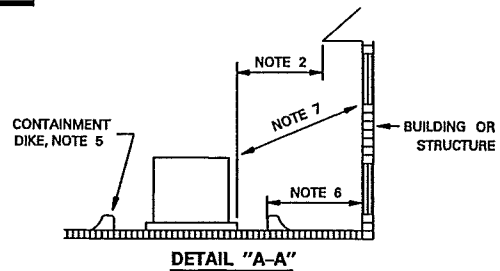


TRANSF. TYPE	BUILDING CONSTRUCTION		WINDOWS, DOORS & VENTS	FIRE ESCAPES
	FIRE RESISTIVE NOTE 3	NON-FIRE RESISTIVE		
1 PHASE	5'-0"	10'-0"	10'-0"	20'-0"
3 PHASE	5'-0"	15'-0"	15'-0"	20'-0"

CLEARANCE TABLE



NOTES:

- CLEARANCE FROM BUILDING WALLS SHALL COMPLY WITH THE CLEARANCE TABLE. ALL DIMENSIONS SHOWN ARE MINIMUM DIMENSIONS.
- WHERE THERE ARE BUILDING EAVES OR OVERHANGS WITHIN 25'-0" ABOVE GROUND, CLEARANCE SHALL BE MEASURED HORIZONTALLY BEGINNING FROM THE EDGE OF THE EAVE OR OVERHANG.
- FIRE RESISTIVE BUILDING WALLS INCLUDE BRICK AND MASONRY STRUCTURES THAT HAVE A 2 HOUR FIRE RATING.
- CLEARANCE TO BUILDING DOORS, WINDOWS, VENTS AND FIRE ESCAPES TO BE MEASURED RADIALLY.
- LIQUID FLOW OF AREA SURROUNDING TRANSFORMER SHOULD BE AWAY FROM BUILDING. WHERE GROUND IS FLAT OR SLOPES TOWARD BUILDING, A DIKE SUFFICIENT TO CONTAIN ALL TRANSFORMER OIL FOR TRANSFORMERS 500 KVA AND LARGER SHALL BE PROVIDED.
- CLEARANCES ARE MEASURED FROM PAD EDGE TO BUILDING WALL, OPENING, OVERHANG OR FIRE ESCAPE UNLESS A CONTAINMENT DIKE IS UTILIZED. IF A CONTAINMENT DIKE IS UTILIZED, CLEARANCE IS MEASURED FROM DIKE.
- CLEARANCES FOR WINDOWS AND VENTS ABOVE TRANSFORMER ARE MEASURED RADIALLY FROM CLOSEST POINT ON TRANSFORMER.
- PADMOUNTED TRANSFORMERS SHALL BE POSITIONED SUCH THAT HOTSTICK USE IS NOT REQUIRED ON THE SIDE FACING THE BUILDING. IF HOTSTICK USE IS REQUIRED ON THE BUILDING SIDE, CLEARANCES SHOWN IN DETAIL SHEET 1 SHALL BE MAINTAINED.
- THERE SHOULD NOT BE ANY ABOVE GROUND OBSTRUCTIONS, SUCH AS SHRUBS, COOLING TOWERS, GAS METERS, FENCING, PEDESTALS ETC. WITHIN 5'-0" OF PAD OR OVERHANGS ABOVE PAD FACILITIES. REFERENCE DETAIL SHEET 1 FOR SCREENING CLEARANCES AROUND PADMOUNTED EQUIPMENT.
- THERE SHOULD NOT BE ANY PIPING OR CONDUIT UNDER THE PAD (EXCEPTION: MUTUALLY AGREED UPON COMMUNICATION CONDUITS) OTHER THAN THOSE ENTERING THE TRANSFORMER.
- TRANSFORMERS SHALL NOT OBSTRUCT FIRE LANE.
- IT IS THE OWNER'S RESPONSIBILITY TO COMPLY WITH ANY INSURANCE REGULATIONS AFFECTING THE PREMISES.

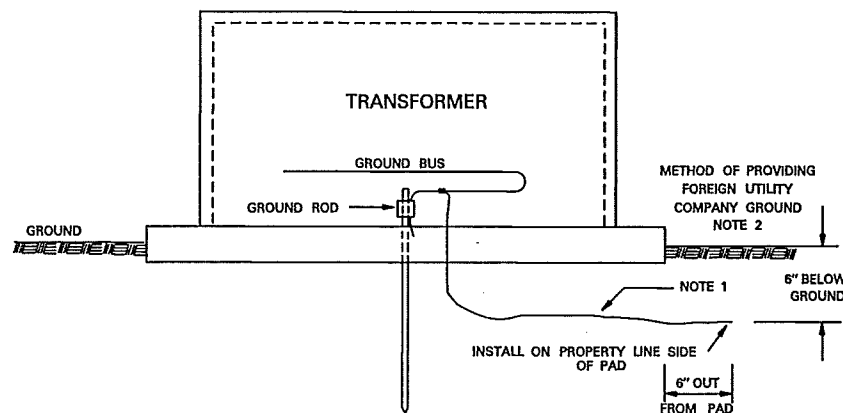
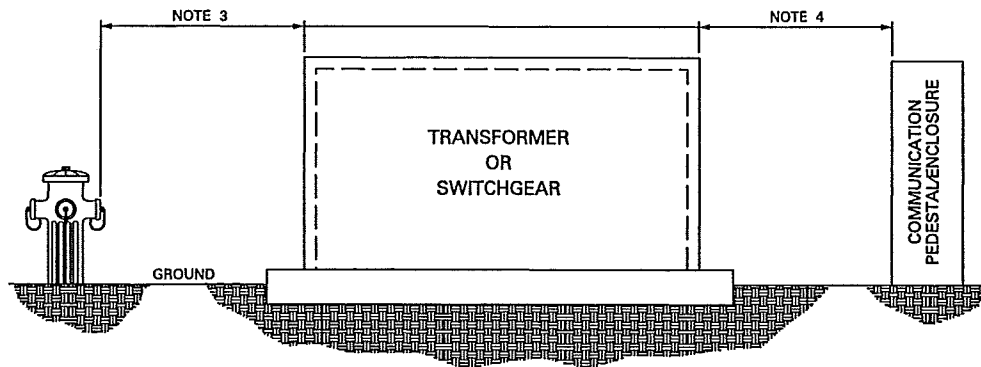
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CLEARANCES BETWEEN PADMOUNTED EQUIPMENT AND STRUCTURES

DCS-5 DETAIL SHEET 2 OF 19

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04 - 13



NOTES:

- ON NEW INSTALLATIONS, INSTALL NO. 6 S.D. BARE COPPER AS SHOWN FOR FOREIGN UTILITY COMPANY BONDING.
- THE NATIONAL ELECTRICAL SAFETY CODE RULE 384C RECOMMENDS BONDING OF ALL ABOVE GROUND METALLIC POWER AND COMMUNICATIONS APPARATUS (PEDESTALS, TERMINALS, APPARATUS CASES, TRANSFORMER CASES, ETC.) THAT ARE SEPARATED BY A DISTANCE OF 6 FEET OR LESS.
- PADMOUNTED EQUIPMENT, PEDESTALS AND OTHER ABOVE GROUND ENCLOSURES SHOULD BE LOCATED NOT LESS THAN 4 FEET FROM FIRE HYDRANTS. WHERE CONDITIONS DO NOT PERMIT A CLEARANCE OF 4 FEET, A CLEARANCE OF NOT LESS THAN 3 FEET IS ALLOWED.
- ALL ABOVE GROUND METALLIC POWER AND COMMUNICATION EQUIPMENT (PEDESTALS, TRANSFORMER CASES, APPARATUS CASES, ETC.) THAT ARE SEPARATED BY A DISTANCE OF 6 FEET OR LESS SHALL BE BONDED.
- HORIZONTAL CLEARANCES FROM ALL ADJACENT SURFACE STRUCTURES WITH THE EXCEPTION OF FIRE HYDRANTS, SHALL HAVE A MINIMUM CLEARANCE OF 5 FOOT SEPERATION ON *NON-OPERATION SIDES AND 10 FOOT OF SEPERATION ON OPERATION SIDES.

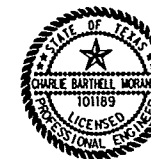
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CLEARANCES BETWEEN PADMOUNTED EQUIPMENT AND FOREIGN UTILITY ENCLOSURES AND EQUIPMENT

DCS-5 DETAIL SHEET 3 OF 19

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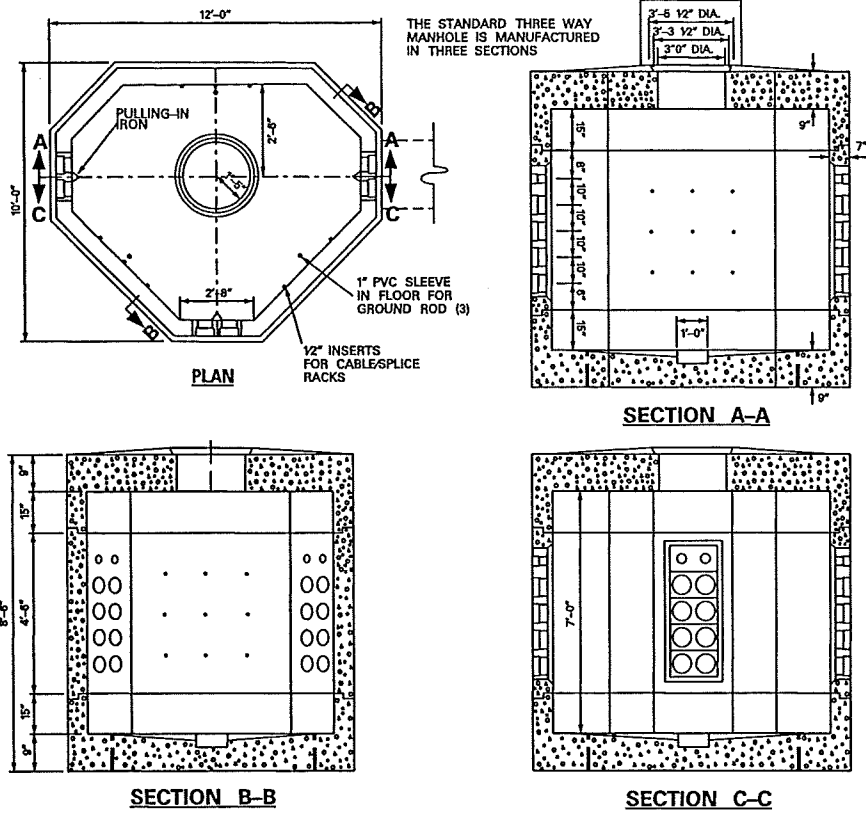
04 - 13



Ch Moran P.E. 10-24-13
 Signature of Registrant Date

FIRM REGISTRATION NUMBER: 312

NO.	REVISION	BY	DATE
<p><i>Addison</i> TOWN OF ADDISON DALLAS COUNTY, TEXAS</p> <p>BELT LINE ROAD UNDERGROUND ELECTRICAL</p> <p>ONCOR DUCT BANK DETAIL 4E6</p>			
<p>HALFF 1201 NORTH BOWSER ROAD, RICHARDSON, TEXAS 75081-2275 TEL (214) 346-6200 FAX (214) 739-0095</p>			
PROJECT	DESIGN	DRAWN	DATE
29350	HALFF	HALFF	OCT. 2013
FILE	SHEET		
29350 ELEC 19d	ELE-19		



NOTES:

1. THE MAXIMUM DESIGN DEPTH FOR A MANHOLE IS 20 FEET TO THE FINISHED FLOOR. THIS INCLUDES 12 FEET OF NECK (FOR DEPTHS GREATER THAN THIS CONTACT AUTHORIZED ONCOR REPRESENTATIVE).
2. ALL JOINTS BETWEEN MANHOLE SECTIONS AND MANHOLE NECK SECTIONS SHALL BE PAINTED WITH RAM-NEK PRIMER OR APPROVED EQUAL BY MANHOLE SUPPLIER. ALL JOINTS ARE TO BE MADE WATERTIGHT AT THE TIME OF INITIAL INSTALLATION.
3. TO PREVENT WATER AND DEBRIS MIGRATION INTO THE MANHOLE, DO NOT REMOVE THE KNOCK OUT MEMBRANES FROM UNUSED TERMINATOR POSITIONS. ALSO, DUCT PLUGS SHOULD BE INSTALLED IN ALL CONDUITS THAT ARE UNOCCUPIED BY CABLE.
4. A MINIMUM OF THREE 5/8 IN. X 8 FT. COPPER CLAD GROUND RODS SHALL BE INSTALLED IN EACH MANHOLE.
5. PRECAST CONCRETE MANHOLES ARE TO BE INSTALLED ON A MINIMUM 18" GRAVEL BASE TO FACILITATE LEVELING.

APPROVED VENDORS FOR 3-WAY PRECAST CONCRETE MANHOLE (TSN 323108) W/COVER & FRAME.

