

UNDERGROUND RESIDENTIAL CONDUIT

INSTALLATION REQUIREMENTS

NOVEMBER 2024

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Table of Contents

Introduction	1
Conformance.....	1
Design Limitations.....	2
Conduit and Trench Requirements.....	2
Important Information.....	3
Ownership and Maintenance.....	4
Meter Base Requirements	4
Installation Requirements.....	6
Available Fault Current	7
Transformers.....	7
Clearance Requirements.....	8
Handholes or Pedestals.....	10
Special Requirements for Poles	11
Distributors of 2" and 3" Schedule 40 PVC 90° Bend with 24" Radius	12

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Underground Residential Conduit Installation Requirements

Introduction

The Customer has the option of installing the underground residential conduit for the service cable in new single-phase, residential, underground electrical services. This document is a guide to the installation requirements. Idaho Power will install the service cable and meter after the installation is complete, inspected, and all requirements have been met.

NOTE—Refer to the [Customer Requirements for Electric Service](#) document on the Idaho Power website for additional requirements and information applicable to all services.

Contact Idaho Power if:



- ◆ This is the first time using this program.
- ◆ The service does not conform with the design limitations below.
- ◆ A conduit stub cannot be found.
- ◆ Service from a pole is required.

Dig-Line—At least 2-10 days before you dig, call **811** or go to [811 In Your State](#) to request buried utility lines be marked.

DIGLINE, Inc. provides a one-call solution to notify all public utility companies of pending excavations, allowing them to mark their lines.



**Know what's below.
Call before you dig.**

Conformance

Installations are subject to inspection at any time by Idaho Power for conformance to these service requirements. If a non-conformance is discovered, then the cable **will not be installed**. Non-conformities might occur in the conduit length, route, depth, etc., or if the service is not ready when the installation crew arrives. After the non-conformance is corrected, contact Idaho Power to reschedule the installation. There will be a return trip charge; see [Cost Information](#) for more information.

ATTENTION! Non-conformances are corrected at the Customer's expense. Idaho Power cannot connect a new service until it has passed an electrical inspection.

It is important to follow the requirements in the most current version of **this** document. If this is a printed copy, check the Idaho Power website at the link below for a new version with the most current requirements:

www.idahopower.com/accounts-service/construction-remodeling/installing-new-service/

Underground Residential Conduit Installation Requirements

Design Limitations

For services using self-contained meter bases that meet the following limitations, contact Idaho Power once the home is ready for permanent service. **If the installation exceeds these limits, contact Idaho Power prior to installing service conduit.**

- ◆ **Maximum Service Length**—The horizontal distance measured along the service route between Idaho Power's equipment and the meter base must not exceed 125 feet.
- ◆ **Conduit Bends**—The total angle of bends below grade must not exceed 315° (this 315° includes the bends at the meter and at the transformer, handhole, or pole in the total).

200 Amp Service—Use 2 inch conduit, bends and fittings unless Idaho Power specifically directs the use of 3-inch conduit.

400 Amp Service—Use 3 inch conduit, bends and fittings.

500 Amp Service with Multiple Meters—Contact Idaho Power for size and quantity of conduit(s) required and maximum length allowed.

Conduit and Trench Requirements

Conduit and Bends—Use only gray colored, Schedule 40 or 80 PVC conduit and manufactured bends with a radius of at least 24 inches, see list of distributors starting on page 12. Do not form bends in the field! Schedule 80 PVC is required above grade per the NEC.

Conduit and bends must be listed or labeled by a Nationally Recognized Testing Laboratory Program, such as Underwriters Laboratories Inc. or CSA Group Testing and Certification Inc.

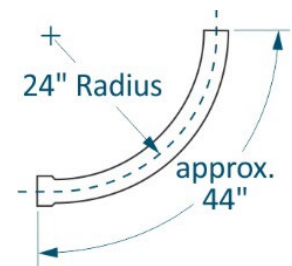


Figure 1 Bend Radius

Adapter—Provide a 2-inch to 3-inch smooth-walled conduit adapter (swedge) when a 3-inch conduit is needed and there is only a 2-inch conduit stub available. The adapter must be tapered with a smooth transition, see Figures 9 and 13.

