

**Grant
Public
Utility
District**



Residential Service Workbook

Electric and Fiber Optics for
Permanent
Single-Family
Residential
Services
and
Construction
Temporary
Services

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RESIDENTIAL SERVICE WORKBOOK

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CHAPTER ONE

General Information

Introduction

Welcome to Public Utility District No. 2 of Grant County, hereafter referred to as “Grant PUD”. Note: *Italicized* words are defined in the Glossary.

This workbook, which includes a “Service Connection Agreement”, outlines design and construction procedures for new permanent and/or temporary electric service and fiber optic cable for single-family residential structures. It is the customer’s responsibility to ensure compliance with the National Electrical Code (NEC), Washington Administrative Code (WAC), and any federal, state, or local codes and ordinances that apply to the project. The customer needs to be aware of electrical equipment sizing and provide equipment that will interrupt available fault currents.

The customer, if not knowledgeable in electrical work, should consider hiring a licensed contractor to complete the project.

Other workbooks are available with information regarding the installation of electric service/fiber optic cable to permanent multifamily and nonresidential commercial buildings, condominium complexes, apartment buildings, mobile home parks, and irrigation sites. These workbooks are available free of charge from the Grant PUD’s Local Offices and on the internet website: grantpud.org.

Contacting Other Utilities or Agencies

New construction typically involves the installation of telephone, cable television and power cables, as well as natural gas, water, and sewer lines. Local providers now offer high-speed internet, television and telephone via fiber optic cable. Contact local provider(s) to see if the construction site is located in a “fiber ready” area. It is the customer’s responsibility to notify each utility or service provider for intended or needed service(s). Obtain a name and phone number for each utility and/or service provider then share this information with each utility. Check the local phone book or the Appendix of this workbook for applicable phone numbers.

Residential Electric Service Availability

Grant PUD offers the following services for single-family residential structures and outbuildings.

Voltage	Amp Rating	Wire Size	Typical Use
120/240	200 Amps	4/0* AWG	Most common size service
120/240	400 Amps	350* kcmil	Large Service
120/240	Over 400 Amps	**	Very Large Service

Table 1. Voltage Ratings

*Grant PUD limits service runs to 250’.

**An *Engineering Technician* shall specify the appropriate service conductor size. The customer shall provide accurate site drawings.

Getting Started

Complete the **Service Connection Agreement** or “SCA” found on page 4 of this workbook or obtain a copy from the *Service Expediter*. The “SCA” will need to be completed for all new service requests. Upon completing the “SCA”, submit it to the *Service Expediter* who will assist and coordinate your service requirements with the appropriate Grant PUD personnel.

NOTE: All service connections are subject to Grant PUD’s Customer Service Policies as they are written or as they are amended by Grant PUD’s Board of Commissioners

Service Connection Agreement – Required Information

The Service Connection Agreement is comprised of six sections:

- Customer Information
- Service Location
- Load Information
- Rights and Obligations
- Site Sketch
- Signature of Legal Land Owner

When completing the SCA, please type or print legibly with a pen. This information will be used by Grant PUD to generate a work request and establish account information which includes rate class, deposit requirements, line extension costs, etc. It is very important that the SCA is filled out completely and all required information

is provided or the request may be delayed or returned.

Please contact the Service Expediter with any questions you may have in filling out the SCA.

Customer Information

Include the customer's full name, current mailing address, and appropriate contact phone numbers. Also include the customer's employer name and spouse's name and employer, if applicable.

Check the appropriate box if anyone connected to this new service will be on a life support system(s). If the answer is "yes" list the type of support system; i.e. oxygen, kidney dialysis, etc.

IMPORTANT NOTE:

If the life support system is critical to an individual's well-being, the customer should consider installation of a back-up power source in case of scheduled and non-scheduled power outages. Customer-owned emergency generation equipment interconnected with Grant PUD's electrical system requires inspection by the Department of Labor and Industries. The customer shall notify Grant PUD to assure generators are connected by methods acceptable to Grant PUD.

The life support information will be included in the customer's account file and will be beneficial when scheduling power outages. However, Grant PUD may not notify the customer for either a scheduled or non-scheduled power outage.

Check the "Yes" box if the customer has had prior service with Grant PUD and provide the name(s) the service was listed under.

Are there pets (especially dogs) that would interfere with construction, maintenance, or on-going meter reading? If so, list whether the pet(s) are confined, number of pet(s), type, and name of pet(s), such as "1 German Shepherd named Ace chained up". This information is helpful to Grant PUD personnel when reading meters and maintaining the service.

List any contact person, other than the customer, who is authorized to represent the

customer and coordinate construction activities. Include his or her name and telephone number on the appropriate line.

Service Location

The Service Address is where the new or altered service(s) will be constructed. Complete the service address information; i.e. a street address, a plat lot, a block, and division.

List the legal owner of record along with his or her mailing address. Include the "Tax Parcel Number(s)" for the property where the service will be constructed. The tax parcel number(s) can be found on the Grant County tax statement or property closing documents (if newly purchased). The tax parcel number is a nine-digit number that is formatted 00-0000-000. The tax parcel number(s) will be used to determine necessary rights-of-way required for construction of the service connection.

Load Information

The Load Information section of the "SCA" should be completed with accurate information. Include any future or additional loads such as hot tubs, swimming pools, outbuildings, etc. This information will allow Grant PUD to adequately size the electrical equipment and provide a cost estimate for the service. Inaccurate information may lead to over-sizing the service, thus increasing installation costs, or under-sizing the service and causing power disturbances at a later date.

For residential service, check the box indicating "Single-Phase 120/240". This is a normal residential service. Normally, three-phase services are for irrigation or commercial applications.

For Commercial and/or Irrigation services, the "Three-Phase 120/208 or 277/480" box may be more appropriate. Refer to Grant PUD's Commercial Service Workbook concerning this type of service.

Depending on the on-site facilities, Grant PUD has the option of constructing the new service either overhead or underground. Check with the local governing body (normally the planning department) to see if an ordinance allows either type of construction. Then check the appropriate box giving the preference of construction. Please refer to the Overhead

and/or underground chapters for more information. See Figure 1: "Typical Overhead Construction," and Figure 2: "Typical Underground Construction" to identify overhead and/or underground construction.

Construction Temporary Service

If electrical power is required for construction, check which type of temporary service the customer will provide, "metered" or "non-metered". Cost for this temporary service will be calculated accordingly. For more information on *temporary services* please refer to Chapter Five: Construction Temporary Services.

Residential Service

Complete the "Residential Load" information section. Indicate the square footage for the home and shop (if applicable) along with the Heating, Ventilation, and Air Condition (*HVAC*) load in KW.

Fill in the service entrance size in amps. Normally this is either 200 Amps or 400 Amps.

Reminder:

If the service is going to be over 400 Amps, this will require CT metering. Please refer to Grant PUD's Commercial Services Workbook.

Next list the type of structure; i.e. stick-built home, modular home, mobile home, shop, pool, etc.

Remember to include any anticipated future electrical needs or construction projects that may require additional capacity. This will allow Grant PUD to size the service connection accordingly.

Rights and Obligations

Please read this section carefully. When the legal land owner signs the "Service Connection Agreement", permission is being granted to Grant PUD to construct and maintain the requested facilities. For additional information regarding *permits* and *easements*, refer to Chapter Six, "Right-of-Way".

Site Sketch

In this section, draw a site plan of the construction project. Here are items to follow in preparing the site plan:

- Draw the site plan indicating which direction is north with an arrow in the upper right hand corner.
- Identify at least two bordering roads.
- Identify any *foreign easement* areas; i.e. irrigation ditch crossing, telephone line, etc. If the service will cross another person's property, identify this easement area and to whom the property belongs.
- Identify any buildings, septic tanks, drain field, sewer lines, water lines, cable TV, etc. that exist on the property.
- Identify existing Grant PUD facilities on the property such as a pole, transformer, *secondary handhole*, or *secondary pedestal*. Show transformer stencil Number "T-XXXXX" if applicable. See page 6 for transformer number location.
- Mark the proposed *meter base* location and proposed transformer location.
- Show route of the underground service and footage.

Summary

The customer completes the Service Connection Agreement and mails, faxes, or delivers it to the *Service Expediter*.

Upon receipt of the "Service Connection Agreement", the *Service Expediter* will determine if the work is a *simple* or *complex service request*.

If the job is a *simple service request*, the Service Expediter will work with the customer and process the service request, applying a *Simple Service Request Fee* to the customer's account.

If the job is a *complex service request*, the *Service Expediter* will notify an *Engineering Technician* to work with the customer and complete a design for the new service. Grant PUD's lead time will vary due to construction activity within the local areas and the type of *permits* required for rights-of-way.

Quoted Costs

Quoted cost estimates to extend Grant PUD facilities for a new service are valid for ninety (90) days.

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SERVICE CONNECTION AGREEMENT

PUBLIC UTILITY DISTRICT OF GRANT COUNTY
PO Box 1519 Moses Lake WA 98837

(All conditions of service are subject to Grant PUD Customer Service Policies)
SERVICE EXPEDITER: Telephone 509-766-2501 Fax 509-754-6658 email NewService@gcpud.org

1) CUSTOMER MAILING & BILLING INFORMATION:

Name		Date:
Spouse		
Mailing Address		
City	State:	Zip:
Phone	Primary:	Secondary:
Email		
Existing Grant PUD Service	<input type="checkbox"/> YES <input type="checkbox"/> NO	Grant PUD Billing Account Number:
Contact person/Contractor	Name:	Phone:

2) SERVICE LOCATION: New Service Existing Service

Residential or Commercial

Address:	
City:	
Plat Addition:	
Lot:	Block:
Parcel Number:	

Irrigation Only

Farm Unit:	Block:	
Twp:	Rng:	Sec:
Legal Owner:		
Lot:	Parcel Number:	
Mailing Address:		

3) LOAD INFORMATION:

<input type="checkbox"/> Single Phase 120/240 (recommended residential)		
<input type="checkbox"/> Three Phase 120/240	<input type="checkbox"/> Three Phase 120/208	<input type="checkbox"/> Three Phase 277/480
<input type="checkbox"/> Underground	<input type="checkbox"/> Overhead	

Construction Temporary

<input type="checkbox"/> Non-Metered	<input type="checkbox"/> Metered	<input type="checkbox"/> None
--------------------------------------	----------------------------------	-------------------------------

Residential:

House size (Sq Ft)		Anticipated KW Usage (including HVAC)	
Shop size (Sq Ft)		Anticipated KW Usage (including HVAC)	
Meter Base Size in Amps	<input type="checkbox"/> 200	<input type="checkbox"/> 400 (320continuous)	<input type="checkbox"/> Over 400 (CT Meter)
Building Type	<input type="checkbox"/> Stick Built	<input type="checkbox"/> Manufactured Home	Other:
Future or Additional Load			

Commercial/Non-Residential:

Type of Business or Facility		
Service Size in Amps		General Load HP/KW:
Motors in HP		Other:

Irrigation:

Service Size in Amps		Individual Pump(s) – HP:
Number of Drive motors (HP)		
End Gun Pump (HP)		Other Pumps or Motors:
TOTAL HP LOAD		Future Load:

***Please be sure to sign the agreement on page 2 of 2**

RIGHTS AND OBLIGATIONS

Public Utility District No. 2 of Grant County (Grant PUD) will construct electrical facilities on customer’s property, if necessary. In exchange for part of this value received, Customer grants Grant County PUD the right to construct, operate, patrol, maintain and remove overhead and/or underground electrical distribution lines and associated appurtenances. Customer grants Grant County PUD the right to clear the area where the distribution equipment and facilities are located on the customer’s property and keep the same clear of brush, trees, timber, structures, improvements and all fire hazards. Customer also grants to Grant County PUD the right of ingress and egress to and from Grant County PUD distribution electrical facilities. Customer agrees not to place, construct or maintain any building, structures or other improvements within a 10-foot area of Grant County PUD electrical facilities. Customer agrees not to reduce or enlarge the required minimum clearances between the existing ground and any overhead or underground power lines. Grant County PUD may seek and enforce specific performance of any activities required of the customer by this section.

SITE SKETCH

Draw a plan of your site including building, septic, drain field, sewer, cable TV, telephone, gas, driveway, other future structures, property lines, proposed power line route and nearest transformer number if available. Also, identify at least two bordering roads and any other foreign easements areas (i.e., irrigation district, public lands, properties belonging to other individuals, etc.)

