BTU Conduit Installation Guidelines

3rd Edition 2020

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Preface

This booklet is issued by Bryan Texas Utilities ("BTU") to acquaint ***Developer***s and their representatives with the general requirements for electric service supplied by BTU and to serve as a guide to architects, builders, electrical contractors, engineers, and others in the planning of electrical installations as it relates to subdivisions and general conduit installations within BTU's electric service territory. Although BTU Staff made every effort to simplify this guide, ***Developer***s and others are advised that specifications contained in this booklet supplement the applicable ordinances, policies, standards, and procedures of the City of Bryan, Texas and BTU and shall be subordinate to these ordinances, policies, standards, and procedures as well as the National Electrical Safety Code in effect at the time.

It is BTU's intent to work closely with the ***Developer*** to provide a technically sound and financially responsible design of electric infrastructure needed to serve their development. To facilitate this, as early as possible during the development's design stage, the ***Developer*** or their agent should contact BTU Line Design at (979) 821-5770 to allow us the opportunity to start our design process.

BTU requires the ***Developer*** make adequate electrical service available to each lot within their development as part of the infrastructure construction phase of their subdivision. As individual lots within each development start construction, BTU will work directly with the owner/builder/etc., to extend service from a transformer to the house or business according to BTU policy.

This Guide will be updated on a regular basis, and its effectiveness will depend on input from the development community. Please feel free to forward any comments or suggestions that would make this guide more useful to the Engineering Design Manager at:

Engineering Design Manager
Bryan Texas Utilities
630 Atkins St
Bryan, TX 77801

The information presented is subject to change and will be revised periodically to reflect any changes which may develop. Please refer to our website at www.btutilities.com for additional information as well as an electronic version of this document.

We look forward to working with you as your electric service provider.

I. Definitions

Words or phrases denoted in ***Bold Italicized*** font shall have the same meaning as in the most current version of BTU's Electric Line Extension Policy. Other terms have the meanings shown below.

Feeder Line*:* Any line, wire, or cable and appurtenances which distributes, transmits, or delivers electric service from a source to a general area or to multiple developments, and not to a specific end user. Sometimes referred to as *600 Amp Primary Distribution*.

Lateral Line*:* Any line, wire, or cable and appurtenances used to distribute, transmit, or deliver electric energy from a Feeder Line to end users of the utility service. Sometimes referred to as *200 Amp Primary Distribution*.

Service Line: Any line, wire, or cable and appurtenances used to distribute, transmit, or deliver electric energy at secondary voltage levels from a source of supply, Feeder Line, or Lateral Line directly to an end user.

II. Overview of BTU Line Extension Policy for Subdivisions

A. Contribution In Aid of Construction (CIAC) Calculation

The ***Developer*** shall be responsible for furnishing and installing conduit per standards set forth in this manual, including any trenching and boring, as required for the installation of all underground development Feeder, Lateral and Service Lines utilized to provide electric utility service to the ***Subdivision Phase***. The ***Developer*** shall also be responsible for installing all concrete pads for large transformers and switching equipment as required, per BTU specifications.

The ***Developer*** shall be responsible for furnishing and installing, and the expense related there to, of conduit for the installation of all on-site underground development Feeder Lines, Lateral Lines, streetlight services and Service Lines utilized to provide electric service to the ***Subdivision Phase***. The specification for the conduit and its manner of installation shall be approved by BTU prior to installation and shall follow BTU's conduit installation specifications.

As part of providing service to a ***Subdivision Phase***, BTU will provide and install all primary cable, secondary cable, transformers, pull boxes, and switches as necessary to serve the ***Subdivision Phase*** at its expense up to $250,000. All costs greater than this amount will be paid by the ***Developer*** as a non-refundable ***CIAC*** prior to BTU securing material necessary to construct BTU's electrical infrastructure.

B. Execution of Development Service Agreement

The ***Developer*** shall execute BTU's Development Service Agreement. This document summarizes the ***Developer***'s responsibilities as it relates to obtaining electrical service as defined under BTU's line extension policy.

C. Placement of Facilities

In all cases (with the exception of certain Lateral Lines and Service Lines constructed in rear-lot ***Subdivision*** projects) lines will be constructed in areas which, in BTU's sole determination, will permit ready access from public roads for personnel and equipment required for construction, operation, and maintenance purposes.

Certain Lateral Lines and Service Lines may be installed along rear lot lines where it is desirable and feasible to do so. If there is an accessible roadway, alley, or other area dedicated to the public along the route of the proposed distribution lines, the dedication shall include language that prohibits obstructions being placed in the roadway that would prevent ready access, including but not limited to, fences, storage buildings, etc. Similar language to that effect is required to be recorded in the deed restrictions for the applicable areas. If these Lateral Lines and Service Lines are to be placed in areas where they are not accessible from an all-weather road or alley, specific easements with special provisions to address access and maintenance of easement areas will be required.

D. Relocation of BTU Underground Electrical Lines or Equipment after Installation

1. If the ***Developer*** changes finish grade after the installation of BTU's underground electrical lines and equipment, any relocation necessary to maintain proper depth shall be at the ***Developer***'s expense.
2. If, after the installation of BTU's electrical lines and equipment, the ***Developer*** re-plats their subdivision or it becomes necessary to relocate any electrical lines or equipment to match new property lines or to accommodate changes in depth, it shall be at the ***Developer***'s expense.

III. Developer's Responsibility

A. Approved Plat

In order to obtain electrical service, a subdivision must have a preliminary plat approved by the appropriate authority in which it is located. Should such subdivision be located within the legal boundaries or within the extraterritorial jurisdiction limits of the City of Bryan or College Station, such plat shall have been approved by the appropriate authority of the respective city. Should such subdivision be located outside the extraterritorial jurisdiction of either city, a plat or plan must be filed with the appropriate county authority. In all cases, plats shall have adequate easements as determined by BTU dedicated for the construction of electrical lines to all of the plots or parcels of land laid out in the plat allowing room for anchors, guys and other appurtenances.

B. Easement Requirements

1. The ***Developer*** shall provide, at no cost to BTU, all necessary ***Easements*** to support all planned electrical lines, either by an approved plat or separate descriptive document.
2. If needed, the ***Developer*** is responsible for obtaining ***Easements*** on adjacent parcels.
3. The ***Developer*** shall also provide BTU a temporary blanket ***Easement*** during construction until all plats are filed.
4. No above ground BTU facilities will be allowed within a drainage easement.
5. Each ***Subdivision Phase*** shall contain those ***Easements*** necessary for design, construction, and maintenance of public services that will serve and/or cross the subdivision.
6. Where any aerial electrical utilities will be installed, these utility ***Easements*** shall be a minimum of 20 feet in width. Depending on services required and project design, the width may be increased.
7. Where rear lot Lateral Line distribution is desired and feasible, each block that does not contain an alley shall have a utility easement at the rear of all lots. The rear utility easements shall be twenty (20) feet in width, centered on the property line (10 feet on either side) where the rear of the lots abut each other, and shall be continuous for the entire length of a block. These easements shall be parallel as closely as possible to the street line frontage of the block. Easements of this type will require special provisions to address access and maintenance of easement areas.
8. Where any BTU facility is required to be adjusted in location or elevation, the ***Developer*** shall cause such changes to be made with the approval of the appropriate BTU representatives, and the ***Developer*** shall bear all costs of such changes.
9. Additional easements may be required for the placement of guy wires where utility easements are not straight within each block, or if such ***Easements*** do not connect directly with adjoining blocks.
10. Additional utility ***Easements*** or additional easement width other than as described above may be required based on the number, size, configuration or depth of existing, proposed or anticipated utilities.

11. Where the proposed subdivision adjoins an unplatted area or future phase of the subdivision, twenty (20) foot width of easement along the rear of lots adjoining the unplatted area and/or an additional ten (10) feet in width along the boundary of the subdivision or subdivision phase may be required.
12. Buildings, signs, masonry walls, and other vertical structures that require a building permit are not permitted within ***Easements***.
13. Streetlight ***Easements*** of ten (10) feet in width shall be provided between necessary interior lot lines (five (5) feet on each side or ten (10) feet on one lot) where electrical service is from the rear.
14. If ***Easements*** for the installation of electric utilities are dedicated by descriptive instruement BTU approved forms shall be used. All liens and other ownership interests shall be subordinated to the easement use.

C. Property Lot Lines

Prior to the ***Developer*** field staking the proposed route and the ***Developer*** installing the conduit, all lot lines shall be surveyed and readily marked. In addition, the ***Developer*** shall certify that all locations of any electrical lines or equipment shall have proper cover at finished grade.

D. Right of Way Clearing

The ***Developer*** is responsible to clear all right of way to support overhead or underground electric lines and allow accessibility for construction. Refer to Section V (R&S).

E. Installation of Conduit

The ***Developer,*** builder, electrician, customer, or contractor must adhere to BTU's conduit installation specifications and coordinate with BTU's inspector to correct any problems as noted. Otherwise, acceptance of conduit system by BTU may be delayed. This, in turn, may delay installation of electrical facilities by BTU. Refer to ***Underground Conduit and Equipment Installation*** for more information.

F. Streetlights

Payment for the monthly charge for street-lighting service shall be the responsibility of the appropriate entity according to city ordinance or, in the absence of a city ordinance, the responsibility of the ***Developer*** or an entity designated by the ***Developer***.

The type of streetlight pole and fixture shall be selected by the ***Developer*** from the approved BTU streetlight standards.

1. Within the City Limits of Bryan

City of Bryan ordinance states that streetlights shall be installed at all street intersections and other locations in accordance with the utility standards of BTU. It also states that all streetlights shall be installed by BTU at the expense of the ***Developer***. However, the ***Developer*** may, at his option, supply and install approved streetlights.

BTU reserves the right to supply and install all streetlight conductors and terminations. BTU's portion of any part of the streetlight installation shall be at the ***Developer's*** expense.

BTU requires streetlights to be installed at all street intersections and at the end of dead-end cul-de-sacs that are at least 300' in length. One streetlight shall be installed every 300' along tangent streets. If additional lights are requested by the ***Developer***, they must first be approved by the City of Bryan prior to installation. Consult with BTU Line Design on the types of streetlights available.

2. Within the City Limits of College Station

City of College Station ordinance states that adequate street-lighting for the protection of the public and property shall be installed in all new subdivisions. It also states streetlights shall normally be installed at all street intersections and access ways, in cul-de-sacs, and at generally 300' intervals or less along tangent streets. BTU typically installs all streetlights. However, the ***Developer*** may, at his option, supply and install approved streetlights. BTU reserves the right to supply and install all streetlight conductors and terminations. BTU's portion of any part of the streetlight installation shall be at the ***Developer's*** expense. Consult with BTU Line Design on the types of streetlights available.

