



**New 1997 Materials
for Your
Electrical Contractors' Handbook**

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1 GENERAL INFORMATION

1.1 Introduction

This Madison Gas and Electric Company (MGE) Electrical Contractors' Handbook gives contractors, architects, engineers, and customers answers to common questions about residential, commercial, and industrial electrical installations and hookups.

Any rules or regulations conform with and supplement local, municipal, and State of Wisconsin electrical codes.

For a complete legal and definitive description of all procedures, regulations, and responsibilities, refer to the Madison Gas and Electric Company Rates and Service Rules Manual available from MGE and on file with the Public Service Commission of Wisconsin (PSCW).

1.2 Definitions

1.2.1 *Service Drop* refers to the overhead conductors between the distribution pole and the point of attachment at the applicant's service entrance facility. A service drop is normally located on the customer's property and is of secondary voltage.

1.2.2 *Service Lateral* is the underground wire between the distribution system, including any risers on a pole or other structure, and the customer's service entrance facility. The service lateral is normally located on the customer's property and is of secondary voltage.

1.2.3 *Distribution System* includes all primary lines, secondary lines, transformers, and control equipment necessary to provide points of connection with service drops or service laterals. Though located on customer property, transformers and associated equipment are part of MGE's distribution system.

Normally, the distribution system is located within an electric utility easement on private property or on public streets, alleys, and roads so that it may be extended to other applicants. Property owners grant easements without cost to MGE.

1.2.4. *Transmission System* includes all overhead lines, underground lines, and transformers operating at or above 69,000 volts line-to-line or 39,800 volts line-to-ground. In addition, it includes all control equipment used to operate these facilities.

1.3 Determine Location of Electric Facilities in Area of Proposed Work.

Prior to performing any excavation, grading, blasting, construction, erection, or demolition work within MGE's service territory in Dane, Iowa, and Columbia Counties, call Diggers Hotline at 1-800-242-8511 to obtain the location of our facilities and other participating utility facilities. We will provide facility location prints and field locating services promptly.

1.3 (Continued)

It is necessary for you to place the request 72 hours (three working days) in advance of nonemergency excavation as required by Section 182.0175 of the Wisconsin Statutes. Make an additional request for location of facilities when the project is delayed or interrupted for ten or more work days or when changes are made in the proposed construction.

You, as the contractor, are responsible for maintaining the stakes and markings placed by our locating personnel that mark the location of our existing facilities. If the markings are inadvertently destroyed or additional work is to be performed which requires restaking of your project area, call 1-800-242-8511.

Note: Make all requests for location of utility facilities through Diggers Hotline at 1-800-242-8511. For questions regarding existing MGE underground facilities, call (608) 252-7195.

When emergency excavation is necessary, call Diggers Hotline during normal working hours. Emergency calls outside of normal working hours should go to (608) 252-7111. MGE locating personnel will respond promptly and field locate our facilities for you.

An emergency location is defined as an underground locate request where excavating or demolition must begin prior to the standard three business days. An emergency exists only when one or more of the following conditions exists:

- a. The unforeseen excavation which, if not performed, could result in the loss of life or limb.

1.3 (Continued)

- b. The excavation is required to repair a service outage.
- c. Excavation is required prior to three business days in order to prevent property damage.
- d. An unstable condition exists which may result in any of the conditions listed above (for example, a leak in any service main or a fault in a primary or secondary wire and/or cable).

When calling in an emergency excavation, inform the operator that an emergency situation exists and be prepared to explain which of the above conditions is in effect. The operator will prepare the ticket for immediate transmission and issue a start date equal to the time the excavation is scheduled to commence.

1.3.1 Placement of Facilities Adjacent to Electric Distribution

Facilities being installed to cross existing underground electric distribution wires and/or conduit (operating at less than 39,800 volts to ground) at or near an angle of 90° must maintain a minimum clearance of six inches. Contact MGE Engineering for review of the circumstances involved in all of these installations.

1.3.1 (Continued)

Facilities that are to be installed parallel or nearly parallel to existing underground electric distribution wires and/or conduit must provide a minimum of 12 inches of horizontal clearance. Unless it is planned to shore the ditch, increase horizontal clearance 12 inches for each 12 inches of depth of ditch below the level of the existing facilities.

Contact MGE Engineering for review of the circumstances involved in all of these installations.

Above-ground appurtenances, poles, buildings, etc., placed adjacent to overhead electric facilities must conform to the clearances specified in the Wisconsin Administrative Code which has adopted the National Electric Safety Code and the National Electric Code. If you have any question as to the clearance required, please call MGE Engineering.

If you are engineering a project or planning to bid on a project that may jeopardize existing MGE electric facilities, please call us for assistance in providing relocation costs or coordination of work activities at 1-608-252-5644. Our clerk will answer your call and direct you to an appropriate engineer.

1.3.2 Placement of Facilities Adjacent to Electric Transmission

Facilities being installed to cross existing underground electric transmission facilities (operating at 39,800 or more volts to ground) must maintain an 18-inch minimum clearance. Contact MGE Engineering for review of the circumstances involved in all of these installations.

Facilities that are going to be installed parallel or nearly parallel to existing underground electric transmission cables or conduit must maintain a minimum horizontal clearance of 18 inches. Unless it is planned to shore the ditch, increase horizontal clearance 12 inches for each 12 inches of depth of the ditch below the level of the transmission line.

Above-ground appurtenances, poles, buildings, etc., placed adjacent to overhead electric facilities must conform to the clearances specified in the Wisconsin Administrative Code which has adopted the National Electric Safety Code and the National Electric Code. If you have any question as to the clearance required, please call MGE Engineering.

If you are engineering a project or planning to bid on a project that may jeopardize existing MGE electric transmission facilities, please call us for assistance in providing relocation costs or coordination of work activities at 1-608-252-5644.

1.3.3 Excavation Near Underground Electric Facilities

After the location of all underground electric facilities has been determined, make sure that all machine operators, foremen, and supervisors on the project are aware of their location. Do not forget new people on the job. They will not know the facilities are there unless you tell them.

Excavations crossing or adjacent to electric facilities must conform with all applicable federal, state, and local codes and ordinances.

Use caution when excavating near underground electric facilities to ensure that no damage is inflicted to the cable jacketing or concentric neutral wires. Do not use poured concrete within 18 inches of underground electric cables due to the deterioration that it causes to the insulation medium on the cables. This deterioration is not immediate but occurs over time. The length of time to cable failure depends on many factors, including strength of concrete, water table, and other environmental conditions.

Do not use any power-operated excavating or earth-moving equipment within 18 inches of the underground facility and the cutting edge of the tool. This is covered by Section 182.0175 of the Wisconsin Statutes. If you are within 18 inches of the underground facility, it will be necessary to hand dig around it to prevent damage.

- R Shoring, sloping, and/or some equivalent means meeting OSHA requirements must be used to prevent caving or movement of ditch banks adjacent to underground electric facilities.

1.3.3 (Continued)

Provide proper supports when excavating near or under electric facilities. These supports are not to damage the facilities they are supporting. If you are uncertain as to what is required, please call MGE Engineering.

Do not attempt to bore past an underground electric facility without adequately determining that sufficient clearance exists. It is recommended that facilities be exposed as necessary to prevent damage. Note: Even a simple underground electric service is capable of causing severe injury and/or death if handled improperly.

On all excavations adjacent to MGE underground electric transmission facilities, an MGE representative is to be present. Please call 1-608-252-7188 to coordinate this inspection work.

1.3.4 Construction Near Overhead Electric Facilities

After the location of overhead electric facilities has been determined, make sure all machine operators, foremen, and supervisors on the project are aware of their location. Do not consider any overhead wire to be insulated. Do not park tall equipment under lines.

Any time you leave the traveled portion of a road, you must consider that the overhead line clearance may not be sufficient for your tall equipment. Even household 120/240-volt service is sufficient to cause severe injury and/or death if not handled properly.

1.3.4 (Continued)

When using boom trucks, cranes, or other tall equipment near overhead electric facilities, you must maintain a minimum clearance of ten feet. This is an OSHA requirement. In addition, we recommend that you contact our Construction Department if you are closer than 20 feet to the overhead conductors with a crane. At our option, we may have personnel on the site to provide guidance for safety purposes.

When excavating is to be performed adjacent to overhead poles and/or structures, leave a minimum of two feet of ground at the ground line of the pole along with a one-to-one slope from that point to the new grade level. Other arrangements can be made by contacting our Engineering Department.

If you believe any structure, permanent or temporary, will be in conflict or close proximity to overhead conductors or a service drop, please contact our Engineering Department.

1.3.5 Blasting Near Any Electric Facility

Do not perform blasting operations in the vicinity of any MGE facilities until we have been notified and measures, satisfactory to us, for safe control of the blasting and protection of all MGE facilities have been taken. Such measures will include preplanned emergency procedures.

1.3.5 (Continued)

When blasting operations are performed, they shall be done only by a licensed blaster and strictly in accordance with all local, state, and federal codes and regulations. Liability for any damage remains the responsibility of the party performing the blasting.

1.3.6 Backfilling in the Area Near Underground Electric Facilities

Report any scrapes, cuts, abrasions, or broken underground cables and/or conduit that have occurred while the facilities are exposed. Call MGE at 1-608-252-7111 to report any damage and to have the underground facilities inspected prior to backfilling. We will inspect and make necessary repairs as warranted.

Where excavation removes the original ground under concrete conduit and manhole systems, backfill the area below this facility with pit run or washed sand compacted mechanically in six-inch lifts to provide the same or better support than was there prior to the excavation.

Replace the sand where excavation removes the original thermal sand from around underground transmission facilities. Our personnel on the site will make the determination on whether the backfill is appropriate.

Compact the backfill above the facilities by mechanical compaction in accordance with our specifications.

1.3.7 Grading and Landscaping Work

When grading or landscaping work is planned that would involve the lowering of existing grades, determine the depth of the underground facilities in the area by hand excavation under MGE guidance before the work commences. Lowering of underground electric facilities due to grade changes is at the cost of the party changing the grade.

1.4 Certificate of Inspection Required Before Connection

We require a Certificate of Inspection from the authorized electrical inspector of the appropriate town, village, or city before connecting new or modified services.

If the area or facility is not required by law to have an authorized electrical inspector, we will accept, in lieu of the Certificate of Inspection, a signed and notarized affidavit from the electrical contractor that certifies the wiring conforms to the Wisconsin State Electrical Code.

1.5 Before Applying for Service Connections

Service connections and extensions are made in accordance with filed rules and regulations. However, we recommend that before you apply for service or prepare wiring plans you give attention to the following:

- 1.5.1 Contact MGE's Electric Distribution Engineering Department as soon as you begin planning for your facility.

1.5.2 Applications

Make the service application as far as possible in advance of the date service is required. You may apply for service at MGE's General Office Facility.

Provide the date your service is required.

Completely identify property location, including name and address, lot and block number, and provide site plans when possible.

For commercial and industrial buildings, we need the architect's and engineer's names and telephone numbers, the type of building, and the planned load.

In areas not served by municipal sewer and water, include a copy of septic and water system prints.

1.5.3 Voltages

Check with us about the availability of 120/208-volt or 277/480-volt three-phase, four-wire service.

Check the low-voltage network map (see **Figure NET-1**) to determine if you are served by the underground low-voltage network system that covers the downtown Madison area.
(See **Section 7**.)

1.5.4 Underground Service

Check or inquire about primary or secondary services.

1.5.4 (Continued)

Review Section 19.16 of the Madison General Ordinances entitled "Underground Utility Entrance Facilities" concerning underground entrance requirements.

1.5.5 Metering

Is a transformer-rated meter socket required?

1.5.6 Underground Vaults in the Network Area

Customers with present or prospective loads of 75 kW or more must provide transformer vaults approved by MGE and meet all applicable specifications and governmental codes.
(See **Section 7.**)

1.5.7 New Residential or Commercial Developments

Check municipal streetlighting requirements for new plats.

2 CHARACTER OF SERVICE

MGE distributes electric current to residential, commercial, and network customers as follows:

2.1 Residential, Commercial, and Network

Transformers supplied by MGE are typically available at 120/240 and 120/208 volts (residential), 120/208 (low-voltage network) and 277/480 (spot network), and all of the above for commercial applications. Transformers are standard ratio and standard impedance single- and three-phase oil-cooled types only.

2.2 Residential and Commercial

- 2.2.1 Single-phase, 60-cycle alternating current is available at 120/240 volts or, in special circumstances, 120/208 volts over a three-wire service.
- 2.2.2 Customers outside the low-voltage network system who provide us with acceptable space for transformer installations may obtain three-phase 120/208 volts or 277/480 volts over a four-wire service subject to the following minimum 15-minute demand: 120/208 volts, 75 kW; 277/480 volts, 300 kW.

2.3 Commercial Only

- 2.3.1 Three-phase, 60-cycle alternating current is available at 240-volts delta over a three-wire service except in the low-voltage network system. An equipment ground wire is grounded on the supply side of the service disconnect and carried through the service entrance conduit to the weatherhead where we connect it to the distribution system's ground wire.

This equipment ground wire is a reduced-size wire and not a load-current-carrying wire. No load circuits or equipment of any type can be connected to it.

- 2.3.2 Three-phase, 60-cycle alternating current may be supplied at 2,400/4,160 volts for large power installations over a four-wire service. This service is available at limited locations and at our discretion (minimum 15-minute demand of 200 kW).



2.3.3 Three-phase, 60-cycle alternating current at 13,800 volts over a three-wire service is available at limited locations and at our discretion (minimum 15-minute demand of 500 kW).

2.4 Network Only

2.4.1 Sixty- (60) cycle alternating current at 120/208 volts over a three-wire or four-wire service.

2.4.2 Three-phase, four-wire, 277/480-volt spot network service is provided only upon our specific written approval where:

The customer requests it;

R The 15-minute demand exceeds 750 kW;

Suitable multiple 13.8-kV circuits are available at the proposed site; and

The customer provides necessary transformer space.

3 SERVICE FACILITIES

3.1 Service Entrance Specifications

We specify, in writing, customers' service entrance locations, including service entrance conduit sizes, quantity, and termination points.

3.2 To Each Customer's Building or Premise, MGE Supplies:

No more than one service drop or service lateral;

No more than one class of service;

3.2 (Continued)

No more than one meter; and

Service to no more than one service entrance, main disconnect, or MGE-approved metering device.

3.2.1 Exceptions

- When more than one point of delivery is necessary because of voltage regulation, governmental requirements, or regulatory orders.
- When more than one service drop or service lateral of the same class of service is necessary to meet the load requirements of large installations.
- When row houses and other multiple-occupancy buildings comply with the State electrical code by having areas separated by fire walls.
- When an additional service or meter may be required to accommodate special approved service rates.
- When 240-volt, three-phase, three-wire delta is available because of existing distribution facilities and the customer's total combined demand is less than 50 kW.
- Where multiple-occupancy buildings require separate meters for individual tenants, more than one meter is allowed.

3.2.1 (Continued)

- When total load exceeds 800 kW for single-metered commercial customers, two classes of service are available.

4 OVERHEAD SERVICE DROPS AND UNDERGROUND SERVICE LATERALS (NON-NETWORK)

4.1 Requirements

- 4.1.1 We install, own, and maintain all service drops and service laterals.
- 4.1.2 For overhead service drops, the applicant's service entrance facility must be located at a point readily accessible to the distribution system and at a height to provide for proper code clearance of the service drop wire.

Where it is necessary to cross adjacent property, the applicant must make arrangements with the landowner for MGE to obtain the proper easements.

The applicant must also obtain the proper location for the service head from MGE and provide suitable anchorage for supporting the service drop on the building.

- 4.1.3 If the present or prospective load is 75 kW or more, we specify that the applicant must provide either:

A transformer vault with vehicle access, constructed in accordance with all applicable codes, minimum 16' D x 18' W x 10' H with two 32" x 32" clear manways and a 5' x 7' equipment-way opening for access and three square inches of free air ventilation per KVA of transformer capacity. (See **Section 7.5** and **Figure MIS-3**.)

An outdoor transformer enclosure with vehicle access, for transformers and switchgear, constructed in accordance with all applicable codes, minimum 15' x 25'. (See **Section 7.5** and **Figure MIS-4**.)

Space for the installation of self-enclosed, pad-mounted transformers and switchgear with vehicle access and in accordance with Wisconsin State Electrical Code (PSC 114-317).

In high-rise buildings, conduit extensions, space for the installation of transformers, primary cables, and associated switchgear and, upon our request, suitable space on-site outside the building for the installation of high-voltage fused disconnecting equipment.

4.2 Location of Service

All service drops and service laterals will be extended from the MGE distribution system to the customer's service entrance facility over the most direct and properly engineered route as determined by MGE. The customer's service entrance point will be specified by MGE.

4.3 Rights-of-Way, Easements, and Maintenance of Grade

The applicant or developer is responsible for furnishing MGE with rights-of-way and easements within reasonable time to meet service requirements. The right-of-way must be cleared of trees, stumps, and other obstructions prior to installation. After installation, the right-of-way may be used by the grantor in any way that does not interfere with our ability to maintain our electrical facilities at any time.

The right-of-way must be graded within six inches of final grade and be maintained by the applicant during utility construction. Future changes or relocations of our facilities due to changes in grade will be at the property owner's expense.

5 METERS AND METER EQUIPMENT

5.1 Customer Responsibility

Customers are responsible for furnishing and installing all wiring for meter installations, including such associated facilities as meter sockets, meter enclosures, meter test block enclosures, current transformer enclosures, etc., as required for the appropriate type of metering installations specified in this section. Meter sockets must be approved for the particular type of service by MGE and must comply with local and state codes.

5.2 Access

5.2.1 In outdoor installations, locate meters where access won't promote damage to lawns, gardens, or shrubbery.

- 5.2.2 Meters must be installed in accessible areas with a minimum of three feet of frontal clearance so we can read and test them without causing customer inconvenience or a safety hazard to our personnel.
- 5.2.3 For multiple-unit residential, commercial, and industrial customers, such as apartments, office buildings, stores, and factories, meters should be located in easily accessible portions of the buildings.

Where there are a number of meters, they must be grouped together and the sockets marked to indicate the portions of the buildings supplied by each meter.

Where meters are mounted side by side, leave at least a seven-inch space between each meter and the nearest adjacent piece of equipment to permit testing and adjusting.

5.3 Mounting and Location

- 5.3.1 Meters mounted outside must be between four and six feet above final grade.

Exception: Pedestal-type meter sockets and multiple meter stacks must be between three and six feet above final grade.
- 5.3.2 Meters mounted inside must be between two and six feet above the floor.
- 5.3.3 Meters must be located in such a manner as not to interfere with gas piping or gas metering. See **Figure MIS-2** to determine minimum clearance required.

- 5.3.4 Meter mountings must be secure and free of vibrations.
- 5.3.5 Meters must be free from unusual temperature and moisture conditions.
- 5.3.6 Single- and two-family residential buildings and other buildings not easily accessible to MGE personnel during normal working hours must have meters located outside.

5.4 Removal and Relocation

- 5.4.1 Only MGE employees may set, remove, or relocate meters.
- 5.4.2 On jobs where it is necessary to temporarily disconnect or relocate a meter, contact the MGE Service Coordinator at least two days before the work is to be done.
- 5.4.3 Where new wiring has been done, inspection permits and/or signed and notarized affidavits are required before we will set the meter.
- 5.4.4 We will seal all meter switches, meter sockets, enclosures, and meters at the time of installation. If a seal is broken in the event of an emergency, contact the MGE Service Department within 48 hours for resealing.

5.5 Residential

Note: In the network area, a switch-fuse-meter sequence may be required, depending on available fault current.

5.5.1 Horn-Type Bypass or Manual Sealable,
lever-operated bypass for self-contained meter
sockets with a meter-switch-fuse sequence for:

- Single-phase installations of 200 amperes or less. (See **Figures RES-1, 2, 3, and 4.**)
- Three-phase installations of 200 amperes or less. (See **Figure COM-1.**)
- Multiple metering installations for two to six units. (See **Figure RES-7.**) All apartments having more than six units should contact MGE. (See **Figure RES-8.**)

5.5.2 Transformer-rated meter sockets and current transformers with switch-fuse-meter sequence for:

- Single-phase installations over 200 amperes of actual load. (See **Figure RES-6.**)
- Three-phase installations over 200 amperes of actual load. (See **Figure COM-7.**)
- Single-metered and single-phase installations of over 200 amperes for single- or multiple-family residential units. (See **Figure COM-3.**)
- Single-metered and three-phase installations of over 200 amperes for single- or multiple-family residential units. (See **Figure COM-7.**)

5.5.3 Underground Service

- For underground service of 200 amperes or less, you must use a meter socket rated for 200 amperes with horn-type or manual sealable lever bypass with meter-switch-fuse sequence. (See **Figures RES-1 and 2.**)
- Underground services over 200 amperes actual load must have current transformer installations with switch-fuse-meter sequence. These are treated on an individual basis. Contact MGE Engineering for determination of the metering required. (See **Figure COM-3.**)
- Optional metering transformer cabinets for services from 201 to 400 amperes and 250 volts or less with single-meter installation and meter-switch-fuse sequence. An outdoor metering transformer cabinet installation required for residential applications.

The customer must provide an MGE-approved cabinet and install it and associated service entrance equipment in accordance with all applicable codes. (See **Figure RES-6.**) ***THIS DOES NOT APPLY TO THE AC LOW-VOLTAGE NETWORK AREA.***

5.5.4 Farm Services - Pole Top

Pole-top disconnects of 200 amperes or 400 amperes, single-phase, 120/240 volt with space for a current transformer are permitted. If the option of standby generator breaker is selected, it must be configured in a break-before-make switch sequence.

The metering sequence will be meter-switch-fuse. For customer-owned generating equipment connections, see **Section 12, CUSTOMER-OWNED OPTIONAL STANDBY ELECTRIC GENERATING EQUIPMENT.** (See **Figures MIS-7 and 8.**)

5.5.5 Off-Peak Water Heating Installation

Wiring for residential off-peak water heating installation must include a socket for the off-peak meter. Use a meter-switch-fuse sequence. (See **Figures RES-9, 9A, and 9B.**)

5.6 Commercial and Industrial

Note: All services of 460 volts or more must be switch-fuse-meter sequence.

