



2015

ELECTRIC SERVICE RULES

ROCHESTER PUBLIC UTILITIES

ELECTRIC SERVICE RULES AND REGULATIONS

Revised May 2015

INTRODUCTION

Rochester Public Utilities (hereafter referred to as RPU) has assembled this booklet to assist its customers and their architects, engineers, or electrical contractors to plan for and obtain electric service. The requirements herein supersede all previous publications of the “Electric Service Rules and Regulations” issued by RPU prior to this date and is subject to change without notice.

The information presented here is intended to supplement the requirements of the National Electrical Code® (NEC®), National Electric Safety Code® (NESC®), National Fuel and Gas Code (NFPA54), Liquefied Petroleum Gas Code (NFPA58), and all other applicable federal, or state, and municipal codes, regulations, laws and ordinances. It is always necessary to refer to and comply with such other codes, regulations, laws, and ordinances when planning, designing, and installing a new electrical service. Specific requirements of RPU do not intentionally conflict with any other requirements known to be in effect as of the publication date of this booklet. Any apparent conflicts of this nature should be brought to the attention of RPU for interpretation. RPU assumes no responsibility whatsoever for the manufacturer’s, supplier’s, electrician’s, or engineering consultant’s compliance with all applicable codes as well as all local and state codes. Any waiver at any time of RPU’s rights or privileges under the electric service rules and regulations will not be deemed a waiver as to any breach of other matter subsequently occurring.

All questions or requests should be directed to RPU's Customer Services at the contact number or address listed on page 2.

These rules and regulations are available on the RPU web site www.rpu.org. Contact RPU for more details.

RPU ELECTRIC CONTACT INFORMATION

Main Office Address:

4000 East River Rd NE
Rochester, MN 55906-2813

Web Address:

www.rpu.org

Contact	Phone Number	Email
Customer Service	507.280.1500	CustomerServiceReps@rpu.org
Customer Service: Toll Free	800.778.3421	
Emergency Electrical Outages (24 hr.)	507.280.9191	
General Information	507.280.1540	
General Fax	507.280.1643	
Metering Department	507.292.1232	
Modified or New Service	507.292.1232	newservice@rpu.org

OTHER CONTACT INFORMATION

Contact	Phone Number	WEBSITE
GOPHER STATE ONECALL	800.252.1166	www.gopherstateonecall.org
Rochester Building and Safety	507.328.2600	

REVISION HISTORY

Revision Date	Brief Description of Revisions
Aug 2011	Starting Revision for tracking
May 2015	Major Revisions

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SECTION 100

DEFINITIONS

Application for Service: The agreement or contract between RPU and the customer under which electric service is supplied and taken.

Accessible: Allowing or admitting, close approach; not guarded by locked doors, elevation, or other effective means including any portion of a temporary or permanent structure.

Building: A structure with roof and walls. Two or more structures shall not be considered a single building merely by the existence of skyways, tunnels, common heating or cooling facilities, common garages, entry halls or elevators, or other attachments.

Connected Load: The combined rated capacity of all motors and other electric energy consuming devices on the customer's premises which may, at the will of the customer, be operated with the electric energy to be supplied from the service of RPU.

Current Transformer: An instrument transformer designed for the measurement or control of current.

Contractor: Licensed individual or company who performs work for the Customer or RPU.

Customer: Any individual, partnership, corporation, or other legal entity now being served or to be served, using the electric service of RPU at any specified location.

Customer's Service Equipment: The necessary equipment and accessories, located near the point of entrance of supply conductors to a building, which constitute the main control and means of disconnecting the supply to that building. This equipment usually consists of a circuit breaker or a switch and fuses.

Disconnection Means: A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

Distribution Lines: RPU's lines located along streets, alleys, highways, or easements on private property, when used or intended for use for general distribution of electric service to customers of RPU.

Dwelling:

Dwelling Unit: One or more rooms for the use of one or more persons as a housekeeping unit with space for eating, living and sleeping, and permanent provisions for cooking and sanitation.

Multi-Family Dwelling: A building containing two or more dwelling units.

Single-Family Dwelling: A building containing a single dwelling unit.

Electric Service: The availability of electric power and energy, regardless of whether any electric power and energy is actually used. The supplying of electric service by RPU consists of the maintaining, at the point of delivery, approximately the agreed voltage, phase and frequency by means of facilities adequate for carrying the load that RPU is thereby obligated to supply by reason of the known requirements.

Excess Facilities: In those instances where RPU provides distribution and/or metering facilities at the customer's request, in excess of the facilities RPU deems necessary to supply service to the customer.

Fault Current: The current that will flow through the system to a point where a piece of equipment or a conductor has failed, such as bare conductors touching together or a bare conductor touching a ground point.

Frost (Frozen Ground): A condition where the water contained in the ground freezes resulting in additional difficulty and expense in excavation.

Individual RPU Metering: Direct measurement by RPU, using a RPU meter, of all electrical consumption of a customer supplied by Company.

Instrument Transformer: A transformer that reproduces in its secondary circuit, the voltage or current proportional to its primary circuit.

Instrument Transformer Cabinet: A cabinet installed and owned by the customer, meeting RPU's requirements, designed for housing instrument transformers used for metering.

Master Metering: Metering configuration where a single meter (master meter) measures the consumption for a building and then sub meters on the customer side of the Master Meter measure the consumption of individual load loads or groups of loads.

Meter/ Meter Set: An instrument or instruments, together with auxiliary equipment, for measuring the electric power and energy supplied to a customer.

National Electrical Code® (NEC®)¹: The current edition of the National Electrical Code as issued by the National Fire Protection Association (NFPA No. 70).

National Electric Safety Code® (NESC®)²: The current edition of the National Electric Safety Code as issued by the Institute of Electrical and Electronics Engineers (IEEE® C2), American National Standards Institute (ANSI® C2).

Nominal Voltage: The value, expressed in volts, which is assigned to a circuit or system for the purpose of conveniently designating its voltage class (as 120/240, 480Y/277, 600, etc.). The actual voltage at which a circuit operates can vary from the nominal within a range established by ANSI C84.1. The customer is responsible for making sure that their systems are capable of operating within range B of ANSI® C84.1.

Occupancy Unit: A room, office, apartment, or other space separated by walls or partitions that enclose the area, or a contiguous grouping thereof when occupied by a single customer.

Outside Sale: The sale or provision of electrical supply by a customer to any other person outside the customer's building or property.

Point of Delivery: The point where RPU's electric facilities first connect to the electric facilities of the customer. This is not necessarily the location of RPU's meter.

Point of Interconnection: The location designated by RPU that the customer must extend conduits to in order for RPU to install our facilities on customer property.

Primary Service: Any type of service with a nominal voltage greater than 600 volts.

RPU: Rochester Public Utilities.

Rate Schedules: The classification of the use of electricity into categories considering the amount of power supplied and the purpose of its use.

Redistribution: The provision of unmetered electrical supply by a customer to customer's tenants or other occupant, or to any person who qualifies for unmetered service.

Redundant Facilities: Duplicate (partial or full) facilities installed at the request of the customer for the purpose of increasing reliability of the system for a particular customer.

¹ *National Electrical Code® and NEC® are registered trademarks of the National Fire Protection Association, Inc., Quincy, MA 02269*

² *National Electric Safety Code® and NESC® are registered trademarks and service marks of the Institute of Electrical and Electronics Engineers, Inc. New York, NY 10017*

Secondary Connection Cabinet: Cabinet required when the number and/or size of the conductors exceeds RPU's limit for terminating in a specific pad-mounted transformer. If a secondary connection cabinet is used it will also be the location of the metering equipment.

Secondary Service: Any type of service with a nominal voltage less than or equal to 600 volts.

Secondary Terminal: The secondary side of a pad mounted transformer or a secondary junction box, whichever is designated by RPU.

Series Subtractive Metering: An arrangement to measure consumption in a multiple occupancy unit building using individual RPU meters on each occupancy unit in series with one RPU master meter to measure total building consumption on the set of service entrance conductors or feeder supplying the individual occupancy units with billing for common area usage determined by Company formula.

Service: The conductors and equipment for delivering energy from RPU's system to the wiring system of the customer.

Service Drop: The overhead service conductors from the last pole or other aerial support to and including the splices, if any, connecting to the service-entrance conductors at the building or other structure.

Service Entrance Conductors, Overhead System: The service conductors between the terminals of the service equipment and a point usually outside the building, clear of building walls, where joined by tap or splice to the service drop.

Service Entrance Conductors, Underground System: The underground service conductors between the terminals of the service equipment and the point of delivery.

Service Equipment: The necessary equipment, usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors to a building or other structure, or an otherwise defined area, and intended to constitute the main control and means of cutoff of the supply.

Submetering: The provision of metered electrical supply through a customer owned meter to a customer's tenants, cooperative or condominium owners, other occupants, or to a portion of the customer's own electrical consumption.

Underground Residential Distribution (URD) Areas: Those residential subdivisions or other specified areas within which all customers are served by underground distribution lines.

Underground Service Lateral: The secondary service conductors from RPU's distribution system.

Upgrade Service: An electric service is considered upgraded if the rating of the customer disconnect is increased or if either the conductors between the meter socket and the customer disconnect or the conductors on the supply side of the meter are changed.

Utility: For the purpose of this document any public, city, or city-franchised organization that furnishes electric service.

Voltage to Ground: For grounded circuits, the nominal voltage between the given conductor and that point or conductor of the circuit that is grounded; for underground circuits, the greatest voltage between the given conductor and any other conductor of the circuit.

Voltage Transformer: An instrument transformer intended for use in the measurement or control of a circuit and designed to have its primary winding connected in parallel with the circuit.

SECTION 200

GENERAL INFORMATION

201 Service Jurisdiction

RPU has been established by the City of Rochester for the purpose of providing electricity to the residents of the City. RPU also provides electricity to residents outside of the City limits but within the service area boundaries established by the State of Minnesota. Service will be provided to all eligible applicants only when all applications, agreements, easements, deposits, payments, and other required information has been provided to RPU.

202 Use of Service

Electric service may be used only for the purposes set forth in the respective rate schedules. RPU is in the business of providing retail electricity to the ultimate consumer. Electricity is supplied for use by customer's household or business, and outside sale of such service is not permitted. RPU permits redistribution and submetering where allowed by law, but a landlord may not charge the tenants more than the landlord is charged by RPU.

The electric service equipment and associated building wiring of buildings must be arranged by the owner to facilitate individual metering of the electrical consumption of each building and occupancy unit. (Minnesota Statute Section 326B.106 Subd.12 requires separate metering on most residential units). If desired by the owner, RPU will install and maintain necessary individual RPU meters to measure consumption and tender bills on the applicable rate schedules to each customer and separately occupied buildings and occupancy units. Installation and maintenance of individual RPU meters by RPU shall not relieve the owner or landlord of responsibility for electrical service equipment and associated building wiring, nor shall it relieve the owner or landlord of responsibility to notify RPU of a single-metered residential building.

Electric service in a single-metered residential building, as defined pursuant to Minn. Stat. 504B.215, shall be billed to the landlord/building owner except when a de minimis exception exists. A de minimis exception to the determination that a building is a single-metered residential building exists if electrical service used in a common area but measured by an individual tenant's meter does not exceed an aggregate 1,752 kilowatt hours per year. The landlord shall bear the burden and cost associated with proving an exception. (Minnesota Statute 504B.215 Subd. 2 requires the landlord of a single-metered residential building shall be the bill payer responsible, and shall be the customer of record contracting with the utility, and requires the landlord to advise the utility of the existence of a single-metered residential building). Except where a de minimis exception applies, a single

metered residential building includes the following situations: “shared meter” in which a utility meter measures service provided to a tenant’s dwelling and also measures such service to areas outside that dwelling; or “mixed wiring” in which electric outlets, fixtures or devices outside the individual unit are included on an individual meter; or “mixed plumbing” when related to electric utility service such as when an electric water heater serves more than one individual unit. RPU shall respond to a tenant customer’s request for a shared meter investigation within ten (10) business days. RPU’s investigation shall consider whether a de minimis exception applies.

The following may be representative de minimis exception examples:

- Common area lighting fixtures up to two 100-watt light bulbs operating 24 hours/day, seven days per week.
- Common area outlets without constant motor loads, such as an outlet in a hallway used for housekeeping.
- Common area garage door opener for non-commercial use.
- Mixed wiring with another tenant unit.
- Laundry appliances accessible by multiple tenants.
- Common area lighting exceeding two 100-watt bulbs operating 24 hour per day, 7 days per week usage.

A landlord seeking to prove a de minimis exception shall do so by providing evidence establishing by actual measurement that the usage does not exceed 1,752 kilowatt hours per year. Where such actual measurement is not possible the landlord shall present written documentation from a licensed tradesperson or housing inspector that this usage is not likely to exceed 1,752 kilowatt hours per year. Such evidence must be presented prior to, during, or within 30 days of the conclusion of a shared meter investigation.

Upon discovery of a single-metered residential building, as defined pursuant to Minnesota Statute Section 504B.215, whether shared metering, mixed wiring or mixed plumbing in which individual metered service had been established and billed, RPU shall, within thirty (30) business days, recognize and make adjustments to its records to reflect that the landlord/building owner is the bill payer responsible and customer of record. RPU shall make adjustments to the tenants and landlord/building owners account based on Minnesota State Statute and RPU’s standard practices. Additionally, the tenant or landlord/building owner may seek additional adjustment of charges or challenge RPU’s finding of a shared meter situation by filing a complaint with the Minnesota Public Utilities Commission, or by court action. Upon request, RPU will provide to the tenant available billing history in relation to such additional actions. The Minnesota Public Utilities Commission has determined that regardless of how or by whom an investigation is initiated leading to utility account adjustments, credits and/or refunds as herein described, the investigation and any resulting adjustments, credits and/or refunds shall implicate the protections of Minnesota Statute

Sections 504B.285 Subds. 2 and 3, and 504B.441.

In the event the landlord/building owner denies access to the building or fails to cooperate with an investigation to determine whether a single-metered residential building exists, as defined pursuant to Minnesota Statute Section 504B.215, the building shall be presumed to be a single-metered residential building as defined pursuant to Minnesota Statute Section 504B.215, and the landlord/building owner shall be the bill payer responsible and customer of record. RPU shall make adjustments to the tenants and landlord/building owners account based on Minnesota State Statute and RPU's standard practices. Additionally, the tenant or landlord/building owner may seek additional adjustment of charges or challenge RPU's finding of a shared meter situation by filing a complaint with the Minnesota Public Utilities Commission, or by court action. The Minnesota Public Utilities Commission has determined that regardless of how or by whom an investigation is initiated leading to utility account adjustments, credits and/or refunds as herein described, the investigation and any resulting adjustments, credits and/or refunds shall implicate the protections of Minnesota Statute Sections 504B.285 subds.2 and 3, and 504B.441.

In order to reestablish individual metered service for the individual tenant units, the landlord/building owner shall be required to provide certification of a licensed electrician that the building has been inspected sufficiently to determine that all instances of mixed wiring, shared metering and mixed plumbing have been eliminated or that the building qualifies for a de minimis exception, as shown by actual measurement or by certification by a licensed tradesperson or housing inspector. Additionally, the building owner may be required by RPU to post a deposit equal to the expected charges for up to two months of usage for electric service to the building.

RPU shall have the right to verify the certification at the landlord/building owner's expense prior to establishing metered service for individual units. Such verification shall not relieve the landlord/building owner of its responsibility to be the bill payer and customer of record of a single-metered residential building as defined pursuant to Minnesota Statute Section 504B.215.

In the event of discovery of a single-metered residential service, as defined pursuant to Minnesota Statute Section 504B.215, after previous certification to reestablish individual metered service for tenants, in addition to the above adjustments, the building shall be ineligible for individual metered service for tenants without petition to the Minnesota Public Utilities Commission by the landlord/building owner and a showing by the building owner by clear and convincing evidence justifying the reestablishment of individual metered service for tenants. Additionally, the MPUC may require consent of the building's tenants in determining that reestablishment of the individual metered service for tenants is appropriate.

