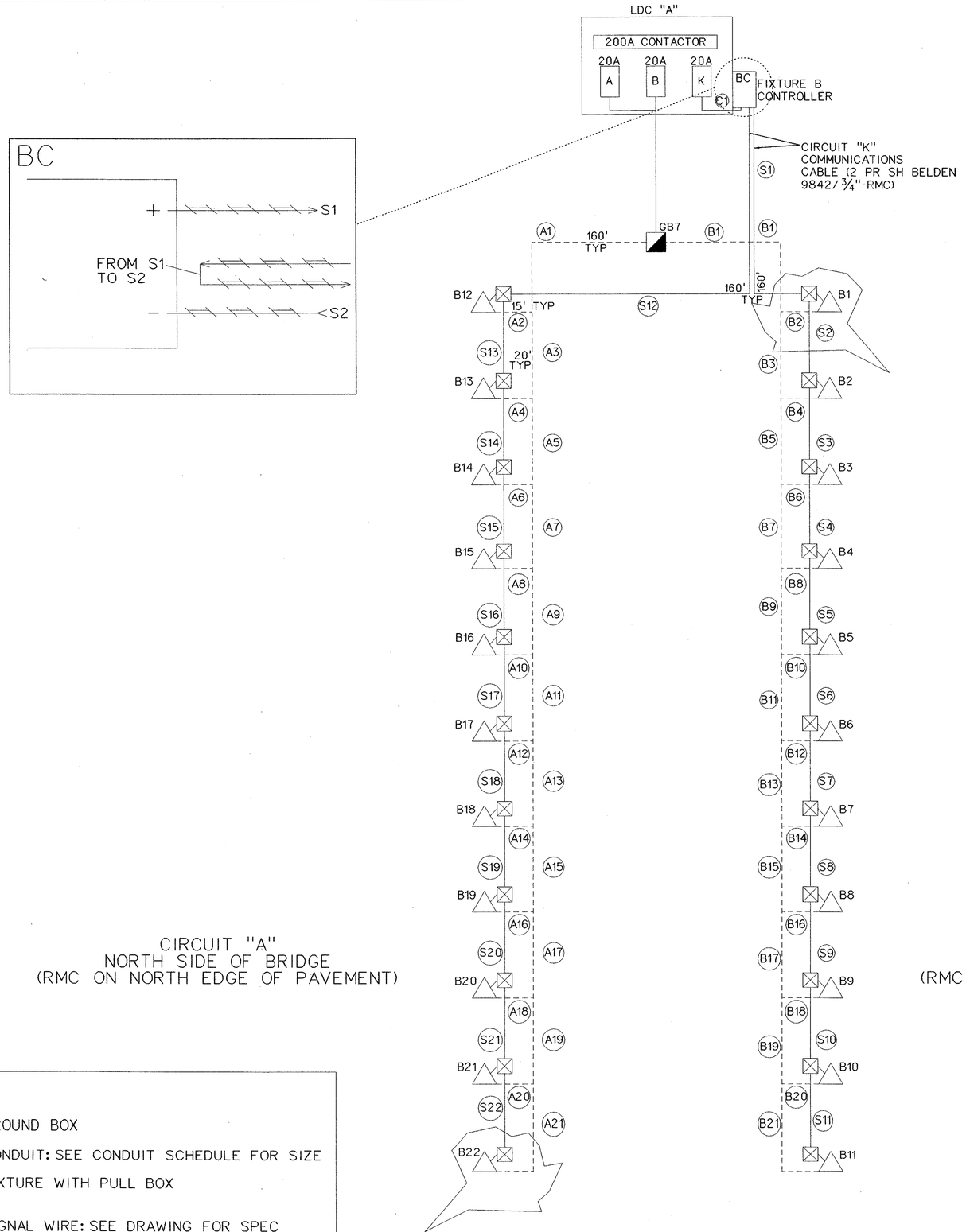


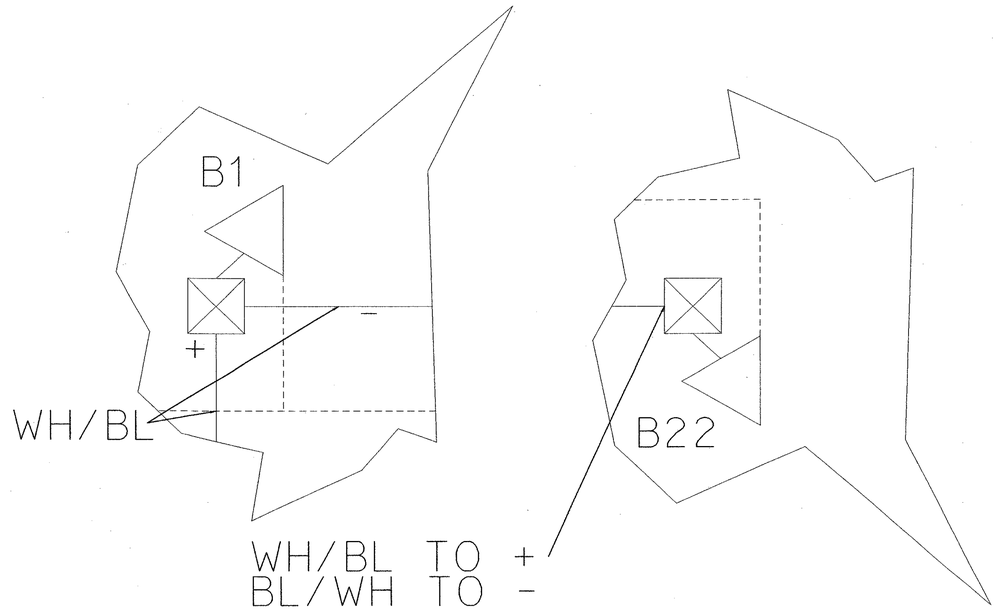
CIRCUIT "A"
NORTH SIDE OF BRIDGE
(RMC ON NORTH EDGE OF PAVEMENT)

CIRCUIT "B"
SOUTH SIDE OF BRIDGE
(RMC ON SOUTH EDGE OF PAVEMENT)

LEGEND:

- GROUND BOX
- CONDUIT: SEE CONDUIT SCHEDULE FOR SIZE
- FIXTURE WITH PULL BOX
- SIGNAL WIRE: SEE DRAWING FOR SPEC

DRIVER CONNECTION DIAGRAM



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NO.	DATE	REVISION	APPROV.

URS GREYSTONE CENTRE
3010 LBJ FREEWAY, SUITE 1300
DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

WIRING DIAGRAM
DIAPHRAGM LED

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-20

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CONDUIT & CONDUCTOR SCHEDULE

	GROUND CONDUCTOR			CONDUCTOR			CONDUIT
	#12 AWG			#12 AWG			3/4" RMC
RUN	LENGTH FT.	QTY.	SUM LENGTH	LENGTH FT.	QTY.	SUM LENGTH	LENGTH FT.
A1	160	1	160	160	2	320	160
A2	15	1	15	15	2	30	15
A3	20	1	20	20	2	40	20
A4	15	1	15	15	2	30	15
A5	20	1	20	20	2	40	20
A6	15	1	15	15	2	30	15
A7	20	1	20	20	2	40	20
A8	15	1	15	15	2	30	15
A9	20	1	20	20	2	40	20
A10	15	1	15	15	2	30	15
A11	20	1	20	20	2	40	20
A12	15	1	15	15	2	30	15
A13	20	1	20	20	2	40	20
A14	15	1	15	15	2	30	15
A15	20	1	20	20	2	40	20
A16	15	1	15	15	2	30	15
A17	20	1	20	20	2	40	20
A18	15	1	15	15	2	30	15
A19	20	1	20	20	2	40	20
A20	15	1	15	15	2	30	15
A21	20	1	20	20	2	40	20
B1	160	1	160	160	2	320	160
B2	15	1	15	15	2	30	15
B3	20	1	20	20	2	40	20
B4	15	1	15	15	2	30	15
B5	20	1	20	20	2	40	20
B6	15	1	15	15	2	30	15
B7	20	1	20	20	2	40	20
B8	15	1	15	15	2	30	15
B9	20	1	20	20	2	40	20
B10	15	1	15	15	2	30	15
B11	20	1	20	20	2	40	20
B12	15	1	15	15	2	30	15
B13	20	1	20	20	2	40	20
B14	15	1	15	15	2	30	15
B15	20	1	20	20	2	40	20
B16	15	1	15	15	2	30	15
B17	20	1	20	20	2	40	20
B18	15	1	15	15	2	30	15
B19	20	1	20	20	2	40	20
B20	15	1	15	15	2	30	15
B21	20	1	20	20	2	40	20
S1	170	1	170	170	2	340	170
S2	20	1	20	20	2	40	20
S3	20	1	20	20	2	40	20
S4	20	1	20	20	2	40	20
S5	20	1	20	20	2	40	20
S6	20	1	20	20	2	40	20
S7	20	1	20	20	2	40	20
S8	20	1	20	20	2	40	20
S9	20	1	20	20	2	40	20
S10	20	1	20	20	2	40	20
S11	20	1	20	20	2	40	20
S12	170	1	170	170	2	340	170
S13	20	1	20	20	2	40	20
S14	20	1	20	20	2	40	20
S15	20	1	20	20	2	40	20
S16	20	1	20	20	2	40	20
S17	20	1	20	20	2	40	20
S18	20	1	20	20	2	40	20
S19	20	1	20	20	2	40	20
S20	20	1	20	20	2	40	20
S21	20	1	20	20	2	40	20
S22	20	1	20	20	2	40	20
C1	20	1	20	20	2	40	20
TOTALS	SUM OF G CONDUCTORS		1780	SUM OF CONDUCTORS		3560	915

ROADWAY ILLUMINATION SUMMARY

POLE OR FIXTURE	STATION	TYPE	REMARKS
B1	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B2	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B3	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B4	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B5	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B6	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B7	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B8	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B9	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B10	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B11	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B12	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B13	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B14	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B15	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B16	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B17	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B18	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B19	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B20	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B21	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS
B22	SHEET 3	TECH SPEC SECT. BELF, FIXTURE "B"	SURFACE-MOUNT BLUE LED MARKER - DIAPHRAGMS

ESTIMATED QUANTITIES

ITEM	UNIT	ESTIMATED QUANTITY	FINAL QUANTITY
CONDUIT RMC (3/4")	LF	915	
ELECTRICAL CONDUCTOR (NO. 12) BARE	LF	1780	
ELECTRICAL CONDUCTOR (NO. 12) INSULATED	LF	3560	
GROUND BOX, GB 7	EA	1	
FIXTURE, TYPE "B"	EA	22	
TRANSIENT VOLTAGE SURGE SUPPRESOR	EA	22	

NOTE 1: EMBED IN T4 TRAFFIC BARRIER, SEE LIGHTPOLE ANCHORAGE DETAILS.

STATE OF TEXAS
EDWARD F. BURKE
25837
REGISTERED PROFESSIONAL ENGINEER
10/6/04

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NO.	DATE	REVISION	APPROV.

URS
GREYSTONE CENTRE
3010 LBJ FREEWAY, SUITE 1300
DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

CONDUIT & CONDUCTOR SUMMARY
DIAPHRAGM LED

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-21

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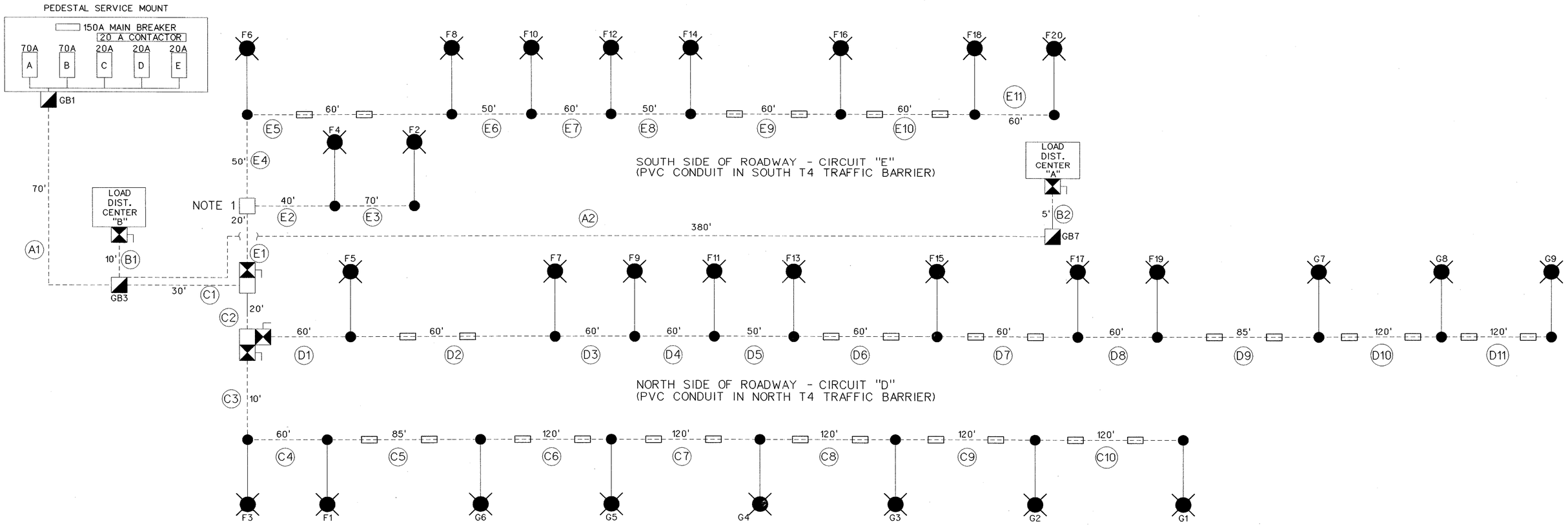

LEGEND:

- GROUND BOX
- JUNCTION BOX
- CONDUIT SLEEVE - THRU EXPANSION JOINT RMC, SIZE TO MATCH CONDUIT RUN.
- TYPE F: NORTH AND SOUTH TRAFFIC LIGHTS (20')
  TYPE G: NORTH TRAFFIC LIGHTS (35')
- CONDUIT - SEE CONDUIT SUMMARY FOR SIZE/TYPE
- FUSED DISCONNECT SWITCH

NOTES:

1) LOCATE PER PLAN ABOVE BENT #8

STATE OF TEXAS
EDWARD F. BURKE
25837
REGISTERED
PROFESSIONAL ENGINEER

343

NO.	DATE	REVISION	APPROV.

URS
GREYSTONE CENTRE
5910 LBJ FREEWAY, SUITE 1500
DALLAS, TX 75254

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

WIRING DIAGRAM (480V)
TYPE "G" & "F" ROADWAY LIGHTS

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-22

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ROADWAY ILLUMINATION SUMMARY

POLE OR FIXTURE	STATION	TYPE	REMARKS
F1	SHEET 2	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F2	SHEET 2	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F3	SHEET 2	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F4	SHEET 2	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F5	SHEET 3	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F6	SHEET 3	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F7	SHEET 3	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F8	SHEET 3	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F9	SHEET 3	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F10	SHEET 3	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F11	SHEET 3	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F12	SHEET 3	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F13	SHEET 3	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F14	SHEET 3	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F15	SHEET 3	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F16	SHEET 3	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F17	SHEET 3	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F18	SHEET 3	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F19	SHEET 3	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
F20	SHEET 3	TECH SPEC SECT. BELF, FIXTURE F	20 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
G1	SHEET 1	TECH SPEC SECT. BELF, FIXTURE G	35 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
G2	SHEET 1	TECH SPEC SECT. BELF, FIXTURE G	35 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
G3	SHEET 1	TECH SPEC SECT. BELF, FIXTURE G	35 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
G4	SHEET 2	TECH SPEC SECT. BELF, FIXTURE G	35 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
G5	SHEET 2	TECH SPEC SECT. BELF, FIXTURE G	35 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
G6	SHEET 2	TECH SPEC SECT. BELF, FIXTURE G	35 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
G7	SHEET 4	TECH SPEC SECT. BELF, FIXTURE G	35 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
G8	SHEET 4	TECH SPEC SECT. BELF, FIXTURE G	35 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER
G9	SHEET 4	TECH SPEC SECT. BELF, FIXTURE G	35 FT POLE HEIGHT MEASURED FROM ROADWAY SURFACE, NOT FROM TOP OF TRAFFIC BARRIER

CONDUIT & CONDUCTOR SCHEDULE

	GROUND CONDUCTOR & LENGTH						CONDUCTORS & LENGTH						CONDUIT			
	#2 AWG		#6 AWG		#10 AWG		#2 AWG		#6 AWG		#10 AWG		2" PVC SCH 80	3/4" PVC SCH 40	1" RMC	3/4" RMC
	LENGTH		LENGTH		LENGTH		LENGTH		LENGTH		LENGTH		LENGTH	LENGTH	LENGTH	LENGTH
RUN	FT.	QTY.	FT.	QTY.	FT.	QTY.	FT.	QTY.	FT.	QTY.	FT.	QTY.	FT.	FT.	FT.	FT.
A1	70	1	70	1	70	3	70	2	70	2	70	6	70			
A2	380	1					380	2					380			
B1			10	1					10	2			10			
C1					30	3					30	6			30	
C2					20	2					20	4			20	
C3					10	1					10	2		10		
C4					60	1					60	2		60		
C5					85	1					85	2		85		
C6					120	1					120	2		120		
C7					120	1					120	2		120		
C8					120	1					120	2		120		
C9					120	1					120	2		120		
C10					120	1					120	2		120		
D1					60	1					60	2		60		
D2					60	1					60	2		60		
D3					60	1					60	2		60		
D4					60	1					60	2		60		
D5					50	1					50	2		50		
D6					60	1					60	2		60		
D7					60	1					60	2		60		
D8					60	1					60	2		60		
D9					85	1					85	2		85		
D10					120	1					120	2		120		
D11					120	1					120	2		120		
E1					20	1					20	2				20
E2					40	1					40	2		40		
E3					70	1					70	2		70		
E4					50	1					50	2		50		
E5					60	1					60	2		60		
E6					50	1					50	2		50		
E7					60	1					60	2		60		
E8					50	1					50	2		50		
E9					60	1					60	2		60		
E10					60	1					60	2		60		
E11					60	1					60	2		60		
TOTALS	450		80		2470		900		160		4940		460	2110	50	20

ESTIMATED QUANTITIES

ITEM	UNIT	ESTIMATED QUANTITY	FINAL QUANTITY
FIXTURE TYPE "F"	EA	20	
FIXTURE TYPE "G"	EA	9	
CONDUIT (PVC) (SCH 80) (2")	LF	460	
CONDUIT (PVC) (SCH 40) (3/4")	LF	1710	
CONDUIT (RMC) (SCH 40) (1")	LF	50	
CONDUIT (RMC) (SCH 40) (3/4")	LF	20	
ELECTRICAL CONDUCTOR (NO. 2) BARE	LF	450	
ELECTRICAL CONDUCTOR (NO. 2) INSULATED	LF	900	
ELECTRICAL CONDUCTOR (NO. 6) BARE	LF	80	
ELECTRICAL CONDUCTOR (NO. 6) INSULATED	LF	160	
ELECTRICAL CONDUCTOR (NO. 10) BARE	LF	2410	
ELECTRICAL CONDUCTOR (NO. 10) INSULATED	LF	4820	
PEDESTAL SERVICE	EA	1	
GROUND BOX, GB1, GB2, GB3	EA	3	
LOAD DISTRIBUTION CENTER, LDC "A", LDC "B"	EA	2	
FND FOR PEDESTAL SERVICE	EA	1	
FND FOR LDC "A" AND LDC "B"	EA	2	
JUNCTION BOXES	EA	3	
GROUND RODS, COPPER CLADDED, 5/8" x 12.5'	EA	6	
ELECTRICAL CONDUCTOR (NO. 2) INSULATED FOR GROUND	LF	100	
ELECTRICAL CONDUCTOR (NO. 6) INSULATED FOR GROUNDING ROADWAY LIGHT POLES	LF	1600	

STATE OF TEXAS
EDWARD F. BURKE
25837
REGISTERED PROFESSIONAL ENGINEER
Burke 7/06/04

344

NO.	DATE	REVISION	APPROV.