5.6.1 Manual sealable, lever-operated bypass, self-contained meter sockets with a meter-switch-fuse sequence for:

- Single-phase installations of 100 amperes or less. (See **Figure COM-1.**)
- Three-phase installations of 100 amperes or less. (See **Figure COM-1.**)

- 5.6.2 Manual sealable, lever-operated bypass, self-contained heavy-duty jaw released meter sockets with a switch-fuse-meter sequence for:
- Single-phase installations for 101 to 200 amperes. (See **Figure COM-2**.)
 - Three-phase installations for 101 to 200 amperes. (See **Figure COM-2**.)
- 5.6.3 Transformer-rated meter sockets and current transformers with switch-fuse-meter sequence for:
- Single-phase installations over 200 amperes for commercial and industrial customers. (See **Figures COM-3 and 4**.)
 - Three-phase installations over 200 amperes for commercial and industrial customers. (See **Figures COM-5, 6, and 7**.)
- 5.6.4 For multiple-meter installations in commercial and industrial buildings, a main building disconnect is required. (See **Figures COM-8, 9, and 10**.)
- 5.6.5 Optional metering transformer cabinets for services of 250 volts or less with single-meter installation and meter-switch-fuse sequence. Commercial or industrial single-metered customers with total service capacity of not more than 1,200 amperes may use an indoor or outdoor metering transformer cabinet installation.

5.6.5 (Continued)

The customer must provide an MGE-approved cabinet and install it and associated service entrance equipment in accordance with all applicable codes. (See **Figures COM-10 and 11.**) ***THIS DOES NOT APPLY TO THE AC LOW-VOLTAGE NETWORK AREA.***

5.6.6 Primary-metered service supplied at 2,400/4,160 volts or 13,800 volts is available at limited locations and at our discretion. Customers taking service at primary voltage must provide all the necessary switchgear for metering and fused protection of the primary side of the transformers.

A switch-fuse-meter sequence must be used. Drawings of primary metered switchgear must be approved by MGE prior to purchase. (See **Figure COM-12.**)

6 NON-NETWORK OVERHEAD AND UNDERGROUND DISTRIBUTION EXTENSIONS**6.1 To Extend Service**

Upon written request, we will extend our distribution system to provide service to new customers in accordance with the following rules and regulations.

6.2 Definition of Distribution System

The Distribution System includes all primary lines, secondary lines, transformers, and control equipment necessary to provide points of connection with service drops or service laterals. Though located on customer property, transformers and associated equipment are part of MGE's distribution system.

Normally, the distribution system is located within an electric utility easement on private property or on public streets, alleys, and roads so that it may be extended to other applicants. Property owners grant easements without cost to MGE.

Service voltages supplied by MGE are typically available at 120/240 and 120/208 volts (residential), 120/208 (low-voltage network) and 277/480 (spot network), and all of the above for commercial applications. Transformers are standard ratio and standard impedance single- and three-phase oil-cooled types only.

6.3 Our Responsibility

We design and install the distribution facilities in the most safe, reliable, environmentally accepted manner and at the lowest reasonable cost following accepted engineering and planning practices as determined by us.

6.4 Items Included in Costs of Extension

If a service extension is required, the customer may be responsible for the cost. The customer's calculated cost of the required extension (to be paid in advance) will not include individual transformers or increased transformer capacity but will include the cost of:

- 6.4.1 Extension of primary and secondary facilities (overhead and/or underground), including excavation and restoration.
- 6.4.2 Reconstruction of existing facilities, including changing from single-phase to three-phase or construction of new feeders made necessary solely by addition of such customers.
- 6.4.3 Tree trimming and rights-of-way clearing.
- 6.4.4 Abnormal trenching costs.
- 6.4.5 Securing easements.
- 6.4.6 Moving conflicting facilities.
- 6.4.7 Overtime expenses. Note: For load increases, only the overtime portion of labor applies.
- 6.4.8 All other costs associated with making the extension, including applicable overheads.

6.5 Definition of Allowances

The average embedded cost for providing a service to an individual customer is used to determine any applicable allowances. We determine this Average Embedded Cost Allowance (AECA) for the following classes of customers:

6.5.1 Energy-Only Basis

These are generally residential and small commercial customers requesting extensions to serve their facilities on individual lots of multilot plats. We calculate their average embedded cost of the distribution facilities by dividing the overall depreciated embedded cost by the total number of customers billed in that classification.

6.5.2 Demand and Energy Basis

These are generally commercial customers with demand greater than 20 kW. Their average embedded cost on a per-kilowatt-of-demand basis is calculated by dividing the overall depreciated embedded cost by the total kilowatt demand for this customer class.

6.5.3 Streetlighting Facilities

The average embedded costs are determined on a per-fixture basis by dividing the overall depreciated embedded cost by the total number of fixtures involved.

6.6 Allowances

We recompute and file the AECA annually on March 1. For current information, please call MGE Engineering.

6.7 Application of Allowances

We apply the allowances to each class of customer as follows:

6.7.1 Energy-Only Customers

The requesting customer receives allowances only for lots having structures beyond the foundation stage that take a service drop or service lateral directly from the distribution extension being made.

The customer pays the total cost of the extension as previously described, less the average embedded cost per customer multiplied by the number of customers to be served by the extension. The cost is computed on an estimated basis, and the requesting customer makes an advance deposit in that amount.

Refunds, on an average embedded cost per customer basis, are made to the original customer who made the deposit as new customers take service drops or service laterals within five years of the original extension completion. The refund equals whichever is greater—the AECA in effect at the time the contributed extension was installed or the AECA in effect at the time the meter was set.

In either case, we reduce the refund by our costs incurred designing and installing the distribution facilities for the second customer. The total refund never exceeds the original total amount paid, and no interest is paid on refunds.

We send a contract letter specifying the terms and conditions for any refunds to the original contributor.

6.7.2 Demand Plus Energy Customers

Customers requesting service that requires rearrangement of or new distribution facilities pay in advance the total cost of the rearrangement or new extension, less the AECA per kW of demand multiplied by the customer's estimated average billed demand. The cost is estimated, and a deposit equal to the estimate is made in advance.

Upon completion of the work, the project is reviewed to determine whether it is within the original scope. If the project is out of scope, an appropriate refund or additional bill will be submitted to the original contributor.

The customer's estimated average billed demand is determined by using 40 percent of the customer's stated service entrance facility rating. It is based on our experience with the relationship between a customer's actual load and the size of the service entrance.

For customers requesting an increase in facilities, the cost is the total distribution facility construction cost as defined in **Section 6.4**, less an allowance equal to the incremental increase in demand multiplied by the average embedded cost per kW, less the accumulated depreciation of the removed facilities, less the salvage value of the facilities removed.

6.7.2 (Continued)

The cost is estimated, and the customer makes a contribution equal to that estimate in advance. Upon completion of the work, the project is reviewed to determine whether it is within the original scope. If the project is out of scope, an appropriate refund or additional bill will be submitted to the original contributor.

After a deposit has been received, we will send a contract letter specifying the possibility of refunds to the customer. It explains the circumstances under which refunds may occur as a result of the addition of new customers taking service drops or service laterals off the extension within five years of the completion of the original extension.

The refund equals the greater of the AECA in effect at the time the contributed extension was installed or the AECA in effect at the time the meter was set. In either case, we reduce the refund by our costs to design and install the distribution facilities for the second customer. The total refund never exceeds the original total amount paid. Interest is not paid on deposited funds.

6.7.3 Streetlight Extensions

For streetlight extensions, service drops, or service laterals, the cost to the requesting party is the total cost of the facilities needed to provide service to the streetlights, less the AECA per fixture. We collect this cost in advance on an estimated basis.

6.7.3 (Continued)

Final appropriate refunds or additional bills are submitted to the original contributor upon completion of the installation. We treat each request for service and/or extension individually for payment.

6.7.4 More Than One Rate Class

For extensions to more than one customer where some are billed on energy only and some on demand and energy, we determine the total allowance by either allocating certain costs of the extension to each class separately or by adding the allowances together to derive one total allowance to offset one total cost. We choose the method that minimizes confusion over payment and/or refund policies.

6.8 Upgrade of Distribution Facilities

For customers who require distribution facility upgrades, we determine allowances as follows:

6.8.1 Demand Schedule

Customers served under a demand rate schedule receive an embedded cost allowance. The kW of demand used in computing the allowance is the customer's estimated average billed demand after the upgrade, less the customer's estimated average billed demand before the upgrade.

6.8.2 Customers Transferring to a Different Energy-Only Subclassification

If a customer changes Energy-Only subclassifications after the upgrade, the customer receives an allowance equal to the difference between the two average embedded cost allowances.

6.8.3 Customers Transferring to a Demand Classification

If a customer transfers from an Energy-Only to a Demand Plus energy classification after the upgrade, the customer receives an AECA. The kilowatts of demand to be used in determining the allowance is the customer's estimated average billed demand after the upgrade, less an estimate of the customer's prior average billed demand (based on calculations described in **Sections 6.7.1 and 6.7.2**).

6.9 Relocation and Rebuilding of Existing Facilities

Submit a written request to relocate service and distribution facilities at the customer's expense, including replacement of overhead with underground.

We compute the estimate by calculating the total cost of the proposed work, including applicable overheads and incidental charges, less the accumulated depreciation of the removed facilities, less their salvage value. The cost is estimated, and a contribution equal to the estimate is made in advance.

6.9 (Continued)

We refund the contribution as additional customers attach to the facilities unless the additional customers require a new extension. The refund will be equal to the greater of the AECA in effect at the time the contributed extension was installed or the AECA in effect at the time the meter was set.

In either case, this refund is reduced by our costs incurred designing and installing the distribution facilities for the second customer. Refunds are made for up to five years after the completion of the changes to the facilities with the total never exceeding the original total amount paid. Interest is not paid on deposited funds.

7 LOW-VOLTAGE AC NETWORK SYSTEM (see Figure NET-1)

7.1 Definitions

7.1.1 A Service Lateral in the network system is defined as the underground secondary facilities between the nearest splicing point on the underground low-voltage network system and the supply end of the customer's service entrance facilities. The service laterals are installed in conduit and normally are only to serve loads that are less than 75 kW.

7.1.2 The Low-Voltage Network Distribution System includes primary lines, ducts, manholes, conduits, transformers, and all other facilities that are part of the system. Some of these facilities may be located on the customer's premises.

7.2 Payment for Service Laterals

The customer will pay, in advance, \$5 per foot for that part of the service lateral as defined above that is located between that customer's lot line and service entrance facilities.

7.3 Residential Metering

7.3.1 Horn-type bypass or manual sealable lever-operated bypass for self-contained meter sockets with a meter-switch-fuse sequence (if fault current dictates, switch-fuse-meter sequence is required) for:

- Single-phase installations of 200 amperes or less. (See **Figure NET-2**.)
- Three-phase installations of 200 amperes or less. (See **Figure NET-2**.)
- Multiple metering installations for two to six units. (See **Figure NET-3**.) All apartments having more than six units should contact MGE. (See **Figure NET-5**.)

7.3.2 Transformer-rated meter sockets and current transformers with switch-fuse-meter sequence for:

- Single-phase installations of 201 amperes to 600 amperes. (See **Figure NET-7**.)
- Three-phase installations over 200 amperes. (See **Figure NET-6**.)

7.4 Commercial and Industrial Metering

Note: All services of 460 volts or more must be switch-fuse-meter sequence.

7.4.1 Manual sealable lever-operated bypass, self-contained meter sockets with a meter-switch-fuse sequence (if fault current dictates, switch-fuse-meter sequence is required) for:

- Single-phase installations of 100 amperes or less.
- Three-phase installations of 100 amperes or less.

7.4.2 Manual sealable lever-operated bypass, self-contained heavy-duty jaw released meter sockets with a switch-fuse-meter sequence for:

- Single-phase installations of 101 to 200 amperes. (See **Figure NET-2.**)
- Three-phase installations of 101 to 200 amperes. (See **Figure NET-2.**)

7.4.3 Transformer-rated meter sockets and current transformers with switch-fuse-meter sequence for:

- Single-phase installations over 200 amperes for commercial and industrial customers. (See **Figure NET-7.**)
- Three-phase installations over 200 amperes for commercial and industrial customers. (See **Figure NET-6.**)

7.4.4 For multiple-meter installations in large commercial and industrial buildings, a main building disconnect is required. (See **Figure NET-3.**)

7.5 Transformer Vaults

If the present or prospective load is 75 kW or more, we specify that the applicant must provide either:

A transformer vault with vehicle access, constructed in accordance with all applicable codes, minimum 16'D x 18'W x 10'H with two 32" x 32" clear manways and a 5' x 7' equipment-way opening for access and three square inches of free air ventilation per KVA of transformer capacity. (See **Figure MIS-3.**)

An outdoor transformer enclosure with vehicle access, for transformers and switchgear, constructed in accordance with all applicable codes, minimum 15' x 25'. (See **Figure MIS-4.**)

Space for the installation of self-enclosed, pad-mounted transformers and switchgear with vehicle access and in accordance with Wisconsin State Electrical Code (PSC 114-317).

In high-rise buildings, conduit extensions, space for the installation of transformers, primary cables, and associated switchgear and, upon our request, suitable space on-site outside the building for the installation of high-voltage fused disconnecting equipment.

Upon customer request, we will furnish transformer vault plans and specifications, including space and ventilation requirements, but the customer's architects and engineers must be responsible for structural design. Such plans must be submitted to MGE prior to construction.

7.6 New Buildings

New building construction for which service laterals are provided must include MGE-approved wall openings for service ducts at locations we specify.

8 RIGHTS AND RESPONSIBILITIES

8.1 Continuity of Service

We use reasonable diligence to provide an uninterrupted and regular supply of service. We are not liable for any interruptions, deficiencies, or imperfections of service. We may temporarily suspend the delivery of service when necessary for the purpose of making repairs, changes, and improvements upon any part of the system.

8.2 Balanced Load

The customer is responsible to balance load over the phases as equally as commercial practice will permit and maintain this balance over time.

8.3 Superposition of Electric Energy on Utility System

Where the customer's equipment couples electric energy to their electric system for equipment control, carrier current transmission, signal systems, broadcasting, communication, or any other purpose, the customer shall install equipment suitable to prevent this energy from being imposed upon or entering our electric system.

8.4 Losses Due to Service Disconnection

We are not liable for any losses, injuries, or damages to persons or property due to disconnection of service in accordance with the disconnection rule found on **page E71** of the Rules and Regulations on file with the PSCW.

8.5 Customer's Responsibility for Damage to MGE Equipment

The customer is responsible for all damage to MGE facilities or equipment caused by the customer or his permittees, including compensation for consumed energy not recorded on the meter.

8.6 Access to Customer Premises

Our authorized agents will have access to customer premises at all reasonable times for the purpose of reading meters, making repairs, inspections, investigations, removing MGE property, or any other purpose incident to providing service.

8.7 Abnormal Trenching Costs

The applicant shall pay, in advance, an amount equal to the estimated extra cost of trenching and hand digging through any area where normal plowing and trenching methods cannot be used; e.g., ledge rock, boulders, landfill, trees, heavy underbrush, water courses, etc.

8.7 (Continued)

Frost charges will apply for any service and/or distribution extension installed between December 10 and March 16 unless the application for service and/or request for distribution extension is received prior to November 1 and the premise and/or site is ready for installation prior to December 1.

The premise and/or site is ready for installation when the following items are satisfied:

- a. All applicable service sketches and easements signed by the customer/owner and received by MGE.
- b. All applicable deposits received by MGE.
- c. The entire trench route cleared and graded to within 6" of final grade.
- d. A physical electric service entrance location installed on or in the building. This can consist of a pedestal, transocket, and a minimum of the required service entrance conduits stubbed out from the foundation wall or securely mounted on the building.

Note: A mark showing the proposed service location on the foundation or building does not qualify as ready for installation.

8.8 Installations Under and Through Private Paved and Landscaped Areas

Except for damage caused by our negligence, MGE is not liable for damage to trees, shrubs, fences, sidewalks, or other obstructions incident to the installation, repair, or maintenance of our electric facilities. The applicant is responsible for lawn and landscape restoration except as noted above.

If we are requested to provide additional landscaping or other services, the applicant is responsible for associated costs. Excavation and backfilling are our responsibility-- the backfill will consist of the original soil when possible.

8.9 Installation of Facilities

The character, location, and method of installation of MGE-constructed facilities will be at our discretion and conform to specifications we prepare. Any exceptions we consent to will be at the customer's expense.

8.10 Applicability of Governmental Codes

All facilities installed, whether by the customer or MGE, will comply with the appropriate provisions of the applicable governmental codes.

8.11 Extraordinary Investment

If an investment in an extension appears extraordinary to us, or where extensive enlargement or changes to existing distribution or other facilities required to accommodate the customer do not appear to be economically justified, we may require the customer to pay us that portion of the capital expenditure not economically justified by the anticipated annual revenue. Such payments will be made before construction.

In addition, we may require a specific contract with the customer to pay operating and maintenance expenses.

9 MOTORS AND STARTING REQUIREMENTS

9.1 Single-Phase Motors

Split-phase motors larger than 1/2-hp capacity are not permitted for any application. The locked rotor starting current for single-phase motors or customer-owned parallel generators may not exceed the values specified in the following table:

**Maximum Permissible Starting Current
Values for Single-Phase Motors**

Size	Allowable Starting Current at 120 Volts	Allowable Starting Current at 208 Volts or 240 Volts
1/3 HP	31 amperes	15.1 amperes
1/2 HP	45 amperes	22.5 amperes
3/4 HP	Not Allowed	30.5 amperes
1 HP	Not Allowed	35 amperes
1 1/2 HP	Not Allowed	40 amperes
2 HP	Not Allowed	50 amperes
3 HP	Not Allowed	70 amperes
5 HP	Not Allowed	100 amperes
7 1/2 HP	Not Allowed	115 amperes

9.1 (Continued)

Note: Window- or room-type air conditioners and portable appliances shall not have starting currents in excess of four times the rated input current.

9.2 Three-Phase Equipment

Construct all three-phase equipment for operation at the voltage available in the location where it is to be used. Please contact MGE with any questions about available service. And be sure to notify us in advance of all proposed additions of three-phase equipment to ensure an adequate supply of service.

9.3 Three-Phase Motors

Limit the starting current for three-phase motors and customer-owned parallel generators to the values given in the table below by suitable starting devices or motor design. These limitations must be met during all stages of the motor start and running cycle.

Construct all motors and parallel generators larger than 100 hp to maintain a power factor in excess of 92 percent at 90 percent of full load or output.

Supply equipment (such as single-phase welders, electric furnaces, motors, parallel generators, and other equipment) which causes frequent variations in current demand that may result in light flicker must be supplied from independent service equipment, including service outlet and meter.

9.3 (Continued)

Maximum Permissible Starting Current Values for Three-Phase Motors

<u>Size</u>	<u>Voltage</u>	<u>Maximum Permissible Starting Current</u>
5 HP	240	82 Amperes/Motor
7½ HP	240	110 Amperes/Motor
10 HP	240	135 Amperes/Motor
15 HP	240	189 Amperes/Motor
20 HP	240	240 Amperes/Motor
25 HP	240	291 Amperes/Motor
30 HP	240	345 Amperes/Motor
35 HP	240	354 Amperes/Motor
40 HP	240	365 Amperes/Motor
50 HP & Larger	240	8 Amperes/HP

The maximum permissible starting current for motors wound for other voltages shall be the starting currents listed above divided by ratio or other voltage.
240 V

10 POWER FACTOR CORRECTION RULE

For nonincandescent lighting, the customer is responsible to maintain a power factor to a level of at least:

Ninety (90) percent lagging for illumination or decorative purposes.

Eighty-five (85) percent lagging for advertising purposes, except that no correction is required for any complete sign supplied from a single auxiliary transformer rated at 225-volt amperes or less.

10 (Continued)

Commercial and industrial customers must maintain a power factor on-peak of not less than 85 percent or be subject to a penalty as dictated by filed rates.

The power factor is determined by the wattmeter-voltmeter-ammeter method.

11 EMERGENCY ELECTRIC SERVICE

In commercial or network installations where code requires an emergency service connection on the line side of the building main disconnect (as with emergency lighting or fire pumps), you must provide a suitable fused disconnect at the closest permissible location to the tap point. Metering must be according to MGE-approved metering guidelines.

12 CUSTOMER-OWNED OPTIONAL STANDBY ELECTRIC GENERATING EQUIPMENT

The purpose of optional standby electric generating equipment is to provide an alternate source of electric power for farms and commercial facilities during power outages to minimize inconvenience or product damage. A standby generator must be connected to the customer's electric system through an approved double-throw, break-before-make disconnect switch. (See **Figures MIS-8 and 9.**) This system will be electrically and mechanically interconnected so the customer's generation cannot feed back into MGE's system.

13 CUSTOMER-OWNED PARALLEL ELECTRIC GENERATING EQUIPMENT

13.1 Application and Contract

Before interconnecting a generating system with the MGE system, we must receive and approve an application and a contract specifying technical connection and operating aspects for the parallel generating facility.

13.2 Lockable Load-Break Disconnect Switch

We require a lockable load-break disconnect switch between generators and the MGE system. A fused cutout switch may be substituted in installations interconnected at greater than 600 volts. Switches must be accessible so we can isolate the generating facility from the MGE system when necessary.

13.3 Separate Distribution Transformers

We require separate distribution transformers for generating facilities that may threaten safety or interfere with other customers' service. This should not be necessary for induction-type generators with capacities of 5 kW or less or generating units of 10 kW or less that utilize line-commutated inverters. Ordinarily, single-phase generators should be limited to a capacity of 10 kW or less.

13.4 Automatic Isolation

Each generating facility must have a system for automatically isolating the generator upon loss of the MGE supply, unless we want local generation to supply isolated load. For synchronous and induction generators, this protection ordinarily consists of overcurrent protection, fuse or circuit breaker, plus a voltage- or frequency-controlled contactor to automatically disconnect the unit whenever its output voltage or frequency drifts outside predetermined limits, such as plus or minus 10 percent of the rated values. Other suitable protective systems may be accepted.

13.5 Disconnection Upon Request

Customers must disconnect the parallel generation upon request. We may isolate the generating facility:

For maintenance or repair of MGE facilities.

During system emergencies.

When the generating facility is operating in a hazardous manner or affects service to other customers or nearby communication systems or circuits.