RPU will not install, operate, maintain, or acquire any series metering system. RPU may, however, require series subtractive metering for its own purposes to measure consumption and render bills for electric energy not otherwise measured.

Electricity is normally supplied to each separate customer through a single service and meter. RPU does not engage in the practice of doing interior wiring on customer's premises except for the installation and maintenance of its own property. The customer may combine the supply of electricity through one meter and one service to two or more buildings or occupancy units if they are located on the same or contiguous parcels of property and occupied by the same customer, solely for customer's own use. If separate buildings are occupied in whole or part by tenants of the customer, then each tenant occupied building, or area, or occupancy unit must be segregated from other loads of the customer and metered by RPU.

If more than one building with tenants, or portions of more than one building with tenants, are served through one meter, this practice may continue until such time as material structural changes are made that will result in major modifications to the customer's service entrance equipment. If such modifications do occur, provisions must be made to allow for individual RPU metering of each tenant occupied building, or area, or occupancy unit. While the single meter service continues, the bill for the buildings will be computed as though each building used an equal portion of the total metered service and was separately billed.

All wiring and equipment on customer's side of the point of delivery, except metering equipment, will be furnished, installed, and maintained at the customer's expense in a manner approved by the public authorities having jurisdiction over the same.

Customer will protect all electrical equipment and systems with devices that conform to the industry accepted standard for the various classes of electrical equipment and systems to prevent fire or damage to equipment from electrical disturbances or fault occurring in the customer's system or in the supplying system. The "industry accepted standard" will be as required in the National Electrical Code and such additional devices as are prescribed by any public authority with jurisdiction over the installation of electrical facilities.

Any inspection of a customer's wiring and equipment by RPU is for the purpose of avoiding unnecessary interruptions of service to its customers or damage to its property and for no other purpose, and will not be construed to impose any liability upon RPU to a customer or any other person by reason thereof. In addition, RPU will not be liable or responsible for any loss, injury, or damage that may result from the use of or defects in a customer's wiring or equipment.

RPU may, however, at any time require a customer to make such changes in customer's electrical or non-electrical property or use thereof as may be necessary to eliminate any hazardous condition or any adverse effect which the operation of the customer's property or equipment may have on said customer, other customers of RPU, the public, or RPU's employees, equipment or service. In lieu of changes by the customer, RPU may require reimbursement from the customer for the cost incurred by RPU in alleviating an adverse effect on RPU's facilities caused by the customer's property.

The transformers, service conductors, meters, and appurtenances used in furnishing electric service to a customer have a definite capacity. Therefore, no material increase in load or equipment will be made without first making arrangements with RPU for the additional electric supply.

203 Application for Service

Application for initial, additional, or temporary electric service must be made by the customer, or a designated representative, to RPU. Applications can be made at RPU's Service Center or by contacting a New/Modified Service Representative (See Page 2 for contact information). At the time of application, the customer will be required to provide, in writing on the form(s) provided, information relating to the service request, including the following:

- (1) Exact location of premises to be served including building street address, apartment or unit number if applicable, lot and block numbers and name of subdivision.
- (2) The type of service desired (e.g. temporary, permanent, residential subdivision, dwelling unit, commercial, industrial, rewire, etc.).
- (3) The approximate date that electric service is required.
- (4) The name, address, and telephone number of the customer's designated representative who will be responsible for working with RPU representatives in providing the electric service (e.g. customer employee, engineer, contractor).
- (5) Commercial Services'
 - a) Load Data Sheet: The Customer or their representative shall submit to RPU Engineering a completed Electrical Load Data Sheet specifying the type of service required by the customer and expected magnitudes of connected and peak load. Additional data in the form of construction drawings and the proposed service entrance may also be necessary for RPU to adequately determine the capacity and arrangement of service to the customer. The load data sheet must be received before RPU can perform the necessary planning and design of the project. Failure to provide this information at the start of a project may result in significant delay in RPU being able to provide service.
 - b) Application for commercial service must be received a minimum of 10 working days prior to energizing the service.

RPU should be advised of planning installations as early as possible so that details for furnishing service may be arranged and construction completed by the desired date. Application forms and additional information may be obtained by contacting RPU's New Service Representative (see page 2 for contact information) or at www.rpu.org.

204 Ownership of Equipment

204.1 RPU-Owned Equipment

The meter and associated metering equipment furnished or installed by RPU are the property of RPU.

- a) Overhead Service—In addition to the metering equipment, the overhead service drop installed by RPU is the property of RPU.
- b) Underground Service—In addition to the metering equipment, all equipment up to and including the designated point of delivery is the property of RPU.

204.2 Customer-Owned Equipment

The meter socket, instrument transformer compartment (if required, see Section 610), the service entrance conductors and conduit from the meter socket to the service entrance disconnect, the service entrance switch or circuit breaker and the service entrance ground equipment and the concrete transformer pad are the property of the customer.

- a) Overhead Service—In addition to the equipment on the customer side of the meter socket, the service drop wire holder or bracket, the weatherhead and either the service mast and conduit with entrance wires or the service entrance cable with watertight connection to the meter socket are the property of the customer.
- b) Underground Service Lateral—In addition to the equipment on the customer side of the meter, all conduit and cable required to extend the service lateral from RPU's point of delivery to the meter socket are the property of the customer.

The customer and RPU are responsible for the installation, maintenance, repair, and replacement of the electric service equipment which each owns.

205 Easements

Whenever any RPU-owned underground and/or overhead material and equipment is located on or above the customer's property, the customer shall grant an easement to RPU to the extent which RPU deems necessary. All utility easements required by RPU are to be granted by the customer at no cost to RPU. The customer must provide a legal description by a Registered Land Surveyor. The easement will be signed and recorded by RPU.

206 Inspection of Customer's Facilities

206.1 As a minimum, wiring and electrical equipment of the customer, shall be installed in accordance with the latest edition of the National Electrical Code®.

206.2 Customer services and associated wiring installations located within the Rochester city limits, including temporary installations, must be inspected and approved by an authorized inspector of the City Building Safety Department as required by Minnesota Statutes Section 326.B.36. RPU will make connection only after approval by the authorized inspecting authority. The inspector is required by Minnesota Statutes Section 326.B.36 to disconnect or have disconnected by the utility any installation that is declared by the inspector to be unsafe and a hazard.

206.3 Customer services and associated wiring installations located outside the Rochester city limits and requesting service from RPU must have their wiring inspected by a state inspector. RPU will make connection before authorization from the state inspector only if the master electrician who installed or supervised the installation agrees in writing to be responsible for said wiring until such time that it can be inspected and approved by the state inspector ("Request for Electrical Inspection" – white form).

207 Service Connection, Disconnection, and Reconnection

After the customer's installation has been inspected and approved by the proper authority, a meter will be installed by RPU and the electric service made available provided that all applications, agreements, and deposits have been submitted by the customer and approved by RPU. Inspection notices must be received by RPU two business days prior to the date that the connection is desired (weekends and holidays excluded). Under special circumstances, verbal inspections will be accepted as long as written inspection documentation is submitted immediately thereafter.

207 Service Connection, Disconnection, and Reconnection (cont.)

Customer requests for disconnection or reconnection of existing services must be received by RPU two business days prior to the desired time of disconnection or reconnection (weekends and holidays excluded). For the mutual protection of the customer and RPU, only authorized employees of RPU are permitted to set and remove meters, or to make and energize or break and de-energize the connection between RPU's service drop or secondary terminals and the customer's service entrance conductors or underground service laterals.

208 Liability

RPU does not engage in the practice of doing interior wiring on customer's premises, except for the installation and maintenance of its own property, and therefore is not responsible for service beyond the point of delivery. RPU shall not be liable for damage to any customer or to any third party resulting from the use of the service or from the presence of RPU's appliances or equipment on the customer's premises.

The customer is solely responsible for any accidents, fires or failures resulting from the condition and use of his wiring installation or equipment.

209 Service Interruptions

RPU reserves the right to interrupt service at any time. Interruptions for maintenance and system improvements will be prearranged and advance notice will be given to the customer whenever practical.

RPU will not be responsible for consequential damages resulting from service interruptions, fluctuations outside its control, or from operations in response to abnormal system conditions. Customers requiring service reliability and/or stability exceeding RPU's normal service should consider uninterruptible power supplies, isolation transformers, power conditioners, redundant services, or other options to provide the level of service needed. RPU's Engineering staff is available to discuss such needs.

210 Access

Employees of RPU shall have the right of access to the customer's premises at all reasonable times for the purpose of installing, reading, inspecting, maintaining, or removing any of its meters, devices, or other equipment which is used in connection with the furnishing of the customer's electric service.

211 Customer Responsibility

Failure of the customer to notify RPU in a timely manner of any planned alteration to electric service facilities or increased electrical load, and failure to comply with RPU's published rules, regulations, and rate schedules may result in delayed connections, interruption of service, or damage to equipment, for which RPU disclaims all responsibility.

212 Revisions of Requirements

All requirements stated or implied herein are subject to change at any time without prior notice.

SECTION 300

RATES, CONNECTION CHARGES, AND CREDIT POLICY

301 Rate Schedule Classification

Electric service is supplied to customers under various rate schedule classifications as determined by the type of service, the amount of electric power supplied, and the purpose for which the electric service is to be used. Copies of RPU's rate schedules are available at RPU's Service Center and www.rpu.org.

302 Payment

RPU will, insofar as possible, read all meters every month and bill the customer for service used during the period. Payment of the bill is due on the date noted on the bill.

If the meter cannot be read during a billing period, or the reading seems erroneous, an estimate will be made for that billing period. Adjustments to bills resulting from inaccuracies in the meters will be handled in the manner described in section **608 Meter Testing**.

303 Customer Charge

There is a customer charge for each meter/service provided. The amount of this customer charge will vary based on the type and number of services provided (see RPU's rate schedule for more information).

304 New Underground Residential Service Connection Charge

RPU will charge an underground service connection charge (New Underground Service fee) for the extension and/or connection of new underground electrical service to any single-family home, townhome, condominium, duplex or triplex located in a R-1, R-1x, R-Sa, R-2, R-4 or Special District, zoning districts. The amount of the charge can be obtained from a Customer Service Representative.

304.1 Service Connections

There will be no charge for connections/reconnections of existing services, in good payment standing, during RPU's normal working hours. If connection must be made outside of normal working hours at the request of the customer, a special connection charge will be assessed. The charge for such work can be obtained from the Customer Service Representative.

305 Service Disconnection/Reconnection

RPU may disconnect a customer's service, with notice, for any of the following reasons:

- Nonpayment of billings or issuance of non-negotiable check.
- Nonpayment of a deposit or other charges/fees.
- Failure to meet credit requirements.
- Failure to provide access to RPU owned metering equipment.

Without notice, the customer's service may be disconnected for:

- A condition determined to be hazardous--to the customer; to other customers or to RPU.
- Unauthorized use of electricity, water, or equipment belonging to RPU.

In the event service has been disconnected for a nonpayment, deposit, theft, or other credit cause, the customer will be required to pay a reconnection fee before the service is restored. In the event that the service is disconnected because of hazardous conditions on the customer owned equipment or unauthorized use, the customer will be required to have all required inspections performed prior to service being restored.

A schedule of fees is available from RPU Customer Service Representative.

306 Service Deposit

RPU has established a credit policy whereby existing customers with an acceptable credit history and customers never having had service with RPU may not be required to provide a deposit as a condition of service. A new or additional deposit may be required in cases where a deposit has been refunded or where the current deposit amount is inadequate. The deposit amount is based on two times the average monthly bill and bears interest at the rate established by Minnesota Statute Section 325E.02. Further information is available in the RPU Deposit Policy.

307 Security Lighting

Security lighting is available under its own rate schedule classification for those customers requesting it.

SECTION 400

STANDARD SERVICES

401 General Characteristics

This section describes the types of services offered to customers under RPU's standard rate schedules. Electric service supplied by RPU is alternating current having a nominal frequency of 60 Hertz (cycles per second).

402 Availability of Service

Although the types of service listed below are generally available throughout the area served by RPU, service of the type requested by a customer may not be available at the location where such service is desired, and in certain cases may be available only through special contractual arrangements and at the expense of the customer. Each customer will generally be allowed only one type of service and one point of delivery for each location. For redundant services see Section 504.

403 Secondary Service Voltages

The following types of secondary service are generally available to customers served under RPU's standard rate schedules:

403.1 Single Phase Service

120/240 Volt, 3-Wire, Grounded Neutral: Generally available where the total load is 100kVA or less for pad-mounted service, or 50kVA or less for pole-mounted service with an underground secondary in each case.

403.2 Three Phase Service

- a) 208Y/120 or 277/480 Volt, 4-Wire, Grounded Neutral: Generally available where three phase utility primary facilities are adjacent to the premises to be served.
 - i. For customers with loads less than 75 KVA, based on RPU's projections, there will be charges for the cost difference between providing a single phase service and a three phase service. These charges will need to be paid by the customer prior to RPU performing the three phase installation.
- b) 240/120 Volt, Delta, 4-Wire, Grounded Neutral: No longer available as a new standard service.

- c) 240 Volt (and 480 Volt), Delta, 3-Wire: No longer available as a new standard service.

404 Primary Service Voltages

Three-Phase, 13800Y/7970 Volt, 4-Wire, Grounded Neutral Service: Available only by special request where the total annual peak load at one site is projected by RPU to exceed 500 kW. RPU reserves the right to deny a request for a primary voltage service.

The point of delivery will normally be the terminals of RPU's cable in the customer's switchgear.

SECTION 500

SPECIAL SERVICES

501 Temporary Service

501.1 Temporary service is intended to be supplied at secondary voltages only to customers for use during the construction of permanent facilities and before the permanent service can be installed.

501.2 The address of the location to be supplied must be permanently displayed at the location and on the temporary pedestal/meter location and be easily readable from the street before RPU will install the temporary service. All overhead and underground temporary services will be metered and billed under one of RPU's standard rate schedules.

501.3 The customer shall provide an approved meter socket with the necessary raceway and a suitable rigid support for attachment of the metering equipment and service drop. On all three phase temporary services, where required, the customer shall also provide a suitable enclosure for installation of RPU's instrument transformers.

501.4 Fees

a) Secondary Available at Property:

A temporary meter installation fee will be assessed for the first single phase temporary service installed for construction. The location of the temporary service will be designated by RPU.

b) RPU has primary voltage facilities available on or adjacent to the lot and setting of a transformer is required:

A temporary meter installation fee and a temporary facilities installation fee will be assessed for the first temporary service installed for construction. The location of the temporary service and facilities will be designated by RPU.

c) RPU does not have adequate facilities in the area:

The Customer will be required to pay RPU for the actual cost to install and remove the temporary services.

Information regarding the charges for temporary service can be obtained from RPU's Customer Service Representative. RPU may require temporary service fees to be paid in advance.

502 Services for Unusual Load Characteristics

The operation of customer equipment having a relatively high load of short or intermittent duration, such as welders, compressor motors, elevators, and X-ray equipment, may cause serious fluctuations of voltage and interfere with the service being provided by RPU to other customers. If such a load is anticipated, the customer must consult with RPU and agree to install such protective devices as may be required so as not to cause damage to any of RPU's equipment or in any way inhibit service to other customers. In addition, special compensation may be required by RPU from the customer in those cases where it is necessary for RPU to install special or larger facilities than would normally be required to provide satisfactory service. (Refer to Section 700 for additional details.)

503 Excess Facilities

RPU will normally size its electric facilities (primary cable and transformer) to serve the load projected by RPU. If a customer desires RPU to install excess facilities, RPU must be advised as soon as possible so the feasibility of such a service can be determined. If RPU determines that excess facilities can and will be provided the customer will be required to reimburse RPU for the difference in cost between the standard and the requested excess facilities, including all labor, materials, and overheads. A written agreement between the customer and RPU shall also be executed at RPU's discretion.

