City of Leesburg
Electric Department

"Blue Book"

Requirements for installation Of Electric Services

2016

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I. INTRODUCTION

The City of Leesburg Electric Department has prepared this booklet to inform the customer about our requirements for installing, maintaining and replacing electric service and metering equipment. This booklet is for customers who may be planning, designing and building facilities requiring electric service. This guide is also for customers who are planning changes to their existing electric service.

Every effort has been made to ensure the requirements within this booklet are up to date. However, with changing needs of the customer, changing codes and technology, may require this booklet to be updated periodically. If you have any questions or comments please contact the Electric Service Planners at the following address:

THE CITY OF LEESBURG ELECTRIC DEPARTMENT
ATTN: ELECTRIC SERVICE PLANNER SUPERVISOR
2010 GRIFFIN ROAD
LEESBURG, FL 34748

Except for the installation and maintenance of its own property, the City of Leesburg Electric Department does not install or repair wiring on the customer's premises and, therefore, is not responsible for the voltage beyond the Point of Delivery and does not assume any responsibility for, or liability arising because of the condition of wires or apparatuses on the premises of any customer beyond this point. Your cooperation will be appreciated and will enable you to receive satisfactory service. A list of Phone numbers has been compiled for the customer to ensure prompt service.

PHONE LIST

Electric Municipal Operations Center (352) 728-9830

- Contact the Dispatchers for general information, report trouble or service quality, and scheduling of services to be installed

Electric Service Planners (352) 728-9786 Extensions 2020, 2021 or 2026

- Contact the Electric Service Planners for information on the availability of electric Service, new services, upgrading existing services, line extensions or rental lights.

City of Leesburg Building and Inspections Department (352) 728-9750

- Contact the building and inspections department for permits or inspections within the City of Leesburg.

City of Leesburg Customer Service (352) 728-9800

- Contact the Customer Service Department for general information, turning services on and off, turning lights on or off.

City of Fruitland Park Building Department (352) 360-6727
Fax #352-360-6652

- Contact the City of Fruitland Park Building Department for permits and inspections within the City of Fruitland Park.

Lake County Building Services-(352) 343-9653 ext. 5
Fax #352-343-9771

- Contact the Lake County Building services for permits and inspections within the unincorporated areas of Lake County.

Sumter County Building Department-(352)-689-4460 or
(352)-569-1500 Fax # (352)-689-4461

- Contact the Sumter County Building Department for permits and inspections within the unincorporated areas of Sumter County.

Sunshine One Call - 811

- Call for locates before digging.
  CALL BEFORE YOU DIG! It's the LAW!

II. GENERAL INFORMATION

A. DEFINITONS

The following definitions shall apply for terms used in this booklet.

Authority Having Jurisdiction - (See Inspector, Inspection Authority)
Available Fault Current - The maximum current that would flow due to a direct short from one conductor to ground or between conductors at the point of calculation.
Contribution-in-Aid of Construction - The added cost paid by a customer or developer to have The City of Leesburg install service facilities costing more than that normally recovered through the monthly energy and Demand charges.
Customer - User of the City of Leesburg's Electric service or his authorized representative (architect, engineer, certified electrical contractors, etc.)
Demand - The average rate at which electric energy in KW, KVA or KVAR is consumed per time interval, typically 30 minutes.
Demand Ampere - Average current flowing during the peak demand interval.
Emergency and Standby Generators - Generators that normally operate only when the City of Leesburg's electric service is unavailable and which are connected in such a way that no interconnection can exist.
FEMA - Federal Emergency Management Agency.
FPSC - Florida Public Service Commission.
High Leg - The conductor in a three-phase delta secondary connection that has a higher voltage-to-ground potential than the other conductors.
Inspector or Inspection Authority - A person or agency authorized by a governmental body to inspect and approve electrical installations.
Instrument Transformer - Current Transformer (CT) or Potential Transformer (PT) used to obtain current or voltage levels required for metering circuits.
Interconnection – Cogeneration and Small Power Producers – An electric service where co-generators and small power producers operate in parallel with the City of Leesburg's electric system. Energy may flow in either direction through an interconnection.
National Electrical Code (N.E.C.) – a code sponsored by the National Fire Protection Association under the auspices of the American National Standards Institute for the purpose of safeguarding persons and property from hazards arising from the use of electricity.
National Electric Safety Code (N.E.S.C.) – A code sponsored by the Institute of Electrical and Electronics Engineers, Inc. under the auspices of the American National Standards Institute for the purpose of the practical safeguarding of persons during the installation, operation or maintenance of electric supply and communication lines and associated equipment.
Point of Delivery – The point as designated by the City of Leesburg Electric Department, where the City of Leesburg's overhead service drop, underground service lateral or transformer secondary bushings connect to the Customer's service entrance conductors.

Service – The supply by The City of Leesburg of electricity to the Customer, including the readiness and availability of electrical energy at the point of delivery at the standard available voltage and frequency whether or not utilized by the Customer.
Service Drop – The overhead service conductors between The City of Leesburg's secondary conductors and the point of delivery to the Customer's property.
Service Entrance – Customer owned wire and enclosures, connecting the Customer's service equipment to the City of Leesburg's Service Drop, Service Lateral, transformer bushings or other source of supply.
Service Lateral – The underground service conductors between the City of Leesburg's secondary conductors or transformers, including any risers at a pole or other structure and the Point of Delivery.
Wire Size – This refers to copper conductors AWG unless otherwise specified. Should another approved conductor material be used, a size having the equivalent current carrying capacity shall be selected.
Photovoltaic Cells- Semiconductor devices that convert sunlight into direct current (DC) electricity.
Inverter- Converts direct current (DC) power to alternating current (AC) power. Utility interactive or Grid Connected- Electric generating system which operates in parallel with the electric utility.
Islanding- A condition in which a portion of a utility network that contains both load and generation remains energized while isolated from the remainder of the Grid.
Power Quality- The measurement and characteristics of voltage and current with respect to instantaneous and steady state values or fluctuations thereof.
Reliability- The availability of electrical service that has acceptable power quality characteristics.

B. AVAILABILITY AND LOCATION OF SERVICE

1. Information concerning the availability of service for a desired location shall be provided by The City of Leesburg Electric Department. **The City of Leesburg Electric Department, in all cases, shall designate the point of delivery.** The City of Leesburg shall make extensions to its existing facilities when required, provided the revenues to be derived shall be sufficient to afford a fair and reasonable return on the cost of making such extensions. These extensions shall be to the point which allows the City of Leesburg to provide service in the most economical and practical means. Should additional facilities be requested by the Customer, additional fees shall be required to cover added costs. The City of Leesburg may require from customers additional fees, easements, or other arrangements whereby the City of Leesburg shall be assured a fair and reasonable return on the cost of providing service.
2. The City of Leesburg Electric Department will determine if overhead or underground service is available in a particular area. Areas that have the primary and/or secondary installed underground, those services will be installed as underground only. In areas that have been designated as going to be converted to underground, all new services and "change of

services" will be underground. Areas that are currently overhead and there is no plans to place underground, can be overhead or underground.

3. In order to assure that the service connection is made promptly and that City equipment has adequate capacity to provide satisfactory service to the customer, cooperation between the Customer and the city of Leesburg Electric Department is necessary. **Before construction is started, the Customer shall request the City of Leesburg Electric Department to designate a point of delivery, and submit appropriate load data to the City of Leesburg Electric Department**. The load data should include the anticipated demand or the type and number of electrical appliances to be used, building plans, and site plans. It is imperative that the City of Leesburg Electric Department and Customer be in agreement on the planned location of all service related equipment before construction is started. However, the City of Leesburg Electric Department shall have final authority to determine the location. This equipment includes meters, risers, pedestals, pull boxes, CT cabinets, PT cabinets, transformers, etc.

C. REQUEST FOR SERVICE

1. In order to obtain permanent service at the desired time, the customer must contact an Electric Service Planner and place a "Service Request".
2. The customer must provide address, service load information, AC size, square footage, site plan and building permit if needed.
3. The Electric Department will determine if overhead or underground service is available in a particular area.
4. The Electric Department will provide the customer with a "Service Request" form which will be taken to City of Leesburg Customer Service to pay all applicable fees, including deposits. See **Table #1** for current fees. A "Customer Service Work Order" will then be issued to the Electric Department. Please see **Figures 26 and 27** for a flow chart of activities that must take place.

D. TYPE AND CHARACTER OF SERVICE

1. ***IT IS ESSENTIAL THAT THE CUSTOMER CONSULT THE CITY OF LEESBURG ELECTRIC DEPARTMENT REGARDING TYPE OF SERVICE WHICH CAN BE FURNISHED AT A PARTICULAR LOCATION BEFORE PROCEEDING WITH PURCHASE OF EQUIPMENT OR INSTALLATION OF WIRING.***
2. Service is provided with alternating current at a normal frequency of sixty (60) hertz (cycles per second).
3. The voltage and/or number of phases which shall be supplied shall depend on the type, size and location of the load, and existing City of Leesburg facilities.
    a. Voltage

Standard voltages are 120/240, 120/208 and 277/480 **(see Figure 1).** Only one of these sets of voltages is normally available at any given location. If a voltage is requested other than that which is currently established at the desired location the Customer may be charged a "Contribution-in-Aid of Construction" to cover the cost to supply the requested voltage.

b. Phase
Single phase, 3 wire service or three phase, 4 wire service shall be provided according to the following:

i. Customers located in predominantly residential areas shall normally be provided with only single phase 120/240 volt service. Three phase service to such customers may be supplied only if a single motor of more than 5 HP or single heat pump/air conditioner of more than 5.6 tons is present, and the required City facilities are readily accessible. The Customer may be charged a "Contribution-in-Aid of Construction" for three phase service.

ii. In multi-occupancy buildings or complexes served by 120/208 volt, three phase facilities, normal service to individual occupancies shall be 120/208 volt, single phase, 3 wire, with a 5th Terminal meter can.

iii. Commercial/industrial Customers located in commercial/industrial areas shall be provided three phase service only if it is currently available at the location, or if loads meet the above size requirement, or if "special" three phase loads are involved as determined by the City of Leesburg Electric Department

iv. If three phase service is requested and the above conditions are not satisfied, the Customer may be charged a "Contribution-in-Aid of Construction."

v. The preferred method of rotation by the City is clockwise.

4. The manner in which single phase load is connected by the Customer is critical with three phase service. On 120/208 volt or 277/480 volt "wye" three phase services, all single phase loads should split evenly among the three phases. On 120/240 volt "delta" three phase services, all single phase load, both 120 volt and 240 volt, shall be connected only to the 120 volt-to-ground legs. No single phase load, either 120 volt or 240 volt, shall be connected to the "high-leg." Connections made otherwise may result in an overload or single phase condition with the possibility of damage to the Customer's three phase equipment.

E. INSPECTION

1. The Customer's wiring and electrical equipment shall be installed in accordance with the adopted edition of the **"National Electric Code"** and local ordinances.

2. All wiring installations shall be inspected and approved by an authorized electrical inspector as required by law. The City of Leesburg Electric Department can make connection only when requirements of this booklet have been met and The City of Leesburg Electric Department has been notified by the customer or owner that the installation has been approved. If a safety inspection is required by an authorized inspecting authority, it shall be done before connection or reconnection of service.
3. The City of Leesburg Electric Department shall make an inspection of the Customer's Service Entrance facilities only to check for compliance with the City of Leesburg Electric Department's requirements stated in this booklet. If it is found that the facilities are not in compliance with these requirements, the City of Leesburg Electric Department may refuse to connect the service. A reasonable effort shall be made to advise the Customer of any changes required by the City of Leesburg Electric Department.
4. The City of Leesburg Electric Department may refuse service to any new or altered installation, or disconnect service to any existing installation, which upon inspection, the City of Leesburg Electric Department or authorized inspecting authority considers unsafe. The City of Leesburg Electric Department may disconnect a service that shows physical evidence of tampering, hazardous condition, or current diversion as provided under State Statutes, rules and regulations of the City of Leesburg Electric Department. The City of Leesburg Electric Department shall not be responsible in any way for any defect in the Customer's wiring or for damage resulting from such defects.
5. Temporary emergency restoration of service to an existing Customer shall be made in accordance with the City of Leesburg Electric Department's rules and regulations and the authority having jurisdiction.

F. ALTERATIONS AND ADDITIONS, "CHANGE OF SERVICE"

1. **SERVICE CONNECTIONS, METERS OR METERING EQUIPMENT, BY LAW, SHALL NOT BE REMOVED OR RELOCATED EXCEPT BY EMPLOYEES OF THE CITY OF LEESBURG ELECTRIC DEPARTMENT AUTHORIZED TO DO SUCH WORK**.
2. Connection to the Customer's premises is made with facilities designed to properly supply adequate electric service for the Customer's operation, using information provided on the application for service. Therefore, no additions of major load, or alterations of the Customer's installation should be made without first notifying the City of Leesburg Electric Department. Failure to provide such notification may affect the quality and reliability of the Customer's own service and also that of the Customer's supplies by the same facilities.
3. "Change of Service" includes the following items
   - Customer chooses to convert from overhead service to underground service.

- Customer changes out an existing outdoor main panel, either keeping it the same size, or increasing the amperage.
- Panels sub-feeding from a main panel will not be included in "**Change of service**" fees.
- Replacement of breakers or conductors of the same size will not be included in "**Change of Service**" fees.
- Exceptions are in cases of "Emergency" where the panel is unsafe and has to be repaired immediately or within a reasonable amount of time.

4. An application for "Change of Service" provided by the City of Leesburg Electric Department shall be made by the Customer in the same manner as application for new service.
5. When the Customer requests a change in the existing service characteristics, the requirements outlined in **Section II-D (Type and Character of Service)** shall apply.
6. Services that are to be upgraded or relocated in areas that are underground or planned to be placed underground will be fed from an underground service.
7. **Overhead to Underground Conversions-**
    a. The customer shall contact the City of Leesburg Electric Department Electric Service Planners to determine the feasibility, cost and route of underground service.
    b. Charges for overhead to underground conversions and non- typical residential services will be based on the following items:
        - Per foot cost based on method of construction approved by the Electric Service Planner.
        - Per foot cost of the conductor used.
        - The cost for riser, adapter and lock ring.
        - The cost of a 2 man service crew and truck used. For conversions the cost shall be calculated using an estimated time of 2 hours.
    c. The Customer will be responsible for locating all underground facilities that belong to the customer. Damage to unmarked underground facilities will be the customer's responsibility.
    d. The City of Leesburg will not be responsible for settlement of ditches.
    e. The City of Leesburg will not be responsible for replacement of sod.
8. When alterations require the relocation of Service Drop wires, meters or metering equipment, the Customer shall make appropriate advance arrangements with the City of Leesburg Electric Department for the accomplishment of such relocation. Relocation of service attachments shall be approved by the City of Leesburg Electric Department before the Customer commences work. When alterations have been satisfactorily completed by the Customer **and the necessary inspection approvals obtained,** the City of Leesburg Electric Department shall make the connections to provide service.
9. **EQUIPMENT REMOVAL**
    a. The City of Leesburg Electric Department shall, upon notification from the Customer, remove equipment no longer necessary to provide service.
    b. The City of Leesburg Electric Department may remove equipment no longer necessary to provide service upon notification to the owner.

c. Before a permit is obtained, it shall be the responsibility of the Customer or his agent to ascertain from the City of Leesburg Electric Department that the meter number and service address for which the permit is to be obtained are in agreement with the current records of the City of Leesburg Electric Department.

G. RIGHTS AND RESPONSIBILITIES

1. The City of Leesburg Electric Department shall have the right to enter the premises of the Customer at all reasonable hours for the purpose of making such inspection of the Customer's installation as may be necessary for the proper application of the City of Leesburg Electric Department's rate schedules and rules and regulations; for installing, removing, testing or replacing its apparatuses or property; for reading meters; and for the entire removal of the City of Leesburg Electric Department's property in the event of termination of service to the Customer for any reason.
2. All property of the City of Leesburg Electric Department installed in or upon the Customer's premises used or useful in supplying service is placed there under the Customer's protection without charge to the City of Leesburg Electric Department. All reasonable care shall be exercised to prevent loss or damage to such property.
3. The Customer shall be held responsible for breaking the meter seals, tampering or interfering with the City of Leesburg Electric Department's meter(s) or other equipment installed on the Customer's premises. **No one except authorized employees/agents of the City of Leesburg Electric Department shall be allowed to make any repairs or adjustments to any meter or other piece of apparatus belonging to the City of Leesburg Electric Department. The customer shall be fined and the meter removed until fines are paid.**

H. METER SEAL POLICY

1. Meter seals shall not be cut or removed by the Customer per **Municipal Code Section 22.1 "Relocating or Tampering with meters"**, nor shall the meter be pulled unless there is immediate danger to life or property.
2. Meter seals shall not be cut or removed by an electrician.
3. All seals on electric meters, meter cans, sealing rings, or CT cabinets, shall only be cut by authorized employees of the City of Leesburg Electric Department.
4. If the Customer needs a seal cut or removed, he must contact the City of Leesburg Electric Department so an authorized person may be sent to cut the seal.
5. Violation of this policy will result in the following;
   a. The City will treat this as a meter tampering under Florida Statute 812.14.

b. The Electric Department will fill out a current diversion field investigation report.
c. There will be a copy of the current diversion field investigation report sent to the City of Leesburg Customer Service Department.
d. The original current diversion investigation report will be filed in the Meter Department of the Electric Department.

I. REFUSAL OR DISCONTINUANCE OF SERVICE BY THE CITY OF LEESBURG

The City of Leesburg Electric Department may refuse or discontinue service for certain reasons. Several of these reasons are listed below.

1. Non Payment of bills for electric service.
2. Refusal or failure to make a deposit when requested.
3. Failure to rectify a deficiency or defect in the Customer's wiring or other facilities after receiving notice from the City of Leesburg Electric Department that such condition exists.
4. Unauthorized use of electric energy.
5. Operation of equipment which causes voltage flicker or objectionable service characteristics to other owners.
6. Neglect or refusal to provide safe and reasonable access to the City of Leesburg.
7. Without notice in the event of tampering with meters or other facilities furnished and owned by the City of Leesburg.
8. Without notice in the event a hazardous condition is found by the City of Leesburg.

J. SOLAR INSTALLATIONS

As part of our commitment to support renewable energy, the City of Leesburg Electric Department is pleased to offer net metering. Net metering is a service that permits customers to offset part or all of their electric needs with their own renewable generating systems. Net metering promotes the development of renewable energy by allowing customers to use their own generation on-site, and to sell any excess generation to their electric utility. Please consult our Solar Installation Requirements at LEESBURGFLORIDA.GOV.

See **Figure #31** for Typical Installations.

