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**ELECTRIC**

**SERVICE**

**REQUIREMENTS**

## **SECTION 1 GENERAL RULES**

### **Section 1.1 Application for Service - Contract**

Electric service shall be provided upon written application, such application being a contract for service, subject to the Electric Service Regulations of the District. Rates shall be as detailed in the applicable Rate Schedule.

### **Section 1.2 Compliance with Codes**

All Customer electrical equipment and wiring must be in accordance with the current edition of the National Electrical Code (NEC) at the time of installation. In addition, the Customer must comply with State and County Codes.

#### **Section 1.2.1 Conflict Resolution**

Any conflict between this policy and the NEC shall be resolved by the Manager of the District.

### **Section 1.3 Inspection Approval Required**

No new service connection will be made unless Contractor's or Customer's electrical work permit is attached to the service entrance or service switch and approved by the proper electrical inspection authority, in accordance with RCW 19.28.210. and District Policy.

No increased, relocated, or otherwise altered service will be reconnected unless Contractor's or Customer's electrical work permit is attached to the service entrance or service switch.

### **Section 1.4 Space and Protection Provision by Customer**

The Customer shall provide sufficient space and exercise proper care to protect District property on his premises. In the event of loss or damage to District property on the Customer's premises arising from neglect, carelessness, or misuse, the cost of necessary repairs or replacement will be billed to the Customer.

The Customer shall provide safe access to metering equipment at all times. This will include keeping shrubs trimmed, pathways clear, dogs restricted, and obstructions removed.

### **Section 1.5 Valid Address Required for Service**

Before a meter can be installed, the Customer must obtain a valid service address from the proper agency. Apartment unit or space numbers are considered part of the valid address.

### **Section 1.5.1 Clear Permanent Meter Marking**

Each meter position and each service switch or breaker shall be clearly and permanently identified by the Customer to indicate the particular location supplied by it. Meters will not be installed nor service energized until marking is complete.

Examples of clear, permanent markings are:

- 1) An identification plate attached by screws or rivets
- 2) Commercially engraved tags with a raised relief surface
- 3) Waterproof paint applied with stencil

Clear identification means an apartment/store space letter or number, or street address/number. The store name may be included; however, it does not constitute a clear designation in itself.

### **Section 1.5.2 Owner Responsibility for Marking Meters**

It is the responsibility of the Owner or Manager of multi-unit complexes to notify the District of any changes in unit or apartment numbering so that the District's personnel may verify metering circuits. Such notice must be given in writing to the District to permit redesignation of meters serving the premises. The Owner or Manager will be responsible for renumbering both the premises and meter sockets prior to dispatch of District personnel.

The Owner or Manager shall be present when the building is initially energized to verify that the proper service is energized as the District's connections are completed.

### **Section 1.6 Load Balance within 10 Percent**

The Customer or his Contractor shall connect his equipment to keep the load, under normal operating conditions, balanced within plus or minus 10% of the average load across the phase wires.

### **Section 1.7 Customer Equipment on District Poles**

No equipment, devices or wiring, other than service entrance equipment belonging to a customer, shall be attached to District-owned poles except by special permission from the District, and any such attachment shall be done strictly in accordance with District specifications.

<b>SECTION 2</b>	<b>SERVICE WIRING</b>
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**Section 2.1 General**

**Section 2.1.1 Availability of Service**

The availability of service for the equipment to be used shall be determined from the District before proceeding with the wiring or the installation of equipment.

**Section 2.1.2 Phase and Voltage To Be Supplied**

The District will advise the Customer of, and supply him with, the most suitable phase and voltage available upon established circuits. Three-phase, 3-wire services are not allowed by the District.

**Section 2.1.3 Fault Current**

The District will advise the Customer of available fault current either at the transformer or the metering point. It will be the Customer's responsibility to provide service equipment rated for the available fault current. In no case shall Customer utilize "cable protectors" ahead of the meter to limit fault duty.

**Section 2.1.4 Service Refusal**

The District reserves the right to refuse to connect, or render service to, any applicant or any Customer where such connection and/or where the applicant or Customer has not complied with State, Municipal, or District regulations concerning the rendition of service.

**Section 2.1.5 Access to Premises for Maintenance**

The District shall have the right, through its agents or employees, to enter upon the premises of the Customer at all times for the purpose of reading, inspecting, repairing, or removing the metering devices, appliances, and wiring of the District. The Customer shall not permit access to such devices by other than accredited representatives of the District. The Customer shall obtain and grant all necessary permission to enable the District to install the service and carry out its contracts.

**Section 2.1.6 Protective Devices**

Suitable protective devices on the Customer's premises may be required whenever the District deems such installation necessary to protect its property or that of its other Customers. See Drawing #35 regarding guard posts for padmount equipment.

**Section 2.1.7 Conductor Common Legs Marked**

All service conductors provided by the Customer will be marked by the Customer or Contractor with colored tape to identify common legs of the service at the point of connection to District facilities. (See Drawings #22, 23, 25, 26, & 27).

### **Section 2.1.8 Overhead Service by District**

Overhead service drops will be run by the District and attached to a connection point acceptable to the District, provided by the Customer, on a Customer's facility. (See Drawings #1, 2, & 4). In the case of metering on a District pole, the District will run the drop to the pole and connect to the customer's wiring thereon. (See Drawings #7 & 8).

### **Section 2.1.9 Underground Service Cable in Conduit by Customer**

The Customer will install underground service conductors in conduit between District facilities and the point of metering in accordance with specifications contained in these Requirements.

## **Section 2.2 Service Supply Conductors - Overhead**

### **Section 2.2.1 District-Provided Service Poles**

The District will furnish and install service poles where they are required. Payment for service poles shall be as determined in Section 3--Line Extension Regulations of the Electric Service Regulations.

### **Section 2.2.2 Metering on Service Pole**

In the case of metering on a District pole, the District will run the drop to the pole and connect to the Customer's wiring thereon. (See Drawings #7 & 8).

### **Section 2.2.3 Attachment Vertical Clearance**

Service drop clearances shall comply with appropriate requirements of the Washington Administrative Code (WAC), National Electrical Safety Code (NESC), and the NEC. Service drop conductors shall not be readily accessible to physical contact. Changes, additions, and/or grading on Customer premises shall not cause clearances under and around service wires to be less than indicated herein. District shall be advised when clearance problems exist. In some cases, Customer may be responsible for costs incurred to restore clearances. Improper clearance is reason for disconnection of service. (See Drawings #4 & 5).

### **Section 2.2.4 Service Conductor Clearances Above A Roof**

The point of service attachment on the building shall be such that both the attachment and the lowest point of the drip loop will be at least 10' above finish grade. The attachment must be high enough to allow 15' of conductor clearance over driveways, and the point of contact should be within 2' of the weatherhead. Where necessary, approved structures to support service conductors and for reinforcement of a building structure to provide adequate anchorage for service drop, conductors shall be provided by Contractor or Customer. (See Drawings #2, 4, and 5).

Conductors shall have a vertical clearance as appropriate for pedestrian and vehicular traffic on roofs as shown on Drawings #4 and 5 herein.

Exception No. 1: Where the voltage between conductors does not exceed 300 and the roof has a slope of not less than 4" in 12", a reduction in clearance to 3' shall be permitted.

Exception No. 2: Where the voltage between conductors does not exceed 300, a reduction in clearance above only the overhanging portion of the roof to not less than 18" shall be permitted if

- (1) Not more than 4' of service-drop conductors pass above the roof overhang, and
- (2) They are terminated at a through-the-roof raceway or approved support.

### **Section 2.2.5 Service Conductor Clearance above Ground**

Service drop conductors, where not in excess of 600 V nominal, shall have minimum clearance from final grade as shown on Drawing #4.

### **Section 2.2.6 Service Conductor Clearances from Openings**

Service conductors shall not be installed beneath openings through which materials may be moved, such as openings in farm and commercial buildings. Overhead wires shall not be run such that they obstruct entrance to these building openings.

### **Section 2.2.7 Service Drop Attachment**

The service entrance must be located where there is adequate material and strength for the District to attach its service drop. The attachment must have sufficient height to provide the required service drop and drip-loop clearances as specified herein. The attachment point must be accessible by ladder.

Preferred points of attachment are building studs or solid masonry at least 1' from a corner. Some trim and soffit boards are acceptable when substantially reinforced. Weatherhead attachments are acceptable provided adequate clearance from the roof is maintained.

Where a mast is over 26" tall or the service attached to it is over 100' long, the mast shall be guyed. (See Drawings #2 & 3 for details).

### **Section 2.2.8 Low Building Provision**

When the building is too low to obtain proper clearance for the service wire attachment, Customer must provide an approved upright or service mast of rigid metal conduit of sufficient strength and height for the attachment of the service drop wires. Minimum acceptable mast shall be 2" galvanized steel conduit. (See Drawings #2 & 3).

### **Section 2.2.9 Multiple Service Entrance-Spacing**

When more than one service entrance is provided on a building, the spacing between the service entrances should not exceed 24" without special permission. Consideration for exceptions would include:

- Fire pumps where separate service is required
- Emergency required standby
- Multiple occupancy buildings with limited space for service entrance
- Capacity requirements in excess of 2000 ampere per service
- Large Area Buildings
- Different electrical characteristics (phase, voltage, phase, etc.)

### **Section 2.2.10 Service Entrance Clearance From Adjoining Property**

Thirty-six inches is required as the minimum permissible clearance between the wall through which the service entrance is brought out and the adjacent property line. The service entrance shall not overhang adjoining property.

