

NES

ELECTRIC SERVICE GUIDELINES VERSION 21

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ELECTRIC SERVICE GUIDELINES

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ELECTRIC SERVICE GUIDELINES

GENERAL INFORMATION

CHAPTER 1 - GENERAL INFORMATION

INTRODUCTION

The Electric Service Guidelines (Customer Handbook) have been thoughtfully and carefully laid out for the Customer's use. Please become familiar with these guidelines before beginning a project. The word "Customer" in this publication refers to the landowner or developer. Many steps will actually be completed by contractors or electricians, but the ultimate responsibility rests with the Customer.

Additional requirements may apply to certain projects which will be handled on an as needed basis.

The Electric Service Guidelines include:

- Temporary Service: services used while building a permanent structure, or for a period of one year or less.
- Residential Development: services to new subdivisions, apartments, townhouses, condominiums or mobile home parks.
- Individual Residences: services for individual home builders, and modular/manufactured homes on permanent foundations that are not part of a park.
- Commercial and Industrial Services: services to permanent commercial or industrial structures, outbuildings on residential property (barns, shops, pump-houses, garages, etc.) or any three-phase service whether it is for residential or commercial use.

SAFETY

It is the responsibility of the developer, builder, contractor, etc., to adhere to all requirements for worker and work site safety as defined in OSHA/TOSHA, including all requirements for electrical safety.

NES observed unsafe work site practices related to NES's energized facilities will be reported to the NES Safety Section.

NES bears no responsibility that would supersede that of a developer, builder, contractor, etc.

Should there be concern about visibility of NES's energized facilities on a work site, the developer, builder, contractor, etc., may request installation of flagging on NES's energized facilities.

Such request shall be directed to NES Safety, safety@nespower.com or (615) 747-3616.

Flagging does not delineate a safe approach distance – that determination lies solely with the developer, builder, contractor, etc.

NES bears neither responsibility nor liability for those entities and persons choosing to work near or around NES electrical infrastructure.

ELECTRIC SERVICE GUIDELINES

GENERAL INFORMATION

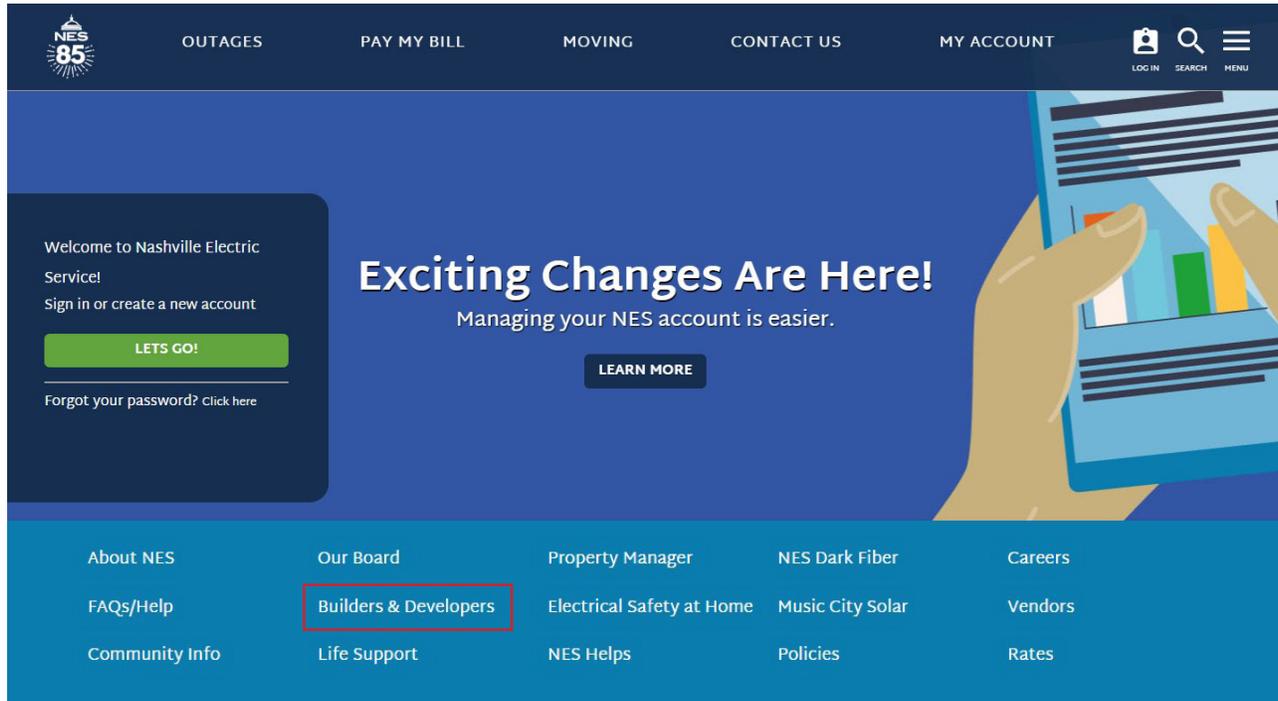


BUILDERS AND DEVELOPERS GUIDELINES

The most recent version of the Electric Service Guidelines may be accessed at www.nespower.com

Select [Builders & Developers](#), then select the appropriate document.

Other useful publications may be found in the *Contractor Guidelines* section such as those listed below.



- [NES Lighting Guidelines](#): Guidelines for installation and maintenance of NES street and private lights.
- [NES Downtown Network Service Guidelines](#): This is the governing document of guidelines for services within the Downtown Underground Network Service Area.
- [Pole Attachment and Conduit Usage Guidelines](#): Covers the installation of Communication Cables, Wireless Equipment, Banners, and Seasonal Equipment on NES Poles and in NES Conduits.
- [Vault Design Guidelines](#): Provides detailed requirements for installation and maintenance of vaults on the NES system.
- [Approved Meter Bases](#): Provides a comprehensive listing of all pre-approved meter bases that can be used across the NES system.
- [Residential and Commercial Applications for Service](#): These forms are used to apply for Residential or Commercial Power Service.
- [Underground Services](#): Two ditch inspections are required when building underground service to your home or business. Minimum requirements are explained in these guidelines. All fees must be paid before an inspection can be scheduled. To request an inspection, complete the form at: <https://www.nespower.com/forms/ditch-inspection-request>



ELECTRIC SERVICE GUIDELINES

GENERAL INFORMATION

OBTAINING SERVICE TO A SINGLE RESIDENCE

Call Customer Relations at (615) 736-6900 for assistance with obtaining service to a residence, or see Appendix D for new installation form and email custserv@nespower.com

OBTAINING SERVICE TO NEW RESIDENTIAL SUBDIVISIONS

The first step is to complete the *Residential Subdivision Application for Service* (see Appendix D) available for download at www.nespower.com.

Once completed, the application should be emailed to energyservices@nespower.com or mailed to:

Nashville Electric Service
Energy Services Engineering
Room 200
1214 Church Street
Nashville, TN 37246

An Energy Services Engineering (ESE) job owner will contact you to confirm receipt of the application. Once all the necessary information is received, the ESE job owner works directly with NES Customer Engineering to obtain a preliminary layout.

Customer Engineering then sends the cost estimate and preliminary drawing to ESE. Once the preliminary layout is agreed upon between NES and the developer, two to three weeks is required to finalize the cost estimate. ESE will then draft a Residential New Business Agreement and determine if a Contribution in Aid to Construction (CIAC) will be required. The estimate must be finalized, a Residential New Business Agreement must be signed, and any CIAC must be paid before the NES job is released for construction.

CONTRIBUTION IN AID TO CONSTRUCTION (CIAC)

NES construction costs must be offset by revenue allowances or by Customer paid Contribution In Aid to Construction. The CIAC is determined by comparing the estimated cost to serve the subdivision to a revenue allowance based on the application information provided by the Customer and the NES schedule of fees and charges. The developer is responsible for paying any difference in these estimates before the work is scheduled for construction. If the estimated cost is less than the revenue allowance a CIAC is not required.

Relocations of electric facilities due to the construction of the subdivision shall be paid in advance of construction. This includes, but is not limited to, road widening and pole relocations due to clearance (safety) issues.

Once all contractual and financial issues are resolved, the job is released to construction. If necessary, a pre-construction meeting will be scheduled shortly after the job is released for construction.

OBTAINING SERVICE TO NEW COMMERCIAL ACCOUNTS

Contact Energy Services Engineering @ energyservices@nespower.com
or Customer Relations @ (615) 736-6900

ELECTRIC SERVICE GUIDELINES

GENERAL INFORMATION



SITE PLAN REQUIREMENTS

The following information is needed before NES can engineer the electrical layout:

- Site plans with civil information (both a hard copy and digital copy)
 - The digital copy shall be provided by an approved file sharing method.
 - The format shall be AutoCAD dwg.
 - The drawing shall not contain X-refs.
 - The drawing shall be registered to the TN State Plane Coordinate System, North America Datum 1983 (NAD83).
 - Data shall be arranged in separate layers and labeled for identification.
- Street names
- Building setbacks/envelopes shown on drawings
- Twenty-foot (20') easement adjacent to roads on a Final Plat
- Proposed grading start date
- Permanent energize service date
- Grading plans
- Proposed location and dimensions for sidewalk/grass strips
- Decision whether primary and service will be overhead or underground
- Water and sanitary sewer plans
- Storm water plans
- Fire hydrant locations
- Street lighting plans
- Stream crossings and bridge requirements
- Any three-phase power requirements
- Plans for any secondary terminations enclosures (troughs not allowed, see Meter Troughs and Secondary Termination Enclosures)
- Location of any electric or dry-type vault rooms
- Planned Road Improvements (i.e. turning lanes or lane improvements)
- Developer's vegetation design shall meet NES Vegetation Management requirements/clearances

EASEMENT NOTE

If facilities are constructed beyond the minimum setback limits and into the public utility easements; then the easement will be considered reduced by that much of the encroachment. Such encroachments may increase the cost of electrical infrastructure to allow for reduced or limited access to equipment. NES reserves the right to enter and to erect, maintain, repair, rebuild, operate, and patrol electric power overhead and underground conductors and communications circuits with all necessary equipment reasonably incident thereto including the right to clear said easement and keep the same clear of brush, timber, inflammable structures, buildings, permanent structures, and fire hazards; all over, under, upon, and across the easement as granted on any plats.

LIMITED ACCESS NOTE

In situations where there is limited access to utility poles, NES may require service points to be located at the front part of the property. Depending on the location and existing infrastructure, service delivery may need to be underground to accommodate these conditions and ensure reliability. Additionally, pedestals or pull-boxes might need to be installed adjacent to NES poles to ensure cable installation feasibility and efficient service delivery.



ELECTRIC SERVICE GUIDELINES

GENERAL INFORMATION

FREQUENTLY ASKED QUESTIONS

(Frequently Asked Questions are for general information, and answers shall not be interpreted as substitutes for compliance with applicable codes and requirements)

Question: *Is there a special phone number for contractors to call Customer Relations (to place business orders and check on order status)?*

Answer: Yes - (615) 747-3443.

Question: *How long will my job take?*

Answer: Your project clock begins once the items listed in the next question are completed. NES needs approximately four (4) weeks to design a single pole-to-pad-mounted transformer job and approximately eight (8) weeks to design the layout for a subdivision. The time needed for the crew to complete construction once the engineering is done varies too widely to estimate. The amount of time depends on weather, equipment availability, number of new business jobs, etc.

All items listed on the following question affect the time needed to complete your job. The number one delay to establishing service is incomplete and/or incorrect information. Time can be minimized by placing the order with NES early, by ensuring the same address is used on the codes release as was used to place the order, by alerting your account representative immediately if there are any changes that affect the electric system such as service rating, relocation of buildings, streets, etc., and by making any required payments or deposits promptly.

Question: *What do I have to do before NES starts construction?*

Answer: Complete the following:

1. Enter into a formal agreement (Contract for Electrical Service, if required) with NES (Pay CIAC and deposit, if required).
2. Furnish NES Energy Services Engineering job owner with site plans (see Site Plan Requirements).
3. Pin and stake the lot lines.
4. Provide graded, usable all-weather roads where electric lines will be located. Before poles or anchors can be set, site needs to be at or within 12" of finished grade.
5. Record the easements (or sign an agreement to furnish and record easements).
6. Pour the foundation, or provide other evidence of new construction.
7. Pay any required Contribution in Aid to Construction (CIAC).
8. Complete any required vegetation removal.

ELECTRIC SERVICE GUIDELINES

GENERAL INFORMATION



Question: *What if the panel size needs to be changed after the order is placed?*

Answer: Let your NES Engineering contact know immediately. If the NES crew arrives to energize the service and discovers the panel size is not the same as the one indicated on the job drawing, or is different from the one inspected by Codes, it will delay the installation of service. If the difference in panel sizes is not noticed by the NES crew, voltage problems or outages could result.

Question: *Why is the street address so important, and where do I get it?*

Answer: The street address is used to match the NES order to the Codes release. Contact your county Codes official to obtain a valid street address.

Question: *What situations do not require a release?*

Answer: An Electrical Release is not required if you are:

- Replacing meter blocks
- Replacing meter base with same amperage base, and NO wire is being replaced
- Replacing or reattaching conduit, or changing out weather-head
- Changing out hub
- Reattaching point of attachment
- Replacing breakers

Question: *When do I need an Electric Release?*

Answer: An Electrical Release is required if you are:

- Installing a new service
- Replacing conductor with new conductor (this includes any Customer-owned conductor)
- Adding additional load (changing the panel size)
- Relocating a service or building a new service
- Service has been de-energized over one year

Question: *When is a change meter order required?*

Answer: A change meter order is required if you have existing service and you are:

- Adding additional load (changing the panel size)
- Relocating a service
- Replacing an existing service
- Replacing conductor with new conductor (this includes any Customer-owned conductor)
- Whenever an Electrical Release is required

Question: *Do I need to request a Temporary Service while remodeling?*

Answer: Vacant homes and occupied homes being remodeled may use existing service to remodel if windows and doors are lockable to insure safety, and the existing service is not in the way of construction. Otherwise, a temporary service will be required.



ELECTRIC SERVICE GUIDELINES

GENERAL INFORMATION

Question: *How do I schedule a planned outage and reconnect of my meter base for situations that do not require a codes release?*

Answer: Planned outages are to be worked during normal business hours Monday through Friday only. Customer or electrician must notify the Customer Relations section of NES at (615) 736-6900 prior to work being performed. Customer Relations will assist you in coordinating a schedule with the appropriate operations department(s).

Question: *How do I change my existing overhead service to underground?*

Answer: For an individual, this will require paying NES for the associated costs (e.g. removing pole and overhead equipment, installation of underground conductor and equipment). Additionally, the Customer is responsible for providing the trenching and conduit for the underground service. When multiple Customers are affected, all participants shall agree on a method for cost-sharing the estimated cost. All Customers being served from poles that are being replaced with underground facilities must be willing to change to underground service, even if they are not participating in the cost-sharing. These costs shall be paid before construction begins.

Question: *Will NES move a pole and if so, who pays for it?*

Answer: If a pole is moved at the Customer's request, the Customer is charged the actual construction costs. Also, suitable easements or property rights shall be provided with no cost to NES. A relocation agreement may be required.

OVERHEAD SERVICE

Question: *How much slack do I need to leave for NES to make up the drip loop?*

Answer: A minimum of twenty-four inches (24") of slack is required to make up the drip loop.

Question: *Can I build underneath my residential service entrance?*

Answer: Only if you keep three feet and six inches (3'-6") clearance between an inaccessible roof and the service line.

Question: *What is the required clearance over a deck?*

Answer: Service lines shall be eleven feet (11') above deck floors (see Appendix C).

Question: *Can my service line go over my hot tub (or swimming pool)?*

Answer: No. Refer to Appendix C for more details of clearances from swimming pools and waterways.

ELECTRIC SERVICE GUIDELINES

GENERAL INFORMATION



Question: *How close can my driveway be to an NES pole?*

Answer: The minimum separation distance is twelve inches (12”) however, NES recommends at least three feet (3’-0”) to avoid damage to the driveway when the pole is replaced.

Question: *What is the required clearance from an operable window, or opening, to my overhead service line?*

Answer: Overhead service line and attachment point shall be a minimum of 3’ in any direction from an operable window or opening.

Question: *Can I place the point of attachment above the weatherhead? (Frequently asked for billboards)*

Answer: Most billboards are on state road or interstate right-of-ways, meaning electrical inspections are done by the State Codes Inspector. The State Codes Inspector has allowed attachments above weatherheads, as long as they meet the National Electric Code (NEC) requirement of twenty-four inches (24”) maximum distance between the point of attachment and the weatherhead. Different counties may have different rules. Check with your local Codes inspector (see Table 2: Useful Contacts) for situations not on state road or interstate right-of-ways. Refer to Figure 64 for Overhead Service to Billboards.

UNDERGROUND SERVICE

Question: *When will I get my pad sketch?*

Answer: Directions for the installation of concrete pads are distributed with all other contractor requirements during the Pre-Construction meeting. General pad sketches (Figures 26A-26F) are provided to give contractors an idea of the space and materials needed. Construction of the pad shall not begin until the final pad sketch is presented during the Pre-Construction Meeting.

Question: *Do I dig the ditch for underground service, or does NES?*

Answer: The Customer is responsible for excavation and conduit including Duct Bank Systems and Manholes. (See Figure 7 for residential requirements, or Figure 19 for commercial requirements)

Question: *What do I do if my 1st or 2nd underground service ditch inspection fails?*

Answer: The Customer will need to resubmit online for the inspection that failed. Please refer to the applicable figure for ditch detail requirements and Figure 69 for ditch inspection process.

Question: *Can phone, cable TV, and power go in the same secondary ditch to the building?*

Answer: Only if there is a one-foot (1’) vertical and horizontal spacing between the NES cables and the other utility cables. (See Figure 7 for residential requirements, or Figure 19 for commercial requirements)



ELECTRIC SERVICE GUIDELINES

GENERAL INFORMATION

Question: *Can I put a condenser over my underground service?*

Answer: No. NES requires the lines not be located under any planned permanent structures to ensure timely maintenance and repairs.

Question: *Who owns the conduit?*

Answer: Once a residential service is energized NES owns and maintains the primary distribution conduit and cable. The Customer owns residential service conduit whether it is from a pad-mounted transformer or a pole-type transformer, and NES owns the cable. The Customer owns, maintains and locates the service cable and conduit of commercial services from pad-mounted transformers. The Customer owns commercial service conduit from a pole-type transformer; NES owns the conductor. See Repair & Maintenance for more details.

METERING

Question: *Can I use a 400 amp self-contained meter base?*

Answer: A class 320 (self-contained) meter base may be used for residential service or single-phase commercial temporary service.

Question: *Can I place the meter base directly onto a mobile home?*

Answer: A manufactured or “mobile” home Customer SHALL install a Customer-owned pole (refer to Figure 28 or Figure 29 for specifications). The meter base may only be installed directly on a “modular” home if the tongue is removed and the home’s manufacturer has certified that the building is rated for such an installation.

Question: *Does my manufactured home, mobile home or modular home qualify as “permanent living quarters?”*

Answer: The variety of situations that can occur makes it difficult to give a black-and-white definition. The rule of thumb is, if it would be easy to reattach the wheels and relocate, it is not a permanent living quarters. A manufactured home installed on a solid foundation is a clear case of permanent living quarters.

Question: *Where do I install the ground wire?*

Answer: The ground wire shall be installed in accordance with your local Codes. Please contact your local Codes inspector for this information. (see Table 2: Useful Contacts).

ELECTRIC SERVICE GUIDELINES

GENERAL INFORMATION



RELOCATE OVERHEAD TO UNDERGROUND ELECTRIC SYSTEM

Any relocation of facilities from overhead (OH) to underground (UG) must allow for future circuit needs as deemed by NES. All costs of relocating OH to UG, including easements, shall be on the requestor as stated in the NES Electric Service Policies Manual.

NES will consider requests for burying segments of our distribution system. Such requests will be evaluated on a case by case basis and will be evaluated on the following engineering and operational considerations: Employee and Public Safety, System Reliability, System loading (Capacity), Future maintenance and accessibility, Future Growth.

NES, in its sole discretion, will determine how going underground will affect current conditions or future plans for our system. To ensure the reliability of NES's system, NES may require that additional manholes, switches, etc. be installed in addition to what is required to serve a specific planned development.

All requests for converting OH circuits to UG must be in writing and shall include justification and a sketch/drawing of the proposed UG route associated with the development. Each request will be presented to an internal NES team for review and comment. Such meetings are regularly scheduled on a monthly basis. In some cases, a system study may need to be performed before a response is provided.

Contact Customer Relations (615) 736-6900 to submit official requests to convert from overhead to underground.



ELECTRIC SERVICE GUIDELINES

GENERAL INFORMATION

INSPECTIONS AND ELECTRIC CODES

This handbook should be used as a guide for meeting NES requirements. It does not cover all federal, state and local code requirements. It is the Customer's responsibility to ensure the project complies with the most recently adopted version of National Fire Prevention Association (NFPA) 70 - National Electrical Code (NEC) and any other federal, state or local codes that apply. Once the Customer's service equipment is installed, and any site preparation has been completed, it is the Customer's responsibility to contact the local Electrical Codes Inspection agency (Codes). Once the installation has passed the Codes inspection, it is the Codes Inspector's responsibility to send a copy of the release to NES. It is the Customer's responsibility to follow up with Codes if the release has not been received by NES.

Once NES receives a release from Codes, confirms that all deposits and fees have been paid, and the engineering design is completed, the job is released to NES Operations for scheduling construction of electrical facilities.

! Codes release shall have the same address as the Customer gave when the application for service was requested. Discrepancies between the two addresses will cause a time delay in the release process. The Customer shall be responsible for correcting any discrepancies.

SERVICE RATINGS

The size of service depends upon the size of the building and the power requirements of the equipment installed in it. The Customer is responsible for determining power requirements for the installed equipment. The following standard types of services are available.

TABLE 1: STANDARD SERVICE RATINGS		
SINGLE-PHASE STANDARD SERVICE RATINGS		
VOLTAGE	WIRES	MAXIMUM ALLOWABLE DEMAND
120/240	3	167kVA Overhead and Underground
THREE-PHASE STANDARD SERVICE RATINGS		
VOLTAGE	WIRES	MAXIMUM ALLOWABLE DEMAND
208 grounded wye /120	4	500kVA Overhead, 1500kVA Underground
480 grounded wye / 277	4	500kVA Overhead, 2500kVA Underground
240 delta*	3	500kVA Overhead, not available Underground
480 delta*	3	500kVA Overhead, not available Underground
4160 grounded wye / 2400	4	1500kVA Overhead, 5000kVA Underground
* This voltage rating is only available to customers with services already at this voltage		
PRIMARY VOLTAGE STANDARD SERVICE RATING (NES Engineering Department must approve use of these voltages for service requirements)		
VOLTAGES		WIRES
13,800 or 69,000, or 161,000		3
23,900 grounded wye / 13,800		4

ELECTRIC SERVICE GUIDELINES

GENERAL INFORMATION



USEFUL CONTACTS

TABLE 2: USEFUL CONTACTS		
NES CONTACTS		
Customer Relations Contractors' Line (All new accounts, residential or commercial)		(615) 747-3443
Energy Services Engineering (Established energy demand customer accounts)		EnergyServices@nespower.com
Street and Private Lighting		NESLighting@nespower.com
Attachments Group		attachments@nespower.com
Power Outage or Dangerous Situations		(615) 234-0000
Ditch Inspections		nespower.com/forms/ditch-inspection-request di@nespower.com
ELECTRICAL CODES INSPECTION CONTACTS		
Davidson County	https://www.nashville.gov/departments/codes	(615) 862-6560 permitinspections@nashville.gov After Hours / Weekends Call (615) 693-1742
Cheatham County	https://www.cheathamcountyttn.gov/bldg_codes.html	(615) 792-7915
Fairview	https://www.fairview-tn.org/depts-services/planning-codes-dept/	(615) 799-2484
Robertson County	https://www.robertsoncountyttn.gov/departments/planning/index.php	(615) 384-3666
Rutherford County	https://buildingcodes.rutherfordcountyttn.gov/electrical-inspections	State: (615) 741-7170 County: (615) 898-7734
Sumner County	State Inspector	(615) 741-7170
Hendersonville	https://www.hvilletn.org/162/Inspections	(615) 590-4642
Williamson County	https://www.williamsoncounty-tn.gov/396/Inspections	(615) 790-5718
Wilson County	https://www.wilsoncountyttn.gov/168/Inspection-Process	(615) 444-3025
State of Tennessee Property along state highways, streets, or roads	https://www.tn.gov/commerce/fire/permit/electrical.html	(615) 741-7170



ELECTRIC SERVICE GUIDELINES

GENERAL INFORMATION

TABLE 2: USEFUL CONTACTS (continued)

CITY CONTACTS		
Metro Nashville	Nashville Department of Transportation	(615) 862-5000
Belle Meade	Nathan McVay	(615) 297-6041
Berry Hill	Joe Baker	(615) 292-5531
Brentwood	Darek Baskin	(615) 371-0060
Forest Hills	Mark Hill	(615) 372-8677
Gallatin	Nick Tuttle	(615) 451-5965
Goodlettsville	Jeff McCormick	(615) 859-2740
Hendersonville	Sarah Lock	(615) 590-4640
LaVergne	Alexandra Thompson	(615) 793-9891
Millersville	Jerry Schrader	(615) 859-0880
Mt. Juliet	Matt White	(615) 773-7957
Oak Hill	Steven Collie	(615) 371-8291
Ridgetop	Tim Shaw	(615) 859-0596
OTHER UTILITY CONTACTS		
AT&T (Nashville)	Ken Fleming	(615) 209-1020
Comcast	Jesse Franklin	(615) 864-2231
Google Fiber	gfiber-bna-relocations@google.com	
Metro Water & Sewer	Mose Jobe	(615) 880-2729
	mose.job@ws.nashville.gov	
Metro Street Address Assignment	Sara Cain	(615) 862-8781
	750 South Fifth St.	
Piedmont/Duke/Spire Natural Gas	Sales	(877) 279-3636
TDS Telecom	Sean Harkins	(615) 754-3893
United Telephone	Scott Niehaus	(931) 364-4337
TN811 - TENNESSEE ONE CALL		
State law requires you notify utilities of your intent to dig through TN811 (Tennessee One Call)		
Call BEFORE digging		
https://www.tenn811.com/		Call: 811

ELECTRIC SERVICE GUIDELINES

GENERAL INFORMATION



COMPARISON OF OVERHEAD AND UNDERGROUND SERVICE

The two types of electrical service available are overhead and underground. Local ordinances such as the one enacted May 17, 2005 in Davidson County may require underground service. It is the Customer's responsibility to be aware of and follow local codes and ordinances. More details of the Davidson County ordinance can be found online at the following address.

https://legisarchive.nashville.gov/mc/ordinances/term_2003_2007/bl2005_628.htm

If the existing primary lines are installed underground, the service shall also be installed underground. In areas where existing service is provided by overhead lines, the Customer may choose either overhead or underground.



Advantages of Overhead Service:

- Equipment and cable costs less
- Easier to connect new Customers
- Equipment uses less ground space
- Outages take less time to repair
- More flexibility – easier to increase capacity, relocate equipment

FIGURE 1A: OVERHEAD SERVICE



Advantages of Underground Service:

- Less tree trimming (but shrubbery must be cleared around pad-mounted equipment)
- No poles or guy wires near driveways or other Customer property
- Can service larger loads (very large transformers are too heavy for poles)
- Reduced chance of storm outage

FIGURE 1B: UNDERGROUND SERVICE

The main difference to the Customer is site preparation. For overhead service, the Customer shall acquire the right-of-way and or easements for any new poles, guys, or other equipment that must be installed to provide service. In addition, the Customer must remove vegetation to clear the path for the new line. For underground service, the Customer is responsible for acquiring the right-of-way and/or easements for pad-mounted equipment, digging and backfilling trenches, providing and installing conduit and ground wire and pouring pads for underground equipment. Commercial Customers are also responsible for providing and installing underground service wire from a pad-mounted transformer.



ELECTRIC SERVICE GUIDELINES

GENERAL INFORMATION

RIGHT OF WAY

! The Customer shall provide all necessary easements, rights-of-way, and tree trimming at NO COST to NES before any line extension is constructed or service is provided. For easement guidance/questions send an email to Property@nespower.com

NES will confine its facility installations to existing rights-of-way, public property or easements whenever possible, except for service conductors.

NES installs poles and equipment on the side of the road wherever possible. This ensures timely maintenance and repairs in the future. Roadside construction minimizes the occurrence of property damage by NES trucks when making repairs or doing maintenance. If NES equipment or primary riser poles are more than fifteen feet (15') from a paved surface, or otherwise deemed inaccessible by NES trucks, the Customer is responsible for installation of an all-weather road as shown in Figure 2 below. This road is required so NES crews can access the equipment when future service restoration and maintenance is necessary. Modifications to the dimensions of the all weather road may be required on a case by case basis.

ALL WEATHER ROAD

Drawing Notes:

1. Notification of need for road will be given during the Pre-Construction Meeting.
2. Twenty-five-foot (25') minimum radius of turn on road curves.
3. Install drainage structures as needed.
4. All weather roads greater than fifty feet (50') will be approved at NES engineer discretion.
5. Slope at equipment operating position shall be limited to 6%.
6. Paved road may be required at NES discretion.
7. NES shall refuse to energize service until required all weather road is provided.

GRAVEL ALL WEATHER ROAD

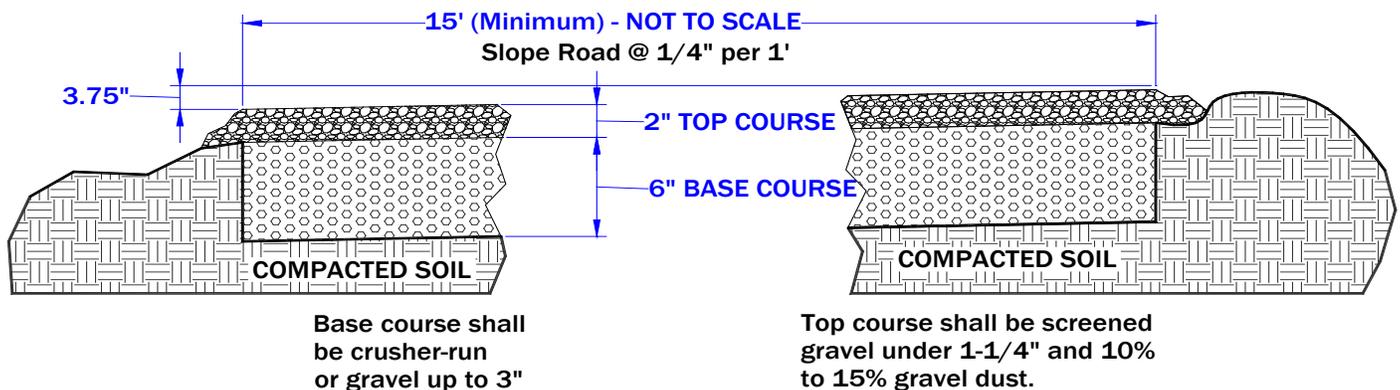


FIGURE 2: ALL WEATHER ROAD

ELECTRIC SERVICE GUIDELINES

GENERAL INFORMATION



REPAIR & MAINTENANCE

OVERHEAD SERVICES

Overhead Services (Residential and Commercial):

The Customer is responsible for repairs on the load side of the service connectors, including the weatherhead, service mast and meter base. NES is responsible for maintenance and repairs on the source side of the service connectors, including the actual service connectors.

UNDERGROUND SERVICES

Primary Conduit (residential or commercial):

NES owns and maintains all primary conduits and cable no matter who installed it. The Customer is responsible for furnishing and installing the conduit, duct banks, and manholes. NES is responsible for maintaining and repairing the conduit and cable.

Service Conduit from pad-mounted transformer (residential):

The Customer owns the residential service conduit. NES owns and maintains the secondary conductor and will locate the service. The Customer is responsible for repairing damage to conduit that does not affect the cable. The Customer will be asked to uncover the conduit as needed in the case of a dig-in outage. NES will repair the conduit if the cable is also damaged.

Service Conduit from pad-mounted transformer (commercial):

The Customer owns, locates, maintains, and repairs commercial service conduit and cables. NES does not own, locate, maintain, or repair commercial service conduits or cables fed from a pad-mounted transformer.

Service Conduit from pole-type transformer (residential or commercial):

The Customer owns the service conduit from a riser pole. NES owns and maintains the cable, and will locate the service. The Customer is responsible for repairing damage to conduit that does not affect the cable. The Customer will be asked to uncover the conduit as needed in the case of a dig-in outage. NES will repair the conduit if the cable is also damaged.

STREET AND PRIVATE LIGHTS

For NES-owned street and private lights that need maintenance, call (615) 736-6900, or visit the Street Light Issue page: <https://www.nespower.com/forms/report-a-streetlight-issue/>

RENOVATIONS/ADDITIONS

If a meter is made inaccessible after installation (for example if a sunroom is built next to the wall with the meter base) the Customer will bear the cost for moving the metering facilities to an accessible outside location approved by NES Engineering.



ELECTRIC SERVICE GUIDELINES

TEMPORARY SERVICE

CHAPTER 2 - TEMPORARY SERVICE

! Safety is a high priority. NES will not connect service wire to attachment hardware deemed unsafe, such as screw knobs. If NES sees an unsafe condition or violation of Codes, the service will be disconnected even if the Customer has a release.

! Temporary service meters shall not be attached to an existing NES pole, a tree, or a building.

! Contractors building in subdivisions should stencil the lot number on the support stake. This will ensure the temporary service is connected at the correct location.

BASIC INFORMATION ABOUT TEMPORARY SERVICES

A service is considered temporary if:

- It serves new construction before the installation of permanent service.
- It serves a construction trailer or crane.
- The service is needed for 12 months or less.
- The service is seasonal such as Christmas tree stands.

Service to mobile homes are considered temporary if:

- They are not owned by the Customer.
- They do not have permanent connection to a water or sewer line.
- They are not installed as permanent living quarters.

A connection fee shall be paid before the temporary service can be energized.

NES does not build new primary lines to a temporary service.

There shall be signs of construction (such as the building foundation), and a permanent service order shall be placed, before a new line will be built to provide service to a temporary meter.

The only standard voltage for temporary service is 120/240 Volts single-phase, three-wire, supplying a service of 200 Amps or less.

Non-standard service voltages are charged as a total “in-and-out” cost (total labor with overhead and indirect charges to install and remove the service, plus the cost of any materials according to the schedule of fees and charges), but will not be any less than the standard temporary connection fee.

Temporary services are billed at the appropriate commercial rate.

ELECTRIC SERVICE GUIDELINES

TEMPORARY SERVICE



STEP 1: SET UP ACCOUNT AND APPLY FOR SERVICE

Call the Customer Relations Call Center at (615) 736-6900. For temporary service larger than 200 amps contact Energy Services at EnergyServices@NESPower.com. New Contractors or Customers will need to set up an account, which may include a deposit.

Once an account has been set up, an NES representative places an order. The NES representative (“rep”) will request general billing information, the address for the new service, and discuss fees. Refer to the Residential or Commercial section for more information if permanent service is requested along with temporary.

The temporary service will be served either overhead or underground. If the existing power system in the area is overhead, the temporary service will also be overhead. If the area is served underground, the temporary service will usually come from a previously installed temporary pedestal, as shown in Figure 4. Call NES Customer Engineering at (615) 747-3641 for more details.

STEP 2: PURCHASE TEMPORARY METER BASE

The Customer is responsible for providing a meter base with the following specifications for a standard temporary service:

- Rated 120/240 Volts
- Single phase
- For approved meter bases refer to www.nespower.com under the Builders & Developers page.
- Maximum rating of 200 Amps
- Four jaws
- Underwriters Laboratory (UL) approved

Any vendor that can meet the above requirements is acceptable.

Vendors who are known to supply NES approved meter bases are:

TABLE 3: METER BASE VENDORS (TEMPORARY)		
CED 330 19th Avenue North Nashville, TN 37203 (615) 329-2601	Graybar Eighth Avenue South Nashville, TN 37203 (615) 254-8484	Border States Electric 656 Wedgewood Avenue Nashville, TN 37202 (615) 255-4161
Utilicor (Power & Tel) 3412 Ambrose Avenue Nashville, TN 37207 (615) 226-0321	Wesco 1400 Fort Negley Boulevard Nashville, TN 37203 (615) 248-9713	Williams Wholesale Supply 831A Cowan Street Nashville, TN 37207 (615) 324-0469
City Electric Supply 120 Ewing Drive Nashville, TN 37207 (615) 942-2201		



ELECTRIC SERVICE GUIDELINES

TEMPORARY SERVICE

STEP 3: INSTALL TEMPORARY SERVICE EQUIPMENT

Temporary services shall comply with the National Electrical Codes (NEC) and National Electrical Safety Code (NESC). Temporary services are subject to inspection by the local Codes Inspector (see Table 2: Useful Contacts). Service will not be scheduled to be energized until an electrical release is received by NES. Check with NES Customer Engineering if there are plans to do anything differently from what is shown in Figure 3 or Figure 4, or if there are any questions. Deviations can result in a delay in receiving service, or in service being denied.

! Temporary service will not be energized until the final release is received by NES.

! Do not relocate the temporary after the service has been energized. Any relocation of the temporary AT ANY TIME requires disconnection, a new Codes release, payment of all applicable fees, and reconnection.

STEP 4: OBTAIN ELECTRICAL RELEASE FOR TEMPORARY SERVICE

Contact the local Codes Inspector. The appropriate Codes Inspector will forward a certified release to notify NES that the service is approved.

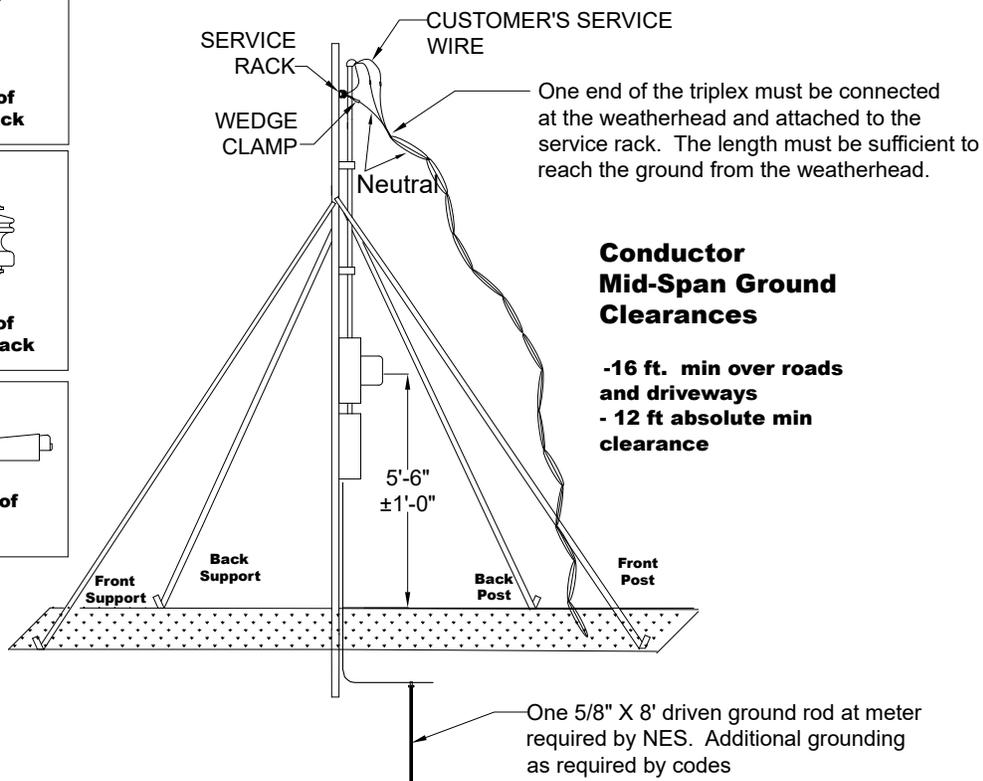
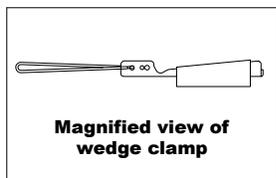
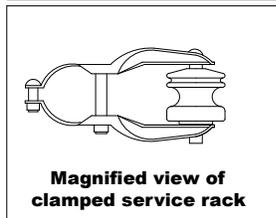
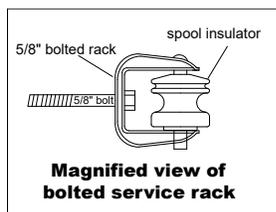
If the temporary is relocated after it has been inspected, a new inspection and release is required. NES may reject the service, remove NES's service wire, or disconnect power at a later date, if the temporary is deemed unacceptable by NES or by Codes.

STEP 5: PAY ANY REQUIRED FEES AND/OR DEPOSITS

Once Customer has paid all fees and deposits, the temporary service will be added to the NES job queue. Once NES receives a release from Codes, temporary service will be scheduled for installation.

STEP 6: NOTIFY NES WHEN TEMPORARY SERVICE IS NO LONGER NEEDED

To have temporary service disconnected, contact NES Customer Relations at (615) 736-6900.



Drawing Notes:

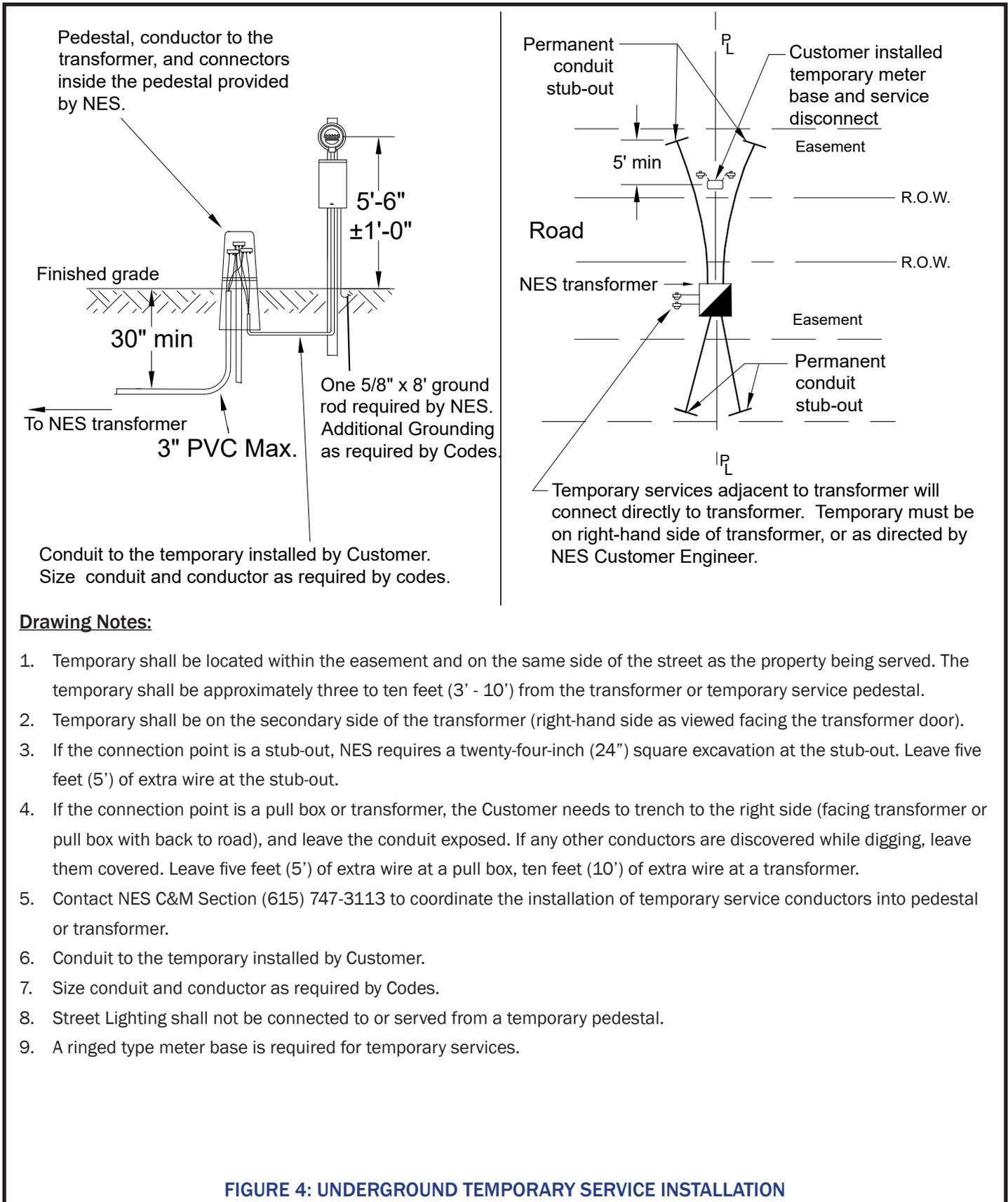
1. The service pole shall be of sufficient height to provide required conductor clearances of sixteen feet (16') over roads and driveways. For lines crossing land that will not be subject to traffic of any kind (including vehicles, trucks, and horseback riders), the absolute minimum clearance is twelve feet (12'). The service rack shall be attached at an elevation such that the lowest point of the conductor meets these clearances. See Figure 45.
2. Pole shall be located on the lot for which service is requested. Distance from NES pole or NES conductor to Customer's temporary pole shall be at least ten feet (10') and no more than one hundred and twenty-five feet (125'). If a distance greater than one hundred and twenty-five feet (125') is required, contact NES Customer Engineering for approval prior to construction. A taller, heavier class post with additional bracing might be required.
3. Pole shall be constructed of such material and installed at a sufficient depth to stabilize the temporary meter base. Conductor shall be shielded by riser conduit from base to weatherhead.
4. Service line shall not cross property belonging to others. If line will cross other's property, Customer shall obtain an easement for NES.
5. Customer shall clear a path through trees or brush that is wide enough to allow utility service personnel to run the line, and to allow lines to hang without contacting trees or limbs.
6. Where practical, pole should be set at least thirty feet (30') behind existing or proposed sidewalk or curb line to avoid conflicts with new poles and anchors. Otherwise, the temporary pole may require relocation at a later date.
7. Aluminum conductor is required for triplex service wire ("pigtail"). Conductor shall be shielded by riser.
8. Neutral shall be attached to service rack by wedge clamp.

FIGURE 3: OVERHEAD TEMPORARY SERVICE INSTALLATION



ELECTRIC SERVICE GUIDELINES

TEMPORARY SERVICE



Drawing Notes:

1. Temporary shall be located within the easement and on the same side of the street as the property being served. The temporary shall be approximately three to ten feet (3' - 10') from the transformer or temporary service pedestal.
2. Temporary shall be on the secondary side of the transformer (right-hand side as viewed facing the transformer door).
3. If the connection point is a stub-out, NES requires a twenty-four-inch (24") square excavation at the stub-out. Leave five feet (5') of extra wire at the stub-out.
4. If the connection point is a pull box or transformer, the Customer needs to trench to the right side (facing transformer or pull box with back to road), and leave the conduit exposed. If any other conductors are discovered while digging, leave them covered. Leave five feet (5') of extra wire at a pull box, ten feet (10') of extra wire at a transformer.
5. Contact NES C&M Section (615) 747-3113 to coordinate the installation of temporary service conductors into pedestal or transformer.
6. Conduit to the temporary installed by Customer.
7. Size conduit and conductor as required by Codes.
8. Street Lighting shall not be connected to or served from a temporary pedestal.
9. A ringed type meter base is required for temporary services.

FIGURE 4: UNDERGROUND TEMPORARY SERVICE INSTALLATION

ELECTRIC SERVICE GUIDELINES

RESIDENTIAL SERVICE



CHAPTER 3 - RESIDENTIAL SERVICE

SUMMARY OF REQUIRED STEPS

TABLE 4: SUMMARY OF REQUIRED STEPS FOR RESIDENTIAL SERVICE

OVERHEAD PRIMARY AND SECONDARY	FURNISH		INSTALL	
	CUSTOMER	UTILITY	CUSTOMER	UTILITY
Set up account, place order with NES	X		N/A	
Tree trimming	X		N/A	
Weatherhead/meter base (location determined by NES)	X		X	
Customer-owned pole or pedestal (if required)	X		X	
Conductor from meter base into building	X		X	
Codes release to NES	X		X	
Secondary conductors (transformer to meter)		X		X
Meter		X		X
OVERHEAD PRIMARY WITH UNDERGROUND SECONDARY	FURNISH		INSTALL	
	CUSTOMER	UTILITY	CUSTOMER	UTILITY
Set up account, place order with NES	X		N/A	
Tree trimming (if required)	X		N/A	
Secondary trenching and backfill	X		X	
Meter base (location determined by NES)	X		X	
Customer-owned pole or pedestal (if required)	X		X	
Secondary conduits	X		X	
Codes release to NES	X		X	
Secondary conductors to meter/ CT cabinet		X		X
Meter		X		X
UNDERGROUND PRIMARY AND SECONDARY	FURNISH		INSTALL	
	CUSTOMER	UTILITY	CUSTOMER	UTILITY
Set up account, place order with NES	X		N/A	
All trenching and backfill	X		N/A	
All conduits (1 and 3 phase)	X		X	
Transformer pad box (1 phase) or Transformer concrete pad (3 phase)	X	X	X	
Equipment bases (if required)		X	X	
Equipment protection (if required)	X		X	
Meter base (location determined by NES)	X		X	
Primary Conductors		X		X
Codes release to NES	X		X	
Secondary terminations in transformer		X		X
Current transformer (if required)	Cabinet	CT	Both	
Secondary/ service conductors (1 phase)		X		X
Secondary/ service conductors (3 phase)	X		X	

Note: If items supplied by NES are lost, stolen, or damaged, the Customer is responsible for replacement.



