

Reading Municipal Light Department



Electric Service Requirements Handbook

**230 ASH STREET, P.O. BOX 150,
READING, MASSACHUSETTS 01867
Telephone: (781) 942-6598**

Rev. 01/20/2021

FOREWORD

Reading Municipal Light Department (RMLD) is one of the 41 Massachusetts Municipal Light Plants and is a Public Power Utility serving the electrical needs of the Town of Reading, North Reading, Wilmington and Lynnfield Center. It is governed by the General Manager with an elected Municipal Light Board consisting of 5 Commissioners.

General Manager

Coleen O'Brien

Reading Municipal Light Board

Robert Coulter

Philip B. Pacino

David Talbot

John Stempeck

David Hennessy

Reading Municipal Citizens' Advisory Board (CAB)

George Hooper (Wilmington)

Dennis Kelley (Wilmington)

Jason Small (North Reading)

Vivek Soni (Reading)

Joseph Markey (Lynnfield)

The Reading Municipal Light Board generally meets on the third Thursday of the month at 7:30 pm. Meeting schedule with agendas are available on RMLD website (www.rml.com)

The CAB was a direct result of a 20-year agreement between RMLD and the Town of Wilmington in 1990. The Town of Wilmington researched its options to withdraw from RMLD to create its own municipal light department. Negotiations between RMLD, the Town of Wilmington and the other three communities concluded in an agreement, which was approved by all concerned. The result was a 20-year agreement providing CAB representation of all four-member communities.

INTRODUCTION

This booklet is published for the benefit of our Customers, architects, engineers, municipal inspectors, employees and contractors to provide a convenient reference as an informational guide. This handbook sets forth the types of services that the Reading Municipal Light Department RMLD currently offers – residential, commercial, temporary services, service upgrades and the relocation of an existing service. **Design or construction should not be undertaken until complete information is obtained from RMLD personnel.** RMLD should be contacted a minimum of 15 days before starting work, noting certain equipment could take up to a 6-month lead time.

RMLD supplies electricity subject to our Terms and Conditions, policies and procedures, rate schedules, and industry standards; and applicable laws and regulations; all of which form RMLD's requirements for service. This handbook reflects RMLD's standard practices and procedures and does not necessarily address every requirement, limitation or particular situation.

RMLD reserves the right to revise, amend or change the information set forth in this handbook without prior notice. Readers should inquire as to whether any revisions, amendments or changes to contents have been made since publication. Please contact RMLD at (781) 942-6598 if you have any questions about the contents of this handbook, your rights or responsibilities, or terms of service. We endeavor to supply electricity adequately and reliably. We do not guarantee a continuous supply and do not assume liability for direct or consequential loss or damage to persons or property due to the supply delivered, or as a result of any interruption or variation in the supply. Momentary interruptions can occur due to the normal operation of our system's protective devices.

Failure to comply with our requirements, applicable codes, or orders of an enforcement authority can result in our refusal to energize an electric service or suspension of existing service.

RMLD REQUIREMENTS

RMLD's requirements for electric service are designed to ensure reliable and appropriate service to our Customers. RMLD has published this Electric Service Requirements Handbook in an effort to provide guidance on the respective responsibilities regarding electric service to residential, commercial and industrial locations. This handbook is intended to improve communications and coordination between our Customers, electricians, inspectors, contractors, architects, engineers, Town Boards, and RMLD. This manual covers the most common situations and sets guidelines and policies to apply its service requirements uniformly and in a non-discriminatory manner. RMLD reserves the right to waive or modify any requirement on a case by case basis.

The electrician of the Customer or its representative must contact RMLD to obtain a Utility Authorization Number (UAN). The electrician needs the Utility Authorization Number in order to obtain a wiring permit from any of the four Town Wiring Inspector Departments located at the respective four Town Halls. Please note that electric distribution equipment such as pad-mount transformers have long lead times, often 6 months or more. For this reason, it is imperative that RMLD be contacted early in the planning process.

Useful Contact information:

Contact

Hours of Operation

**Reading Municipal Light Department
230 Ash Street
Reading, MA 01867
781-942-6598**

**Monday - Friday
8:00 a.m. to 4:30 p.m.**

**Reading Town Hall
16 Lowell Street
Reading, MA 01867
781-942-9001**

**Monday, Wednesday, Thursday
7:30 a.m. to 5:30 p.m.
Tuesday 7:30 a.m. to 7:00 p.m.
Friday Closed**

**North Reading Town Hall
235 North Street
North Reading, MA 01864
978-664-6010
978-664-6053 Fax**

**Monday - Thursday
8:00 a.m. to 4:00p.m.
Friday 8:00 a.m. to 1:00 p.m.**

**Wilmington Town Hall
121 Glen Road
Wilmington, MA 01887
978-658-3311
978-658-3334 Fax**

**Monday - Friday
8:30 a.m. to 4:30 p.m.**

**Lynnfield Town Hall
55 Summer Street
Lynnfield, MA 01940
781-334-9400**

**Monday - Thursday
8:00 a.m. to 4:30 p.m.
Friday 8:00 a.m. to 1:00 p.m.**

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1.0 GENERAL INFORMATION

1.1. PURPOSE

The "Electric Service Requirements Handbook," is issued to provide information to all RMLD Customers, electrical contractors, architects and engineers regarding electric service, installations, billing, metering, system efficiency, safety and reliability, and other information pertaining to service from RMLD. Certain sections have been prepared as a guide and are supplementary to the applicable National, State and Local Electrical Codes, Safety Code, OSHA requirements, etc. The issuance of this booklet by RMLD shall not be construed as relieving the Customer and/or Contractor from the responsibility of installing wiring in accordance with the aforementioned codes, nor shall RMLD be deemed thereby to have accepted any responsibility for the condition of the Customer's wiring and equipment.

1.2. APPLICABILITY AND REVISIONS

This issue of the Electric Service Requirements Handbook reflects RMLD's current requirements and practices. Exceptions may apply for the completion of work in progress or already under contract. Revisions of this information will be made when necessary and RMLD reserves the right to make such revisions. RMLD cannot guarantee to give notice of revisions to persons who may have received this book. The most current edition of the handbook can be found on RMLD's website, www.rmld.com. The most current electric rates and tariffs filed with the Department of Public Utilities (DPU) can be found on RMLD's website, www.rmld.com.

ENFORCEMENT OF RULES

RMLD requires that all wiring intended for connection to its electric system shall be installed in accordance with the rules of the applicable National, State and Local Electrical Codes as well as the Rules and Regulation set forth in this handbook. All connections to RMLD's system shall be designed, installed and operated in a manner that will not adversely impact other Customer's electric service or the ability for RMLD to maintain proper system conditions.

RMLD reserves the right to refuse to connect and/or the right to disconnect a service where the Customer's installation does not comply with the provisions and requirements outlined in this handbook.

1.3. ADVISORY SERVICE

RMLD offers an engineering advisory service to all customers, architects, contractors and engineers, to assist them in obtaining installations, which conform to the requirements of RMLD. All persons are encouraged to avail themselves of the advisory services of the RMLD with respect to applications of power, electric heating, lighting, water heating, etc. Such advice may avoid delays and result in greater satisfaction and more efficient use of electrical service.

Although RMLD endeavors to keep informed of conditions under which Customers use electricity, it is expected Customers will check their use against available rates, or request RMLD to do so, as RMLD does not guarantee any particular rate to be the most favorable.

However, neither by inspection, nor by the rendering for an advisory service, nor in any other way, does RMLD give any warranty, expressed or implied, as to the adequacy, safety, or other characteristics of any equipment, wires, appliances, or devices owned, used or maintained by Customers. It is the Customer's responsibility to ensure that its equipment complies with all applicable codes. RMLD reserves the right to suspend service if it has any reason to believe there is a safety risk. RMLD does not assume responsibility for detecting any unsafe conditions with the Customer's equipment.

1.4.DIGGING / EXCAVATIONS / DIGSAFE

RMLD is a participant in the "DIG SAFE" Program. Prior to any excavation work, the "DIG SAFE" call-center must be contacted by calling **811**.

All contractors, municipal divisions and Customers who may have the necessity to excavate in roads or highways and anywhere there may be underground electric cables in the area should provide a minimum of three working days' notice to RMLD of their intent to excavate and **must contact DIG SAFE**.

Upon request, drawings will be made available that show the approximate location of underground ducts and cables, if present. The customer or its agent may be required to complete and sign a Non-Disclosure Agreement (NDA).

1.5.CONSTRUCTION IN THE PROXIMITY OF OVERHEAD CONDUCTORS

Equipment, such as ladders, scaffolding, etc., regardless of material, can become electrified if brought in contact with wires. Use extra caution when installing siding, painting, cleaning gutters or other reasons to work near RMLD facilities. Any person whether qualified or unqualified to work on or near medium voltage power lines (1kV – 50kV) must give advance notice and make satisfactory arrangements with RMLD before performing **any** type of work within ten (10) feet of overhead high voltage lines. This is in adherence with all applicable OSHA rules and regulations.

In every case in which work needs to be performed near electrical lines, RMLD must be contacted 48 hours prior to the beginning of the work. Contacting RMLD does not guarantee a line will be de-energized unless specified by RMLD – treat all overhead lines as if they are energized. At the request of the Customer, RMLD will furnish overhead rubber insulator sleeving for work done near RMLD overhead lines – a one-week notice is required to reserve the rubber sleeving. RMLD will install overhead rubber insulator sleeving at no cost to the customer for up to a 60-day use. The customer must contact RMLD for removal; a per-diem rate applies to any usage days beyond 60 days, refer to Appendix K for prevailing fee and charges schedule.

General contractors, electrical contractors, electricians, their employees, and other persons performing construction and/or maintenance work in proximity to RMLD's overhead lines, must take the precautions and observe the prohibitions prescribed by Federal, state and local law when working or using any tools, machinery, or construction equipment near these lines.

1.6. STREET AND PRIVATE AREA LIGHTING

REPORTING NON-WORKING STREET LIGHTS

Customers can report non-working or otherwise non-functioning street lighting using one of the following methods: 1) Click on "Contact Us" on our website at <http://www.rml.com> and then click "A Street Light is Out"; or 2) Call 781-942-6598; or

REQUESTING ADDITIONAL PUBLIC AREA LIGHTING

Residents may request lighting be installed on public ways. In order to do so, residents shall make the request through their local town authorities. Once the local town authority approves the installation of a public light, the request shall be passed onto the RMLD for installation.

REQUESTING PRIVATE AREA LIGHTING

Customers may request new or additional private area (dusk to dawn) lighting. See Appendix C for the private area lighting rates and conditions.

REQUESTING INSTALLATION OF LIGHT ONLY POLE

Local town authorities or customers may require a light only pole for the installation of street or contract light. Requests shall be made through customer service. The RMLD shall approve the installation and any applicable billing for the installation of the pole.

1.7. VEGETATION MANAGEMENT

PRIVATE PROPERTY

- a. RMLD will provide tree trimming services for all RMLD equipment on all accepted public right of ways.
- b. RMLD from time to time may be required to access private properties to perform RMLD required vegetation trimming
- c. Vegetation trimming for conventional overhead secondary services on private property is the sole responsibility of the property owner at their sole expense.

WORKING CLEARANCES AROUND PAD MOUNTED EQUIPMENT

Clearances around pad mounted equipment shall be maintained in accordance with Appendix H - Figure 1 by the Customer. These clearances are required in order to operate and maintain the equipment in a safe manner. Obstructions can cause delays when restoring electric service.

METER CLEARANCES

At and directly in front of each meter location, a clear, safe workspace shall be maintained by the Customer. Such workspace shall be at least four (4) feet wide, shall extend out from the meter at least three (3) feet, and up to a height of at least six (6) feet. Appendix H - See Figure 8.

1.8. USE OF ELECTRICITY

RMLD shall not be liable for damage to the person or property of the Customer or any other persons resulting from the use of electricity or the presence of RMLD equipment on the Customer's premises. The provision of electricity is for the Customer's own use and that electricity shall not be resold.

1.9. SAFETY

RMLD is dedicated to making safety its top priority. While the items listed below require particular attention, Public safety, property and the safety of RMLD employees, will always be our first concern.

- a. Any contact with RMLD facilities may cause serious injury or death. Treat all downed, hanging or burning wires as though they are "LIVE", energized, and stay away from them. Do not regard the covering, which may be observed on our wires, as insulation.
- b. Report any downed, hanging or burning wires to RMLD at (781-942-6598) or the Reading Police at (781-944-1212) or Reading Fire Department at (781-944-3132). The North Reading Police at (978-664-3131) or North Reading Fire Department at (978-664-3112). The Lynnfield Police at (781-334-3131) or the Lynnfield Fire Department at (781-334-5152). The Wilmington Police at (978-658-5071) or Wilmington Fire Department at (978-658-3346).
- c. Massachusetts State Law requires contacting "**DIG SAFE**" three (3) full working days prior to doing any excavation, digging holes, or driving posts regardless of whether it is within the street or on private property. Obtain information by calling **811**. The RMLD shall not mark out privately owned underground facilities and it shall be the sole responsibility of the owner of said facilities to have them marked out.
- d. Swimming pools and spas must not be installed beneath our overhead facilities or above our underground facilities.
- e. Proper installation of generators by a qualified person is essential to avoid electrical source feeding back into our lines and endangering unsuspecting utility workers.

UNSAFE EQUIPMENT

It is the Customer's responsibility to ensure that all service equipment on the Customer's premises complies with all applicable National Electric Code (NEC), National Electric Safety Code (NESC), federal, state, and local safety codes. RMLD reserves the right to suspend service if it has any reason to believe the Customer's equipment poses a safety risk.

RMLD does not assume responsibility for detecting any unsafe conditions with the Customer's service equipment. However, if upon inspection RMLD determines that any part of a Customer's service is in violation of applicable electric codes or otherwise poses an electrical safety risk, RMLD has the right to declare a service 'unsafe'.

