LIBERTY

Requirements For
Electric Service and Meter Installations

Commercial & Industrial

(800) 206 – 2300

The latest revision of this book can be found on-line at:
https://central.libertyutilities.com/all/residential/new-service/service-standards.html
Select “Commercial and Industrial Service Standards 2025”

Effective 02/04/2025 (REV1)

Some of the information in this booklet is based on governmental codes and ordinances as well as the National Electric Safety Code, National Electrical Code, and Liberty tariffs on file with the Public Service Commissions. These requirements and guidelines are issued with the intent of complying with all applicable codes, ordinances and tariffs. In the case of conflict, the appropriate code, ordinance, and tariff will supersede the interpretation offered in this booklet. In addition, these requirements are subject to change in the event that the governing codes, ordinances and tariffs are changed. Liberty does not assume responsibility for keeping this book current and should be consulted in case of doubt on the applicability of any terms.

When the term "contact the Company" is used in this booklet, it shall mean for each and every installation, not a single contact.

This publication includes a number of changes and supersedes all previous editions.

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1.0 INTRODUCTION

Liberty constantly strives to maintain a high standard of service to all Customers. This booklet has been prepared for use by Customers, architects, engineers, electrical contractors, and local inspecting authorities so that they may receive full benefit from our service. We believe you will find it helpful when planning new electrical installations, upgrading, or adding additional equipment. Copies are available at the Liberty Central Region Corporate office, service centers, and online through the website;

https://central.libertyutilities.com/all/residential/new-service/service-standards.html

All holders of Requirements for Electric Service and Meter Installations booklets are encouraged to submit comments to aid in future revisions. Please submit comments as follows:

1. Give the section, paragraph, and page number to which the comment pertains.
2. Submit comments in writing, giving details, sketches, drawings, and all supporting pertinent information.
3. Mail or Email to:

   LIBERTY

   Standards Engineering

   PO Box 127

   Joplin MO 64802

   Email: Jeff.Brown@libertyutilities.com

The impression generally prevails that compliance with the National Electrical Code (NEC), or the various electrical ordinances guarantees to the Customer a wiring installation complete and adequate for the full use of electric service now and in the future. This is not necessarily the case. The NEC and these guidelines are designed to provide the minimum requirements considered necessary for safety. **(The NEC, Article 90.2(B) itself states, "Compliance therewith and proper maintenance will result in an installation that is essentially free from hazard, but not necessarily efficient, convenient, or adequate for good service or future expansion of electrical use.")** Careful design and installation often results in a wiring system that exceeds NEC requirements.

LIBERTY, as a utility, must meet the requirements of the National Electrical Safety Code (NESC), which sometimes differ from the National Electrical Code (NEC).

The Company shall have the right to disconnect or refuse service to any installation which violates local, municipal, NEC or NESC regulations. The Company shall also have the right to disconnect or refuse service for installations that are hazardous to the public, or negatively impacts service to other Customers, or Company facilities.

Except for the installation and maintenance of its own property, Liberty does not install or repair wiring or equipment beyond the point of delivery. Therefore, Liberty is not responsible for the voltage levels beyond the point of delivery and does not assume any responsibility for Customer facilities beyond the point of delivery. Your cooperation will be greatly appreciated and will enable you to receive prompt and satisfactory service.

2.0 GENERAL INFORMATION

2.1 DEFINITIONS

Company	LIBERTY
Conduit	Pipe used to protect the electrical conductors. Rigid Steel or Schedule 80 Electrical Grade PVC is required on the wall when an underground service is provided.
Conduit Strap	A properly sized strap or clamp used with screws or nails to securely attach conduit to the structure.
Conduit Reducer	A fitting that provides a way to connect together different sized conduits.
Conduit Vent	A fitting used to provide an outlet so that gases or fluids can be released externally from the conduit. This is commonly used in hilly terrain.
Contribution-in-Aid of Construction	An amount to be paid to the Company by a Customer or developer when the Company has to install electrical facilities over and above what is normally required to provide service. This is required when the cost to serve is not justified by the expected revenue provided by the service.
Customer	User of the Company's electric service or user's authorized representative (architect, engineer, electrical contractor, etc.).
Drip Loop	Short length of the customer's service entrance conductors (wire) extending out of the weatherhead which allows connection to the Company's service drop.
Emergency Disconnect	**A properly labeled means of disconnect, with sufficient short-circuit current rating, located in a readily accessible outdoor location that can be used by first responders or utility personnel to remove power from a structure. Refer to NEC 230.85 for details and requirements.**
Inspector or Inspection Authority	A person or agency authorized by a governmental body to inspect and approve electrical installations.
Interconnection-Cogeneration and Small Power Producers	An electric service where co-generators and small power producers operate in parallel with the Company's electric system. Energy may flow in either direction through an interconnection.
Intersystem Ground Connector (Intersystem Bonding Termination)	A device that provides a means for connecting communications system(s), grounding conductor(s) and bonding conductor(s) at the service equipment or at the disconnecting means for buildings or structures supplied by a feeder or branch circuit.
Line of Sight	Is a straight line from the Liberty designated service source, i.e., Service Pole, Transformer Pole, Padmounted Transformer, Secondary Pedestal, etc. to the Liberty Point of Delivery.
Main Disconnect	This term as used in this document refers to a combination of a disconnecting and overcurrent protection device, e.g., fuse and manual switch or circuit breaker. Liberty recommends that a circuit breaker be used to accomplish this function. See Figure 3.
Maximum Available Fault Current (at the point of delivery)	The maximum current that would flow due to a direct short circuit from one conductor to ground or between conductors. This can be calculated by the company and furnished to the customer upon request.
Manufactured Home/Building	Shall be defined by the following requirements: The structure shall be installed on and secured to a permanent foundation. This does not mean block piers with cable or strap tie downs. The structural integrity of the manufactured home is sufficient to support the metered service equipment per NEC 550.32.

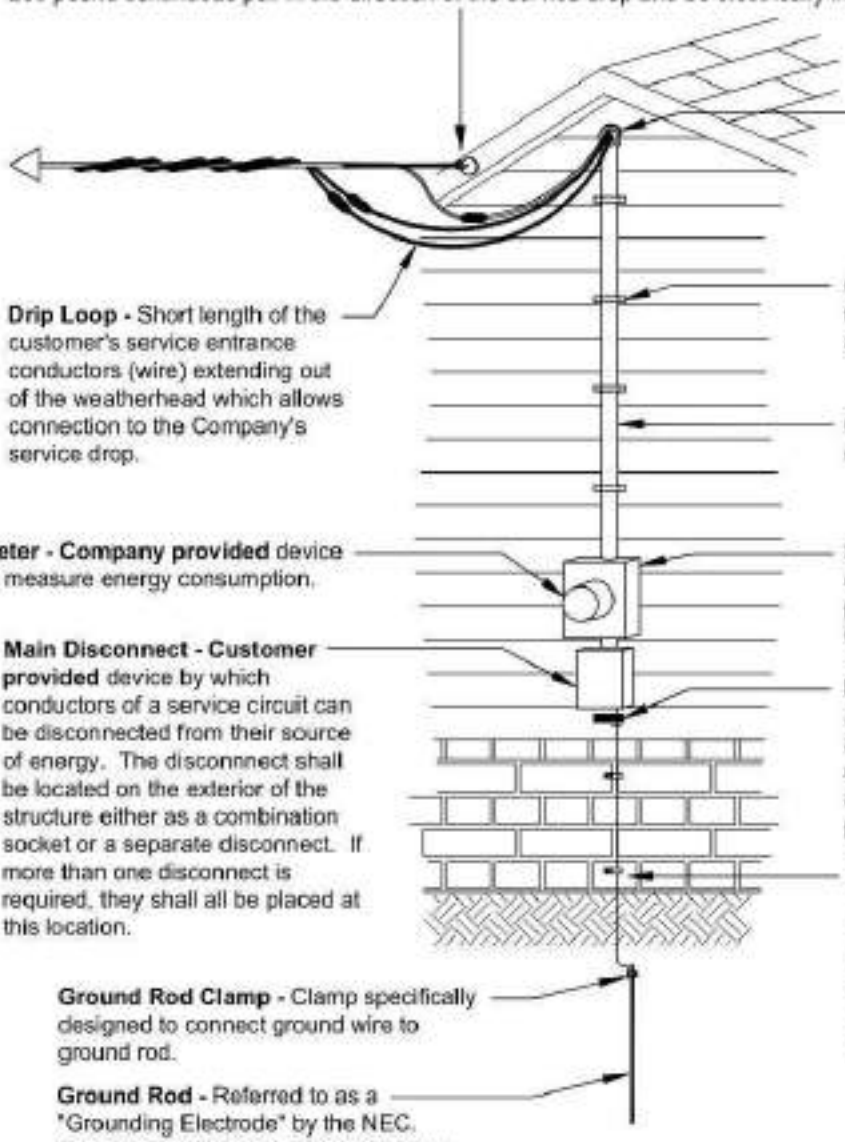
Meter Loop	Customer provided wire and enclosure connecting the Customer's service equipment to the Company's service drop. Consists of the following: Point of Attachment, wires, weatherhead, conduit, conduit straps, and meter socket / disconnect combination. These can be separate components.
Mobile Home	Shall be defined as any other type of structure moved to a site that does not match the Manufactured Building definition of this document.
NEC	The latest edition of the National Electrical Code.
NESC	The latest edition of the National Electrical Safety Code.
Point of Attachment	The point as ***designated by the Company*** at which the Company's service drop is attached to the Customer's facility, can be attached to the structure or to rigid steel conduit. It must be capable of withstanding a 200 pound continuous pull in the direction of the service drop and be electrically insulated from the structure.
Point of Delivery	The point as ***designated by the Company*** where the Company's facilities terminate at the Customer's facilities.
Readily Accessible	Capable of being reached quickly, for operation, renewal, or inspections without requiring those to whom ready access is a requisite to climb over or remove obstacles or resort to portable ladders, etc.
Self-Contained Meter Socket	A meter socket that is installed in line with the service entrance or lateral conductors. If the socket were replaced with conductor, the power could flow straight through to the service equipment.
Service	The supply by the Company of electricity to the Customer, including the readiness and availability of electrical energy at the point of delivery, at the standard available voltage whether or not utilized by the Customer.
Service Drop	The overhead service conductors between Company's last pole or other aerial support to and including the connectors to the service entrance conductors at the point of delivery to the Customer's property.
Service Entrance	Customer owned conductors and enclosures connecting the Customer's service equipment to the Company's service drop or service lateral.
Service Lateral	The underground service conductors between the Company's secondary pedestal or transformer, including any risers at a pole or other structure and the point of delivery.
Slip Joint	A fitting that provides a slip fit adjustment of PVC conduit extending from an electric service box on a building to an underground electric service line. The fitting allows for subsidence of the ground level without creating excessive force on the service box.
Sweep Elbow or ELL	Conduit Bend.
Transformer Clear Zone	The area surrounding a transformer that is to be free at all times of any temporary or permanent fixtures or objects that may impede access, airflow, or pose a fire safety hazard.
Undisturbed Earth	Soil that has not been moved by construction or recompacted soil that approximates such. In engineering terms, it is topsoil or clay void of rotting debris that has been recompacted in 1 foot lifts to the desired level using a vibrating roller or sheep's-foot roller and achieving a 95% modified Proctor Density at each lift.
Wire Size	This refers to the AWG (American Wire Gauge) designation of copper wire unless otherwise specified. Should another approved conductor material be used, a size having the equivalent current carrying capacity shall be selected.

