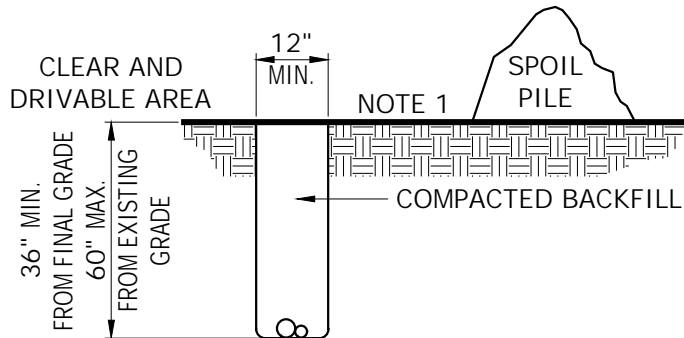


# TRENCHING, CONDUIT AND EQUIPMENT PLACEMENT UNDERGROUND DISTRIBUTION

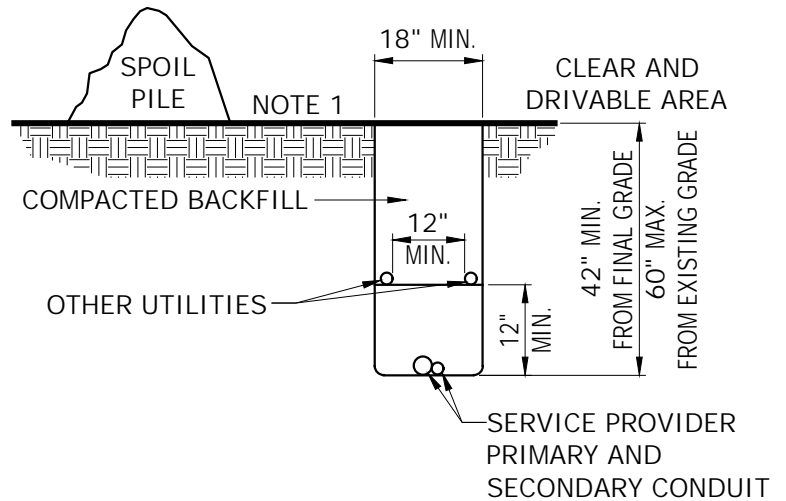


## SERVICE PROVIDER ONLY

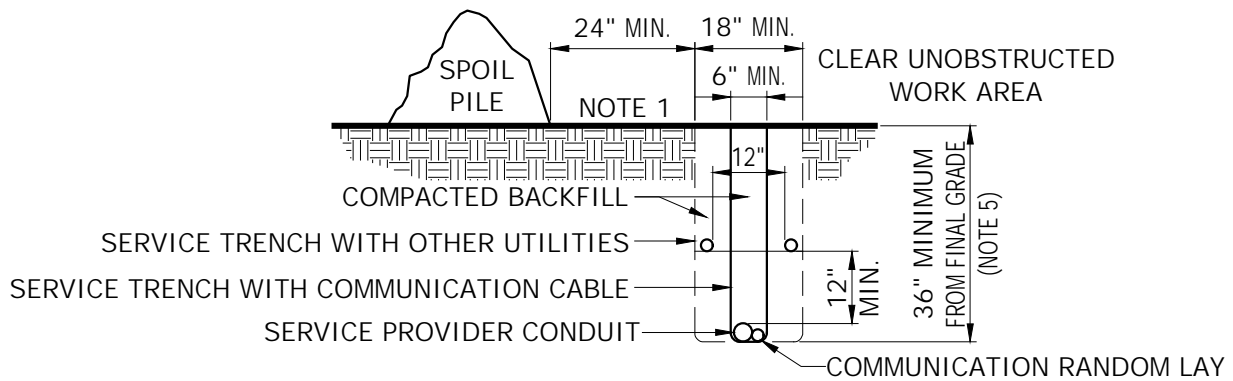


SERVICE PROVIDER  
PRIMARY AND  
SECONDARY CONDUIT

## SERVICE PROVIDER WITH OTHER UTILITIES



## SECONDARY AND/OR SERVICE TRENCH





NOTES:

1. Where possible, the trench spoil shall be placed to the opposite side of the access to the trench. Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling into the excavation. Protection can be provided by placing and keeping such materials at least 2 feet from the edge of the excavation, or by other means that provide equivalent protection. This 2 feet area shall be level and free of debris to permit safe footing during inspection.
2. On-site inspections by Service Provider are required for open trench, bedding, and shading. Contact Design Services to schedule required inspections.
3. When modifying and existing cable-in-conduit (CIC) installation, a 2 feet x 5 feet bell hole is required. Bell holes for service trenches must comply with the requirements of SR-312 and SR-210, where applicable.
4. The minimum horizontal radius in a trench prepared for installation of wave rib conduit system shall be 4 feet and a minimum horizontal radius of 12 feet - 6 inches on a Schedule 40 PVC continuous conduit system.
5. Service trenches for the continuous conduit system must be 36 inches in depth.
6. Under no circumstances is a trench to be dug closer than 3 feet to a down guy anchor rod.
7. See SR-210 for sleeve installation where a trench can not remain open.
8. The service conduit shall be installed into the equipment sites at the same time when the primary and/or secondary conduits are installed. All conduits are to be tied up per the equipment detail, and prior to calling for the trench and conduit inspection.
9. Conduit sweeps into existing equipment shall be 2 1/2 inches x 36 inches x 90 degree, Grey PVC Electrical Grade, Schedule 40. Wave-rib conduit is NOT approved to be used in existing Company equipment.
10. Do not trench under Company owned pad-mounted equipment without Service Provider personnel present. Service Provider's Access Crew can be scheduled to assist with conduit placement and/or trenching required under Company owned equipment. Arrangements must be made by calling 520-918-8300 (TEP) or 520-761-7951 (UES), a minimum of five working days in advance.
11. See SR-207 for bedding and backfill requirements.
12. Company inspectors do not verify grade stakes. Any adjustments required to grade and/or pad sites due to inaccurate grading, grade changes and/or improper grade establishment at trench or pad sites will be the responsibility of the Developer/Contractor. Any associate costs to correct grade or pad sites and any costs incurred by Service Provider due to a change in surface elevation will be borne by the customer.

