

**APPLICANT-INSTALLED FACILITIES AGREEMENT FOR UNDERGROUND  
CONVERSIONS (WR #4787756)**

This Agreement, made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_, by and between **MARTIN COUNTY**, a political subdivision of the State of Florida, (the "Applicant"), a Florida municipal corporation or county with an address of 2401 S.E. Monterey Road, Stuart, FL 34996 and **FLORIDA POWER & LIGHT COMPANY ("FPL")**, a Florida corporation organized under the laws of the State of Florida, with an address of P.O. Box 14000, 700 Universe Boulevard, Juno Beach, FL 33408-0429.

**WITNESSETH:**

**WHEREAS**, the Applicant has executed the appropriate underground facilities conversion agreement ("Conversion Agreement") with FPL to convert certain overhead electric distribution facilities (collectively the "Existing Overhead Facilities") to underground distribution facilities (collectively the "Underground Facilities"), as described in the aforementioned Conversion Agreement (hereinafter the "Conversion");

**WHEREAS**, the Applicant desires to perform itself, or through its Contractors, certain Work as such term is described in Exhibit A associated with the Conversion;

**WHEREAS**, FPL is willing, subject to all the terms and conditions set forth below in this Agreement, to allow the Applicant to perform the Work based on Applicant's assurance that such Work will be in accordance with FPL's designs, instructions, standards and specifications, and such Work will not adversely impact FPL or its electric customers;

**NOW, THEREFORE**, in recognition of the foregoing premises, and in consideration of the covenants and promises set forth herein below, FPL and Applicant do hereby agree as follows:

1. **Compliance with Tariff.** Applicant shall comply with and abide by the requirements, terms, and conditions of this Agreement, the Conversion Agreement, and FPL's electric tariff (the "Tariff").
2. **Conditions for Work to be Performed.** Applicant shall, at its own cost and expense, perform or cause to be performed, all Work, as described in Exhibit A, in accordance with the terms and conditions of this Agreement and the standards and specifications shown in Exhibit B. The Applicant shall provide all survey and staking to ensure that all Underground Facilities are installed as shown in the Conversion Agreement and provide As-Built prints to FPL within two (2) weeks of installation, signed and certified by a Florida registered surveyor.
3. **Commencement of Work.** Applicant shall perform the Work, or any portion of the Work, only upon receipt of a notice to proceed containing the approved drawings, specifications and instructions from FPL ("Notice to Proceed"). After receipt of the Notice to Proceed,

Applicant shall provide written notice of intent to commence work to FPL at least five (5) days prior to commencement of such Work. Applicant shall not perform any excavation work without first notifying Sunshine State One Call for identification and marking of existing underground utilities and complying with the excavation requirements set forth in Florida Statute Chapter 556.

4. **Materials**. All Materials are to be supplied by FPL and shall be picked up by Applicant at the following address \_\_\_\_\_ at a mutually agreed upon time, typically with 5 business days minimum notice, but no more than 15 business days notice, unless mutually agreed upon. Alternatively, FPL will, at Applicant's expense, have the material delivered to a mutually agreed upon location. Applicant assumes liability for any materials lost, stolen or damaged once these materials are picked up by, or delivered to, the Applicant.
5. **Contractors**. Applicant may enter into a contract with a contractor for the performance of the Work, or any portion thereof, provided that the contractor has been approved by FPL in writing prior to execution of such contract. Applicant shall not make any substitution of any contractor for the performance of Work unless the substitution is approved by FPL in writing. The Applicant's contractor(s) shall perform ALL work as outlined within Exhibit A & Exhibit B. No contract or purchase order between Applicant and its contractor(s) shall bind or purport to bind FPL, but each contractor entering into a contract with Applicant with respect to the Work shall name FPL as an intended third-party beneficiary and include a provision permitting its assignment to FPL upon FPL's written request, following default by Applicant or termination or expiration of this Agreement. Applicant shall provide FPL with written certification from each of its contractors performing Work that all warranties, guarantees and obligations of such contractors are equivalent or better than those granted by such contractor to FPL for similar work and shall require that each such contractor name FPL as an intended third party beneficiary of such warranties, guarantees and obligations with the same rights of enforcement as Applicant. Applicant shall assign all representations, warranties, guaranties, and obligations of all contractors at the request and direction of FPL, and without recourse to Applicant, to FPL upon default by Applicant or termination or expiration of this Agreement; provided, however, that, notwithstanding such assignment, Applicant shall be entitled to enforce each such representation, warranty, guaranty, and obligation so long as Applicant has any liability under this Agreement. Applicant hereby assigns to FPL, effective as of the termination or expiration of this Agreement, all representations, warranties, guaranties and obligations of all Contractors.
6. **Right of Entry**. FPL reserves the right, together with its agents or designees to enter the Jobsite as it may elect for the purpose of inspecting the Work, or constructing or installing such collateral work as it may desire, or testing, boring or surveying, or any other purpose.
7. **Inspection and Correction of Deficiencies**.
  - 7.1. All Work shall be properly inspected and tested, if appropriate, by Applicant and FPL and its designee(s).

- 7.2. Neither the failure to make such inspection, nor the failure to discover defective workmanship, materials, or equipment, nor approval of or payment to Applicant for such Work shall prejudice the rights of FPL thereafter to correct or reject the same.
- 7.3. Applicant shall correct any deficiencies found with the Work, including but not limited to discrepancies that are inconsistent with FPL's design, instructions, standards or specifications within two (2) business days. If Applicant does not adequately rectify the identified deficiencies in the required timeframe, FPL may, at its sole discretion, perform, or have performed by its contractor the required repairs and Applicant shall pay FPL for any costs incurred. These requirements apply whether the discovery of deficiencies occurs while Applicant is performing its Work or while FPL, or its contractor, is performing its portion of the work.
- 7.4. If any Work or part thereof is covered over contrary to the requirements of this Agreement or the written request of FPL, it must, if required by FPL, be uncovered for observation and inspection and covered again at Applicant's sole expense.
- 7.5. If any Work that FPL has not specifically requested to observe and inspect prior to being covered has been covered, FPL may request to see such Work or part thereof and it shall be uncovered by Applicant. If such Work or part thereof is found to be in accordance with this Agreement, the cost of uncovering and covering again shall be paid by FPL. If such Work or part thereof fails to meet the requirements of this Agreement, Applicant shall pay all costs of uncovering, correcting, and covering again.
- 7.6. Applicant shall pay FPL for all time spent reviewing and inspecting Applicant's Work.
- 7.7. No electric customers shall be connected to the Underground Facilities prior to all deficiencies being rectified.

## **8. Indemnity / Liability of Applicant.**

- 8.1. To the extent permitted by applicable law and FPL tariff section 2.71, Applicant shall be responsible for the negligent acts and omissions in connection with this Agreement, the Conversion or in connection with the performance of the Work by the Applicant. Applicant shall be responsible for any payment disputes between Contractors and Applicant. Applicant shall ensure that Contractors shall protect, indemnify, defend, and hold harmless FPL and Applicant from and against any liabilities whatsoever resulting from or in connection with this Agreement, the Conversion or in connection with the performance of the Work by the Contractors or Contractor employees.

- 8.2. Applicant shall assume full responsibility for all damages and all restoration arising in connection with the Work.
9. **Design Work.** FPL shall provide all design, instruction, standards and specifications necessary to perform the Conversion.
10. **Completion of Work and Ownership.** Applicant shall complete the Work by \_\_\_\_\_, \_\_\_\_\_ 20\_\_\_\_\_ and notify FPL when said Work is complete. Upon FPL's final written approval of the completion of the Work ("Acceptance"), Applicant acknowledges that all rights, title and interest, free and clear of all liens, in and to the Work shall vest in FPL. If requested by FPL, Applicant shall provide FPL, in a form acceptable to FPL, an affidavit of Applicant certifying payment of all indebtedness to all Contractors and a written release of liens from Applicant and each Contractor.
11. **No Liability by FPL.** FPL assumes no liability due to any damage, misunderstanding of installation drawings or specifications, or any actions due to Applicant or its Contractor.
12. **Suspension for Cause:**
- 12.1. FPL may, by Notice, temporarily suspend the Work, or any portion thereof, under this Agreement when the performance by Applicant or Contractor is unsatisfactory to obtain the results required by this Agreement.
- 12.2. The methods by which Applicant performs its Work are entirely the responsibility of Applicant. FPL's right to suspend Work is intended solely to verify that the Work being performed by Applicant and its Contractor conforms to the design, instruction, standards and specifications and shall not obligate FPL to review the efficiency, adequacy or safety of Applicant's or its Contractors methods or means of operation or construction.
- 12.3. Any additional costs incurred by Applicant resulting from such suspension shall be borne solely by Applicant.
- 12.4. If Applicant immediately corrects the unsatisfactory condition FPL shall authorize resumption of the Work. Applicant's failure to immediately effect correction of the unsatisfactory conditions shall be cause for termination of this Agreement.
13. **Termination for Cause:**
- 13.1. FPL may, upon Notice to Applicant, and without prejudice to any remedy available to FPL under law, in equity or under this Agreement, terminate the whole or any part of this Agreement for cause and take possession of the Work without termination charge, penalty or obligation in the event Applicant fails to perform a material obligation under this Agreement and fails to cure such material obligation default within a reasonable period of time, but in no event more than ten (10)

business days, after Notice from FPL specifying the nature of such default (any such termination referred to as a "Termination for Cause").

13.2. In the event of Termination for Cause by FPL, Applicant shall:

- a. Unless instructed otherwise in the Notice, immediately stop all Work hereunder;
- b. Issue no further contracts except with the prior written consent of FPL;
- c. Assign to FPL, to the extent requested by FPL, all rights of Applicant under contracts outstanding;
- d. Terminate, to the extent requested by FPL, outstanding contracts;
- e. Fully cooperate and refrain from hindering or interfering in any manner with any other persons or parties currently or prospectively performing the Work; and
- f. Take any other action toward termination, or toward preservation of the Work, that FPL may direct.

13.3. Upon a Termination for Cause, all obligations of FPL hereunder shall terminate effective immediately. Upon such Termination for Cause, FPL may either rework or take over the terminated Work and proceed to provide such materials, supplies, equipment and labor of both FPL and FPL contractors, as may be reasonably necessary to complete said Work. FPL may have any partially fabricated portion of the Work removed from Applicant's or contractor's facilities upon Notice to Applicant. Applicant shall be liable for any increase of FPL's costs, including rework costs, incurred by FPL as a result of FPL's termination of the contract for cause.

13.4. In the event of Termination for Cause, FPL shall have no liability to Applicant for costs incurred by Applicant as a result of such termination.

14. **Termination Prior to Construction.** Applicant may terminate this Agreement at any time prior to the start of construction. If Applicant elects to still complete the Conversion, then the Contribution-In-Aid-of-Construction (CIAC) amount provided in the Conversion Agreement shall be revised accordingly. The revised Conversion Agreement must be executed and any additional CIAC due received by FPL prior to the start of construction.

15. **Assignment.** This Agreement is not assignable.

16. **Applicant's Payments to FPL.** Any monies that are owed by Applicant to FPL under this Agreement shall be paid to FPL within forty-five (45) days of FPL producing an invoice.

17. **Notice.** As used herein, the term "Notice" shall mean any formal written correspondence providing notice of action, purpose, intent or the like given under the provisions of this Agreement. Unless otherwise provided in this Agreement, Notice shall be delivered in person, by courier or by certified mail and shall be effective when received. General correspondence is not categorized as Notice.

**IN WITNESS WHEREOF**, FPL and Applicant have executed this Agreement for the provision of Applicant-Installed facilities to be effective as of the date first above written.

**ATTEST:**

**BOARD OF COUNTY COMMISSIONERS  
MARTIN COUNTY, FLORIDA**

\_\_\_\_\_  
CAROLYN TIMMANN, CLERK OF THE  
CIRCUIT COURT AND COMPTROLLER

\_\_\_\_\_  
EDWARD V. CIAMPI, CHAIRMAN

**APPROVED AS TO FORM & LEGAL SUFFICIENCY:**

\_\_\_\_\_  
SARAH W. WOODS, COUNTY ATTORNEY

**For FLORIDA POWER & LIGHT COMPANY**

By: \_\_\_\_\_  
(signature)

Name: \_\_\_\_\_  
(print or type)

Title: \_\_\_\_\_  
(print or type)

## Exhibit A

WR # 4787756

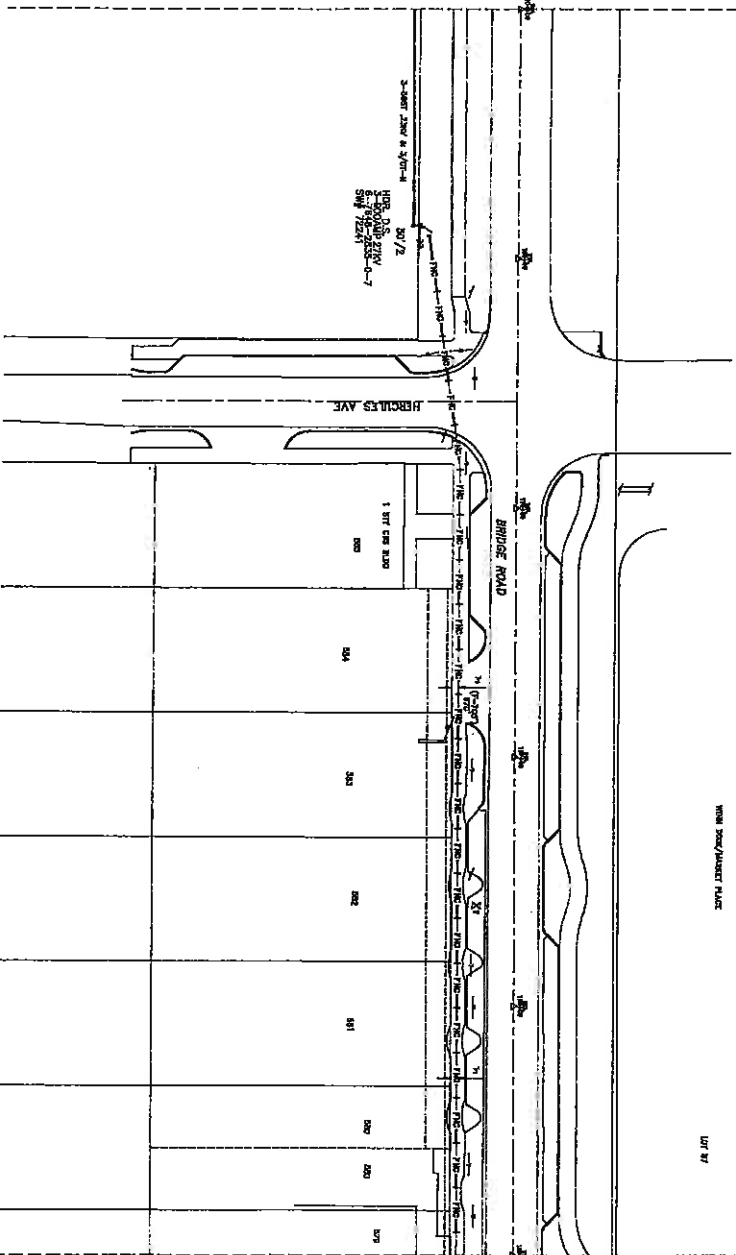
Work to be Performed:

Applicant shall:

- Install all conduit and concrete products based on the attached specifications and in the locations as indicated on the attached drawings.



MATCHLINE SEE DWG# B19R115



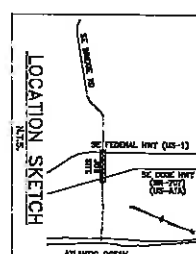
the location and existence of any facilities may not be relied upon by the supplier in responding to a bid or in complying with any contract. Supplier is responsible for activating site considerations both above and below ground including underground facility locations.

## ROW AGREEMENT

[illegible]

FROM STONY BROOK, CONNECTICUT

...



**REFERENCE DWG'S**  
B19R113  
B19R115  
B19CK114

MATCHLINE SEE DWG# B19R114

MATCHLINE SEE DWG# B19R114

TO BE BUILT 12/31/11

1\"/>

CONSTRUCTION NOTES - SEE 4907039

1\"/>

ATTENTION

ROW AGREEMENT

REFERENCE DWG'S

B19R114

B19R115

B19R116

B19R117

LOCATION SKETCH

1\"/>

The location and existence of any facilities may not be relied upon by the supplier in responding to a bid or in complying with any contract. Supplier is responsible for evaluating site conditions both above and below ground including underground facility locations.

Location	Ground Rod Information	Node Number (CHRS)
Field Installed		

**CONSTRUCTION NOTES - WALL 470775**


[illegible]

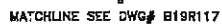
ROW AGREEMENT

[illegible]

REFERENCE DWG:

B19R114  
B19R115  
B19CK114

		RECEIVED BY: T. THOMPSON WORK BY: J. THOMPSON DATE: 02/26/78 MAP NO.: K-0000	
B 10 20 40 FEB 27 1978		MA TC SE BRIDGE RD SE BRIDGE RD BTRN US 1 & DUNE HWY MOBILE COUNTY, ALABAMA	
DMS NO. 47817/58 BTRN 0247-81758 B198718			

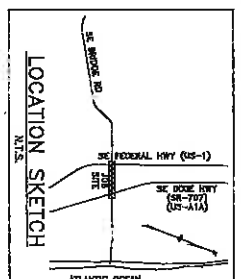



**THIS DRAWING SUPERCEDES  
DRAWING B1 BR13**

[illegible]

The location and existence of any facilities may not be relied upon by the supplier in responding to a bid or in complying with any agreement. Supplier is responsible for evaluating the conditions both above and below ground including underground facility locations.

Ground Rod Investigation		
Location	Feet of Ground Rod Installed	Remarks (Draw)

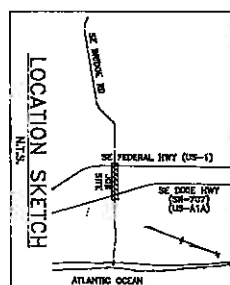


		DESIGNED BY T. FLOWERS DRAWN BY J. TORRES	
DATE 04/24/15 MAP NO. 2-0000		MA. TC SE BRIDGE RD SE BRIDGE RD STATION, IS-1 & CRUE HWY SE BRIDGE RD, WASHINGTON COUNTY, MD	
0 10 20 40 FEET		MA. TC SE BRIDGE RD SE BRIDGE RD STATION, IS-1 & CRUE HWY SE BRIDGE RD, WASHINGTON COUNTY, MD	



The location and existence of any facilities may not be relied upon by the supplier in responding to a bid or in complying with any contract. Supplier is responsible for evaluating site conditions both above and below ground including underground facility locations.

## ROW AGREEMENT

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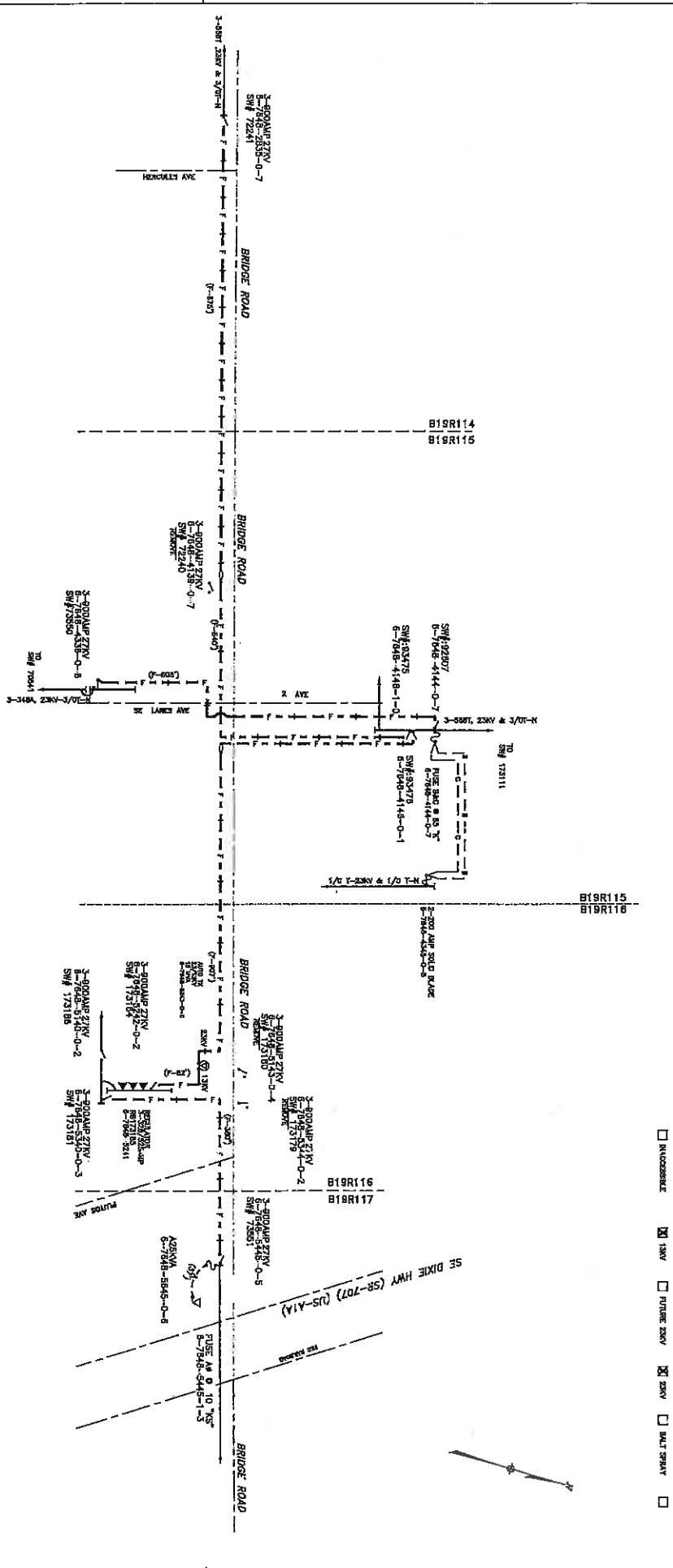
- SS - SOURCELESS STRIP.
- LTZ - LIGHT TAP.
- PAW - POWER FOOT
- R/W - REAR OF WAY
- P/L - PROPERTY LINE
- TPX - TRIPLEX CABLE
- DPA - CUMULATIVE CABLE
- QALD - CUMULATIVE CABLE
- DE - DEED FRONT TRANSFORMER
- LP - LIVE FRONT TRANSFORMER
- A - ALUMINUM CABLE
- Q - COPPER CABLE
- PHS - FEEDER IN CONDUIT
- PHS - CUMULATIVE CABLES IN V CONDUIT

CONSTRUCTION NOTES - WR# 4787  
 REDESIGNED DRAWINGS  
 B10R11(DOOR25)  
 B10R11B  
 B10R117  
 B10R114  
 B10C114

[illegible][illegible]

REFERENCE DWG's  
B19R116  
B19CK114(SCH)

The location and existence of any facilities may not be relied upon by the supplier in responding to a bid or in complying with any contract. Supplier is responsible for evaluating site conditions both above and below ground including underground facility locations.

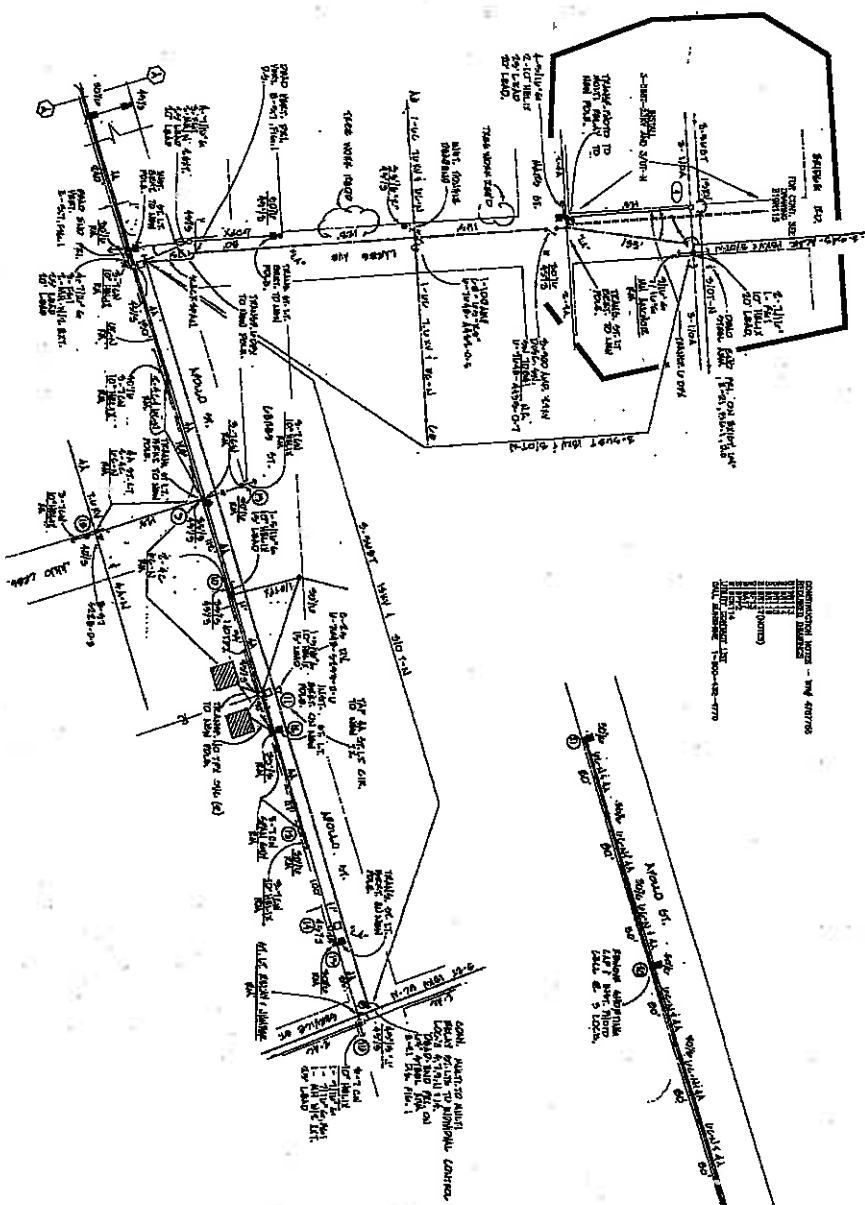


REFERENCE DWG'S  
B19R114  
B19R115  
B19R116  
B19R117

PLAT DATE: 8/19/2013 PLAT TIME: 11:00:13 AM CAD NAME: PER

PROJECT	4781756
DATE	8/19/2013
TOTAL SHEET COUNT: 1 SHEET 1 OF 1 SHEET COUNT	

PROJECT NAME: 4781756 PROJECT NUMBER: 4781756 PROJECT DATE: 8/19/2013 PROJECT TIME: 11:00:13 AM PROJECT CAD NAME: PER	
DRAWN BY: [Signature] DATE: 8/19/2013 SCALE: 1" = 100'	CHECKED BY: [Signature] DATE: 8/19/2013 SCALE: 1" = 100'
PROJECT LOCATION: 4781756 PROJECT ADDRESS: 4781756 PROJECT CITY: 4781756 PROJECT STATE: 4781756 PROJECT ZIP: 4781756	
PROJECT DESCRIPTION: 4781756 PROJECT NOTES: 4781756	



CONSTRUCTION NOTES - SEE 4781756  
 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE IBC AND IRC.  
 2. ALL UTILITIES SHALL BE DEEPER THAN THE FOUNDATION.  
 3. ALL EXISTING UTILITIES SHALL BE MAINTAINED.  
 4. ALL EXISTING UTILITIES SHALL BE MAINTAINED.  
 5. ALL EXISTING UTILITIES SHALL BE MAINTAINED.

NO.	DATE	DESCRIPTION
1	8/19/2013	ISSUED FOR PERMIT
2	8/19/2013	ISSUED FOR PERMIT
3	8/19/2013	ISSUED FOR PERMIT
4	8/19/2013	ISSUED FOR PERMIT
5	8/19/2013	ISSUED FOR PERMIT

The location and existence of any facilities may not be noted upon by the engineer. It is the responsibility of the owner to verify the location and existence of any facilities with the appropriate authorities. The engineer is not responsible for any errors or omissions in this plan.

