

# SERVICE MANUAL

Columbia Water and Light Department

Rules, Regulations, and Policy Relating to Installation and Extension of Water and Electric Facilities

For the latest revisions to this Service Manual, please visit the Water and Light home page at <http://www.GoColumbiaMo.com> /Water and Light

## INDEX

<b>SECTION I</b>	<b>GENERAL INFORMATION</b>	<b>Page No.</b>
Section I-1	How and where to obtain information.....	3
Section I-2	Request for service turn-on and turn off.....	5
Section I-3	Request for installation of new services.....	6
Section I-4	Relocation of utility facilities.....	8
Section I-5	Request for meter test.....	9
 <b>SECTION II</b>	 <b>WATER SERVICE</b>	
Section II-1	Extension of water mains.....	11
Section II-2	Metering and connections for water service...	13
Section II-3	Fire hydrants and fire protection.....	15
Section II-4	Backflow prevention .....	16
Water service territory map.....		18
 <b>SECTION III</b>	 <b>ELECTRIC SERVICE</b>	
Section III-1	Extension of electric distribution system.....	20
Section III-2	Temporary electric service.....	22
Section III-3	Residential electric service.....	24
Section III-4	Commercial or industrial electric service.....	26
Section III-5	Electric metering.....	28
Section III-6	Security lighting.....	29
Section III-7	Street lighting.....	30
Electric service territory map.....		31
 <b>GLOSSARY</b>	 .....	 32

<b>SECTION 1</b>	<b>GENERAL INFORMATION</b>	<b>Page No.</b>
Section I-1	How and where to obtain information.....	3
Section I-2	Request for service turn-on and turn off.....	5
Section I-3	Request for installation of new services.....	6
Section I-4	Relocation of utility facilities.....	8
Section I-5	Request for meter test.....	9

## Section I-1 How and Where to Obtain Information or Service

There are four places where customers can contact the utility for information or service. These are identified and located as shown below.

### (a) **Utility Customer Services**

This is a division of the City Finance Department and is located on the northeast corner of 7th and Broadway, 701 East Broadway, telephone 874-7380.

### (b) **Distribution Center**

This is the maintenance, construction, and operating center located at 1514 Business Loop 70 East, telephone 874-2489 for Electric and 874-2489 for Water.

### (c) **Administrative & Engineering Office**

The Water and Light Director, his administrative staff, rate personnel, and Engineering are on the fourth floor of City Hall, 701 East Broadway, telephone 874-2489.

### (d) **The City of Columbia Website**

The website can be accessed at [www.GoColumbiaMo.com](http://www.GoColumbiaMo.com). This site has links to all city departments as well as making it possible to acquire information relating to utilities.

The following is a list of contact information for answers and questions concerning common utility functions or subjects:

<b>FUNCTION OR SUBJECT</b>	<b>PLACE</b>	<b>PHONE (573)</b>
Application, preliminary, for services	Engineering Services	874-2489
Availability of services	Engineering Services	874-2489
Bills, monthly utility	Utility Customer Services	874-7380
Construction scheduling, electric	Distribution Center	874-2489
Construction scheduling, water	Distribution Center	874-2489
Charges for services	Utility Customer Services	874-7380
Deposits for security	Utility Customer Services	874-7380
Dusk to dawn security lights	Engineering Services	874-2489
Electricity, service interrupted (anytime)	Distribution Center	875-2555
Emergency, lines down, etc. (anytime)	Distribution Center	875-2555
Extension of water or electric lines	Engineering Services	874-2489
Energy Conservation	Administration	874-2489
Fees, amount of, for service	Utility Customer Service	874-7380
Information, General	Administration	874-2489
Leaks, water	Distribution Center	874-2489
Lines, downed power	Distribution Center	875-2555
Leaks, lines/downed power (after hours)	Power Plant	875-2555

Location, underground utilities, specific for the purpose of excavating:	1-800-DIGRITE	1-800-344-7483
Location, utility facilities, general, for purpose of planning:	Engineering Services	874-2489
Low voltage	Distribution Center	875-2555
Meter reading or testing	Distribution Center	875-2555
Policy, general	Administration	874-2489
Rates, water and electric	Administration	874-2489
Service, turn-on or turn-off <b>(must appear in person for turn-on)</b>	Utility Customer Services	874-7380
Street lights, not operating	Distribution Center	874-2489
Street lights, request for additional	Engineering Services	875-2555
Tree Trimming or removal	Distribution Center	875-2555
Water, inadequate service	Distribution Center	874-2489

**All after hours calls of an emergency nature relating to either the water or electric utility should be directed to phone number 875-2555.**

For service to new properties, see Section I-2 and I-3. If additional information concerning new services is required, persons involved in the planning of such facilities should contact the Engineering Services office, phone 874-2489.

## Section I-2 Request for Service Turn-on or Turn-Off

Prior to turning on any service, all persons desiring water or electric service must contact the Utility Customer Service office of the Finance Department at 701 East Broadway or via the City website at [www.GoColumbiaMo.com](http://www.GoColumbiaMo.com) and place an order for the services desired; and arrange for payment of the appropriate fees and security deposits. These customer orders are forwarded to the Distribution Center where they are assigned to appropriate service personnel and worked in an orderly manner. No services can be turned on by CW&L until the order to do so is received from the Finance Department. Prior to requesting that water be turned on, the customer should make certain that all faucets and hydrants are closed and that the plumbing is intact. CW&L will turn on the service as soon as possible after receiving the order. However, if the meter indicates a flow after a reasonable time delay, the service will be turned off until the customer arranges to be at the service address when the CW&L service worker is there, to determine what is causing the flow.

It is always preferable for the customer to be at the service address location when the services are turned on; however, it is impossible for the Utility Customer Service office to schedule this time in advance. When a customer orders water and electric service turned on and later finds the electric service on and the water service not on, in all probability the water was left off because of a flow. The customer should call 874-2489 and make an appointment to meet a service person at the address.

For service to existing facilities where the service connections and the meters have been installed, it is generally only necessary to pay the security deposits when requesting service. For new services, other fees may be due, depending upon the circumstances, and these must be paid before service can be turned on. These other fees, in addition to the security deposits, are as follows:

### FOR WATER SERVICE

- (a) Connection fee
- (b) Meter fee
- (c) Appurtenance fee
- (d) \*Tap fee
- (e) \* \*Water main charge (where applicable)

### FOR ELECTRIC SERVICE

Temporary service charge (when required)

For the amount of these fees and a complete listing of charges and deposits, contact the Utility Customer Service office of the Finance Department.

\*Up to 2" paid for at Utility Customer Services, 4" and larger paid at Engineering Services office.

\*\*These charges will need to be determined and paid at the CW&L Engineering Services office.

## Section I-3 Request for Installation of New Services

All persons desiring water or electric service connections to new or previously un-served facilities must provide a service application to the engineering services office located at 701 E. Broadway. This application shall be in the form of a Public Works building permit for residential construction, or a form completed at Engineering Services for multi-family, commercial, or industrial construction.

For multifamily and commercial or industrial projects the following information must be submitted with the application:

1. A site plan showing the location of the facility, property lines and the proposed location of the water and electric services and meters.
2. The type of material and the size of the domestic water service.
3. The type of material and size of the fire line required.
4. A plumbing schematic including plan view and riser diagram showing relative position of meter, valves, backflow preventers, hydrants, stand pipes, Fire Department connections, fixture units, and any other feature which may affect cold water supply.
5. An electric schematic (riser diagram) showing the relative position of transformer, meter, current transformer when required, main disconnect switches, generators, and all distribution panels and subpanels.
6. The phase, voltage, and ampere rating of the main disconnects, all distribution panels, and subpanels and generators.
7. The size, type, and number of conductors for the main service entrance and for all branch feeders and subfeeders.
8. A panel schedule for each panel showing the connected load to each phase.
9. The total connected load, in watts, for each phase of the service.