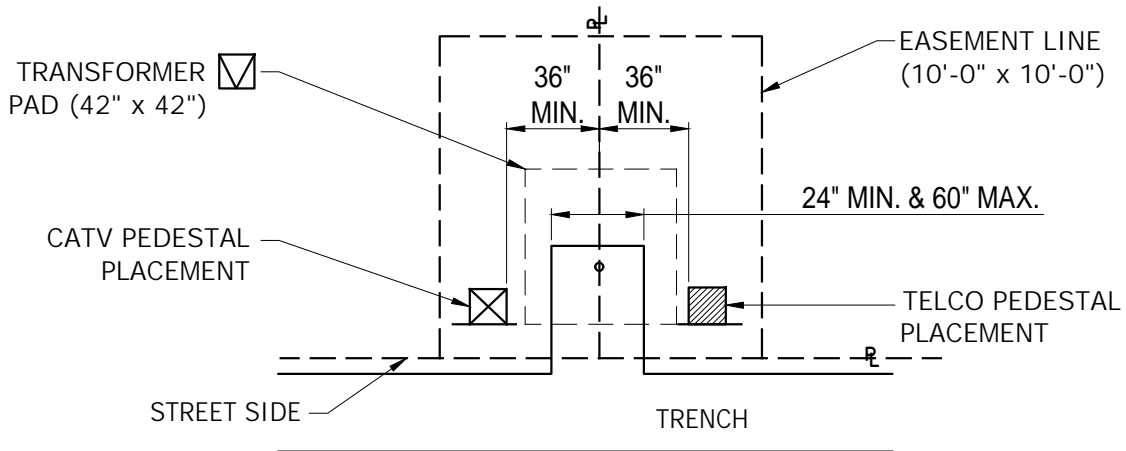


USE: EQUIPMENT  
 PLACEMENT,  
 TRANSFORMER

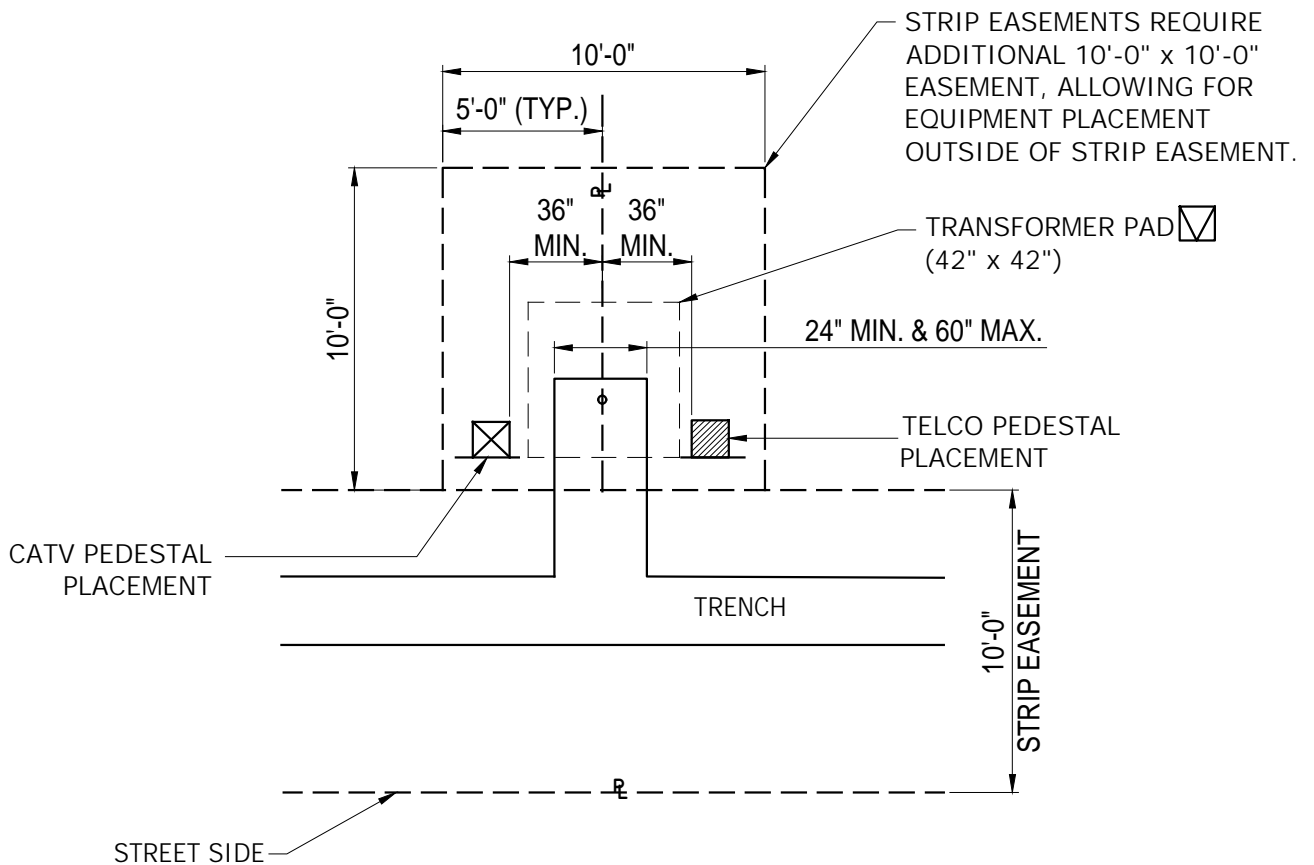
# TRENCHING, CONDUIT AND EQUIPMENT PLACEMENT UNDERGROUND DISTRIBUTION



## OFFSET EASEMENT - TRANSFORMER PAD

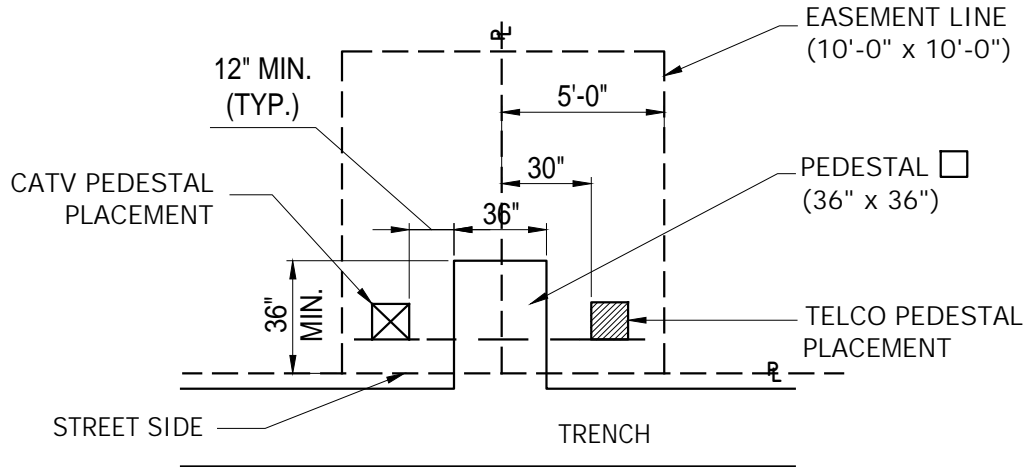


## STRIP EASEMENT - TRANSFORMER PAD

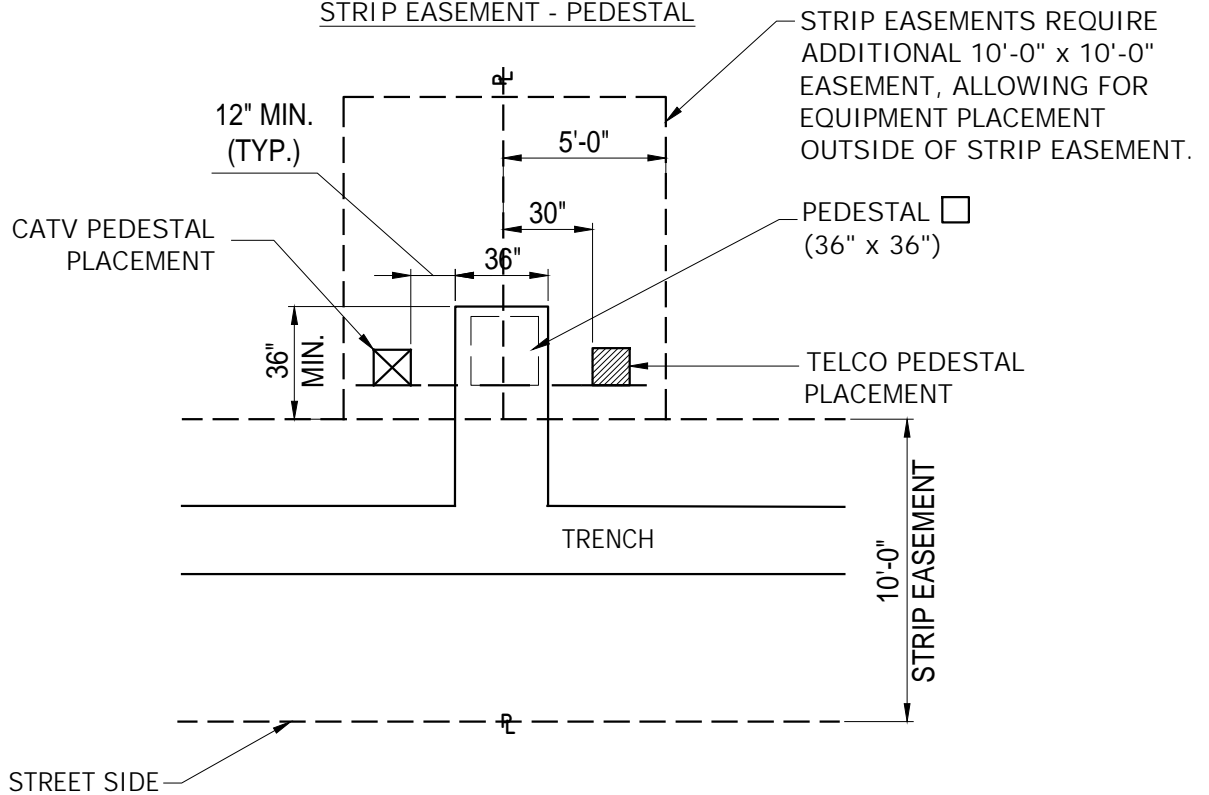




