CITY OF KAUKAUNA

KAUKAUNA UTILITIES

ELECTRIC SERVICE AND METER

SPECIFICATION MANUAL

2021 Revision

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About Kaukauna Utilities

Kaukauna Utilities is dedicated to meeting our customers' needs while helping to make the community a better place to live and work. Kaukauna Utilities is one of this country's 2,200 public power systems — a utility owned by the community it serves.

Public power systems like Kaukauna Utilities are non-profit and have one main purpose — to provide customers with the best services at the lowest possible cost.

A seven-person utility commission, appointed by the City Council, decides how to operate Kaukauna Utilities. This local representation and control allows all citizens to have a voice in how our utility can best meet the community's needs. Community ownership and control is the hallmark of public power — local people working together to meet local needs. At Kaukauna Utilities, we go the extra mile to make sure our customers receive that personal service that makes us proud to be serving a great community.

We're proud to be a community owned and operated utility.

This manual is a composition of rules and technical specifications designed to ensure the safe and reliable continuation of electric service to our customers. Kaukauna Utilities takes both of these issues, safety and reliability, to be of the utmost importance and the implementation of the rules herein is designed to ensure both.

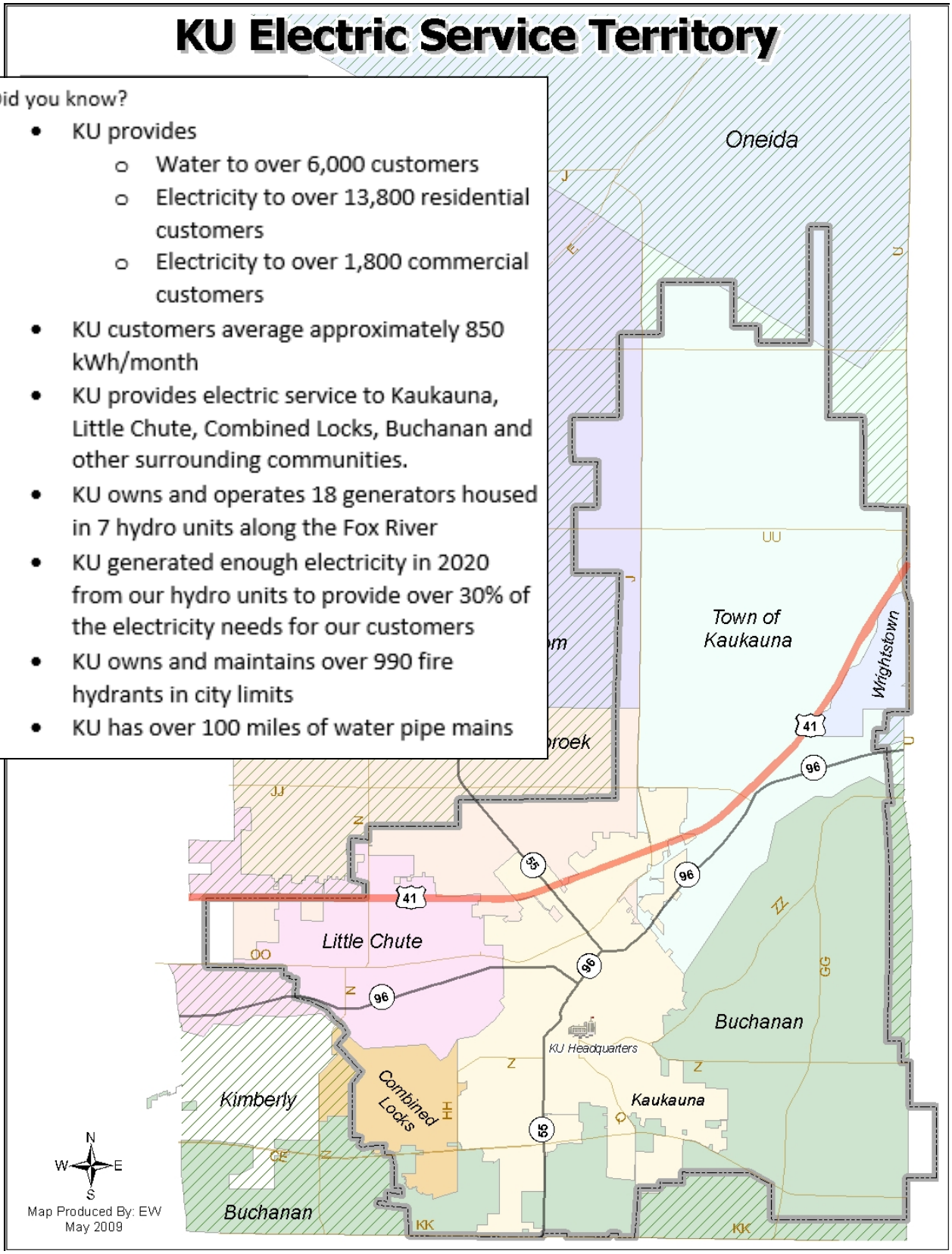
We strongly encourage all those that use this manual to contact the utility if you have any questions or concerns regarding this manual. We look forward to working with you to help the communities that we serve progress into the future.

KAUKAUNA UTILITIES

KU Electric Service Territory

Did you know?

- KU provides
  - Water to over 6,000 customers
  - Electricity to over 13,800 residential customers
  - Electricity to over 1,800 commercial customers
- KU customers average approximately 850 kWh/month
- KU provides electric service to Kaukauna, Little Chute, Combined Locks, Buchanan and other surrounding communities.
- KU owns and operates 18 generators housed in 7 hydro units along the Fox River
- KU generated enough electricity in 2020 from our hydro units to provide over 30% of the electricity needs for our customers
- KU owns and maintains over 990 fire hydrants in city limits
- KU has over 100 miles of water pipe mains



GENERAL INFORMATION

1. Kaukauna Utilities (called “KU” hereafter) will not apprise the local contractors/installers of any changes in local or municipal ordinances.

2. KU will work as closely as possible with local inspectors.

3. It shall be the responsibility of local contractors/installers to keep current on any changes by contacting the utility.

4. Unless otherwise indicated, all items shown on the sketches and schematics included in this manual are to be furnished and installed by the customer.

5. Meters and metering transformers (if needed) will be furnished and maintained by KU.

6. Only meter mounting devices and service termination equipment approved by KU are to be used. The listing of equipment in this manual is not an endorsement or indication of suitability, but only that it is approved for installation for our metering purposes. Alternatives may be approved upon request. Prior approval of primary or specialty metering settings is required.

7. Application of these standards must be made in accordance with the Utility’s **Electric Service Rules and Regulations** established by the WPSC.

8. Electrical contractors are expected to acquaint themselves with the plans of other trades on the premises being wired so that the meter can be located in accordance with the requirements set forth in this manual.

9. For all new and rewired, one and two family, single-phase residential services, **KAUKAUNA UTILITIES WILL PROVIDE A VERBAL OR FIELD SPOT OF THE POINT OF METERING.** A Guaranteed Available Short Circuit Current (G.A.S.C.C.) of 10,000 amps is assumed for these services only for equipment selection purposes. Contact the utility for available interrupting current values for all other types of service.

10. Accepted service entrance cable may be used where permitted by the applicable Wisconsin or local ordinances.

11. Transfer equipment used with stand-by power plants or generators shall be suitable for intended use and be so designed and installed as to prevent the inadvertent inter-connection of normal and stand-by sources of supply in any operation of the transfer equipment. Further, transfer equipment shall be installed such that it is located electrically on the load side of the meter. KU does require an exterior mounted disconnect for any distributed energy resource (generator, solar array, etc.)

12. Customer owned electric service equipment must be of approved material, tested and listed by a nationally recognized testing laboratory. This is a requirement of the Wisconsin State Electrical Code.

13. All temporary services shall have ground fault breakers or ground fault receptacles.

14. PLAN AHEAD! Advance planning is the best way to insure the Utility will schedule your service work to fit your needs. Utility workload, easement complications, tree trimming and other factors could delay your service installation unexpectedly. Appointments are filled on a first call basis. No service will be connected until proper inspections have been completed.

15. If a customer requests a transformer pole to be set in a location not satisfactory to KU representatives, the utility reserves the right to have the meter location changed to suit utility needs. KU is only responsible for maintaining acceptable voltage levels at the point of interconnection with customer equipment (typically measured at the meter socket). The customer is responsible for any voltage drop that occurs beyond that point.

16. When a service mast is used to support the electric service drop, only the electric service drop is to be attached to it. Any other utilities, such as telephone or cable TV, shall not be attached to the electric service mast or meter sockets per Wisconsin Administrative Code.

17. INSPECTIONS - Kaukauna Utilities distributes electricity to all or parts of nine separate political areas. These are the City of Kaukauna, the Village of Little Chute, the Village of Combined Locks and all or parts of the Towns of Kaukauna, Vandenbroek, Freedom, Oneida, Buchanan and Holland. Page 36 of this manual is a listing of contact information for each of these municipalities as of the time of this printing.

    All of the municipalities that are served by KU have inspectors that will need to approve any new service before the utility can energize it. The local inspectors will tag the installation when it is approved. It is the responsibility of the contractor/ installer to set up the inspection. The Utility will not notify contractors of changes in local ordinances. In areas not served by a qualified electrical inspector, the Utility recommends that the customer contact the Wisconsin Department of Commerce for an inspection.

18. KU requires the following before any new service can be energized:

    ~A residential service application (page 35) OR a non-residential service application (page 36)
    ~A customer service application (page 37)
    ~An approved inspection from the municipal inspector having jurisdiction

    Copies of these applications are available at our office and on our web page at:

    http://www.kaukaunautilities.com/online_services/default.asp?CategoryNumber=30

    Also note that any change of address (or new address) will also require that a customer service application (page 37) be filled out by the customer. Copies may also be found at our office, or at:

    http://www.kaukaunautilities.com/online_services/default.asp?CategoryNumber=20

19. Addresses must be clearly labeled at any residential, commercial, or industrial site before the utility can energize a new service.

20. FARM ISOLATION
    a) All phase, neutral and equipment grounding conductors shall be carried to the first disconnect on the load side of the meter.
    b) For overhead construction, the Utility shall terminate its secondary neutral, on both ends, on an insulated spool or dead-end device. The customer shall terminate their neutral, A.C.S.R. or messenger carrying the phases on an insulated spool or dead-end device on both ends. In addition, on the meter pole or pole shared by the utility and customer, it shall be a rule that the customer messenger, A.C.S.R., or neutral be cut off no longer than 3 inches beyond the dead-end device and that no bond shall be placed to the utility neutral.

21. Under no circumstances shall any utility or customer owned lines or equipment be allowed to pass through or attach to the meter encloser, pedestal, conduit or service entrance (SE) cable. This means any conductors or grounds. Grounding shall be done on the grounding electrode, the electrode conductor or in the customer's property.

22. Refer to KU tariff rules established by the Public Service Commission of Wisconsin (page 38) for utility requirements on motor controls and starting current (locked rotor) limitations.

GENERAL REQUIREMENTS FOR METERING

General

The information covered in this section is applicable to overhead, underground and AC network sources of supply.

Location of Meters and Metering Equipment

1. Outdoor metering is required in all cases unless prior approval is received from proper utility officials in advance.

2. For outdoor installations with an OH service drop, the centerline of all meters shall be between 4 and 5 feet from the finished grade.

3. For outdoor installations with an UG service lateral, the centerline of all meters shall be between 3 and 5 feet from the finished grade.

