



Large Commercial Planning
LCP
Overview



LCP What We Do

- 3-phase Installation / remodel padmount transformer jobs that are requested by the Customer.
- All downtown electrical network services requested by the Customer.
- Customer requested data centers and redundant feeds.
- Customer requested padmount transformer outages.



Large Commercial versus Commercial Planning

- **Large Commercial**
 - A standard padmount transformer installation is intended for Commercial or Industrial Customer, or group of such customers, whose demand load **exceeds** 300 kVA.
 - CPS Energy will determine the rating of the transformer based on load data furnished by the Customer.



Commercial Service (cont'd)

- **Commercial**
 - For demand loads up to 300 kVA, the standard method for supplying 3-phase power is from pole-mounted transformer banks.
 - Who Handles These?
 - All customer requested overhead pole-mounted transformers commercial services will be handled by the respective service districts centers:
 - Northwest Center – contact: 353-4727
 - Southside Center – contact: 353-4693
 - Eastside Center – contact: 353-4783
- **New Service Delivery**
 - NSD handles the majority of new customer requested Commercial and Large Commercial Services – contact: 353-4639



Commercial 3-Phase Overhead Electrical Service

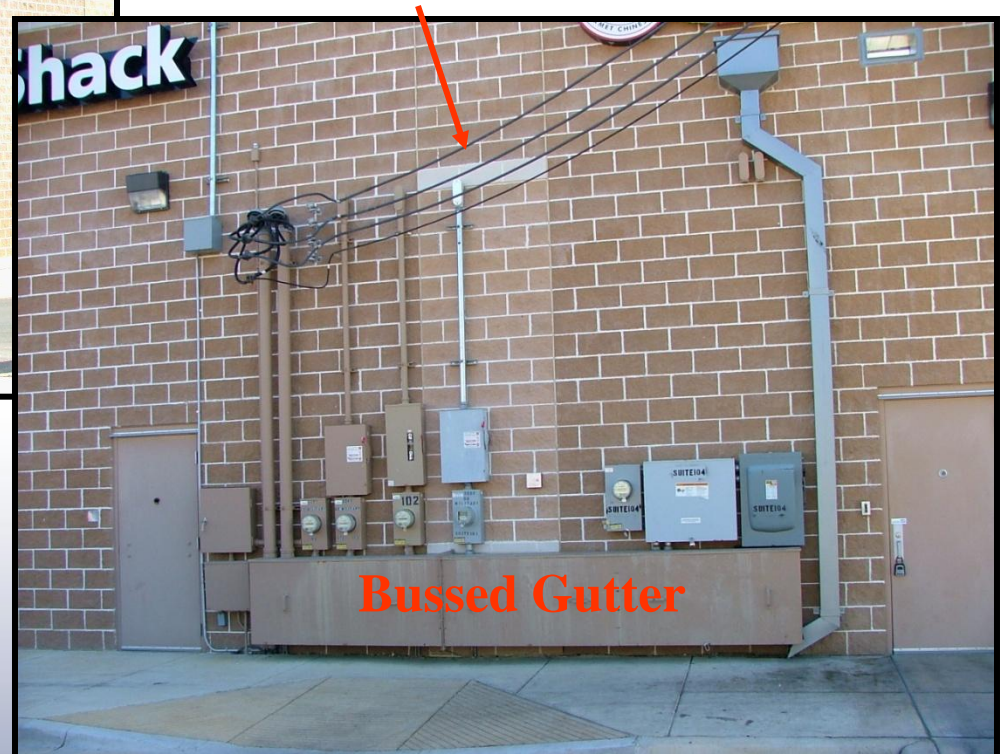


3-Pot Bank

Three-Pot bank is three transformers on a pole that would not exceed 300 kVA.

OH service drop is the secondary cables CPS Energy installs from a transformer pole to a service disconnect or a buss gutter.

Overhead Service Drop



Bussed Gutter



Commercial 3-Phase Overhead-to-Underground Electrical Service

Service Riser

The secondary service riser transitions the secondary service cables from the transformer pole to the service disconnect.