REFERENCE: DWG 3

819N115

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## Exhibit B

WR # 4787756

Standards and Specifications

- 3.3.1      Directional Bores – Surveyor shall provide any staking for layout, as a minimum, marking the ends and any intermediate changes in direction, in accordance with data furnished on the drawings or special instructions. Deliverables: The Surveyor will provide the company an as-built sufficient and complete enough for updating & correcting the FPL Plan & Profile drawings. This may be a combination of surveyor's field notes and boring machine crew information, but in all cases it shall meet the following minimum specifications.
- 3.3.1.1      Show horizontal tie to known landlines, (i.e., right of way, section line, centerlines, etc.) or to baselines shown on the FPL drawings including ,corrections , additions, deletions and bore entry and exit points .
- 3.3.1.2      Show vertical ties (elevations) to a known benchmark, referenced to a known local datum based on NGVD 1929 or NAVD 1988 .
- 3.3.1.3      Assumed elevations are not acceptable. Boring crew ties to a temporary benchmark provided by the surveyor are acceptable.
- 3.3.1.4      Show a total end to end (or end to PI to end) distance based on an above ground measurement.
- 3.3.1.5      Maximum distances between measurements shall be 50 feet. However, minimum requirements of permitting agencies shall in all cases govern. (i.e., The South Florida Water Management district requires a measurement every ten feet.)
- 1

## SPECIFICATIONS FOR UNDERGROUND CONDUIT INSTALLATION

1. Conduit, handhole, and transformer pad placement shall be in the easement provided and in accordance with the design drawings and field staking.
2. Use only FPL supplied conduit with FPL supplied bends. (Figure 1)
3. Glue all joints securely with FPL supplied glue. (Appendix A)
4. FPL conduit markers must be placed at all conduit ends. (Figure 1)
5. All primary and secondary conduit is to have a minimum of 36 inches of cover. (Figure 1)
6. All service and street light conduit is to have 24 – 30 inches of cover at property line. All future service stub-outs at transformer locations to be installed with 90°s. Where primary, secondary, or street light conduit runs turn horizontally, 36 inch radius 90 degree bends are to be used.
7. Cap all ends of the conduit with FPL supplied end caps. Denote termination point of each conduit run on the capped end, (Appendix B). All conduit ends are to be terminated 1 – 2 feet above final grade except at transformer locations where conduit ends are to be terminated 3 inches above final grade. (Figure 3)
8. Install 1 #12 copper locate wire supplied by FPL in each trench per attached specs (Figure 4). All ends of the #12 copper locate wire must be exposed above grade, and secured with a tie wrap to a piece of stubbed up conduit for future locates. (Figure 4)
9. Conduits terminated at transformer locations to be installed with templates supplied by FPL per Figure 3A, 3B, or 3C according to the type of transformer being installed. (Consult your Service Planner).
10. Concrete transformer slabs provided by FPL are to be installed level on compacted fill at final grade and oriented as shown on the FPL design drawing(s) (Figure 3)

3

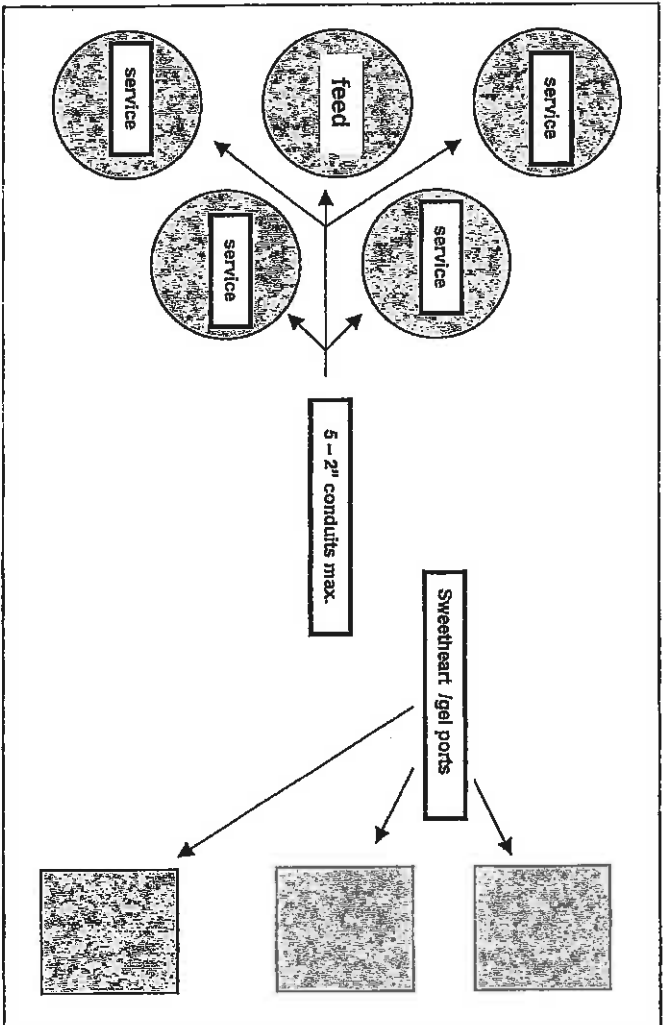
11. Conduits terminated at future secondary handhole locations to be installed per Figure 2. If secondary handholes are being installed at the time of conduit installation, install 45 degree bends as shown in Figure 1.
12. Primary splice handhole to be installed with electronic cable marker. (Figure 2A)
13. Install a continuous length of pull string in all conduit runs.
14. Backfill operations are to be done carefully with special attention given to utilizing clean fill, thereby assuring the elimination of rock and other scrap material to insure that the conduit will not be damaged or marking devices moved and proper compaction is achieved.

## TESTING AND ACCEPTANCE GUIDELINES

Following notification of completed installation of underground conduits by a developer/contractor FPL will:

1. Randomly spot check the installation depth of conduits below grade at a minimum of 2 points between each primary termination point, (transformers, splice boxes & risers) noting the measured depth on the record drawing.
2. After confirming the correct routing and integrity of a conduit run, verify that the cable markers were installed and exposed conduit ends are plugged.
3. Confirm that a continuous length of pull string has been installed in all conduit runs and verify that all conduits runs terminate in the correct locations.
4. The final acceptance of the conduit installation will occur when FPL pulls the conductor and occupies the conduit.

# TEMPLATE

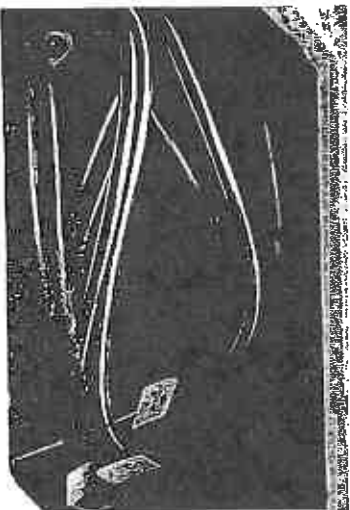


24"

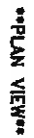
24" handhole

FINISHED PRODUCT

WHEN INSTALLING 2" CONDUITS UP TO 5 MAY BE PLACED IN A 24" HANDHOLE. Please install all conduits within 10" of one end of the handhole. This allows cables to drape across to the other end of handhole where the terminations will be placed such as sweetheart connectors or gel port connectors. When the wires are raised out of the handhole this will allow approximately 18" of wire above ground level making it easier for employees to work on in future situations.



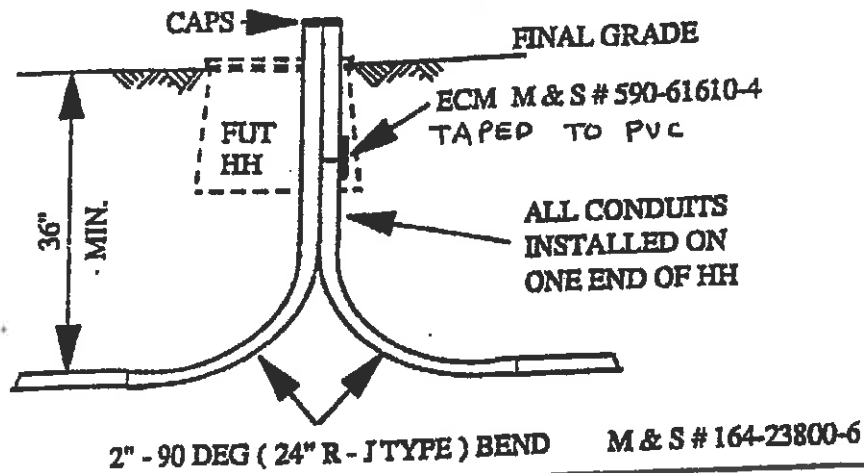
5



**F P L**

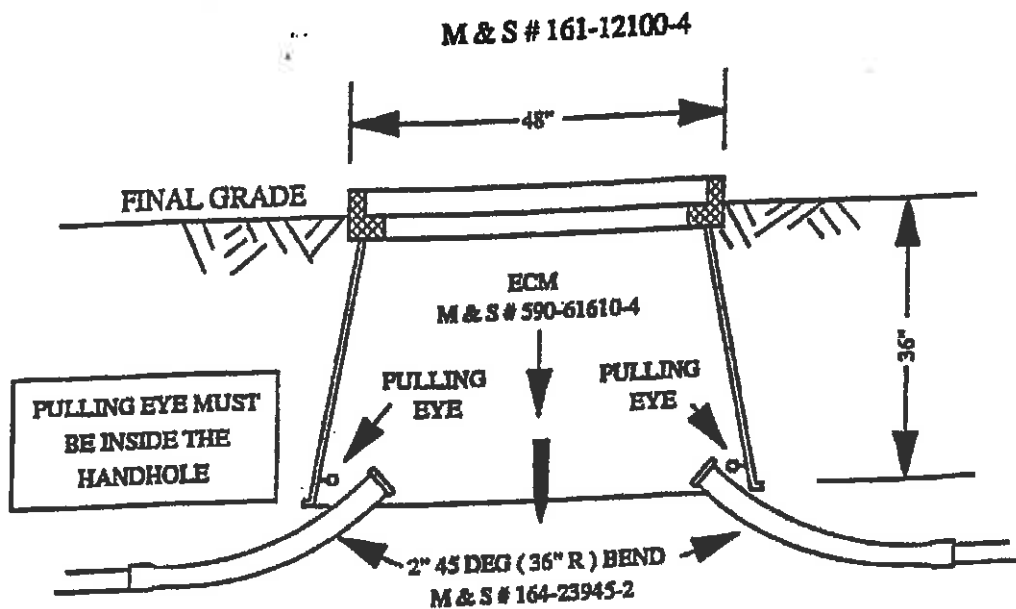
**FIGURE 2**

**TYPICAL SERVICE HANDHOLE INSTALLATION**



**FIGURE 2A**

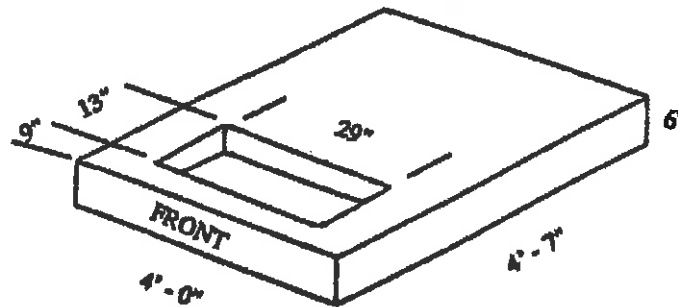
**48" PRIMARY SPLICE HANDHOLE**



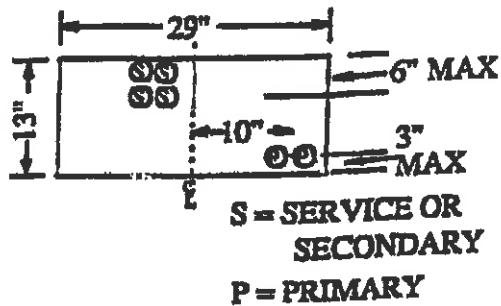
**FIGURE 3**

**PAD & CONDUIT DETAILS**

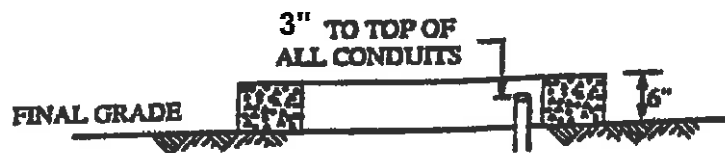
**SINGLE PHASE LOW STYLE  
PADMOUNT TRANSFORMER**



**CONCRETE TRANSFORMER PAD  
M & S # 162-24800-4**



**PAD CONDUIT OPENING**

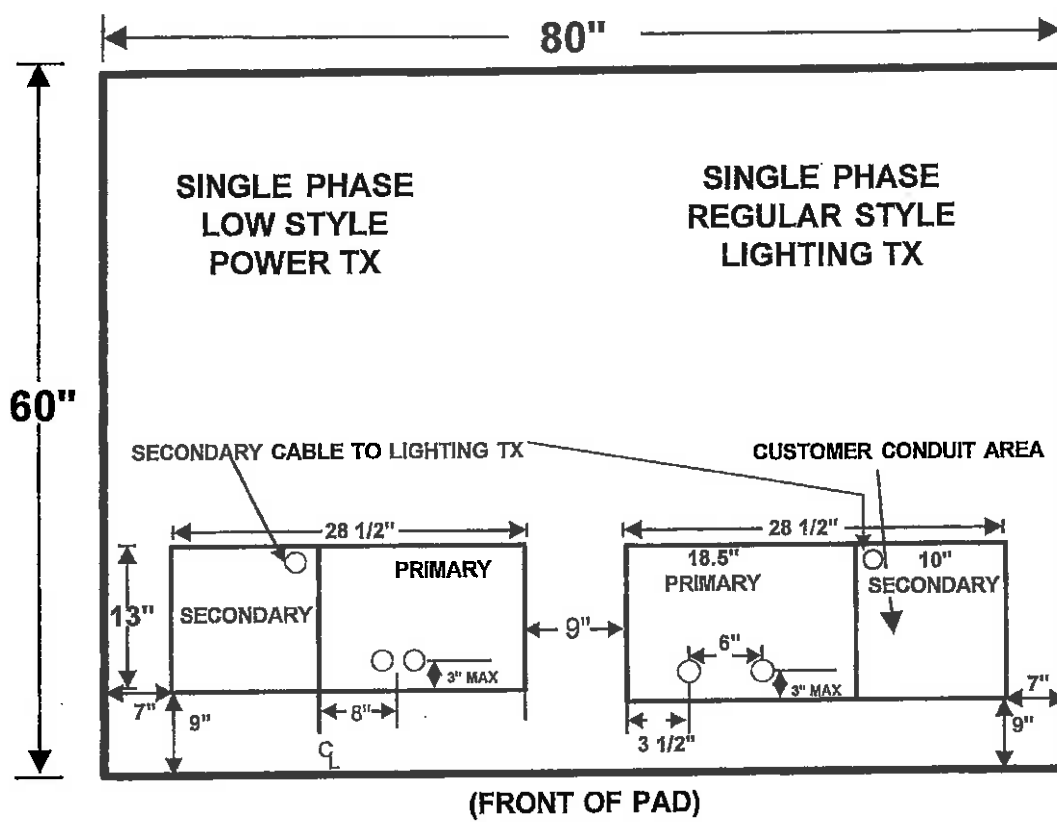


**FRONT ELEVATION OF PAD**



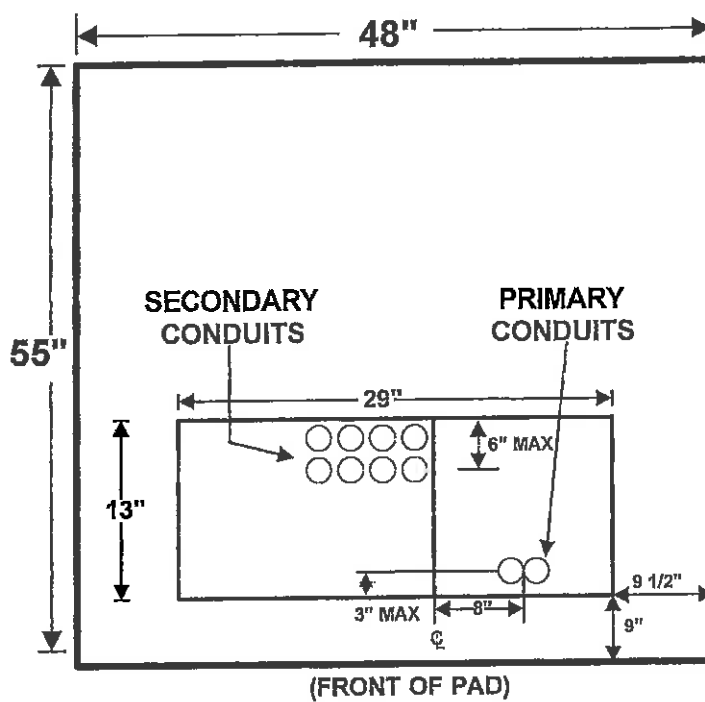
## FIGURE 3A

ONE LOW STYLE & ONE REGULAR STYLE TRANSFORMER



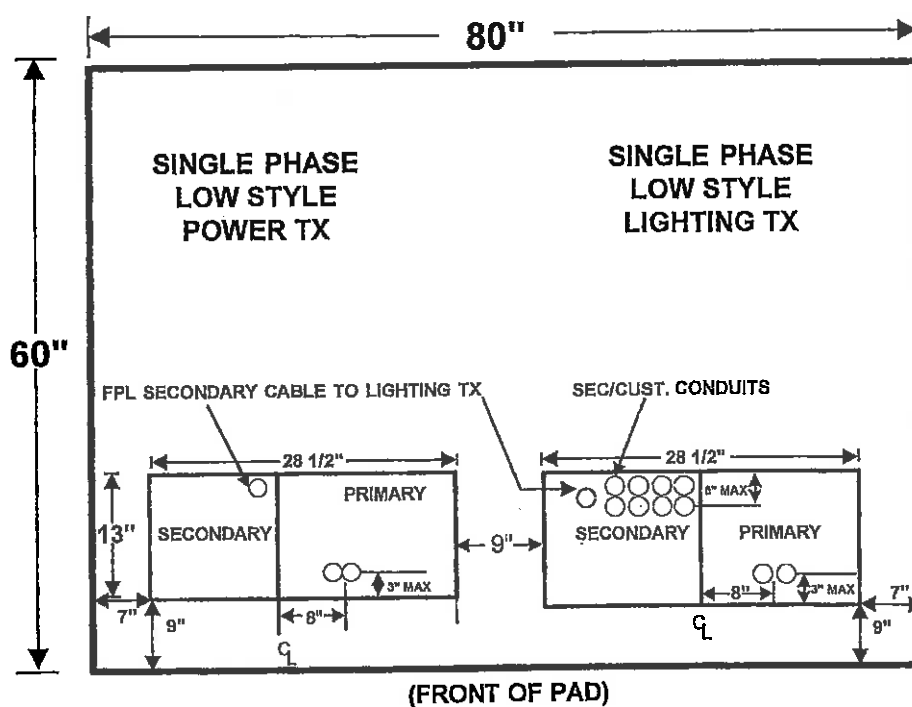
# FIGURE 3B

## SINGLE PHASE LOW STYLE TRANSFORMER



# FIGURE 3C

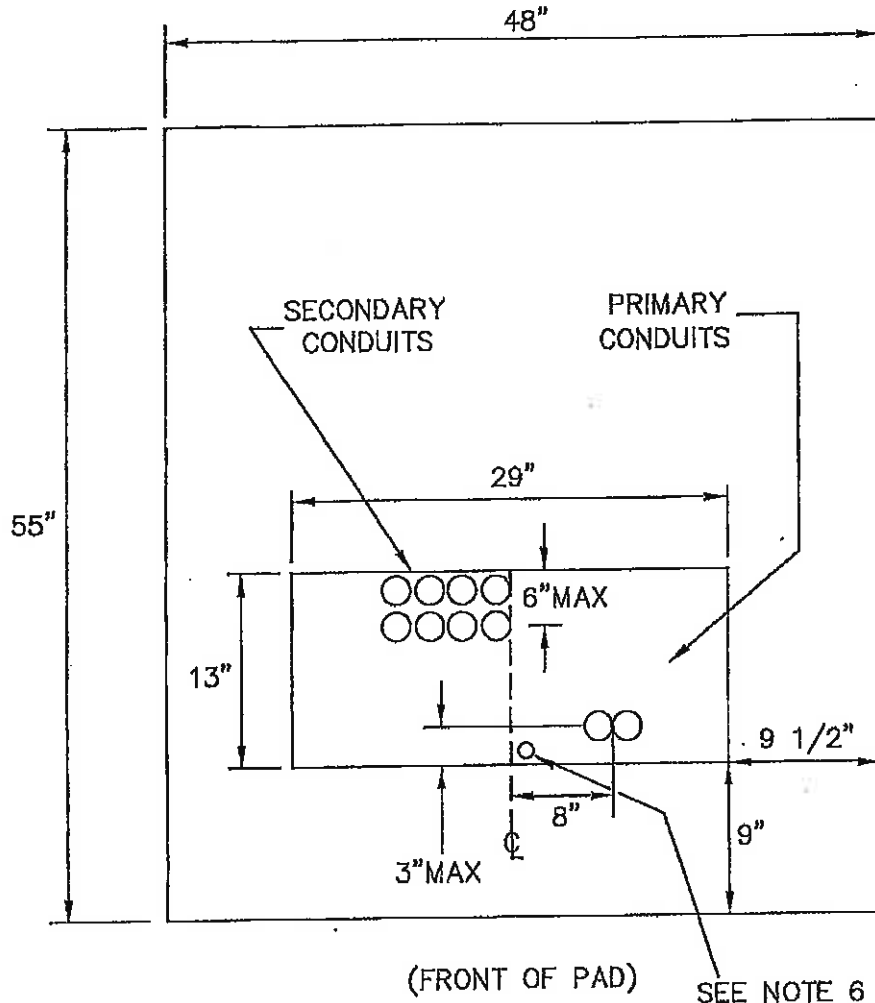
## TWO LOW STYLE TRANSFORMERS



UX-117.0.1

# CONDUIT LOCATIONS FOR SINGLE PHASE LOW STYLE PAD MOUNTED TRANSFORMERS

UX-117.0.1



## NOTES:

1. REFERENCE I-65.0.1 OF THE DCS.
2. PAD M&S #162-248-004.
3. ALL CONDUITS TO EXTEND 3" MAX ABOVE GROUND LEVEL.
4. ALL CONDUIT RELATED DIMENSIONS ARE TO THE CENTER OF THE DUCT UNLESS OTHERWISE INDICATED.
5. MAINTAIN 8' CLEARANCE FROM FRONT AND 3' CLEARANCE FROM SIDES AND BACK OF TRANSFORMER PAD.
6. INSTALL 2" SLEEVE FOR GROUND ROD, 48" LONG.
7. CABLES REQUIRING CT METERING INSIDE THE TRANSFORMER MUST BE PLACED TOWARDS THE FRONT OPENING OF THE TX PAD AND IN FRONT OF ANY OTHER CABLES WHICH ARE NOT CT METERED INSIDE THE TRANSFORMER. THIS IS TO AVOID CABLE TRAINING ISSUES.



F P L

10

## OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: SMS

DRAWN BY: BILL

DATE:

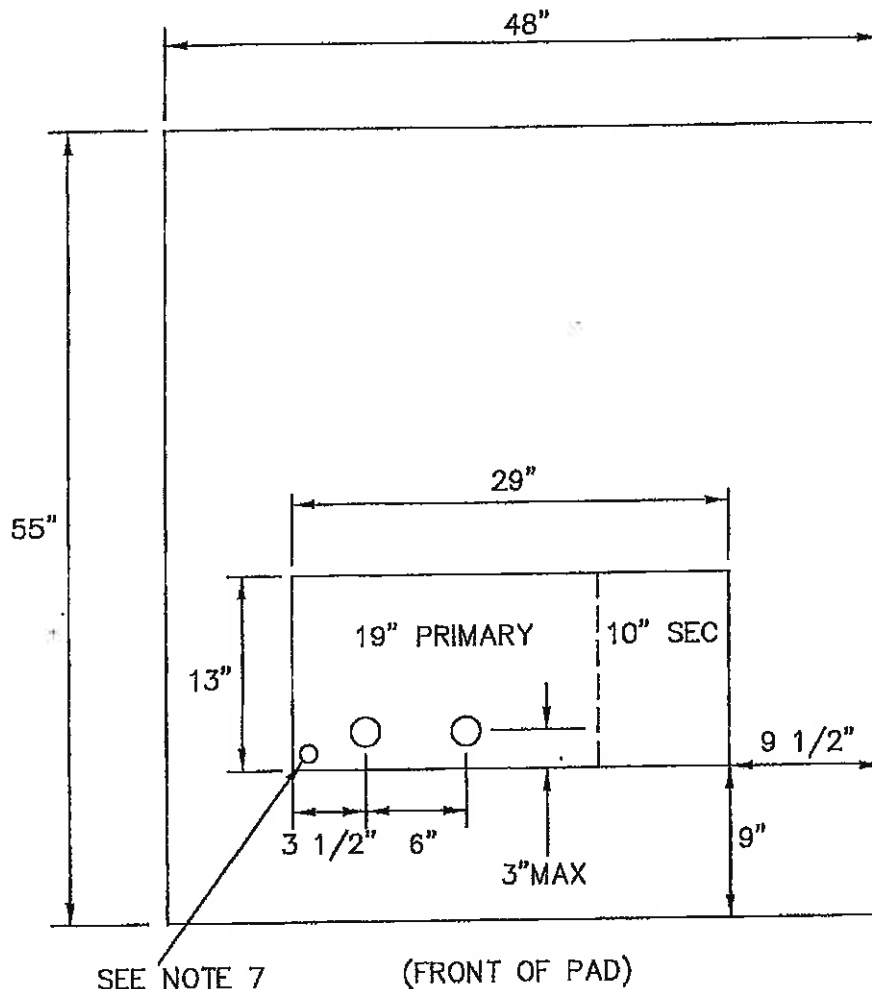
APPROVED: J.J. McEVY

NO SCALE

SUPERVISOR, OH/UG PRODUCT  
SUPPORT SERVICES

NO.	DATE	REVISION	ARR	ELS	RDH
2	1/28/16	UPDATE NOTES	ARR	ELS	RDH
1	5/7/16	UPDATE DRAWING	ARR	ELS	RDH
			ORIG.	DRAWN	APPR.

UX-117.0.2



NOTES:

- NOTES:
1. REFERENCE I-62.0.0 OF THE DCS.
  2. PAD M&S #162-24B-004.
  3. ALL CONDUITS TO EXTEND 3" MAX ABOVE GROUND LEVEL.
  4. ALL SECONDARY/CUSTOMER CONDUITS MUST FIT WITHIN THE 10"X13" AREA INDICATED.
  5. ALL CONDUIT RELATED DIMENSIONS ARE TO THE CENTER OF THE DUCT.
  6. MAINTAIN 6' CLEARANCE FROM FRONT AND 3' CLEARANCE FROM SIDES AND BACK OF TRANSFORMER PAD.
  7. INSTALL 2" SLEEVE FOR GROUND ROD, 48" LONG.
  8. CABLES REQUIRING CT METERING INSIDE THE TRANSFORMER MUST BE PLACED TOWARDS THE FRONT OPENING OF THE TX PAD AND IN FRONT OF ANY OTHER CABLES WHICH ARE NOT CT METERED INSIDE THE TRANSFORMER. THIS IS TO AVOID CABLE TRAINING ISSUES.



F P L

## OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: SMS

DRAWN BY: BILL

DATE:

APPROVED: J.J. McEVROY

NO SCALE

**SUPERVISOR, OH/UG PRODUCT  
SUPPORT SERVICES**

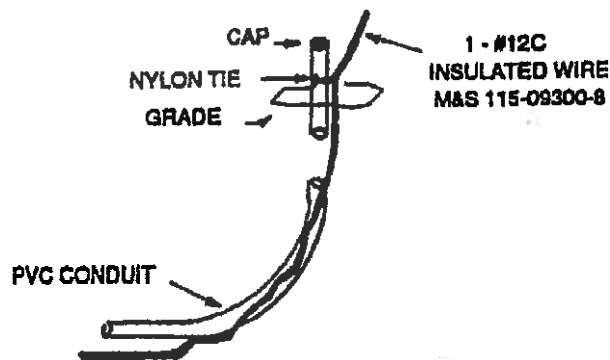
2	1/28/16	UPDATE NOTES	ARR	ELS	RDH
1	5/7/15	UPDATE DRAWING	ARR	ELS	RDH
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

# FIGURE 4

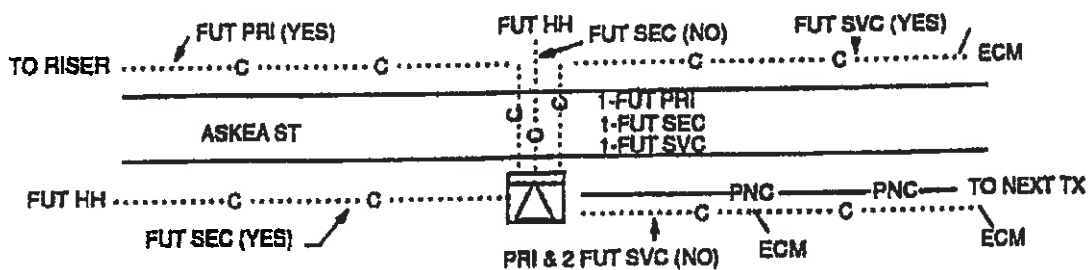
## 1 - #12C INSTALLATION

When installing conduit only (cable to be pulled later), a single #12 copper insulated wire is to be direct buried in every trench at the same depth as the conduits. The ends of the wire are to be terminated above ground at the conduit ends as shown. This wire will allow empty plastic conduits to be located with electronic equipment.

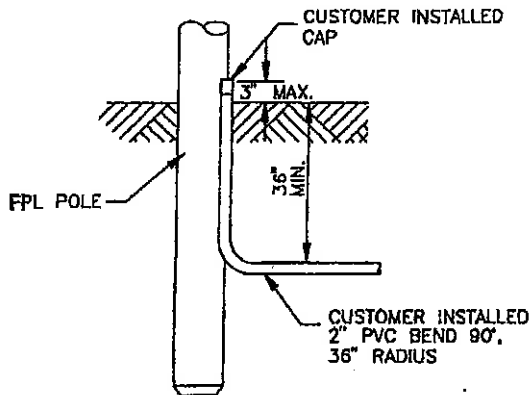
This method is not intended for cases where conduit is installed strictly for road crossings only. In these cases ECM markers should be used to mark the conduit ends.