### **Section 2.2.11 Rewiring Existing Service Entrance**

The service entrance from an existing supply bus on a building may be changed or increased in capacity at its present location if it is in compliance with existing District Requirements.

### **Section 2.3 Supply Service Conductors Underground**

Service cable and conduit shall be provided and installed in a trench also provided by the Customer. See Section 8 for trench requirements.

#### **Section 2.3.1 Underground Service Cable "Tails" by Customer**

Service cables shall be provided by the Customer in lengths adequate to extend up the pole to the secondary or the transformer terminals (including street crossings). (See Drawing #6). For padmount transformers or pedestal sources, sufficient tails shall be left to reach the appropriate connectors. (See Drawings #31, 32, & 33).

#### **Section 2.3.2 Lateral Not Enclosed**

Service entrance provided from underground distribution systems shall be located and terminated in accordance with District design standards. The service lateral shall not be enclosed within or covered by any alteration, facade, or addition to the building.

#### **Section 2.3.3 Cables Rated for Service Environment**

Cables to be installed in conduit or buried in direct contact with the earth shall be a type designated by the Washington State Department of Labor and Industries or NEC for the application (e.g. direct buried in dirt, in conduit, exposed to UV).

#### **Section 2.3.4 Cable Size and Number of Runs**

The number of runs and service conductor size will be as determined by NEC. The conductor sizes allowed by the District shall be 350 MCM, 250 MCM, 4/0, 2/0, and #2 aluminum. The allowable minimum aluminum conductor size shall be #6 aluminum.

#### **Section 2.3.5 Cable Connection By District at District Facility**

Underground service runs provided and installed by the Customer or Contractor will be connected by the District to District provided facilities. However, conductor sizes larger than 350 MCM shall be terminated with Customer provided, 2-hole NEMA spades, 1-3/4" in width and bolted to the transformer by the Customer or Contractor with 316 Stainless Steel bolts; note Belleville washers and flat washers in accordance with Figure 33.

#### **Section 2.3.6 Cable Connection By Customer at Service**

The Customer or Contractor will connect service cables at the service location.

#### **Section 2.3.7 Cable Maintained by District**

The District will only maintain service wiring installed or owned by the District, except that underground service wiring installed to District specifications between a District facility and the Customer's metering installation will be maintained by the District after a one-year warranty period. Whenever a Customer requests changes to the service that affect the maintenance responsibility, the Customer will be so advised.

#### **Section 2.3.8 Trench Inspection by District**

The service conduit on the source side of metering must be inspected and approved by a District representative after installation in the trench, but prior to backfill. (See Drawings #30, 31, and 32 for details).

#### **Section 2.3.9 Splices Not Allowed**

Splices are not accepted on new cable installations on the source side of metering.

#### **Section 2.3.10 Service Cable Burial Depth**

Underground service to the point of metering shall be installed at a depth of 42".

#### **Section 2.3.11 Riser Conduits by Customer**

All pole risers shall be installed on poles utilizing standoff brackets as indicated on Drawings #6, 7, and #8. The Customer or electrician shall attach only the first 10' section and the District will complete the installation. The Customer or electrician shall provide the remainder of the material and conductor to complete the installation as shown. If a conduit riser exists on a pole, the new riser must be installed using existing standoff brackets and mounted adjacent to the existing conduit.

Primary and service pole conduit shall be rigid galvanized metallic conduit or schedule 80 PVC for the lowest 10' section. Conduit above the lowest 10' section may be schedule 40 PVC. Nonmetallic conduit must be UV resistant.

Riser conduit on a building ahead of the meter base shall be rigid galvanized metallic or schedule 80 PVC. (See Drawing #11).

### **Section 2.3.12 No LB Fittings in Service Conduit**

Conduit installations for District maintained cables shall not include conduit elbow fittings (LB). Standard conduit bends must be used. Bend radius should be 24" or larger. (See sweep specifications, Chart #2.)

### **Section 2.3.13 The Riser Bend**

The riser bend shall be provided and installed by Customer between the continuous conduit and the pole riser. The bend shall be PVC Schedule 40 or Schedule 80, rigid non-metallic electrical conduit. The bend shall be installed at the time of conduit installation. The District will extend conduit up pole. The proper location of the riser bend on the pole (quadrant) shall be obtained from District representative. Where the riser bend is to be extended to a location requiring pole setting, replacement, or alteration by the District, such extension shall not be made until the pole work is completed by the District.

### **Section 2.3.14 Conduits Into Existing Transformers**

Conduit into existing transformers or secondary pedestals is to be installed by the District. The Customer or Contractor shall install conduits for new commercial installations into the secondary area of the transformer site prior to the new transformer installation.

### **Section 2.3.15 Conduit Sealing for Below-Grade Locations**

Termination of secondary distribution conduits within the building below grade is not a preferred installation due to water seepage problems. It has proven to be very difficult to insure long-term water tightness of the conduit and cables through the building wall. It is the Customer's responsibility to provide drainage and sealing as needed to prevent damage to the electrical facilities and other property inside the building.

<b>SECTION 3</b>	<b>METERING</b>
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## **Section 3.1 General**

### **Section 3.1.1 One Main Meter For Service Of Same Type**

The District will furnish and install only one main watt-hour meter to register all energy of the same type of service supplied to Customer at any individual premises, unless

accuracy of measurement, engineering, safety reasons, rates, or legal provisions require the installation of more than one meter except as provided for in Section 3.1.8 below. There may be Customer expense for additional requested meters.

### **Section 3.1.2 Customer Provides Meter Mounting Equipment**

On all new wiring and rewiring of electric services, Customer is required to purchase and install appropriate meter-mounting equipment in accordance with the requirements of the latest Electric Service Requirements Manual.

### **Section 3.1.3 Meter Mounting Equipment Defined**

Meter-mounting equipment includes meter sockets, pedestal supports with concrete pad as required, current transformer cabinet, switchgear, landing pads, and conduits as appropriate for the service. See Section 3.6 for additional details.

### **Section 3.1.4 Series Metering Not Allowed**

Meter shall be located to directly measure Customer load. Series (subtractive) metering will not be allowed unless specifically approved by the District.

### **Section 3.1.5 Failure To Install Meter-Mounting Equipment**

Failure to install meter-mounting equipment by Customer/Contractor meeting these requirements may lead to the delay of service until these requirements are met.

### **Section 3.1.6 UL Approval Required**

The meter socket and any integrated electrical equipment shall meet requirements of the Underwriters Laboratories (UL) and shall be labeled UL approved for the type of service equipment being provided.

### **Section 3.1.7 Industry Standards For Meter Sockets**

Meter sockets shall meet standards contained in the latest revision of UL 414 and ANSI C-12, Code for Electricity Metering, and AEIC-EEI-NEMA Standards for watt-hour meter sockets, EEI Publication MSJ-7.

### **Section 3.1.8 Individual Meters Required**

The District requires the installation of individual electric meters on all units in multi-occupancy residential and commercial buildings and mobile home parks, subject to certain exceptions.

When a customer is receiving both single and 3-phase secondary service, that service will be metered with a 3-phase meter unless otherwise authorized by a District representative.

### **Section 3.1.9 Multiple Meter - Main Disconnect Not Required**

Up to 6 meters will be supplied at a single point of delivery without a main means of disconnect. The equipment shall connect each meter to the service entrance conductors on the line side of each individual service-disconnecting device.

### **Section 3.1.10 Multiple Meter - Main Disconnect Required**

In situations where the number of meters requires a main service disconnect, the individual meters shall be located on the line side (ahead) of each Customer disconnect. Equipment ahead of the meter must have sealing provisions so that District may use padlock-type seals.

### **Section 3.1.11 Adding New Meters To Existing Service**

New meters may be added to the existing service subject to the ampacity limitations of the service entrance conductors or service equipment. If the added loads served from the new meters require rewiring, then all (new and existing) meters shall be located in accordance with the District's current meter location policy.

### **Section 3.1.12 Demand Metering**

Demand metering shall be installed on services when total connected load is 100 kilowatts or more and on all reactive metered accounts.

### **Section 3.1.13 Reactive Metering**

Reactive metering shall also be installed on motor loads exceeding 50 horsepower or when the District determines the power factor of the load would be less than 95 percent lagging.

### **Section 3.1.14 Customer Monitoring**

In the event that demand Customers wish to monitor and control kWh use, the District, as engineering permits, will provide kWh pulses to the Customer equipment. District will own, install and maintain the output device. All pulse metering shall be provided on a cost basis. The end-of-interval timing pulse is not provided.

### **Section 3.1.15 Grounding of Metering Equipment**

All metering equipment shall be bonded to ground rods installed at the location.

## **Section 3.2 Meter Locations**

### **Section 3.2.1 General**

In general, all electric meters must be located outdoors at the point closest to the service drop or lateral termination except as defined below. This policy applies to all new installations and rewire work where the meter and/or service equipment is involved. All meters shall be located and mounted in devices in accordance with the requirements of this manual, and acceptable to the District. The customer shall determine from the

District the location of the service entrance and metering equipment, and any wiring installed without first determining service entrance and/or meter locations as covered above is done at the risk of having to change the service location to confirm with the requirements of the District.

### **Section 3.2.2 Location Not at Rear of Residence**

Residential meters may be located remotely or attached to the residence as shown on Drawing #12. Meters shall not be located at the rear of buildings or in any location that would be fenced in.