URS
GREYSTONE CENTRE
3010 LBJ FREEWAY, SUITE 1200
DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

CONDUIT & CONDUCTOR SUMMARY
TYPE G & F ROADWAY LIGHTS

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-23

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SINGLE PHASE

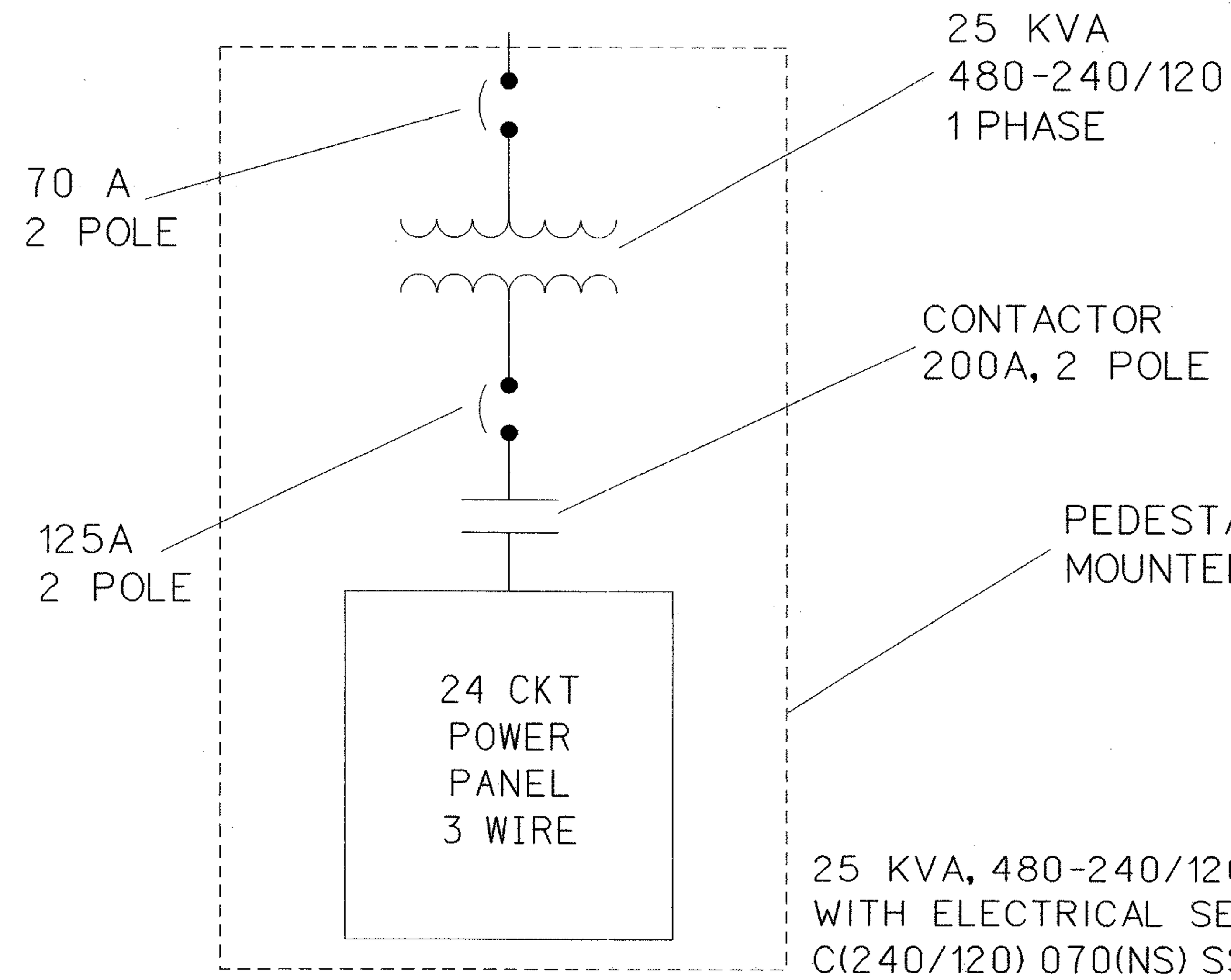
PANEL: LDC "A" VOLTS: 240/120 WIRES: 3 MAIN: 100 A:

	CIRC. NO.	TRIP AMPS	NO. POLES	DESCRIPTION	AMPS L1	AMPS L2	DESCRIPTION	CIRC. NO.	TRIP AMPS	NO. POLES	
	1	20		"B" FIXTURES NORTH	2.0 / 2.0		"B" FIXTURES SOUTH	2	20		
A	3	20	2	"B" FIXTURES NORTH		2.0 / 2.0	"B" FIXTURES SOUTH	4	20	2	B
	5	20		"C" FIXTURES PED. HR	10.0 / 10.0		"C" FIXTURES SOUTH TB	6	20		
C	7	20	2	"C" FIXTURES PED. HR		10.0 / 10.0	"C" FIXTURES SOUTH TB	8	20	2	E
	9	20		"C" FIXTURES PED. HR	10.0 / 10.0		"C" FIXTURES SOUTH TB	10	20		
D	11	20	2	"C" FIXTURES PED. HR		10.0 / 10.0	"C" FIXTURES SOUTH TB	12	20	2	F
	13	20		"A2" FIXTURE S - ARCH	16.0 / 12.3		GFI RECEPT. S - ARCH	14	20	1	H
G	15	20	2	"A2" FIXTURE S - ARCH		16.0 / 12.3	GFI RECEPT. S - ARCH	16	20	1	J
K	17	20	1	"B" FIXTURE CONTROLLER	0.9 / 1.0		"E21" FIXTURE S - STINGER	18	20		
	19	20		SPACE		0.9	"E21" FIXTURE S - STINGER	20	20	2	L
	21	20		SPACE			SPACE	22	20		
	23	20		SPACE			SPACE	24	20		
				CONNECTED LOAD	74.2	73.2					
				ESTIMATED DEMAND	66.2	65.2					

SINGLE PHASE

PANEL: LDC "B" VOLTS: 240/120 WIRES: 3 MAIN: 100 A:

	CIRC. NO.	TRIP AMPS	NO. POLES	DESCRIPTION	AMPS L1	AMPS L2	DESCRIPTION	CIRC. NO.	TRIP AMPS	NO. POLES	
	1	20		"D" FIXTURES	14.8 / 12.8		"A & E" FIXTURES N - ARCH	2	20		
A	3	20	2	"D" FIXTURES		14.8 / 12.8	"A & E" FIXTURES N - ARCH	4	20	2	D
	5	20		"D" FIXTURES	16.0 / 14.5		GFI RECEPT. N - ARCH	6	20	1	E
B	7	20	2	"D" FIXTURES		16.0 / 14.5	GFI RECEPT. N - ARCH	8	20	1	F
	9	20		"D" FIXTURES	0.9 / 13.7		"E22" FIXTURE S - STINGER	10	20		
C	11	20	2	"D" FIXTURES		0.9 / 13.7	"E22" FIXTURE S - STINGER	12	20	2	M
	13	20		SPACE			SPACE	14	20		
	15	20		SPACE			SPACE	16	20		
	17	20		SPACE			SPACE	18	20		
	19	20		SPACE			SPACE	20	20		
	21	20		SPACE			SPACE	22	20		
	23	20		SPACE			SPACE	24	20		
				CONNECTED LOAD	72.7	72.7					
				ESTIMATED DEMAND	64.7	64.7					



25 KVA, 480-240/120, 1 PHASE TRANSFORMER
WITH ELECTRICAL SERVICE
C(240/120) 070(NS) SS(E) PS(U)

STATE OF TEXAS
EDWARD F. BURKE
25837
REGISTERED
PROFESSIONAL ENGINEER

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NO.	DATE	REVISION	APPROV.

URS
GREYSTONE CENTRE
5010 LBJ FREEWAY, SUITE 1300
DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

BRIDGE LIGHTING
PANEL SCHEDULE
LDC "A" & "B"

TOWN OF ADDISON , TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-24

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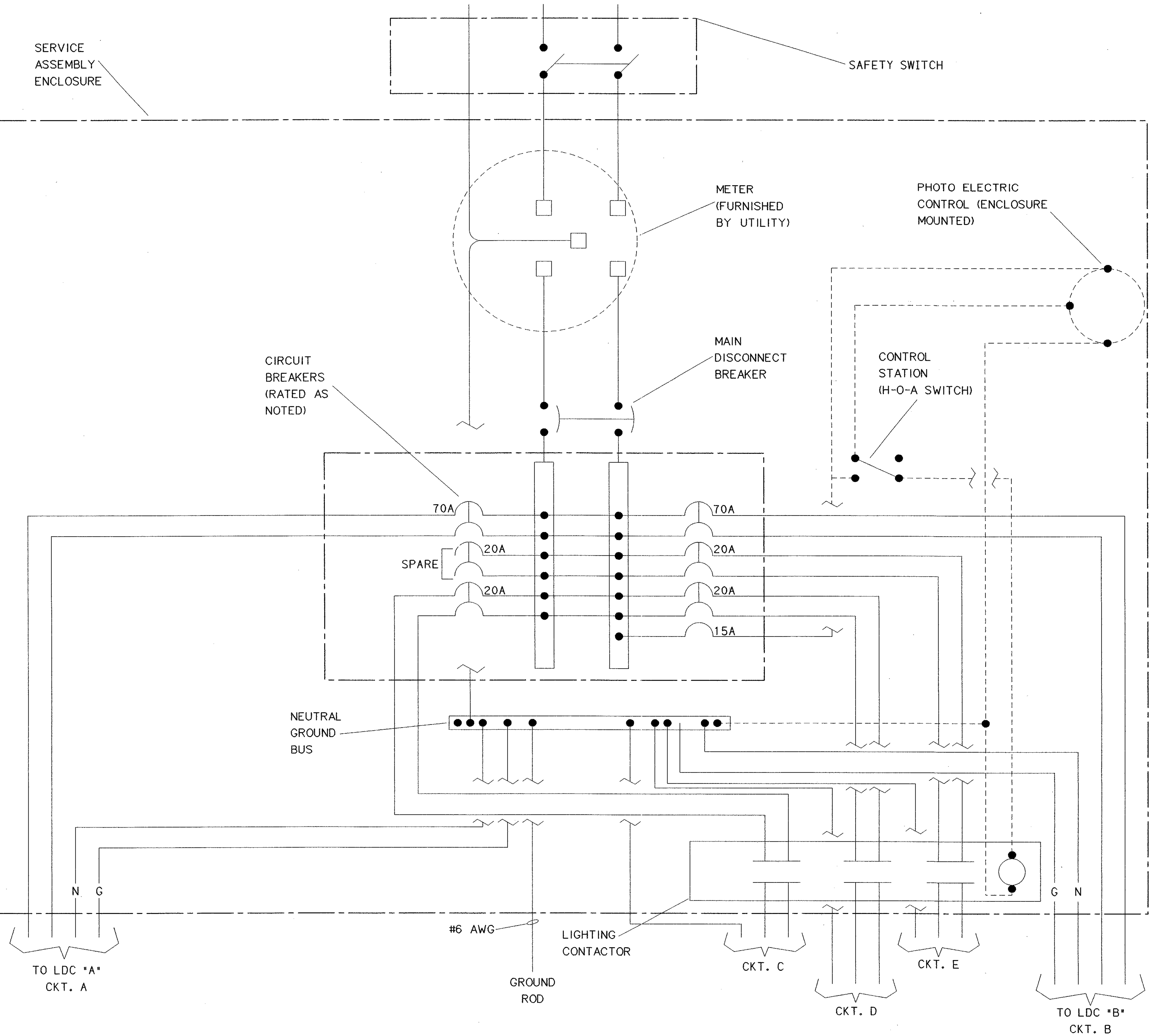

SEE WIRING DIAGRAM (480 V)

NOTE 1: SEE TXDOT STANDARD PLANS ED (4) THROUGH ED (8) FOR ADDITIONAL COMMENTS AND CLARIFICATIONS

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NO.	DATE	REVISION	APPROV.

URS GREYSTONE CENTRE 3010 LBJ FREEWAY, SUITE 1300 DALLAS, TX 75234

ARAPAHO ROAD - PHASE III

SURVEYOR BOULEVARD TO ADDISON ROAD

BRIDGE LIGHTING
ELECTRIC SERVICE SCHEMATIC

TOWN OF ADDISON, TEXAS

Design EFB	Drawn DT	DATE	SCALE	PROJECT NO.	SHEET NO.
Check	Check	05-07-04		25768	BL-25

STATE OF TEXAS EDWARD F. BURKE 25837 REGISTERED PROFESSIONAL ENGINEER 7/06/04

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I. GENERAL REQUIREMENTS FOR ALL ELECTRICAL WORK

The location of all conductors, conduits, junction boxes, ground boxes, and electrical services is diagrammatic only and may be shifted by the Engineer to accommodate local conditions.

Materials shall be new and unused. Materials and installation shall comply with the applicable provisions of the National Electrical Code (NEC), National Electrical Manufacturers Association (NEMA) standards, and shall be Underwriters Laboratories (UL) listed unless otherwise shown on the plans or specifications or approved by the Engineer in writing. Faulty fabrication or poor workmanship in any material, equipment, or installation shall be justification for rejection. When reference is made to UL, it can be considered to mean a Nationally Recognized Independent Testing Lab (NRTL). Comparable standards of Canadian Standard Association, Electrical Testing Laboratories or Factory Mutual can be equal to the referenced UL standard. Where reference is made to NEMA listed devices, IEC listed devices shall not be considered to be an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing.

With the exception of high strength bolts, miscellaneous nuts, bolts and hardware may be stainless steel when plans specify galvanized, provided that bolts are 1/2 inch or less in diameter. The Contractor shall provide the following electrical test instruments as required by the Engineer to confirm compliance with the contract and the NEC. Those test instruments are voltmeter, amp probe, megger (1000 volt DC) and torque wrenches. All meters shall have been properly calibrated within one year. Calibration certification shall be provided to the Engineer upon request. Calibration certification tag shall also be applied to the meter. The Contractor shall operate meters during inspection as requested by the Engineer. Grounding shall be as shown on the plans and in accordance with the NEC. Metallic conduit, light poles, luminaires on bridge structures, and all metal enclosures shall be bonded to the system-grounding conductor. The ground rod in each ground box or junction box at the bridge ends, and in each ground box installed for underpass lighting will also be bonded to the system grounding conductor. The grounding conductor shall be bare or, if insulated, shall be green. Ground rods, connectors, and bonding jumpers will not be paid for separately, but will be subsidiary to the various bid items.

SUBMITTALS:

The contractor shall submit for approval six (6) copies of catalog cut sheets for each of the following three (3) categories.
Category 1. Electrical services including photocell.
Catagory 2. Breakaway disconnects, heat shrink tubing, heat shrink filler tape, GelCaps and ground boxes which will include loading capacity certification.
Category 3. Highmast assembly kits, when applicable. See Item 614 "Highmast Illumination Assemblies". Submittals shall be legible and shall be marked to indicate which product on a cut sheet is to be supplied. Where manufacturers provide warranties and guarantees as a customary trade practice, the Contractor shall furnish to the State such warranties and guarantees.
Any deviation from plans or specifications, including deviations due to plan error shauld be prominently displayed on the submittal. Any changes not prominently noted in submittal and incorporated into the work without proper authorization will constitute grounds for rejection of that portion of the work.

II. CONDUIT

A. MATERIALS

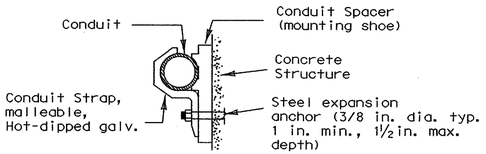
1. Conduit and fittings shall be UL Listed for the intended use shown on plan sheets.
2. Conduit shall be the type shown by descriptive code or shown elsewhere on the plans. Substitution of the various types of conduits will not be permitted. All flexible conduit in rigid metallic conduit (RMC) systems shall be Liquidtight Flexible Metal (LFMC) conduit. All flexible conduit in PVC systems shall be Liquidtight Flexible Non-metallic conduit (LFNC).
3. All exposed conduits shall be RMC, unless otherwise specifically shown on the plans. All metal conduit shall be properly grounded.
4. Couplings, connectors, conduit bodies, grounding bushings, and offset nipples for RMC shall be electro-zinc plated steel or hot dipped galvanized malleable iron, threaded or threadless compression type, rain-tight and shall be UL listed for the intended use.
5. Expansion joints for metal conduit shall be provided with an internal or external bonding jumper and shall be UL listed.
6. Unless otherwise shown on the plans, junction box minimum sizes shall be in accordance with the following table which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes are present, the conductors shall be counted as if all are of the larger size. Situations not applicable to the table shall be sized in accordance with NEC 370-28.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

7. RMC system junction boxes equal to or smaller, in any dimension, than 12 x 12 x 6 (HxWxD), surface mounted and containing conductors #8 or larger, shall be hot dipped galvanized cast iron with minimum wall thickness of 3/16 inch, shall have external mounting lugs, and shall be UL listed Crouse-Hinds Type WAB, OZ/Gedney Type YS or approved equal. Unless otherwise shown elsewhere on the plans, RMC system junction boxes larger than the aforementioned boxes but equal to or smaller, in any dimension, than 18 x 18 x 6 (HxWxD) shall be 14-ga. stainless steel; RMC system junction boxes larger than 18 x 18 x 6 (HxWxD) shall be 12-ga. stainless steel. All metal junction boxes shall be equipped with a threaded hole or lug for grounding. Stainless steel boxes 12 x 12 x 6 and larger need not be UL Listed but shall meet the other requirements of the NEC and shall have ribs, stiffeners, or thicker metal and shall have external mounting feet. Junction boxes with an internal volume of more than 100 cu. in. may be supported by connection of two or more rigid metal conduits, where specifically shown on the plans or where approved by the Engineer.
8. Junction boxes containing only #10 or #12 AWG conductors shall be Crouse Hinds Type GRFX, Appleton Type JBOX, two-gang FD, or similar approved cast iron box. Boxes shall be sized according to NEC Table 370-16(a).
9. IMC and EMT conduit shall not be used unless specifically required by the plan layout sheets. Junction boxes in EMT conduit systems shall be made from galvanized sheeting and shall be UL listed and approved for outdoor use, unless otherwise noted on the plans. Sheet metal junction boxes shall be sized in accordance with the NEC. Junction boxes for IMC conduit systems shall meet the requirements of boxes used with RMC systems.
10. Junction boxes in PVC conduit systems shall be PVC, intended for outdoor use, unless otherwise noted on the plans.
11. Elbows in PVC conduit systems one inch and larger shall be rigid metal, with the exception of traffic signal systems which may have PVC elbows instead of rigid. If any part of the rigid metal elbow is buried less than 18 inches underground the elbow and rigid metal extension shall be grounded. Grounding shall be accomplished by means of a grounding bushing installed on the extension. Unless specifically shown on the plans, rigid metal elbows containing, or entering ground boxes containing only communications conductors, loop detectors, or other low voltage power limited circuits need not be grounded unless a ground wire is present in the conduit or ground box. The rigid metal elbows located in concrete foundations may be extended with PVC conduit and need not be grounded provided that the end of the elbow nearest the end of the conduit run exiting the foundation is at least 2 inches below the concrete. RMC elbows will not be eliminated. RMC elbows will not be paid for directly, but will be subsidiary to various bid items.
12. High-Density Polyethylene (HDPE) conduit shall meet the requirements of Item 622, Duct Cable, except that the HDPE conduit, when bid under Item 618, Conduit, shall not contain factory installed conductors. Fittings for HDPE conduit shall be UL listed as an electrical conduit connector or shall be thermally fused using an electrically heated wound wire resistance welding method. HDPE conduit may be substituted for bored schedule 40 or schedule 80 PVC conduit. When such substitution is made, bored HDPE shall be schedule 40 of the size PVC being replaced. The HDPE conduit shall transition to PVC (or RMC elbow when required) at the bore pit. Size and schedule shall be as shown on the plans. Substituted conduit may not be extended to ground boxes or foundations; RMC elbows shall be installed at ground boxes and foundations. RMC elbows will not be eliminated.
13. All conduit support hardware including straps, nuts, bolts, screws, retaining anchors and washers shall be hot dipped galvanized or stainless steel. Strut type conduit straps shall be stainless steel or hot dipped galvanized. Strut type straps need not be made of malleable type material. Stamped-cadmium plated straps will not be allowed. Straps having only one mounting hole shall not be allowed for use on conduits 2 inches and larger with the exception of electrical service poles where stainless steel standoff straps will be allowed. Two piece conduit straps designed to be used with a mounting shoe shall be installed only with the correctly sized shoe.