504 Redundant Facilities

RPU will normally provide one set of facilities (such as a set of primary cables and a transformer) to one point of delivery for each customer. If a customer requires redundant facilities RPU must be advised as soon as possible so the feasibility of such service can be determined. If RPU determines that redundant facilities can and will be provided, the customer will be required to reimburse RPU for the entire cost of the redundant facilities, including all labor, materials, vehicle charges, and overheads. A written agreement between the customer and RPU shall also be executed at RPU's discretion.

505 Relocation or Protection of RPU Facilities

It is the responsibility of the customer to arrange for the relocation and/or protection of RPU's facilities whenever such action is appropriate. Any intended relocation or protection of RPU facilities must be reviewed with and approved by RPU in advance. The cost of any change or relocation of RPU's facilities for the benefit only of the customer, and which has been initiated by the customer, shall be borne solely by the customer. A deposit by the customer may also be required before the changes are made. RPU will bear costs to the extent that a change or relocation benefits RPU. The customer shall not be required to pay for changes necessitated through public improvements by the City, County or State. The customer shall not paint or otherwise modify the appearance of any RPU owned equipment or facilities.

506 Rewiring or Upgrade Existing Facilities

The customer or electrical contractor shall contact RPU when it is necessary to rewire or upgrade an existing electric service. All RPU Electric Service Rules & Regulations will be followed.

The customer shall be responsible for maintaining the same phase rotation for 3-phase rewires.

When a customer upgrades an existing electric service with RPU owned underground service laterals the ownership of the underground service lateral will transfer to the customer.

Customers shall not be allowed to convert an existing underground electric service to an overhead service.

SECTION 600

METERS AND METERING EQUIPMENT

[All new or upgraded residential or commercial services must have an approved meter socket (see Section 613 for approved meter sockets). Any new or upgraded service without an approved meter socket will not be energized!]

This section covers the installation of meters and associated equipment such as current and potential transformers for both overhead and underground services. Further description of RPU requirements for both overhead and underground services is covered in other sections of this booklet. The requirements contained in this section are for services rated 600 volts or less. When services are required at primary voltage (such as 13800 Y/7970 volts), the metering requirements and equipment will be determined on an individual basis.

601 Responsibilities for Providing Metering Equipment

All metering equipment, with the exception of the meter, current transformers and potential transformers, must be purchased and installed by the customer or electrical contractor. All metering equipment installed must be certified and labeled and have prior approval of the RPU metering department. Metering equipment installed without RPU approval will not be energized unless by special permission of the RPU metering department. RPU will energize only one set of metering equipment under each contract or application for one class of service.

602 Location of Meters

Meter locations will be agreed upon by representatives of the customer and RPU, subject to final approval by RPU.

602.1 Meter Clearances

Meters shall be situated such that there is not less than three feet of unobstructed space in front and one foot on all sides. Meters shall not be located where they are subject to corrosive fumes, dust, vibration or physical damage. Outdoor meters shall not be located in carports, under porches whether open or enclosed, or along walkways or driveways where they might create a hazard to people or be subject to damage by passing objects.

602.2 Access to Meters

Meter locations shall not be hazardous or cause inconvenience to employees of RPU when installing, maintaining, or reading the meters. RPU personnel shall have direct and unobstructed access to RPU's metering equipment at all times.

602.3 Industrial and Commercial

Meters for industrial and commercial service shall be located outdoors.

602.4 Height Limits

All meters located outdoors on residential or commercial services, where the meter is mounted on a permanent structure, shall have a height limit of not more than 6 feet and not less than 3 feet from final grade to the center of the meter. A typical metering arrangement is shown in Section 1100, Exhibit 1.

602.5 Residential

- a) All new services must have the electric meter located outside.
- b) Existing residential customers where the meter is located inside shall relocate the meter to the outside if the service is upgraded.

All new self-contained meter sockets installed must be on the list of approved meter sockets (see section 613).

602.6 Multi-Family Dwelling

Where more than one meter is installed, as on apartment complexes, meters are to be located outside and grouped if possible.

Exceptions:

Multi-Family dwellings that have 24 meters or more may request to locate the meters inside as long as they are grouped at one location and accessible at all times to each customer and RPU personnel.

Multi-Family dwellings where the building has over 3 occupied stories fully above grade the customer may request in writing for permission to be allowed to install grouped metering panels in multiple locations. The metering locations should be minimized and typically would only be allowed on every 3rd story of the building.

In all cases where multi-metering panels with stacked meter sockets are used, the maximum height to the center of the top meter shall be not more than 6 feet and the minimum height to the center of the bottom meter shall be not less 1 feet indoors and 3 feet outdoors. Individual apartment disconnects must be connected on the load

side of the meter. If the service voltage is 120/208 volts, a fifth terminal located at the 9 o'clock position is required in the socket and must be connected to the service neutral in accordance with the NEC[®] (see Exhibit 12). The house meter socket for apartment buildings requires an approved lever actuated positive bypass mechanism which will provide clamping pressure on the meter blades. Only one meter may be installed under one socket cover in multi-metering panels.

602.7 Mobile Homes

RPU will individually meter each mobile home located in a mobile home court or addition to a mobile home court. Resale of metered electrical energy by the court owner will not be permitted in these facilities. Individual meter pedestals, with bypass sockets, shall be provided by the customer or his representative. Maintenance and repair of the meter pedestal is the responsibility of the customer. A typical mobile home metering arrangement is shown in Section 1100, Exhibit 2.

602.8 Commercial Multi-Metering Panels

All commercial multi-metering panels used in shopping centers, spec buildings and multi-commercial tenant buildings shall have a maximum of four meter sockets per vertical stack. In all cases, the maximum height to the center of the top meter shall be 6 feet and the minimum height to the center of the bottom meter shall be 1 foot indoors and 3 feet outdoors. An approved lever actuated bypass is required on all meter sockets and each individual unit disconnect shall only be connected to the load side of the meter. Each individual meter socket shall have a barrier to isolate the customer's disconnect switch and wiring from the metering area. Only one meter may be installed under one socket cover. A system neutral is required to each 5 and 7 terminal meter socket in accordance with the NEC[®].

Each meter shall have a separate accessible lockable service disconnect wired in cold sequence to be used by RPU.

In situations where the building has over 3 occupied stories fully above grade the customer may request in writing for permission to be allowed to install grouped metering panels in multiple locations. The metering locations should be minimized and typically would only be allowed on every 3rd story of the building.

603 Grouped Meters

In installations requiring more than one meter, the meters shall be grouped and suitably connected such that a meter serves no more than one customer. The height limits stated previously also pertain to grouped meters where practicable. If deemed necessary by the space available, the meters may be stacked in an orderly fashion. Any dwelling with more than one customer living therein must have an individual meter for each dwelling unit. These meters must be easily accessible to all tenants and to personnel of RPU. There shall be an approved type of disconnecting means for each meter which is lockable in some way to prevent reconnection by other than RPU personnel. A typical multiple metering arrangements is shown in Section 1100, Exhibit 3.

604 Meter Identification

If more than one meter is required for a building, each meter socket shall be identified and permanently designated in a suitable manner indicating the particular customer served. **For outside locations the meter socket shall be marked with a stamped brass, aluminum or stainless steel tag. If the meter location is inside an engraved hard plastic tag will also be acceptable. The lettering on the tag shall be ½ inch block letters or numbers and the tag shall be securely attached to the exterior, non-removable portion of the meter socket and at the individual meter main disconnect.** Any other means of identification is not acceptable. A permanent marking shall also be inside the meter socket base in a visible location (RPU will except a written address using a permanent marker as satisfying the requirement for marking inside the meter socket). **Meters will not be installed until this requirement is met.**

Each circuit shall be carefully traced and rechecked by the contractor to ensure against errors in wiring that would result in one customer obtaining service through the meter serving another customer. This is especially important when the wiring is concealed. Electric service shall not be energized if meter sockets are not identified. It will be the contractor's/owner's responsibility to correct any errors due to misidentification of meter sockets. RPU reserves the right to charge the building owner and/or electrical contractor for actual costs incurred by RPU to make corrections.

605 Meter Mounting

605.1 Outdoor meters and meter mounting devices shall be mounted securely on permanent structures such as houses, garages, and other buildings. Where outdoor meters are installed on surfaces that prevent installation of the meter mounting device in an exact vertical plane, a meter board must be installed or the surface modified in such a manner that the meter mounting device can be installed vertically. The preferred meter location is within ten (10) feet of the front end of the building (house or attached garage) on a single-family

dwelling for new customer hook-ups. All meter locations for rewired or upgraded services shall be located outdoors with locations agreed upon between customer, contractor, and RPU personnel with final approval by RPU personnel. RPU has the right to refuse to energize service if these requirements have not been met.

605.2 Indoor meters, **where permitted**, shall be mounted in accordance with the preceding requirements of this section and shall be located as close as possible to the point where service enters the building. Indoor metering equipment shall be mounted securely in a vertical plane on permanent structures in a location free from moisture, high temperature, vibration, dust or dirt.

606 Meter Connections

The customer shall provide the necessary wiring for the meter set with the wiring so arranged that the line (supply) side can be connected to the top terminals of the socket and the load side to the bottom terminals. All conductors shall extend into the meter socket a minimum distance equal to the length of the socket trough. All neutral conductors must be insulated. For underground services, the line side neutral wire is to be identified in accordance with the NEC[®]. There should be sufficient slack left in the underground cables to make up for any ground shifting due to settling or extreme cold.

607 Wiring Restrictions on Meters and Metering Sets

No customer wiring is permitted to be connected to the metering, secondary wiring or under the terminals of the meter. No part of the metering set may be used as a junction box for the customer's wiring.

608 Meter Testing

608.1 Any customer who believes that a meter is failing to properly register the use of electricity, may request a meter check by contacting the Customer Service Representative. RPU will test the meter using standard calibration equipment and generally accepted test procedures within a reasonable period of time. Customers who request additional meter tests within a twelve (12) month period may be charged for the additional tests at a standard fee.

608.2 Whenever a watthour meter is found upon test to have an average error of more than two percent (2%) from one hundred percent (100%) or a demand meter more than one and one-half percent (1.5%) from one hundred percent (100%), a recalculation of bills for service will be made on the basis that the meter should be one hundred percent (100%) accurate with respect to a working test standard.

608.3 If the period of inaccuracy cannot be determined, it will be assumed that the metering equipment has become inaccurate at a uniform rate since it was installed or last tested unless there is valid reason to use another method. Recalculation of bills is based on RPU Board Policy for adjustments of customer accounts.

608.4 When the average error cannot be determined by test due to complete failure of all or part of the metering equipment, then an estimate of the quantity of energy consumed based on available data will be used to determine the adjusted bills.

609 Meter Seals

All connections to RPU's service equipment shall be made by RPU personnel only. **Unauthorized connections to or tampering with any RPU meter, associated equipment or meter seals, or indications or evidence thereof subjects the customer to immediate discontinuance of service, prosecution under the laws of Minnesota, adjustment of prior bills for services rendered, and reimbursement to RPU for all extra expense incurred on the account.** In addition, when the unauthorized connections or tampering involve an inside meter, the customer shall, at his own expense, relocate all service equipment and metering facilities outside the building.

610 Services Requiring Instrument Transformer Installation

RPU no longer furnishes instrument rated meter sockets. Please contact a local electrical distributor of your choice to purchase an RPU approved instrument rated meter socket. If requiring an 8 terminal meter socket, please contact RPU's Electric Meter Department for prior approval.

610.1 Single Phase:

When any single phase service has a rating greater than 400 amps, it will be necessary for RPU to use instrument transformers in the metering installation.

610.2 Three Phase:

When any three phase service has a rating greater than 200 amps, it will be necessary for RPU to use instrument transformers in the metering installation. These instrument transformers will be furnished by RPU and installed by RPU's Electric Metering Department, or delivered to the customer/contractor to install into an instrument transformer cabinet. The instrument transformer cabinet will be located before the customer service entrance disconnect switch.

Any new electrical services requiring the use of instrument transformers, the instrument transformers must be mounted in an instrument transformer

cabinet, or equipment designed solely for the purpose to house metering instrument transformers. In situations requiring emergency repairs to an existing electrical service where instrument transformers are installed in any location other than an instrument transformer cabinet, the customer/contractor must receive prior approval for the new mounting location of the current transformer from RPU's Electric Metering Department. These types of installations include, but are not limited to; instrument transformers mounted on a pole, installed inside a distribution transformer, and installed inside customer switchgear.

610.3 Underground Service from Pad Mounted Transformers:

Where service is underground from a pad mounted transformer, instrument transformers are to be mounted in an approved instrument transformer cabinet. The location of the instrument transformer cabinet must be approved by the RPU metering department.

610.4 Overhead Services:

Where service is provided by overhead service drops, approved outdoor instrument transformer cabinets will be required. Location of transformer cabinets will have final approval by RPU Meter Dept. before installation. (No open air CT's or PT's will be allowed.) Refer to 610.5a for cabinet requirements.

610.5 Indoor Mounted Instrument Transformers:

Instrument transformers installed indoors must have a service size of 1200 amps or greater, be installed inside the customer switch gear in a compartment designated for instrument transformers only and have prior approval from RPU metering personnel.

610.5.a Secondary Metering Instrument Transformer Cabinet

Instrument transformer cabinets shall be furnished and installed by the customer. This includes all services either overhead or underground. All cabinets must be certified and labeled, approved by RPU meter personnel and meet all NEC[®] requirements prior to installation. Cabinets must conform to the following:

- a) The minimum instrument transformer cabinet sizes are:
 - i. 250 volts and below: 48 inches High, 25 inches Wide, and 15 inches deep.
 - ii. 251 - 600 volts: 48 inches High, 36 inches Wide, and 15 inches deep.

- b) The door must have provisions for locking with a standard padlock.
- c) The cabinet must be hinged on the right or left side only.
- d) Cabinets shall not be used as junction boxes or service connection cabinets.
- e) Only RPU metering transformers may be contained therein.
- f) Cabinets must be certified and be the correct NEMA class for the area environment in which they are installed.
- g) 1-inch conduit installed between the cabinet and meter socket is required.
- h) Cabinet must accept bar-type current transformers on all services 1200 amps or less.
- i) The customer is required to label the line side and load side of the conductors within the instrument transformer cabinet.

All services that require instrument transformers will require the customer or contractor to purchase an instrument rated meter socket from a local electrical distributor. **RPU no longer stocks, or sells instrument rated meter sockets. Please contact a local electrical distributor of your choice to purchase an RPU approved instrument rated meter socket. If requiring an 8 terminal meter socket, please contact RPU's Electric Meter Department for prior approval. (See Section 613).**

610.5.b Primary Metering Equipment – Indoors

When indoor primary metering service is to be installed, the customer shall furnish a compartment or switchgear cubicle to house the primary current and potential transformers. All current and potential transformers shall be rated for metering accuracy as approved by the RPU Engineering Department. The metering point shall be located electrically between the customer's main disconnect and customer's circuits.

When practical, RPU may request that the customer install instrument transformers per RPU specifications. (Call the Customer Service Representative to obtain Engineering assistance.) In such situations, RPU may credit the customer for installation and material charges up to RPU's normal cost for instrument transformers.

610.5.c Primary Metering Equipment - Outdoors

When outdoor primary service is to be installed, RPU may elect to utilize either a pole-mounted or pad-mounted primary metering equipment set. Outdoor primary metering units are furnished and installed by RPU. Sharing of the material and installation costs for primary metering will be determined on a case-by-case basis.

611 Self-Contained Metering for Commercial Installations

In general, RPU will install self-contained meters (meters without instrument transformers) on single phase services where the service rating is 400 amps or less and on three phase services where the service rating is 200 amps or less. Where such metering is to be used, the customer shall provide a lever-operated bypassing socket (see Section 613). Such sockets permit a continuation of service upon removal of the meter for testing or maintenance. If a lever-operated bypass socket is not installed, the service will not be energized.

