ELECTRIC SERVICE REQUIREMENTS

(ESR) BOOKLET

2016 EDITION
FORWARD

Cowlitz PUD is pleased to serve your electric needs. We are committed to helping you obtain electric service in the most efficient, economical, safe, and timely manner possible. This Electric Service Requirements (ESR) Booklet is designed to serve as a guide and provide information and requirements that you will need for obtaining a new service, upgrading, or adding load to an existing service. Additional standards, specifications, and procedures by Cowlitz PUD, as well as code requirements of Washington State, Federal, and City apply. It is difficult to capture every scenario in the ESR booklet, so we encourage the customer to obtain Cowlitz PUD approval prior to any installation. This applies to all installations including re-wires. Failure to receive approval may result in denial of service until the installation meets the requirements of the Cowlitz PUD ESR booklet and Cowlitz PUD approval.

We hope this information will answer most of your questions and by following these requirements will help to ensure a timely, trouble-free installation of your new electric service.
INTRODUCTION

This 2016 edition of the Electric Service Requirements booklet provides information and service requirements necessary to obtain new electric service, to upgrade, or add load to an existing electric service. The booklet outlines design and construction procedures for new permanent and/or temporary electric service for single family residential, multifamily, commercial, industrial, and housing developments. The booklet may not include all possible standards and specifications required or updated by Cowlitz PUD, state, federal, or local code requirements.

It is recommended that Cowlitz PUD be consulted to resolve any questions concerning the requirements in this booklet. We will do our best to meet your needs for electrical service in an economical and acceptable manner. This booklet may contain different electrical equipment standards and specifications than previously accepted by Cowlitz PUD and are subject to change or updating.
Errata Sheet: corrections included in the 2016 edition  
(Following the April 2011 Edition)

Forward

In the Forward section, the following sentences were added after the fourth sentence:  
*It is difficult to capture every scenario in the ESR booklet, so we encourage the customer to obtain Cowlitz PUD approval prior to any installation. This applies to all installations including re-wires. Failure to receive approval may result in denial of service until the installation meets the requirements of the Cowlitz PUD ESR booklet and Cowlitz PUD approval.*

Definitions

Page xi: In the definitions section, the following words were added:  
*Climbing Space – The vertical section of a pole that allows lineman to move freely and unobstructed.*

Page xiii: In the definitions section, the following words were added:  
*Rigid Metallic conduit (rigid steel)*

Section 1

Page 1: In section 1.3, the following sentence was added to the first paragraph as the third sentence. It reads as follows:

*Where these requirements apply to the utility (source/line) side of the service or applications that may affect Cowlitz PUD personnel during the normal operation and maintenance over the lifetime of the service, it should be noted that Cowlitz PUD is the governing authority and will enforce such requirements that may exceed the NEC or NESC.*

Page 3: In section 1.12, the following sentence was added to the paragraph as the 2nd sentence. It reads as follows:

*Cowlitz PUD customers are also responsible for keeping any and all overhead electrical service lines clear of vegetation from attachment point at house/barn/shop/garage, etc. to the first power pole attachment (1 span). A free of charge service disconnect (service line dropped) is available for customers that want/need the service line removed for safety/work concerns and issues.*

Page 6: In section 1.17, there have been many changes to the Customer Generation Requirements regarding the description of what customer generation is and stating what is required. A new illustration (Figure 1-1) has also been added to show a correct installation.

Section 3

Page 10: In section 3.1 under underground Service, a correction to the available voltages was made and is now shown as the third bullet point. The comment of 'limited locations' was also added to the fourth bullet point. The additions are:

- **Single phase, 240/480 volt, three-wire, grounded.**
- **Three phase, 208/120 volt, four wire, grounded, wye. (Limited Locations)**
Errata Sheet: corrections included in the 2016 edition (Cont’d)

Page 12: In Section 3.4.2, the first sentence was changed to be more specific about where seals are placed. It previously read, “Cowlitz PUD provides seals placed on customer provided meter rings for new service installation and associated service equipment to prevent injury and/or tampering.” It now reads:

Cowlitz PUD provides seals placed on Cowlitz PUD provided meter rings for new service installation and associated service equipment to prevent injury and/or tampering.

Also in Section 3.4.2, the following paragraph was added after the first paragraph. It reads:

*Only qualified Cowlitz PUD employees are allowed to breach PUD security measures. Cutting a seal for any reason is considered tampering and as a result the customer is subject to any and all fees associated with such act in accordance with Cowlitz PUD Customer Service Policy CS-1, section 21.

Page 12: In Section 3.4.3, the second sentence of the first paragraph was corrected to be more specific about the mounting surface. What previously read, “Plumb sockets in all directions and securely mount them to a rigid surface.” The new sentence was changed to:

Plumb sockets in all directions and securely mount them to a rigid, flat surface.

Also in Section 3.4.3, the following sentence was added after the fourth paragraph:

Any hindrance, including but not limited to siding, caulking, enclosures, and landscaping shall be removed by the property owner in order to allow unrestricted access to the meter base.

Page 13: Section 3.5 includes the following additions were made:

- Any vacant house with meter removed for more than 30 days
- Added load in a 320A meter base or CT can.
- Any electrical service disconnected for more than 1 year with or without a meter.

Also in Section 3.5, the last bullet had an addition about installing equipment in compliance with the current ESR specs. It now reads:

- Residential services that have been disconnected will be inspected by Cowlitz PUD to determine if the service equipment is safe to reconnect, if modifications are necessary then the customer will be required to install equipment in compliance with current ESR specs and obtain a permit and inspection by the local code agency.
Errata Sheet: corrections included in the 2016 edition (Cont’d)

Page 15: In section 3.10.2, the fourth paragraph had a few additions for clarity. It previously read, “The high or wild leg four wire delta must be identified with the color orange and be the right side of the meter base or CT cabinet.” It now reads:

The high or wild leg on a four wire delta must be identified with the color orange and be terminated on the right side of the meter base or CT cabinet.

Section 4

Page 17: In the references section of Figure 4-1, line item #3 and #7 were added to the list. They are as follows:

3. For permanent OH service, a pole mounted meter base must be installed using pre-approved unistrut channel or equivalent and secured in a manner which prevents movement due to routine maintenance. Conduit may be fastened directly to a customer owned pole but a climbing space must still be maintained.

7. Service mast must be rigid steel or SCH 40 PVC gray electrical conduit

Page 20: In the reference section of Figure 4-4, line item # 9 was added to the list. The addition is as follows:

9. Schedule 40 PVC gray electrical conduit or RMC.

Section 5

Page 25: In the notes section of Figure 5-2 as well as in the drawing, the minimum clear working space was changed. It was previously 78”H x 30”W x 36” D but was change to:

78”H x 36”W x 36” D.

Section 6

Page 34: In Section 6.1, the second sentence in the 4^{th} paragraph was changed to be more specific on conduit elbow radius size. It previously read, “A long sweep elbow is required at the bottom of the service riser conduit in all cases.” The new sentence was changed to:

A 24” radius elbow is required at the bottom of the service riser conduit in all cases.
Errata Sheet: corrections included in the 2016 edition (Cont’d)

Page 37: In Section 6.3, the conduit requirement was changed from Schedule 80 PVC for any above ground installation to requiring only Schedule 40 PVC. What previously read, “The customer shall install Schedule 40 PVC gray electrical conduit below ground and Schedule 80 PVC gray electrical conduit above ground for the meter base riser.” was changed to:

*The customer is responsible to provide and install Schedule 40 PVC gray electrical conduit the entire length of the wire run from the source to the meter base.*

Also in Section 6.3, the following paragraph was added:

**Conduit installed on a customer owned service pole containing conductors ahead of metering shall be electrical-grade PVC or RMC. A climbing space is required on all customer owned poles.**

Page 38: In Table 6-1, the conduit size for a 200A, single-phase, three-wire service was changed from 2.5” to 3” conduit.

Page 38: In Table 6-1, the conduit size for a 201A to 600A three-phase, four-wire service was changed from two 3” to **two 4”** conduit.

Page 38: In the notes section, an additional note was added to clarify the requirements of the new 3” conduit in 200A meter bases. The new sentence reads:

a. If a 3” to 2.5” bell reducer is needed on a 200A meter base, it must be provided and installed within 12 inches of the meter base. Any other location of the reducer will not be accepted.

Page 40: In the notes section of Table 6-3, two line items were added to the list. They are as follows:

6. Where a barrier post interferes with opening the equipment door or inhibits the workspace, a removable barrier post shall be installed with prior approval of Cowlitz PUD.

7. If required, barrier posts must be installed prior to energizing the service.

Section 7
Page 42: In Section 7.1 in the second paragraph and first bullet point, the wording has been clarified. It previously read, “The customer will provide, install, and maintain all service equipment (including service entrance conductors for overhead services), conduit, enclosures, and meter sockets) to include rights-of-way and space for the installation and maintenance of Cowlitz PUD facilities. Some conditions include:

- The customer must not terminate the principal grounding conductor in Cowlitz PUD’s sealed termination compartment.

It now reads as follows:
Errata Sheet: corrections included in the 2016 edition (Cont’d)

The customer will provide, install, and maintain all service equipment (including service entrance conductors for overhead services), conduit, enclosures, and meter sockets. They are also to include rights-of-way and space for the installation and maintenance of Cowlitz PUD facilities. Some conditions include:

- The customer must not terminate their principal grounding conductor in Cowlitz PUD’s sealed termination compartment.

Also in Section 7.1, the comment about ring type meter sockets has been expanded to say ring-less type meter bases will not be allowed or re-energized. It previously read: “Always use ring type meter sockets, Cowlitz PUD will provide an approved sealable ring.” The sentence now reads:

**Always use ring type meter sockets, Cowlitz PUD will provide an approved sealable ring.**  
**“Ring-less type meter sockets will not be allowed or re-energized”**

Page 45: In the notes section of Figure 7-1, the sentence has been changed to say conductors can enter but not pass through any meter base. It previously read, “Customer Owned conductors cannot enter or pass through the Cowlitz PUD compartment in the meter base (except 320 amp meter bases).” It now reads:

“Customer owned conductors cannot pass through the Cowlitz PUD compartment in the meter base.”

Page 48: In the references section of Figure 7-5, a sentence has been added for clarification of requirements on reference #7. It previously read, “Customer owned pressure treated wood post 6” x 6” minimum set 36” deep and centered in 12” diameter hole with compacted gravel backfill. It now reads:

Customer owned pressure treated wood post 6” x 6” minimum set 36” deep and centered in 12” diameter hole with compacted gravel backfill. **Approved unistrut or pressure treated wood backing is required if all factory holes cannot contact post.**

Page 51: In the references section of Figure 7-7, reference (3) has been changed to allow the service mast to be rigid steel or SCH 40 PVC Gray electrical conduit. It previously read, “Service entrance mast must be rigid steel conduit, NEC approved, and securely attached.” The new sentence now reads:

3. Service entrance mast must be rigid steel or SCH 40 PVC gray electrical conduit (when not protruding through a roof), NEC approved, and securely attached. *If a rigid steel mast is not installed, a secure attachment point must be provided. EMT will not be allowed for new construction or re-wire.*

Section 8

Page 53: In the notes section of Figure 8-1, note (b) has been changed to allow temporary lettering or numbers if permanent doors and siding haven’t been installed yet. It previously read, “Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected.” The new sentence now reads:
Errata Sheet: corrections included in the 2016 edition (Cont’d)

Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected if permanent door and siding has already been installed. Otherwise, clearly identified temporary lettering or numbers must identify each unit.

Page 54: In the notes section of Figure 8-2, note (b) has been changed to allow temporary lettering or numbers if permanent doors and siding haven’t been installed yet. It previously read, “Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected.” The new sentence now reads:

Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected if permanent door and siding has already been installed. Otherwise, clearly identified temporary lettering or numbers must identify each unit.

Page 56: In section 8-4, the third sentence about meter labeling has been changed to allow temporary lettering or numbers if permanent doors and siding haven’t been installed yet. It previously read, “Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected.” The new sentence now reads:

Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected if permanent door and siding has already been installed. Otherwise, clearly identified temporary lettering or numbers must identify each unit.

Section 9:
Page 59: In the references section of Figure 7-5, a sentence has been added for clarification of requirements on reference #7. It previously read, “Customer owned pressure treated wood post 6” x 6” minimum set 36” deep and centered in 12” diameter hole with compacted gravel backfill. It now reads:

Customer owned pressure treated wood post 6” x 6” minimum set 36” deep and centered in 12” diameter hole with compacted gravel backfill. Approved unistrut or pressure treated wood backing is required if all factory holes cannot contact post.

Page 61: In the references section of Figure 9-3, two reference notes were added for clarification of requirements. They are as follows:

2. For permanent OH service, a pole mounted meter base must be installed using pre-approved unistrut channel or equivalent and secured in a manner which prevents movement due to routine maintenance. Conduit may be fastened directly to a customer owned pole but a climbing space must still be maintained. EMT will not be allowed for new construction or re-wire.

Page 62: In the references section of Figure 9-4, two reference notes were added for clarification of requirements. They are as follows:
2. For permanent OH service, a pole mounted meter base must be installed using pre-approved unistrut channel or equivalent and secured in a manner which prevents movement due to routine maintenance. Conduit may be fastened directly to a customer owned pole but a climbing space must still be maintained.

7. Service entrance mast must be rigid steel or SCH 40 PVC gray electrical conduit, NEC approved, and securely attached. *EMT will not be allowed for new construction or re-wire.*

Section 10:

Page 68: In the notes section of Figure 10-1, note (a) has been changed to not require a safety socket on a 120/240V single-phase, meter socket. It previously read, “The EUSERC Safety Socket with test link bypass is required for all 120/240 volt services rated 100 and 200 amps and 480 volt services rated up to and including 200 amps. The new sentence now reads:

*All commercial 120/240V, single-phase, self-contained direct connect meter sockets must have manual link bypass provision but a safety socket is not required. Please ensure the manual link bypass is not covered by any wires.*

Page 70: In the notes section of Figure 10-4, note (d) has been changed to allow temporary lettering or numbers if permanent doors and siding haven’t been installed yet. It previously read, “Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected.” The new sentence now reads:

*Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected if permanent door and siding has already been installed. Otherwise, clearly identified temporary lettering or numbers must identify each unit.*

Page 71: In the notes section of Figure 10-6, note (c) has been changed to allow temporary lettering or numbers if permanent doors and siding haven’t been installed yet. It previously read, “Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected.” The new sentence now reads:

*Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected if permanent door and siding has already been installed. Otherwise, clearly identified temporary lettering or numbers must identify each unit.*

Also in the notes section of Figure 10-6, note (e) has been added. It reads as follows:

**e. Each metered service must have manual bypass facilities. (Safety Socket)**

Page 72: In the notes section of Figure 10-7, note (f) has been changed to allow temporary lettering or numbers if permanent doors and siding haven’t been installed yet. It previously read, “Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected.” The new sentence now reads:

*Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected if permanent door and siding has already been installed. Otherwise, clearly identified temporary lettering or numbers must identify each unit.*
Errata Sheet: corrections included in the 2016 edition (Cont'd)

Page 72: Also in the notes section of Figure 10-6, note (e) has been added. It reads as follows:

i. Each metered service must have manual bypass facilities. (Safety Socket)

Page 73: In the notes section of Figure 10-8, note (d) has been changed to allow temporary lettering or numbers if permanent doors and siding haven't been installed yet. It previously read, “Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected.” The new sentence now reads:

Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected if permanent door and siding has already been installed. Otherwise, clearly identified temporary lettering or numbers must identify each unit.

Page 77: In Section 10.6.3, the third bullet line was removed. It previously read:

- When CT metering conduit dead-ends on the back of a CT cabinet, use PVC flex non-metallic conduit to extend from the back wall to the front of the cabinet.

Page 78: In Figure 10-11, the width of the three-phase CT Can has been changed from 36” wide to 48” wide. This change is also reflected in Table 10-6 on page 80. The drawing has also been changed to better illustrate the preferred conduit installation locations and spacing as well.

Page 78: In the notes section of Figure 10-11, these 4 sentences have been added to note (a). They are as follows:

a. Preferably, the CT Can will be divided in half and the customer load side conduits will be located within the half not occupied by PUD line side conduits and conductor. If existing conditions prevent the separation of line and load conduits and conductor using the approved CT cabinet dimensions, consult Cowlitz PUD for possible options. A larger can may be required depending on the application. Under no circumstance will this separation of work space be compromised.

Page 79: Figure 10-11A was added to illustrate the requirements of a 36”x48” Current Transformer Metering cabinet, wall mounted, three phase commercial service

Page 80: Figure 10-11B was added to illustrate the requirements of a 30”x48” Current Transformer Metering cabinet, wall mounted, Single phase residential service
Errata Sheet: corrections included in the 2016 edition (Cont’d)

Page 81: In the notes section of Figure 10-12, the following four sentences have been added to note (a) and a new note was added for (h). They are as follows:

a. Preferably, the CT Can will be divided in half and the customer load side conduits will be located within the half not occupied by PUD line side conduits and conductor. If existing conditions prevent the separation of line and load conduits and conductor using the approved CT cabinet dimensions, consult Cowlitz PUD for possible options. A larger can may be required depending on the application. Under no circumstance will this separation of work space be compromised.

h. A larger cabinet (48”×48”) is required if both the line and load conductors enter and exit from the bottom of the cabinet (single Phase or three phase applications).

Page 82: In the notes section of Table 10-6, a new line was added for clarification of CT Cabinet size when both line and load conductors enter and exit from the bottom of the cabinet. It reads as follows:

a. A larger cabinet (48”×48”) is required if both the line and load conductors enter and exit from the bottom of the cabinet (single Phase or three phase applications).

Page 92: In the notes section of Figure 10-23, line (d) and (e) were added for clarification of requirements. They are as follows:

d. For permanent OH service, a pole mounted meter base must be installed using preapproved unistrut channel or equivalent and secured in a manner which prevents movement due to routine maintenance. Conduit may be fastened directly to a customer owned pole but a climbing space must still be maintained.

e. Service entrance mast must be rigid steel or SCH 40 PVC gray electrical conduit (when not protruding through a roof), NEC approved, and securely attached. EMT will not be allowed for new construction or re-wire.

Page 94: Figure 10-25 was added to illustrate the requirements for an electrical service in a flooded area.

Page 95: Figure 10-26 was added to show an example of the platform required in Figure 10-25 for the Flooded Platform.

Page 101: In the Meter Base section of the Guidelines For New Residential Electrical Service, the fourth paragraph was modified to reflect the new change to allow SCH 40 PVC conduit. It previously read, “Above ground conduit riser for the meter base must be Schedule 80 PVC electrical conduit. The 200 amp meter base requires 2½ inch and the 320 amp meter base and CT enclosure require 3 inch conduit. Schedule 40 PVC electrical conduit may be used below ground.” The new paragraph now reads as follows:

The 200 amp meter base, 320 amp meter base and CT enclosure all require 3 inch gray schedule 40 PVC electrical conduit.
NEW SERVICES INFORMATION

Thank you for contacting Cowlitz PUD regarding your new electric service. This page contains the phone numbers you will need to arrange for electric service during the construction process. Please call Cowlitz PUD Engineering Department at (360) 501-9546 if you have any questions.

Cowlitz PUD – New Service Contacts

Engineering Department

Engineering Department (360) 501-9546
PUD Main Switchboard (360) 423-2210 (800) 631-1131
(8:00 A.M. - 5:00 P.M. Mon. - Fri.)

For New Services

New Services Representative (360) 501-9546
Account & Contracts Manager (360) 501-9572

Electrical Inspections

Permits must be obtained from one of the agencies below before inspections can take place. Cowlitz PUD cannot install the meter or energize the electric service until the electrical inspector from the appropriate agency notifies the PUD with an approval.

If the new electric service is within the city limits of Longview, please contact the City of Longview. All other areas of the county are under the jurisdiction of the Washington State Department of Labor and Industries.

City of Longview: Permits and Inspections (360) 442-5086
1525 Broadway, Longview, WA 98632

Department of Labor & Industries: Permits and Inspections (360) 575-6900
711 Vine Street, Kelso, WA 98626

Please note that state electrical inspectors are available to answer code questions 8:00-8:30am

CALL BEFORE YOU DIG

There is no charge for this service and existing underground facilities (except customer owned) will be located and marked to avoid damage. Allow two full business days following the day of the call for completion of locates.

