

READY TO BUILD

construction handbook



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Thank you for contacting Black Hills Energy about you power needs. This packet contains valuable information to help you acquire needed electrical service.

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Black Hills Energy Local Contact Numbers
General powerline clearance and safety4
Tree clearance specifications-primary (390)
installations (1430-CL1, 1430-CL2 and 1430-CL3)
Clearances of permanent service drops 600 volts or less attached to building, signs and other

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DEFINITIONS

Service Request: The Service Request is the starting point for all electric utility needs, whether it is a new service request, a change service request, temporary service request, etc. This first step creates a service request number for the customer and establishes the routing for a customer's particular request. No activity/work will commence until this request is made. A customer can make the request by using the Black Hills Energy website blackhillsenergy.com/service-request, or by calling 888-890-5554 speak to one of our representatives.

Temp Power/Construction Power: Anytime you will need power prior to the final installation of power at a building site, you will need to request it at the time you open your Service Request. This will alert our staff and we can make arrangements to supply power during the building on your site. Residential customers will have this billed as a part of their ongoing utility billing cycle. Commercial customers will need to make an application for power and are subject to normal and customary charges separate and apart from the billing cycle. Your Planner will advise you of costs prior to commencement **Site Plan:** The Site Plan gives a visual overview of your project. This does not need to be an architectural type drawing — you can hand draw it, not to scale, but with correct measurements for distances. By showing the intended layout of your project, we can better develop to meet your needs and assess costs according to your specific project. Our planners will work with you to make sure your project is successful.

Grade Agreement: This agreement defines the condition which the site needs to be in before Black Hills Energy can move forward with the installation of your electric services. It is the customer's responsibility to make sure the location meets the described conditions as defined in the Grade Agreement.

Meter: The device which allows the Utility to track your usage and bill properly.



Scan the code or visit blackhillsenergy.com/service-request to create an account and request service.

RESPONSIBILITIES FOR NEW SERVICE

Black Hills Energy Responsibility

- A. Black Hills Energy will supply
 - a. Primary conductors
 - 1. Either overhead or underground
 - 2. Located in utility easement or right-of-way
 - b. Secondary conductors
 - 1. Conductors from Black Hills Energy's overhead transformer to customer owned facilities (commercial and residential)
 - 2. Conductors from Black Hills Energy's underground transformer to customer owned facilities (*residential only*)
- B. Installation of above

Customer Responsibility

- A. Initial information
 - a. Complete a Service Request by website (<u>blackhillsenergy.com/service-request</u>) or by calling 1-888-890-5554
 - b. Service size (voltage, amperage, phase)
 - c. Type of loads (gas heat, electric heat, total electric, seasonal, residential demand service, commercial, etc.)
 - d. Site plan
 - e. Requested location of service meter
- B. The most current signed courthouse copy for each parcel affected by the proposed facilities
 - a. Warranty Deed, Quitclaim Deed, Contract for Deed (showing book and page)
 - b. Certified Plat (showing book and page)
- C. Signed, notarized and returned original copy of any easements requested
- D. Signed and returned Application and Agreement of Electric Service Extension document
 - a. Contribution in aid of construction charges paid in full before construction
- E. Completed and signed Grade Agreement
- F. Wiring affidavit
 - a. Affidavit sent to Black Hills Energy and state authority or completed electrical inspection by local authority if applicable
- G. Trench, conduit and backfill (for underground cable)
 - a. Proper-sized conduit per Black Hills Energy specifications
 - b. Proper bedding per Black Hills Energy specifications
 - c. Schedule trenching and conduit inspection with local office
 - d. Backfill trench per Black Hills Energy specification (finished grade)
- H. All tree trimming per Black Hills energy specification
- I. Meter base, CT enclosures, meter pedestals, secondary termination cabinets and conductors from meter to main panel
- J. Installation of transformer basement per Black Hills Energy specification (commercial only)

2

K. Furnish and installation of secondary conductors from underground Black Hills Energy's transformer to customer owned facilities *(commercial only)*

RESPONSIBILITIES FOR NEW SERVICE

Before Black Hills Energy can extend our power lines to your new residential service we need to have permission to build on your property and possibly your neighbor's property. The permission would be either in the form of an already existing "easement" or a signed "Right-of-Way."

Existing Utility Easement

A utility easement gives a utility the right to place their equipment on your property within the easement. There may be an existing easement on or near your property. The easement may be located along roads, along lot lines or other defined areas. Easements come in the form of drawn easements or described (written) easements. If your property is in a "platted" development, existing utility easements may be shown or noted on a document known as a plat. The official plat is located at your county court house in the Register of Deeds.

If your property has not been platted it is known as "described" property. Easements for described property may also be in the form of drawn easements or as described (written) easements.

Easements on both described and platted properties may be shown or noted either on a drawn or described (written) "exhibit." This document may be filed as a "miscellaneous document."

If it is unknown whether a utility easement exists on your property a search may need to be done in the Register of Deeds.

Signed Easement

If a utility easement does not exist, an easement needs to be produced and signed. An easement gives a utility the right to place their equipment on your property. The easement document may be produced using copies of existing plats or described property as found in the Register of Deeds. Any easement needs to be signed by the owner of the property. In the case of a Contract for Deed the easement needs to be signed by the person(s) selling the property and the person(s) purchasing the property through the contract. Black Hills Energy will provide the needed easement form for you to use to either execute an easement or obtain one from the owners of the neighboring property that the power line will need to cross.

In order for Black Hills Energy to know who owns the property our power lines will cross to serve you, a deed is also needed from the Register of Deeds. A deed can be in the form of a Warranty Deed, a Quitclaim Deed or a Contract for Deed. Any of these show who the owner or owners are of platted or described real estate.

Warranty Deed

This document names the current owner(s) and who the property was purchased from. The Warranty Deed also describes exactly what property is owned. The official Warranty Deed is located at your county courthouse in the Register of Deeds.

Quitclaim Deed

This document names the current owner(s) and who the property was purchased from. The Quitclaim Deed also describes exactly what property is owned. The official Quitclaim Deed is located at your county courthouse in the Register of Deeds.

Contract for Deed

This document names the current owner(s) and who is currently purchasing the property. The Contract for Deed also describes exactly what property is owned. The official Contract for Deed is located at your county courthouse in the Register of Deeds.

It is the responsibility of the person requesting new electrical service to gather the required documents from the county courthouse. For every separate piece of real estate crossed by the new electric extension, a copy of the deed, as described above, needs to be supplied to Black Hills Energy. If the real estate noted on the deed copy has been platted then another document, a plat (copy of), is also required from the courthouse.

There are two ways for you to gather the documents needed for Black Hills Energy to extend our power lines to your new service.

Do it yourself

The first way is for you to go to the courthouse to find and purchase copies of the Deed(s) and/or Plat(s). This may take the least out-of-pocket money but may also take the most time.

Hire someone to do it

The second way is for you to hire someone skilled in this occupation to go to the courthouse to find and purchase copies of the Deed(s) and/or Plat(s) for you. This may be the quickest way but will cost you more. The following companies, among others, can assist you in gathering these documents

Companies and Individuals able to do title, deed, and easement searches Warranty Deed

BUTTE COUNTY

Belle Butte Title Co. 713 6th Ave. Belle Fourche, SD 57717 605-892-3949

LAWRENCE COUNTY

Black Hills Title 245 N. Main St. Spearfish, SD 57783 605-642-7304

PENNINGTON COUNTY REGISTER OF DEEDS

130 Kansas City St. Suite 210 Rapid City, SD 57701 605-394-2177

CUSTER COUNTY

Southern Hills Title, Inc. 322 Mt. Rushmore Rd. Custer, SD 57730 605-673-4838, contact: Joyce

FALL RIVER COUNTY

Fall River Abstract P.O. Box 908 Hot Springs, SD 57747 605-745-5187, contact: Shelly

MEADE COUNTY

Meade County Title Co. 1530 Junction Ave. Sturgis, SD 57785 605-347-4402 1-800-732-7694

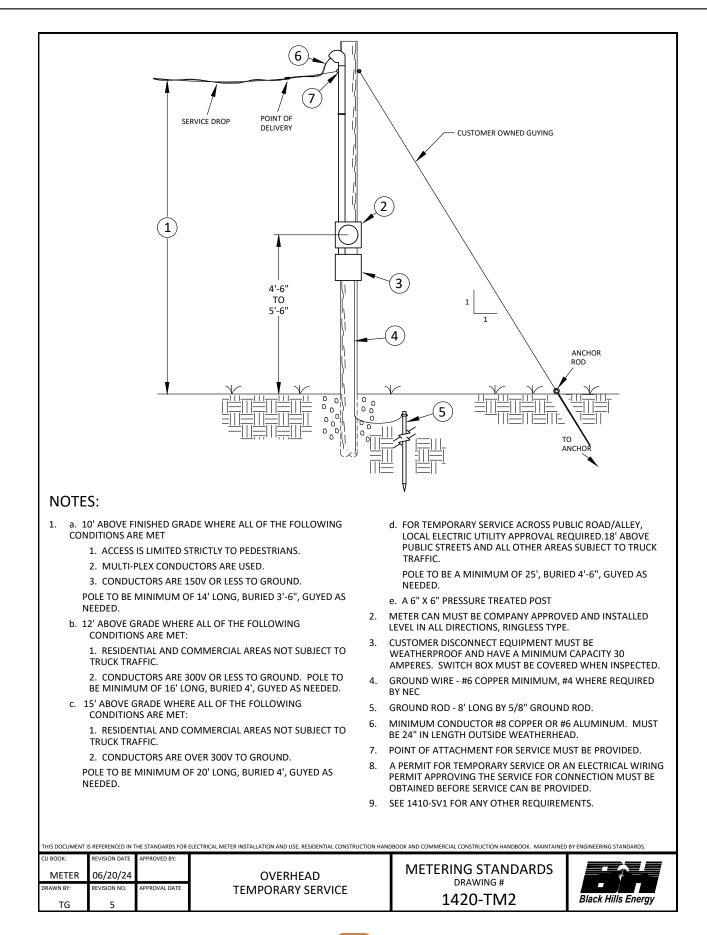
CUSTOMER RESPONSIBILITIES

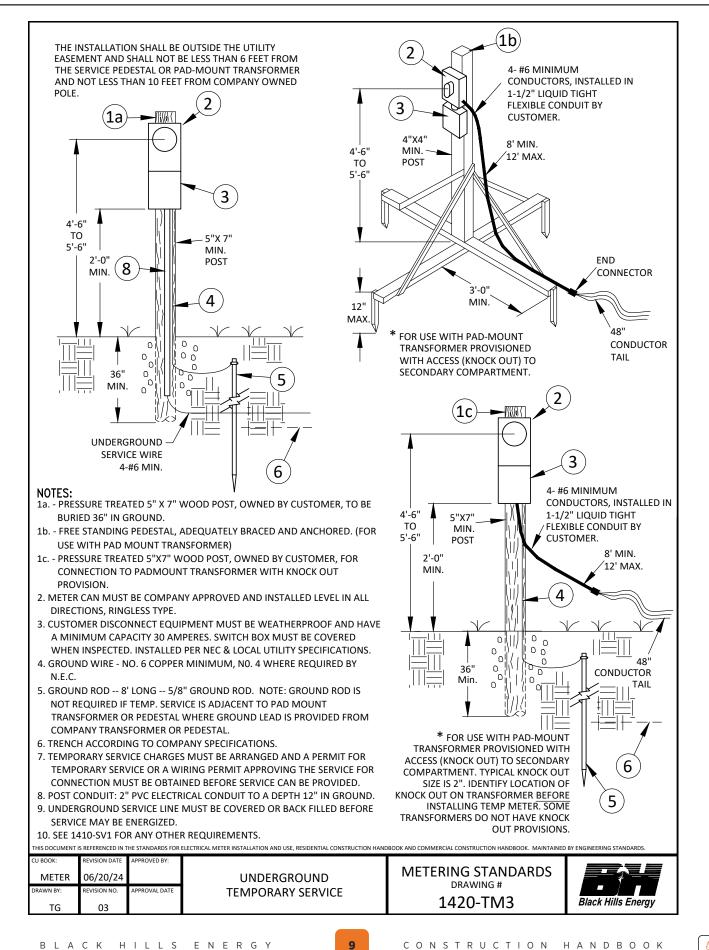
*Service can not be supplied until these items are completed.
Supply Black Hills Energy with courthouse copy of your plat and deed
Supply Black Hills Energy with courthouse copy of your - Neighbor's plat & deed (if crossing their property to serve you)
Provide 911 address of new service to Black Hills Energy
Obtain signatures on all rights-of-way
Sign "Electric Service Extension Agreement"
Sign "Grade Agreement"
Make any applicable payments
Cut trees
Contact other utilities; i.e. gas, telecom, cable
Contact your state's One Call service: -Wyoming One Call 1-800-849-2476 or 811 -South Dakota One Call 1-800-781-7474 or 811 -Montana One Call 1-800-424-5555 or 811 Visit <u>blackhillsenergy.com/811</u> for more information.
Schedule trench and conduit inspection with local office before back filling
Supply proper trench, conduit and backfill at appropriate time

