CITY UTILITIES
Richland Center, WI

ELECTRIC SERVICE MANUAL

Revised August 2020

Electric Shop……608-647-2434

133 W Robb Rd

Utility Office…….608-647-3844

City Municipal Building 450 S Main St

Building Inspector…….608-647-5364

City Municipal Building 450 S Main St

Diggers Hotline……811

This manual provides information for new and existing customers, contractors, and developers to understand the electric service rules and requirements of Richland Center Electric Utility. (RCEU)

This manual does not take exception to any local, state, or federal electric codes.

Modifications to the specifications presented here may be granted only if requested prior to any work being started. In all cases, safety will be paramount in the decision to make any exceptions to our procedures.

RCEU reserves the right to refuse service if a customer does not comply with these rules or if a dangerous electrical condition exists on a customer's premises.

RCEU requests that contractors, developers and homeowners contact RCEU early in the design process to ensure all issues are resolved prior to construction.

Before any new electric service is energized the electrical contractor, building owner, or general contractor must be on site to take responsibility for the newly energized service or RCEU crews must have safe access to the service's main disconnect.

For more detail or information, please refer to the RCEU Rate Tariffs and Electric Rules as filed with, and approved by, the Public Service Commission of Wisconsin (PSC).

Key Contacts:

Scott Gald, Electric Superintendent…….608-604-6456
sgald@cityutilitiesofrc.com

Gerald Klatt, Meter tech, Lineman …… 608-604-1019

Rod Klossowski Lead Lineman……... 608-475-6481

TO GET ELECTRIC SERVICE

RCEU requires an application for electric service be completed and returned to the appropriate city or town Building Inspector prior to connecting a service. A copy of the application is available at the Richland Center municipal building 450 South Main St, Richland Center, WI.

RCEU will work with customers to determine the service size, size of the equipment needed (i.e. transformer, cable, etc.) and identify the most suitable location for the service entrance. RCEU will also work with customers to determine the location of the transformer and other associated equipment. **However, the final decision on service entrance sizing and other equipment is the responsibility of the owner.**

RCEU will also determine the cost to provide service. The fee to provide service includes the cost of all necessary equipment (e.g. cable, fuse cutouts, lightning arrestors, poles, etc.). Please refer to Richland Center's Extension Rules approved by the Wisconsin Public Service Commission for further information.

RCEU will prepare a cost proposal that includes all costs associated with providing service minus the Average Depreciated Embedded Cost as determined by the PSC.

To upgrade an existing service or for additional service facilities, customers must contact the Building Inspector to determine if permits or inspections are needed.

When the service entrance passes inspection, a "Certificate of Inspection" will be issued and forwarded to RCEU. Once the certificate is received, RCEU will prepare a Work Order and schedule the job.

UNDERGROUND FACILITY INSTALLATION RATES

	Single Phase		**Three Phase**	
*Price per foot with Standard wire***	**Direct Buried**	**Conduit/Bored**	**Direct Buried**	**Conduit/Bored**
Primary Extension	$7.00	$15.00	$11	$19
Secondary Extension	$6.50	$14.00	$8 **	$18 **

** Price may vary depending on wire needed
A "frost adder" of $2.50 per foot will be in effect when frost reaches a depth of 6".

The first 100' of a secondary extension is provided at no cost if the service is new or is being upgraded according to our service rules.

TEMPORARY SERVICE

RCEU will install temporary services to provide electricity during construction. All rules, charges (Min $200.00) and codes apply to temporary services with the exception of location of the service. Temporary services may be mounted on RCEU facilities with prior approval. It is preferred that temporary services remain in place for no more 12 months.

• ELECTRIC SERVICE CHECKLIST

Prior to RCEU scheduling a service connection the customer is responsible to be sure:

- ☑ All fees or charges to install a service are paid in full,
- ☑ All necessary easements are signed,
- ☑ Service lateral route is clear of dirt piles, trees, buildings, other obstructions,
- ☑ Service entrance wiring is completed,
- ☑ Electrical inspection is complete, and
- ☑ Grade is within four inches of final grade.

• VOLTAGES

Richland Center Electric Utility has primary distribution voltages of 7200/12470 VAC.

RCEU standard secondary voltages are:

- 120/240 VAC 3-wire single phase
- 120/208 VAC 4-wire wye three phase
- 120/240 VAC 4-wire delta three phase
- 277/480 VAC 4-wire wye three phase

• METERING

Richland Center Electric Utility will supply all electric meters. RCEU's general standard requirement for a single phase service rated at 200 amps continuous is a plug-in meter socket. For approved meter socket please see the service entrance diagrams.

For services rated greater than 400 amps, RCEU requires instrument transformers. RCEU will furnish the instrument transformers and complete all the necessary meter wiring. The customer must furnish an approved metering cabinet, meter socket, and test switch.

Metering equipment may not be located on RCEU's facilities. All meters must be placed on the exterior of any dwelling or facility, must be protected from potential damage, and must be easily accessible for reading and maintenance.

Please contact RCEU at 608-647-2434 prior to installing an electric service.

• TRANSFORMERS

Richland Center Electric Utility will supply all transformers. Transformers may be overhead or pad mount for use with underground service. RCEU will work with customers to ensure that location of transformers meets or exceeds all necessary clearances as outline in state and national safety codes.

There is no charge to customers for transformers up to and including 500 KVA. When the service requires a transformer larger than 500 KVA, the customer must pay the difference between the required transformer and a 500 KVA transformer.

Customers will be charged for the pad or basement for underground transformers.

- ## SECONDARY CABLE

Richland Center will provide secondary cable/conduits/terminators to customer owned metering equipment. For all secondary cable, the first 100' will be included at no charge for new and upgraded services. For services over 100', the customer will be invoiced for the actual cost less the first 100'.

For single family homes and duplexes with services rated 200 amps continuous, RCEU will supply the service lateral at no charge up to 100'.

- ## SERVICE UPGRADES

Overhead Service Drop; Richland Center Electric Utility will upgrade an overhead service drop with a larger size overhead conductor up to the maximum standard size at no charge.

Underground Service Drop; Richland Center Electric Utility will upgrade an underground service drop with a larger size underground conductor up to the maximum standard size at no charge.

Overhead Service Drop to Underground Service Drop; Richland Center Electric Utility shall require a contribution from the customer requesting to have an overhead service drop upgraded to an underground service lateral. The contribution shall be equal to the cost of the underground service lateral less the cost of an equivalent overhead service drop. This is for customers upgrading a service size to a larger amperage service only.

- ## SERVICE RELOCATIONS AND UNDERGROUNDING REQUESTS

Any customer wishing to relocate an existing service, or, convert an overhead service to an underground service without upgrading to a larger amperage service size will be charged the actual costs of the new service.

- ## EMERGENCY SERVICE (Fire Pumps)

Customers requiring emergency service, such as a dedicated service to a fire pump, have several options.

1) Source side (utility side) tap in an outdoor CT cabinet that is not near the main disconnect.

2) Two separate services from the utility transformer, metered separately with separate customer charges. One meter for facility and the other for fire pump service. The services cannot go to the same location on the building. Customer is responsible for actual costs incurred for fire pump service.

3) If Richland Center Electric Utilities has CT metering available at the transformer (this is not usually allowed), the customer can install and own 2 services. This may require installation of disconnects if the services go to more than one building. Contact the inspector whether this applies to fire pumps located in separate building.

4) The customer may request a dedicated transformer for the fire pump system. All costs incurred for this installation will be invoiced to the customer and a monthly customer charge will be applied. This can be a different voltage than the main service.

• Lightning Protection

Lightning damage due to induced electrical surges from nearby lightning strikes is a common problem in Wisconsin. Part of the problem is due to grounding problems. Because of poor grounding conditions, it is critical to bond all metallic systems. The theory is that by bonding everything, there will be little or no difference in potential between metallic systems (therefore minimizing damage). Bonding is also done for safety and code reasons. If you are correcting bonding problems, it is important to bond everything. Partial bonding could actually aggravate problems. Bonding should be done to the grounding electrode system in the following cases:

1. Metallic water piping and hydronic heating systems.

2. Natural gas or LP gas piping if built with black iron pipe. Bonds are desirable on other piping systems, but there are potential problems with bonds damaging the pipe.

3. TV antennae systems – Code requires these to be grounded to a rod by the most direct path possible. It is also important to bond this to the electrical system.

4. Satellite dishes – There should be a ground rod at the dish and a bond to the electrical system. See NEC 810-21 for information. Also, a three-prong outlet and surge suppressor is helpful at the controller. Note that the newer small dishes are not metallic and so avoid many of the bonding issues.

5. Lightning rod systems – It is important to bond this to the electrical system.

6. Structural Steel

7. Cable TV and telephone grounds where they enter the building.

Surge suppressors can also help. It is important, however, that all bonding be completed first. Note that plug-in type surge suppressors will only work on properly installed three-prong outlets. Surge suppressors (lightning arrestors) that are installed at the main disconnect must be installed on the load side of a breaker or fuse. Note that a lightning surge will be over before the breaker can trip. Also, note that these devices do fail and the breaker protection will take the arrestor off line. If the arrestor is wired ahead of the main, arcing can continue, causing a fire. Richland Center Electric Utility installs lightning protection on the distribution system to help protect distribution facilities. This protection will not necessarily protect customers from any direct or indirect lightning strikes and it is the responsibility of the customer to follow all national and local electrical codes to help reduce damage or loss from lightning or other electrical surges.

- **Electric Overhead & Underground Service Spotting**

Residential/Small Commercial 400-amp and Smaller

RCEU shall, in all cases, designate the location where the RCEU service will terminate.

The RCEU service spotting policy is based on the following guidelines:

1) The design should minimize RCEU investment in the service and meter making.

2) The customer should have options to locate the meter base outside our preferred location (these options may require a special facilities payment from the customer).

3) RCEU facilities shall not be located in areas that are likely to cause conflicts with decks, pools, future additions, etc.

The preferred residential and small commercial service spot is within six feet of the corner of the living space nearest the RCEU source. Several typical examples are shown below.

An overhead service is limited to a maximum of 150' because of voltage drop, clearance and conductor tension constraints.

An underground service from an overhead system has a riser cost and trenching which is billable to the customer as special facilities, along with other adders.

RCEU reserves the right not to locate a meter in an area that is likely to cause a future conflict with decks, pools, outbuildings, etc. The customer has the following options:

1) Locate the meter in the preferred zone at no cost (providing service length is not over 150 feet).

2) Locate the meter on the garage at no extra cost to RCEU (provided the spot is closer to the RCEU source that the preferred spot).

3) Pay special facilities cost to locate the meter in any location other than the conflict zone.

Variations – unusual house designs and variations in RCEU system construction will be encountered in the field. Each situation should be addressed individually, based on the guidelines included in this section.

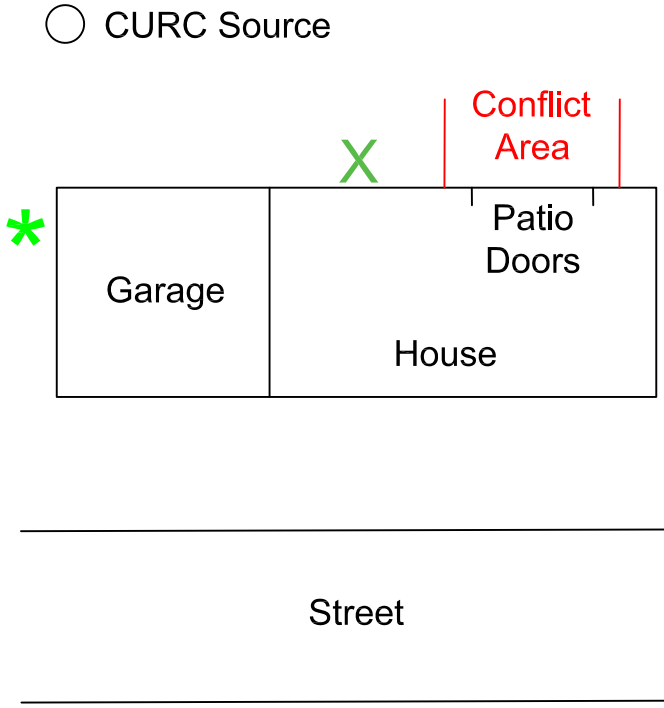
Things to Consider When Evaluating Conflict Zones and Areas

The service spot and route should be selected to provide an acceptable point of delivery, taking into consideration the customer's preferred location. Considerations should be based on minimizing existing and future conflicts for maintenance and safety. Following are some of the items that should be evaluated when making this determination:

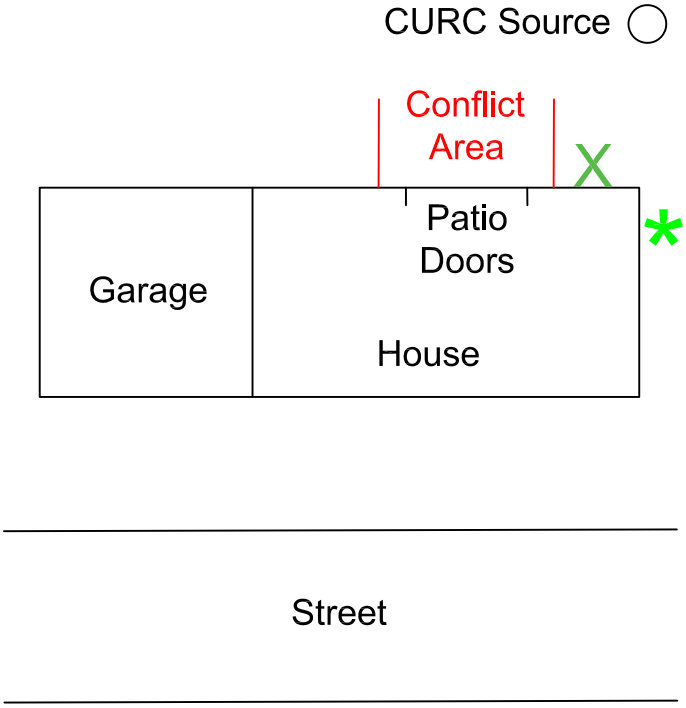
- Enclosed areas, patios, porches, etc.
- Carports
- Fenced-in areas
- Pools and hot tubs
- Clearance problems/codes, etc.
- Common wall for gas and electric meters
- Potentially hazardous, high traffic areas (sidewalks, driveways, alleys)
- Installation and future maintenance costs
- Remote locations that would make meter reading or maintenance difficult (fenced yards)
- Septic systems and their alternate fields
- Wells
- Above ground fuel tanks
- Future buildings or additions
- Grade changes
- Buried customer facilities
- LP tanks and lines
- Concrete areas (patios and driveways)

City Utilities of Richland Center (CURC)
Spotting Electric Services

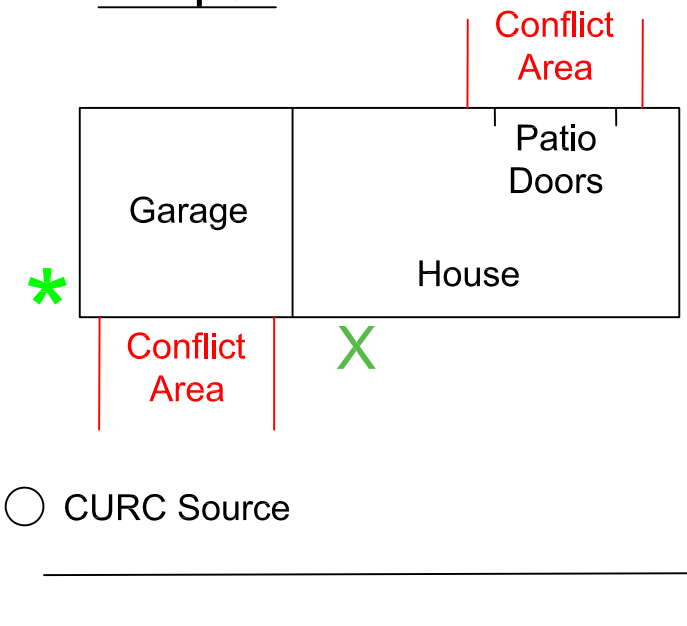
Example 1



Example 2



Example 3



* Preferred Location

X Alternate Location

Conflict Areas are areas such as patios, driveways and future pool locations.

- **SERVICE ENTRANCE DIAGRAMS**

This series of Service Entrance Diagrams is meant to show typical or common service entrances and metering set-ups. Variations to these outlines may be necessary in some applications, but all service entrances must conform to applicable codes and must be approved by City Utilities of Richland Center (CURC).

- Unless otherwise indicated, all items shown on the diagrams are to be furnished and installed by the customer.

- Meters and current transformers will be furnished and maintained by CURC.

- Only meter mounting devices and service termination equipment approved by CURC are to be used. Meter Mounted Transfer Switches are NOT allowed.

- The listing of equipment in this manual is not an endorsement or indication of suitability, but only that it is acceptable for installation of our metering equipment and termination of our service lateral conductors as required. It is the responsibility of the customer or their electrical contractor to verify that the equipment is suitable for the installation and that it is installed in accordance with all applicable codes.

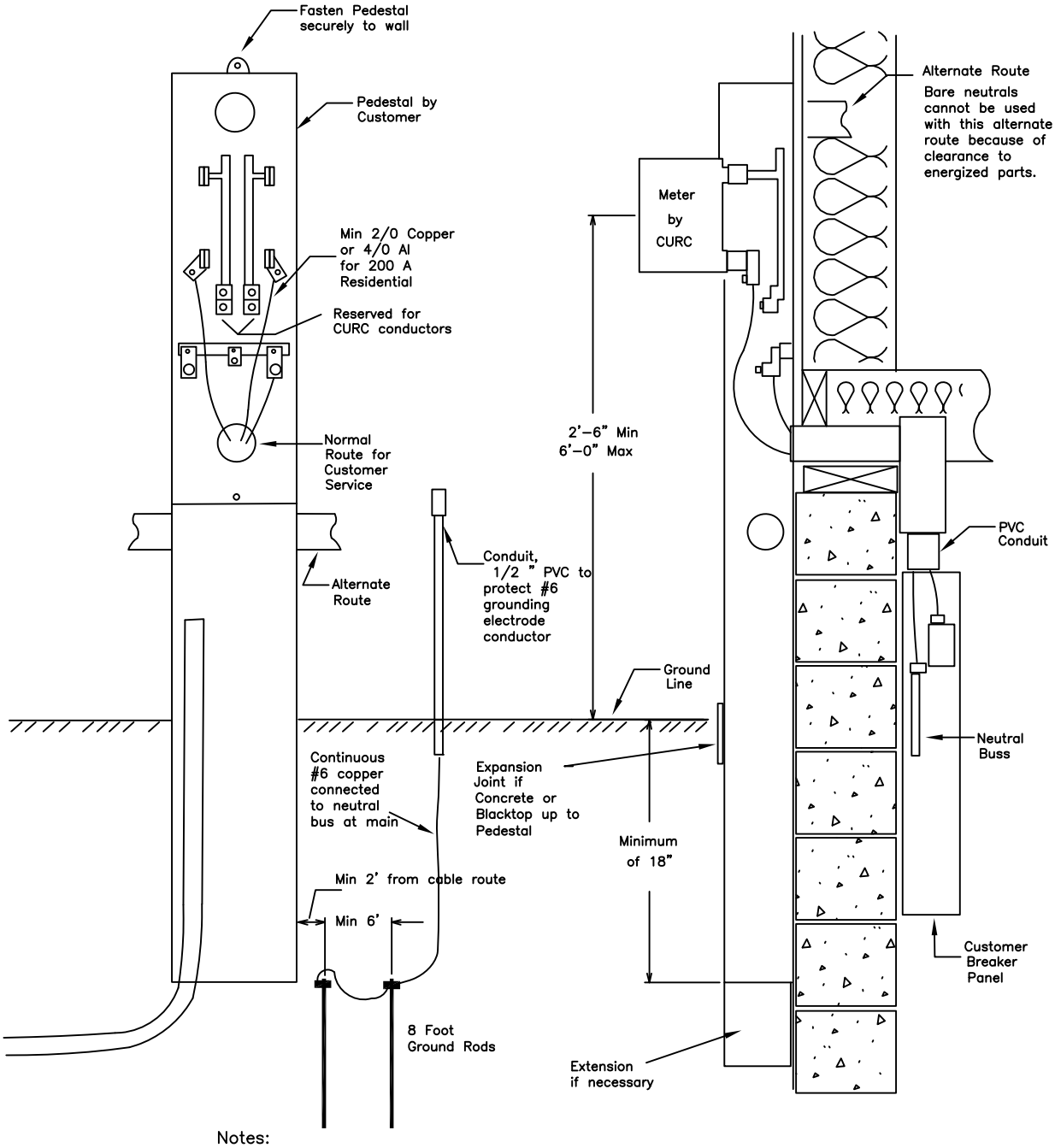
- Application of these standards must be made in accordance with CURC Electric Service Rules and Regulations.