4. For outdoor group installations the centerline of all meters shall be between 2 and 5 feet above the final grade. (For apartment, commercial and other appropriate buildings of more than 2 floors, meters may be located on the different floors of the building provided they are grouped in enclosures as near as practical to the risers serving the floors and the wiring and metering layout for the building is accepted by the utility.)

5. For multiple unit buildings, including duplexes, each meter socket and service switch shall be permanently marked as to identify the unit to be served. Meter sockets need to be marked with permanent numbers – not with a sharpie or other marker (ink pen) as they fade out. The unit shall be identified in the same manner. This identification shall be made on the outside of the meter panels (for the tenant and meter reader) and inside the meter enclosure (non-moveable part). Ref. N.E.C. 110-22 and Wis. Adm. Code P.S.C. 113.0809.

6. There shall be a 3' minimum of unobstructed working space, measured from the meter face, in front of all meters. This space shall extend from the floor or grade to a height of 6' 3". At least one entrance of sufficient area shall be provided to give access to this working space. The unobstructed space required in front of meter cabinets and current transformer compartments shall be as defined by the "Working Space About Electrical Equipment" of the **National Electrical Code.** This unobstructed space shall extend from the floor or ground to a height of 6' 3".

7. Ample space shall be provided for all meters, metering equipment and other aparatus so that they can be safely read, inspected and tested. Meter equipment shall not be located:

    a. in animal enclosures, attics, closets, elevator or ventilating shafts, hall-ways, living quarters, stairways or rooms containing corrosive or explosive vapors (battery rooms);
    b. near stoves, radiators, steam or hot water pipes or within 5' of moving machinery;
    c. above laundry equipment, plumbing fixtures or other bulky equipment;
    d. behind shrubbery or swinging doors; over alleys, driveways, decks, porches or sidewalks, or where it is necessary to trespass on adjacent property;
    e. with less than 3' horizontal clearance between gas and electric meter equipment; NEC515.3 A821
    f. in hazardous locations as defined in Articles 500 to 517 of the **National Electric Code** as amended in Wisconsin by the **Wisconsin Administrative Code.**

8. Meter locations shall be free from excessive moisture, vibrations and heat. Meters shall not be placed on partitions, insecure walls or over doorways. Meters shall be shielded from magnetic disturbances and protected from mechanical damage, moving machinery and belts by means of a suitable protecting cabinet. The customer shall provide a reinforced mounting surface for mounting the meter case. KU reserves the right to approve all meter locations.

Methods of Mounting Metering Equipment.

1. Socket-type meter mounting devices installed on concrete or masonry walls shall be fastened by non-corrosive metal machine screws in lead sleeve, wedge-type expansion anchors.

2. All mounting devices for metering equipment shall be plumb.

3. In group metering installations, the 4" minimum horizontal clearance requirement may be reduced to 1 ½" for the space between the service switch and the adjacent sockets.

Methods of Wiring Service Equipment and Meters

1. On outdoor installations, the knockouts of meter sockets, transockets or meter pedestals **shall not** be used for service entrance conductors unless the knockouts are located entirely below the lowest live parts.

2. Metered and unmetered conductors **shall not** be installed in the same conduit, wiring trough, channel, gutter or similar enclosure.

3. Where a group of meters is supplied from a service raceway, the covers of the raceway must be provided with a means for sealing where individual service taps are made into the raceway.

4. Splice boxes, termination compartments, meter mounting devices or current transformer compartments shall not be used as junction boxes for additional customer circuit connections.

    a. This includes taps for emergency circuits or fire alarms
    b. At single metered installations where 2 to 6 disconnects are used in place of a single main disconnect, a customer owned junction box or switchboard section shall be installed on the load side of all Utility facilities for the purpose of making taps to the individual disconnects.
    c. Transockets are permitted to have up to 2 circuits exiting the transocket. Contact KU at our local utility office for exceptions

5. Sockets shall be equipped with blank covers furnished by the customer at the time of installation.

6. The rating of a single service switch or the combined rating of all service switches connected to a 1-phase 120/240 volt service **shall not** exceed 400 amperes, with one exception: multi-family residential service may not exceed 800 amperes in size with approval from KU.

7. A common grounding conductor shall be used to ground the service entrance equipment and the grounded circuit conductor. In every case these connections shall be made in the customer's main service switch or disconnect means. A grounding conductor shall not be run from the meter socket to ground or through the meter socket or termination compartment in going from the customer's main service switch or disconnect means to ground. Direct grounding of meter sockets is permissible, only on meter poles where the disconnecting means is installed at some other location.

8. Service switches or service breakers shall be installed so that any one service switch or breaker, when disconnected, shall not interrupt continuity of service to any other separately metered customer on the premises.

9. All large installations not covered by this metering section require special consideration and the utility shall be consulted in all such cases. The customer shall submit drawings of the proposed service equipment and metering arrangement to the local utility office for approval.

10. On outdoor current transformer installations, the meter cabinet and conduit shall be grounded, either by bonding to the service entrance conduit or bus duct, or by installing a separate ground rod.

11. The utility shall meter only those voltages supplied to the customer by the Utility; there will be no utility metering after a customer-owned transformer.

SERVICE VOLTAGES & SIZES

1. Service may be taken at the following voltages and sizes:

   120/240 Volts - Single Phase, 100-400 Amps – allowing class 320 settings only.

   120/208 Volts - Three Phase, four wire-wye, 100-2000 Amps

   277/480 Volts - Three Phase, four wire-wye, 100-2000 Amps

   For three phase services greater than 2000 Amps, contact the utility for general requirements.

2. For service not specifically referred to in this manual, please contact utility staff.

3. The utility will supply each customer's building or premises with:

   a. One class of service
   b. One meter
   c. One service drop

   Exceptions to this rule must be granted by the utility in advance. The utility may ask for proof of an ongoing need. The utility reserves the right to grant or deny exceptions. It is understood that a special facilities charge may be added.

4. 60 Amp services are not offered. Any existing 60 Amp services will be subject to terms of the National Electric Code, Article 110.12 sub paragraph (c). Also National Electric Safety Code, Section 12 Article 121 – Inspections, sub paragraph (A) in service equipment.

GENERAL REQUIREMENTS FOR METER MOUNTING DEVICES

Meter Sockets

1. Whenever practical, for overhead and underground sockets, just the basic catalog number has been indicated. Generally, manufacturers change one digit of the basic number or add prefix or suffix letters to the basic number to designate hub size, knockout sizes, knockout locations or other minor variations of the basic approved socket. To obtain the complete catalog number for a specific installation, consult the catalog of the socket manufacturer.

2. Meter sockets and associated equipment shall have an Underwriter's Laboratories (UL) label. If the meter socket is an integral part of a panel board or pedestal, then one label is sufficient.

3. All meter sockets shall be ringless style and shall include bypass devices.

4. All neutral terminals in meter sockets shall be of the double lay-in type and permit the use of either aluminum or copper conductors.

5. If a 4-terminal meter socket is supplied with a removable factory installed 5th terminal; the 5th terminal shall be removed by the customer / contractor.

6. Equipment listed for underground service lateral cable may be used for an overhead service provided that the socket is designed for field modification by having a removable cover plate at the top, and that an adequate water-tight hub of compatible design is properly installed into the socket.

7. U.L. listed meter sockets are rated in two categories:

   a. General Purpose-for intermittent duty at 100 percent rated current; continuous duty at 80 percent rated current.
   b. Continuous Duty-for continuous operation at 100 percent rated current. For specific applications, consult the catalog of the manufacturer.

8. All equipment must be adequately rated without cables being laced. (KU does not lace cables)

9. Although equipment may be listed on the following pages, it is the responsibility of the contractor to verify that the equipment is rated for the available short-circuit current of the service. The available short-circuit current is available from Kaukauna Electric.

10. 120-240 Volt single-phase to 200 Amp, overhead 100 to 200 Amp U.L. approved meter base. Use ringless style only, any mfg. Must have by-pass, lever preferred, horns accepted. Underground 200 Amp only- pedestal-must have by-pass, lever preferred, and horns accepted. Milbank U-3358-0-KK or equal. For duplex Milbank U-1783-0-KK or equal.

11. 120-240 Volt single-phase 201 to 400 Amp Class 320 Amp meter settings allowed only. Milbank U1748-0-WI or equal. For (2) 200 amp breaker type sockets Milbank U3849-2/200 or equal.

12. Network-120-208 2-phase to 200 Amp. Use 5 terminal ringless with lever by-pass only. Rated for 200 Amp. Any mfg. And U.L. approved. The 5th terminal must be mounted in the 9 o'clock position.

13. 120-208 Volt or 277-480 Volt three-phase, four wire-wye up to 200 Amp. On underground 200 Amp rated, a lever by-pass is required. Use Milbank Pedestal U-9107-0 or equal. For duplex use Milbank U-2732-XT or equal. For O.H. installations 200 Amp rated, a lever by-pass required. Use Milbank U-7421-RL/U-9700, Landis & Gyr HQ-7 Series or equal. Please see note #16 below.

14. For service above 200 Amp, refer to pages 13A, B & C for KU approved transockets/meter sockets.

15. Note: KU no longer allows the bolt-in style meter sockets. (i.e. the K7 & K4 styles).

16. KU, in general, installs metering on the side of the utility's padmount transformers for three-phase, single-customer, underground electric service. The customer (and/or their contractor) are responsible for the service lateral in these cases. Please contact the utility for more information on this type of service.

17. The concrete pad for three-phase padmount transformers is the responsibility of the customer and/or their contractor to install. Specifications for these units are on pages 15 and 16. Our Engineering Technician may be reached at (920) 462-0214 if you have any questions.

For service at 120-208 or 277-480 Volts
401 to 1600 Amps 3 phase 4 Wire Wye

APPLICATION CHART
KAUKAUNA UTILITIES

RJB or Erickson Transockets (see notes #16 & 17 on page 12)

WECT – Series	400	All voltages	3 4W			
CATALOG NO	AMPS	VOLTS	SERVICE	CABINET SIZE	CABINET DRAWING	BUS DRAWING
FOR OVERHEAD ENTRANCE – PRE APPROVAL REQUIRED						
KAU-604-13	600	600	3 4W	42 24 8	20104-06B	20104-818
KAU-804-13	800	60	3 4W	42 24 8	20104-02B	20104-821
APPROVED FOR UNDERGROUND ENTRANCE						
KAU-604-13UG	600	600	3 4W	42 24 8	20104-06B	20104-818
KAU-804-13UR	800	600	3 4W	48 46 12	20104-06B	20104838
KAU-1204-13UG	1200	600	3 4W	48 46 12	20104-06B	20104-833
KAU-1604-13UG	1600	600	3 4W	48 54 14	20104-10B	20104-855
WE 2004-13	2000	600	3 4W	66 42 14	20104-16A	20104-863

All Transockets include a single Duncan meter socket, Model HQ-13T **or Milbank UC 7449**.
With a superior 1058 **or Milbank test switch #TS 10-00016** – F Test Switch or equal. Test switch and meter socket are to be pre-wired.

Erickson Transockets
Milbank cat #UC 7445-RL – (meter socket) (see note # 16 on page 12)

FOR OVERHEAD ENTRANCE – PRE APPROVAL REQUIRED						
KAU-283-5	600/800		3 4W	24 48 8		
APPROVED FOR UNDERGROUND ENTRANCE						
KAU-283-5-USG	600		3 4W	49 48 11		
CUCT-84-KAU	800		3 4W	49 48 11		
CUCT-124-KAU	1200		3 4W	60 60 15		
CUCT-164-KAU	1600		3 4W	60 60 15		
CT204SG – WPS	2000		3	60 66.5 15		
WE – 1182-4	400	240 v 480 v	3			
WE – 1182-5	400	120/208 v 277/480 v	3			

-All Transockets include a single Duncan meter socket, Model HQ-13T.
With a superior 1058 – F Test Switch or equal. Test switch and meter socket are to be pre-wired.