3. Areas Outside the City Limits of Bryan or College Station

BTU does not require installation of streetlights within subdivisions outside the city limits of Bryan or College Station. However, if the ***Developer*** chooses to install streetlights, it will be at the ***Developer's*** expense. The ***Developer*** or an entity designated by the ***Developer*** shall authorize and assume the responsibility for the monthly streetlight fee paid to BTU. Quantity and location of streetlights shall be at the ***Developer's*** discretion. Consult with BTU Line Design on the types of streetlights available.

IV. BTU's Responsibility

A. Conduit Inspection

BTU shall be allowed the opportunity to inspect the installation of the conduit at various stages of construction to ensure adherence to BTU's specifications. BTU shall be given, at the start of the installation process, a contact person representing the ***Developer,*** builder, electrician, customer, or contractor that will coordinate and meet with BTU's inspector as needed. BTU will require an open ditch inspection that includes, but is not limited to, areas where equipment will be set and at least one location in the middle of a run. BTU shall be provided at least one working day notice prior to any request for inspection. Upon notification, BTU inspector will respond by the end of the next business day and report any deficiencies found. All deficiencies must be corrected prior to BTU accepting the conduit installation.

B. Work Scheduling Process

After the conduit installation has been inspected and approved by BTU, installation of the equipment and conductors will be scheduled according to BTU's standard scheduling process.

V. Underground Conduit and Equipment Installation

A. Location of Electric Facilities

1. The ***Developer*** shall be responsible for the installation of certain facilities needed for underground Feeder Line, Lateral Line, or Service Line utilized to provide electric utility service to the subdivision, as further described in BTU's *Line Extension Policy* and BTU's *Development Service Agreement*.
2. Where electric service is placed underground, all auxiliary equipment for such service, including but not limited to transformers, junction enclosures, street lighting, site lighting equipment (except for the poles on which the lights are to be affixed) and switching devices, shall be placed six (6) inches above final grade.
3. All installations shall be inspected by BTU prior to acceptance for conformance to BTU specifications.
4. Electric facilities shall be routed to avoid open drainage ditches, areas designated as flood plain, creeks and marsh areas, or other areas that are environmentally sensitive, historically significant, or may in any way hinder construction or operation of the electric system.
5. Electric equipment such as transformers, pull-boxes, switchgear, equipment pads, and other similar equipment shall not be installed in any area that is likely to be fenced in or enclosed.
6. Underground Lateral Lines generally will be installed within utility easements and approximately 5 feet inside either the front lot lines or the rear lot lines.
7. Single-phase pad-mounted transformers will be placed to allow energized switching operations. The front (lock side) of the transformer shall face the street, alley or other access way, and shall require 12 feet clearance from the front of the transformer and three (3) feet clearance from the remaining three sides to fences, shrubs, or other obstacles.
8. Underground Feeder Lines, pad-mounted switch gear and switching cabinets will be generally installed within utility easements, approximately 5 feet inside the front lot lines to allow for energized switching operations and repairs. To insure safe operations for employees, switch gear and switching cabinets will require additional easements to ensure adequate clearance to fences, shrubs, or other obstacles.
9. A reasonably flat 8' by 8' area at six (6) inches above final grade shall be provided for all pad-mounted equipment locations.
10. If electric facilities are to be placed in areas where they are not accessible from an all-weather road or alley, specific easements with special provisions to address access and maintenance of easement areas will be required.

B. General Specifications for Developer Installed Conduit

1. **Ditch Line –** On all underground installations BTU will allow a shared ditch line with dry utilities only (Cable TV, Telephone). Refer to section V (E&F) for installation. BTU does not allow any type of public or private wet utilities (Sewer, Water, or Gas) installed in the same ditch with any BTU owned electrical line.

2. **Conduit and Elbows –** All conduit used shall be minimum schedule 40 grey electrical PVC. All conduits shall be properly glued at all couplings and joints.

Description	600A Primary	200A Primary	Secondary to Pedestal	Service to Meter	Streetlight
Conduit Size/Type	4" PVC	2" PVC	3" PVC	3" PVC (See Notes 2 & 4)	2" PVC
Elbow Type	Aluminum wrapped with Scotchrap™ 50 (See Note 3)	PVC (See Note 1)	PVC	PVC	PVC
Elbow radius	42"	36"	12"	12"	9"
Maximum Wire Pull Lengths	500'	700'	150'	200'	300'

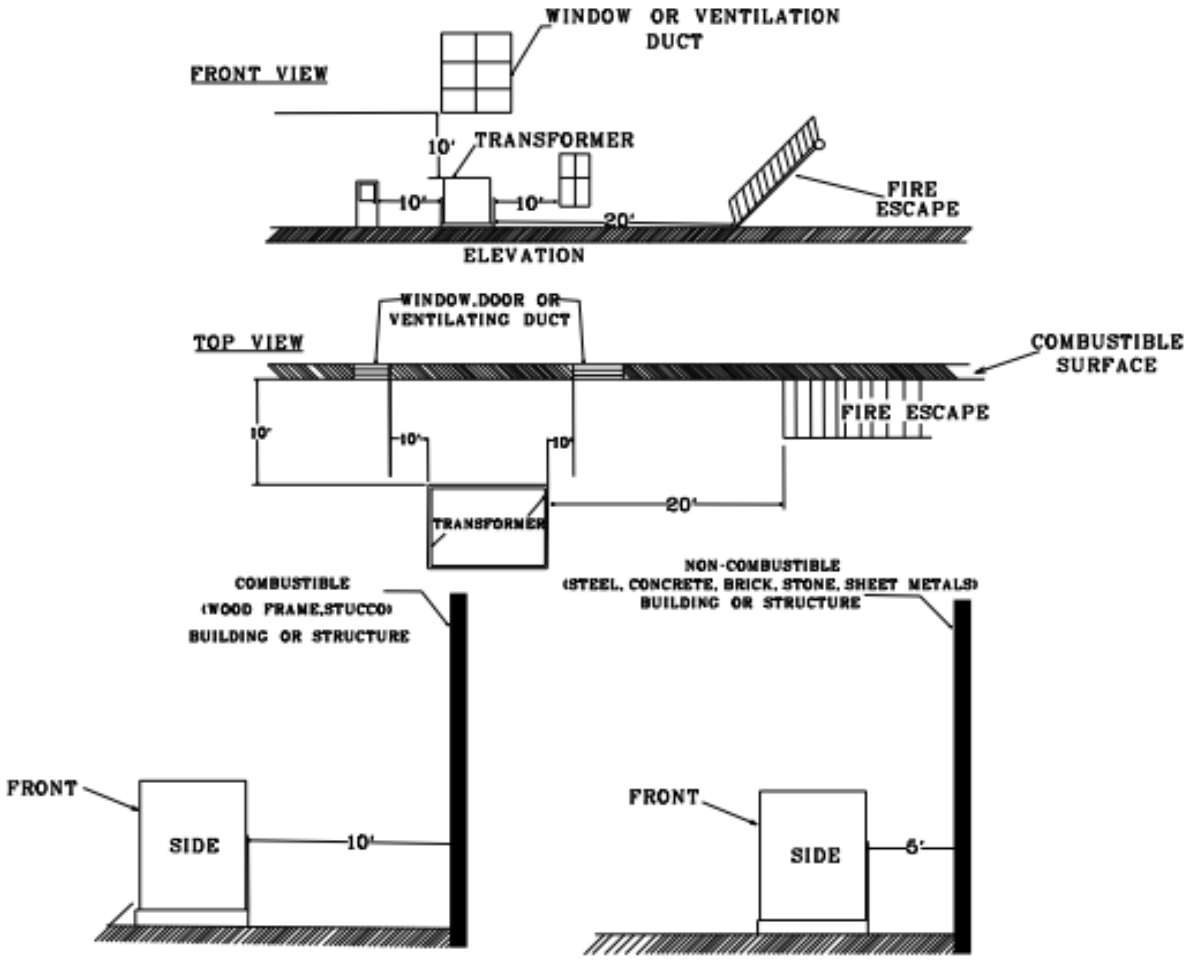
NOTE 1: All primary runs in excess of 300' and with (3) or more 90 degree elbows OR all runs in excess of 500' shall have aluminum elbows installed at all ditch line elbow locations and at all equipment locations.

NOTE 2: Single phase services larger than 320 amps and three phase services may require larger PVC conduit to be installed. Consult with BTU Line Design on these installations. Combined lengths of service and secondary to any meter shall not exceed 200 feet.

NOTE 3: Information on Scotchrap™ 50 can be found at https://www.3m.com/

NOTE 4: All primary and secondary stub outs shall be extended a minimum of 10' from transformer or pedestal. End of stub out shall be marked with a 6'- 6" T-Post painted red to denote electric.

