



## Overview

The City of Naperville owns and operates its own electric utility. The utility established standards for the design and operation of the City's electric system as a whole 20 years ago. Standardizing these elements is beneficial as it lowers the cost of utility operations, which translates into savings for rate payers, and provides a safer working environment for utility employees.

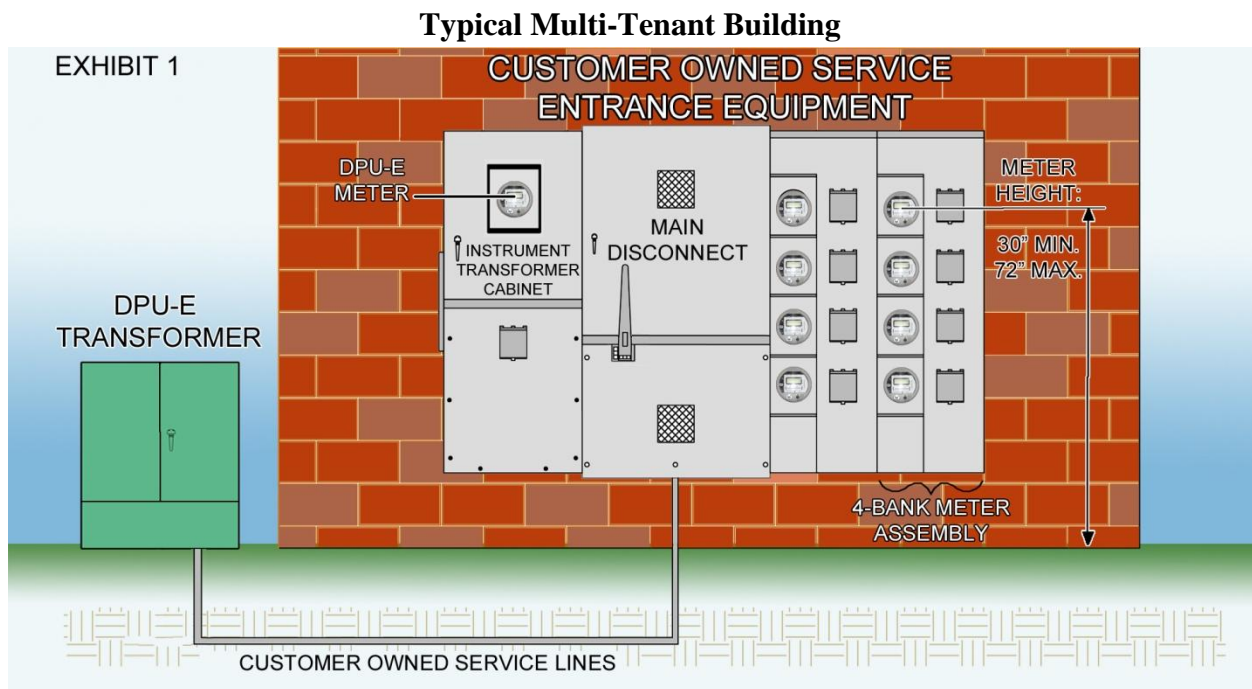
The Department of Public Utilities-Electric (DPU-E) maintains the following standards:

- *Engineering standards* – how to design electric facilities for residential and commercial customers
- *Construction standards* – how to build electric facilities based on the equipment specified
- *Material specifications* – equipment infrastructure