DEFINITIONS ONLY

REFER TO INSTALLATION SPECIFICATION AND FIGURES FOR CONSTRUCTION DETAILS.

Meter Loop - Customer provided wire and enclosure connecting the customer's service equipment to the Company's service drop. Consists of the following: **Point of Attachment, wires, weatherhead, conduit, conduit straps, and meter socket.**

Point of Attachment - The point as ***designated by the Company*** at which the Company's service drop is attached to the Customer's facility. Can be attached to the structure or to rigid steel conduit. It must be capable of withstanding a 200 pound continuous pull in the direction of the service drop and be electrically insulated from the structure.



Weatherhead - Device attached to the top of the conduit to protect the enclosed conductors from the weather.

Drip Loop - Short length of the customer's service entrance conductors (wire) extending out of the weatherhead which allows connection to the Company's service drop.

Conduit Strap - properly sized strap used with screws or nails to securely attach conduit to the structure.

Conduit - Pipe used to protect the electrical conductors.

Meter - Company provided device to measure energy consumption.

Self-Contained Meter Socket - Often called the "Meter Base". **Customer provided** enclosure that holds the Company's metering device.

Main Disconnect - Customer provided device by which conductors of a service circuit can be disconnected from their source of energy. The disconnnect shall be located on the exterior of the structure either as a combination socket or a separate disconnect. If more than one disconnect is required, they shall all be placed at this location.

Intersystem Ground Connector - A connector block designed to provide a grounding path so that others, i.e. cable TV, telephone, may have easy access to ground bonding. This is as per NEC 250.94 (A).

Ground Wire - Referred to as "Grounding Electrode Conductor" by the NEC. Conductor used to connect the Ground Rod to the meter socket grounding connector at the service entrance. It must be securely attached to the structure.

Ground Rod Clamp - Clamp specifically designed to connect ground wire to ground rod.

Ground Rod - Referred to as a "Grounding Electrode" by the NEC. Copper clad steel rod, 5/8" x 8', driven in undisturbed earth as close to the service entrance as possible.

REVISIONS		
12/30/04	SDS	
08/27/19	KMH	
02/05/21	KMJ	

Liberty

DEFINITIONS

DRAWN: JEB	DWG. NO. G18A2089
SCALE: NTS	FIGURE 1
DATE: 5/13/96	

Figure 1: Definitions

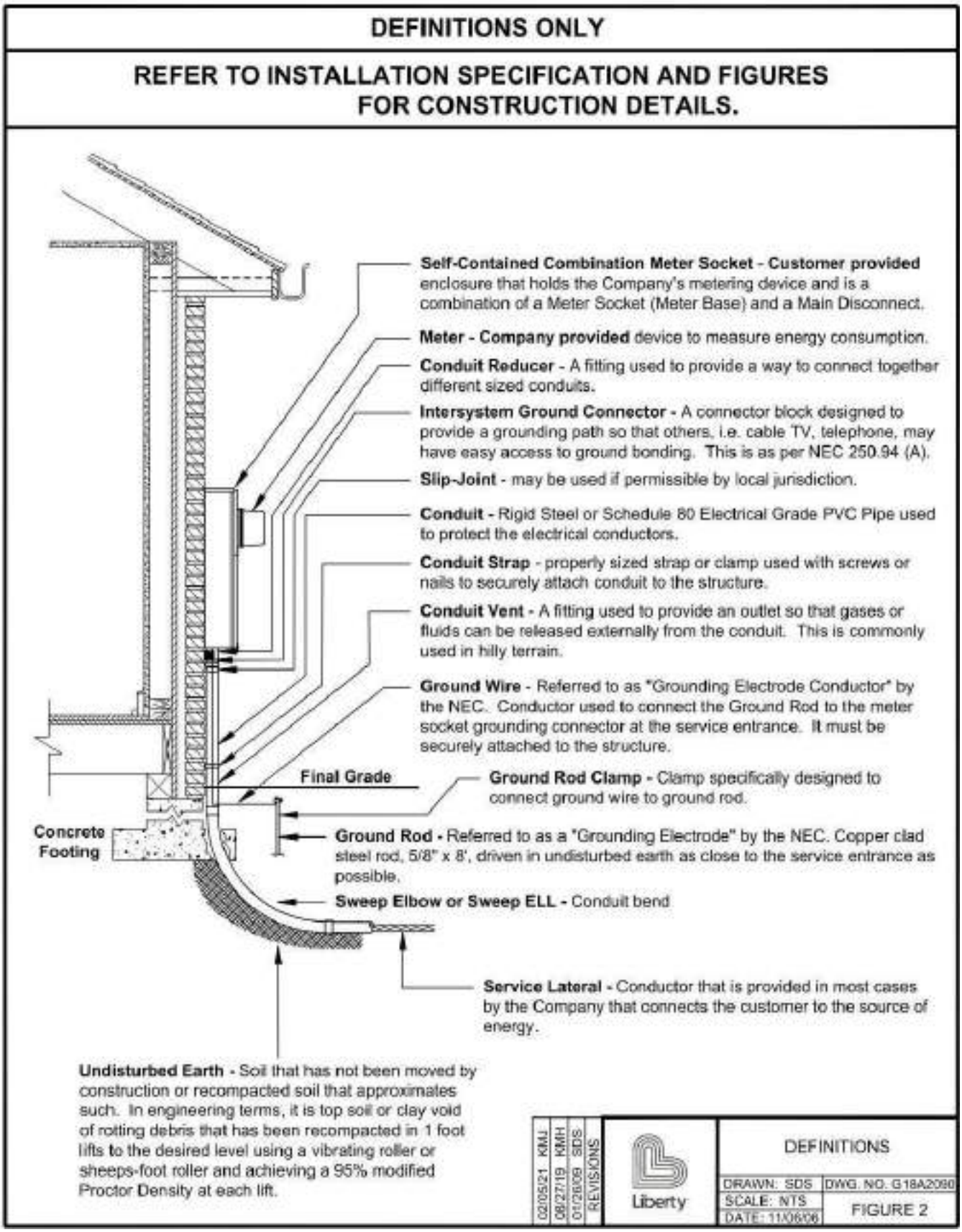


Figure 2: Definitions

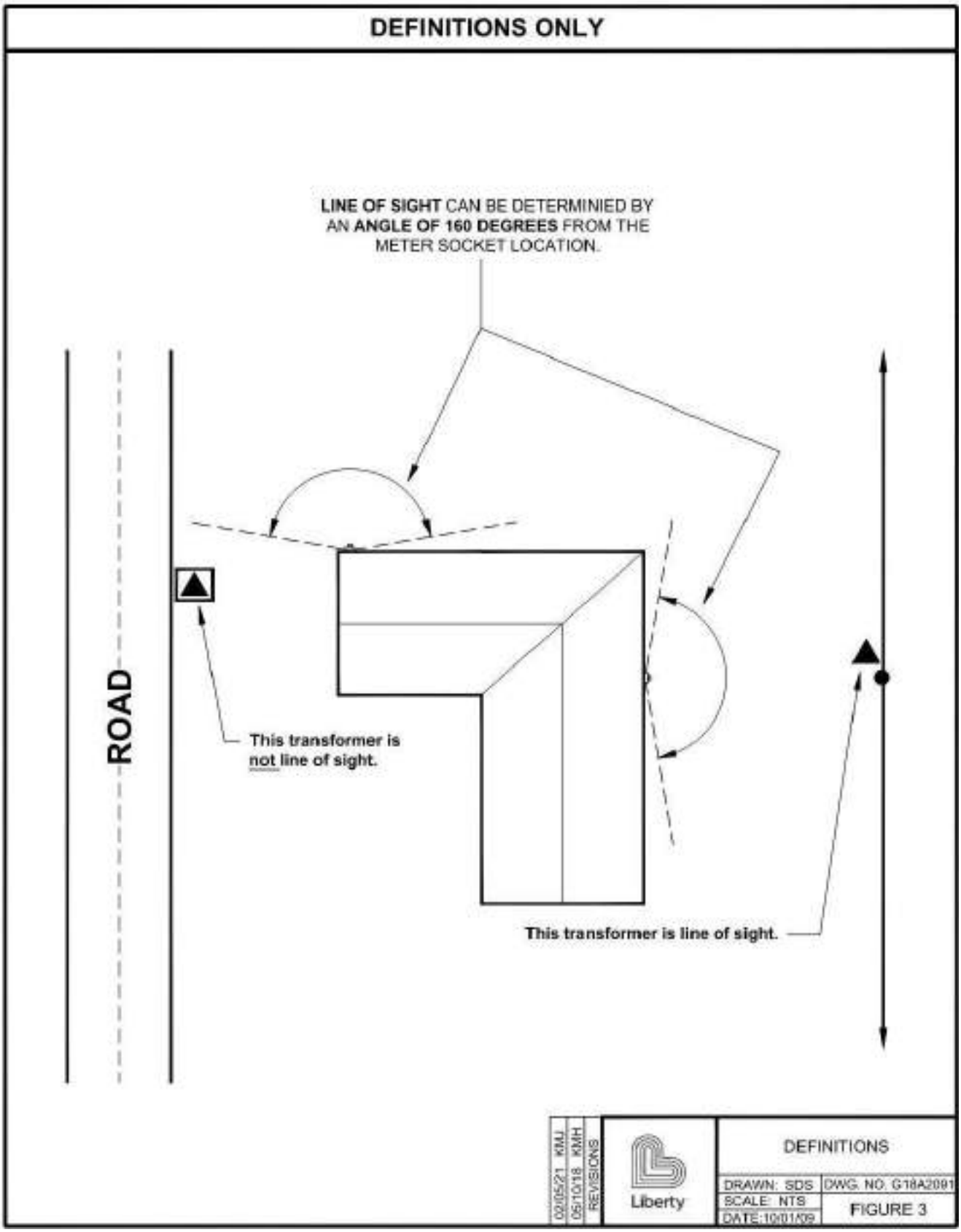


Figure 3: Definitions

2.2 AVAILABILITY AND LOCATION OF SERVICE

Before construction is started, the Customer shall request the Company to designate a point of delivery and submit appropriate load data to the Company. The load data should include the anticipated demand and list of equipment. The Customer shall provide a set of building plans, a survey and a copy of the warranty deed. It is requested that the Customer provide the building plans as an AutoCAD file (.DWG) format.

