Customer Requirements for Electric Service
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Pre-Construction

Before beginning work on any new service or modifying an existing service, contact Idaho Power’s Customer Care Team at 208-388-2323 or 1-800-488-6151 (outside the Treasure Valley).

**EXCEPTION:** For new residential services only, if the installation meets the design limitations described in the Underground Residential Conduit Installation Requirements document; and the Customer will be installing the trench and conduit, Idaho Power does not need to be notified until the service is ready for the conductor and permanent meter to be installed.

Idaho Power strives to provide its Customers with the best possible service. Following the information contained in the current version of this document will allow the process to work efficiently and meet the Customer’s electrical service needs. The most up-to-date version of this document can be found on Idaho Power’s website at:

https://www.idahopower.com/service-and-billing/construction/

**Customer Generation.** Refer to the Idaho Power website for the requirements necessary to install a Customer-owned generation system at:


**Connection Requirements.** Services that do not meet Idaho Power’s requirements cannot be connected. There may be projects requiring engineering approval from Idaho Power (i.e., single-phase motors larger than 7 1/2-HP, phase converters, large loads, etc.) before the service can be connected.

All installations must meet the requirements of the National Electrical Code (NEC) with modifications as adopted by the Authority Having Jurisdiction at the service address and display the proper electrical permit. To avoid a return trip charge and a delay in service, make sure the installation has passed the required electrical inspections before requesting permanent service.

**ATTENTION!** Idaho Power cannot energize a new service or re-energize a disconnected service until it has passed an electrical inspection.

**Dig-Line.** Dial 811 (nationwide). To help prevent damage to other underground facilities, always call Dig-Line for a locate at least 2 business days before digging, excavating or driving a ground rod.
Required Permits

State and local governments may require that the following permits be obtained and provided to Idaho Power before connecting an electrical service:

- City or state electrical permit(s).
- Additional documents and paperwork depending on scope and location of the project (canal or highway permits, easements, etc.).

Service Voltages

**Single-phase (1-Ø):**
- 120/240-volt
- 240/480-volt
- 120/208-volt (“network”)

**Three-phase (3-Ø):**
- 120/208-volt
- 277/480-volt
- 120/240-volt (see note)
- 240/480-volt (see note)

**1-Ø Self-contained Meter Lug Arrangements**

**Note.** Single-phase, 120/208-volt services require a “network” meter with a 5th lug.

**3-Ø Self-contained Meter Lug Arrangement**

**Note.** Three-phase, 120/240-volt and 240/480-volt services are for maintenance only and are not available for new construction, except for some specific applications that must be approved in advance by Idaho Power.

Site Preparation

To avoid a return trip charge and unnecessary delays with a service installation, prepare the site before the arrival of Idaho Power’s team. Site preparation may include the following:

- Install the meter pole, flag its location, or mark the location on the building foundation.
- Provide clear access to the site.
- Identify all property lines with property pins and written documentation.
- Establish the final grade of the site.
- Obtain all required permits and inspections.

Be sure to route to the proper equipment. Refer to the Definitions section or contact Idaho Power for clarification.
Clearances

Separation Between Electric and Gas. A gas meter must have a minimum horizontal separation of 36-inches from any electric meter, enclosure or equipment. Electrical conduit is not considered electrical equipment.

For residential applications only, this clearance can be reduced to 36-inches measured in any direction, except that the horizontal separation must be at least 18-inches. Keep all electric equipment out of the shaded area as shown.

Propane Tanks. Any regulator, pressure relief valve, or fill connection associated with a propane tank or its delivery system must be at least 10-feet from any source of ignition, which includes the electric meter, air conditioning unit, etc. Keep the service conductor and conduit at least 3-feet from the tank.

NOTE. Propane dispensing tanks must be at least 20-feet from any source of ignition.

Overhead Power Lines. Persons, including any tools and equipment being held, must stay at least 10-feet from any overhead distribution power line, and further from any transmission power lines. Buildings, antennas, signs, pools and other objects require additional horizontal and vertical clearances from overhead power lines. Consult Idaho Power for more information.
**Padmounted Equipment.** The working clearance around padmounted equipment is a minimum of 10-feet from the front (or sides with doors) and 3-feet from the other sides and back. Equipment lifting requirements are either 10- or 20-feet above the equipment depending on its size. Keep shrubs, stored material, fences etc. out of this space.

**Working Clearance around Padmounted Transformer**

Combustible structures are required to be 10-feet from padmounted transformers. This clearance may be reduced to the 3-feet working clearance from a non-combustible wall. A 10-foot clearance is still required in front, to each side, and vertically of any door, operable window, air intake vent, or path of egress located on a non-combustible wall or surface.

**Clearance from a Non-Combustible Wall**

Non-combustible walls must have:

- A 1-hour fire rating for most commercial and industrial buildings.
- A 3-hour fire rating for residences and businesses where people may be sleeping (hotels, etc.).

**Exception:** Non-operable windows (that do not open) installed in a non-combustible wall require a 10-foot clearance in front, but only 3-feet to each side.
**Fire-Resistant Barriers.** Where it is not practical to obtain the required clearance between the equipment and a combustible building surface or opening; the Customer may provide a fire-resistant barrier constructed of non-combustible materials and meeting all applicable building codes and Idaho Power’s requirements.

An acceptable fire-resistant barrier is a free-standing wall such as brick, CMU block or concrete that is located between the padmounted equipment and a combustible building or surface.