Commercial self-contained sockets must be rated continuous 200 amperes, minimum.

612 Master Metering

612.1 All new residential units shall be individually metered.

Exception provided in Minnesota Rule 326B.106 Subd.12.

“Buildings intended for occupancy primarily by persons who are 62 years of age or older or disabled, supportive housing, or buildings that contain a majority of units not equipped with complete kitchen facilities, shall be exempt from the provisions of this subdivision. For purposes of this section, “supportive housing” means housing made available to individuals and families with multiple barriers to obtaining and maintaining housing, including those who are formerly homeless or at risk of homelessness and those who have a mental illness, substance abuse disorder, debilitating disease, or a combination of these conditions.”

A customer claiming an exception takes all legal responsibility for proving the exemption for the life of their building.

All customers claiming an exception must provide RPU, in writing, a statement that they are claiming an exception under Minnesota Rule 326B.106 Subd.12 and why they feel their building meets the requirements for an exception. RPU does not determine the validity of the claimed exception and this required filing is for our RPU’s documentations only.

612.2 All new commercial or industrial units will be individually metered.

Exceptions must be approved by the RPU Metering Department.

612.3 Submetering by others for the purpose of charging individual occupants based on measured use must be in accordance with statutory requirements. Submetering by others for information purposes or to control the use of electric power for energy is permitted.

613 Approved Meter Sockets

Meter installations made with unapproved sockets will not be energized, or subject to disconnection if non-approved equipment is installed.

RPU APPROVED METER SOCKETS		
SERVICE TYPE	SERVICE VOLTAGES	APPROVED MFG./PART NUMBER
Meter Socket, 4 Terminal, 100A to 320A, Lever Bypass (Residential, 1-Phase, Self-contained meters)	Single Phase, 2 wire 120V or Single Phase, 3 wire 120 to 480V (240/480V, 200A MAX)	Landis and Gyr: HQ Series Milbank: HD 200 Series Thomas & Betts/Anchor: TB Square D: HD Series
Meter Socket, 5 Terminal, 100A to 320A, Lever Bypass (Residential, 1-Phase, Self-contained meters)	Single Phase, 2 wire 120V or Single Phase, 3 wire 120 to 480V or Single Phase, 3 wire Network 120/240V (240/480V, 200A MAX)	Landis and Gyr: HQ Series Milbank: HD 200 Series Thomas & Betts/Anchor: TB Square D: HD Series
Meter Socket, 6 Terminal, over 400A and larger Residential and Commercial 1-Phase Instrument Transformer rated	Single Phase, 3 wire 120/240V	Milbank: #UC7478-XL-WC-271 (Prewired to RPU spec.)
Meter Socket, 7 Terminal, 200A MAX, Lever Bypass (Commercial, 3-Phase only for Self-contained meters)	Three Phase, 4 Wire-WYE 120 to 480 V Three Phase 4 Wire-Delta, 120/240V (this service is not allowed for new installations)	Milbank: #U4701-RRL Cutler Hammer: #UTE7213BCH L&G: # 40407-025
Meter Socket, 8 Terminal, Over 200A and larger 3-Phase Instrument Transformer rated	Three Phase Delta	Contact RPU for approval
Meter Socket, 13 Terminal, over 200A and larger 3-Phase Instrument Transformer rated (Commercial, 3-Phase for Instrument Transformer rated)	Three Phase, 4 Wire-Wye, 120 to 480V Three Phase, 4 Wire Delta, 120/240V (this service is not allowed for new installations)	Milbank: #UC7445-XL-WC-951 (Pre-wired to RPU spec.)

614 Service at 480 Volts

Any 480 volt metering service requiring the use of current transformers will require the use of a step down potential transformer. RPU will supply and install all metering potential transformers at no cost to the customer/contractor.

615 Location of High-Leg in Meter Socket on 240/120 Volt, 3 Phase Services

The conductor with the higher voltage to ground must be connected to the terminal on the right side. The high-leg conductor must be identified as required by the National Electric Code. Meter sockets with the high-leg in the wrong position will not be energized. Incorrectly wired sockets will be subject to disconnection until wiring is corrected.

616 Removing RPU Seals and Meters

Disconnection of RPU metering equipment and cutting of seals is not allowed.

617 Customer Generation

Where a customer intends to operate any type of electric generator, photovoltaic array, wind generator, or similar equipment interconnected with the RPU system, special service and metering requirements must be satisfied. Contact RPU for details prior to interconnecting any generation equipment.

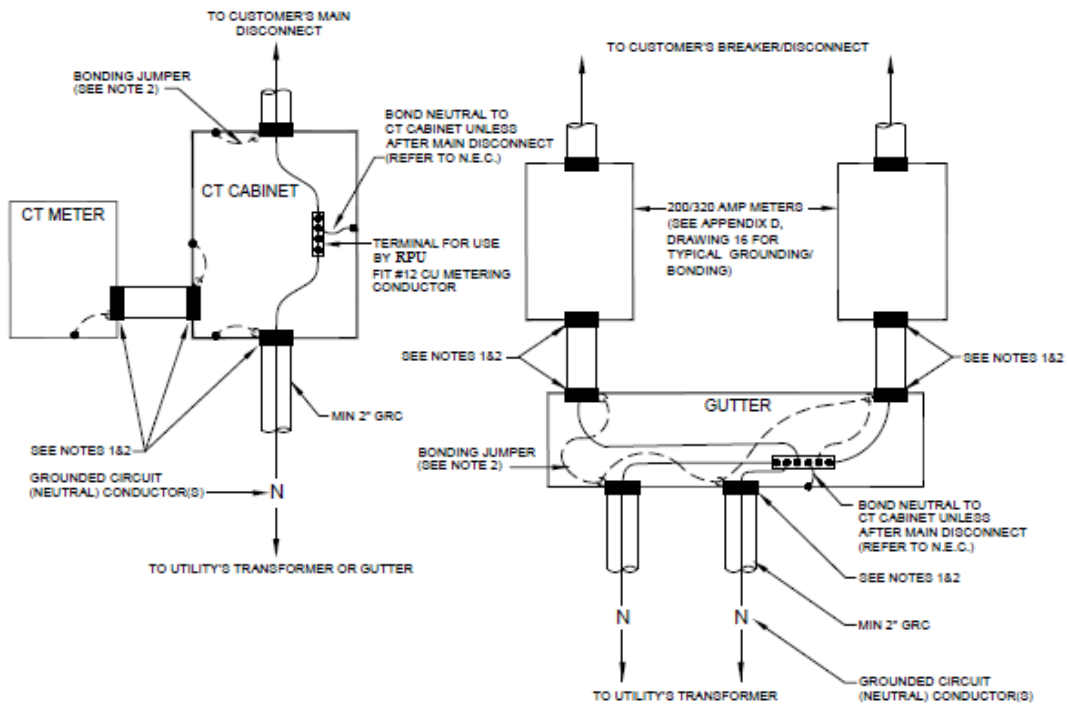
618 Proper Grounding/Bonding of Meter Sockets and Services

Service equipment and enclosures would be called on to carry heavy fault currents in the event of a ground-fault. For this reason, it is imperative that meter sockets and conduits be adequately bonded to the neutral and to the ground. Bonding is to be done by threaded couplings and threaded bosses in a rigid metal conduit system where the joints will be made up wrench tight. Locknuts and bushings do not fulfill the requirement of bonding at service equipment. Grounding bushing (with bonding jumpers), bonding locknuts, threaded conduit hubs, or other means approved. Refer to the NEC[®] Article 250.66. All metering conduits and sockets must be properly grounded. If PVC conduits are used, grounding conductors must be provided and installed by the customer/contractor in accordance with the National Electric Code. Electric services will not be connected if improperly grounded/bonded.

618.1 Neutral for 5 and 7 Terminal Sockets

A system neutral is required to each 5 and 7 terminal socket. Conductor should be sized in accordance with the NEC[®].

TYPICAL GROUNDING/BONDING FOR CT CABINET AND GUTTER



NOTES:

1. The metal conduit raceway (PVC is allowed on the load side of meter socket or CT cabinet) shall be bonded to the neutral conductor by the use of a grounding bushing (with bonding jumper), bonding locknuts, threaded conduit hub.
2. When a grounding bushing is used, a bonding jumper shall be installed to connect with the bonded enclosure. The bonding jumpers shall be sized to meet NEC Table 250-66. Bonding to be completed by contractor.
3. All neutral conductors shall be terminated in CT cabinets and gutters to a common connection.

SIZE OF LARGEST SERVICE-ENTRANCE CONDUCTOR OR EQUIVALENT AREA FOR PARALLEL CONDUCTORS		SIZE OF BONDING JUMPER CONDUCTOR
COPPER	ALUMINUM OR COPPER-CLAD ALUMINUM	COPPER
#1/0 or smaller	#3/0 or smaller	6
#2/0 or #3/0	#4/0 or 250 kcmil	4
Over #3/0 thru 350 kcmil	Over 250 kcmil thru 500 kcmil	2
Over 350 kcmil thru 600 kcmil	Over 500 kcmil thru 900 kcmil	#1/0
Over 600 kcmil thru 1100 kcmil	Over 900 kcmil thru 1750 kcmil	#2/0
Over 1100 kcmil	Over 1750 kcmil	#3/0 or 12-1/2% of conductor kcmil, whichever is larger

619 Customer Disconnect Switch

Individual customer disconnect switches shall be connected on the load side of the meter. No customer devices, e.g. surge suppressors, load management equipment, etc., may be installed on the line side of the meter.

Each non-residential customers must have a separate securable disconnect accessible to RPU at all times. (If the building is a multi-tenant building each non-residential customer must have a separate securable disconnect.) The disconnect shall be labeled and mounted adjacent to the meter.

620 Special Sockets

All special sockets, such as apartment panels, recessed, mobile home parks, socket and switch, or socket and transfer, must have RPU's approval prior to installation.

621 RPU-Owned Equipment

Any metering equipment furnished by RPU, such as meters, instrument transformers, relays, totalizers, test switches, etc., remain the property of RPU. If the equipment has to be removed or disconnected for any reason, please call RPU so that the equipment can be picked up.

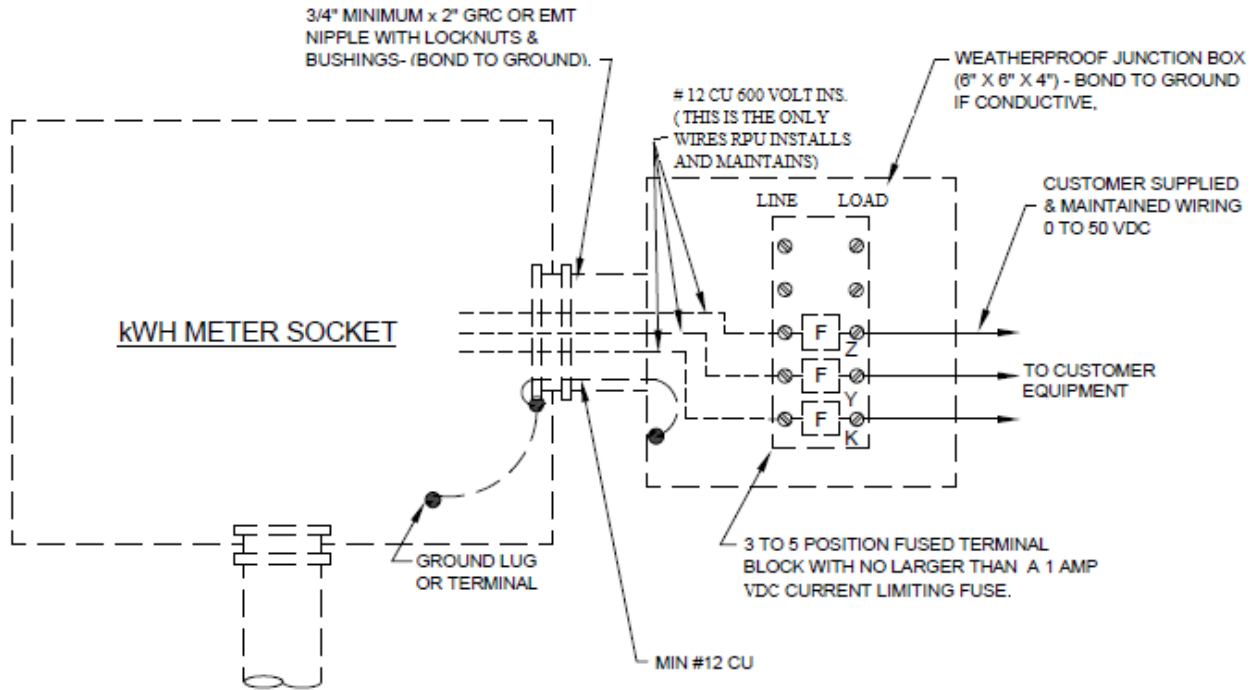
622 The Temporary Removal of Customer Owned Meter Sockets by RPU Personnel for Siding Installation and/or Repairs

RPU will temporarily remove meter sockets from premise walls for siding purposes on single and duplex meter sockets. Any meter housing containing more than two meter sockets for removal, will be at the discretion of RPU's personnel. Should RPU's personnel not be able to perform the work, it will be up to the customer to hire an electrician/contractor to perform the task. If at any time safety is a concern, RPU will have the service de-energized to perform the work. The customer/contractor shall contact RPU two business days in advance to schedule the temporary removal of the meter socket for siding purposes.

623 Pulse Initiating Device

Upon the customer's request, the customer/contractor will install a pulse-initiating device on a customer's existing meter socket. To initiate a request for a pulse-initiating device, the customer shall contact RPU. The customer should submit, in writing, all technical information concerning the customer's load-monitoring equipment to RPU. RPU will determine what type of pulse and the amount of pulses available in a given time interval. The customer/contractor will install a weatherproof junction box, a 3 to 5 position fused terminal block, a 3/4 inch galvanized rigid conduit with ground wire from the meter socket to the weatherproof junction box. The customer will furnish, install and maintain all necessary equipment. This wiring will be in accordance with the requirements of the electrical code governing such installation with RPU stipulation that one-amp current limiting fuses be installed on the load side of the terminal block. RPU will then install pulse-initiating device and wiring from the meter socket to the terminal block. Note: RPU's responsibility and liability ends at the line side of the terminal block. **RPU reserves the right to interrupt pulses at any time in order to test or change the meter and to change the pulse value whenever it becomes necessary to upgrade the metering equipment. Every effort will be made to notify the customer when it becomes necessary to interrupt pulses for equipment maintenance. The customer will be notified of any change to the pulse values.**

CUSTOMER CONNECTIONS FOR PULSE-INITIATING DEVICE INSTALLATION



PULSE INITIATING DEVICE INSTALLATION

SECTION 700

CUSTOMER EQUIPMENT

The customer's service entrance and equipment shall be installed in accordance with all local, state and NEC[®] requirements. It is the intent of this section to provide the customer with recommendations concerning factors that can affect both RPU and the customer in the selection, installation, maintenance and operation of the customer's equipment. If concerns arise that are not covered in this section, RPU's Customer Service Representative should be contacted.

701 Protection of Customer Equipment

The customer is advised to provide adequate protection against the effects of outages or voltage spikes in accordance with the NEC[®] or other pertinent sources of information for all types of motors and other equipment.

Equipment that should be protected includes, but is not limited to:

- motors
- computers
- electronics equipment
- equipment in which computers or electronics form an integral operating part

Equipment should be protected under all conditions, including:

- overload
- loss of voltage
- high or low voltage
- loss of phase(s) (e.g. single phasing on polyphase motors)
- re-establishment of service after any of the foregoing
- phase reversal
- motors that cannot be subjected to full voltage on starting
- harmonics or wave form irregularities

Failure to provide such protection may result in needless damage to equipment and the expense of delay and repair.