Exceptions:

#### **A. Multiple Occupancy Buildings:**

1. Buildings with 4 or more floors constructed for multiple occupancy.
2. General Service Commercial Rate buildings, 3 occupancy floors or less with more than 6 meters per service. Six meters or less per service must be located outdoors.
3. Residential Service Rate buildings, 3 occupancy floors or less with 16 or more meters per service. Fifteen or less meters per service must be located outdoors.

#### **B. Urban locations with District electrical facilities located in alleys.**

### **Section 3.2.3 Meter On Outside Building Line**

Installation of meters on buildings shall be on the outside lines of the building and shall be grouped in such a manner that a single service drop may serve all meters.

### **Section 3.2.4 Meters Shall Not Be Enclosed**

Meters shall not be enclosed in carports, breezeways, porches, or such locations where subsequent additions, rewiring, or remodeling could enclose the meter.

### **Section 3.2.5 Meters shall be grouped**

Meters shall be grouped at locations approved by the appropriate District Engineer or his representative. The number of meter centers in an apartment building shall not exceed 1 for 3 floors without District approval. Meters shall not be installed in commercial buildings above the first or below the first basement level without District approval.

### **Section 3.2.6 Multiple Meter Socket Separation**

Multiple meter sockets shall be arranged so that the minimum vertical distance between socket centers is 10" and the minimum horizontal distance is 8". In addition, no meter socket shall be installed closer than 18" to side wall or ceiling or any other obstruction. (See Drawing #24).

### **Section 3.2.7 Meter Socket Edge Clearance**

A minimum clearance of 18" shall be maintained from the center of the meter base and the service entrance switch, another meter base, wiring troughs, or any obstruction such as down spouts, doors, chimneys, shutters or building projections. (See Drawings #14, 15, 16, & 17).

### **Section 3.2.8 Safe Meter Location Required**

The Customer shall furnish a location to install the metering equipment that is acceptable to the District and that will provide long-term, safe access to District employees, be free from vibration, corrosive atmosphere, abnormal temperatures, dust, water, etc.

### **Section 3.2.9 Meters Shall be Readily Removable**

All meters shall be readily removable, i.e., not plastered in or built in. The surface of the meter base shall not be recessed behind the exterior wall surface. A meter installed in any alley or driveway must be flush mounted on the wall and protected adequately to prevent damage from vehicular traffic. See Drawing #2.

### **Section 3.2.10 Rewire Conformance**

Meter locations required for new or rewire work will conform to this policy even though other existing meters on the premise may not conform. It is recommended but not required that existing meters which are not involved in the wiring work be upgraded to present standards.

### **Section 3.2.11 Meter Location and Rewiring**

Rewiring work shall include the updating of metering equipment and requires that all meters be installed and located in accordance with the requirements of the Electric Service Requirements Manual.

### **Section 3.2.12 Manufactured Home Service location**

The National Electrical Code distinguishes between Mobile homes and Manufactured homes for the purpose of service equipment (NEC 550-23). When installing service to a manufactured home, service equipment can be installed in one of three ways:

1. On a service pole as described in section 2.2.2 and drawing #7.
2. On a service pedestal as described in section 3.3.3 and drawings #14, #16, or #17.
3. On the manufactured home, if both of the following conditions are met
  - a. The manufacturer installed the service equipment at the time the home was built.
  - b. The service equipment meets the meter socket specifications defined in section 3.6 and access requirements defined in section 3.2. and section 3.4.

### **Section 3.2.13 Mobile Home Service location**

When installing service to a mobile home, service equipment can be installed in one of two ways:

1. On a service pole as described in section 2.2.2. and drawing #7.
2. On a service pedestal as described in section 3.6.35.
  - a. The service equipment shall be located in sight from and not more than 30 ft. (9.14 m) from the exterior wall of the mobile home it serves
  - b. The service equipment shall be permitted to be located elsewhere on the premises, provided that a disconnecting means suitable for service equipment is located in sight from and not more than 30 ft. (9.14 m) from the exterior wall of the mobile home it serves. Grounding at the meter shall be as described in section 3.6.39.

### **Section 3.3 Mounting Heights**

#### **Section 3.3.1 Drawings**

Meter mounting heights are shown on Drawings #7, 8, 10, 11, 13, 14, 15, 16, 17, 24, and 26.

#### **Section 3.3.2 General**

Except as otherwise stipulated by the District, individual meter sockets shall be mounted such that the center of the meter opening is between 4'-0" and 6'-0" above grade. The grade shall be reasonably level with no more than a 10 % slope allowed for drainage.

#### **Section 3.3.3 Pedestal**

Underground supplied individual pedestal mounted meter sockets shall be mounted such that the center of the meter is no higher than 48" above grade and no lower than 36" above grade. (See Drawings #14, 15, 16, and 17).

#### **Section 3.3.4 C.T. Meters Mounting Height**

Current transformer rated test switches, phase shifting transformers, and recorders shall not be less than 3' above finished grade or floor immediately below the socket with the reference point the bottom of the device in question.

#### **Section 3.3.5 Protect Meters From Hazards**

Meter sockets and enclosures shall not be elevated to avoid hazards but must be protected from pedestrian and vehicular traffic or parking hazards by Customer. (See Drawing #35 regarding guard posts).

### **Section 3.3.6 Multi-meter Mounting Vertical**

Vertically grouped multi-meter centers shall be installed such that the top meter as measured from the center of the meter opening to grade shall not exceed 6'. The lowest meter measured as above shall be no lower than 3'-0". (See Drawing #24).

Horizontally ganged meter centers shall be installed at the same heights as individual meter sockets.

### **Section 3.3.7 Platforms For Elevated Meters**

When a meter becomes higher than 6' from the ground, a meter access platform may be installed with approval of an authorized District Representative, as shown on Drawing #13.

### **Section 3.3.8 Platforms For Flood Areas**

In flood areas, the bottom of the meter device shall normally be raised above the highest water line on record. Meters, if necessary to raise above 6' from grade, shall have a permanent platform and steps installed and maintained at the meter by Customer for access purposes. The District Engineer should be consulted for specific requirements. (See Drawing #13).

### **Section 3.3.9 Cost of Relocation**

When any changes, alterations, or additions are made on the Customer's premises that violate these requirements, the Customer shall pay the cost of relocating the metering equipment.

## **Section 3.4 Access To Meter Equipment**

### **Section 3.4.1 Meters Not Enclosed**

Meters shall not be enclosed or in any way modified that would impede access to the meter, associated equipment, and the meter seals. Meters shall not be located at the rear of buildings or in any location that would be fenced in.

### **Section 3.4.2 Walkways to Meters Clear**

All pathways or walkways providing access to any meter shall be a minimum of 2' in width and shall be kept clear of any obstacles, including, but not limited to, brush, debris, obstructions, holes, etc. Any pathway or walkway that encounters a ditch of any type over 18" in width shall have a flat, solid, and structurally stable walkway over the ditch with a minimum width of 2'. If the ditch is wider than 6', the walkway shall also be provided with a structurally sound handrail. In this case, structurally sound means a deflection of less than the length divided by 240 when subjected to a live load of 40 pounds per square foot.

### **Section 3.4.3 Work Area Around Meters**

Customer shall maintain a clear access pathway to and in front of meters and metering transformers for District employees at all times for readings, testing, changing, removing, inspecting and servicing such equipment. The clear space in front of the meter equipment shall be 36" deep, as wide as the equipment or 36" whichever is greater and as high as the top of the equipment or at least 6'-6" high. This area shall be clear of all obstructions including piping, ventilating ducts, tanks, steps, rubbish, storage shelves, drums, pumps, air conditioning equipment, decks and other equipment. Working spaces in back of a freestanding switchboard shall not be less than 36" from the panel to the rear wall with provisions for safe exit.

Working space provisions of the NEC, the current issue, Section 110-16 shall be adhered to at the time of installation.

### **Section 3.4.4 Failure to Comply - Consequences**

Failure to provide reasonable and adequate access and clearance may be cause for service to be delayed, refused, or disconnected.

### **Section 3.5 Security Requirements**

#### **Section 3.5.1 Metered And Unmetered Conductors, Same Wireway**

Metered and unmetered conductors shall not be installed in the same wireways, pull box, enclosure, etc., except for at metering enclosures.

#### **Section 3.5.2 Sealing Provisions of Service Equipment**

Adequate provisions must be made for the sealing and security of meter, unmetered service equipment, and circuits. Covers and provisions for sealing of all unmetered service equipment, pull boxes, troughs, wireways, busways, etc., shall be provided by the Customer. Unmetered disconnects shall be sealed by the District and accessed only by the District and the Fire Department. Breakers and fuses will not be allowed in unmetered circuits except for flat rate service as specified elsewhere.

#### **Section 3.5.3 Single Sealing Hasp for Covers**

All meter base covers shall be equipped with 1 or more securely fastened hasp or stud for padlocking and sealing by the District. Depending on the cover size, non-sealable fasteners may be used to mechanically secure the cover in addition to the single sealing hasp. Covers that secure more than 1 meter shall not be allowed by the District.

#### **Section 3.5.4 Sockets Not Energized Without Meters Installed**

Sockets shall not be energized before a meter is set for new services.

### **Section 3.5.5 Unused Hubs or Openings Closed**

Unused hubs or openings shall not be left open. Hubs shall be closed with a blank hub and knockouts with knockout closures, locked in place from the inside. Open, unused breakout, or knockout in meter sockets shall not be allowed.

### **Section 3.5.6 Watertight Meter Equipment**

Raceway or conduit connections at top of meter device shall be watertight and the bottom knockouts closed as detailed in Section 3.5.5.