- Transfer equipment used with stand-by power plants or generators shall be suitable for intended use and be designed and installed as to prevent the inadvertent interconnection of normal and stand-by energy sources. Transfer equipment shall be installed such that it is located electrically on the load side of the meter. All transfer schemes shall be submitted to the CURC office for acceptance before installation.

- The use of approved material, tested and listed by a nationally recognized testing laboratory, and approved methods of installation are requirements of the Wisconsin State Electrical Code by the Wisconsin State Electrical Code Section of the Department of Commerce, and by OSHA for employers, for customer owned electrical service equipment.

- This manual only covers secondary services.

SERVICE ENTRANCE DIAGRAMS
Table of Contents



Notes:

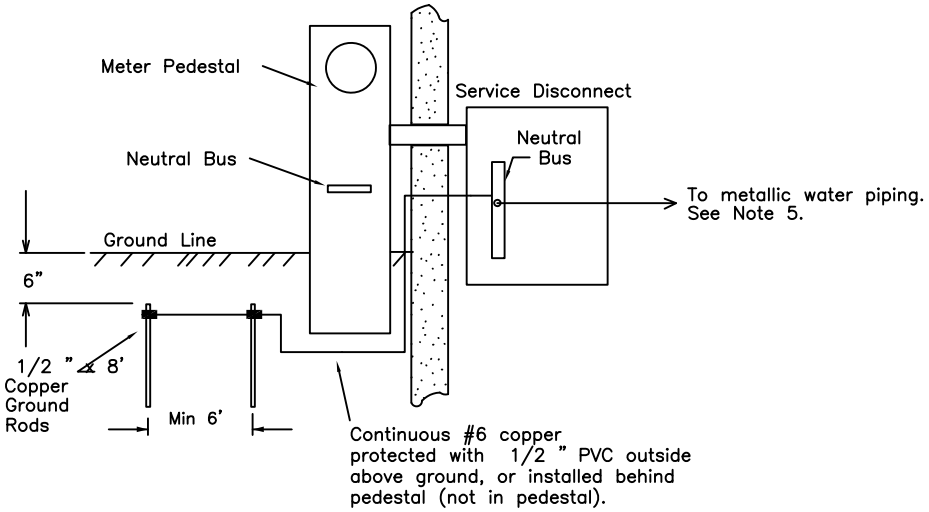
1. No grounds allowed in or on meter pedestal.
2. See 2–2 on grounding options.
3. See 2–3 on general residential wiring considerations.
4. The pedestal can not be used for other customer wires such as a feeder out to the garage NEC 230–7.

MANUFACTURER	CATALOG #	EXTENSION CAT. # IF NEEDED
MILBANK	U3358–O–KK	K4695
ANCHOR	MP–5S–204B–WI	MP–5S–ES
MURRAY	RP118SW	UX078B
MIDWEST	R2EMSSP6	EK129CW
LANDIS/GYR (Siemens)	UAP317–PPW1	5007718

DIGGERS HOTLINE Dial 811

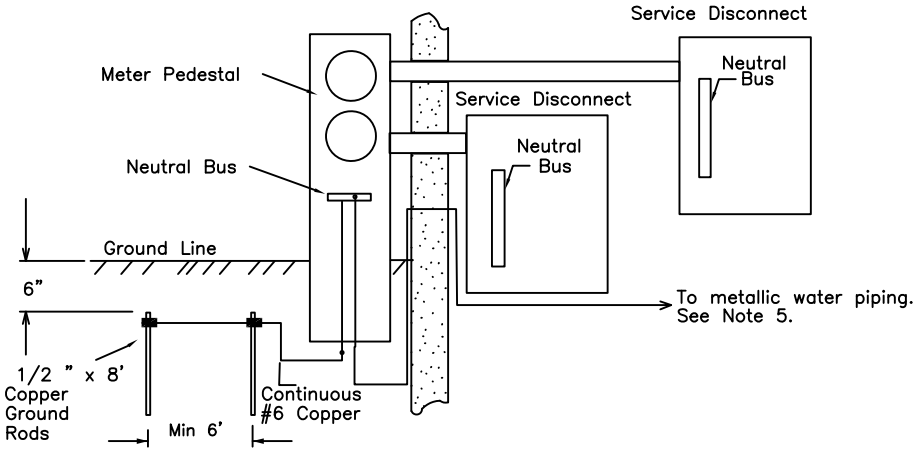
OPTION #1

Single Family Residential or Commercial



OPTION #2

Two Unit Residential and One Unit Residential
if Main Disconnect in Meter Pedestal



Notes:

1. Grounding systems for all Electrical Service Entrances will meet electrical code requirements if:

A. 2 ground rods are installed at least 6 feet apart.

B. And if any of the following on the premises are bonded into the grounding system (as described in the NEC),
   a. Metal underground water pipe system.
   b. Metal frame of building.
   c. Concrete-enclosed electrode.
   d. Ground rings.
   e. Communication grounding electrode.
   f. CATV grounding electrode.

Other variations of these grounding systems are described in COMM 16 and NEC Section 250.

2. Ground rods and grounding electrode conductors shall not be located in front of meter pedestal, wire troughs or within 2 feet of underground cable route. Good wiring practice is to install the rods at or outside the drip line. See NEC 250-64 and 250-66 on sizing and installation details.

3. Grounding electrode conductors cannot be run in or through meter sockets, meter pedestals, or CT cabinets. (Comm 16.27)

4. See page 5-6 on bonding for lightning protection. See page 3-6 for bonding requirements for CT cabinets and termination enclosures.

5. If more than 10 feet of metallic water pipe is in contact with the earth, it must be bonded to the neutral bar at the main distribution panel as part of the grounding system. (Duplexes are an exception - see Option #2). This must be bonded where the water line enters the building and ahead of the water meter, if present (within 5 feet of entering the building per NEC 250-30(3)). Some municipal utilities require the water meter to also be jumpered. This bond must be sized per NEC Table 250-66. For 200 Amp services this is usually #4 copper. Note that the metallic water piping must be bonded even if there is no earth contact. In this case, it is just a bond and not part of the grounding electrode system (sized per NEC Table 250-122).

6. It is suggested that a #6 copper bonding jumper be run to the outside from the main disconnect (connected to the grounding electrode system and identified by being bare copper or green insulated conductor; leave at least a 6-inch tail). This is for telephone and CATV to bond to as required by NEC 250-92(b).

Electrical wiring should only be done by those who have been trained on safety concerns, wiring techniques, and code requirements. City Utilities of Richland Center cannot inspect your wiring or provide electrical code interpretations. This is to be done by State-Certified Electrical Inspectors.

If you do your own wiring, the following are some basic items involving single-family residential wiring up to the main disconnects:

1. The minimum size service is 100 Amp for overhead services and 200 Amp for underground services

2. The minimum service entrance conductor sizes for residential 120/240 single-phase shall be as follows: (This is from the ampacity tables in the NEC 310-15 (b)(6)). (See NEC about reduced neutrals.)

Service Rating	Copper	Aluminum
100	#4	#2
200	2/o	4/o
400	400 kcm	600 kcm

3. Conduit sizes must be as follows:
   - Schedule 40 Electrical PVC is usually used. Schedule 80 PVC is required when subject to physical damage such as at the ground line. (See NEC 300-5(d)).
   - Rigid metal conduit is required for overhead periscopes (aluminum, IMC, or thin wall is not acceptable). All overhead periscopes must be back-guyed.

     0-200 Amp Services Minimum 2" (for strength reasons)

4. A single main breaker/fuse is required. For 200 Amp or more, two mains are allowed.

5. The equipment grounds (green and bare) must be bonded to the neutral at and only at the main distribution panel.

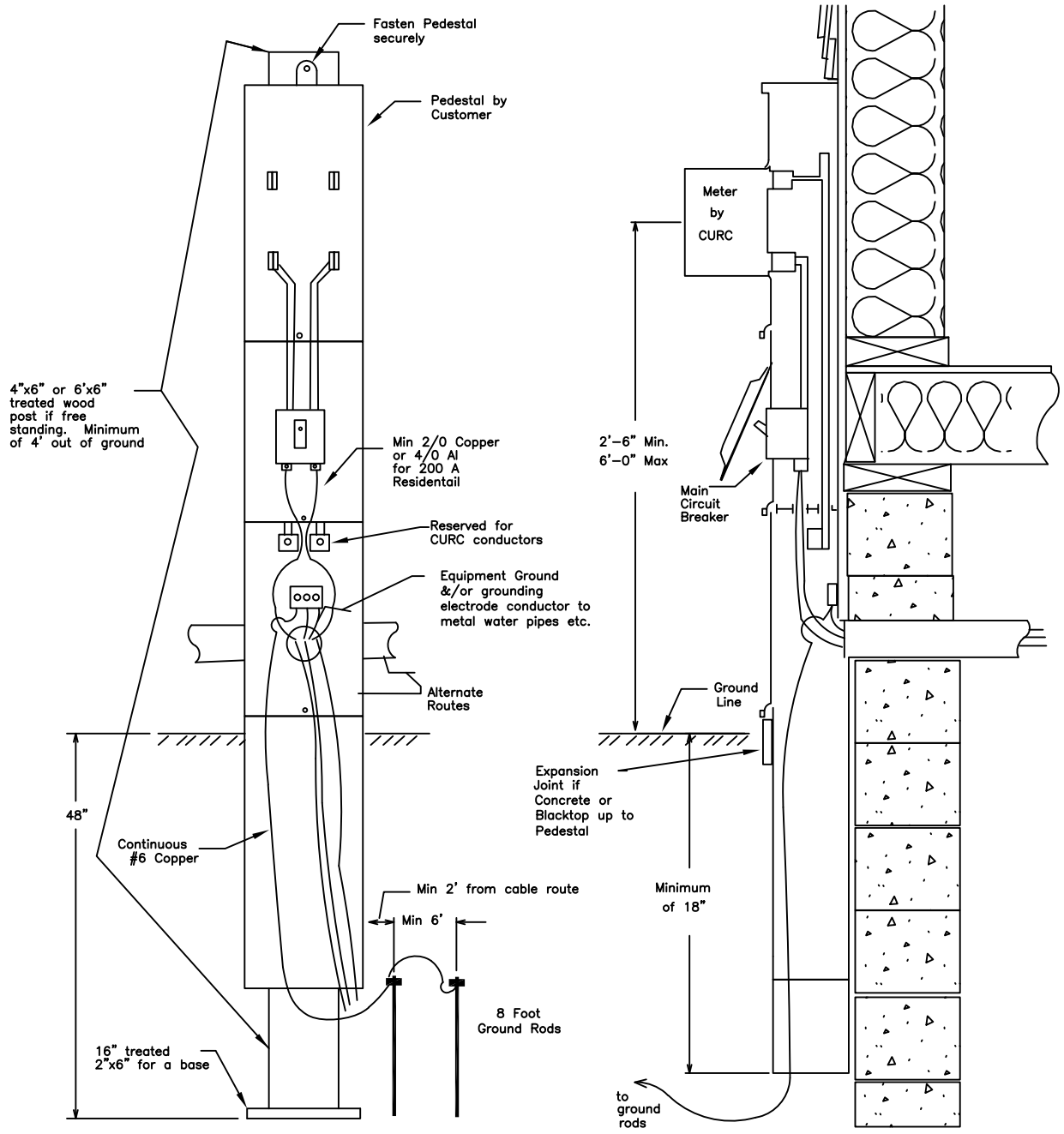
6. All aluminum connections must be made with aluminum rated connectors. The conductor must be cleaned (wire brush or other approved means) and immediately coated with an approved corrosion inhibitor. Common brand names for inhibitors are as follows:

   Noalox Joint Compound
   Gardner Bender Oxguard
   Penetrox

7. The main disconnect must be installed within 8 feet of the location where the service enters the building.

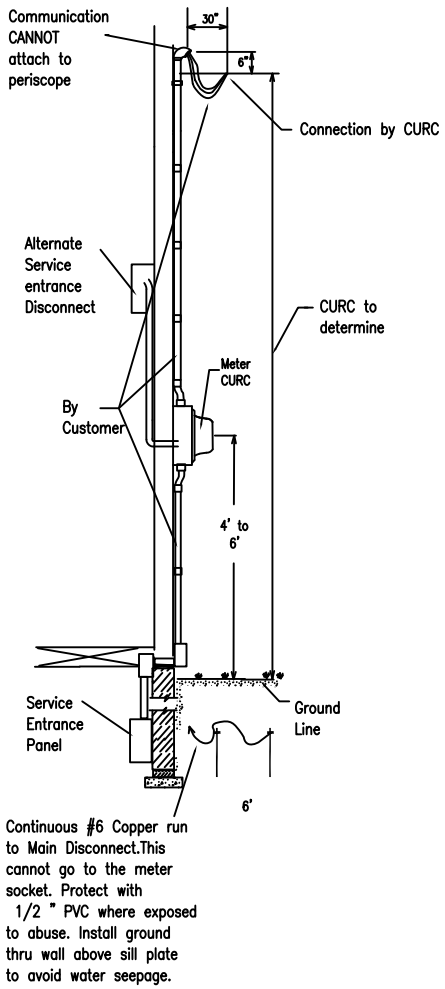
8. The conduit penetrating the outside wall between the meter and the distribution panel conducts cold air. This often causes condensation and potential damage to the electrical system. Things like spray foam or electrical putty will block this air flow.

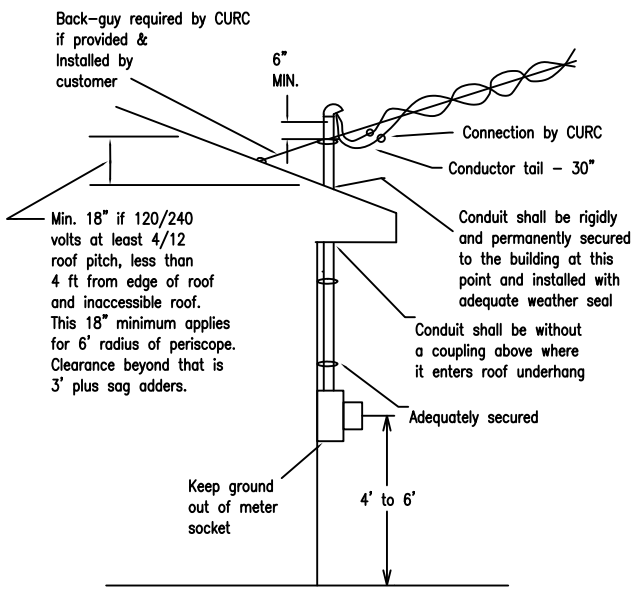
9. Only service entrance conductors and load control circuits can be installed in pedestals or meter sockets. (See NEC 230-7).



Manufacturer	Catalog #	Catalog # for Breaker
Milbank	U8980-0-KK	WBJ2200 for 200 Amp
Landis/Gyr (Siemens)	UAPB317-PBWI 659-0121 5007718	200 amp single phase ped Ped extension if needed
Anchor	MP5S204B-WI	T & B - TBFP-200-2 for 200A

1. This type of meter pedestal required if free standing (remote from building).
2. Not acceptable for mobil home use.
3. Must be attached to support post if free standing.
   Use a minimum of 8 foot, pressure treated 6X6 or 4X6.
   This must be buried at least 48 inches with a 16 inch treated 2X6 for a base.
4. This is commonly used if the service entrance conductor extends greater than 8 feet into the building.





BASIC CLEARANCES – 120/240 VOLT

1. Drip loop must be at least 17 feet above the ground line (unless meets other requirements on p. 7–1)
2. The drip loop and overhead service conductors must be at least 3 feet in any direction from windows, doors, porches or similar structures. An exception is above the top level of the window or a window designed not to open.
3. The drip loop and overhead service conductor must be at least 12 inches from communication circuits.
4. The drip loop and overhead service conductor must have 18 inches of clearance from the roof if a periscope is run thru the roof. This 18" clearance applies for a 6 foot radius of the periscope. The roof must be at least a 4" vertical to 12" horizontal pitch, with the periscope within 4 feet of the edge of the roof, and the roof inaccessible.
5. Basic ground clearances are as follows:
   Note that one foot has been added to account for conductor sag under Loaded conditions. See clearances (Section 7) for details.
   A. Lawns & sidewalks (Pedestrian Only Areas) 13 feet
   B. Roofs & Decks accessible to pedestrians 12 feet
   C. Inaccessible roofs 9 feet
   D. Roads, streets, alleys, parking lots, etc. 18 feet
6. Avoid wood decks when locating the meter socket.
7. Customer to install house knob if used. This is because of need to fasten into substantial support.

Notes:

1. City Utilities of Richland Center employees must designate the service location and specify the mounting height of the periscope. This is required because of numerous code clearance issues with the overhead service drop conductors. See clearances for additional information (page 7–1).

2. The weatherhead must extend at least 6 inches above the attachment point for the service drop. This attachment device is provided by CURC and installed by the customer. It must be adequately attached so it can handle 400 lbs. of line tension.

3. The conductor coming out of the weatherhead shall be at least 30 inches long. CURC will make the connections to the overhead service conductors.

4. The conduit shall be adequately supported with pipe straps. The meter socket shall also be adequately attached to the structure.

5. All periscopes (unsupported conduit extending above the roof) shall be made of rigid metal electrical conduit and if required by CURC shall be back guyed. Aluminum, IMC or thin wall is NOT acceptable. Minimum size shall be 2 inch for 0–200 amp, because of strength requirements. This includes upgrades to 100 Amps. No couplings can be above where the conduit enters the roof overhang or anywhere above the roof on the periscope

6. Communication and customer owned circuits cannot be attached to electrical entrance periscopes (NEC 230–28).

7. The neutral conductor shall be identified by white tape, white insulation, white paint, or other techniques approved by NEC article 200 –7 and 230–22.

