AUBURN BOARD OF PUBLIC WORKS

ELECTRIC UTILITY DEPARTMENT

SERVICE RULES

BOARD OF PUBLIC WORKS
Electric Utility Department Rules

PURPOSE

These utility rules have been adopted by the governing body of the municipal utility. The rules are subject to change from time to time to ensure safe and efficient utility in compliance with applicable laws and regulations.

APPLICABILITY

These utility rules are intended to broadly govern operation of the municipal electric utility. Where a rule cannot be reasonably applied to a specific situation, the governing body reserves the right to act in an adjudicative to resolve such conflicts.
Rates and charges are not included in these operating rules. References to rates or charges and certain other terms and conditions of utility "adopted by the governing body" refer to applicable resolutions or ordinances adopted by the utility's governing body.

RECORDS/COMMUNICATIONS

The principal records repository of the utility are located at Board of Public Work building.

DEFINITIONS

Unless another meaning is specifically indicated, when used in these rules:
"Complaint" means a statement or question by anyone, whether a utility customer or not, asserting a wrong, grievance, injury, dissatisfaction, illegal action or procedure, dangerous condition or action, or utility obligation. The utility may require that complaints be in writing.

"Customer" means any person, firm, association, or corporation, any agency of the federal, state or local government, or legal entity directly benefiting from electric utility or heat from the electric utility. In the case of a residence, customer also means other adult persons occupying the residence.

"Demand" means the quantity of electrical power needed by the customer at a given point in time.

"Distribution System" includes all primary lines, secondary lines, transformers, and control equipment necessary to provide points of connection with Service Drops or Service Laterals. Though located on customer property, transformers and associated equipment are part of Distribution System. Normally, the Distribution System is located within an electric utility easement on private property or on public streets, alleys, and roads so that it may be extended to other applicants. Property owners grant easements without cost to Auburn BPW.

"Governing body" means the utility board established or, if a utility board has not been established, the Board of Public Works.
"Maximum Demand" means the greatest demand required by a customer during a specific length of time.

"Meter" means a device that measures and registers the integral of an electrical quantity with respect to time.

"New Service" is any service that is more recent than the original or where the entrance conductors or any electrical equipment has been or is in need of replacement due to code compliance.

"Service Drop" refers to the overhead conductors between the distribution pole and the point of attachment at the applicant's service entrance facility. A Service Drop is normally located on the customer's property and is of secondary voltage.

"Service Lateral" refers to the underground conductors between the Distribution System, including any risers on a pole or other structure and the customer's service entrance facility. A Service Lateral is normally located on the customer's property and is of secondary voltage.

"Temporary service" defined as a single-phase or three-phase electric service supplied to construction sites, holiday lighting, carnivals or similar purposes.

"Transmission System" includes all overhead lines, underground lines, and transformers operating at or above 69,000 volts line-to-line or 39,800 volts line-to-ground. In addition, it includes all control equipment used to operate these facilities

"Updated Service" Where the entrance conductors or electrical equipment has been replaced due undersized or code compliance.

"Utility" means the Board of Public Works of Auburn, NE

UTILITY CHARACTERISTICS

The utility shall provide service throughout its utility service area as established by the Nebraska Power Review Board. Utility service will be available of a character determined by the utility to meet the needs of its customers.

The standard utility available to meet this obligation is 120/240 (nominal voltage), 60 Hz alternating current, single phase, 200 amperes service. In all standard utility extensions, the utility shall own and maintain the meter.

Other utility connections, including three phase utility and utility at primary voltages, are available at the option of the utility and may require a contribution in aid of construction or an advance for construction costs. Extension policies, including charges and other terms and conditions, shall be established by the governing body.

All service extensions that require an aid in construction cost will be based on revenue justification. The Board will determine credits that will be based upon the expected increase in kilowatt-hour revenue estimates to receive for a period determined by the Board, and/or any benefit that may realize in extension.

Where a customer contribution in aid of construction or an advance for construction costs is required, the governing body may waive such requirements in whole or in part upon a determination that the waiver is in the public interest. Such waiver, when entered in the minutes of the governing body, shall not be considered a discriminatory practice.

Utility Extensions within the Cooperate Limits

The utility shall make standard line extensions, in platted areas within the corporate limits in accordance with terms and conditions established by resolution.

Extensions will be constructed along existing public roads, streets, alleys and wherever practicable, along the rear of the customer’s lot in easements. The route of the line extension and location of the meter will be determined by the utility.

Utility Extensions Rural Areas

In serving residential customers outside the corporate limits, the utility shall extend distribution lines along state or county right of way.

Extensions leaving the right of way shall require a contribution in the aid of construction for a cost of that portion of the extension beyond the first fifty (50) feet on the customer’s property.

Utility extensions serving customer other than residential may require an aid in the cost of construction.
Adding phases, changing voltages, etc. shall be determined the same as above.

Utility Extensions in New Subdivisions

Line extensions to newly platted subdivision of four or more lots may require an aid in construction by the owner or developer. The amount of the aid shall be established by the Board of Public Works and shall be based upon a final plat of the area to be served which the owner or developer shall provide to the utility.

Underground Utilities

Underground utility laterals are required for all new structures, except where the utility determines that underground installations are technically or economically undesirable.

The utility will designate a junction point for the connection of the customer's secondary underground utility lateral. The junction point will be a utility pedestal, junction box, the terminals of the pad-mounted transformer, or a meter enclosure.

For commercial utility extension, the customer may be required to install a transformer pad, constructed to utility specifications at their expenses

For residential utility extensions, the utility will own, install, operate, and maintain all facilities on the source side of the junction point, including the junction enclosure and connections.

The customer will install, own, operate, and maintain all secondary cables, conduit, and related utility equipment specified by the utility at their expenses.

All utility easements requested by the utility to provide utility to the designated junction point shall be granted to the utility by the customer, without cost.

Any existing structure were the service is replaced, upgraded, relocated or improved will be replaced with an underground service.

If the under ground service is installed by the Board of Public Works the customer may be required to reimburse the cost of the installation to the Board. This cost is governed by Board of Public Works tariffs and regulations in effect at the time of installation.

Underground services that are installed by the Board of Public Works will only be done at the conveyance and desecration of the Board.

Residential class customers who are or are converting to an all electrical home may receive an **All Electric Credit** that can be applied toward the cost of the installation of their underground (URD) service. This credit will be established by the governing body.

Non Residential or Low Use Extensions

Low use utility at sites where no residence exists, such as utility for water pumps, cribs, feed lots, garages, shops etc. shall require a contribution in the aid of construction equal to the cost of installing the extension or service.

Temporary Extensions / Services

Where utility service is likely to be temporary, the utility shall require a contribution in aid of construction equal to the total cost of installing and removing the utility, less cost or reusable material. Any deposit in excess of actual cost will be refunded. The utility may also require a customer deposit pursuant to section 3.2 of this tariff. The customer agrees to reimburse the Board of Public Works for all costs associated with providing for the temporary service. These costs include installation, removal, non-salvageable materials and administrative costs. All electric consumed will be billed at the applicable electric rate.

The Board of Public Works will connect the service conductor to the customer owned service entrance conductor

The owner, member, or developer is responsible for ensuring that a temporary service pole is within five feet of an existing pad-mounted transformer or secondary hand hole suitable for providing such service. The temporary service will be provided under standard applicable rates and connect fees.

Service Upgrades

Customers who request service upgrades will be considered on a case by case basis. The customer will be responsible for the upgrade costs as determined by the Board of Public Works. The Board will also determine any upgrade credits using a revenue justification model. The credits will be based upon the expected increase in kilowatt-hour revenue estimated to receive, the age of the existing service, and/or any benefit the Board may realize in plant upgrades.

It will be the responsibility of the customer or authorized contractor to provide the Board with the estimated increase in electrical load. Any customer requesting changes to existing facilities, other than for service upgrades, will pay the full costs of construction.

Security Lighting

Customer who request security lighting will pay the cost of material, insulation and monthly rental fee if installed before metering equipment.
~~Security lighting extensions installed after the meter the customer will pay all cost for installations.~~

Street Lighting

The Utility will, in general, provide wooden poles and overhead service. If the electric service in an area is, in general, underground, the Utility will provide underground service to streetlights. Streetlights in the same subdivision should match each other. The Utility will, in general, supply 250 Watt HPS or equivalent lighting fixtures for Business Area main streets, highway streets at spacing intervals determined to be acceptable by the Utility.

In residential areas, one 150 Watt HPS or equivalent lighting fixture will be provided at intersections, at the end of cul-de-sacs, and at

spacing of approximately 380 ft. New installations will generally be HPS or LED.

If the Utility requested to supply non-standard lighting, the poles, fixtures and layout must be approved by the Utility and the Utility will charge the difference between the cost of the proposed poles and fixtures and the cost of normal installation.

A developer/customer who provides a contribution-in-aid-of construction to any portion of a street lighting system shall not obtain any equity interest in the street lighting system. If parts are no longer available to maintain certain poles and fixtures or if vandalism becomes excessive, the Utility may replace the poles and fixtures with new standard poles and fixtures.

Service Relocations

Customers who request or are required to relocate their service will be responsible for all cost as determined by the Board of Public Works. When the Board of Public Works makes changes in its equipment or facilities to permit work to be done by contractors or others or for the convenience of the customer, the cost of the work shall be billed to and paid for by the party requesting the change. The customer or customer's representative shall notify the Board of Public Works in advance of any work which requires relocation of Board of Public Works equipment. An advance payment or deposit to recover these costs may be required. Only Board of Public Works personnel, its authorized agents, or its contractors may work on or detach Board of Public Works equipment.

ENGINEERING PRACTICE

The utility shall use and shall require compliance with applicable provisions of the publications listed below as standards of accepted good practice and with applicable provisions of the Board of Public Works.

- *National Electrical Safety Code*, by reference, the *National Electric Safety Code*, ANSI C2, and makes modifications to that code.
- National Electrical Code, ANSI/NFPA No. 70.
- American Standard Code for Electrical Metering, ANSI C12.
- USA Standard Requirements for Instrument Transformers, ANSI C57.13.
- American National Standard Requirements for Electrical Analog Indicating Instruments, ANSI C39.1.
- American Standard Requirements for Direct-Acting Electrical Recording Instruments (Switchboard and Portable Types), ANSI C39.2.
- American National Standard Voltage Ratings for Electrical Power Systems and Equipment (60 Hz), ANSI C84.1.
- Grounding of Industrial and Commercial Power Systems, ANSI C114.1.

References to publications listed above shall be deemed to be to the latest edition or revision accepted by the Utilities.

Electric Inspection Policy & Procedure

The Board of Public Works requires that all installations comply with the NEC and NESC Codes. All facilities shall be constructed, installed, maintained and operated in accordance with accepted good engineering practice in the electric industry.

The utility will require compliance with applicable provisions of the publications listed below as standards of accepted good practice and with applicable provisions.

- National Electrical Safety Code.
- National Electrical Code, ANSI/NFPA No. 70.

References to publications listed above shall be deemed to be to the latest edition or revision and approved by the State of Nebraska Electric Division.

Except for facilities defined by the governing body as a responsibility of the utility, the customer/contractor shall be responsible for all wiring and electrical equipment on his or her premises. The installation and maintenance of customer/contractor facilities shall be consistent with standards imposed by these rules, the special conditions of this section, and any other applicable laws or regulations.

All wiring after the attachment point or in the case of underground services after the primary meter connection is the responsibility of the customer.

All facilities will be subject to an electric inspection by a Certified State Electric Inspector or a Qualified Utility Employee of the Board.

At any service where the meter is removed to install a new services or upgraded an existing service will require an inspection or have in possession a State Electrical Permit stating the service can be energized before the BPW will install a meter. A Permit will not be required for locations that have maintenance work such as replacement of a main breaker or disconnect of same size.

All facilities must meet current NEC & NESC codes and the requirement in this Service Manual before electric service can be provided.

Any Locations that have been disconnect for a period of one (1) year or less may be waive of current requirements as long as the installation met past code requirements and the service is in safe condition.

At any locations that has been disconnected over a one year period must meet current requirements and will require State Inspection before the service will be supplied.

The Utility reserves the right to disconnect any facility that is in violation of this Service Manual, NEC or NESC Codes.

No inspection or approval of a customer's compliance with this section by the utility or other agent of the municipal government shall be construed to impose any duty or liability on the utility, but shall be considered solely for the purpose of ensuring protection of the

utility's property and continuity of utility to customers of the utility.

All facilities must meet the requirements of this manual.

Electrical Code Violations / Safety

At any location where it is determined that the service to the property is in violation of an Electrical Code and /or the electrical wiring is determined to be unsafe to either the building or the public, the Board of Public Works may at any time and without notice discontinue supply of service to the customer, and remove its meters and metering equipment.

The service will not be restored until all codes or unsafe conditions are corrected.

SPECIAL CONDITIONS OF UTILITY

Except for facilities defined in section 2.1 of these rules or in extension of policies adopted by the governing body as a responsibility of the utility, the customer/contractor shall be responsible for all wiring and electrical equipment on his or her premises. The installation and maintenance of customer/contractor facilities shall be consistent with standards imposed by section 2.2 of these rules, the special conditions of this section, and any other applicable laws or regulations.

Requirements for Electric Motors

All installations of power loads on the utility's system shall conform to the safety rules as set forth in the National Electrical Code. Customers are required to provide suitable protective devices so that motors and equipment will be protected from damage and from improper or dangerous operation in case of overload, loss of voltage, low voltage, single phasing of poly-phase motors, or the re-establishment of normal utility after any of the above. The utility is not responsible for motor damage caused by any of the above conditions.

No motor in excess of five (5) horsepower shall be installed without application by the customer and express approval of the utility. The utility reserves the right to limit the number and size of motors installed on single phase extensions. The customer or customer's electrician shall contact the utility regarding requirements for motor starting equipment, wiring and other motor specifications.

Corrective Equipment

Customer electrical equipment shall be installed and used in such a manner as not to adversely affect voltage regulation or impair the utility's utility to other customers. When such equipment creates fluctuating voltage or power factor conditions, or any other disturbances in utility detrimental to the utility of other customers or to the utility's use of its own equipment, the customer shall be required to install and maintain, at his or her own expense, suitable corrective equipment to eliminate the detrimental effects.

Standby Generators

No other source of supply of electric shall be introduced or used by a customer in conjunction with electric utility supplied by the municipal utility, without prior written approval of the municipal utility. At a minimum, standby facilities will be approved only if a single change-over switch that provides a visible opening and is padlocked in the open position, or a relay of adequate size, is installed so that municipal utility lines cannot become energized by a standby power source under any condition.

All stand-by sources that are permitted connected are subject to yearly inspection of the Board of Public Works.

Energy Conservation Standards

As a condition of electric utility for space heating or cooling, the owner or builder of any new structure intended primarily for human occupancy must certify to the utility that the building conforms to the energy conservation requirements of the State Building Code.

Posting of Signs

It shall be unlawful for any person or company to post, tack, or fasten to the poles, structures, fixtures, or electrical equipment of the Municipal Electrical System any sign, poster, advertisement, or banner without written permission from the Board of Public Works.

Pole Attachments

It shall be unlawful for any person or company to make attachments to the poles, structures, fixtures, or electrical equipment of the Municipal Electrical System with first acquiring a "Pole Attachment Agreement" and approval from the General Manager.

Joint Trench / Shared Trench

The utility shall allow the use of its trenches to other utilities such as CATV, Telephone or other utilities as the NEC & NESC permit. Only utilities who are member of the Digger Hot line shall be allowed to install wire in a joint trench. All installation shall meet the requirements of the NEC and NESC and special request by the Board of Public Works.

Each entity that is having the Board of Public Works employees install their wire/equipment in a trench shall pay the BPW Joint Trenching Fee as establish by governing body.

At location or projects where the cost of all labor and trenching are shared the entities who participate shall have their Trenching Fee waived.

Class of Utility for Application of Rates

Utility classification shall be based upon the type of utility supplied and on similarities in customer load and demand characteristics. Utility classifications shall be defined as part of the rate schedules adopted by the governing body. In addition, the utility reserves the right to supply large power utility in accordance with the provisions of a written contract. As nearly as practicable, rate schedules adopted

by the utility shall reflect relative differences in the costs of providing various quantities of utility to each customer class.

Temporary Disconnection

The utility may, upon reasonable notice by a customer, make temporary Disconnection for the customer's convenience. The customer shall be required to pay a fee for such utility in an amount to be determined by the governing body.
Charges for temporary disconnection and reconnection made for the convenience for the customer shall be as follows:

- No charge shall apply to disconnections of short duration made during normal business hours and necessary for such purposes as rewiring, changes in customer wiring, piping or appliances, remodeling, and construction.
- A charge for shall apply when either disconnection or reconnection is required after regular business hours of the utility.
- A charge of shall apply when the period of disconnection includes a billing period for which a minimum bill is assessed.
- A charge of will be assets when an account is disconnected, transfer to a new name

TREES LOCATED NEAR POWER LINES

Board's Right to Protect Lines

Whenever it becomes necessary to protect the lines or property of the electric distribution system of the Board, the Utilities Superintendent shall have the right to remove and cut away in a careful and prudent manner overhanging branches or limbs of trees so that its lines shall be free and open. Such right, privilege and authority may also be exercised by the Board of Public Works whenever the Board of Public Works at any regular or special meeting shall pass a resolution stating its intention so to cut or remove such obstructions to the lines and service of its electric distribution system.

Tree Work Close To Power Lines

Any person desiring to cut or remove trees or branches thereof, or to fell the same, in close proximity to the lines of the electric distribution system of the Board, which work might cause injury or damage to the lines thereof, shall before doing the work give reasonable written notice to the Board, shall secure a permit in writing from the Utilities and shall seek the assistance of the Board of Public Works to do such work so that electric service shall not be interrupted or damage done to the lines or property of the Board. Any person felling or removing such trees, or branches of trees, resulting in the interruption of electric service or damage to the lines or property of the Board, without having given notice to the Board, as aforesaid, and without having received such permit in writing from the Utilities shall be guilty of a violation of this Article and will be charged for all repairs and lost revenue.

Tree Trimming / Removal Primary Lines (480 volt or higher)

All vegetation that is interfering with the wires and/or are within the in the power line right of way (streets, alleys and easements) will only be removed. All dead trees within the easement will be removed.

All vegetation in the right-of-way shall be cut to the ground except an occasional low-growing species such dogwood and red bud which may be left for aesthetics, as long as they provide minimum clearances of 15 feet from all wires is maintained and access is in no way impaired. Low growing species that require trimming to maintain clearance will be removed.

Trees outside the easement that require routine trimming will be cutback only. Trees that are outside the power line right of way will be cut back to maintain minimum clearance requirements for a period of 3 years of growth. Minimum clearance is 10 feet from all electric wires.

Trees outside the easement that require routine trimming or that the growths prohibits 3 years of clearance will be removed by permission of the owner. If owner denies removal then additional trimming cost will be billed to the owner.

Trees outside the easement and considered to be endangering electric lines will be removed by permission of the owner. If owner denies removal then any damage to the electrical lines, lost revenue and restorations cost will be billed to the owner.

Dead trees outside the easement that are endangering electric lines will be removed by permission of the owner. If owner denies removal then any damage to the electrical lines, lost revenue and restorations cost will be billed to the owner.

Consideration of other situations is based on the extent of possible danger to municipal facilities and the likelihood of service interruption to other customers. Accessibility for workers and equipment shall also be considered in those circumstances where trees of questionable status are involved. The BPW will not shape trees unless the tree owner pays for the extra trimming in advance. The cost for extra trimming will be determined by BPW after estimates of the number of hours for complete the work.

BPW reserves the right of remove any tree that is on the right of way (streets, alleys and easements) that interferes with or could interfere with primary power lines.

Right-of-way in rural areas is 30 feet wide, i.e., 15 feet on either side of the centerline of the primary facilities, except as may be otherwise defined by either the Right-of-Way or by an on-site inspection. Any question as to a deviation from 30 feet will be resolved by the BPW.

Tree Trimming Service Wires and Secondary (up to 480 Volts)

BPW will normally only trim tree limbs that are touching or rubbing a service or secondary line. The BPW will not shape trees unless the tree

owner pays for the extra trimming in advance. The cost for extra trimming will be determined by BPW after estimates of the number of hours for complete the work. The customer will pay in advance tree-trimming cost before any work is completed.

If a customer wants to remove, a tree that only affects a service wire BPW will schedule to take the service wire down during normal working hours while the customer or his contractor is cutting the tree. In order to avoid charges BPW must be notified one day in advance of work and by 1:00 p.m. that the customer is ready for the service to be put back up. Overtime work to put service wires back up will be charged to the property owner if BPW is notified after 1:00 p.m.

METER INSTALLATION

The utility shall install, own, and maintain a meter of a type appropriate to the nature of the utility, for each utility extension. Meter will be installed at a location determined by the utility. All electric current furnished consumers by the electric distribution system of the Board of Public Works shall be measured by meter. The Board of Public Works will furnish all necessary meters to consumers of electric and will keep all meters clean and in repair at the expense of the Board. The owner or tenant of any premises where a meter is located shall provide ready and convenient access to the meter so that it may easily be examined and read by authorized agents of the Board.

All meters installed shall be and remain the property of the Board. When a meter is entirely worn out and a replacement is necessary, a new meter will be furnished and set by the Board of Public Works for such consumer.

Meters may not be required, however, where consumption can be readily computed without metering or where the utility is of a temporary nature and the cost of meter installation would be unreasonable. A meter seal shall be placed on all meters such that the seal must be broken to gain entry.