13.6 Access

Generating facilities must be accessible to MGE personnel at reasonable times for testing isolation and protection equipment, evaluating power quality, and isolating sources of electric service or communication systems problems.

13.7 Rights and Responsibilities

The owner of a generating facility is responsible for protecting owner-installed equipment and adherence to all applicable codes. Certain generating equipment, such as that utilizing line-commutated inverters, sometimes requires an isolation transformer.

A generating facility's power output must be compatible with normal electrical service and not cause that service to fall outside the prescribed limits of PSCW rules and other standard limitations.

A generating facility must not affect the service or equipment of other customers or produce undesirable levels of harmonics in the MGE power supply.

The owner of a generating facility that is or proposes to be interconnected with the MGE system may appeal to the PSCW if any MGE requirements are considered excessive or unreasonable. Such an appeal will be reviewed and the customer notified of the Commission's determination.

14 CHARGES FOR OVERHEAD DROPS AND UNDERGROUND SERVICE LATERALS

14.1 Temporary Service

We will charge \$65 for providing an underground and \$125 for an overhead 120/240-volt, single-phase temporary service up to 5 kW for construction purposes at a location selected by MGE where facilities currently exist. The service head must be located on a satisfactory temporary support provided by the applicant. This support must be located so that wires will not have to be spliced when moved to the permanent location and must provide the clearance required by state code.

14.1 (Continued)

For any other location, voltage, or load selected by the applicant, the estimated cost of installing and removing the distribution facilities for temporary service will be paid in advance by the applicant. See **Figures MIS-5 and 6** for typical temporary installations.

14.2 Permanent Service

No charge will be made for permanent overhead service drops and underground service laterals meeting the aforementioned definitions and all MGE rules and applicable codes unless there is extraordinary investment or abnormal trenching costs. The customer will pay the portion of the extraordinary investment and abnormal trenching above the cost of a normal service as determined by MGE.

14.3 Upgrade of Service Facilities

No charge will be made for upgrading a service drop or lateral with a larger service drop or lateral.

The Company will require a contribution from a customer requesting to have an overhead service drop upgraded to an underground service lateral. The contribution will be equal to the cost of the underground service lateral less the cost of an equivalent overhead service drop.

However, if the change is a result of a substantial increase in consumption or extensive building modifications, then the change will be treated as a request from a new customer for the purpose of calculating the contribution.

**15 CUSTOMER SERVICE REPRESENTATIVE
 DIRECTORY - ELECTRIC**

Diggers Hotline		800-242-8511
Easements	Mike Halcarz	252-5635
Electromagnetic Field Inquiries (EMF)	Marty Jacobi	252-4785
Emergency		252-7111 800-245-1123
Engineering, Electric Distribution	Marty Jacobi	252-4785
Engineering, Electric Service	Greg Meyer	252-5669
Information		252-7222 800-245-1125
Marketing		252-5697
Meter Sealing		252-7333
N Open C.T. Cabinets		252-7333
Metering, Pick-up		252-4721
Operations and Construction	Ken Wilke	252-7190
Plats, Residential	Jim Lorenz	252-5645
Lights, Private Light Engineering	Jim Herfel	252-7233
Lights, Streetlight Engineering	“Butch” Frosch	252-7112
Outages, Customer Requested	Marty Jacobi	252-4785

**15 CUSTOMER SERVICE REPRESENTATIVE
 DIRECTORY - ELECTRIC (Cont.)**

Relocation of Distribution Facilities	Marty Jacobi	252-4785
Relocation of Overhead and Underground Service Facilities	Jim Herfel	252-7233
Road Improvement Projects	“Butch” Frosch Marty Jacobi	252-7112 252-4785
Service, Commercial Greg Meyer Mark Lund	Jef Waak	252-7379 252-5669 252-7946
Service, Multifamily (Apartments)	Mark Lund	252-7946
Service, Residential New Single Family	Jim Lorenz Bill Roloff	252-5645 252-7341
Service, Residential Overhead Upgrades and Conversions from Overhead to Underground	Jim Herfel	252-7233
Service, Rural Distribution Extensions	Mark Lund	252-7946
Service Coordinator, Distribution (Service Installation Schedule)	Dick Dresen	252-7285
Stray Voltage	Kurt Kaker	252-7933
Voltage Complaints	Kurt Kaker	252-7933
Service Schedule, Residential	Maxine Harris Joyce Skoein	252-7061



COMMERCIAL SERVICES

R = Revised, N = New, D = Deletion

COMMERCIAL SERVICES

Underground service/-	100 amperes or less, single-	COM-1
Overhead service	phase or three-phase.	
Underground service/-	101 to 200 amperes, single-	COM-2
Overhead service	phase or three phase.	
Underground service/-	201 to 600 amperes,	COM-3
Overhead service	120/240-volt, single-phase, three-wire.	
Underground service/-	201 to 600 amperes,	COM-4
Overhead service	120/208-volt, single-phase, three-wire.	
Underground service/-	Greater than 200 amperes,	COM-5
Overhead service	240-volt, three-phase, three- wire.	
Overhead service	- 201 to 400 amperes, three- phase, four-wire.	COM-6
Underground service-	Greater than 200 amperes, three-phase, four-wire.	COM-7
Underground service-	Multiple meters with various service sizes.	COM-8
Underground service-	Multiple metering, 200 amperes/pos. single-phase or three-phase.	COM-9
Underground service-	Multiple metering, 100 amperes/pos. single- phase or three-phase	COM-10
Transformer cabinet	- 400 to 1,600 amperes, three-phase, four-wire.	COM-11
Transformer cabinet	- 400 to 600 amperes, single-phase, three-wire.	COM-12
Switchboard	- Customer-owned secondary switchboard.	COM-13
Primary metering switchgear	- One-line diagram, customer-owned.	COM-14

GENERAL NOTES FOR SERVICE ENTRANCE EQUIPMENT

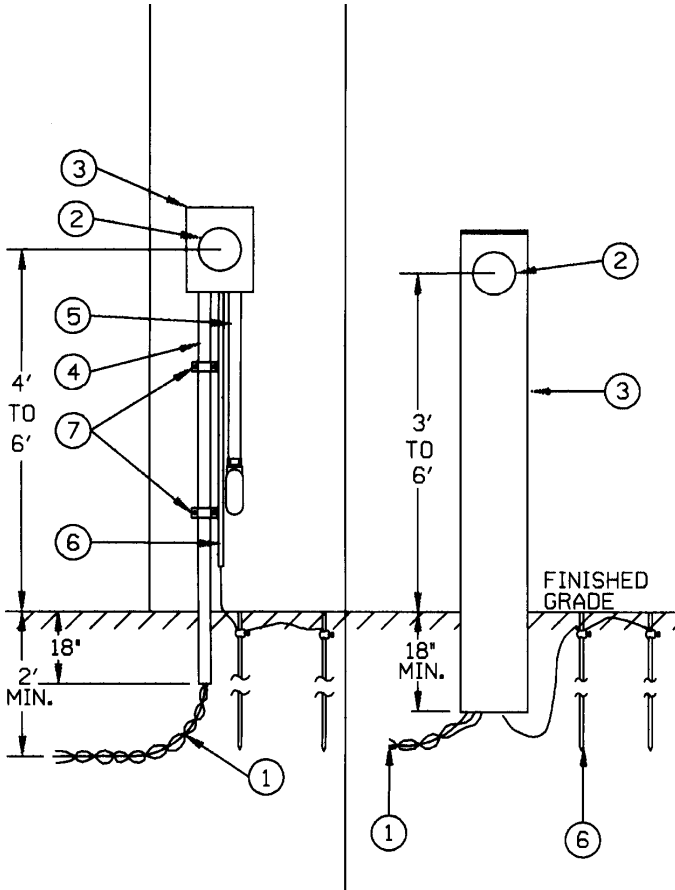
The number of service entrance conduits and minimum gutter size for services requiring a main disconnect switch are as follows:

MAIN SIZE	NUMBER OF SERVICE ENTRANCE CONDUITS	MINIMUM GUTTER SIZE (Larger May Be Required)
200A	1-4 inch	8" x 8" x 24"
400A	1-4 inch	12" x 12" x 24"
600A	2-4 inch	12" x 12" x 24"
800A	2-4 inch	12" x 12" x 24"
1,000A	3-4 inch	12" x 12" x 36"
1,200A	3-4 inch	12" x 12" x 36"
1,600A	4-4 inch	16" x 16" x 36"
2,000A	5-4 inch	16" x 16" x 36"

- ◆ A code- and MGE-approved transition is required between the gutter and main switch. (See **Table 7**.)
- ◆ Use of other gutter/transition arrangements meeting proper cable-bending radius must be approved by MGE prior to installation.
- ◆ Conduits may enter the bottom of a switch if a bottom-fed switch is utilized, but a minimum distance of 24 inches must be maintained from the bottom of the switch to the line-side termination lugs.
- ◆ All switchboard installations and meter stacks must be approved by MGE.
- ◆ Gutters containing unmetrated conductors shall be sealable.
- ◆ Current transformer cabinets must have provisions for padlocking.



- ◆ Where service entrance conduits are subject to physical damage, the conduits shall be Schedule 80 rigid nonmetallic or metal conduit.
- ◆ Protective posts are required if equipment is subject to vehicular traffic.
- ◆ Call Diggers Hotline to locate underground utilities prior to driving ground rods or stubbing service entrance conduits.
- ◆ See **Miscellaneous-2** for clearance guidelines between electric and gas meters.
- ◆ See **Miscellaneous-1A and 1B** for overhead clearance guidelines.
- R ◆ Any 277/480-volt service will require a switch-fuse-meter sequence.



COM-1

**COMMERCIAL UNDERGROUND SERVICE
SINGLE-PHASE OR THREE-PHASE
250 VOLTS OR LESS
100 AMPERES OR LESS
SEQUENCE: METER-SWITCH-FUSE**

R

**DRAWING COM-1
COMMERCIAL UNDERGROUND SERVICE
SINGLE-PHASE OR THREE-PHASE
100 AMPERES OR LESS
SEQUENCE: METER-SWITCH-FUSE**

MGE Will Furnish:

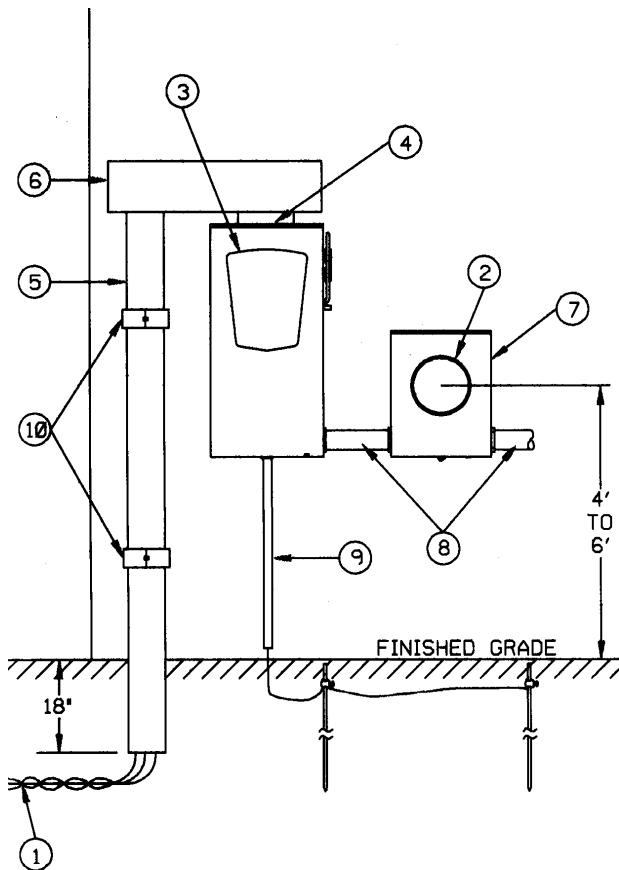
1. Service conductors.
2. Electric meters.

The Customer Will Furnish:

3. MGE-approved 200-ampere underground meter socket with lever bypass. (See **Table 3**.)
 - For 120/240-volt, single-phase, three-wire, use four-terminal socket, or for a pedestal-type socket, use a five-terminal.
 - For 120/208-volt, single-phase, three-wire or 240-volt delta, three-phase, three-wire, use five-terminal socket with 5th terminal at six or nine o'clock.
 - For 120/208-volt, three-phase, four-wire, use seven-terminal socket.
 - See **Drawing MIS-9** for meter wiring schematic.
4. PVC conduit for service entrance conductors, 2" for single-phase, 3" for three-phase.
5. Conduit and wire to main distribution panel.
6. Ground in accordance with applicable electrical codes.
7. Pipe straps as required.

Notes:

- N ♦ A 277-480 volt service requires a switch-fuse-meter sequence (See **Drawing COM-2**).
- ♦ The service entrance equipment shown is constructed for underground service. For overhead service, omit Item 4 and install service conduit, conductor, and weatherhead in accordance with applicable codes. (See **Drawing COM-6**.)
- ♦ A main disconnect switch with current-limiting fuses will be required if the available fault current exceeds the rating of the meter socket and service entrance equipment.
- ♦ See **pages C2 and C3** for additional notes.



COM-2

**COMMERCIAL UNDERGROUND SERVICE
SINGLE-PHASE OR THREE-PHASE
101 TO 200 AMPERES
SEQUENCE: SWITCH-FUSE-METER**

**DRAWING COM-2
COMMERCIAL UNDERGROUND SERVICE
SINGLE-PHASE OR THREE-PHASE
101 TO 200 AMPERES
SEQUENCE: SWITCH-FUSE-METER**

MGE Will Furnish:

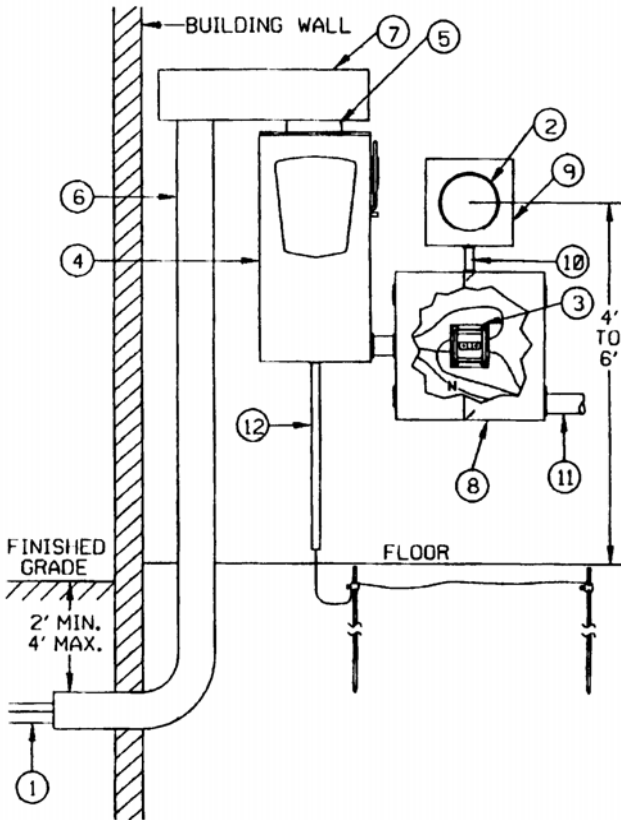
1. Service conductors.
2. Electric meter.

The Customer Will Furnish:

3. Main disconnect switch, fused at 200 amperes or less, with current-limiting fusing, if necessary.
4. MGE- and code-approved transition between gutter and main switch. (See **Table 7**.)
5. Service entrance conduit, minimum 4" PVC.
6. Gutter as specified on **pages C2 and C3**.
7. MGE-approved, heavy-duty meter socket with lever bypass and jaw release. See service equipment, **Table 3**.
 - For 120/240-volt, single-phase, three-wire, use four-terminal socket.
 - For 120/208-volt, single-phase, three-wire or 240-volt delta, three-phase, three-wire, use five-terminal socket with 5th terminal at six or nine o'clock.
 - For 120/208-volt or 277/480-volt, three-phase, four-wire, use seven-terminal socket.
 - See **Drawing MIS-9** for meter wiring schematics.
8. Conduit and wiring to customer's main distribution panel.
9. Ground in accordance with applicable electrical codes.
10. Pipe straps as required.

Notes:

- ◆ The service entrance equipment shown is constructed for underground service. For overhead service, omit Items 4, 5, and 6 and install service conduit and weatherhead in accordance with applicable codes. (See **Drawing COM-6**.)
- ◆ See **pages C2 and C3** for additional notes.



COM-3

**COMMERCIAL UNDERGROUND SERVICE
120/240-VOLT, SINGLE-PHASE, THREE-WIRE
201 TO 600 AMPERES
SEQUENCE: SWITCH-FUSE-METER**

**DRAWING COM-3
COMMERCIAL UNDERGROUND SERVICE
120/240-VOLT, SINGLE-PHASE, THREE-WIRE
201 TO 600 AMPERES
SEQUENCE: SWITCH-FUSE-METER**

MGE Will Furnish:

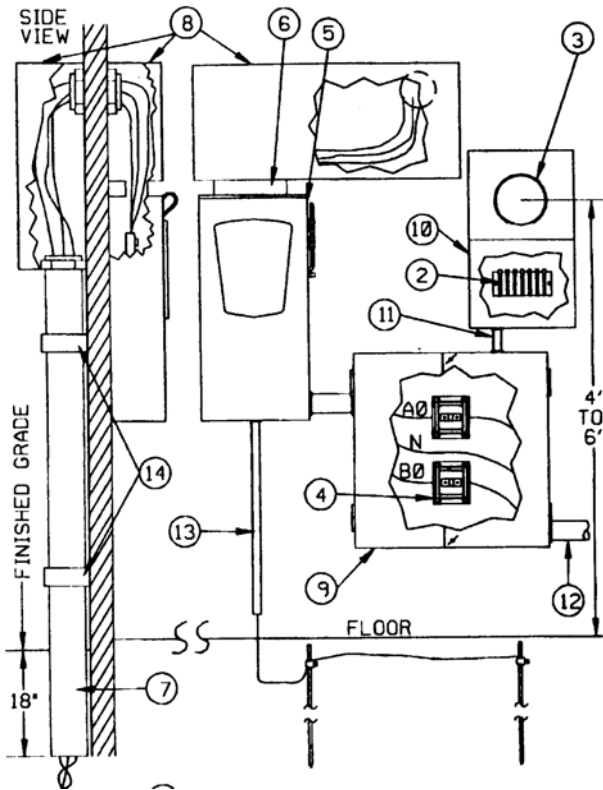
1. Service conductors.
2. Electric meter.
3. "Window"-type current transformer, installed by customer.

The Customer Will Furnish:

4. Main disconnect switch with current-limiting fusing, if necessary.
5. MGE- and code-approved transition between gutter and main switch. (See **Table 7**.)
6. Service entrance conduit(s) as specified on **pages C2 and C3**.
7. Gutter as specified on **pages C2 and C3**.
8. Current transformer cabinet with provisions for padlocking, minimum size 18" x 18" x 9" deep.
9. MGE-approved transformer-rated meter socket. (See **Table 3A**.)
10. One-inch rigid conduit for meter wiring.
11. Conduit and wire to customer's distribution panel.
12. Ground in accordance with applicable electrical codes.

Notes:

- ◆ The service entrance equipment shown is constructed for underground service. For overhead service, omit Items 5, 6, and 7 and install service conduit and weatherhead in accordance with applicable codes. (See **Drawing COM-6**.)
- ◆ Transformer-rated meter socket requires the use of a fifth terminal at nine o'clock. (See **Table 3A**.)
- ◆ See **pages C2 and C3** for additional notes.



COM-4

**COMMERCIAL UNDERGROUND SERVICE
120/208-VOLT, SINGLE-PHASE, THREE-WIRE
201 TO 600 AMPERES
SEQUENCE: SWITCH-FUSE-METER**

**DRAWING COM-4
COMMERCIAL UNDERGROUND SERVICE
120/208-VOLT, SINGLE-PHASE, THREE-WIRE
201 TO 600 AMPERES
SEQUENCE: SWITCH-FUSE-METER**

MGE Will Furnish:

1. Service conductors.
2. Meter test switch, installed by customer.
3. Electric meter and wiring to test switch.
4. "Window"-type current transformers, installed by customer.

The Customer Will Furnish:

5. Main disconnect switch with current-limiting fusing, if necessary.
6. MGE- and code-approved transition between gutter and main switch. (See **Table 7.**)
7. Service entrance conduit(s) as specified on **pages C2 and C3.**
8. Gutter as specified on **pages C2 and C3.** The gutter can be installed horizontally or vertically.
9. Current transformer cabinet with provisions for padlocking, minimum size 24" x 24" x 9" deep.
10. MGE-approved transformer-rated meter socket. (See **Table 3A.**)
11. One-inch rigid conduit for meter wiring.
12. Conduit and wire to customer's distribution panel.
13. Ground in accordance with applicable electrical codes.
14. Pipe straps as required.

Notes:

- ◆ The service entrance equipment shown is constructed for underground service. For overhead service, omit Items 6, 7, and 8 and install service conduit and weatherhead in accordance with applicable codes. (See **Drawing COM-6.**)
- ◆ See **pages C2 and C3** for additional notes.



**DRAWING COM-5
COMMERCIAL UNDERGROUND SERVICE
240-VOLT, THREE-PHASE, THREE-WIRE
GREATER THAN 200 AMPERES
SEQUENCE: SWITCH-FUSE-METER**

MGE Will Furnish:

1. Service conductors.
2. Meter test switch, installed by customer.
3. Electric meter and wiring to test switch.
4. "Window"-type current transformers, installed by customer.

The Customer Will Furnish:

5. Main disconnect switch with current-limiting fusing, if necessary.
6. MGE- and code-approved transition between gutter and main switch. (See **Table 7**.)
7. Service entrance conduit(s) as specified on **pages C2 and C3**.
8. Gutter as specified on **pages C2 and C3**.
9. Current transformer cabinet with provisions for padlocking, minimum size 24" x 24" x 9" deep.
10. MGE-approved transformer-rated meter socket. (See **Table 3A**.)
11. One-inch rigid conduit for meter wiring.
12. Conduit and wire to customer's distribution panel.
13. Ground in accordance with applicable electrical codes.