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III. SERVICES

A. GENERAL INFORMATION

1. **See Figure 26 and 27** for the process of obtaining service.
2. The Electric Department shall be contacted as soon as a permit is issued for a new service to determine the availability of service and service characteristics.
3. Services that are in areas that have underground distribution or is planned to be placed underground, shall be fed underground. (Contact Electric Service Planners to identify these "planned" or designated areas.)
4. Services in the areas that have overhead distribution, and is not planned to be converted, will have the option of being overhead or underground.
5. All Services shall have a main disconnect on the outside at the meter location.
6. Normally, there shall only be one service voltage available at a location, and only one point of delivery for each building.
7. The point of delivery shall be designated by the City of Leesburg Electric Department.
8. All service entrance facilities, including meter bases, shall be located in an exposed or readily accessible area, on the front 1/3 of the building if possible. **(See FIGURE 2)**
9. Residential and commercial building service entrance conductors shall consist of a minimum of three (3) No. 6 copper or equivalent conductors.
10. Aluminum Conductors may be installed provided the meter socket is of a type approved for use with aluminum conductors, and corrosion inhibiting compound recommended by the cable manufacturer is properly applied to the meter socket terminals by the electrical contractor. All neutrals shall be insulated.
11. When an existing service entrance using copper conductors is replaced by a service using aluminum conductors, the existing meter socket, if not marked for use with either aluminum or copper conductors, shall be replaced with one approved for aluminum conductors.
12. Service entrance conductors between the City of Leesburg Electric Department source of supply and the Customer's service equipment should be as short as practical, and shall be enclosed in conduit or metallic tubing unless otherwise permitted by local code.
13. Where conduit or metallic tubing is used, fittings with removable covers should be avoided in the service entrance run if possible. If such fittings cannot be avoided, they shall not be concealed
14. Where a group of Customers are serviced from a service raceway, the covers to the raceway and/or pull box shall be provided with a means of sealing by the City of Leesburg Electric Department.
15. Customer load wires shall never be installed in raceways that contain un-metered wires.

16. Grounding

a. All services shall have a grounded neutral.
b. Grounds shall be established as required by the **"National Electrical Code"**, Authority having jurisdiction and the City of Leesburg Electric Department.
c. All grounds should have a maximum resistance of 25 ohms when measured at the point of delivery and at the meter location.

17. CONDUCTOR MARKING

a. All neutral conductors shall be clearly marked with a white marker at the point of delivery and at the meter location on the CT Cabinet.

b. The "208 volt ground phase" (high leg) of each 120/240, 3 phase, 4 wire service shall be clearly marked with an orange marker at the point of delivery and at the meter location or CT cabinet.

c. Phase conductors other than the "high leg" phase shall be clearly marked with color markers at the point of delivery and at the meter location if more than one conductor per phase is used.

d. Colors used for this purpose shall be the following:
    i. 120/208 Services- Black-A phase, Red-B Phase, Blue-C phase. See Figure #32
    ii. 277/480 Volt Service- Brown-A Phase, Orange-B Phase, Yellow-C phase. See Figure #33
    iii. 120240 Open delta- Black-A Phase, Red- B phase, Orange- High Leg. See Figure #34
e. It is the customer's responsibility to properly label the rotation of the meter center.
f. Rotation Labels are to be 5"x8" with ½" high letters, embossed or engraved, affixed by rivet to the outside of the meter can. If there are multiple meters, each meter socket shall be marked. Labels are to have high visible contrasting colors between the font characters and the background. Red font or red background color is not permissible.
g. Conductors shall be marked 12" from the end of a service entrance, weather-head or conduit.

18. WORK REQUIRING PERMITS

a. City of Leesburg Electric Services areas with 4 different "agencies with Jurisdiction.
    - City of Leesburg
    - City of Fruitland Park
    - Lake County
    - Sumter County
b. Each of these agencies has differing requirements for work requiring permits. Consult each of these entities to confirm what needs permitting.

B. TEMPORARY SERVICE

1. The City of Leesburg shall be consulted for detailed plans of each installation where temporary service is to be supplied.
2. Installations requiring special service, meter or other work for construction purposes, exhibits of short duration, etc, shall be made at the expense of the customer.
3. Temporary installation of service entrance, other wiring and meters shall be made and inspected in the same manner as permanent installations. Temporary service for construction purposes may be either overhead or underground depending on the available service. Arrangements for temporary construction service are shown in **Figures 3, 4, 5.**
4. The temporary service drop or temporary construction wires or cables shall not be tied to the Customers permanent panel except for test purposes. All temporary service poles shall be grounded per local codes.

C. OVERHEAD SERVICES

1. Services that are in areas that have underground distribution or the area is planned to be placed underground, will not have the option of an overhead service.
2. It is the Customer's responsibility to provide a suitable support for attachment of the service drop conductors. This support shall be capable of withstanding a continuous force of 200 lbs. in the direction of the service drop.
3. A minimum of three (3) feet of service entrance wire shall be left projecting from the weatherhead for connection to the service drop. The conductors shall be marked for phase identification at a point one foot outside of the weatherhead. See **SECTION III-A-17** for marking requirements.
4. Where the installation involves more than one service riser, it is the responsibility of the Customer to connect the conductors from each riser together. The City of Leesburg Electric Department shall provide only one connection per phase.
5. Unless otherwise required by local authorities and/or **"NATIONAL ELECTRICAL SAFETY CODE"**, the point of attachment of the service drop conductors shall be located by the customer so as meet or exceed the minimum clearances shown in **FIGURE 6** and as noted below.

Minimum Clearances of service drop Cables

(open wire service drops may require additional clearances)

Above roads, streets, alleys, parking lots, commercial and industrial driveways subject to truck traffic	18’
Above residential driveways	16’
Above space accessible to pedestrians only	12’
Above or below balconies accessible to pedestrians	11’
Above or below balconies not accessible to pedestrians	3.5’
Horizontal to any structures	5’
Swimming Pools(shall meet the “National Electrical Code”)	10’’
All Measurements are in Feet.	

6. Driveways where vehicular traffic may pass under service wires, shall maintain the minimum clearances from ground to service wires required for roads, streets, alleys and parking lots in the above table. For further details, items and definitions not covered above, refer to the **“NATIONAL ELECTRICAL CODE”** and the **“NATIONAL ELECTRICAL SAFETY CODE”.**
7. For service to mobile homes, refer to **FIGURES 7, 8.**
8. Where local inspecting authorities accept mobile homes as a permanent installation, refer to **FIGURE 11** which may apply.
9. Risers must be a minimum of 24” above the roofline and a minimum of 2” galvanized conduit.
10. Risers in excess of 36” shall be guyed by the customer.
11. Risers in excess of 72” above rooflines shall be accessible by City of Leesburg Electric Department bucket trucks.
12. The Customer may be charged a “Contribution-in-aid of Construction” for any cost incurred by the City of Leesburg Electric Department as a result of relocation or repair to City of Leesburg Electric Department facilities necessitated by grade changes, additions, swimming pools, etc.

D. UNDERGROUND SERVICES

1. **RESIDENTIAL SERVICES**
   a. All residential underground distribution, including services shall be installed under the current policies set forth by the City of Leesburg Electric Department.
   b. Charges for typical new underground residential services will be based on the following items:
      - Contractor’s flat fee to install underground service.
      - The cost for conductor based on 4/0 Al. Triplex with an average of 85.’
      - The cost for riser, adapter and lock ring.
      - The cost of a two man service crew and truck for installation and hook up averaged at 1 hour.
      - These charges will be re-calculated at the beginning of each fiscal year to insure accuracy.

- These installation charges are dependent on there being no impediment to the typical method of installation. The typical method of installation is open trenching. The use of non –typical methods of installation will result in additional charges.

c. Charges for non-typical new residential services-Underground.
   - Charges for services over 100' in length will be calculated using linear distance and conductor size as factors.
   - Charges for services requiring larger or more numerous conductors will be calculated using linear distance and conductor size and type as factors.
   - These installation charges are dependent on there being no impediment to the typical method of installation. The typical method of installation is open trenching. The use of non –typical methods of installation will result in additional charges.

d. Normal service voltage shall be 120/240 volt, single phase, and 3 wire. Three phase, 4 wire service shall be provided only if the provisions of **SECTION II-D** have been met. In large multi-story developments, service voltage may be 120/208 volt, single phase, 3 wire, at the option of the City of Leesburg Electric Department., to the individual residential customer.

e. The customer shall request the City of Leesburg Electric Department to designate the point of delivery for each service location before construction is started.

f. Any conduit risers installed by the customer for the City of Leesburg Electric Department shall have 24 inch radius bends, and shall extend 3 feet below grade, and be at least 5 feet away from building.

2. **NON RESIDENTIAL SERVICES, INCLUDING COMMERICIAL AND INDUSTRIAL**

   a. Non residential services will be brought to a service point selected by the City of Leesburg. This may be to pole, pad mounted transformer, pedestal or hand hole box. The Customer shall leave a minimum of five (5) feet of the service entrance conductors in position for connection by the City of Leesburg Electric Department, unless a shorter length is approved for a specific installation. The conductors shall be marked for phase identification both at the end of the conductors and at the point one foot outside of the conduit. See **SECTION III-A-17** for marking requirements.

   b. All non-residential underground services shall be installed under the terms set forth by the City of Leesburg Electric Department.

   c. Normal service voltages are; 120/240 volt single phase, 3 wire; 120/208 volt, 3 phase, 4 wire; and 277/480 volt, 3-phase, 4 wire. In certain areas 120/208 single phase, 3 wire services may be available. Service voltage of 120/240 volt, 3-phase, 4 wire, shall **NOT** be normally be available with underground service. It is important that the customer contact the City of Leesburg Electric Department Electric Service Planners to determine the voltage that is available at a desired service location before construction is started.

d. Cogeneration interconnections to secondary networks shall not be permitted.

3. Services that are in areas that have underground distribution or is planned to be placed underground, will be served with an underground feed. Contact a City of Leesburg Electric Service Planner to determine type of service available.
4. The customer will be charged with "aid to construction" for any cost incurred by the City of Leesburg Electric Department as a result of relocation or repair of the Electric Department facilities necessitated by grade changes, additions, swimming pool, etc.
5. Buried underground services shall maintain a minimum of 5 feet from the water's edge of a swimming pool, or greater, as required by the **"NATIONAL ELECTRICAL CODE**", the **"NATIONAL ELECTRICAL SAFETY CODE"** or local authorities.
6. Some jurisdictions may require special permitting as to the routing of the underground cable.
7. Customer service conductors within padmounted transformers may be cut and shaped by the Electric Department to make connection to the point of service. Reasonable effort shall be made to keep the length of conductors of the same phase equal in length.
8. Any obstruction (on the wall, footer, etc) which prevents installation of the City of Leesburg Electric Department's conduit shall be removed by the customer.

IV. METERING INSTALLATIONS

A. GENERAL REQUIREMENTS

1. The City of Leesburg shall furnish and connect all meters, instrument transformers and meter control wiring necessary to complete the meter installation.
2. For proper selection of metering equipment, it is the Customer's responsibility to furnish the Electric Department specific information such as: type of service (OH or UG), service voltage(s), main line switch amperes (service size), maximum demand amperes and the number and size of the Customer's service entrance conductors.
3. The customer shall furnish and install the necessary self- contained meter socket(s), and other equipment. For CT installations, see **SECTION IV D.**
    a. On single phase services where the anticipated demand current does not exceed 320 amperes, as determined by the Electric Department, a self- contained meter socket shall be used.
    b. Single phase services over 320 amperes see **Section IV D**.
    c. Three phase services over 225 amperes see **Section IV D**.
    d. On all self- contained installations where the service voltage is 240/480 volts, 277/480 volts or 480 volt to ground, a non-automatic disconnect device shall be provided and installed by the Customer on the line side of each individual meter. The disconnect device shall be lockable or sealable by the company and adjacent to each meter (see **Figure 13**). The Customer-owned non-automatic (no over current protection) disconnect device shall equal or exceed the customer's main capacity.
4. On installations involving more than one meter, on a single building, the following guidelines apply:
    a. The customer shall purchase and use single meter equipment for group installations as shown **in Figure 14 and 15**.
    b. The customer shall purchase and use group meter equipment as described in Section IV-B and shown in **Figures 16 and 17**.
    c. Where more than one set of line side conductors from single or ganged sockets terminate in a trough in which the City of Leesburg Electric Department terminates from an underground service, the Customer shall make the necessary connections in the trough to allow the Electric Department to terminate one set of conductors or bus. The trough shall be large enough to accommodate the Customer's and the Electric Department's conductors, connectors and shall be sealable and lockable.
    d. Each meter socket shall be identified on the outside front by an aluminum or plastic plate a minimum of ¾" high, 1 ½" wide and 1/16" thick, with letters a minimum of ¼" high engraved or stamped to indicate the apartment number, office suite, lot number, etc. The plate shall be riveted to the meter base. <u>Glued plates shall not be used</u>.

e. The address on the building or service location shall be permanently and prominently displayed and visible from the street, as required by the authority have jurisdiction.

5. Not more than one conductor shall be installed in a single terminal in any meter cabinet, trough or pedestal. Conductor strands shall not be cut in an effort to fit conductors into terminals.

6. Proper clearance for all line side conductors shall be left inside meter sockets and/or cabinets by the customer.

7. All services shall be installed adjacent to each other, and shall not be spread across the building.

B. OTHER CUSTOMER PURCHASED EQUIPMENT

1. Any customer owned devices associated with the housing of Electric Department owned metering equipment shall be for the exclusive use of the City of Leesburg Electric Department, and conform to the physical and electrical requirements listed in this section and shown in the appropriate figures. The following requirements are based on safety for Electric Department Employees, adequate line service connections and grounding, mounting stability and security from unauthorized energy use:

a. The device shall be manufactured to Underwriters Laboratories, Inc. Standard 414 or NEMA Standard MSJ-7 and/or certified by a nationally recognized electric testing laboratory. Certification shall be stamped or labeled on the device.

b. Provision shall be made for grounding as required by the **" NATIONAL ELECTRICAL CODE"** and the Authority having jurisdiction and for bonding the neutral to the enclosure.

c. The device shall be labeled with the manufacturer's name, catalog number, electrical rating for volts and amps, and service and load terminal wire size range for copper and aluminum wire.

d. The terminal screws on connectors shall have a hex head 5/16" or ½" across the flats or UL approved screw type connectors, or in accordance with the authority having jurisdiction.

e. The service and meter compartments shall provide for locking and sealing by the Electric Department. The Electric department reserves the right to modify the customer owned equipment for safety and security purposes.

2. Customer owned meter centers and pedestals shall conform to the requirements of paragraph 1 above and the following additional requirements:

a. The line and load compartments shall be separated by a stable barrier.

b. The line compartment shall provide for padlocking.

c. The pedestal top shall be fastened so as not to allow easy access to line terminals or bus.

d. The load wiring from the pedestal shall not inhibit entrance to the service compartment.

e. Metal pedestals shall have adequate coating on the burial portion for permanent and complete protection from corrosion. Wood is not permissible.

f. When a direct burial pedestal is installed, the meter pedestal shall be rigid enough to withstand forces applied when meters are installed and/or removed.

3. The customer shall be responsible for all maintenance of meter sockets and related facilities.

4. Customer purchased commercial and residential meter centers shall be approved prior to use. Equipment not meeting the City of Leesburg Electric Department's specifications shall not be energized. Please contact the Meter Department with the manufacturer's name and model number to request approval.

C. METER LOCATION

1. The location of meters is an important consideration to both the City of Leesburg Electric Department and the customer. The Electric Department shall always be consulted and shall endeavor to select a location that shall be most suitable to both parties.
2. **Figures 1 through 20** show typical meter installations. In unusual cases, the Electric Department shall be consulted.
3. Meters shall be located on the building in a place where they shall be protected from mechanical damage. The customer shall be responsible for providing this protection.
4. Meter sockets and enclosures shall be securely mounted in a plumb and level position on a solid wall or structure. The customer shall be responsible for securely fastening the meter base in order to withstand the normal forces required to routinely remove and install the meter.
5. Meter sockets shall not be recessed or framed in any way that blocks access, knockouts or drainage.
6. The center of the meter shall not be more than 5 ½ feet maximum or less than 4 feet minimum from the ground (final grade) or floor unless otherwise noted in drawings shown in this booklet.
   EXCEPTION: In areas where the requirements mandate that the meter be located above 5 1/2' from grade, ready and permanent accessibility to the meter shall be supplied for reading and testing.
7. A clear space at least 48" from the front of all meter sockets shall be maintained from grade to 6' 6" height, minimum of 36" wide (18" on each side of center line of meter socket) to allow easy and safe access for reading and testing. This will be enforced on all existing and new installations.

8. Commercial metering shall normally be installed outdoors. Exceptions to this must be approved by the Electric Service Planners prior to installation.
9. Meters for single family residences shall always be located outdoors and shall normally be on the front 1/3 of a side wall, or on the front wall, and shall not be enclosed by a fence. Meters shall not be located in areas such as carports, open porches, swimming pools, etc. which are susceptible to subsequent enclosures by walls or screens. Any deviation shall be approved in writing by an authorized City of Leesburg Electric Department Employee.
10. In the event a meter area is later enclosed or otherwise made inaccessible or unsafe, the Customer shall, at his expense, have the meter facilities moved to a readily accessible outside location.
11. Meter installations should, whenever possible, be outside. However, they may be grouped together in a meter room furnished by the customer provided the following requirements are met:
    a. Meter rooms should normally be located on the first floor. At the option of the Electric Department, however, they may be located on various floors at mutually agreeable centralized locations.
    b. The Electric Department shall have access to the meter rooms at all times for reading, testing, and servicing the equipment. When meters are located in areas that can be locked, the customer shall make arrangements such that the Electric Department shall have access to the meters at all times.
    c. Meters installed inside shall be in a clean, dry, lighted, safe place; and be easily accessible at all times. They shall not be located in restrooms, dressing rooms, bedrooms, kitchens, ventilating or elevator shafts, boiler rooms, laundry rooms, hallways, etc. They shall not be installed near belts or other moving machinery endangering the safety of those doing work near the meter.
    d. Adequate space, lighting and access shall be provided as defined in consultation with the Electric Department as the facilities are planned. Using meter rooms for storage or other purposes which cause degradation in ease of access or adequacy of workspace shall not be allowed.
    e. Failure to maintain a safe and accessible location for all meters shall require that they be relocated to an appropriate location at the Customer's expense

D. CURRENT TRANSFORMER INSTALLATIONS

1. The use of current transformers shall be determined by the City of Leesburg Electric Department. Three phase services over 200 amps will be CT'd, while single phase services over 320 amps will be CT'd.

2. It is very important to both the City of Leesburg Electric Department and the customer that the instructions and construction details shown in **Figures 18-20** be followed closely on all instrument transformer installations.
3. The facilities necessary for current transformer installations shall be provided and installed as described below:
    a. The customer shall provide and install all inter-connecting raceways or conduits. All such conduits or raceways shall be a minimum of 1 ½" in diameter and a maximum of 30 feet in total length unless otherwise approved by the meter department. For installations entirely or partially below ground, 1 ½" inch minimum schedule 40 PVC conduit shall be used. For installations entirely above ground, 1 ½" minimum schedule 40 PVC or metallic Conduit may be used.
    b. The current transformers and enclosures:
        i. The customer shall provide and install the enclosure for the current transformers. The enclosure shall be 36"x36x12" for three phase installations, and 24"x24"x12" for Single phase installations.
        ii. The Electric Department shall provide the meter enclosure and current transformers and shall install the instruments. See **Figure 24** for instructions on picking up any metering equipment supplied by the City.
        iii. Customer must provide 3/4 plywood backing in Current Transformer cabinets per **Figures 18-19**.
        iv. All current transformer cabinets shall have a lockable hasp. This hasp must be capable of locking with a round lock.

    c. The Electric Department shall provide and install the current Transformer secondary wiring and meter.
    d. The Customer shall not terminate nor splice his conductors within the CT enclosure.
4. Instrument transformer installations are usually made by one of three means, each of which requires coordination between the Customer and the City of Leesburg Electric Department.
    a. Outdoor current transformer enclosures are normally used when the customer receives either overhead or underground service. See **Figures 18 and 19**.
    b. Existing services, which have wall mounted or riser mounted overhead current transformer cabinets shall continue to be serviced. Additions to existing services shall be permitted, but when services are totally rebuilt, they shall be converted to outdoor wall mounted CT enclosures. When additions are made to existing services, contact a Electric Service Planner with the Electric Department for installation requirements.

c. Instrument transformer installations in transformer vaults and pad mounted transformers are applicable only where the number and size of secondary conductors are too many or too large to place in City of Leesburg current tranformers inside wall mounted CT cabinets.