CT & VT Enclosure

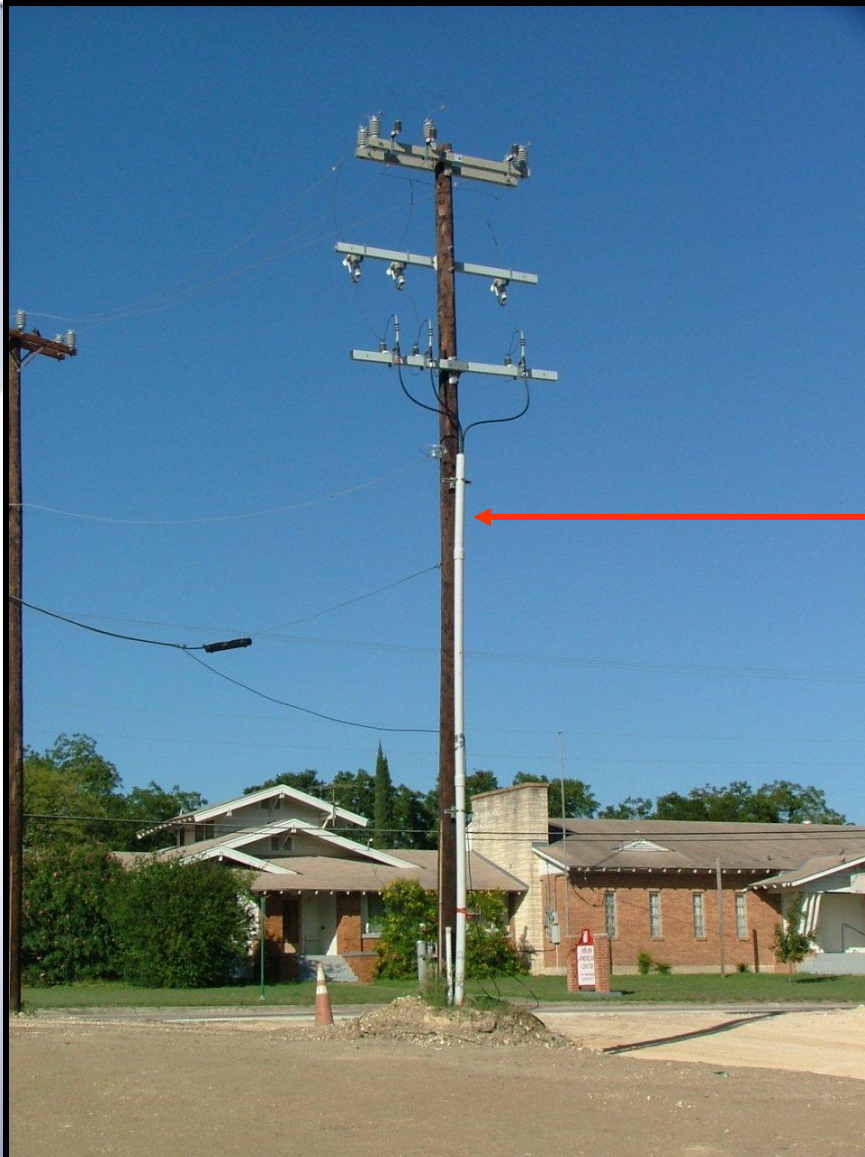
Main Disconnect



The main disconnect switch disconnects power from the transformers on a pole to the Customer's service device.