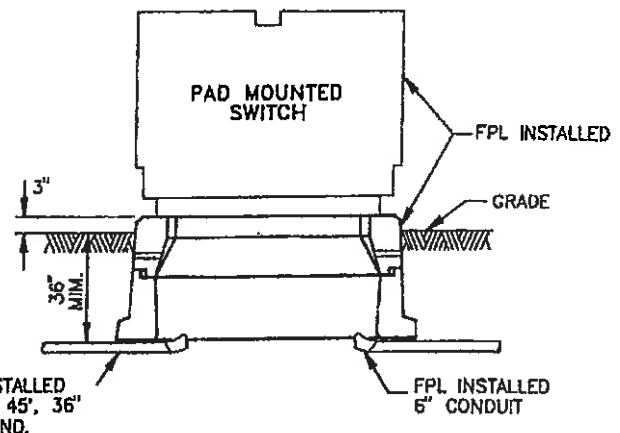
## WHERE TO INSTALL #12C WIRE



# DRAWING SYMBOLS



TYPICAL PVC CONDUIT BEND  
AT RISER POLE INSTALLATION



TYPICAL CONDUIT ENTRANCES  
TO PAD MOUNTED SWITCH

## SYMBOLS

### CONDUCTORS - PRIMARY

FPL OWNED, IN CONDUIT, WITH CONDUCTOR SIZE, METAL, RATED VOLTAGE INSULATION AND NEUTRAL INDICATED.

### EXISTING

— PNC —

### PROPOSED

— PNC —

### CONDUCTORS - SECONDARY - STREET LIGHT

FPL OWNED, IN CONDUIT, WITH CONDUCTOR SIZE, METAL AND INSULATION INDICATED (HM/HD TPX SHOWN).

1/OA  
— — —

4/OA  
— — —

### SERVICE LATERALS

THREE-WIRE SECONDARY SERVICE. FPL OWNED IN CONDUIT WITH CONDUCTOR SIZE, METAL, INSULATION AND JACKET INDICATED.

3-2C RN  
— — —

1/OA TPX  
— — —

### EMPTY CONDUIT

— C —

— C —

### PADMOUNTED TRANSFORMERS

PADMOUNTED TRANSFORMER, 1Ø, WITH KVA RATING (FRONT, OR TERMINAL CHAMBER, IS SMALL RECTANGLE AT RIGHT END OF SYMBOL. PRIMARY PHASE INDICATED) TRANSFORMER STYLE SHOWN AS FOLLOWS: (RS) - REGULAR SIZE - 42" + HIGH, (DF) - DEAD FRONT - 32" + HIGH, (LS) - LOW STYLE - 24" + HIGH.

▶ B 15

▶ B 15

### STRUCTURES

ELECTRONIC CABLE MARKER AND OR SPLICE PIT (BURIED)



SERVICE HANDHOLE



 F P L

UN-27.0.0

# RECOMMENDED PRACTICES FOR FIELD JOINING OF PVC CONDUIT (USING CLEAR SOLVENT CEMENT) AND PVC CONDUIT INSTALLATION

UN-27.0.0

## FIELD JOINING

1. EXAMINE EACH LENGTH OF CONDUIT AND ENSURE THERE ARE NO INTERIOR OR EXTERIOR IMPERFECTIONS, CRACKS, ETC. REMOVE ALL FOREIGN MATERIAL FROM INSIDE CONDUIT.
2. USING A HACKSAW, (594-40800-7) FINE TOOTH WOOD SAW, OR NYLON STRING, CUT PIPE SQUARE (IF REQUIRED). REMOVE ANY BURRS AND BEVEL ANY SHARP EDGES. WIPE DRY WITH A CLEAN, DRY CLOTH.
3. APPLY CEMENT (M & S #522-14100-7) UNIFORMLY ON INSIDE OF BELL OR FITTING. APPLY UNIFORM COAT OF CEMENT ONTO CONDUIT END. DO NOT POUR, SPLASH, OR GLOB CEMENT ON!
4. IMMEDIATELY INSERT THE CONDUIT INTO THE BELL END OF FITTING ALL THE WAY TO THE INSIDE SHOULDER. ENSURE SNUG FIT AND TURN CONDUIT 1/4 TURN TO DISTRIBUTE CEMENT EVENLY.
5. HOLD JOINT FOR APPROXIMATELY ONE MINUTE TO ALLOW CEMENT TO BEGIN SETTING. WIPE OFF EXCESS CEMENT.  
(NOTE: MANUFACTURER RECOMMENDATIONS ARE TO ALLOW FOR A MINIMUM OF 10 MINUTES OF DRYING TIME PRIOR TO ANY BACKFILLING. WEATHER CONDITIONS MAY VARY THIS SETTING TIME.)

## FIELD INSTALLATION

1. LAY CONDUIT RUN INTO TRENCH. DO NOT KICK, THROW OR SLAM IT IN!
2. SURROUNDING TRENCH BACKFILL MUST BE FREE OF LARGE OR SHARP ROCKS, CINDERS OR OTHER DEBRIS WHICH WILL DAMAGE CONDUITS DURING BACKFILL OPERATION OR SUBSEQUENT COMPACTION.
3. IN CORAL ROCK AREAS, IT IS RECOMMENDED THAT HAND BACKFILLING FOR THE FIRST 3 TO 6 INCHES BE PERFORMED.
4. INSTALL PLUGS OR END BELLS ON ALL VACANT DUCTS, AS REQUIRED.
5. THE FINISHED CONDUIT RUN SHALL BE RODDED IN AN APPROVED MANNER (I.E. WINCH LINE, MANDREL, ETC.) TO VERIFY CONTINUITY AND CLEANLINESS. (NOTE: NO CONDUIT RUN SHALL BE ACCEPTED AS PROPERLY INSTALLED UNLESS FREE PASSAGE IS OBTAINED AND VERIFIED BY FPL SUPERVISION.)



F P L

OH &amp; UG DISTRIBUTION SYSTEM STANDARDS

UN

ORIGINATOR: CM

DRAWN BY: BQ

DATE: 9-30-84

APPROVED: R.J. SALESKY

NO SCALE

1	7/16/01	UPDATE DRAWING (TEXT)	RAP	JES	JJM
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

DIRECTOR, DISTRIBUTION ENGINEERING  
AND OPERATIONS SERVICES

FEEDER NUMBER  
SWITCH NUMBER  
PHASE  
CONDUCTOR SIZE, METAL, TYPE INSULATION AND VOLTAGE RATE (IF NOT SAME AS OPERATING VOLTAGE)  
SOURCE OR DIRECTION OF FEED  
OWNERSHIP  
ADDRESS OF BUILDING SERVED  
TLM NUMBER  
DATE OF FAILURE ON SECTION OF CABLE (DIRECT BURIED ONLY)  
ANY UNUSUAL CONDITIONS, I.E. CABLE IN CONDUIT, PARTIALLY IN CONDUIT, DIRECT BURIED, ETC.

ALL CIRCUITS AND VACANT CONDUITS SHOULD BE APPROPRIATELY IDENTIFIED AT EACH TERMINAL OR SWITCHING POINT AND ALL INTERMEDIATE LOCATIONS SUCH AS VAULTS, MANHOLES, PAD MOUNTED TRANSFORMERS, OR HANDHOLES. WHEN THE CIRCUIT OR VACANT CONDUIT IS OWNED BY OTHER THAN FLORIDA POWER & LIGHT COMPANY, SHOW "CUST" ON APPROPRIATE TAG. IF NECESSARY INFORMATION CANNOT BE SHOWN ON ONE TAG, USE ADDITIONAL TAGS.

CONDITION.

3/16" HOLES

1-1/2"D.

ROUND

M&S #549-340-001

ALUMINUM TAGS  
(USE STEEL STENCIL)

RECTANGULAR

M&S #549-341-007

2"

3"

1/4" HOLES

WHITE

FIGURE 1:  
PLAIN PLASTIC TAG WITH  
CLEAR COVER  
(M&S 549-378-008)

COVER STARTS

COVER STOPS

2-1/2"

2-1/2"

**IMPORTANT**  
**USE INDELIBLE**  
**MARKING PEN**  
**ONLY (M&S**  
**#549-501-004)**

PLACE INSIDE METER CAN. USE TIE WRAP TO ATTACH TAG TO CONDUCTORS. PRINT ADDRESS USING MARKING PEN (M&S #549-50100-4)

3/16" HOLES

1-1/4"D.

ROUND (FIBERGLASS)

M&S #549-338-006

ADDRESS \_\_\_\_\_

FPL OWNED \_\_\_\_\_

DATE \_\_\_\_\_ CREW# \_\_\_\_\_

INSTALLER \_\_\_\_\_

FPL/CONTRACTOR \_\_\_\_\_

2-1/2"

2-1/2"

**FIGURE 2:**  
**PLASTIC TAG WITH CLEAR**  
**COVER FOR SERVICES**  
**(M&S 549-378-009)**

Diagram of a 2-1/2 inch wide label with the following fields:

- ADDRESS \_\_\_\_\_
- CUSTOMER OWNED \_\_\_\_\_
- DATE \_\_\_\_\_ CREW \_\_\_\_\_
- INSTALLER \_\_\_\_\_
- FFL/CONTRACTOR \_\_\_\_\_

The label is 2-1/2 inches wide and 2-1/2 inches high.

UNDERGROUND DUCT & MANHOLE SYSTEMS  
USE ALUMINUM TAGS, AFFIXED TO CABLES WITH #12C-TW ON ALL CIRCUITS IN UNDERGROUND SYSTEMS, SUCH AS SUBWAY VAULTS, MANHOLES, RISER POLES, ECT. ROUND ALUMINUM TAGS ARE FOR FEEDER NUMBER AND PHASE IDENTIFICATION. RECTANGULAR ALUMINUM TAGS ARE USED FOR ALL OTHER IDENTIFICATION PURPOSES FOR EXAMPLE, ON ISOLATED NEUTRAL CONDUCTORS OF PILC CABLES, ETC.

DIRECT BURIED AND CABLE IN CONDUIT SYSTEMS

DIRECT BURIED AND CABLE IN CONDUIT SYSTEMS  
USE PLASTIC TAGS AS SHOWN IN FIGURE 2 (M&S 549-378-009) FOR CUSTOMER IDENTIFICATION AT LOCATIONS THAT WILL BE SUBJECTED TO SUNLIGHT, SUCH AS RISERS, AND ALSO IN URD APPLICATIONS FOR IDENTIFYING SERVICES, SUCH AS PADMOUNTED TRANSFORMERS AND HANDHOLES. USE PLAIN PLASTIC TAGS AS SHOWN IN FIGURE 1 (M&S 549-378-008) IN PRIMARY TERMINATION TAGGING APPLICATIONS. PLASTIC TAGS HAVE A CLEAR, UV RESISTANT FLAP TO REDUCE FADING AND WEATHERING. ALLOW 10 SECONDS MINIMUM DRYING TIME TO PREVENT SMEARING BEFORE ADHERING THE CLEAR FLAP. FASTEN PLASTIC TAG TO CABLE WITH 5-3/4" BLACK TIE-WRAPPS (M&S 534-250-001) OR 12" BLACK PLASTIC TIE-WRAPPS (M&S 534-253-000).

[illegible]

SUPERSEDES UV-12.0.0  
LAST REVISED ON 3/15/91

**F P L**

## OH & UG DISTRIBUTION SYSTEM STANDARDS

		SERVICE			
3	6/15/08	UPDATE DRAWING	AR	ELS	JRD
2	8/28/08	UPDATE DWG AND NOTES	GAP	ELS	JJM
1	7/16/01	REVISED TEXT AND ADDED A DETAIL DWG.	RAP	JES	JJM
0	8/30/84	CHANGED PAGE FORMAT AND REVISED NOTES AND DIMENSIONS	RJO	MLG	RJS
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

ORIGINATOR: RJO

DRAWN BY: MLG

DATE: 9-30-94

APPROVED: R.J. SALESKY

NO SCALE

**DIRECTOR, DISTRIBUTION ENGINEERING  
AND OPERATIONS SERVICES**

U  
V



D-15.0.1

# STAKING INFORMATION (EXHIBIT "A")

D-15.0.1

**FLAGS**

NORMALLY ON A PVC OR WIRE STAFF, ARE USED IF FIELD CONDITIONS ALLOW CLEAR SIGHT OF THE FLAGS. NOT TO BE USED WHEN FACE STAKING. FLAGS SHALL BE A MINIMUM OF 4" x 5" WITH A 21" WIRE.

**FLAG MARKINGS**

THE APPROPRIATE PREPRINTED TYPE MAY BE USED IF FIELD CONDITIONS ALLOW. FLAGS SHALL BE PINK LETTERS ON WHITE FLAG AND PREPRINTED AS FOLLOWS:

PROPOSED FPL POLE, PROPOSED FPL ANCHOR, PROPOSED FPL TRANSFORMER PAD, PROPOSED  $\phi$  FPL TRENCH,  
PROPOSED FPL ELECTRONIC CABLE MARKER, PROPOSED FPL HAND HOLE

**STAKES:**

STAKES NORMALLY ARE 24" TO 48" ONE BY TWO'S DEPENDING ON LOCAL PRACTICES AND AVAILABILITY. 8" TWO BY TWO'S, CALLED "HUBS", ARE USED WHERE EXTRA STABILITY IS NEEDED, SUCH AS COW PASTURES, UNPAVED DRIVING AREAS, ETC. AND ARE USUALLY DRIVEN FLUSH WITH THE GROUND.

**STAKE MARKINGS**

DEPENDING ON SURFACE CONDITIONS AT THE WORK LOCATION, DIFFERENT METHODS OF STAKING MAY BE USED. IN EARTH, STAKES OR HUBS WILL BE USED. NAILS, DISCS AND PAINT WILL BE USED IN PAVEMENT OF ASPHALTIC COMPOSITION, AND CONCRETE WILL BE MARKED AND PAINTED. WHERE DEFINITE POINTS OF ALIGNMENT ARE REQUIRED, SUCH AS RIGHT OF WAYS OR IN FACE STAKING, HUBS WILL HAVE NAILS DRIVEN INTO THEM, NAILS AND DISCS WILL BE USED ON ASPHALT, AND CONCRETE WILL BE DRILLED AND PAINTED TO INDICATE THOSE POINTS.

REGARDLESS OF THE LOCATION'S CONDITION, OR OF THE METHOD OF STAKING USED, CERTAIN MARKINGS MAY BE USED BY THE SURVEY CREW TO INDICATE TO THE APPROPRIATE WORKING CREW WHAT EACH STAKED LOCATION REPRESENTS. THE FOLLOWING IS A LIST OF THE MOST COMMONLY USED MARKINGS. ON THE STAKES, THESE MARKING WILL BE ON THE 2" SIDES. ON PAVED SURFACES, THESE MARKINGS WILL BE PAINTED.

1. "ANC" - INDICATES LOCATION OF THE EYE OF THE ANCHOR ROD.
2. "ANC" - INDICATES LOCATION OF THE EYE OF THE ANCHOR ROD.
3. "FPL" - INDICATES MARKINGS ON PAVEMENT (IF EXISTING) PERPENDICULAR AND IN CLOSE PROXIMITY TO THE POLE LOCATION.
4. POLE CENTER STAKING SYMBOLS - ANY ONE OF THE FOLLOWING DETERMINES LOCATION OF THE CENTER OF THE POLE.
  - A.) "CTR. POLE" OR "POLE" MARKED ON A STAKE.
  - B.) "□" OR "O" WITH "POLE" IN THE CENTER, ON PAVED SURFACES OR SIDEWALK. (A NAIL & DISK WITH RIBBON MARKED "POLE" MAY ALSO BE USED.)
5. " $\phi$  TRENCH" OR " $\phi$  FPL TRENCH" - INDICATES CENTER LINE ALONG WHICH A TRENCH IS TO BE DUG.
6. "TX  $\Delta$ " OR "CTR TX PAD" - INDICATES THE LOCATION OF THE CENTER OF A TRANSFORMER PAD.
7. "10' O/S  $\phi$  TX PAD" & "20' O/S  $\phi$  TX PAD" - OFFSET REFERENCE STAKE 10' & 20' FROM THE CENTER OF TRANSFORMER PAD, ALONG ITS CENTER LINE PERPENDICULAR TO TRENCH.
8. "CTR HANDHOLE" - LOCATION OF CENTER OF HANDHOLE.
9. "10' O/S  $\phi$  HANDHOLE" & "20' O/S  $\phi$  HANDHOLE" - OFFSET REFERENCE STAKE 10' & 20' FROM THE CENTER OF THE HANDHOLE ALONG ITS CENTERLINE PERPENDICULAR TO TRENCH.
10. "CTR MARKER" - LOCATION OF THE CENTER THE MARKER.
11. "10' O/S  $\phi$  MARKER" & "20' O/S  $\phi$  MARKER" - OFFSET REFERENCE STAKE 10' & 20' FROM CENTER OF MARKER PERPENDICULAR TO TRENCH.
12. "  $\nabla$  " - GRADE AT CENTER OF PAD OR HANDHOLE. A NOTATION INDICATING NUMERICALLY HOW MUCH TO CUT OR FILL MAY BE PRESENT WHERE NECESSARY.
13. "H" - OFFSET REFERENCE PAINT MARK ON PAVEMENT (IF EXISTING) PERPENDICULAR AND IN CLOSE PROXIMITY TO THE HAND HOLE. CAN BE USED FOR OFFSET PURPOSES.
14. "MKR" - OFFSET REFERENCE PAINT MARK ON PAVEMENT (IF EXISTING) PERPENDICULAR AND IN CLOSE PROXIMITY TO THE MARKER. CAN BE USED FOR OFFSET PURPOSES.

F P L

OH &amp; UG DISTRIBUTION SYSTEM STANDARDS

1	9/04/01	UPDATED DRAWING (TITLE & TEXT)	DPM	JES	JJM
0	8/09/98	CHANGE PAGE FORMAT	PMG	RAS	JJM
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

ORIGINATOR: PMG

DRAWN BY: RAS

DATE: 8/09/98

 APPROVED: J.J. MCEVOY  
 SUPERVISOR, OH/UG PRODUCT  
 SUPPORT SERVICES

NO SCALE

D-15.0.2

# STAKING INFORMATION (EXHIBIT "A")

D-15.0.2

COLOR CRAYONS, PAINTS, AND PLASTIC RIBBONS MAY BE USED FOR IDENTIFYING STAKES. THE FOLLOWING A.P.W.A. COLORS HAVE BEEN ADOPTED STATEWIDE AS STANDARD:

- WHITE  
PROPOSED EXCAVATION
- PINK  
TEMPORARY SURVEY MARKINGS
- RED  
ELECTRIC POWER LINES, CABLES, CONDUIT AND LIGHTING CABLES
- YELLOW  
GAS, OIL, STEAM, PETROLEUM OR GASEOUS MATERIALS
- ORANGE  
COMMUNICATION, ALARM OR SIGNAL LINES, CABLES OR CONDUIT
- BLUE  
PORTABLE WATER
- PURPLE  
RECLAIMED WATER, IRRIGATION AND SLURRY LINES
- GREEN  
SEWER AND DRAIN LINES

ALL COLOR STAKES USED BY FLORIDA POWER & LIGHT COMPANY (EXISTING FACILITIES) WILL BE RED AS DESIGNATED BY ANSI STANDARD Z53.1, ISS--NBS VIVID RED #11. THIS COLOR IS AVAILABLE AS SPRAY PAINT UNDER M&S #504-17100-5.

WHITE PER A.P.W.A. WILL BE USED TO MARK PROPOSED FPL FACILITIES. CRAYONS AND PLASTIC RIBBONS USED FOR STAKING FP&L FACILITIES SHOULD APPROXIMATE THESE COLORS.



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## OH & UG DISTRIBUTION SYSTEM STANDARDS

1	9/04/01	UPDATE DRAWING (TITLE AND TEXT)	DPM	JES	JJM
0	8/08/96	CHANGE PAGE FORMAT	PMG	RAS	JJM
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

ORIGINATOR: PMG

DRAWN BY: RAS

DATE: 8/08/96

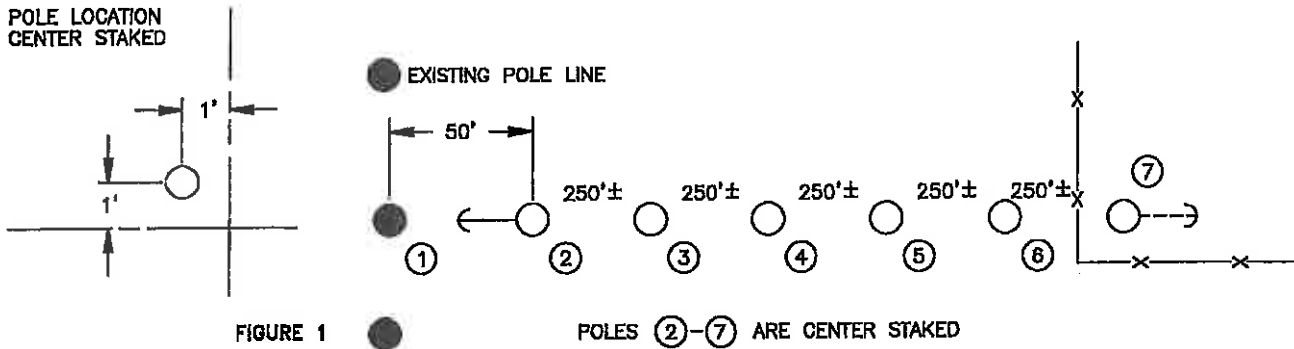
APPROVED: J.J. MCEVOY

NO SCALE

SUPERVISOR, OH/UG PRODUCT  
SUPPORT SERVICES

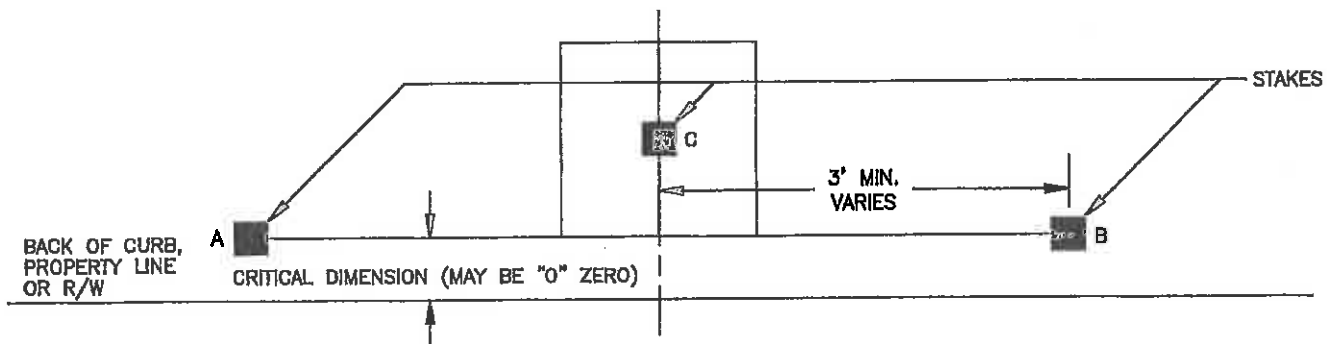
**POLE AND ANCHOR STAKING**

1. AN ANCHOR STAKE LOCATION REPRESENTS THE LOCATION OF THE EYE OF THE ANCHOR ROD.
2. WOOD OR CONCRETE POLES THAT ARE TO BE SET 6' IN RIGHT-OF-WAY AND WOOD POLES THAT ARE TO BE SET 1' IN PROPERTY WILL BE POLE CENTER STAKED. POLES SHOULD ALSO BE CENTER STAKED WHEN IT IS NOT NECESSARY TO HAVE AN EXTREMELY ACCURATE POLE SETTING.

**POLE LOCATION  
CENTER STAKED**

3. WHERE MORE ACCURATE POLE SETTING IS REQUIRED, SUCH AS AT THE RIGHT-OF-WAY LINE OR THREE INCHES BACK OF THE CURB, THE POLE MAY BE FACE STAKED. A STRING PULLED BETWEEN TWO ADJACENT STAKES, MARKED AS FOLLOWS, DETERMINES THE SPECIFIED FACE LOCATION. WHERE NECESSARY THESE MARKINGS MAY BE ABBREVIATED OR SPELLED OUT.  
F.F. OR FIELD FACE                      S.F. OR STREET FACE.

A MINIMUM OF THREE POINTS SHOULD BE MARKED. TWO OF THESE MUST DETERMINE THE LINE THAT THE SPECIFIED FACE OF THE POLE WILL BE AGAINST. THE THIRD TIES THE POLE DOWN AS TO ITS LATERAL POSITION BETWEEN THE FIRST TWO.



"A" & "B" ARE MARKED (AS IN "STAKE MARKINGS") TO INDICATE WHAT FACE OF THE POLE IS TO BE DETERMINED BY THEIR LOCATION. A NAIL WILL BE DRIVEN INTO EACH HUB, HOLES WILL BE DRILLED AND MARKED ON CONCRETE, AND NAIL AND DISCS WILL BE USED ON ASPHALT TO AID IN ALIGNMENT. "C" IS MARKED "C POLE" TO INDICATE THAT THE POLE IS TO BE LOCATED ALONG THIS AXIS, PERPENDICULAR TO LINE FROM "A" TO "B". POLE LOCATION NUMBERS ON THE STAKE MAY BE PRESENT TO AID IN IDENTIFICATION.



F P L

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OH &amp; UG DISTRIBUTION SYSTEM STANDARDS

1	9/04/01	UPDATE DRAWING (TITLE AND TEXT)	DPM	JES	JJM
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NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

ORIGINATOR: PMG

DRAWN BY: RAS

DATE: 8/09/98

APPROVED: J.J. MCEVOY

NO SCALE

SUPERVISOR, OH/UG PRODUCT  
SUPPORT SERVICES

**TRANSFORMER PAD, HANDHOLE & MARKER STAKING**

1. TRANSFORMERS, PADS AND MARKERS ARE MOST OFTEN POSITIONED AT OR NEAR THE TRENCH CENTERLINE. AS A RESULT THE STAKES ARE USUALLY DUG UP DURING TRENCHING. OFFSET OR FACE STAKES ARE USEFUL TO THE CONSTRUCTION FORCES TO RE-ESTABLISH THE LOCATION OF THE FACILITIES AFTER TRENCHING. STAKE CENTER LINE OF HANDHOLE & MARKERS. THE FOLLOWING SKETCHES ARE EXAMPLES OF FACE STAKING AND OFFSET REFERENCE STAKING. FACE STAKING IS PREFERRED, PARTICULARLY FOR TRANSFORMER PADS, BUT OFFSET REFERENCE STAKES MAY BE NEEDED AT TIMES IF TREES OR OTHER OBSTRUCTIONS PREVENT THE USE OF FACE STAKES. ADDITIONAL STAKES SUCH AS CORNER STAKES MAY BE USED TO SUIT LOCAL CONDITIONS.

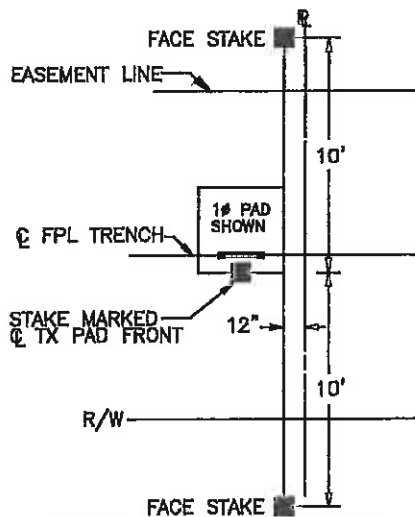
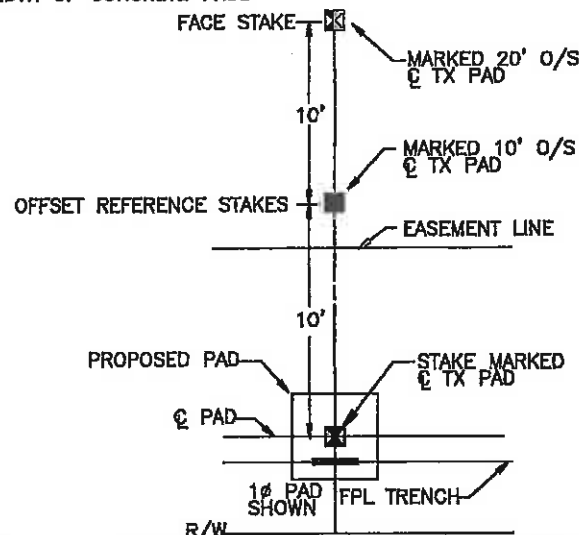
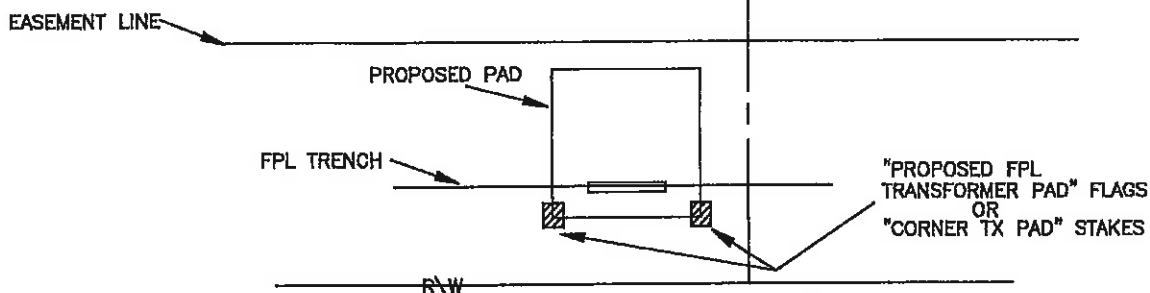
2. WHERE GRADE STAKES ARE REQUIRED, INSTALL AFTER TRENCHING AT PAD OR HANDHOLE.