It is important that the Company and Customer be in agreement on the planned location of all service-related equipment before construction is started. This equipment includes, but may not be limited to; meter sockets, risers, pedestals, conduit and trench location, pull boxes, padmounted transformers, CT/connection cabinets, pole, lines and anchors.

The Customer is responsible to contact customer service to submit a Request for Service. Customer Service can be reached by calling: (800) 206 – 2300.

Failure to comply could result in time delays and/or additional cost to the Customer.

2.3 TYPE AND CHARACTER OF SERVICE

1. **It is essential that the customer consult the Company regarding the type of service which can be furnished at a particular location before proceeding with purchase of equipment or installation of wiring.**

2. The voltage and/or number of phases which will be supplied will depend on the type, size and location of the load, and existing Company facilities.

   a. The table below lists the standard service voltages that are available.

	SINGLE PHASE	THREE PHASE
Pole Mounted Transformer	120/240 Volts, 3-Wire Up to 167 KVA 120/208 Volts, 3-Wire (Limited Applications)	240/120 Volts, 4-Wire DELTA**Φ** Up to 75 KVA 208/120 Volts, 4-Wire WYE***** Up to 500 KVA 480/277 Volts, 4-Wire WYE***** Up to 500 KVA
Pad Mounted Transformer	120/240 Volts, 3-Wire Up to 167 KVA	208/120 Volts, 4-wire WYE***** Up to 1000 KVA 480/277 Volts, 4-Wire WYE***** Up to 2500 KVA

Note:

Φ *The Company **will not** provide a 240/120 volt, four-wire delta service when the surrounding area is served by an underground primary distribution system or service is required from a padmounted transformer. The maximum single position transformer size is 25 kVA.*

* *All wye services require a neutral conductor.*

   b. In some instances, three-phase service at the primary voltage of 7,200/12,470 volts Grd Y or 2,400/4,160 volts Grd Y may be provided. However, this service must be approved by the Company.

3. The manner in which single-phase loads are connected by the Customer is critical when **three-phase four-wire WYE** service is provided. All single-phase loads should be split evenly among the three phases. Connections made otherwise may result in an overload or single-phase condition with the possibility of damage to the Customer's three-phase equipment.

4. The manner in which single-phase loads are connected by the Customer is critical when **three-phase four-wire DELTA** service is provided. No single-phase loads should be connected to the power leg. Inappropriate connections of single phase equipment to the power leg may result in damage to the connected equipment. The Customer shall provide a load schedule detailing the three phase and single phase loads to be served.

5. **The Customer is responsible for providing the necessary equipment and devices to protect any three phase equipment from damage due to a single phasing condition that may occur on the Company's service.**

6. All single phase motors over 6.5 hp and all three phase motors over 15 hp must be approved in advance by the Company. If an adjustable speed drive or DC drive is used, the Customer shall notify the Company so that characteristics particular to the solid state motor control can be taken into account in all studies.

2.4 GENERAL REQUIREMENTS

1. The Customer's wiring and electrical equipment shall be safe, in conformance with the NEC and with all applicable federal, state, and local codes and ordinances.

2. The Main Disconnect ampacity determines the wire size used in the Service Riser as well as the wire size from the Meter Socket to the Main Disconnect.

3. All wiring installations must be inspected and approved by an authorized electrical inspector as required by governmental authority.

   The Company shall have the right to disconnect or refuse service to any installation which violates local, municipal, NEC or NESC regulations. The Company shall also have the right to disconnect or refuse service for installations that are hazardous to the public, or negatively impacts service to other Customers, or Company facilities.

4. The Customer's equipment (motors, welders, etc.) shall operate so as not to impose a voltage drop on the Company's primary system that will exceed the Company's flicker curve limitations. The Customer shall be responsible for the necessary modifications to the equipment to correct the problem.

5. For all 3 phase, 4 wire, wye services supplied by the Customer, a full rated neutral (Grounded Conductor) shall be provided unless the Customer provides documentation from a registered engineer allowing derating of the neutral (Grounded Conductor).

6. Before service can be connected, the 911 address must be displayed at the location.

2.5 ALTERATIONS AND ADDITIONS

1. **SERVICE CONNECTIONS, METERS, OR METERING EQUIPMENT SHALL NOT BE REMOVED OR RELOCATED EXCEPT BY EMPLOYEES OF THE COMPANY OR ITS AUTHORIZED AGENTS.**
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 at the time of application for service. Therefore, no additions of major load, or alterations of the Customer's installation should be made without first notifying the Company. Failure to provide such notification may affect the quality and reliability of the Customer's own service, as well as that of other Customers.
3. When alterations or repairs require the relocation or temporary removal of service drop wires, meters and metering equipment, the Customer shall make appropriate advance arrangements with the Company to perform the relocation or temporary removal. The new location must be approved by the Company before the Customer begins work. All alterations or repairs must meet the applicable codes that are in effect at the time work is done. When alterations or repairs have been satisfactorily completed by the Customer and the necessary inspection approvals obtained, the Company will make the connections to provide service.
4. **Since *serious injury or death* could result from a person coming in contact with an energized electrical circuit or equipment, neither the Customer nor the Customer's agents shall remove an energized meter from its socket. Meters are not designed to be a disconnecting device under load. Arcing, fire, explosion, etc. could occur with the possibility of burns, injury, or death as well as damage to adjacent or surrounding structures and equipment. The Customer will be held legally responsible for such injury, death, or damage if caused by the unauthorized breaking of the seals, tampering, or otherwise interfering with the Company's meter or other equipment of the Company installed on the Customer's premises. No one except authorized employees or agents of the Company will be allowed to make any repairs or adjustments to any meter or other equipment belonging to the Company. The Company will be responsible for disconnecting service and removing the meter prior to the Customer's repair or replacement of the Customer's meter socket.**

3.0 METERING

3.1 GROUNDING

1. GENERAL

Unless otherwise noted, the Customer shall supply and install a 5/8" x 8' ground rod with ground rod clamp outside of the building wall. It shall be installed in accordance with NEC 250.53 and be within two (2) feet of the structure at the meter socket location. If other grounding methods are used, all grounding systems must be bonded together as per NEC.

2. SELF – CONTAINED

When using self-contained meter sockets, the ground wire shall originate at the factory installed grounding connector in the meter socket and terminate at the ground rod clamp on the ground rod. The size of the ground wire shall be as specified in the applicable drawings.

3. CURRENT TRANSFORMER (CT)

When the metering installation requires the use of current transformers, a single ground rod may not be adequate. Consult the NEC for further information.

4. MINIMUM GROUND WIRE

For a 200 Amp service or less, refer to the tables in the applicable drawings. For a service larger than 200 Amp, consult the NEC.

3.2 METERING EQUIPMENT LOCATIONS

1. The metering equipment shall be located outdoors and approved by the Company.
2. Metering equipment shall be located where it is readily accessible to Company employees without special keys or entry requirements (public entry).
3. Metering accuracy is of utmost importance to the Company and its Customers. Therefore, any location where the environment could affect the accuracy of the meter will not be acceptable. These conditions could include, but are not limited to corrosion, vibration, dust, magnetic interference, etc.

4.0 INFORMATION APPLYING TO ALL SERVICES

1. There will only be one service voltage available at a location, and only one point of delivery for each building, except as allowed by the NEC and approved by the Company. If multiple service points are approved by the Company, the service points shall be marked as per NEC 230.2.E. Engraved plaques shall be attached with screws, bolts, or rivets. See Figure 66 for plaque details.
2. *An emergency disconnect shall be provided and labeled as required by and in accordance with NEC 230.85*
3. **The point of delivery shall be designated by the Company prior to beginning construction.**
4. **All utilities must be notified, and all underground facilities located and marked prior to any excavation. This shall include any Customer owned facilities.**
5. All service entrance facilities, including meter sockets, shall be located in an exposed and readily accessible area.
6. **Copper conductors are highly recommended**. Where allowed by local authority, aluminum conductors may be installed per NEC requirement; provided the meter socket is approved for use with aluminum conductors, and a corrosion inhibiting compound recommended by the cable manufacturer is properly applied to the meter socket terminals. **Conductor ampacities used in the wire tables are based on 75 degrees C as per NEC 310.16 as modified by NEC 310.15.**
7. When an existing service entrance using copper conductors is replaced by a service entrance using aluminum conductors, the existing meter socket, if not marked AL-CU, must be replaced with one approved for use with aluminum conductors.
8. Service entrance conductors between the Company's point of delivery and the self–contained metering point, or the first disconnect shall be enclosed in conduit. **Troughs and electrical gutters are not allowed on either side of disconnects on the outside of the building.**
9. Unless otherwise noted, the conduit is to be galvanized rigid steel. **Water pipes, sewer pipes and/or fittings are NOT acceptable.** Unless otherwise stated all sweep ells shall be rigid steel. The minimum sweep radius according to diameter will be as follows; 4" – 16", 3" – 13", and 2" – 9.5".
10. The neutral conductors of all services shall be grounded at the metering point as shown in the applicable drawings.
11. Conductor marking
    a. All neutral conductors shall be clearly marked with white tape at the point of delivery and at the meter location.
    b. The power leg of each 240/120 volt, three-phase, four-wire delta service shall be clearly marked with orange tape at the point of delivery and at the meter location.
12. Phase Rotation
    a. On three-phase installations to ensure proper equipment operation, the Customer is responsible for verifying phase rotation at the time-of-service connection.
13. **Bypass levers are allowed on 320 Amp meter sockets only. Plunger style bypass mechanisms are not allowed.**

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5.0 TEMPORARY SERVICES

1. The Company must be provided with detailed plans of each installation where temporary service is to be supplied. Installations requiring special service, meter, or other work for construction purposes, exhibits of short duration, etc., **will be made at the expense of the Customer**.
2. Temporary services over 300 feet are not available. **The Company will not be responsible for damage done to equipment with temporary services.**
3. **Temporary service equipment shall not be installed on trees or the Company's Poles.**
4. Temporary installation of service entrance, other wiring, and meters shall meet the same requirements as permanent installations, including inspection and approval.
5. **Temporary single-phase service for construction purposes may be provided from either overhead or underground facilities. Arrangements for temporary construction service are shown in Figures 4, 5, and 6.**
6. Prior to connection of permanent service, all temporary service drops, or temporary construction wires or cables shall be removed from the finished structure's permanent distribution panels.
7. The typical temporary service is 120/240v, single phase. Single phase temporary service requiring over 100 amps capacity and three phase temporary may be available. Contact the Company for more details, additional costs may apply.
8. **All temporary installations shall be safe and in good working condition as judged by a Company field representative before the service will be connected.**
9. Temporary service will be available at the site as long as construction is in progress or is otherwise limited by the Local Authority. Once the project is substantially completed the temporary service shall be disconnected.
10. Liberty is not required to provide electric service to temporary Customers at locations that require the extension of Company lines unless the full cost of erection and removal, including indirect costs of construction, of the extension be contributed by the Customer.