Large Commercial 3-Phase Riser

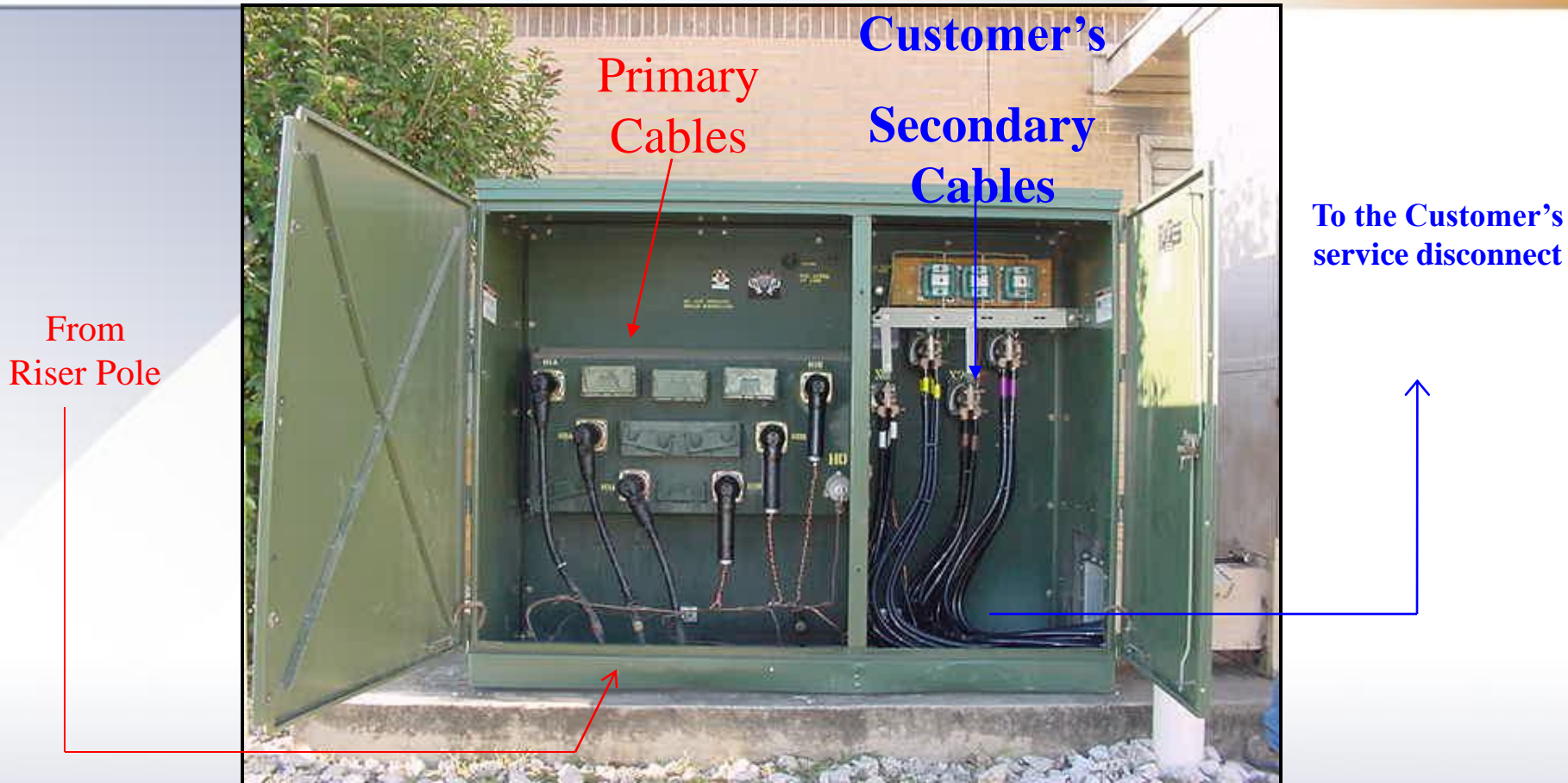


*3-Phase Primary
Riser
Pole*

The 3-Phase riser pole transitions the high voltage power from the riser pole to the padmount transformer.