Upon determination that a Customer's service is 'unsafe', RMLD will post notice at the service address or otherwise notify the Customer. Whenever RMLD or the Town Wire Inspector determines that any electrical system, or portion thereof, has become hazardous to life, health or property, RMLD will issue in writing that such electrical systems either be removed or restored to a safe condition. A time limit for compliance with such order shall be specified in the written notice. When such electrical system is to be disconnected, written notice as prescribed in this section shall be given. In cases of immediate danger to life or property, such disconnection shall be made immediately without such notice.

RMLD may refuse or discontinue service to a Customer if:

- a. Any part of the Customer's wiring or other equipment or the use thereof is determined by the Town Wiring Inspector or RMLD Personnel to be unsafe or
- b. In violation of applicable laws, rules, or regulations, or
- c. If any condition existing upon the Customer's Premises is determined to endanger the well-being of the Customer or any electrical worker.

RMLD will not connect or restore service until the Customer has contracted a licensed electrician to remedy the unsafe equipment issue and gets wiring approval from the Town Wiring Inspector. No person shall use or maintain a defective electrical system after receiving a disconnection notice.

RMLD does not assume any responsibility of repairing the Customer's wiring or other equipment and assumes no liability. (i.e. inadequate grounding, surge protection, overcurrent protection, etc). Refer to Section 12 for further information.

1.10. ENERGY EFFICIENCY, CONSERVATION, AND ELECTRIFICATION PROGRAMS

RMLD offers energy efficiency, conservation, and electrification programs which provide incentives and rebates for all Customer classes. The Programs are intended to increase awareness and accelerate adoption of practices, products, and technologies that provide a multitude of benefits, including:

- Helping customers use energy more efficiently in their home or business
- Reducing RMLD's electricity usage during expensive peak demand times

- Helping the environment by reducing carbon emissions
- Increasing electrification within RMLD's service territory

The Programs are a combination of education, services, and financial incentives including rebates.

The Programs are funded by the Energy Conservation Charge (ECC) included on each customer's electric bill. Residential programs are provided in accordance with the Massachusetts Residential Conservation Services (RCS) Program.

See Appendix G for programs and program requirements. RMLD retains the right to make final determination of Customer eligibility. Qualifying measures are subject to rebate availability. RMLD may suspend or discontinue any programs at its discretion at any time.

1.11. RMLD SYSTEM VOLTAGE CONVERSION AND UPGRADES

RMLD reserves the right to convert from one distribution voltage to a higher distribution voltage during system upgrades. Primary metered Customers (Customers who own private pole lines, underground cable, transformers, and any other equipment) in areas undergoing voltage upgrade are required to upgrade their facilities at their expense to support the new system voltage.

1.12. REQUIREMENTS AND COMPLIANCE WITH ELECTRIC CODES

RMLD requirements stated in this manual are not intended to supersede or conflict with the pertinent standards of the NEC, NESC, or with any state or municipal rule now in effect or which may later be enacted. The latest revision of the NEC is a minimum requirement. Some requirements in addition to those in the latest edition of the NEC are contained herein because RMLD deems them advisable for the public safety and the safety of RMLD representatives. Service Connection will not be made until approval is received from the respective Town Wire Inspector.

RMLD has no obligation or legal authority to determine whether or not the Customer's wiring and installations are proper and safe or comply with the NEC, NESC, or other codes or regulations in effect at the Customer's location. However, if it comes to the attention of RMLD that the Customer's wiring and electrical installations are not proper and safe, or do not comply with such codes, RMLD reserves the right to refuse or discontinue service until such time as the issues are resolved.

1.13. SERVICE INTERRUPTION

RMLD shall not be liable for any interruption, abnormal voltage, or discontinuance of its service if such interruption, abnormal voltage, or discontinuance is without willful misconduct on its part, or is due to causes beyond its immediate control, such as;

- Fire
- Explosion
- Flood

- Weather conditions
- Accident
- Labor difficulties
- Gross negligence
- Conditions of fuel supply
- Reduction in voltage
- Rotating of the use of feeders
- Selected blackouts
- Failure by RMLD Power or Transmission Service Provider to provide electricity for which in any manner it has contracted
- Emergency voltage and / or load reduction program issued by ISO-NE Standard Operational Procedures
- Inability for any other reason to maintain uninterrupted service.

Note: Refer to Section 12 for Customer System Protection Guidelines against electrical anomalies.

CRITICAL CARE CUSTOMERS

RMLD does not maintain a list of medically disabled or otherwise electric dependent Customers. RMLD does not guarantee power or assign priority for power restoration. In the event of a power outage, electric dependent Customers are advised to seek professional medical attention or secure a small house generator to ensure that any critical care equipment can operate.

ISO-NE LOAD SHEDDING OPERATIONAL PROCEDURES

When instructed by ISO-NE, electric power may be cut off to large blocks of Customers to protect the electric system - this is known as 'load shedding'. In extreme situations— such as during a severe generating shortage or the loss of a major transmission line— load shedding may be implemented and usually only after ISO New England and RMLD have pursued all other available actions such as voluntary load curtailment or other emergency actions. Depending on the situation, load shedding could be immediate, with no prior actions taken and RMLD may temporarily not be able to keep power flowing to essential facilities.

ISO New England and RMLD continually take steps to maximize the availability of electricity supplies. Still, power shortages are possible if the region experiences an extended heat wave, there is an extremely heavy demand for electricity, or an extraordinarily high amount of unplanned power outages occur.

2.0 PLANNING YOUR ELECTRIC SERVICE

2.1. AVAILABLE SERVICE VOLTAGES & CHARACTERISTICS

- Single Phase – 3 Wire 120/240V
- Single Phase – 3 Wire 120/208V (from 4 wire system) – Network meter
- Three Phase – 4 Wire 120/208V
- Three Phase – 4 Wire 277/480V
- Three Phase – 13.8kV Primary Service (at RMLD's discretion)

SERVICE TYPE INDEX

When planning electric service work in RMLD territory please identify the bulleted item that best describes your circumstances. Then refer to the recommended section for requirement details that pertain to your project.

- Applying for a new service at an existing location that you own and occupy:

SECTION 5.1

- Apply for service at an existing location that you do not own (rental property):

SECTION 5.2

- Temporary Service to supply power during construction:

SECTION 6.1

- Basic new residential service up to 200 amperes:

SECTION 7.1

- Large residential services, with a main breaker 400 amperes or larger:

SECTION 7.1

- Very large residences, multifamily, apartment complexes, and condominium complexes:

SECTION 7.4

- Commercial and industrial installations three-phase 120/208V or 277/480V:

SECTION 8.1

- Electric Services using back-up generator(s):

SECTION 13.3

- Demolition of Service:

SECTION 2.3

2.2. PERMENANT SERVICES AVAILABLE FROM RMLD

RESIDENTIAL

Residential service is defined as service to a single-family residence or service to multi-family residence such as a duplex or condominium. Single-phase service (120/240 Volts) is available for all residential services up to 400 amps. Multi-family dwellings, such as apartment buildings, with multiple meters may require 120 / 208 three phase feed to the property.

RESIDENTIAL UNDERGROUND RESIDENTIAL SUB-DIVISIONS (URD)

RMLD will supply (at the expense of the contractor / developer) any required transformers, transformer pads, secondary handholes, riser poles, fiberglass light poles, street lighting and any other materials required by RMLD and make the final connection for utility service for URD's. (with the exception of the town of Lynnfield where public area sub-division lighting shall be specified by the town of Lynnfield and provided and installed by the contractor / developer and fed through a separate town billed meter) Each residence in the URD will be supplied 120/240 Volt service rated up to and including 400 amps. For URD's that extend beyond one pole length, 125 feet, from the existing RMLD distribution system, contractors / developers shall be responsible for all RMLD added costs to extend the RMLD electrical distribution system as required.

The contractor will supply materials and associated provisions per RMLD specification for primary cables, primary terminations, secondary cables, grounding, manholes and conduits, The subdivision contractor / developer will be responsible for trenching, installing conduit, primary cable, secondary cable, transformer pads, hand holes, transformer ground grids, terminators, and anything else not provided by RMLD. The contractor/developer is also responsible for providing a spare underground conduit per RMLD design, free of obstruction, with a 2,000 lbs. pulling line through each spare conduit installed.

COMMERCIAL/INDUSTRIAL SERVICE

The Customer shall be required to supply a plot plan showing the placement of buildings, an electrical design of the site. The customer/electrician must request a Utility Authorization Number (UAN) by calling RMLD at (781) 942-6598. The customer's electrical contractor

shall furnish the RMLD with a completed and signed Load Data Sheet form provided in Appendix M.

NUMBER OF ELECTRIC UTILITY FEEDS PER BUILDING

Generally, one feed will be installed to a building. Two or more feeds may be installed at the option of RMLD if approved by the Town Wiring Inspector.

OUTBUILDING SERVICE

RMLD shall not be required to install a service or meter for a garage, stable, or other outbuilding, if it is so located that it may *reasonably* be supplied with electricity through a service and meter located at the property's main building.

SERVICE TO MOBILE HOMES AND TRAILERS

Service is available to mobile homes and trailer parks under the same arrangements as provided for other individual residences with the following considerations:

- a. The meter facilities and service equipment shall be grouped and installed on a permanent support not physically attached to the mobile home or trailer.
- b. An approved rain-tight disconnecting means having a capacity of not less than 100 amps shall be provided at the meter location.
- c. Access to existing poles and lines must not be restricted by Trailer or Mobile Home location.
- d. Proper clearances to metering equipment must be maintained by the Customer at all times. See Section 15.4 and Figure 8 in Appendix H.
- e. Grounding and bonding at mobile home parks needs to be approved by the Wire Inspector per NEC.

DEMOLITION OF SERVICE

Customers seeking to demolish an existing electrical service must obtain the proper permits from the Town Wire Inspector.

- Reading Wire Inspector 16 Lowell Street, Reading, MA 01867
- North Reading Wire Inspector 235 North Street, North Reading, MA 01864
- Wilmington Wire Inspector 121 Glen Road, Wilmington, MA 01887
- Lynnfield Wire Inspector 55 Summer Street, Lynnfield, MA 01940

Refer to applicable town website for contact information

A 72-hour notice (3 days) must be given to RMLD prior to demolition for scheduling removal of RMLD property.

2.3.CONTRIBUTION IN AID OF CONSTRUCTION (REQUIREMENT APPLICABLE TO ALL CUSTOMERS)

INFRASTRUCTURE IMPROVEMENT FOR THE SYSTEM (NO AID TO CONSTRUCTION FROM CUSTOMER)

When RMLD installs, replaces, or makes major repairs to electric infrastructure that will increase the reliability and/or safety of the system all costs will be assessed to the electric rate payers of RMLD.

CONTRIBUTION AID TO CONSTRUCTION POLICIES (AID REQUIRED FROM CUSTOMER)

- If RMLD must add to, expand, or upgrade its facilities due to the increased load of an existing Customer or the projected load of a new Customer, RMLD may require the Customer to pay a Contribution in Aid of Construction reasonably related to the incremental cost of the additional facilities needed to provide the Customer with service.
- RMLD may require a Customer who requests relocation, conversion (undergrounding), modification, or other alteration of RMLD facilities to pay a contribution in aid of construction.
- RMLD may require a contribution in aid of construction payment for any enhanced distribution system or enhanced distribution facilities installed at the request of, or to benefit, a Customer or potential Customer.
- RMLD may require a contribution in aid of construction payment for any design, construction and related costs performed at the Customer's request and that is not specifically covered in the Handbook. Work will begin only after RMLD determines the proper contribution in aid of construction amount and documents in the written agreement, any necessary additional terms and conditions.
- RMLD may require a contribution in aid to construction for the facilities required to serve any load that, based on RMLD estimates will not provide RMLD an adequate return of investment.
- RMLD may, at its option, compute its charges on the basis of standard unit costs as determined from periodic studies made by RMLD of similar construction or removal.
- Any distribution line or service extension or reconstruction of facilities will be individually evaluated. Such line or service extension or reconstruction may require payment of a contribution in aid of construction. See Section 10.
- RMLD requires a full value Working Capital Down Payment for all RMLD supplied equipment.

For non-URD applications, a full value Working Capital Down Payment is necessary from Customers that require transformation equipment which totals 1000 kVA and higher. Charges for transformation, poles, and associated labor and equipment may apply where transformation is required due to voltage drop issues created by proximity of the service to

RMLD's distribution facilities, in which case customers shall be charged for transformation regardless of size.

(i.e. this would apply to buildings with one service, properties with multiple services such as campus style, apartment buildings, etc)

3.0 APPLYING FOR ELECTRIC SERVICE

In all cases new/modified electric service to an existing or new building is a joint effort between the Customer and RMLD. The Customer or their qualified electrical contractor is responsible for obtaining a Utility Authorization Number (UAN) by calling RMLD Customer Service at (781) 942-6598, a wiring permit from the Town where service is located, paying the metering account deposit (if applicable), paying for any applicable Contribution Aid to Construction, and ultimately having the Town Wire Inspector approval on all work performed before RMLD will energize the new or modified service. The Town Wire Inspector must call in approval of the work to RMLD Control Center recorded phone line.

At the site, the Customer must provide an unobstructed overhead path for RMLD overhead service cable or a completed underground system (conduit and cable) ready for connection to RMLD infrastructure. After the necessary paperwork has been completed and the site is readied, RMLD will complete the connection to its electrical infrastructure and install a revenue meter in the Customer's meter socket.

4.0 METERING, BILLING, PAYMENTS, AND NON-PAYMENTS

4.1. METERING

For the purpose of determining the amount of electricity delivered, meters shall be installed by RMLD at locations to be designated by RMLD, and upon the readings of such meters, all bills shall be computed. Bills for electric service will be calculated separately for each location served. A rate available for a certain class of service such as Residential or Commercial shall apply to all such service taken at an individual meter location.

METERING ACCOUNT DEPOSITS

See Section 5.3 and 5.4

CUSTOMER-OWNED GENERATION METERING

This section incorporates the technical specifications related to interconnection requirements and safety standards for customer owned generation systems. This section is applicable to all customer owned generation systems interconnected to the RMLD system,

and applies to every person, firm, company, and corporation engaged in the leasing, construction or operation of any customer owned generation system.