Trench and Backfill—Maintain a minimum of 30 inches cover above conduits at final grade, but do not bury conduits deeper than 36 inches. Contact Idaho Power if this depth cannot be met. Backfill the first 6 inches of cover with native soil and rocks no larger than 2 inches. The remainder of the trench can be native soil with rocks no larger than 6 inches. Compact the trench backfill to prevent future settling

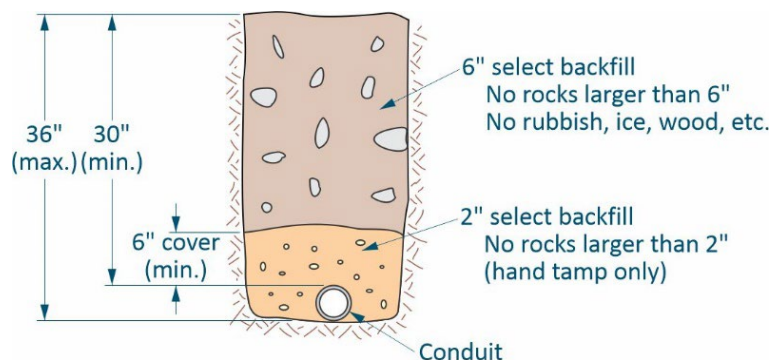


Figure 1 Trench and Backfill

CAUTION! All open trenches must be adequately barricaded or protected for public safety as required by local, state, or federal rules and regulations.

Underground Residential Conduit Installation Requirements

Important Information

DO NOT heat the conduit in any way to shape it or to form bends anywhere in the run or riser, see Figure 3.

DO NOT leave open trenches unprotected. Any open trench must be adequately barricaded or protected to ensure public safety as required by local, state, or federal rules and regulations.

DO NOT change conduit sizes in the run unless a 2 inch to 3 inch tapered adapter is needed at the conduit stub.

DO NOT make long radius sweeps to avoid installing manufactured bends.

DO NOT install conduit beneath buildings or other structures.

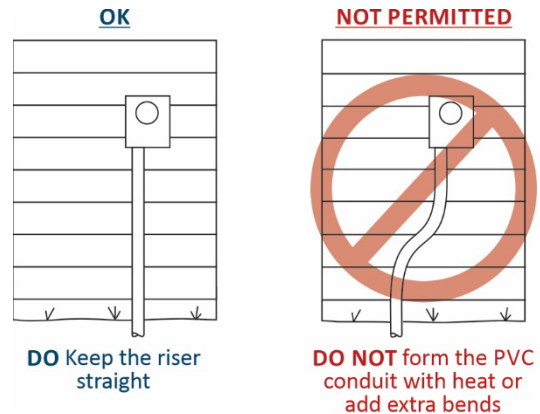


Figure 3 Conduit Riser

DO compact the trench, particularly near the meter where settling could pull the conduit down and damage the meter base. Although compacting the trench is the builder's responsibility, the homeowner is responsible for any future settling.

DO make square conduit cuts, remove burrs from the inside and outside edges.

DO glue conduit joints. All joints must be completely seated and permanently glued with PVC cement.

DO keep dirt and debris out of the conduit.

DO provide an expansion coupler below the meter base for all one- and two-family dwellings.

DO keep proper trench separations. Keep a 12 inch horizontal and vertical clearance between the electrical conduit and all other utilities and any structures.

DO keep proper meter separations. The electric and gas meters must be separated as shown in Figure 4.

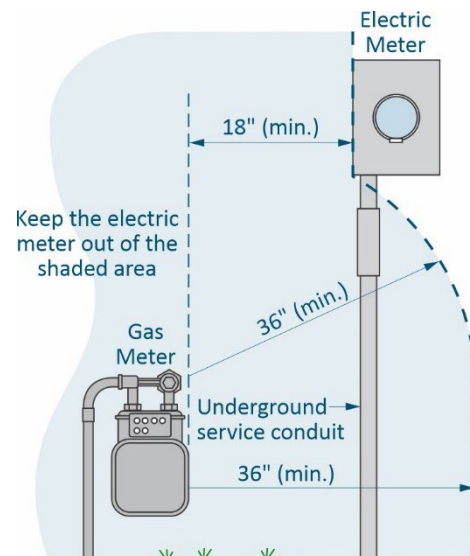


Figure 4 Separation Between Gas and Electric

DO route the service conduit in the most direct and straight-line path between the Idaho Power facility and the meter and keep 2 feet away from property lines.

Underground Residential Conduit Installation Requirements

Ownership and Maintenance

Idaho Power assumes ownership of the **builder-installed** conduit when the electrical service cable is installed. However, the builder is responsible for the condition of the conduit and trench until the ownership of the home is transferred to the first buyer.

After the cable has been installed, Idaho Power will own and maintain the following:

- ◆ All conduit and fittings installed below the finished grade
- ◆ Entire length of electric cable and the connections at Idaho Power's equipment
- ◆ Meter

NOTE—Idaho Power will connect the cable to the meter base, but the Homeowner will own and maintain the connections.