Consider the following when constructing a fire-resistant barrier:

- Make sure that the height and length of the barrier meet the needs of each application.
- Allow space for reasonable variations in the size of the equipment should it need to be replaced in the future.
- The 10-foot clearance is measured “line-of-sight” between the nearest point on the equipment and the wall, opening and/or path of egress.
Changing an Existing Electrical Service

An existing electrical service may be changed, modified, or relocated to meet the Customer’s electrical needs. Sometimes, it may be necessary to disconnect the power to do this work. Some reasons for changing an existing electrical service may include:

- Additional power is needed, and the existing panel is not adequate for the Customer’s new loads. For example, the main breaker may be too small, or the panel is full and there is no room for additional circuits.
- There appears to be power quality problems due to additional or unusual Customer loads and Idaho Power’s service wires, cables, or equipment may be inadequate.
- Replacing an old or damaged panel.
- Relocating the service meter to another location.
- Converting from an overhead service to an underground service.
- Constructing a new structure or modifying an existing structure so the service wires or cables need to be relocated.
- Adding Customer Generation (such as solar panels) to the service. Usually the installer of these systems will determine if the existing electrical panel is adequate or not.

**ATTENTION!** Making changes to an existing service will require the service to comply with Idaho Power’s requirements in this and any other related documents.

Idaho Power will disconnect the existing service and then reconnect it after the work is completed at no cost provided:

1. Idaho Power receives at least 24 hours’ notice for the disconnect and the reconnect.
2. Both the disconnect and the reconnect are done during normal working hours (weekdays between 8:00 am and 5:00 pm).
3. The service is ready to be disconnected when Idaho Power arrives.
4. The service is ready to be reconnected when Idaho Power arrives with a passed an electrical inspection by the Authority Having Jurisdiction.

There may be a charge for this service if it is required outside normal business hours, or if Idaho Power is required to make an extra trip if the service is not ready or does not comply with Idaho Power’s requirements.

Construction fees may apply to any additional work or materials supplied by Idaho Power to meet the needs of the new service. Construction credit allowances may not be available when load is added to an existing service. An Idaho Power representative will review the new service requirements to determine if its existing facilities are adequate for the changes to the existing service.
Portable Generators

Do not connect a portable generator to a building’s electrical wiring unless a transfer switch has been installed as required by **NEC Article 702, Optional Standby Systems** (or other applicable NEC Articles). The transfer switch prevents the generator from feeding back into the Idaho Power electrical system, exposing workers to unforeseeable hazards. The generator can also be damaged if the electrical system becomes energized while the generator is operating.

Transfer devices that are installed in the meter base are not allowed.

Available Fault Current

The NEC requires that service entry equipment must be rated for the maximum available fault current from all sources—including any customer generation.

**Residential Services.** For typical, single-family, residential services with a self-contained meter; and served from a **100-kVA transformer** or smaller, the available fault current contribution from Idaho Power will require service equipment ratings as shown:

<table>
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<tr>
<th>Service</th>
<th>Overhead Services</th>
<th>Underground Services</th>
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<tr>
<td></td>
<td>from Transformer</td>
<td>from Handhole</td>
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<tr>
<td>&gt; 30-ft</td>
<td>&lt; 30-ft</td>
<td>&gt; 40-ft</td>
</tr>
<tr>
<td>400A</td>
<td></td>
<td>&gt; 80-ft</td>
</tr>
<tr>
<td>&gt; 50-ft</td>
<td>&lt; 50-ft</td>
<td>&gt; 80-ft</td>
</tr>
</tbody>
</table>

Contact Idaho Power to obtain more precise fault current contributions, for larger transformers, or for any other type of residential service. Please have a service length and demand load available.

**Commercial, Industrial and Irrigation Services.** Contact Idaho Power to obtain the maximum available fault current.

Who Provides the Materials?

Most materials are provided by the Customer. Idaho Power will provide the meter and service conductors from its facilities to the point of delivery and may provide other material for some installations. Refer to the service diagrams for an installation type for additional information.

Materials provided by Idaho Power may be charged to the Customer as part of the cost of the service. Consult Idaho Power for specific prices. For residential, single-phase services up to 400-amps, Customers may also refer to the Idaho or Oregon cost information sheets.

**Connectors.** Generally, the owner of the enclosure or equipment will provide the electrical connectors (lugs or terminals) within that piece of equipment necessary to connect the electrical conductors, regardless of who owns the conductors. The number, size, and type of conductors must be known so that the proper lugs or terminals can be provided.
When Will Construction Begin?

Idaho Power will schedule installation when all necessary payments, signatures, documents and permits have been received by the company. Idaho Power will strive to meet the requested in-service date; however, construction may be affected by the availability of materials, manpower, weather, site preparation or change orders. The installation may be done by Idaho Power or one of its contractors.
Definitions

General Terms

ANSI (American National Standards Institute) is an organization responsible for a variety of industry standards including pole class.

Authority Having Jurisdiction refers to the Electrical Inspector for the state or city in which the Customer’s equipment is installed.

Customer refers to a present or prospective user of Idaho Power’s service.

EUSERC (Electric Utility Service Equipment Requirements Committee) is the committee that develops standards for meter enclosures and service equipment.

Idaho Power refers to Idaho Power Company or its authorized agent.

IEEE (Institute of Electrical and Electronics Engineers) is an organization that publishes a variety of industry standards for electrical and electronic equipment.

NEC (National Electric Code) is the Code that establishes the requirements for Customer’s wiring that is adopted and/or amended by law and enforced by the Authority Having Jurisdiction. Electrical wiring for Idaho Power is governed by a different Code.

Service has two definitions:

1. The supply of electricity from Idaho Power to the Customer.
2. The conductors (wires or cables) that connect Idaho Power’s facilities to Customer’s equipment.