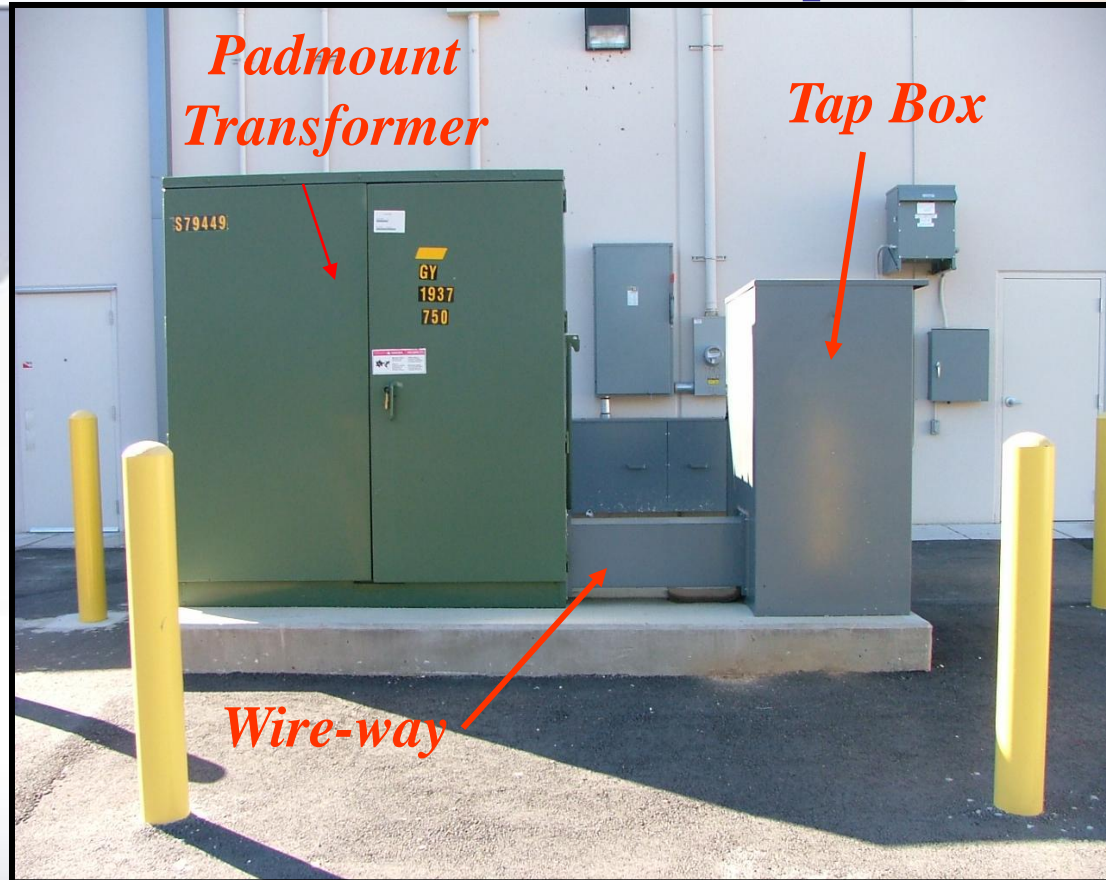
Large Commercial 3-Phase Padmount Transformer



This padmount transformer illustrates the primary cables coming from the riser pole and terminating in the transformer and the secondary cables exiting the transformer and going out to the Customer's service disconnect.



Large Commercial 3-Phase Padmount Transformer with Tap Box



A Transformer with a cable tap box installation. The wire-way transfers the secondary cables to the cable tap box.