1-800-424-5555 or 811

IT’S THE LAW!
Cowlitz PUD District Offices

Longview, WA
District Main Office
961 12th Ave
PO Box 3007
Longview, WA 98632

Longview, WA
Operations Center
875 Industrial Way
Longview, WA 98632

Customer Service (all locations) ................................. (360) 423-2210
Emergencies and Outages (24 hours).............................. (360) 423-1200
Underground Utility Locate Center...............................1-800-424-5555 or 811
Tree Trimming (all locations) ........................................ (360) 423-2210
Website........................................................................http://www.cowlitzpud.org
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Definitions

ANSI - American National Standards Institute.

Backfill - Materials such as sand, or soil that is placed to fill a trench.

Bushings - Plastic or nylon rings that attach to the ends of conduit to protect the electrical cable from sharp edges.

Bypass - A method which allows for service continuity to the customer while the meter is removed for test or inspection.

Climbing Space – The vertical section of a pole that allows lineman to move freely and unobstructed.

Current Transformer (CT) - A Transformer that steps down the customer’s load current at a reduced ratio that is within the capacity of the meter.

Current Transformer Meter - A meter that measures current from current transformers.

Customer - The individual responsible for requesting electrical service from Cowlitz PUD.

Direct Burial Cable - Electrical cable that is approved by a recognized testing laboratory for direct burial in the ground.

Direct Connect Meter - A self-contained meter that is energized to line voltage and carries the entire load current.

Drip Loop - The loop formed by the customer conductors that connects to Cowlitz PUD overhead service drop. The conductors are formed in a downward “loop” so water will not enter the customer’s service mast (weather head).

Elbow - A bend in a conduit having a radius change in direction also (see Sweeps).

EUSERC (Electric Utility Service Equipment Requirements Committee) an association of utilities and manufacturers that creates standard designs for the interface between the electric utility’s service and the customer’s facility.

Fault Current - Maximum available current under bolted short circuit conditions.

Grounding - Grounding of customer equipment must be in accordance with latest issue of NEC (Article 250 Grounding). Code enforcement agencies may require ground connection to be visible when inspection is made. However, for safety reasons, top of ground rod should be flush or below ground level in permanent application.

Lead - The horizontal distance from the surface of the pole to the point of entry of the anchor into the ground.

Manual Link Bypass - Bypass facilities requiring the physical act of placing links across line and load bypass studs (see bypass) provided in the meter socket.
**Definitions** (Continued)

**Manufactured Home** - A factory assembled structure(s), site specific and transportable in one or more sections. These structures are designed to be used as a dwelling with a permanent foundation (see Section 9, Manufactured and Mobile Home Service).

**Meter** - A device that measures and records the summation of electrical energy over a period of time.

**Meter Base** - The mounting device consisting of jaws, connectors, and enclosure for socket type meters. The meter base is also referred to as a meter socket.

**Meter Base Ring** - A metallic ring that secures the meter to the meter base that can be sealed by Cowlitz PUD.

**Meter Pedestal** - A commercially built pedestal that contains a meter base and customer’s disconnect switches.

**Mobile Home** - A factory assembled structure(s) transportable in one or more sections that is built on a permanent chassis and designed to be used as a dwelling without a permanent foundation.

**Modular Home** - A factory assembled structure(s) transportable in one or more sections that is built on a permanent chassis and designed to be used as a dwelling with permanent foundation.

**NEC** - Most recent publication of the National Electrical Code adopted by the state.

**NESC** - Most recent publication of the National Electrical Safety Code adopted by the state.

**NFGC** - Most recent publication of the National Fuel Gas Code.

**OSHA** - Occupational Safety and Health Administration.

**Overhead Service** - Electric service supplied to the Customer from Cowlitz PUD utilizing overhead conductors.

**Plumb** - Correct vertical alignment of the sides and front of customer installed equipment and conduit.

**Point of Attachment** - The location where Cowlitz PUD overhead service lateral attaches to the customer’s structure.

**Point of Delivery** - The point where the Cowlitz PUD circuit connects to the customer’s system.

**Primary** – Distribution conductors over 600 volts.

**Power Factor** - The ratio of the active power to the apparent power expressed as a percent.

**PVC Conduit** - A gray colored schedule 40 PVC or schedule 80 PVC conduit for use in electrical installations.
Definitions (Continued)

Qualified - Having been trained in and having demonstrated adequate knowledge of the installation, construction, or operation of power lines and equipment and the hazards involved, including identification of, and exposure to electric supply and communications lines and equipment in or near the workplace.

Readily Accessible - A roof is considered as readily accessible if it can be casually accessed through a doorway, window, stairway, or permanently mounted ladder by a person on foot who neither exerts extraordinary physical effort nor employs special tools or devices to gain entry per the NEC.

RMC – Rigid Metallic Conduit.

Secondary – Service Conductors 600 volts and under.

Safety Socket – Device consisting of manual link bypass facility and a circuit closing nut and bolt assembly which will maintain service while the meter is removed for test or inspection.

Self-contained Meter - See direct connect meter.

Shading Backfill Material - Material used to bed and cover conduit or direct burial cables. It consists of screened native soil or sand without sharp or foreign objects.

Service Entrance Conductors - Conductors connecting to the customer’s service equipment from the service drop.

Service Trench - Trench provided by the customer for the service lateral.

Service Drop - Conductors from Cowlitz PUD system (e.g., pole, pedestal, vault, transformer) to the customer’s service entrance on the house or customer owned service pole.

Single Family Service - Service furnished to customers for domestic purposes in single family dwellings.

Single phasing - Loss of one phase on a three phase service (running on two phases).

Socket - Mounting device consisting of jaws, connectors, and enclosure for socket type meters.

Sweeps - A factory bend in the conduit forming a large radius change in direction. (Table 6-1 Notes).

Switchboard - A large panel or assembly of panels which contain buses, current transformers, meter switches, and protective devices.

Temporary Service – Electrical service provided for residential and commercial construction, seasonal sales lots, and other limited duration applications. Normally limited to 12 months.

Test Block Facilities (TBF) - An assembly used to de-energize a self-contained meter socket without disconnecting electric service to the customer.
Definitions (Continued)

Test Switch - A device used by Cowlitz PUD to isolate the meter from current transformers.

UL - Underwriters Laboratory

Underground Service - see Service Drop
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1 General Requirements

1.1 General Definitions
The customer is the individual responsible for requesting electrical service from Cowlitz PUD. The customer is the end use consumer of service and the party who will pay for their service. The customer may be the electrical contractor, developer, or home owner installing the electrical service.

1.2 Booklet Purpose and Organization
This Electrical Service Requirements Booklet was prepared as an aid to you in arranging for service from Cowlitz PUD. This booklet applies to new services, relocated services, and rewired services. If additional information is required, please call the Cowlitz PUD Engineering Department at 360-501-9546. Additional information may also be found online at http://www.cowlitzpud.org as well as forms for residential and commercial service applications.

1.3 Changes or Conflicts in Requirements
These requirements are issued with the intent of complying with all applicable codes, ordinances, and tariffs. However, in the case of conflict, the appropriate code, or ordinance, supersedes the interpretation offered in this booklet. Where these requirements apply to the utility (source/line) side of the service or applications that may affect Cowlitz PUD personnel during the normal operation and maintenance over the lifetime of the service, it should be noted that Cowlitz PUD is the governing authority and will enforce such requirements that may exceed the NEC or NESC. In addition, these requirements may change if governing codes, ordinances, or tariffs change. Cowlitz PUD does not assume responsibility for keeping this booklet current and should be consulted when questions arise on the applicability of any item. Common practices are implemented to:

- meet or exceed minimum safety codes and municipal building ordinances
- ensure fair and impartial requirements for all customers
- use safe work procedures by following established Cowlitz PUD standards, and
- facilitate the privacy and security of current and future customers and occupants.

This manual cannot address every possible situation. Consult Cowlitz PUD for solutions to unique circumstances which may require special consideration to meet the intents of this manual.

1.4 Additional Load for Existing Customers
The customer must give Cowlitz PUD prior notice before making additions to electrical equipment or apparatus to allow Cowlitz PUD an opportunity to determine if changes are needed to facilities. (Refer to Cowlitz PUD Line Extension Policy EN-2 V - Changes to Existing Facilities - A. Additional Loads).
1.5 Maximum Available Fault Current

The maximum available fault current will depend on the characteristics of the service being provided. It is the customer’s responsibility to furnish equipment to withstand fault currents. Upon request, Cowlitz PUD will supply the information on maximum available fault current available at the transformer secondary terminals.

1.5.1 Single Family Residential (200 Amps or Less)

For single family residences with services that are 200 amperes or less, the customer is responsible for furnishing equipment that will withstand a minimum of 10,000 amps of fault current.

1.5.2 Single Family Residential (201 to 400 Amps)

For single family residences with services that are larger than 200 amperes, the customer is responsible for furnishing equipment that will withstand a minimum of 22,000 amps of fault current.

1.5.3 Commercial, Industrial, Agricultural, and Multi-Family Services

The customer is responsible for furnishing equipment that will withstand the maximum fault current available from Cowlitz PUD. Upon request, Cowlitz PUD will provide the maximum available fault current available at the transformer secondary terminals.

1.6 Customer’s Responsibility for Safety

The customer shall comply with all laws and regulations to protect themselves; their family, their employees, Cowlitz PUD employees, contractors, and all third parties from injury, loss, or damage, concerning activities in the vicinity of Cowlitz PUD electrical lines and equipment.

If Cowlitz PUD serves the customer by means of primary voltage or transmission voltage circuits on the customer’s premises, Cowlitz PUD may require the customer to obtain and maintain insurance coverage which Cowlitz PUD deems adequate to satisfy the duty of indemnification. Cowlitz PUD may also require a separate indemnification, hold harmless, and/or additional named insured agreement.

1.7 Customer’s Responsibility for Maintaining Switchboards

The customer is responsible for the proper installation and periodic maintenance of customer owned switchboards including switchgear, over current devices, cable, bus connections, terminations, and all other electrical equipment.

1.8 Work Activity near High Voltage Overhead Power Lines (Over 600 Volts)

State statute and Federal OSHA laws require that non-qualified persons must not enter, work, or otherwise move equipment such as ropes, booms, poles, stages,
ladders, or scaffolding within 10 feet of a high voltage overhead power line (some lines require even greater clearance). The following are two requirements:

- The responsible party must notify Cowlitz PUD of the intended work activity a minimum of **five working days** prior to construction work. More lead time may be required depending on the work to be done.

- The responsible party and Cowlitz PUD must agree to a mutually satisfactory method to accomplish the activity safely.

1.9 **Temporary Shutdown**

It may be necessary to require a temporary shutdown of a customer’s service in order to safely maintain or upgrade Cowlitz PUD facilities. These shutdowns will normally be scheduled at a mutually convenient time during normal working hours determined by both Cowlitz PUD and the customer. Cowlitz PUD requires two business days’ notice for routine weekly service disconnects requested by the customer and more time may be necessary for more complex work and which may require Cowlitz PUD Engineering Department assistance. Electrical inspections and approval by the appropriate agency and Cowlitz PUD are required for most electric service alterations.

1.10 **Grounding and Bonding**

Grounding and bonding is critical for safety and electrical reliability. The customer is responsible to ensure that the electrical wiring and service equipment is grounded and bonded in accordance with applicable NEC requirements.

1.11 **Protection of Cowlitz PUD Equipment (Barrier Post)**

The customer is responsible for providing barrier posts for protection of electrical equipment. Barrier posts will be required when vehicles or other equipment can be operated near or around Cowlitz PUD facilities. (See Figure 6-4, Figure 6-5, and Table 6-3, and for more details).

1.12 **Trees, Shrubs, Landscape Bark, & Covers near or over Equipment**

The customer shall install and maintain landscaping in such a manner where trees, shrubs, blackberry vines, and other vegetation will not interfere with the access, proper operation, or maintenance of Cowlitz PUD facilities, see Section 5 (Clearances). Cowlitz PUD customers are also responsible for keeping any and all overhead electrical service lines clear of vegetation from attachment point at house/barn/shop/garage, etc. to the first power pole attachment (1 span). A free of charge service disconnect (service line dropped) is available for customers that want/need the service line removed for safety/work concerns and issues. Additionally, landscape bark or other materials shall not cover vault lids or other below ground Cowlitz PUD facilities, nor shall any covering be placed over electrical equipment. Consult Cowlitz PUD for clearance requirements of your specific installation. For easements and rights-of-way refer to Section 2.2.
1.13 Power Factor
Cowlitz PUD’s current tariff specifies a charge for low power factor for certain commercial and industrial customers. Low power factor on the customer’s electrical system may cause inferior performance resulting in extra charges. Cowlitz PUD recommends that the customer install corrective devices to make the most effective use of the electrical system. Subject to the provisions of Special Contracts, extra charges may be incurred when the monthly average Power Factor of the customer’s load is less than ninety-seven percent (97%) leading or lagging. Cowlitz PUD will not be obligated to deliver electric energy to a customer at any time the Power Factor of the customer’s load is below seventy-five percent (75%) leading or lagging.

1.14 CALL BEFORE YOU DIG 1–800–424–5555 or 811
State laws require the customer/excavator to call for underground utility cable locates. There is no charge for this service and existing underground facilities (except customer owned) will be located and marked to avoid damage. A detailed and accurate description of the location and extent of the excavation is required. White paint is customarily used to mark the excavation so utility locators can identify the site. Cowlitz PUD will mark its underground power line location(s) with red paint. Other utility operators will use their respective designated paint color to mark their underground facilities. Allow two full business days following the day of the call for completion of locates. The excavation must not be started until locates have been marked or the utilities have informed the excavator that they have no facilities in the area.

1.15 Power Quality
The characteristics of the customer’s electrical equipment and devices must allow Cowlitz PUD electrical system to operate efficiently without undue interference to Cowlitz PUD or service to other customers. Whenever a customer’s equipment has characteristics which cause undue interference to Cowlitz PUD or to other customers, the customer must make changes in such equipment or provide, at customer expense, additional equipment to eliminate the interference.

Right to Inspect
Cowlitz PUD reserves the right to inspect and test any equipment connected to its lines and to obtain any information necessary to determine the operational characteristics of the equipment. Prior to purchase, the customer shall submit information to Cowlitz PUD regarding any equipment which might cause interference with service to other customers and/or require additional Cowlitz PUD facilities for its satisfactory operation.

Quality of Power
Electric service supplied by Cowlitz PUD may be subjected to voltage disturbances which will not normally affect the performance of typical electrical equipment. These disturbances may result in the improper operation of voltage sensitive equipment such as computers or microprocessors. The customer must provide any power conditioning devices needed to assure the “quality” of power such as
necessary for optimum performance of voltage sensitive equipment. Cowlitz PUD strongly recommends the use of surge protection equipment to protect your valuable property from the risks related to power surges.

**High Frequency Equipment**

The effects of the design and operation of high frequency equipment (such as electronic heating systems, spark discharge devices, radio transmitting equipment, etc., and equipment that generates harmonics, such as an induction furnace) must not create disturbances on Cowlitz PUD electrical system which interferes with any other customer's proper operation of communication, radio, television, remote control, or other equipment.

Devices which can produce harmonic distortion (such as adjustable speed, electronic ballasts for fluorescent lighting, and switching power supplies for computers and electric vehicles) shall be filtered such that the harmonic distortion resulting from these devices is kept within the limits specified in IEEE 519-1992, Section 10. Compliance with this requirement is by Cowlitz PUD measurement at the **point of delivery** (Section 3.3).

The customer can more easily stay within these harmonic distortion limits by requiring their supplier to provide “low harmonic current distortion” equipment.

1.16 Motors

1.16.1 Protection

To assure adequate safety to personnel and equipment, the customer is responsible for providing and maintaining code approved protective devices to protect all motors against overloading, short circuits, ground faults, low voltage, and for protecting all three phase motors against single phasing.

1.16.2 Starting

Motors rated in excess of 10 horsepower that normally start more than four times an hour, or motors rated in excess of 35 horsepower, may require reduced voltage starters.

The starting currents permitted depend upon the frequency of motor starting, the size and character of the customer’s load, and the design of Cowlitz PUD distribution system in the area. Permitted starting currents will generally be equivalent to the maximum starting current which, in Cowlitz PUD’s opinion, can be supplied without undue interference with service to other customers.

Cowlitz PUD will not normally invest in additional facilities to reduce voltage fluctuations on an individual customer’s service caused by the starting of that customer’s motors after the customer completes installation of all approved reduced voltage starters.
If the customer still requires additional Cowlitz PUD facilities, such facilities will be installed at the customer’s expense.

1.17 Customer Generation

Contact Cowlitz PUD prior to the installation of any generation equipment for specific requirements. The Customer must comply with these provisions to prevent accidents.

NEVER connect portable generators to a permanent wiring system without contacting Cowlitz PUD and having the installation inspected by a Governmental electrical inspector. Failure to do this can produce hazardous situations for Cowlitz PUD or other service personnel. Governmental electrical inspectors and Cowlitz PUD must approve all transfer switches and/or transfer operating schemes.

1.17.1 All Emergency or Standby Generators

An emergency or standby generator is connected to the customer wiring system and provides energy when the normal source is lost. The Customer shall comply with the following requirements and all applicable electrical codes prior to connecting any emergency or standby generators to the Customer's wiring system:

1. The Customer shall notify Cowlitz PUD and provide transfer switch and/or inter-lock scheme specifications and designs to Cowlitz PUD for review and approval prior to the installation of any emergency or standby generator.

2. The Customer shall not connect any generators to a permanent wiring system unless the interconnection uses a permanently installed, code-approved and Cowlitz PUD approved open transition transfer switch (“break-before-make”) or a code-approved and Cowlitz PUD approved secure inter-lock scheme. Failure to use this type of switch could create a hazardous situation for Cowlitz PUD or other service personnel.

3. If desired by the Customer, a closed transition transfer switch (“Make-Before-Break”) may be submitted for approval by Cowlitz PUD for use in this type of installation but all requirements for parallel generation must also be met. Written approval and operating agreements from Cowlitz PUD must be obtained prior to installation.

4. Governmental electrical inspectors must approve all transfer switches and/or inter-lock schemes and perform and approve all code required electrical inspections.
1.17.2 Parallel Generation

Parallel generation is defined as the parallel production of electric energy where sources of generation outside of Cowlitz PUD connect with Cowlitz PUD system for distribution. Such sources, when customer owned, may provide all or a part of a customer’s requirements or the customer may deliver energy directly to Cowlitz PUD. Customer sources may include wind turbines, waterwheels, steam turbines, solar conversion, and geothermal devices. Cowlitz PUD will handle each proposal for parallel generation on an individual basis and will require a special contract between the customer and Cowlitz PUD and compliance with Cowlitz PUD Interconnection Standards Policy EN-4.

Cowlitz PUD must approve operation of the customer’s parallel generation system. Cowlitz PUD will also designate metering type and location, and the method of interconnection between the customer system and Cowlitz PUD system.

1.17.3 Cogeneration

Cogeneration is defined as the joint production of electric energy and useful thermal energy in a combined process. It includes gas turbines, diesel driven generators with waste heat recovery, and steam or back pressure turbines. Cowlitz PUD will handle each proposal for cogeneration on an individual basis by means of a special contract between the customer and Cowlitz PUD and compliance with Cowlitz PUD Interconnection Standards Policy EN-4.

Cowlitz PUD must approve the operation of the customer’s cogeneration system. Cowlitz PUD will also designate the metering location, type of metering, and the method of interconnection between the customer's system and Cowlitz PUD system.
1.17.4 Net Metering

Net metering power production is generation made available to Cowlitz PUD from a customer that owns and operates a solar, wind, fuel cell, or hydroelectric facility with a generating installed capacity of 100kw or less. Net metering measures the difference between the electricity supplied by Cowlitz PUD and the electricity generated by the customer generator and fed back to Cowlitz PUD. A written agreement with Cowlitz PUD is required prior to interconnection and compliance with Cowlitz PUD Interconnection Standards Policy EN-4.
2 Permits

2.1 Codes and Ordinances
The construction of new or remodeled installations must conform to applicable provisions of the National Electrical Code (NEC), National Electrical Safety Code (NESC), state rules and regulations, city and county ordinances and codes, rules on file with or issued by regulators, Occupational Safety Health Administration (OSHA) rules during construction and maintenance, and Cowlitz PUD requirements.

2.2 Rights-of-Way
The applicant shall be responsible, without cost to Cowlitz PUD, for all permits, rights-of-ways, and easements required for the installation and maintenance of the electrical facilities that serve the applicant. A permit from the local jurisdiction is required before any work in the right-of-way may be performed. Only Cowlitz PUD approved excavation contractors and contractors who have made other special agreements with Cowlitz PUD will be allowed to work under Cowlitz PUD’s permit. The contractor must notify the local jurisdiction 48 hours or more before work is to begin. A copy of the permit must be on site.