ELECTRIC SERVICE GUIDELINES

RESIDENTIAL SERVICE

APARTMENTS AND OTHER MULTI-UNIT DWELLINGS

Multi-unit dwellings should provide proposed meter locations or meter pedestals. Meter troughs are not allowed (see Meter section for more details).

A multi-unit residential-Horizontal Property Regime (HPR) is one containing two or more residential dwelling units on one lot. It may also contain a house meter for common equipment or parking lot lighting.

! All multi-unit residential-Horizontal Property Regimes (HPR) are required to have an underground service lateral to the lot. If more than two units exist, the metering shall be an underground NES-approved, Customer-provided, gang meter center. The metering is to be located outside. Contact NES regarding meter specifications and approval of the metering location before starting installation of the service.

High-rise apartments in the downtown area planning to use 400 amp 125/216V single-phase services shall get prior approval from NES Meter Department.

All three-phase services to multi-tenant apartments, condos and other mixed-use dwellings are treated as “commercial” for the purposes of this handbook, regardless of how they are classified for billing, zoning, etc.

! NES needs information for the entire project, not just the first phase, especially if there will be three-phase equipment.

MANUFACTURED AND MODULAR HOMES

Modular homes are defined as a house that comes in several pieces which are put together at the home site on a permanent foundation. The meter base may only be installed directly on a modular home if the home’s manufacturer has certified that the building is rated for such an installation.

Manufactured homes (one piece, formerly referred to as “mobile homes” or “trailers”), shall install a Customer-owned pole or pedestal for mounting the meter base. The maximum distance from the building to the pole is thirty feet (30’) per NEC 550.32. The meter base may only be installed directly on a manufactured home if the tongue is removed and the home’s manufacturer has certified that the building is rated for such an installation.

ELECTRIC SERVICE GUIDELINES

RESIDENTIAL SERVICE



STEP 1: SET UP ACCOUNT AND REQUEST SERVICE

NES will not begin the engineering work or construction for a project until the Customer has established a billing account and paid any required deposits. Contractors or developers building new subdivisions or multi-dwelling units are required to pay a one-time deposit. Individuals can discuss whether a deposit will be necessary, and if so the amount, with a Customer Relations Representative.

Once an account is established, contact Customer Relations to place an order. The Customer will need to be ready to supply information about the types and sizes of electrical equipment going into each building, the number of lots, apartments, square footage, etc. Customer Relations will process the information. An Energy Services Account Manager may contact the Customer to discuss contract terms, and may schedule a site visit for NES Customer Engineering, who will be responsible for the electrical layout. The Customer will need to provide all easements for NES equipment such as poles, anchors, pad-mounted equipment, etc.

NES recommends making decisions about street lights at this step. It is much more cost effective. For underground service, the street lighting conduit can be installed while the trenches are already opened. For overhead service, NES can allow extra pole height for street light attachments. Only the approved brands and fixtures shown in the **NES Lighting Guidelines** can be maintained by NES.

! Customers who obtain a Codes release before completing Step 1 will encounter delays. NES work is prioritized based on the date an application is made with NES, not on the Codes release date.

STEP 2: DESIGN DISTRIBUTION SYSTEM

The NES Energy Services Account Manager will give the application information to NES Customer Engineering. NES Customer Engineering will design the electrical layout for the residence, including the location of the meter base.



ELECTRIC SERVICE GUIDELINES

RESIDENTIAL SERVICE

STEP 3: INSTALL METER BASE AND OTHER SERVICE EQUIPMENT

! Do not install the meter base until Customer Engineering has indicated the proper location. The placement of a meter can have a tremendous effect on the cost of the service, and in some cases can make it practically impossible to provide service, necessitating the expense of relocating the meter base. It is much less expensive to wait until the Engineer identifies the location of the meter base.

For approved meter bases refer to www.nespower.com under the Builders & Developers page.

The meter base shall be located so it will be accessible to NES personnel. Any exceptions to the requirements shall be in writing, and include the NES employee's signature.

Meter Base:

- **Location shall be approved by NES Customer Engineering**
- Shall be located on a permanent structure that is controlled by the Customer.
- Shall be located on the side of the building that is closest to normal public access.
- Cannot be mounted in exit stair breezeways (per Metro Fire Marshall).
- Shall be surface mounted (flush-mounted or recessed meter installations are not acceptable).
- Should not be located in an area that is subject to being fenced, such as patios, decks, porches, backyards.
- Should not be located in areas which are susceptible to subsequent enclosure by walls or screens.
- Overhead service shall be located to prevent service wire from crossing a driveway if possible. If a crossing is unavoidable, the point of attachment shall be high enough for the lowest point of the line to be at least sixteen feet (16') above the driveway. Exception: See Figure 56.
- Underground service shall be located so the conductor does not go under any permanent fixture or building, and is in a straight line. One sweeping bend with a fifteen-foot (15') minimum radius is allowed.
- **Meter locations that do not meet NES clearance and access requirements shall be placed on a NES approved meter pedestal.**
- **If a meter(s) is enclosed or otherwise made inaccessible after installation, without written approval from the NES Meter Department, the Customer will bear the cost for having the metering facilities moved to an accessible location. Contact NES Meter Department with any questions prior to construction.**

! All meter bases with underground feeds SHALL BE located within 5 FEET of the nearest building corner on the side from which it is fed when there is less than 10 FEET of clearance to the next adjacent building or property line.

ELECTRIC SERVICE GUIDELINES

RESIDENTIAL SERVICE



STEP 4 (OH): SITE PREPARATION FOR OVERHEAD SERVICE

Step 4A (OH): Prepare Path from the Existing NES Pole to Customer's Service Mast

The Customer is responsible for trimming and/or removing any tree growing within fifteen feet (15') of any future primary power lines from "ground to sky", and any limbs growing within three feet (3') of the service or secondary power lines.

Vegetation clearance requirements may be in excess of electrical clearances obtained by NES during trimming cycle. Additional clearance provides safe access for NES Operations to build overhead facilities. Consult with NES area arborist on questions regarding minimum electrical clearances and compatible vegetation.

Contact NES Vegetation Hotline at (615) 695-7400.

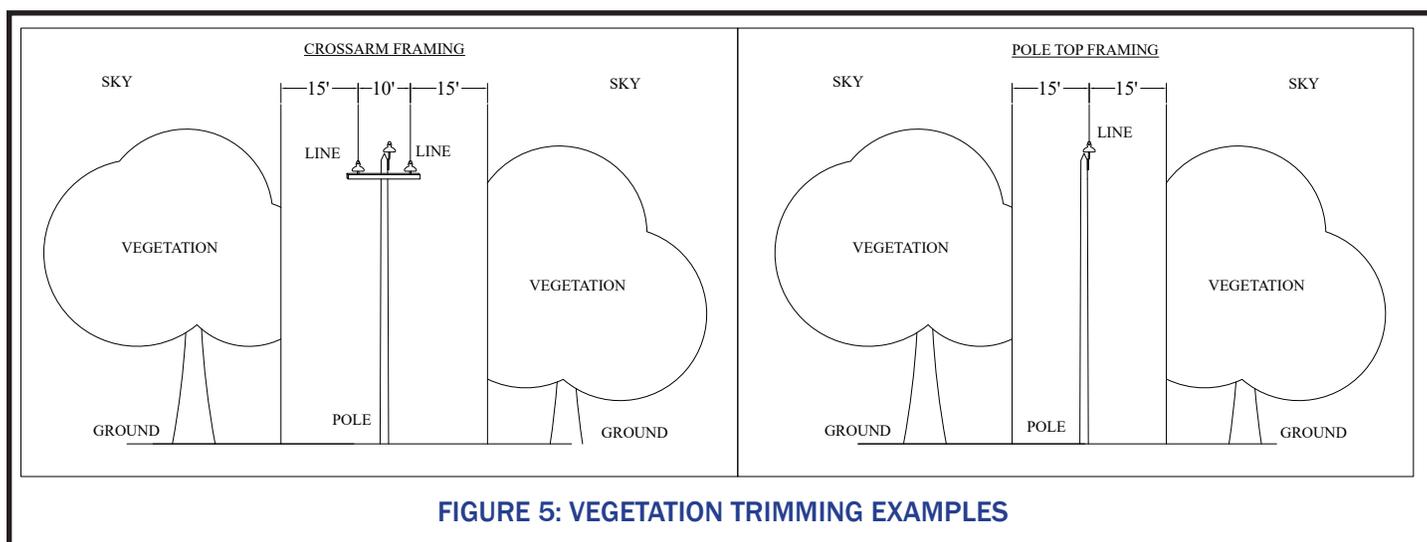


FIGURE 5: VEGETATION TRIMMING EXAMPLES

Step 4B (OH): Install Service Mast

Refer to Figure 6.

When determining the height of the weatherhead, keep in mind that the service conductor can have final sag of up to five feet (5'). There is a Clearance section provided in the Appendix to help the Customer understand some of the factors NES Engineers must consider when designing an electrical layout. The Clearance section may also assist development engineers in locating sidewalks, swimming pools, fire hydrants etc.

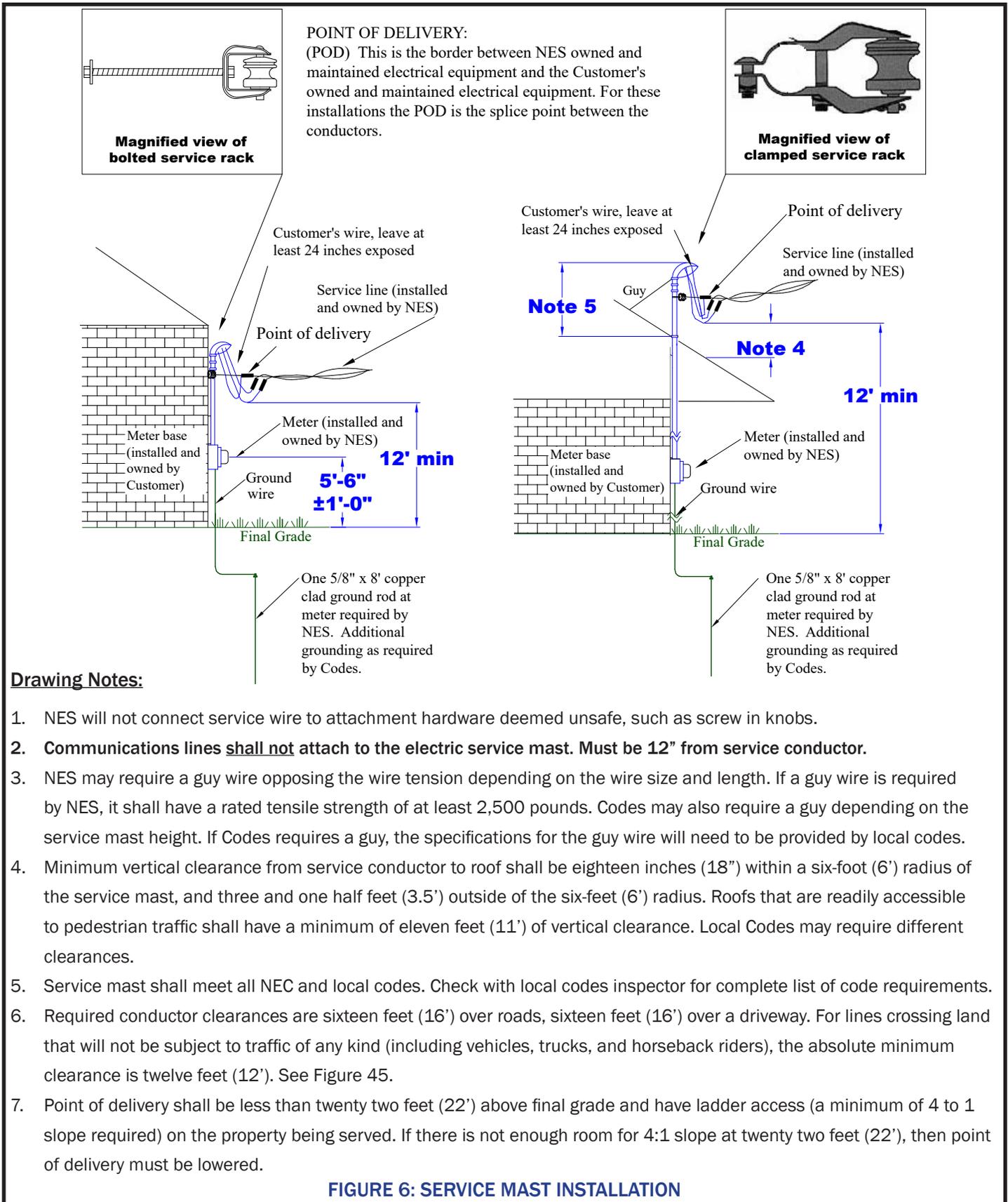
Contact the local Codes Inspector with code related questions. (See Table 2: Useful Contacts).

Service mast shall meet all NEC and local Codes. Check with local Codes Inspector for a complete list of Codes requirements.



ELECTRIC SERVICE GUIDELINES

RESIDENTIAL SERVICE



ELECTRIC SERVICE GUIDELINES

RESIDENTIAL SERVICE



STEP 4 (UG): SITE PREPARATION FOR UNDERGROUND SERVICE

! Do not begin any construction related to NES electric service until the Pre-Construction Meeting has been held.

Step 4A (UG): Receive Underground Layout

Once the job has been processed, Customer Engineering will provide a copy to the Customer, along with the name and phone number of the operations supervisor responsible for working the job. The Engineer will usually schedule a formal “Pre-Construction Meeting” to distribute this information, but may waive the meeting in some instances. For example, the second or third phase of a subdivision when there weren’t any miscommunications on the first phase, or underground service served from a pole-type transformer.

The purpose of a Pre-Construction Meeting is for the NES engineer to review the requirements in this handbook with the Customer, the NES Energy Services Account Manager, and the NES Operations Supervisor who will be inspecting the Customer’s work for compliance (the “NES ditch inspector”). Depending on the complexity of the job other people may be involved such as NES Metering, the Customer’s electrician, general contractor or subcontractors, other utilities, etc. NES Customer Engineering will have a checklist of issues called the Pre-Construction Meeting Information Sheet. Any exceptions to the requirements in this handbook shall be noted on the Pre-Construction Meeting Information Sheet and initialed by the Customer and an NES employee. The Customer will receive a copy of the Pre-Construction Meeting Information Sheet at the end of the meeting, along with construction drawings.

The Customer should keep the copy of the Pre-Construction Meeting Information Sheet until the project has been completed and energized. This way any discrepancies can be easily resolved.

NES supplies fiberglass pad boxes, and bases for equipment such as primary terminating cabinets if the job requires them. If items supplied by NES are stolen, damaged or lost, the Customer shall replace supplies at Customer’s expense.

Step 4B (UG): Dig Trenches

! The NES ditch inspector will not make an inspection until they have received the layout (a drawing) from the NES Engineer. A drawing cannot be made until an order is placed, and all fees have been paid. Following this sequence of steps will ensure your work is handled in a timely manner.

! Customer shall provide room for riser pole on the property that will be served. Pole shall have all proper NESC clearances from other objects on Customer’s property. Pole should be located roadside if at all possible.

! Customer should not begin digging trenches until NES poles have been set. If any digging must be done prior to NES poles being set, digging should stay at least fifteen feet (15’) away from NES stakes. Failure to do so may delay NES installations.



ELECTRIC SERVICE GUIDELINES

RESIDENTIAL SERVICE

General Trench Requirements

- Trenches shall be free of large or sharp rocks and construction debris.
- Trenches shall meet all Occupational Safety and Health Administration (OSHA) standards.
- Excavated materials shall be kept at least two feet (2') from the edge of the trench.
- Trenches should be in a straight line. (One sweeping bend with a fifteen-foot (15') minimum radius may be allowed.)
- Trenches shall not be located under any planned permanent structures (buildings, condensers, retaining walls, entrance walls, etc).
- There shall be at least twelve inches (12") clearance vertically and horizontally between NES and other utilities' conduits. (Note: If the Customer is building in the Harpeth Valley Utility District or the Hendersonville Utility District, five feet (5') of clearance is required between NES and the water/waste water utilities.)
- The Customer provides all conduit, elbows and items necessary to facilitate the conduit installation. The Customer is responsible for the installation of the conduit system in accordance with NES specifications.

Primary Trenches

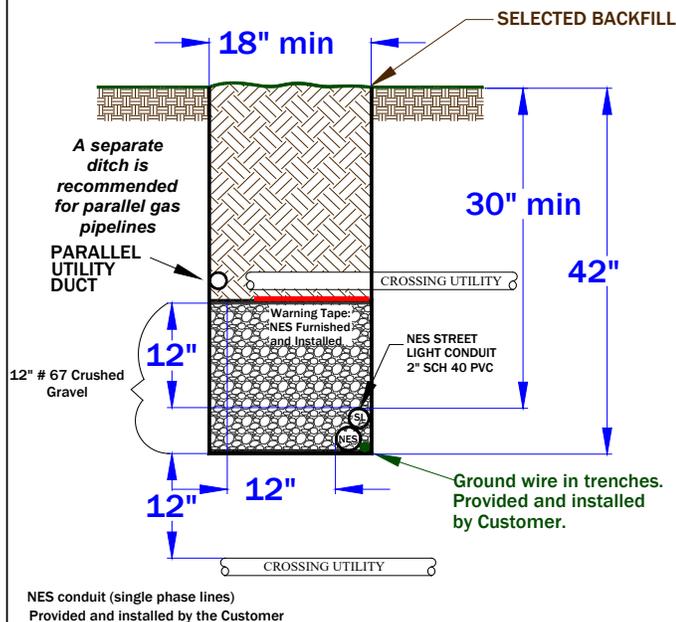
- Detailed drawings will be distributed at the Pre-Construction Meeting and will show the locations of all electrical equipment and trenches.
- The embedment and/or backfill material for switch pads, pull-boxes, fiberglass box pads for terminating cabinets and transformers, and conduits crossing under roads and other traffic areas is #67 gravel.
- The gravel under equipment shall be filled down to undisturbed soil as well as be below the frost line.
- Where conduits cross under roads or other traffic areas, use only #67 gravel backfill in trenches. Selected backfill is not allowed in these areas.
- Install ground wire, pull boxes, fiberglass pads for terminating cabinets & transformers (pull boxes and fiberglass pads will be provided by NES).
- The Customer will provide any manholes in accordance with NES specifications. The NES engineer will provide the specifications on/or before the pre-construction meeting date.
- For more details on primary trench see Figure 7.
- The Customer is responsible for all easements, and arranging any road or private property crossings.

Secondary/Service Trenches

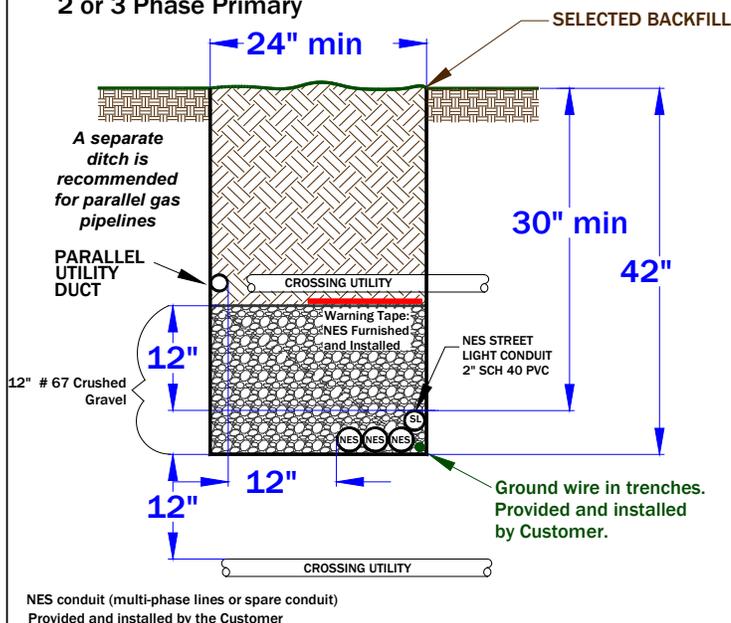
- Trench dimensions shall be at least twenty-four inches (24") wide and at least forty-two inches (42") deep. If NES is the only utility, and the conduit is installed such that the written schedule of the conduit is visible, the dimensions may be reduced to six inches (6") wide by thirty-six inches (36") deep, enabling Customer to use a trencher
- FOR SUBDIVISIONS ONLY: Dig trenches from pad-mounted transformers to five feet (5') inside each property line, as shown on detailed drawings provided during the Pre-Construction Meeting (example of trenching detail shown on Figure 16).



Residential Customer Ditch Detail for Primary Lines (1) 2-1/2" Diameter Schedule 40 PVC Conduit Single (1) Phase Primary



Residential Subdivision Ditch Detail For Primary Lines (1) 4", (1) 3" or (2 to 3) 2-1/2" diameter conduits Schedule 40 PVC 2 or 3 Phase Primary



Drawing Notes:

1. The Customer is responsible for providing all conduits, elbows and appurtenances (including Manholes and Duct Banks) necessary for their proper installation.
2. The NES construction drawing(s) will show the actual number and diameter of conduits required for the project. The NES Engineer will provide the Customer these drawings at the Pre-Construction Meeting.
3. There shall be a minimum of twelve inches (12") clearance in all directions between NES conduits and any other utility's conduits.
4. The Customer is responsible for stabilization of the soil during and after construction.
5. Refer to Table 6 for detailed conduit requirements. Refer to Table 5 for more specific backfilling instructions.
6. NES's street lighting conduit may be positioned anywhere above or adjacent to NES's primary cable. It can not be below NES's primary

INSTALLATION MUST BE INSPECTED BY NES

REFER TO FIGURE 69 - DITCH INSPECTION PROCESS

FIGURE 7: RESIDENTIAL PRIMARY TRENCH REQUIREMENTS



ELECTRIC SERVICE GUIDELINES

RESIDENTIAL SERVICE

Trench Backfill Requirements

Backfill requirements for Residential Installations:

TABLE 5: TRENCH BACKFILL REQUIREMENTS (RESIDENTIAL)		
BACKFILL REQUIRED	CATEGORY	EXAMPLE LOCATIONS
#67 Gravel backfill	Residential Installations 4" and smaller conduit feeds (primary or secondary)	Single family homes Subdivisions Duplexes Townhomes Pools, Clubhouses Recreation, Common use areas Pumping Stations
#67 Gravel backfill	Residential (Point to point) 4" and smaller conduit feeds (primary or secondary)	Riser to switch Riser to pull box or pedestal Switch to switch Switch to TC Road crossings & traffic areas
"Red Dye" Concrete Encased	Other	Any other residential service utilizing 5" and larger conduit feed

- Final decision for all backfill requirements are at the discretion of the NES supervisor and may vary by installation.
- Services in residential areas requiring 5" and larger conduits shall be concrete encased regardless of application or specific use case.
- See Appendix for ditch inspection process flowchart.

Step 4C (UG): Install Conduit and Equipment Bases

TABLE 6: CONDUIT ELBOW RADIUS REQUIREMENTS (RESIDENTIAL)		
CONDUCTOR BEING PULLED	CONDUIT DIAMETER	ELBOW RADIUS <i>(unless otherwise specified at Pre-Construction meeting)</i>
Secondary/Service	(1 or 2) - 3"	24"
Single-Phase Primary (23.9kV)	(1 or 2) - 2 1/2"	24"
Single-Phase Primary (13.8kV)	(1 or 2) - 3"	24"
Three-Phase Primary	(3) - 2 1/2" or (1) - 4", 5", or 6"	24" OR 36" AS REQUIRED
Street Lights	(1) - 2"	24"

ELECTRIC SERVICE GUIDELINES

RESIDENTIAL SERVICE



General Conduit Requirements

- New developments with limited space may require (at the discretion of NES Engineering) an as-built underground conduit and pad-mounted equipment survey to be performed by the developer to ensure all electric facilities are placed in appropriate locations. This survey is to ensure Fire Protection clearances and working spaces are met prior to energizing equipment.
- Conduit should be in a straight line run between elbows. (ONE sweeping bend of a fifteen-foot (15') minimum radius between elbows is allowed.)
- Conduit shall be laid in the trench so the print indicating the conduit size is visible.
- Do not run the conduit under any permanent structure such as a building, condenser, etc.
- The conduit should be encased in concrete where it crosses under drainage ditches or small creeks. This will be discussed at the Pre-Construction Meeting.
- Conduit shall have at least five feet (5') of horizontal clearance from the edge of a swimming pool.

Conduit requirements at the riser pole

- Install ten-foot (10') length of conduit up the pole above grade level. Conduit and elbow shall be rigid galvanized steel.
- A 24" or 36" radius rigid galvanized elbow is required.
- Cap the end of spare riser pole conduit(s).
- There shall be a seven and one-half inch (7 ½") space between pole and conduit.

Secondary Riser pole to meter base (Figure 8 and 9) or riser pole to pull box (Figure 10)

- The conduit shall be a minimum schedule 40 PVC (special circumstances may warrant the use of concrete encasement or rigid galvanized steel).
- Rigid galvanized steel is required for the elbow at the meter base.
- Schedule 80 PVC or rigid galvanized steel is required up to meter base.
- For services greater than 400 amps, install a second conduit run as a spare for additional conductor that may be needed for repairs, or if service is upgraded. The spare conduit should be capped on the riser. Spare conduit should include pull tape (Neptco Muletape WP250P or equivalent). The pull tape should be glued to the conduit cap.
- Meter Base installation is not required for ditch inspection.



ELECTRIC SERVICE GUIDELINES

RESIDENTIAL SERVICE

Primary Riser pole to pad-mounted transformer (Figure 11)

- The first ten-foot length out of the riser elbow, and last ten-foot (10') length before the pad-mounted transformer elbow, shall be rigid galvanized steel.
- The elbow at the pad-mounted transformer shall be rigid galvanized steel.
- Stop ditch 15' short of riser pole stake until pole is set.
- Install the fiberglass pad for mounting the transformer (Figure 12), and any additional equipment bases (Figures 57, 58, 59, and 60).
- Neptco Muletape catalog number WP1250P or equivalent 1/2" pull tape shall be installed in both primary and secondary conduits. The tape's breaking strength shall be at least 1250 lb.
- If crossing under a drainage ditch or small creek, include a concrete encasement as discussed at the Pre-Construction Meeting.
- There shall be at least five feet (5') between the conduit and a swimming pool enclosure.

Pad-mount transformer to meter base (Figures 13 and 14)

- The conduit from the meter to the elbow shall be schedule 80 PVC or rigid galvanized steel
- The elbows shall be rigid galvanized steel.
- Schedule 40 PVC may be allowed between elbows (special circumstances may warrant the use of concrete encasement or rigid galvanized steel).
- For services greater than 400 amps see Figure 14.

! If conduit must be relocated because Customer did not follow these requirements, it will be done at the Customer's expense.

- Metering equipment shall not be mounted on the transformer.

Point of Delivery (POD)

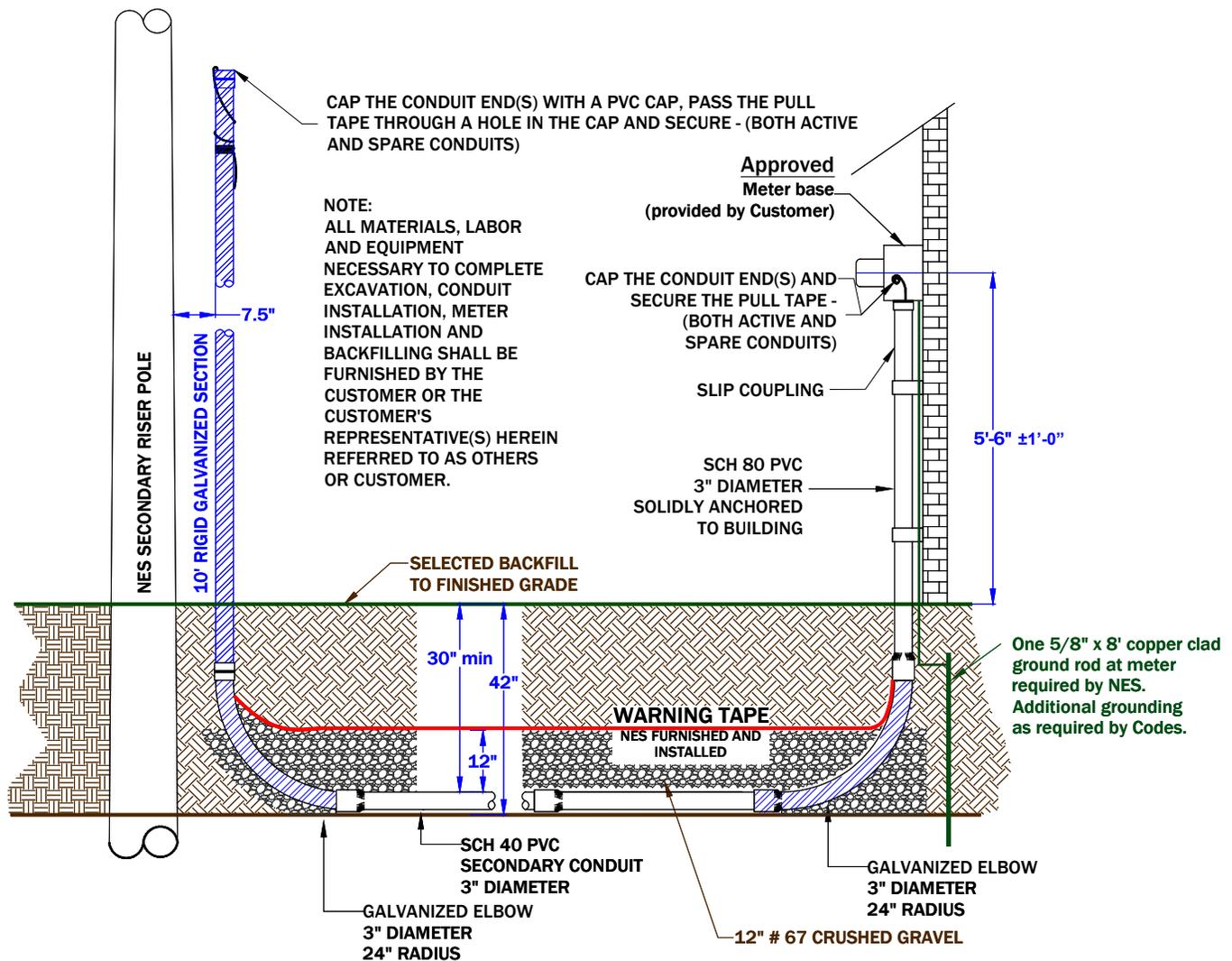
- Residential underground POD is the border between NES-owned and maintained electrical equipment and the Customer-owned and maintained electrical equipment. The following table describes the location of the POD by service feed type.

TABLE 7: POINT OF DELIVERY (RESIDENTIAL)		
RESIDENTIAL SERVICE FEED	FIGURE #	POD
Secondary Riser	8, 9	Meter Base Terminals
Padmount Transformer	11, 13, 14	Meter Base Terminals
Secondary Pull-Box (SPB)	10, 59	Meter Base Terminals
Secondary Termination Enclosure	32, 33	Meter Base Terminals
Secondary Pedestal (SPT)	60	Meter Base Terminals



INSTALLATION MUST BE INSPECTED BY NES

REFER TO FIGURE 69 - DITCH INSPECTION PROCESS



Drawing Notes:

1. Three inch (3") conduit and twenty-four inch (24") radius elbows are to be used unless otherwise specified.
2. Ditch length limited to one hundred and eighty feet (180').
3. The conduit shall be laid so the size imprint is visible.
4. The Customer is responsible for soil stabilization during and after construction.
5. For individual residences, if NES is the only utility, and the conduit is installed such that the written schedule of the conduit is visible, the dimensions may be reduced to six inches (6") wide by thirty-six inches (36") deep, enabling Customer to use a trencher.
6. **Customer shall provide and install lugs for meter base.**
7. Conduit(s) shall have a pull string.
8. Customer shall provide slip coupling at the meter base junction to reduce the effects of settling.
9. Meter base installation is not required for ditch inspection.

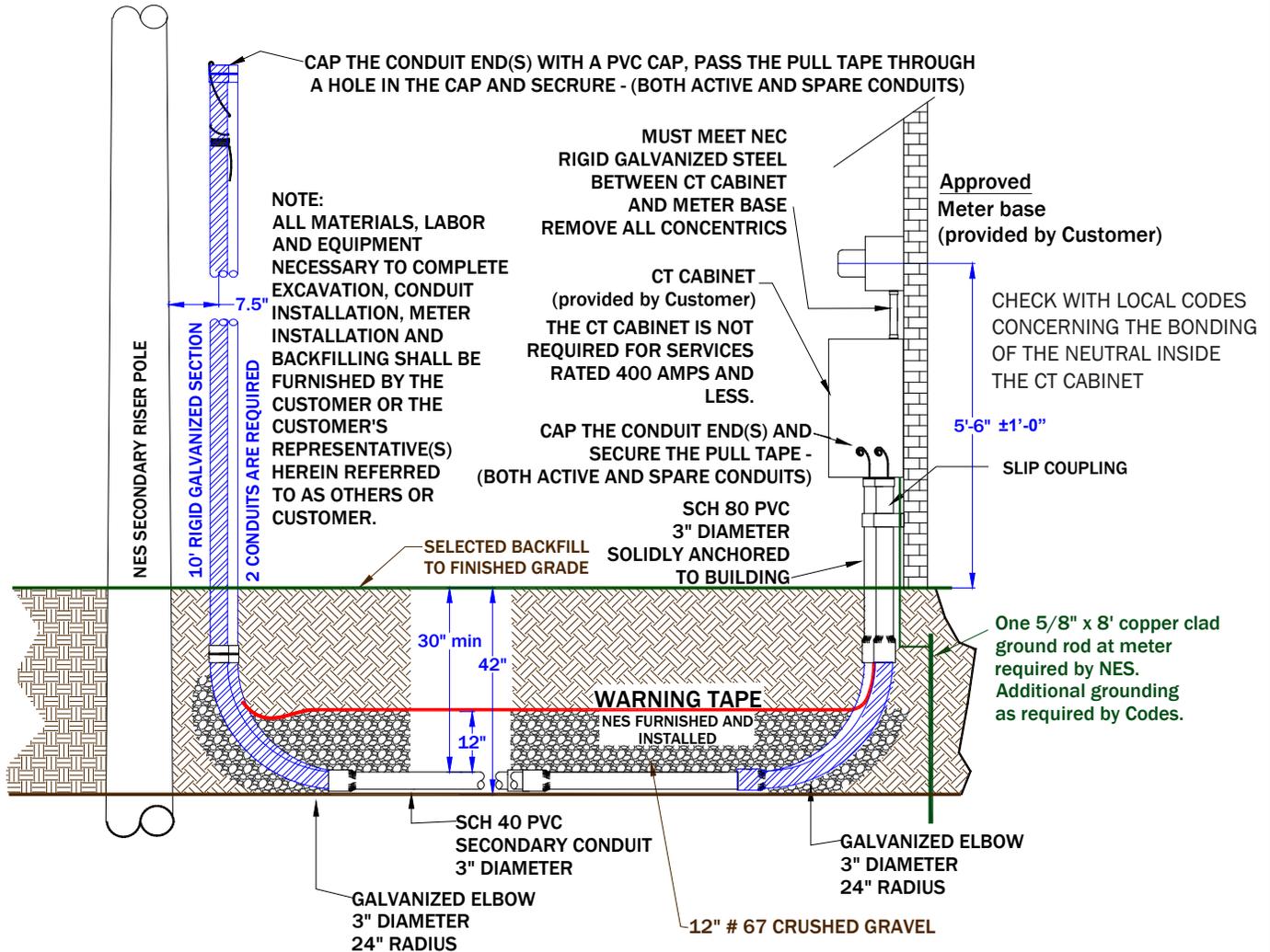
**FIGURE 8: UNDERGROUND RESIDENTIAL SERVICE FROM SECONDARY RISER POLE
(SERVICES UP TO AND INCLUDING 400 AMP)**



ELECTRIC SERVICE GUIDELINES

RESIDENTIAL SERVICE

INSTALLATION MUST BE INSPECTED BY NES
REFER TO FIGURE 69 - DITCH INSPECTION PROCESS



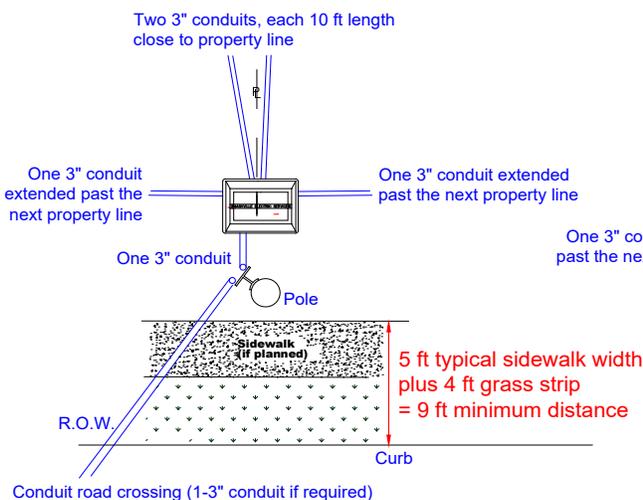
Drawing Notes:

1. Three inch (3") conduit and twenty-four inch (24") radius elbows are to be used unless otherwise specified.
2. The conduit shall be laid so the size imprint is visible.
3. Contact NES Meter Department at (615) 747-3805 to pick up the current transformers (CT's).
4. The Customer is responsible for soil stabilization during and after construction.
5. For individual residences, if NES is the only utility, and the conduit is installed such that the written schedule of the conduit is visible, the dimensions may be reduced to six inches (6") wide by thirty-six inches (36") deep, enabling Customer to use a trencher.
6. Spare conduit should include pull tape. In spare conduit pull tape should be glued to the riser conduit cap.
7. Customer provides pull string in conduits.
8. Customer shall provide slip coupling at the cabinet junction to reduce the effects of settling.
9. Meter base installation is not required for ditch inspection.

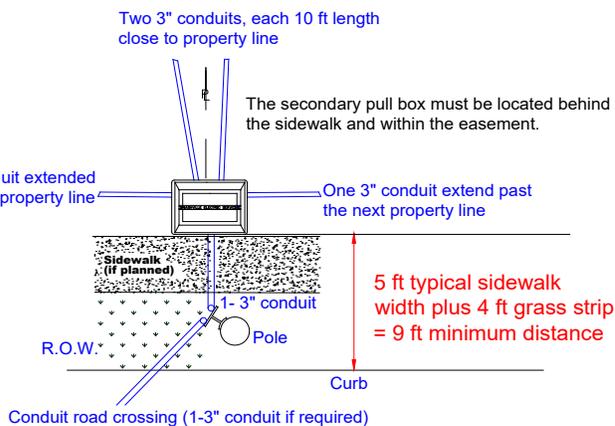
**FIGURE 9: UNDERGROUND RESIDENTIAL SERVICE FROM SECONDARY RISER POLE
(SERVICES GREATER THAN 400 AMP TO 800 AMP MAX)**

ELECTRIC SERVICE GUIDELINES

RESIDENTIAL SERVICE



Top View, Pole Behind Sidewalk

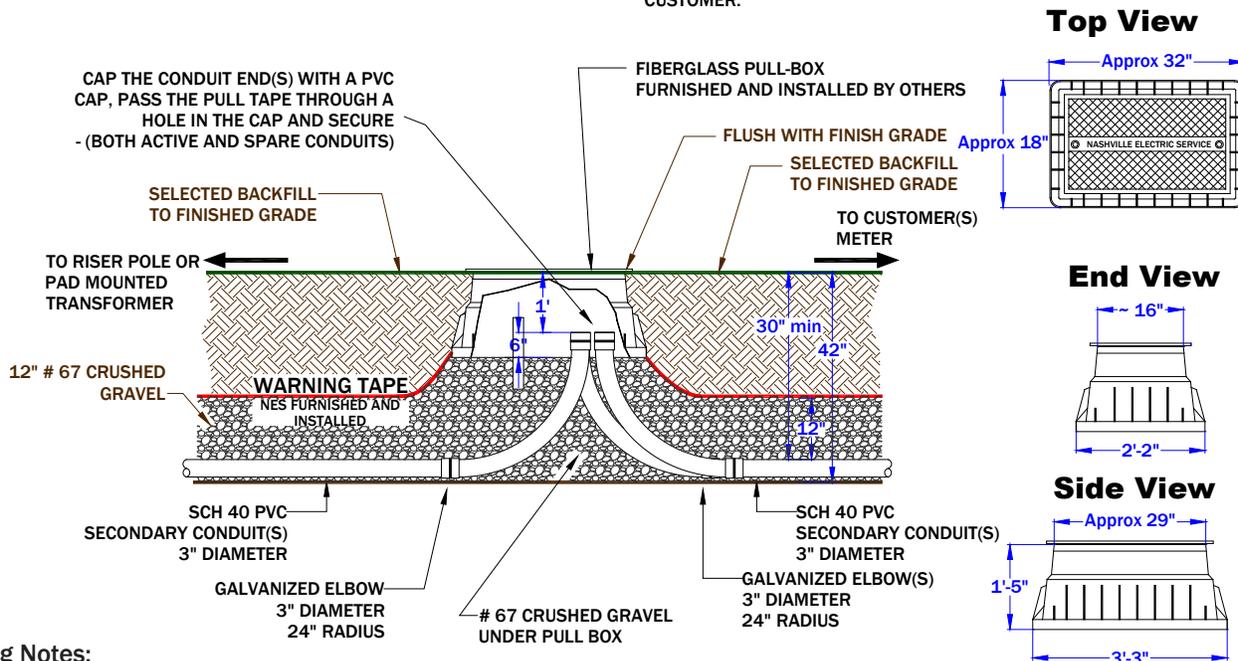


Top View, Pole In Grass Strip

**INSTALLATION MUST BE
INSPECTED BY NES**

**REFER TO FIGURE 69 - DITCH
INSPECTION PROCESS**

NOTE:
ALL MATERIALS, LABOR AND EQUIPMENT NECESSARY TO COMPLETE EXCAVATION, CONDUIT INSTALLATION, AND BACKFILLING SHALL BE FURNISHED BY THE CUSTOMER OR THE CUSTOMER'S REPRESENTATIVE(S) HEREIN REFERRED TO AS OTHERS OR CUSTOMER.



Top View

End View

Side View

Drawing Notes:

1. Three inch (3") conduit laid with imprint visible and twenty-four inch (24") radius elbows to be used unless otherwise specified during the Pre-Construction Meeting. Maximum five conduits-one source, four feed.
2. Final grade shall be within one inch (1") of the top of the fiberglass pull box.
3. Spare conduit should include pull tape. In spare conduit pull tape should be glued to the spare conduit cap.
4. All conduit(s) and terminations shall be grouped on one end of pull box.
5. Pull Box provided by NES and installed by Customer.

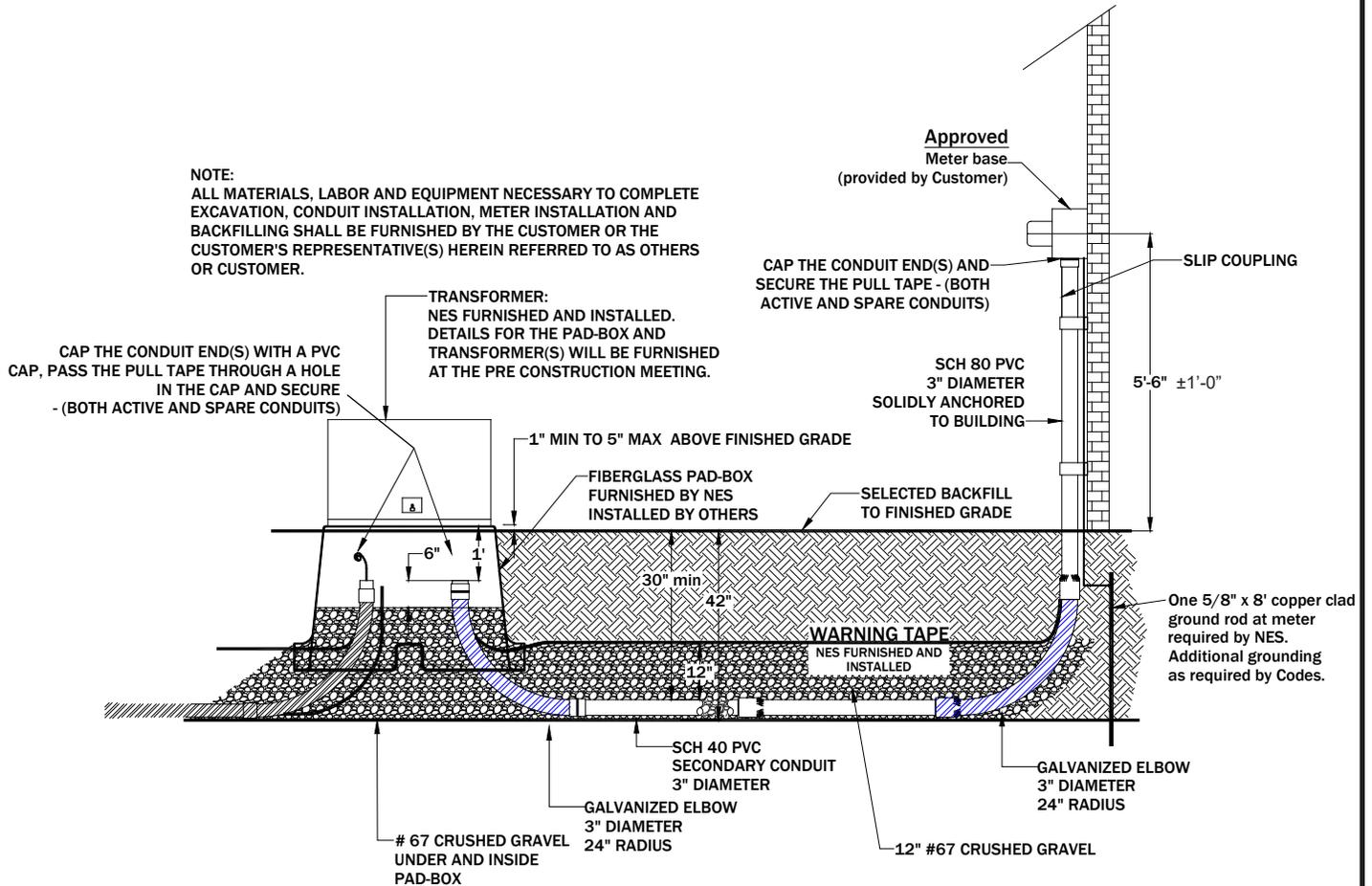
**FIGURE 10: UNDERGROUND RESIDENTIAL SERVICE FROM SECONDARY RISER POLE TO
SECONDARY PULL BOX**



ELECTRIC SERVICE GUIDELINES

RESIDENTIAL SERVICE

INSTALLATION MUST BE INSPECTED BY NES
REFER TO FIGURE 69 - DITCH INSPECTION PROCESS



Drawing Notes:

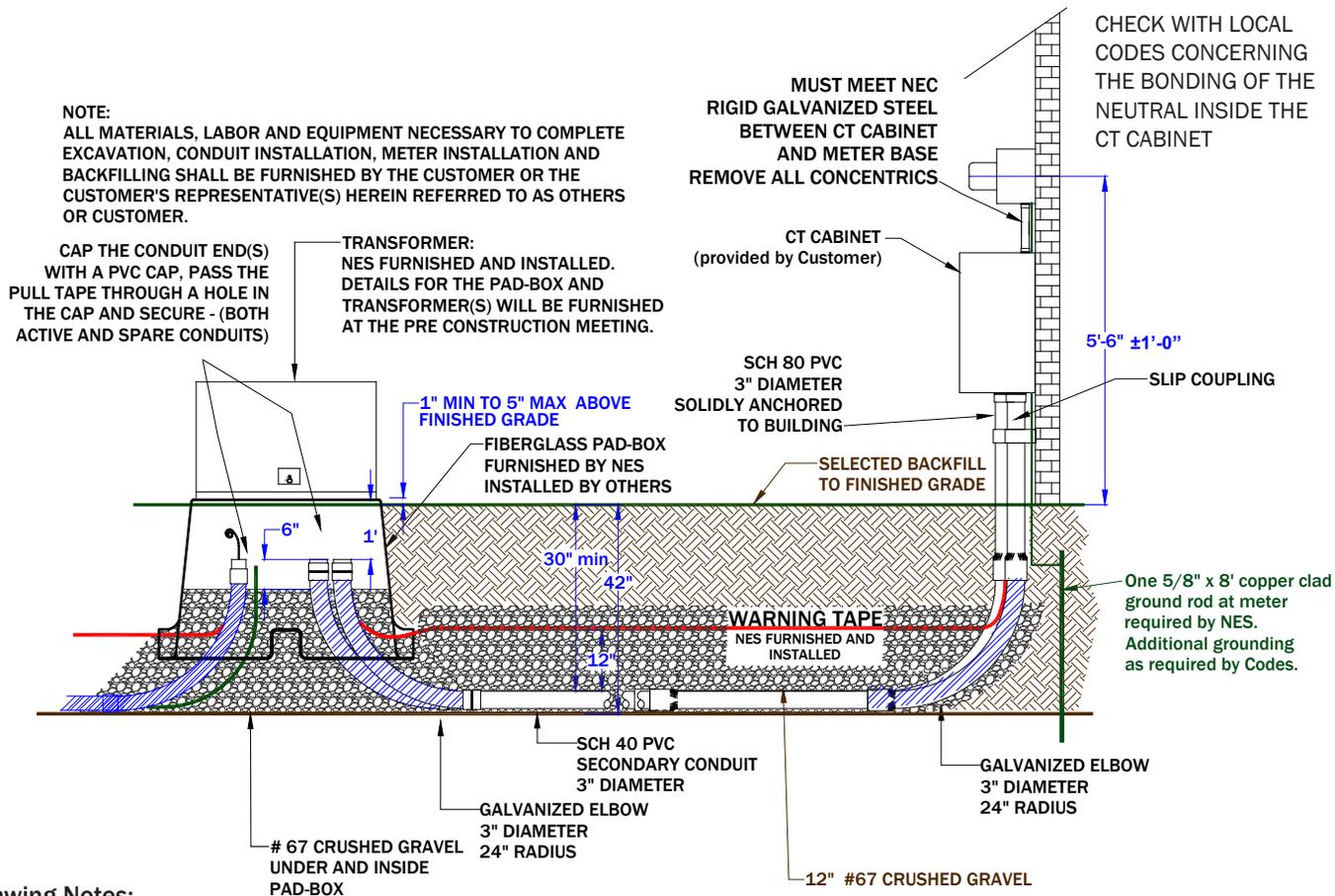
- The maximum number of secondary conduits for each pad-mounted transformer are as follows:
 - Transformers 25-50kVA - (6) three-inch (3") Permanent Service Conduits
 - Transformers 75kVA and larger - (8) three-inch (3") Permanent Service Conduits
 - In addition to conduits listed above, all installations may include: (1) three-inch (3") Temporary Service Conduit and (1) two-inch (2") street light service conduit.
- A minimum of six feet (6') of clearance is required in front of the fiberglass transformer pad. A minimum of three feet (3') is required from the fiberglass pad on the other three sides. This includes signs, structures and the outermost branches of mature plants used for landscaping. Grade of the clearance area around NES equipment shall be level.
- Barrier wall to be installed when distance from pad to non-fireproof building is less than allowed by National Fire Prevention Association codes (refer to Figure 54).
- The Customer is responsible for soil stabilization during and after construction.
- For individual residences, if NES is the only utility, and the conduit is installed such that the written schedule of the conduit is visible, the dimensions may be reduced to six inches (6") wide by thirty-six inches (36") deep, enabling Customer to use a trencher.
- See Figure 51 for specific transformer installation, knuckle boom truck clearance requirements.
- Customer shall provide slip coupling at meter base junction to reduce the effects of settling.