### **Section 3.5.7 Taps Are Not Allowed In Meter Sockets.**

Unmetered potential taps, including the unmetered neutral potential tap, shall be located behind a sealed panel.

## **Section 3.6 Customer Furnished Meter-Mounting Equipment**

### **Section 3.6.1 Approved Meter Socket Manufacturers**

The District will maintain lists of approved manufacturer's catalog numbers. The District will assist the manufacturer in meeting these requirements by reviewing and commenting on designs and/or manufactured samples.

### **Section 3.6.2 Socket Forms Allowed**

Socket forms allowed or arrangements to provide correct metering for the various systems used in the District are illustrated in Drawing #18.

### **Section 3.6.3 Line-side Installation of Meter Sockets**

Individual meter sockets shall be installed on the line side, ahead of Customer service equipment except as provided for elsewhere.

### **Section 3.6.4 Meters To Be Top Connected**

The supply conductors to a self-contained socket shall be connected to the top terminals, and the load supply conductors shall be connected to the bottom terminals. (See Drawings #19, 20, 21, 22, and 23).

### **Section 3.6.5 Cable Lugs Rated for Conductor**

Customer/Contractor shall provide appropriate cable lugs for the termination of District-maintained conductors. When aluminum conductors are used, the meter socket must be listed or approved and clearly marked by the manufacturer that it is acceptable for aluminum conductor.

### **Section 3.6.6 Oxide Inhibitor Used On Aluminum Conductor**

When aluminum service entrance conductors are used in the meter device, the wire should be thoroughly cleaned with a wire brush and then liberally coated with oxide inhibitor.

### **Section 3.6.7 Meter Base Bonding**

The neutral service conductor may be bonded to the meter base using the grounding screw or bonding terminal. The neutral service conductor may be continuous from the weatherhead to the switch box. (See Drawing #20).

### **Section 3.6.8 Minimum Socket Dimensions**

Sockets for residential underground service shall have minimum socket dimensions of 4-1/2" in depth, 11" in width, and 14" in height. (See Drawing #19).

### **Section 3.6.9 Jaw Clearance From Edge of Socket**

Socket terminal jaws shall be 9/16" below cover or edge of sockets.

### **Section 3.6.10 Automatic Circuit Closing Devices**

Automatic circuit closing devices are not permitted in meter sockets.

### **Section 3.6.11 Surface Mounting of Meter Sockets**

All meter socket equipment shall be surface mounted or flush mounted, not recessed.

### **Section 3.6.12 Steel Constructed Meter Base**

The meter socket shall be of steel construction, weather and rain resistant and have a baked painted finish over galvanized steel sheet. Fabrication with aluminum sheet, fiberglass, or non-metallic material is prohibited. All parts used in the assembly of a meter socket shall be held together by bolts and nuts or pre-threaded housing.

### **Section 3.6.13 Meter Socket Cover Retaining Rings**

Meter Socket Covers May Be Ringless or Ring Type. Meter socket cover retaining rings shall be of stainless steel screw type, or stainless steel toggle-action type. Other types are not acceptable.

### **Section 3.6.14 Metering Devices Shall be Labeled**

Metering devices shall be labeled as to ampacity class, maximum voltage, and manufacturer's name and catalog number.

### **Section 3.6.15 Plumb and Rigid Mounting**

Meter socket mounting must be plumb and rigidly supported to prevent movement, sway and vibration and able to withstand forces of the installation or removal of the meter. Meter sockets not mounted to a permanent structure must be supported in a manner approved by the District. Refer to Section 3.6.43 and Drawings #14, 15, 16, 17, and 26 for a preferred meter socket support.

### **Section 3.6.16 Belleville Washers Instructions**

Contractor must adhere to instructions posted inside the meter socket regarding the installation of the "Belleville Washer." (See Drawing #33).

### **Section 3.6.17 Single-Phase 100 - 200 Ampere Rating**

Services rated between 100 and 200 Ampere Rating shall use a 200 ampere socket (160 ampere continuous duty and/or special socket UL approved for 200 ampere continuous duty).

### **Section 3.6.18 Circular Cast or Drawn Sockets**

Circular cast or drawn sockets may be installed on 2- and 3-wire, self-contained, single-phase services where the size of the service entrance conductors does not exceed #2 AWG and the NEC current rating does not exceed 100 amperes. Sockets of this type must be surface-mounted. This size of socket shall not be used for permanent services without permission of a District Representative. (See Drawings #9 and #10 for Temporary Services).

### **Section 3.6.19 Five-Terminal Sockets Are Required For 120/208**

Five-terminal sockets are required for 120/208-volt single-phase services rated up to 200 amperes. The fifth terminal shall be at the nine o'clock position. A #10 AWG wire from the neutral grounded conductor shall be connected to the fifth terminal. (See Drawing #18, socket type "B").

### **Section 3.6.20 Three-Phase 100 - 200 Amp Rated**

An approved 200-amp continuous duty socket is required on all 3-phase installations rated less than 200 amps, except where trough meters are required.

### **Section 3.6.21 Box or Trough Sockets**

Box or trough sockets may be used in place of circular cast or drawn sockets and are required on 120/208 Volt, 3-wire and 3-phase services. This type of socket shall be limited to self-contained installations with service entrance conductors that do not exceed #2 AWG copper or #1/0 aluminum and the NEC current rating does not exceed 100 amperes. This type of socket shall also be used for instrument meter services but shall be a minimum of 4" deep. The exterior face of the meter base shall not be recessed behind the exterior wall surface.

### **Section 3.6.22 7-Terminal Meter Socket**

Up to 200 ampere 3-phase services require a 7-terminal socket. The neutral tap must be connected to the terminal second from the right on the bottom or load side. The socket shall include a grounding electrode bonding clamp. (See Drawings #20 & 21).

### **Section 3.6.23 High Leg Connection**

The high voltage-to-ground phase conductor of a 4-wire, delta, 3-phase service, shall always be connected to the right-hand terminal, top and bottom. (See Drawings #20 and 21).

### **Section 3.6.24 Single Phase 201-400 Amp**

Single-phase residential services rated between 201 amperes and 400 amperes (320 ampere continuous) shall use a 400 ampere maximum or 320 ampere continuous socket with manual bypass (lever type is required). Approved manufacturers of 320-ampere sockets include:

Millbank NU1079-X, NU1129-0, and NU1797-X  
Anchor U-445242-HLO

Others must be submitted to the District for approval prior to installation. (See Drawings #22 and 23)

### **Section 3.6.25 Clamp Jaw Bypass Required Locations**

Clamp jaw bypass meter sockets are required in the following individual self-contained meter situations unless otherwise approved by a district representative: (See Drawings #22 & 23)

All 3-phase meter sockets.  
All 480-V services  
Single and 2-phase, non-residential services,  
Class 320 residential service meter sockets.

### **Section 3.6.26 Clamp Jaw Bypass Rating**

The clamp jaw bypass meter socket shall be heavy duty, lever operated, clamp jaw with jaw tension release design. Bypass mechanisms failing to meet the requirement to visibly open, close, and clamp the socket jaws shall be rejected. Clamp jaw bypass mechanisms not previously used on District system may be offered to the District Engineering Department for review. The clamp jaw bypass shall be rated to carry 100% of class ampacity continuously. The slider type bypass is not permitted.

### **Section 3.6.27 Safety Shield for Clamp Jaw Sockets**

Bypass type meter sockets shall be provided with a clear polycarbonate safety shield over the socket interior.

### **Section 3.6.28 Duncan 400 Amp Meter Socket**

Single-phase non-residential services rated 400 ampere continuous shall use a 400-ampere continuous rated Duncan socket except where trough meters are required.

### **Section 3.6.29 Single-Phase Greater Than 400 Amp**

Six-terminal sockets with room for test switches are required for single-phase services rated above 400 amperes (two current transformers located in C.T. enclosure). (See Drawings #25 and 26).

**Section 3.6.30 Non-Residential 200 - 400 Amp**

Bolt-in meter sockets equivalent to Duncan meter sockets rated Class 400, shall be used on all non-residential single-phase services rated 201A to 400A.

**Section 3.6.31 Bolt-in Sockets Not For 3-Phase**

Bolt-in meter sockets type shall not be installed on 3-phase services rated 201A to 400A.

**Section 3.6.32 No Three-Phase Class 320 Locations**

Class 320-meter sockets shall not be permitted on any 2- or 3-phase meter installations. Class 320 single-phase sockets are not permitted on non-residential service of more than 320-amp rating.

**Section 3.6.33 Three Phase Greater Than 200 Amp**

Above 200 ampere 3-phase requires one 13-terminal meter base with room for test switch. (See Drawings #27 and 28).

**Section 3.6.34 Combined Fuse/Meter Equipment**

Where Customer disconnects and/or fuses are combined with the meter equipment, the cover for the meter and the cover for Customer access to the switch/fuse and load side wiring shall be separated such that District meter and line-side service compartments may be secured and sealed separately from Customer side. On such combination units, internal barriers shall be permanently installed to prevent access to meters and unmetered wiring via Customer compartments. On multi-meter equipment, the line-side cable terminal compartments shall have sealable and lockable covers separate from meter covers.

