



**ALAMEDA
MUNICIPAL POWER**

A Department of the City of Alameda

MATERIAL AND INSTALLATION CRITERIA

FOR

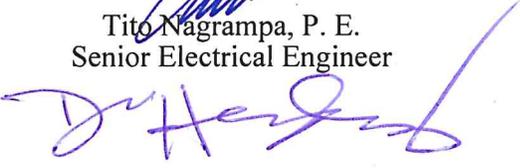
UNDERGROUND ELECTRICAL SYSTEMS

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I. GENERAL NOTES FOR UNDERGROUND ELECTRICAL INSTALLATIONS

- A.** The owner/developer shall provide and install all electrical underground substructures including conduits, pull boxes, risers, transformer pads, vaults, switch pads, etc. as deemed necessary by Alameda Municipal Power (AMP). The owner/developer shall provide and install Code-sized service conductors in conduit from the meter location to the AMP-approved service connection point. The owner/developer shall provide at no cost to AMP access and easement for all utility facilities in the private property.
- B.** AMP will provide the necessary transformer(s), high voltage distribution cables, secondary conductors up to the service point, and will make all service connections to its electric system. AMP will charge the owner/developer for the actual material and labor costs of providing and installing the high voltage distribution cables and secondary conductors. Electrical cable and equipment will be installed after paving, when sidewalk, driveway, bike path, alley, road area, and street have been completed and the conduit system accepted by AMP. Service conductors shall be provided and installed by the customer. Service to a Customer is normally established at one delivery point, through one meter, and at one voltage class. When more than one voltage class is requested, the additional transformer will be considered as Special Facilities.
- C.** AMP will charge the owner/developer for the actual time spent in preparing a conceptual design of required electric utility substructures, field investigation reviewing plans and drawings, coordination of work, and inspecting the owner/developer-furnished substructures. In areas where high voltage feeder is planned by AMP and needed to service the new development, the owner/developer shall pay for 60% of the actual material and labor costs of the high voltage trunk feeder and pad-mounted switchgear, as specified in AMP's Rules and Regulations.
- D.** As much as possible, new construction shall be started adjacent to the nearest AMP-designated power source, utilizing permanent facilities. The cost of any temporary work by AMP will be charged to the owner/developer.
- E.** AMP will schedule its crew to begin construction work after the owner/developer completes the required electric duct system per AMP's specifications. Generally, within 60 days after acceptance of the duct system, AMP will start the installation of its primary voltage cables, secondary voltage cables, and transformer(s), as required. After the City of Alameda Building Services Department's Inspector approves the electric service, AMP will connect the developer-owned service lateral(s) to AMP's supply system at no cost to the customer.

- F. The developer/contractor shall provide submittals for electric service equipment, vaults, pull boxes, conduits and its accessories, where required, for AMP's review and approval prior to procurement.
- G. For temporary construction power requirement, the customer shall coordinate directly with AMP's Engineering Section. The customer shall pay for all costs associated with the temporary electric service.
- H. Electric service facilities with a capacity of 400 Amperes or larger, will be underground per **City Ordinance 2371** and unless there are exceptional circumstances, will require a dedicated pad-mounted transformer.

II. RULES AND REGULATIONS

- A. Applicable Rules & Regulations, General Orders, Standards, Specifications & Requirements.

All work under these specifications shall conform with the requirements of the following authorities or standards:

1. Rules and Regulations of Alameda Municipal Power
2. Electrical Safety Orders, Title 24, State of California Department of Industrial Relations
3. General Order Numbers 95 and 128, State of California Public Utilities Commission
4. Western Underground Committee Standards, Guide 3.6-Non-Concrete Enclosures
5. City of Alameda Policy for Urban Runoff
6. City of Alameda Requirements on Sidewalk and Street Resurfacing
7. California Electrical Code, California Code of Regulations, Title 24, Part 3
8. Electrical code of the City of Alameda (ECCA), City of Alameda Municipal Code Article 13-4
9. Alameda Municipal Power Installation Drawings (included in these Criteria)
10. Electric Utility Service Requirements Committee (EUSERC)

III. CONSTRUCTION INSPECTION

A. General

In order to facilitate the acceptance of utility substructures being installed, the contractor shall provide the following information to AMP:

1. Provide construction schedule that includes but not limited to substructure work, installation of service equipment and energization date.
2. Schedule a pre-construction meeting at least 2 weeks before start of work.
3. Notification of commencement of work 24-hours in advance.
4. Notification of backfilling of trenches 24-hours in advance to allow adequate time for inspection.
5. Notification of any contemplated variation from the plan, where deviations from the plan are necessary to clear obstacles or other utilities, or where the plan is not clear. The respective utility representative, in conjunction with the owner's engineer, shall determine the proper location of all conduit, boxes, or facilities to meet field conditions.
6. Schedule a final walk thru for final acceptance of the substructure work.
7. Provide as built drawings and easement documents.

B. Certificate of Acceptance

A Certification of Acceptance shall be obtained from AMP for each phase of substructure work. These Certificates of Acceptance will be given to owner(s) upon completion of construction and after acceptance of the work by AMP.

IV. INSTALLATION OF MATERIAL & EQUIPMENT

All materials to be furnished by the owner/developer shall be new, of the best quality, and in accordance with these specifications. Approval for any deviation from these specifications shall be required in writing from AMP's Engineering Section. No deviation shall be taken or implemented until written approval is received from AMP.

A. Conduit

All plastic conduits shall be polyvinyl chloride (PVC) Schedule 40, UL-listed, in 20ft. (6 m) lengths with molded couplings. Couplings shall be approximately two times the conduit diameter in length. Conduit lengths and bends shall be connected together using a cement (glue) recommended by the conduit

manufacturer and approved by AMP.

Plastic conduit bends shall be long radius 60-inch (387.1 cm) minimum for 4-inch (10.2 cm), 5-inch (12.7 cm) and 6-inch (15.2 cm) conduits, and concrete-encased. A 48-inch (121.9 cm) bending radius may be allowed under special circumstances with prior approval from AMP's Inspector. AMP will allow a 36-inch (91.4 cm) bending radius for 4-inch (10.2 cm) conduits and a 48-inch (121.9 cm) bending radius for 5-inch (12.7 cm) and 6-inch (15.2 cm) conduits; respectively, entering equipment pads and at pole risers.

All conduits shall be installed after the installation of curbs at the following minimum depths as measured from finished grade to the top of conduit:

Conduit Use	Open Areas	Below Sidewalks	Streets
Primary	30 inches (76.2 cm)	30 inches (76.2 cm)	30 inches (76.2 cm)
Secondary	24 inches (60.1 cm)	24 inches (60.1 cm)	30 inches (76.2 cm)
Streetlight	24 inches (60.1 cm)	18 inches (45.7 cm)	24 inches (60.1 cm)
Service Lateral	18 inches (45.7 cm)	18 inches (45.7 cm)	24 inches (60.1 cm)

All conduits shall be cleaned by using brushes and swabs, as required, and tested with 90% conduit size mandrel for clear bore by a method approved by AMP. Mandrel will be provided by AMP's Utility Construction Compliance Specialist (construction inspector). **Refer to Drawing No. 1-L-621.** All testing shall be done in the presence of an authorized AMP representative. Any conduit that does not pass the test shall be replaced and retested at the owner/developer's expense. All conduits installed in the street shall be tested before and after the street is paved.

If during the testing of the conduit system with a mandrel (or at any other time prior to acceptance by AMP), in the sole opinion of the AMP Utility Construction Compliance Specialist (construction inspector), there is reason to be suspicious of the condition of the conduit, the Contractor may be required to excavate the conduit at the suspected location to determine the conduit condition and replace or repair as necessary at the owner/developer's expense. **Mandrel size shall be at least 90% of the actual inside diameter of the conduit.**

All conduits left clear without conductors shall be provided with a 2,500 lb. (1,136 kg) lubricated pull tape, with waterproof footage markings for measuring. ARNCO lubricated Dandy-line CAT# ARC-L40-2500, or its approved equivalent shall be used. All conduits shall have end bells clearing the bottom of the junction box by a minimum of 2 inches (5.1 cm). Conduit shall extend into the box up to the inside wall surface. Conduit shall be aligned to permit a straight pull through boxes. All conduits left clean without conductor in each junction box shall have blank expansion duct plugs of the appropriate size installed with a rope tie.

Primary conduits shall be concrete capped or encased except under sidewalks, bike paths and road areas, as approved by AMP. A 4-inch (10.2 cm) thick minimum concrete cap shall be constructed as shown on the approved project drawings. Only factory bends, 60-inch (387.1 cm) minimum radius will be allowed on primary runs.

All conduits installed within 5 feet from the existing or proposed tree shall be provided with tree root barrier. **Refer to reference Drawings 1-L-639.**

Any conduit installed for future use shall have an AMP approved pull box at the termination point to facilitate mandrel testing.

B. Boxes or Enclosures

1. General

Primary and secondary boxes or enclosures shall be polymer-concrete without bottom. Box and cover shall conform to the requirements of **ANSI/SCTE 77-2002** - Specification for Underground Enclosure Integrity (or latest revision). Both box and cover shall meet or exceed the Tier 15 standards (15,000 lbs. design load and 22,500 lbs test load). The box shall have two (2) field installed pulling eyebolts, one on each wall and in line with the conduit entry at center and near the bottom of the top enclosure for lengthwise pulling. Box and cover shall meet the interchangeability requirement per **Western Underground Committee Guide 3.6**. The design load of the cover shall match the design load of the box or enclosure. The cover surface shall be skid resistant and shall have a minimum coefficient of friction of 0.5 in accordance with **ASTM C1028**. Refer to reference **Drawing No. 1-L-477** for details of a typical primary/secondary non-traffic rated box with side-entry conduits and field installed pulling eyebolt assembly.

When cutting holes for conduit entry, use one of the following two methods: (1) drill a 7/8-in hole with a carbide tipped masonry drill followed by a diamond tipped masonry hole saw; or (2) use a knockout punch driver. Notching the bottom of the enclosure shall not be allowed except when intercepting existing conduits. Total removed area due to holes drilled in the field shall not exceed more than 25% of each wall and holes shall not cut into a structural reinforcing corner, rib, or box lip.

Boxes and covers located in paved streets, alleys, or areas subject to vehicular traffic, shall be approved for **AASHTO H-20** traffic loading. The contractor shall excavate holes to sizes as shown on details in the AMP-approved drawings, with a 12-inch (30.5 cm) layer of: 3/4 inch (1.9 cm) x 1-1/4 inch (3.2 cm) gravel in the bottom with a minimum of 95% compaction, **see Reference Drawing No. 1-L-513** for typical concrete primary/secondary box details for drivable area

applications). Traffic-rated pull-boxes shall be manufactured with cast-in end bells for PVC Schedule 40 conduit(s), as approved by AMP. The pull-box(es) shall have two (2) pulling irons on each wall in line with the conduit entry for lengthwise pulling. Weight of cover shall not exceed 60 pounds (27.3 kg) per section. Covers of traffic-rated boxes shall have an anti-skid (Allgrip) finish with an AMP approved label and penta-head hold-down bolts. The galvanized steel frame shall be adjustable to grade.

Final box locations will be determined in the field by the AMP Utility Construction Compliance Specialist. All non-traffic boxes shall clear the traffic area by a minimum of 2 feet (0.6 m). **AMP shall have the right to relocate boxes up to a radius of 30 feet (9.1 m) from the position shown on the plans without a Change Order or additional cost to AMP.**

Boxes or enclosures shall be installed flush in paved areas and 1 inch (2.5 cm) above grade in unpaved areas. Paving at boxes shall be graded in a manner to help prevent water from entering the box. Boxes or enclosures located in the sidewalk shall be parallel to the edge of sidewalk. In addition, if the box or enclosure is located in or partially in the sidewalk or areas subject to vehicular traffic, **a minimum of 12 inches (30.5 cm) of 4-inch thick concrete around the outside edge of the box**, with a #4 reinforcing bar on all four sides of the box, rounded rebar corners and tied together is required, **see Reference Drawing No. 1-L-414**. Non-concrete boxes or enclosures shall have a poured concrete bottom. AMP may approve boxes with a manufactured bottom if a concrete bottom is poured before the box is set.

When adjusting a box or enclosure to grade, an extension ring may be required. When a manufactured extension ring smaller than 6 inches (15.2 cm) is not available, the extension shall be formed from inside the box, #4 rebar installed, and concrete poured from the outside.

Primary or high voltage boxes shall be located as shown in AMP-approved drawing(s) for the project. There shall be a primary box near each transformer and switch pad. Primary boxes or enclosures shall be oriented lengthwise in the direction of pull unless a right angle direction change is required. Primary box cover sections shall have lifting means and shall be marked "**ALAMEDA MUNICIPAL POWER HIGH VOLTAGE**".

Secondary or low voltage boxes shall be located as shown in AMP-approved drawing(s) for each project. There shall be a secondary box near each transformer and switch pad. The secondary boxes shall be oriented lengthwise to the direction of the pull unless a right angle direction change is required. Secondary box cover sections shall have lifting means and shall be marked "**ALAMEDA MUNICIPAL POWER ELECTRICAL**".

Fiber Optic boxes shall be located as shown in AMP-approved drawing(s) for

each project. There shall be a fiber optic box near each switch pad. The fiber optic boxes shall be oriented lengthwise to the direction of the pull unless a right angle direction change is required. Fiber optic box cover sections shall have lifting means and shall be marked "**ALAMEDA MUNICIPAL POWER FIBER**".

Upon completion of the installation, each box or enclosure shall be cleaned of all debris and sand. Each box shall have a bolted-down cover using penta-head coil bolts.

2. **Primary or High Voltage Pull Boxes**

For the purpose of these Criteria, a primary or high voltage pull box is an enclosure used to facilitate pulling high voltage distribution cables and may or may not contain cable splice(s) or equipment. Conduits shall enter the primary pull box at the knock-out or at the AMP-designated location(s) **on the side of the box**. Each conduit termination shall extend not more than 1 inch (2.54 cm) into the primary box and shall have an end bell. The bottom of each conduit shall be at least 2 inches (5.1 cm) from the bottom of the box. After the installation of conduits into the primary pull box, all box openings and joints shall be sealed with high strength, quick-set grout both inside and outside the box to prevent the entrance of water and sand into the box. **The grouting of openings must be approved by the AMP Utility Construction Compliance Specialist.** Wherever possible, primary pull box bottom shall be placed on undisturbed soil. If this is not possible, compaction beneath the box shall be a minimum of 90% in 6-inch (15.2 cm) layers. Use temporary wood brace support in the box interior during compaction to prevent damage or bowing of the pull box. The primary box or enclosure shall have a 3-inch (7.6 cm) thick minimum poured concrete bottom.

3. **Secondary Pull Boxes**

For the purposes of these Criteria, a secondary pull box is an enclosure with or without any splice or equipment and is used primarily for ease of pulling secondary or low voltage cables. Conduits shall enter the secondary pull box at the knock-out or at the AMP-designated location(s) **on the side of the box**. Each conduit termination shall extend not more than 1 inch (2.54 cm) into the secondary pull box and shall have an end bell. The bottom of each conduit shall be at least 2 inches (5.1 cm) from the bottom of the box. After the installation of conduits into the secondary pull box, all box openings and joints shall be sealed with high strength, quick-set grout both inside and outside the box to prevent the entrance of water and sand into the box. **The grouting of openings must be approved by the AMP Utility Construction Compliance Specialist.** Wherever possible, secondary pull box bottom shall be placed on undisturbed soils. If this is not possible, compaction beneath the box shall be a minimum of 90% in 6-inch (15.2 cm) layers. Use temporary wood brace support in the box interior during compaction to prevent damage or bowing of the pull box. The secondary pull box

or enclosure shall have a 3-inch (7.6 cm) thick minimum poured concrete bottom.

4. Fiber Optic Pull Boxes

For the purposes of these Criteria, a fiber optic pull box is an enclosure with or without any splice or equipment and is used primarily for ease of pulling fiber or communication cables. Conduits shall enter the fiber optic pull box at the knock-out or at the AMP-designated location(s) **on the side of the box**. Each conduit termination shall extend not more than 1 inch (2.54 cm) into the fiber optic pull box and shall have an end bell. The bottom of each conduit shall be at least 2 inches (5.1 cm) from the bottom of the box. After the installation of conduits into the fiber optic pull box, all box openings and joints shall be sealed with high strength, quick-set grout both inside and outside the box to prevent the entrance of water and sand into the box. **The grouting of openings must be approved by the AMP Utility Construction Compliance Specialist.** Wherever possible, fiber optic pull box bottom shall be placed on undisturbed soils. If this is not possible, compaction beneath the box shall be a minimum of 90% in 6-inch (15.2 cm) layers. Use temporary wood brace support in the box interior during compaction to prevent damage or bowing of the pull. The fiber optic pull box or enclosure shall have a 3-inch (7.6 cm) thick minimum poured concrete bottom.

C. Trenching and Backfill

All trenches shall be shored where required for safety or to eliminate interference with other work being performed. All trenches shall be excavated with straight walls. There shall be a 3-inch (7.6 cm) layer of sand in the bottom of the trench before placing the conduit. Conduits shall be installed in an unobstructed vertical plane. Conduits, whether parallel or crossway, shall have a minimum 3 inches (7.6 cm) radial separation and shall meet the **G.O. 128** requirements where greater separation is required. The first 10 inches (25.4 cm) of backfill above the conduit shall be either sand or excavation material screened to remove all rocks or abrasive materials. All backfill shall be compacted in 1-foot (0.3 m) layers with a minimum of 95% compaction in the street and 90% elsewhere. Contractor shall provide compaction tests at various locations, as determined by the AMP Utility Construction Compliance Specialists and City of Alameda Public Works Department. **Refer to reference Drawing No. 1-L-412** for typical trench sections details.

A continuous plastic marker tape shall be laid in a horizontal plane at least 12 inches (30.5 cm) above all primary and secondary conduits to show the location of the conduits to prevent damage that might be caused by future excavations in the vicinity of the conduits.

The marking tape shall be a minimum of 5.5 mils (0.02 mm) thick composed of 3 mils (0.01 mm) thick metal foil backing and clear mylar coating on both sides. The width of the tape shall be 6 inches (15.2 cm). The tape shall be red in color, printing shall be black ink with a minimum letter size of 1-1/4 inches (3.2 cm) tall and shall state:

"CAUTION Electric Line Buried Below". An acceptable manufacture of above marking tape is Allen "Detecto Tape", or its approved equivalent.

Under paved areas, the tape shall be laid directly on top of the compacted earth subgrade before installation of the base rock pavement. In unpaved areas, the tape shall be laid during the backfilling operation on smooth, compacted backfill 8 inches (20.3 cm) below finished grade surface.

D. Vaults

A vault is a large enclosure which personnel may enter and is used for the purpose of installing, operating, or maintaining trunk feeder cables and equipment.

Electrical vault(s) shall be located as specified in the AMP-approved drawing(s) for the project. Vaults and covers located in paved streets, alleys, or areas subject to any traffic shall be approved for H-20 traffic loading. Vaults located in the sidewalk or bike paths may have H-10 rated covers. Weight of the cover shall not exceed 60 pounds (27.3 kg) per section. Covers shall have an antiskid (All grip or approved equal) finish and labeled "**ALAMEDA MUNICIPAL POWER HIGH VOLTAGE**" with penta-head hold-down bolts, and a galvanized steel frame adjustable to grade. Vault walls shall be manufactured with galvanized Unistrut channel and cast-in end bells for PVC Schedule 40 conduit(s), as approved by AMP. The vault shall have two (2) pulling irons on each wall in line with the conduit entry and two feet (0.6 m) from the top for lengthwise pulling and four (4) pulling irons on the floor at designated locations. The pulling iron shall have an ultimate strength of 20,000 lbs. (9,090 kg) with a Safety Factor of 2. **Refer to reference Drawing No. 1-L-441, reference Drawing No. 1-L-513, and reference Drawing No. 1-L-619** for primary/secondary/fiber vault details for driveable area application.

Vaults shall be installed flush in paved areas and 1 inch (2.5 cm) above grade in unpaved areas. Paving at vaults shall be graded in a manner to help prevent water from entering the vault. Vaults located in the sidewalk shall be parallel to the edge of the sidewalk. In addition, **a minimum of 12 inches (30.5 cm) of 4-inch thick concrete around the outside edge of the vault**, with a #4 reinforcing bar on all four sides of the vaults, rounded rebar corners and tied together is required irrespective of location, see **reference Drawing No. 1-L-414**.

The contractor shall excavate holes to sizes as shown on details in the AMP- approved drawings, with a 12-inch (30.5 cm) layer of 3/4 inch (1.9 cm) x 1-1/4 inch (3.2 cm) gravel in the bottom with a minimum of 95% compaction. No ground rod shall be installed through the vault sump hole.

All electrical conduits in the vault shall be terminated with expansion end bells. After the conduit has been installed, all openings and joints shall be sealed with high-strength quick-set grout and made watertight with particular attention and care taken not to rough up the end bell surface over which the conductors are pulled. Where

required, removable and reusable expansion duct plug water-tight to 30 pounds per square inch (psi) (2.1 kg/cm²) shall be provided. These duct plugs must be easy to install by turning the eye-nut clockwise. The AMP approved expansion duct plug is the Jack Moon duct plug or its approved equivalent. Install 9" Dia. X 10" deep ground well, 5/8" X 8' copper grounding rod and #1/0 copper ground wire in sidewalk or landscape area.

Upon completion of installation, each vault shall be cleaned of all debris and sand. Each vault cover frame shall be bolted to the vault wall and cover plates or manhole cover shall be bolted down with penta-head bolts.

When a vault cover must be raised less than 1 inch (2.5 cm), the gap between the cover frame and vault wall shall be filled with grout.

When a vault cover must be raised more than 1 inch (2.5 cm), but less than 6 inches (15.2 cm), the gap between the cover frame and vault wall shall be formed from inside the vault, and 3/8 inch (1 cm) rebar shall be installed around the wall, and filled from the outside with high-strength concrete.

When a vault cover must be raised 6 inches (15.2 cm) or more, the gap between the cover frame and the vault wall shall be adjusted with a factory-manufactured ring.

E. Transformer and/or Switch Pads

Each transformer and/or switch pad shall be constructed of 3,000 pounds per square inch or psi (211.4 kg/cm²) test strength concrete reinforced as indicated on the AMP-approved drawing(s). The concrete curing period shall be a minimum of 28 days to reach its maximum strength. The top finish shall be of class two rating. The pad shall be poured over a 6-inch (15.2 cm) minimum finished layer of 3/4 inch (1.9 cm) x 1-1/4 inch (3.2 cm) gravel compacted to 90%. Compaction test results shall be submitted to AMP Utility Construction Compliance Specialist. Concrete mix design and delivery tag may be required. The transformer and switch pad shall comply with the AMP minimum clearance requirements. **Reference Drawing No 1-L-636.**

The exact location and dimensions of each transformer and/or switch pad and the location and number of conduits entering the pad shall be determined, inspected, and approved by AMP Utility Construction Compliance Specialist before placing any concrete. Refer to the following **Reference Drawings: 1-L-405, 1-L-408, 1-L-406, 1-L-407, and 1-L-454** for transformer pad details; and **Reference Drawings 1-L-409 and 1-L-482** for switch pad details.

A transition cabinet is required on the secondary service for pad-mounted transformers rated 500 kVA to 1,500 kVA to prevent damage to the transformer secondary cable termination spades due to cable weight. **Refer to reference**

Drawing No. 1-L-620.

F. Equipment Barrier Protection

To protect pad-mounted equipment such as transformer or switchgear from vehicular damage, AMP may require the customer to provide and install steel barrier posts. Barrier posts shall be installed according to **Reference Drawing No. 1-L-427**, Equipment Barrier Protection and Clearances}. The quantity of required barrier posts depends on the size of equipment to be protected. The quantity and location of the steel barrier posts will be determined by AMP Utility Construction Compliance Specialist in the field. Removable steel posts with provision for safety lock may be required in certain applications.

G. Riser on Wood Pole

The riser shall extend a minimum of 6 inches (15.2 cm) above grade. AMP will then install the required Powermold or U-molding to the desired level on the pole. Final orientation/location of the conduit riser on the wood pole will be determined by AMP Construction Compliance Specialist.

AMP will accept 36-inch (91.4 cm) minimum bending radius for a 4-inch (10.2 cm) conduit and a 48-inch (121.9 cm) minimum bending radius for a 5-inch (12.7 cm) or 6-inch (15.2 cm) conduit. A pull box may be required within 10 feet (3.05 m) from the pole or where designated by the AMP Utility Construction Compliance Specialist. **Refer to reference Drawing No. 1-L-413** for riser details.

H. Conductors

Service conductors: Code-sized service conductors shall be installed in Code-sized conduit and approved by the City of Alameda Building Services Department Inspector. The minimum length of service conductors left in the service box shall be twice the length of the service box, see **Reference Drawing No. 1-L-479** for minimum requirement for underground service connection in an electric box.

Service conductor ends shall be sealed in an approved manner to prevent moisture from entering the cable prior to termination. **Service conductors shall have phase-identifying color tape and service address identification using permanent markers.**

Service conductors for commercial and industrial buildings shall be copper. Contractor shall provide the necessary approved two-hole high compression cable terminations to AMP for service cables larger than 500 kCMIL. Aluminum conductors are acceptable for residential building services only.

Code-sized streetlight conductors shall be copper, XLPE insulated, 600 Volts. Conductors, #8 AWG or larger, shall be stranded while conductors #10 AWG or smaller may be solid. Conductors within each streetlight standard may be #10 AWG THHN/THWN copper and color-coded for voltage.

No splicing of streetlight conductors will be permitted except at the hand hole in the electrolier poles or streetlight junction boxes.

Splices, where required, shall be made using 3M Scotch Lok Connector Sealing Packs, or approved equal, properly sized for the conductors.

I. Bus Duct

For secondary services larger than 3,000 Amperes up to 4,000 Amperes, AMP will require the customer to provide and install a copper bus duct per the applicable electrical code. The bus duct shall be sized based on current density at 1000A/square inch Bus duct shall be installed according to **Reference Drawing No. I-L-432 - Bus Duct Requirements for 2,500 KVA Pad-mounted Transformers**. The customer will retain ownership and will be responsible for the maintenance of the bus duct. The customer shall coordinate with AMP if transformer switching is required to facilitate bus duct maintenance.

J. Service Equipment

The customer/developer shall furnish and install an Electric Utility Service Equipment Requirements Committee (EUSERC) compliant service equipment for each building. Service equipment shop order drawings will be required for all services larger than 200 Amperes. The service equipment drawing submittal from the manufacturer shall be reviewed and approved by AMP's Engineering Section. The service equipment shall be inspected and approved by City's Building Services Department and AMP's Electrical Maintenance Technician after installation and prior to energization.

Service equipment or switchboard bus size shall be rated based on the following current density: 1,000 Amperes/sq. inch for copper bus and 750 Amperes/sq. inch for aluminum bus.

Reference Drawing No. I-L-452 shows a typical 100 Ampere, 120/240 Volts, single-phase underground residential service.

K. Metering

1. General

AMP shall furnish and install meters, current and potential transformers, test switches and related meter wiring. The Customer shall furnish and install the necessary meter sockets, enclosures and facilities for the installation of AMP's metering equipment and related wiring. Metering facilities shall be of the type required by AMP and shall conform to the standards set forth by the Electrical Utility Service Equipment Requirements Committee (EUSERC). **Reference Drawing No. I-L-541** shows a typical 100-Ampere single-phase metering pedestal. Only qualified AMP personnel shall remove meters from their sockets.

2. Types of Metering Facilities Required

a. Up to 200 Amperes -Less than 250 Volts, Line-to-Line

The customer shall provide the socket for a self-contained meter. The installed General Service meter socket shall have a provision for manual circuit closing.

b. Up to 200 Amperes- 250 to 600 Volts, Line-to-Line

The customer shall furnish and install a bussed safety socket with factory installed test by-pass facilities for self-contained metering. Otherwise, transformer-rated metering facilities are required. For Services 100 Amperes or less, test by-pass facilities are not required.

AMP will not accept new metering facilities with lever-operated by-pass meter sockets. Upon upgrade or modification of any existing metering facility with lever-operated by-pass meter socket, it shall be upgraded to the current standard.

c. Over 200 Amperes but less than 800 Amperes - Up to 600 Volts, Line-to-Line

Transformer-rated metering facilities shall be required and provided by the Customer.

All 480 Volt services shall have a single main disconnect installed and approved by the City's Building Services Department's Inspector.

d. Large Loads (800 Amperes or greater) - Up to 600 Volts, Line-to-Line

Transformer-rated metering facilities shall be required and provided by the Customer.

All 480 Volt services and all other services equal or greater than 800 Amperes shall have a single main disconnect installed and approved by the City's Building Services Department's Inspector.

e. Over 600 Volts, Line-to-Line, or 600 Amperes

A Service Facility shall include a metering enclosure. The design drawing of the Service Facility shall be submitted to AMP for approval prior to installation.

All electric services greater than 4,000 Amperes at 480 volts will be served at Primary Voltage.

3. Separation of Metered Conductors

Conductors to separately-metered Customers shall not occupy the same enclosure or raceway, except when in the common enclosure of a two or more meter assembly.

4. Metering Locations

- a. All electric meter installation shall be located so as to be accessible to authorized representatives of AMP for installation, removal, reading, testing, and inspection.
- b. Outdoor meter locations are preferred. When meters are located within a building, adequate illumination with a switch located by the entry shall be provided. The room shall be directly accessible from the exterior of the building. If entry is lockable, a key must be provided to AMP prior to energizing the Service. Use of the meter room or enclosure for other than metering, electrical Service equipment, and communication equipment will not be permitted without AMP's approval. Meter room shall not be used for storage.
- c. Electric meter rooms for high rise building shall be located in ground, fifth and eighth floor. Remote antenna requirements for indoor meter room and high rise building will be required. **Reference Drawing 1-L-614.**

Meter(s) shall be located as close as practicable to the point of entry of the Service-Entrance Conductors to the building. The following are **unacceptable** meter locations:

- (1) On any floor other than the ground floor in buildings with four stories or fewer.
- (2) In any place where moisture, fumes or dust may interfere with meter operation or materially damage the meter.
- (3) In any hazardous location.

- (4) Directly over any stairway, ramp or steps.
- (5) On any surface which, in the sole judgment of AMP, is subject to excessive vibration.
- (6) In any doorway unless recessed in the entry wall. On or recessed in the external surface of any wall of any building that is built within three feet of any property line or within three feet from the nearest edge of any walk, alley or driveway giving access to commercial or industrial property or other obstruction.
- (7) On any portion of a building that might be enclosed at a later date, thus making the meter inaccessible. Examples of these locations are carports, breezeways, covered porches, etc.
- (8) Behind a side yard gate.

d. Existing Inaccessible Meter Location

AMP may require one of the following modifications to an existing inaccessible meter location, at the expense of the Customer:

- (1) Conduits, cables and space for installation of AMI equipment
- (2) "Pay as you use" metering
- (3) Other options as determined by AMP

5. Meter Height

Meter shall meet the following installation height requirements:

- a. Individual field-installed meter panels, i.e., not part of an assembly such as switchboard, that are not near a driveway shall be mounted at a minimum height of 48 inches and a maximum height of 66 inches measured from the centerline of the meter to the standing surface.
- b. Individual field-installed meter panels that are near a driveway shall be mounted at a minimum height of 72 inches and a maximum height of 75 inches measured from the centerline of the meter to the standing surface.
- c. Multiple meter panel assemblies or free-standing factory-assembled structures, e.g., switchboard or meter pedestal, shall be mounted at a minimum height of 36 inches and a maximum height of 75 inches measured from the centerline of the meter to the standing surface. Consult Alameda Municipal Power if a multiple meter panel is proposed near a driveway.

6. Meter Working Space

A level standing surface with a clean and unobstructed working space above shall be provide and maintained in front of each metering installation. The working space shall have a width of not less than 30 inches (76.2 cm) and a minimum height of 75 inches (190.5 cm) for individual field-installed meter panels [78-inch (198.1 cm) minimum from standing surface for all other installations]. The working space shall extend at least 36 inches (91.4 cm) in front of the surface on which the metering equipment is mounted. There shall be at least 10 inches (25.4 cm) from the meter centerline to any side obstruction and at least 9 inches (22.9 cm) from the meter centerline to any obstruction above the meter.

Refer to **Reference Drawing No. 1-L-451 and Drawing No. 1-L-535** for required meter working space and mounting clearances.

7. Remote Metering

With the approval of AMP, a remote meter may be installed such that the metering wire length shall not exceed 75 feet. One and one-fourth inch size rigid steel conduit shall be furnished and installed by the Customer between the Service Facility and the remote location.

8. Automated Metering Infrastructure (AMI)

AMP shall install metering equipment that is readable remotely. The customer may be required to provide a smart meter remote antenna facility. **Reference Drawing No. 1-L-614.** AMP may use the Customer's communication facilities on a not- to-interfere basis.

L. Landscaping and Irrigation

Landscaping shall not impair the maintainability and operability of AMP's electrical equipment. For transformers, there shall be an unobstructed minimum clearance of 3 feet (0.9 m) on three sides, and 8 feet (2.4 m) on the front. For pad- mounted switches, the unobstructed minimum clearance shall be 8 feet (2.4 m) in front and rear of the equipment, and 3 feet (0.9 m) on the other two sides. The front of the equipment shall be visible from the street or from the normal access to the equipment.

No tree(s) shall be planted within 5 feet (1.5 m) of the edge of a utility easement. Sprinkler heads must be located to avoid sprinkling of water on AMP's electrical equipment.

M. Easement

Utility easement and access easement shall be provided by the developer for all electrical equipment and duct system in the private property prior to installation of cables and equipment, as shown on AMP- approved drawings for the project. Required minimum electrical easements are as follows:

- a. Cable in conduits - 5 feet (1.5 m) wide
- b. Transformer up to 750 kVA - 10 feet (3 m) wide x 10 feet (3 m) long [3 feet (0.9 m) clear on three sides and 8 feet (2.4 m) clear in front for operation]
- c. Transformer larger than 750kVA- 15 feet (4.6 m) wide x 15 feet (4.6 m) long [3 feet (0.9 m) clear on three sides and 8 feet (2.4 m) clear in front for operation]
- d. Pad-mounted Switch- 10 feet (3 m) wide x 25 feet (7.6 m) long [8 feet (2.4 m) clear in the front and rear for operation, and 3 feet (0.9m) clear on the other two sides]
- e. Primary Vault – 10 feet (3 m) wide x 10 feet (3 m) long
- f. Primary Pull Box - 5 feet (1.5 m) wide x 5 feet (1.5 m) long
- g. Secondary Pull Box - 5 feet (1.5 m) wide x 5 feet (1.5 m) long

N. Pad-Mounted Equipment Screen

To minimize the visual impact of its equipment, AMP may approve the installation of aesthetic screens around its pad-mounted equipment. Minimum required clearances for a pad-mounted transformer shall be 3 feet (0.9 m) on three sides and 8 feet (2.4 m) in front. For pad-mounted switchgear, the minimum required clearances shall be 8 feet (2.4 m) in front and rear, and 3 feet (0.9 m) on other two sides.

Screens may be in the form of landscaping, retaining walls, decorative walls, etc. Screens shall be installed, owned and maintained by the customer unless the AMP equipment is in the public right-of-way. **Refer to Reference Drawing No. 1-L-520 and Drawing No. 1-L-521** for examples of landscape screen and wall screen, respectively. Screens shall not impair the maintainability and operability of AMP's electrical equipment.

Gates or doors may be placed on wall screens as long as a minimum 8 feet (2.4 m) clearance is available with the gates and doors open. Decorative walls or fences are not substitutes to any required barrier posts or bollards.

All equipment screens shall be subject to approval by AMP's Utility Construction Compliance Specialist.

O. Warranty

The developer shall warrant that the installation is free from mechanical and/or electrical defects and agrees to replace or repair any part of the installation that fails within a period of one year from the date of final acceptance.

P. Access to Alameda Municipal Power's In-Service Facilities

Only qualified AMP personnel or its approved contractor(s) are authorized to inspect or enter any in-service electric facility. In-service facilities include vaults, rooms, underground boxes, enclosures, cabinets, equipment, etc. with active components for AMP's electric system.