See Appendix C for Customer Owned Generation Rates and Tariffs. See Appendix E for Customer-Owned Generation Requirements and Guidelines.

PRIMARY METERING

See Section 8.5.

4.2.BILLING AND PAYMENTS

The Massachusetts Department of Utilities' (MDPU) billing and terminations regulations and procedures shall apply to matters regarding billing and payments to the extent applicable. To the event of any conflict, the MDPU's rules and regulations will govern.

- a. Where electricity is delivered through more than one meter, the cost of electricity delivered through each meter will be computed separately.
- b. Wherever reference is made to electricity delivered or a payment to be made for electricity "each month" or "per month" it shall mean the electricity delivered in the period between two successive regular monthly meter readings.
- c. RMLD shall have the right to discontinue its service on due notice and to remove its property from the Customer's premises in case the Customer fails to pay any bill due to RMLD for electric service, or fails to perform any of its obligations to RMLD. For any restoration of service after such credit discontinuance, there will be a disconnect/reconnect fee charged by RMLD. Please see Appendix K for applicable fees and charges.
- d. All bills shall be due and payable upon presentation. RMLD offers a prompt payment discount for all customers (except municipal streetlight formula rate).
- e. All Customers are allowed to pay their energy usage bills at www.rmld.com by clicking on "Pay My Bill" link. RMLD offers a one-time payment choice in addition to a monthly autopay option. RMLD also offers paperless billing. Customers may call Customer Service (781-942-6598) to pay over the phone with a debit, credit card or checking information.
- f. Customer payments returned to RMLD due to either insufficient funds or insufficient credit will be charged a service fee. Please see Appendix K for applicable fees and charges. Additionally, if the Customer receives a credit on their monthly bill for a payment, which is later returned, the Customer Service Department will reverse said credit on the Customer's account.
- g. No officer or agent of RMLD shall charge, demand, collect, or receive a greater, lesser or different compensation for supplying electricity than the rates and charges

applicable thereto, as specified in RMLD Rates and Tariffs in effect at the time – see Appendix C.

- h. Sub-metering of retail electric service for third party resale is not permitted.
- i. See Appendix C for the current RMLD Rates and Tariffs.

4.3.SERVICE DISCONNECTION DUE TO NON-PAYMENT

Except at the request of the Customer, RMLD shall not disconnect electric service unless payment of a valid bill or charge is delinquent and notices of disconnection have been furnished to the Customer, as provided by Customer Service. This shall not apply to any disconnection or interruption of service made necessary for reasons of health or safety of the Customer or the general public. The MDPU's billing and terminations regulations and procedures shall apply to matters regarding service disconnection to the extent applicable. In the event of any conflict, the MDPU's rules and regulations will govern.

Any service that is discontinued will be in strict accordance with applicable billing and termination procedures of the MDPU. RMLD may remove its equipment from the Customer's premises for violation of any federal, state, or local laws or government regulations.

4.4.SERVICE RECONNECTION

- a. Any service reconnection will be in strict accordance with applicable billing and termination procedures of the MDPU.
- b. RMLD will restore service if the disconnected Customer pays the applicable fee and pays the delinquent bill. Please see Appendix K for applicable fees and charges. If Residential Customer has proven financial hardship, 25% of the past due must be paid then a payment plan may be arranged. Under this plan a past due balance may be paid in equal installments over a specific period. Current charges will be due in addition to the payments on the past due balance. The length of time that a payment plan extends will vary from a minimum of four months depending on the past due balance and the ability to pay.
- c. Service reconnects where the service has been shutoff for a period exceeding 14 calendar days shall require Town Wiring Inspector approval prior to reenergization.

ESTABLISHMENT OF A PAYMENT PLAN

When establishing a reasonable payment plan, Customer Service will consider the Customer's payment history, the size of the arrearage, the amount of the current bill, the amount of time the bill has been outstanding, and the reason for the outstanding bill. Payments shall be applied toward the delinquent portion of the account before being applied to the current bill.

4.5. BUDGET BILLING PLANS

RMLD offers budget billing to residential Customers.

- a. The plan shall be designed to reduce fluctuations in Customer bills due to seasonal patterns of consumption. A Customer must elect to participate in the budget billing plan in January.
- b. RMLD has a budget bill program that runs from January to November with the month of December being the true up month. Equalized monthly payments are offered to Customers electing to be billed under this program. Customers must sign up for this option. Customers must sign up for auto pay on these payments.
- c. A budget payment plan shall be based on the Customer's recent twelve-month consumption. If twelve months of billing data are not available for the Customer, then the number of months of billing data available shall be used.
- d. Each plan shall provide that bills clearly identify actual consumption and state the amounts that would be due without budget billing.

5.0 EXISTING RESIDENCE OR COMMERCIAL SERVICE

5.1. OWNER OCCUPANT – EXISTING RESIDENCE OR COMMERCIAL PROPERTY

To apply for electric service at an existing residential or commercial property which is already metered and connected to RMLD distribution system, please contact the Customer Service (781-942-6598) during regular business hours posted on the RMLD website. Please remember that it is the Customer's responsibility to inform RMLD prior to change in ownership or when moving.

5.2. RENTER/TENANT – EXISTING RESIDENCE OR COMMERCIAL PROPERTY

To apply for electric service at an existing residential rental property which is already metered and connected to RMLD distribution system, please contact the Customer Service (781-942-6598) during regular business hours posted on the RMLD website. RMLD requires a security deposit for all renter and that all prior RMLD electric service account balances be paid in full before establishing a new account. A meter reading will be taken, and the billing department will change the account to the new name. Please remember that it is the Customer's responsibility to inform Customer Service (781-942-6598) of a change in ownership or when moving. See the following section for a complete explanation of Customer deposits.

5.3. RESIDENTIAL CUSTOMER DEPOSITS

RMLD Residential Rental Customers are required to pay a security deposit equal to an estimated bill for up to three months' service or such other amount permitted by applicable law or regulation. This requirement shall apply to all Residential Rental Customers of RMLD. It is a condition of obtaining service. For more information, please refer to RMLD's prevailing General Terms and Conditions for Electric Service.

Interest is earned on Customer deposits at a rate equal to yields on the U.S. Treasury securities at a constant, fixed one-year maturity. Earned interest shall be paid to the customer or shall be credited to the Customer account in accordance with applicable laws or regulations. Federal govt. data on interest rates can be found at <http://www.federalreserve.gov/releases/h15>.

ACCOUNT TERMINATION AND RECONNECTION

Upon the Customer's request for termination of service all deposits and accumulated interest will be applied to any outstanding balance; any remaining credit will be returned to the Customer in the form of a refund check mailed from the Town of Reading.

At such time a Customer requests a reconnection of service, any changes in service requirements shall be reviewed by RMLD in regard to the security deposit which shall then be adjusted to satisfy the changes in deposit requirements.

Any account which has been terminated shall not be reconnected until the following conditions of service have been satisfied:

- a. All bills due to RMLD for service previously provided have been paid in full or.
- b. A satisfactory payment plan has been established with RMLD.
- c. A deposit as determined in this section of the handbook has been paid.
- d. A service disconnection notification fee has been paid in full.
- e. Town Wiring Inspector has given their approval for reconnection as needed.

Note: It is the Customer's responsibility to notify RMLD when vacating the premises. The Customer will be held responsible for all bills incurred until official notice of account termination has been received by RMLD.

5.4. COMMERCIAL CUSTOMER DEPOSITS

RMLD Commercial Customers may be required to pay a security deposit equal to an estimated bill for up to three months' service or such other amount permitted by applicable law or regulation. The type of business, the size of the space and the estimated usage may also be taken into consideration in the security deposit calculation. For more information, please refer to RMLD's prevailing General Terms and Conditions for Electric Service.

APPLICABILITY

This requirement shall apply to all Commercial Customers of RMLD. Any account receiving service prior to the effective date of this requirement and having met the deposit requirements of the requirement in effect at the time such original service was installed shall not be required to meet the deposit requirements of this requirement except as otherwise provided herein.

TERMS

All Commercial Customers of RMLD shall be required to pay a security deposit to RMLD prior to the connection of service with exception for Customers who own the land and building(s) at the service address. Such deposits shall be in an amount equal to three months of electrical service billings as estimated by RMLD. No other waivers of such security deposit shall be granted to any new account except those meeting the criteria as cited above.

The security deposits may be maintained for the full term of service. Interest on security deposits held longer than six months shall be paid to the Customer or shall be credited to the Customer's account in accordance with applicable laws or regulations. RMLD may waive the security deposit, in its sole discretion, when payment of the charges may be secured through other means. All bills must be kept current. For more information, please refer to RMLD's prevailing General Terms and Conditions for Electric Service.

INTEREST ON DEPOSITS

Any account in existence shall accrue interest on security deposits. Interest is earned on Customer deposits at a rate equal to yields on the U.S. Treasury securities at a constant, fixed one-year maturity. Earned interest shall be paid to the customer or shall be credited to the Customer account in accordance with applicable laws or regulations. Federal government data on interest rates can be found at data at <http://www.federalreserve.gov/releases/h15>

ACCOUNT TERMINATION AND RECONNECTION

If a Customer requests a reconnection of service, any transfer of accounts or changes in business location shall also be considered as new accounts except if the Customer has previously paid a deposit in full and made all bill payments within the 30-day time frame. Each additional business location shall be considered as a separate account and will be required to individually satisfy the security deposit requirement. Any changes in service requirements shall be reviewed by Customer Service in regard to the security deposit which shall then be adjusted to satisfy the changes in deposit requirements.

Upon the Customer's request for termination of service all deposits and accumulated interest will be applied to any outstanding balance; any remaining credit will be returned to the Customer.

Any account which has been terminated shall not be reconnected until the following conditions of service have been satisfied:

- a. All bills due to RMLD for service previously provided have been paid in full or.
- b. A satisfactory payment plan has been established with Customer Service at RMLD.
- c. For Rental Customers, a security deposit as determined in this section of the handbook has been paid.
- d. A service connection fee has been paid in full if disconnected for credit.

- e. Town Wiring Inspector has given their approval for reconnection as needed.

Note: It is the Customer's responsibility to notify RMLD when vacating the premises. The Customer will be held responsible for all bills incurred until official notice of account termination has been received by RMLD.

6.0 TEMPORARY ELECTRIC SERVICE

6.1. GENERAL

- Temporary service will be provided to the Customer in accordance with RMLD's specifications and requirements and at the Customer's expense. For more information, please refer to RMLD's prevailing General Terms and Conditions for Electric Service.
- Temporary services will be provided at construction sites for connection to RMLD distribution system. The intent of these services is to provide temporary power during new construction or renovation. RMLD reserves the right to determine the justification for temporary service at the time of request and thereafter until removal. Remember that Temporary electrical service is not in lieu of or a substitute for a fully inspected permanent service in any residence or building.
- RMLD must make all connections (or removals) from RMLD distribution facilities. Violation will result in immediate termination of service by RMLD.
- Temporary services indicate to RMLD that a new load will soon be permanently connected to our infrastructure. For this reason, the owner or owner's representative should be prepared to discuss and document planned electrical loads that will result from the new construction by applying for a Utility Authorization Number. Later in this process a RMLD representative will meet with the owner's electrical contractor to determine the exact meter location. If the new building foundation is in place, the final metering location will be marked. If the foundation is not in place, the building plans and plot map will be used to finalize the metering location. RMLD reserves the right to have the final say on service and meter location.
- Temporary services cannot cross adjoining property lines and they must meet all NEC Requirements including clearance requirements.
- No generator is to be connected in parallel with RMLD distribution facilities at any time.

6.2. APPLYING FOR TEMPORARY SERVICE (AVAILABLE AT SECONDARY VOLTAGES ONLY)

A Utility Authorization Number must be obtained by the electrician by calling Customer Service at (781-942-6598). Once Customer Service has issued a Utility Authorization Number (UAN), a permit to perform electric work must be obtained from the Town Hall of the Town where the work is being performed. A UAN number (see Appendix B) is required

to obtain a wiring permit in any of the four Towns that RMLD services. When the work is completed, the Wire Inspector must inspect the work and call in the approval to RMLD.

6.3.COSTS FOR TEMPORARY SERVICE

See Appendix A for a description of RMLD temporary service methods. For more information, please see Appendix K (for applicable fees and rates) and, RMLD's prevailing General Terms and Conditions for Electric Service. There will be an additional charge for all RMLD costs associated with temporary services extending beyond a standard overhead one pole span installation. This charge will be based on the total labor and other costs plus the total costs of any non-reusable materials. Labor costs include the hourly cost of RMLD labor and equipment. Any materials used solely for the temporary service and deemed non-reusable by RMLD will be billed to the Customer. Rates and material costs are subject to periodic change without notice.

Upon completing the application for service and a field visit by a RMLD representative, the temporary service fee and any additional charges will be estimated for the Customer. This estimate will be based on information supplied by the Customer, as well as information gathered during our site visit. The Customer will be required to pay the final temporary service fee and additional charges prior to the connection and installation of the electric revenue meter.

Please note that if RMLD representatives travel to a site at an agreed upon time but cannot make the final connections due to blocked physical access, clearance deficiencies, installation deficiencies, or other conditions beyond our control an additional charge will be assessed for the return trip.

6.4.RESPONSIBILITIES ASSOCIATED WITH TEMPORARY SERVICE

The following lists the general division of work between the contractor/Customer and RMLD. This is subject to change without notice and the contractor may be required to perform additional tasks under unusual situations.

CUSTOMER/CONTRACTOR RESPONSIBILITIES:

- Obtain a Utility Authorization Number (UAN) from Customer Service 781-942-6598.
- Meet on-site with a RMLD representative to determine the location of the temporary service.
- Apply for and obtain a wiring permit as required with the respective Town Wiring Department.
- Call Dig Safe (**811**) for the underground utilities to be marked prior to any digging.
- Install the required temporary service equipment for either overhead or underground connection to RMLD system.
- Pay the applicable non-refundable temporary service fee and applicable charges to RMLD for the temporary service.
- Notify the Town Wiring Inspector that an inspection is required and gain the Inspector's approval of the temporary service equipment.