Notes:

- ◆ The service entrance equipment shown is constructed for underground service. For overhead service, omit Items 6, 7, and 8 and install service conduit and weatherhead in accordance with applicable codes. (See **Drawing COM-6**.)
- ◆ See **pages C2 and C3** for additional notes.



**COM-6
COMMERCIAL OVERHEAD SERVICE
THREE-PHASE, FOUR-WIRE
201 TO 400 AMPERES
SEQUENCE: SWITCH-FUSE-METER**



**DRAWING COM-6
COMMERCIAL OVERHEAD SERVICE
THREE-PHASE, FOUR-WIRE
201 TO 400 AMPERES
SEQUENCE: SWITCH-FUSE-METER**

MGE Will Furnish:

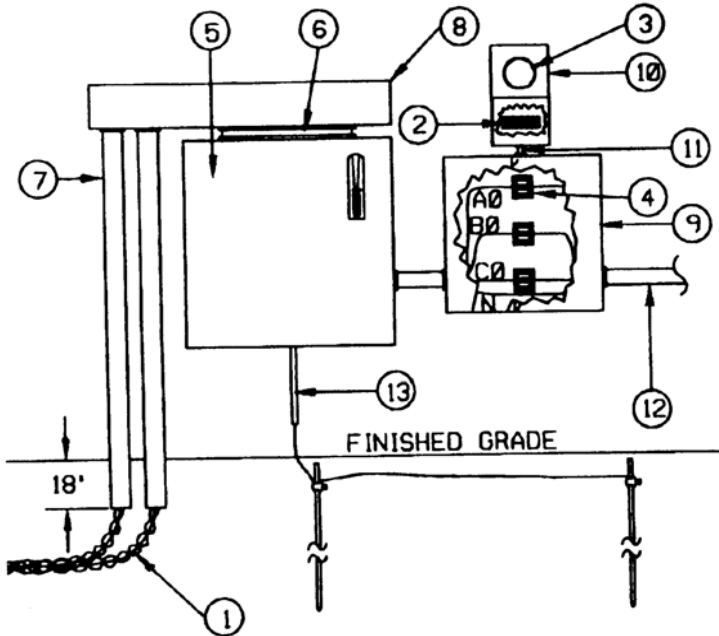
1. Overhead service conductors.
2. Compression-type connectors. MGE to make final connection.
3. Meter test switch, installed by customer.
4. Electric meter and wiring to test switch.
5. "Window"-type current transformers, installed by customer.

The Customer Will Furnish:

6. Main disconnect switch with current-limiting fusing, if necessary.
7. Current transformer cabinet with provisions for padlocking, minimum size 24" x 24" x 9" deep.
8. MGE-approved, transformer-rated meter socket. (See **Table 3A.**)
9. One-inch rigid conduit for meter wiring.
10. Conduit and wire to customer's distribution panel.
11. Ground in accordance with applicable electrical codes.
12. Riser pipe and weatherhead in accordance with applicable codes. Rigid steel riser pipe is required if attachment point is on the riser pipe.
13. Service conductors to main switch. Leave 36-inch-long wire leads for connection to MGE service drop.
14. Point of attachment—suitable insulated spool and bracket to support service drop.

Notes:

- ◆ The point of attachment must be located to provide adequate clearance for the overhead service conductors in accordance with MGE's Overhead Clearance Guidelines. (See **MIS-1A and 1B.**)
- ◆ See **pages C2 and C3** for additional notes.



COM-7

**COMMERCIAL UNDERGROUND SERVICE
THREE-PHASE, FOUR-WIRE
GREATER THAN 200 AMPERES
SEQUENCE: SWITCH-FUSE-METER**



**DRAWING COM-7
COMMERCIAL UNDERGROUND SERVICE
THREE-PHASE, FOUR-WIRE
GREATER THAN 200 AMPERES
SEQUENCE: SWITCH-FUSE-METER**

MGE Will Furnish:

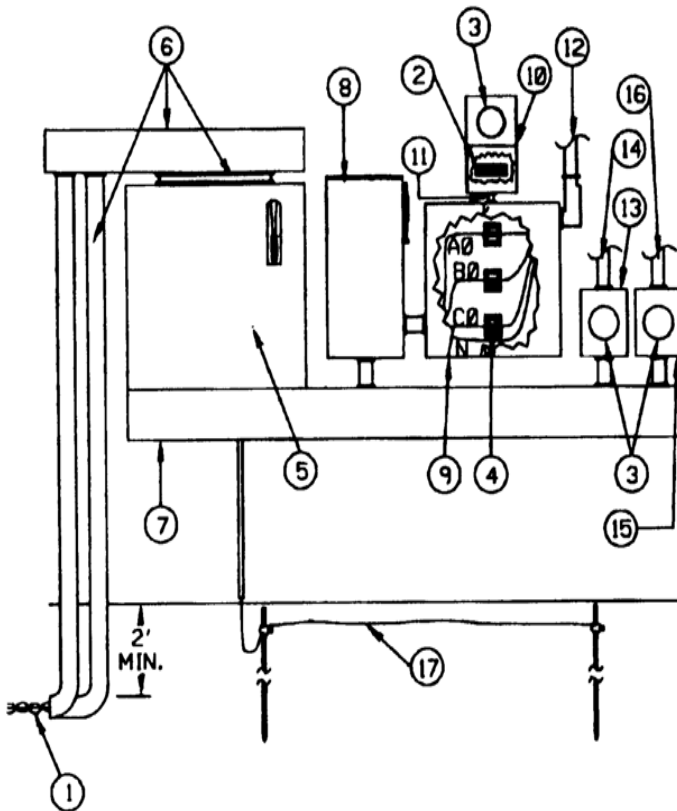
1. Service conductors.
2. Meter test switch, installed by customer.
3. Electric meter and wiring to test switch.
4. "Window"-type current transformers, installed by customer.

The Customer Will Furnish:

5. Main disconnect switch with current-limiting fusing, if necessary.
6. MGE- and code-approved transition between gutter and main switch. (See **Table 7**.)
7. Service entrance conduit(s) as specified on **pages C2 and C3**.
8. Gutter as specified on **pages C2 and C3**.
9. Current transformer cabinet with provisions for padlocking. Services 1,200 amperes or less, minimum size 36" x 36" x 9" deep; for services larger than 1,200 amperes, 36" x 36" x 12".
10. MGE-approved transformer-rated meter socket. (See **Table 3A**.)
11. One-inch rigid conduit for meter wiring.
12. Conduit and wire to customer's distribution panel.
13. Ground in accordance with applicable electrical codes.

Notes:

- ♦ See **pages C2 and C3** for additional notes.

**COM-8**

**COMMERCIAL UNDERGROUND SERVICE,
MULTIPLE METER**
-ONE METER GREATER THAN 200 AMPERES
SEQUENCE: MAIN DISCONNECT-SWITCH-FUSE-METER
-ONE METER 101 TO 200 AMPERES
-ONE METER 100 AMPERES OR LESS
SEQUENCE: MAIN DISCONNECT-METER-SWITCH-FUSE

**DRAWING COM-8
COMMERCIAL UNDERGROUND SERVICE,
MULTIPLE METERS WITH VARIOUS SERVICE SIZES**

MGE Will Furnish:

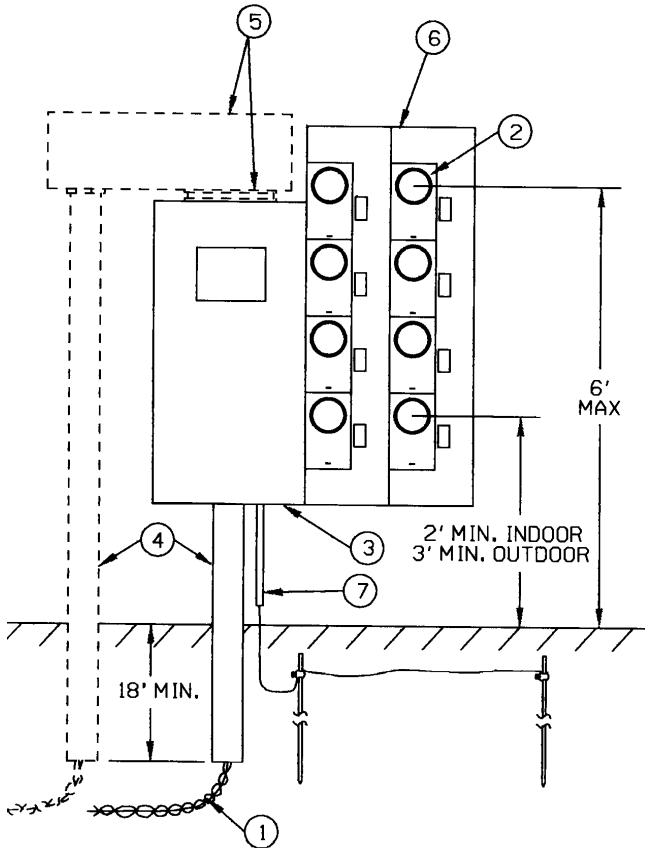
1. Service conductors.
2. Meter test switch, installed by customer.
3. Electric meters and wiring to test switch, if applicable.
4. "Window"-type current transformers, installed by customer.

The Customer Will Furnish:

5. A main building disconnect switch with current-limiting fusing, if necessary.
6. Service conduits, gutter, and approved transition.
See **pages C2 and C3** for specified conduit and gutter sizes.
See **Table 7** for approved transition.
7. Sealable raceway for unmetereed wire only.
8. Main switch for service greater than 200 amperes. Sequence:
Switch-Fuse-Meter.
9. Current transformer cabinet with provisions for padlocking.
Services 1,200 amperes or less, minimum size 36" x 36" x 9"
deep; for services larger than 1,200 amperes,
36" x 36" x 12".
10. MGE-approved transformer-rated meter socket.
(See **Table 3A.**)
11. One-inch rigid conduit for meter wiring.
12. Conduit and wire to a customer's distribution panel that is
greater than 200 amperes.
13. MGE-approved, heavy-duty meter socket with lever bypass
and jaw release. (See **Table 3.**)
14. Conduit and wire to customer's distribution panels of 101 to
200 amperes.
15. MGE-approved meter socket with lever bypass.
(See **Table 3.**)
16. Conduit and wire to customer's distribution panel of
100 amperes or less.
17. Ground in accordance with applicable electrical codes.

Notes:

- ◆ Proper metering sequence must be maintained for all meters
after the main building disconnect switch.
- ◆ Meter heights must be between four feet to six feet off floor.
- ◆ See **pages C2 and C3** for additional notes.



COM-9

**COMMERCIAL MULTIPLE METERING INSTALLATION
SINGLE-PHASE OR THREE-PHASE
200 AMPERES OR LESS PER METER POSITION
SEQUENCE: MAIN DISCONNECT-METER-SWITCH-FUSE**



**DRAWING COM-9
COMMERCIAL MULTIPLE METERING INSTALLATION
SINGLE-PHASE OR THREE-PHASE
200 AMPERES OR LESS PER METER POSITION
SEQUENCE: MAIN DISCONNECT-METER-SWITCH-FUSE**

MGE Will Furnish:

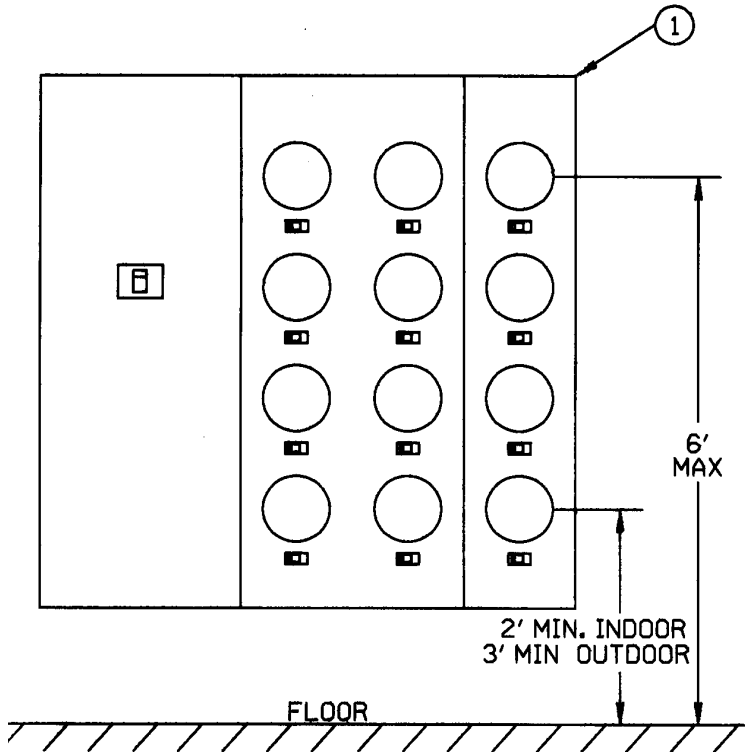
1. Service conductors.
2. Electric meters.

Customer Will Furnish:

3. Prebussed main building disconnect switch with current-limiting fusing, if necessary.
4. Service conduit(s) as specified on **pages C2 and C3**.
5. Gutter and MGE- and code-approved transition, utilize in a top-fed main disconnect application. See **pages C2 and C3** for specified gutter sizes. See **Table 7** for approved transition.
6. Prebussed meter stack. Meter stacks to be approved by MGE on a case-by-case basis.
 - Required Duncan HQ-style meter socket with lever bypass and jaw release.
7. Ground in accordance with applicable codes.

Notes:

- ◆ The maximum single-phase main disconnect switch size is 600 amperes.
- ◆ Each meter socket must be marked to identify the area or apartment that it serves.
- ◆ See **pages C2 and C3** for additional notes.
- ◆ If a bottom-fed disconnect is used, a minimum distance of 24 inches must be maintained from bottom of the switch to the line-side termination lugs.



COM-10

**INDOOR/OUTDOOR COMMERCIAL MULTIPLE
METERING INSTALLATION
100 AMPERES OR LESS PER METER POSITION
SEQUENCE: MAIN DISCONNECT-METER-SWITCH-FUSE**



**DRAWING COM-10
INDOOR/OUTDOOR COMMERCIAL MULTIPLE
METERING INSTALLATION
100 AMPERES OR LESS PER POSITION
SEQUENCE: MAIN DISCONNECT-METER-SWITCH-FUSE**

1. Prebussed main disconnect switch and meter stack furnished by the customer.

Notes:

- ◆ All service and meter configurations must be approved by MGE on a case-by-case basis.
- ◆ For MGE service conductor to the main switch, service entrance conduits and gutter sizes must be approved by MGE on a case-by-case basis.
- ◆ Meter sockets require use of an approved manual-type bypass.
- ◆ Outdoor applications require UL listed weatherproof equipment.
- ◆ The maximum single-phase main disconnect switch size is 600 amperes.
- ◆ Each meter socket must be marked to identify the area that it serves.
- ◆ Protective posts and/or rigid metal service conduit will be required if subject to vehicular traffic.
- ◆ Call Diggers Hotline to locate underground utilities prior to driving ground rods or stubbing service conduits.
- ◆ See **pages C2 and C3** for additional notes.

**DRAWING COM-11
COMMERCIAL METERING TRANSFORMER CABINET
THREE-PHASE, FOUR-WIRE, 250 VOLTS OR LESS
400 TO 1,600 AMPERES
SINGLE METER INSTALLATION ONLY
SEQUENCE: METER-SWITCH-FUSE
(Not to Be Used in the Low-Voltage Network Area)**

MGE Will Furnish:

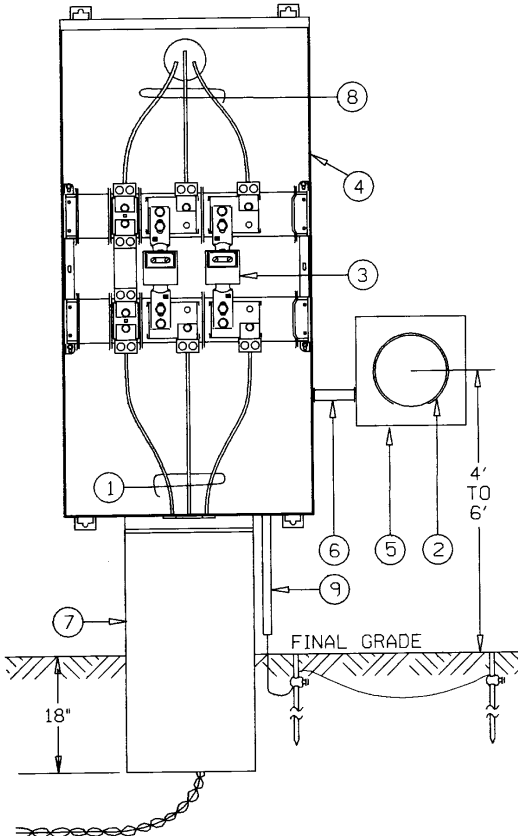
1. Service conductors.
2. Meter test switch, installed by customer.
3. Electric meter and wiring to test switch.
4. Bar-type current transformers, installed by customer.

The Customer Will Furnish:

5. MGE-approved prebussed-type enclosure with the proper number of termination lugs sized to accept 4/0 through 500 MCM AL/CU. (See **Table 4**.)
6. MGE-approved transformer-rated meter socket. (See **Table 3A**.)
7. One-inch rigid conduit for meter wiring.
8. MGE-approved underground service raceway(s) (See **Table 8**).
 - A four-inch service conduit(s) as specified on **pages C2 and C3**, may be substituted for the raceway.
9. Conduit and wire to main distribution panel.
 - MGE conductors enter the bottom of the cabinet, the customer's conductors must exit the cabinet above the load-side termination lugs.
10. Ground in accordance with applicable electrical codes.

Notes:

- ◆ A distance of 24 inches must be maintained from the bottom of transformer enclosure to line-side termination lugs.
- ◆ See **pages C2 and C3** for additional notes.



COM-12

**COMMERCIAL METERING TRANSFORMER CABINET
SINGLE-PHASE, THREE-WIRE, 250-VOLTS OR LESS
400 TO 600 AMPERES
SINGLE-METER INSTALLATION ONLY
SEQUENCE: METER-SWITCH-FUSE
(Not to be Used in the Low-Voltage Network Area)**

**DRAWING COM-12
COMMERCIAL METERING TRANSFORMER CABINET
SINGLE-PHASE, THREE-WIRE, 250-VOLTS OR LESS
400 TO 600 AMPERES
SINGLE METER INSTALLATION ONLY
SEQUENCE: METER-SWITCH-FUSE
(Not to be Used in the Low-Voltage Network Area)**

MGE Will Furnish:

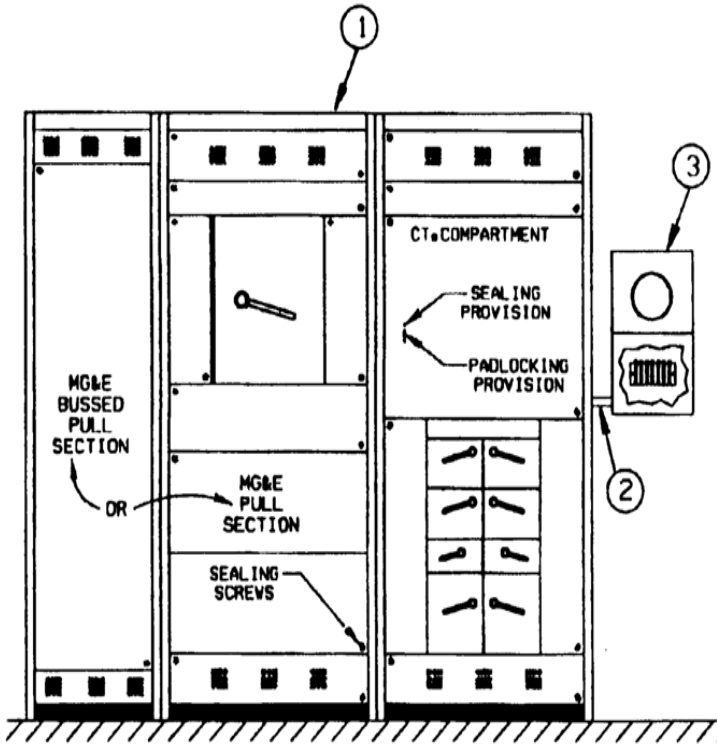
1. Service conductors.
2. Electric meter.
3. Bar-type current transformers, installed by customer.

The Customer Will Furnish:

4. MGE-approved prebussed-type enclosure with the proper number of termination lugs sized to accept 4/0 through 500 MCM AL/CU. (See **Table 4**.)
5. MGE-approved transformer rated meter socket. (See **Table 3A**.)
6. One-inch rigid conduit for meter wiring.
7. MGE-approved underground service raceway (See **Table 8**).
 - Four-inch service conduit(s) as specified on **pages C2 and C3**, may be substituted for the raceway.
8. Conduit and wire to main distribution panel.
 - MGE conductors enter the bottom of the cabinet, the customer's conductors must exit the cabinet above the load-side termination lugs.
9. Ground in accordance with applicable electrical codes.

Notes:

- ◆ A distance of 24 inches must be maintained from the bottom of transformer enclosure to line-side termination lugs.
- ◆ See **pages C2 and C3** for additional notes.



COM-13

**CUSTOMER-OWNED SECONDARY SWITCHBOARD
WITH MAIN DISTRIBUTION PANEL AND METERING
SEQUENCE: SWITCH-FUSE-METER**

**DRAWING COM-13
CUSTOMER-OWNED SECONDARY SWITCHBOARD
WITH MAIN DISTRIBUTION PANEL AND METERING
SEQUENCE: SWITCH-FUSE-METER**

The switchboard shown is typical. Each switchboard will be treated on an individual basis. Consult MGE for approval of each switchboard on a case-by-case basis.