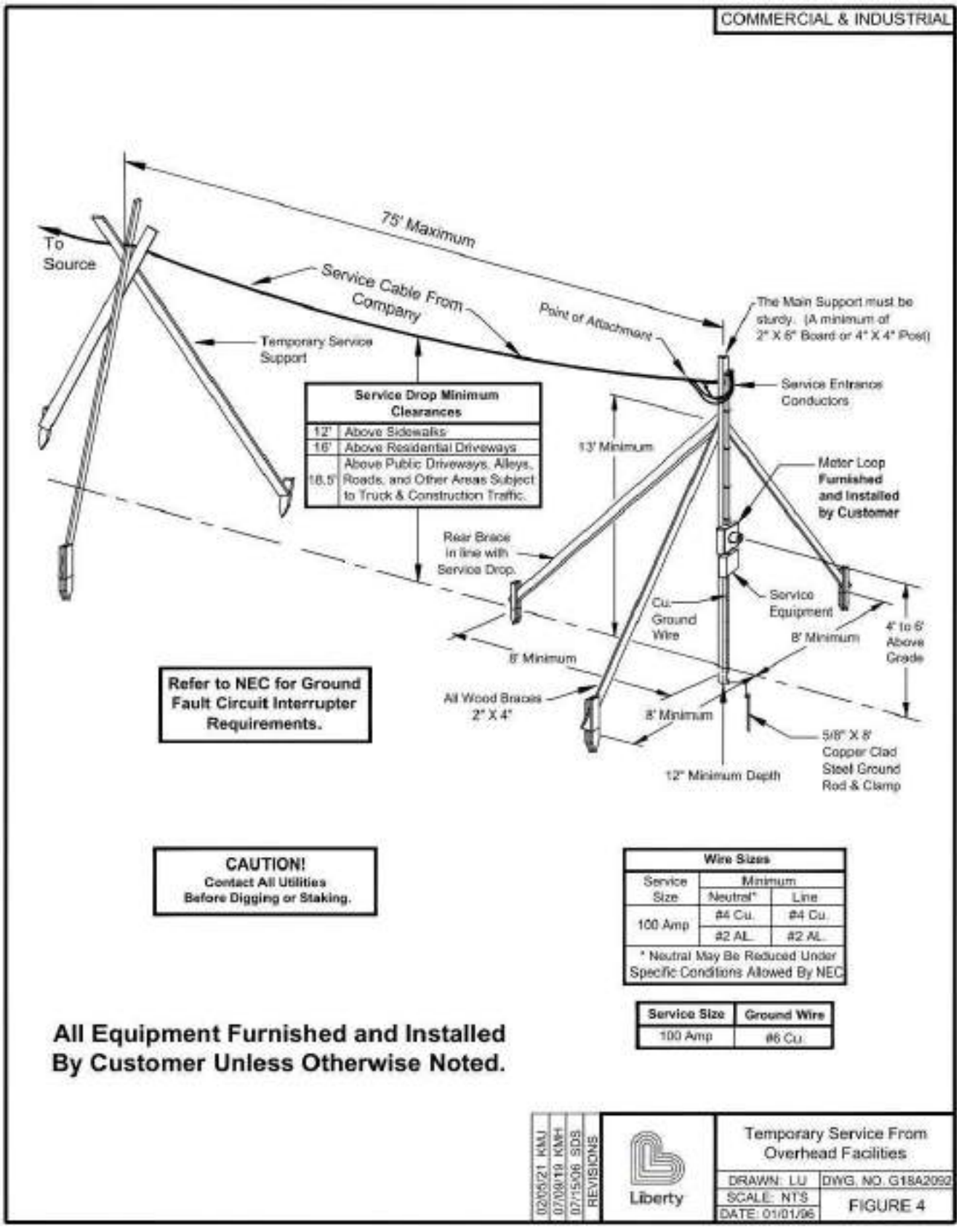


Figure 4: Temporary Service from Overhead Facilities

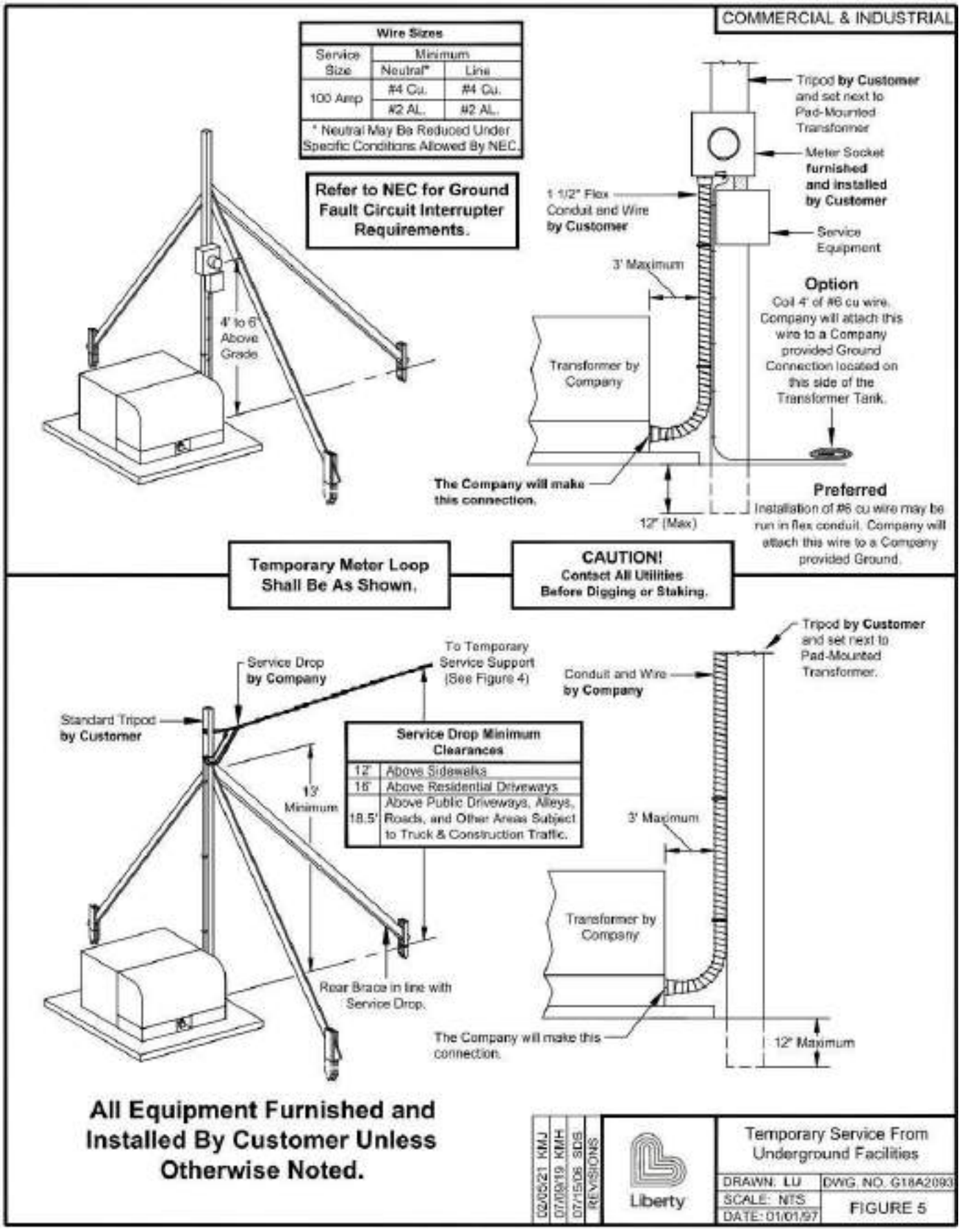


Figure 5: Temporary Service from Underground Facilities

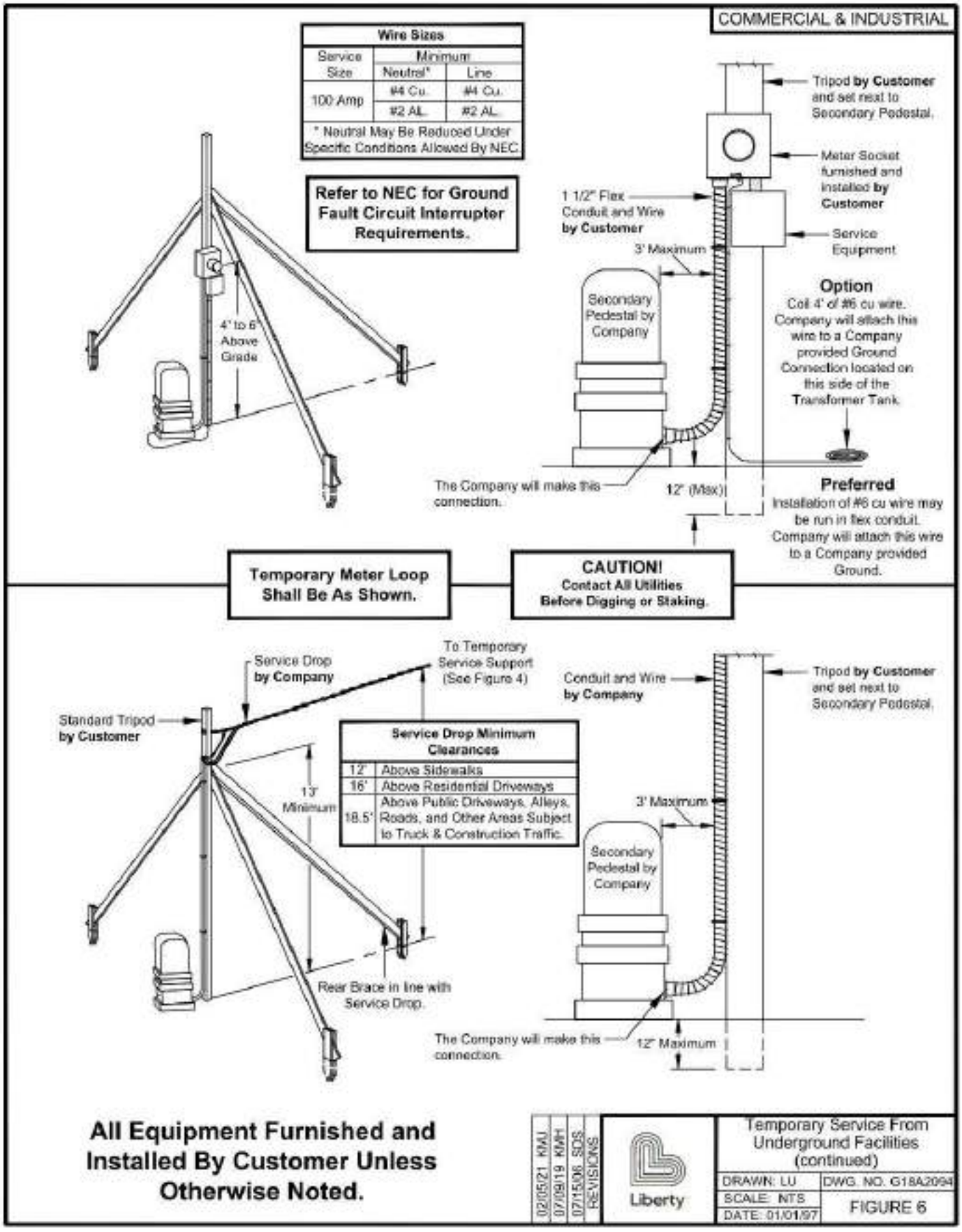


Figure 6: Temporary Service from Underground Facilities (Continued)