5. A clear space at least 48" from the front of all instrument transformer enclosures shall be maintained from grade to 6'6" height, minimum of 36" wide (18" on each side of center line of meter socket) to allow easy and safe access for reading and testing. This will be enforced on all existing and new installations.
6. Procedure to pick up meter can for CT installations and schedule installation of CT's
    a. Present warehouse personnel with electrical permit and work order number provided by a Service Planner. The warehouse is located at 2010 Griffin Road, Leesburg. Warehouse hours are from 7:00 am to 3:30 pm.
    b. Request proper meter can (Single phase CT'd is an 8 terminal, Three phase Ct'd is a 13 terminal Meter can).
    c. Call the meter department at 352-728-9883 a minimum of 72 hours in advance to schedule installation of Current Transformers
7. All new current installations will be wall mounted, unless prior approval is gained through the Service Planners and the Meter Department. Please consult the table below for maximum number of conductors per wall mounted CT installation.

Conductor Size									
4/0	250	300	350	400	500	600	700	750	1000
9	7	6	5	4	3	2	2	2	1
Total number of cables allowed per CT per conductor									

E. SURGE ARRESTORS

1. Surge arresters may be installed on customer owned, self-contained meter enclosures provided that the arresters are properly installed, meet the safety standards set forth below and do not interfere with the voltage delivered or the proper registration of the meter. The standards set forth below are for safety related reasons only and do not address the ability of the arrester to dampen or reduce surge events. Arresters installed shall bear the appropriate label or markings indicating that they have been manufactured to meet the required safety standards.
2. Surge arresters shall not be installed on Company-owned equipment.
3. Surge arrester safety requirements for meter sockets:
    a. Surge arresters must comply with applicable ANSI/IEEE, UL or other nationally recognized testing laboratory (NRTL) safety standards.

b. In addition, all surge protection devices shall be certified to a Stepped Current Impulse Test. This test consists of the application of increasing steps of current impulses until fuse or device failure, whichever comes first. The starting impulse should be 10KA with increasing steps of 5KA each until failure. A cooling off period of three minutes is used before the next application of impulse current. The device should fail without exploding or catching on fire. The fuse elements should clear sufficiently to prevent current from passing. Please refer to IEEE C62.41-1991 (to be revised to IEEE C62.34) relating to all surge protection devices less than 1000 volts.
c. All surge protection devices shall be certified to a Limited Current Abnormal Overvoltage Test (Open Neutral). The MCOV of the device shall be multiplied by 1.6 to determine the test voltage. *Example: 175 MCOV x 1.6 =280 Test Volts.* The right side should be tested at a current level of 5A and the left side should be tested at a current level of 25A. The fuse links or elements should successfully clear the forced voltage without emission of sparks or flames or any unsafe deformation of the housing. Please refer to UL 1449 Section 37.4.1.

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V. EQUIPMENT

A. EQUIPMENT VAULTS

1. General Requirements

a. In a few situations, it may be necessary or convenient to install City of Leesburg Electric Department owned transformers and/or related equipment in a vault inside a Customer's building. In such cases, The Customer shall consult with the City of Leesburg Electric Department before plans are made concerning the vault.

b. The vault shall be constructed in compliance with City of Leesburg Electric Department requirements; the **"National Electric Code"**, The **"National Electric Safety Code"** and such local requirements as may be in force.

c. The vault shall not contain any Customer owned equipment for building service facilities such as: secondary fuses, switches, meters, load control equipment; gas, oil, steam, or water pipes; or ventilation ducts other than those required by the City of Leesburg Electric Department.

d. Fire sprinkler systems shall not be installed in City of Leesburg Electric Department equipment vaults unless specifically required by local authorities.

e. The vault and its contents shall be under the supervision of the City of Leesburg Electric Department, and shall have provisions for locking and security sealing by the City of Leesburg Electric Department. Unauthorized persons shall not be permitted to enter vaults.

2. Customer Responsibilities

The customer shall provide and own the following facilities for use by the City of Leesburg Electric Department:

a. Equipment vault sized and built in accordance with City of Leesburg Electric Department requirements.

b. All facilities required to provide natural or forced ventilation determined necessary by the City of Leesburg Electric Department.

c. All conduits within the building for the Electric Department's facilities, including primary and/or secondary conductors. Such conduits shall extend 5 feet beyond the outside building wall to a point designated by the City of Leesburg Electric Department.

The Customer shall provide properly executed easements on the City of Leesburg forms for all facilities installed on the customer's property.

3. The City of Leesburg Electric Department Responsibilities

The City of Leesburg Electric Department shall determine the physical requirements for each vault, including minimum size, ventilation, lighting and conduits. The Electric Department shall endeavor to work closely with the customer so that the needs of the Electric Department and the desires of the Customer are considered in the design and construction of the vault(s).

B. TRANSFORMER INSTALLATIONS

1. General Requirements

a. The City of Leesburg Electric Department is responsible for installing the padmount transformer at the customer's site.
b. The Customer shall provide the proper easement documents to install transformer, conductors or any other piece of equipment needed to serve the location.
c. The site must be at final grade.
d. The City of Leesburg Electric Department will be responsible for all terminations inside of the transformer.
e. The City of Leesburg Electric Department will provide the necessary transformer pads. (See **Figure #21 and # 22** for transformer pad sizes)
f. The customer must provide easy access to the transformer location 24 hours a day.
g. The customer is responsible for protective bollards as required. (See **Figure # 21**)

2. Clearances for Padmount Transformers

a. Minimum clearances for all equipment are 10' in front of all openings, 3' on sides and rear.
b. 10' Clearance required from combustible walls (including stucco) or overhangs.
c. 3' Clearance required from non-combustible walls (brick, concrete, steel, or stone)
d. 20' Clearance required from doorways.
e. 10' clearance required from windows or intakes.
f. 20' Clearance required for fuel tanks.
g. 5' Clearance required from fire hydrants.
h. 3' Clearance required from gas meters.
i. 10' Clearance required from fire escapes.
j. 15' Clearance required from pools.)
k. Fire resistant barriers can be used to shorten the clearance at doors, windows and walls. These include reinforced concrete, brick, or concrete block barrier walls.
l. See Figure #s 22-25 for details.

VI. CUSTOMER UTILIZATION EQUIPMENT

A. GENERAL

1. The City of Leesburg builds and maintains adequate facilities to supply ANSI Range A service to all customers using normal equipment. However, since equipment installed by one Customer may detrimentally affect the adequacy and continuity of service to other customers, and because the misuse of some equipment might constitute a fire hazard or endanger life, the City of Leesburg has established regulations covering some common installations of utilization equipment.
2. The City of Leesburg Electric Department specifies only such requirements necessary to safeguard both the customer and the City of Leesburg Electric Department to the end that service may be rendered with a maximum of safety and minimum of interruption or disturbance. The Customer should consult the Electric Department for additional details on special equipment which may not be covered in this booklet.
3. Available Fault Current shall be taken into consideration when specifying service entrance equipment. It is important that the customer contact the Electric Service Planner's office for the value of available fault current.
4. Protection of equipment against loss of voltage, under-voltage, transient or sustained over voltage, voltage unbalance, over current, phase failure, phase reversal, loss of synchronism, harmonics and short circuit is the responsibility of the Customer.
5. To protect the property of the Customer and The City of Leesburg , the Customer shall not overload or over fuse the building's service or branch circuits.

B. SINGLE PHASE AIR CONDITIONERS/HEAT PUMPS

1. Air Conditioners and heat pumps are treated separately from other motor loads. This is because the standard design of the electric distribution system includes capacity for their addition. The cost of the facilities is based on a starting current of 30 amps per ton.
2. Where these units are connected to a single phase 240 volt supply, the starting current shall not exceed the values listed below.

Size (ton)	Btu/h	Starting amps @240 volt & 95p.f.
1	12,000	30
1.5	18,000	45
2	24,000	60
3	36,000	90
4	48,000	120
5	60,000	150

NOTE: If necessary, starting kits should be used to reduce starting currents to the above limits and shall be part of the original installation. (if the starting current

exceeds these limits consult with The City of Leesburg Electric Department Electric Service Planners).

C. MOTORS

1. Residential and commercial customers located in predominately residential areas shall normally be provided with single phase service. Three phase service availability is discussed in **SECTION II-D** of this booklet.
2. All motors which cannot be safely restarted immediately should be provided with a device to insure that the motor shall disconnected from the line, or the starting device returned to the "off" position, whenever there is a transient interruption in the supply voltage. To prevent unnecessary shutdown, it is recommended that this device be equipped with a time delay feature so it shall not function unless required.
3. When a customer's motor starting causes objectionable flicker to other customer's, The Electric Department shall require installation of devices such as reduced voltage or part winding starters to limit starting inrush currents to values that shall reduce the flicker to acceptable levels.
4. Single phase 120/240 volt service shall be provided to a maximum of motor size of 5HP.
5. Motors larger than 5HP shall require three phase 208/120 Wye or 240 Delta electric service configuration. In areas where three phase primary distribution is not available, the Customer shall pay to the City of Leesburg a Contribution In Aid to Construction (CAIC) to install the required facilities.
6. Open Wye - Open Delta services to motors shall be provided only in areas where Vee phase (two primary phases) service is available, three phase service is not and only at the discretion of the City of Leesburg Electric Service Planner. In no case shall it be provided to motors greater than 25HP. The Customer shall hold the City of Leesburg harmless for motor failures due to voltage imbalances inherent in this type of service.
7. When the Customer's own voltage stability requirements permit and where full voltage starting is mechanically and electrically suitable for the customer's motors and equipment, the table on the following page is used as a guide for the motor starting inrush that is generally but not necessarily acceptable. The customer must provide the Electric Service Planner with the locked rotor current for any motors in question.

MOTOR STARTING REQUIREMENTS GUIDE

MODE OF MOTOR OPERATION	MULTPLE CUSTOMERS FROM A SINGLE TRANSFORMER AND SECONDARY	MULTPLE CUSTOMERS FROM A SINGLE TRANSFORMER	SINGLE CUSTOMER SERVICE
Continuous motor operation (one start per day	**Locked rotor current less than 100% of transformer full load current**	**Locked rotor current less than 150% of transformer full load current**	**Locked rotor current less than 200% of transformer full load current**
Cycling operation to 10 Min/cycle	**Locked rotor current less than 75% of transformer full load current**	**Locked rotor Current less than 100% of transformer full load current**	**Locked rotor current less than 200% of transformer full load current**
Cycling operation to 1 min/cycle	**Locked rotor current less than 50% of transformer full load current**	**Locked rotor current less than 75% of transformer full load current**	**Locked rotor current less than 200% of transformer full load current**
Cycling operations less than 1 min/cycle	**Locked rotor current less than 25% of transformer full load current**	**Locked rotor current less than 25% of transformer full load current**	**Locked rotor current less that 100% of transformer full load current**

D. SPECIAL EQUIPMENT

1. Due to the very severe operating characteristics of certain equipment such as but not limited to electric welders (particularly of the transformer type), furnaces, X-ray machines and radio and television broadcasting stations, the customer shall apply to the City of Leesburg Electric Department for approval to use such equipment before installation is made. Part of the approval request shall include the operating characteristics of the equipment in question.
2. When the operation of any equipment is detrimental to satisfactory operation of the City of Leesburg's Electric Distribution system, the Electric Department shall require the installation of special equipment to mitigate the detrimental effects such as but not limited to conductors, harmonic filters and transformers at the expense of the customer.
3. When a Customer generates an unacceptable level of harmonic distortion, the customer shall, at his expense, be required to install

equipment necessary to reduce this distortion. If a customers non-linear loads produce total voltage harmonic distortion greater than 3%, or are greater than 15% of the total load, contact the City of Leesburg Electric Department for specific requirements prior to placing these loads in service. Customer compliance with the IEEE 519 recommended practice is required. Examples of non-linear loads include; silicon controlled rectifiers, rotary phase converters, power supplies, variable speed motors, transformers, personal computers, laser printers, etc.

4. Emergency and standby generators shall be connected in such a way that no back feed shall occur into the City of Leesburg's Electric Distribution System. Co-generators that operate in parallel with the City of Leesburg's Electric Distribution System shall require a contract specifying administrative procedures, operating procedures, safety equipment, relaying and financial responsibility.
5. The City of Leesburg Electric Department endeavors to maintain ANSI Range A voltages at all times but does not guarantee that short term voltage and or frequency excursions will not occur. If a Customer requires greater than ANSI Range A voltage stability, The City of Leesburg recommends that the Customer install UPS equipment suitable to their needs provided that the distortion limits of IEEE 519 are not exceeded.

VII. SUBDIVISIONS

A. RESIDENTIAL SUBDVISIONS

1. Residential subdivisions must be approved by the governing authority.(Lake County, Fruitland Park or City of Leesburg)
2. Required utility easements will be platted on all properties within the subdivision including lots, tracts, etc. Minimum easements required are 15' along roadways, 7.5'on interior lot lines. See **Sec. 25-450. Utility easements** in the Leesburg Municipal Code for details. If easements are needed that are not platted, the developer will provide dedicated easements prior to construction.
3. All proposed services including signs, lift stations, water features, irrigation electric meters etc, should be noted on the construction plans submitted to the City of Leesburg.
4. Lift stations- check with Electric Service Planner to verify voltage available before the lift station specifications are complete.
5. Electric utilities to be installed in easements. See **Figure #29** for proposed utility placement within the easement.
6. Sewer and water laterals shall be wye'd to avoid conflict with electric facilities at lot line. See **Figure #30**.

B. CONDUIT INSTALLATION

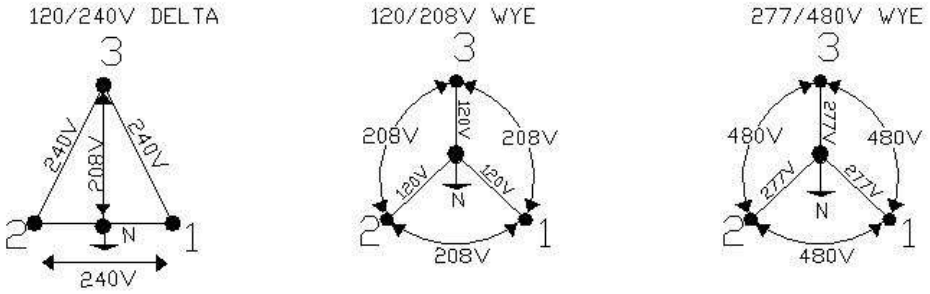
1. The developer will have the option of installing the conduit for the electric distribution or have the City contractor install the conduit.
2. All conduit installations will be installed according to City of Leesburg Conduit installation specifications. See Appendix #1

C. COST OF INSTALLATION

1. The developer will be charged for the installation of the electric distribution per City of Leesburg Municipal Code Sec 25-474.

VIII. FIGURES

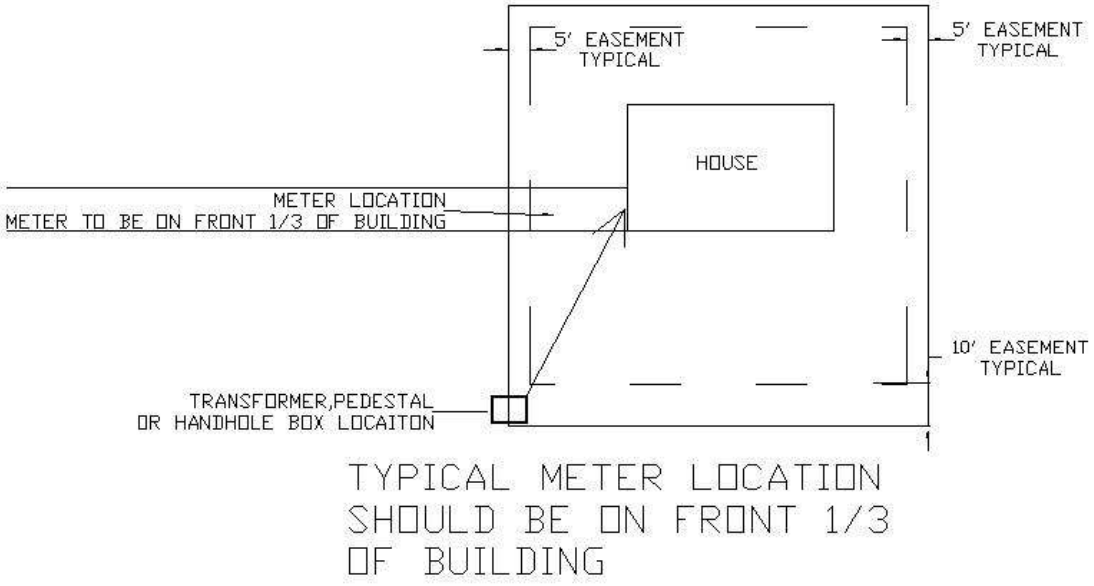
Figure #1 Standard Three Phase Voltages



POINTS MEASURED	120/240V DELTA	120/208V WYE	277/480V WYE
N-1 N-2 N-3	120 120 208	120 120 120	277 277 277
1-2 1-3 2-3	240 240 240	208 208 208	480 480 480

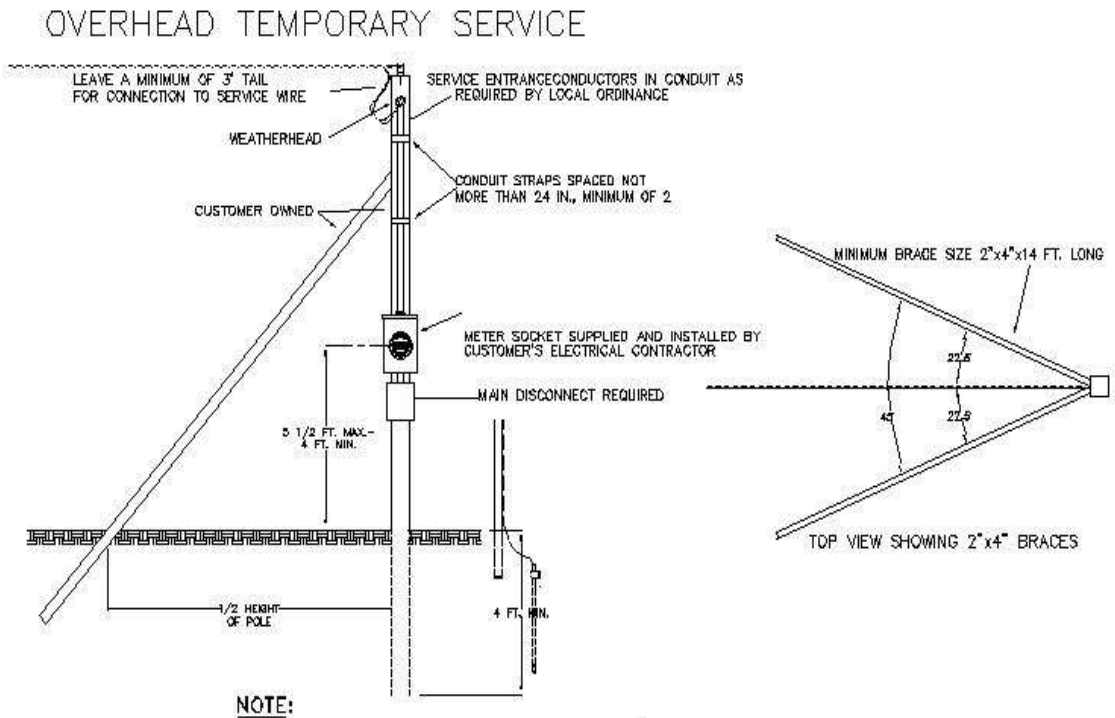
STANDARD THREE PHASE SERVICE VOLTAGES

Figure #2 Typical meter location



The City of Leesburg requests that all new service locations be mounted on the front one third of the building. This is to insure access to the City's meter.