MGE Will Furnish:

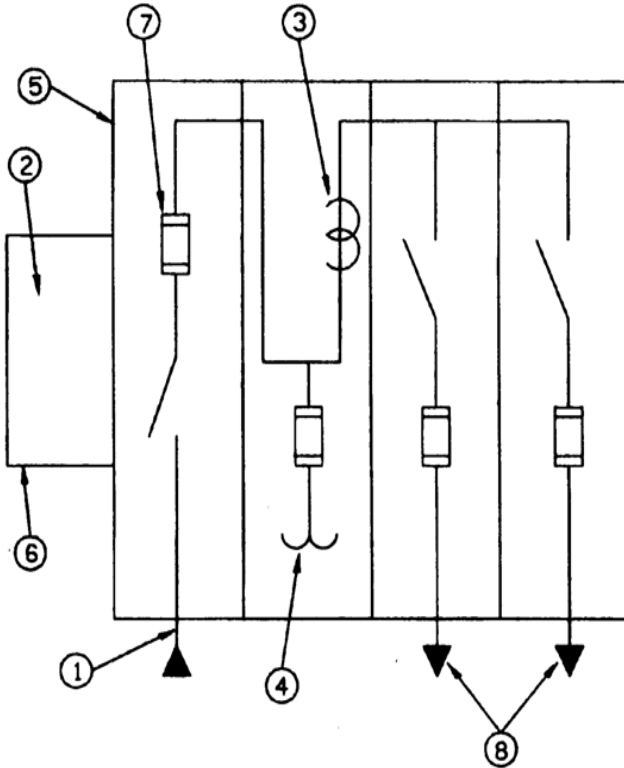
- "Window"-type current transformers installed by the customer or switchboard manufacturer. The current transformer compartment must be sized to accommodate standard MGE current transformers. Contact MGE metering for specific information.

The Customer Will Furnish:

1. Customer-owned secondary switchboard with main disconnect switch, main distribution panel, and metering.
2. Conduit for metering wires provided and installed by customer.
3. MGE-approved transformer-rated meter socket. (See **Table 3A.**)

Notes:

- ◆ A minimum distance of 24 inches must be maintained from the top of the service conduits to the line-side termination lugs.



COM-14

**ONE-LINE DIAGRAM FOR CUSTOMER-OWNED
PRIMARY METERING SWITCHGEAR, 4.16 KV OR 13.8 KV
SEQUENCE: SWITCH-FUSE-METER**



**DRAWING COM-14
ONE-LINE DIAGRAM FOR CUSTOMER-OWNED
PRIMARY METERING SWITCHGEAR, 4.16 KV OR 13.8 KV
SEQUENCE: SWITCH-FUSE-METER**

MGE Will Furnish:

1. High-voltage (4.16 kV or 13.8 kV) service conductors.
2. Metering equipment (not shown).
3. Bar-type current transformers, installed by customer or switchgear manufacturer.
4. Potential transformers, installed by customer or switchgear manufacturer.

The Customer Will Furnish:

5. Primary metering switchgear, as approved by MGE.
6. Meter equipment enclosure, as specified by MGE.
(See **Table 3A.**)
7. Main service fusing, as approved by MGE.
8. Fusing and primary cable to transformers.

Notes:

- ◆ Primary metered service is available at limited locations and at MGE's discretion. Contact MGE for details.
- ◆ Conduit for metering wires provided and installed by customer.



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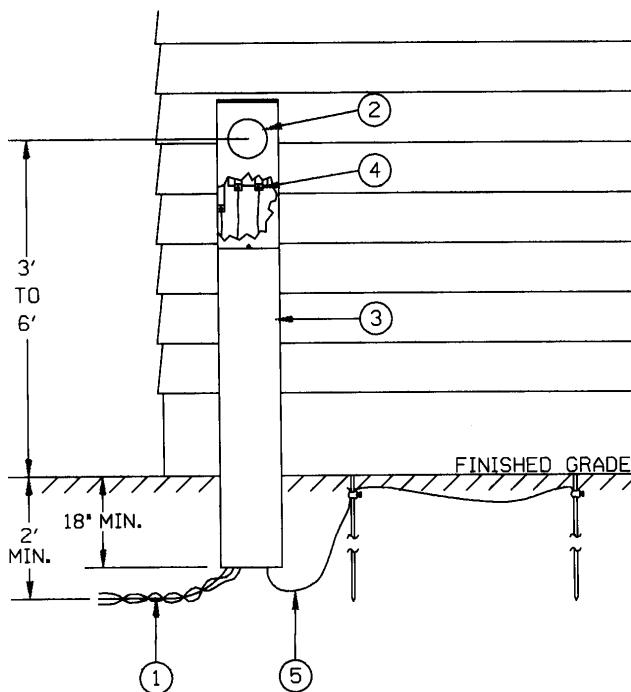
RESIDENTIAL SERVICES

R = Revised, N = New, D = Deletion

RESIDENTIAL SERVICES

Underground service-	pedestal-type meter socket. 200 amperes or less.	RES-1
Underground service-	200 amperes or less.	RES-2
Overhead service	- attachment to building. 200 amperes or less.	RES-3
Overhead service	- attachment through the roof. 200 amperes or less	RES-4
Underground service-	single-phase, 320 amperes	RES-5
Underground service-	single meter installation. 400 to 600 amperes.	RES-6
Underground service-	2 to 6 meters. 200 amperes or less per position.	RES-7
Underground service-	7 meters or more. 200 amperes or less per position.	RES-8
Electric water heater	- 200 amperes or less.	RES-9
Electric water heater	- one-line diagram.	RES-9A RES-9B

Notes: See **Miscellaneous-2** for clearance guidelines between MGE Electric and Gas meters.



RES-1

**RESIDENTIAL PEDESTAL-TYPE
UNDERGROUND SERVICE
200 AMPERES OR LESS
SEQUENCE: METER-SWITCH-FUSE**



**DRAWING RES-1
RESIDENTIAL PEDESTAL-TYPE
UNDERGROUND SERVICE
200 AMPERES OR LESS
SEQUENCE: METER-SWITCH-FUSE**

MGE Will Furnish:

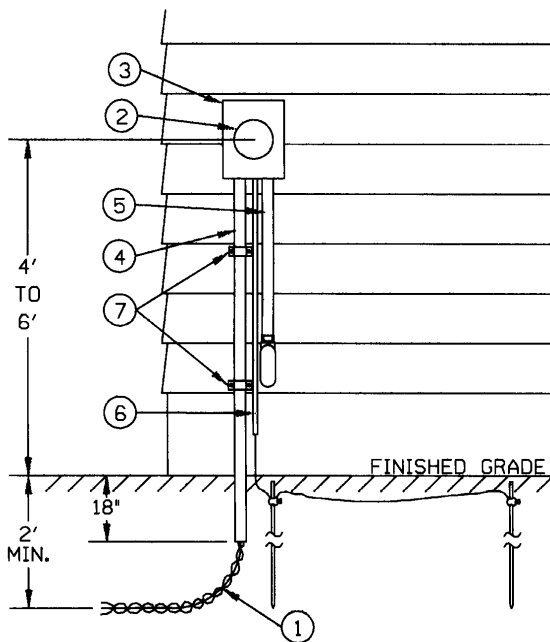
1. Service conductors.
2. Electric meter.

The Customer Will Furnish:

3. MGE-approved, pedestal-type meter socket with horn bypass. (See **Table 1**.)
4. Mechanical-type lugs.
5. Ground in accordance with applicable electrical codes.

Notes:

- ◆ Call Diggers Hotline to locate underground utilities prior to driving ground rods or stubbing service entrance conduit.
- ◆ Protective posts will be required if subject to vehicular traffic.



RES-2

**RESIDENTIAL UNDERGROUND SERVICE
200 AMPERES OR LESS
SEQUENCE: METER-SWITCH-FUSE**



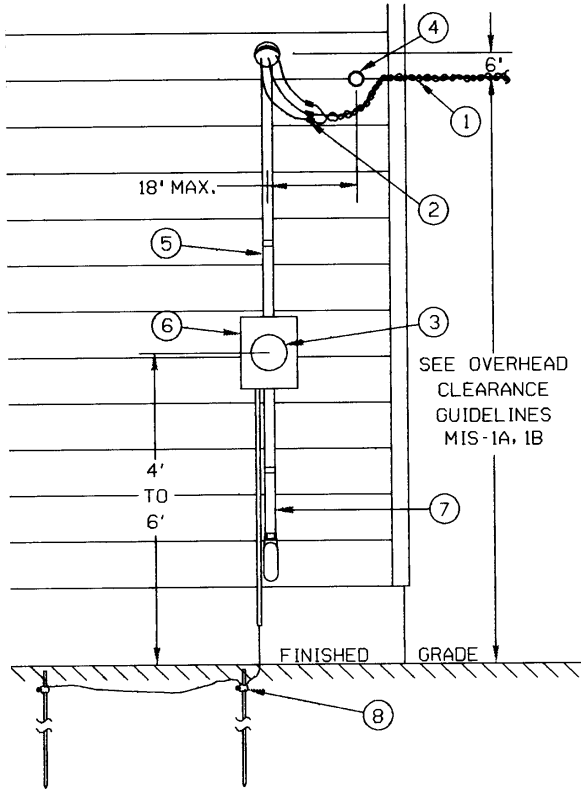
**DRAWING RES-2
RESIDENTIAL UNDERGROUND SERVICE
200 AMPERES OR LESS
SEQUENCE: METER-SWITCH-FUSE**

MGE Will Furnish:

1. Service conductors.
2. Electric meter.

The Customer Will Furnish:

3. MGE-approved meter socket with horn bypass. (See **Table 1.**)
 4. Two-inch PVC conduit for service conductors.
 5. Conduit and wire to main distribution panel.
 6. Ground in accordance with applicable electrical codes.
 7. Pipe straps as required.
- ◆ Call Diggers Hotline to locate underground utilities prior to driving ground rods or stubbing service entrance conduit.
 - ◆ Protective posts and/or rigid metal service conduit will be required if subject to vehicular traffic.



RES-3

**RESIDENTIAL OVERHEAD SERVICE
ATTACHMENT TO BUILDING
200 AMPERES OR LESS
SEQUENCE: METER-SWITCH-FUSE**



**DRAWING RES-3
RESIDENTIAL OVERHEAD SERVICE
ATTACHMENT TO BUILDING
200 AMPERES OR LESS
SEQUENCE: METER-SWITCH-FUSE**

MGE Will Furnish:

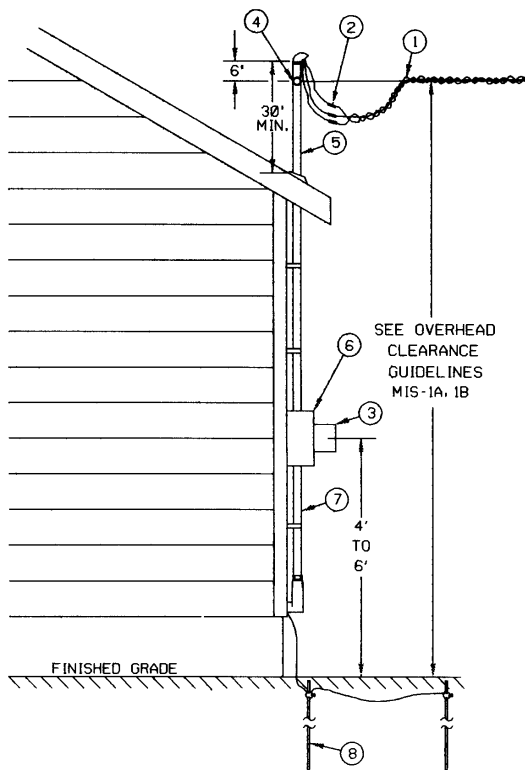
1. Overhead service conductors.
2. Compression-type connectors. MGE to make final connection.
3. Electric meter.

The Customer Will Furnish:

4. Point of Attachment—suitable insulated spool and bracket to support service drop conductors.
5. Service riser, conductors, and weatherhead. Leave 36-inch-long wire leads for connection to MGE service drop.
6. MGE-approved meter socket with horn bypass. (See **Table 1**.)
7. Conduit and wire to main distribution panel.
8. Ground in accordance with applicable electrical codes.

Notes:

- ◆ The point of attachment must be located to provide adequate clearance for the overhead service conductors in accordance with MGE's Overhead Clearance Guidelines. (See **MIS-1A, 1B**.)
- ◆ Call Diggers Hotline to locate underground utilities prior to driving ground rods.
- ◆ Protective posts will be required if subject to vehicular traffic.



RES-4

**RESIDENTIAL OVERHEAD SERVICE
ATTACHMENT THROUGH THE ROOF
200 AMPERES OR LESS
SEQUENCE: METER-SWITCH-FUSE**

**DRAWING RES-4
RESIDENTIAL OVERHEAD SERVICE
ATTACHMENT THROUGH THE ROOF
200 AMPERES OR LESS
SEQUENCE: METER-SWITCH-FUSE**

MGE Will Furnish:

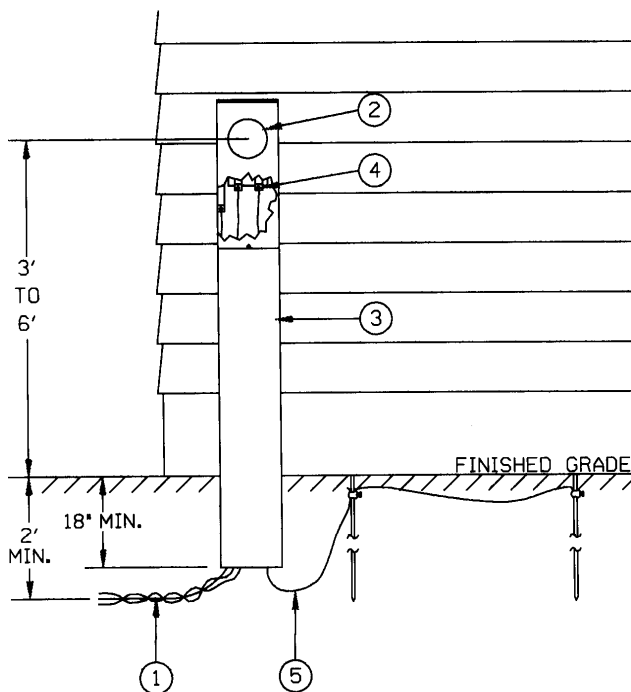
1. Overhead service conductors.
2. Compression-type connectors. MGE to make final connection.
3. Electric meter.

The Customer Will Furnish:

4. Point of Attachment—suitable insulated spool and bracket to support service drop conductors.
5. Service riser, conductors, and weatherhead, minimum two-inch rigid conduit. Leave 36-inch-long wire leads for connection to MGE service.
6. MGE-approved meter socket with horn bypass. (See **Table 1.**)
7. Conduit and wire to main distribution panel.
8. Ground in accordance with applicable electrical codes.

Notes:

- ◆ The customer must install a guy if service drop attachment is higher than 48" above the roof.
- ◆ The point of attachment must be located to provide adequate clearance for the overhead service conductors in accordance with MGE's Overhead Clearance Guidelines. (See **MIS-1A, 1B.**)
- ◆ Call Diggers Hotline to locate underground utilities prior to driving ground rods.
- ◆ Protective posts will be required if subject to vehicular traffic.



RES-5

**RESIDENTIAL UNDERGROUND SERVICE
320 AMPERES, SINGLE-PHASE
SEQUENCE: METER-SWITCH-FUSE**



**N DRAWING RES-5
RESIDENTIAL UNDERGROUND SERVICE
320 AMPERES, SINGLE-PHASE,
SEQUENCE: METER-SWITCH-FUSE**

MGE Will Furnish:

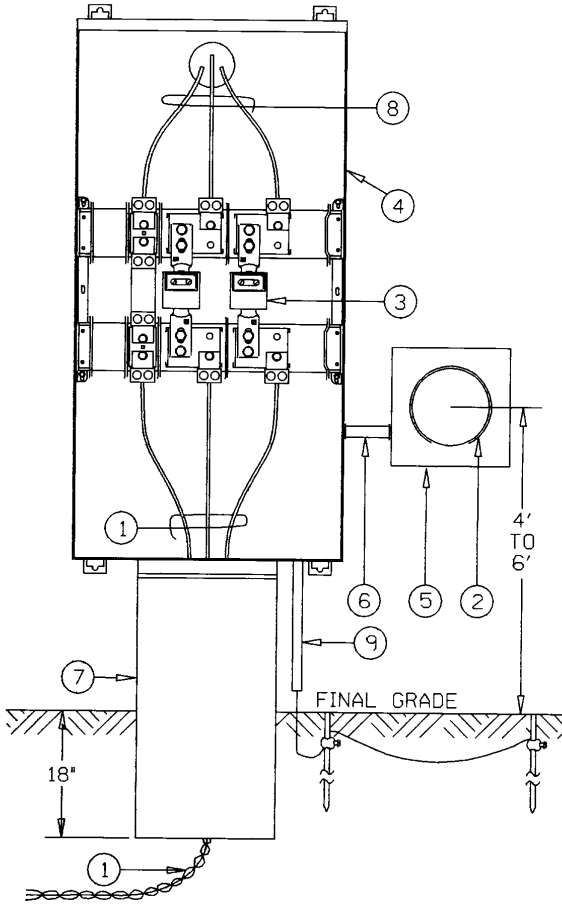
1. Service conductors.
2. Electric meter.

The Customer Will Furnish:

3. MGE-approved, pedestal-type meter socket with horn bypass
(See **Table 1**.)
4. Mechanical-type lugs.
5. Ground in accordance with applicable electrical codes.

Notes:

- ◆ Call Diggers Hotline to locate underground utilities prior to driving ground rods or stubbing service entrance conduit.
- ◆ Protective posts will be required if subject to vehicular traffic.



RES-6

**RESIDENTIAL UNDERGROUND SERVICE
400 TO 600 AMPERES
SEQUENCE: METER-SWITCH-FUSE
(Not to be used in low-voltage network area.)**

**DRAWING RES-6
RESIDENTIAL UNDERGROUND SERVICE
400 TO 600 AMPERES
SEQUENCE: METER-SWITCH-FUSE
(Not to be used in low-voltage network area.)**

MGE Will Furnish:

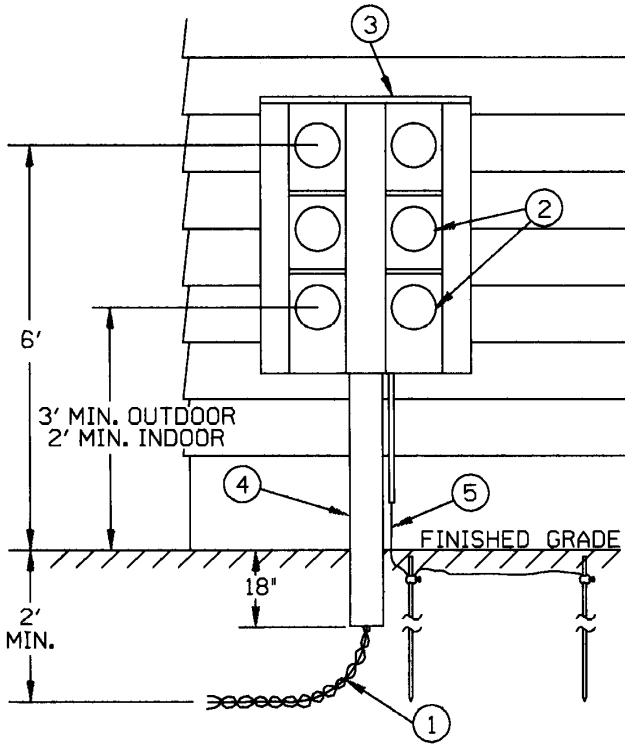
1. Service conductors.
2. Electric meter.
3. Bar-type current transformers, installed by customer.

The Customer Will Furnish:

4. MGE-approved prebussed-type enclosure with the proper number of termination lugs sized to accept 4/0 through 500 MCM AL/CU. (See **Table 4.**)
5. MGE-approved meter socket with horn bypass. (See **Table 3A.**)
6. One-inch rigid conduit for meter wiring.
7. MGE-approved underground service raceway (See Table 8).
 - Four-inch service conduit(s) may be substituted for the raceway.
8. Conduit and wire to main distribution panel.
 - MGE conductors enter into the cabinet from the bottom, the customer's conductors must exit the cabinet above the line-side termination lugs.
9. Ground in accordance with applicable electrical codes.

Notes:

- ◆ Transocket and meter must be placed outdoors in a residential application.
- ◆ A distance of 24" must be maintained from the bottom of transformer enclosure to line-side termination lugs.
- ◆ Call Diggers Hotline to locate underground utilities prior to driving ground rods or stubbing service entrance conduit.
- ◆ Protective posts and/or rigid metal service conduit will be required if subject to vehicular traffic.



RES-7

**RESIDENTIAL MULTIPLE METER
UNDERGROUND SERVICE
2 TO 6 METERS,
200 AMPERES OR LESS PER POSITION
SEQUENCE: METER-SWITCH-FUSE**

**DRAWING RES-7
RESIDENTIAL MULTIPLE METER
UNDERGROUND SERVICE
2 TO 6 METERS,
200 AMPERES OR LESS PER POSITION
SEQUENCE: METER-SWITCH-FUSE**

MGE Will Furnish:

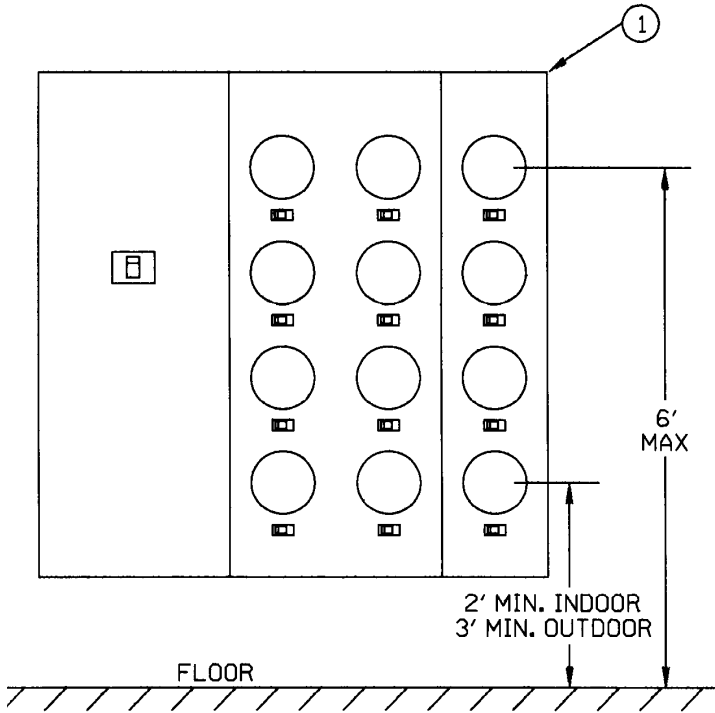
1. Service conductors.
2. Electric meters.