OFFSET EASEMENT - PEDESTAL



STRIP EASEMENT - PEDESTAL

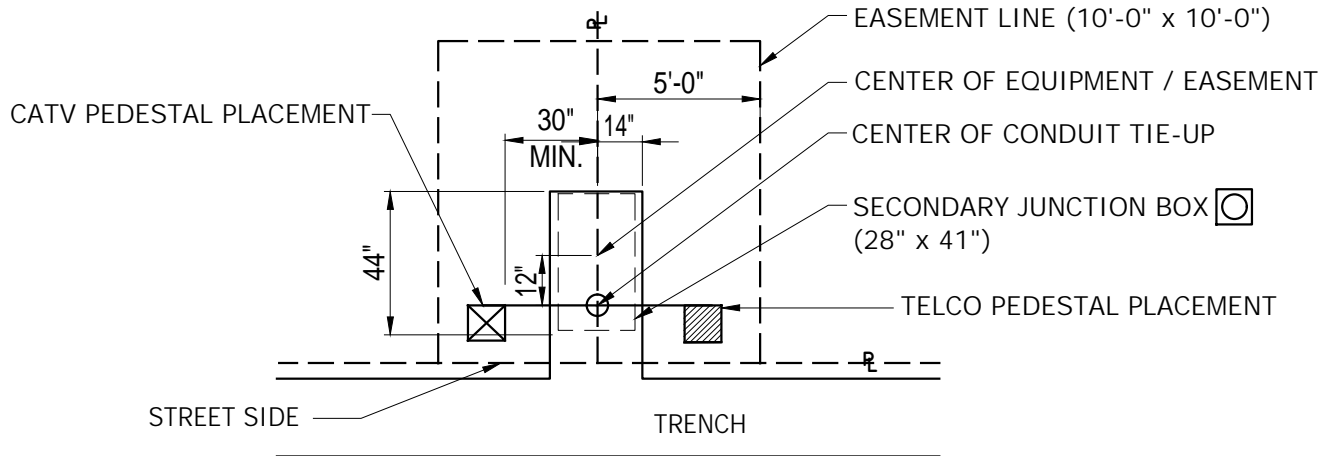


USE: EQUIPMENT  
 PLACEMENT,  
 SUBSURFACE  
 SECONDARY  
 JUNCTION BOX

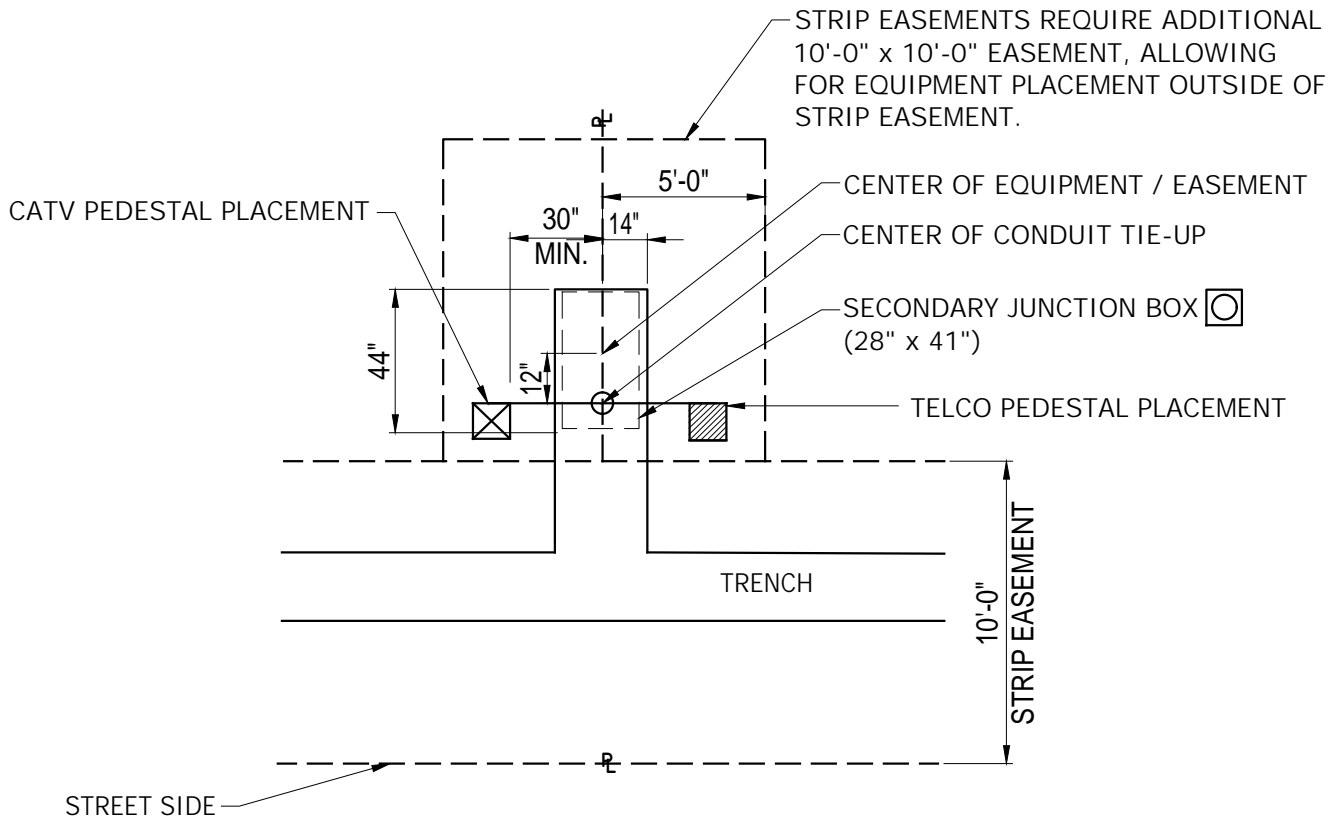
## TRENCHING, CONDUIT AND EQUIPMENT PLACEMENT UNDERGROUND DISTRIBUTION