Tariff refers to the requirements, limitations and rates for a Customer’s service. Tariffs are governed by the Public Utilities Commission.

Electrical Terms

Amp (A) is short for “ampere” and refers to the measurement of current flow. It may also refer to the maximum current a piece of electrical equipment is designed to accommodate (i.e. 200-A meter base).

Arc Flash refers to the release of energy caused by an electrical arc. Protection from the hazards associated with a possible arc flash are established by OSHA (Occupational Safety and Health Administration) and the National Fire Protection Association (NFPA 70E).

Fault Current refers to the amount of electrical current that can be supplied to Customer's equipment in the event of a short circuit. Customer equipment must have an AIC (available interrupting current) rating able to withstand this current.

Horsepower (HP) refers to the size (electrical load) of a motor: 1-HP = 0.746-kW.

Kilowatt (kW) refers to the size (electrical load) of a Customer’s service: 1-kW = 1000-watts.
Kilowatt-Hour (kWh) refers to the electrical consumption of a Customer’s load. A 1000-watt load operating for 1-hour uses 1-kWh.

Kilovolt Ampere (kVA) refers to the apparent power of a Customer’s load and is what Idaho Power uses to size its facilities. kVA = kW/pf.

Non-linear Load refers to an electrical device that draws current in a non-sinusoidal waveform such as:
- Solid-state motor drives
- Variable frequency drives
- Adjustable speed drives
- Electronic motor controllers
- Electronic power supplies
- Electronic phase converters

Tariffs require that these loads must meet IEEE 519-1992 guidelines regarding their effect on voltage distortion and notching.

Phase (Ø) refers to the number of waveforms for an electrical service, either single-phase (1-Ø) or three-phase (3-Ø).

Power Factor (pf) is a ratio used to measure the inefficiency of an electric load. Idaho Power may need to install larger facilities to serve a Customer’s load if the power factor is too low.

Volt (V) is the measurement of electrical potential and corresponds to the Customer’s service voltage (i.e. 120/240-V).

Voltage Drop is a reduction in supply voltage due to resistive heating losses in conductors.

Conduit

Conduit refers to a continuous raceway used for installing electrical conductors.

EMT (Electrical Metal Tubing) is thin wall metal tubing.

Rigid Conduit is required by Idaho Power for certain applications and includes the following types:
- IMC (Intermediate Metal Conduit) is lighter weight than RMC and GRC, but still acceptable for applications that require rigid conduit.
- RMC (Rigid Metal Conduit) and GRC (Galvanized Rigid Conduit) are heavy wall metallic conduit.
- Schedule 80 PVC is heavy weight, non-metallic conduit and is acceptable below ground and for applications that require rigid conduit.

Schedule 40 PVC is a non-metallic conduit that is acceptable to Idaho Power for use below ground.

Weatherhead refers to the weatherproof service drop entry point where overhead power conductors enter the conduit to the meter base.
Metering

Current Transformer (or CT) is an instrument transformer used in metering that allows large Customer loads (those that exceed the capacity of self-contained meters) to be measured.

Current Transformer Enclosure (or CT Enclosure) is a cabinet that houses Idaho Power’s instrument transformers.

Meter is a device for measuring the electric energy consumed by a Customer.

Metering Wires are wires installed in 1-inch conduit by Idaho Power between the CTs and the meter.

Meter Seal is a device installed on a meter base by Idaho Power that, when broken, indicates that the meter base has been opened.

Self-contained Meter refers to a meter that measures a Customer’s load without using CTs.

Poles

Pole Class is an ANSI standard used to establish the strength of a wood pole based on the type of wood and the dimensions of the pole at specific locations. If the pole is not branded follow the table below:

<table>
<thead>
<tr>
<th>Pole Length</th>
<th>Top</th>
<th>6’ from Pole Butt</th>
</tr>
</thead>
<tbody>
<tr>
<td>20’</td>
<td>17” min</td>
<td>23” min</td>
</tr>
<tr>
<td>25’</td>
<td>17” min</td>
<td>26” min</td>
</tr>
<tr>
<td>30’</td>
<td>17” min</td>
<td>28” min</td>
</tr>
<tr>
<td>35’</td>
<td>17” min</td>
<td>30” min</td>
</tr>
</tbody>
</table>

Measurements are circumference for Douglas Fir or Western Red Cedar. Other species of wood poles will vary. For more information contact Idaho Power.

A minimum Class 6, round, treated, wood pole in like-new, climbable condition is required for permanent service. A 6-inch by 6-inch, treated wood post may be used for a temporary service only.

Pole Size refers to the overall length of the pole and includes the portion buried in the ground.
Services

Single-phase (1-Ø) Service refers to an overhead or underground three-wire service used to serve 1-Ø loads. Typically for residential or small commercial and some irrigation Customers.

Three-phase (3-Ø) Service refers to an overhead or underground four-wire service used to serve 3-Ø loads. Typically for commercial, most irrigation and industrial Customers.

Point of Attachment for overhead services is the point on the Customer’s building, structure or pole that supports service wires.

Service Point is the point where Idaho Power’s service conductors connect to the Customer’s wires or equipment.

♦ For self-contained meters on overhead services, the service point is located at the drip loop where the Customer’s conductors exit the weatherhead.
♦ For self-contained meters on underground services, the service point is located at the line-side lugs in the meter base.
♦ For CT metered overhead services, the service point is located at the drip loop where the Customer’s conductors exit the weatherhead, or at the connection of Idaho Power’s conductors to the Customer’s conductors.
♦ For CT metered underground services, the service point is located in the CT enclosure for Idaho Power-owned services; or at the secondary lugs of the transformer, or secondary bus cabinet for Customer-owned services.
♦ For multi-metered services, the service point is located at the lugs in the incoming section of the service equipment.