Sensitive electronics, such as microprocessor-based home electronics and business computers, are susceptible to damage due to voltage spikes or surges.

Before any microprocessor-based electronics are installed:

- Wiring practices that meet manufacturer specifications need to be assured. (For example, proper grounding and dedicated circuits are important.)
- Consideration should be given to installing transient voltage surge suppression.
 - at the main service entrance, and
 - at the point of use.
- An uninterruptible power supply (battery backup) should be considered if a momentary voltage dip or outage would cause loss of data.

702 Motor Starting Currents

Generally, all motors require a starting current substantially greater than their normal running current. Where starting currents are excessive, an abnormal drop in supply voltage will result. In order to minimize the unfavorable effects of such voltage drops, it is essential that the customer's motors do not exceed the allowable starting characteristics as shown in Table 430-251(A and B) of the NEC[®].

NOTE: Customers planning to install any motor larger than 5 hp single phase or 25 hp three phase, must contact the Customer Service Representative. Motor installations that cause power quality problems for other customers shall be corrected at the owner's expense.

702.1 Voltage Flicker

RPU uses IEEE Standard 141 (IEEE Red Book) as a guideline for the level of allowable flicker. Customers are not allowed to start any load on RPU's system that produces unacceptable levels of flicker which affect other customers. Customers are responsible for correcting unacceptable flicker problems in a timely manner when notified by RPU.

703 Power Factor

In order to improve the efficiency of RPU's distribution system, the customer's utilization equipment shall maintain an average power factor as close to unity as possible.

Some of RPU's rate schedules include a demand charge and a penalty for an average power factor that is less than 95%. Details of the method of billing for such customers can be obtained from the Customer Service Representative. For new services, it is suggested that the customer's utilization equipment be designed for operation at high power factor or with capacitors that are switched on and off with the equipment. See Section 1100, Exhibit 11 for correcting customer's power factor.

RPU will calculate the power factor of customers in designed rate classes by installing a varhour meter. See Section 601 for customer's responsibilities in providing metering equipment.

704 Fault Current

The customer's service equipment and other devices shall be adequate to withstand and interrupt the maximum available fault current. For single-family residences with service equipment rated 200 amperes maximum and 120/240 volts, single phase, equipment shall have a minimum interrupting rating of 10,000 amperes symmetrical and other equipment shall be braced to withstand that minimum value (see Section 1003 for more information).

705 Wiring Adequacy

The National Electrical Code[®] (NFPA No. 70) specifies the adequacy of wiring with respect to safety but such installations may not be efficient, convenient, or adequate for good service of future expansion of electrical use. In many instances, the installation of wiring capacity greater than minimum code requirements is strongly recommended.

706 Customer-Owned Generating Equipment

Unless authorized by written agreement, electric generating equipment installed by the customer shall not be interconnected or operated in parallel with RPU system. The customer shall own, install, operate, and maintain electrical interlocking equipment which will prevent parallel operation and such equipment shall be approved by RPU prior to installation. Please contact RPU for specific requirements relating to generation installations designed to operate in parallel with the RPU distribution system (e.g. solar, wind, etc.)

707 Customer's Obligations

707.1 Increased Load

In the event the customer desires to increase load materially, such as additional electric heat, increased motor loads, etc., they shall give RPU sufficient advance notice, so that RPU may provide added facilities if necessary. If the customer fails to notify RPU and RPU's equipment is damaged as a result of such increase in load, the customer shall reimburse and make payment to RPU for all such damages.

707.2 Balancing of Load

Except in the case of three-phase, four-wire delta services, the current unbalance in three-phase services shall not exceed 10 percent of the current that would be required at maximum load under balanced conditions.

707.3 Total Harmonic Distortion (THD)

- a) The application of any nonlinear load by the customer (e.g., static power converters, arc furnaces, adjustable speed drive systems, etc.) shall not cause voltage and/or current Total Harmonic Distortion (THD) levels greater than industry accepted levels on RPU's electric system at the point of power delivery to the customer's facility (reference standard IEEE 519).
- b) The customer shall disclose to RPU all nonlinear loads prior to connection. RPU may test the customer's load to determine the THD levels.
- c) It shall be the responsibility of the customer to assure that the THD requirements are met, including the purchase of necessary filtering equipment. Any load found not in compliance with this policy shall be corrected immediately by the customer at the customer's expense. If not corrected, RPU may disconnect service to the customer's facility.
- d) The customer shall be liable for all damages, losses, claims, costs, expenses and liabilities of any kind or nature arising out of, caused by, or in any way connected with the application by the customer of any nonlinear load operating with maximum THD levels in excess of the values stated in 708.3a. The customer shall hold harmless and indemnify RPU from and against any claims, losses, costs of investigation, expenses, reasonable attorneys' fees, damages and liabilities of any kind or nature arising out of, caused by, or in any way connected with the application by the customer of any nonlinear load operating with maximum THD levels in excess of the values stated in 708.3a.

SECTION 800

OVERHEAD SECONDARY SERVICE

RPU will supply overhead secondary service (600 volts or less), in areas where overhead facilities are available, at the voltages and under the conditions specified in other sections of this publication. The service entrance location will be specified by RPU. This section includes information on distribution transformer size, overhead service drop and connections to the customer's premises or equipment. Metering and customer equipment requirements are covered in other sections of this publication. The requirements of this section apply to all residential, commercial and industrial customers.

801 Maximum Transformer Size

801.1 The maximum standard overhead transformer size installed by RPU will be either one 50kVA transformer for a single phase application or three 15kVA transformers for multiphase applications. If a larger transformer size is required for a particular application, it shall be a pad-mounted type

801.2 One or more secondary services may be supplied from a transformer; the number of services from a transformer shall be determined by RPU depending upon the application.

802 Service Drop Conductors

802.1 The service drop for new services will be a twisted wire triplex (three wires) or quadruplex (four wires) configuration from the distribution system to the point of attachment on the customer's premises.

802.2 Existing services may be either a twisted wire or open wire configuration. If necessary for various reasons, RPU may change a service from an open wire to a twisted wire configuration.

803 Clearances

803.1 The service drop must be so located that the minimum clearance as specified in the latest editions of the NEC[®] and NESC[®] are maintained. An illustration of the clearances required is shown in Section 1100, Exhibit 4. **It is strongly recommended that the customer contact RPU's Engineering Department if the service is going to pass over a roof, balcony/deck, or within 5 feet of a window/door for additional clearance information. RPU will not energize an electric service with an observed clearance violation.**

803.2 Service drop conductors shall not be installed above a swimming pool or surrounding area extending 10 feet horizontally from the pool edge, diving structure, observation stands, towers or platforms.

804 Point of Attachment

A solid point of attachment for supporting the service drop on the building shall be provided by the customer at a point which will comply with previously stated clearances. Where the required heights and clearances cannot be maintained by a point of attachment on the building, the customer shall provide a service mast which is of a permanent nature and of sufficient strength to support the service drop at the required minimum clearance. Typical building attachment and service mast installations are shown in Section 1100, Exhibits 5 and 6, respectively. In such an installation, 2-inch or larger schedule 40 galvanized metallic conduit or 3-inch or larger rigid aluminum conduit shall be used. No couplings in the service mast will be allowed above the roof line. RPU reserves the right to decline to connect its service drop to an extension support which, in its judgment, constitutes a hazard to life or property.

805 Service Entrance

The customer's service entrance wiring shall terminate at a point so located that the service drop from the supply lines will not interfere with windows, doors, awnings, drainpipes, or other parts of the building or other obstructions so that only one bracket is required.

SECTION 900

UNDERGROUND SERVICE

901 New Residential Developments

RPU will designate a point of delivery for the connection of the customer's secondary underground service. The point of delivery may be a service pedestal or junction box, or the terminals of a pad-mounted transformer. In general, RPU will install, own, operate, and maintain all facilities on the source side of the point of delivery, including the junction enclosure and connections; the customer will install, own, operate, and maintain all secondary cables, conduit, and related service equipment specified in other sections of this publication on the load side of the point of delivery. However, the developer of a new subdivision is responsible, during general development, for installing road crossing conduits per RPU specifications. (Refer to Section 1100, Exhibit 13.)

Points of delivery will be located within RPU's easement area along or near a front or rear property line unless it is necessary or desirable to designate locations which are closer to the metering point(s). In such cases, the customer will be charged for the installed cost of any additional lengths of underground distribution cable and conduit from the property line to the point of delivery. Such charges shall be in addition to any other charges specified herein.

Additional information regarding RPU and customer responsibilities for URD installations is provided in Section 1100, Exhibit 9.

902 Residential Undergrounding in Overhead Areas

Customers residing in residential zones served by overhead lines may request underground electric service. Customers intending to relocate, upgrade or replace an existing overhead service may request underground service. In either case, the customer shall install, own, operate, and maintain the facilities specified in Section 901.

Customers replacing an existing overhead service with an underground service will also be responsible for installing an RPU provided secondary pedestal at a location specified by RPU and providing and installing RPU specified conduit from the secondary pedestal to an RPU specified pole or other piece of equipment. The customer should contact RPU's Engineering Department for more details prior to proceeding.

903 Underground Service to Commercial and Industrial Customers

903.1 RPU requires the underground installation of primary and secondary distribution service to new commercial and industrial structures.

903.2 RPU will designate a point of delivery for the connection of the customer's secondary underground service lateral. The point of delivery will normally be the secondary terminals of a pad-mounted transformer placed at a mutually agreeable location on the customer's property, as close as practicable to the metering point.

903.3 RPU will install, own, operate, and maintain the primary underground cable, the distribution transformer, and the secondary connections.

903.4 If underground primary distribution facilities are located on the customer's property, the customer shall provide the conduit from a designated point of interconnection to the distribution transformer.

903.5 If overhead main distribution facilities are located on or adjacent to the customer's property, the customer shall provide conduit to the riser pole, including the elbow, to the pad mounted distribution transformer. See Section 1100, Exhibit 8 for details.

903.6 The customer shall install, own and maintain a concrete transformer pad to RPU specifications. If the transformer is located in an area where it may be subject to physical damage (e.g. from vehicular traffic), RPU may require the customer to furnish and install an approved means of protection.

903.7 The customer shall install, own, and maintain all secondary cables, conduits, and cabinets from the transformer to the building service entrance. The customer shall install, own and maintain all secondary cables, conduits, and cabinets from the transformer (or pole mounted secondaries) to the building service entrance. (Conduit for the riser pole, if required, shall be furnished by the customer.)

RPU must approve the design of all secondary bus duct and cable bus designs. The installation may be inspected by RPU and the secondary connections to the transformer and the transformer side of the connection cabinet will be made by RPU.

It is the customer's responsibility to coordinate with and provide the necessary information to RPU in order to insure adequate connections are available at the secondary terminals of the transformer.

903.8 RPU will furnish and install the meter set in accordance with the requirements of Section 600.

903.9 The maximum number of secondary connections available shall be:

Single Phase:

Six (6)350 MCM conductors per phase

Three Phase:

<u>Transformer Size</u>	<u># of Conductors per Phase</u>
45 KVA	3
75 KVA to 500kVA	6
750kVA to 2500kVA	10

The maximum size secondary conductor to be installed in a 3-phase transformer is 750 MCM. Contact RPU's Engineering Department if more or larger conductors are required.

Any service requiring more conductors per phase than listed above must utilize a customer-provided secondary connection cabinet.

903.10 Secondary cables installed in an RPU manhole must be copper conductor.

904 Secondary Connection Cabinets

Where secondary connection cabinets are necessary, the following apply:

904.1 Cabinet assemblies will be suited to the installation and meet RPU and NEC[®] requirements.

904.2 Cabinets shall be constructed with provisions for bar-type or donut-type current transformers.

904.3 Conduits from service equipment to connection cabinet and from transformer to connection cabinet will be furnished and installed by electrical contractor as concrete pads are being formed and poured. Conduit systems shall meet RPU requirements. Above-grade raceway from the transformer to the connection cabinet is not allowed.

905 Transformer Clearances

Where pad mounted transformers and equipment in pad mounted enclosures are installed, the minimum clearances specified in Section 1100, Exhibit 7 must be maintained. Fences, shrubbery, and trees may be installed by the customer provided that the specified clearances are maintained, the grade is not altered, and the underground cables are not endangered.

906 Winter Installation

The Customer shall be required to pay a per foot additional fee for underground cable installation, at the customer's request, after frost has been established in the ground to an average depth of 6 inches or more. The amount of the frost fee depends on the depth of the frost. RPU may require that the estimated frost charges be paid in advance of performing work.

907 Installation in Rocky Soils or Poor Backfill

The Customer shall be required to pay an additional fee if rock or poor quality backfill is encountered during the installation of RPU's facilities. The fee will be based on the cubic feet of unsuitable material encountered by RPU or our contractor during installation. RPU may require that the Customer pay an estimated fee prior to performing the work.

908 Total Undergrounding

RPU does not install underground vaults, manholes, or submersible transformers on customer property. If the presence of permanent structures up to the property lines, or other conditions, precludes the installation of pad mounted equipment on the customer's property, primary service will normally be provided.

SECTION 1000

TRANSFORMERS and TRANSFORMER DATA

1000 Transformers

Necessary transformers will be installed and maintained by RPU in accordance with its established Rate Schedules, Electric Service Rules and Regulations, and Line Extension Policy.

RPU will not furnish transformers unless they are of standard size and voltage as established by RPU. The Customer shall notify RPU in advance of any change in the customer's load requirements that may affect the installed transformer capacity.

1001 Grounding

All service systems that operate below 600 volts contain a grounded neutral or a grounded phase conductor used as a circuit conductor in the system. The grounded neutral or grounded phase conductor is grounded at the supply transformer and will be run from the transformer bank to the meter socket and to each service disconnection means in accordance with 2014 *National Electrical Code*[®] Article 250.24(B), or as may be amended.

Customers requiring an ungrounded service for operation of a ground detection system, or for other operations permitted by the *National Electric Safety Code*[®], shall submit an exception request detailing the special circumstances necessitating the request. In addition, the customer shall state in the exception request that he is aware of and accepts the increased risk to personal safety associated with an ungrounded service. When supplying an ungrounded service results in an additional cost to the Company, the additional cost may be passed on to the customer.

1002 Special Rules

When a customer furnishes transformers or other equipment, in accordance with the applicable RPU rate schedule, Electric Service Rules and Regulations, RPU accepts no responsibility for maintaining or replacing the customer's transformers or other equipment if damaged or destroyed.

The customer shall provide a minimum of ten (10) feet level clearance on the door side(s) of padmounted transformers for hot-stick operation and ten (10) feet level clearance on the door side(s) of pad-mounted primary metering cabinets for instrument transformer maintenance.

1003 Fault Current

It is RPU's intent to address the customer's need for information concerning fault current and transformer protective device requirements pertaining to new construction, rewire, or additional load. Refer to 2014 *National Electrical Code*® Article 110.9 Interrupting Rating and Article 110.16 Flash Protection, or as may be amended.

Tables 10.1 through 10.3 in this Section show the available RMS symmetrical fault currents that may be expected at the secondary terminals of distribution transformers. Each fault current value listed in the tables is based on the typical lowest percent impedance transformer that might be set initially or as a replacement. No primary source or secondary line impedance has been included since it is generally relatively small, may change, and cannot be accurately forecasted.

Note: Because an overloaded transformer is typically replaced by the next larger size transformer, and an under-loaded transformer may be replaced by the next smaller size transformer, the customer is encouraged to use this range of transformers to perform their studies and select equipment such as current limiting fuses, breakers and switchgear bus bar bracing. When selecting the fault current interrupting rating of the customer protection devices the customer should also take into account the minimum size transformer that would be required to serve the load rating of the customer main protection device.

Due to the variability of the transformer and electric distribution system characteristics these tables are to be used as a general guideline and **shall not** be used as a design tool to replace engineering that may be required by the Code Authorities having jurisdiction. Customers or contractors requiring specific fault current calculations should consult a registered professional engineer of their choice.