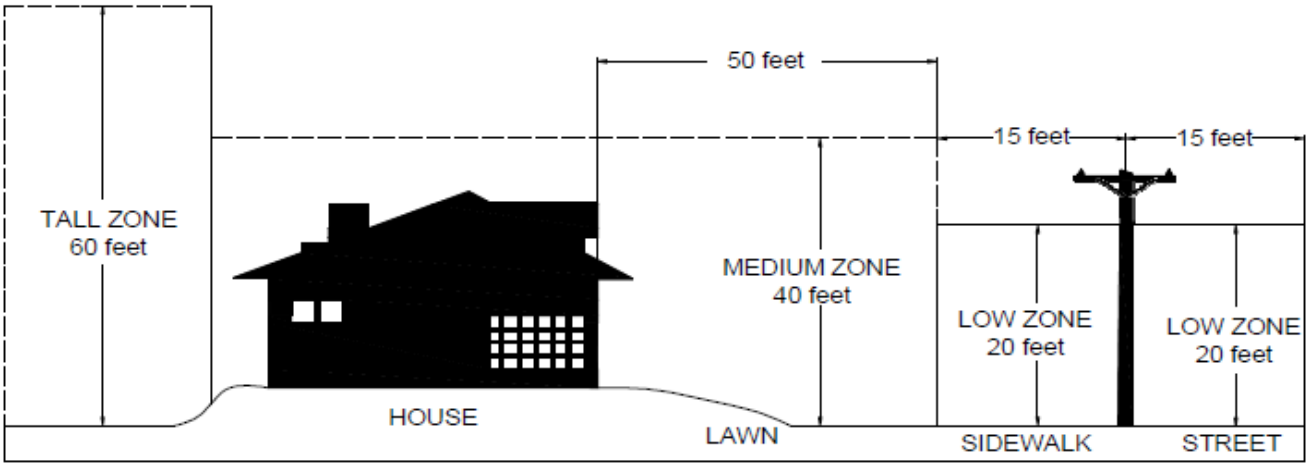
RESERVED FOR FUTURE USE

Figure 7: (Future Use)

6.0 OVERHEAD SERVICES

6.1 GENERAL INFORMATION

1. The Customer shall provide an insulated Point of Attachment within 24" of the weather-head which is capable of withstanding a continuous force of 200 lbs. in the direction of pull of the Service Drop. The weatherhead shall be above the point of attachment, where practical.
2. A minimum of 24 inches of service entrance conductor shall be provided by the Customer extended from a single weatherhead for connection to the service drop. **If the installation requires more than one service riser, it is the responsibility of the Customer to provide enough conductor so that a single connection point per phase can be made at one common location.**
3. The Customer shall provide a clear and unobstructed path for the Company's service drop to the attachment point. The Customer shall request the Company to designate the location of the point of delivery for each service location before construction is started. This shall be done to increase the reliability of electric service. Trees growing into or near power lines are one of the most common causes of power outages. Help avoid the need for future trimming by planting the right tree in the right place. For a list of appropriate trees for the TALL ZONE, MEDIUM ZONE AND LOW ZONE pictured below, please contact your Liberty representative.



4. The point of attachment of the service drop conductors shall be located by the Customer so as to allow not less than the minimum clearances for the service drop as shown in the table below. Greater clearances may be required by local authorities. **In no case shall the attachment height be lower than 12' above final grade.**

MINIMUM CLEARANCES OF SERVICE DROP CABLES[1][2]	
Above roads, streets, alleys, parking lots, commercial and industrial driveways subject to truck traffic	18.5 feet
Above residential driveways	16 feet
Roofs, decks, and loading ramps accessible to vehicles but not subject to truck traffic	16 feet
Above spaces and ways subject to pedestrians or restricted traffic only	12 feet
Over or under roofs, decks, porches, or balconies readily accessible to persons[3]	10 feet
Over roofs or projections not readily accessible to persons[4]	8.5 feet
Horizontal to any walls, projections, porches, balconies, ladders, stairs, fire escapes, or other similarly attached structures	5 feet
Horizontal from directly below conductor to edge of swimming pool or fixed pool related structure (Applies to above or in ground swimming pools)	10 feet
From service conductors not enclosed in conduit to windows designed to be opened or doors [5]	3 feet

(1) Values in this table only apply to cables between 0-750V meeting definitions of NESC Rule 230C2 or 230C3 at final sag conditions. Consult the Company for all situations not covered in this table.

(2) The point of attachment shall normally be 2' - 3' higher than these minimum required clearances to allow for sag of the service cable.

(3) Roofs with solar panel installations shall be considered accessible to persons for the purposes of this publication

(4) Consult the Company before following any exceptions listed in NEC Rule 230.24

*(5) Applies to conductors at attachment point. Conductors meeting the definition of NESC Rule 230C3 run above the top level of a window shall be permitted to be less than the 3 feet requirement. Does not apply to windows **not** designed to be opened.*

5. Street access driveways, where vehicular traffic may pass under service conductors, must maintain the minimum clearances from ground to service conductors required for roads, streets, alleys, and parking lots in the above table. For further details and items not covered above, contact the Company.

6. The point of delivery will be at the weatherhead connections.

6.2 100 AMP, 200 AMP, AND 320 AMP SINGLE PHASE OVERHEAD SERVICES

A. General Notes:

1. Service entrance conductors, 5/8" x 8' copper clad steel ground rod, ground rod clamp, ground wire, conduit, conduit straps, weatherhead, lock nuts, bushings, meter socket, meter socket hub, service drop attachment device, and miscellaneous mounting hard- ware furnished and installed by the Customer.
2. Meter, service connectors, and service drop furnished and installed by Company.
3. The meter socket should be “readily accessible” (see definitions). The Company requires a level and unobstructed workspace of 78 inches tall, 18 inches on either side and 48 inches in front of the meter socket. Prior approval is required for placement of the meter socket in alleyways or areas where it may be subject to damage.
4. The 100 Amp, 200 Amp and 320 Amp meter sockets shall meet the following specifications:
   a. The latest revision of U.L. 414 and ANSI C12.7 Standards.
   b. NEMA 3R compliant enclosure
   c. Must be U.L. listed.
   d. Must have grounding connector for triplex.
   e. Lug size – 2/0 minimum.
   f. On 120/208v services, the customer must provide the meter socket with 5th lug installed in the 9 o’clock position.
   g. **This is not a complete list of criteria for acceptance. See Appendix A for list of approved meter sockets.**
5. Installation requiring a steel service mast shall be installed by the Customer as specified in Figure 9.

B. Mounting:

1. Meter socket, ground wire, and conduit shall be surface mounted and securely fastened to the structure. The meter socket shall be installed in a level and plumb position. **Flush mounted or recessed metering equipment and service riser conduit embedded in a wall will not be permitted.**
2. Where the exterior wall is other than brick or concrete blocks, a supporting frame shall be installed behind the exterior wall to provide a solid mounting surface for the meter socket.
3. Meter sockets, metering cabinets, and conduit straps shall be installed with the following:
   a. Lead anchors or double helix concrete screws shall be used with brick or solid concrete surfaces.
   b. Toggle bolts shall be used with other masonry siding.
   c. Wood screws shall be used with solid wood surfaces.
   d. All mounting hardware shall be minimum #12(1/4”) corrosion resistant screws.
   e. A minimum of 4 fasteners shall be used to install any socket or cabinet unless specifically stated otherwise.
4. An intersystem bonding termination bar shall be installed in accordance with NEC 250.94 to facilitate the connection of other utility’s ground to a common ground. The location of this device shall be located directly below the meter socket or meter combination socket.
   a. See Appendix A for list of approved intersystem bonding termination bars.

C. Connections:

1. Do not score line or load wire when removing insulation.
2. The Customer shall use wire brush or sandpaper to clean all conductors, apply a non-grit type inhibitor and tighten to manufacturer's specifications.

D. Conductor Marking:

All neutral conductors shall be clearly marked with white tape at the point of delivery and at the meter socket.