- Notify RMLD that the temporary service is approved for connection.

RMLD RESPONSIBILITIES:

- Meet with the Customer to determine an acceptable location of the temporary service.
- Provide an estimated temporary service fee and applicable charges to the Customer in a timely fashion.
- Check prior to installing power to the temporary that all NESC for clearances to buildings and roadways will be met.
- Install the overhead service lines to the temporary structure to supply power.
- Connect the Customer's cables to RMLD distribution facilities.
- Install a meter in the socket.
- De-energize the temporary service after notification by the Customer that it is no longer needed.

6.5.TEMPORARY CONNECTION METHODS

See Appendix A for a list of possible methods for connecting temporary service to RMLD grid. The Customer may request a particular method; however, RMLD personnel will make the final decision as to the method of interconnection.

7.0 RESIDENTIAL ELECTRIC SERVICE – NEW, UPGRADE OR RELOCATION

7.1.GENERAL

RMLD residential services to single and multiple family housing units are generally provided at 120/240V single-phase (up to and including 400 amp service).

Very large homes and multi-family dwellings that require a 400-amp service will be generally supplied using a single 120/240 volt pad mount or pole mount transformer. For residential dwellings with a service above 400 amps RMLD will work with the Customer or contractor in an effort to achieve the required power in the most economical, sensible and safe manner. Generally, this will involve one or more 120/208 volt three-phase pad mount transformer(s) located on the Customer's premises. These transformers will require a primary voltage feed from RMLD distribution facilities. An appropriate legal easement as defined by RMLD and furnished by the customer shall be required for any RMLD owned facilities on the customer's premises. The signed and registered easement shall be provided with an approved plot plan by the applicable town and RMLD.

7.2.COSTS FOR PERMANENT SERVICE

GENERAL

A single or three-phase transformer will be supplied by RMLD to residential Customers and RMLD will make necessary connections to the distribution facilities up to and including 750 kVA of transformation at no charge. This includes the connections to the transformer and at

the riser pole. RMLD will also provide the secondary service handholes. All other charges such as trenching, conduit, primary and secondary cable, terminators, transformer base and ground grid, riser, etc. are the Customer's responsibility. Contact RMLD's Engineering dept. for further information.

OVERHEAD SERVICE

RMLD will connect a Customer to RMLD overhead distribution facilities at no additional charge if they are located within approximately 150 feet of the our overhead distribution facilities (terrain and angle dependent) with RMLD supplying and installing *up to* one pole and one section of wire and a service drop. Please see RMLD requirement in Section 10 of this handbook for residential Customers that require longer connecting facilities. All construction from RMLD primary distribution system leading up to the Customer's point of attachment will be owned and operated by RMLD.

UNDERGROUND SERVICE

Customers connecting to RMLD 120/240V overhead distribution facilities via underground conductors, will be connected, as specified by RMLD, and supplied with 150 feet of overhead cable, riser pole (if the home can't be reached with a standard overhead service which is approximately 120') along with a handhole if and as needed; however, the trenching, conduit, wire, terminators, pole riser and other costs associated with the UG service are the Customers' responsibility. All construction from the point of connection at the riser up to the Customer meter will be owned and operated by the customer.

7.3.APPLYING FOR PERMANENT RESIDENTIAL SERVICE

A Utility Authorization Number must be obtained for all residential services. Once RMLD has issued a Utility Authorization Number, a permit to perform electric work must be obtained from the respective Town Hall. Refer to the following link for further information:

<https://www.rmlld.com/service/faq/i-am-electrician-how-do-i-apply-utility-authorization-number-uan-and-what-information-do>

OPTIONAL CONNECTIONS TO RMLD DISTRIBUTION FACILITIES

With the approval of the RMLD, the Customer may choose how they wish their residence to be connected to RMLD system if the facilities are available and they agree to the additional charges necessary to accomplish the desired task.

RESIDENTIAL OVERHEAD SERVICE

The most basic service connection is a service drop from an existing or a new pole to the point of attachment on a dwelling. Typically, RMLD can reach the Customer within the maximum (no charge) allotment of one pole and 150' on private property, one section of wire, and a service drop. The meter location and service attachment point are identified early in the project by RMLD. Upon final inspection by the Town Wiring Inspector, RMLD will route service cable to the homeowner's service point of attachment and install the meter in the Customer's socket then energize the service upon approval of the wire inspector.

The Customer is required to provide an easily accessible, clear path (both aerial & on the ground), devoid of trees, wetlands, and other obstacles, where our crews can route the service cable. RMLD will provide a maximum of one utility pole with associated infrastructure at no cost to the Customer. The Customer will be financially responsible for all poles and other infrastructure beyond this 1 Pole Limit. See Section 10 for details. Please note that tall growing vegetation planted under power lines could encroach on your power line – see Section 1.8. The Customer is responsible to provide a clear path to RMLD meters at all times.

RESIDENTIAL UNDERGROUND SERVICE

Customer may be in an area that requires the service to the residence to be underground with no new aerial wires. RMLD requires all new developments to be supplied with underground residential design guidelines. This may also include underground requirements in areas of the Town designated as only allowing underground service entrances. The Building Inspector, the Town Wiring Inspector, as well as RMLD may assist in determining the requirements and options available to you.

UNDERGROUND SERVICE TO HOMES FED FROM OVERHEAD INFRASTRUCTURE

In existing overhead service areas, the Customer shall tap (120/240 Volt secondary) to RMLD distribution facilities via underground conduit. The Customer will be responsible for any required trenching, conduit, wire, concrete to protect the conduit, the service riser (including the weather seal) on the pole as well a meter socket and the service conductors. RMLD will not be liable for the weather seal or any leakage that occurs on the service riser. Steel conduit shall be used for all secondary risers. The customer's electrician shall drive a ground rod at the pole and bond it to the steel riser in accordance with NEC guidelines – see Appendix H, Figure 13. If the Customer chooses to use gray PVC electrical grade conduit (40 or 80), from the riser pole to the meter socket, they must use a steel sweep (36", 90 degree) at the pole with up to 10' of steel conduit in the ground and transition to PVC and connect to an RMLD supplied handhole. Customer shall be responsible to provide RMLD with an adequate length of service cable at the riser pole for interconnection to RMLD's infrastructure. RMLD will make the final connections at the pole including attaching all riser poles above 10 feet (safety issue) and the installation of a suitable meter.

UNDERGROUND SERVICE TO HOMES FED FROM EXISTING UNDERGROUND INFRASTRUCTURE

In existing underground service areas (UG) the Customer will be required to meet RMLD system via underground conduit and wires to the existing hand hole or transformer using electrical grade gray PVC schedule 40. The service entrance shall be connected to the underground conduit via an expansion coupling at the meter socket to allow for settling of the construction site without damage to the service. The Customer will be responsible for any required trenching, conduit, wire, concrete to protect the conduit, as well a meter socket. RMLD will make the final connections at the hand hole or transformer.

UNDERGROUND SERVICE TO METER PEDESTAL

With prior approval of the RMLD, Customers building new residences may elect to have the meter and service at their location connected using a pedestal meter, typically located some distance away from the house. Conduit to the Customer's service panel as well as other utilities is then run underground from the pedestal into the basement area of the house. Refer to sections above for interconnection requirements when connecting to overhead or underground RMLD infrastructure.

7.4. RESPONSIBILITIES AND EASEMENTS ASSOCIATED WITH RESIDENTIAL PERMANENT SERVICE

A Customer's premises may be connected to RMLD's overhead distribution facilities via an underground connection where the Customer installs and maintains the entire underground service exclusive of the riser pole. Ownership of all service equipment located on the Customer's property shall remain the property of the Customer. The service connection when located in the public way shall become the property of RMLD. An easement may be required as determined by the RMLD.

- a. If for any reason it becomes necessary for RMLD to relocate any of its pole, wire, or cable facilities by which a Customer is served, the Customer shall change the location of its point of delivery to a point readily accessible from the new location. The cost of this work is the responsibility of the Customer. In addition, the customer shall grant the RMLD an easement for any RMLD owned and operated equipment.
- b. Electric service must not be used in such manner as to cause unusual fluctuation or disturbance in RMLD's supply system and in the case of violation of this rule, RMLD may discontinue service, or require the Customer to modify the installation and/or equipment using approved controlling devices that will eliminate such disturbance.
- c. The Customer will be required to pay the cost of any special installation necessary for service at other than standard voltages or for service with closer voltage regulation than required by standard practice. The excess cost will represent the difference in costs between the special installation and a normal installation.
- d. Applications involving extension requiring abnormal construction which would result in extraordinary costs, such as crossing rivers, railroads, ponds, extending to an island, use of submarine cable, and other special conditions, are considered as special cases. Customers or other parties requesting such extensions shall be responsible for all costs incurred including maintenance and repair costs in the future.
- e. If, at any time, RMLD is required to remove a Customer's meter and determines that it is unsafe to do so, the Customer is required to upgrade any equipment necessary to ensure the safe removal/installation of the meter at their own expense.

ELECTRIC FACILITY EASEMENTS AND PLANS

The Customer, owner, developer, and contractor shall be monetarily responsible for providing, granting and furnishing an easement for all electric facilities. Typical electric utility easement requirements are stated below:

- A fifteen (15) feet wide strip or cable easement along all front and or street property lines.
- A five (5) feet wide street crossing easement from front property line to front property line wherever cable crossings are required.
- A twenty-two feet wide by twelve feet deep (22'W X 12'D) equipment easement for sectionalizing cabinet and or a pad mount transformer installation.
- A twelve feet wide by twelve feet deep (12'W X 12'D) equipment easement for pad mount transformer and / or secondary handhole installation at the front lot corner(s) and located equally on each lot.
- Note that such easement requirements are project dependent. Project easement requirements will vary both upward and downward from the above stated requirements. All project easement requirements should be filed with definitive subdivision plans.
- RMLD Residential service easements should be determined during the planning stage; however, late stage design changes may be required after open trench inspection.
- Two recordable copies of easement plans — Underground "As Built" drawings showing all underground conduits, sweeps, distance between sweeps, property lines, structures, and utility easements, must be provided to RMLD Engineering and Operations Division prior to energizing of any underground circuits. The total cost for the primary underground installation must also be submitted.
- Deeded private primary underground line easements are required by RMLD. A copy of this deed must be provided to RMLD prior to energization. The size and scope of these easements will be established by RMLD after a site visit.

8.0 COMMERICAL/INDUSTRIAL ELECTRIC SERVICE

8.1. GENERAL

- RMLD can often provide adequate power to commercial enterprises requiring no larger than a 400 amp 120/240 Single Phase service via existing overhead facilities.
- Check with RMLD Engineering department at 781-942-6459 to determine if RMLD can deliver Three Phase 120/208 or 277/480 Volt power to any specific location.
- Customers must provide RMLD with site electrical one-line drawing(s), a Load Data Sheet, and a Utility Authorization Number so that RMLD can plan the utility infrastructure needed to accommodate the service request.
- RMLD will supply the facility meter(s) as well as all complex metering accessories such as PT's and CT's that supply load information to the Customer. These metering installations may also provide electric demand and power factor information. All

meters are owned and maintained by RMLD, therefore RMLD has rights to all of the generated information.

- The Customer will be responsible for all trenching, installing and maintaining all conduit, transformer Pads, necessary ground grid(s), and transformer protective bollards if necessary. In addition, the customer will be responsible for installing, testing, and maintaining all customer owned primary and secondary cables.
- The Customer will be responsible for the installation of all the necessary equipment in accordance with the latest NEC and / or NESC standards.
- For overhead services, the Customer is responsible for all electrical infrastructure past the weather head with the exception of the meter.
- For primary metered customers, the Customer will be responsible and will own the transformer(s) and all primary as well as all secondary electrical infrastructure beyond primary metering. Refer to section 8.5 for primary metering qualification.
- The customer is responsible for providing and maintaining an easement for RMLD owned and operated equipment.

8.2. APPLYING FOR PERMANENT COMMERCIAL/INDUSTRIAL/RESIDENTIAL DEVELOPMENT SERVICE

A Utility Authorization Number (UAN) must be obtained from Customer Service for all electrical work being done. Once RMLD Customer Service has issued a Utility Authorization Number, a permit to perform electric work must be obtained from the Town Hall in the Town where the work is being performed.

8.3. COST FOR COMMERCIAL AND INDUSTRIAL SERVICE

RMLD will provide 1 pole span from existing primary (150' – overhead) onto private property at no cost to the Customer. An underground service may be provided at additional cost paid for by the customer. Please contact RMLD's Engineering dept. for further details. See Section 2.4 for Customer Contribution in Aid of Construction information.

A. All overhead equipment and wiring leading to the RMLD transformer(s) will be owned and operated by RMLD exclusive of Customer cost contribution. All additional wiring and equipment beyond the first 150' will be paid for by the Customer. B. All lateral underground equipment and wiring leading to the transformer (s) will be installed, owned and maintained by the customer.

C. RMLD shall furnish and install transformer(s) up to and including 750 kVA. For transformers sized at 1000 kVA and above, shall be paid for by customer per section 8.4.

Note: Commercial/Industrial Customers requesting a service may be required to pay for all equipment (including transformer) and wiring beyond RMLD's complimentary 150-foot span. Please contact RMLD's Engineering dept. for further details. RMLD requires standardized Load data sheets.

8.4. DEPOSITS AND PAYMENTS

Customers that require transformation equipment sized at 1000 kVA and above shall be required to pay a Working Capital Down Payment to cover the total new value cost of the transformer(s) before an order will be placed.

RMLD requires new value Working Capital Down Payment for the transformers on underground residential developments (URD's) to insure recovery of capital investment.

Customers requiring non-stock or otherwise special-order transformer(s) can expect up to a 6 month or longer lead time upon making the Working Capital Down Payment **in full**.

8.5.PRIMARY METERING

Requests for primary metering, totalized metering, or any other proposed departures from standard metering shall be made in writing to RMLD Engineering staff (781-942-6459) The request will document the need and circumstances for the proposed metering. Customers requiring total transformation of 1500kVA and greater may qualify for primary metering installation.