When a new or re-build construction project requires penetration to an existing in-service AMP facility, such as conduit installation into an existing vault or pull box, only qualified AMP personnel or approved AMP contractor(s) shall do the penetration work. AMP will charge all costs associated with the penetration work to the developer or owner of the construction project. AMP will provide the required conduit stub-out(s) for the new construction. All trenching and restoration work shall be done by the developer or his/her contractor. **A two-week minimum advance notice is required for any penetration work.**

END

City of Alameda, California
Alameda Municipal Power

MATERIAL AND INSTALLATION CRITERIA

FOR

UNDERGROUND ELECTRICAL SYSTEMS

SECTION V

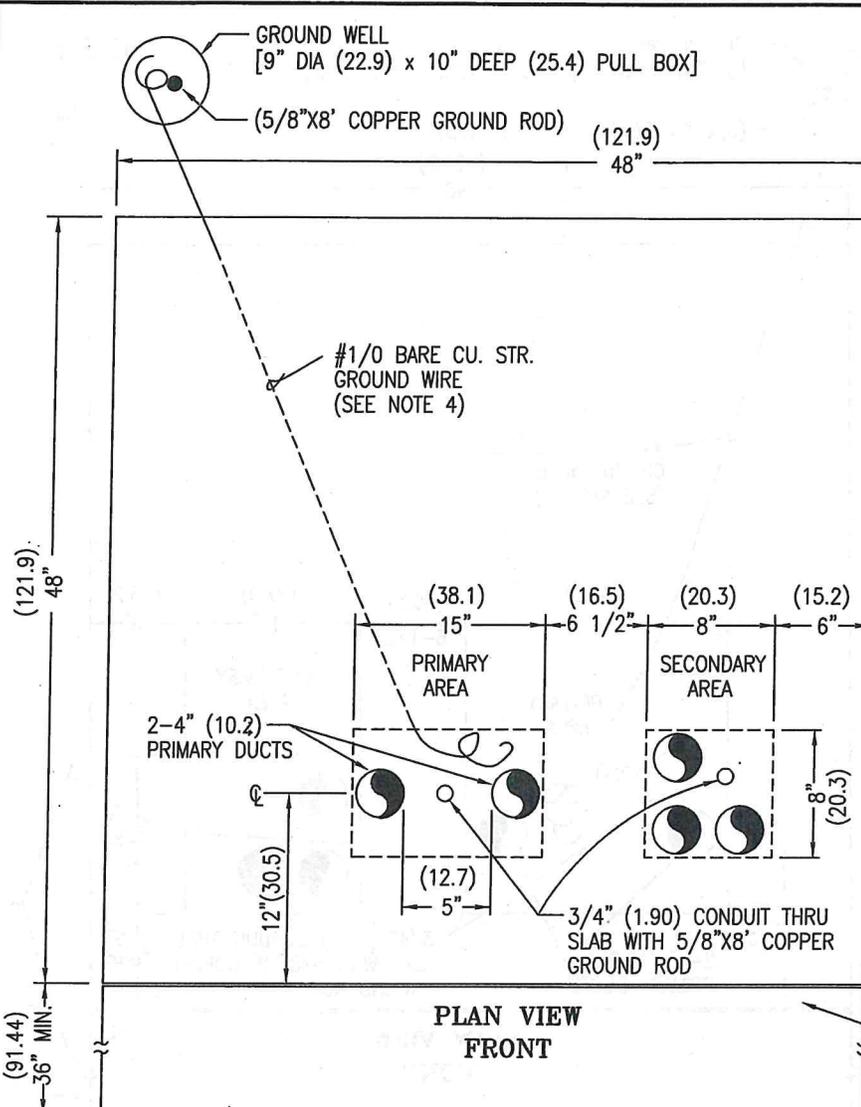
REFERENCE DRAWINGS

V. REFERENCE DRAWINGS

	Dwg. No.
A. Concrete Pad for Single-Phase LT Transformers.....	1-L-405
B. Concrete Pad for Single-Phase LX Transformers.....	1-L-408
C. Concrete Pad for Three-Phase Transformers (75 to 750 kVA Sizes).....	1-L-406
D. Concrete Pad for Three-Phase Transformers (1,000 kVA & 1,500 kVA).....	1-L-407
E. Concrete Pad for Three-Phase Transformers (2,500 kVA).....	1-L-454
F. Switch Pad Detail (600 Amp).....	1-L-409
G. Motorized Switch Pad Details (2-Way Switch with One VFI Tap).....	1-L-482
H. Concrete Pad for Pad-mounted Capacitor Bank.....	1-L-410
I. Pad-mount Equipment Clearance Requirements.....	1-L-636
J. Typical Trench Section Details.....	1-L-412
K. Riser Detail.....	1-L-413
L. Detail of Reinforcing Required Around Utility Boxes and Vaults.....	1-L-414
M. Typical Joint Trench Design Guide	1-L-550
N. Tree Root Barrier	1-L-639
O. 1 Decorative Block Retaining Wall for Pad-Mounted Equipment.....	1-L-561

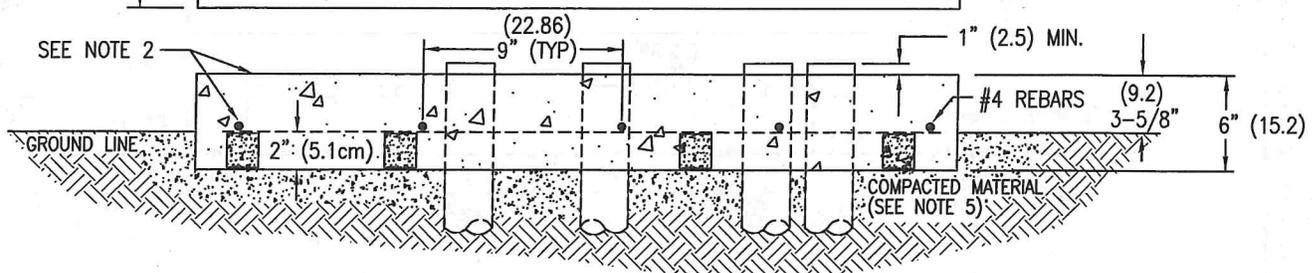
V. REFERENCE DRAWINGS (Continued)	Dwg. No.
P. Mandrel Testing	1-L-621
Q. 4'-6" x 8'-6" x 6'-0" I.D. Primary Vault Details for Full Traffic Driveable Area Applications.....	1-L-441
R. Concrete Primary/Secondary Box Details for Full Traffic Rated (H20) Box and Cover.....	1-L-513
R.1 Full Traffic Rated (FVT-H20) 3'-0" x 5'-0" x 3'-6" (I.D.) Primary/Secondary Fiber Box and Cover.....	1-L-619
SI Polymer-Concrete Primary/Secondary Pull Box Details (Side-Entry).....	1-L-447
T. Bus Duct Requirements for 2,500 kVA Pad-Mounted Transformer (2 Sheets).....	1-L-432
T.1 Secondary Service Transition Cabinet Service Size Larger than 800A (2 Sheets).....	1-L-620
U. Equipment Barrier Protection and Clearances.....	1-L-427
V.1 Typical Residential Underground Service 100 Amperes, 120/240 Volts, 1-Phase.....	1-L-452
V.2 Typical 100-Ampere Single-Phase Metering Pedestal.....	1-L-541
W.1 Meter Working Space.....	1-L-451
W.2 Required Minimum Separations & Clearances Between Electrical and Gas Meters.....	1-L-535
W.3 Typical Overhead Service Installation	1-L-628
W.4 Meter Installation in Residential Driveway	1-L-624
W.5 Smart Meter Remote Antenna Requirement for Indoor Meter Room and High Rise Building	1-L-614
X. Minimum Requirements for Underground Service Cable Connection from Electric Box.....	1-L-479
Y. Landscape Screen for Pad-Mounted Equipment.....	1-L-520
Z. Wall Screen for Pad-Mounted Equipment.....	1-L-521

REV	DESCRIPTION	BY	DATE
1	ADDED NOTE 6	jml	5/3/02
2	ADDED GROUND WELL & REV. NOTES	C.B.	8/20/03
3	REV. NOTE 4	jml	10/20/04
4	CHANGE CO. NAME		
5	ADDED NOTE 7	TN	4/10/20



CLEARANCE REQUIREMENT

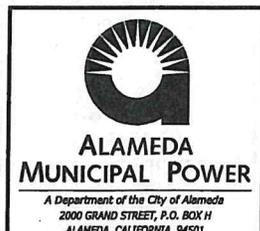
FRONT	8 ft (2.4m)
SIDE	3 ft (0.9m)
BACK	3 ft (0.9m)



NOTES:

- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS IN PARENTHESES ARE IN CENTIMETERS.
- CONCRETE TO BE 6" (15.2) THICK (MINIMUM) WITH #4 REINFORCING STEEL SPACED AT 9" (22.9) INTERVALS AND CROSS LACED. PAD SURFACE TO BE APPROX. 3-5/8" (9.2) ABOVE GRADE. REBARS SHOULD SIT ON TOP OF THE 2" (5.1cm) CONCRETE DOBIES. CALL ALAMEDA MUNICIPAL POWER (AMP) FOR INSPECTION BEFORE POURING CONCRETE, AND GROUND ROD INSTALLATION TEL. (510) 385-6682.
- SECONDARY CONDUITS, AS REQUIRED BY NATIONAL ELECTRICAL CODE AND APPROVED BY AMP. ALL CONDUITS SHALL BE AS FAR LEFT IN SECONDARY AREA AS POSSIBLE (THREE SECONDARY CONDUITS MINIMUM)
- INSTALL A #1/0 AWG BARE COPPER GROUND WIRE UNDERNEATH THE PAD FROM THE GROUND ROD IN THE PRIMARY AREA TO THE GROUND ROD OUTSIDE THE PAD LOCATED 6' (1.83m) MIN. AWAY FROM PAD. LEAVE 15' (4.5m) LEAD ON THE TRANSFORMER PAD END & 2' (5.08cm) LEAD ON THE GROUND WELL END. THE #1/0 GROUND WIRE SHALL BE BONDED TO THE REBARS.
- THE PAD SHALL BE POURED OVER A 6" MINIMUM FINISHED LAYER OF CLASS 2 AGGREGATE BASE COMPACTED TO 90%. COPY OF COMPACTION TEST REPORT AND CONCRETE DELIVERY SLIP ARE REQ'D.
- TRANSFORMER PAD SHALL BE CONSTRUCTED OF 3,000 PSI (211.4kg/cm²) TEST STRENGTH CONCRETE.
- POUR 4" THICK CONCRETE SLAB INFRONT OF THE TRANSFORMER PAD. THE APRON SHALL BE 2" BELOW GRADE OF THE PAD.

(NOTE: SUPERSEDES DRAWING #UT5)

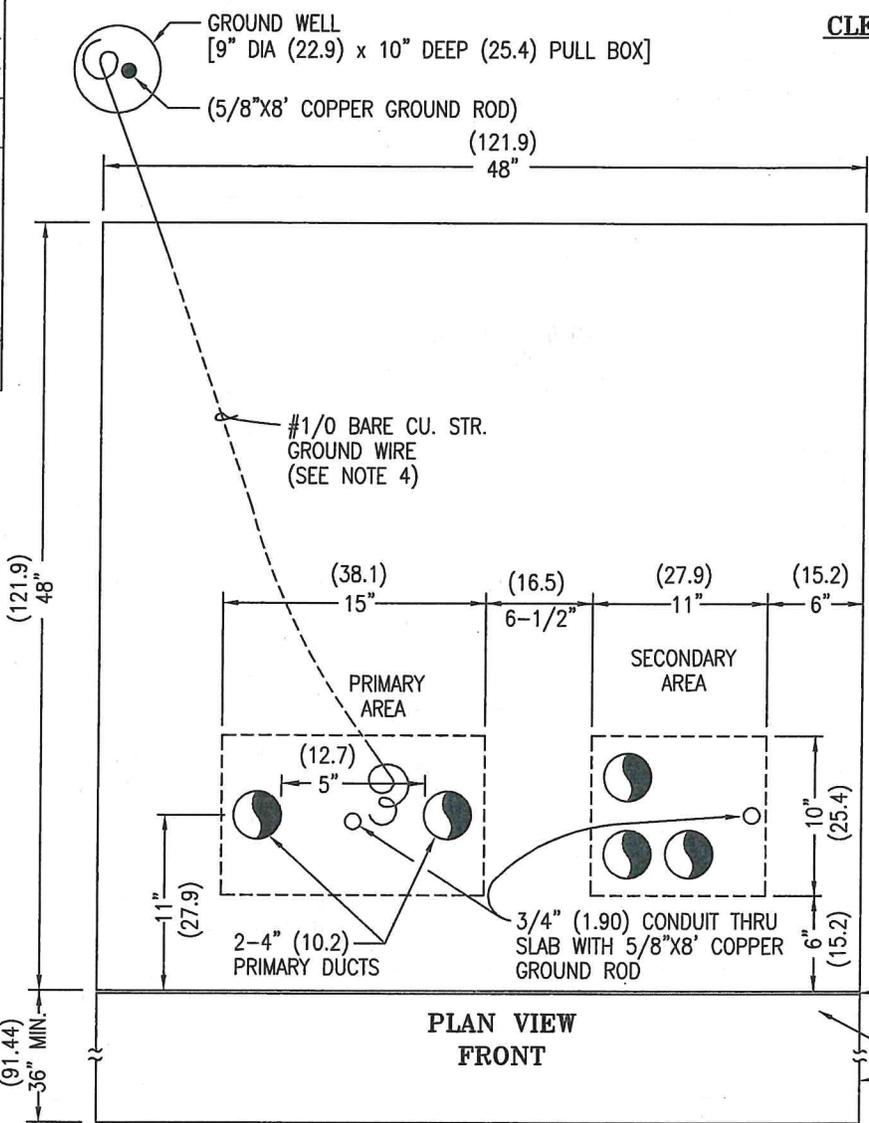


TITLE :			
CONCRETE PAD FOR SINGLE PHASE LT TRANSFORMERS			
DRAWN :	LJ ANCHETA	DATE: MAY 06, 2020	DWG. NO.:
REVIEWED:			1-L-405
APPROVED:			5
SCALE: NTS		SHT 1 OF 1	

3:\ENGINEERING&OPERATION\ENGINEER DRAWINGS\WorkOrder\Construction Standard\Material & Inst Criteria UG Elect System\1L405.dwg

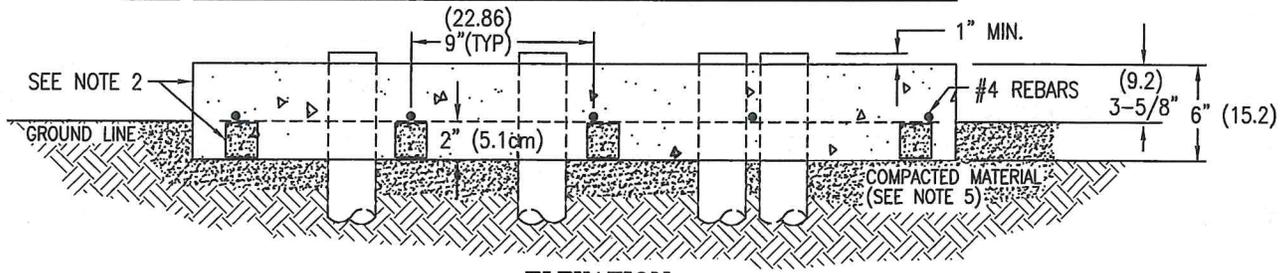
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REV	DESCRIPTION	BY	DATE
1	REV. NOTE #5 & ADDED NOTE 6	jml	5/3/02
2	REV. NOTES ADDED GROUND WELL	C.B.	8/20/03
3	REV. NOTE 4	J.U	10/20/04
4	CHANGE CO. NAME		
5	ADDED NOTE 7	TN	4/10/20



CLEARANCE REQUIREMENT

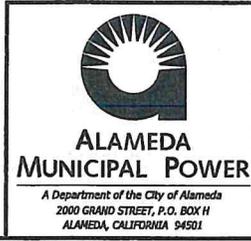
FRONT	8 ft (2.4m)
SIDE	3 ft (0.9m)
BACK	3 ft (0.9m)



NOTES:

- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS IN PARENTHESES ARE IN CENTIMETERS.
- CONCRETE TO BE 6" (15.2) THICK (MINIMUM) WITH #4 REINFORCING STEEL SPACED AT 9" (22.9) INTERVALS AND CROSS LACED. PAD SURFACE TO BE APPROX. 3-5/8" (9.2) ABOVE GRADE. REBARS SHOULD SIT ON TOP OF THE 2" (5.1cm) CONCRETE DOBIES. CALL ALAMEDA MUNICIPAL POWER (AMP) FOR INSPECTION BEFORE POURING CONCRETE, AND GROUND ROD INSTALLATION TEL. (510) 385-6682.
- SECONDARY CONDUITS, AS REQUIRED BY NATIONAL ELECTRICAL CODE AND APPROVED BY AMP. ALL CONDUITS SHALL BE AS FAR LEFT IN SECONDARY AREA AS POSSIBLE (THREE SECONDARY CONDUITS MINIMUM)
- INSTALL A #1/0 AWG BARE COPPER GROUND WIRE UNDERNEATH THE PAD FROM THE GROUND ROD IN THE PRIMARY AREA TO THE GROUND ROD OUTSIDE THE PAD LOCATED 6' (1.83m) MIN. AWAY FROM PAD. LEAVE 15' (4.5m) LEAD ON THE TRANSFORMER PAD END & 2' (5.08cm) LEAD ON THE GROUND WELL END. THE #1/0 GROUND WIRE SHALL BE BONDED TO THE REBARS.
- THE PAD SHALL BE POURED OVER A 6" MINIMUM FINISHED LAYER OF CLASS 2 AGGREGATE BASE COMPACTED TO 90%. COPY OF COMPACTION TEST REPORT AND CONCRETE DELIVERY SLIP ARE REQ'D.
- TRANSFORMER PAD SHALL BE CONSTRUCTED OF 3,000 PSI (211.4kg/cm) TEST STRENGTH CONCRETE.
- POUR 4" THICK CONCRETE SLAB INFRONT OF THE TRANSFORMER PAD. THE APRON SHALL BE 2" BELOW GRADE OF THE PAD.

(NOTE: SUPERSEDES DRAWING #UT8)



TITLE : CONCRETE PAD FOR SINGLE PHASE LX TRANSFORMERS				
DRAWN :	L.V. ANCHETA	DATE: MAY 06, 2020	DWG. NO.:	REV.
REVIEWED:			1-L-408	5
APPROVED:	DWH		SCALE: NTS	SHT 1 OF 1

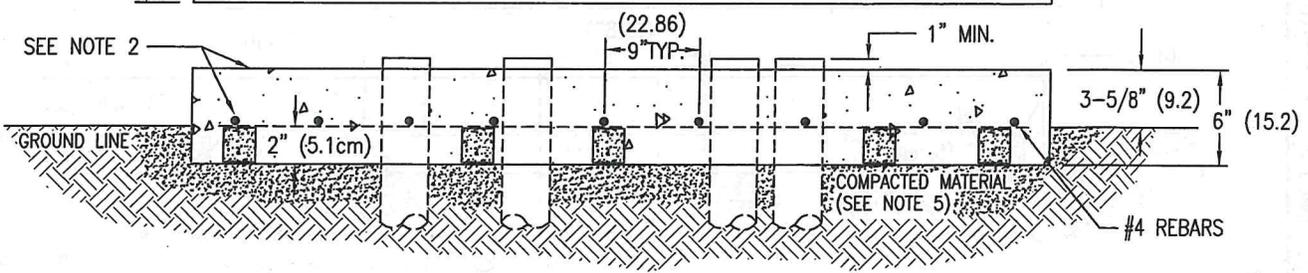
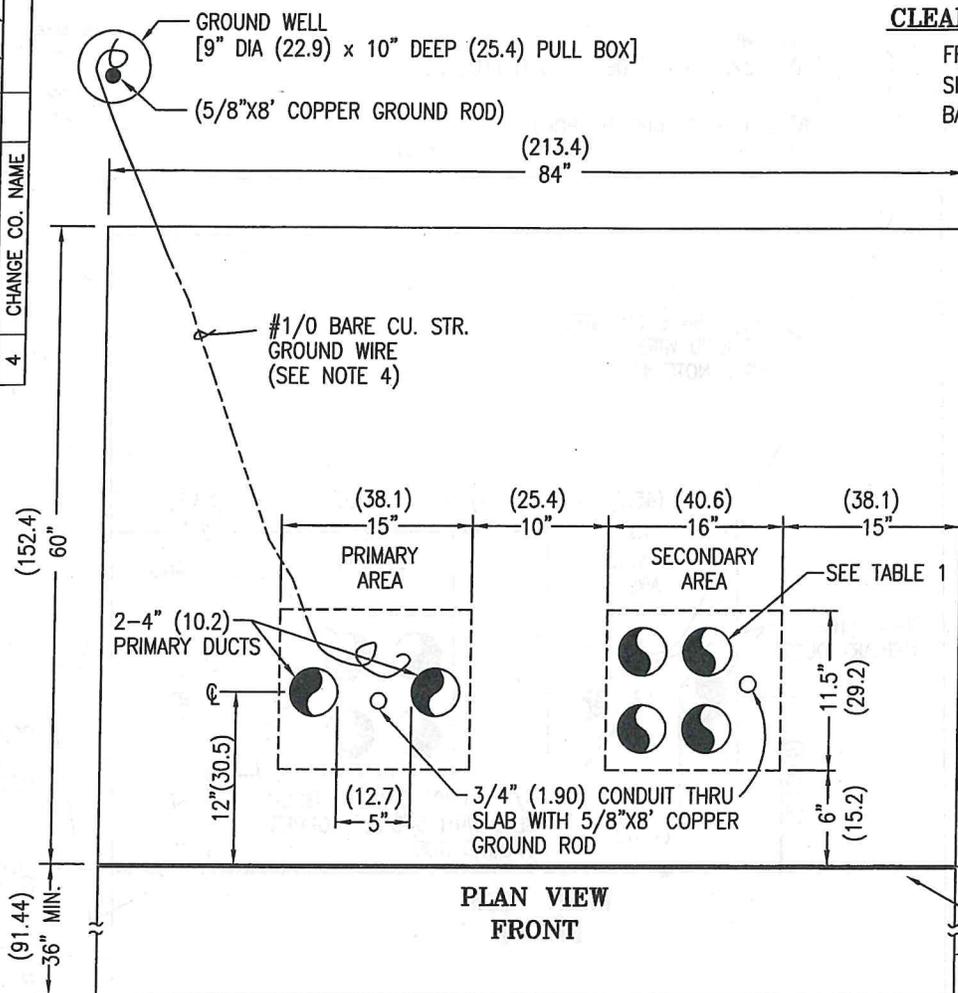
CLEARANCE REQUIREMENT

FRONT	8 ft (2.4m)
SIDE	3 ft (0.9m)
BACK	3 ft (0.9m)

TABLE-1

SERVICE SIZE	NO. OF SEC. CONDUITS
2000A	NOTE 7
1600A	NOTE 7
1200A	5-4"C
1000A	4-4"C
800A	4-4"C
600A	3-4"C
400A	3-4"C

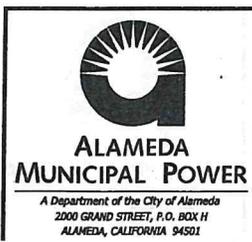
REV	DESCRIPTION	BY	DATE
1	REV. NOTE #5 & ADDED NOTE 6	jmi	5/3/02
2	ADDED GROUND WELL AND TABLE-1	C.B.	8/20/03
3	REV. NOTE 4	J.U	10/20/04
4	CHANGE CO. NAME		



NOTES:

- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS IN PARENTHESES ARE IN CENTIMETERS.
- CONCRETE TO BE 6" (15.2) THICK (MINIMUM) WITH #4 REINFORCING STEEL SPACED AT 9" (22.9) INTERVALS AND CROSS LACED. PAD SURFACE TO BE APPROX. 3-5/8" (9.2) ABOVE GRADE. REBARS SHOULD SIT ON TOP OF THE 2" (5.1cm) CONCRETE DOBIES. CALL ALAMEDA MUNICIPAL POWER (AMP) FOR INSPECTION BEFORE POURING CONCRETE, TEL. (510) 358-6682
- SECONDARY CONDUITS, AS REQUIRED BY NATIONAL ELECTRICAL CODE AND APPROVED BY AMP. ALL CONDUITS SHALL BE AS FAR LEFT IN SECONDARY AREA AS POSSIBLE (SEC. CONDUITS SHOWN FOR REFERENCE ONLY, QUANTITY MAY VARY ACCORDING TO TABLE-1)
- INSTALL A #1/0 AWG BARE COPPER GROUND WIRE UNDERNEATH THE PAD FROM THE GROUND ROD IN THE PRIMARY AREA TO THE GROUND ROD OUTSIDE THE PAD LOCATED 6' (1.83m) MIN. AWAY FROM PAD. LEAVE 15' (4.5m) LEAD ON THE TRANSFORMER PAD END & 2' (5.08cm) LEAD ON THE GROUND WELL END. THE #1/0 GROUND WIRE SHALL BE BONDED TO THE REBARS.
- THE PAD SHALL BE POURED OVER A 6" MINIMUM FINISHED LAYER OF CLASS 2 AGGREGATE BASE COMPACTED TO 90%. COPY OF COMPACTION TEST REPORT AND CONCRETE DELIVERY SLIP ARE REQ'D.
- TRANSFORMER PAD SHALL BE CONSTRUCTED OF 3,000 PSI (211.4kg/cm²) TEST STRENGTH CONCRETE.
- AMP WILL DETERMINE WHETHER BUS DUCT OR TRANSITION CABINET PER DWG 1-L-432 OR 1-L-620
- POUR 4" THICK CONCRETE SLAB INFRONT OF THE TRANSFORMER PAD. THE APRON SHALL BE 2" BELOW GRADE OF THE PAD.

(NOTE: SUPERSEDES DRAWING #UT6)



TITLE :			
CONCRETE PAD FOR THREE PHASE TRANSFORMERS (75 TO 750 KVA SIZES)			
DRAWN :	J.V. ANCHETA	DATE: MAY 06, 2020	DWG. NO.:
REVIEWED:			1-L-406
APPROVED:	DVA		REV. 6
SCALE: NTS		SHT 1 OF 1	

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CLEARANCE REQUIREMENT

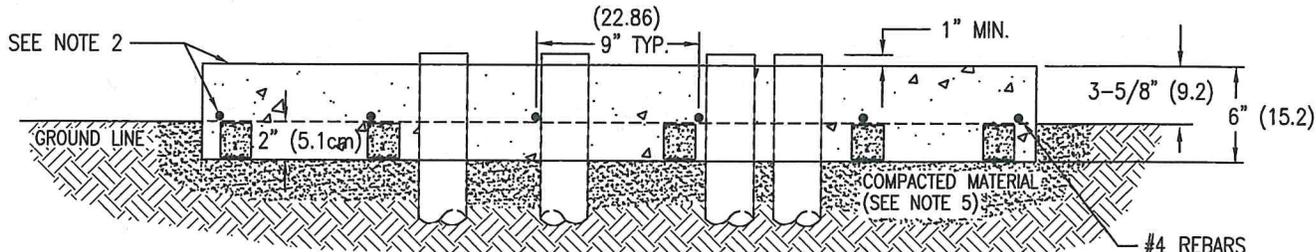
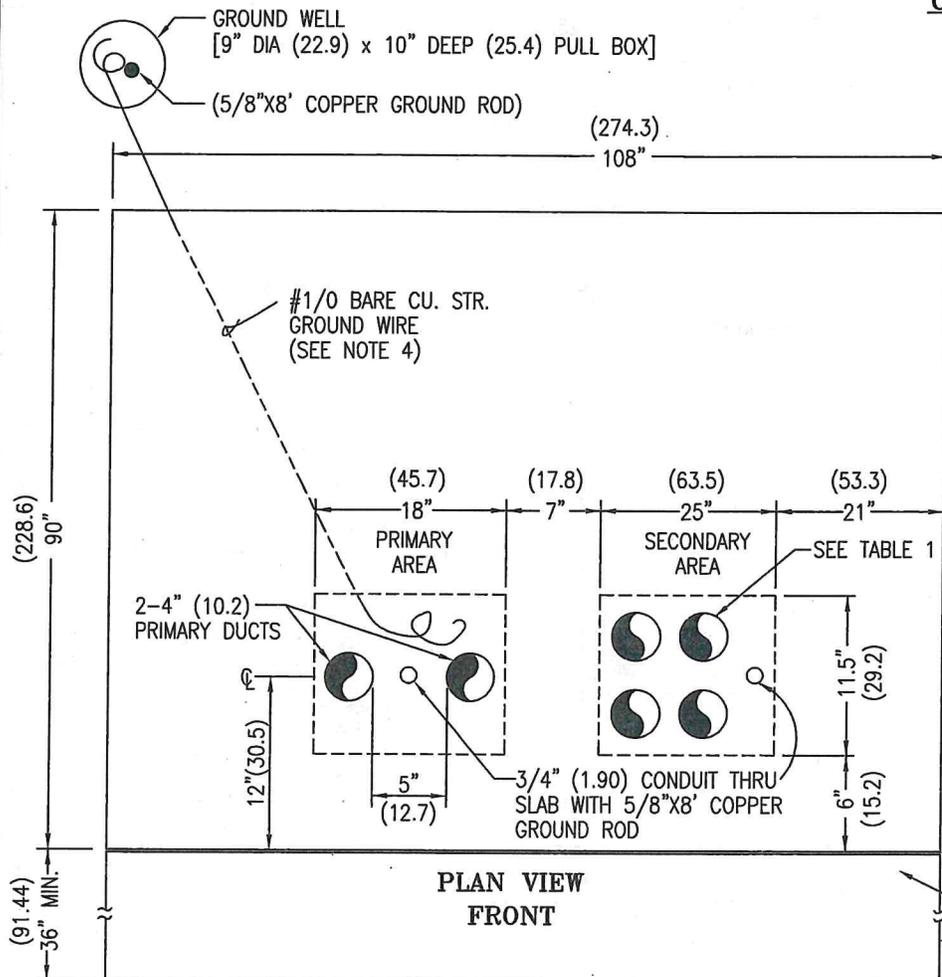
FRONT	8 ft (2.4m)
SIDE	3 ft (0.9m)
BACK	3 ft (0.9m)

TABLE-1

SERVICE SIZE	NO. OF SEC. CONDUITS
3000A	NOTE 7
2000A	NOTE 7
1600A	NOTE 7

REV	DESCRIPTION	BY	DATE
1	ADDED NOTE 6	jml	5/3/02
2	REV. NOTE & ADDED TABLE-1	C.B.	8/20/03
3	REV. NOTE 4	J.U	10/20/04
4	CHANGE CO. NAME		

ADDED NOTE No. 7	D.H.	11/26/18
5	TN	4/10/20
ADDED NOTE No. 8	D.H.	11/26/18
6	TN	4/10/20

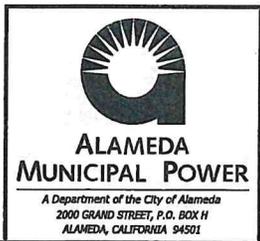


NOTES:

ELEVATION

- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS IN PARENTHESES ARE IN CENTIMETERS.
- CONCRETE TO BE 6" (15.2) THICK (MINIMUM) WITH #4 REINFORCING STEEL SPACED AT 9" (22.9) INTERVALS AND CROSS LACED. PAD SURFACE TO BE APPROX. 3-5/8" (9.2) ABOVE GRADE. REBARS SHOULD SIT ON TOP OF THE 2" (5.1cm) CONCRETE DOBIES. CALL ALAMEDA MUNICIPAL POWER (AMP) FOR INSPECTION BEFORE POURING CONCRETE, TEL. (510) 385-6682
- SECONDARY CONDUITS, AS REQUIRED BY NATIONAL ELECTRICAL CODE AND APPROVED BY AMP. ALL CONDUITS SHALL BE AS FAR LEFT IN SECONDARY AREA AS POSSIBLE (SEC. CONDUITS SHOWN FOR REFERENCE ONLY, QUANTITY MAY VARY ACCORDING TO TABLE-1)
- INSTALL A #1/0 AWG BARE COPPER GROUND WIRE UNDERNEATH THE PAD FROM THE GROUND ROD IN THE PRIMARY AREA TO THE GROUND ROD OUTSIDE THE PAD LOCATED 6' (1.83m) MIN. AWAY FROM PAD. LEAVE 18' (5.4m) LEAD ON THE TRANSFORMER PAD END & 2' (5.08cm) LEAD ON THE GROUND WELL END. THE #1/0 GROUND WIRE SHALL BE BONDED TO THE REBARS.
- THE PAD SHALL BE POURED OVER A 6" MINIMUM FINISHED LAYER OF CLASS 2 AGGREGATE BASE COMPACTED TO 90%. COPY OF COMPACTION TEST REPORT AND CONCRETE DELIVERY SLIP ARE REQ'D.
- TRANSFORMER PAD SHALL BE CONSTRUCTED OF 3,000 PSI (211.4kg/cm²) TEST STRENGTH CONCRETE.
- AMP WILL DETERMINE WHETHER BUS DUCT OR TRANSITION CABINET PER DWG 1-L-432 OR 1-L-620
- POUR 4" THICK CONCRETE SLAB INFRONT OF THE TRANSFORMER PAD. THE APRON SHALL BE 2" BELOW GRADE OF THE PAD.

(NOTE: SUPERSEDES DRAWING #UT7)



TITLE :			
CONCRETE PAD FOR THREE-PHASE TRANSFORMER (1000 KVA & 1500 KVA)			
DRAWN :	L.V. ANCHETA	DATE: MAY 06, 2020	DWG. NO.:
REVIEWED:			1-L-407
APPROVED:	DCA		6
SCALE: NTS		SHT 1 OF 1	

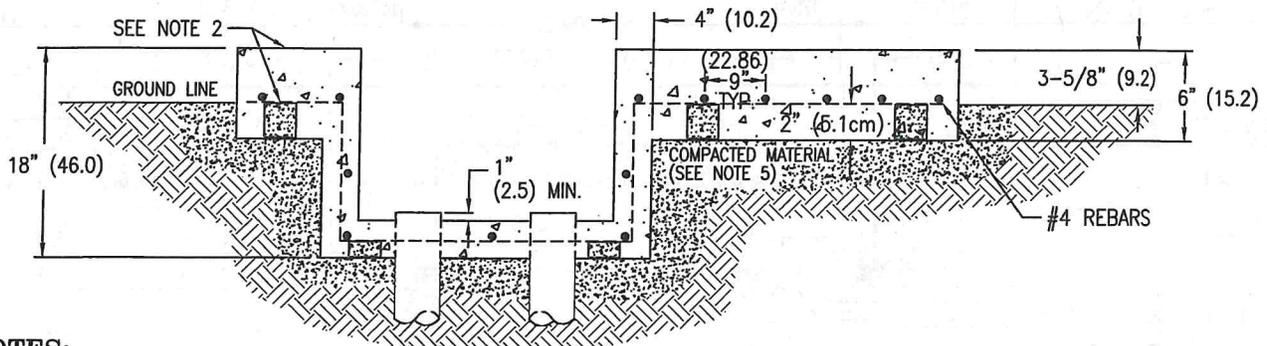
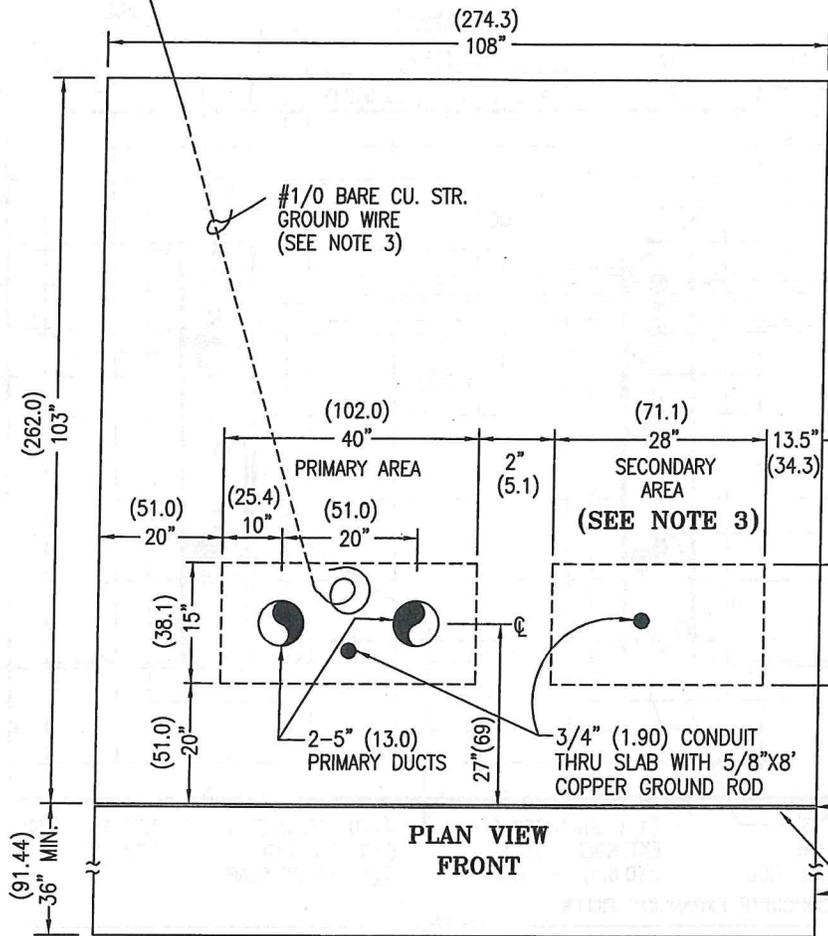
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REV	DESCRIPTION	BY	DATE
1	ADDED NOTE 6	jml	5/3/02
2	REV. NOTES	C.B.	8/20/03
3	REV. NOTE 3	J.U.	10/20/04
4	CHANGE CO. NAME		
5	ADDED NOTE 7	TN	4/29/2020

GROUND WELL
[9" DIA (22.9) x 10" DEEP (25.4) PULL BOX]
(5/8"X8' COPPER GROUND ROD)

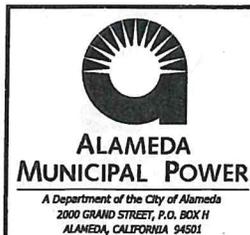
CLEARANCE REQUIREMENT

FRONT	8 ft (2.4m)
SIDE	3 ft (0.9m)
BACK	3 ft (0.9m)



NOTES:

- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS IN PARENTHESES ARE IN CENTIMETERS.
- CONCRETE TO BE 6" (15.2) THICK (MINIMUM) WITH #4 REINFORCING STEEL SPACED AT 9" (22.9) INTERVALS AND CROSS LACED. PAD SURFACE TO BE APPROX. 3-5/8" (9.2) ABOVE GRADE. REBARS SHOULD SIT ON TOP OF THE 2" (5.1cm) CONCRETE DOBIES. CALL ALAMEDA MUNICIPAL POWER (AMP) FOR INSPECTION BEFORE POURING CONCRETE, AND GROUND ROD INSTALLATION TEL. (510) 385-6682.
- INSTALL A #1/0 AWG BARE COPPER GROUND WIRE UNDERNEATH THE PAD FROM THE GROUND ROD IN THE PRIMARY AREA TO THE GROUND ROD OUTSIDE THE PAD LOCATED 6' (1.83m) MIN. AWAY FROM PAD. LEAVE 18' (5.4m) LEAD ON THE TRANSFORMER PAD END & 2' (5.08cm) LEAD ON THE GROUND WELL END. THE #1/0 GROUND WIRE SHALL BE BONDED TO THE REBARS.
- AMP REQUIRES BUS DUCT FOR SECONDARY CONNECTIONS OF 2,500KVA TRANSFORMER.
- THE PAD SHALL BE POURED OVER A 6" MINIMUM FINISHED LAYER OF CLASS 2 AGGREGATE BASE COMPACTED TO 90%. COPY OF COMPACTION TEST REPORT AND CONCRETE DELIVERY SLIP ARE REQ'D.
- TRANSFORMER PAD SHALL BE CONSTRUCTED OF 3,000 PSI (211.4kg/cm₂) TEST STRENGTH CONCRETE.
- POUR 4" THICK CONCRETE SLAB INFRONT OF THE TRANSFORMER PAD. THE APRON SHALL BE 2" BELOW GRADE OF THE PAD.