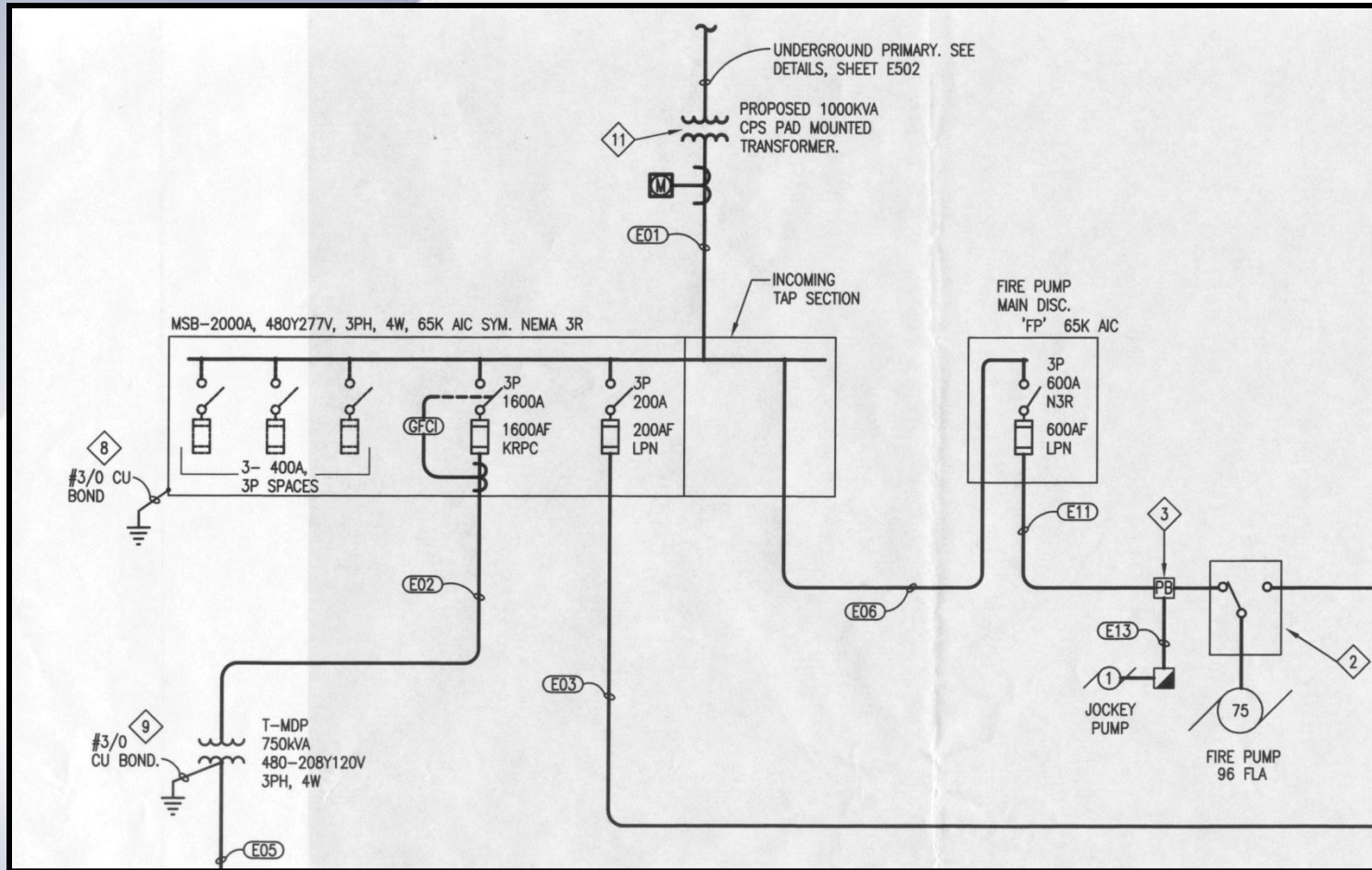


Required Information from Customer/Contractor for a 3-Phase Padmount Transformer

- **Electrical One-Line Diagram**
 - Shows the quantity and size of secondary conduits and conductors
- **Electrical Load Analysis**
 - Shows the connected and demand power requirements in “kVA” (*The total square footage must also be provided.*)
- **Utility Site Plan**
 - Shows the transformer, riser pole, manhole(s), and preferred layout of the primary duct line.
 - The route of the secondary conductors to the main distribution switch should also be indicated.
 - A transformer detail should also be included showing perimeter clearances and location of meter.
 - Provide written dimensions with respect to some permanent existing structure to define the transformer location.

Drawings need to be signed and sealed by a Texas Registered Engineer

Large Commercial One Line Diagram



This is a one-line diagram that describes the electric flow from the transformer to the Customer's service disconnect or Customer's distribution device.



Large Commercial Load Analysis

BUILDING LOAD SUMMARIES

	CONNECTED LOAD (KVA)		DEMAND LOAD (KVA)
BLDG. 2: R2 OCCUPANCY 83,137 SF			
1. DWELLING UNITS: 56 UNITS	2007.8	(.24)	481.8
2. COMMON AREAS:			
HVAC	229.1		229.1
LTG	17.3		17.3
RECEPT	75.7		42.8
HEATING (ELECT)	3.0		0
OTHER (ELEV.)	76.5		72.6
TOTAL (BLDG. 2)	<u>2409.4</u>		<u>843.6</u>