8. The raceways containing service entrance conductors or service entrance cables shall not extend more than 8 feet into the Building before the main disconnect. Note that if the conduit is installed under the siding, or it is bricked in, it is considered already being inside the building per the state of Wisconsin [Comm 16.25(4)].

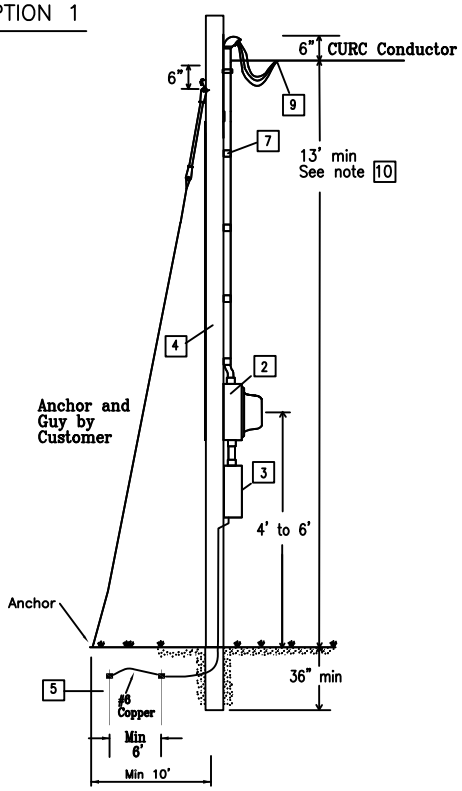
9. Service entrance cable (rather than conduit) is acceptable, if installed properly, accepted by a local inspection authority and not placed behind any siding.

10. Supports used to support service–drop conductors (attain clearance over buildings) will not be used for new installations. Forexisting installations, they must be substantial and meet the requirements of NEC 230–29.

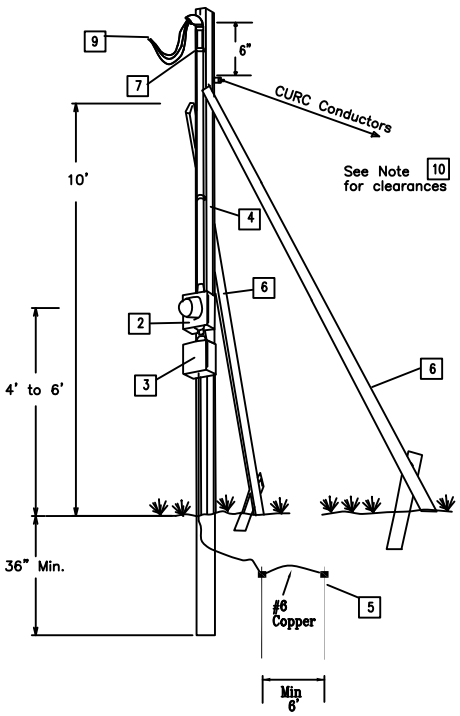
ACCEPTABLE METER SOCKETS

The utility has no list of approved sockets for this application. The only requirements are that they be UL approved, a minimum of 100–Amp rated, (if 100 Amp entrance), ringless style and have at least manual bypass horns.

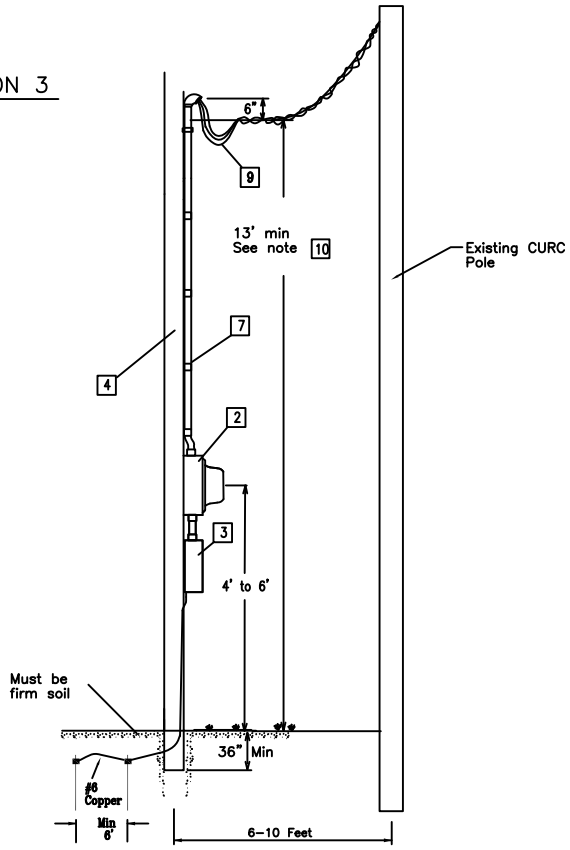
OPTION 1



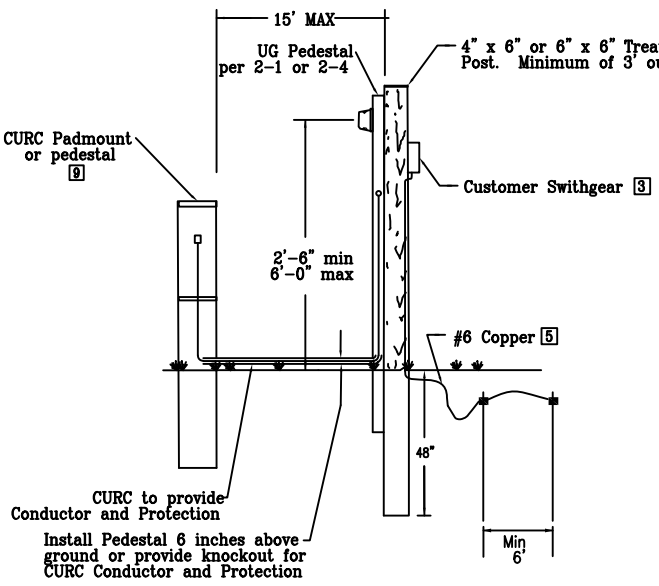
OPTION 2



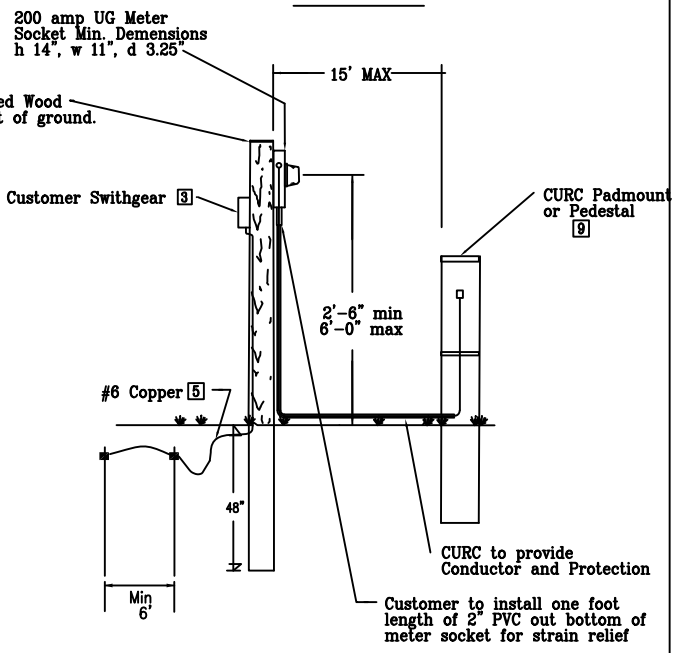
OPTION 3



OPTION 4a

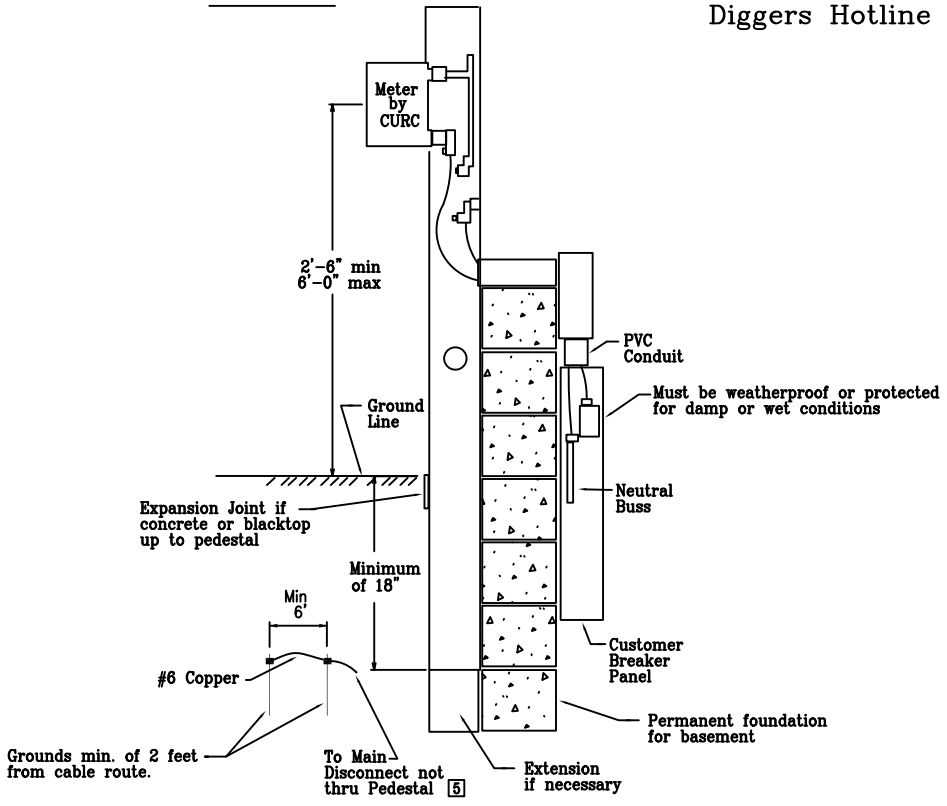


OPTION 4b



OPTION 5

Diggers Hotline Dial 811



Notes:

1. The utility shall specify the location of temporary service poles. Care must be taken to avoid the permanent service route. Potential clearance problems must also be avoided.

2. The meter sockets shall be 100 or 200 Amp rated. They shall be a ringless design with bypass horns and UL approved.

3. The switchgear shall be installed as per code. This requires the switchgear to be weatherproof or protected from the elements. It also requires GFI protection on all outlets unless OSHA-required electrical inspections are done regularly (difficult to comply with).

4. The temporary service pole shall be at least 4-inches in diameter, provided and installed by customer.

5. Ground as required by code. Two ground rods are required. Also a bond to metallic water pipe may be required, if available. The ground conductor shall be terminated in the switchgear and not in the meter sockets.

6. Brace and stakes made out of 2 x 4's.

7. For residential 100 Amp temporaries, the conductor must be at least #4 copper or #2 aluminum. For residential 200 Amp temporaries, the conductor must be at least 2/o copper or 4/o aluminum.

8. Temporary services are intended only for a short use. If the temporary service is expected to be used longer than one year, see Sections 2 or 3 for permanent installation instructions.

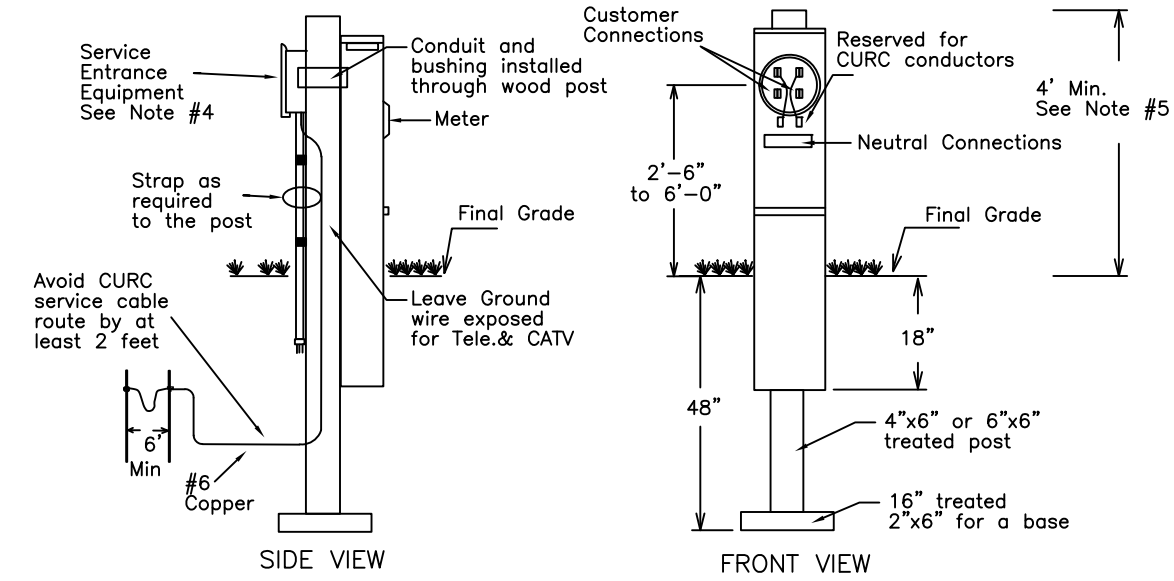
9. CURC will make the connections to the CURC system.

10. Temporaries must be high enough to maintain basic ground clearances. The following are some basic ground clearances. Note that one foot has been added to cover conductor sag. See the Clearance page 7-1 for details.
    A. Lawn or sidewalks (pedestrian only areas) 13 feet
    B. Roads, streets, alleys, parking lots, etc 18 feet

11. Junk equipment, such as 60 Amp meter sockets and old indoor 60 Amp fuse panels, are not acceptable for temporaries. If CURC must make return trips because of clearance problems or unsafe equipment, there may be additional charges.

12. Option #5 shows how to install a permanent meter pedestal and breaker panel and how to avoid using a temporary service. The breaker panel must either be weatherproof or protected from a wet or damp environment. The basement walls must be backfilled and adequately tamped for CURC to run the permanent underground service. Another option is to use approved flexible conduit between the meter pedestal and the breaker box. See page 2-1 for details on permanent underground services.

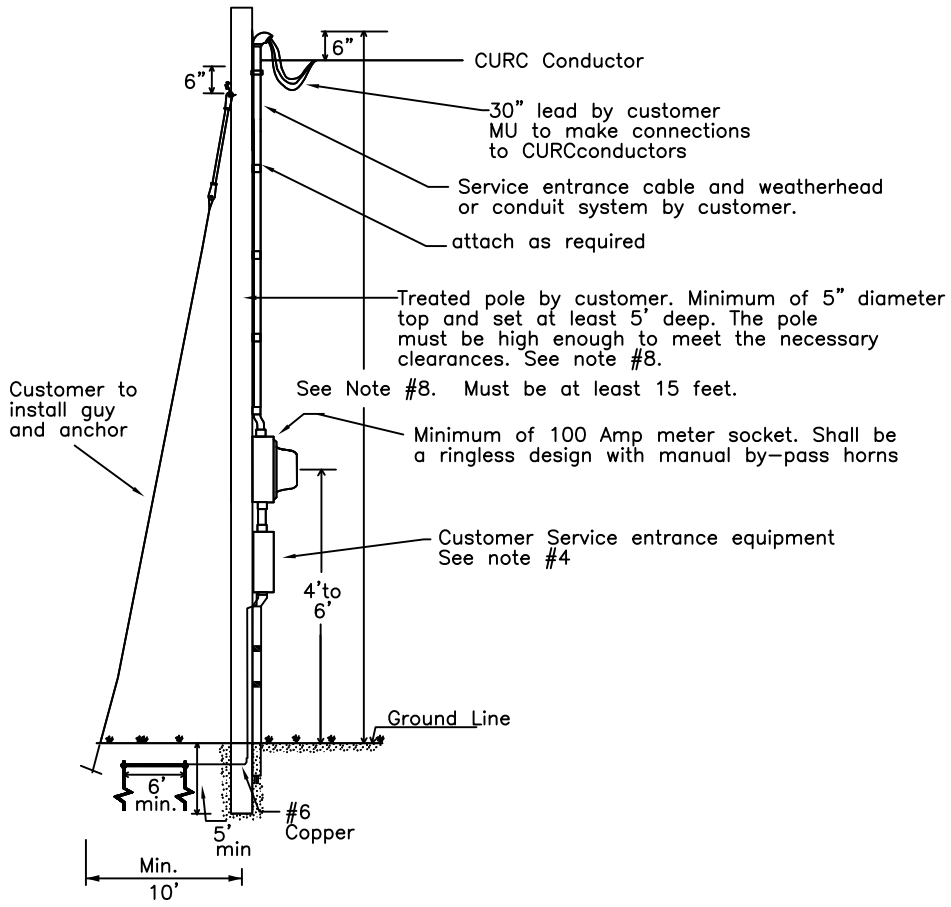
Requires assembly of individual components



Option #1 – Pedestals	
Mfg.	Pedestal for Above Catalog #'s
Milbank	U3358-O-KK
Anchor	MP-5S-204B-WI

Note: Will allow back to back pedestals, no more than 2 meters per set-up. MUST meet all code requirements.

OPTION #2 – Overhead Service



NOTES:

1. Mobile Home (definition from NEC 550–2): "A factory–assembled structure or structures transportable in one or more sections, that is built on a permanent chassis and designed to the required utilities, and includes the plumbing, heating, air–conditioning, and electric systems contained therein. Mobile homes can be identified by a red, rectangular HUD inspection label on the outside corner of the home. Manufactured homes (Ex. Wausau Home) on the other hand can be identified by a state inspection sticker on the electrical panel or inside of closet door or similar location.

2. Mobile homes must be wired per this standard. The only exception is if the mobile home is installed on a basement. In that case a meter pedestal can be attached to the basement wall and installed per 2–1. The service entrance panel with main disconnect must be installed on the inside of the basement wall. It is not acceptable to go into the basement and then up into the mobile home panel directly. This is because of the requirements of NEC 230–70, 550–23 and COMM 16.25. Also note that the mobile home panel is not rated as "Service Entrance Equipment." It is also unacceptable if there is only a crawl space or slab because of NEC 110–26(e).

3. Install mobile home metering pedestals with the meter pointed toward the driveway or street, or away from the mobile home. It is not acceptable to point the meter toward the home or away from the driveway. CURC will spot the location of metering facilities to comply with code clearances.

   The metering pedestals must be labeled in mobile home parks or RV parks where it is not obvious what it feeds. No more than 2 services per pole.

4. The following are basic Electrical Code Requirements for Mobile Homes (NEC 550–23):

   A. Service shall be 120/240 single–phase.

   B. The service entrance equipment shall be rated at least 100 Amp, be weatherproof, and be mounted at least two feet above ground level.

   C. The service entrance equipment cannot be mounted on the mobile home, must be within sight of the mobile home, but not more than 30 feet from the mobile home.

   D. The service entrance equipment must have at least a 50 Amp 120/240 volt breaker or fuse for feeding the mobile home. The norm is 100 Amp or more.

   E. There shall be branch circuit capabilities in the service entrance equipment for serving an accessory building, structure, or additional electrical equipment. This is often used to feed a well or out–building. Wisconsin code does not require a single main disconnect for mobile homes.

   F. The service entrance equipment should have provisions for serving an outside 15 or 20 Amp, 120–Volt GFI outlet.

   G. Two 8–foot ground rods with a minimum of 6–foot separation shall be installed. The grounding electrode conductor shall be at least #6 copper and run into the service entrance equipment (not meter socket).