After the cable has been installed, the builder or homeowner will own and maintain the following:

- ◆ All conduit and fittings installed above the finished grade
- ◆ Trench and any landscaping
- ◆ Meter base and its connections to the electric cable
- ◆ All wiring and electrical connections on the Customer's side of the meter

Connect to the Proper Equipment

See the [Customer Requirements for Electric Service](#) Definitions section, on the Idaho Power website for more information.

Meter Base Requirements

120/240-Volt, 1-Ø Meter Bases

EUSERC-approved meter bases are recommended. Bypass meter bases are not allowed on residential services. Other meter bases may be accepted if they have adequate wiring space between the load terminals and underground conduit entry, and meet the dimensions shown in the table below:

1-Ø Meter Base Minimum Dimensions							
Service	Number of Terminals	Exterior Dimensions*			Wiring Space	Lug Range	Conduit Entry
		Height	Width	Depth			
200A	4	15"	11"	4"	4"	#2 - 4/0	2"
400A	4	22"	11"	5"	6"	#1/0 - 350	3"

*Dimensions shown are rounded to the nearest inch.

Meter Base Wiring

The Customer's wiring for a self-contained meter base is required to be connected to the "load-side" (bottom) terminals, and Idaho Power's wiring is on the "line-side" (top) terminals.

For more information, see the [Customer Requirements for Electric Service](#), Metering section on the Idaho Power website.

Underground Residential Conduit Installation Requirements

Meter Location

The meter base and conduit must be securely mounted on the outside of an exterior structure wall and remain accessible to Idaho Power. The following is a list of common errors:

- ◆ Do not place the meter behind a fence.
- ◆ Do not put the meter at the back of the house.
- ◆ Do not cover or enclose the meter.
- ◆ Recessed meter bases are not allowed.

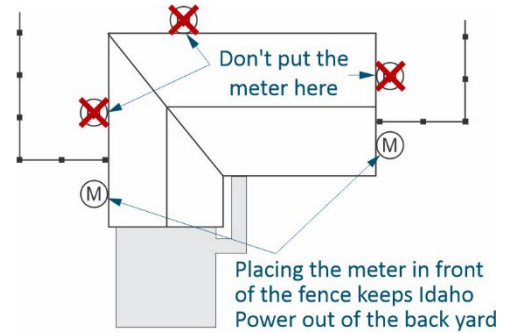


Figure 5 Meter Location

Meter Height

The preferred height for permanent meters is 5 feet, 6 inches, to the center of meter socket, and 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.

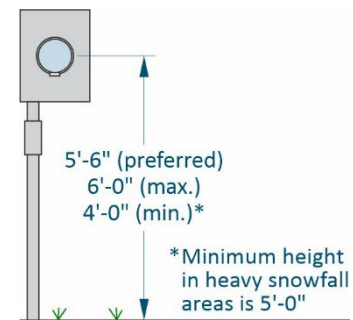


Figure 6 Meter Height

Working Space

The 36×36 inch area directly in front of the meter base must be clear of equipment, landscaping, or other obstacles that will interfere with access.

Equipment not associated with the meter or service must be kept out of this space on either side of the base. This includes door frames for inward-swinging doors or perpendicular walls. Frames for outward-swinging doors must be at least 36 inches from the edge of the meter base.