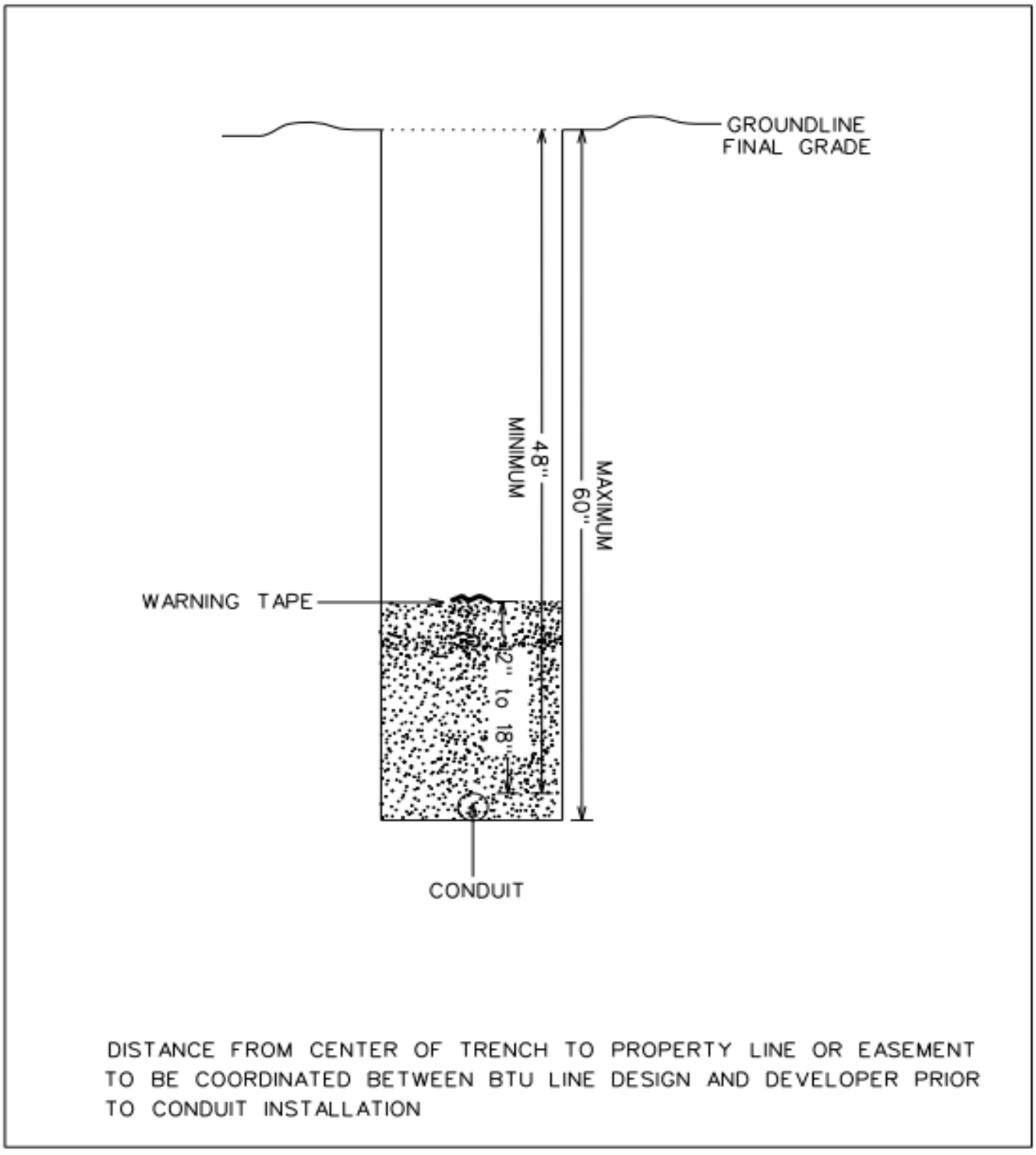
C. Pad Mounted Transformer Clearances



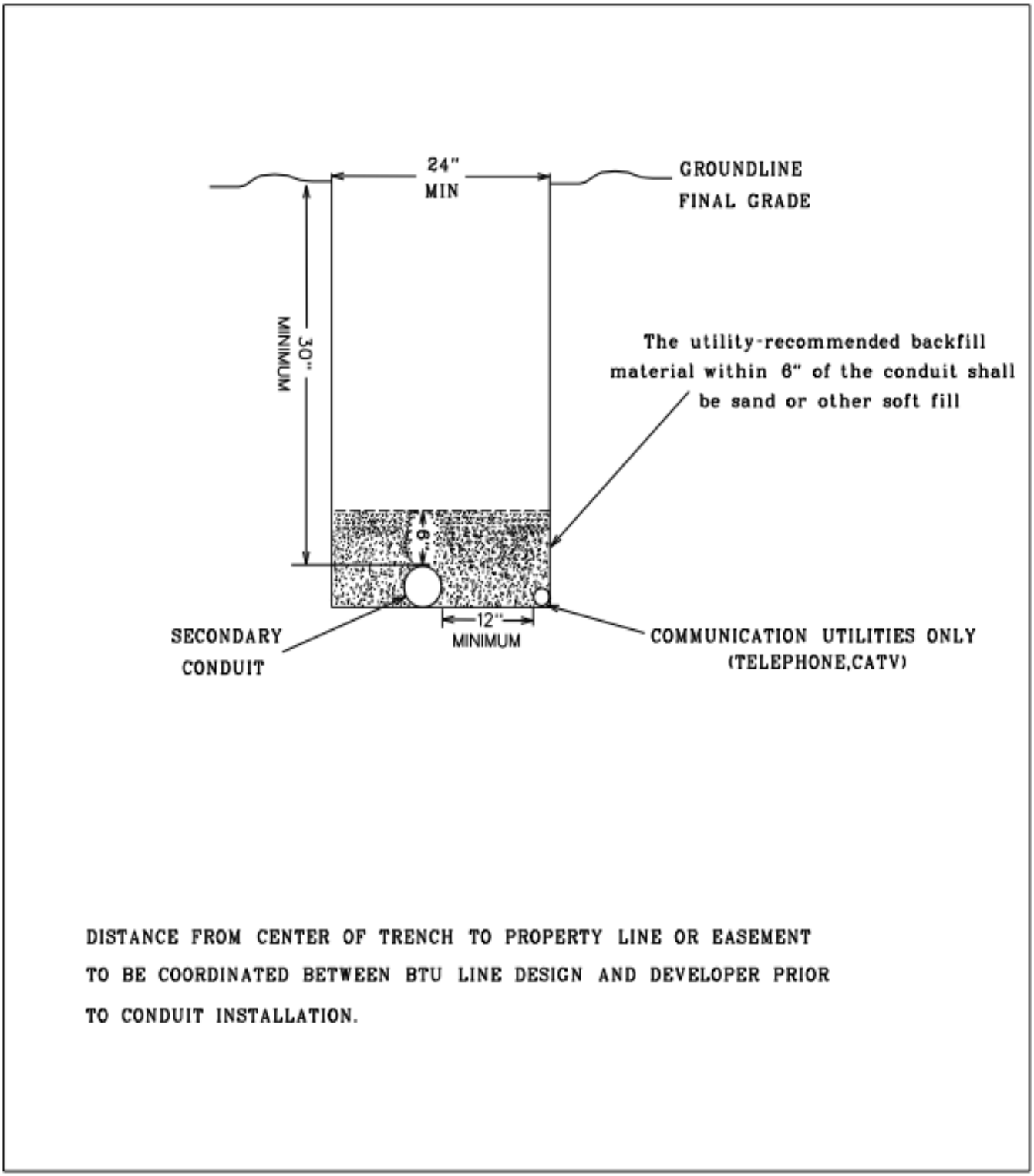
NOTES:

1. ALL DIMENSIONS SHOWN ARE MINIMUM DIMENSIONS (NOT TO SCALE).
2. THERE SHOULD BE NO ABOVE GROUND OBSTRUCTIONS, SUCH AS SHRUBS, AIR CONDITIONERS, GAS METERS, CABLE AND PHONE UPRIGHT PEDESTALS WITHIN 5 FEET OF PAD OR WITHIN 12 FEET OF THE EQUIPMENT DOORS.
3. THERE SHOULD BE NO UTILITIES OR OTHER OBSTRUCTIONS PASSING UNDER TRANSFORMER PAD.
4. CLEARANCES FROM TRANSFORMER TO SURFACE CAN BE REDUCED TO 3 FEET IF SURFACE IS 2-HOUR FIRE RATED.
5. ALL CLEARANCES SHOULD BE DOUBLED FOR TRANSFORMERS) 750KVA.
6. PAD-MOUNTED EQUIPMENT, PEDESTALS, AND OTHER ABOVEGROUND ENCLOSURES SHOULD BE LOCATED NOT LESS THAN 4 FEET FROM FIRE HYDRANTS.