Site Sketch


North

Transformer number T _____ or G _____
 Be sure to include location of customer’s meter socket

Legal Landowner of Record Signature

Your signature indicates you have read and agree to the Conditions stated in the “Rights and Obligations” section. Customer understands the work requested & authorizes Grant PUD to begin work as listed on the Service Connection Agreement form. Customer agrees to pay all charges associated with Construction.

Print Name

Signature

Date

Official Use:

Unsigned and/or incomplete Service Connection Agreement may delay processing of work order.

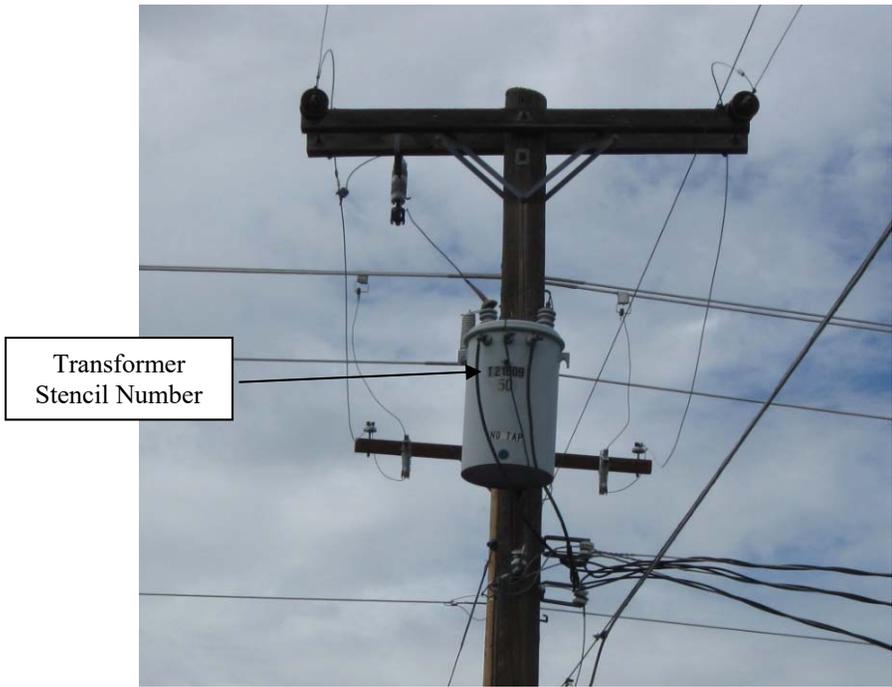


Figure 1. Typical Overhead Construction



Secondary Pedestal (Moped)

Padmount Transformer

Figure 2. Typical Underground Construction

CHAPTER TWO

Overhead Services

General Requirements

This chapter provides the general requirements for an overhead service. The customer is responsible for contacting the local planning department to determine what type of service is permissible.

The following checklist is provided to assist in the installation of an overhead service.

- Determine an acceptable location for the *meter base* (see Chapter Four – Metering in this workbook).
- Determine the location of Grant PUD's nearest pole. (Verify this location with Grant PUD's *Service Expediter*)
- Determine the distance between your *meter base* and the base of the pole.
- Provide a clear path and adequate clearance, free from aerial obstructions such as trees, towers, buildings, etc., from Grant PUD's pole to the *service mast*.
- Determine if the service conductor will cross someone else's property. If so, it will be necessary to obtain an *easement* from the legal property owner. (see Chapter Six – Right of Way).
- Complete the "SCA" with sketch. (see Chapter One – Service Connection Agreement.)
- If necessary, the *Service Expediter* will schedule an on-site visit with a Grant PUD *Engineering Technician*. The *Engineering Technician* will create a design drawing and calculate the construction charges. The customer will be notified of the charges either by phone or mail.
- Stake your proposed structure and *meter base* location prior to on-site visit with Grant PUD's *Engineering Technician*.
- Acquire an electrical installation *permit* from Washington State Department of Labor & Industries (L&I).
- Install the electrical service equipment including the *meter base* and *weatherhead*. If there are any questions regarding the installation of the service equipment, Grant PUD suggests consulting the *NEC* and *WAC*, calling the *state electrical inspector*, or contacting an electrical contractor.
- Install the *service entrance conductors* (leaving 18 inches exposed at the *weatherhead*).
- Verify that the *service mast* height requirements have been met.
- Pay Grant PUD's construction charges.

- Verify that all clearances and accessibility for maintenance and operation of the service conductors and meter have been met.
- Have the installation inspected and approved by the *state electrical inspector*.
It is the customer's responsibility to request the inspection.
- Notify Grant PUD's *Service Expediter* that the installation is ready for connection. The *state electrical inspector* will also notify Grant PUD when the electrical installation has been approved.
- The *Service Expediter* will verify that all fees, construction costs are paid and all *permits* and *easements* have been obtained.
- The *Service Expediter* or *Engineering Technician* will then schedule the service installation, including the meter, after verifying the above criteria.

Modifications of Existing Facilities

Additional electrical load requiring modifications to customer and/or Grant PUD facilities shall be brought up to current Grant PUD, *NEC*, *WAC*, federal, state and regional codes and standards. Normally Grant PUD has the right to connect a service modification, prior to a state electrical inspection, if Grant PUD deems the installation is safe for connection and the State Electrical Permit is posted at the site. However, if the state electrical inspector finds deficiencies in the installation, he will initiate a request for disconnect. The service will be disconnected until such time as the state electrical inspector approves the installation.

Demarcation Point

Grant PUD shall identify a *demarcation point* which determines the customer's responsibility for construction and cost. **Normally the demarcation point will be the point of connection at the weatherhead.** The *Service Expediter* or *Engineering Technician* will notify the customer if the *demarcation point* is not at the point of connection or *weatherhead*.

The customer shall provide the *meter base*, *service mast*, *weatherhead*, clamp and insulator, and appropriate *mast guy* (if applicable) and the *service entrance conductors* to 18 inches beyond the *weatherhead*. The *weatherhead* mounted on a pole shall be within six inches of the pole top.

Service Mast Requirements

Mast supports are required when the top of the *service mast* is more than 26 inches above the roof. A mast support is typically a *guy* or a brace which is installed to prevent the weight of the *secondary conductor* from pulling the *service mast* over.

Further information regarding *guying* and bracing *service masts* is available in the *NEC* and *WAC*. See Figure 4: “Typical Overhead Service Installation” for an example of a *service mast guy*.

Clearance Requirements

It is the customer’s responsibility to know the required clearances for Grant PUD’s service conductors and construct the service entrance in order to maintain these clearances over the life of the service connection. Additional height may be required depending upon the location and type of structure or terrain. If an *Engineering Technician* is assigned to the project, he can assist in the design and clearance requirements for the service connection. Figures 5 and 6 illustrate other minimum clearances that must be maintained. The Service Expediter can help answer questions regarding clearances as well.

NOTE:
Secondary conductors cannot pass over hot tubs or swimming pools. A minimum clearance of 15 feet is required for secondary conductors passing within 25 feet of a swimming area.

Openings and Gas Meters

A minimum clearance of three feet is required between *secondary conductors* and windows, doors, porches, fire escapes, or similar openings. A minimum horizontal clearance of three feet (National Fuel Gas Code 54-5.7.2.3) is required between electric service equipment and natural gas metering equipment (see Figure 3).

Manufactured Homes

The overhead service equipment for a manufactured home may be installed one of two ways:

- The customer mounts the service equipment on a Grant PUD installed and maintained meter pole.
- The *meter base* is mounted on the manufactured home and both conditions are met:
 - a. The manufacturer installed the *meter base* on the manufactured home when it was constructed and,
 - b. The service equipment meets Grant PUD’s *meter base* requirements. See Chapter Four – Metering.

The service equipment must meet all applicable *NEC*, federal, state, and regional codes and be inspected by the *state electrical inspector* prior to

connection. The *meter base* shall meet Grant PUD requirements listed in Chapter Four – Metering.

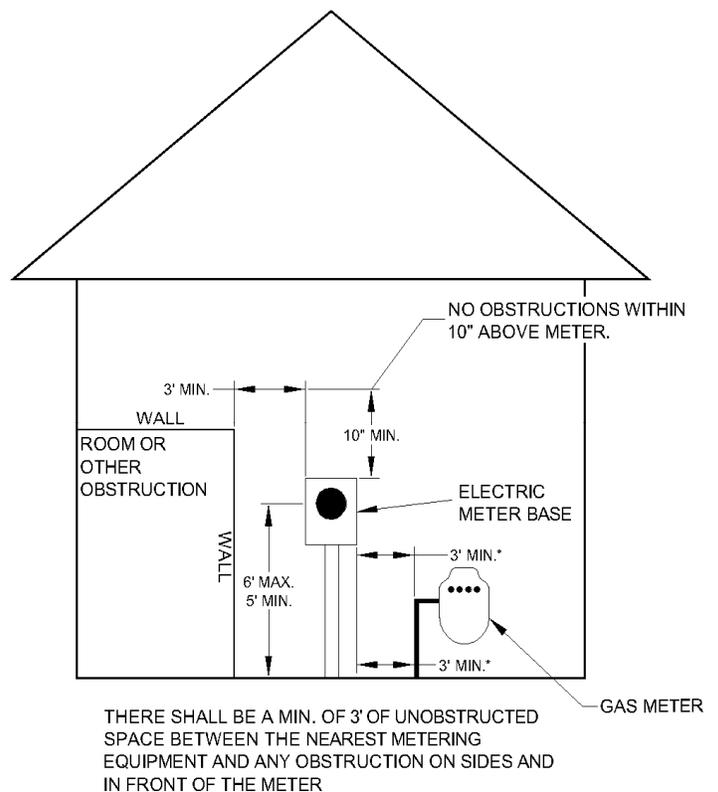
PUD Owned Meter Poles

Grant PUD will furnish and install a meter pole for a manufactured home. The customer is responsible for mounting the service equipment on the pole and obtaining the necessary inspections. See Figures 7 & 7a for an example of a meter pole installation. Grant PUD will assign an *Engineering Technician* to the project to design and coordinate construction.

Typical Overhead Installations

The following pages are for reference only. Clearance requirements may change with the latest edition of the *NEC*.

Figure 3. Working Space Requirements



* NATIONAL FUEL GAS CODE 54-5.7.2.3

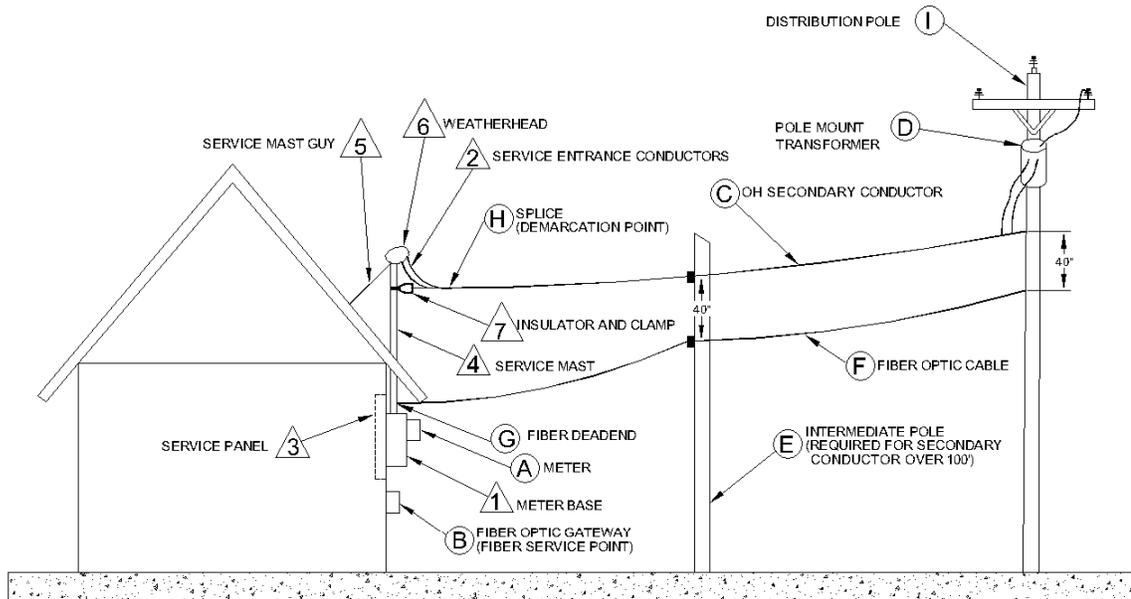


FIGURE 4. TYPICAL OVERHEAD SERVICE INSTALLATION

<p>△ ITEMS PROVIDED AND INSTALLED BY THE CUSTOMER</p> <ol style="list-style-type: none"> 1. METER BASE 2. SERVICE ENTRANCE CONDUCTORS 18" WEATHERHEAD - CUSTOMER OWNS 3. SERVICE PANEL 4. SERVICE MAST 5. SERVICE MAST GUY 6. WEATHERHEAD 7. INSULATOR AND CLAMP 	<p>○ ITEMS OWNED AND INSTALLED BY GRANT COUNTY PUD</p> <ol style="list-style-type: none"> A. METER B. FIBER OPTIC GATEWAY (FIBER SERVICE POINT) C. OVERHEAD SECONDARY CONDUCTOR D. POLE MOUNT TRANSFORMER E. INTERMEDIATE POLE F. FIBER OPTIC CABLE G. FIBER OPTIC DEADEND H. SPLICE (DEMARICATION POINT) I. DISTRIBUTION POLE
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Figure 4. Typical Overhead Service Installation