   H. The cable or cord run from the service entrance panel shall be a four–conductor cable (two hots, neutral, and an equipment ground).

5. The wood post in option #1 & #2 shall extend out of the ground by at least four feet. This is to accommodate telephone and/or CATV on the sides of the wood post.

6. All load conductors shall be installed by the customer.

7. The proper depth and tamped back–fill is critical to minimize frost heave and future potential customer maintenance costs.

8. On overhead service drop installations, it is critical to have a tall enough pole to maintain code clearances. Some of the common, basic clearances are as follows: (Note that one foot has been added to account for conductor sag when loaded)

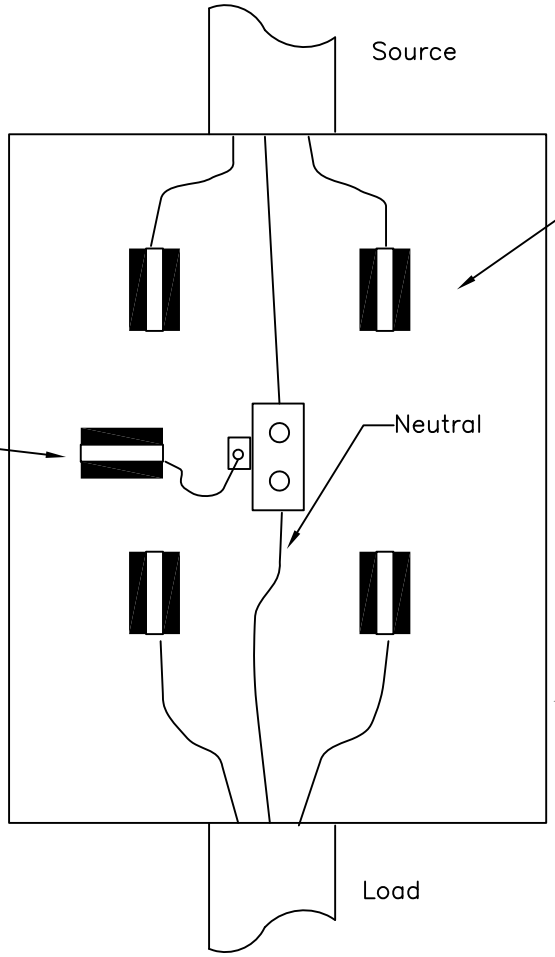
   A. Over the mobile home or garage roof — 9 feet
   B. Lawns or sidewalks (Pedestrian Only Areas) — 13 feet
   C. Roads, streets, alleys, parking lots, and driveways — 18 feet
   D. Horizontal clearance from wells to service drop (see clearance section for specifics (Section 7)) — 14 feet

9. Milbank Catalog #U8980–0–KK pedestals are not acceptable for mobile homes because they lack a accessary breaker position. This pedestal can, however, be used if Note #2 applies (See page 2–4).

10. CURC requires UG Services in all new mobile home parks. This is because of OH clearance issues and moving mobile homes.

    Diggers Hotline Dial 811

Diagram of Connections



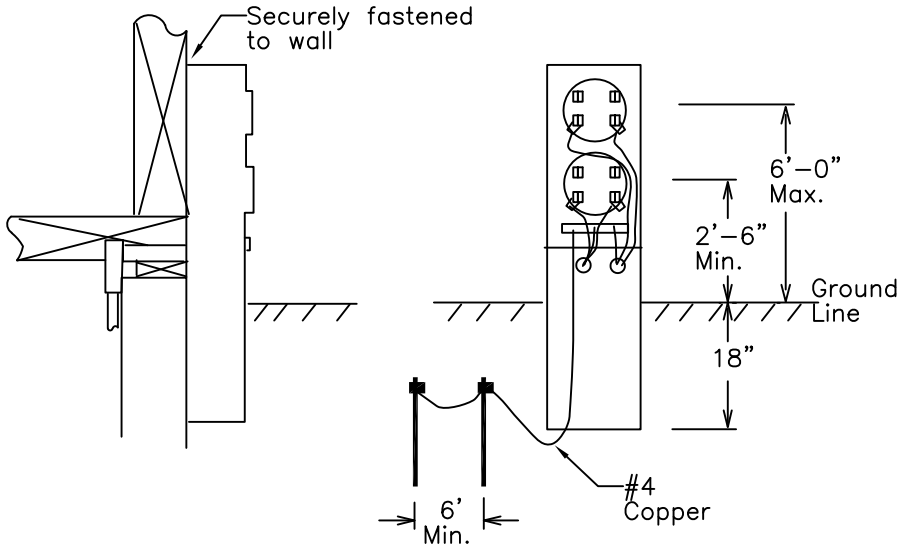
NOTES:

1. A fifth jaw can be added to most new–style,single–phase 120/240 meter sockets for 120/208 single–phase service. The fifth jaw shall be added in the 9 o'clock position as pictured and securely attached (Milbank Snap in Jaws are not acceptable).

2. This voltage is common in or near commercial areas. It is also common for large apartment complexes.

3. There are some existing installations with the fifth jaw in the 6'clock position (as compared to the normal 9 o'clock position) or with a wire jumper between the meter and the meter socket. These should be corrected if possible when upgrading the wiring.

4. Single phase service drop application shall be limited to 400 Amp. Larger installations shall have a three phase service drop with the single phase meters and connected loads balanced on all phases. The single phase meters must also be limited to 400 Amp.



NOTES:

1. CURC requires all meter sockets to be rated at least 100 Amp, single phase, ringless, and sealable, have manual bypass horns (manual bypass lever is acceptable for single phase and required for three phase meter sockets, see 2–12) and must be approved by a nationally accepted testing firm such as UL. This standards page gives catalog numbers for common multiple meter installations for duplexes (3rd meter for common area if required per NEC 210–25 or PSC 113.0802 or 113.0803). For duplex or larger multiple meter installations, follow the basic CURC meter socket requirements. It is also critical to follow the requirements of 3–9 for UG service terminations.

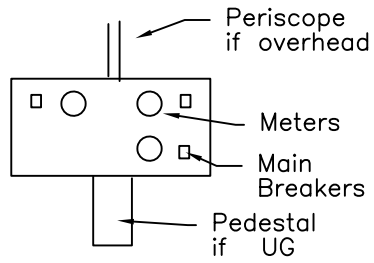
2. CURC cannot run two services to a duplex. This may be desirable when the garages are between the two units, but it is a code problem. NEC 230–2(a) states that there can only be one service to a building. Comm 16.17 states that there must be a minimum three–hour firewall present for the duplex to be considered two buildings (this is a substantial masonary wall).

3. See page 2–7 for details on typical overhead services.
   See page 2–1 for details on typical underground services.

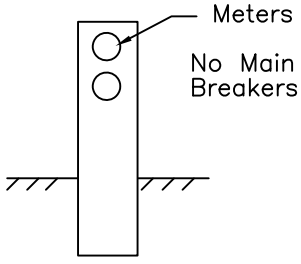
4. Each meter position must be labeled as per page 3–11, note 1.

5. Note 3–10, 3–11, and 3–12 for clearances for large multi–meter installations.

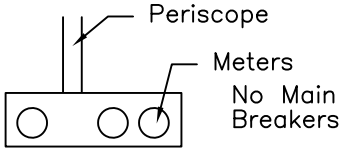
6. CURC requires pedestals for UG installations on duplexes.



STYLE A



STYLE B



STYLE C

MFG	No. of Meters	Style	Amps Per Position	Main Bus rating	Meter Socket Catalog #	Pedestal Catalog # if UG	Fifth Jaw for 120/208 Applications
Milbank	2	A	125	200	U2852–X–PED–KK–K–1539	S2291–TO/S2571	K2381
	2	A	200	250	U2862–X–PED–KK–K1539	S2291–TO/S2571	K2381
	3	A	125	200	U2853–X–PED–KK–K1539	S2291–TO/S2572	K2381
	3	A	200	270	U2863–X–PED–KK–K1539	S2291–TO/S2572	K2381
Milbank	2	B	200	400	U1783–O–KK	–––––	5T24R
Milbank	2	C	100	200	U8032–XL–KK☆☆☆	––––	5T24R
	2	C	200	200	U1252–X–KK ☆	S2291–TO/S2571	5T24R
	3	C	100	300	U8033–XL–KK☆☆☆	––––	5T24R
	3	C	200	225	U1253–X–KK ☆☆	S2291–TO/S2571	5T24R

Electrician must consider Main Bus Rating when designing an installation.

The NEC requirements of load calculations are critical (NEC 220).

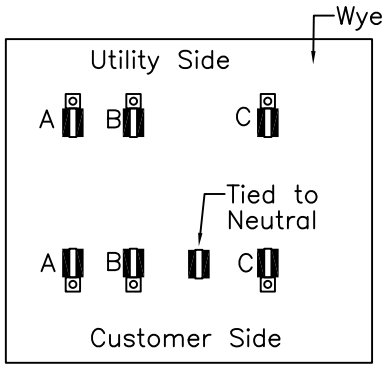
Note that commercial applications may require specialty meter gear to meet the minimum bus rating.

☆ Add K1–PED to catalog number if underground

☆☆ Add K3–PED to catalog number if underground

☆☆☆ Not for use on underground

VIEW OF METER SOCKET



7 Jaw Meter Socket
Used for:
120/208 4–wire 3 Ø/wye
277/480 4–wire 3 Ø/wye

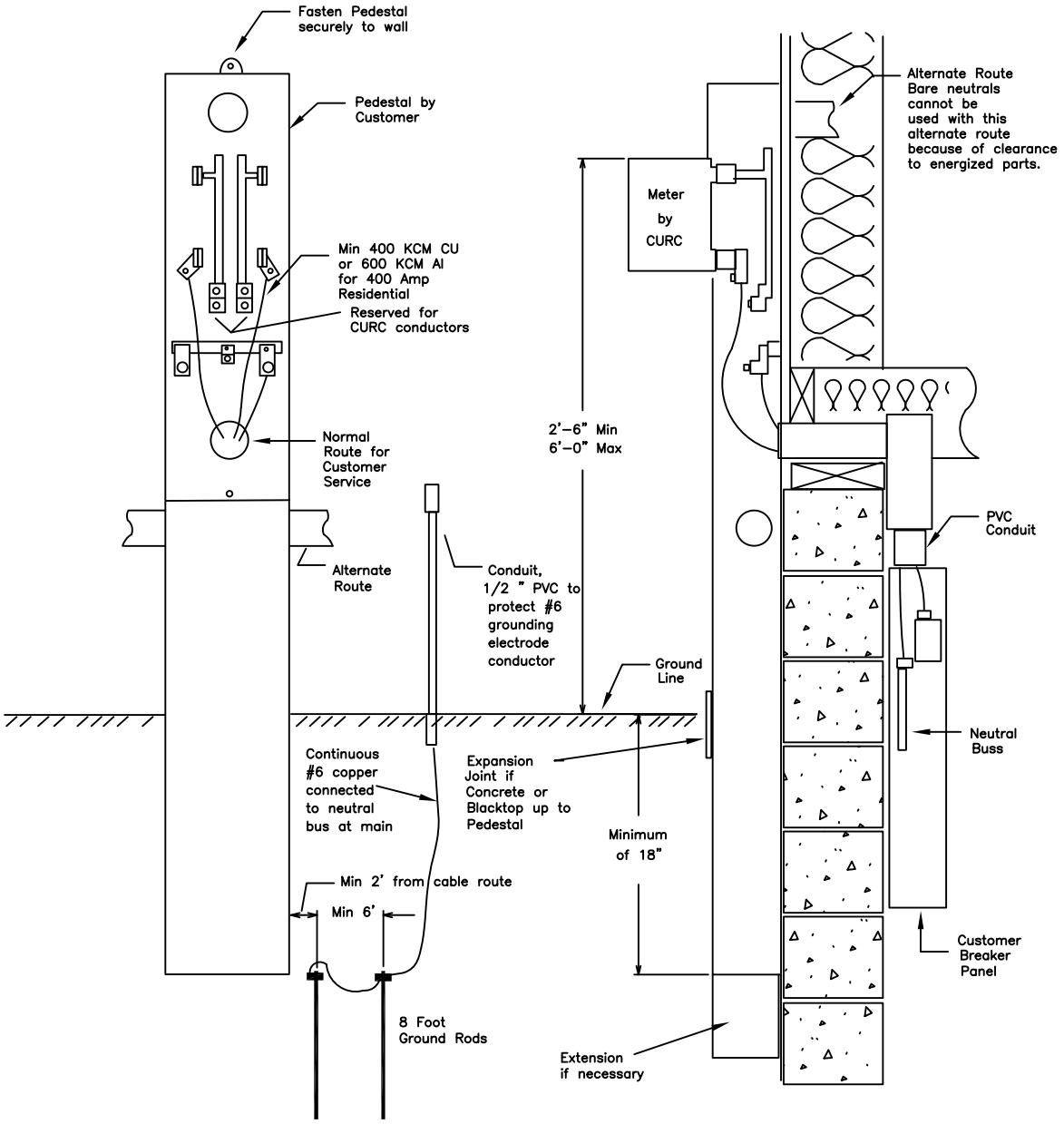
Basic Meter Socket Requirements

1. Ringless style, 200 Amp minimum rated, clamp type jaws, 600 volt rated, wrench operated connectors (not screwdriver), sealable, and provided with protective shield covering the jaws.
2. The meter sockets shall have a manual by–pass, designed to visually check the by–pass connections with meter installed. Also it must be designed so the cover cannot be installed with the by–pass closed.
3. The phase designations are commonly used designations by electricians. They do not indicate clockwise or counter–clockwise rotation.

APPROVED METER SOCKETS

	7 Jaw 120/208 277/480	7 Jaw 120/208 277/480	7 Jaw 120/208 277/480 120/240
Type	UG Pedestal	OH	UG Meter Socket
Similar To	p.2–1	p.2–7	p.3–2
Anchor	———	U42572–HO/ HLO	U42572–HO/ HLO
Landis&Gyr (Siemens)	40407P–9WI	40007(HQ–7)	40407(HQ–7U)
Murray	———	RH–173–GR	RH–173–GR
Milbank	U9107–O & S3488 (ext.)	U9700–XL	U9701–XL

STANDARD EQUIPMENT

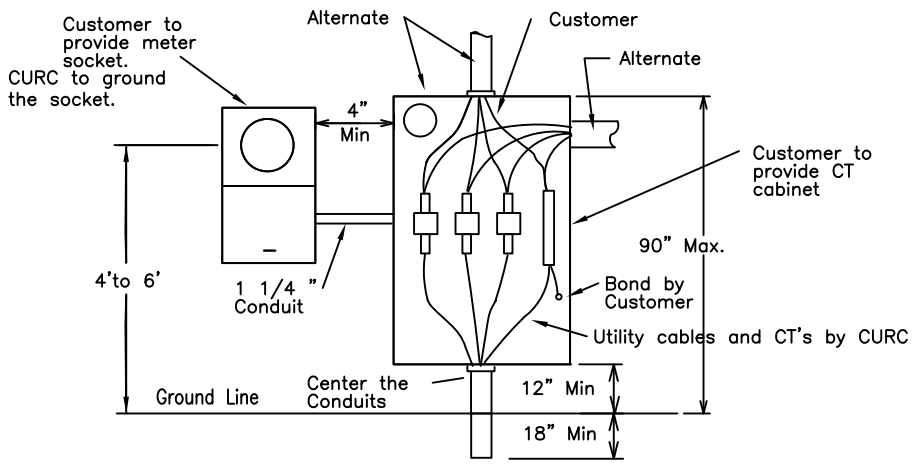


Manufacturer	Catalog #	Extension Cat # if needed
Milbank	U1748–0–WI–K1350	S1848
Landis & Gyr (Siemens)	47604P–9WI	
Anchor	MP44342–WI	

NOTES:

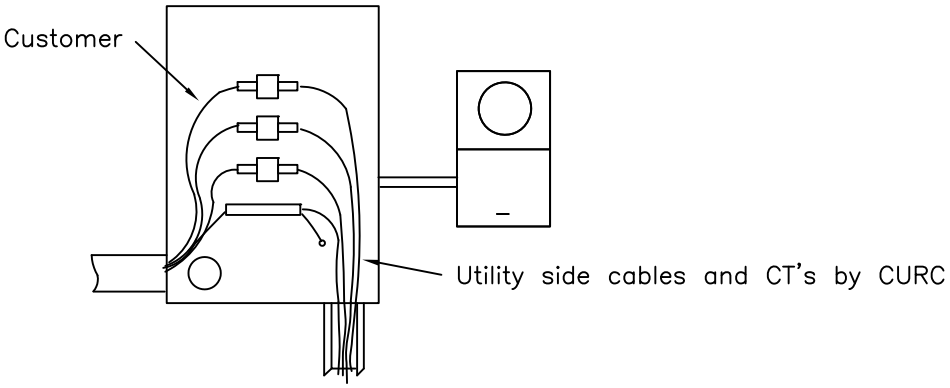
1. This is a 320 class meter (400 Amp Residential). Designed for 320 Amps continuous and 400 amps intermittent.
2. See page 2–2 for grounding options. No grounds allowed in or on meter pedestal.
3. See page 2–3 on general residential wiring considerations.

PREFERRED



ALTERNATE

ALT. Galva–Closure Cabinet



Notes:

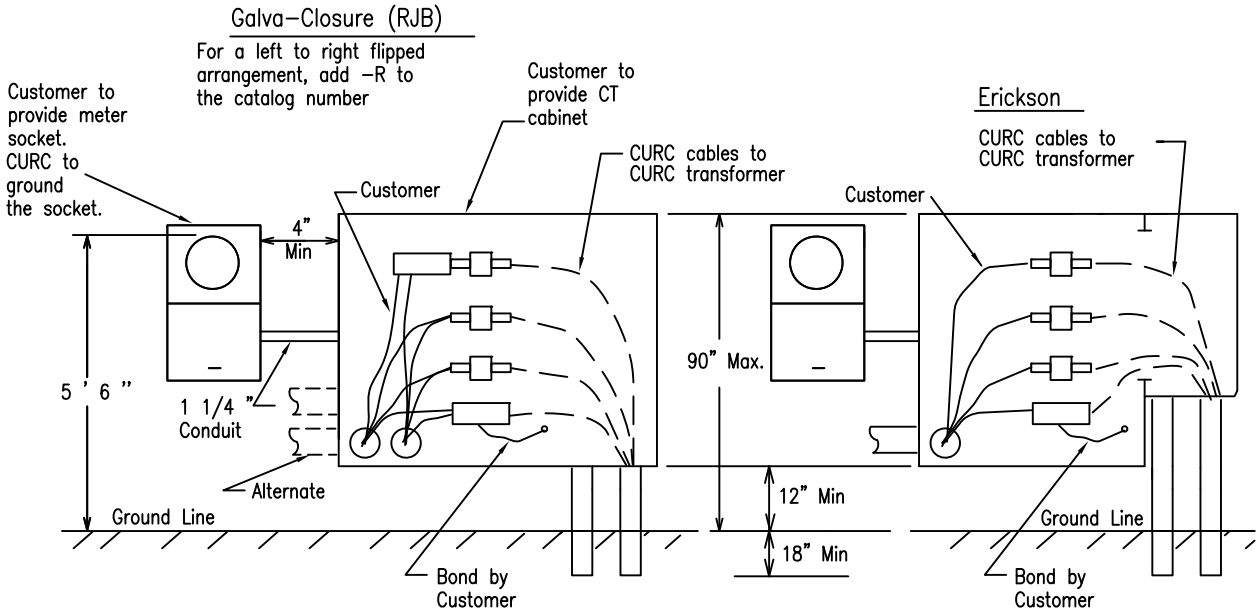
1. The CT cabinet shall be mounted outside.
2. The 320 Amp plug–in meter socket is standard for residential. Consult CURC before using CT cabinets on 400 Amp services.
3. The CT cabinet must be bonded per NEC 250–102.
4. CURC cannot size the customer's service entrance conductors.
5. Minimum clear space in front of cabinet and/or meter shall be 2 feet beyond the cover in the extended position or a minimum of 3 feet, whichever is greater.