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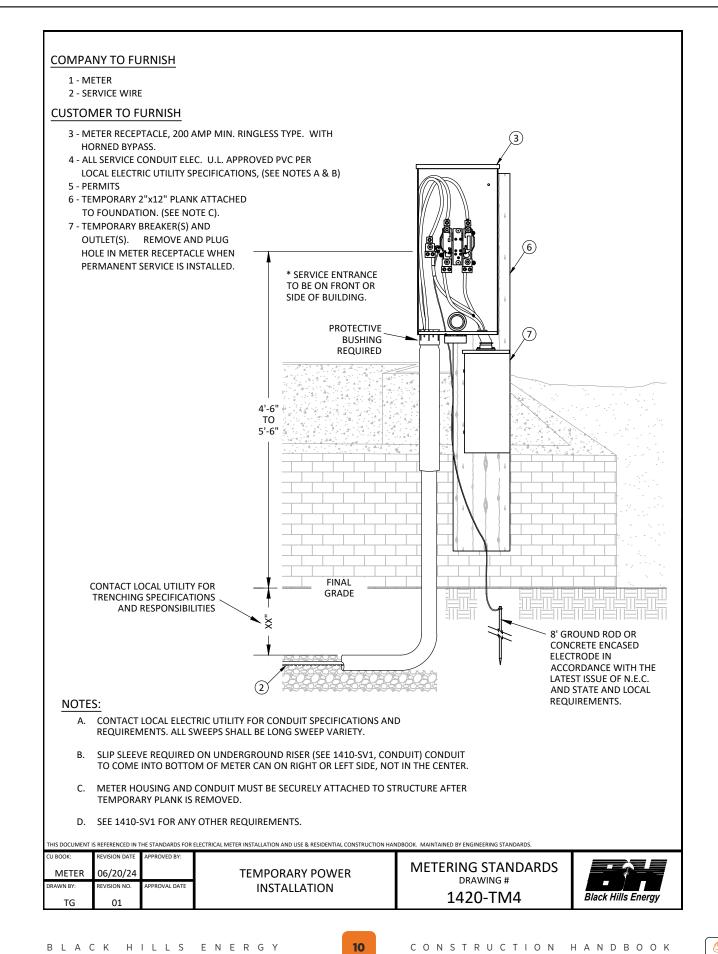
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	EQUIRED ELECTRICAL WIRING PERMIT AN IBTAINED BEFORE SERVICE CAN BE PROVI		
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C O N S T R U C T I O N H A N D B O O K