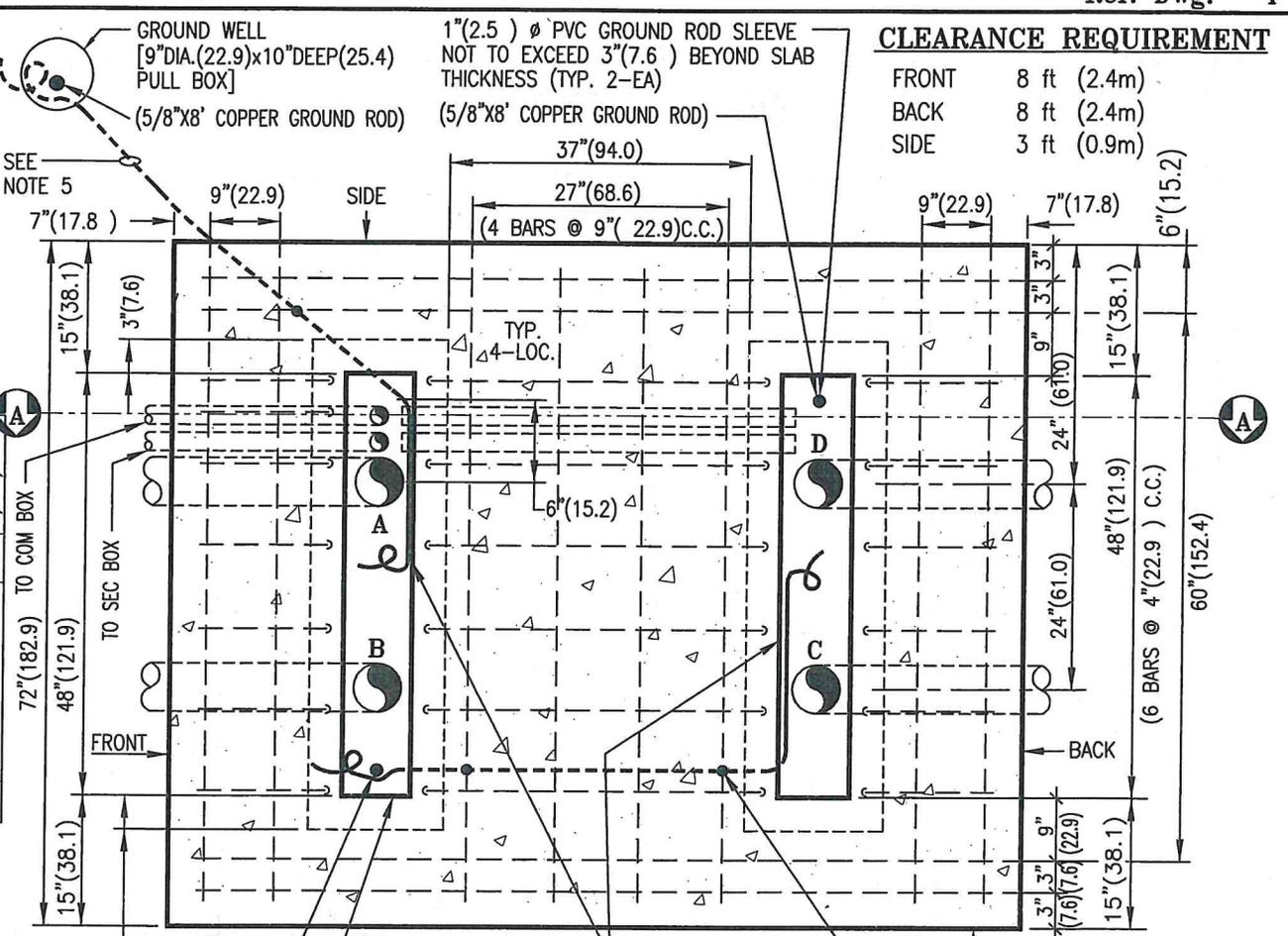
TITLE :			
CONCRETE PAD FOR THREE PHASE TRANSFORMER (2,500 KVA)			
DRAWN :	L.V. ANCHETA	DATE: MAY 06, 2020	DWG. NO.:
REVIEWED:			1-L-454
APPROVED:			5
SCALE: NTS		SHT 1 OF 1	

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REV	DESCRIPTION	BY	DATE
1	ADDED 1-2" CONDUIT	rcb	4/5/02
2	ADDED NOTE 3	jmi	5/3/02
3	REV. NOTE #2	C.B.	8/20/03
4	INCREASE GND WIRE SIZE	J.U.	10/20/04
5	CHANGED CO. NAME	T.N.	11/20/09

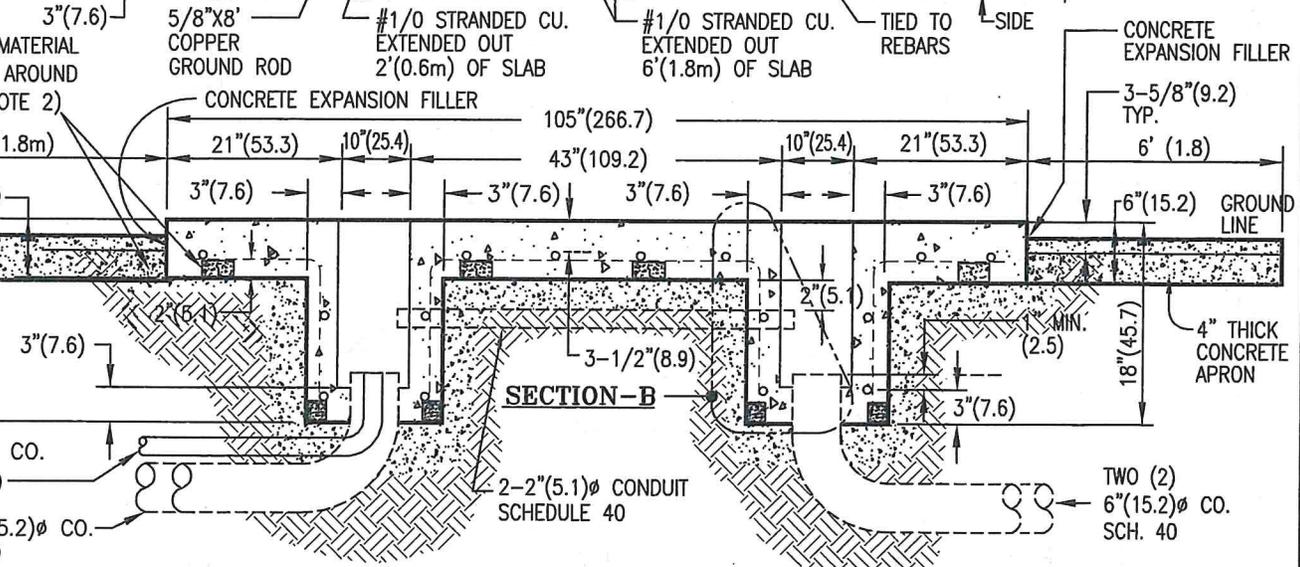
REV	DESCRIPTION	BY	DATE
6	RELOCATED & REDUCED NUMBER OF GND RODS	L.S.	03/26/10
7	INCREASE DEPTH BY 6"	T.N.	01/18/13
8	CORRECTED PAD DIMENSIONS	T.N.	06/12/14
9	ADDED CONCRETE APRON	T.N.	4/10/20
10	CORRECT TITLE	DB	5/14/20

RELOCATED & REDUCED NUMBER OF GND RODS
 INCREASE DEPTH BY 6"
 CORRECTED PAD DIMENSIONS
 ADDED CONCRETE APRON
 CORRECT TITLE



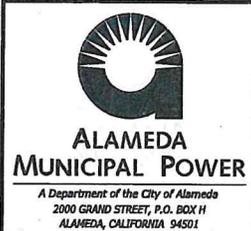
CLEARANCE REQUIREMENT

FRONT	8 ft (2.4m)
BACK	8 ft (2.4m)
SIDE	3 ft (0.9m)



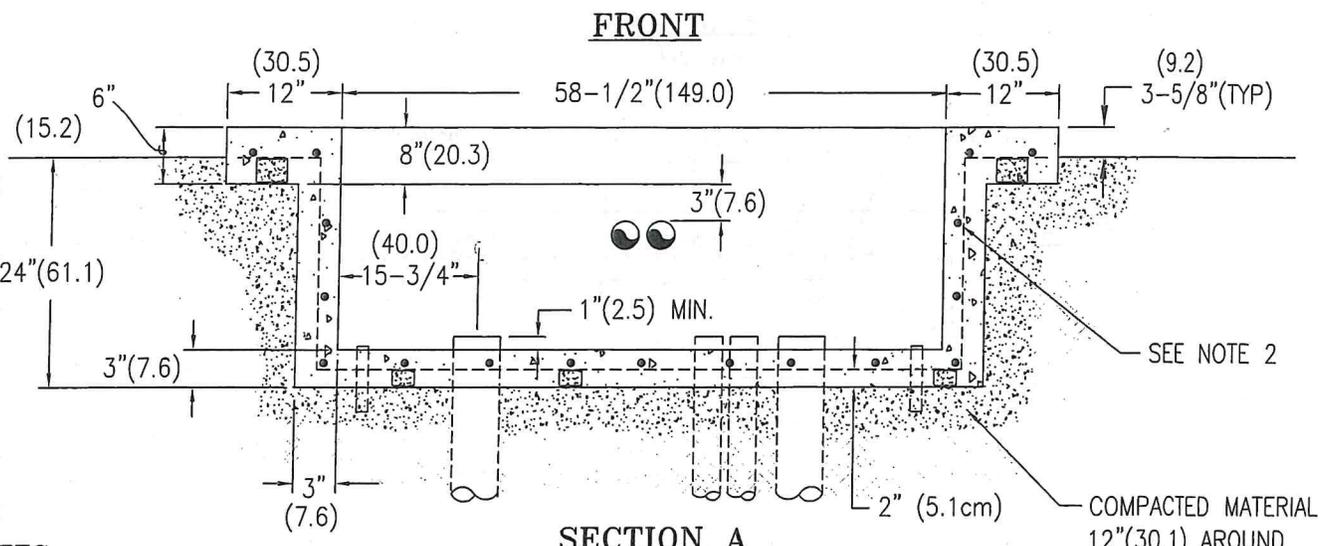
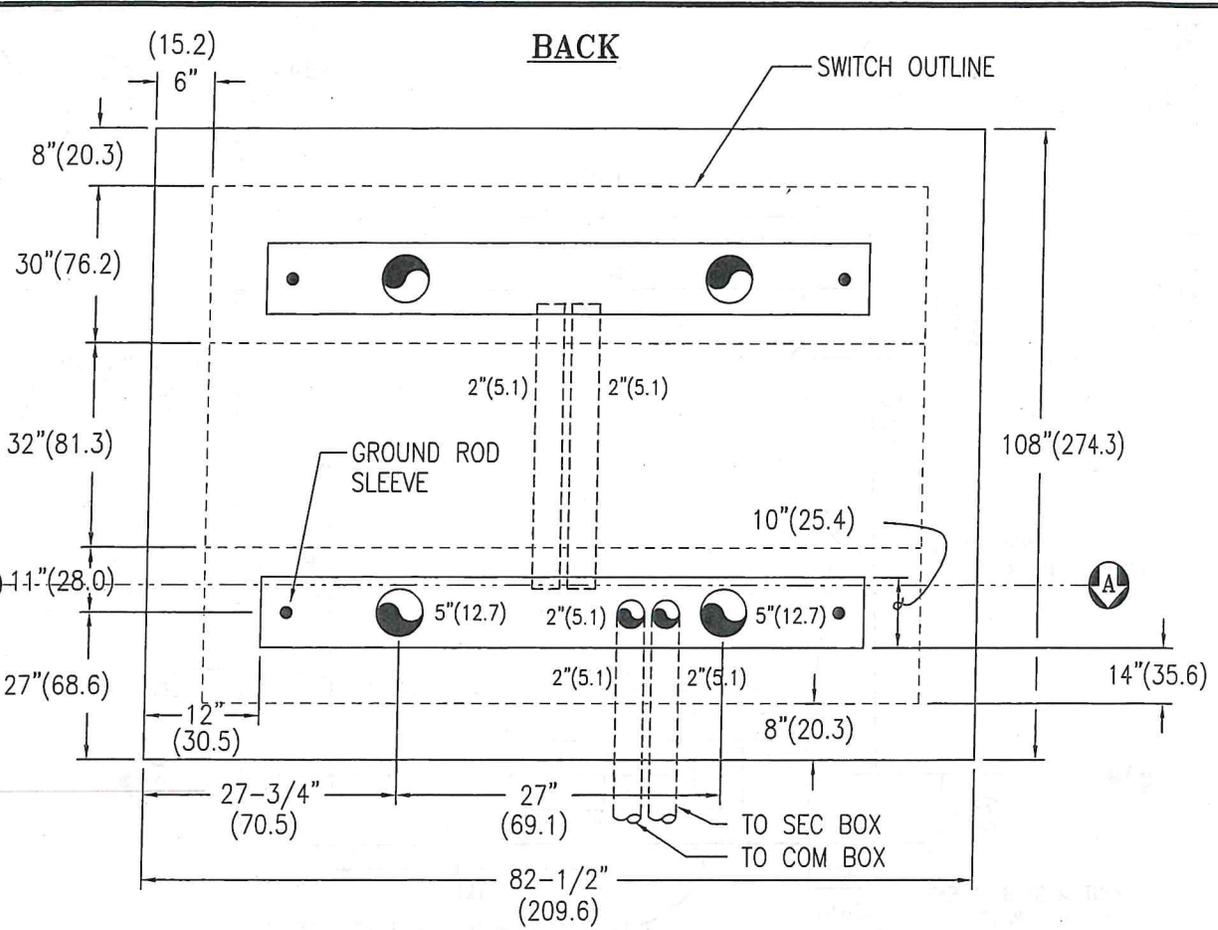
NOTES:

- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS IN PARENTHESES ARE IN CENTIMETERS. CALL ALAMEDA MUNICIPAL POWER (AMP) FOR INSPECTION BEFORE POURING CONCRETE. TEL. (510) 385-6682
- INSTALL #4 REINFORCING STEEL SPACED AT 9"(22.9) INTERVALS AND CROSS LACED. PAD SURFACE TO BE APPROX. 3-5/8"(9.2) ABOVE GRADE. REBARS SHOULD SIT ON TOP OF THE 2"(5.1cm) CONCRETE DOBIES. CALL AMP FOR INSPECTION BEFORE POURING CONCRETE, AND GROUND ROD INSTALLATION TEL. (510) 385-6682
- THE PAD SHALL BE POURED OVER A 6" MINIMUM FINISHED LAYER OF CLASS 2 AGGREGATE BASE COMPACTED TO 90%. COPY OF COMPACTION TEST REPORT AND CONCRETE DELIVERY SLIP REQUIRED.
- SWITCH PAD SHALL BE CONSTRUCTED OF 3,000 PSI (211.4kg/cm²) TEST STRENGTH CONCRETE.
- INSTALL A 1/0 AWG BARE COPPER GROUND WIRE FROM THE GROUND WELL TO THE "A" SIDE OF PAD WITH A GROUND WELL-GROUND ROD SLEEVE 6'(1.6m) MIN. SEPARATION. LEAVE 2'(.6m) LEAD GROUND WELL.



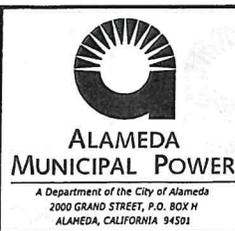
TITLE : (NOTE: SUPERSEDES DRAWING 1-F-326)			
600-AMP SWITCH PAD DETAIL (SWITCH PROVISION FOR CONTROLS)			
DRAWN :	D. BALLINGER	DATE: MAY 14, 2020	DWG. NO.:
REVIEWED:			1-L-409
APPROVED:			REV. 10
SCALE: NTS		SHT 1 OF 1	

DATE	5/3/02
BY	jmi
DESCRIPTION	REV. NOTE #3 & ADDED NOTE 4
REV	1
ADDED REBAR TO DWG & REV. NOTES.	2
T.T.	5/9/06
ADDED SECONDARY CONDUIT	11/30/09
CHANGE CO. NAME	



NOTES:

- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS IN PARENTHESES ARE IN CENTIMETERS. CALL ALAMEDA MUNICIPAL POWER (AMP) FOR INSPECTION BEFORE POURING CONCRETE, TEL. (510) 748-3943
- INSTALL #4 REINFORCING STEEL SPACED AT 9" (22.9) INTERVALS AND CROSS LACED. PAD SURFACE TO BE APPROX. 3-5/8" (9.2) ABOVE GRADE. REBARS SHOULD SIT ON TOP OF THE 2" (5.1cm) CONCRETE DOBIES. CALL AMP FOR INSPECTION BEFORE POURING CONCRETE, TEL. (510) 748-3943.
- THE PAD SHALL BE POURED OVER A 6" MINIMUM FINISHED LAYER OF CLASS 2 AGGREGATE BASE COMPACTED TO 90%. COPY OF COMPACTION TEST REPORT AND CONCRETE DELIVERY SLIP REQ'D.
- SWITCH PAD SHALL BE CONSTRUCTED OF 3,000 PSI (211.4kg/cm₂) TEST STRENGTH CONCRETE.



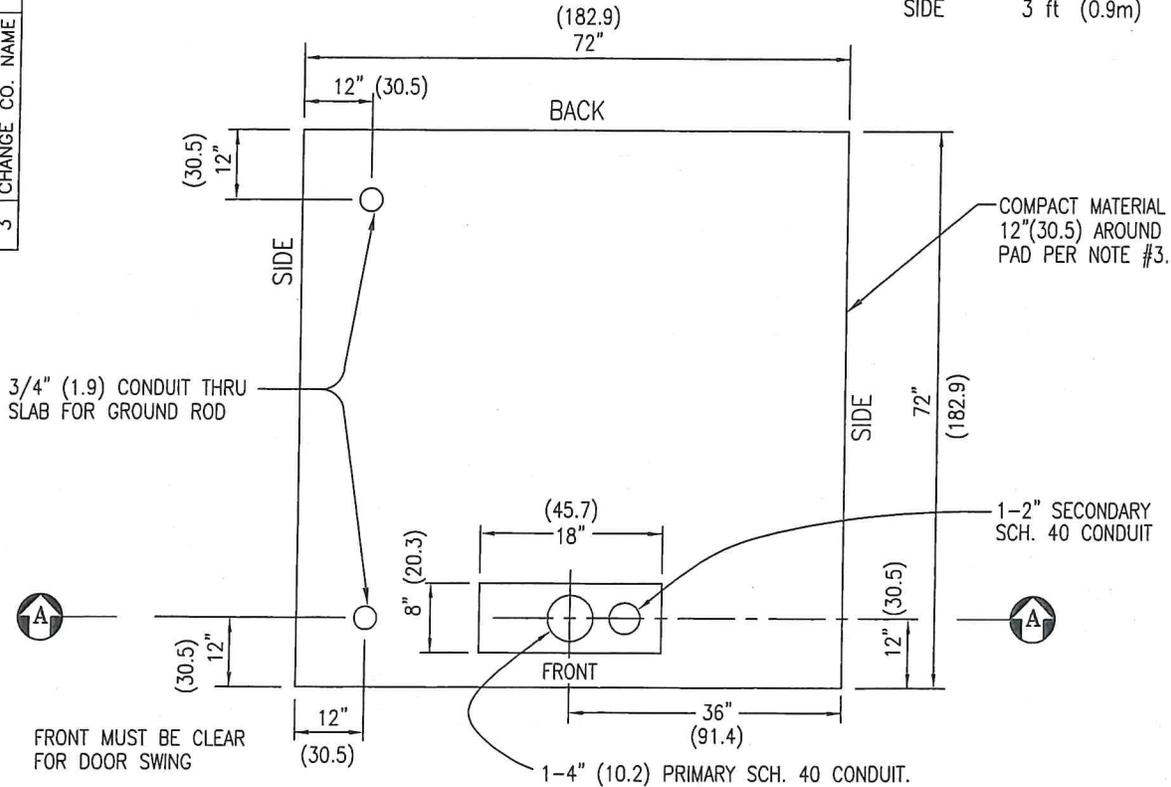
TITLE :			
MOTORIZED SWITCH PAD DETAILS (2 WAY SWITCH W/ ONE VFI TAP)			
DRAWN :	LV ANCHETA	DATE: DEC. 17, 2009	DWG. NO. :
REVIEWED:	<i>[Signature]</i>		1-L-482
APPROVED:	<i>[Signature]</i>		REV. 4
SCALE : NTS		SHT 1 OF 1	

M:\PwrDwgs\Work\ConstructionStd\1L482.dwg December 17, 2009

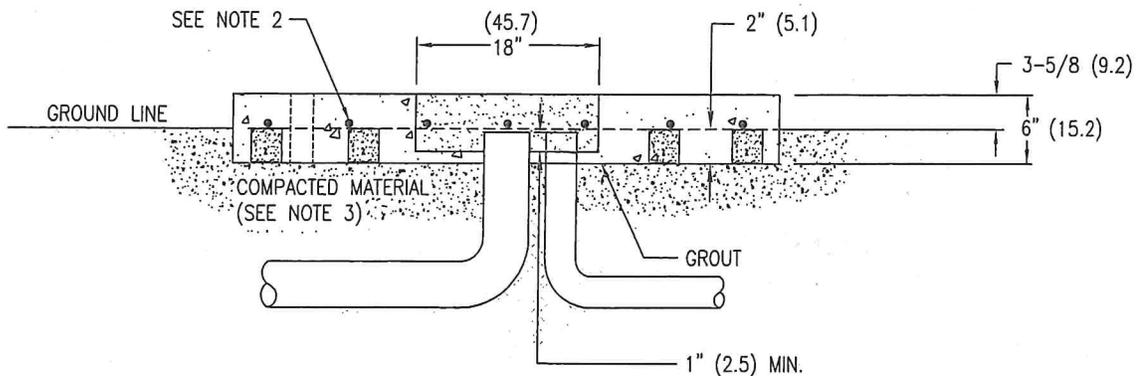
CLEARANCE REQUIREMENT

FRONT	8 ft (2.4m)
BACK	8 ft (2.4m)
SIDE	3 ft (0.9m)

REV	DESCRIPTION	BY	DATE
1	REV. NOTE #3 & ADDED NOTE 4	jmi	5/3/02
2	REV. NOTES 2 & 3	C.B	8/20/03
3	CHANGE CO. NAME		11/20/09



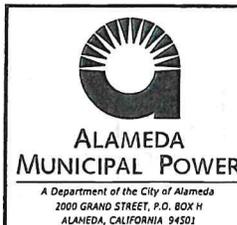
**PLAN VIEW
FRONT**



SECTION A-A

NOTES:

- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS IN PARENTHESES ARE IN CENTIMETERS.
- INSTALL #4 REINFORCING STEEL SPACED AT 9" (22.9) INTERVALS AND CROSS LACED. PAD SURFACE TO BE APPROX. 3-5/8" (9.2) ABOVE GRADE. REBARS SHOULD SIT ON TOP OF 2" (5.1cm) CONCRETE DOBIES. CALL ALAMEDA MUNICIPAL POWER (AMP) FOR INSPECTION BEFORE POURING CONCRETE, TEL. (510) 748-3943. COPY OF COMPACTION TEST REPORT AND CONCRETE DELIVERY SLIP ARE REQUIRED.
(NOTE: SUPERSEDED DRAWING #1-F-307)
- THE PAD SHALL BE POURED OVER A 6" MINIMUM FINISHED LAYER OF CLASS 2 AGGREGATE BASE COMPACTED TO 90%. COPY OF COMPACTION TEST REPORT AND CONCRETE DELIVERY SLIP ARE REQ'D.
- CAPACITOR PAD SHALL BE CONSTRUCTED OF 3,000 PSI (211.4kg/cm²) TEST STRENGTH CONCRETE.



TITLE :			
CONCRETE PAD FOR PAD-MOUNTED CAPACITOR BANK			
DRAWN :	L.V. ANCHETA	DATE: DEC. 17, 2009	DWG. NO. :
REVIEWED:	<i>[Signature]</i>		1-L-410
APPROVED:	<i>[Signature]</i>		REV. 3
SCALE : NTS		SHT 1 OF 1	

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REV	DESCRIPTION	BY	DATE

PURPOSE AND SCOPE:

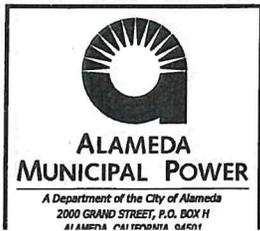
THIS DOCUMENT CONTAINS INFORMATION RELATING TO THE PLACEMENT OF PAD MOUNTED ELECTRICAL EQUIPMENT. THIS IS A GUIDE FOR DETERMINING THE MINIMUM REQUIREMENTS FOR EACH SPECIFIC INSTALLATION.

CLEARANCES:

1. CLEARANCES FROM BUILDING WALLS (SEE SHT. 6) - OIL FILLED PAD MOUNTED EQUIPMENT SHALL HAVE THE FOLLOWING CLEARANCES:
 - A. 3 FEET MINIMUM FROM ANY BUILDING WALL TO THE EDGE OF THE PAD. THIS CLEARANCE MAY BE REDUCED TO 2 FEET IF THE BUILDING SURFACE IS NONCOMBUSTIBLE, WITH APPROVAL OF ELECTRIC UTILITY ENGINEERING.

2. DOORWAY AND WINDOW CLEARANCE (SEE SHT. 6) - PAD MOUNTED EQUIPMENT SHALL NOT BE PLACED WHERE IT IMPEDES THE FLOW OF AIR OR TRAFFIC THROUGH A DOORWAY OR WINDOW. CLEARANCE SHALL BE 10 FEET RADially FROM THE DOORWAY OR WINDOW TO THE CLOSEST EDGE OF THE PAD.

3. VERTICAL CLEARANCE FROM OVERHANGS (SEE SHT. 7) - TO PROVIDE SPACE FOR HOISTING EQUIPMENT SO THAT IT CAN BE REPLACED, THE FOLLOWING VERTICAL CLEARANCES FROM THE TOP OF THE PAD ARE REQUIRED:
 - A. 20 FEET MINIMUM FOR 1Ø PAD MOUNTED EQUIPMENT.
 - B. 30 FEET MINIMUM FOR 3Ø PAD MOUNT EQUIPMENT.
 - C. WHEN REQUIRED FOR INSTALLATIONS SUCH AS IN DRY VAULTS, THE CLEARANCES FOR PAD MOUNT EQUIPMENT MAY BE REDUCED TO 10 FEET FROM THE TOP OF THE PAD. THIS REDUCED CLEARANCE WILL GREATLY INCREASE THE REPLACEMENT TIME, SINCE THE EQUIPMENT MUST BE JACKED AND ROLLED OUT TO A POSITION WHERE THE CLEARANCE IS ADEQUATE TO HOIST IT.



TITLE :				
PAD MOUNT EQUIPMENT CLEARANCE REQUIREMENTS				
DRAWN :	L. ANCHETA	DATE: MAY 18, 2020	DWG. NO.:	REV.
REVIEWED:	<i>[Signature]</i>		1-L-636	0
APPROVED:	<i>[Signature]</i>		SCALE: NTS	SHT 1 OF 9

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REV	DESCRIPTION	BY	DATE

HORIZONTAL WORK SPACE REQUIREMENTS:

4. CLEAR AND LEVEL WORK AREAS ARE REQUIRED AROUND PAD MOUNTED EQUIPMENT TO PROVIDE A SAFE WORKING SPACE TO OPERATE AND MAINTAIN THE EQUIPMENT.

5. PAD MOUNTED EQUIPMENT (SEE SHT. 9):
 - A. 8 FEET MINIMUM IN FRONT OF ALL EQUIPMENT DOORS TO PROVIDE ROOM TO OPERATE WITH HOT STICKS.
 - B. 3 FEET MINIMUM FROM NON-OPERABLE SIDES. THIS CLEARANCE MAY BE REDUCED WITH APPROVAL BY ALAMEDA MUNICIPAL POWER ENGINEERING FOR LANDSCAPING OBSTRUCTIONS (DECORATIVE WALLS, PLANTERS, ROCKS, ETC.) THAT MAY BE PLACED NEXT TO THE PAD ON NON OPERABLE SIDES.

PROTECTION FROM VEHICULAR TRAFFIC:

6. PHYSICAL PROTECTION FROM VEHICULAR TRAFFIC SHALL BE PROVIDED IN ACCORDANCE WITH THE LEVEL OF EXPOSURE. BARRIER POSTS, ETC., ARE INTENDED TO PROVIDE REASONABLE WARNING FROM ACCIDENTAL VEHICULAR CONTACT, RATHER THAN PREVENTING ALL POSSIBLE CONTACT. WHEN THE ELECTRIC ENGINEERING, OR OPERATIONS, DEPARTMENT DETERMINES IT NECESSARY, THE APPLICANT WILL PROVIDE PHYSICAL PROTECTION AS SPECIFIED BY ALAMEDA MUNICIPAL POWER (SEE 1-L-427)

7. PAD MOUNTED EQUIPMENT HAVING THE FOLLOWING SET BACKS MAY NOT REQUIRE THE CUSTOMER TO PROVIDE ADDITIONAL PHYSICAL PROTECTION:
 - A. SINGLE-FAMILY, DUPLEX AND OTHER LOW DENSITY RESIDENTIAL AREAS: 3 FEET MINIMUM FROM THE EDGE OF THE CURB.
 - B. COMMERCIAL, APARTMENT, CONDOMINIUM AND OTHER HIGH DENSITY AREAS: 9 FEET FROM THE EDGE OF THE ROAD OR CURB DUE TO HIGH VEHICULAR TRAFFIC AND FREQUENT TRUCK BACKING. THE DESIGN OF THE PARTICULAR LAYOUT MAY, OF COURSE, CALL FOR AN INCREASE OR DECREASE IN THESE DIMENSIONS. FOR EXAMPLE, A 3 FOOT SET BACK IS OFTEN ADEQUATE FOR PARTS OF THE COMMERCIAL PARKING LOTS WHERE TRAFFIC FLOW IS CONSTRAINED AND BACKING PERPENDICULAR TO CURB IS UNLIKELY.

 ALAMEDA MUNICIPAL POWER <small>A Department of the City of Alameda 2000 GRAND STREET, P.O. BOX H ALAMEDA, CALIFORNIA 94501</small>	TITLE :			
	PAD MOUNT EQUIPMENT CLEARANCE REQUIREMENTS			
	DRAWN :	L.V. ANCHETA	DATE: MAY 18, 2020	DWG. NO.:
	REVIEWED:	<i>[Signature]</i>		1-L-636
APPROVED:	<i>[Signature]</i>		SCALE: NTS SHT <u>2</u> OF <u>9</u>	
			REV. 0	

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REV	DESCRIPTION	BY	DATE

8. STEEL POSTS ARE THE STANDARD MEANS FOR PROVIDING SUCH PHYSICAL PROTECTION. SUITABLE ALTERNATIVES TO THESE PROTECTIVE POSTS MAY BE PROPOSED BY THE APPLICANT FOR CITY APPROVAL.
9. ALL BARRIER POSTS AT THE SAME INSTALLATION SITE WILL BE THE SAME HEIGHT AND SHALL BE PAINTED PADMOUNT GREEN.
10. A BUILDING CAN BE CONSIDERED AS PHYSICAL PROTECTION PROVIDED IT IS LOCATED AT A POINT WHERE A POST WOULD BE NORMALLY REQUIRED.
11. LOCATE BARRIER POSTS SO THAT THEY DO NOT INTERFERE WITH OPENING OF THE EQUIPMENT'S DOORS. CERTAIN TYPES OF PAD MOUNTED EQUIPMENT HAVE DOORS IN BOTH FRONT AND BACK AND REQUIRE 8'-0" MINIMUM CLEARANCE AND CAREFUL BARRIER POST PLACEMENT TO ALLOW THE DOORS TO BE OPENED.
12. USE REMOVABLE POSTS WHEN:
 - A. POSTS ARE INSTALLED LESS THAN 8 FEET IN FRONT OF THE EQUIPMENT'S DOORS.
 - B. WHERE FIXED POSTS WOULD OBSTRUCT ACCESS FOR INSTALLATION OR REPLACEMENT OF THE EQUIPMENT.

HAZARDOUS LOCATIONS:

13. THE FOLLOWING GUIDE IS TO BE USED WHEN INSTALLING PAD MOUNTED EQUIPMENT IN AREAS WHERE HAZARDOUS LIQUIDS AND GASES ARE DISPENSED OR STORED IN SEALED CONTAINERS:
 - A. LIQUIFIED FLAMMABLE GASES: DO NOT INSTALL PAD MOUNTED EQUIPMENT WITHIN 20 FEET OF A GAS DISPENSER WITHOUT CONFORMING TO THE REGULATIONS CONCERNING INSTALLATION OF ELECTRICAL EQUIPMENT IN HAZARDOUS AREAS (REFER TO ARTICLES E500-1, E500-2, E514-1 AND E514-2 OF TITLE 24, PART 3, STATE BUILDING STANDARDS).
 - B. ANY CONTAINER WHICH STORES FLAMMABLE LIQUID OR GAS WILL BE CONSIDERED EQUIVALENT TO A "COMBUSTIBLE WALL". THE MINIMUM REQUIRED CLEARANCE IS 3 FEET.

 ALAMEDA MUNICIPAL POWER <small>A Department of the City of Alameda 2000 GRAND STREET, P.O. BOX H ALAMEDA CALIFORNIA 94501</small>	TITLE :			
	PAD MOUNT EQUIPMENT CLEARANCE REQUIREMENTS			
	DRAWN :	L.V. ANCHETA	DATE: MAY 18, 2020	DWG. NO.:
REVIEWED:	<i>[Signature]</i>		1-L-636	
APPROVED:	<i>[Signature]</i>		REV. 0	
			SCALE: NTS	SHT 3 OF 9

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REV	DESCRIPTION	BY	DATE

OIL CONTAINMENT:

- OIL ENCLOSURES ARE REQUIRED BY THE STATE OF CALIFORNIA IF PAD MOUNTED TRANSFORMERS ARE LOCATED IN AREAS WHERE OIL FROM A RUPTURED TANK COULD FLOW TOWARDS A COMBUSTIBLE SURFACE. OIL ENCLOSURES MAY CONSIST OF FIRE RESISTANT DIKES, CURBED AREAS OR BASINS, OR TRENCHES FILLED WITH COARSE CRUSHED STONE. THEY MUST BE CAPABLE OF HOLDING THE TOTAL VOLUME OF OIL CONTAINED IN THE EQUIPMENT TANK. THE CONSTRUCTION OF REQUIRED OIL CONTAINMENT FACILITIES MAY IN NO WAY IMPEDE THE REQUIRED WORK SPACE AREA. THE CUSTOMER WILL BE RESPONSIBLE FOR PROVIDING ADEQUATE OIL CONTAINMENT ENCLOSURES TO SATISFY THE REQUIREMENTS OF THE STATE OF CALIFORNIA AND ENVIRONMENTAL PROTECTION REGULATIONS.

RETAINING WALLS:

- RETAINING WALLS SHALL BE PROVIDED WHEN THE CITY DETERMINES IT NECESSARY TO PROTECT EQUIPMENT AGAINST LANDSLIDES, DRAINAGE WASH, DRIFTING SANDS, ETC. THE APPLICANT IS RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF THE RETAINING WALL. THE RETAINING WALL SHALL BE DESIGNED TO PROVIDE A BARRIER OF SUFFICIENT STRENGTH AND SUITABLE CONSTRUCTION TO PROVIDE ADEQUATE PROTECTION AND WORKING SPACE AROUND THE EQUIPMENT. TYPICAL EXAMPLE OF RETAINING WALL PLACEMENT ARE SHOWN IN SHT. 8 OF THIS DOCUMENT.
- RETAINING WALLS GREATER THAN 2 FEET IN HEIGHT WILL REQUIRE A DRAIN PIPE AS SHOWN IN SHT. 8 OF THIS DOCUMENT. DRAIN PIPE SHALL BE A 3" PERFORATED PLASTIC PIPE, COVERED FIRST BY MARAFI DRAIN CLOTH, THEN BY DRAIN ROCK AND FINALLY BACKFILLED.
- TREATED REDWOOD OR PRESSURE-TREATED DOUGLAS FIR POSTS (NOMINAL 4"x4" MINIMUM) AND PLANKS (NOMINAL 2" OR THICKER) MAY BE USED FOR RETAINING WALLS. POSTS SHOULD BE 24" OR LESS IN LENGTH AND EXTENDED AT LEAST 12" BELOW GROUND AND NOT MORE THAN 12" ABOVE GROUND.
- THE WORKING AREA WITHIN THE RETAINING WALL WILL BE AT THE SAME LEVEL OR BELOW THE PAD BEING PROTECTED. THE AREA WILL BE KEPT WEED FREE AND COVERED WITH A DECORATIVE COVERING.