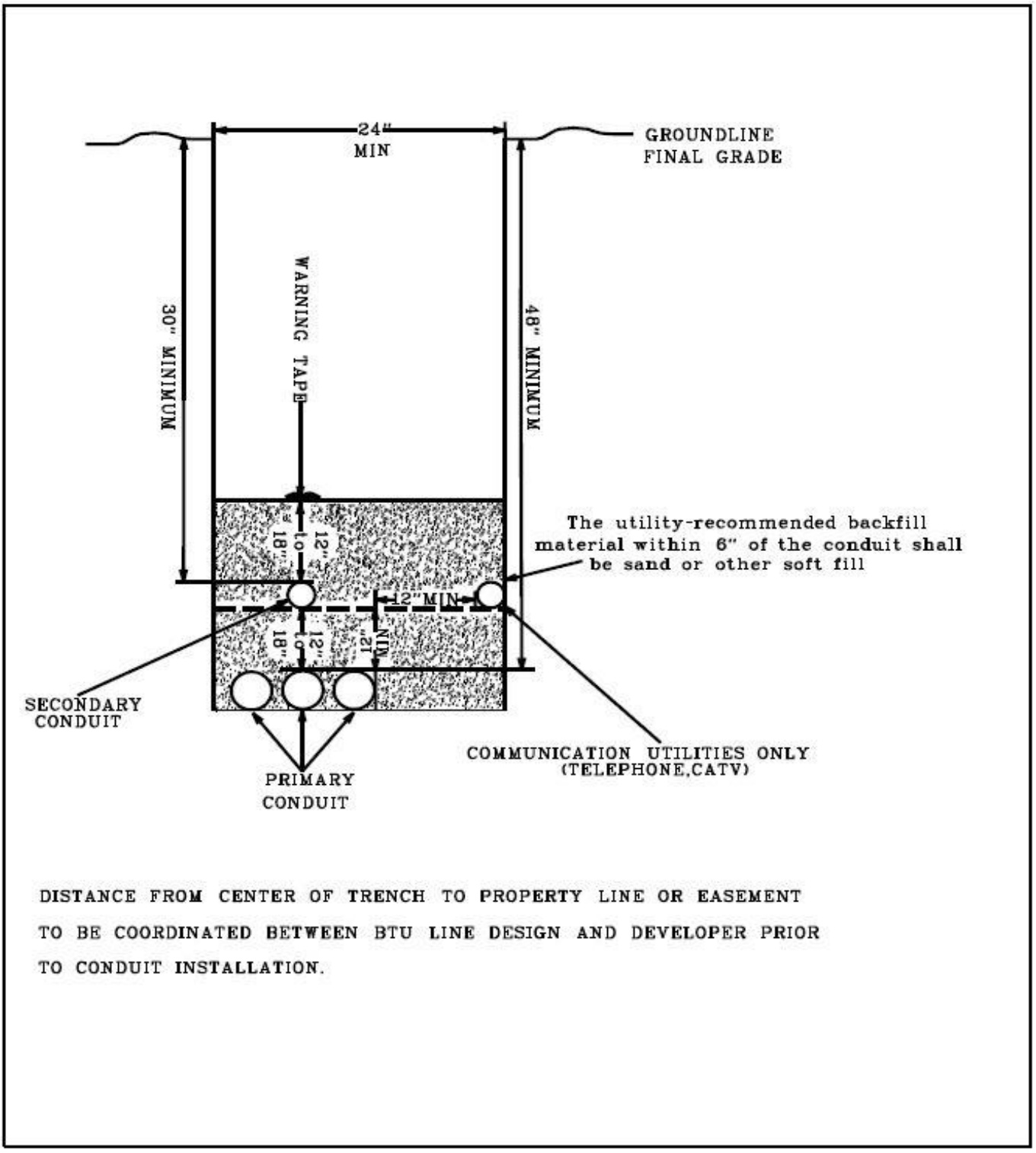
D. Primary Conduit Installation



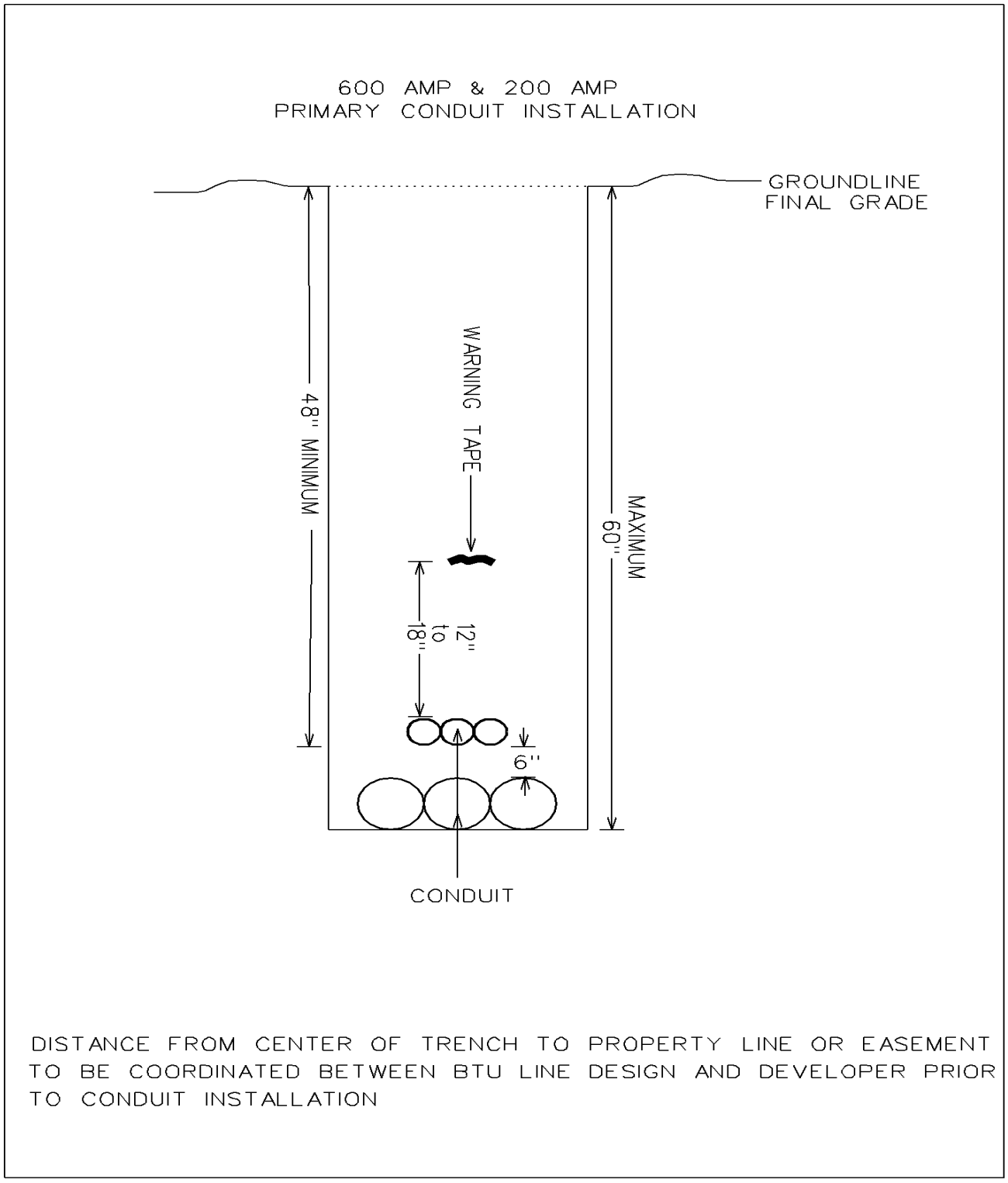
E. Secondary Conduit Installation



F. Primary and Secondary Conduit Installation in the Same Ditch Line



G. 600 Amp and 200 Amp Primary Conduit Installation in the Same Ditch Line



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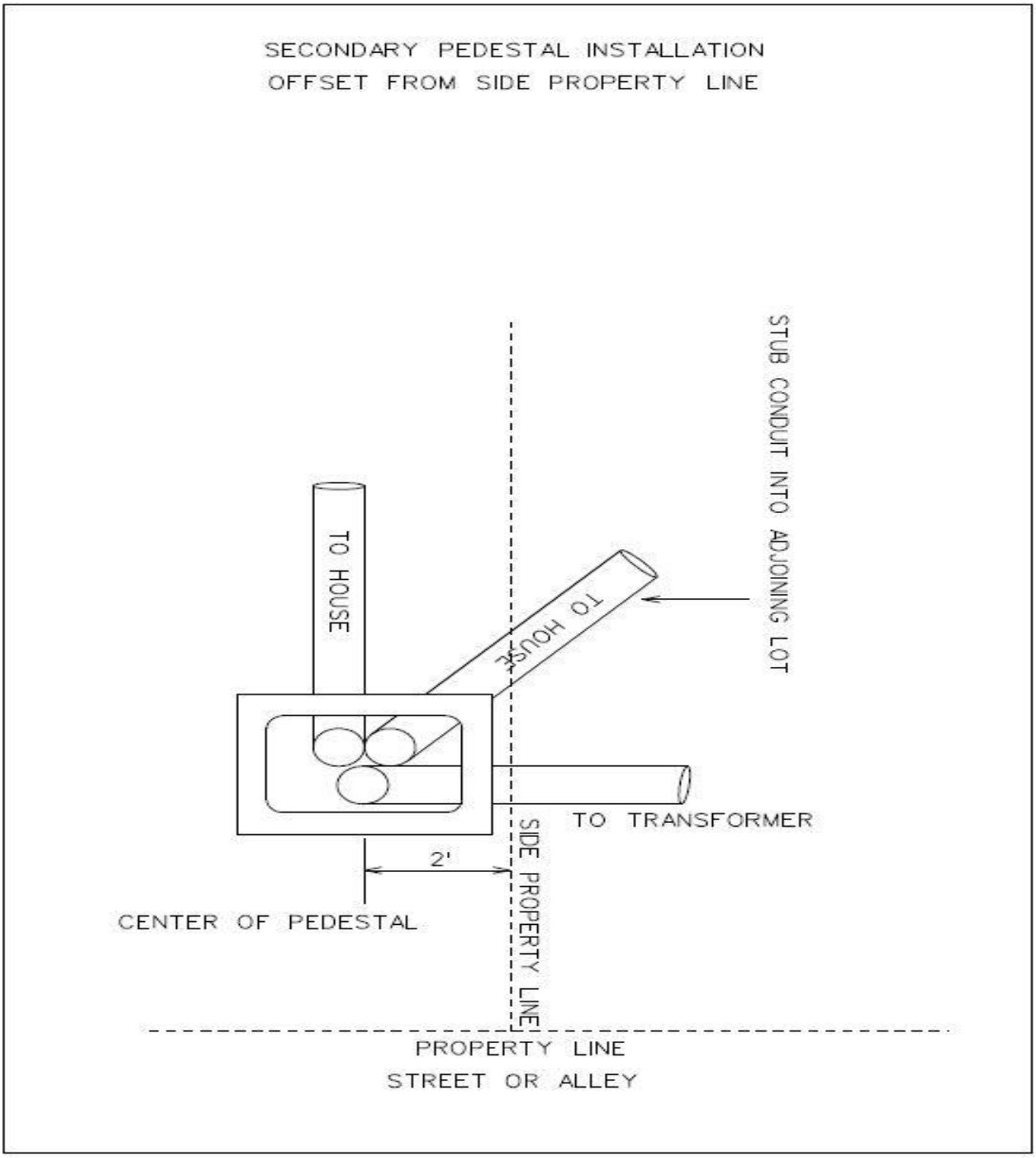
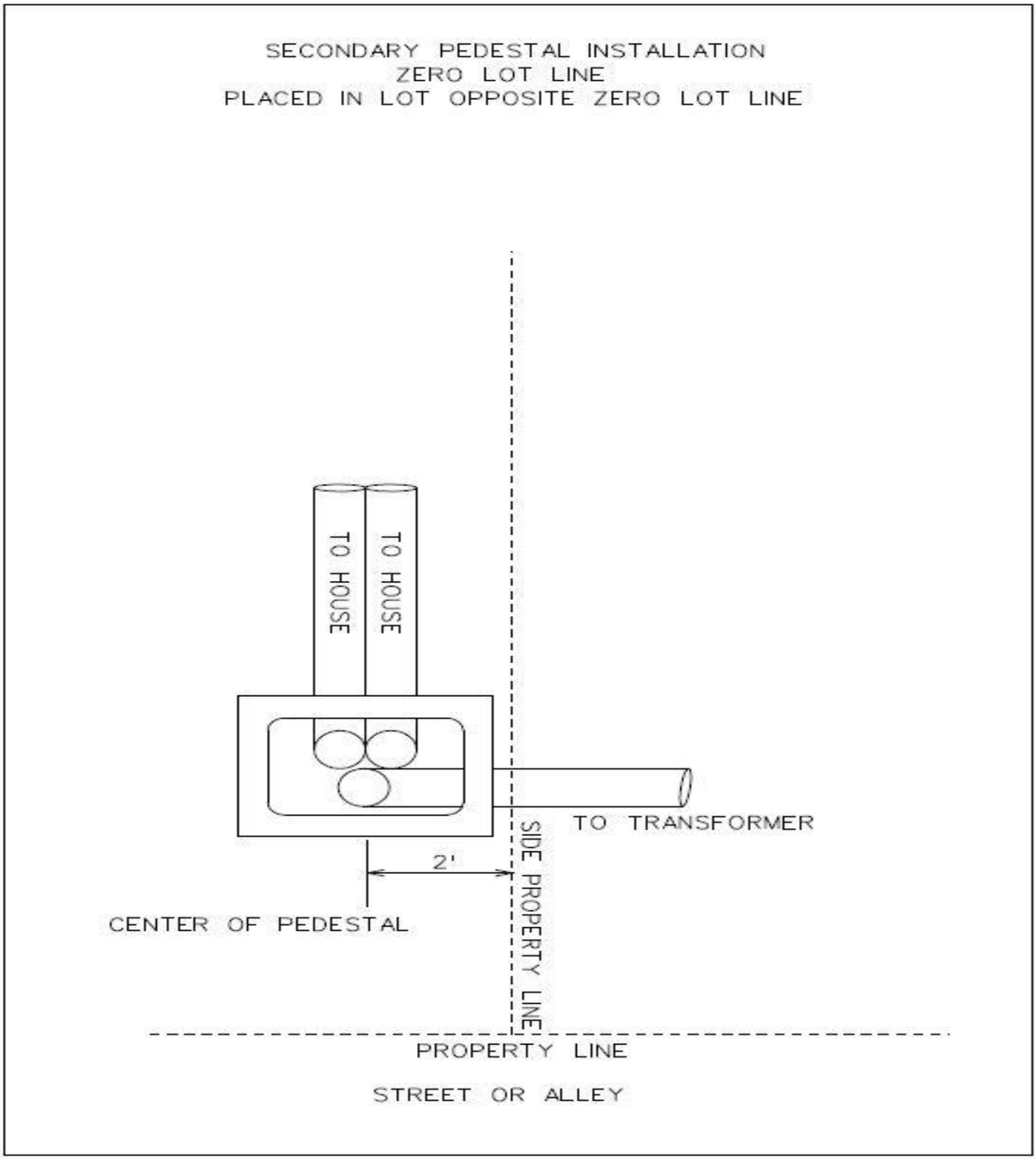
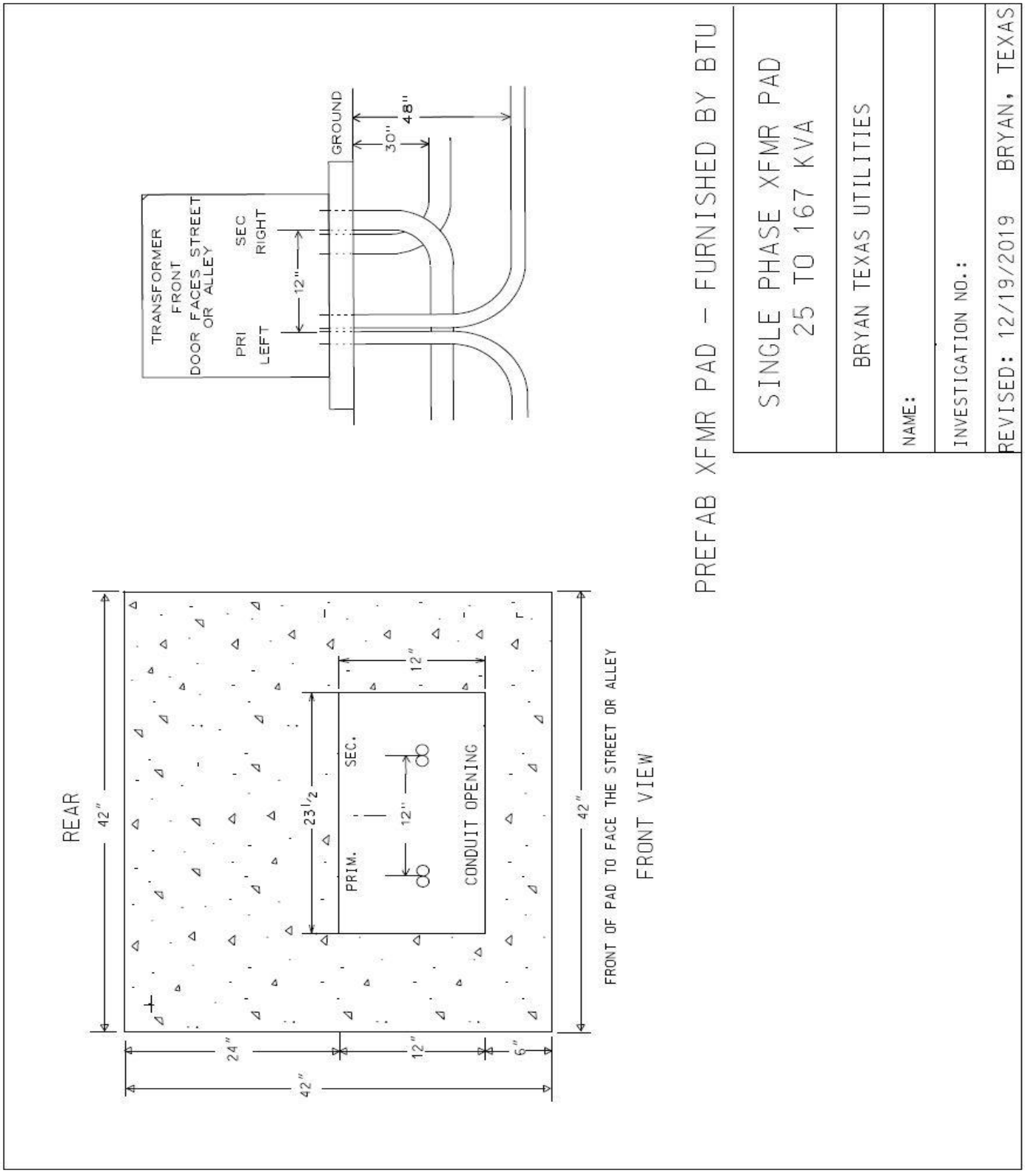
H. Secondary Pedestal Installation Offset from Property Line