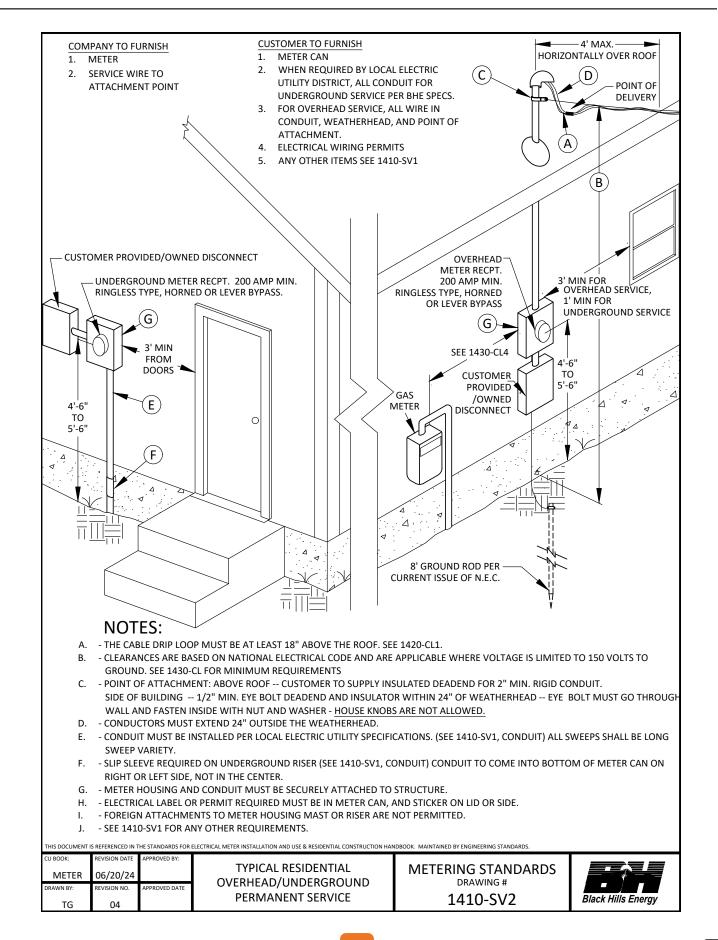


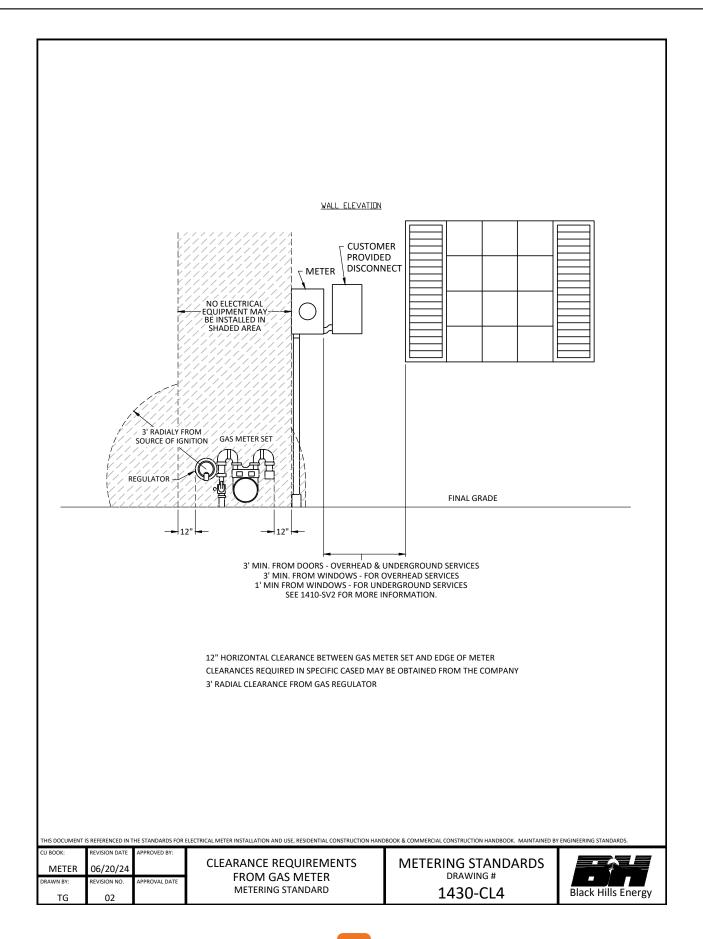
CONSTRUCTION HANDBOOK

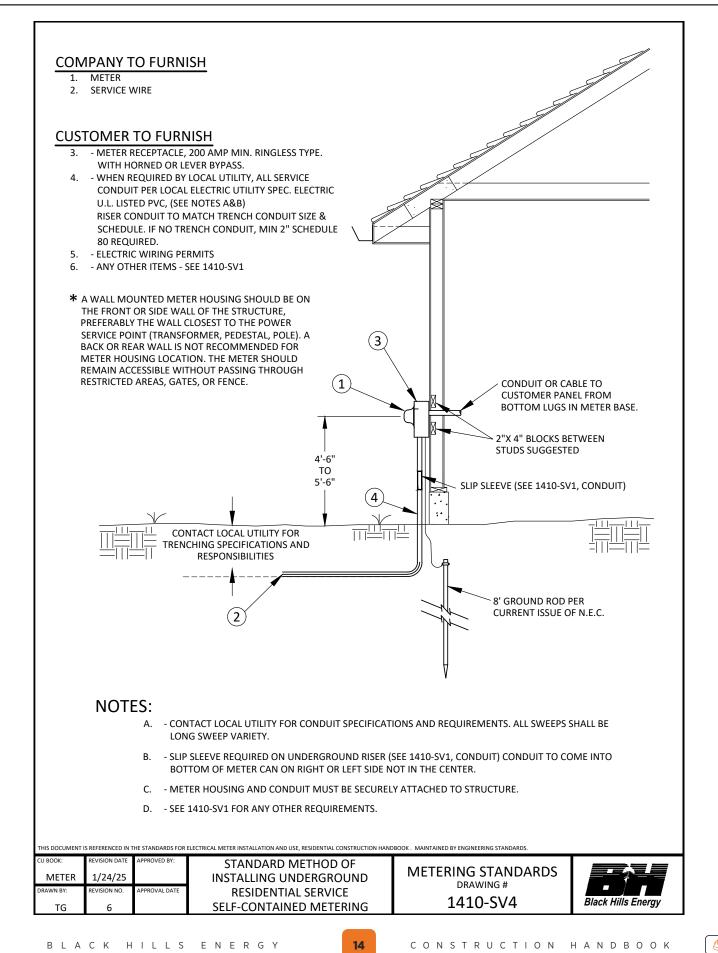


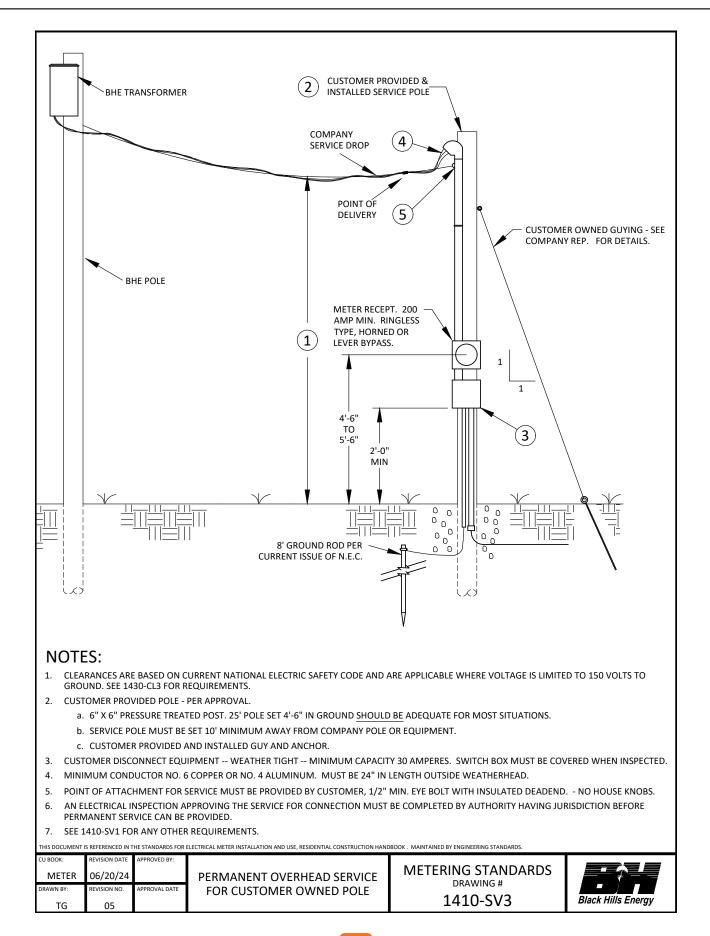
- 1. THE CUSTOMER SHALL MAKE EARLY CONTACT WITH A BHE CONSTRUCTION PLANNER OR SPECIALIST FOR PERMANENT SERVICE AND METER HOUSING LOCATION.
- 2. AN ELECTRICAL WIRING PERMIT AND INSPECTION SHALL BE OBTAINED FROM THE AUTHORITY HAVING JURISDICTION BEFORE SERVICE CAN BE PROVIDED.
- 3. PERMANENT SERVICES MUST BE LOCATED WHERE THE METER WILL BE PROTECTED FROM MECHANICAL INJURY. BLACK HILLS ENERGY WILL NOT BE RESPONSIBLE FOR THE RELOCATION OF A METER SOCKET THAT DOES NOT MEET COMPANY STANDARDS.
- 4. OVERHEAD PERMANENT SERVICE DROPS SHALL BE SUPPORTED ON COMPANY APPROVED POLE, WALL, OR STRUCTURE. THE MAXIMUM SERVICE DROP LENGTH FROM COMPANY POLE TO THE SERVICE DEPENDS UPON CONDUCTOR SIZE. CONSULT WITH YOUR COMPANY REPRESENTATIVE TO DETERMINE THE MAXIMUM DISTANCE. PERMANENT SERVICE MUST MEET COMPANY STANDARDS.
- 5. CUSTOMER OWNED METERING EQUIPMENT, SWITCHING DEVICES, CONDUITS, CONDUCTORS, LUMINARIES, ETC., ARE NOT TO BE MOUNTED ON COMPANY POLES.
- 6. THREE (3) FEET MINIMUM WORKING SPACE REQUIRED BETWEEN ELECTRICAL METER AND ANY OTHER OBSTRUCTION ATTACHED TO THE BUILDING. (SEE N.E.C. REQUIREMENTS)
- 7. <u>CUSTOMER HAS RESPONSIBILITY</u> TO PROVIDE AND MAINTAIN A THREE (3) FOOT CLEARANCE FROM ALL TREE LIMBS FOR THE ELECTRICAL OVERHEAD SERVICE FROM THE POLE TO THE SERVICE ATTACHMENT ON THE CUSTOMERS BUILDING OR DWELLING.
- 8. WHEN PRACTICAL, EQUIPMENT OR OTHER OBSTRUCTIONS SHALL MAINTAIN A MINIMUM CLEARANCE OF TEN (10) FEET AWAY FROM A COMPANY POLE. THIS INCLUDES ITEMS SUCH AS TEMPORARY SERVICE PEDESTALS OR POLES, METER PEDESTALS, COMMUNICATION PEDESTAL, PADMOUNT TRANSFORMERS, FENCES, ETC.
- 9. GROUNDING REQUIREMENTS:
 - A. GROUND WIRE NO. 6 COPPER MINIMUM IN SEPARATE CONDUIT NOT IN WITH COMPANY WIRE.
 - B. GROUND RODS -- 8' LONG -- 5/8" GROUND ROD, AS PER CURRENT ISSUE OF N.E.C.
 - C. ALL GROUND RODS TO BE INSTALLED IN UNDISTURBED EARTH.
 - D. ALL GROUND RODS TO BE EMBEDDED BELOW PERMANENT MOISTURE LEVEL PER N.E.C.
- 10. METERING REQUIREMENTS: (METER FURNISHED BY COMPANY)
 - A. ALL METER HOUSINGS TO BE RING-LESS, NO RING TYPE.
 - B. ANY COMMERCIAL INDIVIDUAL SELF CONTAINED METER HOUSING MUST HAVE LEVER BYPASS .
 - C. ANY RESIDENTIAL METER HOUSING MUST HAVE HORN OR LEVER BYPASS.
 - D. ALL PERMANENT SELF CONTAINED METER HOUSINGS MUST BE AT LEAST 200 AMP AS PER COMPANY STANDARDS AND INSTALLED LEVEL IN ALL DIRECTIONS.
 - E. METER HOUSINGS SHALL CONFORM TO ALL COMPANY CRITERIA.
 - F. ALL METERS TO BE OUTSIDE OF BUILDINGS NOT INSIDE.
 - G. A WALL MOUNTED METER HOUSING SHOULD BE ON THE FRONT OR SIDE WALL OF THE STRUCTURE, PREFERABLY THE WALL CLOSEST TO THE POWER SERVICE POINT (TRANSFORMER, PEDESTAL, POLE). A BACK OR REAR WALL IS NOT RECOMMENDED FOR METER HOUSING LOCATION. THE METER SHOULD REMAIN ACCESSIBLE WITHOUT PASSING THROUGH RESTRICTED AREAS, GATES, OR FENCES.
 - H. IF SELF CONTAINED METER HOUSING IS NOT ATTACHED TO A BUILDING, A SERVICE DISCONNECT WILL BE REQUIRED ON THE LOAD SIDE OR ADJACENT TO THE METER HOUSING. BOTH DISCONNECT AND WIRE ON THE LOAD SIDE WILL BE CUSTOMER OWNED.
 - 1. WHEN USING MULTIPLE METER HOUSINGS THE SERVICE ADDRESS SHALL BE CLEARLY MARKED AND PERMANENTLY ATTACHED TO THE EXTERIOR OF THE MAIN BODY OF METER SOCKET BY MEANS OF A PERMANENT STAMPED BRASS, ALUMINUM, STAINLESS STEEL OR PLASTIC TAG AND HAVE ADDRESS PERMANENTLY WRITTEN ON INSIDE OF METER SOCKET (NOT LID).
- 11. CONDUIT FOR METER RISER, FROM METER CAN TO 18" BELOW GRADE:
 - A. PVC ELECTRIC U.L. LISTED PER LOCAL ELECTRIC UTILITY SPECIFICATION.
 - A.A. RISER CONDUIT TO MATCH TRENCH CONDUIT SIZE & SCHEDULE. IF NO TRENCH CONDUIT, MIN. 2" SCHEDULE 80 REQUIRED.
 - B. NO LB ELBOWS ON LINE SIDE CONDUIT ALLOWED, ALL CORNERS SHALL BE OF THE SWEEP VARIETY.
 - C. SLIP SLEEVES ARE REQUIRED ON ALL PVC RISERS.
- 12. CUSTOMER OWNED GUYING, WHEN REQUIRED, TO BE ADEQUATE FOR WIRE SIZE AND SPAN LENGTHS. SEE YOUR COMPANY REPRESENTATIVE FOR RECOMMENDATIONS.

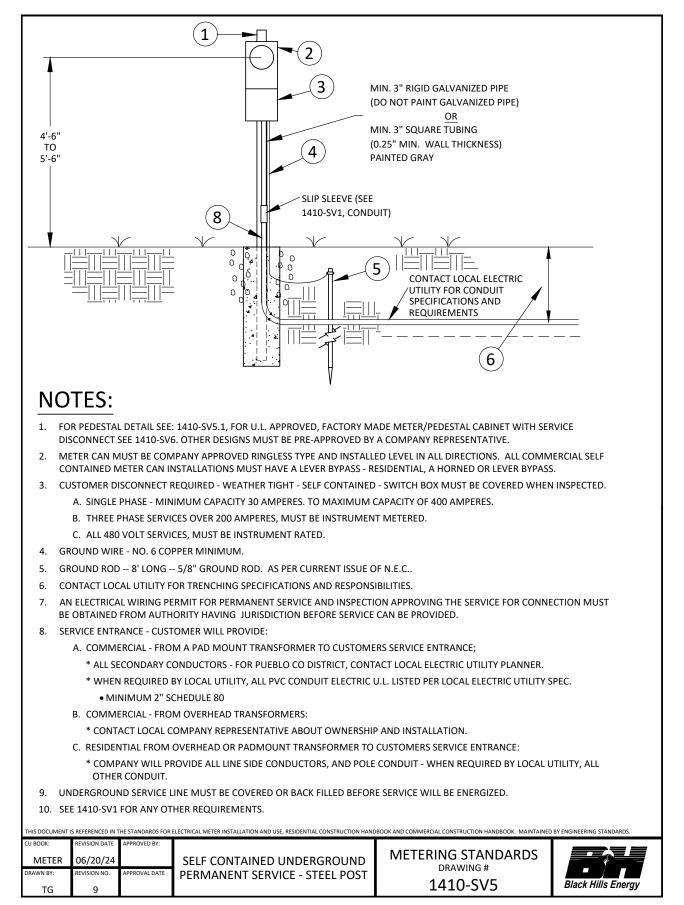
THIS DOCUMENT	IS REFERENCED IN 1	THE STANDARDS FOR	ELECTRICAL METER INSTALLATION AND USE, RESIDENTIAL CONSTRUCTION HANE	BOOK AND COMMERCIAL CONSTRUCTION HANDBOOK. MAINTAINED	BY ENGINEERING STANDARDS.
CU BOOK: METER	REVISION DATE 3/20/25		REQUIREMENTS FOR		
DRAWN BY:	revision no. 10	DATE	PERMANENT ELECTRIC SERVICE	1410-SV1	Black Hills Energy



