

Wellesley Municipal Light Plant
Standard Requirements for Electric Service

Index

Section 1.....General Information

Section 2.....General Requirements for Service

Section 3.....Types of Available Service

Section 4.....Underground Service

Section 5.....Overhead Service

Section 6.....Underground Residential Developments

Section 7.....High Voltage Service Equipment Located on Private Property

Section 8.....Wiring and Voltage Requirements

Section 9.....Metering Requirements

Section 10.....Theft of Service

Section 11.....Motors and Utilization Equipment

Attachment 1 Underground Policy Study – Executive Summary

Section 1

General Information

- 1.1 **Introduction** - The Wellesley Municipal Light Plant (WMLP) issues these “Standard Requirements for Electric Service” (Requirements) in order to communicate to its customers, architects, builders, electrical contractors, engineers and any other entity undertaking work which affects WMLP's electric system, its requirements for electric service. These Requirements, in conjunction with WMLP's Schedule of Rates and its terms and conditions on file with the Massachusetts Department of Telecommunications and Energy (DTE), as well as its Customer Service policies, constitute WMLP's requirements to obtain electric service within the Town of Wellesley.
- 1.2 **Applicability** - These “Standard Requirements for Electric Service” supercede all previous policies issued by the Wellesley Municipal Light Board and its predecessor, the Wellesley Board of Public Works, and is effective immediately for all construction work affecting WMLP, with reasonable allowance for the completion of work in progress. Revisions of the information contained in these Requirements will be made as necessary and WMLP reserves the right to make any such changes.
- 1.3 **Service Voltages** - The information contained in these Requirements applies primarily to electric service delivery voltages not exceeding 600 volts, although requirements for receipt of service at higher voltages is also provided in Section 7, “*High Voltage Service Equipment Located on Private Property*”. Service requirements for installations at higher voltages are also subject to individual agreements between the customer and WMLP.
- 1.4 **Jurisdiction** - All customer wiring intended for connection to the WMLP system shall be subject to the jurisdiction of the Town of Wellesley Wire Inspector and shall be in accordance with the National Electric Code, the Massachusetts Electric Code, any other applicable codes and with WMLP's requirements.
- 1.5 **Quality of Service** - All connections to the WMLP's system shall be designed, installed and operated in a manner that will not adversely affect the quality of service to other WMLP customers. No service connection shall be made by WMLP until approval is received from the appropriate authority and communicated to WMLP.

The WMLP reserves the right to discontinue service, at its sole discretion, to any customer who, after proper notice from WMLP, continues to use any equipment or apparatus that adversely affects the quality of service to other WMLP customers, creates an unsafe working condition for WMLP employees or hinders WMLP in maintaining proper system conditions.

- 1.6 **Advisory Service** - WMLP's policy is to actively cooperate with customers, architects, contractors, engineers and any other entity undertaking work which affects WMLP's electric system. However, neither by inspection nor by the rendering of advisory service,

nor in any other way, does the WMLP provide any warranty, expressed or otherwise implied, as to the adequacy, safety, or other characteristics of any equipment, wires, appliances or devices owned, used, or maintained by customers.

The WMLP will furnish all information regarding the availability of service and the cost to the customer to supply such service. Therefore, it is strongly urged that WMLP's assistance be requested prior to the commencement of construction in order to facilitate timely rendering of service by WMLP.

- 1.7 **Customer Service Department Requirements** – In many cases, WMLP receives information from its Customer Service Department in order to energize new services or services which have been disconnected for non-payment. All proper account information, advance deposits and payments must be in good standing with WMLP's Customer Service Department before any service shall be connected to WMLP's system.
- 1.8 **Theft of Service** – Theft of service as defined in Section 10.1 is a serious crime and WMLP will prosecute violators to the full extent of the law.
- 1.9 **Work Near Overhead High Voltage Lines** - General contractors, electrical contractors, electricians, their employees and any other person(s) undertaking work in the proximity of WMLP's overhead electric lines must take proper precautions and observe the prohibitions prescribed by federal and state law when working or using any tools, machinery, or construction equipment near these lines.

The applicable federal provisions for work near overhead high voltage lines are set forth in the regulations of the Federal Occupational Safety and Health Administration (OSHA) at 29 CFR 1926.550(a)(15).

Massachusetts General Laws, Chapter 166, Sections 21A-21G, prohibits anyone from performing any type of work within close proximity (defined as six feet) to any overhead high voltage lines without having promptly notified, and making satisfactory arrangements with, the appropriate utility company. In Wellesley, this is WMLP.

In every case in which work needs to be performed near electrical lines, WMLP must be contacted prior to the beginning of work. WMLP reserves the right, at its sole option, to install protective equipment at the contractor's expense prior to the beginning of construction, in order to protect both the contractor and its employees as well as WMLP's facilities.

- 1.10 **Limitation of Liability** - WMLP shall not be liable for damage to the person or property of a customer or any other person(s) resulting from that customer's use of electricity or the presence of WMLP's equipment on customer premises. WMLP is a municipal entity governed in accordance with the provisions of Massachusetts General Law Chapter 164.

Section 2

General Requirements for Service

- 2.1 **Application Location** - Written application for new electric service or alteration to an existing electric service shall be made at WMLP's offices, 4 Municipal Way, Wellesley Hills, Massachusetts, on a form supplied by the WMLP.
- 2.2 **Written Application** - Application for new service or alteration of an existing service should be made as far in advance as possible to assure time for engineering, material procurement, system additions (if necessary) and construction. A plot plan indicating the location of the buildings and additions shall be provided, if available, as well as additional load data.
- WMLP will review the application for service and advise the party applying for service whether the type of service requested is available, what the customer or their designated representative must do to prepare for WMLP to install the service and what charges WMLP will require to be paid in advance in order for WMLP to install and connect the new service. The customer or their designated representative should not proceed to make any load additions until WMLP has notified them that the conditions under which WMLP can supply the new or increased load have been met.
- 2.3 **Customer Wiring** - The WMLP will not install, or be responsible in any way, for wiring on the consumers' premises. The WMLP will not knowingly supply electric energy to any premises where the electrical wiring is not in conformance with all applicable codes and the requirements of the Town of Wellesley Wire Inspector.
- 2.4 **Wire Inspector Approval** - The WMLP is not allowed to energize a new service, or reconnect an existing service which has been disconnected for wiring work to be performed, until the Wire Inspector for the Town of Wellesley has issued a certificate of approval to WMLP. It is the responsibility of the electrical contractor to receive all Wire Inspector approvals so that WMLP will be directed by the Wire Inspector to energize the service.
- 2.5 **Service Relocation or Alteration** - When relocation or alteration are to be made to an existing service, WMLP shall be notified in advance so that it can determine the conditions under which such changes can be made. The customer or their designated representative shall be responsible for the WMLP's cost of such relocation or alteration work and such cost estimate will be prepared by WMLP and paid in advance of WMLP performing any work to relocate or alter the service.
- 2.6 **Customer Equipment** - The customer shall use their service from WMLP with due regard for the effect of such use on the quality of service to other customers of WMLP. Customers shall notify WMLP prior to the installation of any major appliance so that WMLP will have sufficient time to evaluate the impact of such load on its system.

WMLP, at its sole option, shall determine the feasibility of adding such load to WMLP's system and will undertake work as necessary, at the customer's expense, to accommodate the added or changing nature of the load and thus prevent any possible disruption of service to the area.