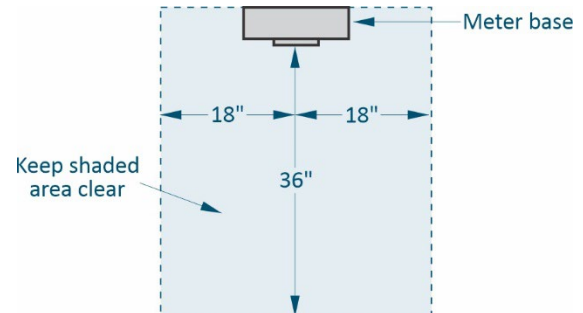
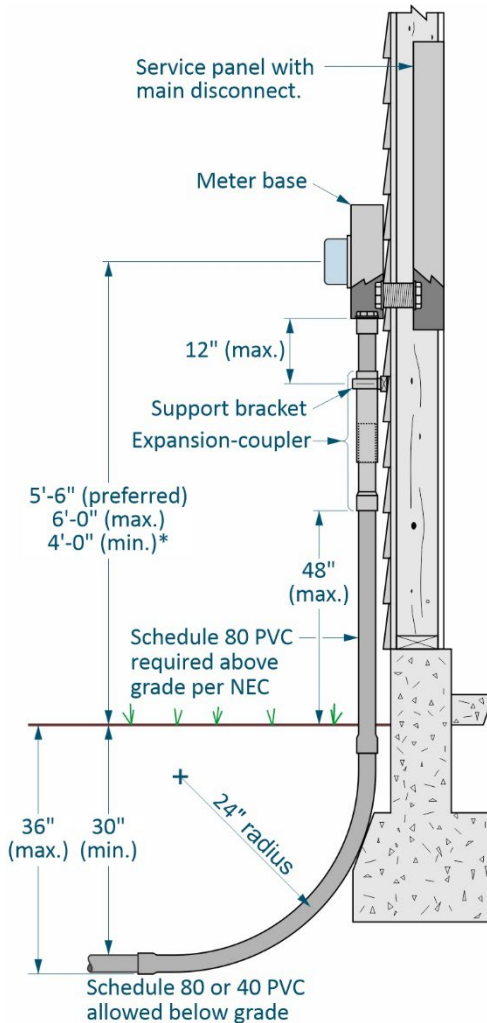


Figure 7 Working Space

Underground Residential Conduit Installation Requirements

Installation Requirements

Use the diagram below as guidance for residential meter base installation requirements. An electrical permit is required from the city or state, and the installation must have passed an electrical inspection before Idaho Power will energize the service.



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

NOTES:

Follow manufacturer's installation instructions for all equipment.

Be careful not to obstruct the service conduit entry into the meter base with penetration and wiring to service panel.

Expansion-coupler must be anchored tightly at upper end of barrel. Locate support bracket near top of barrel within 12" of meter socket and glue to upper conduit OR install barrel end in meter base. Be sure to orient expansion-coupler with piston on the bottom.

Suggestion: Provide block or shim behind support bracket for a snug fit.

Unless otherwise directed by manufacturer due to ambient temperature at time of installation, set piston approximately half-way in barrel and glue piston to lower PVC conduit.

DO NOT glue piston and barrel together!
DO NOT secure conduit to wall below barrel!

Keep conduit straight above grade from elbow to meter socket. Orient conduit bell ends down and away from meter base to minimize water intrusion and facilitate conductor installation. A maximum conduit length of 48" is allowed between finished grade and the piston on the expansion-coupler.

DO NOT heat or bend PVC conduit!

Suggestion: Block out a portion of the foundation to allow for an easier service conduit installation.

Ground service per NEC-250 (not shown).

Figure 8 Typical Residential Meter Installation

Underground Residential Conduit Installation Requirements

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.

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:

AIC Ratings for Underground Residential Services by Length				
	from Transformer		from Handhole/Pedestal	
Service	10k AIC	22k AIC	10k AIC	22k AIC
200A	≥ 40-ft	< 40-ft	≥ 20-ft	< 20-ft
400A	≥ 80-ft	< 80-ft	≥ 40-ft	< 40-ft

Contact Idaho Power for larger transformers or to obtain more precise fault current values.

Transformers

Most transformers have 2 or 3 inch conduit stubs approximately 5 feet from the transformer, as shown below. Expose the end of the conduit stub and connect the new conduit. If there is no stub marker or a conduit is not present, dig up to the edge of the transformer pad. **DO NOT dig under a transformer!**