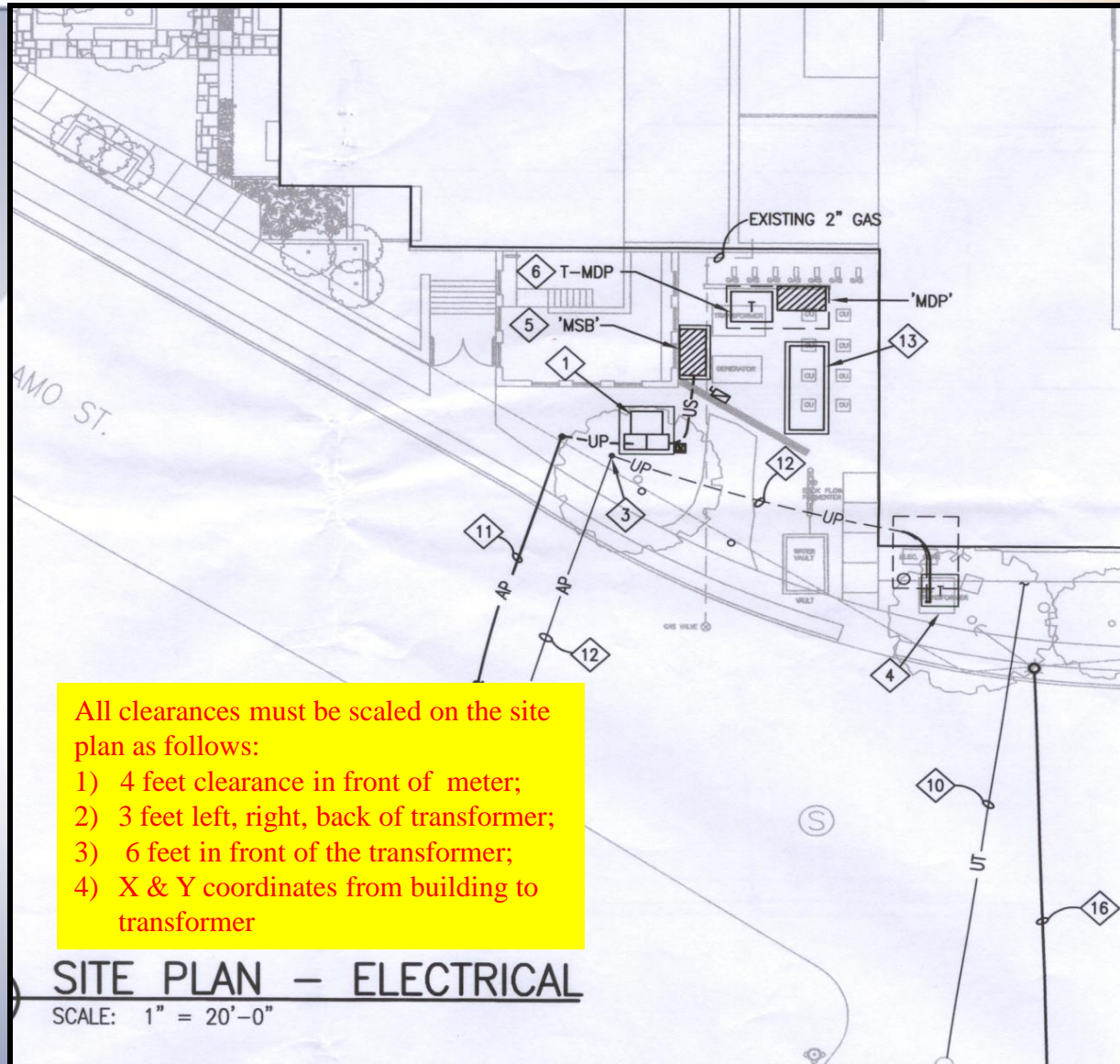
843.6KVA/.831 = 1015 AMPS @ 480V, 3PH. THEREFORE, THE 2000A 480V, 3PH, 4W SERVICE IS ADEQUATE FOR BUILDING 2.

BLDG. 3: R2 OCCUPANCY 15,018 SF			
1. DWELLING UNITS: 10 UNITS	408.0	(.43)	175.4
2. COMMON AREAS:			
HVAC	26.2		26.2
LTG	2.1		2.1
RECEPT	12.5		11.3
HEATING (ELECT)	3.0		0
OTHER (ELEV.)	45.0		45.0
POOL	20.0		10.0
TOTAL (BLDG. 3)	<u>516.8</u>		<u>270.0</u>

270KVA/.360 = 750 AMPS @ 208V, 3PH. THEREFORE, THE 800A 208V, 3PH, 4W SERVICE IS ADEQUATE FOR BUILDING 3.

This is the description of the load to be used in its perspective manner, i.e. lighting receptacles, air conditioning, motors, etc.