Milbank test switches #TS10-0016

GROUNDING REQUIREMENTS

Due to increased use of non-metallic lines in water mains, laterals and water services, the utility shall require two driven grounding electrodes in all cases of new or updated electric services. The use of a water system, concrete reinforcing or metal structures shall not be considered sufficient in or of themselves.

1. Each grounding electrode shall be a minimum of eight feet in length. Separation of eight feet shall be required between electrodes.

2. For service up to 400 amps, electrodes shall be ½ inch copper clad steel or equal. For services of 401 amps or larger 5/8 inch copper clad steel or equal is required.

3. The grounding electrode conductor shall not be run through the meter socket or transocket.

4. The grounding electrode conductor shall be of a size to comply with the N.E.C. based on service conductor size.

5. Ground rods and grounding electrode conductors shall not be located in such a position as to interfere with underground service installation.

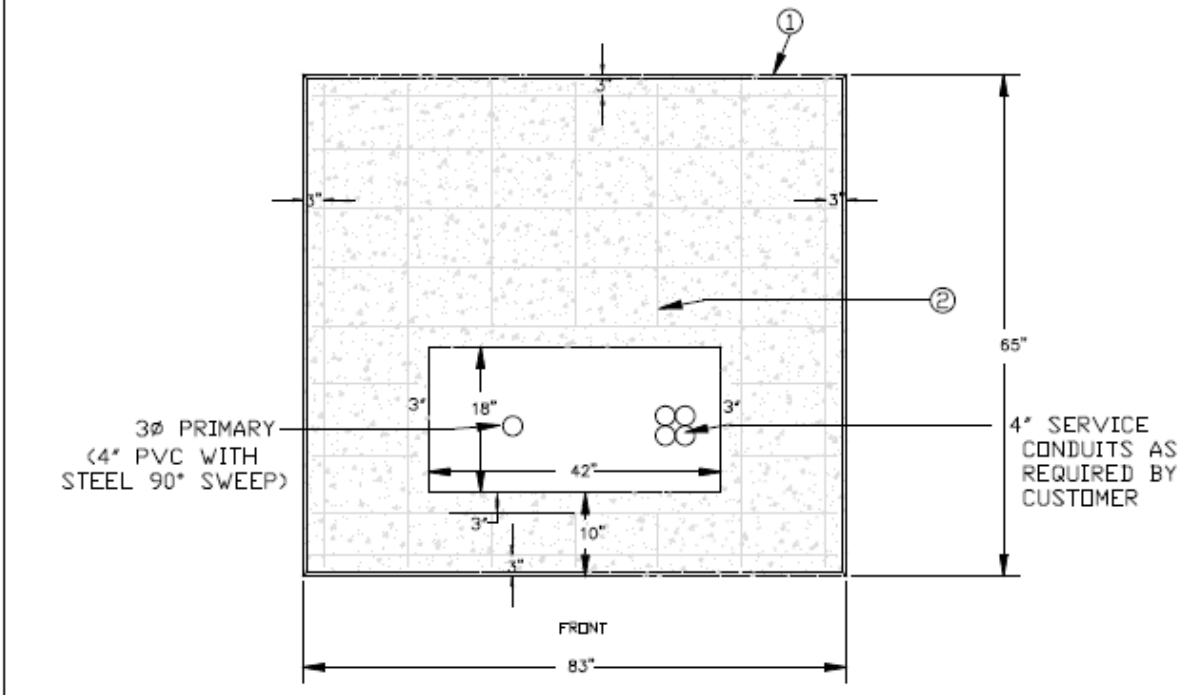
6. Stainless steel (A.I.S.I. 302, 304 or 416) ground rods are recommended where rods must be installed in the vicinity of buried galvanized rigid conduit to reduce the possibility of corrosion.

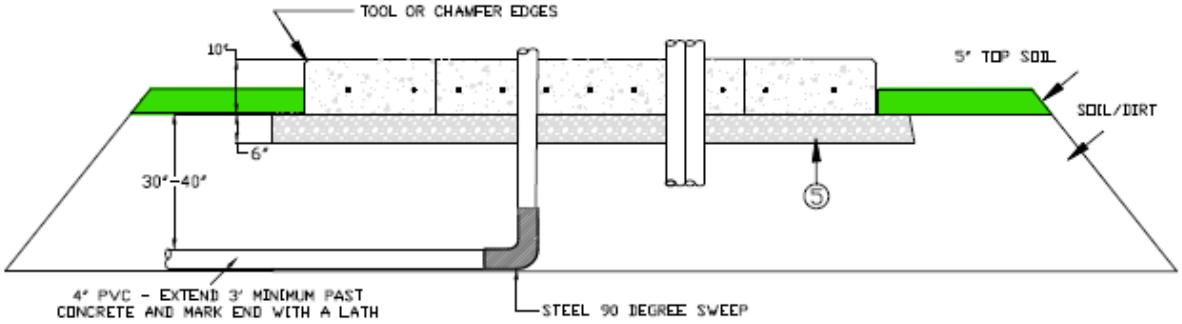
7. Grounding electrodes shall be installed in <u>undisturbed soil outside the drip line.</u>

8. 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. 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 250-81). Some municipal utilities require the water meter to also be jumpered. This bond must be sized per NEC Table 250-94. For 200 Amp services this is usually #4 copper. <u>NOTE</u> 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 250-95).

9. If any of the following are on the premises, they shall be 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. Grounding rings
    e. Communication grounding electrode
    f. CATV grounding electrode





NOTES:

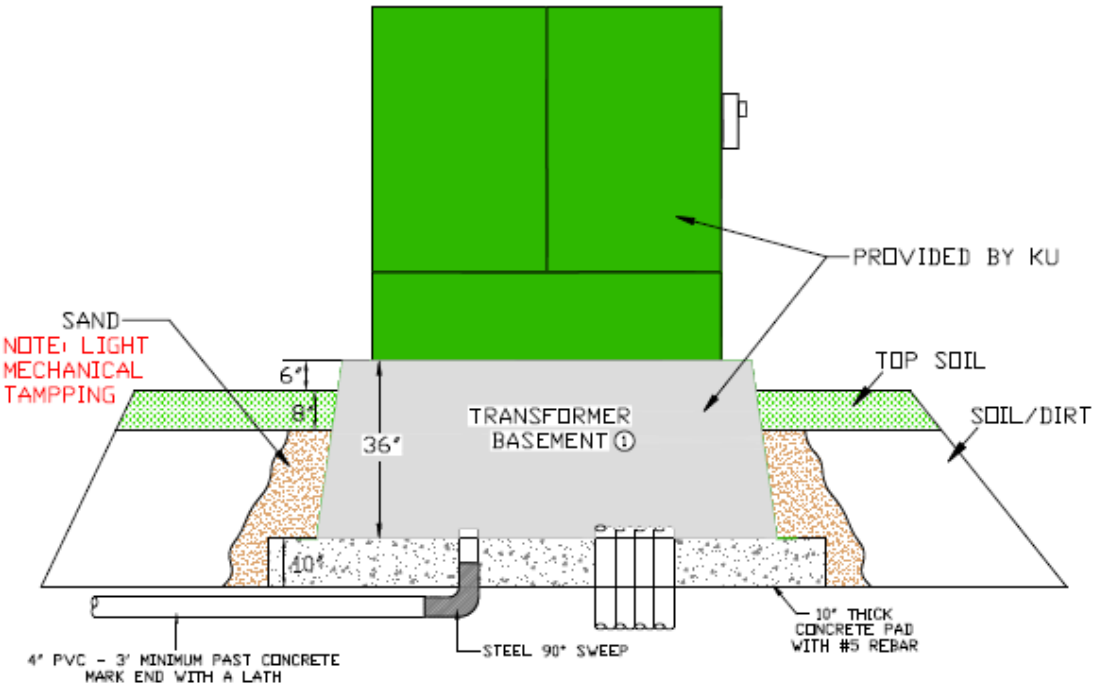
1. CONCRETE TESTING, 4000 POUNDS PER SQUARE INCH; 4% TO 6% ENTRAINED AIR, 3/4" MAXIMUM SIZE AGGREGATE.
2. REINFORCING STEEL, ATSM-A615 GRADE 60, PLACE APPROX. 12" O.C. EACH WAY AND SECURELY TIED TOGETHER.
3. MINIMUM CONCRETE COVER OVER REINFORCING STEEL 2 INCHES UNLESS NOTED.
4. WOOD FLOAT FINISH, LEAVING NO DEPRESSIONS.
5. USE 3/4" CLEAR GRAVEL UNDER CONCRETE PAD. 95% COMPACTION REQUIRED.
6. **MUST BE INSPECTED BY KU (920-766-5988) PRIOR TO BEING POURED.**

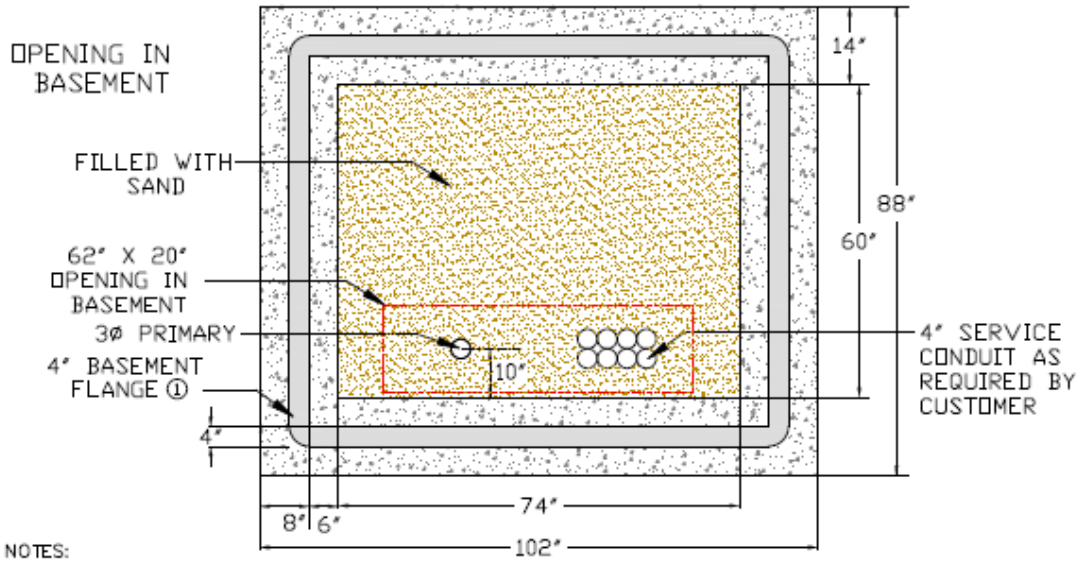
DWN BY		DATE		CHECKED	
NO	REVISION	BY	DATE	BY	DATE
1	MODIFIED TO KU STANDARD	MJB	04-17-18		
2	UPDATED KU STANDARD	DAP	01-08-21		