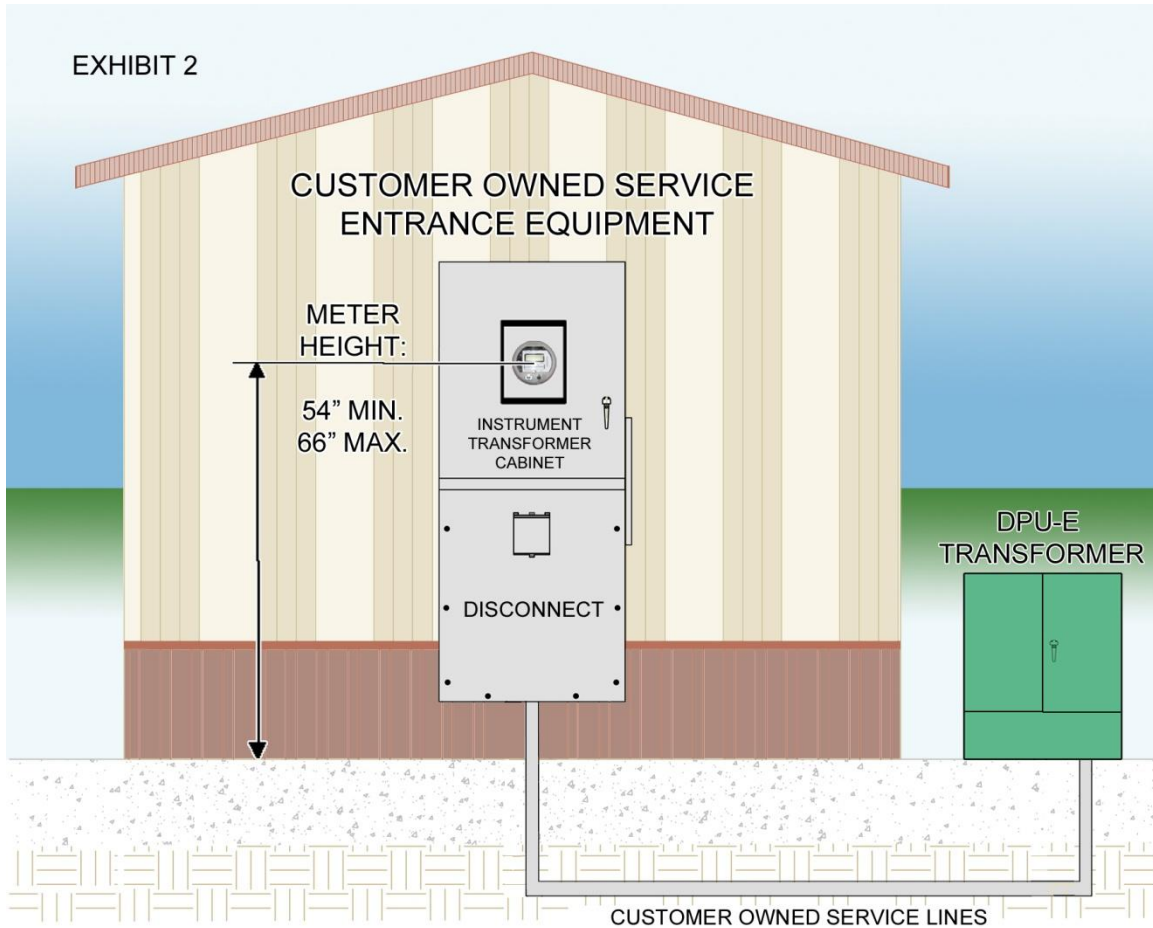
All equipment that is used for the purpose of providing electricity, be it owned by the utility or customer, is reviewed based on the following criteria: functionality, efficiency and safety of operation.

## What Do I Own?

As a commercial customer of the utility, you own some of the equipment that provides power to your business. This equipment is referred to as **service entrance equipment**. Below are exhibits and diagrams that explain what you own versus what the utility owns. A summary of common terms can be found in Appendix A.