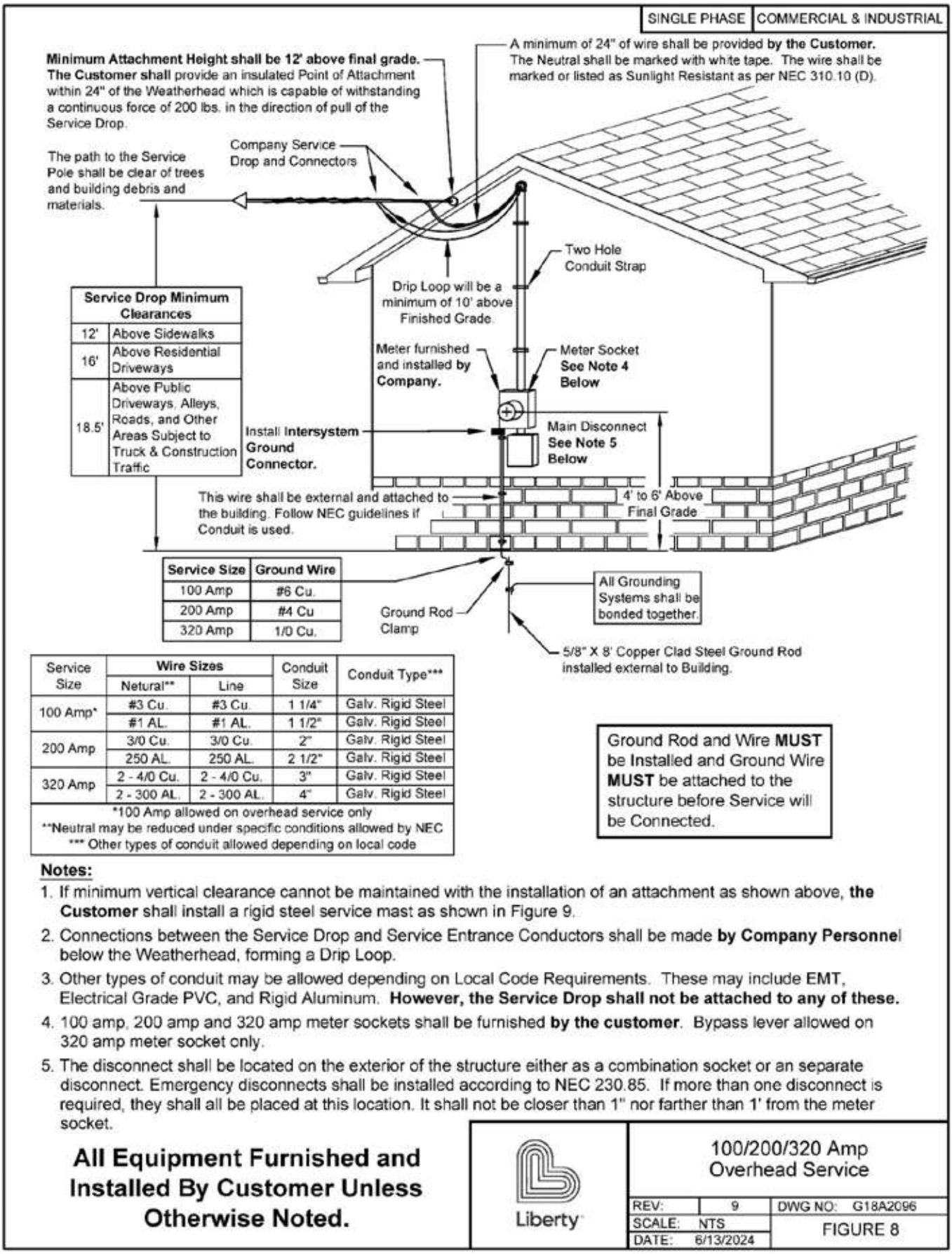


Figure 8: 100/200/320 Amp Overhead Service

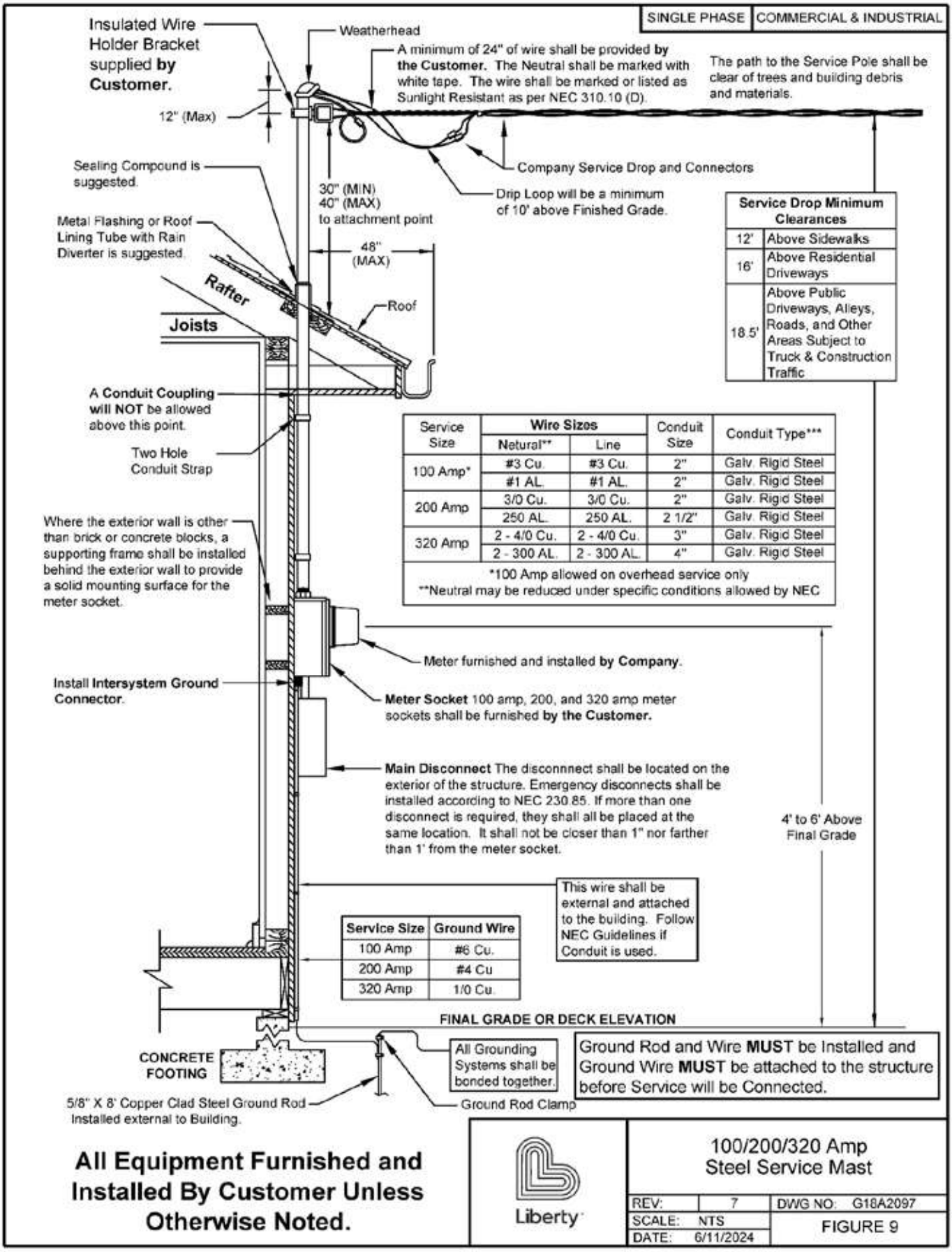


Figure 9: 100/200/320 Amp Steel Service Mast

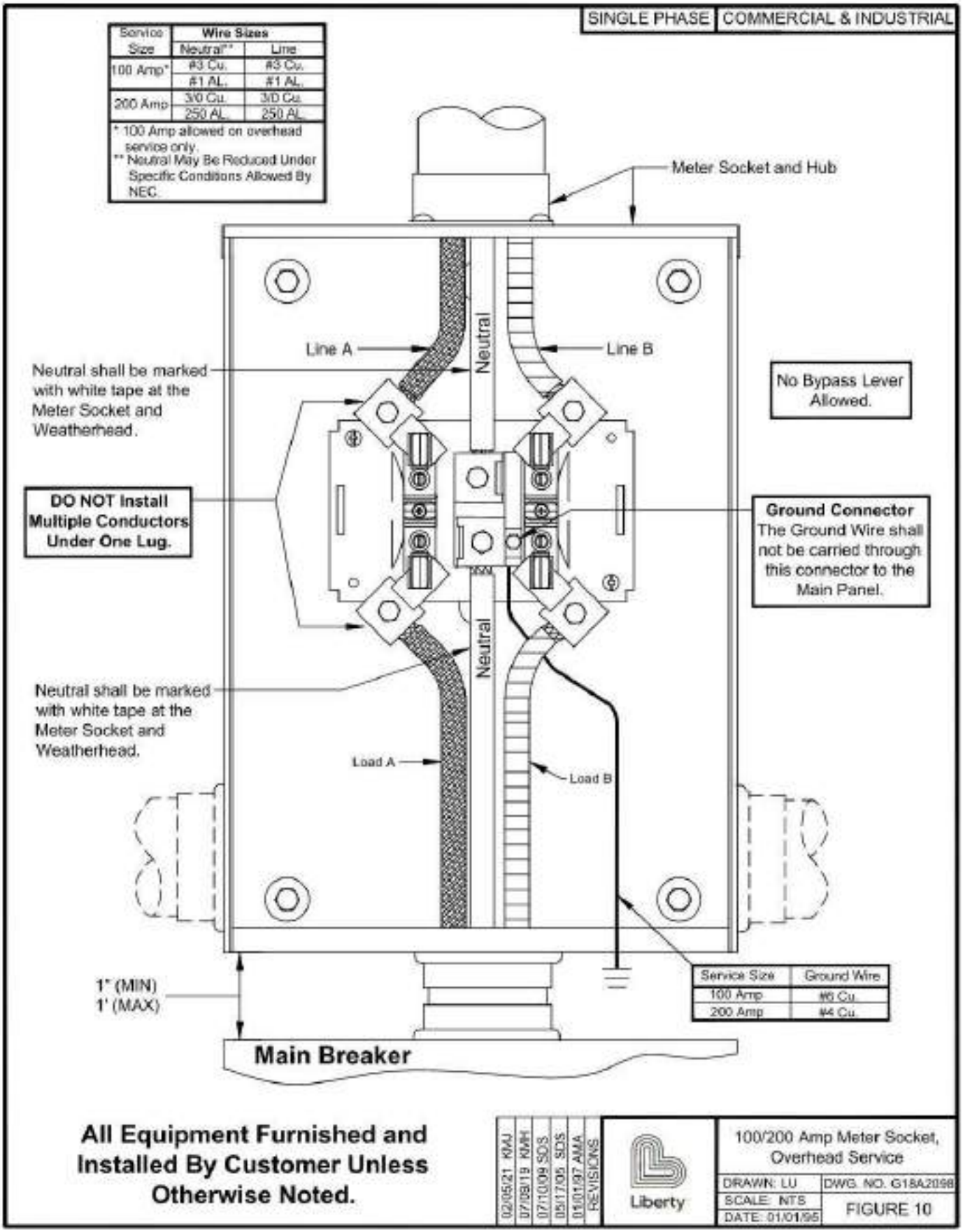


Figure 10: 100/200 Amp Meter Socket, Overhead Service

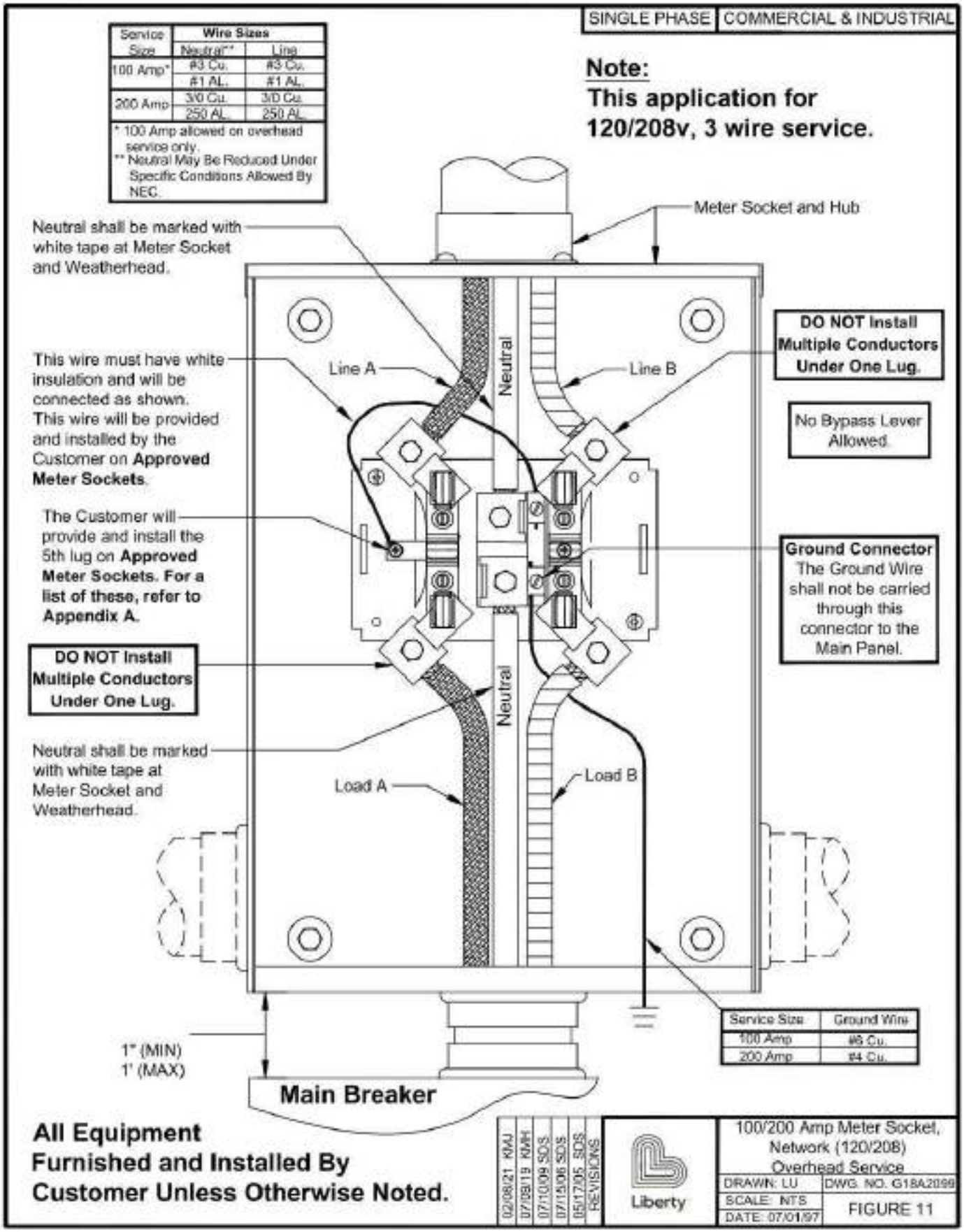