For apartment buildings or other multiple occupancy facilities the application must also include a numbering or addressing plan, approved by the City Public Works Department and the U.S. Post Office, which will clearly identify and show the location of each apartment and its respective meters.

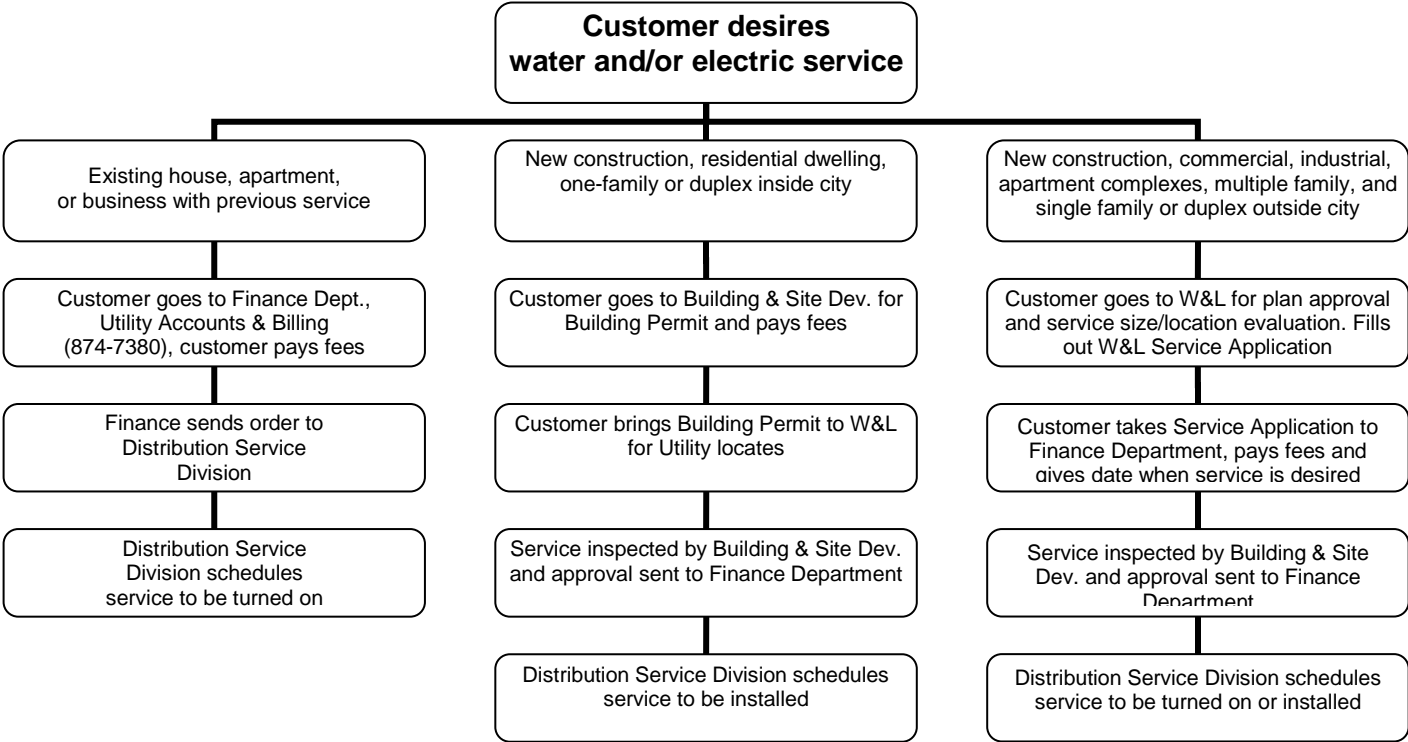
**Note: water or electric service will not be connected until the address is clearly marked on each unit.**

Orders for permanent services shall be completed only after the required inspections have been made.

For single family or duplex residential units, this application is made at the Public Works Department in conjunction with the application for building permit.

Figure I-1 shows a flow chart designed to assist in routing customers to the proper office, in the proper sequence when requesting service.

Figure 1-1



## **Section I-4 Relocation of Utility Facilities**

Any person or parties desiring to have water or electric facilities such as poles, hydrants, meters, transformers, etc. moved or relocated shall contact CW&L's Engineering Services division located at City Hall, 701 E. Broadwy, 4<sup>th</sup> floor. After passing an engineering review for conformance with ordinances and specifications, CW&L will make an estimate of the cost for performing the relocation. The parties requesting the relocation must then deposit with CW&L the full amount of the estimate before the work will begin. Upon completion of the work, CW&L will bill the person or parties requesting the relocation. The charges will be CW&L's actual cost, including overhead, for labor, material, and equipment necessary to perform the work. Any differences between the deposit and the actual costs will be rectified upon completion of the work.

The customer may also, with CW&L Engineering approval, hire a contractor, skilled in the type of work required, to do the work according to CW&L specifications. The customer will be responsible for all charges for any engineering and inspections required of CW&L.



## **Section I-5 Request for a Meter Test**

Customers may request a meter test on the water or electric meters which serve their property. CW&L will perform such test by comparing the meter with a certified standard using approved industry methods.

If the results of such a test show that the meter is accurate, within 2 percent, the customer requesting the test shall pay CW&L for expenses incurred in making the test. If any meter is found to register 2 percent above or below normal, CW&L will bear the expense of the tests. The readings of that meter previously taken for billing purposes shall then be corrected for the disputed time period, not to exceed 90 days, and the customer's bill shall be adjusted, upward or downward according to the percentage of inaccuracy found.

Charges for performing a meter test shall be the actual cost of labor and equipment plus appropriate overhead, as incurred by CW&L unless otherwise set by City Ordinance.

CW&L does advise customers to use discretion and caution in requesting meter tests in order to avoid unnecessary expense, because meters, like any mechanical device, become worn with use, which increases friction and results in the meter running slower or registering less than the normal quantity. CW&L will advise customers in these matters when requested to do so.

All meters found to be inaccurate in excess of industry standards will be replaced by CW&L.

<b>SECTION II</b>	<b>WATER SERVICE</b>	<b>Page No.</b>
Section II-1	Extension of water mains.....	11
Section II-2	Metering and connections for water service...	13
Section II-3	Fire hydrants and fire protection.....	15
Section II-4	Backflow prevention .....	16

## **Section II-1 Extension of Water Mains**

As early as possible in the planning and development stage of any project Engineering Services should be contacted to determine the availability of the utility's facilities and the requirements for providing services.

City ordinances require that all extensions of water mains must continue entirely across the front or other dimension of each lot or tract to be served. The purpose of this requirement is so that the main will be available for further extension in the future without having to install a portion of a main abutting a property which is already served. The term "other dimension" applies when the main is installed along the side or rear of a lot, as may be the case on a corner lot, or where a lot fronts away from the right-of-way being utilized. The location of the main, and the decision as to whether "other dimension" is applicable, shall be determined by CW&L.

Customers may initiate the extension of water mains, as provided by City Ordinances, in one of two ways:

1. A request for permission to extend the mains solely at their own expense can be made by any individual, corporation, developer, or any group of persons.
2. A group of persons desiring a water main extension can petition the City Council to extend the water main and tax bill the abutting property.

### **Method 1**

Under the first method, customers can arrange to extend the water main by submitting a written application for permission to the Engineering Services Division of Columbia Water and Light. The applicant must agree to size, location, and to construct the extension to CW&L's requirements; must agree to assume the cost of the extension; must agree to obtain all easements required; and, upon completion, must agree to transfer ownership of the water main, its appurtenances, and easements to the City. Also, the applicant must assume the maintenance of the installation for one year after transfer of ownership to the City. Upon approval of this application by the Director of CW&L, and receipt of site plans including property lines, easements, streets, and sewers, Engineering Services will prepare a set of plans and specifications for the extension. The plans will indicate the exact location or route to be followed, the size of the main to be installed, and the types of materials which can be used. Any other requirements will be set forth in the plans and/or specifications. The plans will show the location of any required fire hydrants. Engineering Services will obtain Fire Department approval and will furnish the necessary inspection during construction.

