College Station Utilities

Reliable, Affordable, Community Owned

Construction Specifications, Electric Service, & Meter Installation Guidelines

Jan 6, 2025

V.1.0.12

This booklet is not intended to conflict with the current versions of the National Electrical Safety Code (NESC) and the National Electrical Code (NEC), or any state and local laws or ordinances as may be in force in the City of College Station or College Station Utilities Service Area. The following electric service guides are the requirements set forth by College Station Utilities at the date of publication and are subject to change. College Station Utilities personnel should be contacted for the latest requirements in effect.

Failure to follow these guidelines will result in a delay of electric service.

Contact Information

CSU Operations:
(855)528-4278

CSU Design:
CSUDesign@cstx.gov

Design and Engineering:

Call for electrical distribution design, electric civil installation inspections, and status of service installations.

Electric Design Supervisor:
Name: Hugh Leland
Email: hleland@cstx.gov
Phone: (979)764-3504

Electric Project Planning Coordinator:
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Senior Electric Designer:
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Electric Designer:
Name: Jeb Curry
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Electric Designer:
Name: Ashley Holston
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Phone: (979)764-2580

Electric Designer:
Name: Taylor Threat
Email: TThreat@cstx.gov
Phone: (979)764-5045

Plans Examiner & Permit Inspections:

Call for plan review and installation inspections requiring permit.

Plans Examiner:

Name: Tyler Haney
Email: thaney@cstx.gov
Phone: (979)764-3570

Plans Examiner:

Name: Benjamin McCarty
Email: bmccarty@cstx.gov
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Assistant Building Official:

Name: Bryce Trujillo
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Phone: (979)764-3570

Building Official:

Name: Brian Binford
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Phone: (979)764-3570

Metering:

Call for questions regarding metering.

Commercial Electric Metering Foreman:

Name: Scott Montgomery
Email: smontgomery@cstx.gov
Phone: (979)764-3454

AMI Supervisor:

Name: Daniel Graalum
Email: dgraalum@cstx.gov
Phone: (979)764-5071

Utility Billing Customer Service:

Call for setting up or verifying status of billing account.

Customer Service Supervisor:

Name: Carol Rodriquez
Email: crodriquez@cstx.gov
Phone: (979)764-3535

Table of Contents

SECTION 1 – INTRODUCTION

This informational booklet is issued by College Station Utilities (CSU) for the guidance of the customers, engineers, architects, contractors, and other interested parties planning electrical installations for residential buildings and small commercial establishments. The information and recommendations set forth herein are, in general, sufficient to answer questions concerning most of the installations within its scope. When questions arise which are not covered by this booklet, please contact CSU Design and Engineering Group at 979-764-3660 to discuss the options available to provide electric service for the project.

When planning electrical installations for larger commercial or industrial establishments, it will be necessary for the engineer, architect, or electrical contractor to contact CSU for detailed information on service requirements.

All customer owned equipment shall be installed in accordance with the requirements of the latest revision of the National Electrical Code (NEC) adopted by the City of College Station that may be in effect for governing electrical installations in the area where the installation is made. The customer, engineer, architect, or electrical contractor should ascertain that such requirements are met.

The National Electrical Safety Code (NESC), the NEC, and various Federal, State, County and Municipal Ordinances are based on the prevention of hazards to life and property. They are not intended to mean that an electrical installation, made in accordance with such rules and regulations, is adequate for the customer's present or future electric service.

The requirements set forth herein are not necessarily complete facility or safety specifications. Rather they cover matters of mutual concern to the Customer and CSU, which facilitate the supplying of electric service. The requirements are subject to revision from time to time without notification so that they keep pace with developments and progress in the electric industry. Compliance with these requirements does not absolve the Customer from the obligation to install and maintain wiring and equipment in a safe condition; also, the City and CSU does not accept any responsibility for the quality or condition of the Customer's wiring or equipment. An electrical installation should not only be capable of serving the electrical devices of today in an efficient, safe, and convenient manner, but the Customer should provide circuits and circuit capacity for future load growth.

SECTION 2 – DEFINITIONS

CLEARANCES: The clear distance between two objects measured surface to surface. The clearance above ground, driveways, roads, etc. specified in this guide are the minimum required by the NESC for electrical conductor sag conditions. As such, during actual installations, higher clearances may be required to allow for the increased sag of cables/conductors under all conditions.

CITY: The word “City” as used throughout this booklet refers to the City of College Station.

CSU: The term “CSU” as used throughout this booklet refers to College Station Utilities.

CUSTOMER: The word "Customer" means either a present or prospective user of the CSU's electric service.

READILY ACCESSIBLE: Capable of being reached quickly for operation, renewal, or inspections, without the necessity of climbing over or removing obstacles or resorting to portable ladders, stepstools, etc.

SERVICE DROP: The conductors from the transformer or pole to the customer’s metering point.

POINT of DELIVERY: Generally, the point where CSU's conductors are connected to the Customer's conductors, typically at the meter socket, pedestal, transformer, pull box, service enclosure, or other approved enclosures.

Disconnecting Means:

1.) Secondary Voltages (below 600 volts) –
   a.) Circuit breaker.
   b.) Fuses in series with a double throw visible disconnect switch.
   c.) AMI metering
   d.) In applications with six or more throws, or a 277/480V, 200 A service, a solid blade gang switch will be required before the tap can
2.) Primary Voltages (600 volts and above) –
   a.) Circuit breaker.
   b.) Fused disconnects.
   c.) Gang operated disconnect switch.
   d.) Individually operated disconnect switches.

Definitions for the following can be found in the National Electrical Code: feeder, ground, grounding conductor, grounding electrode conductor, service conductors, service entrance conductors, overhead system, underground system, service equipment, service lateral, and service point.

SECTION 3 – ELECTRIC SERVICES AVAILABLE

3.01 GENERAL

One system of electrical distribution is available, namely 60 Hertz alternating current. As the voltage and the number of phases which will be supplied depend upon the character of the load as well as its size and location, it is necessary for the Customer to consult CSU regarding the type of service which will be furnished before proceeding with the purchase of equipment or the installation of wiring.

All services requested by the Customer shall be metered for energy consumption.

3.02 RESIDENTIAL SERVICE

Residential Service will be supplied single-phase three-wire, nominally 120/240 volts, or where available or needed, in a network area, three-wire, nominally 120/208 volts.

3.03 COMMERCIAL AND INDUSTRIAL SERVICE

The secondary distribution available to serve commercial and industrial loads may be a three-wire, single-phase system or four-wire, three-phase system. CSU should always be consulted regarding the exact characteristics of the service that will be available.

3.04 SERVICE AT VOLTAGE ABOVE 208 VOLTS

Service may be available for applications at voltages higher than 208 volts. Contact CSU for more information.

SECTION 4 – GENERAL REQUIREMENTS

4.01 APPLICATION FOR ELECTRIC SERVICE

Application for electric service to either a new installation, or a revision of service for an existing installation, must be made to and accepted by CSU before service will be supplied. Application can be made by contacting CSU and should be made as far in advance as possible of the date service is required. The Customer must consult CSU for information concerning the point of attachment of CSU's service facilities to the Customer's building, the location of the meter, characteristics of service, and other pertinent matters before proceeding with the installation of the service.

4.02 EXTENSION OF CSU'S FACILITIES

When the Customer requests CSU to deliver energy in a manner or location other than that designated by CSU, the Customer will be required to pay the additional costs. CSU will be pleased to discuss its terms and conditions for the extension of facilities upon request.

4.03 INSTALLATION AND RESPONSIBILITY

It is necessary for the protection of the Customer that all work, wiring, and apparatus be installed and maintained in a safe manner by a licensed electrician or qualified party. The Customer, in accepting service from CSU, assumes full responsibility for the safety of the wiring and apparatus which the Customer installs.

The Customer shall not operate any apparatus which creates a condition that interferes with CSU's operation and prevents CSU from supplying satisfactory service to the Customer or to other Customers. This condition includes, but is not limited to, operating equipment that interferes with the satisfactory operation of other Customer's radio, television, and communication equipment.

CSU reserves the right to place restrictions on the type and manner of use of all the Customer's electrical equipment, which is connected to CSU's lines, especially prohibiting any large loads of highly fluctuating or low power factor characteristics.

4.04 REQUIREMENTS FOR ELECTRICAL INSPECTION

The Customer is responsible for obtaining inspections from the City on work done to their electrical system from the point of service throughout their residence as required by the local inspection authority. CSU will inspect all work from the source up to the point of service on the residence.

4.05 CUSTOMER ALTERATIONS AND ADDITIONS

CSU's facilities that are used to provide service have definite capacity limitations and can be damaged by overloads. Therefore, the Customer must notify CSU prior to making alteration to the service entrance equipment so that facilities of proper capacity may be provided. The Customer shall be responsible for all expenses and/or damages to Customer's facilities resulting from failure to give proper notice. The Customer may also be subject to charges by CSU for work required to meet the Customers' alteration. The Customer should contact CSU for information concerning charges for such work.

4.06 TEMPORARY SERVICE

CSU has special requirements for temporary service and should be consulted in each case.

Please contact CSU Design and Engineering Group at 979-764-3660 for CSU specifications.

4.07 STRUCTURES NEAR OVERHEAD LINES

Structures, including but not limited to signs, flagpoles, light standards, antennas, patio covers, or aerials shall not be installed under, over, or in close enough proximity to lines carrying electric current that they could be raised into or fall onto such lines or that they cannot be safely maintained. Antennas or aerials shall not be attached to a CSU pole, or any pole used in supplying electric service to the Customer. Consult CSU for clearance requirements.

4.08 ATTACHMENTS TO CSU-OWNED FACILITIES

Under no conditions will the Customer's facilities be installed on CSU's poles or other property unless special arrangements have been made with CSU.

4.09 ACCESS TO CUSTOMER'S PREMISES

CSU's authorized representatives and employees shall have access to the Customer's premises, only to the extent needed by CSU for access to its property and at all reasonable hours, for the purposes necessary in connection with supplying and maintaining service. Upon termination of service, CSU shall be permitted to remove any or all such property. Authorized CSU employees visiting the premises of the Customer for any purposes are furnished with an identification card. The Customer should refuse admission to persons not having proper identification.

SECTION 5 – OVERHEAD SERVICE REQUIREMENTS

5.01 SERVICE FROM OVERHEAD LINES

All (permanent) new construction in the City will be designed with underground service and/or primary distribution. Changes to an existing overhead service will be considered on a case-by-case basis and approval to remain overhead must be obtained prior to start of construction.

Please contact CSU Design and Engineering Group at 979-764-3660 for CSU specifications.

SECTION 6 – UNDERGROUND SERVICE REQUIREMENTS

6.01 UNDERGROUND SERVICE

All new construction in the City will be designed with underground service and/or primary distribution.

Please contact CSU Design and Engineering Group at 979-764-3660 for CSU specifications.

SECTION 7 – SERVICE ENTRANCE

7.01 SERVICE ENTRANCE CONDUCTORS (For Maintenance Only)

The service entrance cable or raceway, extending from the point of attachment on the structure to CSU-owned metering equipment, shall be run exposed for its entire length except in those cases where it is necessary to pass through over-hanging eaves or projections from the main wall of the building. Where this is necessary, the service entrance cable shall be protected from physical damage in accordance with the NEC. Where conduit is used for protecting the service entrance conductors, there shall be no joints in the length of conduit that is covered by the building construction. In cases acceptable to CSU, and for purposes of obtaining necessary clearance to the ground for the service drop conductors, a rigid metallic conduit will be required and may extend through the roof not less than 18 inches and no more than 36 inches unless guyed per NESC requirements. The service entrance conductors and conduit will be furnished and installed by the customer or their contractor. Appropriate clearance of overhead electric supply lines shall be maintained in accordance with the NESC at all times.

7.02 COMMERCIAL OR INDUSTRIAL SERVICE ENTRANCE

The service entrance conductor needs of commercial and/or industrial customers are usually more complex than those for residential customers. To assure that such services meet the electrical load requirements, CSU shall be consulted in every case before plans are made or

equipment purchased. Service entrance conductors are furnished and installed by the Customer in accordance with the requirements of the NEC. In cases where CSU supplies the service, the requirements of the NESC shall govern.

For those commercial metering installations (below 600 volts) that require current transformer cabinet/enclosure, the customer shall furnish and install the cabinet. The enclosure shall have provision for City lock and seal, which is solely for City access. All enclosures shall be commercial grade, painted, and galvanized steel NEMA 3R or greater. Local inspecting authorities may require enclosure to be UL listed or equivalent.

All services from CSU three phase pad mount transformers are 4 wire - WYE connected.
The neutral conductors are required to be grounded at CSU transformer and at the customer's main disconnect or switchgear. The neutral connection is required to protect against line to ground faults. CSU will not connect a service without the proper neutral connection.

7.03 TRANSFORMER VAULTS

CSU does not allow transformer vaults.

7.04 GROUNDING

The grounded neutral conductor of the service entrance conductors shall be grounded in accordance with the NEC. All conduits, metallic tubing, and service entrance equipment shall be grounded in accordance with the latest revision of the NEC. The NEC or other local governing code shall be consulted at the time for dimensions, specification of material, and to determine the appropriate method of installing the grounding system (5/8 inch diameter stainless steel and copper or zinc coated steel rod with a length of 8 feet minimum). The equipment grounding conductors should not be installed along with the service entrance conductors being installed to the secondary compartment of CSU's pad mount transformers.
Communication companies, such as telephone, satellite dish, and cable television, are forbidden to ground their systems to the meter enclosure or service mast.

SECTION 8 – METERING EQUIPMENT

8.01 METER LOCATION

The Customer will provide a suitable location on their premises for the installation of CSU's meter and other equipment necessary for CSU to provide electric service. The metering location shall be located at the closest point of attachment to the power source. The service entrance will be arranged so that CSU can measure the Customer's entire electric service with one meter, unless otherwise specified in the City's rate tariff schedule. Meters for service to residential and commercial Customer shall be installed outdoors, unless prior approval obtained by CSU. No trees or shrubs shall be planted in front of the meter (NEC 110.26). In general, a location shall be such that it will not interfere with traffic, sidewalks, or driveways nor obstruct the opening of doors and windows. Meters shall be installed on the ground floor and on an exterior wall of the building. Exceptions to this must be preapproved by CSU Design and Engineering Group.

No customer or third-party equipment is allowed to be attached to the meter, associated metering equipment, nor located inside a meter or current transformer enclosure, unless otherwise approved by CSU.

The center of the meter should not be more than 5 1/2 feet or less than 4 feet from finished grade.

Meters will be mounted on customer-owned poles only when no other means of mounting are feasible. When mounted on customer-owned poles, all devices and methods of mounting will be specified by CSU.

8.02 METER SOCKETS

Meter sockets for single family and commercial projects installed in CSU's service territory are provided by CSU.

Meter sockets for multi family developments (condos and apartments) shall be furnished by the Contractor or Builder. These meter sockets shall meet all CSU specifications and guidelines.

If the project requires a different/special type of meter socket, the contractor/builder must contact CSU for preapproval before installing any foreign meter socket. In addition, meter sockets purchased by the Customer shall be ringless, UL listed and labeled in accordance with NEC. Please use left opening on underside of meter can for CSU conduit and wire only.

In CSU's Service Territory, meter sockets used on a commercial Customer shall have a lever operated by-pass device for three phase (200A and 320A) services. By-pass meter sockets are not to be used as load breaking devices.

Services rated at 480V that use a self-contained meter shall have a non-fused disconnect in front of the self-contained meter. No exceptions are allowed.

Repairs to meter sockets are the responsibility of the Customer. If repairs cannot restore the socket to its standard condition, the Customer will be notified in writing to replace the damaged meter socket within (30) thirty days to avoid a disconnection of service. CSU may, in the interests of safety and efficiency, disconnect the service when conditions warrant. CSU has sole discretion to determine conditions. "Acts of God" are not included as a Customer responsible repair and in this case, CSU will provide a replacement meter can upon request.

Contact Metering Department for questions regarding solar meters.

It is prohibited for the Customer/Contractor to install any type of devices between the CSU-owned meter socket and the CSU-owned meter; Doing so could result in a disconnection of service.

8.03 METER IDENTIFICATION ON MULTI-OCCUPANCY BUILDINGS

On multi-occupancy buildings, all meter socket covers, and main service disconnect switches shall be plainly and permanently marked and maintained with numbers and/or letters by the owner to indicate the building address and apartment/condominium address served; if applicable, this includes a suite or apartment number. The markings must be either engraved phenolic nameplates or adhesive-type labels at least one inch high. **Felt tip pens and label maker tape are not considered permanent marking**. Service will not be established until marking is complete. CSU will assume no responsibility for inspecting the Customer's equipment, or the accuracy of matching premise location as indicated on the meter socket and main service disconnect switch but shall have the right to satisfy itself that the service is certified by the local inspection authorities and that it is safe to connect.

8.04 RELOCATION OF SERVICE AND METER EQUIPMENT

Whenever it becomes necessary to relocate the service entrance and meter equipment of an existing installation, CSU shall be consulted before such work is begun. Additional charges will be necessary for relocation of and/or changes to power facilities serving the customer especially if the work is performed at the customer's request and for the Customer convenience. These charges will be reviewed on a case-by-case basis but if applicable, must be paid in full and prior to CSU beginning to work.

8.05 NO CONNECTIONS AHEAD OF METERING DEVICES

The connection of any Customer owned apparatus or device to the service conductors ahead of CSU owned meters or to the meter socket without CSU authorization is expressly forbidden. All 480-volt self-contained meter installations require the installation of a non-fused disconnect switch (provided and installed by customer) ahead of the meter socket for the safety of the City's employees and will be sealed and/or locked by CSU.

The meter socket/can or current transformer enclosure/cabinet shall not be used as a junction box. Connections will be made in a separate tap enclosure using insulated Polaris blocks.

8.06 SEALS

All enclosures containing un-metered conductors shall be capable of being effectively sealed and locked by CSU.

The breaking of a seal by anyone other than authorized persons or tampering with CSU's meters and measuring devices is prohibited. Where CSU detects that the physical facilities of CSU have been tampered with to cause an unauthorized use of electric energy, or loss of meter registration, CSU may at any time without notice, discontinue the supply of electric energy to the Customer and remove its meter and other apparatus until such time as the customer has corrected the condition to the satisfaction of CSU. Such tampering could also result in criminal and/or civil actions depending upon applicable state laws.

8.07 ENERGY MANAGEMENT

CSU recommends that the Customer who is contemplating the installation of demand or energy control equipment, contact CSU prior to installing such equipment.

At the Customer's request, CSU will furnish energy and/or demand pulses (KYZ or equivalent approved methods). The Customer will be charged for the installation costs to supply these pulses.

The customer's or third-party load monitoring equipment must be installed only on the load side of the meter. No customer or third-party equipment is allowed to be attached to the meter, associated metering equipment, nor located inside a meter or current transformer enclosure. Such actions could result in criminal and/or civil actions depending upon applicable state laws.

8.08 UNDERGROUND SERVICE WITH CURRENT TRANSFORMER (CT) METERING

The use of three phase or single-phase distribution is determined by CSU in the design phase of a project. Placement/location of CTs or CT enclosure will be determined in the design phase of a project. The top of the CT enclosure should not be more than 6 feet or less than 4 feet from finished grade. See section 9.03 for CT enclosure requirements. See here for photographs of acceptable CT enclosure designs.

Please contact CSU Design and Engineering Group at 979-764-3660 for CSU specifications.

SECTION 9 – CUSTOMER'S SERVICE EQUIPMENT

9.01 GENERAL

Each Point of Delivery shall have a single disconnecting means which will disconnect all non-grounded customer conductors from the CSU system. This disconnecting means shall be located as close as possible to the Point of Delivery and be readily accessible.

9.02 SERVICE EQUIPMENT RATING

The service entrance conductors and the service equipment on residential buildings should have an electrical rating large enough to accommodate the initial electrical load plus anticipated future needs. The equipment interrupting rating shall exceed the maximum fault availability as determined by CSU and rating as required by the current NEC.

All fuses and circuit breakers shall be provided by the Customer and shall be of suitable capacity to protect the wiring installation and utilization equipment connected thereto. Circuit protective devices shall not have a rating higher than the current carrying capacity of the conductors that they protect, except where it is necessary to provide for motor starting currents. "Time delay" or "time lag" fuses or circuit breakers are recommended for protection of branch circuits supplying motor driven devices.

It is not permissible to fuse or switch the grounded neutral conductor of a grounded system. The customer shall consult the latest applicable edition of the NEC and other local codes for applicable requirements.

9.03 CUSTOMER OWNED CURRENT TRANSFORMER ENCLOSURES SPECIFICATIONS

The top of the CT enclosure should not be more than 6 feet or less than 4 feet from finished grade.

Please contact CSU Meter Department at 979-764-3454 for approval before installation.

Enclosure Construction

In non-corrosive areas, steel enclosures may be used. Steel enclosures shall be a minimum of G-90 galvanized steel. All edges shall be smooth after forming. The enclosure shall be painted after fabrication. Finish coat shall be minimum of 2 mils thickness and provide a tough, non-chalking weather resistant finish. Construction shall be in accordance with ANSI/UL50. Outdoor enclosures shall be rated Type 3R. The current transformer enclosure shall be fitted with vertically hinged door(s) and sealing shall be provided by a minimum grade 304 stainless steel latch and rivets with provision for a 3/8-inch padlock and ribbon seal. The inside back of enclosure shall be entirely covered by 3/4-inch treated plywood or suitable mounting brackets must be provided. A grounding lug shall be provided by the customer/contractor to ground the enclosure. Enclosure must have provision for a 3/8-inch padlock.

Protection

Enclosures shall be designed to protect personnel against accidental contact with the electrical devices and guard against unauthorized use of electric service. They cannot be opened without either breaking the seal or visibly damaging the enclosure.

Corrosive Environments

Aluminum or fiber reinforced polyester enclosures must be used in corrosive areas. Corrosive areas are any area where high moisture or chemical exposure may exist such as chemical plants or water treatment plants. Enclosure construction shall be in accordance with ANSI/UL50. Outdoor enclosures shall be rated NEMA Type 3R. Current transformer enclosure shall be fitted with vertically hinged door(s) and sealing shall be provided by high strength stainless steel latch with provision for 3/8-inch padlock and ribbon seal. Exposed hinges and hardware shall be minimum grade 316 stainless steel or better. Other methods of sealing may be acceptable but must be approved by CSU prior to being utilized. The inside back of enclosure shall be entirely covered with back plate and/or suitable mounting brackets must be provided. Enclosure ventilator is required. A grounding lug shall be provided by the customer/contractor to ground the enclosure.

9.04 CUSTOMER OWNED ENCLOSURE

All metering troughs, switchgear, gutters containing un-metered conductors, and metering equipment must have prefabricated provisions for sealing by CSU Meter personnel. The

Customer or Electrician shall contact CSU to obtain access for inspection. Nothing shall be attached to the meter, meter enclosure, current transformer enclosure, or the associated metering equipment that would inhibit CSU personnel and/or their designee from reading the meter, changing or testing the metering equipment, performing routine maintenance, etc. Customer owned equipment shall only be installed on the load side of any meter.

SECTION 10 – CUSTOMER'S UTILIZATION EQUIPMENT

10.01 GENERAL

All customer utilization equipment must be designed for operation on alternating current at a nominal frequency of 60 Hertz.

Customers installing power factor correction apparatus shall consult CSU to ensure that such apparatus will have suitable characteristics to accomplish the desired results and be compatible with CSU equipment.

In general, CSU shall be notified before any significant new load is added to ensure that adequate capacity is available. This includes air conditioning and heat pumps.

10.02 VOLTAGE FLUCTUATION AND FLICKER LIMITS

Loads that are known to cause major voltage fluctuations, voltage flicker, and significant wave form distortion or system overloads, are subject to individual consideration and approval by CSU. Where such equipment is used, the Customer may be required, at their expense, to install corrective devices or apparatus, or may be requested to limit the operation of this equipment, to prevent disturbances caused by such equipment from affecting service to other customers. Objectionable fluctuations result from the combination of the magnitude of the fluctuation and the frequency of occurrence of the fluctuations. Other disturbances may include equipment miss-operation and possible damage to other customers' equipment or process.

In order to avoid misunderstanding and inconvenience, the Customer or their electrical contractor should consult CSU before purchasing motors or any other devices of the character mentioned above. There are certain Public Service Commission requirements and/or industry standards that may be required to be met to alleviate possible adverse effects to other services or equipment. Even in cases where CSU gives prior permission, it cannot give absolute assurance that the installation will not later require changes to maintain proper service, if either the information provided earlier was not accurate or changes occurred in customer load.

10.03 CURRENT/VOLTAGE HARMONIC DISTORTION LIMITS

For all customers, whose delivery voltage is less than 69 KV (IEEE standard 519), the following limits apply regarding harmonic distortion that can occur from customer usage of non-linear loads such as variable speed motors, arc furnaces, rectifiers, low wattage electric lights, and other electronic loads. For Current Distortion, the Total Demand Distortion (TDD) limit can range from 5% to 20%, for voltages from 120 volts to 69 kV, (of the maximum yearly metered demand) depending on the short circuit strength of the electrical system in relation to the Customer's load.

For voltage, the Total Harmonic Distortion (THD) limit is 5% for voltage below 69 kV. Individual harmonic component levels for both current and voltage are required to be lower than the above stated limits. These limitations are located at the point of common coupling where the Customer and CSU systems interface. It is the customer's responsibility to mitigate the distortions found to meet the 5% minimum threshold. If the customer is unwilling to correct the problem, CSU will mitigate the distortion at the customer's expense.

It is recommended that the customer consult CSU if these total limits are exceeded or require assistance in determining the acceptable harmonic levels and on recommendations for mitigation of unacceptable harmonic levels contributed from customer load.

10.04 PROTECTION FOR VOLTAGE SENSITIVE EQUIPMENT

The Customer should consider providing and maintaining suitable protective devices on their equipment to prevent any loss, injury or damage that might result from single phasing conditions or any other fluctuation or irregularity in the supply of energy.