Service Disconnect is a Customer-owned circuit breaker or fused switch that is intended to disconnect the Customer’s electrical system from Idaho Power.
Equipment

**Handholes** are small subsurface boxes that contain connections between the Customer’s service and Idaho Power’s facilities. Don’t hide, bury or drive vehicles over handholes.

**Pedestals** are above-ground boxes that contain connections between the Customer’s service and Idaho Power’s facilities. Meter pedestals are different, as they contain a meter base and not just connectors.

**Transformers** are electrical devices that convert Idaho Power’s high voltage facilities to the desired voltage needed for the Customer’s service.
1-Ø and 3-Ø Padmounted Transformers

Don’t mistake other Idaho Power padmounted equipment for a transformer. Only transformers have service voltages on them. Contact Idaho Power for clarification.

Other Padmounted Equipment
Meters

Meter Base Requirements

Refer to the Meter Base Identification document for more information.

208-Volt 3-Ø Meter Base. EUSERC-approved with or without “safety socket test bypass” meter bases are accepted on all self-contained, 208-volt services up to 200-amps.

480-Volt 3-Ø Meter Base. EUSERC-approved with “safety socket test bypass” meter bases area required on all self-contained, 480-volt meter bases up to 200-amps.

CT Meter Bases. CT meters are required for services greater than 400-amps. Bases for these meters are provided by Idaho Power.

NOTE. There is an additional charge for CT metering when the Customer’s main breaker or panel size is 400-amps or less.

Meter Location

The meter and any associated equipment must be located so that the installation and any future maintenance can be performed without undue inconvenience to the Customer or Idaho Power. Locate residential meters as shown below:

Residential Meter Location

The meter must be located in a reasonably protected area to minimize the risk of inadvertent damage. Placing the meter in front of the fence keeps Idaho Power personnel out of the back yard.

The meter base, conduit and any CT enclosure must be adequately supported on the outside of an exterior structure wall so that it will be readily accessible to Idaho Power. Do not cover or enclose the meter.

Recessed Meter Bases. Recessed meter bases are not allowed.
**Meter Poles**

All poles for mounting metering equipment are provided, installed and owned by the Customer. They must be tall enough to provide adequate clearance above the finished grade or obstacles for the service conductor and drip loop.

Each pole must have a minimum setting depth of **10% of the length of the pole plus 2-feet, 6-inches**. Additional bracing must be installed if the tension of the service conductor will cause the pole to lean. A minimum Class 6, round, wood pole is required for permanent service.

**Meter Height**

**Permanent Meters.** The preferred height for permanent meters is 5-feet, 6-inches (to the center of meter socket) above finished grade or other accessible surface such as a deck or stairs. Meters may be mounted between 4-feet and 6-feet, except in areas with heavy snowfall, where the minimum height is 5-feet.

*Minimum height in heavy snowfall areas is 5'-0"

**Non-CT** meters for underground services not associated with a building, such as pedestals or on freestanding racks, may be mounted as low as 3-feet.

*Minimum height in heavy snowfall area is 5'-0"

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*Permanent Meter Height*

*Non-CT* meters for underground services not associated with a building, such as pedestals or on freestanding racks, may be mounted as low as 3-feet.

*Minimum height in heavy snowfall area is 5'-0"*
The tops of multiple meter bases must be no higher than 6-feet, 6-inches.

**Multiple Meters**

The NEC generally requires a building or structure to be supplied by only one service (meter). Multiple meters of the same Rate Class are not allowed on a single structure at a single address. This requirement does not apply to two-meter Customer generation installations or multi-tenant buildings such as duplexes, apartments complexes or strip malls.

**Marking.** Each meter base or service disconnect that is part of an installation with more than one meter is required to be plainly marked with numbers and/or letters that correspond to the address, suite, office or room it serves. **Marking shall be a permanent nameplate or placard** (hand-written address information is not acceptable).

**Tap Gutters.** Tap gutters are not allowed for connecting multiple meters.

**Meter Rooms for Multiple Meters**

Multiple meter installations for multi-tenant buildings may be located in a meter room provided that all of the following criteria are met:

1. A plan for the meter room must be submitted to Idaho Power for approval prior to construction.
2. The meter room must be directly accessible to Idaho Power through an exterior metal door without having to pass through another interior space.
3. A lock box must be provided on the exterior of the building at the exterior door.
4. The exterior door must be permanently labeled with the words “Electrical Room”.
5. The meter room may only be used for electrical equipment and communication equipment that does not interfere with the electrical equipment. No storage of any kind is allowed.
6. Lighting, drainage and health issues are the responsibility of the Customer.

**NOTE.** The meter for a single tenant building may not be installed in an electrical or meter room.
Working Space

Keep the 36-inch by 36-inch area directly in front of the meter base clear of any equipment, landscaping or other obstacles that could interfere with access to the meter.
Temporary Service

General

A Temporary Service is a non-recurring service intended to be used for a limited time (not to exceed 18 months) for construction.

**ATTENTION!** Idaho Power cannot connect a temporary service without a passed electrical inspection in most cities within its service territory.

Contact Idaho Power about installing a temporary service to:

- Determine which transformer or handhole will be used as the source for the temporary service.
- Receive a single-phase temporary service from a three-phase, 120/208-volt source. A regular 120/240-volt meter base is not acceptable since a “network” meter with a 5th lug is required.
- Receive a three-phase temporary service.
- Receive a single- or three-phase, 480-volt temporary service.