2.3 Application for Service
It is important that the applicant provide accurate load information in a timely manner to Cowlitz PUD and the requested service date. Requests for service to commercial and industrial customers normally require considerable advance planning by Cowlitz PUD in order to serve the load. All applicants should give a 60 day minimum lead time. Commercial and industrial customers and other installations requiring special transformers or other equipment not in stock may require a six month lead time or longer.

All applicants shall include a plot plan which shows the preferred service and meter location with request for service. Commercial or industrial plot plans shall also show a single line diagram of the electrical layout, panel schedules, and load summary. Commercial or industrial applicants must provide all load information including lighting, water heating, cooking, space heating, air conditioning, and motor loads in horse power and operating voltage. Sufficient information on equipment operations that estimate the total kilowatt demand of the load should also be included. (See Commercial and Residential Electrical Service Application forms at the back of this booklet.)

Cowlitz PUD will provide assistance upon request to customers and contractors on service requirements and problems relative to electric energy utilization for new, existing, and reconstructed installations. The customer or the contractor will be held liable for any personal injury or property damage resulting from improper loading of Cowlitz PUD equipment if inadequate notice to and/or approval by Cowlitz PUD was not previously granted.

If changes in the service application are required, immediately contact Cowlitz PUD to set up alternative arrangements.

Local ordinances or state laws require that an applicant obtain appropriate permits before Cowlitz PUD establishes service. This may include approval of an electrical
installation by the electrical inspection authority. Approval for service will be granted only after all service requirements have been met. This includes all requirements referenced in Section 2, as well as the requirements of this booklet and other Cowlitz PUD standards.
3 Services

3.1 Types of Service Furnished
Available electric service includes 60 hertz, alternating current, single-phase or three-phase (See Section 3.10, Load Requirements). The nominal secondary voltages are given below:

**Underground Service:**

The following underground service may be provided:

- Single phase, 120/240 volt, three wire, grounded.
- Single phase, 120/208 volt, three wire, grounded
- Single phase, 240/480 volt, three wire, grounded.
- Three phase, 208/120 volt, four wire, grounded, wye. (Limited Locations)
- Three phase, 480/277 volt, four wire, grounded, wye.
- Three phase, 240/120 volt, four wire, grounded, open delta (motor loads limited to 40HP or less)

**Overhead Service:**

The following overhead service may be provided:

- Single phase, 120/240 volt, three wire, grounded.
- Three phase, 208/120 volt, four wire, grounded, wye.
- Three phase, 240/120 volt, four wire, grounded, open delta (motor loads limited to 40HP or less)
- Three phase, 480/277 volt, four wire, grounded, wye.
- If larger motor sizes are required, the customer must request and Cowlitz PUD must approve these voltages before services can be provided. Cowlitz PUD will not provide 4160 volt service.

3.2 Permanent Service Connection
Only authorized Cowlitz PUD employees shall make the permanent connection or disconnection of Cowlitz PUD electric service. Services shall not be jumpered prior to local inspection and permanent connection by Cowlitz PUD. Services shall not be energized without NEC approved covers properly secured and local jurisdiction approval.

3.3 Point of Delivery
The point of delivery for commercial and industrial customers refers to that location where Cowlitz PUD circuit connects to the customer’s system. Where the point of delivery is located at the customer’s building, Cowlitz PUD will only install service connections to customers metering equipment at the main or entry floor level. Prior approval by Cowlitz PUD must be obtained in order to have this metering equipment be located inside the building and then shall be in a dedicated electrical room meeting NEC Code.
Cowlitz PUD shall have access to this room during normal business hours. If this room also contains meters the door shall be keyed for a Cowlitz PUD lock or a door key shall be provided and stored in a Cowlitz PUD approved lock box at customer’s expense prior to energizing. (See Section 5.2, Electrical Equipment Room) for additional requirements. **Note: The preferred meter location is on the outside of the building nearest this room.**

The point of delivery for residential customers must be located on the front one third of the building nearest the Cowlitz PUD source facility. When this condition cannot be met, the customer must contact Cowlitz PUD to determine an appropriate location of the customer’s metering equipment.

### 3.4 General Meter Installations

Cowlitz PUD tariff and rate schedules require the delivery of each class and type of electrical service through one meter to one customer at one location. Meters must be accessible during normal work hours for meter reading and testing.

The customer is responsible for providing, installing, and maintaining all service equipment (including overhead service entrance conductors, conduit, enclosures, and meter sockets). Service equipment shall be installed and maintained so as to accommodate rights-of-way and provide space for the installation and maintenance of Cowlitz PUD facilities.

Meter location is subject to Cowlitz PUD approval. Meters shall not be installed near the drive through service entrance of commercial buildings.

Customers or contractors are not authorized to relocate any meter belonging to Cowlitz PUD or interfere in any way with the meter or its connection. The person responsible for the electrical work must contact Cowlitz PUD for any work that involves relocation, rewire, or new installation of a meter.

**CAUTION: With some types of meter sockets, removal of the meter does NOT de-energize the service.**

The customer or contractor must promptly notify Cowlitz PUD upon completion of repairs or modifications so Cowlitz PUD can inspect, reinstall, and reseal the meter (See the Section 3.4.2, Sealing Provisions and Section 1.6 concerning customer Responsibility for Safety).

### 3.4.1 Acceptable Meter Sockets

Acceptable meter sockets are manufactured in accordance with the current EUSERC requirement standards for Safety Meter Sockets. The customer must provide and install ring type meter sockets complete with terminal lugs, meter jaws, manual link bypasses or safety sockets (when required), and sealing means for all sections. Consult Cowlitz PUD for meter socket types.

### 3.4.2 Sealing Provisions

Cowlitz PUD provides seals placed on Cowlitz PUD provided meter rings for new service installation and associated service equipment to prevent injury
and/or tampering. Sealing provisions for associated service equipment shall mean using a stud/wing nut assembly or a clip suitable for use with a seal.

*Only qualified Cowlitz PUD employees are allowed to breach PUD security measures. Cutting a seal for any reason is considered tampering and as a result the customer is subject to any and all fees associated with such act in accordance with Cowlitz PUD Customer Service Policy CS-1, section 21.

All cabinets and gutters containing unmetered conductors (other than switches required by applicable codes) must have sealing provisions. Removable sections of conduit may only be installed when approved by Cowlitz PUD and must be sealed by Cowlitz PUD.

Non-metered conductors passing through a service disconnect for a mobile home service pedestal must be in conduit and arrangements must be made for sealing.

### 3.4.3 Mounting of Meter Sockets

Verify that clearances for meter sockets meet the requirements shown in (Figure 5-1 and Figure 5-2). Plumb sockets in all directions and securely mount them to a rigid, flat surface. Securely fasten conductors to their respective terminals and arrange them in a manner which will not interfere with the installation of Cowlitz PUD conductors, the meter or cover, or with the operation of manual link bypasses.

If the meter cabinet is to be recessed into the building wall, install a flush type box or meter cabinet designed specifically for that purpose so the face of the meter cabinet projects outward beyond the building surface as approved by Cowlitz PUD.

(NESC) requires 36 inches of clear working space in front of live parts and 78 inches of clear head room. No barrier shall be installed that will be within 36 inches of the front of the meter panel when a meter is removed and energized parts are exposed. Locate meter sockets and other metering equipment at least 36 inches horizontally from a gas meter, gas valve, or nearest gas component (outlet elbow or flange) of the meter set. (See Figure 5.3 and Figure 5.6)

The unmetered service conductor and the metered service conductor shall not be run in the same conduit, raceway, or gutter.

Any hindrance, including but not limited to siding, caulking, enclosures, and landscaping shall be removed by the property owner in order to allow unrestricted access to the meter base.

Be sure adequate protection exists for meters subject to physical damage. Barrier posts are required when metering equipment is exposed to vehicle traffic. (See Section 6.4.5)
3.4.4 Corrosive Areas

Meter sockets and other metering cabinets installed in highly corrosive areas (e.g., dairy farms, fertilizer or chemical plants, etc.) shall be constructed of stainless steel.

3.4.5 Meter Socket Adapters

Customer owned meter socket adapters or “meter collars” used for purposes such as providing a power source are not allowed on Cowlitz PUD services.

3.5 Connection and Disconnection of Service

Connection and disconnection of any service will be done by Cowlitz PUD. The customer may be billed a charge depending on the extent and type of the work involved. Residential services that have been disconnected will be inspected by Cowlitz PUD to determine if the service equipment is safe to reconnect, if modifications are necessary then the customer will be required to obtain a permit and inspection by the local code agency. A permit and inspection by the local code enforcing agency, and approval by Cowlitz PUD, is required before reconnection for the following:

- Commercial services that have been disconnected.
- Any service that has had service equipment modified or altered in any way.
- Any vacant house with meter removed for more than 30 days
- Added load in a 320A meter base or CT can.
- Any electrical service disconnected for more than 1 year with or without a meter.
- Residential services that have been disconnected will be inspected by Cowlitz PUD to determine if the service equipment is safe to reconnect, if modifications are necessary then the customer will be required to install equipment in compliance with current ESR specs and obtain a permit and inspection by the local code agency.

All work must be coordinated with Cowlitz PUD for connection and disconnection of service. Cowlitz PUD requires two business days’ notice for routine weekday service disconnects and more complex work may require extra time and scheduled outages. Job and labor costs incurred by Cowlitz PUD must be paid before scheduling. No permit or inspection is required if an overhead service is disconnected temporarily to allow falling of a tree or to provide safe working clearances for roofing, painting, or similar work.
3.6 **Theft of Service or Unmetered Electric Service**

Any unauthorized connections or wiring attached ahead of the meter, allowing for unmetered electric service, whether intentional or unintentional, should be immediately reported to Cowlitz PUD.

3.7 **Relocation of Services and Facilities**

A fee may be charged if the customer requests or requires relocation of existing Cowlitz PUD facilities.

3.8 **Customer Equipment on Cowlitz PUD Poles**

Customer owned metering equipment, switching devices, conduits, conductors, luminaires, etc., shall not be mounted on a Cowlitz PUD pole.

3.9 **Customer Owned Meter Poles and Guying**

All customer owned and installed poles for overhead service shall meet Cowlitz PUD requirements for height, depth of setting, pole class, and guying.

Poles shall be 20 foot minimum length and set 5’ below ground. Additional pole height is required when the service crosses a road and/or other clearance requirements must be met per electrical code(s). Poles longer than 30’ shall be set at a depth of 10% of pole height plus two feet below ground level. Gravel backfill may be necessary in areas of poor soil conditions. The pole size is to be Class 6 (six inch minimum top diameter, seven inch diameter six feet from the butt) or better, commercially treated full length.

All customer owned poles shall be guyed and anchored unless prior permission is obtained from Cowlitz PUD. Guys are to be minimum 5/16 inch galvanized steel cable, having a lead to height ratio of 1:2.

3.10 **Load Requirements**

3.10.1 **Single phase Service**

Equipment having a capacity of 2 kilowatts or more shall be operated at 208 volts or higher.

Customers connecting any single phase motor larger than 7 ½ horsepower must obtain prior approval in writing from Cowlitz PUD. In addition, air conditioners and heat pumps larger than five tons require prior Cowlitz PUD approval.

Single phase motors larger than 3 horsepower may cause voltage dips objectionable to some customers. Space or water heating must be designed and controlled so that no more than 48 amperes of load at 240 volts switches on or off at any one time.

Cowlitz PUD will limit the maximum single phase 120/240 volt load served through one point of termination to the capacity of a 167kva single phase transformer.

Cowlitz PUD will require the customer to use three phase service in lieu of single phase service, if Cowlitz PUD determines the customer’s connected load is excessive.
for single phase service.
Single phase service over 320 amps requires current transformer metering as described in Section 10.6, Current Transformer Metering – 800 Amps Maximum.

3.10.2 Three Phase Service

Three phase service will be provided upon request to residential and non-residential customers in accordance with Cowlitz PUD’s current tariff.

Three phase service over 200 amps requires current transformer metering as described in Section 10.6, Current Transformer Metering – 800 Amps Maximum, or over 800 Amps see Section 10.7, Switchboard Metering.

The customer’s connection of single phase loads to three phase should follow the guidelines shown below in order to reduce the likelihood, or eliminate a common cause, of overloading or single phasing condition which could damage the customer’s three phase equipment:

- On 208Y/120 volt or 480Y/277 volt three phase services, the single phase load(s) shall be split evenly among the three phases.

- On 240/120 volt open delta three phase service, the single phase load(s) (both 120 and 240 volt) shall not utilize the wild leg, except 240 volt resistance heat may be balanced across all three phases.

The high or wild leg on a four wire delta must be identified with the color orange and be terminated on the right side of the meter base or CT cabinet.

Cowlitz PUD will choose the voltage supplied to the customer depending upon the characteristics of Cowlitz PUD distribution system in the area and the customer’s electrical needs. Cowlitz PUD limits service at 208Y/120 volts to a maximum 2000 amp panel and 480Y/277 volts to a maximum 3000 amp panel.

Three phase, 480/240 volt service will not be supplied.

Three phase, three-wire service is not available.
4 Temporary Service for Construction

4.1 General
Upon request, Cowlitz PUD will supply temporary service at a location adjacent to Cowlitz PUD facilities as provided for in appropriate electric service policies. Consult Cowlitz PUD for information regarding temporary construction service.

Always locate temporary services for construction work to protect the meter and equipment from accidental damage, and when practical, in a location usable throughout the entire construction period. The service pole must be sound and in good condition for the duration of its use.

4.2 Construction Criteria for Temporary Service
Figures 4-1, 4-2, 4-3, 4-4, and 4-5 show typical installations for overhead and underground temporary service for construction. Temporary structures must meet all of the following requirements before Cowlitz PUD can provide service. **Cowlitz PUD will not connect the service** if height, strength bracing, or other requirements are not met.

- Installation of service post (Figure 4-2, Overhead Temporary Service Post), for temporary construction power requirements cannot exceed 180 days of use. If temporary construction power service is needed beyond 180 days, then Figure 4-1, Overhead Service Pole must be provided.

- To ensure strength, all lumber must be free of any sucker knobs and have spike knots no larger than 1/3 of any face, checks greater than ½ inch wide are not permitted, and no visible wood decay is allowed.

- The pole in (Figure 4-1, Overhead Service Pole), must be pressure or thermally treated with an approved American Wood Preservatives Association preservative.

- Distance between electric utility point of attachment and temporary service post (See Figure 4-2, Overhead Temporary Construction Service Post) must be less than 60 feet. If distance between electric utility point of attachment and temporary service post is greater than 60 feet, then a clearance post (See Figure 4-3, Overhead Temporary Clearance Post) shall be used, to ensure adequate clearance.

- A service conductor that crosses a driveway or road is required by the NEC and NESC to have a higher clearance above ground. This will normally require an installation of a pole as shown in (Figure 4-1, Overhead Service Pole).

- Soil surrounding pole or post must be tamped to provide stability.

- The appropriate code enforcing agency may require grounding connection to be visible when electrical inspection is made. For safety reasons the top of the ground rod should be flush with or below ground level.
References:

1. Meter socket must be NEMA type 3R (rainproof) and in good condition with no holes, bends or damage, and be plumb in all directions.
2. Service equipment must be NEMA type 3R (rainproof) and in good condition with no holes, bends or damage. NEC approved covers must be properly secured.
3. For permanent OH service, a pole mounted meter base must be installed using pre-approved unistrut channel or equivalent and secured in a manner which prevents movement due to routine maintenance. Conduit may be fastened directly to a customer owned pole but a climbing space must still be maintained.
4. Ground in accordance with the requirements of NEC. Use minimum No. 6 copper wire.
5. Customer installed conductor with 24” minimum length outside weatherhead.
6. Customer installed pole shall be 20’ minimum length and set 5’ minimum in ground. Additional pole height is required when the service crosses a road and/or other clearance requirements must be met per electrical code(s). Poles longer than 30’ shall be set at a depth of 10% of pole height plus 2’ below ground level. Gravel backfill may be necessary in areas of poor soil conditions. Size of the pole is to be minimum Class 6 (6” minimum top diameter, 7” diameter 6’ from the butt) or better, commercially treated full length.
7. Service mast must be rigid steel or SCH 40 PVC gray electrical conduit.
1. Meter socket must be NEMA type 3R (rainproof) and in good condition with no holes, bends or damage, and be plumb in all directions.
2. Service equipment must be NEMA type 3R (rainproof) and in good condition with no holes, bends or damage. NEC approved covers must be properly secured.
3. Ground in accordance with NEC requirements. Use minimum No. 6 copper wire for grounding.
4. Minimum conductor No. 8 copper or No. 6 aluminum with 24” minimum length outside weatherhead.
5. 4”x 4” minimum, new or treated post set 3’ deep minimum.
6. 2”x 4” brace, 12’ minimum length.
7. 2”x 4” stake set 18” deep minimum.
8. Refer to Table 5-1 for clearances.

Note: If Overhead Temporary Service Post is located within approximately 20’ of source pole, and is firmly in place, 3’ deep minimum, then bracing may be omitted as determined by Cowlitz PUD.
Notes:

1. 4"x 4" post x required height to meet clearance refer to (Table 5-1). Set 3’ deep minimum. Maximum distance 60’ between posts.
2. 2"x 4" brace, 12’ minimum length.
3. 2”x 4” stake set 18” deep minimum.
Notes:
1. Meter socket must be NEMA type 3R (rainproof) and in good condition with no holes, bends or damage, and plumb in all directions.
2. Service equipment must be NEMA type 3R (rainproof) and in good condition with no holes, bends or damage. NEC approved covers must be properly secured.
3. Ground in accordance with NEC requirements. Use minimum No. 6 copper wire.
4. Tamp earth around post to ensure that the post is firmly set in the ground. If necessary, use braces with stakes on the back side of post at 90 degrees separation as shown.
5. Customer owned conduit and meter base with breaker(s) and receptacles.
6. Conduit must be clamped to post per code.
7. See Section 6 for underground and conduit requirements.
8. Customer owned, new or pressure treated wood post 4” x 4” minimum.
9. Schedule 40 PVC gray electrical conduit or RMC.
Figure 4-5 UNDERGROUND TEMPORARY SERVICE INSTALLATION

NOTE: Underground utility locates must be requested before digging; CALL 1-800-424-5555. There is no charge for this service and existing underground facilities will be located and marked to avoid damage. Allow two business days after the day of the request.

1. **Temporary service to be located in the hatched area as shown, preferably on the right side of, and within 3 feet of the transformer or 2 feet if the power source is a secondary pedestal, and out of line of any future service trench. Customer to provide 24” deep trench from the temporary service to the edge of the no dig zone as shown (or to the previously installed conduit for the temporary service), install customer provided conductor in the trench and coil the remaining required extra length at the trench edge nearest to the transformer.**

2. **Customer to supply, own, and install the temporary meter base, conductor, and all other hardware according to electrical code(s); and shall meet Cowlitz PUD requirements and inspection by the state or city. The PUD will dig the trench in the no dig zone and make the secondary connections in the transformer, and supply, own, and install the electric meter; energize the service after all requirements have been met, all inspections passed, and customer has backfilled their portion of the trench.**
5 Clearances

5.1 Meter Clearances and Locations

The customer must provide suitable space and provisions for mounting a meter base at a location acceptable to Cowlitz PUD. It is in the mutual interest of both the customer and Cowlitz PUD to provide a suitable location resulting in the most convenience to both parties for reading, maintenance, and replacement of meters.

The minimum unobstructed working space required in front of a single meter is 78" high, 30" wide, and 36" deep per NEC 110.26 (see Figure 5-1 and Figure 5-2). Meters installed in a cabinet require a minimum space of 48" deep to open the cabinet door. **Locate all meters and metering equipment at least 36" horizontally from a gas meter.**

Install residential meters and CT cabinets outdoors at a location acceptable to Cowlitz PUD. Generally, locate the meter on the front one third of the building nearest the Cowlitz PUD source facility (street) side to prevent meters from being located behind yard fences and backyards. Avoid installations on exterior bedroom or bathroom walls or patios as well as exterior walls that are likely to be enclosed. Never install the meter over window wells, steps in stairways, or in other unsafe or inconvenient locations. CT enclosures must be located on an outside wall near the meter base (no basement installations). Keep shrubs and landscaping from obstructing access to meter.

Install non-residential meters and CT cabinets outdoors unless Cowlitz PUD confirms prior to installation that no acceptable outdoor location exists. Any indoor location must have prior written approval by Cowlitz PUD. Do not locate indoor meters in show windows, closets, bathrooms, over sinks or laundry tubs, or in any location not safe, convenient, or readily accessible.