### OFFSET EASEMENT - CUSTOMER PROVIDED SUBSURFACE SECONDARY JUNCTION BOX



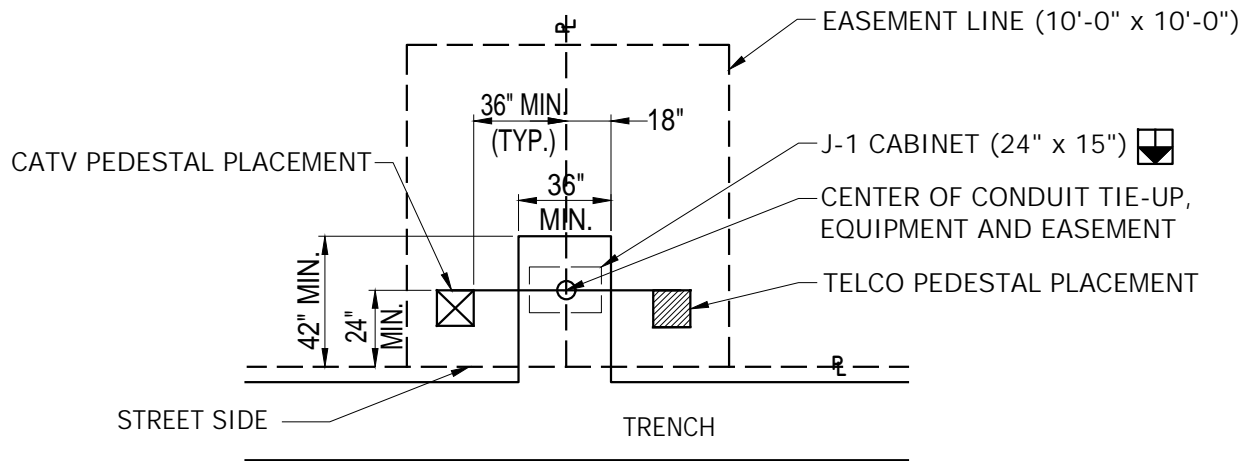
### STRIP EASEMENT - CUSTOMER PROVIDED SUBSURFACE SECONDARY JUNCTION BOX



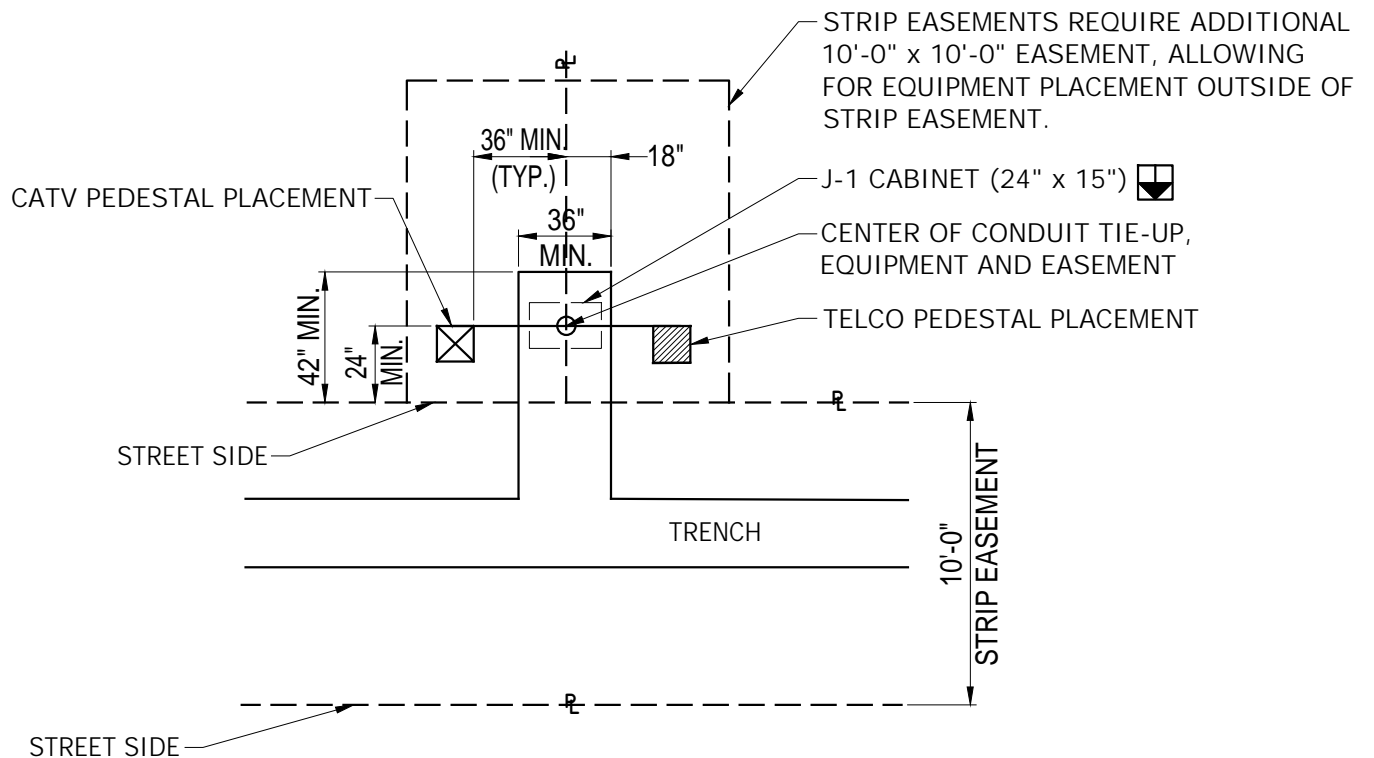
# TRENCHING, CONDUIT AND EQUIPMENT PLACEMENT UNDERGROUND DISTRIBUTION



## OFFSET EASEMENT - J-1 