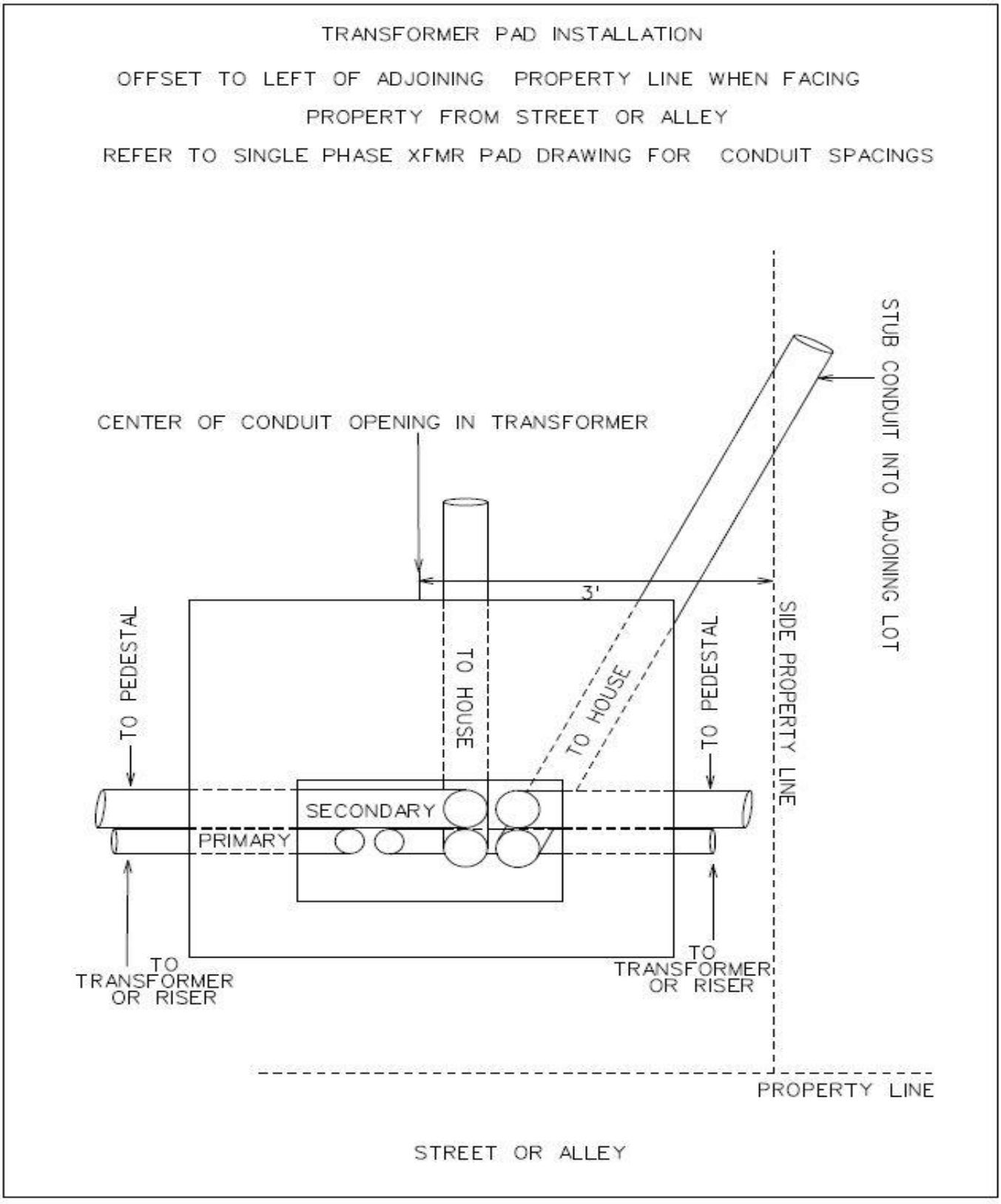
I. Secondary Pedestal Installation with Zero Lot Lines



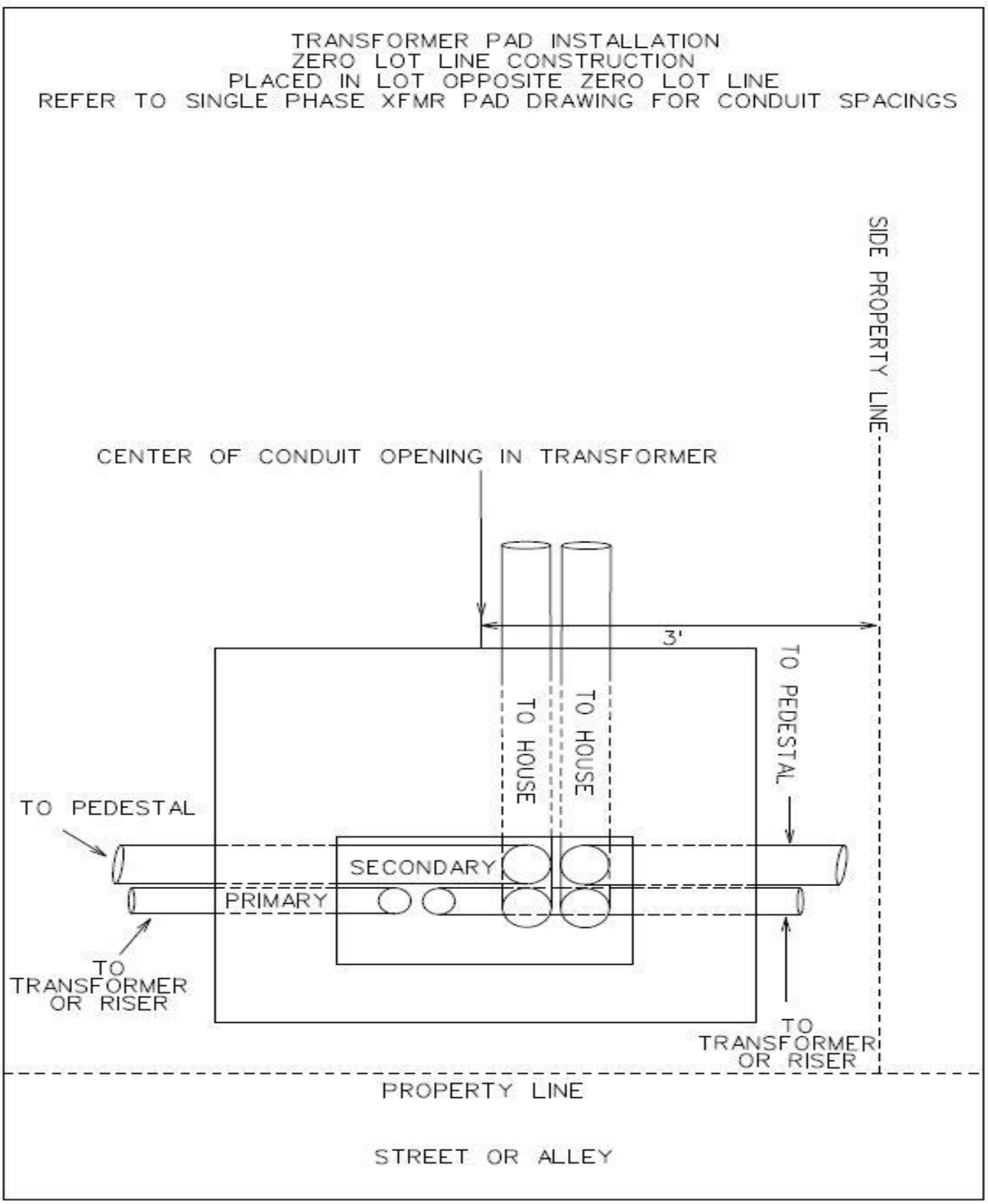
J. BTU Transformer Specification for Single Phase Transformer Pad



