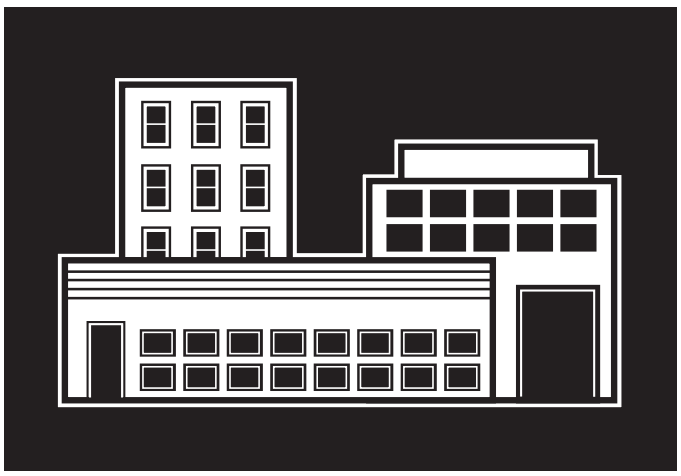
Clark Public Utilities

Commercial Electric Service Handbook



January 2011

CONTACTS

Clark Public Utilities:

Website . . . . . www.ClarkPublicUtilities.com

Construction Services department (To initiate a new service, service upgrade or request a meter unlock) . . . . . (360) 992-8558

Operations department (To request a standby or for questions on jobs that are inspected, backfilled and ready to be scheduled) . . . . . (360) 992-8839

Customer Service department (For general billing questions about existing electric or water accounts) . . . . . (360) 992-3000

Note your job number and the name of your Clark Public Utilities representative for quick reference:

Job number _____

Utility representative name _____

Phone number/e-mail _____

Other:

"Call Before You Dig" number (underground utilities locating service) . . . . . 811 or 1-800-424-5555

Washington State Department of Labor and Industries

- To obtain an electrical permit . . . . . (360) 896-2300
- Questions about a permit or code. . . . . (360) 896-2360
- To request an electrical inspection . . . . . (360) 896-2350

City of Vancouver

- To obtain an electrical permit . . . . . (360) 487-7802
- Questions about a permit or to request a permit extension . . . . . (360) 487-7802
- To request an electrical inspection . . . . . (360) 619-1200

Additional utility contacts:

Telephone _____

Cable television _____

Fiber optic _____

Water _____

Natural gas _____

Clark Public Utilities

Updated January 2011

P.O. Box 8900 • Vancouver, WA 98668 • 360-992-8558

CONTENTS

CHAPTER 1

Introduction

This handbook is a guide to Clark Public Utilities' requirements for new or altered electric services to commercial structures. The information in the following chapters applies only to Clark Public Utilities commercial customers.

Glossary of terms used in this handbook

Glossary words appear in bold italics throughout the text the first time they occur (e.g., ***safety socket***). The glossary of terms is located in the appendix at the back of this handbook.

Codes, permits and inspections

This handbook should be used only as a guide. It should not be interpreted to conflict with regulations of the state of Washington or other regulatory bodies having jurisdiction.

It is the customer's responsibility to ensure the project complies with all federal, state or local codes that may apply. All codes and requirements related to a project should be addressed before construction begins.

Electrical service equipment inspection for new service

Prior to Clark Public Utilities connecting the service, the newly installed service equipment requires an electrical inspection from the Department of Labor and Industries or the city with jurisdiction. It is the customer's responsibility to request this inspection with the appropriate agency.

Local inspecting agencies can be contacted at the following numbers:

- Washington State Department of Labor and Industries ..... (360) 896-2350
- City of Vancouver (within Vancouver city limits)..... (360) 619-1200

How to contact Clark Public Utilities

Located inside the front cover of the handbook is a listing of Clark Public Utilities' contact phone numbers. This list also includes phone numbers for other construction-related contacts.

To initiate a request for new service or to ask a question about an existing construction project, call our Construction Services department at (360) 992-8558.

Jobs are scheduled for connection once the project has passed required inspections and all utility requirements have been met. Contact the Operations department at (360) 992-8839, referencing the job number, for current construction scheduling.

Online applications for service, a copy of this publication, and additional information can be found on the Clark Public Utilities website: **www.clarkpublicutilities.com**.

For general billing questions regarding existing electric or water service accounts, please call Customer Service at (360) 992-3000.

CHAPTER 2

Commercial Electric Service General Information

Service installation responsibilities

Installing a new electrical service to a commercial structure is a cooperative effort between the customer and Clark Public Utilities in which both share responsibility.

Clark Public Utilities is responsible for:

- Providing an electrical design based on Clark Public Utilities' construction standards that best suits the customer's needs.
- Applying for right-of-way trenching and crossing permits within Clark County unincorporated and all crossings of state highways. Fees for these permits will be added to the customer's Clark Public Utilities construction bill.
- Connecting the inspected and approved service.
- Setting the electric meter in a customer-installed and maintained meter base.

Customer is responsible for:

- Requesting electrical service and establishing an electric account.
- Hiring a utility-approved electrical contractor to supply and install all required primary (high voltage) electrical equipment based on the utility-provided electrical design.
- Obtaining right-of-way trenching and crossing permits within any incorporated city limits.
- All trenching related to the installation.
- Installing the primary and ***secondary service*** including the required primary and secondary facilities, trenches, ***conduit***, conductor and ***metering equipment***.
- Obtaining electrical wiring permits and inspections from state or local municipalities.
- Maintaining the service line and associated metering equipment, excluding the meter. See *Ownership and Maintenance Responsibilities* section for additional information.
- Keeping the meter equipment accessible to Clark Public Utilities personnel 24 hours a day, seven days a week.
- Maintaining electrical equipment safety ***clearances*** for both existing and new installations of primary and secondary equipment.

NOTE: Adding additional load to an existing commercial service may require upgrades to the existing facilities and distribution system. Costs for required upgrades are the responsibility of the customer.

Ownership and maintenance responsibilities

Once the new service passes electrical inspection, is backfilled by the customer and energized by the utility, Clark Public Utilities assumes ownership of the primary voltage facilities. The utility is then responsible for repairing and maintaining the primary voltage system and related equipment.

All service equipment, conductors and wiring on the customer side of the ***transformer*** is owned and maintained by the customer. Commercial services that include a ***secondary junction box/pedestal*** are customer-owned on the load side of the secondary connectors. The customer is responsible for facilitating any necessary repairs or changes to the underground service line, meter equipment, switchgear, and electrical paneling.

Starting the installation process

Setting up an account

A billing account will be established at the time the customer calls to request new electric service or completes and submits the ***New or Altered Commercial Electric Service Worksheet*** found on page 43 in the appendix of this handbook.

Construction Services can be reached at (360) 992-8558. The construction services representative will ask for billing information and the address of the new service site. ***Chapter 3*** provides a detailed list of information required to initiate a commercial service request.

Service voltage

Table 1 provides a listing of commercial voltages offered by Clark Public Utilities.

Table 1 Commercial service voltages

Service Type	Voltage
Single-phase	120/208 Volt, 3 wire* (limited applications) 120/240 Volt, 3 wire 240/480 Volt, 3 wire* (limited applications)
Three-phase	120/208 Volt, 4 wire wye, grounded 120/240 Volt, 4 wire delta* (limited applications) 277/480 Volt, 4 wire wye, grounded

* Requires pre-approval from a utility representative.

Motor loads

Commercial customers with large motor loads are responsible for providing and maintaining code-approved protective devices. These devices are required to protect motors against overloading, short circuits, ground faults, low voltage, and single phasing of three-phase motors.

NOTE: Motor loads of 100 hp or larger will require a "soft start" device.

Meter equipment location requirements

The meter base and associated devices (CT enclosure, switchgear, etc.) must be attached to a permanent fixed structure. This location is to remain accessible to Clark Public Utilities personnel 24 hours a day, without the need to call for an appointment.

Location requirements:

- On the outside of the structure being served.
- On the ground floor, with the center of the meter 5 to 6 feet above finished grade (5 feet preferred).
- Readily accessible to utility personnel 24 hours a day.
- Inside ***electrical equipment rooms*** that have an exterior entrance and allow the utility 24-hour access. This location must be approved by a utility representative prior to construction.

These approved locations allow Clark Public Utilities to:

- Read the meter in a cost-effective manner.
- Maintain the ***metering equipment*** efficiently.
- Disconnect the electrical service quickly in case of emergency.

NOTE: See ***Chapter 4, Commercial Metering*** for more information.

Trenching

The licensed and bonded, approved primary electrical contractor hired by the customer is responsible for digging the primary electric and secondary service trenches and calling the utility for inspection of the primary voltage trench. The contractor backfills and compacts all trenches after required inspections have taken place.

For additional trenching information, see ***Chapter 3, Commercial Underground Services***.

Locating and notifying underground utilities

Locating existing underground utilities

State law requires that the customer call the underground utilities locating service at least two full business days (48 hours) before trenching, directional drilling/boring or excavating for underground electric services. Customers

Table 2 Color codes for locating underground utilities

Color	Underground Service
Red	Electric
Yellow	Gas, Oil, Steam
Orange	Telephone, Cable television, Fiber optic
Blue	Water
Purple	Reclaimed water
Green	Sewer, Storm drain
Pink	Temporary survey marks
White	Proposed excavation

within Clark County can call the national ***"Call Before You Dig"*** number, 811 or 1-800-424-5555. One call to the locating service notifies all utilities that locates have been requested. Underground electric distribution lines owned and maintained by Clark Public Utilities will be located. This service is free of charge. The customer is responsible for facilitating locates for privately-owned, underground utilities. ***Table 2*** shows the color code for marking the location of each utility.

NOTE: Any digging within 24 inches of location marks must be done by hand with wood or fiberglass handled tools. Do not use digging bars in the vicinity of buried cables.

Notifying other utilities about new electric service installations

New construction typically involves the installation of telephone lines, cable television cables and natural gas lines as well as electric power cables. It is the customer's responsibility to notify each utility about the intended electric service installation.

Joint use facilities

Joint use describes a group of utilities that share pole space or trenches in an effort to keep installation and maintenance costs lower for the customer. In Clark County, there are joint use agreements with phone, cable television and fiber optic services.

Joint use trench

The customer may place telephone, cable television, or other communication wires in a trench with electric service conductors, providing the installation meets the requirements of Clark Public Utilities and all other parties sharing the trench. In certain cases, natural gas and water services may be installed in a common trench. See ***Chapter 3, Commercial Underground Services*** for additional trenching information.

NOTE: Sewer lines, water mains and storm drainage systems are ***not*** allowed in a joint trench with Clark Public Utilities' electric service lines.