To prevent possible equipment failure and data loss, computers, programmable controllers and other voltage sensitive digital devices should be protected against abnormal system conditions by using commercially available AC line conditioners, surge suppressors, or uninterruptible power supplies to provide a constant power source to these devices.

10.05 MOTORS

All motor installations should be provided with devices that will protect the motor and motor circuit against overload and short circuit. In addition, three-phase motors should be protected against single-phase operation. All motors that cannot be safely subjected to full voltage at starting, and are not equipped with automatic restarting means, should be provided with a device to ensure that, upon failure of supply voltage, the motor will be disconnected from the line or the starting device returns to the "off" position. To prevent unnecessary shutdowns, it is recommended that this "no voltage release" device be equipped with a time delay feature so that it will not function until the motor speed drops to a point where it will not pick up on a restoration of service.

All equipment and motor frames are to be grounded using a grounding conductor according to the current NEC guidelines or be double insulated.

For the requirements for motor circuits and controllers, refer to the NEC. Wire sizing and limitations can be found in the NEC book. Always consult the motor manufacturer before making any modifications to the motor's protection or starting equipment.

10.06 EMERGENCY STAND-BY GENERATOR

CSU shall be notified of the Customer's intention to install an Emergency Stand-By Power System. In such cases, CSU will verify that the transfer switch has a non-modifiable open transition

switching to eliminate any possibility of back feed to CSU's power system that could endanger the public and/or CSU Personnel and cause damage to CSU or Customer property. The transfer equipment installed with emergency standby generators shall be installed in accordance with the current NEC.

10.07 PORTABLE GENERATOR

A positive method of isolating CSU power circuits from the generator circuits must be provided. The following hazards exist which require that different power sources be isolated:

1. DANGER! Electrocution of CSU personnel or the public can result if the generator circuit is not properly isolated from the electric utility power circuit.

2. If generator and utility power are not isolated from each other and utility power is restored while the generator is supplying power, utility power can back feed through the generator. Damage to the generator and a possible electrical fire can then occur.

3. Portable generators must be sized and connected to the load in accordance with all applicable codes and the manufacture's recommendation.

SECTION 11 – Pool Reroutes, Service Conversions and Demolition

11.01 – Pool Reroute

When the addition of a pool or accessory structure requires the rerouting of a structure lateral.

11.02 – Service conversions

Service conversions are performed to move overhead power lines to the new city standard of underground service.

11.03 - Demolition

Demolition is performed to remove old conductor, conduit, and other devices that are currently in the field.

FIGURES

(All figures, drawings, etc. are not to scale)

Construction Notes

(These are the typical notes that are printed on construction drawings provided by CSU)

1. These drawings present quantity and type of material to be used. Exact location of existing and new facilities should be verified prior to beginning work. The facility locations are not to scale on these drawings.
2. Before construction starts, the contractor shall meet with CSU Design and Engineering representatives for exact conduit routing and installation instructions. Conduit installed without prior approval may have to be removed and reinstalled at the contractor's expense.
3. All conduit shall be inspected by CSU representative before it is covered, See Ditch and Mandrel Inspection of Conduit/Duct. No exceptions.
4. All underground conduit to be gray schedule 40 PVC. Use long sweep factory elbows at all bends in conduit runs. Substitutions may be considered with prior notification and approval.
5. Contractor will install conduit for all conductor runs.
6. All conduit stubbed out or installed for future use will be capped and marked with red steel t-post.
7. All stubbed out conduit for CSU use shall be marked with red paint for the last 18 inches of conduit.
8. All conduit will be installed by the contractor to CSU specifications.
9. Primary conduit will be installed at a minimum 4' depth below finished grade.
10. Contractor will install transformer pad in accordance with CSU specifications. Conduit placement is critical. Contact CSU prior to roughing in the pad.
11. CSU will furnish aluminum rigid conduit (30' per riser). Contact CSU prior to placement of stubs up at base of pole. Improperly placed stub ups will be corrected at the expense of the contractor. CSU install all riser conduit.
12. Pull string in all primary runs shall be tied at both ends of conduit.
13. Caps shall be placed at both ends of conduit.
14. Secondary conduit will be installed at a minimum 30" below finished grade.
15. Primary conduit will have 12" to 18" of dirt cover prior to placing a 6" wide red "caution" tape. Final backfilling can then be placed.
16. Soil around all pad mounted transformers to be mechanically compacted to ninety-five percent standard density within a ten-foot radius of concrete pad.
17. Contractor to locate all utilities prior to commencement of construction.
18. Cost of leveling pad mounted transformers and junction boxes that are leaning within twelve months of installations will be the responsibility of the developer. This also applies to in-ground pull boxes that have settled below grade. Maximum allowable tilt for transformers will be 2 degrees in any direction.
19. Primary pull boxes and single-phase residential transformers pads will be provided by CSU and installed by the contractor.
20. Three-phase transformer pads will be built by contractor to CSU specifications.
21. Concrete used in transformer pads should be rated for 3000 psi.
22. Contractor will be responsible for installing conduit in manholes. Entry will be achieved by core drilling. No other method will be accepted. Contact CSU prior to core drilling. No exceptions.
23. If easements are existing, contractor will verify boundaries prior to installation of conduit. Conduit not within easement boundaries will be corrected at contractor's expense.
24. If the meter is located on transformer, the service wire and conduit will be furnished and installed by contractor.

25. If a CT-can is required, it will be furnished and installed by the customer. Up to 600 amp, minimum size will be 36”x36”x 10” with locking capability. 800 amp and above shall be a 48”x48”x10” with locking capability. CTs and meter base will be furnished by CSU and installed by customers. Service conductors will be furnished and installed by CSU up to the metering point.
26. All necessary connections (minimum 6-hole Polaris blocks and minimum 500 mcm wiring) shall be provided by the customer.
27. On CT’d services, customer wiring shall extend through the CTs into the owner furnished Polaris blocks.
28. Contractor shall be responsible for installing ground rods at all transformer locations as well as any other necessary electrical facilities. CSU will provide the ground rods to the contractor.
29. Effective April 2022 all new projects will be assessed a fee based on the increased cost of transformers, calculated by the following formula: Average price of transformer of the required voltage and capacity in inventory today – price in 2020 = Fee owed by customer.

Guidelines for Residential Conduit, Wire and Meter Installation

1. For single family and commercial projects, the Electrician will request a meter can through **eTRAKiT** at https://etrakit.cstx.gov
   (Must have Electric Permit to match address). Pick up your meter can at 1601 Graham Road. For multi family projects (condos and apartments), the Electrician/General Contractor must furnish their own meter cans/packs per CSU spec.
2. When the meter can is mounted and load side wire from meter can to breaker panel is installed, contact Planning & Development to request an **Electric New Service (ENS)** Inspection**.**
   PLEASE NOTE: Once an ENS is passed these are the following procedures:
   A. A Connect Work Order will be created by Utility Billing.
   B. A Connect Work Order is sent from Utility Billing to Electric Design & Engineering to be matched with an internal Electric Department Project Work Order.
   C. The Work Order is put on hold until an eTRAKiT notification is received. This notice indicates a Ditch Inspection, and a Wire Inspection have been requested and completed. Once the applicants are ready to have the temporary (temp) meter relocated to the house, then it is the applicant's responsibility to request Pipe and Wire Inspections through eTRAKiT.

Once the CSU Design & Engineering Group receives your request, these are the response times for services in working days (working days do not include Friday, Saturday, Sunday, or holidays):

- **Conduit Inspection:** CSU Inspector will respond within 1 to 3 working days. Wire will not be installed unless you have passed your CSU conduit and ENS inspections.
- **Conductor Only Inspection:** A required inspection to determine that mule tape has been installed to spec inside the conduit. Mule tape must be ¾" – 2500 LB test, and must be one continuous piece, no knots will be allowed.
- **Wire Installs**: CSU Crew will install within 5 to 7 working days. Service wire will not be installed unless you have passed both your CSU conduit and ENS inspections. When CSU Crew is onsite to install **wire only,** an AMI Technician will **relocate the meter from the temp pole to the permanent location. It will remain under your temp account.**

It is the responsibility of the home builder, or their electrician, to install service conduit for all Services. If installation of service is being completed in a neighborhood that is served overhead, and a secondary pedestal is not existing, the developer is required to install a pedestal to CSU design and specification. CSU will provide the pedestal; the developer must install the provided pedestal per CSU design and specification. Please call CSU Design for more information. All conduit installed will require a ditch and conductor inspection. Developer may request a ditch and conductor inspection through eTRAKiT.

Guidelines for Service Re-routes, Conversions, Capacity Upgrades and Service Demolitions

Service Lateral Re-routes for the addition of a Pool or Other Structure.

If during preparation for the installation of a pool or other structure, a CSU customer finds that their service drop (overhead) or run (underground) -called a lateral moving forward- needs to be relocated, the customer will need to begin the permit application process with COCS Planning and Developmental Services (PDS).

A CSU designer will work with PDS and the applicant via eTrakit during the applicant's pool permitting, or additional structure permitting process. If it is determined that a customer's service lateral needs to be re-routed, an assigned CSU Designer will work with the applicant to determine a suitable new service route, as specified in this guidebook, and in NESC requirements.

It will be the responsibility of the applicant's contractor to have all in-ground utilities located, to install the new underground service lateral to CSU specifications and design, and to secure all applicable inspections as laid out in this guidebook.

It is the responsibility of the applicant's contractor or agent to coordinate with the assigned CSU designer, and to also contact the CSU T&D Supervisor to schedule the day and time for a CSU service crew to come and remove existing conductor and install new service conductor along the new route. If conduit reconfiguration is required while service conductor is removed, the service crew may leave and return once conduit work has been completed. This is at the discretion of the foreman and will be worked out with the contractor as conditions warrant. It is CSU's intention to keep service outages due to service re-routes as short as possible. The timeliness of the contractor completing the reroute will contribute the largest factor in the length of the service outage.

If the re-route makes relocation of the meter can necessary, all relevant city building inspections and green tags must be completed prior to the reconnection of power. Please reach out to COCS PDS to discuss additional inspections that may be required to relocate a meter can. CSU will provide the new meter can, and it is to be installed by the applicant's contractor.

If the re-route necessitates the installation of a secondary pedestal, the applicant's contractor or agent will be required to install all necessary conduit and the CSU provided secondary pedestal to CSU specification. Secondary pedestals must be installed in a Public Utility Easement (PUE). It is the responsibility of the applicant to verify proper easements exist, and secondary facilities are installed in the PUE. If a PUE does not exist, applicant will need to work with COCS PDS to secure the proper easements.

Once the service reroute is complete, construction on the pool or additional structure can begin.

Converting Service Laterals from Overhead to Underground

Service conversions are performed where an existing customer is being fed overhead and wishes to or is required by ordinance to remove an overhead service drop, and update service runs to the new COCS city ordinance requiring all new construction and substantial remodels to be served form underground. The process for underground conversion will be much the same as in section 11.1, except the applicant will be required to get service conduit from the residence back to the source that CSU will feed them from. This will require conduit being installed from the meter location back to one available secondary location including: a pole, a pad mount transformer, or most likely, a secondary pedestal.

The secondary pedestal will feed from either a transformer on a pole or from a padmount transformer. If a secondary pedestal is not available, the applicant's contractor will be required to install one, if the

assigned CSU Designer deems this necessary. Secondary pedestals must be installed in a Public Utility Easement (PUE).
It will be the responsibility of the applicant's contractor to have all in-ground utilities located, and to install all new conduit required by the design to CSU specifications and design, and to secure all applicable inspections as laid out in this guidebook.
If a suitable source is not available in the yard of the applicant, conduit may need to be run to a pole in an adjacent yard or property. It is the responsibility of the applicant to ensure that easements exist, and if they do not to procure them. Applicant will need to work with COCS PDS to secure the proper easements if they are not existing. Applicant's contractor or agent will be responsible for all conduit installation on adjacent properties, remaining within the CSU PUE.
Conversion will also require the applicant to swap out an existing overhead meter can for an underground meter can during the process of conversion. This will require the applicant to secure an Electric New Service (ENS green tag) from COCS PDS, before service can be reconnected. CSU will provide the meter can, applicant's contractor or agent will be responsible for changing out the meter can.
It is the responsibility of the applicant's contractor to coordinate with the assigned CSU designer, and to also contact the CSU T&D Supervisor to schedule the day and time for a CSU service crew to come and reconfigure the service for the applicant. If conduit reconfiguration is required while service conductor is removed, the service crew may leave and return once conduit work has been completed by the applicant's contractor. This is at the discretion of the foreman and will be worked out with the contractor as conditions warrant. It is CSU's intention to keep service outages due to service re-configurations as short as possible. The timeliness of the contractor completing the conduit installation and meter can swap out will play a large factor in the length of the service outage.

Increasing the Capacity of a Residential Service

If a customer needs to convert their residential service from a 200amp (standard) to a 320amp service, applicant will need to call CSU Design to discuss. Service enlargement will require swapping out the meter can and ensuring that 3" (grey schedule 40) conduit is installed from the meter can back to the source. 200amp services are usually run in 2" conduit and will have to be changed out to 3" for a 320amp service to be installed. If the customer is currently fed overhead, they will have to install the requisite conduit (see previous section for information).
Procedure for swapping a 200amp service for a 320amp service are the same as in the previous section (Converting Service Laterals from Overhead to Underground).
Residential services larger than 320amp are outside of CSU standard and will be handled on a case-by-case basis. Please call CSU Design to discuss.

Temporary Service Removal

If a CSU customer needs their service lateral temporarily removed to change out a meter can, change out a service panel, cut down limbs conflicting with an overhead service lateral, etc., they should call CSU Operations at 855-528-4278. Leave a message and a dispatcher will return your call. NOTE: all necessary city inspections will be required including but not limited to an ENS inspection and green tag before service can be re-connected.

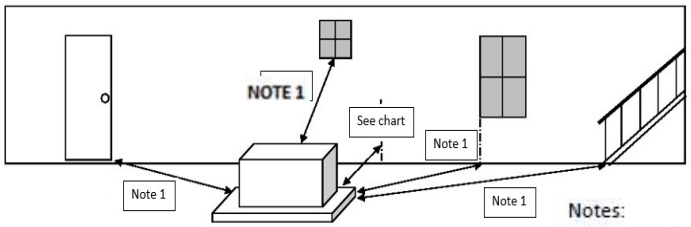
Service Lateral Demolition

Service demolition is performed at the request of the customer to remove an existing service lateral. If the service is active, a disconnect order from CSU Utility Billing is required for CSU to retire a service and remove an existing service lateral. If the service is already retired and a meter is not present, a service lateral can be removed by simply contacting CSU Design. NOTE: Per COCS ordinance, once an overhead service drop has been removed, new service will be required to be underground.

Clearance Requirements for Pad Mount Transformers

FIRE PROTECTION:

Transformers contain mineral oil and therefore require adequate clearances from buildings and building features such as doors, windows, ducts, and fire escapes. Clearances are also required to provide adequate cooling ventilation for the transformer. The clearances listed below are minimum clearances required by CSU. It is the owner's/builder's responsibility to comply with any insurance regulations that might affect their property that might be above and beyond those clearances listed. Transformers shall not be located where they obstruct fire lanes.



Minimum Clearance Requirements[1]			
Transformer Type	Wall	Fire Escapes and Stairs	Windows, Doors, and Vents/Ducts
1 Phase	10'-0"	20'-0"	10'-0"
3 Phase	15'-0"	20'-0"	15'-0"

Notes:

1) If the building has an overhang less than 25' high, add width of overhang to required clearance

NOTES:

1. Minimum clearance requirements to transformer are measured radially from wall, door, fire escape/stairs, windows, and ducts from nearest point on transformer pad or dike, if required.

2. Clearances from windows, ducts or overhangs located above the transformer are measured radially from the closest point on the transformer.

TRANSFORMER LOCATION:

The transformer should be located such that liquid flow of the area surrounding the transformer is directed away from the building. If the transformer is 500 kVA or larger and the slope is toward the building, a dike sufficient to hold the entire oil content of the transformer shall be provided by the customer/builder/developer. If the transformer location is subject to traffic, bollards shall be installed to protect the transformer. The transformer should be situated where it opens away from the building. If it cannot be located in this manner, then the minimum clearance from the pad to the building shall be 10 feet or over the value in the minimum clearance chart, whichever is greater. Only electric conduits are allowed under the footprint of the pad (no gas, water, communication, or other facilities).

TRANSFORMER SCREENING/MECHANICAL YARD:

No above ground obstructions (E.G. shrubs, cooling towers, gas meters, fences) should be within 10' of the transformer pad. If screening of the transformer is required, then the minimum distance from the screening to the transformer pad is 10' on the front, sides and on the back if the back is not the building. If the back is the building, then the minimum clearance requirements chart should be used. The front of the screening shall have a gate that opens outward with a width of not less than 10 feet, screening walls shall be constructed in a way as to provide adequate ventilation to the transformer.

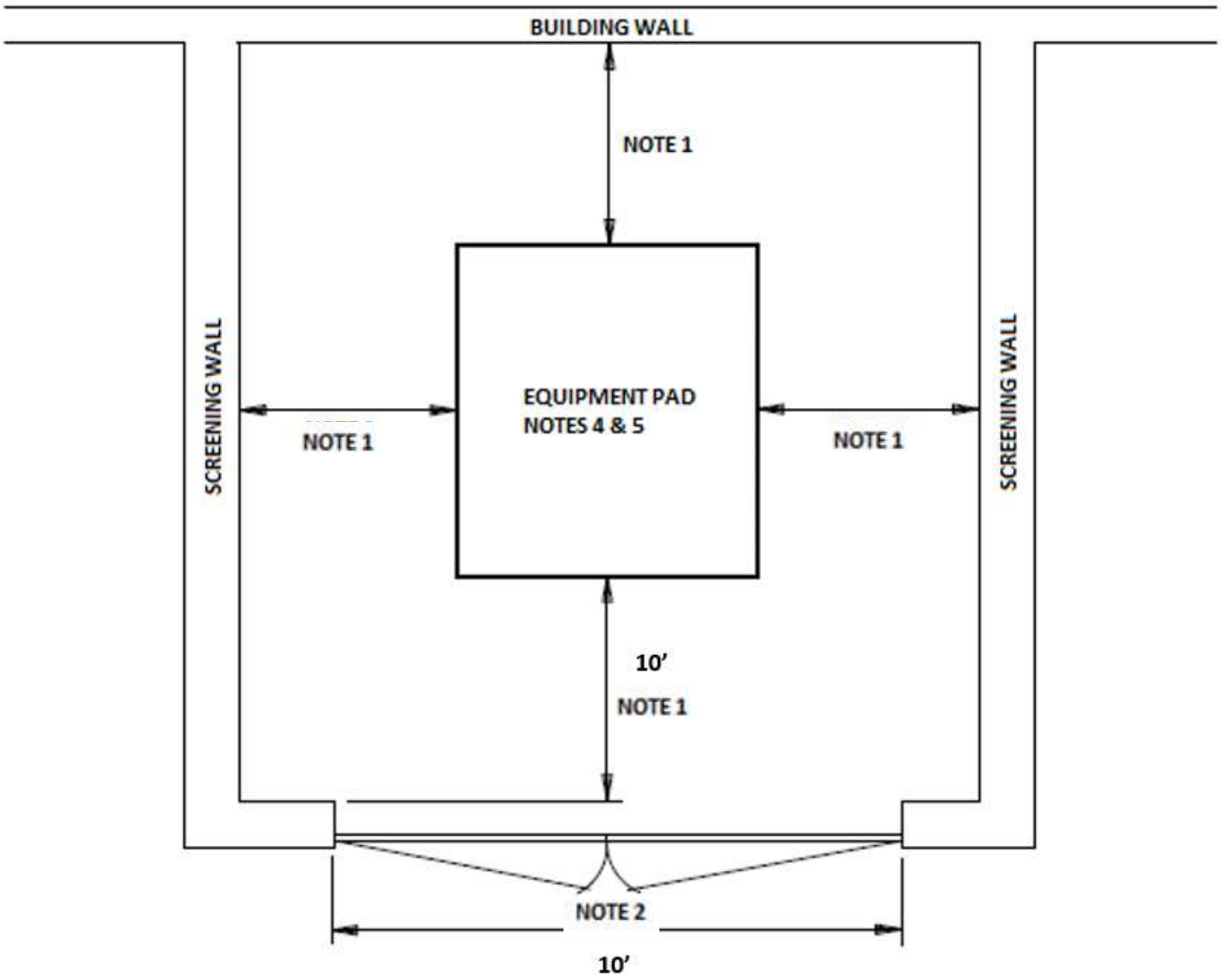
OVERHEAD CLEARANCE:

There shall be no overhead obstructions.

MULTIPLE TRANSFORMER INSTALLATION:

If multiple transformers are installed adjacent to each other, there shall be a minimum of 5' between each transformer. The transformer pad shall be poured as one continuous structure with appropriate knockouts (openings) for conduit stub-up required for each transformer. Pad layout must be review and approved by CSU Design and Engineering Group prior to installation – NO EXCEPTIONS.

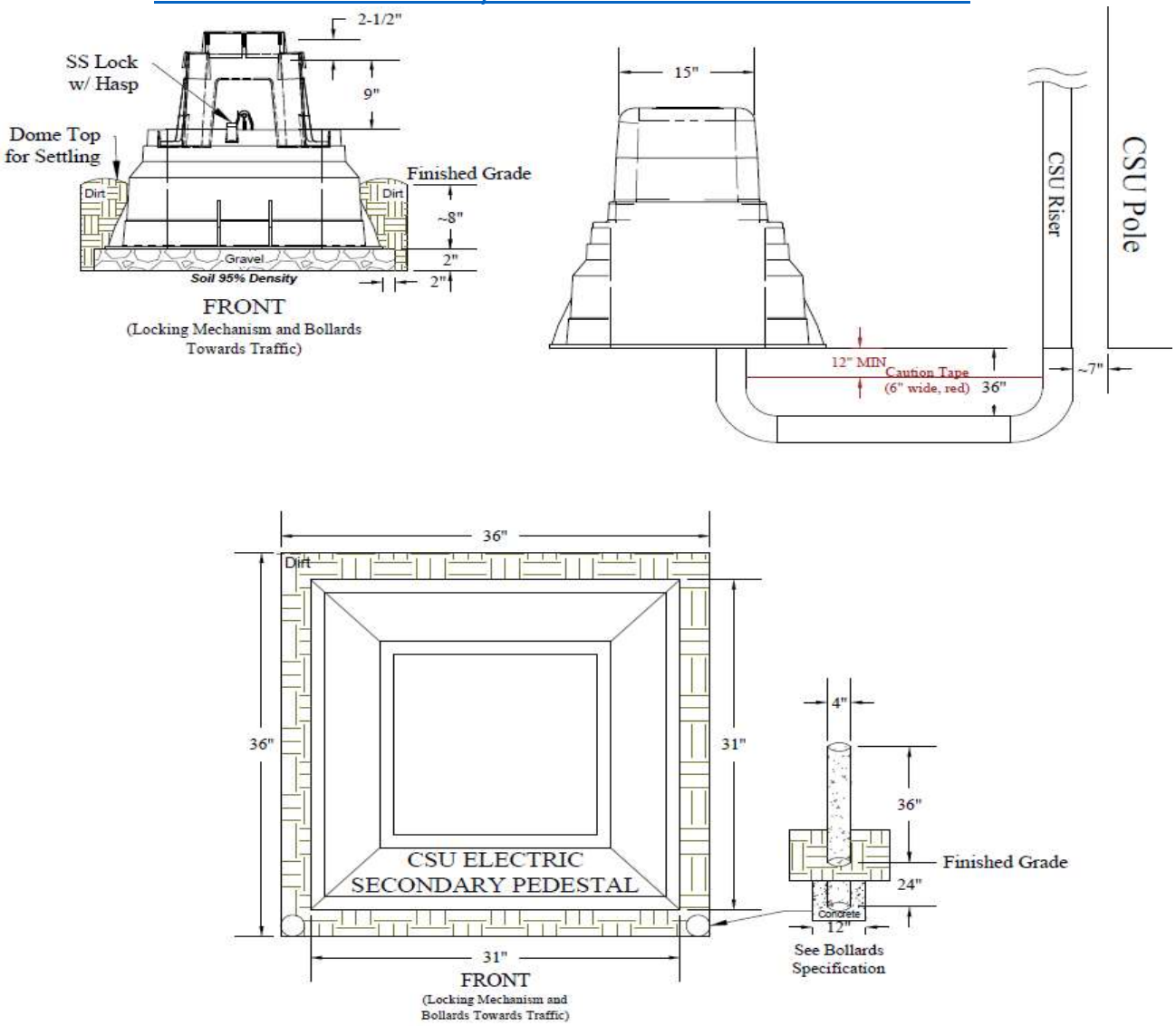
Clearances Around Pad Mounted Equipment



Notes:

1. Clearances to building walls shall be greater than 10'
2. Gate shall open outwards, and the width shall be no less than 10 feet.
3. No roof or cover shall be allowed over the equipment or clearance spaces.
4. Where ground is flat or slopes toward building, a dike sufficient to contain all oil for transformer 500 kVA and larger shall be provided by the developer.
5. Screening walls shall provide adequate ventilation.
6. Rules surrounding screening walls also apply to shrubbery and other forms of landscaping.