The completed plans will be given to the applicant who arranges for and furnishes all materials, and does the actual installation by retaining a contractor experienced in water main work.

Often, it is necessary for CW&L to request that the main be installed larger than the minimum or normal size required by the applicant. When this occurs, the applicant is required to install the requested size main and CW&L will reimburse, with City Council approval, the applicant for the difference in cost between the normal minimum size and the required size. Applicants will be informed of the required pipe size and the estimated difference in the cost between the normal minimum size and the required size. The amount that will be paid by CW&L and other details concerning the installation will be provided to the applicant shortly after receipt of the application to extend the water main.

### **Method 2**

Applicants can initiate a water main extension under method 2 by submitting to the Water and Light Director a written request that the main be extended and the cost of the extension be assessed to the abutting properties. Such an application must contain the signatures of property owners who own at least 51% of the

abutting property. Upon receipt of such application, CW&L will prepare a resolution for consideration by the City Council. The request contains a brief description of the extension, the estimated cost, and any other pertinent information. The City Council will schedule a public hearing on the matter where all interested persons will be permitted to speak, and, based upon the need and the will of the majority, decides whether or not the extension should be made.

If the Council decides in favor of the extension, CW&L will prepare detailed plans and specifications; and the Council will adopt an ordinance authorizing the extension as a public improvement. The plans will then be given to the applicants who will have 30 days to make the extension on their own. If the extension is not made within the 30-day period, CW&L will be authorized to make the extensions, either by contract or with the department forces.

Due to the process involved, this second method requires a considerable amount of time before an actual extension is made. A minimum of two months, and more likely, three months time is required.

**Extensions by CW&L:** From time to time, CW&L does extend water mains at the expense of the utility. Usually these are large mains called transmission mains used for the purpose of delivering large volumes of water to specific areas. However, there may be smaller mains installed to close loops in the distribution system or for other reasons determined by the Director of Water and Light. Any customer having property abutting one of these department installed non-transmission mains may arrange for a service connection to such main by paying the appropriate per foot cost of a main of the same material but of a size as would normally be required for a distribution main in the area. If the main is located in a public right-of-way and customers on both sides of the right-of-way can be served, each customer is required to pay one-half of the appropriate per foot cost.

## Section II-2 Metering and Connections for Water Service

**Meter Required:** Customers desiring water service to new or previously un-served facilities, following submission of the service application (see Section I-3), must order such service at the Utility Customer Service office of the Finance Department and pay the appropriate fees. A separate meter is required for each of the following types of facilities:

- Apartment-Residential Unit
- Boarding or Lodging house
- Commercial Business- A separate meter is required for each business regardless of its location.
- Industrial or Manufacturing plant
- Dormitory Building
- Motel Complex
- Mobile Home Park
- Single Family Dwelling
- Dwelling unit in multifamily building
- Farmstead
- Recreational facility

For facilities not mentioned above, the rule for determining metering units is one meter for each family unit used for residential purposes, except at the owner's option as outlined below, and one meter for each business, industry, public, or religious entity.

Owners of apartment buildings or other multifamily buildings may elect to install a single water meter for each building, but have to pay a connection fee for each family unit. Owners of a mobile home park may elect to install a single water meter for each mobile home provided that the water main system, including all service connections and appurtenances, meets the standard and requirements of CW&L.

Whenever more than one family residential unit is served through a single meter, the monthly charge for water usage is the same as it would be if individual meters were used.

**Service Line:** A standard service line, as provided by CW&L, consists of a water main connection and a service line of the size requested which is extended to the customer's property line. Standard services can be installed, up to 2-inch, only to property adjoining a water main. The standard installation includes the installation of a meter in a below grade meter box located on the customer's property adjoining the property line. While the normal location for the meter is at the property line, it may be located indoors or in another location as approved by CW&L. It is the customer's responsibility to extend the service from the discharge side of the meter to the facility, or from a shut-off valve located near the property line if the meter is located elsewhere. The customer or the customer's engineer shall determine the required size of the service line. CW&L reserves the right to size the meter in order to obtain accurate registration of the water consumed.

**Installation of Meter and Service Line:** CW&L will install a standard service line, 2-inch or smaller, and meter box at the property line upon payment of the appropriate fees. The customer shall furnish and install the service line from the meter to the facility. CW&L will connect the customer's service line to the meter if it is in the correct place at the time the meter and meter box are installed.

For properties served by private water mains and/or private water service lines, where one or more, 2-inch or smaller water meters are required, the meter boxes and appurtenances will be purchased from CW&L and installed by the customer's plumber or contractor. The meter fittings and gaskets will be furnished by CW&L and the customer will be assessed the required fee per meter. Meters will be provided and installed by CW&L, and the appropriate meter fees will apply. For service connections larger than 2-inch, the fee shall be the actual cost of labor, equipment, material, and meter, plus overhead required of CW&L to provide the service. Detailed drawings of typical installations are available at Water and Light Engineering Services.

The customer shall provide a finished grade marker at the property line in the proposed location of the meter or shut-off valve prior to installation. If it becomes necessary to adjust meter or valve boxes for grade difference due to the lack of correct grade information at the time of installation, the cost of such adjustment will be billed to the customer.

The water service line to the property and the meter shall remain the property of CW&L and shall be maintained by CW&L. However, the customer will be held responsible for damage to the meter resulting from the negligence of persons using or occupying the premises. Water service lines cannot be extended across the property of one party to reach the property of another party.

Any water service deviating from the standard service described above, including services larger than two inches, must be handled on an individual basis by contacting CW&L's Engineering Services Division. All costs in excess of those applicable to a standard water service will be billed to the customer. CW&L reserves the right to refuse installation of any nonstandard service when, in the judgment of CW&L, the service is impractical or likely to be unfeasible.

## **Section II-3 Fire Hydrants and Fire Protection**

CW&L will maintain fire hydrants throughout the city wherever adequate water mains exist. The location of hydrants is determined by CW&L in conjunction with the Columbia Fire Department, and in compliance with the standards and specifications for fire protection as established by the Insurance Services Office (ISO).

Approved fire hydrants will be furnished and installed by the developer, in areas utilizing city water.

Supply lines used to provide water to sprinklers, stand pipe, or other fire protection facilities shall be installed, owned, and maintained by the customer. All such installations shall be made in accordance with the standards and specifications of the ISO. When requested, CW&L will make the connection for a fire line to the city main, with the costs for such connection charged to the customer.

There is a monthly fire flow charge to customers based on meter size.

The use of fire hydrants for purposes other than extinguishing fires, or by persons other than authorized employees of the City, is prohibited. However special uses may be permitted by the Manager of Operations.

## Section II-4 Backflow Prevention

To assure that no contamination of the City's water supply will occur, the Missouri Department of Natural Resources requires that each customer maintains the customer's water system in good condition to insure that no cross-connections exists which might allow contaminated water to enter the City's system. A cross-connection is defined by City ordinance as a physical connection between a potable water supply and any waste pipe, soil pipe, sewer, drain, or any unapproved water source. Also, any water outlet which is or can be submerged in waste water or any device, either temporary or permanent, through which, or because of which, backflow can occur is considered a cross-connection and is strictly prohibited.