**FIGURE 13: UNDERGROUND RESIDENTIAL SERVICE FROM A PAD-MOUNTED TRANSFORMER
(SERVICES UP TO AND INCLUDING 400 AMP)**



INSTALLATION MUST BE INSPECTED BY NES

REFER TO FIGURE 69 - DITCH INSPECTION PROCESS



Drawing Notes:

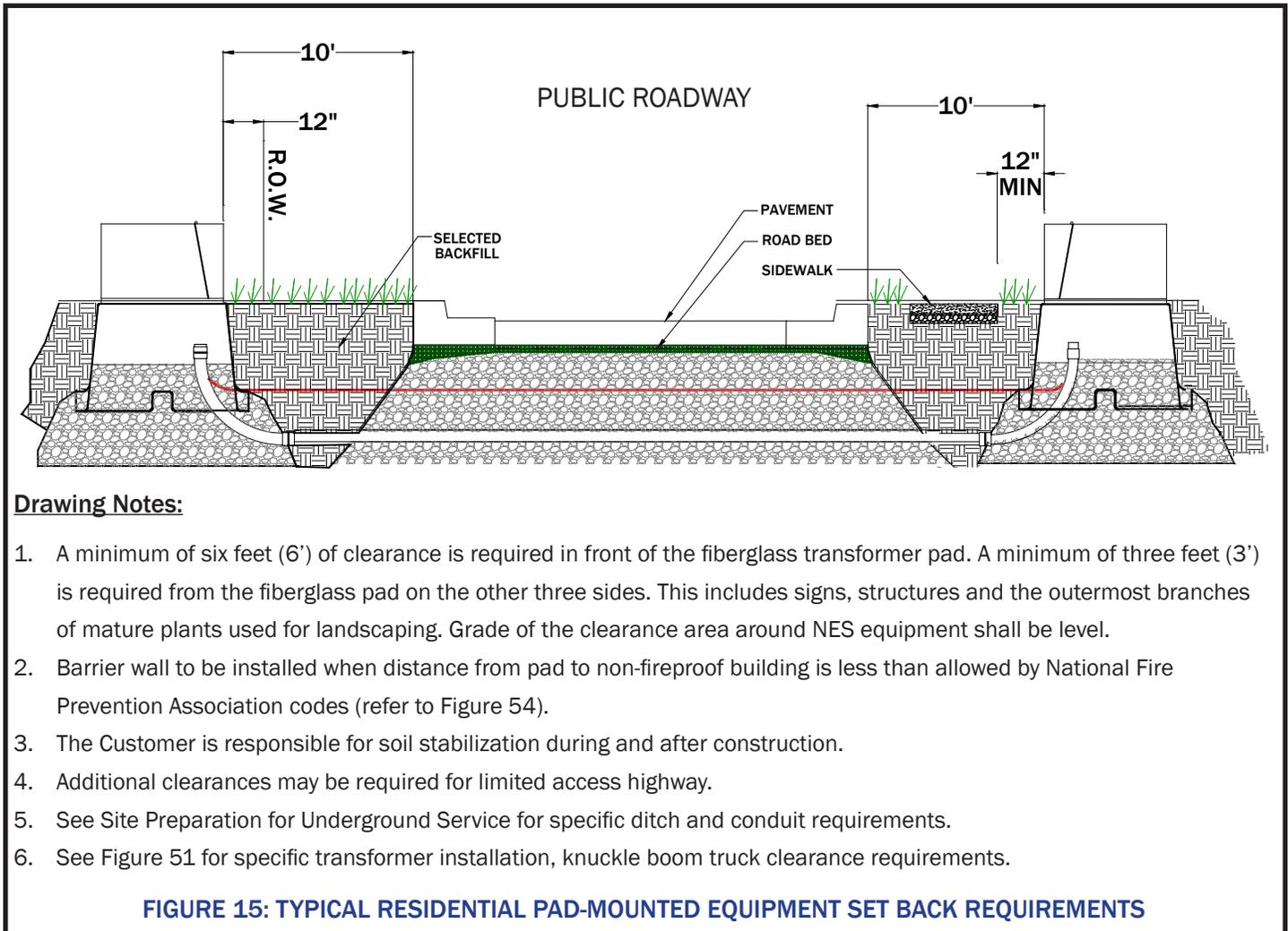
- At least (2) three-inch (3") Permanent Service Conduits must be provided for services greater than 400A. The maximum number of secondary conduits for each pad-mounted transformer are as follows:
 - Transformers 25-50kVA - (6) three-inch (3") Permanent Service Conduits
 - Transformers 75kVA and larger - (8) three-inch (3") Permanent Service Conduits
 - In addition to conduits listed above, all installations may include: (1) three-inch (3") Temporary Service Conduit and (1) two-inch (2") street light service conduit.
- A minimum of six feet (6') of clearance is required in front of the fiberglass transformer pad. A minimum of three feet (3') is required from the fiberglass pad on the other three sides. This includes signs, structures and the outermost branches of mature plants used for landscaping. Grade of the clearance area around NES equipment shall be level.
- Barrier wall to be installed when distance from pad to non-fireproof building is less than allowed by National Fire Prevention Association codes (refer to Figure 54).
- The Customer is responsible for soil stabilization during and after construction.
- Pull tape is also required in spare conduits. In spare conduit, pull tape should be glued to the conduit cap.
- Check with local codes concerning the bonding of the neutral inside the CT Cabinet.
- See Figure 51 for specific transformer installation, knuckle boom truck clearance requirements.
- Customer shall provide slip coupling at cabinet junction to reduce the effects of settling.

**FIGURE 14: UNDERGROUND RESIDENTIAL SERVICE FROM PAD-MOUNTED TRANSFORMER
(SERVICES GREATER THAN 400 AMP)**



ELECTRIC SERVICE GUIDELINES

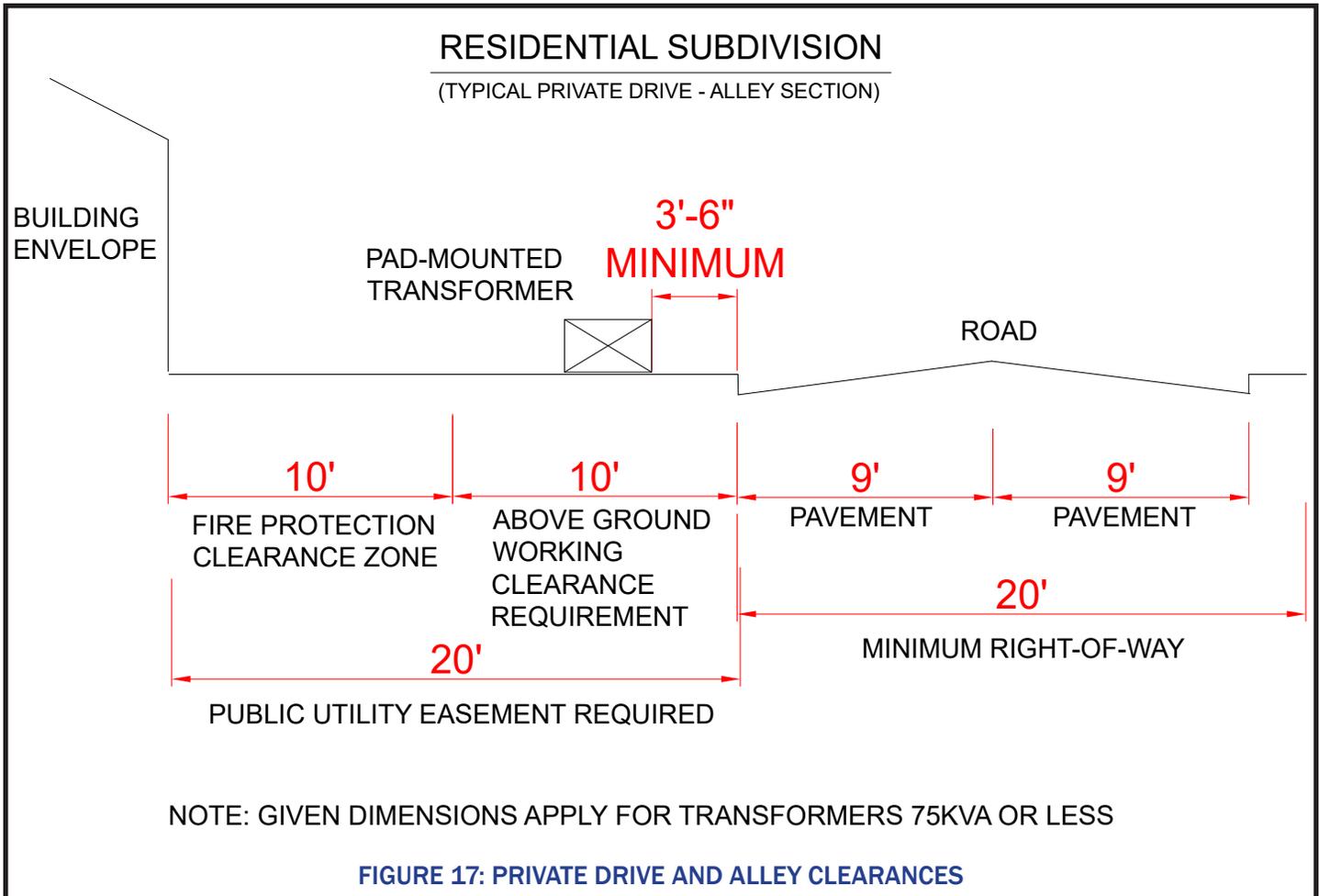
RESIDENTIAL SERVICE





ELECTRIC SERVICE GUIDELINES

RESIDENTIAL SERVICE



4D (UG): Arrange Inspection of Trench, Conduit, and Meter Base

Contact the NES ditch inspector who will be working the job, usually the person who attended the Pre-Construction Meeting. The NES ditch inspector will inspect the job for compliance with the above requirements. The inspection shall be done before backfilling the trench. The previous steps outlined, including signing up for service, shall be completed before the ditch inspection will be done.

Note: See Figure 51 for specific transformer installation, knuckle boom truck clearance requirements.

4E (UG): Backfill Trenches

After NES approves the conduit and meter base installation, backfill the trench twelve inches (12") with #67 crushed gravel above the conduit.

Checklist for proper backfill:

- Ditch contains no solid material larger than two inches (2") in diameter.
- Ditch is free from stones, rocks, or other material which could damage the conduit.
- #67 gravel will be required twelve inches (12") above the conduit.
- The backfill under paved areas shall be #67 gravel.

ELECTRIC SERVICE GUIDELINES

RESIDENTIAL SERVICE



4F (UG): Arrange Inspection of Backfill, Grade Property

Once the trench has been backfilled twelve inches (12”), and any changes required during the first visit have been made, contact the NES ditch inspector who did the previous inspection. The NES ditch inspector will inspect the backfill, and provide and install electrical warning tape. After this inspection, make any changes required by the NES ditch inspector. After re-inspection and warning tape installation, complete the backfilling. For ditch inspections services please visit <https://www.nespower.com/forms/ditch-inspection-request/>

4G (UG): Arrange Installation of Cables and Equipment by NES

! Equipment relocations after installation, due to changes in final grade or other conditions, shall be at the Customer’s expense.

NES will begin the construction scheduling process when the following are completed:

- Property, including roads, are at final grade.
- If an all-weather road was required at the Pre-Construction meeting, it shall be completed.
- All requested easements shall be recorded or an agreement to furnish and record all requested easements shall be signed by the developer.
- There shall be evidence of new home construction.
- Payment of a Contribution in Aid of Construction shall be received, if required.
- Codes release shall be received by NES before completion of job.

Once these conditions are met, NES will schedule the work to install the primary and secondary conductors into the conduit, and any equipment required. NES will also provide a red stub-out marker (see Figure 65) which will be needed to locate the conduit run once the home-owner is ready to install their service. **DO NOT REMOVE OR CUT OFF THESE MARKERS!**

The NES Meter Department will install the meter.



ELECTRIC SERVICE GUIDELINES

COMMERCIAL SERVICE

CHAPTER 4 - COMMERCIAL SERVICE

SUMMARY OF REQUIRED STEPS

TABLE 8: SUMMARY OF REQUIRED STEPS FOR COMMERCIAL SERVICE				
OVERHEAD PRIMARY AND SECONDARY	FURNISH		INSTALL	
	CUSTOMER	UTILITY	CUSTOMER	UTILITY
Set up account, place order with NES	X		N/A	
Tree trimming	X		N/A	
Weatherhead and meter base	X		X	
Customer-owned pole or pedestal (if required)	X		X	
Conductor from meter base into building	X		X	
Codes release to NES	X		X	
Secondary conductors (transformer to meter)		X		X
Meter		X		X
OVERHEAD PRIMARY WITH UNDERGROUND SECONDARY	FURNISH		INSTALL	
	CUSTOMER	UTILITY	CUSTOMER	UTILITY
Set up account, place order with NES	X		N/A	
Tree trimming (if required)	X		N/A	
Secondary trenching and backfill	X		X	
Meter base (location determined by NES)	X		X	
Customer-owned pole or pedestal (if required)	X		X	
Secondary conduits and weatherhead	X		X	
Codes release to NES	X		X	
Secondary conductors		X		X
Meter		X		X
UNDERGROUND PRIMARY AND SECONDARY	FURNISH		INSTALL	
	CUSTOMER	UTILITY	CUSTOMER	UTILITY
Set up account, place order with NES	X		N/A	
All trenching and backfill	X		N/A	
All conduits (1 and 3 phase)	X		X	
Concrete encasement of PVC (3 phase)	X		X	
Transformer pad box (1 phase) or Transformer concrete pad (3 phase)	X		X	
Equipment bases (if required)		X	X	
Equipment protection (if required)	X		X	
Meter base (location determined by NES)	X		X	
Primary Conductors		X		X
Secondary terminations and grounding in transformer		X		X
Current transformer (if required)	Cabinet	CT	Both	
Secondary/ service conductors	X		X	
Codes release to NES	X		X	
Meter		X		X

ELECTRIC SERVICE GUIDELINES

COMMERCIAL SERVICE



STEP 1: ESTABLISH ACCOUNT AND REQUEST SERVICE

If the Customer does not already have an account, call NES Customer Relations at (615) 736-6900 to establish an account.

Application for new service may be made by telephone, facsimile, mail, or in person. Identification such as driver's license, federal ID number, social security card, passport, or birth certificate is required before electric service can be provided.

SERVICE APPLICATIONS & CONTRACTS

Contact NES Customer Relations (615) 736-6900 to apply for service.

A formal contract may be required for a commercial service according to NES policies. All services greater than 1000kW demand will require a contract. A sample Contract for Electric Service is shown in Appendix D. The initial term of the contract depends on the contract.

! Estimate load as closely as possible. NES Engineering will use this estimate to determine wire and equipment size. If the load is underestimated, the Customer can experience voltage drop or other problems.

CONTRIBUTION IN AID TO CONSTRUCTION (CIAC)

NES construction costs must be offset by revenue allowances or by Customer paid Contribution In Aid to Construction. The CIAC is determined by comparing the estimated cost to serve the property/development to a revenue allowance based on the application information provided by the Customer and the NES schedule of fees and charges. The developer is responsible for paying any difference in these estimates before the work is scheduled for construction. If the estimated cost is less than the revenue allowance a CIAC is not required.

Relocations of electric facilities due to the construction of the property/development shall be paid in advance of construction. This includes, but is not limited to, road widening and pole relocations due to clearance (safety) issues.

Once all contractual and financial issues are resolved, the job is released to construction. If necessary, a pre-construction meeting will be scheduled shortly after the job is released for construction.

DEPOSITS

Deposit options can be found on our website. Please visit: <https://www.nespower.com/moving/>

Select the link for "Residential" or "Commercial" then Follow the link to → "Start", "Stop" or "Transfer" Service.

Contact **Customer Relations** for assistance with Commercial deposits at: **(615) 736-6900**



ELECTRIC SERVICE GUIDELINES

COMMERCIAL SERVICE

! Customers who obtain a Codes release before completing Step 1 will encounter delays. NES work is prioritized based on the date an application is made with NES, not on the Codes release date.

STEP 2: DESIGN DISTRIBUTION SYSTEM

The NES Energy Services Account Manager will give the application information to NES Customer Engineering. NES Customer Engineering will design the electrical layout for the business, including the location of meter bases.

STEP 3: INSTALL METER BASE AND OTHER SERVICE EQUIPMENT

! Do not install the meter base until Customer Engineering has indicated the proper location. The placement of a meter can have a tremendous effect on the cost of the service, and in some cases can make it practically impossible to provide service, necessitating the expense of relocating the meter base. It is much less expensive to wait until the Engineer identifies the location of the meter base.

For approved meter bases refer to www.nespower.com on the Builders & Developers page.

The meter base shall be located so it will be accessible to NES personnel. **Get any exception to the requirements listed below in writing, including the NES employee's signature.**

Meter Base Location:

- Shall be approved by Customer Engineering
- Shall be located on a permanent structure that is controlled by the Customer.
- Shall be located on the side of the building that is closest to normal public access.
- Cannot be mounted in exit stair breezeways (per Metro Fire Marshall).
- Shall only be surface mounted (flush-mounted or recessed meter installations are not acceptable).
- Shall not be located in an area that is subject to being fenced, such as patios, decks, porches, backyards.
- Should not be located in areas which are susceptible to subsequent enclosure by walls or screens.
- Overhead service should be located to prevent service wire from crossing a driveway if possible. If it has to cross, the point of attachment should be high enough for the lowest point of the line to be at least sixteen feet (16') above the driveway. (See Figure 45: Vertical Clearances in Appendix C for more details).
- Underground service shall be located so the conductor does not go under any permanent fixture or building, and is in a straight line. (One sweeping bend with a minimum radius of fifteen feet (15') is allowed by NES).
- The reasons for these requirements are:
 - NES access to read the meter in a cost effective manner.
 - NES can efficiently maintain the meter.
 - NES can quickly disconnect electrical service if there is a fire or other disaster.
 - Overhead service lines crossing driveways can be hit by vehicles.
 - Underground service lines can be damaged when pulling through multiple bends.

ELECTRIC SERVICE GUIDELINES

COMMERCIAL SERVICE



STEP 4 (OH): SITE PREPARATION FOR OVERHEAD SERVICE

4A (OH): Prepare Path from the existing NES Pole to the Customer's Service Mast

The Customer is responsible for trimming and/or removing any tree growing within fifteen feet (15') of any future primary power lines from "ground to sky", and any limbs growing within three feet (3') of the service or secondary power lines. Refer to Figure 5 for vegetation trimming examples.

Vegetation clearance requirements may be in excess of electrical clearances obtained by NES during trimming cycle. Additional clearance provides safe access for NES Operations to build overhead facilities. Consult with NES area arborist on questions regarding minimum electrical clearances and compatible vegetation.

Contact NES Vegetation Hotline at (615) 695-7400.

4B (OH): Install Service Mast

Checklist for proper installation (Refer to Figure 18):

When determining the height of the weatherhead, keep in mind that service conductor can have final sag of up to five feet (5'). Appendix C: Safety Clearances is provided to help the Customer understand some of the factors NES Engineers must consider when designing an electrical layout. The Clearance section may also assist development designers in locating sidewalks, swimming pools, fire hydrants, etc.

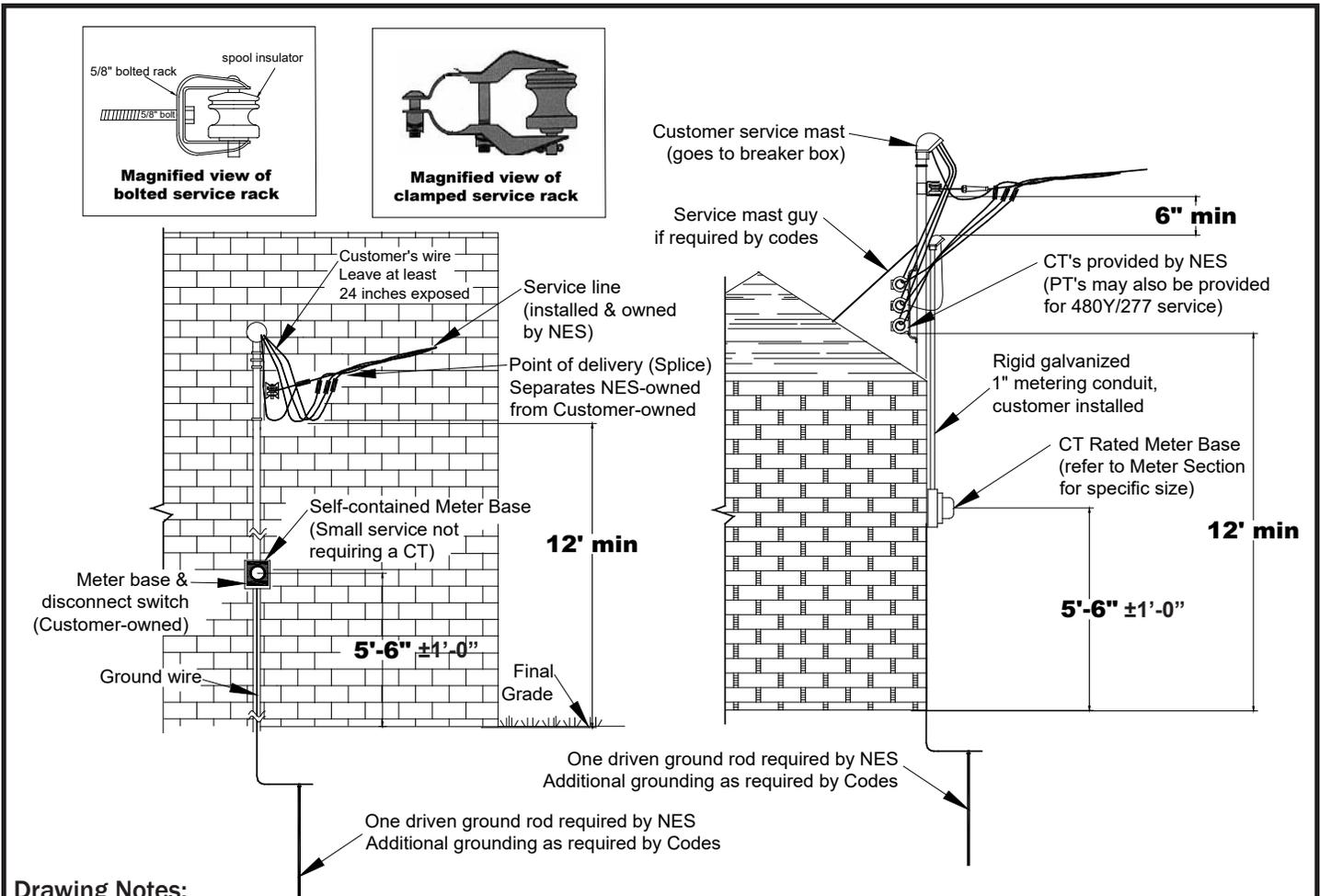
Contact the local Codes Inspector with questions (See Table 2: Useful Contacts).

Service mast shall meet all NEC and local Codes. Check with local Codes Inspector for complete list of Codes requirements.



ELECTRIC SERVICE GUIDELINES

COMMERCIAL SERVICE



Drawing Notes:

1. NES will not connect service wire to attachment hardware deemed unsafe, such as screw knobs.
2. **Communications lines shall not attach to the electric service mast. Must be 12" from service conductor.**
3. NES may require a guy wire opposing the wire tension depending on the wire size length. If guy wire is required by NES, it shall have a rated tensile strength of at least 2,500 pounds. Codes may also require a guy depending on the service mast height. If local Codes requires a guy, the specifications for the guy wire will need to be provided by local Codes.
4. Minimum vertical clearance from service conductor to roof shall be eighteen inches (18") within a six-foot (6') radius of the service mast, and three feet and six inches (3'-6") outside of the six-foot (6') radius. Roofs that are readily accessible to pedestrian traffic shall have a minimum of eleven feet (11') of vertical clearance. **Local Codes may require different clearances.**
5. Service mast shall meet all NEC and local codes. Check with local Codes inspector for complete list of Codes requirements.
6. Required conductor clearances are sixteen feet (16') over roads, sixteen feet (16') over a driveway.
7. Point of delivery shall be less than twenty two feet (22') above final grade and have ladder access (a minimum of 4 to 1 slope required) on the property being served. If there is not enough room for 4:1 slope at twenty two feet (22'), then point of delivery must be lowered.
8. Eighteen inches (18") of clearance is required from the bottom of the CT or PT.

FIGURE 18: COMMERCIAL SERVICE MAST INSTALLATION



STEP 4 (UG): SITE PREPARATION FOR UNDERGROUND SERVICE

! Do not begin digging or construction until the Pre-Construction Meeting has been held.

Step 4A (UG): Receive Underground Layout

Once the job has been processed the Engineer will schedule a formal “Pre-Construction Meeting” to distribute construction information, but may waive the meeting in some instances (for example, the second or third phase of a subdivision when there weren’t any miscommunications on the first phase, or underground service served from a pole-type transformer).

The purpose of a Pre-Construction Meeting is for the NES engineer to review the requirements in this handbook with the Customer, the NES Energy Services Account Manager, and the NES Operations Supervisor. Depending on the complexity of the job other representatives involved such as NES Metering, the Customer’s electrician, general contractor or subcontractors, other utilities, etc. may be invited for coordination. The NES Engineer will have a checklist of issues called the Pre-Construction Meeting Information Sheet (See Appendix D). Any exceptions to the requirements in this handbook shall be noted on the Pre-Construction Meeting Information Sheet and initialed by the Customer and an NES employee. The Customer will receive a copy of the Pre-Construction Meeting Information Sheet at the end of the meeting, along with construction drawings.

The Customer should keep the copy of the Pre-Construction Meeting Information Sheet until the project has been completed and energized. This way any discrepancies can be easily resolved.

NES supplies fiberglass pad boxes and bases for equipment such as terminating cabinets if the job requires them. The Customer is responsible for pickup and loading of fiberglass equipment. Any materials supplied by NES that are stolen, damaged or lost, shall be replaced at the Customer’s expense.

! The NES ditch inspector will not make an inspection until they have received the layout (a drawing) from the NES Engineer. A drawing cannot be made until an order is placed. Following this sequence of steps will ensure your work is handled in a timely manner.

! Customer shall provide room for riser pole on the property that will be served. Pole shall have all proper NESC clearances from other objects on Customer’s property. Pole should be located roadside if at all possible, or an easement or all weather road shall be provided.



ELECTRIC SERVICE GUIDELINES

COMMERCIAL SERVICE

Step 4B (UG): Dig Trenches

! Customer should not begin trenching until NES poles have been set. If any digging must be done prior to NES poles being set, digging should stay at least fifteen feet (15') away from NES stakes. Failure to do so may delay NES installations.

General Trench Requirements

- Utility Red Dyed concrete backfill may be required for critical duct-bank construction in commercial sites at the supervisors discretion.
- Use Duct Spacers on Duct Banks that are connected to a switch and/or a manhole. (Minimum 4 spacers per 20' length of duct run)
- Trench shall be free of large or sharp rocks and construction debris.
- Trench shall meet all Occupational Safety and Health Administration (OSHA) standards.
- Excavated materials shall be at least two feet (2') from the edge of the trench.
- Trench should be a straight and level run (ONE sweeping bend of fifteen-foot (15') minimum radius between elbows is allowed).
- Trench shall not be located under any planned permanent structures (buildings, condensers, etc).
- There shall be at least twelve inches (12") clearance vertically and horizontally between NES and other utilities' conduits. Note: If the Customer is building in the Harpeth Valley Utility District or the Hendersonville Utility District, five feet (5') clearance is required between NES and the water/waste water utilities.
- The Customer is responsible for soil stabilization during and after construction.
- See Appendix for ditch inspection process flowchart.

Primary Trenches

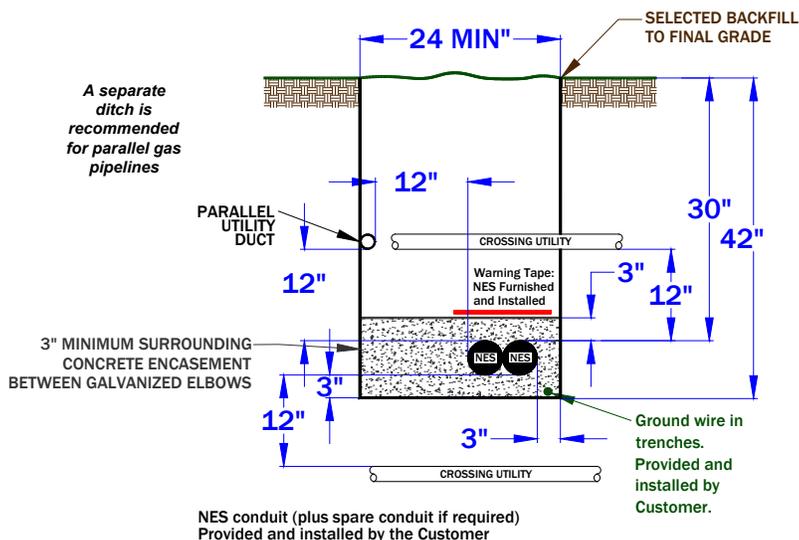
- The detailed drawings will be distributed at the Pre-Construction Meeting and will show the location of the trenches.
- The embedment and/or backfill material for switch pads, pull-boxes, fiberglass box pads for terminating cabinets and transformers and conduits crossings under roads and other traffic areas is #67 gravel.
- Gravel shall be filled down to undisturbed soil and below the frost line for equipment embedment.
- Use only #67 gravel to backfill trenches where the concrete encased or rigid galvanized conduit systems cross under roads or other traffic areas
- Install ground wire, pull boxes, fiberglass pads for terminating cabinets & transformers (pull boxes and fiberglass pads will be provided by NES).
- The Customer will provide any manholes and concrete pads in accordance with NES's specifications. The NES engineer will provide the specifications during the pre-construction meeting.
- Trench dimensions are determined by the number and size of conduits. A general detail is provided in Figure 19.
- Customer is responsible for all easements and arranging any road or private property crossings.

Secondary/Service Trenches

Trench dimensions: see Appendix for specific ditch details.



Commercial Customer Ditch Detail Using Concrete Encased Schedule 40 PVC



Drawing Notes:

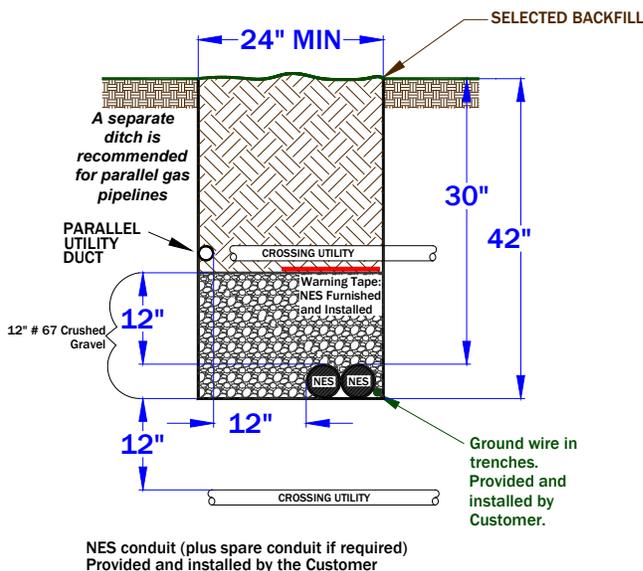
1. A spare conduit is required to facilitate future repairs and maintenance.
2. Actual number and sizes of NES conduits and conduit fittings shall be shown on construction drawings, which shall be presented at the Pre-Construction Meeting.
3. There shall be a minimum of twelve inches (12") horizontal and vertical clearance between NES conduits and any other conduits.
4. The Customer is responsible for soil stabilization during and after construction. The Customer is also responsible for the disposition of spoils from excavation.
5. The Customer is responsible for providing all conduits, elbows and appurtenances (including Manholes and Duct Banks) necessary for their proper installation.
6. Typical Pole/Pad conduit requirements:

Wire Size	Conduits
#1	2 - 4"
4/0	2 - 5"
500 or 750	2 - 6"

Note: NES may require additional conduits on a case by case basis at the discretion of the NES engineer.

Utility Red Dyed concrete backfill shall be required for critical duct bank construction in commercial sites.

Commercial Customer Ditch Detail Using Rigid Galvanized Duct



INSTALLATION MUST BE INSPECTED BY NES

REFER TO FIGURE 69 - DITCH INSPECTION PROCESS

FIGURE 19: COMMERCIAL PRIMARY TRENCH REQUIREMENTS



ELECTRIC SERVICE GUIDELINES

COMMERCIAL SERVICE

Trench Backfill Requirements

TABLE 9: TRENCH BACKFILL REQUIREMENTS (COMMERCIAL)		
BACKFILL REQUIRED	CATEGORY	EXAMPLE LOCATIONS
“Red Dye” Concrete Encased	Commercial Metering 5” conduit and larger	Office buildings Government buildings Commercial plants and facilities Medical facilities Hotels, Motels, Hospitality Retail stores Restaurants & bars Sports & Recreation facilities Public parks & outdoor Churches Schools & Universities
“Red Dye” Concrete Encased	Multi-tenant metering Multi-unit metering Mixed-use metering	Apartment complexes Condominiums Retirement homes Assisted living facilities Mixed-use (Residential / Commercial)
“Red Dye” Concrete Encased	Commercial (Point to point)	Riser to switch or TC Switch or TC to switch or TC Road crossings & traffic areas
“Red Dye” Concrete Encased	Other	Any commercial service utilizing 5” and larger conduit feed
Concrete Encased	Other	Any commercial service utilizing 4” and smaller conduit feed
#67 Gravel backfill	Secondary Termination Enclosure	Transformer to Enclosure

Backfill requirements for Commercial Installations:

- Final decision for all backfill requirements are at the discretion of the NES supervisor and may vary by installation.
- Maximum Distance between Transformer and Secondary Termination Enclosure is 6 Feet.
- Services in commercial areas requiring 5” and larger conduits shall be “red dye” concrete encased regardless of application or specific use case.
- See Appendix for ditch inspection process flowchart.

ELECTRIC SERVICE GUIDELINES

COMMERCIAL SERVICE



Step 4C (UG): Install Conduit, Pads, and Equipment

TABLE 10: CONDUIT ELBOW RADIUS REQUIREMENTS (COMMERCIAL)

CONDUCTOR BEING PULLED	CONDUIT DIAMETER	ELBOW RADIUS <i>(unless otherwise specified at Pre-Construction meeting)</i>
Secondary/Service	(1 or 2) - 3"	24"
Single-Phase Primary (23.9kV)	(1 or 2) - 2 1/2"	24"
Single-Phase Primary (13.8kV)	(1 or 2) - 3"	24"
Three-Phase Primary	(3) - 2 1/2" or (1) - 4", 5", or 6"	24" OR 36" AS REQUIRED
Street Lights	(1) - 2"	24"

General Conduit Requirements

- New developments with limited space may require (at the discretion of NES Engineering) an as-built underground conduit and pad-mounted equipment survey to be performed by the developer to ensure all electric facilities are placed in appropriate locations. This survey is to ensure Fire Protection clearances and working spaces are met prior to energizing equipment.
- Any PVC conduit installed shall have a minimum three inches (3") thick surrounding concrete encasement.
- Conduit should be a straight and level run (ONE sweeping bend of fifteen-foot (15') minimum radius between elbows is allowed).
- Do not run conduit under permanent structure such as building, condenser, etc.
- If rigid galvanized steel conduit crosses under a drainage ditch or small creek, include a concrete encasement as discussed at Pre-Construction Meeting.
- Conduit should be laid in the trench so the print indicating conduit size is visible.
- Conduit size will be discussed at the Pre-Construction Meeting. Size will depend on service size and length.
- There shall be at least five feet (5') of horizontal clearance from swimming pool enclosures.
- Underground services over 800 Amps shall be served with a pad-mounted transformer. They cannot be served directly from a secondary riser pole to the meter base.
- Only one group of conductor is allowed per conduit.

Primary and secondary conduit(s) requirements at the riser pole

- Install ten-foot (10') length of conduit up the pole above grade level. Conduit and elbow shall be rigid galvanized steel.
- A twenty-four-inch (24") radius elbow (rigid galvanized) is required for four inch (4") and five inch (5") conduit. Six inch (6") conduit requires a thirty-six inch (36") radius elbow. Larger radius elbows could be required by NES Operations or Engineering based on conditions encountered on the job.
- Cap both ends of the spare conduits. All conduits require a pull tape.
- There shall be seven and one-half inches (7 1/2") of space between pole and conduit.

Point of Delivery (POD)

- Commercial underground POD is the border between NES-owned and maintained electrical equipment and the Customer-owned and maintained electrical equipment.



ELECTRIC SERVICE GUIDELINES

COMMERCIAL SERVICE

The following table describes the location of the POD by service feed type.

TABLE 11: POINT OF DELIVERY (COMMERCIAL)		
COMMERCIAL SERVICE FEED	FIGURE #	POD
Secondary Riser	20, 25	Meter Base Terminals
Padmount Transformer	21, 22	Transformer Secondary Terminals
Secondary Pull-Box (SPB)*	62	Transformer Secondary Terminals
Secondary Terminating Pedestal (STP)**	60	STP Terminals
Special Application Secondary Termination Enclosure***	32, 33	Enclosure Terminals
* Refers to building service		
** Refers to non-building service (e.g. small cells, billboards)		
*** Special Application Secondary Termination Enclosure fed from Transformer, enclosure access controlled by NES		

Secondary conduit(s) from riser pole to meter base, up to 800 Amps (Figure 20)

- NES will provide and install the secondary conductors from the secondary riser to the service Point of Delivery.
- Rigid galvanized conduit(s) is required from riser elbow(s).
- One or two elbows, rigid galvanized steel, are required at the meter base.
- Schedule 80 PVC is required up to the meter base.

Primary conduit(s) from riser pole to pad-mounted transformer

(single phase, Figures 21 & 22; three phase, Figure 23)

- First ten-foot (10') length out of riser elbow (above grade) shall be rigid galvanized steel. Remainder of run may be either rigid galvanized steel or concrete encased schedule 40 PVC conduit.
- Elbows shall be twenty-four-inch (24") radius elbow(s), unless otherwise specified by Customer Engineering. Rigid galvanized steel at the pad-mounted transformer.
- Install the concrete pad or fiberglass box-pad for mounting transformer (detailed pad sketch provided at Pre-Construction Meeting).
- Neptco "Muletape" catalog number WP1250P or equivalent 1/2" pull tape shall be installed in the primary conduit. The tape's breaking strength shall be at least 1250 lb.
- Pulling tape in the spare conduit should be glued to the conduit cap.

Pad-mounted transformer to meter base

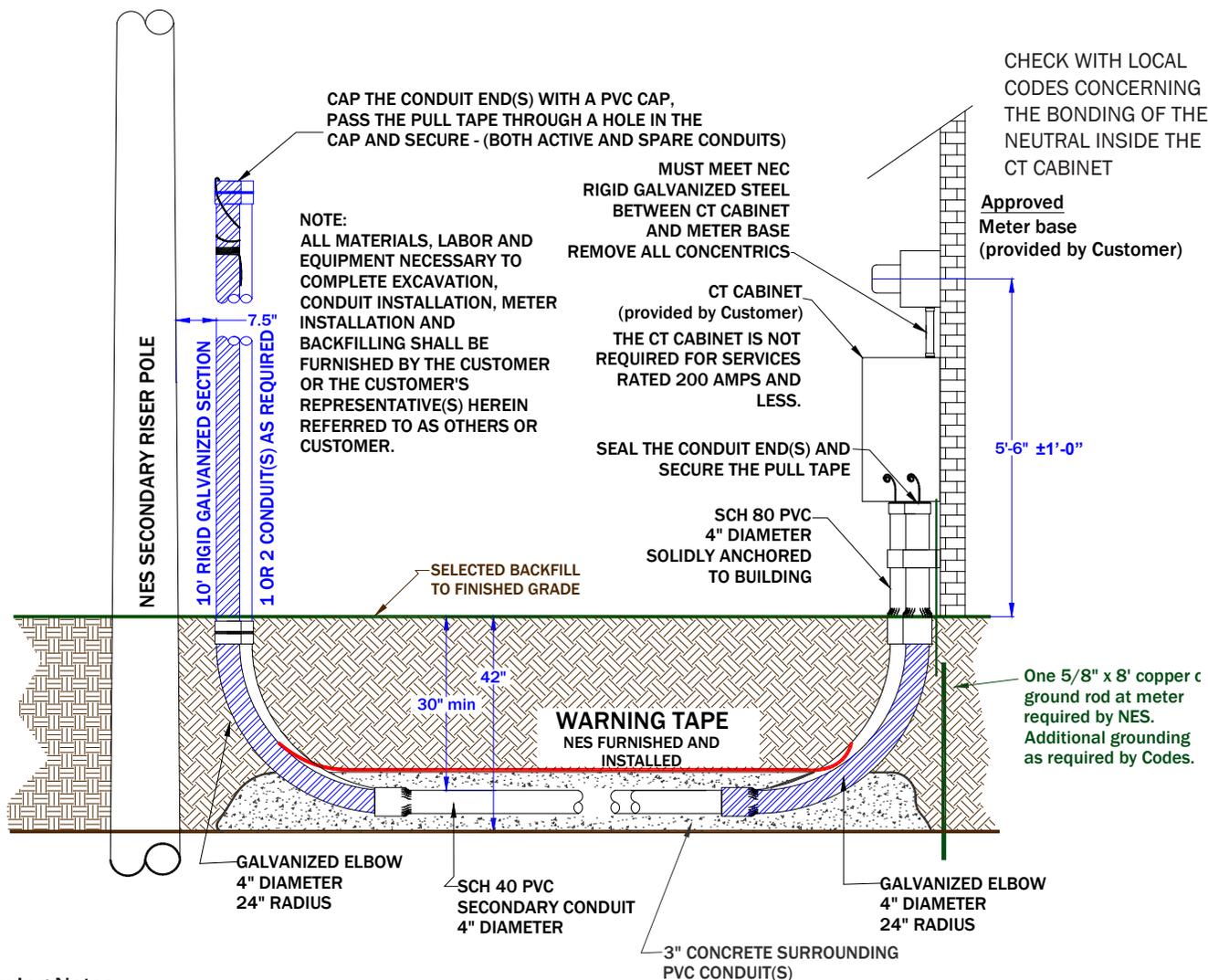
Customer provides, installs and owns all secondary conductor and conduit from the building to the pad-mounted transformer. NES will terminate secondary conductors at the transformer. Secondary conduit quantity restrictions will be discussed at the pre-construction meeting.

Manholes, Duct Banks, Transformer & Switch Pads

Manholes are integral components to the conduit system. The Customer shall provide manholes, duct banks, transformer pads, and switch pads as required. Pre-cast manholes, transformer and switch pads shall be purchased from only pre-approved manufacturers. **The specification and details will be provided by the NES engineer assigned to the job. The shop drawings for manholes and switch pads must be approved by the designing engineer.**



INSTALLATION MUST BE INSPECTED BY NES
REFER TO FIGURE 69 - DITCH INSPECTION PROCESS



Drawing Notes:

1. Typical conduit sizes, unless otherwise specified:
Three-inch (3") conduit for single-phase services. [Including Small Cells, (non-network)]
Four-inch (4") conduit for three-phase services.
2. A spare conduit is required for services 600A and greater, and may be required at the Engineer's discretion for other services to facilitate future repairs and maintenance. Spare conduits shall be capped.
3. If current transformers (CT's) are required, contact NES Meter Department at (615) 747-3805.
4. The Customer is responsible for soil stabilization during and after construction.
5. Conduit(s) shall have a pull string.
6. Check with local codes concerning the bonding of the neutral inside the CT Cabinet.
7. Customer shall provide slip coupling at cabinet junction to minimize the effects of settling.
8. Direct burial of secondary wire is prohibited.