**Section 3.6.35 Mobile Home Pedestals**

Mobile home pedestals shall be approved by the District, meet UL requirements, and be appropriately labeled. The pedestal shall be equipped with post extension, be set 2' in the ground, and have a footing base of 36" x 36" x 4" concrete for support. The meter pedestal installation shall meet the requirements as shown on drawing #15. Pedestal owner is responsible to maintain pedestal in plumb (vertical) position and fulfill all other maintenance requirements. (See Section 3.6.44)

**Section 3.6.36 The District Approved Meter Pedestals:**

Murry	Model JCS00CZ	Unicorn	Model MPAP-200
Millbank	Model U3240-0-200	Challenger	Cat. # SMB20 (4-8) SLBN
Millbank	Model U3200-XTLRL	ITE	Model EMC200MB8P
Midwest	Model M282CP6HP	Siemans	Cat. No. MC0816MB1200P
Cuttler Hammer	Model CGBT12M2S		

### **Section 3.6.37 Other Applications of Mobile Home Pedestals**

Other types of installations may use acceptable meter sockets suitably mounted and wired to main disconnecting equipment approved for mobile homes, refer to Drawing #15.

### **Section 3.6.38 Pedestal Meter Height**

Pedestal meter height shall be not less than 36" or greater than 48" from finished grade with the reference point being the center of the meter. (See Drawings #14, 15, 16, and 17).

### **Section 3.6.39 Ground Rod Required**

Every pedestal-mounted meter shall have at least one ground rod at the meter location with a minimum #6 copper ground wire connecting the ground rod(s) to the meter base. Two ground rods are required at the service panel location. (See Drawings #14, 15, 16, & 17).

### **Section 3.6.40 Meter On Same Lot As Customer Served**

A meter pedestal shall be located on the same lot as the Customer being served.

### **Section 3.6.41 Parking Area Protection**

When a meter pedestal is located in a parking area, it must be so located that parked vehicles will not restrict meter accessibility nor meter pedestal be damaged by vehicular traffic.

### **Section 3.6.42 Transformer-Meter Pedestal Clearance**

The meter pedestal shall not be closer than 5' to the side of a padmount transformer without prior approval of the District. (See Drawings #14, 15, 16, & 17).

### **Section 3.6.43 Meter Pedestal Support**

An on-the-job or pre-assembled meter pedestal, which is composed of listed or approved meter socket and conduit or raceways, must be set a minimum of 2' in the ground and secured in a minimum 36" x 36" x 4" concrete slab (see Drawings #14, 15, 16, & 17), and supported by any one of the following:

1. A single 1" x 4" galvanized steel channel
2. Two pieces of heavy duty, 1-5/8" x 1-5/8" galvanized, uni-strut.
3. Two pieces of 2" galvanized rigid conduit.
4. Two pieces of 2" x 2" galvanized angle iron.

### **Section 3.6.44 Meter Socket Maintenance by Customers**

It is the responsibility of Customer/Building Owner to maintain, repair, and replace the meter mounting (socket) equipment in order to keep such equipment in a safe, secure, and useable condition. This shall include any and all maintenance that is discovered by

the District during authorized activities including, but not limited to, meter testing, meter maintenance, meter change-out, meter disconnect or connect. When such equipment is subject to vandalism or damage, it is the responsibility of Customer/Building Owner to remedy the situation by protective measures or by changing meter location.

### **Section 3.6.45 The District Will Perform Emergency Repair**

The District will perform emergency repair in an attempt to maintain or restore service and to protect the public safety. In the event that the hazard posed by the equipment is critical to safe operation, immediate disconnection of service may be necessary until corrections are made by the Customer/Building Owner. The District will notify Customer/Building Owner and the Inspection Authority when an unsafe meter socket and/or service equipment problem is found. The District will allow a reasonable time, normally not to exceed 30 days, for the repair or replacement of meter socket equipment, subject to the hazard involved. The District emphasizes the need for the responsible Building Owner to minimize safety hazards to all concerned by maintaining meter socket equipment and service compartments in a safe and good working order.

<b>SECTION 4</b>	<b>CURRENT TRANSFORMER INSTALLATIONS</b>
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Current transformers (C.T.s) shall be furnished, installed, and owned by the District on single-phase services whose continuous rated ampacity is greater than 400 amperes and 3-phase services whose rated ampacity is greater than 200 amperes. See 3.6.27 for 400 amp continuous rated services.

Contractor installed 1" diameter rigid galvanized conduit shall extend from the terminal strip to the meter enclosure for instrument transformers located within 50' of the meter and 1-1/2" rigid galvanized conduit for instrument transformer located within 150' of the meter. For distances greater than 150', contact the District. No conduit outlet bodies or other non-sealable fixture shall be allowed in the rigid conduit between the C.T. enclosure and meter socket.

Instrument metering socket shall be grounded to the system neutral by a minimum of #10 solid or stranded copper green-colored insulated conductor for distances of up to 50' and #8 copper for distances of up to 150'. For greater distances, contact a District representative. Connections to be made by District Meter Department.

### **Section 4.1 Ampacity Up To 800 Amps**

#### **Section 4.1.1 General**

District C.T.s shall be mounted in Customer provided, owned, installed and maintained enclosure, compartment, box, or as part of panel boards as specified herein. The C.T. enclosure, compartment, box, etc., is dedicated for metering purposes only.

Unauthorized access is not permitted. No Customer equipment or other wiring shall be allowed in or to pass through the dedicated space. C.T.s shall normally be installed on the source-side of the service disconnect - unless otherwise approved by a District Engineer.

**Section 4.1.2 Outdoor Installation**

All C.T.s located outdoors shall be installed in weather tight approved cabinets.

**Section 4.1.3 C.T. Enclosure and Conduit by Customer**

Customer provides the C.T. enclosure with landing pads rated for the service ampacity, installs line and load-side wiring, and provides necessary "meter conduit." The Customer shall terminate all conductors with 2-hole compression lugs or 2-hole set screw connectors may be used for conductor sizes 350 MCM and smaller and bolt all service conductors to the current transformer landing pad. Up to 4 cables per phase may be connected to the C.T. landing pads using "stacking lugs." All connectors shall be bolted to the landing pads with stainless steel bolts, flat washers, Belleville washers and silicone bronze nuts as per detail on Drawing #33.

The high leg conductor of a delta service shall be marked with orange tape and connected on the right-hand side in the C.T. enclosure.

**Section 4.1.4 District Instrument Transformers**

The District provides and installs bar-type C.T.s. The District attaches the C.T.s to the landing pads mounted to the back of the current transformer enclosure and installs the metering conductors and test switches and installs the meter.

**Section 4.1.5 The C.T. Enclosure Sizes Required**

The C.T. enclosure sizes required shall be as listed below.

<u>Service Size</u>	<u>Enclosure size</u>
400 Amperes Single Phase	24" x 36" x 11"
800 Amperes Single Phase	36" x 36" x 11"
400 Amperes 3-Phase	36" x 36" x 11"
800 Amperes 3-Phase	36" x 48" x 11" with Hinged Door

In some instances, larger enclosures may be required to accommodate conductor bending radius requirements.

**Section 4.1.6 Cabinet Cover Size**

Cabinet covers, pull box covers, C.T. cabinet covers, and any miscellaneous service equipment covers shall be limited to 36" by 48". All covers 36" x 48" shall be hinged.

Unhinged covers may be equipped with two handles for removal. All doors shall be equipped with provisions for locking.

#### **Section 4.1.7 Cabinet Mounting Height**

Current transformer enclosures shall be mounted such that the bottom of the enclosure is no higher than 3' above grade or the bottom lower than 6" above grade. (See Drawing #26).

#### **Section 4.1.8 No Meters on C.T. Enclosure Cover**

The cover of an instrument transformer enclosure shall be free of meters or equipment.

#### **Section 4.1.9 C.T. Enclosure Not a Conductor**

The current transformer enclosure shall not be used as a current carrying conductor.

#### **Section 4.1.10 Enclosures Shall Be Grounded**

All outdoor current transformer enclosures shall be grounded with a #6 copper ground wire to a ground rod at the meter location. (See Drawings #25, 26, 27, & 28).

#### **Section 4.1.11 C.T.s Mounted On Service Poles**

C.T.s may be mounted on service poles when the Customer wiring extends directly from the service pole to multiple load centers. (See Drawing #8). The customer shall supply a suitable mounting bracket and mount the current transformers on the service pole.

#### **Section 4.1.12 Mast-mounted Current Transformers Shall Not Be Allowed.**

#### **Section 4.1.13 Outdoor Installation Locations**

The meter device shall normally be mounted on an outdoor building wall, a remote pedestal, or a service pole. The meter enclosure or socket, subject to meter location policy, should be located as close as practical to the C.T.s. Enclosures shall not be located in carports, breezeways, porches, or such locations where subsequent addition, rewiring, or remodeling could enclose the enclosure. An enclosure installed in an alley or driveway must be recessed in the wall or protected adequately to prevent damage from vehicular traffic.

#### **Section 4.1.14 Metering Not On District Equipment**

Metering, except current transformers, shall not be mounted on or in District equipment except on service poles if approved in advance. All pole-mounted meter equipment shall be grounded with a #6 copper ground wire to a ground at the meter location. (See Drawings #7 & 8).

## **Section 4.2 Service Ampacity Larger Than 800 Amperes**

### **Section 4.2.1 Switchgear C.T.**

For services with ampacity greater than 800 A, the C.T. enclosures shall be part of the Customer service panels or switchgear. The District should be consulted for review of compartment size and service prior to purchasing and installing equipment. The C.T. space shall have bus bars through the C.T.s that are removable from within the C.T. compartment space. The C.T.s shall be furnished and installed by the District. Cables must be landed on hardware independently supported from the bus link through C.T. window. Cables shall not be brought through the C.T. window. Customer or Contractor shall terminate all conductors with 2-hole connectors and bolt to the current transformer landing pad bus bars. (See Drawing #29).