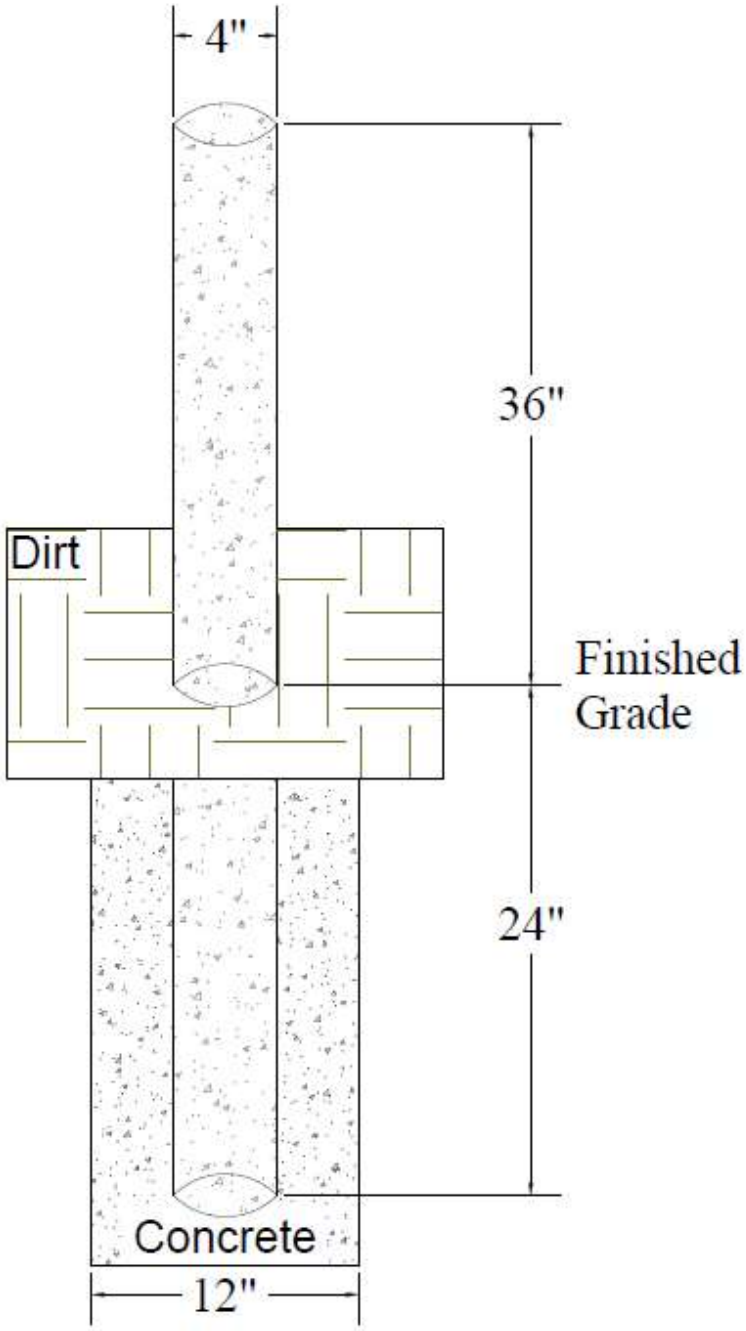
Pad Mounted Secondary Pedestals and Bollards Installation



Notes:

1. The gravel must be 2” in depth and extend 2” from the base of the secondary pedestal. Gravel shall be 3/4 Minus washed rock. Soil under secondary pedestal must be compacted to 95% standard density.
2. The buffer shall be a minimum of 36” x 36” centered from the center of the pedestal. No concrete pouring allowed in the area except for the bollards (see Note 2). Concrete may surround no more than three (3) sides of the pedestal and must be at least 6” from all sides of the pedestal.
3. Bollards to be installed by the contractor in the front corners (the side facing traffic). Bollards will be 4” rigid pipe, capped, poured in concrete, and no more than 6’ apart.
4. If the concrete will have a finished grade higher than that of the existing finished grade of the pedestal, the contractor will be responsible for raising the pedestal up to the height of the finished grade of the concrete and filling in the difference in grade.

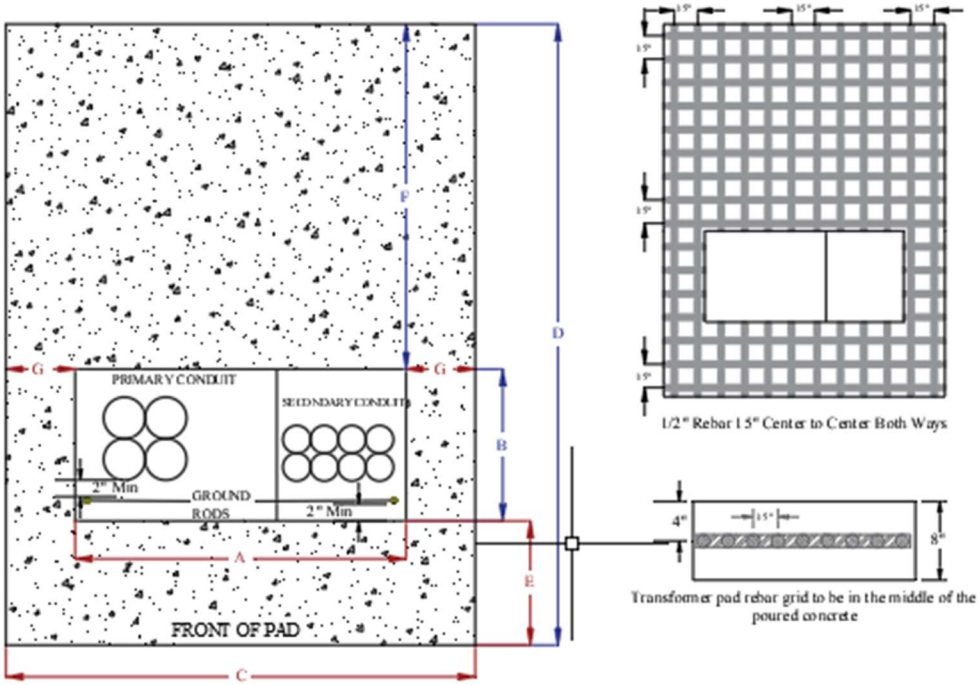
Bollards Installation



Notes:

1. Bollards to be installed in the corners of CSU equipment unless otherwise specified. Bollards will be 4” rigid pipe, capped, and poured in concrete.
2.

Concrete Pad Specifications for Single Phase & Three Phase Transformers



	XFMR (KVA)	A (IN)	B (IN)	C (IN)	D (IN)	E (IN)	F (IN)	G (IN)	MAX WEIGHT (LBS)
SINGLE PHASE	100 through 250	24	11	54	70	10	49	15	5,908
THREE PHASE	75 through 300	46	15	91	91	21	55	22.5	8,031
	500 750 1,000	53	15	111	105	21	59	29	11,565
	1,500 2,000 2,500	58	15	114	120	25	80	28	21,213

Soil around all pad mount transformers to be mechanically compacted to ninety-five percent standard density within a ten-foot radius of concrete pad.
Class "A" Concrete as Per City of College Station Specifications

Notes:

1. All Conduits will not extend more than 1" above the top of the poured transformer pad.
2. Ground rods will be 5/8" x 8' copper clad, continuous, and cannot be cut. It may extend no more than 1" above the top of the transformer pad.
3. Maximum number of conduits should be verified before installation.
4. Primary and Secondary conduits are to be bundled.
5. Any corrections required will be at contractor's expense and will result in delay of project time.
6. For maximum number of secondary conduits, please see **Maximum Number of Secondary Conduits & Conductors for Pad Mount Transformers**.

Maximum Number of Secondary Conduits & Conductors for Three Phase Pad Mounted Transformers

THREE PHASE TRANSFORMERS SIZE (kVA)	MAXIMUM NO. 4" PVC CONDUITS		MAXIMUM NO. OF CONDUCTORS INCLUDING NEUTRAL		MAXIMUM SIZE CONDUCTORS INCLUDING NEUTRAL (MCM)	
	120/208Y	277/480Y	120/208Y	277/480Y	120/208Y	277/480Y
75 – 150	6		24		500	
225 – 300	6		24		500	
500	8	6	32	24	500	
750	12	6	48	24	500	
1000	16	8	64	32	750	
1500	-	12	-	48	-	750
2000	-	16	-	64	-	750
2500	-	16	-	64	-	750

Notes:

1. If number of runs installed by customer is more than maximum shown in table, a Secondary Cabinet with pad shall be required. If a Secondary Cabinet is required, it will be provided and installed by the developer/contractor. Enclosure and pad details must be approved by CSU representative.

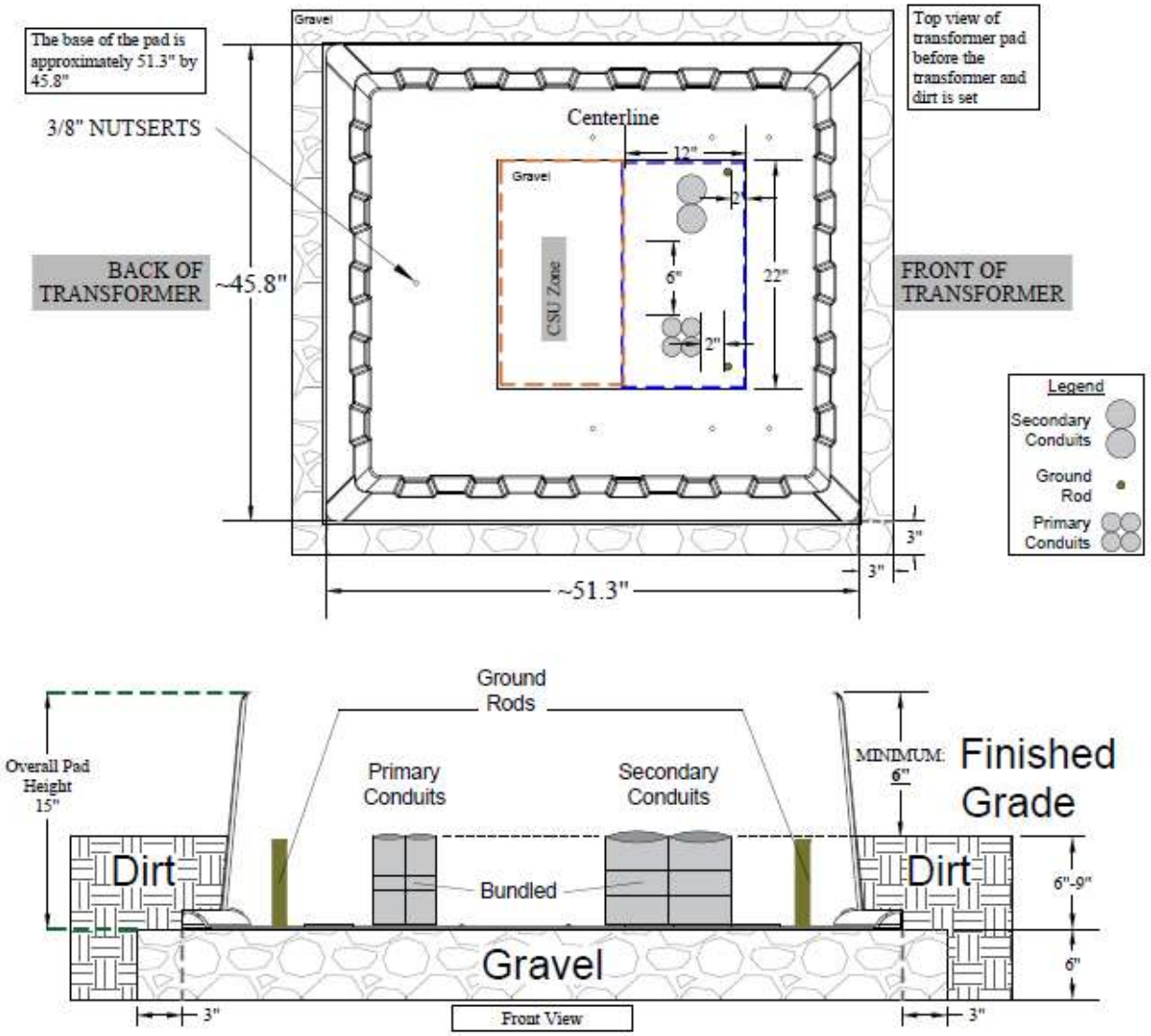
2. For multi-family dwellings and services 2000 amps and above, please contact CSU Design and Engineering Group to determine installation criteria.

3. Where metering occurs at the transformers, please contact CSU Design and Engineering Group. **The chart above does not apply.**

4. For single phase transformers, no more than 4 – 4" conduits shall be installed.

Transformer Box Pad Installation

(For single phase transformers only)



Notes:

1. The gravel must be 6" in depth and extend 3" from the base of the transformer box pad. Gravel shall be 3/4 Minus washed rock. There shall be no gravel or debris in the conduits.
2. No more than 4-4" secondary conduits shall be installed.
3. All conduits shall be 6" above the gravel, (leveled with ground line). Conduits and ground rod must be installed within the 22" by 12" window (see above). The Primary Conduits shall be about 1-2” from the edge of the window as shown above. Primary and Secondary conduit shall each be bundled as a set to facilitate ease of use.
4. Ground rod will be 5/8" x 8' copper clad, continuous, and cannot be cut. It shall be 6" above the top of the gravel.
5. First inspection will be done before the dirt is poured and the second inspection will be done after the dirt is compacted at 95% density. Any corrections required will be at contractor's expense and will result in delay of project time.

CSU Available Voltages and Color Identification Codes for Conductors at Service Entrance

Overhead	Underground
120/240V Single-Phase	120/240V Single-Phase
120/208V Single-Phase/Three-Phase (Existing Applications only)	120/208V Three-Phase
	277/480V Three-Phase

120V Single-Phase

Neutral – White	Leg "A" – Black	Leg "B" – Red

120/240V Three-Phase Delta (For Reference Only)

Neutral – White	Leg "A" – Black	Leg "B" – Blue	Leg "C" – Orange

The Hi-Leg (Orange) is to be located on the right hand lug of the meter can and the middle ("B") lug of the electrical panel or disconnect.

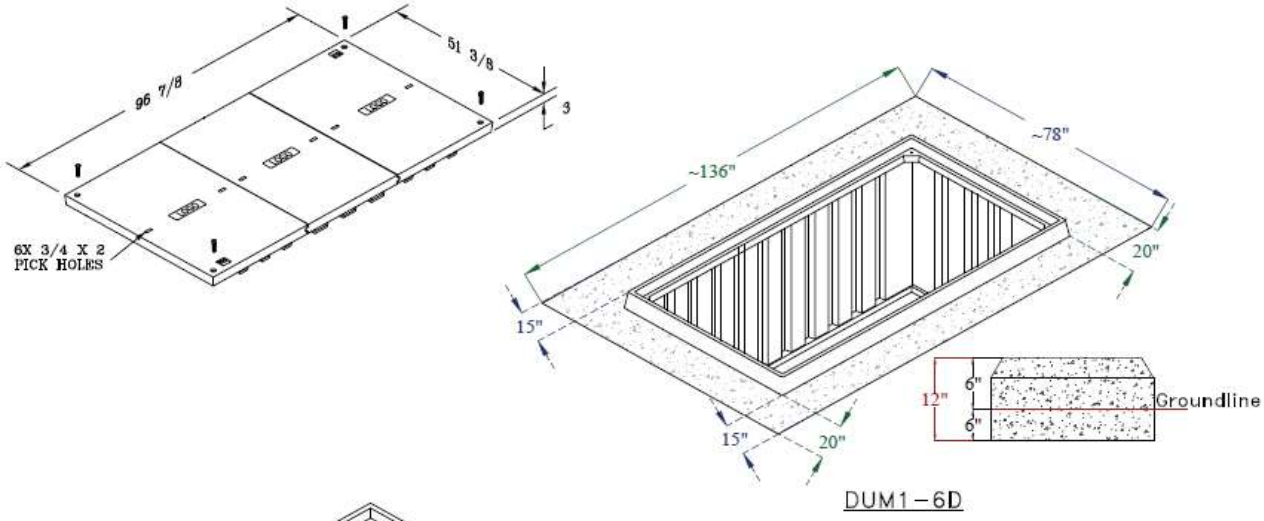
120/208V Three-Phase Wye

Neutral – White	Leg "A" – Black	Leg "B" – Red	Leg "C" – Blue

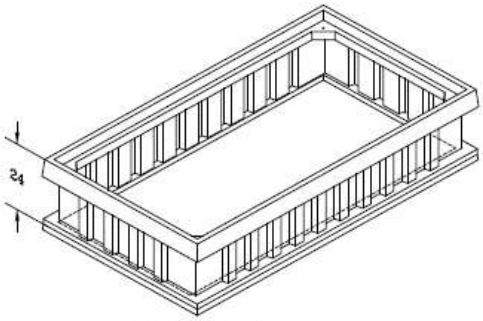
277/480V Three-Phase Wye

Neutral – White	Leg "A" – Brown	Leg "B" – Purple	Leg "C" – Yellow

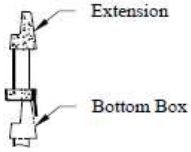
Switchgear Pad With 48” X 96” X 72” Pull Box



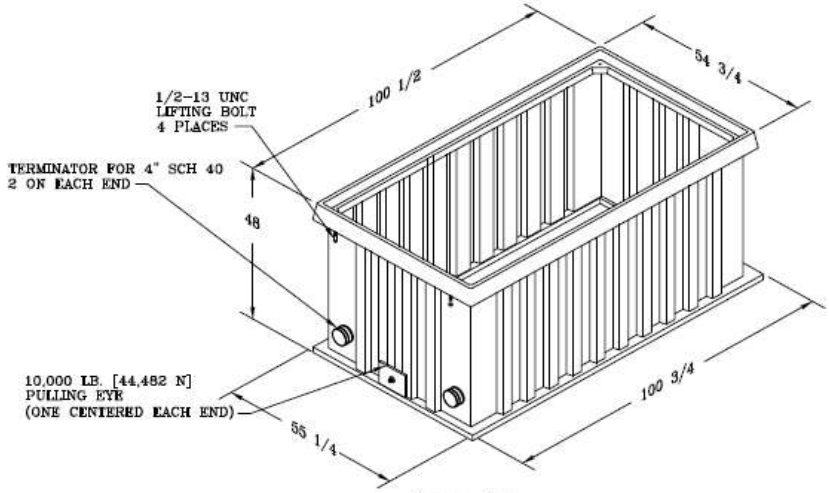
DUM1–6D



DUM–KEX



Top Extension to Box Detail

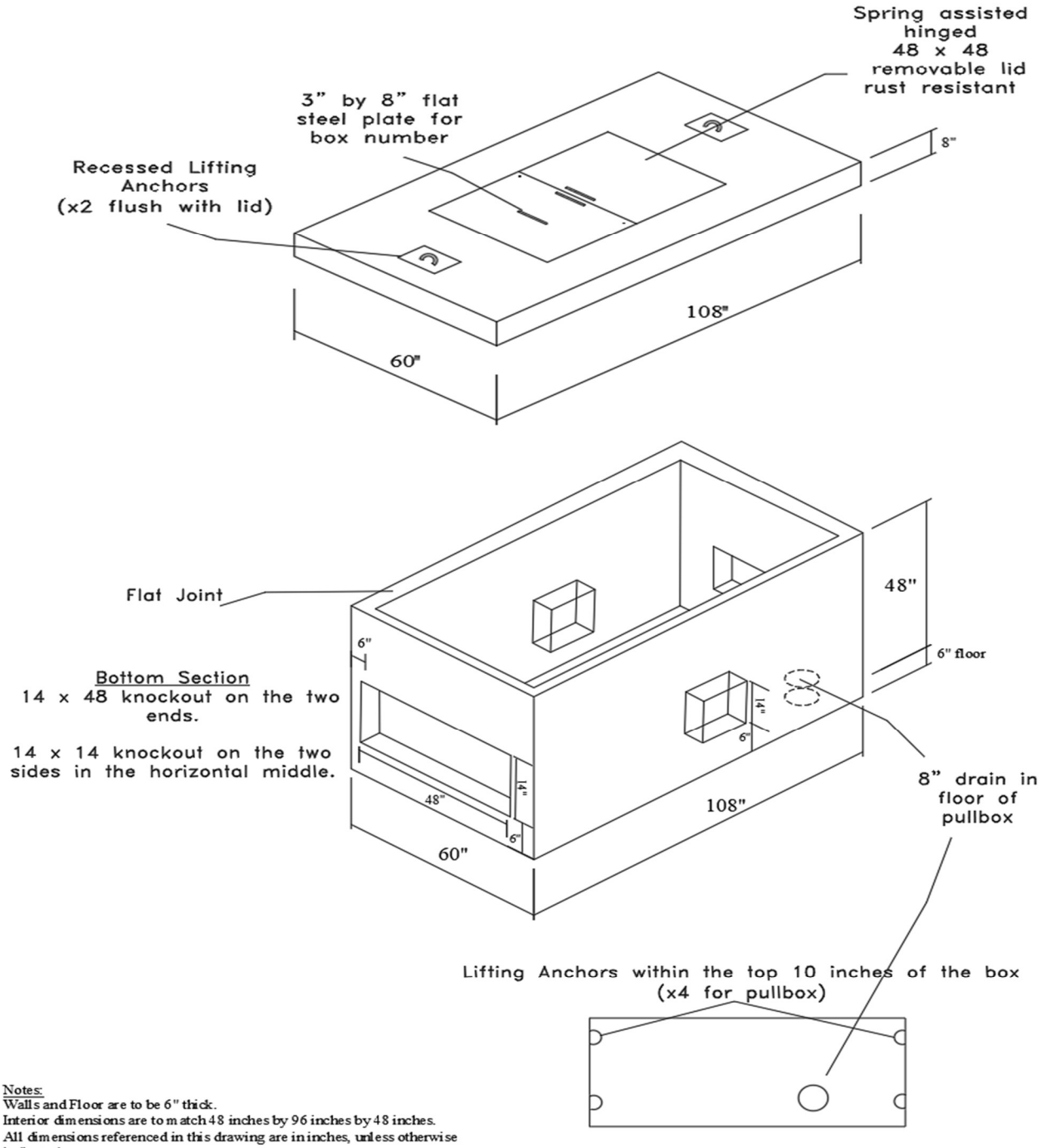


DUM–K1

Notes:

1. Drawing not to scale.
2. Pad assemblies include site preparation, bedding, and drainage.
3. Slabs may be precast or poured in place. Concrete shall be a 1:2:4 mixture with a minimum design strength of 3,000 P.S.I. Reinforcing steel shall be 3/8” rebar placed on 4” center on sides and top. Minimum concrete cover 2” over reinforcing steel.
4. Equipment shall be secured to pad in accordance with manufactures’ instructions.
5. Location and size of cable opening shall be as required for cable run.
6. The pad shall be installed with 6 inches above and 6 inches below final grade.