Rate structure allowances for primary metering are not intended to provide any additional economic benefit to Customers. A primary meter measures both the load and the no load losses across the transformer(s). The primary metering rates take into account for the total the losses across the transformer(s). See Appendix C for primary metering rates.

Primary metering allowances are distinctly separate from any allowances for Customer ownership of facilities. RMLD will, in all cases, make the final determination of the metering scheme and will be based on cost to RMLD and the reliability and accuracy of the overall metering installation.

RMLD personnel determines when primary metering is necessary. For example, primary metering is necessary for a campus style configuration that requires 15 kV switchgear.

8.6.RESPONSIBILITIES AND EASEMENTS ASSOCIATED WITH COMMERCIAL / INDUSTRIAL PERMANENT SERVICE

- A Customer's premise may be connected to RMLD's overhead distribution facilities via an underground connection where the Customer installs and maintains the entire secondary underground service inclusive of the electrical riser installed on RMLD owned pole. Ownership of all secondary service equipment located on Customer's property shall be owned and maintained by the Customer (with the exclusion of RMLD's meter and metering CT's/PT's). The service connection at the riser pole is owned and maintained by the RMLD.
- If for any reason it becomes necessary for RMLD to relocate any of its poles, wire, or cable facilities by which a Customer is served, the Customer shall change the location of its point of delivery to a point readily accessible from the new location. The cost of this work is the responsibility of the Customer.
- Electric service must not be used in such manner to cause unusual fluctuation or disturbance in RMLD's supply system and in the case of violation of this rule, RMLD

may discontinue service, or require the Customer to modify his installation and/or equipment using approved controlling devices that will eliminate such disturbance.

- Projects involving extensions requiring abnormal construction which would result in extraordinary costs, such as crossing rivers, railroads, ponds, extending to an island, use of submarine cable, and other special conditions, are considered as special cases. Customers or other parties requesting such extensions shall be responsible for all costs incurred including maintenance costs.

ELECTRIC FACILITY EASEMENTS AND PLANS

The developer and/or contractor shall be monetarily responsible for providing, granting and furnishing an easement for all electric facilities, as specified by RMLD. Typical electric utility easement requirements are stated below:

- A fifteen (15) foot wide strip or cable easement along all front and or street property lines.
- A five (5) foot wide street crossing easement from front property line to front property line wherever cable crossings are required.
- A twenty feet wide by twenty feet deep (20'W X 20'D) equipment easement for sectionalizing cabinet and / or a pad mount transformer installation.
- A twelve feet wide by twelve feet deep (12'W X 12'D) equipment easement for pad mount transformer installation at the front lot corner(s) and located equally on each lot.
- Note that such easement requirements are project dependent. Project easement requirements will vary both upward and downward from the above stated requirements. All project easement requirements should be filed with definitive subdivision plans.
- Two recordable copies of easement plans — Underground as Built drawings showing all underground conduits, sweeps, distance between sweeps, property lines, structures, and utility easements, must be provided to the RMLD's engineering office prior to energizing of any underground circuits. The total cost for the primary underground installation must also be submitted.
- Deeded private primary underground line easements are required by RMLD. A copy of this registered deed must be provided to RMLD prior to energization. The size and scope of these easements will be established by RMLD after a site visit.

9.0 CUSTOMER SERVICE CONNECTION CLEARANCES AND RESPONSIBILITIES

The Customer shall furnish and install the service entrance conductors, meter socket and equipment. These items shall at a minimum meet the current requirements of the NEC, NESC, the Massachusetts Electric Code and any additional requirements of RMLD. The Customer must grant RMLD any utility easement(s) needed as dictated throughout this document. RMLD requires that these easements be recorded (in perpetuity) on the property deed in all cases. RMLD must be provided with a copy of these registered deeds prior to utility connection.

9.1. LOCATION OF METER AND SERVICE ENTRANCE

RMLD will identify suitable locations for pad mount transformers, meters, and the appropriate riser pole for underground services or point of attachment for overhead

services. Under no circumstances shall construction begin prior to these assignments. See section 14 and 15 of this handbook for more information.

Notes:

- Pedestal meters are allowed in underground areas.
- Although RMLD retains the right of final say, Customer requests will be considered during this process.
- Customers must notify RMLD of intent to start work at least 72 hours in advance to allow time for a service location to be assigned. RMLD Utility Authorization Number (UAN) must be obtained prior to this notification.

9.2.POINT OF ATTACHMENT

Overhead service entrance conductors must be securely fastened to the building, with a weather head height in accordance with the current NEC requirements and any additional requirements of RMLD. An attachment eye bolted and securely fastened to the structure of the building must be installed at a point 6 inches below the weather head or at a suitable point determined by RMLD. RMLD will provide a D-Eye and galvanized bolt, washers and nut for this purpose upon request at no charge to the Customer. Attachments must be made to a structurally sound and well secured surface, suitable for the purpose as approved by RMLD. Attachment to siding, soffits and the like are not acceptable. Customer's service cable shall be extended beyond the weather head by 30 inches for connection allowing for a cable drip loop.

9.3.SERVICE MASTS

Service masts are a suitable alternative to gain the required height when installed in accordance with current NEC requirements and any additional requirements of RMLD and/or Code Administration. The mast shall be adequately attached. Refer to Figure 7 in Appendix H for RMLD requirements.

9.4.CONCEALMENT OF SERVICE ENTRANCE

Service entrance cables or conduit containing service entrance cables shall not be placed within a building wall or concealed in any way, except where they pass horizontally through the building wall to the service panel or inside service mast conduit passing thru a roof. Refer to current NEC requirements.

9.5.SERVICE CLEARANCES TO BUILDING STRUCTURES

CLEARANCES TO PADMOUNT TRANSFORMERS

The following clearances must be maintained to structural features of the building and other potential hazardous situations. In all cases the closest edge of the pad mount to the building

feature or hazard is used in the measurement. If the structure has an overhang (i.e. deck, staircase, eave) clearance distance is measured from the outside edge of the overhang. In no case shall a pad mounted transformer be located under any type of overhang. Refer to Figure 1 in Appendix H.

CLEARANCES TO ELECTRICAL SERVICE ENTRANCES

Clearances from the Service Entrance Must Be Maintained to Structural Features of the Building and or other Potential Hazards. Refer to Figures 4 through 7 in Appendix H.

9.6.OVERHEAD SERVICE DROP CLEARANCES

SERVICE CABLE REQUIRED MINIMUM VERTICAL CLEARANCES NOT EXCEEDING 300 VOLTS TO GROUND

CABLE WITH A BARE NEUTRAL CONDUCTOR	REQUIRED MINIMUM VERTICAL CLEARANCE
RESIDENTIAL PROPERTY ACCESSIBLE ONLY TO PEDESTRIANS	12 FEET VERTICAL
RESIDENTIAL PRIVATE DRIVEWAYS AND COMMERCIAL AREAS NOT SUBJECT TO TRUCK TRAFFIC	16 FEET VERTICAL
PUBLIC STREETS, ALLEYS, ROADS, PARKING AREAS, SUBJECT TO TRUCK TRAFFIC, AND ALL NON-RESIDENTIAL DRIVEWAYS	18 FEET VERTICAL

MINIMUM VERTICAL CLEARANCES TO STRUCTURES

Minimum allowed Vertical Clearances over Structures for Service Cable with a Bare Neutral conductor (Not exceeding 300 Volts to Ground)

LOCATION	REQUIRED MINIMUM VERTICAL CLEARANCE
DECKS ATTACHED TO RESIDENTIAL PROPERTY	10 FEET VERTICAL CLEARANCE
SHED METALLIC ROOF NOT ACCESSIBLE TO PEDESTRIANS	8 FEET VERTICAL CLEARANCE

SHED NON-METALLIC ROOF NOT ACCESSIBLE TO PEDESTRIANS	3.5 FEET VERTICAL CLEARANCE
SHED NON-METALLIC ROOF FLAT WALKABLE	10 FEET VERTICAL CLEARANCE
STAIRS TO BUILDING, INCLUDING LANDING	10 FEET VERTICAL CLEARANCE
SWIMMING POOLS INCLUDING DIVING BOARDS FOR A DISTANCE OF 10 FEET HORIZONTALLY IN ANY DIRECTION, WADING POOLS, AND HOT TUBS	CANNOT BE PLACED UNDER RMLD SERVICE OR PRIMARY CONDUCTORS

10.0 **LINE EXTENSIONS**

When a Customer requests an electric line extension, RMLD will inform the Customer in writing of Customer rights, responsibilities and options for line extensions, including but not limited to: payment terms; easement and right-of-way information; contribution-in-aid-of-construction; basic information about design, siting and location, such as overhead or underground placement, and road-side or off-road siting.

OVERHEAD EXTENSION OVER PRIVATE PROPERTY/PUBLIC HIGHWAY

RMLD will at no charge to the Customer extend an overhead line up to one pole section per lot (except URD's) over private property providing an acceptable right-of-way or easement.

When an extension of an overhead line is necessary to provide service to a permanent residence and the length of the extension over private property exceeds 150 feet or one pole span, a contractual agreement will have to be negotiated with RMLD to compensate for the cost of all construction in excess of these limits.

- a. The length of the extension shall be measured from the last pole carrying the circuit with the required voltage from which a Customer can be served. If the extension involves both public streets and private property, the negotiated contract will cover the entire extension and any deposits required will be the sum of the deposits required to cover the total cost of the extension.
- b. Transformer installations and one permanent service drop per Customer shall be furnished at no charge.
- c. All construction will be owned and maintained by RMLD up to the Customer point of demarcation.
- d. RMLD will schedule construction of a line under this requirement when the Customer to be supplied has signed the necessary contract. If no contract is required, construction under this requirement will be scheduled when the

Customer to be supplied has completed most of the wiring of the premises to be supplied.

- e. Construction will not commence or continue during periods of inclement weather or other system emergencies.

ABNORMAL CONDITIONS

For extensions in areas with abnormal conditions such as unpaved roadways or undefined roadways requiring excessive tree clearing, surveying, etc., the excess cost will be treated the same as cost of an extension in excess of 150 feet.

11.0 METER TAMPERING / THEFT OF SERVICE

11.1. DEFINITION

Theft of service is diversion of electrical energy by any method or device used by any person that prevents the electric meter from properly registering the quantity of electricity supplied by RMLD and/or any taking of any electric energy without RMLD's consent. Making an unauthorized connection to obtain unmetered electric service is theft of services and punishable as a crime in Massachusetts. Where there is evidence of meter tampering or theft of electricity with intent to avoid a lawful charge for electricity by themselves or another person, such person or persons responsible shall be liable for prosecution under penalty of law.

Under Massachusetts General Laws, the applicable sections dealing with theft of electrical energy are Chapter 164, Sections 127 and 127A; Chapter 266, Section 30; and Chapter 266, Section 127 (See Appendix D).

11.2. METER TAMPERING WARNING

- a. Meter seals and other locking devices installed by RMLD on metering equipment shall not be cut or removed by anyone except by authorized RMLD personnel or by a licensed contractor who has been issued a permit by the Town Wiring Inspector.
- b. All meters and metering equipment enclosures are sealed by RMLD with various types of locking devices. Seals and locking devices shall not be broken or removed by electrical contractors or other unauthorized personnel before obtaining the appropriate electrical permit from the Town Wiring Inspector and/or written approval from RMLD. Electric contractors may request removal of meter seals and locking devices to perform work on service equipment. A 48-hour advance notice to RMLD is required from the contractor to allow RMLD to schedule a personnel visit to the work site. The contractor is required to notify RMLD within 48 hours of completing work so RMLD personnel may reseal the meter.

- c. **In no case shall any person who is not authorized by RMLD jumper the service or otherwise tamper with any RMLD metering equipment.**
- d. Protection of RMLD owned meters and metering equipment is the responsibility of the Customer. Relocation of meters and equipment damaged due to tampering, vandalism, environmental damage, negligence, or other avoidable damage will be at the Customer's expense.

11.3. NOTICE OF VIOLATION

- a. A "Notice of Violation" **may** be mailed or otherwise delivered at the discretion of RMLD General Manager if:
 - I. Evidence suggests the possibility of theft of utility service at the Customer's premises, including evidence of meter tampering, or
 - II. The violation does not constitute an immediate threat of safety or equipment integrity to the system.
- b. A "Notice of Violation" **will** be mailed or delivered and the Customer's service is subject to immediate cut-off in any of the following situations:
 - I. In the opinion of RMLD General Manager, theft of service is clearly evident on the Customer's premises; or
 - II. When in the opinion of RMLD General Manager a situation exists that may endanger public health.

11.4. BILL ADJUSTMENTS FOR THEFT

If RMLD determines that a theft of service has occurred, it reserves the right to adjust the Customer's current bill and the bills for the past twelve (12) months usage. If the approximate amount of service that was stolen cannot be reasonably determined, the Customer's usage will be set at two to four times the minimum bill from the previous twelve (12) months as set on a case by case basis by the General Manager, according to the facts of each case.

11.5. RESTORATION OF SERVICE

Service will not be restored until all payments for the following are received by RMLD:

- a. Adjusted payment for utility service;
- b. All service call charges;
- c. Labor;

- d. Replacement parts;
- e. Disconnection Notification Fee.

Service will be reinstated only during regular working hours, Monday through Friday, except in the case of an emergency.

11.6. CUSTOMER PAYMENT LIABILITY

Discontinuance of service from RMLD shall not release the Customer from liability for payment for service already received or from liability from payments that thereafter become due under the minimum bill provisions or other provisions of the Customer's contract.

11.7. CUT-OFFS AND LIABILITY

RMLD shall not be liable for any loss or damage resulting from the discontinuance of service.

11.8. CUSTOMER RESPONSIBILITY

The Customer(s) whose name(s) appear(s) on the account is responsible for payment of all charges. That Customer is also responsible for any rules or requirements violations that occur regarding electric service to that property. Personal participation by the Customer in any such violation shall not be necessary to impose personal responsibility on the Customer.