The Customer Will Furnish:

3. MGE-approved 2- to 6-position meter socket. (See **Tables 2 and 2A.**)
4. Four-inch service conduit.
5. Ground in accordance with applicable electrical codes.

Notes:

- ◆ Call Diggers Hotline to locate underground utilities prior to driving ground rods or stubbing service entrance conduit.
- ◆ Protective posts and/or rigid metal service conduit will be required if subject to vehicular traffic.



RES-8

**INDOOR/OUTDOOR RESIDENTIAL
APARTMENT METERING INSTALLATION
200 AMPERES OR LESS PER METER POSITION
SEQUENCE: MAIN DISCONNECT-METER-SWITCH-
FUSE**

**DRAWING RES-8
INDOOR/OUTDOOR RESIDENTIAL
APARTMENT METERING INSTALLATION
200 AMPERES OR LESS PER POSITION
SEQUENCE: MAIN DISCONNECT-METER-SWITCH-
FUSE**

1. Prebussed main disconnect switch and meter stack furnished by customer.

Notes:

- ◆ All service and meter configurations must be approved by MGE on a case-by-case basis.
- ◆ For MGE service conductor to the main switch, service entrance conduits and gutter sizes must be approved by MGE on a case-by-case basis.
- ◆ Meter sockets require use of an approved bypass. When each socket has a separate sealable cover plate which is removable without disturbing other cover plates, utilize a horn-bypass. When the meter cover plate is not removable individually, utilize a manual-type bypass.
- ◆ Outdoor applications require UL listed weatherproof equipment. See sketch for changes in minimum height requirements.
- ◆ The maximum single-phase main disconnect switch size is 600 amperes.
- ◆ Each meter socket must be marked to identify the area or apartment that it serves.
- ◆ Protective posts and/or rigid metal service conduit will be required if subject to vehicular traffic.
- ◆ Call Diggers Hotline to locate underground utilities prior to driving ground rods or stubbing service conduits.

**DRAWING RES-9
RESIDENTIAL CONTROLLED ELECTRIC WATER HEATER
200 AMPERES OR LESS
SEQUENCE: METER-SWITCH-FUSE**

MGE Will Furnish:

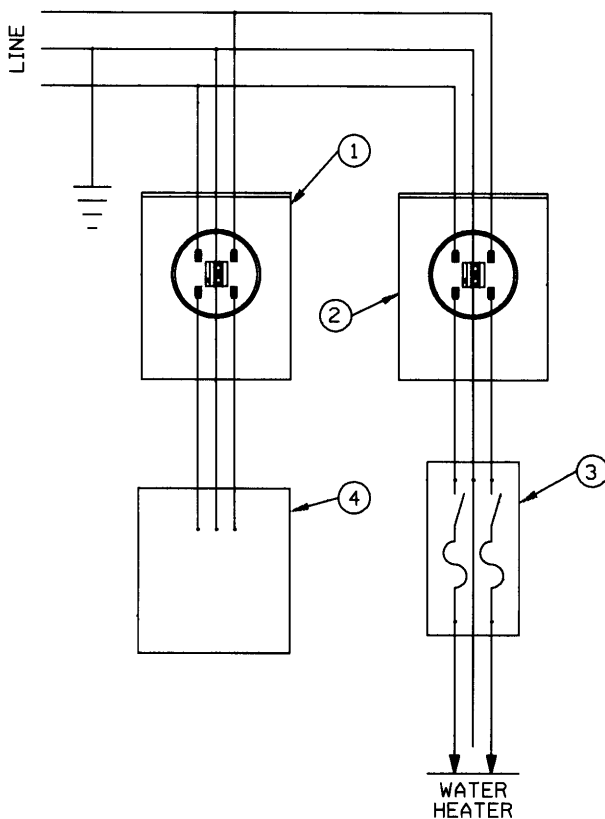
1. Service conductors.
2. House meter.
3. Off-peak meter with time switch built in.

The Customer Will Furnish:

4. MGE-approved duplex meter socket. (See **Table 2.**)
5. PVC conduit, two-inch.
6. Conduit and wire to main distribution panel.
7. Conduit and wire to electric hot water heater.
8. Ground in accordance with applicable electrical codes.
9. Pipe straps as required.

Notes:

- ◆ See **Drawings RES-9A and 9B** for schematic wiring diagrams.
- ◆ Protective posts and/or rigid metal service conduit will be required if equipment is subject to vehicular traffic.



RES-9A

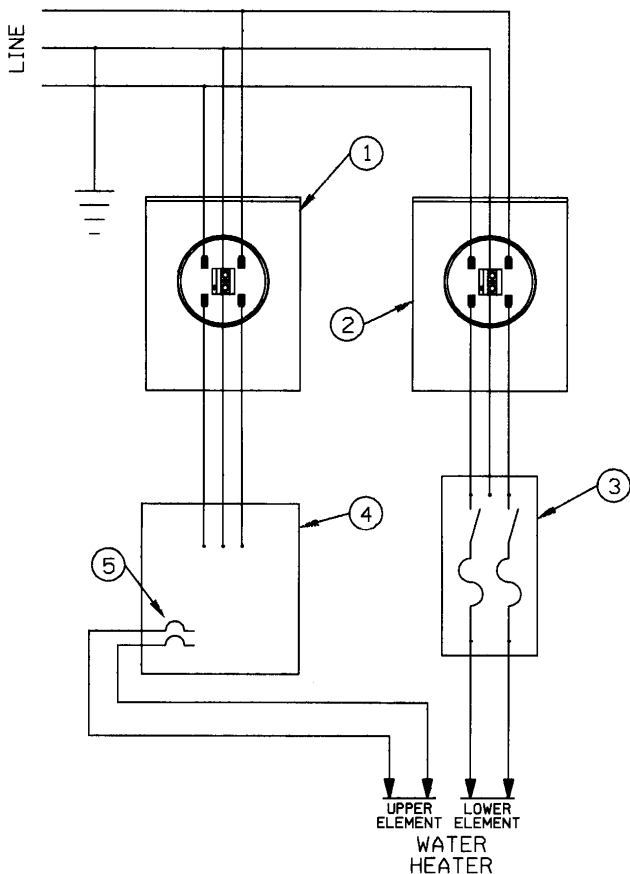
**RESIDENTIAL CONTROLLED
ELECTRIC WATER HEATER
200 AMPERES OR LESS**

**DRAWING RES-9A
RESIDENTIAL CONTROLLED
ELECTRIC WATER HEATER
200 AMPERES OR LESS**

1. House meter.
2. Off-peak meter and time switch.
3. Water heater service switch, maximum 30-ampere fuse or breaker.
4. Main distribution panel.

Notes:

- ◆ See **Drawing MIS-9** for a typical installation of metering equipment.
- ◆ The sum of all heating elements on at any time shall not exceed 5,500 watts.
- ◆ See **Drawing RES-9B** for an alternate installation using split elements.



RES-9B

**RESIDENTIAL CONTROLLED
ELECTRIC WATER HEATER WITH SPLIT ELEMENTS
200 AMPERES OR LESS**

**DRAWING RES-9B
RESIDENTIAL CONTROLLED
ELECTRIC WATER HEATER WITH SPLIT ELEMENTS
200 AMPERES OR LESS**

1. House meter.
2. Off-peak meter and time switch.
3. Off-peak water heater service switch (lower element), maximum 30-ampere fuse or breaker.
4. Main distribution panel.
5. Water heater fuse or breaker on main distribution panel, fed from house meter and connected to upper water heater element.

Notes:

- ◆ See **Drawing MIS-9** for a typical installation of metering equipment.
- ◆ The sum of all heating elements on at any time shall not exceed 5,500 watts.
- ◆ For **Drawing RES-9B**, the lower element is fed from the time switch, and the upper element is fed from the house meter. Both the upper and lower elements must have separate thermostats and temperature-limiting switches. The heating elements shall be interlocked to prevent simultaneous operation.



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NETWORK SERVICE

NETWORK SERVICES

Network Map	- Low-voltage Network Map	NET-1
Residential/Commercial	- 200 amperes or less, single-phase or three-phase	NET-2
Outdoor Residential	- Multiple meters, 200 amperes or less per position, single-phase or three-phase.	NET-3
Commercial	- Multiple meters, 200 amperes or less per position, single-phase or three-phase.	NET-4
Residential Apartment	- Meter stack, 200 amperes or less per position, single-phase or three-phase.	NET-5
Residential/Commercial	- Single meter, 200 ampere or larger, three-phase.	NET-6
Residential/Commercial	- Single meter, 201 to 600 amperes, single-phase.	NET-7

GENERAL NOTES FOR SERVICE ENTRANCE EQUIPMENT

The number of service entrance conduits and minimum gutter size for services requiring a main disconnect switch are as follows:

MAIN SIZE	NUMBER OF SERVICE ENTRANCE CONDUITS	MINIMUM GUTTER SIZE (Larger May Be Required)
200A	1-4 inch	8" x 8" x 24"
400A	1-4 inch	12" x 12" x 24"
600A	2-4 inch	12" x 12" x 24"
800A	2-4 inch	12" x 12" x 24"
1,200A	3-4 inch	12" x 12" x 36"

- ◆ The size of the service entrance conduit may be determined by MGE's existing conduit. Contact MGE for required size.
- ◆ A code and MGE-approved transition is required between the gutter and main switch. (See **Table 7**.)
- ◆ Use of other gutter/transition arrangements meeting proper cable-bending radius must be approved by MGE prior to installation.
- ◆ Conduits may enter the bottom of a switch if a bottom-fed switch is utilized, but a minimum distance of 24" must be maintained from the bottom of the switch to the line-side termination lugs.
- ◆ All switchboard installations and meter stacks must be approved by MGE.
- ◆ Gutters containing unmetered conductors shall be sealable.
- ◆ Protective posts will be required if equipment is subject to vehicular traffic.
- ◆ Call Diggers Hotline to locate underground utilities prior to driving ground rods or stubbing service entrance conduits.



**DRAWING NET-2
RESIDENTIAL OR COMMERCIAL NETWORK SERVICE
120/208-VOLT, SINGLE-PHASE OR THREE-PHASE
200 AMPERES OR LESS
SEQUENCE: SWITCH-FUSE-METER**

MGE Will Furnish:

1. Service conductors and conduit.
2. Electric meter.

The Customer Will Furnish:

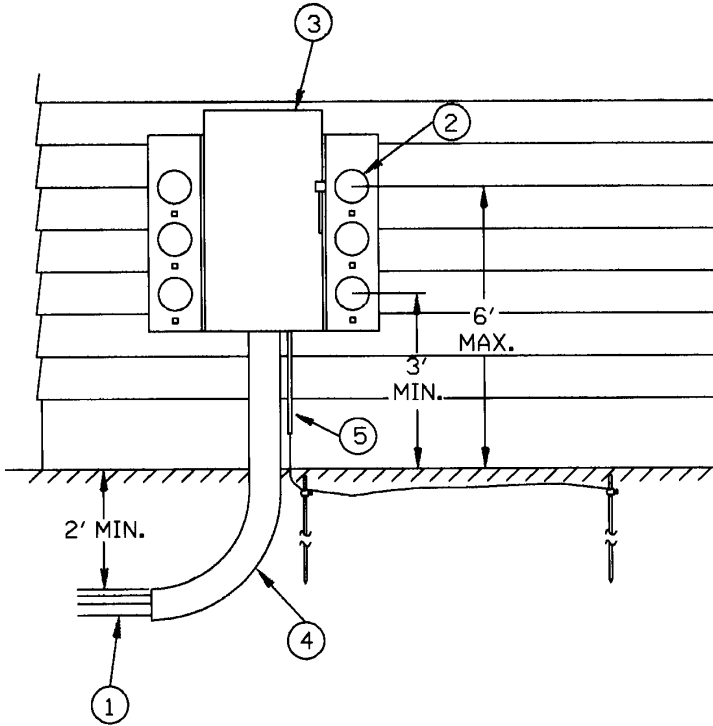
3. Main disconnect switch, fused at 200 amperes or less, with current-limiting fusing, if necessary.
4. MGE- and code-approved transition between gutter and main switch. (See **Table 7**.)
5. Four-inch or five-inch PVC service conduit; contact MGE for required size.
6. Gutter as specified on **page N2**.
7. MGE-approved meter socket. For a commercial service, utilize an MGE-approved, heavy-duty meter socket with lever bypass and jaw release. (See **Table 3**.)
 - For single-phase, 120/208-volt service, use five-terminal socket.
 - For three-phase, 120/208-volt service, use seven-terminal socket.

See **Drawing MIS-9** for meter wiring schematics.

8. Conduit and wiring to customer's main distribution panel.
9. Ground in accordance with applicable electrical codes.
10. Pipe straps as required.

Notes:

- ◆ Protective posts will be required if equipment is subject to vehicular traffic.
- ◆ See **page N2** for additional notes.



NET-3

**OUTDOOR RESIDENTIAL
MULTIPLE METER NETWORK SERVICE
120/208 VOLT, SINGLE-PHASE OR THREE-PHASE
200 AMPERES OR LESS PER METER POSITION
SEQUENCE: MAIN DISCONNECT-METER-SWITCH-FUSE**



**DRAWING NET-3
OUTDOOR RESIDENTIAL
MULTIPLE METER NETWORK SERVICE
120/208 VOLT, SINGLE-PHASE OR THREE-PHASE
200 AMPERES OR LESS PER METER POSITION
SEQUENCE: MAIN DISCONNECT-METER-SWITCH-FUSE**

MGE Will Furnish:

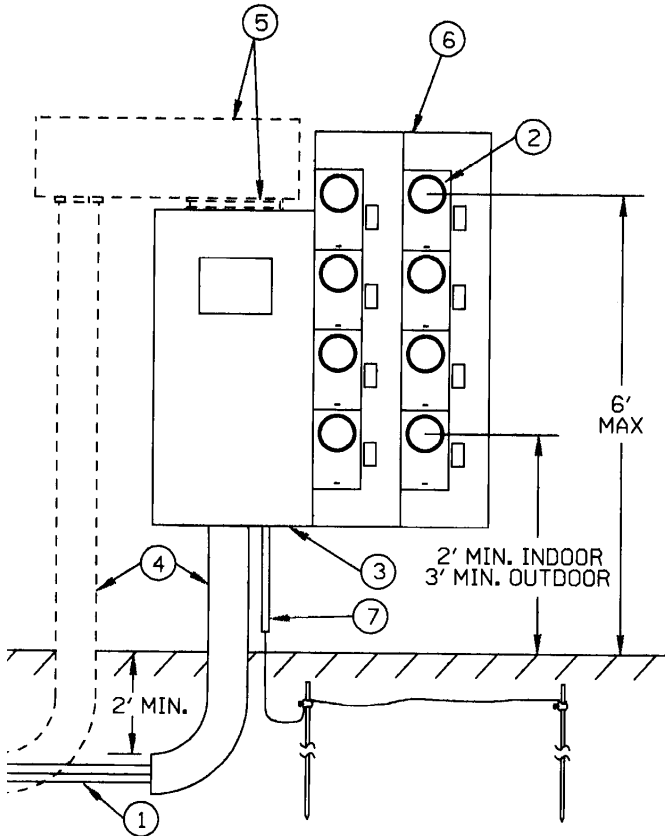
1. Service conductors and conduit.
2. Electric meters.

The Customer Will Furnish:

3. Prebussed meter stack and bottom feed main disconnect switch with current-limiting fusing, if necessary. Meter stack and switch must be approved by MGE prior to purchase.
4. Four-inch or five-inch PVC service conduit; contact MGE for required size.
5. Ground in accordance with applicable electrical codes.

Notes:

- ◆ Protective posts will be required if equipment is subject to vehicular traffic.
- ◆ See **page N2** for additional notes.
- ◆ Conduits may enter the bottom of a switch if a bottom-fed switch is utilized, but a minimum distance of 24 inches must be maintained from the bottom of the cabinet to the line-side termination lugs.



NET-4

**COMMERCIAL MULTIPLE METERING
NETWORK SERVICE
120/208 VOLT, SINGLE-PHASE OR THREE-PHASE
200 AMPERES OR LESS PER METER POSITION
SEQUENCE: MAIN DISCONNECT-METER-SWITCH-FUSE**



**DRAWING NET-4
COMMERCIAL MULTIPLE METERING
NETWORK SERVICE
120/208 VOLT, SINGLE-PHASE OR THREE-PHASE
200 AMPERES OR LESS PER METER POSITION
SEQUENCE: MAIN DISCONNECT-METER-SWITCH-FUSE**

MGE Will Furnish:

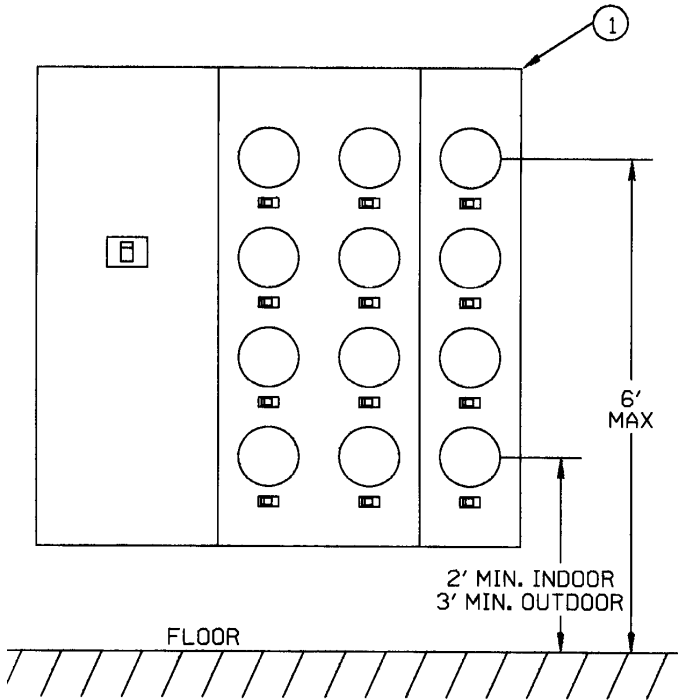
1. Service conductors and conduit.
2. Electric meters.

Customer Will Furnish:

3. Prebussed main building disconnect switch with current-limiting fusing, if necessary.
4. Four-inch or five-inch PVC service conduit(s); contact MGE for required size.
5. Gutter, with an MGE- and code-approved transition; utilize in a top-fed main disconnect application.
6. Prebussed meter stack. Meter stacks to be approved by MGE on a case-by-case basis.
 - Required Duncan HQ-style meter socket with lever bypass and jaw release.
7. Ground in accordance with applicable codes.

Notes:

- ◆ The maximum single-phase main disconnect switch size is 600 amperes.
- ◆ Each meter socket must be marked to identify the area or apartment that it serves.
- ◆ Protective posts will be required if equipment is subject to vehicular traffic.
- ◆ See **page N2** for additional notes.
- ◆ Conduits may enter the bottom of a switch if a bottom-fed switch is utilized, but a minimum distance of 24" must be maintained from the bottom of the cabinet to the line-side termination lugs.



NET-5

**INDOOR/OUTDOOR APARTMENT MULTIPLE METERING
NETWORK SERVICE
120/208 VOLT, SINGLE-PHASE OR THREE-PHASE
200 AMPERES OR LESS PER POSITION
SEQUENCE: MAIN DISCONNECT-METER-SWITCH-FUSE**



**DRAWING NET-5
INDOOR/OUTDOOR APARTMENT MULTIPLE METERING
NETWORK SERVICE
120/208 VOLT, SINGLE-PHASE OR THREE-PHASE
200 AMPERES OR LESS PER POSITION
SEQUENCE: MAIN DISCONNECT-METER-SWITCH-FUSE**

1. Prebussed main disconnect switch and meter stack furnished by customer.

Notes:

- ◆ All service and meter configurations must be approved by MGE on a case-by-case basis.
- ◆ For MGE service conductor to the main switch, service entrance conduits and gutter sizes must be approved by MGE on a case-by-case basis.
- ◆ Meter sockets require use of an approved manual-type bypass.
- ◆ Outdoor applications require UL listed weatherproof equipment.
- ◆ The maximum single-phase main disconnect switch size is 600 amperes.
- ◆ Each meter socket must be marked to identify the area that it serves.
- ◆ If service is provided from a vault, customer to provide service conduit and conductors, including installation of same.
- ◆ Protective posts and/or rigid metal service conduit will be required if subject to vehicular traffic.
- ◆ Call Diggers Hotline to locate underground utilities prior to driving ground rods or stubbing service conduits.



**DRAWING NET-6
RESIDENTIAL OR COMMERCIAL
SINGLE METER NETWORK SERVICE
120/208-VOLT, THREE-PHASE, FOUR-WIRE
LARGER THAN 200 AMPERES
SEQUENCE: SWITCH-FUSE-METER**

R

MGE Will Furnish:

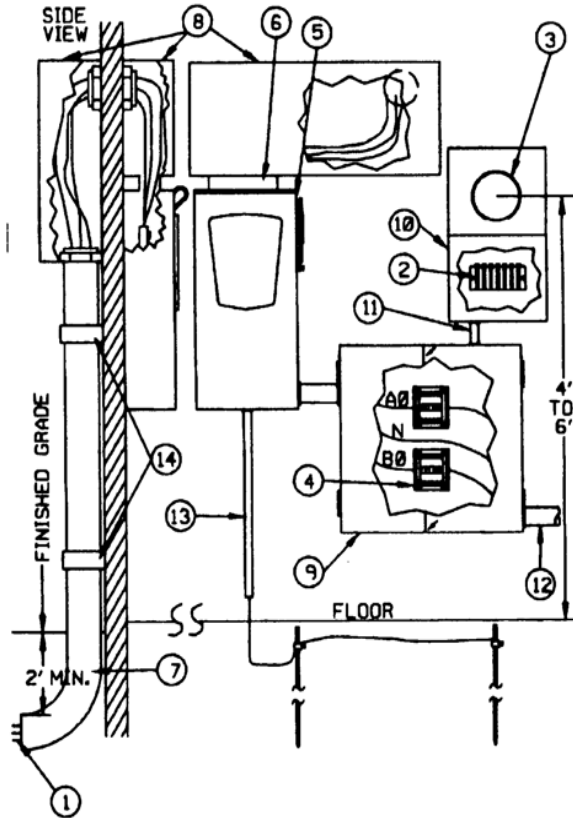
1. Service conductors from manhole to building.
2. Service conductors from manhole to main switch.
3. Electric meter and wiring to test switch.
4. Meter test switch, installed by customer.
5. "Window"-type current transformer, installed by customer.