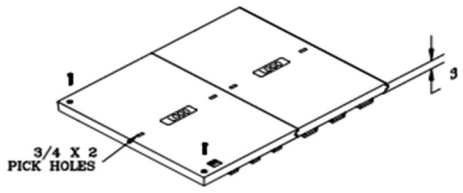
Switchgear Pad With 48” X 96” X 72” Concrete Pull Box

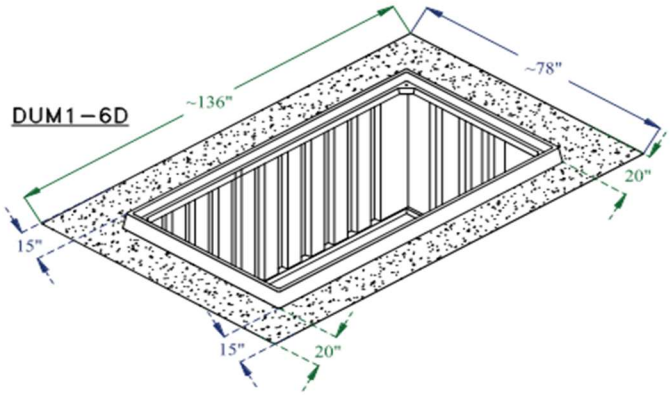


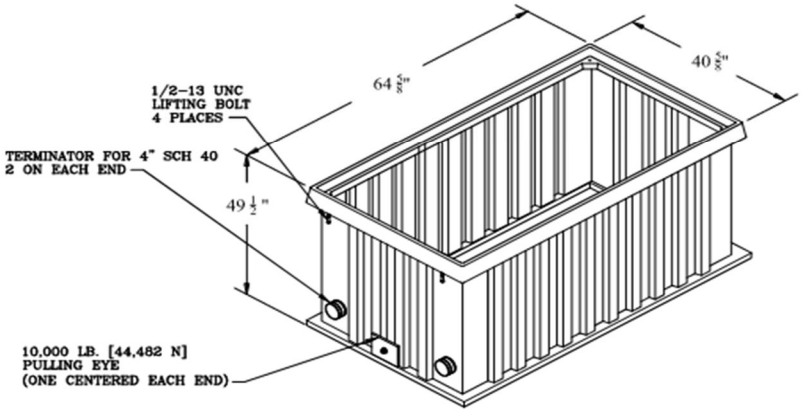
Notes:
Walls and Floor are to be 6" thick.
Interior dimensions are to match 48 inches by 96 inches by 48 inches.
All dimensions referenced in this drawing are in inches, unless otherwise indicated.
Concrete has a 28 day strength of 5000 psi.
Steel reinforcement of pullbox is ASTM A615 grade 60
Tolerances are +/- $\frac{1}{8}$"
Heavy vehicle traffic rated pullbox HS-20

19-24

36” X 60” X 72” Pull Box



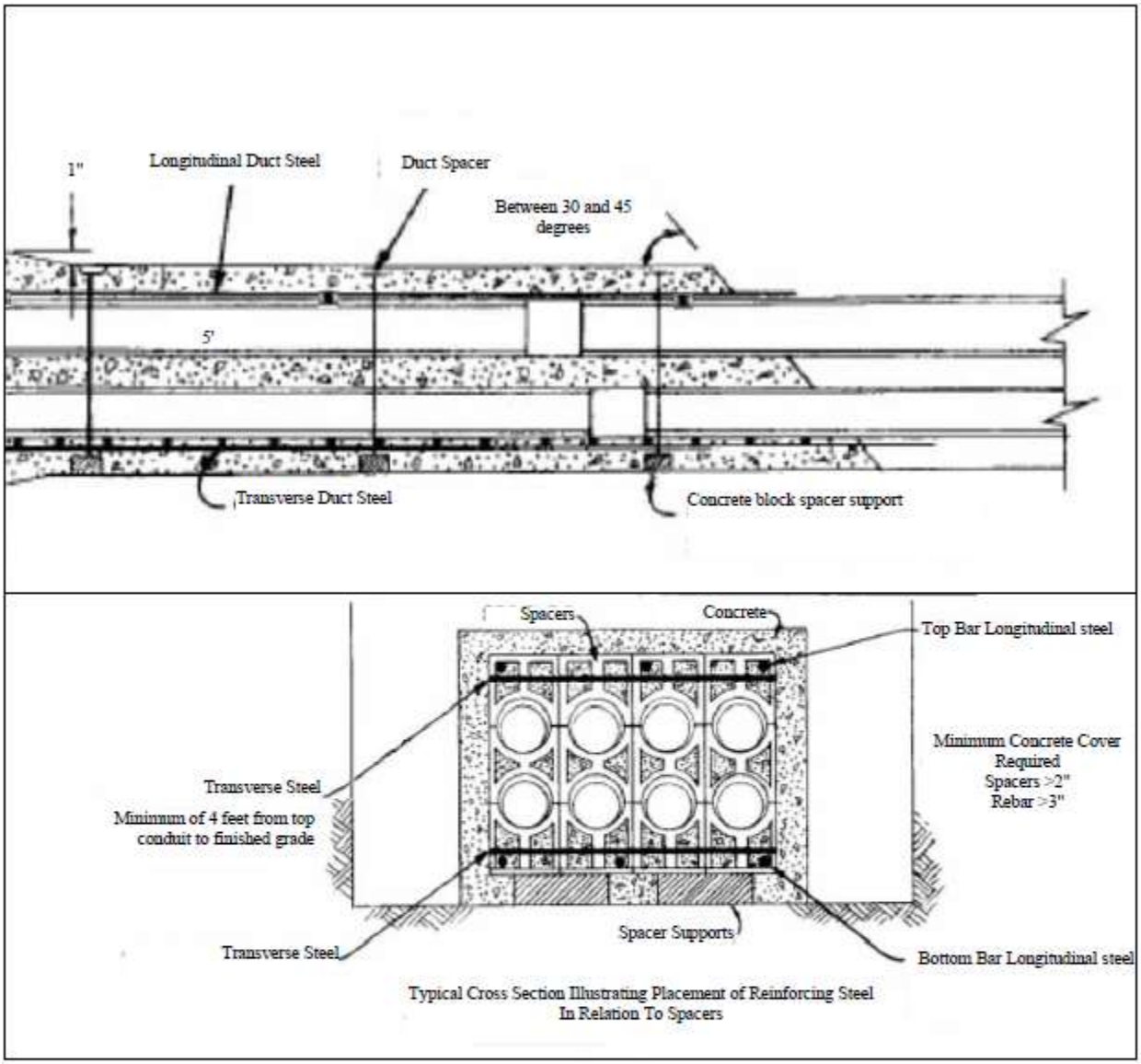




Notes:

1. Drawing not to scale.
2. Pad assemblies include site preparation, bedding, and drainage.
3. Slabs may be precast or poured in place. Concrete shall be a 1:2:4 mixture with a minimum design strength of 3,000 P.S.I. Reinforcing steel shall be 3/8” rebar placed on 4” center on sides and top. Minimum concrete cover 2” over reinforcing steel.
4. Location and size of cable opening shall be as required for cable run.
5. The pad shall be installed with 6 inches above and 6 inches below final grade.

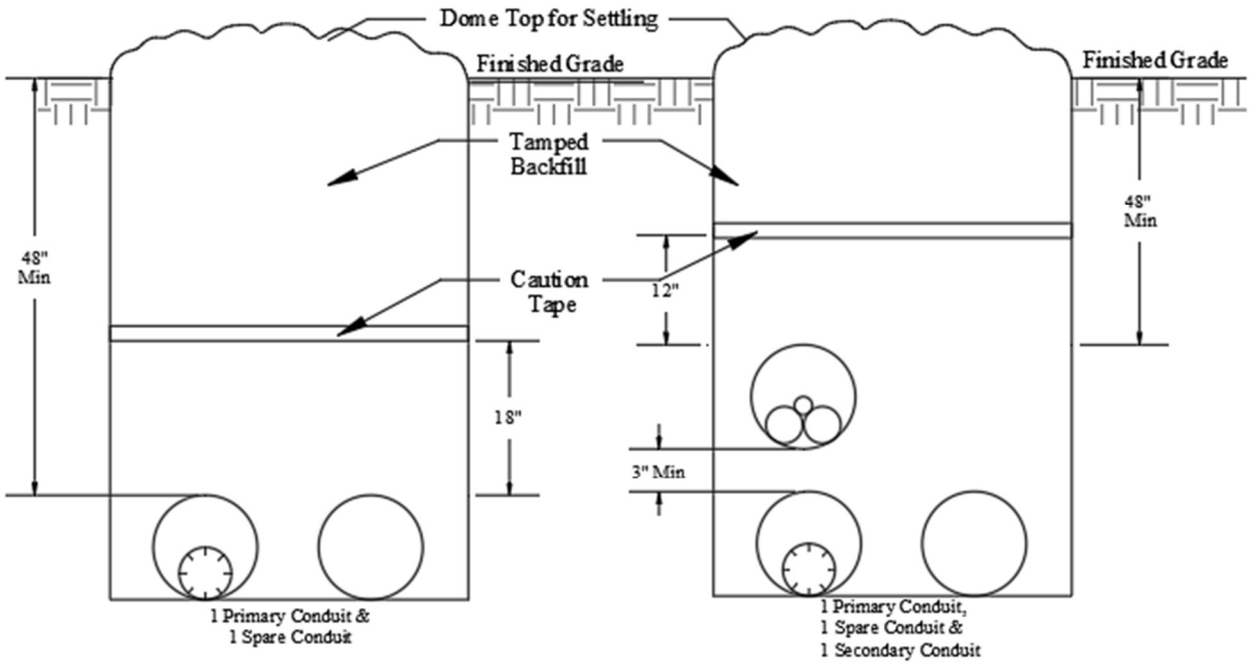
Typical Electric Trench with Conduit for Duct bank Installation



* Conduit amount and size will be determined on a job by job basis as needed by CSUE Designers

** All trenches are to be compacted to 95% standard soil density

Trench Requirements for Primary and Secondary Conduits

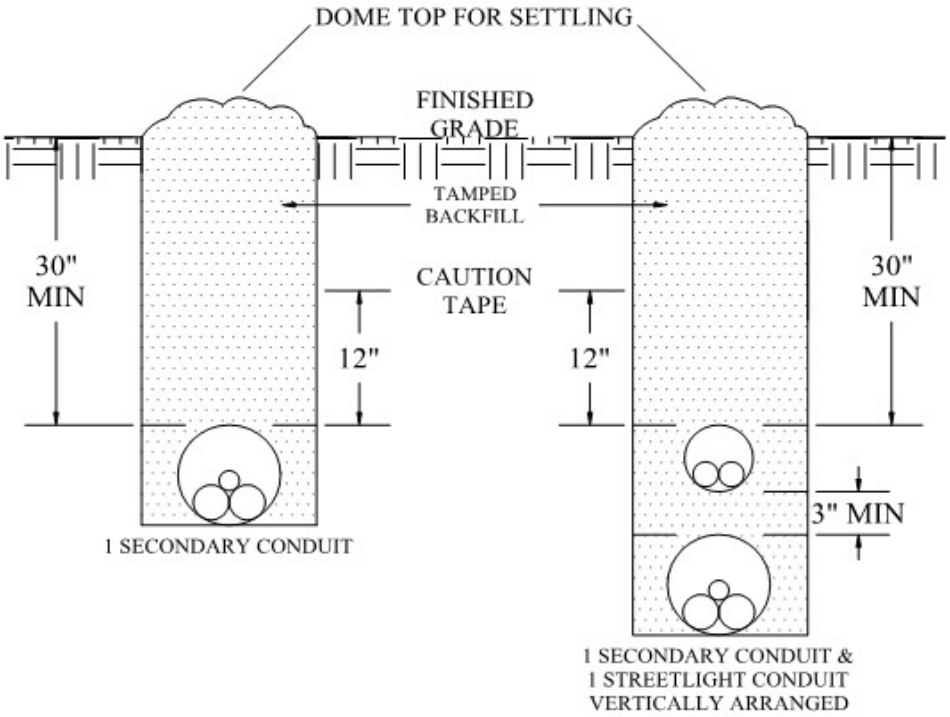


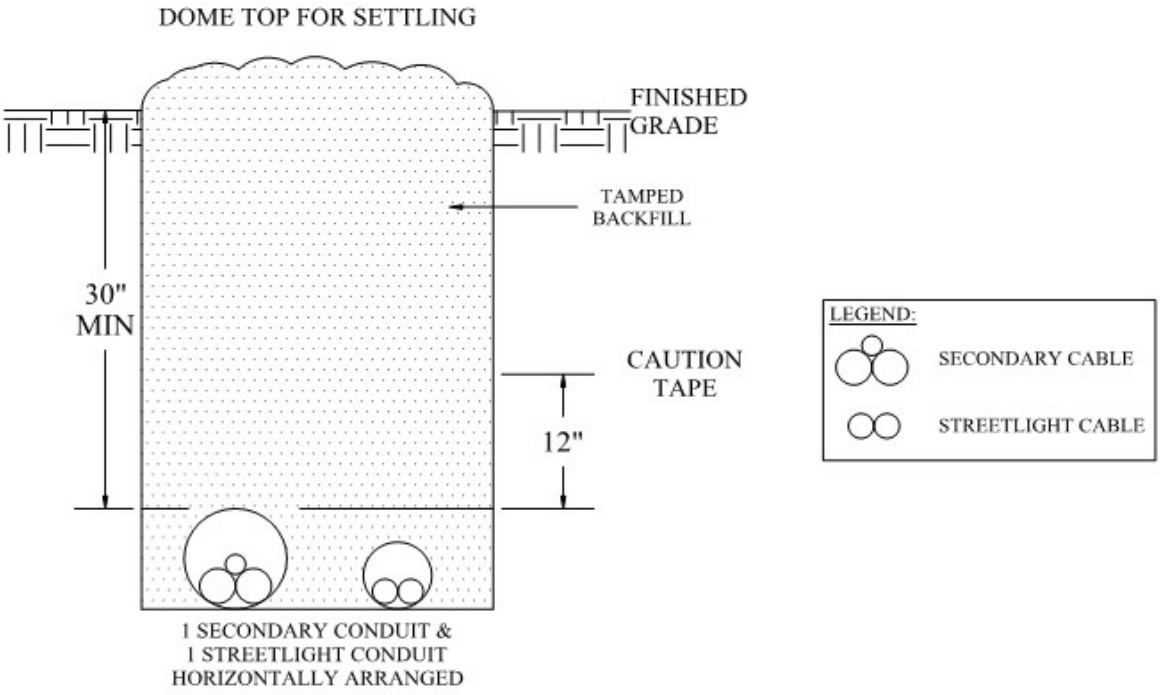
DRAWING NOT TO SCALE

Notes:

1. Consult CSU Design and Engineering Group for conduit size.
2. Separation dimensions apply to CSU conduits or cables only. Maintain 12” separation between CSU conduits or cables, and foreign conduits or cables.
3. Backfill material shall be mechanically compacted to ninety-five percent standard density.

Trench Requirements for Secondary and Streetlight Conduits



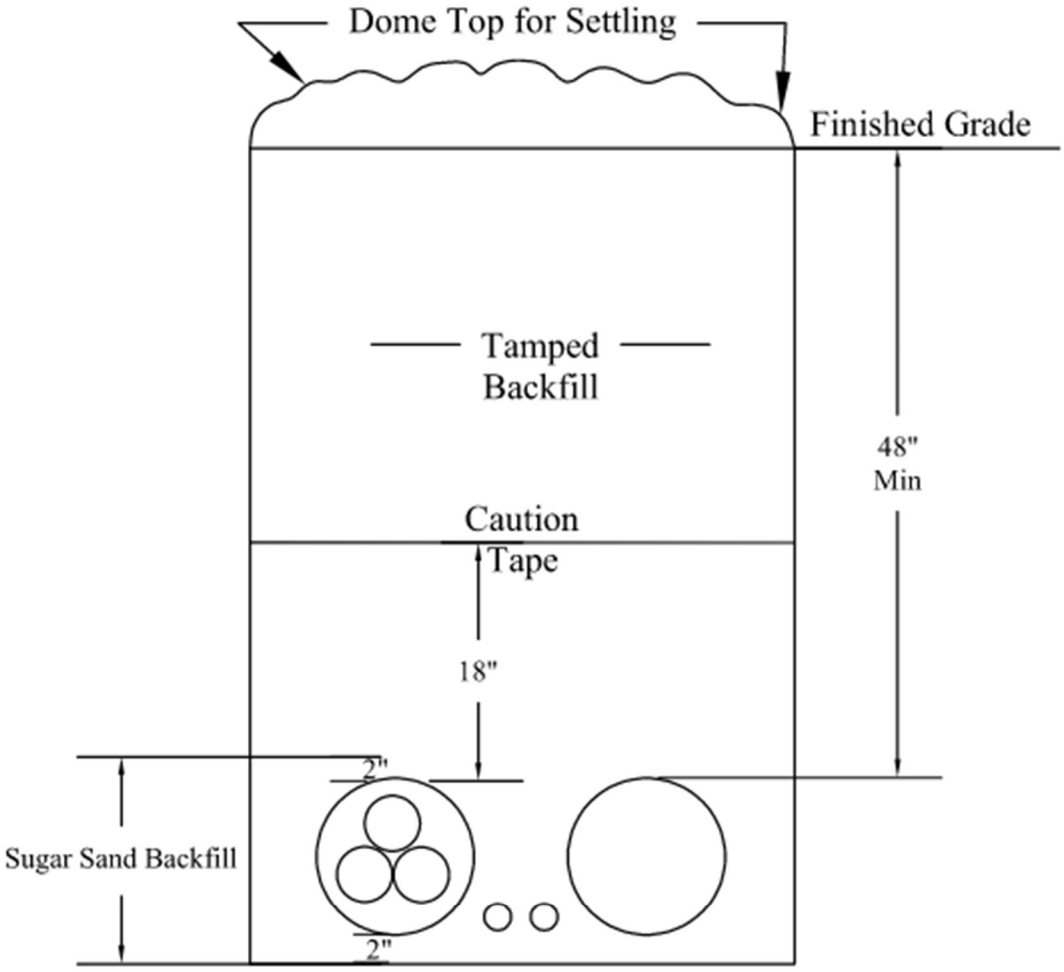


DRAWING NOT TO SCALE

Notes:

1. Consult CSU Design and Engineering Group for conduit size.
2. Separation dimensions apply to CSU conduits or cables only. Maintain 12” separation between CSU conduits or cables and foreign conduits or cables.
3. Backfill material shall be mechanically compacted to ninety-five percent standard density.

Trench Requirements for 600A Feeder Conduit

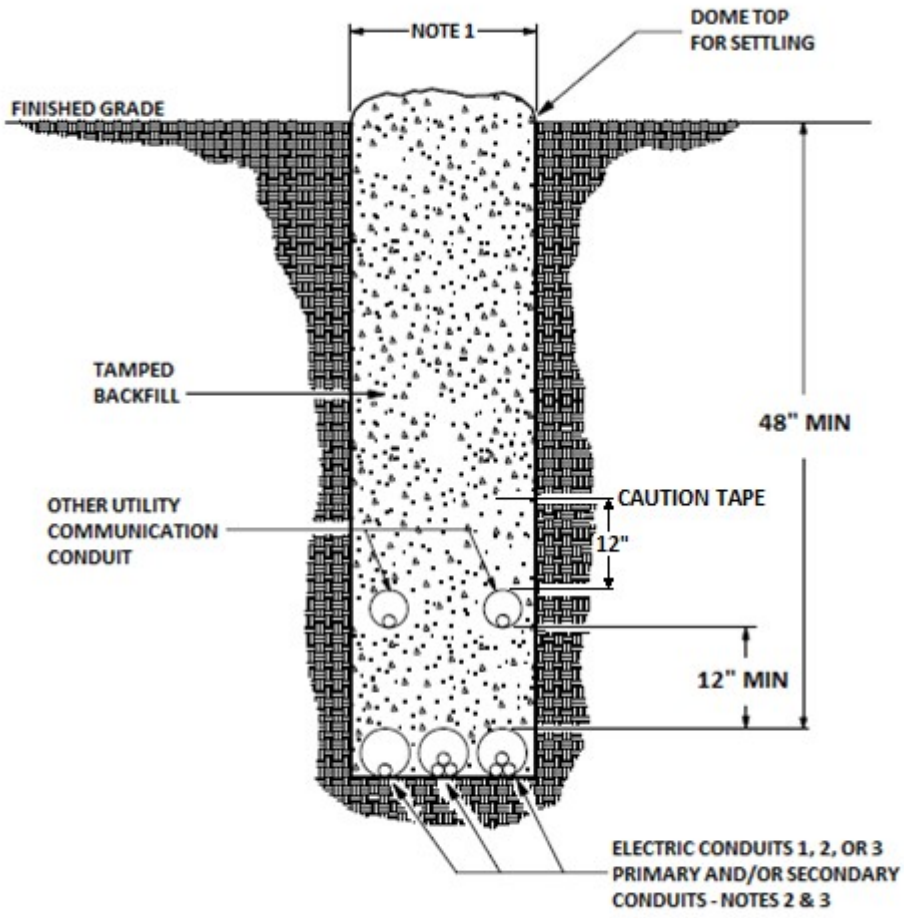


Two 6" (six inch) conduits
&
Two 2" (two inch) conduits

NOTES:

1. Separation Distances apply to CSU conduits or cables only. Maintain 12" separation between CSU conduits or cables and foreign conduits or cables
2. If multiple feeders are planned in one trench, approved duct bank configuration and spacers must be utilized
3. Backfill material shall be compacted to 95% standard density
4. Sugar sand backfill is to start 2 inches below the bottom of the conduit and is to continue to 2 inches above the top of the conduit. After that 95% standard density compacted spoils may be used.

Trench Requirements for Joint Use Electric and Communication Conduits



DRAWING NOT TO SCALE

Notes:

1. 12” min. with more than one electrical supply conduit.
   4” min. with one electrical supply conduit.
2. Ampacities are reduced for multiple circuits in a trench.
3. Backfill material shall be mechanically compacted to ninety-five percent standard density.

Installation of Conduits – Notes and Instructions

1. Trench alignment shall be as straight as conditions permit. Any deviations from planned alignment shall have prior approval by the project engineer/inspector. All trench cuts shall be in accordance with existing safety regulations in effect.

2. Trench bottom should be undisturbed, tamped, or relatively smooth earth. Where excavation is in rock, the conduit should be laid on a layer of clean backfill.

3. All backfill should be free of debris or other material that may damage the conduit system or cause settling. The material should fill the voids around the conduit to prevent hot spots and settling.

4. Backfill should be adequately compacted. Backfill not under pavement should be compacted to the density of the surrounding undisturbed soil. Backfill under pavement should be compacted to no less than 95% of the density of undisturbed soil as determined by ASTM D-696.

5. Each conduit run shall be checked by pulling a mandrel through the entire length at the completing of the civil installation.

6. Mule tape shall be installed in one continuous run for the entire length of the conduit and attached to both ends with 10 feet minimum extending from each end of the conduit. Pull boxes are start/stop points for each run of mule tape. Mule tape shall be installed in all conduits.

7. CSU requires ¾" mule tape with a 2,500-pound rating and continuous footage markers for all conduit sizes.

8. Arrange conduit such that conduit enters pullboxes in the same configuration on both ends of a conduit run – Rack conduit with **approved spacers only**.

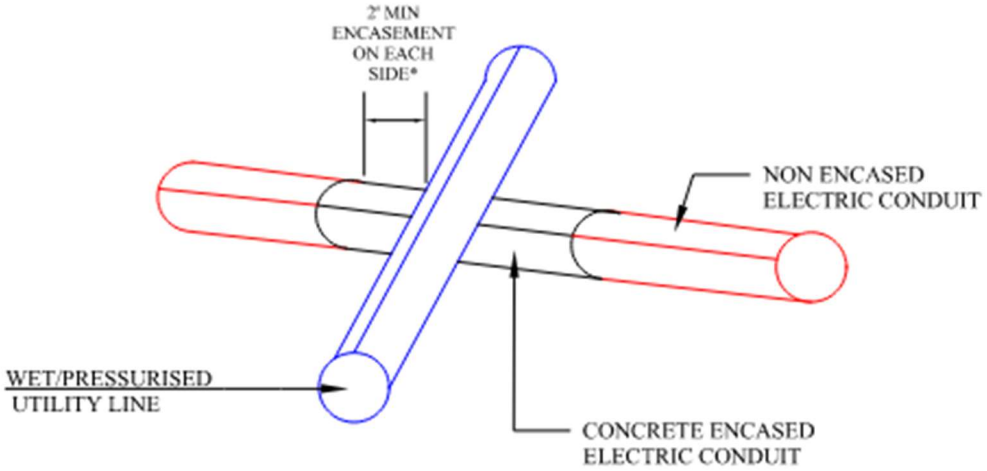
9. If more than four conduits are being installed, or any conduit is being ducted – Racking of conduits is required.

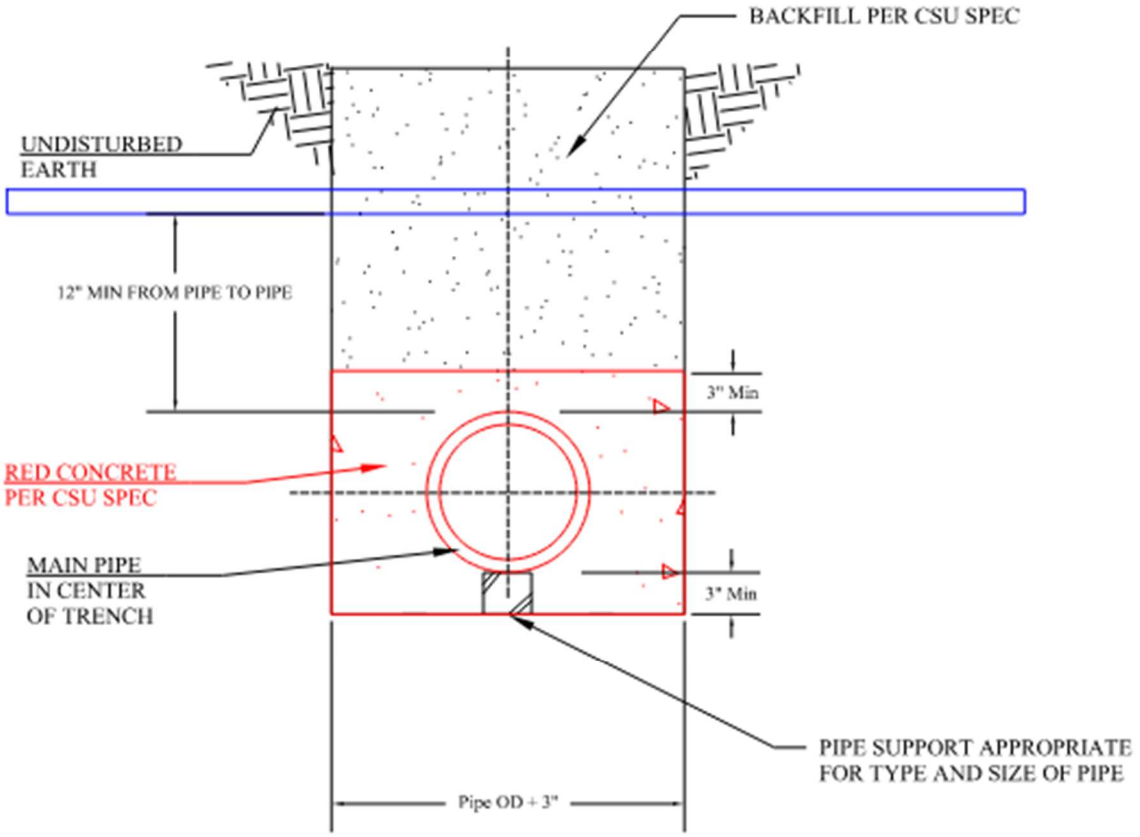
10. **All Conduits** shall be installed in a PUE. Per COCS UDO, it is the responsibility of the developer to locate all easements and dedicate PUE if one does not exist.

11. CSU does not allow more than (3) three (90°) ninety-degree fittings, or the equivalent of (270°) two hundred and seventy degrees of bends in any conduit run.

12. If conduit must be heated to create a custom bend, a mandrel will be required to pull through the conduit. If the mandrel does not pass through the conduit, repairs will be completed by and at the expense of the developer.

Installation of Crossing Conduits Without Minimum Clearance





Notes:
*Crossings involving a gas line will require notice to and inspection from ATMOS Energy
*If the crossing is not perpendicular, encasement increases to 4' on each side of the crossing

19-21

Ditch and Mandrel Inspection of Conduit/Duct

All conduits shall be visually inspected before backfilling the trench by CSU Representatives. Any concrete encased duct must be inspected by first by CSU Representatives prior to the pouring of the concrete, and a second time after the pouring of concrete and prior to backfilling the trench. Any conduit not visually inspected prior to backfill will be required to be re-excavated to verify proper depth and placement. All conduit installed must fulfill CSU design requirements such as size and use of factory sweeps and elbows.