**Overhead Requirements.** The Customer-provided meter pole must be securely set in a location that will allow the temporary service conductor to be attached to the permanent meter location by merely relocating it. A maximum of 100-feet of #2 triplex conductor is allowed.

**Underground Requirements.** The Customer-provided meter post must be securely set within 2-feet of the handhole, pedestal or padmounted transformer. Dig the post hole and set the post by tamping it in place. Trench up to the transformer, handhole or pedestal and leave enough wire coiled up in the trench to reach the connection point. Idaho Power will insert the cable into the equipment and backfill the trench.
# Overhead Temporary Service

<table>
<thead>
<tr>
<th>Item</th>
<th>Provided by</th>
<th>Installed by</th>
<th>Maintained by</th>
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<tbody>
<tr>
<td>Meter</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
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<tr>
<td>Conductor from transformer to drip loop</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
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<tr>
<td>Connectors for service conductors at drip loop</td>
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<td>Idaho Power</td>
<td>Idaho Power</td>
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<tr>
<td>Meter base with lugs</td>
<td>Customer</td>
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<tr>
<td>Conduit, support brackets and weatherhead</td>
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<tr>
<td>Pole for equipment mounting</td>
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<td>Point of attachment</td>
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<td>Conductor from meter base to drip loop per NEC</td>
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<td>Grounding electrode(s), ground conductor and connections per NEC</td>
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Underground Temporary Service

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<td>Meter</td>
<td>Idaho Power</td>
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<td>Idaho Power</td>
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<tr>
<td>Connectors for temporary conductors at transformer or handhole</td>
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<td>Idaho Power</td>
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<tr>
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<td>Conduit, support bracket(s)</td>
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<td>Post for equipment mounting</td>
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<td>Conductor from meter base to transformer or handhole</td>
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</tbody>
</table>
Overhead Services

Heights for Overhead Services

Overhead services must meet the minimum clearance above the finished grade or other accessible surface as shown below. Make sure the point of attachment is high enough to meet these requirements.

Contact Idaho Power to determine the minimum conductor height requirement when the service conductor must cross over areas that are not addressed here (such as a road, highway, railroad track, canal, waterway, etc.).

**Mast Height.** If the installation requires a mast height that exceeds 15-feet above grade in pedestrian areas, or 18-feet above residential driveways, contact Idaho Power prior to construction to verify that the service can be safely installed.

Services Over Building Roofs

A service conductor or drip loop that crosses over the roof of a building must meet the minimum conductor height over the roof as shown in Table 1 Minimum Conductor Heights. There are three exceptions where reduced clearances are permitted:

1. A service conductor (or the drip loop) up to 600-roots line-to-line that crosses over a non-accessible roof must have a clearance of 8-feet above the roof.

2. A service conductor (or its drip loop) up to 300-volts line-to-line that crosses over a non-accessible roof with a slope of 4-to-12 or greater must have a clearance of 3-feet above the roof.
3. A service conductor (or its drip loop) up to 300-volts line-to-line that crosses only the eave portion of the roof where it reaches the service mast must have an 18-inch clearance over the roof. The service mast must not be more than 4-feet from the edge of the roof. Only 6-feet of the service conductor may be above the roof as shown:

**Exception 3 typically applies to the most common installations for service to a building. Exceptions 1 and 2 often apply where the service mast location for the building being served will not qualify for Exception 3. A roof may be considered non-accessible if it cannot be reached through a door, window or by a stairway, or fixed ladder.**

**Service Mast.** Use a minimum of 2-inch conduit for service masts. Masts that penetrate a roof must be rigid conduit (RGS or IMC). Non-rigid EMT or Schedule 80 PVC conduit may be used below the roof.

**Mast and Roof Height.** If the installation requires a mast height that exceeds 6-feet above a roof, or the roof height exceeds 10-feet above grade (without bucket truck access); contact Idaho Power prior to construction to verify that the service can be safely installed.

**Bracing.** Bracing is required for masts that exceed 30-inches above a roof, in heavy snow areas, or where the service span exceeds the length shown in **Table 2 Maximum Span Lengths**.

**Table 2: Maximum Span Lengths**

<table>
<thead>
<tr>
<th>Service Size</th>
<th>1Ø</th>
<th>3Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>200A and less</td>
<td>100'</td>
<td>80'</td>
</tr>
<tr>
<td>201 - 400A</td>
<td>80'</td>
<td>60'</td>
</tr>
<tr>
<td>Larger than 400A</td>
<td>60'</td>
<td>40'</td>
</tr>
</tbody>
</table>

*Contact Idaho Power for requirements.
### 1-Ø Overhead (Residential) Service

<table>
<thead>
<tr>
<th>Item</th>
<th>Provided by</th>
<th>Installed by</th>
<th>Maintained by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
</tr>
<tr>
<td>Conductor from transformer to drip loop</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
</tr>
<tr>
<td>Connectors for service conductors at drip loop</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
</tr>
<tr>
<td>Meter base with lugs</td>
<td>Customer</td>
<td>Customer</td>
<td>Customer</td>
</tr>
<tr>
<td>Conduit, support brackets, weatherhead and bracing</td>
<td>Customer</td>
<td>Customer</td>
<td>Customer</td>
</tr>
<tr>
<td>Structure for equipment mounting</td>
<td>Customer</td>
<td>Customer</td>
<td>Customer</td>
</tr>
<tr>
<td>Conductor from meter base to drip loop per NEC</td>
<td>Customer</td>
<td>Customer</td>
<td>Customer</td>
</tr>
<tr>
<td>Grounding electrode(s), ground conductor and connections per NEC</td>
<td>Customer</td>
<td>Customer</td>
<td>Customer</td>
</tr>
<tr>
<td>Item</td>
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<td>Installed by</td>
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<td>Idaho Power</td>
</tr>
<tr>
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<td>Customer</td>
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</tr>
<tr>
<td>Conduit, support brackets, weatherhead and bracing (as required)</td>
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<tr>
<td>Structure for equipment mounting</td>
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Overhead Service to a Pole (1-Ø or 3-Ø)