Large Commercial Padmount Site Plan



All clearances must be scaled on the site plan as follows:

- 1) 4 feet clearance in front of meter;
- 2) 3 feet left, right, back of transformer;
- 3) 6 feet in front of the transformer;
- 4) X & Y coordinates from building to transformer

SITE PLAN – ELECTRICAL
 SCALE: 1" = 20'-0"



Large Commercial Overhead Clearances & Requirements

- All weather drivable access to within 15 feet of riser pole
- Easements must be provided prior to energizing the electrical service to support an easement of 28 feet for overhead lines, which is 14 feet on each side of the pole centerline.



Large Commercial Underground Clearances & Requirements

- Three (3) feet clearance on the sides and back of padmount transformer slab.
- Six (6) feet of clearance in front of padmounted transformer slab.
- Three (3) feet of clearance from the face of meter.
- Manhole(s) may be required depending on length and number of bends of the primary ductbank.



Large Commercial Underground Clearances & Requirements

- Field notes must be provided prior to energizing the electrical service to support an easement of 20 feet for underground lines. It would be 10 feet on each side of centerline of ductbank, including the padmount transformer with the proper clearances.
- Padmount transformers that are installed within proximity of a drivable surface will require bollards at the discretion of Underground Engineering.



Contractor Responsibilities for a Large Commercial Padmount Transformer

- Contractor needs to read all the notes on the slab drawing and all inspections should be done before and after pouring concrete.
- Install 2 – 4” PVC concrete incased primary duct line from riser pole to padmount transformer slab per CPS Energy specifications (must be inspected by a CPS Energy inspector).
- Install concrete slab per CPS Energy specifications (must be inspected by CPS Energy inspector).
- Provide and install wire-way from padmount transformer to cable tap box, if required. (reference Slide 7)



Contractor Responsibilities for a Large Commercial Padmount Transformer

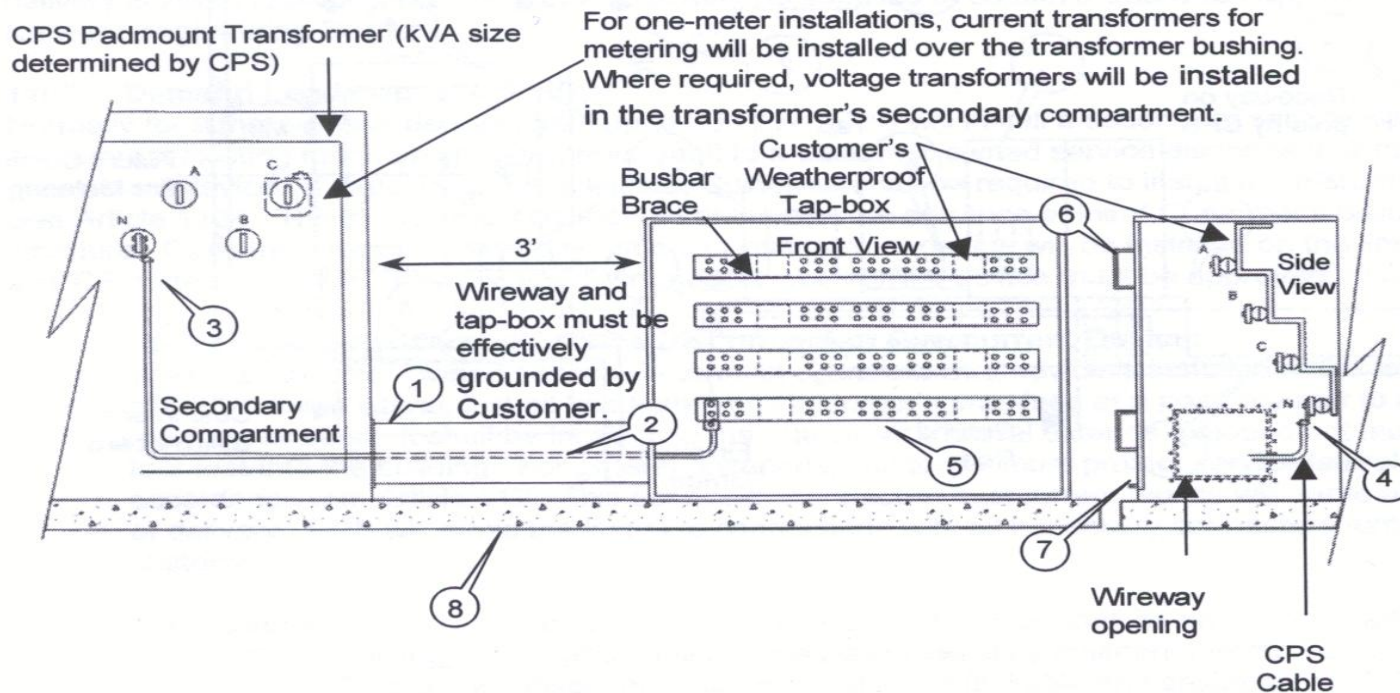
- Provide and install cable tap box, if required. (reference Slide 9)
- Install appropriate metering racks and equipment.
- Provide and install secondary cables. (reference Slide 8)
- Call and to order 3-phase CPS Energy meter socket/can.
- Person or entity responsible for payment of monthly electric bill needs to call and make application for service.