CSU reserves the right to request a mandrel inspection on any conduit run – new or existing. Customer installs duct system and calls for an inspection before backfilling the trench. Any concrete encased duct must be inspected prior to and after the pouring of concrete but prior to backfilling the trench. After this part of the installation has been approved, the customer will backfill the trench in accordance with CSU Backfill and Bedding Guidelines and prepare to pull a mandrel no more than 1/2" smaller than the inside of the duct. The next inspection will be made by CSU when the mandrel is pulled through the duct. Prior to mandrel inspection the Customer/Contractor shall have mule tape series 2500 or better installed in the duct system. At the time of inspection, the customer will provide CSU required continuous (**no splices**) length of footage calibrated mule tape to be attached to the mandrel and pulled into the duct. The mule tape will be used by CSU for subsequent cable installation. Failure to have required inspections at the proper time will result in a delay until the duct is uncovered for inspection and the mandrel is pulled in the presence of CSU Representative(s).

Backfill and Bedding

This page outlines the acceptable soil that may be utilized to provide bedding and trench backfill over and around CSU installed primary, secondary, and service cable in polyethylene coil able HDPE or PVC duct. For this discussion, “bedding” is defined as the soil mixture surrounding the duct, 6” on top and 3” on sides. “Backfill” is defined as the remaining soil mixture required to fill the trench excavation.

Backfill is the material placed on top of the bedding starting a minimum of 6” above the duct. Bedding is the material in which the duct is placed and extends a minimum of 6” and 3” to the side of the duct. When imported bedding is required, the trench shall be over-excavated to provide a minimum of 6” of bedding under the duct and maintain the proper depth requirements for the duct.

The trench floor shall be relatively smooth, with no loose or protruding rocks and/or organic material (roots, boards, etc.).

Should the existing soil conditions not meet this condition, then the duct shall be bedded in 6” of soil free of debris and gravel larger than 2 inches. Additionally, natural river or bank sand that is free of silt, clay, loam, friable, or soluble materials may be used.

From point 6” above the duct where the bedding ends, the trench may be backfilled with excavated material, provided there are no rocks larger than 2” in any dimension be allowed in the trench. All backfill shall be compacted to ninety-five percent standard density. It shall be placed in a manner that will not damage the conduit or its substructure or allow future subsidence of the trench or substructure.

For any 600A Feeder conduit installation, the drawing Trench Requirements for 600A Feeder Conduit lays out the requirements, sugar sand fill is required to protect the conduit during compaction. Any questions should be directed to the CSU Design group.

Instruction for Joining PVC Conduit

The chemicals used in solvent welding of conduit are intended to penetrate the surface of both pipe and fitting, which after curing result in a complete fusion at the joint. The over-use or the under-use of chemicals results in leaky joints or weakened pipe.

A. Clean conduit by wiping off all dust, dirt, and moisture from surfaces to be cemented, either by mechanical or chemical cleaning.
    a. Mechanical cleaning – fine abrasive paper or cloth (180 grit or finer) or clean oil-free steel wool.
    b. Chemical cleaning – cleaner recommended by manufacturer or equivalent (methyl ethyl ketone – MEK)

B. With a non-synthetic bristle brush, apply an even coating of cement to the outside of the pipe and inside the socket. Make sure that the amount of cement applied to the conduit is equal to the depth of the socket. Before assembly, if some evaporation of solvent from the surfaces to be joined is noted, reapply cement, then assemble.

    If cement being used has an appreciable change in viscosity or shows signs of jelling, it shall be discarded. In no case shall thinner be used in an attempt to restore jelled PVC cement. Thinner may only be used to change the viscosity of a medium bodied cement to that of a regular bodied cement for application on PVC pipe smaller than 2-1/2 inch diameter. A medium bodied cement shall be used on 2-1/2 to 6 inch PVC pipe.

    In cold weather, use a primer to soften the joining surfaces before applying cement, allow longer cure time. (See item E)

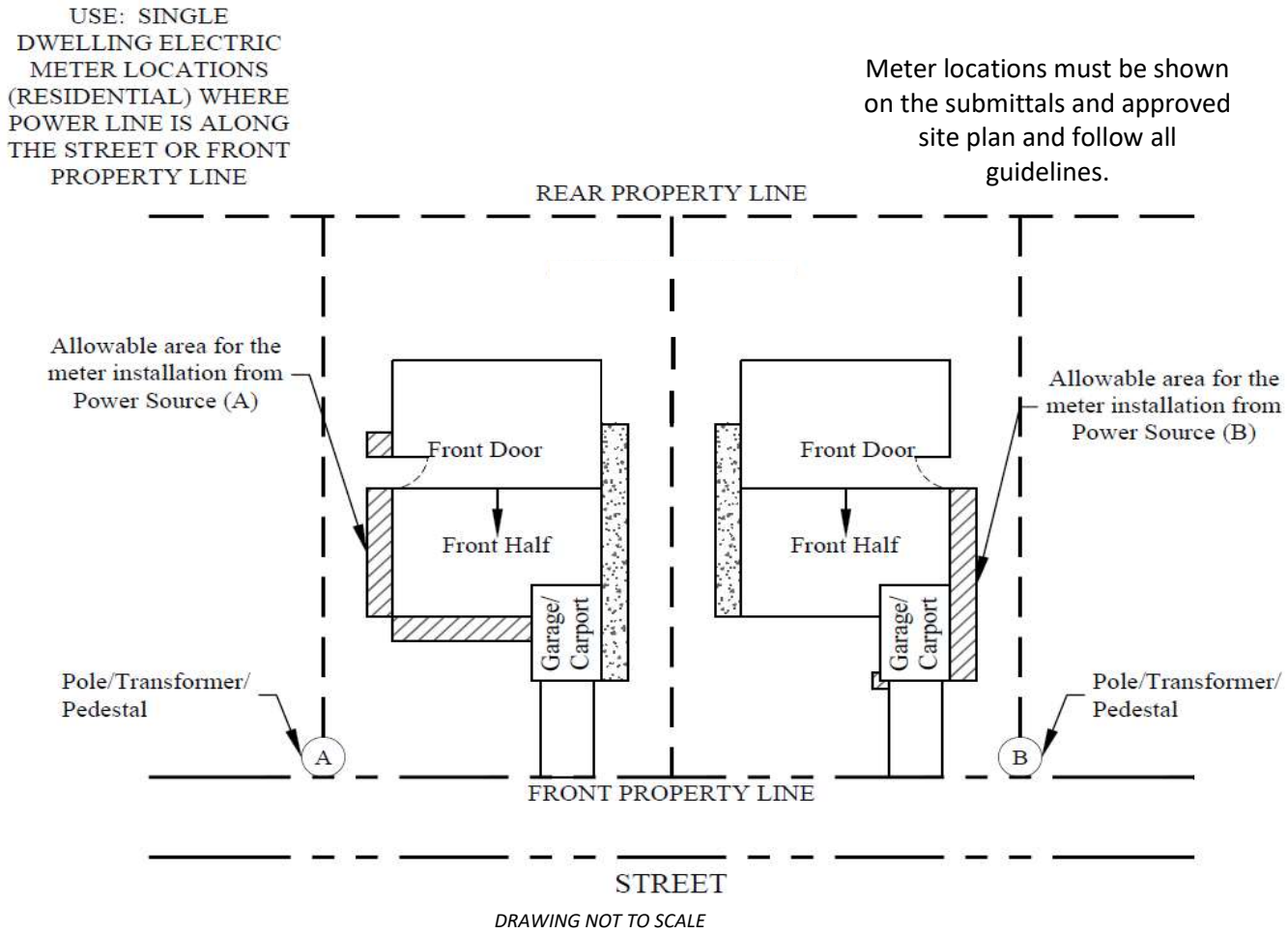
C. Join pipe within 20 seconds of applying cement, turn the pipe ¼ turn to ensure even distribution of cement on surfaces to be bonded. Make sure that pipe is inserted to the full depth of the socket.

D. Clean off any bead or excess cement that appears at the outer shoulder of the fitting, excess cement allowed to remain in contact with the material is apt to cause weakening of the material and subsequent failure.

E. Newly assembled joints should be handled carefully until the cement has cured the recommended set period. Set periods are related to the ambient temperature as follows:

    30 minute minimum at 60° to 100° F
    1 hour minimum at 40° to 60°F
    2 hour minimum at 20° to 40°F
    4 hour minimum at 0° to 20°F

Residential Meter Location – Front Property Line Utility Placement



DRAWING NOT TO SCALE

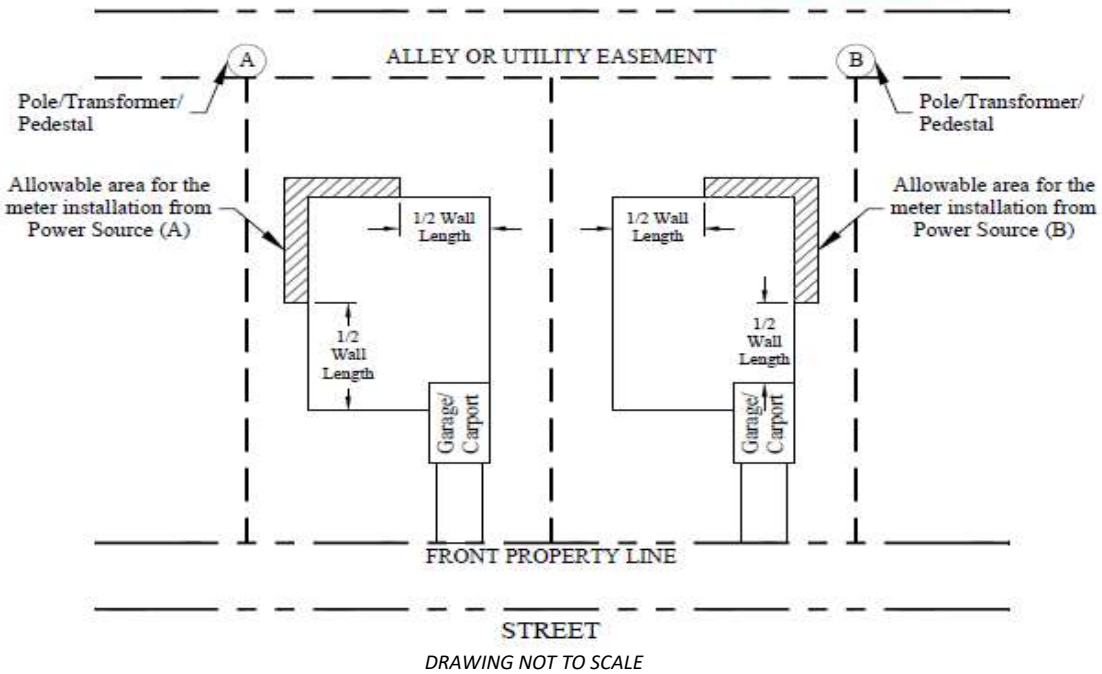
Notes:

1. Front property line utility placement requires the meter to be located within one-half (1/2) the length of the front or side wall nearest to the designated power source.
2. The lot corner from which the meter is to be served shall be designated by a CSU Representative. For subdivisions, service stub outs will be depicted on CSU's construction drawing of the underground electrical distribution system.
3. All meters shall be located on an exterior house or garage wall and are not allowed under a carport, breezeway, patio, porch, or area that can be enclosed with building expansion.
4. The meter shall be accessible for reading, connecting, disconnecting, testing, and maintenance. CSU reserves the right to determine meter location.
5. In townhouse developments where side wall locations are not available, meter location may be determined in consultation by CSU Design and Engineering Department.
6. The underground service length is to be 100' or less. Schedule 40 PVC conduit must be used and it may have no greater than 270° of bends, with no more than three (3) 90° bends, within the conduit run. Contact the CSU Design and Engineering Department for approval of service location prior to panel installation and trench excavation. Also see: Trench Requirements for Secondary and Streetlight Conduits
7. Meter Location is required to be shown on the submittals and must be approved by CSU.
8. For additional information regarding meter locations, contact the CSU Design and Engineering Department.

Residential Meter Location – Rear Property Line Utility Placement

USE: SINGLE DWELLING ELECTRIC METER LOCATIONS (RESIDENTIAL) WHERE POWER LINE IS ALONG THE ALLEY OR REAR PROPERTY LINE

Meter locations must be shown on the submittals and approved site plan and follow all guidelines.

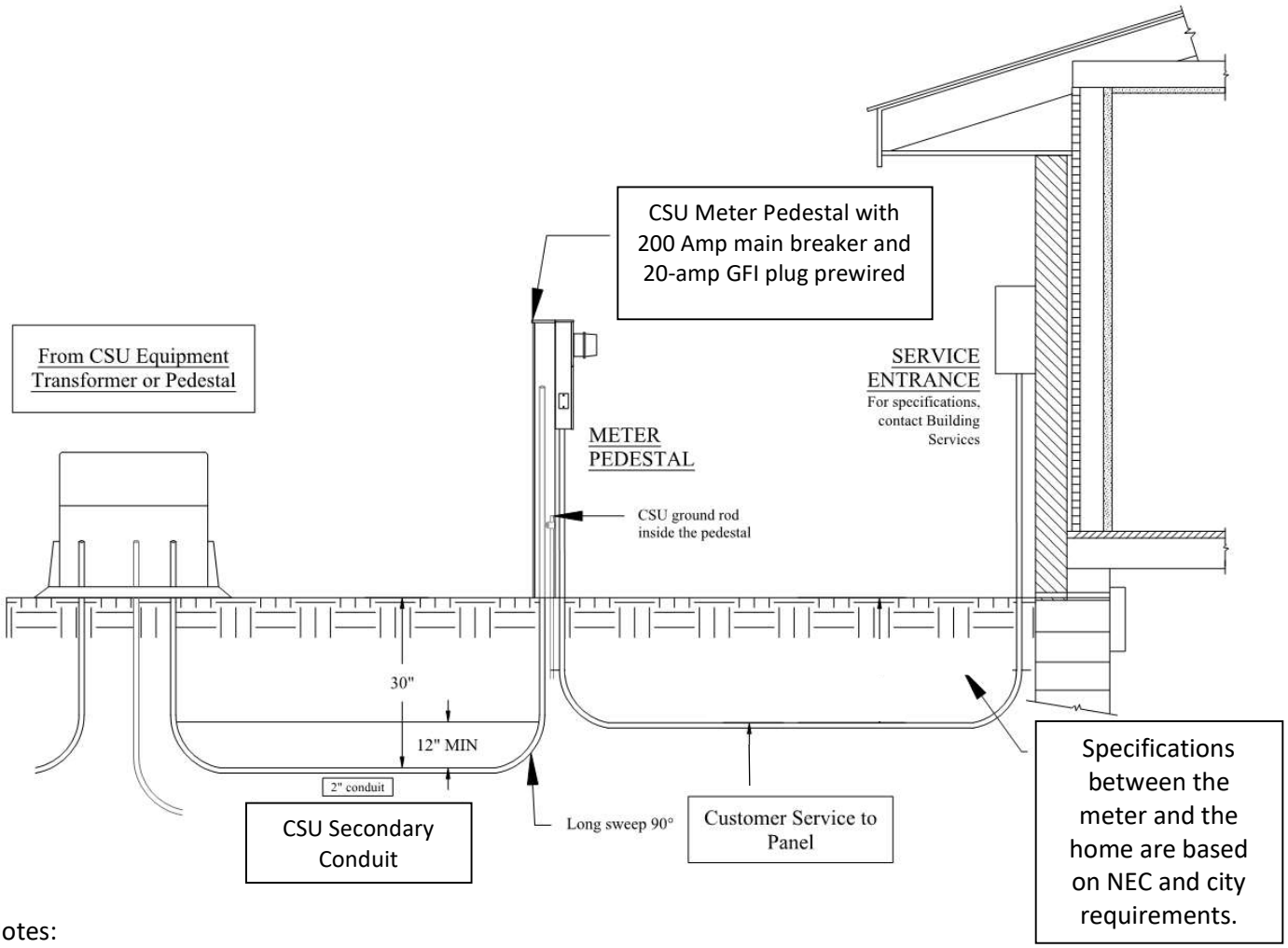


DRAWING NOT TO SCALE

Notes:

1. Rear property line utility placement requires the meter to be located within one-half (1/2) the length of the rear or side wall nearest to the designated power source (closest quadrant).
2. The lot corner from which the meter is to be served shall be designated by a CSU representative. For subdivisions, electrical meters will be depicted on CSU's construction drawing of the underground electrical distribution system.
3. All meters shall be located on an exterior house or garage wall and are not allowed under a carport, breezeway, patio, porch, or area that can be enclosed with building expansion.
4. The meter shall be accessible for reading, connecting, disconnecting, testing, and maintenance. CSU reserves the right to determine meter location.
5. In townhouse developments where side wall locations are not available, meter location may be determined in consultation by CSU Design and Engineering Group.
6. The underground service length is to be 100' or less. Schedule 40 PVC conduit must be used and it may have no greater than 270° of bends, with no more than three (3) 90° bends, within the conduit run. Contact the CSU Design and Engineering Department for approval of service location prior to panel installation and trench excavation. Also see: Trench Requirements for Secondary and Streetlight Conduits
7. Preferable to run parallel to the property line and then to the meter location to eliminate future conflicts with swimming pool or accompanying structures installation.
8. Meter location must be shown on the submitted site plans and must be approved by CSU
9. For additional information regarding meter locations, contact the CSU Design and Engineering Department.

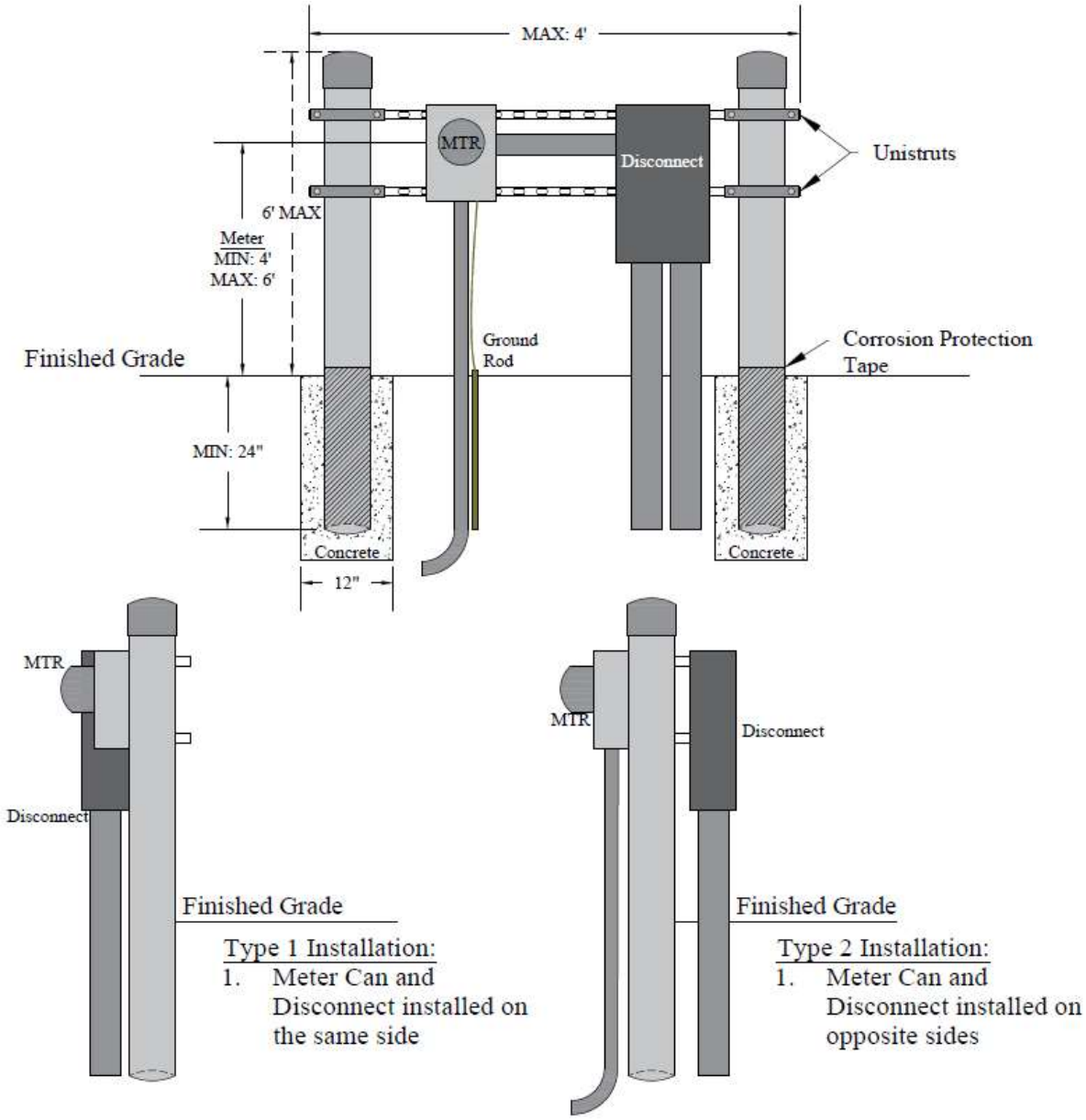
Underground Meter Pedestal



Notes:

1. All customer installations require a conduit and mule tape inspection by CSU. Backfill all trenches with clean material. Minimum hand tamp, preferably with pneumatic tool, to ninety-five percent (95%) standard density.
2. All meter pedestals will be installed by CSU as the temp pole and should be connected by customer to serve as the permanent meter location when ready.
3. All conduit sizes and depths between service entrance and meter pedestal are recommended and shall comply with applicable rules, regulations, and codes.
4. CSU to install Meter Pedestal using foam or concrete for backfill.

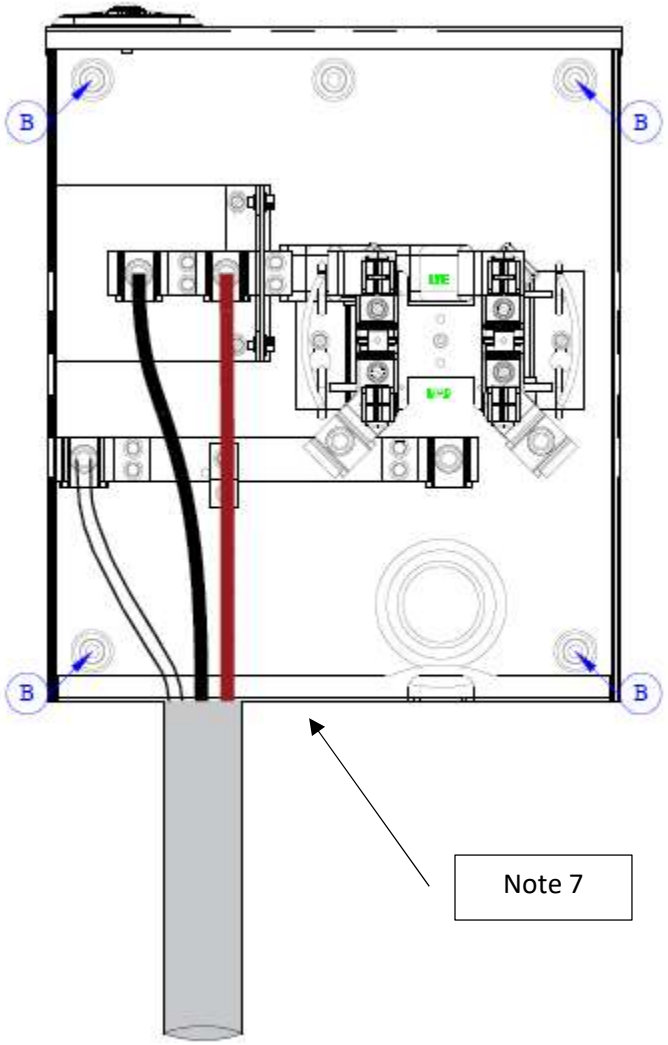
Single Phase or Three Phase Meter Rack Installations



Notes:

1. Meter racks up to 200 amps shall be constructed with 2" galvanized rigid pipe or equivalent and must be capped. Rigid pipe under the finished grade must be wrapped in corrosion protection tape. Each rigid pipe shall be encased in 10" diameter poured concrete. No Wooden materials allowed under any circumstances.
2. Meter racks above 200 amps shall be constructed with 2" galvanized rigid pipe or equivalent and must be capped. Rigid pipe under the finished grade must be wrapped in corrosion protection tape. Each rigid pipe shall be encased in 10" diameter poured concrete. No Wooden materials allowed under any circumstances.
3. Electrical conduits shall be schedule 40 PVC.

4. The contractor is responsible for providing and installing the service entrance enclosure, meter sockets, conductors, raceway, and gutter. Ground rod will be installed by the Meter Can and shall be 5/8” x 8’ copper clad, continuous, and cannot be cut.
5. Each socket must be clearly and **permanently** marked on the interior and exterior of the meter socket to indicate each location served.
6. Service entrance conductors to be continuous from load side of meter socket into service enclosure. Enclosure shall have provisions for locking or sealing.
7. Please use the **left opening** on the underside of the Meter Can for CSU conduit connection and wiring **only**.
8. Contact CSU Personnel for approval of meter pedestal prior to letting bids and installing equipment.



Rules for Metering High Rise Apartment Complexes

Note: all meter locations, transformer locations, facility routes, and available voltages needs to be approved by the CSU Electric Designer before any designs are finalized. All metering installations will be installed to meet CSU's requirements and the City's building code requirements.

Customer Choices for Residential Services:

1. Individually Metered Apartment Complexes
    a. Services (up to the meter) and meters provided by CSU.
    b. Service to be 120/208V three phase (with single phase apartment load balanced between phases).
    c. Meter packs to be furnished and installed by customer. Must meet installation requirements set forth by CSU.
    d. Meters must be located on the ground floor exterior wall or meter room on ground floor meeting CSU's requirements.
    e. Multiple service points may be provided if City firewall and code requirements are met. This will involve the customer marking sites available for metering, transformers, and facilities that meet CSU's accessibility, clearance, and right of way requirements.