 <p>ALAMEDA MUNICIPAL POWER <small>A Department of the City of Alameda 2000 GRAND STREET, P.O. BOX H ALAMEDA, CALIFORNIA 94501</small></p>	TITLE :			
	PAD MOUNT EQUIPMENT CLEARANCE REQUIREMENTS			
	DRAWN :	L.V. ANCHETA	DATE: MAY 18, 2020	DWG. NO.:
REVIEWED:	<i>[Signature]</i>		1-L-636	0
APPROVED:	<i>[Signature]</i>		SCALE: NTS	SHT 4 OF 9

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REV	DESCRIPTION	BY	DATE

TRUCK ACCESSIBILITY:

19. PAD MOUNTED EQUIPMENT MUST BE ACCESSIBLE TO CITY TRUCKS. TRUCKS MUST BE ABLE TO BE BACKED UP TO WITHIN 5 FEET OF THE PAD ON:
- A. A SURFACE CAPABLE OF WITHSTANDING TRUCK WEIGHT OF 24 TONS AND
 - B. A PATH THAT IS A MINIMUM OF 12 FEET WIDE AND
 - C. A MINIMUM VERTICAL CLEARANCE OF 14 FEET SHALL BE MAINTAINED FROM THE STREET TO THE EQUIPMENT PAD.

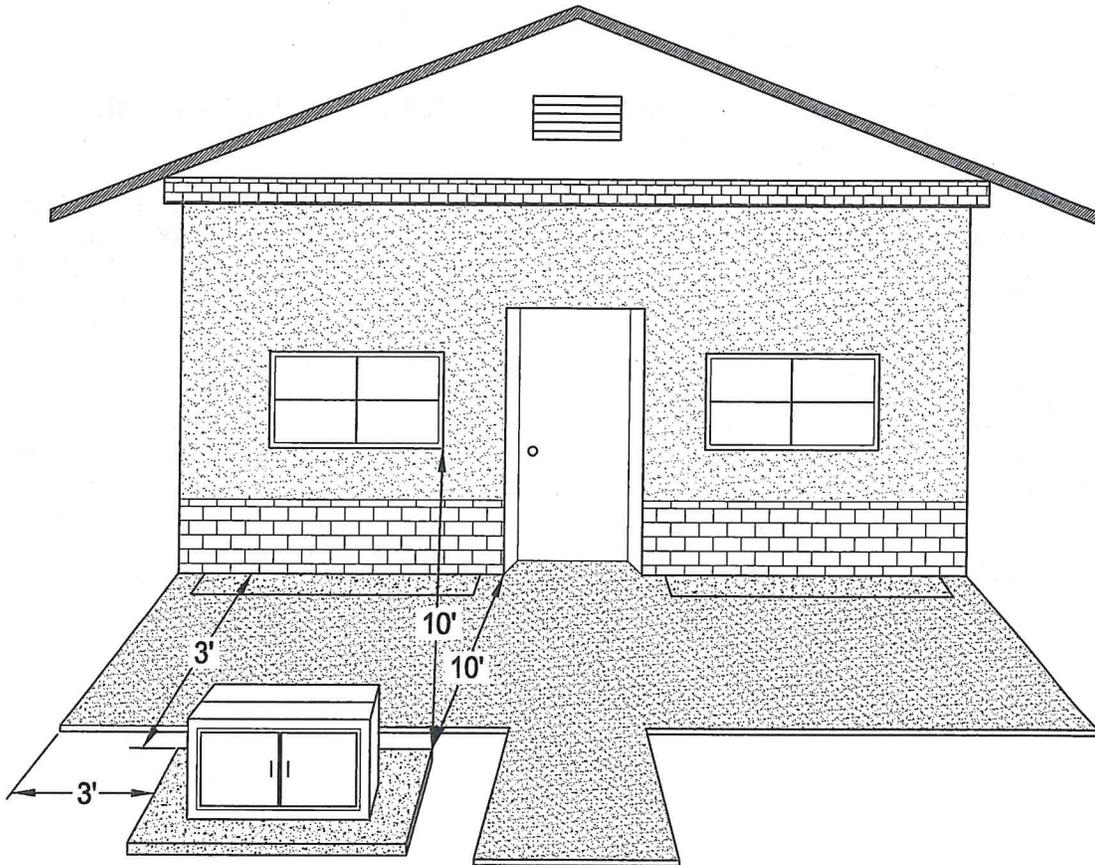
IF THE PATH TO THE EQUIPMENT PAD REQUIRES ANY TURNS BY CITY TRUCKS, THE MINIMUM REQUIREMENTS OF 12'x14' PREVIOUSLY DESCRIBED MAY NEED TO BE INCREASED. FOR LOCATIONS WHERE THE STANDARD ACCESSIBILITY REQUIREMENT ARE NOT MET, CONSULT WITH THE ALAMEDA MUNICIPAL POWER FOR OTHER OPTIONS.

FUTURE CONSTRUCTION:

20. CONSIDERATION SHOULD BE GIVEN NOT ONLY TO CONDITIONS EXISTING AT THE TIME OF INSTALLATION BUT ALSO TO POSSIBLE FUTURE STRUCTURES AND EQUIPMENT WHICH COULD INTERFERE WITH REQUIRED CLEARANCES OR ACCESSIBILITY. ON THOSE INSTALLATIONS WHERE THERE IS A HIGH PROBABILITY OF A FUTURE OBSTRUCTION, INSTALL A CLEARANCE REQUIREMENT SIGN ON THE EQUIPMENT.

 ALAMEDA MUNICIPAL POWER <small>A Department of the City of Alameda 2000 GRAND STREET, P.O. BOX H ALAMEDA, CALIFORNIA 94501</small>	TITLE :				
	PAD MOUNT EQUIPMENT CLEARANCE REQUIREMENTS				
	DRAWN :	L.Y. ANCHETA	DATE: MAY 18, 2020	DWG. NO.:	REV.
	REVIEWED:	<i>[Signature]</i>		1-L-636	0
APPROVED:	<i>[Signature]</i>		SCALE: NTS	SHEET 5 OF 9	

REV	DESCRIPTION	BY	DATE



BUILDING, DOORWAY & WINDOW MINIMUM CLEARANCES
NOT TO SCALE

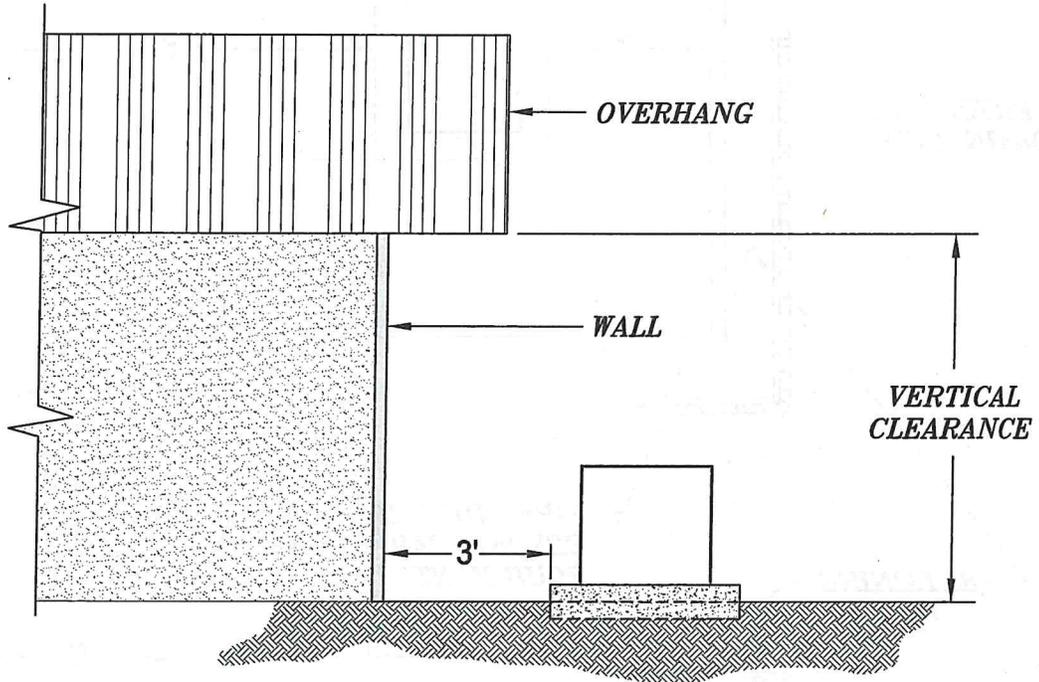
3:\ENGINEERING&OPERATION\ENGINEER DRAWINGS\PwrDwgs\WorkOrder\L_Construction Standard\Material & Inst Criteria UG Elect System\1L636.6.dwg

**ALAMEDA
MUNICIPAL POWER**
A Department of the City of Alameda
 2000 GRAND STREET, P.O. BOX 11
 ALAMEDA, CALIFORNIA 94501

TITLE :				
PAD MOUNT EQUIPMENT CLEARANCE REQUIREMENTS				
DRAWN :	LV ANCHETA	DATE: MAY 18, 2020	DWG. NO.:	REV.
REVIEWED:	<i>[Signature]</i>		1-L-636	0
APPROVED:	<i>[Signature]</i>		SCALE: NTS	SHT 6 OF 9

\ENGINEERING&OPERATION\ENGINEER DRAWINGS\PwrDwgs\WorkOrder\L_Construction Standard\Material & Inst Criteria UG Elect System\1L636.7.dwg

REV	DESCRIPTION	BY	DATE



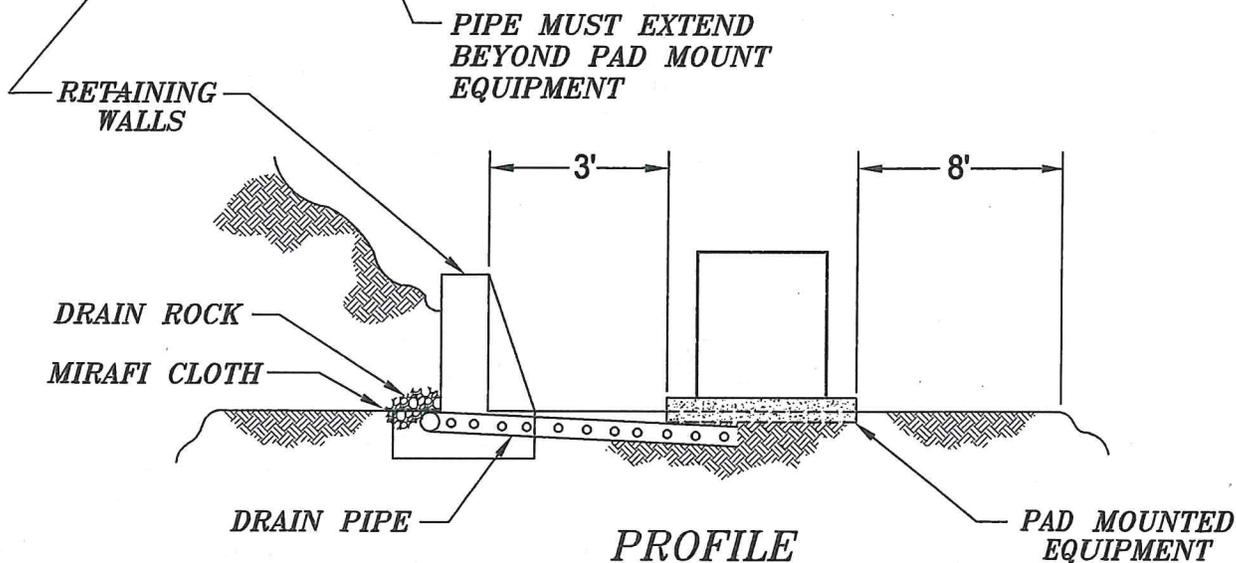
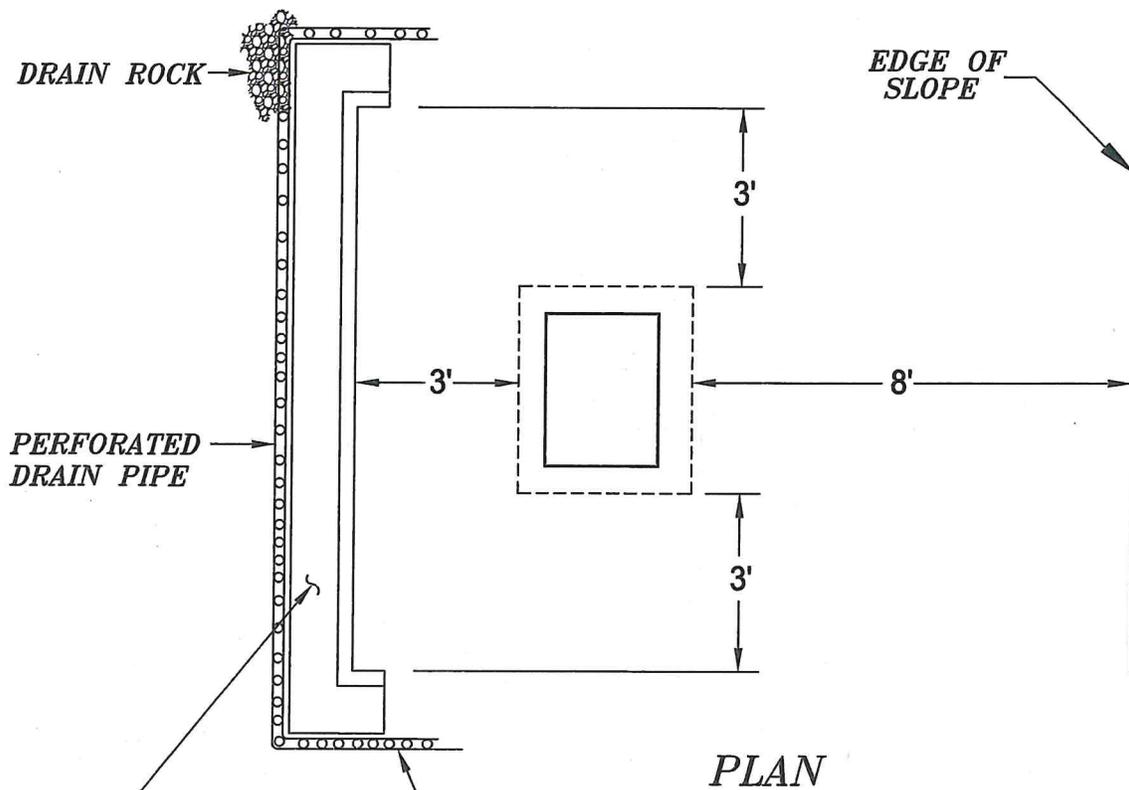
VERTICAL CLEARANCE REQUIREMENTS

VERTICAL CLEARANCE	EQUIPMENT
20'	1 ϕ PAD MOUNTED
30'	3 ϕ PAD MOUNTED

MINIMUM CLEARANCES FOR PAD MOUNTED EQUIPMENT

 <p>ALAMEDA MUNICIPAL POWER A Department of the City of Alameda 2000 GRAND STREET, P.O. BOX H ALAMEDA, CALIFORNIA 94501</p>	TITLE :			
	PAD MOUNT EQUIPMENT CLEARANCE REQUIREMENTS			
	DRAWN :	L.V. ANCHETA	DATE: MAY 18, 2020	DWG. NO.:
	REVIEWED:	<i>[Signature]</i>		1-L-636
APPROVED:	<i>[Signature]</i>		SCALE: NTS	REV. 0
			SHT 7 OF 9	

REV	DESCRIPTION	BY	DATE



**EXAMPLE OF PAD MOUNTED EQUIPMENT
INSTALLATION ON SLOPED TERRAIN**

**ALAMEDA
MUNICIPAL POWER**

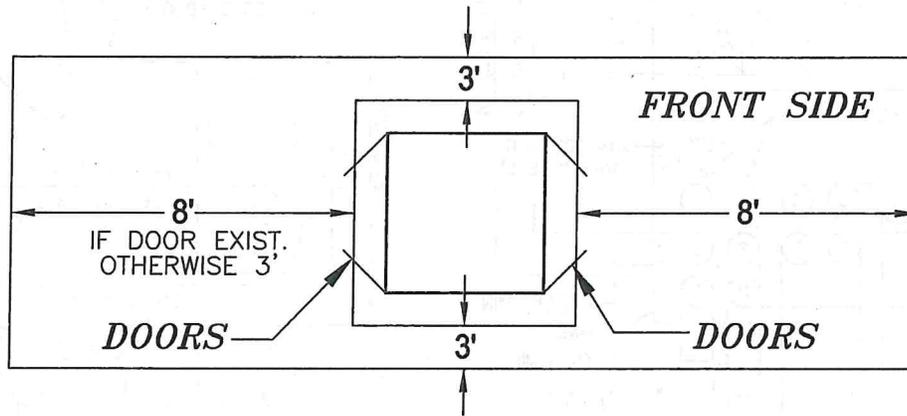
A Department of the City of Alameda
2000 GRAND STREET, P.O. BOX H
ALAMEDA, CALIFORNIA 94501

TITLE :			
PAD MOUNT EQUIPMENT CLEARANCE REQUIREMENTS			
DRAWN :	LV ANCHETA	DATE: MAY 18, 2020	DWG. NO.:
REVIEWED:	<i>[Signature]</i>		1-L-636
APPROVED:	<i>[Signature]</i>		SCALE: NTS SHT 8 OF 9
			REV. 0

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REV	DESCRIPTION	BY	DATE

PAD MOUNTED SWITCH OR CAPACITOR



WORK SPACE FOR PAD MOUNTED SWITCHES AND CAPACITORS

\\ENGINEERING&OPERATION\ENGINEER DRAWINGS\PrwrDwgs\WorkOrder\L_Construction Standard\Material & Inst Criteria UG Elect System\1L636.9.dwg

ALAMEDA MUNICIPAL POWER
A Department of the City of Alameda
 2000 GRAND STREET, P.O. BOX H
 ALAMEDA, CALIFORNIA 94501

TITLE :				
PAD MOUNT EQUIPMENT CLEARANCE REQUIREMENTS				
DRAWN :	LV ANCHETA	DATE: MAY 18, 2020	DWG. NO.:	REV.
REVIEWED:	<i>[Signature]</i>		1-L-636	0
APPROVED:	<i>[Signature]</i>		SCALE: NTS	SHT 9 OF 9

\\ENGINEERING&OPERATION\ENGINEER DRAWINGS\WorkOrder\L\Construction Standard\Material & Inst Criteria UG Elect System\1L412.dwg

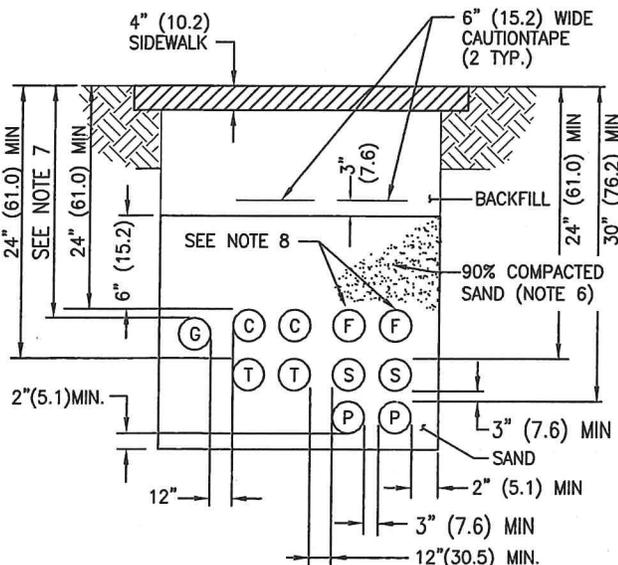
REV	DESCRIPTION	BY	DATE
1	EXTENDED PAVED AREA ON TYPE B	jmu	5/3/02
2	REV. TITLE BLOCK	C.B.	8/20/03
3	ADDED NOTE 6	J.U.	9/01/04
4	REVISED DEPTH & CLEARANCES	A.C.	11/16/05
5	ADDED GAS & NOTE 7	A.C.	05/22/06
6	CHANGE CO. NAME	TN	04/29/20

LEGEND

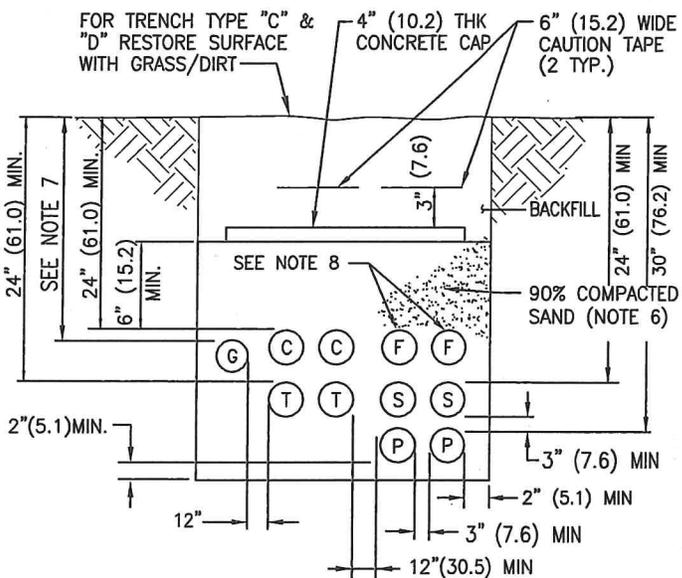
G	- GAS
T	- TELEPHONE
C	- CABLE TV-COAX
F	- FIBER
S	- SECONDARY
P	- PRIMARY

	MIN. DEPTH AND CLEARANCES					MIN. COVER
	G	T	C	S	P	
S	12" (30.5)	12"* (30.5)	12"* (30.5)	3" (7.6)	3" (7.6)	24" (61.0) IN SIDEWALK/DIRT/GRASS 30" (76.2) IN STREET
P	12" (30.5)	12" (30.5)	12" (30.5)	3" (7.6)	3" (7.6)	30" (76.2) SIDEWALK/DIRT/GRASS STREET
T	12" (30.5)	0	0	12"* (30.5)	12" (30.5)	24" (61.0) IN SIDEWALK/DIRT/GRASS 36" (91.4) IN STREET
C	12" (30.5)	0	0	12"* (30.5)	12" (30.5)	24" (61.0) IN SIDEWALK/DIRT/GRASS STREET
F	12" (30.5)	0	0	3" (7.6)	12" (30.5)	30" (76.2) SIDEWALK/DIRT/GRASS STREET

* CLEARANCE MAY BE REDUCED TO 3" IF MUTUALLY AGREED UPON BY INVOLVED UTILITIES.



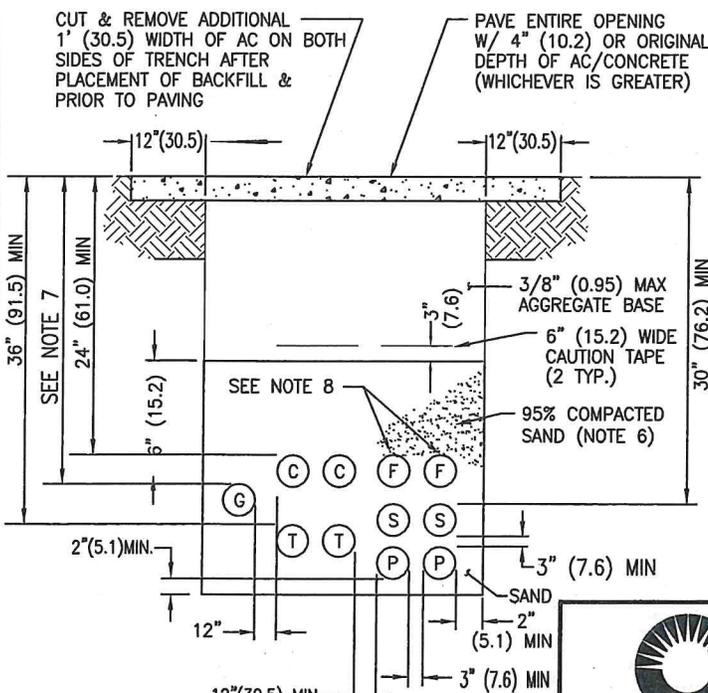
TRENCH TYPE "A"
TRENCH IN SIDEWALK



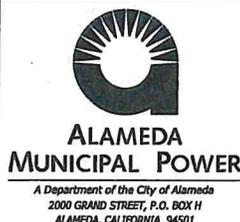
TRENCH TYPE "C" & "D"
TRENCH IN GRASS/DIRT

NOTES:

- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS IN PARENTHESES ARE IN CENTIMETERS.
- ALL BACKFILL SHALL BE COMPACTED IN ONE FOOT LAYERS WITH A MINIMUM OF 90% COMPACTION FOR TRENCH A, C & D AND 95% COMPACTION FOR TRENCH TYPE B. COMPACTION MAY BE SUBJECT TO TESTING.
- CONCRETE CAP MAY BE "RAPID SET" PCC.
- ALL TRENCH WORK SUBJECT TO ALAMEDA MUNICIPAL POWER (AMP) INSPECTION. CALL AMP FOR INSPECTION BEFORE BACKFILLING TRENCH, TEL (510) 385-6682.
- THIS DRAWING IS FOR REFERENCE ONLY AND, IS SUBJECT TO DEVELOPER'S AND ALL INVOLVED UTILITIES' APPROVED PLAN AND SPECIFICATIONS.
- SAND SHALL BE SUITABLE FOR THE PURPOSE INTENDED, AND SHALL BE OF SUCH SIZE THAT 90 PERCENT TO 100 PERCENT WILL PASS A 4.75-mm (No. 4) SIEVE AND NOT MORE THAN 5% WILL PASS A 75-mm (No. 200) SIEVE.
- REFER TO GAS UTILITY FOR MINIMUM COVER REQUIREMENTS.
- AMP FIBER CONDUITS MAY BE PLACED ON THE SAME VERTICAL ALIGNMENT WITH AMP ELECTRIC CONDUITS AS LONG AS PROPER DEPTH & CLEARANCES ARE MAINTAINED.



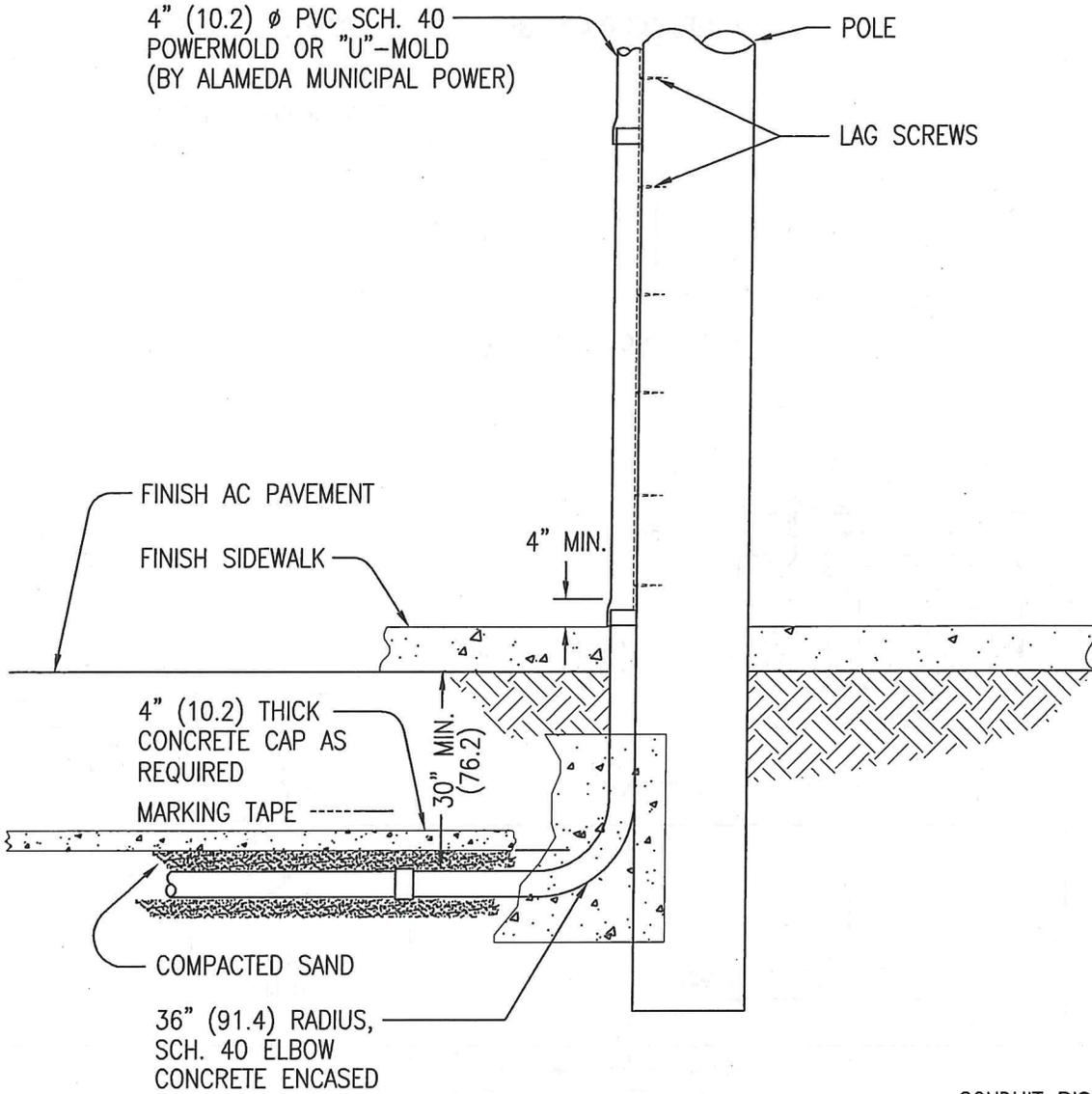
TRENCH TYPE "B"
TRENCH IN STREET



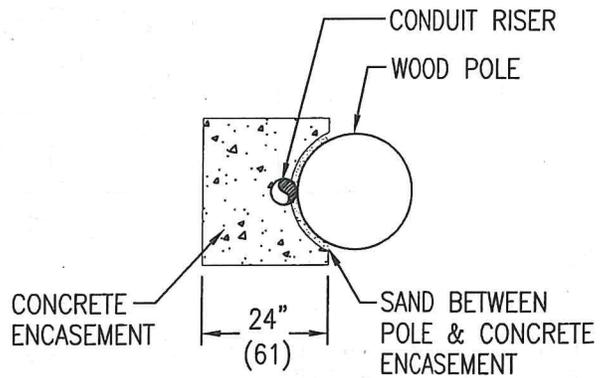
TITLE : (NOTE: SUPERSEDES DRAWING #1-F-301)			
TYPICAL TRENCH SECTION DETAIL			
DRAWN :	LV/ANCHETA	DATE: APRIL 29, 2020	DWG. NO.:
REVIEWED:			1-L-412
APPROVED:			REV. 6
SCALE: NTS		SHT 1 OF 1	

\ENGINEERING&OPERATION\ENGINEER DRAWINGS\PowerDwgs\WorkOrder\Construction Standard\Material & Inst Criteria UG Elect System\1L413.dwg

REV	DESCRIPTION	BY	DATE
1	TOP VIEW DETAIL	jmu	5/3/02
2	ADDED NOTE 4	jmu	8/7/02
3	CHANGE CO. NAME		
4	ADDED NOTE 5	TN	4/10/20

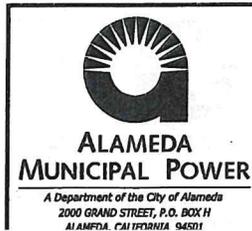


- NOTES:**
1. DIG WITH CAUTION AROUND OR IN THE VICINITY OF EXISTING UNDERGROUND UTILITIES.
 2. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS IN PARENTHESES ARE IN CENTIMETERS.
 3. CALL ALAMEDA MUNICIPAL POWER (AMP) FOR INSPECTION TEL. (510) 385-6682
 4. CONDUIT BENDING RADIUS SHALL BE INCREASED TO 48-INCH FOR CONDUITS SIZE 5-INCH & 6-INCH.
 5. FINAL LOCATION OF THE RISER CONDUIT WILL BE DETERMINED BY THE COMPLIANCE INSPECTOR IN THE FIELD.