The Customer Will Furnish:

- 1a. Service entrance conduit.
- 2a. Service conductors from vault to main switch.
6. Four-inch or five-inch conduit(s) stubbed beyond outside building wall.
7. Minimum 12" x 12" x 24" gutter.
8. MGE- and code-approved transition between gutter and main switch (not shown). (See **Table 7.**)
9. Main disconnect switch with current-limiting fusing, if necessary.
10. MGE-approved transformer-rated meter socket. (See **Table 3A.**)
11. Current transformer cabinet with provision for padlocking. Services 1,200 amperes or less, minimum size 36" x 36" x 9" deep; for services larger than 1,200 amperes, 36" x 36" x 12" deep.
12. One-inch rigid conduit for meter wiring.
13. Conductor to customer's distribution panel.
14. Ground in accordance with applicable electrical codes.

Notes:

- ◆ See **page N2** for additional notes.



NET-7

**RESIDENTIAL OR COMMERCIAL
SINGLE-METER NETWORK SERVICE
120/208-VOLT, SINGLE-PHASE, THREE-WIRE
201 TO 600 AMPERES
SEQUENCE: SWITCH-FUSE-METER**



**DRAWING NET-7
RESIDENTIAL OR COMMERCIAL
SINGLE-METER NETWORK SERVICE
120/208-VOLT, SINGLE-PHASE, THREE-WIRE
201 TO 600 AMPERES
SEQUENCE: SWITCH-FUSE-METER**

MGE Will Furnish:

1. Service conductors and conduit.
2. Meter test switch, installed by customer.
3. Electric meter and wiring to test switch.
4. "Window"-type current transformer, installed by customer.

The Customer Will Furnish:

5. Main disconnect switch with current-limiting fusing, if necessary.
6. MGE- and code-approved transition between gutter and main switch. (See **Table 7**.)
7. Four-inch or five-inch PVC service entrance conduit; contact MGE for required size.
8. Gutter as specified on **page N2**. The gutter can be installed horizontally or vertically.
9. Current transformer cabinet with provision for padlocking, minimum size 24" x 24" x 9" deep.
10. MGE-approved transformer-rated meter socket. (See **Table 3A**.)
11. One-inch rigid conduit for meter wiring.
12. Conduit and wire to customer's distribution panel.
13. Ground in accordance with applicable electrical codes.
14. Pipe straps as required.

Notes:

- ◆ Protective posts will be required if equipment is subject to vehicular traffic.
- ◆ See **page N2** for additional notes.



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MISCELLANEOUS

R = Revised, N = New, D = Deletion

MISCELLANEOUS DRAWINGS

Overhead clearance guidelines	MIS-1A
Overhead clearance guidelines—Drawings	MIS-1B
Clearance requirements between gas meters and electric meters.	MIS-2
Typical below-grade transformer vault.	MIS-3
Typical transformer enclosure.	MIS-4
Customer-owned overhead temporary service.	MIS-5
Customer-owned underground temporary service.	MIS-6
Farm pole-top metering installation.	MIS-7
Standby emergency generator.	MIS-8
Typical direct-metering wiring diagrams.	MIS-9



**CLEARANCE GUIDELINES FOR A TYPICAL
OVERHEAD SERVICE DROP INSTALLATION (0-300 VOLTS)
ADAPTED FROM THE
1994 WISCONSIN ADMINISTRATIVE CODE
MIS-1A**

The following are guidelines for overhead service drops. Refer to the 1994 Wisconsin Administrative code for specific information concerning special conditions, or contact MGE Engineering for assistance with specific applications.

	Minimum Vertical Clearance
A. Roads, streets, alleys, nonresidential driveways, parking lots, and other areas subject to truck traffic.	18'*
B. Residential driveways.(1)	18'*
C. Spaces or ways subject to pedestrians or restricted traffic only.(2)	14'*
D. Over or under balconies and roofs accessible to pedestrians.(3)	13'*
E. Over or under roofs or projections not accessible to pedestrians.(4)	10'*
F. Signs, chimneys, billboards, radio and TV antennas, tanks, and other installations not classified as buildings.	5.5'*
G. Windows, doors, or similar locations.(5)(6) (Service drop attached to building.)	3'
H. Other land traversed by vehicles, such as cultivated, grazing, forest, orchard, etc.	18'*
	Minimum Horizontal Clearance With Wind Displacement
I. Building walls, projections, windows, doors, balconies, fire escapes, porches, decks, etc. (Service drop not attached to building.)	5'
J. Building walls, projections, windows, doors, balconies, fire escapes, porches, decks, etc.(5)(6) (Service drop attached to building.)	3'
K. Signs, chimneys, antennas, etc.	3.5'
SPECIAL HORIZONTAL CLEARANCES FOR OVERHEAD SERVICE DROPS (0-300 VOLTS) WITH WIND DISPLACEMENT	

FOOTNOTES:

1. Where the height of attachment to a building or other installation does not permit service drops to meet this value, the clearances may be reduced to the following:
 - a. 14' for supply service drops limited to 150-volts to ground and meeting Rules 230C1 and 230C3 as stated in the NESC.
 - b. 10' for drip loops of service drops limited to 150-volts to ground and meeting Rules 230C1 and 230C3 as stated in the NESC.
2. Spaces or ways subject to pedestrians, equestrians, or restricted traffic only are those areas where vehicles or other mobile units, exceeding 8' in height are prohibited by regulation or permanent terrain configurations or are otherwise not normally encountered or not reasonably anticipated.
3. A roof, balcony, or 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 run is 8' or more from the ground or other permanently installed accessible surface.)
4. This clearance may be reduced to 5'(*) for supply conductors limited to 300 volts to ground and if the roof has a slope of not less than 4 inches vertical in 12 inches horizontal.
5. 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.
6. This does not apply to windows that are not designed to open.

Notes:

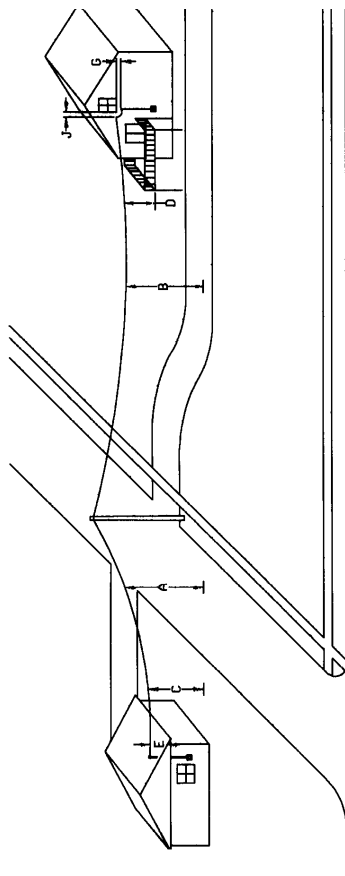
- * Two additional feet of clearance have been added to these values to allow for additional sag when conductor temperatures exceeding 120 degrees fahrenheit are caused by large load currents.

REFER TO PAGES M4 AND M5 FOR DRAWINGS ADDRESSING OVERHEAD CLEARANCE REQUIREMENTS.

SWIMMING POOLS - 10' minimum horizontal clearance from the inside walls of the pool and 18' clearance in any direction to the edge of water surface.

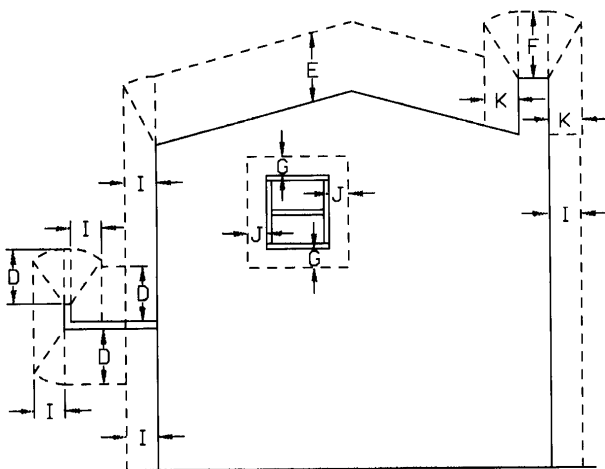
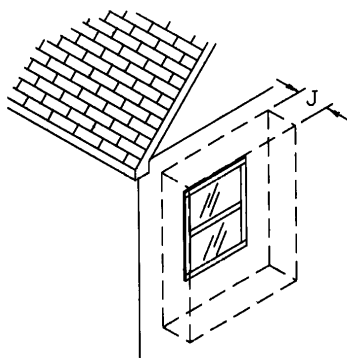
Notes:

- MGE prohibits the installation of pools under overhead service conductors.
- ABOVEGROUND FLAMMABLE LIQUID STORAGE TANKS AND LP STORAGE TANKS - 8' minimum horizontal clearance. (This does not apply to LP tanks of 1,000 gallons or less.)



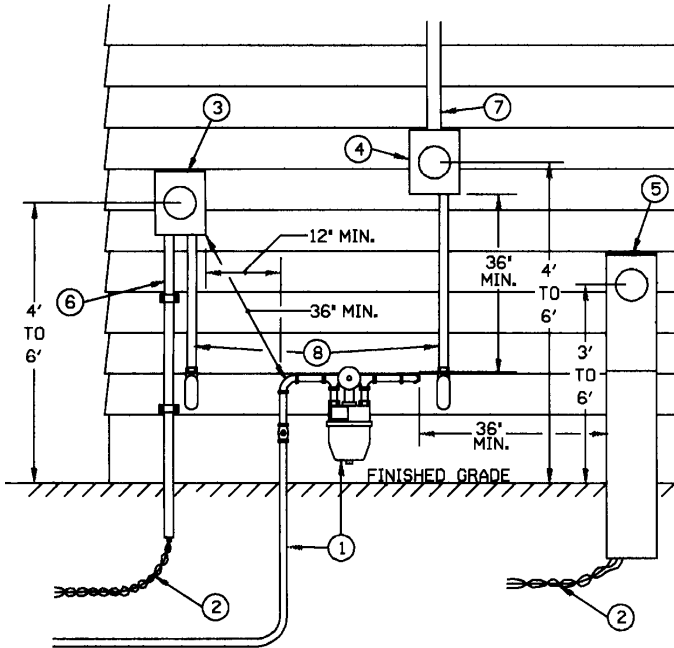
MIS-1A

OVERHEAD CLEARANCE GUIDELINES



MIS-1B

OVERHEAD CLEARANCE GUIDELINES



MIS-2

**CLEARANCE REQUIREMENTS BETWEEN
GAS AND ELECTRIC METERS**

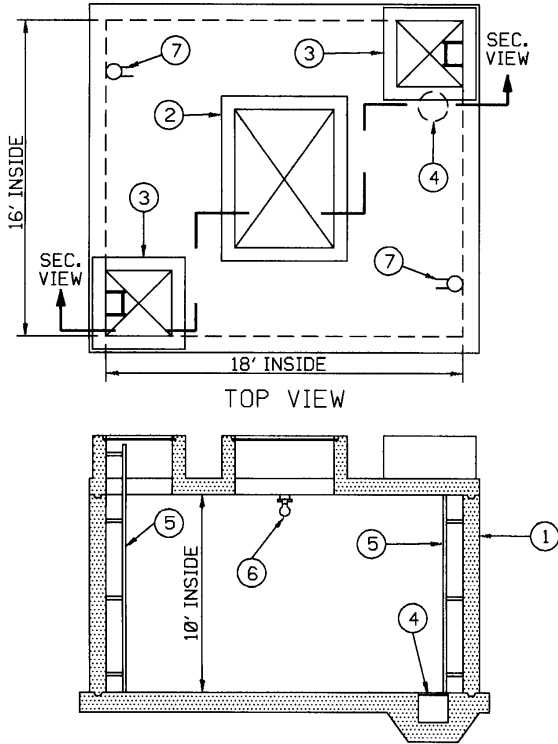


**DRAWING MIS-2
CLEARANCE GUIDELINES BETWEEN
GAS AND ELECTRIC METERS**

1. Gas meter and piping.
2. Underground electric service conductors.
3. MGE-approved underground meter socket.
4. MGE-approved overhead meter socket.
5. MGE-approved pedestal-type meter socket.
6. Two-inch PVC conduit for electric service conductors.
7. Overhead service riser and conductors.
8. Conduit and wire to main distribution panels.

Notes:

- ◆ These requirements are applied in both residential and commercial applications.
- ◆ Gas piping is defined as both the gas service lateral before the meter and house piping after the meter.



MIS-3

**TYPICAL BELOW-GRADE TRANSFORMER VAULT
250 VOLTS OR LESS**

N DRAWING MIS-3 TYPICAL BELOW-GRADE TRANSFORMER VAULT, 250 VOLTS OR LESS

Dimensions and configuration shown are typical. Each transformer vault will be treated on an individual basis. Consult MGE for required vault dimensions and configuration. The customer will be responsible for the structural design and construction of the transformer vault.

MGE Will Furnish:

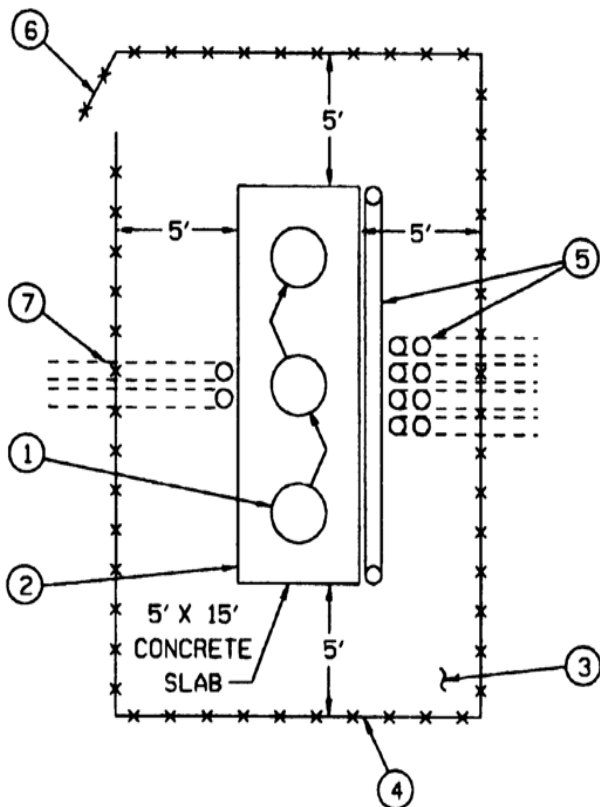
- Submersible network transformer (7-month lead time required).
- Primary cables and terminations at transformer.
- Secondary terminations at transformer.
- Ground rods (coordination required - installed prior to pouring of vault floor).
- Pulling irons at appropriate locations (furnished by MGE, installed by customer; coordination required - installed prior to pouring of vault wall).

The Customer Will Furnish, Install, Own, and Maintain:

1. Transformer vault, including structural design, construction with proper support of existing facilities, and permanent maintenance.
2. Galvanized equipment access doors, 6'x8' minimum, grilled to provide ventilation.
3. Galvanized personnel access doors, 32" x 32" minimum, grilled to provide ventilation.
4. Sump pit, 18"x18" minimum, covered with galvanized steel plate, locate just to the side of one of the ladders; entire floor must drain toward pit. Floor must be smooth troweled.
5. Galvanized steel ladders at personnel access door.
6. Lighting with associated light switches located at each personnel access door no more than 18" below the ceiling.
7. Electrical outlets, as required by code, and at least one 120/208-volt outlet at the light switch location for each personnel access door.
 - Secondary bus duct from main disconnect switch to collector bus including NEMA 2-hole, double-compression copper lugs. Customer will furnish, and MGE will install, 24"-wide aluminum cable trays between transformers and bus duct tap boxes.

Notes:

- ◆ Vault shall be constructed and maintained in accordance with all applicable codes and governmental regulations.
- ◆ MGE requires that the transformer vault be located away from occupied space.
- ◆ The National Electric Code requires 3 square inches of free air space per kVA of transformer capacity - adequate ventilation shall be maintained at all times.
- ◆ Per City of Madison General Ordinances, the loading requirements for vaults and covers located within road right-of-way, with no vehicular restrictions, are 250 pounds per square foot or 12,000-pound concentrated load in any position.
- ◆ Permanent truck access to the vault is required.
- ◆ Windows shall be provided in the walls of the vault to accommodate the primary conduit package(s) as required - coordinate exact sizes and locations with MGE.
- ◆ This information is intended to supplement the customer's construction documents; any discrepancies shall be forwarded to MGE Engineering prior to construction.



MIS-4

TYPICAL TRANSFORMER ENCLOSURE

**DRAWING MIS-4
TYPICAL TRANSFORMER ENCLOSURE**

Dimensions and configuration shown are typical. Each transformer enclosure will be treated on an individual basis. Consult MGE for required enclosure dimensions and configuration. The customer will be responsible for the structural design and construction of the transformer enclosure.

MGE Will Furnish:

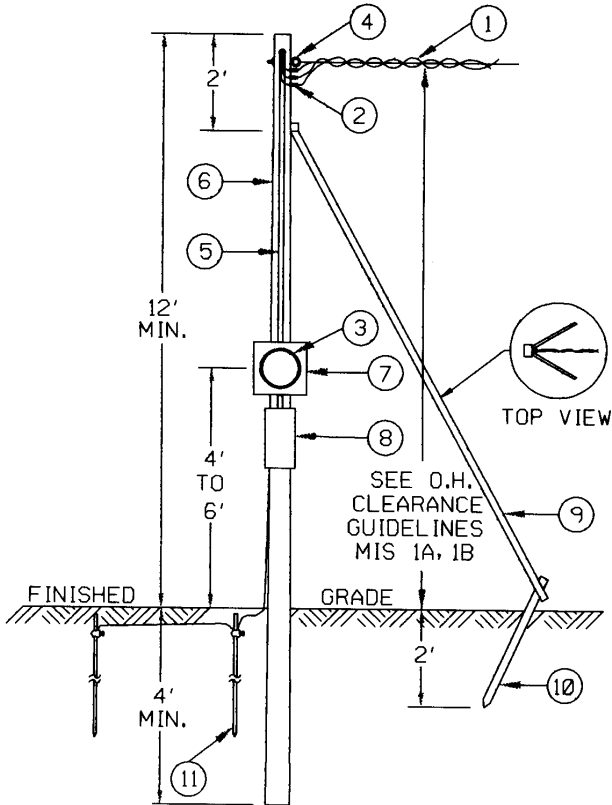
1. MGE transformers.
 - High-voltage cables.
 - MGE will make terminations at transformer (for standard cable size and amounts only).

The Customer Will Furnish:

2. Concrete transformer pad, constructed to support three equal loads totaling 10,000 pounds. Pad must be level.
3. Interior of enclosure to be crushed rock.
4. Fence, 8' high with top 1' to be 3 strands of barbed wire, or an 8' nonscalable block wall.
5. Service conduits, cables, and cable supports.
6. A 3' opening with gate and locking hasp.
7. Two 4" PVC conduits, Schedule 40, UL listed, buried 30" deep. Utilize sweep 90° bends, turn up and cap.

Notes:

- ◆ Enclosure must be constructed in accordance with all applicable codes and regulations.
- ◆ Customer must provide vehicle access to transformer enclosure.
- ◆ Ground rods are supplied and installed by MGE during construction of the enclosure. Sufficient time needs to be allotted for coordination.
- ◆ MGE requires that the transformer vault should be located away from occupied space.



MIS-5

**CUSTOMER-OWNED OVERHEAD TEMPORARY SERVICE
SINGLE-PHASE, 120/240 VOLT, 5 KW OR LESS
SEQUENCE: METER-SWITCH-FUSE**

**DRAWING MIS-5
CUSTOMER-OWNED OVERHEAD TEMPORARY SERVICE
SINGLE-PHASE, 120/240 VOLT, 5 KW OR LESS
SEQUENCE: METER-SWITCH-FUSE**

MGE Will Furnish:

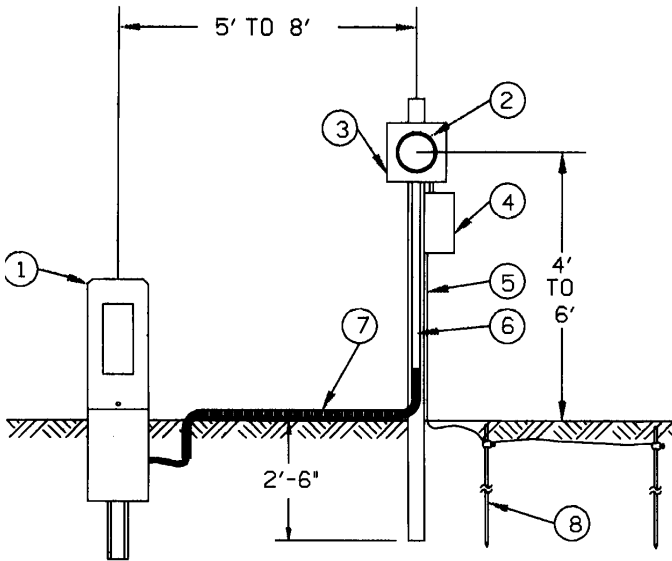
1. Overhead service conductors, maximum length of 100 feet.
2. Compression-type connectors.
3. Electric meter.

The Customer Will Furnish:

4. Point of Attachment—insulated spool and bracket to support service drop conductors.
5. Service riser, conductors, and weatherhead. Leave 36-inch-long wire leads for connection to MGE service drop.
6. Customer-owned pole with minimum cross section of 4" x 4". Poles over 16' long must be a minimum Class 7 pole or equivalent.
7. MGE-approved meter socket with horn bypass. (See **Table 1**.)
8. Distribution panel/outlets.
9. Two braces in direction of service origin.
10. Two 2" x 4" stakes.
11. Ground in accordance with applicable electrical codes.
 - Temporaries within certain municipalities will require the electrical contractor to submit a signed and notarized affidavit in lieu of the certificate of inspection.