Where the point of delivery is located in the customer’s building, Cowlitz PUD will only install service connections to customers metering equipment at the main or entry floor level.

Set the center of any meter socket located outdoors to no more than 5 ½’ +6” above the finished grade or floor immediately in front of the meter, except for the center of meter sockets in pedestals which are set for 42” minimum above finished grade. In the case of vertical four gang meter bases, set the center of the lowest meter socket to no less than 42” above final grade and upper meter socket no higher than 75” maximum (see Figure 8.2).

If a customer makes a meter inaccessible (in the opinion of Cowlitz PUD) by installing a fence, enclosure, or obstruction, the customer must, at customer’s expense, provide access acceptable to Cowlitz PUD or move the meter socket to a location acceptable to Cowlitz PUD.

Cowlitz PUD will not install meters on mobile structures such as trailers, barges, cranes, dredges, draglines, or any mobile pumping equipment or on floating dwelling units such as houseboats.

5.2 Electrical Equipment Rooms

A room containing metering equipment shall be a dedicated electrical room meeting NEC code and accessible to Cowlitz PUD personnel during normal business hours. If the room also contains meters the door shall be keyed for a Cowlitz PUD lock or a door key shall be provided and stored in a Cowlitz PUD
approved lock box at customer’s expense. The door must open outward and be equipped with a “panic bar”. The door must open to the outside of the building or access a hallway that leads straight to the outside of the building. The room shall be illuminated and shall not be used for storage of equipment, cleaning supplies, or other materials. As a minimum, the room should be sheet-rocked and taped. The following requirements in the checklist below also apply:

**Electrical or Meter Room Checklist**

**Access Door (Reference Section 3.3 & 5.2)**

- [ ] Keyed for Cowlitz PUD lock or Cowlitz PUD approved lockbox (for rooms containing meters).
- [ ] Door must open outward and be equipped with a “panic bar”.
- [ ] Door must have minimum dimensions of 24” wide and 6’-6” high.
- [ ] Door must open to the outside of the building or access a hallway that leads straight to the outside of the building.
- [ ] 36” of clear space in front, back, and to the sides of the access door.

**Working Space (Reference Figure 5-2)**

- [ ] 48” of clear space in front of electrical cabinets with door. Doors must not block egress.
- [ ] 78” high by 30” wide by 36” deep working space in front of meter bases

**Storage (Reference Section 5.2)**

- [ ] Rooms shall not be used for storage of equipment, cleaning supplies, or other materials.

**Electrical Panels/Switchboards/CT Cabinets (Reference Section 10)**

- [ ] Review by Cowlitz PUD Engineering Department and or Meter Department

**Miscellaneous (Reference Section 5.2)**

- [ ] Room shall be illuminated.
- [ ] Walls should be finished with sheetrock and taped.

Consult NEC, Section 110 for other electrical requirements.
Notes:

a. Cowlitz PUD requires a minimum clear working space of 78" high by 36" wide by 36" deep in front of the meter base.

b. Surface mount meters shall have a minimum 2" x 4" backing.
Notes:

1. In a multiple meter socket installation, a minimum unobstructed working space is needed. See Figure 8-2 for additional clearances.

2. Cowlitz PUD requires a minimum clear working space of 78”Hx36”Wx36”D in front of meter bases (NEC 110.26). For current transformer (CT) and switchboard installations, see section 10.

3. All doors to rooms that contain Cowlitz PUD metering and termination equipment (120 volts or higher) must open out. Doors must be equipped with “panic bars”. See 5.2 Electrical Equipment Rooms.

4. The current transformer cabinet door shall be hinged. The meter socket is preferred to be located on the non-hinged side of the current transformer cabinet door.
References:

1. Refer to Table 5-1 for minimum drip loop clearances.
2. The cable and drip loop (lowest point) must be at least 18” above an inaccessible roof as defined by the NESC. Weatherhead to be located a minimum of 24” above roof and within four feet of the roof edge. See Figure 7-7 for guying requirements.
3. For Minimum Clearances for Service Drops see Table 5-1.
4. Six feet maximum of service cable length over roof surface.
5. Ten feet maximum from corner of house closest to Cowlitz PUD lines.
6. Three feet minimum distance from gas meter (see Figure 5-6), window or doors for customer’s privacy and clearance. (See note c this page.)
7. Point of attachment must be 3/8” minimum eyebolt within 24” of the weatherhead.
8. Service mast must be RMC.

Notes:

a. Meter base and location must be approved by Cowlitz PUD prior to installation.
b. Buildings should not be constructed under or adjacent to lines.
c. The three foot distance from windows is not required if the window does not have a view of living space (e.g., garage). This applies to overhead and underground services.
d. Local code enforcing agencies require three feet clearance to windows openings.
Table 5-1. Minimum Clearances for Service Drops
(750 Volt and Below, Based on NESC)

<table>
<thead>
<tr>
<th>Service drop clearance (NESC Table 232-1)</th>
<th>Power Company-Required Minimum Clearance at Time of Construction (ft)²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over roads, streets, and other areas subject to truck traffic</td>
<td>16</td>
</tr>
<tr>
<td>Over or along alleys, parking lots, and nonresidential driveways</td>
<td>16</td>
</tr>
<tr>
<td>Over land travelled by vehicles</td>
<td>16</td>
</tr>
</tbody>
</table>

Clearances over residential driveways (NESC Table 232-1)

- If height of building or installation will permit:
  - for service drops 120/240 & 208Y/120 volt: 12 ft
  - for drip loops of service drops 120/240 and 208/120 volts: 10 ft

Clearances over spaces and ways subject to pedestrians/restricted traffic only (NESC 232-1. See note b. of Table 5.2.2.)

- If height of building or installation will permit:
  - for 480Y/277V (see Note 8-b of NESC Table 232-1): 10.5 ft
  - for 120/240 and 208Y/120 volt (see Note 8-d of NESC Table 232-1): 10 ft

Clearances from building for service drops not attached to the building (NESC Table 234-1)

Vertical clearance over or under balconies and roofs and:
- accessible to pedestrians, if cabled with a grounded bare neutral (not available in coastal areas): 11 ft
- accessible to pedestrians, if open wire or cabled with an insulated neutral (not available in coastal areas): 11.5 ft
- not accessible to pedestrians, if cabled with a grounded bare neutral (not available in coastal areas): 3.5 ft
- not accessible to pedestrians, if open wire or cabled with an insulated neutral (not available in coastal areas): 10.5 ft

Horizontal clearance to walls, projections, windows, balconies, and areas accessible to pedestrians:
- cabled with grounded bare neutral (not available in coastal areas): 5 ft
- open wire or cabled with an insulated neutral (coastal areas only): 5.5 ft

Clearances for service drops attached to a building or other installation

(over or along the installation to which they are attached; service cable with an effectively grounded bare neutral; see NESC 230.C)

- readily accessible (see NESC 234.C.3.d.1): 8 ft
- not readily accessible (see NESC 234.C.3.d.1, exception 1): 3 ft
- above a not-readily-accessible roof and terminating at a (through-the-roof) service conduit or approved support, the service and its drop loops set no less than 18” above the roof. No more than 6’ of the service cable passes over the roof or within 4” of the roof edge (see NESC 234.C.3.2.1): 1.5 ft
- in any direction from windows designed to open (does not apply to service cable above the top level of a window; see NESC 234.C.3.d.2): 3 ft
- in any direction from doors, porches, fire escapes, etc. (see NESC 234.C.3.d.2): 3 ft

²A two-foot addition to certain NESC values is required by the Power Company to ensure minimum clearances in extreme conditions.

* The customer shall provide a point of attachment which allows NESC minimum requirements to be met. Additional clearances may be necessary to allow for extreme conditions, terrain, and or long service lengths. Consult with Cowlitz PUD before installation.
5.2.1 Definition Notes for Clearances Table 5–1

1. Areas not subject to truck (heights of 8-14 feet) traffic include places where truck traffic normally never occurs or is not reasonably anticipated.

2. Spaces and ways subject to pedestrians or restricted traffic only include those areas prohibiting equestrians, vehicles, or other mobile units that exceed 8 feet in height, through regulations, by permanent terrain configurations, or not normally encountered or reasonably anticipated.

3. The NESC considers a roof, balcony, or area to be readily accessible to pedestrians if it can be casually accessed through a doorway, ramp, window, stairway, or permanently mounted ladder, by a person on foot who neither exerts extraordinary physical effort nor employs special tools or devices to gain entry. The NESC does not consider a permanently mounted ladder as a means of access if its bottom rung is eight feet or more from the ground or other permanently installed accessible surface.

5.3 Clearances from Pools and Hot Tubs

5.3.1 Overhead Clearances to Pools and Diving Structures

Pools and diving structures shall not be located within 10 feet horizontally of an overhead utility multiplex service drop, or secondary (0-750 volts), or 25 feet horizontally of any open wire secondary or primary.

5.3.2 Underground Clearances

Underground conductors shall not be under or horizontally within 5 feet of the inside wall of a pool or spa. For trench depth, cover, and conduit requirements see Sections Figure 6-2 and Figure 6-4.

5.4 Clearance from Underground Fuel Storage Tanks

Underground service conduits shall have a minimum of 10 feet of separation between the conduit run and the nearest point to buried fuel storage of any construction (metal, fiberglass, etc.).

5.5 Clearance from Pad Mount Transformers

Figure 5-4, Pad Mount Transformer Clearances, shows appropriate clearances from pad mounted equipment.
Notes:

a. The above distances apply to all single phase transformers and the smaller three phase transformers having 499 gallons or less of mineral oil on the Cowlitz PUD distribution system.

General Notes

a. Where exposed to motorized vehicles, the customer must install Cowlitz PUD approved barrier posts to protect pad mounted transformers (see Figures 6-4, 6-5).

b. Locate residential transformers 15 feet minimum and 25 feet maximum from edge of road/driveway for vehicle traffic clearance and transformer maintenance.

c. Locate commercial transformers within 25 feet from the road/driveway, or parking lot access for transformer maintenance purposes.
Table 5-3. Separation of Cowlitz PUD Mineral Oil Filled Equipment from Other Oil Filled Equipment
(Electrical Equipment, Fuel Storage Tanks, etc.)

<table>
<thead>
<tr>
<th>Mineral Oil/Fluid Capacity of Either Container (Gal)</th>
<th>Horizontal Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 499</td>
<td>5 Ft</td>
</tr>
<tr>
<td>500 - 5000</td>
<td>25 Ft</td>
</tr>
</tbody>
</table>

Source is Factory Mutual Property Loss Prevention Data Sheets, Paragraph 2.4.11

Figure 5-5 Working Clearances around Pad Mount Transformers

X = 10 ft horizontal clear area to allow use of hot sticks. (Maintain 3 ft min. clearance on all sides not having door or access panels for crew work)

This area to be kept clear of all utility structures (vaults, pedestals, etc.)
Figure 5-6 Separation of Electrical Equipment and Meter Bases from Gas Meter Sets

* Length of gas meter set varies with number of meters & associated equipment.

**Gas meter set design will vary; regulatory will not always be farthest component in set.
5.6 Cowlitz PUD Secondary Voltage Pedestals

Cowlitz PUD pedestals shall have three feet of horizontal separation from the gas meter set. Since these installations do not have switches inside the pedestals, and thus are not a concern of the gas company, this separation is a Cowlitz PUD requirement for working space only.

Figure 5-7 Line Crew Working Clearances around Cowlitz PUD Vaults

5.7 Separation of Cowlitz PUD Electrical Equipment from LP Gas (Propane, Butane, etc.) Containers

All Cowlitz PUD electrical equipment (transformers, switches, vaults, pad mounted equipment, meter bases, and pedestals) are considered to be a source of ignition and shall be separated from LP gas containers as required in the National Fire Protection Assn. Liquefied Petroleum Gas Code, Article 58. In general for Cowlitz PUD purposes, separation is determined as the distance from either the pressure relief valve on any portable container, or from the filling connection(s) or vent valve(s) for containers filled on site from a bulk truck, to the Cowlitz PUD electrical equipment.

The following separations shall apply for installation of above listed Cowlitz PUD equipment on the customer’s property having LP gas containers.
### Table 5-4. Separation between Cowlitz PUD Electrical Equipment and LP Gas Containers

<table>
<thead>
<tr>
<th>Container Type</th>
<th>Installation Design</th>
<th>Container Size (Gal. WC)</th>
<th>Minimum Distance (Ft) from Ignition Source (Any Direction)</th>
<th>From Relief Valve of Container Not Filled on Site</th>
<th>From Fill Tubes or Relief / Vent Valves of Containers Filled on Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT</td>
<td>Above ground</td>
<td>All Sizes</td>
<td>5</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>ASME</td>
<td>Above ground</td>
<td>All Sizes</td>
<td>N/A</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>ASME</td>
<td>Below ground</td>
<td>0 - 2000</td>
<td>N/A</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>ASME</td>
<td>Below ground</td>
<td>2001 - 120000</td>
<td>N/A</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**
1. Source is NFPA Liquefied Petroleum Gas Code, Article 58, pages 26-27 and Appendix I (Container Spacing)
2. Container Sizes are rated in gallons of water capacity (WC) in the English System.
3. Federal Department of Transportation rating (DOT)

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**Figure 5-8 Minimum Distances from LP Storage Tanks**

![Diagram showing minimum distances from LP storage tanks]
6 Underground Requirements

6.1 Underground Service

The customer or developer is responsible for the trenching, backfilling, compaction, installing conduit with 2500lb min. test mule tape, transformer pads or vaults, and any other requirements to complete the construction for underground service. For transformer installations, the customer must provide space for the transformer. For all trenching and transformer installations, the customer must meet any requirements of governmental authorities (including excavation permits) and Cowlitz PUD.

Where exposed to motorized vehicles, the customer must install and maintain Cowlitz PUD approved barriers to protect pad mount transformers and other equipment. (See Figures 6-4, 6-5.)

In most cases, Cowlitz PUD will install, maintain, and own the underground service conductors from Cowlitz PUD distribution line or transformer to the point of delivery.

Cowlitz PUD will install conductors in customer provided conduit. A 24” sweep elbow is required at the bottom of the service riser conduit in all cases.

All bends must be factory made. Heated bends are not acceptable.

Refer to the Table 6-1, (Minimum Conduit Required for Utility Conductors). Contact Cowlitz PUD for conduit requirements if primary voltage conductors are to be installed.

Where a customer’s conduit extends vertically through a paved or concrete surface adjacent to the service entrance, place a sleeve around the conduit to prevent direct contact of the conduit with the pavement. The sleeve helps avoid damage to conductors and service equipment caused by soil settling. (See Figure 7-4.)

Where a customer’s conduit extends to a Cowlitz PUD pole, the customer must provide the 90-degree long radius sweep. Consult Cowlitz PUD for the exact location at the pole base. See Section 6.3, Conduit, for approved conduit material.

Cap all conduits at BOTH ends during installation to keep them free of dirt and debris. All conduits must have a non-conductive 2500 lb. min. rated mule tape with 6 feet extending from each end.

All conduits shall be permanently attached along all conduit sections, including couplings, adapters, sweeps, and fittings, using either PVC glue or other permanent mechanical joints.

The customer is responsible for repairing, or the costs associated with repairing, any conduit problems prior to the installation of Cowlitz PUD conductors. Cowlitz PUD will own and maintain the conduit system once Cowlitz PUD conductors have been installed.

6.2 Trenches Provided by the Customer

The customer is responsible for complying with OSHA rules and state standards regarding shoring the trench. Also see Section 7.2, Underground Service.
6.2 Trenches Provided by the Customer (Continued)

The location of the service entrance on the customer’s premises is an important consideration to both the customer and Cowlitz PUD.

- Consulting with Cowlitz PUD to determine the route for service conductors, meter locations, service outlet locations, current transformers and terminal cabinet enclosures. Routing conduit under buildings or other permanent obstructions shall be avoided; exceptions may be allowed with approval from Cowlitz PUD if alternative routes are not available. Special construction methods or materials may be required.

- Locating the service entrance to make the meter and service easily accessible from Cowlitz PUD distribution lines and convenient for the installation, operation, and maintenance of Cowlitz PUD meters and equipment.

- The customer is responsible to recognize potential surface and subgrade water flows that may allow the entry of water into the customer’s electrical equipment. Cowlitz PUD will coordinate with the customer to assist in preventing this water entry.

- Obtaining a permit from the local jurisdiction is required before any work in the right-of-way may be performed. Cowlitz PUD will apply for such permits as necessary for construction by Cowlitz PUD approved contractors. Only contractors who have made special agreements with Cowlitz PUD will be allowed to work under Cowlitz PUD’s permit. The contractor must notify the local jurisdiction 48 hours before the work is to begin and a copy of the permit must be on site.

6.2.1 Call Before You Dig

State laws require the customer/excavator to call for underground utility locates at least two full working days (48 hours) prior to excavation. The excavation must not be started until all underground utilities have been marked or the utilities have informed the excavator that they have no facilities in the area. Call 1-800-424-5555 or 811 before you dig.

6.2.2 Service Trench

When installing only service cable in the trench, follow “Service Trench” dimensions in Figure 6-1. When installing service cable with other telecommunication utilities (telephone, cable T.V.) follow “Joint Use Trench without Gas” Figure 6-2 or “Joint Use Trench with Gas” Figure 6-3.

6.2.3 Select Backfill

Trench depth shall include requirements for select backfill as necessary to protect cables installed in rocky soil conditions. Figures 6-1, 6-2, and 6-3 provide select back fill depth requirements.

Select backfill are materials that pass through a 3/4” sieve and contain no sharp or foreign objects.
NOTES: (Figures 6-1, 6-2 & 6-3)

1. Where on-site backfill contains rocks larger than 4" and/or fractured rock (with sharp corners), select backfill shall be used. Select backfill shall be placed a minimum of 4" below and 6" above the centerline of the conduit/cable configuration, as shown. Select backfill material shall pass through a 3/4” sieve and contain no sharp or foreign objects. Backfill in the remainder of the trench shall be free of rocks larger than 4” in diameter.

2. The customer is responsible for backfilling trenches and site restoration.

3. Customer’s water lines are allowed in trenches adjacent to Cowlitz PUD conductors and must have a minimum of one foot vertical and one foot horizontal clearance from Cowlitz PUD conductors.

6.3 Conduit

Conduit is required on all new underground services. The customer is responsible to provide and install Schedule 40 PVC gray electrical conduit the entire length of the wire run from the source to the meter base. Mule tape capable of withstanding 2500 lbs. min. tension shall be provided by the customer with 6 feet of line extending from each end of the conduit. Mule tape shall be installed after conduit is jointed and glue is dry. When the conduit terminates at a Cowlitz PUD pole, consult Cowlitz PUD for exact conduit location. Refer to Table 6-1 for minimum conduit requirements.

Conduit installed on a customer owned service pole containing conductors ahead of metering shall be electrical-grade PVC or RMC. A climbing space is required on all customer owned poles.
### Notes:

8. If a 3” to 2.5” bell reducer is needed on a 200A meter base, it must be provided and installed within 12 inches of the meter base. Any other location of the reducer will not be accepted.

9. Larger conduit size, additional conduits, or larger bend radius may be required for longer runs, four-wire full neutral, or direct connection to utility conduit. Contractor shall consult Cowlitz PUD for specific requirements.

10. See Figure 6-1, Figure 6-2, or Figure 6-3 for normal trench depth.

11. Customer’s service conductors must be in a separate conduit system from Cowlitz PUD conductors.

12. Bends to be minimum 24” long sweep radius. All bends must be factory made. Heated bends are not acceptable. If a run is longer than 100 feet, the bends used and distance must be approved by Cowlitz PUD.

13. The maximum total bends in any run is 270 degrees, no exceptions.

14. Mule tape capable of withstanding 2500 lbs. min. tension shall be provided by the customer with 6 feet of line extending from each end of the conduit. Mule tape shall be installed after conduit is jointed and glue is dry.

15. Cowlitz PUD will not install conductors if conduit system is improperly constructed. Customers are responsible to ensure that their conduits have been installed properly.

16. All conduit routes must be approved by Cowlitz PUD prior to installation by customer and customer installed conduit must be inspected by Cowlitz PUD before backfill.

17. The customer is responsible to recognize potential surface and subgrade water flows that may allow entry of water into the customer’s electrical equipment. Cowlitz PUD will coordinate with the customer to assist in preventing this water entry.
6.4 Concrete Pads and Vaults for Pad Mount Transformers

6.4.1 Pads

Customers must consult Cowlitz PUD to obtain drawings and dimensions for concrete pads for three phase pad mount transformers. Precast pads are acceptable from certain manufacture(s) to Cowlitz PUD specifications. Pads must be flush with the finished grade within 12” of a sidewalk or other paved area.