TOP VIEW

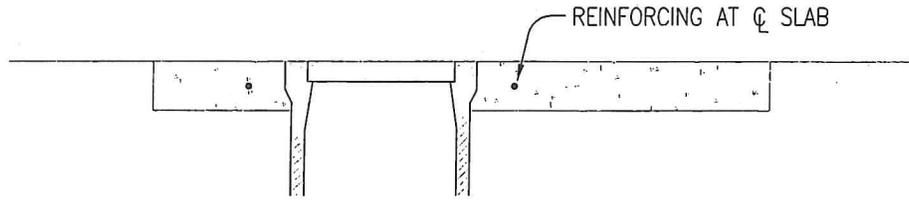
(NOTE: SUPERSEDES DRAWING #1-F-299)



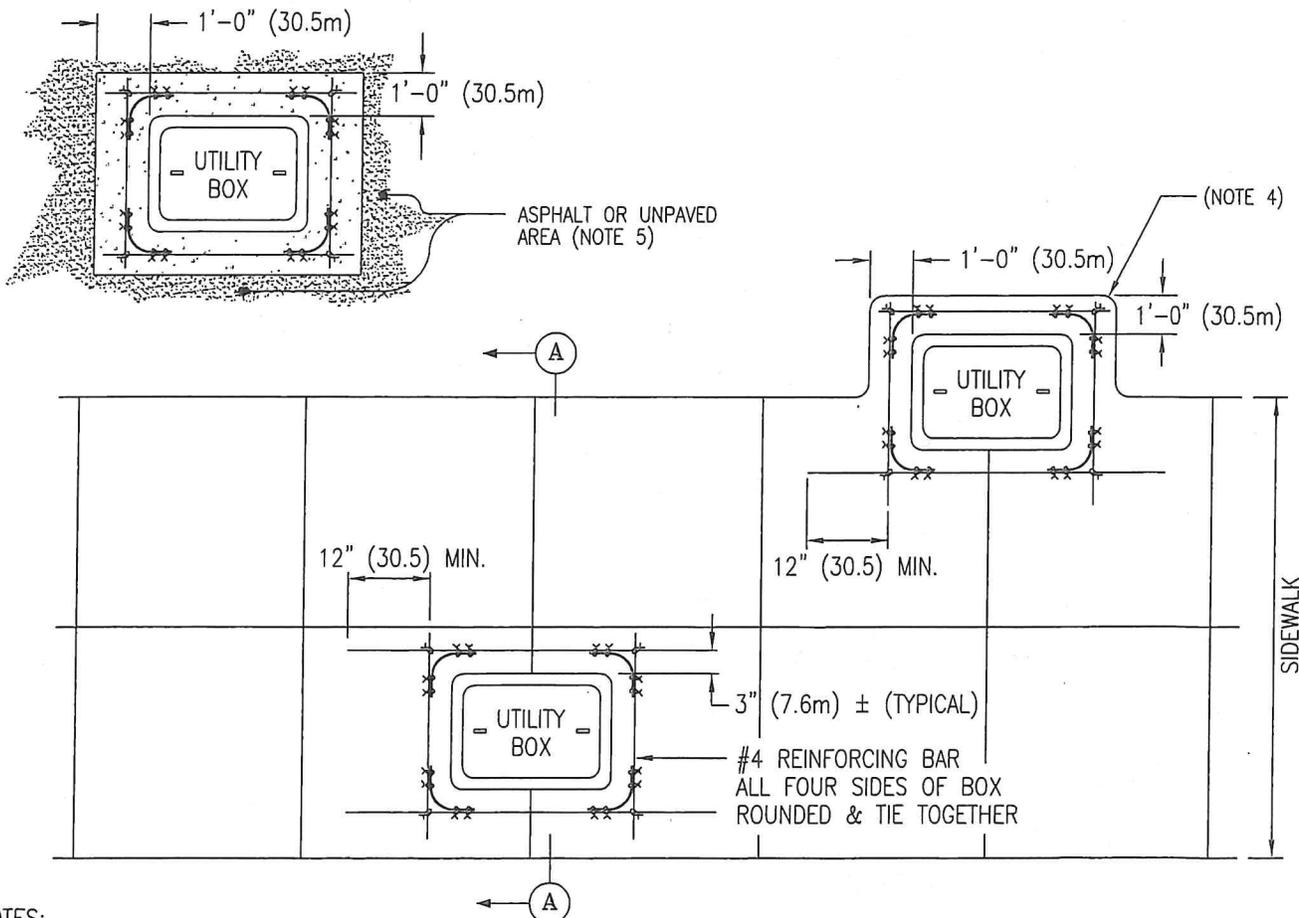
TITLE :			
POWERMOLD RISER DETAIL			
DRAWN :	C.V. ANCHETA	DATE: APRIL 23, 2020	DWG. NO.:
REVIEWED:	<i>[Signature]</i>		1-L-413
APPROVED:	<i>[Signature]</i>		REV. 4
SCALE: NTS		SHT 1 OF 1	

REV	DESCRIPTION	BY	DATE
1	CHANGE CO. NAME	T.N.	11/20/09
2	ADDED NOTE 4 & 5	J.U.	12/03/09

DETAIL OF REINFORCING AROUND UTILITY BOXES



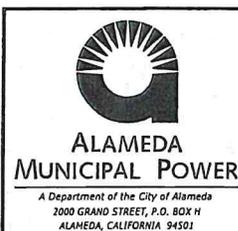
SECTION A



NOTES:

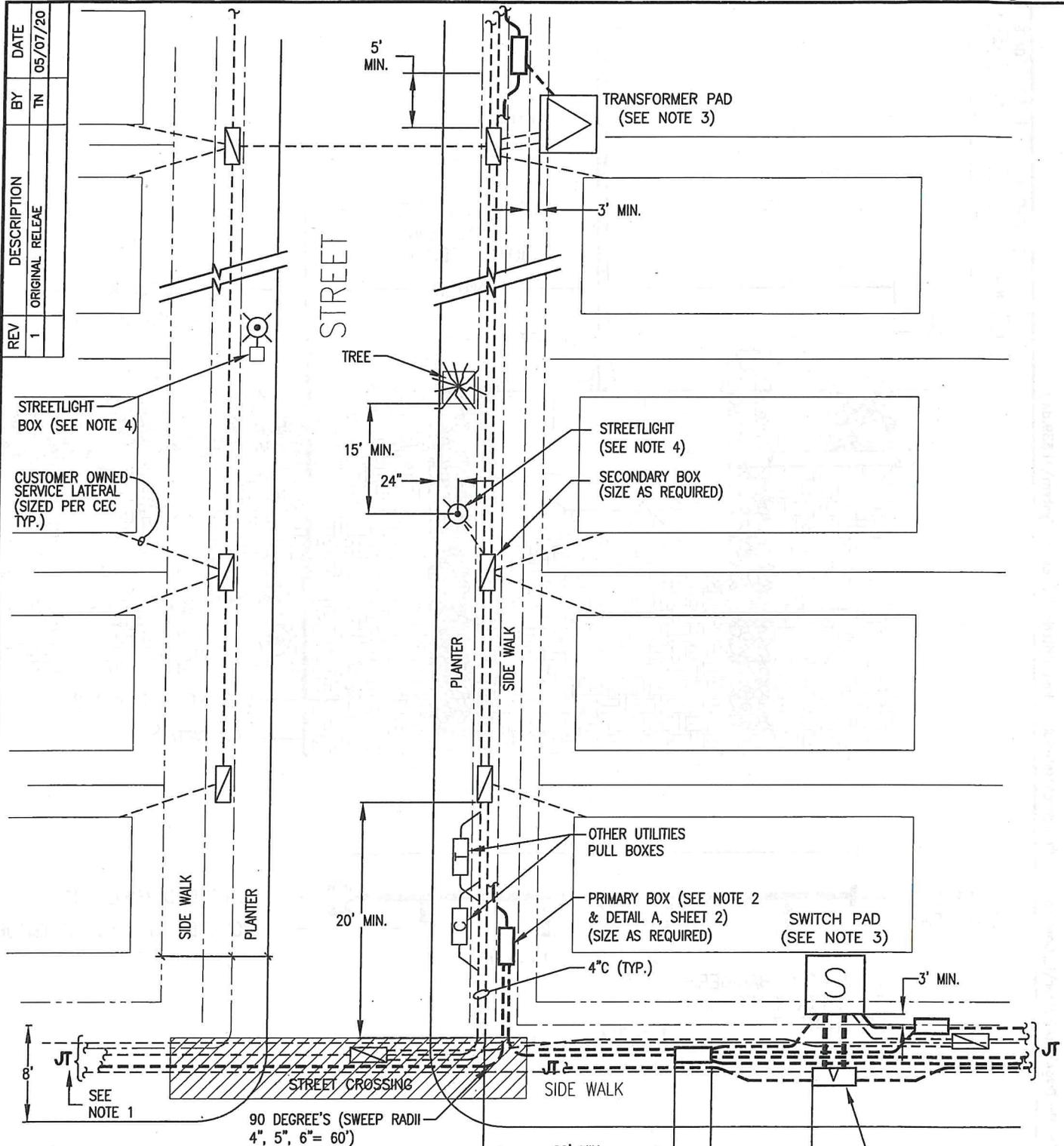
- THIS DRAWING IS BASED ON CITY OF ALAMEDA PUBLIC WORKS DEPARTMENT'S REQUIREMENT AS SHOWN IN DWG. 6080 CASE 22, DATED FEB, 1970.
- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS IN PARENTHESES ARE IN CENTIMETERS.
- CALL ALAMEDA MUNICIPAL POWER (AMP) FOR INSPECTION BEFORE POURING CONCRETE, TEL. (510) 748-3943.
- BOXES OR ENCLOSURES LOCATED IN OR PARTIALLY IN THE SIDEWALK SHALL BE PARALLEL TO THE EDGE OF SIDEWALK, **HAVING A MINIMUM OF 12 INCHES (30.5cm) OF CONCRETE AROUND THE OUTSIDE EDGE OF THE BOX**, WITH A #4 REINFORCING BAR ON ALL FOUR SIDES OF THE BOX.
- VAULT AND H-20 TRAFFIC LOADING BOX APPLICATION:** WHEN LOCATED IN UNPAVED AREAS, THE TOP OF THE VAULT OR TRAFFIC RATED BOX SHALL BE SET LEVEL APPROXIMATELY 1 INCH (2.5cm) ABOVE THE FINISHED GRADE. IN ADDITION, A MINIMUM OF 12 INCHES (30.5cm) OF 4-INCH THICK CONCRETE AROUND THE EDGE OF THE VAULT OR TRAFFIC RATED BOX WITH A #4 REINFORCING BAR ON ALL FOUR SIDES OF THE VAULT IS REQUIRED WHEN INSTALLED IN ASPHALT OR UNPAVED AREAS.

(NOTE: SUPERSEDES DRAWING #1-T-4)

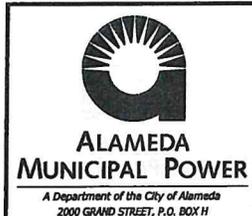


TITLE :			
DETAIL OF REINFORCING REQUIRED AROUND UTILITY BOXES AND VAULTS			
DRAWN :	L.V. ANCHETA	DATE: JUN. 11, 2010	DWG. NO. :
REVIEWED:	<i>[Signature]</i>		1-L-414
APPROVED:	<i>[Signature]</i>		REV. 2
SCALE : NTS		SHT 1 OF 1	

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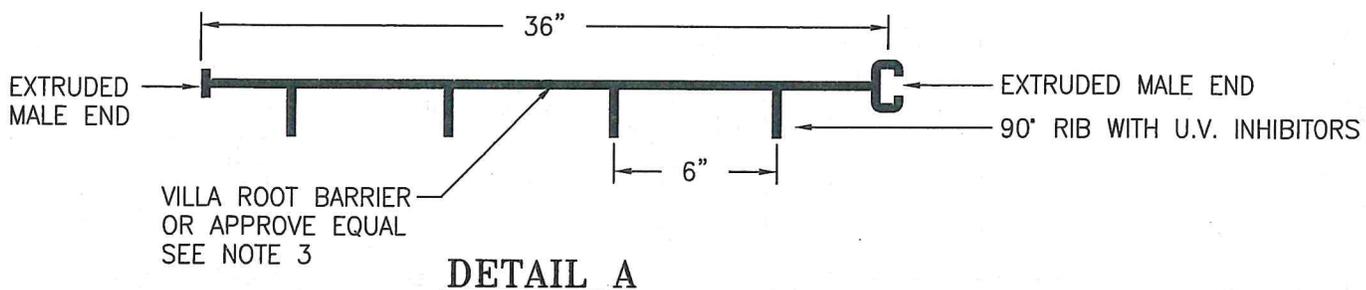
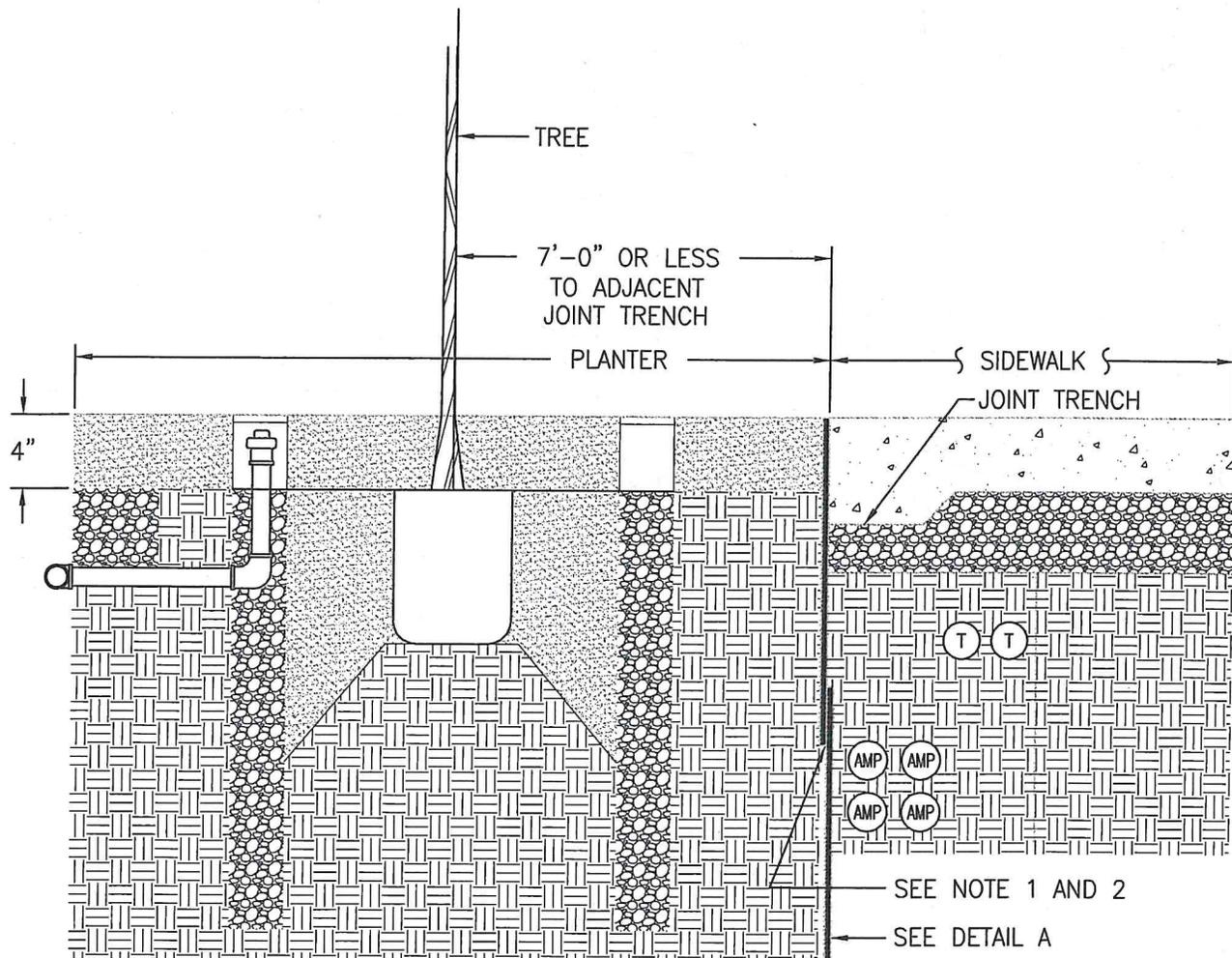


- NOTES**
1. JOINT TRENCH CONSTRUCTION REQUIREMENTS SHALL APPLY WHEN ALL UTILITIES SUBSTRUCTURES ARE INSTALLED. REFER TO DWG. I FOR TYPICAL TRENCH SECTION DETAILS AND REQUIREMENTS.
 2. INSTALL VAULTS, PRIMARY AND SECONDARY PULL BOXES PREFERABLY IN SIDEWALKS IN ALIGNMENT WITH THE JOINT TRENCH. ALTERNATE LOCATIONS WILL BE DETERMINED BY AMP. REFER TO DWGS. Q, R AND S FOR DETAILS AND REQUIREMENTS.
 3. INSTALL TRANSFORMER OR SWITCH PADS IN THE PLANTER AREAS OR PARKING LOT. REFER TO DWGS. A, B, C, D, E AND F FOR DETAILS AND REQUIREMENTS.
 4. INSTALL STREETLIGHT IN PLANTER AREA. PER CITY OF ALAMEDA STANDARDS.



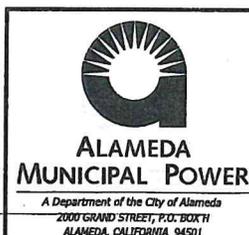
TITLE :				
TYPICAL JOINT TRENCH DESIGN GUIDE (SIDEWALK)				
DRAWN :	RB/LVA	DATE: MAY 13, 2020	DWG. NO.:	REV.
REVIEWED:			1-L-550	0
APPROVED:				

REV	DESCRIPTION	BY	DATE
0	ORIGINAL	TN	4/12/20



NOTES:

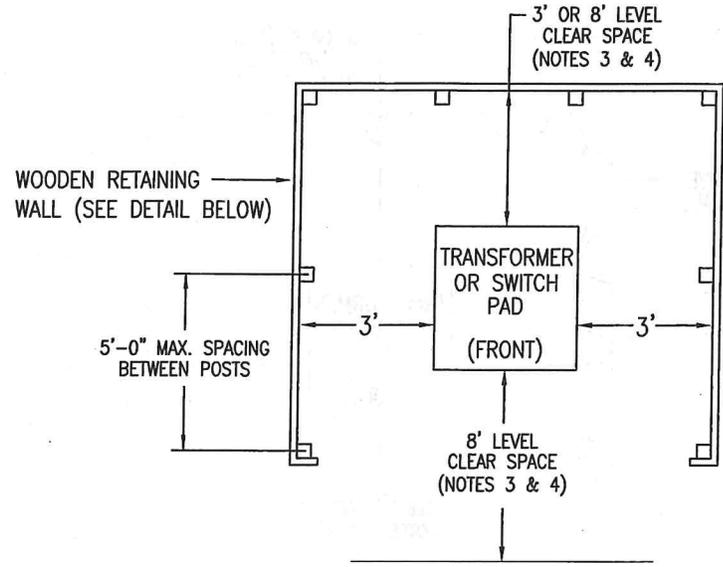
1. INSTALL DOUBLE STACK OF TWO 3 FT HEIGHTS W/ 12 FT. OVERLAP FOR AN OVER ALL DEPTH OF 6 FT. ON AMP JOINT TRENCH SIDE.
2. INSTALL ONE STACK OF 3 FT. HEIGHT ON NON-AMP JOINT TRENCH SIDE.
3. THE TREE ROOT BARRIER SHALL BE MADE OF HIGH DENSITY POLYETHYLENE MATERIAL WITH A MINIMUM OF 0.085 IN. THICKNESS



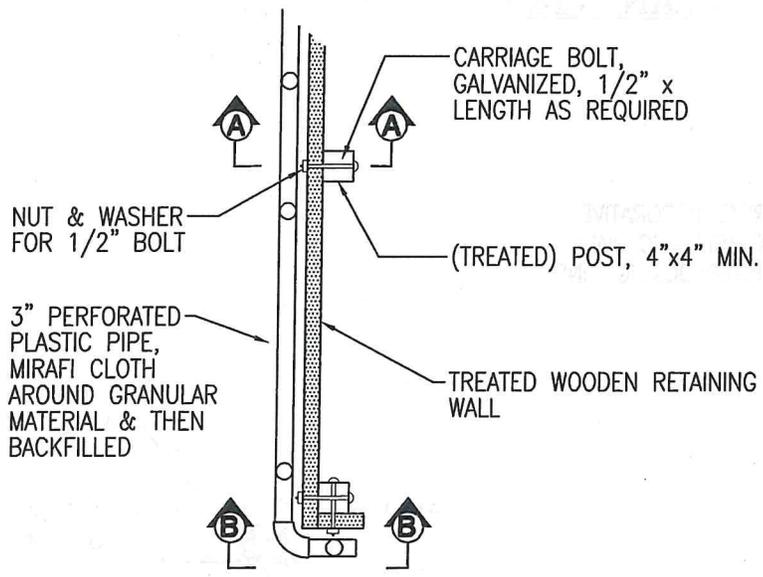
TITLE :			
TREE ROOT BARRIER INSTALLATION			
DRAWN :	<i>V. ANCHETA</i>	DATE: MAY 18, 2020	DWG. NO.:
REVIEWED:	<i>[Signature]</i>		1-L-639
APPROVED:	<i>[Signature]</i>		REV. 0
SCALE: NTS			SHT 1 OF 1

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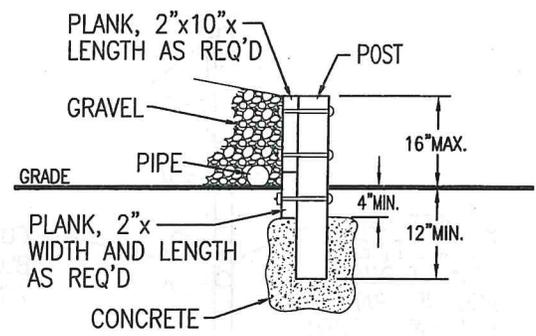
REV	DESCRIPTION	BY	DATE
1	CHANGED COMPANY LOGO	J.U.	9/04/15
2	CHANGE DWG #	DB	5/14/20



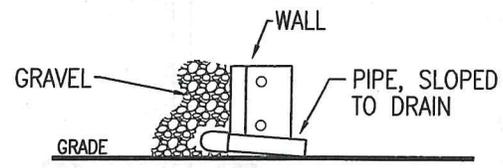
PLAN VIEW



DETAIL



SECTION A-A



SECTION B-B

NOTES:

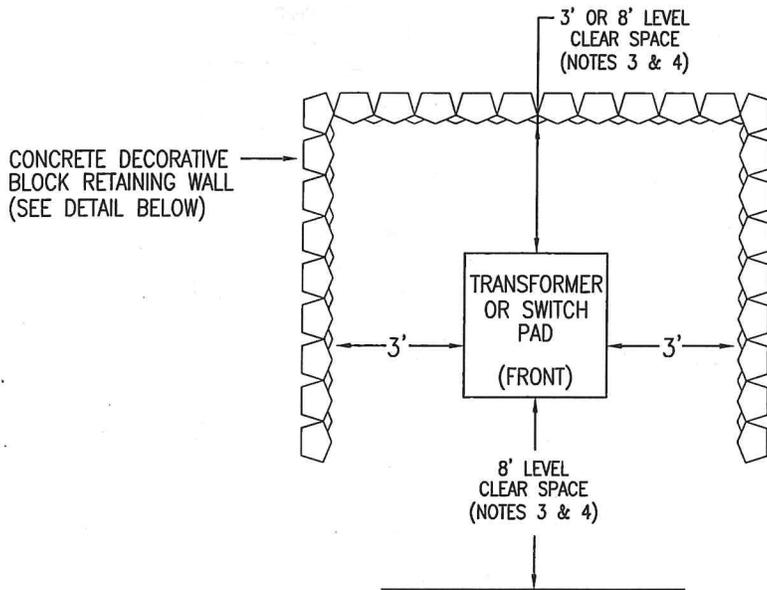
1. THIS DRAWING PROVIDES AN ILLUSTRATIVE WOODEN RETAINING WALL DESIGN WITH WHICH THE CUSTOMER IS REQUIRED TO SURROUND A PAD-MOUNTED TRANSFORMER OR SWITCH. THIS MAY BE MODIFIED TO FIT A PARTICULAR SITE CONDITION, SUBJECT TO APPROVAL BY ALAMEDA MUNICIPAL POWER.
2. THE WOODEN RETAINING WALL SHALL BE INSTALLED, OWNED AND MAINTAINED BY THE CUSTOMER/PROPERTY OWNER.
3. A LEVEL, CLEAR WORKING SPACE OF 8 FEET IS REQUIRED IN FRONT OF AND 3 FEET IN BACK OF A TRANSFORMER PAD.
4. A LEVEL, CLEAR WORKING SPACE OF 8 FEET IS REQUIRED AT THE FRONT AND BACK OF A SWITCH PAD.
5. WOODEN RETAINING WALLS ARE NOT SUBSTITUTES TO ANY REQUIRED BARRIER POSTS OR BOLLARDS.

ALAMEDA MUNICIPAL POWER
 A Department of the City of Alameda
 2000 GRAND STREET, P.O. BOX 11

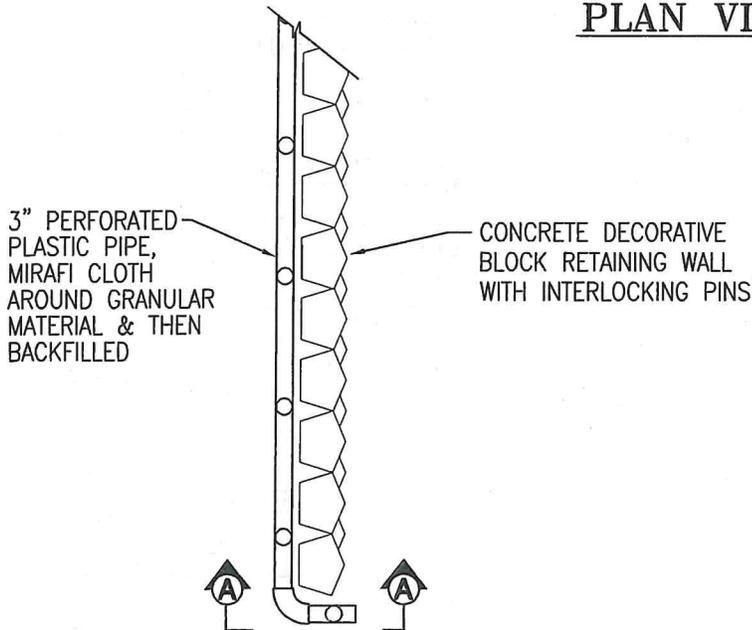
TITLE :			
WOODEN RETAINING WALL FOR PAD-MOUNTED EQUIPMENT (ALTERNATE OPTION)			
DRAWN :	<i>B. BALLINGER</i>	DATE: MAY 14, 2020	DWG. NO.:
REVIEWED:			1-L-561-1
APPROVED:			REV. 2

\ENGINEERING&OPERATIONS\Engineer Drawings\PwrDwgs\WorkOrder\L_Construction Standard\Material & Inst Criteria UG Elect System\1L561-2

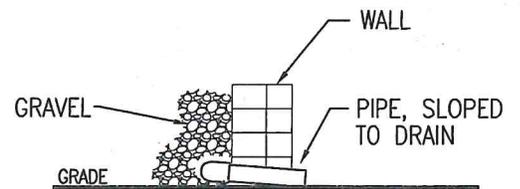
REV	DESCRIPTION	BY	DATE
1	ORIGINAL	J.U.	9/04/15
2	CHANGE DRAWING #	DB	5/14/20



PLAN VIEW



DETAIL



SECTION A-A

NOTES:

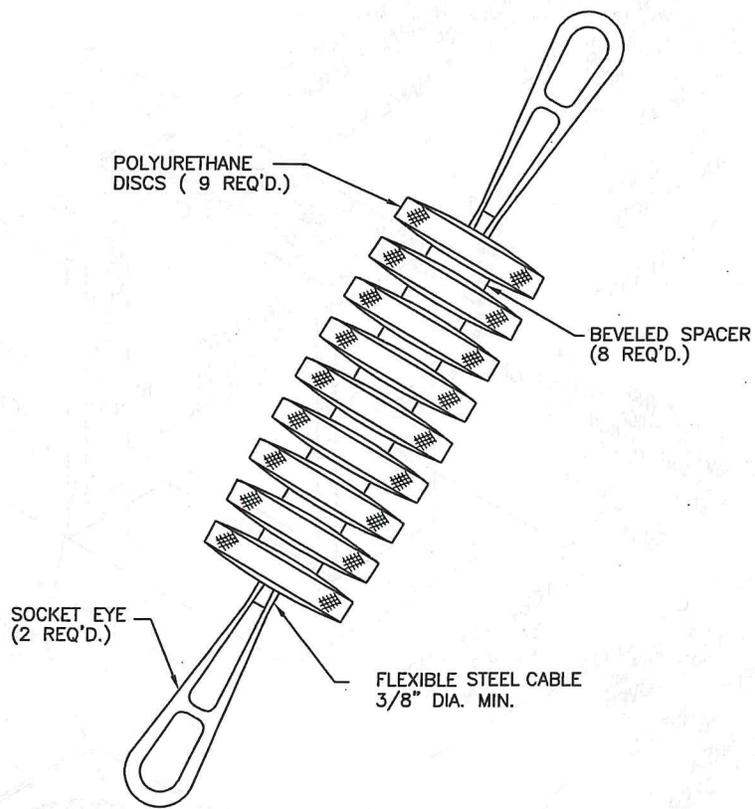
1. THIS DRAWING PROVIDES AN ILLUSTRATIVE DECORATIVE BLOCK RETAINING WALL WITH INTERLOCKING PINS DESIGN WITH WHICH THE CUSTOMER IS REQUIRED TO SURROUND A PAD-MOUNTED TRANSFORMER OR SWITCH. THIS MAY BE MODIFIED TO FIT A PARTICULAR SITE CONDITION, SUBJECT TO APPROVAL BY ALAMEDA MUNICIPAL POWER.
2. THE DECORATIVE BLOCK RETAINING WALL SHALL BE INSTALLED, OWNED AND MAINTAINED BY THE CUSTOMER/PROPERTY OWNER.
3. A LEVEL, CLEAR WORKING SPACE OF 8 FEET IS REQUIRED IN FRONT OF AND 3 FEET IN BACK OF A TRANSFORMER PAD.
4. A LEVEL, CLEAR WORKING SPACE OF 8 FEET IS REQUIRED AT THE FRONT AND BACK OF A SWITCH PAD.
5. DECORATIVE BLOCK RETAINING WALLS ARE NOT SUBSTITUTES TO ANY REQUIRED BARRIER POSTS OR BOLLARDS.

ALAMEDA MUNICIPAL POWER
 A Department of the City of Alameda
 2000 GRAND STREET, P.O. BOX 11
 ALAMEDA, CALIFORNIA 94501

TITLE :				
WOODEN RETAINING WALL FOR PAD-MOUNTED EQUIPMENT (ALTERNATE OPTION)				
DRAWN :	D. BALLINGER	DATE: MAY 14, 2020	DWG. NO.:	REV.
REVIEWED:			1-L-561-2	2
APPROVED:	<i>[Signature]</i>		SCALE: NTS	SHT 2 OF 2

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REV	DESCRIPTION	BY	DATE
0	ORIGINAL	P.V.	6/29/18
1	CHANGE REF #	DB	5/14/20



DUCT SIZE	MANDREL SIZE *	SAFE WORKING LOAD (LBS) **
1-1/2"	1-1/4"	1400
2-0"	1-3/4"	2330
3-0"	2-3/4"	2330
4-0"	3-3/4"	4800
5-0"	4-3/4"	4800
6-0"	5-3/4"	4800

NOTES:

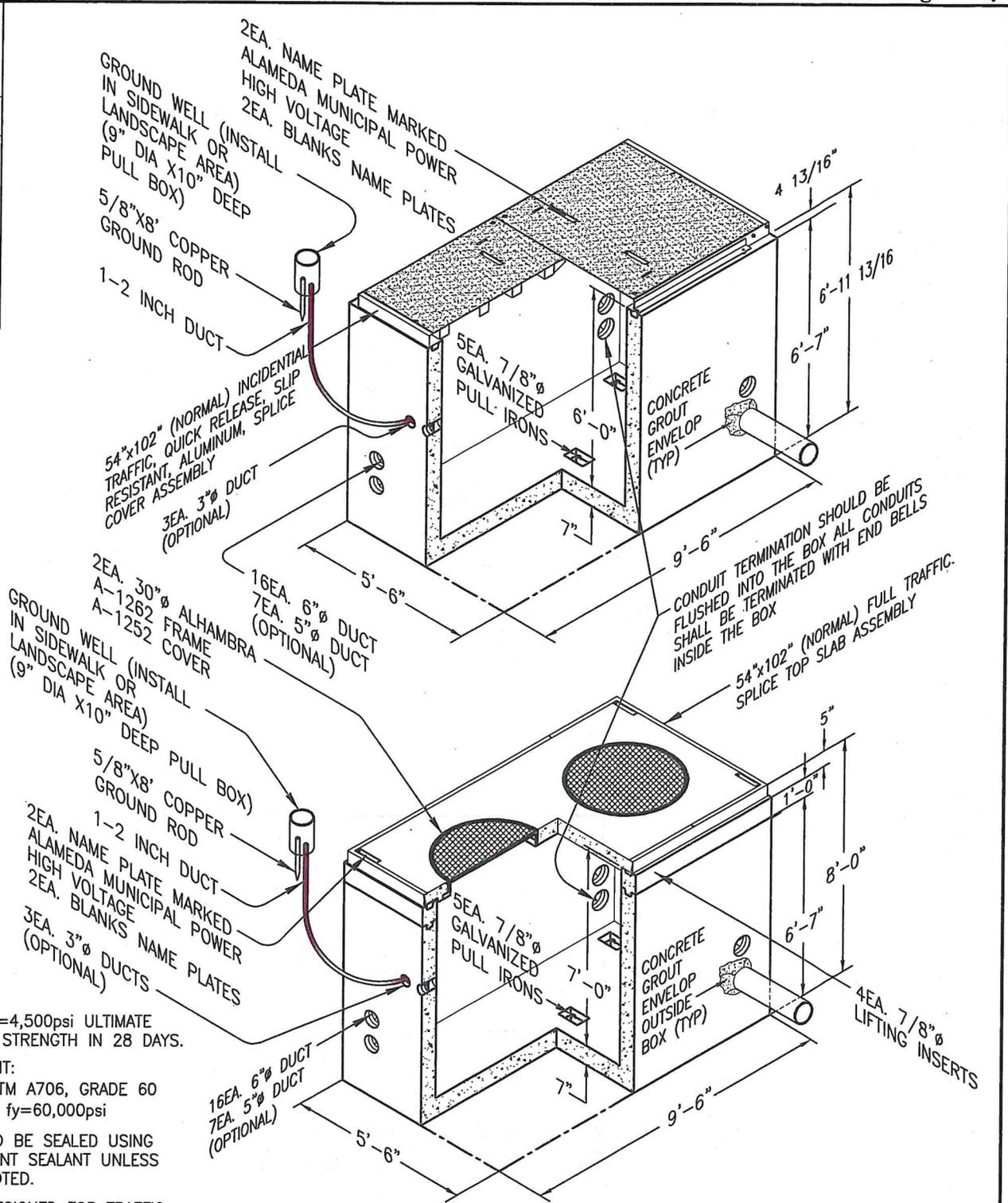
- AMP WILL PROVIDE MANDREL FOR TESTING OF THE INSTALLED CONDUITS, THE FLEXIBLE MANDREL IS CONSTRUCTED OF POLYURETHANE DISCS OF GRADUATED SIZES STRUNG ON A CABLE 3/8" MINIMUM DIAMETER SEPARATED BY BEVELED SPACERS AND EQUIPPED WITH DROP-FORGED STEEL SOCKET EYES ON EACH END.
 - REMOVE SHARP EDGES FROM EACH DISC TO AVOID DAMAGE TO THE DUCT.
 - ALL MANDREL TESTING SHALL BE WITNESSED BY THE AMP UTILITY CONSTRUCTION COMPLIANCE SPECIALIST. TESTING SHALL BE DONE ONLY AFTER TRENCH IS BACKFILLED AND PAVED (STREET, SIDEWALK OR PARKING).
 - ALL CONDUITS, NEW OR EXISTING, SHALL BE TESTED AND APPROVED PRIOR TO INSTALLATION OF ANY CABLES.
- * OUTSIDE DIAMETER OF THE 3 CENTER DISCS.
 ** SAFETY FACTOR (HORIZONTAL PULL ONLY.)

 ALAMEDA MUNICIPAL POWER <small>A Department of the City of Alameda 2000 GRAND STREET, P.O. BOX H</small>	TITLE :				
	MANDREL TESTING				
DRAWN :	D. BALLINGER	DATE: MAY 14, 2020	DWG. NO.:	REV.	
REVIEWED:			1-L-621	1	

G:\ENGINEERING&OPERATION\ENGINEER DRAWINGS\PowerDwgs\WorkOrder\Construction Standard\Material & Inst Criteria UG Elect System\1L441.1.dwg

REV	DESCRIPTION	BY	DATE
1	ADDED DETAIL	jmu	5/3/02
2	ADDED NOTE 6	J.U.	8/20/03
3	BOLT & LABEL DETAILS	J.U.	10/15/03
4	CHANGED SUMP HOLE FROM 8" TO 14"	J.U.	10/15/04

ADDED S/S PULL IRONS	J.U.	4/22/05
5	J.U.	4/22/05
6	A.C.	1-11-10
7	CHANGED CO. NAME	T.N.
8	ADAPTED BOX STD.	3-28-19
9	ADDED GRD. WELL	4/10/20



NOTES:

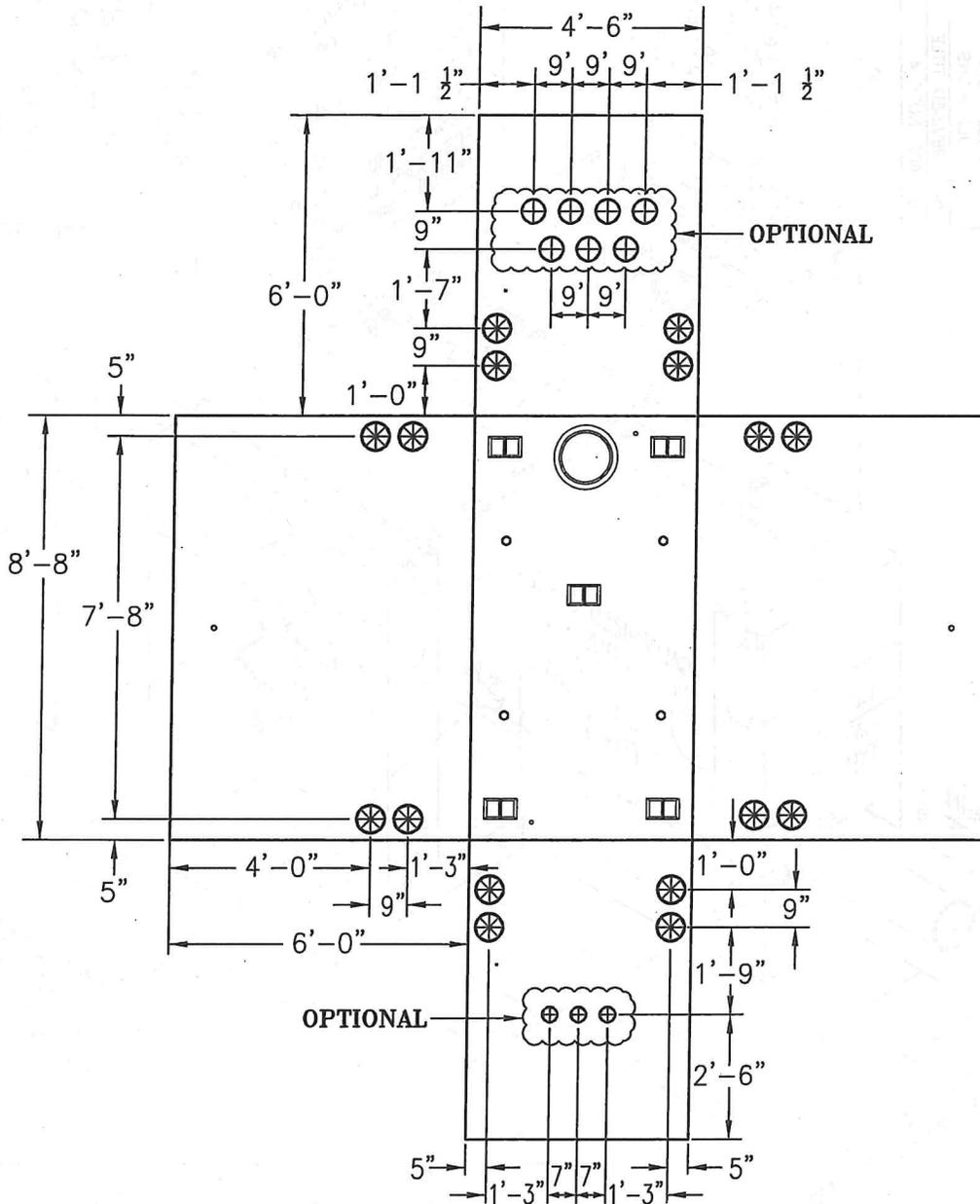
1. CONCRETE f'c=4,500psi ULTIMATE COMPRESSIVE STRENGTH IN 28 DAYS.
2. REINFORCEMENT:
A) REBAR: ASTM A706, GRADE 60
B) STRENGTH: fy=60,000psi
3. ALL JOINTS TO BE SEALED USING APPROVED JOINT SEALANT UNLESS OTHERWISE NOTED.
4. STRUCTURE DESIGNED FOR TRAFFIC H-20 LOADING PER ASTM C-857. (16,000lb. WHEEL LOAD).
5. LOCATION & NUMBER OF END-BELLS/TERM-A-DUCTS VARY FOR EVERY JOB. COORDINATE W/ ALAMEDA MUNICIPAL POWER (AMP) PRIOR TO MANUFACTURING.
6. PROVIDE NON-SKID GALVANIZED VAULT COVERS (60lbs OR LESS PER SECTION) WITH COIL BOLTS. ALL-GRIP FINISH SHALL BE APPLIED ON THE DIAMOND PLATE COVER AT THE FACTORY.
7. VAULT SHALL BE INSTALLED WITH A MINIMUM OF 12 INCHES (30.5cm) OF 4-INCH THICK REINFORCED CONCRETE AROUND THE OUTSIDE EDGE OF THE VAULT IRRESPECTIVE OF LOCATION (REFER TO DRAWING 1-L-414).