- 2.7 **Access to Premises** - The WMLP shall have the right of access to the customer's premises at all reasonable times in accordance with Massachusetts General Laws, Chapter 164, Section 124 for the purpose of inspecting and keeping in repair WMLP equipment, meter reading, or removing any or all of WMLP's equipment and for such purposes that the customer authorizes and requests his landlord, if any, to permit WMLP to enter said premises.
- 2.8 **Temporary Service** - WMLP shall make available temporary electric service to any customer or their authorized representative upon written application at WMLP's offices, subject to the availability of such service, at WMLP's sole option. Temporary service is any service for a construction project or temporary display which is not expected to continue in use for a period long enough to justify a permanent service installation. For residential home construction, temporary service shall be permitted for a period not to exceed one (1) year.

The WMLP is not allowed to energize a temporary service until the Wire Inspector for the Town of Wellesley has issued a certificate of approval.

Temporary service shall be made available upon advance payment of the cost for WMLP to install and remove the service.

- 2.9 **Conditions of Service** – The WMLP shall not be responsible for any failure to supply electric service hereunder, nor for the interruption of service, reversal or abnormal voltage of supply if such failure, interruption, reversal or abnormal voltage is without willful default or gross negligence on the part of WMLP. WMLP shall always endeavor to operate its system in accordance with good utility practice.

Whenever the integrity of the WMLP system or the supply of electricity is threatened by conditions on the WMLP system or the systems with which WMLP is directly connected or indirectly connected, or whenever it is necessary or desirable to aid in the restoration of service, the WMLP may, in its sole judgment, curtail or interrupt electric service or reduce voltage to some or all of its customers and such curtailment, interruption or voltage reduction shall not constitute gross negligence or willful default on the part of WMLP.

Section 3

Types of Available Service

- 3.1 **Availability of Service** - The acceptance of an application for electric service will be contingent upon WMLP having the necessary poles, wires, conduits, cables, etc. to supply service at the location where it is requested. When the application is for a supply of energy in excess of the capacity of the WMLP system as it then exists to deliver service to the requested location, WMLP reserves the right to delay the acceptance of such application.

Prior to the customer or their designated representative ordering equipment or commencing construction, it is the customer's responsibility to make application to WMLP to ascertain the availability of the service characteristics for the service desired and to determine if WMLP has additional requirements to those contained herein for such service. Designation of the service entrance location, meter location and size of service shall be specified by WMLP. All costs associated with extension of service shall be the responsibility of the customer.

- 3.2 **Electric Meter** - All meters are to be installed on the customer's premises in a meter socket supplied by the customer's electrician and located in a manner satisfactory to WMLP. The Wire Inspector must approve the final electrical connections in the meter socket before WMLP will install the meter. The meter will be supplied by the WMLP at no expense to the customer. Metering requirements for WMLP are more fully explained in Section 9 of these Requirements.
- 3.3 **Equipment Acquisition** - In the event that the WMLP is forced to pay a premium to obtain transformers, switchgear or other equipment required to meet the schedule or special service requirements of the applicant, the applicant shall reimburse WMLP that portion of the premium above and beyond the cost which WMLP would normally incur to provide electric service, as determined solely by WMLP.
- 3.4 **Standard Service Characteristics** – The following types of service are generally standard but it must be noted that not all types of service are available at all locations. Before purchasing any equipment or performing any wiring, a customer must submit a service application to WMLP to determine the availability of the desired service.
- a) 120/240 volt, single-phase, 3-wire – Most commonly used for residential customers and small commercial customers up to 50 kVa of load and individual motors not over 5 hp.
 - b) 120/208Y volt, single-phase, 3-wire – May be available to customers who are located in a 120/208Y volt, 3-phase area if the connected load is less than 50 kVa.
 - c) 120/208Y volt, three-phase, 4-wire – For customers with loads larger than can be served with 120/240 volt single phase supply. If three-phase service is allowed for

loads less than 50 kVa, the additional cost above and beyond the cost of a single-phase service may, at WMLP's sole option, be at the expense of the customer.

- d) 277/480Y volt, three-phase, 4-wire – Normally for large commercial and industrial load applications with loads significantly higher than can be served with either 120/240 volt single phase or 120/208Y volt three phase supply.
 - e) Customers seeking high voltage service under the terms of WMLP's Large General Service – Primary tariff shall consult with WMLP to determine service requirements.
 - f) Voltages other than those specified herein may be available from WMLP through negotiation and may involve additional cost to the customer to account for equipment acquisition required to provide the requested voltage.
- 3.5 **Services Per Building** – Generally one electric service will be installed per building. Additional services may be required and can be installed at WMLP's sole discretion and with the Wire Inspector's written approval, subject to applicable electrical and fire codes. In addition, a letter of consent from the Wellesley Fire Department is also required indicating that they are aware that more than one electric service enters the premises. The cost to install additional building services shall be borne entirely by the customer.
- 3.6 **Multiple Meter Charges** – Where electricity to a building is delivered through more than one meter, each meter shall have a separate account established with WMLP's Customer Service Department and shall be subject to the applicable WMLP tariff.
- 3.7 **Customer Requirements** – Where it is determined that the customer's load level requires that WMLP equipment, with the exception of house service cable, be placed on private property for the purposes of supplying electric service to that property, WMLP shall require and the customer shall grant WMLP an easement for the location of the WMLP's equipment on the property. WMLP will prepare the easement documents and record the easement. The cost of preparing and recording the easement shall be at customer expense.
- 3.8 **Unbalanced Load** – The customer shall at all times utilize energy in such a manner that the load will be balanced between phases to within 10% of one another. WMLP reserves the right to require that the customer make necessary changes at customer expense to correct the unbalanced condition.
- 3.9 **Final Electrical Connections** – WMLP personnel will make the final connection of the customer's wiring to the WMLP system for permanent or temporary service. Unauthorized personnel are not permitted to connect to WMLP conductors or equipment.
- 3.10 **Secondary Surge Arresters** – Secondary surge arresters may be installed by a customer at their own expense. For such protection to be effective, the devices should be connected to the service-entrance conductors and bonded to the metallic water pipe

system, the raceway system, the grounded service conductor at the service entrance equipment and any metallic drainage system.

Where the service from WMLP is 750 volts or less, the surge arrester may be mounted on the service equipment enclosure.

The customer shall be responsible for providing and installing any secondary surge protection devices and for operating, maintaining and inspecting such installations. The WMLP shall not be responsible for the operation, maintenance or inspection of a customer installation or for any damage to a customer's equipment resulting from voltage surges which may occur on the customers wiring.

3.11 **Short Circuit Currents** – In order that engineers and contractors may select proper service equipment to meet National Electric Code regulations for short circuit ratings, the following will apply to new installations served:

- a) **Residential** – Supplied at 120/240 volts from overhead or underground fed transformers. Fault current available at residential service equipment will generally be more than 5,000 amperes but less than 10,000 amperes.
- b) **Commercial, Industrial and Apartment Complexes** – Available fault currents will vary with each installation. Inquire to WMLP for the fault levels at a particular location in WMLP's system.

3.12 **Customer Emergency Standby Generation** – The customer must notify WMLP in advance of installing standby generating equipment and obtain WMLP's approval for the method of connection. Where the customer installs a standby generator for the purpose of supplying all or part of their load, in the event of an interruption in the supply of service from WMLP, the customer wiring shall be arranged so that no electrical connection can occur between the WMLP lines and the customer's alternate source of electric supply. This will require installation of a double-throw switch that has a visible break. This transfer scheme must meet the non-parallel requirements established by WMLP. All wiring associated with the customer installation shall comply with all applicable codes and be approved by the Town of Wellesley Wire Inspector.