- 1). OLD CASTLE PRECAST (PART NUMBER - 913 SERIES)
- 2). HANSON PIPE & PRECAST (PART NUMBER - HANSON-3WAY)
- 3). THE TURNER COMPANY (PART NUMBER - ELMH3WAY)

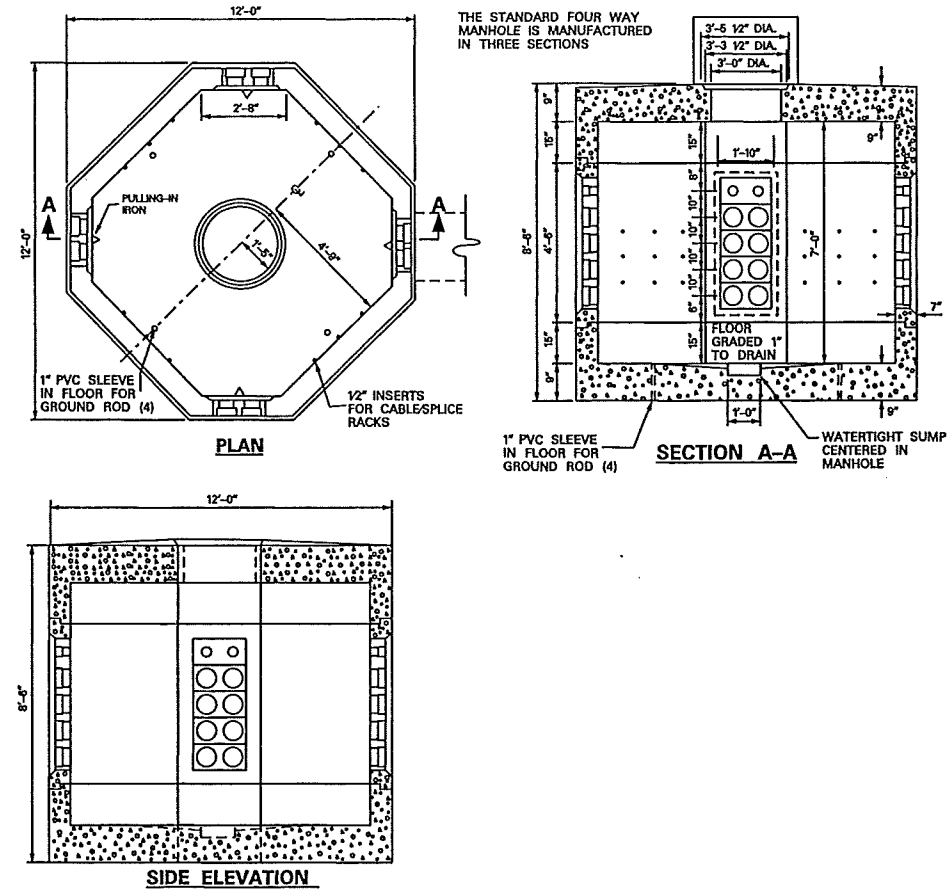
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PRECAST THREE WAY MANHOLE

DCS - 5 DETAIL SHEET 7 of 19

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04 - 13



NOTES:

1. THE MAXIMUM DESIGN DEPTH FOR A MANHOLE IS 20 FEET TO THE FINISHED FLOOR. THIS INCLUDES 12 FEET OF NECK (FOR DEPTHS GREATER THAN THIS CONTACT AUTHORIZED ONCOR REPRESENTATIVE).
2. ALL JOINTS BETWEEN MANHOLE SECTIONS AND MANHOLE NECK SECTIONS SHALL BE PAINTED WITH RAM-NEK PRIMER OR APPROVED EQUAL BY MANHOLE SUPPLIER. ALL JOINTS ARE TO BE MADE WATERTIGHT AT THE TIME OF INITIAL INSTALLATION.
3. TO PREVENT WATER AND DEBRIS MIGRATION INTO THE MANHOLE, DO NOT REMOVE THE KNOCK OUT MEMBRANES FROM UNUSED TERMINATOR POSITION. ALSO, DUCT PLUGS SHOULD BE INSTALLED IN ALL CONDUITS THAT ARE UNOCCUPIED BY CABLE.
4. A MINIMUM OF FOUR 5/8 IN. X 8 FT. COPPER CLAD GROUND RODS SHALL BE INSTALLED IN EACH FOUR WAY MANHOLE.
5. PRECAST CONCRETE MANHOLES ARE TO BE INSTALLED ON A MINIMUM 18" GRAVEL BASE TO FACILITATE LEVELING.

APPROVED VENDORS FOR 4-WAY PRECAST CONCRETE MANHOLE (TSN 316942) W/COVER & FRAME.

- 1). OLD CASTLE PRECAST (PART NUMBER - 914 SERIES)
- 2). HANSON PIPE & PRECAST (PART NUMBER - HANSON-4WAY)
- 3). THE TURNER COMPANY (PART NUMBER - ELMH4WAY)

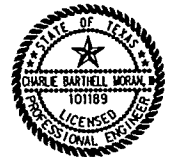
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PRECAST FOUR WAY MANHOLE

DCS - 5 DETAIL SHEET 8 of 19

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04 - 13



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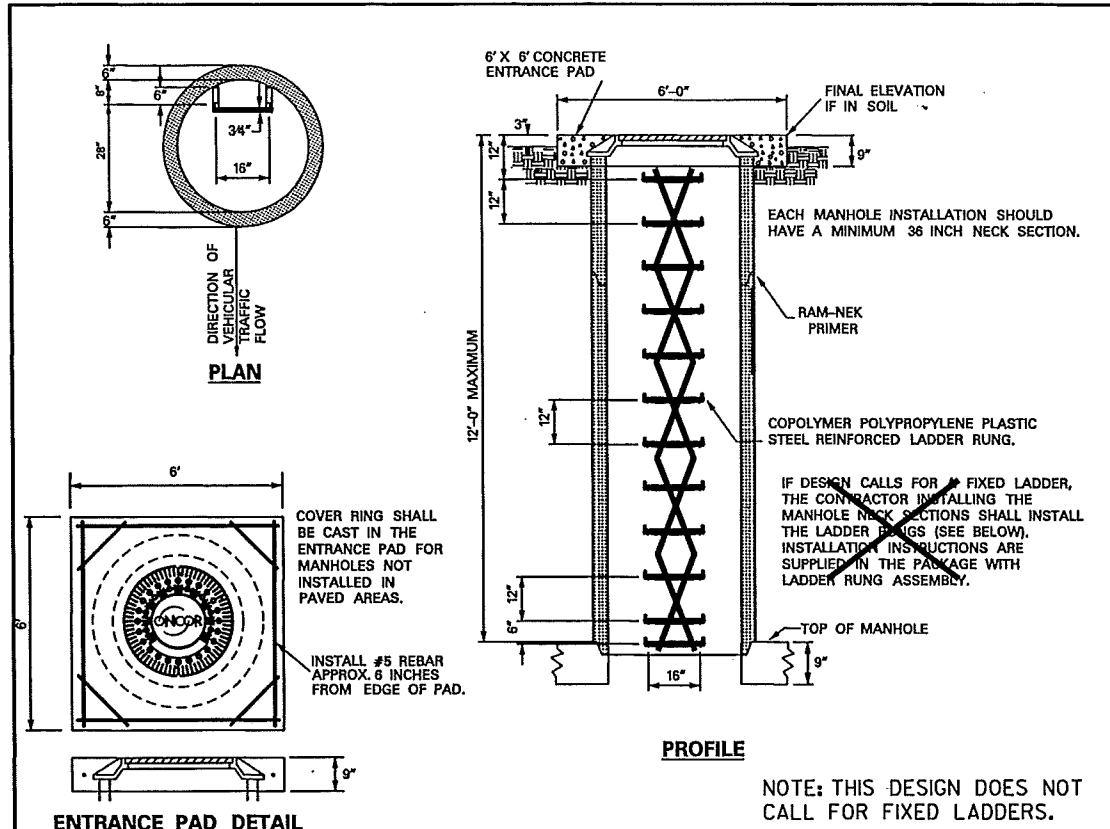
Addison TOWN OF ADDISON
 DALLAS COUNTY, TEXAS

BELT LINE ROAD
 UNDERGROUND ELECTRICAL

ONCOR DUCT BANK DETAIL 4E6

HALFF 1201 NORTH BOWSER ROAD, RICHARDSON, TEXAS 75081-2275
 TEL (214) 346-6200 FAX (214) 739-0095

PROJECT	DESIGN	DRAWN	DATE	FILE	SHEET
29350	HALFF	HALFF	OCT. 2013	29350 ELEC 20d	ELE-20

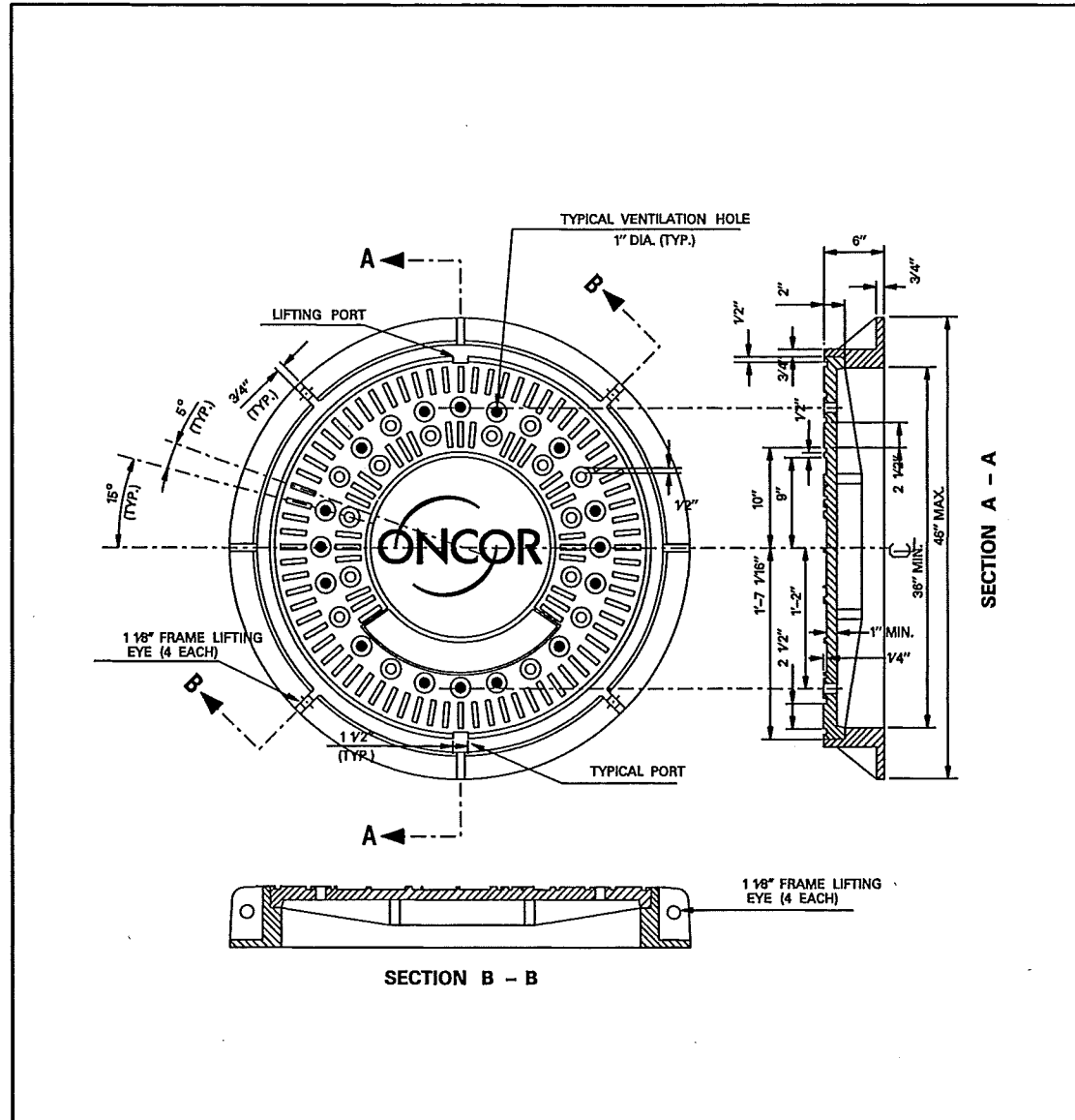


DESCRIPTION & APPROVED VENDORS	ONCOR TSN	VENDOR PART#
12 IN. X 36 IN. PRECAST CONCRETE NECK SECTION.	320774	
OLD CASTLE PRECAST		048060
HANSON PIPE & PRECAST		HANSON-12NECK36
THE TURNER COMPANY		ELGR3612
18 IN. X 36 IN. PRECAST CONCRETE NECK SECTION.	320775	
OLD CASTLE PRECAST		048080
HANSON PIPE & PRECAST		HANSON-18NECK36
THE TURNER COMPANY		ELGR3618
24 IN. X 36 IN. PRECAST CONCRETE NECK SECTION.	320776	
OLD CASTLE PRECAST		048090
HANSON PIPE & PRECAST		HANSON-24NECK36
THE TURNER COMPANY		ELGR3624
36 IN. X 36 IN. PRECAST CONCRETE NECK SECTION.	320777	
OLD CASTLE PRECAST		048110
HANSON PIPE & PRECAST		HANSON-36NECK36
THE TURNER COMPANY		ELGR3636
MANHOLE STEP, PLASTIC STEEL REINFORCED, DRIVE IN SINGLE RUNG	482911	
M.A. INDUSTRIES		PS-3-PCF004-516

APPROVED BY ONCOR

MANHOLE NECK, LADDER, AND ENTRANCE PAD

DCS - 5 DETAIL SHEET 9 of 19



APPROVED VENDORS FOR (TSN 327563) MANHOLE COVER AND FRAME.