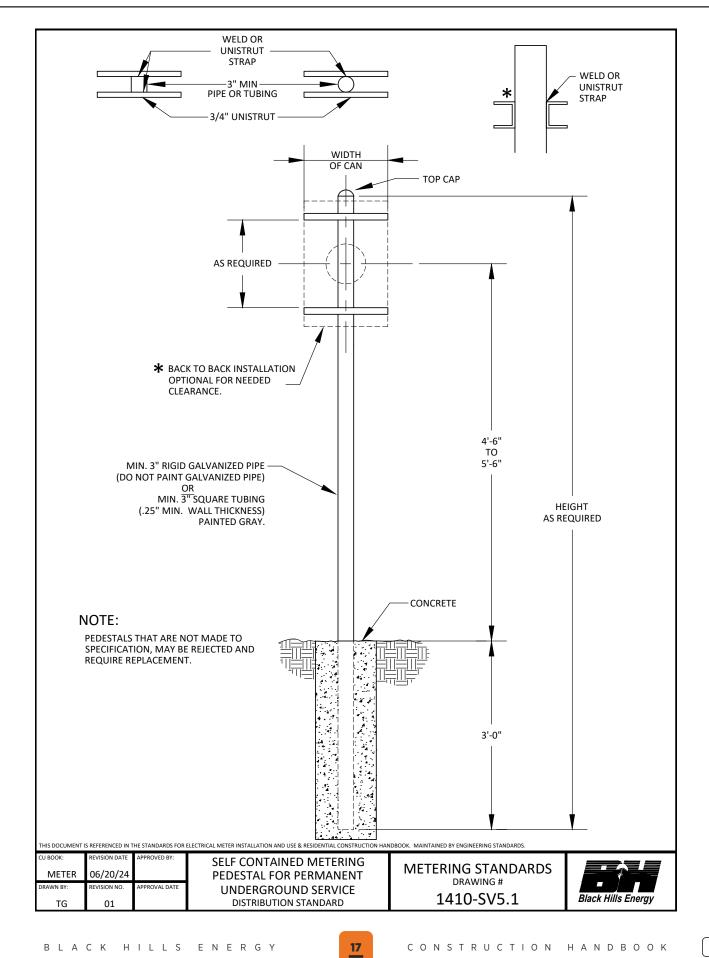


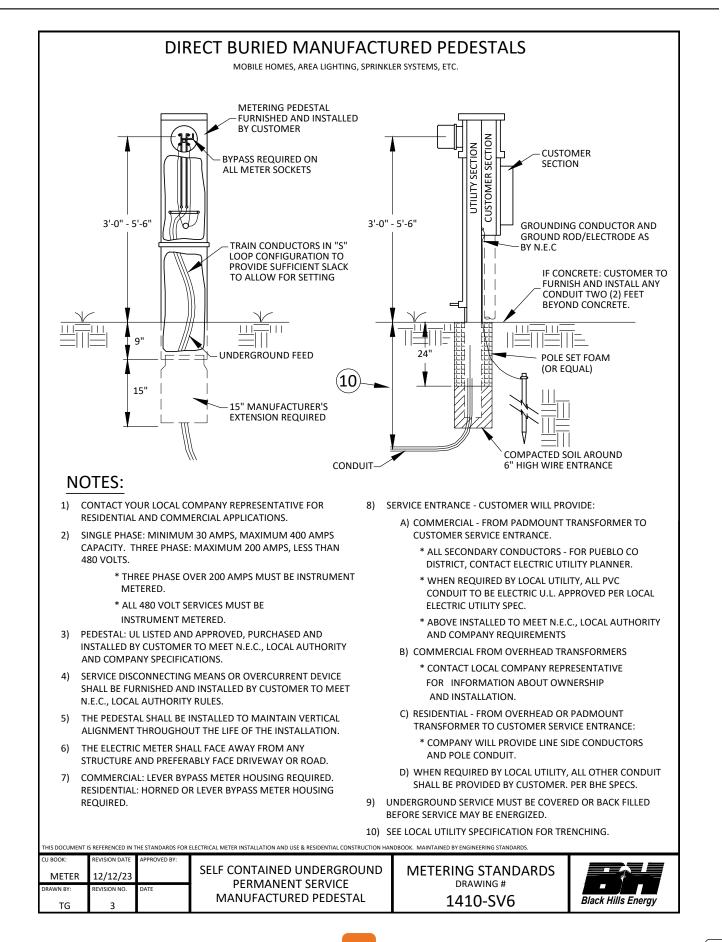




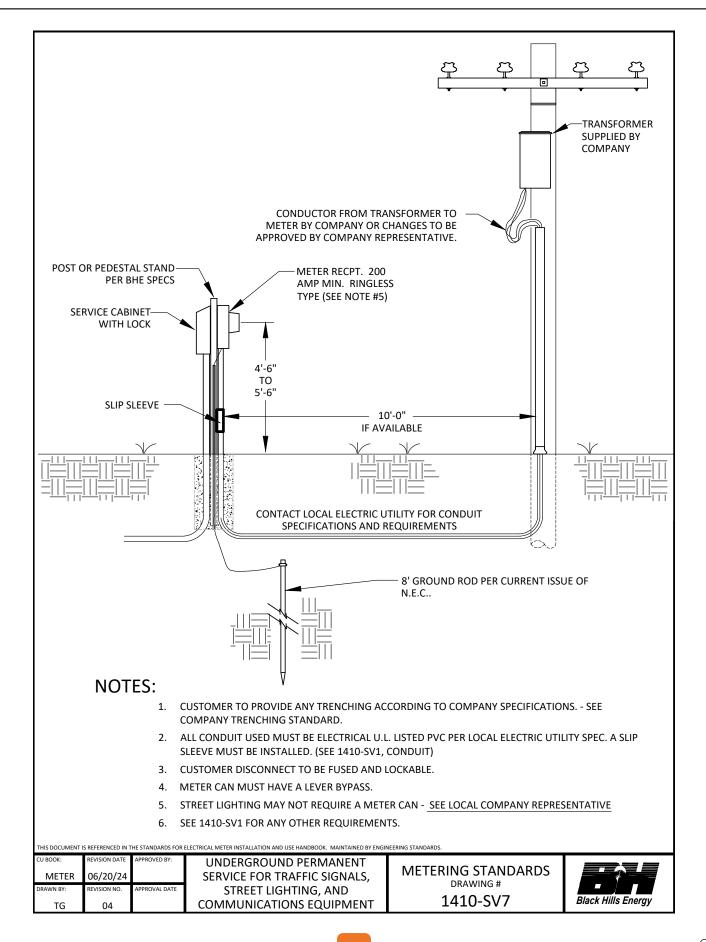


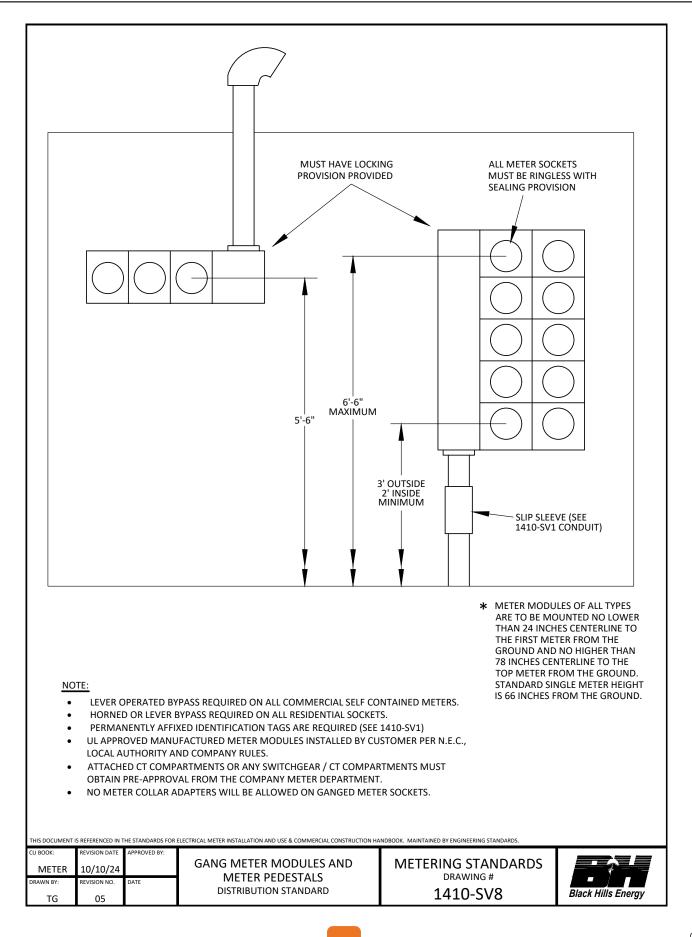
See page 31-38 for trenching specifications