CABINET



## STRIP EASEMENT - J-1 CABINET

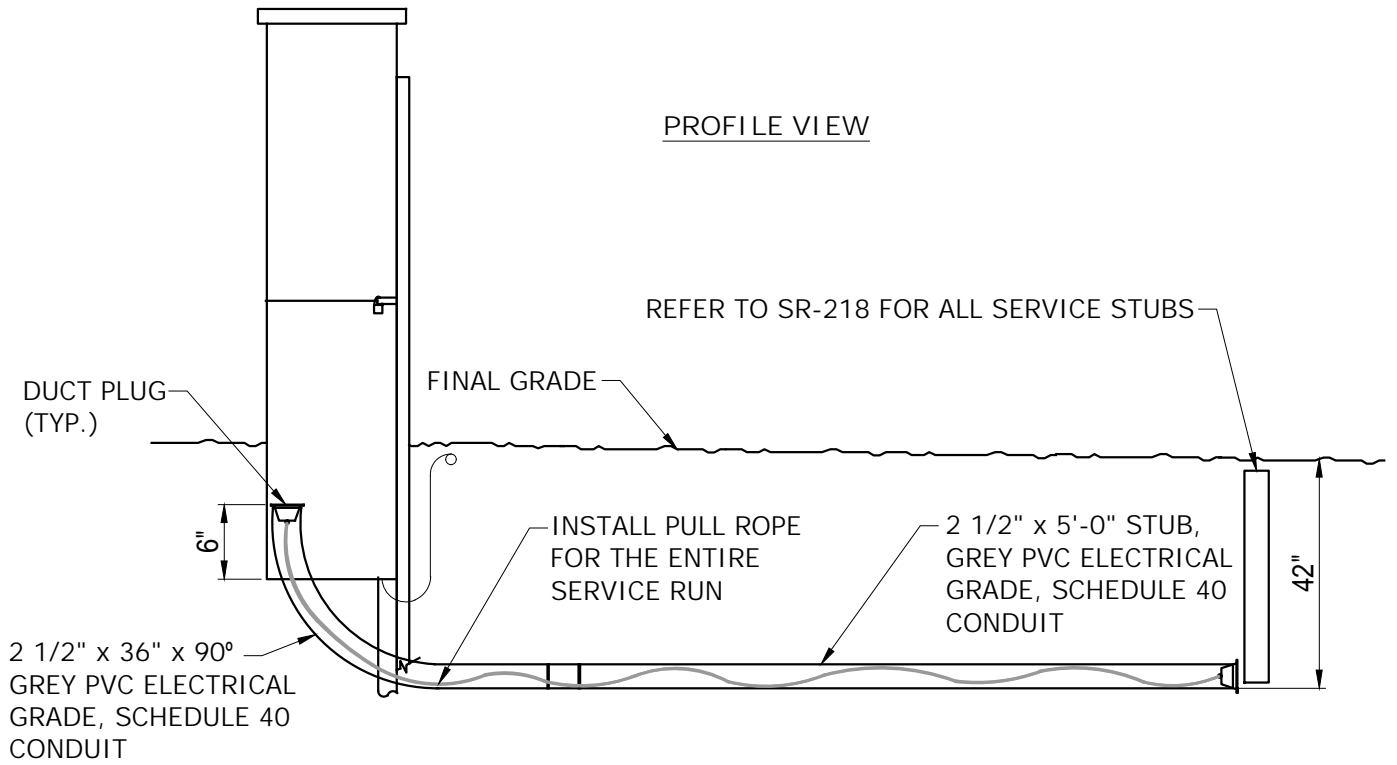


USE: CONDUIT PLACEMENT,  
EXISTING STEEL  
PEDESTAL

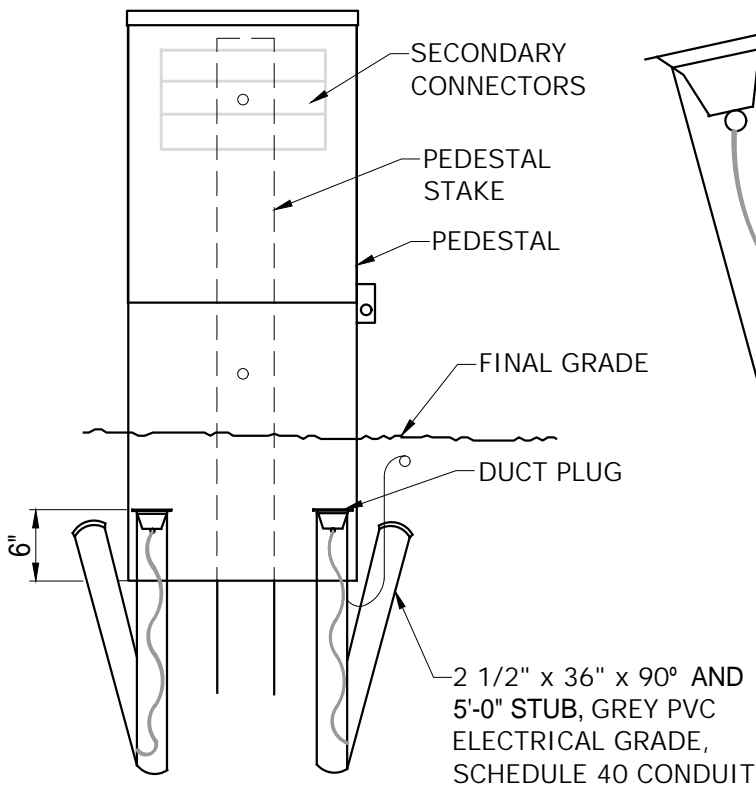
# TRENCHING, CONDUIT AND EQUIPMENT PLACEMENT UNDERGROUND DISTRIBUTION



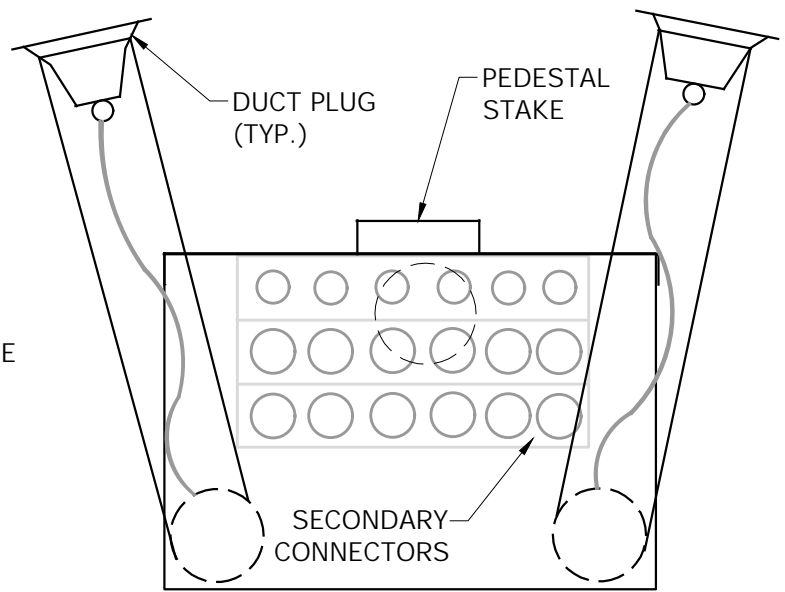
PROFILE VIEW



FRONT VIEW