1. OLD CASTLE PRECAST (PART NUMBER - MHRL2010)
2. THE TURNER COMPANY (PART NUMBER - ELCVR36)

APPROVED BY ONCOR

MANHOLE COVER AND FRAME

DCS - 5 DETAIL SHEET 10 of 19



Ch Moran, P.E. 11-8-2013
 Signature of Registrant Date
 FIRM REGISTRATION NUMBER: 312

NO.	REVISION	BY	DATE
ADDISON TOWN OF ADDISON DALLAS COUNTY, TEXAS BELT LINE ROAD UNDERGROUND ELECTRICAL ONCOR DUCT BANK DETAIL 4E6			
1201 NORTH BOWSER ROAD, RICHARDSON, TEXAS 75081-2275 TEL (214) 346-8200 FAX (214) 739-0095			
PROJECT	DESIGN	DRAWN	DATE
29350	HALFF	HALFF	NOV. 2013
FILE	SHEET		
29350 ELEC 21d	ELE-21		

ENCASED 6 INCH CONDUIT SYSTEM DIMENSIONS					
DIMENSION	2WX1H	2WX2H	2WX3H	2WX4H	2WX5H
A (MIN.)	46"	56"	66"	76"	86"
B (MIN.)	16"	26"	36"	46"	56"

TABLE 1 (DIMENSION HAS BEEN ROUNDED UP TO NEAREST INCH)

	POLYURETHANE DISK MANDREL	MAX. DISK DIAMETER	TOTAL WEIGHT
	6 INCH DUCT CONDUIT	5 1/2 INCH	6.20 LB.

NOTES:

- CONDUIT FOR CONCRETE ENCASEMENTS IS TO BE SOLID WALL PVC DB-60 AND SHALL NOT BE A CELLULAR CORE PVC PRODUCT.
- ALL CONCRETE OF THE ENCASEMENT IS TO HAVE A COMPRESSION TEST STRENGTH OF 3000 PSI AT TWENTY EIGHT DAYS.
- INSTALL APPROVED DUCT SPACERS (SEE BELOW) EVERY 5 FEET ALONG THE ENTIRE LENGTH OF THE CONDUIT SYSTEM.
- THE DUCT SPACERS ARE TO PROVIDE 3 INCHES OF VERTICAL AND HORIZONTAL SEPARATION BETWEEN CONDUITS.
- THE DUCT LINE SHALL BE SECURED TO EARTH AT A MINIMUM OF EACH FOURTH SPACER LOCATION, OR EVERY 20 FT. ALONG THE DUCT PRIOR TO POURING CONCRETE TO PREVENT THE CONDUIT FROM FLOATING.
- ALL CONDUIT/DUCT SPANS SHOULD SLOPE TOWARD ADJACENT MANHOLES TO PROVIDE DRAINAGE TO A PUMPABLE LOCATION.
- ALL BACKFILL OF A CONDUIT/DUCT TRENCH SHALL BE REPLACED TO A MINIMUM COMPACTION OF 95%.
- RED POWDER CONCRETE DYE IS TO BE PLACED ON TOP OF THE ENCASEMENT IMMEDIATELY AFTER THE CONCRETE IS POURED.
- CONDUIT ENDS FOR INCOMPLETE DUCT LINES (STUBS) ARE TO REMAIN EXPOSED FROM THE ENCASEMENT FOR FUTURE RETRIEVAL. THE ENDS SHALL BE CAPPED WATERTIGHT AND HAVE AN ELECTRONIC MARKER INSTALLED.
- EACH CONDUIT OF A CONCRETE ENCASED DUCT SHALL BE INSPECTED BY PULLING A DISK MANDREL OF PROPER SIZE THROUGH ITS ENTIRE LENGTH AS SOON AS POSSIBLE AFTER ENCASEMENT TO VERIFY INTEGRITY.
- EACH 6" CONDUIT SHALL HAVE A 6000 LB. PULL TAPE INSTALLED.

APPROVED VENDORS FOR (TSN 300325) 6" BASE SPACER & (TSN 300332) 6" INTERMEDIATE SPACER.

- CARLON (BASE PART NUMBER - S288RLN) & (INTERMEDIATE PART NUMBER - S289RLN).
- CANTEX INDUSTRIES (BASE PART NUMBER - 5336039) & (INTERMEDIATE PART NUMBER - 5336038)

APPROVED VENDORS FOR (TSN 300398) 6" TYPE II DB-60 PVC SOLID WALL CONDUIT.

- CANTEX INDUSTRIES (PART NUMBER - A79GA42)
- PRIME CONDUIT (PART NUMBER - 48817)
- HERITAGE PLASTICS (PART NUMBER - 53602)

APPROVED BY ONCOR

CONCRETE ENCASED CONDUIT SYSTEMS

DCS - 5 DETAIL SHEET 11 of 19

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THE CHEMICALS USED IN SOLVENT WELDING OF CONDUIT ARE INTENDED TO PENETRATE THE SURFACE OF BOTH PIPE AND FITTING, WHICH AFTER CURING RESULT IN A COMPLETE FUSION AT THE JOINT. THE OVER USE OR UNDER USE OF CHEMICALS RESULTS IN LEAKY JOINTS OR WEAKENED PIPE.

A. REMOVE ALL DUST, DIRT, AND MOISTURE FROM SURFACES TO BE CEMENTED EITHER BY MECHANICAL OR CHEMICAL CLEANING.

- MECHANICAL CLEANING - FINE ABRASIVE PAPER OR CLOTH (180 GRIT OR FINER) OR CLEAN OIL-FREE STEEL WOOL.
- CHEMICAL CLEANING - CLEANER RECOMMENDED BY MANUFACTURER OR EQUIVALENT (METHYL ETHYL KETONE - MEK).

B. WITH A NON-SYNTHETIC BRISTLE BRUSH APPLY AN EVEN COATING OF CEMENT TO THE OUTSIDE OF THE PIPE AND INSIDE THE SOCKET. MAKE SURE THAT THE AMOUNT OF CEMENT APPLIED TO THE CONDUIT IS EQUAL TO THE DEPTH OF THE SOCKET. BEFORE ASSEMBLY, IF SOME EVAPORATION OF SOLVENT FROM THE SURFACES TO BE JOINED IS NOTED, REAPPLY CEMENT, THEN ASSEMBLE.

IF CEMENT BEING USED HAS AN APPRECIABLE CHANGE IN VISCOSITY OR SHOWS SIGNS OF JELLING, IT SHALL BE DISCARDED. IN NO CASE SHALL THINNER BE USED IN AN ATTEMPT TO RESTORE JELLED PVC CEMENT. THINNER MAY ONLY BE USED TO CHANGE THE VISCOSITY OF A MEDIUM BODIED CEMENT TO THAT OF A REGULAR BODIED CEMENT FOR APPLICATION ON PVC PIPE SMALLER THAN 2 1/2 INCH DIAMETER. A MEDIUM BODIED CEMENT SHALL BE USED ON 2 1/2 TO 6 INCH PVC PIPE.

IN COLD WEATHER, USE A PRIMER TO SOFTEN THE JOINING SURFACES BEFORE APPLYING CEMENT. ALLOW LONGER CURE TIME. (SEE ITEM E).

C. JOIN PIPE WITHIN 20 SECONDS OF APPLYING CEMENT. TURN THE PIPE 1/4 TURN TO ENSURE EVEN DISTRIBUTION OF CEMENT ON SURFACES TO BE BONDED. MAKE SURE THAT PIPE IS INSERTED TO THE FULL DEPTH OF THE SOCKET.

D. CLEAN OFF ANY BEAD OR EXCESS CEMENT THAT APPEARS AT THE OUTER SHOULDER OF THE FITTING. EXCESS CEMENT ALLOWED TO REMAIN IN CONTACT WITH THE MATERIAL CAN CAUSE WEAKENING OF THE MATERIAL, AND SUBSEQUENT FAILURE.

E. NEWLY ASSEMBLED JOINTS SHOULD BE HANDLED CAREFULLY UNTIL THE CEMENT HAS CURED TO THE RECOMMENDED SET PERIOD. SET PERIODS ARE RELATED TO THE AMBIENT TEMPERATURE AS FOLLOWS:

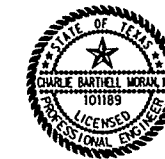
30 MIN. MINIMUM AT 60° TO 100°F
 1 HR. MINIMUM AT 40° TO 60°F
 2 HR. MINIMUM AT 20° TO 40°F
 4 HR. MINIMUM AT 0° TO 20°F

APPROVED BY ONCOR

INSTRUCTIONS FOR JOINING PVC CONDUIT

DCS-5 DETAIL SHEET 12 OF 19

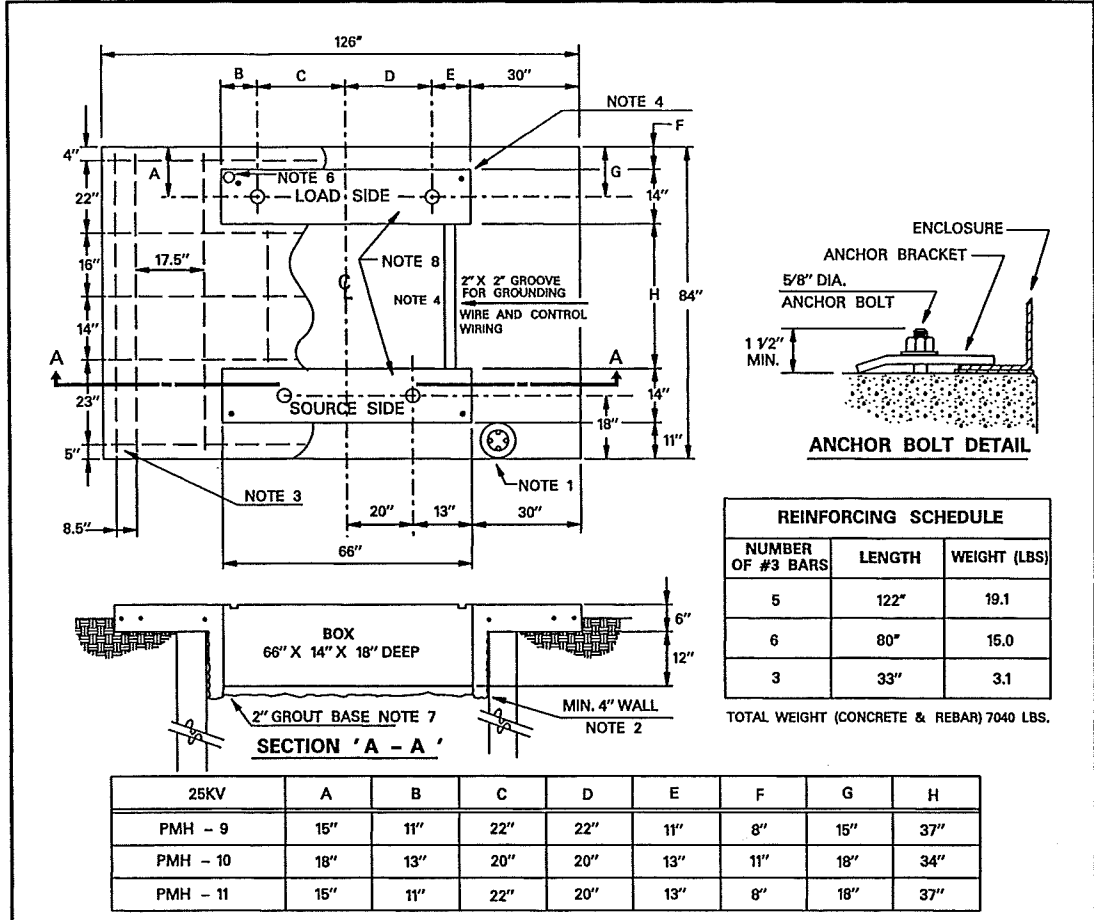
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Ch Moran, P.E. 10-24-13
 Signature of Registrant Date

FIRM REGISTRATION NUMBER: 312

NO.	REVISION	BY	DATE		
TOWN OF ADDISON DALLAS COUNTY, TEXAS BELT LINE ROAD UNDERGROUND ELECTRICAL ONCOR DUCT BANK DETAIL 4E6					
1201 NORTH BOWSER ROAD, RICHARDSON, TEXAS 75081-2275 TEL (214) 346-6200 FAX (214) 739-0095					
PROJECT	DESIGN	DRAWN	DATE	FILE	SHEET
29350	HALFF	HALFF	OCT. 2013	29350 ELEC 22d	ELE-22