11.9. COURT AND ATTORNEY'S FEES

In the event any Customer fails to pay RMLD any service fee or charge, the Customer shall pay all costs of collection including court costs and reasonable attorney's fees incurred by RMLD in collection such sums.

12.0 CUSTOMER SYSTEM PROTECTION GUIDELINES

12.1. SECONDARY SURGE ARRESTERS

- a. Secondary surge protective devices may be installed by and at the expense of the Customer. Refer to NEC for installation requirements to protect your equipment.
- b. The Customer shall be responsible for providing and installing any secondary surge protective devices and for operating, maintaining, and inspecting any such installations.

- c. RMLD will not be responsible for the operation, maintenance or inspection of a Customer's installation or for damage to a Customer's equipment resulting from voltage surges, which may occur on the Customer's wiring.

12.2. SHORT-CIRCUIT CURRENTS

Available fault currents will vary with each installation. Inquiries for a particular location should be directed to RMLD Engineering & Operations department at 781-942-6459.

12.3. GROUNDING

All grounding shall be done in accordance with the NEC or any other applicable Code enforced by the Town Wiring Inspector. RMLD shall not be liable for damage to the property of the Customer resulting from unbalanced voltage conditions due to the opening of a grounded neutral service conductor.

GROUNDING SECONDARY AC SERVICE

- a. Where the secondary system is grounded at any point, the grounded conductor shall be run to each individual service.
- b. Services having a grounded conductor shall have that conductor and the service equipment grounded on the Customer's premises by connecting the grounding electrode conductor to the grounded service conductor of the distribution system on the supply side of the service disconnecting means. This connection should be made within the service-entrance-equipment enclosure.
- c. An underground metallic water pipe, either local or supplying a community, shall always be used as a part of the grounding electrode system where such pipes are available. It shall be supplemented by one or more acceptable grounding electrodes as required by the NEC or any other applicable Code for other grounding electrodes and equipment grounding.
- d. To minimize the hazard of electrical shock, all metallic water-piping systems inside a building shall be bonded to the grounding electrode per the NEC.
- e. Where extensive metal in or on buildings may become energized, adequate bonding to the grounding electrode shall be provided per the NEC.
- f. Three-phase, 3-wire, 240-volts or greater, delta service conductors shall be insulated from the service equipment and shall not be grounded. The service equipment shall be grounded by an equipment grounding conductor connected to the grounding electrode as per NEC.

13.0 GENERATION INTERCONNECTION

The following general requirements apply to Customer generating facilities designed to operate directly connected to RMLD system (parallel operation) and those which are designed to operate isolated from the system (non-parallel operation). Requirements and specifications for various types and sizes of Customer facilities shall be obtained from RMLD prior to installation.

All installations must be in accordance with the NEC (as well as all applicable codes in effect at the location of the Customer's electric service) and the town wire inspector's approval.

All Customers that want to interconnect a generator within RMLD service territory must first obtain all proper zoning and building permits from the appropriate authorities. During the design stages and prior to installation of a generator, the Customer must obtain approval from the town building department and RMLD.

13.1. CUSTOMER-OWNED GENERATION REQUIREMENTS

All interconnected distributed generation systems must follow all applicable local, state, and national rules, regulations and codes. Customers shall reference Appendix "E" for all RMLD requirements.

PV SYSTEMS UNDER 20 kW

A manual external AC disconnect is required for PV systems under 10 kW.

PV SYSTEMS 20 kW – 150 kW

- a. The PV system shall have an external, lockable, and visible disconnect switch between the inverter and the utility delivery point (AC Disconnect).
- b. The AC disconnect switch must be rated for max system voltage and current and be accessible at all times to RMLD personnel.
- c. The AC disconnect switch must be clearly labeled as RMLD PV System Master Disconnect Switch. If more than one system is installed on a single parcel, a directory map indicating the locations of all Distributed Generation (DG) Master disconnects are located. This directory map must be installed at each of the DG disconnect locations.
- d. RMLD PV System Master Disconnect Switch may be required to be installed at the primary voltage level delivery point at the Customer's expense.

PV SYSTEMS GREATER THAN 150kW

- a. For PV systems greater than 150kW, all requirements for PV systems 20kW-150kW reference above shall apply.
- b. For PV systems greater than 150kW, the customer shall be required to furnish a system impact study per RMLD requirements.

13.2. GENERATOR ISOLATION REQUIREMENTS

All potential generators must have an isolation scheme that adheres to NEC guidelines and the Customer must gather design approval from the Town Wiring Inspector.

13.3. STANDBY/BACK-UP GENERATION (NON-PARALLEL OPERATION)

The Customer may install a standby generator to supply all or part of the load in the event of a service interruption. The Customer must secure a permit from the Town Wiring Inspector and notify RMLD in advance of installing stand-by generating equipment and obtain approval for the method of connection.

- a. Where the Customer installs a stand-by generator for the purpose of supplying all or part of the load in the event of an interruption in the supply of service, the Customer's wiring shall be arranged so that no electrical connection can occur between RMLD service and the Customer's other source of supply. This will require the installation of a double-throw switch that has a visual opening. This transfer scheme must meet the non-parallel requirements established by RMLD. See Figure 2 in Appendix H.
- b. Where automatic throw-over switching is installed, the Customer shall provide a load-break isolation switch in combination with each automatic transfer switch. The isolation switch shall provide a visible, lockable means for manually isolating the emergency generator, in accordance with NEC.
- c. RMLD personnel may tag the isolation switch (as required) in a locked open position during maintenance or repair of RMLD supply lines. **Arrangements utilizing interlocking of single-throw devices are not acceptable.**

13.4. FUEL STORAGE REQUIREMENTS

- a. Customer's on-site generator and fuel storage are often located adjacent to RMLD pad mounted transformers for ease in using the same trench to the electrical room.
- b. RMLD requires protection between the transformer and the generator fuel storage unit, by either a twenty (20) foot separation or a masonry wall. This wall should be erected parallel to and located three (3) feet from one side of the pad-mounted transformer foundation. The wall should be six (6) feet high and extend approximately three (3) feet beyond each end of the transformer foundation. See Figure 3 in Appendix H. Exact details for such application shall be supplied to RMLD for approval.

- c. Customer's shall check with local fire department for other requirements as needed.

13.5. CUSTOMER COGENERATION

A cogeneration facility is defined as a facility that produces electric energy and steam or forms of useful energy (such as heat), which are used for industrial, commercial, heating or cooling purposes. Prior to the design and installation of any equipment, a Customer considering a cogeneration installation shall consult with RMLD engineering division.

13.6. SYSTEM OPERATION GUIDELINES

Precautions must be taken where alternate means of generation are employed, whether emergency or otherwise, to eliminate the possibility of electrical connection between the distribution system and the Customer's alternate source of supply.

The Customer must notify RMLD and provide electrical details of generator installation and isolation from RMLD's system for **ALL generation interconnections**.

If it appears to RMLD, at any time, that operation of the Customer's generator is adversely affecting or may adversely affect RMLD system, RMLD may immediately take any and all steps it reasonably believes necessary to mitigate or cure the conditions including, without limitation, disconnecting the Customer's source of generation from RMLD system.

The Customer shall at all times permit RMLD operational personnel access to inspect, test, or examine the system or metering equipment.

The Customer is liable for the costs and expenses incurred by RMLD related to disconnection and reconnection of the generation system to RMLD system.

Note: All Cogeneration require an automatic voltage regulator (AVR) before connecting to RMLD infrastructure.

14.0 SERVICE ENTRANCE GUIDELINES

14.1. SIZE OF CONDUCTORS

The minimum size of service entrance conductors shall be appropriately rated for 100 amps for overhead services and 200 amps for underground services.

14.2. SERVICE EQUIPMENT

One or more service switches or circuit breakers shall be installed as part of the permanent wiring for each service entrance. These devices shall conform to the following:

- a. All service switches or circuit breakers shall meet the requirements of all applicable Electrical Codes and be of a type listed by the Underwriters' Laboratories, Inc. or

approved by both RMLD and the Town Wiring Inspector. All equipment shall be installed in accordance with all applicable Electrical Codes.

- b. Any service equipment located between the meter and the customer's service coupling point must be of the enclosed type, with facilities for sealing by RMLD. Fuse replacement or breaker reset must be possible without disturbing the enclosure seal.
- c. Where multiple service equipment is provided for either commercial or dwelling occupancy, each disconnecting means shall be marked in a conspicuous, legible and permanent manner to indicate which portion of the installation it controls.

14.3. LOCATION OF SERVICE DISCONNECT

- a. In general, the service disconnect shall be located on the load side of the meter (hot sequence metering). The service disconnecting means may be installed either inside or outside the building wall and must be accessible to RMLD operational personnel 24/7.
- b. At any location where more than six-meter sockets are required, the service disconnects shall be installed on the line side of the metering equipment (cold sequence metering), in accordance with NEC.

14.4. MAIN SWITCHES AND DISCONNECTING MEANS

It is required that services be equipped with a main disconnect in order to be able to completely disconnect all of the conductors in the building from the service-entrance conductors. On all services supplied from RMLD, main disconnects are required. They shall be located in a readily accessible place as near as possible to the point of entrance of the service conductors into the building and be of a type approved by Underwriters' Laboratories, the Town Wiring Inspector, and RMLD.

14.5. ASSIGNING LOCATION OF SERVICE AND METERING EQUIPMENT

The locations of the service and metering equipment shall be assigned by RMLD. No wiring dependent upon service-entrance and meter locations shall be started until these locations have been assigned and approved. The Customer or his agent shall notify RMLD.

14.6. UNMETERED CONDUCTORS

- a. Unmetered conductors on Customer's premises shall not be installed in the same raceway or conduit with metered conductors.
- b. When unmetered conductors are run through private basements or other private areas not containing RMLD equipment, they shall be enclosed in a continuous length of exposed, rigid metal raceway.
- c. The installation of pull boxes or other similar devices is not permitted in such raceways, except where bends exceed those permitted by the applicable Electrical

Codes. Where approved, pull boxes shall be sealable and approved by the RMLD engineering division.

- d. In a multi-tenant commercial / industrial property, the unmetered conductors shall be enclosed in a rigid metal raceway, with provisions for the installation an RMLD seal.

14.7. OVERHEAD

POINT OF ATTACHMENT FOR SERVICE-DROPS

Point of Attachment for service-drop conductors will be provided by RMLD as follows:

- a. A service bolt or other suitable support is required on all buildings constructed of tile, brick veneer, stucco, concrete, concrete block, cinder block, asbestos shingle, sheet iron, plywood, insulating board or other materials which make it difficult to obtain a suitable anchorage for the service-drop conductors. The Customer shall install such bolts or other suitable support. Where a service bolt is adequate, it may be obtained from RMLD at no cost to the Customer.
- b. The service bolt shall be located below the service head or weather cap or as otherwise instructed by RMLD.

A typical service-entrance-mast installation is shown in Appendix H - Figures 6 and 7.

TEMPORARY SERVICE ENTRANCES

- a. The Customer shall provide a service entrance, which meets the requirements of a permanent installation with respect to service-drop clearances, metering, grounding and safety.
- b. The service entrance may be installed on a guyed or braced 4 inches x 6 inches timber structure that meets the specifications and installation requirements of RMLD. Where a laminated 4 inches x 6 inches structure is to be assembled using (two) 2 inch x 6 inch planks, these planks should be bolted together at intervals not exceeding (4) four feet.
- c. The temporary service drop span shall not be more than 100 feet. See Appendix H - Figure 12.

RESIDENTIAL SERVICE REQUIREMENTS

- a. **Single-Family Residence** – Meters shall be mounted on the outside of the building in an approved 100 amp or larger meter socket supplied by 100 amp or larger service-entrance conductors.
- b. **Multi-Family Residences** – Meters shall be mounted on the outside of the building except as otherwise approved by RMLD.

BUILDING ALTERATIONS AFFECTING ELECTRIC SERVICE

- a. To ensure continuity of service, the Customer should notify RMLD before starting alterations to a building which might affect the electrical service. This will give RMLD time to inspect the service-drop attachment and advise the Customer of any metering or service problems that could result from the alterations.
- b. It will be the responsibility of RMLD, at no cost to the Customer, to **temporarily** remove from the building the service-drop attachment to permit the alterations. Customer must supply an approved and inspected temporary mast or other approved structure for this purpose. See Appendix A.
- c. When notified, RMLD will reattach this equipment to the building.
- d. It will be the responsibility of the Customer to have the service entrance equipment detached from the building and reattached when the work has been completed. It will also be the responsibility of the Customer to install a permanent service bolt for the service drop.

SIDING TO BE INSTALLED ON EXISTING BUILDINGS

To ensure continuity of service, the Customer should notify RMLD **ten days** before installation is started. This will give RMLD time to inspect the service-drop attachments and advise the Customer of any metering or service problems that could result from the installation of the siding. The Customer should check with the Town Wiring Inspector over service requirements for siding.

CONNECTION TO OVERHEAD CONDUCTORS

A minimum length of six (6) feet for each conductor shall be left at the upper end of the service entrance to provide for connection to RMLD service-drop conductors. Connections to RMLD lines will be made by RMLD.

WIRING METHODS

Service-entrance cables and conduit shall normally be exposed for their entire length, except when they pass through building walls or are encased in two inches of concrete. The service disconnecting means shall be installed either inside or outside of a building or structure at a readily accessible location nearest the point of entrance of the service entrance conductors.

14.8. UNDERGROUND

UNDERGROUND CONDUCTOR CONNECTIONS

- a. A minimum length of five (5) feet for each service entrance conductor shall be left at the junction box, hand hole, or above riser (see Figure 9) to provide for the connection to RMLD service conductors.

- b. RMLD will provide and install the terminal block connectors in the Customer's hand hole.
- c. If the Customer's entrance conductors are other than RMLD standard, a suitable adapter must be provided for the connectors.

HAND HOLES, JUNCTION BOXES, AND SECONDARY PEDESTALS

On underground services, hand holes and/or junction boxes will be furnished by RMLD and installed by a licensed electrician. Only approved RMLD hand holes and/or junction boxes may be used.