6.4.2 Vaults

Cowlitz PUD requires vaults under certain cable compartments and locations. Consult Cowlitz PUD for vault dimensions. Precast vaults are acceptable from certain manufacture(s) to Cowlitz PUD specifications. The vault lid is to be installed 2” above the finished grade in landscaped areas and flush with the finished grade within 12” of a sidewalk or other paved area.

6.4.3 Clearances

See Figure 5-4 Page 27

6.4.4 Excavation and Backfill

Excavate entire area beneath pad or vault to a depth of 18 inches below final grade. All soil beneath the pad site must be compacted and level prior to setting or pouring the pad or vault to prevent settling. Backfill with compacted ¾ inch minus gravel to 90 percent compaction of undisturbed earth within 5’ of pad or vault.

6.4.5 Barrier Post

Install concrete filled steel barrier post(s) around Cowlitz PUD equipment in areas where the equipment is exposed to vehicle traffic. See Figure 6-4 and 6-5. For additional specifications and other options contact Cowlitz PUD.
**Figure 6-4 Heavy Duty Barrier Post**

**Table 6-3. Barrier Post**

<table>
<thead>
<tr>
<th>Type</th>
<th>Dimensions</th>
<th>Hole Dia.</th>
<th>Height “A”</th>
<th>Concrete Space “D”</th>
<th>WWF Dia. “E”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loading Docks (Heavy Traffic)</td>
<td>6” Dia. x 9’</td>
<td>30”</td>
<td>54”</td>
<td>6”</td>
<td>18”</td>
</tr>
<tr>
<td>Parking Lots</td>
<td>6” Dia. x 8’</td>
<td>24”</td>
<td>42”</td>
<td>Not Needed</td>
<td>Not Needed</td>
</tr>
</tbody>
</table>

1. Place 6” Schedule 40 H.D. galvanized steel post filled with concrete a maximum of 6’ apart on all sides exposed to vehicles.
2. All concrete shall have a minimum compressive strength of 3000 psi after 28 days.
3. Barrier post installation shall be in undisturbed earth. However, the area between the vault wall and barrier hole may be filled with 3/4” minus compacted gravel if three feet of undisturbed area is not available after the vault is set.
4. Steel reinforcement shall be welded wire fabric (WWF), 6” x 6” grid of 6/6 round, formed in a cage as shown above. Reinforcement not required for areas having only car traffic.
5. Posts shall be painted bright yellow.
6. Where a barrier post interferes with opening the equipment door or inhibits the workspace, a removable barrier post shall be installed with prior approval of Cowlitz PUD.
7. If required, barrier posts must be installed prior to energizing the service.
Figure 6-5 Barrier Post Locations at Pad Mount Transformer Installations. 
Standard Duty Barrier Post

NORTH
Not to Scale

61.5''

24''

24''

64''

Removable Bump Post

NOTE:
1. SET POST(S) AS SHOWN ABOVE.
2. POSTS MUST BE SET WHERE THEY WILL NOT INTERFERE WITH OPENING THE DOORS TO THE TRANSFORMER. WHERE THIS IS NOT POSSIBLE, A REMOVABLE BUMP POST IS REQUIRED.
3. BEFORE DIGGING POST HOLES, CONTACT THE P.U.D. TO LOCATE ANY UNDERGROUND CABLES.
4. CONCRETE BUMPER WALLS MAY BE USED IF APPROVED BY Cowlitz PUD.
7 Single Family Service

7.1 General

The location of the service entrance on the customer’s premises is an important consideration. All new services shall be installed underground according to PUD policy. For clearance and location information see Section 5-1, Meter Clearances and Locations and Figure 5-1, Meter Socket Clearance Requirements for Single Meter Installations.

- Consult Cowlitz PUD for location of meter socket before wiring service.
- Locate the service entrance and meter on the front one-third of the building closest to Cowlitz PUD facility and convenient for the installation, reading, and maintenance. Avoid backyard locations and no basement installations.

The customer will provide, install, and maintain all service equipment (including service entrance conductors for overhead services), conduit, enclosures, and meter sockets. They are also to include rights-of-way and space for the installation and maintenance of Cowlitz PUD facilities. Some conditions include:

- The customer must not terminate their principal grounding conductor in Cowlitz PUD’s sealed termination compartment.
- Customer wires installed in meter bases must allow clear space for the installation of Cowlitz PUD wires. Panel covers must be secured prior to being inspected and energizing.
- See Section 6, Underground Requirements. For conduit size see Table 6-1
- The meter socket, meter base, or CT cabinet, must not be used as a junction box.

*Always use ring type meter sockets, Cowlitz PUD will provide an approved sealable ring. **Ring-less type meter sockets will not be allowed or re-energized**

7.1.1 Residential Sockets

Single phase direct connect residential sockets which have maximum current capacity of 200 amps or 400 amps (320 continuous) amperes and are ANSI, UL, EUSERC, and Cowlitz PUD approved may be used.

Code calculated loads greater than 320 amperes require current transformer metering. The customer must contact Cowlitz PUD for information and requirements. (See Section 10, Commercial, Industrial, and Large Residential Services.)
7.2 Underground Service
For preparation of underground service, the customer or electrical contractor must obtain approval and specifications from Cowlitz PUD covering the proposed installation and the customer’s responsibilities.

The customer is responsible to recognize potential surface and subgrade water flows that may allow the entry of water into the customer’s electrical equipment. Cowlitz PUD will coordinate with the customer to assist in preventing this water entry.

Customers adequately served by existing overhead distribution facilities, but desiring underground service, should contact Cowlitz PUD for details of Cowlitz PUD policy for conversions. Special rules may apply in areas of cities where local ordinances specify underground service.

Cowlitz PUD underground conductors will be installed as specified in Section 6.2, Trenches Provided by the Customer, and Section 6.3, Conduit, for underground service to residential services. The customer must furnish and install conduit approved by Cowlitz PUD. The customer or developer is responsible for the cost of all trenching, conduits, vaults, excavation, backfill, and site restoration on the premises, or within the confines of the subdivision to be served. In some cases, this also includes costs for work outside the project to permit connection to Cowlitz PUD facilities.

Cowlitz PUD will install, own, and maintain the underground service lateral from its distribution line to the customer’s point of delivery.

7.2.1 Underground Service Extension
The customer is responsible for the trench, backfill, compaction, surface restoration and conduit installation as required for service extensions. Figure 7-2 shows a typical underground service installation on the house. Figure 7-1 shows a typical installation of a meter and associated hardware for surface and flush meter mounting methods. See Table 6-1 for conduit requirements.
NOTES:

a. Hubs are not approved for use on the concentric knock out of underground socket enclosures. Approved bushings, box adapters, or other conductor protection are required for these enclosures.

b. The 200 amp 3" SCH 40 PVC conduit riser is preferred to be in line with the left side of entrance knock out (not in the center). (Figure 7-4). The 320 amp 3" SCH 40 PVC conduit riser must be in the center 

c. Customer owned conductors cannot pass through the Cowlitz PUD compartment in the meter base.
Customer provides continuous electrical conduit from the meter base to the transformer or secondary pedestal with non-conductive 2500 lb. test mule tape installed. (Consult Cowlitz PUD prior to installing conduit.)

*200Amp meter base shown*

* 3' Minimum from windows for customer’s privacy if window has a view of a living space.

**References:**

1. The customer will provide and install a Cowlitz PUD approved meter base. The point of delivery for residential customers must be located on the front of the building or no more than 10 feet back from the front corner. When this condition cannot be met, the customer must contact Cowlitz PUD to determine the exact location of the meter.

2. For 320 Amp service, 3” Schedule 40 PVC electrical conduit with up to 270 degrees of bends can be used. Use 3” Schedule 40 PVC electrical conduit for the meter base riser. All bends to be **24 inch long sweep radius** (factory made) or larger. Heated bends are not acceptable. See Section 6.1, Underground Service, for other underground trench and conduit requirements.

3. When the conduit extends to a Cowlitz PUD pole consult Cowlitz PUD for exact conduit location. The back side of the conduit must be within a minimum 8 inches of the pole.
Figure 7-3 Secondary Pedestals

[Diagram of secondary pedestals with Sch 40 PVC]
Figure 7-4 Residential Underground Service
(Direct Connect metering)

References:

1. Meter base and conduit must be securely attached to the structure. Meter socket and conduit must be plumb when inspected. Cowlitz PUD will determine the exact location of the meter. Refer to Figure 5-1 (Meter Socket Clearance Requirements) 2" x 4" back supports are required.

2. A sleeve around the conduit is required when passing through paved area adjacent to building foundations to prevent ground settling from pulling conduit down.

3. See section 6 for underground requirements and conduit.

4. Ground in accordance with the currently adopted issue of NEC (Article 250 Grounding).

5. Use factory bends with no more than 90° of total bend to obtain a minimum depth of 24” while keeping the conduit flush against the house.
References:

1. Meter socket must be NEMA type 3R (rainproof) and in good condition with no holes, bends or damage, and plumb in all directions.
2. Service equipment must be NEMA type 3R (rainproof) and in good condition with no holes, bends or damage. NEC approved covers must be properly secured.
3. Ground in accordance with latest adopted issue of NEC (Article 250 Grounding). Use a minimum No. 6 copper wire for grounding.
5. Conduit must be clamped to post per code.
6. See Section 6 for underground and conduit requirements.
7. Customer owned pressure treated wood post 6” x 6” minimum set 36” deep and centered in 12” diameter hole with compacted gravel backfill. **Approved unistrut or pressure treated wood backing is required if all factory holes cannot contact post.**
7.3 Overhead Service

All new services shall be installed underground according to PUD policy. In an area where underground service is not deemed feasible by Cowlitz PUD an overhead service drop will be installed by Cowlitz PUD from overhead distribution lines to the service entrance on the customer’s residence, building, or structure. Consult Cowlitz PUD for location of meter socket before wiring service.

The customer must provide a single attachment point within two feet of the weatherhead which can be reached with a single span of service drop cable from an adjacent Cowlitz PUD line. For service mounted on a customer owned pole, locate the weatherhead within six inches of the top of the pole. The point of attachment must be high enough above finished grade and in a proper position to provide minimum clearances as specified in Table 5-1, (Minimum Clearances for Service Drops). It is important to avoid overhang of service drop above adjacent property and provide a service drop route without obstruction by buildings, trees, or other objects. Locate the point of attachment on the building wall facing the nearest Cowlitz PUD line or on a service mast capable of withstanding the tension of the service drop.

Extend and tie supports for service drops from and into the main structural members of the building. Extend the service mast through the roof on a typical single story building unless adequate clearance exists at the gable end of the building. (Also refer to Figure 5-3, Residential Clearances for Overhead Service). Use a rigid metal pipe clamp for the point of attachment for a service mast. For attachment to a building, use a 3/8 inch minimum forged closed eyebolt connected to a significant structural member (e.g. rafter, roof plate, etc.). For single story buildings, the attachment shall not be below the downhill slope of the roof or the rain gutters. Attachments to “fascia” boards are not permitted. If a Customer encounters problems in meeting these clearances, Cowlitz PUD will provide assistance in determining specific requirements that will comply with codes.
Figure 7-6 Residential Overhead Approved Meter Sockets

Figure 7.3.1 – Residential Overhead Approved Meter Sockets
(Overhead Only)

(A) 100 and 200-Amp maximum single-phase service meter socket (EUSERC 301)

(B) 400-Amp maximum single-phase service meter socket with manual-link bypass (EUSERC 302B)

(C) 100 and 200-Amp maximum single-phase service meter socket only (ANSI socket)

Notes:
See Figure 5-1 for additional information

Figure 7-7 Residential Overhead Service
Surface or Flush Mount Metering

Guying Recommendations by Mast Size

<table>
<thead>
<tr>
<th>Service Mast Rigid Steel Conduit</th>
<th>Service Size</th>
<th>Utility Service Length</th>
<th>Length of Unsupported Mast</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 inch/ 21/2 inch</td>
<td>200 Amp Service or Less</td>
<td>Less Than 100 ft.</td>
<td>24 inches</td>
</tr>
<tr>
<td>3 inch</td>
<td>201-400 Amp Service</td>
<td>Less than 80 feet</td>
<td>24 inches</td>
</tr>
</tbody>
</table>

References:

1. Allow 24 inch conductor leads for connection to service drops.
2. Guying shall be 1/8 inch galvanized steel strand or larger.
3. Service entrance mast must be rigid steel or SCH 40 PVC gray electrical conduit. **EMT will not be allowed for new construction or re-wire.**
4. Grounding per NEC (Article 250 Grounding).

Notes:

a. Mount service mast on side nearest distribution pole. Avoid service wire overhang over roof or provide clearance required over roof. (See Section 5, Clearances.)
b. For brick veneer or concrete block, use 1/4" x 3 1/4" lead sleeve expansion bolt in joint, in place of lag screws on anchor straps.
c. See Figure 7-8 for guying and anchoring mast.
d. Cowlitz PUD will determine the exact location of the meter base for new and rewire installations.

Figure 7-8 Mast Guying and Anchoring
Note:

a. Service mast must be mounted on side nearest distribution pole. Refer to Section 5, for clearance required over roof.

b. See Figure 7-7 to determine when guying is required.

c. For dwelling-mounted masts, a rigid steel pipe clamp shall be used for the point of attachment on guy wire for a service rigid steel mast. A 3/8-inch eyebolt shall be connected to a significant structural member for the point of attachment on a building.
8 Multiple Family Service

8.1 Grouping Service Entrances
Cowlitz PUD requires grouping of service entrances at a common point for multi-family units such as duplexes or apartments.

8.2 Underground Service
Refer to Section 6 for underground and conduit requirements.

Figure 8-1 Underground Service for Multi–Family Dwelling

Notes:

a. Electrical label or permit must be displayed on meter base.
b. Each multiple meter base and panel cover must have a permanently engraved metal, hard plastic, or self-adhesive label with minimum 3/8" high letters to identify the unit service address (see Figure 8-4). Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected if permanent door and siding has already been installed. Otherwise, clearly identified temporary lettering or numbers must identify each unit.
c. Cowlitz PUD will determine the exact location of the meters.
d. The customer is responsible to recognize potential surface and sub-grade water flows that may create an entry of water into the customer’s electrical equipment.
e. See Section 5 (Clearances).
f. House meters shall be Safety Socket type, except where the meter serves lighting only then a bypass or safety socket is not required.
Figure 8-2 Meter Socket Installations for Underground Multiple Family Services
Typical Residential Combination Enclosure and Meter Socket Panels for Multi-Unit Applications

Notes:

a. Cable pulling section must be sized for service termination ampacity per EUSERC 343 and must have bus extension drilled for landing lugs. When the sum of distribution section ampacities exceed the pulling section ampacities the customer will be responsible to provide NEC approved load calculations.

b. Each multiple meter base and panel cover must have a permanently engraved metal, hard plastic, or self-adhesive label with minimum 3/8” high letters to identify the unit service address (see Figure 8-4). Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected if permanent door and siding has already been installed. Otherwise, clearly identified temporary lettering or numbers must identify each unit.

c. House meters shall have manual bypass, except where the meter serves lighting only.

d. Refer to EUSERC 353 for minimum and maximum dimensions for meeting spacing and stacking.

e. NEC requires main disconnect when more than 6 services are connected.

f. A minimum 3” spacer is required between disconnect or pull section and meter socket panel.

g. “If cross bussing is installed below or behind a terminating position, the cross bussing shall be fully insulated or have a barrier.” (EUSERC 347)
Figure 8-3 Meter Socket Modules (0-800 Amps) (EUSERC 342)

Typical Service Terminating Arrangements: 2 Meters (0-200 Amps)

Typical Service Terminating Arrangements: 3-6 Meters (201-600 Amps) (EUSERC 342)

Table 8-1. Dimensions of Terminating Section for Meter Socket Modules (EUSERC 342)

<table>
<thead>
<tr>
<th>Equipment Rating</th>
<th>“W”</th>
<th>“Y”</th>
<th>“X”</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-200 Amps</td>
<td>6-1/2” Min</td>
<td>5-1/2” Min</td>
<td>11” Min</td>
</tr>
<tr>
<td>201-600 Amps</td>
<td>10-1/2” Min</td>
<td>6” Min</td>
<td>22” Min</td>
</tr>
<tr>
<td>601-800 Amps</td>
<td>Consult Cowlitz PUD</td>
<td>Consult Cowlitz PUD</td>
<td>Consult Cowlitz PUD</td>
</tr>
</tbody>
</table>

Notes:

a. 801-1200 Amp see Figure 10-9 (EUSERC 343)
b. “If cross bussing is installed below or behind a terminating position, the cross bussing shall be fully insulated or barriered.” (EUSERC 347)
8.3 Overhead Service

The customer is responsible to bring service entrance conductors from the service head to Cowlitz PUD point of attachment. Cowlitz PUD will not extend conductors from the point of attachment to individual service heads. It will be the customer’s responsibility to obtain permission for variances from the electrical code enforcing authority having jurisdiction.

8.4 Meter Labeling

It is the developer or owner’s responsibility to ensure that each meter socket is correctly labeled. Each meter base and panel cover must have a permanently engraved metal or hard plastic label with minimum 3/8” high letters to identify the unit service address (see Figure 8-4). Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected if permanent door and siding has already been installed. Otherwise, clearly identified temporary lettering or numbers must identify each unit. Cowlitz PUD may check such meter installations to verify they are correctly labeled and charge a fee to the developer or owner for incorrectly labeled meter sockets.

Figure 8-4 Meter Label
9 Manufactured and Mobile Home Service

9.1 Underground Service Information
Refer to Section 6 and to Section 7.2 for requirements that pertain to installation of underground secondary (less than 600 volts) service.

9.2 Underground Service to Manufactured Homes Sockets
Underground service to manufactured homes will be provided under the same requirements as single family service (see Section 7, Single Family Service,) because the home is site specific, occupies a private lot, and has a permanent foundation. Pay particular attention to the meter height and position requirements in Section 5.1, Meter Clearances and Locations.

The location of a factory installed meter socket shall be approved by Cowlitz PUD before manufacture of the home. When the meter socket is improperly located, the customer is responsible for all modifications to relocate or locate the meter to Cowlitz PUD requirements.

9.3 Underground Service to Mobile Homes
For underground service to a mobile home, locate the customer’s service entrance equipment either in an approved meter pedestal, or mount a meter base on a wood post not less than 6” x 6” pressure treated with an American Wood Preservative Association approved preservative (see Figure 9-2). The customer must furnish, install, and maintain the pedestal or wood post. The bottom of the meter pedestal enclosure containing the service equipment shall not be less than 24 inches above the finished grade. For a meter subject to physical damage, the customer must install and maintain barrier posts or other suitable protection approved by Cowlitz PUD (see Figure 6-4 for barrier post requirements). Permanent labels on the meter socket enclosure with the space number are required in mobile home parks.

Cowlitz PUD will provide service to the meter pedestal for the mobile home service. Each mobile home in a mobile home park must have a separate meter pedestal approved by Cowlitz PUD. Cowlitz PUD conductors shall not be installed under the mobile home pad.

Figure 9-1 Underground Service for Mobile Homes (EUSERC 307)
References:
1. Access door to Cowlitz PUD connections must be kept clear 6" minimum above final grade and have sealable provision for Cowlitz PUD.
2. See Section 6 for trenching, underground, and conduit requirements.

Notes:

a. Cowlitz PUD will secure the access door to its connections using a Cowlitz PUD meter seal

b. Do not install customer’s conduit across the front of Cowlitz PUD access door on pedestal.

c. Cowlitz PUD will specify the location of the meter pedestal.

d. Other applications for this pedestal may be permitted upon approval from Cowlitz PUD.
References:

1. Meter socket must be NEMA type 3R (rainproof) and in good condition with no holes, bends or damage, and plumb in all directions.
2. Service equipment must be NEMA type 3R (rainproof) and in good condition with no holes, bends or damage. NEC approved covers must be properly secured.
3. Ground in accordance with the latest adopted issue of NEC (Article 250 Grounding). Use a minimum No. 6 copper wire for grounding.
5. Conduit must be clamped to post.
6. See Section 6 for underground and conduit requirements.
7. Customer Owned pressure treated wood post, 6” x 6” minimum, set 36” deep and centered in 12” diameter hole with gravel backfill. Approved unistrut or pressure treated wood backing is required if all factory holes cannot contact post.
9.4 Overhead Service Information
Cowlitz PUD will supply new overhead service to any building or premises when installation of underground service is deemed not feasible by Cowlitz PUD. Refer to Section 9.6 for service drop information.