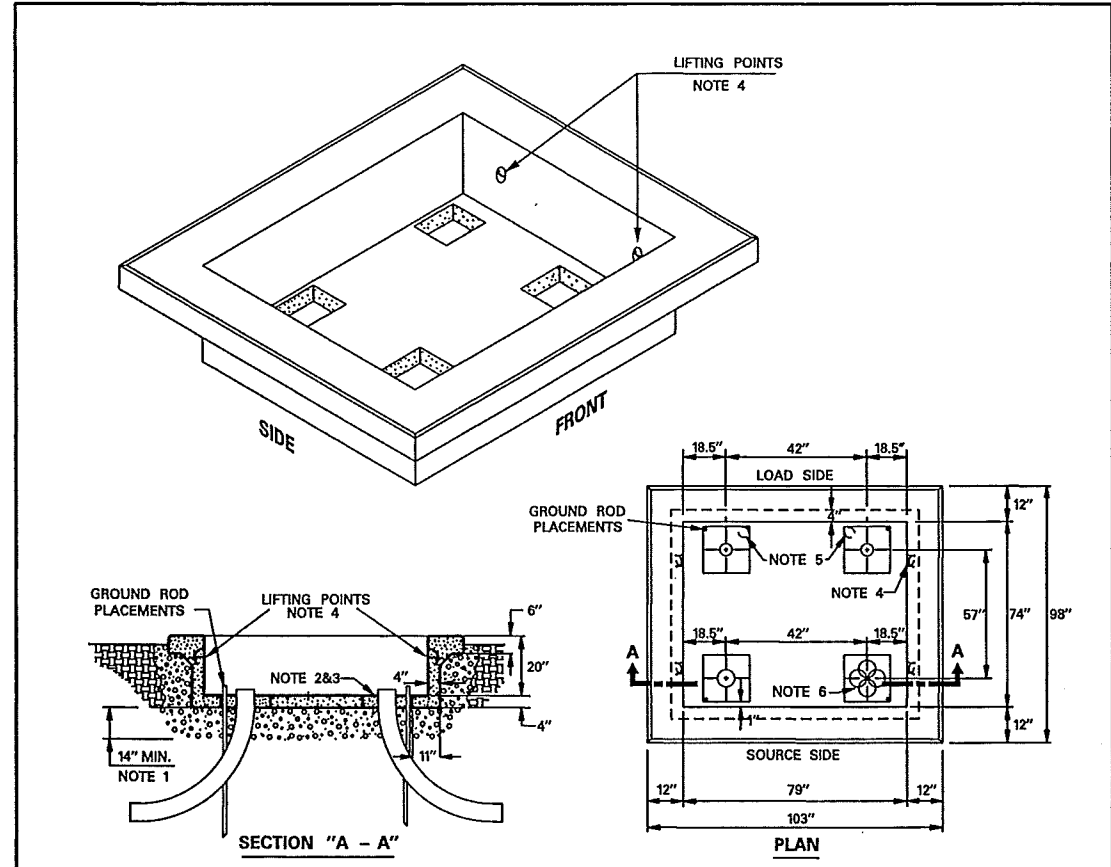
25KV	A	B	C	D	E	F	G	H
PMH - 9	15"	11"	22"	22"	11"	8"	15"	37"
PMH - 10	18"	13"	20"	20"	13"	11"	18"	34"
PMH - 11	15"	11"	22"	20"	13"	8"	18"	37"

- NOTES:**
- PIERS ARE REQUIRED ON ALL SWITCHGEAR PADS UNLESS WAIVED BY THE COMPANY INSPECTOR.
 - USE WIRE MESH FOR CONCRETE REINFORCEMENT AROUND DEEPWELL BOX.
 - ENDS OF RE-BAR SHALL REMAIN A MINIMUM OF 2" INSIDE OF CONCRETE AND SHALL BE INTERMEDIATE GRADE 60 AND CONFORM TO ASTM A615.
 - CONTACT COMPANY REPRESENTATIVE ON WHERE TO ACQUIRE 5/8" X 10' COPPER CLAD GROUND RODS. GROUND RODS TO BE OBTAINED AND INSTALLED BY CONTRACTOR. INSTALLATION DEPTH SHALL BE 7'-6".
 - FOR CLEARANCES ON ALL SIDES OF THE SWITCHGEAR SEE DETAIL SHEETS 1, 2, 3 AND 4.
 - FOR PADS PLUMBED INTO DUCT BANKS, INSTALL 3" COMMUNICATION CONDUIT FROM MANHOLE TO FRONT RIGHT CORNER OF LOAD SIDE CONDUIT OPENING OF PAD.
 - GROUT CONDUIT WINDOW OPENINGS.

APPROVED BY ONCOR

POURED IN PLACE PAD FOR
 25KV SUPERVISORY CONTROL
 LIVE FRONT SWITCHGEAR

DCS-5 DETAIL SHEET 13 OF 19



- NOTES:**
- TO PREVENT SETTLING AND IMPROVE PAD STABILIZATION ADD A MINIMUM OF 14 INCHES MEDIUM SIZE GRAVEL BOTTOM & SIDES.
 - CONDUIT SHALL NOT EXTEND MORE THAN 2 INCHES ABOVE CONDUIT WINDOW OPENING.
 - TO ALLOW FOR ADEQUATE DRAINAGE DO NOT SEAL CONDUIT WINDOW OPENINGS WITH GROUT. FILL WITH AGGREGATE ONLY.
 - LIFTING POINTS (4) RATED AT 2000 LBS EACH. TOTAL PAD WEIGHT IS 6100 LBS.
 - FOR PADS PLUMBED TO CONCRETE ENCASED DUCT, INSTALL 3 INCH COMMUNICATION CONDUIT FROM MANHOLE TO A LOAD SIDE OPENING.
 - EXAMPLE OF CONDUIT PLACEMENTS (VERTICAL OR HORIZONTAL) WHEN SPARE CONDUITS ARE REQUIRED.

DESCRIPTION & APPROVED VENDORS	ONCOR TSN	VENDOR PART#
PAD, PRECAST, 20" DEEPWELL, SWITCHGEAR, 25KV PMHPME TYPE, 103" X 98"	329429	
OLD CASTLE PRECAST		1804702
THE TURNER COMPANY		ELPAD25KV
ROD, GRD, CU CLAD STL, 5/8" X 10', UL LABEL & DIMEN STAMPED ON TOP	306212	
ERITECH		615800

APPROVED BY ONCOR

PRECAST WELLED PAD FOR
 DEAD FRONT SWITCHGEAR

DCS - 5 DETAIL SHEET 14 OF 19



Ch Moran P.E. 10-24-13
 Signature of Registrant Date
 FIRM REGISTRATION NUMBER: 312

NO.	REVISION	BY	DATE

ADDISON TOWN OF ADDISON
 DALLAS COUNTY, TEXAS

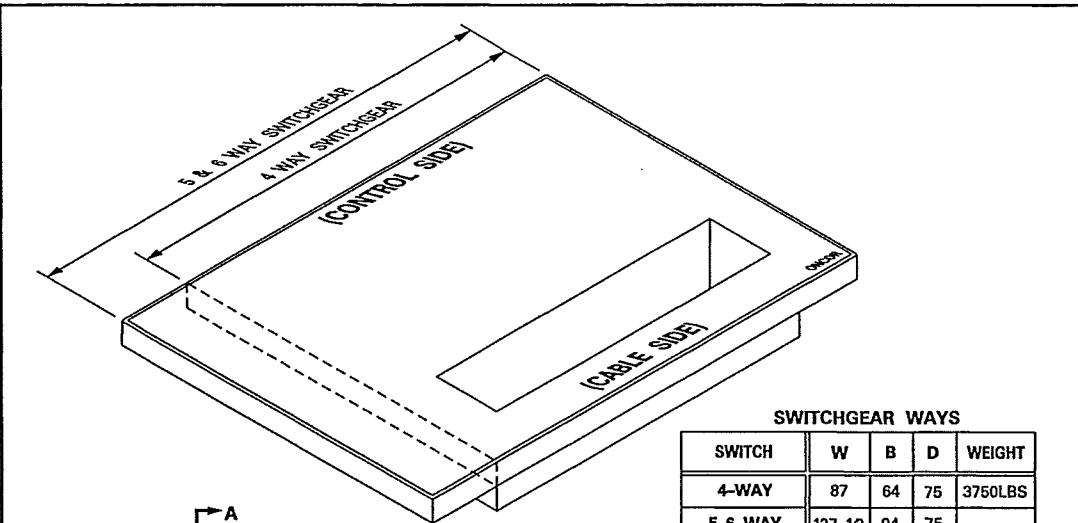
BELT LINE ROAD
 UNDERGROUND ELECTRICAL

ONCOR DUCT BANK DETAIL 4E6

HALFF 1201 NORTH BOWSER ROAD, RICHARDSON, TEXAS 75081-2275
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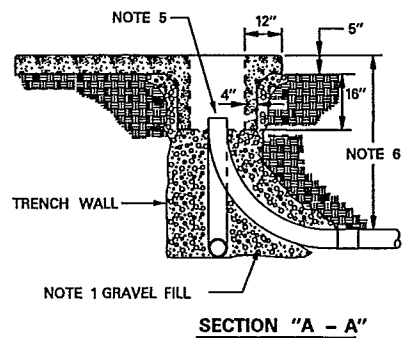
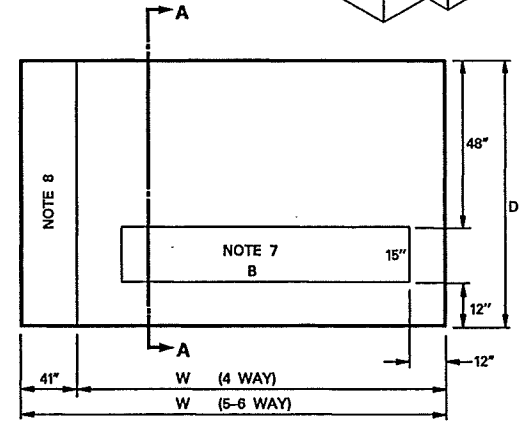
PROJECT	DESIGN	DRAWN	DATE	FILE	SHEET
29350	HALFF	HALFF	OCT. 2013	29350 ELEC 23d	ELE-23

USER: oh1299
 OFFICE: RCH
 PROJECT #: 29350
 FILE: 29350 ELEC 24d.dgn
 TIME: 2:26:29 PM
 DATE: 10/24/2013



SWITCHGEAR WAYS

SWITCH	W	B	D	WEIGHT
4-WAY	87	64	75	3750LBS
5-6 WAY	127 1/2	94	75	5465LBS
4-5 WAY ATO	127 1/2	94	75	
4-5 WAY RSC	127 1/2	94	75	



NOTES:

- FOR STABILIZATION AND DRAINAGE INSTALL SMALL TO MEDIUM GRAVEL UNDER PAD DEEP WELL.
- FOR CLEARANCES ON ALL SIDES OF THE SWITCHGEAR SEE DETAIL SHEETS 1, 2, 3 AND 4.
- PIERS ARE REQUIRED ON ALL SWITCHGEAR PADS UNLESS WAIVED BY THE COMPANY INSPECTOR.
- LIFT PAD WITH PROVIDED LIFTING POINTS ONLY. SEE LIFTING RINGS INSIDE WALL OF DEEP WELL.
- CONDUIT NOT TO EXTEND MORE THAN 3" ABOVE BOTTOM OF DEEP WELL.
- MINIMUM TRENCH DEPTH AT PAD TO TOP OF CONDUIT FOR THE FOLLOWING CONDUITS:
 6" CONDUIT - 61"
 4" CONDUIT - 47"
 2" CONDUIT - 40"
- REFER TO DETAIL SHEET 16 FOR CONDUIT LOCATIONS.
- ADDITIONAL AREA FOR CONTROL CABINET WHEN MOUNTING REMOTE SUPERVISORY CONTROLLED SWITCHGEAR.
- CONTACT COMPANY REPRESENTATIVE ON WHERE TO ACQUIRE 5/8" X 10" COPPER CLAD GROUND RODS, GROUND RODS TO BE OBTAINED AND INSTALLED BY CONTRACTOR. INSTALLATION DEPTH SHALL BE 7'-6".
- CONTACT COMPANY REPRESENTATIVE ON WHERE TO ACQUIRE PRECAST CONCRETE PAD.