**TRANSFORMER PAD, HANDHOLE, MARKER & MANHOLE STAKING**

1. THE FOLLOWING TABLE GIVES THE DIMENSIONS OF THE CONCRETE TRANSFORMER PADS TO AID IN ACCURATE STAKING.

PAD TYPE	W	L	APPLICATION
UX-115	6'-8"	5'-0"	3ø LF PM W/SECT.
UX-116	6'-0"	5'-0"	3ø & 2ø W/O SECT. & 3ø DF W/SECT.
UX-117	4'-0"	4'-7"	ALL 1ø
UX-119	9'-10"	10'-6"	PADMOUNTED AUTOTRANSFORMER
UN-18	10'	5'	FEEDER SPLICE BOX

LENGTH AND WIDTH OF CONCRETE PADS

FIGURE 3 - FRONT LOT URD CONSTRUCTION  
FACE STAKINGFIGURE 4 - FRONT LOT URD CONSTRUCTION  
OFFSET STAKINGFIGURE 5 - FRONT LOT URD CONSTRUCTION  
FACE STAKING**TRENCH STAKING**

CENTER LINE OF TRENCH STAKES SHOULD BE APPROXIMATELY 50' APART EXCEPT ON CURVES, WHERE 25' OR 30' SEPARATION SHOULD BE MAINTAINED. ON SMALL RADIUS CURVE THERE SHALL BE A MINIMUM OF 4 STAKES (PC, PT & 2 ONLINE) TO AVOID "CUTTING THE CORNER". DIFFERENT METHODS OF STAKING, SUCH AS A STAKE PER LOT, MAY BE USED IF LOCAL CONDITIONS REQUIRE THEM.



F P L

19

**OH & UG DISTRIBUTION SYSTEM STANDARDS**

ORIGINATOR: PMG

DRAWN BY: RAS

1 9/04/01 UPDATE DRAWING (TITLE AND TEXT) DPM JES JJM

0 8/09/96 CHANGE PAGE FORMAT PMG RAS JJM

NO. DATE REVISION ORIG. DRAWN APPR.

DATE: 8/09/96

APPROVED: J.J. MCEVOY

NO SCALE

SUPERVISOR, OH/UG PRODUCT  
SUPPORT SERVICES

UN-28.0.0

# CABLE IN CONDUIT (CIC) INSTALLATION GUIDELINES "FOR REFERENCE ONLY"

UN-28.0.0

**DIRECTIONAL BORE**

THE USE OF CIC FOR DIRECTIONAL BORING APPLICATIONS SHOULD BE LIMITED TO MAINLY STRAIGHT, POINT TO POINT RUNS. MOST CONTRACTORS WILL NOT INSTALL DIRECTIONAL BORED CIC WHERE THERE ARE MANY BENDS DUE TO THE BENDING RADIUS AND TENSIONS THE CABLE WILL ENCOUNTER. THE CABLE WILL BE REMOVED FROM THE DUCT AND PULLED UNDER SUCH CONDITIONS THEREBY LOSING ANY ADVANTAGE TO DESIGNING WITH CIC. HOWEVER, CIC WILL PROVIDE VERY GOOD LABOR SAVING ADVANTAGES WHEN EMPLOYED IN STRAIGHT LENGTH BORES. THE REEL TRAILER SHOULD BE SET UP TO PAY OUT THE CIC FROM UNDER THE REEL DRUM. (SEE FIGURE 2.) FOR TERMINATING AND CUTTING OF CIC, REFER TO INSTRUCTIONS UNDER "OPEN TRENCH".

WHEN FIRST CONSIDERING THIS TYPE OF INSTALLATION, IT IS ADVISABLE TO REVIEW THE DESIGN WITH AN EXPERIENCE DESIGNER, THE CONTRACT ADMINISTRATION COORDINATOR AND THE CONTRACTOR, AS NEEDED.

**OPEN TRENCH**

MAINTAIN A UNIFORMLY FLAT OR GRADUALLY CHANGING TRENCH BY REMOVING VERY LARGE ROCKS. (SEE FIGURE 1.) POSITION THE REEL SO THAT THE CONDUIT PAYS OUT FROM BELOW THE REEL DRUM AND AS NEAR TO THE CENTER LINE OF THE TRENCH AS POSSIBLE. AVOID REVERSE BENDING AND OVER SPINNING OF THE REEL DRUM DURING PAY OUT. (SEE FIGURE 2.)

DURING INSTALLATION AVOID SWAYING AND KINKING OF THE DUCT. (SEE FIGURE 3.) DEPENDING ON THE LENGTH OF THE RUN, DETERMINE WHETHER TO PAY OUT THE CIC ALONG THE TRENCH LINE OR TO SIMPLY CUT THE DESIRED LENGTH AS REQUIRED. (REFER TO TABLE 1 FOR REEL LENGTH AND OTHER DATA.) SEAL THE CIC AND, IF DESIRED, INSTALL A CABLE PULLING GRIP AT THE INSTALLING END (M&S #593-728-001).

WHEN ENCOUNTERING OBSTRUCTIONS SUCH AS UTILITY LATERALS, FEED THE DUCT END BEYOND THE DESIRED ANGLE AND THEN ROLLING TO THE VERTICAL POSITION. (SEE FIGURE 4.) DO NOT EXCEED MINIMUM BENDING TO ALLOW FOR A GRADUAL BEND. (SEE FIGURE 5.)

FOR TERMINATIONS INTO A PAD OR A RISER, THERE IS NO NEED TO TRANSITION TO A PVC BEND SO LONG AS THE MINIMUM BENDING RADIUS IS NOT EXCEEDED. THIS WILL BE THE CASE IN THE MAJORITY OF INSTALLATIONS, IF THERE IS A NEED TO TRANSITION TO A 2" PVC BEND, USE THE 2" PVC COUPLING (M&S #164-470-006). BONDUIT ADHESIVE KIT, (M&S #522-142-000), IS REQUIRED AND WILL HOLD PE DUCT ON THE CIC END.

USE ONLY APPROVED DUCT AND CABLE CUTTING TOOLS. (M&S #594-406-058 FOR DUCT & M&S #593-557-001 FOR CABLE). UNWINDING CIC WILL RESULT IN THE CONDUCTOR LENGTH BEING SHORTER THAN DUCT LENGTH. ALLOW ABOUT 15' OF CONDUCTOR LENGTH SHORTAGE FOR EACH 1000' OF CIC TO BE INSTALLED, OR ROUGHLY 1.5% OF CIC UNROLLED. ALLOW FOR EXTRA CIC AT THE STARTING END AS CALCULATED. DO LIKEWISE AT TERMINATING POINTS (HANDHOLES, PADS OR RISERS). CUT THE DUCT BACK, EXPOSING THE CABLE, SO AS TO LEAVE A MINIMUM OF 3" PE DUCT ABOVE RISER.

PRIOR TO INSTALLING TERMINATIONS OR SPLICES, SLIP A 2" COLD SHRINK TUBE (M&S #163-010-001) OVER EACH CABLE AND DUCT END. SEAL THE CIC BY UNWINDING THE TUBE AFTER ALL TERMINATIONS OR SPLICES ARE COMPLETE (SEE ILLUSTRATION BELOW). MECA UNITS ARE AVAILABLE IN SECTION 4925.

FOR ROAD CROSSINGS, INSTALL A 5" PVC DUCT PRIOR TO ROAD PAVING. PUSH THE CIC THROUGH AT THESE LOCATIONS. (SEE FIGURE 6 FOR BACKFILL RECOMMENDATIONS).



F P L

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OH &amp; UG DISTRIBUTION SYSTEM STANDARDS

2	4/13/16	UPDATE TITLE	ARR	ELS	RDH
1	2/22/11	UPDATE NOTES	ARR	ELS	BXN
0	8-9-96	REVISED M&S # IN 8TH PARAGRAPH AND PVC DUCT SIZE IN PARAGRAPH 9.	BLM	RAS	JJM
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

ORIGINATOR: BLM

DRAWN BY: RAS

DATE: 8/9/96

APPROVED: J.J. McEVY

NO SCALE

SUPERVISOR, OH/UG PRODUCT  
SUPPORT SERVICES

**DESIGN CONSIDERATIONS**

WHERE DIRECT BURIED CABLE IS TO BE REPLACED WITH CABLE IN DUCT, DIRECTIONAL BORING SHOULD BE THE METHOD OF CHOICE WHEN THE CABLE IS BURIED UNDER EXISTING ROADWAYS, DRIVEWAYS, PARKING LOTS, EXPENSIVELY LANDSCAPED AREAS. ADDITIONAL FACTORS THAT WILL HAVE TO BE CONSIDERED FOR EACH JOB INCLUDE CUSTOMER SATISFACTION, SOD AND ASPHALT RESTORATION COSTS, AND ACCESSIBILITY TO EQUIPMENT. SMALL BORING RIGS WILL FIT THROUGH A 3 FOOT CHAIN LINK GATE.

FOR WATER CROSSINGS WHERE CLX CABLE IS TO BE REPLACED IN ENVIRONMENTALLY SENSITIVE AREAS, CONSIDER THAT SEVERAL FPL DIRECTIONAL BORING CONTRACTORS HAVE EQUIPMENT AND EXPERIENCE FOR BORES UP TO 3,000 FEET. SPECIAL REEL LENGTHS OF FEEDER CABLE WOULD BE REQUIRED. CABLE PULL CALCULATIONS WOULD ALSO HAVE TO BE CONSIDERED. BUTT FUSING OF THE PE DUCT END TO END IS REQUIRED FOR THESE BORES. CORE SAMPLES BELOW THE WATER BOTTOM WILL BE REQUIRED. CONTACT THE ENVIRONMENTAL DEPT. DURING THE PLANNING PHASE.

WHETHER THE JOB IS FOR A WATER CROSSING OR FOR URD REPLACEMENT, AN OPEN AREA FOR EQUIPMENT SET UP WILL BE REQUIRED (I.E. APPROXIMATELY A 20 FT. X 10 FT. FOR URD TYPE RIGS, 100 FT. X 50 FT. MIN. FOR LARGER TRACK RIGS.) AN AREA FOR THE BENTONITE SLURRY AND WATER TRUCKS WILL BE NEEDED ADDITIONALLY. DISCUSS THIS WITH CONTRACTOR PLANNING AND STRATEGY DEPT. AND THE CONTRACTOR.

RAIL ROAD CROSSINGS CAN BE DONE USING JACK AND BORE AND DIRECTIONAL BORING METHODS. CONTACT THE RAIL COMPANY AS REQUIRED, PRIOR TO ENGINEERING THE JOB. NORMALLY, A MINIMUM DEPTH OF 10FT. PLUS THE BORE DIAMETER BELOW THE TRACKS WILL BE REQUIRED WHEN PE CONDUIT IS USED. FOR SHORT LENGTH BORES (NORMALLY UNDER 100 FEET) SMALLER DIRECTIONALLY GUIDED BORING EQUIPMENT IS PROVIDED BY SOME CONTRACTORS OR MAY BE AVAILABLE THROUGH YOUR LOCAL TOOL COORDINATOR. THESE SMALLER BORING TOOLS ARE COMMONLY TERMED "BULLETS" AND SOME CAN BE GUIDED. FOR LONGER LENGTH BORES, USE TABLE 1 BELOW FOR REFERENCE.

**TABLE 1**

DUCT SIZE	SDR	CONDUIT W/MINIMUM TENSILE YIELD = 3000PSI		CONDUIT W/MINIMUM TENSILE YIELD = 3500PSI	
		SPF (LB-F)	SPL (FT)	SPF (LB-F)	SPL (FT)
2"	13.5	1386	3718	1616	4338
6"	11	12991	3718	15156	4335
8"	9	26313	3718	30699	4338
10"	9	40877	3719	47690	4340

- \* SPF = SAFE PULL FORCE
- \* SPL = SAFE PULL LENGTH

**ENGINEERING**

MECA UNITS ARE LOCATED IN THE MECA SYMBOL CATALOG SECTION 4925 AND 4937. ACCESS PITS WILL BE REQUIRED AT TERMINATION POINTS AND AT LOCATIONS WHERE A 90 DEGREE TURN IS REQUIRED. CUL-DE-SAC AREAS MAY REQUIRE ACCESS PITS TO COMPLETE. PLAN AND PROFILE DRAWINGS ARE BEST, AND MAY BE REQUIRED FOR AS-BUILT PURPOSES AS NEEDED. CALL FOR BORING PER LOCATION IN THE NOTES. FOR PE DUCT LENGTHS REFER TO TABLE 2. FOR SPECIAL CABLE REEL LENGTHS CONTACT THE RESPONSIBLE PRODUCT ENGINEER. FOR ACCESS PIT LOCATIONS, OR WHERE CONNECTING TO A PVC BEND. USE PLASTIC COUPLINGS USING BONDUIT ADHESIVE M&S #522-142-000. PE CONDUIT CAN NOT BE GLUED WITH PVC CEMENT. THESE COUPLINGS CAN BE INVENTORIED THROUGH MECA AS NEEDED. (SEE TABLE 3.)

FOR ADDITIONAL INFORMATION OR SPECIAL CONDITIONS, SEE TABLE 1 AND 2, AND CONTACT THE SME (SUBJECT MATTER EXPERT) RESPONSIBLE FOR THIS DESIGN AREA. WHEN JOINING PVC-TO-PLY OR PVC-TO-FIBERGLASS, USE A STRAIGHT PVS COUPLING ADHESIVE KIT AND DISPENSING TOOL, FOR DETAILS SEE TABLE 3.

**TABLE 2**

DUCT M&S #	DUCT SIZE (INCHES)	SDR	AVERAGE OUTSIDE DIAMETER (INCHES)	MINIMUM INSIDE DIAMETER (INCHES)	MINIMUM BEND RADIUS * (INCHES)	REEL LENGTH (FEET)	WEIGHT (LBS/FT)	LUBRICANT SPONGE SPREADER M&S #
164-76200-7	2	13.5	2.375	1.98	35	3000	.528LBS/FT	595-439-103
164-76320-8	6	11	6.625	5.33	42	450	4.944LBS/FT	595-439-405
164-763-800	8	9	8.625	6.6	88	40	10.001LBS/FT	
164-763-810	10	9	10.75	8.218	215	40	15.534LBS/FT	
164-763-900	20	11.5	19.782	16.146		20		

**TABLE 3**

M&S #	COUPLING SIZE
164-466-009	1" PVC TO 1" PVC
164-470-006	2" PVC TO 2" PVC
164-453-004	4" PVC TO 4" PVC
164-448-020	4" PVC TO 2" PVC
164-449-007	5" PVC TO 5" PVC
164-448-001	4" PVC TO 5" PVC
164-450-005	6" PVC TO 6" PVC
164-447-004	5" PVC TO 6" PVC
164-446-000	8" TO 6" COUPLING FOR PVC, HDPE, STEEL

\* VALUES SHOWN ARE ACCORDING TO PLASTICS PIPE INSTITUTE GENERAL INDUSTRY STANDARDS. IF NEEDED, CONSULT WITH CONDUIT SME FOR ADDITIONAL INFORMATION.

BONDUIT ADHESIVE KIT M&S #522-142-000  
DISPENSING TOOL - M&S #593-780-000

10	9/2/16	UPDATE TABLE 2	ARR	ELS	RDH
9	7/26/16	UPDATE NOTES	ARR	ELS	RDH
8	4/20/16	UPDATE TABLE 2	ARR	ELS	RDH
7	2/17/16	ADDED TABLE	ARR	ELS	RDH
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

**F P L**

**OH & UG DISTRIBUTION SYSTEM STANDARDS**

ORIGINATOR: BLM

DRAWN BY: RAS

DATE: 8/9/96

APPROVED: J.J. McEVOY

NO SCALE

SUPERVISOR, OH/UG PRODUCT  
SUPPORT SERVICES

CONSTRUCTION AND INSTALLATION

AFTER SET UP, THE DRILL FRAME IS ANCHORED TO THE GROUND AT A SHALLOW APPROACH ANGLE, USING FLEXIBLE STEEL BORING RODS, AVAILABLE IN VARYING WIDTHS AS REQUIRED, A STEERABLE BORING HEAD IS THEN USED TO ADVANCE THROUGH THE GROUND, LEVELING AND EXITING WHERE REQUIRED. THESE RODS ARE AT TIMES REFERRED TO AS A "DRILL STRING". THE HEAD CONSISTS OF A JET BIT OR DOWN HOLE MUD MOTOR.

THE DRILL HEAD HAS AN ANGLED FACE. WHEN ROTATED, IT ADVANCES FORWARD. WITHOUT ROTATION, IT WILL GLANCE AWAY FROM THE ANGLED FACE. COMBINING THESE TECHNIQUES, STEERING IS ACCOMPLISHED MOVING UP, DOWN, LEFT OR RIGHT. A RADIO TRANSMITTING DEVICE IN THE HEAD PROVIDES DEPTH, ROLL ANGLE AND PITCH DATA TO A RECEIVER ABOVE GROUND TO TELL THE OPERATOR WHERE THE DRILL HEAD NEEDS TO GO.

AFTER THE PILOT HOLE IS CREATED, A REAMER IS ATTACHED TO THE DRILL STRING FOR PULL BACK. A SWIVEL IS THEN ATTACHED TO PREVENT THE PE DUCT FROM ROTATING. THE WORK STRING IS PULLED BACK TO THE DRILLING RIG, SIMULTANEOUSLY INSTALLING THE CONDUIT IN THE EXPANDED HOLE.

FOR 6" PE DUCT INSTALLATIONS, IT IS RECOMMENDED THAT THE ENTIRE REEL LENGTH BE REMOVED AND ALLOWED TO REGAIN ITS ROUND SHAPE PRIOR TO PULL BACK. THIS TAKES ABOUT ONE HOUR IN SUNLIGHT. THIS IS NOT REQUIRED FOR SMALLER SIZES. WHERE INSTALLING 6" PE IN WATER CROSSINGS, INSTALL THE 1000 MCM AL TRXLPE 25 KV CABLE (M&S #100-298-008).

FOR PULLS, IT IS RECOMMENDED THAT A SPONGE SPREADER BE USED TO SPREAD THE LUBRICANT AHEAD OF THE CABLE WHILE USING THESE SPREADERS, CONSIDER USING ABOUT 1 GALLON OF APPROVED CABLE LUBRICANT FOR EVERY 200 FEET OF CABLE. SEE TABLE 2 FOR THE APPROVED SPREADERS AVAILABLE AS A TOOL ITEM.

AFTER COMPLETION OF THE BORE AND PULL BACK, ALL SURFACE SLURRY WILL BE REMOVED FROM THE SITE BY THE CONTRACTOR. ANY SOD REPLACEMENT REQUIRED AT ACCESS PITS WILL ALSO BE DONE BY THE CONTRACTOR. AS BUILTS WILL BE PROVIDED AS REQUIRED AS WELL. CONTACT LOCAL CONTRACT ADMINISTRATION FOR MORE INFORMATION.

GROUNDING

FOR INSTALLATION IN DIRECTIONAL BORE DUCT BANKS, INSTALL A 2" CONDUIT IN THE DIRECTIONAL BORE WITH THE OTHER CONDUITS AND PULL THE 4/0 COPPER INSULATED CABLE NEUTRAL IN THE 2" CONDUIT. THE 4/0 COPPER INSULATED CABLE NEUTRAL SHALL BE CONNECTED TO THE SUBSTATION GROUND.

FOR ANY ADDITIONAL QUESTIONS RELATED TO CONSTRUCTION OPERATIONS, CONTACT THE RESPONSIBLE DEO OPERATIONS SPECIALIST.



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## OH &amp; UG DISTRIBUTION SYSTEM STANDARDS

2	12/13/17	UPDATE DRAWING (NOTES)	ARR	JES	RDH
1	8/27/99	UPDATE DRAWING (NOTES)	RAP	JES	JJM
0	8/09/98	ORIGINAL DRAWING	BLM	RAS	JJM
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

ORIGINATOR: BLM

DRAWN BY: RAS

DATE: 8/9/96

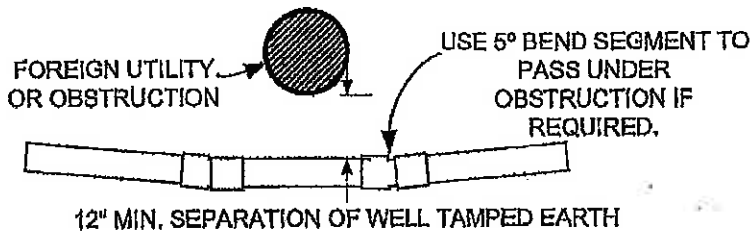
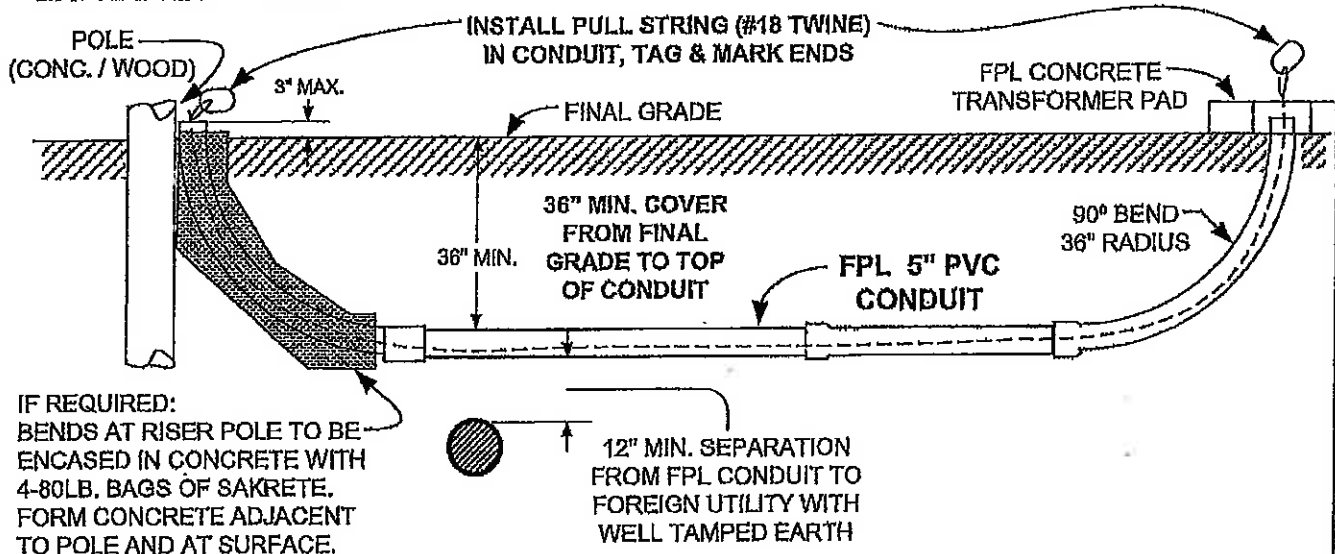
APPROVED: J.J. McEVOY

NO SCALE

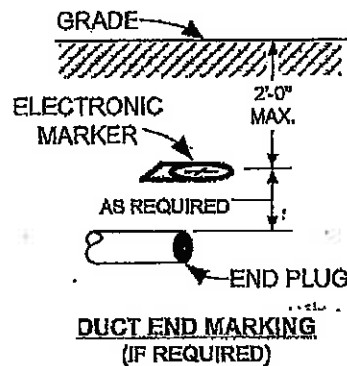
SUPERVISOR, OH/UG PRODUCT  
SUPPORT SERVICES

**\*\*\*\* NOTICE \*\*\*\***

- CALL SUNSHINE 1-800-432-4770 48HOURS BEFORE YOU DIG FOR UNDERGROUND LOCATIONS.
- NOTIFY FPL REP. FOR INSPECTION OF TRENCH DEPTH & PVC INSTALLATION PRIOR TO BACKFILLING TRENCH.



**FPL CONDUIT CROSSING UNDER A FOREIGN UTILITY**

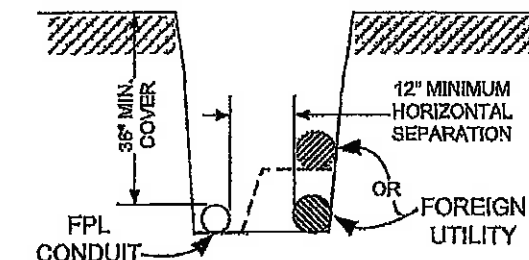


**NOTES:**

- BACK-FILL WITHIN 4" OF THE CONDUIT TO BE FREE OF MATERIAL THAT MAY DAMAGE CONDUIT SYSTEM (BOARDS, ROCKS LARGER THAN 1" IN DIAMETER, DEBRIS, ETC.)
- IF COMPACTION OF TRENCH ROUTE IS REQUIRED FOR PAVING, ETC. BEGIN MACHINE COMPACTION 6" MINIMUM ABOVE CONDUIT.
- WHERE 36" OF COVER CANNOT BE MAINTAINED, 30" OF COVER WILL BE ALLOWED WITH 3" OF CONCRETE ENCASEMENT AROUND THE CONDUIT. (N.E.S.C. RULE FOR PRIMARY VOLTAGES)

**MATERIAL LIST 5" PVC SCH 40 CONDUIT**

20' LENGTH (BELLED END)	164-33800-1
90° BEND 36" RADIUS	164-25250-5
90° BEND 48" RADIUS	164-25200-9
45° BEND 48" RADIUS	164-61400-8
5° BEND SEGMENT	164-58100-1
22.5° SWEEP 12'-6" RADIUS	164-13000-1
STRAIGHT COUPLING	164-44900-7
REPAIR SLEEVE 8' LONG	164-47530-0
END PLUG	164-53500-1
ELECTRONIC MARKER	590-61601-5
TWINE #18 1/2# ROLL	542-21800-5



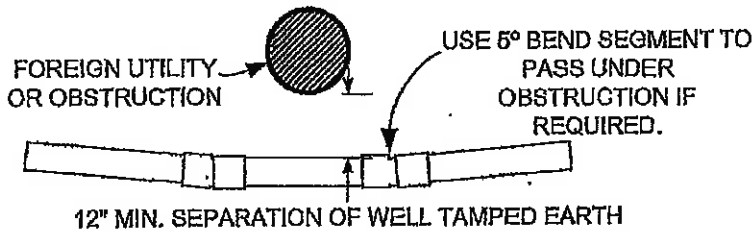
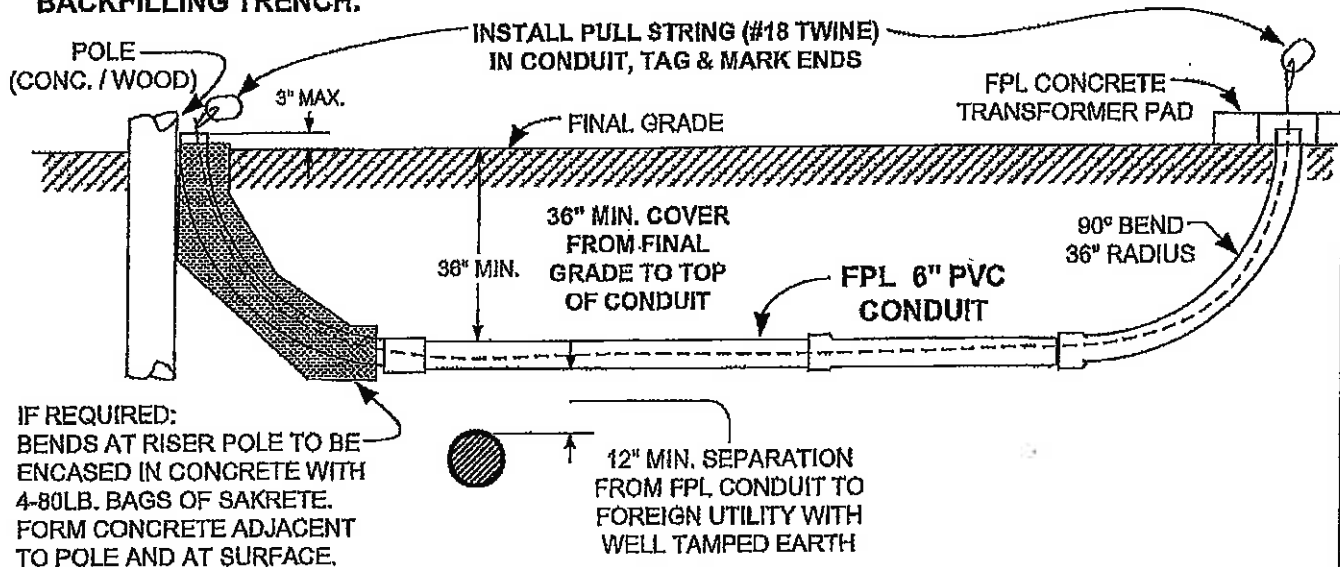
**INSTALLATION OF FPL CONDUIT  
PARALLEL WITH - OR - IN A SHARED TRENCH  
WITH A FOREIGN UTILITY.**

**FPL SUPPLIED 5" PVC CONDUIT  
TYPICAL CUSTOMER INSTALLATION DETAILS  
(PORTIONS OF UN-6, UN-15, CONG. & PAD DETAILS)**

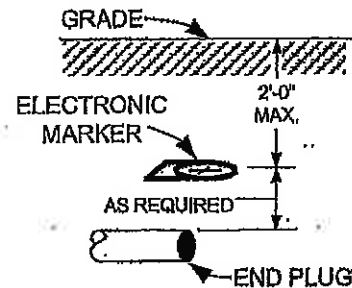


**\*\*\*\* NOTICE \*\*\*\***

- CALL SUNSHINE 1-800-432-4770 48HOURS BEFORE YOU DIG FOR UNDERGROUND LOCATIONS.
- NOTIFY FPL REP. FOR INSPECTION OF TRENCH DEPTH & PVC INSTALLATION PRIOR TO BACKFILLING TRENCH.