Note 1: All installations served from a single-phase pad-mount transformer should as a minimum use the calculations based on the installation of a 37.5kVA minimum transformer.

Note 2: All temporary construction meter installations may use the actual transformer size.

1004 Arc Flash

It is RPU's intent to address a customer's need for information concerning arc flash data requires as follows:

For Secondary Voltage Services the Company will provide, upon request from the customer:

- a) Transformer size, primary voltage, secondary voltage, and typical percent impedance.
- b) Transformer primary fuse information size and type.
- c) Calculated symmetrical bolted three-phase fault current, bolted single-line ground fault current and calculated system impedance (R and X) at the high side of the transformer.
- d) The upstream protective device information nearest the service point. This information will include the device model, rating and applicable settings.

For Primary Voltage Services RPU will provide, upon request from the customer:

- a) Calculated symmetrical bolted three-phase fault current, bolted single-line ground fault current and calculated system impedance (R and X) at the service point.
- b) The upstream protective device information nearest the service point. This information will include the device model, rating and applicable settings.

Fault current calculations are based upon the distribution system configuration at the time of the calculations. RPU does not provide minimum fault current information or associated protective device clearing times.

It is understood that this data is to be used for arc flash calculations. Parties using this data must understand that it may change due to various reasons. RPU will not notify the customer when such changes occur.

Tables 10.1 through 10.3 in this Section are only intended to provide the basic information necessary for secondary service customers to make their own internal system fault current and basic arc flash calculations. Primary service customers will still need to consult with an RPU Engineer, to obtain fault current and protective device information for their service locations.

As a safety measure, RPU recommends that when customers are performing maintenance work on or near exposed electrical equipment that their electrical system be de-energized whenever possible.

SINGLE-PHASE PADMOUNT TRANSFORMERS										
EXPECTED SINGLE-PHASE FAULT CURRENTS (IN RMS AMPS) AT THE SECONDARY TERMINALS										
TRAN KVA	TRAN %Z	TRAN %R	TRAN %X	Fault Current 240 V Secondary	Protective Device, 7960 V Primary	TRAN %Z	TRAN %R	TRAN %X	Fault Current 480 V Secondary	Protective Device, 7960 V Primary
10	1.0	0.39	0.92	4,170	Bay-O-Net 4000358C03	1.0	0.39	0.92	2,840	Bay-O-Net 4000358C03
15	1.0	0.39	0.92	6,250	4000358C03	1.0	0.39	0.92	2,840	4000358C03
25	1.0	0.32	0.95	10,420	4000358C05	1.0	0.32	0.95	2,840	4000358C05
37.5	1.0	0.25	0.97	15,630	4000358C05	1.0	0.25	0.97	2,840	4000358C05
50	1.1	0.57	0.94	18,940	4000358C05	1.1	0.57	0.94	2,840	4000358C05
75	1.1	0.38	1.03	28,410	4000358C08	1.1	0.38	1.03	2,840	4000358C08
100	1.1	0.34	1.05	37,880	4000358C08	1.1	0.34	1.05	2,840	4000358C08
167	1.2	0.34	1.05	57,990	4000358C10	1.2	0.34	1.05	2,840	4000358C10
Note: Bay-O-Net fuse is a Cooper or equivalent										

Table 10.1 Single Phase Underground

SINGLE-PHASE OVERHEAD TRANSFORMERS												
EXPECTED SINGLE-PHASE FAULT CURRENTS (IN RMS AMPS) AT THE SECONDARY TERMINALS												
TRAN KVA	TRAN		TRAN		TRAN		TRAN		TRAN		Protective Device, Overhead Fuse	
	%Z	%R	%X	Fault Current 240 V Secondary	%Z	%R	%X	Fault Current 120 V Secondary	Typical	Limited Use		
10	1.2	0.35	1.15	3,470	1.48	0.53	1.38	5,630	1.5X	6 ELF		
15	1.2	0.66	1.00	5,210	1.56	0.99	1.20	8,010	2X	6 ELF		
25	1.2	0.50	1.09	8,680	1.51	0.75	1.31	13,800	3.5X	6 ELF		
37.5	1.2	0.39	1.13	13,020	1.48	0.59	1.36	21,110	5.5X	8 ELF		
50	1.2	0.43	1.12	17,360	1.49	0.65	1.34	27,960	7X	12 ELF		
75	1.2	0.17	1.19	26,040	1.45	0.26	1.43	43,100	10X	18 ELF		
167	1.2	0.17	1.19	57,990	1.45	0.26	1.43	95,980	25KS	18 ELF		

Table 10.2: Single Phase Overhead

THREE-PHASE PADMOUNT TRANSFORMERS									
EXPECTED THREE-PHASE FAULT CURRENTS (IN RMS AMPS) AT THE SECONDARY TERMINALS									
TRAN KVA	TRAN %Z	TRAN %R	TRAN %X	Fault Current 120/208 V Secondary	Fault Current 277/480 V Secondary	Transformer Protective Device			
						Cooper or Equivalent	Current Limiting	Cooper or Equivalent	BAY-O-NET
45	1.3	1.04	0.78	9,600	NA	3544040M61M	Cooper or Equivalent	4000358C05	4000358C05
75	1.3	0.70	1.10	16,000	6,900	3544040M61M	Cooper or Equivalent	4000358C05	4000358C05
112.5	1.4	0.49	1.31	22,300	9,700	3544100M51M	Cooper or Equivalent	4000358C05	4000358C05
150	1.4	0.35	1.36	29,700	12,900	3544100M51M	Cooper or Equivalent	4000358C05	4000358C05
225	1.4	0.43	1.33	44,600	19,300	3544125M61M	Cooper or Equivalent	4000358C08	4000358C08
300	1.4	0.48	1.32	59,500	25,800	3544125M61M	Cooper or Equivalent	4000358C08	4000358C08
500	1.6	0.40	1.55	86,700	37,600	3544080M51M (2 in parallel)	Cooper or Equivalent	4000358C10	4000358C10
750	4.5	0.39	4.48	46,300	20,000	3544150M51M (2 in parallel)	Cooper or Equivalent	4000358C12	4000358C12
1,000	5.1	0.32	5.09	54,400	23,600	3544150M51M (2 in parallel)	Cooper or Equivalent	4038361C03CB	4038361C03CB
1,500	5.1	0.36	5.09	NA	35,400	3544150M51M (2 in parallel)	Cooper or Equivalent	4038361C04CB	4038361C04CB
2,000	5.1	0.43	5.08	NA	47,200	3544125M61M (2 in parallel)	Cooper or Equivalent	4038361C05CB	4038361C05CB
2,500	5.1	0.33	5.09	NA	59,000	3544175M51M (2 in parallel)	Cooper or Equivalent	4038361C05CB	4038361C05CB

Table 10.3: Three Phase Padmount Transformers

SECTION 1100

EXHIBITS

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EXHIBIT 1

TYPICAL UNDERGROUND RESIDENTIAL
METERING ARRANGEMENT UP TO AND
INCLUDING 200 AMP, 120/240 VOLT

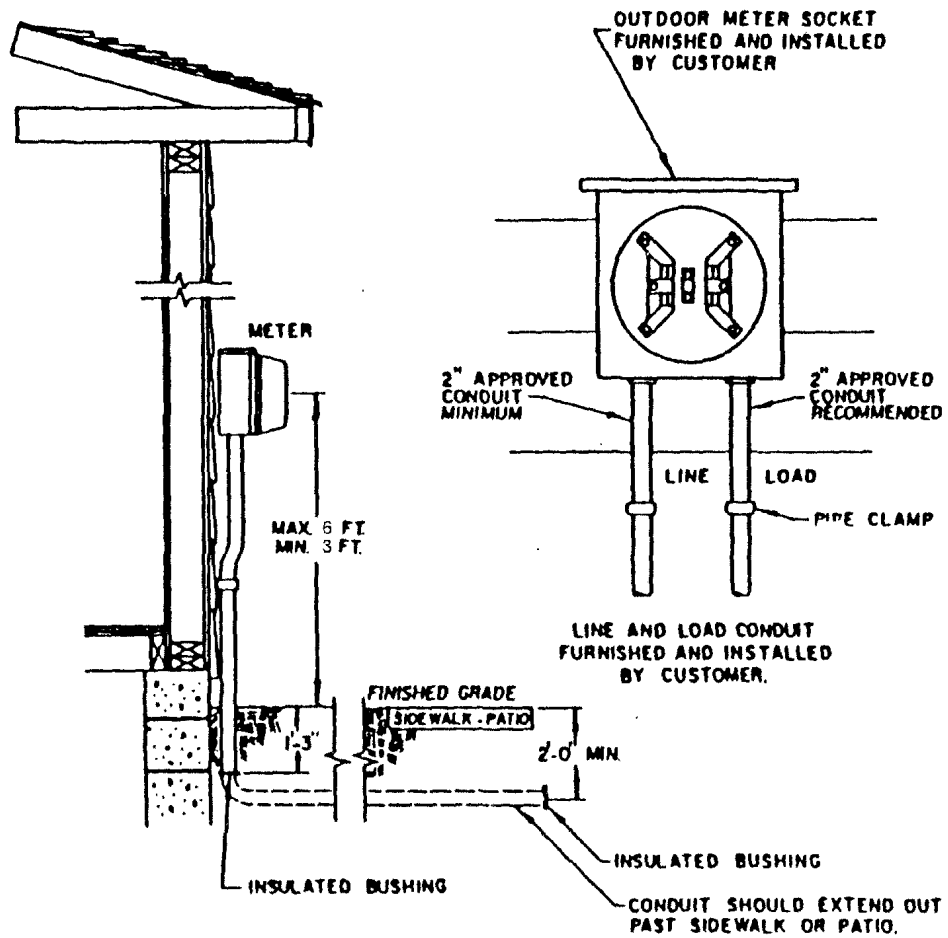
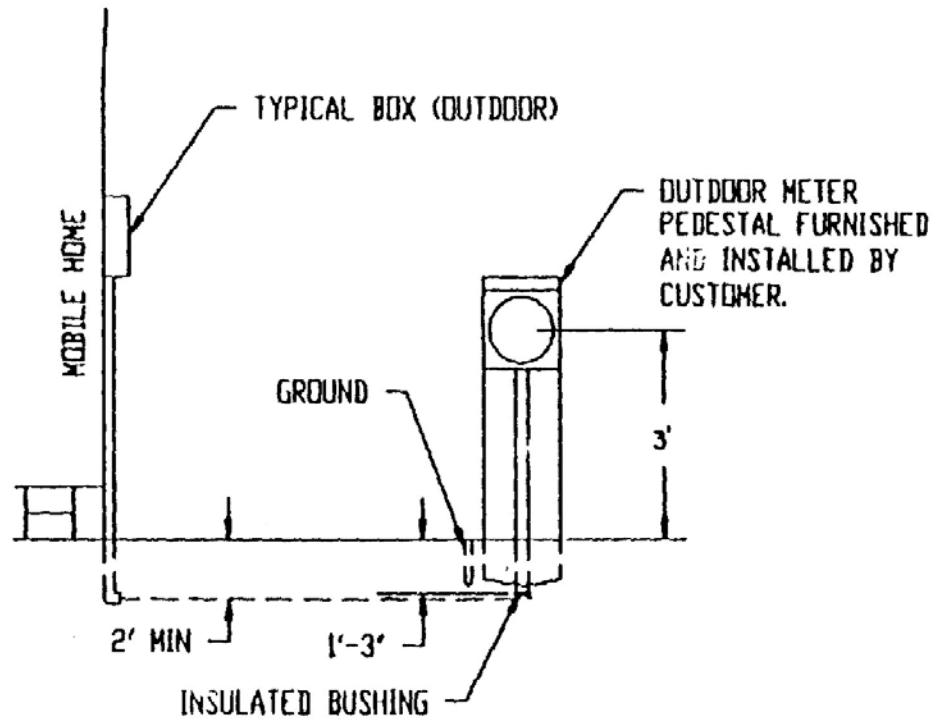


EXHIBIT 2

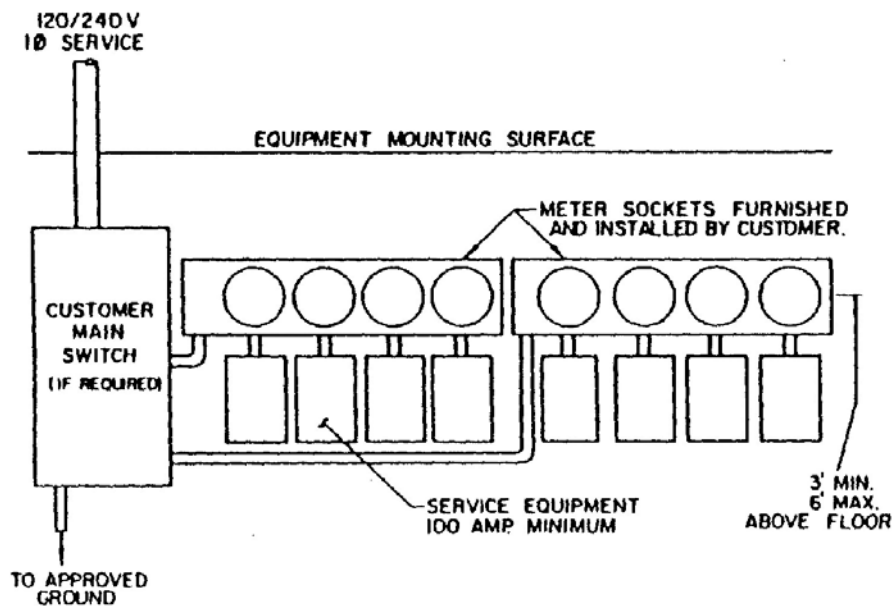
TYPICAL MOBILE HOME METERING ARRANGEMENT



1. METERS ARE TO BE PERMANENTLY LABELED.
2. METERS ARE TO FACE TOWARDS STREET.
3. SERVICE LATERAL FROM THE SECONDARY JUNCTION AT THE PROPERTY LINE, TO THE METER PEDESTAL, TO THE MOBILE HOME, IS THE RESPONSIBILITY OF THE CUSTOMER.

