OPALCO

Co-op Run. Community Powered.

Facility Installation Specifications
Steps for a Successful Electrical Installation

There is no faster or more cost effective way to get your service installed than by reading and following the policies and procedures outlined in this document. Any deviation from these policies and procedures will cost you time and money.

Reference documents: Articles of Incorporation, Bylaws, Member Service Policies and Tariffs. These documents can be found on OPALCO's website at www.opalco.com or requested by calling OPALCO's Member Service Department at 360-376-3500.

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INTRODUCTION AND NOTES

Orcas Power & Light Cooperative (OPALCO) is a member-owned, non-profit, electrical cooperative governed by a Board of Directors elected by the membership.

In an effort to treat all members equally and as a prerequisite for Membership, the Board has elected to require members and entities to agree to abide by the provisions of all OPALCO Articles of Incorporation, Bylaws, Member Services Policies, Tariffs and Membership Application. These documents can be found on the OPALCO web site (www.opalco.com), or requested by contacting the OPALCO Member Services Department.

Failure to comply with these provisions may result in loss of membership. Members who elect not to comply with all provision in the above mentioned documents will be notified of the violation and required action in writing. Members shall be given 120 days to comply with membership obligations. At the expiration of this period, OPALCO shall deem failure to comply with the required provisions as a surrender and forfeiture of membership and remove all meters connected in the former member's name.

Installing a new electric service is a joint project between a member and the Cooperative. This publication, along with the guidance of OPALCO staff, is designed to provide you with the information needed for the successful installation of a new service or modification of an existing service. Please take the time to read this pamphlet and familiarize yourself with the procedures outlined herein. If you need assistance, please contact the OPALCO Engineering Department for your area.

IMPORTANT: OPALCO will not energize a service unless all requirements as stated herein have been met. Members are also required to meet all state and local regulations in addition to OPALCO Member Services Policies.

Right to Refuse Service

OPALCO members have, by paying the membership fee and signing the application, agreed to contractual agreement with other members.

OPALCO is an electrical service Cooperative made up of individual members who have entered into a contractual agreement with each other to share in the benefits of electricity.

This benefit is available to all responsible parties who agree to be governed by the same contractual obligations.

OPALCO may refuse to provide service to any responsible party who refuses to comply with OPALCO Articles of Incorporation, By-Laws, Member Services Policies and membership application.

This right to refuse service does not limit OPALCO's authority to refuse service under other conditions.

Seven Steps to Successful Electrical Installation

The following steps must be completed in the order in which they appear.

1. Joining the Cooperative
2. Completing the Application for New Service
3. Contribution in Aid of Construction (CAIC)
4. Acquiring Easements and Permits
5. Paying for the CAIC and OPALCO Design
6. Scheduling
7. Setting the Meter

Joining the OPALCO Cooperative

Those needing service must be an Orcas Power & Light Cooperative member and have a current membership on file at OPALCO. First-time applicants must fill out an Application for Membership.

A $5 (five dollar) membership fee is included in the Contribution in Aid of Construction or the first monthly billing. Members are contractually obligated and financially responsible for complying with OPALCO Articles of Incorporation, Bylaws, Member Service Policies and Tariffs.
As with any contract, it is the responsibility of the member to be familiar with the provisions of the contract. These documents can be found on the OPALCO website (www.opalco.com) in the Resource Library, or by contacting the OPALCO Member Service Department at 360-376-3500.

Filling Out Application for New Service

The Application for New Service must be filled out completely in the name of the member applying for service and shall include all supporting documentation as requested in the form.

The information provided assists OPALCO in determining the size, type, location and availability of equipment required for a given service.

To accurately place equipment in a mutually agreeable manner, a site visit is required with an OPALCO Engineer and the responsible party or a designated representative.

All property lines and corners must be located and staked prior to site visit so that OPALCO can determine if easements are necessary.

Failure to provide all required information and/or failure to identify property boundaries may result in a charge for the site visit.
As soon as all information has been received, the applicant is then required to schedule an appointment through OPALCO Engineering
Department for a site visit. Engineering Department personnel are available for site visits Tuesday through Thursday. No site visits shall be scheduled for Monday or Friday. Appointments must be scheduled two (2) weeks in advance to ensure the availability of personnel.

Replies to written correspondence may take four (4) to six (6) weeks.
All primary equipment and facilities to the member's point of delivery must be designed, owned, and maintained by OPALCO. OPALCO Engineering has sole authority in specifying routing for any extension of OPALCO owned and maintained primary distribution network. All OPALCO facilities and distribution conductors must be installed along maintainable routes and locations.

Applications for subdivisions, marinas, mobile home courts, and commercial or multi-occupant facilities must include the plat drawings that were submitted for approval to the regulating agency.

Contribution In Aid Of Construction (CIAC)

After OPALCO has received all required information, an estimate of the anticipated equipment supplied by OPALCO to provide the applicant with reliable service shall be mailed to the responsible party. This is only an estimate. The party requesting OPALCO services is required to pay 100% of the actual cost to connect to OPALCO's last point of established service.

All equipment on the member side of the point of delivery including, but not limited to, the secondary conductor, conduit, wiring, service equipment and all associated equipment is the responsibility of the member as ***contribution in aid of construction*** (CIAC). All meter bases are required to be approved through OPALCO's Engineering Department before the member or contractor purchases the meter base.-**Written notices from OPALCO's System Engineer approving installation of meter bases not listed in the OPALCO Facility Installation Specification shall be required. Meter bases installed without pre-approval by OPALCO shall not be connected to OPALCO's distribution system.**

All single-phase services of 600 amps and over, or over 200 amps three-phase and above, shall be Current Transformer (CT) meter bases. Installation will require a separate member supplied single service-disconnect that includes over-current protection, which is located within 2 feet and in sight of CT enclosure.

The member shall provide the CT enclosure, CT mounting rack, and the single service-disconnect that includes overcurrent protection that is located in sight and within 2 feet of an OPALCO-provided meter base. OPALCO will provide at member's expense the CTs, test switch, meter base and meter. Member is responsible for the mounting of OPALCO provided meter base as directed by OPALCO.

All ***ganged meter packs*** shall be pre-approved by OPALCO and contain a single-service disconnect that includes over-current protection for each meter. Single-service disconnect with overcurrent protection shall be a U.L. listed as part of the serving meter base. Attachments of secondary equipment to new non-approved meter bases for the purpose of adding a service disconnect with overcurrent protection shall not be allowed.

All new line extensions must be installed underground. All trenching shall be provided by the responsible party, and must meet the requirements set forth by OPALCO.

Acquiring Easements and Permits

Easements — Any OPALCO facilities that are installed on private property shall require an easement from the effected property owner of record. This process takes a **minimum of two (2) weeks**. In most cases, the requirement is a fifteen (15) foot wide easement centered on the center line of OPALCO's buried distribution cable and support facilities *as installed* for the installation and continued operation, maintenance, repair and replacement of OPALCO facilities.

It is up to the member to approach neighboring property owners about obtaining easements on a neighbor's property prior to OPALCO involvement. The applicant must provide OPALCO with the following required information so that the easement can be properly formatted**:**
Plot plan, full legal descriptions, tax parcel numbers and the names as they appear on the ownership documents for all involved properties as well as copies of any existing recorded easements, plats or surveys. Evidence in the field of pertinent lot corners, monuments, lot lines and easement and rights of way margins and alignments.

NOTE: As soon as OPALCO has drawn up the easement and forwarded that to the member, all required signatures must be notarized and one original copy returned to OPALCO prior to the start of construction.

Permits — The Town of Friday Harbor and San Juan County require that all new installations within their rights-of-way to have a valid permit to install electrical facilities. It is the member's responsibility to obtain the necessary permits and engineered drawings, if required, for installation of OPALCO facilities in the town and County rights-of-way. All necessary permits and drawings are to be properly approved prior to construction.

Paying for CIAC and OPALCO Design Work

Payment to OPALCO of the CIAC authorizes OPALCO to begin the formal process of design, procurement, and documentation required for the installation of electrical service to a given location. OPALCO has sole authority over the placement and routing of OPALCO maintained facilities and conductors.

Depending on present inventory, workload, and size and nature of work, this process can take two (2) to four (4) weeks to be completed. After this period, OPALCO's Operations Department may be contacted to coordinate scheduling of work. OPALCO requires 60 days' notice for any new or modified service in order to manage equipment inventory.

Scheduling

The responsible party may schedule work with OPALCO's Operations Department after receiving notice from OPALCO that the formal design process and documentation has been completed. The Operations Department's General Foreman for your area *(*see the *OPALCO directory* at the back of this document*)* will schedule the work on a first-come, first-served basis and as material inventory will allow.

When trenching or installing conduit for OPALCO is scheduled, the responsible party must give the OPALCO Operations Department of their area at least three (3) working days' notice prior to start of excavation. In addition, one (1) working day notice shall be given of the intention to stop work on uncompleted jobs, except in circumstances where shut downs are caused by adverse weather or other conditions beyond the installer's control.

Setting Meters

OPALCO will install the meter in the permanent meter base that was authorized by OPALCO and installed by a responsible party or electrician.

The meter base may be energized only *after* the following steps have been completed.

- All ditches are backfilled.
- The service has been inspected, approved, and tagged by the Washington state electrical inspector (see page 47).
- It has been confirmed by OPALCO that the meter base installation has met the requirements as outlined in the *Meter and Meter base Specifications* in this brochure.

Under normal conditions, the meter will be placed within 72 hours from the time of the call to OPALCO Operations advising that the above conditions have been met. Members may be charged a service fee if OPALCO is requested to install a meter, but the meter base is not installed correctly or has not been inspected. As stated in the Washington state WAC rules WAC 296-46B-230 Wiring and protection – services 001 (1).

That WAC rule states:
"The owner or owner's agent, or the electrical contractor making the installation must consult the serving utility regarding the Utilities service entrance requirements for equipment location and meter equipment requirements before installing the service and equipment. Provisions for a meter and related equipment, and attachment of a service drop, or an underground service lateral must be made at a location acceptable to the serving utility."