**FPL CONDUIT CROSSING UNDER A FOREIGN UTILITY**



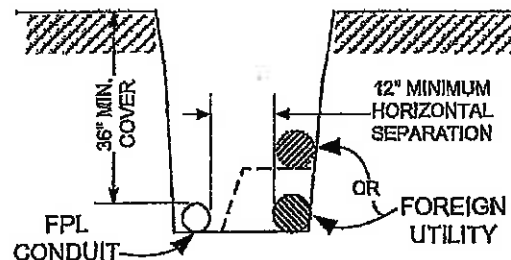
**DUCT END MARKING (IF REQUIRED)**

**NOTES:**

- ♦ BACK-FILL WITHIN 4" OF THE CONDUIT TO BE FREE OF MATERIAL THAT MAY DAMAGE CONDUIT SYSTEM (BOARDS, ROCKS LARGER THAN 1" IN DIAMETER, DEBRIS, ETC.)
- ♦ IF COMPACTION OF TRENCH ROUTE IS REQUIRED FOR PAVING, ETC. BEGIN MACHINE COMPACTION 6" MINIMUM ABOVE CONDUIT.
- ♦ WHERE 36" OF COVER CANNOT BE MAINTAINED, 30" OF COVER WILL BE ALLOWED WITH 3" OF CONCRETE ENCASEMENT AROUND THE CONDUIT. (N.E.S.C. RULE FOR PRIMARY VOLTAGES)

**MATERIAL LIST 6" PVC SCH 40 CONDUIT**

20' LENGTH (BELLED END)	164-34000-5
90° BEND 48" RADIUS	164-25100-2
45° BEND 60" RADIUS	164-61500-4
5° BEND SEGMENT	164-56200-8
22.5° SWEEP 12'-6" RADIUS	164-13100-7
STRAIGHT COUPLING	164-45000-5
REPAIR SLEEVE 6" LONG	164-47540-7
END PLUG	164-63600-7
ELECTRONIC MARKER	590-61601-5
TWINE #18 1/2# ROLL	542-21800-5



**INSTALLATION OF FPL CONDUIT PARALLEL WITH - OR - IN A SHARED TRENCH WITH A FOREIGN UTILITY.**

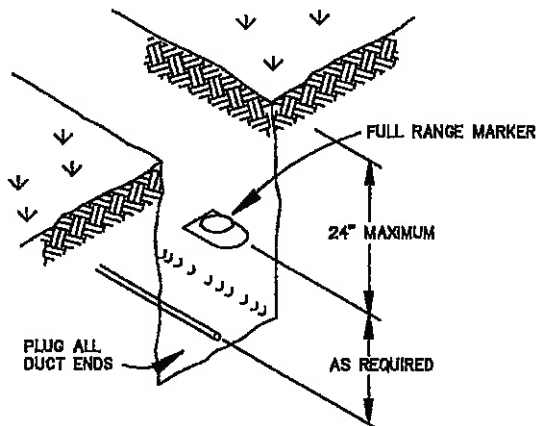
24

**FPL SUPPLIED 6" PVC CONDUIT**  
**TYPICAL CUSTOMER INSTALLATION DETAILS**  
 (PORTIONS OF UN-6, UN-15, CONC. & PAD DETAILS)

UN-15.0.0

# LOCATION OF DUCT OR CABLE ENDS USING ELECTRONIC MARKER SYSTEM TYPICAL INSTALLATION

UN-15.0.0



DUCT ENDS  
FOR CABLE IN CONDUIT

FPL EMS MARKERS	
M&S #	DESCRIPTION
590-61601-5	FULL RANGE, "TOILET SEAT"
590-61610-4	PEG MARKER, EXISTING HANDHOLES
590-61600-7	4" SPHERICAL MARKER



4" SPHERICAL MARKER

## NOTES:

- THE ELECTRONIC MARKER SYSTEM (EMS) IS AN ELECTRONIC ELEMENT TUNED TO A SPECIFIC FREQUENCY FOR FPL CO.
- A TYPICAL INSTALLATION IS SHOWN ABOVE. OTHERS MAY BE:
  - ENDS OF CONDUIT PLACED ACROSS AREAS (PAVED, LANDSCAPED, ETC.) IN ADVANCE OF CABLE INSTALLATION. CABLE WILL BE INSTALLED IN THE CONDUIT ON SUBSEQUENT JOB.
  - TEMPORARY END OF UNDERGROUND CABLES OR CONDUITS.
  - TEMPORARY END OF CUSTOMER CONDUITS THAT FPL WILL EXPOSE AND CONNECT TO.
  - FEEDER CABLE OR DUCT BANK TURNING POINTS NOT EASILY LOCATED FROM ABOVE GROUND REFERENCES.
  - FUTURE HANDHOLE LOCATIONS.
  - AT BOTH ENDS OF A ROAD CROSSING NOT OTHERWISE INDICATED ABOVE.
- THEY ARE NOT GENERALLY USED FOR:
  - MARKING THE ROUTE OF DUCT OR CABLE.
  - MARKING THE ENDS OF SPARE CONDUITS PLACED ALONGSIDE OF EXISTING SECONDARY CABLE.
- CARE SHOULD BE TAKEN IN REMOVAL, AS THE EMS IS A REUSABLE ITEM.
- FULL RANGE MARKERS SHOULD BE SET LEVELED HORIZONTALLY ABOVE CONDUIT OR CABLE TO BE MARKED. SPHERICAL MARKERS CAN BE INSTALLED IN ANY ORIENTATION. PEG MARKERS MUST BE INSTALLED VERTICALLY.
- MARKER SHOULD BE COVERED WITH 4" OF FIRM SOIL TO PREVENT MOVEMENT DURING BACKFILL.
- NOTE SHOULD BE MADE ON WORK SKETCH THAT CABLE OR CONDUIT ENDS ARE TO BE MARKED WITH EMS.

SUPERSEDES UN-15.0.0 LAST REVISED ON 1-29-92



F P L

OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: BLM

DRAWN BY: RAS

DATE: 8/09/96

APPROVED: J.J. MCEVOY

NO SCALE

SUPERVISOR, OH/UG PRODUCT  
SUPPORT SERVICES

4	8/18/05	UPDATE NOTES	RJO	ELS	JJM
3	11/18/03	UPDATE NOTES	RJO	ELS	JJM
2	7/16/01	UPDATE DRAWING (NOTES)	RAP	JES	JJM
1	8/26/99	UPDATE DRAWING (TEXT & CHART)	RAP	JES	JJM
0	8/09/96	ORIGINAL DRAWING	BLM	RAS	JJM
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

UN

1	CONDUIT LOCATIONS FOR 3 PHASE DEAD FRONT PAD MOUNTED TRANSFORMERS WITH SECTIONALIZING (CABLE THRU) UP TO 500KVA USING 2-5" DUCTS FOR PRIMARY CABLES	
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[illegible]

- 1) REFERENCE I-70.0.1 OF THE DCS
- 2) PAD M&S 182-24880-0
- 3) ALL CONDUITS TO EXTEND 3" MAX ABOVE GROUND LEVEL
- 4) ALL SECONDARY /CUSTOMER CONDUITS MUST FIT WITHIN THE 19"x13" AREA INDICATED. WILL HOLD 8-4" CONDUITS MAX.
- 5) ALL CONDUIT RELATED DIMENSIONS ARE TO THE CENTER OF THE DUCT
- 6) MAINTAIN 8' CLEARANCE FROM FRONT AND 3' CLEARANCE FROM SIDES AND REAR OF TRANSFORMER PAD.

## OH & UG DISTRIBUTION SYSTEM STANDARDS

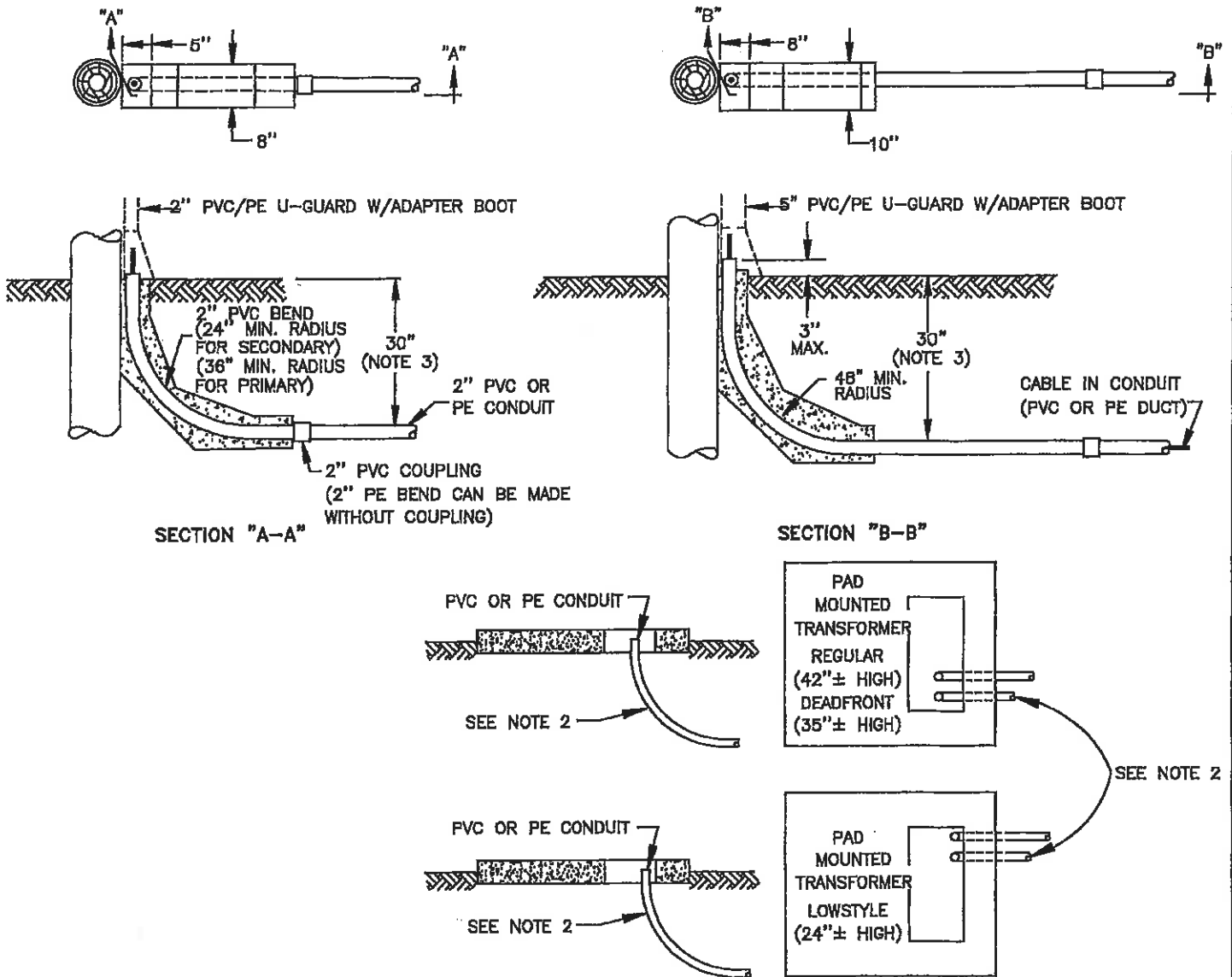
1	05/28/02	UPDATE DRAWING (NOTE 4)	RAP	YES	JM	DATE	APPROVED: J.J. NEEVOY	NO SCALE
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.		SUPERVISOR, OH/UG PRODUCT SUPPORT SERVICES	

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UN-6.0.0

# TYPICAL INSTALLATION OF CONDUIT ELLS AT RISER POLES AND PAD MOUNTED TRANSFORMERS

UN-6.0.0



## NOTES:

1. BENDS AT RISER POLE CAN BE ENCASED IN CONCRETE (3-80LB. BAGS FOR 2" RISER CONDUIT AND 4-80LB. BAGS FOR 5" RISER, SAKRETE M&S #503-10700-1). IF PULL TENSIONS WARRANT, FORM CONCRETE ADJACENT TO POLE AND AT SURFACE.
2. RADIUS VARIES. FOR 2" PVC CONSTRUCTION USE 24" OR 36" RADIUS, M&S #164-23800-6 OR M & S #164-23901-1. PE CONDUIT MAY BE FIELD BENT.
3. NESC RULES REQUIRE MIN. 30" DEPTH FOR PRIMARY VOLTAGE CABLE. WHERE CONCRETE ENCASED, LESSER DEPTHS ARE PERMITTED.

SUPERSEDES UN-6.0.0 LAST REVISED ON 6-30-93



F P L

OH &amp; UG DISTRIBUTION SYSTEM STANDARDS

UN

2	7/13/01	UPDATE DRAWING (NOTES & TEXT)	RAP	JES	JJM
1	8/26/99	UPDATE DRAWING (NOTES & TEXT)	RAP	JES	JJM
0	8/09/96	ORIGINAL DRAWING	BLM	RAS	JJM
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

ORIGINATOR: BLM

DRAWN BY: RAS

DATE: 8/09/96

APPROVED: J.J. MCEVOY

NO SCALE

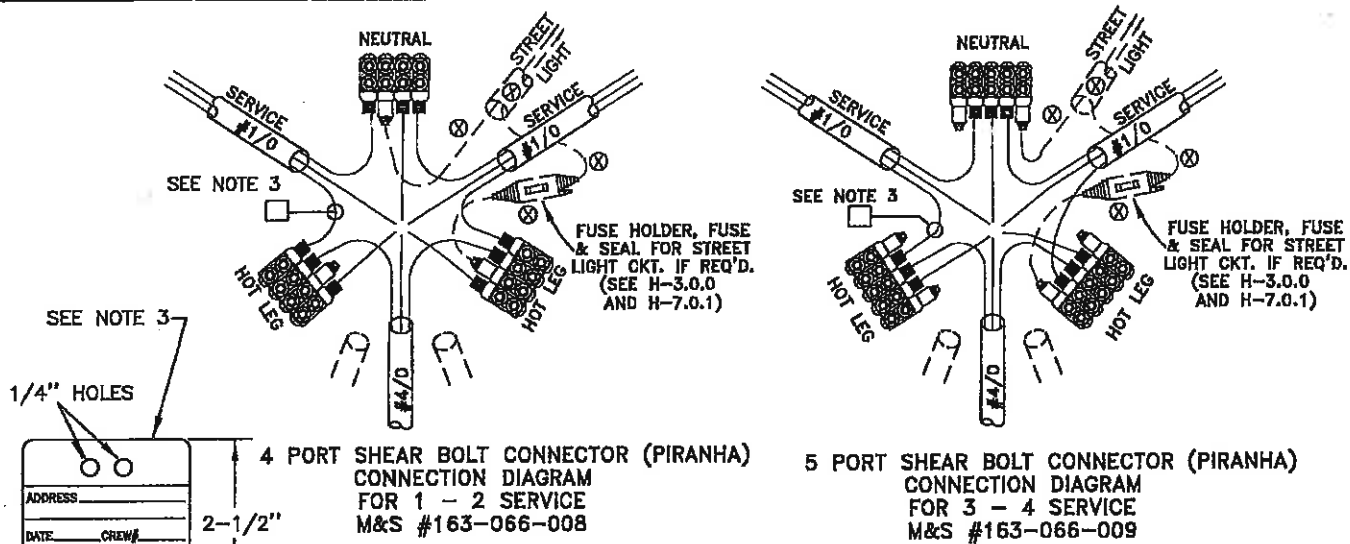
SUPERVISOR, OH/UG PRODUCT  
SUPPORT SERVICES

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L-17.0.7

# **SHEAR BOLT SECONDARY CONNECTORS IN HANDHOLE FOR CONNECTING 2 TO 4 SERVICES**

L-17.0.7



M&amp;S # 549-378-009

**NOTES:**

- FOR ONE SERVICE, SEE UC-5.0.0, UC-6.0.0 AND UC-6.0.2.
- ONLY INSULATED CONDUCTORS MAY BE CONNECTED TO SHEAR BOLT CONNECTORS.
- INSTALL TAG M&S #549-378-009 EVERYTIME A CONNECTOR IS INSTALLED OR REPLACED.
- FOR ADDITIONAL INFORMATION REFER TO L-17.0.9, L-17.0.10 AND L-17.0.11.
- FOR 24" AND 30" HANDHOLES INSTALL ALL CONDUITS AT ONE END OF THE HANDHOLE. BOTH THE 24" AND 30" HANDHOLES COME WITH A SPECIAL STENCIL "TO PLACE ALL CONDUITS AT THE END OF THE HANDHOLES". THIS ALLOWS THE CONDUCTOR TO BE LIFTED OUT OF THE HANDHOLE AND WORK THE CONNECTORS ABOVE GROUND.
- WHEN FIELD CONDITIONS DICTATE THE USE OF FIVE OR MORE CABLES, IT MAY BE BEST TO CONSIDER THE USE OF THE 30" HANDHOLE, AS THIS WILL ALLOW ADDITIONAL ROOM TO WORK THE CONNECTIONS.
- A 24" HEAVY DUTY HANDHOLE (M&S #162-120-500) IS ALSO AVAILABLE FOR USE IN SIDEWALKS, DRIVEWAYS AND PARKING LOTS. NOT FOR USE IN ROADWAYS OR AREAS OF DELIBERATE TRAFFIC.

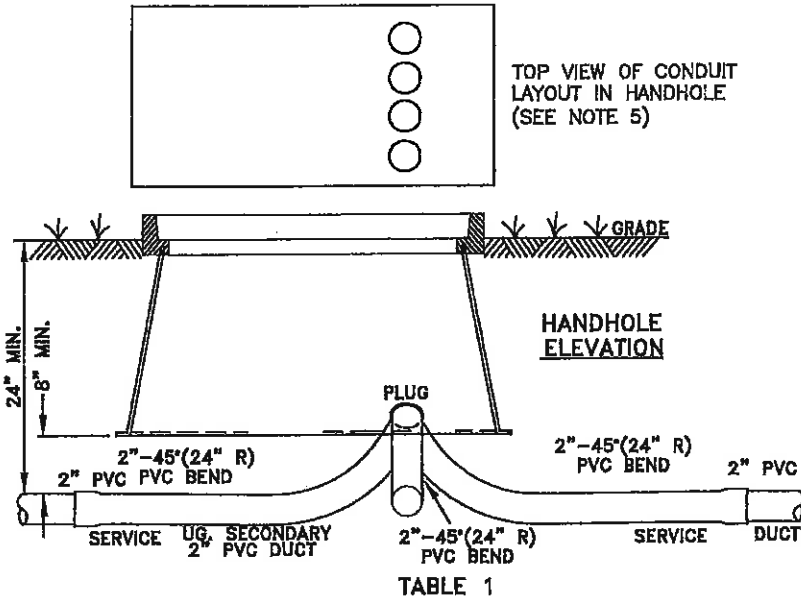


TABLE 1

CABLES	CONNECTORS	HANDHOLE
1/0 SECONDARY, #6 DUPLEX AND 12CU FOR STREET LIGHT	163-066-008 (4 PORT)	162-304-001 (15.5"x10.5"x18" DEEP)
1/0 SECONDARY, AND 1/0 SERVICES, UP TO 4 SERVICES	163-066-009 (5 PORT)	162-120-008 (24"x13"x18" DEEP)
4/0 SECONDARY, AND 1 OR 2 SERVICES	163-066-008 (4 PORT)	162-120-008 (24"x13"x18" DEEP)
4/0 SECONDARY, AND 3 OR 4 SERVICES	163-066-009 (5 PORT)	162-120-008 (24"x13"x18" DEEP)
250 MCM TO 350 MCM	163-066-010 (5 PORT)	162-100-007 (30"x17"x18" DEEP)
350 MCM TO 500 MCM (NO MORE THAN 4 SETS)	163-066-011 (5 PORT)	162-100-007 (30"x17"x18" DEEP)
400 MCM TO 500 MCM (NO MORE THAN 4 SETS)	163-017-502 (6 PORT)	162-100-007 (30"x17"x18" DEEP)
400 MCM TO 500 MCM (NO MORE THAN 5 SETS)	163-017-502 (6 PORT)	162-121-004 (48"x30"x36" DEEP)
600 MCM TO 750 MCM	163-017-502 (6 PORT)	162-121-004 (48"x30"x36" DEEP)
FOR TRAFFIC LOADING USE HANDHOLE		162-122-892 (32"x50"x36" DEEP)
		162-122-893 (17"x30"x18" DEEP)

22	12/7/17	UPDATE TABLE	ARR	ELS	RDH
21	11/3/17	UPDATE TABLE	ARR	ELS	RDH
20	10/24/16	ADD NOTE 7	ARR	ELS	RDH
19	9/27/16	UPDATE TABLE AND DRAWING	ARR	ELS	RDH
18	5/12/16	UPDATE DRAWING AND NOTES	ARR	ELS	RDH
17	11/11/14	UPDATE TABLE	ARR	ELS	RDH
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

**F P L**

28

OH &amp; UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: SMS

DRAWN BY: RAS

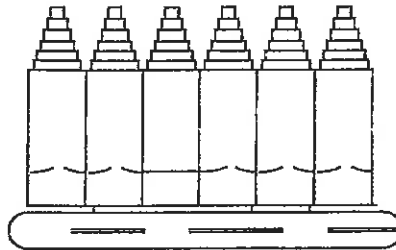
DATE: 8/09/96 APPROVED: J.R. "PEPE" DIAZ NO SCALE  
RELIABILITY ENGINEERING MANAGER

L-17.0.8

# INSTALLATION INSTRUCTIONS FOR UG MULTITAP CONNECTORS #400-750MCM CABLES

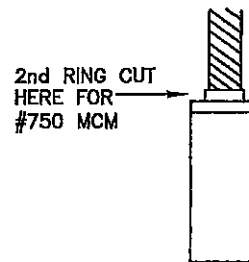
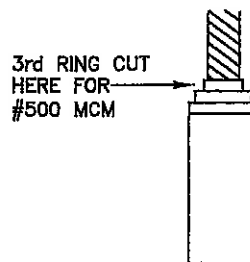
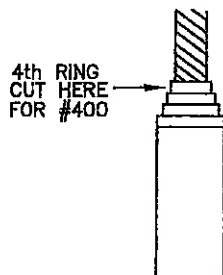
L-17.0.8

M&S #163-017-502  
(6 PORT CONNECTOR)



## INSTALLATION STEPS :

1. IDENTIFY THE CONDUCTOR SIZE BEING USED AND CUT ROCKET TO CORRECT RING SIZE .



2. WIPE CONDUCTOR JACKET CLEAN , APPLY SILICON GREASE AND SLIDE CUT ROCKET OVER CONDUCTOR .
3. **REMOVE ANY EXCESS SILICON GREASE**, STRIP 2-1/4" OF INSULATION FROM CONDUCTOR (REMOVE ANT DAMAGE CONDUCTOR, I.E., BURNED INSULATION, BROKEN STRANDS) DO NOT USE A KNIFE FOR REMOVING INSULATION, USE THE APPROVED 4 WAY STRIPPER INSTEAD.
4. WIRE BRUSH THE CONDUCTOR THOROUGHLY TO BREAK UP SURFACE OXIDES ADD INHIBITOR AND WIRE BRUSH AGAIN INTO STRANDS.
5. INSERT CONDUCTOR INTO THE CONNECTOR'S PORT LEAVING A MAXIMUM OF 1/4" BARE CONDUCTOR EXPOSED.
6. TIGHTEN BOTH SETS OF SCREWS ON THE CONDUCTOR TO A TORQUE VALUE OF 30FT-LBS (FOR #400-#750MCM CABLES).
7. SLIDE ROCKET OVER THE PORT AND ON TO THE PVC SHOULDER OF THE CONNECTORS. MAKE SURE THAT A TIGHT FIT IS ACCOMPLISHED BETWEEN THE CONNECTORS BODY AND THE ROCKET.

## NOTES :

FOR ADDITIONAL INFORMATION REFER TO PAGES UC-1.0.1. AS WELL AS MANUFACTURER INSTALLATION INSTRUCTIONS PROVIDED WITH EACH CONNECTOR.

REFER TO DCS PAGE L-17.0.7 FOR ADDITIONAL INFORMATION.

5	4/20/15	UPDATE M&S NUMBER	ARR	ELS	RDH
4	11/3/11	UPDATE NOTE 3 AND 7	ARR	ELS	WM
3	1/20/11	UPDATE TITLE BAR, DWG & NOTES	ARR	ELS	BXN
2	5/15/09	UPDATE TITLE BAR & NOTES	ARR	ELS	JRD
1	9/24/08	UPDATE NOTES	ARR	ELS	JRD
0	7/12/07	ORIGINAL DRAWING	ARR	ELS	JRD
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

F P L

29

OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: AR

DRAWN BY: ELS

DATE: 7/12/07

APPROVED: JOSE R. DIAZ

MANAGER, RELIABILITY ENGINEERING

NO SCALE

L-17.0.9

# **SHEAR HEAD BOLT CONNECTOR FOR CONNECTING 2 TO 4 SERVICES IN HANDHOLES**

L-17.0.9

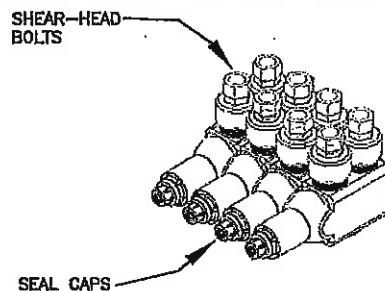
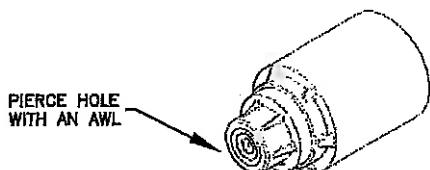
## **INSTALLATION INSTRUCTIONS FOR UNDERGROUND CONNECTORS**

**M&S #163-066-008 (4 PORT) & M&S #163-066-009 (5 PORT)**

**STEP 1** LOOSEN, BUT DO NOT REMOVE THE SHEAR-HEAD BOLTS ON THE PORT/PORTS TO BE USED.

**STEP 2A** FOR #4/0 AND #1/0 CABLES REMOVE THE SEAL CAP.

**STEP 2B** FOR #2,#6,#10 AND #12 CABLES LEAVE THE SEAL CAP IN PLACE AND PIERCE A SMALL HOLE IN THE END OF THE SEAL CAP USING AN AWL. MAKE SURE TO "BUNDLE UP" THE CABLES UP TO 3 TIMES FOR A PROPER CONNECTION BETWEEN THE SHEAR BOLTS, THE CABLE AND THE TEETH IN THE PORTS OF THE CONNECTORS.



**STEP 3** FOR #1/0 AND #4/0 CABLES, CUT THE END OF THE CABLES AT A SLIGHT ANGLE (NO MORE THAN 25°) TO FACILITATE THE INSERTION INTO THE PORT. DO NOT STRIP THE CABLE INSULATION.

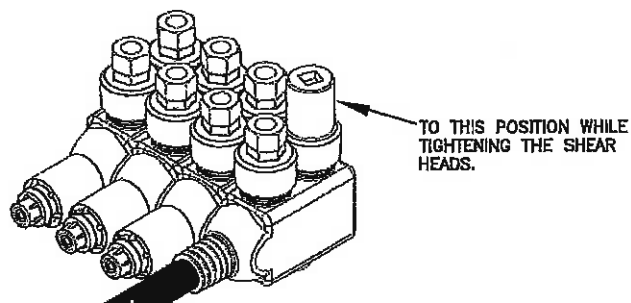
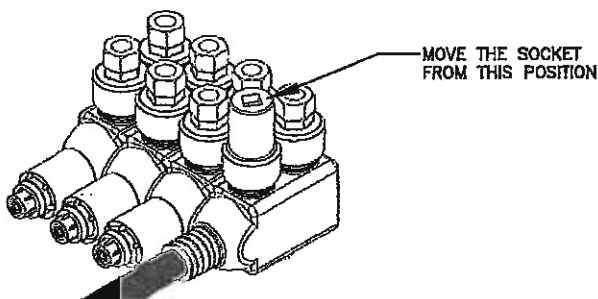


**STEP 4** WIPE THE CONDUCTOR CLEAN AND APPLY SILICON GREASE TO THE CABLE TO AID IN THE INSERTION PROCESS. FOR #4/0 CABLES PRE-PUNCH THE PORTS WITH A PIECE OF #1/0 CABLE.

**STEP 5** MARK CABLE JACKET WITH VINYL TAPE OR GREASE PENCIL AT A DISTANCE OF 4 1/2" FROM THE END TO MAKE SURE THAT CONDUCTOR IS FULLY INSERTED.



**STEP 6** HAND TIGHTEN THE SHEAR BOLTS ON THE USED PORTS. USE A SHORT SIX-POINT 3/4 INCH SOCKET (M&S #594-955-002) ON A BATTERY OPERATED IMPACT DRIVER (MAKE SURE THE BATTERY IS FULLY CHARGED) TO AVOID ROUNDING THE SHEAR-HEADS. TIGHTEN THE BOLTS ON PORTS USED, GOING FROM THE SHEAR-HEAD CLOSEST TO THE CONDUCTOR TO THE OTHER ON THE SAME CONDUCTOR, UNTIL THE SHEAR-HEAD OPERATES. ENSURE THAT THE SOCKET FULLY ENGAGES THE SHEAR-HEAD EACH TIME. FOR SHEAR BOLTS REMOVAL USE A SHORT SIX-POINT 11/16 INCH SOCKET (M&S #594-955-003).



**STEP 7** ENSURE ALL SHEAR HEAD BOLTS ON USED PORTS HAVE BEEN "SHEARED OFF", THAT SEAL CAPS ARE NOT MISSING ON UNUSED PORTS AS WELL AS NO LOOSE SHEAR-HEAD BOLTS.

### NOTES:

- M&S #163-066-064, SHEAR BOLT FOR 4 AND 5 PORT PIRANHAS WITH A #6-#4/0 CABLE SIZES.
- FOR CONNECTING #250-350MCM CABLES USE M&S #163-066-010. SEE TABLE I ON PAGE L-17.0.7.