THREE PHASE
TRANSFORMER
CONCRETE PADS
FROM 45 TO 500kVA

KAUKAUNA UTILITIES
PHONE:920-766-5988

CONSTRUCTION UNIT NAME
UM1-6C





NOTES:

1. SEE DETAIL ON UM1-7Ca
2. **MUST BE INSPECTED BY KU (920-766-5988) PRIOR TO BEING POURED.**

DWN BY		DATE		CHECKED	
NO	REVISION	BY	DATE	BY	DATE
1	MODIFIED TO KU STANDARDS	MJB	04-18-18		

BASEMENT FOR TRANSFORMERS 750 KVA AND LARGER

KAUKAUNA UTILITIES
PHONE:920-766-5988

CONSTRUCTION UNIT NAME
UM1-7C

KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS

MINIMUM HEIGHT & CLEARANCE REQUIREMENTS FOR SERVICE DROPS NOT EXCEEDING 300 VOLTS

A. PUBLIC STREET, ROAD, ALLEY . . . . .18 FT
PUBLIC PARKING LOTS OPEN TO PUBLIC (SHOPPING CENTER) . . . . . .18 FT

B. SIDEWALK . . . . . .12 FT

C. FINISH GRADE . . . . . .12 FT

D. PRIVATE DRIVEWAY . . . . . .12 FT

E. ROOF (NOT READILY WALKED ON – PITCH EQUAL TO OR GREATER THAN 4 INCHES PER FOOT). . . . . 3 FT
ROOF (READILY WALKED ON – PITCH LESS THAN 4 INCHES PER FOOT) . . . . . 8 FT

F. WINDOWS...(ABOVE) . . . . . .SEE NOTE
BESIDE, BELOW AND IN FRONT. . . . . 3 FT

G. DOORS . . . . . 3 FT

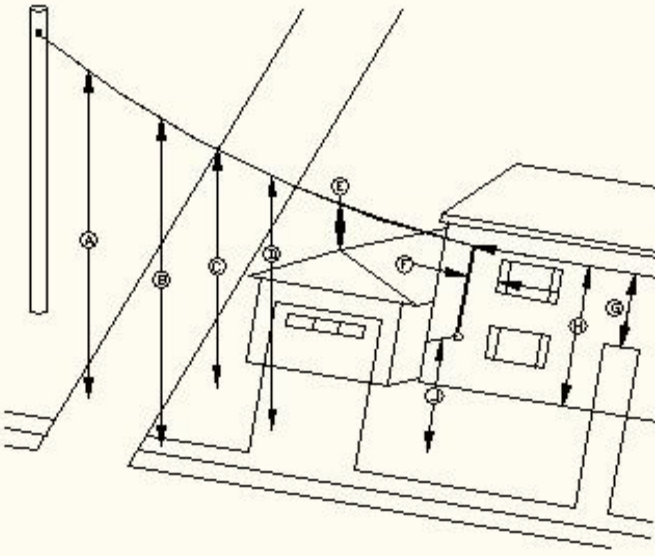
H. HEIGHT OF ATTACHMENT . . . . .(MIN. 12 FT) (MAX. 30 FT)
CUSTOMER'S SERVICE HEAD TO BE ABOVE SERVICE DROP. . .(MIN. 6 IN)

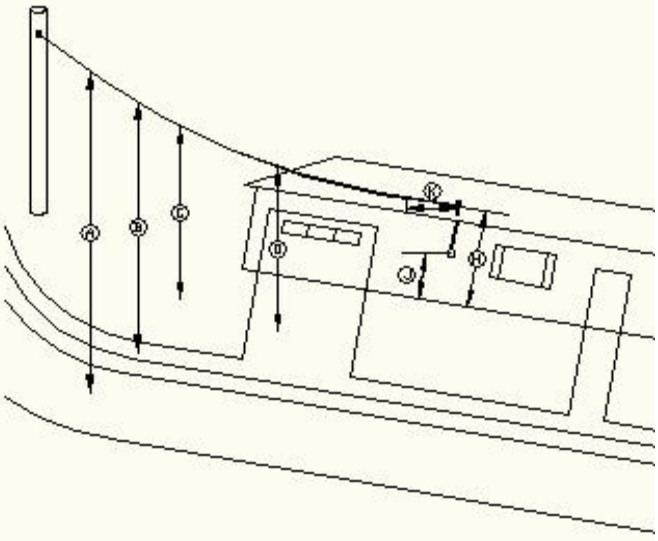
J. CENTER OF METER SOCKET TO FINISH GRADE . . . . . .(MIN. 3 FT) (MAX. 5 FT)

K. SERVICE ROOF CROSSING (If service clearance above roof less than 8'). . . (MAX. 4 FT)

NOTE: Above the top level of a window is considered out of reach from that window and where necessary may be installed less than 3' if all other requirements are met.

REFERENCE: N.E.C.
ARTICLES: 230-24(a & b)
230-26
230-9

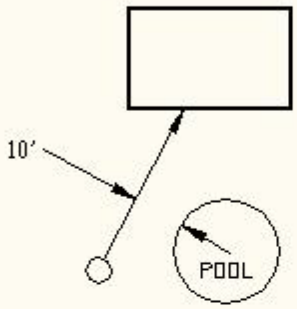




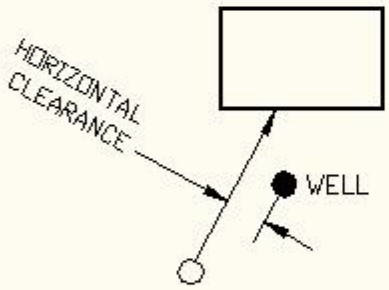
KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS

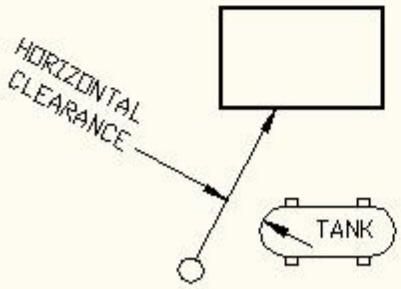
HORIZONTAL CLEARANCES FROM POOLS, WELLS, AND STORAGE TANKS



A horizontal clearance of at least 10 feet shall be maintained between service drops or other open overhead wiring and swimming pools, diving structures, observation stands, towers or platform.



A horizontal distance of at least 3/4 of the required vertical clearance of conductors to ground shall be maintained between open conductors and wells.



A horizontal clearance of at least 15 feet shall be maintained between above ground flammable liquid storage tanks and open conductors operating at more than 300 volts to ground. When voltages are 300 volts or less, a horizontal clearance of not less than 10 feet shall be maintained.

This requirement does not apply to LPG tanks with a capacity of 1000 gallons or less.

KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS

MAXIMUM HEIGHT ABOVE MAST SUPPORT FOR TRIPLEX ATTACHMENT TO UNGUYED SERVICE MAST

1. Galvanized Steel Mast	Service Drop Length	2" Conduit	2 1/2" Conduit	3" Conduit
#1/0 Aluminum Triplex (200 amp entrance)	30	3' 6"	6' 7"	8' 0"
	40	3' 4"	6' 2"	8' 0"
	50	3' 1"	6' 2"	8' 0"
	60	3' 3"	6' 2"	8' 0"
	70	3' 3"	5' 10"	8' 0"
	80	3' 0"	5' 9"	8' 0"
	90	2' 10"	5' 5"	8' 0"
	100	2' 9"	5' 3"	8' 0"
#2 Aluminum Triplex (100 amp entrance)	30	5' 8"	8' 0"	8' 0"
	40	5' 3"	8' 0"	8' 0"
	50	4' 10"	8' 0"	8' 0"
	60	5' 1"	8' 0"	8' 0"
	70	4' 11"	8' 0"	8' 0"
	80	4' 10"	8' 0"	8' 0"
	90	4' 6"	8' 0"	8' 0"
	100	4' 2"	7' 9"	8' 0"

2. Aluminum Mast	Service Drop Length	2" Conduit	2 1/2" Conduit	3" Conduit
#1/0 Aluminum Triplex (200 amp entrance)	30	*	2' 1"	3' 6"
	40	*	2' 0"	3' 4"
	50	*	1' 11"	3' 3"
	60	*	1' 11"	3' 3"
	70	*	1' 10"	3' 1"
	80	*	1' 10"	3' 0"
	90	*	1' 8"	2' 10"
	100	*	1' 8"	2' 9"
#2 Aluminum Triplex (100 amp entrance)	30	2' 3"	3' 4"	5' 8"
	40	2' 1"	3' 1"	5' 3"
	50	2' 0"	3' 0"	5' 1"
	60	1' 11"	2' 11"	4' 11"
	70	1' 11"	2' 10"	4' 10"
	80	1' 9"	2' 10"	4' 10"
	90	1' 9"	2' 7"	4' 6"
	100	1' 9"	2' 5"	4' 2"

* Conduit strength not adequate for 18" minimum height of service attachment above roof.

KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS

Service Drops, Attachments, Supports and Entrances

(1) All service drops are furnished and installed by the UTILITY.

(2) The customer shall ascertain the proper location of the service drop from the UTILITY which will furnish this information in writing upon request.

(3) In all cases, an adequate support attachment for the service drop shall be provided by the customer. (See Service Mast requirements) The UTILITY will, upon request, provide information as to the pounds of pull that the service drop support must withstand.

(4) Typical installations for various service voltages and ampere capacities are shown in succeeding pages. Unusual installations require special consideration and the UTILITY shall be consulted in such cases.

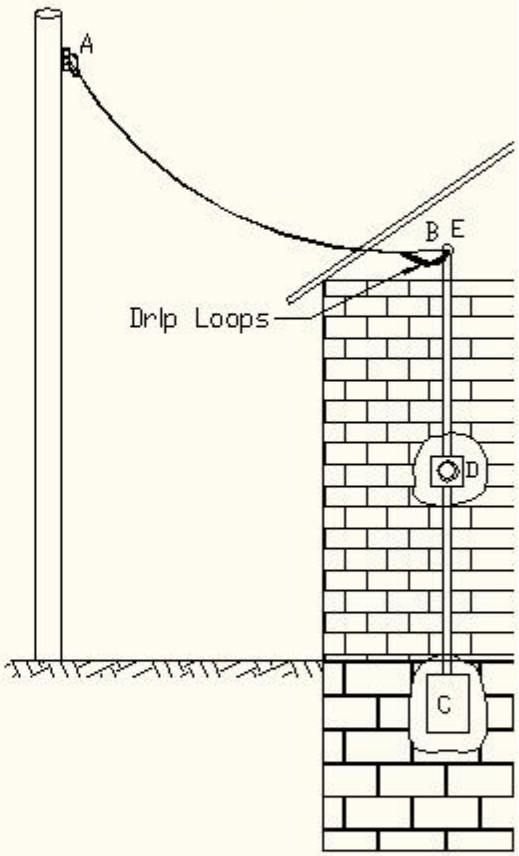
(5) Approved service entrance cable may be used where permitted by applicable code.

Grounding

(1) Grounding shall be in accordance with applicable codes (only minimum grounding requirements are illustrated herein).

(2) See page G-1 for grounding details

NAME OF PARTS OF AN OVERHEAD SERVICE



LEGEND

A-B - Service Drop
B-C - Service entrance facilities (conductors, raceway, meter sockets service equipment).
C - Service equipment
D - Outdoor meter socket Outdoor meter
E - Service head

KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS

INSTALLATION DETAILS FOR SERVICE MASTS NOT HAVING ROOF BLOCKING

1. Customer furnishes and installs the following equipment:

   1. Weather head

   2. Neoprene collar and heavy duty flash plate.

   3. Service mast

   4. Service entrance conductors. Service entrance conductors shall be extended at least 18 inches beyond the service head to permit proper connection to the UTILITY conductors.