CALL BEFORE YOU DIG

By Washington state law, a responsible party causing any damage to underground utilities is financially liable for all repairs associated with damages to the underground installations. Any time work is performed in the vicinity of existing underground facilities, an underground locate is required. Locate requests are made by calling the Underground Locate Center at 1-800-424-5555

Equipment Ownership and Requirements

All primary voltage facilities to an OPALCO point of delivery shall be designed, specified, owned, and maintained by OPALCO. **Members may not install their own primary voltage facilities (7.2 kV and above).** OPALCO will install the meter in the member's meter base. All meter bases on OPALCO's power distribution network must have a single service disconnect that includes over-current protection that is U.L. listed to operate within in the OPALCO approved serving meter base. A 60-day notice is required for any new or modified meter base request.

NOTE: Any modification to an existing service requires that the entire service be brought up to present state and local codes, as well as all OPALCO Member Services Policies as defined in this *Facility Installation Specifications* document.

All new secondary services shall be underground. Owners shall provide, at their expense, all clearing, trenching, bedding, backfill and restoration, and all other expenses that are not included in the CIAC. All secondary facilities beyond the point of delivery, including but not limited to secondary conductor, conduit, wiring, service equipment, enclosure, meter base, single service disconnect that includes over-current protection, and all other associated equipment shall be installed and maintained by the member. Members are responsible for meeting all codes and regulations set forth by state and local agencies.

Contribution In Aid of Construction

Responsible parties of the property requesting new service or the alteration of existing service are required to pay 100% of the actual costs associated with OPALCO's labor and material involved in bringing to or modifying electricity at their location.

Payment to OPALCO of the CIAC authorizes OPALCO to begin the formal process of design, procurement, and documentation required for the installation of electrical service to a given location. Depending on the present inventory, workload, and size and nature of the work, it may take two (2) to four (4) weeks for the process to be completed. OPALCO will notify the responsible party advising when to contact the OPALCO Operations Department to coordinate scheduling.

Because transformers are expensive and electrical equipment lead times long, OPALCO requires 60 days' notice for any new or modified service in order to manage equipment inventory. When the work is completed, any difference in the paid CIAC to actual project cost that is equal to or greater than $250.00 shall be adjusted in a re-bill or refund. OPALCO will not put any primary distribution cable into service that does not meet current cable specifications and installation practices.

NOTE: Any facilities that have been de-energized for longer than 12 months are subject to line retention or abandonment by OPALCO.

OPALCO will generate up to two (2) CIACs per project. Any additional estimates shall be billed at OPALCO's engineering rate. CIACs are only estimates. At all times the responsible party is liable for all costs associated with connection to OPALCO's established point of power distribution.

A transportation fee will be included on all CIACs that require travel to non-ferry-served islands.

Easements

OPALCO requires that adequate easements or public rights-of-way exist prior to the placement of all new facilities in any area. The suitability of easements or rights-of-way for installing OPALCO facilities shall be determined at OPALCO's sole discretion.

It is the obligation of the responsible party to provide all needed documentation to make this determination including legal descriptions, ownership documentation, and plot plans of all affected subject parcels and, if applicable, copies of existing recorded easements, surveys, and plats. In addition, the property owner shall provide evidence of pertinent lot corners, monuments, lot lines, easement and rights-of-way margins and alignments in the field. The suitability of this monument for ensuring the proper placement of facilities within the easement or rights-of-way shall be at the sole discretion of OPALCO.

If OPALCO Engineering determines that adequate easements and/or public rights-of-way do not exist for the placement of the proposed facilities, OPALCO requires that suitable easements be executed. Under such circumstances, OPALCO shall prepare the necessary easement documents based on the above described required property information provided by the property owner. OPALCO reserves the right to require that an additional route survey be performed by a qualified, registered land surveyor or engineer at the sole expense of the property owner for inclusion in preparation of the easement. It is the responsibility of the property owner to acquire all needed notarized signatures for the proper execution of all easements, including third party property owners.

NOTE: OPALCO will not deliver any materials to a job site until all easements have been recorded with County.

IMPORTANT: No work may be scheduled with OPALCO until all easements have been recorded.

Allowance for Multiple Use by Others

The design of new and existing facilities are approved and determined by OPALCO, including the siting and location of these facilities to enable multiple uses (services including other members). In such circumstances where the location and easement do not intrinsically accommodate such multiple uses, OPALCO reserves the right to require the member to grant additional easement routes allowing for the future installation, repair and maintenance of multiple use facilities by others (see *Fair share Policy* in this document). Any time OPALCO facilities are placed on private property, an easement is required prior to the installation of said facilities. OPALCO will prepare the easement document from member provided information.

Fair Share Policy

OPALCO will make a fair share, or partial reimbursement of CIAC, to the property owner of record for which the original CIAC was made if additional members connect to the facility within four (4) years of the date of payment of the original CIAC of $30,000.00 or less, not including the meter. If the CIAC for a line extension to a single family residence exceeds $30,000.00, not including the meter, the fair share period will be extended to six (6) years.

Fair shares within the designated reimbursement period shall be calculated by OPALCO in such a way that all entities that share the line extension facility have a proportionate monetary interest in said shared facilities based on the original CIAC. Fair share will be released upon the activation of a metered service by the additional members.

Sub-dividers or developers installing line extensions to and/or within subdivisions, mobile home courts and marinas are *not* entitled to fair share. Fair share is limited to the original contributors of line extension. The original contributors of the line extension become ineligible for fair share upon sale, transfer of title, or subdivision of the property.

Line Retention Policy

Members have 12 months from date of installation of conductors and facilities to energize (that is, install a meter) at a transformer installed on their behalf. **At the 13th month, the account is subject to the *line retention rate*, provided that there are no other metered services on that transformer.** Payment of the line retention rate assures that the facilities remain in place for future use. Refusal or failure to pay the line retention rate allows OPALCO, at its sole discretion, to remove or abandon the idle equipment and facilities. Any future services at that location would be subject to a reapplication for service at the member's expense. All connections to OPALCO's distribution network shall require that the installation meet present OPALCO installation guidelines.

Protective Equipment

It is the member's responsibility to provide suitable protective equipment for the devices and appliances on their premises. The member should install surge suppression devices to protect sensitive electronic equipment such as computers and other home electronic appliances from overload, short circuit, phase failure, transient voltage spikes caused by lightning, system failures, or normal utility load switching, for example.

Where the member requires a degree of regulation of the characteristics of the electrical service greater than that normally furnished by OPALCO, the member shall be responsible for obtaining, installing and maintaining the required regulating equipment.

Where three-phase equipment is used, it is the member's responsibility to protect such equipment against loss of phase and reverse phasing, as well as under-and-over voltage conditions.

Three-phase service

Three-phase service is available only in specific portions of OPALCO service territory. Members requiring three-phase service must check with the OPALCO Engineering Department to determine the cost and availability.

Single-phase service

The vast majority of OPALCO's distribution network is single-phase. OPALCO distribution lines do have limitations. Large single-phase loads can have operational problems or may cause objectionable voltage dips to neighboring members. Before any new load is connected onto OPALCO's distribution network, OPALCO requires that notice be given so that an assessment may be conducted of the effects this additional service or load may have on the network.

If the load of an existing facility increases, therefore requiring a change in transformer or meter size and the member (or owner of record) has been paying for power at this facility for more than five (5) years, OPALCO shall change out the transformer and/or meter at OPALCO's expense. If the member has been paying for power at this facility for less than five (5) years, the member shall change out the transformer and or meter at their expense.
If the load of a transformer or meter increases due to the addition of *new* facilities being served by the transformer, the owners of the added facilities shall pay all costs to change out the transformer and/or meter.

Addition to Single-Phase Loads

The responsible party shall give at least 60 days written notice to the OPALCO Engineering Department of any additional load requirements on single-phase transformers. This includes, but is not limited to, additional facilities and/or service runs to an existing meter base.

Modification to an existing meter base require that it be brought up to present OPALCO standards. Specialized equipment such as transformers may have lengthy delivery schedules, and the Engineering Department requires time to assess the impact of the increased load on the power distribution network. OPALCO will issue a preliminary design estimate based on the information supplied by the responsible party.

NOTE: The initiating party is responsible for all costs to accommodate increased service capacity on the primary distribution network.

Addition to Three-Phase Loads

The responsible party shall give OPALCO at least six (6) months advance notice of any additional load requirements, or the addition of facilities or service runs to an existing meter base on any three-phase transformers or bank of transformers forming a three-phase system.

Specialized equipment such as three phase transformers may have lengthy delivery schedules and the Engineering Department requires time to assess the impact of the increased load on the power distribution network. OPALCO will issue a preliminary design estimate based on the information supplied by the responsible party. The initiating party is responsible for all costs to accommodate increased service capacity on the primary distribution network.

Conversion from Single-Phase to Three-Phase

Three-phase service is made available only in specific portions of OPALCO's service area. The responsible party who is planning to convert from single-phase to three-phase shall check with OPALCO to determine the availability and cost of providing three-phase service. All costs associated with conversion from single- phase to three-phase shall be paid for by the requesting responsible party. OPALCO's power distribution network has no single-phase protection of three- phase lines.

NOTE: It is the responsibility of the requesting party to protect their three-phase equipment from loss of phase or reverse direction conditions.

Power Quality or Suspect Service

Should voltage fluctuation or blinking lights occur, the first step is to call an electrician to verify that the service panel is grounded and the secondary connections secure. After the electrician verifies that the secondary connection is in proper condition, OPALCO Engineering Department may be called for assistance.

IMPORTANT: The OPALCO member is, at all times, responsible for all costs associated with the troubleshooting, investigation, or maintenance of the electrical system beyond the OPALCO point of delivery (connection).