Individual Metering

Individual metering shall be required on multi-occupancy premises in which units are separately rented or owned, except that the utility may provide single meters for electric used: in central heating or cooling, water heating, or ventilation systems or where individual metering is impractical; where a facility is designated for elderly or handicapped persons and utility costs constitute part of the operating cost and are not apportioned to individual tenants; or where sub-metering or resale of utility was permitted prior to the approval of this manual.

Special Metering Installations

The utility reserves the right, at its option, to require or place special meters or instruments on the premises of a customer for the purpose of special tests of all or part of the customer’s load.

Meter Register

Where it is necessary to apply a multiplier to the meter readings, the multiplier shall be marked on the face of the meter register or

stenciled in weather resistant paint upon the front cover of the meter. Wherever practicable, customers shall have continuous visual access to meter registers.

Meter Testing

All meters and associated devices shall be inspected, tested, adjusted, and certified to be within an allowable tolerance of error before installation and in accordance with commonly accepted engineering practice.

~~Periodic test schedule: In the test interval below the word "years" means calendar years and the word "month" means calendar months. The basic periodic test interval shall not be longer than provided for in the following schedule:~~
~~A: Alternating current watt-hour meters:~~
~~Polyphase meters used with instrument transformer four (4) years~~
~~Single phase meters used with instrument transformer eight (8) years~~
~~Self-contained polyphase meters eight (8) years~~
~~Self-contained single phase meters ten (10) years~~
~~B: All new watt-hour meters will be tested for acceptable accuracy before being placed in utility. Any watt-hour meter removed from utility for any reason will be tested.~~
~~All electronic meters shall be exempt for this schedule expect for the testing of instrument transformer.~~

Customer Requested Meter Tests

The utility will periodically inspect and test meters in accordance with accepted engineering practice. In addition to regular testing, the customer may request a meter test, providing that such tests need not be made more frequently than once each twelve months. The customer or the customer's representative may be present when the meter is tested and the results shall be reported to the customer within a reasonable time. If the meter is within the allowable tolerance, the customer shall be billed for the cost of the test in an amount established by the governing body.

Adjustment of Bill for Meter Error

Whenever a meter is found to have an average error exceeding the allowable tolerance by more than 2.0 percent, or in the case of a demand meter, by more than 1.5 percent, the utility shall adjust a current customer's bill or issue a refund or back bill to a past customer. The amount of the adjustment shall be calculated on the basis of metering accuracy of one hundred percent.

The adjustment period shall extend from the date the error began. If that date cannot be determined, it shall be assumed the error has existed for the shortest time calculated as five years from the date the error was discovered, one half the time since the meter was installed, or one half the time since the last previous meter test.

When the adjustment is due to meter "creep" it shall be assumed that creeping affected meter registration 25 percent of the adjustment period. The adjustment period for slow meters shall not exceed six months without the approval of the governing body. When a meter is found not to register, the utility shall issue an estimated bill.

An adjustment, refund or back-billing shall be made for any overcharge or undercharge resulting from incorrect reading of the meter, incorrect application of the rate schedule, incorrect meter connection or other similar reason.

This section shall not be construed to require a cash refund to a current customer nor a refund or back-billing to a previous customer in an amount less than two dollars. The utility further reserves the rights to forego back-billing procedures which it determines are not cost effective.

APPLICATION FOR UTILITY

Application for utility shall be filed at the utility's business office. At the time of application, the applicant shall be given an opportunity to designate a person or agency to receive a copy of any notice to disconnect utility due to the applicant's nonpayment of a bill.

Applicant may also appoint a party to be responsible for his/hers bill. Both parties will be required to fill out a Responsibility for Bill Form. At which time the party responsible for the bill will be billed for the utility at that account until they notify the Utility.

As soon as practicable after the approval of the application, the utility shall supply utility to the applicant in accordance with these rules and at a rate established by the utility for the applicant's appropriate class of utility.

Each prospective customer will be required to sign a service application agreeing to pay for service in accordance with the applicable rate schedule and the Rules and Regulations of the Board. When applying for service, the customer will be required to furnish the

Board of Public Works the following information:

- Name of the customer requesting service
- Location of the premises to be served
- Customer's Mailing Address
- Customer's Social Security Number
- Customer's Driver License Number
- Size and general characteristics of the proposed load
- Any special requirements of the load
- Previous address of the prospective customer, if any, where Board of Public Works service was rendered.

Unauthorized Use of Service

Any tampering, breaking of meter seals, opening or damaging of Board of Public Works locks, interference, or unauthorized work on meter installations or other property of the Board of Public Works is prohibited.

The Board of Public Works may at any time and without notice discontinue supply of service to the customer, and remove its meters and metering equipment in the event of such tampering or interference.

The customer shall be responsible for payment of all costs which result from such tampering or interference with Board of Public Works property.

These costs may include, but are not limited to, disconnection and reconnection charges, investigation-related costs, damage to Board of Public Works property, and payment for electric energy consumed but not metered. Service will not be restored to such customer until payment has been made to the Board of Public Works for all costs

If access to BPW Equipment is needed a minimum of a 24 hour notice may be needed.

Utility Calls

The customer shall be billed for cost incurred which will include labor, material and equipment time as follow:

- For a utility call where the trouble is found to be on the customer's equipment and the customer has been notified to contact a contractor to correct the problem.
- For any work after normal business that is requested by a customer.
- For any work performed on customer owned facilities.
- For a utility call requesting the relocation of facilities belonging to the utility, the customer shall be billed for the direct cost of labor and replacement of materials. An advance deposit equal to the total estimated cost may be required where the estimate exceeds one hundred dollars.
- For a utility call requesting temporary relocation of electric lines or other utility facilities to accommodate movement of buildings or large equipment, the person responsible for the move shall be billed for the direct cost of labor and materials. The utility shall be given notice of the move at least two business days in advance and shall be consulted regarding the route of the move. An advance deposit or cash bond may be required to cover estimated costs.

The customer shall be billed an amount in accordance with terms and conditions established by the governing body.

Unauthorized Use of Service

Any tampering, breaking of meter seals, opening or damaging of Board of Public Works locks, interference, or work performed on meter installations or other property of the Board of Public Works is prohibited. The Board of Public Works may at any time and without notice discontinue supply of service to the customer, and remove its meters and metering equipment in the event of such tampering or interference. The customer shall be responsible for payment of all costs which result from such tampering or interference with Board of Public Works property.

These costs may include, but are not limited to, disconnection and reconnection charges, investigation-related costs, damage to Board of Public Works property, and payment for electric energy consumed but not

metered. Service will not be restored to such customer until payment has been made to the Board of Public Works for all costs.

CUSTOMER OBLIGATIONS

Acceptance of utility shall obligate a customer to the conditions imposed by these rules and applicable rules. Customers should note that other sections of these utility rules prescribe standards of engineering practice and establish special conditions for the installation of certain motors and other equipment, common to industry and agriculture.

When a governing authority requires either permits or inspections of new installations, the Board of Public Works will not make service connections until such permits are obtained and the installation passes the required inspections.

The Board of Public Works reserves the privilege for protection of its facilities and safeguarding its service to others, to inspect the customer's installation at any time and to refuse service whenever such installation fails to meet minimum safety and operating standards.

Wiring and Electrical Equipment

Except for the meter socket and meter and other facilities defined in utility extension policies as the responsibility of the utility, the customer shall be responsible for all wiring and electrical equipment on his or her premises. The installation and maintenance of customer facilities shall be consistent with standards imposed by these utility rules and any other applicable laws or regulations. Location of the meter loop and meter socket shall be at the discretion of the utility, consistent with the customer's reasonable convenience.

The installation and maintenance of the customer facilities shall be consistent with standards imposed by this manual and any other applicable laws or regulations.

Damage to Utility Facilities

The customer shall not use the equipment or structures of the utility for reasons other than those incidents to normal utility nor create a condition likely to interfere with the functions of such equipment and structures, without written consent of the utility. The customer shall be held responsible for his or her actions which cause damage to or loss of equipment or structures located on property occupied by the customer.

It shall be unlawful for any person to willfully or carelessly break, injure, or deface any building, machinery, apparatus, fixture, attachment, or appurtenance of the Municipal Electrical System. (Ref.28519RS Neb)

Customer Premises

The customer and owner shall grant the utility, without charge, right of way over and on the premises on which equipment and structures of the utility are located. Access to the equipment and structures shall

be granted to the utility at reasonable times for installation, inspection, testing, repair, and other functions necessary for the maintenance of satisfactory utility.

At any premise where special arrangements are need to access metering equipment for inspection, testing, repair, and other functions necessary for the maintenance of satisfactory utility the customer may be charged a Utility Call Out.

Customer Complaints

Customers may be asked to submit complaints in writing, specifying the nature of the complaint and the relief sought. Complaints concerning the charges, practices, facilities or utility of the utility shall be investigated promptly and thoroughly. A customer may appeal the findings of the investigation and shall be given reasonable opportunity for a full hearing of the matter before the governing body or hearing officer(s) appointed by the governing body.

SMALL POWER PRODUCTION AND COGENERATION FACILITIES

The utility shall purchase electric power from and sell electric power to qualifying small power facilities as required by state and federal law. The rate, terms and conditions of purchase and sales shall be in accordance with an agreement or contract between the utility and the qualifying small power facility, consistent with applicable state and federal regulations.

Copies of current federal and state regulations shall be made available by the utility for public inspection.

Definitions

Unless another meaning is specifically indicated, definitions of terms used in this division.

”Qualifying Facility” means a cogeneration facility or small power production facility which is a qualifying facility under 18 CFR 292, Subpart B and which is not a qualifying alternate energy production facility or a qualifying small hydro facility.

”Qualifying alternate energy production facility,” means any of the following:

- A solar, wind turbine, waste management, resource recovery, refuse-derived fuel, or wood burning facility;
- Land, systems, buildings, or improvements that are located at the project site and are necessary or convenient to the construction, completion or operation of the facility; or
- Transmission or distribution facilities necessary to conduct the energy produced by the facility to the purchasing utility.

”Qualifying small hydro facility,” means any of the following:
A hydroelectric facility at a dam; Land, systems, buildings, or improvements that are located at the project site and are necessary or convenient to the construction, completion of operation of the facility; or Transmission or distribution facilities necessary to conduct the energy produced by the facility to the purchasing utility.

In addition to these definitions, the term “small power facilities” shall be used in this division to mean any or all of the types of facilities defined in paragraphs “a” and “c” above.

System Cost Data

Upon request, the utility shall provide the information required by federal regulation, intended to enable qualifying facilities to estimate the utilities avoided costs for energy.

Obligations of the Utility

Pursuant to applicable state and federal regulations, the utility shall:

- Purchase electric power directly or indirectly from qualifying power facilities.
- Sell power to qualifying power facilities.
- Interconnect with qualifying power facilities.
- At its discretion and with consent of the qualifying small power facility to another utility.
- Offer to operate in parallel with the qualifying small power facility.

Rates for Purchase

Rates for purchase of electrical power from a qualifying facility shall be determined by the utility in accordance with applicable regulations. In the case of facilities with a design capacity 100 kilowatts or less, the Board of Public Works may adopt standard rates of purchase.

Rates for Purchase

Rates for sales of electrical power to a qualifying facility shall be determined by the utility.
Rates for sales for electrical power to qualifying alternate energy production and small hydro facilities shall be determined in accordance schedule adopted by the Board

Interconnection Cost

Interconnect costs for all qualifying small power facilities will be assessed on a nondiscriminatory basis with respect to other customers with similar load characteristics. Payment for connection costs shall be due at the time such costs are incurred. Upon petition by any party involved and for good cause shown, the utility may allow reimbursement of costs over a reasonable period of time and upon such conditions as the Board of Public Works may determine.

System Emergencies

All qualifying small power facilities shall be required to provide energy to the utility during a system emergency to the extent it is required to do so by agreement with the utility or as ordered under state or federal authority. The utility may discontinue purchases from and sales to a qualifying small power facility during a system emergency when purchases would contribute to the emergency ants when discontinuance of sales is on a nondiscriminatory basis.

Standards for Interconnections, Safety and Operating Reliability

Standards or interconnection, safety, and operating reliability for the utility and all qualifying small power facilities shall be those established.

CUSTOMER SERVICE AND METERING MANUAL

Introduction

The purpose of this section is to supply essential information to customers, customers' representatives, employees, architects, engineers, contractors and others concerned with the electrical installations of Board of Public Works of Auburn's customers. It is the Board of Public Works of Auburn's objective to cooperate with and assist customers to obtain safe, efficient electric service.

Nothing contained in this section shall be construed to relieve or lessen the responsibility of the customer or the customer's representative from complying with all applicable codes, rules, and regulations. Consistent with the Board's Tariff, no inspection by the Board, nor failure to object to the customer's installation, shall render the Board of Public Works liable for injury or damage resulting from any defective installation by the customer.

The drawings and written portion of this manual supplement each other. Materials and workmanship specified or implied by one and not the other shall be supplied and installed in accordance with the more stringent of the requirements. The drawings are general in nature and are not intended to be design specifications. This information is based on management-approved interpretation of the intended safe and practical application of the National Electrical Code, (NEC), the regulations of the Board of Public Works Tariff. National Electric Code and NEC are registered trademarks of the National Fire Protection Association, Inc., Quincy, MA 02269. Local governing authorities may impose more stringent requirements than shown in this manual. The Board of Public Works recognizes and enforces the current NEC and NESC manuals

This manual does not cover installations that are under the exclusive control of the Board of Public Works for the purpose of metering, generation, control, transformation, transmission or distribution of electric energy, or associated work practices of the Board of Public Works in the exercise of its function as a utility. The Electrical Safety Code and National Electrical Safety Code (NESC) contain provisions relating to Board of Public Works installations and work practices.

If you desire to discuss specific problems not covered or resolved by this manual, contact your Board of Public Works representative.

Availability and Characteristics of Service

The following table lists the nominal voltages offered to the customer, and the maximum size service entrance that the Board of Public Works may be able to accommodate without special consideration. Not all listed nominal voltages are available at all locations or for all loads. It is recommended that the customer contact the Board of Public Works before purchasing equipment. The Board of Public Works will provide one voltage to each service location.

SERVICE VOLTAGES AND LIMITATIONS

Max. Service Entrance Size Voltage		Underground / Overhead (Amperes)	Service Type
120V,	2-wire, single-phase	60	Residential or Commercial
120/240 V,	3-wire, single-phase	400	Residential or Commercial
120/208 V,	3-wire, single-phase	400	Residential or Commercial
120/208 V,	4-wire, three-phase	Greater than 400 See Note 2	Commercial
120/240 V,	4-wire, three-phase	Greater than 400 See Note 2	Commercial
277/480 V,	4-wire, three-phase	Greater than 400 See Note 2	Commercial
480 V,	3-wire, three phase	Greater than 400 See Note 2	Commercial

Note 1: Services greater than 400 amp may not be available in certain areas contact your Board of Public Works representative.

Note 2: Contact your Board of Public Works representative for service availability.

Higher voltage service may be available for approved loads upon application to the Board. Availability and extension cost information is available at Board of Public Works business offices. All extensions of service will be installed according to the extension policy. The Board of Public Works will normally permit only one service entrance per customer.

Resale of Service

Electric service is only offered to the ultimate consumer, and shall not be remetered, resold or shared by others, nor shall it be extended outside the premises for service to other customers, except:
For customers receiving service which has been remetered, resold or shared continually since April 1, 1963. Service under this exception may continue until appropriate elimination of remetering, resale or sharing can be accomplished.

Where such consumer is an occupant of a unit of a multi-occupancy premise, which, continually since January 1, 1979, has been normally held for rent and where service has been furnished to the tenant as an undefined part of a fixed rental or lease payment.

Where service is delivered to multi-occupancy premises for centralized heating, cooling, water heating, ventilation or common-area lighting systems.

Where individual metering of service used by separate tenants of multi occupancy premises is determined by the Board of Public Works to be impractical.

Where a facility is designated for elderly or handicapped persons and utility costs constitute part of the operating costs and are not apportioned to individual tenants.

Interruption and Liability

The Board of Public Works will use reasonable diligence to supply steady and continuous service, but does not guarantee its service against irregularities or interruption. When required by valid curtailment or peroration orders, rules and regulations promulgated by State or Federal regulatory authorities, or as the result of an emergency; the Board of Public Works may not be able to deliver electric energy. Service also may be suspended for the purpose of making necessary repairs or changes in facilities; with notice, when practicable, to customers who would be seriously affected or without notice when necessary.
The Board of Public Works will use reasonable diligence to provide high quality service to its customers. However, the Board of Public Works shall not be liable for any loss or damage due to any failure or delay in providing service under the Board of Public Works tariff resulting from any cause beyond the Board's reasonable control including, but not limited to: acts of God; acts or omission of civil or military authority; acts or omission of suppliers; equipment failure; fires; floods; epidemics; quarantine restrictions; severe weather; strikes or other labor disputes; embargoes; wars; sabotage; political strife; riots; delays in transportation; compliance with any regulations or directives of any national, state, local or municipal government, or any department thereof; or fuel, power, material or labor shortages.

Power Quality

The Board of Public Works provides electric service to its customers that meets or exceeds all requirements. In some instances such as major storms where lightning, high winds or similar adverse conditions occur; the Board's electrical system may experience momentary outages and/or voltage spikes. In such cases when electrical service is interrupted and/or voltage spikes occur whether for fractions of a second or for hours, it is the customer's responsibility to install the necessary protective devices on equipment such as computers, motor controllers and electronic type equipment.
Microprocessor based home electronics and business computers have led to the need for increased protection against voltage transients. Sensitive electronics are more susceptible to damage due to voltage spikes or surges. Before any microprocessor based electronics are installed, wiring practices that meet manufacturer specifications need to be assured. For example, proper grounding and dedicated circuits are important. Consideration should also be given to installing transient voltage surge suppression at the main service entrance and at the point of use.

If a momentary voltage dip or outage would cause loss of data, an uninterruptible power supply (battery backup) should be considered. If you have any questions concerning minimum protective requirements, contact the equipment supplier or your Board of Public Works representative.

Right of Way

The customer shall provide, without cost to the Board, right-of-way for the equipment or facilities of the Board of Public Works over, across, under and upon the property owned or controlled by the customer as is necessary and incidental to supplying service to the Board's customer(s), and shall permit access thereto by the employees of the Board.
Route to from the system to the customer's service entrance facility shall use the most direct and properly engineered route as determined by Board.

The applicant or developer is responsible for furnishing rights-of-way and easements within reasonable time to meet service requirements. The right-of-way must be cleared of trees, stumps, and other obstructions prior to installation. After installation, the right-of-way may be used by the grantor in any way that does not interfere with Board's ability to maintain its electrical facilities at any time.

The right-of-way must be graded within 6 inches of final grade and be maintained by the applicant during utility construction. Future changes or relocations of our facilities due to changes in grade will be at the property owner's expense.

The customer shall provide and maintain safe, convenient, and unobstructed access to the Board's meter(s) and shall permit entry thereto by employees of the Board, at all reasonable times, for the purpose of inspecting, reading, testing, repairing, replacing or removing the meter(s) or equipment used in connection with the service.

At locations where access is inaccessible due obstruction created by owner and special arrangements have to be made to for the purpose of inspecting, reading, testing, repairing, replacing or removing the meter(s) or equipment used in connection with the service the owner may be assessed a Utility Callout fee as determined by the Board of Public Works.

Relocating Board of Public Works Equipment or Facilities

Customers who request or are required to relocate their service will be responsible for all cost as determined by the Board of Public Works When the Board of Public Works makes changes in its equipment or facilities to permit work to be done by contractors or others or for the convenience of the customer, the cost of the work shall be billed to and paid for by the party requesting the change. The customer or customer's representative shall notify the Board of Public Works in advance of any work which requires relocation of Board of Public Works equipment. An advance payment or deposit to recover these costs may be required. Only Board of Public Works personnel, its authorized agents, or its contractors may work on or detach Board of Public Works equipment.

Temporary Service

Where utility service is likely to be temporary, the utility shall require a contribution in aid of construction equal to the total cost of installing and removing the utility, less cost or reusable material. Any deposit in excess of actual cost will be refunded. The utility may also require a customer deposit pursuant to section 3.2 of this tariff. Temporary service is defined as a single-phase or three-phase electric service supplied to construction sites, holiday lighting, carnivals or similar purposes. The customer agrees to reimburse the Board of Public Works for all costs associated with providing for the temporary service. These costs include installation, removal, non-salvageable materials and administrative costs. All electric consumed will be billed at the applicable electric rate.
The Board of Public Works will connect the service conductor to the customer owned service entrance conductor
The owner, member, or developer is responsible for ensuring that a temporary service pole is within five feet of an existing pad-mounted transformer or secondary hand hole suitable for providing such service. The temporary service will be provided under standard applicable rates and connect fees.

Accessing Equipment and Energizing Connections

Entry into the Board's locked or secured facilities or equipment by non-company personnel is strictly prohibited. When entry into secured Board of Public Works facilities is required by the customer, the customer or the customer's agent shall contact the Board of Public Works business office to make arrangements for Board of Public Works personnel to de-energize the facilities and provide access.
For any exceptions, the customer or the customer's agent will be required to sign an indemnification agreement stating that they are qualified to work on and in the vicinity of electrical facilities.
All Board of Public Works transformers shall be located in an area accessible to Board of Public Works vehicles. If special equipment, such as a crane, is required for setting or replacing the transformer, the customer shall pay all expenses.
Customers should avoid plantings or construction that interferes with Board's required maintenance access to its equipment. Refer to Appendix B.1.
All connections, permanent or temporary, between the Board's service lines and the customer's facilities shall be made or removed only by authorized Board of Public Works representatives.