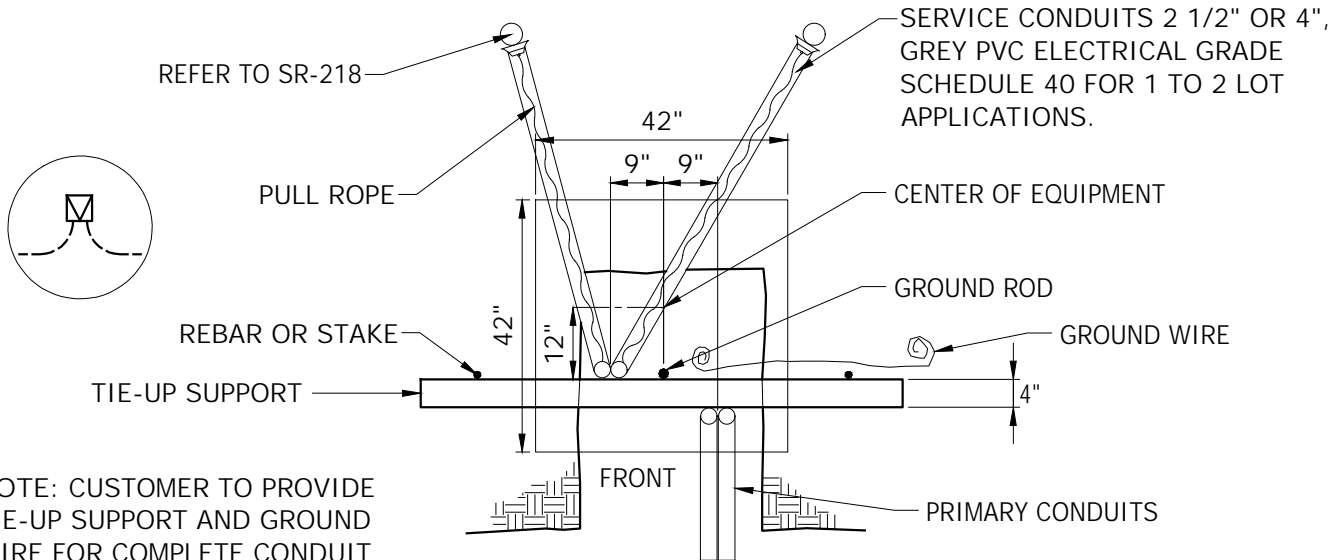
TOP VIEW



FRONT

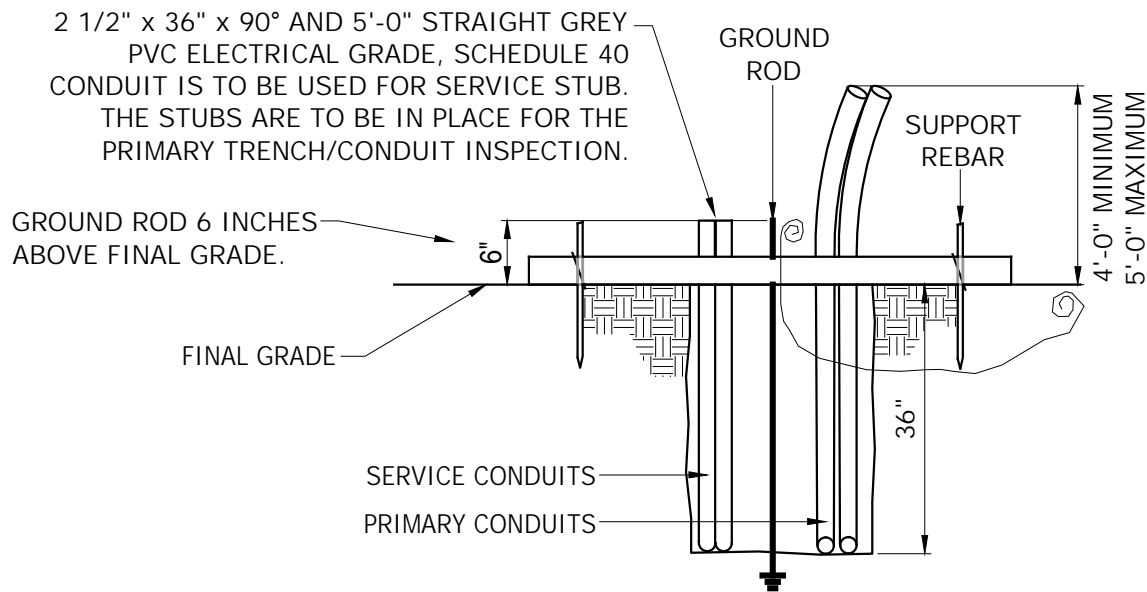
USE: CONDUIT PLACEMENT,  
TIE-UP PRIMARY AND  
SERVICE

## TRENCHING, CONDUIT AND EQUIPMENT PLACEMENT UNDERGROUND DISTRIBUTION



NOTE: CUSTOMER TO PROVIDE  
TIE-UP SUPPORT AND GROUND  
WIRE FOR COMPLETE CONDUIT  
INSTALLATIONS.