OPALCO System Changes

OPALCO will make changes to its Power Distribution network when, in OPALCO's judgment, such change will result in a better, more efficient or more reliable system. Examples include adjusting transformer size based on load, installation of sectionalizing equipment, installation of special metering or data collection equipment, and so on. OPALCO may use all or part of a member's line extension as part of a system improvement without paying a fair share.

Undesirable Service Characteristics

Undesirable service characteristics are defined as services connected to the OPALCO distribution network that affect the power quality, reliability, and cost to distribute power on the power distribution network. To limit the effects of undesirable service characteristics to the membership, OPALCO requires the following for continued service:

- **Reduced Voltage Starting –** Individual single-phase or three-phase motor units rated seven and a half (7.5) horsepower or more shall be controlled by soft-start or reduced-voltage starters.
- **Three Phase Required –** Individual motor units rated at more than seven and a half (7.5) horsepower shall be three-phased when three-phase service is available, unless otherwise approved in writing by OPALCO prior to installation.
- **Highly Fluctuating Loads –** OPALCO may disconnect service when an owner-member adds any load that causes a large fluctuation in voltage or a significant disruption to the electric system, or otherwise disturbs the service provided to other members.
- **Harmonics –** A member installing equipment that can be expected or found to generate harmonics will be required to install appropriate filters to remove the harmonics at the member's expense. OPALCO may require that a member increase the size of the neutral conductor to accommodate for increased neutral-conductor load as a condition of continuing to provide power to the facilities from which the harmonics emanate.
- **Additional Protection Device –** Members installing electrical services or electrical equipment that OPALCO determines could potentially cause additional risk to the distribution network will be required to pay for additional protection devices on the primary side of the serving transformer.

Cause for Disconnection

OPALCO will immediately disconnect service to a member without advance notice under the following conditions:

- **Immediate Hazard –** Service will be disconnected if an immediate hazard exists which threatens the health or safety of the member, the general population or OPALCO's personnel or facilities.
- **Meter Tampering –** Service will be disconnected if OPALCO has evidence of meter tampering, power theft, or fraud by a responsible party.
- **Curtailment –** Service will be disconnected if the responsible party has failed to comply with the curtailment procedures imposed by OPALCO during an emergency.
- **Undesirable Service Characteristics** – Services that cause undesirable service characteristics on OPALCO's power distribution network shall be immediately disconnected until the responsible party has corrected the condition to OPALCO's satisfaction. OPALCO has sole authority in determining the effect of a connected service on OPALCO's distribution network. OPALCO holds no liability for disconnecting said service for the purpose of protecting the power distribution network.
- **Failure to Provide OPALCO with Easement on Property** – All facilities owned and maintained by OPALCO on private property require an easement. The Orcas Power & Light Cooperative membership Application agreement includes the requirement for a member to grant to the Cooperative and its assigned reasonable requests for easements. Failure to fulfill this obligation may result in the denial or discontinuation of membership.

NOTE: In the event that the member does not or will not provide OPALCO with an easement for an existing primary distribution line serving transformers on the property, OPALCO may, at its own discretion, disconnect the member's service and relocate OPALCO owned facilities back to a point of legal private easement or public rights-of-way. In such cases, all reconnections to OPALCO facilities shall be treated as a new service request.

The responsible party refusing legal easement is liable for all costs associated with installation of their meter base and the reconnection of secondary conductors, regardless of date of service or installation. OPALCO shall give the owner a 60-day notice in advance of relocation of OPALCO facilities.

IMPORTANT: It is the member's responsibility to apply to OPALCO for a new service, obtain any electrical permits required, secure all secondary easements required to connect to OPALCO facilities, and to arrange and pay for trenching and installation of secondary conductors.

Failure to Provide Adequate Clearances for and around OPALCO Facilities – It is the member's responsibility to maintain adequate clearances around all OPALCO facilities on their property in a manner which will not hinder access. Failure to maintain facilities in a manner requested by OPALCO may result in OPALCO removing its facilities from service. The owner-member shall be responsible for the full disposal and replacement cost of any equipment found to have failed due to inadequate clearances.

Failure to Meet Contractual Obligations Agreed to as a Requirement of Membership – OPALCO is a member-owned, non-profit, electrical cooperative that is governed by a Board of Directors elected by the membership. The Board has elected to require individuals and parties to agree to abide by the provisions of OPALCO's Articles of Incorporation, Bylaws, Member Services Policies, Tariffs and Membership Application as a prerequisite for Membership. Failure to comply with these provisions may result in loss of membership.

Responsible parties who elect not to comply with all provision in the above mentioned documents will be notified of the violation and required action in writing. Responsible parties shall be given 120 days to comply with membership obligations. After the expiration of this period, OPALCO shall deem failure to comply with the required provisions as a surrender and forfeiture of membership. OPALCO shall remove all meters connected in the responsible party's name.

Energy Savings and Energy Assistance

OPALCO Energy Services Department has detailed information on many aspects of energy efficiency, including heat pumps, electric thermal storage units, appliance rebates and energy efficiency tips. Members can contact the Energy Services Department at the number listed in the OPALCO Directory.

Go Electric!

OPALCO has done extensive research to verify that electricity is the most efficient form of energy available here in San Juan County. OPALCO's Energy Services Department has valuable information that can help in the wise use of energy resources.

Go Green!

OPALCO invites members to participate in the Go Green Program, helping the environment by increasing the demand for cleaner forms of energy and making an investment in the sustainable future needs of San Juan County.

Member-Owned Generation Equipment

OPALCO encourages the interconnection and operation of alternative electric generation, such as solar, wind and micro-hydro. Interconnection must be in accordance with *OPALCO Member Service Policy 14.* The Energy Services Department has more information regarding this topic. No line-side service connections shall be allowed; that is, no connection to OPALCO service conductors shall be allowed. All member-owned generation equipment must be connected on the servicing meter base member's side and be protected with a separate service rated disconnect with overcurrent protection.

Project PAL

OPALCO's Project PAL Program awards grants to members who qualify for assistance in paying their power bill. Members are invited to voluntarily round up their monthly power bill to the next whole dollar for contribution to the Project PAL fund. The yearly contribution averages about $6.00 per year, per account. Anyone having financial difficulty, and needing assistance with their power bill can contact the OPALCO office of your area for a Project PAL application form or go online to *www.opalco.com/projectpal*.

OPALCO Facility Installation Specifications

Electric Service Requirements

Electrical conductors leaving the member's meter base are not protected by any device until they are connected to the member's service-disconnect and over-current protection device. The service-disconnect and over-current protection device does not protect OPALCO's distribution network or the member's secondary conductors from failure between the transformer and the device.

Because these secondary conductors are beyond the reasonable control of the Cooperative, OPALCO attempts to fairly manage the risk of each meter installation by requiring that each meter base's secondary conductors be terminated into a single service-disconnect and over-current protection device with an ampacity rating equal to or smaller than the size of the meter base rating.

The service-disconnect and over-current protection device must be a U.L. listed part of the meter base. The short-circuit current capable of being delivered by a transformer shall be determined by OPALCO's Engineering Department and be validated by the transformer's manufacturer.

Any remodeling of or additions to existing facilities in which any portion of the electrical service conductors or serving meter base are to be modified, upgraded, or relocated shall be required to meet these OPALCO Electric Service requirements:

OPALCO requires a 60-day written notice of any proposed increase of facilities, meter base installation or modifications on the power distribution network.

At no time does OPALCO allow entrance into an existing meter base to add or modify a service connection without the advanced approval of OPALCO's Engineering Department. Termination of all secondary connections shall be attached into a U.L. listed device specifically designed and rated to be installed in OPALCO approved meter bases.

OPALCO has sole jurisdiction over metering equipment location, and meter equipment installation and connection requirements. Members or contractors found to have modified any meter base installation shall be liable to OPALCO for damages. No meters shall be set by OPALCO personnel for contractors or members found to have modified an OPALCO meter base installation, without OPALCO's knowledge and direction, until damages have been collected by OPALCO and required corrective action has been completed.

Member-Provided Equipment

All equipment beyond the point of delivery shall be owned by the member including, but not limited to, the secondary conductors, conduit, wiring, service equipment, enclosure, meter base, disconnect switch, and associated equipment. All member-owned electrical equipment shall be installed to conform to OPALCO Member Services Policies. It is the responsibility of the member to maintain the installation on the member's side of the point of delivery.

Installation and Access

Installation of all OPALCO facilities (including protective equipment, poles, switch pedestals, vaults, and transformers and meters) must be accessible by OPALCO maintenance vehicles at all times. All cost to access OPALCO installed equipment on member property where access has been removed, restricted or not maintained by the member or member's representative will be billed back to the member. If access to facilities is not corrected OPALCO may abandon in place any equipment that cannot be accessed and maintain with equipment owned and operated by OPALCO.

All cost associated with the relocation of OPALCO equipment is the responsibility of the member.

Failure to pay cost associated with accessing OPALCO facilities on member property will be treated the same as a delinquent power bill and may result in the disconnection of power to the property if not paid within 90 days.

All meter bases must be in accordance with all state and local codes and OPALCO's Member Services Policy. All meter base locations shall be approved by OPALCO Engineering prior to installation and must be located so that they are easily accessible by OPALCO staff with no obstructions within two (2) feet to either side of the meter and three (3) feet in front of meter. OPALCO requires that the meter base installation be inspected and approved by the State Electrical Inspector (a Washington state service approval label must be in place prior to a service being energized). All secondary trenches must be backfilled, and pedestal or uni-strut meter base support must be set in the earth with at least 80 pounds of concrete prior to OPALCO setting a meter. OPALCO will not set any meter until all state and local codes and OPALCO's Member Services Policy have been met.

OPALCO Connections

Neither the member nor the member's electrical contractor is allowed to perform any work on an OPALCO facility (that is, pole, structure, transformer, or other equipment). The member or the member's electrical contractor must provide a length of conductor for OPALCO's use in completing the member's connection to OPALCO's equipment. OPALCO will determine the length of conductor necessary and the location where the member's installation will terminate.