### **Section 4.2.2 Enclosures To Be Accessible**

Enclosures shall not be installed on ceilings. If the enclosure is installed on a balcony or platform, it must be available by a permanent stairway and be surrounded by a railing, both of which conform to OSHA requirement.

### **Section 4.2.3 C.T.s Readily Accessible**

On switchboards, the instrument transformers shall be installed in such a manner as to be readily accessible after all bussing is in place. Installation plans regarding size of cubicle and placement of equipment shall be approved by the District before switchboard manufacturing. Neutral connections for metering shall be readily accessible and sealable.

### **Section 4.2.4 Unmetered Conductor Compartments Sealed**

All sections of the switchgear that contain unmetered conductors shall have provisions for sealing compartment doors or covers.

## **Section 4.3 Primary Voltage Meter Installations - Over 600 V**

### **Section 4.3.1 C.T. Locations Allowed**

Primary service is metered either with

- (1) instrument transformers, outdoor mounted on pole,
- (2) outdoor station mounted instrument transformers,
- (3) instrument transformers mounted inside Customer owned switchgear or
- (4) inside padmounted transformer meter enclosure. District provides and owns instrument transformers and other metering equipment.

The primary metering shall be located at the interface between District facilities and the Customer's facilities.

### **Section 4.3.2 Main Disconnect by Customer**

Customer shall provide incoming line main disconnect. Customer main disconnect is normally required on line-side of District metering instrument transformers. Gang operated disconnect switches may be required in some locations.

### **Section 4.3.3 District Approval for Service**

Customer, Consultant, or Contractor shall inform the District of proposed service needs such that District will provide specifications pertaining to District requirements before Customer equipment is purchased or work started. District requirements include but are not limited to load, voltage, location, electrical and physical arrangements, relaying needs pertaining to overcurrent protection of District distribution facilities, and transfer scheme as well as metering.

### **Section 4.3.4 Dedicated Compartment for Metering Equipment**

Customer owned switchgear will contain dedicated compartment(s) for the purpose of housing District provided instrument transformers, i.e., current and voltage transformers, for metering purposes. Customer provided meter compartment shall have a minimum width of 36". This compartment must be dedicated to District equipment such that front and rear hinged doors shall be provided with padlocking and sealing provisions by Customer for securing by the District. Customer equipment shall not be located within or accessible through this dedicated compartment.

### **Section 4.3.5 Padmount Metering Enclosure**

Customer owned padmount-metering enclosures shall be as per District specification. The metering enclosure shall be installed on a concrete pad as per District specifications. The instrument transformers shall be installed and maintained by the District. Access shall be limited to District metering equipment. Clearances from buildings, other pedestals, etc., shall be the same as required for padmount transformers. (See Drawing # 29).

### **Section 4.3.6 C.T. Meter Location**

Contractor shall install one meter enclosure for each set of instrument transformers at a District approved location. For indoor switchgear, it is required that the meter enclosure be located on an outdoor wall.

### **Section 4.3.7 District Instrument Transformers**

District shall provide, own, and maintain potential and current transformers and associated equipment.

### **Section 4.3.8 Pole Mounted Primary Metering**

District owned primary voltage instrument transformers for metering and meter enclosure will be mounted on District owned pole, if pole mounted.

#### **Section 4.3.9 Customer Provides Switches, etc.**

Customer provides - switches, fusing or other over-current protection, lightning arresters, grounding, and all primary wiring to Customer service equipment to District requirements.

#### **Section 4.3.10 District Provides Transformers**

District provides transformers and mounts on pole instrument transformers on cluster support, meter enclosure, and interconnecting meter wiring and conduit, if pole mounted.

#### **Section 4.3.11 District Mounted Equipment**

District mounts pole switches, fusing, or other over-current protection, lightning arresters, and installs the associated grounding. District completes primary connections of Customer wiring to District primary voltage supply conductors and instrument transformers.

#### **Section 4.3.12 Customer Review Requirement**

Customer/Contractor should contact District to get standard drawings and specifications giving details of Customer requirements before work is started.

#### **Section 4.3.13 Conduit for Instrument Transformer Metering**

The conduit between C.T. location and meter device, shall be Customer installed (unless pole mounted in which case District will install the customer provided conduit). Customer wiring is not permitted in this conduit. District will provide, install, and connect the C.T. metering conductors. (See also meter grounding below (Section 4.3.15)).

#### **Section 4.3.14 Metering Conduit Length**

The Customer shall provide 1" rigid conduit for distances less than 50' and 1-1/2" rigid conduit for distances less than 150' between the meter socket and the current transformer enclosure. For distances greater than 150', contact the District. No conduit outlet bodies or other non-sealable fixture shall be allowed in the rigid conduit between the current transformer enclosure and the meter socket.

#### **Section 4.3.15 Meter base grounding**

District shall provide and install a No. 10 AWG solid or stranded copper wire in the same conduit with the meter wiring for distances up to 50' and #8 copper for distances up to 150'. For greater distances, contact the District. Connections to be made by District Meter Department.

#### **Section 4.3.16 C.T. Enclosure Sealed**

All Customer-provided C.T. enclosure covers shall be provided with a hasp for padlocking. If the C.T. space is part of panel boards or switchgear, the C.T. space shall be partitioned from within and covered with its own separately sealable steel cover or door.

**SECTION 5****CUSTOMER WIRING AND INSTALLATION****Section 5.1 Notify District of New or Rewire Work**

Customer or Contractor should promptly notify the District (refer to Section 1) of the electrical work planned. Prompt notification will minimize wiring problems and avoid unwanted delays when work is completed.

**Section 5.2 Wiring Inspection**

Customer wiring may be subject to inspection and approval by Washington State Wiring Inspector. Contact Department of Labor and Industries for requirements.

Circumstances generally requiring wiring approval before service can be connected or reconnected are:

New wiring is installed or existing wiring is added to, repaired, or altered.

Fire - Service has been ordered disconnected by the Fire Department, disconnected by the Fire Department themselves, or disconnected by the District personnel because of hazard to the public.

Storm or Vandal Damage - Disconnected by the District personnel because of danger or hazard to the public. The District will promptly notify the inspection authority.

Ordered disconnected by an electrical inspection authority because of defective or hazardous wiring.

Disconnected by District personnel upon observing a hazard to the public caused by Customer wiring. The District will promptly notify the electrical inspection authority.

Disconnected by District personnel at the request of the Customer or their electrical Contractor in order to add to, repair, or change the wiring. (Contractor can usually arrange by telephone for the electrical inspection authority to give verbal wiring approval to the District).

**Section 5.3 Emergency Repairs After Hours, Weekends and Holidays**

Reconnection can be made for emergency reasons if Contractor provides the District with electrical license number. The District will promptly notify electrical inspection authority of this action.

#### **Section 5.4 Diversion of Service**

It is illegal to tamper with a District meter and to make unauthorized connections and reconnections in service and C.T. equipment, at service outlets, to service cables, and overhead wires with the intent to divert electric service. Such diversion is subject to service cutoff and legal action.

#### **Section 5.5 Contractor Access**

Contractor may access Customer-owned and District secured meter and C.T. equipment in the pursuit of legitimate work. The Contractor is required to inform the District within 24 hours of this action and the work intended, by calling the appropriate District office. Failure to provide prompt notification will cause access to be considered unauthorized and subject to legal action.

#### **Section 5.6 Grounded Neutral**

All secondary A.C. supply systems shall have a grounded neutral or grounded conductor run from the District point of distribution to Customer service entrance disconnect equipment and approved ground. A grounding electrode system approved by the NEC at the time of installation is required at all services.

#### **Section 5.7 Water Pipe Bonding**

Customer/Contractor shall install a grounding conductor as prescribed in the NEC. When bonded to a cold water pipe, the ground wire shall be attached by means of an approved ground clamp. This connection shall not constitute the sole equipment ground.

#### **Section 5.8 Communication Bonding**

Telephone and/or other electronic equipment may require grounding external to Customer premises. Such ground connections are not permitted inside District sealed and secured cable and meter compartments.

#### **Section 5.9 Distribution Center Pole Metering**

Farm Customer may desire service at a number of locations making it uneconomical to distribute from a meter located at the residence. In such cases, Customer can request a distribution center pole on which District meter is installed and from which Customer extends service to the various locations.

#### **Section 5.10 Transfer Equipment**

Transfer equipment, including transfer switches, shall operate such that all ungrounded conductors of District source of supply are disconnected before any ungrounded conductors of the second source are connected.

#### **Section 5.11 Customer Generation**

The following general requirements apply to customer generation facilities designed to operate directly connected to the District's electrical system (parallel operation) and

those that are designed to operate isolated from the District's system (non-parallel operation). Requirements and specifications for various types and sizes of customer facilities shall be obtained from the Customer Service Representative prior to installation.

A) Standby Generation (Non-Parallel Operation)

The Customer may install a standby generator to supply all or part of the load in the event of a service interruption. The customer's wiring shall be arranged so as to prohibit the interconnection of the District's service and the customer's alternate source of supply. This will require the installation of a double-throw switch or its equivalent as approved by the District. Sketch #37 schematically illustrates some typical installations of standby generating equipment.