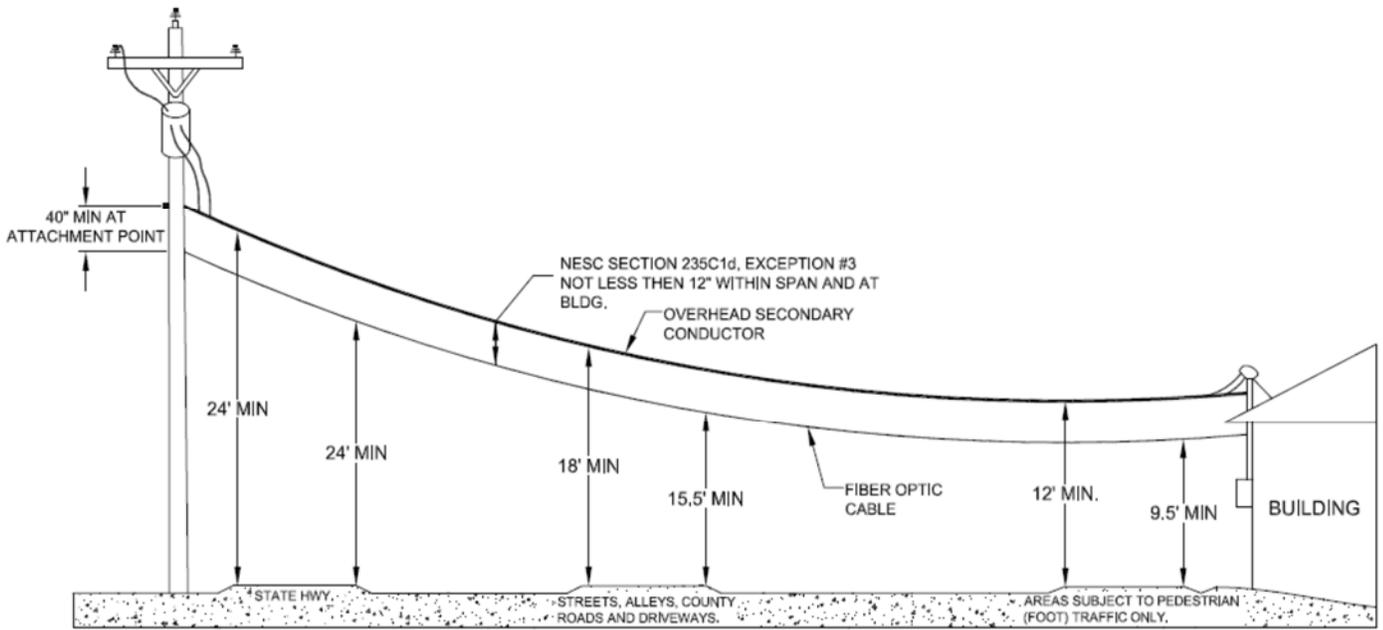


Figure 5. Minimum Vertical Clearance From Ground

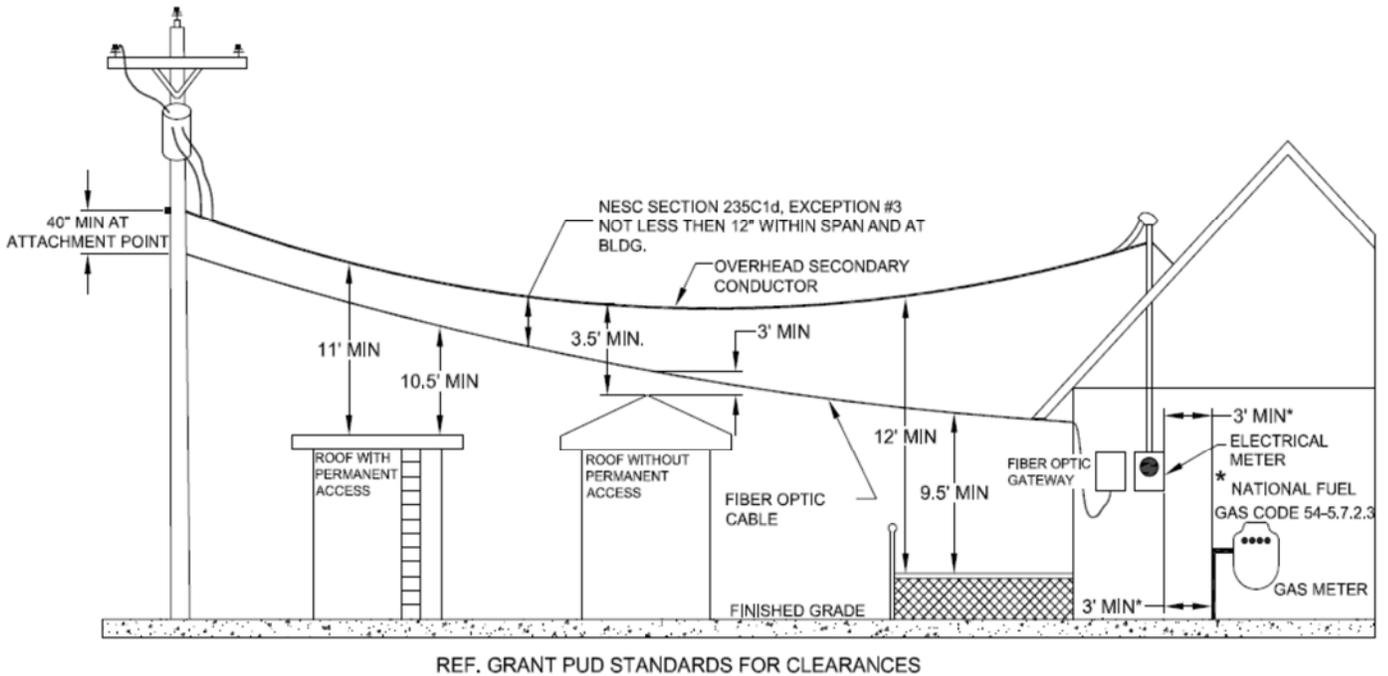


Figure 6. Minimum Clearances Over Other Structures

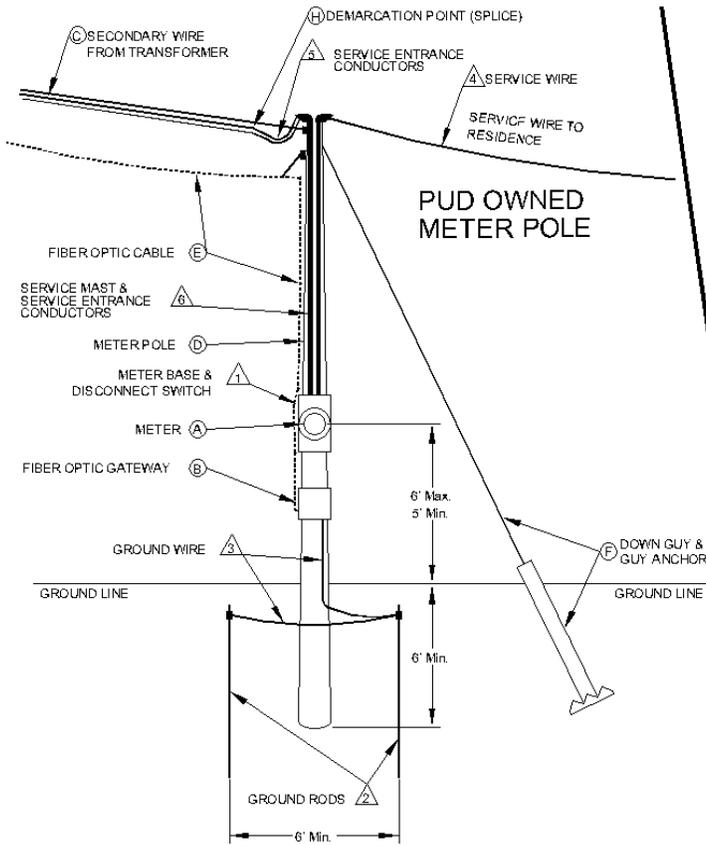


FIGURE 7. PUD OWNED METER POLE

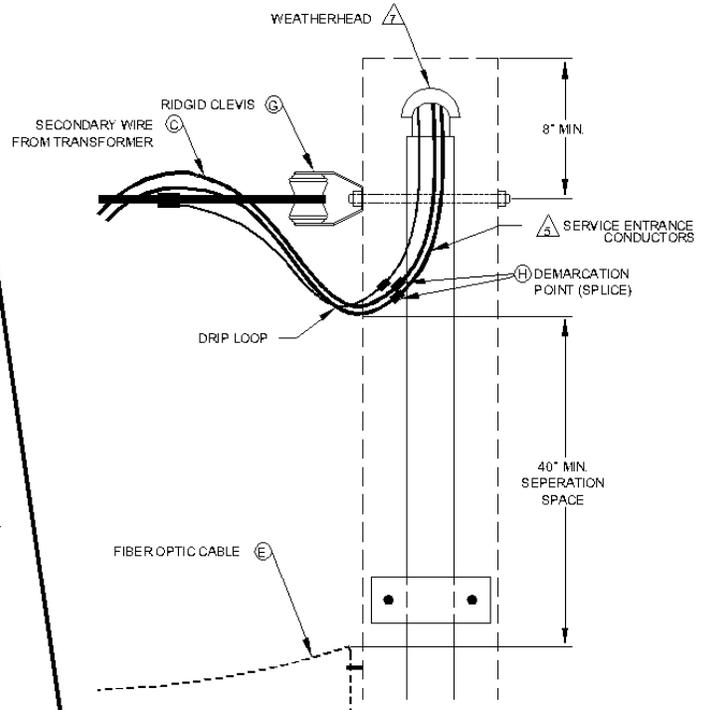


FIGURE 7A DETAIL

<p>△ ITEMS PROVIDED AND INSTALLED BY THE CUSTOMER</p> <ol style="list-style-type: none"> 1. METER BASE AND DISCONNECT EQUIPMENT, IF APPLICABLE 2. GROUND RODS (PER NEC AND WAC) 3. GROUND WIRE (PER NEC AND WAC) 4. SERVICE WIRE (CUST. OWN AND MAINTAIN) 5. SERVICE ENTRANCE CONDUCTORS 18 INCHES OUT OF WEATHERHEAD. 6. SERVICE MAST, SERVICE ENTRANCE CONDUCTORS 7. WEATHERHEAD 	<p>○ ITEMS OWNED AND INSTALLED BY GRANT COUNTY PUD</p> <ol style="list-style-type: none"> A. METER B. RESIDENTIAL GATEWAY C. SECONDARY WIRE FROM TRANSFORMER D. METER POLE E. FIBER OPTIC CABLE F. DOWN GUY AND ANCHOR (REQUIRED IF SECONDARY WIRE IS MORE THEN 100') G. RIDGID CLEVIS H. DEMARCATION POINT (SPLICE)
---	--

**Figure 7. PUD Owned Meter Pole
and
Figure 7A. Detail**

CHAPTER THREE

Underground Services

General Requirements

This chapter provides the general requirements for an underground service. The customer is responsible for contacting the local planning department to verify what type of service is permissible, overhead or underground.