OPALCO will allow contractors to make OPALCO authorized connections to member's meter base. All meter base secondary conductor penetrations serving underground services shall enter the meter base from the bottom.

Location

Alternate service locations requested by any member are subject to review and approval by OPALCO's Engineering Department prior to installation. Due to line loss issues, the member's meter base must be located next to the serving transformer.

Any variation from this requirement must be approved in writing by an OPALCO Engineer prior to installation. Voltage problems due to the customer's installation are not the responsibility of OPALCO.

Changes in Location or Size of Service Equipment

OPALCO Engineering Department has sole jurisdiction over the location of all facilities that are maintained and/or read by OPALCO personnel. Any change in the location or size of a service connection, provided such change is approved by OPALCO, will be pre-approved by OPALCO and paid for by the member.

NOTE: A meter base that has been installed, modified, or increased in size without OPALCO's pre-approval and authorization will not be connected to the OPALCO power distribution network.

Member-Initiated Conversions

Owner-members may request the conversion of overhead primary or secondary facilities to underground if the overhead or secondary facilities are located on their property. If OPALCO agrees to the request, those requesting the conversion will be responsible for the total actual costs of conversion and supplying all associated easements to OPALCO.

Installation Sites

OPALCO Engineering shall approve and stake the location of all facilities that will be owned, maintained, or read by OPALCO, including, but not limited to: transformers, sectionalizing equipment, vaults, poles, anchors, loops, and meter bases.

The location of the OPALCO facilities must be installed along maintainable routes and shall be prepared so that equipment does not end up in a depression or on a mound of significantly different elevation than the surrounding area.

All transformer, loops, and switch pedestals sites are to be sand bedded, as shown in Figure 1, or with prior approval by OPALCO, filled with 3/8" (inch) or 5/8" (inch) crushed rock on a 4 feet x 8 feet x 2 feet excavated pad.

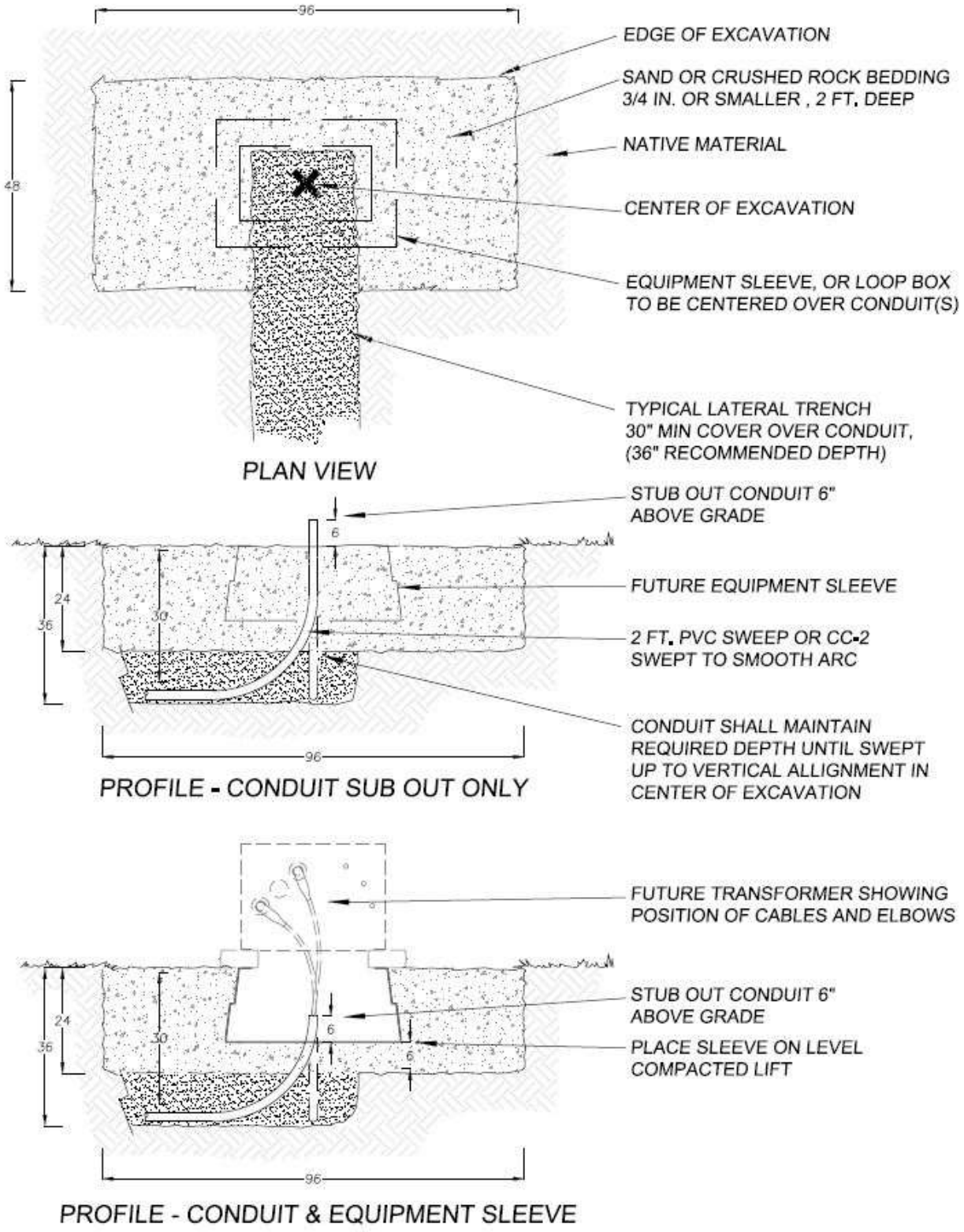


Figure 1 – Transformer Site Preparation

Trench and Cable Installation Specifications

It is the duty of the responsible party to obtain any necessary permits from San Juan County Community Development for all installations along county road rights-of-way.

The responsible party will maintain all OPALCO underground primary power lines with a minimum of 30" (inches) of cover over the cables and/or conduit.

All OPALCO primary power lines shall be installed at a minimum of 12" (inches), vertically or horizontally, either from other utility cables or waterlines. When LPG gas lines are installed in an OPALCO power line trench, the power line shall be installed and maintained with 18" (inches) of clearance either vertically or horizontally from the LPG gas line.

In the event that OPALCO underground primary power lines are buried with sewer and/or liquefied fuel lines, the following limitations apply:
All OPALCO primary power lines shall be installed in conduit, and all sewer lines in the same trench will be solid line (tight line - Schedule 40) and liquefied fuel lines will maintain a minimum of 24" (inches) of horizontal separation from the closest point of each conduit.
Perforated sewer lines will not be allowed in an OPALCO power line trench.

If these clearance requirements cannot be met, a separate trench will be required for OPALCO underground primary lines. On all OPALCO underground primary power installations, the marking tape (terra-tape) shall be installed 18" (inches) above the power cable, or 12" (inches) below finished grade. See **Figure 2 – Trenching/Cabling.**

TYPICAL PRIMARY TRENCH
PROFILE
SHOWING COVER AND
CLEARANCES

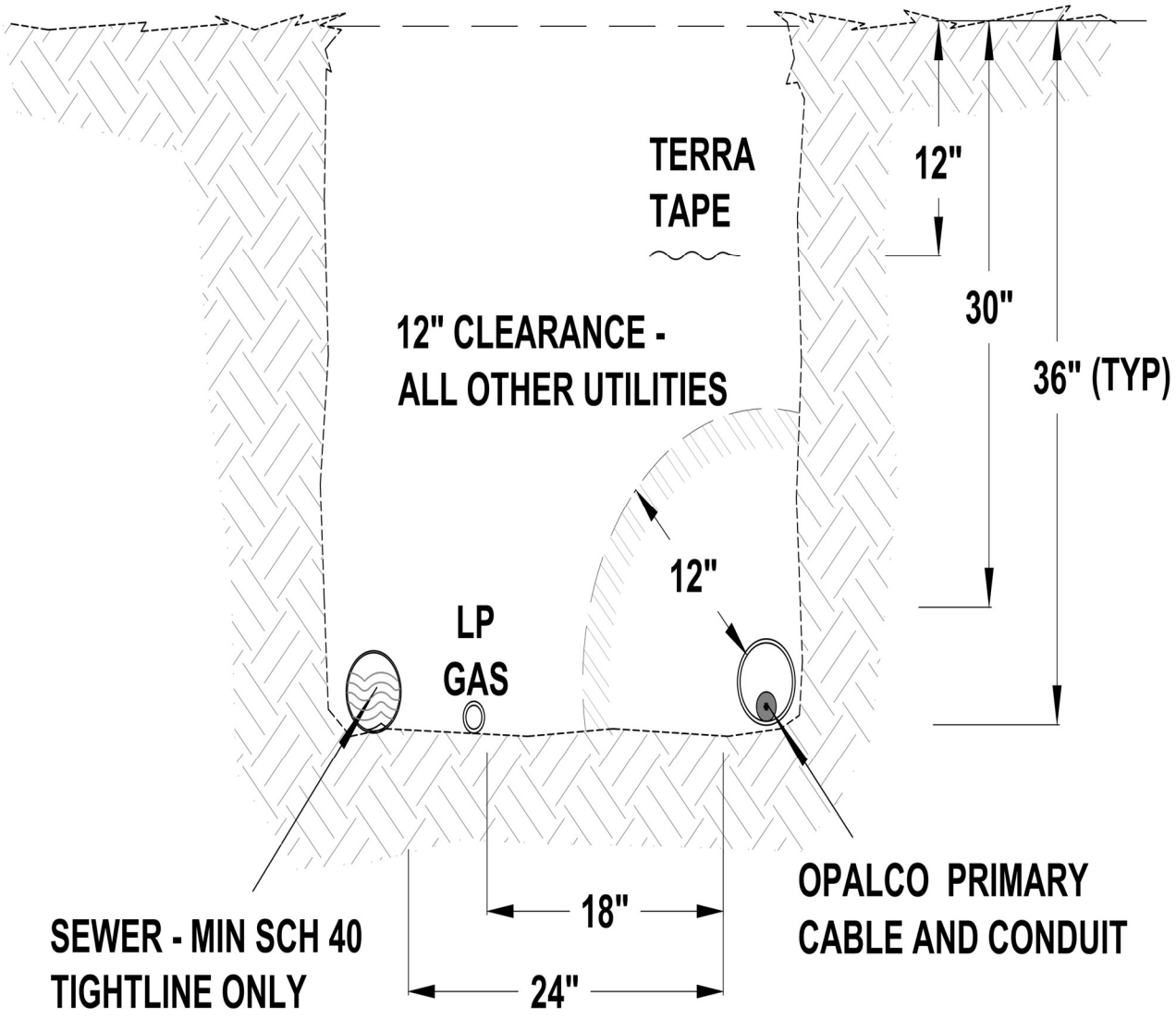


Figure 2 – Trenching/Cabling

Clearances – Landscaping

OPALCO facilities (vaults, switch pedestals, transformers, and meters) must remain visible and accessible at all times. OPALCO personnel are required to locate facilities during periods of bad weather, and in the dark.