Figure # 3 Overhead Temp Service



NOTE:

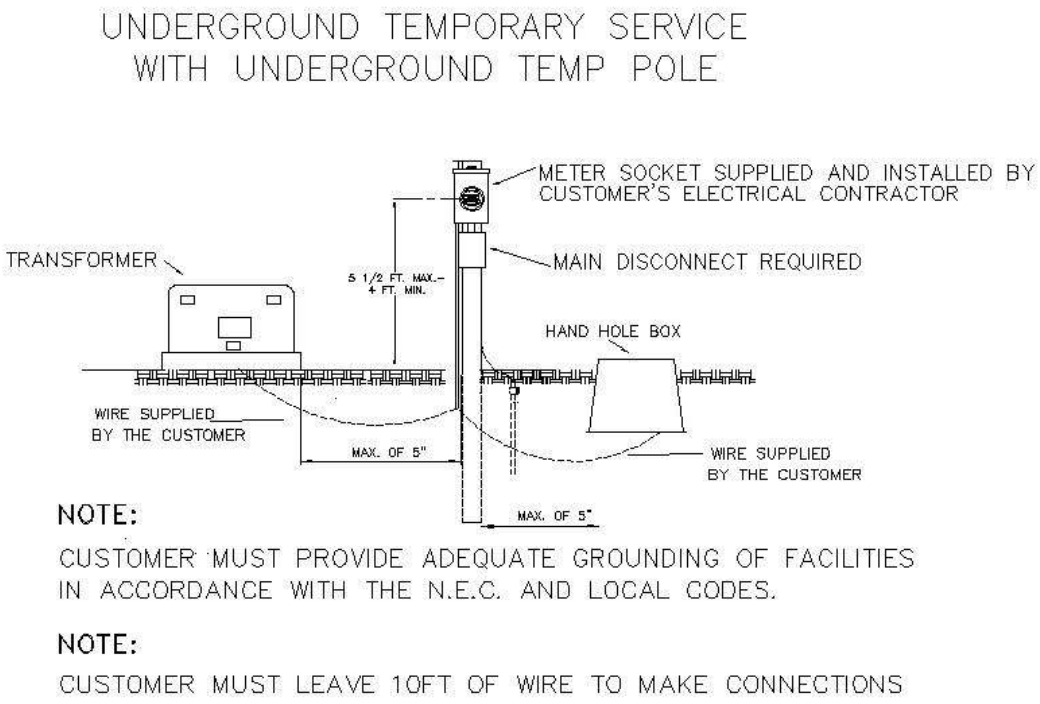
POLE MUST BE SUFFICIENTLY RIGID AND/OR BRACED TO WITHSTAND 200 POUNDS PULL AT THE TOP.

CUSTOMER MUST PROVIDE ADEQUATE GROUNDING OF FACILITIES IN ACCORDANCE WITH THE N.E.C. AND LOCAL CODES.

POLES WITH A 100 AMP, SINGLE PHASE DISCONNECT MAY HAVE A MAXIMUM SERVICE DROP OF 80 FT. LENGTH; 101 – 200 AMP, SINGLE PHASE DISCONNECT MAY HAVE A MAXIMUM SERVICE DROP OF 60 FT. LENGTH. FOR ALL THREE PHASE TEMPORARY SERVICES, THE COMPANY'S SERVICE PLANNING DEPARTMENT MUST BE CONTACTED.

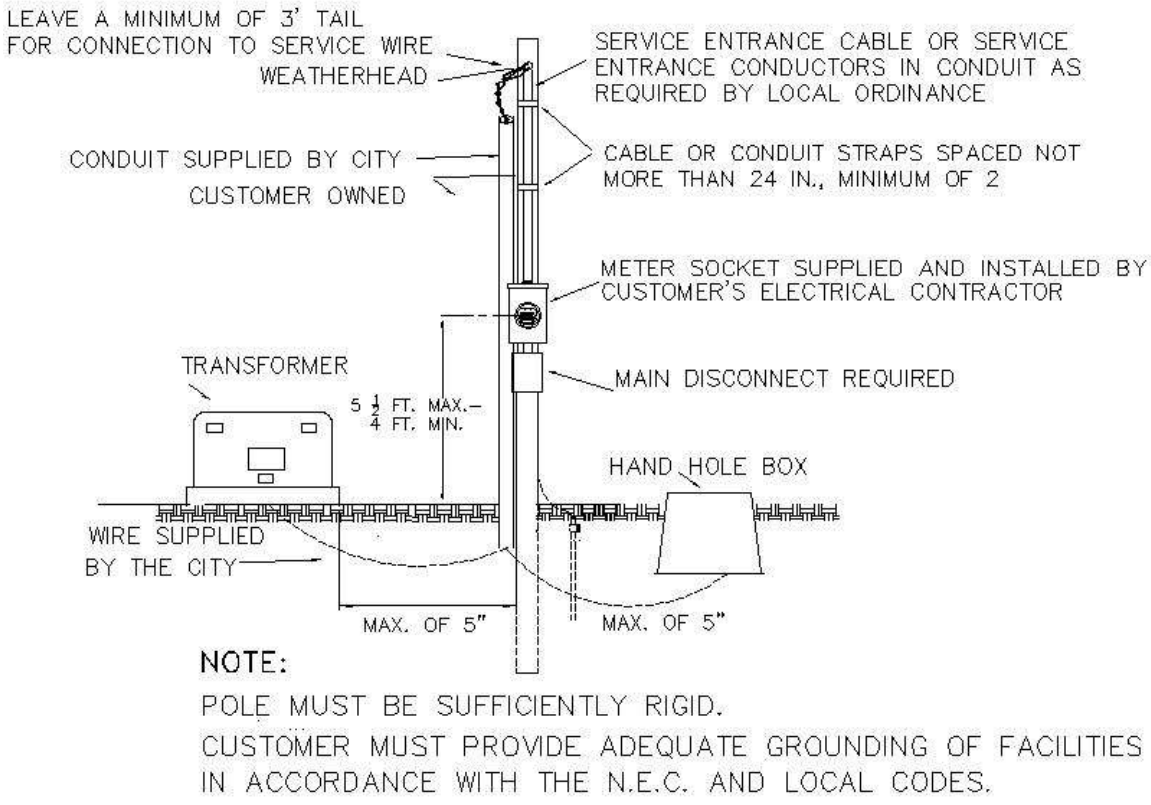
OVERHEAD TEMP SERVICE
FED BY AN OVERHEAD SERVICE

Figure # 4 Underground Temp Service



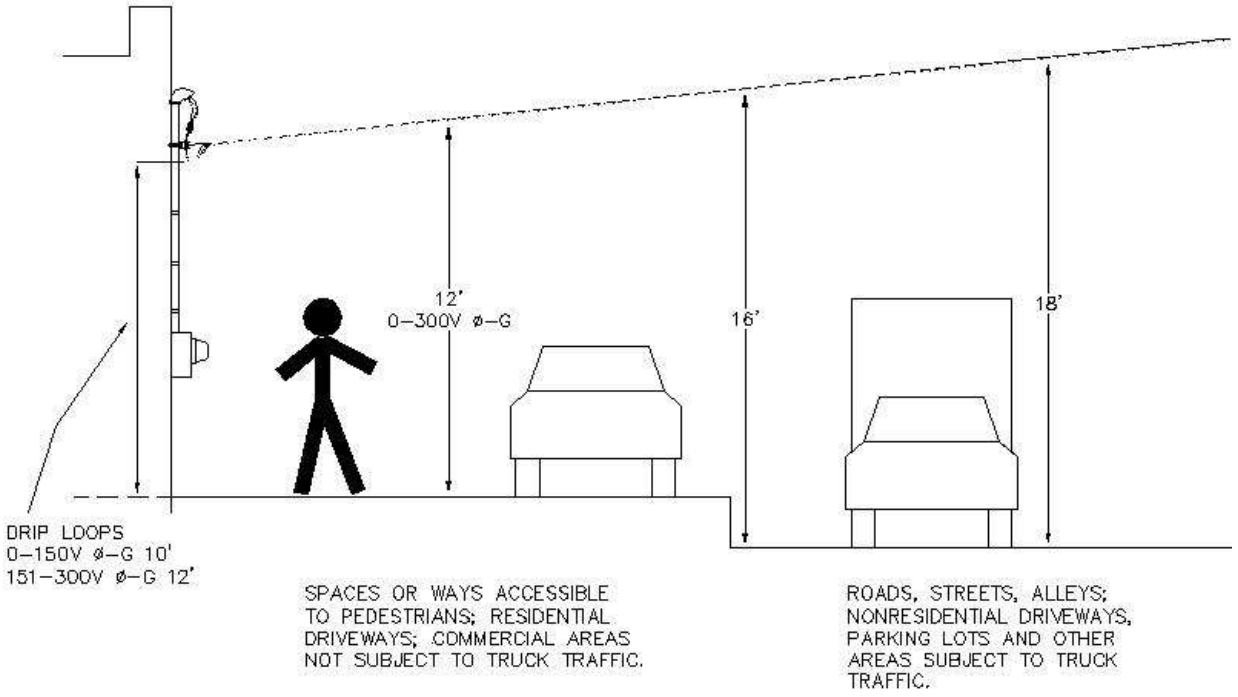
UNGERGROUND TEMP SERVICE
FED BY UNDERGROUND SERVICE

Figure # 5 Overhead Temp Service fed by underground



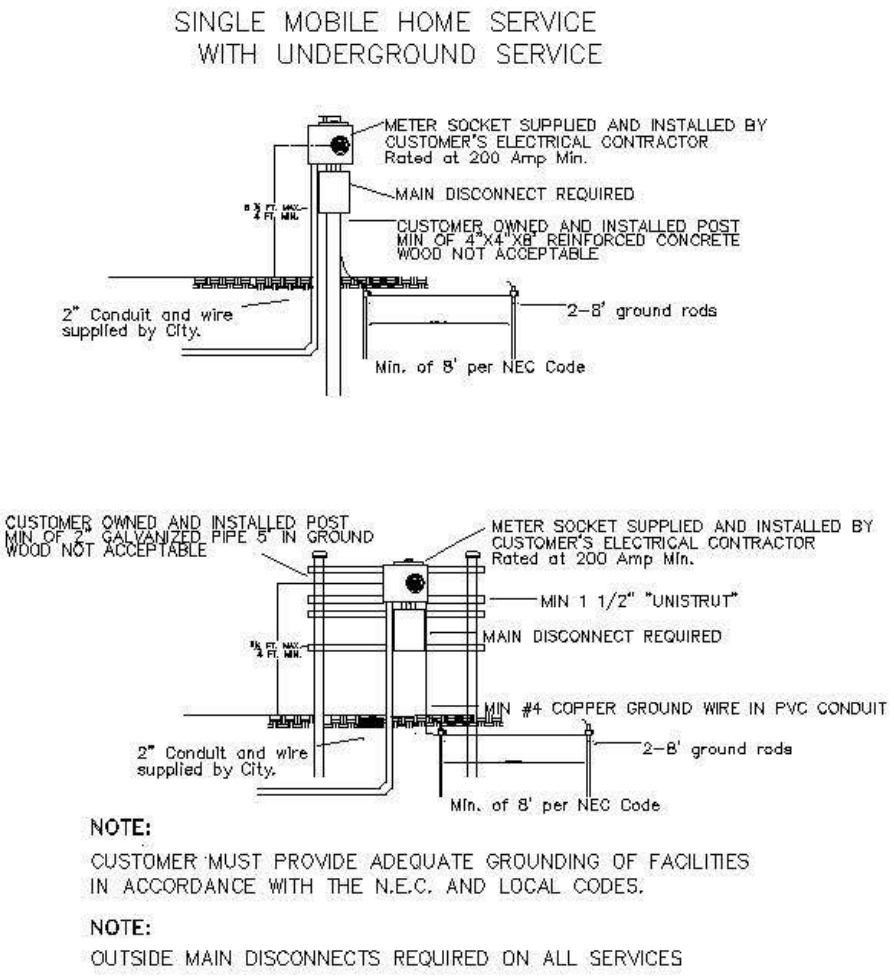
OVERHEAD TEMP
FED BY UNDERGROUND
SERVICE

Figure # 6 NESC Clearances



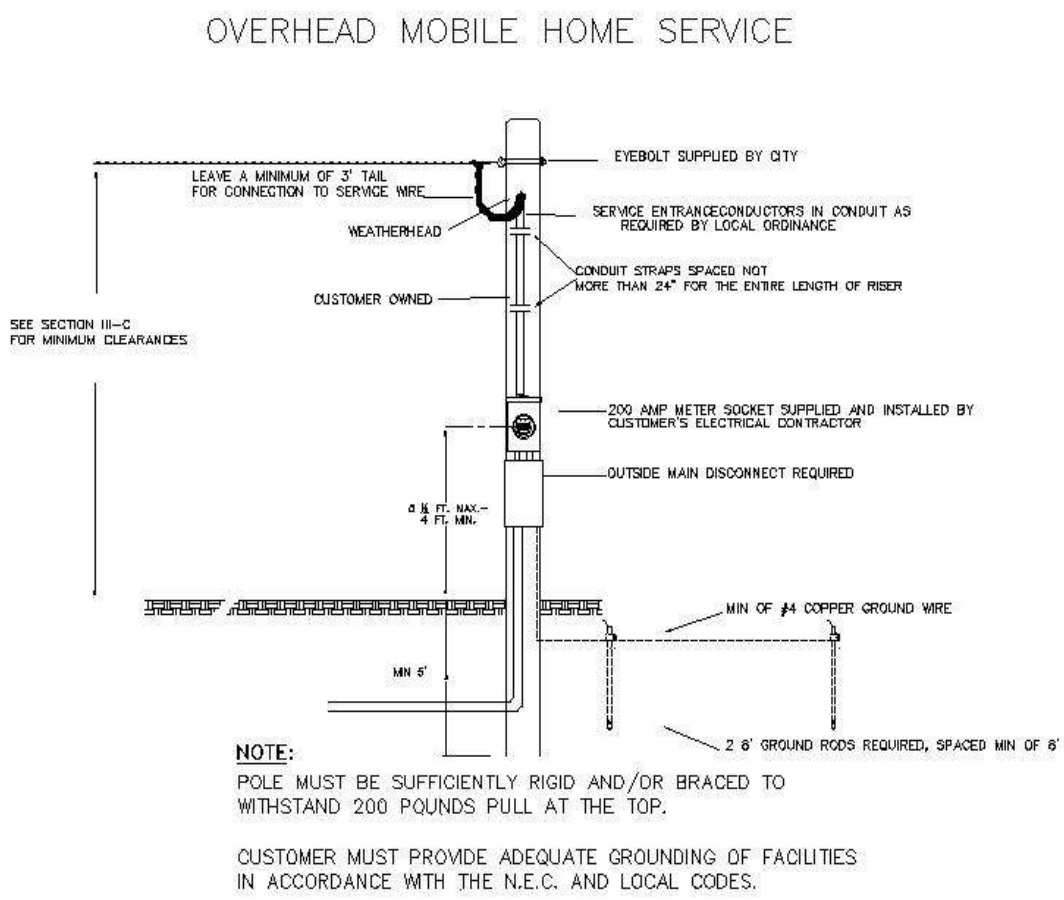
CLEARANCES FOR OVERHEAD SERVICES
PER NESC

Figure # 7 Typical Mobile Home Underground Services



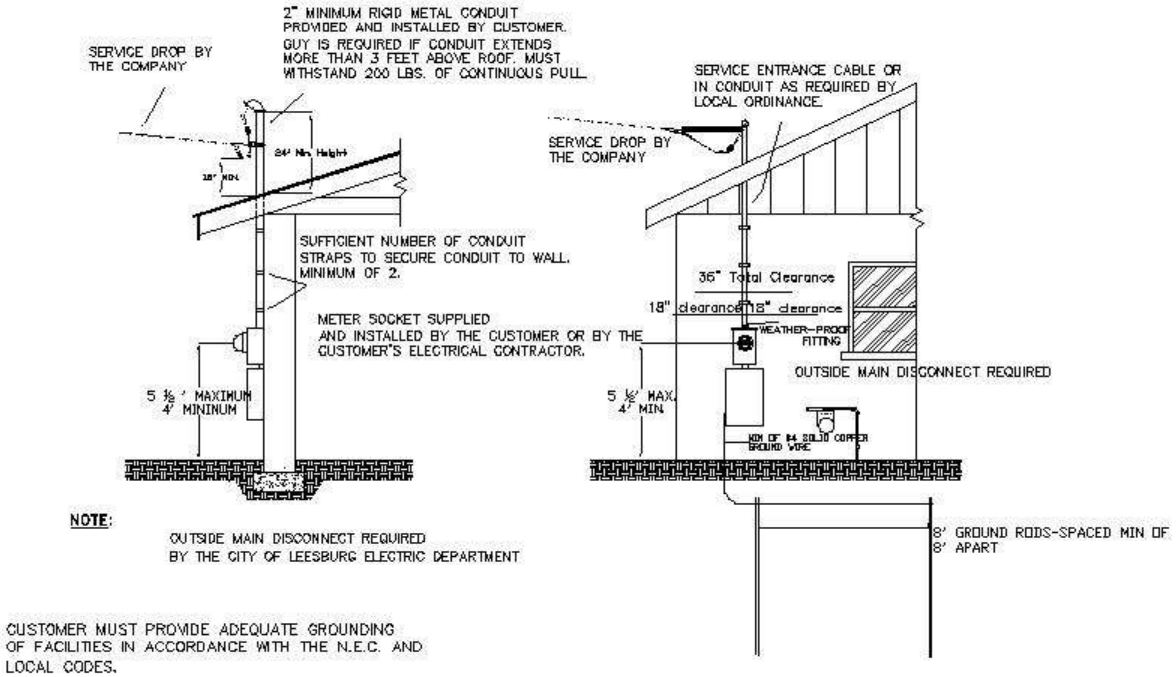
TYPICAL MOBILE HOME UNDERGROUND SERVICES
NOT PERMANTLY ATTACHED TO MOBILE

Figure# 8 Typical Mobile Home Overhead Service



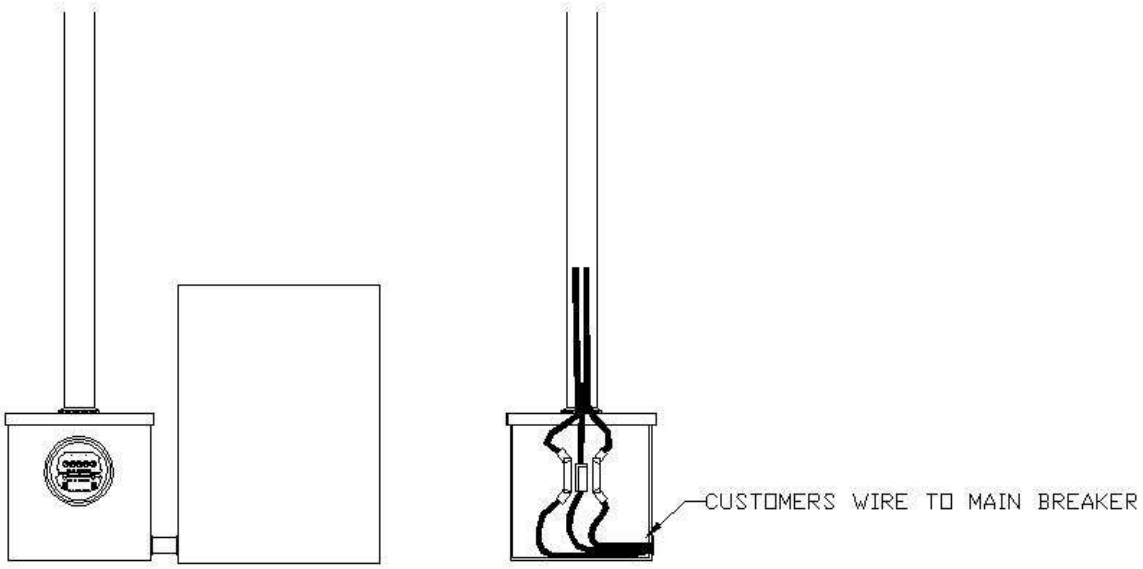
TYPICAL MOBILE HOME OVERHEAD SERVICE
MULTIPLE SERVICES WILL NOT BE ALLOWED ON
ONE POLE FOR NEW CONSTRUCTION.
POLE MUST BE A MINIMUM OF 6" IN DIAMETER AT THE GROUND LINE.