6	5/22/16	ADD NOTE 1	ARR	ELS	RDH
5	12/21/10	UPDATE STEP 2B	ARR	ELS	BXN
4	1/12/10	UPDATE STEP 3,4 AND 6	ARR	ELS	JRD
3	11/3/09	UPDATE STEP 6 & ADDED NOTE	ARR	ELS	JRD
2	9/29/09	ADDED M&S #594-955-002 ON STEP 6	ARR	ELS	AEL
1	4/9/09	UPDATE NOTES	ARR	ELS	AEL
0	11/11/08	ORIGINAL DRAWING	ARR	ELS	AEL
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

**F P L**

**OH & UG DISTRIBUTION SYSTEM STANDARDS**

ORIGINATOR: ARR

DRAWN BY: E.SCHILLING

DATE: 10/14/08

APPROVED: ARI LIMA  
LEAD SUPERVISOR, UG PRODUCTS

NO SCALE

30

L-17.0.10

# **SHEAR HEAD BOLT CONNECTOR FOR CONNECTING 2 TO 4 SERVICES IN HANDHOLES FOR #4/0, #250-#350MCM CABLES**

L-17.0.10

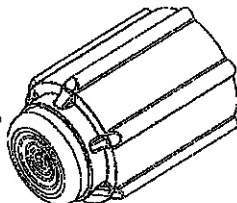
## **INSTALLATION INSTRUCTIONS FOR UNDERGROUND CONNECTORS** **M&S #163-066-010 (5 PORT)**

**STEP 1** LOOSEN, BUT DO NOT REMOVE THE SHEAR-HEAD BOLTS ON THE PORT/PORTS TO BE USED.

**STEP 2A** FOR #4/0, #250 AND #350MCM CABLES REMOVE THE SEAL CAP.

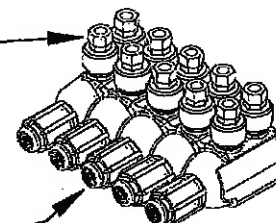
**STEP 2B** FOR #1/0 CABLES LEAVE THE SEAL CAP IN PLACE AND CUT THE TOP OF THE CAP RING.

CUT THE TOP OF  
THE CAP RING AT  
THIS LOCATION



SHEAR-HEAD  
BOLTS

SEAL CAPS

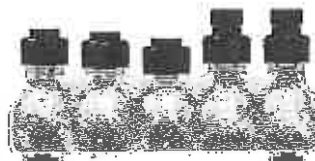


**STEP 3** CUT THE END OF THE CABLES AT A SLIGHT ANGLE (NO MORE THAN 25°) TO FACILITATE THE INSERTION INTO THE PORT. DO NOT STRIP THE CABLE INSULATION.

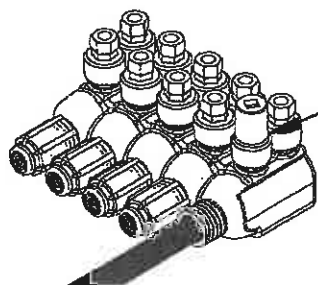


**STEP 4** WIPE THE CONDUCTOR CLEAN AND APPLY SILICON GREASE TO THE CABLE TO AID IN THE INSERTION PROCESS. FOR #4/0, #250 AND #350 CABLES PRE-PUNCH THE PORTS WITH A PIECE OF #4/0 CABLE.

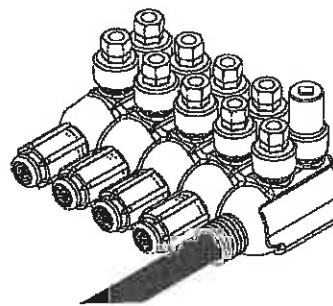
**STEP 5** MARK CABLE JACKET WITH VINYL TAPE OR GREASE PENCIL AT A DISTANCE OF 4 1/2" FROM THE END TO MAKE SURE THAT CONDUCTOR IS FULLY INSERTED.



**STEP 6** HAND TIGHTEN THE SHEAR BOLTS ON THE USED PORTS. USE A SHORT SIX-POINT 3/4 INCH SOCKET (M&S #594-955-002) ON A BATTERY OPERATED IMPACT DRIVER (MAKE SURE THE BATTERY IS FULLY CHARGED) TO AVOID ROUNDING THE SHEAR-HEADS. TIGHTEN THE BOLTS ON PORTS USED, GOING FROM THE SHEAR-HEAD CLOSEST TO THE CONDUCTOR TO THE OTHER ON THE SAME CONDUCTOR, UNTIL THE SHEAR-HEAD OPERATES. ENSURE THAT THE SOCKET FULLY ENGAGES THE SHEAR-HEAD EACH TIME. FOR SHEAR BOLTS REMOVAL USE A SHORT SIX-POINT 11/16 INCH SOCKET (M&S #594-955-003).



MOVE THE SOCKET  
FROM THIS POSITION



TO THIS POSITION WHILE  
TIGHTENING THE SHEAR  
HEADS.

**STEP 7** ENSURE ALL SHEAR HEAD BOLTS ON USED PORTS HAVE BEEN "SHEARED OFF", THAT SEAL CAPS ARE NOT MISSING ON UNUSED PORTS AS WELL AS NO LOOSE SHEAR-HEAD BOLTS.

NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

**F P L**

**OH & UG DISTRIBUTION SYSTEM STANDARDS**

ORIGINATOR: ARR

DRAWN BY: E.SCHILLING

DATE: 1/26/2010 APPROVED: ARI LIMA  
LEAD SUPERVISOR, UG PRODUCTS

NO SCALE

31



L-17.0.11

# **SHEAR HEAD BOLT CONNECTOR FOR CONNECTING 2 TO 4 SERVICES IN HANDHOLES FOR #350-#500MCM CABLES**

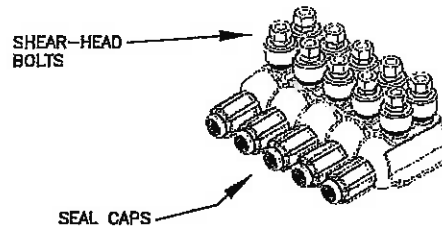
L-17.0.11

## **INSTALLATION INSTRUCTIONS FOR UNDERGROUND CONNECTORS**

**M&S #163-066-011 (5 PORT)**

**STEP 1** LOOSEN, BUT DO NOT REMOVE THE SHEAR-HEAD BOLTS ON THE PORT/PORTS TO BE USED.

**STEP 2A** FOR #350MCM AND #500MCM CABLES REMOVE THE SEAL CAP.

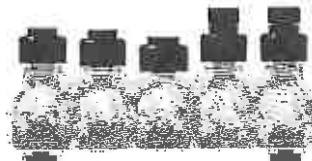


**STEP 3** CUT THE END OF THE CABLES AT A SLIGHT ANGLE (NO MORE THAN 25°) TO FACILITATE THE INSERTION INTO THE PORT. DO NOT STRIP THE CABLE INSULATION.

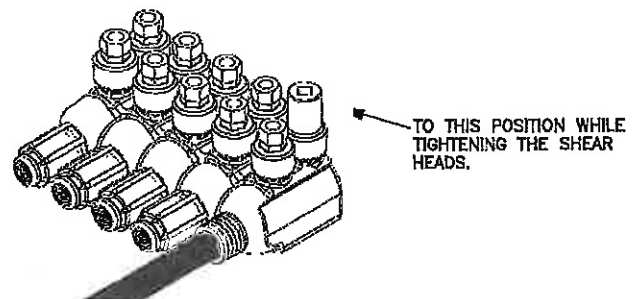
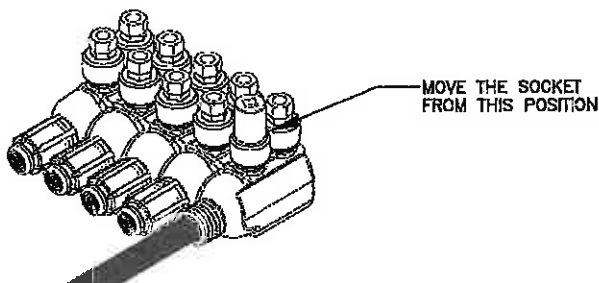


**STEP 4** WIPE THE CONDUCTOR CLEAN AND APPLY SILICON GREASE TO THE CABLE TO AID IN THE INSERTION PROCESS. PRE-PUNCH THE PORTS WITH A PIECE OF #4/0 CABLE.

**STEP 5** MARK CABLE JACKET WITH VINYL TAPE OR GREASE PENCIL AT A DISTANCE OF 4 1/2" FROM THE END TO MAKE SURE THAT CONDUCTOR IS FULLY INSERTED.



**STEP 6** HAND TIGHTEN THE SHEAR BOLTS ON THE USED PORTS. USE A SHORT SIX-POINT 3/4 INCH SOCKET (M&S #594-955-002) ON A BATTERY OPERATED IMPACT DRIVER (MAKE SURE THE BATTERY IS FULLY CHARGED) TO AVOID ROUNDING THE SHEAR-HEADS. TIGHTEN THE BOLTS ON PORTS USED, GOING FROM THE SHEAR-HEAD CLOSEST TO THE CONDUCTOR TO THE OTHER ON THE SAME CONDUCTOR, UNTIL THE SHEAR-HEAD OPERATES. ENSURE THAT THE SOCKET FULLY ENGAGES THE SHEAR-HEAD EACH TIME. FOR SHEAR BOLTS REMOVAL USE A SHORT SIX-POINT 11/16 INCH SOCKET (M&S #594-955-003).



**STEP 7** ENSURE ALL SHEAR HEAD BOLTS ON USED PORTS HAVE BEEN "SHEARED OFF", THAT SEAL CAPS ARE NOT MISSING ON UNUSED PORTS AS WELL AS NO LOOSE SHEAR-HEAD BOLTS.

NO.	DATE	REVISION	ORIG.	DRAWN	APPR.



F P L

OH &amp; UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: ARR

DRAWN BY: E.SCHILLING

DATE: 4/22/14

APPROVED: RICK HUFF

MANAGER OF ELECTRICAL STANDARDS

NO SCALE

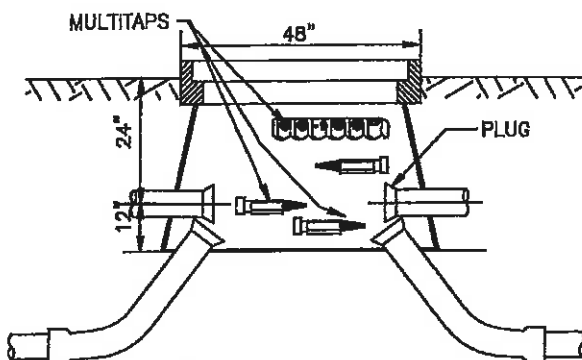
32



UN-19.0.0

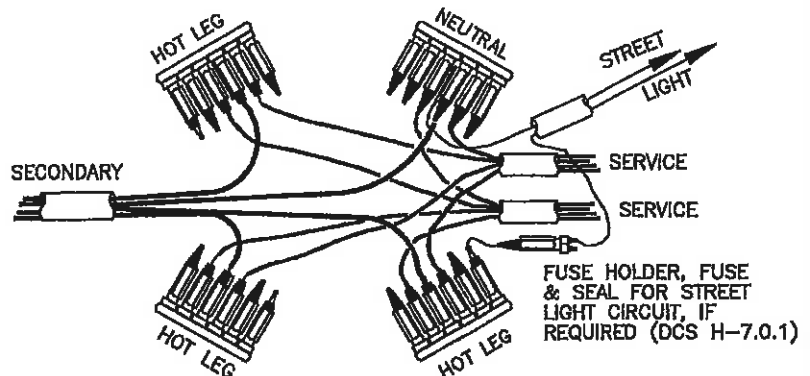
# MULTITAP CONNECTORS IN HANDHOLE (30"x48"x36") FOR CONNECTING 2 TO 5 SERVICES AND 1/O PRIMARY SPLICE BOX

UN-19.0.0

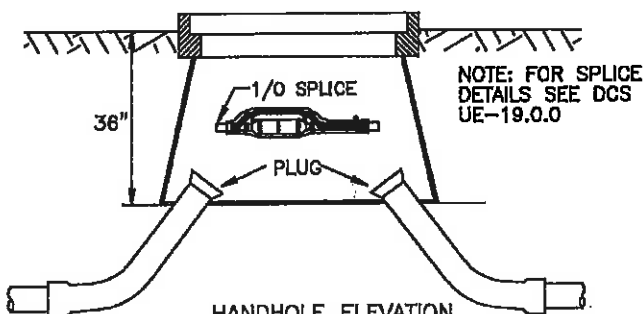
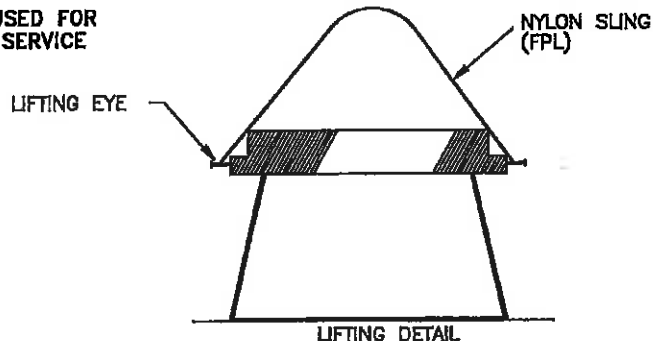


NOTE: KNOCKOUTS  
WILL ACCOMMODATE  
5" PVC 2 KNOCKOUTS  
EACH SIDE

HANDHOLE ELEVATION

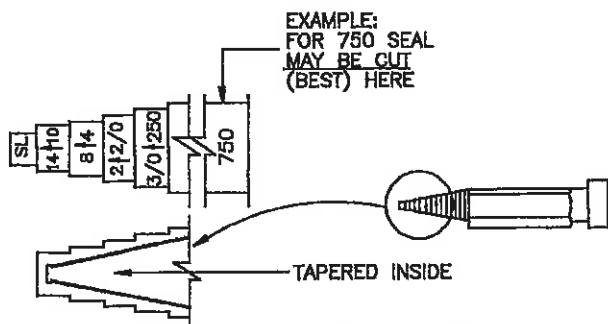


FOR EASE OF INSTALLATIONS TRAIN THE CABLES  
ABOVE GRADE, INSTALL THE MULTITAP CONNECTORS,  
THEN INSTALL INSIDE HANDHOLE

CONNECTION DIAGRAM  
(EXPANDED)HANDHOLE USED FOR  
SECONDARY SERVICEHANDHOLE ELEVATION  
HANDHOLE USED AS A 1/O PRIMARY SPLICE BOXLIFTING DETAIL  
HANDHOLE MAY BE LIFTED WITH  
OR WITHOUT COVER IN PLACE

## NOTES:

1. MAXIMUM 1 SECONDARY CONDUIT WITH 2 TO 5 SERVICES.
2. MAXIMUM 3 SPLICES.
3. PROVIDE GROUNDING FOR ANY RUN GREATER THAN 650FT, INSTALL GROUND RODS AT THE 48" HANDHOLES TO GROUND THE CABLE. IF A HANDHOLE IS BEING INSTALLED IN A RUN FOR "CONVENIENCE" (TOO MANY BENDS IN THE RUN, CUTTING INTO A LOOP TO EXTEND INTO A CUL-DE-SAC, REPAIRING A DIG IN, ECT.) THERE IS NO NEED FOR THE GROUND RODS.
4. 6-PORT MULTITAP CONNECTOR M&S #163-017-502 WILL ACCOMMODATE #1/O CABLE AND #400-#750 MCM COPPER OR ALUMINUM CABLES
5. WEIGHT:  
2 PIECE LID = 82 LBS. EACH  
BODY = 190 LBS.
6. LIFTING:  
COVER MAY BE LIFTED WITH THE HANDHOLE LID LIFTER (HOOK) TOOL M&S #593-930-021.
7. COMPLETE HANDHOLE, INCLUDES COVER M&S #162-121-004.
8. REPLACEMENT COVER M&S #162-121-012.
9. HANDHOLE SHOULD NOT BE EXPOSED TO VEHICULAR TRAFFIC, SUCH AS STREETS, PARKING LOTS, OR DRIVEWAYS.
10. FOR DRIVEWAY LOADING HANDHOLE 32"x50"x36" DEEP, USE M&S #162-122-892. (UX-202.0.0) APPROXIMATE WEIGHT 2,663 LBS.

MULTITAP CONNECTOR M&S 163-017-502  
FLOOD SEAL

8	7/28/11	UPDATE NOTE 3	ARR	ELS	BXN
7	2/4/10	UPDATE NOTE 4	ARR	ELS	JRD
6	6/16/08	UPDATE NOTES	GAP	ELS	JJM
5	8/16/05	UPDATE NOTES	RJO	ELS	JJM
4	11/18/03	UPDATE NOTES	RJO	ELS	JJM
3	7/16/01	UPDATE DRAWING (NOTES)	RAP	JES	JJM
2	9/27/99	UPDATE DRAWING (NOTES)	RAP	JES	JJM
1	8/09/96	ADDED EMS & NOTES 9, 10, & 11	SMS	RAS	JJM
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

F P L

34

OH & UG DISTRIBUTION SYSTEM STANDARDS  
SUPERSEDES UN-19.0.0 LAST REVISED ON 9-30-94

ORIGINATOR: SMS

DRAWN BY: SMS

DATE: 9/30/94

APPROVED: J.J. MCEVOY  
SUPERVISOR, OH/UG PRODUCT  
SUPPORT SERVICES

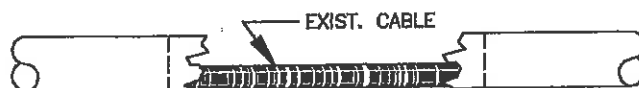
NO SCALE

UN-25.0.0

# REPAIR OF OCCUPIED DIRECT BURIED CONDUIT SIZES 2, 4, 5 & 6

UN-25.0.0

STEP 1 AFTER LOCATING DAMAGED CONDUIT.....



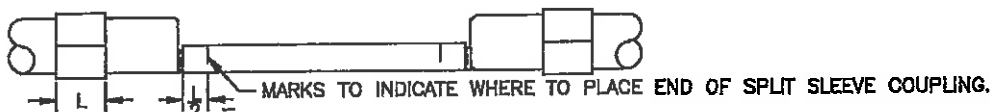
STEP 2 CUT DAMAGED ENDS SQUARELY USING NYLON TWINE AND DEBUR INSIDE EDGE. BEVEL ANY SHARP EDGES. WIPE ENDS WITH A CLEAN, DRY CLOTH, INSIDE AND OUT. REMOVE ANY DEBRIS FROM INSIDE DUCT.



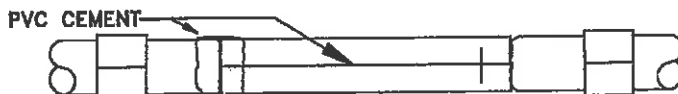
STEP 3 SLIDE SPLIT SLEEVE COUPLING OVER EACH CONDUIT SECTION. ENSURE ALL SECTIONS ARE CLEAN AND DRY.



STEP 4 PLACE ONE SECTION OF SPLIT CONDUIT UNDER CABLE IN LINE WITH PIPE AND MARK THE SPOT WHERE THE SPLIT SLEEVE COUPLING SHOULD FIT.



STEP 5 PLACE TOP SECTION OF SPLIT CONDUIT OVER CABLE AND SNAP THE INTERLOCKING SECTIONS TOGETHER. APPLY PVC CEMENT AS REQUIRED.



STEP 6 SLIP SLEEVE OVER DAMAGED END AND REPAIR SECTION. WHILE CEMENT IS STILL WET, TURN CONDUIT 1/4 TURN TO DISTRIBUTE CEMENT EVENLY AND ENSURE SNUG FIT. HOLD JOINT TOGETHER APPROXIMATELY ONE MINUTE TO ALLOW CEMENT TO SET. WIPE EXCESS OFF.



STEP 7 REPEAT STEP 6 FOR THE OTHER SIDE OF THE REPAIR SECTION. TY-RAPS ARE OPTIONAL.



## MATERIAL LIST

M&S #	SPLIT COUPLING	SPLIT CONDUIT
164-28100-9		2" X 10' LONG
164-28200-5	2" X 6" LONG	
164-28140-8		4" X 10' LONG
164-28300-1	4" X 8" LONG	
164-28150-5		5" X 10' LONG
164-28400-8	5" X 9" LONG	
164-28160-2		6" X 10' LONG
164-28500-4	6" X 10" LONG	
522-14100-7	PVC CEMENT	
594-40600-7	18" HAND SAW	

F P L

35

OH &amp; UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: BLM

DRAWN BY: RAS

DATE: 8-9-96

APPROVED: J.J. MCEVOY

NO SCALE

SUPERVISOR, OH/UG PRODUCT  
SUPPORT SERVICES

1 7/16/01

UPDATE MATERIAL LIST

RAP

JES

JJM

NO.

DATE

REVISION

ORIG.

DRAWN

APPR.

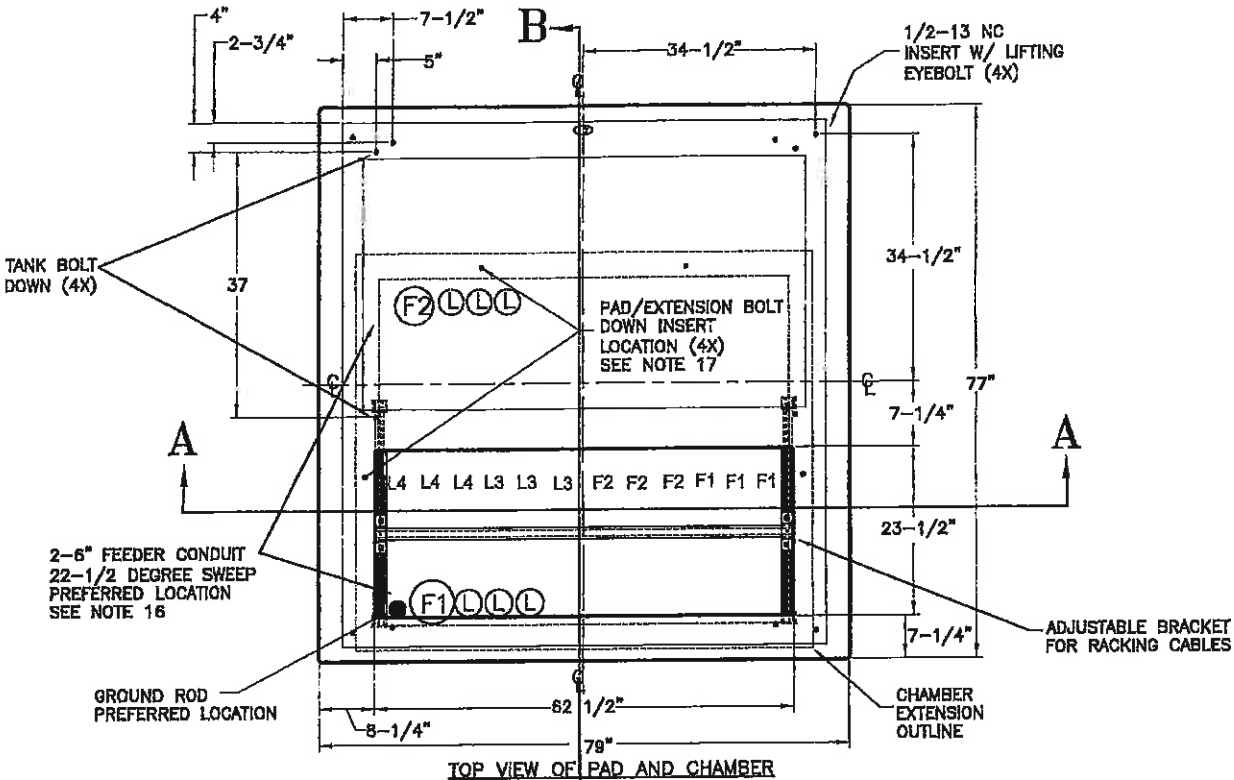
UN

C-46.0.0

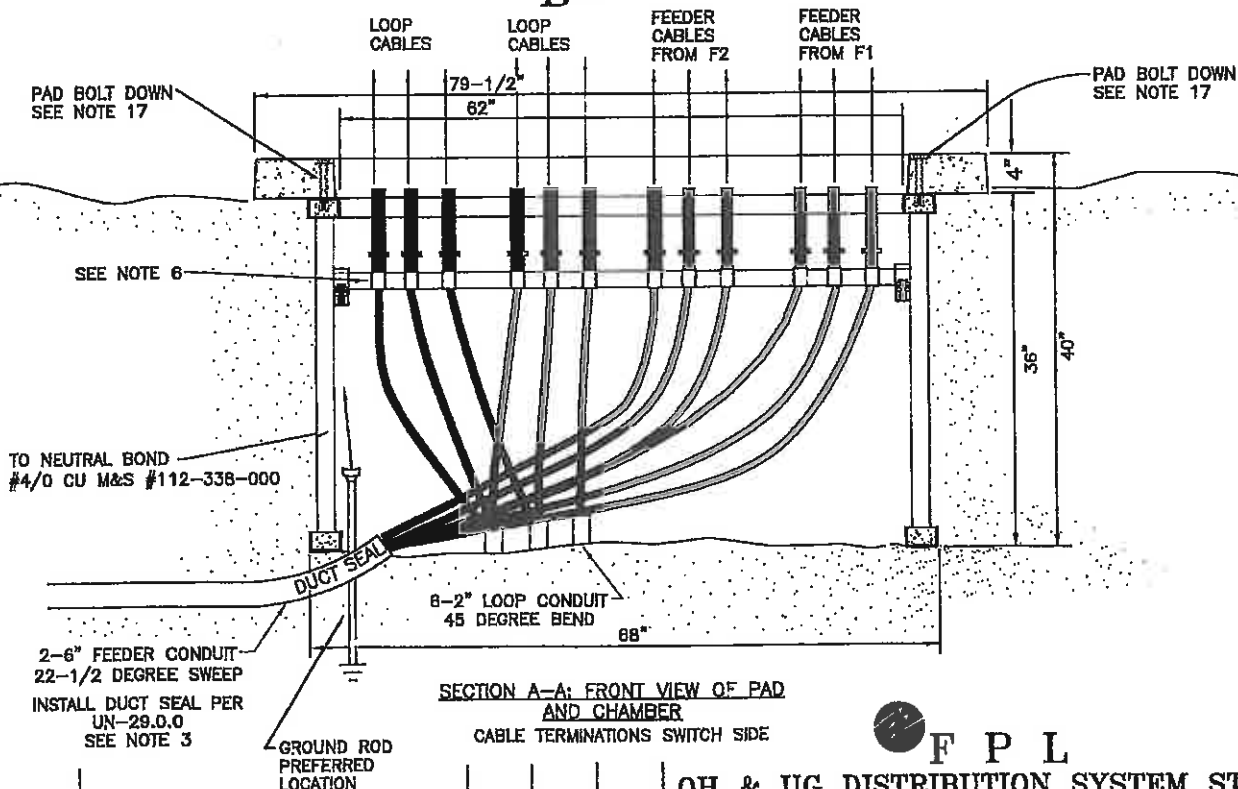
# TYPICAL INSTALLATION OF 25KV S&C VISTA THREE PHASE SWITCH FOR USE IN 13KV OR 23KV BELOW GRADE AND PAD MOUNTED APPLICATIONS

C-46.0.0

TYPICAL BUSHING POSITION ON VISTA SWITCH MODEL 422 SHOWN  
F=FEEDER L=LATERAL



TOP VIEW OF PAD AND CHAMBER

SECTION A-A: FRONT VIEW OF PAD AND CHAMBER  
CABLE TERMINATIONS SWITCH SIDE

F P L

OH &amp; UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: A. PANTOURIS

DRAWN BY: E. SCHILLING

DATE: 5/29/09

APPROVED: ARI LIMA

NO SCALE

LEAD SUPERVISOR, UG SERVICES

NO.	DATE	REVISION	ORIG.	DRAWN	APPR.
1	11/14/12	LOOP CABLE IDENTIFICATION	JGV	ELS	WM

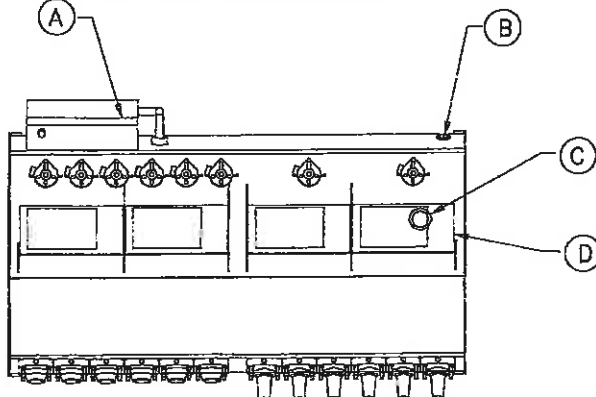
C-46.0.1

# TYPICAL INSTALLATION OF 25KV S&C VISTA THREE PHASE SWITCH FOR USE IN 13KV OR 23KV BELOW GRADE AND PAD MOUNTED APPLICATIONS