Overhead joint use

Whenever an existing Clark Public Utilities pole is replaced or an overhead service is converted to underground and the pole has joint users attached, the pole will be abandoned (left on site) to the remaining joint users on that pole. The utility has no authority to remove or relocate other utilities on the pole. It is the customer's responsibility to contact all joint use utilities for conversion of their services and to coordinate the removal of the pole(s) ***prior*** to beginning the project.

Conduit

All new underground single-phase and three-phase primary electrical systems serving commercial structures require continuous runs of conduit. The electrical design provided by the utility will list the size and number of primary voltage conduits required.

The design firm hired by the customer will provide conduit specifications for the secondary service. These requirements are dictated by the National Electric Code (NEC) and fall under the jurisdiction of the Washington State Department of Labor and Industries or the City of Vancouver.

The number of secondary service circuits and size of conduit may be limited by the ***source*** facility. A Clark Public Utilities designer will review the secondary service design and advise on the number of secondary circuits and size of conduit allowed. See ***Secondary service conduit*** on page 15 for additional information.

Contact the ***authority having jurisdiction*** for additional information on electrical service conduit requirements.

Work clearances around transformers

A minimum of 10 feet of clear, level working space is required in front of a padmounted transformer, three feet from the back and sides. This allows utility personnel enough room to perform transformer switching (rerouting of high voltage power) and maintenance. Landscaping, fences and other obstructions must not encroach on these clearances.

Additional information about clearances around padmounted equipment and transformer placement can be found in ***Chapter 3, Commercial Underground Services***.

Cost for service

Charges vary depending on the location of existing electrical facilities, the size of service requested and the type of metering required. Following is a brief description of the charges that may be applied to commercial electric service requests. These charges are subject to change. Contact Clark Public Utilities' Construction Services department at (360) 992-8558, or visit our website **www.clarkpublicutilities.com** for verification of current rates. Electric service requests on file longer than six months will require updating to current charges.

System development charge

This charge covers costs incurred by the utility to increase the capacity of the existing electric distribution system. Charges are based on phase, voltage and panel size of the new or altered service.

Service panel changes and upgrades may also require payment of the system development charge.

Miscellaneous construction charges

New and upgraded services that require an extension of primary facilities or upgrades to existing secondary or primary facilities may have additional charges applied. These charges cover the cost of labor and materials used to modify the utility's existing system when connecting additional services.

A utility representative will evaluate the job site and advise of any miscellaneous construction charges that may apply.

Temporary services

Commercial customers may request a metered ***temporary service*** to provide electrical service during the building process. A utility representative will provide a design for the requested temporary service. The customer provides and installs the meter base, underground conductor and panel(s) as required by the electrical design and the local governing office. Once the service passes an electrical inspection and the trench is backfilled by the customer, the utility will connect the service and set the meter.

Overhead temporary services require the customer to provide and install the meter post, meter base, panel(s) and weatherhead. The utility will provide the overhead conductor, meter and connect the service once the electrical inspection has been completed.

Permits

Clark Public Utilities will process and apply for all right-of-way work permits required for primary voltage electric services installed within unincorporated Clark County. This includes permitting required for county, state and railway property right-of-way trenching and crossing.

Fees for these permits vary depending on the requirements of the job and will be added to the customer's construction billing.

If the job site is within any incorporated city limit, it is the customer's responsibility to apply for and secure the required permits.

Visit our website, ***www.clarkpublicutilities.com****, or contact a* ***Clark Public Utilities representative*** *regarding questions about construction fees or to access a listing of current charges.*

CHAPTER 3

Commercial Underground Services

Preparing for the installation

The following checklist will assist in preparing a project for the installation of a commercial underground electric service. After these items have been completed, Clark Public Utilities will connect the service and set the meter.

To obtain new commercial underground electric service, the financially responsible party is asked to:

❑ Contact Clark Public Utilities' Construction Services department at (360) 992-8558 to initiate a request for service.

❑ Provide the following information:

- Job site address and/or Assessor's Parcel Number (APN).
- Description of commercial business to be served.
- Contact person's full name and phone number.

❑ Obtain an electrical work permit from the Washington Department of Labor and Industries (360) 896-2300 or from the City of Vancouver (360) 487-7802.

❑ Provide the utility's designer with the following information:

- Civil drawings of the planned structure including any required street lighting.
- Site plan with feasible location for electrical equipment indicated.
- Voltage requirements.
- Load information (panel size and expected load).
- Itemized load summaries.
- Notice of future road improvements surrounding the job site.
- Documentation of any existing utility easements.

NOTE: All required easements must be secured by the customer prior to service connection.

❑ Call the national "Call Before You Dig" locating service by dialing 811 or 1-800-424-5555 to determine the location of existing underground utilities.

❑ Obtain a primary voltage and/or secondary service electrical design from a Clark Public Utilities designer.

❑ Pay all pre-billed utility construction charges.

- ❑ Hire a primary electrical contractor from Clark Public Utilities' approved primary contractors list to purchase and install the required underground facilities, materials and metering system as outlined in the approved utility design.
- ❑ Have the Clark Public Utilities approved electrical contractor call (360) 992-8839 to request inspections of all primary equipment and trenches.
- ❑ Contact the utility's Meter department at (360) 992-8001 to schedule delivery and installation of CTs and the meter ***prior*** to the final service inspection.
- ❑ Obtain an electrical service inspection from the authority having jurisdiction.
- ❑ After inspection and approval, ***backfill*** the trench to final grade. Complete backfill of the primary trench is required prior to the utility scheduling the job to be energized.

  NOTE: The electrical inspector will notify Clark Public Utilities after the service has been approved.

Once Clark Public Utilities has received verification of ***approval*** and the customer has completed backfilling the trench, the utility will:

- ❑ Energize all electrical facilities required.
- ❑ Connect underground primary and secondary conductor in an energized source facility.
- ❑ Set the electric meter in the customer-owned meter base.

Design responsibilities

Clark Public Utilities

A Clark Public Utilities designer will provide a design of system upgrades and new electrical facilities required to serve the commercial job site. Once the electrical design is complete, the customer is responsible for hiring a utility-approved contactor to trench and install the primary voltage electrical equipment as outlined in the utility's electrical design.

Commercial customer

The customer's electrical designer is responsible for providing a design of all electrical services required to serve the commercial structure. This includes designs for the following customer-owned and maintained services:

- ▶ Service to the commercial structure.
- ▶ Street light locations, as required by the authority having jurisdiction.
- ▶ Fire-pump services. This service may require a dedicated circuit.

Ownership and maintenance responsibilities

Clark Public Utilities takes over ownership and maintenance of newly energized underground facilities up to the connectors inside the secondary junction box/pedestal. If no secondary junction box/pedestal exists, utility ownership ends at the secondary connectors inside a padmounted transformer or at the secondary connection point of an overhead transformer.

All electrical equipment and wiring on the customer's (load) side of the transformer (including the service mast of overhead services) is owned and maintained by the commercial customer. The customer is responsible for facilitating any necessary repairs or changes to the service and metering equipment. This includes the underground conductor, conduit, entrance equipment, meter base and ***associated equipment***.

NOTE: Commercial customers installing primary metering will have ownership and maintenance agreements that are mutually agreed upon. In most cases, the customer owns and maintains all facilities and equipment beyond the primary metering.

Commercial street lighting

Commercial job sites within incorporated cities of Clark County may require street lighting as part of the project. Once the customer-provided lighting design has been approved by the incorporated city with jurisdiction, the customer's design firm is required to submit this plan to Clark Public Utilities' design group. A utility designer will provide a design of electrical facilities needed to serve the new street lights.

It is the commercial customer's responsibility to request a design for the lighting service and coordinate the installation of facilities to serve both the commercial structure and street lighting.

Street lighting ownership and maintenance

Customers submitting approved lighting designs that call for Clark Public Utilities' standard lighting materials will have the option of purchasing these materials from the utility. The utility will maintain approved materials that are installed to Clark Public Utilities' specification.

Street lighting fixtures installed within Vancouver or Camas city limits are maintained by the City of Vancouver and City of Camas. Overhead and underground conductors providing service to these street lights are maintained by Clark Public Utilities.

Lighting designs calling for non-standard materials are customer-owned and maintained. The utility requires metering installed ahead of all customer-owned street lighting services.

Site preparation

The following site requirements must be met before the installation of a new commercial service can begin:

- A Clark Public Utilities primary design has been completed.
- The customer has hired a primary electrical contractor from Clark Public Utilities' current list of approved contactors.
- All required permits have been secured (right-of-way, street crossing, etc.).
- The site is at final grade or acceptable sub-grade in the area of construction.
- The trench route is clear of construction material and any obstructions.

Primary trench

Trench width and depth

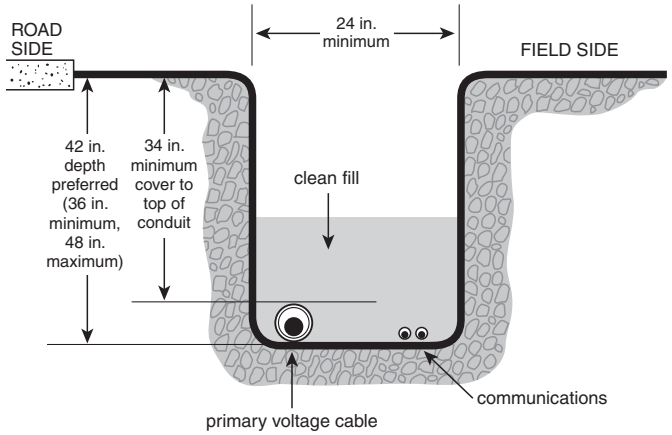
The primary trench width is 24 inches unless otherwise approved by utility personnel. The excavator may need to increase the trench width to accommodate other conduits and/or lines installed in a joint use trench. When increasing the trench width, remember to allow a minimum of 12-inch horizontal separation between Clark Public Utilities' electrical conduits and other utility service lines.

The preferred trench depth for commercial primary electrical lines is 42 inches with 36 inches of cover. The minimum depth trench is 36 inches with a minimum of 34 inches of cover, measured from the top of the electrical conduit over the entire length of the trench. The maximum trench depth allowed is 48 inches. ***Figure 1*** illustrates the utility's width and depth requirements for commercial primary line extension trenches with and without a natural gas/water service line.