Recreational Vehicles

Service will be supplied to vacation and recreational vehicle parks through one metering installation and billed to the park owner/operator on the applicable general service rate. Service will be extended as provided in the extension policy. The park owner/operator shall own and maintain the distribution facilities beyond the point of delivery.

SERVICE AND SERVICE ENTRANCES

General Requirements

The Board of Public Works will normally permit only one service entrance per customer.

The main switch and fuses or circuit breakers shall be of ample size to carry the load and to safely interrupt the available fault current at the particular location. If fault current information is required contact your Board of Public Works representative for the available fault current.

Section 230-70 of the NEC requires a service to have a disconnecting means. The service disconnecting means shall be installed at a readily accessible location either outside of the building or structure, or inside nearest the point of entrance of the service conductors. All properties shall have only one location for the service disconnection means. An over current device may not be required adjacent to the metering point, but shall be installed in accordance with the NEC at each entrance served through the meter.

The customer will provide, install and maintain the additional equipment necessary for the service, which may include the meter socket. If the service entrance is overhead the customer shall provide a service attachment of adequate strength to support the Board's service conductors. (NEC Section 230-27, 230-28, 230-29).
It is required that customer installed service conductor(s)be matched to the main breaker(s) size or rating. On all Y systems, the neutral conductor will be counted as a current carrying conductor.

The grounded neutral may be reduced in size accordance with the NEC. However, if the neutral is reduced more than one size, calculations justifying the reduction must be accepted by the Board. The grounded conductor may be a bare copper conductor or insulated and marked with a white or natural gray color. (NEC Section 200-6, 200-7, 230-41).
All service entrance equipment shall be UL listed. Any other type of meter sockets shall meet Board of Public Works specifications, see Appendix C. Service entrances for residences shall have a rated size of at least 150 amperes at 120/240 volts, three-wire, single-phase.
No conductors other than service entrance conductors shall be installed in the service entrance conduit. Service entrance conductors shall not be spliced or tapped. Service entrance conductors are to extend 24 inches beyond the weatherhead.

If changes occur to a customer's property, such as grade changes, construction of decks or garages, which result in inadequate clearances, the customer will be required to relocate or bring the service into compliance with these rules and current NEC requirements.

The Board of Public Works shall not be liable or responsible for any loss, injury, or damage, which may result from the use of or defects in, the wiring or equipment beyond the point of delivery.

Entrance and Meter Location

All meters shall be installed outside and securely attached to a permanent structure.

The point of attachment shall be on the side of the structure adjacent to the distribution facilities. All meter locations shall be approved by the Board. Exceptions will not be allowed.

The meter location shall be accessible to Board of Public Works employees and protected from physical damage. If a meter pole is used it will be owned and installed by the customer and shall be in a location mutually agreed upon between customer and Board. The meter pole will also be required to have a service disconnect below the meter. The meter pole shall be in an accessible location out of the way of traffic. Service wires should not cross adjoining property or livestock areas.

The Board of Public Works may refuse connection to any service entrance not installed in an approved location.

A clear working space of not less than 36 inches in front of the meter and 30 inches wide shall be maintained at all times or the meter shall be relocated at the customer's expense. (NEC Section 110-16).
Two or more meter sockets installed on the property must be grouped, with each meter socket and associated breaker or fuse panel plainly and permanently identified, i.e., apartment numbers, duplex numbers, house meter, water heater, etc. Identification and marking of these meter sockets and the breaker or fuse panel for each individual unit or apartment, is the responsibility of the customer.

The customer shall contact the Board of Public Works representative for the meter location, material, and wiring requirements on 480 volt and instrument transformer metering installations.

Meters shall not be installed on or in a trailer, mobile home or any building not on a permanent foundation. Typical meter installations for these applications are referenced in Figures 14 and 15.

Overhead Service and Service Entrances

All overhead facilities located between the customer's property line and the first point of attachment to the customer's building or other structure shall be installed, operated and maintained by the Board.

Except for certain metering equipment, all aerial facilities on private property beyond the point of attachment shall be installed, owned, operated and maintained by the customer. The attachment of the customer's metering equipment and distribution wiring will not be allowed on Board of Public Works poles. Service entrance conductors, between the weatherhead and the main disconnect shall be installed in conduit. Check with your Board of Public Works representative concerning metering applications over 600 volts.

~~Existing overhead services shall be maintained by the Board.~~

~~Multifamily, commercial and industrial services on the customer's property shall be maintained by the customer. The Board's responsible for maintenance will end at the attachment point.~~
~~With Board of Public Works approval a customer may install overhead service on his property, at his expense, to a location designated by the Board. The cable shall be approved by and installed in a manner satisfactory to the Board. Sufficient cable shall be left at the base of the service riser pole or gang socket to connect to the Board's system.~~

Underground Service and Service Entrances

The Board of Public Works will supply the conductors for residential services, commercial and industrial service shall be supplied by a contractor.

If the underground service is installed by the Board of Public Works the customer may be required to reimburse the cost or a portion of cost of the installation to the Board. This cost is governed by Board of Public Works tariffs and regulations in effect at the time of installation.

Underground services may be installed to a property by the Board of Public Works at location where it is determined that the benefit of the underground outweighs the cost incurred. This will only be done at the convenience and desecration of the Board of Public Works.
Three-phase transformer pads shall be installed by the Board of Public Works or a contractor at the customer's expense at a mutually agreed upon location.

Consult the Board of Public Works regarding placement of transformers adjacent to building and building openings. It is necessary to have adequate and unobstructed space for the installation and maintenance of pad mounted transformers. Minimal clearances are shown in Appendix B-I for Board of Public Works installation and maintenance requirements. Normally, pads for single-phase transformers will be furnished and installed by the Board.

Installation of Underground Conduit

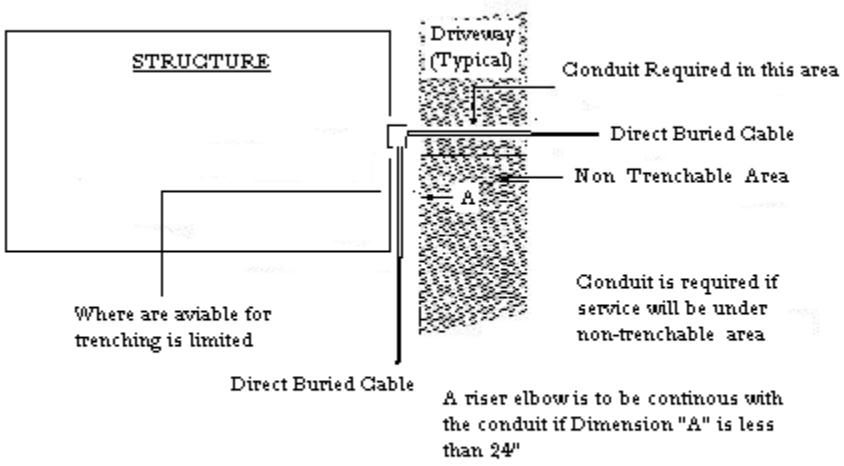
The customer may be required to install conduit at a minimum depth of 30 inches below final grade. Conduit materials and installation methods are to be acceptable to the Board of Public Works and may be required under the following conditions:

1. Under existing or likely future hard surface areas.
2. For both primary and secondary cables for townhouses, condominiums and mobile home parks.
3. Where area available for trenching is limited by any of the following:
4. Less than 10 feet clear width
5. Less than 10 feet clear height
6. Slope greater than 3 to 1
7. Distance between paved areas of less than 50 feet
8. Where the edge of the non trench able surface on property line is parallel to and within 2 feet of the structure foundation
9. Where single corridor is used for multiple utilities.
10. Where future landscaping will make cable location and repair difficult.
11. In locations where the customer wants to expedite cable installation.
12. Where a developer is paving a street with islands or medians, and it is necessary to install cable (either street lighting or primary) in those medians, the customer shall install conduit for the cable installation.

13. If the customers install the conduit, the customer shall install a pull wire or rope in the conduit.
14. The end of the conduit must be capped and the location of the cap is to be marked with a stake.

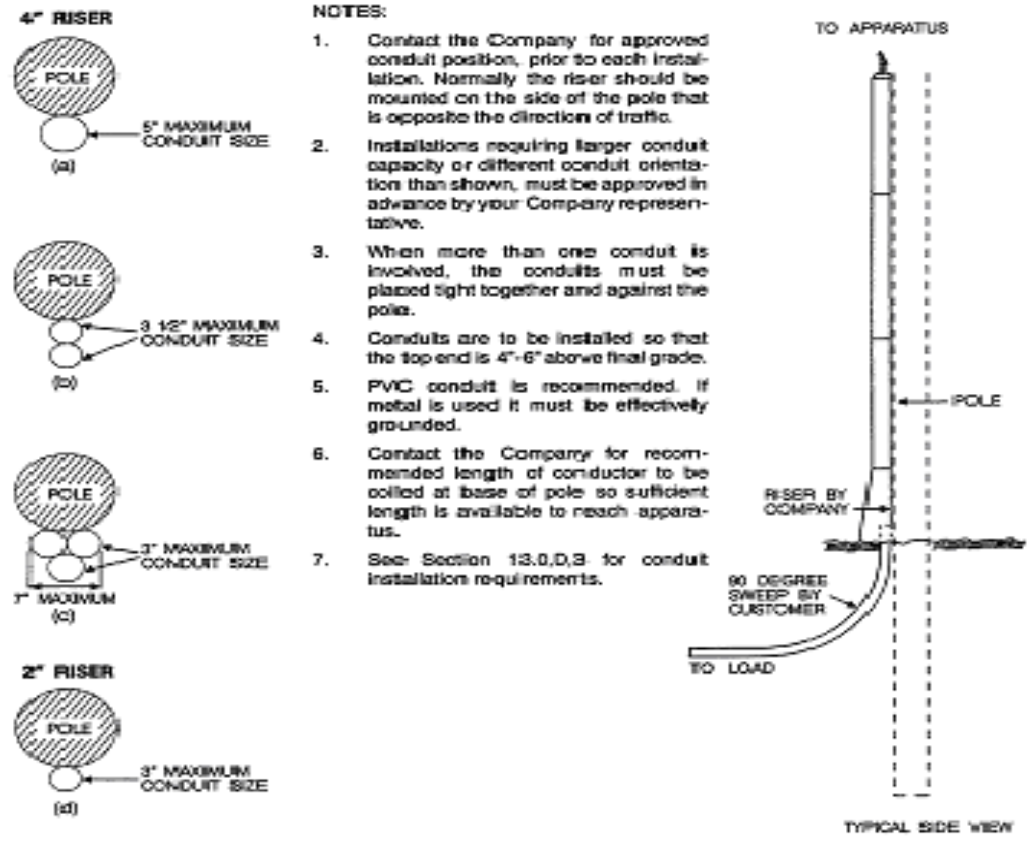
The customer has the option to locate the service entrance on another less restricted surface of the structure to avoid these requirements. Where the customer owns and maintains the service, the requirements to install the conduit may be waived by the Board. Contact your Board of Public Works representative.

UNDERGROUND CONDUIT INSTALLATION



The dimensional limitations and acceptable arrangements of conduit exits are shown below. For conduit installations the elbow exit, at the ground line, must be tight against the pole. If more than one elbow is used, the exit ends must be tight together. This requirement is necessary to accommodate the Board's cable guard.

UNDERGROUND CONDUIT INSTALLATION AT RISERS



CONDUCTOR IDENTIFICATION

Neutral conductor identification shall be in accordance with NEC Section 200-6. An insulated neutral conductor of No. 6 or smaller shall be identified by a continuous white or natural gray outer finish along its entire length.

An insulated neutral conductor larger than No. 6 shall be identified either by a continuous white or natural gray outer finish along its entire length, or at the time of installation by distinctive white or natural gray paint, or wrapped with white or natural gray tape at the weatherhead, other points of connection to Board of Public Works facilities, and all termination.

A grounded conductor may be un-insulated in accordance with NEC Section 230-41, except for neutral jumpers as indicated in Figures 27, 29, 30 and 31.

High phase identification shall be in accordance with NEC Section 230-56. On a 120/240 volt three-phase four-wire delta service, the phase conductor having the higher voltage to ground shall be identified by an outer finish that is orange in color, or at the time of installation, painted orange or wrapped with orange tape at the weather head, other points of connection to Board of Public Works facilities, and all termination.

The high phase conductor must be on the RIGHT HAND TERMINALS OF SELF-CONTAINEDMETER SOCKETS (see Figure 30), but on the MIDDLE TERMINAL OF SWITCHBOARDS AND PANELBOARDS (see NEC Section 384-3(f)).

When multiple conductors per phase are needed for a service the phase wires shall be identified with paint or tape so the proper grouping can be determined.

ALLOWED SERVICE CONDUCTOR SIZES AND CONNECTIONS

The Board of Public Works will allow the use of any NEC approved service conductor as shown in Figure 7. The Board of Public Works will furnish and install all connectors necessary to connect service conductors to the source of power.

1. All service conductor connections made by the customer, ahead of the main disconnect, or connections to instrument transformers, must meet the following requirements:
2. All lugs must be UL listed and not modified.
3. Lugs may not be stacked unless specifically UL listed for the application.
4. Bolts must be Grade 5 or better, plated steel, assembled with a heavy flat washer and cupped spring washer (Belleville) and properly tightened, for other than UL listed, factory-assembled, terminal connector provisions.
5. Bolts must be the maximum diameter that the lug hole will accept, except as restricted by the terminal hole size of the instrument transformer. The instrument transformer terminal holes shall not

be enlarged to accept larger bolts. An effort should be made to match the lug hole to the instrument transformer hole size.

6. Lugs must be attached with the maximum number of bolts possible. Two hole lugs are required on each side of bar type CT connections.

METERING EQUIPMENT

The Board of Public Works will normally supply meters and equipment for metering installations in accordance with the following:
Self-contained socket-type metering will normally be used where the size of the load-side wiring is less than 400 amperes and the voltage is 480 volts or less.

1. All services larger than 200 amps will require a service disconnect.
2. All self-contain 480 volt services will require a means of disconnect before the meter.
3. A 200 ampere self-contained socket type meter may be used for single-phase, three-wire, 120/240 volt service, where the size of the load side wiring does not exceed 200 amperes. No means of disconnect at the meter will be required if the meter socket is located on the same wall or within five feet of the same wall in the same room.
4. Services larger than 400 amps will be CT Metered.
5. Socket-type five or six terminal metering, with space for test switch or automatic bypasses mounted in the socket, will be used where single-phase three-wire services require current transformers.
6. Socket-type metering with test switches or automatic bypasses will normally be used with instrument transformers for three-phase installations where the size of the load-side wiring exceeds 400 amperes.
7. The use of meter sockets and other Board of Public Works sealed enclosures as junction boxes and raceways for customer's circuits is prohibited.
8. Taps or splices for the purpose of service entrance conductor extensions to additional metering points shall not be permitted in instrument transformer cabinets or in meter sockets.
9. Meter sockets with automatic bypass are allowed.
10. The Board of Public Works will furnish the instrument transformers, meter socket and meters. The customer shall furnish, install, and maintain the related cabinets, conduits and secondary leads from the instrument transformers to the meter socket. The secondary leads shall be No. 12 stranded copper wire with 600 volt type THWN insulation. The number and color of secondary leads are specified in the appropriate figures. Primary connections to the instrument transformers shall be made by the customer. Secondary connections to the instrument transformers, meter socket and meters will be made by the Board. The meters will be installed by the Board. Meter and instrument transformer cabinets shall be equipped with pad-lockable handle or other means to padlock or seal. Key locks will not be approved.
11. Under certain conditions, and only with special permission, the metering current transformers may be located within the

service transformer housing. The Board of Public Works representative, in consultation with appropriate Board of Public Works technical personnel, can advise if this option is available at a particular location.

12. If the customer desires the use of a Board of Public Works meter signal for demand monitoring purposes, the Board of Public Works will install, at the customer's expense, dry contacts external to the meter socket or cabinets. These contacts will provide the customer with a real and/or reactive power pulse. The Board of Public Works will not provide an end-of-interval timing pulse.

MOTORS AND SPECIAL EQUIPMENT

The proper operation of motors and other electrical equipment is necessary to minimize objectionable motor starting effects and to otherwise protect the service to other customers. All motors require starting currents substantially greater than their normal running currents. Excessive starting currents will result in objectionable drops in the supply voltage to the customers in the vicinity. Therefore, the customer's equipment will normally conform to the following requirements and any exceptions thereto will be subject to agreement between the Board of Public Works and the customer.

Protection of Motors and Other Equipment

Customers are advised to provide protection in accordance with the NEC or other pertinent sources of information for all types of equipment including, but not limited to, motors, computers, electronic equipment, and equipment in which computers or electronic equipment form an integral operating part, to adequately protect such equipment under all conditions including the following:

- Overload
- Loss of voltage
- High or low voltage
- Loss of phase (single-phasing on poly phase motors)
- Re-establishment of normal service after any of the above
- Phase reversal

Motors that cannot be subjected to full voltage on starting
Harmonics or wave form irregularities
The failure of the customer to provide proper protection may result in needless damage to equipment and the expense of delay and repair. For further information about protective devices, the customer is urged to contact the equipment supplier or your Board of Public Works representative.

Guidelines for Motor Sizes

Single-phase motors, 5 horsepower (hp) and smaller, may be operated without special means of reducing starting current. Single-phase motors larger than 5 hp may be permitted with Board of Public Works approval, provided the Board's electric facilities are adequate to supply the service and provided the use of such a motor or motors does not interfere with the quality of service rendered to other customers. In general, single-phase motors up to 2 hp may be operated on 120 volts. Single-phase motors 2 hp and larger shall not be operated on 120 volts.

Motors which are rated 230 volts may not operate satisfactorily on 208 volts.
Polyphase motors larger than 5 hp which are operated from a single phase service by use of a phase converter will only be allowed with Board of Public Works approval.
Polyphase motors rated at 15 hp and less may be started at full line voltage. For larger motors, the Board of Public Works reserves the right to require the customer to limit the motor starting current by the use of reduced-voltage starters or other acceptable means. Contact the Board of Public Works regarding any starting current limitations or information on high-efficiency motors.

Group Motor Installations

Reduced-voltage starting requirements for the largest motor will be the maximum allowable across the-line starting current for smaller motors. In this case, the reduced-voltage starting requirements for smaller motors may be omitted.

Special Equipment Applications

The installation of welders, x-ray equipment, diathermy equipment, radio transmitters, phase converts, large VFD drives, etc., may adversely affect the electric service to adjacent customers. Prior to installation, contact your Board of Public Works representative for specific requirements for the installation.

Power Factor

A customer's electric system having a low power factor produces an adverse effect on the Board's electric supply system and on the customer's electrical equipment. The Board's electric tariffs may impose an additional cost on customers when a customer's power factor falls below a specified limit.
Cost justification may exist for the customer to install high power factor equipment and/or capacitors on the customer's electric system to maintain an acceptable power factor. Motors should be sized so that normal motor operation is at or near the rated size of the motor.

Three phase Commercial and Industrial customers must maintain a power factor on peak of not less than ninety (90) percent or be subject to a penalty as dictated by filed rates.

The power factor is determined by the wattmeter-voltmeter-ammeter method. Contact your Board of Public Works representative for information regarding power factor correction techniques.

STANDBY GENERATOR SERVICE

The Board of Public Works does allow a customer to have standby generators for temporary or emergency electric service. For the safety of Board of Public Works personnel, as well as protection of the customer's equipment, there must be a positive means to guarantee that the standby generator cannot accidentally be connected in parallel to the Board's system.

A manual or automatic transfer switches shall be installed at the customer's expense by licensed electricians.

This switch must be designed so that under no conditions will the standby generator and the Board's electrical system operate in parallel. It must have a positive break-before-make design. The switch should also incorporate a visual break or some means of determining the physical position of the switch without removing a cover. The switch shall be installed in compliance with this manual and the NEC.

Before installing a system, please contact your Board of Public Works representative to be sure the proposed standby transfer switch installation meets the Board of Public Works requirements. If a standby generator is connected without an approved throw over device, service will be disconnected until such device is installed. Safety of personnel demands this requirement.

PARALLEL GENERATION OPERATION

Operation of any customer-owned generating equipment in parallel with the BPW system is prohibited without express written agreement between the customer and the Board. Contact your Board of Public Works representative before installing such equipment.