EXHIBIT 3

TYPICAL MULTIPLE METERING ARRANGEMENT



1. METERS ARE TO BE PERMANENTLY LABELED
2. METERS MUST HAVE INDIVIDUAL LOCK-OFF CAPABILITY.
3. METERS MUST BE ACCESSIBLE TO R.P.U. AND TO CUSTOMERS

EXHIBIT 4

SECONDARY SERVICE DROP CLEARANCES

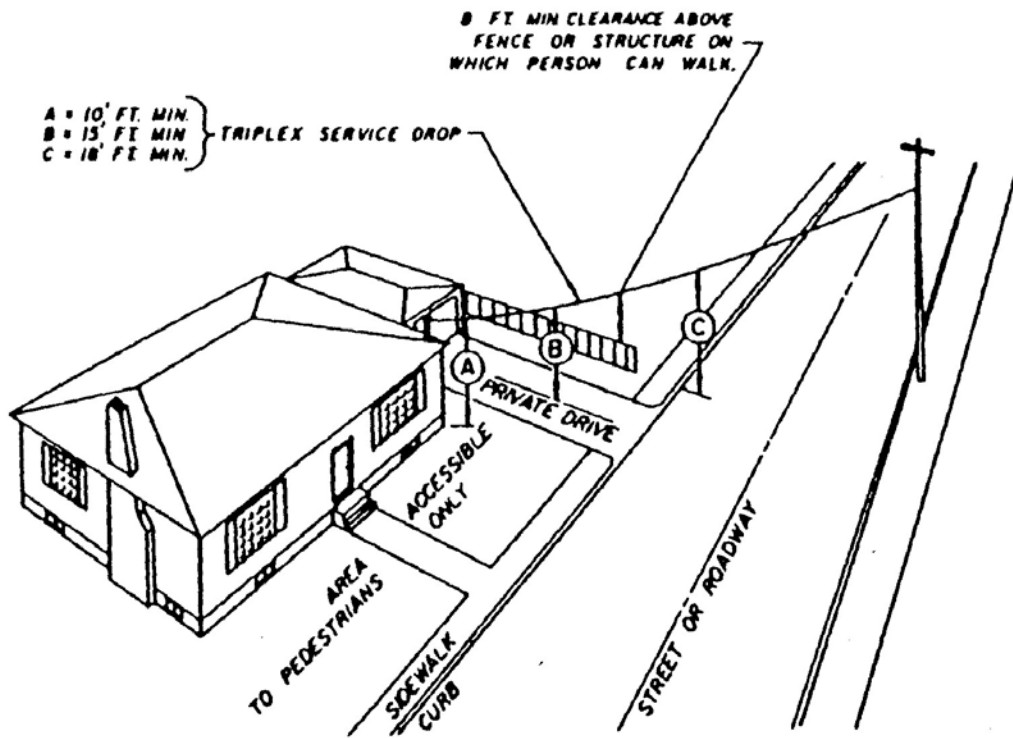


EXHIBIT 5

TYPICAL RESIDENTIAL OVERHEAD SERVICE INSTALLATION

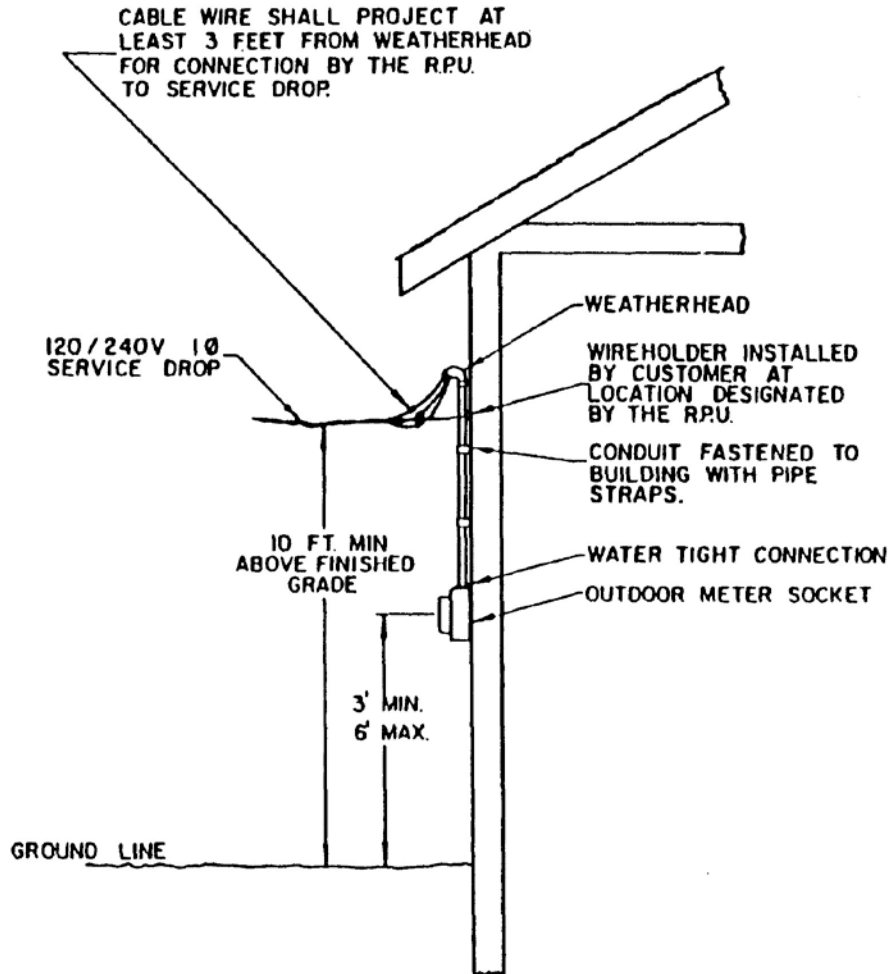


EXHIBIT 6

TYPICAL RESIDENTIAL SERVICE MAST

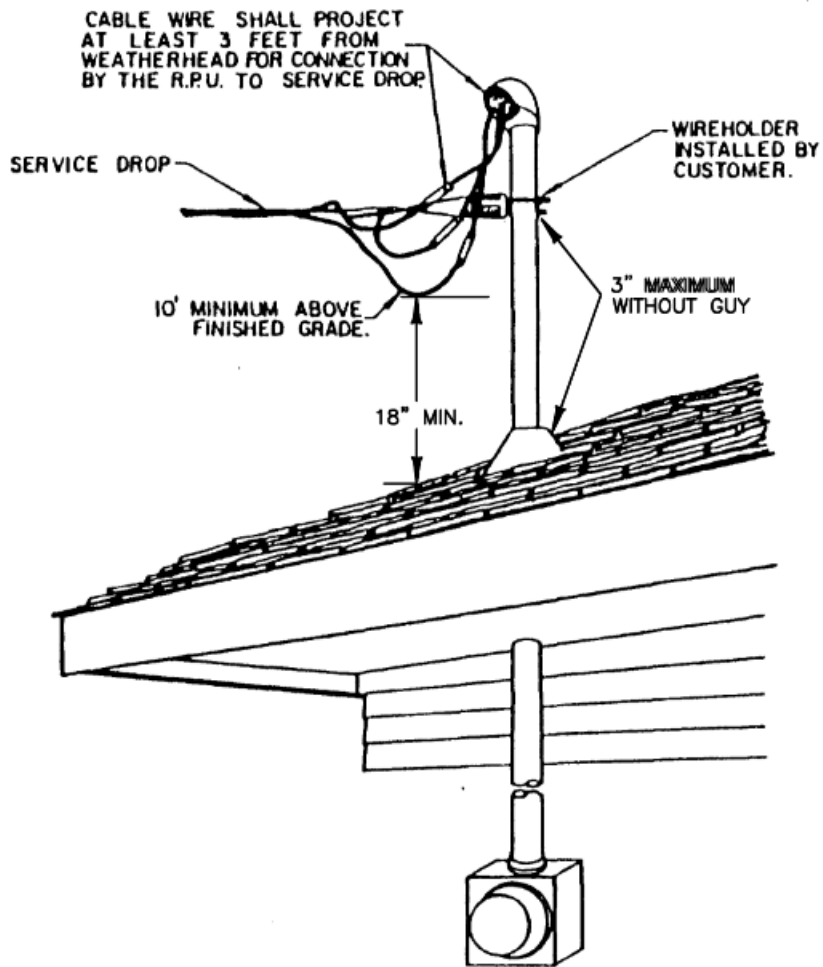


EXHIBIT 7

Clearance Requirements of Pad-Mounted Transformers

A minimum zone free of vegetation and obstructions shall be maintained around padmounted transformers. The minimum clearances around the transformer are 10 feet in front of the transformer doors and 2 feet from the sides and back of the transformer or the outside dimensions of the transformer pad whichever is greater. These minimum clearances must be at the same grade as the transformer. Transformers shall not be located under any overhang (roof, balcony, stairs, etc.) without customer provided and installed provisions for setting/removal of the transformer and prior approval by RPU's Engineering Department.

The following additional clearance requirements shall be met if the transformer is located near a structure.

1. **Non-Combustible Walls**

(Included in this class would be wood framed brick veneered buildings, metal clad steel framed buildings, asbestos-cement-board walled metal framed buildings and masonry buildings.)

Pad-mounted oil insulated transformers may be located a minimum distance of 24 inches from non-combustible walls if all the following clearances are maintained from doors, windows and other building openings. A sump shall be installed for transformers if the immediate terrain is not pitched away from the transformer. Contact RPU's Engineering Section for sump specifications. If a combustible first floor overhang exists, a 10-ft. distance from the edge of the transformer to the edge of the overhang (combination of vertical and horizontal distance) shall be required in addition to the other clearance as shown.

a) **Doors**

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

b) **Air Intake Openings**

Pad-mounted oil transformers shall not be located within a zone extending 10-ft. outward and 10-ft. to either side of an air intake opening located at the level of the transformer. If the air intake opening is located above the transformer level, the distance from the transformer to the opening shall be a minimum of 25-ft.

The above term "level of the transformer" is to be interpreted as within 10-ft. off the ground.

c) **Windows or Openings other than Air Intake**

1. **First Story**

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

2. **Second Story**

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

2. **Combustible Walls** (Included in this class would be wood buildings and metal clad buildings with wood frame construction.)

Pad-mounted oil insulated transformers shall be located at a minimum of 10-ft. from the building wall. In addition to the clearance from building doors, windows and other openings set forth for non-combustible walls. A sump shall be installed for transformers if the immediate terrain is not pitched away from the building. Contact RPU Engineering Section for sump specifications. If a combustible first floor overhang exists, a 10-ft. distance from the edge of the transformer to the edge of the overhang (combination of vertical and horizontal distance) shall be required in addition to the other clearances as shown.

3. **Barriers** (Included in this class are reinforced concrete, brick or concrete block barrier walls.)

If the clearance specified above cannot be obtained, a fire resistant barrier shall be constructed in lieu of the separation. The barrier when required is provided by the customer. The following methods of construction are acceptable:

a) **Non-Combustible Walls**

The barrier shall extend to a projection line from the corner of the pad-mount to the furthest corner of the window, door or opening in question. The height of the barrier shall be 1-ft. above the top of the pad-mounted transformer.

b). **Combustible Walls**

The barrier shall extend 3-ft. beyond each side of the pad-mounted transformer. The height of the barrier shall be 3-ft. above the top of the pad-mounted transformer. If a combustible first floor overhang exists, the 24-in. specified shall be measured from the edge of the overhang rather than from the building wall.

4. **Fire Escapes**

Pad-mounted oil insulated transformers shall be located such that a minimum clearance of 20-ft. is maintained from fire escapes at all times.

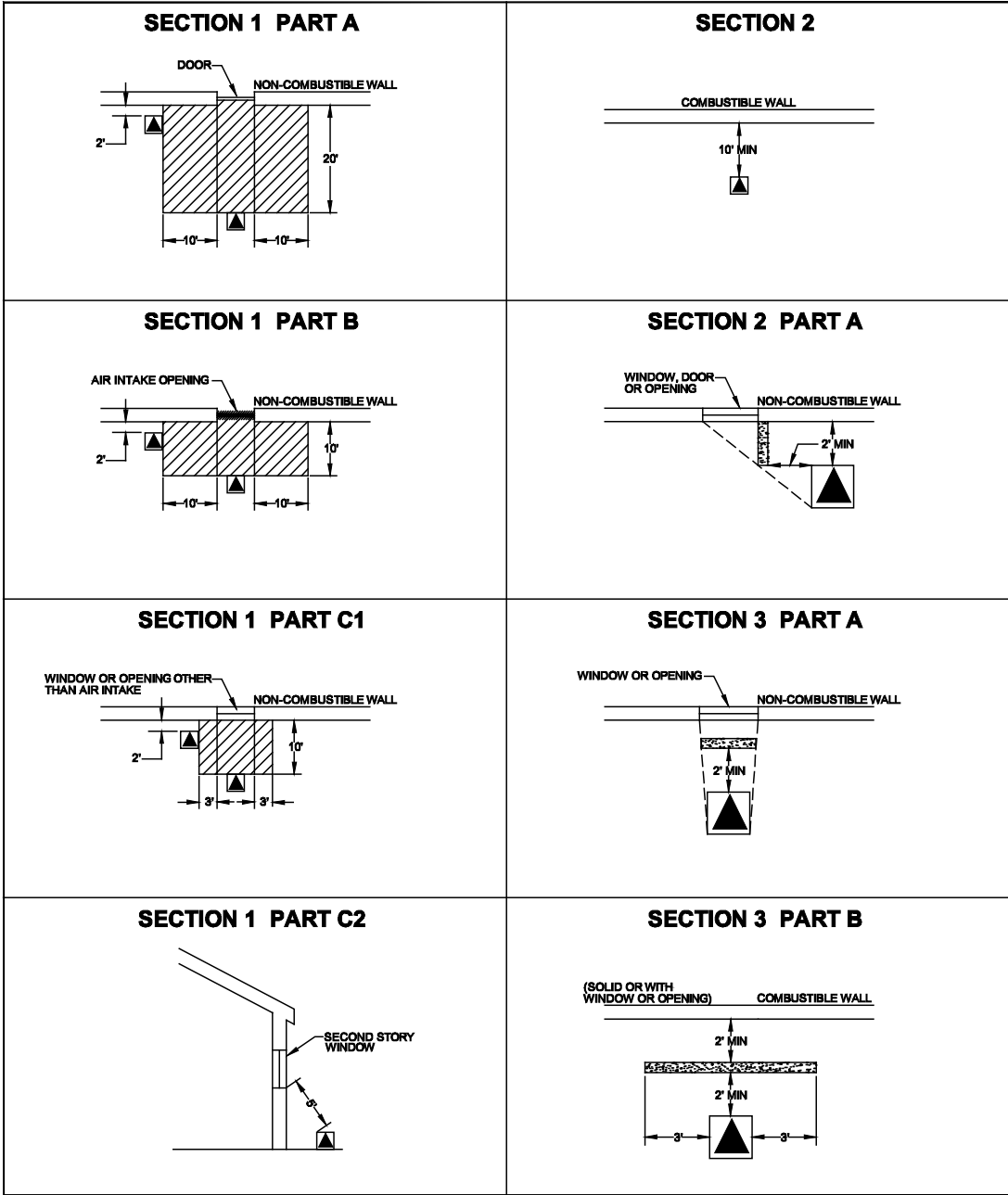
Exception: Pad-mounted transformers may be located closer to a fire escape than the 20-ft. minimum when a fire resistant barrier is constructed around the pad-mounted transformer (side walls and roof). The barrier shall extend a minimum of 1-ft. beyond the pad-mount transformer. The pad-mount and barrier shall not in any way obstruct the fire escape exit. A 10-ft. clearance is required in front of pad-mounted transformer doors. Adequate transformer accessibility and ventilation must be provided.

5. **Decorative Combustible Enclosure**

Decorative combustible enclosures (fence) installed by the customer around pad-mounted transformers adjacent to a combustible building wall shall not extend more than 24-in. beyond the transformer towards the combustible wall. A 10-ft. clearance is required in front of pad-mounted transformer doors. Adequate transformer accessibility and ventilation must be provided.

6. **Non-Combustible and Combustible Walls — Fire Resistant Barriers**

For definitions of combustible and non-combustible walls and fire resistant barriers, refer to the State of Minnesota Building Code. This information can be obtained at the office of the Rochester Building Safety Department (See contact number on page 2).



ROCHESTER PUBLIC UTILITIES

NO	REVISION	APPROVED BY	DATE
0	ORIGINAL DRAWING	NLS	11/98
1	CHANGED TITLE NAME & DWG #	RLA	2/21/06

EXHIBIT 7 – TRANSFORMER
CLEARANCE INFORMATION

DWG #
UD7TR01

EXHIBIT 8

RPU AND CUSTOMER RESPONSIBILITIES ASSOCIATED WITH NON SINGLE FAMILY RESIDENTIAL UNDERGROUND INSTALLATIONS

RPU RESPONSIBILITIES

1. Designate service location and/or transformer location.
2. Supply and install pad-mounted transformer.
3. Make all primary terminations and connections.
4. Connect the customer's secondary cable to the secondary terminals of the transformer only after customer's wiring has been approved by the inspecting authority.
5. Energize the service only when authorized to do so by the inspecting authority.
6. Install conduit supplied by customer on terminal poles.
7. Supply and install all primary cable at no cost to the customer after said customer furnishes and installs conduit for the entire distance from the property line to the transformer (including a 30 foot vertical riser on the pole).
8. Supply and install one meter set for each customer, including all meters required for billing purposes and any accessories such as totalizers, current and potential transformers, phase-shifting transformers, test switches, and color code meter wiring.
9. Inspect customer-furnished equipment required by RPU. Installations not in compliance with RPU regulations will be rejected.