NOTE:
ACTUAL LOCATION, SIZE, & QUANTITY OF KNOCKOUTS MAY VARY DEPENDING ON PROJECT REQUIREMENTS ACCEPTABLE VENDOR-OLD CASTLE CODE No. AMP-4686 OR APPROVED EQUAL

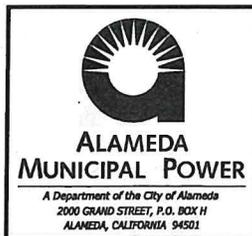
ALAMEDA MUNICIPAL POWER
A Department of the City of Alameda
2000 GRAND STREET, P.O. BOX H
ALAMEDA, CALIFORNIA 94501

TITLE :			
4'-6" x 8'-6" x 6'-0" I.D. PRIMARY VAULT DETAILS FOR INCIDENTAL TRAFFIC AND DRIVABLE AREA APPLICATIONS			
DRAWN :	L.V. ANCHETA	DATE: APRIL 30, 2020	DWG. NO.:
REVIEWED:	[Signature]		1-L-441
APPROVED:	[Signature]		8
SCALE: NTS		SHT 1 OF 2	

REV	DESCRIPTION	BY	DATE
1	ADDED DETAIL	T.N.	3/28/19



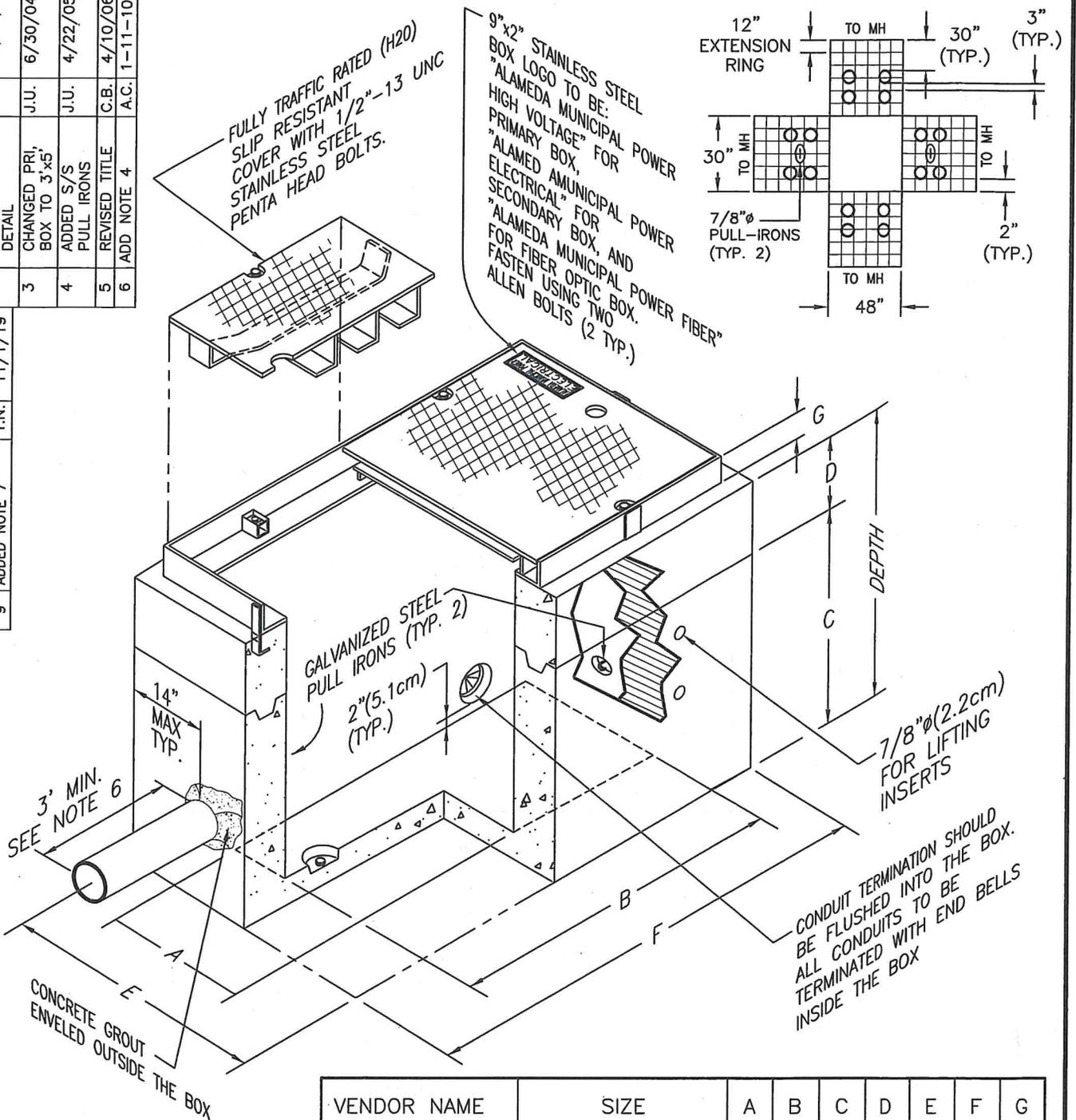
NOTE:
 ACTUAL LOCATION, SIZE, & QUANTITY OF KNOCKOUTS
 MAY VARY DEPENDING ON PROJECT REQUIREMENTS
 ACCEPTABLE VENDOR—OLD CASTLE CODE No. AMP-4686
 OR APPROVED EQUAL



TITLE : 4'-6" x 8'-6" x 6'-0" I.D. PRIMARY VAULT DETAILS FOR INCIDENTAL TRAFFIC AND DRIVABLE AREA APPLICATIONS			
DRAWN :	LV ANCHETA	DATE: APRIL 01, 2019	DWG. NO. :
REVIEWED:	<i>[Signature]</i>		1-L-441
APPROVED:	<i>[Signature]</i>		SCALE : NTS SHT 2 OF 2
			REV. 1

REV	DESCRIPTION	BY	DATE
1	ADDED NOTE 3	imu	5/3/02
2	ADDED BOLT DETAIL	CB	10/16/03
3	CHANGED PRI. BOX TO 3'x5'	J.U.	6/30/04
4	ADDED S/S PULL IRONS	J.U.	4/22/05
5	REVISED TITLE	C.B.	4/10/06
6	ADD NOTE 4	A.C.	1-11-10

CHANGED CO. NAME	D.H.	T.N.
7		
8	9/6/18	
9	11/1/19	

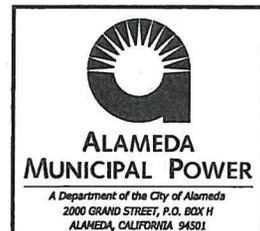


NOTE:

1. SEAL ALL JOINTS WITH MASTIC SEALANT IF EXTENSIONS ARE USED.
2. COVER MAY BE ONE SECTION IF WEIGHT DOES NOT EXCEED 60 LBS.
3. BOX SHALL BE INSTALLED OVER MATERIAL COMPACTED TO 95% MIN.
4. BOX SHALL BE INSTALLED WITH A MINIMUM OF 12 INCHES (30.5cm) OF 4-INCH THICK REINFORCED CONCRETE AROUND THE OUTSIDE EDGE OF THE H-20 BOX IRRESPECTIVE OF LOCATION (REFER TO DRAWING 1-L-414).
5. BOX FOR PRIMARY/SECONDARY 36" x 60" x 42" (REFER TO DRAWING 1-L-619)
6. PROVIDE AT 3 FT. OF STRAIGHT CONDUIT RUNS BEFORE ANY BENDS IS ALLOWED

VENDOR NAME	SIZE	A	B	C	D	E	F	G
UTILITY VAULT *	SECONDARY 17"x30"x30"	17"	30"	30"	12"	25"	38"	2.5"
UTILITY VAULT *	SECONDARY 24"x36"x36"	24"	36"	36"	12"	32"	45"	2.5"

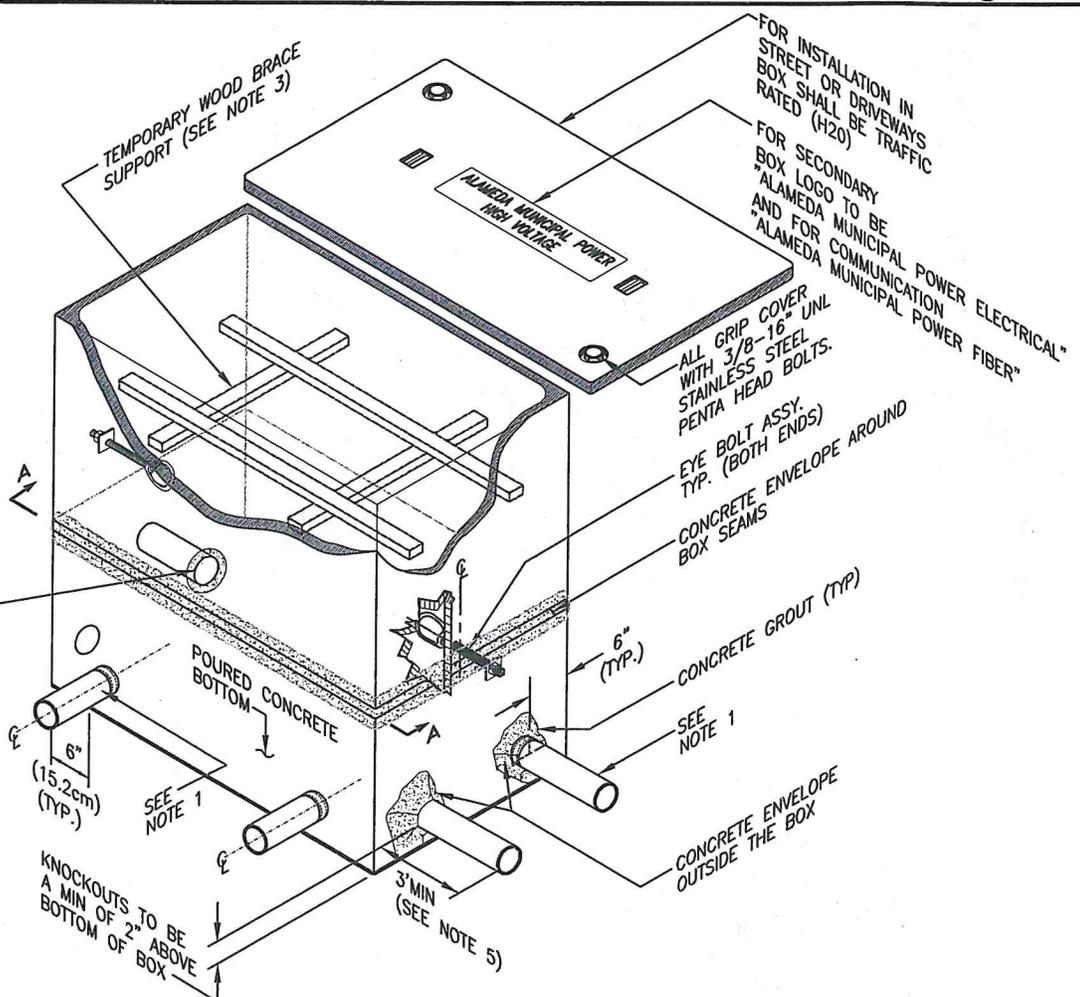
* OR OTHER APPROVED MANUFACTURER



TITLE : CONCRETE PRIMARY/SECONDARY BOX DETAILS FULL TRAFFIC RATED (H20) BOX & COVER			
DRAWN :	L.V. ANCHETA	DATE: NOV. 06, 2019	DWG. NO. :
REVIEWED:			1-L-513
APPROVED:			REV. 9
SCALE : NTS			SHT 1 OF 1

M:\PwrDwgs\WorkOrder\ConstructionStd\1-L405.dwg November 01, 2019

REV	DESCRIPTION	BY	DATE
1	ADDED ITEM 2	jmu	3/11/02
2	ADDED ITEM 3	jmu	5/3/02
3	ADDED COVER CATALOG #.	jmu	9/9/03
4	ADDED NOTE 4	CB	10/15/03
5	ADDED NEW 36"x60" BOX	J.U.	6/30/04
5	ADDED EYE BOLT	J.U.	4/22/05
6	UPDATED SECTION	C.B.	4/10/06
7	CHANGE CO. NAME	T.N.	11/20/09
8	UPDATED CAT NO.	T.N.	11/01/19

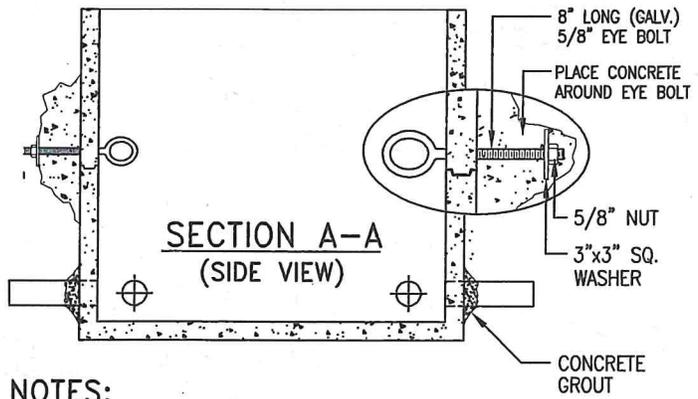


CONDUIT TERMINATION SHOULD BE FLUSHED INTO THE BOX. ALL CONDUITS TO BE TERMINATED WITH END-BELLS INSIDE THE BOX

POURED CONCRETE
6" (15.2cm) (TYP.)
SEE NOTE 1

KNOCKOUTS TO BE A MIN OF 2" ABOVE BOTTOM OF BOX

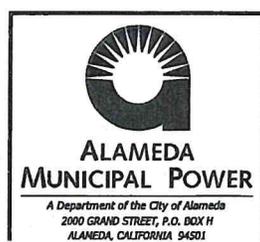
BOX SIZE	VENDOR/MFR *	CATALOG No.	
		BOX	COVER
SECONDARY 17"x30"x26" (43.2x76.2x66.0)	QUAZITE	PG1730BA18 PG1730BA08	PG1730HA00E81P
	OLD CASTLE (CARSON)	1730-18 1730-08	1730-P1
	NEW BASIS	PCA173018-90081	
SECONDARY 24"x36"x36" (61x91.4x91.4)	QUAZITE	PG2436BA18 (2 EA.)	PG2436HA00E81P
	OLD CASTLE (CARSON)	2436-18 (2 EA.)	2436-P1
	NEW BASIS	PCA243636-90140	
PRIMARY/SECONDARY 30"x48"x36" (76.2x121.9x91.4)	QUAZITE	SEC PRI PG3048BA18 (2 EA.)	PG3048HA00E81P PG3048HA00L91P
	OLD CASTLE (CARSON)	3048-18 (2 EA.)	3048-P1 (ONE-PIECE)
	NEW BASIS	PCA304836-90218	
PRIMARY/SECONDARY 36"x60"x36" (91.4x152.4x91.4)	QUAZITE	SEC PRI PG3660BA18 (2 EA.)	PG3660HA00E81P PG3660HA00L91P
	OLD CASTLE (CARSON)	3660-18 (2 EA.)	3660-P1 (TWO PIECE)
	NEW BASIS	PCA366036-90130	



NOTES:

1. ACTUAL NUMBER & LOCATION OF CONDUIT ENTRIES INTO THE BOX WILL BE DETERMINED IN THE FIELD BY ALAMEDA MUNICIPAL POWER (AMP) COMPLIANCE INSPECTOR.
2. CONDUIT ENTRIES INTO THE BOX SHALL BE AT BOX PERIMETERS TO MAXIMIZE BENDING RADIUS OF FUTURE CABLE INSTALLATION.
3. BOX SHALL BE INSTALLED OVER MATERIAL COMPACTED TO 90% MIN. USE TEMPORARY WOOD BRACE SUPPORT IN THE INTERIOR DURING COMPACTION.
4. BOX & COVER SHALL MEET OR EXCEED THE ANSI/SCTE 77 TIER15 OR "UL TIER 10" DESIGN & TEST LOAD REQUIREMENTS.
5. PROVIDE AT LEAST 3 FT. OF STRAIGHT CONDUIT RUNS BEFORE ANY CONDUIT BENDS IS ALLOWED

* OR OTHER APPROVED MANUFACTURER



TITLE : POLYMER-CONCRETE PRIMARY/SECONDARY BOX DETAILS FOR SIDEWALK & PLANTER APPLICATIONS (SIDE-ENTRY)			
DRAWN :	L.V. ANCHETA	DATE: NOV. 01, 2019	DWG. NO. :
REVIEWED:	<i>[Signature]</i>		1-L-447
APPROVED:	<i>[Signature]</i>		REV. 8
SCALE : NTS			SHT 1 OF 1

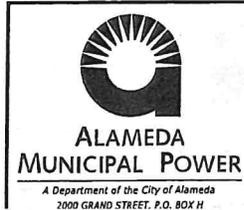
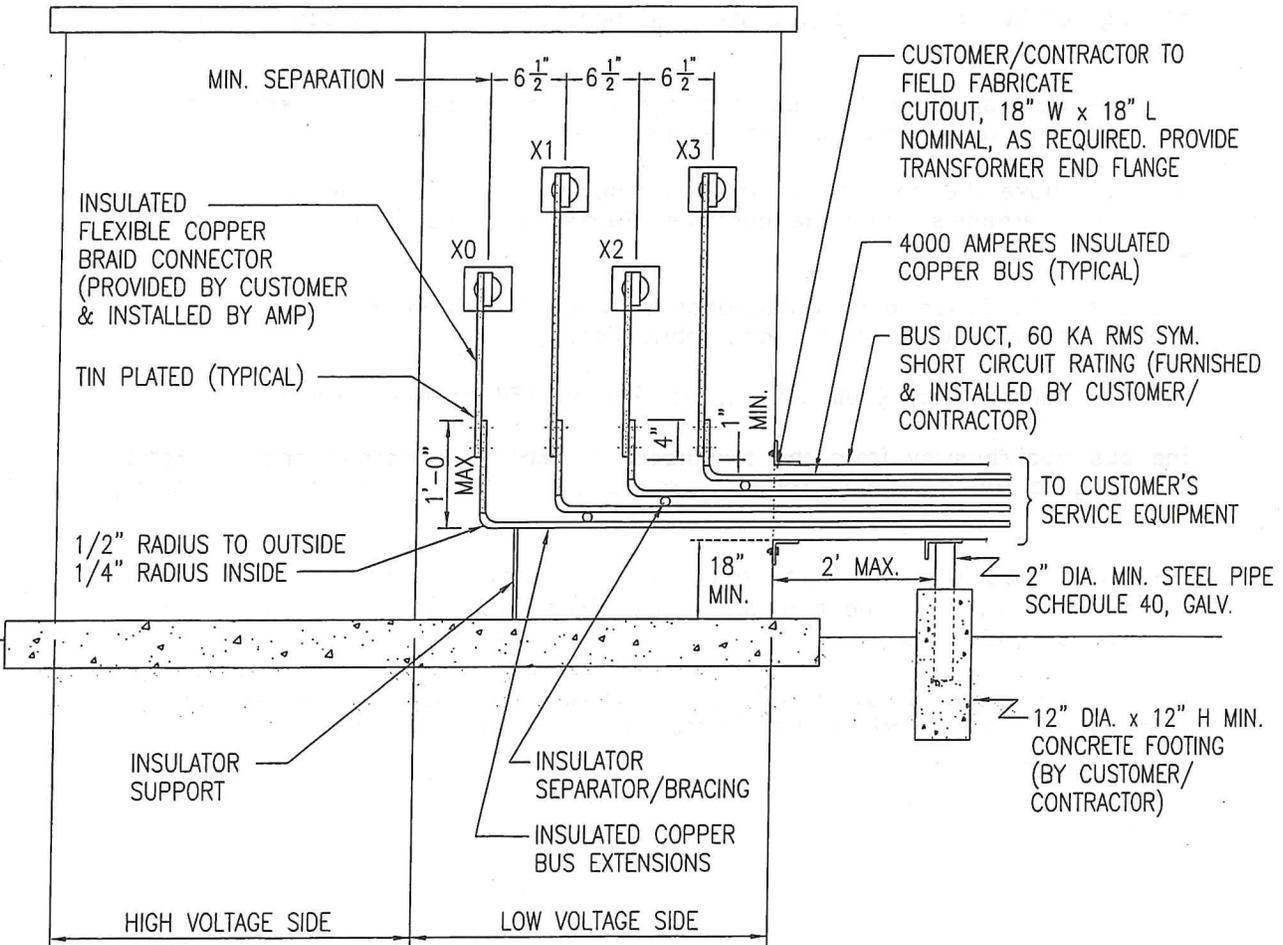
ENGINEERING&OPERATION\ENGINEER DRAWINGS\PrwDwgs\WorkOrder\Construction Standard\Material & Inst Criteria\UG Elect System\1L447.dwg

City of Alameda, California
Alameda Municipal Power

BUS DUCT REQUIREMENTS FOR 2,500 KVA PAD-MOUNTED TRANSFORMERS

For secondary services larger than 3,000 Amperes up to 4,000 Amperes, the Alameda Municipal Power (AMP) will require the customer to provide and install a copper bus duct sized per National Electrical Code. The customer will be responsible for the bus duct installation and maintenance. Customer shall coordinate bus duct maintenance with AMP so that AMP could perform the necessary switching to deenergize its transformer.

REV	DESCRIPTION	BY	DATE
1	AP&I WAS BUREAU	JU	01/02/02
2	CLARIFY NOTES	T.T.	5/9/06
3	CHANGE CO. NAME	T.N.	11/25/09



TITLE :				
BUS DUCT REQUIREMENTS FOR 2,500 KVA PAD-MOUNTED TRANSFORMERS				
DRAWN :	L.V. ANCHETA	DATE: NOV. 25, 2009	DWG. NO. :	REV.
REVIEWED:	jmu	<i>[Signature]</i>	1-L-432	3

REV	DESCRIPTION	BY	DATE
1	REVISED GEN. NOTES	JU	01/02/02
2	CHANGE CO. NAME	T.N.	11/25/09

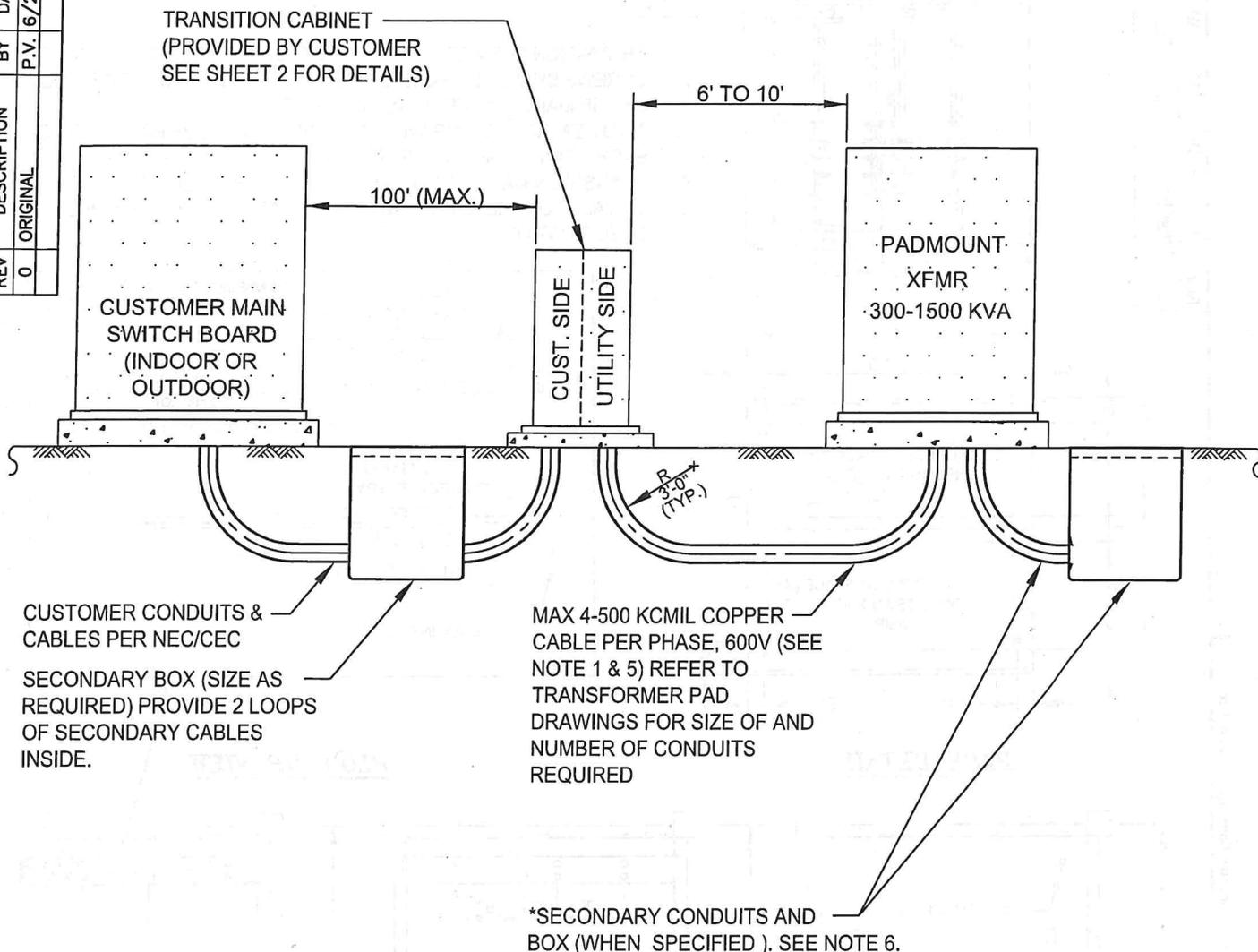
GENERAL NOTES:

1. The customer shall provide sufficient copper bus duct length, including flanged ends, elbows and straight sections as required, from the customer's switchgear to the point of attachment at the secondary compartment of Alameda Municipal Power (AMP) transformer.
2. The customer shall also supply tie straps, insulated bus extensions, necessary bracing for bus extensions and insulated flexible copper braid connectors, as required.
3. The bus duct shall be installed in a horizontal configuration. Top entry of bus duct into the transformer will not be permitted.
4. AMP will make the connections from the bus extensions to the transformer secondary terminals using the customer-furnished insulated flexible copper braid connectors.
5. The bus duct design and configuration shall be submitted to AMP for review and approval prior to procurement and fabrication.
6. The bus duct/busway shall conform to Section 364 of the National Electrical Code.
7. The bus duct/busway from the switchgear to AMP's transformer shall be rated according to the service entrance overcurrent protection device and fabricated per ANSI 37.23.
8. Customer's electrical contractor shall field fabricate/cut a rectangular hole in AMP's transformer for the bus duct entry. Contractor shall provide a suitable transformer end flange.
9. To facilitate future removal/replacement of AMP's transformer, the bus duct shall be supported at no farther than 2 feet from the side of the transformer it is connected to.

4:\PwrDwgs\Work\ -ConstructionStd\1L432-2.dwg November 25, 2009

 ALAMEDA MUNICIPAL POWER <small>A Department of the City of Alameda 2000 GRAND STREET, P.O. BOX 11 ALAMEDA, CALIFORNIA 94501</small>	TITLE :			
	BUS DUCT REQUIREMENTS FOR 2,500 KVA PAD-MOUNTED TRANSFORMERS			
	DRAWN :	J.V. ANCHETA	DATE: NOV. 25, 2009	DWG. NO. :
	REVIEWED:	<i>[Signature]</i>	<i>[Signature]</i>	1-L-432
APPROVED:	<i>[Signature]</i>		REV. 2	
SCALE : NTS			SHT 2 OF 2	

REV	DESCRIPTION	BY	DATE
0	ORIGINAL	P.V.	6/28/2018



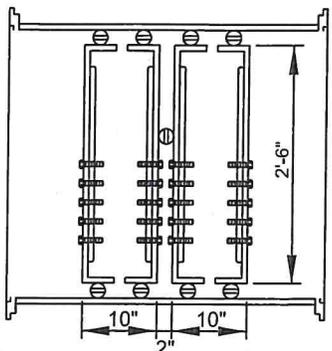
NOTES:

1. AMP SHALL FURNISH, INSTALL AND CONNECT THE SERVICE LATERAL CONDUCTORS BETWEEN THE TRANSITION CABINET AND TRANSFORMER SECONDARY TERMINALS.
2. CUSTOMER SHALL INSTALL CABLES FROM THE TRANSITION CABINET TO THE MAIN SWITCHBOARD.
3. THE DESIGNATED SERVICE POINT SHALL BE THE CUSTOMER OWNED AND SUPPLIED TRANSITION CABINET.
4. THE TRANSITION CABINET SHALL BE FABRICATED PER SHT. 2 OR APPROVED EQUIVALENT.
5. AMP WILL PROVIDE LUGS ON THE TRANSFORMER SECONDARY TERMINALS. CUSTOMER SHALL PROVIDE/INSTALL LUGS AND TERMINATE CABLES AT SWITCHGEAR AND TRANSITION CABINET.
6. AMP MAY REQUIRE ADDITIONAL SECONDARY CONDUIT AND BOX FOR SECONDARY DISTRIBUTION USE.

ENGINEERING&OPERATIONS\ENGINEER DRAWINGS\PowerDwgs\WorkOrder\Construction Standard\Miscellaneous Cons... sion Standard\1-L-620.1.dwg

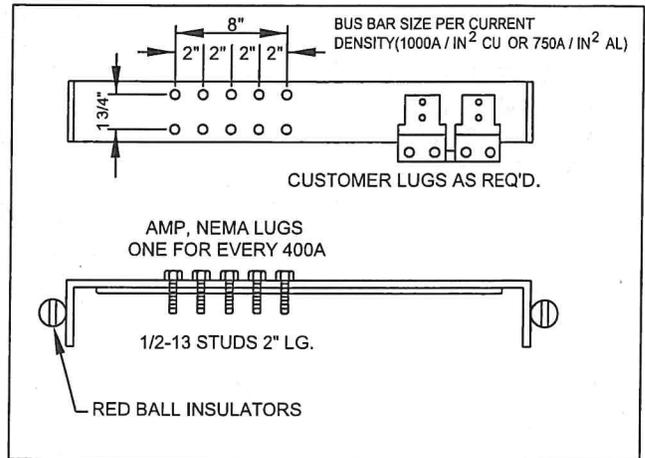
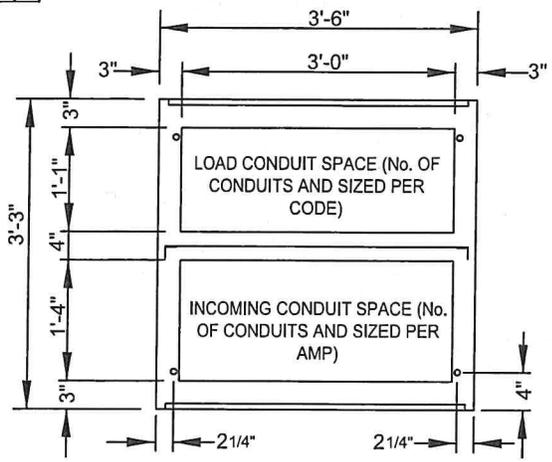
 ALAMEDA MUNICIPAL POWER <small>A Department of the City of Alameda</small>	TITLE :			SECONDARY SERVICE TRANSITION CABINET SERVICE SIZE LARGER THAN 800A	
	DRAWN : REVIEWED:	L.V. ANCHETA 	DATE: JULY 09, 2018	DWG. NO. : 1-L-620	REV. 0

REV	DESCRIPTION	BY	DATE
0	ORIGINAL	P.V.	6/29/18



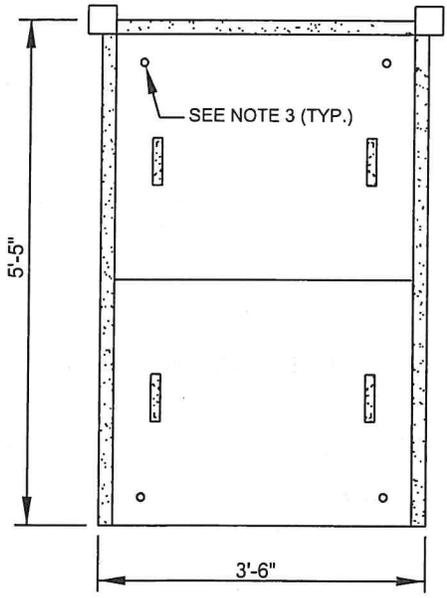
NOTES:

1. TRANSITION CABINET SHALL BE FREE STANDING AND NEMA 3R TYPE.
2. SCREWS SHALL BE PROVIDED FOR THE TRANSITION CABINET COVERS BY THE MANUFACTURER AS REQUIRED.
3. TWO SEALABLE STUDS WITH WING NUTS SHALL BE PROVIDED FOR EACH TRANSITION CABINET COVER.
4. TRANSITION CABINET WILL BE I.E.M. OR APPROVED EQUIVALENT
5. INSTALL CONCRETE PAD AND PLACE PAD PER MANUFACTURERS SPECIFICATION.

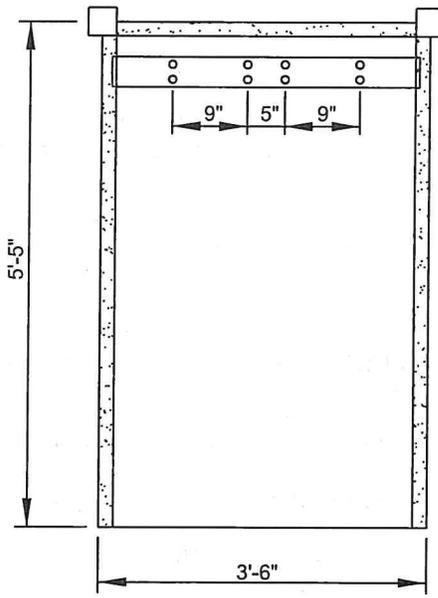


BASE DETAIL

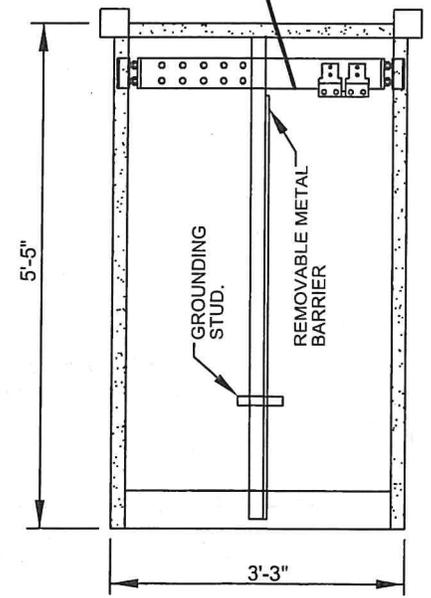
BLOW UP VIEW



FRONT VIEW



FRONT INTERIOR VIEW



SIDE VIEW

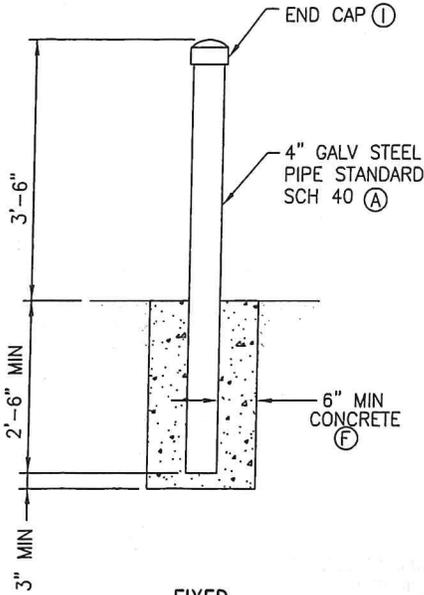
TYPICAL TRANSITION CABINET FOR LARGER SERVICES

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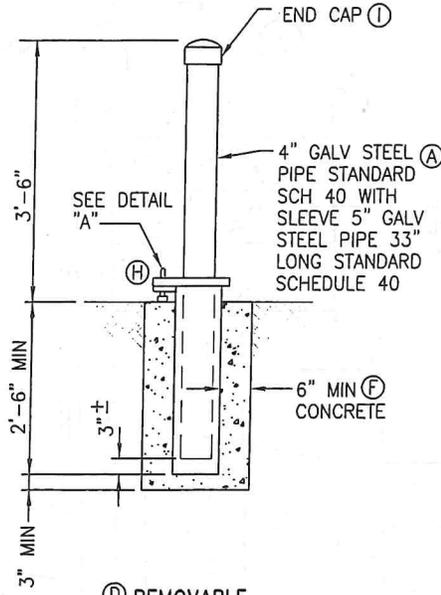
ALAMEDA MUNICIPAL POWER
 A Department of the City of Alameda
 2000 GRAND STREET, P.O. BOX H
 ALAMEDA, CALIFORNIA 94501

TITLE :			
TRANSITION CABINET DETAILS			
DRAWN :	LV, ANCHETA	DATE: JULY 09, 2018	DWG. NO. :
REVIEWED:			1-L-620
APPROVED:			REV. 0
SCALE : NTS		SHT 2 OF 2	

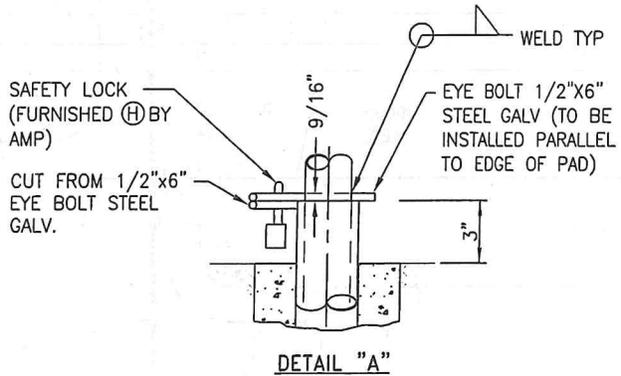
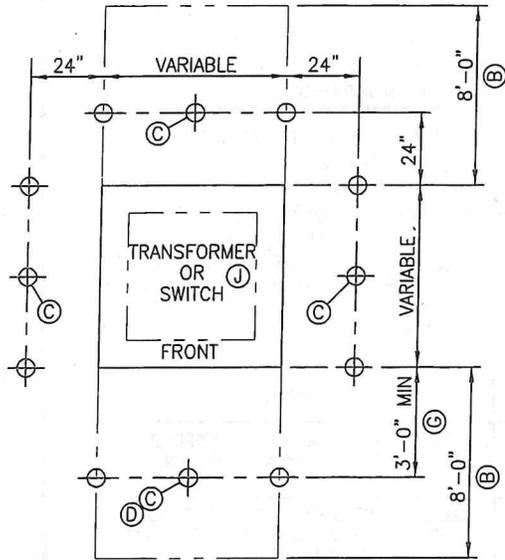
REV	DESCRIPTION	BY	DATE
1	REV. SPELLING	C.B.	4/10/06
2	CLARIFY NOTE "B"	T.T.	5/9/06
3	CHANGE CO. NAME	T.N.	11/20/09



**FIXED
STEEL POST DETAIL**



**REMOVABLE
STEEL POST DETAIL**

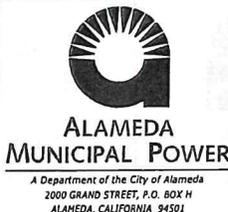


INSTALLATION NOTES:

- (A) USE 4 INCH GALVANIZED STEEL PIPE, WITH STANDARD SCHEDULE 40. THE PIPE SHALL BE PRIMED AND PAINTED YELLOW.
- (B) PROVIDE AN 8 FOOT MINIMUM CLEARANCE FROM ANY ABOVE GROUND OBJECT IN FRONT, AND BACK WHERE NECESSARY, OF THE PAD WHERE THE EQUIPMENT DOOR OPENS FOR HOT STICK OPERATION.
- (C) WHEN USING THE LARGEST TRANSFORMER PAD OR SWITCH PAD, ADDITIONAL BARRIERS ARE REQUIRED AS SHOWN.
- (D) ANY ADDITIONAL BARRIERS REQUIRED IN FRONT OF THE EQUIPMENT DOORS MUST BE REMOVABLE.
- (F) THE CONCRETE ENCASEMENT SHALL BE A MINIMUM OF 6 INCHES THICK.
- (G) MAY BE REDUCED TO 24 INCHES IF ALL THE BARRIER POSTS IN FRONT OF THE EQUIPMENT DOORS ARE REMOVABLE.
- (H) INSTALL PROVISION FOR SAFETY LOCK.
- (I) INSTALL WELDED END CAP AT THE TOP OF BARRIER POSTS.
- (J) PAD-MOUNTED SWITCHES HAVE DOORS IN BOTH FRONT AND BACK AND REQUIRE A 36" MINIMUM CLEARANCE. PLACE BARRIER POSTS PROPERLY TO ALLOW DOORS TO BE OPENED.