<table>
<thead>
<tr>
<th>Item</th>
<th>Provided by</th>
<th>Installed by</th>
<th>Maintained by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter</td>
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<td>Conductor from transformer to drip loop</td>
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</tr>
<tr>
<td>Meter base with lugs</td>
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</tr>
<tr>
<td>Conduit, support brackets and weatherhead</td>
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<td>Customer</td>
</tr>
<tr>
<td>Pole for equipment mounting</td>
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</tr>
<tr>
<td>Point of attachment</td>
<td>Customer</td>
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<td>Customer</td>
</tr>
<tr>
<td>Conductor from meter base to drip loop per NEC</td>
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<td>Customer</td>
<td>Customer</td>
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<tr>
<td>Grounding electrode(s), ground conductor and connections per NEC</td>
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<td>Customer</td>
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</tbody>
</table>

**Metal Poles** may be allowed under certain circumstances and must be approved by Idaho Power prior to installation.
## Overhead CT Service to a Building (1-Ø or 3-Ø)

<table>
<thead>
<tr>
<th>Item</th>
<th>Provided by</th>
<th>Installed by</th>
<th>Maintained by</th>
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</thead>
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<tr>
<td>CTs and meters</td>
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<tr>
<td>Conductor from drip loop to transformer</td>
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<td>Idaho Power</td>
<td>Idaho Power</td>
</tr>
<tr>
<td>Connectors for the service conductors at drip loop</td>
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<tr>
<td>CT metering wires and connectors</td>
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<td>Idaho Power</td>
<td>Idaho Power</td>
</tr>
<tr>
<td>CT meter base with lugs</td>
<td>Idaho Power</td>
<td>Customer</td>
<td>Idaho Power</td>
</tr>
<tr>
<td>1-inch conduit, support brackets and weatherhead for CT wiring</td>
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<td>Customer</td>
<td>Idaho Power</td>
</tr>
<tr>
<td>Conduit, support brackets, weatherhead and bracing (as required)</td>
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<td>Customer</td>
<td>Customer</td>
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</tr>
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</table>
Overhead CT Service to a Pole (1-Ø or 3-Ø)

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<td>CTs and meters</td>
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<tr>
<td>CT meter base with lugs</td>
<td>Idaho Power</td>
<td>Customer</td>
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<td>1-inch conduit, support brackets and weatherhead for CT wiring</td>
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<td>Idaho Power</td>
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<tr>
<td>Pole for equipment mounting</td>
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<td>Point of attachment</td>
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<tr>
<td>Conductor from service equipment to drip loop per NEC</td>
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<tr>
<td>Grounding electrode(s), ground conductor and connections per NEC</td>
<td>Customer</td>
<td>Customer</td>
<td>Customer</td>
</tr>
</tbody>
</table>
Sealing for Moisture and Gas

Each meter base that is connected to an underground service where the service conductors are installed in conduit must have all opening(s) between the meter base and the interior of a building permanently sealed to prevent any liquids or vapors from passing into the building. See NEC 230.8, Raceway Seal.

Underground Conduit

Use gray, UL listed, Schedule 40 or Schedule 80 PVC conduit, bends and fittings for Idaho Power-owned service installed below grade. The NEC requires Schedule 80 PVC or another type of rigid conduit above grade and for Customer-owned service conduit. All conduit joints must be completely seated and permanently glued with PVC cement. Contact Idaho Power for size and quantity of conduit(s) required.

Single-phase, residential services. The Customer may provide and install the Idaho Power conduit below grade by following the Underground Residential Conduit Installation Requirements document on the Idaho Power website for this program.

Slip couplers. Slip-couplers are required for all one- and two-family residential services.

Non-residential services. The Customer may work with an Idaho Power designer to determine if it is beneficial for the Customer to install Idaho Power-owned underground service conduit. Follow the trench, backfill and compaction requirements below when installing Idaho Power conduit.

Bend Radius. Use grey colored, manufactured bends. For 2-inch and 3-inch conduit, use 24-inch radius bends and 36-inch radius bends for larger sized conduits. Do not heat conduit in any way to shape it or form bends in the field!

Burial Depth. Conduit for electrical service conductors must be buried 30-inches deep. The trench must be deeper than the burial depth to allow for the diameter of the conduit. Contact Idaho Power if this depth cannot be achieved.
Conduit Routing. The preferred route for service conduit is the most direct, straight-line path between the Idaho Power facility (transformer, handhole, or pole) and the meter. Keep the number of conduit bends to a minimum.

Avoid routing service conduit under driveways, or in areas where it is reasonable to expect future digging—particularly routes that run along property lines. If the route must follow a property line, keep the conduit at least 2-feet away. Do not route service conduit under buildings or build over the top of existing service conduits.

Separation from other Utilities. Keep electrical service conduit at least 12-inches from other underground utility lines. Avoid routing electrical conduit parallel to or directly above or below other underground utilities.