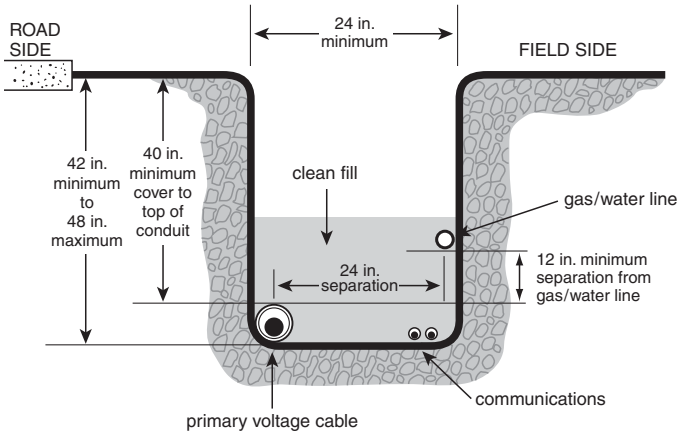
NOTE: Sewer lines, water mains and storm drainage systems are ***not*** allowed in a joint trench with Clark Public Utilities' electric service lines.

Figure 1 Typical commercial utility trenches with primary voltage cable

trench with primary voltage cable (no gas/water line)



trench with primary voltage cable and gas/water line



NOTE: The maximum trench depth allowed is 48 inches.

Trench excavating requirements

The following trench requirements must be met before primary power conduits can be installed:

- The customer is responsible for applying for and securing right-of-way work permits required within incorporated city limits.
- Trenching or installing a crossing for primary voltage service in the public road right-of-way of unincorporated Clark County requires a public roadway use permit, applied for and issued to Clark Public Utilities by the authority having jurisdiction. Fees for utility-secured permits will be added to the customer's construction billing.
- No work in the right-of-way shall be performed until required permits have been secured.
- A licensed and bonded excavation contractor hired by the customer must perform all work in the public road right-of-way.
- The approved contractor shall comply with all roadway use permit requirements.
- All road crossings shall be a minimum 42-inch to maximum 48-inch depth depending on the other utilities that will share the crossing.
- Trenches and crossings within the state right-of-way require five feet of cover, measured from the top of the conduit.
- Any work in the public right-of-way must meet the erosion and sediment control requirements of the local jurisdiction.
- Trenches shall be excavated according to the trench detail, and Clark Public Utilities' electrical design.
- Trenches shall be straight and the bottom smooth, level, and free from rocks, obstructions and construction debris.
- The customer shall remove all water in primary voltage and secondary electric service trenches prior to inspection by pumping or draining.
- The customer is responsible for roadway restoration and clean-up as required by the permit issuing agency. Electrical facilities will not be energized until final approval of restoration has been issued by the authority having jurisdiction.

Directional drilling/boring

Directional drilling/boring used to install primary voltage electric service must meet the following requirements:

- Pre-approval of the drilling/boring route from a Clark Public Utilities representative prior to the beginning of construction.
- The utility-approved electrical contractor hired by the customer contacts the new construction superintendant at least one week prior to the start of work for site approval and specification review.
- Road crossing and right-of-way work permits have been secured prior to the start of work.

NOTE: If drilling/boring is used to cross a driveway or street ***only***, the customer is not required to notify the construction superintendant.

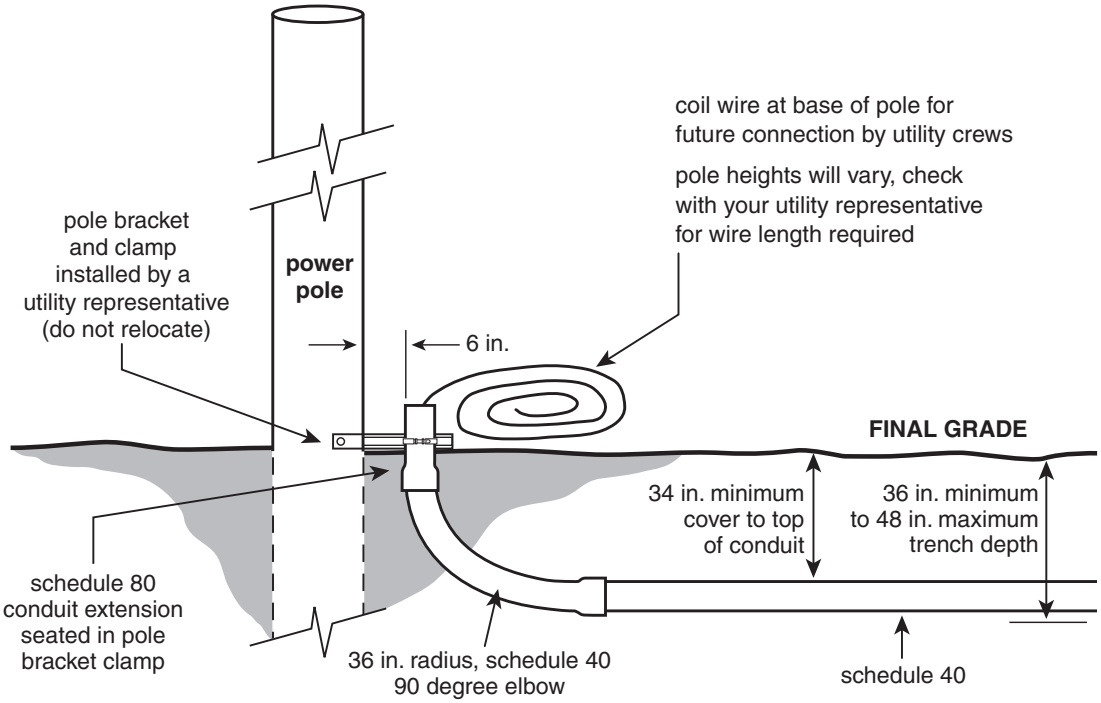
Primary voltage conduit

Clark Public Utilities requires the installation of a continuous conduit for all primary voltage conductors. Conduit is installed by a utility-approved electrical contractor hired by the customer. It is the electrical contractor's responsibility to contact the utility and request the conduit inspection.

The primary voltage conduit shall meet the following specifications:

- 2-inch diameter, one conduit per phase of service, or one 4-inch diameter conduit containing three phases of conductor. A Clark Public Utilities designer will specify the required conduit on the electrical design.
- Electrical grade, UL listed, schedule 40, PVC.
- Gray in color.
- Overhead to underground commercial services require a schedule 40 conduit elbow seated in the trench and a schedule 80 conduit extension installed in the pole bracket clamp attached to the pole base ***(Figure 2)***.
- Conduit size, wall thickness and total degree of bends allowed will be outlined on the approved utility design.
- Install only manufactured radii. ***Heat bending conduit is not acceptable.***
- All conduit joints shall be permanently connected using PVC cement.

Figure 2 Primary voltage overhead to underground pole bracket installation



NOTE: Trench depths vary; review your utility-provided design for required depth.

Secondary service conduit

The design firm hired by the customer will provide conduit specifications for the secondary service. These requirements are dictated by the NEC and fall under the jurisdiction of the Washington State Department of Labor and Industries or the City of Vancouver.

The number of secondary service circuits and size of conduit may be limited by the source facility. A three-phase transformer (75 kVA-1500 kVA) on a standard pre-cast concrete pad will allow six secondary circuits with a maximum wire size of 750 kcm. Transformers with a pre-cast pad and secondary vault will allow up to eight secondary runs.

The requirements of each job site vary. A Clark Public Utilities designer will review the secondary service design and advise the number of secondary circuits and conduit size allowed.

Trench backfill requirements

Clark Public Utilities will not energize electrical facilities until all primary trenches are backfilled to final grade by the customer.

Once primary inspections are complete, the customer is responsible for the following:

- Allowing PVC cement to cure according to manufacturer's recommendations prior to backfill.
- Providing a minimum 4- to 6-inch layer of clean backfill (with rocks no larger than 5/8 inch and no sharp objects) placed above power conduit(s). The remaining trench shall be backfilled with soil that is free of rocks larger than 5 inches and any foreign objects.
- Completing backfill as soon as practical after facilities are placed and inspected.
- Backfilling with controlled density fill (CDF)/select backfill when required by utility personnel.
- Carefully placing backfill to prevent damage or movement of the conduit(s).
- Completing backfill up to and around customer-installed elbows attached to the pole bracket assembly ***(Figure 2)***.
- Relocation costs due to change in grade or alignment.

Transformers

Transformer sizing

Transformers are sized by a Clark Public Utilities designer. Customer-provided load information will be analyzed by the utility designer and the transformer will be sized accordingly.

Maximum available fault current

The customer is responsible for providing and installing equipment to withstand fault currents. ***Table 3*** on the following page provides the maximum available

short-circuit current for Clark Public Utilities' most commonly installed padmounted transformers. These values are based on measures taken at the transformer's secondary bushings and do not account for the secondary conductor.

Short-circuit current information on existing or additional transformer types and sizes are available by calling your utility representative.

NOTE: To allow for future system expansion or upgrades, always calculate using the next larger size transformer.

Table 3 Maximum short-circuit current for new single-phase and three-phase padmount transformers

SINGLE-PHASE			
KVA	**240/120**	**Min. Z%**	**Max. Z%**
25	10k	1.04	2.0
50	10k	2.08	3.0
75	10k	3.13	4.0
100	14k	2.98	4.0
THREE-PHASE			
KVA	**208Y/120**	**Minimum Z%**	
75	10k	2.08	
150	22k	1.89	
300	42k	1.98	
500	65k	2.14	
750	65k	3.20	
1000	85k	3.27	
KVA	**480Y/277**	**Minimum Z%**	
75	14k	.64	
150	14k	1.23	
300	25k	1.44	
500	30k	2.01	
750	30k	3.01	
1000	50k	2.41	
1500	50k	3.61	
2000	50k	4.81	
2500	55k	5.46	

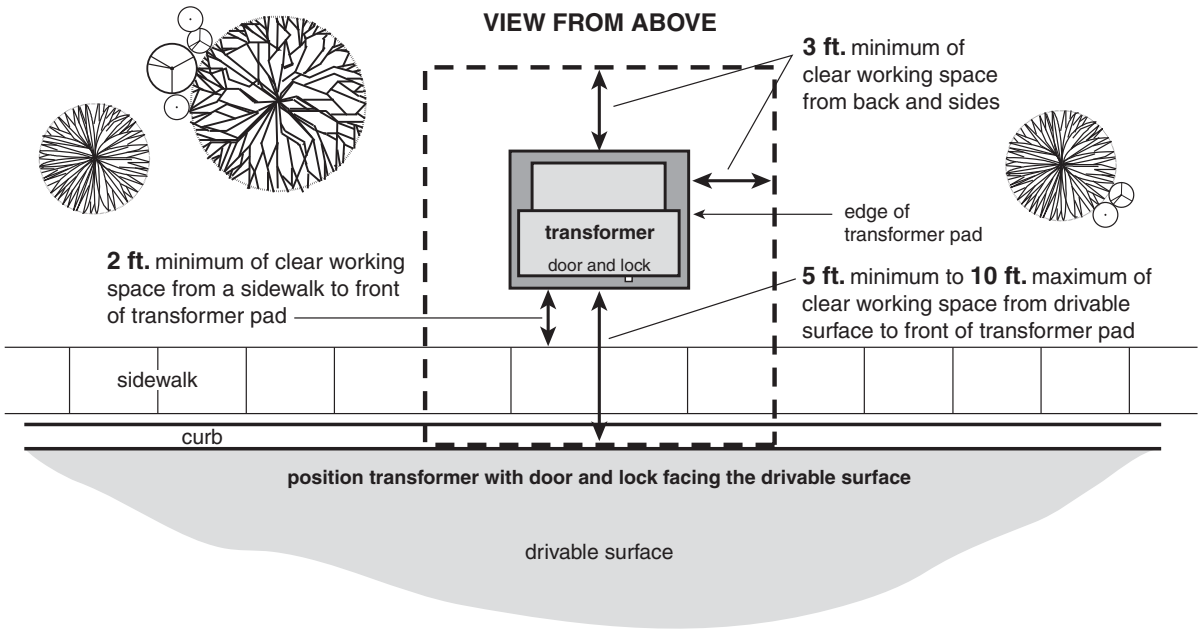
Transformer location and access

Underground electrical facilities must be readily accessible by the utility during construction and for future operation and maintenance. The area around padmounted electrical equipment must provide a clear and level working space and remain free from obstructions such as landscaping, poles, retaining walls, structures, fences, etc.