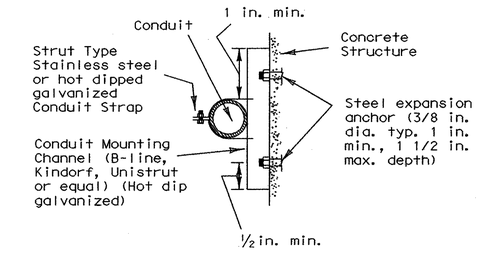
B. CONSTRUCTION METHODS

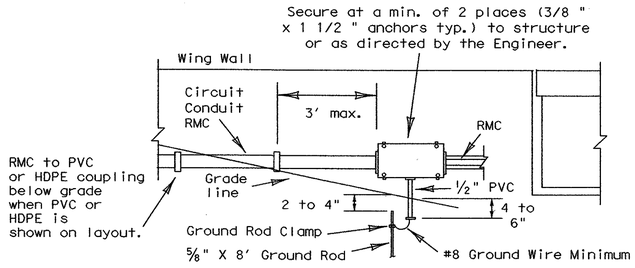
1. Conduit in structures shall have expansion fittings at structure expansion joints. All straight runs of RMC conduit exposed on structures such as bridges shall have expansion joints installed at maximum intervals of 150 feet. Expansion joints shall be installed so they allow for movement of the conduit. Installation of the joint in such a manner that will not allow for movement shall be repaired at no expense to the state. The method of determining the final setting length of the expansion joint shall be provided to the Engineer upon request.
2. Conduit supports shall be spaced at maximum intervals of 5 feet. Conduit spacers shall be used with metal conduit placed on surfaces of concrete structures (See conduit mounting options).
3. Conduit supports shall not be attached directly to prestressed concrete beams except as shown specifically in the plans and approved by the Engineer.
4. Unless otherwise shown on the plans, conduit placed beneath existing roadways, driveways, or sidewalks, or after the base or surfacing operation has begun, shall be accomplished by jacking or boring. The Contractor shall back fill and compact the bore pits to the bottom of the conduit prior to installing connecting conduit or duct cable to prevent bending of the connection.
5. Conduit trenched in the subgrade of new roadways shall be backfilled with excavated material, unless otherwise noted on the plans. Conduit trenched in the sub-base of new roadways shall be backfilled with cement-stabilized base.
6. Open ends of all conduit and raceways shall be fitted with temporary caps or plugs to prevent entry of dirt, debris and rodents during construction. The temporary cap may be constructed of duct tape, but in all cases shall be tightly fixed to the conduit and shall be durable. The contractor shall clean out the conduit and prove it clear in accordance with Standard Specifications Item 618.3 prior to installing any conductors.
7. Conduit entry into the top of enclosures such as safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes shall be made weatherproof using conduit sealing hubs, or threaded bosses.
8. A bonding jumper shall be installed from each grounding bushing to the nearest grounding rod, grounding lug, and/or equipment grounding conductor. All jumpers shall be the same size as equipment grounding conductor. Conduit used as casing under roadways for duct cable need not be grounded if duct extends full length through the casing. At electrical services, grounding electrode conductor shall be a solid Copper #6 AWG.
9. Metal junction boxes shall be bonded to the grounding conductor in accordance with the NEC.
10. Conduits entering ground boxes shall be placed so that the conduit ends shall be not less than 3 inches nor more than 6 inches from bottom of box (See ground box detail on sheet ED(3).
11. Conduit ends shall be sealed with heat shrink boots with waterproof sealant, urethane foam, or by other methods approved by the Engineer. Sealing shall be done after completion of any required pull tests. Duct tape shall not be used as a permanent conduit sealant. Silicone caulking shall not be used as a sealant.
12. All strut mounting material and hardware shall be hot-dip galvanized or shall be stainless steel. The cut ends of strut and non-galvanized rigid metal conduit threads shall be coated with a zinc rich paint (90% or more zinc content). Zinc rich paint may only be used to touch up galvanized material as allowed under item 445.6 galvanizing. The painting of non-galvanized material with a zinc rich paint shall not be considered as an approved alternative for galvanized materials.
13. All PVC conduit terminations shall be fitted with bushings or bell ends. All metal conduit terminations shall be fitted with a grounding type bushing.



CONDUIT MOUNTING OPTIONS

(Attachment to concrete surfaces)
(See para. II.B.2)

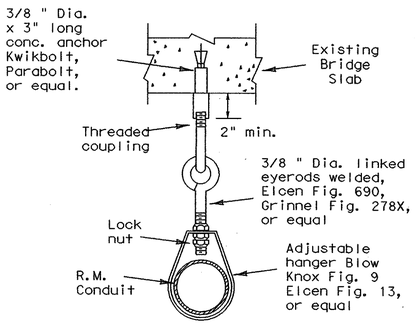




TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

NOTES

1.) Ground rod clamp to be UL listed for direct burial.
2.) For conduit placed in structure, use flush-mounted box.
3.) Bond junction box and metal conduits to equipment grounding conductor and grounding electrode conductor using listed connector.
4.) Seal all conduits entering the junction box from underground.
5.) Install bell end or bushing on 1/2 " PVC conduit both ends.
6.) Ground rod to be driven within 8 inches of 1/2 inch PVC conduit end.



CONDUIT HANGER DETAIL

(Attachment to horizontal surfaces)
Hangers need not be UL listed for electrical use
ie: plumber pipe hangers are acceptable

5/03 Revision

⚠1 Revised notes.

347

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS-CONDUIT

ED(1)-03

DN: KB	CK: JW	DW: DN	CK: GC	MEG NO.:

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
4-98		6		BLS-1
12-00				
3-03	COUNTY	CONTROL	SECTION JOB	HIGHWAY
5-03				

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

DATE:
ACC:
FILE:
DN:
CK:
DW:
CK:

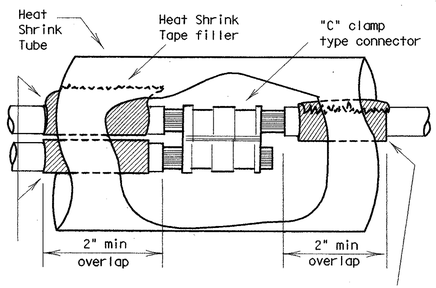
I. ELECTRICAL CONDUCTORS

A. MATERIALS

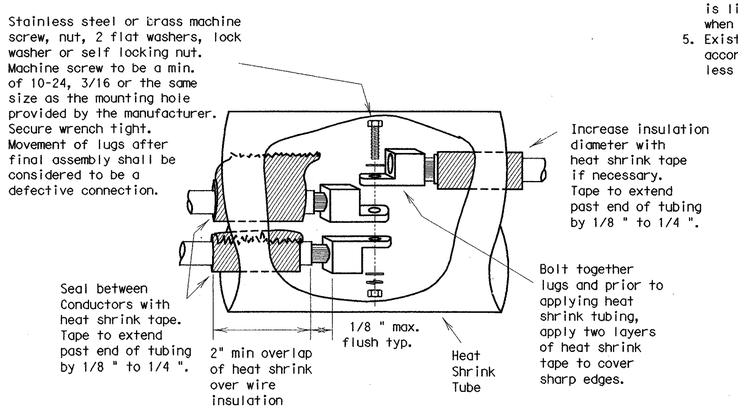
1. Insulated conductors shall be NEC Type XHHW. Insulated conductors shall be color coded in accordance with the NEC, articles 200, 250, and 310; i.e. Insulation of grounded conductors (neutrals) shall be white. Grounding conductors (ground wires) shall be bare or insulation shall be green. Insulation of ungrounded conductors (hots) shall be any color except green, white, or gray. Identification of conductors #6 American Wire Guage (AWG) and smaller shall be by continuous jacket color. Color coding of electrical conductors #4 AWG and larger shall be either by continuous color jacket or by colored tape. Colored tape marker shall consist of a half-lap of tape covering a 6-inch length of conductor.
2. Where two or more circuits are present in one conduit or enclosure, the conductors of each circuit shall be identified by a permanent non-metallic tag at each accessible location. The tag shall be fastened to the conductors by two plastic straps. Each tag shall indicate circuit number, letter, or other identification shown in the plans.
3. Grounding electrode conductor #6 AWG for bonding to ground rod at electrical service, shall be solid. Connection of conductor to ground rod shall be made using UL Listed connectors designed for such purposes.
4. Heat Shrink Tape filler shall be used to seal the ends of heat shrink tubing around two or more conductors that are insulated with heat shrink tubing. Tape material shall have a minimum dielectric strength of 225 volts per mil and shall be cross-linked butyl rubber. Tape shall be supplied in rolls and shall have a backing (release paper) to prevent the tape from sticking to itself.
5. Heat shrink tubing shall be heavy wall, UL listed for 600 volts or greater and shall have factory applied internal sealant.
6. GelCaps shall be UL listed for 600-volt applications. GelCap shall have see-through elastomer molded cover. Cover shall be filled with high dielectric insulating gel silicone sealant to provide waterseal. Cover shall be held in place by snap-lock, molded clamp made of UV stable polypropylene.
7. Splicing materials, insulating materials, breakaway disconnects, GelCaps and fuse holders will not be paid for directly but shall be subsidiary to various bid items.

B. CONSTRUCTION METHODS

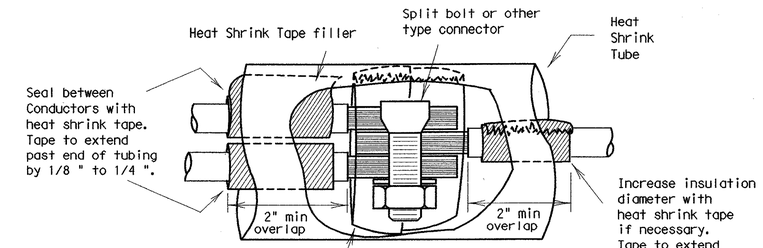
1. After conductors have been installed in conduit, a pull test shall be made on conductors. When any length of conductor cannot be freely pulled, the Contractor shall make any needed alterations or repairs at no expense to the State.
2. The Contractor shall perform insulation resistance tests in accordance with Item 620, "Electrical Conductors." The Contractor shall coordinate with the Engineer to witness the tests.
3. A sufficient length of conductor for making up connections shall be left in ground boxes (2 feet minimum, 3 feet maximum, to point of splice, 3 feet minimum, 4 feet maximum, when conductor is pulled through with no splice), enclosures, weatherheads and pole bases (1 foot minimum, 1.5 feet maximum).
4. Splices shall be made only in junction boxes, ground boxes, pole bases, or electrical enclosures and shall be made with listed compression or screw type pressure connectors, terminal blocks, bolted lugs, or split bolt connectors. Splices shall be insulated with heavy wall heat shrink tubing or GelCaps and shall be made so as to provide a watertight splice. Heat shrink sleeve shall overlap conductor insulation a minimum of 2 inches on both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, the Contractor shall increase the diameter of the conductors insulation using heat shrink filler tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Tape shall be visible after completion of all splices. Where filler tape is used but not visible, the Engineer shall approve each individual splice by conducting a physical inspection of each splice. When it appears the tubing has been burned, or overheated the tubing shall be considered to be defective and shall be replaced.
5. GelCaps when used in place of heat shrink method of splicing, shall be sized and installed according to manufacturer's specifications. (Raychem GelCap and GelCap SL or equal.)
6. Wire nuts may be used for #8 AWG or smaller conductors in above-ground junction boxes, but not in pole bases or ground boxes. Wire nuts shall be positioned upright to prevent the accumulation of water. Wire nuts used at these locations shall have factory applied waterproof sealant.
7. Conductors in illumination poles shall be supported by a J-hook in the top of the pole.
8. All conductors bid under Item 620 "Electrical Conductors" shall have breakaway electrical disconnects installed anytime conductors pass through a break-away support device.
9. For terminating the conductors, insulation-jacketing material shall be removed in such a manner as to not nick any of the individual strands of the conductor. When individual conductor strands are removed, the conductor shall be considered to be damaged.
10. When a conductor or cable has been damaged, or fails to pass an insulation resistance test, the conductor shall be replaced.
11. Duct tape, black electrical tape, or wire nuts shall not be used in the repair of a damaged conductor.
12. For terminations, no more than one wire may be installed under a single pressure connector, unless the device is listed for more than one wire.
13. Conductors connected to break-away in line fuse holders must be installed in accordance with the specific manufacturer's installation instructions. Where threaded connections are made, they shall be properly torqued. Where crimp type connections are made, crimps shall be made using properly sized crimping pliers. Proper conductor terminations are critical to the safe operation of break-away devices.
14. Waterproofing boots shall be properly trimmed to fit snugly around the conductor so as to provide a water proof connection. No more than one wire may enter a single opening in any one boot. Water proofing boots must provide the correct number of openings. Where only one wire is to be connected to a boot, the boot may not be a two wire type.



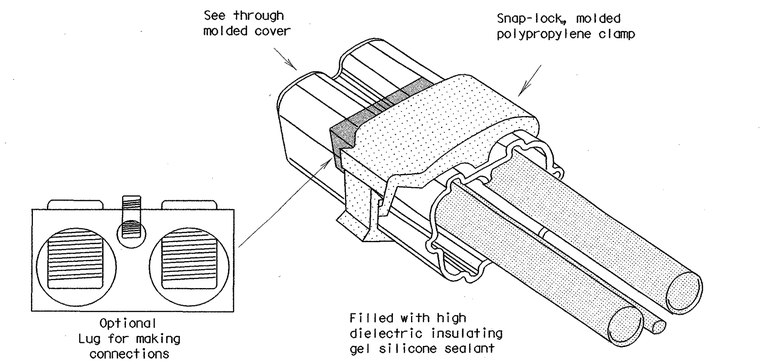
SPLICE OPTION 1
C-CLAMP



SPLICE OPTION 2
BOLTED WIRE LUGS



SPLICE OPTION 3
SPLIT BOLT



SPLICE OPTION 4
GELCAP

GelCap shall be sized and installed according to manufacturers specifications

15. All conduits that contain circuit wiring of 50 volts or more shall contain an equipment grounding conductor (EGC). Conduit for traffic signals shall have an EGC, with a minimum size of #8 AWG stranded. Unless otherwise shown on the plans, the EGC for all other conduits shall be the same AWG size as the largest current carrying conductor contained in that conduit. The EGC shall be paid for item 620-Electrical Conductors.

C. TEMPORARY WIRING

1. Temporary conductors and electrical equipment to provide power for utilization equipment, shall be installed in accordance with the NEC article 305. All temporary wiring materials and methods shall comply with the standard sheets. All power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade, supplied from a utility power source, shall be provided with a ground fault circuit interrupter.
2. Residual current protective devices (GFCI) may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.
3. Where wire nuts are approved for temporary wiring, they shall be of the self-sealing type.
4. All conductor splices must be contained within a listed enclosure, ground box or the splices will be more than ten feet above grade vertically and more than five feet horizontally from any metal structure. Where temporary conductors are installed in any area that is likely to be subjected to vehicle traffic, or mobile construction equipment, the vertical clearance to ground shall be at least 18 feet when measured at the lowest point. Where power conductors are to be supported by a span wire, the span wire shall be properly grounded.
5. Existing conduit containing service conductors uncovered during the construction process shall be repaired in a timely manner in accordance with the NEC. Existing non-metallic conduit exposed during construction shall not be left exposed above grade, or with less than eighteen inches of cover, without protective methods approved by the Engineer.

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS-CONDUCTORS

ED(2)-03

©TxDOT January 1992	DW:- KB	CK:- JW	DW:- DN	CK:- GC	NEG NO.:	
REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT			SHEET
10-93		6				BLS-2
4-98	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
12-00						
3-03						

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

DATE:
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II. GROUND RODS

A. MATERIALS

1. All ground rods installed at electrical services, including supplemental lightning protection ground rods specified by the plans in other locations such as pole bases, shall be copper clad and UL listed. Rods shall be a minimum diameter of 5/8 inch. The length shall be a minimum of 8 feet. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets.
2. Ground rod clamps shall be listed to be in direct contact with the soil. Where concrete encasement is required, the clamp shall be listed for concrete encasement.

B. CONSTRUCTION METHODS

1. Ground rods installed in locations such as pole bases, to provide supplemental lightning protection need not be totally in contact with the soil. Where called for in the plans, rods may be encased in soil or concrete or any combination of soil and concrete. When concrete encased, the connection of the conductor to the rod shall be readily accessible for inspection or repairs. When driven into the soil the upper end shall be between 2 to 4 inches below finished grade. Ground rods shall not be placed in the same drilled hole as a timber pole.
2. Ground rods shall be installed such that the end imprinted with the rod's part number is installed as being the upper end.
3. Non-conductive coatings such as concrete splatter shall be removed from the rod at the clamp location.
4. Routing of lightning protection ground rod wires shall be run as short and straight as possible. Where bends are required they shall have a minimum radius of four inches.
5. Unless specifically called for by the plans, conduits used for ground rod wires shall be non-metallic. Where metal conduits are specified, a grounding bushing and properly sized bonding jumper shall be provided and properly installed on each end.
6. Where rocky soil or a solid rock bottom is encountered when driving a ground rod and the horizontal trench placement method is the only viable solution, written authorization from the Engineer must be obtained.