Installation. Keep dirt and debris out of the conduit. Make square conduit cuts and remove burrs from the inside and outside edges. All joints must be completely seated and permanently glued with PVC cement. Do not change conduit sizes in the run.

Trench Requirements

Trench Spoils. Keep trench spoils at least 2-feet from the edge of the trench and any property pins or permanent markers and out of the roadway or other access areas whenever possible. Any spoils or debris to be removed from the site should be hauled away each day and disposed of in accordance with all applicable regulations.

CAUTION! Any open trench must be adequately barricaded or protected for public safety as required by local, state or federal rules and regulations.
Shading and Backfill. Shade the conduit with enough 2-inch select backfill material to provide a 6-inch covering. This helps protect the conduit from being damaged during the compaction process. After shading, backfill the rest of the trench with 6-inch select backfill material. Don’t put garbage, wood, ice, etc., in the trench.

![Diagram of Shading and Backfill](image)

**Compaction**

Compact all trench backfill to prevent future trench settling. Some settling may be permissible in most new construction areas that are not under paved areas such as sidewalks, driveways and road surfaces. These areas are much more sensitive to settling and require high compaction.

**Standard Compaction.** Standard compaction is required for most new construction projects where some settling is permissible and achieves up to an 80% compaction rate but is dependent on soil conditions. Backfill with the desired material and wheel roll the trench. The first 6-inches of cover can be native soil with no rocks larger than 2-inches. The remainder of the trench can be native soil with no rocks larger than 6-inches.

**Medium Compaction.** Medium compaction is required when trenching through existing landscaped areas where only minimal trench settling is tolerable. Backfill the trench with the same material as required for standard compaction, but in 24-inch lifts. Compact each lift with a tamping rammer or other similar compaction device.

**High Compaction.** High or 95% compaction results in the least amount of trench settling and is required in certain rights-of-ways and when the trench is under paved or concrete surfaces such as roadways, alleys, parking lots, driveways and sidewalks. Backfill with 3/4-inch road mix, pit run, or sand in 12-inch lifts, compacting each lift with a tamping rammer or other similar compaction device. Using shallower lifts or adding water to the backfill may help reach the desired compaction rates.
Special Requirements for Poles

If the service will come from a pole, contact an Idaho Power prior to digging the trench. An Idaho Power representative will determine:

1. If the pole is adequate for the service.
2. Toward which side of the pole to route the conduit.

Underground Conduit to a Pole

Trench all the way to the base of the pole. If the pole becomes unstable, contact Idaho Power immediately! When backfilling the trench, leave 6- to 8-feet open adjacent to the pole. After Idaho Power connects the pole riser and conduit, it is the Builder’s responsibility to backfill and compact any remaining trench.
Handholes in Driveways

Standard-duty plastic handholes cannot be driven over. Heavy-duty handholes can only be driven over if they are cast into a concrete driveway or a concrete area not less than 18-inches larger in all directions than the handhole.

A Customer has three options when a driveway or other driving surface conflicts with the location of an existing handhole:

1. Move the driveway away from the handhole, thus avoiding the conflict.
2. Pay Idaho Power to install a suitable handhole or vault that is rated for the expected usage.
3. Frame a 24-inch by 35-inch opening in a concrete driveway that will accommodate a steel protective cover. The Customer or Idaho Power (at the Customer’s expense) can provide this cover.
   - The cover must be made with 1/4-inch galvanized diamond plate steel, have a 5/8-inch hole for lifting, and be permanently marked with “IPCO”.
   - The opening in the concrete must have a 1/4-inch by 1-inch shelf on all four sides to support the cover, which must be flush with the driveway surface.
   - There must be at least 2 inches between the steel cover and the top of the handhole.

![Handhole in a Driveway Diagram](image-url)
### 1-Ø Underground (Residential) Service

The diagram illustrates the components of a 1-Ø underground service for residential use, including the meter base, conduit, and connections. The table below lists the items, the party responsible for providing, installing, and maintaining them:

<table>
<thead>
<tr>
<th>Item</th>
<th>Provided by</th>
<th>Installed by</th>
<th>Maintained by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
</tr>
<tr>
<td>Wire from transformer or hand hole to meter base</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
</tr>
<tr>
<td>Connection of Idaho Power wire at meter base</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
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</tr>
<tr>
<td>Conduit below grade (see Note)</td>
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</tr>
<tr>
<td>Meter base with lugs</td>
<td>Customer</td>
<td>Customer</td>
<td>Customer</td>
</tr>
<tr>
<td>Conduit riser above grade, slip coupler and support bracket(s)</td>
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<td>Customer</td>
<td>Customer</td>
</tr>
<tr>
<td>Structure for equipment mounting</td>
<td>Customer</td>
<td>Customer</td>
<td>Customer</td>
</tr>
<tr>
<td>Wire from meter base to main disconnect</td>
<td>Customer</td>
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<tr>
<td>Connection of Customer wire at meter base</td>
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<tr>
<td>Structure for equipment mounting</td>
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<tr>
<td>Grounding electrode(s), ground wire and connections per NEC</td>
<td>Customer</td>
<td>Customer</td>
<td>Customer</td>
</tr>
</tbody>
</table>

**NOTE:** The Customer may provide and install the underground conduit (Schedule 40) from the Idaho Power service point to the meter riser for residential services that meet certain criteria. Refer to the *Underground Residential Conduit Installation Requirements* for more information.
### 3-Ø Underground (Commercial) Service

<table>
<thead>
<tr>
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</tr>
<tr>
<td>Connection of Idaho Power conductor at meter base</td>
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<tr>
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<tr>
<td>Meter base with lugs</td>
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<tr>
<td>Conduit riser above grade and support bracket(s)</td>
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<td>Structure for equipment mounting</td>
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<td>Conductor from meter base to main disconnect</td>
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<td>Connection of Customer conductor at meter base</td>
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Idaho Power-owned Underground CT Service (1-Ø or 3-Ø)

CT Enclosure Requirements

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<tr>
<td>CT metering wires and connectors</td>
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<tr>
<td>1-inch Conduit for CT wiring</td>
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<td>Conduit above ground per NEC</td>
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<td>Grounding electrode(s), ground conductor and connections per NEC</td>
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</tr>
</tbody>
</table>

Enclosures larger than 36" x 36" require a hinged cover.