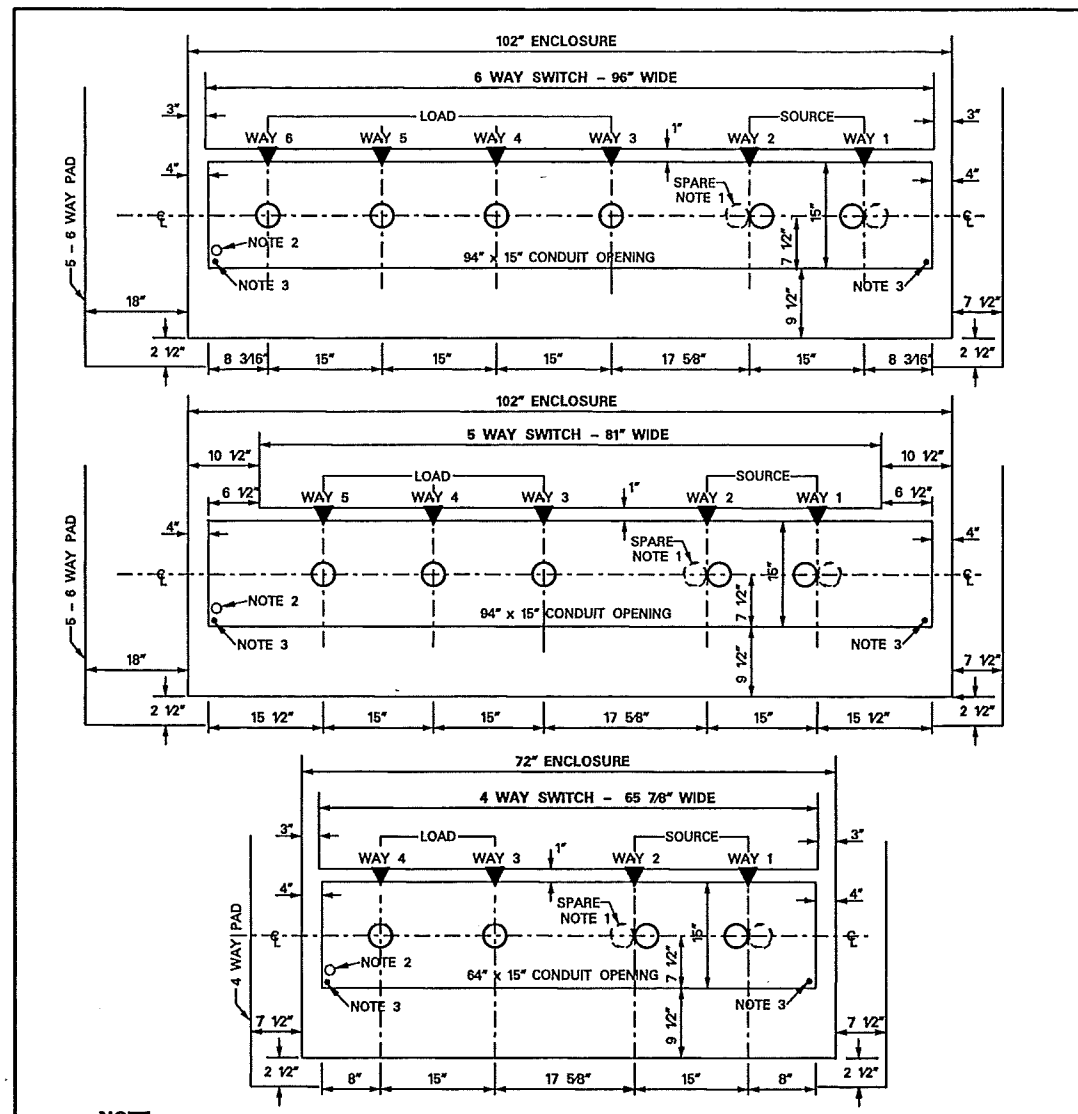
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**PRECAST WELLED PAD
 FOR SF6 DEAD FRONT
 SWITCHGEAR**

DCS-5 DETAIL SHEET 15 OF 19

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04 - 13



NOTE:

- CONDUIT SHALL BE CENTERED ON CENTER BUSHING OF EACH SWITCHED WAY. IF SPARE CONDUIT IS REQUIRED, BOTH SHALL BE CENTERED AS SHOWN ON CENTER BUSHING OF SWITCHED WAY.
- FOR PADS PLUMBED INTO DUCT BANKS, INSTALL 3" COMMUNICATION CONDUIT FROM MANHOLE TO FRONT LEFT CORNER OF THE CONDUIT OPENING OF PAD.
- INSTALL 58" X 10" COPPER CLAD GROUND RODS IN FRONT CORNERS OF WINDOW.