All transformers and padmounted equipment are to be located:

- Within 10 feet of a drivable surface but not closer than 5 feet ***(Figure 3)***.
- With the front of the equipment (door and lock side) facing toward the drivable surface.
- With the transformer pad parallel to the edge of the drivable surface.
- Allowing 10 feet of clearance in front and 3 feet from the back and sides of the equipment ***(Figure 3)***.
- At least 2 feet from a sidewalk for pedestrian safety.

Figure 3 Commercial padmounted transformer location and access



Transformer safety clearances

Clearances from padmounted transformers to structures are measured from the nearest metal portion of the transformer to the structure or any overhang. The clearance from a building is 10 feet if the building has combustible walls, and 3 feet if the building has non-combustible walls as shown in ***Figure 4***. ***Table 4*** provides additional safety clearances that apply to any oil-filled electrical equipment.

Figure 4 Commercial padmounted transformer minimum safety clearances

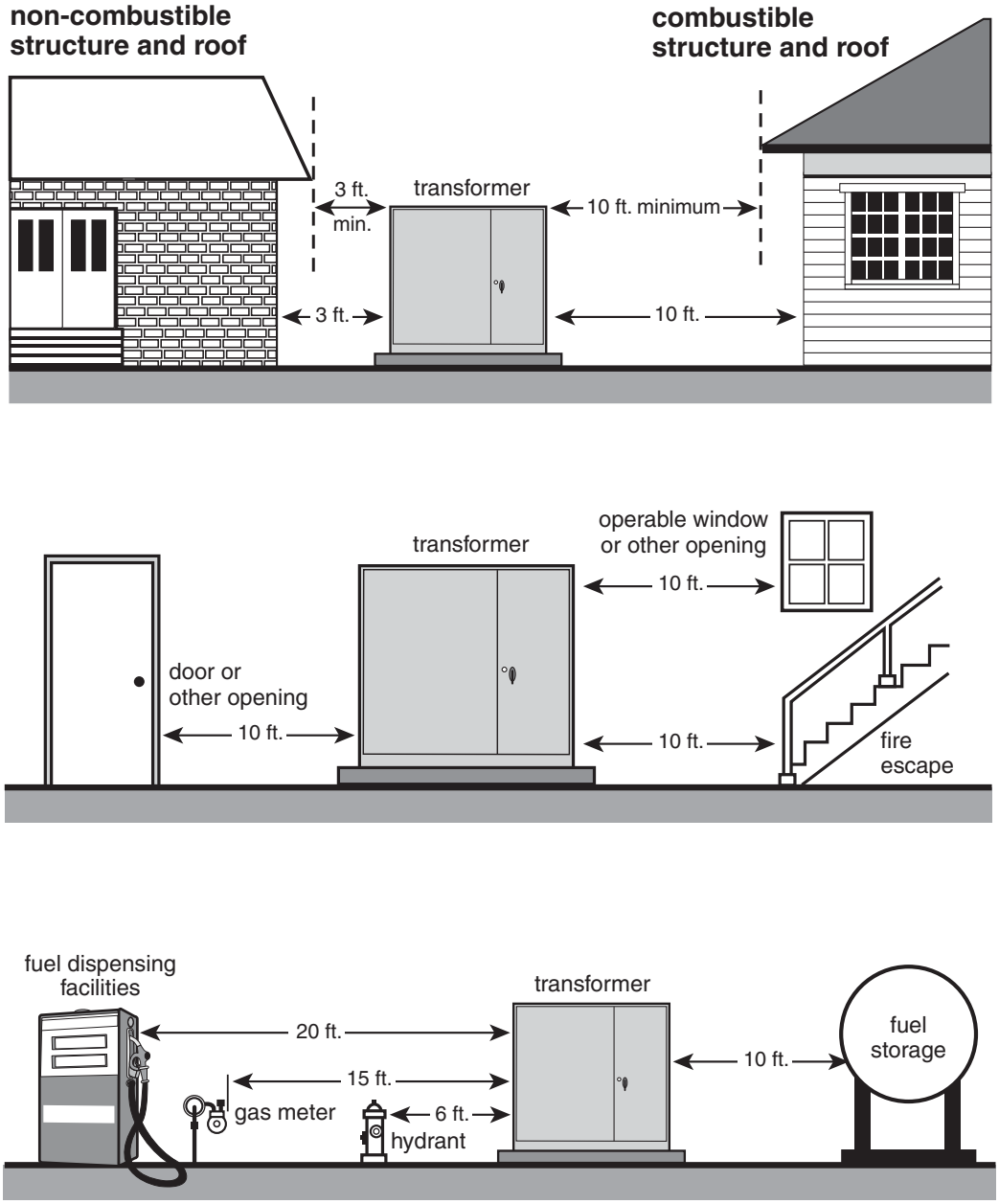


Table 4 Electrical equipment safety clearances

Feature	Clearance distance
Combustible walls or roof (including stucco)	10 feet
Non-combustible walls (including brick, concrete, steel and stone), provided the side of the transformer facing the wall does not have doors. Materials that pass UBC standard 2-1 or ASTM E136-79 are considered to be non-combustible.	3 feet
Fire sprinkler valves, standpipes and fire hydrants	6 feet
Doors, windows, vents, fire escapes, and other building openings	10 feet
The water's edge of a swimming pool or any body of water	25 feet
Facilities used to store hazardous liquids or gases (e.g. service station fuel storage tank filler opening or emergency generator fueling points)	10 feet
Facilities used to dispense or store hazardous liquids or gases (e.g. service station gas pumps or propane bulk dispensing tanks)	20 feet
Gas service meter relief vents	15 feet

Guard post installation

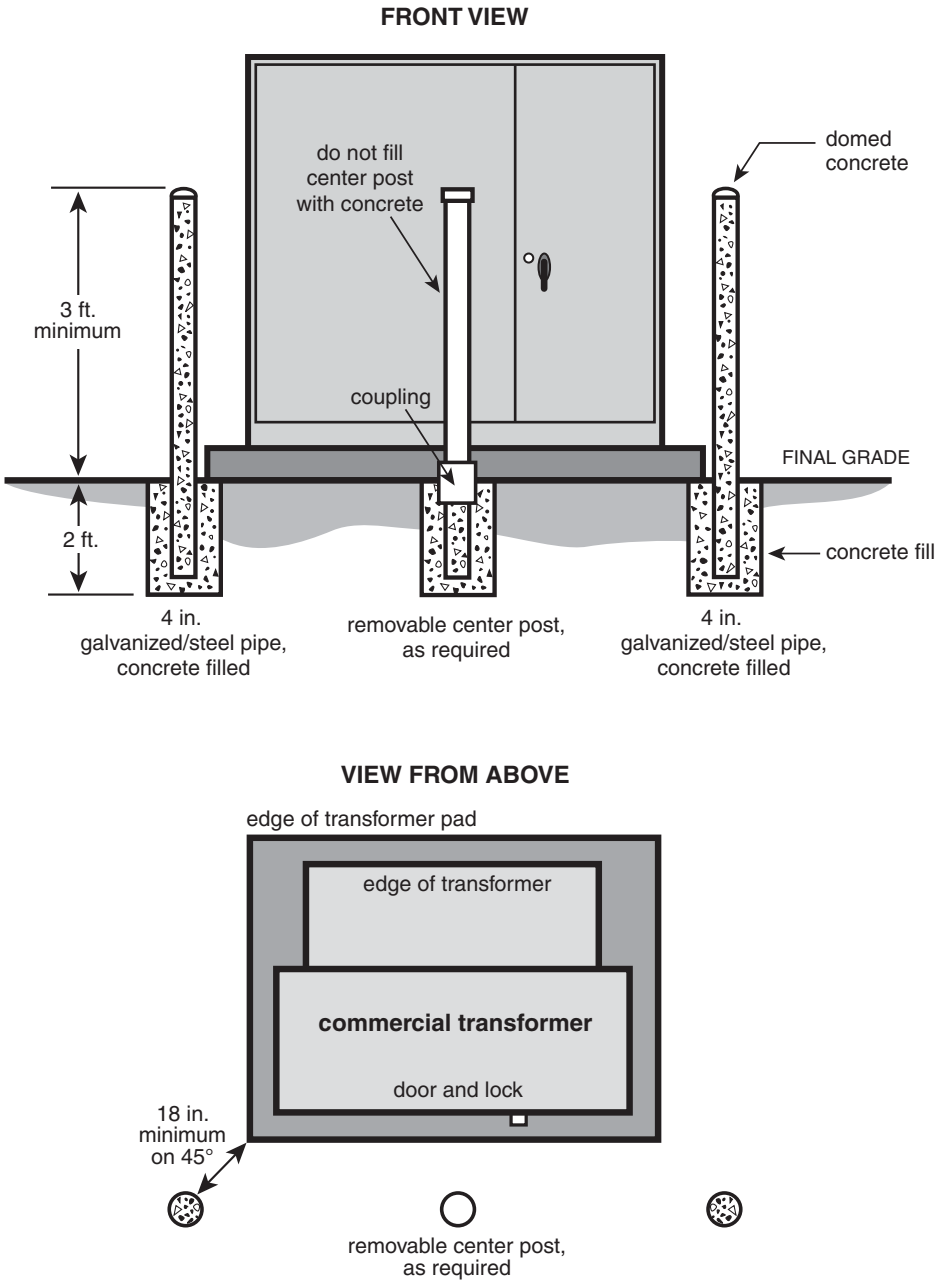
The installation of ***guard posts*** (bollards) may be required when electrical equipment is exposed to vehicular traffic or minimum clearances around equipment cannot be met. It is the customer's responsibility to supply, install and maintain guard posts when required by Clark Public Utilities personnel. See ***Figure 5***.