SERVICE CLEARANCES

Minimum Clearances for Overhead Service Conductors 480 Volt and Below

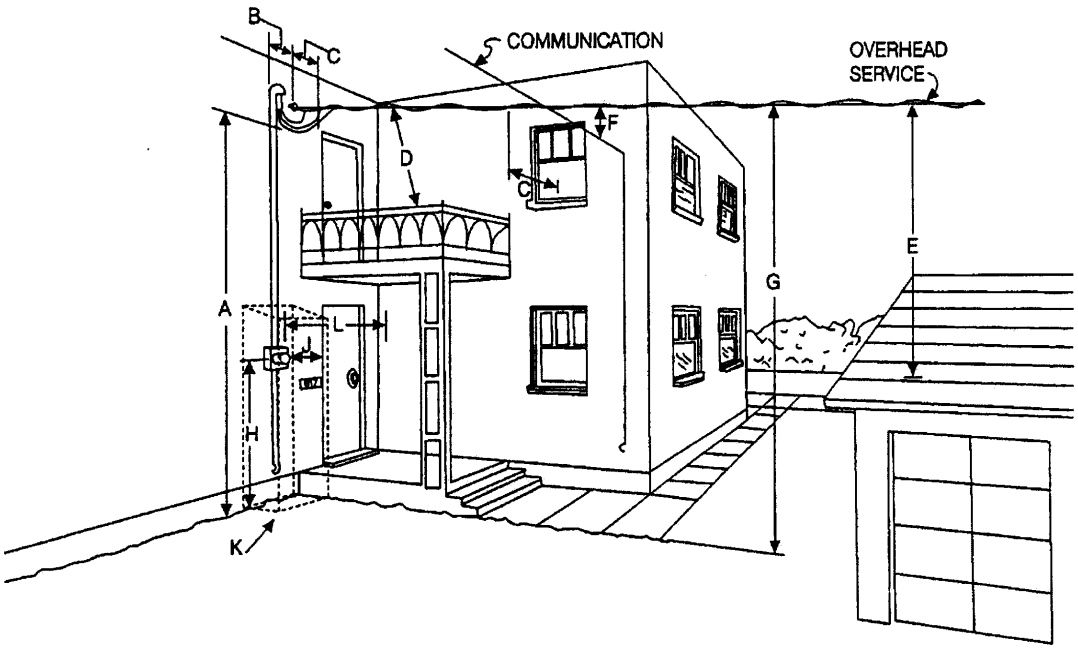
The following general clearances include Board of Public Works requirements and interpretations derived from the National Electrical Safety Code (NESC) Rule 234 and the National Electric Code (NEC) Section 230-24. Refer to these codes for specific conditions not shown in Figure 1.

Clearances for utility owned service drops and cables, beyond the perimeter of the customer's building, will be controlled by the NEC & NESC requirements. The following alphabetical designations and respective dimensions apply to Figure 1 on the opposite page. Clearances shown are for multiplex (duplex, triplex and quadruplex) service drop conductors. Open wire service conductors require greater clearances.

1. The drip loop or service attachment fixture, whichever is the lowest point, shall have 12 feet minimum vertical clearance above final grade. A clearance of 15 feet is required for 480 volt services.
2. The clearance between the service attachment and weatherhead shall be 12 inches minimum and 24 inches maximum.
3. Service conductors that are not protected by conduit or raceway shall have a minimum clearance of 3 feet from windows designed to be opened, doors, porches, fire escapes, signs, and similar construction. Conductors run above the top level of a window shall be permitted to be less than the 3 feet requirement.
4. The diagonal distance from the nearest edge of a balcony or deck handrail to the service conductor shall be 3 feet minimum.
5. Clearances over all roofs shall be 8 feet minimum

6. Minimum vertical clearances between service drop and communication conductors shall be 2 feet at the conductor crossing and 40 inches at adjacent vertically spaced attachments to the building
7. The minimum clearance is 12 feet above sidewalk, ground, and residential driveways; 18 feet above commercial areas, public driveways, alleys and streets, and other land traversed by vehicles.
8. For individual settings, the clearance between the center of the meter and the finished grade is to be 6 feet maximum and 4 feet minimum
9. Clearance for open conductors are greater than the clearance listed here
10. The horizontal clearance from the nearest side of the meter socket enclosure to any structural protrusion shall be 3 inches minimum
11. A clear working space of not less than 36 inches in front of the meter and 30 inches wide shall be maintained at all times or the meter shall be relocated at the customer's expense. (NEC Section 110-16)
12. The dimension between the hinged side of a door and the nearest surface of the meter is to be door width plus 6 inches

Example Minimum Clearances for Conductors 480 Volt and Below



A The drip loop or service attachment fixture, whichever is the lowest point, shall have 12 feet minimum vertical clearance above final grade. A clearance of 15 feet is required for 480 volt services. Service entrance conductors shall be in conduit.

B The clearance between the service attachment and weather head shall be 12 inches minimum and 24 inches maximum. Service conductors that are not protected by conduit or raceway shall have a minimum clearance of 3 feet from windows designed to be opened, doors, porches, fire escapes, signs and similar construction.

C Conductors running above the top level of a window shall be permitted to be less than the 3 feet requirement.

D The diagonal distance from the nearest edge of a balcony or deck handrail to the service conductor shall be 3 feet minimum.

E Minimum vertical clearances of service drop wires over any roof are 8 feet.

F Clearance between service drop and communication conductors shall be 2 feet at the conductor crossing and 40 inches at adjacent vertically spaced attachments to the building

G The minimum clearance is 12 feet above sidewalk, ground, and residential driveways; 18 feet above commercial areas, public driveways, alleys and streets and other land traversed by vehicles.

H For individual settings, the clearance between the center of the meter and the finished grade is to be 6 feet maximum and 4 feet minimum

I The horizontal clearance from the nearest side of the meter socket enclosure to any structural protrusion shall be 3 inches minimum

J A clear working space of not less than 36 inches in front of the meter and 30 inches wide shall be maintained at all times or the meter shall be relocated at the customer's expense. (NEC Section 110-16)

K The dimension between the hinged side of a door and the nearest surface of the meter is to be door width plus 6 inches

GENERAL NOTES

1) The house number must be clearly posted and readable from the street.
2) The service weather head is to be located no lower than the service attachment point to insure a positive drip loop.
3) Contact your Board of Public Works representative for entrance and meter location. The Board of Public Works will refuses connection to any service entrance not installed in an approved location.
4) The customer shall install a suitable service attachment point to obtain proper ground clearance.
5) Service entrance conductors must be in conduit.
6) Clearances shown are for multiplex (duplex, triplex, and quadruplex) service drop conductors. Open wire service conductors require greater clearances.

General Requirements

1. The customer shall install a suitable service attachment point. For proper ground clearance.
2. Eyebolts connected directly to the roof will not be approved.
3. The service weather head is to be located no lower than the service attachment point to insure a positive drip loop.
4. Service drop conductors shall not pass over or within 6 inches of furnace, fireplace, or sewer vents.
5. Voltage between the conductors is 300 volts or less and the horizontal distance that the service drop conductors overhang the roof is 4 feet or less. This distance is measured along the direction of conductor approach. (See figure 2B). The vertical clearance of the conductors at the weather head is 18 inches minimum.
6. If the dimension is greater than 4 feet and the voltage between the conductors is 300 volts or less and the roof slope is greater than or equal to 4” in 12”. The vertical clearance of the conductors at the weather head is 3 feet minimum for a distance not to exceed 4 ft at which time vertical clearance will increase to 8 ft.
7. If the dimension is greater than 4 feet and the voltage between the conductors is 300 volts or less and the roof slope is less than 4” in 12”. The vertical clearance of the conductors at the weatherhead is 8 feet minimum.
8. Voltage between the conductors is 300 volts or greater special conditions are required.
9. All vertical dimensions apply to any point on the roof surface directly under the conductors.

Roof & Service Attachment Requirements

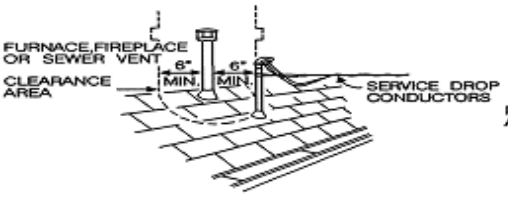


FIG. 2(A)

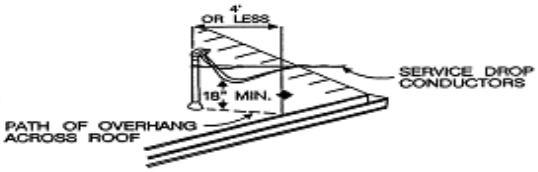


FIG. 2(B)

FIG. 2(C)

Distance from the edge of the roof to service mask is greater than 4 feet and the roof slope is equal to or greater than 4" in 12".

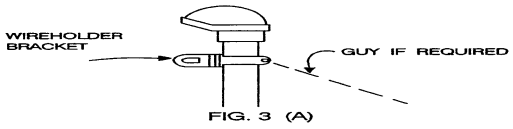


FIG. 3 (A)

SERVICE RISER MAST
(REFER TO FIG. 4 FOR
CONDUIT SIZE REQUIREMENTS)

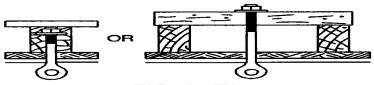


FIG. 3 (B)

BRICK VENEER, STUCCO, PLASTER,
SHEET METAL WALLS, OR ANY
FRAME BUILDING

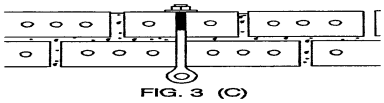


FIG. 3 (C)

SOLID MASONRY, BRICK, OR CEMENT:
EYE BOLTS MAY BE INSTALLED
THROUGH THE MORTAR JOINT

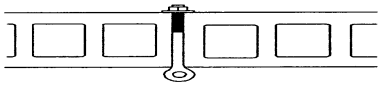


FIG. 3 (D)

CONCRETE BLOCK OR HOLLOW TILE:
EYE BOLTS MAY BE INSTALLED
THROUGH THE MORTAR JOINT

1 The customer shall be responsible for all service attachment provisions.

2 Eye bolts, where required, shall be galvanized, ½ inch minimum diameter, and installed by the customer. Screw point or lag type attachments are not permitted.

3 Other types of service attachments may be required for larger services.

4 Service drop conductors shall not be attached to fire walls, parapet walls or chimneys.

Typical Overhead Service Mast Requirements

ENTRANCE SIZE	Height Above Roof in Feet (Rigid or Intermediate)	MAXIMUM SERVICE DROP LENGTH (Ft.) 1.5	2	3	4	5
100A	2″	125	100	75	75	50
	2-1/2"or 3″	150	150	100	100	75
	3-1/2"or 4″	150	150	150	125	100
200A	2″	100	75	50	50	50*
	2-1/2"or 3	150*	100	75	75	50
	3-1/2"or 4″	150*	150*	125*	100*	75*
400A	2-1/2"or 3″	100	100	75	50	50
	3-1/2"or 4″	125	100	100	75	75

(*) Indicate that 25 ft. must be subtracted from the indicated span length if service is quadruplex

1. The maximum service drop lengths shown are for triplex and quadruplex services attached to unguyed riser masts.

2. Conductor supports for spans longer than the maximum service drop lengths, for a given condition listed in the above table, must be guyed or braced to withstand the following maximum actual service drop tension:

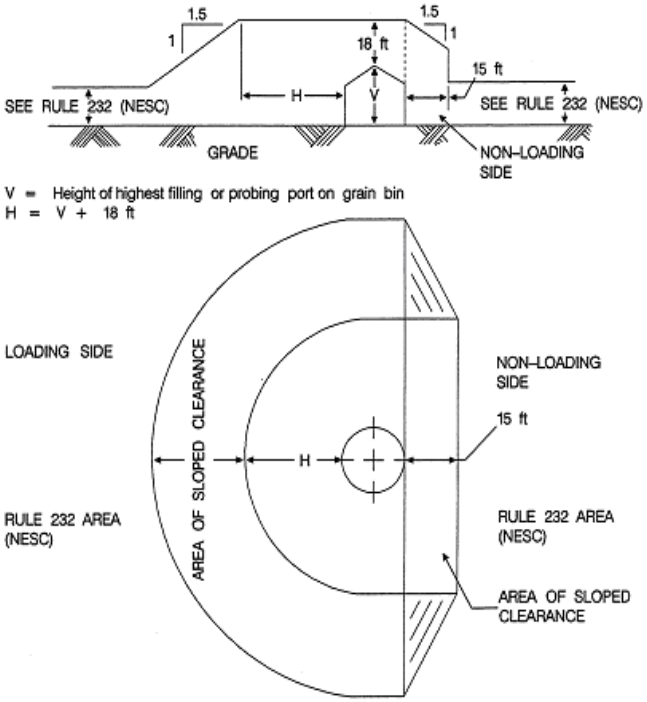
Entrance Size	**Maximum Actual Tension**
100A	1500 Lbs
200A	2000 Lbs
400A	3500 Lbs

The customer should consider providing additional strength as a "Safety Factor" (NEC Section 230-28).

3. The service conductor type and span length will be selected by the Board of Public Works representative as part of their inspection to determine the service entrance location. This information will be made available to the customer on request.

4. EMT (thin wall conduit) is not acceptable for any portion of the service mast.

Clearance requirements Around Grain Bins



1) Overhead service drop conductors should not be routed through the clearance envelope as shown above. For exceptions, see NESC Rule 234F.

2) The customer shall contact the Board of Public Works representative to review clearances between grain bins and Board of Public Works facilities.

3) This figure is reprinted from IEEE Std C2-1 993, National Electrical Safety Code.

GROUNDING REQUIREMENTS

1. All grounding of electric installations shall meet the requirements of NEC Article 250, requirements of the Board of Public Works as shown in these construction standards, and all other applicable codes.
2. The grounding electrode system shall consist of the provisions specified in NEC Section 250-81 and, when required, Section 250-83. The Board of Public Works does not allow the use of gas piping for grounding of electrical services.
3. Ground rods, when used, shall be at least 8 feet long and ½ inch in diameter if copper, copper clad, or stainless steel, or 5/8 inch in diameter if galvanized or steel. The top of the rod shall be 2 to 6 inches below ground level. In certain instances additional grounding electrodes may be required, see NEC Section 250-84.
4. A main bonding jumper shall be installed at the main service equipment as required by NEC Section 250-53b.
5. If a metal underground water pipe is in direct contact with the earth for 10 feet or more, it must be bonded to the grounding electrode system. In addition, a copper bonding conductor, or equivalent, must be connected around the water meter. See the following NEC Table 250-94, reprinted with permission from NFPA 70-1993, the National Electrical Code, Copyright 1992, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

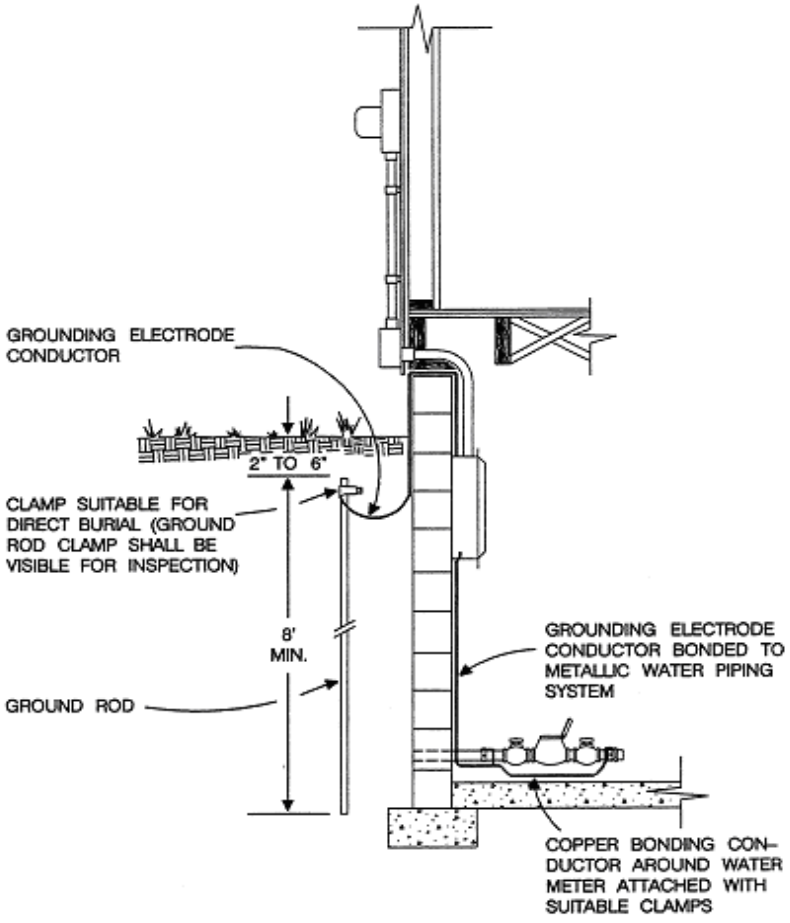
Grounding Electrode Conductor for AC Systems

Size of Largest Service Entrance Conductor or Equivalent Area for Parallel Conductors		Sizing of Grounding Electrode Conductor	
Copper	Aluminum or Copper Clad Aluminum	Copper	Aluminum or Copper Clad Aluminum
2 or smaller	1/0 or smaller	8	6
1 or 1/0	2/0 or 3/0	6	4
2/0 or 3/0	4/0 or 250 kcmil	4	2
Over 3/0 thru350 kcmil	Over 250 kcmil thru 500 kcmil	2	1/0
Over 350 kcmil thru 600 kcmil	Over 500 kcmil thru 900 kcmil	1/0	3/0
Over 600 kcmil thru 1100 kcmil	Over 900 kcmil thru 1750 kcmil	2/0	4/0
Over 1100 kcmil	Over 1750 kcmil	310	250 kcmil

Where multiple sets of service-entrance conductors are used as permitted in NEC Section 230-0, Exception No. 2, the equivalent size of the largest service-entrance conductor shall be determined by the largest sum of the areas of the corresponding conductors of each set.

NOTE: Where connected to made electrodes as in NEC Section 250-83 © or (d), that portion of the grounding electrode conductor that is the sole connection to the grounding electrode shall not be required to be larger than No. 6 copper wire or No. 4 aluminum wire.

See installation restrictions in NEC Section 250-92(a)


GROUNDING ELECTRODE CONDUCTOR
2" TO 6"
CLAMP SUITABLE FOR DIRECT BURIAL (GROUND ROD CLAMP SHALL BE VISIBLE FOR INSPECTION)
8' MIN.
GROUND ROD
GROUNDING ELECTRODE CONDUCTOR BONDED TO METALLIC WATER PIPING SYSTEM
COPPER BONDING CONDUCTOR AROUND WATER METER ATTACHED WITH SUITABLE CLAMPS

ALLOWABLE SERVICE CONDUCTOR SIZES

Allowable ampacities of insulated conductors rate 0-2000 Volts, 60 to 90C (140 to 194C) not more than three conductors in raceway or cable or earth (directly buried), based on ambient temperature of 300C(860F)

The following NEC Table 310-16 is reprinted from NFPA 70-1993, the National Electrical Code, Copyright 1992, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

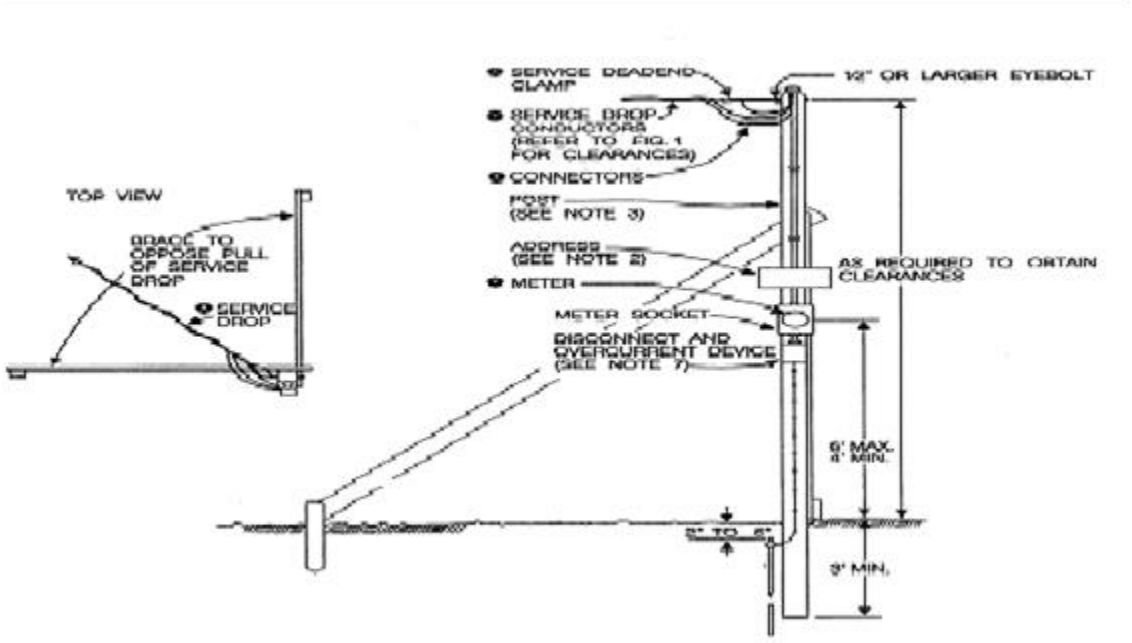
TEMPERATURES RATING OF CONDUCTOR SEE TABLE 310-13 OF THE NEC

Wire Size	TW,UF 60 C (140 F) COPPER	FEPW, RH, RHW, THHW,TH W, THWN, XHHW, USE, ZW 75C (167 F)	TA,TBS, SA, SIS, FEP, FEPB, MI,RHH, RHW-2, THHN, THHW, THW-2, THWN-2, THW-2, THWN-2, XHHW-2, ZW-2 90C (194 F)	TW,UF 60 C (140F) ALUMINUM OR COPPER CLAD ALUMINUM	FEPW, RH, RHW, THHW,TH W, THWN, XHHW, USE, ZW 75 C (167 F)	TA,TBS, SA, SIS, FEP, FEPB,MI , RHH, RHW-2, THHN, THHW, THW-2, THWN-2, THW-2, THWN-2, XHHW-2, ZW-2 90 C (194 F)	Wire Size
6	55	65	75	-	-	-	
4	70	85	95	55	65	75	4
3	85	100	110	65	75	85	3
2	95	115	130	75	90	100	2
1	110	130	150	85	100	115	1
1/0	125	150	170	100	120	135	1/0
2/0	145	175	195	115	135	150	2/0
3/0	165	200	225	130	155	175	3/0
4/0	195	230	260	150	180	205	4/0
250	215	255	290	170	205	230	250
300	240	285	320	190	230	255	300
350	260	310	350	210	250	280	350
400	280	335	380	225	270	305	400
500	320	380	430	260	310	350	500
600	355	420	475	285	340	385	600
700	385	460	520	310	375	420	700
750	400	475	535	320	385	435	750

Note: For residential applications, see Note 3 following Table 310-19 of the NEC

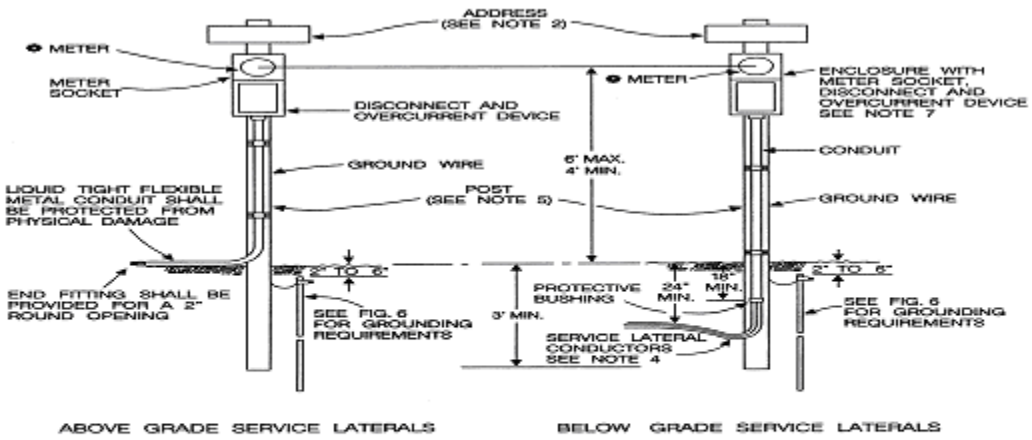
SELF CONTAINED METER INSTALLATIONS

Overhead Temporary Service



1) An address sign that is visible from the street shall be posted on the meter setting. It shall be made of materials that provide a clearly legible address for the duration of the setting.
2) With the exception of pedestal type settings, the support shall be a square or round timber post, 4 inch x 4 inch minimum or equivalent.
3) Meters shall not be installed on or in trailers, portable houses, or any buildings not on a permanent foundation.
4) The weather head is to be located above the level of the service attachment point.
5) The customer shall provide, install and connect all grounding equipment.
6) All 120 volt circuits shall have ground fault circuit interrupters GFI (NEC Section 305-6).
7) All customers provided equipment shall be weatherproof.
8) The service drop conductors shall not cross adjoining property.