CT meter can be located to the side or above CT enclosure. Keep 6" between enclosures.

идна Мощность (Ø или 3-Ø)

Технические требования для установки CT (1-Ø или 3-Ø)

<table>
<thead>
<tr>
<th>Тип оборудования</th>
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<td>1-дюймовый провод для CT</td>
<td>Customer</td>
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<td>Idaho Power</td>
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<td>Провод сверху по NEC</td>
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<td>Установка CT по требованиям Idaho Power</td>
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<td>Соединители для проводов</td>
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<td>Установка CT с растяжками до отключения по NEC</td>
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<tr>
<td>Кабельное оборудование с учетом NEC</td>
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</tbody>
</table>

*Enclosures larger than 36" x 36" require a hinged cover.*
Customer-owned Underground CT Service (1-Ø or 3-Ø)

**OPTION:** CT meter may be installed by Idaho Power on the side of the transformer.

**WARNING!** Do not dig under transformer.

<table>
<thead>
<tr>
<th>Item</th>
<th>Provided by</th>
<th>Installed by</th>
<th>Maintained by</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTs and meter</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
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<tr>
<td>CT metering wires and connectors</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
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<tr>
<td>CT meter base with lugs (when not installed on transformer)</td>
<td>Idaho Power</td>
<td>Customer</td>
<td>Idaho Power</td>
</tr>
<tr>
<td>1-inch Conduit for CT wiring</td>
<td>Customer</td>
<td>Customer</td>
<td>Idaho Power</td>
</tr>
<tr>
<td>Conductor below grade per NEC</td>
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<tr>
<td>Conductor from transformer to service disconnect per NEC</td>
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<td>Connections for the service conductors at transformer</td>
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<tr>
<td>Structure for equipment mounting</td>
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<tr>
<td>Grounding electrode(s), ground conductor and connections per NEC</td>
<td>Customer</td>
<td>Customer</td>
<td>Customer</td>
</tr>
</tbody>
</table>

CT meter base may be supported on a building wall, 3” galvanized pipe (RMC); or 12-guage, 1-5/8” x 1-5/8” slotted channels set 2’ deep in concrete.

18” (min.)

Support bracket(s) as needed

Ground per NEC

Use 18” special radius bends

Sch. 40 PVC allowed below ground
### Basement under Transformer for More than 8 Runs of Conductor

<table>
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<td>CT meter base with lugs</td>
<td>Idaho Power</td>
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<tr>
<td>Conduits from transformer to secondary bus enclosure</td>
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<tr>
<td>Basement and pad w/hinged cover</td>
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<td>Secondary bus enclosure</td>
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<td>Conduit below grade per NEC</td>
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<tr>
<td>Conduits from bus enclosure to service disconnect per NEC</td>
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<tr>
<td>Connections for service conductors at secondary bus enclosure</td>
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<td>Grounding electrode(s), ground conductor and connections per NEC</td>
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**Idaho Power-owned Underground Service to Multiple Meters (1-Ø or 3-Ø)**

<table>
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<tr>
<td>Conductor from transformer to service entrance section</td>
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</tr>
<tr>
<td>Connection of Idaho Power conductor at lugs</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
<td>Idaho Power</td>
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<tr>
<td>Conduit below grade</td>
<td>Idaho Power</td>
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<tr>
<td>Multi-meter equipment with lugs</td>
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<tr>
<td>Conduit riser above grade and support bracket(s)</td>
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<tr>
<td>Structure for equipment mounting</td>
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<td>Grounding electrode(s), ground conductor and connections per NEC</td>
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</tbody>
</table>

**NOTE:** For multi-meter services requiring CT metering, refer to the “Idaho Power-owned Underground CT Service” diagram for enclosure dimensions.
### Underground Service Not Associated with a Building (1-Ø or 3-Ø)

**Diagram:**
- Meter base may be supported using 3" galvanized pipe (RMC), or 12-gauge, 1-5/8" x 1-5/8" slotted channels set 24" deep in concrete.
- Support bracket(s) as needed.
- Conduit riser above grade and support bracket(s)
- Structure for equipment mounting
- Grounding electrode(s), ground conductor and connections per NEC

<table>
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<td>Conductor from transformer to meter base</td>
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<td>Connection of Idaho Power conductor at lugs</td>
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<tr>
<td>Conduit below grade</td>
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<tr>
<td>Meter base with lugs</td>
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<tr>
<td>Conduit riser above grade and support bracket(s)</td>
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## Revision History

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<td>0</td>
<td>03/15/2020</td>
<td>Reformatted, clarified and combined overhead and underground service requirements, definitions, changing existing service, and temporary service documents into a single document. Added additional definitions, information on site preparation and clearances, permits and inspection requirements, and trenching and conduit requirements. Recessed meter bases and tap gutters are no longer allowed. Updated residential fault current values.</td>
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