Materials and installation requirements:

- 5-foot by 4-inch galvanized or steel pipe.
- Set each post 24 inches deep.
- Fill posts with concrete.
- Posts set in stable soil are to be surrounded by 6 inches of concrete.
- Unstable soil or sand requires 12 inches of concrete surrounding each post.
- If several guard posts are used, locate them no more than 5 feet apart or as otherwise specified by a Clark Public Utilities representative.

- If the distance between the corner posts exceeds 5 feet, a removable center post is required ***(Figure 5)***.
- If a removable center post is installed, the threaded joint requires treatment with an anti-seizing agent.
- Paint exposed section of post "traffic yellow."

Figure 5 Guard post (bollard) installation for commercial transformers



NOTE: Additional guard posts may be required at back and sides of transformer.

Underground secondary junction box/pedestal

Site preparation and excavation

Prior to the installation of an underground secondary junction box/pedestal the job site requires:

- Staking of property lines.
- Excavation to final grade.
- Curbs poured.

A utility representative will determine the size of the junction box/pedestal required. Dimensions and equipment location will be indicated on the utility-provided electrical design.

The customer is then responsible for:

- Excavating the site to the dimensions provided by the utility representative.
- Installing the appropriate junction box/pedestal as called for in the electrical design.
- Installing appropriate labeling as called for on the utility-provided electrical design.
- Backfilling around the equipment to flush with final grade if in a hard surfaced area or 2 inches below the junction box/pedestals' indicated grade line if in a landscaped area.

Conduit and cable installation

Prior to Clark Public Utilities energizing a secondary junction box/pedestal the customer is responsible for:

- Installing conduit for all cables entering the ***enclosure***.
- Installing conduits so that cable is pulled toward the bell ends.
- Providing, installing and marking all required futures.
- Capping all conduit futures that are plumbed into the enclosure.
- Requesting a standby with qualified utility personnel (two business days notice required) to plumb conduit and cable into any energized secondary enclosures.

Primary voltage installations to utility pole bases

A utility representative will install a pole bracket and clamp assembly at the base of the source pole. The commercial customer is responsible for providing and installing the following equipment up to Clark Public Utilities' pole bases (See ***Figure 2*** on page 14 of this chapter):

- 36-inch minimum depth (42-inch preferred) trench up to and exposing the pole base.
- Conduit and wire as outlined in the utility design.

- Schedule 40 conduit elbow seated in the trench next to the pole base.
- Schedule 80 conduit extension installed in the pole bracket clamp attached to the pole base.
- Secondary junction box or pedestal as required by the utility design.
- Minimum 45-foot tail of wire coiled at the pole base (coil length varies based on pole height).

Additional pole base installation information:

- Do not trench to or install service to a utility pole that does not have a pole bracket assembly installed. Contact the utility designer to install or reattach the assembly.
- Do not remove or relocate a utility-installed pole bracket assembly.

CHAPTER 4

Commercial Metering

This chapter contains information on the metering equipment required for connection of a new or upgraded commercial electric service. Call our Meter department at (360) 992-8854 regarding questions about commercial electric service metering.

The following outlines the primary areas of interest in this chapter and provides page numbers for quick reference:

General commercial metering

The following information applies to all metering systems installed for Clark Public Utilities' commercial customers.

Responsibilities

Clark Public Utilities

The utility is responsible for furnishing, installing and maintaining the following commercial metering equipment:

- ***Self-contained*** and transformer-rated meters.
- ***Current transformers (CTs)*** and test switch.
- ***Potential (voltage) transformers (PTs)***.
- Associated low-voltage CT meter system wiring.

Only qualified and authorized Clark Public Utilities personnel shall unlock, remove, install and seal meters.

Commercial customer

The customer is responsible for providing, installing and maintaining the following commercial meter equipment:

- Meter base.
- Current transformer (CT) enclosure.
- Switchgear and cabinet.
- Connectors and insulating covers.
- Service conductors.
- Metering conduit between CT enclosure and meter base.
- Protection equipment.
- Equipment grounds.

Commercial meter bases

The following general requirements apply to all commercial meter bases called for by the utility and installed by the customer:

- Ring-type socket.
- Rated for exterior use and rain tight.
- ***Underwriters Laboratories (UL)*** rated.
- All unused openings in the enclosure are tightly sealed from the inside of the socket.
- Installed level, plumb and fastened securely to a rigid structure.

Grounding requirements

All meter equipment including bases, enclosures, switchgear and conduit shall be bonded and grounded in accordance with the NEC and the local governing office.

Service inspection and approval

The customer is responsible for securing the electrical wiring permit and requesting an electrical inspection. Once the metering equipment is installed, the State of Washington, or city with jurisdiction, requires that the installation pass an electrical inspection ***prior*** to being energized by the utility. Clark Public Utilities will not connect a new or upgraded commercial electric service without notification of approval from the local governing office.

Additional customer equipment

Customer-owned load monitoring equipment and current-limiting fuses are not allowed inside a meter base, CT enclosure or distribution transformer. Clark Public Utilities requires all customer-owned equipment to be installed on the load side of the meter system, inside the customer's service panel or a separate enclosure between the meter base and panel.

Protection

A safety socket style self-contained meter base is required for all three-phase commercial services and any single-phase 480 volt service, 200 amps or less. Single-phase self-contained metering installed inside an approved meter enclosure also requires a safety socket. Manual link bypass meter bases are acceptable for commercial single-phase services less than 480 volts. See ***Meter socket types*** section on page 29 of this chapter for additional information on safety socket and manual link bypass meter bases.

CT metered installations require a test switch provision mounted inside the meter base.

The ampacity rating of the main circuit breaker, or safety switch, cannot exceed the maximum rating on the meter base. Three-phase services, with continuous ampacity exceeding 200 amps, require CT metering.

All meter equipment is installed ahead of the main disconnect unless otherwise agreed upon by Clark Public Utilities.

Meter equipment installed in areas accessible to vehicular traffic may require the installation of guard posts. The customer is responsible for providing, installing and maintaining these posts when required by a utility representative. See ***Guard post installation*** section and ***Figure 5*** on pages 19 and 20 of this handbook for requirements.

Meter equipment location

Clark Public Utilities currently requires all meter bases and associated equipment (CT enclosures, switchgear, etc.) be attached to the outside of a permanent, fixed structure.

Customer-owned commercial meter systems must be installed in a location that allows 24-hour access to utility personnel for meter reading, testing and maintenance. This location is to remain free of obstruction, vibration, corrosives and abnormal temperature fluctuation. All meter equipment locations are subject to approval by a Clark Public Utilities representative prior to installation.

Approved commercial meter equipment locations:

- Outside of the structure being served.
- On the ground floor, with the center of the meter 5 to 6 feet above finished grade (5 feet preferred).
- In an area that is ***not*** subject to being fenced-in or enclosed.

NOTE: Utility-provided ***lockboxes*** or hasp locks may be required to allow utility personnel 24-hour access to metering equipment.

These locations allow Clark Public Utilities to:

- Read the meter in a cost-effective manner.
- Maintain the meter efficiently.
- Disconnect the service in case of emergency.

Do not locate meter equipment:

- On poles owned by Clark Public Utilities.
- On customer-owned poles or posts without prior utility approval.
- Where shrubs or landscaping could obstruct access.
- Above a stairway or window well.
- Inside a breezeway or fenced area.
- On a mobile structure such as a trailer.
- In a drive thru where vehicular traffic could obstruct access.

Metering installed in a vehicle traffic area will require guard posts. See guard post requirements listed on pages 19 and 20 for additional information.

Electrical equipment rooms

Clark Public Utilities requires all commercial meter equipment to be mounted on the outside of the structure containing the load being served. In certain situations the commercial structure may have an electrical equipment room. These installations require prior approval from a utility representative ***before*** construction begins and must provide 24-hour access to all meter equipment, without the need to call for an appointment.

To maintain safety and allow maintenance of metering equipment, Clark Public Utilities has the following requirements for electrical equipment rooms:

- Utility approval of the electrical equipment room design prior to construction.
- 24-hour access to all utility-maintained equipment.

- An access door that leads directly to the outside with the door opening outward.
- A minimum door size of 2 feet 8 inches by 6 feet 8 inches.
- Signage on the exterior of the door stating "Electrical Room." The utility will also attach a small Clark Public Utilities identifying sticker.
- Well lit inside the room and the entrance.
- Contains electrical and communications equipment only, no storage of other items.
- Maintain proper working space and clearances around all metering equipment ***(Figures 6 and 7)***.
- A lockbox containing the access key, card key or door combination.

Lockbox requirements

Clark Public Utilities will provide and install the required lockbox for meter systems installed in an electrical equipment room. Lockboxes installed for access to electrical equipment rooms have the following requirements:

- Visible from and installed within 10 feet of the equipment room door.
- Key, card key or door combination provided by the customer to the Meter department, prior to any meters being set.
- Door combinations must be engraved on a hard plastic or metal tag no larger than 2 inches long by 1 inch in height, with a 1/16 inch hole punched in the top left corner for hanging.
- If equipment room door locks are changed, it is the customer's responsibility to contact the utility as soon as possible to coordinate the exchange of new keys, card keys or combinations.

Clearance requirements for meter installations

Meter clearances are measured from the center of the meter socket or from the center of the face of the meter. The customer is required to provide and maintain these clearances at all times. The following clearances are required for all commercial meters:

- The center of the meter shall be between 5 and 6 feet above finished grade (5 feet preferred).
- A clear working space, 3 feet deep ***(Figure 6)*** in front of the meter, CT enclosure and switchgear. This space is to be kept clear of any obstructions including landscaping.
- There is a 10-inch minimum horizontal and vertical clearance between the center of the electric meter and any obstruction ***(Figure 6)***.
- If a recessed meter base is installed, a 10-inch radial clearance is required from the center of the meter to the closest portion of the wall ***(Figures 6 and 7)***.
- If a flush or recessed meter base is installed, the siding or finished surface of the structure shall not overlap the cover of the meter base.

- The opening around a flush or recessed meter base must extend a minimum of 3 inches ***(Figure 7)***.
- Meters located near natural gas piping require a minimum of 3 feet of clearance.