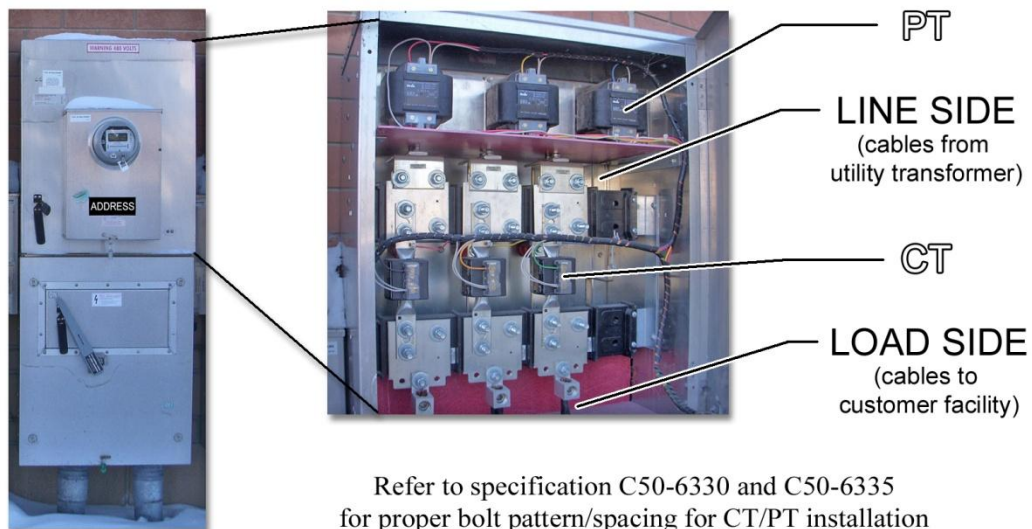


## Typical Single-Tenant Building

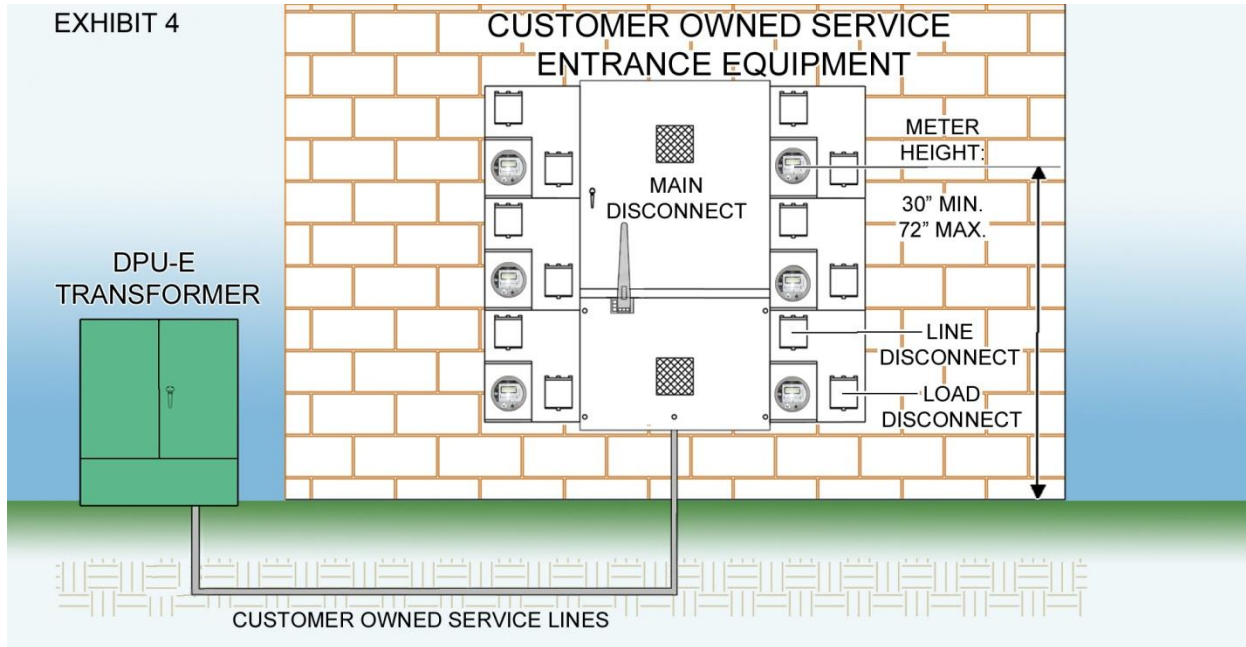


## Typical Instrument Transformer Cabinet with CT/PTs

EXHIBIT 3



## Proposed Dual Disconnect Service Entrance Equipment for 200Amp/480Volt Multi-Tenant Building



### Changes to the Requirements

In recent months, DPU-E and the Transportation, Engineering and Development (TED) Business Group were asked to review service entrance equipment standards and requirements for commercial electrical installations and consider possible changes. Below is a chart describing the service standard that was reviewed, the current status of the standard, the proposed change and how the proposed change to the standard benefits you and the utility.

After reviewing these changes, if you have any questions, please contact Ron Ritter in DPU-E at (630) 420-4183 or [RitterR@naperville.il.us](mailto:RitterR@naperville.il.us).

Standard Item Reviewed	Current Standard	Change to Standard	Reasoning/Basis for Change and Standard
<b>Height range for meters</b>	A commercial multi-bank installation must be between 36" and 60"	A commercial multi-bank installation can range from 30" to 72." (Exhibit 1)	Allows for 4 meters in one bank (Exhibit 1)  Potential cost savings to customer  Space saver on customer wall