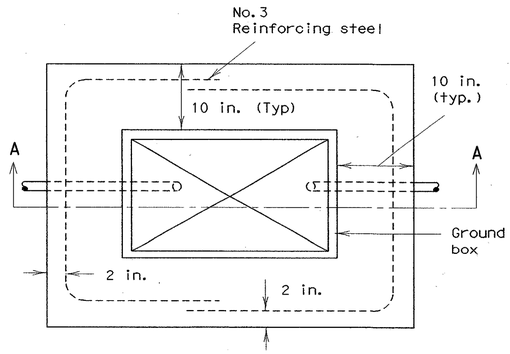
III. GROUND BOX

A. MATERIALS

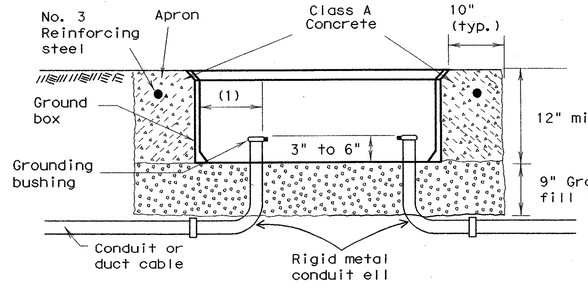
1. Ground boxes 16x30x24 inches (WxLxD) or smaller shall be polymer concrete of the type required by the descriptive code shown elsewhere. Larger ground boxes shall be as shown elsewhere in the plans.
2. All ground boxes and covers shall be permanently marked either by impress or by permanent ink, with manufacturer's model number and manufacturer's name or logo.
3. Covers shall be bolted down, and bolt holes in the box shall be arranged to drain dirt.
4. Ground box Types A, B, C, D & E shall meet the following requirements:
   a. Ground boxes and covers be manufactured from polymer concrete reinforced with continuous strands of woven or stitched borosilicate fiberglass cloth. The polymer concrete shall be made from catalyzed polyester resin, sand and aggregate, and shall have a minimum compressive strength of 11,000 psi. Polymer concrete containing chopped fiberglass or fiberglass reinforced plastic is not acceptable.
   b. Minimum inside dimensions shall be as follows (width x length x depth):
      Type A shall be 11.5 inches x 21 inches x 10 inches, (122311)
      Type B shall be 11.5 inches x 21 inches x 20 inches, (122322)
      Type C shall be 15.25 inches x 28.25 inches x 10 inches, (162911)
      Type D shall be 15.25 inches x 28.25 inches x 20 inches, (162922)
      Type E shall be 11.5 inches x 21 inches x 16 inches, (122317)
   c. Bottom edge of box or extension shall be footed with a minimum 1 1/4 inch flange.
   d. Ground boxes shall withstand 600 lbs. per sq. ft. applied over the entire sidewall with less than 1/4 inch deflection per foot length of box. Ground boxes and covers shall withstand a test loading of 20,000 lbs. over a 10 inch by 10 inch area centered on the cover with less than 1/2 inch deflection. Ground boxes and covers shall meet Western Underground Standards 3.6. Manufacturer shall supply certification by an independent laboratory or sealed by a Texas-Licensed Professional Engineer.
   e. Covers shall be 2 inch (nominal) thick polymer concrete. All hardware shall be stainless steel. Cover shall be secured with two 1/2 inch stainless steel bolts. Bolts shall be self-retaining and shall withstand a minimum of 70 ft-lbs. torque and shall have a minimum 750 lbs. straight pull out strength. Nuts shall be floating and shall provide a minimum of 1/2 inch movement from the center of the nut. Covers shall be skid resistant, minimum 0.5 coefficient of friction. Covers shall be interchangeable between manufacturers and shall conform to the dimensions shown herein. Unless otherwise approved by the Engineer, cover shall be legibly imprinted with the following words in minimum 1 inch letters:
      Ground Boxes containing wiring for traffic signals shall be labeled, Danger High Voltage Traffic Signal.
      Ground boxes containing wiring for illumination systems shall be labeled, Danger High Voltage Illumination.
      Ground boxes containing wiring for traffic management systems shall be labeled, Danger High Voltage Traffic Management.
      Ground boxes containing wiring for sign illumination systems shall be labeled, Danger High Voltage Sign Illumination.
      Ground boxes containing wiring for traffic signals that also contain illumination, powered by the signal electrical service, shall be labeled, Danger High Voltage Traffic Signal.

B. CONSTRUCTION METHODS

⚠1
1. Ground boxes shall be set on a 9 inch (minimum) bed of aggregate from 3/4 " up to 2" in size. Aggregate shall be in place prior to setting box and conduits shall be capped. Any gravel or dirt in conduit shall be removed.
2. When required by Item descriptive code, construction of an apron encasing a ground box including concrete and reinforcing steel shall not be paid for directly but shall be subsidiary to the ground box. Reinforcing steel may be field bent. Concrete for aprons shall be considered miscellaneous concrete for testing purposes. Aprons shall be cast in place.
3. Conduit holes may be cut in the walls of type B & D boxes at least 18 inches beneath the cover.
4. If, within the limits of this project, the Contractor must utilize an existing ground box equipped with a metal cover, the Contractor shall bond the cover to the grounding conductor with a 3 foot long flexible stranded jumper the same size as the grounding conductor. Connection of bonding jumper to metal ground cover shall not be paid for directly but shall be subsidiary to various bid items. The box(es) must be clearly shown on the plans with plan notes fully describing the work required.
5. If there are other ground boxes with metal Covers within the project limits but not involved in the contract, the Engineer may direct the Contractor to ground the covers, designating and identifying the specific boxes in writing. This work will be paid for separately.
6. Termination to metal ground box covers shall be made using a tank ground type lug.



PLAN VIEW

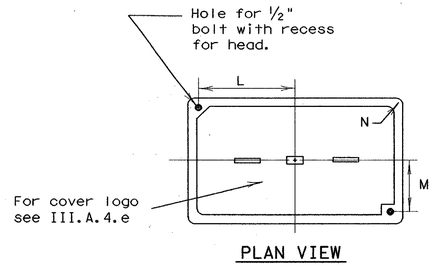


SECTION A - A

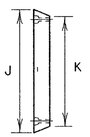
APRON FOR GROUND BOXES

(Where required)

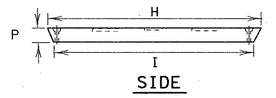
(1) Final position of end of conduit shall not exceed one-half the distance to the side of box opposite the conduit entry.
(2) Place gravel "under" the box. not "in" the box. Gravel should not encroach on the interior volume of the box.
(3) Install bushing on the upper end of all ells.
(4) Where a ground rod is present in the ground box, connect it to any and all equipment grounding conductors using a listed connector.
(5) Maintain sufficient space between all conduits so as to allow for proper installation of bushings.
(6) All conduits shall be installed in a neat and workmanlike manner.
(7) All conduits installed in the ground box shall be sealed after completion of conductor installation and any required pull tests. Silicone shall not be used as sealant.



PLAN VIEW



END



SIDE

GROUND BOX COVER

GROUND BOX COVER DIMENSIONS								
BOX	DIMENSIONS (INCHES)							
SIZE	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2

5/03 Revision

⚠1 Revised notes.

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STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS- GROUND BOXES

ED(3)-03

©TxDOT January 1992	DN: KB	CK: JW	DW: DN	CK: GC	NEG NO.:
REVISIONS 4-98, 12-00, 3-03, 5-03	STATE DISTRICT	FEDERAL REGION 6	FEDERAL AID PROJECT		SHEET BLS-3
	COUNTY		CONTROL	SECTION	JOB / HIGHWAY

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

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ELECTRICAL SERVICES NOTES

All work, materials, services, and incidentals, whether or not specifically shown on the plans, which may be necessary for a complete and proper electrical service installation as specified in the plans to obtain electrical power shall be paid for, performed, furnished and installed by the Contractor. The Contractor shall contact the Utility for metering and shall comply with all Utility requirements.

Primary line extensions, connection charges, meter charges, and other charges by the Utility company to provide power to the location shown, when required, shall be paid for under force account work. The costs associated with these charges shall be approved by the Engineer prior to engaging the Utility company to do the work. The Contractor shall consult with the appropriate Utility to determine costs and requirements, and shall coordinate the Utility's work as approved by the Engineer. The Contractor shall be reimbursed only the amount billed by the Utility. No additional amount for supervision of the Utility's work will be paid.

Materials shall be new and unused, materials and installation shall comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards and shall be Underwriters Laboratories (UL) Listed. Electrical Service conduits, conductors, disconnects, contactors, circuit breaker panel sizes, and branch circuit breakers, shall be as shown in the Electrical Service Data elsewhere in the plans. Faulty fabrication or poor workmanship in any material, equipment, or installation shall be justification for rejection.

The Contractor shall submit for approval no less than six (6) copies of catalog cut sheets on electrical service materials. Submittals shall be legible and shall be marked to indicate which product on a cut-sheet is to be supplied. Where manufacturers provide warranties and guarantees as a customary trade practice, Contractor shall furnish to the State such warranties or guarantees.

The Contractor shall provide locks keyed with Master #2195 for all lockable electrical enclosures. Keys and locks become property of the State. Unless otherwise approved by the Engineer, enclosures shall not be energized until locks are provided and all bolts are installed.

Circuit directories, where provided, shall be filled out. All breakers and components in shop built panels and enclosures shall be labeled with duo-colored plastic labels. Letters shall be a minimum 3/8 " in height.

Enclosures with external disconnects that de-energize all equipment inside the enclosure, need not have dead front trim, except that incoming line terminations shall be protected from incidental contact.

When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used. All wiring and components shall be rated for 75 degrees C. Minimum size for service entrance conductors shall be #6 XHHW.

I. Safety Switch. A safety switch, placed ahead of the meter, shall only be used when specified by the Utility and when shown on the Electrical Service Data. The switch shall be UL Listed, heavy duty type, 600 volt, unfused, with a UL type 3R enclosure and equipped with a solid neutral (s/n) assembly. The switch shall be padlockable in the "on" position.

II. Service Type. Electrical service types A, C, D, and T shall be as schematically detailed on ED(4) or ED(5). Other service types shall be as detailed elsewhere on the plans.

III. Branch Circuit Breakers. Circuit breakers shall be thermal magnetic and have a minimum interrupting capacity of 10,000 amps and a voltage rating compatible with their use. Circuit breakers shall be sized as shown in the electrical service data. Circuit breakers in panelboards and load centers shall be full size and designed exclusively for the panelboard or load center in use. Tandem and half-width breakers shall not be used. All circuit breakers shall be permanently and clearly marked identifying the circuit or device supplied. Circuit breakers shall be UL Listed to UL489.

IV. Circuit Breaker Panelboard. Panelboards shall be UL Listed. Panelboards shall have copper busses, a minimum of 6 one-pole spaces or as required in the electrical service data, and when required will be rated for service equipment. Enclosure shall meet or exceed UL type 3R classification. Panelboards shall have a threaded hub conduit entry for conduit entering the top of the enclosure. Circuit breakers shall be bolt-in type only.

V. Circuit Breaker Load Center. Load centers shall be UL Listed.
Load centers for type T services may have copper or aluminum busses, all other load centers will be copper bus only. Load center will have a minimum of 4 one-pole spaces, and shall be rated for service equipment. Enclosure shall meet UL type 3R classification. Load centers shall have a threaded hub conduit entry for conduit entering the top of the enclosure. Circuit breakers shall be plug-in type only. Load centers for type T services shall accomodate a maximum of 6 one-pole breakers.

VI. Separate or Auxiliary Enclosure. Separate enclosures for HOA, photocell and lighting contactors for types D & T Services shall be a UL Listed assembly with outer door. Interior shall have dead front trim. HOA switch operator shall extend through the dead front trim. Photocell shall be mounted inside the enclosure as described in paragraph XIII when required by descriptive code. Separate enclosures shall meet the construction requirements of paragraph VIII. E, except that separate enclosure shall not have external operating handle, need not have a data pocket and door may latch at only one point. All equipment may be located in one enclosure instead of two, when approved by the Engineer.

VII. Where a Type D or T service is provided, laminated "as built" drawings are required as shown on ED(5) VIII E; shall be delivered before completion of the work, to the Engineer in lieu of placement within these smaller enclosures. Conduit may not enter the back wall of a service enclosure penetrating the equipment mounting panel. Provide grounding bushings on all metal conduits, terminate bonding jumper to grounding bus. Grounding bushing is not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss such as a meter base.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X (XXX/XXX) XXX (XX) XX (X) XX (X)

Example: ELEC SERV TY A(240/480)100(NS)SS(E)GC(O)

Schematic Type

Service Voltage (V / V)

Disconnect Amp Rating
(000 indicates main lug only)

SS= Safety switch ahead of meter
NS= No switch ahead of meter and/or no meter required

Enclosure Type
GS= Galvanized steel (see ED(5)VIII,D)
SS= Stainless steel
AL= Aluminum

Photocell Mounting Location
T= Top of pole
E= Inside service/separate enclosure
L= Luminaire mounted
N= None

Service Support Type
GC= Granite concrete
OC= Other concrete
TP= Timber pole
SP= Steel pole
SF= Steel frame
OT= Pole by others or paid for separately
EX= Existing pole
TS= Switch gear to be placed on traffic signal pole
RT= Rectangular structural tubing
PS= Pedestal Service (see ED(5)VIII,G)

O= Overhead service
U= Underground service

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

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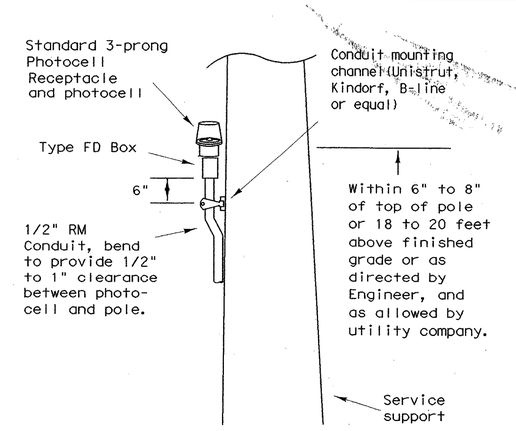
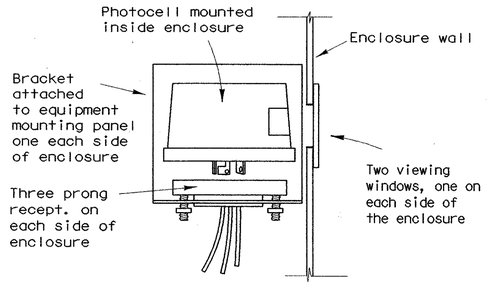


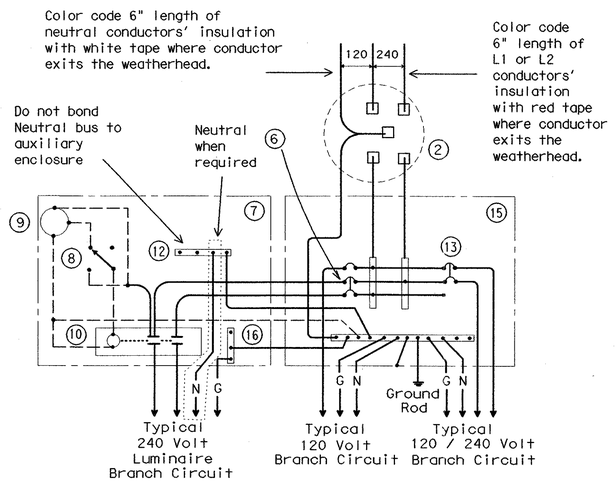
TOP MOUNTED PHOTOCELL

Conduit support spacing 3 feet from enclosure; 5 feet max.



ENCLOSURE MOUNTED PHOTOCELL

For photocell specifications see ED(5),XIII.



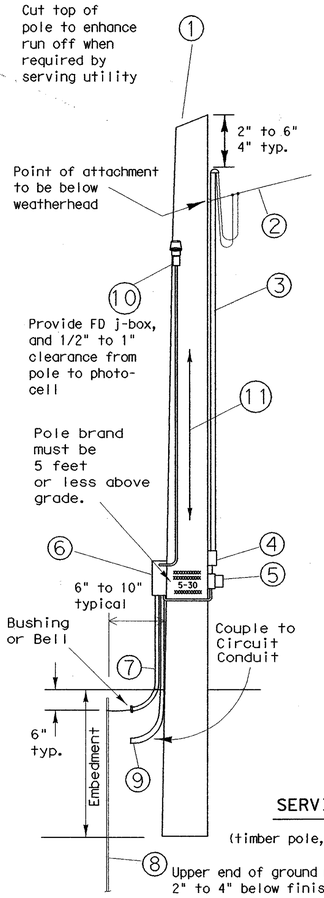
SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Install photocell and lighting contactor when shown on Electrical Service Data.

SCHEMATIC LEGEND

1 - omitted
2 - Meter (when required)
3 - Service Assembly Enclosure
4 - Main Disconnect Breaker (Not Used)
5 - Omit
6 - Circuit Breaker, 15 Amp typical for control circuit wiring
7 - Auxiliary Enclosure
8 - Control Station ("H-O-A" Switch)
9 - Photo Electric Control (enclosure-mounted shown)
10 - Lighting Contactor
11 - Power Distribution Terminal Blocks (Not Used)
12 - Neutral Bus required when 120 v. lights are controlled by lighting contactor
13 - Branch Circuit Breaker (See Electrical Service Data)
14 - Circuit Breaker Panelboard (Not Used)
15 - Load Center
16 - Ground Bus

——— Power Wiring
- - - - - - - Control Wiring
——N—— Neutral Conductor (when required-to serve 120 v. loads only)
——G—— Equipment grounding conductor-always required



1 - Class 5 pole, height as required
2 - Service drop from utility company (attached below weatherhead)
3 - Service conduit and service entrance conductors (RMC) (See Electrical Service Data)
4 - Safety switch (when required)
5 - Meter (when required)
6 - Service enclosure
7 - No. 6 bare grounding electrode conductor in 1/2 " PVC to ground rod - extend 1/2 " PVC 6" underground.
8 - 5/8 " x 8' Copper clad ground rod - drive ground rod completely underground unless otherwise approved by the Engineer.
9 - RM conduit - same size as branch circuit conduit.
10 - Photocell and conduit - if top mounted. (See Electrical Service Data)
11 - When required by the serving utility provide bare #6 awg copper conductor. Run wire from pole top to butt wrap or copper butt plate. Protect conductor to a height of 8 ft above finish grade.

LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

(If applicable)

- Liquidtight flexible metal conduit, may be used when meter and service enclosure are mounted 90 to 180 degrees to each other. Size shall be same as service entrance conduit.
- LFMC shall not exceed 3 ft. and shall be securely supported within one ft. of each end. No strap required for LFMC shorter then 12"
- Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting.
- A neutral conductor must be installed within the LFMC.
- Bend in liquidtight flexible metal conduit shall not exceed 180 degrees.
- A pull test is required on all installed conductors, at least six inches of free conductor movement shall be demonstrated to the satisfaction of the Engineer.

SERVICE SUPPORT TYPE TP (O)

(timber pole, overhead service, typical arrangement)

TIMBER POLE NOTES

1. Conduit and electrical conductors attached to the electrical service pole and underground within 12 inches of service pole shall not be paid for directly but shall be subsidiary to the service pole.
2. Pole top mounted photocell, install on north side of pole or in service enclosure as required. See Electrical Service Data.
3. Attach meter and service equipment with stainless steel or galvanized channel (Unistrut, Kindorf, or equal). Gain pole as required to provide flat surfaces for each strut. Paint ends of galvanized channel with zinc rich paint. Gain depth 5/8" max. Gain height 1 7/8" max. Strut to be 1" max. deep, and 1 5/8" wide max. Secure each strut section to timber pole with two galvanized or SS lag bolts, 1/4" diameter min. by 1 1/2" length min. Place flat cut galvanized or SS washer on each lag bolt. Gain pole in a neat and workmanlike manner.
4. Embedment depth shall be as required in Item 627 Treated Timber Poles.
5. Poles trimmed for excess length shall be trimmed from the top end only.

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STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS- SERVICE SCHEMATICS AND SUPPORT-TYPE TP (OVERHEAD)

ED(4)-03

DN: KB	CK: JW	DW: DN	CK: GC	REG NO.:

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
12-00		6		BLS-4
3-03	COUNTY		CONTROL / SECTION / JOB	HIGHWAY

SERVICE ENCLOSURE NOTES

VIII. Service Assembly Enclosures. All service assemblies and enclosures shall be UL Listed for the intended purpose.

A. Shop built or shop assembled service assemblies (all types except Type T and Type D without lighting contactor or enclosure mounted photo cell) and all auxilliary equipment enclosures mounted with service equipment and paid for as part of Item 628, "Electrical Services", shall be built or assembled by a UL Listed Industrial Control Panel shop and shall have a unique serial numbered UL Label with the words "LISTED ENCLOSED INDUSTRIAL CONTROL PANEL". The same or an additional label shall have the name, location, and phone number of the shop, the UL file number of the shop, the shop order or drawing number, date of manufacture or assembly, and the line voltage. The service assembly enclosure shall also be labeled "SUITABLE ONLY FOR USE AS SERVICE EQUIPMENT".