**PAD MOUNTED TRANSFORMER  
PLAN VIEW**



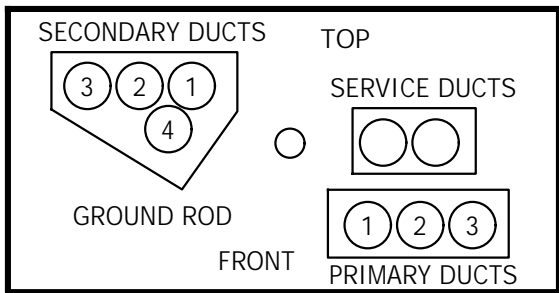
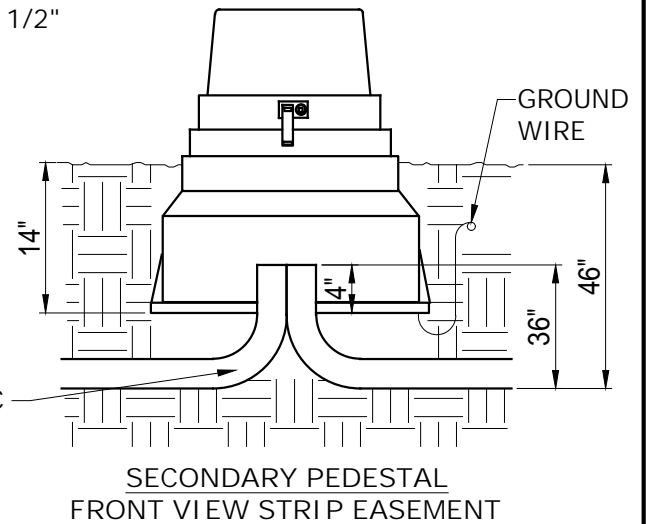
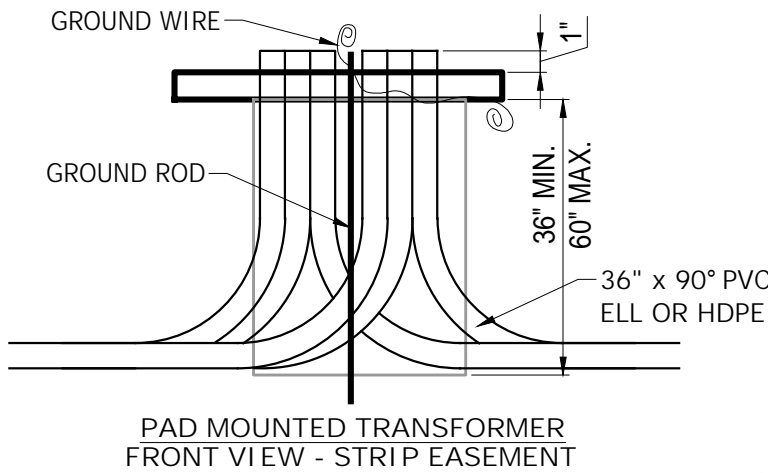
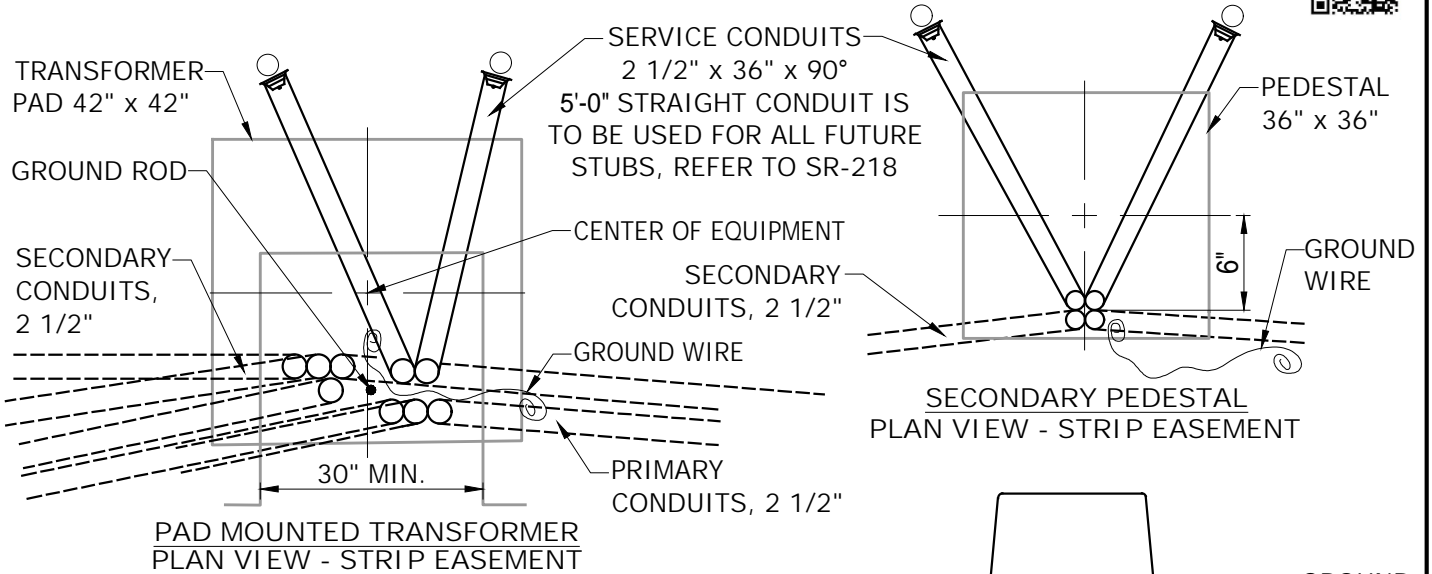
**PAD MOUNTED TRANSFORMER  
FRONT VIEW**