<b>Standard Item Reviewed</b>	<b>Current Standard</b>	<b>Change to Standard</b>	<b>Reasoning/Basis for Change and Standard</b>
<b>Height range for meters</b> (continued)	Meter height mounted on instrument transformer cabinet must be between 36"-60"	Meter height mounted on instrument transformer cabinet can be between 54"-66" (Exhibit 2)	Allows for proper working height for installations of instrument transformers (CT/PTs)
<b>Metering at 200Amp/480Volt</b>	Required CT/PT rated service	Allowed with dual (line/load) disconnects (Exhibit 4)	Dual disconnects will allow safe operation for utility personnel and a customer's electrician  Space saver on customer wall  Significant cost savings for customer
<b>Instrument transformer cabinet size</b>	Specific dimensions were in place	Flexible dimensions are available based on customer's need	Customer's responsibility to make sure cabinet size fits utility CT/PTs and bolt patterns and spacing are correct (Exhibit 3)  DPU-E stocks standard size CT/PTs as defined in specification C50-6330 and C50-6335  Customer responsibility to size cable and determine quantity  Early design work by customer can have significant cost savings and prevent delays
<b>Main disconnect for multiple meter installations</b>	Main disconnect for all multiple meter installations (Exhibit 1)	Will be determined on a case-by-case situation for both existing and new construction	General building usage, location and potential expansion will determine requirements

Standard Item Reviewed	Current Standard	Change to Standard	Reasoning/Basis for Change and Standard
<p><b>Main disconnect for multiple meter installations</b> (continued)</p>		<p><i>Examples where a single disconnect would be required:</i></p> <p>Multi-tenant buildings that are metered individually (strip malls, medical, office buildings) (Exhibit1)</p> <p>Buildings fed from a community transformer (more than one customer using same transformer)</p> <p><i>Examples where a single disconnect would NOT be required:</i></p> <p>Small commercial buildings limited in size</p>	<p>Existing facilities will be evaluated based on safety and operational requirements</p> <p>Main disconnect</p> <ul style="list-style-type: none"> <li>• Protects transformer</li> <li>• Allows for work to be done on facility without involving the utility for disconnect (cost savings to customer)</li> <li>• Allows for customer to work on facility without impacting other customers fed off of the same transformer (e.g. requiring outages)</li> <li>• Allows customers the flexibility to run longer feeders for units</li> <li>• Allows customers a cost savings by not requiring internal main breakers</li> </ul>

## **Important Reminders About Service Entrance Equipment**

Your service entrance equipment must comply with the National Electric Code (NEC) and DPU-E's Service Rules and Policies. DPU-E Service Rules and Policies are available to view at [www.naperville.il.us/emplibrary/DPU-E-ServiceRulesPolicies.pdf](http://www.naperville.il.us/emplibrary/DPU-E-ServiceRulesPolicies.pdf).

Electrical drawings must be included on any building plans submitted to TED for plan review, and catalog cuts of the metering equipment must be submitted to DPU-E for approval prior to the contractor ordering the equipment. Although your electrical contractor may not be hired until later in the project, it is important to consider these requirements early on during the plan review process. This will result in fewer time delays and potential reduced costs for equipment.

It is also important to relay any comments provided during the City's plan review to your electrician. There are unique requirements for every electric utility, just as there are unique requirements for building construction, so communication and follow-through is important. Lead times for service entrance equipment should be taken into consideration. It is not a best practice, from a cost or safety standpoint, to purchase oversized service entrance equipment if timing is critical. Proactive planning can result in properly sized equipment and a reduced cost to you.

### **Service Entrance Equipment 101: Educating the Customer**

Although the City is not responsible for obtaining individual customer service entrance equipment, the City will educate customers on what to look for so that common pitfalls and associated unnecessary installations and higher costs can be avoided. This educational effort will focus on providing customers with requirement information during the initial phases of their projects. This guide will also be posted to the City's website in conjunction with the Service Rules and Policies to provide guidance.

## **Appendix A: Common Terms**

**Current Transformer (CT):** The utility-owned equipment used to step down the customer's current to allow the utility-owned meter to register customer electricity usage.

**Instrument Transformer Cabinet:** The customer-owned cabinet where utility-owned CT/PTs are mounted for metering customer load.

**Line Disconnect:** The customer-owned device used by utility personnel to isolate the electricity from the utility transformer. (This is used on 200Amp/480Volt services.)

**Line Side:** The top side in the customer-owned instrument transformer cabinet where utility-owned CTs and customer service cables from the utility transformer are mounted.

**Load Disconnect:** The customer-owned device used to disconnect the customer's individually metered load.

**Load Side:** The bottom side in the customer-owned instrument transformer cabinet where utility-owned CTs and customer service cables going to the customer's facility are mounted.

**Meter:** The utility-owned device used to measure the amount of electricity the customer uses.

**Main Disconnect:** The customer-owned device used to isolate the customer's entire load.

**Potential Transformer (PT):** The utility-owned equipment used to step down the customer's voltage to allow the meter to register customer usage.

**Service Entrance Equipment:** The customer-owned equipment used for metering and disconnection at the customer's service location.

**Transformer:** The utility-owned equipment used to provide electricity to the customer.