B. Conduit entries into the top of enclosures shall have threaded hub. Conduit entries through the equipment mounting back plate will not be allowed.

C. All service enclosure front doors shall be permanently labeled "DANGER HIGH VOLTAGE". Label shall be a self sticking type, intended for outdoor installation. Lettering style, layout and colors of red, black and white shall be as required by OSHA. Label letters shall be 1 to 1 1/2 inches high or as high as the enclosure door width will permit for smaller services. Separate or auxiliary lighting enclosures need not be OSHA labeled when mounted in the same viewing plane as the service enclosure front door. Where only one type of load is served by the service, the service door shall be marked using duo-colored plastic labels or self adhesive vinyl weather resistant labels, minimum of 1 inch high; applied in a neat and workmanlike manner. On the label will be the service number shown on the plans as well as identifying the load served specifically (i.e. lighting, landscaping, signals, traffic management or other wording as directed by the Engineer). Safety switches need not be OSHA labeled unless specifically required by the serving utility.

D. Type GS enclosures will only be allowed for service Types D and T without an enclosure mounted photocell and/or lighting contactor and the Type C panelboard. This spec will allow an "off the shelf" product meeting these specifications to be used. Type GS enclosures shall be made from pre-galvanized steel sheeting, hot dipped galvanized steel, or powder coat painted steel unless shown differently on the plans. Steel enclosures shall be painted inside and outside; galvanized enclosures may be painted. Unless otherwise approved by the Engineer, painted enclosures shall be gray, beige, white or light green. Panelboard/loadcenter enclosures shall meet UL type 3R requirements, shall have a dead front trim, and an outer padlockable door preventing unauthorized persons from operating contained equipment. Galvanized steel is no longer allowed for Types A,C,or custom-built D or T enclosures. If GS is shown in the descriptive code for any of these, an AL shall be provided.

E. Type AL enclosures for service Types A and C shall meet UL type 3R requirements and shall also meet additional requirements of this paragraph. The enclosure shall have both a main disconnect remote operator handle and a door latch handle. Die-cast handles are not acceptable. The main disconnect remote operator shall be flange-mounted, shall interlock the door when in the "on" position, and shall be padlockable in both the "on" or "off" positions. Door latch shall latch at two or more points, operate by a handle separate from disconnect switch and be capable of being locked. Door closure clamps will not be allowed. Lock must be keyed to Master #2195. All the enclosures shall have either a continuous stainless steel piano hinge with stainless steel pin or enclosures less than 30 inches may have two heavy duty hinges, those over 30 inches must have three. Heavy duty two and three point hinges shall have a 0.185 inch minimum diameter electro-zinc plated steel pin or a stainless steel pin. Two point hinged doors shall be rated for 56 lbs of loading. Three point hinged doors shall be rated for 70 lbs of loading. The door shall have an attached data pocket constructed of either thermoplastic or metal. Pocket shall be 12" x 12", unless that size will not fit in enclosure. The pocket shall then be as large as possible, as approved by the Engineer, and mechanically attached with stainless steel nuts and bolts, or stainless steel or aluminum rivets. Enclosure shall include an equipment mounting panel installed inside the enclosure on collar studs or tapped bosses, and constructed of a minimum 12 guage galvanized steel. Equipment mounting panels shall not be painted. Enclosure shall have factory installed external mounting feet. Enclosure door shall be capable of opening at least 130 degrees, with arm or other approved means to hold the door open. Only the enclosure exterior will be primed and painted. Paint color shall be beige or gray and shall be powder coat paint as shown below. Condensation drainage shall be provided in the bottom of the enclosure before leaving the factory. The Contractor shall prepare and submit a schematic drawing unique to an individual service. The approved drawing shall be laminated and placed in the document pocket of the service at the time of shipment to the job site. All applicable wiring diagrams and plan sheet layouts for all equipment and branch breaker circuits supplied by that service shall also be laminated and placed in the document pocket prior to shipping. Type AL enclosures for Type D and T services with enclosure mounted photocell and/or lighting contactor shall have the loadcenter interior mounted in an enclosure with properly adapted dead front trim. Types D and T shall not have a loadcenter exterior "can" mounted inside another enclosure meeting these specifications. (Do not put one enclosure inside another enclosure). Types D and T with enclosure mounted photocell and/or lighting contactor shall meet the additional requirements of this paragraph except that remote-operating handle will not be provided.

F. Type SS enclosures for Type A and C shall meet all the requirements above for their respective type AL. Type SS enclosures for D and T shall meet all the requirements above for their respective type AL. Stainless Steel shall not be painted.

G. PS enclosure shall be as detailed and specified on ED(8). Galvanized steel will not be allowed for any pedestal service. If GS is shown in the descriptive code an AL will be provided.

IX. Powder Coat Paint. Powder coating shall be either a polyester thermosetting resin, a zinc rich primer with a TGIC (triglycidyl isocyanurate) powder overcoating, or a zinc-rich epoxy powder, applied by either electrostatic spray or fluidized bed immersion, high temperature oven cured, high density, low gloss, 4 mil thick (minimum), coating. Adhesion shall meet the 5A or 5B classifications of ASTM D3359. Finish shall be uniform in appearance and free of scratches.

X. Main Disconnect. Main disconnect device shall be a circuit breaker, as specified in the Electrical Service Data, shall be two or three pole, and rated for the voltage and amperage specified. Circuit breaker shall be an UL Listed thermal-magnetic circuit breaker controlled by flange-mounted remote operator in the service assembly enclosure when required. Circuit breakers shall have a minimum interrupting rating of 10,000 Amps. When the utility company provides a transformer larger than 50 KVA, Contractor shall verify that the available fault current is less than the circuit breaker amps interrupting capacity (AIC) rating and shall provide documentation from the Utility to the Engineer. Documentation shall be submitted at the same time as other electrical submittals. Circuit breaker shall be UL Listed to UL489. No backfed breakers will be allowed for use as a main disconnect.

XI. Control Circuit. Control circuit protection shall be 15 amp circuit breaker.

XII. Control Station ("H-O-A" Switch). Control station shall be a maintained-contact, three position selector switch in an UL type enclosure. Switch shall be rated 600 volts and shall be fitted with "Hand-Off-Auto" legend.

XIII. Photo Electric Control. Photo electric control shall consist of a photocell, internal lightning arrester, and relay or bimetallic switch mounted inside a weatherproof enclosure with standard 3-prong twist lock photocell plug and receptacle. The enclosure shall be made of poly-acrylic with clear acrylic window. Enclosure chassis shall be molded thermosetting plastic. The photocell shall have a polyethylene gasket, and shall have a hermetically sealed cadmium sulfide cell. The arrester shall have an enclosed type expulsion arrester rated 2.0 kV sparkover with 5,000 amps follow-through. Relay or switch shall be time delay type with normally closed contacts. Photo electric control shall be rated a minimum of 1800 VA, voltage as required. Enclosure mounted photocells shall be the same as above except that the photocell shall be mounted inside the enclosure. The enclosure shall have two acrylic paned windows, or other material approved by the Engineer, one on each side of the enclosure. Each window shall be rectangular approximately one inch by two inches, round 2 inch diameter, or as otherwise approved by the Engineer. Bracket and photocell's receptacle will be mounted inside enclosure next to each window. Except for window side, 2" of clearance is required on all sides of photocell for ease of replacement. The photocell's receptacle is held in place by two mounting screws on bracket and located next to each window of the enclosure. The 3-prong twist lock photocell shall be mounted in a position to receive light from the window closest to the photocell. The photocell shall be mounted in a position to receive light from one window. Top of pole mounted photocells shall be mounted as shown on ED(4). The Contractor shall be responsible for proper operation of the photo-electric control. The Contractor shall move and/or adjust or shield the photocell from stray or ambient nighttime light or shall make any other adjustments required for proper operation. The photocell shall face North when practicable. Unless otherwise shown on the plans, the photocell shall turn on the illumination system at 1.0 +(-) 0.5 footcandle and turn off the illumination system at two footcandles higher than turn on.

XIV. Lighting Contactor. Lighting contactor shall be a UL Listed NEMA rated lighting contactor, two-pole or multipole as required, electrically held type designed to control high pressure sodium lighting loads, with silver alloy double break contacts rated at 240 volts, 480 volts or 600 volts as required. Lighting contactor shall not be the DIN rail mounted type.

XV. Power Distribution Terminal Blocks. Power distribution terminal blocks shall be rated for 600 volts and shall be used for line side connections to branch circuit breakers where more than one circuit breaker is required. Lugs on blocks shall be properly sized for conductors being used. Only one conductor shall be placed under each lug.

XVI. Neutral/Ground Bus. Neutral/ground bus shall be a factory made bus permanently bonded to the enclosure with properly sized lugs for grounding and neutral conductors.

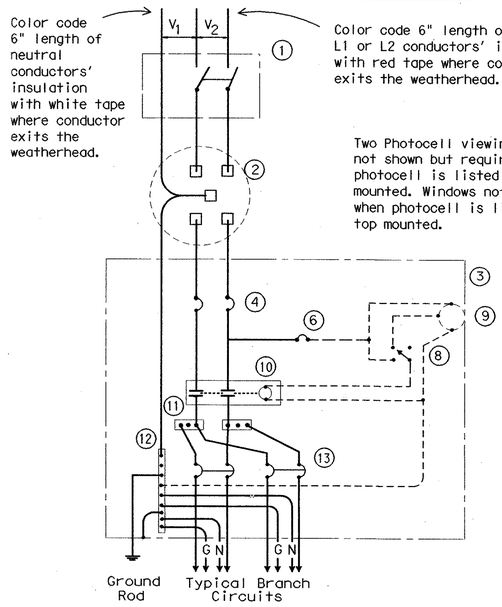
SCHEMATIC LEGEND

1 - Safety Switch (when required)
2 - Meter (when required)
3 - Service Assembly Enclosure
4 - Main Disconnect Breaker (See Electrical Service Data)
5 - Omit
6 - Circuit Breaker, 15Amp
7 - Auxiliary Enclosure
8 - Control Station ("H-O-A" Switch)
9 - Photo Electric Control (enclosure-mounted shown)
10 - Lighting Contactor
11 - Power Distribution Terminal Blocks
12 - Neutral/Ground Bus
13 - Branch Circuit Breaker (See Electrical Service Data)
14 - Circuit Breaker Panelboard (See Electrical Service Data) (If Type C is shown as AL or SS on descriptive code, this is the service assembly enclosure only. Panelboard enclosure is GS unless otherwise noted.
15 - Load Center

———— Power Wiring
- - - - - - - Control Wiring
——N—— Neutral Conductor (when required) serve 120 v. loads only)
——G—— Equipment grounding conductor-always required

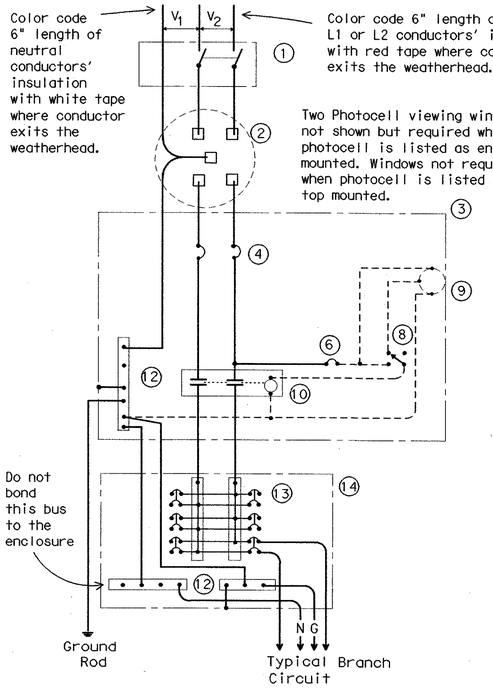
LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

DATE:
ACC:
FILE:
DN:
CK:
DW:
CK:



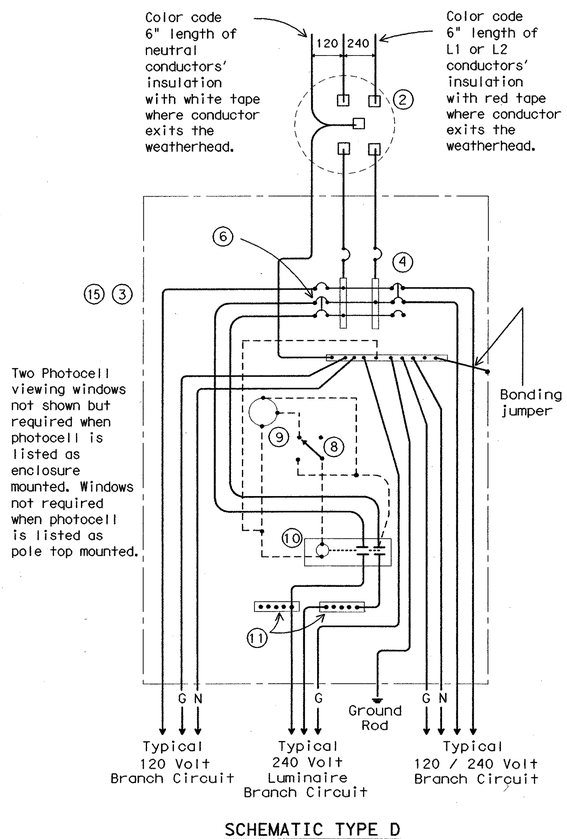
SCHEMATIC TYPE A
THREE WIRE

[Maximum feeder circuit size (High Mast Poles): 100 amps for two pole 480V, 125 amps for one or two pole 120V or 240V. Maximum branch circuit size: 50 amps.]



SCHEMATIC TYPE C
THREE WIRE

[Maximum feeder circuit size (High Mast Poles): 100 amps for two pole 480V, 125 amps for one or two pole 120V or 240V. Maximum branch circuit size: 50 amps.]



SCHEMATIC TYPE D
120/240 VOLTS - THREE WIRE

[Install photocell and lighting contactor when shown on Electrical Service Data. See Type D service notes.]

TYPE D SERVICE NOTES

Photocell and lighting contactor shall be located either in the same UL type 3R enclosure with load center or, if approved by Engineer, in separate enclosure. There shall be a window on each side of enclosure to allow operation of photocell. Both photocell contactor and breaker area shall have dead front trim. Enclosure, except for RT and PS supports, shall not exceed 36 inches in height or 16 inches in width unless approved by the Engineer. Ty D load center with lighting controls or TY D separate lighting control enclosure shall have power distribution blocks for a minimum of 4, #8 conductors per phase.

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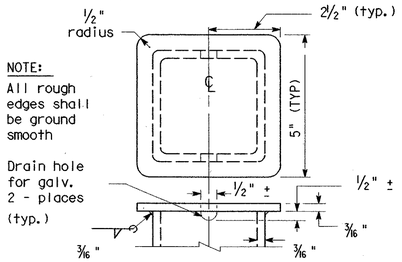
STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS- SERVICE ENCLOSURE & NOTES

ED(5)-03

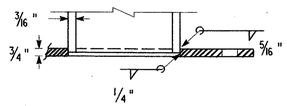
DN: KB	CK: JW	DW: DN	CK: GC	NEG NO.:

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
12-00 3-03		6		BLS-5
	COUNTY	CONTROL	SECTION JOB	HIGHWAY

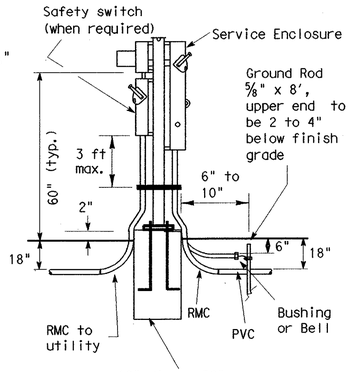


TOP OF POLE
TYPE SF & SP

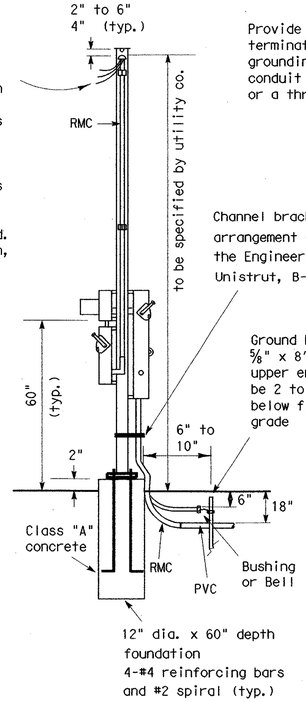
Color code 6" of grounded neutral conductors insulation with white tape where conductor exits the weatherhead. Color code 6" of L1 or L-2 Hot-ungrounded conductors insulation with red tape where conductor exits the weatherhead. Conductor free length, 12" min., 18" max.



BOTTOM OF POLE
TYPE SF & SP

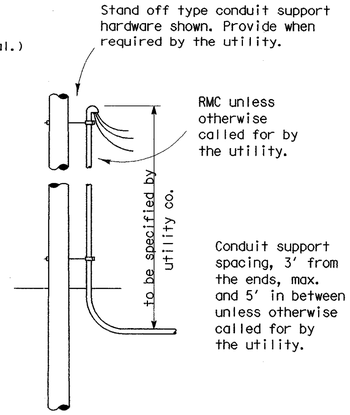


SERVICE SUPPORT
TYPE SP (U)
UNDERGROUND SERVICE
WITH SAFETY SWITCH



Provide grounding bushings on all metal conduits, terminate bonding jumpers(min. #6 AWG. Copper) to grounding bus. Grounding bushing not required when conduit end is fitted with a conduit sealing hub or a threaded type of boss such as a meter hub.