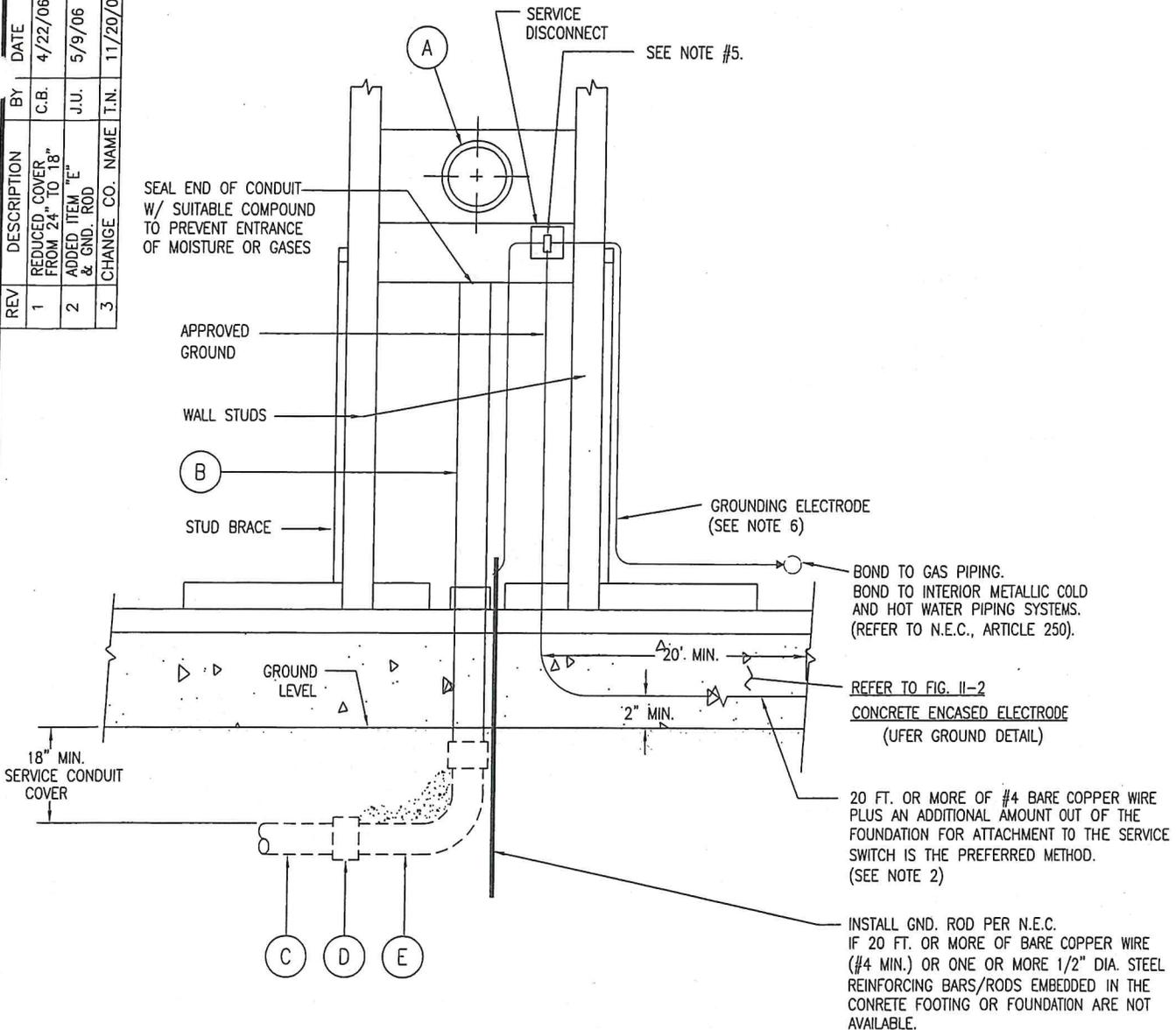
GENERAL NOTES:

1. THIS STANDARD SHOWS BARRIER POSTS REQUIRED TO PROTECT PAD-MOUNTED EQUIPMENT FROM VEHICULAR DAMAGE. BARRIER POST LOCATIONS SHALL BE APPROVED BY ALAMEDA MUNICIPAL POWER (AMP) CONSTRUCTION INSPECTOR.
2. TRAFFIC POSTS ARE NOT NECESSARY IF ABOVE GROUND OBJECTS EXIST WHICH PROTECT PAD MOUNTED EQUIPMENT FROM VEHICULAR TRAFFIC.
3. CAUTION MUST BE TAKEN WHEN INSTALLING BARRIER POSTS ENSURING THAT THEY DO NOT MAKE CONTACT WITH ANY UNDERGROUND UTILITIES.
4. CALL "UNDERGROUND SERVICE ALERT" (U.S.A.) 1-800-227-2600 TWO WORKING DAYS BEFORE YOU DIG TO VERIFY THE LOCATION OF UNDERGROUND UTILITIES.



TITLE :			
EQUIPMENT BARRIER PROTECTION & CLEARANCES			
DRAWN :	LV ANCHETA	DATE: NOV. 20, 2009	DWG. NO. :
REVIEWED:	[Signature]		1-L-427
APPROVED:	[Signature]		REV. 3
SCALE : NTS			SHT 1 OF 1

REV	DESCRIPTION	BY	DATE
1	REDUCED COVER FROM 24" TO 18"	C.B.	4/22/06
2	ADDED ITEM "E" & GND. ROD	J.U.	5/9/06
3	CHANGE CO. NAME	T.N.	11/20/09

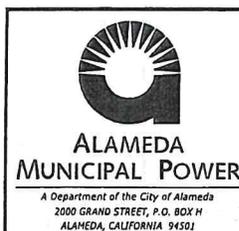


NOTES :

- BONDING JUMPER REQUIRED BETWEEN INTERNAL GAS PIPING AND WATER PIPING. BRASS CLAMPS ARE REQUIRED FOR ALL CONNECTIONS.
- CONCRETE ENCASED ELECTRODE (UFER) REQUIRED ON NEW BUILDINGS AND BUILDING WITH NEW FOUNDATIONS.
- MINIMUM CONDUCTOR SIZE TO BE #4 CU. OR #2 AL. THW OR EQUIVALENT.
- 120/208 VOLT SYSTEMS REQUIRE A 5-JAW METER AND #2 CU. OR #1 AL. FOR 100 AMPS.
- IF NEUTRAL BUS IS INSULATED FROM ENCLOSURE, INSTALL A BONDING JUMPER OR SCREW. REFER TO THE LATEST REVISION OF THE N.E.C., ARTICLE 250.
- REFER TO THE LATEST REVISION OF THE N.E.C., ARTICLE 250 FOR TYPE AND SIZE OF MATERIAL AND PROTECTION OF THE GROUNDING ELECTRODE CONDUCTOR.

ITEM	DESCRIPTION
A	METER MOUNTING DEVICE. SEE APPROVED LIST IN METER REQUIREMENTS SECTION.
B	UNDERGROUND SERVICE ENTRANCE CONDUIT. RIGID GALVANIZED STEEL OR PVC SCH. 40. PER N.E.C., ARTICLE 300.
C	UNDERGROUND CONDUIT. HOT-DIPPED GALVANIZED RIGID STEEL OR PVC, 2" MIN.
D	PLASTIC TO STEEL ADAPTER, IF PLASTIC CONDUIT IS USED IN ITEM #c.
E	METAL ELBOW PERMITTED TO BE UNGROUNDED PROVIDED IT IS ISOLATED FROM POSSIBLE CONTACT BY AT LEAST 18" OF COVER TO ANY PART OF THE ELBOW.

4:\PwrDwgs\WorkOr -ConstructionStd\1L452.dwg November 20, 2009



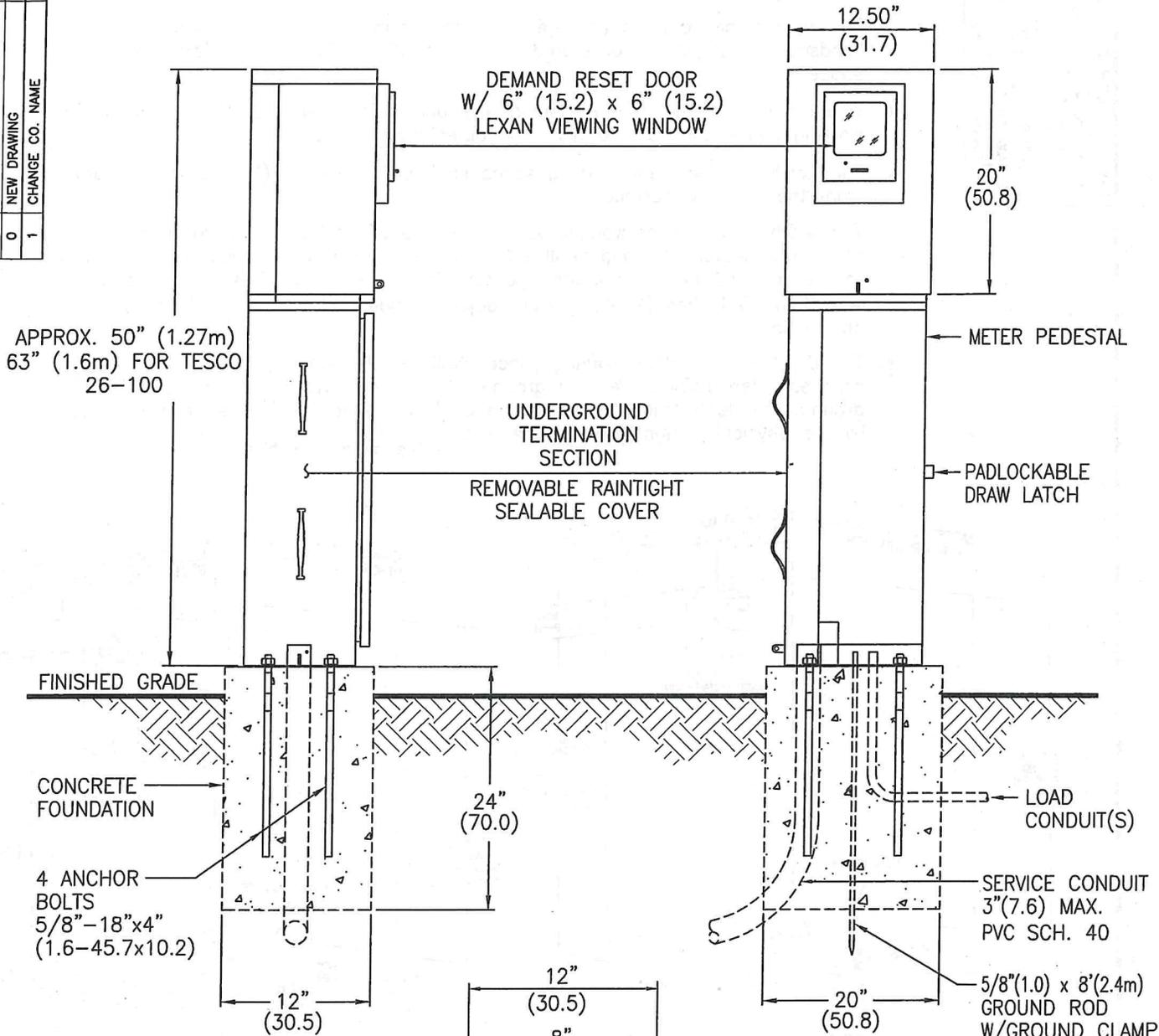
TITLE :			
TYPICAL RESIDENTIAL UNDERGROUND SERVICE 100 AMPERES, 120/240 VOLTS, 1-PHASE			
DRAWN :	J.V. ANCHETA	DATE: NOV. 20, 2009	DWG. NO. :
REVIEWED:	<i>[Signature]</i>		1-L-452
APPROVED:	<i>[Signature]</i>		REV. 3
SCALE : NTS			SHT 1 OF 1

ENGINEERING & OPERATION DRAWINGS \ PwrDwgs \ WorkOrder \ L \ Construction Standard \ Mater. \ & Inst Criteria UG Elect System \ 1L541.dwg

REV	DESCRIPTION	BY	DATE
0	NEW DRAWING	CB	07/01/04
1	CHANGE CO. NAME	T.N.	11/20/08

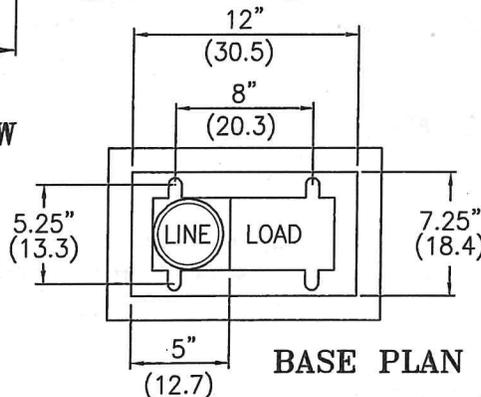
METERING SECTION
HOOD FRONT-TOP
& SIDES HINGED

METER SOCKET (100 AMP MIN.)
FACTORY WIRED FROM LINE
LANDING LUGS TO METER SOCKET
IN A SEPARATE WIREWAY



SIDE VIEW

FRONT VIEW

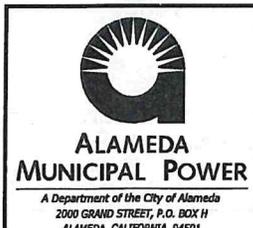


BASE PLAN

NOTES:

- METERING PEDESTAL MAY BE USED FOR STREETLIGHTING, PARK LIGHTING, IRRIGATION, PUMP STATIONS, ETC.
- EQUIPMENT SHALL MEET ALL EUSERC REQUIREMENTS.
- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS IN PARENTHESES ARE IN CENTIMETERS.
- CALL ALAMEDA MUNICIPAL POWER (AMP) FOR INSPECTION BEFORE POURING CONCRETE, TEL. 510-748-3943

MFG	CATALOGUE NO.		
TESCO	26-000	26-100	27-100
MILBANK	MPRV-100-78		
STRONG BOX	MPS-A16-10K MPS-C20-10K MPS-A106-10K		



TITLE :

**TYPICAL 100-AMPERE
SINGLE-PHASE METERING PEDESTAL**

DRAWN :	L.Y. ANCHETA	DATE: MAY 06, 2020	DWG. NO.:	REV.
REVIEWED:	[Signature]		1-L-541	1
APPROVED:	[Signature]		SCALE: NTS	SHT 1 OF 1

METER WORKING SPACE

Working space in front of the meter permits access to the metering installation and provides a safe working environment for personnel. A working space entirely on the property of the customer is required in front of all meters.

- a. The working space is to be kept clear and unobstructed at all times. Landscaping, structures or stored material shall not intrude into the working space.
- b. When meters or metering equipment are placed in cabinet enclosures, the clear working space shall extend from the outer face of the cabinet.
- c. The height of the clear working space shall be 75 inches (190.5cm) minimum from the standing surface.
- d. The width of the clear working space shall be 30 inches (76.2cm) minimum on one-meter installation and shall extend the additional width necessary for access to the total number of metering panels. Centerline of any meter shall not be less than 10 inches (25.4cm) from adjacent side wall or other protruding obstruction.
- e. The depth of the clear working space shall be 36 inches (91.5cm) minimum services rated 150V or less to ground. When the service is in excess of 150V to ground, the depth shall be as require applicable electrical codes or as dictated by the physical design and arrangement of the metering cubicles.

REV	DESCRIPTION	BY	DATE
1	CHANGED 78" TO 75" MAX. AND 66" TO 48" MIN. AND 30" WIDE TO 36"	jmu	5/3/02
2	REV. DIMENSIONS & NOTES	C.B.	8/20/03
3	ADD NOTE 4	C.B.	10/26/05
4	CHANGE CO. NAME	T.N.	11/20/09

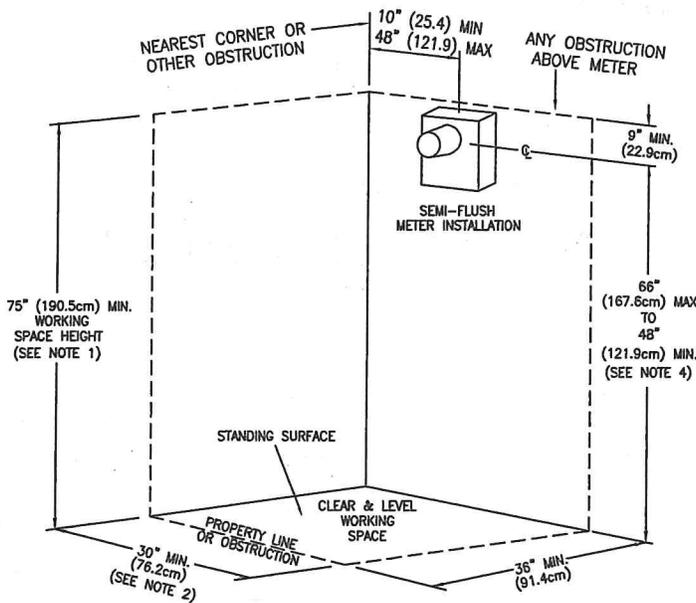


FIGURE 2
SEMI-FLUSH METER INSTALLATION

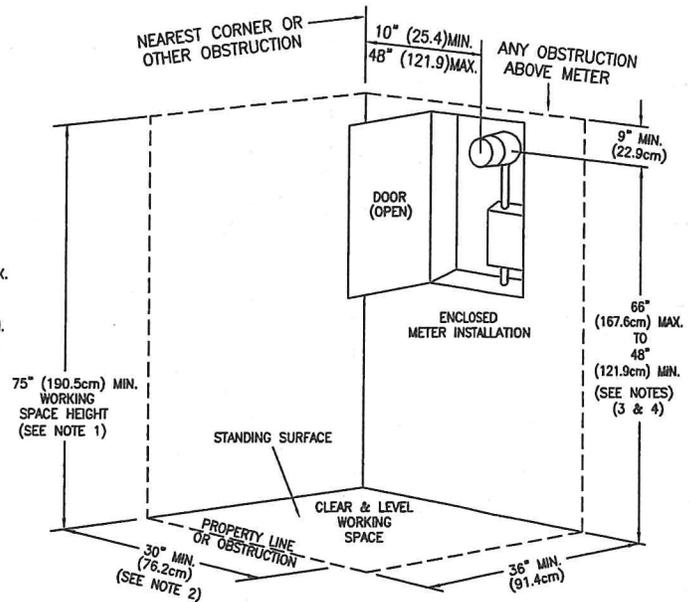
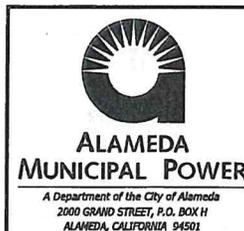


FIGURE 3
ENCLOSED METER INSTALLATION

NOTES:

1. 78" (198.12cm) MINIMUM REQUIRED FOR OTHER THAN INDIVIDUAL FIELD-INSTALLED METER PANELS
2. TO ALLOW THE CABINET DOOR TO OPEN FULLY (90° OR MORE). THE 30" (76.2cm) MINIMUM WIDTH DIMENSION OF THE METER WORKING SPACE SHALL BE INCREASED AS NECESSARY.
3. EUSERC ALLOWS 36" (91.4) MINIMUM AND 75" (190.5) MAXIMUM METER HEIGHT FOR FREE STANDING-FABRIY ASSEMBLED STRUCTURE (e.g. SWITCHBOARD OR METER PEDESTAL).
4. METER HEIGHT SHALL BE 72" (182.9cm) MINIMUM WHEN INSTALLED NEAR DRIVEWAY.

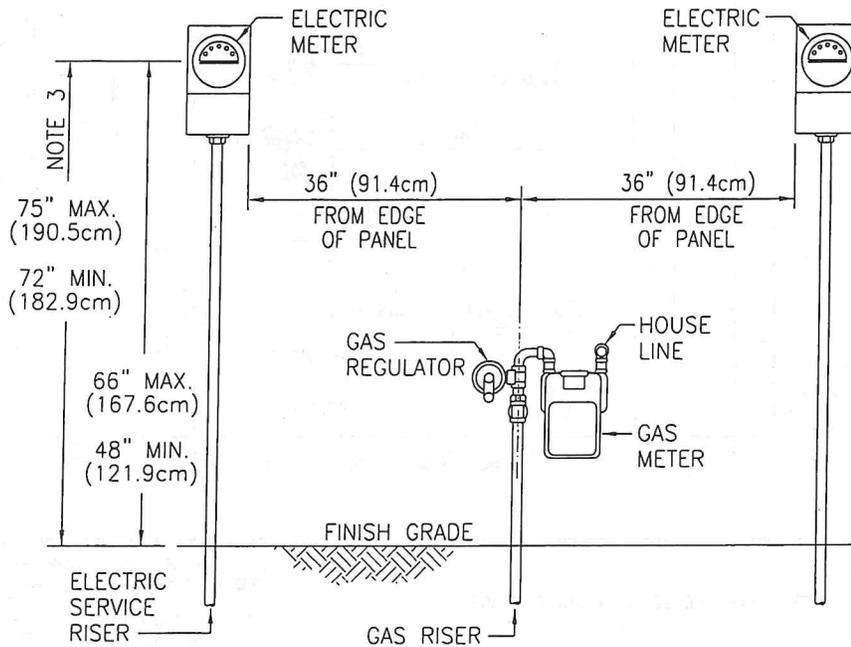


TITLE :				
METER WORKING SPACE				
DRAWN :	LVA/RCB	DATE: NOV. 20, 2009	DWG. NO. :	REV.
REVIEWED:	<i>[Signature]</i>		1-L-451	4
APPROVED:	<i>[Signature]</i>		SCALE : NTS	SHT <u>1</u> OF <u>1</u>

November 20, 2009

M:\PwrDwgs\WorkOrder\L_ConstructionStd\1L451.dwg

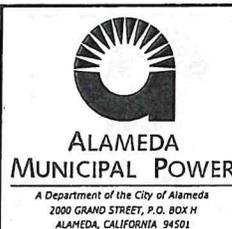
REV	DESCRIPTION	BY	DATE
1	CHANGED CO. NAME	T.N.	11/20/09
2	CHANGED REF. LINE FOR 10" CLEARANCE	L.S.	6/06/12
3	NEW CLEARANCES	J.U.	6/3/15
4	CORNER TWO DIAGRAM DIMENTION REMOVE	J.U.	7/21/15



REQUIRED MINIMUM SEPARATIONS AND CLEARANCES BETWEEN ELECTRICAL AND GAS METERS

NOTES:

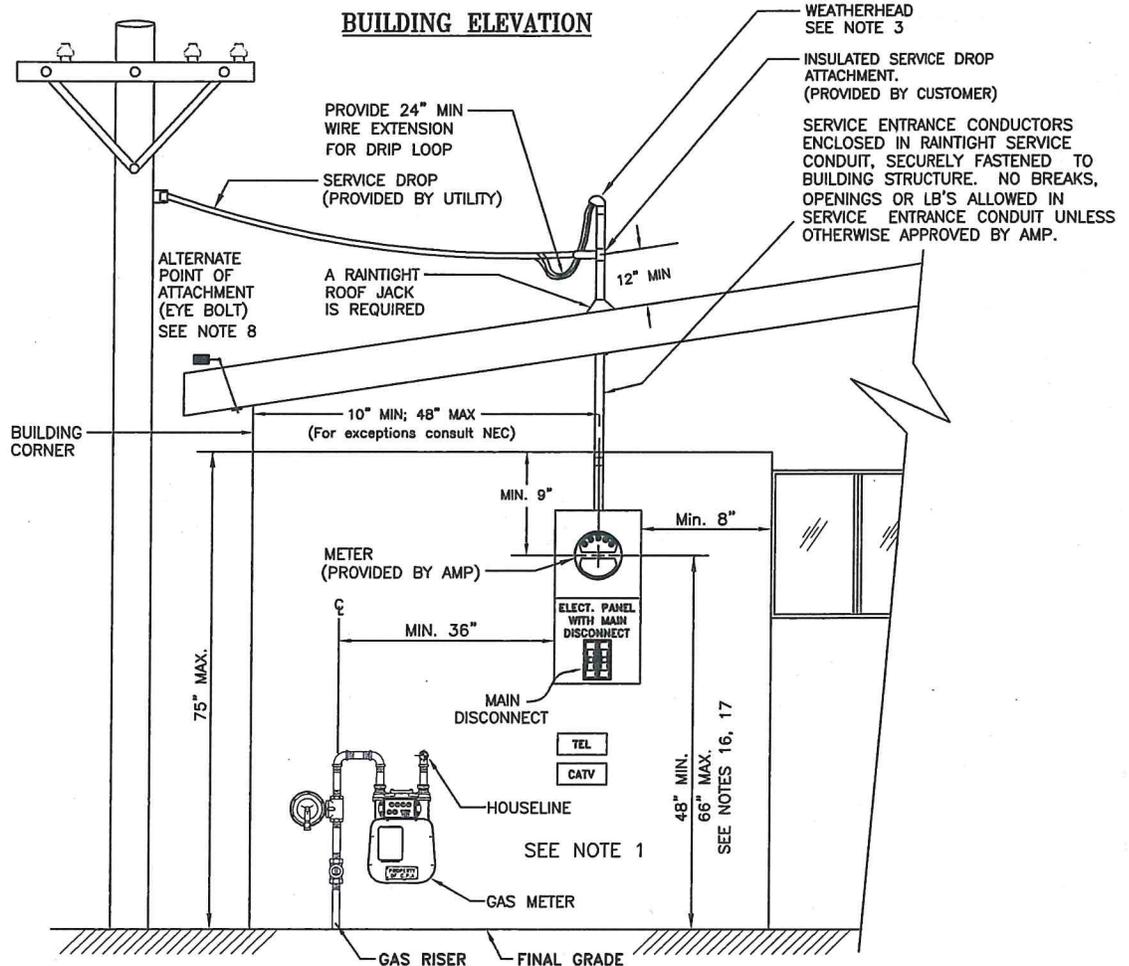
1. ELECTRIC METER PANEL LOCATIONS ARE SUBJECT TO ALAMEDA MUNICIPAL POWER (AMP) APPROVAL AND MUST COMPLY WITH THE ALAMEDA ELECTRICAL CODE REQUIREMENTS.
2. GAS METER LOCATIONS ARE SUBJECT TO GAS UTILITY'S APPROVAL.
3. INDIVIDUAL ELECTRIC METER WHEN INSTALLED NEAR A DRIVEWAY.



TITLE :			
REQUIRED MINIMUM SEPARATIONS AND CLEARANCES BETWEEN ELECTRICAL AND GAS METERS			
DRAWN :	L.V. ANCHETA	DATE: JULY 21, 2015	DWG. NO. :
REVIEWED:	<i>[Signature]</i>		1-L-535
APPROVED:	<i>[Signature]</i>		4
SCALE : NTS		SHT 1 OF 1	

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REV	DESCRIPTION	BY	DATE

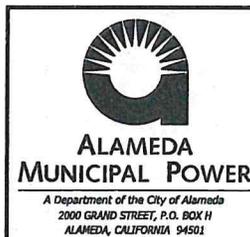


NOTES:

- NO OBSTRUCTIONS ARE PERMITTED WITHIN THE AREA AROUND THE METER, SEE DWG 1-L-451 FOR DETAILS.
- MAINTAIN A 30" WIDE X 36" DEEP CLEAR AND LEVEL WORKING SPACE IN FRONT OF THE ELECTRIC METER
- THE WEATHERHEAD SHALL BE LOCATED NO MORE THAN 24" FROM THE SERVICE ATTACHMENT POINT AND BETWEEN 18" AND 48" ABOVE THE ROOF, 24" TO 30" RECOMMENDED. IF THE PERISCOPE EXTENDS MORE THAN 30" ABOVE THE ROOF IT SHALL BE BRACED AGAINST THE SERVICE CONDUCTOR PULL.
- THE POINT OF ATTACHMENT MAY BE EITHER ON THE BUILDING WALL NEAR THE UTILITY LINE OR ON A PERISCOPE FIXED TO THE BUILDING'S ROOF NOT MORE THAN 18 INCHES BACK OF THE ROOFLINE.
- THE POINT OF ATTACHMENT SHALL BE BETWEEN 12 AND 18 FEET ABOVE GRADE AND SAFELY ACCESSIBLE BY LADDER. WORKING SPACE FOR A LADDER EQUAL TO A DEPTH OF 1/4 THE HEIGHT OF THE LADDER TOP SUPPORT IS REQUIRED.
- BRACING SHALL BE TWO GALVANIZED STEEL BRACES (3/4" RIGID STEEL PIPE OR 1-1/4" X 1-1/4" X 1/8" STEEL ANGLE IRON MINIMUM) SECURELY BOLTED OR LAGGED TO THE FRAMEWORK WITH 3/8" X 3" LAG SCREWS WITH A 90° SPREAD AND SECURED TO THE PERISCOPE NO MORE THAN 6" BELOW THE SERVICE POINT OF ATTACHMENT.
- ROOF CLEARANCES FOR THE SERVICE DROP MUST MEET THE REQUIREMENTS OF CEC ARTICLE 230.24.
- ONLY ELECTRICAL FACILITIES MAY BE ATTACHED TO THE ELECTRICAL WEATHERHEAD.
- ONLY THREADED PIPE COUPLINGS ARE ALLOWED (NO COMPRESSION COUPLINGS) AND BRACING IS REQUIRED BOTH ABOVE AND BELOW THE COUPLING.
- METER SOCKET CLEARANCE FROM THE GROUND SHALL BE MEASURED FROM THE FINAL GRADE
- WHERE LOAD REQUIRES HEAVY SERVICE DROP CONDUCTORS, THE SERVICE DROP WILL BE 3 SINGLE CONDUCTORS INSTEAD OF CABLE AND 3 EYEBOLTS OR INSULATED CLEVICES WILL BE REQUIRED.
- METER MOUNTING DEVICE SHALL HAVE A MAIN DISCONNECT IN THE SAME CABINET.
- FOR MORE DETAILED INFORMATION CONSULT AMP ELECTRIC SERVICE REQUIREMENTS.
- UNLESS OTHERWISE NOTED, ALL SERVICE FACILITIES ARE THE RESPONSIBILITY OF THE CUSTOMER.
- SERVICE ENTRANCE CONDUIT AND CABLE MUST MEET CEC REQUIREMENTS.
- PER CEC ARTICLE 404.8(A) THE HIGHEST POINT OF THE BREAKER HANDLE CANNOT BE MORE THAN 79" ABOVE GRADE/FLOOR.
- SEE AMP ENG STD DWG 1-L-624 FOR METER DETAILS ON METER INSTALLATIONS IN DRIVEWAYS.