FIGURE 20: UNDERGROUND COMMERCIAL SERVICE FROM SECONDARY RISER POLE
(SERVICES GREATER THAN 200 AMP TO 800 AMP MAXIMUM)

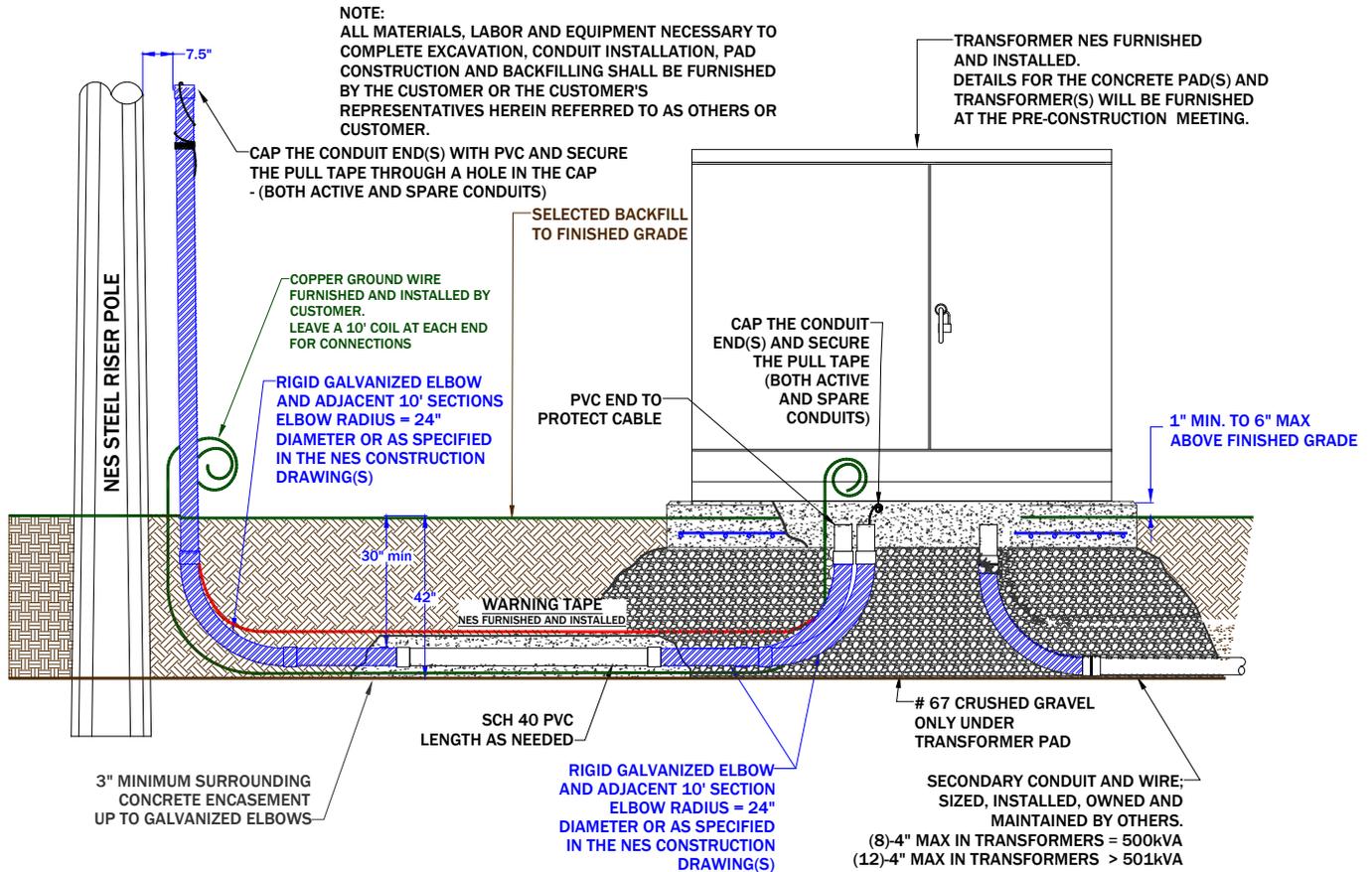


ELECTRIC SERVICE GUIDELINES

COMMERCIAL SERVICE

INSTALLATION MUST BE INSPECTED BY NES

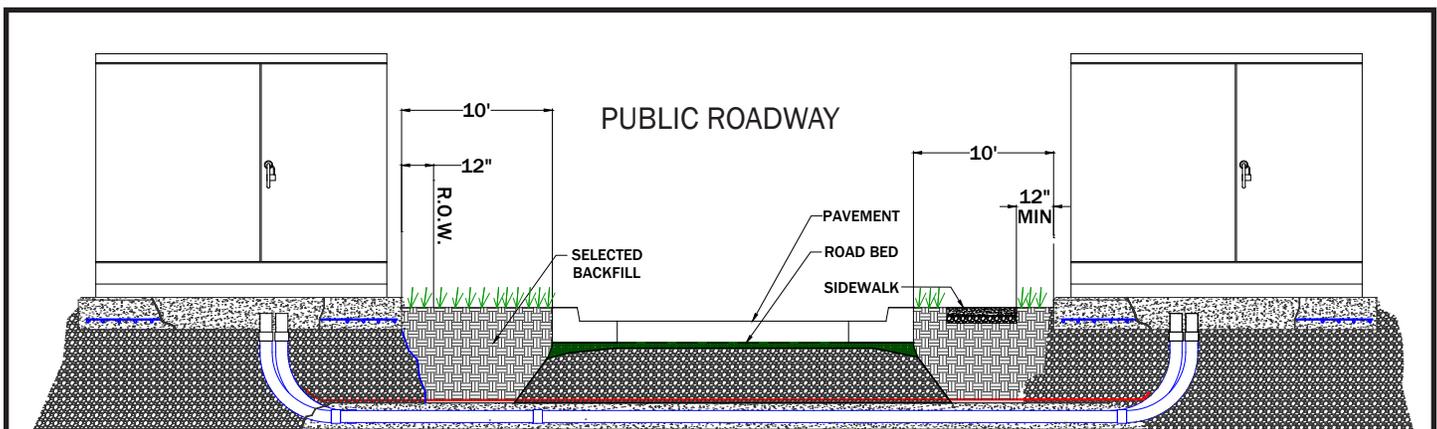
REFER TO FIGURE 69 - DITCH INSPECTION PROCESS



Drawing Notes:

1. Four-inch (4") conduit (s) and twenty-four-inch (24") radius elbows are to be used unless otherwise specified during the Pre-Construction Meeting. A spare conduit is required.
2. Bollards are to be installed when transformer is exposed to traffic (refer to Figure 66).
3. NES ditch inspector shall approve form before pouring concrete pad for transformer.
4. Barrier wall to be installed when distance from pad to non-fireproof building is less than allowed by National Fire Prevention Association Codes (refer to Figure 54).
5. Install a one-half-inch (1/2") pull tape with a minimum breaking strength of 1250 pounds in the **primary** conduit only. (Neptco Muletape WP1250P or equivalent). In spare conduits pull tape should be glued to the conduit cap.
6. A minimum of six feet (6') of clearance is required at the front of transformer pad. A minimum of three feet (3') is required from the pad on the other three sides. **A minimum of twenty five feet (25') of overhead clearance is required.** This includes signs, structures and the outermost branches of mature plants used for landscaping. Grade of the clearance area around NES equipment shall be level..
7. Transformer Pad shall be above grade with proper natural drainage. The Customer is responsible for soil stabilization during and after construction.
8. Concrete encasement is not required for galvanized conduit unless specified in the pre-construction meeting.
9. Ground wire will be either **#2 AWG 7 strand** or **4/0 AWG 19 strand**, depending on the specific requirements of the Project.
10. NES determines transformer size to be installed.
11. See Figure 51 for specific transformer installation, knuckle boom truck clearance requirements.
12. Direct burial of secondary wire is prohibited.

FIGURE 23: UNDERGROUND COMMERCIAL THREE-PHASE PRIMARY INSTALLATION



Drawing Notes:

1. A minimum of six feet (6') of clearance is required in front of the fiberglass transformer pad. A minimum of three feet (3') is required from the fiberglass pad on the other three sides. **A minimum of twenty five feet (25') of overhead clearance is required.** This includes signs, structures and the outermost branches of mature plants used for landscaping. Grade of the clearance area around NES equipment shall be level.
2. Barrier wall to be installed when distance from pad to non-fireproof building is less than allowed by National Fire Prevention Association codes (refer to Figure 54).
3. Transformer Pad shall be above grade with proper natural drainage. The Customer is responsible for soil stabilization during and after construction.
4. Additional clearances may be required for limited access highway.
5. See Site Preparation for Underground Service for specific ditch and conduit requirements.
6. See Figure 51 for specific transformer installation, knuckle boom truck clearance requirements.
7. Transformer must be positioned so that it doesn't have to be worked on with hot line tools from the road.
8. Door orientation to be determined based on site layout. Doors shown in figure are for reference only.

FIGURE 24: TYPICAL COMMERCIAL PAD-MOUNTED EQUIPMENT SETBACK REQUIREMENTS

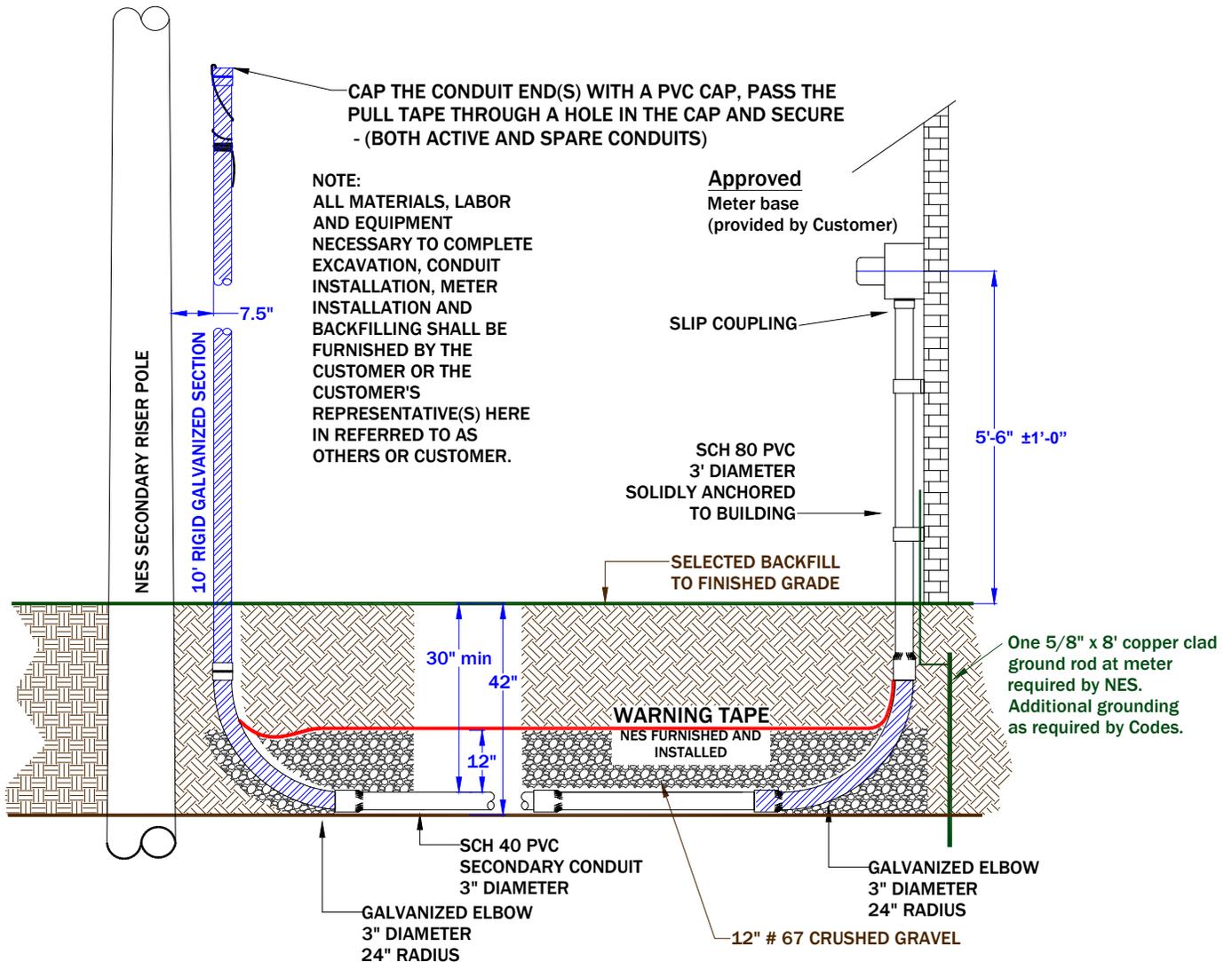


ELECTRIC SERVICE GUIDELINES

COMMERCIAL SERVICE

INSTALLATION MUST BE INSPECTED BY NES

REFER TO FIGURE 69 - DITCH INSPECTION PROCESS



Drawing Notes:

1. Three-inch (3") conduit and twenty-four-inch (24") radius elbows to be used unless otherwise specified.
2. Conduit shall be laid so the size imprint is visible.
3. The Customer is responsible for soil stabilization during and after construction.
4. The Customer provides and installs lugs for the meter base.
5. Conduit(s) shall have a pull string.
6. Customer shall provide slip couplings at meter base junction to reduce the effects of settling.
7. Direct burial of secondary wire is prohibited.

FIGURE 25: COMMERCIAL LIGHTING OR SUPPLEMENTAL RESIDENTIAL SERVICE FROM SECONDARY RISER (UP TO AND INCLUDING 200 AMPS)

ELECTRIC SERVICE GUIDELINES

COMMERCIAL SERVICE



Concrete Pad Construction Notes:

1. NES will inspect all conduits prior to concrete being poured. When ready for inspection, contact the NES ditch inspector (this person's name and phone number will be supplied at the Pre-Construction Meeting).
2. **No other utilities may pass beneath the NES pad location or be located within six feet (6') of the transformer pad.**
3. NES will install grounding rods and grid at the pad location when excavation is complete and prior to backfilling or forming the pad (at the time that the rebar is inspected). Contact the NES ditch inspector.
4. Concrete shall be a minimum of 3000 PSI compressive strength at 28 days.
5. The NES pad shall be on a firm bearing. All fill material beneath the pad will be a minimum of two feet (2') of #67 washed gravel base filled to below the local frost line. Increased pad depth or concrete piers may be necessary to reach a firm bearing for the pad. Do not fill open conduit well.
6. Reinforcing steel shall be ASTM A-615 Grade 60 (#5 rebar) or better.
7. NES to inspect the pad form and rebar steel prior to concrete being poured. Contact the NES ditch inspector.
8. Bollards will be installed by Customer at NES approved locations if the NES transformer is exposed to vehicular traffic.
9. **Concrete Pad Clearances: No structure, landscaping, shrubbery or trees (final growth) allowed within six feet (6') of the front or three feet (3') from the sides and back of the concrete pad.**

! These pad sketches provide general information regarding the space and materials needed. Do NOT begin construction of the concrete pad until the Engineer determines the transformer size that will be installed and provides you a specific pad sketch for your job.

NES will accept OldCastle precast pads. Other brands may be considered only if approved by NES Standards Group prior to the Pre-Construction meeting.

Not For Construction

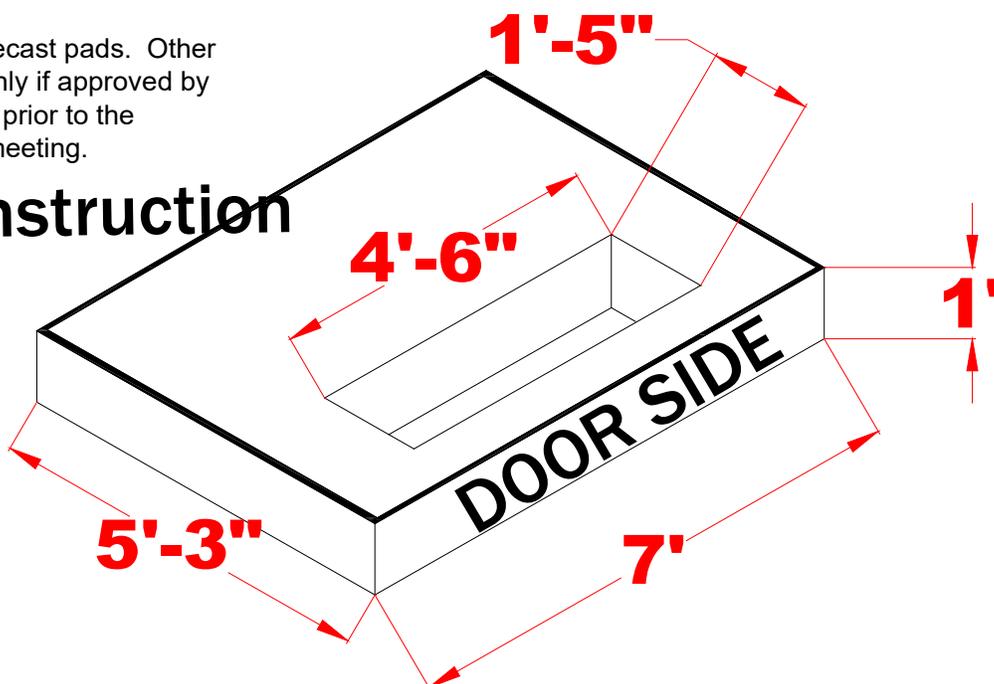
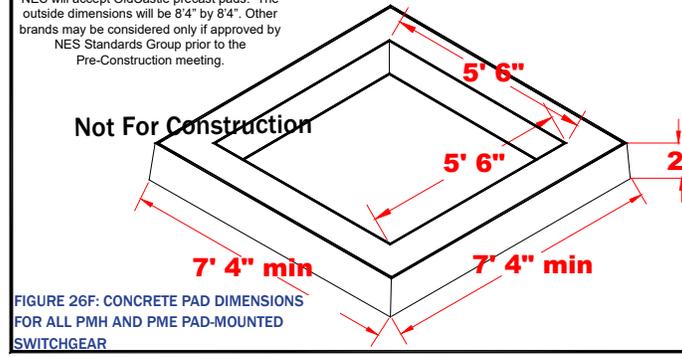
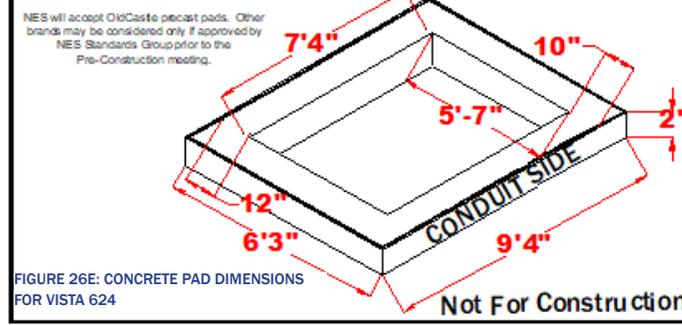
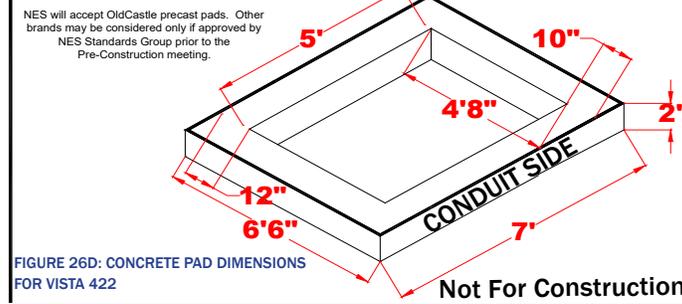
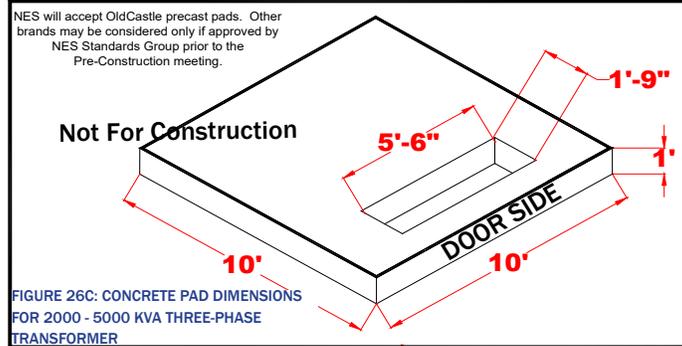
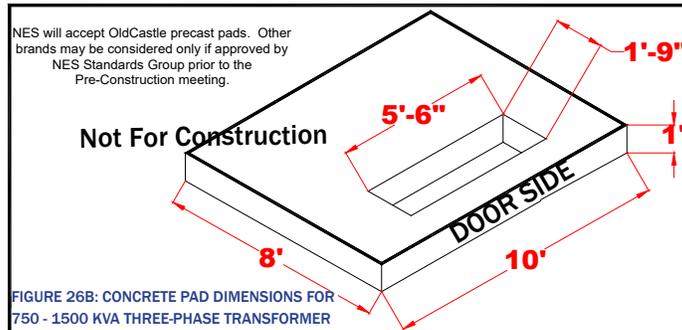


FIGURE 26A: CONCRETE PAD DIMENSIONS FOR 75 - 500 KVA THREE-PHASE TRANSFORMER



ELECTRIC SERVICE GUIDELINES

COMMERCIAL SERVICE



ELECTRIC SERVICE GUIDELINES

COMMERCIAL SERVICE



Step 4D (UG): Arrange Inspection of Primary Trench, Conduit, and Meter Base

All prerequisites outlined in this document (signing up for service, paying deposits, job assigned to Operations Supervisor, etc.) shall be completed before a ditch will be inspected. Contact the NES ditch inspector whose name and number is given at the Pre-Construction Meeting. The NES ditch inspector will inspect the job for compliance with NES's requirements. The inspection shall be done before any backfilling of the trench.

Step 4E (UG): Backfill Primary Trenches

After NES approves the conduit and meter base installation, backfill the trench twelve inches (12") with #67 crushed gravel above galvanized conduit (or pour concrete if using PVC conduit).

Checklist for proper backfill:

- Ditch contains no solid material larger than two inches (2") in diameter.
- Ditch is free from stones, rocks, or other material which could damage the conduit.
- #67 gravel is required twelve inches (12") above and six inches (6") below the conduit.

Step 4F (UG): Arrange Inspection of Backfill, Grade Property

Once PVC conduit has been concrete encased, or trench has been backfilled twelve inches (12") if rigid galvanized steel is used, contact the NES ditch inspector who did the previous inspection. The NES ditch inspector will check the encasement or backfill. If changes are necessary, complete the requested alteration(s) and again call the inspector. When the encasement or backfill is approved, the inspector will install the warning tape. The trench may then be backfilled to finished grade.

Step 4G (UG): Arrange Installation of Cables and Equipment by NES

The Customer is expected to install commercial secondary and service if served from a pad-mounted transformer. The Customer may select any wire size as shown in the table below. However if the Customer selects a wire size for which NES does not stock termination lugs, the Customer shall supply the termination lugs.

NES stocks lugs for the following sizes (aluminum or copper):

#1	2/0	4/0	250	300	350	400	500	600	750
----	-----	-----	-----	-----	-----	-----	-----	-----	-----

! NES does not stock lugs for compacted wire.



ELECTRIC SERVICE GUIDELINES

COMMERCIAL SERVICE

Step 4H (UG): Maximum Number of Secondary Services - (Pad Mount)

TABLE 13: MAXIMUM CONDUCTORS FOR PAD-MOUNTED TRANSFORMERS			
SYSTEM TYPE	CONDUCTORS (PER PHASE)	TRANSFORMER (KVA)	CONDUIT SIZE
1 PHASE	6	25 - 50	3"
1 PHASE	8	75 - 250	3"
3 PHASE	8	≤ 500	4"
3 PHASE	12	> 500	4"

! If more conductors are required by the Customer, a Secondary Termination Enclosure shall be supplied and installed by the Customer. Reference the Metering Section.

NES will begin process for scheduling and installation of primary conductor and equipment, and make proper connection of the cable at the secondary bushing of the transformer, when the following are completed:

- Property where NES equipment is located shall be at final grade.
- If an all-weather road was required at the Pre-Construction meeting, it shall be completed.
- All requested easements shall be recorded or an agreement to furnish and record all requested easements shall be signed by the developer.
- There shall be evidence of construction.
- There shall be payment of a Contribution in Aid of Construction, if required.
- Codes release shall be received by NES before service can be energized.

! Equipment relocations after installation due to changes in final grade, improper location, or other conditions, shall be at the Customer's expense.

Once these conditions are met, NES will begin process to schedule and install the primary conductor into the conduit, and any equipment required. NES will connect the Customer's secondary inside the pad-mounted transformer, and ground the transformer. If the Customer is installing service directly from the pole to the meter, NES will install the service conductor.

The NES Meter Department will install the meter. NES will not energize the line until all required deposits or fees have been paid.



CHAPTER 5 - METERING

CUSTOMER METERING AND WIRING STANDARDS

All meter bases, meter centers, breaker boxes, and wiring installed by the Customer shall conform to all applicable codes and ordinances, as exemplified by the requirements of the National Electrical Safety Code and the National Electrical Code. The Customer shall at all times maintain the meter bases, meter centers, breaker boxes, wiring, and equipment furnished by the Customer, in such condition and repair as may be required by NES and by any statute, law, city ordinance, or code. All NES approved meter bases can be found at www.nespower.com under the Builders & Developers page.

See Figures 28, 29 and 34 for all working clearances. In addition any meter with a bypass handle requires 36" clearances to the right of the meter base excluding electrical equipment that does not exceed 6" of depth difference.

No electrical meter room will be allowed inside without prior written NES Meter Department approval. Approval must be obtained before construction has begun.

If a meter(s) is enclosed or otherwise made inaccessible after installation, without written approval from the NES Meter Department, the Customer will bear the cost for having the metering facilities moved to an accessible location.

NES does not provide metering on pad-mounted transformers. Services fed from a pad-mounted transformer that require CT metering will require a CT cabinet at the service entrance to the building, or a switchboard with a metering bay approved by Meter Department. Customer will be required to provide the CT cabinet as well as the meter base for the service. See Figure 14 or Figure 20 for example installations for the CT cabinet and meter base.

Meters and related equipment shall be adequately protected from physical damage.

If you are interested in installing any type of generation system such as Solar, Wind, Generators etc. please contact NES Customer Engineering, NES Meter Department, and NES Energy Services BEFORE purchasing or installing any of this type equipment. Refer to Chapter 6 for Power Production Facilities.

Metering equipment shall not be located on the load side of a Customer-owned transformer.

There shall be no access to unmetered conductors such as: troughs, wire ways, LB's, gutters, pull boxes, etc.



ELECTRIC SERVICE GUIDELINES

METERING

It has been determined by NES that the by-pass handle mechanism in an Anchor meter socket is dangerous, and prone to catastrophic failure when operated by utility personnel. For the protection and safety of NES personnel, the NES Meter Department considers all Anchor brand bases with a bypass handle condemned at the time the account is final, or the account is cut off for nonpayment. It is the Customer's responsibility to replace with an approved meter base.

NES does not allow the use of a 600 amp self-contained meter base (K-7 meter base). A K-7 base cannot be repaired, or be replaced with a K-7 base. For the protection and safety of NES personnel, the NES Meter Department considers all K-7 meter bases condemned at the time the account is final, or the account is cut off for nonpayment. It is the Customer's responsibility to replace with an approved meter base. The service must be replaced with a CT rated service.

The Customer is responsible for providing and installing all service equipment other than the meter. All meter bases, enclosures, and conduit must be bonded and grounded in accordance with current NEC Codes. **All meter bases and/or CT enclosures shall be grounded with a minimum #4 copper wire.**

Any vendor may be used to supply the meter base provided they meet the requirements outlined in this section. The below vendors are known to carry NES and NEC approved meter bases:

TABLE 14: METER BASE VENDORS		
CED 330 19th Avenue North Nashville, TN 37203 (615) 329-2601	Stuart C. Irby 1284 Heil Quaker Boulevard LaVergne, TN 37086 (615) 280-3300	Graybar Eighth Avenue South Nashville, TN 37203 (615) 254-8484
Border States Electric 656 Wedgewood Avenue Nashville, TN 37202 (615) 255-4161	WESCO 1400 Fort Negley Boulevard Nashville, TN 37203 (615) 248-9713	
Mayer Electric Supply Co. Inc. 2924 Sidco Drive Nashville, TN 37204 (615) 242-1100	Inline Electric Supply Co. 831A Cowan Street Nashville, TN 37207 (615) 324-0469	

NES reserves the right to trim or remove any landscaping, signs or other items interfering with the operation or maintenance of metering equipment. This may be necessary to restore or maintain service, and/or to ensure NES employee safety.



METERING REQUIREMENTS LOOK-UP TABLE

Find the service type being metered, and compile all of the requirements listed on the following pages. Using the resulting lists will ensure the meter base purchased meets all NES requirements. All other meter related questions should be directed to the Meter Department directly at (615) 747-3805.

TABLE 15: METERING REQUIREMENTS		
SERVICE TYPE	SERVICE SIZE	LISTS THAT APPLY
Single-Phase, 120/240 Volt		
Overhead or Underground	Up to 225 Amps	Single-Phase Self-Contained Meter Base Requirements
	226 - 400 Amps	Class 320 Meter Base Requirements or Class 320 Underground Requirements or CT Rated Meter Base Requirements (8 Terminal NES Approved Meter Socket, 5S)
	Over 400 Amps	CT Rated Meter Base Requirements (8 Terminal NES Approved Meter Socket, 5S)
Single-Phase, 120/208 Volt		
Overhead or Underground	Up to 225 Amps	Single-Phase Self-Contained Meter Base Requirements <i>(see Figure 27 - 5th Terminal Installation)</i>
	226 - 400 Amps	Class 320 Meter Base Requirements <i>(see Figure 27 - 5th Terminal Installation)</i> or Class 320 Underground Requirements <i>(see Figure 27 - 5th Terminal Installation)</i> or CT Rated Meter Base Requirements (8 Terminal NES Approved Meter Socket, 5S)
	Over 400 Amps	CT Rated Meter Base Requirements (8 Terminal NES Approved Meter Socket, 5S)
Three-Phase, 120/208Y Volt or 277/480Y Volt Services		
Overhead or Underground	Up to 225 Amps	Three-Phase Self-Contained Meter Base Requirements Seven-Terminal Base (HQ7) with manual bypass block Grounded neutral conductor connected or tapped to the third terminal from the left on the lower terminals
	Over 225 Amps	CT Rated Meter Base Requirements Thirteen-Terminal Base (9S) with test switches Disconnect installed behind the meter base 3 CT's (480Y/277 voltage also requires (3) - 2.5:1 PT's, PT's and CT's are supplied by NES)



ELECTRIC SERVICE GUIDELINES

METERING

SINGLE-PHASE SELF-CONTAINED METER BASE REQUIREMENTS

All meter bases must be on approved meter base list (Go to www.nespower.com, Builders & Developers page).

In addition, meter bases must:

- No surge protection or Customer-owned equipment can be installed between the meter and meter base.
- Be either ringed or ringless, and cannot have built-in breakers or disconnects in standalone applications.
- All multi-gang meter centers must be ringed.
- Have four meter jaws and one connection point for the neutral conductor.
- **Center of meter must be mounted at 5'- 6" (\pm 1'- 0") from final grade, and must have 18" of side working clearance from walls, HVAC units, other utilities, and other obstructions.**
- Side working clearance is not required as long as the device within that space does not protrude more than 6" beyond the surface of the meter base. This will allow for faceplate or band removal and/or meter base maintenance.
- Be rated for exterior use, and be weather proof according to NEMA-3R.
- Have all unused openings closed with plugs that are locked tightly in place from inside the base or enclosure.
- Be level, plumb and securely fastened to the supporting structure.
- Be bonded and grounded in accordance with Articles 230 and 250 of the latest edition of the NEC (when self-contained meter bases are used, the neutral conductor must be connected to the neutral terminal in the base).
- NES will not energize a meter base with built in breakers, (temporary or permanent service), the only exception will be multi-gang load centers.
- Be covered and sealed with a transparent cover plate when a meter is not installed if the base contains energized equipment.

UNDERGROUND METER BASE REQUIREMENTS

In addition to single-phase self-contained meter base requirements, underground meter bases for 120/240 Volt services, **Shall:**

- *Be left-side connected from approved meter base list available on www.nespower.com. Line and load conductors shall not cross each other in base.*
- Accept three inch (3") rigid galvanized steel or schedule 80 PVC conduit.
- Include pull strings in any underground service conduit.
- Have lugs (electrical connectors) that are marked to accept 4/0 aluminum conductors.
- Use the left side concentric knockout (because of the bending radius of the cable).

CLASS 320 METER BASE REQUIREMENTS

In addition to single-phase self-contained requirements, Class 320 meter bases for 120/240 Volt, 400 Amp or 120/208 Volt Network, 400 Amp services, **must:**

- Be rated for 120/240 Volt or 120/208 Volt (Network) and 320 Amps continuous.
- Contain a Class 320 manual bypass block with clearances that can be found in Figure 35.

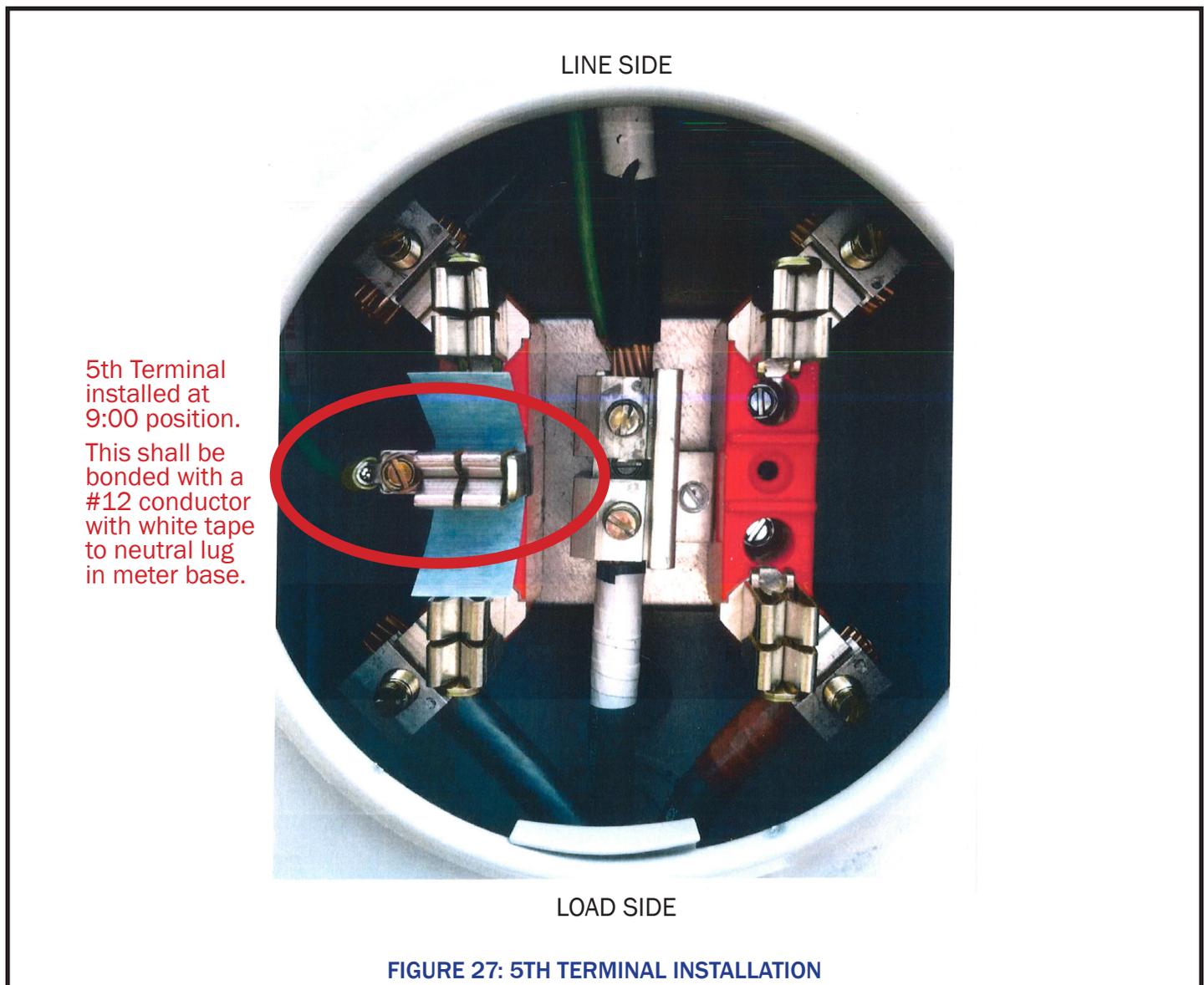


CLASS 320 UNDERGROUND METER BASE REQUIREMENTS

In addition to single-phase self-contained and Class 320 meter base requirements, Class 320 meter bases for underground services, **must:**

- Have lugs that accept up to 350 MCM aluminum wire.
- Accept three-inch (3") rigid galvanized steel or schedule 80 PVC conduit, through a knockout at the bottom left corner of the enclosure.
- Include pull strings in any underground service conduit.
- Have at least eight and one-half inches (8 ½") of clearance between the bottom of the lugs and the bottom of the enclosure.

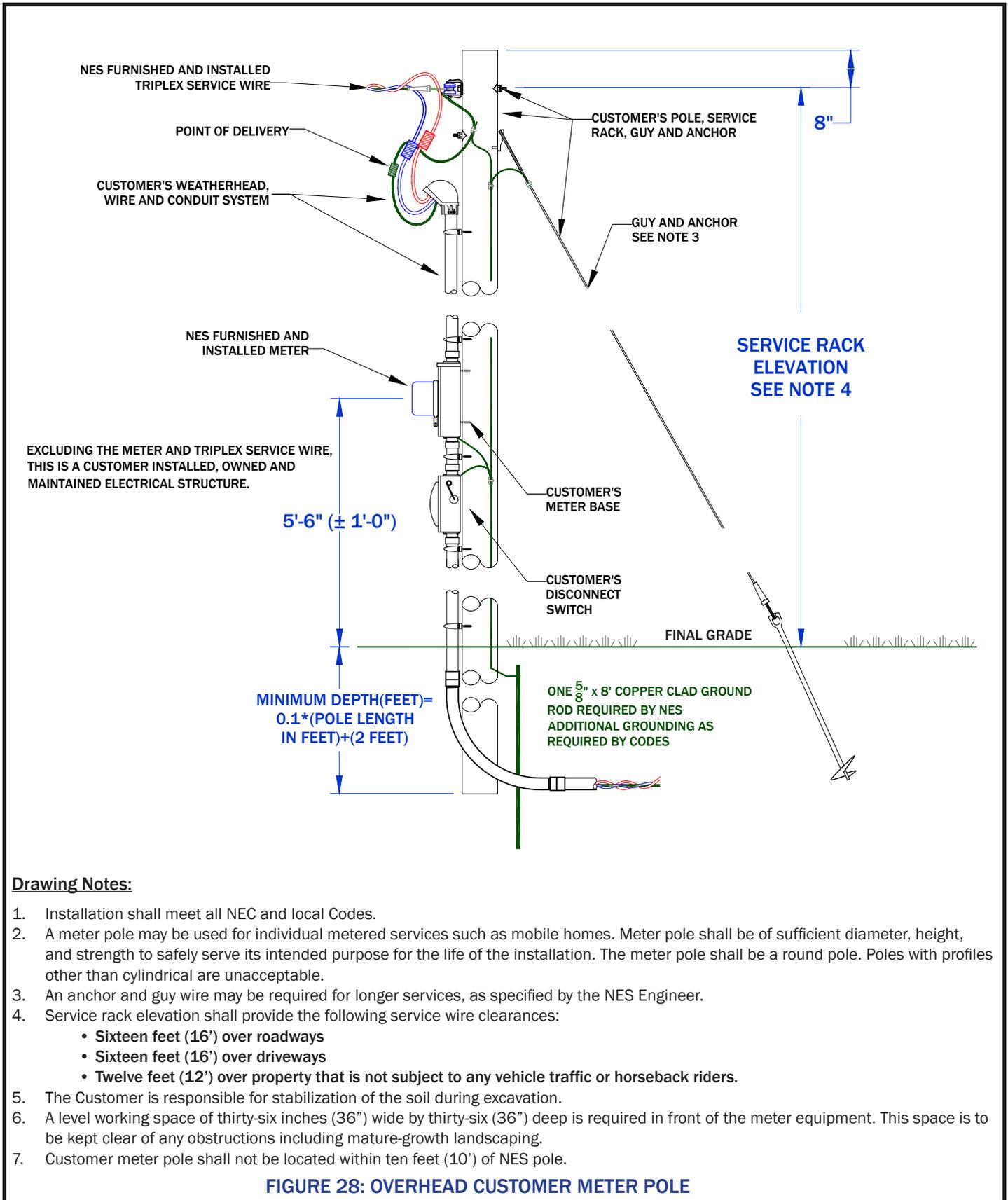
! NES will not energize a meter base with built in breakers, (temporary or permanent service), with the exception of multi-gang load centers.

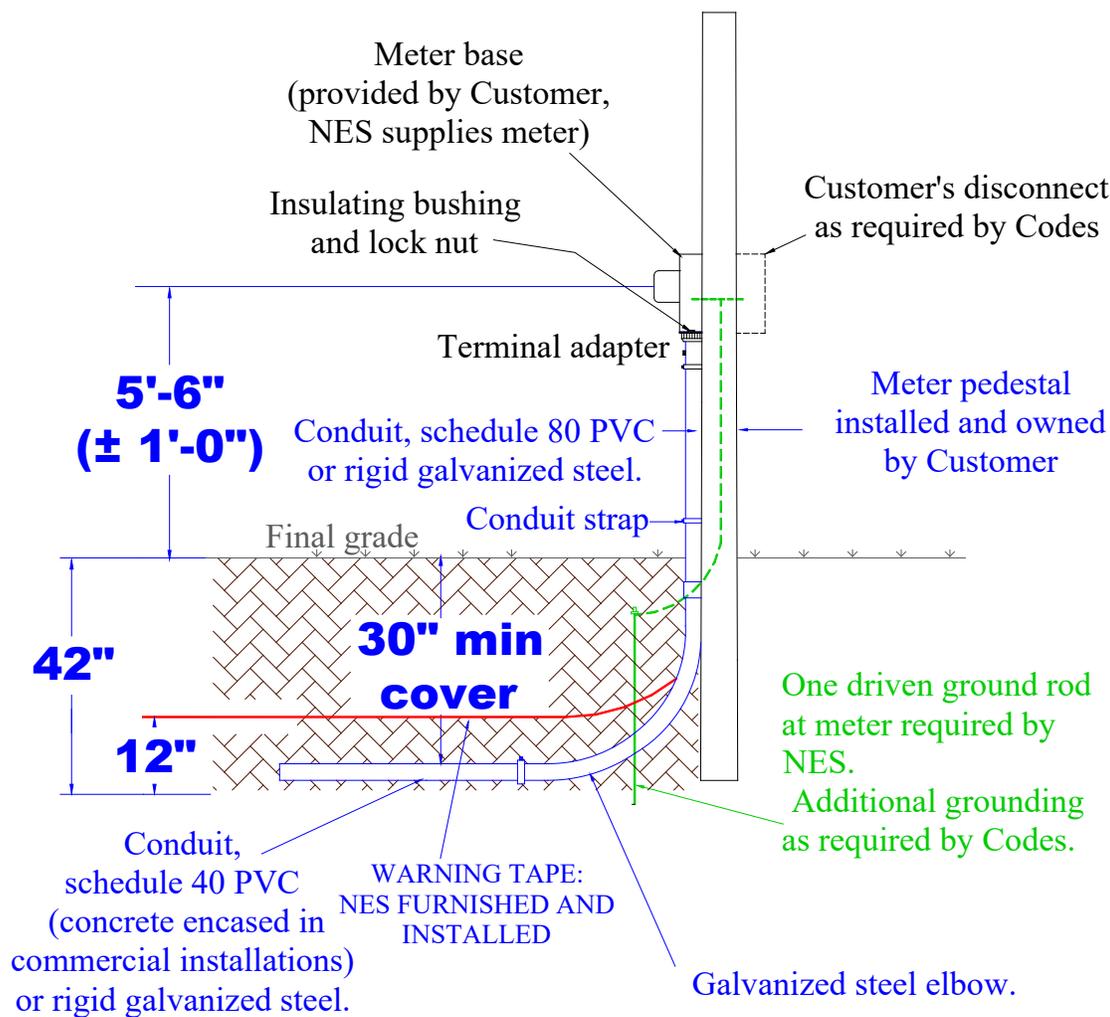




ELECTRIC SERVICE GUIDELINES

METERING





Drawing Notes:

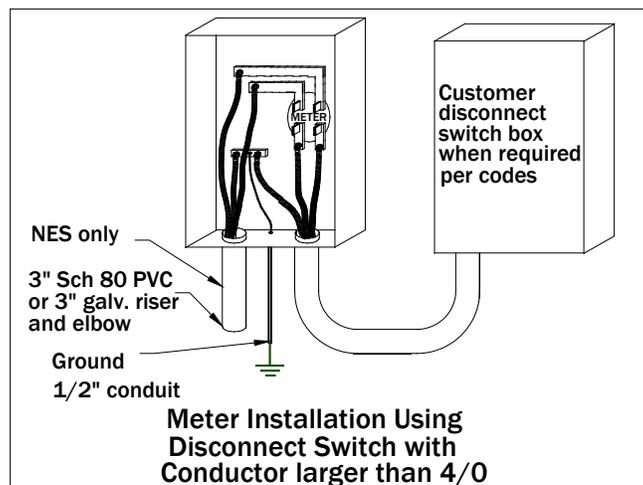
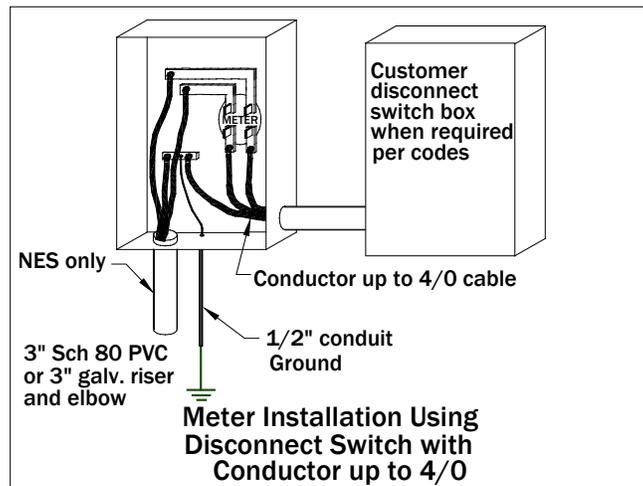
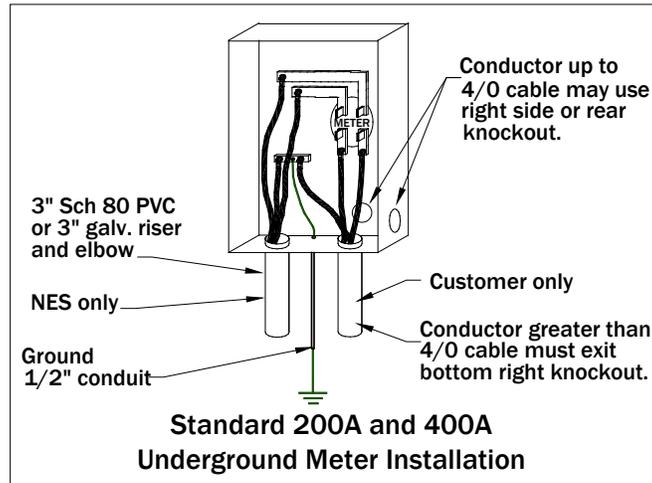
1. Installation shall meet all NEC and local Codes.
2. A level working space of thirty-six inches (36") wide by thirty-six inches (36") deep is required in front of the meter equipment. This space is to be kept clear of any obstructions including mature-growth landscaping.
3. The center of the meter base should be five feet six inches (5'-6") above finished grade or floor level.
4. Line side conductors shall be left side connected.
5. Pedestals shall be constructed of materials that will not easily or readily deteriorate over time. For example, minimum of 2" rigid galvanized steel post set in concrete with unistrut cross bracing, or a masonry wall with unistrut.
6. All underground service conduits shall have a pull string.
7. The Customer is responsible for stabilization of the soil during excavation.
8. Maintain a minimum of ten feet (10') clearance from NES poles.

FIGURE 29: UNDERGROUND CUSTOMER METER PEDESTAL



ELECTRIC SERVICE GUIDELINES

METERING



Drawing Notes:

1. Meter bases not in accordance with NES standards will not be energized.
2. Line side and load side conductors shall not cross in the meter base.

FIGURE 30: RESIDENTIAL UNDERGROUND METER CONNECTIONS



MULTI-FLOOR AND HIGH RISE METERING

Scan the QR code or visit: <https://www.nespower.com/-/media/project/nes/common/pdfs/builders-and-developers/highrisemeteringrequirements.pdf> to view the most recent Multi-floor and High Rise Metering requirements.



Electrical Room Requirements

No electrical meter room will be allowed inside without prior written NES meter department approval. Approval must be obtained before construction has begun.

The electrical room shall have a door accessible to a public area. The electrical room shall be well lit and always accessible to NES employees (24 hours/7 days-a-week). The size of the door shall be a minimum of two feet - eight inches (2'-8") by six feet - eight inches (6'-8").

Meter Base Sockets shall be located inside an electrical equipment room which is used solely for power equipment. Spaces dedicated as meter rooms shall have no other items in, or passing through the meter room that are not associated with NES metering.

Customer is responsible for:

- Purchasing and installing a four inch by four inch (4"x4") stainless steel key box adjacent to each "**Electrical Meter Room**" door with provisions for a NES padlock (7/16th" shank).
- Customer must provide a map for all "**Electrical Meter Room**" locations on the inside of associated meter room door of all Electrical Meter Rooms.
- Following any upgrade or change to an existing meter room service the Customer will be required to upgrade room access with key box, as well as any Advanced Metering Infrastructure (AMI) requirements.
- All metering services shall meet all working clearances as defined in Figure 35 in the meter section of this manual.
- Maintain a current working key or key fob inside the box which allows access to the electrical meter room.
- Installing a sign on the exterior door saying "**Electrical Meter Room**"

Failure to meet electrical room requirements will cause electric service to be disconnected until requirements are met.

Metered Circuit Requirements

- Sufficient clearance for adequate cable bending radius shall be provided to avoid placing undue strain on the terminal facilities.
- Terminals shall be rated for the conductor size being used.
- Strands shall not be removed from the conductor in order to fit under-sized terminals.
- When a three-phase transformer provides single-phase 120/208 Volt service, it is the Customer's responsibility to add a 5th terminal in the 9 o'clock position on the meter base as well as identify the conductors and balance the load on the transformer. This is provided by the Customer.
- Line-side conductors shall always be connected to the top terminals of the meter base. Line and load conductors shall not cross in the base.
- Service conductors shall be arranged in the base to avoid interfering with the meter installation or operation of the bypass blocks.
- Current limiting fuses shall not be installed in meter bases, instrument transformer enclosures, or NES distribution transformers. Current limiting fuses shall be installed in the Customer's service panel, or in a separate enclosure between the base and the panel.