The following checklist is provided to assist in the installation of an underground service.

- Determine an acceptable location and ampacity for the *meter base* (see Chapter Four – Metering in this workbook).
- Determine location of nearest connection point to Grant PUD underground facilities. Verify location with the *Service Expediter* before proceeding with building plans or project.
- Determine if service will cross someone else's property. If so, it will be necessary to obtain an *easement* from the legal property owner. (See Chapter Six – Right-of-Way).
- Complete the "SCA" with sketch.
- If necessary, an on-site visit will be scheduled with a Grant PUD *Engineering Technician*. The *Engineering Technician* will create a Grant PUD work order and calculate the construction charges. The customer will be notified of these charges either by phone or mail.
- Stake your proposed structure and *meter base* location prior to on-site visit with Grant PUD's *Engineering Technician*.
- The *Engineering Technician* or *Service Expediter* will determine the *demarcation point*.
- Acquire an electrical installation *permit* from Washington State Department of Labor and Industries (L&I).
- Call the Utilities Underground Location Center One-Call number: **811 or 800-424-5555**
- Dig a trench from the meter location to Grant PUD's facilities. Excavate to the center edge of a *padmount transformer*, *secondary handhole*, or a *secondary pedestal*. If trench is to a pole, excavate to the center directly under the overhead transformer. Verify location and routing of trench with Grant PUD prior to digging.

(See Grant PUD Specification No. 10.0008 in the Appendix.)

- Contact the *Engineering Technician* or *Grant PUD Service Expediter* for delivery of Grant PUD supplied electrical and/or fiber conduit (based on the particular project design).

NOTE:

Grant PUD provides the gray electrical conduit and up to three sweeps (elbows or 90 degree bends or any combination of bends not exceeding a total of 270 degrees is allowed per run.) for placement by the customer in the trench. The diameter of this conduit depends on the service the customer is installing. Grant PUD also supplies the

- Install Grant PUD-furnished conduit. Conduit is required from demarcation point to meter base. The conduit size will be determined by the size and number of conductors. White water pipe or sewer pipe is not acceptable and shall not be energized by Grant PUD.
- Install the *meter base* and associated equipment. See Figures 8 & 9 for typical underground installations.
- Pay the applicable construction fees to Grant PUD.
- When all the electrical equipment has been installed, call the *state electrical inspector* for an inspection.
- After your service has been approved by L&I and your trench has been backfilled, contact Grant PUD's *Service Expediter* and provide L&I permit number. The electrical inspector will also notify Grant PUD when the service is approved for energizing.
- The *Service Expediter* or *Engineering Technician* will check to see if all *permits* and *easements* have been obtained and construction charges have been paid.
- The *Service Expediter* will schedule the construction and/or service connection.
- Verify that all the clearance requirements from Grant PUD equipment, including the meter, will be adequate for installation, construction, maintenance and meter reading. NOTE: A secondary conductor failure may be subject to excavation. Make sure the service conductor can be easily reached and excavated.

Access to Grant PUD Facilities

Only Grant PUD authorized and qualified personnel can access transformers, secondary pedestals (Moped), and secondary handholes. Contact the Service Expediter when access is necessary to complete the construction.

Service Equipment Installation Requirements

There are four ways this equipment can be installed:

- 1. Flush-Mounted
- 2. Surface-Mounted
- 3. Post-Mounted
- 4. Meter Pedestal

See Chapter Four – Metering for additional information.

Contacting Other Utilities or Agencies

New construction typically involves the installation of telephone, cable television and power cables, as well as natural gas, water, and sewer lines. Local providers now offer high-speed internet, television and telephone via fiber optic cable. Contact a local service provider to see if this service is in a “fiber ready” area. It is the customer’s responsibility to notify each utility for service. Provide Grant PUD with a contact and phone number for each utility providing service.

Underground Locates

Forty-eight (48) hours prior to any excavation, it is the excavator’s responsibility to call the Utilities Underground Location Center (UULC). The UULC will request a location; the Section, Township, and Range is required in addition to the exact location within the Section. The UULC will ask if the area is staked or marked. There is no charge for this service. A location number will be given to the excavator for their protection and future correspondence with the UULC. To obtain an underground locate, call the UULC One Call at **811 or 800-424-5555**.

A color code for underground locates has been established by the State of Washington. The color codes are:

- Red Electric
- Yellow Gas/Oil

- Orange Communications
 - Blue Water
 - Green Sewer
 - White Area to be located
- Excavation within twenty-four (24) inches on either side of the location markings shall be done by hand. Damage to underground facilities is subject to penalties of up to three times the cost to repair.

Manufactured Home

An underground service to a manufactured home can be installed one of three ways:

- Mobile home pedestal.
- Post-mounted meter base
- Meter Base mounted on the manufactured home, if both of the following conditions are met:
 - a. The manufacturer installed the meter base on the manufactured home when it was constructed and
 - b. The service equipment meets Grant PUD’s meter base requirements. (See Chapter Four – Metering.)

The service equipment must meet all applicable NEC, federal, state, and regional codes and be inspected by the state electrical inspector prior to connection. The meter base shall meet Grant PUD requirements listed in Chapter Four – Metering.

Modifications of Existing Facilities

Adding electrical load which requires modifications to customer and/or Grant PUD facilities requires that the facilities be brought up to current NEC, WAC, federal, state and regional codes and standards. Normally Grant PUD has the right to connect a service modification, prior to a state electrical inspection, if Grant PUD deems the installation is safe for connection and the state electrical permit is posted at the site. However, if the state electrical inspector finds deficiencies in the installation, he will initiate a request to disconnect service. The service will be disconnected until such time as the state electrical inspector approves the installation.

A demarcation point will be identified to determine the customer’s responsibility for construction and cost of the system upgrade to facilities.

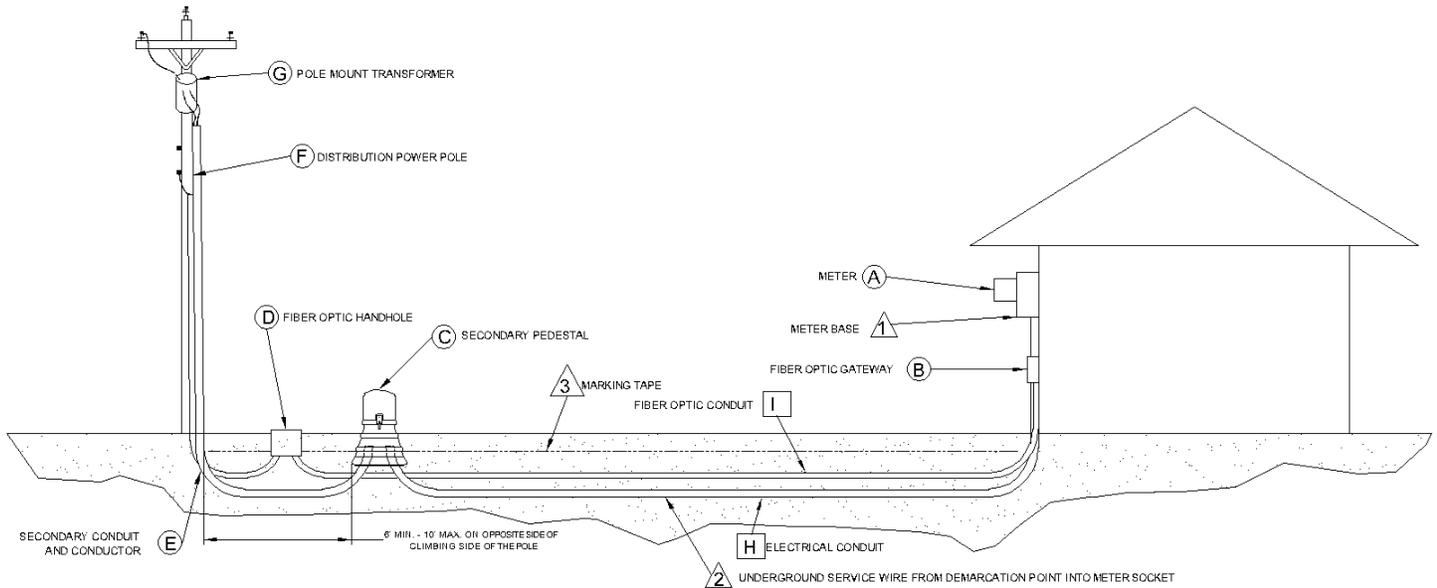


FIGURE 8. UNDERGROUND SERVICE FROM OVERHEAD LINE AND POLE MOUNT TRANSFORMER

<p>△ ITEMS PROVIDED AND INSTALLED BY THE CUSTOMER</p> <ol style="list-style-type: none"> 1. METER BASE 2. UNDERGROUND SERVICE WIRE FROM DEMARCATION POINT INTO METER SOCKET (DISTRICT OWNS CONDUCTOR AFTER SERVICE IS ESTABLISHED) 3. MARKING TAPE 	<p>○ ITEMS OWNED AND INSTALLED BY GRANT COUNTY PUD</p> <ul style="list-style-type: none"> A. METER B. FIBER OPTIC GATEWAY (FIBER SERVICE POINT) C. SECONDARY PEDESTAL D. FIBER OPTIC HANDHOLE E. UNDERGROUND SECONDARY CONDUIT AND CONDUCTOR F. DISTRIBUTION POWER POLE G. POLE MOUNT TRANSFORMER
	<p>□ ITEMS PROVIDED BY THE DISTRICT AND INSTALLED BY THE CUSTOMER</p> <ul style="list-style-type: none"> H. ELECTRICAL CONDUIT (DISTRICT OWNS CONDUIT AND CONDUCTOR AFTER SERVICE IS ESTABLISHED) I. FIBER OPTIC CONDUIT (DISTRICT OWNS CONDUIT AFTER SERVICE IS ESTABLISHED)

Figure 8. Underground Service From Overhead Line and Pole Mount Transformer

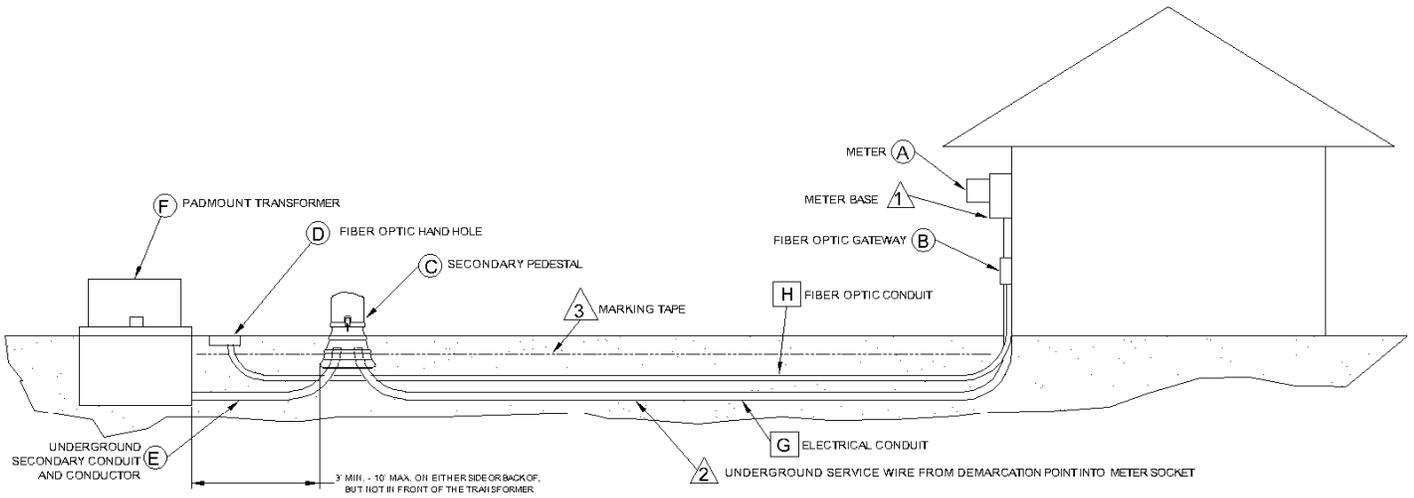


FIGURE 9. UNDERGROUND SERVICE FROM PADMOUNT TRANSFORMER

<p><input type="checkbox"/></p> <p>ITEMS PROVIDED AND INSTALLED BY THE CUSTOMER</p> <ol style="list-style-type: none"> 1. METER BASE 2. UNDERGROUND SERVICE WIRE FROM DEMARCATON POINT INTO METER SOCKET (DISTRICT OWNS CONDUCTOR AFTER SERVICE IS ESTABLISHED) 3. MARKING TAPE 	<p><input type="radio"/></p> <p>ITEMS OWNED AND INSTALLED BY GRANT COUNTY PUD</p> <ol style="list-style-type: none"> A. METER B. FIBER OPTIC GATEWAY (FIBER SERVICE POINT) C. SECONDARY PEDESTAL D. FIBER OPTIC HANDHOLE E. UNDERGROUND SECONDARY CONDUIT AND CONDUCTOR F. PADMOUNT MOUNT TRANSFORMER
	<p><input type="checkbox"/></p> <p>ITEMS PROVIDED BY THE DISTRICT AND INSTALLED BY THE CUSTOMER</p> <ol style="list-style-type: none"> G. ELECTRICAL CONDUIT (DISTRICT OWNS CONDUIT AND CONDUCTOR AFTER SERVICE IS ESTABLISHED) H. FIBER OPTIC CONDUIT (DISTRICT OWNS CONDUIT AFTER SERVICE IS ESTABLISHED)

Figure 9. Underground Service From Padmount Transformer

CHAPTER FOUR

Metering

General Information

This chapter covers Grant PUD's requirements for metering equipment furnished and installed by the customer.