RECOMMENDED SERVICE ENTRANCE CONDUCTOR

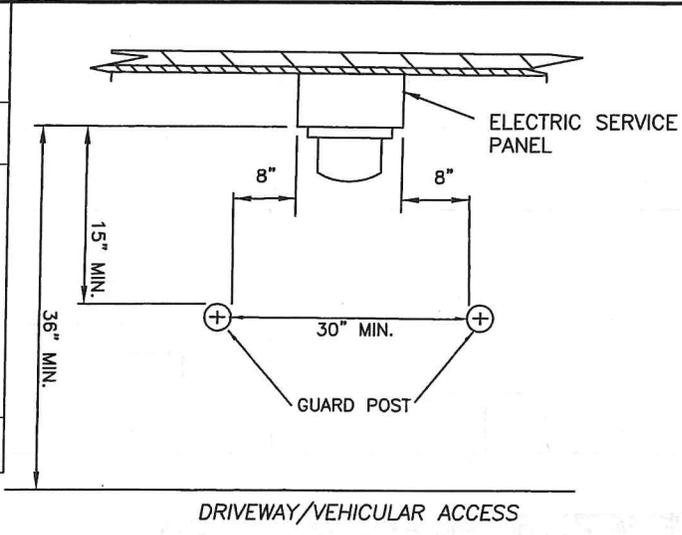
Service Voltage (Volts)	Main Service (Amps)	Customer's Minimum Conduit Size	Recommended Conductor Size	
			AL	CU
120/240 1-phase	100/125	1 1/4" - 2"	1/0	2
	200	2"	4/0	2/0
120/208 1-phase 3 wire	200	2"	4/0	2/0



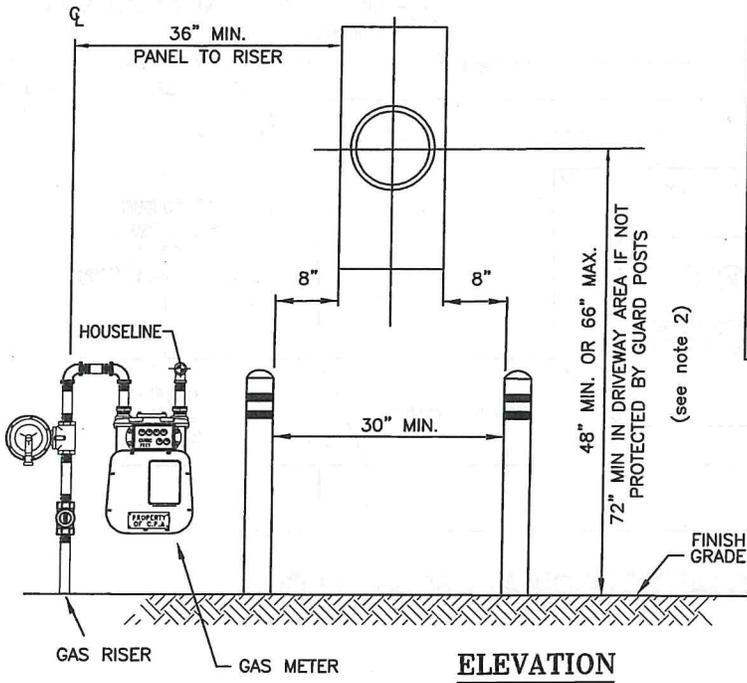
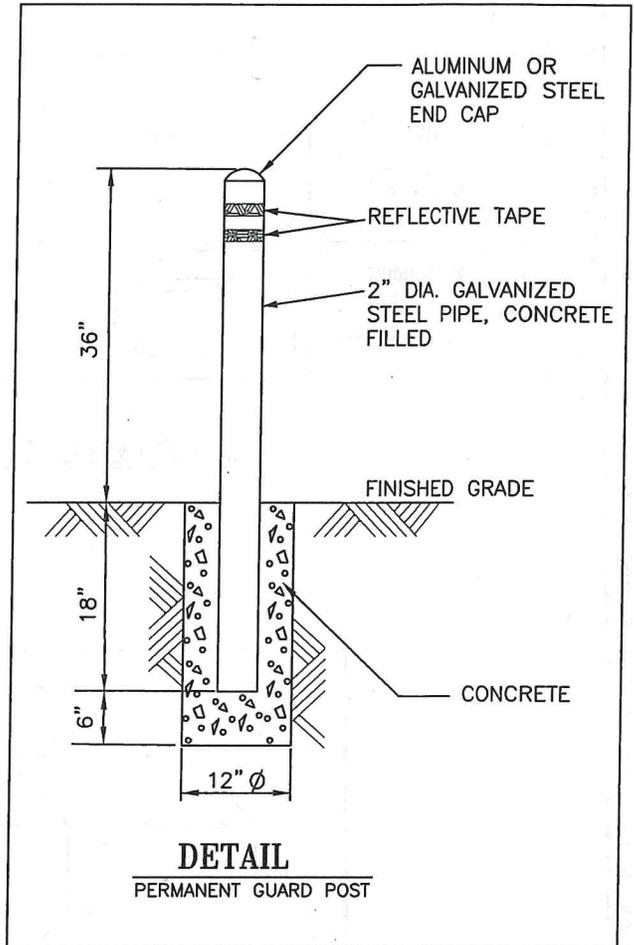
TITLE :			
TYPICAL OVERHEAD SERVICE INSTALLATION			
DRAWN :	L.V. ANCHETA	DATE: AUG. 7, 2019	DWG. NO.:
REVIEWED:	<i>[Signature]</i>		1-L-628
APPROVED:	<i>[Signature]</i>		REV. 0
SCALE: NTS		SHT 1 OF 1	

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REV	DESCRIPTION	BY	DATE



PLAN VIEW



NOTES:

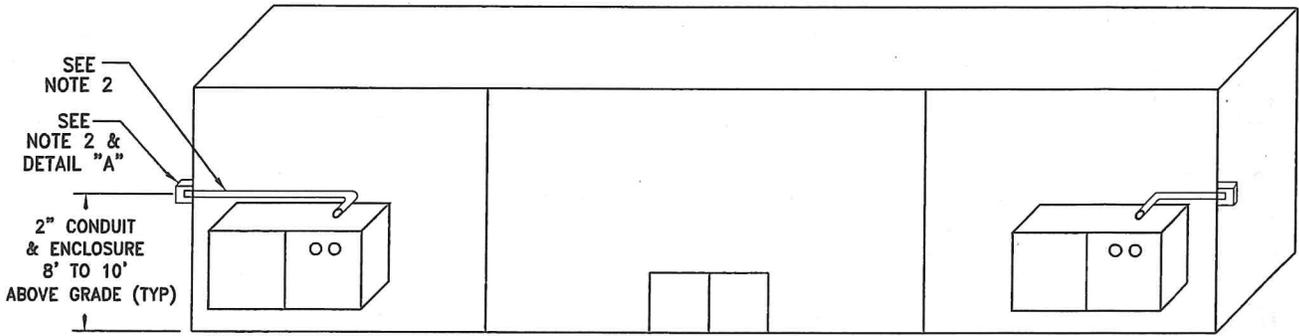
1. METERS INSTALLED IN LOCATIONS SUSCEPTIBLE TO VEHICULAR DAMAGE SHALL BE PROTECTED BY GUARD POSTS OR INSTALLED AT A SUITABLE HEIGHT TO PREVENT CONTACT.
2. PER CEC ARTICLE 404.8(A), THE HIGHEST POSITION OF THE BREAKER HANDLE MUST NOT BE MORE THAN 79" ABOVE GRADE/FLOOR.
3. THIS STANDARD IS FOR RESIDENTIAL INSTALLATIONS ONLY, NOT FOR MULTIFAMILY DWELLINGS.
4. PERMANENT FIXED POSTS ARE REQUIRED.

ALAMEDA MUNICIPAL POWER

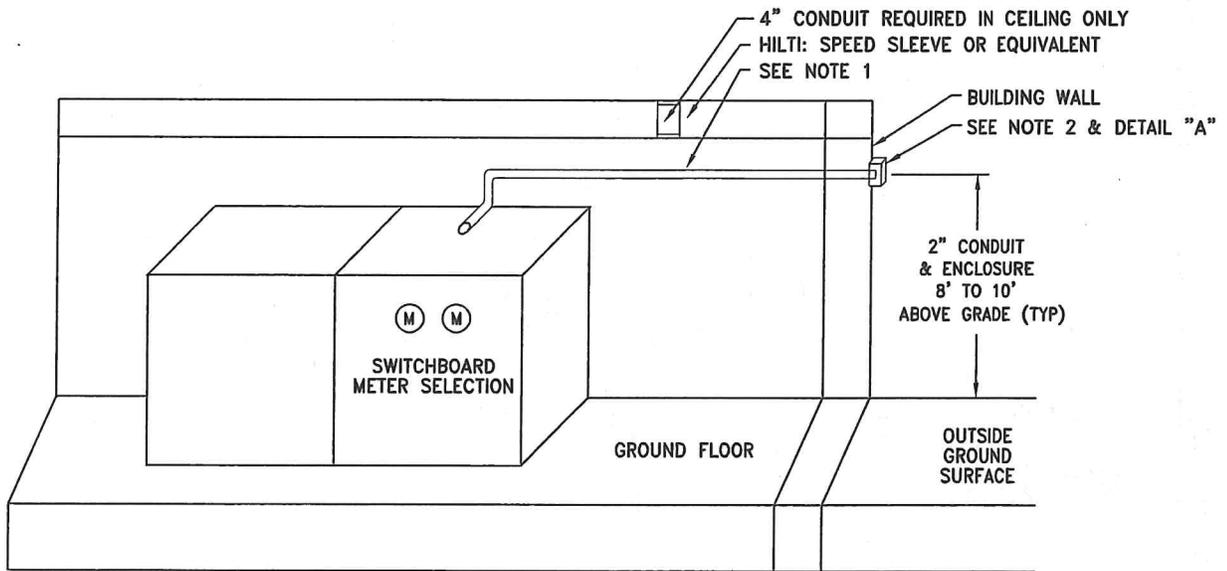
A Department of the City of Alameda
 2000 GRAND STREET, P.O. BOX H
 ALAMEDA, CALIFORNIA 94501

TITLE :				
METER INSTALLATION IN RESIDENTIAL DRIVEWAY				
DRAWN :	L.V. ANCHETA	DATE: NOV. 26, 2018	DWG. NO.:	REV.
REVIEWED:	<i>MG</i>	<i>UP</i>	1-L-624	0
APPROVED:	<i>DM</i>		SCALE: NTS	SHT 1 OF 1

REV	DESCRIPTION	BY	DATE
0	NEW DRAWING	TN	8/7/17



MULTIPLE ELECTRIC METER ROOMS AT GROUND FLOOR



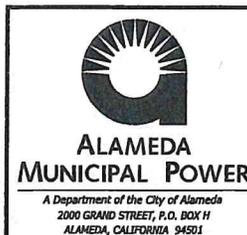
INDOOR ELECTRIC METER ROOM AT GROUND FLOOR

GENERAL NOTE:

ALL METER LOCATION SHALL COMPLY WITH ALAMEDA MUNICIPAL POWER RULES & REGULATIONS, NEC/CEC & AMP & CONSTRUCTION STANDARDS.

NOTES:

1. Install 2-inch rigid steel conduits from the top of the main meter service equipment to the termination enclosure outside of the building wall. The conduits may be installed in the walls, ceilings and concrete floors. It must not enter or pass through inside the service equipment. Provide 500 lbs of pulling tape placed inside the conduit to facilitate cable pulling. Provide 12"x 12"x 4" inch junction box when the conduit bends exceeds 270 degrees between end points or the total conduit run exceeds 300 feet. Conduit ends should be temporarily capped.
2. Provide and install 12"x 12"x 6" (min) NEMA 3R termination enclosure installed between 8 feet to 10 feet above grade. The termination enclosure shall have a lockable front door opening.
3. Provide and install dedicated 120VAC, 20ampere GFCI duplex receptacle in the NEMA 3R enclosure (installed per California Electrical Code) for the RF antenna power supply.

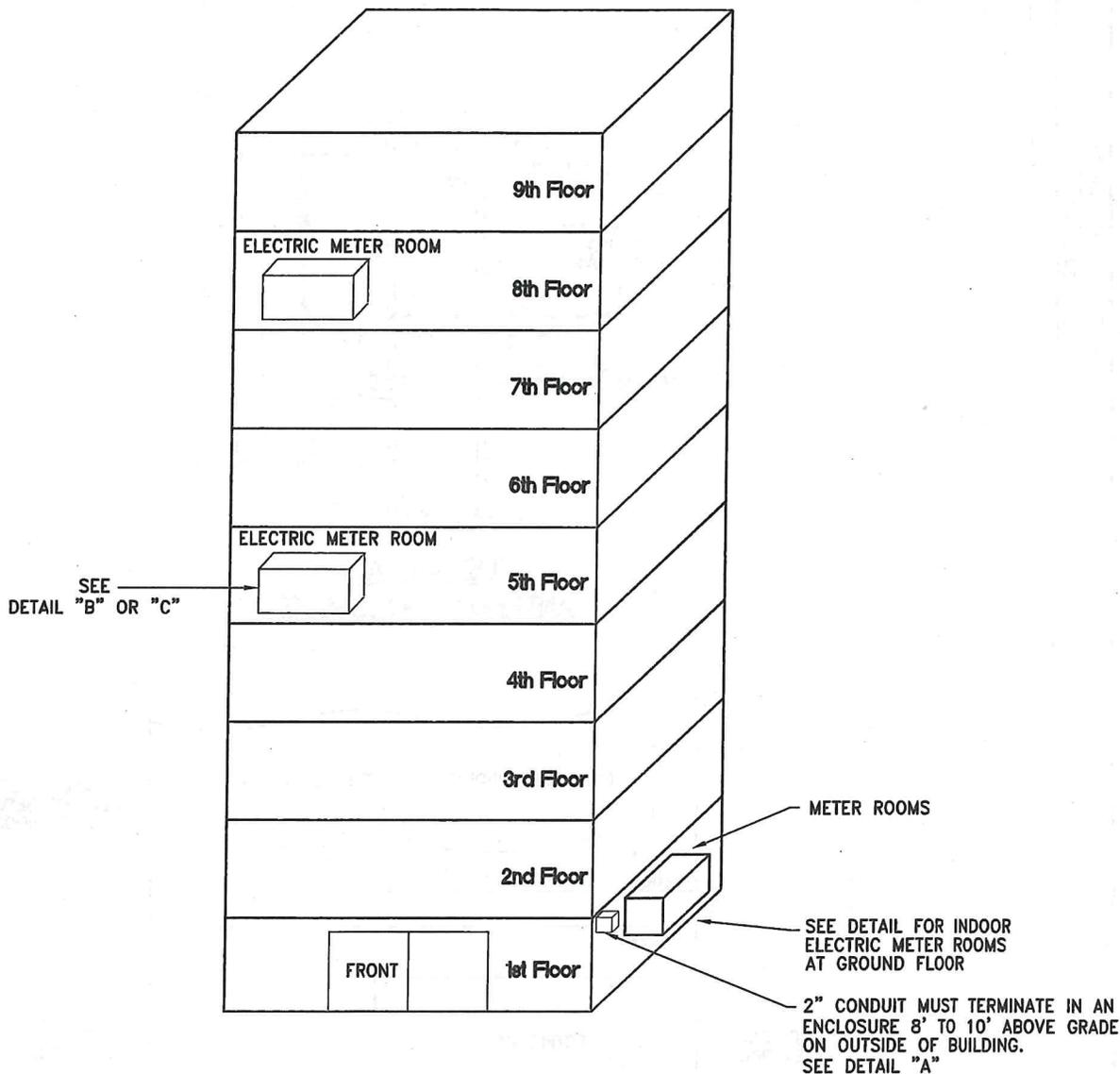


TITLE :			
SMART METER REMOTE ANTENA REQUIREMENTS FOR INDOOR METER ROOM & HIGH RISE BUILDING			
DRAWN :	LVA/RB	DATE: MAY 06, 2020	DWG. NO.:
REVIEWED:	<i>[Signature]</i>		1-L-614
APPROVED:	<i>[Signature]</i>		REV. 0
SCALE: NTS		SHT 1 OF 4	

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REV	DESCRIPTION	BY	DATE
0	NEW DRAWING	TN	8/7/17



HIGH RISE BUILDING WITH ELECTRIC METER ROOMS

METER ROOM LOCATIONS AND METERING FACILITIES ARRANGEMENTS

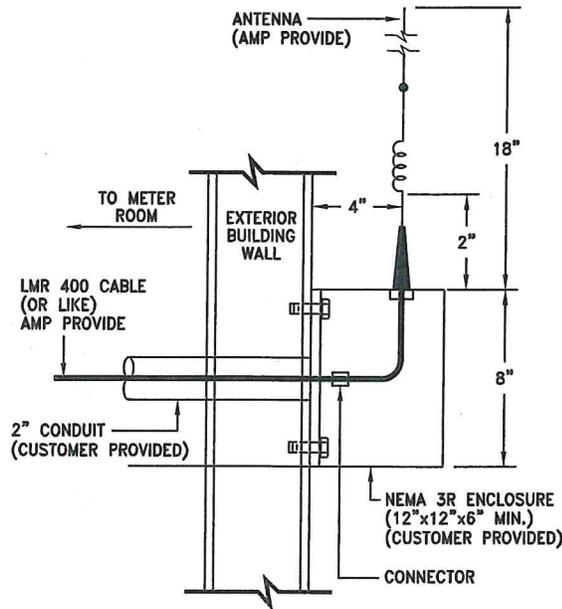
LOCATIONS	METERING FACILITIES
FIRST FLOOR	UNDERGROUND TERMINATING PULL SECTION, MAIN SERVICE DISCONNECT & HOUSE METER & METERS FOR FIRST, SECOND & THIRD FLOORS
FIFTH FLOOR	METERS FOR FOURTH, FIFTH & SIXTH FLOORS
EIGHT FLOOR	METERS FOR SEVENTH, EIGHT & NINTH FLOORS

ALAMEDA MUNICIPAL POWER
 A Department of the City of Alameda
 2000 GRAND STREET, P.O. BOX H
 ALAMEDA, CALIFORNIA 94501

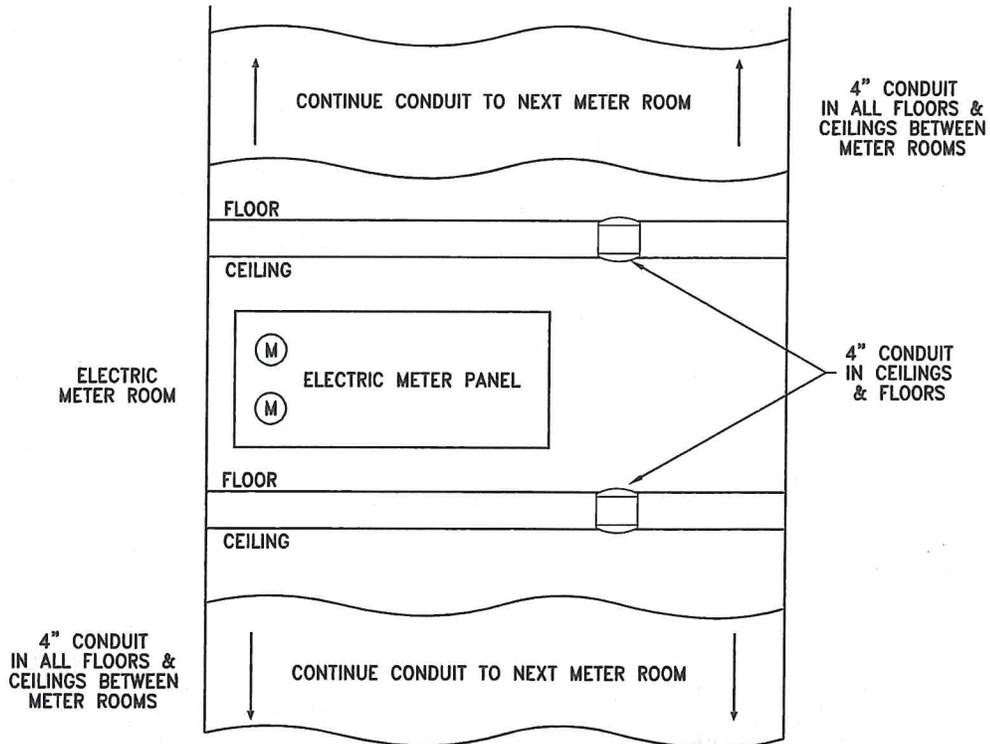
TITLE :			
SMART METER REMOTE ANTENA REQUIREMENTS FOR INDOOR METER ROOM & HIGH RISE BUILDING			
DRAWN :	WJA/RB	DATE: MAY 06, 2020	DWG. NO.:
REVIEWED:	<i>[Signature]</i>		1-L-614
APPROVED:	<i>[Signature]</i>		REV. 0
		SCALE: NTS	SHT 2 OF 4

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REV	DESCRIPTION	BY	DATE
0	NEW DRAWING	TN	8/7/17



DETAIL 'A'
ANTENNA ENCLOSURE

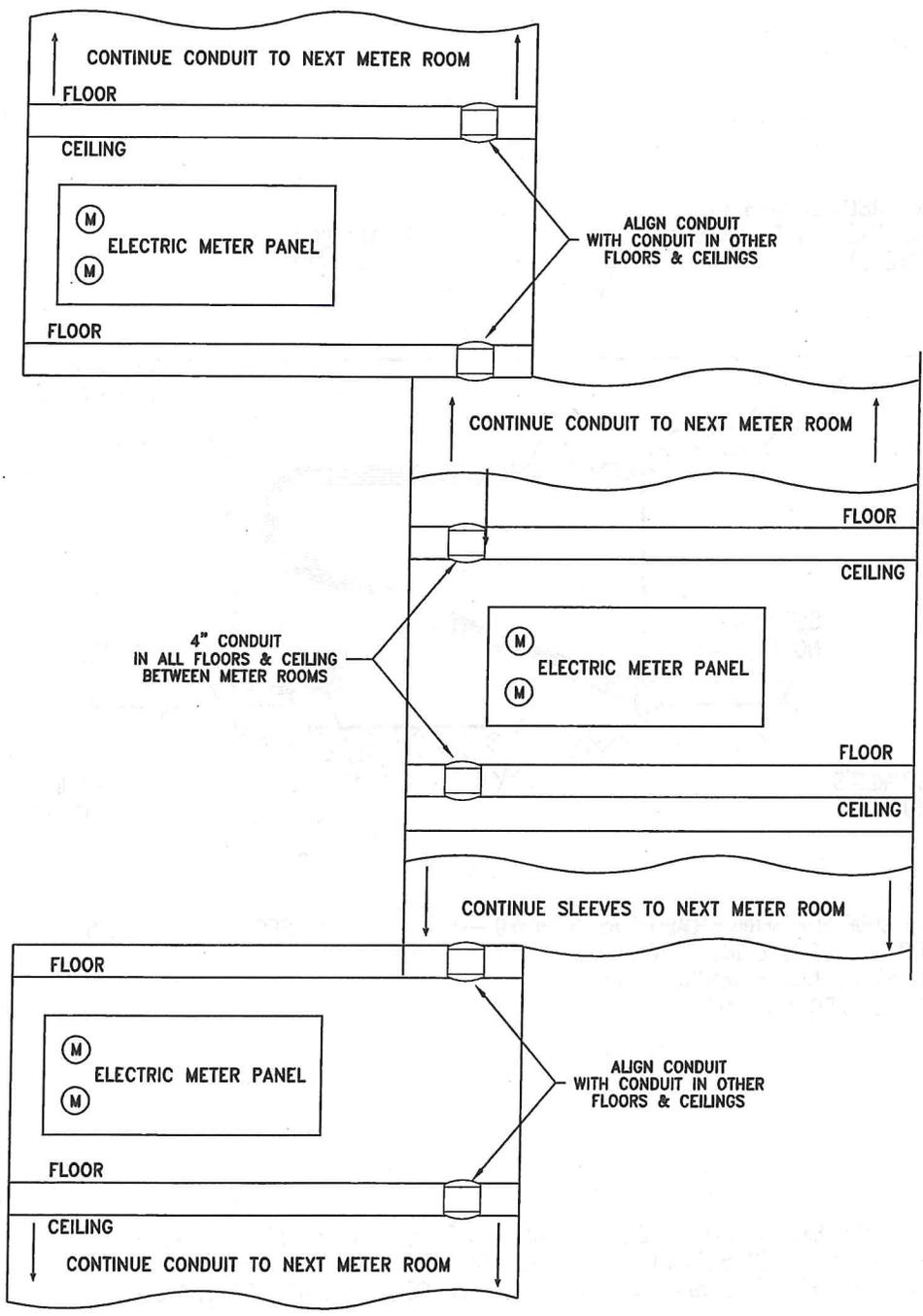


DETAIL 'B' ABOVE METER ROOMS

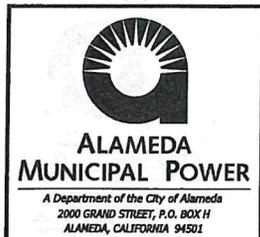
 ALAMEDA MUNICIPAL POWER <small>A Department of the City of Alameda 2000 GRAND STREET, P.O. BOX H ALAMEDA, CALIFORNIA 94501</small>	TITLE :			
	SMART METER REMOTE ANTENNA REQUIREMENTS FOR INDOOR METER ROOM & HIGH RISE BUILDING			
	DRAWN :	LWA/RB	DATE: MAY 06, 2020	DWG. NO.:
	REVIEWED:	<i>[Signature]</i>		1-L-614
APPROVED:	<i>[Signature]</i>		SCALE: NTS	
			SHT 3 OF 4	

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REV	DESCRIPTION	BY	DATE
0	NEW DRAWING	TN	8/7/17

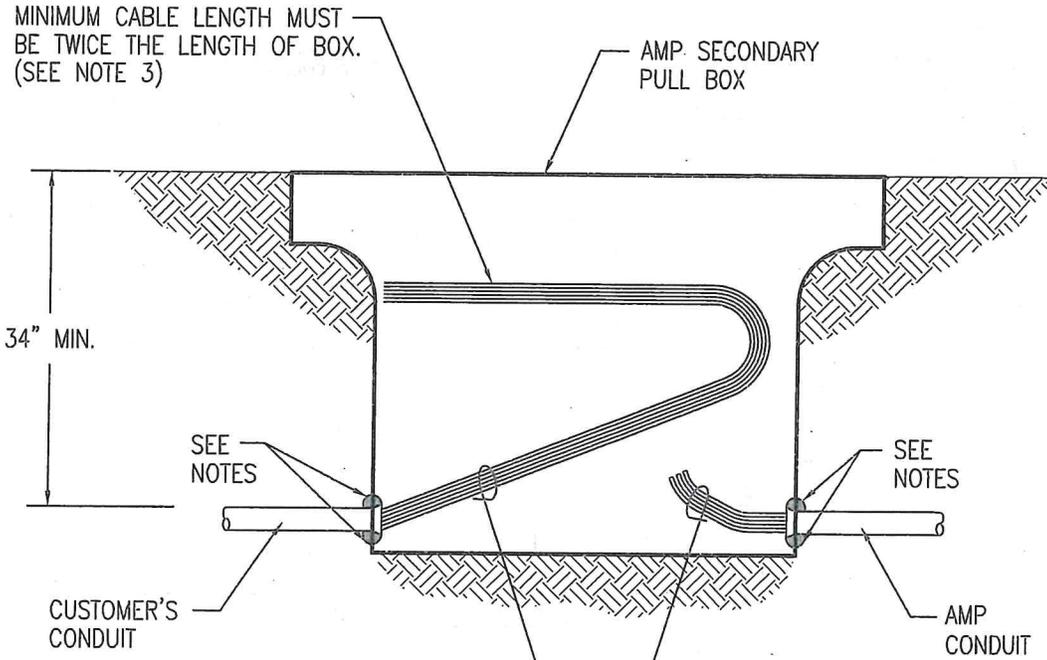


DETAIL 'C' VERTICALLY OFFSET METER ROOM



TITLE :				
SMART METER REMOTE ANTENA REQUIREMENTS FOR INDOOR METER ROOM & HIGH RISE BUILDING				
DRAWN :	LJA/RB	DATE: MAY 06, 2020	DWG. NO.:	REV.
REVIEWED:			1-L-614	0
APPROVED:	<i>[Signature]</i>		SCALE: NTS	SHT 4 OF 4

REV	DESCRIPTION	BY	DATE
1	REVISED NOTE 3	T.T.	5/9/06
2	CHANGE CO. NAME	T.N.	11/20/09



CUSTOMER'S CODE SIZE SERVICE CABLES AS APPROVED BY THE CITY ELECTRICAL INSPECTOR. CABLES MUST BE COLOR MARKED FOR PHASE AND SEALED AT ENDS.

AMP SECONDARY CABLES

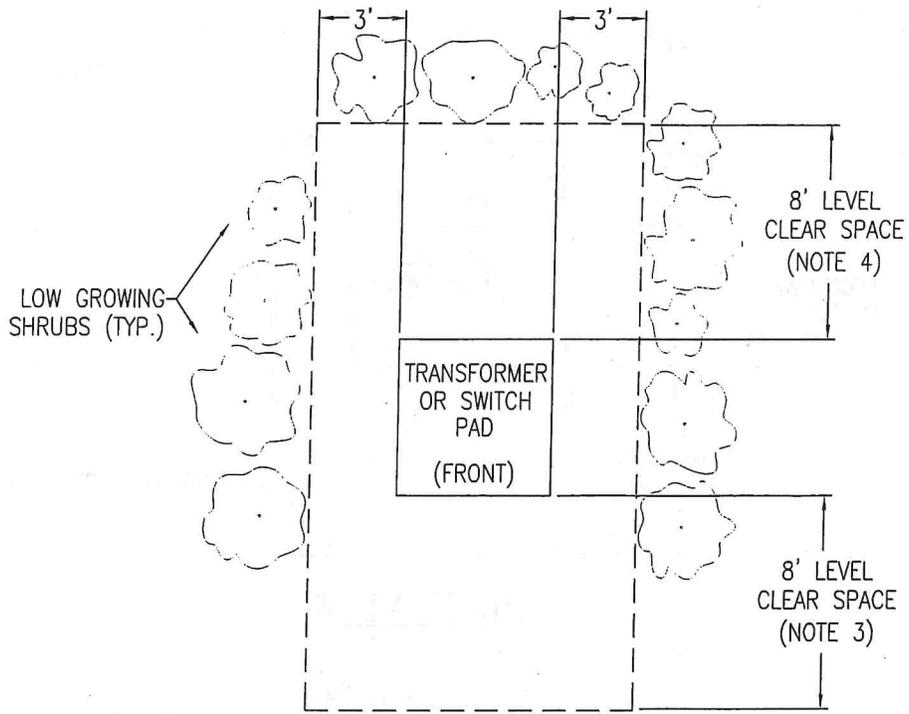
NOTES:

1. STEEL CONDUITS SHALL EXTEND NO MORE THAN TWO INCHES (2") INTO THE BOX AND SHALL BE TERMINATED WITH INSULATED BUSHINGS. PLASTIC CONDUITS SHALL BE TERMINATED WITH BELL ENDS FLUSH WITH THE WALL OF THE BOX. ALL CONDUIT ENTRANCE SHALL BE GROUTED.
2. BOTH ENDS OF THE SERVICE CONDUIT SHALL BE SEALED WITH APPROVED MATERIAL.
3. WHEN CUSTOMER SERVICE CABLES GO DIRECTLY TO ALAMEDA MUNICIPAL POWER (AMP) TRANSFORMER LUGS, CABLE LENGTH MUST BE LONG ENOUGH TO LOOP IN THE BOX AND RUN TO THE TRANSFORMER LUGS.
4. AMP'S CREW SHALL MAKE ALL CONNECTIONS IN THE BOX.

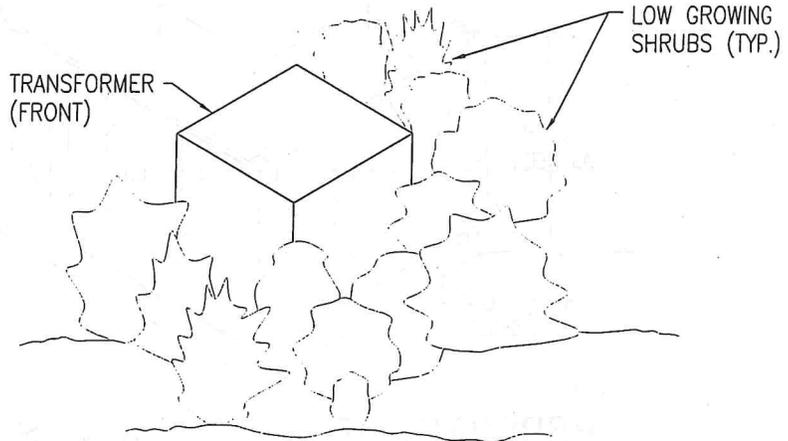
G:\ENGINEERING\OPERATION\ENGINEER DRAWINGS\PowerDwgs\WorkOrder\Construction Standard\Material\UG Elect System\1L479.dwg

 ALAMEDA MUNICIPAL POWER <small>A Department of the City of Alameda 1029 GRAND STREET, P.O. BOX 11 ALAMEDA, CALIFORNIA 94501</small>	TITLE : MINIMUM REQUIREMENTS FOR UNDERGROUND SERVICE CABLE CONNECTION FROM ELECTRIC BOX			
	DRAWN :	L.V. ANCHETA	DATE: NOV, 20, 2005	DWG. NO. : 1-L-479
	REVIEWED:	<i>[Signature]</i>	<i>[Signature]</i>	REV. 2
	APPROVED:	<i>[Signature]</i>		SCALE : NTS SHT 1 OF 1

REV	DESCRIPTION	BY	DATE
1	ADDED SWITCH REQUIREMENT	T.T.	5/9/06
2	ADD NOTE 3		
3	CHANGE CO. NAME	T.N.	11/20/09



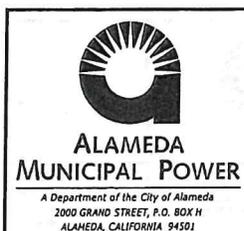
PLAN VIEW



PERSPECTIVE - RESIDENT'S VIEW

NOTES:

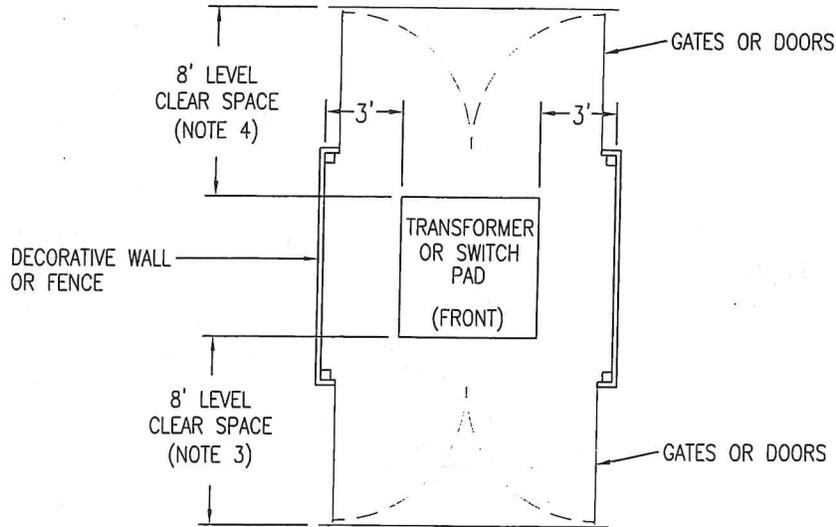
1. THIS DRAWING PROVIDES AN ILLUSTRATIVE LANDSCAPE DESIGN IDEA THAT THE CUSTOMER MAY USE TO SCREEN A PAD-MOUNTED TRANSFORMER OR SWITCH. THIS MAY BE MODIFIED TO FIT A PARTICULAR SITE CONDITION, SUBJECT TO APPROVAL BY ALAMEDA MUNICIPAL POWER (AMP).
2. LANDSCAPING, ETC. SHALL BE INSTALLED, OWNED AND MAINTAINED BY THE CUSTOMER. LANDSCAPING SHALL NOT IMPAIR MAINTAINABILITY AND OPERABILITY OF ELECTRICAL EQUIPMENT. SPRINKLER HEADS MUST BE LOCATED TO AVOID SPRINKLING OF WATER ON THE EQUIPMENT.
3. CONCRETE OR TREATED WOOD RETAINING WALL MAY BE REQUIRED IF HANDSCARVING GRADE IS HIGHER THAN PAD OR BOX FINISHED GRADE.
4. A CLEAR, LEVEL WORKING SPACE OF 8 FEET IS REQUIRED IN FRONT OF THE TRANSFORMER OR SWITCH.
5. A CLEAR, LEVEL WORKING SPACE OF 8 FEET IS REQUIRED IN BACK OF A SWITCH.



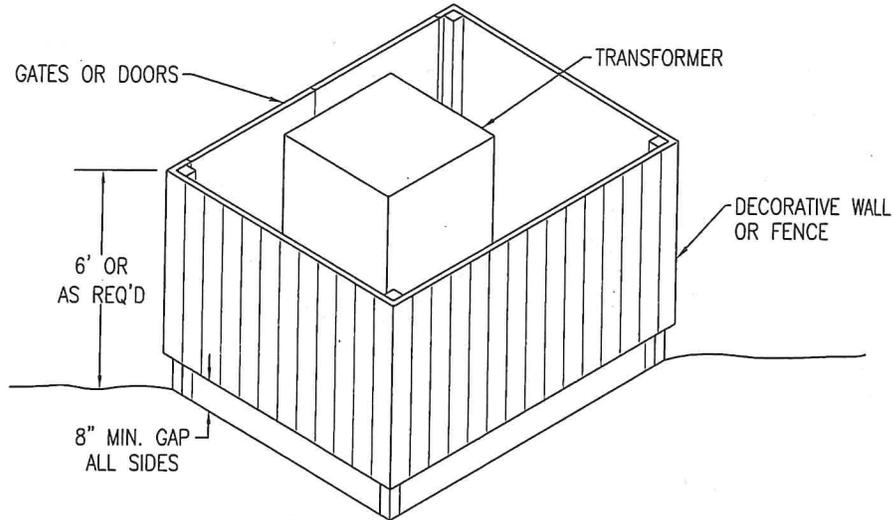
TITLE : LANDSCAPE SCREEN FOR PAD-MOUNTED EQUIPMENT			
DRAWN :	L.V. ANCHETA	DATE: NOV. 20, 2009	DWG. NO. : 1-L-520
REVIEWED:	<i>[Signature]</i>		REV. 3
APPROVED:	<i>[Signature]</i>		SCALE : NTS SHT 1 OF 1

M:\PwrDwgs\Work0 -ConstructionStd\1L520.dwg November 20, 2009

REV	DESCRIPTION	BY	DATE
1	ADDED SWITCH REQUIREMENT	T.T.	5/9/06
2	CHANGE CO. NAME	T.N.J.	11/20/09



PLAN VIEW



PERSPECTIVE - RESIDENT'S VIEW

NOTES:

1. THIS DRAWING PROVIDES AN ILLUSTRATIVE WALL DESIGN IDEA THAT THE CUSTOMER MAY USE TO SCREEN A PAD-MOUNTED TRANSFORMER OR SWITCH. THIS MAY BE MODIFIED TO FIT A PARTICULAR SITE CONDITION, SUBJECT TO APPROVAL BY ALAMEDA MUNICIPAL POWER (AMP).
2. DECORATIVE WALL OR FENCE SHALL BE INSTALLED, OWNED AND MAINTAINED BY THE CUSTOMER. AN 8" MINIMUM GAP IS REQUIRED AROUND THE ENTIRE BOTTOM OF ANY WALL ENCLOSURE AS SHOWN ON DRAWING.
3. A CLEAR, LEVEL WORKING SPACE OF 8 FEET IS REQUIRED IN FRONT OF THE TRANSFORMER. GATES OR DOORS MAY BE PLACED AS LONG AS A MINIMUM 8-FT. CLEARANCE IS AVAILABLE WITH THE GATES OR DOORS OPEN.
4. A CLEAR, LEVEL WORKING SPACE OF 8 FEET IS REQUIRED AT THE FRONT AND BACK OF A SWITCH. GATES OR DOORS MAY BE PLACED AS LONG AS A MINIMUM 8-FT CLEARANCE IS AVAILABLE WITH THE GATES OR DOORS OPEN.
5. DECORATIVE WALLS OR FENCES ARE NOT SUBSTITUTES TO ANY REQUIRED BARRIER POSTS OR BOLLARDS.

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ALAMEDA MUNICIPAL POWER
A Department of the City of Alameda
 2000 GRAND STREET, P.O. BOX 14
 ALAMEDA, CALIFORNIA 94501

TITLE :			
WALL SCREEN FOR PAD-MOUNTED EQUIPMENT			
DRAWN :	L.V. ANCHETA	DATE: NOV. 20, 2009	DWG. NO. :
REVIEWED:	<i>[Signature]</i>		1-L-521
APPROVED:	<i>[Signature]</i>		REV. 2
SCALE : NTS			SHT 1 OF 1