15.0 METER INSTALLATION AND MAINTENANCE GUIDELINES

15.1. GENERAL

All energy supplied by RMLD shall, in general, be measured by appropriate meters for billing purposes. The installation of meters and metering equipment shall comply with the requirements set forth in this Section. RMLD shall furnish and install all meters required for billing purposes.

RMLD has the right to disconnect a Customer's meter / service at discretion of RMLD; it is the Customer's responsibility to update and maintain secondary service connection (i.e. service panel, meter socket) to the NEC standards. If a Customer's secondary connection is found to be unsafe or otherwise non-compliant after RMLD personnel have disconnected the meter the Customer must upgrade the service at their expense before RMLD will energize.

15.2. DEFINITIONS

Only definitions of terms pertinent to this Section are included:

- a. Delivery-point (service-point) is the point of connection to the facilities of the Customer and the terminus of RMLD's ownership of lines or equipment.
- b. Metering-point is the location of the meter or metering equipment such as instrument transformers.

15.3. STANDARD METER INSTALLATIONS

The following are standard meter installations normally specified for the various types of service installations:

- a. Metering equipment shall normally be installed on the line side of the service disconnecting means (hot sequence).
- b. The meter socket shall have an approved single handle operated manual bypass for all services 400 Amps or greater.

- c. Meters will be installed on buildings, not on pedestals, except for service to mobile homes, temporary services or by approval from RMLD.
- d. For all services, where the load-side capacity is 400 amps or less, self-contained socket-type meters shall be installed. Where the capacity is in excess of 400 amperes, socket-type meters with current transformers will be installed. All sockets shall be furnished by the Customer and have U.L. listing.

For Three-Phase Services, the Customer or their contractor shall always consult with RMLD to obtain meter socket specifications.

- e. A disconnecting means shall be required on the load side of the meter in all services.
- f. On services with more than one metering installation, the disconnecting means must be arranged so that each Customer may be disconnected without affecting the other. (except where six (6) or more services require a main disconnect)

15.4. OUTDOOR METER LOCATIONS

GENERAL

- a. Outdoor meter locations are required for all installations or as otherwise approved by RMLD.

ACCESSIBILITY

- a. Each location shall be readily accessible to RMLD representatives for meter reading, testing, and maintenance.
- b. Service will not be provided if reaching the meter requires RMLD employees to use adjacent property, climb fences or other obstructions, or cause damage to the Customer's shrubbery or flower beds in gaining access to the meter.

CLEARANCES

- a. The meter socket shall not protrude over the sidewalk or driveway.
- b. Meters on garages shall be so located that they will not be damaged by motor vehicles.
- c. At and directly in front of each meter location, a clear, safe workspace shall be maintained. Such workspace shall be at least four (4) feet wide, shall extend out from the meter at least three (3) feet, and up to a height of at least six (6) feet. See Appendix H - Figure 8.

- d. In addition, the meter socket must be located at least three (3) feet, measured horizontally, from a gas meter, regulator, or propane cylinder. Appendix H - See Figure 4.

POLE MOUNTED METERS

Metering equipment shall not be installed on RMLD owned poles, except for metered power supplies for communication companies.

15.5. INDOOR METER LOCATIONS

GENERAL

- a. In areas subject to vandalism or damage, permission may be granted for indoor meters in single occupancy buildings for commercial and industrial accounts.
- b. In multiple occupancy buildings, for residential or commercial use, meters may be installed indoors in one common location accessible to all occupants and authorized employees of the RMLD.
- c. Permission for additional meter rooms may be granted where requirements are in excess of six meters per location or the service capacity is in excess of 600 amperes per location.

ACCESSIBILITY

- a. All indoor meters shall be in a readily accessible location next to the service-entrance equipment.
- b. RMLD will be supplied a key or code to access any enclosed meter location.
- c. Any time the lock is changed for any reason, the Customer is required to provide RMLD with a new key or access code to the meter enclosure.

15.6. METER HEIGHT

OUTDOOR METERS

In no instance will any Outdoor meter be installed with the top of the meter more than six (6) feet nor the bottom of the meter less than three (3) feet above the final grade. A clear area of three (3) feet is required in front of each meter.

EXCEPTION: Meters for power supplies for communication companies must be installed above the normal height. Appendix H - See Figure 19.

INDOOR METERS

Multiple meter centers installed indoors shall be mounted so that the face of the meter is 60 inches maximum and 30 inches minimum above the floor level. A clear area of three feet is required in front of each meter.

VOLTAGE DROP

Meter locations and feeder sizes should be so chosen that the voltage drop between the point of service entrance and the meter will not exceed one percent at full load of the feeder.

MOUNTING

Meter sockets and meter/breaker centers shall be mounted plumb and firmly secured to supports. Where supports are attached to masonry or concrete walls, expansion bolts or anchors shall be used. Wood plugs driven into holes in masonry, concrete, plaster or similar materials are not acceptable.

15.7. IDENTIFICATION OF METER SOCKETS AND CUSTOMER DISCONNECTING MEANS

All meter sockets and Customer disconnecting means shall be plainly and permanently marked for proper suite, floor, office, etc. by the electrical contractor or owner. Permanent labels must be used – marker is not acceptable. Service will not be provided to a building that has unidentified meter sockets.

Suites, offices, apartments or other areas must be assigned space designations by the building owner or the electrical contractor which shall clearly designate the location of each tenant's premises.

15.8. UNMETERED CONDUCTORS

- a. Unmetered conductors shall not be installed in the same raceway with metered conductors.
- b. Where unmetered conductors are run through Customer's premises, they shall be enclosed in a continuous run of rigid metal conduit or service bus way.
- c. The installation of pull boxes or other similar devices is not permitted in such raceways, except where bends exceed those permitted by the applicable Electrical Codes. Where approved, pull boxes shall be sealable and approved by the RMLD engineering division.
- d. Where unmetered plug-in type armor-clad bus way is used to serve Customers in the same building, all plug-in access openings shall be provided with a steel hasp assembly for padlocking the hinged hood in the closed position.
- e. The sealing of unmetered raceways shall be performed by RMLD authorized employees.

15.9. DEMAND AND KVA METER WIRING

Commercial and industrial installations may require kW and kVA demand metering. Contractors should obtain specific information from RMLD for each such installation.

15.10. SECURITY

- a. All cabinets, switches, circuit breakers and other enclosures giving access to unmetered wiring shall be equipped with approved locking provisions.
- b. The service switch or circuit breaker, when installed on the line side of the meter, shall be so designed that the unmetered wiring is inaccessible without removing the locking device, even during the renewal of fuses.

15.11. MOVING OR REMOVING METERING EQUIPMENT

Meters, instrument transformers, and other metering devices are the property of RMLD and must not be moved, removed or altered in regard to wiring or connections by other than authorized employees of RMLD, except when written specific permission is obtained from Code Administration and/or RMLD. Violators will be prosecuted.

ELECTRIC WORKER RESPONSIBILITY -METERS

Any qualified person who has been given permission to remove RMLD metering equipment is required to label each meter socket and its associated meter *before* removing the meter. It is the sole responsibility of the person that removes a meter to re-install it in the same meter socket location it was pulled from. All such work shall be approved by the RMLD ahead of time and may incur a charge.

MIXED/CROSSED METERING (METER NUMBER DOESN'T MATCH SERVICE ADDRESS)

Plugging or disconnecting a meter shall not be used as a means to determine mixed or crossed metering at a location where multiple meters are present. The owner or tenant is required to contact RMLD and arrange an appointment with meter services and the Town Wiring Inspector to determine if mixed/crossed wiring has occurred.

If mixed/crossed wiring is found all electric bills shall be forwarded to the owner until repairs are made, all meter sockets are proven to be properly labeled, and a re-inspection is made by meter services and the Town Wiring Inspector. Any over charge for crossed or mixed wiring shall be paid by the owner of the service address to affected tenants; RMLD is not responsible for providing compensation.

15.12. METER SOCKETS

SELF-CONTAINED METERS

For each service with self-contained metering, the Customer shall furnish and install an approved meter socket that shall have the U.L. listing and conform to RMLD requirements as follows:

- a. Automatic by-passes are never permitted.
- b. All meter sockets installed on commercial and industrial services, shall be equipped with a safety arc shield and an approved visual, single-handle operated manual by-pass. Appendix H - See Figures 14 and 15.
- c. The non-by-passed, in-service position of the operating mechanism must be visible when the meter is installed.
- d. It must not be possible to replace the meter socket cover when the operating mechanism handle is in the by-passed position.
- e. All by-pass style meter sockets shall have a mechanism which locks the meter blades in the socket jaws.
- f. After the meter socket has been installed, it is the contractor's responsibility to protect the interior of the socket by installing an optically clear cover obtained from RMLD.

Warning: Do not use a manual by-pass as a disconnect to open or close a circuit carrying load.

COVER PLATES

After the wiring has been completed, the interior of the socket shall be protected. Socket covers will be furnished by RMLD for unused socket meter positions. Sealing rings will also be furnished by RMLD.

INSTALLATION OF SOCKETS

- a. Meter sockets must be mounted plumb and level, using wood screws of sufficient length and size to hold the socket securely, independent of conduit or cable connections.
- b. Rust-resisting screws shall be used outdoors and in damp locations.
- c. Standard expansion bolts or anchors shall be used for masonry walls.
- d. The threads on conduit, fittings or sealing plugs screwed into the hubs of meter sockets located outdoors shall have joint compound applied to prevent the entrance of water.

METER CONNECTIONS

The service or line-side conductors are always connected to the top terminals of meter sockets or troughs and the load-side conductors to the bottom terminals. A number of typical connections for socket meter installations are shown in Appendix H - Figures 14 and 15.

GROUNDING

- a. For grounding requirements, refer to the NEC and the Town Wiring Inspector.

15.13. METER PEDESTALS

In general, these devices are only used for mobile homes and temporary services. However, at the discretion of RMLD, they may be approved for certain other appropriate applications and follow the guidelines put forth in this section.

- a. Meter pedestals are free-standing units intended to be mounted outdoors on a concrete pad in conjunction with underground wiring.
- b. If a free-standing meter pedestal is used, it must extend a minimum of 34 inches above the finished grade or ground line. The pedestal shall have a stabilizing means extending below the frost line to ensure that the meter mounting stays in a plumb position and is able to handle the pressure required for installing and removing the meter.
- c. Meter pedestals for self-contained metering must be listed devices and shall incorporate circuit breakers, but these are not intended to replace the service disconnecting means required at the building.
- d. The neutral strap in a meter pedestal is bonded to the enclosure and must be provided with a terminal for a grounding conductor.

15.14. INSTRUMENT TRANSFORMERS

INSTRUMENT TRANSFORMERS AND ENCLOSURES

For all installations requiring instrument transformers, the transformers (current and voltage transformers) shall be supplied by RMLD. Transformer cabinets shall be supplied by the Customer. The Customer shall install the transformer cabinet, Current Transformers and Voltage Transformers and provide and install the raceway (as required). Appendix H - Figure 18 shows typical primary connections.

METER ENCLOSURE AND TEST SWITCHES

Meter enclosures and test switches for use with instrument transformers may be furnished by RMLD. Meter socket enclosures shall be installed by the Customer and wired by RMLD.

INSTRUMENT TRANSFORMER SECONDARIES

A metal raceway shall be provided between the transformer cabinet and the meter test switch cabinet for instrument transformer secondaries as follows:

- a. Provide 1-1/2 inch raceway for secondary conductor runs that are up to 50 feet in length. The maximum distance between meter and instrument transformer shall be 50 feet unless otherwise approved by the RMLD
- b. Secondary wiring will be furnished and installed by RMLD.

USE OF INSTRUMENT TRANSFORMER CABINETS

- a. Instrument transformer cabinets shall not be used as junction boxes or for branch circuit wire-ways.
- b. Service conductors shall enter and leave the cabinet as one circuit with no branches regardless of number of conductors per phase.
- c. Line-side connections to other meters shall not be made in the transformer cabinet or enclosure except for where approved by the RMLD.

15.15. CUSTOMER REQUEST FOR METERING PULSES

Upon written request from a Customer, RMLD will install at the Customer's expense, as part of its metering facilities at the metering point, a source of kWh pulses to the Customer so that the Customer may monitor load/demand for the purpose of load control. The following conditions apply:

- a. The Customer's load is presently being measured with a watt-hour meter with pulse initiation equipment; or
- b. If there is no pulse initiating equipment or if the output does not meet the Customer's requirements, the Customer will reimburse the RMLD for the installation of the necessary additional equipment to furnish the pulses, including isolation relays where necessary.
- c. The installation, operation, and maintenance of any equipment, other than that provided by RMLD, shall be the responsibility of the Customer.
- d. The point of connection of RMLD and Customer equipment shall be designated by RMLD and the connection made by RMLD.
- e. The Customer will be required to reimburse the RMLD for subsequent installation and maintenance charges and any alterations necessitated by a change to the existing meter installation.

Please contact RMLD to request load data and/or installation of pulse metering equipment.

15.16. APPROVED METERING EQUIPMENT

General Requirements:

- a. Safety will be the number one consideration when approving any metering equipment.
- b. All meter sockets must have a UL listing.
- c. Any modification of a meter socket will void the UL listing and the manufacturer's warranty, making it non-compliant with RMLD's approved standards.
- d. All self-contained meter sockets must be rated for 600 volts or less.
- e. All self-contained meter sockets may require a lever operated manual bypass, with a receiver bracket and a ring-less cover with a 7/16" knockout to accept a barrel lock. Please check with RMLD before furnishing this requirement.
- f. The lever operated manual bypass is required to be single-handle operated and must be supplied with jaw release.
- g. The non-bypassed, in-service position of the operating mechanism must be visible when the meter is installed.
- h. Auxiliary straps or jumpers are not acceptable as bypass devices.
- i. It must not be possible to override the bypass by replacing the cover when the operating mechanism handle is in the bypassed position.
- j. A safety flash shield is required on all self-contained meter positions.
- k. Horn-type bypasses are not permitted.
- l. Sliding-type bypasses are not permitted.
- m. Automatic bypasses are not permitted.
- n. Meter sockets for use on three-wire 120/208-volt network must have a fifth terminal located at left in the 9 o'clock position, connected to neutral.
- o. Custom-made meter channels and modular metering panels may be used for groups of meters such as in apartment houses. Prints of these panel arrangements must be submitted to RMLD for approval prior to installation. Line-side panels must be sealable.
- p. All underground, residential, single-position sockets must be a minimum 16"W x 22"H x 5"D, 200 amp, ring-less with line side lugs capable of accepting 350 KCMIL

conductors. Sockets will also have a minimum 3-inch knockout to accept a 3-inch slip joint. If a service run is greater than 200 feet, contact RMLD.