Figure 11: 100/200 Amp Meter Socket, Network (120/208) Overhead Service

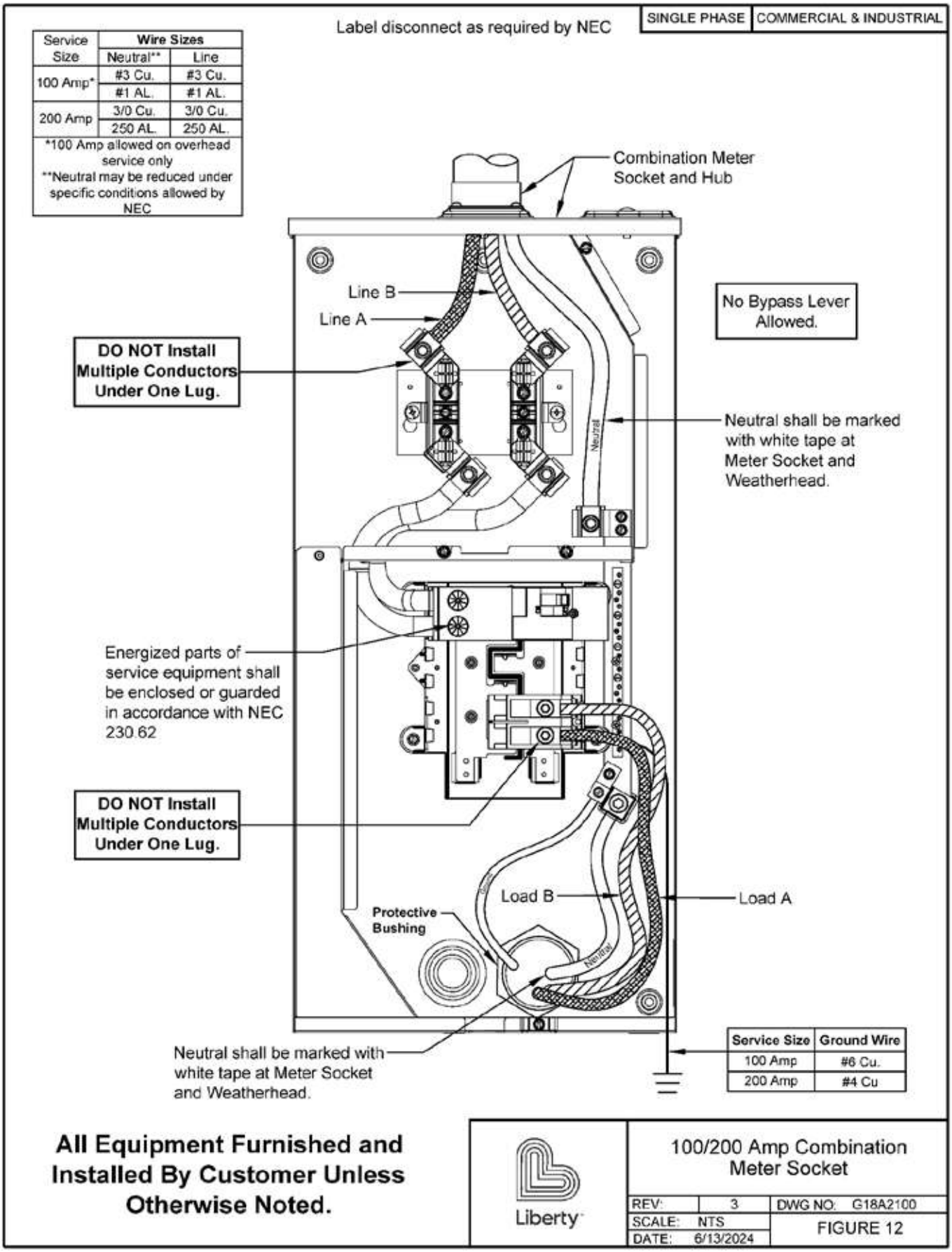


Figure 12: 100/200 Amp Combination Meter Socket

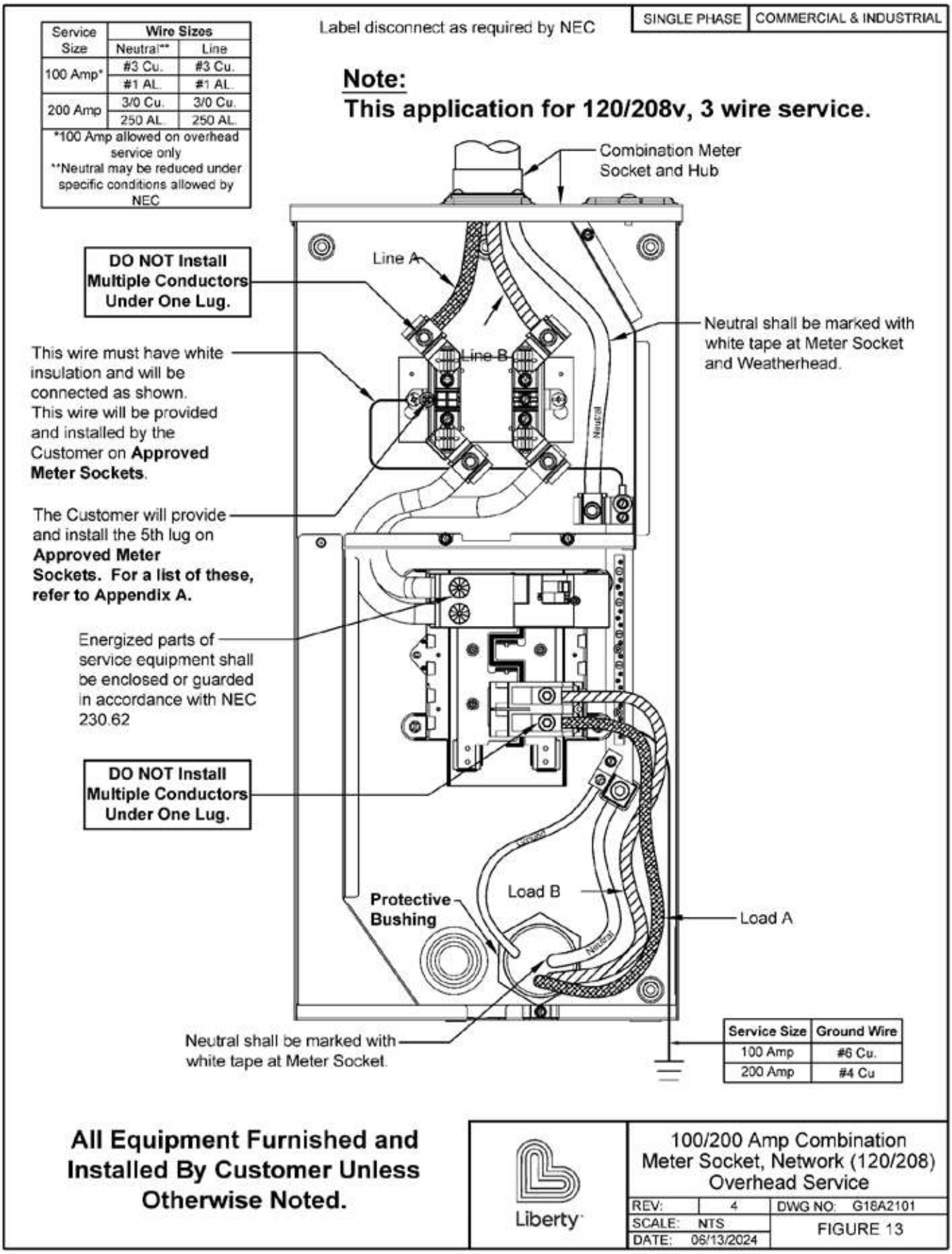


Figure 13: 100/200 Amp Combination Meter Socket, Network (120/208) Overhead Service