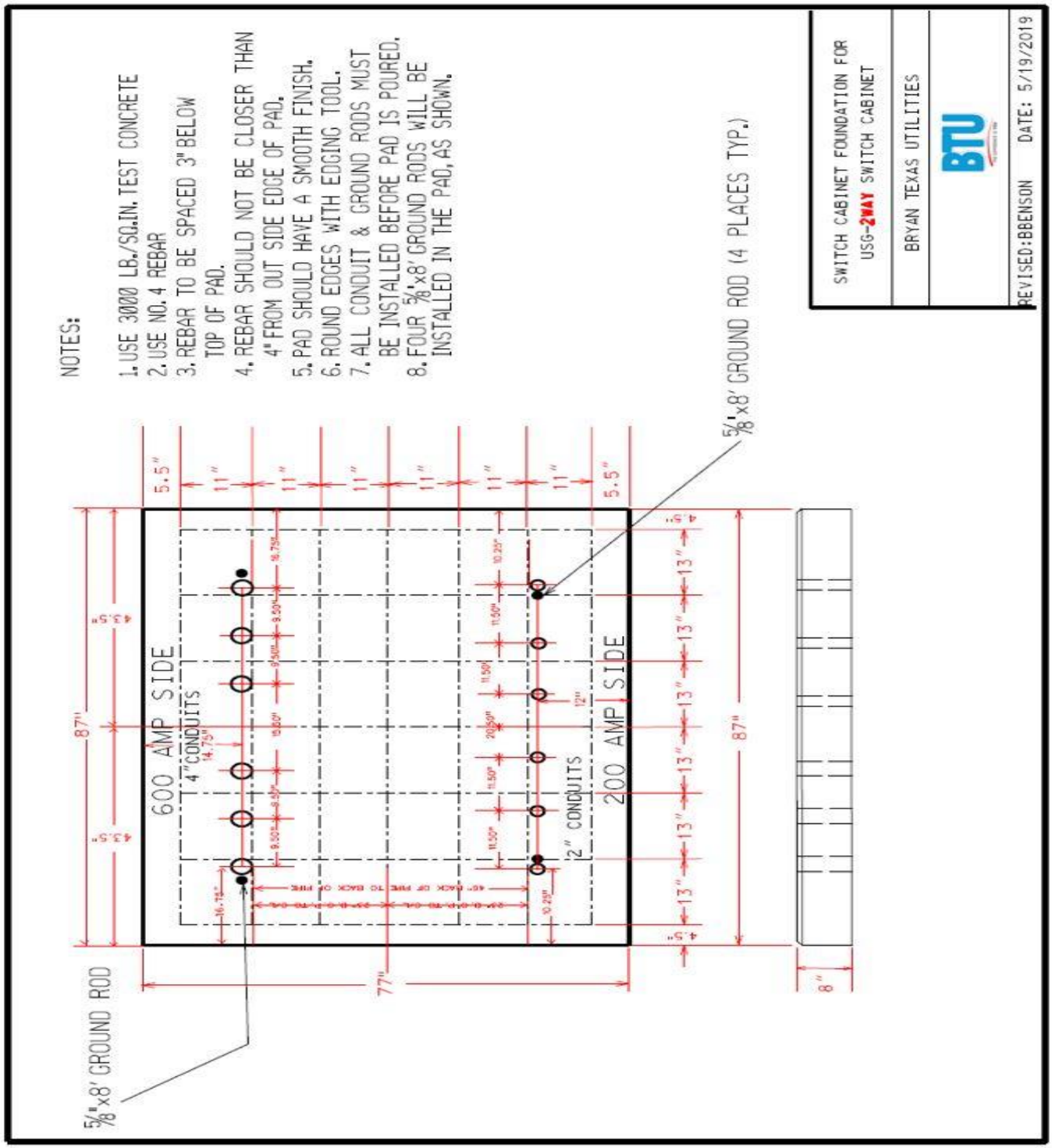
K. Conduit Location for Single Phase Transformer Pad Offset from Property Line



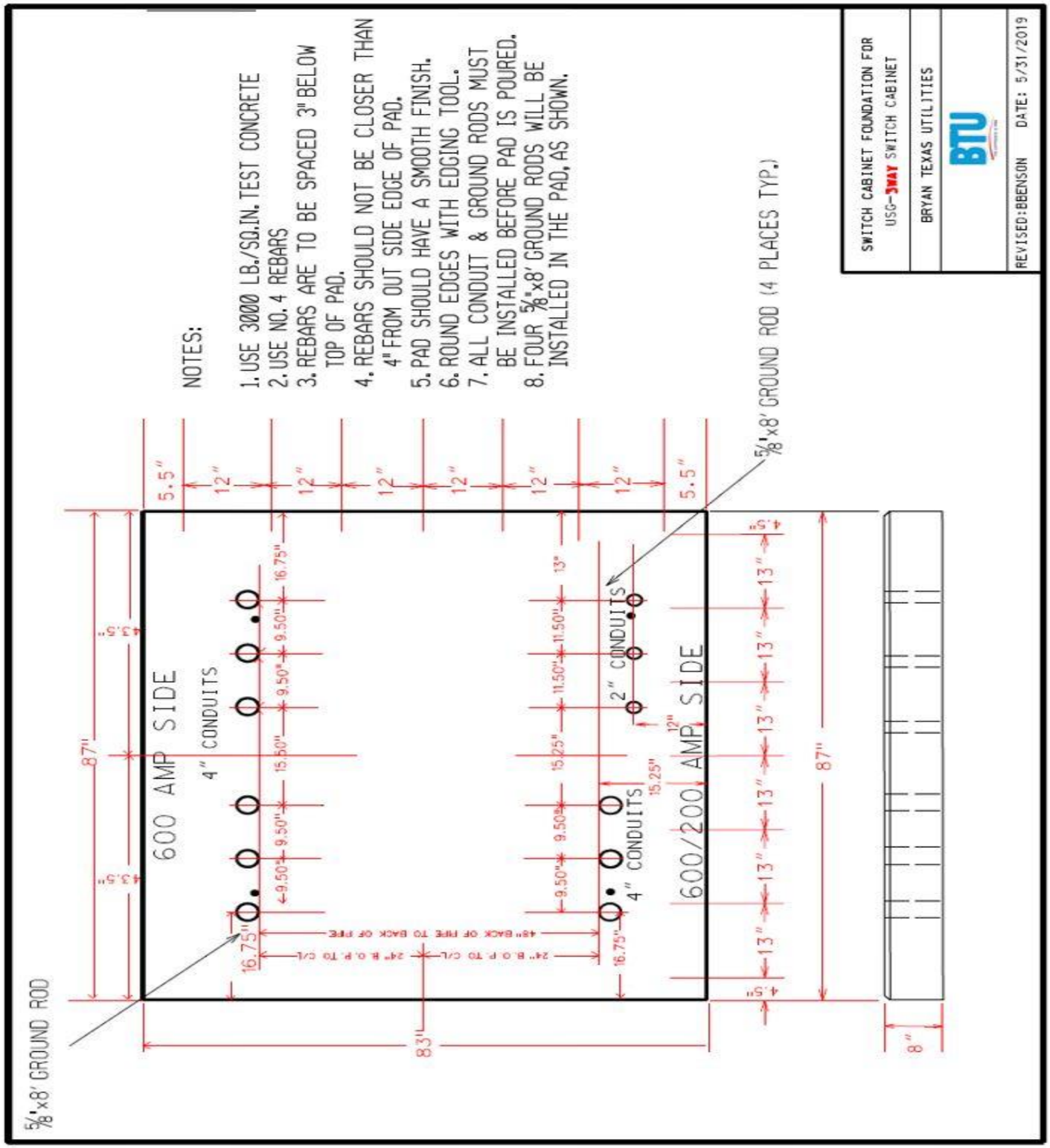
L. Conduit Location for Single Phase Transformer Pad With Zero Lot Line



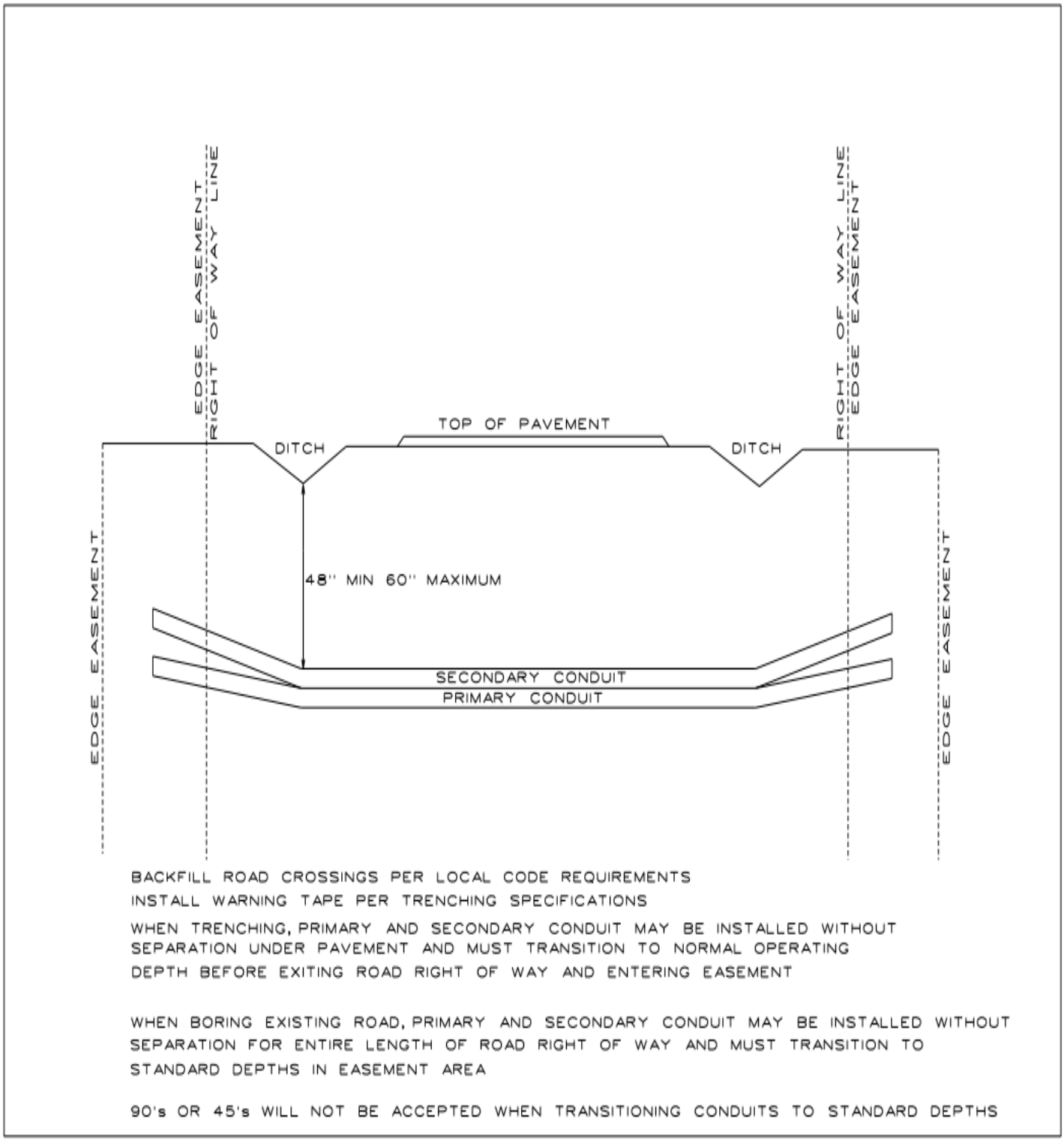
M. Switch Cabinet Foundation for USG-2 Way Switch Cabinet