Landscaping around OPALCO facilities that renders the facilities difficult to locate or access, or decreases the life of facilities shall be remedied in one of four ways.

1. The member must modify landscaping to OPALCO clearance specifications within 90 days of written notification.
2. The member is required to pay all cost associated with the relocation of facilities.
   NOTE: Facilities reconnection is treated as an application for new service.
3. The member agrees, in writing, to pay all future costs incurred by OPALCO in maintaining and accessing the facilities.
   a. The member shall be required to pay full clean-up and facility replacement cost of any equipment whose failure is attributed to member's landscaping.
   b. The member understands that the facilities may be disconnected at any time if OPALCO feels that there is a risk to the facilities.
4. OPALCO may disconnect all above-ground facilities that cannot be maintained or accessed by OPALCO, and will remove facilities from the site if a way can be found to do so safely.

NOTE: OPALCO must give the member a 90-day written notice of any corrective action required. If the member does not select and complete any of the corrective remedies described above, OPALCO may apply remedy four (4) as stated in prior section at any time after this 90-day period**.**

The member is responsible for providing and maintaining the required minimum clearances to OPALCO equipment (transformer, switch pedestal), facilities (vaults and poles) and meter base as shown in Figure 3-Pad-Mounted Equipment-Clearances and in Figure 4 – Clearances for Landscaping.

Those clearances are listed here:

- 10 feet from all obstructions on the (opening) side(s) of the transformer, switch pedestals, protective devices and a minimum of three (3) feet around non-opening sides of same equipment.
- 8 feet to any combustible structure and 3 feet to any noncombustible structure.
- 20 feet to liquid propane, gas and fuel storage tanks.
- 10 feet to generators
- 6 feet to telephone, cable/television pedestals.
- 3 feet to all other utilities such as water.
- 3 feet to all other obstructions such as shrubs, sidewalks, boulders, and so on.
- 8 feet to trees, fire hydrants or embankments.

All OPALCO managed and maintained equipment must be visible and accessible to OPALCO employees and free of vegetation at all times.

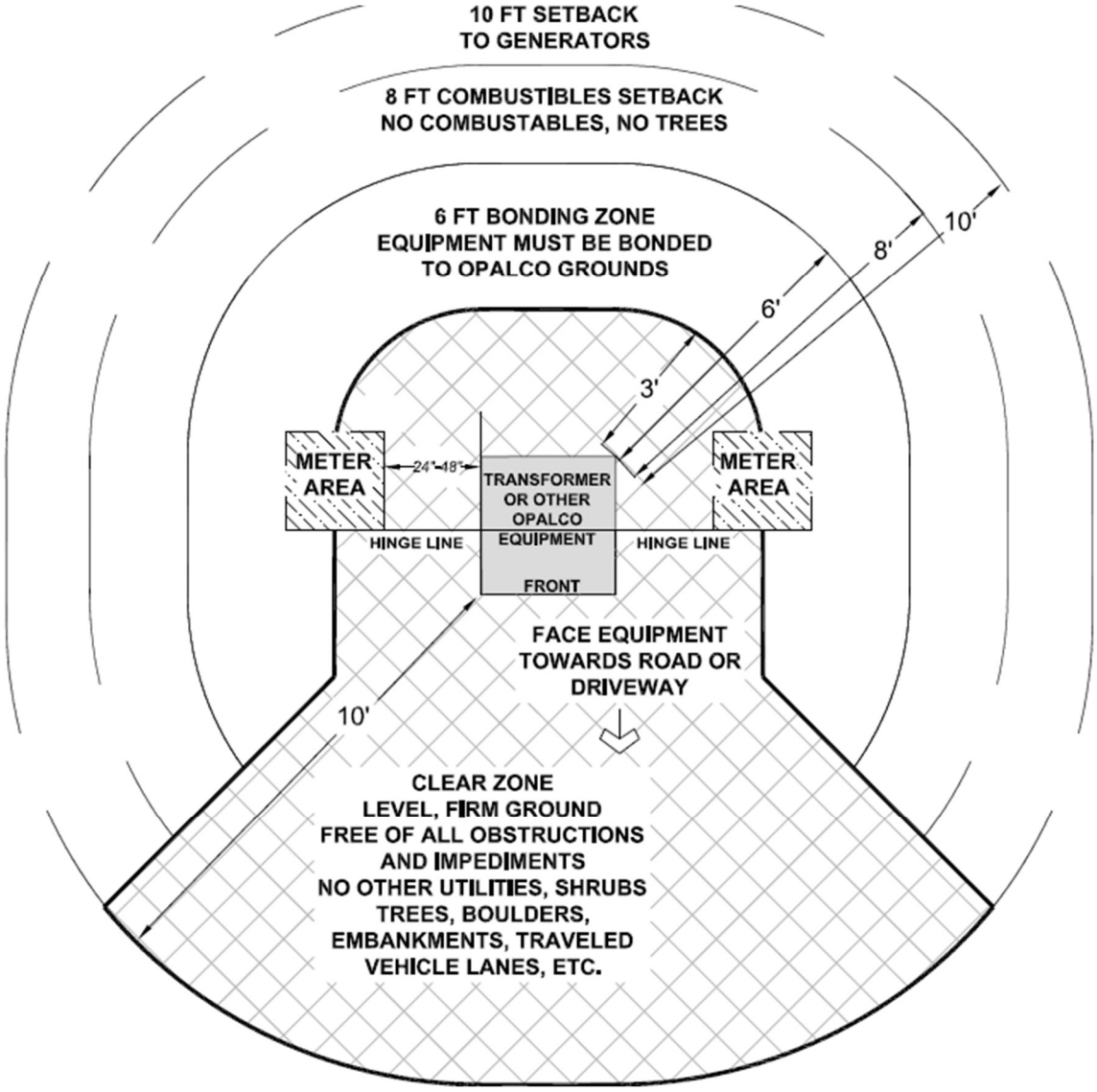


Figure 3 – Pad-Mounted Equipment-Clearances

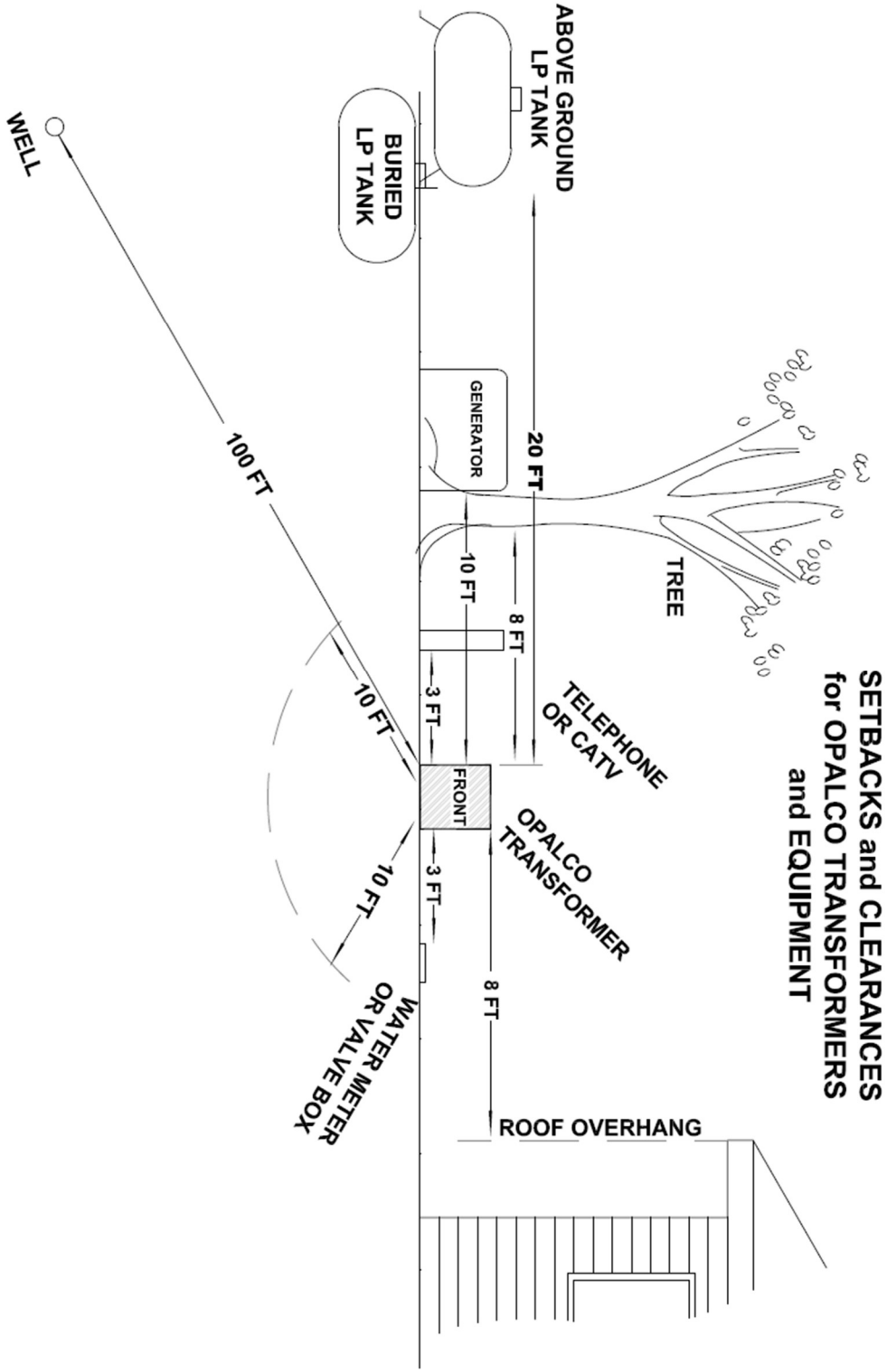


Figure 4 – Clearances for Landscaping

An OPALCO Staking Engineer will make a site visit and mark (stake) the location of all OPALCO equipment (vaults, switch pedestals, protective devices and meter bases). All meter base locations and equipment must be approved by OPALCO before the OPALCO-approved meter base is set in place. Meter bases installed without prior approval will not be connected.