Any metering costs associated with the customer's standby generation due to special metering requirements, as determined by WMLP, shall be the responsibility of the customer.

Customer on-site generation and fuel storage are often located adjacent to the pad-mounted equipment of the electric utility. Because of the proximity of the electric room to the transformer, WMLP requires protection between the transformer and the generator fuel storage unit, by either a twenty (20) foot separation or a masonry wall. The wall shall be erected parallel to and located three (3) feet from one side of the transformer foundation. The wall should be a minimum of six (6) feet high and extend approximately

three (3) feet beyond each end of the transformer foundation. The design shall be submitted to and reviewed by WMLP personnel for approval before construction.

- 3.13 **Customer Auxiliary Generation** – Should a customer elect to install solar, wind turbine or other auxiliary generation for the purpose of operating interconnected with WMLP, customers shall notify WMLP of the installation in writing to assure proper interface between the different power systems. Proper precautions must be taken to maintain adequate safety, to maintain the quality of service to WMLP's other customers and to protect WMLP's system and its workers. The customer shall be required to provide protective and synchronizing equipment to safeguard WMLP's system from the auxiliary equipment at customer expense. The design of the protective system shall be submitted to WMLP for review and approval before implementation.

Any metering costs associated with the customer's auxiliary generation due to special metering requirements, as determined by WMLP, shall be the responsibility of the customer.

- 3.14 **Customer Cogeneration** – Cogeneration equipment is designed to produce electrical energy and steam, or other useful forms of energy, which is used by a customer for industrial, commercial, heating or cooling applications. Prior to the design and installation of any cogeneration equipment, a customer considering cogeneration shall consult with WMLP to ascertain WMLP's policy for such installations.

Section 4

Underground Service

- 4.1 **Service Connections** - All electric services to customer premises, either new installations or upgrades of existing service, shall be installed underground. Service to customers may originate from a WMLP pole or manhole. Exceptions to this requirement shall be at WMLP's sole discretion.
- 4.2 **Cost of Service** - All service shall be installed by WMLP in accordance with its specifications, at the expense of the customer. Whenever an application for electric service is received which will require the installation of a new service, the applicant will be required to deposit, in advance of construction, an amount equal to the estimated cost thereof. WMLP will determine, at its sole discretion, which installations are to be performed on a fixed cost basis and which will be performed on the basis of an estimated cost.

When the installation has been completed, the cost of service installations that are not performed on a lump sum basis shall be computed. Should the customer deposit be found to be in excess of the actual cost, such excess shall be refunded to the customer. If the cost should exceed the deposit, then before the meter is connected and the service is committed to use, the applicant shall pay the deficiency.

Specific requirements for underground electric service to homes, covered in WMLP's *Electric Service Upgrades and New Installations Policy*, are available at WMLP's office.

- 4.3 **Ownership of Underground Service** – WMLP shall own and maintain the service lateral from the line side of the meter socket back into the WMLP system. WMLP will also assume ownership and maintenance responsibility of the conduit system installed for the service cable once the system is approved by WMLP.
- 4.4 **Failure of Underground Service** - Should an underground electric service installed by WMLP to a customer premises fail on the line side of the meter socket, resulting in a temporary service installation by WMLP to the customer in order to provide electric service, WMLP shall be responsible for repairing the failed underground service cable. All interruptions of service due to equipment failures from the meter socket into the customer premises are the sole responsibility of the customer.

Where WMLP determines that the cable is repairable, WMLP will repair the cable, arrange with the customer to remove the temporary electric service and re-energize the repaired cable. Should WMLP determine that it is appropriate to replace the service, WMLP will arrange to have underground conduit installed from the source of the WMLP service to the customer premises (if necessary), install new underground cable and arrange with the customer to remove the temporary electric service and energize the new service.

Electrical panel work required to accommodate the repair or replacement of the failed underground service shall be performed by WMLP. The extent of the electrical work to be performed from the meter socket into the home shall be at WMLP's sole discretion and subject to the Town of Wellesley Wire Inspector's approval.

At the time that WMLP installs new underground cable to replace a failed service, the customer will have the option of upgrading the cable that would normally be required to provide the same capacity as the old service with a higher capacity cable. The customer will be responsible for the difference in the cost of the cable between the cable WMLP would normally install and the higher capacity cable. Payment for the higher capacity cable shall be made by the customer to WMLP before WMLP performs the service installation. In addition, all electrical work from the meter socket into the home required to accommodate the higher capacity service shall be at customer expense and subject to the Town of Wellesley Wire Inspector's approval.

- 4.5 **Temporary Underground Service** - WMLP shall make available temporary electric service to any customer or their authorized representative upon written application at WMLP's offices, subject to the availability of such service at WMLP's sole option. Temporary service connections may be underground fed, as determined by WMLP. All temporary service connections shall be in conformance with all applicable codes and shall be subject to conditions imposed by and require approval of the Town of Wellesley Wire Inspector. WMLP will not energize any temporary service until authorized to do so by the Wire Inspector. Temporary service shall be installed for a period not exceeding twelve (12) months.

In the event that the temporary service is fed underground and a meter pedestal is used, the meter pedestal shall conform to the requirements of Section 9.16. The meter pedestal shall be located adjacent to and as close as possible to the permanent structure so that the service may be transferred to the point of permanent attachment when the construction is completed.

Where temporary service is made available by WMLP, advance payment of the cost for WMLP to install and remove the service shall be made prior to energizing the temporary service. It shall also be the responsibility of the customer to establish an account with WMLP's Customer Service Department for the cost of electricity before the service can be energized.

- 4.6 **Undergrounding of WMLP Facilities** – Should the undergrounding of WMLP's overhead distribution facilities become an issue in any section of Wellesley, WMLP's policy shall be as outlined in the Wellesley Municipal Light Plant's *Underground Policy Study – Executive Summary*, as accepted by the Wellesley Municipal Light Board (Attachment 1).

Section 5

Overhead Service

5.1 **Service Connections** – No overhead services are allowed on the WMLP system, either for new installations or for upgrades of existing service, in order to permanently connect a customer to the WMLP system. The only case in which an overhead service is allowed is for temporary service, as defined in Section 2.8 of these Requirements. The Town of Wellesley requires that all new or upgraded utility services to residences and businesses be placed underground.

5.2 **Temporary Overhead Service** - WMLP shall make available temporary electric service to any customer or their authorized representative upon written application at WMLP's offices, subject to the availability of such service at WMLP's sole option. Temporary service connections may be overhead fed, as determined by WMLP. All temporary service connections shall be in conformance with all applicable codes and shall be subject to conditions imposed by and require approval of the Town of Wellesley Wire Inspector. WMLP will not energize any temporary service until authorized to do so by the Wire Inspector. Temporary service shall be installed for a period not exceeding twelve (12) months.

The customer shall provide a support structure which meets the requirements of the Wire Inspector and WMLP with respect to service drop clearances, metering, grounding and safety for temporary overhead service, as defined in Section 2.8. The service entrance equipment shall be installed on a pole set five (5) feet in the ground or on a braced timber structure approved by the Wire Inspector and WMLP.