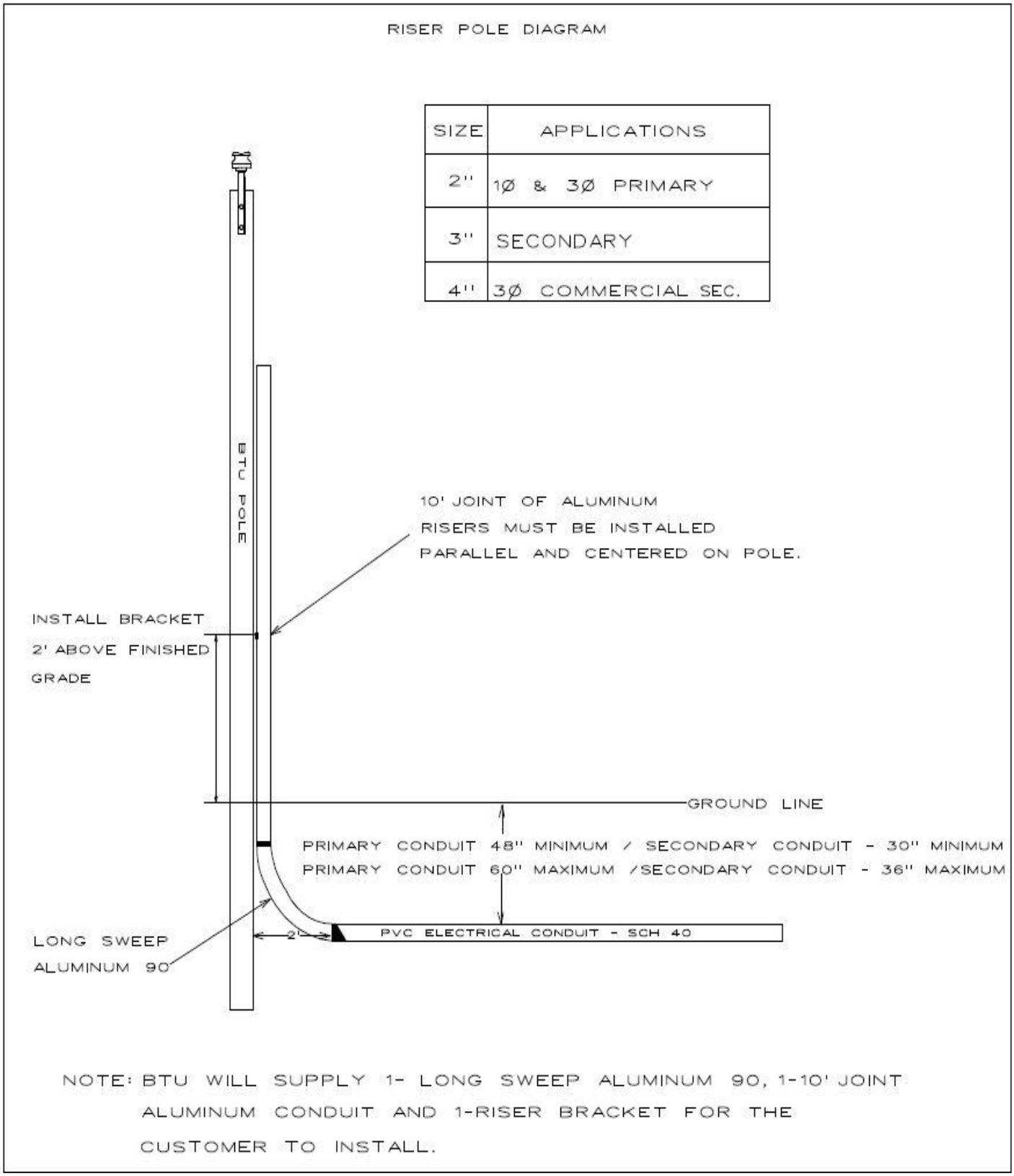
N. Switch Cabinet Foundation for USG-3 Way Switch Cabinet



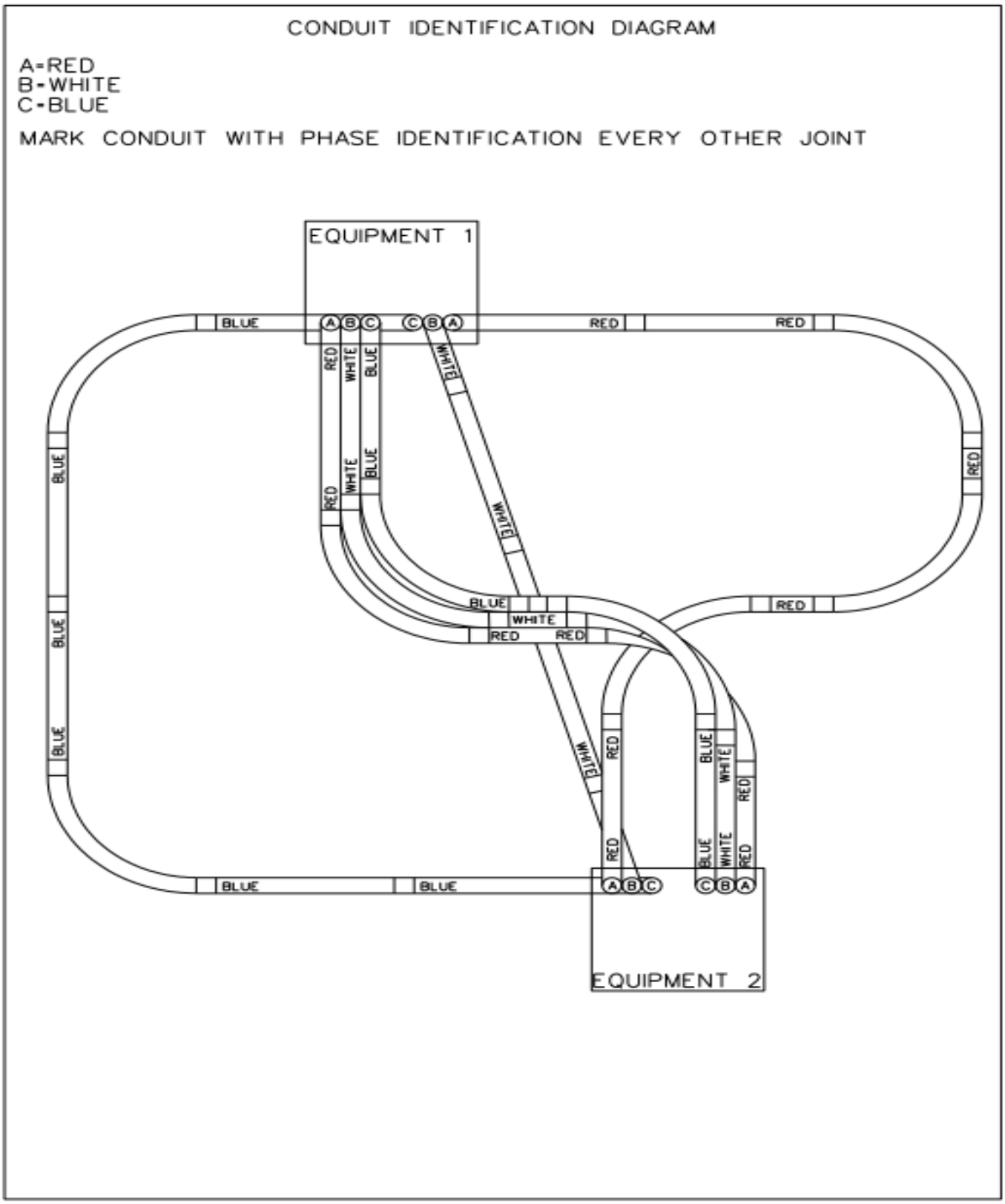
O. Conduit Installation for Crossing a Proposed Road Right of Way