9.5 Overhead Service to Manufactured Homes
Cowlitz PUD will provide overhead service to manufactured homes using the same requirements as residential occupancies listed in Section 7, Single Family Service. The customer must make provision for meter height and placement as described in Section 5.1, Meter Clearances and Locations.

The location of a factory installed meter socket shall be approved by Cowlitz PUD before manufacture of the home. If the meter socket is improperly located the customer is responsible for all modifications to relocate or locate meter to Cowlitz PUD standards.

9.6 Overhead Service to Mobile Homes
The customer must install the meter base and service equipment on a wood pole. The pole requires pressure treatment with an American Wood Preservative Association approved preservative. The pole height must provide all required clearance for Cowlitz PUD service drop and any telephone, cable TV or other attachments (see Section 5, Clearances).
Cowlitz PUD will not energize the service if the customer provided service pole is not safe to climb.
References:
1. Meter socket must be NEMA type 3R (rainproof) and in good condition with no holes, bends or damage, and be plumb in all directions.
2. For permanent OH service, a pole mounted meter base must be installed using pre-approved unistrut channel or equivalent and secured in a manner which prevents movement due to routine maintenance. Conduit may be fastened directly to a customer owned pole but a climbing space must still be maintained.
3. Service equipment must be NEMA type 3R (rainproof) and in good condition with no holes, bends or damage. NEC approved covers must be properly secured.
4. Ground in accordance with NEC requirements. Use minimum No. 6 copper wire.
5. Customer installed conductor must be 24" in length outside of weatherhead.
6. Customer installed pole shall be 20' minimum length. Additional pole height is required when the service crosses a road and/or other clearance requirements must be met per electrical code(s). Poles longer than 30' shall be set a t a depth of 10% of pole height plus 2' below ground level. Gravel backfill may be necessary in areas of poor soil conditions. Size of the pole is to be minimum Class 6 (6" minimum top diameter and 7" diameter 6' from the butt) or better, commercially treated full length.
7. Service entrance mast must be rigid steel or SCH 40 PVC gray electrical conduit, NEC approved, and securely attached. **EMT will not be allowed for new construction or re-wire.**
References:

1. Meter socket must be NEMA type 3R (rainproof) and in good condition with no holes, bends or damage, and be plumb in all directions.

2. For permanent OH service, a pole mounted meter base must be installed using pre-approved unistrut channel or equivalent and secured in a manner which prevents movement due to routine maintenance. Conduit may be fastened directly to a customer owned pole but a climbing space must still be maintained.

3. Service equipment must be NEMA type 3R (rainproof) and in good condition with no holes, bends or damage. NEC approved covers must be properly secured.

4. Ground in accordance with NEC requirements. Use minimum No. 6 copper wire.

5. Customer installed conductor must be 24” in length outside of weatherhead.

6. Customer installed pole shall be 20’ minimum length. Additional pole height is required when the service crosses a road and/or other clearance requirements must be met per electrical code(s). Poles longer than 30’ shall be set at a depth of 10% of pole height plus 2′ below ground level. Gravel backfill may be necessary in areas of poor soil conditions. Size of the pole is to be minimum Class 6 (6” minimum top diameter and 7” diameter 6′ from the butt) or better, commercially treated full length.

7. Service entrance mast must be rigid steel or SCH 40 PVC gray electrical conduit, NEC approved, and securely attached. **EMT will not be allowed for new construction or re-wire.**
10 Commercial, Industrial, Agricultural, and Large Residential Services

10.1 General

This section describes Cowlitz PUD requirements for commercial, industrial, agricultural, and large residential services up to 600 volts. This section covers single phase and three phase services for direct connect and current transformer type metering. All commercial, industrial, agricultural, and large residential customers must coordinate their service requirements with Cowlitz PUD before purchase and installation of equipment.

Meters must comply with accessibility and location requirements in Section 5. For commercial meters located outdoors, the ground in front of the meter(s) must be “level” for a minimum area of 3'-6" x 3'-6".

All doors must open outward to rooms that contain Cowlitz PUD metering or termination equipment. Doors must be equipped with a “panic bar”. (see Section 5, Meter or Meter Room Checklist.)

Each multiple metered service must have a permanently engraved metal or hard plastic label with a minimum 3/8" high letters to identify the customer’s service address before power is connected (see Figure 10-5). It is the developer or owner’s responsibility to ensure that each meter socket is correctly labeled to Cowlitz PUD standards.

Single phase services over 320 amps continuous and three phase services over 200 amps require current transformer (C.T.) metering except as referenced in Section 10.2.

For this section, large residential services are single residential services over 320 amps continuous and all three phase residential services. Residential meters shall meet the residential location and clearance requirements as outlined in Section 5.1.

Where metering equipment is installed in a location where it might be struck by a motorized vehicle, the customer is required to install and maintain a Cowlitz PUD approved barrier post(s) (see Figure 6-5 for standard bump post). Meter bases, terminal cabinets, current transformer cabinets, and transformers should be located away from landscape irrigation sprinklers.

Where the permanent final or finished grade (or the final platform landing) cannot be provided in front of metering or service termination equipment, at the time of connection, the Customer must supply and install a temporary minimum 4’ x 4’ platform of sufficient strength to support Company personnel. Steps to the platform shall also be required, as needed.

10.2 Direct Connect (self-contained) Metering

Cowlitz PUD requires a direct connect socket type meter when the ampacity of a single phase service entrance is 400 amperes maximum (320 amps continuous) or less, or when the ampacity of a three phase service is 200 amperes continuous or less. (See Table 10-2) Three phase, three wire services are no longer offered for new construction or rewires (e.g., meter socket replacement). All rewires shall be upgraded to four wire, grounded services.
Limit the continuous duty on direct connect meter sockets for motor loads to:

- 60 hp at 208/120 volt, three phase
- 60 hp at 240/120 volt, three phase
- 125 hp at 480/277 volt, three phase

Motor sizes above these horsepower values shall be metered with current transformers (see Section 10.6, Current Transformer Metering – 800 Amps Maximum).

10.3 Pull Box Requirements

Locate and make accessible all compartments for termination of Cowlitz PUD service laterals as close as possible to where the conductors enter the building. When connecting two or more sets of service equipment to a single service lateral, the customer must provide a sealable terminal box complete with terminating positions. The customer must also provide an approved method in which to make multiple taps. Do not install customer owned devices (such as limiters, fuses, etc.) in terminal boxes. The customer must supply any terminal blocks.

Cowlitz PUD requires a main or entry level floor location for termination of load carrying conductors. The termination compartment for Cowlitz PUD conductors must meet EUSERC 342 requirements shown in Table 8-1, (Dimensions of Terminating Section for Meter Socket Modules or EURERC 343 shown in Figure 10-9, Pull Box with Terminating Facilities, 0-600 Volts, 0-800 Amps. The customer must supply any terminal blocks used. All doors must open outward to rooms that contain Cowlitz PUD metering or termination equipment. Doors must be equipped with a “panic bar”.

Cable pulling section must be sized for Cowlitz PUD service termination in EUSERC 342 and 343 and must have bus extension drilled for landing lugs. NEC requires main disconnect when more than 6 services are connected. When the sum of distribution section ampacities exceed the pulling section ampacities, the customer will be responsible to provide NEC approved load calculations.

The termination compartment for large residential (0-800 amps) modular metering section must meet size requirements of Table 8-1.
10.4 Customer’s Responsibility for Maintaining Switchboards

The customer is responsible for the proper installation and periodic maintenance of customer owned switchboards including switchgear; overcurrent devices; cable and bus connections and terminations; and all other electrical equipment.

Ensuring bolted connections have a long service life requires that there be a clean contact surface and proper clamping pressure between the terminal lug and the terminal pad. Use of torque wrenches will result in more consistent clamping forces on bolted connections. Cowlitz PUD recommends that bolted connections be torqued according to Table 10-1.

<table>
<thead>
<tr>
<th>Bolt</th>
<th>Aluminum</th>
<th>Everdur</th>
<th>Stainless Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8&quot;</td>
<td>12 FT-LB</td>
<td>18 FT-LB</td>
<td>20 FT-LB</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>25 FT-LB</td>
<td>40 FT-LB</td>
<td>45 FT-LB</td>
</tr>
</tbody>
</table>

*For set screw connections torque to manufacturer recommendations.

10.5 Primary Voltage Service (over 600 volts)

Consult Cowlitz PUD for requirements and equipment
Table 10-2. Direct connect Meter Socket Requirements

<table>
<thead>
<tr>
<th>Type of Service</th>
<th>Socket Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>120/240 volt, single Phase, 3 wire</td>
<td>4 jaw</td>
</tr>
<tr>
<td>120/208 volt, single phase, 3 wire (note b)</td>
<td>5 jaw, safety socket</td>
</tr>
<tr>
<td>240/480 volt, single phase, 3 wire</td>
<td>5 jaw, safety socket</td>
</tr>
<tr>
<td>208/120 volt, three phase, 4 wire</td>
<td>7 jaw, safety socket</td>
</tr>
<tr>
<td>480/277 volt, three phase, 4 wire</td>
<td>7 jaw, safety socket</td>
</tr>
<tr>
<td>240/120 volt, three phase, 4 wire</td>
<td>7 jaw, safety socket</td>
</tr>
</tbody>
</table>

**Single Phase**

![Single Phase Diagram](image)

**Three Phase**

![Three Phase Diagram](image)

**Notes:**

a. For safety socket requirements, refer to Figure 10-1.

b. Contact Cowlitz PUD for information.

c. 120V service is no longer offered.
Note:
Customer installed conductor must not cross over Cowlitz PUD conduit entrance.

Notes:

a. All commercial 120/240V, single-phase, self-contained direct connect meter sockets must have manual link bypass provision but a safety socket is not required. *Please ensure the manual link bypass is not covered by any wires.*

b. No safety socket is required for service equipment rated 200 amps or less for the following use: telephone booths, billboards, temporary construction, and residential pumps, gates, outdoor lighting, barns, and sheds.

c. A manual link bypass is required for (1) all 120/240 volt single phase services with a nominal rating of 400 amps (320 amps continuous), and (2) 100 amp traffic control equipment.
Figure 10-2 Commercial Pedestal (EUSERC 308)

Notes:
a. Consult Cowlitz PUD for pad requirements.
b. See EUSERC 308 for additional notes.

Table 10-3. Minimum Dimensions for Pedestals

<table>
<thead>
<tr>
<th>Service</th>
<th>W</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Phase</td>
<td>10-1/2&quot;</td>
<td>10&quot;</td>
</tr>
<tr>
<td>3 Phase</td>
<td>12-1/2&quot;</td>
<td>10&quot;</td>
</tr>
</tbody>
</table>
Figure 10-3 Commercial Three Phase, Direct Connect Meter Safety Socket

Notes:

a. The socket must be an approved EUSERC Safety Socket with test blocks which maintain service to the customer while the meter is removed for test or inspection.

b. Three phase 320 amp direct connect meter sockets are not approved for commercial use.

c. For 4 wire delta services, the high (power) leg conductor must be identified by orange marking, and located on the right side of the test blocks. The test block must also be factory marked and readily identified.

d. 3-Phase, 3 wire, 240 and 480 volt services are not approved for new construction or rewire.
**Notes:**

a. Cable pulling section must be sized for service termination (EUSERC 343) and must have bus extension drilled for landing lugs.

b. NEC requires main disconnect when more than 6 services are connected. (When the sum of distribution section ampacity ratings exceed the pulling section ampacity ratings, the customer will be responsible to provide NEC approved load calculations.)

c. Meters must be accessible during normal work hours for meter reading and testing. Lock boxes must be installed outside of meter room.

d. Each multiple meter base and panel cover must have a permanently engraved metal or hard plastic label with minimum 3/8” high letters to identify the unit service address. Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected, **if permanent door and siding has already been installed.** Otherwise, clearly identified temporary lettering or numbers must identify each unit. (see Figure 10-5).

e. If cross bussing is installed below or behind a terminating position, the cross bussing shall be fully insulated or barriered. (EUSERC 347)

**Figure 10-5 Meter Label**
Notes:

a. NEC requires main disconnect when more than 6 services are connected. (When the sum of distribution section ampacity ratings exceed the pulling section ampacity ratings, the customer will be responsible to provide NEC approved load calculations.)

b. Meters must be accessible during normal work hours for meter reading and testing. Lock boxes must be installed outside of meter room.

c. Each multiple meter base and panel cover must have a permanently engraved metal or hard plastic label with minimum 3/8" high letters to identify the unit service address. Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected, if permanent door and siding has already been installed. Otherwise, clearly identified temporary lettering or numbers must identify each unit. (see Figure 10-5).

d. If cross bussing is installed below or behind a terminating position, the cross bussing shall be fully insulated or barriered. (EUSERC 347)

e. Each metered service must have manual bypass facilities. (Safety Socket)
Figure 10-7 Commercial Multiple Metering
(Direct Connect, Floor Mounted, Switchboard, 1201 Amps & Above)
EUSERC 306/345

Notes:

a. All removable panels and covers to compartments used for metering shall be sealable.
b. Metering conductors shall not pass through adjacent metering compartments except in enclosed wireways.
c. For 4 wire delta services the high (power) leg must be identified by orange tape on the right side of the test blocks. This marking must be continuous throughout the equipment for all metering and Company termination points.
d. Test blocks with rigid insulating barriers shall be furnished, installed, and wired or bussed to the meter sockets. Test block cover panels shall be sealable and fitted with a lifting handle.
e. Meter panels shall be removable but shall be non-removable when meter is in place.
f. Each multiple meter base and panel cover must have a permanently engraved metal or hard plastic label with minimum 3/8” high letters to identify the unit service address. Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected, if permanent door and siding has already been installed. Otherwise, clearly identified temporary lettering or numbers must identify each unit.(see Figure 10-5). Each associated disconnect must also be labeled as to the unit, suite, or space number.
g. For pull section details when used on underground services, see Figure 10-16 or EUSERC 345.
h. The customer must provide an acceptable concrete pad for all switchboard metering service sections and pull boxes.
i. Each metered service must have manual bypass facilities. (Safety Socket)
j. If free standing unit can be expanded beyond 6 sockets (from load growth), then a main disconnect will be required in the initial installation.
k. Vacant meter positions shall be factory sealed or the meter base shall be in position before the panel is activated.

l. Concrete base construction shall include a dedicated 3 feet of concrete surface in front of the cabinet.

**Figure 10-8 Combination Current Transformer/Direct Connect Metering**

**Wall Mount, 0 - 800 Amp**

Notes:
- Bonding jumpers shall be used around knockouts.
- Pull section must be rated at the sum of the service maximum ampacity.
- Bonding and grounding per NEC, Article 250.
- Each multiple meter base and panel cover must have a permanently engraved metal or hard plastic label with minimum 3/8” high letters to identify the unit service address. Permanent lettered or numbered address must be placed on each corresponding main door entrance before power is connected, if *permanent door and siding has already been installed*. Otherwise, clearly identified temporary lettering or numbers must identify each unit. (see Figure 10-5).
- For services larger than 800 amps, see Section 10-7 Switchboard Metering.
Figure 10-9 Pull Box with Terminating Facilities 0-600 Volts, 0-800 Amps
EUSERC 343 & 347

TOP VIEW

Cable Pulling Section Of Service Termination Pull Box.

3/4” Min. “W”

EUSERC 343

Bus Stubs Anchored To Prevent Turning
Load Side

Customer Service Entrance Conductors Exit Above Lugs

Orange To Identify High (Power) Leg

Service Termination Bus Stubs See Dwgs. 2&3 For Clearance and Bus Detail

Shaded Space For Service Supply Conductors Only

"Y"

1 1/2"

4” Min.

1/2” Bolts

1” Min.

2” Min., 2 1/2” Max.

Front View

Note: See Figure 5-2 for clear working space.

Table 10-4. Pull Box with Terminating Facilities Dimensions (EUSERC 343)
(Appplies Only to Cowlitz PUD Portion of Pull Box)

<table>
<thead>
<tr>
<th>Total Service</th>
<th>“W”</th>
<th>“Y”</th>
<th>“X”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amps</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-200</td>
<td>10 1/2”</td>
<td>14”</td>
<td>6”</td>
</tr>
<tr>
<td>201-400</td>
<td>10 1/2”</td>
<td>14”</td>
<td>6”</td>
</tr>
<tr>
<td>401-800</td>
<td>16 1/2”</td>
<td>22”</td>
<td>11”</td>
</tr>
<tr>
<td>801-1200</td>
<td>See Section 10-7 Switchboard Metering</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10.6 Current Transformer Metering – 800 Amps Maximum
Current transformer (CT) metering is required when a three phase service exceeds 200 amperes, or when a single phase 120/240 volt service exceeds 400 amps (320 continuous amps). For services over 800 amps see Section 10.7 (Switchboard Metering).

The CT cabinet and meter shall be mounted outside of the building as described in Section 5.1 (Meter Clearances and Locations). The CT cabinet should not be placed lower in elevation than the Cowlitz PUD transformer in order to prevent water intrusion.

10.6.1 The Customer will provide and install:
- The weather tight NEMA 3R rated metallic cabinet securely mounted on a rigid surface. The door is to be hinged and capable of being sealed. The cabinet is to be sized in accordance with Table 10-6, (Current Transformer Cabinet).
- EUSERC approved current transformer mounting bases are rated 50,000 amperes fault duty. Fault currents over 50,000 amperes must have switchboard metering. Contact Cowlitz PUD for fault currents.
- The remote socket enclosure drilled and tapped for a Cowlitz PUD test switch.
- The conduit between the socket enclosure and the current transformer mounting base. Refer to Section 10.6.3 (Current Transformer Metering Conduit).
- Barrier post (6” diameter) required where metering equipment is installed in vehicle traffic area. Refer to Section 6.4.5 and Figure 6-4, 6-5.
- Bonding per NEC (Article 250) for all meter and CT enclosures.
- Both the current transformer cabinet and meter socket must be mounted plumb in both directions.

10.6.2 Cowlitz PUD will:
- Provide, own, and install the meter and test switch, with their associated wiring.
- Provide, own, and install line side service conductors on the current transformer mounting base and connectors for Cowlitz PUD owned conductors.
- Consult Cowlitz PUD for current transformer installation specifications.

10.6.3 Current Transformer Metering Conduit
The Customer must provide conduit between the meter socket and the current transformer cabinet. Use the following guidelines to install the conduit:

Use rigid steel conduit. A minimum of 1” conduit is required with proper fittings and bushings to protect metering conductors and ensure bonding of metal parts.

Schedule 80 PVC may be allowed when a bonding lug is provided in both the CT cabinet and meter base and bonded in accordance with NEC.
For standard installation, conduit must be of sufficient length to insure a minimum distance of 10" between the center of the meter socket and the current transformer cabinet.

If the standard location is not suitable or workable, an alternate location may be approved. Any alternate location must have prior written Cowlitz PUD approval and must adhere to the following guidelines.

- Conduit runs must be 50 feet or less, with no more than three bends totaling 270°. No one bend greater than 90° will be allowed.
- Pull string capable of withstanding 200 lbs. min. tension is required.
- LB’s may not be used for new construction.

10.6.4 Current Transformer Cabinets

- Only conductors associated with a single meter shall be permitted in the current transformer enclosure. No connections shall be made in any current transformer enclosure to supply any other meter.

- Customer conductors shall exit the enclosure on the load side of the current transformers. Customer’s conductors will not be permitted in Cowlitz PUD terminating and pull space.

- The cabinet must be mounted in a readily accessible location acceptable to Cowlitz PUD. **Cabinet must be a minimum of 12” above the finished grade.**

The top of the CT mounting bracket shall not be more than 6 feet above floor level. The cover shall have factory installed hinges for side opening with sealing provisions and shall be able to hold the cover in the open position at 90° or more.

A clear work space (see Figure 5-2) is required in front of this cabinet. The hinged door shall open to the opposite direction from the room door so as not to block ingress and egress from the room. The location of cabinets shall be on the main or entry level floor. Meter sockets shall not be located above the CT cabinet due to safety of working in front of live bus and shall not be located behind the hinged door.

**Current Transformer Cabinets** (Continued)
• For overhead service, the customer will provide connectors and terminate load side service conductors in the CT compartment. The customer will connect his conductors to the load side of the EUSERC approved mounting base. Line and load side terminations on CT landing pads require two bolts per connector.

• For underground service, Cowlitz PUD will provide connectors and terminate line side service conductors directly on the current transformer mounting base. The customer will provide connectors and terminate load side service conductors in the CT compartment.