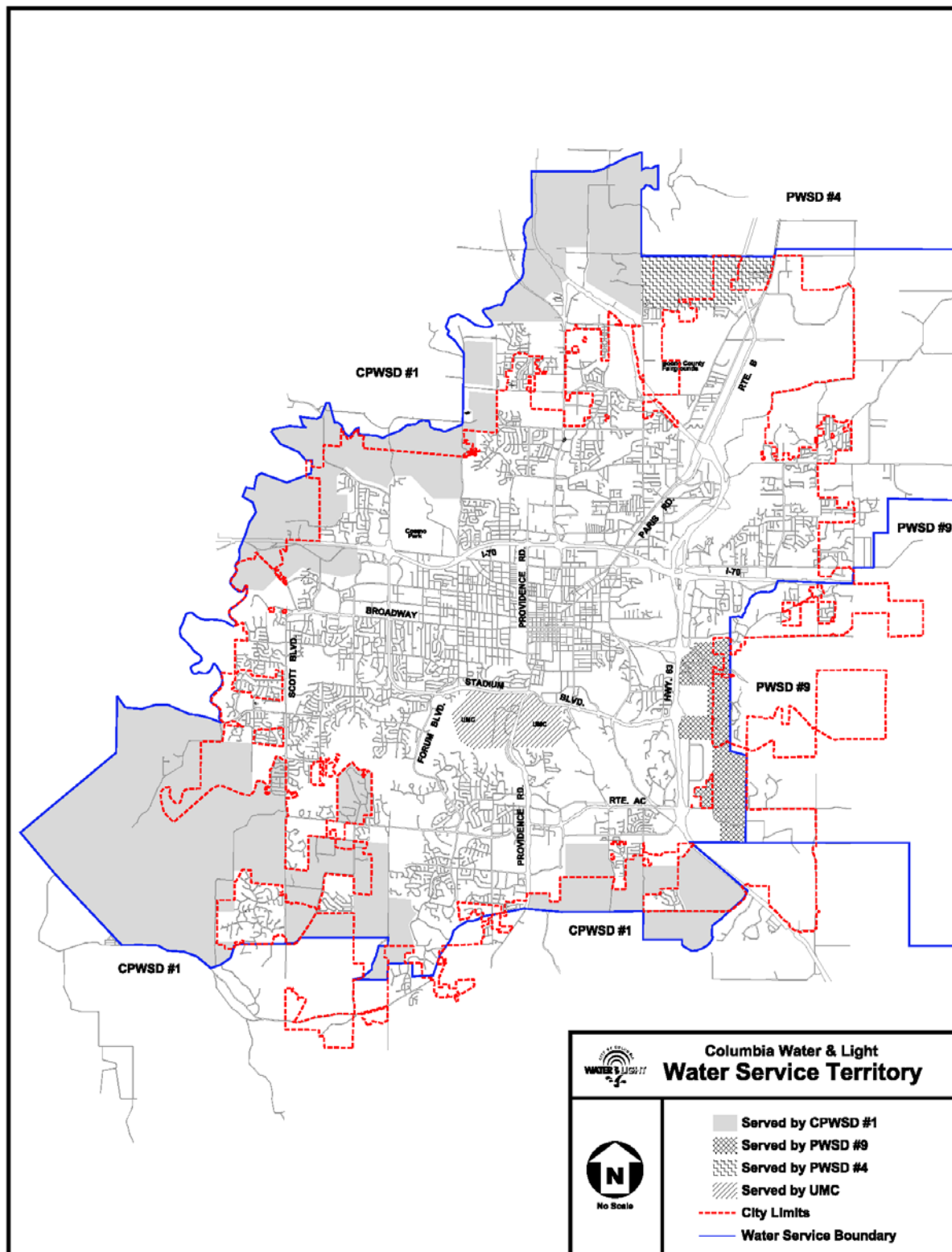
If a cross-connection is found to exist, CW&L will notify the customer and immediate action shall be taken to either remove the cross-connection or install an approved backflow device. If corrective action has not been taken in 15 days, CW&L is required by City ordinances to discontinue service. If, in the opinion of the Water and Light Director, a serious threat to public health is posed by the cross-connection, CW&L may discontinue service without notice. Every attempt will be made to notify the customer of the problem so speedy corrective action can be taken.

Because of the nature of their operation and the chance that backflow could accidentally occur, the following types of facilities are required to install approved backflow devices in their water service lines:

Type of Facility	Type of Device Required
Beverage bottling plants:	AG, or RPD, or DCA
Packing houses:	AG, or RPD
Cold storage plants:	AG, or RPD
Dairies:	AG, or RPD, or DCA
Film laboratories:	AG, or RPD
Hospitals, medial buildings, sanitariums, morgues, autopsy facilities:	AG or RPD
Nursing or convalescent homes/clinics:	DCA
Irrigation system separate from domestic system:	AG, or RPD
Lawn sprinkling system adjunct to domestic system:	DCA
Sewage treatment plant:	AG, or RPD
Laundries:	RPD
Car washes:	RPD
Water loading stations:	AG, or DCA
Industries using toxic substance:	RPD
Stockyards:	RPD
AG	Air gap
DCA	Double check valve assembly
RPD	Reduced pressure backflow device

Any other facility which, in the judgment of CW&L, has the potential for danger to public health from backflow.





<b>SECTION III</b>	<b>ELECTRIC SERVICE</b>	<b>Page No.</b>
Section III-1	Extension of electric distribution system.....	20
Section III-2	Temporary electric service.....	22
Section III-3	Residential electric service.....	24
Section III-4	Commercial or industrial electric service.....	26
Section III-5	Electric metering.....	29
Section III-6	Security lighting.....	30
Section III-7	Street lighting.....	31

## Section III-1 Extension of Electric Distribution System

As early as possible in the planning and development stage of any project Engineering Services should be contacted to determine the availability of the utility's facilities and the requirements for providing services.

**General:** Extensions of the electric distribution system are made by CW&L to any customer desiring service within the CW&L service territory which is not already served by Boone Electric Cooperative. Extensions of the electric system to reach a developer's project will be made at the cost of CW&L. Electric extensions within a developer's project will be made partially at CW&L expense and partially at the developer's expense as described below. Normally electric extensions are made utilizing underground construction.

**Developer's Responsibility:** In a new residential R-1 or R-2 subdivision the developer shall submit to Water and Light Engineering an application to extend electric distribution lines, along with drawings of the final plat and plans for streets, storm sewers and sanitary sewers. The extension will be designed by Water and Light and the developer shall install or pay for the installation of the trenching and conduit system. Materials for these extensions shall be provided by Columbia Water and Light. If the developer chooses to install the conduit system, CW&L will provide to the developer the conduit, secondary boxes, transformer pads, street light posts and pre-cast concrete manholes and switchgear foundation materials for the extension. CW&L will provide a conduit system construction inspector to assist with technical questions and to approve the installation before backfilling. Excavations for conduits crossing under roads, excavations around manholes and under switchgear foundations are required to be backfilled with 1" clean rock. Most other trenches not under roadways may be backfilled with native soil. Some trench excavations in rocky areas will be required to be backfilled with 1" clean rock if the CW&L inspector believes that boulders and/or sharp rocks in the native material removed from the trench may damage the conduit system if allowed to be used as fill. 1" clean rock, where required, will be furnished by the developer. Upon completion of the installation of the conduit system, Water and Light will provide and install all the energized parts, including the conductors, transformers, switchgears, street light luminaries, and other equipment to complete the extension. The developer shall be responsible for coordinating the installation of electric distribution line extensions with the installation of all other utilities and with the construction of streets and other facilities.

The CW&L inspector will record the linear footage of trench that is joint with CATV and telephone companies for the purpose of joint trench billing. CW&L will continue to bill the CATV and telephone companies for their appropriate cost share of the joint trench, and then refund that amount back to the developer.

For internal cost accounting purposes, CW&L requires that the developer submit his cost to open the trench and install the conduit materials and backfill the trench. This information is to be submitted as soon as it is available after the conduit system is complete, and before any permanent meters are plugged into the completed electric system. CW&L also requires that any needed easements be received before plugging in permanent electric meters.