Conduit

Acceptable conduits for OPALCO underground primary power cables shall be specified and authorized by OPALCO only. Installation of conduits without OPALCO's authorization shall not be accepted for use by OPALCO.

NOTE: No member-installed conduits will be accepted without a legal easement being granted for the use of the conduit. The OPALCO member is responsible for the cost of filing for the member-installed conduit.

Conduit is required:

- In all primary underground installations owned and maintained by OPALCO.
- In any other areas specified by the design engineer.

Conduit runs must:

- Be restricted to 600' (feet) to 700' (feet) between pulling points, or as specified by the OPALCO Engineer.
- Be laid in the trench as straight as possible and shaded with sand or rock-free material so the conduit is not damaged.
- Be from one pull point to another.
- Not exceed 360 degrees total of bends between pulling points in PVC conduit installations of 2" (inches) PVC conduit or larger. Conduit sizes of less than 2" (inches) shall not be allowed for use with primary conductors.
- Extend vertically from the trench line and end 6" (inches) above the final grade of the excavation.
- Have the ends capped off above ground and stubbed into a loop box or vault.

Sweeps

Where sweeps exit the trench line, they will exit on a vertical plane and end 6" (inches) above the final grade of excavation.

Where sweeps are installed in a PVC conduit installation, in any one section between pulling points, not more than two (2) 36" (inch) radius sweeps are to be used.

Due to the nature of polyethylene conduit, pre-formed sweeps are most often not necessary. At the ends, the duct should be swept gradually to negate any sharp bends or kinks in the duct. Total degree of bends between pulling points shall not exceed 360 degrees. PVC sweeps shall be used with the appropriate couplings if a vertical exit from the trench line cannot be maintained.

Member-Installed Conduit System

Member-provided and member-installed conduit installations for OPALCO underground primary power lines will be installed per an OPALCO pre-approved design as specified and only after an easement has been granted and registered with the county.

NOTE: The member installing the conduit system is responsible for all costs related with creating and filling of the easement.

Fees and other charges:

- A $100.00 (one-hundred dollar) inspection fee will be included on the CIAC for an OPALCO inspection of all member-installed conduit.
- There will be a $150.00 (one hundred and fifty dollar) fee for OPALCO to install a pull line and certify conduit installation for future use.
- If the member-provided conduit system is unacceptable according to OPALCO Facility Inspection Specifications, the member shall, at their own expense, satisfy the requirements for installation before power cable will be installed.
- If cable cannot be pulled into member-provide conduit, the member shall, at their own expense, be required to pay for the re-installation of conduit.

Meter and Meter base Specifications

CAUTION: Improper handling of a meter is not safe. Removal of an installed meter does not always de-energize a service entrance.

All meter location and meter base equipment are subject to OPALCO pre-approval.

Meter base are intended to be used as meter bases only. If there is no meter installed in a meter base the whole meter base included service breaker must be removed from system. Meter bases shall not be used as splice or pull boxes and shall not be slugged.

IMPORTANT: No "line-side" connection are allowed on the OPALCO distribution system. All conductors leaving the OPALCO-approved U.L.-listed meter base must connect to the load side of a factory-authorized circuit breaker. The member or the contractor will be held liable for any personal injury or property damage if inadequate installation notice or information was given to the OPALCO, or if meter location or meter base equipment is not approval by OPALCO.

Members or contractors are not authorized to relocate, increase service size or increase the number feeders from an existing meter base without first submitting an altered service application and receiving written permission from OPALCO Engineering Department.

Members or contractors shall not remove any meter from a meter base socket belonging to OPALCO or interfere in any way with the meter or its connection. **Members must contact OPALCO for any work that involves relocation, rewiring, removal or installation of a meter.**

All secondary installations extending from OPALCO transformer locations shall be fed underground, and meet all state and local codes and OPALCO specifications prior to connection.

If installation is along the county road rights-of-way, the member must secure the proper County permits. Notification and compliance is required by the San Juan County Public Works Department.

If a meter has been removed due to abandonment, or has been removed at the members request for a period considered to be abandonment, it must be upgraded to current OPALCO requirement before service is re-established. However, if a facility becomes unsafe, the member may be disconnected for safety reasons and the service may then be subject to re-establishment requirements.

IMPORTANT: OPALCO does not allow temporary meter base installations. Meter bases installed on wooden post or unsupported uni-strut metal shall not be connected to an OPALCO's transformer.

Meters will not be installed unless the service conductor connections are tight and conform to the wiring diagram for the class of service involved. Where large conductors are connected to terminals in box or trough-type sockets, meters will not be installed if conductors are placing undue strain on the terminal facilities. Terminals are rated for the size of conductor to be used. Do not remove strands to make conductors fit undersized terminals.

Arrange entrance wiring so that metered circuits do not enter raceways or enclosures containing unmetered circuits.
All meter bases must be self-supporting on supports made of uni-strut metal, and shall be set in a minimum of 80 pounds of concrete. Meter bases shall not be mounted on or attached to wooden post or timber.

All equipment is to be installed per electrical codes with proper permits and inspections.

An electrical inspector must approve and tag the installation prior to OPALCO installing a meter and connection wires.

All meter bases shall be approved by OPALCO's Engineering Department before purchase and shall have a single service-disconnect that includes over-current protection. Current Transformer (CT) meter base installation will require a separate member-supplied single service-disconnect that includes over-current protection, which is located within site and 2' (feet) of the CT enclosure.

All meter base, enclosures, and conduit must be bonded and grounded in accordance with Articles 230 and 250 of the latest edition of the NEC. NEC 250-84 requires two ground rods where a single ground electrode has a resistance over 25 ohms.

The service sequence must be:

(1) OPALCO managed service conductor(s)
(2) Utility side of meter socket termination lugs
(3) Member side of meter socket termination lugs
(4) Service disconnect switch with overcurrent protection
(5) Member load

Meter and service disconnect with overcurrent protection shall be contained in the same U.L listed meter base overcurrent protection shall open all phases upon failure of a single phase. Fuses that only open up individual phases are not allowed.

Meter bases that have been installed without approval shall not be connected.

Rural Residential and Large-Lot Subdivisions

In this kind of installation, all meter bases will be:

- Installed at the transformer, as permanent and freestanding (see **Figure 5 – Pole-Mount Transformer /Meter Installation** and **Figure 6 – Underground Transformer Meter Base Installation**) and shall maintain 36" (inches) of clearance from center of installed meter to finished grade.
- Set in concrete and mounted plumb.
- Mounted perpendicular to the transformer and behind the plane of access or service lid to the transformer.

Small-Lot Subdivisions, Mobile Home Courts, Multi-Occupant and Commercial Building

In this kind of installation, all meter bases will be:

- Will be installed at the transformer according to the criteria as stated for Rural Residential and Large Lot Subdivisions (above), or
- May be, and only with pre-approval from the OPALCO's Engineering Department, mounted on the building. However, the distance from the transformer to the location of the meter bases may be no more than 100' (feet) and the appropriate-sized conduit and conductor shall be installed. A U.L. listed single service-disconnect that includes over-current protection that is contained within the serving meter base shall be required. OPALCO will maintain the service wires to the top of the OPALCO approved meter base.
- All equipment beyond the point of delivery shall be owned and maintained by the member.

Multiple Metering Services (Ganged Meter Bases)

For ganged meter bases, each metered service must have a permanently engraved metal or hard plastic label to identify the customer's address. The label must be permanently attached to the top half of the meter enclosure. The service will not be energized until the label is permanently attached.

Vacant meter positions shall be factory sealed, or the meter shall be in position before the panel is energized. All removable panels and covers to compartments used for metering shall be sealable.

Metering conductors shall not pass through adjacent metering compartments except in enclosed wire ways.

NOTE: NEC requires a main disconnect when more than six services are connected. If an existing installation expands beyond six services, a main disconnect shall be installed.