- q. All OH/UG 320-amp meter sockets must have 4-inch knockouts, jaw release lever operated manual bypass, with a receiver bracket and a ring-less cover with a 7/16" knockout to accept a barrel lock.
- r. All underground hubs or knockouts must be a minimum of three (3) inches diameter.
- s. Hot sequence metering is required for six (6) socket positions or less.

16.0 POWER QUALITY

RMLD delivers high quality power. The increased use of Customer-owned equipment that can adversely affect the quality of electric service to other Customers is of great concern. In order to maintain delivery of high quality power to all of our Customers, the installation of Customer-owned equipment, which may affect RMLD's system, shall be required to meet the necessary specifications outlined in this section. RMLD reserves the right to withhold or disconnect service where installation of such loads or equipment is detrimental to other Customers.

16.1. VOLTAGE SENSITIVE EQUIPMENT

Customers owning, or planning to own computers, reproduction, X-ray, data processing, emergency equipment, or other voltage sensitive equipment, are advised that auxiliary devices and relays must be employed to filter out voltage spikes and to adjust for voltage variations. Customers should consult the manufacturer of their equipment for suitable devices to protect against these conditions. RMLD shall not assume responsibility for voltage variations that may be caused by switching, lightning surges, motor vehicle accidents or any other conditions either normal or emergency in nature.

16.2. FLUCTUATING LOADS

Electric welders, furnaces, boilers, x-ray equipment, compressors, pumps, molding machines or similar equipment with load fluctuations at a frequency greater than four times per hour should not be installed except under conditions specified by RMLD. Voltage dips caused by load fluctuations, regardless of their frequency, shall not cause undue disturbance to other Customers nor hinder RMLD in maintaining proper voltage conditions. RMLD reserves the right to withhold and/or remove connection to loads that are considered detrimental to the service of other Customers.

16.3. SECONDARY LIGHTNING ARRESTERS

The Customer may install secondary lightning protective devices. The Customer will be solely responsible for the expense, installation, operation, maintenance, and inspection of such devices. Lightning arresters shall not be mounted on meter sockets or metering equipment. Installation of lightning protective devices shall be done in accordance with the NEC.

16.4. SHORT CIRCUIT CURRENTS

RMLD shall provide the available fault current and transformer impedance data, it shall be the customers responsibility in the selection of the proper service equipment to meet the code requirements. Available fault currents will vary with each residential, commercial, and industrial installation. Provided fault current is under current system conditions and is subject to change.

16.5. LOAD BALANCING

The Customer shall at all times take and use energy in such a manner that the load will normally be balanced to within +/-10% between phases on three-phase services and between live conductors on single-phase services. RMLD reserves the right to require the Customer to make necessary changes at the Customer's expense to correct the unbalanced load conditions.

16.6. HARMONIC DISTORTION

Customers with loads that inject harmonic current/voltage distortion into RMLD grid shall follow **all practices and requirements for harmonic control in electric power systems** as established by the IEEE-519 standard. Any Customer found in violation of the guidelines set forth in table 17.7 will be subject to financial penalties as deemed by RMLD personnel. It will be the Customer's responsibility to furnish all power quality correction equipment to bring their load within the specified tolerances outlined in Table 17.7. Protection against any damages caused by harmonics is the responsibility of the customer.

Table 17.7

Maximum Harmonic Current Distortion in % of I_L						
Individual Harmonic Order (Odd Harmonics)						
I_{sc}/I_L	< 11	$11 \leq h < 17$	$17 \leq h < 23$	$23 \leq h < 35$	$35 \leq h$	TDD
$< 20^*$	4.0	2.0	1.5	0.6	0.3	5.0
$20 < 50$	7.0	3.5	2.5	1.0	0.5	8.0
$50 < 100$	10.0	4.5	4.0	1.5	0.7	12.0
$100 < 1000$	12.0	5.5	5.0	2.0	1.0	15.0
> 1000	15.0	7.0	6.0	2.5	1.4	20.0
Even harmonics are limited to 25% of the odd harmonic limits. TDD refers to Total Demand Distortion and is based on the average maximum demand current at the fundamental frequency, taken at the PCC.						
* All power generation equipment is limited to these values of current distortion regardless of I_{sc} I_L .						
I_{sc} = Maximum short circuit current at the PCC I_L = Maximum demand load current (fundamental) at the PCC h = Harmonic number						

16.7. GROUNDING

All secondary services having a grounded neutral shall have that neutral adequately grounded in accordance with NEC on the Customer's premises at the service equipment. The

system-grounding conductor shall be connected to the neutral conductor at the service equipment and not in the meter trough, thereby allowing inspection to be made without removing the meter. On premises where a metallic underground water piping system is not available to provide an effective ground, other approved grounding electrodes, as specified by the NEC and Massachusetts Electrical Code, shall be provided.

16.8. POWER FACTOR

Maintenance of a high-power factor is of the utmost importance to both the Customer and RMLD in the operation of the distribution systems. Power factors of 90% or higher are advantageous for both the Customer and RMLD. RMLD should be consulted in advance regarding any installation likely to create power factors of less than 90%. RMLD reserves the right to require Customer to make the necessary modifications at the Customer's expense to correct power factors below 90%. **RMLD reserves the right to de-energize any service that creates voltage distortion or inadvertent current flow to its system.**

POWER FACTOR CORRECTION CAPACITORS

When a Customer desires to install capacitors for the purpose of power factor correction, RMLD should be consulted prior to the ordering of such equipment. Approval by RMLD for all capacitor installations is required so service to other Customers will not be adversely affected by the manner in which such equipment is installed and operated.

17.0 ELECTRIC UTILIZATION EQUIPMENT

17.1. GENERAL

RMLD should be consulted regarding the voltage and capacity available at each location. All installations must conform to the requirements of local or state authorities and to pertinent sections of the applicable Electrical Codes.

17.2. SYSTEM DISTURBANCES

Certain electronic equipment, such as computers and microprocessors, and some manufacturing processes are extremely sensitive to and can be damaged by disturbances, which are inherent in all supply systems. Therefore, it is the Customer's responsibility to furnish, install, own and maintain equipment needed to protect their operations.

17.3. SINGLE-PHASE MOTORS

Single-phase motors will be supplied at one of the nominal voltages indicated below. If the use of equipment with locked rotor currents listed below causes flicker in illumination or dips in voltage, which would be objectionable to other Customers, the locked-rotor current must be reduced. *Refer to Table No. 17.3.*

- a. 120 Volt Supply Motors with ratings of 1/2 horsepower or less and window-type air conditioning units whose full-load running current does not exceed 7-1/2 amperes,

with not more than four starts per hour and with a locked rotor current not exceeding 50 amperes, may be connected to a 120 volt supply.

- b. Motors having a full-load running current of more than 7-1/2 amperes but less than 12 amperes, and conforming to the above locked-rotor current limitations, may be connected to a 120 volt branch circuit only if such branch circuit supplies the one unit and does not supply lighting units or other appliances. It is strongly recommended that units drawing more than 7-1/2 amperes full-load running current be connected to 240 or 208 volt circuits.
- c. 208 or 240-Volt Supply Motors with ratings larger than 2-1/2 but less than 6-1/2 horsepower will normally be supplied at 208 or 240 volts, provided the locked rotor current does not exceed the values given in Table No. 17.3.
- d. In predominantly residential areas, and for small commercial installations, RMLD should be consulted before installing motors with ratings over five horsepower.

MAXIMUM LOCKED-ROTOR CURRENTS FOR SINGLE-PHASE MOTORS

- a. Single-phase motors supplied from combined light and power secondary systems shall not have locked-rotor current in excess of those shown in Table No. 17.3. Motors having locked-rotor current in excess of those shown in the Table shall be equipped with starters which will limit the current to the values specified.
- b. Motors that start more than four times per hour are an exception to the above and may cause interference to other Customers. Automatically (frequently) started motors for general use, such as motors for refrigerators, oil burners, and similar devices shall not have a locked-rotor current exceeding 23 amperes at 120 volts or 29 amperes at 240 volts.
- c. For multi-motored devices arranged for starting of motors one at a time, the locked-rotor current limits shall apply to each individual motor.

SINGLE-PHASE MOTORS ON THREE-PHASE SERVICE

Where single-phase motors are supplied from a three-phase service, they shall be properly balanced across the three phases.

TABLE NO. 17.3: SINGLE-PHASE MOTORS

This table is based on not more than four starts per hour with long periods of continuous operation under maximum load conditions. Consult RMLD where these conditions cannot be met, or where equipment rating and/or starting characteristics exceed the following:

Rated At	Maximum Locked-Rotor Current
----------	------------------------------

120 volts	50 amp
<u>240 or 208 volts, single phase</u>	
2 hp or less	60 amp
2.5 to 6.5 hp Residential Use	Consult RMLD
2.5 - 6.5 hp Commercial Use	60 amp plus 20 amp per hp in excess of 2 hp
<u>Air Conditioning or Heat Pump Equipment Rated in Btu per Hour - 240 or 208 volts, single phase</u>	
20,000 Btu/hr. or less	60 amp
21,000-30,000 Btu/hr.	60 amp plus 3 amp per 1000 Btu/hr. in excess of 20,000 Btu/hr.
Over 30,000 Btu/hr.	Consult RMLD

17.4. THREE-PHASE MOTORS

- a. Three-phase motors shall not have locked-rotor currents in excess of those shown in Table No. 17.4.
- b. Starting compensators are ordinarily required for three-phase motors 10 horsepower and larger. Exception to this practice will be allowed to the extent local distribution facilities will permit.
- c. Motors having locked-rotor current in excess of that shown in the Table shall be equipped with starters that will limit the currents to the values specified.
- d. Increment-start motors must have not less than a one-half second interval between steps.
- e. RMLD should be consulted in regard to the installation of three-phase motors larger than 10 horsepower.

TABLE NO. 17.4: THREE-PHASE MOTORS

Maximum Locked-Rotor Current Values in Amperes

This table is based on not more than four starts per hour with long periods of continuous operation under maximum load conditions. Consult RMLD where these conditions cannot be met, or where equipment rating and/or starting characteristics exceed the following:

Rated At	Maximum Locked-Rotor Current
<u>230 volts, three-phase</u>	
2 hp or less	50 amp
2.5 to 10 hp	50 amps plus 14 amp per hp in excess of 2 hp
Over 10 hp	Consult RMLD
<u>Air Conditioning or Heat Pump Equipment Rated in Btu Per Hour - 230 volts, three-phase</u>	
20,000 Btu/hr. or less	50 amp
21,000-50,000 Btu/hr.	50 amp plus 2.5 amp per 1000 Btu/hr. in excess of 20,000 Btu/hr.
Over 50,000 Btu/hr.	Consult RMLD

17.5. ELECTRIC UTILIZATION EQUIPMENT PROTECTION

The Customer's equipment shall be equipped with devices that protect against over-current, short-circuit and ground faults. Such devices shall conform to the requirements of the applicable Electrical Codes. RMLD strongly recommends that all motor installations be adequately protected to prevent improper operation, equipment damage and personal injury which might result from abnormal conditions occurring in RMLD's facilities or the Customer's wiring system. Providing proper and adequate protection of the customer's equipment is the responsibility of the customer. Customers shall consult manufacturer for proper equipment installation and protection.

17.6. PROTECTION AGAINST SINGLE-PHASE OPERATION

As required by the Massachusetts Electric Code, three-phase motors shall be protected against the possibility of the failure of any one phase of the supply circuit. Three over-current (overload) units shall be used on all motors unless the motor is protected against single-phase operation by other approved means.

17.7. UNDERVOLTAGE PROTECTION

Motors that cannot be safely subjected to full voltage at starting or motors the starting of which on return of normal voltage after an interruption would endanger life or property, should be provided with automatic under-voltage protection. Such protective device should insure that with either no voltage or under-voltage, the motor will be disconnected from the line or the starter will be returned to the "off" position. RMLD recommends the use of time delay under-voltage protection because instantaneous under-voltage protection will operate on momentary fluctuations of voltage.

17.8. OVERLOAD PROTECTION

All motors should be protected against overload by the installation of adequate over-current thermal protective devices or their equivalent, which will operate so as to prevent excessive motor winding temperatures.

17.9. PROTECTION AGAINST PHASE REVERSAL

On motors for passenger and freight elevators, cranes, hoists, and other equipment, where reversal of direction of rotation might cause property damage or injury, a reverse-phase relay should be installed so the motor circuit will be opened in the event of a phase reversal or the loss of any phase. The operation of this relay and associated circuit breaker should be instantaneous and should be such that the circuit cannot be re-energized until the normal phase relations are restored.

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19.0 Summary of Changes

1.20.2021 – Clarified rebate incentive programs to help accelerate rebate processing and capture load changes, with an emphasis on Heat Pump and EV Charger programs.

1.20.2021 – Clarified contractor requirements for residential sub-divisions, URDs, and commercial / industrial electrical service to promote additional electrification and maintain network reliability.

1.20.2021 – Defined 1,500 kVa as the threshold for primary metering qualification. Clarified equipment ownership between customer and RMLD.

1.20.2021 – Updated all figures contained within the handbook.

1.20.2021 – Updated distributed generation resources requirements to require impact study for all systems above 150 kW; clarified requirements for systems below 20 kW; clarified disconnect switch requirements for systems between 20 kW and 150 kW.

1.20.2021 – Increased size of RMLD provided transformer to 750 kW for specific installations.