Meter base installation tips

When installing a commercial meter base the following mechanical checks will ensure the installation runs as smoothly as possible. After installing the meter base, verify:

- Conductors are not under undue strain on the terminals.
- Terminals are rated for the size and type of conductor used.
- Strands have not been removed to make conductors fit under-sized terminals.

Figure 6 Meter equipment minimum work clearances

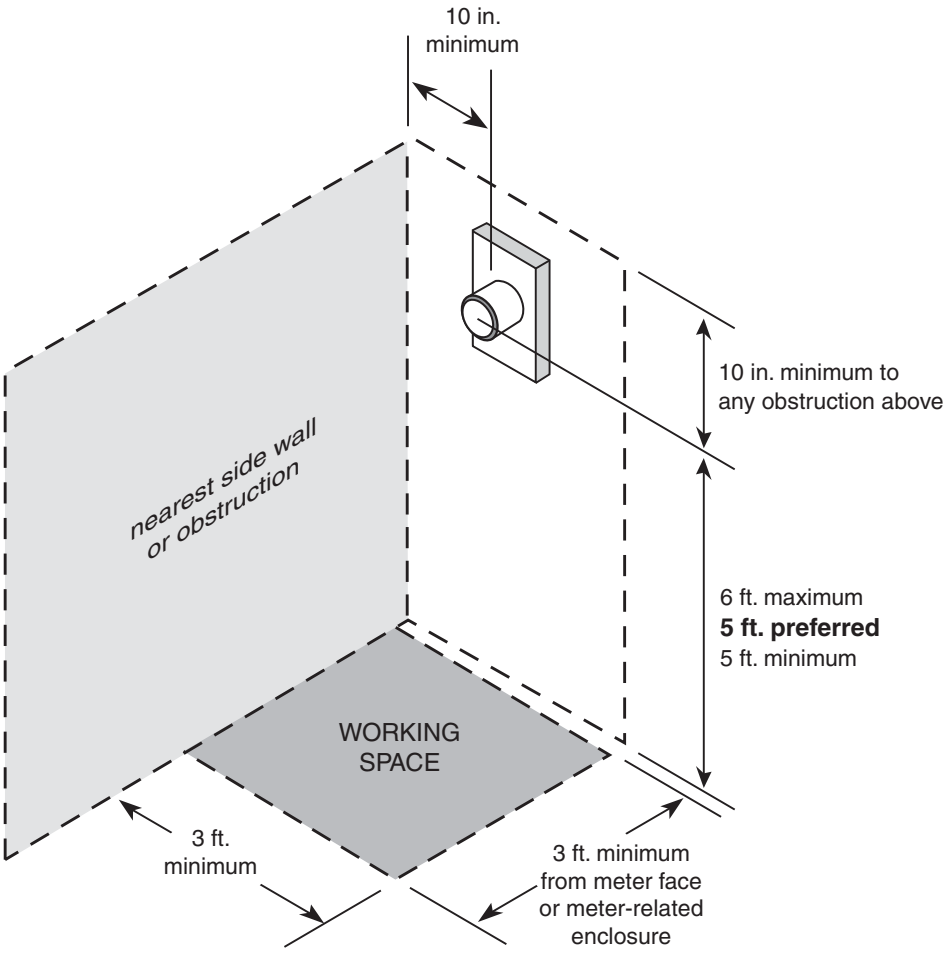
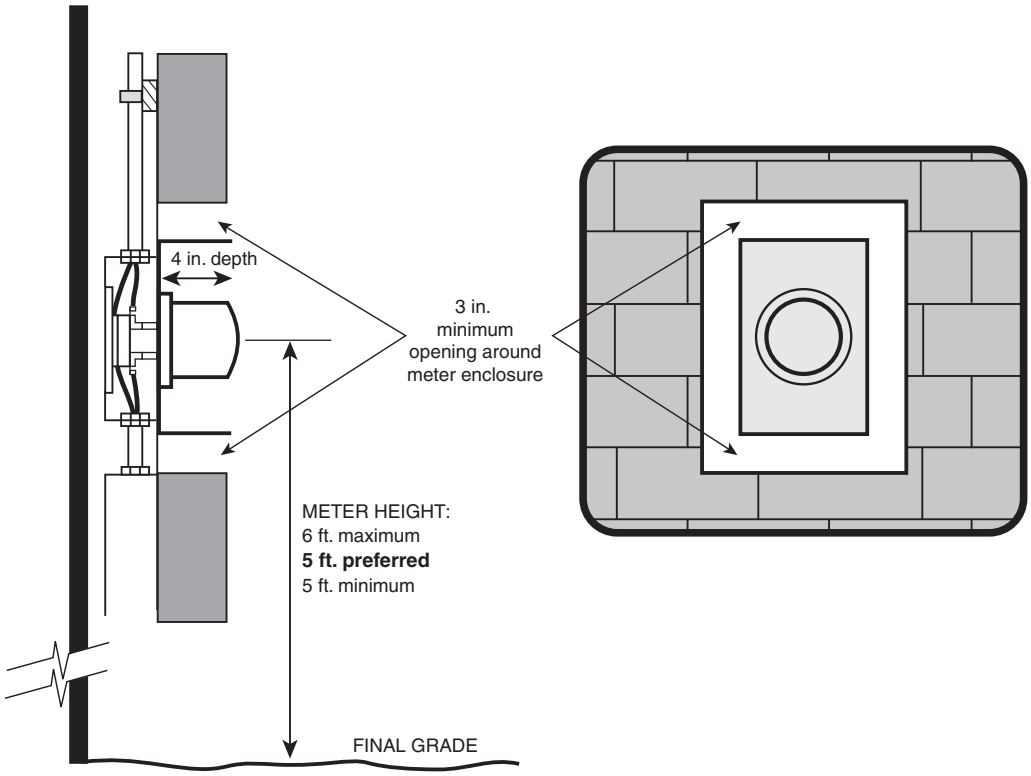


Figure 7 Recessed meter base detail



Meter socket types

The table located on page 30 ***(Table 5)*** provides useful information on the requirements of the most common commercial meter sockets accepted by Clark Public Utilities.

Self-contained metering systems

Self-contained, or direct connect meters, carry full load current and connect directly across full line voltage. A safety socket or bypass meter socket is required for all self-contained commercial meter systems.

Self-contained metering can be installed for the following services:

- Single-phase, up to 400 amps (320 amps continuous).
- Three-phase, up to 200 amps 120/208 or 120/240 volt with a maximum motor load of 60 hp.
- 277/480 volt services, up to 200 amps with a maximum motor load of 125 hp.

NOTE: Structures with loads greater than 320 amps of continuous current require CT metering.

Table 5 Commercial meter socket requirements

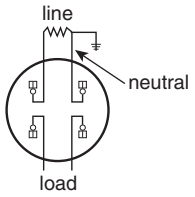
SC = Self-contained CT = Current transformer B-Line part numbers are for cross reference only.

Source Voltage	Ampacity	Meter Base	Reference B-Line Part Number or Equivalent	# of Terminals	Manual Block Bypass	Safety Socket	Test Switch Required	Meter Configuration Diagram
SINGLE-PHASE								
120 2 wire	0–100 amp	SC	U121314	4	Yes	No	No	A
120/240 3 wire	0–200 amp	SC	U264	4	Yes	No	No	B
	201 to 320 amp	SC	324N, 324NF	4	Yes	No	No	B
	Over 400 amp	CT	12146	6	n/a	n/a	Yes	CT rated
120/208 3 wire (network)	0–200 amp	SC	U264, U121315 (<100 amp)	5*	Yes**	No	No	C
	Over 200 amp	CT	12148	8	n/a	n/a	Yes	CT rated
THREE-PHASE								
120/208 4 wire wye	0–200 amp	SC	127TB	7	No	Yes	No	D
	Over 200 amp	CT	121413	13	n/a	n/a	Yes	CT rated
120/240 4 wire delta	0–200 amp	SC	127TB	7	No	Yes	No	E
	Over 200 amp	CT	121413	13	n/a	n/a	Yes	CT rated
277/480 4 wire wye	0–200 amp	SC	127TB	7	No	Yes	No	D
	Over 200 amp	CT	121413	13	n/a	n/a	Yes	CT rated

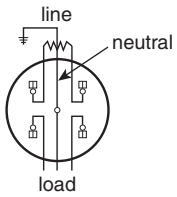
* 5th terminal is purchased from supplier separately

** House meters that are part of a residential meter pack do not require a manual bypass

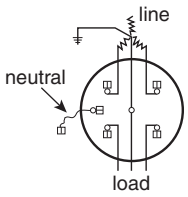
Single-phase self-contained meter socket configurations



A

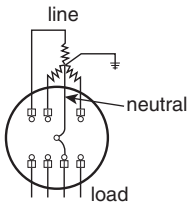


B

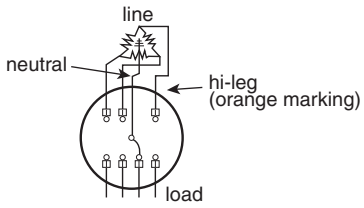


C

Three-phase self-contained meter socket configurations



D



E

Safety socket

A safety socket allows the utility to maintain self-contained metering systems without interrupting service to the commercial customer. The meter terminals are de-energized allowing utility personnel to safely perform routine meter maintenance. A safety socket style meter base is required for the following services:

- All commercial three-phase services.
- Single-phase 240/480 volt services (municipal lighting only).
- Temporary commercial services that are three-phase or 480 volt.
- Single-phase services with metering installed inside a meter enclosure. Contact Clark Public Utilities' Meter department for additional information on vandal-proof meter enclosures for commercial services.

NOTE: All 480 volt services, regardless of phase, require a safety socket.

Manual bypass

Manual bypass meter sockets also allow maintenance of self-contained metering equipment while maintaining service to the customer. Meter terminals are not de-energized when bypassed. This style of meter base is acceptable for lower voltage (less than 480 volts), single-phase commercial services only. A manual bypass meter socket is required for:

- All single-phase commercial services 240 volts or less.
- 120/208 volt single-phase commercial network meters.

NOTE: Single-phase services with metering installed inside a meter enclosure require a safety socket.

The following commercial metering exceptions do not require a manual bypass or safety socket style meter base:

- Single-phase commercial temporary services (120/240 or 120/208 voltages).
- House meter sockets included in a factory-built multifamily residential ***meter pack***.

Current transformer metering

Clark Public Utilities provides and installs the CTs, meter, test switch and associated wiring. The customer provides and installs any additional metering equipment beyond the ***point of delivery***. The location of CT metering equipment is subject to the approval of Clark Public Utilities. See ***Figure 8*** for meter and enclosure clearances.

Current transformer (CT) metering is required in the following situations:

- Three-phase service exceeding 200 amps.
- Single-phase service exceeding 400 amps (320 amps continuous).