Figure# 9 Typical Overhead Service



TYPICAL OVERHEAD INSTALLATION
200/320 AMP SERVICES

Figure# 10 Typical Single Phase Overhead Service

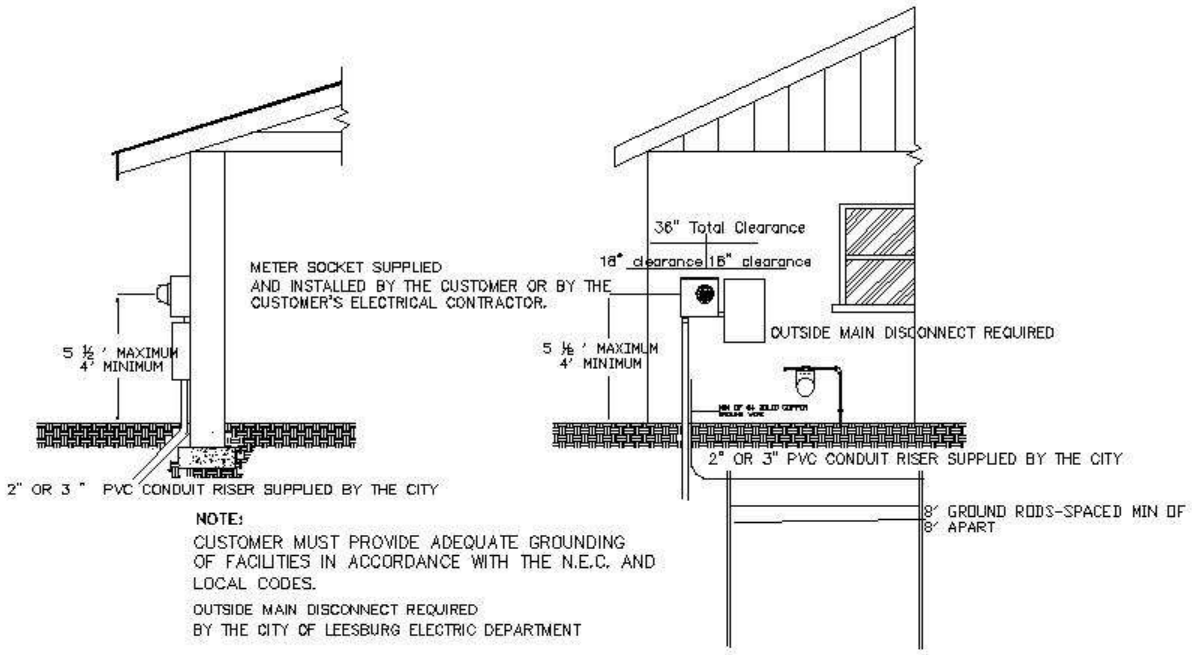


Typical Single phase Overhead Service

Meter socket

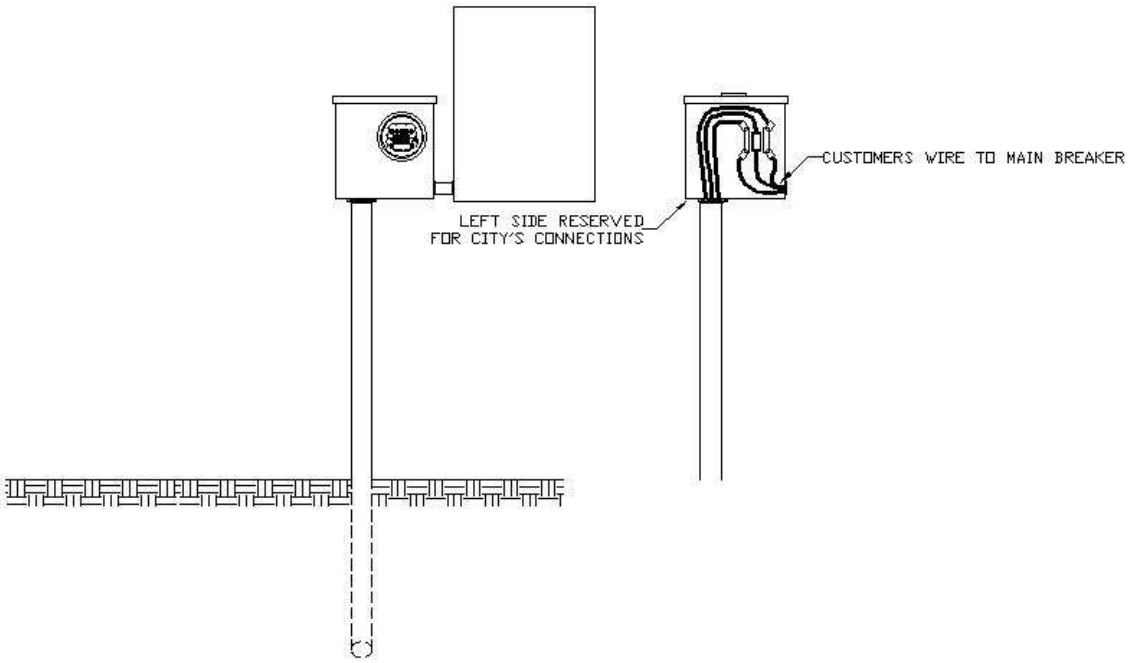
Meter Base shall be bonded to ground as required by NEC or Authority having jurisdiction. Meter socket to be provided by customer and approved by the City of Leesburg Electric Dept. The City requires the meter socket to be rated at a minimum of 200 amps. All services shall have a main disconnect.

Figure# 11 Typical Underground Service



TYPICAL 200/320 AMP UNDERGROUND
SINGLE PHASE SERVICE

Figure# 12 Typical Single Phase underground Service

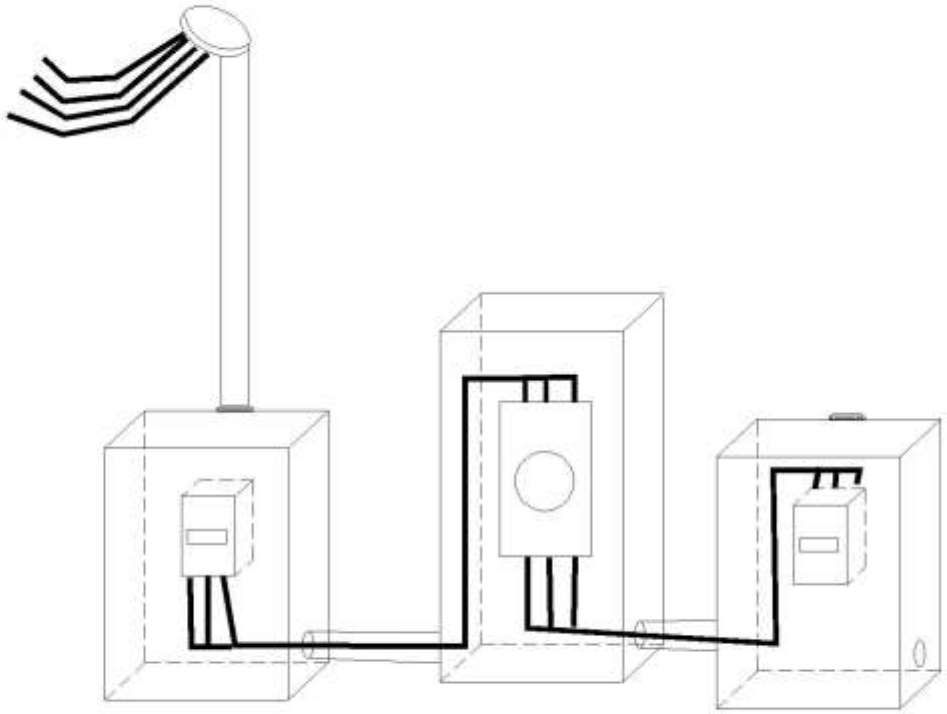


Typical Single phase underground Service

Meter socket

Meter Base shall be bonded to ground as required by NEC or Authority having jurisdiction. Meter socket to be provided by customer and approved by the City of Leesburg Electric Dept. The City requires the meter socket to be rated at a minimum of 200 amps. All services shall have a main disconnect. The center of the meter shall be no lower than 4’ and no higher than 5 ½’.

Figure #13 Typical 240/480, 277/480 and 480 to ground service

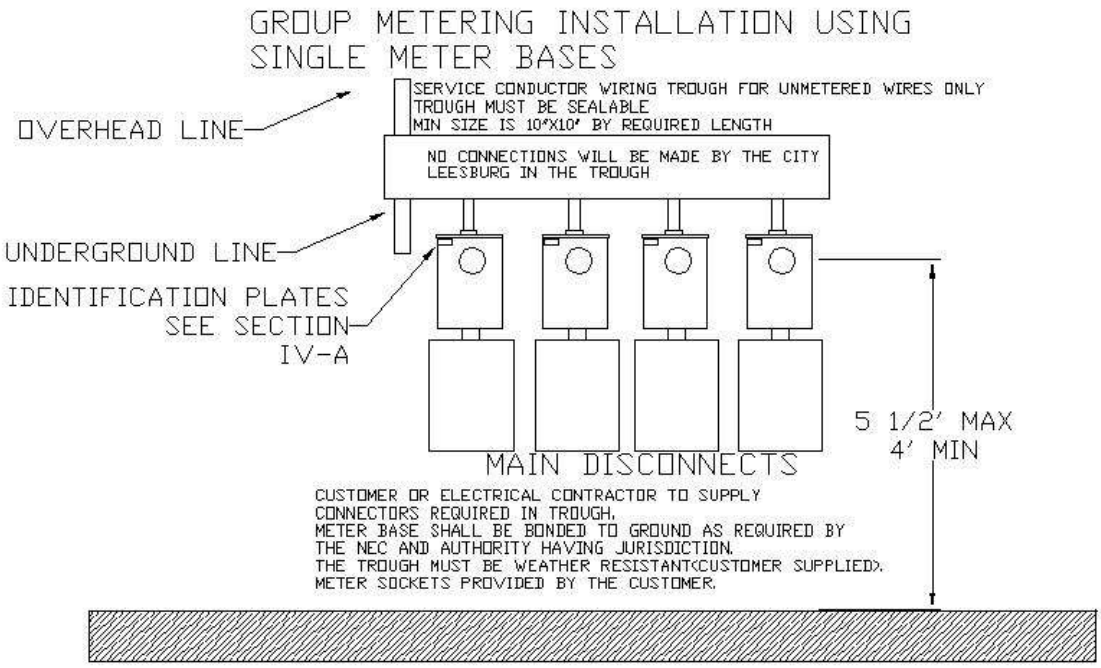


Notes:

METER ENCLOSURE AND DISOCNNECT DEVICE SHALL BE BONDED TO GROUND AS REQUIRED BY THE N.E.C. OR AUTHORITY HAVING JURISDICTION.
DEVICE MUST MEET OR EXCEED CUSTOMER'S MAIN CAPACITY

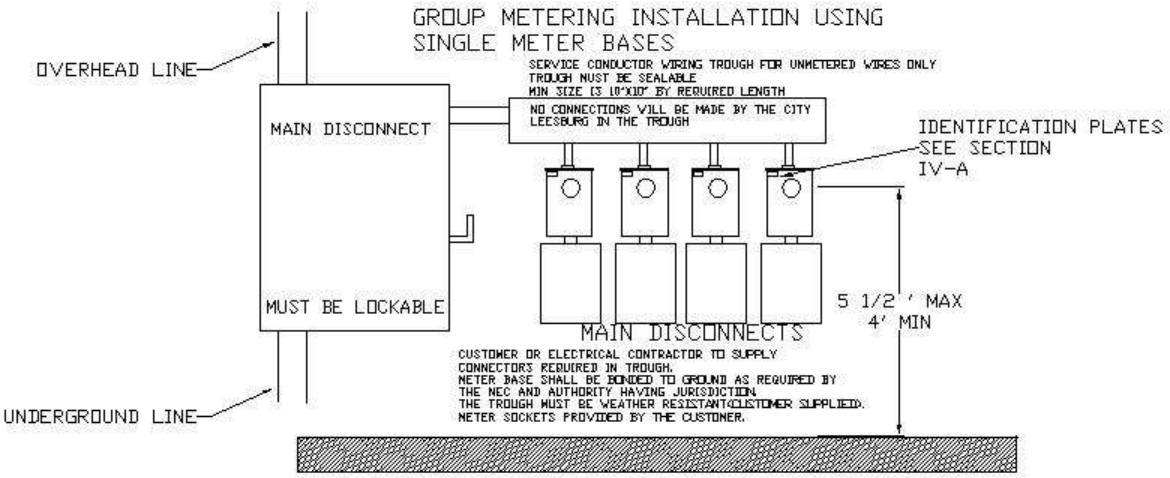
TYPICAL 240/480V, 277/480V, AND 480V TO GROUND SELF CONTAINED SERVICE WITH NON AUTOMATIC DISCONNECT DEVICE

Figure# 14 Typical Installation Group Metering without Disconnect



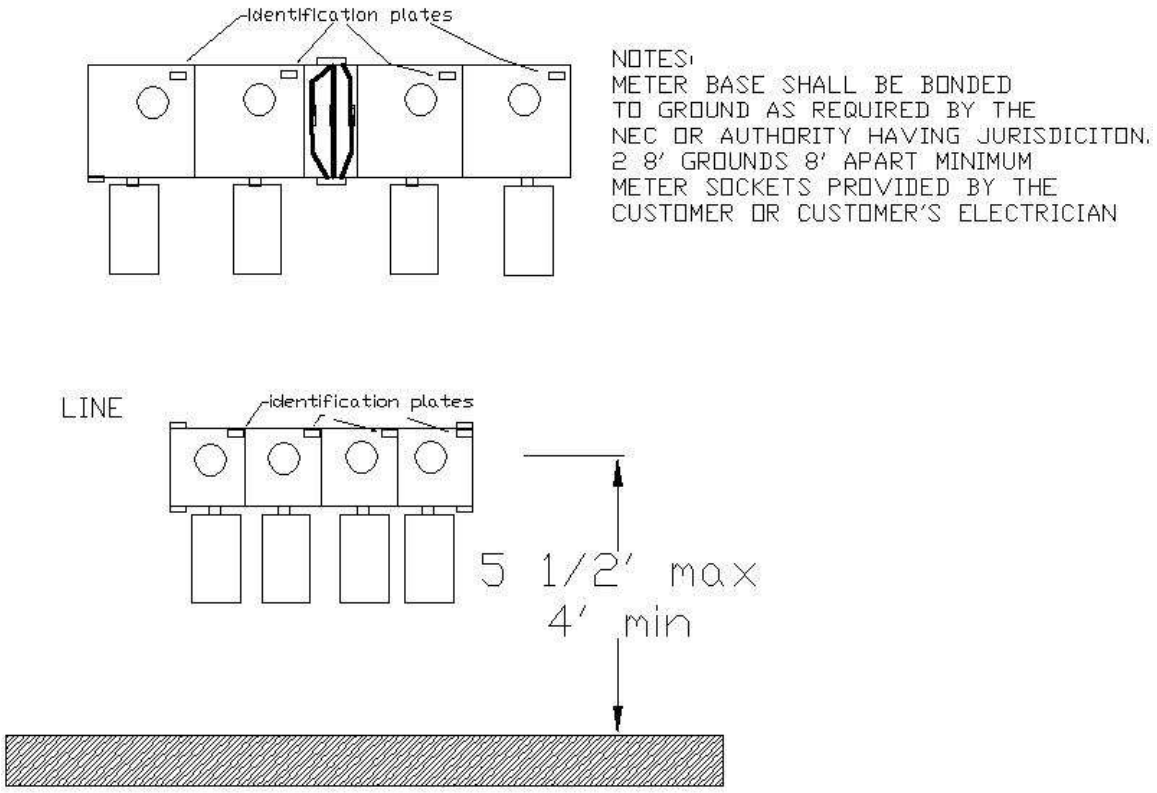
TYPICAL INSTALLATION OF
GROUP METERING WITHOUT
A MAIN DISCONNECT
NO CONNECTIONS WILL BE MADE
BY THE CITY OF LEESBURG
IN THE TROUGH

Figure# 15 Typical Installation Group Metering using Single meter bases with Main Disconnect



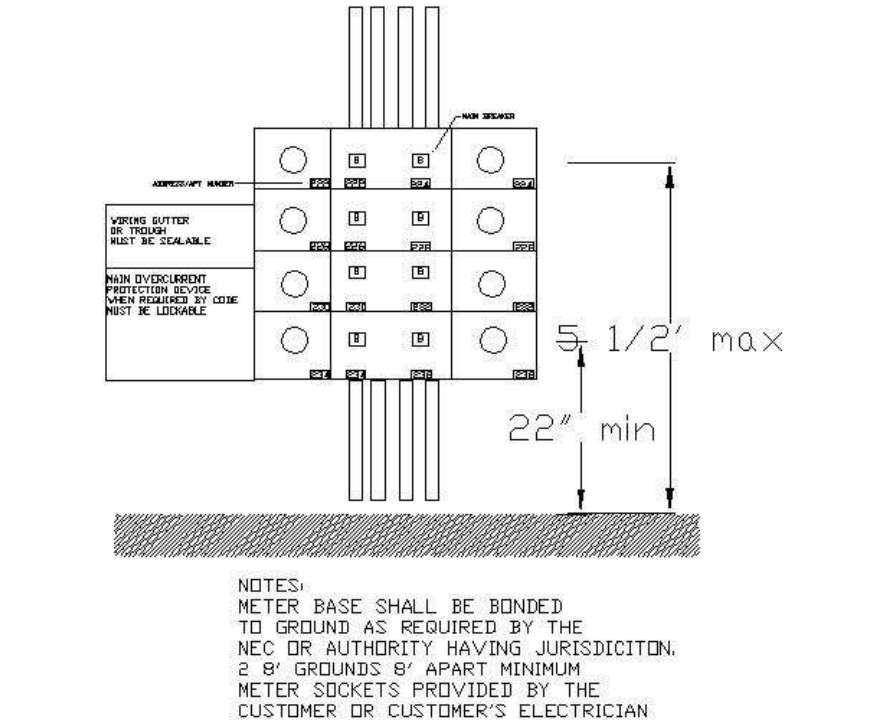
TYPICAL GROUP METERING
USING SINGLE METER BASES
WITH MAIN DISCONNECT
NO CONNECTIONS WILL BE MADE
BY CITY OF LEESBURG IN
TROUGH