Figure 10-10 Remote Socket for Current Transformer Meters
EUSERC 339

Use a meter socket enclosure for current transformer metering with a space reserved below the socket for a Cowlitz PUD test switch 9 ½ inches in length. Use the following guidelines for the enclosure and meter socket:

• Verify that the enclosure contains a mounting perch, drilled and tapped, for a test switch. Cowlitz PUD will furnish and install the test switch.

• Do NOT use meter sockets with circuit closers or bypass clips. They will not be approved.

• All unused openings must be covered and secured by the customer.

Table 10-5. Current Transformer Meter Socket Requirements

<table>
<thead>
<tr>
<th>Socket Type</th>
<th>120/240 volt, single phase, 3 wire</th>
<th>208/120 volt, three phase, 4 wire</th>
<th>480/277 volt, three phase, 4 wire</th>
<th>240/120 volt, three phase, 4 wire</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 jaw</td>
<td>13 jaw</td>
<td>13 jaw</td>
<td>13 jaw</td>
<td></td>
</tr>
</tbody>
</table>

Figure 10-11 Current Transformer Metering-Wall Mount
Three Phase Commercial Service Shown below 600 Volts, 800 Amps Max., 48”x48” Cabinet
Notes:

a. The customer service entrance conduits must exit the enclosure on the load side of the current transformer. Cowlitz PUD will not allow customer conductors or conduit in Cowlitz PUD’s terminating and pull space. Preferably, the CT Can will be divided in half and the customer load side conduits will be located within the half not occupied by PUD line side conduits and conductor. If existing conditions prevent the separation of line and load conduits and conductor using the approved CT cabinet dimensions, consult Cowlitz PUD for possible options. A larger can may be required depending on the application. Under no circumstance will this separation of work space be compromised.

b. Current transformer cabinet door must have factory installed hinges, a pad-lockable hasp and a minimum 90 degree door swing opening.

c. For 4 wire delta services, identify right hand CT mounting base as the high (power) leg. The high (power) leg conductor must be identified by orange marking, and located on the right side of the CT mounting base (NEC Article 215-8).

d. Bonding must be in accordance with latest issue of NEC (Article 250 Grounding) The Code enforcing agency may require bonding connection to be visible when electrical inspection is made.

e. Meter sockets shall not be located above CT cabinets due to safety of working in front of live bus and shall not be located behind hinged door.

f. See Section 5.1 for CT cabinet and metering location requirements.

g. Cabinet must be 12” minimum above finished grade.

h. Three Phase CT Cabinet size 36” x 48” Minimum, for single phase CT cabinet size (see Table 10-6).

Figure 10-11A Current Transformer Metering-Wall Mount

Three Phase Commercial Service Shown below 600 Volts, 800 Amps Max., 36”x48” Cabinet
Notes:

a. The customer service entrance conduits must exit the enclosure on the load side of the current transformer. Cowlitz PUD will not allow customer conductors or conduit in Cowlitz PUD’s terminating and pull space. Preferably, the CT Can will be divided in half and the customer load side conduits will be located within the half not occupied by PUD line side conduits and conductor. If existing conditions prevent the separation of line and load conduits and conductor using the approved CT cabinet dimensions, consult Cowlitz PUD for possible options. A larger can may be required depending on the application. Under no circumstance will this separation of work space be compromised.

b. Current transformer cabinet door must have factory installed hinges, a pad-lockable hasp and a minimum 90 degree door swing opening.

c. For 4-wire delta services, identify right hand CT mounting base as the high (power) leg. The high (power) leg conductor must be identified by orange marking, and located on the right side of the CT mounting base (NEC Article 215-8).

d. Bonding must be in accordance with latest issue of NEC (Article 250 Grounding) The Code enforcing agency may require bonding connection to be visible when electrical inspection is made.

e. Meter sockets shall not be located above CT cabinet due to safety of working in front of live bus and shall not be located behind hinged door.

f. See Section 5.1 for CT cabinet and metering location requirements.

g. Cabinet must be 12” minimum above finished grade.

h. Three Phase CT Cabinet size is 36” x 48” Minimum, for single phase CT cabinet size (see Table 10-6).

i. A larger cabinet (48"x48") is required if both the line and load conductors enter and exit from the bottom of the cabinet (single phase or three phase applications).

Figure 10-11B Current Transformer Metering-Wall Mount
Single Phase Residential Service Shown below 600 Volts, 800 Amps Max., 30”x48” Cabinet

Notes:

a. The customer service entrance conduits must exit the enclosure on the load side of the current transformer. Cowlitz PUD will not allow customer conductors or conduit in Cowlitz PUD’s terminating and pull space. Preferably, the CT Can will be divided in half and the customer load side conduits will be located within the half not occupied by PUD line side conduits and conductor. If existing conditions prevent the separation of line and load conduits and conductor using the approved CT cabinet dimensions, consult Cowlitz PUD for possible options. A larger can may be required depending on the application. Under no circumstance will this separation of work space be compromised.

b. Current transformer cabinet door must have factory installed hinges, a pad-lockable hasp and a minimum 90 degree door swing opening.

c. Bonding must be in accordance with latest issue of NEC (Article 250 Grounding). The Code enforcing agency may require bonding connection to be visible when electrical inspection is made.

d. Meter sockets shall not be located above CT cabinet due to safety of working in front of live bus and shall not be located behind hinged door.

e. See Section 5.1 for CT cabinet and metering location requirements.

f. Cabinet must be 12” minimum above finished grade.

g. Single Phase CT Cabinet size is 30” x 48” Minimum

h. A larger cabinet (48”x48”) is required if both the line and load conductors enter and exit from the bottom of the cabinet (single phase or three phase applications).
Notes:

a. The customer service entrance conduits must exit the enclosure on the load side of the current transformer. Cowlitz PUD will not allow customer conductors or conduit in Cowlitz PUD’s terminating and pull space. Preferably, the CT Can will be divided in half and the customer load side conduits will be located within the half not occupied by PUD line side conduits and conductor. If existing conditions prevent the separation of line and load conduits and conductor using the approved CT cabinet dimensions, consult Cowlitz PUD for possible options. A larger can may be required depending on the application. Under no circumstance will this separation of work space be compromised.

b. Current transformer cabinet door must have two factory installed hinges, a pad-lockable hasp and a minimum 90 degree door swing opening.

c. Bonding must be in accordance with latest issue of NEC (Article 250 Grounding) The Code enforcing agency may require bonding connection to be visible when electrical inspection is made.

d. Meter sockets shall not be located above CT cabinets due to safety of working in front of live bus and shall not be located behind hinged door.

e. See Section 10.6 Current Transformer Metering.

f. Cabinet must be 12” minimum above finished grade.

g. Three Phase CT cabinet size is 36” x 48” minimum, single phase CT cabinet size min. 30” x 48”. (See Table 10-6).

h. A larger cabinet (48”x48”) is required if both the line and load conductors enter and exit from the bottom of the cabinet (single Phase or three phase applications).
Figure 10-13 Current Transformer Cabinet – 800 Amperes Maximum, 0-600 Volt
EUSERC 316, 317, 318

Table 10-6. Current Transformer Cabinet

<table>
<thead>
<tr>
<th>Current Transformer Cabinets (Hinged)</th>
<th>CT Mounting Base</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min. Cabinet Dimensions</td>
</tr>
<tr>
<td></td>
<td>Width</td>
</tr>
<tr>
<td>Single phase, 3 Wire 401-800 Amps --</td>
<td></td>
</tr>
<tr>
<td>Wall Mount</td>
<td>30&quot;</td>
</tr>
<tr>
<td>Post Mount</td>
<td>30&quot;</td>
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<tr>
<td>EUSERC 328B</td>
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<tr>
<td>Three phase, 4 Wire 201-800 Amps --</td>
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<td>Post Mount</td>
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<td>EUSERC 329B</td>
<td></td>
</tr>
</tbody>
</table>

Above 800 amps, see Section 10.7 (Switchboard Metering)

Note:

a. A larger cabinet (48”x48”) is required if both the line and load conductors enter and exit from the bottom of the cabinet (single Phase or three phase applications).
Notes:

a. The customer to supply and install all lugs and connect the line and load on overhead services and load only on underground services.

b. Mounting base accepts bar type current transformers only

c. Verify that the mounting base for CT’s meets ratings for available fault current (50,000 amp maximum)

d. Line and load side terminations on CT landing pads require two bolts for each mounting position.

e. Termination for service conductors shall be aluminum bodied mechanical lugs. One position lug for 0-400 amps and a three position lug for 401-800 amps.
Figure 10-15 Transformer Mounting Base for Installation in Current Transformer Enclosure. Three phase, Four wire, 800-Amp Max (EUSERC 329B).

Notes:

a. The customer to supply and install all lugs and connect the line and load on overhead services and load only on underground services.
b. Mounting base accepts bar type current transformers only.
c. Verify that the mounting base for CT’s meets ratings for available fault current (50,000 amp maximum).
d. Line and Load side terminations on CT landing pads require two bolts for each mounting position.
e. Termination for service conductors shall be aluminum bodied mechanical lugs. One position lug for 0-400 amps and a three position lug for 401-800 amps.
f. For 4 wire delta services, the power (wild) leg conductor must be identified by orange marking and located on the right hand side of the CT mounting base.
10.7 Switchboard Metering

A EUSERC approved switchboard metering section is required when the service entrance rating is greater than 800 amperes (may also be used for three phase services over 200 amperes and single phase service over 320 amperes). The metering current transformers will be located in the current transformer compartment. The meter and test switch may be mounted on the compartment’s hinged cover or located remotely. The area below this compartment’s barrier may be used as a main switch (breaker) compartment, a load distribution compartment, or a bottom entrance terminating pull section. The metering compartment shall be on the supply side of the main switch or breaker. The Mounting pad for all switchboard metering enclosures will be a minimum 4” thick concrete pad.

10.7.1 Switchboard Service Termination

- The customer will provide the switchboard service section, instrument transformer mounting base, panels, meter socket, and provisions for a test switch.
- Meter and test switch are to be owned, provided, and installed by Cowlitz PUD in the customer owned metering compartment. Window or doughnut type current transformers for switchboards are provided by Cowlitz PUD and installed and secured by the customer.
- For 4 wire delta services the high (power) leg must be identified by orange tape. This marking must be consistent throughout the equipment for all metering and Company termination points.
- Customer locking means for the metering enclosure must provide for independent access by Cowlitz PUD.
- Customer owned conductors and devices (limiters, fuses, etc.) are not permitted in Cowlitz PUD sealed pull sections or metering compartments.

EUSERC Notes:

- Terminating bolts must be secured in place and shall be provided with nuts, flat washer, and a spring washer, and all parts must be plated to prevent corrosion. Bus bars are required from the pull section into the service section.
- The NEC requires a clear work space of 78” high by 36” minimum wide by 36” deep in front of switchboards.
- Bonding must meet NEC requirements. Lugs for terminating the customer’s bonding wire (or other bonding conductors) shall be located outside of the sealable section and shall be designed to readily permit the customer’s neutral system to be isolated, when necessary, from Cowlitz PUD neutral.
- All removable panels and covers to the compartments used for terminating or routing conductors shall have sealing provisions.
- All pull and termination sections shall be full front access. Cover panels shall be removable, sealable, provided with two lifting handles, and limited to a maximum size of 9 square feet in area.
Figure 10-16 Underground Service Termination Switchboard Service Section
400 to 3000 Amp, 0–600 Volts
EUSERC 345

Notes:

a. A switchboard pull section, a separate termination enclosure, or a bottom feed service section shall be provided for all switchboard underground services.

b. Bus bars, with provisions for termination lugs per EUSERC 347, are required from the pull section into the service section when the main switch is rated above 800 amperes, or when multiple metering is to be supplied.

c. Minimum dimensions listed are for vertical entry at the top or bottom only. Side or rear entry of the service cable into the pull section may require a greater dimension than that shown in the table (See Figure 10-17 and Table 10-7).

d. All pull and termination sections shall have full front access. Cover panels shall be removable, sealable, provided with two lifting handles, and limited to a maximum size of 9 square feet in area.

e. Customer shall provide a drawing with dimensions of proposed service equipment.

f. Consult Cowlitz PUD for services larger than 2000 amps.
**Notes:**

a. The service entrance conductors, cable or bus bar, are furnished and installed by the customer in the following manner:

1. When the switchboards are served with bus bar conductors, the conductors shall enter through the top or at the side or back in the upper 10" section.
2. When the switchboards are served with cable conductors, the conductors shall only enter the top of the switchboard.

b. When conduits enter from the side or rear, an extension may be required.

c. The direction of feed is from top to bottom in the switchboard service section. Load conductors shall leave below the metering compartment and may not be routed back through the current transformer compartment in order to exit the service section.
Figure 10-19 Switchboard Metering

For outdoor switchboard installation on a pad, the customer shall supply and install a concrete pad with a dedicated min. 3' of concrete in front of the cabinet. Drainage slope away from cabinet.

Notes:

a. Exterior doors on outdoor switchboards must be sealable and must hold securely at 90° minimum when open with meters and test switches mounted. Meter panels shall not be hinged to a filler panel.

b. Neutral terminal shall be permanently identified in clearly visible block lettering reading either “neutral” or “N”.

c. For 240/120 volts, three phase, four wire services, the power leg (“C” phase) terminal shall be permanently marked in orange color by the manufacturer.

d. Prior approval must be obtained from Cowlitz PUD if the metering switchboard is to be installed indoors. Indoor switchboards must be accessible for maintenance and meter reading. (See Section 5.1 (Meter Clearances and Locations))
Notes:

a. The service termination and metering equipment should be located outside near the transformer. If Cowlitz PUD allows the service termination to be located inside the building, the metering enclosure must be located outside the building.

b. The conduit in the switchboard section shall be PVC Schedule 80 conduit and shall be terminated in the current transformer compartment in front of the current transformers. 90 degree sweeps (LB’s or similar devices) are not permitted inside the enclosure.

c. Neutral terminal shall be permanently identified in clearly visible block lettering reading either “neutral” or “N”.

d. For 240/120 volts, three phase, four wire services, the power leg (“C” phase) terminal shall be permanently marked in orange color by the manufacturer.

e. If, in the opinion of Cowlitz PUD, the switchboard service section is inaccessible for meter testing and maintenance, the customer must provide direct access between the remote meter and the current transformer.

f. The customer must provide and install the remote meter socket enclosure, metering switchboard section and 1 1/4” conduit for the metering secondary conductors. Refer to Section 10.6.3 (Current Transformer Metering Conduit) in this book for conduit requirements.
**Figure 10-21 Current Transformer Compartment for Switchboards 0 -1,000 Amps, 0-600 Volts Three phase, Four wire, EUSERC 320**

Notes:

a. Set the direction of feed from the top or bottom. No other conductors shall pass through this compartment.

b. Bus arrangement and supports shall be provided as shown, except the neutral bus may be located at either side or on either side wall.

c. A clear unobstructed work space shall be provided around the current transformer bus units from the barrier to the upper support bar.

d. The barrier shall be constructed of rigid insulating material resistant to ARC tracking.

e. Dimensions measured to inside edge of the compartment access opening.
**Figure 10-22** Current Transformer Compartment for Switchboards 1,001-3,000 Amps, 0-600 Volts Three phase, 4 Wire Service

**EUSERC 322**

Notes:

a. Busways must remain in position when the removable section “B” is out.

b. Set the direction of feed from the top or bottom. No other conductors shall pass through this compartment.

c. When horizontal cross busways supply the service section phase buses, a neutral bus bar extension shall be provided in the instrument transformer compartment above the lower CT bus support.

d. Dimension measured to inside edge of the compartment access opening.
10.8 Special Metering Configurations

Figure 10-23 Irrigation Pumping Overhead Metering – Direct Connect

Notes:

- The customer shall install the service conductors from the pump switchgear to the meter socket and meter socket to the weatherhead.
- Consult Cowlitz PUD for platform requirements when installing in wet areas. Refer to Table 5-1, (Minimum Clearances for Service Drops)
- Customer poles must be pressure or thermally treated by a commercial treating plant. See Figure 4-1 Overhead Service Pole for pole and metering requirements.
- For permanent OH service, a pole mounted meter base must be installed using preapproved unistrut channel or equivalent and secured in a manner which prevents movement due to routine maintenance. Conduit may be fastened directly to a customer owned pole but a climbing space must still be maintained.
- Service entrance mast must be rigid steel or SCH 40 PVC gray electrical conduit, NEC approved, and securely attached. *EMT will not be allowed for new construction or re-wire.*
**Figure 10-24 Options for Commercial Service – Free Standing Backboards**

Notes:

a. All hardware to be galvanized or stainless steel.

b. All posts must be set 36” deep centered in 12” holes, with compacted 3/8” gravel backfill, metal posts set in concrete.

* All metal pieces shall be bonded to ground conductor

2” square galvanized capped posts or 3” galvanized pipe posts capped

Unistrut* (bolt meter base and disconnect to unistrut)

Unistrut* to support conduit

6” diameter

2” x 6” or 2”x8” or 2”x10” pressure treated timbers

Pressure treated posts, capped

6” diameter

6”x6” posts

2”x6” or 2”x8” or 2”x10” pressure treated timbers

Conduit Support

Compacted 3/8” gravel backfill

6” diameter

Unistrut*

1/8”- 3/8” Thick galvanized steel

6’ Max 4’ Min
Figure 10-25 Typical Meter Access Platform in a Flood Area

Notes:

Follow these requirements when installing a meter access platform in a flood area. Cowlitz PUD requires a clear workspace in front of a switchboard of 78-inches high, a minimum 36-inches wide, and 36-inches deep.

a. Cowlitz PUD and the Customer will determine when a platform is required and where it will be located. Contact Cowlitz PUD for variations in platform requirements. The platform must be approved by Cowlitz PUD before installation.

b. All lumber used to make a platform must be pressure-treated. The cost of construction shall be the responsibility of the Customer. The Customer must maintain the platform for future access and structural strength.

c. The Customer is responsible for permits or use of land associated with a meter access platform.

d. The pole will be furnished and installed by the Customer.

e. The stair run will vary with the height of the platform, and the handrail stanchions will be equally spaced.

f. The Customer is responsible for ensuring that the minimum electrical clearances are maintained from the platform to the service attachment. See Table 5-1, Minimum Clearances for Service Drops, 750 Volts and Lower Based on NESC C2-2012.

IMPORTANT: If a hazardous situation exists with a meter access platform, the Customer will be notified. The Customer will have 60 days to repair the safety or maintenance issue. Should repairs not be made after 60 days, the customer’s service will be subject to disconnection.
Figure 10-26 Customer Built Flood Platform

Notes:
*Please see requirements for platform on Figure 10-25.
## RESIDENTIAL ELECTRICAL SERVICE APPLICATION

*NOTE* A non-refundable $100 Application Fee is required and the Residential Electrical Service Application Requirements on page two must be met before your application can be accepted.

### Customer Information:

Name(s) / ___________ Home Phone No. ___________

Work Phone ________ Message Phone ________ E-Mail ________

Mailing Address __________________ City ___________

State____ Zip Code____ Social Security Number(s) _______ / 

Date of Birth _______/ ________ Drivers License # _______/ ________

Employer(s) ___________ / 

Builder/Electrical Contractor ___________ Phone No. ___________

(Contact Person)

### Site Information:

Service Address __________________

City & Zip Code ____________________ Detailed Directions to Site: __________________

Subdivision Name __________________

Parcel/ Lot No(s) __________________ Nearest Cross Street: __________________

### Load Information:

**Service Type:**
- □ House
- □ Manufactured Home
- □ R.V.
- □ Shop
- □ Other: __________________

House Size _______ Sq. Ft. No. Panels & Size _______/ _______ Amps

Shop Size _______ Sq. Ft. No. Panels & Size _______/ _______ Amps

**Service Entrance:**
- Size _______ Amps
- Type: □ SC □ CT

**Mounted On:**
- □ Hse
- □ Shop
- □ Well Hse
- □ Post

**Type of Heat & Load in KW:**

- □ Electrical
- □ Gas
- □ Propane
- □ Other: __________________

- □ Heat Pump Ton _______ LR A _______ Auxiliary Heat _______ KW

- □ Heat Pump Ton _______ LR A _______ Auxiliary Heat _______ KW

- □ Electric Furnace _______ KW

- □ Wall Heat _______ KW

- □ Baseboard _______ KW

**Additional Loads:**

- □ Water Heater: □ Electric □ Gas
- □ Cooking: □ Electric □ Gas
- □ Dryer: □ Electric □ Gas
- □ Well _______ KW □ Hot Tub _______ KW
- □ Welder _______ KW
- □ Other _______ KW
Additional Information:

Temporary Service:
- [ ] Yes  [ ] No
- [ ] Underground  [ ] Overhead

Note: Temporary service will be disconnected upon connection of permanent service unless otherwise requested.
Additional remarks including any future load requirements:

Residential Electrical Service Application Requirements:

- [ ] Service address obtained from the local governmental agency and posted at the site.
- [ ] Electric heat load(s) include: heat pump tonnage (Ton), locked rotor amps (LRA), kilowatts (KW) of auxiliary heat strips.
- [ ] Road/driveway installed and capable of supporting heavy trucks.
- [ ] House perimeter staked and the planned meter base location marked.
- [ ] Copy of your assessor’s map and/or survey, or short plat, and property corners identified in the field.
- [ ] Copy of your title report, recorded warranty deed, or real estate contract.
- [ ] Site plan including: all buildings, well, septic system, retaining walls, fences, and landscaping.