2. Non-sub metered Master Metered Apartment Complexes – "All Bills Paid" Apartments
    a. Service (up to the meter) to commercial metering and Master Meter provided by CSU.
    b. Service to be 120/208V or 277/480V three phase. Customer is responsible for any voltage conversions required.
    c. CSU meters must be located on the ground floor exterior wall, a meter rack, or a meter room on ground floor meeting CSU's requirements. The only way the meter can be located on the transformer is if CSU determines that it is the only meter that will ever be served from that transformer.
    d. Multiple service points may be provided if City firewall and code requirements are met. This will involve the customer marking sites available for metering, transformers, and facilities that meet CSU's accessibility, clearance, and right of way requirements.
    e. Customer falls under PUCT Substantive Rule 25.141 if they bill tenants for individual apartment electric Usage.

3. Sub metered Master Metered Apartment Complexes
    a. Service (up to the meter) to commercial metering and Master Meter provided by CSU. **CSU will not be responsible for any third-party metering.**
    b. Service to be 120/208V or 277/480V three phase. Customer is responsible for any voltage conversion required.
    c. CSU meters must be located on the ground floor exterior wall, a meter rack, or a meter room on ground floor meeting CSU's requirements. The only way the meter can be located on the transformer is if CSU determines that it is the only meter that will ever be served from that transformer.
    d. Multiple service points may be provided if City firewall and code requirements are met. This will involve the customer making sites available for metering, transformers, and facilities that meet CSU's accessibility, clearance, and right of way requirements.

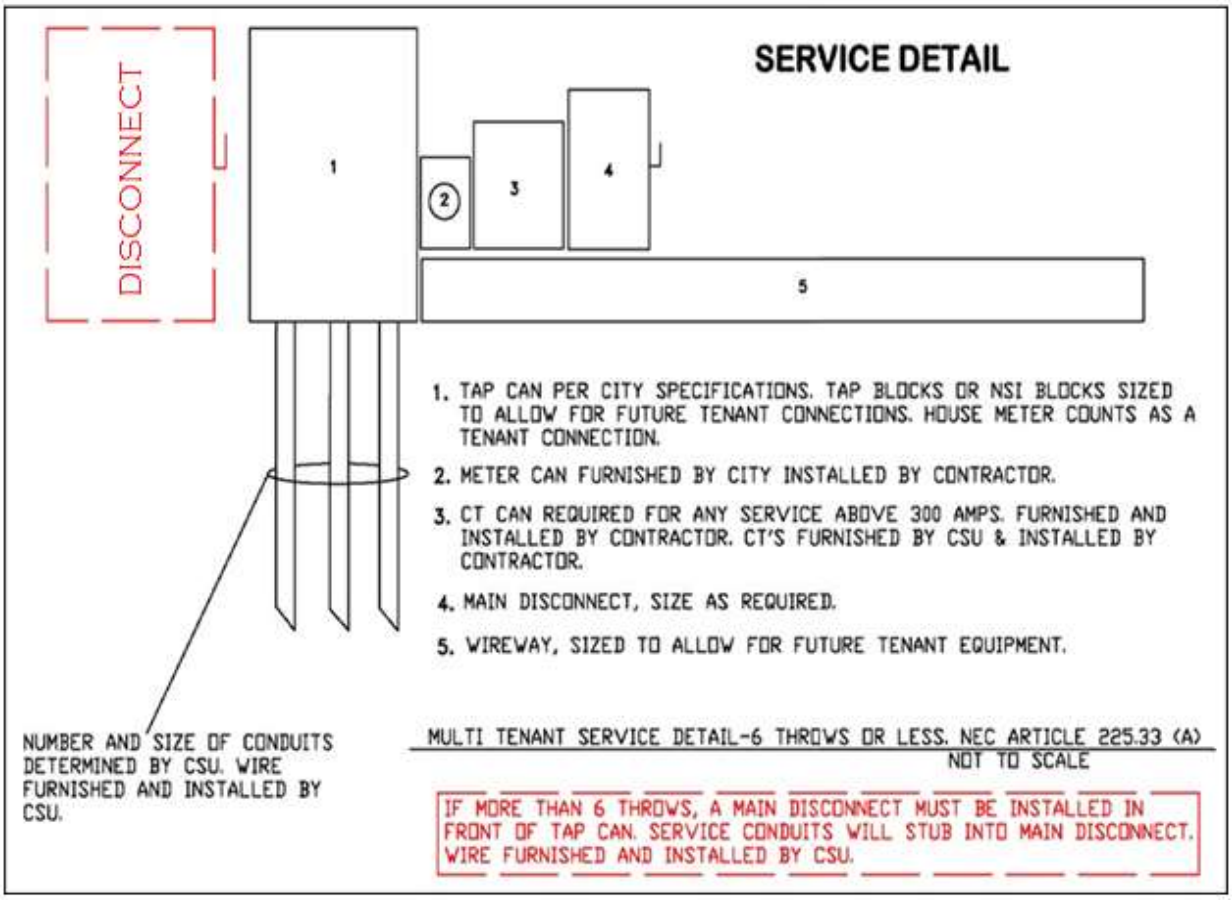
e. Customer falls under PUCT Substantive Rule 25.142 for requirements for billing tenants for individual apartment usage.
f. Developer will pay cost difference from a 120/240V meter to a 120/208V meter. Current cost of meter to be determined at start of project.

Requirements for Commercial Services:

1. Common Use Areas
    a. CSU meters must be located on the ground floor exterior wall, a meter rack, or a meter room on ground floor meeting CSU's requirements. The only way the meter can be located on the transformer is if CSU determines that it is the only meter that will ever be served from that transformer.
    b. Meter will be a commercial meter with demand.
    c. The service to Common Use Areas will be the same voltage as the service to the building unless prior arrangements are made with, and approved by, CSU.
    d. If more than one transformer is required (regardless of voltage level), the physical location, clearances, right of ways, and routing facilities for each transformer must be distinctly available.
    e. Customer falls under PUCT Substantive Rule 25.141 if they bill tenants for electricity used in Common Use Areas.

2. Commercial Lease Spaces
    a. CSU meters must be located on the ground floor exterior wall, a meter rack, or a meter room on ground floor meeting CSU's requirements. The only way the meter can be located on the transformer is if CSU determines that it is the only meter that will ever be served from that transformer.
    b. Meter will be a commercial meter with demand.
    c. The service to the Commercial Lease Spaces will be the same voltage as the service to the building unless prior arrangements are made with, and approved by, CSU.
    d. If more than one transformer is required (regardless of voltage level), the physical location, clearances, right of ways, and routing facilities for each transformer must be distinctly available.

Commercial Multi-Tenant Service Detail



Sizes

CT Cans

Up to 600 – 36 x 36 x 10

Greater than 600 – 48 x 48 x 10

Tap Cans

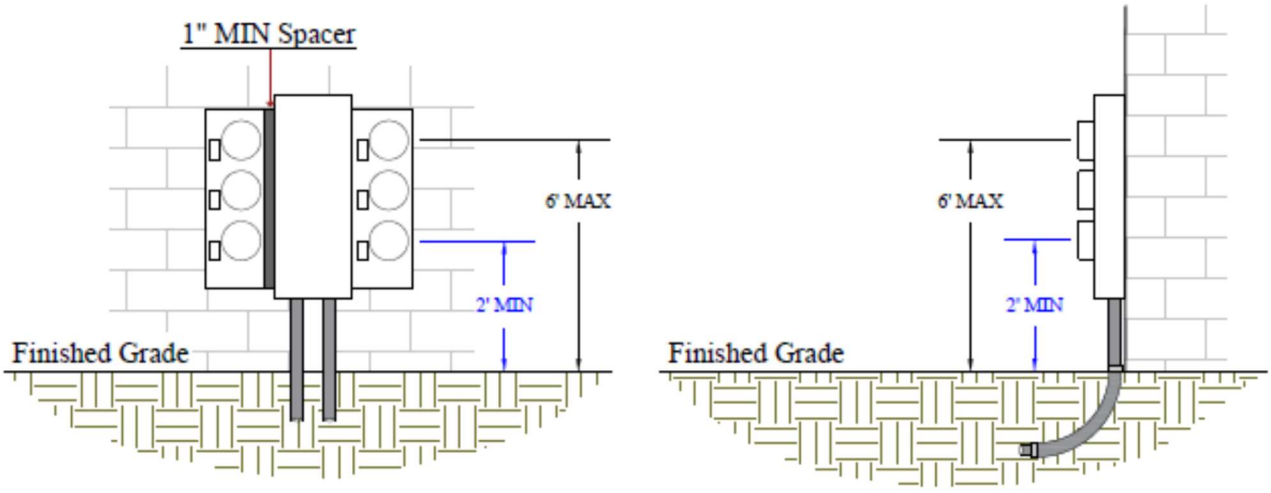
2 to 4 services – 36 x 36 x 10

5 or more – 48 x 48 x 10

*Confirm with CSU design before purchasing or mounting cans.

The boxes below are examples, sporting both a hinged lid, and a provision for a 3/8" padlock.

Apartment/Condominium Meter Installations



DRAWING NOT TO SCALE

The max and min heights shown above are only for 3 high Meter Packs

NOTES:

1. The contractor is responsible for providing and installing the service entrance enclosure (for multiple meter installations), meter sockets, conductors, raceway, and gutter.
2. On meter racks where the meter is closest to the service enclosure (image above), a spacer of at least 1 inch in width is required.
3. Each socket must be clearly and permanently marked on the interior and exterior of the meter socket to indicate each apartment/condominium or location served.
4. Service entrance conductors to be continuous from meter socket into service enclosure.
5. Contact CSU for approval of meter packs prior to letting bids and installing equipment.
6. Service entrance enclosure shall have provisions for locking or sealing.
7. Conduits shall be schedule 40 PVC or aluminum rigid.

IF MORE THAN 6 THROWS, A MAIN DISCONNECT MUST BE INSTALLED IN FRONT OF TAP CAN. SERVICE CONDUITS WILL STUB INTO MAIN DISCONNECT. WIRE FURNISHED AND INSTALLED BY CSU.

Streetlights

1. General Standards
    a. Streetlights shall be designed and installed according to the utility standards in effect at the time of subdivision construction or addition thereto.
    b. The quantity, size, and type of streetlight pole and fixture shall be selected by the subdivider from the approved CSU streetlight standards.
    c. The subdivider shall furnish public utility easements for the installation of streetlights, with said easement to normally be five feet (5') in width.
    d. Where underground electric service is provided, all streetlighting and site lighting equipment shall be placed underground except for the poles on which the lights are to be affixed. Where overhead electric service is provided, streetlighting and site lighting equipment may be placed overhead or underground.
    e. Alternatives can be accepted, however it will require pre-approval from planning and development, and any deviation from CSU Streetlight specs will cause the developer to take on all maintenance and power costs associated with the long-term use of such streetlights. (Streetlights will be provided a meter).

2. Streetlight Locations
    a. Streetlights shall normally be required at all street intersections and access ways, in cul-de-sacs, and at approximately three hundred feet (300') intervals along tangent streets.
    b. In rural residential subdivisions, streetlights are only required at street intersections and at the end of cul-de-sacs greater than three hundred feet (300') in length, The subdivider may request additional streetlights at other locations within the subdivision, provided the frequency does not exceed the general subdivision location standards recited above.

3. Installation and Maintenance
    a. The developer or "their" authorized construction representative shall be responsible for furnishing and installing all streetlight facilities, including streetlight, conduit, and conductor, poured bases, streetlight poles and arms, luminaires, and roam photoelectric control nodes, in accordance with CSU's design and specifications and the City Unified Development Ordinance. All conduit installations shall be inspected prior to acceptance for conformance with the utility specifications.
    b. Streetlights shall be owned and maintained by electric utility provider with Certificate of Convenience and Necessity (CCN) for that area.
    c. The electric utility provider shall not be responsible for the installation or maintenance of streetlights on alleys, private streets, public access alleyways, driveways, or parking lots.
    d. If an alternate streetlight is requested by the developer, it will require pre-approval from planning and development, and a signed agreement between CSU's director, the city manager, and the developer indemnifying CSU from all maintenance and costs associated with the streetlights for the lifetime and removal of the light. Approved nonstandard lights will be metered and billed to the developer.

Streetlight Standards and Practices

Type of Lighting	Street Classification	Street Width	Pole Height Above Ground	Mast Arm Length	Mast Arm Rise	Light Fixture Mounting Height	Cobra Head Type Fixture Wattage
City Residential	Residential	27’	28’	8’	2’	30’	50 Watt LED
City Residential	NTD Residential	24’	28’	8’	2’	30’	50 Watt LED
Rural Residential	Rural Residential	24’	28’	8’	2’	30’	50 Watt LED
Rural Residential	Rural Collector	30’/36’	37.5’	15’	5’	42.5’	130 Watt LED
City Thoroughfare	Minor Collector	38’	37.5’	15’	5’	42.5’	130 Watt LED
City Thoroughfare	Major Collector	54’	37.5’	15’	5’	42.5’	130 Watt LED
City Thoroughfare	Minor Arterial	83’	40’	15’	5’	45’	210 Watt LED
City Thoroughfare	Major Arterial	95’	40’	15’	5’	45’	210 Watt LED

See Ordinance No. 2023-4453 for requirements for Streetlighting.

Residential Collector, Major Arterial and Thoroughfares, Local/City, State Roads and Highways Streetlighting on these types of streets are designed with a continuous lighting pattern. Lighting designs include but are not limited to the following: poles and fixtures on one (1) side of the road, both sides of the road, or twin mask arm fixtures in medians in the middle of the road.

Major Arterials may require a transformer/breakaway base as per TXDOT requirements.

All poles shall be foundation mounted
Fixture Type: LED Cobra heads
Standard Poles and Fixtures for College Station: Dark Bronze

Streetlighting Construction Notes

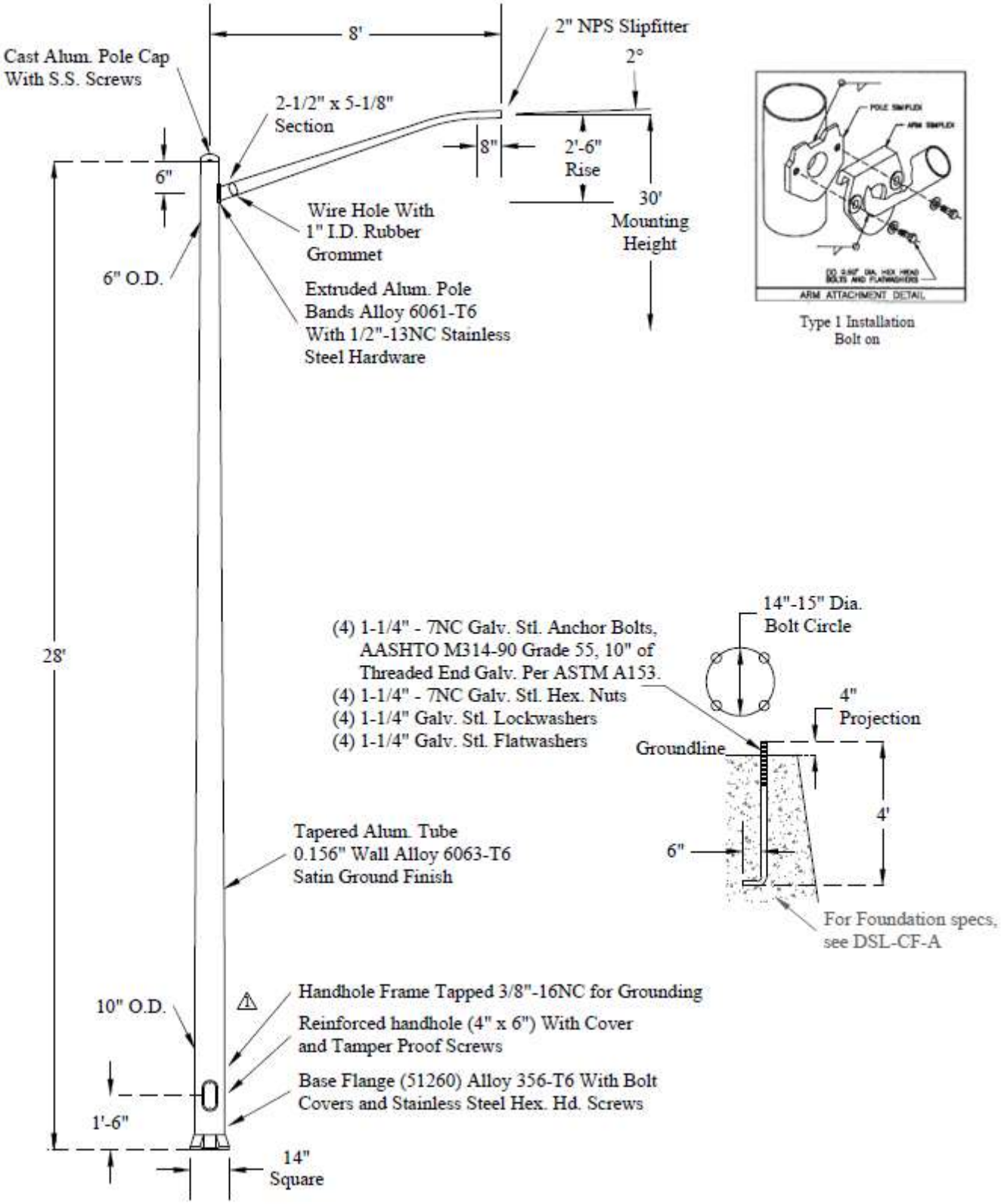
Contact Info

1. These drawings represent quantity and type of material to be used. Exact location of existing and new facilities should be verified prior to beginning work. The facility locations are not to scale on these drawings.
2. Before construction starts, contractor shall meet with the design group representative for exact conduit routing and installation instructions. Conduit installed without prior approval may have to be removed and reinstalled at the contractor's expense.
3. Please call College Station Utilities at (979)764-3660 and ask for the Design and Engineering Group.

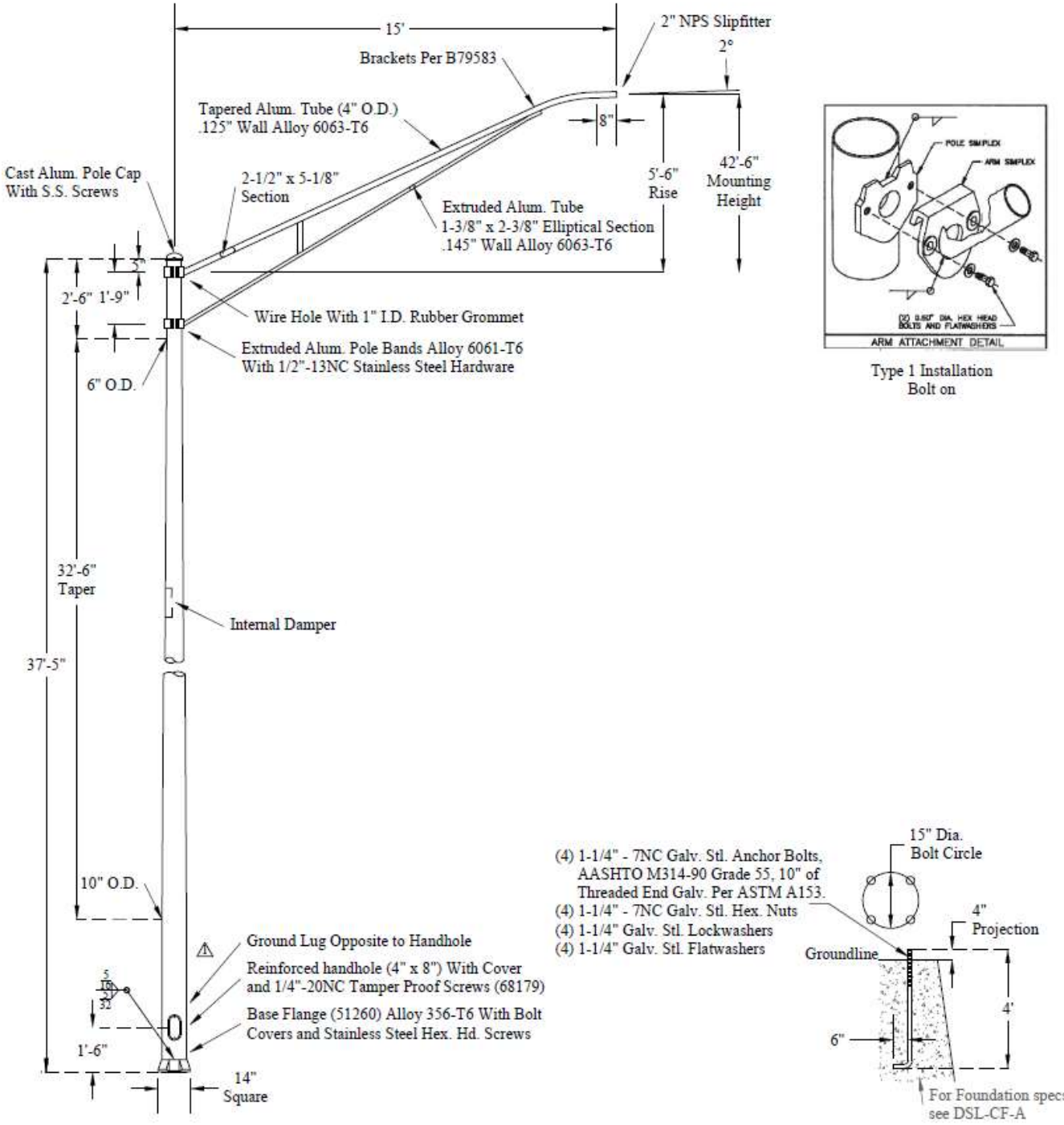
Streetlight Construction Notes

1. Before construction starts, the contractor shall meet with the CSU Design and Engineering representative.
2. No substitutions without prior approval. No exceptions.
3. All conduit will be installed by contractor to City specifications.
4. All conduit installations to be owned by CSU must be inspected by CSU Representatives before it is covered. See Ditch and Mandrel Inspection of Conduit/Duct for more information.
5. All underground conduit for streetlights will be gray schedule 40 and will have 2500 lb. rated mule tape tied at both ends.
6. Use long sweep manufactured elbows at all bends in conduit runs. Gradual sweeping of the conduit is an acceptable method of changing direction.
7. Streetlight conduit will be installed at a minimum 30” below finished grade.
8. A 5' easement will be required along lot lines for streetlight conduit, where applicable.
9. Contractor will backfill streetlight conduit trench to a depth of 12" to 18" and then install a 6" wide red "caution" tape. Final backfilling can then be placed.
10. Contractor to install streetlight conductors per city specifications. For 120 volt circuits, conductors inside conduit will be #6 Aluminum duplex, conduit in the streetlight pole will be #12 Copper Romex.
11. Contractor will stub up streetlight conduit into pad-mounted transformer or pedestal serving streetlight. Inside the streetlight the conduit will be stubbed up to the base of the hand hole.
12. Streetlight conduit and poles will be installed 3' behind back of curb unless there is a sidewalk in which case 1' behind sidewalk.
13. 50 Watt LED Fixture will have a minimum 30' mounting height above ground and 8' mast arms American Electric Light (Catalog No. ATBS G MVOLT R2 3K BZ XL NL P5) no substitutions.
14. 130 Watt LED Fixture will have a minimum 42.5' mounting height above ground and 15' mast arms. American Electric Light (Catalog No. ATBM F MVOLT R3 BZ XL NL P5) no substitutions.
15. 210 Watt LED Fixture will have a minimum 45' mounting height above ground and 15' mast arms. American Electric Light (Catalog No. ATBL D MVOLT R3 BZ XL NL P5) no substitutions.
16. Streetlights with double mast arms will have a minimum 42.5' mounting height above ground and 15' mast arms. Fixtures will match LED specifications listed above.
17. ROAM nodes: Acuity Controls ROAM Dimming Node Control (Catalog No. REN127DV 1 0 G M50) no substitutions.
18. Provide ROAM nodes directly to CSU at 1601 Graham Road, CSU will install ROAM nodes.