METER SOCKETS

	Three Phase
Manufacturer	13 Terminal 120/208, 277/480
Anchor	RTSS13–13W–2–HP–SR1
Meter Devices	3040A–13 with 110–54–583
Milbank	UC7449–XL with TS10–0109
Galva–Closure (RJB)	MS–2034–13 with 10 pole test switch

CT CABINETS

Size	# Wires	Mfg. Catalog # HxWxD inches	Unprotected Withstand Amps	Bonding Jumper (see above)	Conduit
400 Amp See Note 2	3–Wire	Erickson 1182–1WPS 45.5X20X7.25	42,000	1/0 Copper	1–4"
		Galva–Closure (RJB) WPS–403UG 42X20X8.5			
	4–Wire	Erickson 1182–2WPS 45.5X20X7.25	42,000		
		Galva–Closure (RJB) WPS–404UG 42X20X8.5	65,000		
		Electro–Mechanical Industries CTB346–W 48X30X10	65,000		
600 Amp	4–Wire	Erickson 1076–2WPS–LE 60X36.5X15	65,000	2/0 Copper	1–4"
		Galva–Closure (RJB) WPS–604UG 54X36X13	65,000		
		Galva–Closure Alternate ☆ WPS–604UGA 48X46X13	65,000		
800 Amp	4–Wire	Erickson 1076–2WPS–LE 60X36.5X15	65,000	2/0 Copper	2–4"
		Galva–Closure (RJB) WPS–804UG 54X36X13	65,000		



Notes:

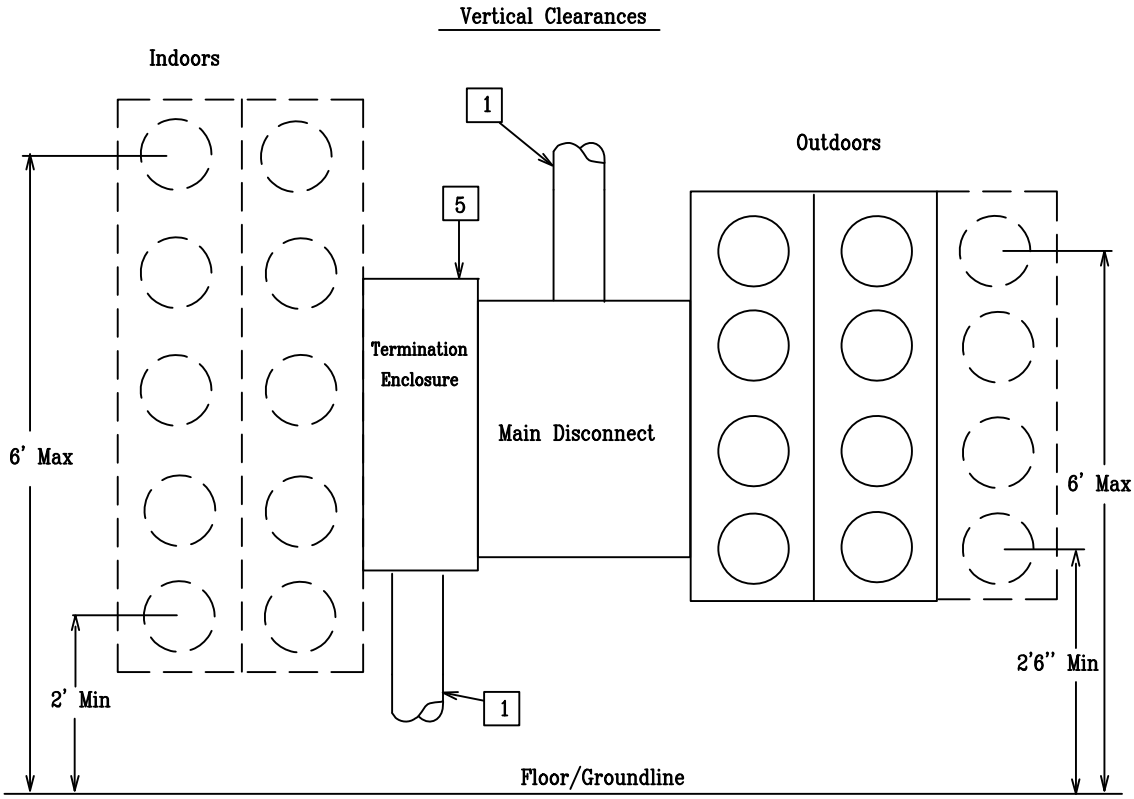
1. The CT cabinet shall be mounted outside.
2. The CT cabinet must be bonded as per NEC 250–102.
3. Minimum clear space in front of cabinet and/or meter shall be 2 feet beyond the cover in the extended position or a minimum of 3 feet, whichever is greater.

METER SOCKETS

	Three Phase
Manufacturer	13 Terminal 120/208, 277/480
Anchor	RTSS13–13W–2–HP–SR1
Meter Devices	3040A–13 with 110–54–583
Milbank	UC7449–XL with TS10–0109
Galva–Closure (RJB)	MS–2034–13 with 10 pole test switch

CT CABINETS

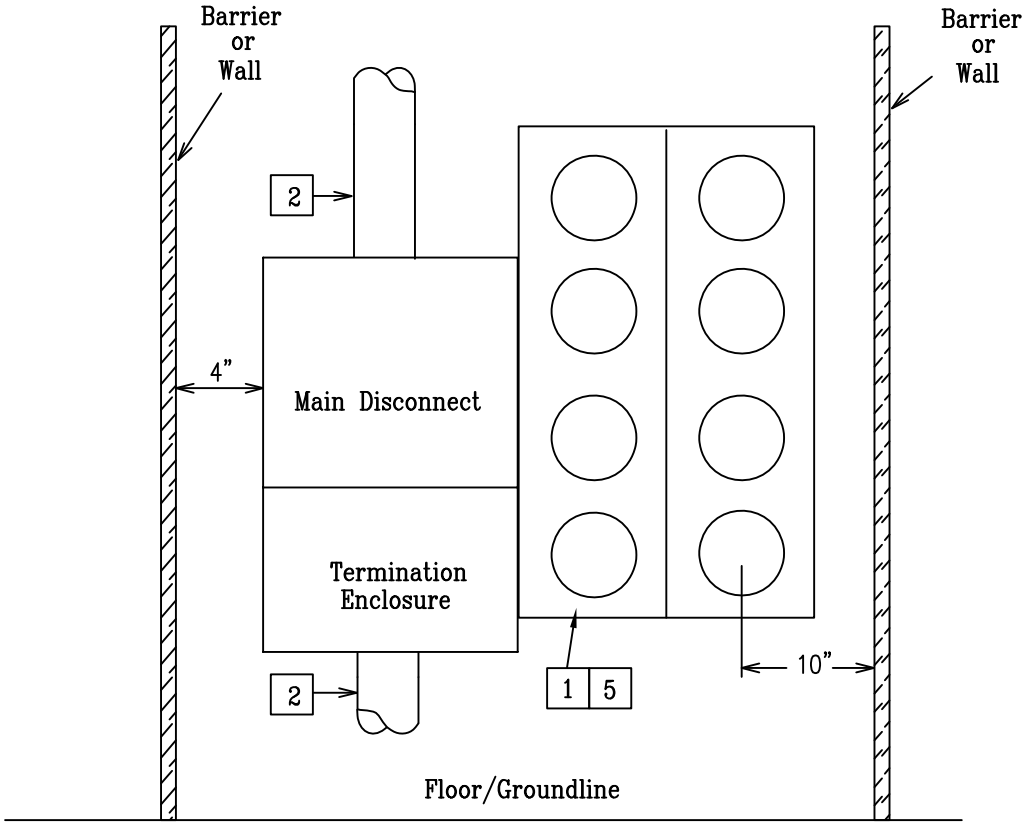
Size	# Wires	Mfg. Catalog # HxWxD inches	Unprotected Withstand Amps	Bonding Jumper (see above)	Conduit
1000 Amp and 1200 Amp	4–Wire	Erickson CUCT–124WPS 60X51X15 Galva–Closure (RJB) WPS–1204UG 48X45.75X13	85,000 85,000	4/0 Copper	3–4"
1600 Amp	4–Wire	Erickson UCT–164WPS 60X60X15 Galva–Closure (RJB) WPS–1604UG 60X60X15	85,000 85,000	250 Copper	5–4"
2000 Amp	4–Wire	Erickson CT204SG–WPS 60X66.5X15 Galva–Closure (RJB) WPS–2004–UG 60X60X15	100,000 85,000	350 Copper	6–4"



☐ NOTES:

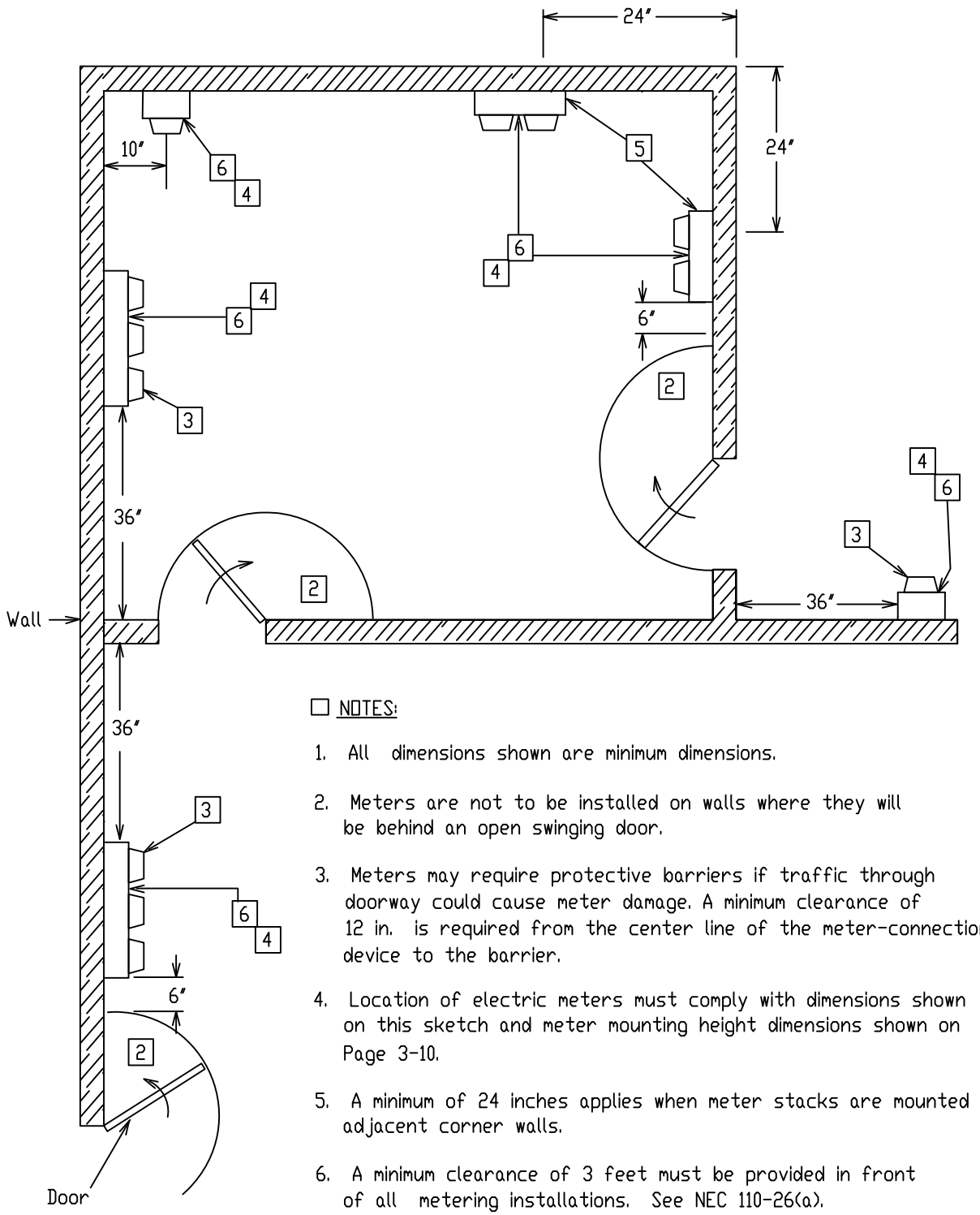
1. Service drop or lateral.
   A. Underground line conductors and lugs for 400 Amp or less are furnished by utility.
   B. Load conductors and lugs furnished and installed by customer.
2. Customer shall furnish, install and maintain multiple metering equipment including meter sockets, switches, fuses, circuit breakers, termination enclosures and associated equipment.
3. A minimum of 3 feet must be provided in front of all metering installations. See NEC 110–26(a).
4. All 100 Amp or 200 Amp meter sockets shall contain the horn type by–pass for single–phase or network installations, be ringless and UL approved.
5. 6'6" oh headroom working space required per NEC 110–16e.
6. CURC uses 90°C conductor, therefore CURC can not terminate on customer main disconnects (NEC 110–14). CURC can terminate in integral termination enclosures or separate termination enclosures.

Horizontal Clearances



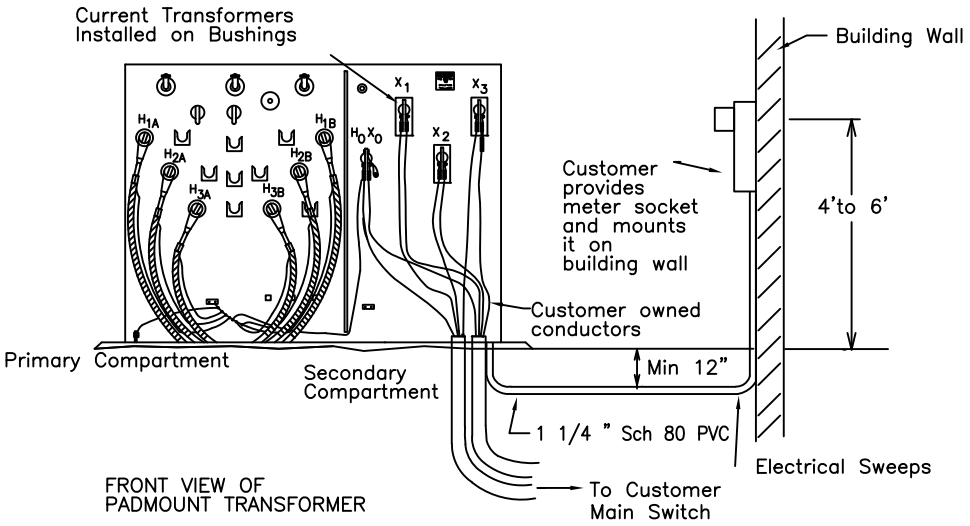
☐ NOTES:

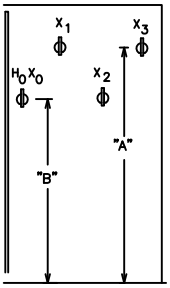
1. On group installations each meter socket and service switch shall be permanently marked identifying the location to be served. The location being served shall be identified in the same manner.This identification shall be made on the outside of the metering panels (for the benefit of tenants and meter readers), Inside the meter enclosure (non–moveable part as cover panels usually are interchangeable), and at the service panel that the meter serves. A label on the service panel is critical because labeling systems for apartments change, making it difficult to trace. This identification is often done with permanent black markers or white paint. See NEC 110–22 and PSC 113.0809.
2. Service drop or lateral.
   A. Underground line conductors for 400 Amp or less services are furnished and installed by utility.
3. Customer shall furnish, install and maintain multiple metering equipment including meter sockets, switches, fuses, circuit breakers, termination enclosures and associated equipment.
4. A minimum of 3 feet must be provided in front of all metering installations. See NEC 110–26(a).
5. All 100 Amp or 200 Amp meter sockets shall contain the horn type bypass, for single–phase or network installations. Installations shall have ringless meter sockets and be UL approved.
6. CURC uses 90°C conductor, therefore CURC can not terminate on customer main disconnects (NEC 110–14). LMW&L can terminate in integral termination enclosures or separate termination enclosures.



☐ NOTES:

1. All dimensions shown are minimum dimensions.
2. Meters are not to be installed on walls where they will be behind an open swinging door.
3. Meters may require protective barriers if traffic through doorway could cause meter damage. A minimum clearance of 12 in. is required from the center line of the meter-connection device to the barrier.
4. Location of electric meters must comply with dimensions shown on this sketch and meter mounting height dimensions shown on Page 3-10.
5. A minimum of 24 inches applies when meter stacks are mounted on adjacent corner walls.
6. A minimum clearance of 3 feet must be provided in front of all metering installations. See NEC 110-26(a).
7. The utility shall be consulted concerning the location of metering equipment before metering equipment is installed. No meters to be located indoors on new construction.