If the developer chooses to pay Water and Light to install the conduit system, CW&L will provide a cost estimate for the installation of the conduit system and will commence work to install the conduit system after receiving a deposit covering the estimated cost of the developer's portion of the work. The developer shall present to CW&L and all other utilities involved, a construction schedule for the area so that all underground systems can be installed in an orderly, logical method. All installations which will be deeper than the conduit system shall be installed prior to the electric extension. All easements and street right-of-ways shall be graded to within 6 inches of final grade and shall be cleared of obstructions such as stumps, dirt piles and other materials, and all lot corners shall be staked and marked for identification purposes prior to the installation of the electric extension. The developer is responsible for the installation of conduits for street and driveway crossings. Conduits should be installed after the surface has been brought to sub-grade elevation and prior to the placing of any base or paving materials. All excavations in streets shall be backfilled and compacted in accordance with the requirements of the City of Columbia Public Works Department.

The developer shall be available on the job site, or shall appoint a representative who shall be available on the job site during all construction phases to see that the schedule is properly observed and to assist with any coordination problem which might arise. The developer shall send notice in writing to the electric distribution supervisor of CW&L indicating the name, phone number, etc. of the person who will be responsible for coordinating the installation. It shall be the developer's responsibility to provide the final grades and to stake out all easements, streets and lots in such a manner that the proper location for the underground extension can be easily and readily determined. If grades or stakes are wrong, or if changes are made after installation of the underground extension, the cost of relocating or rebuilding the system as a result of the change or error shall be paid for by the developer.

**Extensions Outside the City Limits:** When requested, CW&L will consider extensions outside the city limits that are within the CW&L service territory. Such extension will be handled on an individual basis, utilizing the most advantageous type construction and availability of facilities. If the estimated revenues do not appear to be sufficient to make the extension economically feasible, the customer or persons requesting the extension will be required to pay all or a part of the initial cost.

## Section III-2: Temporary Electric Service

**Standard Service:** When requested, CW&L will furnish and install a temporary electric service. When the following conditions exist, the charge for a single phase, 3 wire, up to 100 amperes, temporary electric service shall be seventy five dollars (\$75.00).

- a) The service will be used for the purpose of constructing a building or other facility which, when completed, will be permanently connected to CW&L's electric distribution system.
- b) The permanent facility will utilize a service at the same phase and voltage as the temporary service.
- c) All poles, wires, cables, transformers or other appurtenances utilized or installed, except CW&L furnished temporary service equipment, shall be placed in a permanent location and required for providing the permanent service.

At the above locations, CW&L will furnish and install one temporary electric service consisting of a meter base and meter, two 20 ampere, 120 VAC, grounded, duplex outlets and one 50 ampere, 4 wire, single phase, 240 VAC (208 VAC at some locations) outlet mounted in a weatherproof enclosure, installed on or beside the pole, transformer or secondary box that is to permanently serve the lot or facility. The temporary electric service equipment shall remain the property of CW&L and will be maintained by CW&L.

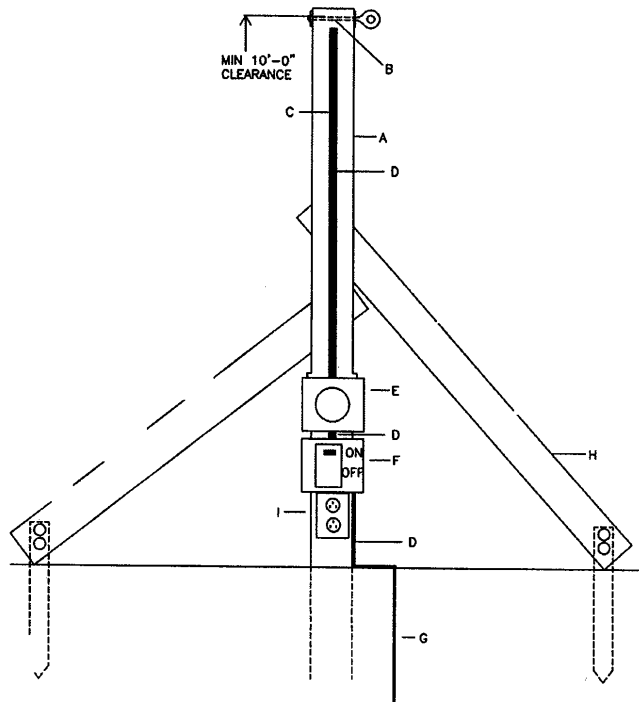
Temporary electric service equipment, temporary poles, etc., shall be placed on the lot where the permanent structure is to be located and shall be located in an area that is accessible and provides a route for the service drop that is clear and free of obstructions. Temporary services shall not be attached to trees in any manner.

All temporary service provided shall be subject to and in accordance with the City of Columbia Electrical Code. The department may disconnect temporary service at any time for failure to comply with the above, or for safety reasons. The department may, without notification, remove any temporary service that has been off for more than thirty (30) days.

**Special Temporary Service:** Temporary electric service to any facility that will not be connected permanently to CW&L's electric distribution system, temporary service of a different phase or voltage other than that will be utilized permanently, temporary service requiring more than 100 amperes, single phase, or temporary service requiring the installation of any poles or wires, or other electrical distribution material or apparatus which will not be utilized permanently, shall be available only if the customer requesting such service assumes all costs incurred by CW&L in installing and removing such service, including the cost of labor, material not salvaged, engineering, supervision and overhead. The customer shall furnish and install the temporary service pole, or other approved support, for attachment of the service drop. The customer shall furnish and install the meter loop, service entrance, etc. All temporary service equipment and facilities furnished and installed by the customer shall conform to the following minimum requirements:

- a) Weatherproof construction.
- b) Minimum capacity of 150 amperes, single phase, 3 wire.
- c) Neutral conductor and all metal parts grounded.
- d) Where a service drop does not cross a public street or alley, the pole shall consist of two-inch by six-inch boards securely braced to withstand five hundred (500 pounds) of horizontal pull at the top in the direction of the service drop.

e) Where a service drop crosses a public street or alley, the pole shall consist of a treated pine, or equivalent, pole having a circumference at the top of fifteen (15) inches or more and of sufficient length to provide eighteen (18) feet of clearance above the street or alley surface. The pole shall be placed a minimum of four and one-half (4 1/2) feet into the ground and braced or guyed to withstand one thousand five hundred (1500) pounds of horizontal pull at the top in the direction of the service drop.



**Figure III-1**

Customer Furnished Temporary Service Support for Single Phase (See Figure III-1)

- a) Service Support timber or pole, minimum 4"x 4"
- b) Weather head (minimum 10 ft. clearance above ground)
- c) Service conductors (no. 6 min) in conduit with clamps, conductor tails of 2 ft. length shall extend out of the riser weather head to facilitate making connections to the service drop wire
- d) Metal conduit for continuous bond
- e) Meter socket
- f) Weatherproof disconnect switch, 30A minimum (customer locked)
- g) Ground connection: ground rod, conductor, and clamps
- h) Braces to adequately support timber or pole
- i) Weatherproof GFI receptacles grounded type

### Section III-3 Residential Electric Service

**General:** The standard electric service to one or two family dwellings in areas zoned for residential use is 120/240 volts, single phase, 3 wire, and shall be either 100, 200, or 325 ampere capacity as required. Residential services requiring 120/208V three phase, or single phase services that are 400 amps or larger are considered non-standard, and are covered under Section III-4. All new residential electric services will be installed underground. (CW&L no longer builds new overhead services except by permission of the Director.)

**Point of Delivery:** For a new standard residential underground service with a single self-contained meter, the point of delivery is the load terminal of the meter socket. For residential services requiring a pad-mounted transformer for the exclusive use of the residence, the point of delivery shall be the secondary terminals of the transformer. Exclusive use shall be defined as a transformer located at the request of a customer due to nonstandard service or unusual lot configuration which prohibits the use of the transformer for any other services or street lighting.