APPROVED BY ONCOR

**CONDUIT LOCATIONS FOR
 SF6 DEAD FRONT SWITCHGEAR**

DCS-5 DETAIL SHEET 16 OF 19

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04 - 13



Ch Moran P.E. 10-24-13
 Signature of Registrant Date

FIRM REGISTRATION NUMBER: 312

NO.	REVISION	BY	DATE

ADDISON TOWN OF ADDISON
 DALLAS COUNTY, TEXAS

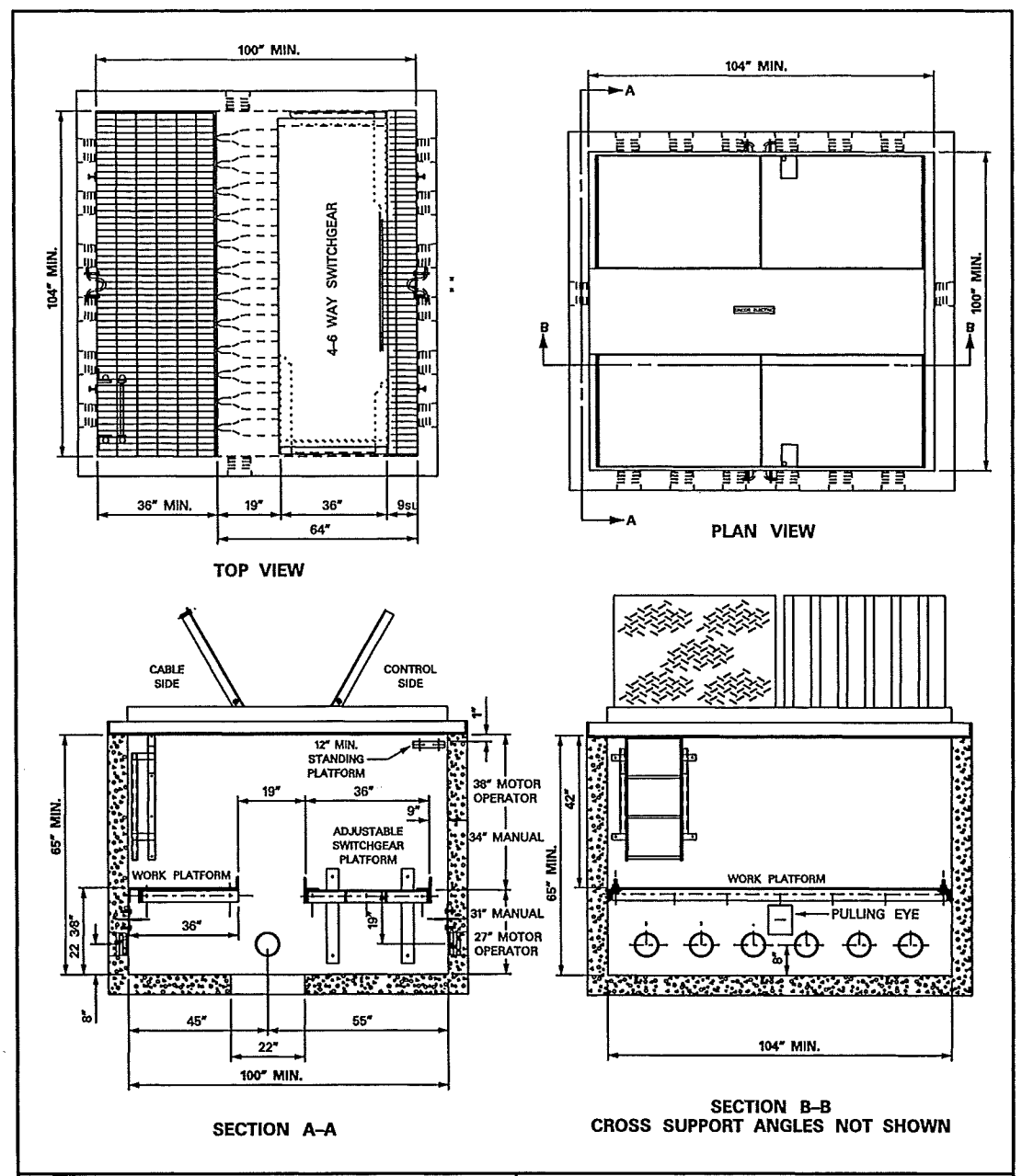
BELT LINE ROAD
 UNDERGROUND ELECTRICAL

ONCOR DUCT BANK DETAIL 4E6

HALFF 1201 NORTH BOWSER ROAD, RICHARDSON, TEXAS 75081-2275
 TEL (214) 348-6200 FAX (214) 739-0095

PROJECT	DESIGN	DRAWN	DATE	FILE	SHEET
29350	HALFF	HALFF	OCT. 2013	29350 ELEC 24d	ELE-24

DATE: 10/24/2013 TIME: 2:26:55 PM FILE: 29350 ELEC 25d.dgn PROJECT # 29350 OFFICE: RCH USER: ah1299



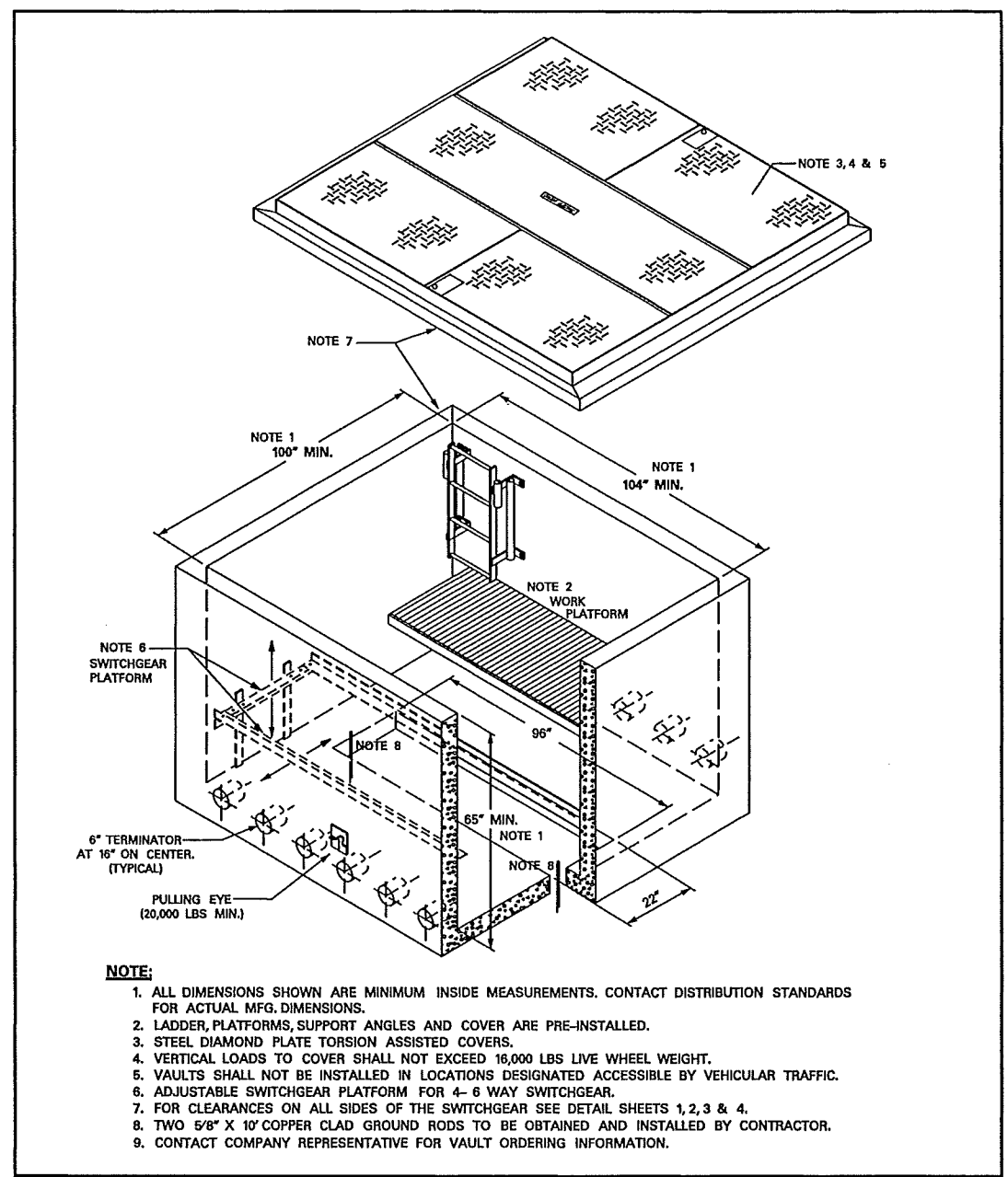
APPROVED BY ONCOR

PRECAST VAULT FOR SF6 DEAD FRONT SWITCHGEAR

DCS-5 DETAIL SHEET 17 OF 19

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04 - 13



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PRECAST VAULT FOR SF6 DEAD FRONT SWITCHGEAR

DCS-5 DETAIL SHEET 18 OF 19

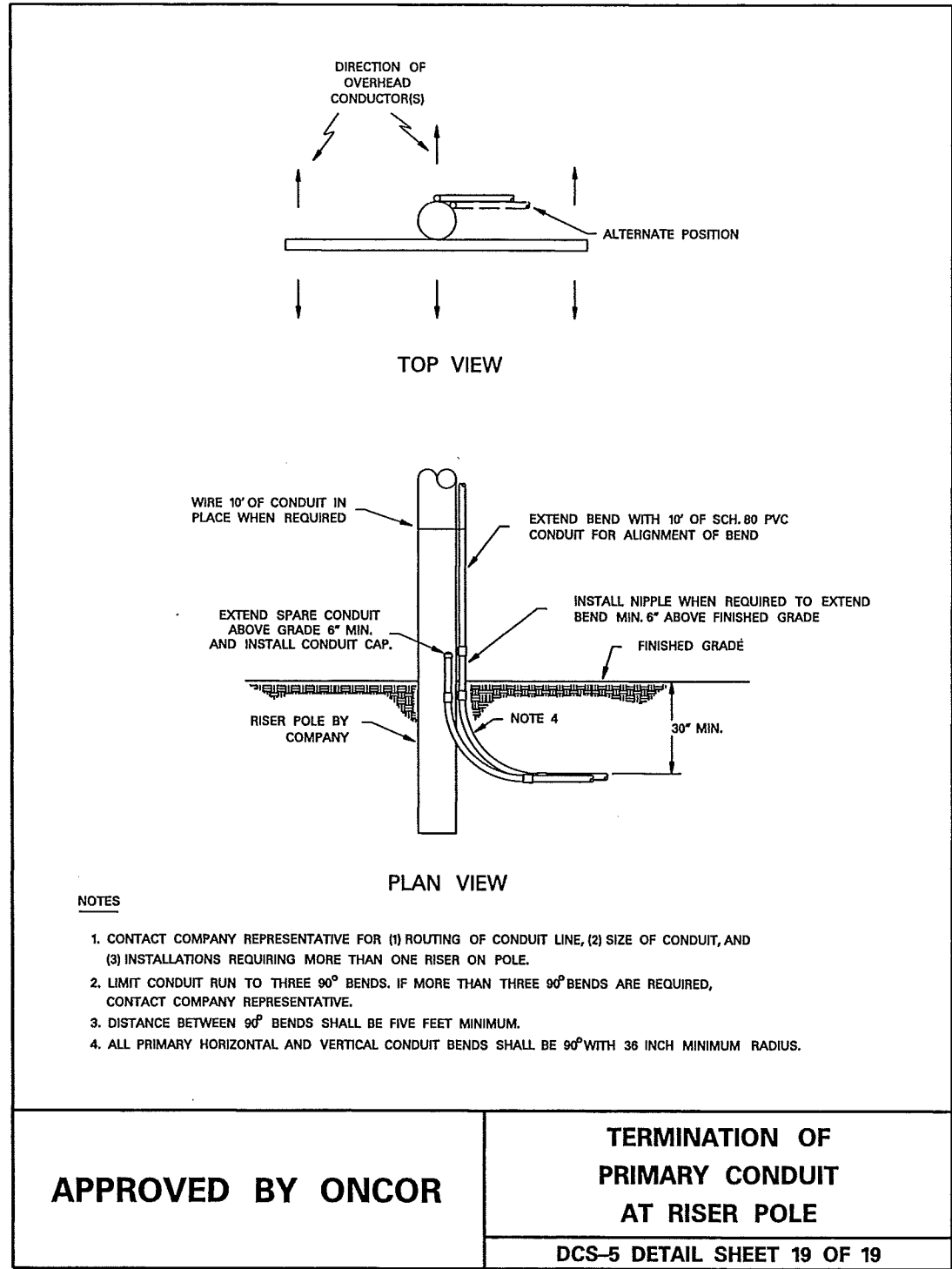
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04 - 13



Ch Moran, P.E. 10-24-13
 Signature of Registrant Date
 FIRM REGISTRATION NUMBER: 312

NO.	REVISION	BY	DATE
TOWN OF ADDISON DALLAS COUNTY, TEXAS BELT LINE ROAD UNDERGROUND ELECTRICAL ONCOR DUCT BANK DETAIL 4E6			
HALFF 1201 NORTH BOWSER ROAD, RICHARDSON, TEXAS 75081-2275 TEL. (214) 346-6200 FAX (214) 739-0095			
PROJECT	DESIGN	DRAWN	DATE
29350	HALFF	HALFF	OCT, 2013
FILE	SHEET		
29350 ELEC 25d	ELE-25		



APPROVED BY ONCOR

**TERMINATION OF
PRIMARY CONDUIT
AT RISER POLE**

DCS-5 DETAIL SHEET 19 OF 19

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04 - 13



Ch Moran, P.E. 10-24-13
Signature of Registrant Date

FIRM REGISTRATION NUMBER: 312

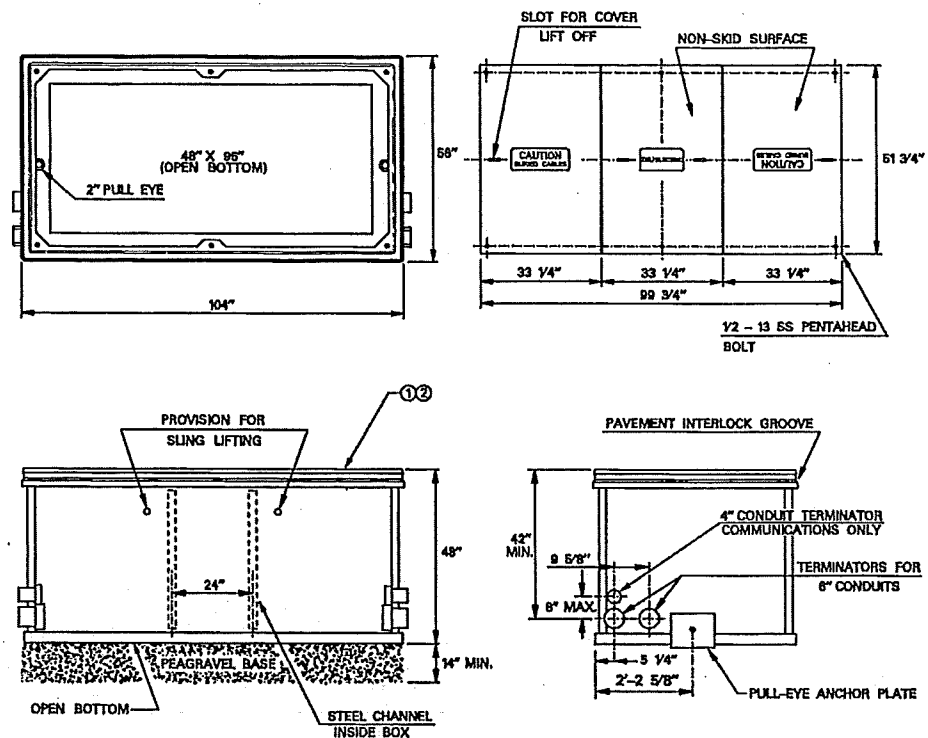
NO.	REVISION	BY	DATE
<p><i>Addison</i> TOWN OF ADDISON DALLAS COUNTY, TEXAS</p> <p>BELT LINE ROAD UNDERGROUND ELECTRICAL</p> <p>ONCOR DUCT BANK DETAIL 4E6</p>			
<p>HALFF 1201 NORTH BOWSER ROAD, RICHARDSON, TEXAS 75081-2275 TEL (214) 346-6200 FAX (214) 739-0095</p>			
PROJECT	DESIGN	DRAWN	DATE
29350	HALFF	HALFF	OCT. 2013
FILE	SHEET		
29350 ELEC 26d	ELE-26		

USER: ohi299
 PROJECT # 29350 OFFICE: RCH
 FILE: 29350 ELEC 27d.dgn
 TIME: 1:57:21 PM
 DATE: 10/24/2013

205 - 215
 01 - 00

**THREE PHASE PRIMARY
 SUBSURFACE SPLICE/PULL BOX
 48" X 96" X 48"**

205 - 215
 01 - 00



NOTES:

- H10 LOADING (8000 LBS. LIVE WHEEL /10,400 LBS. ROLL OVER). FOR USE IN AREAS SUBJECT TO PEDESTRIANS, MOWERS AND OCCASIONAL LIGHT VEHICULAR TRAFFIC.
- A16 LOADING (HEAVY OCCASIONAL VEHICULAR TRAFFIC 16,000 LBS. LIVE WHEEL /20,800 LBS. ROLL OVER) FOR USE IN ALLEY WAYS AND PARKING LOTS. NOT FOR CONTINUOUS VEHICULAR TRAFFIC.
- FOR LOCATIONS IN ALL ROADWAYS SUBJECT TO CONTINUOUS DAILY VEHICULAR TRAFFIC, CONTACT DISTRIBUTION STANDARDS.
- NUMBER AND LOCATION OF PENTAHEAD BOLTS AND LIFTING PROVISIONS MAY VARY AMONG MANUFACTURERS.
- LIMIT TO 3 - 500 KCMIL THRU 3 - 1000 KCMIL.

ITEM	QTY	DESCRIPTION	TSN/REF	CU	MU
1	1	BOX, SPLICE/PULL, 48"X96"X48" H10 (LOADING SEE NOTE 1)	316043	BSP306	
2	1	BOX, SPLICE/PULL, 48"X96"X48" A16 (LOADING SEE NOTE 2)	408734	BXSPLA16	

APPROVED BY

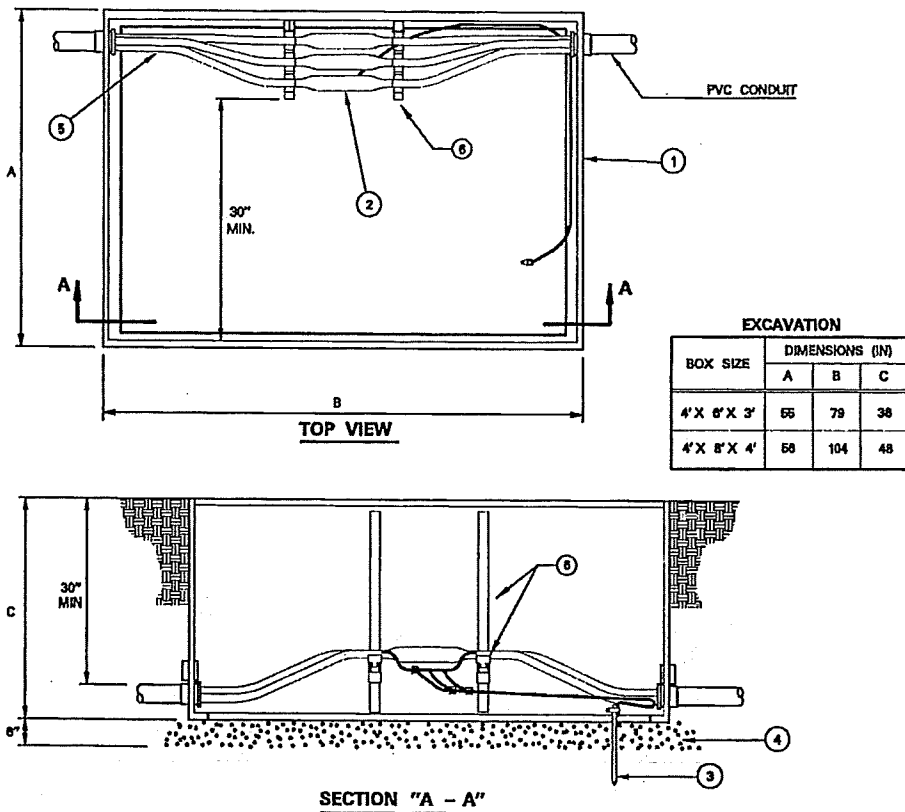


TXU Electric & Gas
 Primary/TV Service & Line Service

205 - 270
 05 - 04

**THREE PHASE PRIMARY
 SUBSURFACE SPLICE/PULL BOX
 INSTALLATION**

205 - 270
 05 - 04

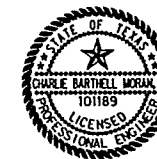


NOTES:

- SPLICE/PULL BOX DESIGNED FOR PARKWAY INSTALLATION WITH H-10 LOADING (LIGHT VEHICULAR TRAFFIC).
- THIS BOX IS INTENDED FOR USE AS AN INTERMEDIATE SPLICE BOX AS NEEDED DUE TO LONG PULLING DISTANCES AND RESTRICTED TO ONE 3/4 CIRCUIT.