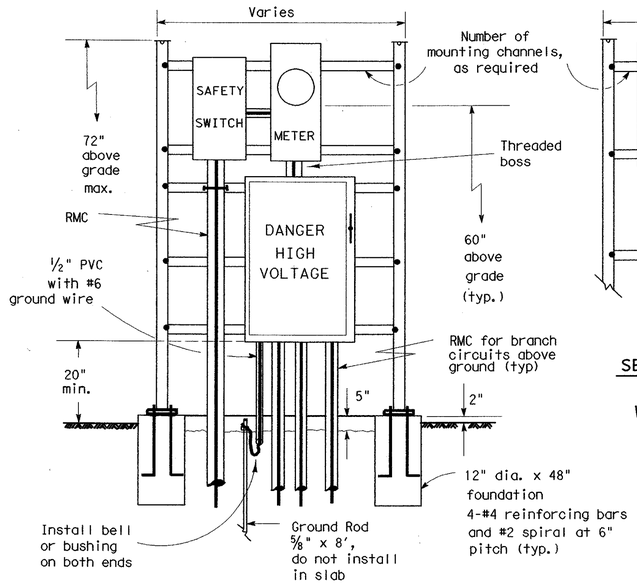
SERVICE SUPPORT
TYPE SP (O)
OVERHEAD SERVICE
WITH SAFETY SWITCH



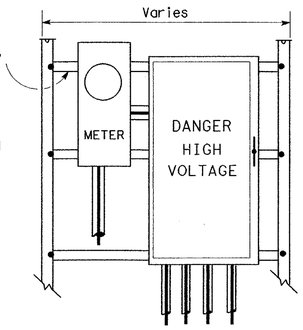
UNDERGROUND RISER
AT UTILITY POLE
(for underground service)

NOTES:

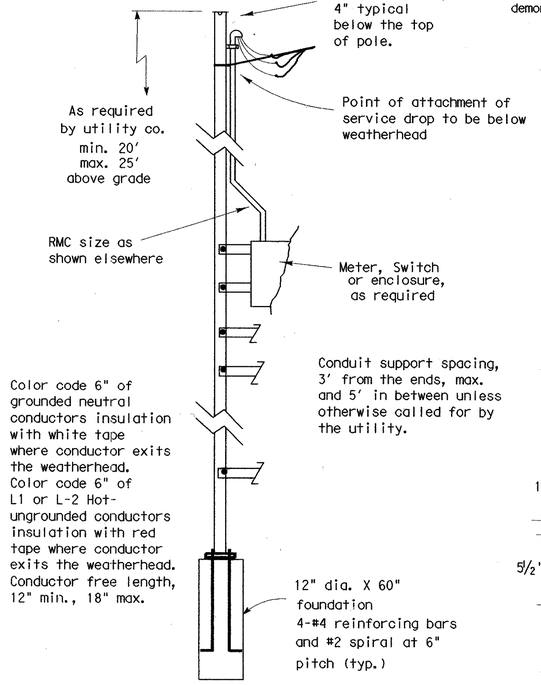
1. Support Type SP and SF: Fabricated from 4" x 4" x 3/16 " square structural tubing, ASTM A500 Grade A or G or equal. Base plate shall be 3/4 " plate, ASTM A36 or equal. All equipment and conduit shall be mounted on galvanized channel strut, 1 1/2 " x 1 5/8 " x 12 guage galvanized steel channel (Unistrut, Kindorf, B-line or equal) clamped with channel hardware, bolted or welded to vertical member as approved by the Engineer.
2. Paint field cut ends of all channels with zinc-rich paint.
3. All Steel Poles (SP and SF) shall be hot-dip galvanized after fabrication. Poles for overhead service shall be fitted with eyebolt or similar fitting, as approved by the utility company, for attachment of sevice drop to the pole.
4. All conduit and conductors attached to the electrical service and within 12 inches of the electrical service will not be paid for directly, but shall be subsidiary to the electrical service. All conduit and conductors from the utility company pole to the point 12 inches from the electrical service, including conduit and conductors required for the utility pole riser when furnished by the Contractor, will be paid for separately.
5. All mounting hardware and installation details of services shall be in accordance with utility company specifications.
6. Anchor bolts for underground service supports shall be 3/4" x 18" x 4" (dia. x length x hook length). Anchor bolts for overhead services shall be 3/4" x 56" x 4". Anchor bolts shall be provided with leveling nuts.
7. Conduit for grounding electrode conductor (ground rod wire) shall be 1/2" PVC. All other conduit on electrical services shall be rigid metal conduit. Service entrance conduit size shall be as shown elsewhere. Conduit for branch circuit entry to enclosure shall be the same size as that shown on the layout sheets for branch circuit conduit. Rigid metal conduit shall extend to the rigid metal elbow and then be coupled to the type conduit shown on the layout for that particular branch circuit. RMC shall have grounding bushings in enclosures.
8. If pole is painted, each separate painted piece shall have a bonding jumper attached to a tapped hole.
9. Sheet metal screws are not allowed for bonding. Provide 1/4-20 machine screws. Remove all non-conductive material at contact points. Terminate bonding jumper using listed device. Bonding jumper min. #6 AWG Copper. Make up all threaded bonding connections wrench tight.
10. Conduits entering enclosure from underground shall be sealed at both ends. Silicone sealant will not be allowed.
11. Ground rod clamp to be UL listed for direct burial.
12. Service entrance conductors shall exit separately bushed non-metallic openings in weatherhead.
13. Free conductor at weatherhead to be 12 in. min., 18 in. max., or as required by utility. Color code grounded-neutral conductor with white tape covering 6 in. of conductor. Color code L1 or L2 Hot un-grounded conductor with red tape covering 6 in. of conductor. Service drop and service entrance conductors must not contact metal pole in such a manner as to result in abrasion of insulated conductors.
14. Conduit support spacing to be max. 3 ft. from ends, and max. 5 ft. in between.
15. Shop drawings are not required for service support structure unless specifically stated elsewhere or as directed by the Engineer.
16. Service enclosure to be labeled as specified on ED(5) VIII C.
17. Liquidtight flexible metal conduit (LFMC) may be used between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. LFMC shall be the same size as service entrance conduit. LFMC shall not exceed 3 ft. and shall be securely supported within one foot of each end. LFMC shorter then 12" need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. A neutral conductor must be installed within the LFMC. Bend in LFMC shall not exceed 180 degrees. A pull test is required on all installed conductors, at least six inches of free conductor movement shall be demonstrated to the satisfaction of the Engineer.



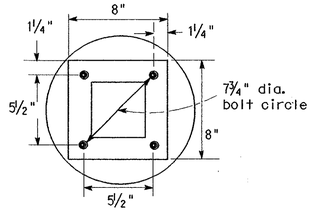
SERVICE SUPPORT TYPE SF (U)
UNDERGROUND SERVICE
WITH SAFETY SWITCH
(Typical Arrangement)



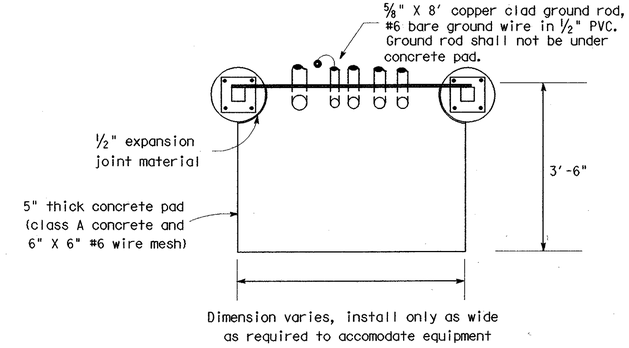
SERVICE SUPPORT TYPE SF (U)
UNDERGROUND SERVICE
WITHOUT SAFETY SWITCH



SERVICE SUPPORT TYPE SF (O)
OVERHEAD SERVICE



BASE PLATE DETAIL
TYPE SF & SP



SERVICE SUPPORT TY SF (O) & SF (U)
TOP VIEW

5/03 Revision
⚠1 Revised notes.

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STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS-SERVICE SUPPORT TYPES SF & SP

ED(6)-03

©TxDOT January 1992	DN: KB	CK: JW	DW: DN	CK: GC	REQ NO.:
REVISIONS 4-98 12-00 3-03 5-03	STATE DISTRICT	FEDERAL REGION 6	FEDERAL AID PROJECT		SHEET BLS-6
	COUNTY		CONTROL	SECTION	JOB / HIGHWAY

715

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

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CK: CW
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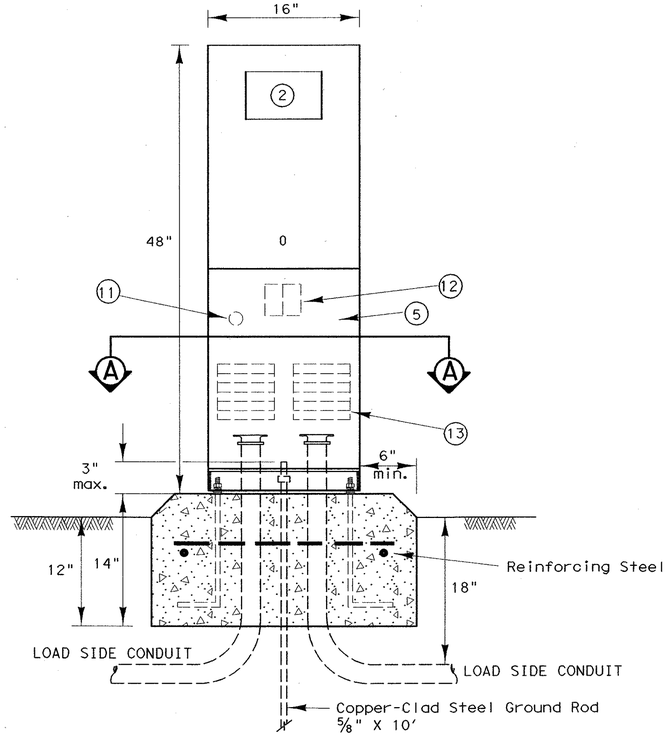
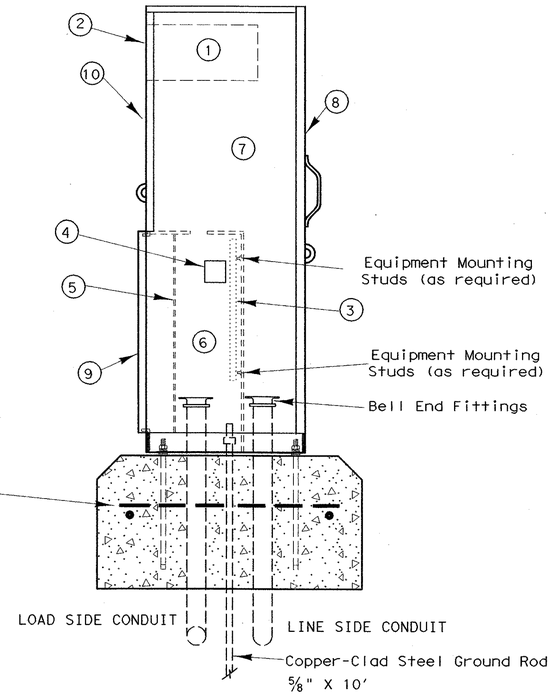
CK: MT



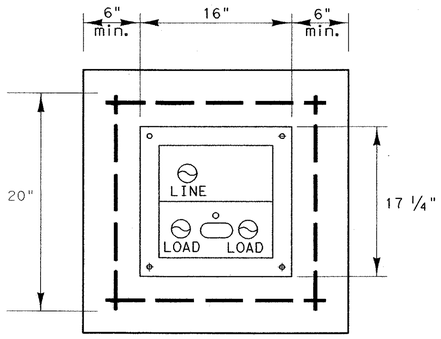
Note: Ells in foundation are rigid metal, size called for on the plans. Extension conduits from these ells may be PVC, provided ends of rigid metal conduits are more than 2 in. below top of concrete foundation. Where extension conduits are metal, grounding bushing must be installed and a bonding jumper properly terminated.

FRONT VIEW

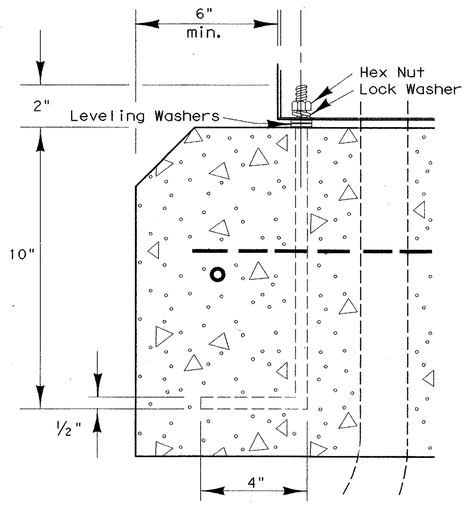
Ty C shown, Ty A similar except that Ty A shall have individual circuit breakers mounted on a equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SIDE VIEW



SECTION A-A



ANCHOR BOLT DETAIL

GENERAL NOTES

1. The pedestal service shall be UL type 3R, and shall be constructed of a minimum of 12 guage stainless steel or aluminum as required by descriptive code. Stainless steel shall not be painted. For aluminum, the finish shall be an electrostatic applied polyurethane baked on powder, light green in color, or color as shown elsewhere and as approved by the Engineer. The front of the interior dead front trim shall be permanently labeled, "Danger High Voltage" with OSHA style label. The exterior of the pedestal service door shall be permanently labeled with a placard as to its use (i.e. Roadway Lighting, Traffic Signals, etc.). Placard shall be neat and professional in appearance. Lettering shall be 1" minimum height.
2. Utility Access Door shall have stainless steel piano hinge and provisions for padlocking.
3. Pedestal door shall have stainless steel piano hinge and stainless steel latch with provisions for padlocking.
4. Meter Access shall be hinged and capable of padlocking.
5. All mounting hardware and installation details of services shall be in accordance with utility company specifications. The Contractor is responsible for contacting the local utility company and obtaining their approval of pedestal details prior to making submittal to the Department and prior to constructing the electrical pedestal service. Any changes required by the utility company shall be noted on the submittals.
6. Meter Socket shall be a minimum of 100 amp rating and shall comply with the local utility requirements.
7. Photoelectric Control shall meet the requirements as shown on ED(5). Shield to control stray light is allowable. The Contractor shall be responsible for proper operation of the photo-electric control. The Contractor shall move and/or adjust or shield the photocell from stray or ambient nighttime light or shall make any other adjustments required for proper operation. The photocell shall face North when practicable. Unless otherwise shown on the plans, the photocell shall turn on the illumination system at 1.0 +(-) 0.5 foot-candle and turn off the illumination system at two footcandles higher than turn on.
8. The Control Station (H-O-A Switch) shall be as shown on ED(5) except that H-O-A Switch operating handle shall protrude through hinged deadfront trim and NEMA 1 enclosure will not be required.
9. Concrete for pedestal service foundation shall be class A or C and shall be in accordance with Item 420, "CONCRETE STRUCTURES", except that concrete will not be paid for directly but shall be considered subsidiary to Item 628, "ELECTRICAL SERVICES".
10. Reinforcing steel shall be #4 rebar in accordance with Item 440, "REINFORCING STEEL".
11. Anchor bolts shall be A36M55 in accordance with Item 449, "ANCHOR BOLTS". Anchor bolts shall be 1/2 inch x 12 inches x 4 inches (dia. x length x hook length).
12. All conduit and conductors attached to the pedestal service and within 12 inches of the pedestal service will not be paid for directly, but shall be subsidiary to the pedestal service. All service conduit and conductors from the utility company transformer to a point 12 inches from the pedestal service shall be paid for separately. Service conduit shall be the size and type as shown in the Electrical Service Data.
13. Dimensions may vary to accomodate required equipment, utility company requirements, or manufacturer's standard equipment dimensions. The Contractor shall submit to the Engineer for approval, six (6) copies of brochures and/or drawings of the pedestal service to be supplied, including actual dimensions, and a paint color sample.
14. A separate enclosure as shown on ED(4) or ED(5) for photocell shall not be used for pedestal services. Photocell shall be installed as shown here.
15. The pedestal door shall have a mechanically attached data pocket on the inside. Pocket shall be either metal or thermoplastic and shall measure at least 12 inches by 12 inches. The Contractor shall prepare and submit a schematic drawing unique to an individual service. The approved drawing shall be laminated and placed in the document pocket of the service at the time of shipment to the job site. All applicable wiring diagrams and plan sheet layouts for all equipment and branch breaker circuits supplied by that service shall also be laminated and placed in the document pocket prior to shipping.
16. ⚠1 Ground rod clamp to be UL listed for direct burial. All non-conductive coating to be removed from ground rod at clamp location. Ground rod wire to be #6 AWG solid copper. Metal conduit ells to have grounding bushing and bonding jumpers correctly installed.
17. All conduits entering enclosures from underground must be sealed. Silicone shall not be allowed.
18. All conductors shall be megged and pull tested. Traffic signal cable not to be megged after connection, as electronics will be damaged.
19. Top of concrete foundation to be finished in a neat and workman like manner. If leveling washers are used, no more than 1/8 in. height shall be used at any one corner. Maximum dip or rise in foundation is not to exceed 1/8 in per foot. When properly installed, top of service enclosure shall read level front to back and side to side within 1/4 in. Rocking or movement of the service enclosure shall be repaired by the contractor at no cost to the state.
20. Liquidtight flexible metal conduit shall not be allowed on PS type services.

LEGEND

1. METER SOCKET, (when required)
2. METER SOCKET WINDOW, (when required)
3. EQUIPMENT MOUNTING PANEL
4. PHOTO ELECTRIC CONTROL WINDOW, (when required)
5. HINGED DEADFRONT TRIM
6. LOAD SIDE CONDUIT AREA
7. LINE SIDE CONDUIT AREA
8. UTILITY ACCESS DOOR, with handle
9. PEDESTAL DOOR
10. HINGED METER ACCESS
11. CONTROL STATION (H-O-A Switch)
12. MAIN DISCONNECT
13. BRANCH CIRCUIT BREAKERS

⚠1 5/03 Revision
Revised notes.

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

DATE:
ACC:
FILE:
DN:
CK:
DW:
CK:

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STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS
ELECTRICAL SERVICE SUPPORT
PEDESTAL SERVICE TYPE PS

ED(8)-03

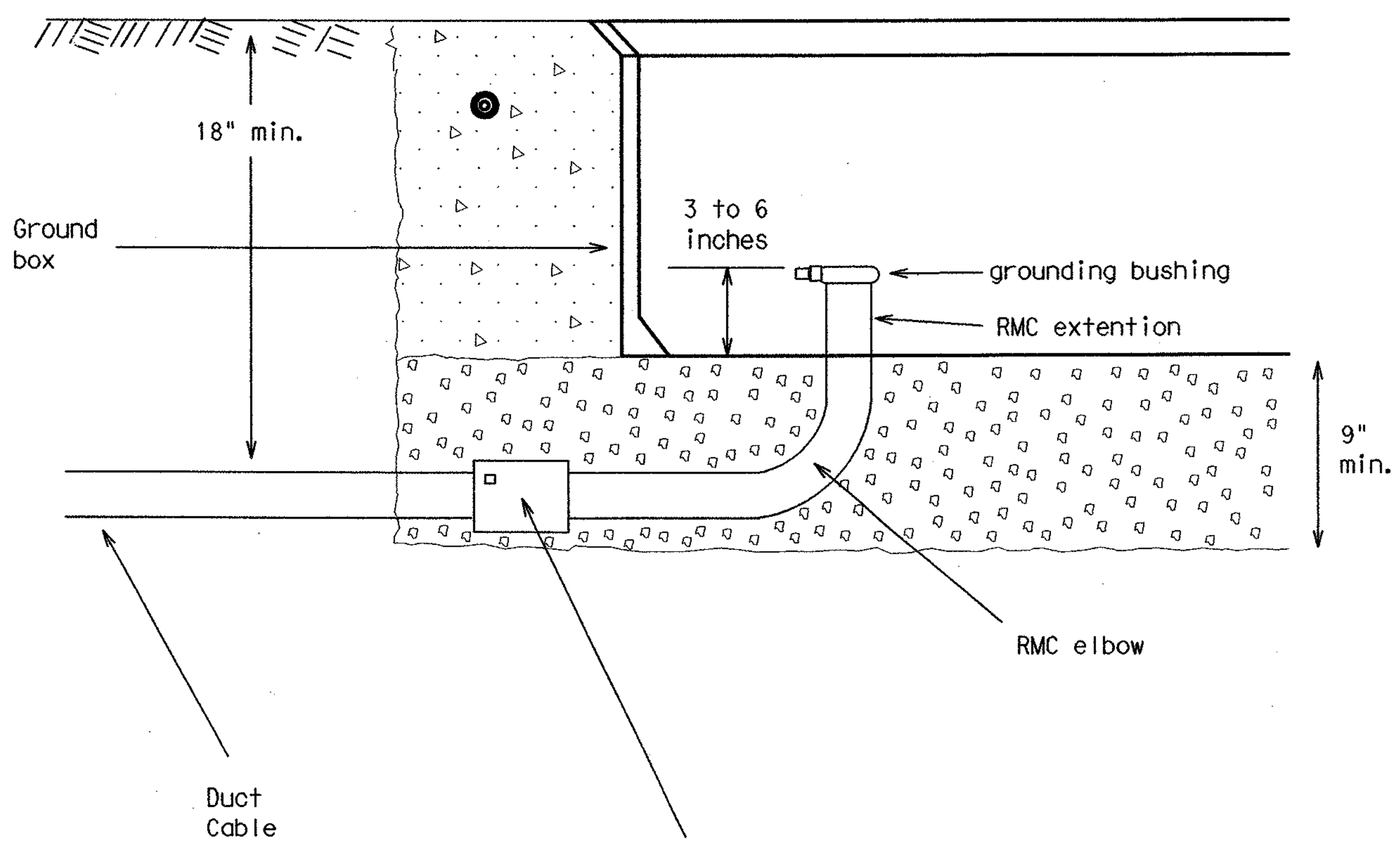
DN: KB	CK: JW	DW: DN	CK: GC	MSG NO.:

REVISIONS	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
12-00		6		BLS-7
3-03	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
5-03					

71H

I. DUCT CABLE

A. Duct cable shall be placed by the open trench method at a minimum depth of 18 inches. Bends in duct cable shall be made in the manner recommended by the manufacturer; minimum bending radius shall be 20 inches for 1 1/2 inch duct and 26 inches for 2 inch duct. Unless otherwise approved by the Engineer in writing, duct cable shall be 2 inch diameter. Handling of duct cable reels and installation of duct shall be as recommended by the manufacturer. Duct for duct cable is designed as a conduit system and shall be considered as such in NEC interpretations. Conductors shall not be spliced within a duct. Duct entering a ground box or foundation shall be coupled to a RMC elbow.
B. Duct cable shall have factory installed conductors. AWG size of electrical conductors shall be as called for in the plans or as required by the National Electrical Code. Conduit bid as High Density Polyethylene (HDPE) conduit shall meet the requirements of duct cable except that the conduit shall be supplied without factory installed conductors. HDPE conduit may be substituted for duct cable. After HDPE conduit is installed, conductors shall be installed. AWG size of electrical conductors shall be as called for in the plans.
C. Duct cable shall be extended through conduit casings in one continuous length without connection to the casing.
D. After duct cable has been installed, a pull test will be made on conductors. If conductors cannot be freely pulled, Contractor shall replace or otherwise adjust installation to free up the conductors. Duct cable ends shall be sealed with foam electrical conduit sealant or with heat-shrinking material after pull test is completed.
E. Sufficient clearance shall be left between each conduit ell so the bonding bushings may be correctly installed. Conduit cover is shown as 18 inches minimum, where run under a road, the minimum cover requirement is 24 inches.
F. All duct splices shall be by means of UL listed fittings, threaded duct with PVC threaded connector or UL listed tiewrap fitting or central Fusamatic electrically heated fusing conduit coupling installed in accordance with the manufacturer's instructions and approved by the Engineer. Glue on connectors, water pipefittings and heat shrink tubing splices will not be allowed.