NOTE:

The customer is responsible for determining the electrical requirements for the service entrance prior to contacting Grant PUD.

Service Equipment Ampacity Ratings

Grant PUD's metering requirements for single-family residential structures (excluding apartments or condominiums) are based upon the following single-phase service ratings:

Voltage	Ampere Rating
120/240	200 Amp
120/240	400 Amp
120/240	over 400 Amps*

*Single phase services rated over 400 Amps and three phase services are not covered in this workbook. Contact the *Service Expediter* for more information on these types of services.

General Requirements

Meter bases can be mounted as follows:

200 Ampere	400 Ampere
Flush Mounted	
Surface Mounted	
Post Mounted	
Mobile Home Pedestal	

Meter Base Location

The customer shall install the *meter base* outside and in a location allowing Grant PUD access for maintenance, emergency response, and meter reading. The *meter base* shall be mounted on a customer-owned structure. All meter installations are subject to Grant PUD approval.

The customer shall install a post-mounted meter base or a mobile home pedestal such that it faces the road and/or allows for Grant PUD access.

The customer shall install the meter base such that the center of the meter (once installed) shall be between five and six feet above finished grade (*this does not apply to mobile home pedestals*).

For convenience purposes, Grant PUD recommends the *meter base* be installed as close to existing Grant PUD facilities or near a property corner or boundary as possible.

Installing the *meter base* adjacent to a property corner or boundary has several advantages:

- Grant PUD can maintain its facilities without needing access to the customer's property.
- The location will not interfere with any future construction projects such as remodeling, adding on, landscaping, etc.
- The ability to disconnect service quickly in case of an emergency (i.e. fire).

NOTE:

Customers with wells benefit from having a separate circuit from the *meter base* to their well.

Meter Base Clearance Requirements

Grant PUD requires the following clearances around all *meter base* installations. It is the customer's responsibility to provide and maintain these clearances. Refer to Figure 3 for the following:

- A working space of 3 feet wide and 3 feet below ground line is required around the *meter base*. This working space must be kept clear of any obstructions, including landscaping.
- A minimum vertical clearance of 10 inches, measured from the top of the *meter base* to any obstruction, is required.
- A minimum horizontal clearance of 3 feet measured from the edge of the *meter base* to any obstruction including gas meters and/or walls, is required.
- Siding or the finished surface of the structure shall not overlap the cover of a flush mounted *meter base*.

Additional Meter Base Requirements

Customer provided and installed *meter bases* shall meet the following Grant PUD's requirements:

- The customer shall provide and install only Grant PUD approved 200 or 400 Amp *meter bases*. Refer to Table 2 "Approved Residential Meter Base (Sockets)".
- All unused openings shall be tightly sealed from the inside of the *meter base*.
- The *meter base* shall be mounted plumb and securely fastened to the supporting structure.

- The *meter base* shall have a suitable device for sealing.
- Lever by-passes and/or lever releases are unacceptable and shall not be energized.

Service Equipment Grounding Requirements

All *meter bases*, enclosures, and conduit shall be bonded and grounded in accordance with the *NEC* and *WAC*.

Removing and Installing Meters (After the Service is Energized)

Once a service is energized and serving load to the customer, only authorized Grant PUD personnel are allowed to install and remove meters and access *meter bases*.

Any meter base that has been de-energized for more than 12 months will require an L&I inspection prior to being energized by Grant PUD personnel.

The customer or contractor should contact Grant PUD prior to performing any work around or on the *meter base*. Grant PUD can coordinate with the customer to have the service de-energized by a serviceman allowing the customer or contractor access to the *meter base*. Contact the Service Expediter at 509-765-2501 to arrange de-energizing your service. Please provide meter number when requesting de-energizing your service. Please have your meter number or address available.

NOTE:

Under emergency conditions, exceptions may be granted to qualified electricians by contacting Grant PUD’s Local Office or, after hours, Grant PUD’s distribution dispatcher. Should this occur, the qualified electricians (or whomever removes the meter) shall accept full liability for damage or alteration to equipment, injury to persons or property, and loss of revenue to Grant PUD from the time the seal is removed until 72 hours after Grant PUD has been notified that the equipment is ready to be resealed.

The customer or contractor shall promptly notify Grant PUD when repairs or modifications have been completed. The customer or contractor should use extreme caution when meters are removed or installed since depending upon the type of service or *meter base*, removal of the meter **does not** necessarily de-energize the customer’s service.

Self-Contained 400 Amp Meter Base

The *meter base* requirement for a 120/240 Volt, self-contained 400 Amp service is called a “**Class 320**” *meter base*. This *self-contained meter base* does not require current transformers. It can be installed where the continuous current rating is 320 Amps or less.

NOTE:

The continuous current rating is defined as the maximum coincidental current flow at any one time and should not to be confused with the total connected load.

Meter Pedestals

A meter pedestal is a structure that supports the service equipment, normally a *meter base* and a disconnect switch. The customer is responsible for furnishing and installing the meter pedestal if needed for the service.

There are two meter pedestal options:

- Post-mounted
- Factory-built

A post-mounted pedestal consists of a short pole with the *meter base* and disconnect switch mounted on the pole. The factory-built pedestal comes complete with *meter base* and disconnect switch. The requirements for each are shown in Figures 10 and 11.

Single Phase 200 Amp Without Branch Breakers and With or Without a Manual Bypass			
Manufacturer	Model Number	Service Type	
Cooper B-Line (Circle AW)	204	Overhead	
	204F	Overhead	Flush Mount
	UG204	Underground	
	UG204F	Underground	Flush Mount
	U264	Overhead OR Underground	Manual Circuit Closing
	U264F	Overhead OR Underground	Manual Circuit Closing
Landis & Gyr	UAT327	Overhead	
	UAT427	Overhead OR Underground	
Milbank	U4517	Overhead	
	U4518-O-W	Underground	
	U7018-XL-TG	Overhead OR Underground	
	U3514-XL	Overhead OR Underground	Manual Circuit Closing
Single Phase 200 Amp With Main and/or Branch Breakers and Without a Manual Bypass			
Manufacturer	Model Number	Service Type	Main Breaker
Eaton (Cutler Hammer)	CMBE**B200BTS	Overhead OR Underground	1-200 AMP
	MBE**/B200BTS	Overhead OR Underground	1-200 AMP
Midwest	M282CB1	Overhead OR Underground	1-200 AMP
Siemens	MC**/B1200C	Overhead OR Underground	1-200 AMP
	MC**/B1200CT	Overhead OR Underground	1-200 AMP
Square-D	URTRS213B	Overhead OR Underground	
Single Phase 200 Amp Meter Sockets for Mobile Homes and Mobile Parks			
Manufacturer	Model Number	Service Type	Main Breaker
Eaton (Cutler Hammer)	MBT**B200**	Underground	1 - 200 Amp
Midwest (No Bypass)	M281C1P6H####	Underground	1-200 Amp
Single Phase 400 Amp Meter Sockets With or Without Main and/or Branch Breakers and With a Manual Bypass			
Manufacturer	Model Number	Service Type	Main Breaker(s)
Cooper B-Line (Circle AW)	324C	Underground	N/A
	324N	Overhead	N/A
	U404MCC	Underground	1-400 Amp
	U4042MCC	Underground	2-200 Amp
Landis & Gyr	UAT 427	Overhead OR Underground	N/A
Milbank	U3548	Overhead OR Underground	N/A
Square-D	CU12L400CB	Underground	2-200 Amp
** indicates branch circuit capacity			
#### indicates outlet addition when listed as 010			

Table 2. Approved Residential Meter Base (Sockets).