Figure# 16 Typical Residential Single Phase Gang Meter Socket



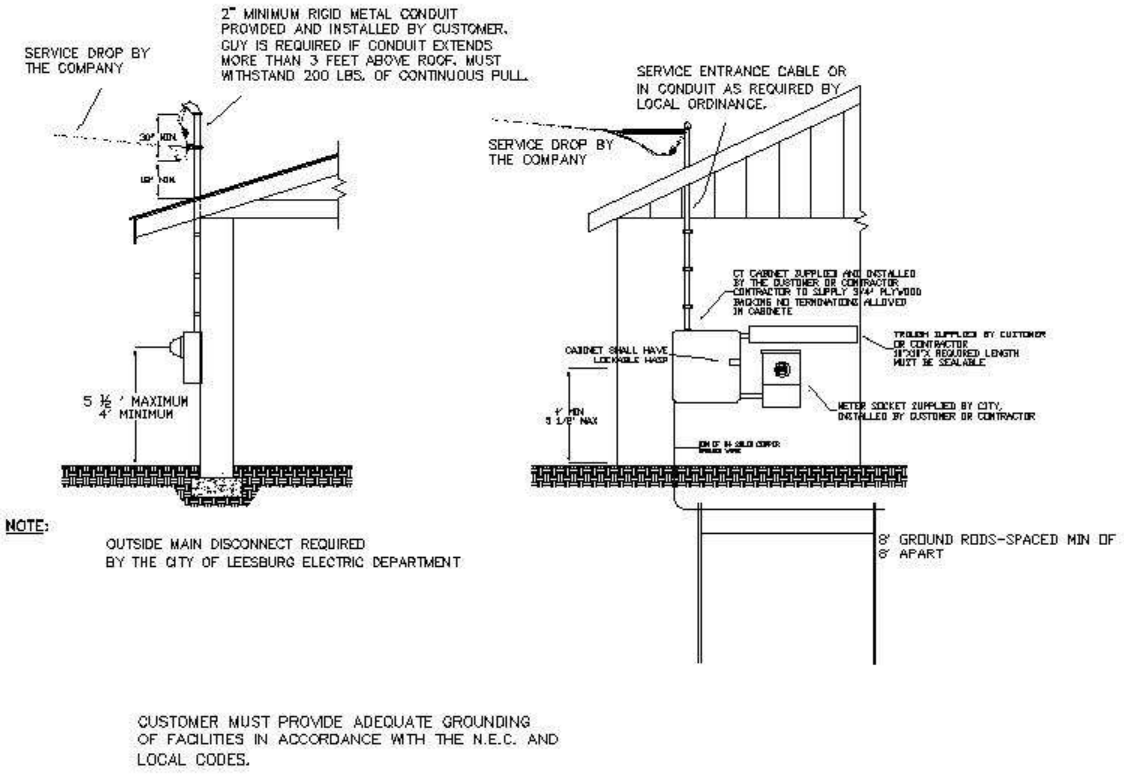
TYPICAL RESIDENTIAL SINGLE PHASE
3-WIRE 2, 4 AND 6 GANG METER SOCKET

Figure# 17 Typical Multi Unit Meter Center with Grouped Load Breaker Panel



TYPICAL MULTI UNIT METER CENTER
WITH GROUPED LOAD BREAKER PANEL

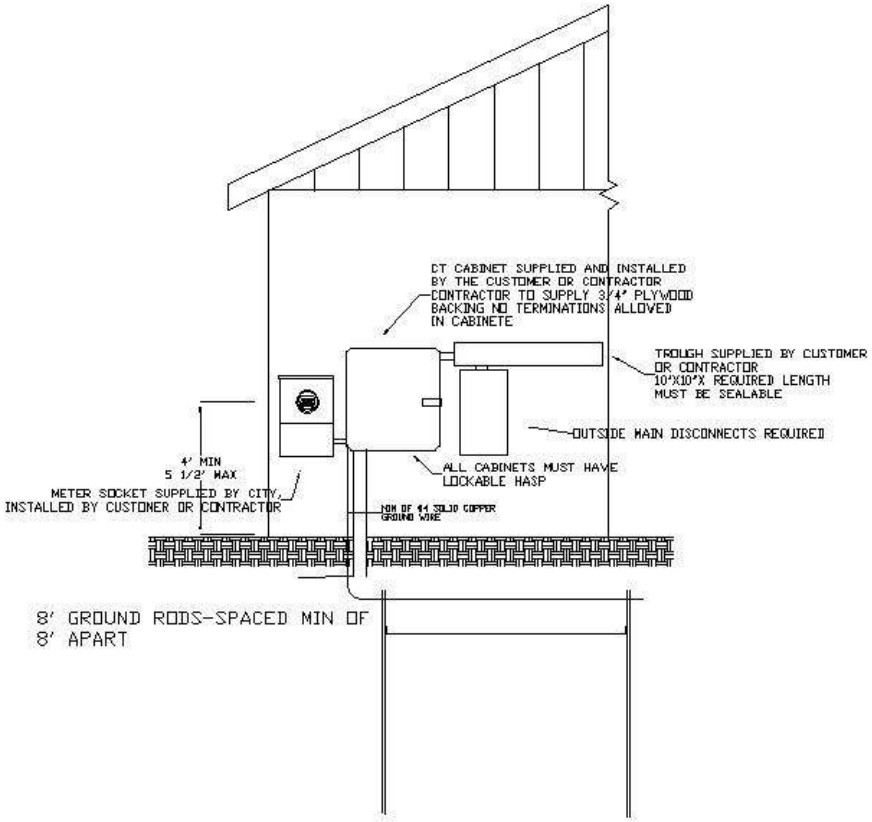
Figure# 18 Overhead CT Installation



OVERHEAD CT INSTALLATION

CT CABINETS FOR SINGLE PHASE CABINETS
ARE 24"X24"X12"
THREE PHASE CABINETS ARE
36"X36"X12"
ALL CABINETS SUPPLIED BY CONTRACTOR
CT CABINETS SHALL HAVE LOCKABLE HASP.
Customer to supply ¾ plywood backing.

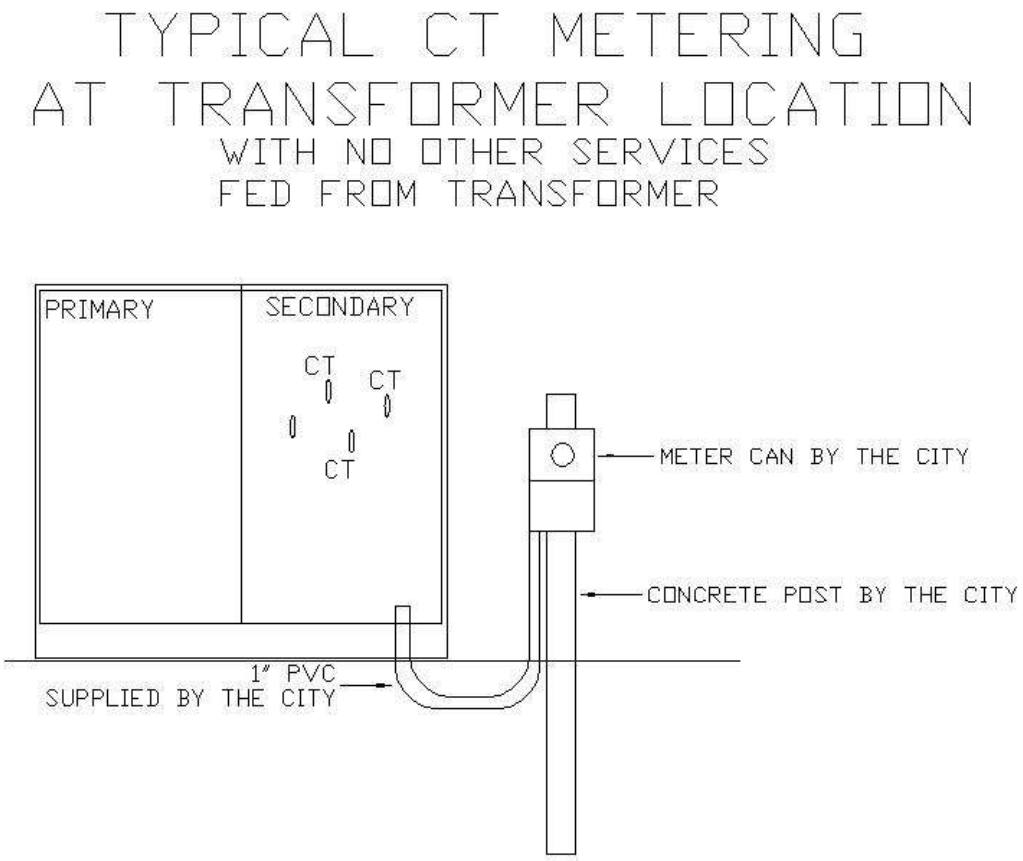
Figure# 19 Underground CT Installation



UNDERGROUND CT INSTALLATION

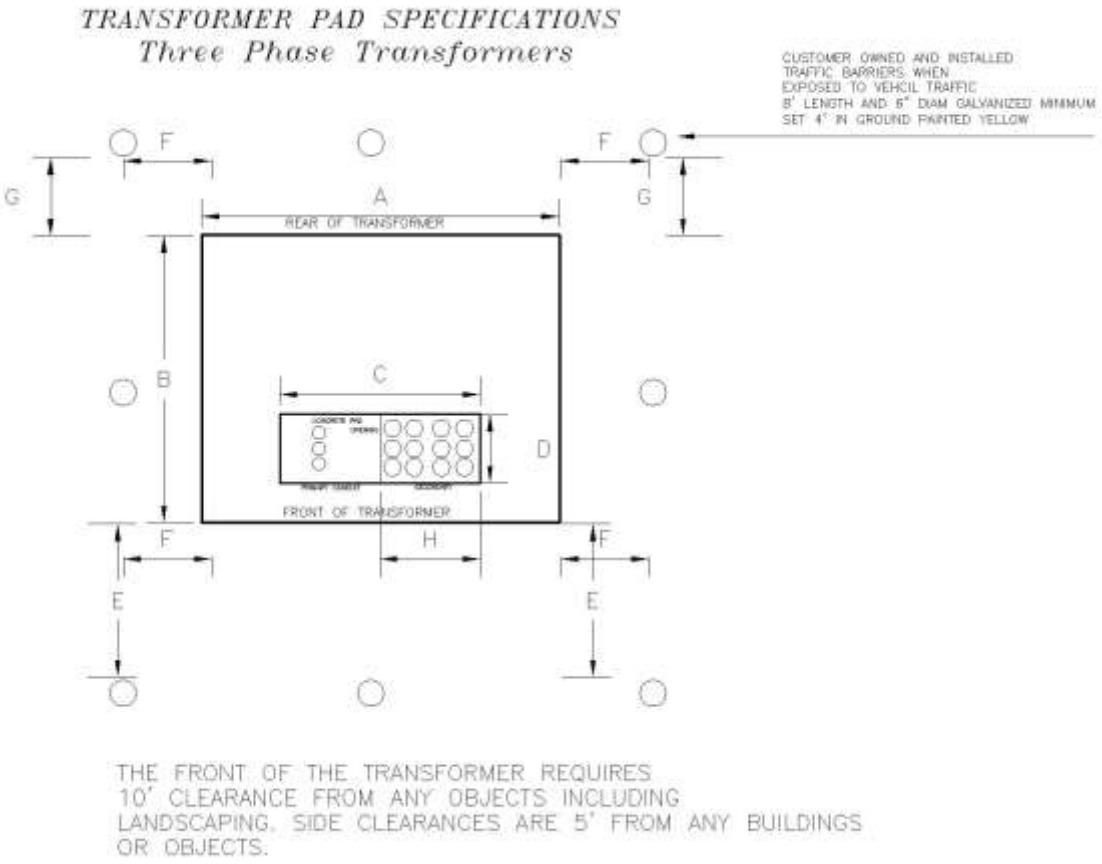
CT CABINETS FOR SINGLE PHASE CABINETS
ARE 24"X24"X12"
THREE PHASE CABINETS ARE
36"X36"X12"
ALL CABINETS SUPPLIED BY CONTRACTOR
ALL CABINETS TO HAVE LOCKABLE HASP
CUSTOMER TO SUPPLY 3/4" PLYWOOD BACKING.

Figure# 20 Pad mounted Transformer CT Installation



PAD MOUNTED TRANSFORMER CT INSTALLATION
CONDUCTORS TO BE SUPPLIED BY THE OWNER/CONTRACTOR
CT'S TO BE INSTALLED BY THE ELECTRIC DEPARTMENT
METER CAN PROVIDED BY THE ELECTRIC DEPARTMENT
CT METERING AT THE TRANSFORMER IS NOT NORMALLY AVAILABLE.
EXCEPTIONS WILL BE BASED ON NUMBER AND SIZE OF CONDUCTORS NEEDED FOR A LARGE SERVICE.

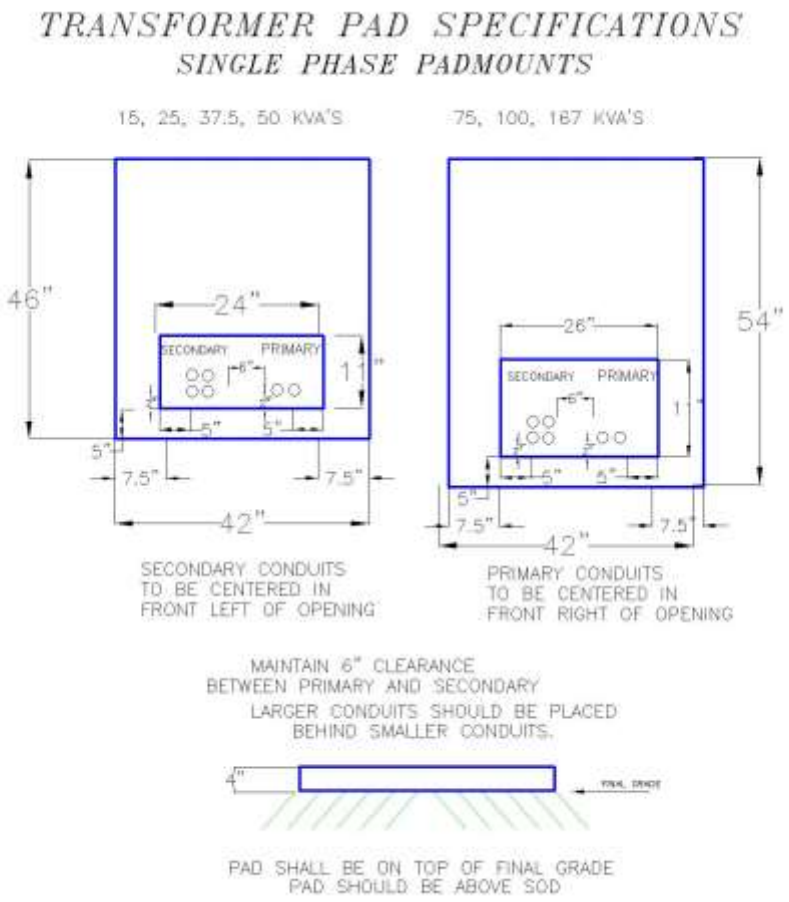
Figure# 21 Three phase transformer pad specifications



Transformer size	A	B	C	D	E	F	G	H
75-500 KVA	82”	66”	46”	16”	36”	18”	18”	23”
750-2000 KVA	96”	96”	66”	20”	36”	18”	18”	23”

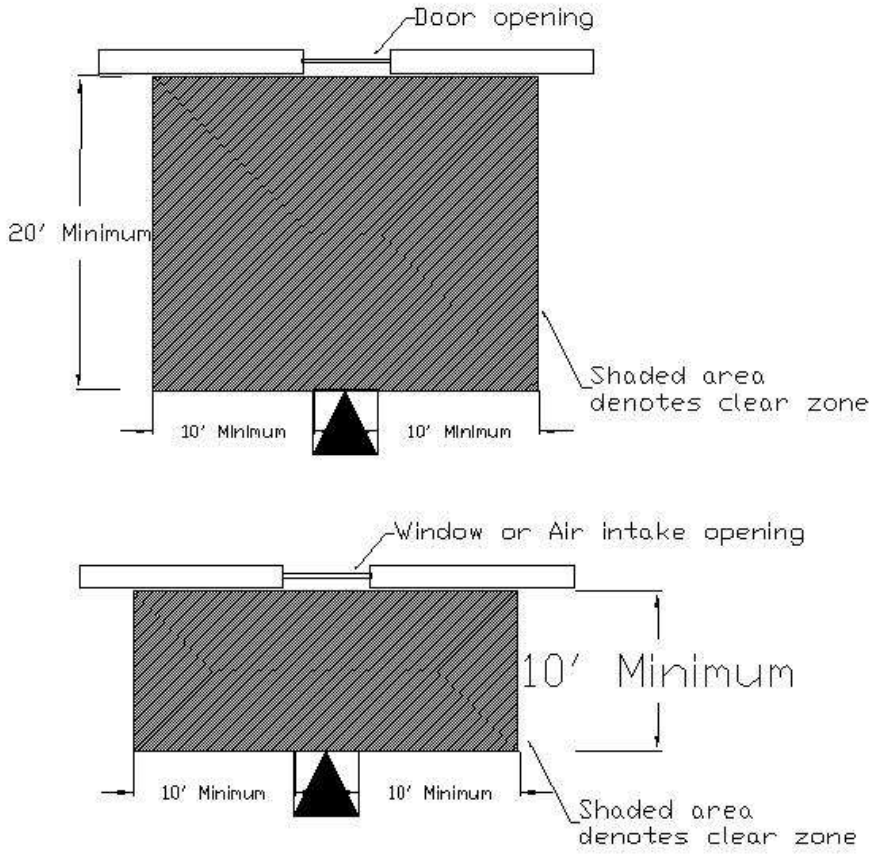
CHECK WITH ELECTRIC SERVICE PLANNERS FOR INSTALLATION OF BOLLARDS
FOR TRAFFIC PROTECTION
ALL TRANSFORMER LOCATIONS WILL BE DECIDED BY
THE CITY OF LEESBURG ELECTRIC DEPARTMENT