For older pre-existing residential overhead services, the point of delivery is service attachment hook at the weatherhead. CW&L responsibility for maintenance of older overhead services stops at the point of delivery. The customer is responsible for the structural integrity of the service attachment hook on the building, and for the weatherhead, and for the conductors comprising the service entrance from the meter to the crimpets at the weatherhead drip loop where the customer service entrance conductors are connected to the utility overhead service drop triplex conductors. On multiple family dwellings or special applications, the point of delivery may be a junction box, current transformer enclosure, pedestal, distribution transformer compartment, or other suitable point located outside the building and as determined by CW&L. In no case will the point of delivery be inside the building or facility to be served. The connection at the point of delivery will be made by CW&L. The customer is responsible for the installation, upkeep, and maintenance of all wiring on the load side of the point of delivery, except for the meter and associated terminals within a meter base originally furnished by CW&L. Unless as otherwise provided herein, the point of delivery for underground service to a single family residence will be a point on the side of the building which is closest to the electric power source. On duplexes or multi-family buildings designed as rental units, the point of delivery will be near a meter bank centrally located in the rear of the building, or at another mutually agreeable point.

**Underground Services:** Residential underground services extend from CW&L's transformer, secondary vault, or in overhead areas from the power pole located adjacent to the property line to the point of delivery, normally at the meter base, on the side of the building which is closest to the source, and in as straight a line as is practicable. CW&L responsibility for maintenance of underground services from multi-use transformers extends to the point of delivery (usually the meter base) on the building. New services are installed at no cost to the customer except in the event abnormal excavating conditions are encountered, such as rock, stumps, buried debris, or any other material not readily removable by normal trenching methods. The cost of such abnormal trenching will be billed to the customer. The area where the service is to be installed must be at final grade and all obstacles including dirt piles, building materials, etc. must be removed before the service will be installed. The minimum depth for underground service is 3 feet. If the underground service crosses driveways, sidewalks, patios, or any area where normal excavating methods are not practical or permitted, the customer is required to install suitable conduit for CW&L's use in installing the service. Where front lot line construction is utilized and the power source is on the front of the lot, the normal point of delivery on a single family residence is on the end of the building closest to the power source. If the customer requires the service to be on the side of the building opposite from where the CW&L transformer or secondary vault is located, the customer shall install a 2½" gray schedule 40 PVC conduit run with 36" of cover from the meter to a point 5 feet from the CW&L transformer or vault. Customer furnished conduit run shall use tape wrapped galvanized rigid steel 24" radius sweep 45° or 90° elbows at each deflection. Customer installed conduit run shall be inspected by CW&L before backfilling (874-2489).

Any underground service deviating from normal in any way must be handled on an individual basis by contacting CW&L's engineering section. All costs in excess of those applicable to a standard underground service will be billed to the customer.

For residential services requiring a pad-mounted transformer for the exclusive use of the residence, the point of delivery shall be the secondary terminals of the transformer. The connection at the point of delivery will be made by CW&L. The customer is responsible for the installation, upkeep, and maintenance of all wiring on the load side of the point of delivery. The meter may be installed at the transformer or on the building. If installed at the building, the service conductors from the transformer to the meter will be the responsibility of the customer and are to be installed in conduit. The customer shall also furnish and install a suitable sized conduit(s) sized by CW&L engineering and required easements, from the transformer location to the connection to the distribution feeder at or near the property line. The transformer shall be in a mutually agreeable location providing all weather accessibility. This type of service shall be considered nonstandard and will be installed following the requirements for commercial services. (See section III-4)

CW&L reserves the right to refuse installation of any nonstandard service if, in the judgment of CW&L, the service is impractical or likely to be unfeasible.

Where a new residential electric service is required in an area having existing overhead electric distribution lines, CW&L may require that the customer provide an easement in a mutually agreeable location, usually on the street frontage of the property, for a new padmounted transformer. If the new padmounted transformer will be for the sole use of the property, the customer will be required to install the necessary conduit system (see Section III-1). If the new padmounted transformer may be used by CW&L to serve multiple adjacent properties or street lighting, CW&L will install the necessary primary conduit system and pad for the transformer.

**Upgrading or Changing Residential Services:** When a customer requires additional service capacity and provides for such capacity by installing larger service entrance facilities, CW&L will upgrade the existing service under the same terms and conditions as for a new service. When a customer desires to relocate an underground or an overhead service where there is no additional capacity requirement, the change or adjustment will be made at the expense of the customer.

When the customer wishes to convert an overhead service to an underground service, then the customer shall install gray PVC schedule 40 conduit with a minimum of 36" of cover, as per CW&L specifications, from the pole to the meter base, and call CW&L for a conduit inspection prior to backfilling. CW&L will provide a new underground style meter base and standoff brackets for the pole riser and install and terminate the conductors and remove the overhead service at no cost to the customer.



## Section III-4 Commercial or Industrial Electric Extensions and Service Characteristics

As early as possible in the planning and development stage of any project Engineering Services should be contacted to determine the availability of the utility's facilities and the requirements for providing services.

Standard commercial or industrial service voltages available are single phase, 3 wire, 120/240 volt; 3 phase, 4 wire, 208Y/120 volt; and 3 phase, 4 wire, 480Y/277 volt. Primary voltages at 13800Y/7960V are also available to large customers with primary metering. In some areas, distribution systems are in place with other than the standard characteristics listed above. These other characteristics are 3 phase, 3 wire, 240 volt delta or 3 phase, 4 wire, 120/240V 'wild leg delta'. CW&L is actively working to convert these existing three phase delta transformer locations to wye, and no new delta transformer banks will be built, except where special circumstances warrant.

The final determination of service voltage available at any given location within the CW&L service territory will be made by CW&L. Single phase, 3 wire, 120/240 volt commercial overhead service of 400 amp capacity or less will be handled in a manner similar to residential services. All other services will be handled individually. Information may be obtained by contacting the CW&L engineering section.

For condominiums and townhouses, one service shall normally serve two units and the point of delivery will be at the rear of the building at the common point between two units; or in the case of a single unit being served, the point of delivery will be on the rear of the building at the point nearest the power source. The above may also be serviced from a central metering location with the point of delivery being at or near the meter bank. When using a central metering location, should the building require the exclusive use of a pad-mounted transformer the point of delivery shall be the secondary terminals of the transformer. With all of the above, customers must furnish and install a conduit(s), sized at the time of application for service, from the point of delivery to a mutually agreeable location for the transformer or secondary box at or near the property line.

**Installation, General:** When an extension of the electric distribution system is required for all PUD, CP, commercial or industrial zoned projects (not R-1 or R-2 zoning), the same rules for extensions of the electric system as in R-1 and R-2 zonings will apply, except that the developer will be responsible to purchase and provide the conduit system materials, vaults, manholes, and pads needed as specified by CW&L Engineering. CW&L will not provide reimbursement for joint trench billing within these commercially zoned developments. All necessary easements internal to the development are required to be received by CW&L Engineering prior to permanent meters being installed. As with the R-1 and R-2 zoned projects, CW&L requires that the developer submit his cost to open the trench and install the conduit materials and backfill the trench. This information is to be submitted to CW&L as soon as it is available after the conduit system is complete. Failure to submit timely cost accounting of the value of the conduit system may be cause for delay in plugging in permanent meters. Partial submittals of the cost of portions of the conduit system may be submitted to CW&L before the entire cost of the conduit system is known.

The standard commercial or industrial service shall be installed underground and in conduit. Direct buried commercial or industrial service will not be permitted. The customer shall provide the trenching and backfilling, and shall install the conduit from CW&L's source near the property line to the point of delivery on or adjacent to the outside building wall. All PVC conduit installed for CW&L's use must be gray in color and must be approved for electric service. Note: For safety reasons, white PVC pipe will not be approved for use as electrical conduit. CW&L will install the conductors and make the service connections at each end.