Notes:

- ◆ The Point of Attachment must be located to provide adequate clearance for the overhead service conductors in accordance with MGE's Overhead Clearance Guidelines. (See **MIS 1A, 1B**.)
- ◆ Contact MGE to determine a suitable location for the temporary pole.
- ◆ Contact MGE for temporary service in excess of 5 kW for three-phase temporary service.
- ◆ Call Diggers Hotline to locate underground utilities before setting temporary service equipment or driving ground rods.



MIS-6

**CUSTOMER-OWNED UNDERGROUND
TEMPORARY SERVICE ENTRANCE
SINGLE-PHASE, 120/240 VOLTS OR
120/208 VOLTS, 5 KW OR LESS
SEQUENCE: METER-SWITCH-FUSE**

**DRAWING MIS-6
CUSTOMER-OWNED UNDERGROUND
TEMPORARY SERVICE ENTRANCE
SINGLE-PHASE, 120/240 VOLT OR
120/208-VOLT, 5 KW OR LESS
SEQUENCE: METER-SWITCH-FUSE**

1. Existing MGE pedestal or pad-mounted transformer.

MGE Will Furnish:

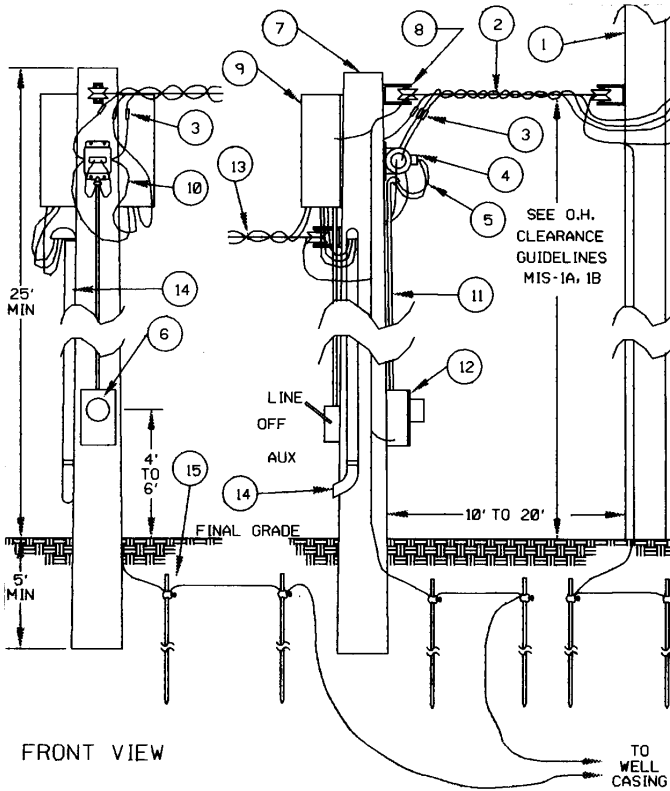
2. Electric meter.

The Customer Will Furnish:

3. MGE-approved meter socket with horn bypass; four terminal for 120/240-volt single-phase; five terminal for 120/208-volt single-phase. (See **Table 1**.)
4. Distribution panel/outlets.
5. Supporting post with a minimum cross section of 4" x 4".
6. Two-inch PVC conduit.
7. Protective flexible conduit and cable of sufficient length to be terminated in pedestal or pad-mounted transformer. Cable must be protected in accordance with applicable codes. MGE personnel to make terminations within pedestals and transformers.
8. Ground in accordance with applicable electrical codes.
 - Temporaries within certain municipalities will require the electrical contractor to submit a signed and notarized affidavit in lieu of the certificate of inspection.

Notes:

- ◆ Call Diggers Hotline to locate underground facilities before setting temporary service equipment or driving ground rods.
- ◆ Location of temporary service equipment shall be located between 5' and 8' from MGE pedestal or pad-mounted transformer.
- ◆ Contact MGE for temporary service in excess of 5 kW or for three-phase temporary service.
- ◆ Install temporary service in a location that will not interfere with the installation of the permanent service.
- N ◆ A 277/480-volt temporary service requires a switch-fuse-meter sequence (See **Drawing COM-2**).



FRONT VIEW

MIS-7

**FARM POLE-TOP METERING INSTALLATION
SINGLE-PHASE, 200 TO 400 AMPERES
SEQUENCE: METER-SWITCH-FUSE**

**DRAWING MIS-7
FARM POLE-TOP METERING INSTALLATION
SINGLE-PHASE, 200 TO 400 AMPERES
SEQUENCE: METER-SWITCH-FUSE**

MGE Will Furnish:

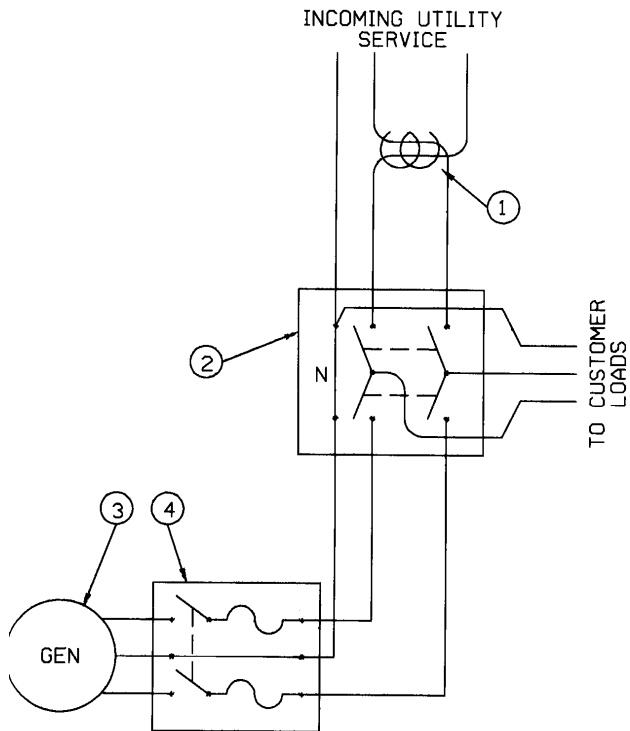
1. Pole and transformer, contact MGE for determination of location and cost.
2. Service conductors.
3. Compression-type connectors.
4. "Window"-type current transformer, installed by customer.
5. Wiring from current transformer to transformer-rated meter socket.
6. Transformer-rated electric meter.

The Customer Will Furnish:

7. Minimum 30', Class 6 pole buried to a minimum depth of 5' with guying as necessary.
8. Point of Attachment—suitable insulated spool and bracket to support service conductors.
9. MGE-approved, pole-top manual transfer switch.
(See **Table 6**.)
10. Wiring through current transformer to transfer switch.
11. One-inch rigid conduit and weatherhead for current transformer wiring.
12. Approved transformer-rated meter socket. (See **Table 3A**.)
13. Service conductors to fused distribution panels in other outbuildings.
14. Standby generator receptacle, conduit, and weatherhead.
15. Ground in accordance with applicable electrical codes.

Notes:

- ◆ The Point of Attachment must be located to provide adequate clearance for the overhead service conductors in accordance with applicable codes. See Overhead Clearance Guidelines, **MIS 1A, 1B**.
- ◆ See **Drawing MIS-8** for schematic diagram of a standby emergency generator installation.
- ◆ Care should be taken to locate service such that overhead primary wires need not be located in areas where large farm equipment will be operated.



MIS-8

STANDBY EMERGENCY GENERATOR

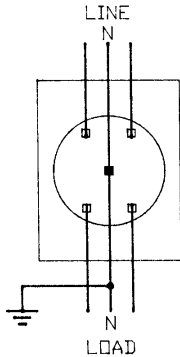


**DRAWING MIS-8
STANDBY EMERGENCY GENERATOR**

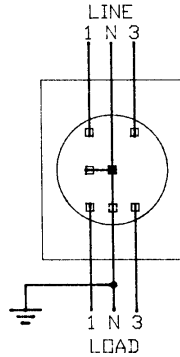
1. Current transformer.
2. MGE-approved manual transfer switch, double-pole, double-throw with break-before-make contacts.
3. Customer-owned standby generator.
4. Generator breaker.

Notes:

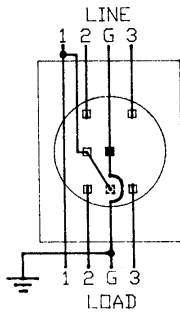
- ◆ See **Drawing MIS-7** for typical equipment arrangement.



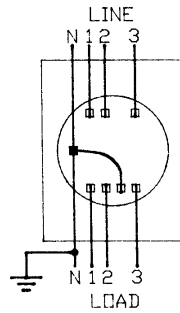
SINGLE-PHASE
120/240 VOLT
THREE-WIRE



SINGLE-PHASE
120/208 VOLT
THREE-WIRE



THREE-PHASE
240 VOLT
THREE-WIRE



THREE-PHASE
120/208 OR 277/480 VOLT
FOUR-WIRE

MIS-9

TYPICAL DIRECT-METERING WIRING DIAGRAMS



METER SOCKETS

Date 3-17-97



Page MS1

Table 1.

Approved Residential Pedestal-Type Meter Sockets

	Supplier	Size	Bypass	120/240 Volt - 4 Terminal	120/208 Volt - 5 Terminal
R	Milbank	200A 200A	Horn Horn Lever	U3358-0-KK U8980-0-KK(10)(9)	U9108-0 (10)(11)
R	Landis & Gyr	200A 200A	Horn Horn	UAP-317-PPW1	UAP-317-PPW1
	Murray	200A	Horn	RP118SW(8)	RP118SW(6)(8)
	Midwest	200A	Horn	R2EMSSP6	
N	Milbank	320A	Lever	U1748-0-W1(12)	
N	Landis & Gyr	320A	Lever	47604P-9W1	

Approved Residential Meter Sockets

Supplier	Service Size	120/240 V - 4 Terminal Single-Phase		
		Bypass	Overhead	Underground
Anchor	100A 200A	Horn Horn Lever	URS1004B-G URS1804B-G URS1394ML	(1) URS1394B URS1394ML
Landis & Gyr	100A 200A	Horn Horn	UAT111-OP UAT317-OP	(1) UAT417-XP
Milbank	100A 200A	Horn Horn Lever	U7487-KK U1773-KK NU1211	(1) U1773-KK NU1211
Murray	100A 200A	Horn Horn Lever	RJ192AX,AC RS192AX RS172AX	(1) RS192A RS172A
Superior	100A 200A	Horn Horn	LRLOU-412VA CU-414	(1) LQRLPU414-12A

Table 1 (Continued)**Service 120/208 V - 5 Terminal Single-Phase**

Supplier	Size	Bypass	Overhead	Underground
Anchor	100A	Horn	URS1004G-B(5)	(1)
	200A	Lever Horn Lever Jaw Rel	URS1005GML URS1804B-G(5) U22552ML U42552	(1) URS1394B(5) U22552ML U42552
Landis & Gyr	100A	Horn	UAT111-OP(7)	(1)
	200A	Horn	UAT317-OP(7)	UAT417-XP(7)
Milbank	100A	Horn	U7487-KK(2)	(1)
	200A	Horn Lever	U1773-KK(2) NU1211(3)	U1773-KK(2)
Murray	100A	Horn	RJ192AX,AC(6)	(1)
	200A	Horn Lever	RS192AX(6) RH173CR	RS192A(6) RH173CR
Superior	100A	Horn	LRL0U-412-VA(4)	(1)
	200A	Horn Lever	CU-414(4) CU18005	LQRLPU414-12A(4) CUJ-15

Comments for Table 1:

1. Underground service to a single-family home requires a 200A rated meter socket.
2. Requires installation of fifth terminal at nine o'clock, use Part No. 5T24R.
3. Requires installation of fifth terminal at nine o'clock, use Part No. K3356.
4. Requires installation of fifth terminal at nine o'clock, use Part No. 20087A.
5. Requires installation of fifth terminal at nine o'clock, use Part No. 8855-1.
6. Requires installation of fifth terminal at nine o'clock, use Part No. RX012.
7. Requires installation of fifth terminal at nine o'clock, use Part No. 659-0121.
8. Requires the use of extension Part No. UX08B.
9. Pedestal includes meter and main switch.
10. Replace the compression terminals with mechanical-type lugs. Part No. K1539.
11. Requires the use of extension Part No. S3488.
12. Requires the use of extension Part No. S1848.

Table 2.

APPROVED RESIDENTIAL APARTMENT METER SOCKETS
120/240V - 4 TERMINAL SINGLE-PHASE (3)
HORN-TYPE BYPASS
NUMBER OF POSITIONS

		Service			
		NUMBER OF POSITIONS			
SUPPLIER	SIZE	2	3	4	
	Anchor	2URS1004L-B-C350 2URS1004L-B-C350 2URS1804-B-C350 2URS1804-B-C350	3URS1004L-B-C350 3URS1004L-B-C350 3URS1804-B-C600 3URS1804-B-C600	4URS1004L-B-C350 4URS1004L-B-C350 4URS1804-B-C600 4URS-1804-B-C600	
R	Power Master By Challenger	1 MP Series	1 MP Series	1 MP Series	
R	Cutler-Hammer	CG5 Series	CG5 Series	CG5 Series	
	Landis & Gyr	100A OH UA2311-OP 100A UG UA2717-YP 200A OH UA2717-YP 200A UG UA2717-YP	UA3311-OP UA3717-YP	UA4311-OP UA4719-YP	
	Pedestal Type	PDUA2717-YP	PDUA3717-YP	PDUA4719-YP	
	Milbank	100A OH U7362-KK 100A UG U8032-KK 200A OH U1252-KK 200A UG U1252-KK	U7363-KK U8033-KK U1253-KK U1253-KK	U7364-KK U8034-KK U1254-KK U1254-KK	
	Condo Type	125A UG U2852-X-PED-KK-K1539 200A UG U2862-X-PED-KK-K1539	U2853-X-PED-KK-K1539 U2863-X-PED-KK-K1539	U2904-X-PED-KK U2864-X-PED-KK	
	Pedestal Type	200A UG U1252-KK-K1539-PED 200A UG U1783-O-KK	U1253-KK-K1540-PED	U1254-KK-K1540-PED	
	Murray	100A OH UM 229 RS 100A UG UM 229 RS 200A OH AM 247 RP 200A UG AM 247 RP	UM 329 RS UM 329 RS AM 367 RP AM 367 RP	UM 449 RS UM 449 RS AM 467 RP AM 467 RP	
	Superior	100A OH CU-452 100A UG CU-452 200A OH CU-482 200A UG CU-482	CU-453 CU-453 CU-483 CU-483	CU-454 CU-454 CU-484 CU-484	
	Square D	Class 4141	Class 4141	Class 4141	
N	Siemens	125 UG W22PAKUR 200 UG W42PAK200UR	W33PAKUR W43PAK200UR	W44PAKUR W44PAK200UR	
N	Thomas & Betts	MP Series	MP Series	MP Series	

Table 2. (Continued)

**APPROVED RESIDENTIAL APARTMENT METER SOCKETS
120/240V - 4 TERMINAL SINGLE-PHASE (3)
HORN-TYPE BYPASS
Service
NUMBER OF POSITIONS**

	SUPPLIER	SIZE	5	6
	Anchor	100A OH 100A UG 200A OH 200A UG	5URS1004-L-B-C350 5URS1004-L-B-C350 5URS1804-B-C2600 5URS1804-B-C2600	6URS1004L-B-C350 6URS1004L-B-C350 6URS1804-B-C2600 6URS1804-B-C2600
R	Power Master By Challenger	----	1 MP Series	1 MP Series
R	Cutler- Hammer	----	CG5 Series	CG5 Series
	Landis & Gyr	100A OH 100A UG 200A OH 200A UG	UA5719-KP	UA6719-KP
	Pedestal Type	200AUG	PDUA5719-KP	PDUA6719-KP
	Milbank	100A OH 100A UG 200A OH 200A UG	U7365-KK U8035-KK U1255-KK U1255-KK	U7366-KK U8036-KK U1256-KK U1256-KK
	Condo Type	125A UG 200A UG	U2905-X-PED-KK U2865-X-PED-KK	U2906-X-PED-KK U2866-X-PED-KK
	Pedestal Type	200A UG 200A UG	U1255-KK-K1541-PED	U1256-KK-K1541-PED
	Murray	100A OH 100A UG 200A OH 200A UG	UM 549 RS UM 549 RS AM 567 RP AM 567 RP	UM 649 RS UM 649 RS AM 667 RP AM 667 RP
	Superior	100A OH 100A UG 200A OH 200A UG	CU-455 CU-455	---- ---- ---- ----
	Square D	----	Class 4141	Class 4141
N	Siemens	125 UG 200 UG	W45PAKUR W45PAK200UR	W46PAKUR W46PAK200UR
N	Thomas & Betts	MP Series	MP Series	MP Series

Comments for Table 2:

For 120/208-volt, three-wire service, install fifth terminal.

Table 3.

APPROVED COMMERCIAL AND INDUSTRIAL METER SOCKETS

SUPPLIER	SERVICE SIZE	BYPASS	OVERHEAD	UNDERGROUND
			120/240V SINGLE-PHASE, 4 TERMINAL, 200A RATED	
Anchor	150A 200A	Lever Jaw Rel	URS1394ML U42552	URS1394ML U42552
Landis & Gyr	150A 200A	Lever Jaw Rel	40204 40804	40604 40404
Milbank Pedestal	150A 200A 200A	Lever Jaw Rel Jaw Rel	NU1211 U9550-DL	NU1211 U9551-0 U9108-0(1)
Murray	200A	Jaw Rel	RH173CR	RH173CR
Superior	150A 200A	Lever Jaw Rel	RLOUZ-414-A CU18005	RLPUZ-414-12A CU18005
120/208V SINGLE-PHASE OR 240V THREE-PHASE 5 TERMINAL, 200A RATED				
Anchor	150A 200A	Lever Jaw Rel	U22552ML U42552	U22552ML U42552
Murray	200A	Jaw Rel	RH173CR	RH173CR
Landis & Gyr Pedestal	150A 200A 100A	Lever Jaw Rel Jaw Rel	40225 40005	40605 40405 PD40405
Milbank Pedestal	200A 200A	Jaw Rel Jaw Rel	U9550-DL	U9551-0 U9108-0(1)
Superior	150A 200A	Lever Jaw Rel	RLOUZ-414A CU18005	RLPUZ-414-12A CU18005

Table 3. (Continued)**APPROVED COMMERCIAL AND INDUSTRIAL METER SOCKETS**

SUPPLIER	SERVICE SIZE	BYPASS	OVERHEAD	UNDERGROUND
Anchor	150A 200A	Lever Jaw Rel	U22572ML U42572	U22572ML U42572
Landis & Gyr Pedestal	150A 200A 100A	Lever Jaw Rel Jaw Rel	40307 40007	40607 40407 PD40407
Milbank Pedestal	200A 200A	Jaw Rel Jaw Rel	U9700	U9701 U9107-0(1)
Murray	200A	Jaw Rel	RH173GR	RH173GR
Superior	150A 200A	Lever Jaw Rel	RRLOU18447A CU18007	CU-449 CUJ-17/CU-449
277/480V THREE-PHASE, 7 TERMINAL, 200A RATED				
Anchor	200A	Jaw Rel	U42572	U42572
Landis & Gyr	200A	Jaw Rel	40007	40407
Milbank	200A	Jaw Rel	U9700	U9701
Murray	200A	Jaw Rel	RH173GR	RH173GR
Superior	200A	Jaw Rel	CU18007	CUJ-17/CU-449

Comments for Table 3:

- Requires use of 15" extension, Part No. S3488. Meter must be at a minimum height of 3' off final grade. Also, replace compression terminals with mechanical-type lugs, Part No. K1539.

Table 3A.

APPROVED TRANSFORMER-RATED METER SOCKETS

Supplier	120/240 Volt Single-Phase (Requires use of fifth terminal at nine o'clock.)	120/208-Volt Single-Phase 240 Volt Three-Phase	120/208 Volt Three-Phase	277/480 Volt Three-Phase
Anchor	URS7004G-B	RTSS8	RTSS13	RTSS13
Milbank	U7487-KK-TG	UC7448	UC7449	UC7449
Superior	LRLOU412VA	RLP11577AH	RLP11577BA	RLP11577BA
Landis & Gyr	U9837-8101	U9837-8401	U9837-8501	U9837-8501
Erickson	W-130	W-130	W-340	W-340
N RJB	-	MS-2033-8	MS-2034-13	MS-2034-13

Table 4.

APPROVED TRANSOCKETS

Supplier	Size	Single-Phase	Three-Phase
Erickson	400A 600A 800A 1,200A 1,600A	MGE1182-1 MGE283-1	MGE1182-2 MGE283-2 MGE283-2 CT-124MGE CT-164MGE
RJB Enterprises	400A 600A 800A 1,200A 1,600A	MGE-403UG MGE-603UG	MGE-404UG MGE-604UG MGE-804UG MGE-1204UG MGE-1604UG
AMP Manufacturing and Supply	400A 600A 800A 1,200A	ACT4-3TM ACT6-3TM	ACT4-4TM ACT6-4TM ACT8-4TM ACT12-4TM

Table 5.

APPROVED TEST SWITCH ENCLOSURE

Supplier	Manufacturer's Number	Enclosure Size
Square "D"	13991	10.5" x 12.5" x 4.5"

Table 6.

APPROVED POLE-TOP METERING EQUIPMENT

Supplier	Size	Single-Phase	Three-Phase
Ronk	200A	9205	9805
	400A	9406	9806

Table 7.

APPROVED TRANSITIONS

Supplier	Manufacturer's Number	Size
Square "D"	RWT10-CC(1)	3.5" x 10"
	RWT18-CC(1)	3.5" x 18"

Comments for Table 7:

1. Approved for indoor use only in the city of Madison.

Table 8.

APPROVED UNDERGROUND SERVICE RACEWAYS

	Supplier	Catalog Number	Size
	Erickson	USR-36	11"x6"x36"
		USR-48	11"x6"x47"
		USR-60	11"x6"x47"
N	RJB (Galva-Closure Products)	CC-36	10-1/2"x6"x36"
N		CC-46	10-1/2"x6"x46"
N		CC-60	10-1/2"x6"x60"

Comments for Table 8:

1. Use one raceway for service less than or equal to 800 amperes, use two raceways for service greater than 800 amperes.



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