ITEM	QTY	DESCRIPTION	TSN/REF	CU	MU
1		BOX, SPLICE/PULL	205-210/215	BSP306	
2		SPLICE, PRIMARY, STRAIGHT	206-100/101	PSS	
3		DRIVEN GROUND	204-270	GSSPB	
4		GRAVEL FILL			
5		CABLE, PRIMARY	SECTION B		
NEW CONSTRUCTION					
6		CABLE RACKS, NON-METALLIC	206-070	CRA	MCRA
MAINTENANCE ONLY					
6		CABLE RACKS WITH PORCELAIN INSULATORS	206-070	CRB	

APPROVED BY



Ch Moran, P.E. 10-24-13
 Signature of Registrant Date

FIRM REGISTRATION NUMBER: 312

NO.	REVISION	BY	DATE

Addison TOWN OF ADDISON
 DALLAS COUNTY, TEXAS

BELT LINE ROAD
 UNDERGROUND ELECTRICAL

SPLICE/ PULL BOX
 INSTALLATION DETAIL

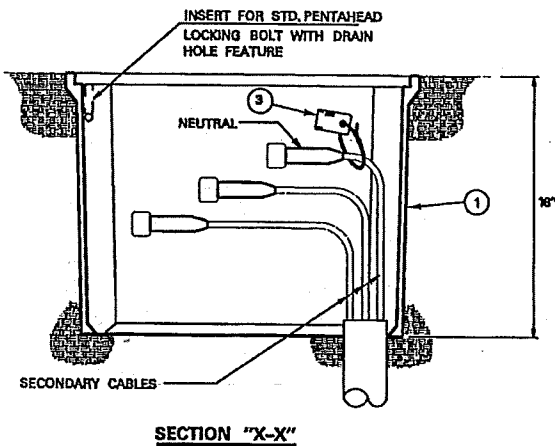
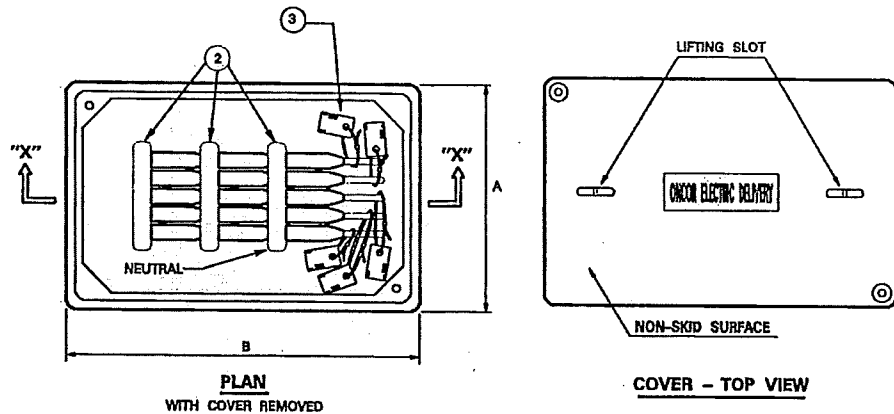
HALFF 1201 NORTH BOWSER ROAD, RICHARDSON, TEXAS 75081-2275
 TEL (214) 346-6200 FAX (214) 738-0095

PROJECT	DESIGN	DRAWN	DATE	FILE	SHEET
29350	HALFF	HALFF	OCT. 2013	29350 ELEC 27d	ELE-27

212 - 130
06 - 07

**SUBSURFACE
SECONDARY/SERVICE BOX**

212 - 130
06 - 07



BOX SIZE (IN.)	OVERALL DIM. (IN.)		MAX. NO. CIRCUITS
	A	B	
13 X 24	16	25	5
17 X 30	20	33	8

BOX SIZE (IN.)	REPLACEMENT LID TSN	
	LID	TSN
13 X 24		328508
17 X 30		326509S

NOTES:

1. BOXES ARE DESIGNED FOR LIGHT VEHICULAR TRAFFIC H-10 LOADING.
2. MANUFACTURERS COVERS ARE INTERCHANGEABLE.
3. BOXES DEPTH IS 18 INCHES.
4. BOXES COME WITH LID.

ITEM	QTY	DESCRIPTION	TSN/REF	CU	MU
1		BOX, SECONDARY, 17" X 30" X 18"	300306	SSB17	
1		BOX, SECONDARY, 13" X 24" X 18"	316037	SSB13	
2		CONNECTOR, MOLE, URD	212-112	UMBH	
3		TAG, ADDRESS OR "FLN", WITH CABLE TIE	215-020		

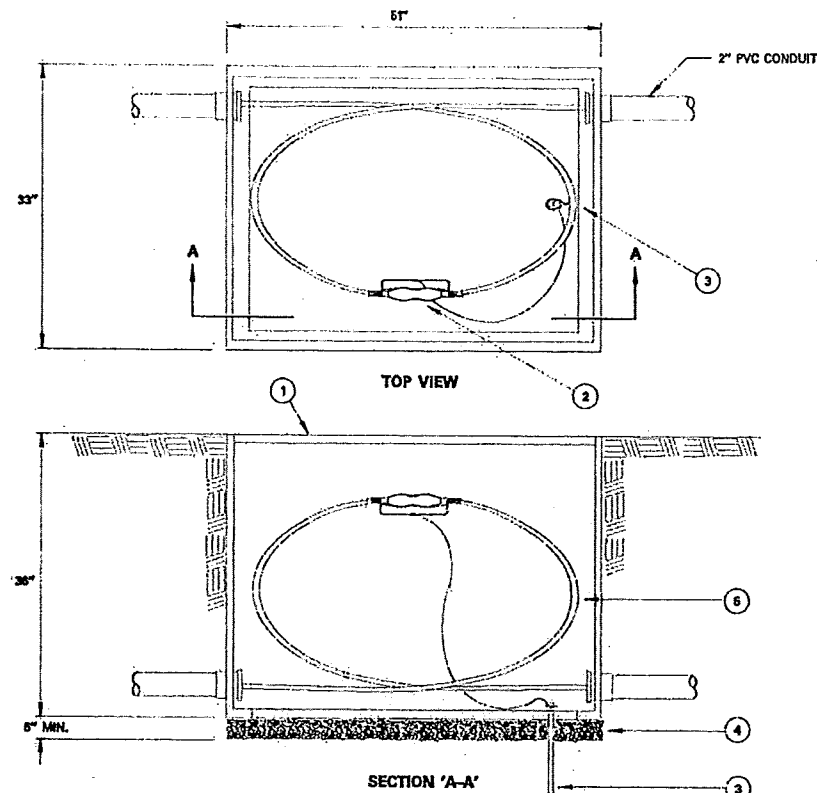
APPROVED BY



205 - 260
10 - 95

**SINGLE PHASE PRIMARY
SUBSURFACE SPLICE / PULL BOX
INSTALLATION**

205 - 260
10 - 95



NOTES:

1. SPLICE/PULL BOX DESIGNED FOR PARKWAY INSTALLATION WITH H-10 LOADING (LIGHT TRAFFIC).
2. THIS BOX IS INTENDED FOR USE AS AN INTERMEDIATE SPLICE BOX AS NEEDED DUE TO LONG PULLING DISTANCES AND RESTRICTED TO SINGLE #10 CABLE.

ITEM	QTY	DESCRIPTION	TSN REF	CU	MU
1		BOX, SPLICE/PULL, 30 X 48 X 36 IN.	205-200	BSPM	
2		SPLICE, PRIMARY, STRAIGHT	208-100	FSS	
3		GROUNDING	204-200	GPSB	
4		GRAVEL FILL			
6		CABLE, PRIMARY	208-		

APPROVED BY

TUELECTRIC



Charles Moran P.E. 10-24-13
Signature of Registrant Date

FIRM REGISTRATION NUMBER: 312

NO.	REVISION	BY	DATE

TOWN OF ADDISON
DALLAS COUNTY, TEXAS

BELT LINE ROAD
UNDERGROUND ELECTRICAL

SPLICE/ PULL BOX
INSTALLATION DETAIL

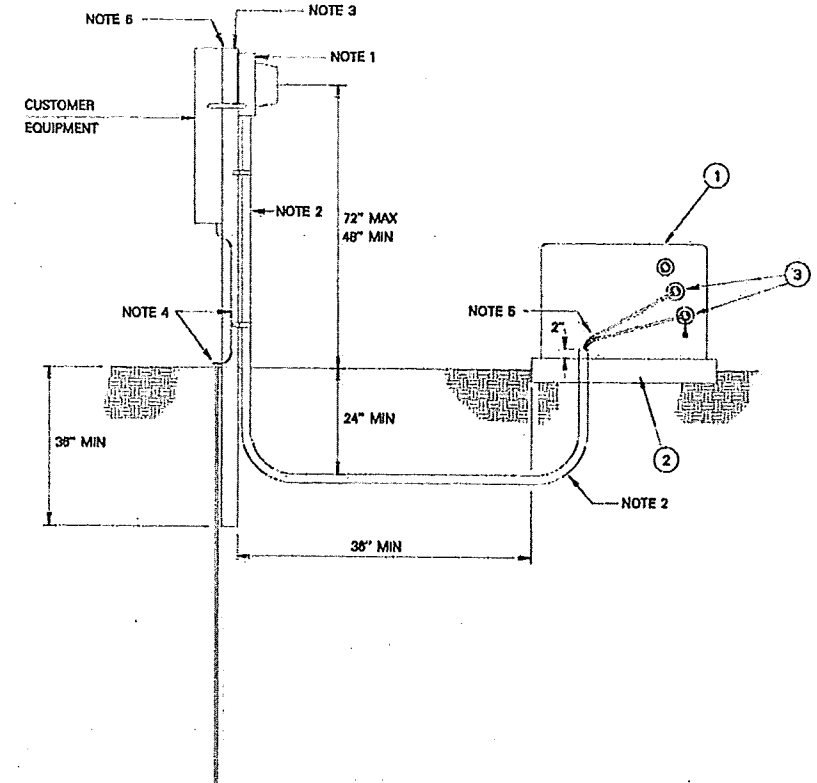
HALFF 1201 NORTH BOWSER ROAD, RICHARDSON, TEXAS 75081-2275
TEL (214) 346-6200 FAX (214) 739-0995

PROJECT	DESIGN	DRAWN	DATE	FILE	SHEET
29350	HALFF	HALFF	OCT. 2013	29350 ELEC 28d	ELE-28

DATE: 10/24/2013 TIME: 1:56:12 PM FILE: 29350 ELEC 29d.dgn PROJECT # 29350 OFFICE: RCH USER: ch1299

212 - 315 11 - 94 SECONDARY SERVICE FROM PADMOUNTED TRANSFORMER FOR CATV 1 PHASE, 2 WIRE, 120V METER INSTALLATION 212 - 315 11 - 94

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- NOTES:
- METER SOCKET INSTALLED BY CUSTOMER. CUSTOMER TO MAKE ALL SERVICE CONDUCTOR CONNECTIONS.
 - ALL RACEWAY (CONDUIT, HARDWARE, ACCESSORIES, ETC.) SERVICE ENTRANCE CONDUCTORS, PROVIDED AND INSTALLED BY CUSTOMER. RACEWAY AND SERVICE LATERAL CONDUCTORS TO BE FURNISHED AND INSTALLED BY CUSTOMER. RACEWAY FOR SERVICE LATERAL CONDUCTORS TO BE MINIMUM OF 2 INCH APPROVED SCHEDULE 40 PVC.
 - POLE TO BE A MINIMUM OF 3 INCH RIGID GALVANIZED STEEL PIPE AND CONCRETE BACKFILLED. POLE LOCATION TO BE APPROVED BY TUELECTRIC.
 - CUSTOMER TO PROVIDE AND INSTALL 8 FT. GROUND ROD AND AT MINIMUM A #8 SOLID BARE CU. GROUND WIRE.
 - CUSTOMER TO LEAVE SUFFICIENT LENGTH OF SERVICE LATERAL CONDUCTORS TO FACILITATE CONNECTIONS BY TUELECTRIC.
 - INSTALLATION TO BE ACCORDING TO THE NATIONAL ELECTRICAL CODE. INSPECTION AUTHORITY APPROVAL REQUIRED IN INSPECTION LIMITS.

ITEM	QTY	DESCRIPTION	TSN REF	CU	MU
1		TRANSFORMER	209-210,211		
2		PAD, TRANSFORMER, 44" X 66"	205-155		
3		CONNECTOR, SECONDARY	212-105		

APPROVED BY **TUELECTRIC**



Ch. Merial P.E. 10-24-13
Signature of Registrant Date

FIRM REGISTRATION NUMBER: 312

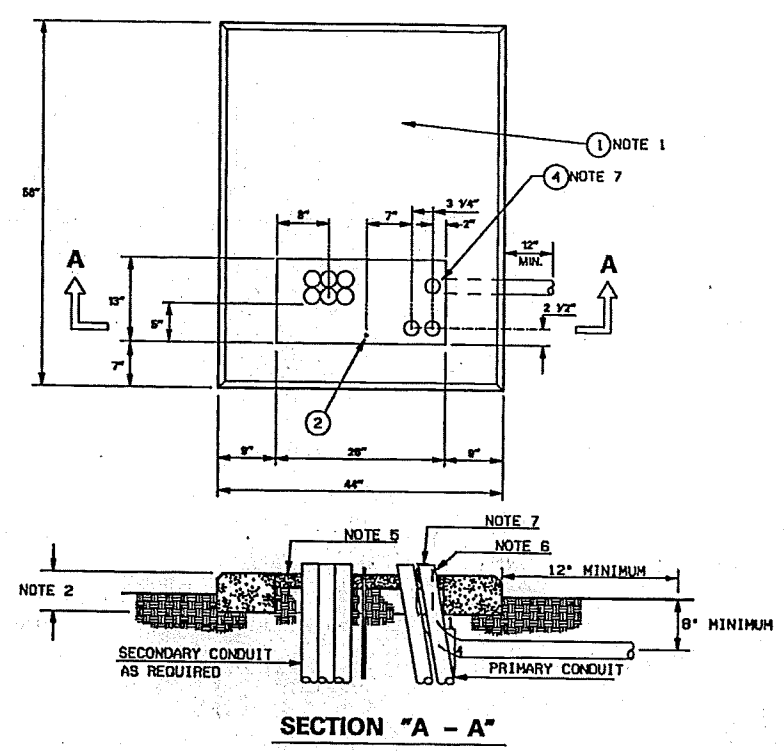
NO.	REVISION	BY	DATE
HALFF TOWN OF ADDISON DALLAS COUNTY, TEXAS BELT LINE ROAD UNDERGROUND ELECTRICAL SPLICE/ PULL BOX INSTALLATION DETAIL			
1201 NORTH BOYSER ROAD, RICHARDSON, TEXAS 75081-2275 TEL (214) 346-6200 FAX (214) 739-0095			
PROJECT	DESIGN	DRAWN	DATE
29350	HALFF	HALFF	OCT. 2013
FILE	SHEET		
29350 ELEC 29d	ELE-29		