ELECTRIC SERVICE GUIDELINES

METERING

Customer Owned-Meter Poles and Pedestals

If the meter base needs to be attached to a separate structure instead of directly on the building, the Customer is responsible for the purchase and installation of the meter pole or pedestal, and related equipment as shown in Figure 28 for overhead service, and in Figure 29 for underground service. The Customer retains ownership of the equipment.

The location requirements for this equipment are the same as those listed in this section for a meter base.

Service to Fire Pumps

Service to fire pumps shall be metered three-phase, four-wire, wye, with CT's. A neutral is required in the CT cabinet.

METER TROUGHS AND SECONDARY TERMINATION ENCLOSURES

For the protection and safety of NES personnel, NES shall not connect to any new troughs. Troughs shall be replaced with a termination enclosure (provided by the Customer) under the following circumstances: Adding load, upgrading service, adding a new service, or replacing NES line side conductors. NES will still connect a finalized account provided that the amperage does not exceed the meter base rating. Secondary termination enclosures may be required on commercial services where multiple CT rated services will be used. This determination will be made by the NES engineer when the job is designed.

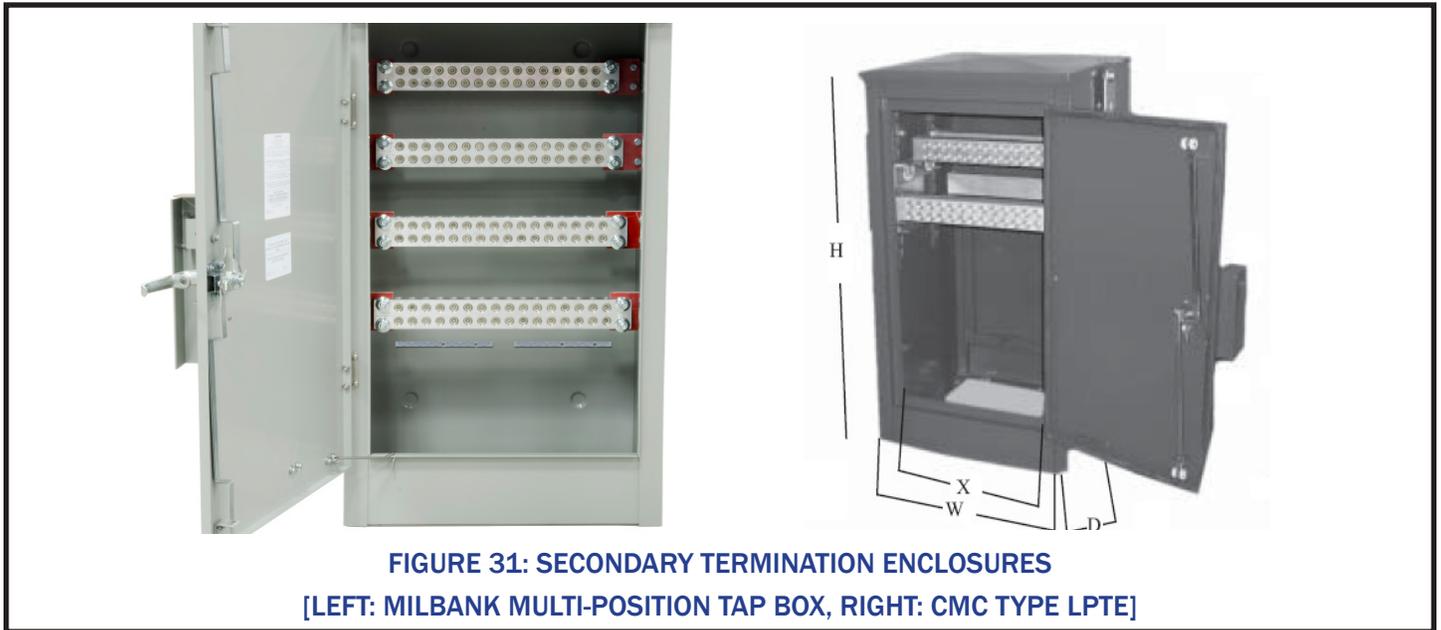


FIGURE 31: SECONDARY TERMINATION ENCLOSURES
[LEFT: MILBANK MULTI-POSITION TAP BOX, RIGHT: CMC TYPE LPTE]

Termination enclosures can be purchased at local electrical distributors such as the ones listed in Table 14. More information on termination enclosures can be provided at the Pre-Construction Meeting. Termination enclosures are the property of the Customer. NES requires an NES lock on these enclosures. The NES Meter Department (615) 747-3805 will unlock enclosure for the Customer when necessary. The enclosures listed in Table 16 are acceptable part numbers. Obtain approval from NES Meter Department prior to purchasing other solutions.



TABLE 16: APPROVED SECONDARY TERMINATION ENCLOSURES

	MAX WIRE SIZE	NUMBER OF LUGS	WIDTH	DEPTH	HEIGHT	MAXIMUM UL RATING	
MILBANK PART #	IN KCMIL		DIMENSIONS IN INCHES			IN AMPS	
UAP6094-O-NES	500	16	25 5/8	16	43	3,000	
UAP6095-O-NES	500	22	32 3/8	16	43	4,000	
UAP6096-O-NES	750	14	25 15/16	16	51	3,300	
CMC/ESP PART #						COPPER	ALUMINUM
LWTE21-500	500	21	32	16	51	3,800	3,100
LWTE14-750	750	14	32	16	51	3,325	2,695
LWTE14-1000	1000	14	32	16	51	3,815	3,115

Each individual service in the termination enclosure shall be labeled by unit number, apartment number, suite number, space number, on the service cable for disconnect/reconnect purposes. All conductors shall be routed behind the termination enclosure buss work.

! A disconnect is allowed in front of a termination enclosure, but is not allowed between the termination enclosure and the meter.

SPECIAL APPLICATION SECONDARY TERMINATION ENCLOSURES

TABLE 17: SPECIAL APPLICATION SECONDARY TERMINATION ENCLOSURE

PADMOUNT TRANSFORMER SECONDARY CONDUIT & CONDUCTORS

(MAXIMUM QUANTITY, SIZE, & TYPE BY LOCATION) 3Φ - 208/120V OR 480/277V @ 100% MAX. LOAD, 90 °C.

Transformers 500kVA or less requiring more than (8) - 750MCM copper secondary conductors shall have a [Special Application Secondary Termination Enclosure](#) connected as shown below.

Transformers greater than 500kVA requiring more than (12) - 750MCM copper secondary conductors shall have a [Special Application Secondary Termination Enclosure](#) connected as shown below.

TRANSFORMER SIZE (KVA)	208/120V			480/277V		
	CONDUIT	CONDUCTOR	RATING (A)	CONDUIT	CONDUCTOR	RATING (A)
75	(2) - 4"	(1) - 4/0 AL	225	(2) - 4"	(1) - 4/0 AL	225
150	(3) - 4"	(2) - 4/0 AL	450	(2) - 4"	(1) - 4/0 AL	225
225	(4) - 4"	(2) - 500 AL	740	(3) - 4"	(2) - 4/0 AL	450
300	(6) - 4"	(3) - 500 AL	1110	(3) - 4"	(1) - 500 AL	370
500	(8) - 4"	(4) - 500 AL	1480	(4) - 4"	(2) - 500 AL	740
750	(12) - 4"	(6) - 500 AL	2220	(5) - 4"	(3) - 500 AL	1110
1000	(12) - 4"	(8) - 500 AL	2960	(7) - 4"	(4) - 500 AL	1480
1500	(12) - 4"	(12) - 500 AL	4440	(9) - 4"	(5) - 500 AL	1850
2000	NOT APPLICABLE			(12) - 4"	(7) - 500 AL	2590
2500	NOT APPLICABLE			(12) - 4"	(9) - 500 AL	3330

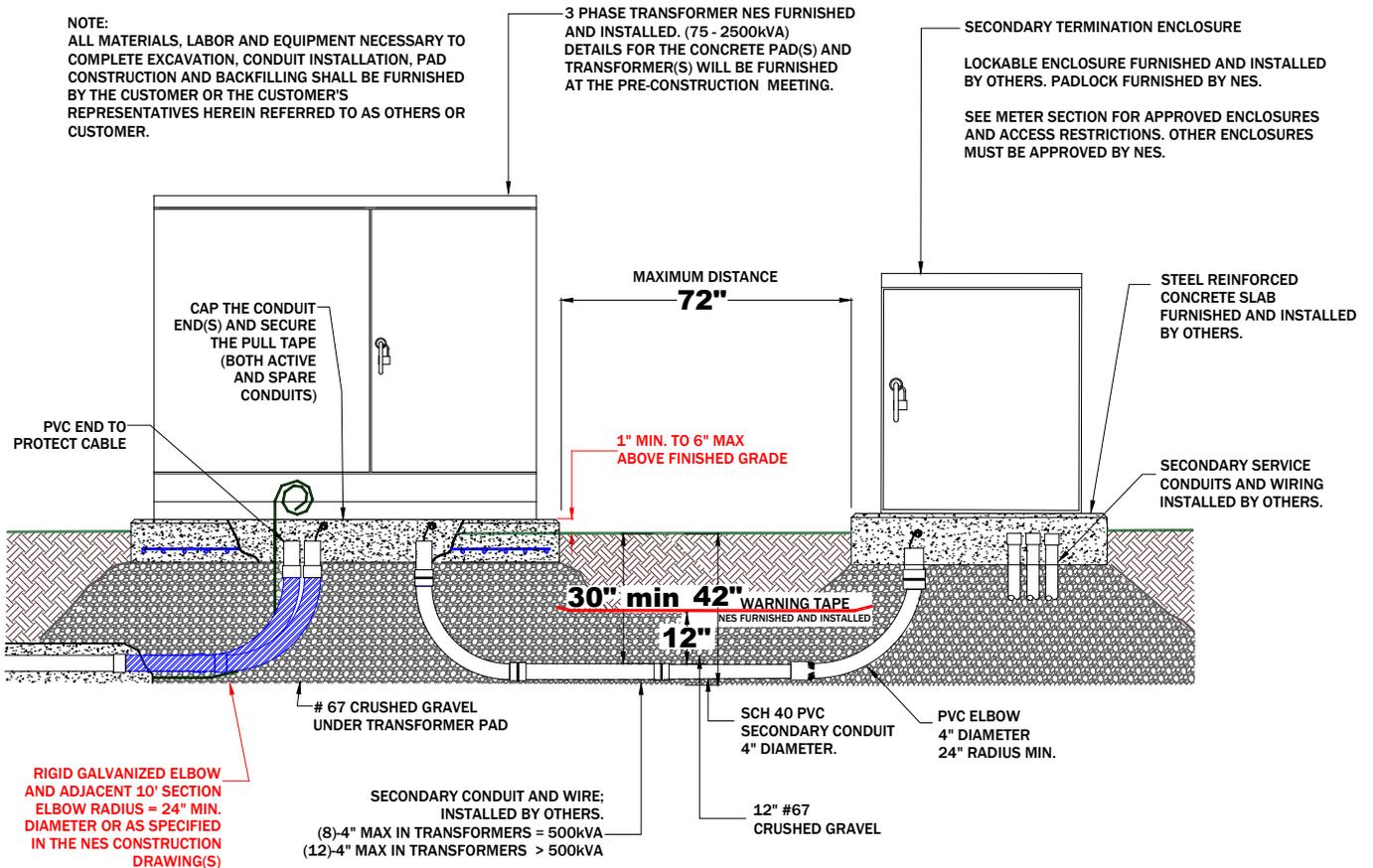
Notes:

- This table applies only to Special Application STE's needed to comply with NEC service conductor requirements.
- Conductors listed are 4/0 Wake Forest and 500 Wofford quadruplex aluminum.



ELECTRIC SERVICE GUIDELINES

METERING



INSTALLATION MUST BE INSPECTED BY NES

REFER TO FIGURE 69 - DITCH INSPECTION PROCESS

Drawing Notes:

1. Customer shall furnish and install secondary service equipment. Once energized, NES shall maintain equipment up to Point of Delivery (POD) as shown in Figure 33.
2. Enclosure shall have removable sides and top for clear cable pulling access.
3. Enclosure shall have penta-head bolt with access door and padlocking provisions.
4. Enclosure shall have no exposed screws or fasteners. (Prevents unauthorized disassembly or internal access)
5. No other utility equipment, conduit, or cabling is allowed within 6' feet of secondary termination enclosure.
6. Enclosure exterior shall be permanently and legibly marked indicating its source. (Transformer number, pole number, etc.)
7. See Table 16 for pre-approved list of enclosures. Others must be approved in writing by NES Engineering. Customer shall select Termination Enclosure based on NEC requirements.
8. Transformer and termination enclosure grounds shall be bonded together.
9. This detail applies only to Special Application STE's needed to comply with NEC service conductor requirements, see Table 17.

FIGURE 32: SPECIAL APPLICATION SECONDARY TERMINATION ENCLOSURE – DITCH DETAIL



3-PHASE PADMOUNT TRANSFORMER: (75 -2500kVA)
NES FURNISHED AND INSTALLED

SERVICEABLE BAYONET FUSES AND TAP CHANGER
LOCATED IN PRIMARY WIRING COMPARTMENT (NOT SHOWN)

(SECONDARY WIRING COMPARTMENT
CONNECTIONS SHOWN)

SECONDARY
TERMINATION
ENCLOSURE
LEFT SIDE -
UTILITY WIRING

SECONDARY
TERMINATION
ENCLOSURE
RIGHT SIDE -
CUSTOMER WIRING

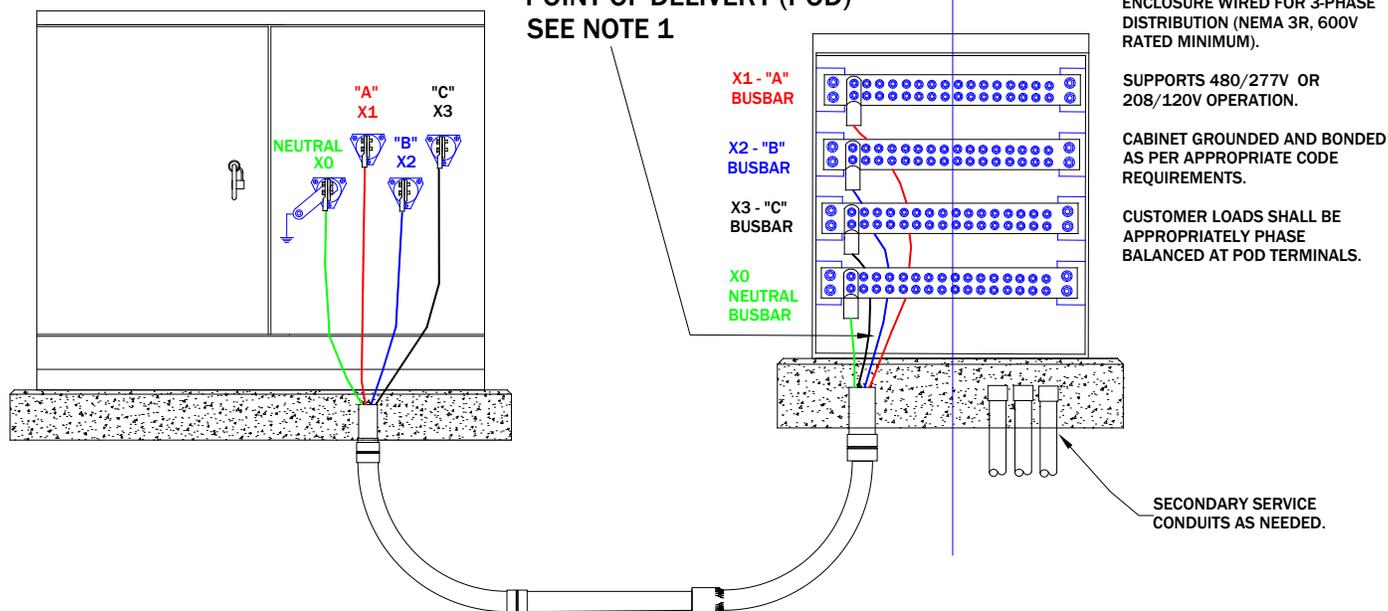
**SPECIAL APPLICATION STE
POINT OF DELIVERY (POD)
SEE NOTE 1**

SECONDARY TERMINATION
ENCLOSURE WIRED FOR 3-PHASE
DISTRIBUTION (NEMA 3R, 600V
RATED MINIMUM).

SUPPORTS 480/277V OR
208/120V OPERATION.

CABINET GROUNDED AND BONDED
AS PER APPROPRIATE CODE
REQUIREMENTS.

CUSTOMER LOADS SHALL BE
APPROPRIATELY PHASE
BALANCED AT POD TERMINALS.



Drawing Notes:

1. For Special Application Secondary Termination Enclosures (STE) the Point of Delivery (POD) shall be the Utility Wiring side of the enclosure.
 - Utility cables and connections shall be NES maintained in the left half of enclosure.
 - Customer cables and connections shall be customer maintained in the right half of enclosure only.
 - Customer shall maintain all conduit.
2. Once energized, access to secondary termination enclosure shall be restricted and controlled by NES.
3. 2-hole single barrel compression lugs (9/16" diameter x 1-3/4" spaced, rated for 90 °C) shall be used for connections inside enclosure.
4. Maximum cable and lug size used between transformer and termination enclosure shall not exceed 750MCM.
5. Lug connections shall not be obstructed and shall have clear "straight-in" access for installation/removal tools.
6. Enclosure exterior shall be permanently and legibly marked, indicating its source. (Transformer number, pole number, etc.)
7. Access door and all exposed metal surfaces shall be grounded as per applicable codes.
8. See Table 16 for pre-approved list of enclosures. Others must be approved in writing by NES Engineering. Customer shall select termination enclosure based on NEC requirements.
9. This detail applies only to Special Application STE's needed to comply with NEC service conductor requirements, see Table 17.

FIGURE 33: SPECIAL APPLICATION SECONDARY TERMINATION ENCLOSURE – WIRING DETAIL



ELECTRIC SERVICE GUIDELINES

METERING

THREE-PHASE SELF-CONTAINED METER BASE REQUIREMENTS

All meter bases must be on approved meter base list on www.nespower.com. Commercial meter bases shall:

- Center of meter base must be mounted at 5'- 6" (\pm 1'- 0") from final grade.
- Be UL (Underwriters Laboratory) approved.
- Be rated for exterior use, and be weather proof according to NEMA-3R.
- Have all unused openings closed with plugs that are locked tightly in place from inside the base or enclosure.
- Be level, plumb and securely fastened to the supporting structure.
- Be bonded and grounded in accordance with Articles 230 and 250 of the latest edition of the NEC (when self-contained meter bases are used, the neutral conductor shall be connected to the neutral terminal in the base).
- Not be jumpered to provide power.
- Have terminals marked with a conductor range for aluminum or copper conductors (When aluminum conductors are used, the base shall be approved and clearly marked by the manufacturer for that use).
- Be covered and sealed with a transparent cover plate when a meter is not installed if the base contains energized equipment.
- All underground service conduits shall have a pull string.
- Have a manual bypass block with 36" of working clearance to the right of the handle.

It has been determined by NES that the by-pass handle mechanism in an Anchor meter socket is dangerous, and prone to catastrophic failure when operated by utility personnel. For the protection and safety of NES personnel, the NES Meter Department considers all Anchor brand bases with a bypass handle condemned at the time the account is final, or the account is cut off for nonpayment. It is the Customer's responsibility to replace with an approved meter base.

! NES will not energize a meter base with built in breakers, (temporary or permanent service), with the exception of multi-gang load centers.

NES does not allow the use of a 600 amp self-contained meter base (K-7 meter base). A K-7 base cannot be repaired, or be replaced with a K-7 base. For the protection and safety of NES personnel, the NES Meter Department considers all K-7 meter bases condemned at the time the account is final, or the account is cut off for nonpayment. It is the Customer's responsibility to replace with an approved meter base. The service must be replaced with a CT rated service.



CURRENT TRANSFORMER (CT) RATED METER BASE REQUIREMENTS

NES provides the actual Current Transformers. The Customer shall pick up the CT's from the NES Meter Department, 300 George L. Davis Boulevard, (615) 747-3805, between the hours of 7:00AM to 2:00PM before purchasing a base. This provides the Meter Department time to assist the Customer in selecting the correct CT-rated base which should be purchased. The table below gives general guidelines:

TABLE 18: CT BASE GUIDELINES	
IF THE SERVICE IS:	BASE NEEDED:
3 wire single-phase service (with 2 CT's)	Form 5S, 8 terminal
4 wire three-phase service (with 3 CT's)	Form 9S 13 terminal meter socket

Customer is required to purchase the CT-rated meter base. Approved meter base list is located at www.nespower.com under the Builders & Developers page.

In addition:

- Mount metering cable weatherhead at least six inches (6") above the highest mounted CT.
- Locate the meter base no more than thirty feet (30') from the CT's.
- CT and PT brackets shall be mounted either on the service conductor riser, or between the service conductor riser and the point of attachment.
- Overhead services require heel-to-heel mounting bracket (provided by NES) for CT and PT installation. The bracket may be mounted to the building structure or a riser.
- For ALL CT-rated services provide conductor long enough to pass through the CT's and an additional twenty-four inches (24") of conductor past the CT's.
- Install the CT cabinet such that top of the CT cabinet is a maximum of six feet and eight inches (6'-8") above the floor or finished grade and the bottom is a minimum of eighteen inches (18") above the floor or finished grade. CT cabinets must not be mounted in crawl spaces, attics, any confined areas, or mounted on ceilings.
- All metering conduit must be rigid galvanized steel.
- Remove all concentric knock outs when installing galvanized steel conduit between the meter base and CT location. The size of the conduit will be determined by the size of the hole with all the concentric knockouts removed.
- For overhead services only, use a one inch (1") rigid galvanized steel conduit in the supplied hub up to the CT location. Conduit must be as short as possible, and must not exceed thirty feet (30') in length.
- Flex conduit is not acceptable in meter circuits. The conduit must not contain condulets, tees, or junction boxes. Conduit shall not contain any screw connectors or compression fittings. All conduit shall be threaded.
- All conduit with more than 90 degrees worth of total bends must be 1 1/2" conduit and must have mule tape rated for 500lbs or equivalent installed.
- Conduit shall not be used for grounding, or any other purpose, other than NES metering cable.
- For underground services only, Customer shall install CT cabinet, including lockable hinged door. Cabinet must not block a safe exit while open. Customer shall provide the CT cabinet.

! A disconnect is allowed in front of a termination enclosure, but is not allowed between the termination enclosure and the meter.



ELECTRIC SERVICE GUIDELINES

METERING



NO

YES

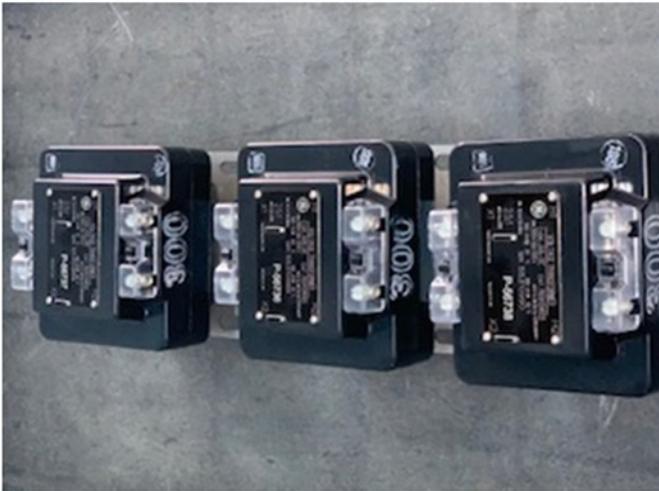
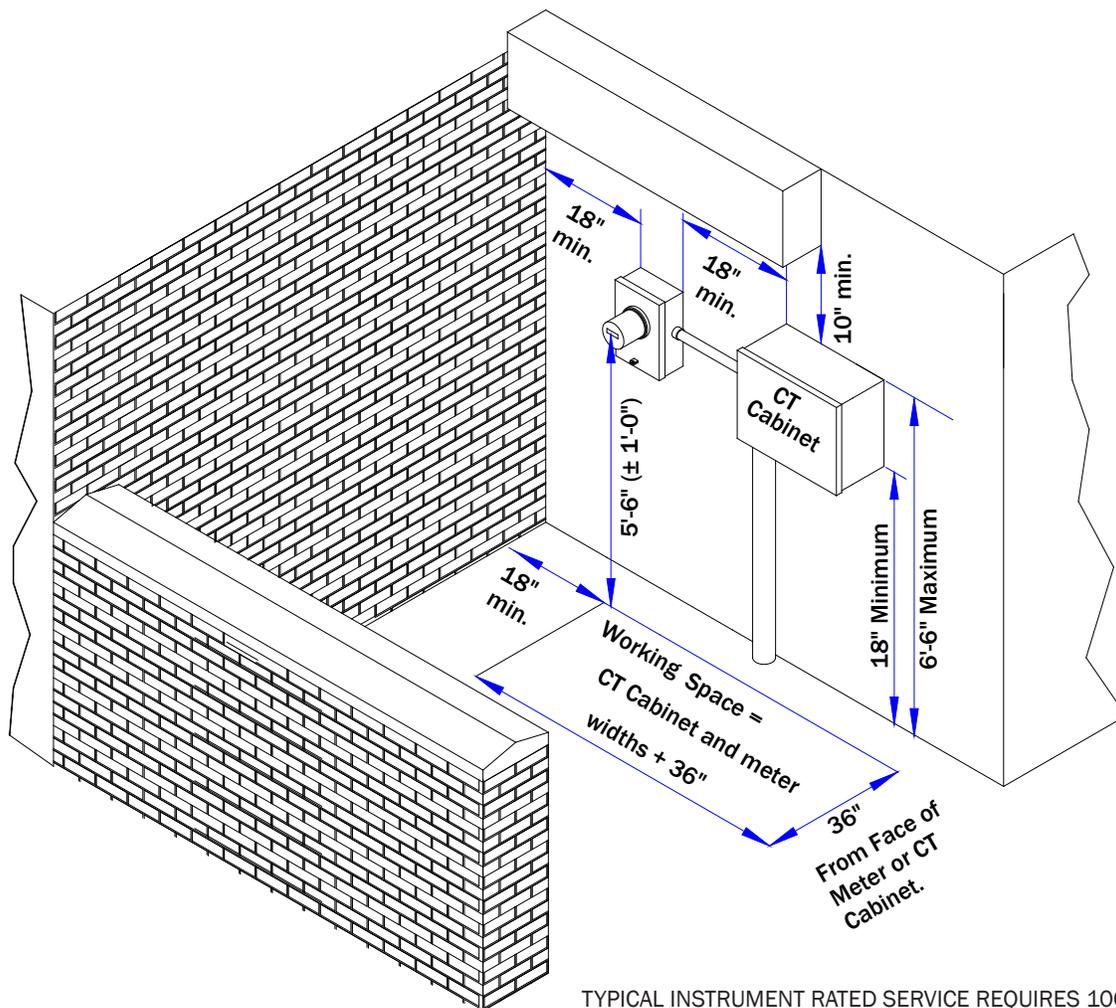


FIGURE 34: CT/PT EXAMPLES

Functions and Orientations of a Current Transformer (CT)

A current transformer (CT) is used to measure the current flow in a conductor or group of conductors. Every CT also has a primary side which must be where the line side of the conductor(s) enter the CT opening. This may also be referred to as the utility side, source side, transformer side, or line side, and it is of great importance to have this installed correctly. **The primary side (above the window or opening) of a CT is marked with either H1 or a white dot that is usually within a raised ring or bump (see Figure above).** If the number of conductors exceeds the size of the CT window, refer to the Switchgear Metering section.



TYPICAL INSTRUMENT RATED SERVICE REQUIRES 100 LINEAR INCHES OF WALL SPACE FOR METERING EQUIPMENT.

Drawing Notes:

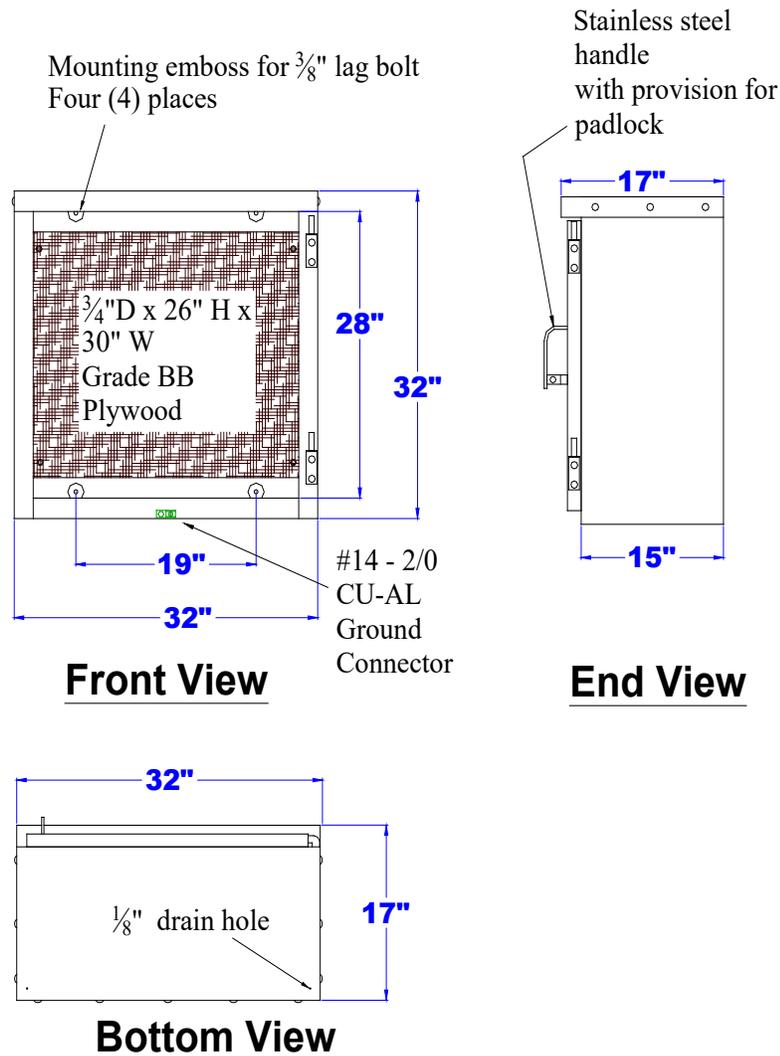
1. Installation shall meet all NEC and local Codes.
2. Working space shall be provided for equipment maintenance at all times. Minimum working area extends eighteen inches (18") beyond both sides of the total width of the meter and CT cabinet installation and projects thirty-six inches (36") out from the surface of the CT cabinet or meter.
3. There shall be open access to the meter assembly for Meter Services personnel.
4. Do not install any obstruction above the meter base. NES equipment may be installed such as a CT cabinet below the meter base as long as it meets local code ordinances, and NES minimums as defined above. **There shall be no other utility meters (such as gas), air conditioners, or other non-NES obstructions installed directly below the meter base. Any other installations should have a minimum eighteen inches (18") of horizontal clearance from the meter base.**
5. NES equipment may be installed such as a CT cabinet below the meter base as long as it meets local code ordinances, and NES minimums as defined in Figure 36 of this manual.
6. **The edge of all meter base enclosure shall be a minimum of eighteen inches (18") from adjacent walls, ceilings, gas meters and related piping, or any other similar obstruction.** All service equipment, additional meter bases, including disconnect switches shall be a minimum of eighteen inches (18") from the edge of the meter socket.

FIGURE 35: METER CLEARANCES



ELECTRIC SERVICE GUIDELINES

METERING



Drawing Notes:

1. CT cabinets are required for underground services but, may be used for overhead services as well.
2. NES-approved CT cabinet shall be provided by Customer.
3. **Contact the NES Meter Department, (615) 747-3805, for prior approval of alternate cabinet size where space requirements are critical.**
4. Construction material is 100 5052-H32 aluminum. Finish is natural aluminum.
5. All hardware and hinges are stainless steel.
6. Doors are to be removable.
7. All flanges are to be one inch (1").
8. All conductors passing through a CT cabinet shall be marked with phasing tape.
9. All conduit in CT cabinet shall be marked Line / Load using a permanent marker.
10. The Customer shall provide a #4 AWG copper wire from the ground rod to the grounding block inside the CT cabinet. CT cabinets shall be grounded and bonded in compliance with the current NEC.
11. Minimum of 24" of conductor tail must pass through the CT's
12. All underground service conductor conduits shall have a pull string.
13. Any conduits entering or exiting the top of the CT cabinet shall be water proof.
14. If equipment is stacked, check with local inspector for approval.

FIGURE 36: CURRENT TRANSFORMER (CT) CABINET



SWITCHGEAR METERING (LESS THAN 600 VOLTS)

- All switchgear metering designs shall have prior approval by NES Meter Department. (Approved manufacturers include: Eaton, Schneider, AMP, Milbank, and GE. Any other manufacturer must be submitted for approval before installation.)
- Please contact NES Meter Department for stand alone metering solutions, (615) 747-3805.
- All switchgear metering shall be hot sequenced. (breakers and disconnects after the meter bay)
- **Ask about fire pump section, after meter, before breaker.**
- Shall be bottom feed through the metering compartment.
- All metering bays in switchgear must be of sufficient size to mount CT's and PT's in the metering bay, and secure the compartment with a NES padlock (7/16" diameter).
- All CT's and PT's in switchgear must be issued by NES Meter Department.
- Metering equipment mounted in metering bay shall be no lower than eighteen inches (18") from final grade and no higher than six feet (6') from final grade.
- CT secondary termination must be mounted so that its between the bus and the door with no other obstructions.
- CT's must be supported and not affixed to a nonconductive shelf.
- On 480V services, PT's shall either be mounted in the same bay as the CT's or in a lockable bay just above or below the CT bay, and must be easily accessible from the front. A (1") chase nipple shall be installed between the CT and PT compartments.
- All busses in the metering bay used to pass through the CT's shall be no larger than four inches (4"). Any other size buss must be approved by NES Meter Department prior to ordering the gear.
- All metering equipment shall be mounted by electrical contractors.
- NES Meter personnel will make all meter equipment secondary connections.
- Customer shall provide UV- rated placard denoting the voltage in the metering compartment.
- No monitoring equipment or surge protection devices shall be installed on the line side of the CT's.
- All rigid conduit installed from the meter base to the switchgear shall run directly to the section in which the CT's and PT's are installed.

SWITCHGEAR METERING (PRIMARY)

- All primary switchgear metering designs shall have prior approval by NES Meter Department.
- All switchgear metering shall be hot sequenced. (breakers and disconnects after the meter bay)
- All metering bays in switchgear must be of sufficient size to mount CT's and PT's in the metering bay, and secure the compartment with a NES padlock (7/16" diameter).
- All CT's and PT's in switchgear must be issued by NES Meter Department.
- All metering equipment shall be mounted by the switchgear manufacturer.
- Switchgear manufacturer will make all the primary side connections.
- NES Meter personnel will make all meter equipment secondary connections.
- Customer shall provide UV rated placard denoting the voltage in the metering compartment.



ELECTRIC SERVICE GUIDELINES

METERING

METER IDENTIFICATION AND TAGGING POLICIES

1. Any premise, address, or lot that has multiple metered services shall be required to properly tag and identify each individual metered service that corresponds with NES billing information.
2. All identification tags shall meet the following requirements:
 - Be outdoor rated brass or stainless steel. Trophy brass, or brass plated **will not** be accepted.
 - Minimum tag size shall be one by three inches (1"x3").
 - Minimum character height shall be one half inch (1/2").
 - Characters shall be stamped or CNC machined.
 - Tags shall be attached with either rivets or screws.
 - On a single meter base application the tag shall be attached on the face of the meter cover.
 - On a multi-gang meter center the tag shall be attached to the front panel center beneath the main breaker.
 - On any multi-gang meter center that has multiple breakers covered, the tag shall be attached to the appropriate side on the meter center at approximate height of the meter.
 - The alpha numeric phrase on the tag shall include the complete apartment, building number and street address that corresponds with NES billing information.
3. **Any maintenance, repairs, or replacement of multi-gang meter bases shall be required to be identified by an approved NES tag.**
4. Any vendor may be used to supply the meter base identification tags provided they meet the requirements outlined in this section, and **been pre-approved by NES Meter Department prior to tag installation.** The vendors below are known to carry approved NES identification tags

TABLE 19: METER TAG VENDORS

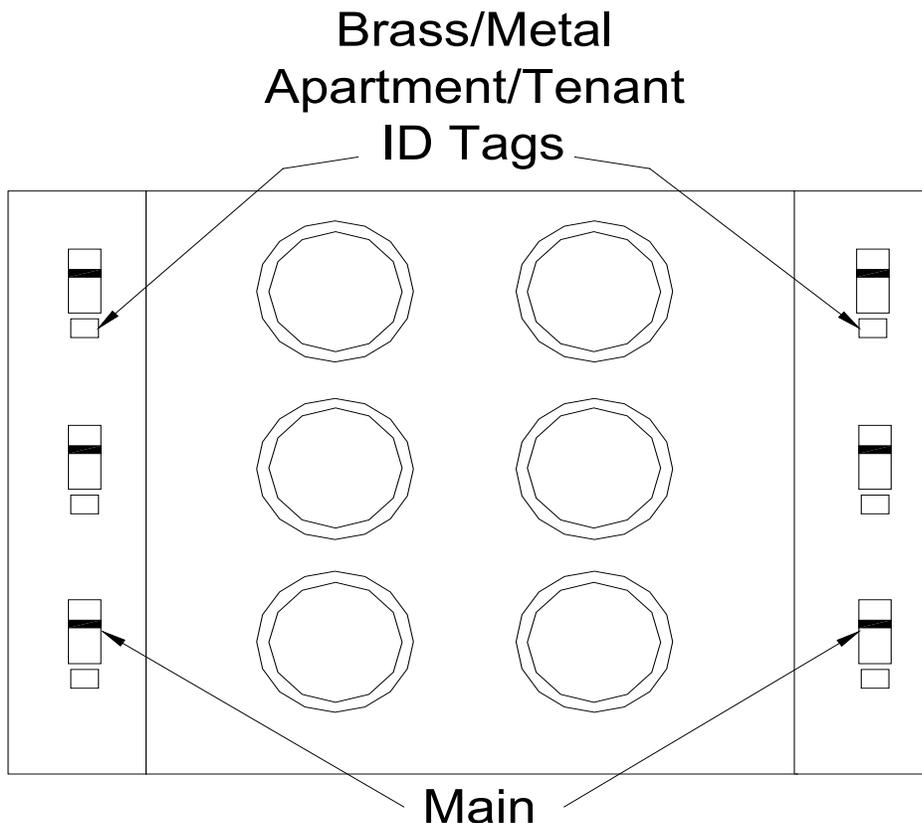
Demented Tags 509 N Graycroft Ave. Madison, TN 37115-2508 (615) 300-8186	Border States Electric 656 Wedgewood Ave. Nashville, TN 37202 (615) 255-4161	E & J Engraving 7766 Highway 100 Bellevue ,TN 37221 (615) 405-0800	Specialty Engraving Co. P.O. Box 131 3042 York Rd Pleasant View, TN 37146 (615) 351-1962
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5. **Owners or management companies are responsible for NES time spent investigating, billing, and/or correcting crossed meters due to unmarked or incorrectly marked bases.**
6. **All tagging shall coordinate with postal plan.**



MULTIPLE METER INSTALLATIONS (“GANG METERS”)

Multi-unit, or “gang” meters, shall be labeled to identify the part of the premises they serve before service will be energized (as shown in Figure 37 below).



Drawing Notes:

1. Multi gang meter bases shall be listed on the approved meter base list at www.nespower.com
2. **Any maintenance, repairs, or replacement of multi-gang meter bases shall be required to be identified by an approved NES tag.**
3. ID Tags shall be outdoor rated brass, or stainless steel.
4. Identification tags shall be a minimum of 1" x 3" and shall be **stamped**, or **CNC Machined** with a minimum character of 1/2" in height, placed either directly above or below the breaker.
5. **Owners or management companies are responsible for NES time spent correcting crossed meters due to unmarked or incorrectly marked bases.**
6. The center of the gang base shall be approximately five feet (5') above the floor or finished grade
7. Maximum numbers of vertical meters shall not exceed five (5).
8. Meters and related equipment shall be adequately protected from physical damage.
9. Meter pedestals shall be constructed of materials that will not easily or readily deteriorate over time. For example, materials could be rigid galvanized post set in concrete with unistrut cross bracing or a masonry wall. Gang meter base (s) shall not be mounted on any wood pedestal.
10. Maximum individual service size in a gang meter center is up to 225 Amps.
11. **No Surge Protection on the line side of any meter service.**
12. **Buss extension may be required. Check with NES Meter Department before ordering and installing.**
13. **Residential single-phase fed from a pad-mounted transformer to a gang meter center and a main disconnect shall be treated like a commercial service. The Customer owns, installs, maintains, and locates the cable from the transformer to the breaker lugs.**

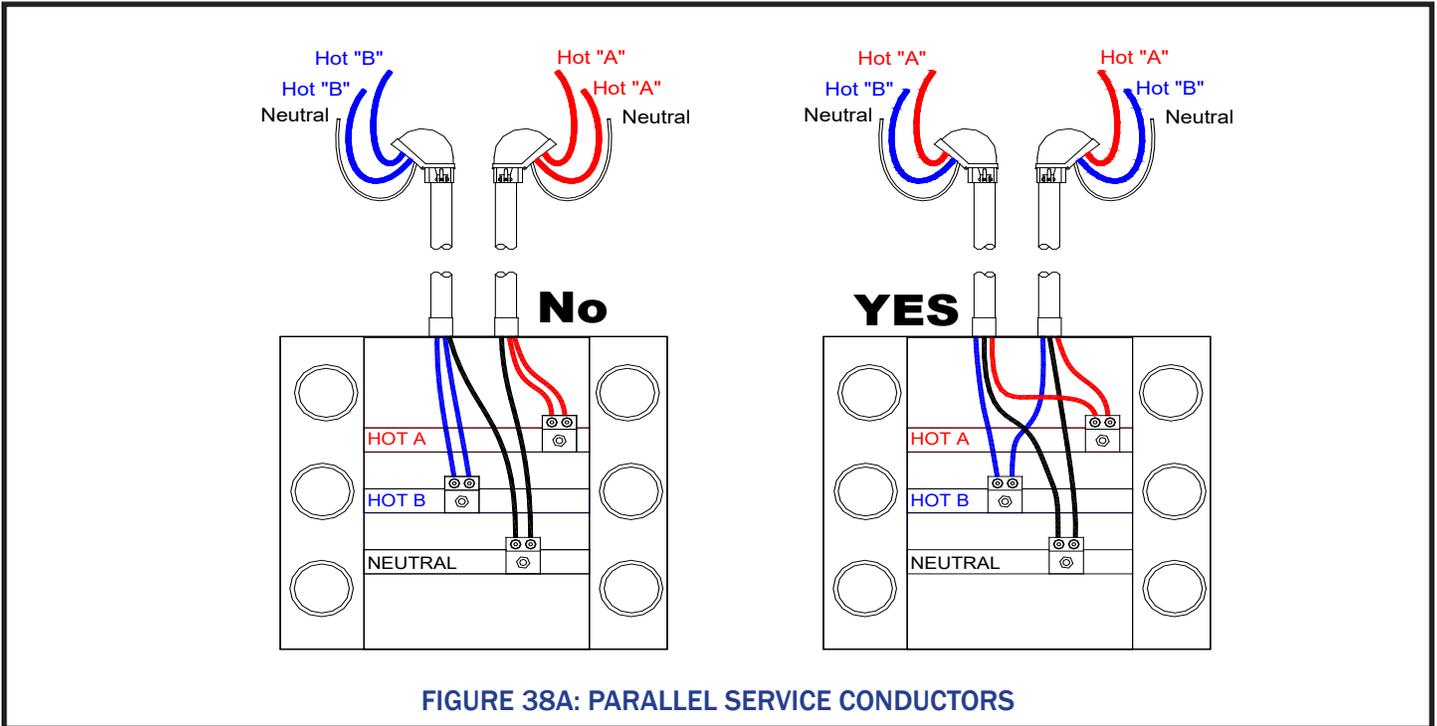
FIGURE 37: GANG METER DETAILS



ELECTRIC SERVICE GUIDELINES

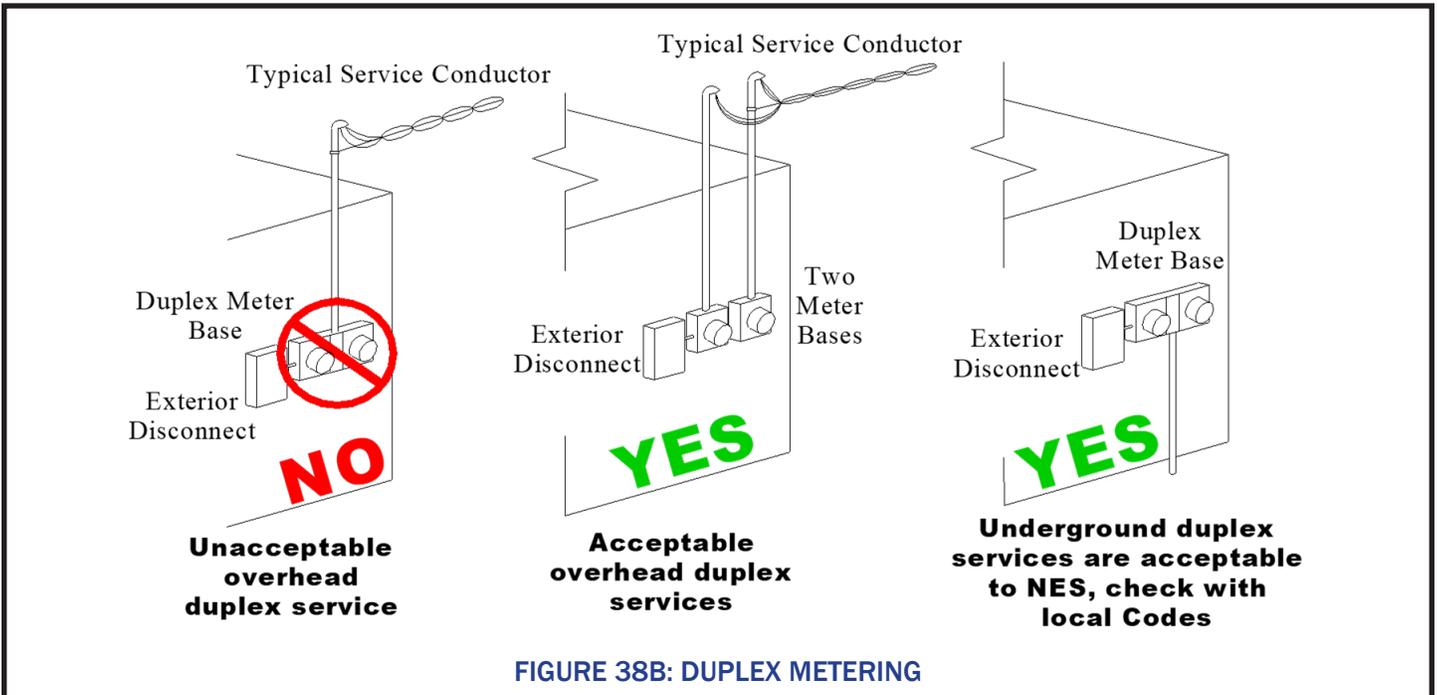
METERING

When the Customer's panel requires parallel service conductors in multiple conduits to support the electrical load, each conduit shall be comprised of a neutral and one conductor tied to each hot bus in the panel.



Duplex Metering

Duplex meter bases for overhead service are not allowed (see Figure 38B), but is acceptable for underground service if it is approved by the Codes inspector. Triplex meter bases shall not be used on a duplex residential service. Duplex meter bases shall be labeled as described in the drawing notes for (Figure 37: Gang Meter Details).



ELECTRIC SERVICE GUIDELINES POWER PRODUCTION FACILITIES



CHAPTER 6 - POWER PRODUCTION FACILITIES

INTRODUCTION

This section for Power Production Facilities (PPF) has been developed as a general guide to aid those wishing to install production facilities on their property. Please become familiar with all information prior purchasing materials. Many steps may be completed by contractors or electricians, but the ultimate responsibility of the PPF belongs to the Customer. Refer to other sections of this Guideline for topics which may also apply to your project.

! NES strongly recommends that you not purchase any project equipment or materials until you have received approval to interconnect.

This Section Includes PPF guidelines for the following types of installations:

- PPF that include Engine driven, internal combustion, Co-Generation or any type of Emergency Generation with Closed Transition Transfer Switches.
- Renewable and/or Inverter based PPF.

! For safety and reliability reasons, PPF installations installed on the downtown secondary network must meet the Downtown Underground Network Secondary Services Guidelines.