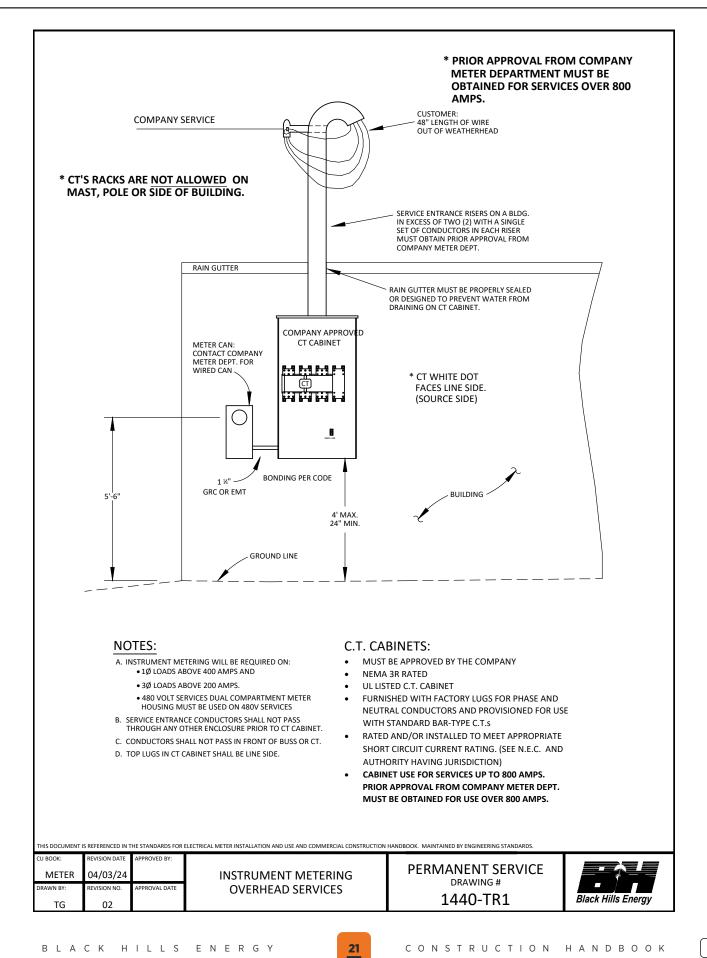




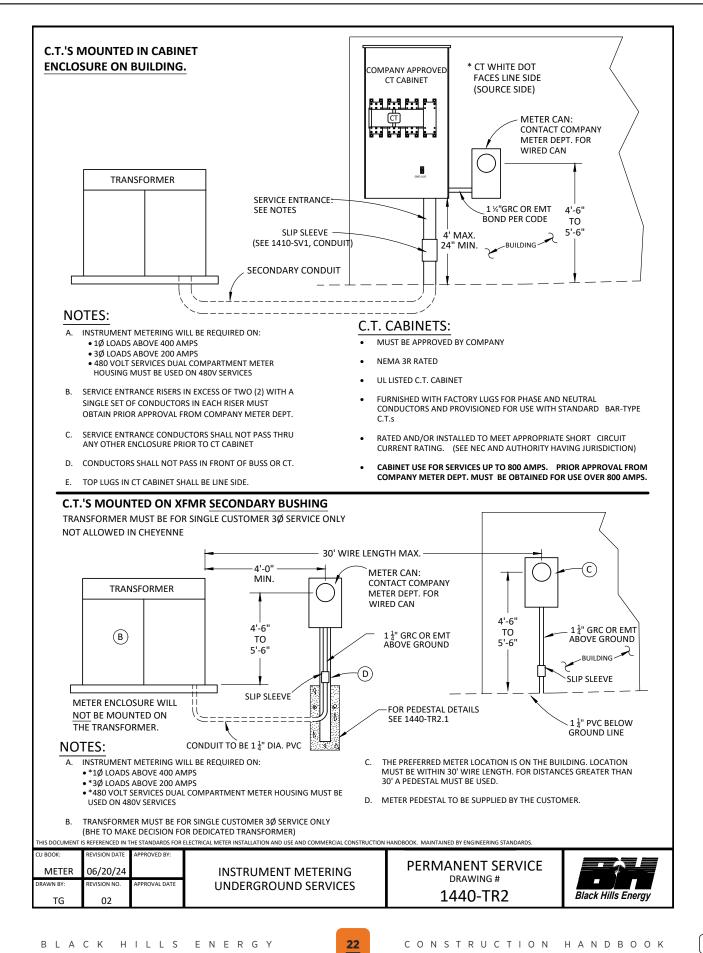
CONSTRUCTION HANDBOOK



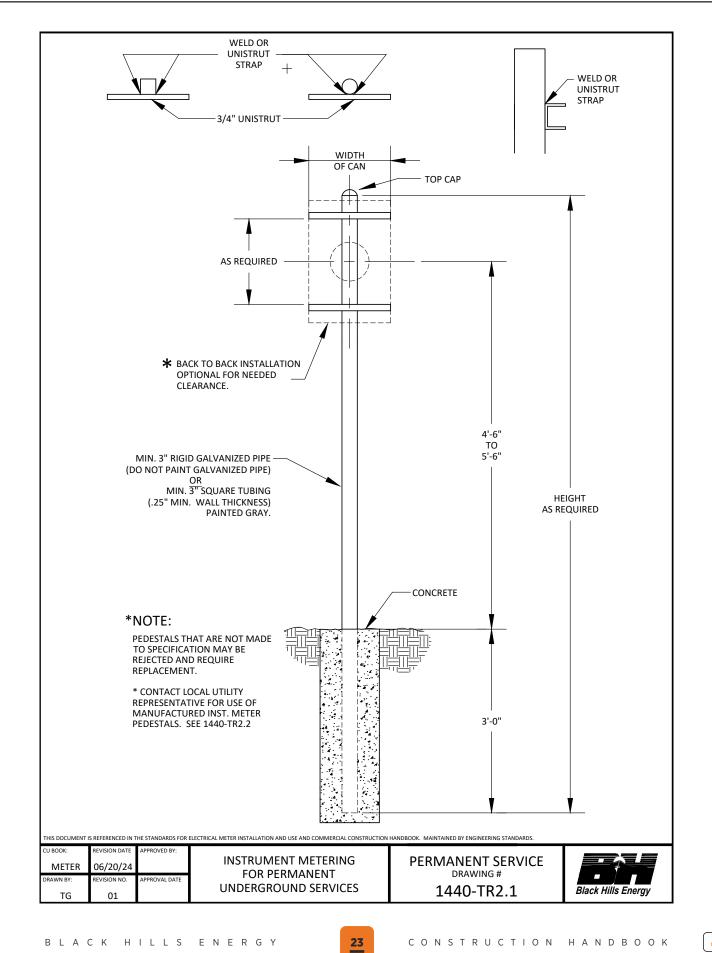


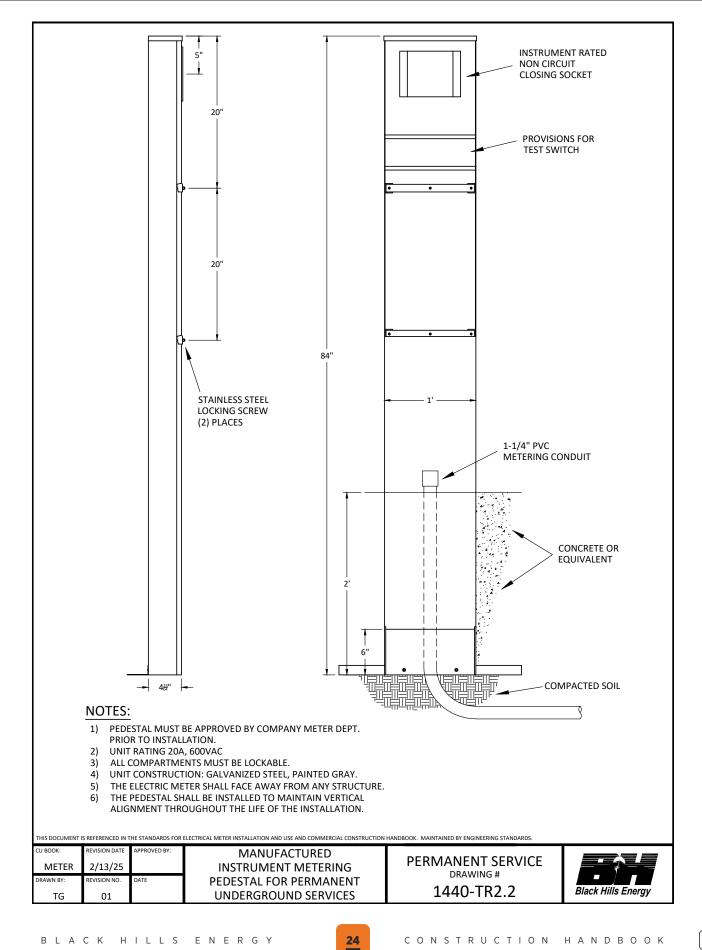


CONSTRUCTION HANDBOOK



CONSTRUCTION HANDBOOK





METER SOCKET LABELING

Meter socket identification for multiple metering panels

On premises where there are multiple meter sockets, such as apartment buildings, condos, townhouses, strip malls, et cetera, Black Hills Energy requires labeling of the services. The unit number shall be plainly marked by permanent, durable means at the meter socket, the corresponding main service breaker and doorway or entrance to the apartment, office, store or other space. Meters serving other loads on the premises such as clubhouses, elevators, pumps, etc., should also be labeled. The labeling is the responsibility of the electrician/ customers. Labeling of all meters helps to ensure worker safety, to include means of disconnecting in an emergency, and accurate billing and maintenance of each account. **Complete labeling and approved, final inspections from the authority of jurisdiction is required before the service will be energized.**

Requirements for labels

The method of identifying the corresponding unit on the meter socket shall be with a stamped brass, aluminum, stainless steel or plastic tag that is permanently affixed to the socket. It shall be attached to the exterior, non-removable portion of the meter socket or at the individual meter main disconnect.

Example



- Black Hills Energy requires a 3-by-1-inch black plastic placard with white engraved letters like the pictures above. These types of labels are available at the retailers noted later in this document.
- A label is required for the building's main disconnect that includes the house or suite number. If no disconnect is present, it may be affixed to the ganged meter socket.
- Permanently affixed labels are required on the **outside** of the meter socket, corresponding breaker and building/house meter (if applicable). The **inside** of the meter socket and **inside** of the tenant's electrical panel must be labeled by use of a black permanent marker.

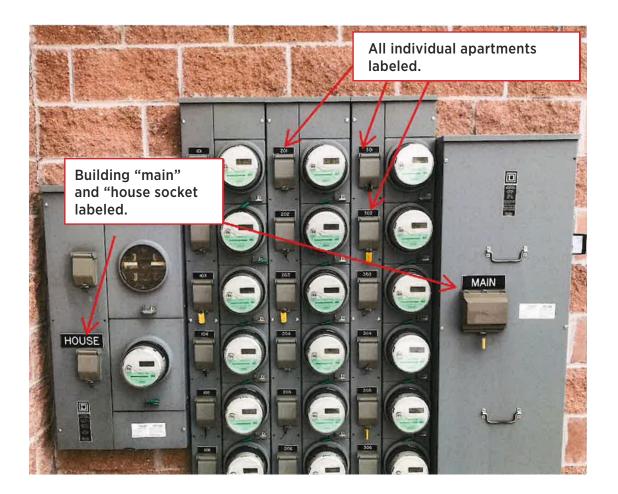
- Labels must correspond to the permanent unit/suite/apartment numbers that are attached to or next to the unit doors/suite/apartment entrances. The labeling of the unit/suite/apartment number must be completed before the meters will be set. At this time, the permanent label at the unit/suite/ apartment does not have to be installed, but they must be labeled with at least a temporary label during construction that will correspond to the permanent label when the project is complete.
- The final addresses must be established with the county or city with jurisdiction before the meters will be installed.

Requirements for labels

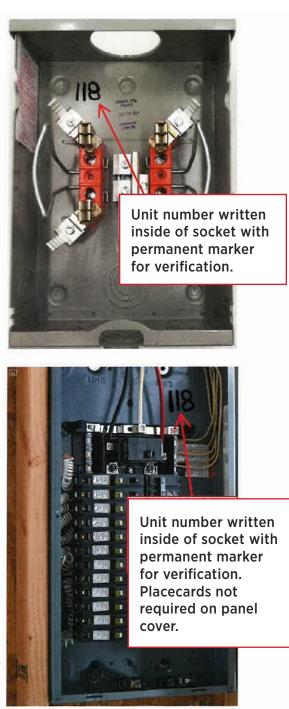
The method of identifying the corresponding unit on the meter socket shall be with a stamped brass, aluminum, stainless steel or plastic tag that is permanently affixed to the socket. It shall be attached to the exterior, non-removable portion of the meter socket or at the individual meter main disconnect.

Residential gang meter socket examples:

Apartment gang meter socket:



Inside of socket and panel labeled with permanent marker:



Entrance door to unit apartment labeling:

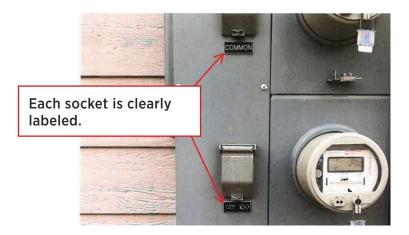




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Plastic placard sources

RAPID CITY

Vanway Trophy (Troy) 3120 West Main St. Rapid City, SD 57702 605-341-2929 vanway@vanwaytrophy.com

JJ's Engraving (Pam) 215 E. North St. Rapid City, SD 57701 605-388-3943 pstainbrook24@hotmail.com

NORTHERN HILLS

Winner's Circle (Becky) Belle Fourche, SD 605-210-0265 beckyjeitztrophies@hotmail.com *Will need to make arrangements for pickup as she doesn't have a storefront.*

SOUTHERN HILLS

LIU Designs (Pat) 13830 SD Hwy 40 Hermosa, SD 57744 605-201-1021 liu@liudesigns.com

Definitions:

- 1. Electric utilities include power, lighting, telephone, cable t.v., signal circuits, etc.
- 2. Non-electric utilities include water, gas, sewer, storm drains, etc.
- 3. Clean dirt, fines, sand, or rock less than 2" are approved bedding material for the conduit system. Deviation from approved bedding can only be authorized by a BLACK HILLS ENERGY representative.

Trench:

- 1. All cable to be installed in conduit system unless approved by a BLACK HILLS ENERGY representative.
- 2. Clearances must be obtained from all other buried utilities before digging.
- 3. The conduit system should be located a minimum of two feet from the property line.
- 4. The conduit trench must meet the specifications of Standard Drawings #2200 T1-T4.
- 5. Where the surface grade of the trench location is not final, steps must be taken to ensure minimum standard depth subsequent to installation.
 - a. If the grade is to be lowered, the depth of cut must be added to our standard trench depths.
 - b. If the grade is to be raised, the trench must be standard depth at the time it is dug.
 - c. Curb and gutter must be installed in subdivisions prior to trenching to insure proper grade.
- 6. Back fill or bedding within 4 inches of conduit systems shall be free of all rocks larger than 2" or other materials that may damage the conduit. Refer to "definitions" above for standard approved material for the "cushion" around the conduit.
- 7. Back fill must be adequately tamped or packed to prevent sinking and meet the specifications of governmental agencies when necessary. Machine compaction must not be used within 6 inches of the conduit to prevent damage.