USER: ch1299
 OFFICE: RCH
 PROJECT #: 29350
 FILE: 29350 ELEC 30d.dgn
 TIME: 1:58:24 PM
 DATE: 10/24/2013

205 - 155
 12 - 08

TRANSFORMER PAD - PRECAST
 SINGLE PHASE
 DEADFRONT (TYPE II)

205 - 155
 12 - 08



- NOTES:
1. A PRECAST CONCRETE PAD SHALL BE USED UNLESS LIFTING EQUIPMENT IS UNAVAILABLE OR CANNOT ACCESS THE SITE. USE POLYMER PADS ONLY WHEN SETTING PAD BY HAND.
 2. THIS DIMENSION IS 8 INCHES FOR PRECAST CONCRETE PAD AND 3 1/4 INCHES FOR POLYMER CONCRETE PADS.
 3. REFERENCE STANDARD 202-360 FOR FOREIGN UTILITY COMPANY EQUIPMENT GROUND.
 4. PIERS SHALL BE INSTALLED UNDER PAD WHEN DIRT HAS BEEN DISTURBED UNDER THE LOAD BEARING AREA OF THE PAD. REFERENCE STANDARD 205-485 FOR PIER INSTALLATION.
 5. GROUTING DETAIL, SEE STANDARD DRAWING 206-180.
 6. THE CONDUITS MUST BE INSTALLED TO ENSURE THAT THE TOTAL MAXIMUM BENDING RADIUS FOR THE PRIMARY CABLE DOES NOT EXCEED 9 INCHES. (ANGLE PRIMARY CONDUIT WHENEVER POSSIBLE).
 7. THE 3" FLEX CONDUIT (T&N 308205) SHALL HAVE A MINIMUM OF 8" OF COVER AS IT EXITS ON THE RIGHT HAND SIDE OF THE TRANSFORMER PAD.

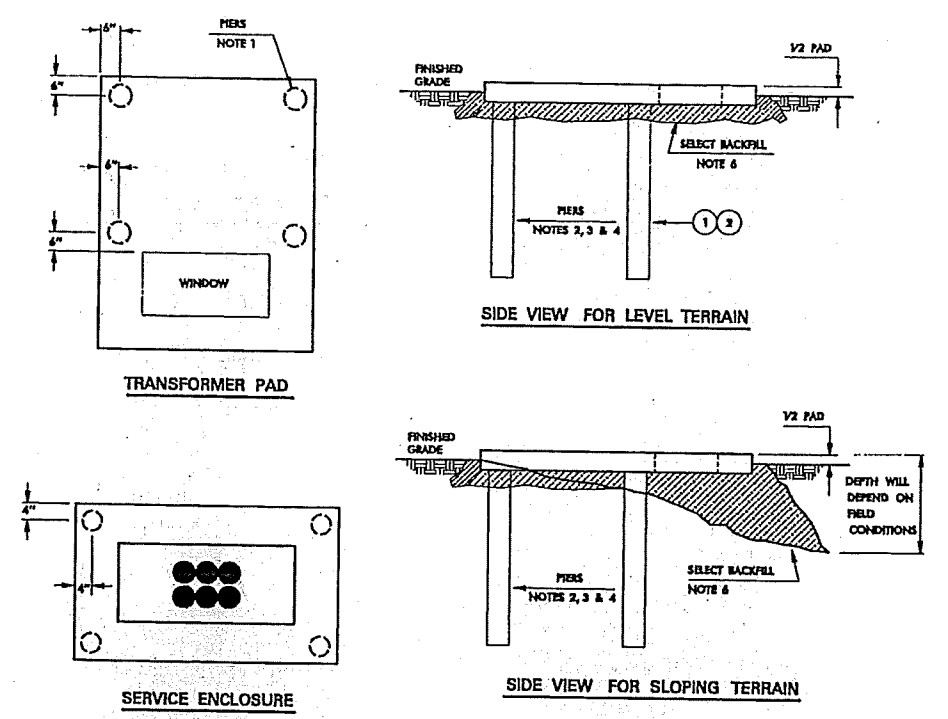
ITEM	QTY	DESCRIPTION	TSN/REF	CU	MU
1	1	PAD, TRANSFORMER, PRECAST CONCRETE 44 x 56 IN.	304037	PPRCTII	
1	1	PAD, TRANSFORMER, POLYMER CONCRETE 44 x 56 IN.	319332	PPROCTII	
2	1	ROD, GROUND 6/8" x 8' CU	204-160		
4	3	CONDUIT, HDPE, FLEX, 3"	308206		

APPROVED BY

205 - 165
 09 - 05

SINGLE PHASE TRANSFORMER PAD
 AND 44" X 52" X 24" SERVICE ENCLOSURE
 PIER INSTALLATION

205 - 165
 09 - 05



- NOTES:
1. PIERS SHALL BE INSTALLED UNDER PAD WHEN DIRT HAS BEEN DISTURBED UNDER THE LOAD BEARING AREA OF PAD. TAMP BACKFILL (P&X COMPACTION) TO TOP OF PIER SUPPORTS (USE DITCH SPOL WHEN POSSIBLE).
 2. CUT SUPPORT PIERS FROM SECTION OF 4 IN. PVC CONDUIT.
 3. PLACE PIERS AS SHOWN, FILL WITH CONCRETE.
 4. TOP OF PIERS SHOULD BE LEVEL AND 3 IN. BELOW FINAL GROUND LEVEL TO A DEPTH OF:
 - (1) MINIMUM OF 36 IN. IN UNDISTURBED EARTH (SOIL).
 - (2) BOTTOM OF DITCH.
 - (3) BEGINNING OF SOLID ROCK.
 5. AFTER PLACING PAD, FILL VOIDS UNDER AND AROUND PAD WITH SELECT DITCH SPOL.
 6. ALL BACKFILL UNDER AND AROUND PAD SHALL BE WELL TAMPED.

ITEM	QTY	DESCRIPTION	TSN/REF	CU	MU
1	1	CONDUIT, PVC, 4 IN.	287887	PHPK	
2	1	CONCRETE (AS REQUIRED)			

APPROVED BY



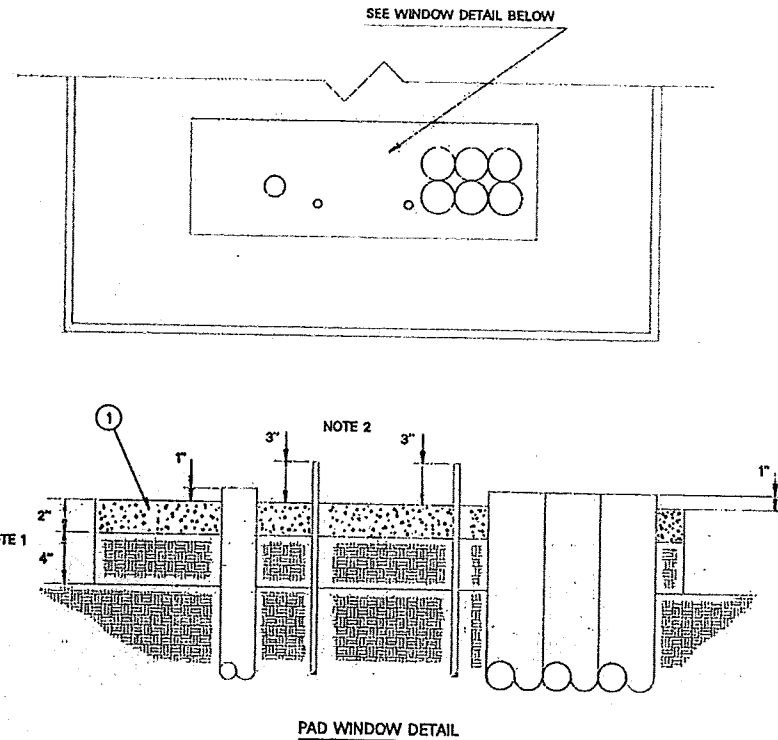
Ch Morral, P.E. 10-24-13
 Signature of Registrant Date
 FIRM REGISTRATION NUMBER: 312

NO.	REVISION	BY	DATE
TOWN OF ADDISON DALLAS COUNTY, TEXAS BELT LINE ROAD UNDERGROUND ELECTRICAL SINGLE PHASE TRANSFORMER PAD INSTALLATION DETAIL			
PROJECT DESIGN DRAWN DATE FILE SHEET 29350 HALFF HALFF OCT. 2013 29350 ELEC 30d ELE-30			

205 - 180
12 - 93

GROUTING DETAIL FOR TRANSFORMER PAD WINDOWS

205 - 180
12 - 93



NOTES:

1. FILL IN PAD WINDOW WITH 4 INCHES OF EARTH BACKFILL AND 2" OF GROUT.
2. GROUND RODS SHALL EXTEND A MAXIMUM OF 3 INCHES ABOVE GROUTING TO ASSURE ADEQUATE DRIVEN DEPTH AND ALLOW FOR ADEQUATE CONNECTING SPACE.

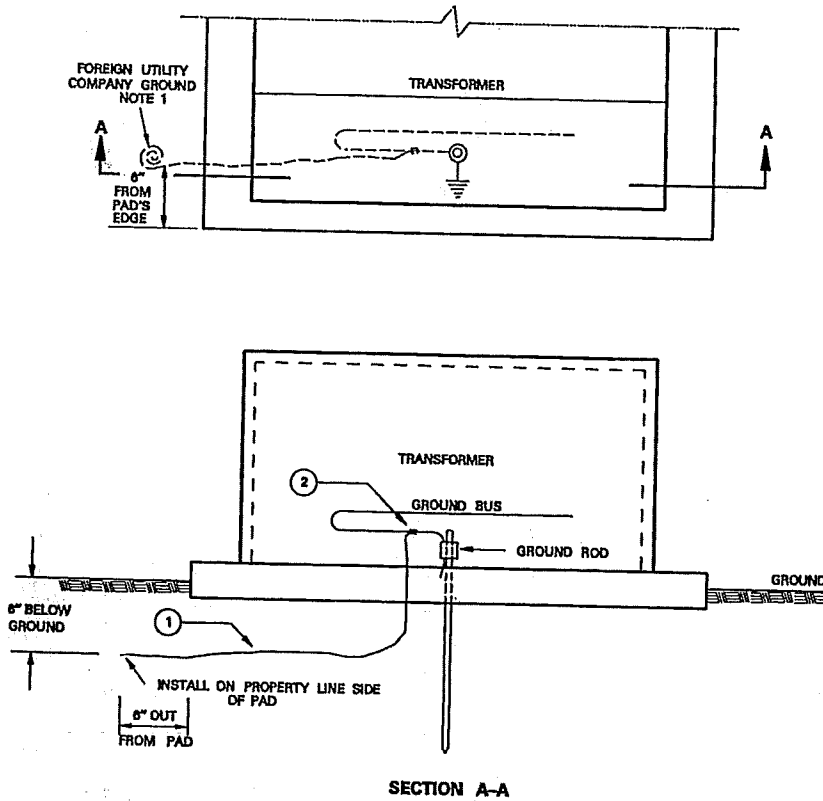
ITEM	QTY	DESCRIPTION	TSN	AUN	MACRO AUN
1	AS REQD	GROUT			

APPROVED BY **TUELECTRIC**

202 - 350
10 - 08

METHOD FOR PROVIDING FOREIGN UTILITY COMPANY EQUIPMENT GROUND

202 - 350
10 - 08

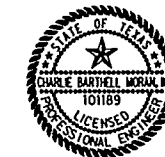


NOTE:

1. ON NEW INSTALLATIONS, INSTALL NO. 6 S.D. BARE COPPER AS SHOWN FOR FOREIGN UTILITY COMPANY BONDING.
2. THE NATIONAL ELECTRICAL SAFETY CODE RULE 384 C RECOMMENDS BONDING OF ALL ABOVE GROUND METALLIC POWER AND COMMUNICATIONS APPARATUS (PEDESTALS, TERMINALS, APPARATUS CASES, TRANSFORMER CASES, ETC.) THAT ARE SEPARATED BY A DISTANCE OF 6 FEET OR LESS.

ITEM	QTY	DESCRIPTION	TSN/REF	CU	MU
1	1	WIRE, #6 CU, BARE	303244		
2	1	CONNECTOR, #2 CU - #8 CU	305838	FUCEG	

APPROVED BY **TXU**
Electric Delivery



Chal Morin P.E. 10-24-13
Signature of Registrant Date
FIRM REGISTRATION NUMBER: 312

NO.	REVISION	BY	DATE
Advison! TOWN OF ADDISON DALLAS COUNTY, TEXAS			
BELT LINE ROAD UNDERGROUND ELECTRICAL			
SINGLE PHASE TRANSFORMER PAD INSTALLATION DETAIL			
HALFF 1201 NORTH BOWSER ROAD, RICHARDSON, TEXAS 75061-2275 TEL (214) 348-6200 FAX (214) 739-0095			
PROJECT	DESIGN	DRAWN	DATE
29350	HALFF	HALFF	OCT. 2013
FILE	SHEET		
29350 ELEC 31d	ELE-31		