NOTE: Services over 800 amps also require a switchboard.

The CT metering equipment installed by the customer shall meet the following general requirements:

- Securely mounted, plumb and level on the outside of the structure.
- Rain tight and NEMA 3R-rated.
- 6 feet maximum height to top of cabinet or center of meter.
- Grounding and bonding of both the meter base and CT enclosure in accordance with the NEC and local governing office.

In addition to the requirements previously listed the CT enclosure shall meet the following:

- Bottom of cabinet a minimum of 18 inches from finished grade or floor.
- Side opening, hinged door with sealing provisions.
- Factory-installed hinges located on the opposite side of the enclosure from where the ***meter socket*** is located.

Table 6 provides enclosure dimensions, based on phase and service size.

NOTE: A CT enclosure cannot be used as a junction box or bus gutter.

CT metering conduit

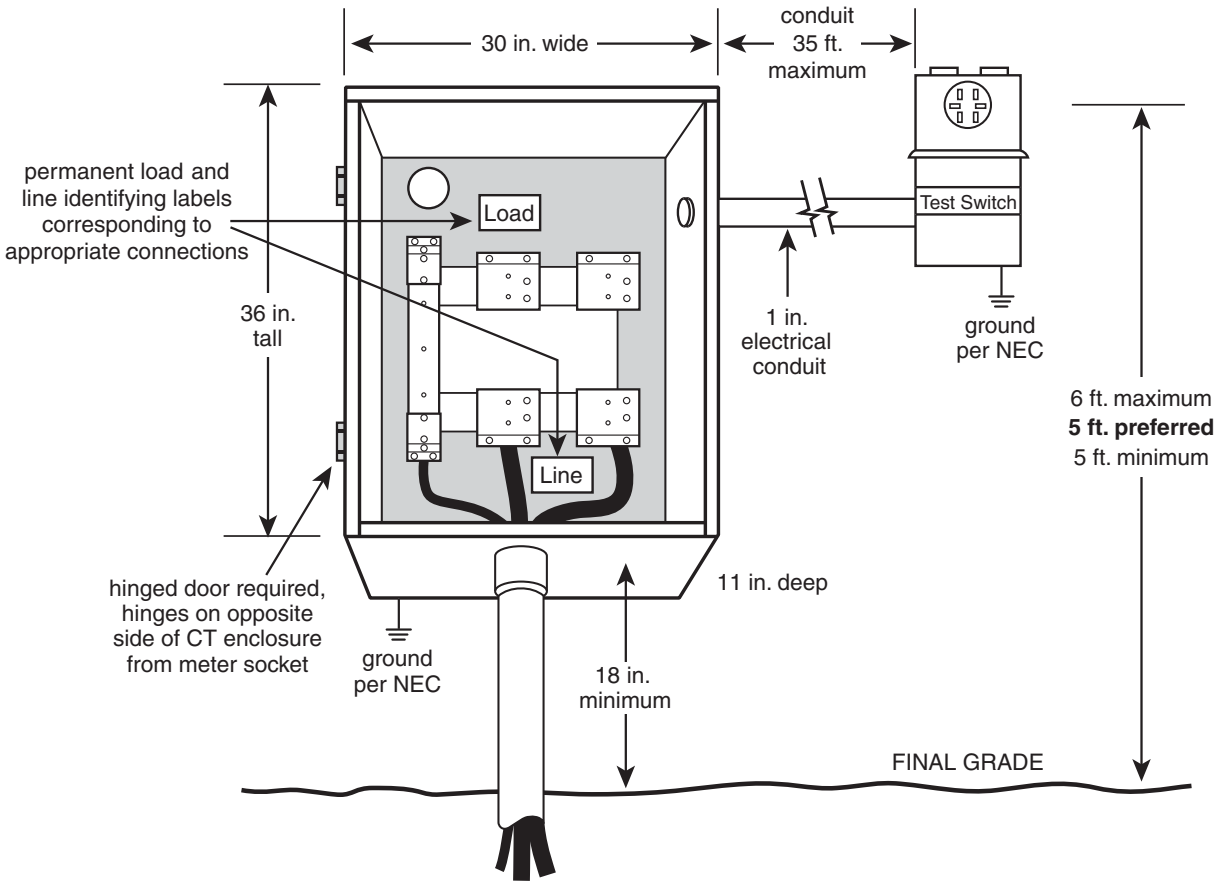
Customer-installed conduit between the meter base and CT enclosure requires:

- 1-inch minimum electrical conduit for single-phase services; 1¼-inch minimum for three-phase services.
- Schedule 80 PVC or rigid galvanized conduit. (Flex conduit is not acceptable.)
- Grounding bushings at both ends of the run if galvanized conduit is used.
- A maximum length of 35 feet (pull cord required for runs over 25 feet) between the enclosure and meter base.
- A continuous run, with no ***conduit bodies*** (LB joints, condulets, etc.).
- Conduit installed with no more than three 90-degree elbows in the total length (270 degrees total).
- Conduit entering the meter enclosure adjacent to the test switch (See ***Figure 8***).

Table 6 CT enclosure and mounting base specifications

Amperes	Phase	Dimensions (W" x H" x D")	CT mounting base
200–400 amps	Single-phase	24"x30"x11"	6019-HAL (lug lug)
401–800 amps	Single-phase	30"x36"x11"	6019-HEL (lug lug)
200–400 amps	Three-phase	30"x36"x11"	6067-HAL
401–800 amps	Three-phase	36"x48"x11"	6067-HEEL

Figure 8 Typical 401–800 amp single-phase current transformer (CT) metering



CT mounting base

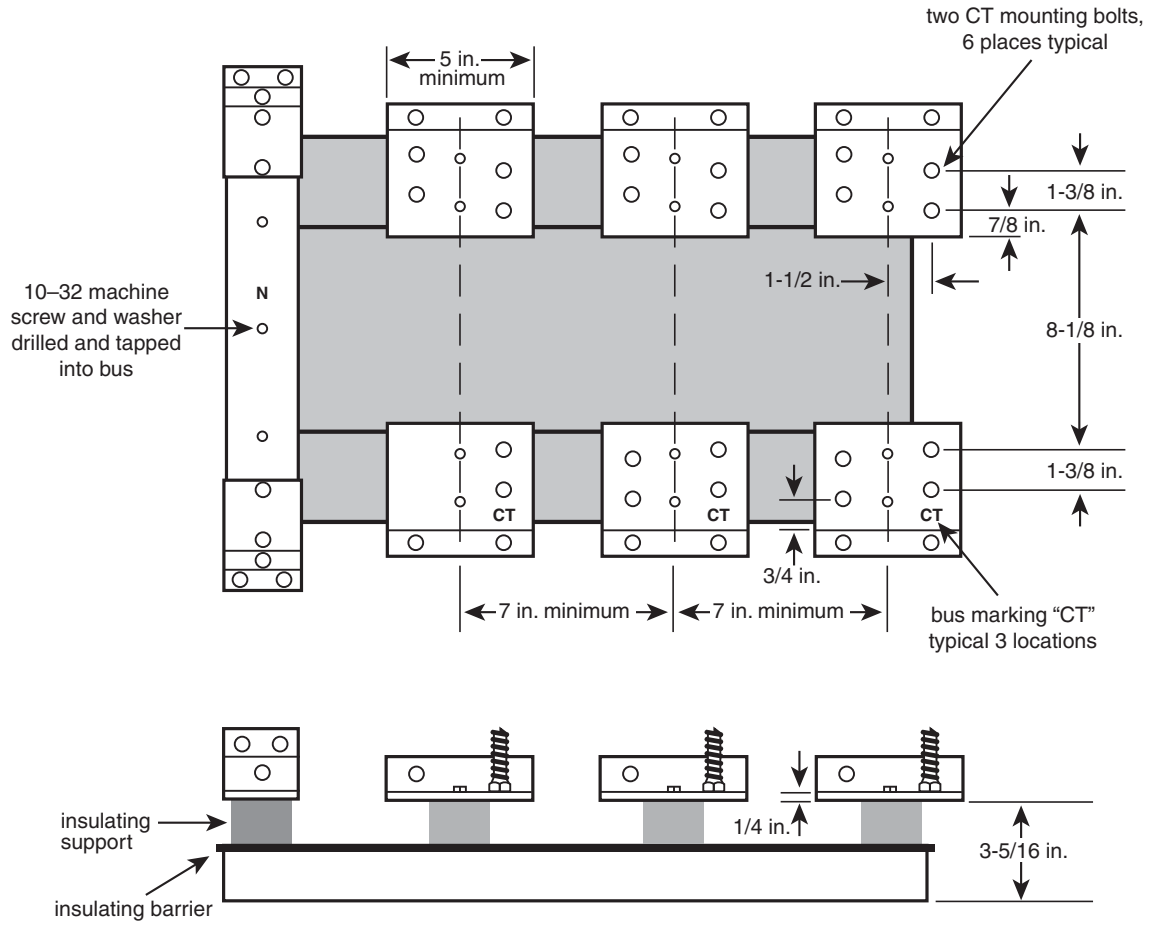
Installation requirements for current transformer mounting bases are as follows *(Figure 9)*:

- Mounting base is rated for a minimum of 50k amps fault current.
- Line and load side terminations require two bolts per connector and two bolts on the ***neutral*** bus.
- The customer furnishes all lugs and terminates both load and line side conductors to the bus.
- A 4-wire delta service requires orange marking of the high leg.

Switchboard metering

Switchboard metering is required for three-phase services over 800 amps. At the customer's option, this type of metering may be installed for services sized 201 to 800 amps. The customer-installed equipment must be EUSERC-approved.

Figure 9 Commercial three-phase CT mounting base



NOTE: For additional information see EUSERC drawing 329B.

All customer-installed switchboards require a:

- Current transformer (CT) mounting base.
- Service section.
- Set of bus bars/links.
- Panel(s).
- Meter base with provisions for a test switch.
- Means for locking the meter enclosure with independent 24-hour access to utility personnel.
- Concrete mounting pad.
- Case ground as required per the NEC.

NOTE: Customers requiring more than 480 volts of service will have primary metering. Ownership and maintenance agreements for primary metered services will be mutually agreed upon with Clark Public Utilities.