The temporary structure shall be located adjacent to the permanent building whenever possible. The temporary overhead service cannot be used for permanent service.

Where temporary service is made available by WMLP, advance payment of the cost for WMLP to install and remove the service shall be made prior to energizing the temporary service. It shall also be the responsibility of the customer to establish an account with WMLP's Customer Service Department for the cost of electricity before the service can be energized.

5.3 **Ownership of Temporary Service** - Once a temporary overhead electric service is installed, WMLP shall own the service from the connections at the weatherhead back into the WMLP system.

5.4 **Overhead Line Extensions on Private Property** – Overhead line extensions on private property are not allowed by WMLP.

5.5 **Existing Overhead Services** – In the event that there is an existing permanent overhead service to a WMLP customer, WMLP's ownership ends at the physical point of attachment of the overhead service to the customer's cable. This is typically at the service weatherhead. All equipment beyond this connection, including the service drop attached to the side of the house that feeds into the meter socket, is the property of the customer.

It is the customer's responsibility to maintain all proper National Electric Safety Code (NESC) clearances required for the overhead service drop and to notify WMLP in the event that clearances to the service will be affected by construction work on the customer's property.

Section 6

Underground Residential Developments

- 6.1 **Residential Developments** - Upon request from a developer proposing to construct a residential development consisting of dwelling facilities and requiring electric facilities to provide service to such facilities, the WMLP will provide an underground distribution system in public or private ways, or rights of way to be installed throughout the entire development subject to the provisions set forth herein. Even where an existing public way is in place with overhead electric facilities, WMLP shall require all electric facilities for the residential development to be placed underground.

A qualifying residential development is one proposed to be built on a land area defined in a real estate development plan, approved by the Town of Wellesley Planning Board and subject to the requirements of the “*Rules and Regulations Governing the Subdivision of Land in Wellesley Massachusetts*” as adopted by the Wellesley Planning Board on December 13, 1971 and as amended from time to time.

- 6.2 **Initial Requirements** - When no electric distribution system exists in an area contemplated for subdivision, the developer shall request that WMLP provide the design of an underground distribution system in public or private ways and specify easements or rights-of-way required to service the proposed development and adjacent undeveloped areas.

The developer shall furnish to WMLP proposed plans, which will include:

- a) A plan showing the layout of the lots and ways with grading contours.
 - b) A plan showing the proposed construction of the streets and other underground utilities.
 - c) A plan showing the outline of lots, ways and easements on which the electric system may be overlaid for reproduction of the plan and
 - d) Proposed electrical loads, service sizes and service voltage required.
- 6.3 **Schedule** - The developer shall furnish in writing to WMLP the anticipated schedule for construction of houses on a lot-by-lot basis.
- 6.4 **Electric Distribution Design** – Utilizing the information provided by the developer as required in Section 6.2, WMLP will develop a detailed design of the underground electric system for the developer, which shall conform to the policies of WMLP. WMLP will make its best efforts to work with the developer in designing a system that considers the developer’s other utility requirements.

- 6.5 **Cost of Infrastructure** - All costs associated with construction of the underground infrastructure to house WMLP's distribution system shall be the responsibility of the developer. This shall include all conduit, manholes, transformer pads, grounding grids and any other appurtenance required to extend complete electrical service to the development, subject to WMLP's requirements.
- 6.6 **Cost of Providing Electric Service** - All costs associated with the installation of electrical equipment required to provide service shall be the responsibility of the developer. This shall include, but not be limited to, all cable, transformers, streetlights and any other appurtenance necessary to provide complete electrical service to the proposed development. WMLP shall prepare an estimate of all charges associated with its work for the developer. Payment of WMLP's estimated costs shall be made before WMLP begins work. WMLP also reserves the right to charge additional amounts above and beyond its estimate to the developer for significant changes in the scope of work. Payment of these additional amounts shall be due immediately upon presentation to the developer.
- 6.7 **Construction Standards** - Construction of the infrastructure to house WMLP's high voltage system shall be in accordance with the design and standards approved by WMLP. Specific construction requirements for the conduit and manhole work will be as specified by WMLP and in accordance with the "*Rules and Regulations Governing the Subdivision of Land in Wellesley Massachusetts*" as revised November 27, 2001, Section VI (D). Any work in the public right-of way shall also comply with the requirements of the Wellesley Department of Public Works "*Work in the Public Right-of Way*", issued on April 1, 1998 and as amended from time to time.
- 6.8 **Ownership** – WMLP shall assume ownership of the electric distribution infrastructure once the Town elects to accept the residential development as a public way. In the event that the development is not accepted as a public way or if the development is maintained as a private way, ownership of the electric distribution infrastructure reverts to WMLP upon fulfillment of the following conditions:
- a) WMLP is granted a permanent, perpetual easement for the manholes, conduit, conductors, transformers and any other appurtenance that WMLP deems necessary for extension of service on private property.
 - b) The customer is responsible for payment of all costs associated with the extension of service on private property as outlined in Sections 6.5 and 6.6.
 - c) The customer transfers ownership of underground private property construction to WMLP upon execution of the easement documents with all rights to perform maintenance of the manhole and conduit system and the electrical distribution system, as necessary.
 - d) The customer installs at least one service drop from the underground system on private property.

6.9 **Easements** – WMLP shall require and the customer shall grant WMLP an easement for the location of the WMLP's equipment on the property in order to provide permanent and perpetual access to all electrical facilities owned by WMLP, including but not limited to; conduit, manholes, cable, transformers, transformer foundations, street lights, poles (as the origin point of the underground service) and any other appurtenance required to extend complete electric service to the proposed development. The easement shall be granted to WMLP by the developer as a condition of service. The size of the easement shall be determined by WMLP and specified to the developer during the design phase. WMLP will prepare the easement documents and record the easement. The cost of preparing and recording the easement shall be at customer expense.

Section 7

High Voltage Service Equipment Located on Private Property

- 7.1 **General** – The general provisions of this section apply to customers who take service from WMLP owned equipment and are considered commercial customers with secondary metering. These requirements do not apply to customers taking primary service from WMLP, who are classified as Large General Service – Primary customers with primary metering.
- 7.2 **Type of Installation** - Customers may be required to provide space on private property for WMLP owned transformers and protective equipment. This would typically occur in the following manner:
- a) **Padmount Transformer** - A padmount transformer supplied by an underground cable fed from a pole or manhole. The pole or manhole supplying the transformer may also be on private property.
- 7.3 **Cost** – All costs associated with the extension of electric service on private property shall be the responsibility of the customer. WMLP will prepare an estimate of applicable charges for the customer. The estimated cost of WMLP's installation work must be paid prior to construction. WMLP will provide the transformer and metering equipment to the customer at no cost, subject to the provisions of Section 3.3.
- 7.4 **Customer Design Requirements** – All construction performed to accommodate the padmount transformer must be performed in accordance with WMLP standards, a portion of which is as follows:
- a) **Padmount Transformers** - Sufficient space must be provided around the transformer pad to allow ease of installation of the padmount transformer unit, preparation of terminations in the high and low voltage compartments and unhindered operation of the transformer. The space requirements are a minimum of ten (10) feet open clearance in the front and five (5) feet open clearance on the remaining three sides, free of any obstructions. The unit must also be located a minimum of ten (10) feet from any flammable surface or a minimum of five (5) feet from a non-flammable surface, such as a building wall.