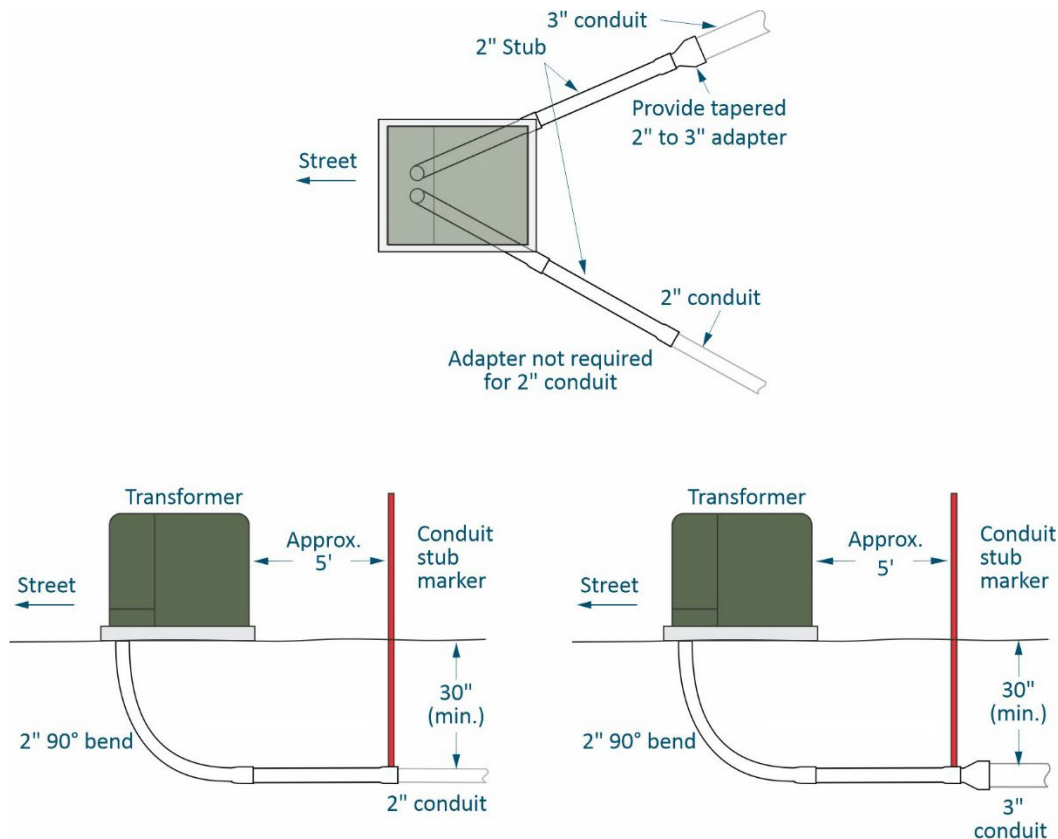


Figure 9 Transformer Conduit Stub-out

Underground Residential Conduit Installation Requirements

Clearance Requirements

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.

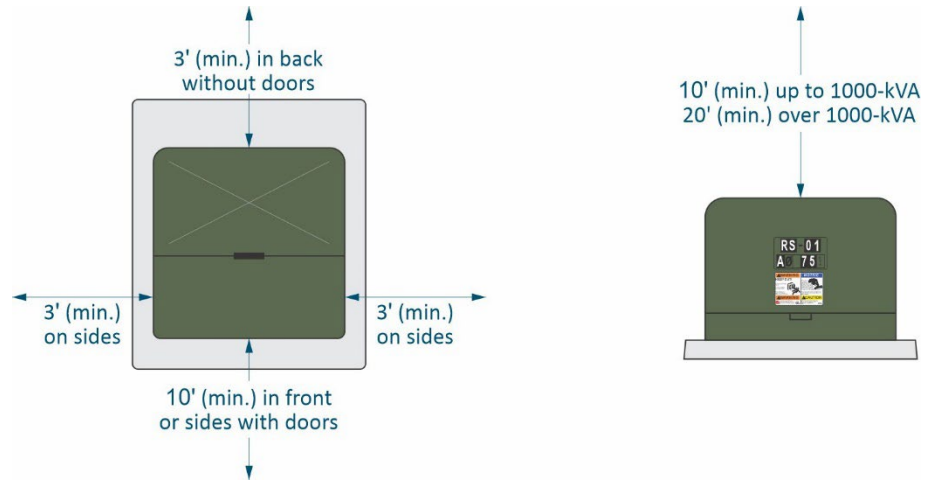


Figure 10 Working Clearance around Padmounted Transformer

Combustible structures are required to be 10 feet from padmounted transformers. This clearance may be reduced to 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.

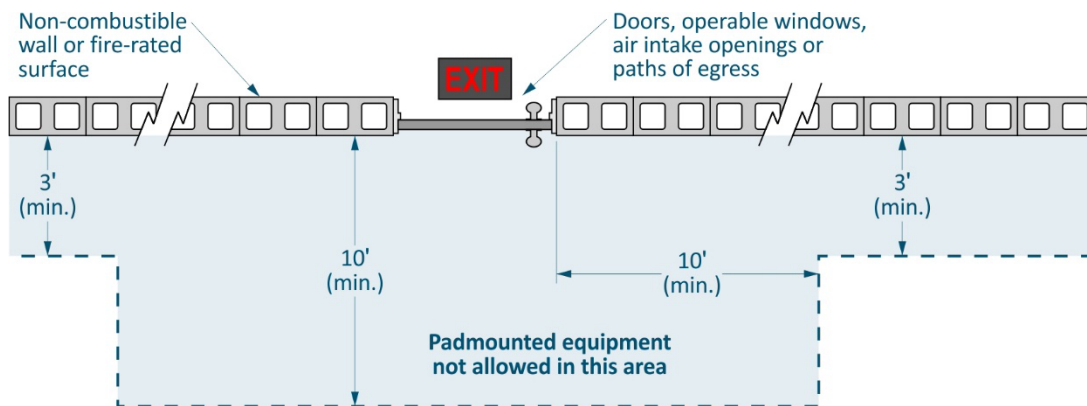


Figure 11 Clearance from a Non-Combustible Wall

To be considered noncombustible one of the following requirements must be met:

1. A one-hour or greater fire rating as certified by a licensed architect, engineer, or other authority having jurisdiction.
2. Have an automatic fire suppression system, i.e., fire sprinkler system.
3. Surface material that will not ignite, burn, support combustion, or release flammable vapors when subject to fire or heat according to ASTM E136. There must be $\frac{5}{8}$ inch gypsum board on the inside of the surface with fire/smoke detectors; and the surface material must be installed with one of the following underneath:
 - ◆ Minimum of $\frac{5}{8}$ inch gypsum board.
 - ◆ Cement board.
 - ◆ Fire-rated OSB.

All building surfaces within 10 feet of the transformer must be noncombustible.

Underground Residential Conduit Installation Requirements

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.

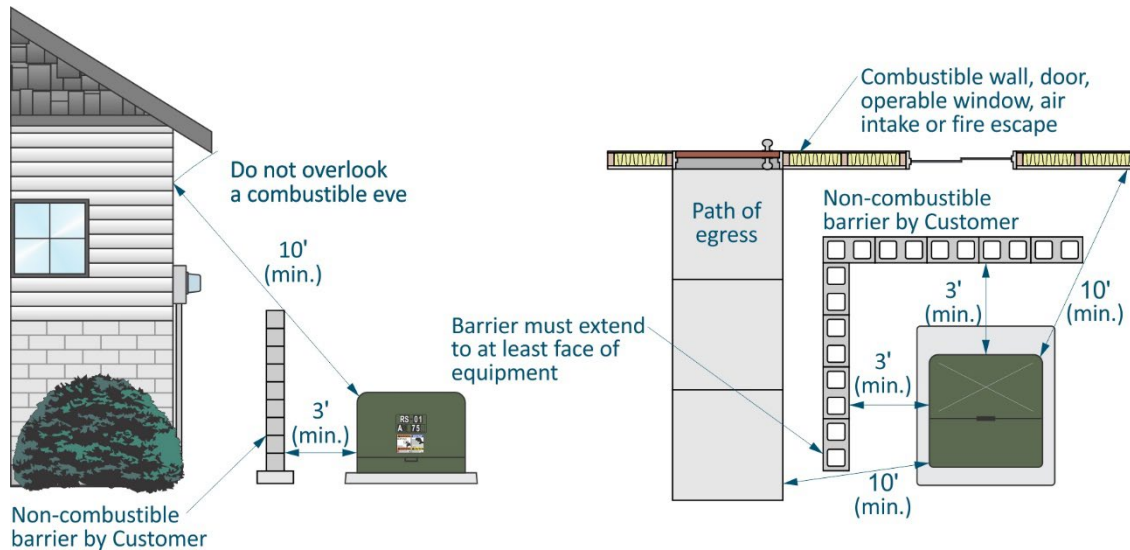


Figure 12 Fire-Resistant Barrier

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.

Overhead Power Lines

People, and any tools or equipment held by them, must stay at least 10 feet from overhead distribution power lines and farther away from transmission power lines. Buildings, antennas, signs, pools, and other objects require additional clearances from overhead power lines. Consult with Idaho Power for more information.

Underground Residential Conduit Installation Requirements

Handholes or Pedestals

Handholes or above-ground pedestals in subdivisions may have a 90° bend stubbed out of them and will be marked with a red stake. If there is a stub, it will typically be a 2 inch conduit, sometimes with a 2 inch to 3 inch adapter attached. However, a 3 inch conduit may be provided if the lot was expected to require a larger service. In this case, there will not be an adapter supplied and the Builder should install a 3 inch conduit to the meter base.

The builder must provide a tapered 2 inch to 3 inch adapter as shown in Figure 13 if a 3 inch conduit is used and adapter has not been provided.