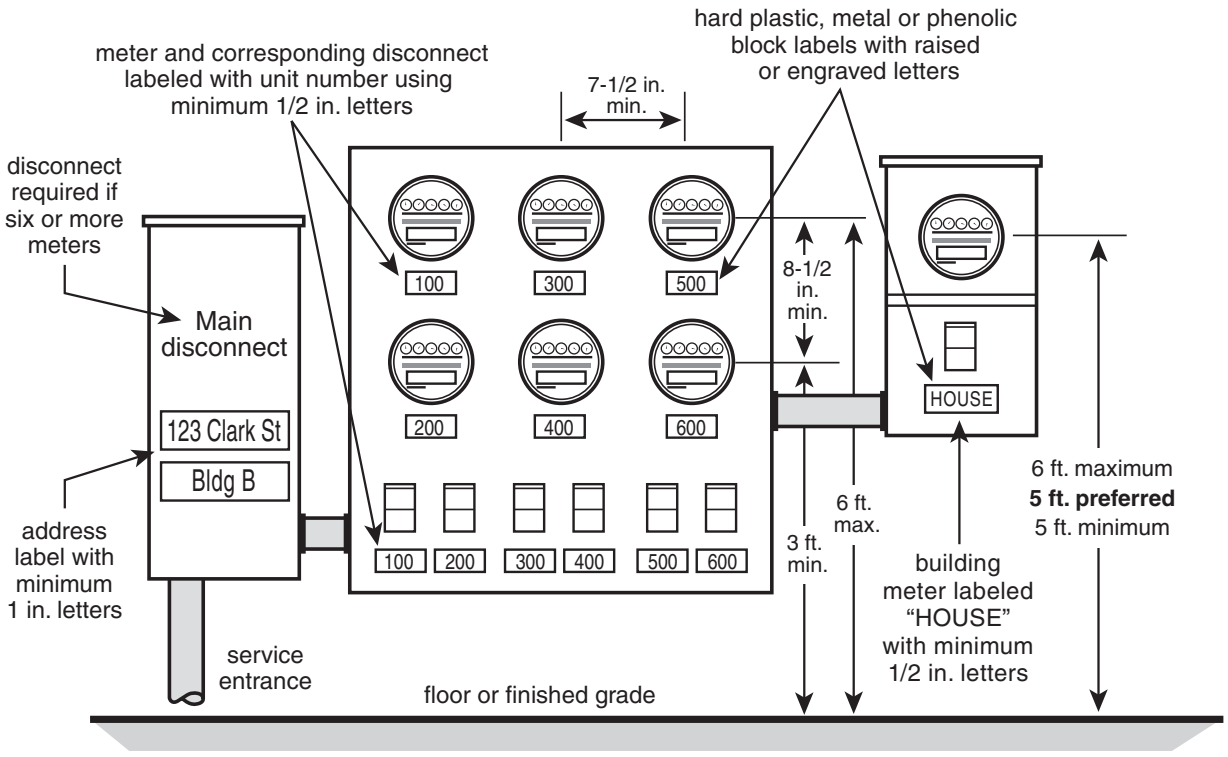
Multiple metered services

Commercial tenant spaces

Non-residential multiple meter installations such as ganged, modular and switchboard metering have the following requirements:

- Spacing to socket centers a minimum of 3 feet and a maximum of 6 feet above the finished grade or the floor of an approved equipment room (factory-built meter packs require meters installed at least 3 feet above the ground).
- Meter packs with more than six meters require a main disconnect per the NEC ***(Figure 10)***.
- All self-contained meter bases require a safety socket or a manual link bypass.
- Each metered service is permanently labeled. (See ***Multiple meter labeling*** section for additional information.)
- Panel covers must be secured prior to connection of the service.

Figure 10 Multiple meter socket detail



NOTE: See page 31 for meter base bypass requirements.

Residential multifamily

Multiple meter installations for residential services such as multifamily units or duplexes shall meet the following requirements prior to the utility connecting the service:

- Spacing to socket centers a minimum of 3 feet and a maximum of 6 feet above the finished grade or the floor of an approved equipment room (factory-built meter packs require meters installed at least 3 feet above the ground).
- Meter packs with more than six meters require a main disconnect per the NEC ***(Figure 10)***.
- Meter bases cannot be used as junction boxes.
- Three-phase house service meters, seated in a separate meter base require a safety socket.
- Stand-alone single-phase house meter services require a manual block bypass socket.
- Each metered service is permanently labeled per Clark Public Utilities' design requirements. (See ***Multiple meter labeling*** section for additional information.)
- Panel covers must be secured prior to connection of the service.

Multiple meter labeling

Multiple meter installations require permanent labeling that identifies the unit and/or building address of the structure being served. The customer is responsible for ensuring that all meter bases, corresponding breakers, electrical panels, unit doors and the building's main disconnect are correctly labeled.

Label requirements

- Hard plastic, metal or ***phenolic block labels*** with raised or engraved letters are required. These types of labels are available at trophy and sign shops. ***NOTE:*** The use of label maker tape or permanent felt tip marker is not acceptable labeling.
- Meter equipment labels must correspond to permanent unit numbers attached to or next to corresponding unit doors.
- The main building (house) meter is labeled "HOUSE".
- Each electrical panel requires a label displaying the number of the unit it serves. Electrical panel labels may be affixed to the outside or the inside of the hinged panel door.
- A minimum of 1/2-inch height letters are required for the labels of the meter, corresponding breaker, electrical panel, and building (house) meter.
- A minimum of 1-inch height letters are required for the building's main disconnect label. If there are less than six meters and no main disconnect, the address/building number label may be attached to the meter pack.
- Multi-unit structures with less than six meters (duplex, triplex, etc.) also require corresponding labeling, as outlined above, at the meter, panel and unit door.

Building (house) meter service connect

Clark Public Utilities will not connect electrical service to the building (house) meter until permanent labeling has been completed at all required locations (meter base, corresponding breaker, electrical panel and main disconnect).

Individual unit meter service connect

Individual unit meters, their corresponding disconnect, electrical panel, and unit door require appropriate labeling at the time that meter is set. Proof of final addressing from the county or city with jurisdiction is required when permanent service connection to an individual unit is requested.

NOTE: Labeling of residential multifamily meter bases may have additional requirements. Contact your utility representative for more information.

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APPENDIX

Glossary

Approval — Acceptable to the authority having jurisdiction.

Associated equipment — As related to metering equipment: such as the current transforms, CT wiring and test switches.

Authority having jurisdiction — The qualified representative of a city, county or state who has been authorized by governmental agencies to inspect.

Backfill — Native soil or soil brought in from another area, free from sharp objects, rocks, scrap building material, and corrosive material.

Call Before You Dig number, 811 — National one call underground utility locating service.

Clark Public Utilities representative — The designated representative responsible for design and coordination of new or upgraded services to utility customers.

Clearance — A set distance between two objects.

Conduit — A listed or approved wireway with a smooth interior surface. Conduit may vary in size or schedule (wall thickness), depending on its usage, in accordance with codes and Clark Public Utilities' specifications.

Conduit bodies — A combination of conduit and an electrical outlet. In the electrical industry may be referred to as a condulet or LB joint.

Current transformer (CT) — A device used to measure the current flow of services 200 amps or greater.

Current transformer (CT) mounting base — CT mounting base required for commercial CT metered services.

Directional drilling/boring — A trenchless method of installing underground electrical conduit.

Electrical equipment room — Locked room containing only electrical and communications equipment. Equipment rooms must provide 24-hour access to utility personnel without the need for an appointment.

Enclosure — A utility-approved lockable cabinet that contains meter equipment and/or electrical connections.

Guard post — A bollard or post designed to protect the electrical facility or meter installation from vehicular traffic.

Joint use — A group of utilities that share space on a utility pole or trench.

Lockbox — Permanently installed, locked box containing keys, combinations or card keys allowing utility personnel 24-hour access to metering equipment.

Manual bypass — A self-contained meter base socket with provisions for paralleling the meter circuit, allowing the meter to be removed without interrupting service to the commercial customer. Meter terminals are not de-energized when bypassed.

Meter pack — Ganged, modular and switchboard metering with multiple meter sockets. Installed for commercial tenant spaces and residential multifamily units.

Meter socket — The mounting device consisting of meter jaws, connectors, and enclosure for accommodating socket-type meters.

Metering equipment — Any equipment associated with measuring electrical energy.

Neutral — The grounded conductor in a single-phase, three-wire, or three-phase, four-wire system. The service conductor that is at zero potential to ground.

Phenolic block label — Permanent label attached to the meter base, corresponding breaker, electrical panel and door of the unit being served.

Point of delivery — The connection point of the meter base, on the customer's premises, where Clark Public Utilities' circuit and the customer's system are interconnected.

Potential (voltage) transformer (PT) — A device used to reduce primary voltage to 120 volts. PTs are installed in conjunction with a CT rated meter.

Safety socket — A self-contained meter base socket with provisions to de-energize the meter terminals while maintaining service to the customer.

Secondary junction box/pedestal — Enclosure installed behind padmounted transformers and at pole bases allowing multiple connections of underground secondary service.

Secondary service — The lower voltage, after transformation, used to supply the customer with electrical energy.

Self-contained — In reference to meter sockets: a device designed and rated to continuously carry the entire capacity of the service entrance equipment through the meter.

Source — Clark Public Utilities' equipment (transformer, secondary junction box/pedestal, pole) that supplies the customer's electric service.

Switchboard — Service entrance with secondary service conductors terminated directly to the customer's main distribution center. A switchboard is required for services 800 amps or greater.

Temporary service — An electrical service providing power to a customer on a temporary basis.

Transformer — Equipment used to reduce (step down) primary voltage to the secondary service required to supply the customer.

Underwriters Laboratories (UL) — A nationally recognized test laboratory that lists materials it has tested and accepted.

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Clark Public Utilities New or Altered Commercial Electric Service Worksheet

Clark Public Utilities

Contact Clark Public Utilities' Construction Services department at **360-992-8558**, or return this completed worksheet to initiate a request for new or altered commercial electric service to:

PO Box 8900, Vancouver, WA 98668, or Fax to: 360-992-8823

Inquiry date: _____

Name of financially responsible party: _____

Mailing address: _____

Contact person: _____

Contact phone numbers: *Business #* _____ *Mobile #* _____ *Fax #* _____

Job site address: _____ **APN number:** _____

Near address: _____

TYPE OF SERVICE

Commercial service to: _____ **Number of tenant spaces:** _____

Request for: ❑ Permanent Service ❑ Temporary Service ❑ Information Only

New Service Size: _____ Amps **Existing service size and voltage:** _____

Total connected load: _____

VOLTAGE REQUIREMENTS

SINGLE-PHASE

- ❑ 120/208 volt 3 wire
- ❑ 120/240 volt 3 wire
- ❑ 240/480 volt 3 wire

THREE-PHASE

- ❑ 120/208 volt 4 wire wye, grounded
- ❑ 120/240 volt 4 wire delta
- ❑ 277/480 volt 4 wire wye, grounded

A utility designer will visit the job site and contact the customer for additional information.

Call the Construction Services department or consult our Commercial Electric Service Handbook for additional information.