**NOTES:**

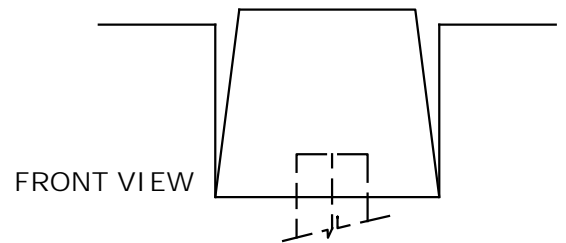
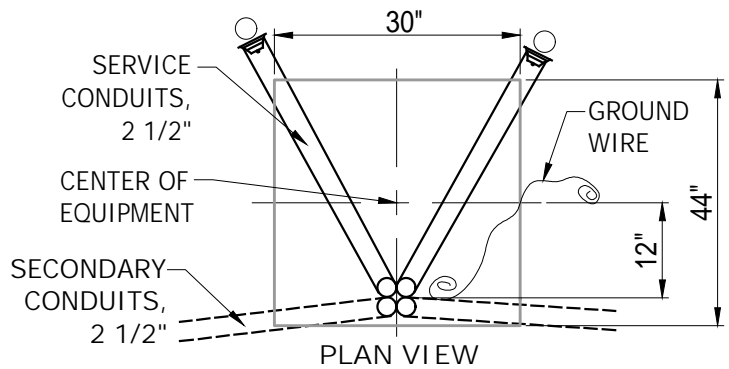
1. NEW EQUIPMENT SITES (ONLY) - WHEN USING WAVE-RIB CONDUIT, LEAVE 4 TO 5 EXTRA FEET TO ASSIST WITH SHAPING AND HOLDING THE CONDUIT IN PLACE, DURING BACKFILL. CONDUIT SHOULD ONLY BE CUT AFTER BACKFILL INSPECTION IS COMPLETE AND APPROVED BY DESIGN SERVICES.
2. EXISTING COMPANY EQUIPMENT - CONDUIT SWEEPS INTO EXISTING EQUIPMENT SHALL BE 2 1/2" x 36" x 90 DEGREE, GREY PVC ELECTRICAL GRADE, SCHEDULE 40. WAVE-RIB CONDUIT IS NOT APPROVED FOR USE IN EXISTING EQUIPMENT. CONTACT TEP (520) 918-8300 OR UES (520) 761-7952, TO SCHEDULE AN ACCESS APPOINTMENT FOR ASSISTANCE WITH THE CONDUIT PLACEMENT.
3. GROUND RODS ARE NOT PERMITTED TO BE CUT UNDER ANY CIRCUMSTANCE. IF SOIL CONDITIONS PROHIBIT DRIVING THE GROUND ROD PER THE SERVICE REQUIREMENT, CONTACT DESIGN SERVICES.



# TRENCHING, CONDUIT AND EQUIPMENT PLACEMENT UNDERGROUND DISTRIBUTION



TRANSFORMER TEMPLATE



SECONDARY JUNCTION BOX  
(CUSTOMER PROVIDED, OPTION)

NOTE:  
GROUND RODS ARE NOT PERMITTED TO BE CUT UNDER ANY CIRCUMSTANCE. IF SOIL CONDITIONS PROHIBIT DRIVING THE GROUND ROD PER THE SERVICE REQUIREMENT, CONTACT DESIGN SERVICES.

 Tucson Electric Power	 SANTA CRUZ COUNTY	INITIATED BY	GC	REVISION NO.	5	SR-209 Pg. 9 of 10
		ESR COMM.	6-05	ESR COMM.	9-20	
				EFFECTIVE DATE	9-20	

# TRENCHING, CONDUIT AND EQUIPMENT PLACEMENT UNDERGROUND DISTRIBUTION



**NOTES:**

**1. EASEMENT/EQUIPMENT IDENTIFICATION**

Customer is to provide property pins and/or swing ties (stakes) to the center of equipment at the equipment (transformer, pedestal, J-10, J-1, J-2, etc.) location. These pins/stakes must be in place for the trench/conduit and backfill/mandrel inspections.

**2. CONDUIT PLACEMENT / TRANSFORMER PAD SITE PREPARATION**

- a. Pad and trench sites shall be level and at final grade before calling Design Services for a trench/duct inspection. Driven ground rod to be 6 inches above final grade. Ground Rods are Not Permitted to be cut under any circumstance. If soil conditions prohibit driving the ground rod per the SR, contact Design Services.
- b. Customer to utilize an approved conduit template available for purchase from Design Services, during the backfill process to ensure proper conduit and ground rod placement at final grade. Duct plugs are required for all conduits, use of duct tape to close ducts is not approved.
- c. After the conduits (SR-205) and ground rods are in place, the customer is to install a #6 solid soft drawn copper conductor for Telco bonding from the ground rod 2 feet above the pad (at the ground rod), 12 inches away from the front of the pad and 36 inches to the right of the pad site. Bury the conductor 12 inches below final grade and coil up approximately 2 feet of conductor. With the template in place, pour concrete on the conduit if using PVC, per SR-205 and 215, Page 1 of 2, and call for an inspection. Upon passing the inspection, backfill and compact to 95 percent, level the equipment site and install the transformer pad. The conduit shall be cut 1 inch above the top of the pad and covered with the appropriate duct plug. See SR-208 for equipment site preparations, including sites with slopes.

- d. The customer to call for a transformer pad site, pedestal site, and mandrel inspection, upon approval the customer will pour 1/2 inch mortar slurry mix in the pad opening for rodent protection.

**3. PEDESTAL SITES**

The Company will provide the pedestal. The customer is to excavate and install per SR-209, Page 9. After the conduits (SR-205) are in place, the customer is to install a #6 solid soft drawn copper conductor for Telco bonding from 2 feet above the sub grade (next to the right side of the conduits), 12 inches away from the front of the pedestal and 24 inches to the right of the equipment site. Bury the conductor 12 inches below final grade and coil up approximately 2 feet of conductor.

**4. JUNCTION CABINET SITES, J-1 AND J-2**

The Company will provide the subsurface base. The customer is to excavate and install per SR-235 (J-1) or SR-234 (J-2). For J-1, install ground wire per Note 3 on this page.

**5. SECONDARY JUNCTION BOX SITES, J-10 (Customer provided in place of pedestals)**

The customer to provide and install the 20K Rated J-10 box, per SR-209, Page 9. Install ground wire per Note 3 on this page.

- a. After the conduit (SR-205) is installed, the customer to provide, install and level an approved Company secondary junction box (see below) so the top of the box is one (1) inch above final grade. Place the lid on the box.

- b. Approved Secondary Junction Box, (J-10, 17"x30"):

Armorcast Products - Cat. No. 6001640-AS

Electrimold Inc. - Cat. No. ECAA-173018-100

CDR Systems - Cat. No. PA30-1730-18S

New Basis - Cat. No. FMA173018TN20001P212N00000

Christy Concrete Products - Cat. No. FL36BOX18

Quazite - PT1730BA (Box), PT1730CA00 (Cover)

The Company will furnish the transformer pads, pedestals, and ground rods at the customers' request. A two week noticed is needed to allow for scheduling. A site contact name, phone number and location of material staging area needs to be provided when making arrangements for delivery. A signature will be required upon delivery. It is the customers' responsibility for the care of the material. Any lost, or damaged material will be the responsibility of the customer to replace with Company approved material.

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			EFFECTIVE DATE	7-22	