**Dedicated Padmounted Transformer:** When a pad-mount transformer is required for the exclusive use of a customer or facility and is placed adjacent to such facility or other agreed on location, the primary connection from the main distribution feeder near the property line to the pad-mount transformer shall be considered as

part of the service facilities and shall be installed by the customer. The transformer must be in a mutually agreeable location 3 feet from buildings or walls and within 10 feet of a paved surface providing all weather access and protection from damage. The primary conduit shall be gray 4" schedule 40 PVC and shall be placed with a minimum of 48 inches of cover below final grade. All 90 degree bends in the primary conduit must be long sweep rigid steel. The concrete transformer pad forms and reinforcement, and the primary conduits must be inspected by CW&L before pouring or backfilling. Detailed drawings are available at Water and Light Engineering Services when applying for service.

**Multi-Use Padmounted Transformer:** When a padmounted transformer serves two or more lots owned by different property owners, the transformer will be placed in an easement or public right-of-way accessible to all properties served. Standard services are then placed underground from the transformer to the point of delivery on the outside of the building. CW&L will furnish and install the high voltage conduit run in an easement from CW&L facilities to the transformer pad, the transformer pad, and the secondary conductors from the transformer to the point of delivery. The customer will furnish the secondary conduit from the transformer pad to the point of delivery which shall be the meter socket, current transformer cabinet, or in the case of multiple meters, the junction box or wiring trough mounted in a mutually agreeable location outside the building and not an unreasonable distance from the transformer. The secondary conduit that is furnished and installed by the customer shall be gray schedule 40 PVC placed with a minimum of 36 inches of cover below the final surface grade and sized as determined by CW&L Engineering.

**Overhead or Nonstandard Services:** CW&L no longer builds new overhead services except where special circumstances are present and by permission of the Director of Water and Light.

**Primary Service:** Primary service at 13,800 wye/ 7970 volts, 3 phase, is available to large commercial or industrial customers and will be provided if feasible. Before approval for primary service is given, the customer will be required to demonstrate that he has the resources and ability to maintain the high voltage facilities and transformers for the facility. For primary service, CW&L will install the primary metering equipment including overcurrent protective devices designed and operated so as to protect the CW&L distribution system from faults and failures on the customer owned equipment. The primary metering equipment enclosure shall be the point of delivery for the primary metered service. The customer will be responsible for the installation, operation, and maintenance of all distribution equipment on the customer's side of the point of delivery; this distribution equipment shall be installed and operated by the customer so as to protect the customer's facilities from faults and failures on the customer's side of the point of delivery. The customer shall be responsible to operate customer owned facilities so as not to cause objectionable system voltage disturbances to neighboring properties (see Code of Ordinances section 27-104 dealing with motor installations and section 27-117 dealing with customer power factor requirements).

**Maintenance and Upkeep of Service Facilities:** CW&L will maintain all service facilities up to the point of delivery. It is the customer's responsibility to provide CW&L personnel access to all service facilities located on the property and to safeguard and protect the service facilities from damage caused by the customer's activities or by reason of the activities of others. The customer is required to install protective guard barriers adjacent to transformers and other surface mounted service equipment whenever such equipment is frequently exposed to hazards caused by vehicles or moving machinery.

Customers will be billed for the cost of maintenance or repair of service facilities which have been damaged due to the activity of the customer or the negligence of the customer with respect to properly safeguarding the service facilities.

**Relocation, Adjustment, or Change to Commercial or Industrial Service Facilities:** If it becomes necessary to relocate or adjust any service facilities for the benefit or convenience of the customer, the customer will be billed the actual cost of any work performed by CW&L. If a customer desires a change from overhead service to underground service, CW&L will share the cost of this improvement according to a division of responsibility whereby the customer will be required to do the trenching and install the conduits,

the same as on a new service; and CW&L will furnish and install the new underground conductors and remove the existing overhead facilities.

## Section III-5 Electric Metering

**General:** A separate meter is required for each residential unit and for each business, industry, commercial activity, school, religious facility, and recreational facility. Unless by special permission an alternate metering arrangement is negotiated with the Director of Water and Light, multi-tenant office buildings may have a single meter on each building provided that no retail business or manufacturing is conducted within. Apartment buildings requiring more than 8 meters may have more than one point of delivery.

Any secondary service with a capacity of 200 amperes or less, will be normally metered using a self-contained meter, where all of the current will flow through the meter. Services with a capacity greater than 200 amperes may also be metered with self-contained meters if, in the judgment of CW&L, the actual current flow at any time is less than the maximum rating of the meter. All other installations will be metered using current transformers (CT's) which allow smaller current flow through the meter which is directly proportional to the load current to determine the customer's actual usage. All meters will be installed in an outdoor location designated and approved by CW&L. Indoor electric meters are not permitted except under special circumstances, and by permission of the Director of CW&L. Meters mounted on buildings are to be not less than 4 feet and not more than 7 feet above the ground. Pedestal mounted meters are to be not less than 3 feet above the ground.

**Self-Contained Installation:** CW&L will furnish the meter base and meter. The customer is required to install the meter base in his service entrance at or near the point of delivery on the outside of the facility to be served, and normally on the line side of the main fused disconnect or circuit breaker. On multiple meter installations the customer shall furnish and install a meter center. CW&L does not allow new installations of multiple individual meter bases or sockets to be banded together and served from a wiring trough.

**Transformer Rated Meter Installation:** When the customer requires a 400 amp or larger service and is served by an exclusive use transformer, CW&L will furnish and install metering CT's on the secondary terminals of the transformer. When the customer is served by a multi-use transformer, the point of delivery is on the customer's building and the customer shall furnish and install a galvanized steel enclosure on the outside of the building with the bottom of the enclosure being at least 24" above ground level. CW&L will furnish and install metering CT's in the customer furnished CT enclosure. The CT enclosure shall be 36" x 36" x 12" deep for services less than 1200 amps, and shall be 48" x 48" x 12" deep for services 1200 amps or larger. CT's will not be installed inside the customer's building except by special arrangement with the customer and approval by CW&L's Engineering division. CW&L will furnish the CT rated meter base and meter. The customer is to furnish and install 1" conduit from the CT location to the CT rated meter base on an outside wall or other location approved by CW&L. CW&L will furnish and install the metering conductors in the customer installed 1 inch conduit.

When large customers are served by more than one exclusive use transformer, each transformer shall have its own metering CT's. If it is decided to consolidate the usage of these meters so that the customer receives only one electric bill based on the total kwhr usage and coincident kw demand of all the meters, the customer shall furnish and install a 1" telephone conduit with telephone cable from the telephone patch panel in the building so as to provide dial tone to the meters. CW&L will then install and remotely read pulse types of meters, and provide the customer with one electric bill based on the totalized kwhr usage and coincident Kw demand of all the meters.

## **Section III-6 Security Lighting**

CW&L will install and maintain security lights, commonly called “dusk to dawn” lights, in any commercial or industrial area of the city when such service is requested. Customers desiring this service should contact CW&L’s Engineering division. The Engineering division will provide assistance in determining the number, location, and size of lights needed if requested to do so. Any new lighting provided by CW&L must comply with the requirements of the Outdoor Lighting Regulations in Section 29-30.1 of the City of Columbia Ordinances.

In areas with overhead electric distribution, the security lights consist of 100 watt full cutoff high pressure sodium luminaires identical to those used for street lighting, mounted on 35 ft wood poles. Luminaires may be mounted on existing power poles or other suitable supports, as determined by CW&L, and connected to existing overhead lines. When no suitable support exists, CW&L will provide a suitable wood pole and one span of overhead wire, at an additional charge, if the request is for lighting in an area with overhead electric distribution.

In areas with underground electric distribution, security lights consist of 100 watt post top luminaires identical to those used for street lighting, mounted on 16 ft black fiberglass poles. CW&L will not provide wood poles and overhead wiring for security lighting in areas with underground electric distribution. If underground wiring or other special devices not shown in CW&L’s rate schedule are required for security lighting, the customer shall provide these items.

A monthly charge is assessed for each security light and for each additional pole. The amount of this charge is based on the watt rating of the luminaire and is designed to cover the cost of the initial investment, the maintenance, and the operating cost of the fixture. For current rates, persons should contact CW&L’s Administrative Office, Engineering, or Utility Customer Services.