For more information, contact Energy Services Engineering at Renewables@NESPower.com

FREQUENTLY ASKED QUESTIONS

Question: *What size PPF should I install?*

Answer: NES will furnish demand and energy data for the associated meter upon Customer's request. Customers will need to work with their contractor to determine the optimal location and size of PPF system needed to meet Customer's expectations.

Question: *How much does it cost for NES to install PPF on my building?*

Answer: NES does not install, own, operate, or maintain PPF installations on Customer property. The PPF system is the responsibility of the Customer.



ELECTRIC SERVICE GUIDELINES

POWER PRODUCTION FACILITIES

Question: *When should I contact NES about my PPF project?*

Answer: As early as possible, even before hiring an electrician or consultant. Customers who obtain a Codes Release, purchase equipment, or proceed with construction before notifying NES may encounter delays and potential design/installation concerns.

Question: *When should I purchase the equipment and materials for my project?*

Answer: NES strongly recommends that you not purchase any project equipment or materials until you have completed Step 2 of the PPF process. This is to protect the Customer and Contractor from any undue financial burden caused by a project having design/installation or cost related concerns.

Question: *Will I need a release?*

Answer: Yes, since new conductors are being added to your building. Contact your local Codes department for a permit, release and inspection. See Chapter I - Inspections and Electric Codes.

Question: *Can I use my own meter or a meter provided by a contractor?*

Answer: NES will provide the PPF meter when used for NES billing purposes. Any additional meters that are not used for NES billing purposes shall be provided by the Customer.

Question: *What is the payback for installing a PPF*

Answer: Please work with your installer or contractor to determine the return on your investment. NES does not compensate the Customer for any excess generation, unless specifically defined in their contract when Customer is participating in a related NES/TVA program.

Question: *How do I interconnect to NES?*

Answer: There are typically two options for interconnection — Line side or Load side. Load Side connected PPF's are interconnected to NES through Customer-owned equipment. Line side connected PPF's are interconnected to NES ahead of the NES billing meter. Line or load interconnection requirements may also be dependent on contractual arrangements or Customer objectives. See figures 38 and 39 for further information.

Question: *I am installing a backup generator with an open transition transfer switch on my building. What do I need to submit to NES for review?*

Answer: When the generation source is not electrically connected to the NES system, NES typically does not require an application package. In some cases, NES will ask to review system specifications during the NES design process. Please coordinate your installation with the local Authorities Having Jurisdiction (AHJ) for permitting requirements.

ELECTRIC SERVICE GUIDELINES

POWER PRODUCTION FACILITIES



! Customers who obtain a Codes Release, purchase equipment, or proceed with construction before notifying NES may encounter delays and potential design concerns. NES work is prioritized based on the date an application is made with NES, not on the Codes release date.

STEP 1: APPLICATION REQUIREMENTS

Step 1A: Application Package Requirements

The first step with a PPF project is for the Customer to submit an application package. The Renewable Generation Interconnection Application can be found on our website at: www.nespower.com/clean-energy/renewable-energy/

The completed application must be signed by the Customer and submitted to NES Energy Services Engineering (ESE). Please email Renewables@NESPower.com for more information.

It is the Customer's responsibility to include the correct service address for the PPF on the application and the address shall match the Codes Permit/Release. Failure to do so may result in delays in your project.

Step 1B: PPF Site Plan Requirements

The following checklist items need to be included on the site plan:

- Building footprint
- Location of NES billing meter
- Location of PPF readily accessible utility disconnect switch(es) to disconnect all generation and energy storage sources from the NES distribution system
- Location of and proposed wording on all warning signage placards
- Location of main electrical service panel/switchboard
- Location of proposed NES Generation meters, where applicable
- Location of all major PPF equipment
- Nearby Street names and PPF address
- Easements on Final Plat, if applicable
- PPF installations 50kW and larger require AutoCad site plans in State Plane coordinates see Site Plan Requirements.
- Location of Point of Interconnection
- Location of NES electrical service



ELECTRIC SERVICE GUIDELINES

POWER PRODUCTION FACILITIES

Step 1.C - One Line Requirements

The following information needs to be included on the one line diagram:

- All major wire and fuse sizes
- All major equipment (Transfer switches, Inverters, overcurrent protection, protective relays, disconnect switches, etc.)
- All NES meter locations and service type (overhead/underground)
- Capacity of generation equipment
- Any other items pertaining to the PPF
- For generation projects over 50kW, indicate interlocks and methods of operation to disconnect system from utility source upon loss of utility power.

Step 1.D - Equipment Specification Requirements

In addition to the items listed above, please include all major equipment specification documentation and manufacturer cut sheets and any other applicable drawings or documents necessary for the proper design of the PPF. Indicate which specific items are being used on all documentation.

STEP 2: APPROVALS AND DESIGN

Step 2.A - Approvals & Contracts

Once All items in Step 1 have been provided by Customer, NES will review the completed Application Package.

NES does not review the design for local Code compliance. NES requirements may exceed Code requirements.

Application Package approval does not give the Customer approval to interconnect or generate. Generation and interconnection requirements are listed in Step 5.

Any associated Application Fees will be invoiced after this design review is complete.

Step 2.B - NES Design Review Checklist & Requirements

Fuse, wire, breaker, and where applicable, the generation meter ratings shall meet or exceed the output rating of the PPF.

Ampacity of conductors connected to an NES meter shall meet or exceed the amp rating of the NES meter.

Inverter based PPF shall meet UL 1741 and IEEE 1547 requirements.

PPF output voltage and phase characteristics shall match the NES service equipment. The loads served shall not cause an electrical phase imbalance of more than 10 percent at the NES billing meter.

PPF systems that interconnect with NES and/or TVA facilities, must be associated with a billing meter.

Details of placards shall be provided in the application package. One placard is required on the Utility Disconnect switch. A second placard, which includes the system one-line diagram, is required on or within site of the Utility Disconnect. This placard must include the name and contact information for the system owner and installing contractor.

ELECTRIC SERVICE GUIDELINES

POWER PRODUCTION FACILITIES



For inverter based PPF's, NES will require a separate disconnect switch for NES purposes, the 'Utility Disconnect'. Other PPF types may also require an additional disconnect switch. Where required, the Utility Disconnect shall meet or exceed the following criteria:

- Disconnect switch shall disconnect all generation and energy storage systems from interconnection to the NES/TVA distribution facilities.
- Disconnect switch shall include a handle capable of being locked in the open position with a 7/16" shank lock, and shall be located at least 18" away from any other equipment.
- Disconnect switch for inverter based PPF must be fusible.
- Disconnect switch location shall be readily accessible located on the exterior of the building.
- When revenue meter is located in an exterior location, disconnect switch shall be located within 50' and line of sight of the revenue meter and be accessible to NES personnel.
- NES makes the final determination of acceptable generation meter location, when required, and Utility Disconnect switch location. Any exceptions to the requirements shall be in writing, and shall include the signature of the NES employee approving the location.
- The Utility Disconnect switch shall be provided with a placard with the inscription: "Generation Source Utility Disconnect Switch".

Once the application package is reviewed and approved, a field meeting with the Customer, and all appropriate NES departments may be held to resolve detailed questions.

! Customers who obtain a Codes Release, purchase equipment, or proceed with construction before notifying NES may encounter delays and potential design concerns. NES work is prioritized based on the date an application is made with NES, not on the Codes release date.

In order to move to Step 3, Customer will need to sign an Interconnection or Parallel Operating Agreement. This document will be provided by NES to the Customer and shall be reviewed and signed by the NES Primary billing account holder.



ELECTRIC SERVICE GUIDELINES

POWER PRODUCTION FACILITIES

STEP 3: NES DESIGN AND CUSTOMER CONSTRUCTION

Once all items from Step 2 have been completed, the Customer may begin construction of the PPF.

NES will complete a review of existing distribution facilities to determine if any modifications are needed. NES will prepare an NES design sketch, and determine any associated costs to upgrade the NES facilities.

After the NES design is complete, NES construction costs/Contribution in Aid to Construction (CIAC), will need to be paid by the Customer. CIAC's, if any, shall be paid before NES work will begin.

STEP 4: AUTHORITIES HAVING JURISDICTION (AHJ) AND NES APPROVALS

These guidelines do not cover federal, state, or local Code requirements. It is the Customer's responsibility to ensure the project complies with the currently adopted version of National Fire Prevention Association's National Electrical Code (the NEC) and any other federal, state or local codes that apply.

Codes Release shall have the same address as provided on the Application Package. Discrepancies between the two addresses will cause a time delay in the NES process. The Customer will be responsible for correcting any discrepancies.

Once the Customer's PPF is complete, it is the Customer's responsibility to contact the local AHJ.

The local AHJ will provide a Codes Release to NES. NES will then verify the information on the release matches the account data. It is the Customer's responsibility to make sure that the AHJ provides the release to NES.

The Codes Release must be received before NES commissioning will be scheduled.

STEP 5: COMMISSIONING, TESTING, AND INTERCONNECTION

NES will perform a System Commissioning and Testing visit.

During this visit, NES will have a checklist of performance requirements for each system type

NES may upgrade or replace the billing meter during final system testing

System shall remain electrically separated from NES until all performance requirements are met

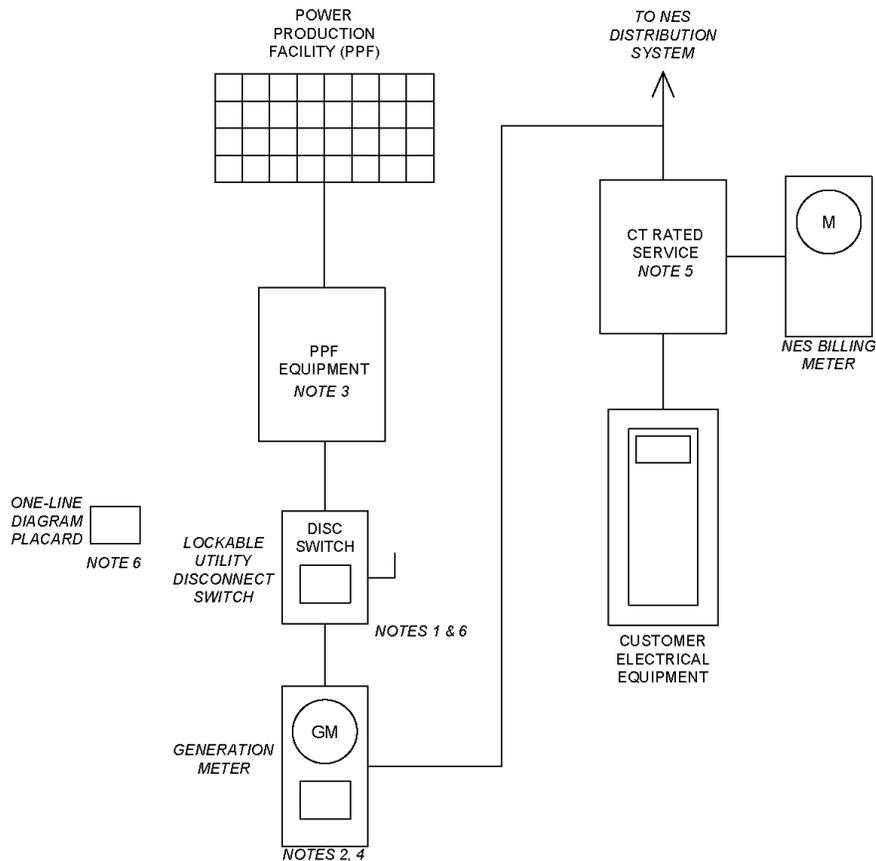
! During System Commissioning, a qualified Customer Representative capable of operating the PPF shall be present.

ELECTRIC SERVICE GUIDELINES

POWER PRODUCTION FACILITIES



LINE SIDE CONNECTED EXAMPLE



Drawing Notes:

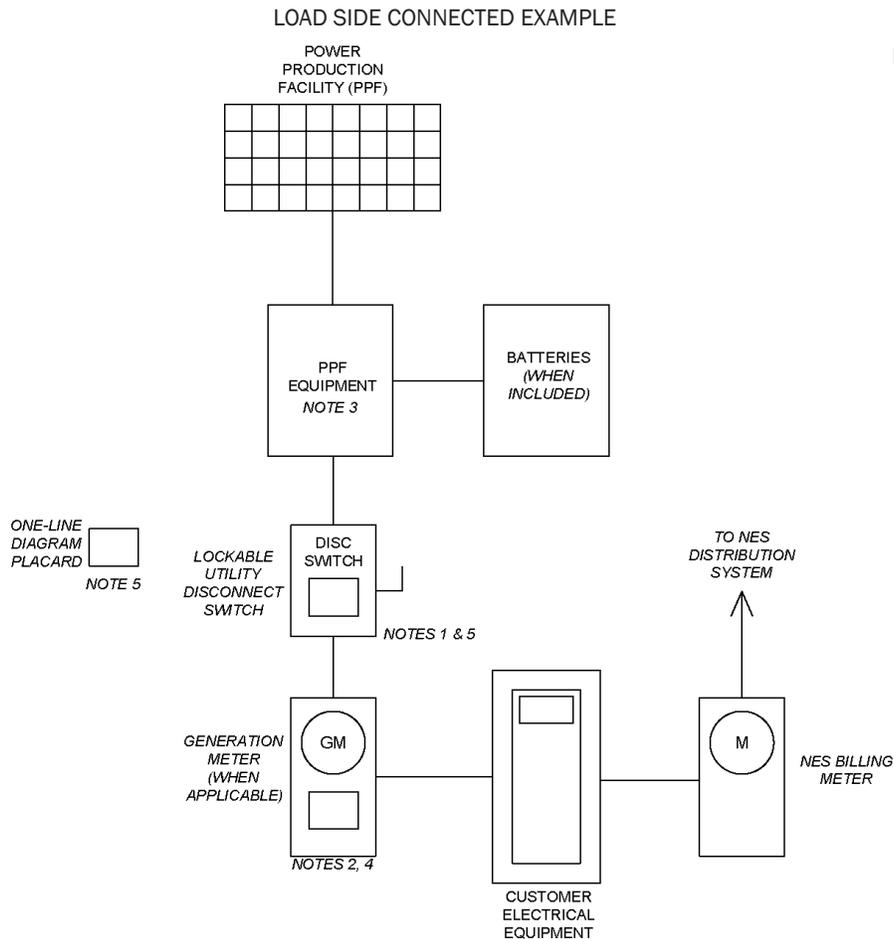
1. Disconnect switch shall disconnect all generation and energy storage systems from interconnection to the NES distribution facilities.
2. Where a generation meter is required, generation meter shall be within 50 feet and within line-of-sight of the revenue meter.
3. PPF equipment includes any power production facility equipment such as inverters, transfer switches, gateway devices, etc.
4. The line side conductors at the generation meter shall be from the PPF output.
5. Line side connection points will vary based on the type of service. Typical connection points include the weatherhead for overhead service or a CT cabinet for CT rated services. Line side connection points will be reviewed as part of the utility design review process.
6. Provide placard on utility disconnect switch identifying the switch as "GENERATION SOURCE UTILITY DISCONNECT SWITCH" and a placard within sight of utility disconnect switch with the system one-line diagram.

FIGURE 39A: EXAMPLE OF LINE SIDE CONNECTED POWER PRODUCTION FACILITIES



ELECTRIC SERVICE GUIDELINES

POWER PRODUCTION FACILITIES



Drawing Notes:

1. Disconnect switch shall disconnect all generation and energy storage systems from interconnection to the NES distribution facilities.
2. Where a generation meter is required, generation meter shall be within 50 feet and within line-of-sight of the revenue meter.
3. PPF equipment includes any power production facility equipment such as inverters, transfer switches, gateway devices, etc.
4. The line side conductors at the generation meter shall be from the PPF output.
5. Provide placard on utility disconnect switch identifying the switch as "GENERATION SOURCE UTILITY DISCONNECT SWITCH" and a placard within sight of utility disconnect switch with the system one-line diagram.

FIGURE 39B: EXAMPLE OF LOAD SIDE CONNECTED POWER PRODUCTION FACILITIES

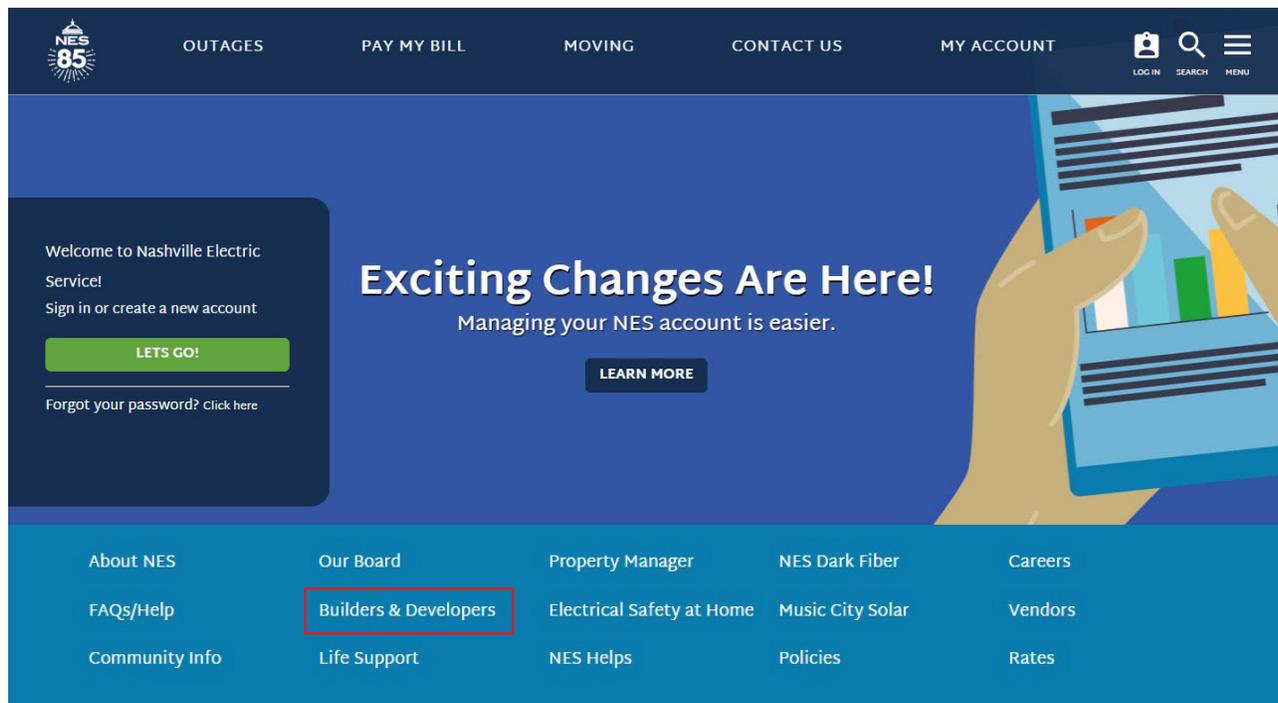


APPENDICES

APPENDIX A - LIGHTING

Obtaining Street Lights

NES will maintain the poles and luminaires shown in the **NES Lighting Guidelines**. The guidelines can be viewed at www.nespower.com on the Builders & Developers page under Lighting Guidelines, or contact NESLighting@NESPower.com to obtain a copy of the guidelines.



Refer to the Lighting Guidelines for a step by step process to request and install street lighting.

Obtaining Private Lights

To obtain private lights, call the Customer Call Center at (615) 736-6900. An Energy Services Account Manager will contact the Customer to complete a Security Lighting Agreement. NES will normally install outdoor lighting on an existing wood utility pole if the voltage and clearance are available. If a new pole needs to be set, there will be a monthly charge. NES must install outdoor lighting such that NES equipment can be safely operated without damage to the surrounding property (NOTE: A Hold Harmless clause is provided in the agreement).



ELECTRIC SERVICE GUIDELINES

APPENDIX B

APPENDIX B - LEGENDS USED ON NES DRAWINGS

EXISTING <i>BLACK</i>	NEW <i>RED</i>	REMOVE <i>GREEN</i>	EXAMPLE NOTATIONS	DESCRIPTIONS
				SECONDARY PULL BOX
				PRIMARY PULL BOX
				PAD MOUNTED SWITCH: PMH-3, PMH-6, PMU-6M, PMH-9, PMH-11, PMH-12, OR PMH-9-AUTO
				TERMINATING CABINET: NUMBER OF PHASES AND POLES
			MH-1	MANHOLE LARGE RECTANGULAR
			MH-1	MANHOLE SMALL RECTANGULAR
			MH-1	MANHOLE LARGE OCTAGONAL
				1Ø UGRD TRANSFORMER 14.4/24.9kV to 120/240V PAD # and kVA SIZE
				3Ø UGRD TRANSFORMER PAD #, kVA SIZE PRIM./SEC. VOLTAGES AS NOTED
	COLOR BLUE 			TEMPORARY SERVICE PEDESTAL FOR TEMPORARY UNDERGROUND SERVICES.
				GROUND SURGE ARRESTER, STATE VOLTAGE, 12kV OR 18kV
				STUB OUT CONDUIT FOR FUTURE SERVICE STANDARD 3" DIAMETER SCH 40 PVC UNLESS OTHERWISE NOTED
				UNDERGROUND PRIMARY CABLE. STATE CABLE SIZE, LENGTH, NUMBER OF CONDUITS AND THE DIAMETER.
				FEED THROUGH BUSHING TO BE INSTALLED ON PAD MOUNTED TRANSFORMERS TO PROVIDE Y SPLICE.
				SECONDARY TO A MULTIPLE METER POINT. INDICATE BUILDING NUMBER, WIRE SIZE, CONDUIT SIZE AND LENGTH AND NUMBER OF METERS

FIGURE 40: UNDERGROUND EQUIPMENT SYMBOLS



EXISTING <i>BLACK</i>	NEW <i>RED</i>	REMOVE <i>GREEN</i>	TEMP <i>BLUE</i>	EXAMPLE NOTATIONS	DESCRIPTIONS	
				OPW50-(CLASS) POLE NUMBER R-PW45	NES TO INSTALL A NEW 50 FOOT TALL CLASS 3 WOOD POLE AND REMOVE A 45 FOOT TALL CLASS 4 POLE	
				OPC50-(CLASS) POLE NUMBER R-PC50	NES TO INSTALL A NEW 50 FOOT TALL CONCRETE POLE AND REMOVE A 50 FOOT TALL CONCRETE POLE	
				OPS50-(CLASS) POLE NUMBER R-PS50	NES TO INSTALL A NEW 50 FOOT TALL STEEL POLE AND REMOVE A 45 FOOT TALL STEEL POLE	
				BST 50'C-3 POLE NUMBER BST 45'C-4	SCB TO INSTALL A NEW 50 FOOT TALL TALL CLASS 3 WOOD POLE AND REMOVE A 45 FOOT TALL CLASS 4 POLE	
				SPECIAL DESIGN INFORMATION ON CONS. DRAWING	STEEL TOWER OWNED BY NES	
				SPECIAL DESIGN INFORMATION ON CONS. DRAWING	STEEL STUB BY NES	
				SPECIAL DESIGN INFORMATION ON CONS. DRAWING	STEEL POLE TOWER OWNED BY NES	
					LEAD= DISTANCE IN FEET FROM BASE OF POLE TO THE ANCHOR, ANC SIZE= HOLDING CAPACITY OF ANCHOR IN THOUSANDS OF POUNDS, DG_ =DOWN GUY SIZE IN HOLDING CAPACITY SDWK INDICATES THE USE OF A SIDEWALK BRACE. TEL INDICATES AN ANCHOR INSTALLED BY BELLSOUTH DO NOT INSTALL NES GUYS IN CABLE TV ANCHORS	
						BST ANCHOR
						CATV ANCHOR
					ADD OR REMOVE A GUY FROM AN EXISTING ANCHOR.	

FIGURE 41: POLE AND ANCHOR SYMBOLS



ELECTRIC SERVICE GUIDELINES

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EXISTING <i>BLACK</i>	NEW <i>RED</i>	REMOVE <i>GREEN</i>	TEMP <i>BLUE</i>	EXAMPLE NOTATIONS	DESCRIPTIONS
				1-25kVA R-25kVA	1Ø OVHD TRANSFORMER kVA SIZE
				1-112.5kVA 125/216V	3Ø OVHD TRANSFORMER kVA SIZE & SECONDARY VOLTAGE
				1-3-100kVA 277/480V	3Ø OVHD BANK XMFR'S kVA SIZE & SECONDARY VOLTAGE OF EACH UNIT
				SEE THE SWITCH SECTION OF THE PLATE BOOK	SWITCH OVHD, INDICATE SIZE, ABS OR LBS, SWITCH #, POLE #. AND OPEN OR CLOSED STATUS
				SEE THE SWITCH SECTION OF THE PLATE BOOK	DISCONNECT SHOW FUSE SIZE
				SEE THE SWITCH SECTION OF THE PLATE BOOK	DISCONNECT WITH BLADES SHOW # OF BLADES
				SEE THE SWITCH SECTION OF THE PLATE BOOK	ELECTRONIC SECTIONALIZER SHOW AMPS AND # OF SHOTS
				SEE THE SWITCH SECTION OF THE PLATE BOOK	OIL SWITCH OR RECLOSER
				SEE THE SWITCH SECTION OF THE PLATE BOOK	STATE SWITCH SIZE AND ADD ANTENNA SYMBOL IF REMOTE OPERATION IS REQUIRED
				SEE THE SWITCH SECTION OF THE PLATE BOOK	IN-LINE DISCONNECT SWITCH: STATE SWITCH SIZE: 900A OR 1200A
				SEE THE SWITCH SECTION OF THE PLATE BOOK	LINE TAP DISCONNECT SWITCH 900A ONLY
				1-ANTENNA @ 42' MINIMUM	ANTENNA SYMBOL FOR A REMOTELY OPERATED SWITCH
					<u>DURABUTE "GE"</u> DO NOT INSTALL
				1-3-18kV SUR. ARR.	ARRESTER, SURGE 18kV, 12kV & 3kV
				1-3-200kVAR CAP.	CAPACITOR BANK DESIGNATE NES OR TVA
				1-PM-(1, 2 OR 3)	METERED PRIMARY LINE

FIGURE 42: OVERHEAD EQUIPMENT SYMBOLS

ELECTRIC SERVICE GUIDELINES

APPENDIX B



EXISTING <i>BLACK</i>	NEW <i>RED</i>	REMOVE <i>GREEN</i>	TEMP <i>BLUE</i>	FUTURE <i>MAGENTA</i>	EXAMPLE NOTATIONS	DESCRIPTIONS
					SL/6/250	STREET LIGHT / MASTARM LENGTH / WATTAGE
					LSTAND/AL/27 POLE NUMBER SL/8/150	STREET LIGHT & MASTARM MTD ON ALUMINUM POLE
					LPW35 POLE NUMBER P400/2	PRIVATE LIGHT & MASTARM MOUNTED ON WOOD POLE
					INSTALLED BY OTHERS MAINTAINED BY NES	HIGH MAST INTERSTATE LIGHT
						OFFSET (MONGOOSE)
					LSTD-HADCO-16 POLE NUMBER L15HPS-H/ACORN/BL/V	DECORATIVE
						FLOOD
						WALL PACK
						SHOE BOX
						CONTROL STATION
						DISCONNECT

FIGURE 43: LIGHTING SYMBOLS



ELECTRIC SERVICE GUIDELINES

APPENDIX B

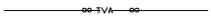
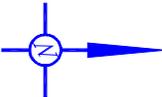
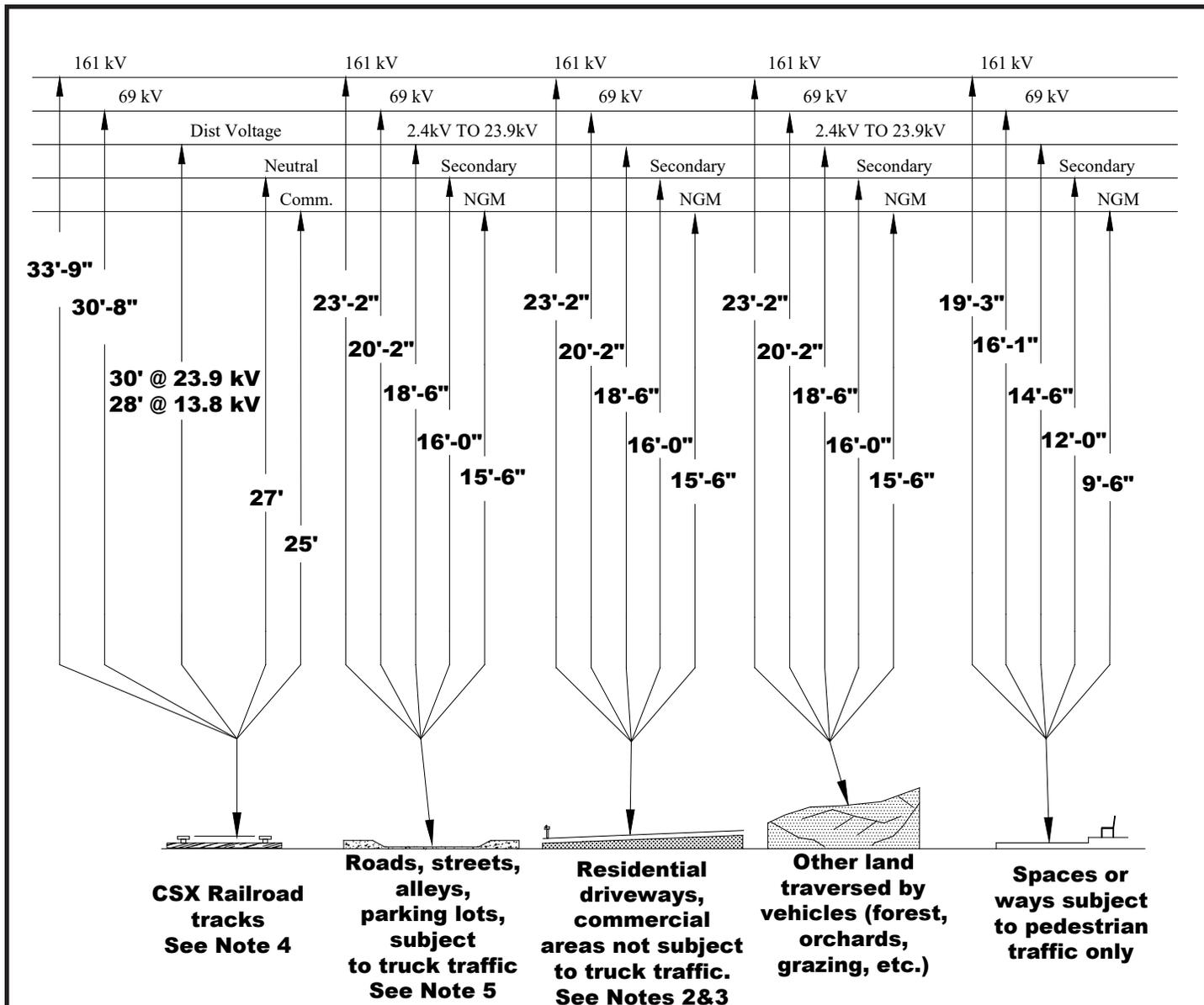
SYMBOL	DESCRIPTIONS
	CUSTOMER POLE
	TVA STEEL TOWER
	TVA TRANSMISSION LINE, USED WHERE ROW IS UNKNOWN
	FENCE LINE
	PROPERTY LINE
	RIGHT-OF-WAY LINE
	RAILROAD - SINGLE TRACK
	RAILROAD - DOUBLE TRACK
	STREET BOUNDARIES
	WATER LINES
	SEWER LINES
	UNDERGROUND COMMUNICATIONS
	GAS LINES
	TRIM TREES TO CLEAR LINES, STATE IF PERMISSION WAS OBTAINED ALONG WITH THE PROPERTY OWNER'S NAME AND TELEPHONE NUMBER
	NORTH ARROW
	FUTURE NES FACILITIES. DRAW THE APPROPRIATE SYMBOL USING THE LINE TYPE AND FUTURE EQUIPMENT AUTOCAD LAYER.
	TRAFFIC AND PARKING SIGNAL POLE
	ROADWAY SIGNAGE AND BILLBOARDS

FIGURE 44: BASE MAP SYMBOLS



APPENDIX C - SAFETY CLEARANCES



Drawing Notes:

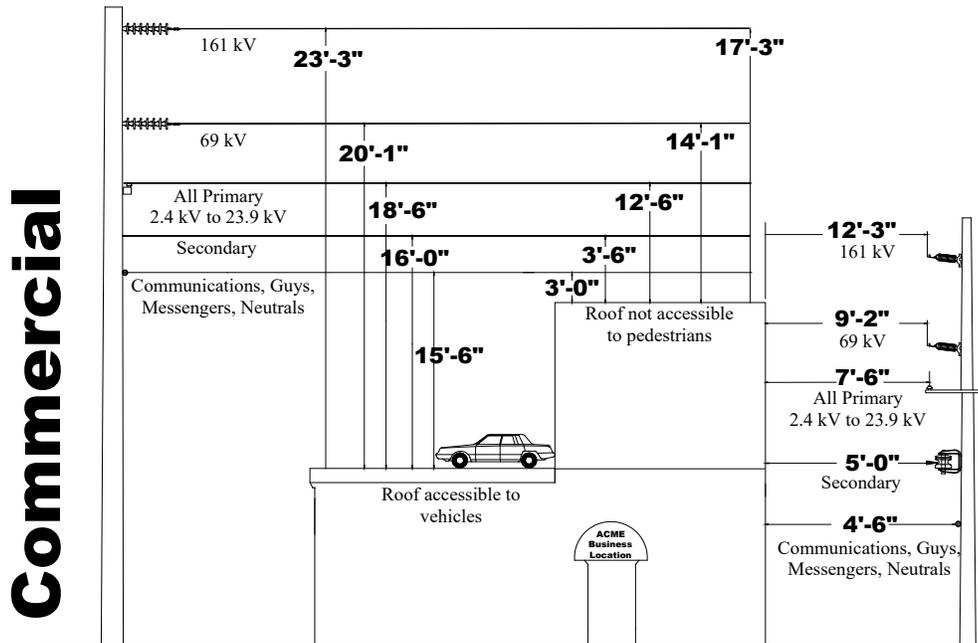
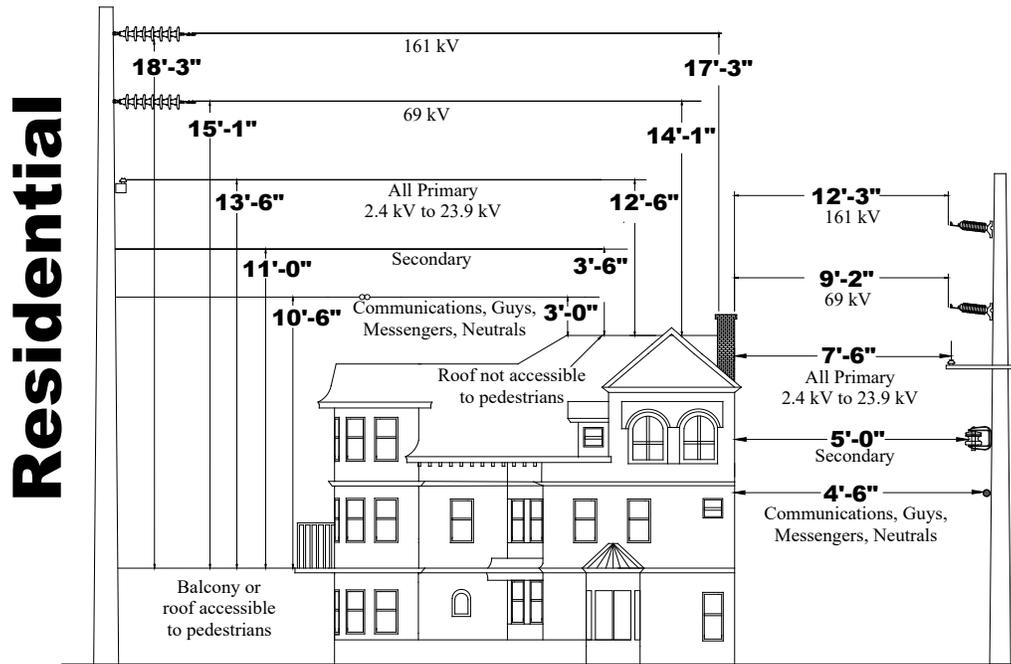
1. These clearances meet or exceed the National Electrical Safety Code (NESC) Table 232-1.
2. New Construction: If a truck over 8' is not reasonably expected, the service drop clearance may be reduced to 12'-6" worst case sag.
3. Make Ready: Where the height of attachment to a building does not permit service drops to meet this value, clearances may be reduced per exceptions listed in NESC Table 232-1.
4. Railroad clearances shown are specified by CSX Design and Construction Standards. Clearances of any line within 1000' of a bridge, trestle or large culvert shall not be less than 50' above the rail. If crossing a rail other than CSX, consult that rail owner or NESC, whichever is greater clearance.
5. Service drops over roadways shall be no lower than 16' at worst case sag per NESC Table 232-1.
6. Secondary clearances are for triplex or quadruplex. Add six inches (6") for open-wire secondary.

FIGURE 45: VERTICAL CLEARANCES



ELECTRIC SERVICE GUIDELINES

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Drawing Notes:

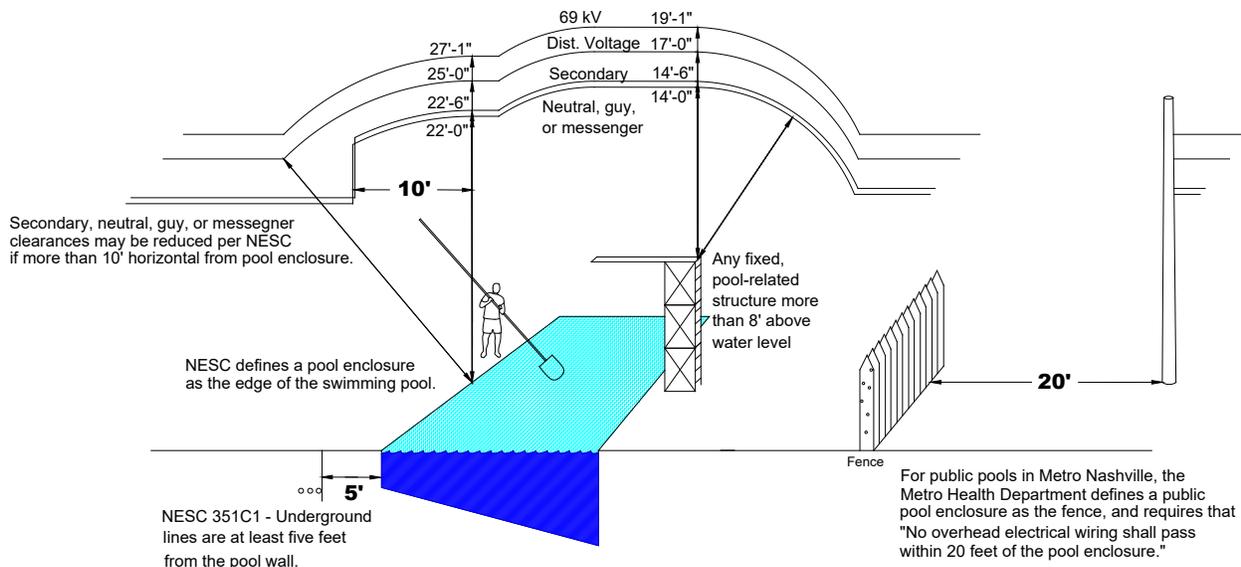
1. These clearances meet or exceed the National Electrical Safety Code (NESC), Table 234-1.
2. Clearances for transmission lines include a three foot (3') blow-out allowance. Conductors on suspension insulators may require additional clearance. Clearance is a function of span length and sag at 60° F. Refer to section 5.1.7 for more details.
3. Pedestrian access applies if the roof can be reached by ramp, stairway, doorway or permanent ladder.
4. Vehicle clearances apply if vehicles which are eight feet or greater in height are allowed.
5. Secondary distances are for triplex or quadruplex. Add six inches (6") for open-wire secondary.

FIGURE 46: BUILDING CLEARANCES

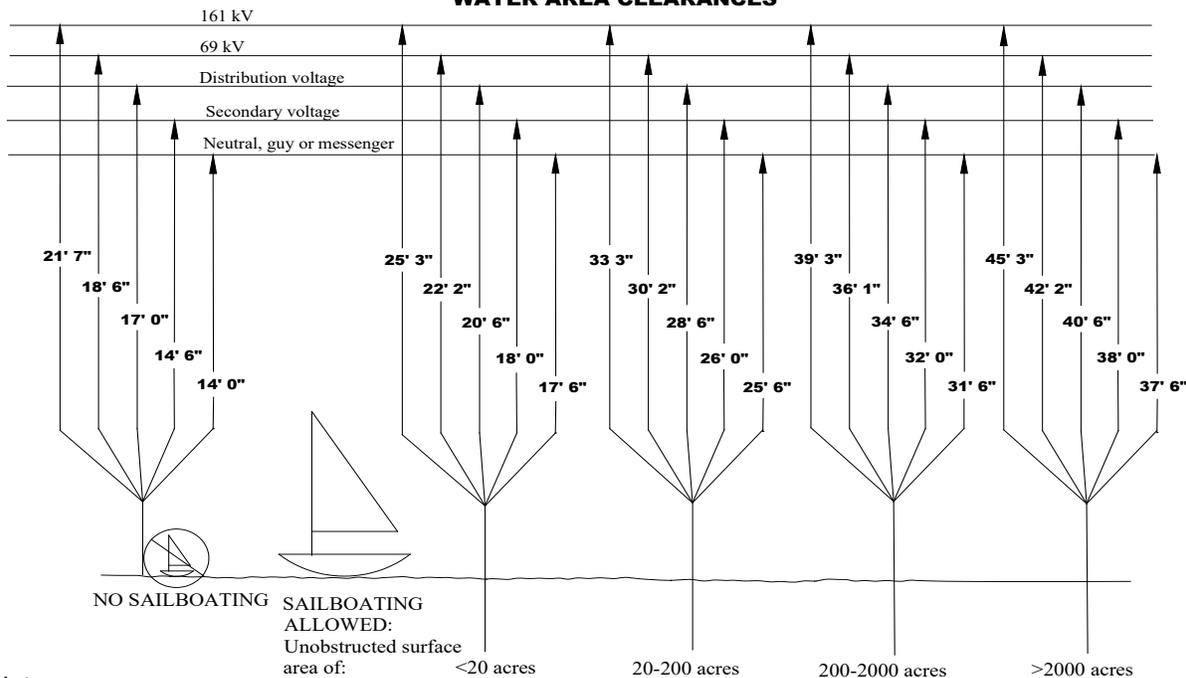


SWIMMING POOL CLEARANCES

Per NESC Rule 234E1



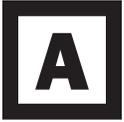
WATER AREA CLEARANCES



Drawing Notes:

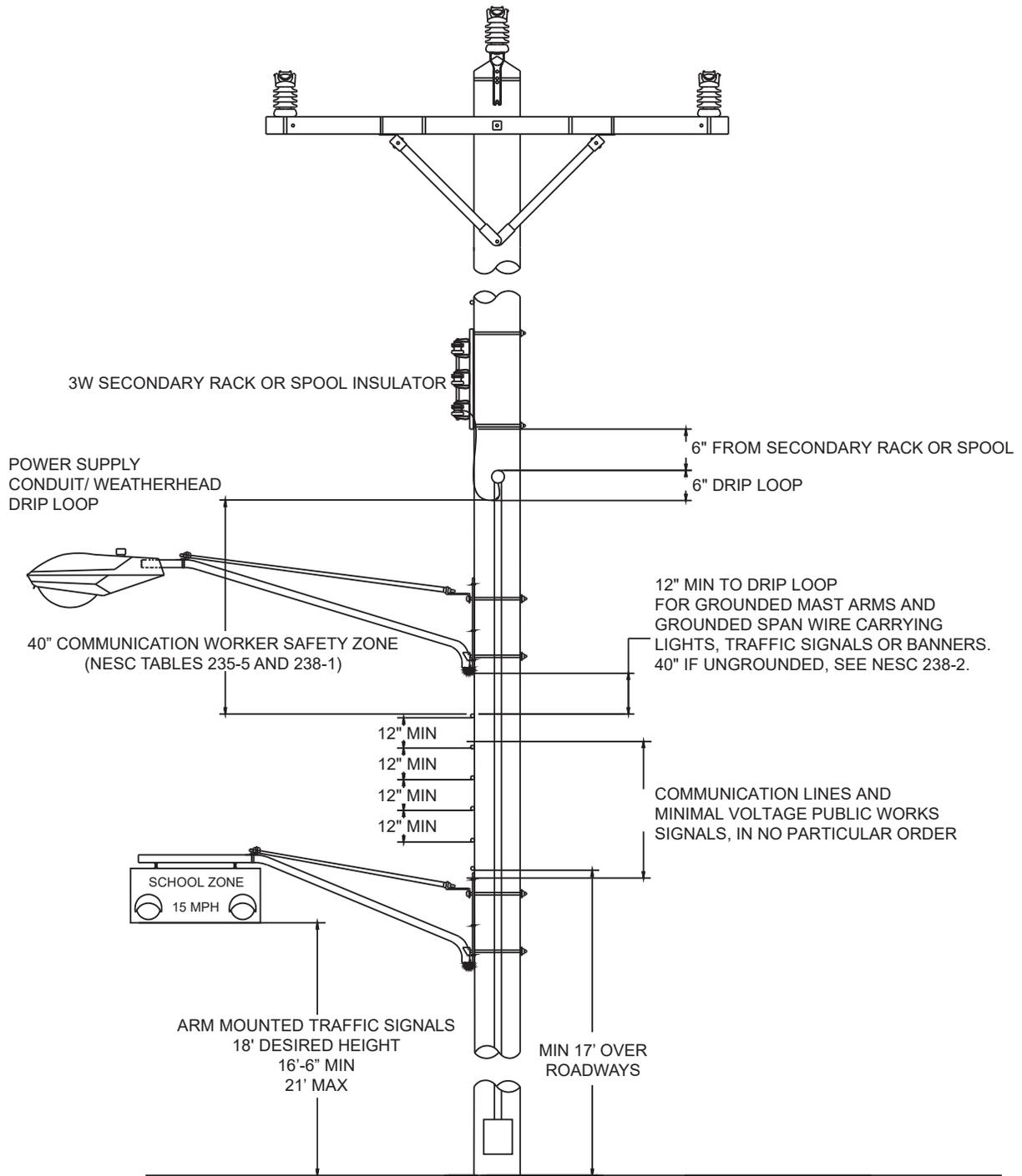
1. These clearances meet or exceed the National Electrical Safety Code (NESC), Table 232-1.
2. NESC clearances are in ANY direction from water level, edge of pool, base of diving platform or anchored raft.
3. Although NESC allows placement of an electric line over a swimming pool or other body of water, the NES design practice is to avoid this whenever possible.
4. For boat ramps and associated rigging area, add five feet to the applicable "Sail Boating Allowed" clearance.
5. For hot tubs use the same clearances indicated for swimming pools, using the outer deck of the hot tub as the 'pool enclosure'.
6. Secondary distances are for triplex or quadruplex. Add six inches (6") for open-wire secondary.