Conduit:

- All conduit shall be approved HDPE black endless w/3 red stripes or PVC schedule 40 electrical conduit.
 a. 2" conduit may be used for #6 DPLX for street lighting and PAL lighting.
 - b. 3" conduit may be used of or #2, 1/0, & 4/0 single phase primary cable.
 - c. 3" conduit shall be used for 1/0 and 4/0, residential service cable serving a 200A meter can.
 - d. 3" conduit shall be used for 600V 350 triplex for secondary and service cable.
 - e. 4" conduit shall be used for #2, 1/0, and 4/0 3 phase primary cables.
 - f. Two single phase services may be placed in one 4 inch conduit.
 - g. 6" conduit shall be used for 350MCM, 500MCM, 750MCM and 1000MCM primary circuits.
- Minimum residential service cable conduit size will be 3" and standard 24" RADIUS PVC sweeps up to 150 feet, with no more than 270 degree of bends.
- Any residential service cable conduit systems 150 feet in length or longer with 270 of bends or more need to have 24" RADIUS fiberglass sweeps installed. 200A secondary conduit systems should not exceed 280' (total wire length) or 270 degree of bends without prior approval.
- 4. A 1/2", 1200 lb pull tape shall be installed in all conduits.
- 5. Conduit ends must be sealed with a Plug with PULL TABS and extend out to the ground 4 to 8 inches.
- Primary conduit sweeps shall be FIBERGLASS with a minimum RADIUS of 36" for 4" or less. 6" sweeps will require a 48" RADIUS.
- Conduit risers shall be installed in accordance with PVC molded riser drawings.
- 8. Schedule 80 pipe under all city, county, and state roads.

Safety:

- 1. Before working on primary wire, be sure there is a visible open at both ends and it is grounded, unless insulated sticks are used.
- 2. All enclosures, transformers and switching modules must be kept locked at all times except when actually working at their location.

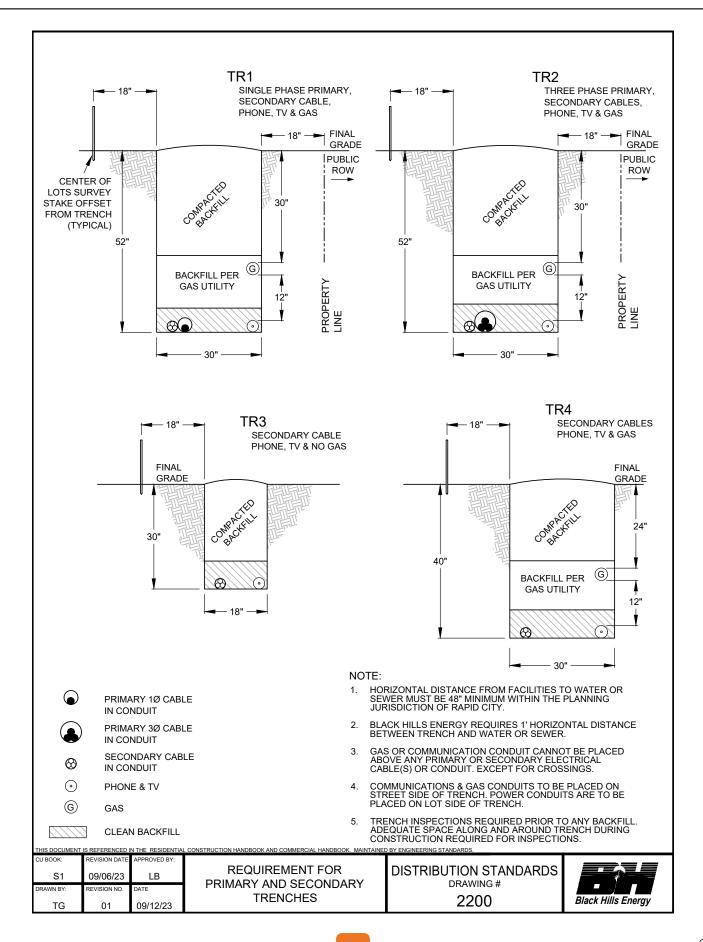
Cable Installations:

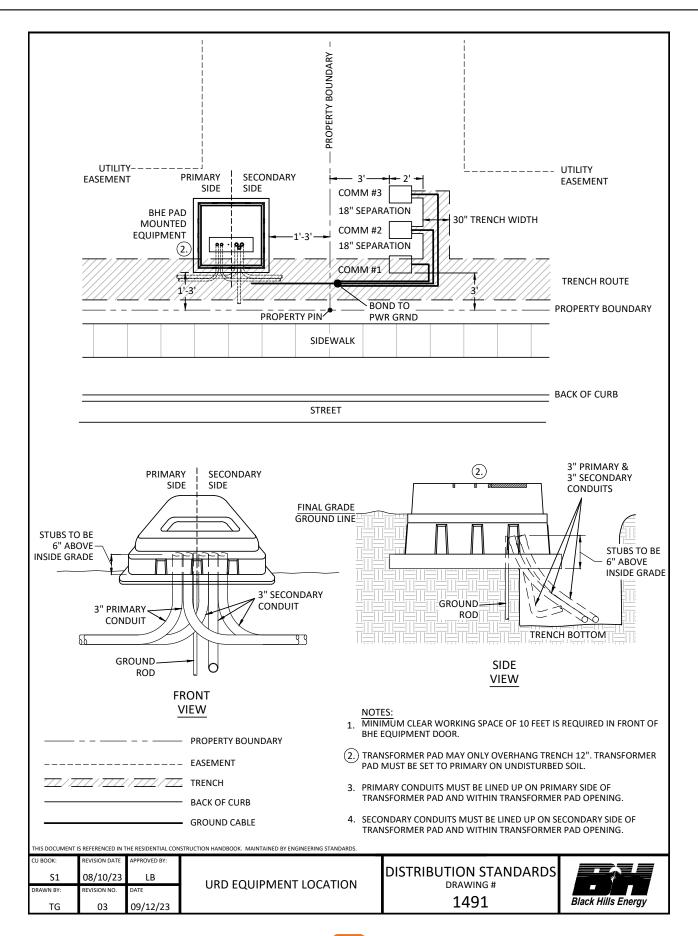
- 1. Cable will not be placed in a conduit system unless it meets the the standard trench specification including the appropriate bedding.
- 2. Cable will be inspected as it is installed to insure no kinks, cuts, abrasions or damage of any kind.
- 3. Be sure sufficient lengths of cable are left at the ends for risers and or terminations.
- 4. Cable paralleling non-electric utilities or other subsurface structures shall not be installed directly above or below such utilities. See Trench Specifications for minimum spacing.
- 5. Trench will be inspected prior to cable installation and prior to back filling, by BLACK HILLS ENERGY personnel.

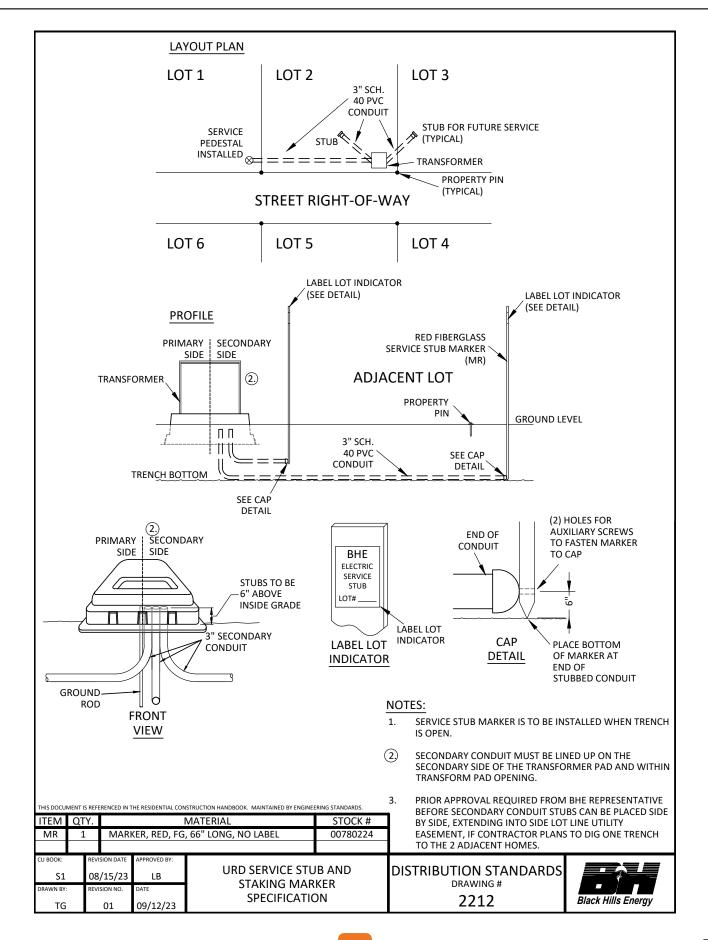
NTAL CONSTRUCTION HANDROOK AND COMMERCIAL HANDROOK, MAINITAINED BY ENCINEERING STANDARD

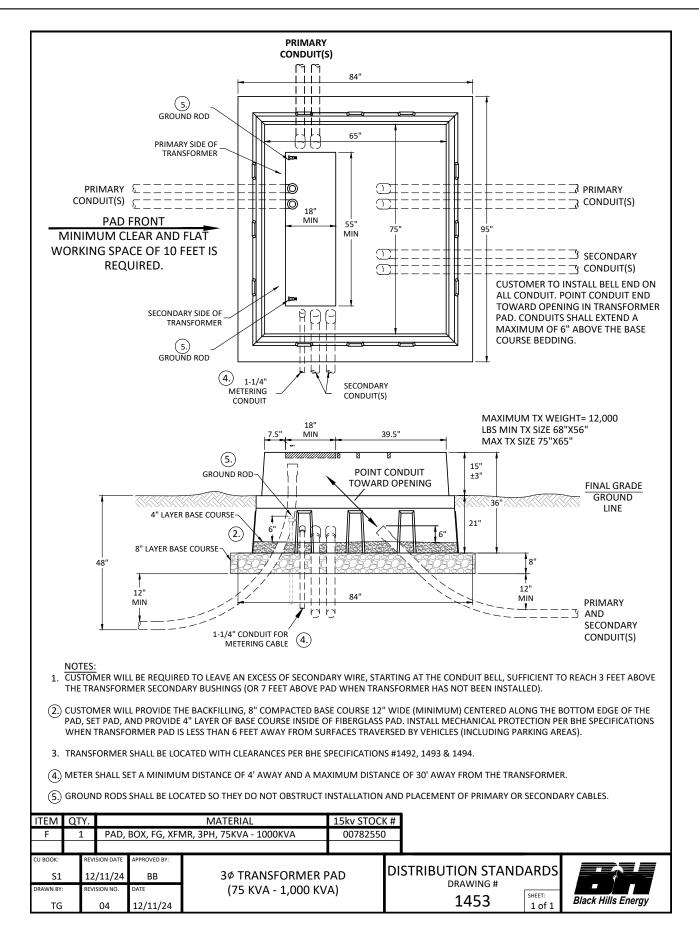
6. Cable ends must be sealed when exposed if termination or splice is to be done at a later time. This will prevent moisture migration into the cable.