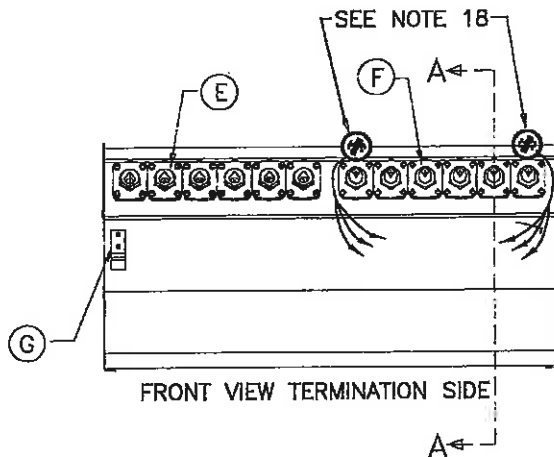
C-46.0.1

TYPICAL VISTA SWITCH MODEL 422 SHOWN

TOP VIEW OPERATION SIDE



TOP VIEW TERMINATION SIDE

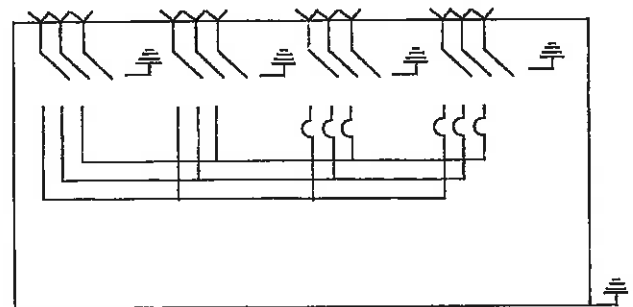


FRONT VIEW TERMINATION SIDE

## FEATURES IN THIS ASSEMBLY

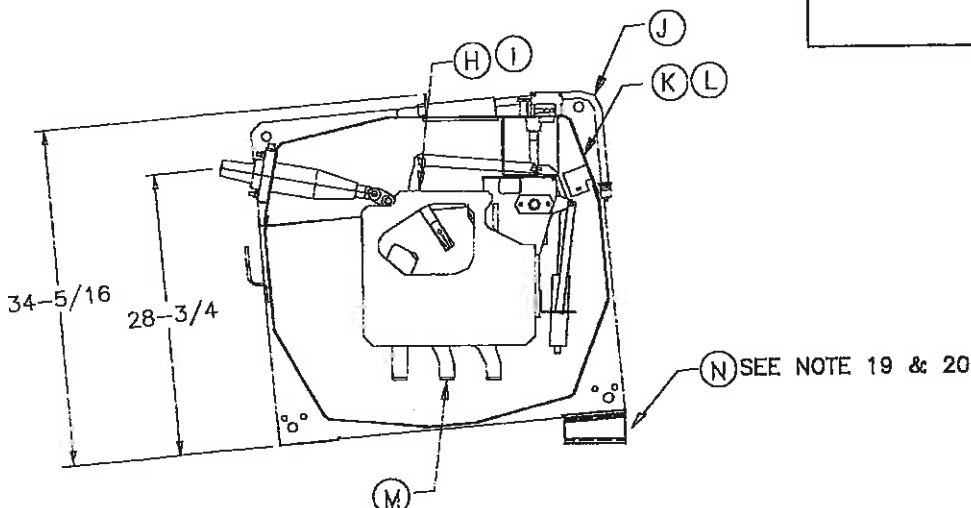
- A. OVERCURRENT CONTROL
- B. GAS FILL PORT
- C. PRESSURE GAUGE
- D. WINDOW FOR VIEWING OPEN GAP AND GROUND POSITION OF LOAD-INTERRUPTER SWITCH OR FAULT INTERRUPTER
- E. 200-AMPERE BUSHING-WELLS FOR FAULT-INTERRUPTER
- F. 600-AMPERE BUSHINGS FOR LOAD-INTERRUPTER SWITCH
- G. TWO-HOLE GROUND PAD
- H. 600-AMPERE THREE-POLE LOAD-INTERRUPTER SWITCH WITH GROUND POSITION
- I. OPERATING MECHANISM
- J. MANUAL OPERATING HANDLE
- K. NAMEPLATE
- L. SUBMERSIBLE SF6-INSULATED TANK
- M. 600-AMPERE ALUMINUM BUS
- N. BASE BRACKET

TERMINATION SIDE



OPERATION SIDE

CONNECTION DIAGRAM



SECTION A-A: FEEDER SWITCH

F P L

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## OH &amp; UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: A. PANTOURIS

DRAWN BY: E. SCHILLING

DATE: 7/27/09

APPROVED: ARI LIMA

NO SCALE

LEAD SUPERVISOR, UG SERVICES

1	11/14/12	CHANGE C-46.0.2 TO C-46.0.1
NO.	DATE	REVISION

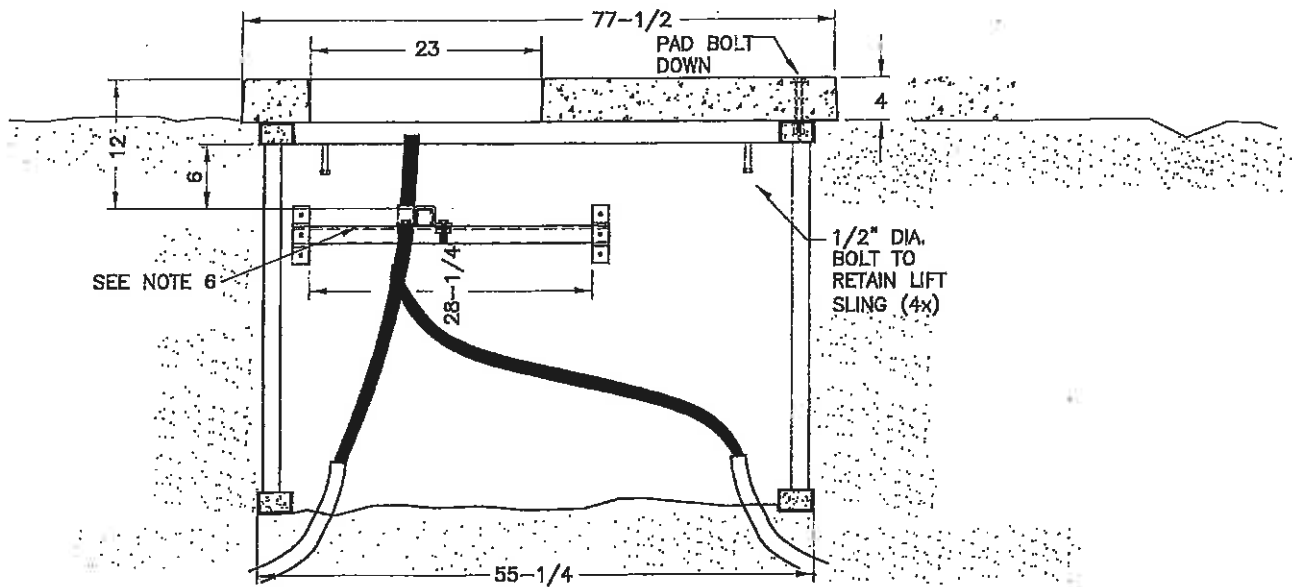
JGV	ELS	WM
ORIG.	DRAWN	APPR.



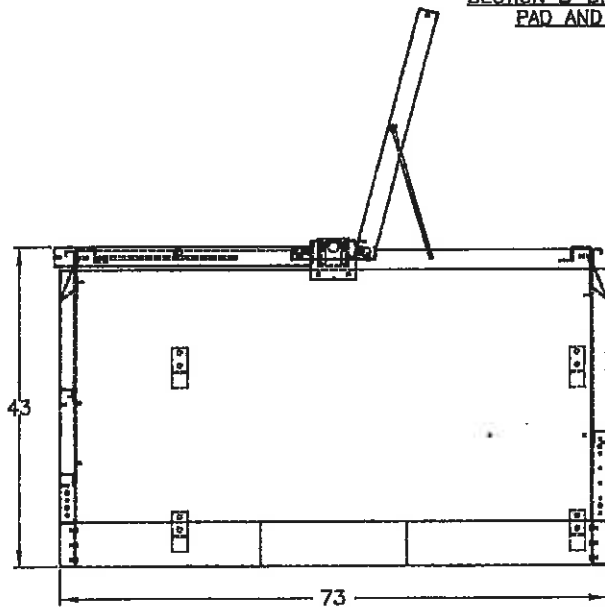
C-46.0.3

**TYPICAL INSTALLATION OF 25KV S&C VISTA  
THREE PHASE SWITCH FOR USE IN 13KV OR 23KV  
BELOW GRADE AND PAD MOUNTED APPLICATIONS**

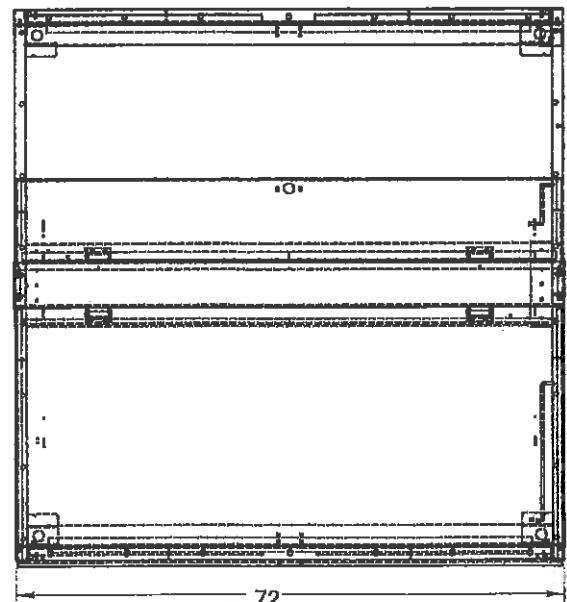
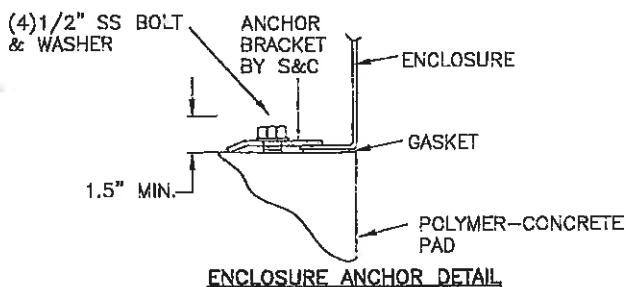
C-46.0.3



**SECTION B-B: SIDE VIEW OF  
PAD AND CHAMBER**



**SWITCH ENCLOSURE SIDE VIEW**



**SWITCH ENCLOSURE TOP VIEW**



39

**OH & UG DISTRIBUTION SYSTEM STANDARDS**

ORIGINATOR: A. PANTOURIS

DRAWN BY: E. SCHILLING

DATE: 7/27/09

APPROVED: ARI LIMA

NO SCALE

LEAD SUPERVISOR, UG SERVICES

NO.	DATE	REVISION	ORIG.	DRAWN	APPR.
1	11/14/12	CHANGE C-46.0.1 TO C-46.0.3	JGV	ELS	WM



C-46.0.4

# TYPICAL INSTALLATION OF 25KV S&C VISTA THREE PHASE SWITCH FOR USE IN 13KV OR 23KV BELOW GRADE AND PAD MOUNTED APPLICATIONS

C-46.0.4

## MATERIAL LIST

ITEM	DESCRIPTION	QUANTITY	M&S NUMBER	WMS CU
1	VISTA 422 (4 "WAYS", 2-THREE PHASE FEEDER GANG SWITCHES AND TWO-THREE PHASE, INDIVIDUALLY PROTECTED LOAD TAPS, WITH A STAINLESS STEEL ENCLOSURE	1	279-209-050	SW-VISTA-422-PAD
	VISTA 431 (4 "WAYS", 3-THREE PHASE FEEDER GANG SWITCHES AND ONE-THREE PHASE, INDIVIDUALLY PROTECTED LOAD TAPS, WITH A STAINLESS STEEL ENCLOSURE		279-211-050	SW-VISTA-431-PAD
2	PAD AND CHAMBER FOR PM DF VISTA SWITCH (77"X 79"X 40" DEEP)	1	162-690-790	PD-SW-W/CC-VISTA
3	600 AMP T-BODY ELBOWS (25KV)	VARIES	163-639-007	TM-PDF-600-1K
4	200 AMP BUSHINGS (25KV)	VARIES	163-864-001	SW-PD-BSH
5	200 AMP LOADBREAK ELBOWS (25KV)	VARIES	163-502-001	TM-PDF-1/0
6	PROTECTIVE CAP (15KV ONLY)	VARIES	163-022-000	TM-PDF-GC
7	ELBOW SURGE ARRESTERS (25KV ONLY)	VARIES	334-015-005	TM-PDF-LA
8	GROUND ROD CONNECTOR, CLAMP TYPE	1	120-036-106	DG-CLP-5/8
9	GROUND RODS, AS NEEDED	VARIES	130-614-005	DG-PKG-5/8
10	GROUND ROD COUPLINGS	VARIES	130-405-104	DG-C-5/8
11	#4 COPPER WIRE, SDB	6	112-309-000	SW-PMD-GC (Qty - 1)
12	#4/0 CU CABLE, 600V	27	110-101-169	
13	#4/0 CABLE CONNECTORS	6	120-871-005	
14	COPPER TO COPPER BOLTED CONNECTORS	22	102-800-002	SW-PMD-LOCK
15	STANDARD LOCKS	2	546-246-011	SW-VISTA-MT-HDW
16	CABLE MOUNTING BRACKET, STAINLESS	12	160-310-000	
17	BOLTS, SS, 1/2"X 1-1/2" FOR CABLE BRACKET		140-515-557	
18	SPRING, NUTS, SS, FOR 1/2" BOLT FOR CABLE BRACKET		161-463-000	
19	LOCK WASHER, 1/2", FOR CABLE BRACKET		145-294-010	
20	800 AMP FAULT INDICATOR	VARIES	163-297-009	P-CL-FCI-800
21	ROTATABLE FEEDTHRU DEVICE, 200AMP, 25KV	6	163-250-002	SW-VISTA-422-PAD
		3	163-250-002	SW-VISTA-431-PAD

### NOTES:

1. THE INTERRUPTERS MUST BE PRE-SET BY THE ERC PRIOR TO BEING ISSUED TO THE JOB. CALL 863-4921 OR 863-4900 TO MAKE ARRANGEMENTS.
2. THE PAD MOUNTED VISTA SWITCH MAY BE INSTALLED IN AREAS SUBJECT TO FLOODING.
3. SEAL THE INCOMING DUCTS PER UN-29.0.0.
4. THE SWITCH AND ITS ENCLOSURE MUST BE BOLTED TO THE PAD.
5. REFER TO DCS UH-41.0.1 FOR PROPER INSTALLATION OF 600 AMP T-BODY ELBOWS.
6. BOTH THE FEEDER CABLES AND LOOP SIDE CABLES ARE TO BE RACKED THROUGH THE CABLE SUPPORT BRACKETS INSTALLED ON THE UNISTRUT IN THE CABLE CHAMBER.
7. CABLES MUST NOT BE IN CONTACT WITH THE CABLE CHAMBER OR PAD TOP.
8. ALLOW SUFFICIENT LENGTH OF CONCENTRIC NEUTRAL TO REACH GROUNDING BARS AND PERMIT THE FREE MOVEMENT OF THE ELBOWS.
9. MAKE CERTAIN OF CABLES LOCATIONS BEFORE DRIVING GROUND RODS.
10. APPLY CAULKING COMPOUND TO THE SEAM BETWEEN THE ENCLOSURE AND THE PAD TOP.
11. DUST CAPS USED FOR COVERING BUSHINGS AND BUSHING WELLS DURING SHIPMENT MUST BE REMOVED PRIOR TO ENERGIZING THE SWITCH.
12. UNUSED LOAD TAPS MUST HAVE BUSHINGS AND PROTECTIVE CAPS INSTALLED.
13. UNUSED FEEDER POSITIONS MUST HAVE 600 AMP PROTECTIVE CAPS INSTALLED (M&S #163-645-007).
14. AFTER THE SWITCH ENCLOSURE HAS BEEN INSTALLED, THE LIFTING BRACKETS MUST BE REMOVED AND STORED INSIDE THE ENCLOSURE FOR FUTURE USE.
15. ENSURE THAT THE WARNING LABEL (M&S #548-580-104) IS INSTALLED ON BOTH THE CABLE COMPARTMENT AND THE OPERATOR SIDES OF THE ENCLOSURE.
16. INSTALL FEEDER CONDUITS AS SHOWN IN C-46.0.0 AND C-46.0.2 ON LEFT AND/OR REAR SIDE OF CABLE CHAMBER TO ALLOW FOR BENDING RADIUS OF CABLE.
17. BOLTS FOR SECURING PAD TO CHAMBER ARE INCLUDED FROM VENDOR. THERE ARE 4 BOLTING LOCATIONS AS SHOWN ON DRAWINGS.
18. INSTALL 800 AMP 3Ø FAULT INDICATORS ON EACH SET OF FEEDER CABLES. SEE UV-14.0.0, UV-14.0.1, & UV-14.0.2.
19. FOR PAD MOUNTED APPLICATIONS, THE BASE BRACKETS ("FEET"). "N" AS SHOWN IN C-46.0.1 ARE REQUIRED.
20. THE BASE BRACKETS ARE NOT REQUIRED FOR BELOW GRADE ("UNDER-COVER") APPLICATIONS, BUT SHOULD BE KEPT WITH THE SWITCH IN THE POSSIBLE EVENT OF FUTURE RE-USE IN A PAD MOUNTED APPLICATION.
21. INSTALL ROTATABLE FEED-THRU DEVICE ON THE LOAD SIDE OF THE VISTA SWITCH (M&S #163-250-002)

**F P L**

40

### OH & UG DISTRIBUTION SYSTEM STANDARDS

2	11/14/12	UPDATE NOTES 16 AND 19 ADD NOTE 21 AND ITEM 21	JGV	ELS	WM	ORIGINATOR: A. PANTOURIS	DRAWN BY: E. SCHILLING
1	9/2/10	UPDATE ITEM 16	GAP	ELS	BXN	DATE: 9/1/03	APPROVED: ARI LIMA
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.	LEAD SUPERVISOR, UG SERVICES	NO SCALE

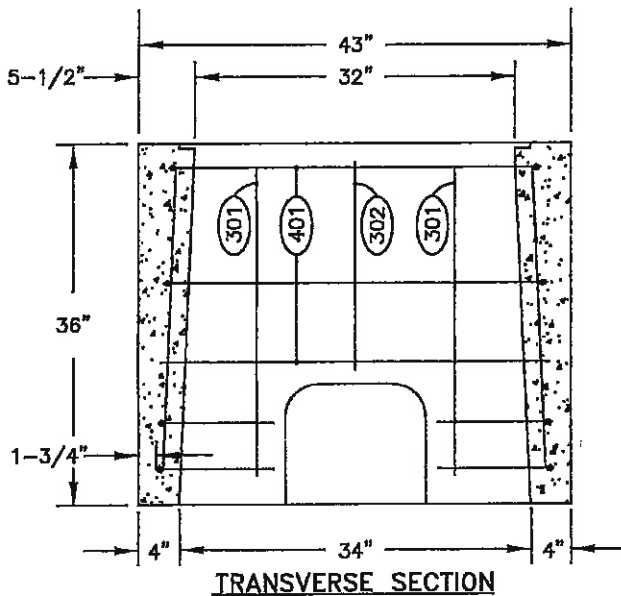
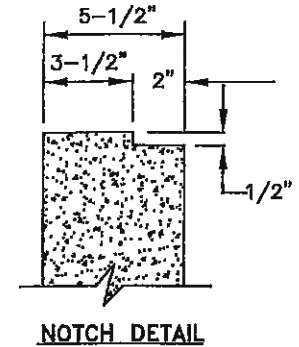
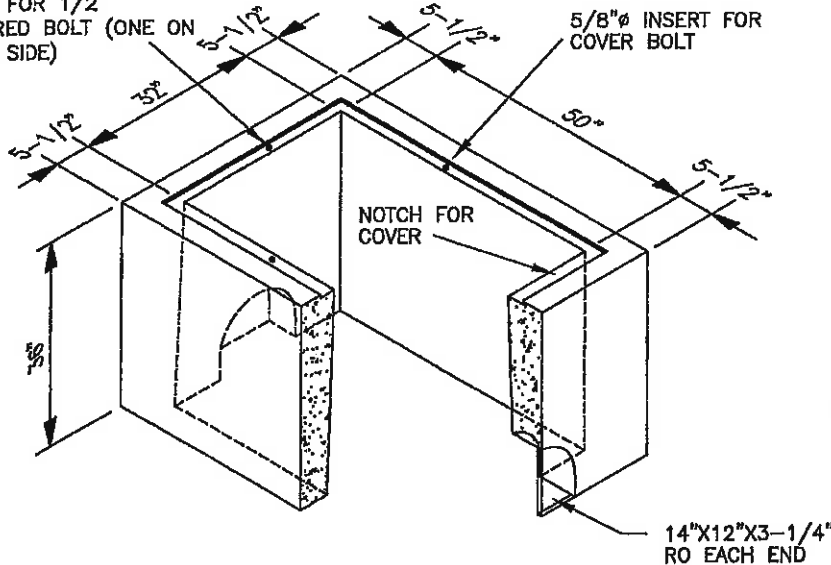
UX-202.0.0

# PRECAST HANDHOLE (32"X 50" X 36") DRIVEWAY LOADING DESIGN M&S #162-122-892

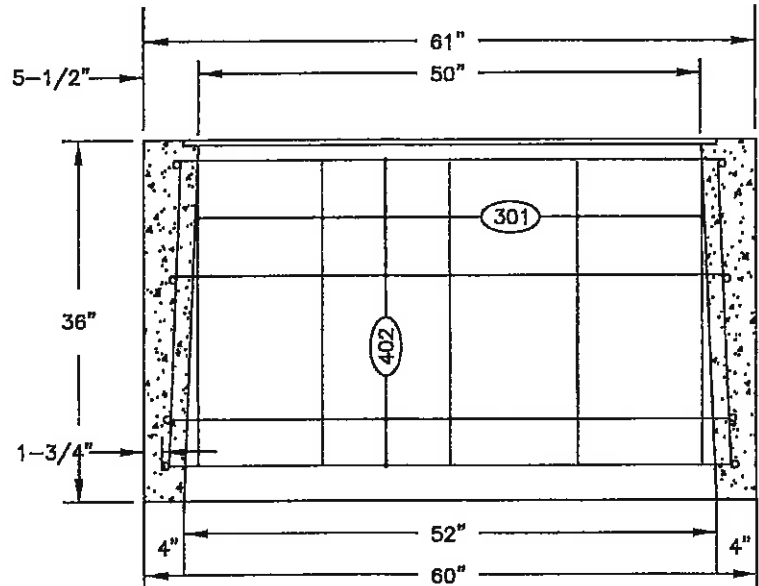
UX-202.0.0

1"Ø COUNTER SINK

HOLE FOR 1/2"

TAPERED BOLT (ONE ON  
EACH SIDE)

TRANSVERSE SECTION



LONGITUDINAL SECTION

## REINFORCEMENT SCHEDULE

MARK	SIZE	LENGTH	QTY	DETAIL
(301)	NO.3	2'-6"	14	STRAIGHT
(302)	NO.3	1'-5"	2	STRAIGHT
(401)	NO.4	3'-2"	6	STRAIGHT
(402)	NO.4	5'-0"	8	11"   38"

WEIGHT: 2,863 POUNDS  
CU. FT. - 18  
CU. YDS. - .66

## NOTES:

1. CONCRETE COMPRESSION STRENGTH 5000 PSI.
2. REINFORCEMENT ASTM A-615 (GRADE 60).
3. WHEEL LOADING 16,000 LBS, H2O VEHICLE LOADING (FULL TRAFFIC LOADING).
4. FOR STEEL COVER DETAILS, SEE UX-202.0.1

**F P L**

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6	10/16/18	ADD NOTE 4	ARR	ELS	RDH
5	10/26/16	UPDATE NOTES	ARR	ELS	RDH
4	1/17/13	UPDATE NOTES	ARR	ELS	BXN
3	10/21/10	UPDATE NOTES	ARR	ELS	BXN
2	10/10/98	REPLACE OLD BORDER	SMS	BILL	SMS
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

OH &amp; UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: SMS

DRAWN BY: E. SCHILLING

DATE:

APPROVED: J.J. McEVoy

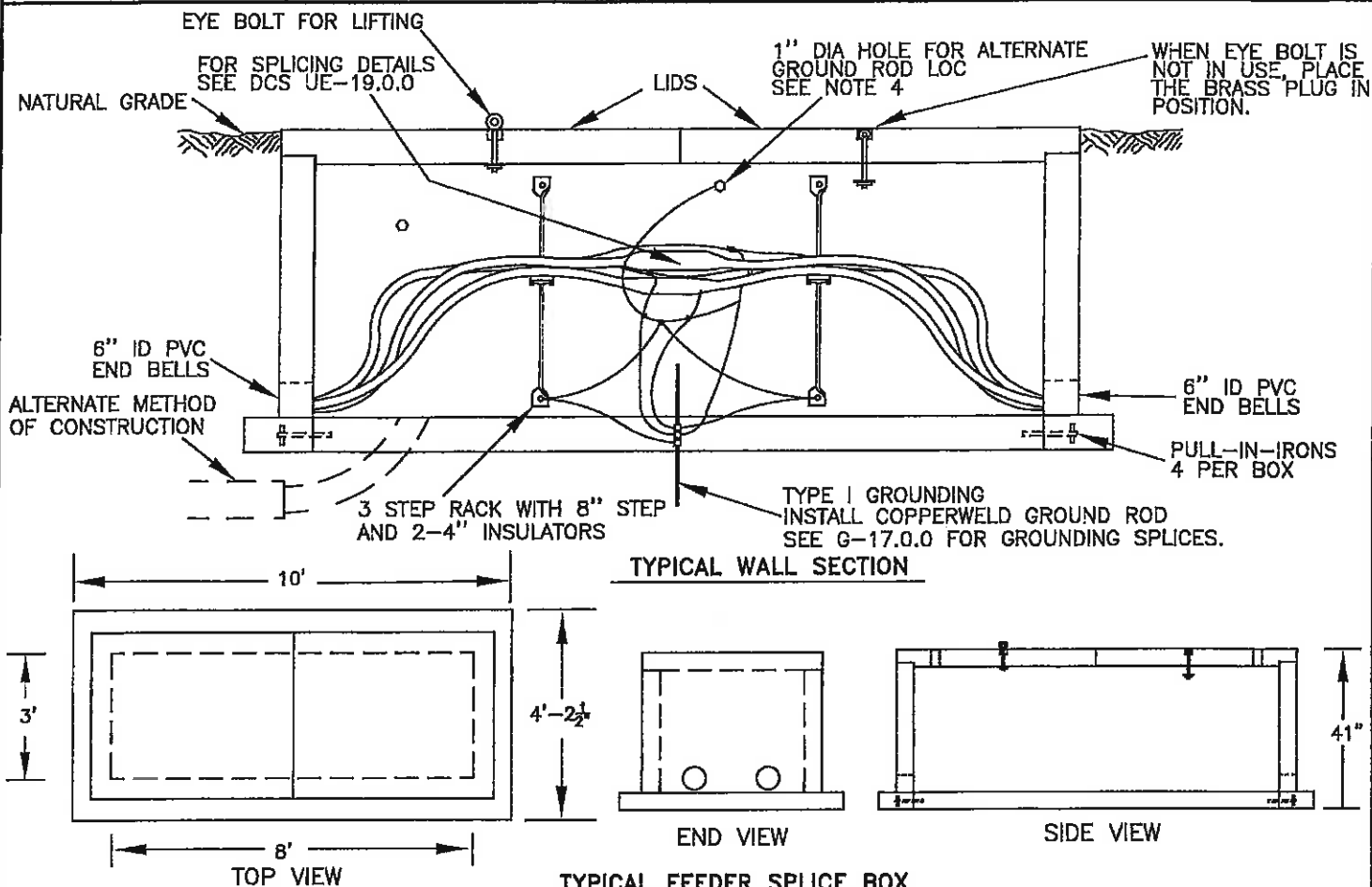
NO SCALE

SUPERVISOR, OH/UG PRODUCT  
SUPPORT SERVICES

UN-18.0.0

## FEEDER SPLICE BOX

UN-18.0.0



M&S NUMBER	DESCRIPTION
162-240-003	CONCRETE FEEDER SPLICE BOX & LIDS. (SEE NOTE 5)
162-241-000	CONCRETE FEEDER SPLICE BOX & LIDS COMES WITH SPECIAL BRUSHED SIDEWALK FINISH LIDS AND FLUSH INSERTS SUITABLE FOR PEDESTRIAN TRAFFIC. (SEE NOTE 5)
162-242-203	POLYMER CONCRETE FEEDER SPLICE BOX. TO BE INSTALLED IN AREAS NOT SUBJECT TO ANY VEHICULAR TRAFFIC SUCH AS STREETS, PARKING LOTS, OR DRIVEWAYS.