The customer shall check with WMLP to determine any additional requirements which may apply.

- 7.5 **Customer Installation Requirements** – Customer requirements for private property installation work are outlined below:
- a) **Secondary Cable and Conduit** - The customer shall supply and install all secondary conduit, cable, hardware and transition enclosures, where applicable. If the secondary cable is required for installation to a WMLP manhole, WMLP

shall supply and install the cable at customer expense. WMLP requires copper secondary conductors for connection to WMLP transformers and aluminum secondary conductors are not allowed. Conductor sizes over 500 MCM must be specifically approved by WMLP. Size of the conductors and conduit will be in accordance with all applicable codes and subject to Wire Inspector approval.

- b) **Transformer Pad** – The customer will be responsible for installation of a transformer pad and grounding grid to accommodate the padmount transformer. The transformer pad shall be constructed to WMLP specifications. WMLP will provide the specifications for the pad to the customer as well as advisory service during the construction process to ensure that the pad is properly constructed. If the pad is located adjacent to a parking lot or other exposed area, WMLP may require lally columns to be installed to provide physical protection for the transformer.
- c) **Final Connections** – All final connections to WMLP equipment shall be performed by WMLP at customer expense. Connectors used to connect customer secondary cable to WMLP equipment shall be supplied and installed by WMLP at customer expense.

7.6 **WMLP Installation Requirements** - WMLP requirements for private property installation work are outlined below:

- a) **Source of Supply from Overhead System** – WMLP will perform all high voltage work required to extend high voltage service from the WMLP overhead system. The cost for all work shall be at customer expense.

If the installation originates from a pole to a padmount transformer, WMLP will install all cable terminations and protective equipment on the pole, pull high voltage cable to the transformer, terminate the high voltage cable in the primary compartment of the transformer and make all secondary connections on the cable installed by the customer using WMLP secondary termination lugs. The WMLP will also install the transformer on the customer-supplied pad.

- b) **Source of Supply from Underground System** - WMLP will perform all high voltage work required to extend high voltage service from the WMLP underground system to the customer pad. The cost for all work shall be at customer expense.

It must be noted that WMLP requires two high voltage supplies to transformers fed from WMLP's underground system, if possible, in order to expedite service restoration in the event of an outage on the underground system.

If the installation originates from WMLP's underground system to a padmount transformer, WMLP will install two (2) sets of high voltage cables from the manhole to the padmount transformer. In addition, WMLP will perform all

required splicing in the manhole on both high voltage supplies, terminate both high voltage supplies in the primary compartment of the transformer, and make all secondary connections on the cable installed by the customer using WMLP secondary termination lugs. The WMLP will also install the transformer on the customer-supplied pad.

- 7.7 **Ownership of Equipment** – WMLP will assume ownership and maintenance responsibilities for the conduit, manholes, poles, equipment and any appurtenant facility required to extend service to the customer upon completion of the project and the granting of an easement as outlined in Section 7.8. WMLP ownership shall end at the connectors used for the secondary terminals of the transformer. All equipment beginning at the secondary cables supplying the customer will continue to be the property of the customer.
- 7.8 **Easements** – As a condition of service, WMLP shall require and the customer shall grant WMLP an easement for the location of WMLP's equipment on the property in order to provide permanent and perpetual access to all electrical facilities owned by WMLP which WMLP deems necessary for extension of service to the property. WMLP will prepare the easement documents and record the easement. The cost of preparing and recording the easement shall be at customer expense.
- 7.9 **Primary Service Installations** – Customers who request primary service from WMLP shall be subject to the requirements listed in WMLP's Large General Service – Primary Tariff, currently on file with the Massachusetts Department of Telecommunications and Energy.

The specific details regarding the installation of primary service by WMLP to a customer requesting such service are subject to negotiation and development of a specific agreement covering the terms and conditions of service between the customer and WMLP.

Section 8

Wiring and Voltage Requirements

- 8.1 **Fluctuating Loads** – Electric welding equipment, furnaces, boilers, compressors, pumps or similar equipment should not be installed except under the conditions specified by WMLP. WMLP shall be advised of the proposed installation of this type of equipment in accordance with Section 2.6.

Voltage fluctuations caused by this type of equipment, regardless of their frequency, shall not cause undue degradation to the quality of service experienced by WMLP's other customers. Installation of this type of equipment shall not cause WMLP difficulty in maintaining proper voltage conditions on its system.

WMLP, at its sole option, shall determine the feasibility of adding such load to WMLP's system and will undertake work as necessary, at the customer's expense, to accommodate the added load and thus prevent any possible disruption of service to the area.

The WMLP reserves the right to discontinue service, at its sole discretion, to any customer who, after proper notice from WMLP, continues to use any equipment or apparatus that adversely affects the quality of service to other WMLP customers, creates an unsafe working condition for WMLP employees or hinders WMLP in maintaining proper system conditions.

- 8.2 **Grounding** – All grounding shall be done in accordance with National Electric Code standards and all applicable codes and under the authority of the Town of Wellesley Wire Inspector. WMLP shall not be liable for damage to the property of a customer resulting from unbalanced voltage conditions due to the opening of a grounded neutral service conductor.
- 8.3 **Grounding Secondary Service** – Where the secondary system is grounded at any point, the grounded conductor shall be run to each individual service. 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 disconnection means. This connection should be made within the service entrance equipment enclosure.

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 National Electric Code or other applicable code for grounding electrodes and equipment grounding. To minimize the hazard of electrical shock, all metallic water piping systems inside a building shall be bonded to the grounding electrode. Where extensive metal in or

on buildings may become energized, adequate bonding to the grounding electrode will provide additional safety, as required by the Wire Inspector.

- 8.4 **Power Factor** – Maintenance of a high system power factor is of the utmost importance to WMLP in the efficient operation of its system. Electric rates are based on customers maintaining a minimum 90% power factor, which is the threshold WMLP shall accept before requiring power factor correction by the customer. Should a customer anticipate operation of their system at a power factor lower than 90%, WMLP shall be notified so that corrective measures may be developed between WMLP and the customer. The cost to implement such corrective measures will be borne entirely by the customer.
- 8.5 **Power Factor Correction Capacitors** – When a customer desires to install capacitors for the purpose of power factor correction, WMLP shall be consulted prior to the ordering of such equipment. Approval by WMLP for all capacitor installations is required to assure that the quality of service to other WMLP customers is not adversely affected by the manner in which the equipment is installed and operated.
- 8.6 **Power Supply to Voltage Sensitive Appliances** – Customers who use computers, microprocessor controlled equipment, x-ray equipment, or other sensitive electronic equipment should consider the installation of auxiliary devices designed to protect the customer equipment from power fluctuations and disturbances. These disturbances shall include, but not be limited to, voltage sags or swells, voltage spikes, temporary loss of power, or any other deviation from normal system conditions.

WMLP will work closely with customers to identify and minimize the causes and effects of these disturbances.

- 8.7 **General Conditions** - WMLP shall not be held liable for disturbances resulting from weather conditions, Acts of God, operations on WMLP's system which are within good utility practice or any other disturbance which may be generated by the operation of other customer owned equipment or of systems with which WMLP is directly connected or indirectly connected.

Section 9

Metering Requirements

9.1 **General Requirements** – All energy supplied by WMLP shall be measured, in general, by appropriate meters for billing purposes. The installation of meters and metering equipment shall comply with the requirements set forth in this Section. WMLP shall supply and install, at no expense to the customer, all meters required for billing purposes, except as noted in Sections 3.12 and 3.13.