Figure 10. Post Mounted Meter Installation

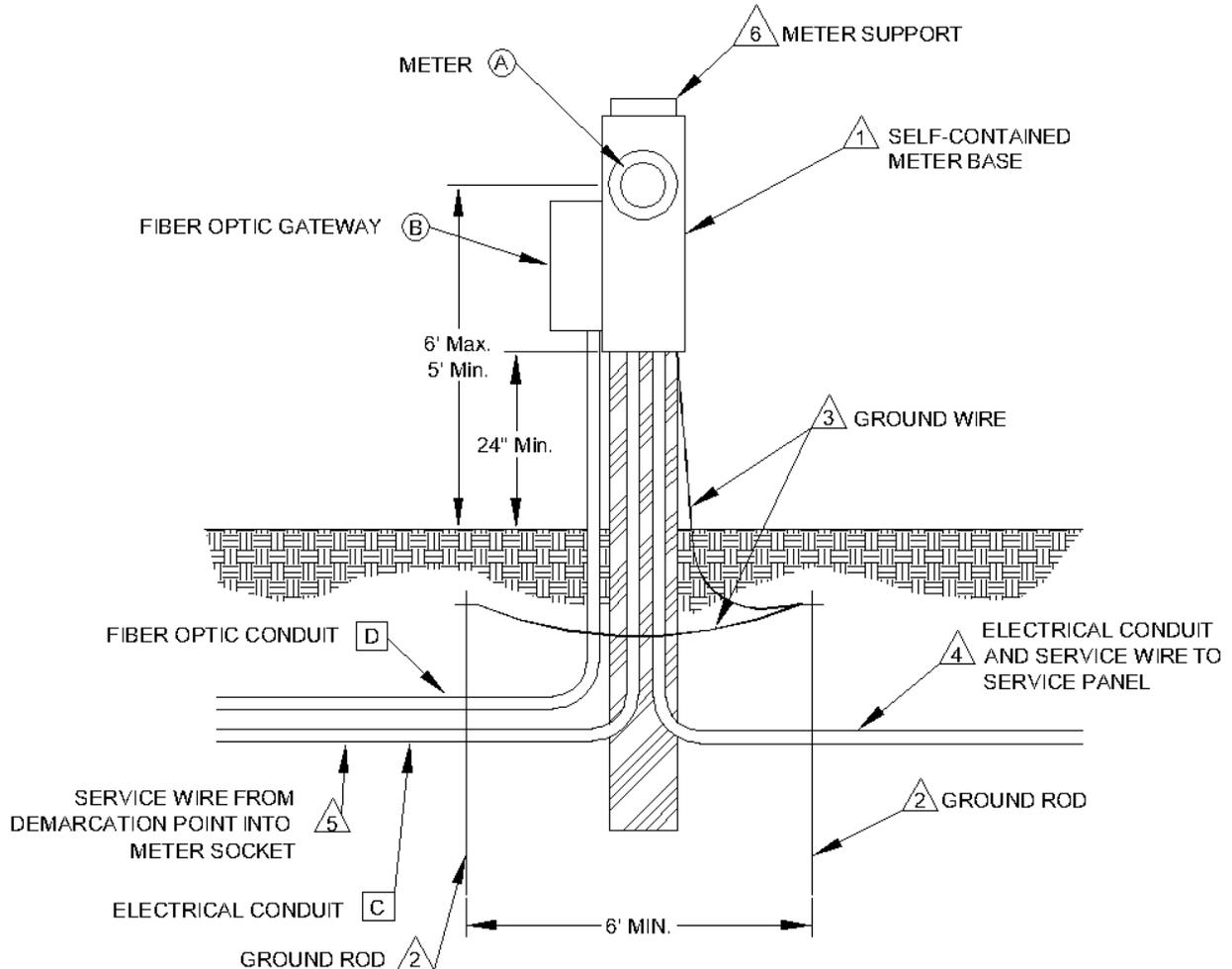


FIGURE 10. POST MOUNTED METER INSTALLATION

<p>△ ITEMS PROVIDED AND INSTALLED BY THE CUSTOMER</p> <ol style="list-style-type: none"> 1. SELF-CONTAINED METER BASE 2. GROUND RODS (IN ACCORDANCE WITH NEC AND WAC RULES, TWO REQUIRED.) 3. GROUND WIRE (IN ACCORDANCE WITH NES AND WAC RULES) 4. ELECTRICAL CONDUIT AND SERVICE WIRE TO SERVICE PANEL 5. SERVICE WIRE FROM DEMARCATION POINT INTO METER SOCKET (DISTRICT OWNS AFTER SERVICE IS ESTABLISHED.) 6. METER SUPPORT, 6" x 6" x 10' MIN. LENGTH FULLY PRESSURE-TREATED POST OR METAL SUPPORT BURIED A MIN. OF 3' DEEP. WHEN ANGLE IRON, CHANNEL IRON OR RIGID PIPE IS USED, IT MUST BE SET IN 6" x 24" x 24" CONCRETE FOOTING. 	<p>○ ITEMS OWNED AND INSTALLED BY GRANT COUNTY PUD</p> <p>A. METER B. FIBER OPTIC GATEWAY (FIBER SERVICE POINT)</p> <hr/> <p>□ ITEMS PROVIDED BY THE DISTRICT AND INSTALLED BY THE CUSTOMER</p> <p>C. ELECTRICAL CONDUIT - (DISTRICT OWNS CONDUIT AND CONDUCTOR AFTER SERVICE IS ESTABLISHED) D. FIBER OPTIC CONDUIT - (DISTRICT OWNS CONDUIT AFTER SERVICE IS ESTABLISHED)</p>
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Figure 11. Mobile Home Pedestal Installation

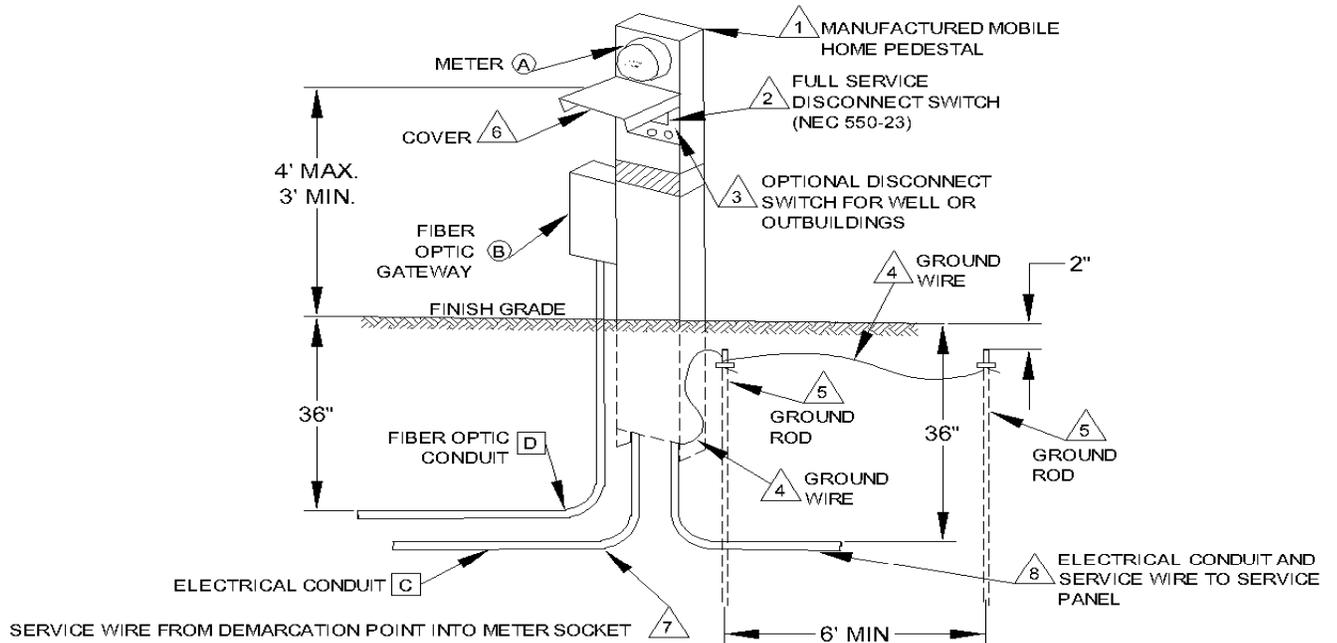


FIGURE 11. MANUFACTURED MOBILE HOME PEDESTAL WITH METER BASE INSTALLATION

<p>△ ITEMS PROVIDED AND INSTALLED BY THE CUSTOMER</p> <ol style="list-style-type: none"> 1. MANUFACTURED MOBILE HOME PEDESTAL. 2. FULL SERVICE DISCONNECT SWITCH (NEC 550-23) 3. OPTIONAL DISCONNECT SWITCH FOR WELL OR OUTBUILDING 4. GROUND WIRE (IN ACCORDANCE WITH NEC AND WAC RULES) 5. GROUND RODS (IN ACCORDANCE WITH NEC AND WAC RULES) 6. COVER 7. SERVICE WIRE FROM DEMARCATION POINT INTO METER SOCKET (DISTRICT OWNS AFTER SERVICE IS ESTABLISHED) 8. ELECTRICAL CONDUIT AND SERVICE WIRES TO SERVICE PANEL 	<p>○ ITEMS OWNED AND INSTALLED BY GRANT COUNTY PUD</p> <ol style="list-style-type: none"> A. METER B. FIBER OPTIC GATEWAY (FIBER SERVICE POINT) <hr/> <p>□ ITEMS PROVIDED BY THE DISTRICT AND INSTALLED BY THE CUSTOMER</p> <ol style="list-style-type: none"> C. ELECTRICAL CONDUIT (DISTRICT OWNS CONDUIT AND CONDUCTOR AFTER SERVICE IS ESTABLISHED) D. FIBER OPTIC CONDUIT (DISTRICT OWNS CONDUIT AFTER SERVICE IS ESTABLISHED)
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CHAPTER FIVE

Construction Temporary Services

General Information

A *Construction temporary service* is an electrical service used for construction purposes. It is only available where single phase, 120/240 volt power, is adjacent and accessible to the customer installed temporary service panel.

If construction temporary service is unavailable, contact Grant PUD *Service Expediter* for more information. The customer may need to apply for a permanent service.

The construction temporary services can be either metered or *non-metered*.

1. Metered temporary construction service: The customer completes a "Service Connection Agreement" and submits it to Grant PUD *Service Expediter*. The customer installs a meter panel adjacent to Grant PUD facilities and obtains an electrical *permit* from Washington State Department of Labor and Industries (L&I). When installation is approved by L&I, the customer contacts Grant PUD's *Service Expediter* to schedule energizing the service. **Grant PUD charges a one-time fee of \$10 (Ten Dollars) to energize the temporary service.** Subsequent usage will be billed at the appropriate rate schedule up to one year. At the end of one year, Grant PUD will either remove the service or charge the customer the simple service connection fee and consider the service permanent.
2. Non-metered temporary construction service: The customer completes a "Service Connection Agreement" and submits it to Grant PUD's *Service Expediter*. The customer installs a temporary service panel (limited to 60 Amps; see Figure 12) adjacent to Grant PUD facilities and obtains an electrical *permit* from L&I. When the installation is approved by L&I, the customer contacts Grant PUD's *Service Expediter* to schedule energizing the service. The **non-metered connection fee is \$60**

(Sixty Dollars) for a six month period. Grant PUD will allow one six-month extension for another **\$60 (Sixty Dollars)**.

There are underground and/or overhead connected temporary services. Please refer to the section in this chapter for the type of service being requested. Please contact Grant PUD's *Service Expediter* for additional information or to answer any questions.

Temporary Overhead Service

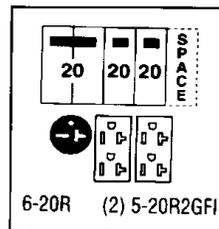
Temporary overhead service is available in Grant PUD's service area where the existing electrical system is overhead construction.

A temporary overhead service may be placed within 50 feet of Grant PUD facilities, provided adequate clearances can be maintained.

If Grant PUD's facilities are underground, refer to the temporary underground service section of this chapter.

Temporary Underground Service

Temporary underground service is available in Grant PUD's service area where existing power facilities are installed underground. Underground temporary services need to be installed within 10 feet of a *padmount transformer, secondary handhole* or pedestal. The customer provides the trench, conduit, and *conductor* from Grant PUD's facilities to the temporary service. Allow three (3) feet of extra conductor for makeup to a *secondary handhole* or pedestal and ten (10) feet extra if run to a *padmount transformer*.



Wiring Diagram



Figure 12. Non-metered Temporary Service Panel

CHAPTER SIX Right of Way

General Information

This chapter covers Grant PUD's requirements and the Customer's responsibilities for land use requirements, rights-of-way, *permits* and associated fees (Appendix B).

An *Engineering Technician* will be assigned to any "complex project" that requires additional rights-of-way and/or *permits*.

Land Use Requirements

The customer shall comply with the following land use requirements for both the electric system and the fiber optic system.

- **Compliance with other Agencies:**
The Customer will be required to comply with all applicable jurisdictional agencies, state, county, and local statutes. These shall include, but not necessarily be limited to, the County Unified Development Code, International Building Code, Urban Growth Management Area development standards, and regulations requiring certain minimum improvements.
- **Provide Copies to Grant PUD:**
The customer shall provide Grant PUD with executed copies of any and all required agency developmental approvals, i.e. approved building site plan.
- **Property Corners:** Property corners that are disturbed shall be replaced by a Licensed Surveyor at the owners expense. Property corners shall not be driven deeper than 18 inches below final grade in order to protect buried facilities.

Easements for Rights-of-Way

The customer shall complete the "Service Connection Agreement" with the names of legal land owners, property description(s), and sketches showing all property boundaries that the service connection will affect.

The customer is required to obtain the property owner's signature on the "Service Connection Agreement" in order for Grant PUD to install facilities on the property.

Grant PUD will determine if additional *easements* for rights-of-way are required. Grant PUD will prepare all *easements* on Grant PUD *easement* templates and the Customer shall obtain all property owners' signatures. **Grant PUD's cost for preparing the easement(s) for rights-of-way will be a flat fee of \$100.00 (one hundred Dollars) per easement.** The assigned *Engineering Technician* will advise the customer of the required fees.

Once the *easement(s)* for rights-of-way are signed by the property owner(s) and notarized in the presence of a Notary Public, return them to Grant PUD: Attention; Lands Department – Distribution Right-of-Way. Grant PUD will record the *easement(s)* at the respective Auditor's Office of the appropriate county, i.e. Grant, Lincoln, Adams, Douglas, etc.

Public Agency Permits/Licenses for Rights-of-Way

Grant PUD will obtain the required *permits/licenses* from public agencies or entities (WSDOT, BLM, WDNR, Railroads, Cities, etc.).

The customer shall pay for any or all *permits/licenses*, including but not limited to, Washington State Department of Transportation, United States Bureau of Reclamation, Bureau of Land Management, Department of Natural Resources, Railroad, and other *permits/licenses* as may be required along with any required professional surveys.

City Permits may be required if Grant PUD's underground *primary* or *secondary conductors* are constructed within city limits. A minimum of two weeks is required to obtain *permit(s)*. The City of Quincy and the town of Warden are the only municipalities that charge a fee. Their fees are based on distance and type of disturbance.