Underground Temporary Service

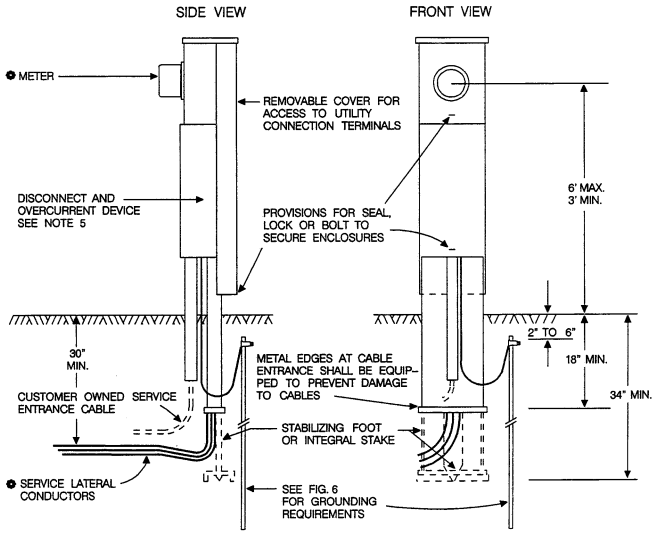


SERVICE CHARACTERISTICS		METER WIRING
VOLTAGE	SIZE	
1-PHASE 120 V 2-WIRE	60 A MAX.	FIG. 27
1-PHASE 120/240 V 3-WIRE	200 A MAX.	FIG. 27
1-PHASE 120/208 V 3-WIRE	200 A MAX.	FIG. 29
3-PHASE 120/208 V 4-WIRE	200 A MAX.	FIG. 30

1) An address sign that is visible from the street shall be posted on the meter setting. It shall be made of materials that provide a clearly legible address for the duration of the setting.
2) The Board of Public Works will provide and install all ~ marked items. The customer shall be responsible for all other items.
3) The service lateral conductors shall be suitable for direct burial.
4) The customer shall provide and install the service lateral conductors in a manner that provides a sufficient length of conductor coiled at the transformer, secondary hand hole or secondary pedestal, for connection to the power source by the Board.
5) With the exception of pedestal type settings, the support shall be a square or round timber post, 4 inch x 4 inch minimum or equivalent.
6) The customer shall provide, install and connect all grounding equipment.
7) All 120 volt circuits must have ground fault circuit interrupters (GFI), (NEC Section 305-6).
8) All customers provided equipment shall be weatherproof.
9) If the temporary meter setting is located adjacent to pad mount transformer, secondary pedestal or secondary hand hole, it shall be between 5 to 7 feet away from the enclosure.

Underground Residential Service Meter Pedestal

TYPICAL UNDERGROUND RESIDENTIAL SERVICE METER PEDESTAL

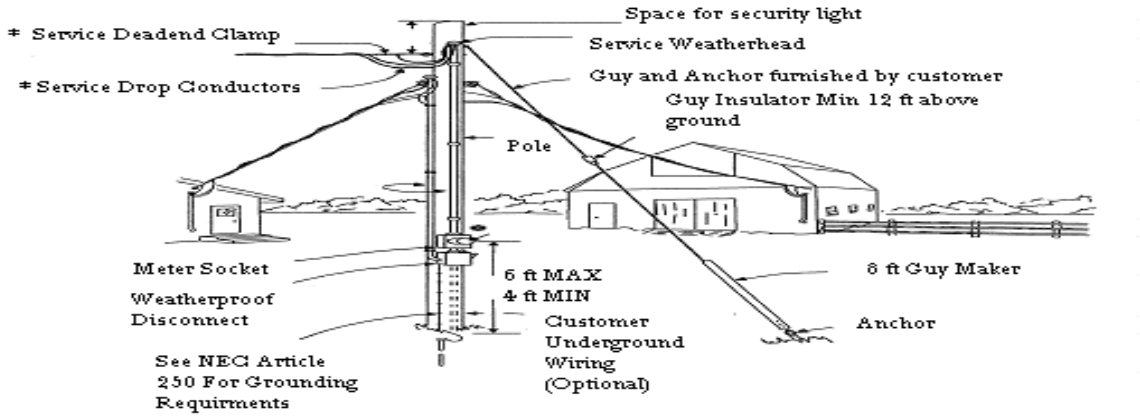


SERVICE CHARACTERISTICS		METER WIRING
VOLTAGE	SIZE	
1-PHASE 120/240 V 3-WIRE	400 A MAX.	FIG. 27

a. Meter pedestal shall have a removable cover for access to utility connection terminals.
b. Meter pedestal shall have provisions for seal, lock, or seal able bolt to secure the enclosure key locks will not be approved.
c. Meter mounting equipment shall meet the requirements listed in the Board's Minimum Specifications for Meter Sockets. See Appendix C.
d. Pedestal materials shall be fiberglass or steel. Steel shall be minimum of 14 gauge and plated or galvanized. The finish shall be tough, non-fading and have long service life.
e. Metal pedestals shall be bonded to the neutral connector. The neutral connector shall be equipped with a lug for exclusive use of a copper ground wire.
f. Pedestals manufactured by the following meet the above requirements:
   i. Anchor
   ii. Durham
   iii. Midwest Electric Products, Inc.
   iv. Nordic Fiberglass, Inc.
g. Meter mounting equipment that meets the above criteria, but is not on the attached list will be evaluated on a case-by-

case basis. If found acceptable, the equipment will be added to the list.

Rural Service Meter Pole with Disconnect Figure 15

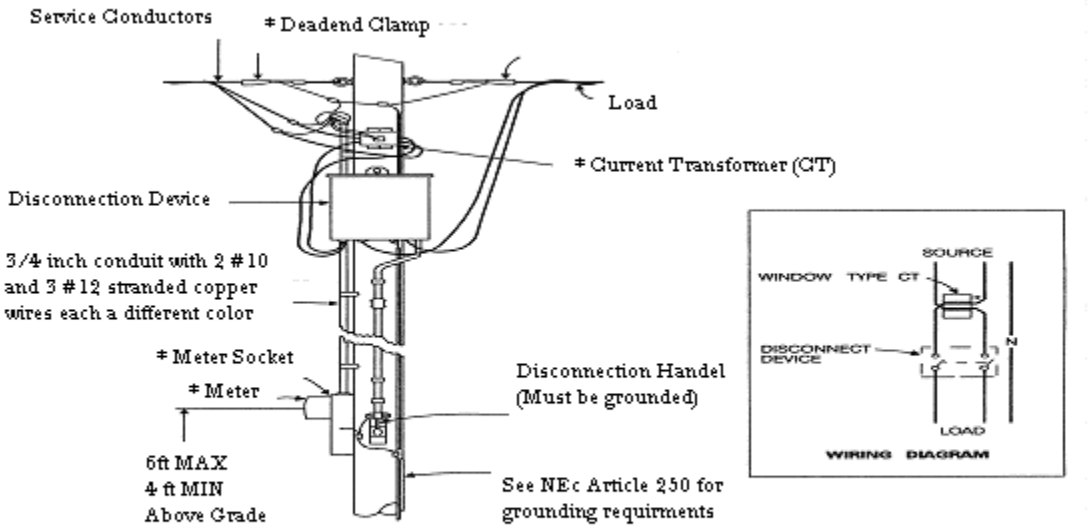


~
lic Works will provide and install all * marked items. The customer shall be responsible for all other items.

2) The attachment of the customer's metering equipment and distribution wiring will not be allowed on company poles.
3) The customer shall be responsible for providing and installing a pole that is in suitable condition for extended service life, to support the service drop conductors and equipment. The pole shall be in an accessible location out of the way of farm equipment traffic. The pole is to meet or exceed the following minimum requirements: Length: Sufficient to maintain proper clearances, Setting Depth: 5 feet Top Diameter: 5.5 Inches Treatment: Pentachlorophenol or equivalent
4) Contact your Board of Public Works representative to determine the need for an approved down guy
5) The Board of Public Works can provide and install, at the customer's expense, a pole and (if necessary) the down-guy.
6) The customer's service riser, metering equipment and wiring shall conform to NEC requirements.
7) The service weather head is to be located above the service attachment point to insure a positive drip loop.
8) When using a pole top disconnect refer to Figure 16.
9) When facilities for a standby generator are installed refer to Figure 17
10) Locations of fuel storage tanks and dispensing devices shall be in accordance with NEC Table 514-2.

11) The Board of Public Works strongly requires that the customer install a disconnecting switch or an over current protection device on the load side of the meter.
12) The customer shall provide fuse or circuit breaker protection and grounding for each building supplied from the meter pole (NEC Articles 225 and 250).
13) The service conductors should not cross adjoining property or livestock areas.
14) Metered and unmetered conductors shall not be installed in the same conduit.

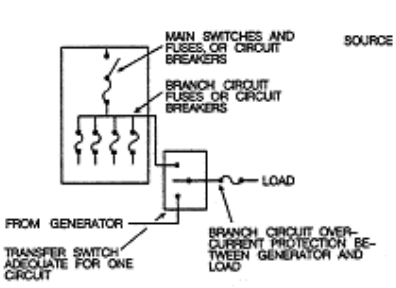
Rural Service Meter Pole with Pole Top Disconnect Figure 16



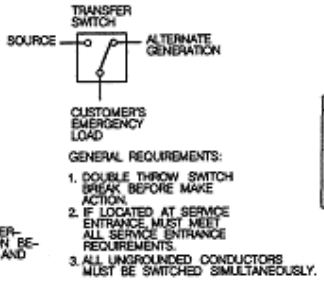
1) The Board of Public Works will provide and install all marked items. The customer shall be responsible for all other items except the current transformer (CT), which will be furnished by the Board of Public Works and installed by the customer.
2) The metering wiring conduit weather head shall be mounted above the current transformer to insure a positive drip loop.
3) The customer shall install five No. 12 stranded copper meter leads (blue, black, red, orange, and white) through the meter wiring riser conduit and provide sufficient length to reach the CT terminals. Connection of these leads to the CT terminals will be made by the Board of Public Works.
4) The phase conductors must pass through the CT window from opposite directions as shown in the wiring diagram.
5) Only window type current transformers will be mounted outdoors.
6) Use five terminal meter socket with space for test switch.
7) For pole, down guy and attachment provision requirements refer to Figure 15.
8) When facilities for a standby generator are involved refer to Figure 17.
9) Other service voltages may be available. Contact your Board of Public Works representative.

Meter Installation with Standby Generator Figure 17

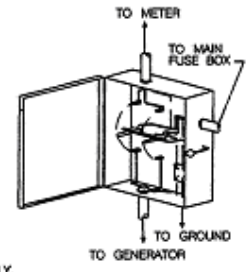
IF A STANDBY GENERATOR IS CONNECTED WITHOUT AN APPROVED TRANSFER SWITCH, SERVICE WILL BE DISCONNECTED UNTIL SUCH SWITCH IS INSTALLED. SAFETY OF PERSONNEL DEMANDS THIS REQUIREMENT. SEE SECTION 19 OF THIS MANUAL FOR ADDITIONAL INFORMATION.



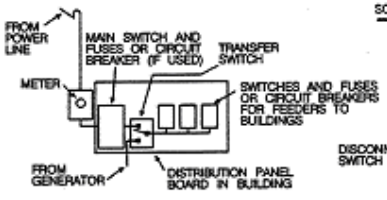
STANDBY GENERATOR CONNECTED TO ONE CIRCUIT



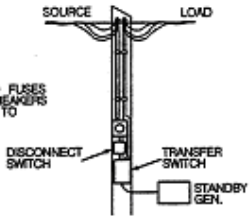
ONE LINE DIAGRAM



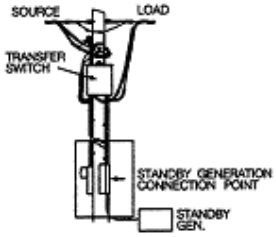
DOUBLE THROW SWITCH



STANDBY GENERATOR CONNECTED AT SERVICE ENTRANCE ON BUILDING



POLE MOUNTED SERVICE ENTRANCE WITH SELF-CONTAINED METER



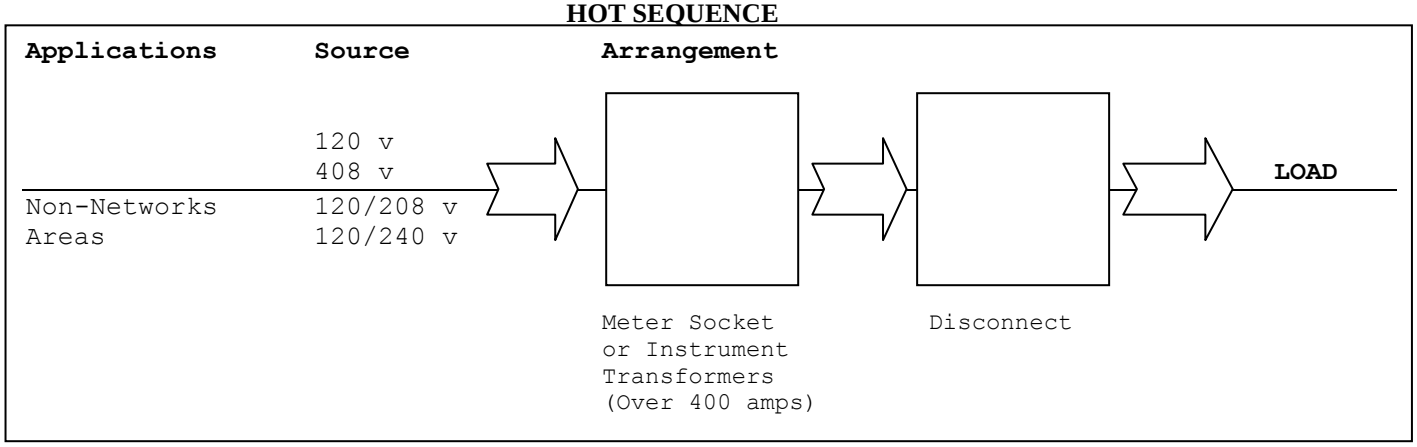
POLE MOUNTED SERVICE ENTRANCE WITH CT METERING

The position of the transfer switch, with respect to the main switch, can vary from that shown. Contact your Company representative to be sure that the proposed transfer switch installation meets the Company requirements.

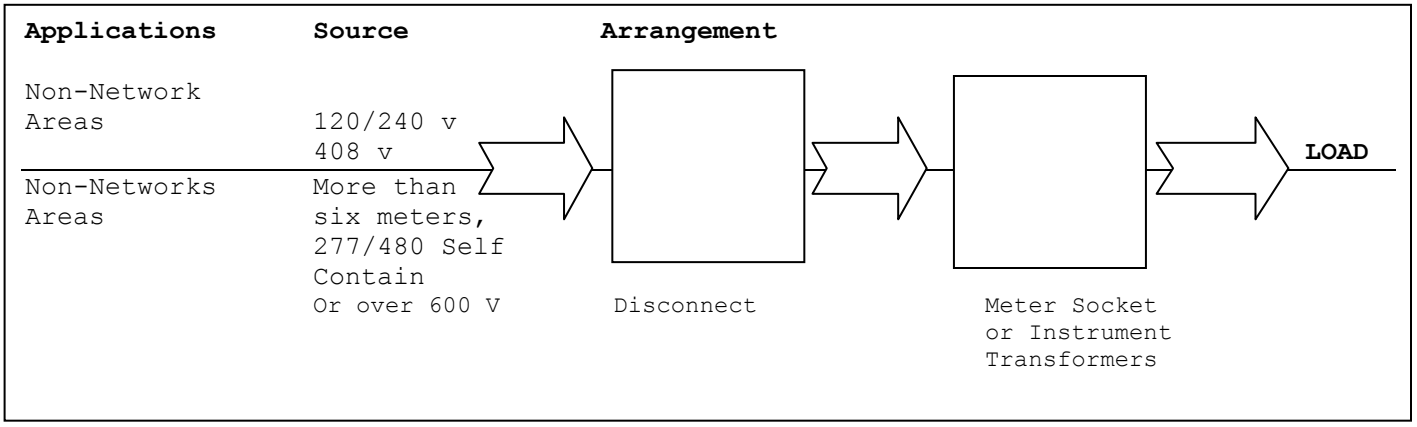
Metering Sequence Requirements – Non Residential Services

Notice:
Contact Board of Public Works to determine Metering Sequence Requirements

HOT SEQUENCE

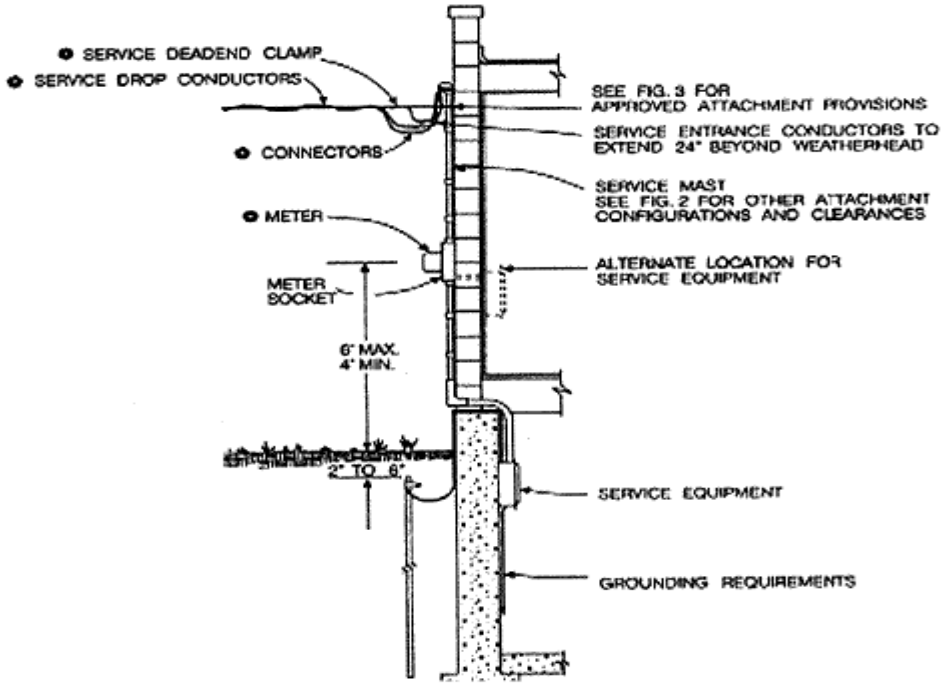


COLD SEQUENCE



SELF CONTAIN METERING

Typical Self Contain Overhead Service

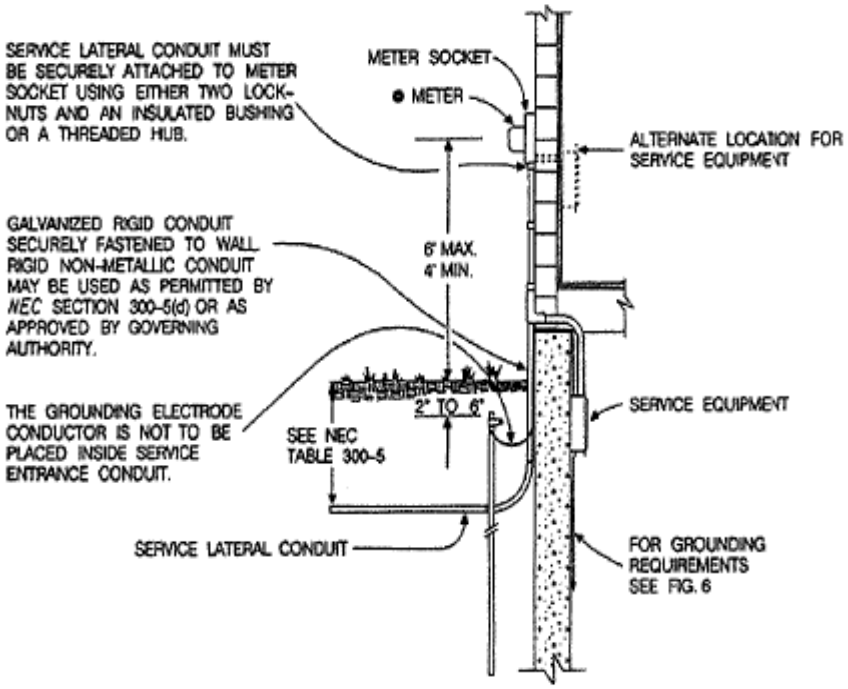


SERVICE CHARACTERISTICS

Voltage	**Size**
1 Phase 120 V 2 Wire	60 A Max
1 Phase 120/240 V 3 wire	200 A Max
1 Phase 120/240 V 3 wire	400 A Max
1 Phase 120/208 V 3 wire	200 A Max
1 Phase 277/480 V 3 wire	200 A Max
3 Phase 120/208 V 4 wire	200 A Max
3 Phase 120/240 V 4 wire	200 A Max
3 Phase 120/208 V 4 wire	400 A Max
3 Phase 120/240 V 4 wire	400 A Max

Items marked with an * are supplied by the BPW.