## NOTES:

1. LEAVE SUFFICIENT EXPOSED GROUND ROD TO INSTALL 6 EACH #4/0-#2 CONNECTIONS M&S #120-118-005.
2. GROUND ALL SPICES PER DISTRIBUTION STANDARD G-17.0.0.
3. GROUND CABLE RACKS.
4. EACH SPLICE BOX IS SUPPLIED WITH 2-1" DIA HOLE FOR ALTERNATE GROUND ROD LOCATION. MAKE ALL GROUNDING CONNECTIONS INSIDE THE BOX. RUN SUFFICIENT AMOUNT OF 4/0 TO MAKE CONNECTION TO ALT. GROUND ROD LOCATION. RESEAL 1" DIA HOLE WITH AQUASEAL.
5. REFER TO UX-233.0.1 FOR DRIVEWAY LOADING SPLICE BOXES (H20 RATED), M&S #162-240-003 AND 162-241-000. (H20 RATED = 32,000LBS).
6. WEIGHT OF SPLICE BOX (W/O LIDS) = 6700 LBS. DIMENSIONS ARE 10' X 4'-2.5" X 41" DEEP.
7. WEIGHT OF EACH LID = 1400 LBS. TWO LIDS REQUIRED. M&S # FOR LID ONLY 162-240-011.
8. URD FEEDER CABLE SPLICES MUST BE BONDED TO DRIVEN GROUNDS.
9. REFER TO UE-19.0.0 FOR SPLICE ASSEMBLY. A WATER TIGHT SEAL MUST BE MADE WHERE INSULATED.
10. CONDUCTORS CONNECT TO SYSTEM NEUTRAL. SEE G-17.0.0.
11. THE MAXIMUM PERMISSIBLE IMPEDENCE TO SYSTEM NEUTRAL FOR A DRIVEN GROUND IS 25 OHMS.
12. AS SHOWN ABOVE, THE PVC MAY ENTER UNDERNEATH THE SPLICE BOX BY USING A 45 DEGREE SWEEP. SEAL CONDUIT WITH DUCT SEAL.
13. IN AREAS SUBJECT TO WATER INTRUSION, INSTALL A SUFFICIENT AMOUNT OF PEAROCK 1/4"-3/4" SIZE, ROCK TO ALLOW FOR THE PERCOLATION OF THE WATER.
14. IF FEEDER SPLICE BOX IS TO BE INSTALLED IN A SIDEWALK, A SEPARATION WILL BE NEEDED BETWEEN THE CONCRETE AND THE LIDS. THE D.O.T. INDEX 310 SPECIFIES THE USE OF A 1/2" EXPANSION JOINT (PREFORMED JOINT FILLER) FOR THIS SEPARATION. ALSO CONSULT YOUR LOCAL MUNICIPALITY FOR ANY ADDITIONAL REQUIREMENTS.
15. THE MAXIMUM SEPARATION BETWEEN FEEDER SPLICE BOXES IS 950', THIS IS TO ALLOW FOR PROPER CABLE PULLING TENSIONS.
16. UX-233.0.1 AND UX-233.0.3 FOR MORE DETAIL.
17. WHEN SETTING A PAD/MANHOLE OR FEEDER SPLICE BOX, THE AREA MUST BE LEVELED WITHIN 1 INCH IN 8 FEET IN ALL DIRECTIONS, AND THOROUGHLY COMPACTED WITH A VIBRATORY PLATE COMPACTOR. THIS STEP WOULD PROVIDE A SMOOTH AND LEVEL SURFACE.

7	8/8/18	ADD NOTE 17	ARR	ELS	RDH
6	6/12/17	UPDATE DRAWING AND NOTES	ARR	ELS	RDH
5	5/19/17	ADD NOTE 15	ARR	ELS	RDH
4	3/17/17	UPDATE NOTE 5	ARR	ELS	RDH
3	11/21/16	UPDATE DRAWING	ARR	ELS	RDH
2	6/8/08	UPDATE NOTE 14	GAP	ELS	JJM
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

F P L

42

OH &amp; UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: RAP

DRAWN BY: J.SHOUP

DATE: 8/27/99

APPROVED: J.J. McEvoy

NO SCALE

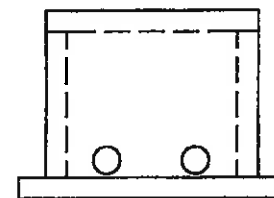
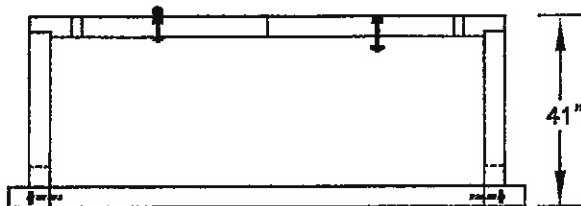
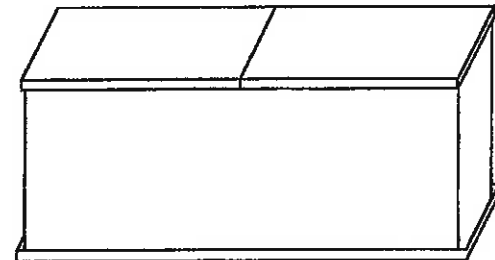
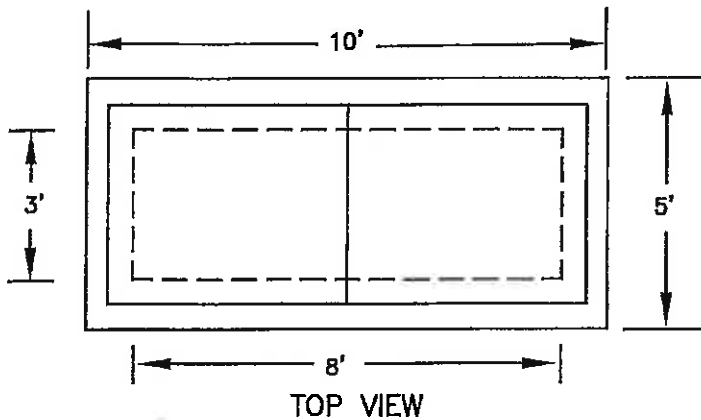
SUPERVISOR, OH/UG PRODUCT  
SUPPORT SERVICES

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UN-18.0.1

## FEEDER SPLICE BOX

UN-18.0.1



## NOTES:

1. LEAVE SUFFICIENT EXPOSED GROUND ROD TO INSTALL 6 EACH #4/0-#2 CONNECTORS M&S #120-11800-5.
2. GROUND ALL SPLICES PER DISTRIBUTION STANDARD G-17.0.0.
3. GROUND CABLE RACKS.
4. EACH SPLICE BOX IS SUPPLIED WITH 2-1" DIA HOLE FOR ALTERNATE GROUND ROD LOCATION. MAKE ALL GROUNDING CONNECTIONS INSIDE THE BOX. RUN SUFFICIENT AMOUNT OF 4/0 TO MAKE CONNECTION TO ALT. GROUND ROD LOCATION. RESEAL 1" DIA HOLE WITH AQUASEAL.
5. DISTRIBUTION SPLICE BOX AND LIDS ARE DESIGNED FOR H-20 VEHICLE LOADING. (FULL TRAFFIC LOADING)
6. WEIGHT OF SPLICE BOX (W/O LIDS) = 6700 LBS. DIMENSIONS ARE 10' X 5' X 41" DEEP
7. WEIGHT OF EACH LID=1400 LBS. TWO LIDS REQUIRED. M & S # FOR LID ONLY 162-24001-1.
8. URD FEEDER CABLE SPLICES MUST BE BONDED TO DRIVEN GROUNDS.
9. REFER TO UE-19.1.1 & UE-19.1.2 FOR SPLICE ASSEMBLY. A WATER TIGHT SEAL MUST BE MADE WHERE INSULATED
10. CONDUCTORS CONNECT TO SYSTEM NEUTRAL. SEE G-17.0.0
11. THE MAXIMUM PERMISSIBLE IMPEDENCE TO SYSTEM NEUTRAL FOR A DRIVEN GROUND IS 25 OHMS.
12. AS SHOWN ABOVE, THE PVC MAY ENTER UNDERNEATH THE SPLICE BOX BY USING A 45 DEGREE SWEEP. SEAL CONDUIT WITH DUCT SEAL.
13. IN AREAS SUBJECT TO WATER INTRUSION, INSTALL A SUFFICIENT AMOUNT OF PEAROCK 1/4"-3/4" SIZE ROCK TO ALLOW FOR THE PERCOLATION OF THE WATER.
14. IF FEEDER SPLICE BOX IS TO BE INSTALLED IN A SIDEWALK. A SEPERATION WILL BE NEEDED BETWEEN THE CONCRETE AND THE LIDS.
15. REFER TO UX-233.0.1

F P L

43

OH &amp; UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: RAP

DRAWN BY: J. SHOUP

DATE: 8/27/99

APPROVED: J. McEVY

NO SCALE

1	11/18/03	UPDATE NOTES	RJO	ELS	JJM
0	9/09/99	ORIGINAL DRAWING	RAP	JES	JJM
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

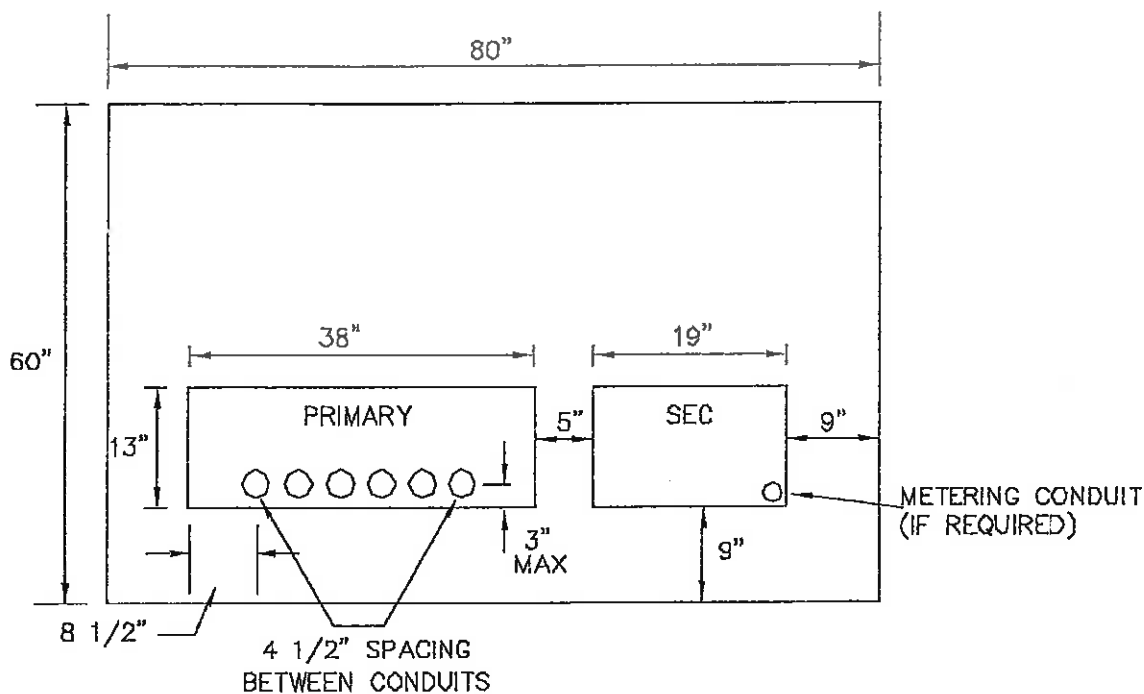
SUPERVISOR, OH/UG PRODUCT  
SUPPORT SERVICES

UX-114.0.2

CONDUIT LOCATIONS FOR 3 PHASE  
DEAD FRONT PAD MOUNTED TRANSFORMERS  
WITH SECTIONALIZING (CABLE THRU) UP TO  
500KVA USING 6-2" DUCTS FOR PRIMARY CABLE

UX-114.0.2

## ALTERNATIVE 1



(FRONT OF PAD)

## NOTES:

- 1) REFERENCE I-70.0.1 OF THE DCS
- 2) PAD M&S 162-24680-0
- 3) ALL CONDUITS TO EXTEND 3" MAX ABOVE GROUND LEVEL
- 4) ALL SECONDARY /CUSTOMER CONDUITS MUST FIT WITHIN THE 19"X13" AREA INDICATED. WILL HOLD 8-4" CONDUITS MAX.
- 5) ALL CONDUIT RELATED DIMENSIONS ARE TO THE CENTER OF THE DUCT
- 6) MAINTAIN 8' CLEARANCE FROM FRONT AND 3' CLEARANCE FROM SIDES AND BACK OF TRANSFORMER PAD.



F P L

OH &amp; UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: SNS

DRAWN BY: BILL

1

05/25/02

UPDATE DRAWING (NOTE 4)

RAP

JES

JIM

DATE:

APPROVED: J.L. MCEVOY

NO SCALE

NO.

DATE

REVISION

ORIG.

DRAWN

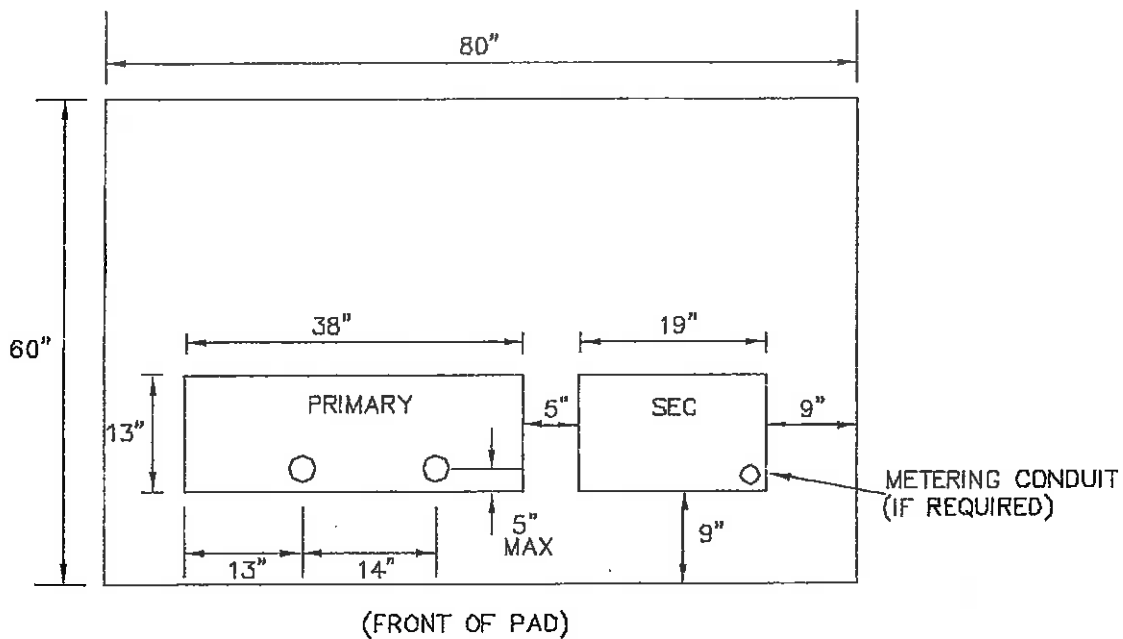
APPR.

SUPERVISOR, OH/UG PRODUCT  
SUPPORT SERVICES

UX-114.0.1

CONDUIT LOCATIONS FOR 3 PHASE  
DEAD FRONT PAD MOUNTED TRANSFORMERS  
WITH SECTIONALIZING (CABLE THRU) UP TO  
500KVA USING 2-5" DUCTS FOR PRIMARY CABLES

UX-114.0.1



## NOTES:

- 1) REFERENCE I-70.0.1 OF THE DCS
- 2) PAD M&S 162-24680-0
- 3) ALL CONDUITS TO EXTEND 3" MAX ABOVE GROUND LEVEL
- 4) ALL SECONDARY /CUSTOMER CONDUITS MUST FIT WITHIN THE 19"X13" AREA INDICATED. WILL HOLD 8-4" CONDUITS MAX.
- 5) ALL CONDUIT RELATED DIMENSIONS ARE TO THE CENTER OF THE DUCT
- 6) MAINTAIN 8' CLEARANCE FROM FRONT AND 3' CLEARANCE FROM SIDES AND REAR OF TRANSFORMER PAD.



F P L

OH &amp; UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: SMS

DRAWN BY: BILL

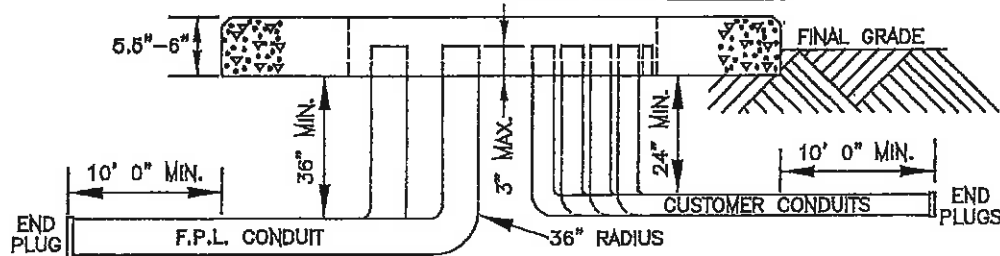
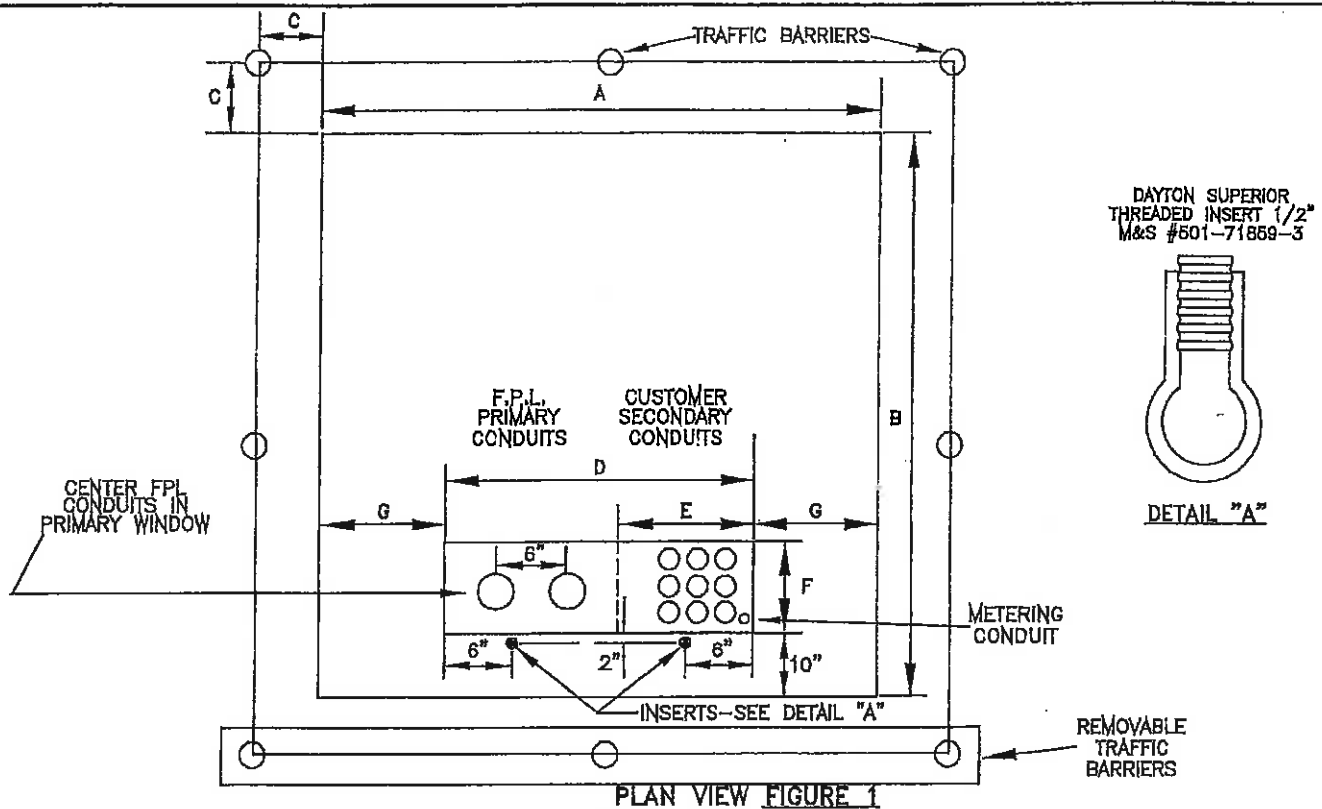
1	05/25/02	UPDATE DRAWING (NOTE 4)	RAP	JES	JJM	DATE:	APPROVED: J.J. MCEVOY	NO SCALE
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.		SUPERVISOR, OH/UG PRODUCT SUPPORT SERVICES	

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UX-116.1.1

# CONCRETE FOUNDATION CONSTRUCTION DETAILS FOR 750 TO 2,500 KVA 3Ø RADIAL & LOOP TYPE PAD MOUNTED TRANSFORMERS

UX-116.1.1



PROFILE FIGURE 2

TRANSFORMER KVA	SECONDARY VOLTAGE	MAX. NUMBER OF CONDUCTORS & SIZE	MAX. NUMBER OF CONDUITS & SIZES	A	B	C	D	E	F	G
750	277/480 V	8 SETS 750KCMIL AL 750KCMIL CU*	8 - 5" MAX.	78	78	18	60	25	16	9
750	120/208 V	12 SETS 750KCMIL AL 750KCMIL CU*	12 - 5" MAX.	78	78	18	60	25	21	9
1000	120/208 V 277/480 V	12 SETS 750KCMIL AL 750KCMIL CU*	12 - 5" MAX.	88	88	18	60	25	21	14
1500-2000	277/480 V	12 SETS 600-750KCMIL* 14 SETS 500KCMIL OR LESS	12 - 5" MAX 14 - 5" MAX	94	94	18	64	26	21	15
2500	277/480 V	12 SETS 600-750KCMIL* 16 SETS 500KCMIL OR LESS	12 - 5" MAX 16 - 5" MAX	108	108	18	66	28	26	20

## NOTES:

- SEE UX-116.1.2 FOR CONSTRUCTION DETAILS AND UX-116.1.3 FOR INSTALLATION GUIDELINES AND RESPONSIBILITIES
- (\*) CABLES LARGER THAN 600 CU WILL REQUIRE MULTITAP CONNECTOR 103-80505-9.
- FOR ANY NEW INSTALLATION WHICH HAS MORE THAN 8 SETS OF 750 KCMIL CU OR MORE THAN 12 SETS OF A SMALLER SIZE CONDUCTOR, IT IS RECOMMENDED TO USE THE LARGE THREE-PHASE SECONDARY CABINET, M&S# 161-40100-3, AS SHOWN IN DCS 1-76.0.0.

SUPERSEDES UX-116.1.1 LAST REVISED ON 01/18/01



F P L

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OH &amp; UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: MV

DRAWN BY: BILL

2	04/10/01	UPDATE CHART AND NOTES	RAP	JES	JJM
1	10-9-98	GENERAL REVISION	MV	BILL	JJM
0	8-9-98	REVISED TABLE AND PAD DIMENSIONS	MV	RAS	JJM
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

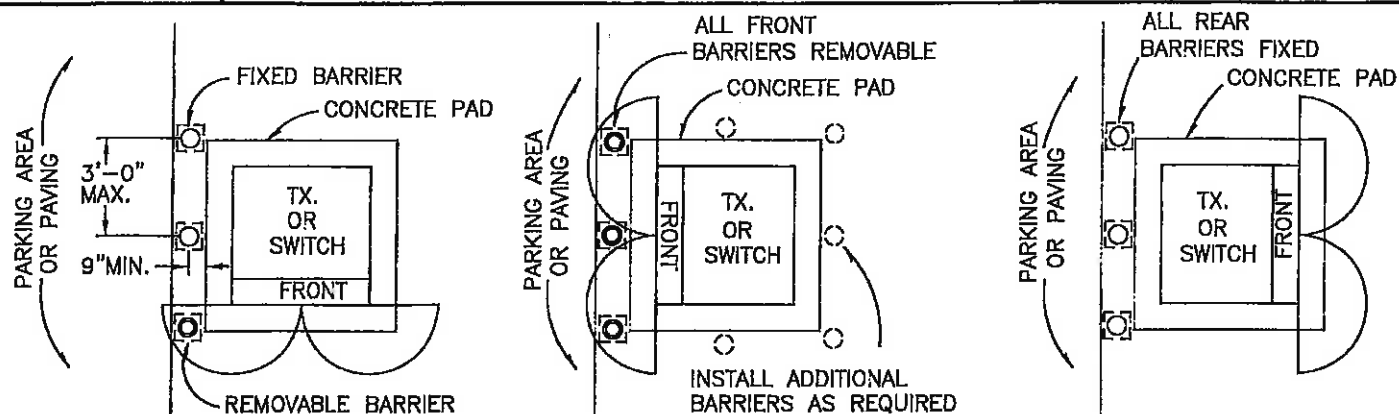
DATE: 10-9-98

APPROVED: J.J. McEVoy

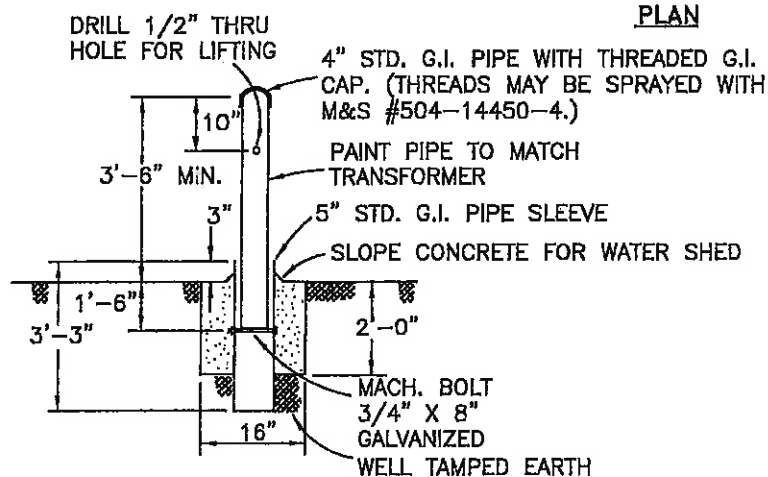
NO SCALE

SUPERVISOR, OH/UG PRODUCT  
SUPPORT SERVICES

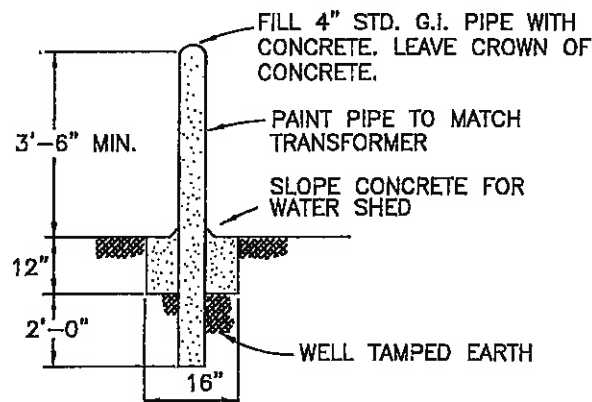
## UN-21.0.0



## PLAN

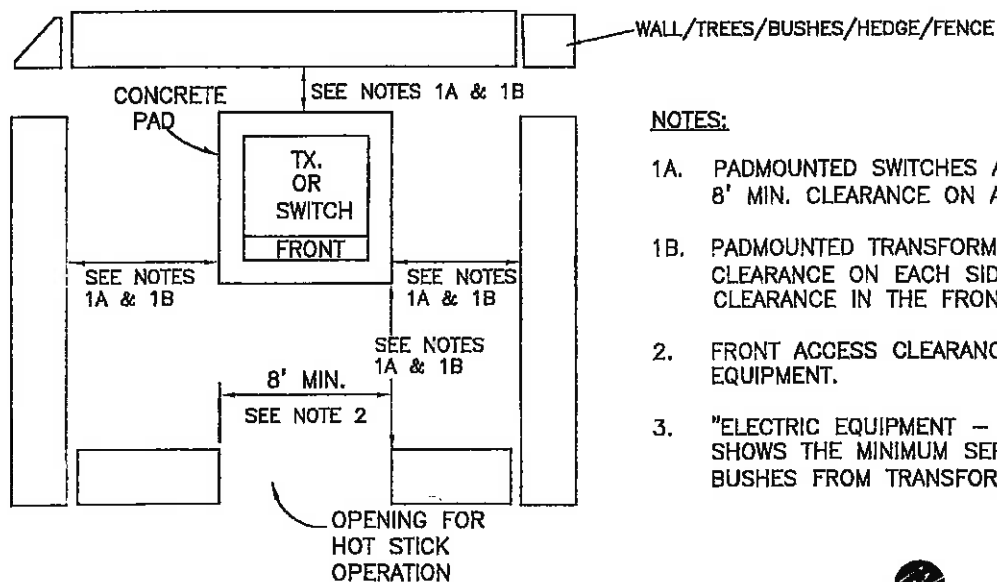


REMOVABLE BARRIER



FIXED BARRIER

## SECTION



## PLAN

NOTES:

- 1A. PADMOUNTED SWITCHES AND CAPACITOR BANKS REQUIRE 8' MIN. CLEARANCE ON ALL SIDES.
- 1B. PADMOUNTED TRANSFORMERS REQUIRE 3' MIN. CLEARANCE ON EACH SIDE AND BACK AND 8' CLEARANCE IN THE FRONT.
2. FRONT ACCESS CLEARANCE SHOULD BE 8' FOR ALL EQUIPMENT.
3. "ELECTRIC EQUIPMENT — KEEP OUT" DECAL THAT SHOWS THE MINIMUM SEPARATION DISTANCES FOR BUSHES FROM TRANSFORMERS IS M&S #548-560-101.

**F P L**

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## OH & UG DISTRIBUTION SYSTEM STANDARDS

5	3/3/17	UPDATE DRAWING (NOTES)	ARR	ELS	RDH
4	9/13/16	UPDATE DRAWING (NOTES)	ARR	ELS	RDH
3	9/17/13	UPDATE DRAWING (NOTES)	JJR	ELS	WM
2	7/16/01	UPDATE DRAWING (NOTES)	RAP	JES	JJM
1	8/27/99	UPDATE DRAWING (NOTES)	RAP	JES	JJM
0	9/30/94	ORIGINAL DRAWING	CJM	PMG	RJS
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

ORIGINATOR: CJM

DRAWN BY: PTH

DATE: 9/30/94

APPROVED: R.J. SALESKY  
DIRECTOR, DISTRIBUTION ENGINEERING  
AND OPERATIONS SERVICES

NO SCALE

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