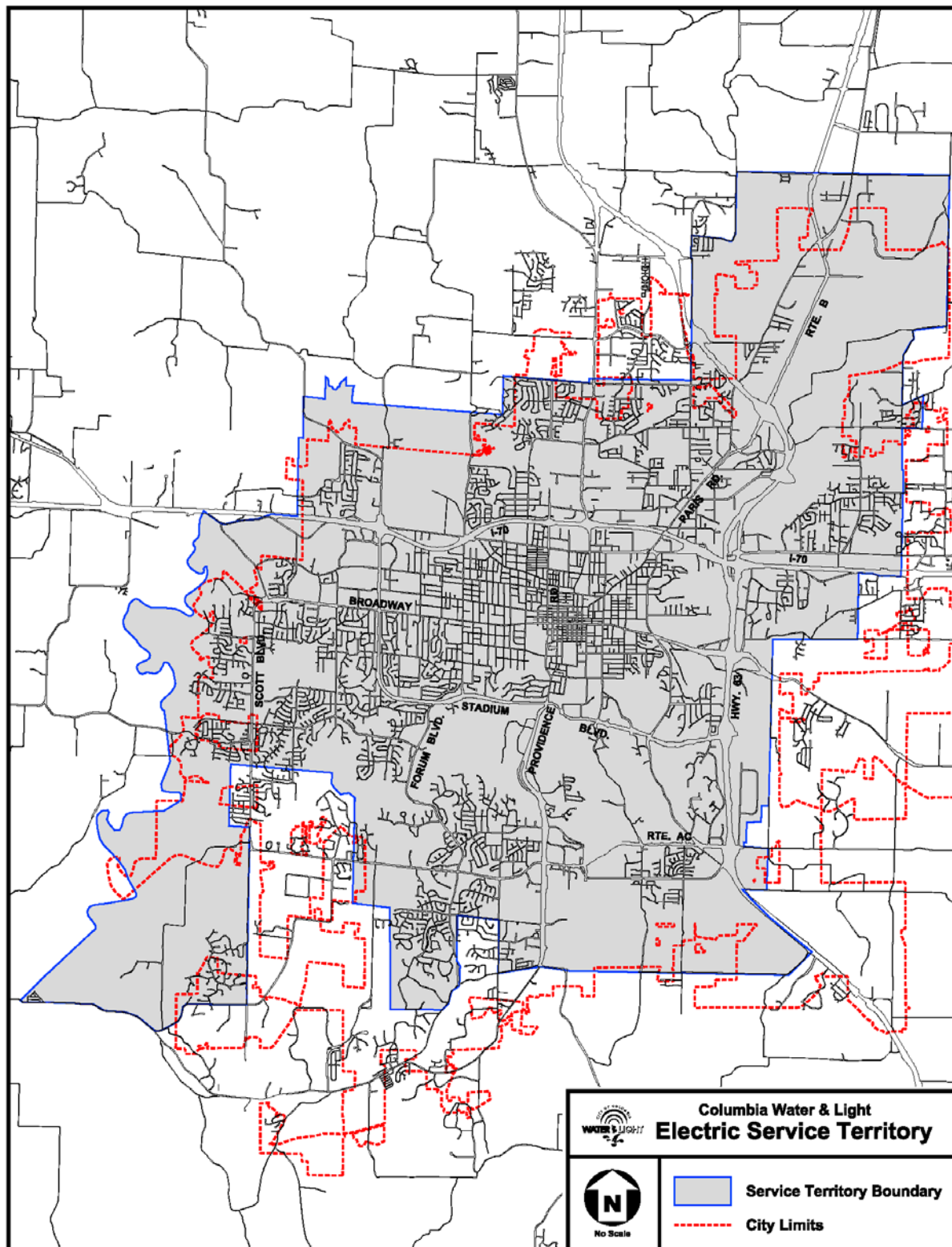
In areas served by or when the customer requests underground facilities, the customer will be required to furnish, install and maintain all conduits and supply wiring. The customer shall contact the CW&L Engineering division for specifications and will provide an “as built” drawing for the installation, showing the location of junction boxes, conduits, etc. The CW&L will install the luminaires and make the connections at the luminaires and at the city power source.

## **Section III-7 Street Lighting**

The City of Columbia provides lighting on public streets and alleys as set forth in city ordinances. The primary purpose of this lighting is to promote safety and convenience for pedestrians and the traveling public. In order for the City to light a street, it must be a dedicated "public way", must be open to the public and have a sufficient traffic volume by the public to warrant lighting. CW&L installs, and maintains most street lighting for the City. Persons desiring information or wishing to request changes to the street lights should contact CW&L's Engineering division. Lights not operating or other maintenance needs should be reported to the CW&L Distribution Division.

Lighting on residential streets is limited to intersections, potential danger areas such as curves or crossings, or at intervals of approximately 400 feet where blocks are extremely long. The purpose of residential street lighting is to promote safety and provide guidance to the drivers and pedestrians using the public way. It is not intended to provide security or other benefits to private property adjoining the street. However, due to the nature of the lights, some light may spill over onto private property near the street lights and the owners of those properties may receive an unintended additional benefit. Requests for street light changes on residential streets will be evaluated by CW&L Engineering Services division on a case by case basis. The installation of additional lights or removal of existing lights on residential streets will require a petition for the changes that has been signed by all residents living adjacent to the proposed change. CW&L will not install or remove residential lighting unless the neighbors living close to the proposed changes are in agreement that the changes are needed.

Due to the higher volume of traffic on collector or arterial streets and the truck traffic in commercial districts, continuous lighting with higher intensity is installed. Lighting in these areas is based on the ANSI Standard RP-8 requirements for roadway lighting as approved by the City Council. These lighting projects are expensive and impact the thousands of people using these major roadways. Requests for the lighting of sections of collector or arterial streets may be initiated by individual citizens, but will be referred to the neighborhood associations through which the street travels to see if there is a public consensus for the additional lighting. If it appears that there is consensus from the neighborhoods to do a major lighting project, the request will then be forwarded to the City Council for authorization and funding consideration. In addition, any lighting installed on State controlled routes or highways within the City must be approved by, and be in compliance with, regulations of the Missouri State Highway Commission. Because of the many state routes in Columbia, and due to the restrictive regulations of the State Highway Commission, it is impracticable for the City to provide street lighting on some routes.



## GLOSSARY

<b>Appurtenance:</b>	Material used to connect a water meter between the source and the customer, including the meter box and cover
<b>Backflow preventer:</b>	Device to stop the reversal of flow of undesirable substances into the public water system
<b>Branch feeder:</b>	Circuit from transformer panel
<b>CATV:</b>	Cable television
<b>CTs:</b>	Current transformers
<b>CW&amp;L:</b>	Columbia Water and Light
<b>Crimpets:</b>	Wire compression connectors
<b>Delta:</b>	Method of connecting transformers for three phase service without a ground or neutral connection
<b>Distribution panels:</b>	Breaker panels
<b>Fire Department connection:</b>	A fitting outside of a building where a pumper truck attaches to the inside sprinkler system and supplies water from an outside source
<b>GFI:</b>	Ground fault interrupter
<b>ISO:</b>	Insurance Services Office. Makes recommendations and sets standards for providing fire protection including fire flow capacities of water mains
<b>Kw:</b>	Kilowatt, a measure of power
<b>Kwhr:</b>	Kilowatt-hour, a measure of energy
<b>Meter loop:</b>	Electrical equipment between the utility and a customer panel
<b>Phase:</b>	Method of supplying electrical current, single phase is used for small demands and three phase is used for large demands
<b>Potable:</b>	Safe to drink
<b>Service entrance:</b>	Electrical equipment between the utility and a customer panel
<b>VAC:</b>	Volts alternating current



**Wild leg delta:** Method of connecting transformers for three phase service

**120/208Y (Wye):** Method of connecting transformers for three phase service