Typical Self Contain Underground Service

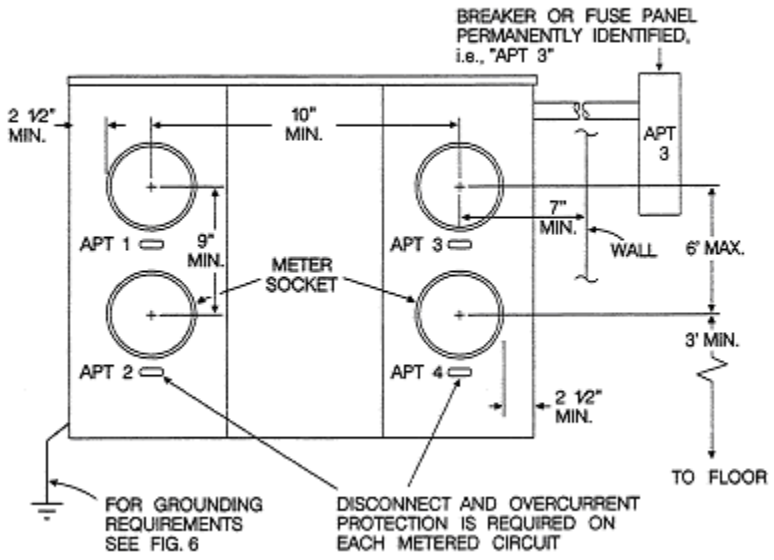


SERVICE CHARACTERISTICS

Voltage	**Size**
1 Phase 120 V 2 Wire	60 A Max
1 Phase 120/240 V 3 wire	200 A Max
1 Phase 120/240 V 3 wire	400 A Max
1 Phase 120/208 V 3 wire	200 A Max
1 Phase 277/480 V 3 wire	200 A Max
3 Phase 120/208 V 4 wire	200 A Max
3 Phase 120/240 V 4 wire	200 A Max
3 Phase 120/208 V 4 wire	400 A Max
3 Phase 120/240 V 4 wire	400 A Max

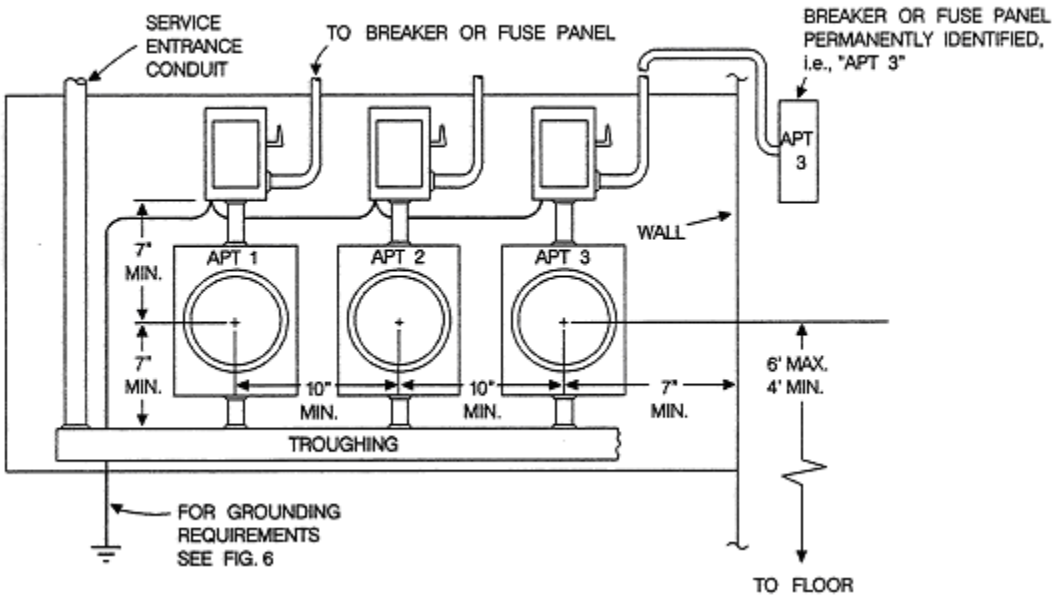
Items marked with an * are supplied by the BPW.

Group Metering More than Two or Six or Less



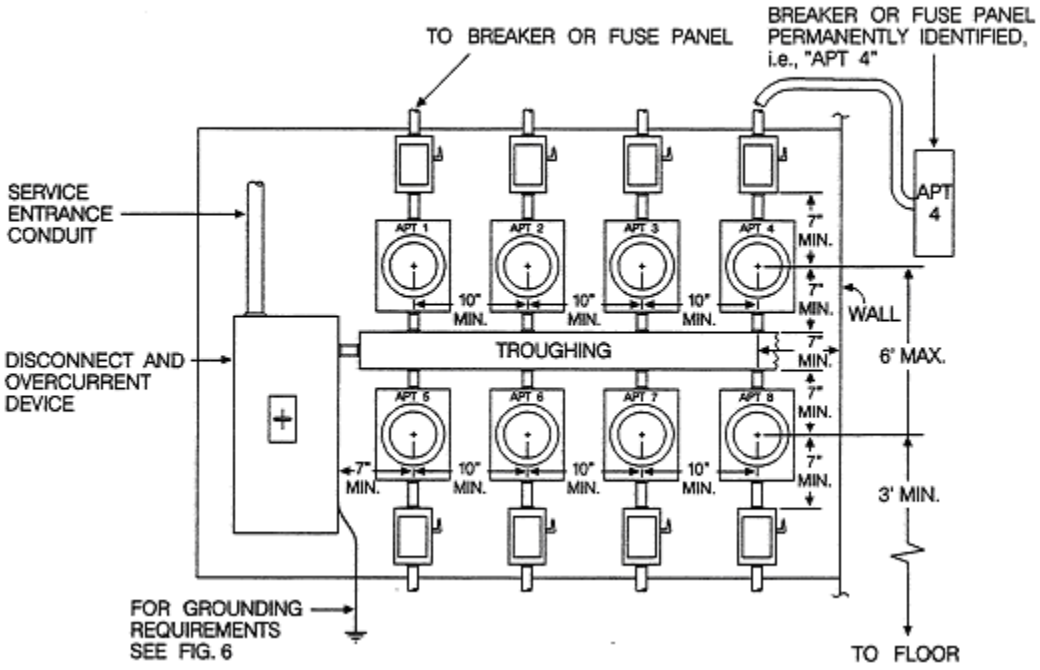
1) All service entrance equipment shall be UL listed.
2) All meter sockets shall meet Board of Public Works specifications.
3) Working space in front of service entrance equipment and meter sockets shall be in accordance with NEC Section 110-16.
4) Apartments, rooms, or suites shall have identical markings on the entry door, meter socket, and fuse or breaker panel.
5) All wiring after the point of connection of the service wires is the responsibility of the owner.

Group Metering More than Two or Six or Less Fabricated



1) All service entrance equipment shall be UL listed.
2) All meter sockets shall meet Board of Public Works specifications.
3) Working space in front of service entrance equipment and meter sockets shall be in accordance with NEC Section 110-16.
4) Apartments, rooms, or suites shall have identical markings on the entry door, meter socket, and fuse or breaker panel.
5) All wiring after the Disconnect is the responsibility of the owner.

Group Metering Six or More Field Fabricated



1) All service entrance equipment shall be UL listed.
2) All meter sockets shall meet Board of Public Works specifications.
3) Working space in front of service entrance equipment and meter sockets shall be in accordance with NEC Section 110-16.
4) Apartments, rooms, or suites shall have identical markings on the entry door, meter socket, and fuse or breaker panel.
5) All wiring after the Disconnect is the responsibility of the owner.

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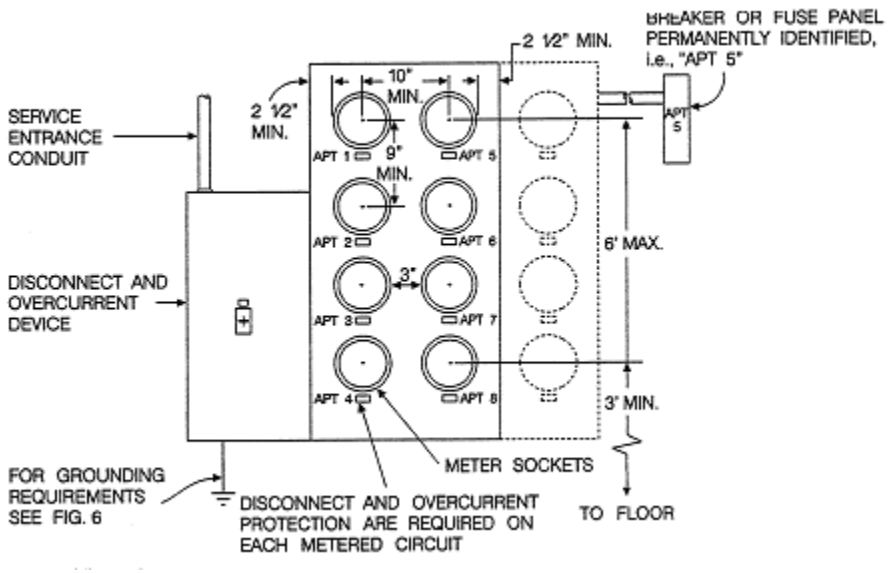
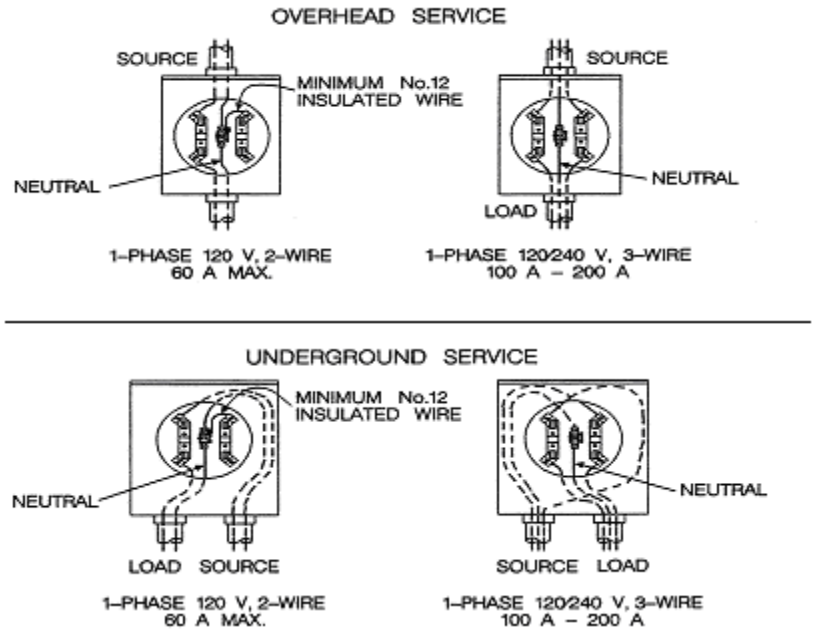
Group Metering Six or More Meters



1) All service entrance equipment shall be UL listed.
2) All meter sockets shall meet the Board of Public Works specifications.
3) Working space in front of service entrance equipment and meter sockets shall be in accordance with NEC Section 110-16.
4) Apartments, rooms, or suites shall have identical markings on the entry door, meter socket, and fuse or breaker panel.
5) All wiring after the Disconnect is the responsibility of the owner.

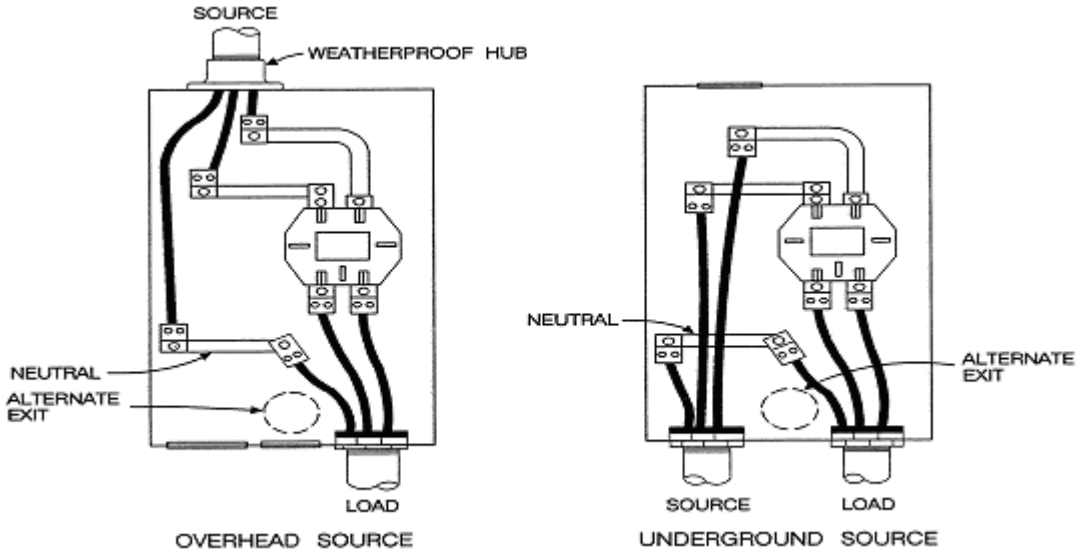
Meter Socket Wiring 1 Phase 120-240 V, 200 Amp Maximum



CAUTION: Source conductors shall be positioned along the sides of the meter socket, utilizing adequate bending radius, to provide maximum clearance from other socket terminals.

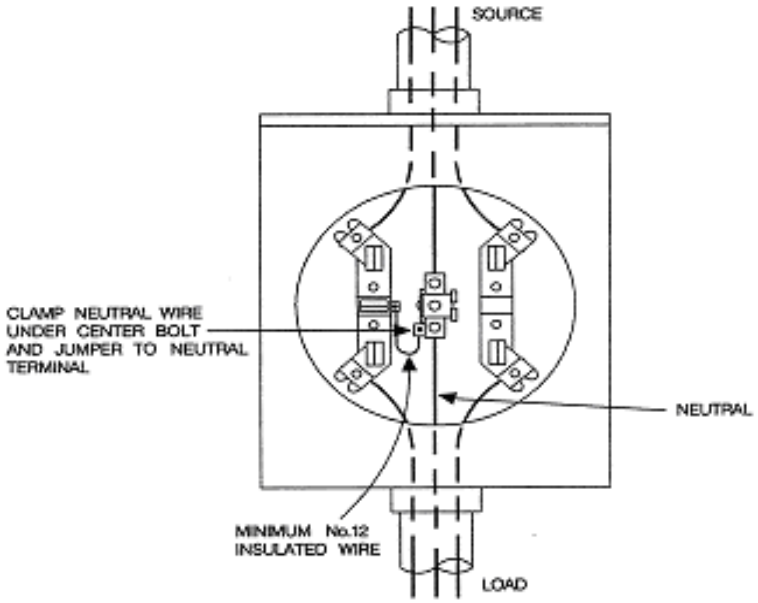
1. The meter sockets shall meet Board of Public Works specifications.
2. Working space in front of service entrance equipment and meter sockets shall be in accordance with NEC Section 110-16.
3. When using aluminum conductors, wire brush conductors and apply oxide inhibitor on all connections.
4. The neutral shall be grounded at the main disconnect in accordance with the NEC.
5. Please contact your Board of Public Works representative if any questions arise concerning this installation.

Meter Socket Wiring 1 Phase 120 – 480 V, 400 Amp Maximum



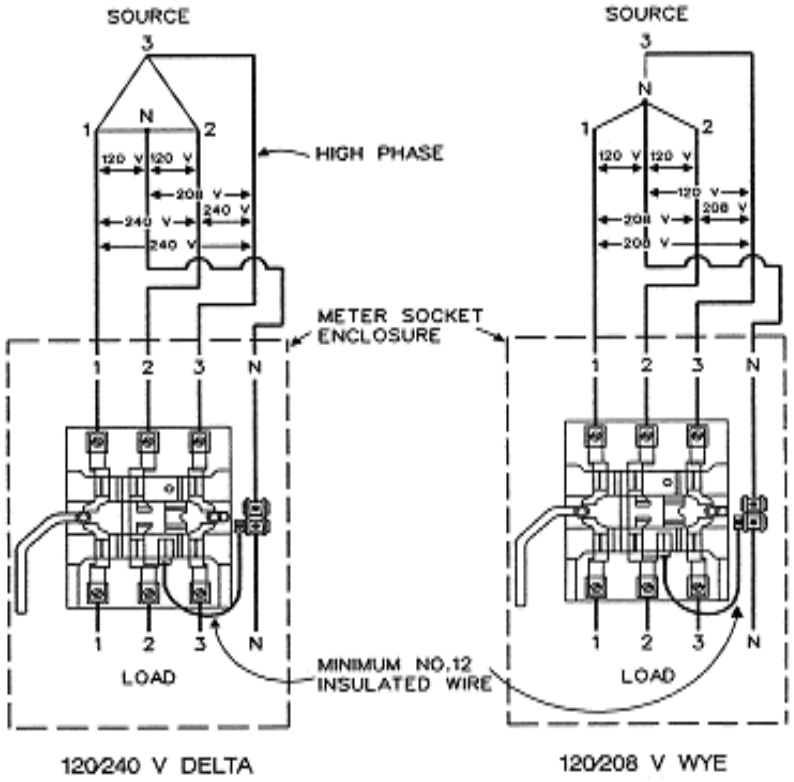
1. The meter sockets shall meet Board of Public Works specifications.
2. Working space in front of service entrance equipment and meter sockets shall be in accordance with NEC Section 110-16.
3. When using aluminum conductors, wire brush the' conductors and apply oxide inhibitor on all connections.
4. When the neutral is not continuous through the meter socket, a dual lug neutral connector shall be used.
5. Services size over 200 amps will require a means of disconnection either before or after the meter.
6. Service with a rated voltage over 240 volts will require disconnect before the meter.

Meter Socket Wiring 1 Phase 120 – 208 V, 400 Amp Maximum



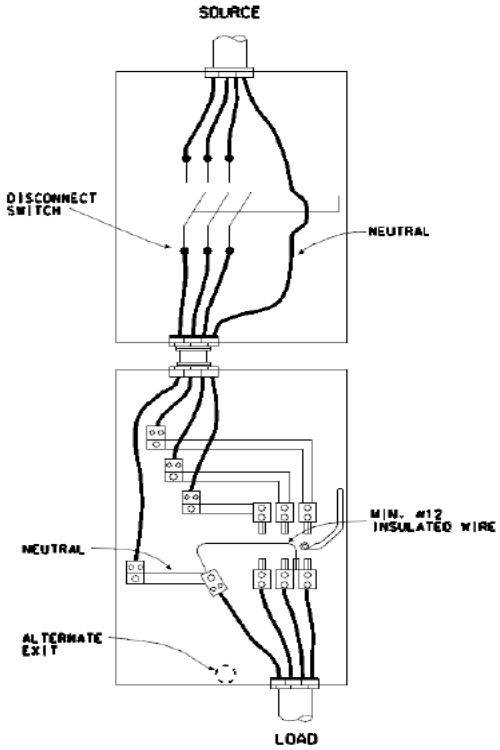
1. The meter sockets shall meet Board of Public Works specifications.
2. Working space in front of service entrance equipment and meter sockets shall be in accordance with NEC Section 110-16.
3. When using aluminum conductors, wire brush the' conductors and apply oxide inhibitor on all connections.
4. When the neutral is not continuous through the meter socket, a dual lug neutral connector shall be used.
5. 120/208 V 3-wire is normally available only from a 3-phase 120/208 V 4-wire service entrance.
6. Services size over 200 amps will require a means of disconnection either before or after the meter.