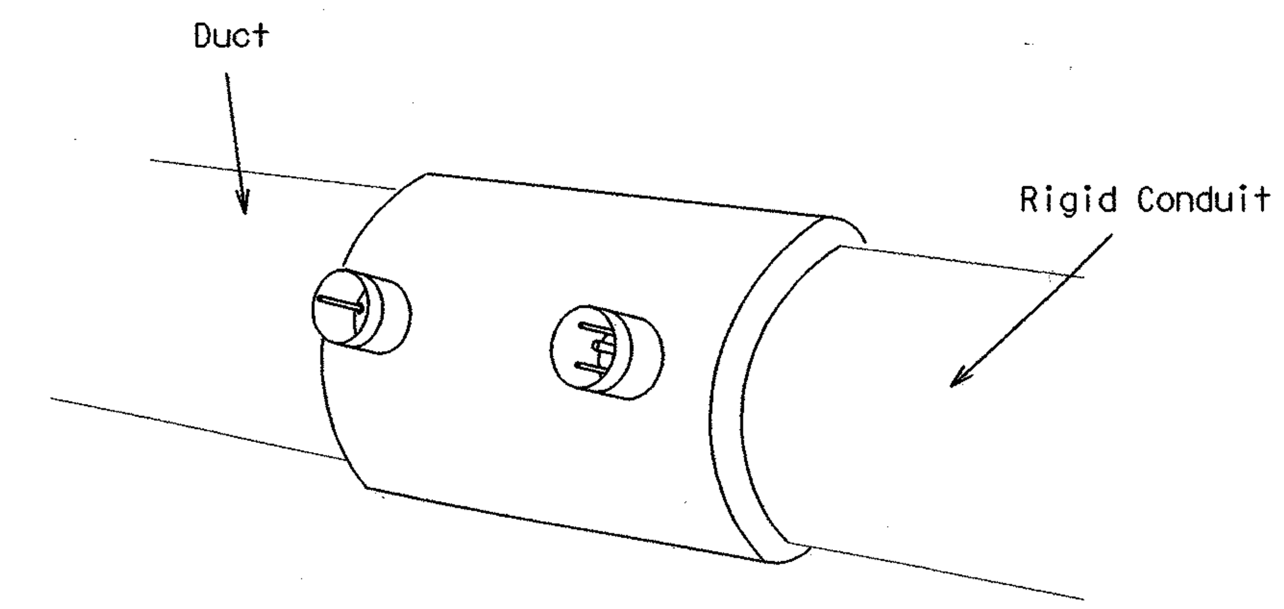


When the upper end of an RMC Ell does not enter the ground box, it may be extended with a Sch-40 PVC conduit nipple and bell end, provided there is 18" of cover over all parts of the elbow. If not, a rigid extension and ground bushing is required.

Gravel bed is to be a min, of 9 inches deep, placed under and not in the ground box. Gravel shall not encroach into the interior of the box.

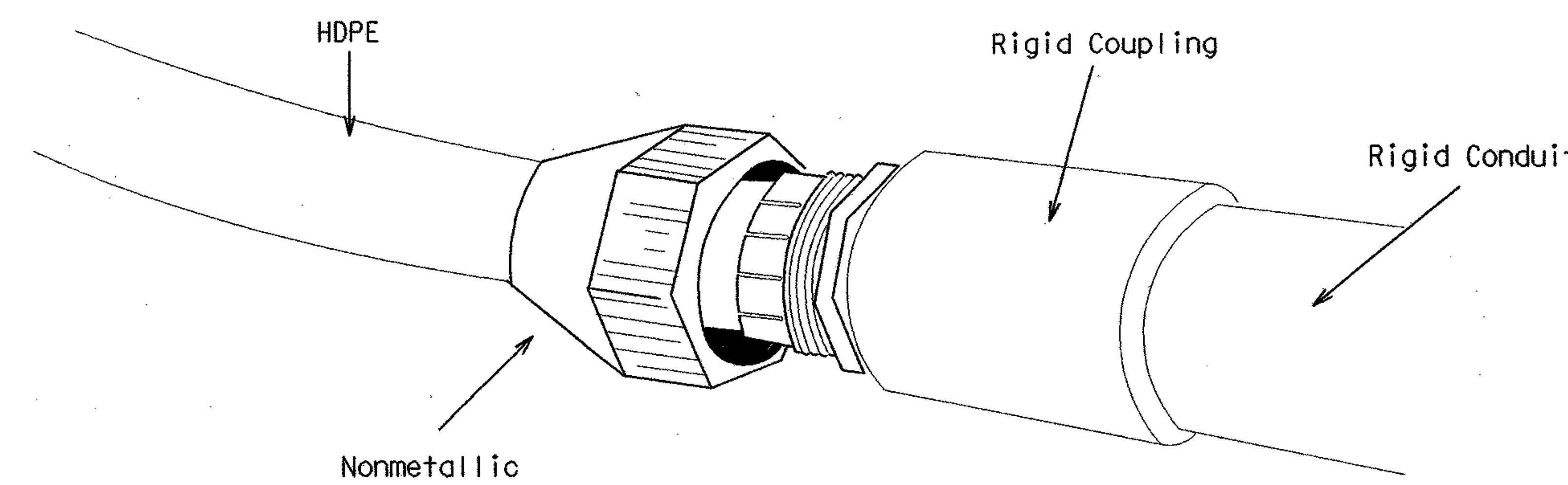
Duct Cable to Conduit Adapter - Duct cable - HDPE conduit and couplings shall comply with the material specification as shown on ED(1) II Conduit A. Materials 12.

DUCT CABLE AT GROUND BOX



Central Fuseamatic

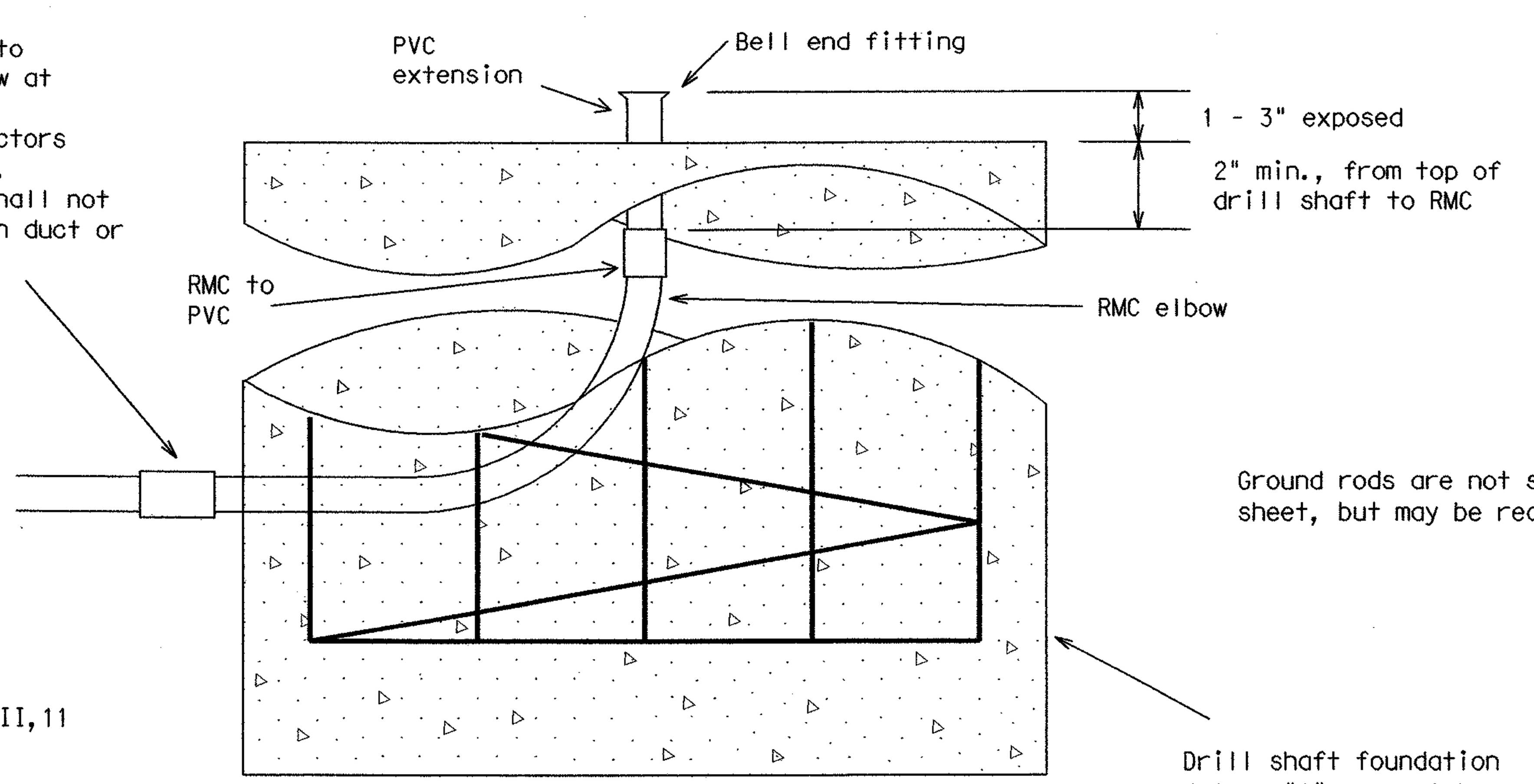
Electrically Heated Fusing Conduit Coupling



Nonmetallic Liquidtight Fitting (T&B- Plastic Bullet® or equal.)

EXAMPLES OF PROPER CONNECTIONS

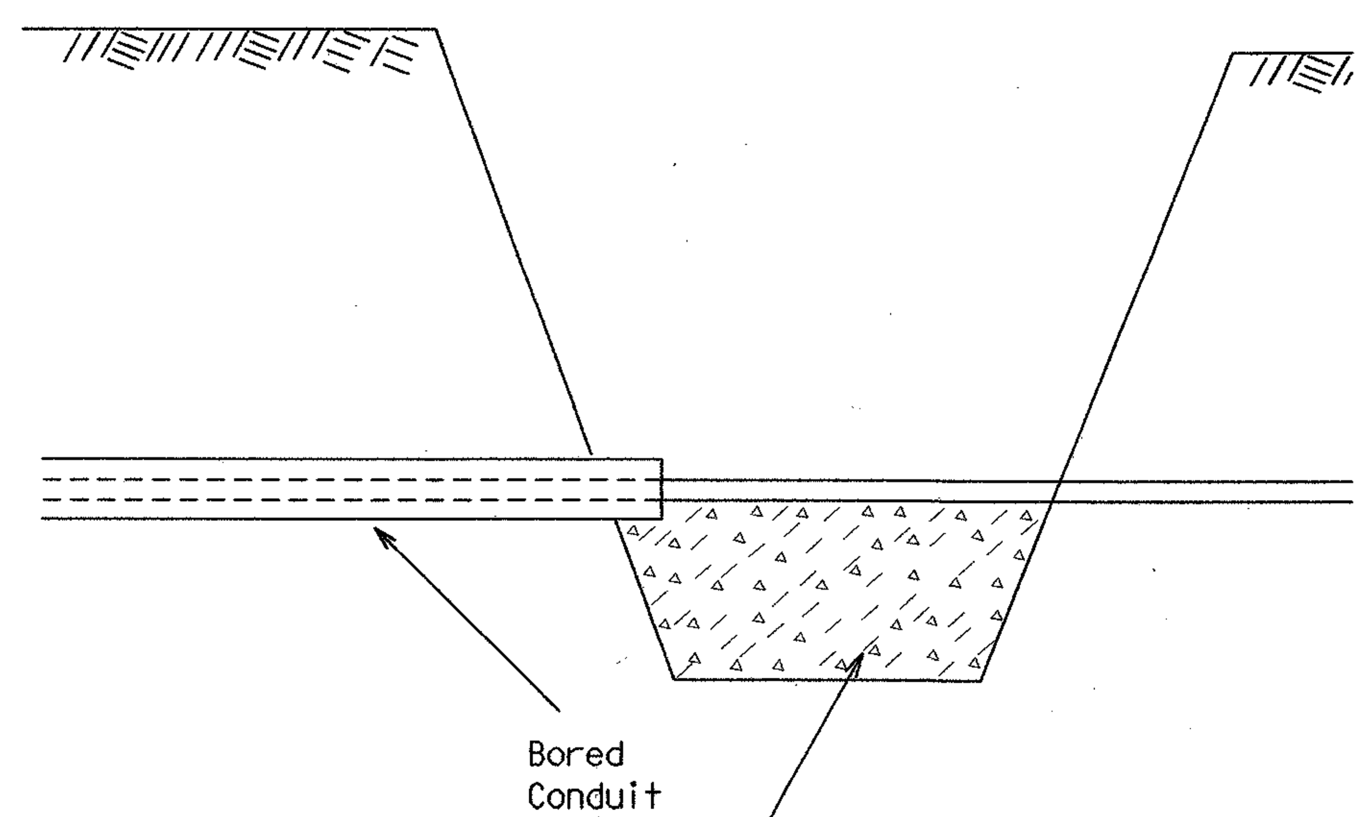
Couple duct to conduit elbow at foundations. Extend conductors to pole base. Conductors shall not be spliced in duct or conduit.



Ground rods are not shown on this standard sheet, but may be required else where in plans.

See ED(1), II,11

DUCT CABLE AT FOUNDATION



Compact back fill to bottom of conduit casing prior to placing duct cable, to prevent kinking.

BORE PIT DETAIL

354

STANDARD PLANS
TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division

ELECTRICAL DETAILS- DUCT CABLE

ED(10)-03

©TxDOT April 1998	DN:- KB	CK:- JW	DW:- DN	CK:- GC	NEG NO.:
REVISIONS 12-00 3-03	STATE DISTRICT	FEDERAL REGION 6	FEDERAL AID PROJECT		SHEET BLS-8
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY

71K

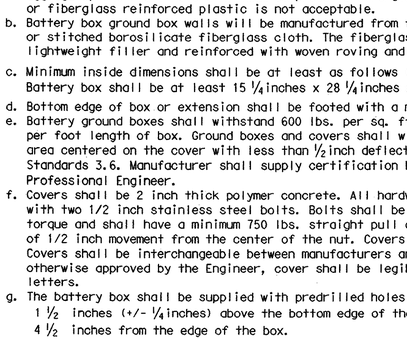
GROUND BOX - Type - Battery Box

A. MATERIALS

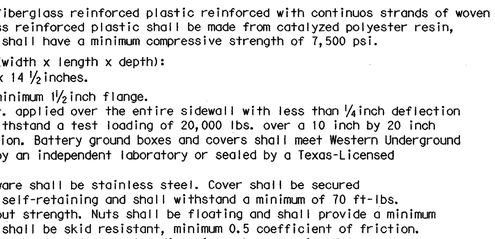
1. Battery box ground boxes shall be constructed such that it will be possible to install and accomodate up to 4 batteries measuring 8" x 13.5" x 10" (W x L x D).
2. All battery box ground boxes and covers shall be permanently marked either by impress or by permanent ink, with manufacturer's model number and manufacturer's name or logo.
3. Covers shall be bolted down, and bolt holes in the box shall be arranged to drain dirt.
4. Battery box ground boxes shall meet the following requirements:
   a. Battery box cover and cover ring will be manufactured from polymer concrete reinforced with continuous strands of woven or stitched borosilicate fiberglass cloth. The polymer concrete shall be made from catalyzed polyester resin, sand and aggregate, and shall have a minimum compressive strength of 11,000 psi. Polymer concrete containing chopped fiberglass or fiberglass reinforced plastic is not acceptable.
   b. Battery box ground box walls will be manufactured from fiberglass reinforced plastic reinforced with continuos strands of woven or stitched borosilicate fiberglass cloth. The fiberglass reinforced plastic shall be made from catalyzed polyester resin, lightweight filler and reinforced with woven roving and shall have a minimum compressive strength of 7,500 psi.
   c. Minimum inside dimensions shall be at least as follows (width x length x depth):
      Battery box shall be at least 15 ¼inches x 28 ¼inches x 14 ½inches.
   d. Bottom edge of box or extension shall be footed with a minimum 1½inch flange.
   e. Battery ground boxes shall withstand 600 lbs. per sq. ft. applied over the entire sidewall with less than ¼inch deflection per foot length of box. Ground boxes and covers shall withstand a test loading of 20,000 lbs. over a 10 inch by 20 inch area centered on the cover with less than ½inch deflection. Battery ground boxes and covers shall meet Western Underground Standards 3.6. Manufacturer shall supply certification by an independent laboratory or sealed by a Texas-Licensed Professional Engineer.
   f. Covers shall be 2 inch thick polymer concrete. All hardware shall be stainless steel. Cover shall be secured with two 1/2 inch stainless steel bolts. Bolts shall be self-retaining and shall withstand a minimum of 70 ft-lbs. torque and shall have a minimum 750 lbs. straight pull out strength. Nuts shall be floating and shall provide a minimum of 1/2 inch movement from the center of the nut. Covers shall be skid resistant, minimum 0.5 coefficient of friction. Covers shall be interchangeable between manufacturers and shall conform to the dimensions shown herein. Unless otherwise approved by the Engineer, cover shall be legibly labeled, "Traffic Signals Danger High Voltage" in minimum 1 inch letters.
   g. The battery box shall be supplied with predrilled holes to accept ⅜inch stainless steel rods. The holes shall be installed 1 ½ inches (+/- ¼inches) above the bottom edge of the box along the length of the box at 3 ½inch centers beginning 4 ½ inches from the edge of the box.
   h. A minimum of seven ⅜inch stainless steel rods threaded on both ends shall come equipped to be inserted in the predrilled holes to serve as a rack sufficient to accommodate up to four batteries. The rods shall be secured in place utilizing ⅜" stainless steel (s.s.) nuts and ⅜" X 1" s.s. flat washers.
   i. Ground boxes of the type specified above shall meet the requirements shown above. The Contractor will be permitted to furnish like materials of any manufacturer provided they are of equal quality and comply with the specifications.
   j. Two ⅜" plastic sheets measuring a nominal 6" x 24" shall be supplied which are to be placed on the secured rods upon which the batteries (supplied by others) are to be set.
   k. A minimum of four battery "bell jars" and respective tie down straps are to be supplied. These bell jars are inverted over the batteries and strapped to the batteries.