Figure #22 Single Phase transformer pad dimensions



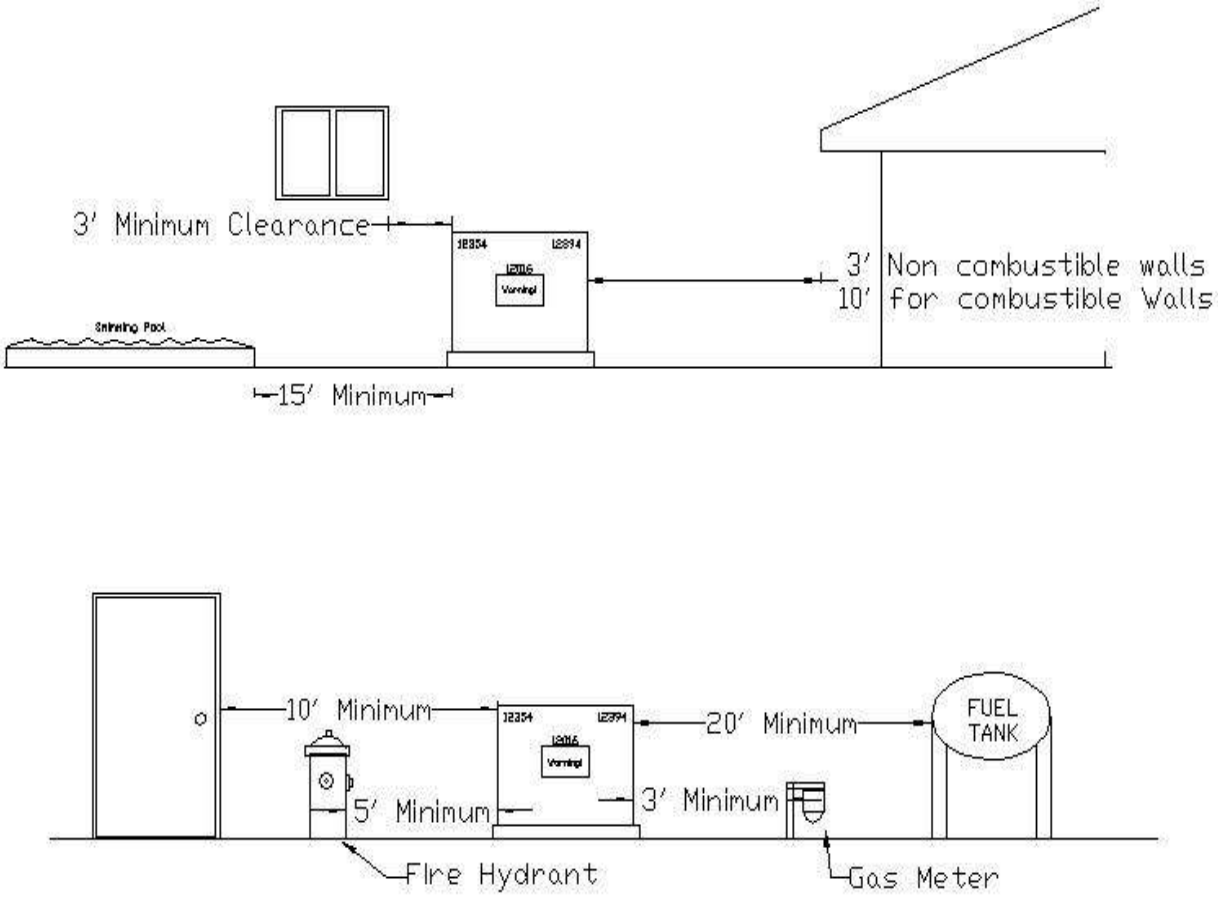
Single phase transformer pad dimensions

Figure# 23 Transformer clearances, doorways and windows



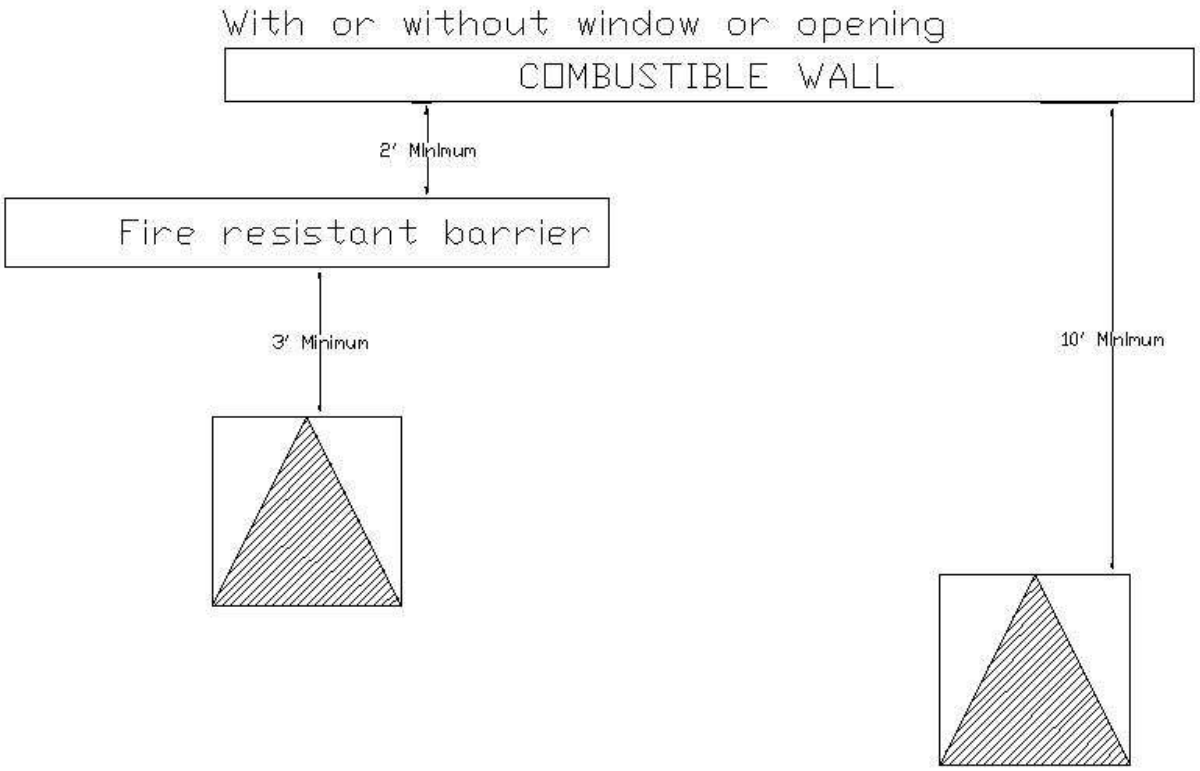
Transformer Clearances
Doorways and windows

Figure # 24 Transformer clearances, continued



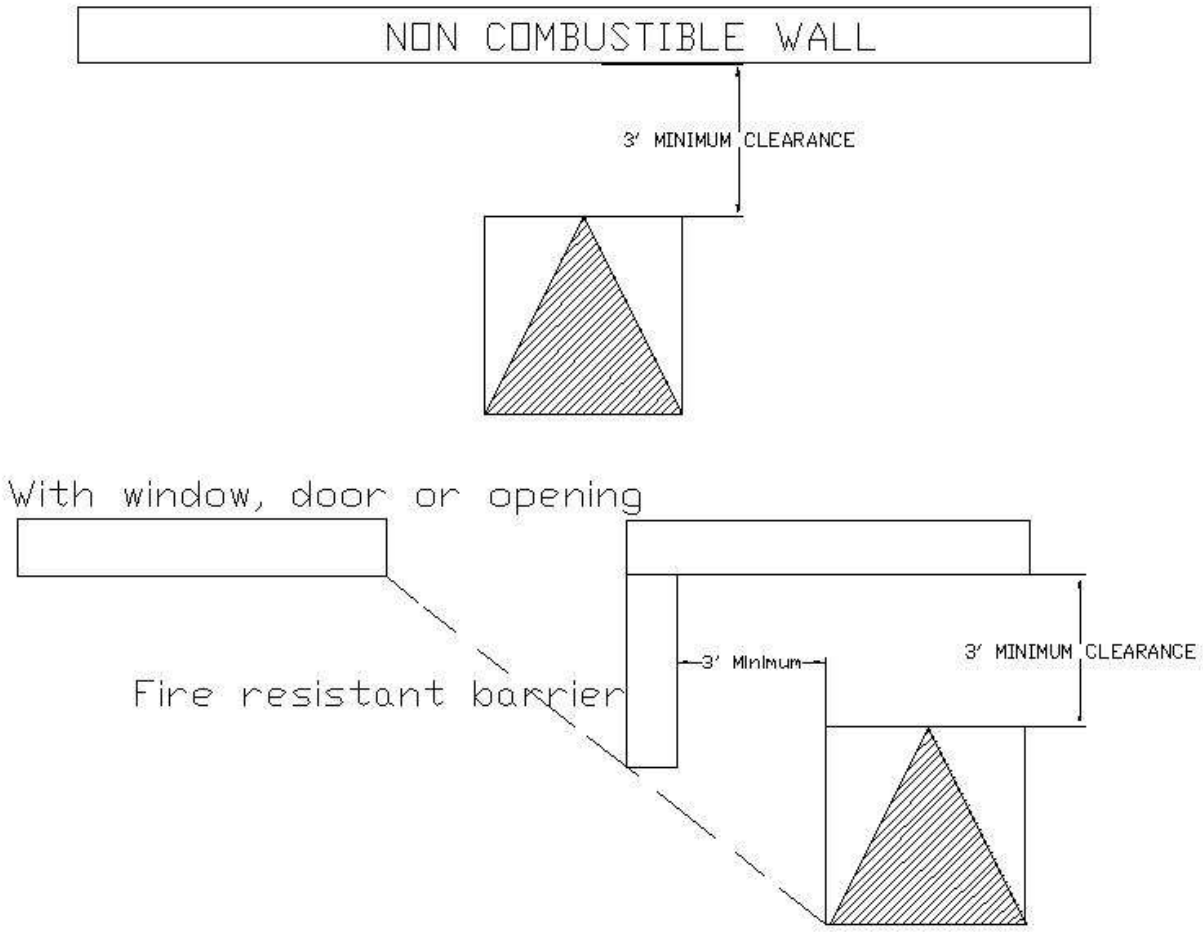
Transformer Clearances, cont.

Figure #25 Transformer clearance, combustible walls with and without fire resistant barrier



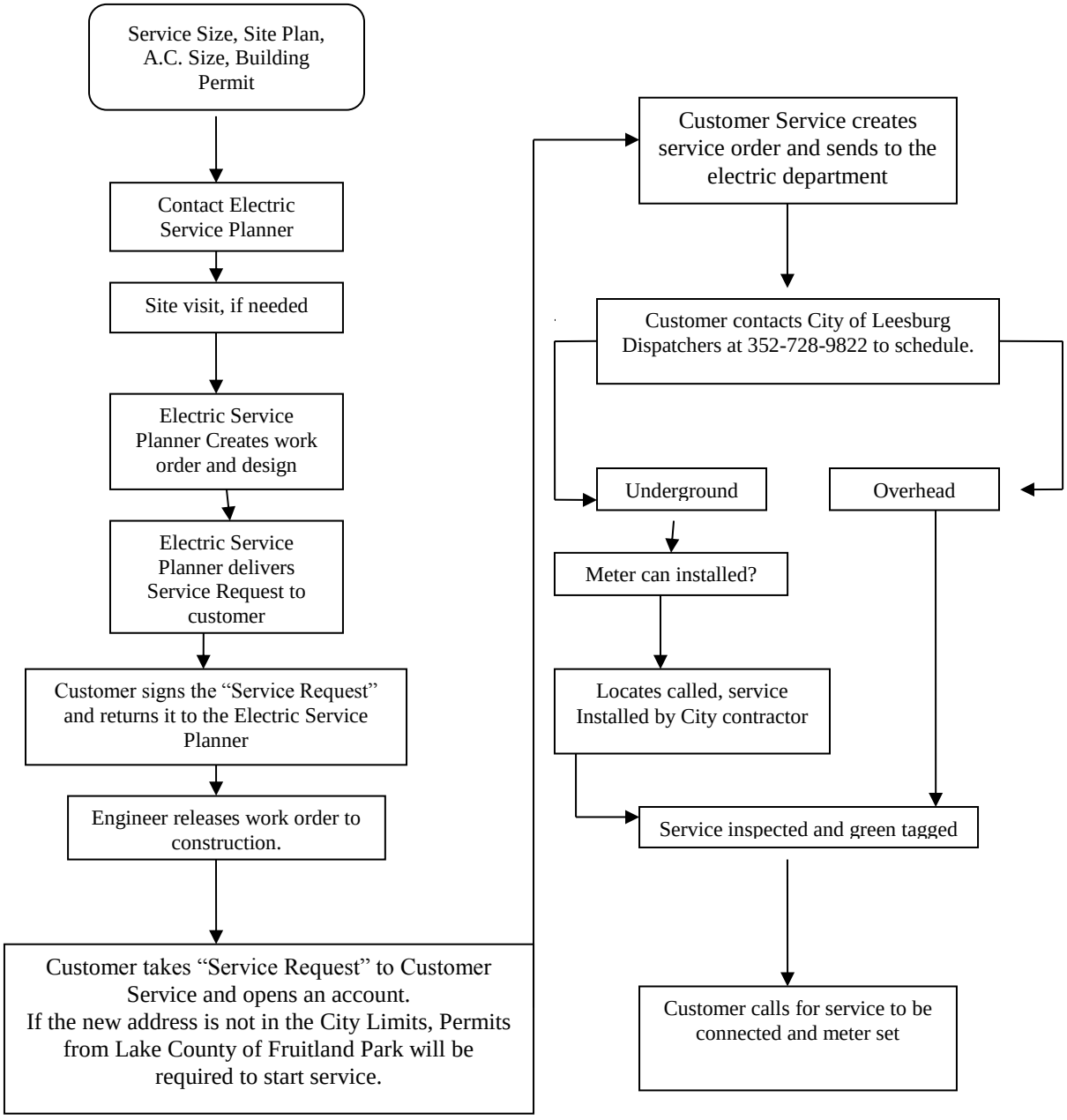
Transformer clearance for combustible wall,
With and without fire resistant barrier.

Figure # 26 Transformer clearance, non-combustible walls with and without fire resistant barrier



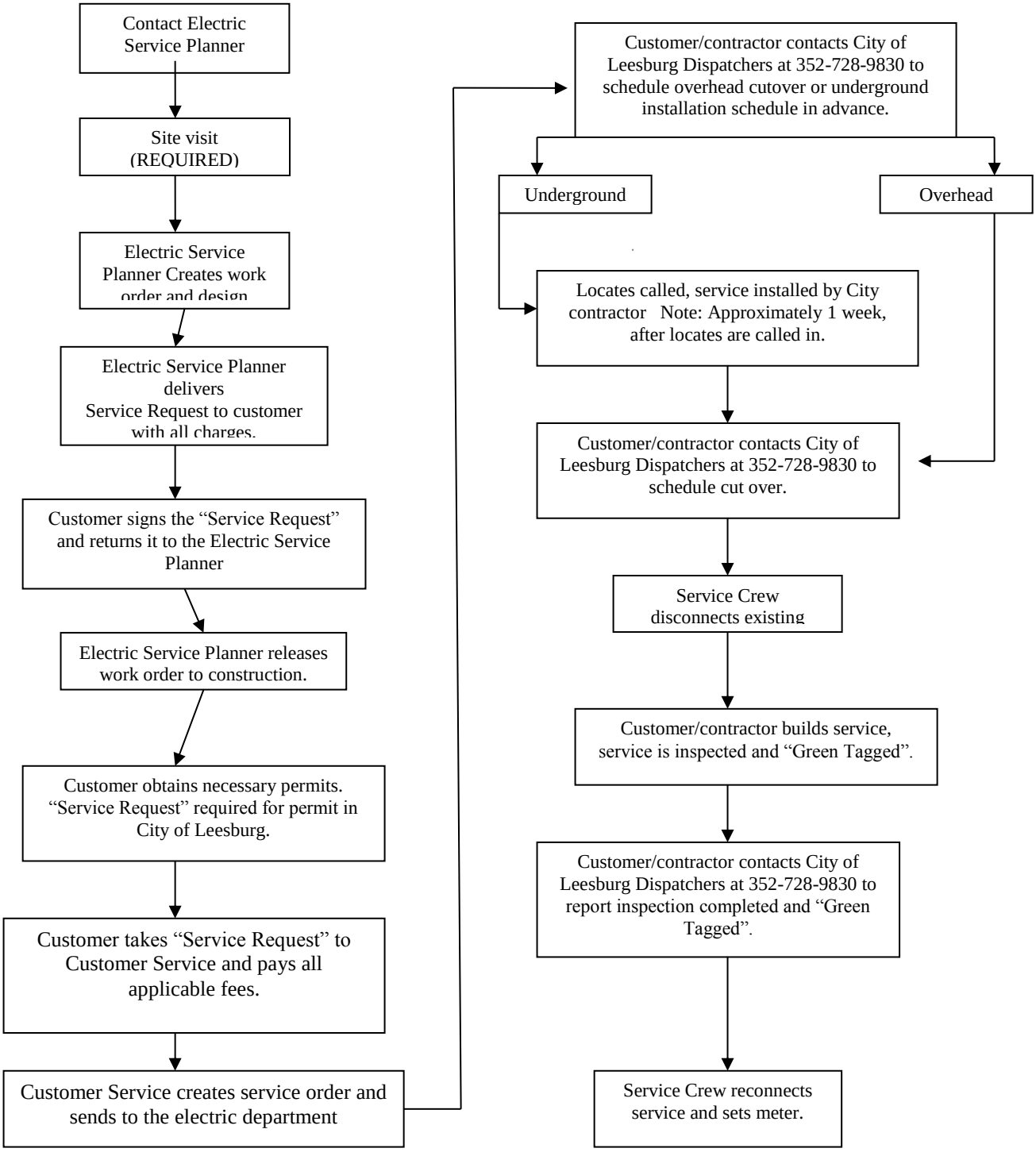
Transformer clearance, non-combustible walls
With and without fire resistant barrier

Figure #27 Steps for New Residential Electric Services



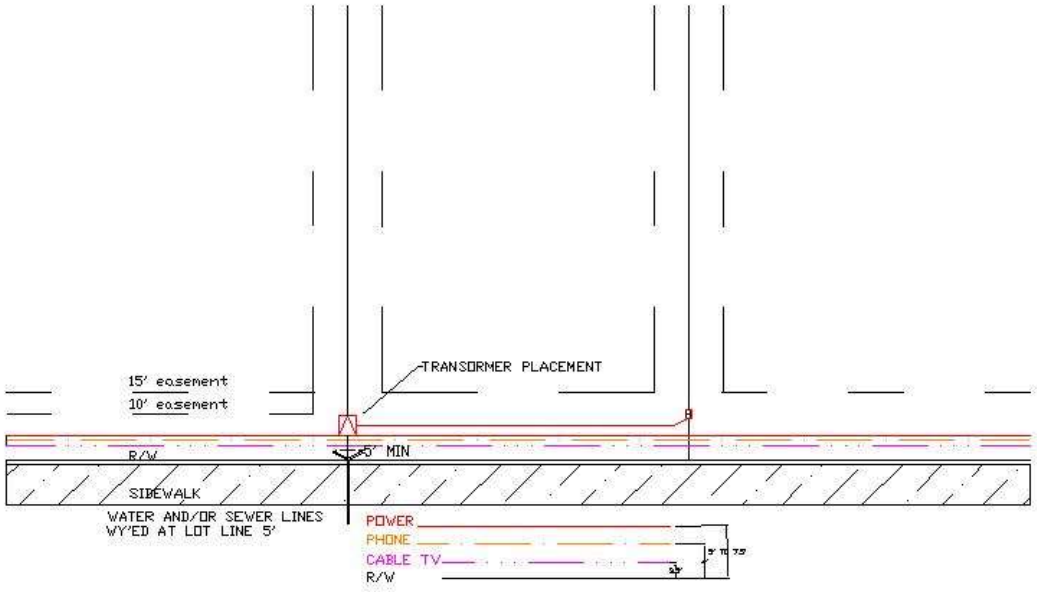
Steps for New Residential Electric Services

Figure# 28 Steps for Change of Services, Service upgrades, or Oh to UG conversions



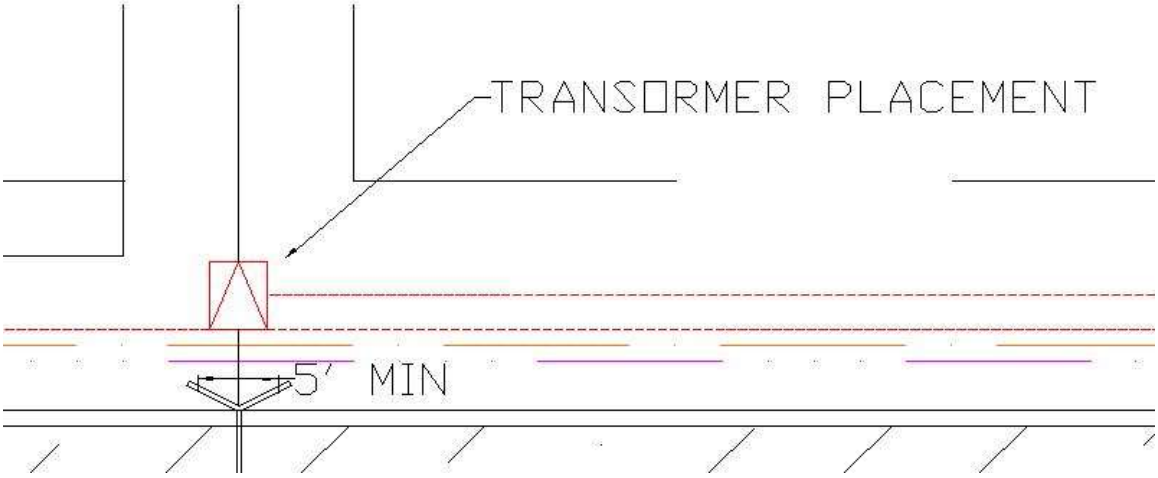
Steps for Change of Services, Service upgrades, or Oh to UG conversions.