THIS DOCUMENT	13 REFERENCED I	IN THE RESIDENTIAL	CONSTRUCTION HANDBOOK AND COMMERCIAL HANDBOOK. MAINTAINED	D BT ENGINEERING STANDARDS.		
CU BOOK:	REVISION DATE	APPROVED BY:				
S1	3/20/25	LB	URD CABLE AND		ARDS	
DRAWN BY:	REVISION NO.	DATE:	TRENCH GUIDELINES	DRAWING #		
TG	02	09/12/23		2210	SHEET: 1 of 2	Black Hills Energy



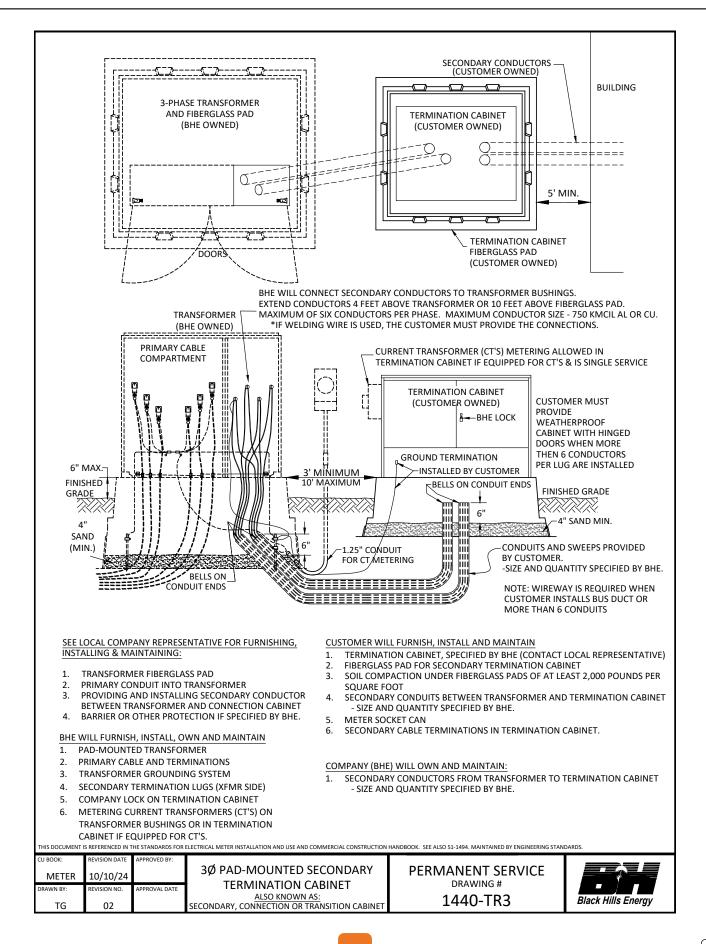






GENERAL: 📕 CORPORATE STANDARD PAD MOUNT TRANSFORMERS SHALL BE LOCATED IN AN AREA ACCESSIBLE TO LINE TRUCKS FOR EASY INSTALLATION AND REMOVAL. 1) PAD MOUNT TRANSFORMERS SHALL BE LOCATED IN AN AREA NOT SUBJECTED TO FLOODING. 2) PADS FOR TRANSFORMERS SHALL BE PROTECTED AGAINST LANDSLIDES, DRAINAGE WASH OR DRIFTING SAND, ETC. THE 3) INSTALLATION OF RETAINING WALLS OF SUFFICIENT STRENGTH AND SUITABLE CONSTRUCTION TO PROVIDE ADEQUATE PROTECTION SHALL BE THE RESPONSIBILITY OF THE CUSTOMER. 4) PADS FOR TRANSFORMERS SHALL BE INSTALLED AND MAINTAINED LEVEL. 5) ANY PROTECTIVE OR DECORATIVE FENCING OR ENCLOSURE TO BE BUILT AROUND A PAD MOUNTED TRANSFORMER MUST BE APPROVED BY CONSTRUCTION PLANNING AND ENGINEERING PRIOR TO INSTALLATION. COMBUSTIBLE AND NON-COMBUSTIBLE SURFACES SHALL BE DEFINED IN ACCORDANCE TO ASTM E136. 6) **BASIC HORIZONTAL CLEARANCES: (FIGURE 1)** THE FOLLOWING HORIZONTAL CLEARANCES BETWEEN PAD MOUNTED TRANSFORMERS AND ADJACENT STRUCTURES ARE REQUIRED: TEN FEET MINIMUM FROM COMBUSTIBLE SURFACES. CUSTOMER SHALL PROVIDE NON-COMBUSTIBLE SURFACES OR 1) FIRE-RESISTANT BARRIERS, AS SPECIFIED IN FM DATA SHEET 5-4, IF CLEARANCE IS LESS THAN 10'. THREE FEET MINIMUM FROM A NON-COMBUSTIBLE SURFACE ON ANY SIDE AND AT LEAST 10' CLEAR WORKING SPACE ON THE 2) FRONT SIDE OF THE TRANSFORMER. 3) OVERHANGS (COMBUSTIBLE) a) IF AN OVERHANG OF COMBUSTIBLE MATERIAL CLEARS THE TOP OF OIL-FILLED PAD MOUNTED TRANSFORMERS BY A MINIMUM OF 20' VERTICALLY, THE REQUIRED DISTANCE SHALL BE MEASURED FROM THE BUILDING WALL. b) IF AN OVERHANG OF COMBUSTIBLE MATERIAL CLEARS THE TOP OF OIL-FILLED PAD MOUNTED TRANSFORMERS LESS THAN 20' VERTICALLY, THE REQUIRED CLEARANCE SHALL BE MEASURED FROM THE FARTHEST PROJECTION OF THE OVERHANG. CLEARANCE FROM AIR INTAKE, WINDOWS, DOOR AND FIRE ESCAPES: (FIGURE 2) DOORS: A PAD MOUNT TRANSFORMER SHALL NOT BE PLACED WITHIN A ZONE EXTENDING 20' OUT FROM AND 10' TO EITHER SIDE 1) OF A DOOR. WINDOWS: A PAD MOUNT TRANSFORMER SHALL NOT BE PLACED WITHIN A ZONE EXTENDING 10' OUT AND 8' EITHER SIDE OF A 2) WINDOW ON THE 1st FLOOR. THE TRANSFORMER SHALL NOT BE ANY CLOSER THAN 5' FROM ANY PART OF A SECOND STORY WINDOW, NOR DIRECTLY BELOW AN OPERATING WINDOW. 3) AIR INTAKES: A PAD MOUNT TRANSFORMER SHALL NOT BE PLACED WITHIN A ZONE EXTENDING 10' OUT FROM AND 10' TO EITHER SIDE OF AN AIR INTAKE. IF THE AIR INTAKE IS ABOVE THE TRANSFORMER, THE TRANSFORMER SHOULD BE 25' FROM THE OPENING. 4) FIRE ESCAPES: A PAD MOUNT TRANSFORMER SHALL NOT BE PLACED WITHIN A ZONE EXTENDING 20' OUT FROM AND 20' TO EITHER SIDE OF A FIRE ESCAPE. HORIZONTAL CLEARANCE FROM BUILDINGS CLEAR ZONE FOR BUILDING OPENING OR FIRE ESCAPE SEE FIG 1 BUILDING WAL OVERHANG EASUREMENT MEASUF C PAD MOUNT **BUILDING OPENING** TRANSFORMER **OR FIRE ESCAPE** ACCESS DOORS A TRANSFORMER CLEAR ZONE OUTLINE BUILDING SURFACE CLEARANCE CLEARANCE TYPE OPENINGS COMBUSTIBLE 10' B © NON-COMBUSTIBLE FIRE ESCAPE 3 20' <u>20'</u> DOORWAY NOTE: DIMENSION (A) IS FROM THE TRANSFORMER TO THE BUILDING 10' 20' WINDOW 10' 8 SURFACE IF THE OVERHANG IS NON-COMBUSTIBLE OR MORE AIR INTAKE 10 10 THAN 20' FROM TOP OF TRANSFORMER. FIGURE 1 FIGURE 2

CU BOOK:	REVISION DATE	APPROVED BY:			
S1	8/02/23	BB	PAD-MOUNT TRANSFORMER		
DRAWN BY:	REVISION NO.	DATE	LOCATIONS AND CLEARANCES		
TG	02	8/02/23		1492 SHEET: 1 of	1 Black Hills Energy



CONSTRUCTION HANDBOOK

APPLICATION:

IF PAD MOUNTED EQUIPMENT MUST BE LOCATED IN PAVED OR TRAVELED AREAS, OR ADJACENT TO SUCH AREAS WITH THE POSSIBILITY OF DAMAGE FROM VEHICLES, PHYSICAL PROTECTION ACCEPTABLE TO BLACK HILLS ENERGY MUST BE PROVIDED, INSTALLED, AND MAINTAINED BY THE CUSTOMER. BLACK HILLS ENERGY WILL DETERMINE WHEN SUCH PROTECTION IS NECESSARY, AND WILL REVIEW AND APPROVE THE CUSTOMER'S PROPOSED DESIGN.

MATERIAL:

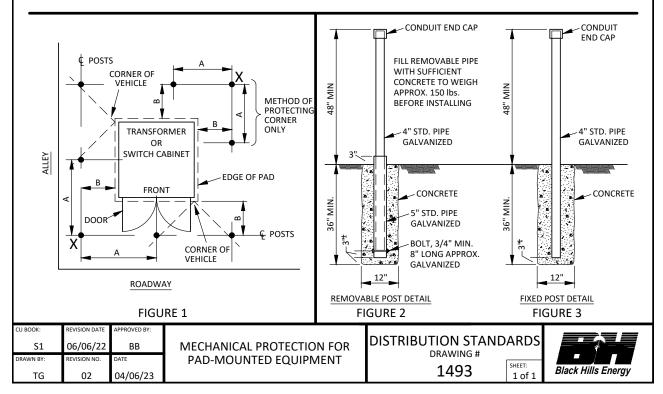
GALVANIZED 4" STANDARD PIPE AND END CAP IS THE <u>PREFERRED</u> METHOD OF POST FABRICATION. A SMOOTH CONCRETE DOME IS PERMITTED IN PLACE OF THE END CAP. WHEN A <u>CONCRETE DOME</u> IS USED, THE PIPE END MUST BE FREE OF SHARP EDGES. THE 5" DIAMETER SECTION FOR INSTALLING REMOVABLE POSTS MUST ALSO BE GALVANIZED.

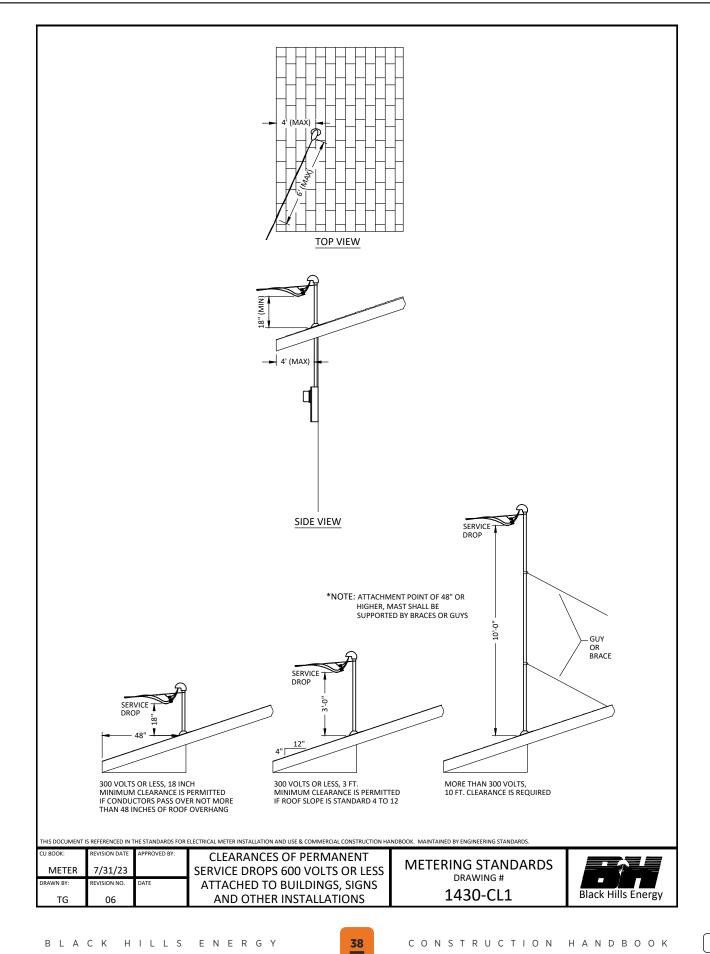
LOCATION:

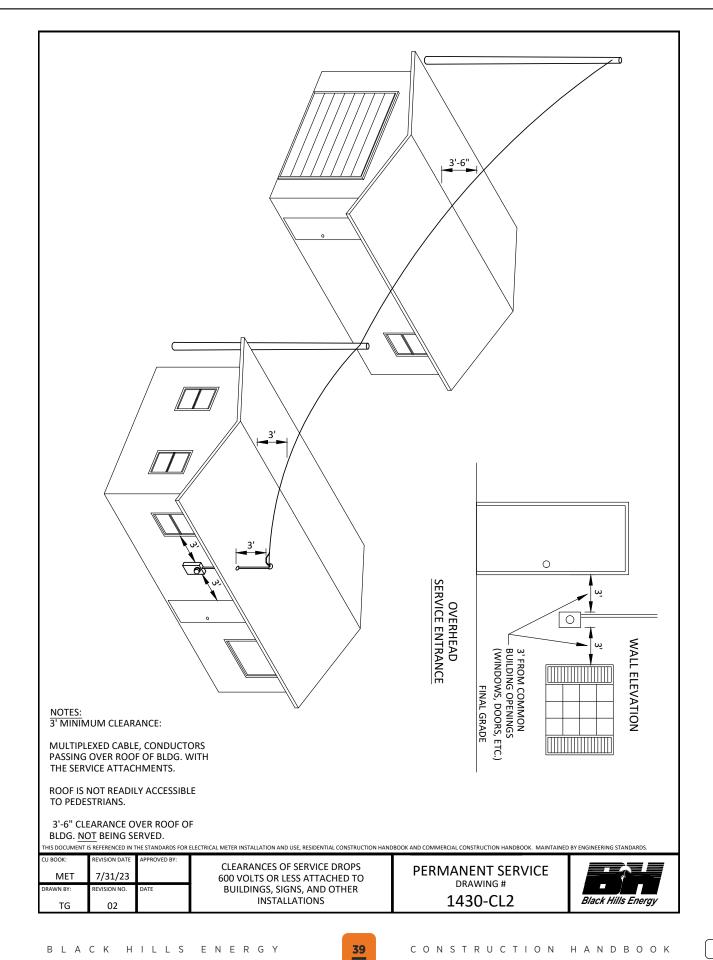
- 1) LOCATE BARRIER POST SO THEY DO NOT INTERFERE WITH THE OPENING OF EQUIPMENT DOORS. USE REMOVABLE BARRIER POSTS AS FOLLOWS:
 - a) ON DOOR SIDE(S) OF EQUIPMENT WHERE POSTS COULD INTERFERE WITH OPERATION OF LIVE LINE TOOLS.
 - WHERE THE USE OF FIXED POSTS WOULD OBSTRUCT ACCESS FOR INSTALLATION OR REPLACEMENT OF EQUIPMENT.
- 2) DIMENSIONS FOR LOCATION OF POSTS WITH RESPECT TO EQUIPMENT PAD ARE DETERMINED AS FOLLOWS: (SEE FIGURE 1)
 - a) DETERMINE THE MOST PRACTICABLE DISTANCE "B" (FOR EACH SIDE) THAT POSTS CAN BE LOCATED FROM THE EDGE OF THE PAD.
 - b) DIMENSION "A" (FOR EACH SIDE) MUST BE LESS THAN OR EQUAL TO 2 TIMES "B" MINUS 6 INCHES BUT SHOULD NOT EXCEED 42 INCHES.
 - c) PLACE THE FIRST POST AT THE INTERSECTION OF PROJECTED CENTERLINES, (POINT X).
 - d) PLACE ONE POST DISTANCE "A" FROM POINT "X" ALONG EACH SIDE TO PROTECT CORNER.
 - e) CONTINUE TO PLACE POSTS DISTANCE "A" APART ALONG SIDES TO BE PROTECTED.
 - f) <u>TO PROTECT ONE SIDE ONLY</u>, PROCEED AS IN "a" AND "b" ABOVE, PLACE FIRST POST DISTANCE "B" FROM EDGE OF PAD AT EACH POINT WHERE PROTECTION IS REQUIRED THEN PROCEED AS IN "e" ABOVE.
 - g) <u>TO PROTECT CORNER ONL</u>Y, PROCEED AS IN "a" THROUGH "d" ABOVE.

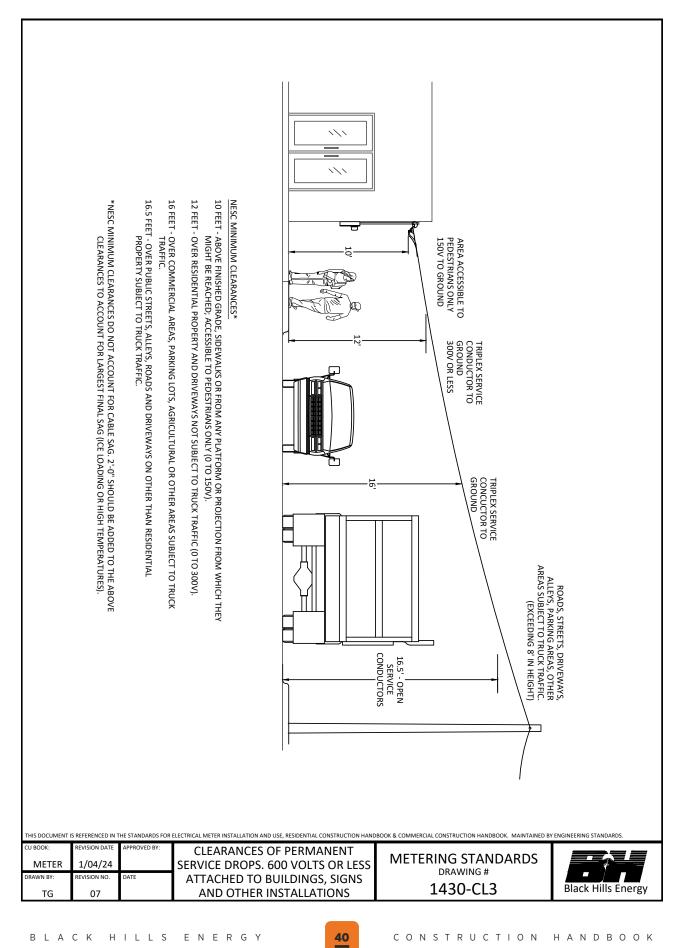
NOTES:

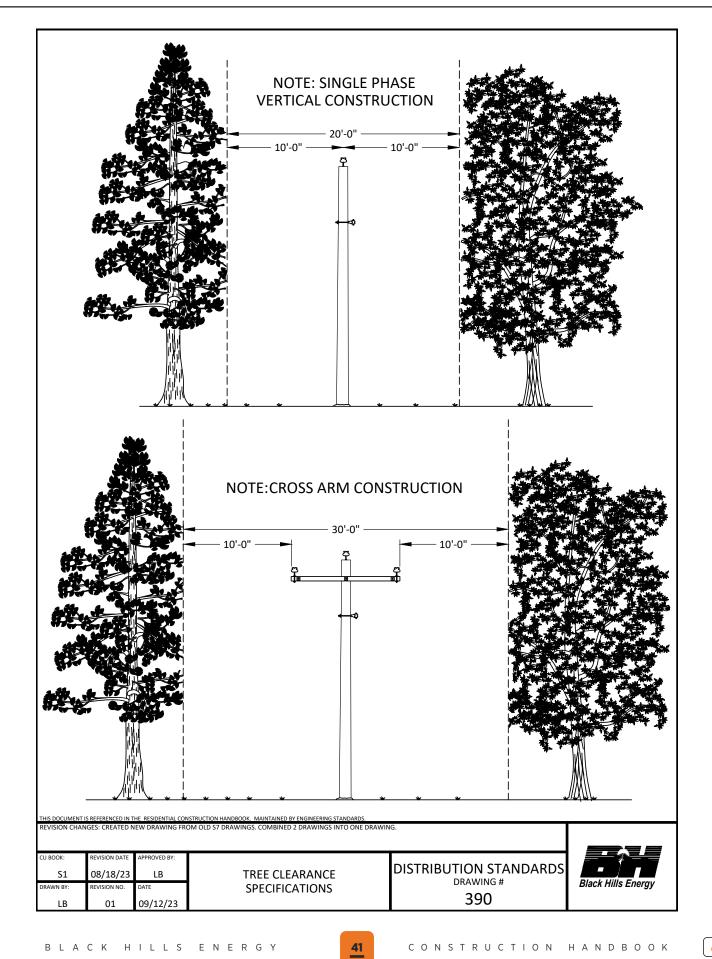
- 1) A BUILDING WILL PROVIDE PROTECTION IF IT IS LOCATED AT A POINT WHERE A POST WOULD NORMALLY BE REQUIRED.
- 2) SQUARE FACED STREET CURBING PARALLEL TO NORMAL TRAFFIC FLOW CAN BE CONSIDERED SUITABLE PROTECTION IF THE PAD-MOUNT EQUIPMENT IS LOCATED A MINIMUM OF 6 FEET BEHIND THE CURBING.

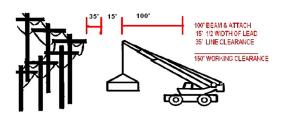












Rule of Thumb: If the overhead power line is 50kV or less, then stay at least 10 feet away. For everything else, keep at least 35 feet away.

Power Line Clearance Distances		
Voltage	Distance from Power Line	
≤50kV	10 feet	
200kV	15 feet	
350kV	20 feet	
500kV	25 feet	
650kV	30 feet	
800kV	35 feet	

For More Information on Training & Other Contact: Construction Safety Council 4415 West Harrison Street, Suite 407 Hillside, Illinois 60162 Phone: 800-552-7744

Web Site: www.buildsafe.org

General

- Move equipment/activity to the safe working distance from power lines.
- Have utility de-energize and visibly ground power lines.
- Have utility move power lines to the safe working distance.
- Have utility install insulated sleeves on power lines.*
- Install flagged warning lines to mark horizontal and vertical power line clearance distances.
- > Use non-conductive tools and materials.

Cranes and Other High Reaching Equipment

- Use an observer.*
- Use an insulated link, if applicable.*
- Use a boom cage guard, if applicable.*
- Use a proximity device, if applicable.*

Mobile Heavy Equipment

- Install rider posts or goal posts under power lines.
- Install warning signs at driver's eye level.

Ladders

- User non-conductive ladders.
- Don't carry or move extension ladders fully extended. Retract before moving.
- Get help moving ladders to maintain control.

Material Storage

- Don't store any materials under power lines.
- Use caution tape and signs to cordon off area under power lines.

Excavations

- Call local one-call service several days before you dig to locate all underground cables.
- Hand dig within three feet of cable location.
- Be aware that more than one underground cable may be buried in area of locator markings.

*These options do not allow the operator to work closer than the line clearance distance.

South Dakota Codified Law

49-32-11 Activities bringing persons or equipment in proximity to high voltage lines prohibited—Violation as misdemeanor. No person may, individually or through an agent or employee, and no person as an agent or employee of another person, may perform or permit another to perform any function or activity if it is probable that during the performance of such activity any person or any tool, equipment, machinery, or material engaged in performing work connected with such activity, will move, or be placed in, a position within ten feet of any high voltage overhead electrical line or conductor. A violation of this section is a Class 2 misdemeanor.

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Source: SL 1973, ch 288, § 2; SL 1983, ch 15, § 130; SL 202, ch 215, § 1

CONTACTS

RAPID CITY Office: 605-721-2581

NORTHERN HILLS

Office: 605-206-2966

SOUTHERN HILLS Office: 605-858-7015

START SERVICE REQUEST

blackhillsenergy.com/service-request

Call & before before you dig.

Whether you're planting a tree or digging a post hole, it's critical to know what's underground. Safety is in your hands. Every dig. Every time.

44



Have your buried utilities marked before you dig.