9.2 **Definitions** – The following definitions shall apply:

Delivery Point – The point of connection between WMLP's facilities and the facilities of the customer. This is also the line of demarcation between WMLP's maintenance responsibility and the customer's maintenance responsibility.

Metering Point – The location of WMLP's meter or metering equipment, such as potential transformers and current transformers. The metering point is typically on the secondary side of the transformer.

Generally, the Delivery Point and the Metering Point are the same location. In the case of customers on the Large General Service – Primary tariff, however, the Delivery Point and the Metering Point are not the same. Other exceptions to this requirement exist, which include, but are not limited to, those indicated in Sections 5.5 and 7.7.

9.3 **Standard Meter Installations** – WMLP will specify the type of metering which will apply for each installation. Self-contained single phase socket metering is standard for up to 400 ampere service where the load side capacity is not more than 320 amperes continuous.

In general, self-contained polyphase socket metering is standard where the load capacity is not more than 320 amperes continuous and the voltage is less than 300 volts to ground. Current transformers are required for all services where the load side capacity exceeds 400 amperes. Installations with both current and voltage transformers are required for all services exceeding 400 amperes where the line-to-ground voltage is more than 300 volts and on ungrounded systems where the line-to-line voltage is more than 500 volts. Consult WMLP for proper meter sockets for each application. Conductors for instrument transformer runs shall not exceed 50 circuit feet from the meter.

9.4 **Assigning Location of Service and Metering Equipment** – The location of the service and metering equipment shall be assigned by WMLP. No wiring dependent upon service entrance and meter locations shall be started until these locations have been assigned by WMLP and approved by the Wire Inspector.

9.5 **Meter Locations** – Metering equipment shall be installed on the line side of the service disconnecting means (hot sequence) at a point to be determined by WMLP. The exception to this requirement shall be in network areas, where the metering equipment shall be installed on the load side of the service disconnecting means (cold sequence). On projects requiring installation of current transformers, hot sequence metering is preferred.

Outdoor meter locations are required for all single occupancy installations. Each location shall be readily accessible to WMLP for meter reading, testing, maintenance and removal. Service shall not be provided if accessibility to the meter requires WMLP employees to use adjacent property, climb fences or encounter other obstructions to read or remove the meter. Final meter location shall be determined by WMLP for new installations or for upgrades to existing service during the service planning process.

Customers in a single occupancy dwelling who have meters which are located inside the home and who are performing a service upgrade of the existing service must relocate the meter to the outside of the home to accommodate the new service. Exceptions to this requirement shall be granted only by the WMLP Director and only in such cases where the installation would be deemed impractical or cost prohibitive, at WMLP's sole discretion.

In areas subject to vandalism or damage, WMLP may require the meter to be installed in a lockable enclosure furnished and installed by the customer. A WMLP padlock will be used on such installations to ensure access to WMLP personnel.

In multiple occupancy buildings, for residential or commercial use or both, meters may be installed in one common location accessible to WMLP. The owner or their designated representative shall provide a key to WMLP for accessibility.

9.6 **Unmetered Conductors** – Unmetered conductors shall not be installed in the same raceway as metered conductors. Where unmetered conductors are run through the customer premises, they shall be enclosed in a continuous run of rigid metal conduit or service bus way. The installation of pull boxes or other similar devices is not permitted on unmetered raceways on customer premises.

9.7 **Meter Height** - The following requirements shall be followed when locating electric meters:

- a) **Outdoor Meters** – Outdoor meter sockets or troughs shall be mounted so that the face of the meter is between three (3) and five (5) feet above final grade. In no case shall the meter face be less than three (3) feet above final grade. Exceptions to this requirement shall be granted only by the WMLP prior to the installation of the meter socket. A clear area of three (3) feet square in front of the meter shall be required and maintained at all times. Clear and unimpeded access to the meter for WMLP personnel shall be maintained at all times.

- b) **Indoor Meters** – Indoor meter sockets or troughs shall be mounted so that the face of the meter is approximately five (5) feet above floor level. In no case shall the bottom of the meter be less than four (4) feet above floor level. Exceptions to this requirement shall be granted only by the WMLP prior to the installation of the meter socket. A clear area of three (3) feet square in front of the meter shall be required and maintained at all times. Clear and unimpeded access to the meter for WMLP personnel shall be maintained at all times.

- 9.8 **Location of Service Disconnect** – In general, the service disconnect shall be located on the load side of the meter (hot sequence). The service disconnecting means shall be installed at a readily accessible location nearest the point of entrance of the service entrance conductors. The following exceptions apply:

Exception No. 1 – At any location where more than six meter sockets are required, the service disconnect shall be installed on the line side of the metering equipment (cold sequence).

Exception No. 2 – In underground network areas, the service disconnect means shall be installed on the line side of the metering equipment (cold sequence).

Exception No. 3 – On 277/480Y volt meter sockets, a circuit breaker shall be installed on the line side of each meter socket (cold sequence).

- 9.9 **Meter Mounting** – Meter sockets and meter breaker centers shall be mounted plumb and firmly secured to supports, independent of conduit or cable connections. 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. Rust resistant screws shall be used for both indoor and outdoor locations.

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.

- 9.10 **Meter Socket Identification** – For multiple occupancy installations, the electrical contractor or owner is responsible for clearly and permanently marking the meter socket and/or the customer disconnecting means. This marking shall clearly identify which individual occupancy is supplied by the meter socket and customer disconnect. WMLP will not provide service to a multi-occupancy building until the meter sockets are properly identified.

- 9.11 **Moving / Removing Metering Equipment** – Meters, instrument transformers, and other metering devices are the property of WMLP and shall not be moved, removed, or altered in any way. Wiring and connections to metering equipment shall not be altered in any way, except by employees of WMLP, with the exception of specific situations where special permission is expressly obtained from WMLP. Violators will be prosecuted.

In the event of service upgrades, it is the responsibility of the electrician to make sure that all metering equipment that is removed to accommodate the new service is returned to WMLP. Under no circumstances shall an electric service go unmetered during a service upgrade. Electricians who leave customer installations unmetered during service upgrades shall be subject to the theft of service and meter tampering provisions of Sections 10.1 and 10.2

9.12 **Meter Sockets for Self Contained Meters** – For each service with self-contained metering, the customer shall furnish and install an approved meter socket that shall have a UL label and conform to WMLP's requirements as follows:

- a) Automatic bypasses are never permitted.
- b) All meter sockets installed on commercial and industrial services, and for meters which serve common areas in apartment or condominium complexes, shall be equipped with a safety arc shield and an approved single handle operated manual bypass.
- c) Individual or multiple position meter sockets without bypasses are acceptable for most residential services.

All 320 ampere meter sockets shall be specifically approved for installation by WMLP.

Sockets with manual bypass must meet WMLP requirements.

9.13 **Meter Connections** – The service or line-side conductors shall always be connected to the top terminals of the meter socket or trough and the load-side conductors shall always be connected to the bottom terminals. The customer electrician shall be responsible for connecting WMLP's conductors on the line side of the meter socket as well as connecting the customer's conductors on the load side of the meter socket. The conductor numbered three (3) will be white taped by WMLP and shall be used by the customer electrician as the neutral wire. Before installation of the meter, the Wire Inspector, who authorizes WMLP to energize the service and install the meter, must approve all connections.