Public Agency Permits/Licenses for Rights-of-Way (cont'd)

Grant County Road Permits are required if Grant PUD's *primary* or *secondary conductors* cross a county road or parallel a county road within their right-of-way. A minimum of two weeks is required to obtain *permit(s)*.

Lincoln County Road Permits are required if Grant PUD's *primary* or *secondary conductors* cross a county road. The cost varies from \$75 to \$150, and is subject to change. A minimum of four weeks is required to obtain the *permit(s)*.

Columbia Basin Irrigation District Permits are required if Grant PUD's *primary* or *secondary conductors* cross an irrigation district waterway. These *permits* will be obtained by Grant PUD from the appropriate irrigation district (i.e. South, Quincy, or East Columbia Basin Irrigation District.) A minimum of six weeks is required to obtain *permit(s)*. East Columbia Basin Irrigation District charges \$100 per crossing application.

Washington State Department of Transportation (WSDOT) Permits are required if Grant PUD's *primary* or *secondary conductors* cross a state highway or parallel a state highway within their right-of-way and *easement*. There is a fee for this *permit*, usually ranging in cost from \$150 to \$500. A minimum of four to six months is required to obtain the *permit(s)*.

Washington Department of Natural Resources (WDNR) Easements are required if Grant PUD's *primary* or *secondary conductors* cross WDNR property. To obtain this *permit* a professional survey is required. Customer is responsible for acquiring a WDNR approved survey. The WDNR charges \$2,500 (subject to change) for the costs of the *permit*. Upon completion of the survey, the survey and application fee will be submitted to WDNR for processing and approval. A minimum of twelve months is required to obtain *permit(s)*.

WDNR tenants are required to obtain an easement.

Bonneville Power Administration (BPA) Permits are required if Grant PUD's *primary* or *secondary conductors* cross under a BPA power line or are located in the BPA *easement* area. A minimum of twelve months is required to obtain *permit(s)*.

United States Bureau of Reclamation (USBR) Licenses or Consent to Use are required if Grant PUD's *primary* or *secondary conductors* cross USBR property. The USBR charges a \$100 application fee (subject to change) and a work charge deposit based upon USBR evaluation. The customer will be required to pay the USBR work charge deposit prior to work beginning on the *License* or *Consent to Use* agreement and any additional costs incurred by the USBR. A minimum of Eighteen months is required to obtain *license(s)*.

Bureau of Land Management (BLM) Right-of-Way Grant is required if Grant PUD's *primary* or *secondary conductors* cross BLM property. To obtain this *permit*, an application and *permit* fee must be submitted to BLM. The *permit* processing fee ranges from \$175 to \$1,156. A minimum of twelve months is required to obtain grant(s). Any grant renewal fees will be charged to customer.

Railroad Licenses are required if Grant PUD's *primary* or *secondary conductors* cross over, under or parallel to the railroad track.

The application fee for Burlington Northern Santa Fe Railroad is \$800, the *license* cost is \$3,717, and the cost for the required Railroad protective insurance coverage is \$460. The customer will also pay any BNSF Flagging costs.

The application fee for Columbia Basin Railroad is \$600, the *license* cost is \$3,000 (either fee is subject to change), and a Railroad protective insurance policy will be required and will be acquired by Grant PUD and charged to the customer.

A minimum of four months is required to obtain *permit(s)*. Any *license* renewal fees will be charged to the customer.

CHAPTER SEVEN

Fiber Optic Cable

Underground Fiber Optic Cable

Grant PUD will furnish and install fiber optic cable in accordance to Grant PUD's "Fiber Optic Customer Service Policies" and build-out schedule, or as amended by Grant PUD. Grant PUD will supply 1" or 2" orange PVC conduit for the customer to install.

The fiber optic conduit shall be installed, in the customer's supplied trench, from the *demarcation point* to a location near the electrical meter. Grant PUD's *Service Expediter* will identify the *demarcation point* for the customer. Normally, the fiber optic conduit will parallel the electrical service conduit.

If fiber optic service is available, Grant PUD will provide and install fiber optic cable in the customer installed conduit to Grant PUD's supplied residential fiber gateway box (generally located next to *meter base*).

NOTE: Grant PUD supplied fiber optic conduit is for fiber optic cable only. Other companies including telephone and cable TV will not be authorized to utilize Grant PUD's supplied fiber optic conduit.

Overhead Fiber Optic Cable

If fiber optic service is available, Grant PUD will provide and install fiber optic cable to Grant PUD's residential fiber gateway box (generally located next to *meter base*).

Contacting Other Utilities or Agencies

For fiber optic service, the customer needs to contact a "Service Provider". Service providers offer high-speed internet, television, and telephone via the fiber optic cable connection. It is the customer's responsibility to notify a service provider and request service. Service providers are listed on the Grant PUD website under High Speed Network in the Customer Service section.

Conduit Size

Trenches over 100 feet in length require two (2) ch orange conduit.

Fiber Gateway

The Fiber Gateway box will require customer supplied power to operate. The gateway will be plugged into a 120VAC outlet located either inside or outside of the structure onto which it is mounted.

Glossary

Complex Service Request - A request for electrical service that requires a Grant PUD Engineering Technician design which may or may not include right-of-way.

Demarcation Point - A Grant PUD established location which defines where Grant PUD's construction stops and the customer's construction starts. For an overhead service, the *demarcation point* is typically *the point* just outside the customer's weatherhead atop the *service mast* or a temporary *meter base*. For underground service, the *demarcation point* is the first secondary connection on the customer's property either at a *padmount transformer*, *secondary handhole*, *secondary pedestal* or a *meter base*. Note that this Demarcation Point only applies to construction. Once a service is energized, a *service point* is established which defines ownership.

Easement – The right to use to use the land of another.

Engineering Technician - A Grant PUD employee that designs construction projects and coordinates construction activities.

Guy or Guying - Cables or braces used to relieve the strain of overhead conductors on masts and poles.

HVAC - Heating, Ventilation and Air Conditioning.

License - A license is an authorization to cross another owner's land, it is revocable.

Meter Base – An enclosure consisting of meter jaws and connectors for accommodating socket-type meters.

Metered Temporary Service – A metered service panel provided and installed by the customer or his contractor for the purpose of providing power during construction of a premise. The cost of a Metered Temporary Service is \$10 (Ten Dollars) for the initial connection and energizing. The customer is then billed monthly at the appropriate rate schedule for the power used.

Moped – A plastic rounded top above ground secondary junction box which contains electrical equipment or splices.

NEC - National Electric Code

NESC – National Electric Safety Code

Padmount Transformer - An electrical device mounted on a concrete base used to provide the appropriate voltage to serve customers.

Permit - A permit is an authorization to cross another owner's land, it is revocable. Often used by governmental agencies.

Primary Conductor - Electrical high voltage conductor.

Rigid Clevis - A porcelain insulator with mounting bracket used to terminate overhead services.

Secondary Handhole - A box that is flush mounted in the ground which contains electrical equipment or splices.

Secondary Pedestal - A box that is mounted above ground level which contains electrical equipment or splices.

Secondary Conductor – Electrical conductors from Grant PUD's system to the customer's *demarcation point*; *either* overhead or underground.

Self-Contained - In reference to *meter bases*: an enclosure designed and rated to continuously carry the entire capacity of the service entrance equipment. The maximum *self-contained meter base* current rating approved by Grant PUD is 400 Amps (also called a single-phase Class 320 A meter).

Service Entrance Conductors - The electrical conductors in an overhead service that extend from the *meter base* up through the service mast and 18 inches past the weatherhead to the *demarcation point*. Service Entrance conductors are provided and installed by the customer.

Service Expediter - A Grant PUD employee that is the initial contact person on construction projects.

Service Mast - The conduit above the meter used to provide mechanical protection for the service entrance conductors and to support the service drop from Grant PUD's system.

Service Point – The point of connection where the customer's electrical or telecommunications equipment connects to Grant PUD's systems. This point will be the load lugs on the customer owned but Grant PUD controlled *meter base*. The fiber *service point* is the CAT5 RJ45 cable connectors in the Gateway enclosure.

Service Conductors - The electrical conductors in an underground service that extend from the *meter base* to Grant PUD's *demarcation point*. Service conductors are provided and installed by the customer.

Simple Service Request - A request for electrical service at a site where required Grant PUD facilities already exist on a customer's property and does not require right-of-way.

Simple Service Request Fee - A flat fee applied to the customer's account, based on the Simple Service Request type: See Grant PUD Fee Schedule.

Splice - A junction point between two conductors.

State Electrical Inspector - The qualified representative of the State of Washington Department of Labor and Industries, who has been authorized to inspect electrical service installations.

Non-Metered Temporary Service – A temporary service providing up to 60 amp capacity, 120/240 volt single phase electrical service installed by the customer to provide construction power to a job site for up to six months. The cost for a Non-Metered Temporary Service is \$60 (Sixty Dollars).

Utility System – The electrical equipment owned or under the control of Grant PUD. "Under the control" means restricted public access by means of lock or seal. This includes the customer owned service entrance and *meter base*.

Weatherhead - A device installed at the top of the service mast that prevents water from entering the conduit, while allowing access for the service entrance conductors.

Important Telephone Numbers

Grant County PUD

Service Expediter.....	766-2501
Service Expediter Fax.....	754-6658
Ephrata Local Office - 30 C Street S.W., Ephrata.....	754-0500
Grand Coulee Local Office - 555 Grand Coulee West, Grand Coulee.....	633-2522
Moses Lake Local Office - 312-3rd Avenue West, Moses Lake.....	766-2505
Quincy Local Office - 27 B Street S.W., Quincy.....	787-3565
Royal City Local Office - 505 Royal Road, Royal City.....	346-2228
Royal City Local Office - Mattawa Exchange.....	932-4299
Customer Service Call Center.....	766-2505
Grant PUD Toll Free Number.....	1-800-422-3199

State & County Government

Department of Labor and Industries- 3001 W. Broadway, Moses Lake.....	764-6900
Department of Labor and Industries Electrical Inspection (24 hour) Line.....	764-6966
Building Department - 332 Division West, Ephrata.....	754-2011
Health District - 35 C Street N.W., Ephrata.....	754-6060
Health District - 903 W 3rd Avenue, Moses Lake.....	766-7960

City and Town Government

Town of Coulee City - 501 Main Street West.....	632-5331
Town of Electric City - 10 Western Avenue.....	633-1510
City of Ephrata - 121 Alder S.W.....	754-4601
City of George - 102 Richmond Avenue.....	785-5081
City of Grand Coulee - 306 Midway Avenue.....	633-1105
Town of Hartline - Main Street North.....	639-2606
Town of Krupp (Marlin) - 293 Urquhart Avenue North.....	345-2531
City of Mattawa - East 521 Government Road.....	932-4037
City of Moses Lake - 321 Balsam Street- Existing Service.....	766-9214
City of Moses Lake - 321 Balsam Street - New Service.....	766-9235
City of Quincy - 104 B Southwest.....	787-3523
City of Royal City - 697 Camelia Street.....	346-2263
City of Warden - 201 Ash Street.....	349-2326
City of Wilson Creek- 204 4th North.....	345-2531

Utilities Underground Location Center (UULC)..... 811

APPENDIX (Standard 10.0008 Trench Construction – PVC Conduit)

TRENCH CONSTRUCTION, PVC CONDUIT**1. SCOPE:**

This specification covers trenching, trenching location in reference to other utilities, conduit location within the trench, backfill and compaction of backfill.

2. STANDARDS:

This specification includes reference to the following “*The American Society for Testing and Materials International*” (ASTM International) standards.