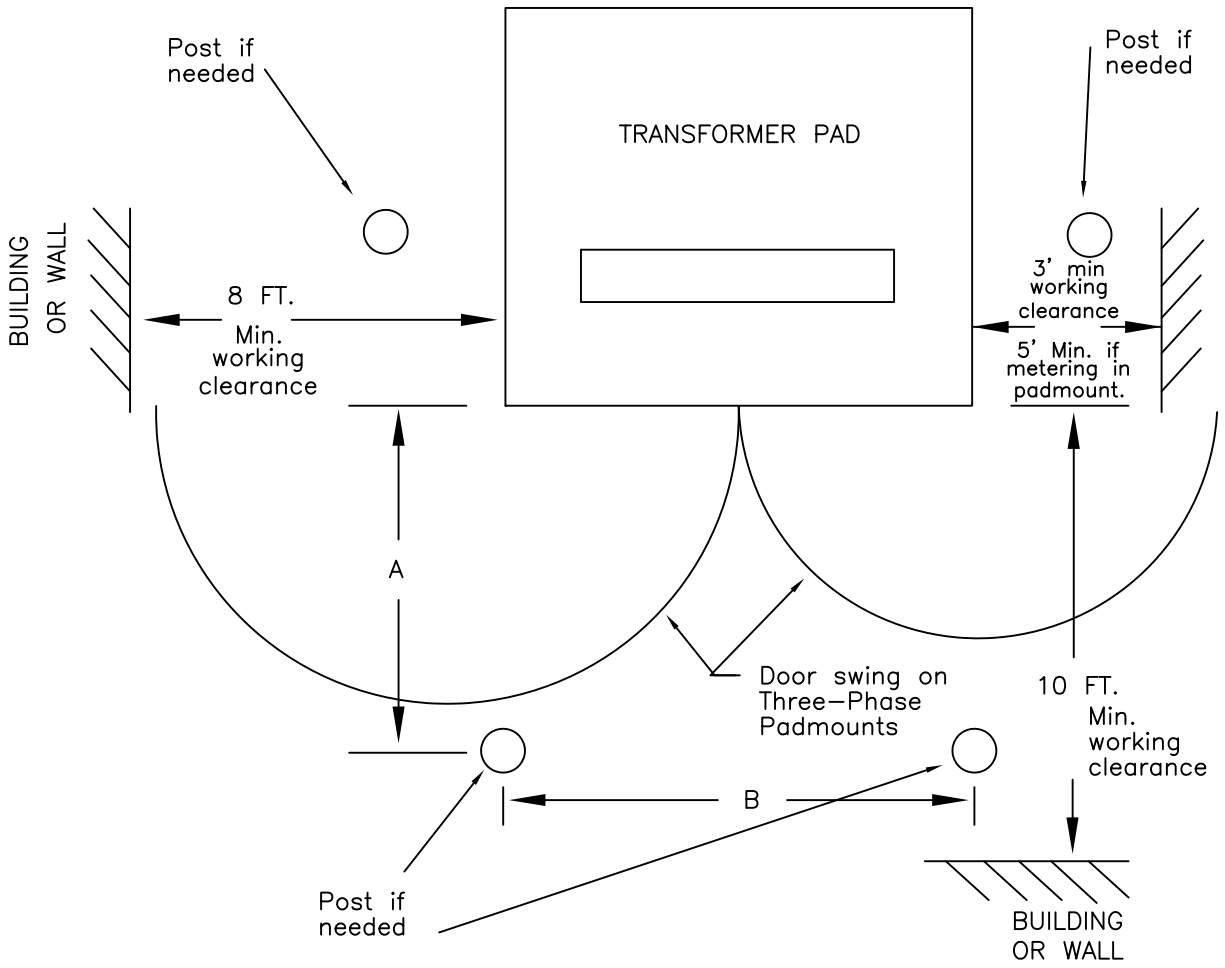
Transformer Size	"A"	"B"
75–150 KVA	"33"	"27"
225–500 KVA	"39"	"31"
750–2500 KVA	"54"	"46"

NOTES:

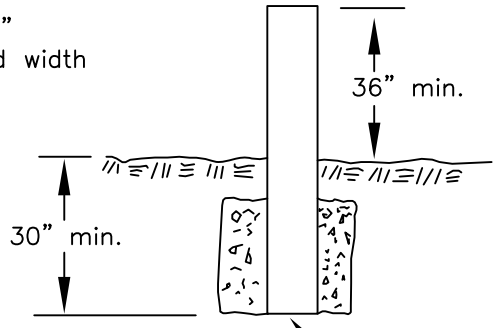
1. Prior approval must be obtained from CURC to use this metering option. Will only be allowed in extreme circumstances where a CT cab. can not be used.
2. The customer shall own, install and maintain the service. CURC may terminate the transformer end of the customer service conductors, if possible. Let CURC know the size and number of service conductors.
3. The above drawing is a diagram showing the metering. See page 39 for details on padmount siting.
4. The meter socket shall be provided by the customer and installed on a building wall by the customer. The maximum distance between the padmount and the meter socket is 25 feet.
5. Mounting the meter socket on a free–standing pedestal is acceptable only by CURC approval.
6. Meter socket to be grounded by customer.
7. Consult with CURC if the neutral and equipment ground bond is to be made at the padmount transformer.
8. Utility will provide plan & details for the concrete transformer pads with instruction for the routing of conduit and placement. CURC must inspect installation before concrete is poured.

	Three Phase
Manufacturer	13 Terminal 120/208 & 277/480
Anchor	TSS13–HO–SR1
Meter Devices	3040A–13
Milbank	UC7449–XL
Galva–Closure (RJB)	MS–2034–13

W/ 10 pole test switch



All single phase A=24", B=48"
All three phase A=60", B=pad width



Concrete filled 4" or 6"
Steel Pipe or minimum of 6"x6"
treated wood post

Diggers Hotline 811

NOTES:

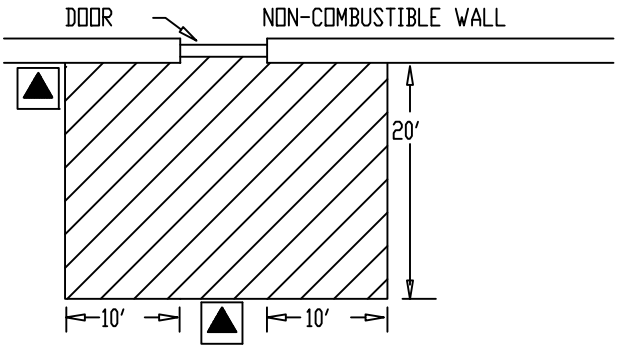
1. See page 3-18 for code clearances to combustable walls, doors, windows, intakes, etc.
2. Protective posts are required where the transformer is subject to vehicular traffic. Installation and cost of this protection is the responsibility of the customer.

This is reprinted from Vol. 1 of the Wisconsin State Electrical Code (PSC 114.317)

I NON-COMBUSTIBLE WALLS

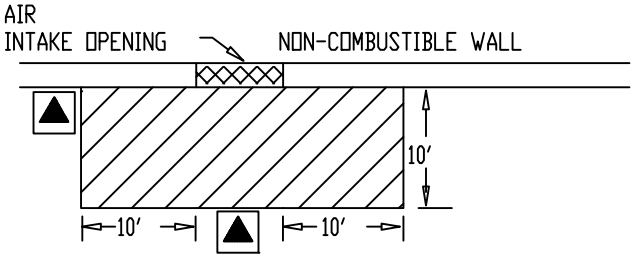
Padmounted oil insulated transformers may be located directly next to non-combustible walls, but not closer than 3 ft., if all of the following clearances are maintained from doors, windows and other building openings.

Combustible walls are walls of Type No. 8 buildings as determined by COMM 51.03. Note that Type 8 buildings are "unprotected wood frame". Veneers of stone, brick, metal, etc, don't change the classification unless rated by UL as a Type 7 assembly.



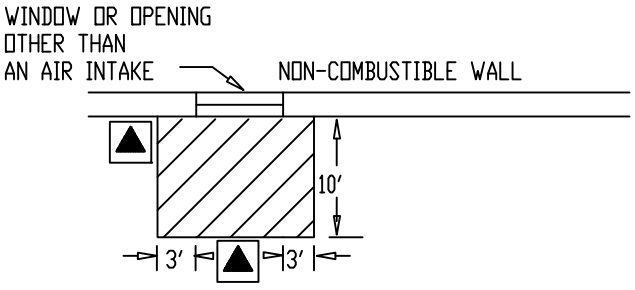
A. DOORS

Padmounted oil insulated transformers shall not be located within a zone extending 20 ft. outward and 10 ft. to either side of a building door.



B. AIR INTAKE OPENINGS

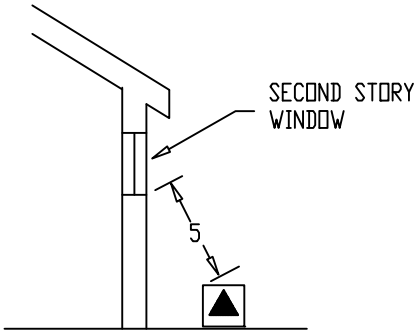
Padmounted oil insulated transformers shall not be located within a zone extending 10 ft. outward and 10 ft. to either side of an air intake opening. If the air intake opening is directly above the transformer, there must be a 25 ft. vertical distance from the opening to the transformer.



C. WINDOWS OR OPENINGS OTHER THAN AIR INTAKE

1. First Story

Padmounted oil insulated transformers shall not be located within a zone extending 10 ft. outward and 3 ft. to either side of a building window or opening other than an air intake.



2. Second Story

Padmounted oil insulated transformers shall not be located less than 5 ft. from any part of a second story window or opening other than an air intake.

II. COMBUSTIBLE WALLS

A. Padmounted oil insulated transformers in sizes up to and including 100 KVA shall be located according to the provisions set forth for non-combustible walls.

Note: Installations with 75KVA three phase padmounts should be designed with upgrades to 150KVA in mind.

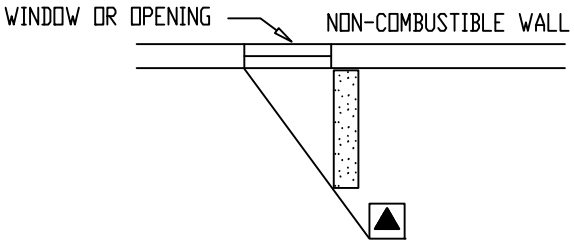
B. Padmounted oil insulated transformers in sizes above 100 KVA shall be located a minimum of 10' from the building wall in addition to the clearances from building doors, windows and other openings set forth for non-combustible walls. Also, a sump shall be installed for transformers in sizes exceeding 500 KVA if the immediate terrain is pitched toward the building. Contact CURC for sump specifications.

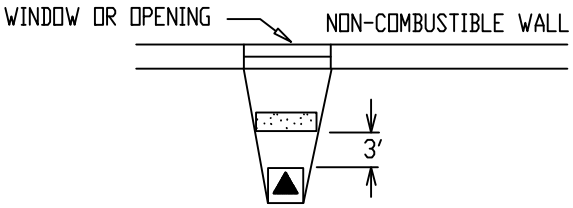
III. BARRIERS

If the clearances specified above cannot be obtained, a fire resistant barrier shall be constructed in lieu of the separation. The following methods of construction are acceptable:

A. NON-COMBUSTIBLE WALLS

The barrier shall extend to a projection line from the corner of the padmount to the furthest corner of the window, door or opening in question. The height of the barrier shall be 1' above the top of the padmount transformer.

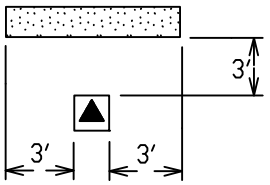




(SOLID OR WITH WINDOW OR OPENING) COMBUSTIBLE WALL

B. COMBUSTIBLE WALLS

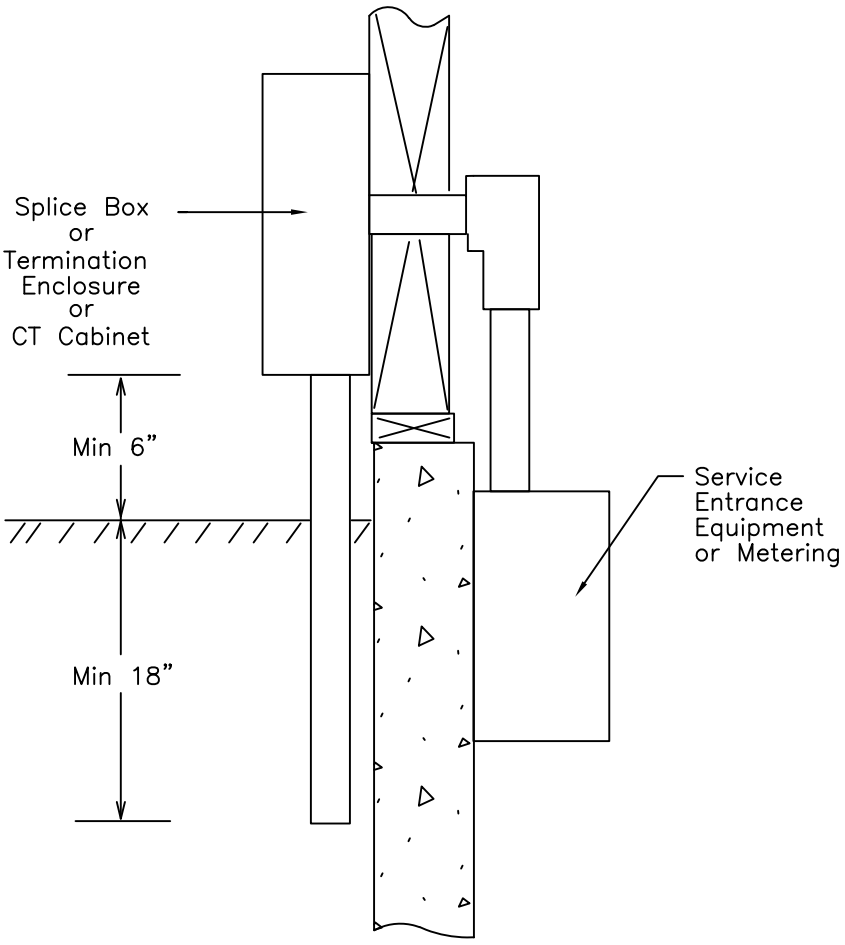
The barrier shall extend 3' beyond each side of the padmount transformer. The height of the barrier shall be 1' above the top of the padmount transformer.



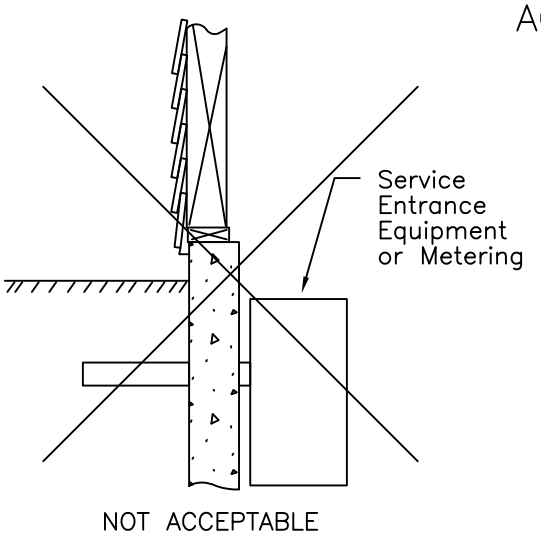
IV. FIRE ESCAPES

Padmounted oil insulated transformers shall not be located within a zone extending 20 feet outward and 10 feet on either side of the point where a fire escape meets the ground.

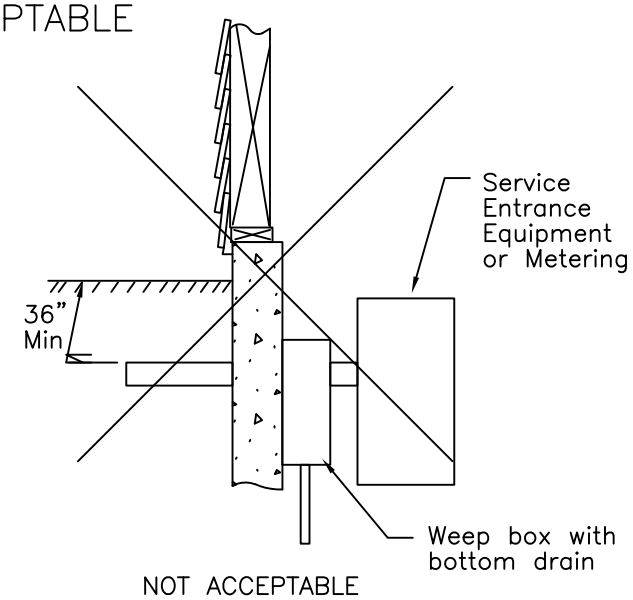
Padmounted oil-insulated transformers located beneath fire escapes shall have a vertical clearance of not less than 10 feet from the top of the transformer to the bottom of the fire escape.



ACCEPTABLE

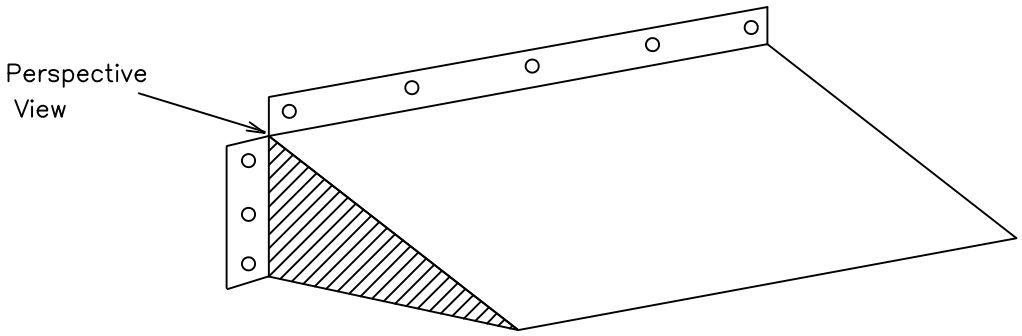


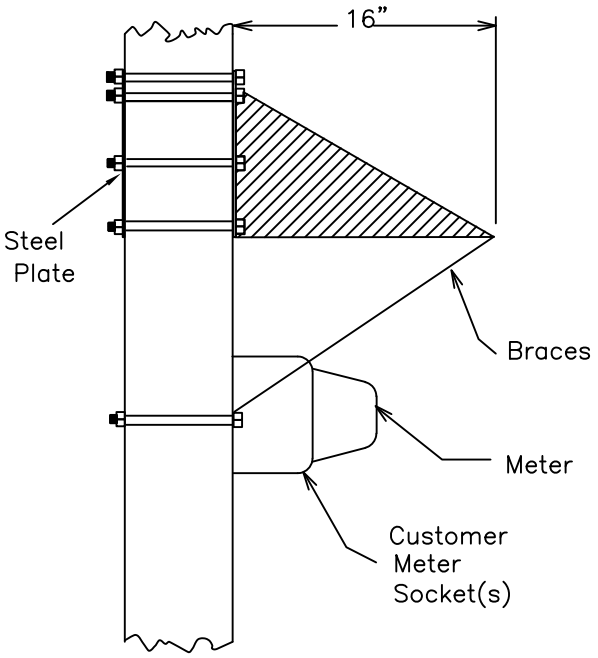
NOT ACCEPTABLE



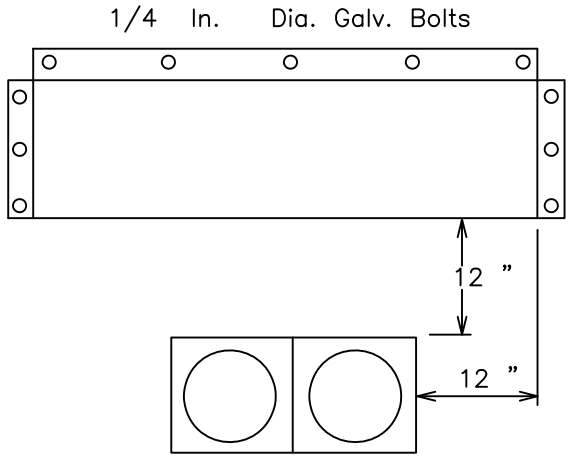
NOT ACCEPTABLE

The above shows how to and how not to deal with water seepage through basement wall problems. CURC will not run its conductors through a basement wall because of the possibiity of causing water seepage problems.