9.14 **Clearance** – Clearances to the meters shall be as specified in Section 9.7. Clearance between the meter socket and gas meters or gas fitting openings shall be a minimum of 3 feet.

9.15 **Grounding of Meter Sockets** – Where the meter socket is installed on the line side of the service disconnecting means, the socket shall be grounded by bonding to the grounded conductor (the neutral). Where the socket is installed on the load side of the service disconnecting means, it shall be permissible to ground the socket by connection to the grounded conductor on the load side of the service disconnect if:

- a) No service ground fault protection is installed and

- b) All meter sockets are located near the service disconnecting means.

The grounded conductor (neutral) may be insulated from the grounded parts of the socket.

- 9.16 **Meter Pedestals** – Meter pedestal enclosures are freestanding units intended to be mounted outdoors on a concrete pad in conjunction with underground wiring. If a meter pedestal is not mounted on concrete, it must extend a minimum of 36 inches below finished grade or ground line. The pedestal shall have a stabilizing means extending below the frost line to insure the meter mounting stays in the plumb position. The final meter height shall be in accordance with the requirements of Section 9.7.

Meter pedestals shall also incorporate circuit breakers, although these are not intended to replace the service disconnecting means required at the building. The neutral strap in a meter pedestals shall be bonded to the enclosure and must be provided with a terminal for a grounding conductor.

- 9.17 **Instrument Transformers** – For all installations requiring instrument transformers for metering purposes, WMLP shall supply and install the metering transformers. Enclosures shall be furnished and installed by the customer and approved by WMLP. Enclosures shall be equipped with WMLP padlocks.

Instrument transformers may also be mounted in separate compartments of switchgear or other service equipment.

WMLP will require mounting space for the meter and auxiliary equipment adjacent to or, if necessary, remote from the switchgear.

Except for WMLP metering equipment, no instruments, meters or other equipment shall be placed in the instrument transformer compartments or connected to the secondaries of metering transformers.

- 9.18 **Meter Sockets and Test Switches** - Meter sockets and test switches for use with instrument transformers shall be furnished by WMLP at the customer's expense. Meter socket enclosures shall be installed by the Customer and the meter sockets inside those enclosures shall be wired by WMLP. Where the metering is pole mounted, WMLP will both install and wire the meter socket enclosure.
- 9.19 **Instrument Transformer Cabinets** – Instrument transformer cabinets shall not be used as junction boxes or for branch circuit wireways. Service conductors shall enter and leave the cabinet as one circuit with no branches regardless of the number of conductors per phase. Line-side connections to other meters shall not be made in the transformer cabinet or enclosure.
- 9.20 **Primary Metering** – Primary metering shall be installed for customers who are being served under WMLP's Large General Service – Primary tariff. If the customer is served

at more than one point, totalization will be required to totalize the customer's coincident load for billing purposes.

Section 10

Theft of Service

- 10.1 **Theft of Service** - 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 WMLP and/or any taking of any electric energy without WMLP's consent. Where there is evidence of meter tampering or theft of electrical energy 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.

- 10.2 **Meter Tampering Warning** – Meter seals and other locking devices installed by WMLP on metering equipment shall not be cut or removed except by authorized WMLP employees.

All meters and metering equipment enclosures are sealed by WMLP with various types of locking devices. Seals and locking devices shall not be broken or removed by electrical contractors or other unauthorized personnel. Electrical contractors may request removal of meter seals and locking devices to perform work on service equipment. A one-day advance notice to WMLP is required from the contractor to allow WMLP to schedule personnel to visit the work site. The contractor is required to notify WMLP within one working day of completing work so that WMLP personnel may reseal the meter.

In no case shall a contractor jumper the service without specific authorization from WMLP.

Protection of WMLP owned meters and metering equipment is the responsibility of the customer. Relocation of meters and equipment damaged due to tampering, vandalism or negligence will be at the customer's expense.

Section 11

Motors and Utilization Equipment

- 11.1 **General** – Customers must not use electric service from WMLP in such a manner as to cause unusual fluctuations or disturbances on the WMLP's electric system or to adversely affect the quality of service to other WMLP customers. WMLP reserves the right to discontinue service or require that the customer modify their installation with appropriate control devices.

Motors and other installations connected to WMLP's system must be of a type to utilize minimum starting current and must conform to WMLP's requirements as well as to the National Electric Code and any other applicable code with respect to wiring, equipment type and control devices.

- 11.2 **Supply Voltage** - Alternating-current single-phase motors rated at 5 horsepower or less will be regularly supplied at one of the following voltages:
- a) **Frequently Started Motors** –Nominally 120 volts, provided the locked-rotor current does not exceed 20 amperes, and nominally 208 or 240 volts when the locked-rotor current exceeds 20 amperes. Motors starting more than once in any two-hour period are classified as “Frequently Started”.
 - b) **Infrequently Started Motors** – Nominally 120 volts, provided the locked-rotor current does not exceed 40 amperes, and nominally 208 or 240 volts when the locked-rotor current exceeds 40 amperes. Motors starting not more than once in any two-hour period are classified as “Infrequently Started”.
 - c) **Air Conditioning Motors** – Motors used for air conditioning units that are not thermostatically controlled are classified as “Infrequently Started”. Such motors having a full load running current greater than 7 ½ amperes but less than 15 amperes, shall be supplied at nominal 208 or 240 volts provided the locked-rotor current does not exceed 60 amperes.
- 11.3 **Maximum Size of Motors** – Motors larger than 5 horsepower, but not exceeding 10 horsepower, may, at the WMLP's sole discretion, be accepted for single-phase operation in locations where 3-phase service is not available. Specific approval shall be obtained in writing from the WMLP Superintendent for single-phase operation of motors rated in excess of 5 horsepower.
- 11.4 **Maximum Locked-Rotor Currents** – Motors having locked-rotor current values in excess of those shown on Table 1 shall be equipped with starters, which will limit the current to the values specified.

For multi-motored devices arranged for starting of motors one at a time, the locked-rotor current limits shall apply to the individual motors.

For multi-motored devices arranged for starting two or more motors simultaneously, the locked-rotor current limit shall be that value which would be applied to a single motor having a horsepower rating equal to the sum ratings of the two or more motors.

- 11.5 **Single-Phase Motors on Three-Phase Service** – When multiple single-phase motors are supplied from a three-phase service, they shall be properly balanced across the three phases.
- 11.6 **Three-Phase Motor Supply Voltage** – When WMLP agrees to supply three-phase service, it will typically be at 208 volts nominal. In certain locations, and under conditions specified by WMLP, nominal 240 volt or 480 volt, three-phase power service may be furnished. These voltages are not standard and their availability is solely at the discretion of WMLP. The WMLP shall be consulted as outlined in Section 2.6 and Section 3.4 regarding the proper voltage for each location.
- 11.7 **Size of Three-Phase Motors** – When three-phase service is supplied, motors larger than 5 horsepower shall be three-phase. In general, the WMLP will not make available a three-phase service for any motor of 5 horsepower or less, nor for any group of motors, which in aggregate total 10 horsepower or less, on an individual service.

Single-phase motors, 5 horsepower or less, or any group of such motors may be supplied from a three-phase service, provided they are properly balanced across the three-phases.

- 11.8 **Maximum Locked-Rotor Currents** – The maximum permissible locked-rotor current values in amperes for individual alternating current three-phase motors rated 25 horsepower or less are shown in Table 2. Motors have locked-rotor current values in excess of those shown in Table 2 shall be equipped with starters which will limit the current to the values specified.