Meter Socket Wiring 3 Phase 120 – 240 V, 400 Amp Maximum



1. The meter sockets shall meet Board of Public Works specifications.
2. Working space in front of service entrance equipment and meter sockets shall be in accordance with NEC Section 110-16.
3. When using aluminum conductors, wire brush conductors and apply oxide inhibitor on all connections.
4. The neutral shall be grounded at the main disconnect in accordance with the NEC.
5. The neutral, if insulated, shall be identified by a white or gray covering, or white paint or tape.
6. The high phase of a 120/240 V installation shall be identified by orange color, insulation, paint, or tape.
7. Services size over 200 amps will require a means of disconnection either before or after the meter.
8. Please contact your Board of Public Works representative if any questions arise concerning this installation.

Meter Socket Wiring 3 Phase 277 – 480 V, 400 Amp Maximum

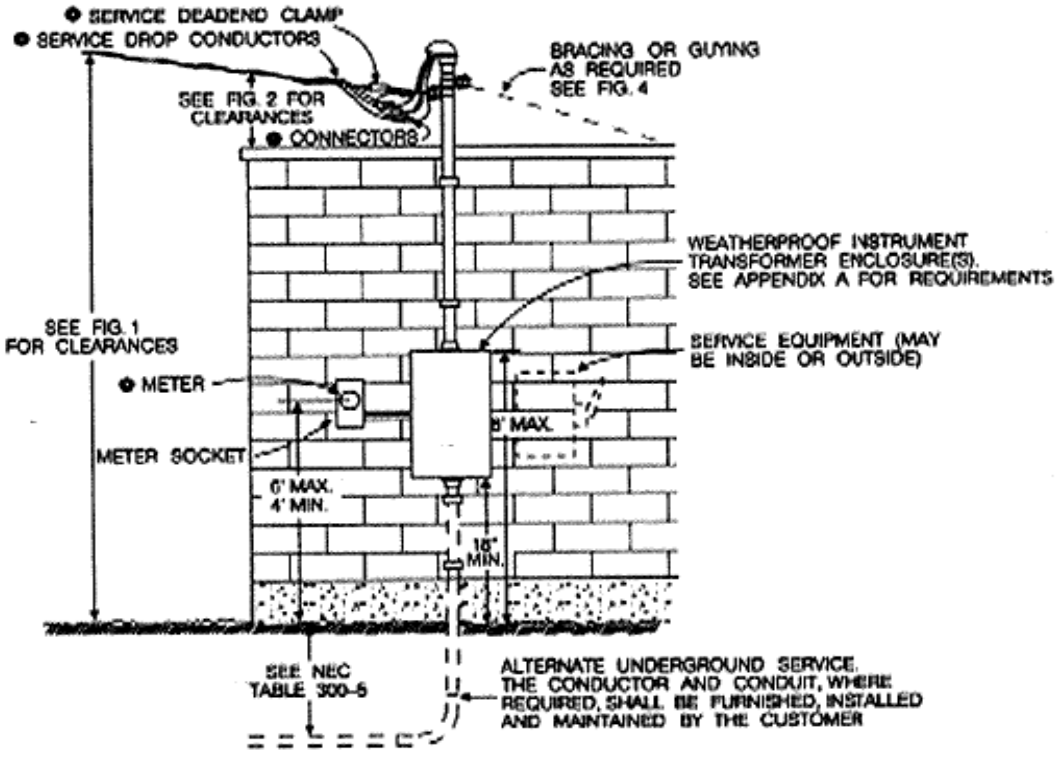


1. The meter sockets shall meet Board of Public Works specifications.
2. Working space in front of service entrance equipment and meter sockets shall be in accordance with NEC Section 110-16.
3. When using aluminum conductors, wire brush conductors and apply oxide inhibitor on all connections.
4. The neutral shall be grounded at the main disconnect in accordance with the NEC.
5. The neutral, if insulated, shall be identified by a white or gray covering, or white paint or tape.
6. The high phase of a 277/480 V installation shall be identified by orange color, insulation, paint, or tape.
7. Please contact your Board of Public Works representative if any questions arise concerning this installation.

INSTRUMENT TRANSFORMER METERING

1) Meter sockets shall not be mounted more than 35 circuit feet from instrument transformers.
2) Test switches and meters will be furnished and installed by the Board of Public Works.
3) Meter sockets shall be grounded by bonding to the service entrance ground or neutral.
4) Insulated bushings are required on all conduits.
5) Working space in front of service entrance equipment and meter sockets shall be in accordance with NEC Section 110-16.
6) The customer shall furnish and install the specified number and color of No. 10 & 12 stranded copper meter leads through the meter wiring conduit. The customer shall provide sufficient length to permit neatly arranged connections to the test switch and meter terminals, by extending the wires a minimum of 42 inches into the metering and test switch socket.
7) Connection of the meter leads will be made by the Board.

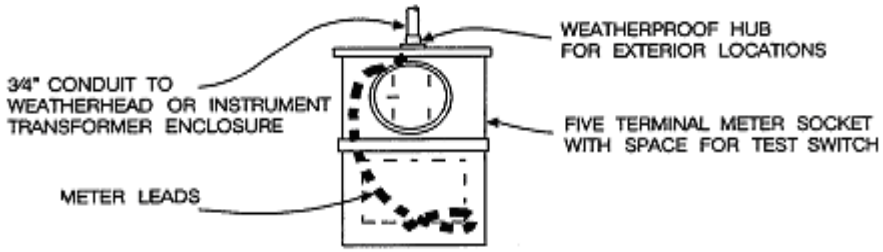
CT Transformer Metering



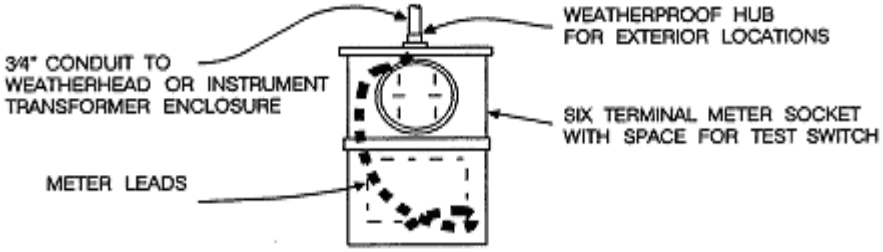
1) The Board of Public Works will provide and install all ~ marked items. The customer shall be responsible for all other items A maximum length of 50 feet of service conductor measured from the property line will be provided at no charge.
2) Current transformers and potential transformers are furnished by the Board of Public Works and installed by the customer. Submit current transformer and potential transformer mounting details to the Board of Public Works for approval.
3) Mount current transformers and potential transformers so that the polarity marks of each set are arranged in identical position.
4) Instrument transformer wiring shows indoor mounting bar type current transformers, wiring for outdoor installations is similar except that window type current transformers are used.

5) Bond all metal racks to the neutral wire when a neutral is present. If a neutral is not present, metal racks must be grounded.
6) Working space from electric equipment shall be in accordance with *NEC* Section 110-16.
7) Service entrance conduit shall be mounted on an exterior wall accessible to Board of Public Works personnel.

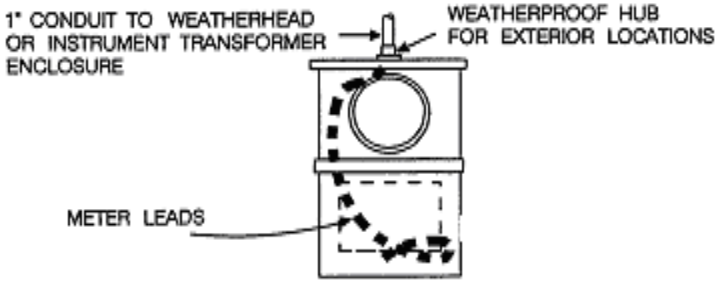
CT Metering Socket



1–PHASE 120/240 V 3–WIRE WITH ONE CT

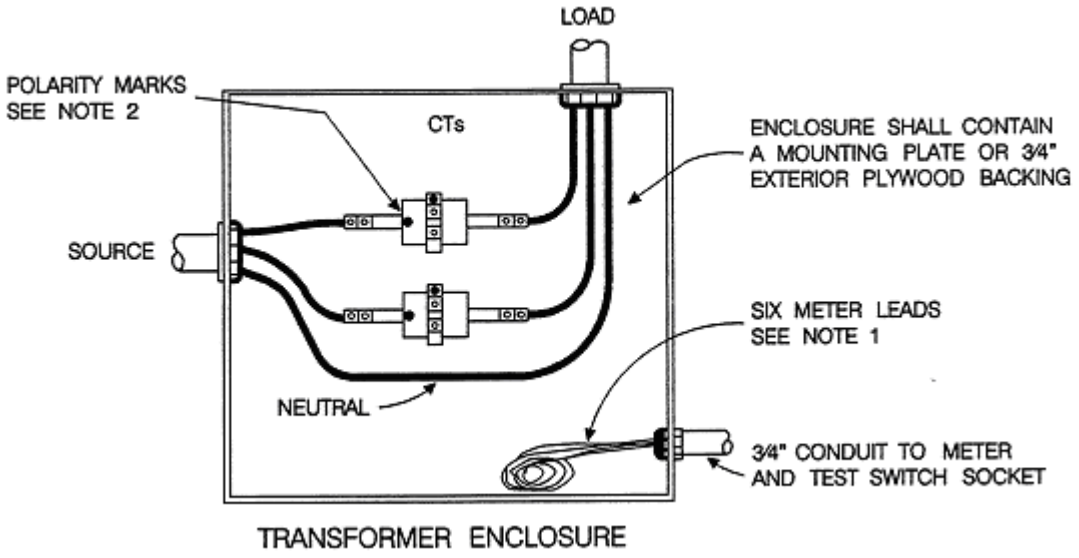


1–PHASE 120/240 V 3–WIRE WITH TWO CTs



3–PHASE 3–WIRE OR 4–WIRE WITH THREE CTs

CT Cabinet Wiring 1 Phase 120/240 V > 400 Amps



1. The customer shall furnish and install two #12 and three #10 stranded copper meter leads (two blue, two red, white) through the meter wiring conduit and provide sufficient length to reach the CT terminals. Connection of these leads to the CT terminals will be made by the Board of Public Works.

2. The CTs shall be mounted so that the polarity marks are arranged in identical positions.

3. Insulated bushings are required on all conduits.

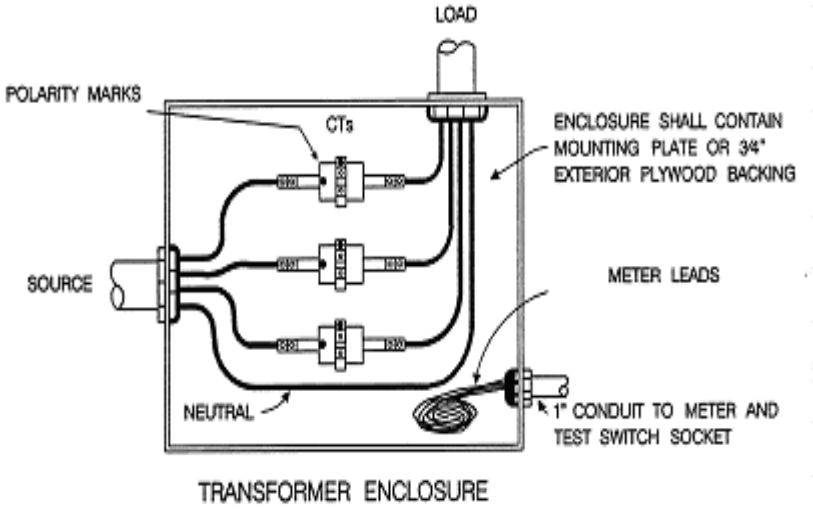
4. Instrument transformer enclosures shall be grounded by bonding to the service entrance ground or neutral.

5. Window or bar type CTs are allowed in enclosures and will be provided by the Board of Public Works.

6. The neutral shall be available in the instrument transformer enclosure for connection of the meter potential leads.

7. In unusual conditions contact your Board of Public Works representative.

CT Cabinet Wiring 3 Phase 120/240 V > 400 Amps



TRANSFORMER ENCLOSURE

1. The customer shall furnish and install three #12 and four #10 stranded copper meter leads (two blue, two red, two black and white) through the meter wiring conduit and provide sufficient length to reach the CT terminals. Connection of these leads to the CT terminals will be made by the Board of Public Works.

2. The CTs shall be mounted so that the polarity marks are arranged in identical positions.

3. Insulated bushings are required on all conduits.

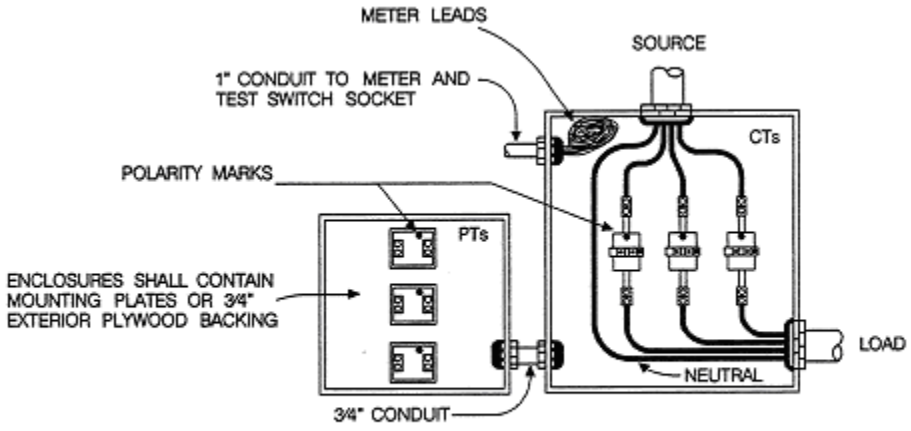
4. Instrument transformer enclosures shall be grounded by bonding to the service entrance ground or neutral.

5. Window or bar type CT's are allowed in enclosures and will be provided by the Board of Public Works.

6. The neutral shall be available in the instrument transformer enclosure for connection of the meter potential leads.

7. In unusual conditions contact your Board of Public Works representative.

Potential & Instrument Transformer Cabinet Wiring



POTENIAL AND CURRENT TRANSFORMER ENCLOSURE

1. The customer shall furnish and install eight No. 12 stranded copper meter leads (blue, black, yellow, white, red, purple, brown, and orange) through the meter wiring conduit. These wires shall have sufficient length to permit neatly arranged connections between the appropriate instrument transformer and test switch terminals. Connection of these leads will be made by the Board of Public Works.

2. The CTs shall be mounted so that the polarity marks are arranged in identical positions.

3. Insulated bushings are required on all conduits.

4. Instrument transformer enclosures shall be grounded by bonding to the service entrance ground or neutral.

5. Window or bar type CT's are allowed in enclosures and will be provided by the Board.

6. The high phase conductor of Delta installation shall be identified by orange insulation, paint or tape at the weather head, CT connections, and all other termination.

7. The neutral shall be available in the instrument transformer enclosure for connection of the meter potential leads.

8. In unusual conditions contact your Board of Public Works representative.

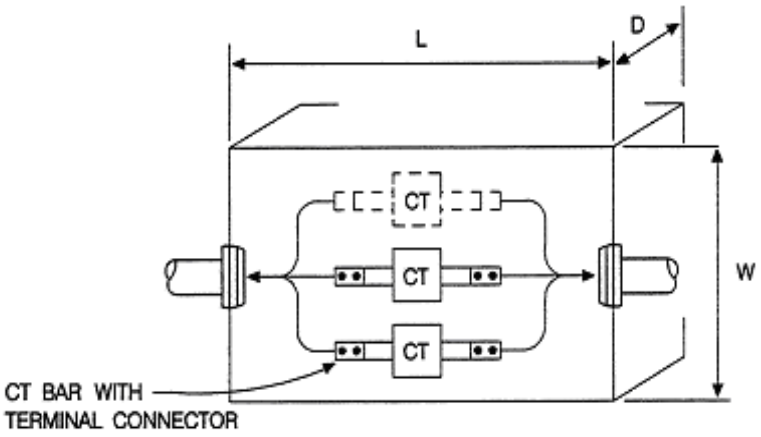
Instrument Transformer Cabinet

1) The fabrication requirements and minimum sizes for enclosures shall conform to NEC Article 373. The size of separate potential transformer (PT) enclosures, when required, is indicated in Note 4 below. The remaining information applies to the minimum sizes for current transformer (CT) enclosures.
2) Space requirements for wire bends as specified in NEC Tables 373-6(a) and 373-6(b) will affect these dimensions, depending on the wire exit arrangement. The customer has the option to use the CT size and spacing information shown in Appendix A-2, along with the NEC tables, to determine the minimum size required as directed by the NEC, or to use the simplified enclosure size reference shown below. The customer shall contact a Board of Public Works representative for approval of exceptions to these arrangements or when it is preferred to mount the CT's and PT's in the same enclosure.
3) The minimum CT enclosure depth will vary depending on entrance size as follows:

Entrance	**Minimum Depth**
1200 A or smaller	10"
Larger than 1200 A	12"

4) The minimum size of the PT enclosure shall be 22" wide x 22" high x 8" deep.
5) The top of instrument transformer enclosures shall be no more than 8 feet and the bottom no less than 18 inches above the floor. Working space in front of enclosures shall be in accordance with NEC Section 110-16.
6) A hook-on cover installed with the hooks at the top is acceptable if the box is 36 inches x 32 inches or smaller and the top of the enclosure is no more than 5 feet above the floor. Otherwise, a hinged cover (with hinges on the side of the box) is required, with a latch. If the enclosure is 48 inches or wider, the cover shall be split, and hinged at each side. All hinged covers shall be installed with sufficient clearance to open at least 90 degrees. All enclosures shall have provisions for sealing.
7) If located outdoors the enclosures shall be weatherproof.
8) Securing covers in place with multiple screws is not acceptable.
9) Current transformers and potential transformers may be mounted by the manufacturer in a customer's factory fabricated switch gear. Contact your Board of Public Works representative for details. Before fabrication, switchgear shop drawings shall be submitted to the appropriate Board of Public Works representative for review and approval of instrument transformer mounting details.

Instrument Transformer Cabinet Sizing



MINIMUM CT ENCLOSURE SIZE REQUIREMENTS (DIMENSIONS L, W, D)

WIRE SIZE	NUMBER OF WIRES PER TERMINAL CONNECTION				
	1	2	3	4	5
	L - W - D (INCHES)	L - W - D (INCHES)	L - W - D (INCHES)	L - W - D (INCHES)	L - W - D (INCHES)
4/0	29 - 26 - 10	30 - 26 - 10	32 - 26 - 10	----------	----------
250	32 - 26 - 10	32 - 26 - 10	33 - 26 - 10	35 - 26 - 10	----------
300	35 - 26 - 10	35 - 26 - 10	37 - 26 - 10	39 - 26 - 10	----------
350	39 - 26 - 10	39 - 26 - 10	41 - 26 - 10	43 - 26 - 10	----------
400	41 - 26 - 10	41 - 26 - 10	43 - 26 - 10	45 - 26 - 10	47 - 35 - 12◆
500	43 - 26 - 10	43 - 26 - 10	45 - 26 - 10	49 - 35 - 12◆	49 - 35 - 12
600	45 - 26 - 10	47 - 26 - 10	51 - 26 - 10	55 - 35 - 12◆	55 - 35 - 12
700	47 - 26 - 10	51 - 26 - 10	55 - 26 - 10	61 - 35 - 12	61 - 35 - 12
750	49 - 26 - 10	53 - 26 - 10	61 - 35 - 12◆	65 - 35 - 12	65 - 35 - 12

1) The above dimensions are for three CT's installations. Subtract 8" to obtain the W dimension for two CT's installations

2) Dimensions followed by a * may be reduced as follows if aluminum wire is used: reduce L by 2" and reduce W by 9". All other dimensions apply when copper wire is used.

3) Two or three CT version of this arrangement may be installed horizontally (as shown) or vertically, or opposite hand. Rotate the page until the diagram fits the preferred arrangement.

PRIMARY METERING

Overhead Service

The Board of Public Works will provide and install service conductors, current transformers, potential transformers, meter grounding and meter.

Customer will provide CT – PT Cabinets as require by utility. Location and design of the metering shall be referred to appropriate Board of Public Works technical personnel.

Location and design of the customer's primary system shall be submitted to the Board of Public Works representative for approval by appropriate technical personnel

The customer shall install and maintain overhead conductors beyond the primary meter pole. Proper clearances will be maintained by the customer. (See NESC Table 232-1).

The customer shall own, install and maintain a single visible break disconnecting means immediately beyond the metering pole. All wiring and equipment installed beyond the meter shall be in accordance with the NESC in addition to the requirements of the NEC.

Primary Underground Service

The Board of Public Works will provide and install the primary underground conductors between the Board's distribution system and the first point of attachment in the customer supplied switch gear. The Board of Public Works will also provide instrument transformers for metering which are to be installed by the customer. The Board of Public Works will provide and install the meter. The customer will provide Company-approved enclosed upright or pad mount switch gear, fuses, grounding bails, metering cubicle, concrete pads and conduits, in a Company-approved location. This location must provide, and the customer shall maintain adequate clearances around the switch gear for operating purposes. These clearance requirements will be determined by Board of Public Works technical personnel and meet minimum NESC requirements.