B. CONSTRUCTION METHODS

1. Battery box ground boxes shall be set on a 9 inch (minimum) bed of coarse No. 1 aggregate as defined by Item 421. Gravel shall be in place prior to setting box and conduits shall be capped. Any gravel or dirt in conduit shall be removed.
2. Construction of an apron encasing the battery box ground box including concrete and reinforcing steel is required and shall not be paid for directly but shall be subsidiary to the ground box. Reinforcing steel may be field bent. Concrete for aprons shall be considered miscellaneous concrete for testing purposes. Aprons shall be cast in place.
3. Any holes cut into the sidewall of battery box ground boxes shall be accomplished using a round hole saw or other method approved by the Engineer.



PLAN VIEW

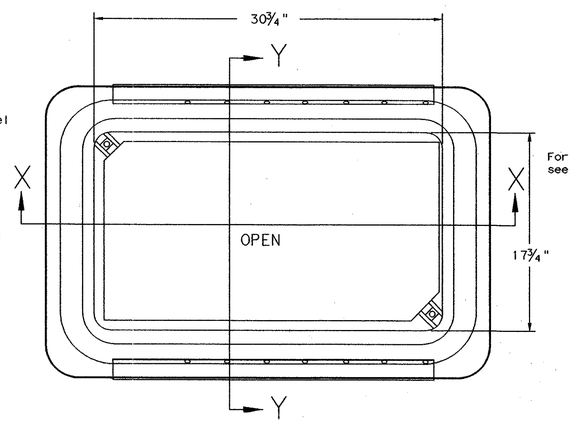


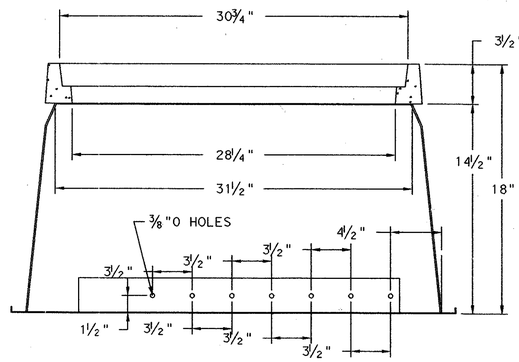
SECTION A - A

APRON FOR GROUND BOXES

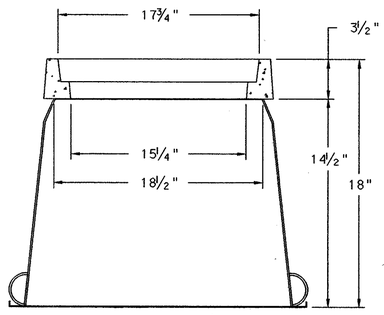
(Where required)

(1) Place gravel "under" the box. not "in" the box. Gravel should not encroach on the interior volume of the box.
(2) Install bushing on the upper end of all ells.
(3) All conduits shall be installed in a neat and workmanlike manner.

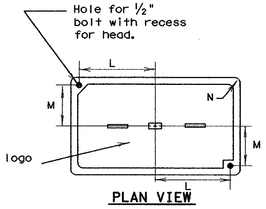




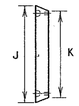
SECTION X-X



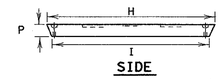
SECTION Y-Y



PLAN VIEW



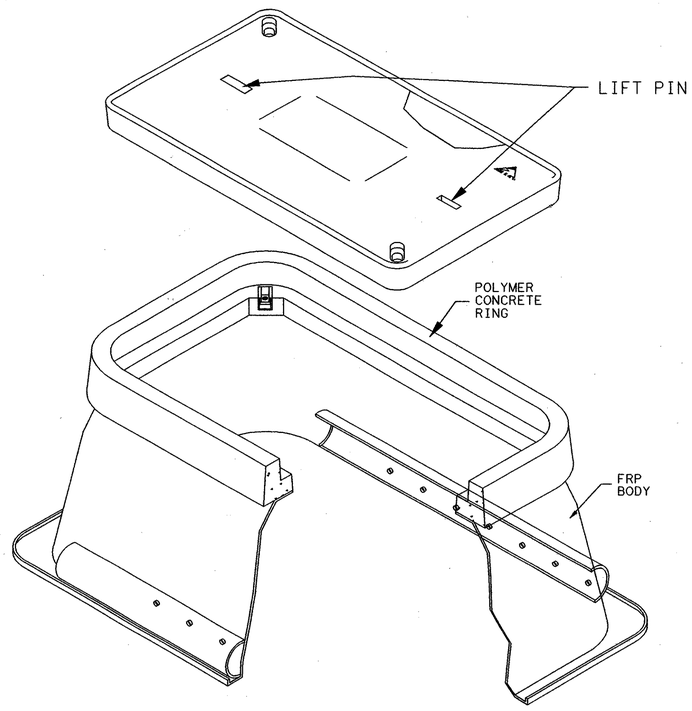
END



SIDE

GROUND BOX COVER

GROUND BOX COVER DIMENSIONS								
BOX	DIMENSIONS (INCHES)							
SIZE	H	I	J	K	L	M	N	P
Battery box	30 ½	30 ¼	17 ½	17 ¼	13 ¼	6 ¾	1 ⅜	2



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STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

ELECTRICAL DETAILS GROUND BOXES/ BATTERY BOX

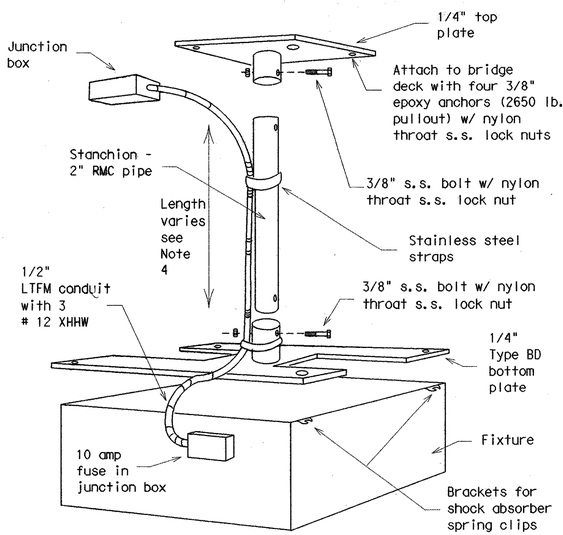
ED(13)-03

DN: HW	CK: BV	DW: HW	CK: CAL
REVISIONS	STATE DISTRICT: 6	FEDERAL REGION	FEDERAL AID PROJECT	SHEET: BLS-9
COUNTY	CONTROL	SECTION	JOB	HIGHWAY

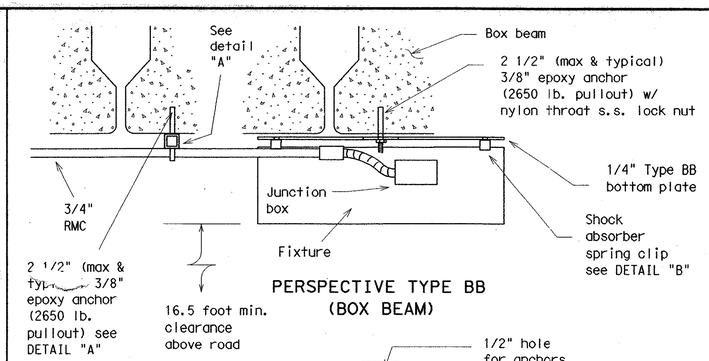
71N

LEVELS DISPLAYED ACC:

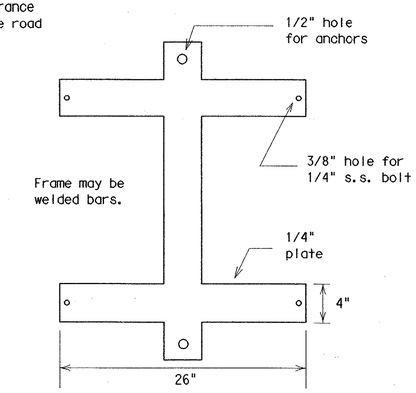
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	



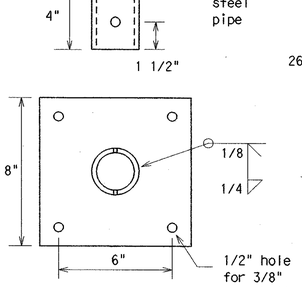
PERSPECTIVE TYPE BD
(BRIDGE DECK)



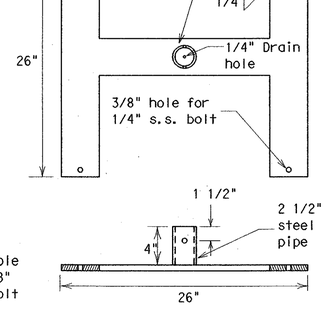
PERSPECTIVE TYPE BB
(BOX BEAM)



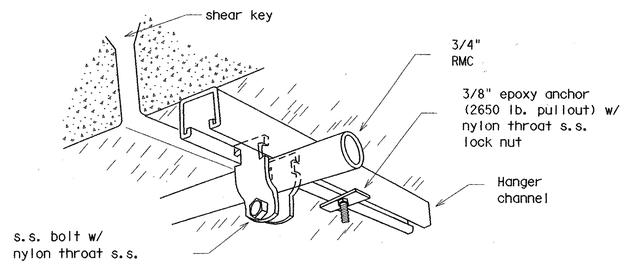
BOTTOM PLATE - TYPE BB



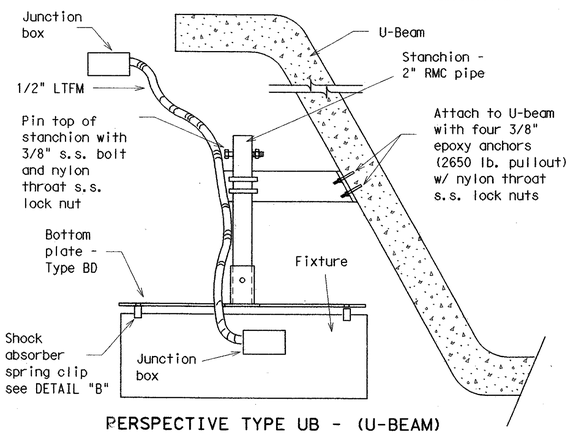
TOP PLATE - TYPE BD



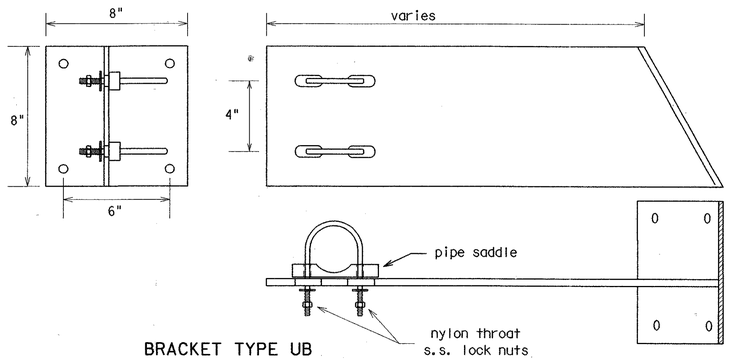
BOTTOM PLATE - TYPE BD



DETAIL "A"
Conduit attachment to box beam
(shown longer than necessary for clarity)



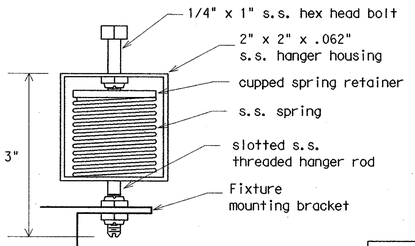
PERSPECTIVE TYPE UB - (U-BEAM)



BRACKET TYPE UB
Make from 1/4" plate

GENERAL NOTES:

1. These details apply to Roadway Illumination Assemblies bid under Item 610, "Roadway Illumination Assemblies," under the descriptive code, "Rdwy Ill Assem U/P Type IF." All associated hardware, mounting assemblies, parts, junction boxes, lamps, lenses, brackets, tools and labor required to install the underpass lighting assembly will not be paid for directly but shall be subsidiary to the various items of the contract, except that conduit, and conductors supplying the fixtures will be paid for separately. Mounting channel for conduit supports will not be paid for directly but shall be subsidiary to the various bid items of the contract.
2. See RID (4) for general routing of conduits under bridge structures. New bent caps and columns shall have conduit embedded in concrete. One disconnect switch shall be installed for each group of underpass luminaires at each underpass or as shown on the lighting layout sheets. Disconnect switches shall be mounted on bent cap or header walls as shown on the plans or as directed by the Engineer. Disconnect switches shall be 30 amps, of the voltage rating of the circuit, fused for 20 amps unless shown otherwise on the plans. Disconnect switches shall not be paid for directly but shall be subsidiary to the various items of the contract.
3. Indiscriminate drilling into pre-cast concrete beams will not be allowed. Drill only as shown or as specifically approved by the engineer.
4. Cut stanchion to position fixture even with bottom of beams. Adjust stanchion to seat all the way into the 2 1/2 inch pipe to reduce rattling, then field drill and pin with bolt as shown. Do not oversize hole for pin. Repair cut ends and drilled hole galvanizing with three coats zinc rich paint (dry completely between coats).
5. Hot dip galvanize all steel parts in accordance with Item 445, "Galvanizing."
6. Adjust stanchion for bracket Type WB for vertical stanchion with fixture even with bottom of beam.
7. Fixture shall meet the following requirements.
   a. Fixture shall be a maximum of 28 inches square and 10 inches deep (mounting feet and junction box may extend outside the 28 inch square).
   b. Fixture lamp(s) shall be one 150-watt Osram Sylvania Icetron induction fluorescent or one Philips QL 165 watt induction fluorescent. (240 volt or 120 volt only). External transformers will not be allowed.
   c. Fixture shall be a full cutoff flat glass luminaire emitting a symmetric or asymmetric light pattern. Reflector shall be polished aluminum and shall be at least 95% efficient in reflecting light. Fixture lens retainer shall be positioned so as to not block light emitted from the fixture, i.e. shall not protrude over the reflecting surface.
   d. When operating at 12,000 lumens and when mounted at 15 feet above the midpoint of a circular area, the radius of which is defined below, the fixture shall provide minimum light levels as shown below;
      i. 0.2 foot-candles in a 35 ft radius
      ii. 1.0 one foot-candle in a 22 ft radius
      iii. 2.0 foot-candles in a 19 ft radius
      iv. Maximum of 27.0 foot-candles at any point in a 35ft radius.
   e. Fixture photometrics shall match photometrics of published data.
   f. Housing shall be made from aluminum sheeting (0.10 inch min), stainless steel (14 ga. Min) or cast aluminum. All seams shall be continuously welded. Fixture housing shall be sturdy and of good workmanship. Fixture housing shall have external mounting feet. Housing shall not have any penetrations except that wiring from the external junction box may penetrate to the ballast compartment. Such penetration shall be factory sealed with potting compound or CGB connector. All openings or construction joints in housing shall be effectively sealed.
   g. Lens shall be heat tempered C73 flat glass, minimum 5/32 inch thick. Lens frame shall be sealed with continuous closed cell neoprene (EDPM) or silicon gasket material as approved by the engineer. Gasket shall be a minimum of 9/16 inch wide and 1/8 inch thick. Lens frame shall contact gasket with a minimum 9/16 inch return flange footing. Frame and housing shall have welded seams ground flush to provide flat surface for gasket contact. Lens shall be securely screwed to the housing with a minimum of 8 number 10 stainless steel screws. Screws shall have Teflon, neoprene, or silicon washers. In addition, the lens frame shall be sealed shut at the factory with RTV 501 sealant.
   h. Wire attachment shall be through a junction box rigidly secured to the side of the fixture housing. Junction box shall be a minimum of 3/16 inch thick aluminum (Adelet) or hot dipped galvanized cast iron walls (FD type) and shall have a threaded knockout for 3/4 inch conduit. Wiring entry into fixture shall be sealed with sealing compound in a minimum 1 inch length nipple or by use of a CGB connector when cord is used. Box back wall shall be sealed to the fixture housing with sealant.
   i. Fixtures shall be painted completely inside and outside with gray paint similar in color to "cobra head" luminaires. When other colors are shown on the plans, color shall be as approved by the engineer.
   j. Fixtures shall be certified, in writing, by the lamp manufacturer to be capable of sufficient heat dissipation. Certification shall be submitted for approval with fixture submittal. Icetron lamps shall be supported at each end of the lamp. Lamp manufacturer and fixture manufacturer shall provide a written 60,000-hour life replacement warranty for the fixture/lamp combination for the underpass installation conditions of this project. Lamps/fixture shall be considered failed if light output drops below 60% of rated lumens. Warranty shall be submitted for approval with the fixture submittal.
   k. Only materials, with approved product codes or designations, from prequalified producers are accepted on bids. The Construction Division (CST) of the Texas Department of Transportation (TxDOT) maintains the material producers list of approved producer product codes or designations. Use the following website to view this list:
      http://www.dot.state.tx.us/business/materialproducerlist.htm
      Use of prequalified material does not relieve the contractor of the responsibility to ensure that the material meets specifications. All materials, including those shown on the prequalified material list, may be inspected and tested at any time and may be rejected if not in compliance with the specifications.
   l. All anchors into concrete shall be stainless steel and may be either expansion or epoxy, minimum 1000 lb. pull out, unless otherwise shown.
8. For box beam construction, if 16.5 foot clearance cannot be obtained, see Engineer for alternative underpass lighting.
9. Dimensions of brackets shall be adjusted as necessary to accomodate fixtures being supplied. Use Type BD for double T-beam mounting. Other mounting arrangements may be as approved by the Engineer.



Spring clip shall be installed with three nylon throat s.s. lock nuts.

DETAIL "B"
SHOCK ABSORBER SPRING CLIP
(Hascall-Denke SLH002 or equal)

1/04 Revision

Modify fixture specifications

356

STANDARD PLANS
Texas Department of Transportation
Traffic Operations Division

ROADWAY ILLUMINATION DETAILS

RID(5)-04

© TxDOT June 2002	DN: KB	CK: KB	DW: FDN	CK: CAL
REVISIONS 1-04	STATE DISTRICT	FEDERAL REGION 6	FEDERAL AID PROJECT	SHEET BLS-10
	COUNTY	CONTROL	SECTION	JOB / HIGHWAY

725

LEVELS (D) DISPLAYED
ACC:
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63