For motors rated in excess of 25 horsepower, WMLP shall be consulted prior to installation and will specify maximum permissible locked-rotor currents.

- 11.9 **Protection Against Single-Phase Operation** – Three-phase motors should be protected against the possibility of the failure of any phase on the supply circuit. Providing this protection is the responsibility of the customer and WMLP shall not be liable for failure by the customer to provide proper single-phasing protection of any three-phase motor.
- 11.10 **Undervoltage Protection** – All motors requiring protection against the application of full voltage at starting shall be provided with automatic undervoltage protection. Since occasional system disturbances may dip the system voltages sufficiently to operate instantaneous undervoltage protective devices, causing motors to shut down, it is strongly recommended where such shutdowns may have serious consequences for the customer, that a time delay attachment be added to instantaneous undervoltage devices to enable motors to continue to operate through such disturbances. Providing this protection is the

responsibility of the customer and WMLP shall not be liable for failure by the customer to provide proper undervoltage protection of any motor.

11.11 **Overload Protection** – All motors should be protected against overload by the installation of adequate overcurrent thermal protection devices or their equivalent, which will operate so as to prevent excessive motor winding temperatures. Providing this protection is the responsibility of the customer and WMLP shall not be liable for failure by the customer to provide thermal overload protection of any motor.

11.12 **Phase Reversal** - On motors for passenger and freight elevators, cranes and hoists, or other equipment where reversal or direction of rotation might cause property damage or injury, an approved reverse phase relay should be installed so that the motor circuit will be opened in the event of loss of any phase or phase reversal. 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 rotation is restored. Providing this protection is the responsibility of the customer and WMLP shall not be liable for failure by the customer to provide proper phase reversal protection of any motor.

11.13 **Power Factor** – Individual units of alternating-current apparatus that operate with a power factor below 80 percent will be accepted only with the express and written permission of the WMLP Superintendent.

11.14 **Power Factor Correction with Capacitors** – When the customer desires to, or is directed by WMLP to install capacitors for the purpose of power factor correction, WMLP shall be consulted prior to the ordering of such equipment. Approval by WMLP for all capacitor installations is required to assure that the quality of service to other customers will not be adversely affected by the manner in which such equipment is installed and operated.

(See Next Page for Tables 1 and 2)

TABLE 1
Single-Phase Motors

Maximum Permissible Locked-Rotor Current Values in Amperes
with Related National Electric Code Name Plate Code Letter

Horsepower Rating	FREQUENT STARTING *				INFREQUENT STARTING				Horsepower Rating
	Nominal Service Voltage				Nominal Service Voltage				
	120 Volts		208 or 240 Volts		120 Volts		208 or 240 Volts		
	Am-peres	Code Letter	Am-peres	Code Letter	Am-peres	Code Letter	Am-peres	Code Letter	
1/8-1/4	20	A-L	30	A-V	40	A-U	60	A-V	1/8-1/4
1/3	20	A-J	30	A-U	40	A-P	60	A-V	1/3
1/2	20	A-E	30	A-T	40	A-L	60	A-V	1/2
3/4	20	A	30	A-P	40	A-G	60	A-T	3/4
1	-		30	A-G	40	A-E	60	A-R	1
1 1/2	-		30	A-D	40	A	60	A-L	1 1/2
2	-		30	A-B	-		60	A-H	2
3	-		45	A-B	-		60	A-E	3
5	-		65	A	-		100	A-D	5

* Motors starting more frequently than once in any given two-hour period.

TABLE 2
Three-Phase Motors *

Maximum Permissible Locked-Rotor Current Values in Amperes
with Related National Electric Code Name Plate Code Letter

Horsepower Rating	FREQUENT STARTING **		INFREQUENT STARTING	
	Nominal Service Voltage		Nominal Service Voltage	
	208 or 240 Volts		208 or 240 Volts	
	Amperes	Code Letter	Amperes	Code Letter
1 or less	25	A-L	30	A-N
1 1/2	25	A-G	40	A-M
2	29	A-F	50	A-L
3	39	A-E	60	A-J
5	59	A-E	90	A-H
7 1/2	78	A-C	120	A-G
10	98	A-C	130	A-G
15	143	A-C		A-F
20	189	A-C		A-F
25	237	A-C		A-F

Note: If a motor rated at 480 Volts has no Name Plate Letter, one half of the amperes shown in the table will apply to a 480 Volt motor.

* Refer to Section 11.6 for availability of service.

** Motors starting more frequently than once in any two-hour period.

Attachment 1

Excerpted from WMLP “Study of Underground Policy”, July 1999

WELLESLEY MUNICIPAL LIGHT PLANT

Underground Policy Study – Executive Summary

Objective

To identify major considerations necessary to establish a Town-wide policy that places all existing and future electric, telephone, cable television/internet and fire alarm overhead lines underground.

Key Components Of An Effective Policy

In order for the Wellesley Municipal Light Plant (‘WMLP’) to formulate a successful policy the following minimum requirements must be achieved:

- ◆ Must be accepted and supported by Town Boards and Town Meeting members;
- ◆ WMLP must be able to absorb the additional costs without adversely affecting its ability to compete in a deregulated market – specifically maintaining low rates; high reliability; and financial benefits to the Town;
- ◆ Financial obligation to compensate other impacted entities, e.g. Verizon, Comcast, etc., must be clearly defined and completely independent of the WMLP for funding purposes; and
- ◆ Must be in compliance with all applicable federal and state laws; specifically Chapter 166, Section 22 of the Massachusetts General Laws.

Benefits To Underground Infrastructure

Within the Town of Wellesley the main benefit for the placement of lines underground is one of the aesthetic values to the townspeople. A number of Wellesley residents have expressed their displeasure with the unattractiveness of poles and overhead lines. A secondary benefit is the increased reliability to withstand major outages due to severe weather conditions such as the January 1998 ice and freezing rain that resulted in power outages in parts of New Hampshire, Maine and Canada which had some homes without electricity for almost a week. Contrary to popular belief, underground facilities are not significantly more reliable than overhead lines except in the case of natural disasters. Even if a natural disaster should occur, Wellesley would still be exposed to the New England electrical grid in which more than 90% of the system is supplied by overhead lines.

Cost To Underground Existing Lines

There are significant costs involved to relocate existing overhead systems underground. Given that most of New England utilizes overhead distribution systems it is obvious that the additional cost cannot be justified purely from an operational benefits standpoint. If undergrounding existing overhead systems were found to be cost-effective this practice would have been widely adopted a long time ago by all publicly /investor-owned electric and telephone companies.

For electric utilities the labor and material costs (excluding excavation) to place electric facilities underground is estimated to be more than four times higher than the costs required to supply electricity with overhead lines. As a frame of reference the WMLP's budgeted capital expenditures to rebuild existing overhead lines for fiscal years 1997 through 2000 was \$2.7

million. To replace these same facilities with an underground infrastructure the total cost would have been \$10.8 million, and this does not include excavation.

Of the total cost to place all utilities underground the electrical infrastructure amounts to between 30% and 40%. Chapter 166, Section 22 of the Massachusetts General Laws allows all effected utilities to recover their costs through a 2% surcharge. This surcharge is collected by the utility by adding 2% to each Wellesley customer's bill until such time as all construction costs have been reimbursed.