   5. Galvanized steel ring bolts or pipe clamp brackets.

2. UTILITY furnishes and installs the following equipment:

   6. Service attachment

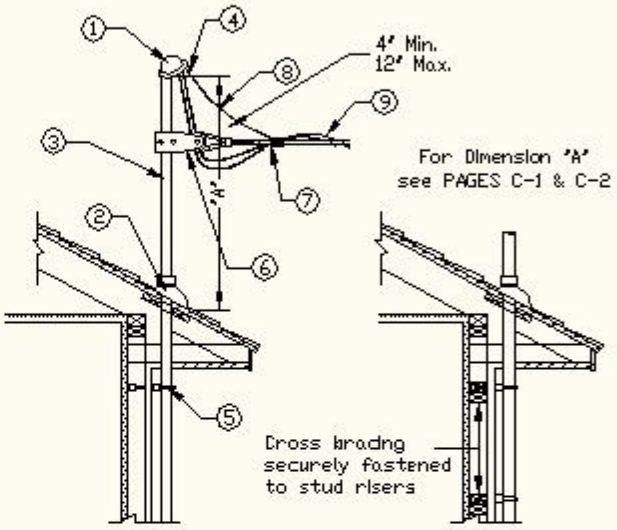
   7. Service deadend attachment (clamp type wireholder).

   8. Service connectors

   9. Service drop conductors

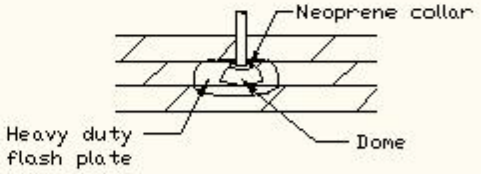
Notes:

That portion of service mast above uppermost pipe clamp bracket shall be a continuous length without couplings. See item 5 above.



FOR CONDUIT LOCATED OPPOSITE STUDDING

FOR CONDUIT LOCATED BETWEEN STUDDING



DETAIL OF FLASH PLATE SUPPORT

KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS

INSTALLATION DETAILS FOR SERVICE MASTS SUPPORTED BY BLOCKING BETWEEN RAFTERS

1. Customer furnishes and installs the following equipment:

   1. Service head.

   2. Service mast

   3. Neoprene collar and heavy duty flash plate.

   4. Service entrance conductors. Service entrance conductors shall be extended at least 18 inches beyond the service head to permit proper connection to the UTILITY conductors.

   5. Galvanized steel ring bolts or pipe clamp brackets.

   6. Wood blocking

2. UTILITY furnishes and installs the following equipment:

   7. Service attachment

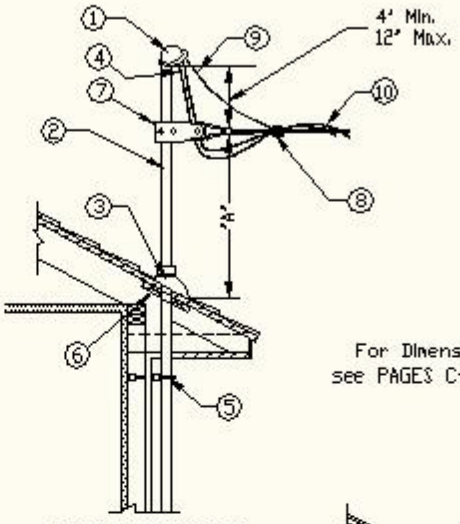
   8. Service deadend attachment (clamp type wireholder).

   9. Service connectors

   10. Service drop cable.

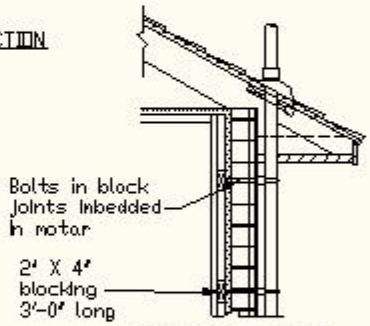
Notes:

That portion of service mast above uppermost pipe clamp bracket shall be a continuous length without couplings. See Item 5 above.

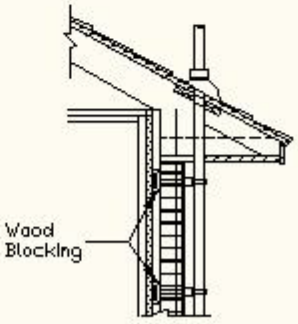


FRAME CONSTRUCTION

For Dimension "A" see PAGES C-1 & C-3



CONCRETE OR CINDER BLOCK CONSTRUCTION



BRICK VENEER CONSTRUCTION

KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS

INSTALLATION DETAILS FOR GUYED SERVICE MASTS

1. Customer furnishes and installs the following equipment:

   1. Service head.

   2. Service mast

   3. Service entrance conductors. Service entrance conductors shall be extended at least 18 inches beyond the service head to permit proper connection to the UTILITY conductors.

   4. Neoprene collar and heavy duty flash plate.

   5. Galvanized steel ring bolts or pipe clamp brackets.

   6. Galvanized guy wire and the necessary attachments when required (1/4" size, 3 or 7 strands).

2. UTILITY furnishes and installs the following equipment:

   7. Service attachment

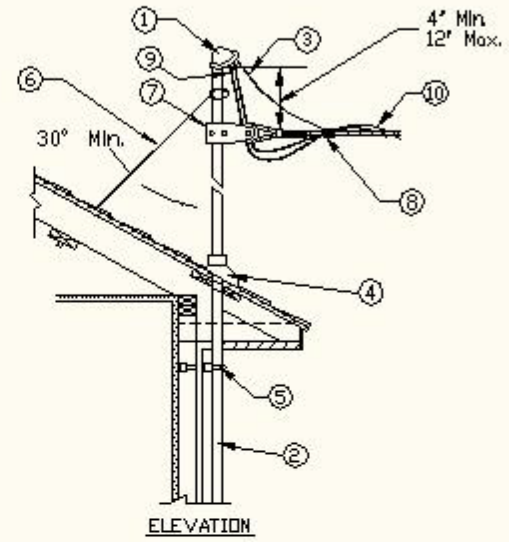
   8. Service deadend attachment (clamp type wireholder).

   9. Service connectors

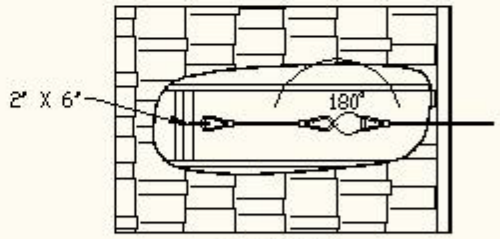
   10. Service drop cable.

Notes:

That portion of service mast above uppermost pipe clamp bracket shall be a continuous length without couplings. See Item 5 above.



ELEVATION



PLAN VIEW

SERVICE ENTRANCE SIZE	MAXIMUM SERVICE LENGTH
100 ANP	150 FEET
200 ANP	130 FEET

KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS

INSTALLATION DETAILS FOR SERVICE ATTACHMENT TO BUILDINGS WITH BRICK OR STONE VENEER (#2 AND #1/0 TRIPLEX ONLY) EXISTING BUILDINGS

1. Customer furnishes and installs the following equipment:

   1. Service head.

   2. Service entrance conduit.

   3. Service entrance conductors. Service entrance conductors shall be extended at least 18 inches beyond the service head to permit proper connection to the UTILITY conductors.

2. UTILITY furnishes and CUSTOMER installs the following equipment:

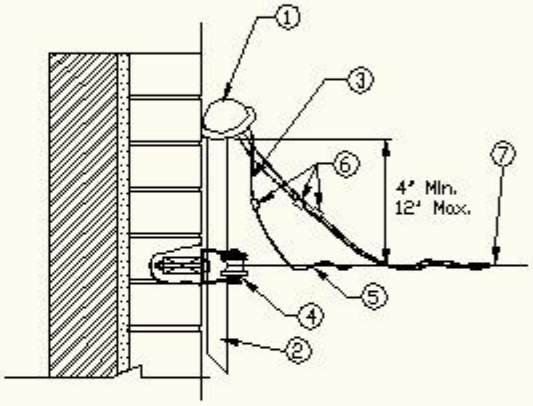
   4. Service attachment 1/2" expandable screw anchor with secondary insulated clevis.

3. UTILITY furnishes and installs the following equipment:

   5. Service drop cable deadend.

   6. Service connectors

   7. Service drop cable.



NOTE: This attachment to be used on existing brick or stone buildings only.

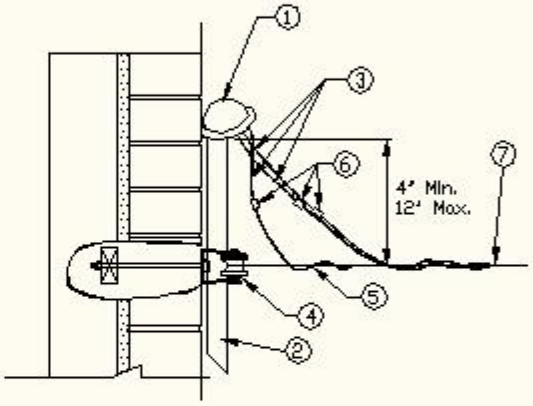
SERVICE ENTRANCE SIZE	MAXIMUM SERVICE LENGTH
100 AMP	150 FEET
200 AMP	150 FEET

KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS

INSTALLATION DETAILS FOR SERVICE ATTACHMENT TO BUILDINGS WITH BRICK OR STONE VENEER (#2 AND #1/0 TRIPLEX ONLY) NEW CONSTRUCTION

1. Customer furnishes and installs the following equipment:
   1. Service head.
   2. Service entrance conduit.
   3. Service entrance conductors. Service entrance conductors shall be extended at least 18 inches beyond the service head to permit proper connection to the UTILITY conductors.
2. UTILITY furnishes and CUSTOMER installs the following equipment:
   4. Service attachment 1/2" X 10" machine bolt with secondary insulated clevis.
3. UTILITY furnishes and installs the following equipment:
   5. Service drop cable deadend.
   6. Service connectors
   7. Service drop cable.



NOTE: This attachment to be used before brick or stone is installed

SERVICE ENTRANCE SIZE	MAXIMUM SERVICE LENGTH
100 AMP	150 FEET
200 AMP	150 FEET

KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS

INSTALLATION DETAILS FOR SERVICE ATTACHMENT TO BUILDINGS WITH NON-MASONRY SIDING

1. Customer furnishes and installs the following equipment:

   1. Service head.

   2. Service entrance conduit.

   3. Service entrance conductors. Service entrance conductors shall be extended at least 18 inches beyond the service head to permit proper connection to the UTILITY conductors.