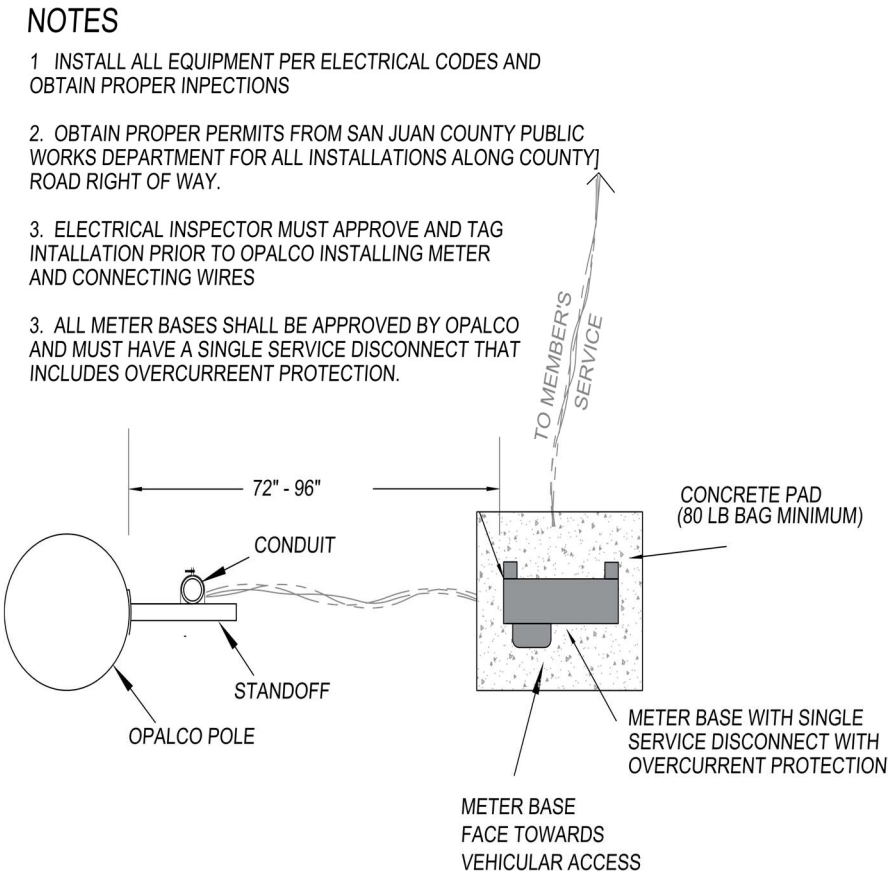
Connecting from an OPALCO Pole-Mounted Transformer

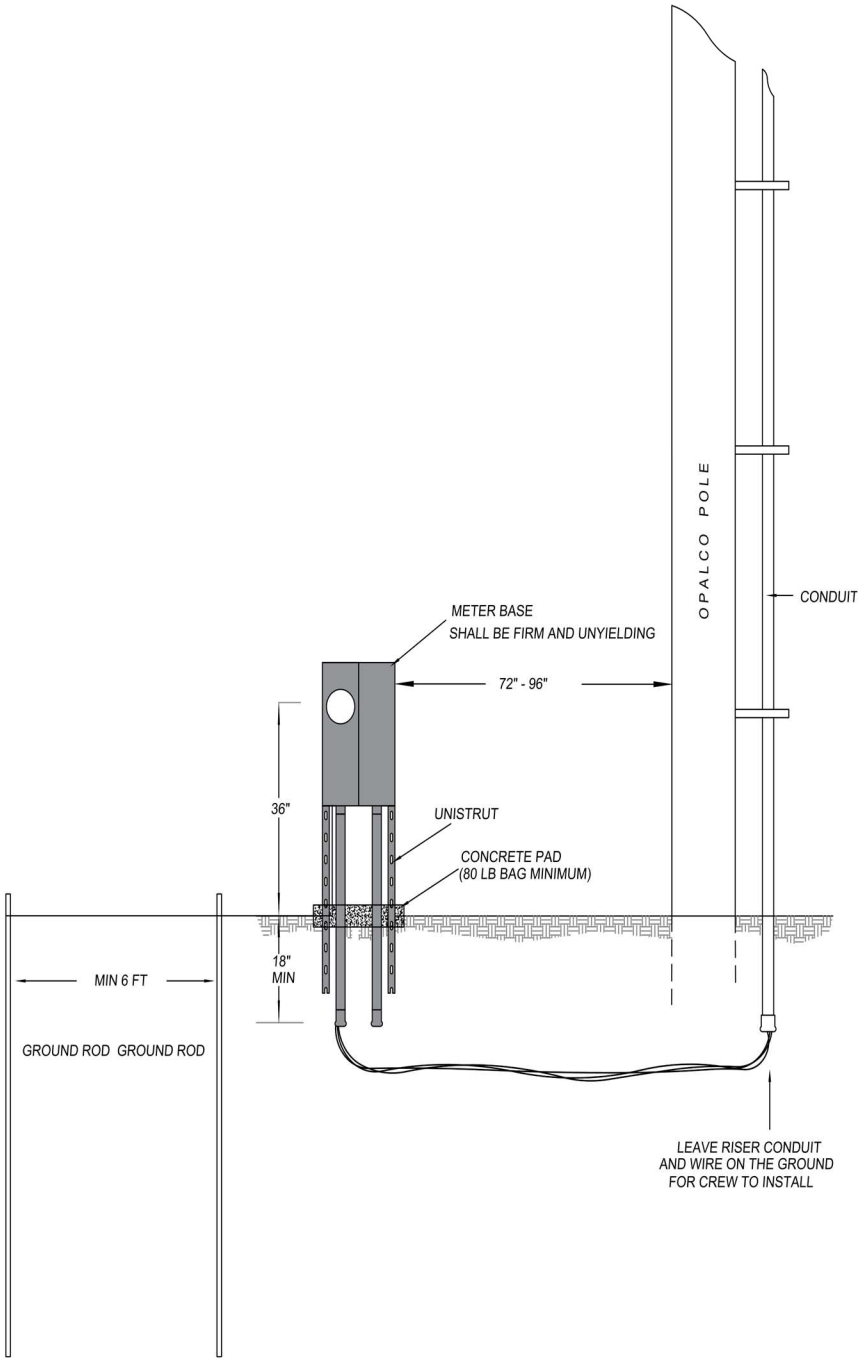
The meter base shall be mounted on a freestanding support no closer than 6 feet, but not more than 8 feet, from the face of the pole. Under no circumstance shall the meter base be mounted on the pole.

All secondary risers extending from the meter base to the pole mounted transformer shall be mounted on the pole with standoffs, supplied by OPALCO, that allow a minimum of 6" (inches) clearance from the conduit to the pole surface. See **Figure 5 – Pole-Mount Transformer /Meter Installation** for an example.

NOTE: Pole risers will be installed on OPALCO poles by OPALCO Operations personnel to assure proper placement.

Figure 5 – Pole-Mount Transformer /Meter Installation





Connecting from an OPALCO Pad-Mount Transformer

The meter base for a residential installation shall be set no closer than 2' (feet) and no further than 4' (feet) from the transformer or as directed by OPALCO Staking Technicians.

The secondary service tails shall be extended to the transformer, leaving adequate service wire for OPALCO to make the connections to the transformer.

All meter base equipment shall be approved through OPALCO's Engineering Department. All meter bases not listed in this document that are to be used on OPALCO's system require written permission to be installed.

See Figure 6 – Underground Transformer Meter Base Installation for an example of the correct installation design.

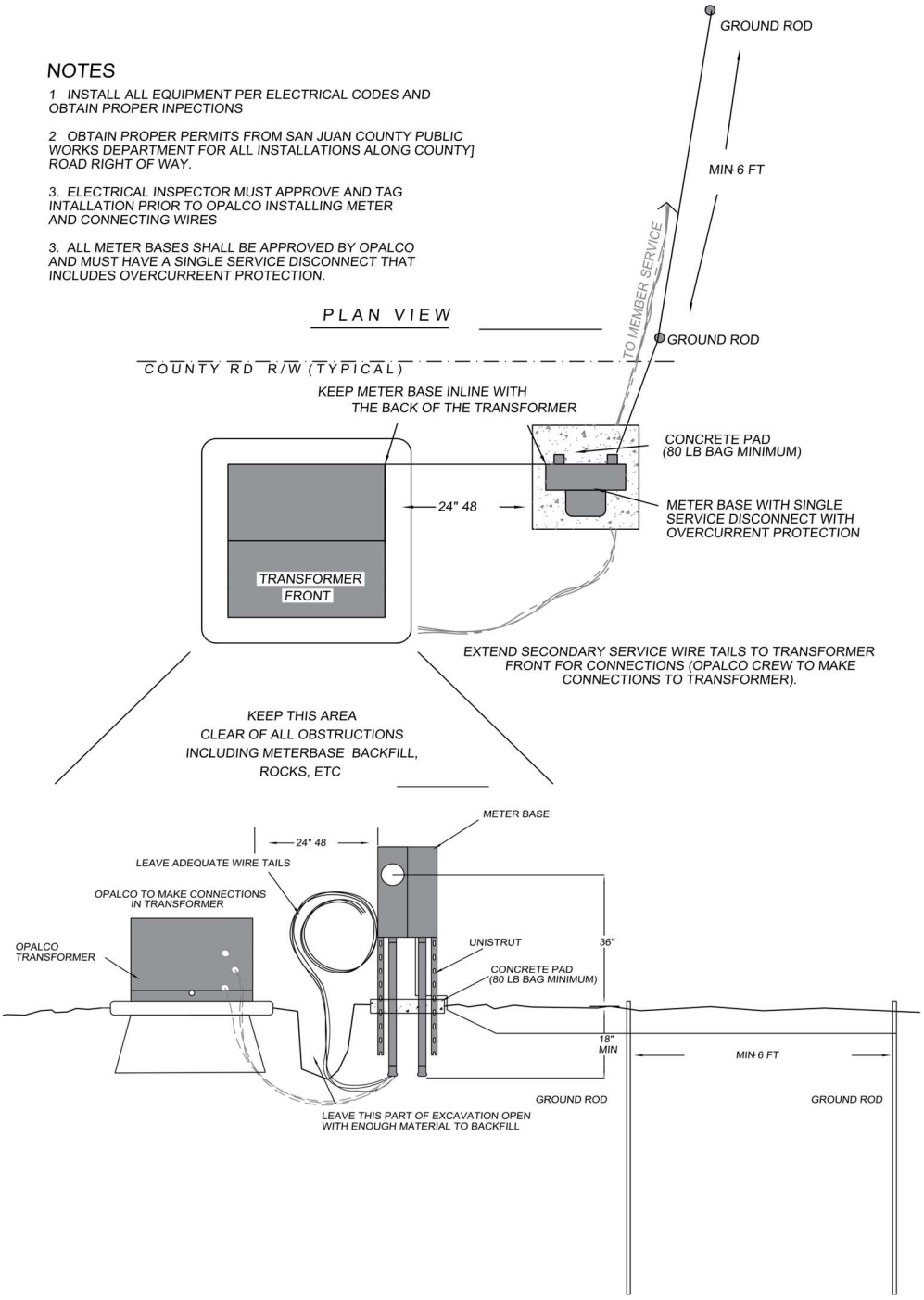


Figure 6 – Underground Transformer Meter Base Installation

NOTE: A State of Washington Electrical permit must be applied for and the inspection complete **before contacting OPALCO for connection to transformer**.