- 2.1. Soil Compaction:
ASTM D 698.00a Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort 12,400 ft.-lb/ft cubed.
- 2.2 Soil Classifications for Backfill:
ASTM D 2487-00 Standard Practice for Classifications of Soils for Engineering Purposes. (Unified Soil Classification System)
ASTM D 2488-00 Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)

3. TERMINOLOGY:

- 3.1. Trench: Excavation for placement of individual conduits or duct systems for electrical and/or communication services.
- 3.2. Backfill Area: Area of trench backfilled in three zones- 1) Foundation 2) Embedment 3) Final Backfill Zone.
- 3.2.1. Foundation: Used only where the trench bottom is unstable or a material that does not compact. Additional compacted material may be added to make a secure base.
- 3.2.2. Embedment: Compacted material placed below, around and above the conduit/duct system to provide support and protection for the conduit/duct system..
- 3.2.2.a. Bedding: Material placed on the trench bottom or on foundation to provide uniform support and protection for the conduit(s)
- 3.2.2.b. Conduit Zone: Material placed on either side of the conduit and/or between ducts. This material prevents lateral displacement of the conduit/duct due to live loads or water infiltration.
- 3.2.2.c. Spring Line Cover: Six inches of material placed above the top of the

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DESIGNER:	AJW		
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TRENCH CONSTRUCTION, PVC CONDUIT

conduit/duct system. This material provides protection for the conduit duct system from final backfill and/or live loads imposed on the trench.

- 3.2.3. Final Backfill: Trench area that extends from the top of the 6 inch cover to the top of the trench. Material here is native soil, unless the material contains cobbles or boulders over 4 inches in diameter.
- 3.3. Spring Line: The top of a single conduit or highest duct in the trench with more than one conduit.
- 3.4. PVC Conduit: Polyvinylchloride (PVC) conduit used for single conduit runs or duct systems. PVC conduit for electric systems will be grey. PVC conduit for fiber optic system shall be orange.
- 3.5. Definitions: This standard includes the definitions in ASTM 2487 and 2488, Section 3 “Terminology.”

4. BACKFILL MATERIALS:

General: All backfill materials are defined in ASTM 2487 & 2488, Section 3 ‘Terminology.’ All backfill used in any trench shall be organic-free material. This includes organic particles and larger organic debris.

- 4.1. Foundation Materials:
This material shall be compactible material such as gravel, sand, silt or clay or a mixture of those materials. Nothing larger than 1 inch minus gravel/aggregate shall be used. See ASTM 2487 & 2488, Section 3 “Terminology,” 3.1.2 “Gravel” (subsection “fine”)
- 4.2. Embedment Zone Materials:
Material in all three areas, bedding, conduit zone and cover, shall be sand, silt or clay material. Material shall pass a number 40 sieve but does not have to pass a number 200 sieve. Clay or Silt materials are defined as *fine grained top soil or soil free of any gravel, rock or rock chips*. See ASTM 2487 & 2488, Section 3 “Terminology,” 3.1.1 “Clay” & 3.1.7 “Silt.”
Sand is defined as *fine particles of rock, common reference “blow sand”*. See ASTM 2487 & 2488, Section 3 “Terminology,” 3.1.6 “Sand” (subsection “fine”)
- 4.3. Final Backfill Zone Materials
This material can in most cases be native soil/rock excavated from the trench. However if this material contains cobble/boulders larger than 4 inches in diameter it shall not be used.

5. CONSTRUCTION LOCATION/DIMENSIONS:

- 5.1. Location: The trench shall be within the easement granted to the District. The trench shall not be closer to other utilities than described below.

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- 5.1.1 Water Facilities: The electric facilities shall be a minimum of 18 inches radially from any water line. This measurement is from surface to surface, not center to center.
- 5.1.2 Gas Facilities: The electric facilities shall be a minimum of 10 feet radially from any gas transmission line and 18 inches radially from any gas service line. This measurement is from surface to surface, not center to center.
- 5.1.3 Sewer Facilities: Where the sewer facilities are at or above the electric line elevation the radial separation shall be a minimum of 24 inches. If the sewer facilities are at a lower elevation than the electric line the trench shall be a minimum of 36 inches radially from the sewer line trench. These measurements are from surface to surface, not center to center.
- 5.1.4 Communication Facilities: Communication facilities, other than the District’s fiber optic cable, shall be a minimum of 12 inches radially from the any electric facility. This measurement is from surface to surface, not center to center.

5.2. Width:
 The minimum width of an electrical trench shall be 24 inches for a single conduit up to 4 inches in diameter. (See Figure # 1 in Section 7 under 7.1 Cross Section Dimension on page 5 of 6.) Trenches for conduit larger than 4 inches in diameter or with more than one conduit shall be determined by the conduit(s) placement in the trench. Minimum trench width shall be 5 times the diameter of a single conduit or 24 inches. (Which ever is larger).

5.3. Depth:
 The minimum depth of an electrical service trench, for primary or secondary power or fiber optic cable, shall be 36 inches. This depth shall be measured from the top of the conduit (Conduit Spring Line). The trench must be deep enough to place the foundation (if required) and bedding so the entire diameter of the conduit is below minimum grade. (Exceptions to this must have prior District approval and be installed as shown in this Standard. See Figure # 2 in Section 7 under 7.2 Concrete Encased Conduit on page 6 of 6.)

5.4 Backfill:

- 5.4.1 Foundation: Foundation where required shall be a minimum of 2 inches of compacted material. Foundation backfill does not need to be continuous provided compaction & cable protection is achieved.
- 5.4.2 Bedding: Bedding shall be a minimum of 2 inches continuous compacted material and shall be constructed so the conduit is in contact with bedding at all times.
- 5.4.3 Conduit Zone: Conduit zone depth shall be determined by the diameter of the conduit. The conduit zone shall be from the bedding to the spring line of the conduit and shall consist of material compacted along each side of the conduit. The material shall be

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installed so there are no voids along the bottom sides of the conduit. Filling these voids shall be accomplished by shovel slicing, water compaction or other standard method.

5.4.4. Six Inch Cover: Cover zone shall be a minimum of 6 inches of compacted material.

5.4.5. Final Back Fill Zone: The final back fill zone shall restore the trenched area to the original contours with compacted native or barrow fill.

6. COMPACTION:

6.1. General Compaction:

All trench materials shall be compacted to 95% compaction. Compaction can be achieved by water, vibration or mechanical means. All material shall be compacted in 6 inch layers or as per ASTM D 698.

See ASTM D 698 for full requirements.

6.2. Zone Required Compaction:

6.2.1. Trench Bottom/Foundation: The trench base shall be compacted if excavated with a back hoe. All rake ridges shall be compacted or removed to undisturbed soil. If full or partial foundation is required it shall be added in minimal lifts and compacted to 95% compaction.

6.2.2. Bedding: The compacted (95%) two inches of bedding shall form a smooth pipe bed for uniform support of the conduit.

6.2.3. Conduit Zone: The compaction of the conduit zone shall be done in a manner that shall not damage or compress the conduit. Compaction shall be a minimum of 95%, as required.

6.2.4. Six Inch Cover: The conduit cover zone shall be in one lift and compacted to 6 inches @ 95% compaction.

6.2.5. Final Backfill: Final backfill requirements shall be determined by the material used and the land use over the trenched area. Compaction shall be a minimum of 95% with lifts that shall not exceed 8 inches regardless of the material employed as backfill.

6.2.5.1. Landscaped Areas: Any landscaped area shall be restored with acceptable top soil or native fill.

6.2.5.2. Parking Lot/Street: Any material and compaction under lots and/or streets shall be determined by the governing agency/owner.

6.2.5.3. Sidewalks/Curbs/Retaining Walls: Native fill shall be replaced with either 5/8 or 3/4 inch minus material that is compacted to full density.

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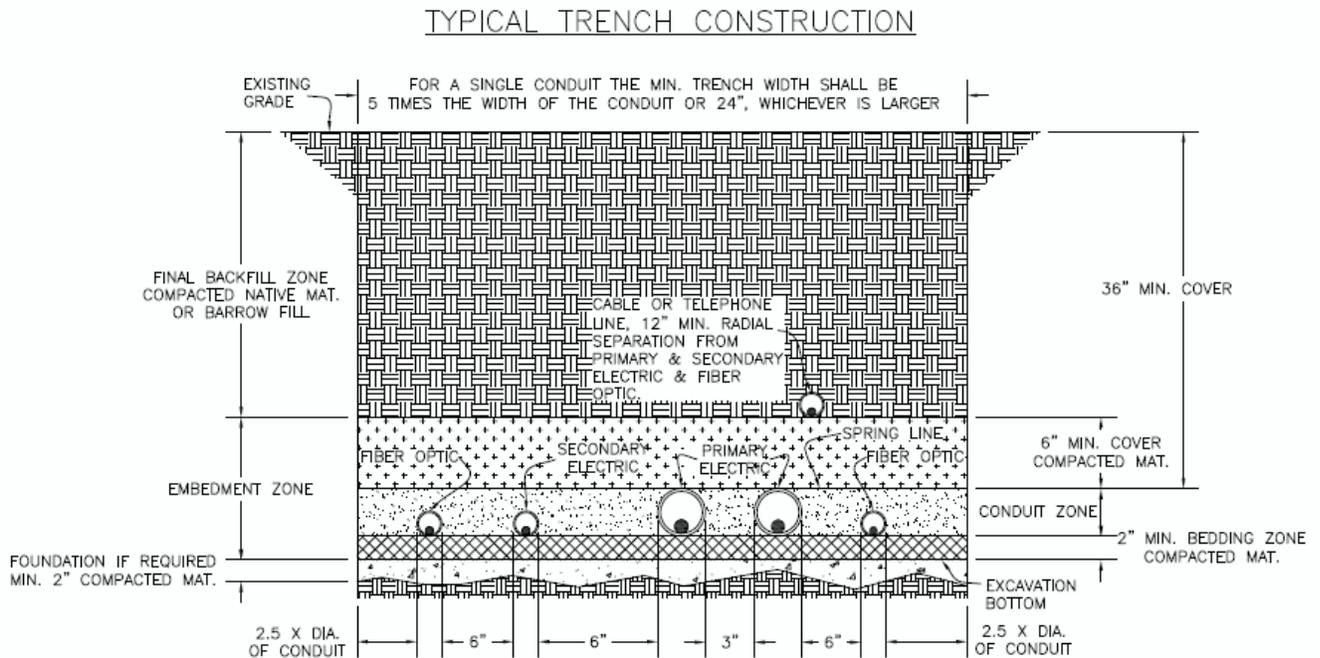
TRENCH CONSTRUCTION, PVC CONDUIT

7. DRAWINGS/DIAGRAMS/ILLUSTRATIONS

Figure #1 below is a typical trench layout cross sectional view showing the various zones and minimum required dimensions.

Figure #2 on page 6 of 6 is a cross section view of a concrete encased conduit. This method of reduced clearances is acceptable only with approval of District Staff.

7.1 Figure #1 Cross Section Dimension:



MULTI-CONDUITS SHALL BE CONFIGURED AS SHOWN.

NOTE:
ALL TRENCHING, TRENCH LOCATION IN REFERENCE TO OTHER UTILITIES,
CONDUIT LOCATION WITHIN THE TRENCH, BACKFILL AND COMPACTION OF
BACKFILL SHALL BE IN ACCORDANCE WITH ASTM INTERNATIONAL STANDARDS.

NOT TO SCALE

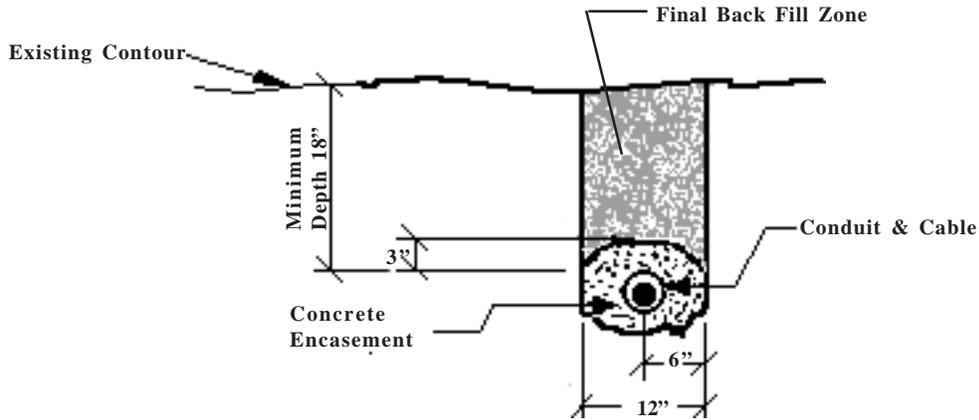
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7.2 Figure #2 Concrete Encased Conduit



Notes:

1. Conduit shall rest on either concrete or suitable foundation.
2. Concrete encasement shall be a 4 sack cement mix.

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