CUSTOMER RESPONSIBILITIES

1. Contact RPU to obtain the location and routing of RPU's facilities and to fill out an Application for Service, Load Data Sheet and any other forms or statements required by RPU.
2. Provide necessary easements and clear area of all construction obstructions.
3. Bring area to final grade before installation of cable and transformers. Grade changes requiring cable adjustments will result in charges to the party requiring the changes.

EXHIBIT 8 - Continued

4. Compaction along conduit route after installation of conduit is customer's responsibility.
5. Furnish and install a transformer pad and ground rod to RPU specifications. Contact RPU to obtain the pad specifications and transformer location (transformer location shall be truck accessible and within 15 feet of a hardened surface) for the specific service being installed. Notify RPU to inspect formed pad prior to pouring concrete.
6. Provide a location for the transformer(s) that meets the clearance requirements of Exhibit 7.
7. Provide easy accessibility to area 24 hours a day.
8. Furnish and install all secondary cables, cabinets, and conduits from the transformer to the building service entrance.
9. Furnish and install electrical conduit per RPU's specifications (typically schedule 40 PVC 4" or larger) with marking tape to the point of interconnection with RPU. All conduit shall be installed a minimum of 36" below final grade. All radiuses less than 60" shall be factory fabricated and shall be made of schedule 40 galvanized rigid metallic conduit. Minimum elbow (bend) radius shall be 36 inches. Furnish and install pull rope in conduit. **Final location of the riser sweep attachment to the pole must be approved by RPU personnel.**
10. Install protective bollards if transformer pad is to be installed in parking area or area subject to vehicular traffic.
11. Protect RPU facilities from damage during construction period.
12. Have all required inspections of facility performed and approved.
13. Notify RPU prior to any proposed building or grade changes within 10 feet of the electrical service or the cable route.
14. Supply and install RPU approved meter socket on outside wall or approved location and install conduit for service cable.
15. Notify RPU as far in advance as possible when any unusual loads are anticipated, such as special medical equipment, arc welders, elevators, or any other equipment that could affect RPU's system or any other customer.
16. Pay all applicable RPU fees.

EXHIBIT 9

RPU AND CUSTOMER RESPONSIBILITIES ASSOCIATED WITH UNDERGROUND SINGLE FAMILY RESIDENTIAL DISTRIBUTION (URD) INSTALLATIONS

RPU RESPONSIBILITIES

1. Designate point of delivery or transformer location.
2. Supply and install all primary cable, transformer pads, and pad-mounted transformers.
3. Make all primary terminations and connections and install the grounding system.
4. Connect customer's secondary cables to RPU's point of delivery after customer's wiring has been approved by the inspecting authority.
5. Supply and install the meter set, including the meter(s) and any other meter accessories needed for billing purposes, excluding the meter socket.
6. Energize the service only when authorized to do so by the inspecting authority.
7. Install conduit supplied by customer on terminal poles.
8. Supply and install secondary connection pedestals and secondary cable to the pedestals.

CUSTOMER RESPONSIBILITIES

1. Contact RPU to obtain the location of RPU's facilities and customer service point and to fill out an "Application for Service," and any other forms or statements required by RPU.
2. Provide necessary easements and clear area of all construction obstructions.
3. Bring area to final grade before installation of cable and transformers. Install grade stakes at all front lot line property corners. Grade changes requiring cable adjustments will result in charges to the party requiring the changes.
4. In new developments, install road crossing conduits per Exhibit 13 as designated by RPU in the general development specifications.
5. In areas with overhead transformers, supply Schedule 80 PVC or rigid steel conduit for RPU installation on the riser pole.
6. Allow RPU to install cable/conduit prior to installation of sidewalks, soil or lighting along cable route.
7. Compaction of customer installed (buried) cable is customer's responsibility. (RPU will compact all primary and secondary cable it buries.)
8. Provide firm soil conditions under the pad area to prevent settling of the pad.
9. Provide location for the transformer(s) that meets the clearance requirements of Exhibit 7.
10. Protect RPU facilities from damage during construction period.
11. Provide easy accessibility to the area 24 hours a day.
12. Have wiring approved by inspecting authority and then request service connection by RPU.

13. Install protective posts if transformer pad is to be installed in parking area or area of vehicular traffic.
14. Notify RPU prior to any proposed building or grade changes within 10 feet of the electrical service or the cable route.
15. Notify RPU as far in advance as possible when any unusual loads are anticipated, such as special medical equipment, arc welders, elevators, or any other equipment that could affect RPU's system or any other customer.
16. Supply and install RPU approved meter socket on outside wall.
17. Supply all secondary cable extending from the meter to the RPU designated secondary terminus.
18. Contact RPU 2 business days in advance when a service is to be installed so that RPU can schedule the meeting to provide access to the power source and the contractor can install the service into the power source.
19. Pay all applicable RPU fees.

EXHIBIT 10

INSTALLATION GUIDELINES

Scheduling:

1. RPU will install underground electric facilities on a first come - first served basis. If for some reason the site is not ready for the installation on the scheduled date it will be rescheduled to the end of the queue.
2. New Commercial/Residential Subdivisions are typically installed as joint installations with other utilities. These installations are jointly scheduled by the utilities and our contractor once certain site conditions are met. If for some reason the site is not ready for installation of all facilities on the scheduled date the installation will be rescheduled to the end of the queue.
3. Installation in Rocky Soils or Poor Backfill:

The customer shall be required to pay an additional fee if rock or poor quality backfill is encountered during the installation of RPU's facilities. The fee will be based on the cubic feet of unsuitable material encountered by RPU or our contractor during installation. RPU may require that the Customer pay an estimated fee prior to performing the work.

4. Winter Installations:

The customer shall be required to pay a per foot additional fee for underground cable installation, at the customer's request, after frost has been established in the ground to an average depth of 6 inches or more. The amount of the frost fee depends on the depth of the frost. RPU may require that the estimated frost charges be paid in advance of performing work.

Installations scheduled on or after the onset of frost will be attempted at the discretion of RPU, based on ground conditions.

5. Partial Installations:

Where conditions do not permit the completion of a scheduled installation, or where a development cannot be completely brought to grade in time, partial installation may be made at no added cost under the following conditions:

- a) Partial installation must conform to final design layout, including placement of one (minimum) permanent transformer.
- b) Partial installations must be contiguous with existing facilities.
- c) Total project fees must be paid before partial installation will be approved.
- d) All standard pre- and post-installation site conditions must be met for a partial installation.

EXHIBIT 11

MULTIPLIERS TO DETERMINE REQUIRED CAPACITOR KVARs FOR CORRECTING POWER FACTOR

Original Power Factor	Corrected Power Factor						
	90%	92%	94%	95%	96%	98%	100%
60%	0.849	0.907	0.97	1.005	1.042	1.13	1.333
62%	0.781	0.839	0.903	0.937	0.974	1.062	1.265
64%	0.716	0.775	0.838	0.872	0.909	0.998	1.201
66%	0.654	0.712	0.775	0.81	0.847	0.935	1.138
68%	0.594	0.652	0.715	0.75	0.787	0.875	1.078
70%	0.536	0.594	0.657	0.692	0.729	0.817	1.02
72%	0.48	0.538	0.601	0.635	0.672	0.761	0.964
74%	0.425	0.483	0.546	0.58	0.617	0.706	0.909
76%	0.371	0.429	0.492	0.526	0.563	0.652	0.855
78%	0.318	0.376	0.439	0.474	0.511	0.599	0.802
80%	0.266	0.324	0.387	0.421	0.458	0.547	0.75
82%	0.214	0.272	0.335	0.369	0.406	0.495	0.698
84%	0.162	0.22	0.283	0.317	0.354	0.443	0.646
86%	0.109	0.167	0.23	0.265	0.302	0.39	0.593
88%	0.055	0.114	0.177	0.211	0.248	0.337	0.54
90%	0	0.058	0.121	0.156	0.193	0.281	0.484
92%		0	0.063	0.097	0.134	0.223	0.426
94%			0	0.034	0.071	0.16	0.363
96%					0	0.089	0.292
98%						0	0.203
100%							0

INSTRUCTIONS:

1. Determine the average power factor that your system operates at during peak demand months. Call this your ORIGINAL POWER FACTOR.

2. In the row titled CORRECTED POWER FACTOR at the top of the page, find the power factor that you wish to correct your system to.

EXHIBIT 11 - Continued

3. Read from left to right along the row corresponding to your ORIGINAL POWER FACTOR until you reach the column that shows your desired CORRECTED POWER FACTOR.
4. Read the number that you find at the intersection of the row and column. Multiply your KW Demand by this number to calculate the total amount of capacitor KVAR you need to install to your electric service.
5. If your plant operates with a 3 phase electric service, divide the total KVAR by 3 to determine the amount of KVAR to connect per phase.

Example: If your plant has a 3 phase demand of 410 KW and operates at 76% power factor, but you want to correct to 95%:

- a) Find 95% in the CORRECTED POWER FACTOR row at the top of the page.
- b) Find 76% in the ORIGINAL POWER FACTOR column along the left edge of the page. Read from left to right along this row until you reach the 95% column.
- c) Read the number at the intersection of the row and column (0.526).

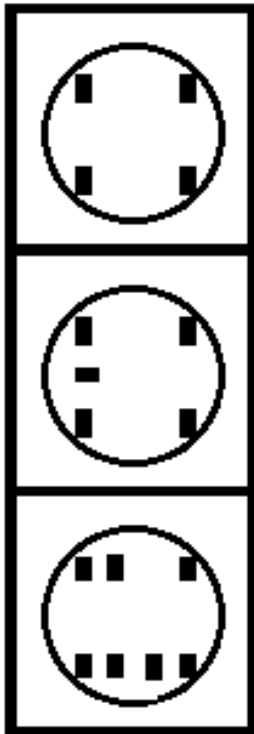
$410 \text{ KW} \times 0.526 = 216 \text{ KVAR}$ needed to correct your system to 95% power factor.

- d) $216 \div 3 = 72 \text{ KVAR}$ per phase.

EXHIBIT 12

ALL SELF-CONTAINED METER SOCKETS MUST CONTAIN A LEVER BYPASS, AND WILL NEED TO BE PURCHASED BY THE HOME OWNER OR ELECTRICIAN / CONTRACTOR

Self-Contained



4 TERMINAL
120-240 VOLT
SINGLE PHASE

5 TERMINAL
120-208 VOLT
SINGLE PHASE
FIFTH TERMINAL NEEDS TO BE
LOCATED IN THE 9 O'CLOCK POSITION

7 TERMINAL
120-208, 277-480 VOLT
THREE PHASE 4 WIRE
ALSO 240 VOLT 4 WIRE DELTA

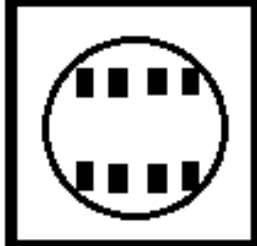
EXHIBIT 12 - CONTINUED

ALL TRANSFORMER RATED METER SOCKETS MUST BE PURCHASED AT A LOCAL ELECTRICAL DISTRIBUTOR.
RPU NO LONGER SELLS METER SOCKETS.

TRANSFORMER RATED



6 TERMINAL
120-240 VOLT
SINGLE PHASE

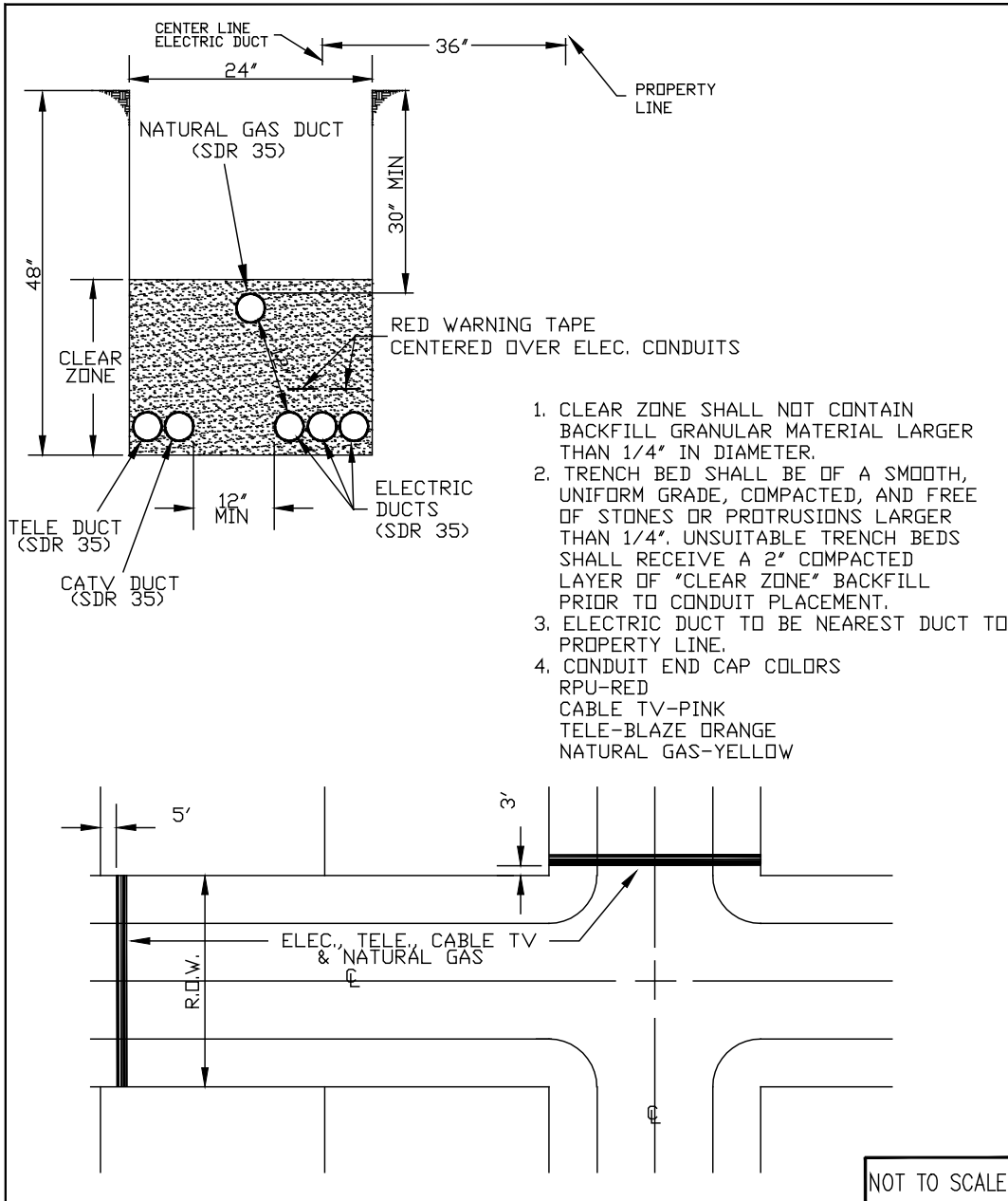


8 TERMINAL
120-240 VOLT
THREE PHASE THREE WIRE
MUST HAVE BYPASS LEVER IN
METER SOCKET



13 TERMINAL
120-208, 240, 277-480 VOLT
THREE PHASE FOUR WIRE

EXHIBIT 13



ROCHESTER PUBLIC UTILITIES

NO	REVISION	APPROVED BY	DATE
0	ORIGINAL DRAWING	GAV	8/89
1	CHANGED FROM SCH 40 TO SDR 35 DUCT	NJS	8/98
2	CHANGED YELLOW WARNING TAPE TO RED	KCH	12/03
3	CHANGED PLATE NUMBER	RLA	2/17/06

INFORMATION - DUCT INSTALLATION
ROAD CROSSING

DWG #
UD7DU01