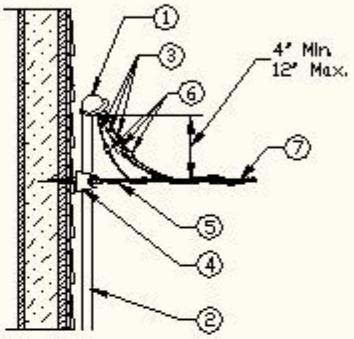
2. UTILITY furnishes and installs the following equipment:

   4. Service attachment (wireholder for wood siding). See Note 1.

   5. Service drop cable deadend.

   6. Service connectors

   7. Service drop cable.



SERVICE ENTRANCE SIZE	MAXIMUM SERVICE LENGTH
100 AMP	130 FEET
200 AMP	130 FEET

Note 1:
Contractor shall mark location of studs on outside of non-masonry siding

KAUKAUNA UTILITIES

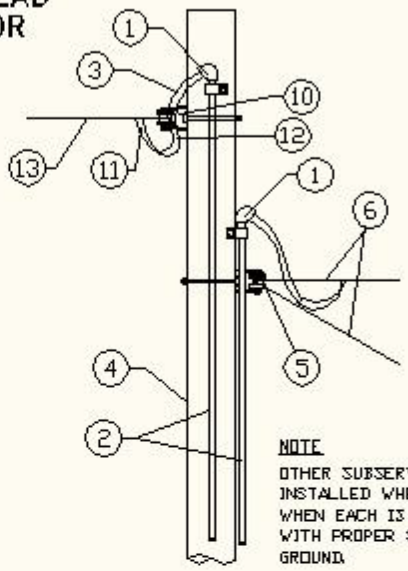
ELECTRIC SERVICE & METER SPECIFICATIONS

INSTALLATION DETAILS FOR SERVICE ENTRANCE ON PRIVATE POLE OR ATTACHMENT TO BUILDINGS – OVERHEAD
3 PHASE – 120–208 OR 277–480 OR
1 PHASE – 120–240 0–400 AMPS

CUSTOMER TO FURNISH AND INSTALL THE FOLLOWING EQUIPMENT:

1. WEATHER HEADS.
2. SERVICE ENTRANCE CONDUITS. SCH 40 SUNLIGHT RESISTANT OR BETTER, PROPERLY SIZED TO ACCOMMODATE CONDUCTORS.
3. SERVICE ENTRANCE CONDUCTORS. SERVICE ENTRANCE CONDUCTORS SHALL BE EXTENDED AT LEAST 18 INCHES BEYOND THE SERVICE HEAD.
4. TREATED WOOD POLE. (MINIMUN REQUIREMENTS CLASS 6, LENGTH 30 FEET, SETTING DEPTH 5' 6"). CUSTOMER SHALL CONSULT UTILITY FOR MINIMUM SETTING DEPTH FOR CLASS AND LENGTH OF POLE TO BE INSTALLED (SEE NOTE #1).
5. SUBSERVICE DEADEND ATTACHMENT.
6. SUBSERVICE CONDUCTORS (SEE NOTE #1).
7. METER SOCKET: (SEE NOTE #3)
8. GROUNDING (SEE PAGE G-1)
9. DISCONNECT – PROPERLY SIZED OVER CURRENT PROTECTION.

SHOWN FOR POLE ATTACHMENT, INDOOR FOR BUILDING ATTACHMENT PREFERRED.



NOTE
OTHER SUBSERVICES MAY BE INSTALLED WHERE NECESSARY WHEN EACH IS PROVIDED WITH PROPER SERVICE GROUND.

NOTE #1
IT MAY BE NECESSARY TO GUY THE METER POLE. CUSTOMER SHALL CONSULT THE UTILITY TO OBTAIN SUCH INFORMATION AS SERVICE DROP TENSION AND DIRECTION SO THAT HE CAN INSTALL ADEQUATE AND EFFECTIVE GUYING.

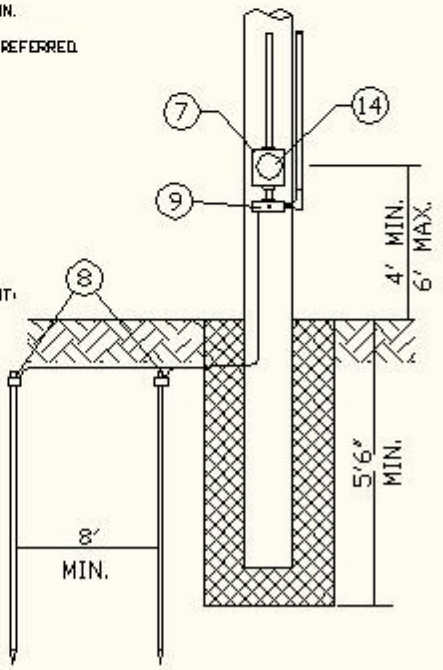
NOTE #2
REFER TO PAGES IL-2 THRU IL-7 FOR PROPER TYPE OF O.H. BUILDING ATTACHMENTS.

UTILITY FURNISHES AND INSTALLS THE FOLLOWING EQUIPMENT:

10. SERVICE DEADEND ATTACHMENT.
11. SERVICE DROP CABLE DEADEND.
12. SERVICE CONNECTORS.
13. SERVICE DROP CABLE.
14. METER.

NOTE #3
UTILITY APPROVED OUTDOOR METER SOCKET

NOTE #4
ALL PHASE, NEUTRAL AND EQUIPMENT GROUNDING CONDUCTORS, SHALL BE CARRIED BY THE CUSTOMER TO THE FIRST DISCONNECT ON LOAD SIDE OF METER.



N.T.S.

KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS

SERVICE TERMINATION AT OUTDOOR METER PEDESTAL DIRECT BURIED LATERAL
120/240 VOLT SINGLE PHASE
0-200 AMPERES

1. Customer furnishes and installs the following equipment:

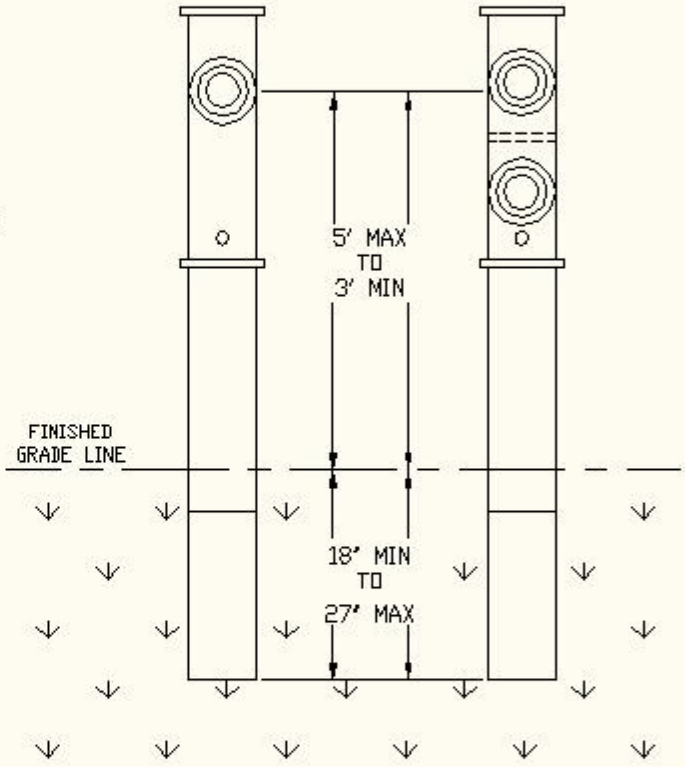
   1. Service Entrance Conductors

   2. Utility approved outdoor 200 ampere socket MILBANK U3358-O-KK or equal.

      For duplex, MILBANK U1783-O-KK or equal.

2. UTILITY furnishes and installs the following equipment:

   3. Service Lateral

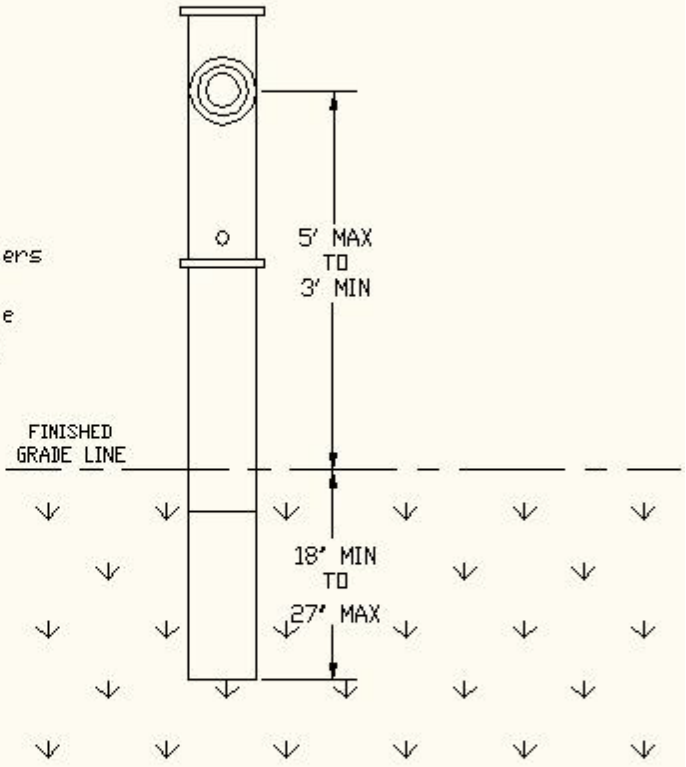


KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS

SERVICE TERMINATION AT OUTDOOR METER PEDESTAL DIRECT BURIED LATERAL
120/208 VOLT THREE PHASE
277/480
0-200 AMPERES

1. Customer furnishes and installs the following equipment:
   1. Service entrance conduit
   2. Service entrance conductors
   3. Grounding bushing and bonding jumpers
   4. Utility approved outdoor 200 ampere meter Ped. MILBANK U9107 or equal
2. UTILITY furnishes and installs the following equipment:
   5. Service Lateral

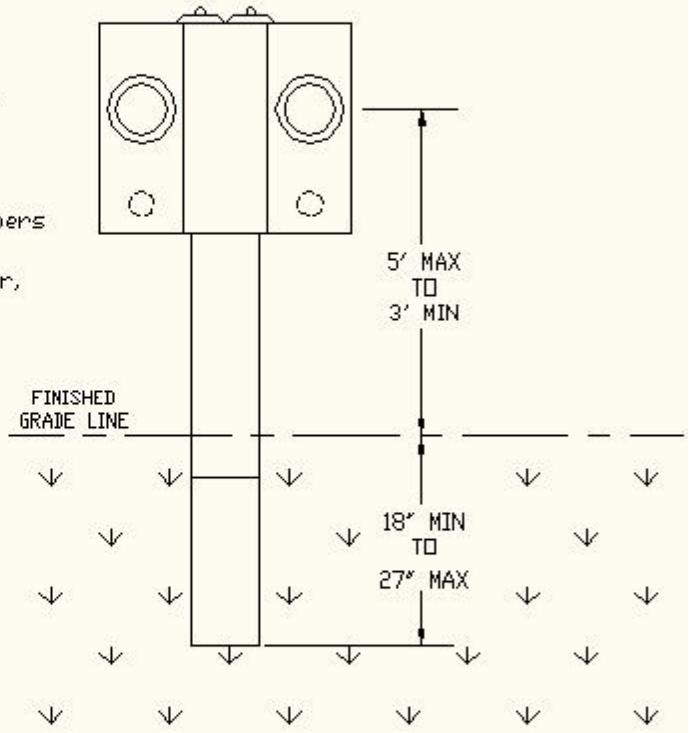


KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS

UNDERGROUND SERVICE TO MULTIPLE OCCUPANCY BUILDING TWO UNITS SERVED FROM ONE DIRECT BURIED LATERAL 120/208 OR 277/480 VOLT 0–200 AMPERES PER METER POSITION