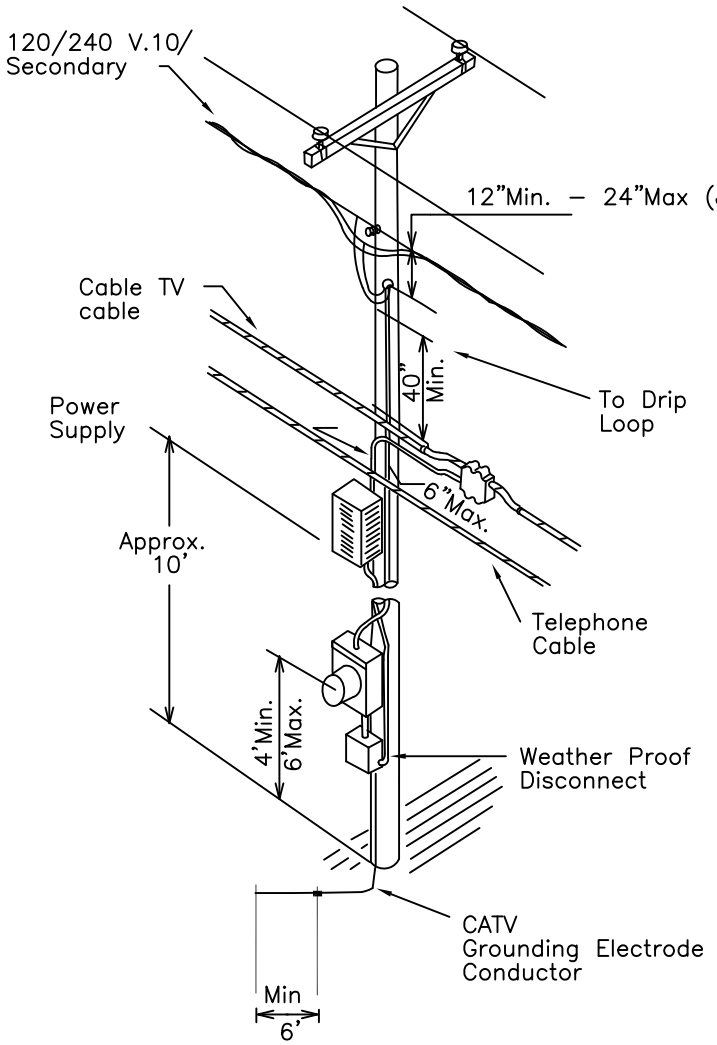
Wall section

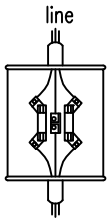


Front View

NOTES:

1. A snow and ice shield provided by the customer is mandatory on the pitched side of metal buildings. A shield is highly recommended for other areas. The customer is responsible for damage to the metering and meter sockets, etc.
2. Shield must be capable of protecting meter.
3. Metal shields (min. of 10 gauge) shall be primed and painted with rust resistant paint.
4. Wood or plywood shields shall be supported by braces.





load
wiring for 3 wire
120/240 volts

1. Contact CURC before installing in order to make sure that 120/240 volt service is available on the pole in question.
2. All installations must conform with all applicable electrical codes and CURC requirements including requirements for clearances, climbing space and working space.
3. Only qualified and authorized personnel shall make this type of installation. They shall be trained and knowledgeable of the clearance requirements and working rules of the NESC (Vol.1 Wisconsin State Electric Code). The qualified personnel shall be trained and competent in:
    a. Distinguishing exposed live parts from other parts of electric equipment.
    b. The techniques necessary to determine the nominal voltage of exposed live parts.
    c. Minimum approach distances corresponding to the voltages to which the qualified personnel will be exposed.
4. All materials, except meter, shall be furnished and installed by the CATV company.
5. The meter socket shall be a minimum of 100 amp, ringless style, with manual by–pass horns. The service will be 3–wire 120/240 volt. Two wire 120 volt service is not acceptable.
6. The service entrance conductors shall be run in non–metallic conduit, Schedule 80. If metallic conduit is used, it shall be covered with a non–metallic covering 40" above and 72" below any communications attachments (NESC 239G.1.). The service entrance conductors shall extend 30" beyond the weatherhead and shall be rated with 600 volt insulation. CURC will make connections to its' lines.
7. It is a code violation to have fused and unfused service entrance conductors in the same raceway.
8. The disconnect, power supply unit, meter socket and CATV cable shall be mounted on the same quadrant of the pole. There shall be a maximum of 6" between the service entrance conduit and CATV cable.
9. Grounding shall be in accordance with the National Electrical Code article 250. Note that code requires a separate ground down the pole and a separate double ground rod. Do not run this ground into the meter socket (COMM 16.27).
10. When a unit contains both the service disconnect switch and the power supply, installation height shall be in accordance with applicable codes.
11. This unit may not be mounted on any pole on which there are transformers, primary risers, section cutouts, capacitors, circuit reclosers, regulators, traffic signals or similar fixtures without the consent of the CURC Electrical Engineer.

Single Meter and Service Rule

The Company will normally supply to each customer's building, structure or premises:

1. One Service Lateral (drop)
2. One Class of Service
3. One Meter

EXCEPTIONS to this rule are:

1. Multiple occupancy buildings (e.g., row houses, condominiums) which comply with the Wisconsin State Electrical Code by having areas under different occupancies separated by approved fire walls may be supplied by more than one service.

   Note: A fire wall is a 3-hour fire-resistive wall which shall be a substantially constructed masonry wall running from the foundation and extending to the roof. A wall constructed of materials other than masonry must be approved in writing by a verified testing company and/or building inspector or fire department. (COMM 16.17)

2. Fire pumps or other emergency electrical systems requiring separate service. (CURC suggests tapping ahead of the main disconnect. This will avoid ongoing service charges and possible special facilities charges.)

3. Large or unusual loads requiring additional services or in cases where, in the judgement of the utility, voltage regulation would be unreasonable due to load size and distance between loads.

4. Where more than one point of delivery or more than one point of metering is necessary because of interruptible service rate, governmental requirements or regulatory rules.

   a. As of March 1, 1980, the Wisconsin Administrative code, PSC 113.0803 requires individual electric meters for nontransient multidwelling unit residential buildings, mobile home parks and for commercial establishments. Individual unit metering will not be required:

      1). Where commercial unit space requirements are subject to alteration with change in tenants as evidenced by temporary versus permanent type wall construction separating the unit spaces.

      2.) For electricity used in central heating, ventilating and air conditioning systems.

      3.) For electric backup service to storage heating and cooling systems or when alternative renewable energy resources are utilized in connection with central heating, ventilating and air conditioning systems.

5. Customers with an existing three-phase service do not qualify for an additional single-phase service.

6. Customers with an existing three-phase service would not qualify for a second three-phase service of a different voltage unless approved by CURC.

7. Customers with 120/240 single-phase requesting 120/208 three-phase are required to eliminate the single-phase service.

8. A property with a residence and a second building or facility used for domestic purposes (example: garage) would qualify for only one service unless the second building was more than 150 feet from the closest point on the residence. The second service would be a special facility charge.

Clearances for Electric Overhead Cable Services

This does not deal with secondary or primary clearances.
(Per NESC Table 232-1 and Table 234-1)

Vertical Clearances	Nominal Voltages to Ground 150v	300v	750v
Roads, Streets and Areas Subject to Truck Traffic	17'	17'	17'
Single and 2-Family Residential Driveways ⑨	16'	16'	17'
By Special CURC Approval ②	13'	13'6"	17'
Drip Loops to Ground - Line Clearance for the Span Applies			
Unless by Special CURC Approval ②	10'	10'6"	16'
Pedestrians-Only Areas to Ground	13'	13'	13'
Wisconsin DOT Highways	18'	18'	18'
Michigan Roads ③	23'	23'	23'
Over or Under Roofs or Projections (also railings, walls, or parapets around balconies or roofs) (Inaccessible) ④⑤⑥	9'	9'	9'
If Roof has Slope of 3 Horizontal and 1 or More Vertical (4" in 12" slope or more)	4'	4'	9'
Over or Under Roofs, Balconies, Decks, etc. (Accessible) ④⑤	12'	12'	12'
Over Roofs, Balconies, Decks and Service Attached to Building (Accessible) (If conductors or drip loop not readily accessible) ④⑤⑧	9'	9'	9'
Signs, Chimneys and Other Structures Not Classified as a Building	4'6"	4'6"	4'6"

Horizontal Clearances	Nominal Voltages to Ground 150v	300v	750v
Building Walls, Projections, Windows, Balconies, etc. ⑦	5'	5'	5'
Signs, Chimneys and Other Structures Not Classified as a Building	3'6"	3'6"	3'6"

Notes:

1. One foot is added to all vertical clearance to account for thermal or ice loading of the service cable. One foot was not added for vertical clearances for service drip loops and for horizontal clearances. For horizontal clearances, conductor blow-out must be considered.

2. Where the height of attachment to a building or other installation does not permit service drops to meet the normal values, the clearances may be reduced to the values listed. This reduction in clearance must be approved by CURC.

3. This applies to all Wisconsin roads for open supply conductors. This does not apply to normal triplex or quadriplex cables.

4. A roof, balcony or other area is considered accessible to pedestrians if the means of access is through a doorway, ramp, window, stairway or permanently-mounted ladder. A permanently-mounted ladder is not considered a means of access if its bottom rung is 8 feet or more from the ground or other permanently-installed accessible surface.

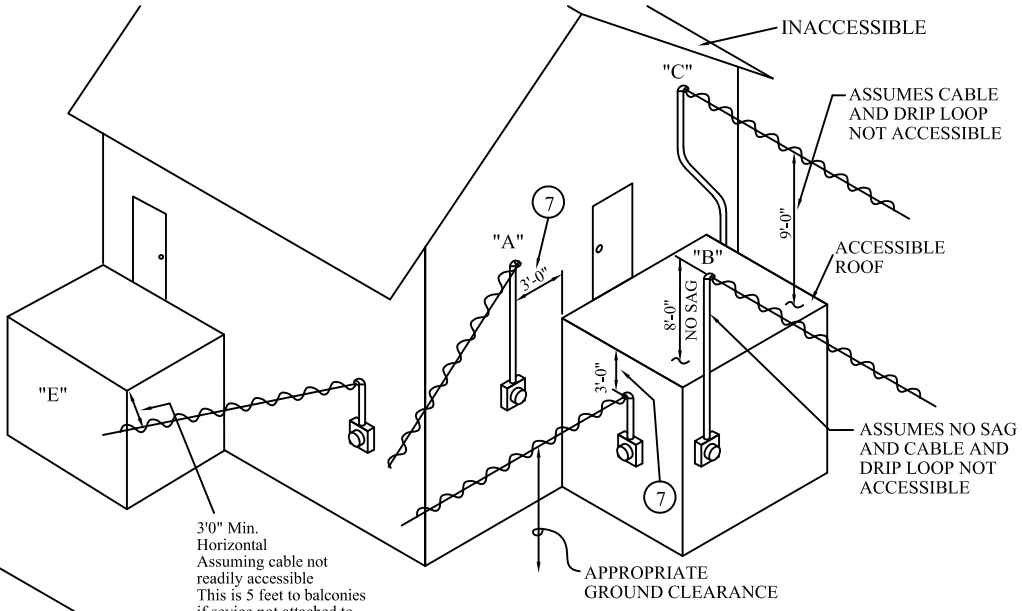
5. Where these clearances cannot be obtained, the conductors and rigid live parts shall be guarded. (NESC 234C2)

6. See figure #3 for an exception to roof clearance when using a periscope (through the roof raceway) and non-accessible roof or balcony and with voltages less than 300 volts to ground. NESC 234C3d (1).

7. This may be reduced to three feet in any direction from windows (above windows is accepted), doors, porches, and fire escapes if the service drop is attached to the building and not readily accessible. See Figure #2. NESC 234C3d (2).

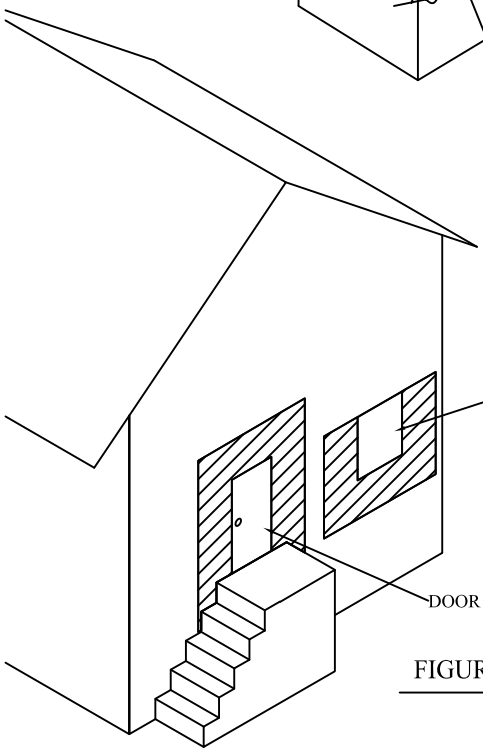
8. From NESC 234C3d.

9. A driveway to a residence that can reasonably have trucks on it must not use this clearance. Examples are garbage and septic trucks that take most rural driveways out of this category for clearances.



7

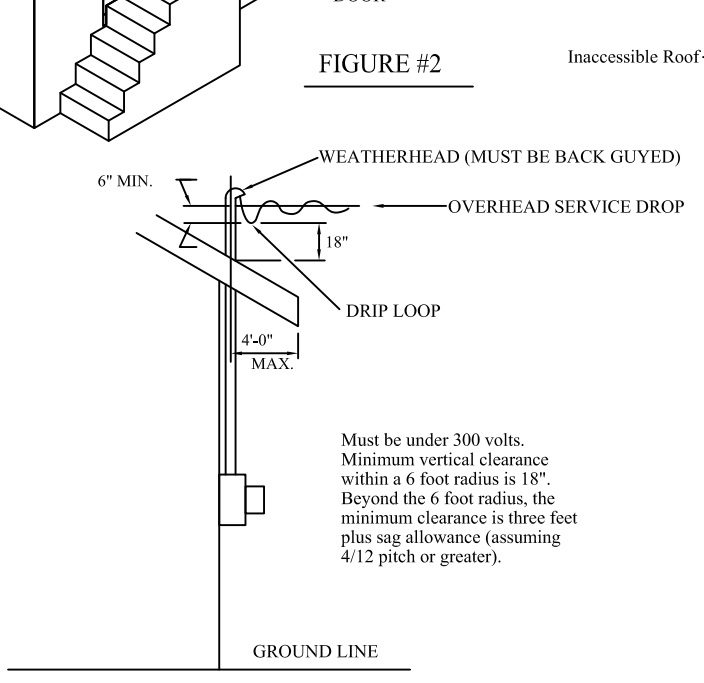
FIGURE #1



7

SERVICE DROP ATTACHMENT MUST BE CLEAR OF THE THREE FOOT ZONE.THIS ALSO INCLUDES THREE FEET OUT FROM THE DOOR, WINDOW, PORCH, OR FIRE ESCAPE. IT MUST ALSO NOT BE READILY ACCESSIBLE. APPROPRIATE GROUND CLEARANCES APPLY.

FIGURE #2



VIEW A-A

Must be under 300 volts. Minimum vertical clearance within a 6 foot radius is 18". Beyond the 6 foot radius, the minimum clearance is three feet plus sag allowance (assuming 4/12 pitch or greater).

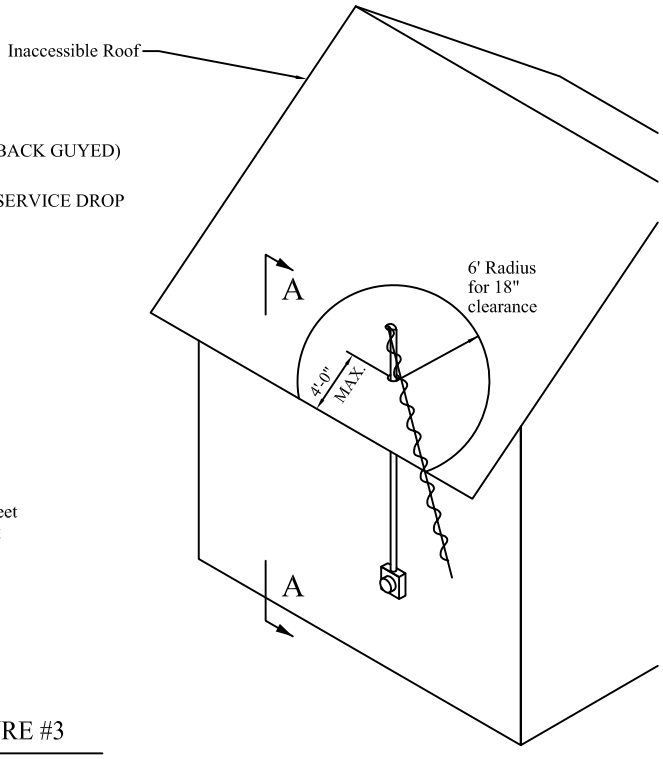
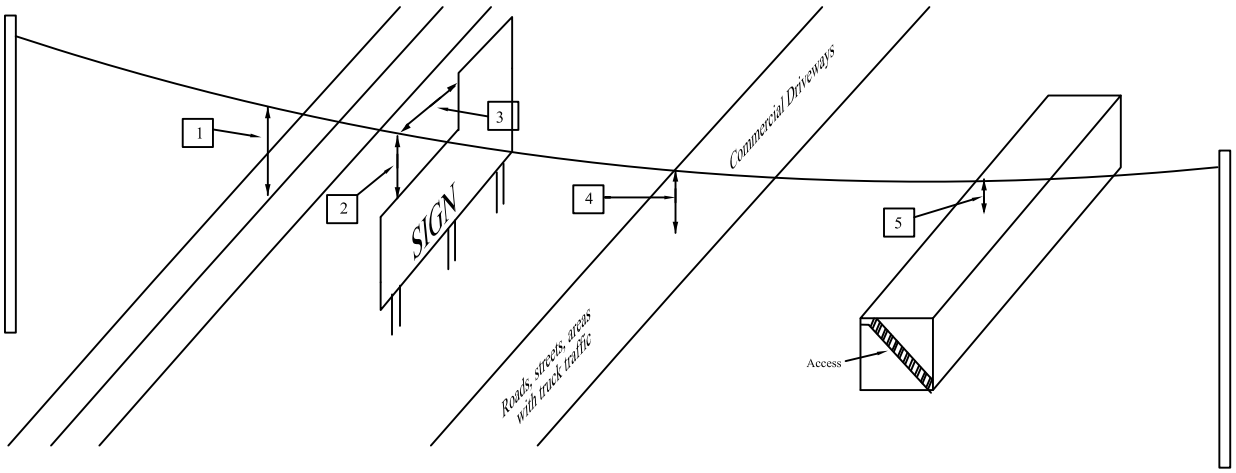


FIGURE #3



NOTES:

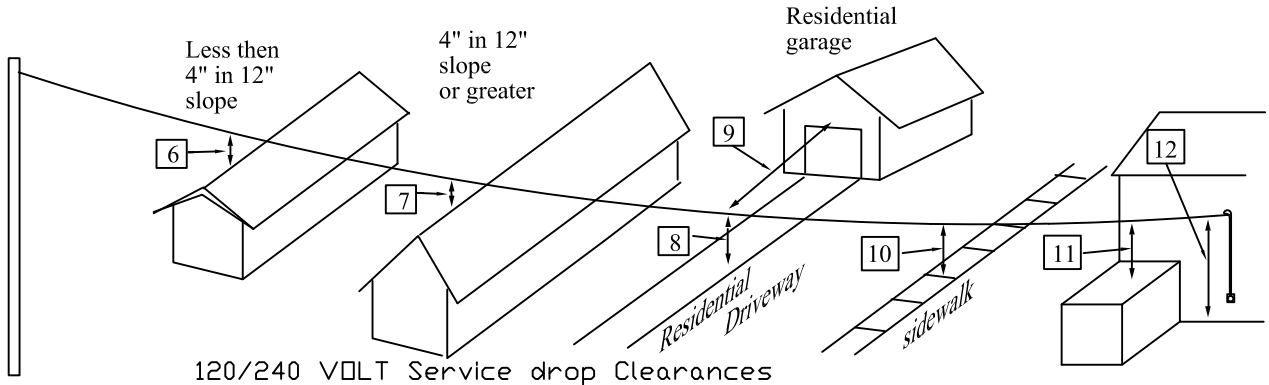
1. 18′ for Wisc. State and Federal roads.