FIGURE 47: SWIMMING POOL AND WATERWAY CLEARANCES



ELECTRIC SERVICE GUIDELINES

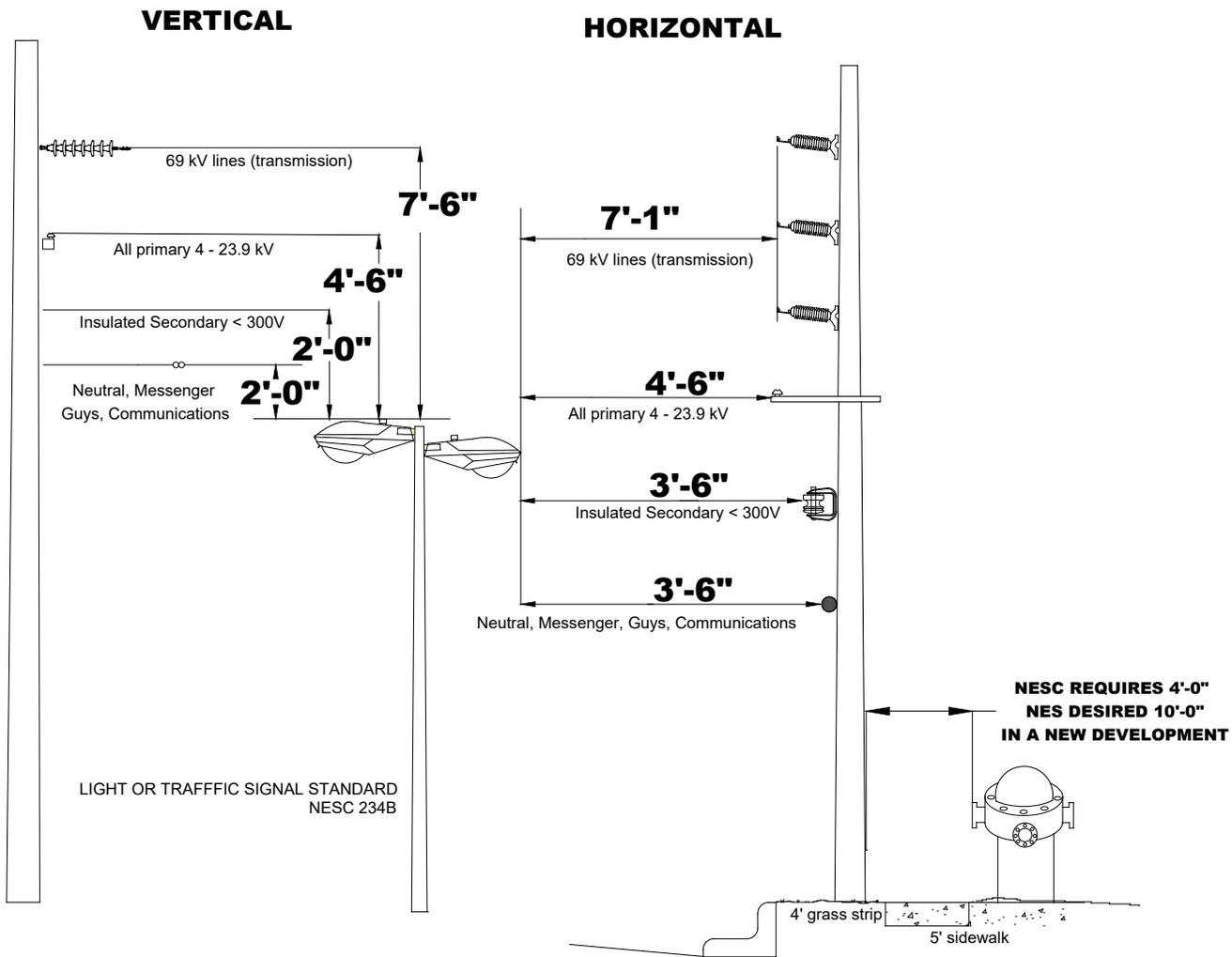
APPENDIX C



Drawing Notes:

1. These clearances meet or exceed the National Electrical Safety Code (NESC), applicable rule appears on drawing.
2. These distances are minimums. NESC Rule 235 H requires clearances between lines of different communication companies to be at least four inches (4") anywhere in the span. NESC Rule 235H also requires spacing between messengers supporting communications cables to be at least 12 inches. This may necessitate spacing at the pole greater than the NESC minimum shown.

FIGURE 48: COMMUNICATIONS CLEARANCES



Drawing Notes:

1. These clearances meet or exceed the NESC 2023 edition, Table 234-1.
2. All clearance measurements are taken from the closest point of the line to the closest point of the object.
3. Secondary distances are for triplex or quadruplex. Add six inches (6") for open-wire secondary unless otherwise noted.

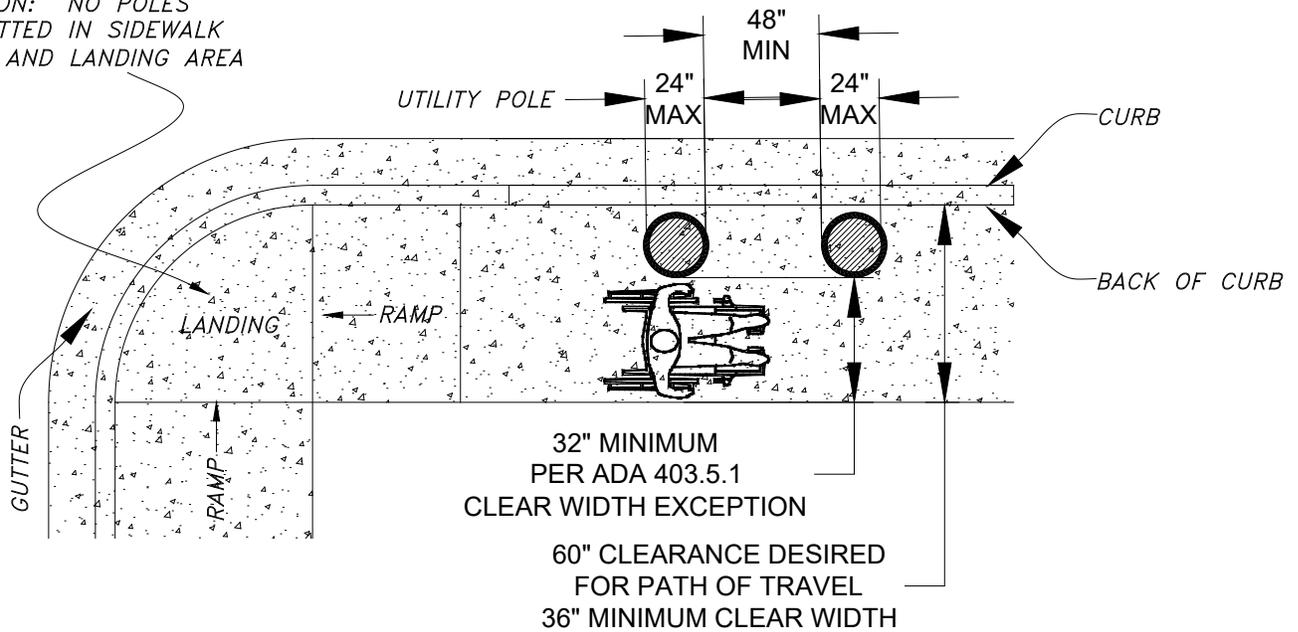
FIGURE 49: STREET LIGHT FIXTURE AND FIRE HYDRANT CLEARANCES



ELECTRIC SERVICE GUIDELINES

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CAUTION: NO POLES PERMITTED IN SIDEWALK RAMP AND LANDING AREA

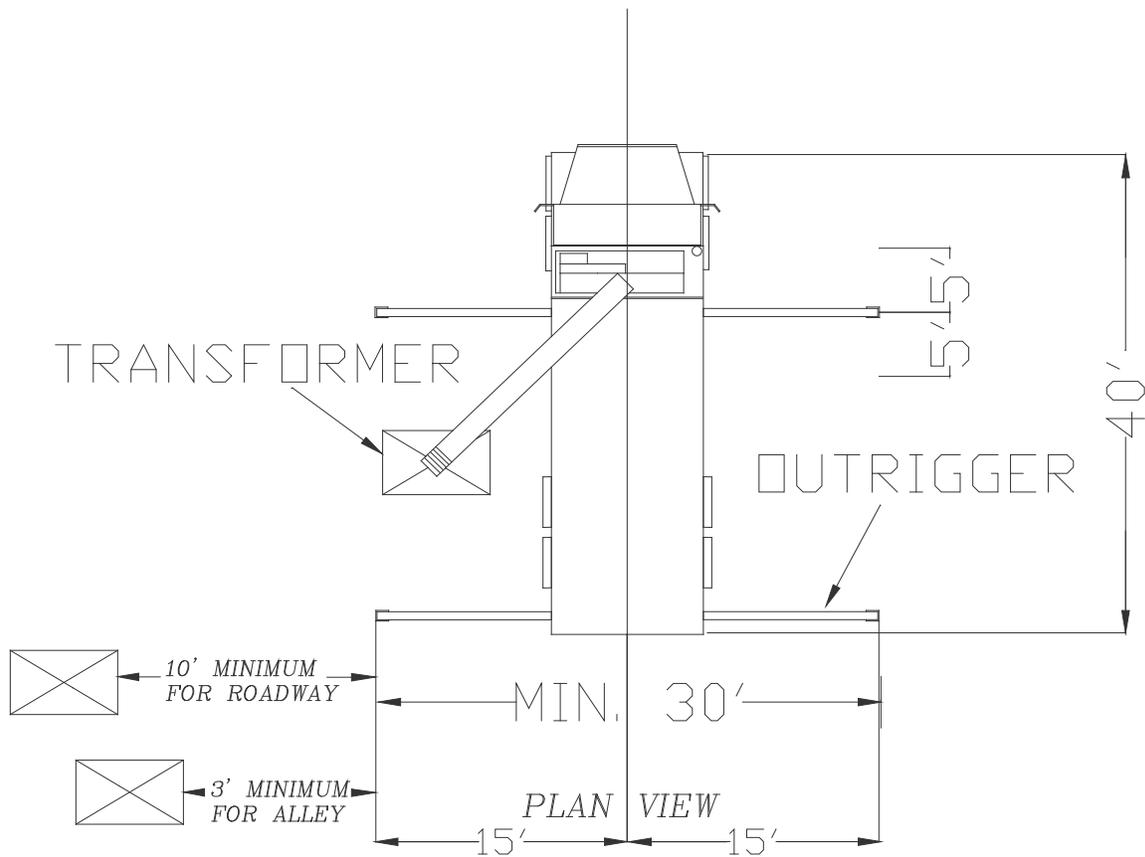


Drawing Notes:

1. Dimensions shown are from the Department of Justice 2010 ADA Standards for Accessible Design Rule 403.5.1 Clear Width Exception, which states "The clear width shall be permitted to be reduced to 32 inches (815 mm) minimum for a length of 24 inches (610 mm) maximum provided that reduced width segments are separated by segments that are 48 inches (1220 mm) long minimum and 36 inches (915 mm) wide minimum."
2. If an NES pole is located in the sidewalk, underground conduits shall be placed on the side of the pole parallel to pedestrian traffic unless the pole is located on the back of the sidewalk where conduits won't impact ADA clearance. The intent is to keep conduits on poles from violating ADA requirements.

FIGURE 50: ADA SIDEWALK CLEARANCES

Knuckle Boom Truck



Drawing Notes:

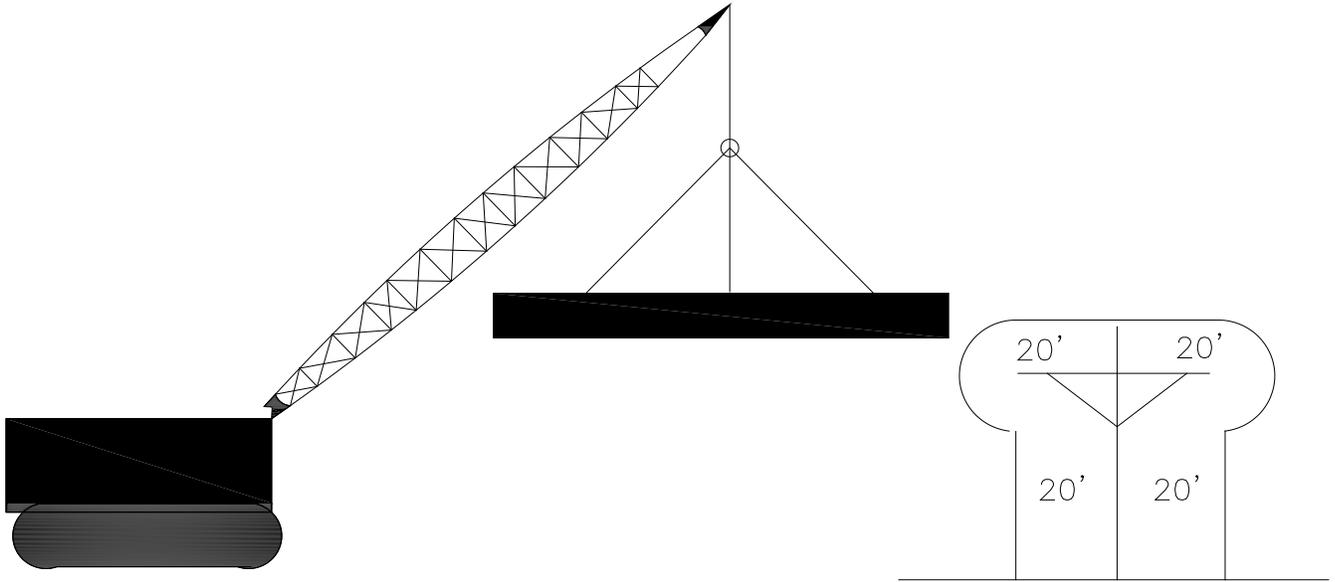
1. Knuckle Boom Truck Clearance:
A minimum of 30' is required between ends of knuckle boom truck outriggers to safely install a pad-mounted transformer. Transformer sizes range from 25kVA to 1500kVA.
2. Transformers installed along alleys shall meet this requirement. Care should be taken in the design process to assure that a minimum of 30' clearance (15' from centerline of length of truck) along a 40' span centered on the transformer can be obtained for new installations and for future maintenance.

FIGURE 51: TRANSFORMER INSTALLATION - KNUCKLE BOOM TRUCK CLEARANCE



ELECTRIC SERVICE GUIDELINES

APPENDIX C



Drawing Notes:

1. Keep all vehicles and heavy machinery – cranes, bucket and dump trucks, backhoes, front-end loaders, cement pumpers, etc. out of the danger zone around distribution lines (a minimum of 20 feet) as required by OSHA and TOSHA (see OSHA STD. 1926.1408).
2. Any exception to these clearances must be approved by TOSHA/OSHA and the NES Safety Department.
3. **Transmission lines require an even greater distance.**
4. Contact NES Safety @ (615) 747-3616 for assistance concerning clearance issues.

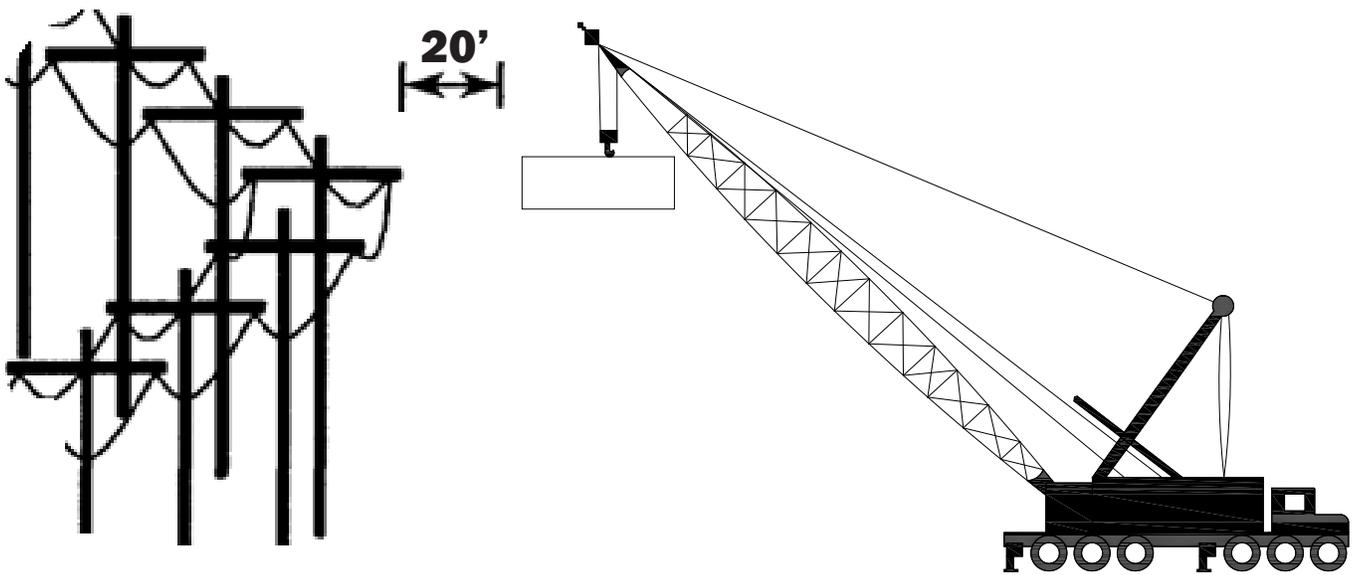
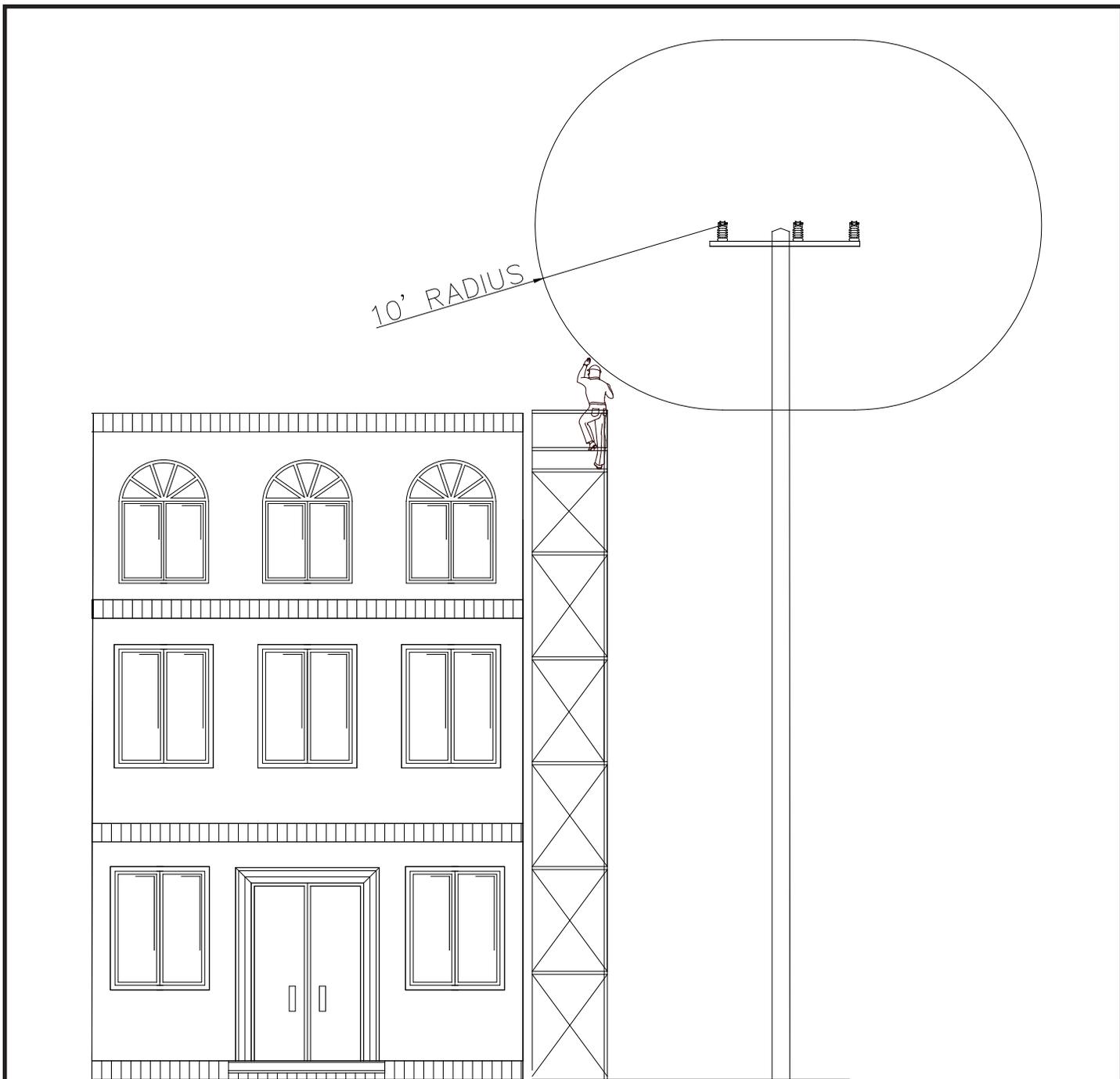


FIGURE 52: CRANE/ELEVATED EQUIPMENT CLEARANCES



Drawing Notes:

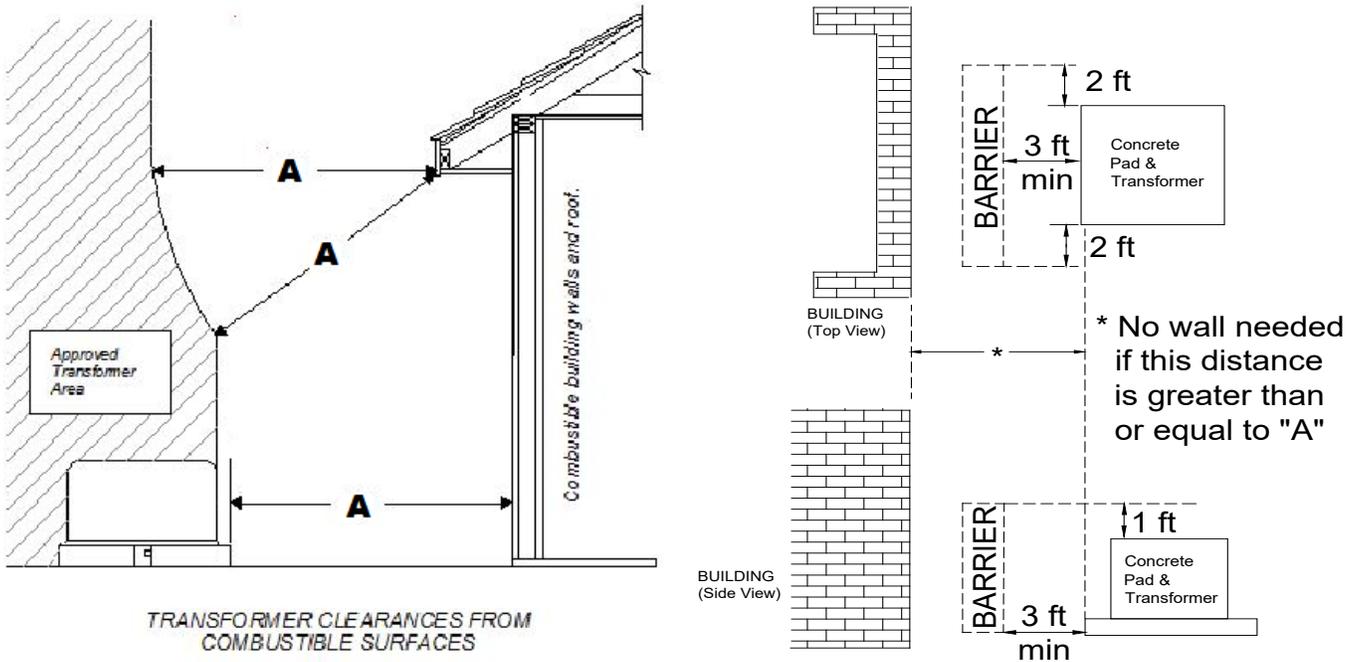
1. Construction and maintenance considerations should include any equipment required, such as scaffolds.
2. Minimum of working clearances from energized lines and equipment are required by OSHA and TOSHA (see OSHA STD 1926.451). Minimum distance includes scaffolding and any conductive material handled on the scaffold. Any exception to these clearances must be approved by TOSHA/OSHA and the NES Safety Department.
3. Poles with primary distribution shall be a minimum of 20' from new buildings.
4. **Contact NES Safety @ (615) 747-3616 for assistance concerning clearance issues.**
5. **Transmission lines require an even greater distance.**

FIGURE 53: OSHA AND TOSHA WORKING CLEARANCES FOR SCAFFOLDS



ELECTRIC SERVICE GUIDELINES

APPENDIX C

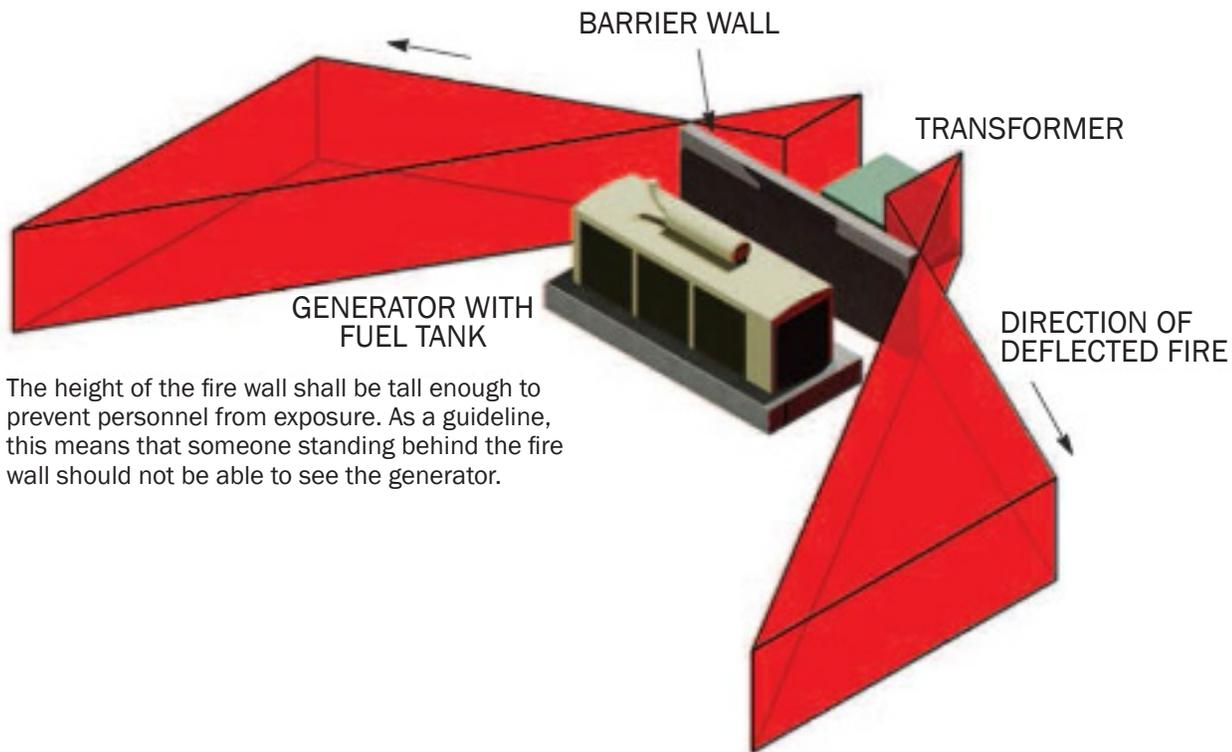


TRANSFORMER SIZE	"A" DISTANCE	MINIMUM WALL DIMENSIONS
0-75 KVA	10 FEET	8 FT WIDE X 7FT TALL FROM TOP OF PAD
76-333 KVA	20 FEET	8 FT WIDE X 7FT TALL FROM TOP OF PAD
OVER 333 KVA	30 FEET	10 FT WIDE X 7FT TALL FROM TOP OF PAD

Drawing Notes:

- The fire barrier guidelines apply to all liquid-insulated pad-mounted equipment.
- Transformer pads SHALL NOT be installed, under any circumstances, less than three feet (3') from a building or any other structure. Transformers installed less than the distance indicated as "A" shall have a fire barrier wall installed between the transformer and the building.
- The barrier shall be constructed of non-combustible material so it will qualify as a 4-hour fire wall (solid concrete block, reinforced concrete, steel or eight inch (8") brick).
- Transformer Pad may be installed closer to the building than shown above as distance "A" if the following conditions are fully satisfied:
 - There is no exposure to combustible eaves or trim.
 - The exposed wall construction shall qualify as a 4-hour fire wall (solid concrete block, reinforced concrete, steel, or eight inch (8") brick).
 - Any opening in the exposed wall at the same level as the transformer within the separation distance required (A) shall be protected with approved fire doors.
 - Transformer doors must face away from adjacent walls, including screen walls.

FIGURE 54: FIRE BARRIER WALL



The height of the fire wall shall be tall enough to prevent personnel from exposure. As a guideline, this means that someone standing behind the fire wall should not be able to see the generator.

Drawing Notes:

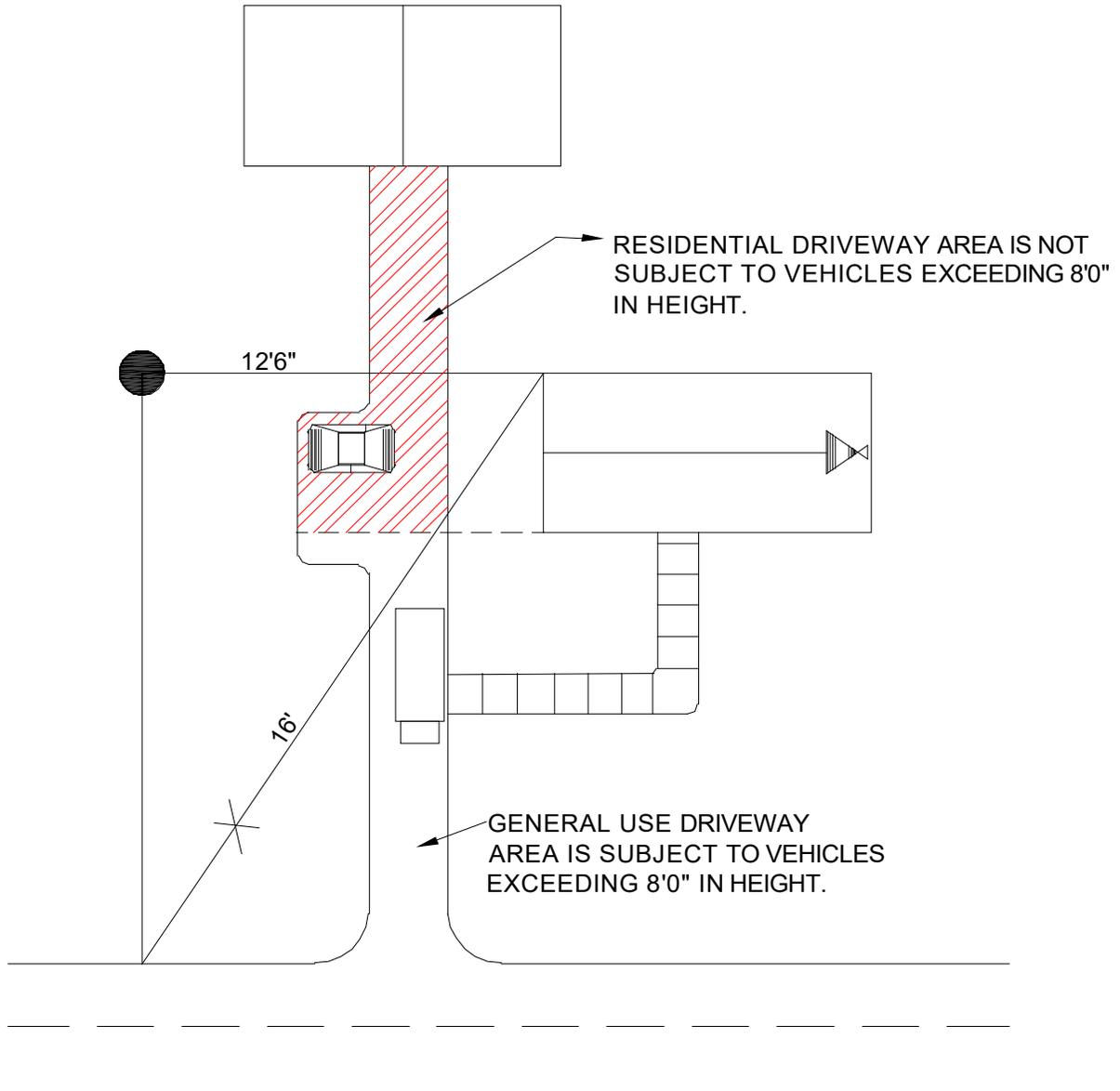
1. A minimum of twenty feet (20') of clearance is required between transformers and any fuel sources ie; generator fuel tanks, propane tanks, gas meters etc. The clearance may be reduced to 3' if an appropriate firewall is built between the transformer and the fuel source. In all cases, generator exhaust shall be directed away from direction of transformer or vault.
2. The firewall shall be constructed of non-combustible material so it will qualify as a 4-hour fire wall (solid concrete block, reinforced concrete, steel, or eight inch (8") brick).
3. The height and width of the firewall shall meet ALL of the following requirements:
 - A. Meet the minimum dimensions Figure 54.
 - B. Be at minimum two feet (2') taller than the tank of the generator.
 - C. Extend two feet (2') beyond the generator pad on each side

FIGURE 55: GENERATOR BARRIER WALL



ELECTRIC SERVICE GUIDELINES

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- GENERAL USE DRIVE WAY AREA IS SUBJECT TO VEHICLES EXCEEDING 8'0" IN HEIGHT.
- RESIDENTIAL USE DRIVE WAY AREA IS NOT SUBJECT TO VEHICLES EXCEEDING 8'0" .

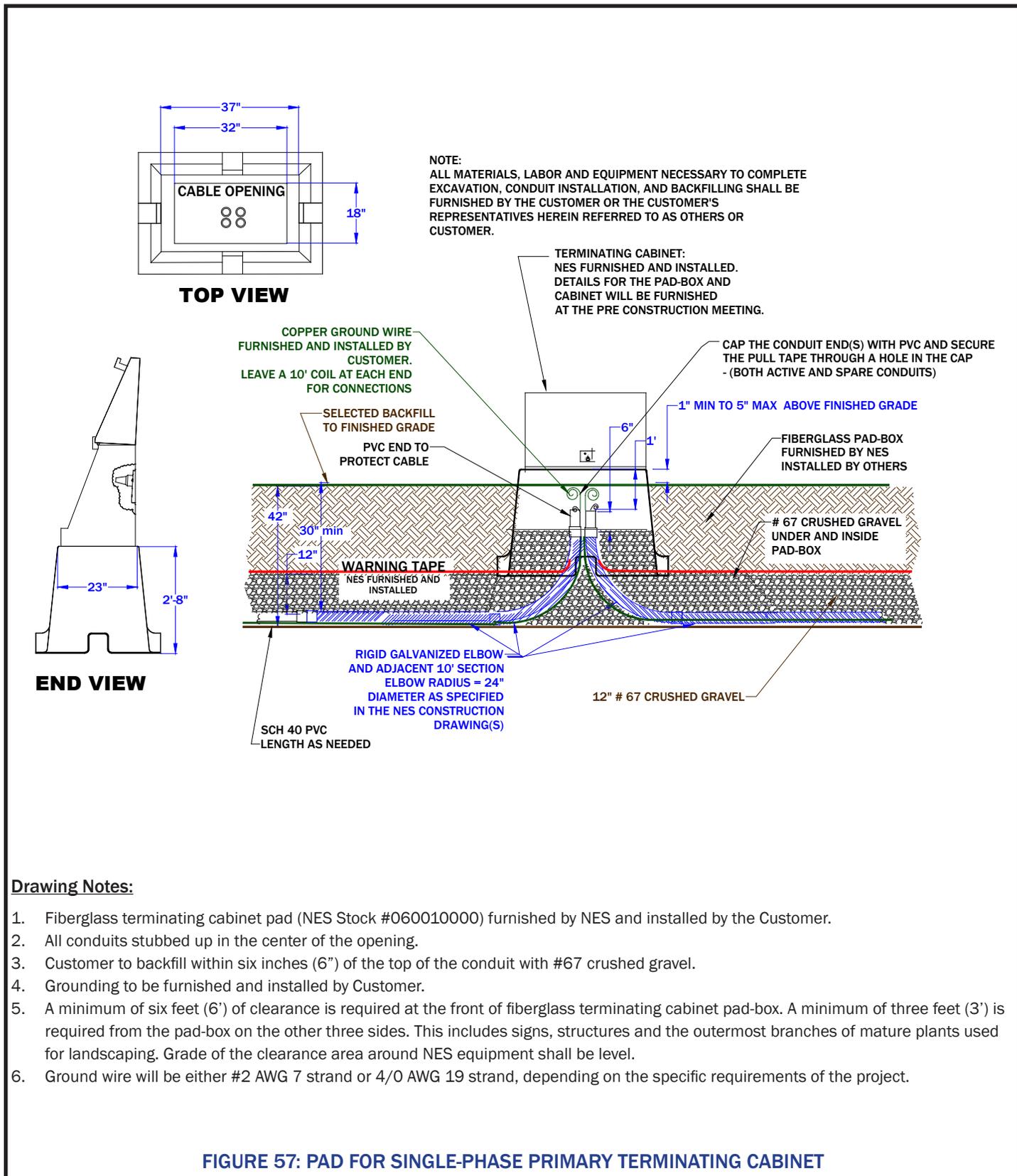
Drawing Notes:

1. Residential driveway exception allows for 12 ft. - 6 in. service heights crossing the driveway if there are no vehicles taller than eight (8) feet expected.
2. Consider Customer's future plans for the property when designing these jobs.

FIGURE 56: DRIVEWAY CLEARANCES



APPENDIX D -ADDITIONAL INFORMATION



Drawing Notes:

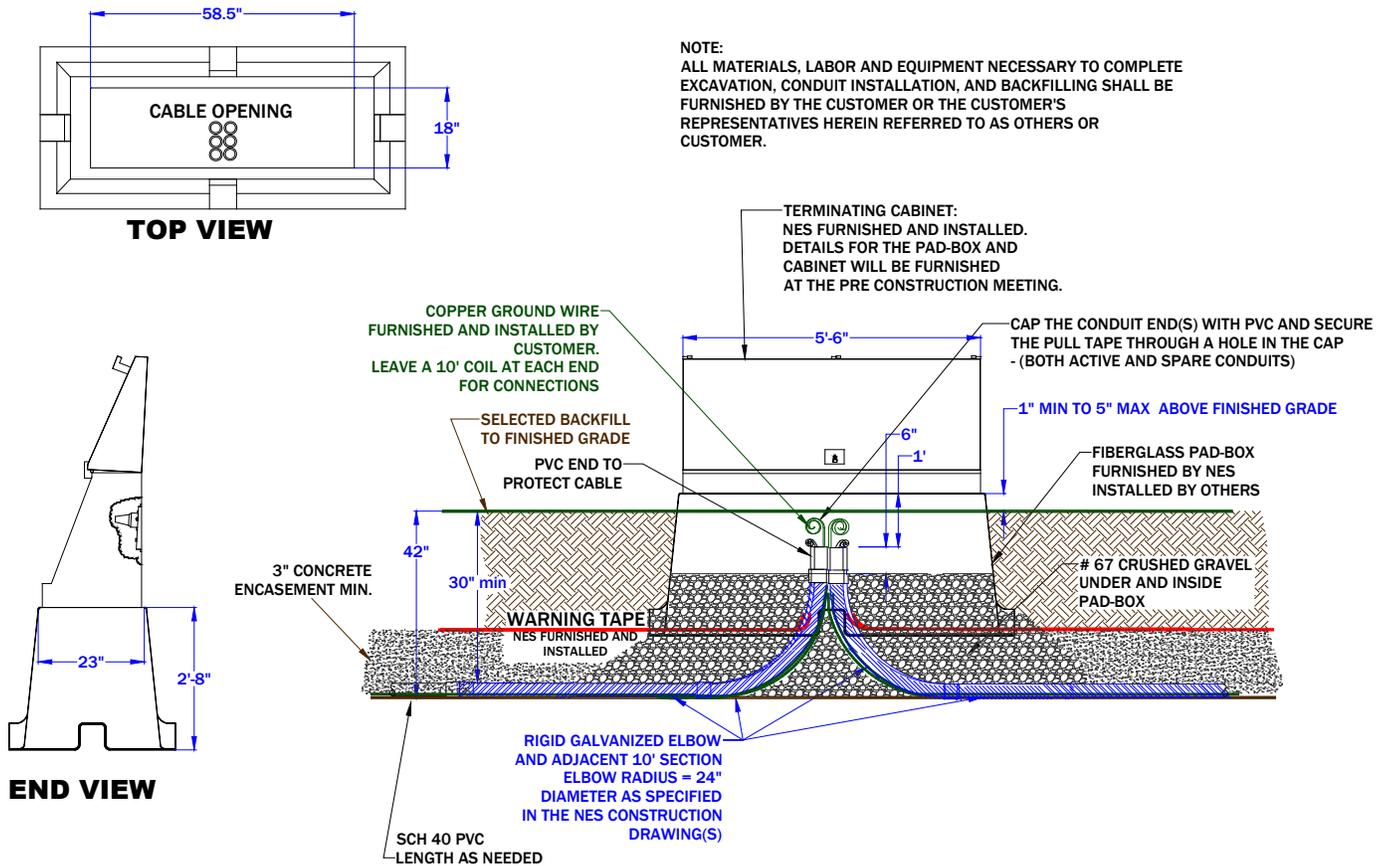
1. Fiberglass terminating cabinet pad (NES Stock #060010000) furnished by NES and installed by the Customer.
2. All conduits stubbed up in the center of the opening.
3. Customer to backfill within six inches (6") of the top of the conduit with #67 crushed gravel.
4. Grounding to be furnished and installed by Customer.
5. A minimum of six feet (6') of clearance is required at the front of fiberglass terminating cabinet pad-box. A minimum of three feet (3') is required from the pad-box on the other three sides. This includes signs, structures and the outermost branches of mature plants used for landscaping. Grade of the clearance area around NES equipment shall be level.
6. Ground wire will be either #2 AWG 7 strand or 4/0 AWG 19 strand, depending on the specific requirements of the project.

FIGURE 57: PAD FOR SINGLE-PHASE PRIMARY TERMINATING CABINET



ELECTRIC SERVICE GUIDELINES

APPENDIX D



Drawing Notes:

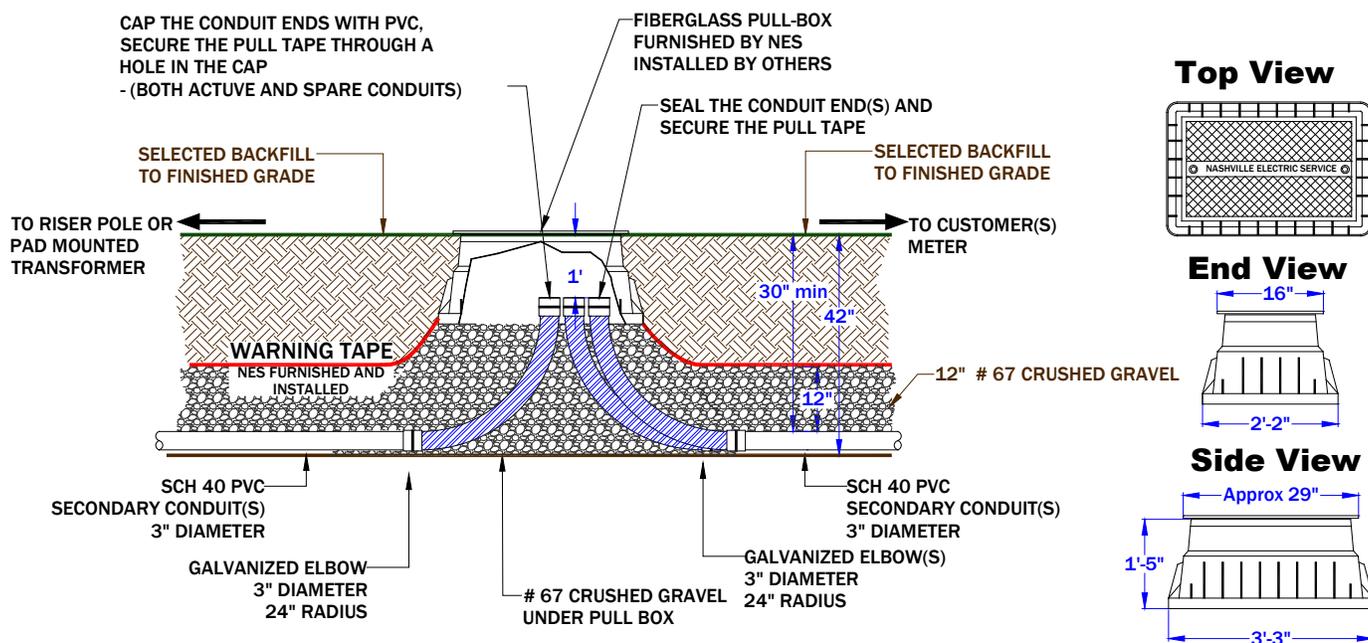
1. Fiberglass terminating cabinet pad box (NES Stock #060015000) to be furnished by NES and installed by the Customer.
2. All conduits stubbed up in the center of the opening.
3. Customer to backfill within six inches (6") of the top of the conduit with #67 crushed gravel.
4. Multiple conduits to be grouped at the single conduit location when applicable.
5. A minimum of six feet (6') of distance is required at the front of terminating cabinet door. A minimum of three feet (3') is required from the pad on the other three sides. This includes signs, structures and the outermost branches of mature plants used for landscaping. Grade of the clearance area around NES equipment shall be level.
6. Ground wire will be either #2 AWG 7 strand or 4/0 AWG 19 strand, depending on the specific requirements of the project.

FIGURE 58: PAD FOR THREE-PHASE PRIMARY TERMINATING CABINET



INSTALLATION MUST BE INSPECTED BY NES
 REFER TO FIGURE 69 - DITCH INSPECTION PROCESS

NOTE:
 ALL MATERIALS, LABOR AND EQUIPMENT NECESSARY TO COMPLETE EXCAVATION, CONDUIT INSTALLATION, AND BACKFILLING SHALL BE FURNISHED BY THE CUSTOMER OR THE CUSTOMER'S REPRESENTATIVE(S) HEREIN REFERRED TO AS OTHERS OR CUSTOMER.



Drawing Notes:

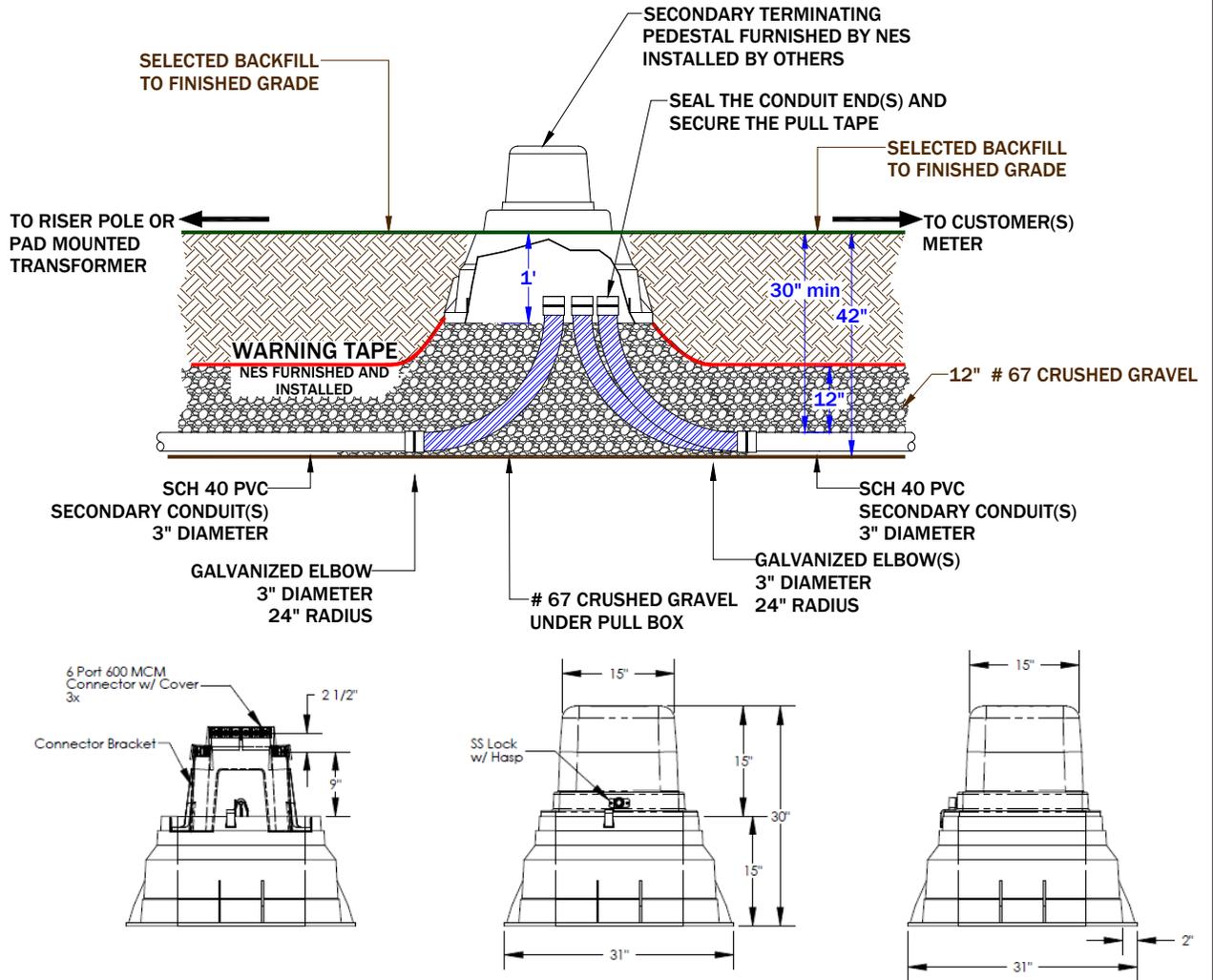
1. Maximum number of permanent service conduits is five (5), including the feeder conduit from riser pole to pull box. Conduits are three inch (3") diameter, unless specified otherwise on the design drawing. Additionally, there can be a three inch (3") temporary conduit, and a two-inch (2") street lighting conduit installed in the pull box.
2. Fiberglass pull box (NES Stock #060034000) is furnished by NES and installed by the Customer.
3. Appropriate backfill as required by NES.
4. Final grade shall be within one inch (1") of the top of the fiberglass pull box.
5. A minimum of three feet (3') of clearance is required all around the pull box cover. This includes signs, structures and the outermost branches of mature plants used for landscaping. Grade of the clearance area around NES equipment shall be level.
6. This installation may be used for commercial applications at NES discretion. Pull box size and type may vary.
7. This installation is not to be used in the Downtown Network area.