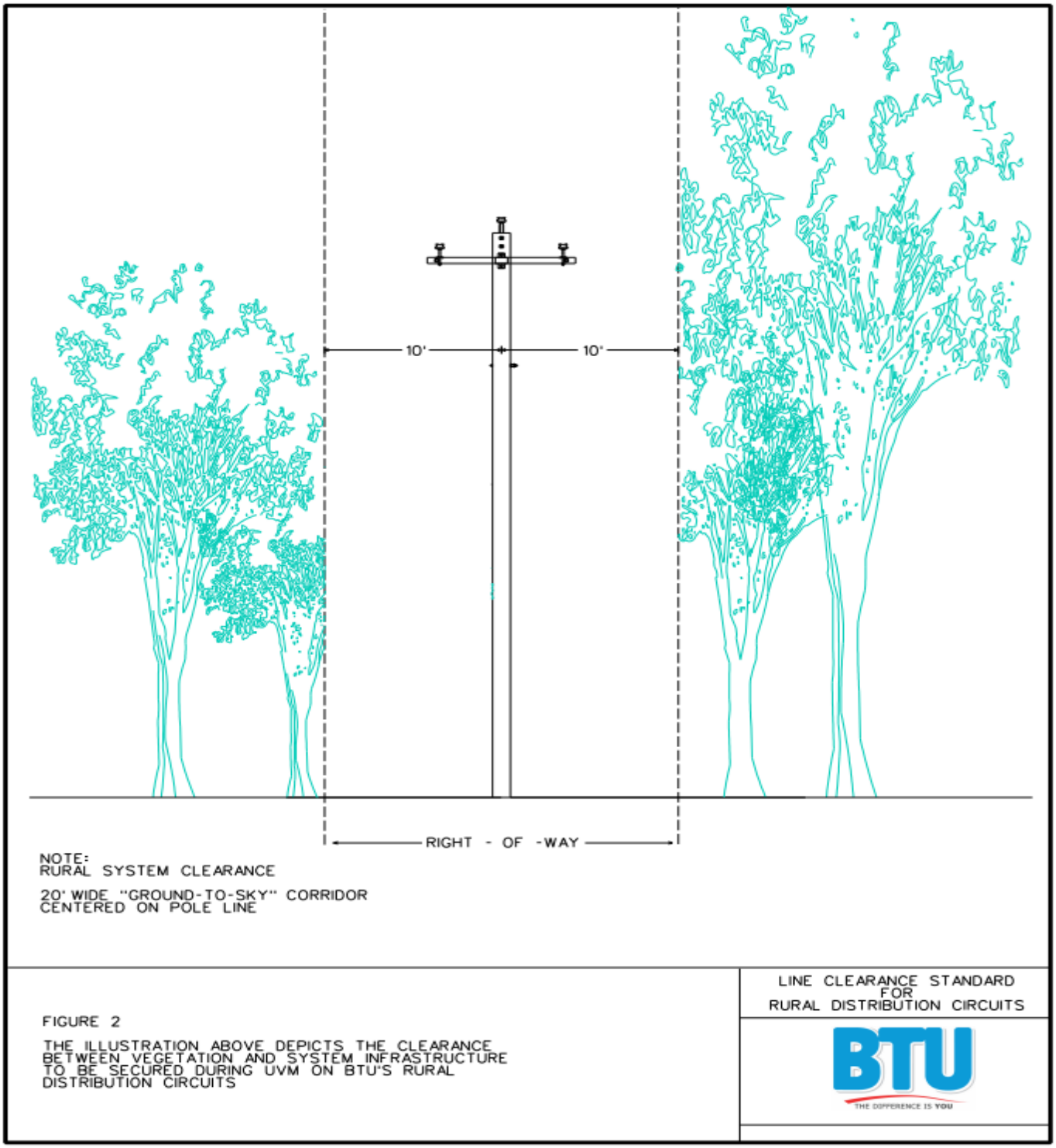
P. Riser Diagram for as Primary or Secondary Installations Attached to a Pole



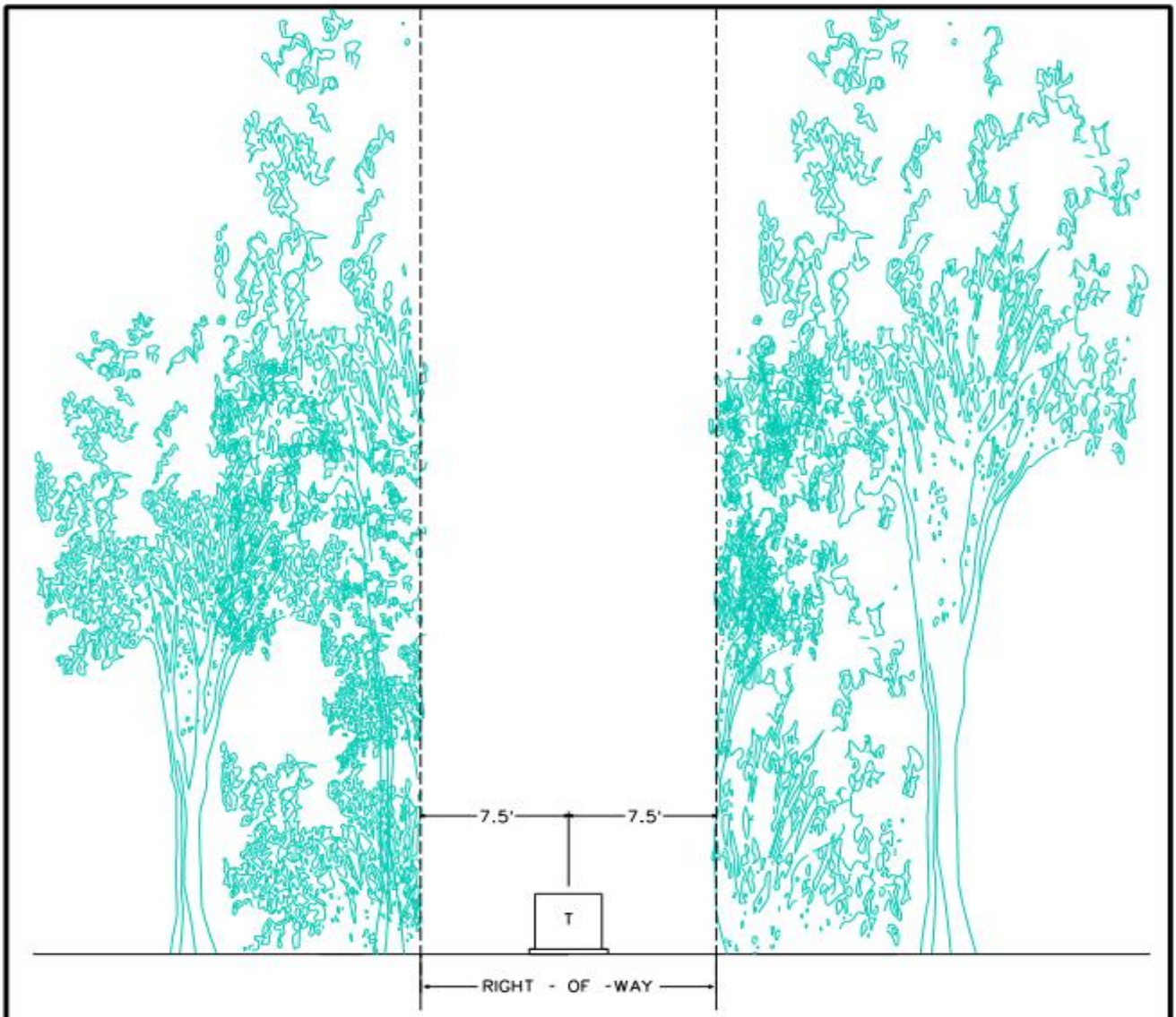
Q. Conduit Identification Diagram



R. Right of Way Clearance Standard for Rural Distribution Circuits



S. Right of Way Clearance Standard for Underground Distribution Circuits



VI. Overview of Subdivision Design & Construction Process

1. Preliminary Design

Participants: ***Developer*** or ***Developer***'s representative and BTU personnel

A. Obtain preliminary development information from the ***Developer*** including the following CAD design files of development showing:
   i. Property lines
   ii. Easements
   iii. Existing BTU facilities
   iv. Water lines
   v. Sewer lines
   vi. Storm sewer lines
   vii. Phone lines
   viii. Cable lines
   ix. Gas lines including pipelines

B. Discuss design considerations and cost drivers including zero lot lines

C. Discuss ***Developer*** requirements including easement clearing and access, construction schedule , ***Developer*** installed conduit and inspection process street lighting requirements, and BTU's requirements for underground installations.

D. Discuss the need for property pins and proper control to be in place prior to ***Developer*** field staking conduit routes and equipment locations

2. BTU Preliminary Design

Participants: BTU personnel

A. Prepare preliminary design

B. Notify warehouse personnel of major material items by submitting a special material request

3. *Developer* Review BTU Preliminary Design Meeting.

Participants: ***Developer*** or ***Developer***'s representative, BTU personnel

A. Discuss preliminary design

B. Discuss right of way requirements for preliminary design

C. Discuss easement requirements for preliminary design

D. Discuss street lighting & select a type of streetlight

E. Discuss ***Developer*** responsibilities for installing conduit and guidelines to follow for installation

4. BTU Detailed Design

Participants: BTU personnel

A. Prepare detailed design

B. Schedule design review meeting with BTU supervisors to review design prior to preparing cost estimate

C. Prepare cost estimate and subdivision development package to include the following if applicable:
   i. Contribution In Aid of Construction (CIAC) letter

ii. Development Service Agreement
iii. Customer installed conduit guidelines
iv. Application for service
v. Lighting Agreement
vi. Easements

D. Send detailed material notification to warehouse personnel including project number and all job numbers
E. Send CIAC and Development Service Agreement to ***Developer***

5. <u>Mandatory</u> Conduit Installation Preconstruction Meeting

Participants: ***Developer*** or ***Developer***'s representative, ***Developer***'s contractor, BTU personnel

A. Review final design including street lighting
B. Discuss *BTU Conduit Installation Guidelines* with ***Developer*** and contractor
C. Confirm property pins and proper controls are in place
D. Identify "hot spots"
E. Discuss right of way clearing, proposed start date, and who to contact for inspection
F. Discuss final grade concerns
G. Discuss conduit installation start date, inspection process, inspection check list, and who to notify for inspection
H. Obtain ***Developer*** contractor's contact information for conduit installation
I. Discuss all items that Developer is responsible for to be completed before BTU or its contractor will perform BTU's portion of construction
J. Identify if BTU or a BTU contractor will perform the work
K. Notify ***Developer*** of who to contact with problems questions or concerns

6. Post Construction Meetings

Participants: ***Developer*** or ***Developer's*** representative, ***Developer's*** contractor, BTU personnel

A. Schedule post construction meeting with ***Developer*** to address any problems, questions or concerns
B. Schedule post construction meeting with BTU contractor to address any problems, questions or concerns
C. Confirm ***Developer*** responsibilities are 100% complete

7. Project Review (as required)

Participants: BTU personnel

A. Review project and identify solutions to problems encountered in project
B. Modify process if needed to provide better customer service

VII. Frequently Called Numbers

24-Hour Outage/Emergency Hotline…….(979) 822-3777

Line Design……(979) 821-5770

Line Design Fax……....(979) 821-5796

Engineering Design Manager…….(979) 821-5773

Job Scheduling Information……...(979) 821-5940

Conduit Inspection…….(979) 821-5845

Streetlight Outage……..…...www.btutilities.com or (979) 822-3777

New Service Applications (Fax):……...(979) 821-5781

Customer Service General Number……...(979) 821-5700

Temporary Construction Pole Connections……...(979) 821-5770

City Of Bryan Planning and Development……(979) 209-5010

City of College Station Planning and Development……..(979) 764-3570

Texas 811 (Line Locates)……..(800) 344-8377

Brazos County (New Address Request)……(979) 779-0911

City of Bryan (New Address Request)……..(979) 209-5030

Bryan Texas Utilities

Physical Address	Mailing Address
205 E. 28th Street Bryan, TX 77803	PO Box 1000 Bryan, TX 77805

Telephone…….(979) 821-5715
Fax……....(979) 821-5795

Line Design Telephone……..(979) 821-5770
Line Design Fax…….. (979) 821-5796

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