Large Commercial Typical Tap Box Installation

Figure 1000.1
TYPICAL WEATHERPROOF CABLE TAP-BOX / TRANSFORMER INSTALLATION

Use of Cable Tap-box: When the number and size of Customer's load conductors are in excess of those allowed in Table 1000.1, Customer shall furnish and install an approved cable Tap-box. Documents for tap-box approval must be submitted to CPS' Electric Service and Metering Standards Section. The Tap-box must be installed within three feet from the secondary compartment of the transformer as shown below. CPS will provide and install the conductors as indicated in Table 1000.1; if the wireway length exceeds three feet from the CPS transformer, the Customer will provide the conductors. In this case, CPS' point of deliver will be in the tap-box. See Article 1002.4(d). The physical dimensions of the tap-box are to be determined by Customer. For additional data, refer to Figure 1000.2.





Padmount Transformer / Conductor Table

TABLE 1000.1

CPS standard Padmount Transformer Size	Wire Size	Allowable Number of Conductors Per Phase and Their Size Customer May Install in the CPS Padmount Transformer Shown at Left (If these values are exceeded, a Customer-owned tap-box is required)										Conductors Per Phase CPS will Install if a Tap-box is Required.	
		1	2	3	4	5	6	7	8	9	10		
480Y/277-volts													(*)
150 kVA	CU AL	500 750	3/0 4/0										1 - 250 kCM
300 kVA	CU AL		500 750	250 350	3/0 4/0								2 - 250 kCM
500 kVA	CU AL			600 900	350 500								2 - 500 kCM
750 kVA	CU AL				750 900	500 750	350 500						3 - 500 kCM
1000 kVA	CU AL					800 1000	600 900						4 - 500 kCM
1500 kVA	CU AL							900 1000	600 900				6 - 500 kCM
2000 kVA	CU AL								1000 1000				8 - 500 kCM
2500 kVA	CU AL										1000 1000		10 - 500 kCM

208Y/120 volts		1	2	3	4	5	6	7	8	9	10	(*)
150 kVA	CU AL		600 900	350 500	4/0 300							2 - 350 kCM
300 kVA	CU AL				600 900							3 - 500 kCM
500 kVA	CU AL				1000 1000							4 - 750 kCM
750 kVA	CU AL						1000 1000					6 - 750 kCM
1000 kVA	CU AL								1000 1000			8 - 750 kCM



Customer/Contractor Financial Responsibilities

- **New Permanent Service**
 - Customer/Contractor is responsible for the entire costs of the project where applicable.
- **Added Load**
 - If load is increased to require an upgrade (even if Customer/Contractor is relocating the service), CPS Energy will upgrade the existing primary service cable(s) and transformer(s) at no charge.
 - Customer/Contractor is responsible for any additional installation or removal of overhead work or underground infrastructure.
 - If the Customer/Contractor already has a padmount transformer and is able to use the existing riser, there is no charge to upgrade the padmount transformer.
 - If the Customer/Contractor has an existing 3-pot bank transformer and is upgrading to a padmount transformer, the Customer/Contractor will be responsible for the charges for any overhead work which is usually associated with the riser pole.



CPS Energy Responsibilities for Large Commercial Padmount Transformer

- Install riser pole and associated overhead facilities.
- Install primary cable from riser pole to the padmount transformer.
- Install padmount transformer.
- Terminate all secondary cables in padmount transformer.
- Set the meter device.



Electric Service & Standards

- More information is available in the Electrical Service Standard book or on the web at www.cpsenergy.com.
- Search “Standards & Specs” in search window
- Click on “Electric Service Standards”