Note: Any deviation from the electrical design, once established, may result in incurring additional costs for redesign and construction may be delayed. It is the customer’s responsibility to provide all the necessary PUD requirements and specifications to subcontractors.

I affirm that the above information is correct to the best of my knowledge. I have met the above Residential Electrical Service Application Requirements.

Signature(s) __________________________ Date __________________________
Guidelines for New Residential Electrical Service

This list of guidelines provides you with the general requirements necessary to obtain electrical service for your new residential building. Additional information will be provided by your PUD Engineering Planner at an on-site meeting. Please call to schedule an appointment after completing your residential electrical service application and requirements.

Electrical Inspections

- Permits must be obtained from one of the agencies below before inspections can take place. Cowlitz PUD cannot install the meter or energize the electric service until the electrical inspector from the appropriate agency notifies the PUD with an approval. If your new electric service is within the city limits of Longview, please contact the City of Longview. All other areas of the county are under the jurisdiction of the Washington State Department of Labor and Industries.

  City of Longview: Permits and Inspections (360) 442-5086
  1525 Broadway, Longview, WA 98632

  Department of Labor & Industries: Permits and Inspections (360) 575-6900
  711 Vine Street, Kelso, WA 98626

  Please note that state electrical inspectors are available to answer code questions 8:00-8:30am

- Inspection and approval by the electrical inspector is required before facilities can be energized.

Temporary Power

- If temporary power is needed for construction indicate on the application for service. Temporary services may be served overhead or underground. For any installation other than a service drop, the customer will pay the PUD cost of installing and removing temporary facilities. The customer shall provide the temporary meter pole, meter base, and if power is available from an underground source, supply the underground secondary.

Meter Base

- The customer shall provide, install, and maintain the service entrance and meter base at a location approved by the PUD prior to installation. The size and type of the meter base will depend on the type of service installation and will be specified by the PUD.

- The meter base must be on an outside wall or on the customer’s service pole and centered at a height of 5 1/2 feet plus or minus 6 inches above established final grade (except prewired pedestals) where it is readily accessible to PUD personnel. CT enclosures must be located on a 1 outside wall near the meter base (no basement installations). All locations are subject to PUD approval and backyard locations are discouraged due to access requirements.

- The PUD service crew can install the service conductor in the meter base prior to an electrical inspection but it cannot be energized until approved and all trenches are backfilled.

- Above ground conduit riser for the meter base may be Schedule 40 PVC electrical conduit. The 200 amp meter base, 320 amp meter base and CT enclosure require 3 inch conduit. Schedule 40 PVC electrical conduit may be used below ground.

Trench

- All trenching, backfilling, and conduit installation on private property is the customer’s responsibility and must be done in accordance with PUD specifications. Trench spoil must not be placed on the road surface preventing PUD service truck access.

- Underground utility locates must be requested before digging. Call 1-800-424-6666. There is no charge for this service and existing underground facilities (except customer owned) will be located and marked to avoid damage. Allow two full business days following the day of the call for completion of locates.
Guidelines for New Residential Electrical Service (Continued)

- **Depth** - The primary trench (PUD side of the transformer) must be 3 feet below final grade and the secondary trench (customer side of the transformer) must be 2 feet below final grade.
- **Location** - Primary trenches must follow a road or driveway for maintenance access. Secondary trenches may cross the property.
- **Electrical conduit** is required for all new underground installations. Primary conductor requires 2 inch schedule 40 PVC conduit. Service conductors require 1 inch conduit for 200 amp service and 3 inch conduit as required for 320 amp and CT metering.
- All conduit runs require mule tape 2500 lb. test. Conduit runs must not have more than 270 degrees of long radius factory bends.
- Notify your PUD Engineering Planner to have your open trenches and conduit inspected and again when trenches are backfilled.

**Transformer Site**

- Provide a graded area 4 feet x 4 feet that is level compacted soil, or gravel to PUD specifications if soil conditions are unstable. The transformer site shall be within 100 feet of the meter base depending on load requirements and 15 feet minimum and 25 feet maximum from edge of road/driveway for vehicle traffic clearance and transformer maintenance purposes. The transformer site should be chosen carefully to ensure a suitable location with easy access and away from traffic as the cost of relocating the transformer in the future is the customer’s responsibility. The transformer site should not be installed at a grade higher than that of the meter base or lower than the surrounding grade in order to prevent water intrusion.

**Roads/Driveways**

- All roads/driveways must have a minimum base rock thickness capable of supporting heavy trucks with a minimum of 10 feet in width to the transformer site described above. PUD service trucks will not be driven on dirt roads. Trench spoil must not be placed on the road surface preventing PUD service truck access.

**Easements**

- Easement documents, if required, will be prepared by the PUD and all necessary signatures will be the responsibility of the customer. All easement documents must be signed, notarized, and returned to the PUD before the installation of the new service.

**Job Costs**

- A Request for Payment will be prepared based on the job and sent to the customer. The total job cost for your new service is required to be paid prior to the installation of PUD facilities.

When all requirements have been met and all inspections passed, your PUD Engineering Planner will release your new service job for construction. Please allow 3-5 days normal construction time.

*Note: Any deviation from the electrical design, once established, may result in incurring additional costs for redesign and construction may be delayed. It is the customer’s responsibility to provide all necessary PUD requirements and specifications to subcontractors.*

Received By: ___________________________ Date: ________________

Service Address: ___________________________

Thank you for closely following these steps to help ensure that your electrical service is installed in a safe, timely manner.
COMMERCIAL ELECTRICAL SERVICE APPLICATION

*NOTE* A non-refundable Application Fee is required and the Commercial Electrical Service Application Requirements on page two must be met before your application can be accepted.

Customer Information:

Name(s) / Home Phone No.
Work Phone Message Phone E-Mail Address
Mailing Address City
State Zip Code Social Security Number(s) /
Date of Birth / Drivers License # /
Employer(s) /
Builder/Electrical Contractor Phone No.

I am interested in financial incentives available from the PUD for energy efficiency: lighting, ref., HVAC etc. □ Yes □ No

Site Information:

Service Address Detailed Directions to Site:
City & Zip Code
Subdivision Name Parcel/Lot No(s):
Nearst Cross Street

Load Information:

Service Type: □ Commercial/Industrial □ Apartment Complex □ Shop □ Other__________
Building Size Sq. Ft. Type of Business No. of Employees Business Hrs/Wk

Service Entrance: Size Amps Type: □ SC □ CT □ Switchgear Voltage / Phase: □ 1 PH □ 3 PH

Type of Heat: □ Electric □ Gas □ Propane □ Other:________________________

Total Electrical Load in KW:

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<th>Existing</th>
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<th>Phase</th>
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List other types of loads in KW:
Total Connected Load KW Estimated Total Demand KW

Page 1 of 2
Addition Information:
Approximate Date Permanent Service Required ____________

Temporary Service:
☐ Yes  ☐ No
☐ Underground  ☐ Overhead

Note: Temporary service will be disconnected upon connection of permanent service unless otherwise requested.
Additional remarks including temporary loads in (kw) and any future load requirements


Commercial Electrical Service Application Requirements

☐ A non-refundable $100 application fee is required.
☐ Service Address obtained from your local governmental agency and posted at the site.
☐ Electrical One Line Diagram, including size, type, and number of secondary conductors.
☐ Electrical Load Breakdown, including voltage required, identify both single phase and three phase load requirements in terms of horsepower and/or kilowatt. Identify the largest motor and all remaining motors with their respective load requirements.
☐ Total Load Summary, including total connected load and estimated total demand.
☐ Switchgear Diagram (if applicable), including manufacturer, size (amps), and type of switchgear, CT bus bar and enclosure dimensions.
☐ Land Ownership Details, including a copy of your title report, recorded warranty deed, or real estate contract; a copy of your assessor’s map and/or survey; or short plat, and the name and address of the person(s) authorized to sign easement documents.
☐ Site Plan, including all buildings, parking areas, sidewalks, other utilities, retaining walls, fences, landscaping, and the proposed transformer and metering location.

Note: Any deviation from the electrical design, once established, may result in incurring additional costs for redesign and construction may be delayed. It is the customer’s responsibility to provide all the necessary PUD requirements and specifications to subcontractors.

I affirm that the above information is correct to the best of my knowledge. I have met the above Commercial Electrical Service Application Requirements.

__________________________  __________________________
Signature                              Date

__________________________  __________________________
Signature                              Date
Guidelines for New Commercial Electrical Service

This list of guidelines provides you with the general requirements necessary to obtain electrical service for your new commercial building. Additional information will be provided by your PUD Engineering Planner at an on-site meeting. Please call to schedule an appointment after completing your commercial electrical application.

Electrical Inspections

- Permits must be obtained from one of the agencies below before inspections can take place. Cowlitz PUD cannot install the meter or energize the electric service until the electrical inspector from the appropriate agency notifies the PUD with an approval. If your new electric service is within the city limits of Longview, please contact the City of Longview. All other areas of the county are under the jurisdiction of the Washington State Department of Labor and Industries.

  City of Longview: Permits and Inspections (360) 442-5086
  1525 Broadway, Longview, WA 98632

  Department of Labor & Industries: Permits and Inspections (360) 575-6900
  711 Vlue Street, Kelso, WA 98626

  Please note that state electrical inspectors are available to answer code questions 8:00-8:30am

- Inspection and approval by the electrical inspector is required before facilities can be energized.

Temporary Power

If temporary power is needed for construction provide the voltage and load requirements on the application for service. Temporary services may be served overhead or underground. For my installation other than a service drop, the customer will pay the PUD cost of installing and removing temporary facilities. The customer shall provide the temporary meter pole, meter base, and if power is available from an underground source, supply the underground secondary conductor.

Metering

- The customer shall provide, install, and maintain the service entrance and meter base at a location approved by the PUD prior to installation. The size and type of the meter base will depend on the type of service installation and will be specified by the PUD. Ganged metering is required on multiple dwellings in accordance with PUD specifications.

- Where the PUD is to provide the secondary conductor, the above ground conduit riser for the meter base must be Schedule 80 PVC electrical conduit. Schedule 40 PVC conduit may be used below ground. When Cowlitz PUD is supplying the secondary conductors the size and number of conduits required depend on the size of the service according to Cowlitz PUD specifications.

- The meter base(s) must be on an outside wall nearest to the PUD facilities which will serve the new installation and centered at a height of 5½ feet plus or minus 6 inches above established final grade where it is readily accessible to PUD personnel according to Cowlitz PUD specifications.

- Where CT metering is required all installations are the customer’s responsibility except providing the CTs and associated wiring. The meter loop conduit must be 1 inch rigid steel or Schedule 80 PVC with factory elbows, no coullets will be accepted. When Schedule 80 PVC is used for the meter loop conduit, the meter base must be bonded and grounded according to electrical code. The meter base shall not be located above the CT cabinet. The maximum meter loop conduit run is 50 feet with no more than two elbows and installation of a pull string (200lb. min test) is required.

- On multiple services (including residential), each meter base, panel cover, and front door of the corresponding unit must have its respective permanent address numbered or lettered identification before facilities can be energized. The meter base may be marked with either etched plastic or reflective self-adhesive labels. The panel may be marked with the same, or with painted stenciling. Pressed adhesive labels such as Dyno Tape and felt tip pen markings are not acceptable.
CT Enclosure/Switchgear

- Minimum CT enclosure size shall be specified by the PUD based on the size and type of service installation. The CT enclosure must be installed minimum of 12 inches from established final grade to the bottom of the CT enclosure and a maximum of 6 feet to the top of the CT mounting bracket enclosure. The CT enclosure must have a pad lock hasp and a minimum of 90 degree door swing opening left to right. CT meters shall not be installed above the CT enclosure.

- Switchgear plans must be pre-approved by the PUD Engineering Department.

Underground Secondary Conductor

- The PUD will provide and install single phase, three conductor 600 volt secondary cables and three phase four conductor 600 volt secondary cables in most installations, contact the PUD at the beginning of the project. The size and number of secondary conduits will be specified by the PUD.

Trench

- All trenching, backfilling, and conduit installation on private property is the customer’s responsibility and must be done in accordance with PUD specifications.

- **Underground utility locates must be requested before digging. Call 1-800-424-5555.**
  There is no charge for this service and existing underground facilities will be located and marked to avoid damage. Allow two full business days following the day of the call for completion of locates.

- **Depth** - The primary trench (PUD side of the transformer) must be 3 feet below final grade and the secondary trench (customer side of the transformer) must be 2 feet below final grade.

- **Conduit** - Schedule 40 PVC electrical conduit is required when PUD service conductor is to be installed. Primary conductor requires Schedule 40 PVC 2 inch conduit for single phase and typically 4 inch or 6 inch conduit for three phase conductors as specified by PUD. All conduit runs provided for PUD conductor(s) require installation of pull tape (male type 2500lb min. test). Contact the PUD before conduit installation.

- Primary conduit runs must not have more than 270 degrees of 36 inch radius bends unless pre-approved by the PUD and rigid steel bends with plastic end bushings may be required on certain conduit runs.

- Notify your PUD Representative to have your open trenches inspected and again when backfilled.
Transformers

- Provide and install the concrete transformer pad(s) for three phase transformers as specified by the PUD. Transformer pads may be poured in place according to PUD specifications and inspection or a precast transformer pad to PUD specifications (Catalog Number 7500-1752) may be obtained from Oldcastle Precast, Inc. (503) 682-2844.

- Provide and install bumper posts or other mechanical protection as specified by the PUD when the transformer or other facilities are within an area of vehicular traffic. The transformer site shall be located within 25 feet from the road/driveway, or parking lot access for transformer maintenance purposes.

- If the transformer is to be located near a building see appropriate code(s) for clearances.

- The minimum working space around a transformer is 3 feet on the sides and back, and 10 feet of clearance is required at the front of the transformer. Landscape which does not interfere with the operation and maintenance of the transformers as determined by the PUD is acceptable.

Easements / Permits

- Easement documents, if required, will be prepared by the PUD and all necessary signatures will be the responsibility of the customer to obtain. All easement documents must be signed, notarized and returned to the PUD before the installation of the new service. No permanent structures shall be constructed or permitted to be constructed within or upon the easement area.

- Permits, if required, are the responsibility of the customer. The PUD may apply for certain necessary permits for work in conjunction with customer’s project and the expense of the permit(s) and related inspection fee(s) if any shall be the responsibility of the customer. Please be advised that certain permits may take several weeks to process. All permit documents must be signed, approved, and returned to the PUD before installation of the new service.

- Provide access for PUD personnel and equipment for the installation, maintenance, and removal of PUD facilities. The customer shall provide and maintain a 10 foot wide access roadway with an adequate road base capable of supporting heavy equipment to within 15 feet of the transformer and other electrical facilities as required.

- A safe walking access and minimum working clearances per applicable code(s) shall be provided at all times for PUD personnel to the meter and other related equipment. Any extraordinary arrangement requiring a locking device to accommodate entry into such access must be pre-approved by the PUD and any expenses for installation of such device shall be the customer’s responsibility.

Job Costs

- The total job cost for your new service is required to be paid prior to the installation of PUD facilities.

When all requirements have been met and all inspections passed, your PUD Representative will release your new service job for construction. Please allow time for scheduling and construction as required.

Note: Any deviation from the electrical design, once established, may result in incurring additional costs for redesign and construction may be delayed. It is the customer’s responsibility to provide all the necessary PUD requirements and specifications to subcontractors.

Received By: ___________________________ Date: ________________

Site Address: ____________________________

Thank you for closely following these steps to help insure that your electrical service is installed in a safe, timely manner.
The following list provides the general requirements to be met when applying for a new residential subdivision electrical system.

**REQUIRED ITEMS:**

- **A non-refundable** application fee is required based on $100 per lot up to ten lots $1,000 maximum.

- **Land Ownership Details** – including: a copy of your title report, recorded warranty deed, or real estate contract, a copy of the assessor’s map and/or survey, and the name, address, and telephone number of the owner/developer and the person(s) authorized to sign easement documents, land surveyor/engineer, contractor.

- **Subdivision Map** – including: the section, township, range, lot lines and road locations, existing and proposed new locations for water, sewer, gas, communications and storm utilities. Provide one hard copy and one electronic copy (Auto CAD Format).

**New Residential Subdivision Electrical System Installation Process**

The following list provides you with the necessary steps to be completed in order to obtain electrical service.

**Step 1:** Complete the PUD *Electrical Service Application* for the subdivision.

**Step 2:** Call your PUD Engineering Representative to schedule an appointment. The subdivision must be evaluated for electrical load feasibility prior to development. The size and location of the development may require additional work elsewhere in the PUD infrastructure to support the new electrical load which may be included in the total job cost.

**Step 3:** A PUD Engineering Representative will design an electrical system using information provided. The design schedule is based upon completion of the above requirements, the application date, and the developer schedule. Notify other utilities for the installation of their facilities.

**Step 4:** Easement documents if required will be prepared by the PUD and all necessary signatures are the responsibility of the developer to obtain.

**Step 5:** Make payment for the job cost prior to the installation of PUD facilities. The job cost of the new electrical system for the subdivision will be based on the PUD estimate.

**Step 6:** The job will be released for construction after the electrical system design has been approved and payment for the job has been received by the PUD. All necessary documents and easements must be completed and returned to the PUD.

**Guidelines for New Residential Subdivision Electrical System (Continued)**
• Underground utility locates must be requested before digging: Call 1-800-424-5555. There is no charge for this service and existing underground utilities will be located and marked to avoid damage, allow two full business days following the day of the call for completion of locates.

• Inspection – All trenches and conduit must be inspected by a PUD Engineering Representative before backfill.

• Trench – The primary trench must be a minimum of 36” below final grade and the secondary trench must be a minimum of 24” below final grade. Trenches shared with other utilities must be a minimum of 36” wide to allow proper conduit/cable separation and installation.

• Subdivisions – Street curb must be installed prior to opening trenches (except road crossings).

• Large Lot Subdivisions - All roads must have a base rock thickness capable of supporting heavy trucks with a minimum of 10 feet in width. Trench spoils must not be placed on the road surface preventing PUD service truck access. (Electrical conductor(s) may be plowed in by a PUD approved plow contractor).

• Other Utilities – Coordination with other utilities is the responsibility of the developer. Joint trenches with natural gas require a minimum of 36” wide trench with a minimum of 24” horizontal and a minimum 6” vertical separation between gas lines and PUD conduit.

• Conduit – Conduit shall be supplied and installed by the developer. The size and number of conduits will be determined by the PUD according to the requirements of the job. A 2500 lb. minimum test mule tape is required in all conduit installations.

• Electrical Cable Installation and Devices – The PUD will install all primary electrical cable and will set PUD devices such as transformers, switching devices, fusing cubicles, and primary pedestals.

• PUD Contractor Responsibilities – The PUD contractor will be responsible for installing PUD facilities in existing State, County, or City right-of-way.

Easements and Permits

• Easement documents if required will be prepared by the PUD and all necessary signatures are the responsibility of the developer. All easement documents must be signed, notarized, and returned to the PUD before installation of PUD facilities. Small lot subdivisions may require an additional easement beyond the designated road right-of-way as determined by the PUD for the placement of PUD facilities. Permits, if required, are the responsibility of the developer and may take several weeks to obtain. The PUD may apply for certain permits to perform work in conjunction with the job and permits fees will be included in the job cost. All permit documents must be signed, approved, and returned to the PUD before installation of PUD facilities.

Note: Any deviation from the electrical design, once established, may result in incurring additional costs for redesign and construction may be delayed. It is the developer’s responsibility to provide all the necessary PUD requirements and specifications to subcontractors.

Received By: ______________________________________ Date: _________________________
Address: __________________________________________

Thank you for closely following these steps to help ensure that your electrical system is installed in a safe, timely manner.