OPALCO Pad-Mount or Pole-Mounted Transformer to a Meter Base on Buildings

When planning for pad- or pole-mounted transformer to a meter base on a building, follow the guidelines in this section, and refer to the the illustration in **Figure 7 – Pad and Pole Mounted Transformer / Meter Installation on building**.

Generally:

1. Meter base installation on buildings (both meter base and meter base location) shall be pre-approved in writing by OPALCO staff and meet the 100 foot distance rule.
2. Meter base installation on buildings shall be required to be installed in conduit with electrical junction boxes installed on both side of the service conduit.
3. All future costs associated with conduit and wiring between the member building and OPALCO transformer is the member's responsibility. OPALCO will fix or replace as a custom order billed to current owner of the property, not to renters of property.

The member must:

1. Supply to the OPALCO Staking Technician the plat drawing with building orientation shown so that OPALCO can locate meter base on building. OPALOC shall specify and/or approve the location of the meter base location in writing. Per WAC rule *WAC 296-46B-230 Wiring and protection – Services,* 001 General service requirements (1).
2. Furnish and install the meter base with single source disconnect with over-current protection that is pre-approved by OPALCO engineering staff.
3. Provide the trench, backfill, compaction, and where required, surface restoration.
4. Install all conduit to a minimum depth of 24" per NESC.
5. Limit the length of the conduit to 100 feet, with no more than 270 degrees of total bend in the conduit.
6. Be responsible for identifying and remediation potential surface or subsurface problems that may damage OPALCO facilities including, but not limited to, surface or sub-grade water flow or frost heaves.
7. Display the electrical label or permit on the meter base.

Elevation View

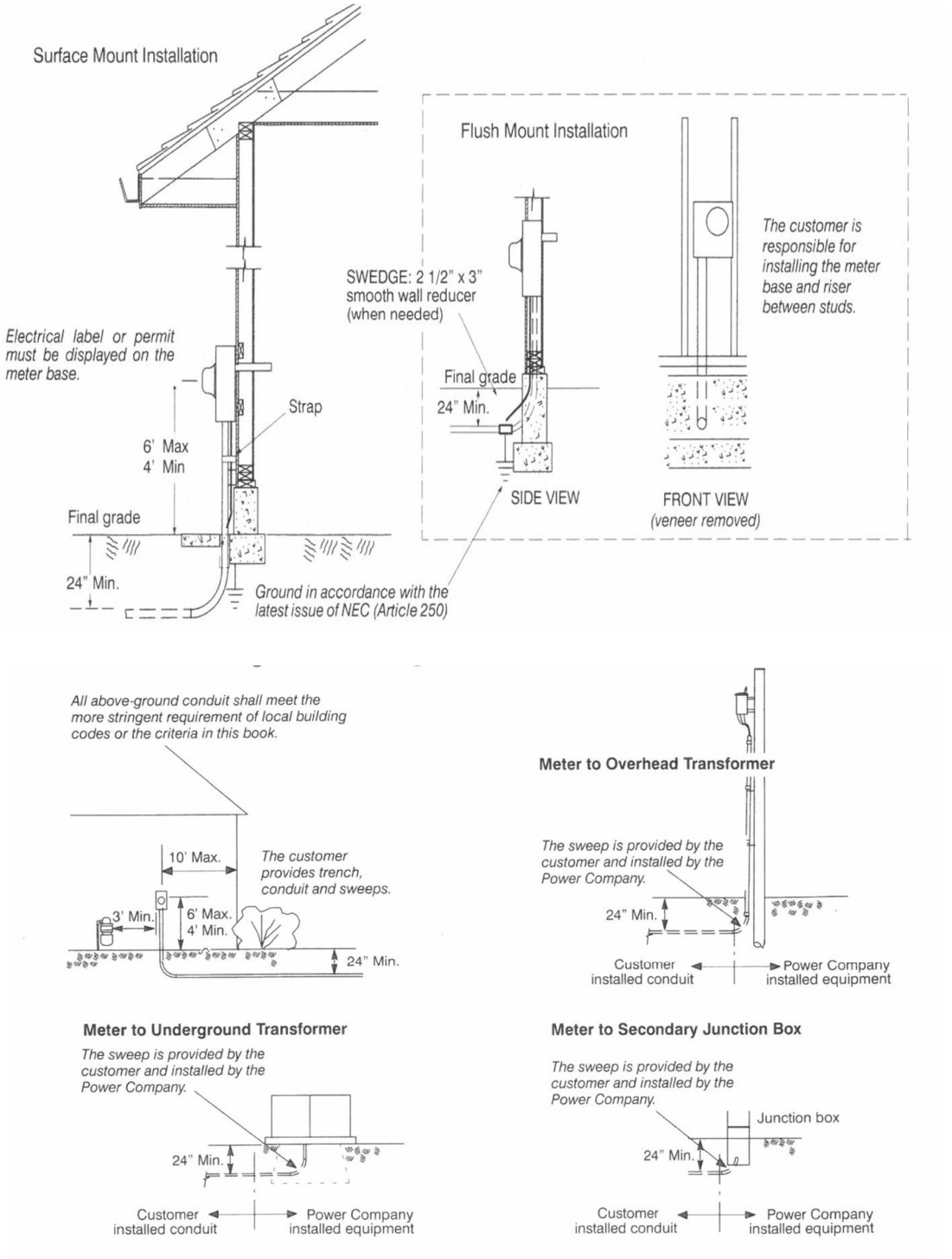


Figure 7 – Pad and Pole Mounted Transformer /Meter Installation on building.

OPALCO APPROVED METER BASES

Figure 8–

Single-Phase, 3 Wire, 120/240V	
100 Amp Service	
MIDWEST #M101CB2	
MILBANK #U5100-XL	
SQUARE D #SC1624M-100S	
200 Amp Service	
CUTLER HAMMER #CMBEB200BTS	**MILBANK** #U3251-0-200
MIDWEST #M281-	**MILBANK** #U5854PXL200
MIDWEST #M254CP6	**MILBANK** #U5198-XL-200S
MIDWEST #M208CP6HP	**MILBANK** #M400-UG-APS-LC
MIDWEST #M281CB1	**SIEMENS** #MC0816B1200CT
MIDWEST #R281CB1034 (Commercial)	**SIEMENS** #W0202MB1200CU
MILBANK #U3584-O-200	**SQUARE D** #SC816F200PS
MILBANK #U5854-PXL-200	**SQUARE D** #SC816F200C
	SQUARE D #SC816F200PS
400 Amp Service with One (1) 400 Amp Main Breakers	
COOPER B-LINE #U404MC	
DURHAM #HC364N4T **Specify 400 amp main*	
MILBANK #M401-UG	
MILBANK #M401UGBS	
SQUARE D #CU816D400CB	
400 Amp Service with Two (2) 200 Amp Main Breakers	
COOPER B-LINE #U4042MC	
DURHAM #HC364N4T	
MIDWEST #MS45508C	
MILBANK #M400-UG-APS-LC	
MILBANK #400-UG-APS-XXX	
SIEMENS #MM0404L1400RLM	
SQUARE D #CU816D400CB	
Three-Phase, 4 Wire, 208/120V or 240/120V Delta	
MILBANK #U227MTB	
MILBANK #U217MTB	
SQUARE D #EZM3225TB	
SQUARE D #EZM3225TBCU	
Three-Phase, 4 Wire, 480/277V or 240/120V Delta	
MILBANK #U227MTB-48/22	

CURRENT TRANSFORMER (CT) METER BASES

All meter bases to be used in applications containing current transformers **shall have** "test switches" to provide for shunting of all current transformers upon removal of the electric meter. All such meter bases shall be clearly labeled:

WARNING: Removal of a CT meter does not de-energize the circuit.

Current transformer ratios will be selected by OPALCO based on information supplied by the member.

OPALCO reserves the right to change current transformers to provide metering accuracy.

Current transformer rated meter base's must be mounted within two (2) feet of the single service disconnect that includes over-current protection and shall be effectively grounded so as to pass L & I inspection.

The minimum conduit size for CT meter wiring is one inch.
The meter base may be attached directly to the side of the current transformer enclosure in free-standing applications; however, the enclosure must not impede the ability to open the current transformer cabinet cover.

All meter bases to be used in applications containing current transformers shall be of the "manual circuit closing with test block" type to provide for shunting all current transformers upon removal of electric meter.

Current Transformer Metering

Table 1 Standard Single-Phase 600 Amp and Over and Three-Phase Over 200 Amp

Refer to Figure 8 – pg 37

IMPORTANT: The member must provide the appropriate size CT enclosure, CT mounting rack, and the single service-disconnect with overcurrent protection. OPALCO will provide at, member's expense, the CTs, test switch, CT meter base and meter.
CT ENCLOSURES must size per the NEC. If the member is installing a 400 amp service the CT enclosure shall be rated for a 400 amp service. A smaller or higher rated CT enclosure will not be accepted (a 200 amp or 600, 800, 1200 amp CT enclosure is not acceptable).