2. 4′6″ vertical clearance to signs, chimneys and other structures.

3. 3′6″ horizontal clearance to signs, chimneys and other structures. Wind movement of the service drop must be considered and added to this.

4. 17′ Vertical to roads and areas subject to truck traffic.

5. 12′ over accessible roofs or balconies not attached to the building being served by the service drop.



120/240 VOLT Service drop Clearances
Note: Add 1 foot to all vertical clearances except to drip loops in order to account for thermal and ice loading.

6. 9′ if low sloped roof and inaccessible.

7. 4′ if steep roof and inaccessible.

8. 16′ to residential driveways. This can be reduced in special cases where higher attachment points can't be obtained. If there is a reasonable chance of truck traffic this 16′ clearance does not apply.

9. 5′ horizontal clearance to building. Wind movement of the service drop must be considered and added to this.

10. 13′ over sidewalks and pedestrian only areas. This does not apply if vehicles can reasonably be driven here.

11. 9′ over accessible attached roofs and balconies (assumes cable and drip loop not readily accessible).

12. Adjacent line clearance for the lines applies. In this example it would be 13′ (note 10). It can be reduced to 10′′ if no other options and is approved by CURC.

Miscellaneous Clearances

Wells

Underground 5 feet for electric or gas.

Overhead Horizontal clearance must be no less than 3 4 of the required vertical clearance of the conductors to ground. A conservative guide is 14 feet on service drops and 20 feet on primary lines. Note OSHA working clearances. (PSC 114.234C8)

Private Septic Systems

Sewer Pipe Gravity fed pipes - One foot.
Pressurized Pipes - Try to avoid. One foot by code.

Stored Materials

Overhead Overhead lines shall not be run over areas designated for material storage where cranes or other types of high machinery are used unless adequate clearance can be provided for full use of the equipment (PSC 114.234C6).

Working Clearances

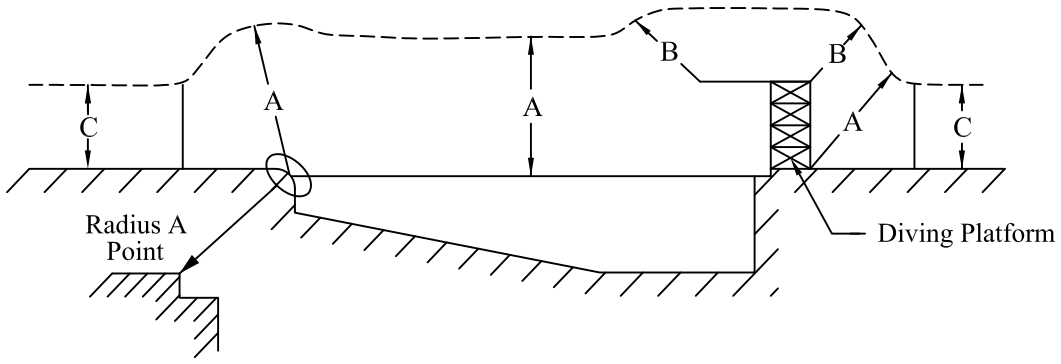
Following are the Department of Labor, Occupational Safety and Health Administration, Safety and Health Regulations for Construction. OSHA subsection N 1926.416(g)(2).

Voltage	Minimum personnel clearance, to any part of crane, or to the load in feet
69 kv and below	10
115 kv and 138 kv	11
345 kv	15

Swimming Pools (also includes Outdoor Hot Tubs per PSCW 7/00)

Underground 5 feet of pool hot tub or auxiliary equipment (NESC 351C1)

Overhead Shall be avoided by 10 feet horizontally. The following are clearances for utility service drops (under 750 volts). One foot is added for thermal loading. (PSC 114.234E1).
A=19 feet, B=15 feet, C=Normal Clearance



Padmount Transformers

See page 3-18.

Natural Gas Lines and Meters

Basic underground clearance from gas lines to all other utilities or below-ground structures is one foot (PSC 114.352E). It is recommended that clearance to wells and septic fields be 5 feet. Note the mound system clearances on page 7-5.

Fuel Tanks

Overhead — Electric lines cannot be run over above-ground flammable liquid or LPG storage tanks. The horizontal clearance is 8 feet for secondary and services, 15 feet for all other electric lines. LPG tanks with a capacity of 1000 gallons or less are exempt. (PSC 114.234C7)

Underground — Underground cables shall not go under fuel tanks. They shall not come within 10 feet of above or below-ground tanks. Electric cables can come closer if installed in "Fiberglass Reinforced Epoxy" (FRE) conduit or other approved conduit. (See EDE for details).

Class I Hazardous Locations

Buried electric lines, meter sockets, CT cabinets, or termination enclosures must observe the following minimum horizontal clearances from the flammable fuel system components listed below:

Under fuel storage tanks	0 feet
Fill Pipe	10 feet
Dispensing device on tank	20 feet
Remote pump	10 feet

Consult CURC for other Class I Hazardous locations. (NESC 127 and NEC 514-2).

Antennas

See page 7-4 for details.

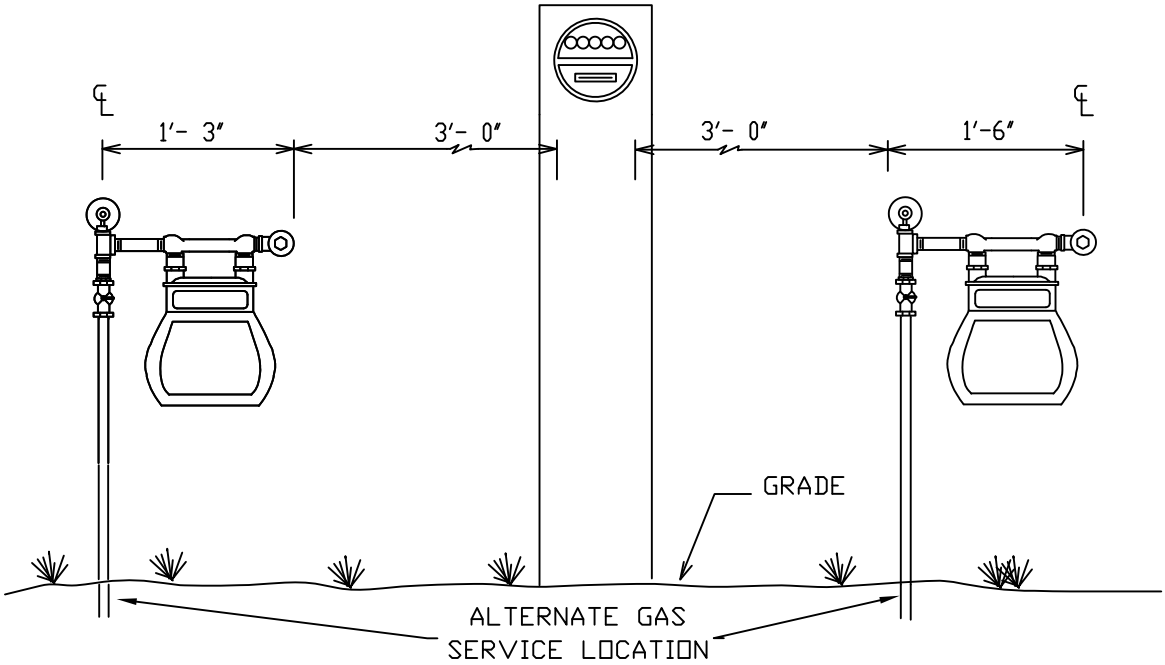
Buildings

Underground electric lines are not allowed under buildings unless installed in conduit. (NESC 351C2 and NEC 300-5c)

Special Cases

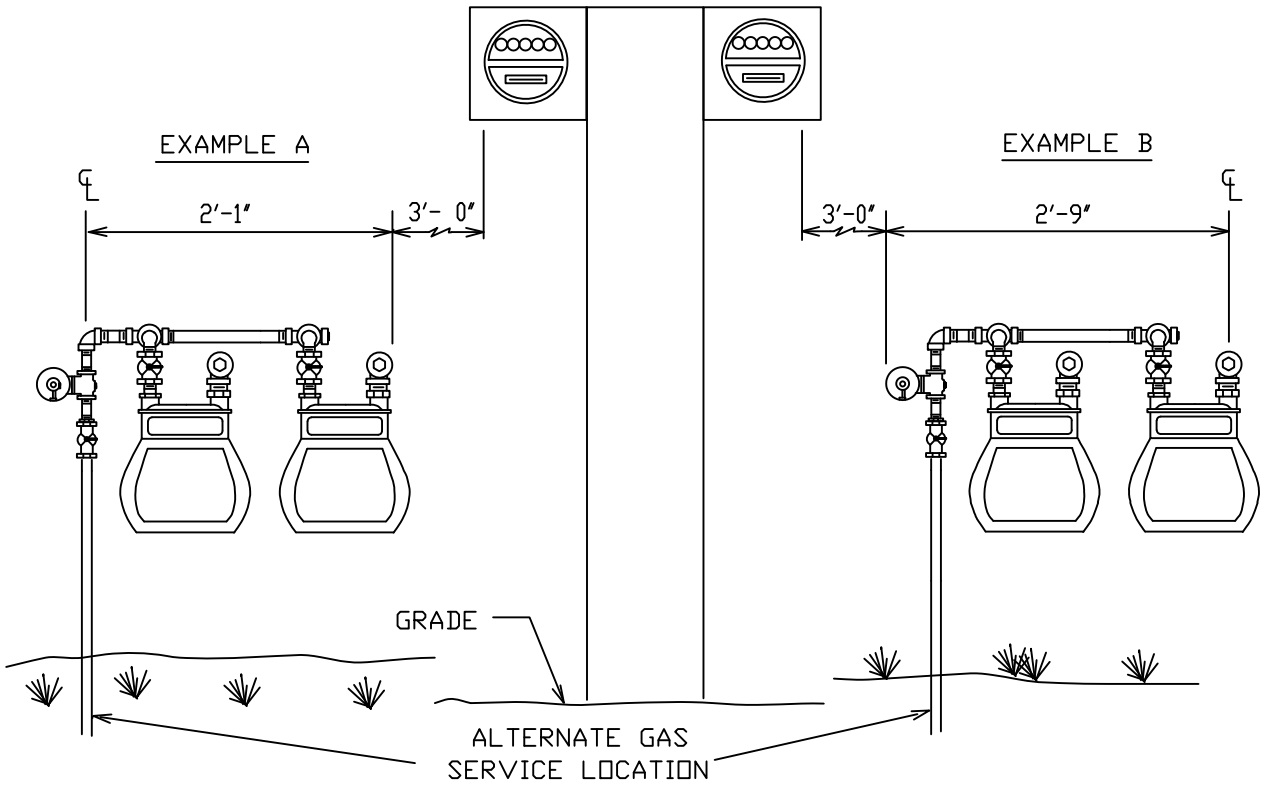
See CURC for additional clearance requirements not listed above. Some of the items which require special clearances include the following:

Railroads
Flag Poles
Light Poles (standards)
Grain Bins
Sailboat Areas
Boat Landings
Airport Approaches
Electric Transmission Distribution Lines

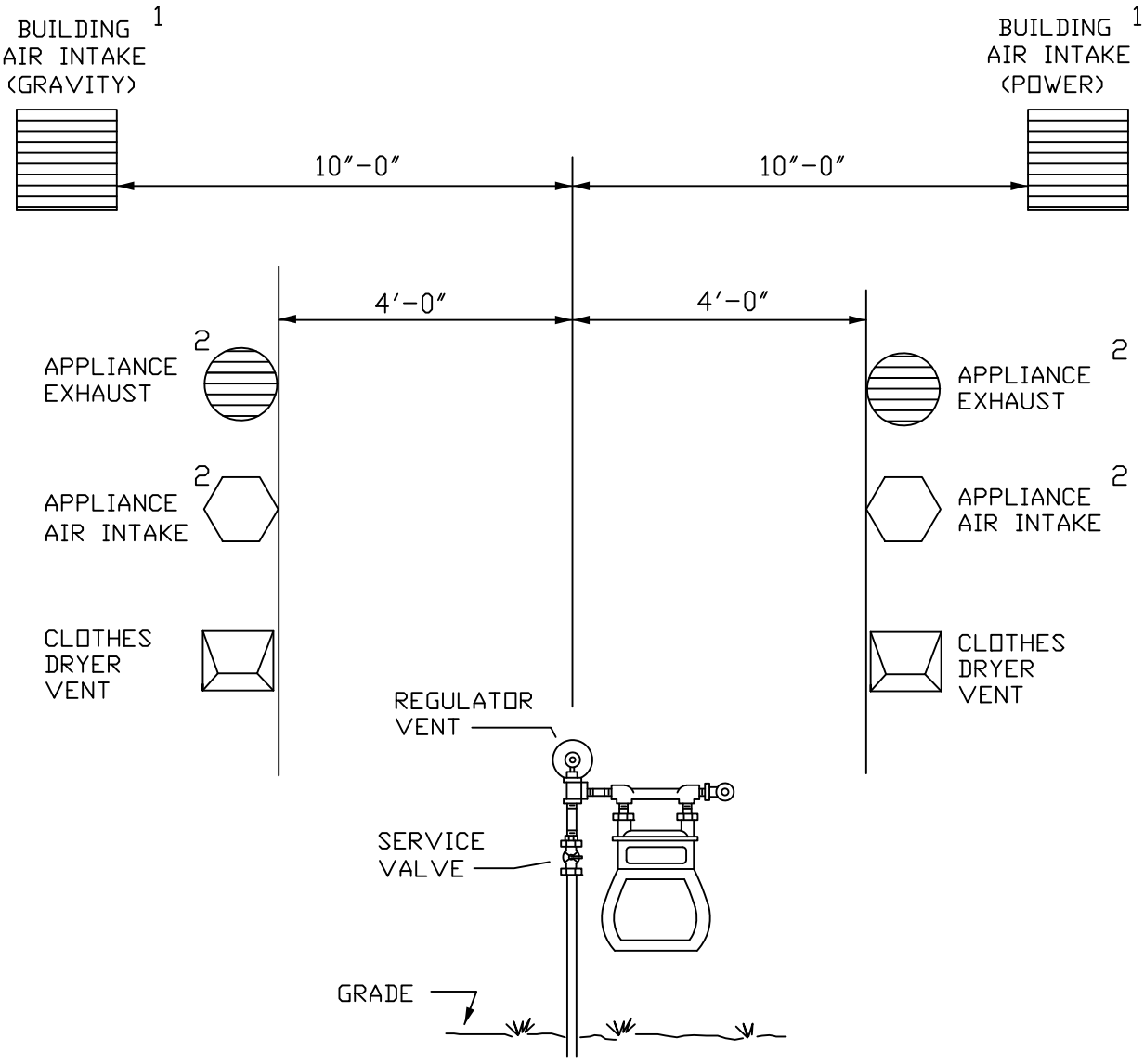


THREE FOOT RULE COMES FROM THE
NATIONAL FUEL GAS CODE Z223.1 SECTION 2.7.2

"Gas meters shall be located at least 3 feet from sources of ignition." Electric meter sockets, disconnects, outlets, etc. are examples of sources of ignition. Conduit runs, termination enclosures, CT cabinets, etc. are not considered as sources of ignition. This code went into effect in 1980 and is not retroactive. These clearances do not apply to gas piping including fuel runs.



VENT CLEARANCES

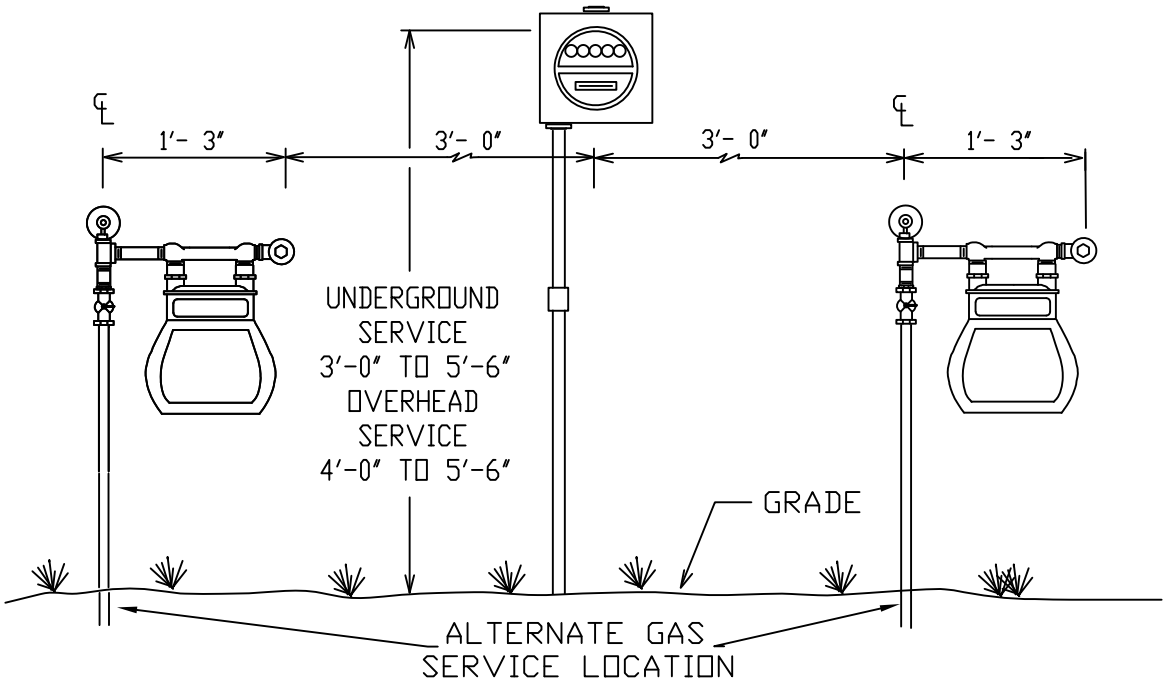


1) GAS /WOODBURNING FIREPLACE COMBUSTION AIR, MAKE-UP AIR UNITS, BUILDING VENTILATION, ETC.

2) APPLIANCES INCLUDE SEALED COMBUSTION FURNACES, WATER HEATERS, ETC.

3) EXHAUST VENTS WHICH MAY LEAK WATER, CONDENSATE, GREASE, OIL OR OTHER SUBSTANCES ARE NOT ALLOWED ABOVE GAS METERS OR OTHER GAS CONTROLS.

4) AVOID SHORT OVERHANGS WHICH COULD CAUSE ICE PROBLEMS IN WINTER. SEE PAGE 42 FOR ICE SHIELDS.



THREE FOOT RULE COMES FROM THE
NATIONAL FUEL GAS CODE Z223.1 SECTION 2.7.2