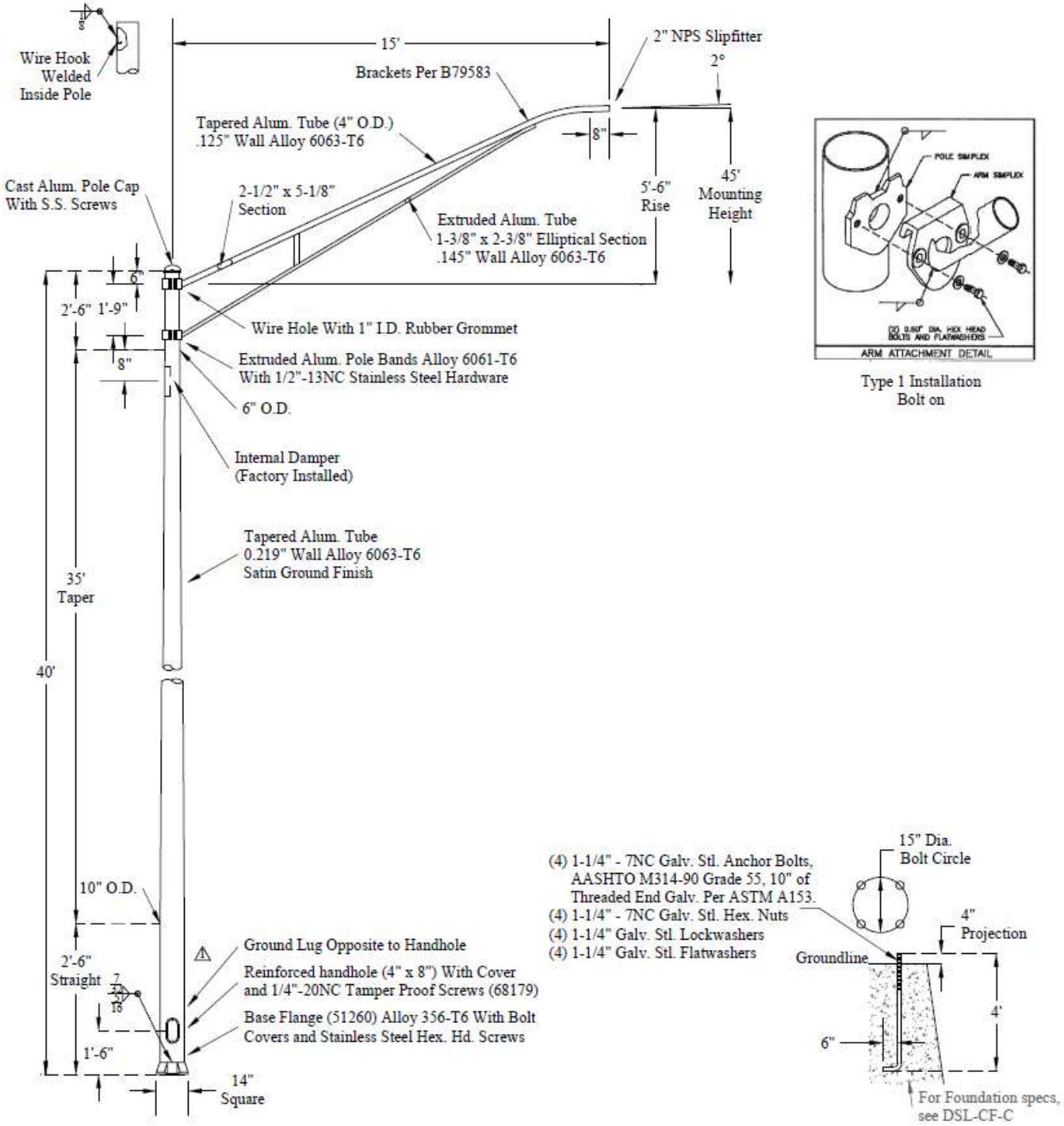
Standard Streetlight Pole (50W LED)



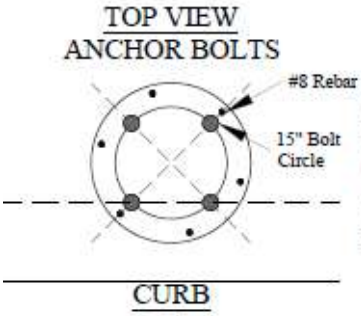
Standard Streetlight Pole (130W LED)



Standard Streetlight Pole (210W LED)



Standard Streetlight Pole Foundation (DSL-CF-A)

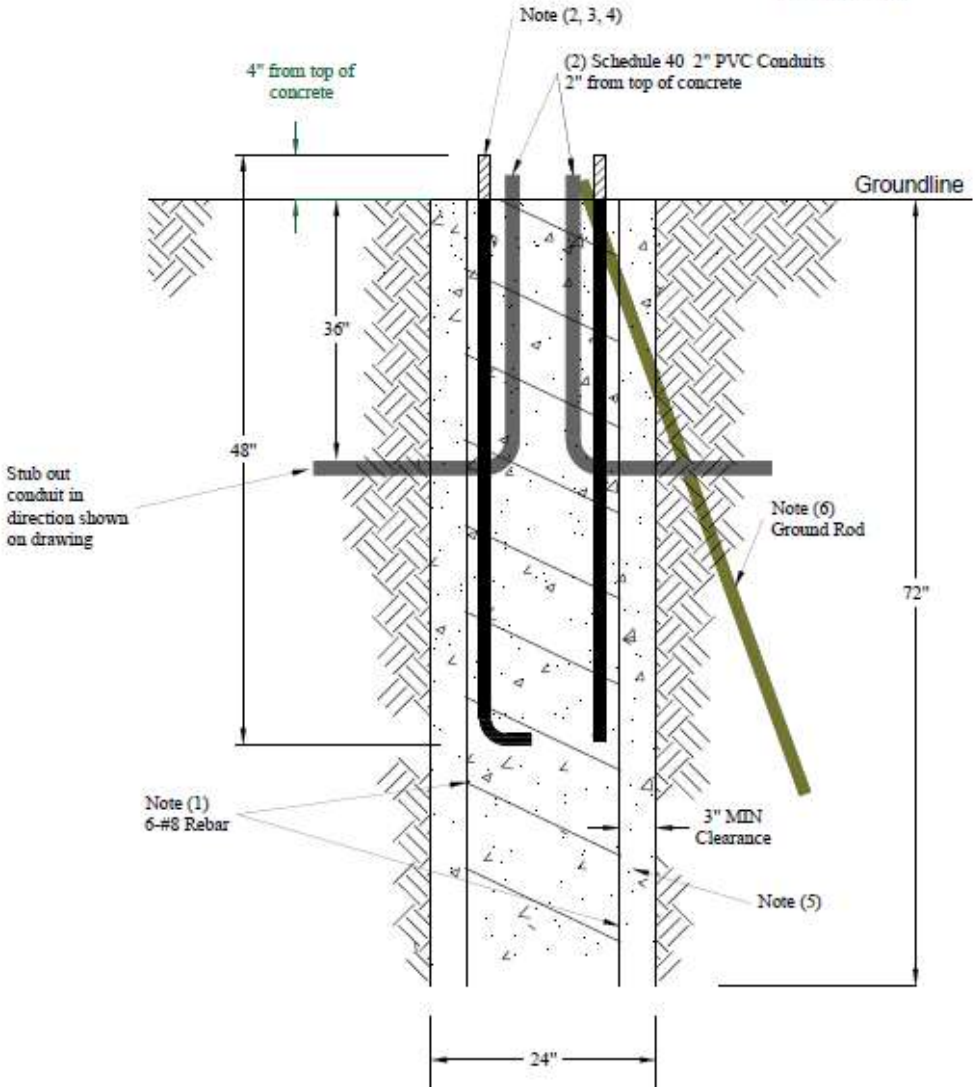


VERIFY ORIENTATION OF BOLTS WITH ACTUAL POLE BASE PRIOR TO POURING CONCRETE.

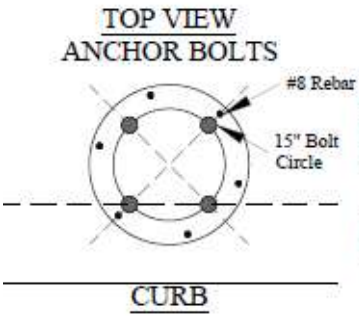
TWO BOLTS MUST BE IN PARALLEL WITH THE CURB

Notes:

1) Reinforcing steel to be #3 spiral with 4" pitch and (6) #8 rebar. Rebar cage to have 3" minimum clearance from shaft wall
2) (4) Anchor bolts to be 1-1/4" x 48" long with 4" projection from concrete
3) Anchor bolts to have a 6" thread with the top 2' to be galvanized
4) Anchor bolts shall conform with ASTM A-325, along with (2) nuts and (2) square washers
5) All Concrete to be 3,000 PSI (Class A) Grade
6) Install 5/8" x 8' copper clad ground rod at an angle where at least 4 feet is in undisturbed soil
7) This Concrete Streetlight Base is to be used with CSU Specifications DSL-30B and DSL-37.5B



Standard Streetlight Pole Foundation (DSL-CF-C)

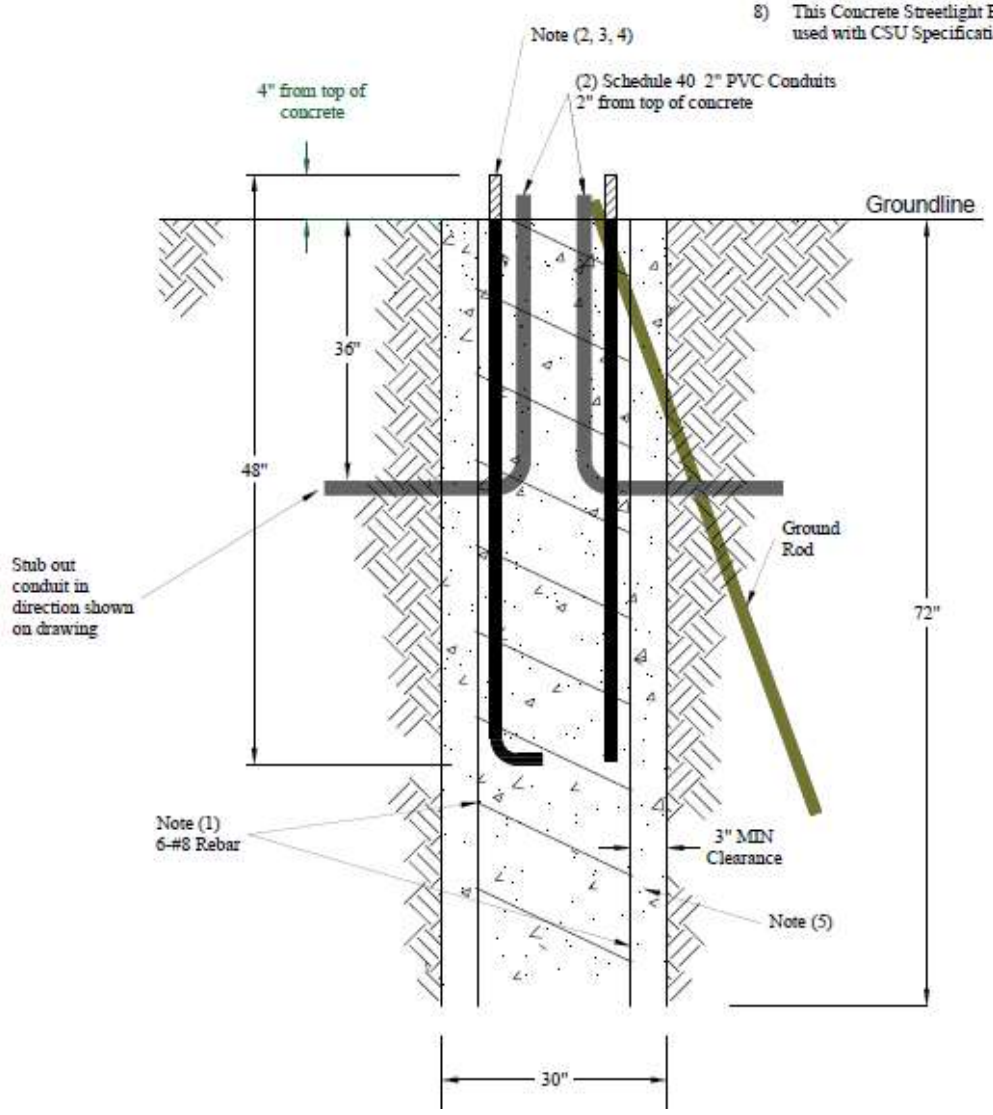


VERIFY ORIENTATION OF BOLTS WITH ACTUAL POLE BASE PRIOR TO POURING CONCRETE.

TWO BOLTS MUST BE IN PARALLEL WITH THE CURB

Notes:

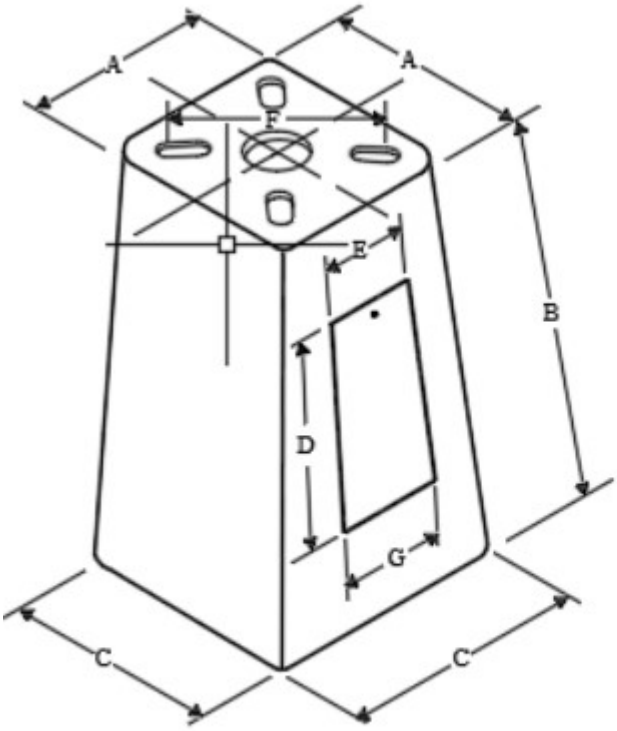
1) Reinforcing steel to be #3 spiral with 4" pitch and (6) #8 rebar. Rebar cage to have 3" minimum clearance from shaft wall
2) (4) Anchor bolts to be 1-1/4" x 48" long with 4" projection from concrete
3) Anchor bolts to have a 6" thread with the top 2' to be galvanized
4) Anchor bolts shall conform with ASTM A-325, along with (2) nuts and (2) square washers
5) All Concrete to be 3,000 PSI (Class A) Grade
6) Install 5/8" x 8' copper clad ground rod at an angle where at least 4 feet is in undisturbed soil
7) See TxDOT Specifications for additional information.
8) This Concrete Streetlight Base is to be used with CSU Specification DSL-45B



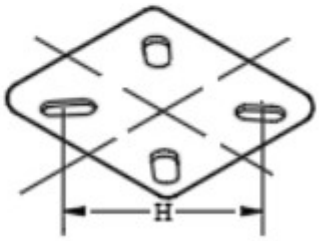
Standard Breakaway Foundation (DSL-BB)

For use in TXDOT corridors

BASE DIMENSIONS	
A	15-1/2"
B	17"
C	16-1/4"
D	11-1/2"
E	9-1/2"
F	13.5"-15" Top Bolt Circle
G	9-1/2"
H	15"-20" Bottom Bolt Circle
Bolt Size - 1.25" X 3.5"	
Base Opening 15"	
Approximate Weight - 40 lbs.	

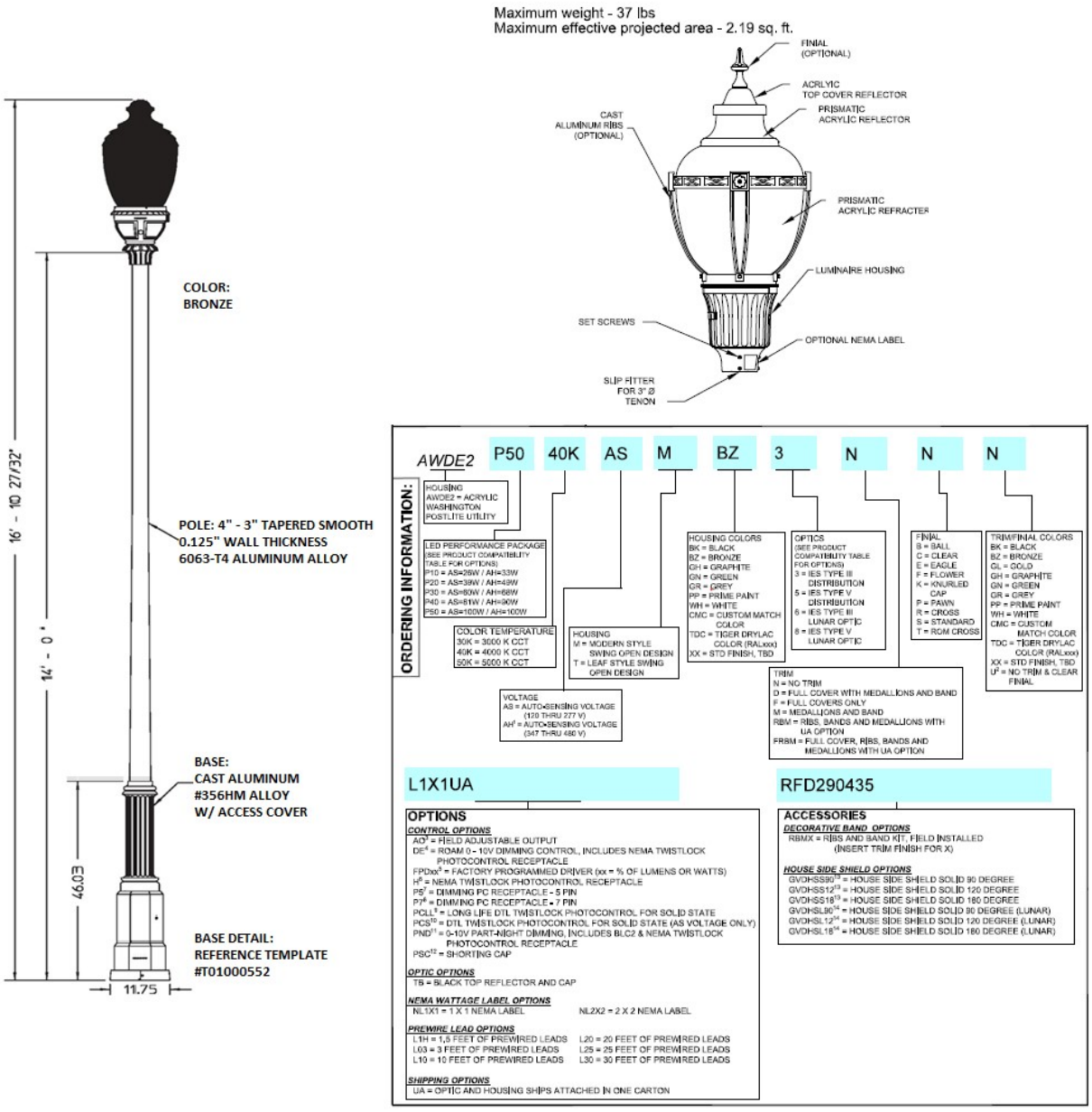


DSL-BB
Streetlight Breakaway
Base



Bottom View

Standard Historical District/Decorative Lighting Pole

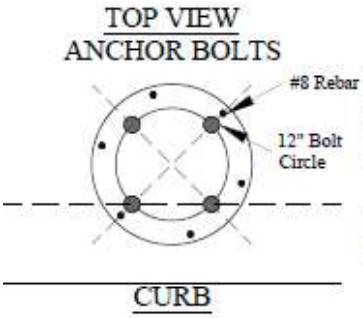


HOLOPHANE®
LEADER IN LIGHTING SOLUTIONS
An AcuityBrandsCompany

DECORATIVE OUTDOOR

Acrylic Washington Postlite® LED Series Luminaire
Prismatic Style: Acrylic Washington
Housing Size: Utility

Standard Historical District/Decorative Lighting Foundation

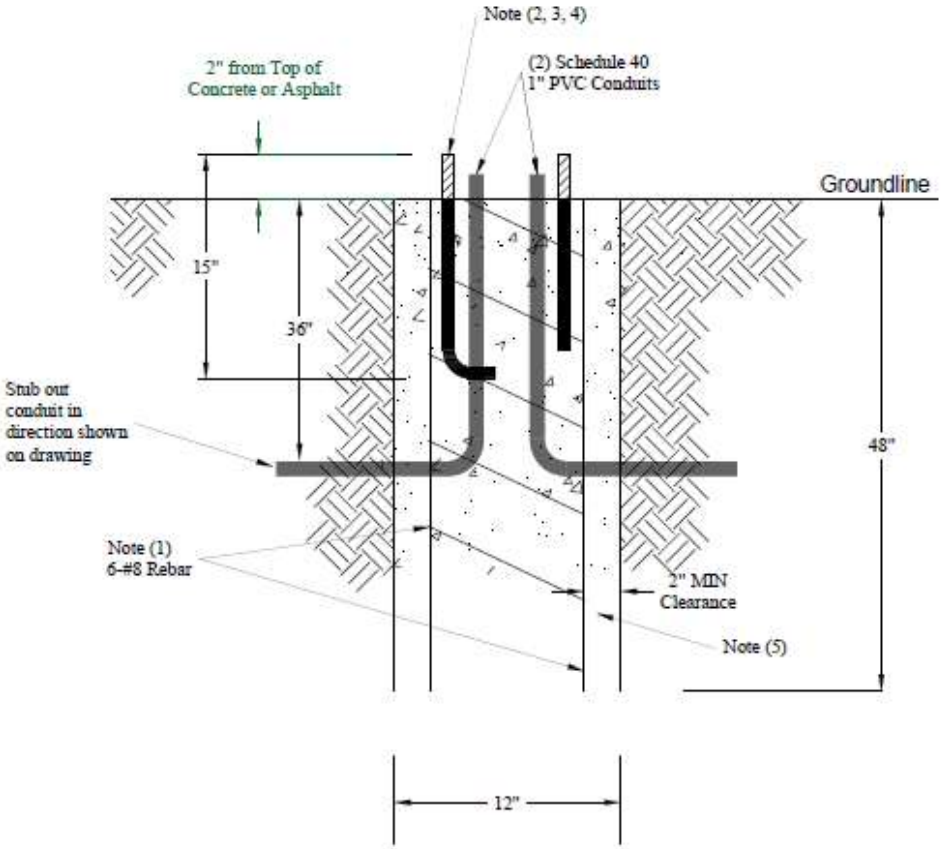


VERIFY ORIENTATION OF BOLTS WITH ACTUAL POLE BASE PRIOR TO POURING CONCRETE.

TWO BOLTS MUST BE IN PARALLEL WITH THE CURB

Notes:

1) Reinforcing steel to be #3 spiral with 4" pitch and (6) #8 rebar
2) (4) Anchor bolts to be 5/8" x 15-3/8" long with 4" projection from concrete
3) Anchor bolts to have a 6" thread with the top 2' to be galvanized
4) Anchor bolts shall conform with ASTM A-325, along with (2) nuts and (2) square washers
5) All Concrete to be 3,000 PSI (Class A)



SIDE VIEW

Easement Comments for Plat & Site Plan Project Review

CSU requires that the developer/contractor install conduit and device pads. Conduit and device pads may be installed by the developer/contractor at any time during the construction phase of a project. Electric infrastructure cannot be installed or energized by CSU until a public utility easement that covers the entire electric infrastructure route is granted to the City.

Easements – one of the following will be applicable to your project

1. **BLANKET EASEMENTS:** Developer provides temporary blanket easement for construction purposes and upon completion of project must provide descriptive easements for electric infrastructure as designed by CSU.
   - *Blanket easements are typically requested for large commercial projects when electric primary routing cannot be determined early in the design/development process. This allows for electric infrastructure and conductors to be installed and energized before dedicated or descriptive public utility easements are granted* to the City.
   - *Blanket easements are sometimes used for smaller commercial projects when electric primary routing cannot be determined early in the design/development process.*
   - *Blanket easements may be released in part or in their entirety upon the completion of a project and after dedicated or descriptive public utility easements are granted* to the City.
2. **EXISTING EASEMENTS:** All easements on site are existing. Electric facilities will be designed within existing easements.
   - *This comment is typically used when a property has already been platted and all public utility easements shown on plat or site plan are sufficient to extend electric infrastructure to the required location.*
3. **DESCRIPTIVE EASEMENTS:** Developer provides descriptive easements for electric infrastructure as designed by CSU, as shown on plat or site plan and filed with the city planning department.
   - *This comment is often used in conjunction with a temporary blanket easement. Before a blanket easement can be released, descriptive public utility easements for electric infrastructure as designed and installed must be granted to the City.*
   - *This comment is also be used when the project civil engineers and the CSU Electric Designer have agreed to the routing of electrical infrastructure early in the project design phase. In this case public utility easements must be granted to the City before electric infrastructure can be installed and energized.*

Notes:

If easements are existing, the **developer is responsible** for locating easements on site and ensuring that electrical infrastructure is installed within easement boundaries.

- *CSU will perform field inspections to verify the depth and number of conduits as well as the size and construction of device pads installed by the contractor.*
- *CSU does not verify that conduits and device pads are installed within public utility easement boundaries. The developer and/or contractor are responsible for the correct routing of conduit and the placement of device pads even after the completion of a project.*
- *Conduits and device pads not installed within the boundaries of a public utility easement will be corrected at developer/contractor expense.*

The following easements will be required:

- Easements are required under the terms of COCS UDO.
- CSU maintains the right to request easements in addition to the minimums required in the UDO.
- Perimeter easements are required per UDO.
- All primary conduit and primary equipment are required to be in a PUE.
- All secondary conduit is required to be in a PUE.
- Service conduit serving neighboring lots is required to be in a PUE.

General Electric Comments for Plats & Site Plan Project Review

GENERAL ELECTRICAL COMMENTS

1. Developer installs conduit per CSU specifications and design.
2. CSU will provide reference only drawings for electrical installation. All facilities are to be installed per the stamped civil drawing package.
3. Developer will intercept existing conduit at designated transformers or other existing devises and extend as required, this shall always be coordinated with CSU design.
4. If conduit does not exist at designated transformer or other existing devices, developer will furnish and install conduit as shown on CSU electrical layout.
5. Developer pours electric device pads or footings, i.e. transformers, pull boxes, or other device, per CSU specifications and design.
6. Developer installs pull boxes and secondary pedestals per CSU specifications and design. Pull boxes or secondary pedestals will be provided by CSU.
7. Final site plan must show all proposed electrical facilities necessary to provide electrical service, i.e. transformers, pull boxes, or switchgears. All meter locations and conduit routing must be completed as designed by CSU. This plan will not to be to scale.
8. When a customer is metered on the transformer, all conduit and service conductor is to be provided by the customer. CSU will terminate customers service wire inside the transformer.
9. Developer will provide CSU with a digital AutoCAD (.dwg format) version of the plat and/or site plan as soon as it is available. Email directly to CSUDesign@cstx.gov.
10. Project design engineer should contact CSU design at earliest convenience to begin discussion of electrical infrastructure design.