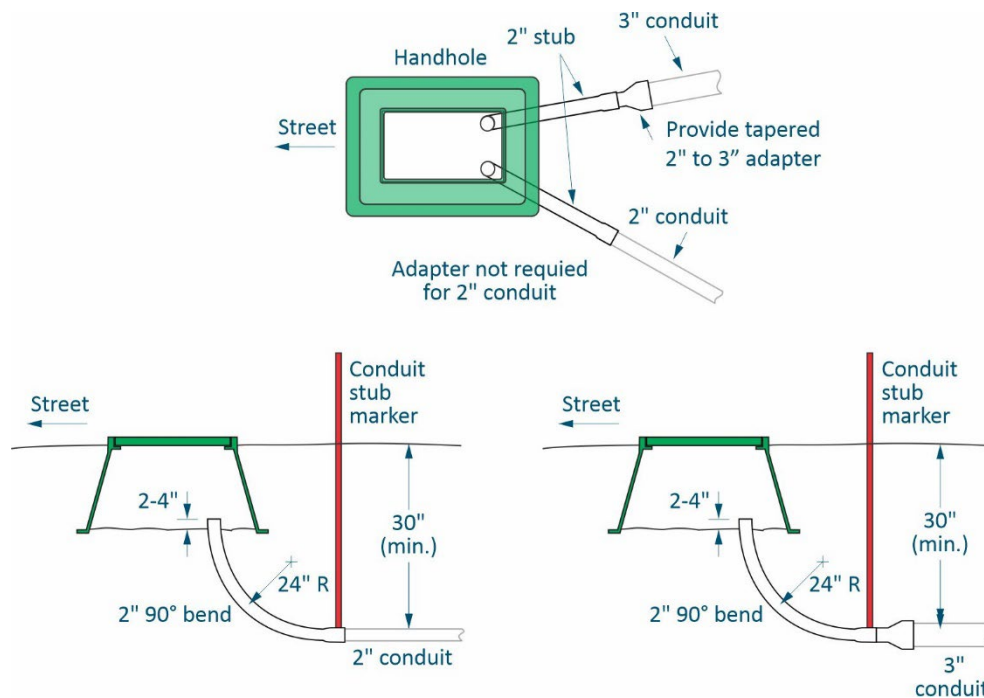


Figure 13 Handhole or Pedestal Conduit Stub-out

DO NOT dig within 2 feet of a handhole or pedestal unless a conduit stub has not been provided.

If the handhole or pedestal does not have a conduit stub, then follow the instructions below:

- ◆ Plumb the 90° bend into the nearest corner of the handhole with the end between 2 and 4 inches above the handhole floor.
- ◆ Plug or cap the open end of the conduit to keep out dirt and debris.

NOTE—Handholes that are located in a driveway require supplemental protection; see [Customer Requirements for Electric Service](#) on Idaho Power’s website for more information.

Underground Residential Conduit Installation Requirements

Special Requirements for Poles

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

- ◆ If the pole is adequate for the service.
- ◆ From which side of the pole to route the conduit.

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 Customer's responsibility to backfill and compact any remaining trench.