In the design, purchase, and installation of the switch gear package, close coordination is necessary between customers, switches gear manufacturer and Board of Public Works personnel. The customer shall furnish a minimum of three copies of the switch gear drawings and site plan for Board of Public Works engineering approval. A letter of agreement between Board of Public Works and customer is recommended before the switch gear is ordered.
The customer shall provide and install all wiring connected to and beyond the metal-clad switch gear according to the NESC in addition to the requirements of the NEC.

Transformers

The Board of Public Works or the customer may provide and install standard distribution transformers located beyond the primary meter. The customer shall provide the necessary primary fusing as determined

by the Board of Public Works to protect all Board of Public Works transformers.

All Board of Public Works transformers shall be located in an area accessible to Board of Public Works vehicles and shall meet the clearance requirements of the NESC.

The Board of Public Works will provide load break bushing inserts for Board of Public Works owned pad mount transformers.

Pad mount transformer installations shall be in accordance rules of this manual.

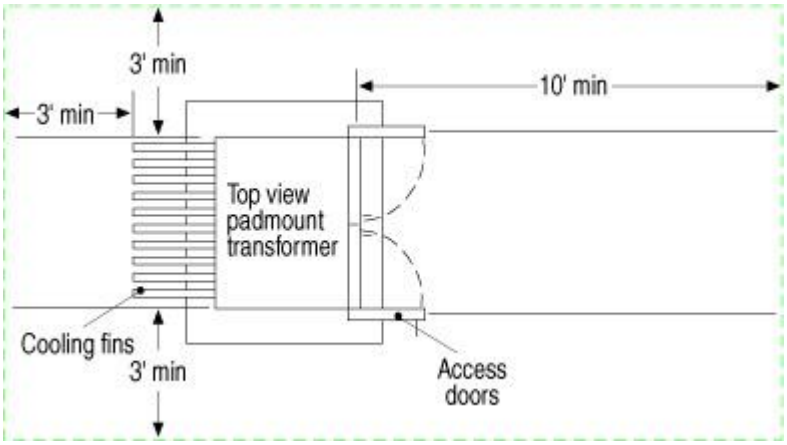
All indoor, rooftop, or specialty transformers, shall be furnished and maintained by the customer.

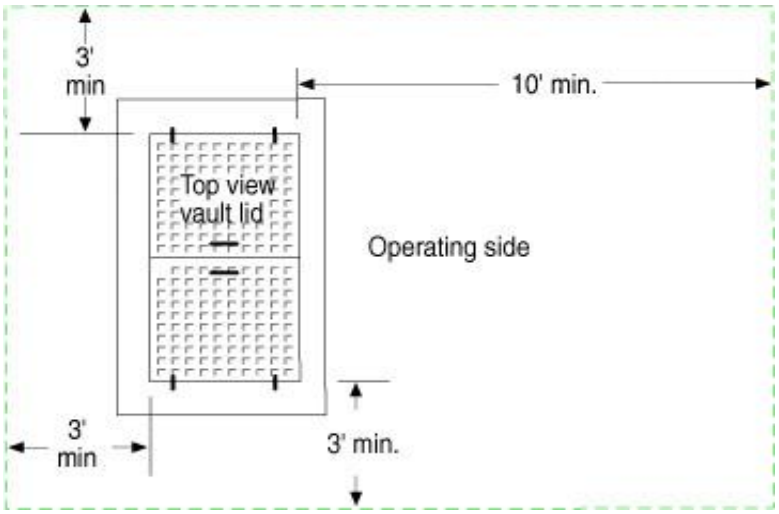
PAD MOUNT TRANSFORMER

Working Clearances around Transformers

A minimum clearance of 10 feet of clear, level working space is required in front of a pad mount transformer, to allow use of hot sticks. Other clearances are shown below for pad mount transformers and for underground transformers. These clearances apply to any oil-filled electrical equipment.

Landscaping and other obstructions must not encroach on these clearances.





Required Clearances around Transformer

The BPW is responsible for installing a pad mount or submersible (totally underground) transformer at the customer's site. Conductors to the primary side of the transformer enter at the left side of the transformer; conductors to the secondary side enter at the right. The trench runs from the right side of the transformer to the customer's building.

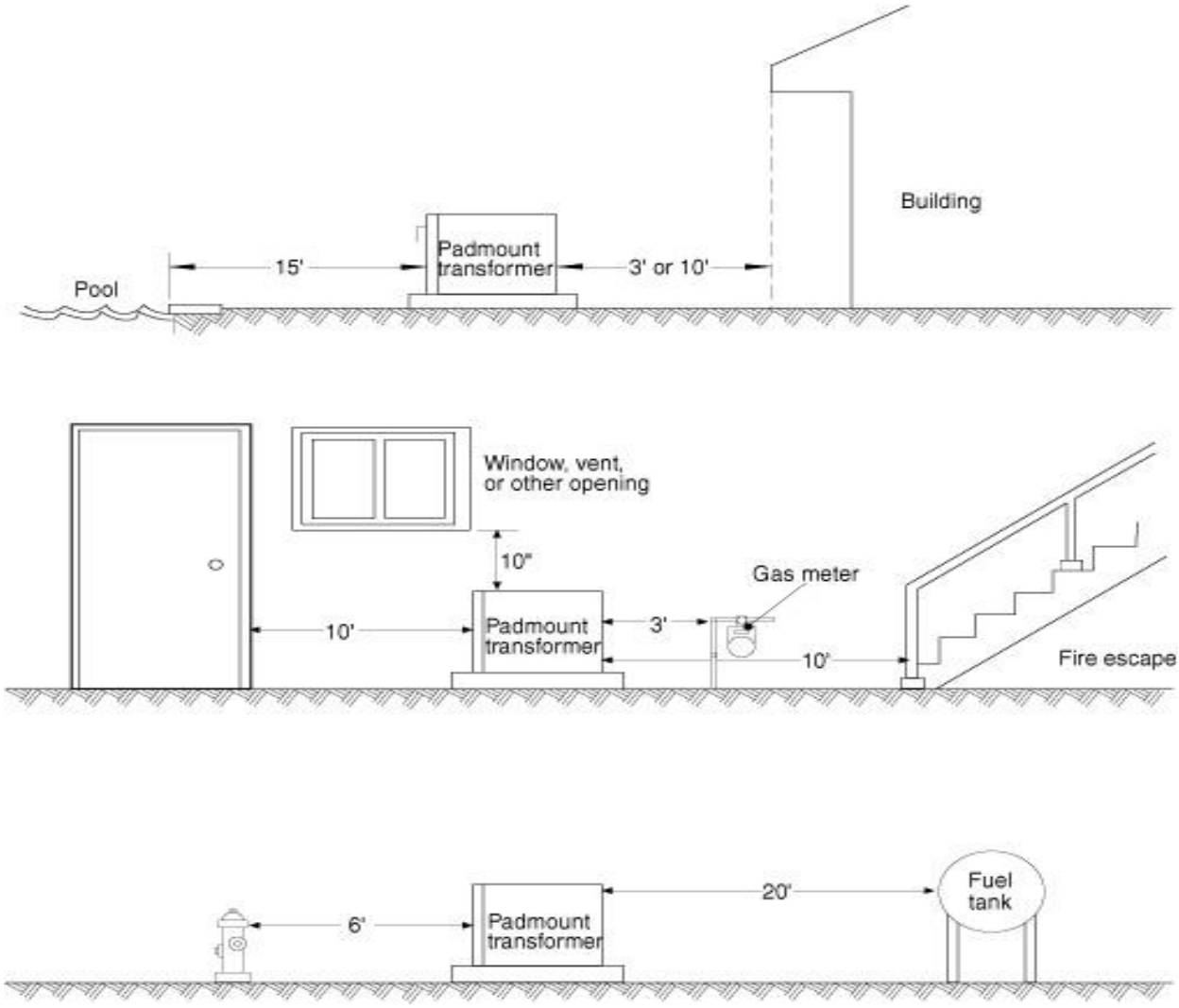
The customer may be responsible for installing the service conductors in the trench, from the transformer to the building.

Safety Clearances around Transformers

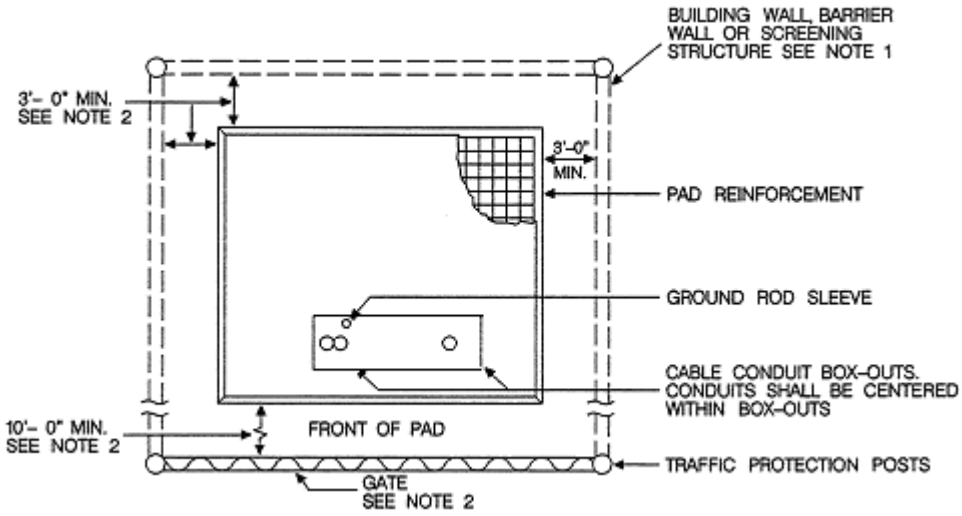
Clearances from pad mount transformers to structures are measured from the nearest metal portion of the transformer, to the structure or any overhang.

The clearance from a building is 3 feet if the building has non-combustible walls (brick, concrete, steel, or stone), 10 feet if the building has combustible walls (including stucco).

Other clearances are shown on the next page. These clearances also apply to any oil-filled electrical equipment.

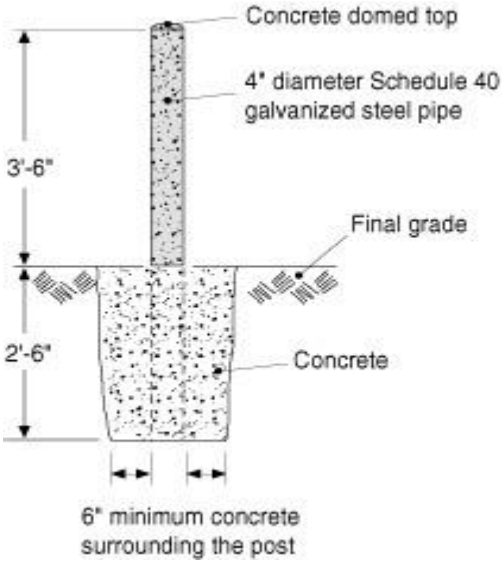

Building
Padmount transformer
15'
3' or 10'
Pool
Window, vent, or other opening
10"
Gas meter
10'
Padmount transformer
3'
10'
Fire escape
20'
Fuel tank
6'
Padmount transformer

Transformer Screening & Barrier



1) The installation of a screening or barrier structure is an optional feature that may be installed by the customer, or as required by your local governing authority, provided that the clearance limitations of notes 2 and 3 are accommodated.
2) A 3'-O" minimum clearance is to be maintained from pad sides and back, to the nearest structure. A 10'- 0" minimum clearance is to be maintained from the front of pad, to the nearest fixed structure. If a full length gate is installed, it shall be hinged and no closer than 3'-0" from pad front. Local government, fire protection, and building codes may require greater clearances.
3) All conduits shall extend beyond the pad and screening structure (if used) and the locations of the ends of primary conduits shall be identified.
4) When metallic conduit is utilized, customer shall install grounding bushings.
5) When necessary for traffic protection, set a 4" diameter concrete filled galvanized steel post 3'-O" diagonally from pad corner. Post shall be 7' long with a 3' concrete embedment.

Transformer Guard Post



It is the customer's responsibility to install and maintain guard posts where power company equipment is exposed to vehicular traffic.

Guard posts are also required where minimum clearances around equipment cannot be met. For example: Guard posts are required where pad mounted devices cannot be given 3 feet clearance from the back and sides of the device, and 10 feet from the front.

If the post is placed in stable soil, surround it with 6 inches of concrete.
If the soil is unstable or sand, surround the post with 12 inches of concrete.

If several guard posts are used, locate them no more than 5 feet apart. For extra visibility, paint the posts traffic yellow.

In some situations a 6-inch diameter post is required, not the 4-inch post illustrated here.

Concrete Pad Specification Phase Pad mount Transformer

The Contractor shall furnish all labor, materials, form work, equipment, and services required to complete all concrete pad work shown on the drawings specified herein.

Quality Assurance

Comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified:

- ACI 301 "Specifications for Structural Concrete for Buildings."
- ACI 318 "Building Code Requirements for Reinforced Concrete"
- Concrete Reinforcing Steel Institute, "Manual of Standard Practice."

Concrete Testing Service:

The Contractor may be required to employ a testing laboratory acceptable to Board of Public Works to perform material evaluation tests and to design concrete mixes.

MATERIALS

Form Materials

Forms for Exposed Finish Concrete: Unless otherwise indicated, construct framework for concrete surfaces with construction lumber, plywood, metal, metal framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without deflection.

Reinforcing Materials

Reinforcing Bars (ReBar): ANSIIAS™ A 615 Grade 40, Deformed.
Welded Wire Fabric (WWF): ANSIIAS™ A 185, Welded steel wire fabric.
Supports for Reinforcement: Provide supports (including bolsters, chairs, and spacers) for positioning reinforcing bars and welded wire fabric in place.

Concrete Materials

Cement shall conform to the latest revised standard specification for Portland Cement, AS™ C 150, Type I, or standard specification for blended hydraulic cements, AS™ C 595.Concrete aggregates shall conform to the latest revised standard specification for concrete aggregates, AS™ C 33. Use crushed limestone for all aggregates. Maximum coarse aggregate size shall be not more than 1 ½ inches. All mixing water shall be clean and free from deleterious amounts of acids, alkaline, or organic materials. Air-entraining admixtures for concrete shall conform to the latest revised standard specifications for air-entraining admixtures for concrete, AS™ C260.Calcium chloride not permitted. All other materials used in the concrete shall conform to current applicable AS™ specifications.

SUB GRADE PREPARATION

Material: All soft and yielding material and portions of the sub grade that will not compact readily when rolled or tamped shall be removed and replaced with suitable material.

Compaction: The sub grade shall be brought to a firm and unyielding condition.

- Soil greater than/or equal to 95% Proctor density or 55 psi presumptive bearing value (pbv).
- Soil should be compacted at or slightly above standard optimum moisture.

Moisture Barrier: A minimum 6 mil polyethylene film shall be placed on top of the sand leveling bed prior to pouring the concrete.

CONCRETE SPECIFICATIONS

General

All concrete shall have a minimum 28-day compressive strength of 3500 psi. Concrete shall be produced with a minimum cement content of 520 lb per cubic yard and an entrained air content of 7% by volume. Maximum allowable concrete slump shall be 4 inches. Where it can be shown that adequate strength, surface finish, and durability can be obtained on a consistent basis with mix designs other than those specified above, such designs may be used upon written approval.

Forms

Construct forms to sizes, shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work of finished structure.
Provide for openings, sink ages, chamfers and blocking in the structure.
Fabricate forms for easy removal without hammering or prying against concrete surfaces.

Placing Reinforcement

Clean reinforcement of loose rust, mill scale, earth, ice, and other materials which reduce or destroy bond with concrete. Accurately position, support, and secure reinforcement against displacement by form work, construction, or concrete placement operations.
Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers as required. Place reinforcement to obtain adequate concrete protection.

Concrete Placement

Pre placement Inspections: Before placing concrete the Contractor shall give Board of Public Works48 hours notification. All items to be embedded will be exposed at the time of the inspection. Board of Public Works will not place a transformer on a concrete pad that has not been inspected. Board of Public Works has the right to request the Contractor to replace the pad due to failure to properly and timely request such inspection.

Temperature

When air temperature is between 85F and 90F, reduce mixing and delivery time from 1 ½ hours to 75 minutes. When air temperature is above 90F, reduce mixing and delivery time to 60 minutes. Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures.
When air temperature has fallen to or is expected to fall below 40 F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50F and not more than 80F at point of placement. At any time the ambient temperature is expected to fall below 32F, the concrete shall be immediately protected and maintained at a surface temperature of 40F for a period of 7 days after placing. Use of frozen materials or materials containing ice or snow is not permitted. Concrete shall not be placed on frozen sub grade or sub grade containing frozen materials.
Deposit concrete continuously and as nearly as practicable to its final location to avoid segregation.

Consolidation
Consolidate placed concrete by mechanical vibrating equipment so that concrete is thoroughly worked around reinforcement and other embedded items.
Use equipment and procedures for consolidations of concrete in accordance with ACI recommended practices.
Excessive or over vibration will not be permitted.
Maintain reinforcing in proper position during concrete placement operation.
Bring slab surfaces to correct level with straight edge and strike-off. Use bull floats, darbies or hand floats to smooth surface free of humps or hollows. The finished slab shall be level.

FINAL INSPECTION

Finish Work
Apply non-slip broom-finish to exposed concrete. Seal concrete with a standard concrete sealer. Apply sealing compound to concrete as soon as final finishing operations are complete (within two (2) hours). Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's directions. Let concrete cure for 24 hours before removing forms without putting undo pressure on concrete that may cause chipping or cracking. Back fill and tamp around pad where applicable. All edges are to be finished with an edger.

Transformer Pad Size

PAD	Single Phase Transformer kva	Dimensions in inches				
		A	B	C	D	E
#1	25, 37.5, 50	76	62	10	42	4
#2	75, 100, 167	104	100	10	54	6

PAD	3 Phase Transformer kva	Dimensions in inches				

		A	B	C	D	E
#1	75, 112.5, 150, 225, 300, 500	76	62	10	42	6
#2	750, 1000, 1500, 2500	104	100	10	54	8

Notes:

1) Concrete testing, 3,000 pounds minimum per square inch; 4% to 6% entrained air, ¾ maximum aggregate size.
2) Reinforcing steel ATSM-A-615 Grade 60, placed approximately 6" on center each way and securely tied together.
3) Minimum concert cover over reinforcing steel 2 inches
4) Wood float finish leaving no depression

ACCEPTABLE METER MOUNTING EQUIPMENT

MANUFACTURER	ANCHOR		LANDIS & GYR		MILBANK		DURHAM	
SINGLE POSITION SOCKETS	OH	UG	OH	UG	OH	UG	OH	UG
150 AMP 4 TERMINAL	URS 1504G-HO	URS 1534LG	UAS214-(*)	UAS214-(*)	U7262-RL	U8084-XL	T-RS502 B	T-RS502 A
200 AMP 4 TERMINAL	URS1394-HO		UAS419-(*)	UAS419-(*)	U7021-RL	U7040-XL	T-125202 B	T-RS202 A
200 AMP 4 TERMINAL/LEVER BYPASS	URS1394ML-HP		HQ-4GU-40404-015		NU1207-RL	NU1211-XL	T-4213 B	T-4213 A
320 AMP 4 TERMINAL CLAMP JAW BYPASS	URS44542-H10		HQ-4D-47704-01		NU1079-R	NU1797-X	T-H4330-U (HCP)	
200 AMP 5 TERMINAL/LEVER BYPASS (2)	U42552-HO		HQ-5U-40405-015		NU9318-RL	NU9319-XL	T-H5213-U (HCP)	
200 AMP 7 TERMINAL/LEVER BYPASS (2)	U42572-HO/HLO		HQ-7U-40407-015		NU7421-R-RL	NU7423-XL	T-H7213-U (HCP)	
MULTIPLE POSITION SOCKETS								
150 AMP 2 POSITION 4 TERMINAL	2URS244HOHP		UA2313-OG		U1232-K1539-RL	U1232-K1539-XL	T-2R5432-U (HCP)	
200 AMP 2 POSITION 4 TERMINAL	2URS1804-C600-HLO		A2716-YG		U1252-K1539-RL	U1252-K1539-XL	T-2R2332-U (HCP)	
200 AMP 3 POSITION 4 TERMINAL	3URS1804-C600-HLO		A3717-YG		U1253-K1540-RL	U1253-K1540-XL	T-3R2332-U (HCP)	
200 AMP 4 POSITION 4 TERMINAL	4URS1804-C600-HLO		A4717-YG		U1254-K1540-RL	U1254-K1540-XL	T-4R2353-U (HCP)	
TRANSFORMER RATED SOCKETS								
5 TERMINAL			9837-8110		U7442-RL	U7442-XL	STS5-1K	
6 TERMINAL	RTSS6-HO		9837-8210		U7478-RL	U7478-XL	STS6-1K	
8 TERMINAL	RTSS8-HO		9837-8410		U7444-RL	U7444-XL	STS8-1K	
13 TERMINAL	RTSS13-HO		9837-8510		U7445-RL	U7445-XL	STS13-1K	

Notes:

(1) HCP - Hub Cover Plate

(2) Bypass Mechanisms not allowed on 480 V sockets

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HUB TABLE For Type I Small Opening			
1"	A	Hub Opening	O
1-1/4"	B		
1-1/2"	C	Closure Plate	X
2"	D		
2-1/2"	E	No Hub Opening	P