ELECTRICAL COMMENTS REQUIRING IMMEDIATE ATTENTION

- **SITE PLAN/PLAT:** Developer will provide CSU with a digital (AutoCAD dwg format) version of plat and / or site plan as soon as it is available. Email to: hleland@cstx.gov.
- **LOAD DATA:** The developer will provide project loading data to CSU as soon as it is available. This should include a one-line diagram, and any additional loading data. This information is critical for CSU to accurately determine the size, capacity, and number of transformers, and other equipment, required to provide service to the project. Failure to provide load data will result in construction delays and, due to clearance requirements, could affect the final building footprint. Lead time for pad mount transformers is currently in excess of 52 weeks, so it is crucial to get this information to CSU as early as possible.
- **CIAC:** Once transformer has been sized, the developer will be responsible for paying a CIAC (Contribution In Aid of Construction) fee. A transformer will only be reserved once CIAC payment has been received. Failure to pay the CIAC fee may result in lengthy delays due to CSU inventory availability.

Customer Installed Conduit

CSU reserves the right to install and terminate all conductors from the power source to the customer's meter can.

In a platted underground subdivision, the developer is required to install conduit stub-outs from the pad mount transformers and pedestals for future service installations. The customer or their electrical contractor shall connect their service conduit to these stub outs. For verification of a stub out, contact CSU Design and Engineering Group.

CSU does not allow any customer unescorted access inside any of CSU's electrical equipment. If a customer is installing their conduit where a stub-out does not exist, please contact CSU Design and Engineering Group to coordinate installation.

To schedule access inside CSU equipment, contact CSU Operations at 855-528-4278.

Before acceptance of customer installed conduit, the installation must conform to CSU's installation specifications. The installation shall be inspected by an authorized CSU representative before the trench is backfilled, it is the responsibility of the developer to schedule this inspection with CSU Design while the trench is still open. Failure to coordinate conduit inspection may result in the customer incurring delays and additional expenses related to the customer reopening the trench line to allow for proper inspection.

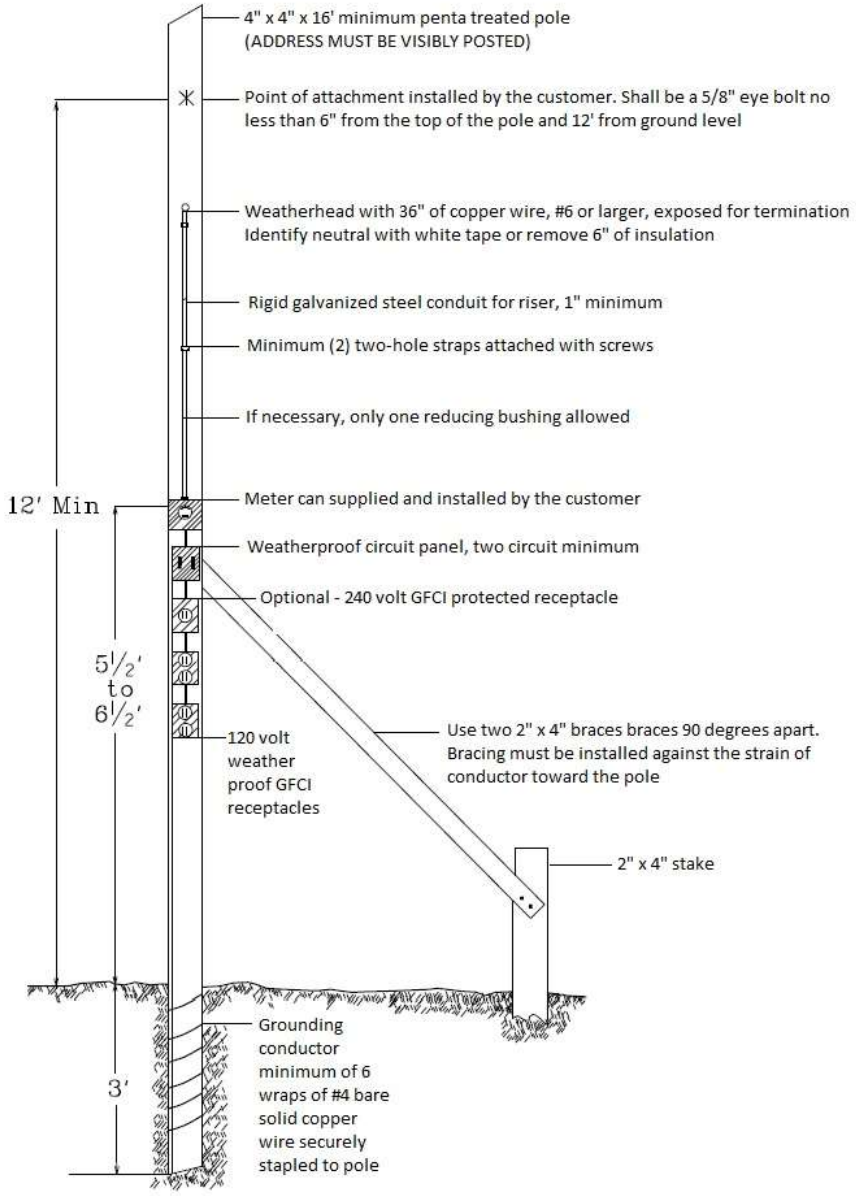
Before service conductor can be pulled, it is the responsibility of the developer to contact CSU Design to schedule a "CSU Conductor Only" inspection must be requested and completed. This is to ensure that the mule tape has been properly installed in the conduit.

NOTE: All conduit installed must be minimum schedule 40 GRAY electrical rated PVC. Contact CSU Design and Engineering Group for proper size. 6" wide red "caution" tape is required for all conduit installations.

NOTE: All elbows and sweeps used in customer installed conduit must be as they were manufactured from the factory, and all sweeps must be long sweep.

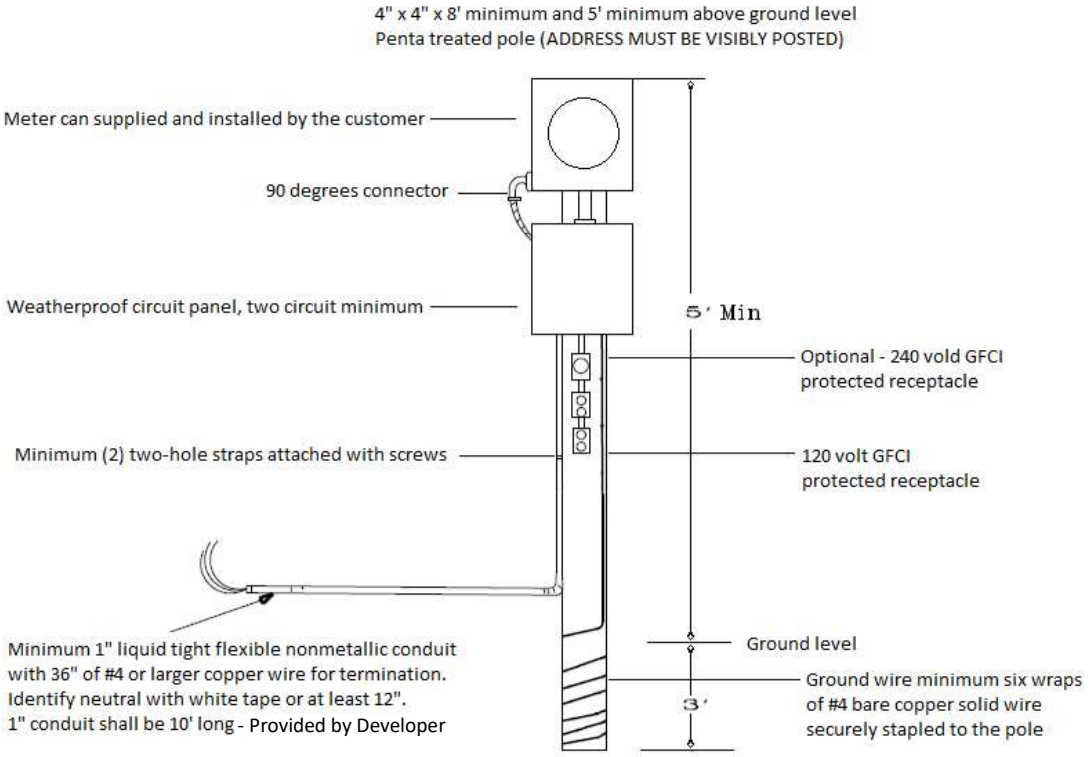
CSU allows the use of custom bends made by heating conduit as a last resort. Any conduit installation is subject to a mandrel test at the request of a CSU representative, and any conduit that fails such a test is required to be repaired by the developer at their own cost.

Temporary Overhead Fed Meter Pole



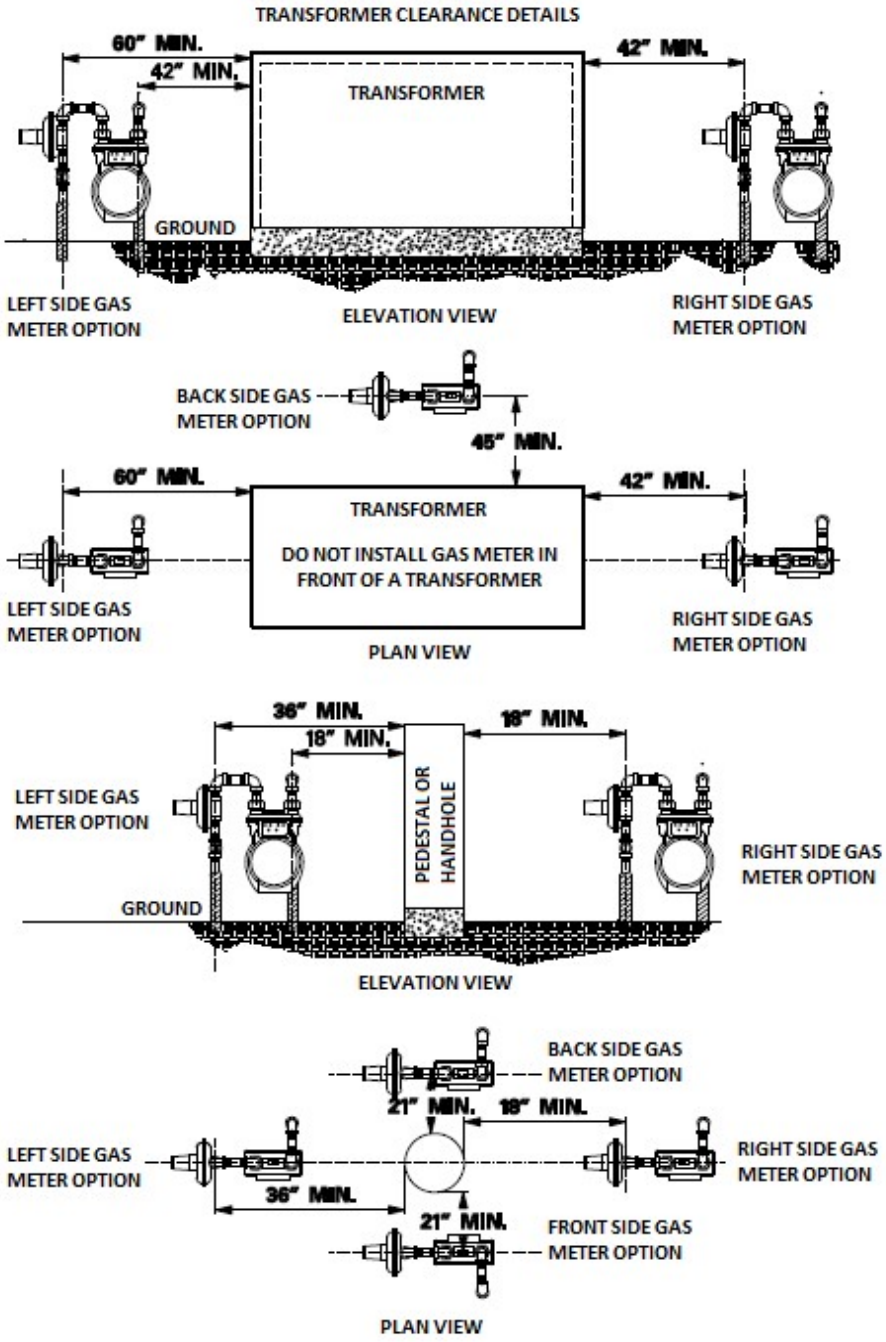
Temporary pole shall be installed within 50' of a CSU pole where 120/240V secondary voltage is available

Temporary Underground Fed Meter Pole



Install the temporary pole within 5' of the right front side of a padmounted transformer or within 5' of an underground secondary pedestal

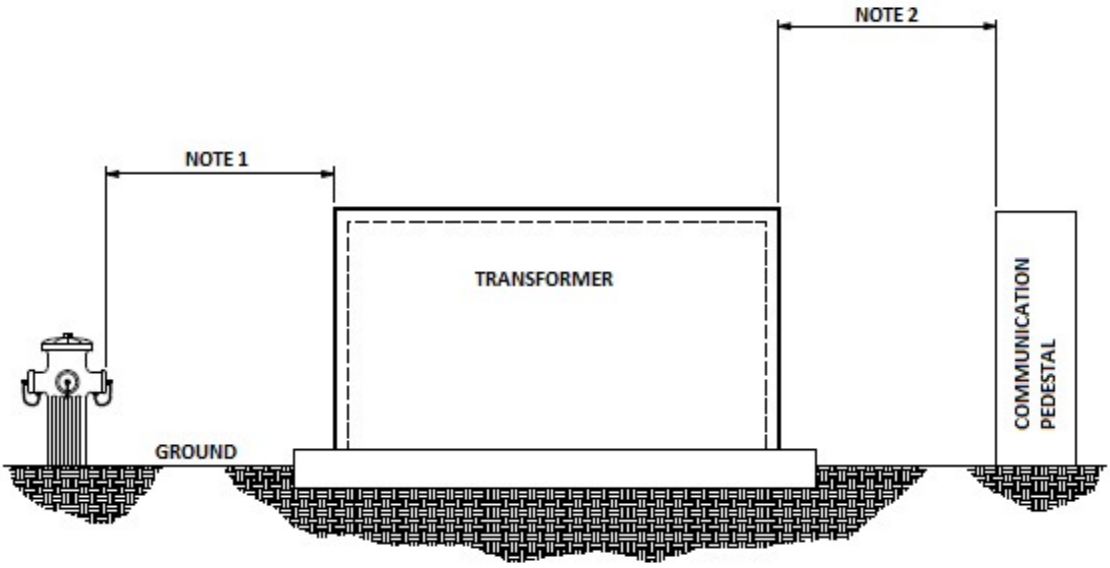
Aboveground Clearances from Gas Meter Installations



Notes:

1. Measurements are referenced from the inlet gas riser.
2. The measurements will ensure:
   a. That a minimum clearance of 36” is attained between the entire gas meter installation and the transformer
   b. That a minimum clearance of 12” is attained between the entire gas meter installation and all other aboveground facilities including electric and other utility pedestals and handholes

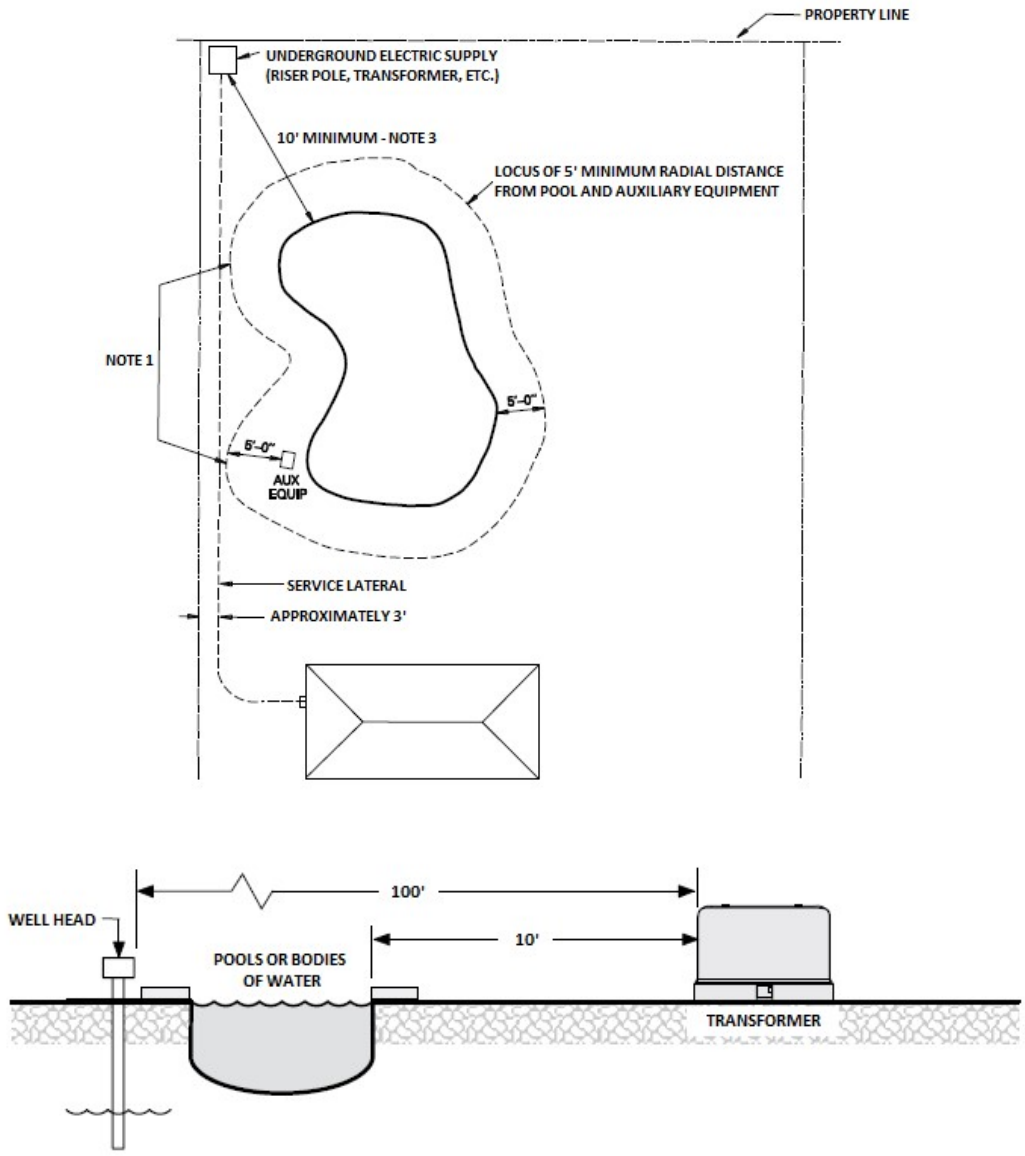
Clearances of Aboveground Equipment – Foreign Utilities Enclosures and Equipment



Notes:

1. Pad mounted equipment, pedestals, and other above ground enclosures should be located no less than 6 feet on the sides and 10 feet in front of the opening of the transformer.
2. All above ground metallic power and communication equipment (pedestals, transformer cases, apparatus cases, etc.) that are separated by 6 feet or less shall be bonded.

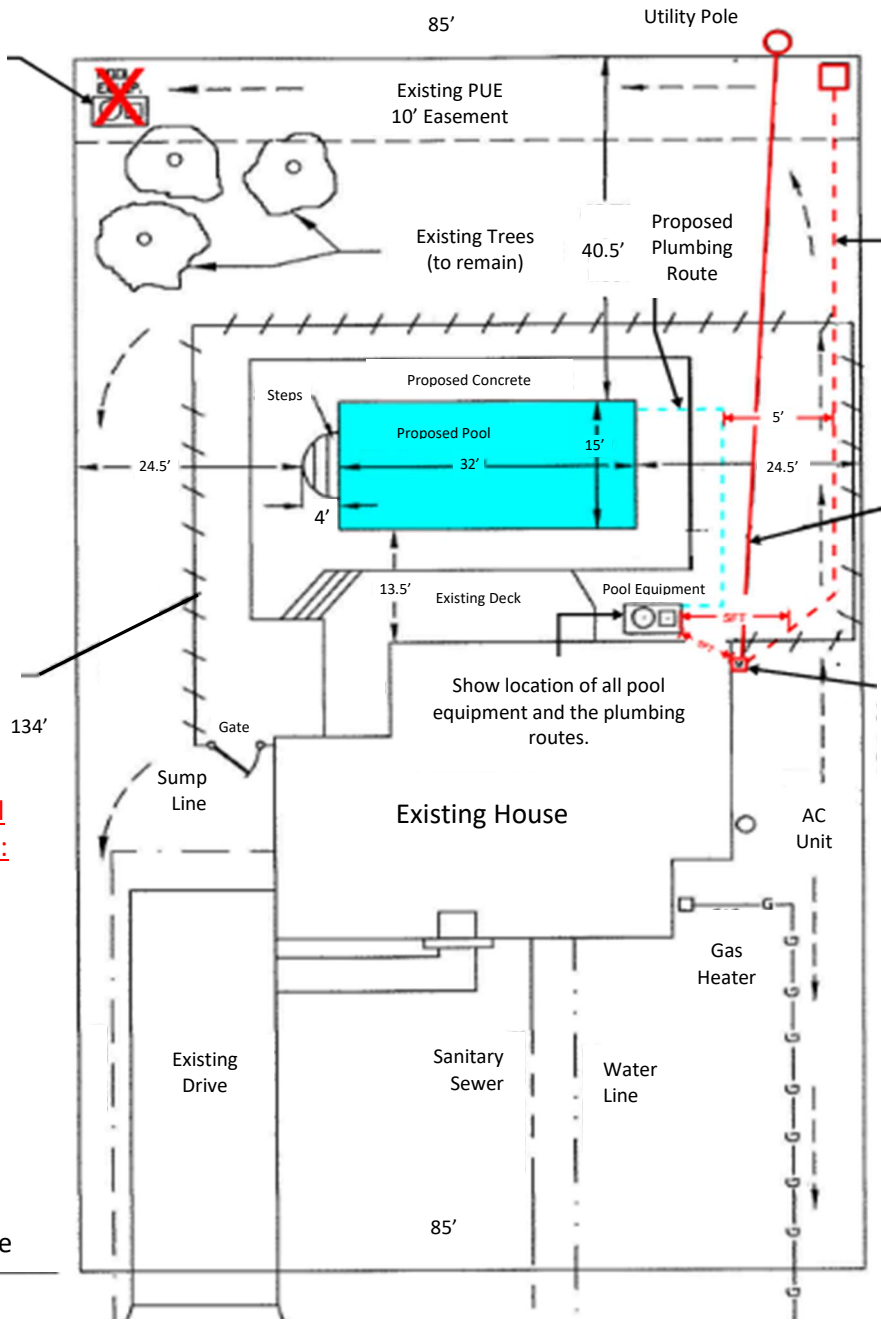
Location of Service Lateral near a Swimming Pool



Notes:

1. A swimming pool or its auxiliary equipment or water pipes shall not be installed within 5 feet of an existing underground service lateral.
2. Where a swimming pool must be installed within 5 feet of existing items mentioned in Note 1, the customer shall provide and install a conduit including pull wire from the service connection point to the meter.
3. The water's edge must be located 10 feet or more from pad mounted equipment.

Sample Pool Permit Submission



Note: Locates must be called in for as necessary. Ensure all minimum clearances are met per the NESC Handbook, and clearly shown with measurement on the Plot Plan.

Note 1: If the service is Underground, acquire locates and show the route of the service line on the survey and plan. Ensure the distance from the pool edge or any pool plumbing meets NESC regulations referenced in rule 351-C in the NESC Handbook.

Note 2: If the service is Overhead, show the route on the permit, and ensure that the distance from the edge of the pool, surface of the pool water, or base of diving platform meets NESC regulations referenced in table 234-3 in the NESC Handbook.

Document Revisions:

Version	Description	Revision Date	Author(s)
1.0.0	First edition	APR 2019	CSU
1.0.1	Added decorative streetlights, pg. 26, pg. 29; edited sections 8.08, 9.03; minor changes	JUL 2019	CL, DG, HL, MM, WD, WG, YR
1.0.2	Red caution tape instead of yellow; added Underground Meter Pedestal detail; Margins from 1" to 0.75"; Replaced Typical Riser & Trench Detail page; Updated Trench Requirements drawings;	SEP 2019	MM, SW, WD, YR
1.0.3	Updated chart in "Maximum Number of Secondary Conduits & Conductors for Pad mount Transformers" page;	JAN 2020	YR
1.0.4	Updated Contact Information; Adjusted page spacing;	APR 2020	YR
1.0.5	Added Transformer Box Pad Installation spec; updated Transformer Conduit Installation spec; pg. 17 Figures description; Added some language from Section 9.03 pertaining to CT enclosure requirements and a reference to Section 9.03 and the photographs on page 42 to section 7.02. Added references to Section 9.03 and the photographs located here to Section 8.08;	JUN 2020 JUL 2020	YR, MSM
1.0.6	Combined V1.0.5's page 43 and 44 in Apartment/Condominium Meter Installations as well as updated the drawings; updated Metering's contact info;	08/03/2020	YR
1.0.7	Updated Concrete Pad drawing, Switchgear Pad drawing, and Pad mounted Secondary Pedestal and Bollards Installation; added Bollards Installation and Single Phase/Three Phase Meter Pedestal Installations;	04/06/2021	YR
1.0.8	Updated Contact Information; Construction Notes; Section 8; Streetlight Standard and Practices, streetlight poles and foundations; Updated drawings for Front and Rear Property Line Utility Placement;	12/02/2021	YR
1.0.9	Updated Contact Information; Corrected the Residential Meter Location – Front Property Line Utility Placement drawing; Added solar metering contact information under 8.02; Updated Footer;	02/10/2022	YR
1.0.10	Updated Contact Information; General cleanup; Added a new construction note (XFMR pricing increase issue); Updated Streetlight specs; Updated grounding directions; Updated best practice in several sections; Added Pool reroutes section	4/1/2022	JA
1.0.11	Continued general cleanup, updated meter can drawing, added service drawing	2023	JA
1.0.12	Updated contact information for all designers, updated design positions, general revisions, added 600-amp trench spec, added pool permit example, added guidelines for service reroutes section	8/23/2024	JA