1. Customer furnishes and installs the following equipment:
   1. Service entrance conduit or cable
   2. Service entrance conductors
   3. Grounding bushing and bonding jumpers
   4. Utility approved 7 terminal, outdoor, ganged meter pedestal. MILBANK U2732-XT-Ped or equal
2. UTILITY furnishes and installs the following equipment:
   5. Service lateral conductors

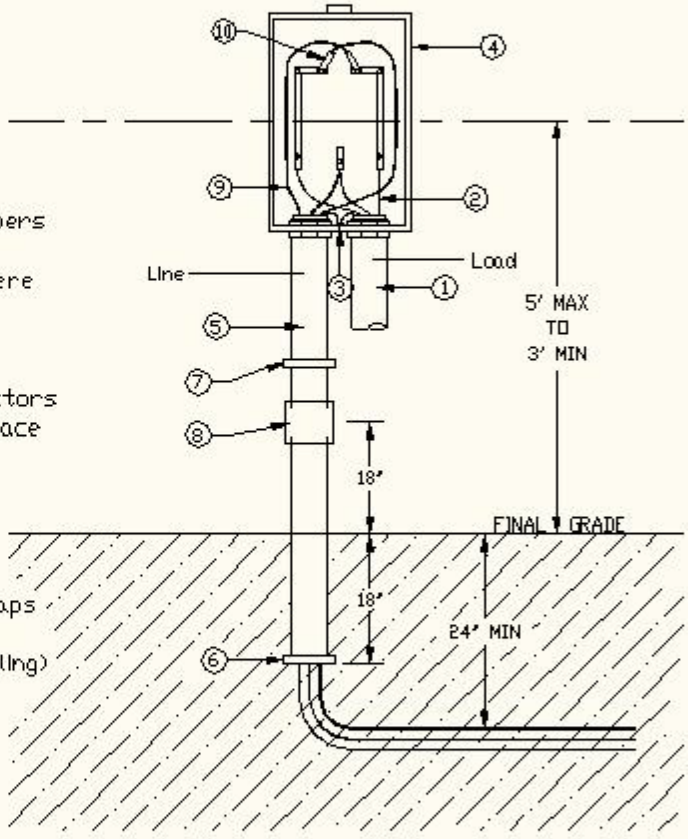


KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS

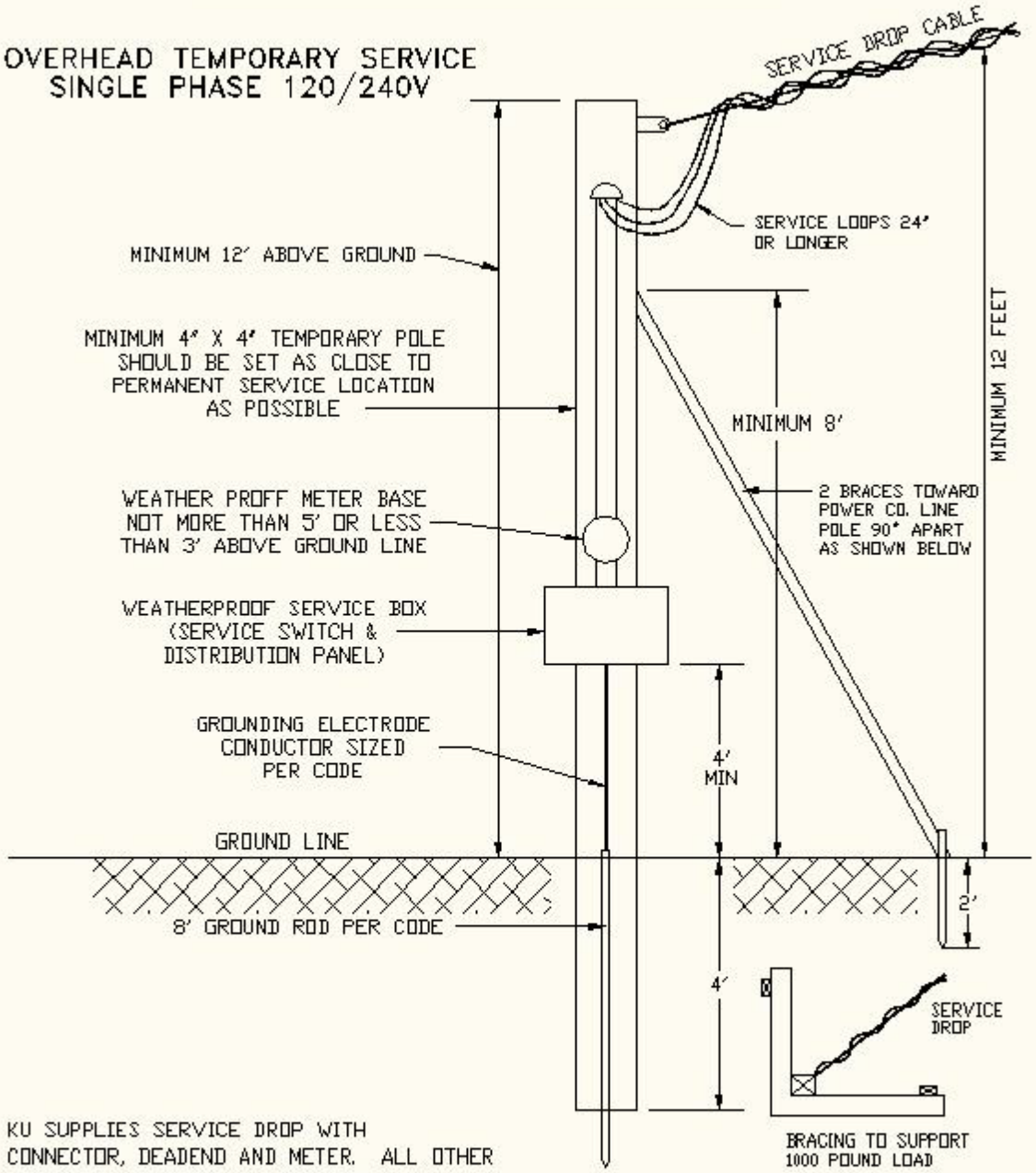
SERVICE TERMINATION AT OUTDOOR METER SOCKET DIRECT BURIAL LATERAL 201–400 AMPERES, 120/240V SINGLE PHASE 120/208 OR 277/480V THREE PHASE

1. Customer furnishes and installs the following equipment:
   1. Service entrance conduit
   2. Service entrance conductors
   3. Grounding bushing and bonding jumpers
   4. UTILITY approved outdoor 400 ampere meter socket
   5. Service lateral galvanized rigid conduit, properly sized for conductors Schedule 40 PVC may be used in place of galvanized steel
   6. Insulated conduit bushing
   7. Galvanized steel ring bolts or galvanized steel two hole pipe straps
   8. Coupling (Must be a threaded coupling)
2. UTILITY furnishes and installs the following equipment:
   9. Service lateral
   10. Service lateral conductors



KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS

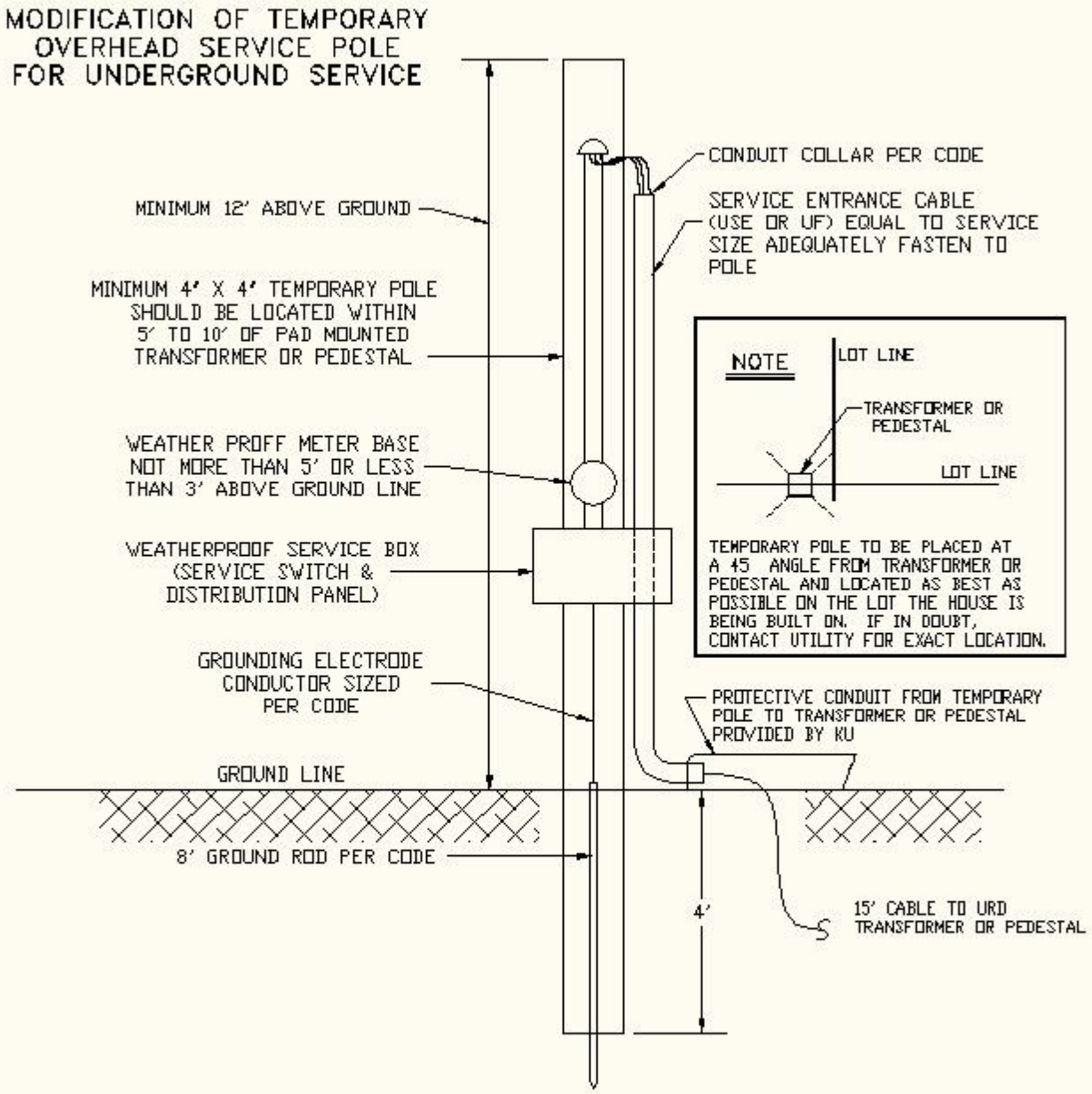


KU SUPPLIES SERVICE DROP WITH CONNECTOR, DEADEND AND METER. ALL OTHER EQUIPMENT SUPPLIED BY CUSTOMER.

IF A REQUEST FOR SERVICE IS MADE BEFORE THE TEMPORARY SERVICE IS NEEDED, THE COMPANY USUALLY WILL BE ABLE TO PROVIDE THE SERVICE WITHOUT DELAY PROVIDED PERMITS AND EASEMENTS FOR LINE CONSTRUCTION CAN BE OBTAINED. WHERE A LINE EXTENSION IS NECESSARY, A LONGER TIME MAY BE REQUIRED AND A REQUEST FOR SERVICE SHOULD BE MADE AS SOON AS POSSIBLE.

KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS



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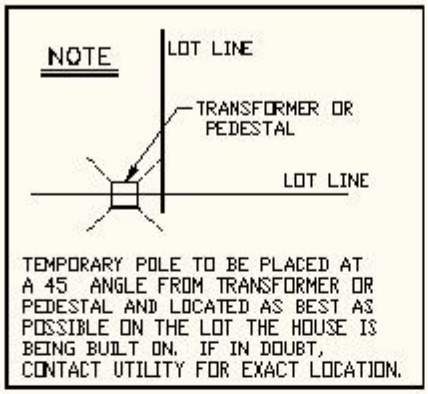
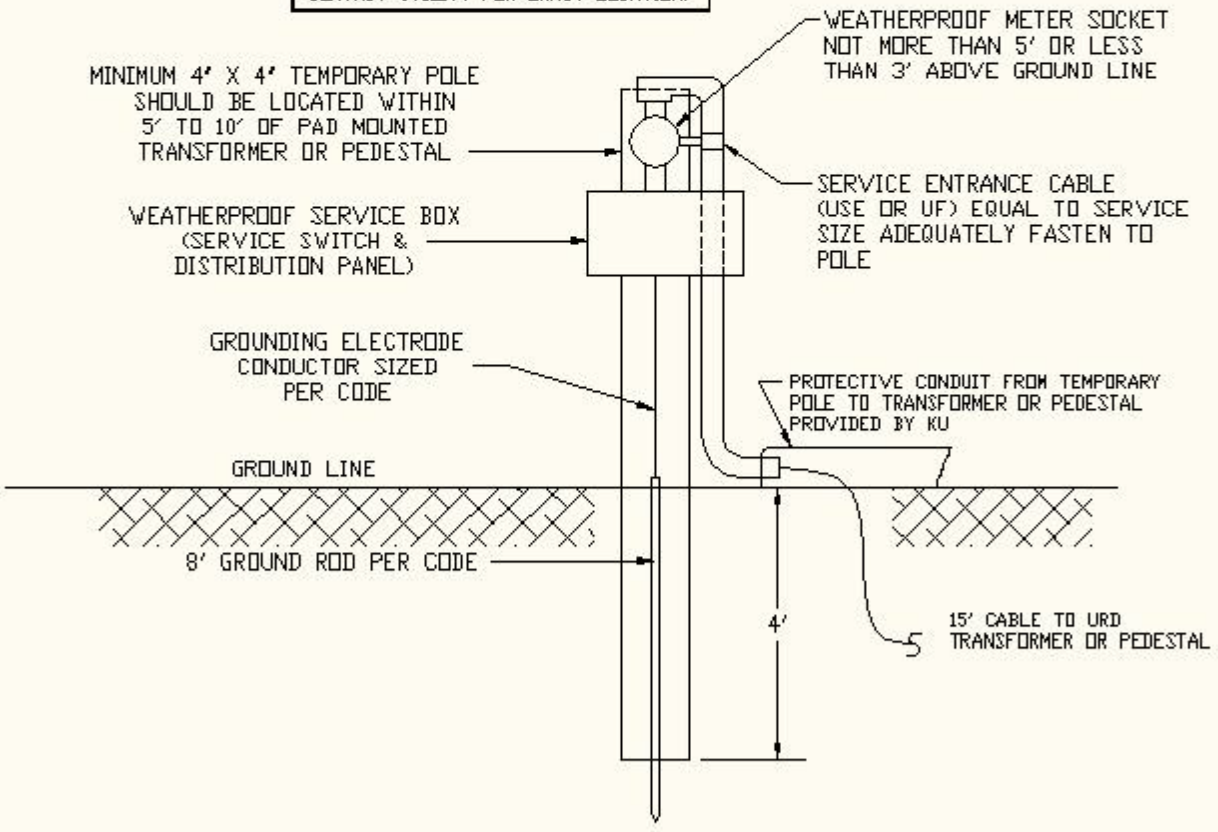
KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS

UNDERGROUND TEMPORARY SERVICE POLE





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KAUKAUNA UTILITIES

ELECTRIC SERVICE & METER SPECIFICATIONS

METER PEDESTAL WITH UNDERGROUND SERVICE LATERAL
1-PHASE, 3-WIRE, 120/240 VOLTS, 201-320 AMPERES
FOR RESIDENTIAL APPLICATIONS ONLY

1. Customer furnishes and installs:

   1. Company listed 4-terminal meter pedestal (see Note 4).

   2. Service entrance conduit and conductors (see Note 1).

   3. Bonding. Metallic conduit shall be bonded to the meter pedestal.

2. UTILITIES furnishes and installs:

   1. Service lateral.

   2. Watthour meter (not shown).

NOTES:

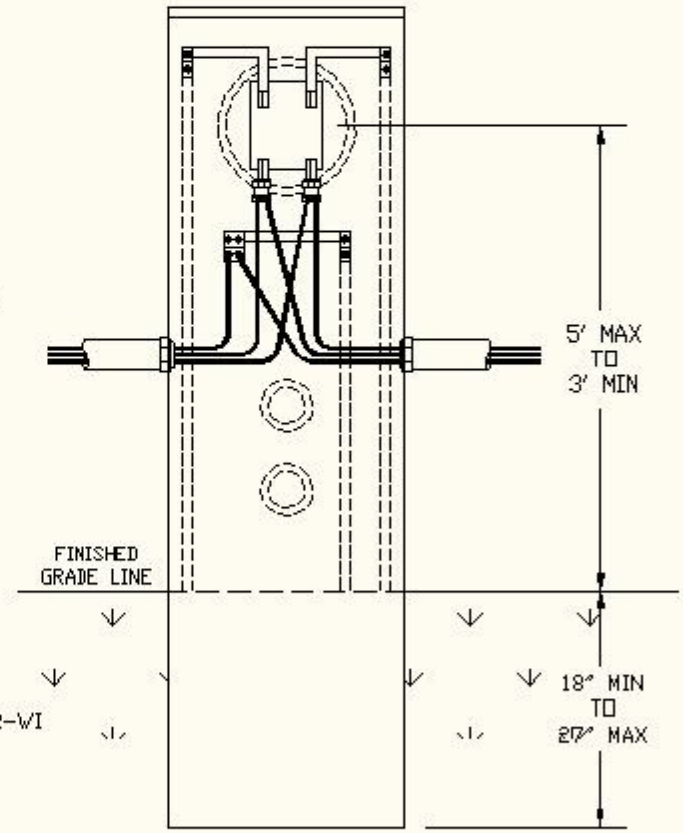
1. Service entrance conductors are allowed to leave as two circuits and must exit the pedestal below the lowest live part and above grade.

2. This equipment is rated at 320 Amperes for continuous duty, which must not be exceeded.

3. If overhead service is desired contact utility representative for approval.

4. U.G. Pedestals: Milbank U1748-O-WI
   Thomas & Betts MP-44342-WI
   Landis & Gyr 47604-9WI

   O.H: Landis & Gyr HQ4D
   Milbank U1079-R



MUNICIPALITY	NAME	TITLE	PHONE
Buchanan, Town of	Paul Hermes	Building Inspector	920-687-0476 Office/Fax 920-858-0102 Cell
Combined Locks, Village of	Paul Hermes	Building Inspector	920-687-0426 Office/Fax 920-858-0102 Cell
Freedom, Town of	Paul Hermes	Building Inspector	920-687-0426 Office/Fax 920-858-0102 Cell
Kaukauna, City of	City Inspections Department	Building Inspector	920-766-6325
Kaukauna, Town of	Tom Smith	Building Inspector	920-655-1735
Little Chute, Village of	Brett Jensen	Building Inspector	920-423-3871
Oneida, Town of	Paul Hermes	Building Inspector	920-687-0426 Office/Fax 920-858-0102 Cell
Vandenbroek, Town of	Paul Hermes	Building Inspector	920-687-0426 Office/Fax 920-858-0102 Cell
Wrightstown, Village of	Paul Birschbach	Building Inspector	920-428-3865

ELECTRIC RULES

117 MOTORS AND MOTOR CONTROL

In order to prevent impairment of service to other customers, it is necessary to establish limits for the allowable starting currents for motors. Before selecting motor equipment, the customer should consult the utility to determine the specific voltages available at any location.

When a motor is used to drive equipment that requires varying torque during each cycle of operation, such as a compressor or reciprocating pump, the combined installation should have enough momentum in its moving parts so that its operation will not interfere unduly with service to other customers.

(1.) Types of motor service available on general service lighting rates, single-phase only are as follows:

a. Single-phase fractional horsepower motors: Automatically controlled and frequently started, whose locked rotor currents do not exceed 23 amperes may be connected to 120-volt circuits.

b. Single-phase motors, one horsepower or less: Manually controlled or infrequently started, whose locked rotor currents do not exceed 50 amperes may be connected to 120-volt circuits. No single-phase motor larger than 1 horsepower shall be operated on a 120-volt circuit.

c. Infrequently started single-phase motors of 10 horsepower or less may be connected to 240-volt other circuits if their locked rotor currents do not exceed the values shown in the next section describing motor service available on power rates.

d. In urban areas infrequently started three-phase motors of 10 horsepower or less; connected through single-phase to three-phase converters may be used on other circuits.

e. Single-phase motors above 10 horsepower are not permitted in rural areas.

ELECTRIC RULES

117 MOTORS AND MOTOR CONTROL (continued)

(2.) Types of motor service available on power rates and combined light and power rates, single-phase and three-phase are as follows:

a. Motors with long periods of continuous operation under maximum load conditions and having not more than four starts per hour may be connected if their locked rotor currents do not exceed those listed in the following table. Consult the utility where these conditions cannot be met, or where equipment ratings and/or starting characteristics exceed the values in the table below:

Motor Starting Table

Motors Rated	Total Locked Rotor Current Not to Exceed
120 Volts, Single-Phase	50 Amperes
240 volts, Single-Phase 2 Horsepower or Less	60 Amperes
2 to 6.5 Horsepower	60 Amperes Plus 20 Amperes Per Horsepower in Excess of 2 Horsepower
6.5 to 15 Horsepower	150 Amperes Plus 10 Amperes Per Horsepower in Excess of 6.5 Horsepower
240 Volts, Three-Phase 2 Horsepower or Less	50 Amperes
2 to 19.9 Horsepower	50 Amperes Plus 14 Amperes Per Horsepower in Excess of 2 Horsepower
20 to 40 Horsepower	300 Amperes Plus 4 Amperes Per Horsepower in Excess of 20 Horsepower
50 Horsepower and Over	8 Amperes Per Horsepower

ELECTRIC RULES

117 MOTORS AND MOTOR CONTROL (continued)

b. Motors above 10 horsepower rating are to be three-phase.

c. New installation of motors of 50 horsepower or larger should be approved by the utility as to motor type, starting and protective equipment, and as to availability of an adequate power supply at the proposed location.

d. Motors subject to frequent starts, such as elevator and hoist motors, when connected to the secondary distribution system, should have their starting current limited to 100 amperes.

e. For motors of higher voltage rating than shown in the motor starting table, the allowable currents are inversely proportional to the voltages.

118 MISCELLANEIOUS EQUIPMENT

X-ray equipment operated on lighting or combined lighting and power services shall have input currents not exceeding 24 amperes without specific approval of the utility.

All other equipment not specifically provided for in this section will be subject to approval of the utility on the basis of starting currents specified herein for motors with the same frequency of starting. Customers are advised to consult the utility before connecting any such apparatus.

119 PRIVATE POWER PLANTS

No generator may be electrically connected to the utility's lines or equipment without the written consent of the utility and with adequate physical arrangements to prevent hazard to life and damage to utility property.