Figure #29 Typical Utility Placement



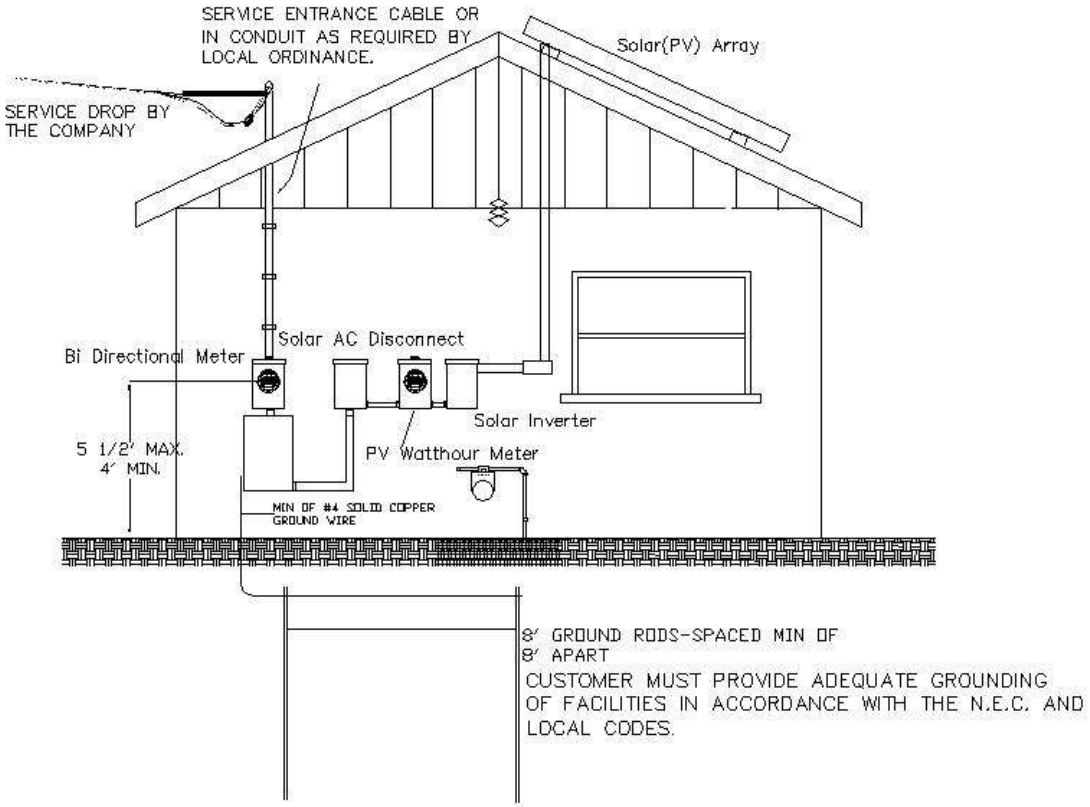
Typical Utility Placement in Easements

Figure #30 Sewer and water clearances



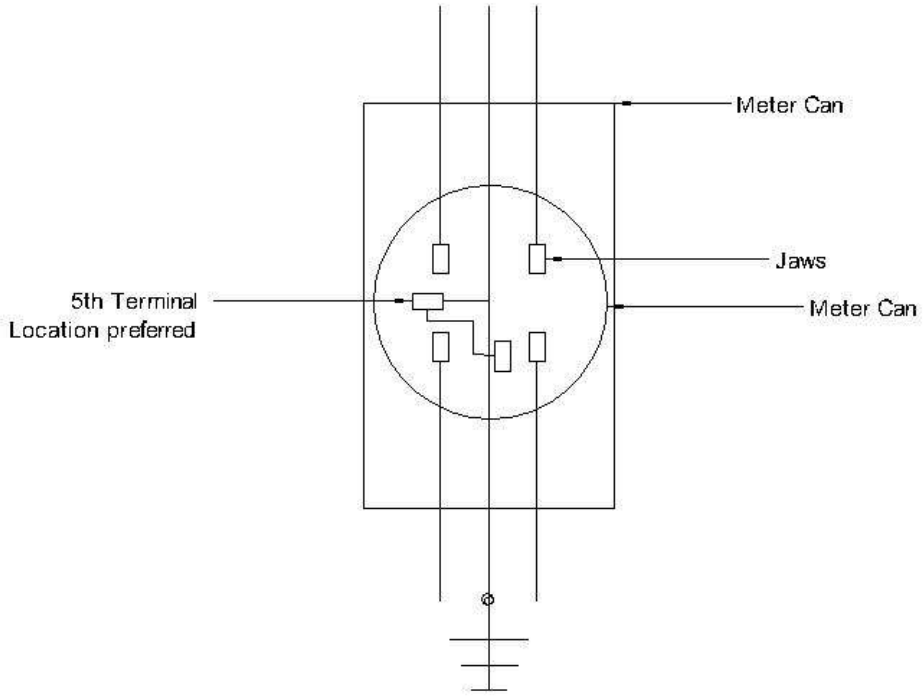
Water and Sewer Wy'ed

Figure #31 Typical Solar Installation



Typical Solar installation with
Disconnects, and solar production meter

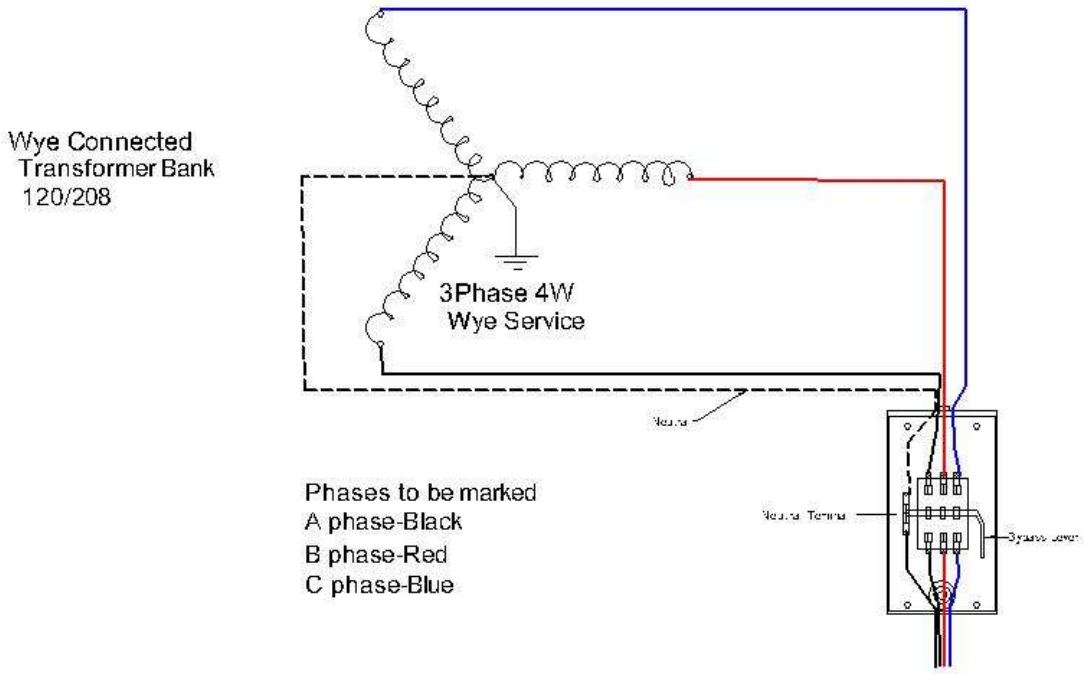
Figure #32 5th Terminal Meter Can



Form 12S, 3 wire network, 120/208 volt
5th Terminal Meter can, 9 O'Clock Position only!

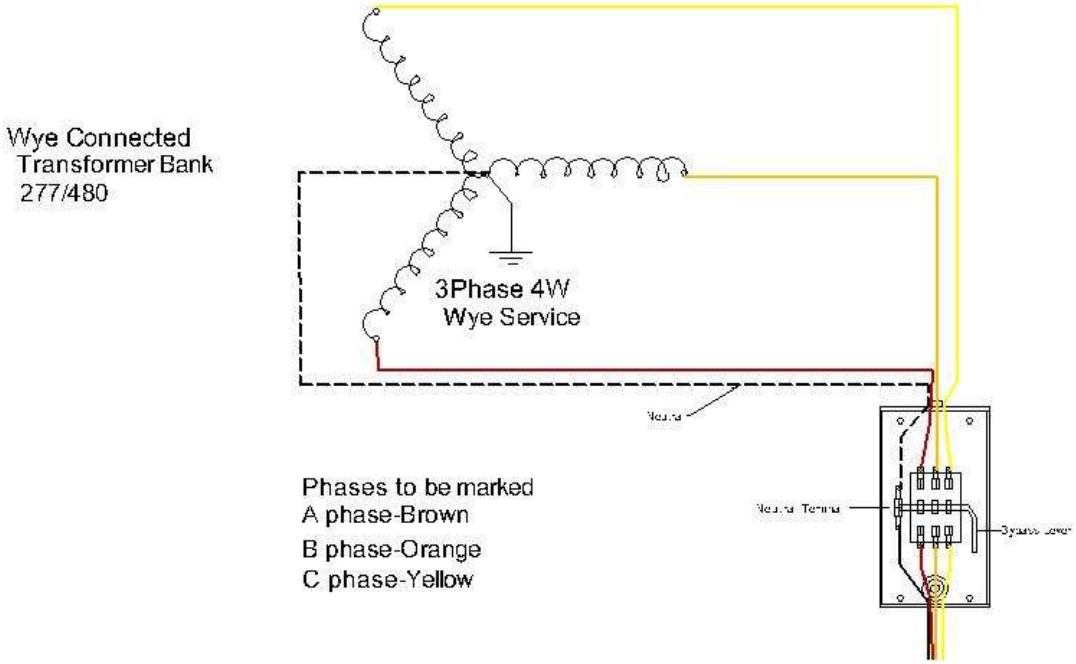
5th Terminal Meter Can for 120/208 volt single phase services.
Use the 9 O'Clock position only for the 5th Terminal

Figure #33 Three Phase 120/208 Wye Connected Service



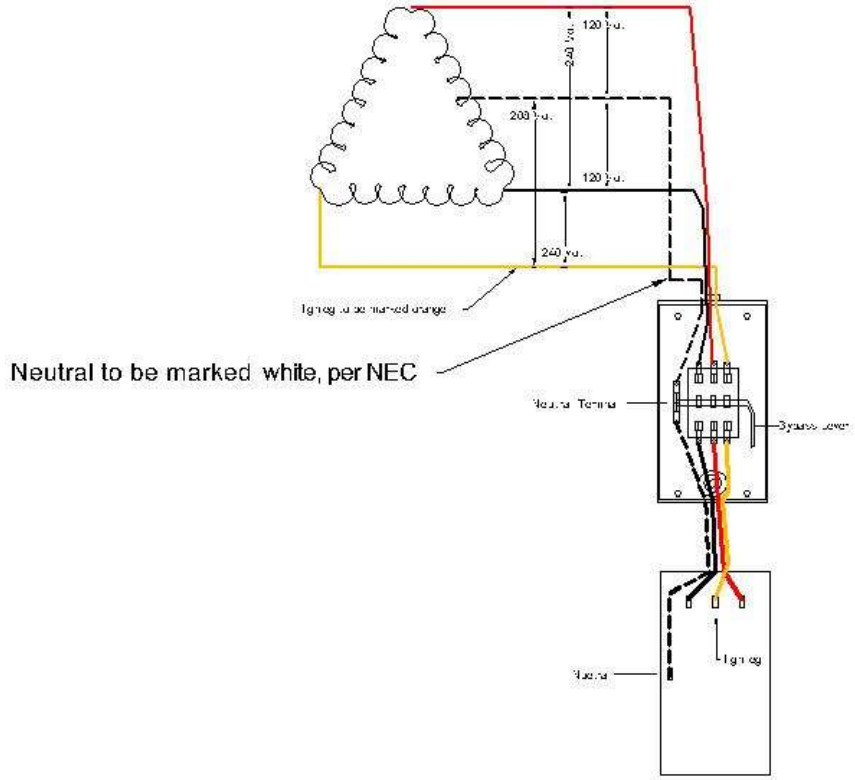
120/208 Wye Connected Service
Clockwise rotation is required at all meter sockets
Mark phases as A-Black, B-Red, and Blue-C phase
It is the Customer's responsibility to label the rotation on the Meter Center.
Labels are to be made of metal or plastic, 5"x8" with ½ inch high letters, embossed or engraved, affixed by rivet to the outside of the meter can.

Figure #34 277/480 volt Wye Connected Service



277/480 Wye Connected Service
Clockwise rotation is required at all meter sockets
Mark phases as A-Brown, B-Orange, and Yellow-C phase.
It is the Customer's responsibility to label the rotation on the Meter Center.
Labels are to be made of metal or plastic, 5"x8" with ½ inch high letters, embossed or engraved, affixed by rivet to the outside of the meter can.

Figure #35 120/240 Open Delta Connected Service



120/240 Open Delta Connected Service
Clockwise rotation is required at all meter sockets
Mark phases as A-Black, B-Red, and C “High Leg”-Orange.
It is the Customer’s responsibility to label the rotation on the Meter Center.
Labels are to be made of metal or plastic, 5”x8” with ½ inch high letters, embossed or engraved, affixed by rivet to the outside of the meter can.

IX. TABLES

Table #1 Utility Fee Schedule

UTILITY FEE SCHEDULE	**APPROVED 05/09/05 BY CITY COMMISSION RESOLUTION 7355**
DESCRIPTION OF SERVICE	**CHARGE PER SERVICE OR METER**
Initial Connection Fee	**$25**
Reconnection Fee	**$25**
Transfer Fee	**$25**
After Hours connection/reconnection fee	**$100**
Single Phase Meter Installation Fee	**$20**
Three Phase Meter Installation Fee	**$25**
Temporary Electric Service, New Service	**$50**
Change of Service, upgrades of Overhead or underground services	**$50**

Fees are subject to change.
Please contact Electric Service Planners
For Current fees

X. APPENDICES

Conduit Installation Guidelines

1. A preconstruction site visit will be required. The Electric Service Planner and the Electric Superintendent or his appointee for installation inspections will be in attendance.
   Prior to this meeting, the following will need to be completed.
   a. All easements must be granted the City prior to any construction.
   b. The construction area will be at grade.
   c. All easements, transformer and pedestal locations, will be staked by the developer/contractor prior to installation of underground facilities.
   d. Curbing, edge of pavement, radiuses shall be staked prior to installation.
2. The Electric Department will supply all conduits, elbows, glue and pull string. No items will be used that are not approved by the Electric Department.
3. Contact the Electric Superintendent at 352-728-9819 to schedule the conduit to be issued to the contractor/developer. The developer/contractor will schedule all inspections through the electric superintendent.
4. The Developer/contractor shall be responsible for having active locate tickets for any areas under excavation. The phone number is 811.
5. Inspections will be required on a **daily basis as scheduled**. Conduit **shall not** be covered up until after inspection. If the contractor/developer has covered up any conduit prior to inspection, they may be required to uncover the conduit for the full length not inspected.
6. All conduits shall be installed at a minimum depth of 36", unless specified by the Electric Service Planner.
7. All conduits and transformers shall be installed in easements.
8. All conduit stub ups shall be at a 90 degree angle. Conduits not installed straight will have to be straightened prior to acceptance.
9. All conduit stub outs will be installed according to drawings provided by the City of Leesburg Electric Department.
10. All conduits shall have a pull string installed. The pull string shall be secured in a fashion that will not allow the string to fall into the pipe, prior to wire pulling.
11. All transformer locations shall be at grade and tamped. Singe phase transformers will require a 5'x 5' tamped area. Three phase transformers will require a 10'x10' area.
12. The developer/contractor will be responsible for protecting any infrastructure installed until the completion of construction. All electric facilities (including transformers, pedestals, hand hole boxes, and conduit stubs) shall be marked in a way to prevent damage. The developer/contractor will be billed for any damage caused by any contractor or sub on the site.
13. All clearances shall be maintained.

a. A twelve inch (18") minimum clearance shall be maintained from all other utilities in a common trench.
b. CATV and Phone Company pedestals shall maintain a 36" minimum clearance on all transformer and electric pedestals.
c. CATV and Phone company pedestals shall not be installed in the front of any transformer, unless a clearance of 10' is maintained.
d. Consult the City of Leesburg's Service Requirements ("Blue Book") booklet for additional clearances.

14. The city reserves the right to ***not accept*** any conduit installation not installed to the City of Leesburg's Guidelines.
15. The developer/contractor will be required to repair any conduit issues at their costs.
16. The developer/contractor may be charged a remobilization fee if City crews or contract crews have to leave the site prior to their work being completed, if the reasons are caused by the developer/contractor or their crews.