FIGURE 59: SECONDARY PULL BOX FOR NEW SUBDIVISION INSTALLATIONS

INSTALLATION MUST BE INSPECTED BY NES

REFER TO FIGURE 69 - DITCH INSPECTION PROCESS

NOTE:
ALL MATERIALS, LABOR AND EQUIPMENT NECESSARY TO COMPLETE EXCAVATION, CONDUIT INSTALLATION, AND BACKFILLING SHALL BE FURNISHED BY THE CUSTOMER OR THE CUSTOMER'S REPRESENTATIVE(S) HEREIN REFERRED TO AS OTHERS OR CUSTOMER.



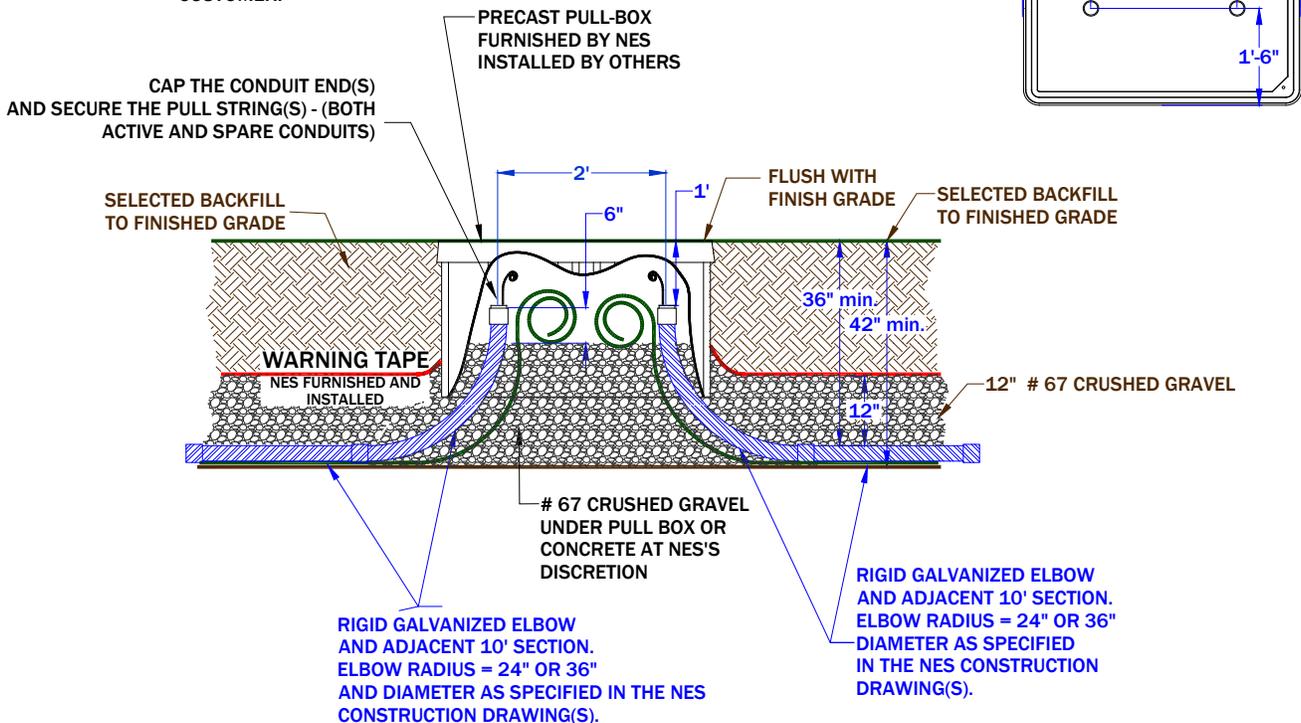
Drawing Notes:

1. Maximum number of permanent service conduits is five (5), including the feeder conduit from riser pole to pull box. Conduits are three inch (3") diameter, unless specified otherwise on the design drawing. Additionally, there can be a three inch (3") temporary conduit, and a two-inch (2") street lighting conduit installed in the pull box.
2. Secondary Terminating Pedestal (NES Stock #060395500) is furnished by NES and installed by the Customer.
3. Appropriate backfill as required by NES.
4. A minimum of three feet (3') of clearance is required all around the pedestal. This includes signs, structures and the outermost branches of mature plants used for landscaping. Grade of the clearance area around NES equipment shall be level.
5. This installation may be used for residential applications at NES discretion.
6. This installation is not to be used in the Downtown Network area.

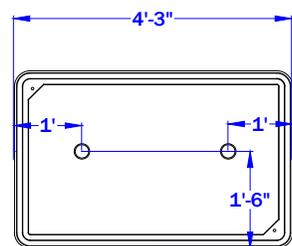
FIGURE 60: SECONDARY TERMINATING PEDESTAL INSTALLATIONS



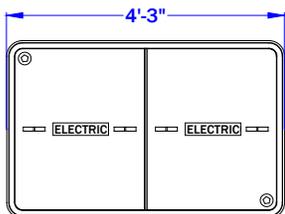
NOTE:
ALL MATERIALS, LABOR AND EQUIPMENT NECESSARY TO COMPLETE EXCAVATION, CONDUIT INSTALLATION, AND BACKFILLING SHALL BE FURNISHED BY THE CUSTOMER OR THE CUSTOMER'S REPRESENTATIVES HEREIN REFERRED TO AS OTHERS OR CUSTOMER.



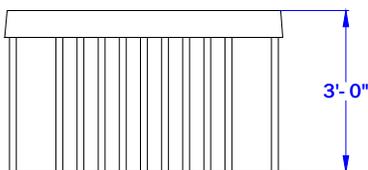
Inside View



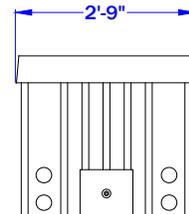
Top View



Side View



End View



Drawing Notes:

1. This is a non traffic area rated pull box furnished by NES (NES Stock #060044000) and installed by the Customer. Traffic rated pull boxes may be required at NES engineer discretion.
2. Customer to backfill inside box within six inches (6") of the top of the conduit with #67 crushed gravel.
3. Final grade shall be within one inch (1") of the top of the pull box.
4. A minimum of three feet (3') of clearance is required all around the pull box cover. This includes signs, structures and the outermost branches of mature plants used for landscaping. Grade of the clearance area around NES equipment shall be level.
5. This installation is not to be used in the Downtown Network area.

FIGURE 61: PRIMARY PULL BOXES



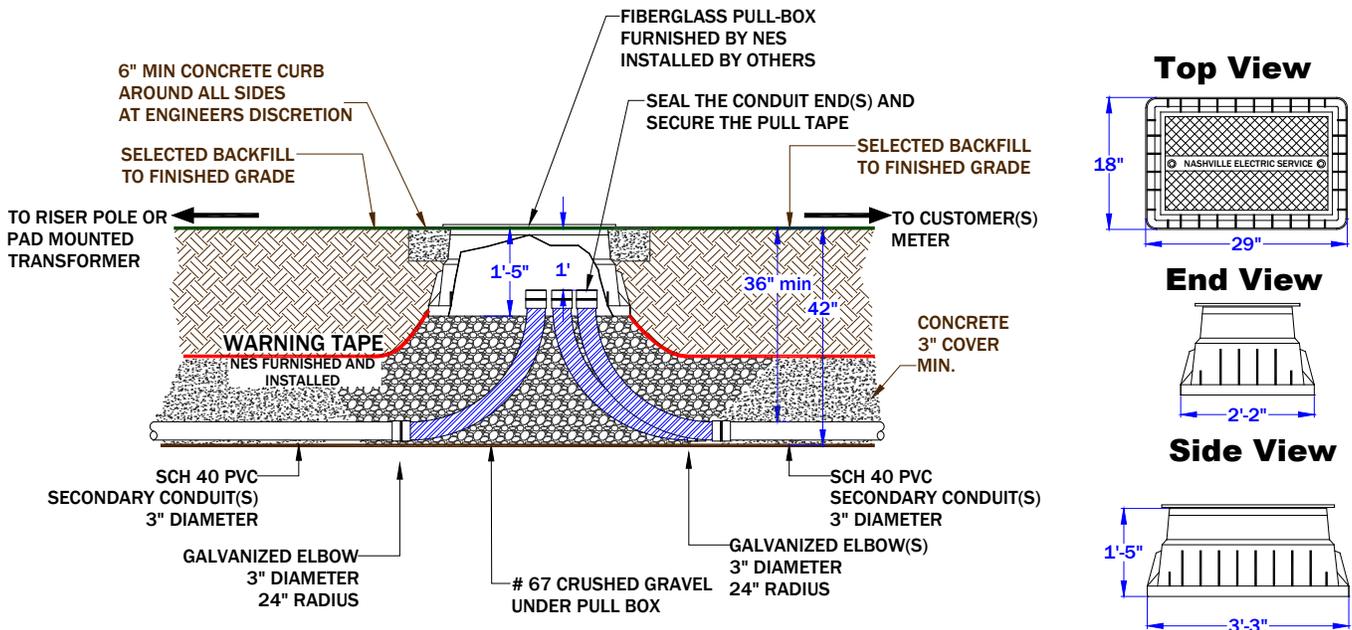
ELECTRIC SERVICE GUIDELINES

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INSTALLATION MUST BE INSPECTED BY NES REFER TO FIGURE 69 - DITCH INSPECTION PROCESS

NOTE:

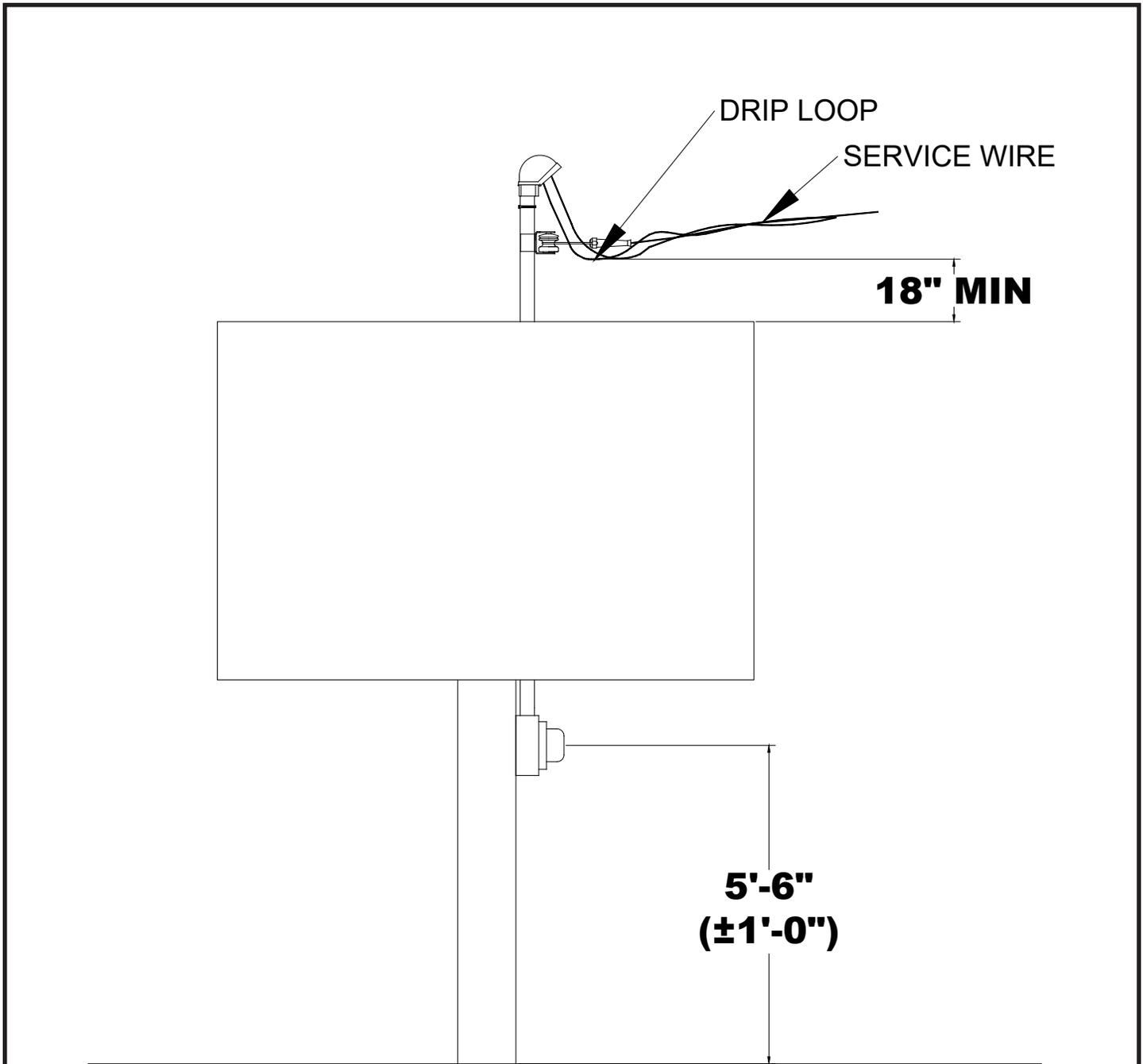
ALL MATERIALS, LABOR AND EQUIPMENT NECESSARY TO COMPLETE EXCAVATION, CONDUIT INSTALLATION, AND BACKFILLING SHALL BE FURNISHED BY THE CUSTOMER OR THE CUSTOMER'S REPRESENTATIVE(S) HEREIN REFERRED TO AS OTHERS OR CUSTOMER.



Drawing Notes:

1. Maximum number of permanent service conduits is five (5), including the feeder conduit from riser pole to pull box. Conduits are three inch (3") diameter, unless specified otherwise on the design drawing. Additionally, there can be a three inch (3") temporary conduit, and a two-inch (2") street lighting conduit installed in the pull box.
2. Fiberglass pull box (NES Stock #060034000) is furnished and installed by the Customer unless otherwise specified.
3. Appropriate backfill as required by NES.
4. Final grade shall be within one inch (1") of the top of the fiberglass pull box.
5. A minimum of three feet (3') of clearance is required all around the pull box cover. This includes signs, structures and the outermost branches of mature plants used for landscaping. Grade of the clearance area around NES equipment shall be level.
6. Minimum 10' clearance from any pole to service pull box.
7. All conduit(s) and terminations shall be grouped on one end of pull box.
8. At the engineers discretion, if the pull-box is outside of a sidewalk or paved area, the box must be surrounded by 6" min. of concrete.
9. This installation may be used for commercial applications at NES discretion. Pull box size and type may vary.
10. This installation is not to be used in the Downtown Network area.

FIGURE 62: COMMERCIAL SECONDARY PULL BOXES



Drawing Notes:

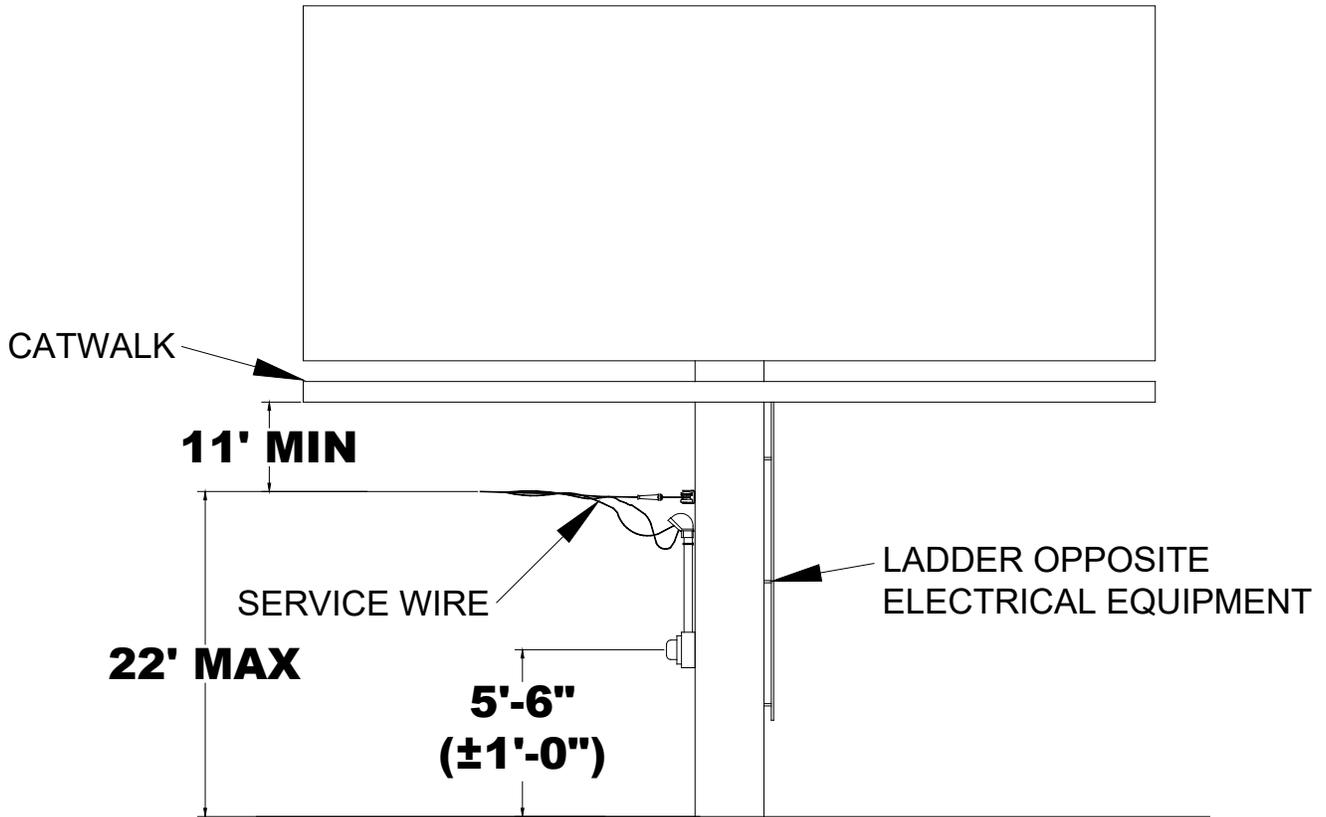
1. 1st Preference: Customer to power sign from main panel in business.
2. 2nd Preference: Underground secondary feed.
3. 3rd Preference: Overhead power feed as shown in figure.
4. Above drawing is for concept view only (not drawn to scale).

FIGURE 63: OVERHEAD SERVICE TO SIGNS



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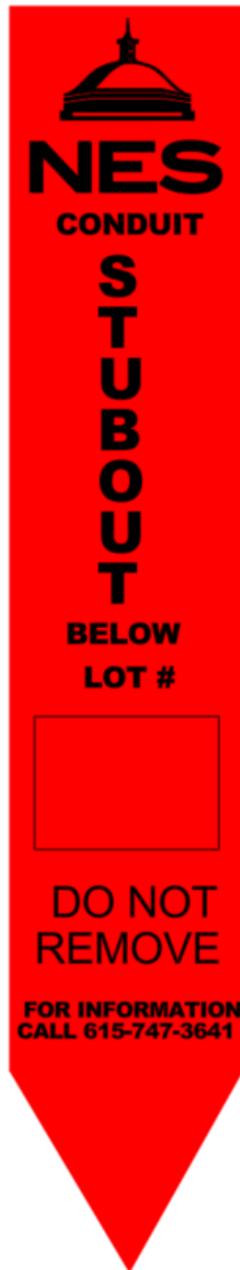
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Drawing Notes:

1. 1st Preference: Customer to power billboard from main panel in business.
2. 2nd Preference: Underground secondary feed.
3. 3rd Preference: Overhead power feed as shown in figure.
4. If clearances can't be met a Customer Pole will be required.
5. Above drawing is for concept view only (not drawn to scale).

FIGURE 64: OVERHEAD SERVICE TO BILLBOARDS



Drawing Notes:

1. NES will provide these markers (NES Stock #465337000) for the contractor/Customer to install.
2. If markers have been removed, the conduit should be located by digging in the general location. If locating the conduit by digging is unsuccessful, call NES Customer Engineering (747-3641) to locate conduits.

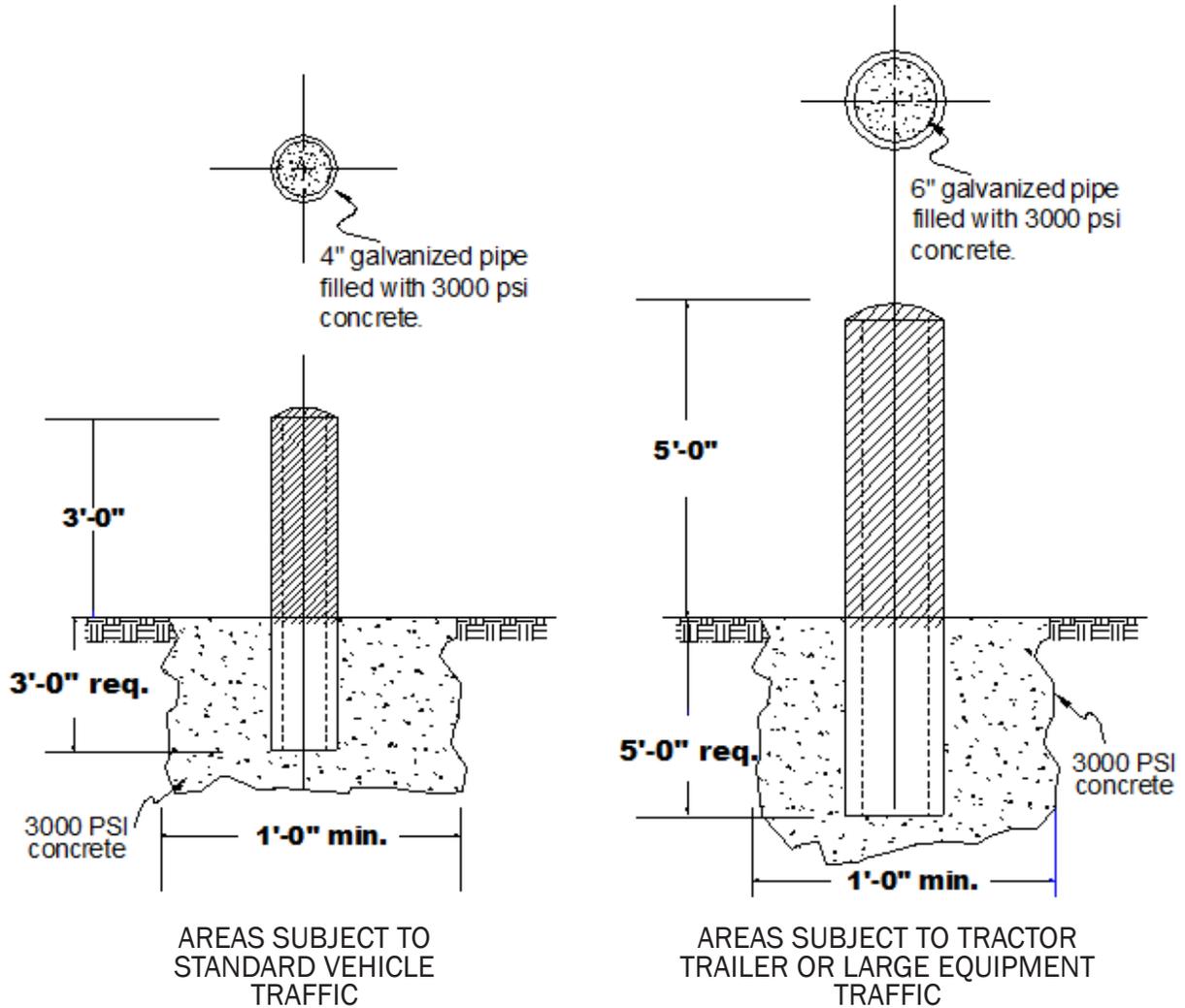
! Do not remove or cut off these markers. They are placed when conduit is installed to provide the Customer with a quick and easy means for locating the stub-out. Removal can delay construction.

FIGURE 65: CONDUIT STUB-OUT MARKER



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Drawing Notes:

1. Exact placement of the bollard(s) will be determined by the NES Engineer. Bollards shall be a minimum of six feet (6'-0") from the front of the transformer pad, and three feet (3'-0") from the other sides.
2. Preferred color is safety yellow. Post shall have a yellow or brightly colored paint to make it visible.

FIGURE 66: BOLLARD / GUARD POST



Drawing Notes:

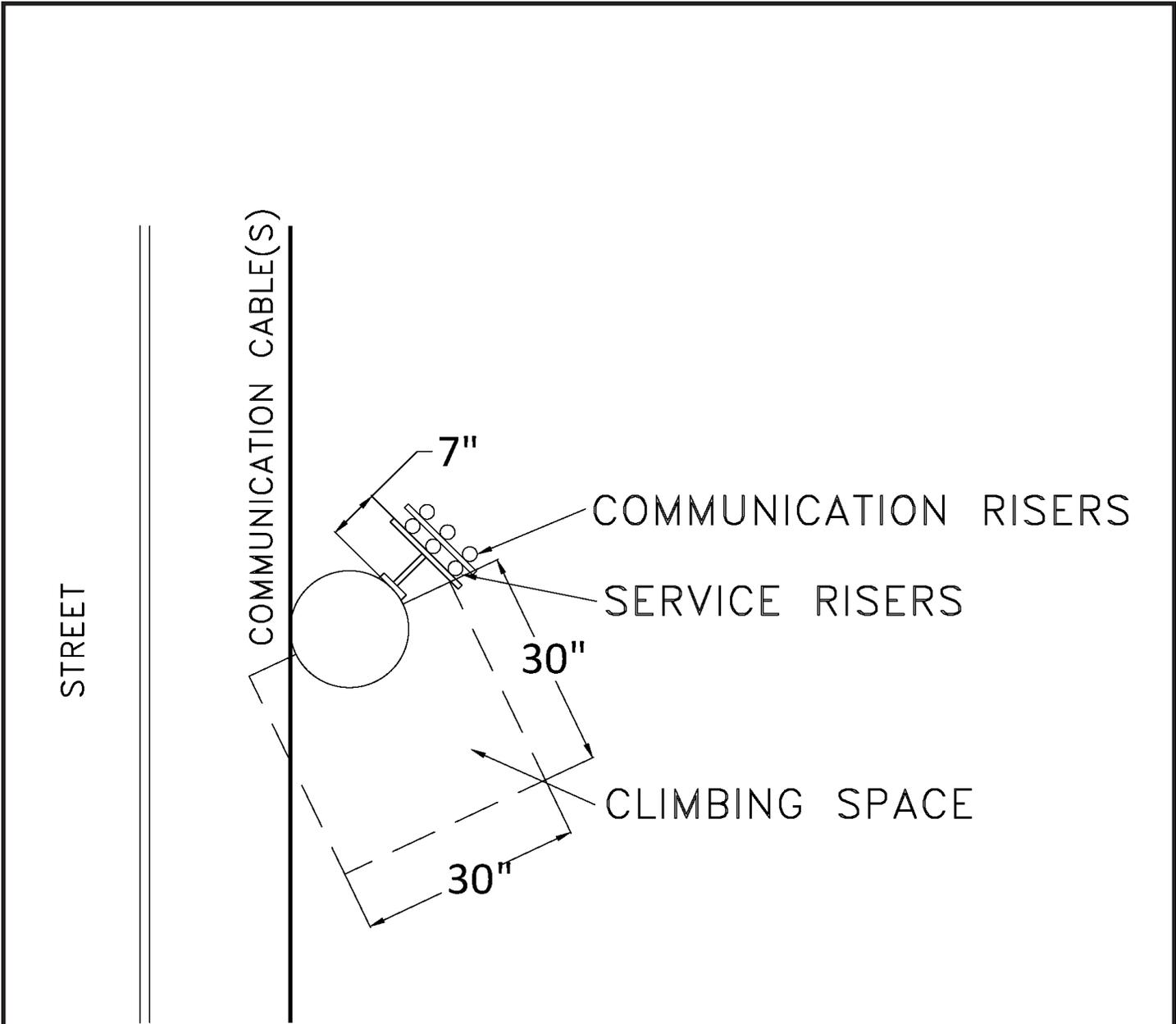
1. NES will place these decals on the door of pad-mounted transformers, terminating cabinets and switches after they are set on the pad.
2. Clearances around pad-mounted equipment are six feet (6') in front and three feet (3') from the sides and back.
3. NES reserves the right to trim or remove any landscaping, signs or other items placed closer to the equipment than indicated on this label. This may be necessary to restore or maintain service, and/or to ensure the employee's safety while operating the equipment. Items removed from the clear zones will not be replaced by NES.

FIGURE 67: EQUIPMENT WARNING LABEL



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Drawing Notes:

1. Maximum six (6) conduits, includes NES conduits. Maximum diameter of communication conduits is two inches (2"). All conduits must be racked together.
2. Conduit shall not stub up from or obstruct sidewalk.

FIGURE 68: COMMUNICATION RISER REQUIREMENTS



Notes:

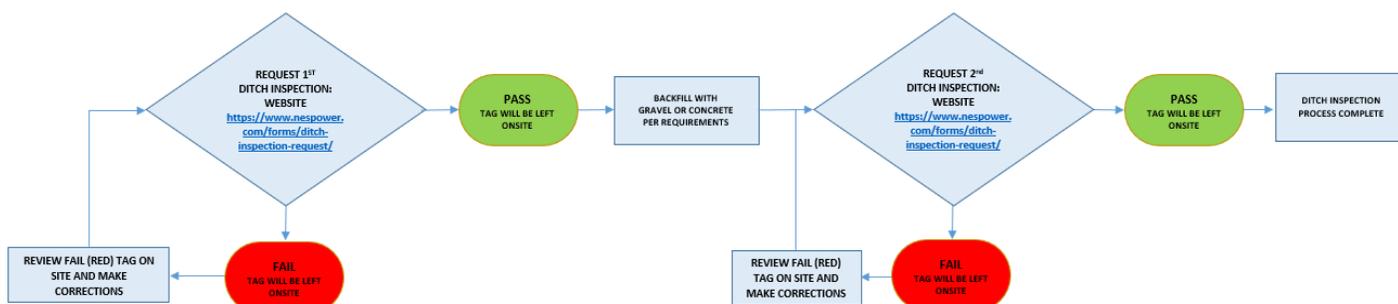
1. Read all instructions carefully before initiating process.
2. All communications and correspondence is via the website: <https://www.nespower.com/forms/ditch-inspection-request/>
3. Meter Base installation is not required for ditch inspection.
4. Contact NES if status tag is missing, unclear or illegible.

DITCH INSTALLATION PROCESS FOR PRIMARY CONDUIT:

1. CONTACT INFORMATION FOR THE NES OPERATIONS SUPERVISOR INSPECTING THE PROJECT WILL BE PROVIDED AT THE PRE-CONSTRUCTION MEETING.
2. COORDINATE ALL INSPECTIONS WITH NES OPERATIONS SUPERVISOR.

DITCH INSTALLATION PROCESS FOR SECONDARY SERVICE CONDUIT:

1. EXCAVATE DITCH
2. INSTALL CONDUIT
3. GO TO [HTTPS://WWW.NESPOWER.COM/FORMS/DITCH-INSPECTION-REQUEST/](https://www.nespower.com/forms/ditch-inspection-request/) TO REQUEST INSPECTION.
4. IF DITCH PASSES INSPECTION A **PASS** TAG WILL BE LEFT ONSITE. PROCEED TO STEP 5.
IF DITCH FAILS INSPECTION A **FAIL** TAG WILL BE LEFT ONSITE. REVIEW FAIL TAG, MAKE CORRECTIONS, THEN RETURN TO STEP 3. (IF PARTIAL INSPECTIONS ARE PASSED, ONLY PROCEED TO STEP 5 AFTER THE ENTIRE DITCH HAS PASSED INSPECTION)
5. BACKFILL 12" WITH #67 CRUSHED GRAVEL.
6. GO TO [HTTPS://WWW.NESPOWER.COM/FORMS/DITCH-INSPECTION-REQUEST/](https://www.nespower.com/forms/ditch-inspection-request/) TO REQUEST INSPECTION.
7. IF DITCH PASSES INSPECTION A **PASS** TAG WILL BE LEFT ONSITE. PROCEED TO STEP 8.
IF DITCH FAILS INSPECTION A **FAIL** TAG WILL BE LEFT ONSITE. REVIEW FAIL TAG, MAKE CORRECTIONS, THEN RETURN TO STEP 6.
8. AFTER WARNING TAPE IS INSTALLED, BACKFILL TO FINISHED GRADE.



! The NES ditch inspector will not make an inspection until they have received the layout (a drawing) from the NES Engineer. A drawing cannot be made until an order is placed, and all fees have been paid. Following this sequence of steps will ensure your work is handled in a timely manner.

! Customer shall provide room for riser pole on the property that will be served. Pole shall have all proper NESC clearances from other objects on Customer's property. Pole should be located roadside if at all possible.

! Customer should not begin digging trenches until NES poles have been set. If any digging must be done prior to NES poles being set, digging should stay at least fifteen feet (15') away from NES stakes. Failure to do so may delay NES installations.

FIGURE 69: DITCH INSPECTION PROCESS



Residential Subdivision Application for Service

- A) Developer _____ Date submitted ____/____/____
- B) Contact name & number _____
Address of development _____
Name of development/phase _____
Development type Subdivision Condos Townhomes Cottages Apartments
- C) Responsible party _____
Authorization letter required from property owner if different from responsible party.
Responsible party address _____
Property owner _____
County tax map # _____
Parcel # _____
Deed of record # _____
- D) Type of primary electric service Overhead Underground
 Overhead w/ underground secondary
Number of lots/units _____ Average square footage per unit _____ Stories _____
Type of heat Gas Electric kW of auxiliary heat per unit (if heat pump) _____
If primarily gas heat, any additional electric heat pumps Yes No Tons _____
Average total tons of A/C per unit _____ Water heaters per unit _____ (Electric) _____ (Gas)
Ranges per unit _____ (Electric) _____ (Gas) Clothes dryers per unit _____ (Electric) _____ (Gas)
Sidewalk plans, if applicable Yes No If yes, provide _____ ft. width for grass strip.
Street lighting required per Public Works Yes No
Private lighting along private road Yes No

FOR INTERNAL USE ONLY	
WR #	Drawing #



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Residential Subdivision Application for Service

The following items must be provided before an estimate can be initiated:

- ACAD civil site drawing in state plane coordinates included with the application (choose one)
 - Yes No Emailed to energyservices@nespower.com

One hardcopy set of Metro approved civil plans accompanied by a Metro Planning Commission approval letter and additional plan types (e.g. architectural, electrical) may be needed.
- Building envelopes shown on civil site drawings
- Proposed or existing easements on final plat (standard 20 ft. PUE adjacent to roads)
- UG High voltage layout when zoning setbacks restrict 20 ft. easements (i.e., SP, UDO, UZO and PUD plans must allow for electrical pad-mounted equipment)
- Fire hydrant locations
- Grading plans
- Storm water plans
- Water & sanitary sewer plans
- Three-phase power requirements
- Multi-unit dwelling proposed meter locations, if applicable
- Meter pedestals required on multi-unit dwelling, if applicable

The following items must be provided before an estimate can be finalized:

- Proposed grading start date _____
- Permanent energize service date _____
- Sidewalk & grass strip details
- Street lighting plans if mandatory by Public Works
- Stream crossings and bridge cross-sections
- Postal plans identify address (multi-family only)
- Three-phase, multi-meter, secondary termination enclosure required. No troughs allowed.
- Dry-type vault room required, if applicable

Additional comments

Customer and street lighting guidelines are available at nespower.com under Builders & Contractors.

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	<h3>NASHVILLE ELECTRIC SERVICE</h3>						
APPLICATION FOR NEW COMMERCIAL SERVICE - 50kW and larger							
For each metered service, please complete the following information and e-mail to _____ or fax 615.747.3552							
1. CUSTOMER/BUSINESS INFORMATION							
Legal Business Name: _____ Federal Tax ID (EIN) #: _____ Corporate Phone: _____ Corporate Address: _____ City: _____ State: _____ Zip: _____ Corporate Contact Name: _____ Title: _____ Email: _____							
2. ELECTRIC SERVICE ACCOUNT INFORMATION							
Service Address: _____ City: _____ State: _____ Zip: _____ Mailing Address: _____ City: _____ State: _____ Zip: _____ Site Representative Name: _____ Title: _____ Email: _____							
3. GENERAL FACILITY INFORMATION See www.SICCODE.com for more information							
SIC/NAICS Facility Code: _____ Total Square Footage: _____ Service Turn-on Date: _____ Days/Hours of Operation: _____ Existing Square Footage: _____ Primary Use of Facility: _____							
4. CONTRACTOR INFORMATION							
Business Name: _____ General Contractor <input type="checkbox"/> Electrical contractor <input type="checkbox"/> Contact Name: _____ Title: _____ Phone: _____ Email: _____							
5. SERVICE INFORMATION							
The Electric Service Guidelines are found at: www.nespower.com/content.aspx?page=guidelines *Sections B-E are not required for Successor Turn on							
A. Action	B. Service Size	C. Service Type	D. Voltage	E. Meter Location			
<input type="checkbox"/> Permanent <input type="checkbox"/> Temporary <input type="checkbox"/> Meter Change <input type="checkbox"/> Successor *	<input type="checkbox"/> 100 A <input type="checkbox"/> 200 A <input type="checkbox"/> 400 A <input type="checkbox"/> 600 A <input type="checkbox"/> Other	<input type="checkbox"/> Utility Pole/Overhead <input type="checkbox"/> Utility Pole/Underground <input type="checkbox"/> Pad Transformer <input type="checkbox"/> Transformer Vault	<input type="checkbox"/> 120/240V-1 Phase/3 Wire <input type="checkbox"/> 120/208V-3 Phase/4 Wire <input type="checkbox"/> 277/480V-3 Phase/4 Wire	<input type="checkbox"/> Meter Room <input type="checkbox"/> Pedestal <input type="checkbox"/> Outside Wall <input type="checkbox"/> Switchgear/Meter Center <input type="checkbox"/> Customer Pole			
6. ELECTRIC LOAD INFORMATION (Please list new loads only)							
Installed Item	Connected Load	Installed Item	Connected Load	Installed Item	Connected Load	Installed Item	Connected Load
Lighting	_____ kW	Other Motors	_____ kW	Heating	_____ kW	Other	_____ kW
Water Heating	_____ kW	Fire Pump	_____ kW	Refrigeration	_____ kW	Other	_____ kW
Receptacles	_____ kW	Cooking Equip.	_____ kW	Elevator	_____ kW	Other	_____ kW
Largest Motor	_____ kW	Air Conditioning	_____ kW	Vehicle Charger	_____ kW	Total Connected	_____ kW
Alternative energy sources:		<input type="checkbox"/> Generator	<input type="checkbox"/> Renewable Generation	<input type="checkbox"/> Battery Storage	<input type="checkbox"/> Natural Gas	<input type="checkbox"/> Geothermal	
7. Certification							
I certify this information to be correct to the best of my knowledge and agree to notify Nashville Electric Service (NES) of any changes to the facility such as service size, kW load, alternate power sources, or other electric service impacts.							
I also understand this completed form obligates the Customer to the NES Terms and Conditions , NES Policies & Regulations , and NES Schedule of Fees and Charges ; all available at our website www.nespower.com/content.aspx?page=policies .							
The Customer's Representative signing this Application represents and warrants that he or she is duly authorized to execute this Application and that such execution creates a valid, binding and enforceable legal obligation of the Customer.							
Customer Representative: _____		Title: _____		Date: _____			
8. FOR NES USE ONLY							
Received by: _____		Date: _____		WR#: _____		Account No: _____	
						Ex. Peak kW: _____	



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APPENDIX D

PRE-CONSTRUCTION FORM (EXAMPLE COPY)

(For projects that require a pre-construction meeting)

Pre-Construction Meeting Information Sheet

Individuals Attending Meeting		Designer:
		Meter Tech:
		NES Dwg No.:

- Issued New Electric Service Handbook Issued Construction Drawings to Contractor, Telephone, and CATV Issued: Pad Sketch Manhole Details

Ditch/Conduit Requirements:

- Refer to drawing for conduit sizes and quantity.
- Customer must provide secondary termination enclosure meeting NES specs (See metering section of Electric Service Guidelines: <http://nespower.com/guidelines.html>, click "Electric Service Guidelines").
- Customer should refer to metering section of NES Electric Service Guidelines for all metering requirements.
- Customer is responsible for all necessary tree trimming based on requirements from NES Vegetation Management.
- Minimum 12-inch separation in all directions from other utilities and NES equipment.
- Minimum 3-inch concrete encasement all around conduit or conduits (commercial services with SCH 40 PVC)
- 12-inch concrete encasement (minimum 3 inches under and minimum 9 inches above conduit) where exposed to drainage areas, creeks or other utilities.
- Ditch must be the width specified in the NES Customer Guidelines for New Electric Service, Residential and Commercial Trench Requirements. There must be minimum 30-inch cover over conduit(s). Ditch must be 42" deep, but may be reduced to 36" if NES is the only utility. (Any variances MUST be pre-approved by NES ditch inspector)

Approved by: _____

- No other utilities** can be placed under any NES electrical equipment (such as switches, terminating cabinets, transformers, primary and secondary pull boxes).
- Minimum ten-foot separation between water hydrants and NES equipment.
- Greater than six-foot separation between telephone and CATV pedestals and NES equipment (such as switches, terminating cabinets, transformers, primary and secondary pull boxes).
- Grounding of all other underground facilities to be coordinated by the customer with other providers.
- Divert other utilities away from NES equipment 15 feet before and after coming in proximity of NES equipment.
- Duct bank excavation must be stopped a minimum of 10 feet from the stated riser pole location prior to NES crews installing riser pole.
- Red dyed concrete required in ditch.
- Bollards required to protect padmounted equipment.
- Customer must furnish ground wire: _____ #2 Cu (7 strand) _____ 4/0 Cu (19 strand)

Placement or location of NES equipment:

- Switches, terminating cabinets, and fiberglass transformer pad boxes to be 1 to 5 inches above finished grade.
- Fiberglass primary and secondary pull boxes to be installed flush with finished grade.
- Fire Barrier Walls required (check one): 6 ft tall x 8 ft wide or 8 ft tall x 10 ft wide.
- Landscaping: At mature growth must be 6 feet from front of pad-mounted transformers and switches, and 3 feet from other sides.
- It is strictly forbidden to build a roof over, or completely enclose in a building, any pad-mounted equipment such as transformers, switches or translosures. Proper access for inspection, maintenance and replacement of NES equipment must be maintained.
- All NES equipment to be placed in dedicated easement.
- All surveying provided by developer/contractor.
- Property pins to be staked as specified by NES designer. Notes regarding staking: _____
- The customer is responsible for any cost to relocate NES equipment as a result of changes to the property pins.
- Developer's representative must approve the staked pole locations. Any relocations due to lack of grading or proper positions within the site, will only occur after reimbursement to NES for the relocation.
- An As-Built survey is required prior to energizing the site.

Other items discussed: _____

Person to contact for inspections or questions:

Name: _____ Phone # _____



CONTRACTOR PICK-UP MAP

CONTRACTOR PICK-UP INFO SHEET

NOTICE: CUSTOMER IS RESPONSIBLE FOR LOADING THEIR OWN MATERIAL. NES WILL NOT ASSIST IN LOADING.

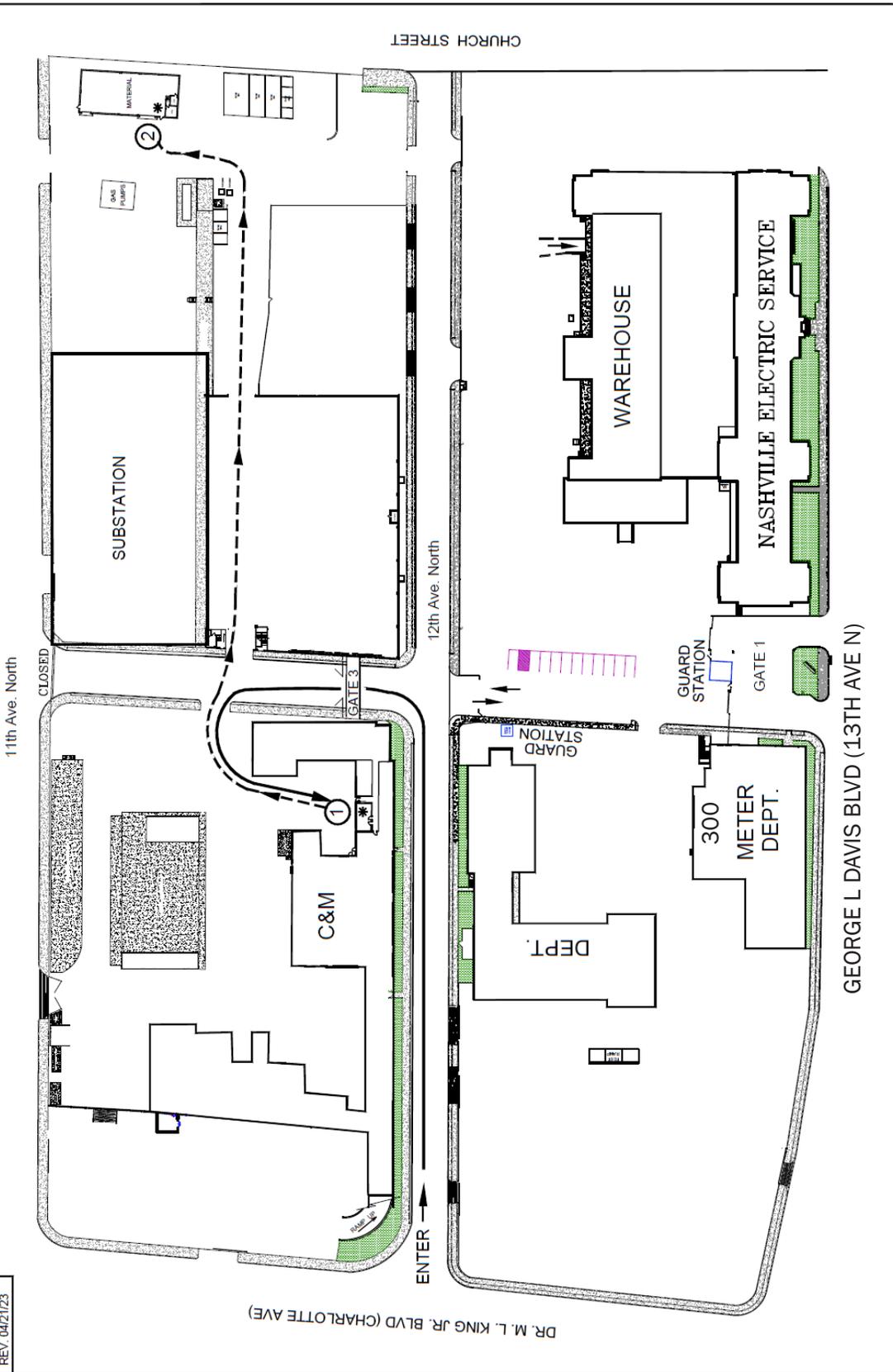
- WR # _____
- ① REQUISITION MATERIAL @ C & M OFFICE
- ② PICK-UP MATERIALS

REV. 04/21/23



C&M MATERIAL CONTACTS:
 Will Reese (615-747-3170)
 Sarah Sylvester (615-747-3682)

OFFICE HOURS: 8:00A.M. - 2:00P.M. Mon.-Fri.



METER EQUIPMENT TO BE PICKED UP AT 300 GEORGE L DAVIS BLVD
 SEE GUARD AT ENTRANCE FOR LOCATION TO PICK UP EQUIPMENT

ELECTRIC SERVICE GUIDELINES

ELECTRIC SERVICE GUIDELINES REVIEW COMMITTEE

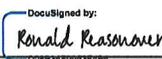
Editors:

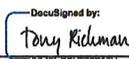
Brad McKelvey  Innovation, Projects, and Standards
Cedric Short  Innovation, Projects, and Standards

Reviewers:

Travis Shoemaker  Customer Engineering
Adam Creasor  Customer Engineering
Chris Luark  Customer Engineering
Ronnie Mayo  Customer Engineering
Andrew Bray  Customer Engineering
Darrell Thompson  Customer Engineering
Troy Hornbeak  Civil and Environmental Engineering
Will Reese  Underground
Terry Green  Safety
Michael Brewster  Safety
Clay Hullett  Meter Services
Rick Minatra  Meter Services
Brandon Hill  Donelson Service Center
Dan Kennedy  North Service Center
Justin Jernigan  West Service Center
Donnie Hunter  Central Service Center
Sean-Micheal Tibbs  Central Service Center

Approved By:

  Date: 1/12/2026
Ronald Reasonover Innovation, Projects, and Standards Supervisor

  Date: 3/7/2026
Tony Richman Innovation, Projects, and Standards Manager