B) **Note:** Precautions must be taken where alternate means of generation are employed, whether emergency or otherwise, to eliminate the possibility of electrical connection between the District's service and the customer's alternate source of supply. The customer must notify the District and provide electrical details of generator installation and isolation from the District's system Auxiliary Generation (Parallel Operation)

Prior to the installation of any auxiliary generator facilities (e.g. wind turbine, solar panel, etc.) the customer must notify the District to obtain approval for the facility's protective and synchronizing equipment arrangement.

C) Cogeneration (Parallel Operation)

Cogenerators are defined as facilities that produce electrical energy and utilize the heat energy by-product for other purposes (e.g., heating or cooling). The customer must notify the District prior to the installation of this equipment in order to provide design information and obtain approval for connection of the equipment the District's facilities.

<b>SECTION 6</b>	<b>MOTORS AND APPARATUS</b>
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**Section 6.1 General**

Customer is advised to consult the District before purchase, installation, or wiring of motors or other apparatus to determine the kind of service that will be supplied and the manner in which such equipment should be connected.

**Section 6.2 Motor Characteristics**

All motors, apparatus, and appliances shall have such characteristics, which enable the District to maintain a satisfactory standard of service to Customer being served and all

other Customers in the immediate area, including starting current and harmonic characteristics. Customers shall install no motors whose starting shall cause a voltage drop greater than 3% at the service meter point nor greater than 2% at a neighboring point of service. Changes in District service equipment to accommodate such motors may be at Customer expense.

### **Section 6.3 Service Type Designation by District**

The District reserves the right to select the type of service to be supplied and should be consulted before equipment is purchased or ordered. The single phase of motors 7-1/2 horsepower and larger or where the aggregate load of smaller motors is more than 20 horsepower require the approval of the District.

### **Section 6.4 Motors Starting**

Industrial Motors (covers all other applications). These applications up to and including 25 horsepower would be permitted to be started across the line. Over 25 horsepower would require starting facilities, which are subject to approval by the District.

### **Section 6.5 Special Motors**

Special Motor consideration will be given to:

- 1) Application of 3-phase motors beyond single phase conversion devices and
- 2) Larger single-phase motors with current limiting starting mechanisms.

<b>SECTION 7</b>	<b>PROTECTION AGAINST ABNORMAL CONDITIONS</b>
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### **Section 7.1 Undervoltage Protection**

All motors and special apparatus should be equipped with suitable undervoltage time delay tripping devices to protect against sustained undervoltage or service interruption and to prevent automatic disconnection of equipment upon momentary voltage disturbance.

### **Section 7.2 Single-Phase Protection**

Three-phase motors should be equipped with suitable protective devices to prevent single-phase operation, improper direction of rotation and excessive heating due to overcurrent.

### **Section 7.3 The District Will Not Be Responsible For Damage**

The District will not be responsible for damage to Customer equipment due to failure of Customer to provide adequate protection.

#### **Section 7.4 Uninterruptible Power Supply**

Customer should consider installing an Uninterruptible Power Source (UPS) or voltage suppressers where momentary or extended outages or voltage fluctuations will cause inconvenience, loss of electronic memory, or trip alarms, etc.

<b>SECTION 8 TRENCHING REQUIREMENTS</b>
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#### **Section 8.1 General Cable Trench Requirements**

a. Customer Provided

All trenches shall be provided by the Customer. Inspection and acceptance by the utility's representative is required.

b. Definition

Trench shall be defined to mean trenching, bedding, backfilling, restoration, and maintenance of subsequent ditch settling for electrical cables and conduits.

c. Notification

The District, all participating utilities, and the Underground Locating Center, shall be notified a minimum of 48 hours in advance of the date and time for the right-of-way trenching and facility placement. Locating services notification is required by state law.

#### **Section 8.2 Root and Rock Restrictions**

The trench shall be free of rocks or roots greater than 2" in diameter.

#### **Section 8.3 Specification Drawings**

The trench shall be dug to the specifications shown on Drawings #30, 31, & 32, unless otherwise approved by a District representative.

#### **Section 8.4 Water-Free Trench**

The Customer is responsible for installing well points, pumping, or other measures to provide reasonably water-free trenches.

#### **Section 8.5 Access, Construction**

To facilitate installation, the Customer shall place all excavated material in a manner, which allows the District's installation vehicle to drive on the opposite side of the trench

the full length of the project unless other specific arrangements are approved by the District representative.

### **Section 8.6 Sloping and Shoring**

Any area where District personnel must enter the trench shall be excavated in accordance with Chapter 296-155 WAC of the Washington State Safety Code. The Code requires that the excavated material be at least 2' from the edge of the trench and that any trench over 4' deep be sloped, shored, sheeted, or otherwise adequately protected.

### **Section 8.7 Joint Use Of Trenches**

District rules and applicable codes require a minimum vertical separation of 1' between electric cables and telephone or telecable utilities. The District must be consulted regarding water line joint use. No sewer lines will be allowed in any electrical trench. (See Drawing #30).

#### **Section 8.7.1 Random Lay**

Electric cables and communication cables may be buried together at the same depth with no deliberate separation between facilities provided certain requirements are met. Consult with the District to determine if conditions can be met at particular sites.

### **Section 8.8 Permanent Access**

All surface areas above direct-buried cable and cable in conduit must be accessible for future District operations including, but not limited to, maintenance, location repair, and replacement. The Customer shall not construct any building, fence, landscaping device, or other obstruction over the direct-buried cable route that restricts said access. In addition, customers should consider that cable in conduit routes may also need to be accessed in the event the conduit system fails or otherwise needs to be repaired or maintained. All transformers and other aboveground devices must remain accessible to District vehicles at all times and the opening side of the device must have at least 10' of clearance from any obstruction. The District handout on padmounted equipment requirements provides more details. (See Drawings #34 and 35). Failure by the customer to maintain accessibility to all District facilities may result in delays in repairs and the restoration of service to the customer.

### **Section 8.9. Cable Pulled Into Continuous Conduit**

When service cable is installed in continuous conduit, the cable shall be pulled into conduit after it has been assembled (conduit shall not be installed by slipping over cable as it introduces rock and dirt into the conduit and does not allow for an adequate sealing procedure). See Chart #2 for minimum conduit and sweep sizes allowed for conductor sizes.

### **Section 8.9.1 PVC Joints Must be Glued**

Each PVC conduit joint must be permanently glued, prior to cable installation.

### **Section 8.9.2 Maximum Number of Bends in Service Conduit**

Total number of bends in a service run shall not exceed 360 degrees. All bends shall be long radius type (24-inch minimum). See Chart #1 for minimum sweep dimensions for various conduit sizes.

### **Section 8.9.3 Conduit Under Buildings**

The District will only allow power lines to be installed under a building when it is absolutely unavoidable and must have written approval of the Manager of the District.

- a. The required conduit(s) shall be paralleled by an equal spare conduit(s) from the pole to the vault or between vaults.
- b. Conduits shall not pass through nor conflict with the building's foundation walls.
- c. Conduit(s) shall be encased in concrete. Minimum encasement shall be 2" thick on all sides of the conduit.  
Exception: The concrete encasement requirement can be waived if the building will have a minimum 4" thick concrete slab first floor and no basement.
- d. A Hold Harmless Clause will become part of the power line easement.
- e. Total number of bends shall not exceed 180 degrees.

### **Section 8.10 Equipment Locations Permanent**

The Customer is responsible for establishing the location and grade of the cable trench route and transformers, junction boxes, or secondary pedestals that are shown on the sketches provided by the District. The transformer, junction box, and pedestal locations are considered permanent and moving them is difficult and expensive. In the event any of these facilities need to be relocated, the entire cost will be at the Customer's expense. We recommend that a licensed surveyor be used to determine the lot lines, property corners, right-of-way, and easements to ensure that the facilities are properly located.

### **Section 8.11 The Customer Shall Provide Final Grade**

The Customer shall provide final grade at the site of a transformer or other above-ground devices. After installation, the Customer shall not change the cable depth by cutting or filling without the express consent of the District.

### **Section 8.12 Backfill Bedding Material**

Bedding material for backfill will be subject to approval by a District representative. The Customer will provide the appropriate bedding material when native material is unsuitable. The Customer shall place the approved bedding material in the trench in sufficient quantity to protect the conduit, prior to installation. The Customer shall place an equal amount of approved bedding material over the installed conduit prior to

backfilling with native materials. The typical requirement is 6" of bedding below and 6" above the conduit.

### **Section 8.13 Backfill Compaction**

All trenches shall be compacted to the satisfaction of the District in the following manner:

- Compacted sufficiently to prevent later settling of the fill material.
- Compact in lifts to attain 95% compaction. The Customer shall provide compatible 1" minus granular material (i.e. sand, screen reject, or pit run) should the District determine that native material is unsuitable for backfill. The surface material shall be replaced with material equal to existing surface (crushed rock, asphalt, concrete, etc.).
- Below transformers, pedestals, and above-grade devices - Compact in lifts to attain 95% compaction. The Customer shall provide compatible 1" minus granular material (i.e. sand, screen reject, or pit run) should the District determine that native material is unsuitable for backfill.

### **Section 8.14 Conduit for Primary**

Conduit for Primary underground cable will be provided and installed in the trench by the District at no charge to the Customer when installed as part of a Customer paid line extension.

### **Section 8.15 Requirements Before Construction**

The District will schedule the Customer's project only after required easements are received and necessary monies are paid. Trenching should not be started before consultation with a District representative and a date scheduled for the work. At this consultation, any special requirements for the trench will be outlined. The trench shall then be dug prior to the arrival of a District crew on the scheduled date.