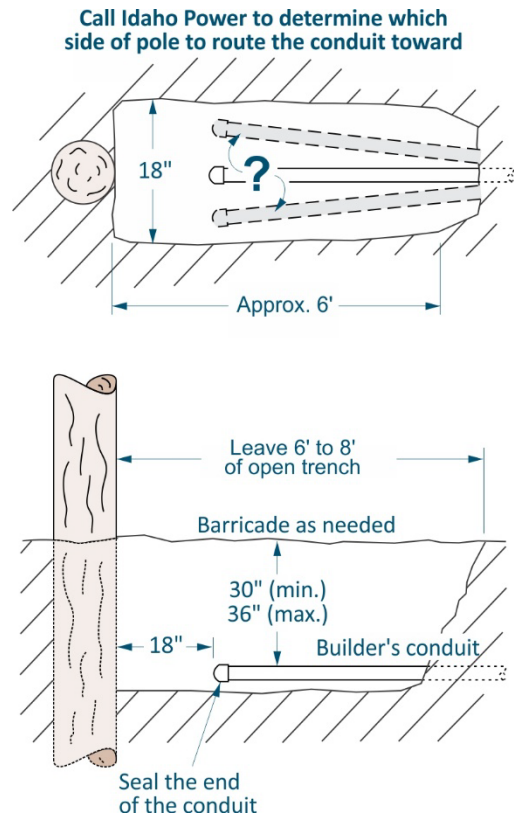


Figure 14 Underground Conduit to a Pole

Underground Residential Conduit Installation Requirements

Distributors of 2" and 3" Schedule 40 PVC 90° Bend with 24" Radius

Location	Distributor	Address	Phone	Notes
Blackfoot	Electrical Wholesale Supply Co.	560 Jensen Grove Dr	(208) 542-4955	
Boise	Anixter Power Solutions	12070 W Executive Dr	(208) 362-7500	
	Columbia Electric Supply	8645 Westpark St	(208) 322-1231	2" only
	Consolidated Electric Distribution	11589 W Executive Dr	(208) 377-4140	
	Electrical Wholesale Supply Co.	5185 W Bethel St	(208) 375-9900	
	Graybar	801 South 13 th St	(208) 343-2594	2" only (3" special order)
	Grover's Pay & Pack	5730 W Franklin Rd	(208) 342-6576	
	Interstate Electric Supply	415 N Philippi St	(208) 375-6880	
	Platt Electric Supply	5603 W Bethel St	(208) 367-5643	
	WESCO	5480 Irving St	(208) 362-7500	
Buhl	Gietzen Electric Inc.	125 9 th Ave South	(208) 543-4610	
Burley	Ace Hardware	2256 Overland Ave	(208) 678-5534	2" only
Caldwell	Electrical Wholesale Supply Co.	3409 Arthur St	(208) 455-8400	
	Interstate Electric Supply	3705 Arthur St	(208) 455-7760	36" radius on 3"
Eagle	Evan's Building Center	931 E State St	(208) 939-6435	2" only
Emmett	Mountain West Building Supply	2449 West Highway 52	(208) 365-7580	2" only
	Valley Pump & Equipment	608 N Washington Ave	(208) 365-2972	
Hailey	Consolidated Electric Distribution	1010 Business Park Dr	(208) 485-8399	
	Platt Electric Supply	3990 Woodside Blvd	(208) 788-3544	
Jerome	Consolidated Electric Distribution	220 W Yakima # B	(208) 324-0281	36" radius on 3"
	Platt Electric Supply	2735 Tucker Ct	(208) 324-4201	
Kuna	Kuna Lumber	175 School St	(208) 922-3545	2" only
McCall	Consolidated Electric Distribution	102 Mission St	(208) 634-7001	
	Interstate Electrical Supply	13788 ID-55	(208) 634-1366	36" radius on 3"
	May Hardware	809 N 3 rd St	(208) 634-7665	2" only (on order)
Meridian	D&B Supply	1725 E Fairview Ave	(208) 887-0949	
	Interstate Electric Supply	760 N Ralstin St	(208) 287-3713	
	Platt Electric Supply	1300 E Kalispell St	(208) 855-0071	

Underground Residential Conduit Installation Requirements

Location	Distributor	Address	Phone	Notes
Mountain Home	P & C Plumbing and Electrical	950 Sunset Strip	(208) 587-2777	
Nampa	Consolidated Electric Distribution	1112 W Hemingway Blvd	(208) 467-2161	
	Grover's Pay & Pack	824 Caldwell Blvd	(208) 466-8707	
	Interstate Electric Supply	1917 Industrial Rd	(208) 466-8404	
	Platt Electric Supply	401 6 th St North	(208) 461-3289	
Ontario	Interstate Electric Supply	287 SE 2 nd St	(541) 889-9679	
Pocatello/ Chubbuck	D & S Electrical Supply Co.	363 W. Chubbuck Rd	(208) 237-8200	
	Electrical Wholesale Supply Co.	220 W. Maple St	(208) 233-1362	
	Platt Electric Supply	2815 Garrett Way # A	(208) 233-2002	
	WESCO	2815 Garrett Way # F	(208) 233-2003	
Salmon	Havemann Ace Hardware	720 S Challis St	(208) 756-3322	
Twin Falls	Colombia Electric Supply	455 4 th Ave W.	(208) 733-1033	36" radius on 3"
	Columbia Electric Supply	552 2900 East Rd	(208) 733-6861	
	Electrical Wholesale	218 Blake St South	(208) 734-2882	
	Grover's Pay & Pack	130 Eastland Dr South	(208) 733-7304	
	Platt Electric Supply	294 2900 East Rd	(208) 734-5413	

Underground Residential Conduit Installation Requirements

Revision History

REVISION	DATE	DESCRIPTION
0	03/15/2020	Reformatted document. Added clearance requirements around transformers.
1	03/15/2021	Added Installation Requirements diagram.
2	12/02/2022	Added working space requirements around meters.
3	03/17/2023	Added requirements about conduit routing and long-radius sweeps. Builder to provide 2-inch to 3-inch adapter when needed.
4	11/29/2023	Revised burial depth requirements for service conduits.
5	10/25/2024	Revised "Design Limitations" wording about Conduit Bends limited to 315°.