<b>SECTION 9</b>	<b>AREA LIGHTS AND STREET LIGHTS</b>
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### **Section 9.1 General**

District will install lighting facilities on District poles. The standard method is to mount a standard fixture on a wood pole, either an existing pole or a new "area light pole." New light installations are to conform to the specifications listed below. Existing contracts may be supplemented with additional lights utilizing previous installation methods as subject to NESC and NEC code restrictions.

### **Section 9.2 Maintenance by District**

District-owned light fixtures and services are maintained by District. (See Drawing #36).

### **Section 9.3 Customer Maintenance**

Lights and facilities not owned by District are maintained by Customers. These installations are subject to State of Washington wiring permit and inspection procedures.

### **Section 9.4 Rates**

Rates are based upon the light output and installation requirements. Contract rates apply with municipal Customers; flat rates apply for individual Customers as per District Rate Schedules.

### **Section 9.5 Served From Overhead Systems**

#### **Section 9.5.1 District Lights On District Poles**

District-owned and installed lights are installed on District owned and installed poles. If a new pole and/or transformer is required for service, special installation and monthly rates will apply. The following procedures apply:

- Service contract signed by Customer.
- Installation charges paid by Customer.
- District installs pole, light, runs service, and maintains facilities.

### **Section 9.6 Served From Underground System**

#### **Section 9.6.1 District Lights on District Poles**

District owned and installed lights are installed on District owned and installed poles. If a new transformer is required to provide service, an installation and special monthly rate will apply. The following procedures apply:

- Service contract signed by Customer.
- Installation charges paid by Customer.
- Trench and backfill by Customer from source to light pole, if required.
- Cable (#12 copper, minimum) and conduit, installed by customer from transformer or secondary pedestal to pole.
- District installs pole, light, connects service cable and maintains facilities.

#### **Section 9.6.2 Customer Owned Light Fixtures**

For Customer owned and installed lights installed on Customer owned and installed poles, the following procedures apply:

- Application for service (contract) signed by Customer.
- Connect fees paid by Customer.
- Metered installation--Customer owned disconnect required.
- Meter pedestal and wiring required as per NEC.
- Three #6 Aluminum conductor in 1" conduit minimum.

Inspected by State of Washington wiring inspector.  
Maintained by Customer beyond disconnect.  
Trench and backfill by Customer as per District specifications, if required.

<b>SECTION 10</b>	<b>COMMUNICATION EQUIPMENT ON DISTRICT POLES</b>
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**Section 10.1 Contact Approval Required**

Contact approval is required for foreign contacts on District poles. Approval requires prior request to install and field check by District Representative to determine that adequate space is available.

**Section 10.2 District Riser Requirements**

District Riser requirements regarding standoff brackets apply. A minimum of 6" of space between the cabinet and the surface of the pole to which it is mounted shall be maintained.

**Section 10.3 Washington State Wiring Permit Required**

Wiring permit requirements apply. The equipment wiring shall be inspected by the Washington State Wiring inspector and approved prior to electrical connection by the District.

**Section 10.4 Dimension and Weight Limits**

Maximum size shall be 26" wide x 36" high x 16" deep and weigh 500 pounds or less. The cabinets shall be 14-gauge metal painted to resist exposure and to prevent rust.

**Section 10.5 Equipment Grounding as per NEC**

The equipment shall be effectively grounded to a grounding system installed by the cablevision company. Ground rod(s) shall be installed a minimum of 18" from the base of the pole on which the equipment is mounted.

**Section 10.6 Clearances As Per NESC**

The schedule 40 PVC or galvanized metallic conduit, capped with a weatherhead, shall terminate 8" below the level of the District's overhead secondary attachment or neutral position. The service shall include 18" of tail at the weatherhead. The Cabinet shall be mounted with the bottom no lower than 12' above ground.

**Section 10.7 Voltage and Protection**

The unit shall be designed to operate from connection to a 120-volt, single-phase District secondary. Its circuitry shall include a 15 amp, 120-volt rated breaker, and back-feed voltage protection to prevent power from the unit being routed into the District's system.

### **Section 10.8 Battery Flame Protection**

Battery pack auxiliary power supplies shall have batteries in the assembly which have flame arrester vent caps and shall be protected from electrical spark by having separate metal containers. The batteries shall be located above the assembly's power inputs and transformer units to insure isolation of any gasses from open flame or spark. The battery containers and the cabinet shall be well vented.

### **Section 10.9 Load Information Required (Wattage of Power Supply)**

The District shall be notified of the connected load of the power supply prior to connection.

### **Section 10.10 Rates**

In addition to the standard attachment fee, the customer shall pay the District a flat rate to cover the cost of providing electrical service to the auxiliary power supply unit. This rate shall be based upon the connected load.

### **Section 10.11 Transfer and Relocation**

In the event that it is necessary to replace or relocate a pole on which an auxiliary power supply unit is mounted, the customer shall transfer or relocate the unit at no cost to the District.

<b>SECTION 11</b>	<b>CHARTS</b>
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### **CHART # 1 Non-Metallic PVC Direct-Buried Conduit**

PVC Conduit must meet the following requirements:

A. The following information shall be imprinted on all PVC conduit:

1. Manufacturers name or trademark
2. Nominal size
3. Material (PVC)

B. Schedule 40 or 80 PVC is required for service riser according to the NEC 710 and the NEMA Standard TC-2 for applications listed below:

- Type III - Designed for normal-duty applications above ground (Sch 40)
- Type IV - Designed for heavy-duty applications above ground (Sch 80)  
(Hazardous areas, e.g. next to driveways)

C. Conduit bends shall be long-radius type.

- |           |    |              |
|-----------|----|--------------|
| Minimums: | 2" | - 24" Radius |
|           | 3" | - 30" Radius |

4" - 48" Radius  
6" - 60" Radius

D. Residential secondary service conduit shall be a minimum 2" Schedule 40 PVC, NEMA Standard TC-2.

**CHART # 2 Minimum Conduit Size Based on Maximum Fill Requirements,  
Triplexed and Quadruplexed Secondary Conductors**

XLP CONDUCTOR		TRIPLEX			QUADRUPLEX		
SIZE		NOMINAL	ONE	TWO	NOMINAL	ONE	TWO
PHASE	NEUTRAL	O.D.	RUN	RUNS	O.D.	RUN	RUNS
1/0	2	1.06"	2"	3"	1.42"	3"	3"
2/0	1	1.17"	2"	3"	1.59"	3"	4"
3/0	1/0	1.27"	2"	3"	1.72"	3"	4"
4/0	2/0	1.39"	2"	3"	1.88"	3"	4"
250	3/0	1.53"	2-½"	4"	2.08"	3"	4"
350	4/0	1.72"	3"	4"	2.34"	3"	6"
500	(300)	2.00"	4"	6"	2.71"	4"	6"
750	(400)	2.35"	4"	6"	3.22"	4"	6"
1000	(500)	2.66"	4"	6"	3.63"	4"	n/a

(400) and (500) minimum size for neutral ampacity.

(300) size per Essex Cable Handbook could be 250 and have required neutral ampacity.

5" conduit is not District standard; must use 6" to be compatible when the District will be extending customer conduits.

Use NEC conduit sizing where the District will not own the conductors.

## **SECTION 12      DRAWINGS**

Drawings contained here illustrate items of text and some typical service and meter arrangements. Further detail on these and other types of service arrangements may be obtained from the District. All installations must comply with the current NEC at the time of installation, and local ordinances or other requirements.

- 1      Service Brackets
- 2      Overhead Strike to Residence
- 3      Guying - Stiff Leg Type
- 4      Clearances: Services Over Ground and Roofs - A
- 5      Clearances: Services Over Ground and Roofs - B
- 6      Service Assembly Underground from Overhead Take-off
- 7      Metering Assembly, Self Contained, Pole Installation
- 8      Metering Assembly, CT, Pole Installation
- 9      Service Assembly, Overhead Temporary
- 10     Service Assembly, Underground Temporary
- 11     Metering Assembly, Wall Mounted, Self Contained
- 12     Meter Location On Buildings
- 13     Platforms For Elevated Meters
- 14     Meter Pedestal, Self Contained
- 15     Meter Pedestal, Mobile Home
- 16     Meter Pedestal, 320 Amp Service
- 17     Meter Pedestal, CT Meter
- 18     Meter Socket Clip Arrangement
- 19     Meter Socket, 200 Amp, Single Phase
- 20     Metering, Self Contained, Overhead Service, Single Phase
- 21     Metering, Self Contained, Overhead Service, Three Phase
- 22     320 A Lever Type Bypass Meter Base (Underground)
- 23     320 A Lever Type Bypass Meter Base (Overhead)
- 24     208/120V 3-Phase 4-Wire to Serve Multiple Occupancy
- 25     CT Enclosure Wiring, Single Phase, 400 to 800 A, Overhead
- 26     CT Enclosure Wiring, Single Phase, 400 to 800 A, Underground
- 27     CT Enclosure Wiring, Three-Phase, 400 to 800 A, Overhead
- 28     Metering, Overhead Service, 3-Phase, C.T. 400 to 800 A
- 29     Metering, Underground Service, 3-Phase, C.T., 800 A or greater
- 30     Trench Requirements - Depth, Width, Clearances
- 31     Underground Service, Wall Mounted Meter
- 32     Underground Service, Meter Pedestal
- 33     Conductors Terminated in Padmount Transformers by Customers
- 34     Padmount Transformer Clearances
- 35     Guard Posts for Padmount Transformers
- 36     Area lights - Underground and Overhead Service
- 37     Standby Generator Schematic Connection Diagrams