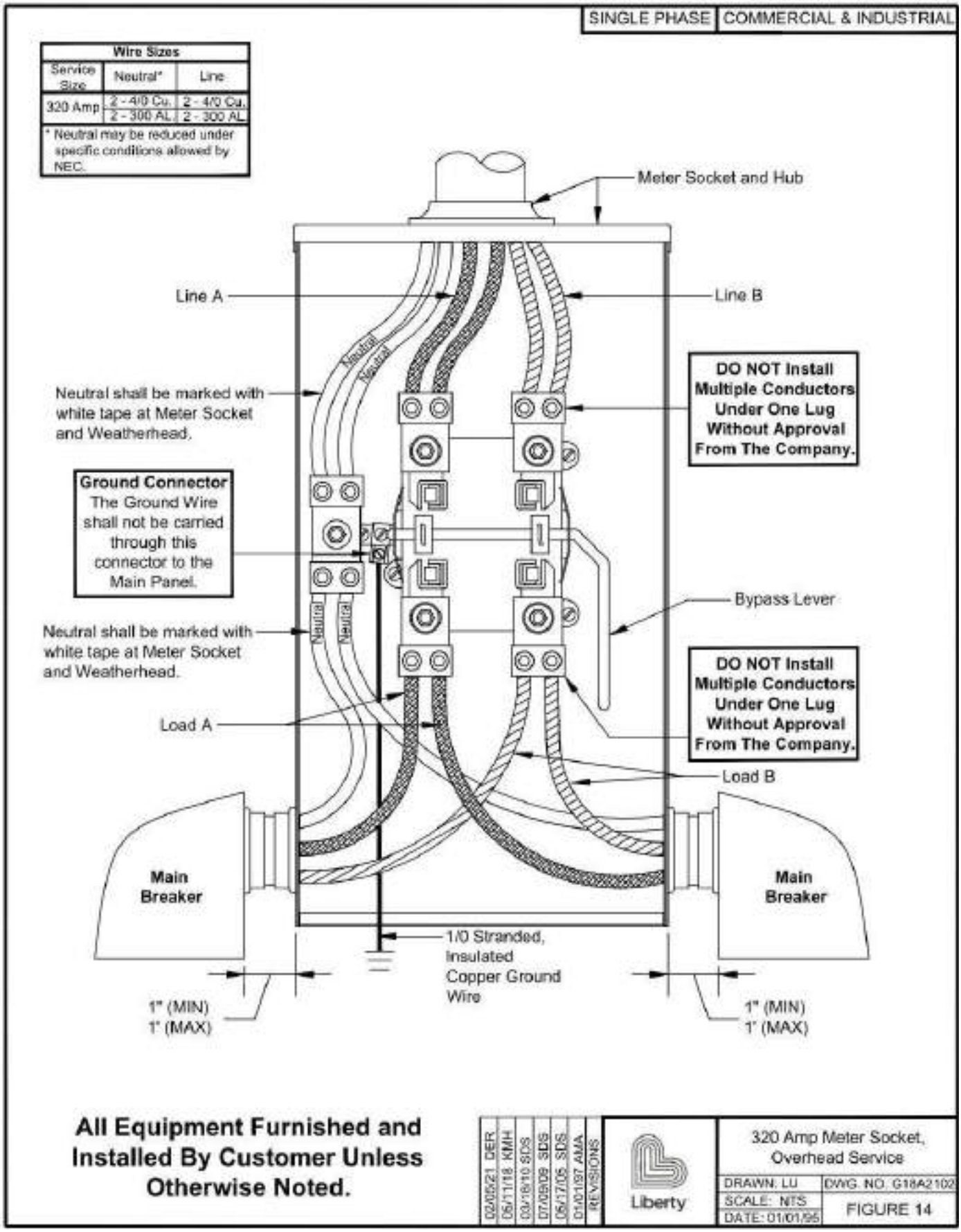


Figure 14: 320 Amp Meter Socket, Overhead Service

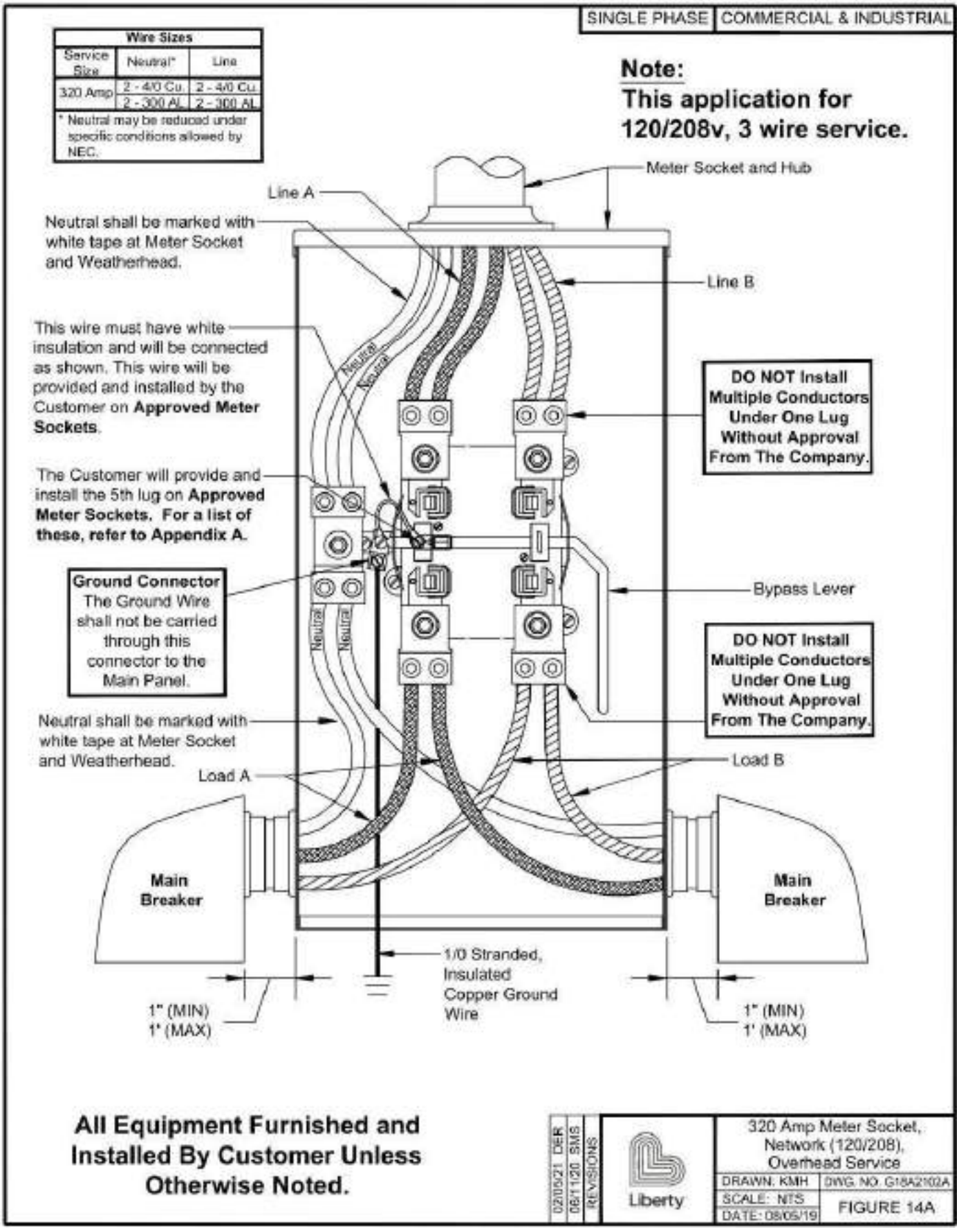


Figure 14A: 320 Amp Meter Socket, Network (120/208), Overhead Service

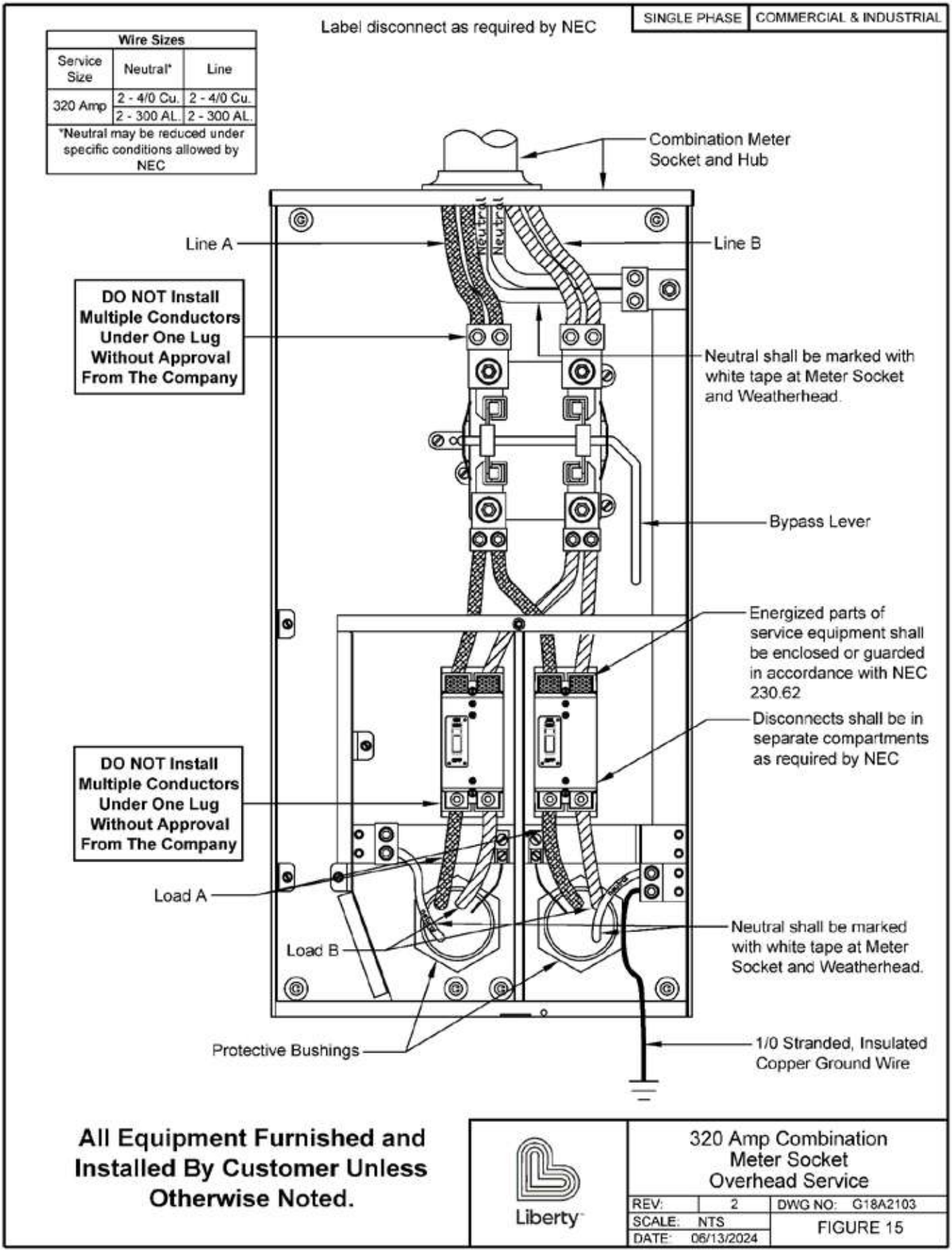


Figure 15: 320 Amp Combination Meter Socket, Overhead Service

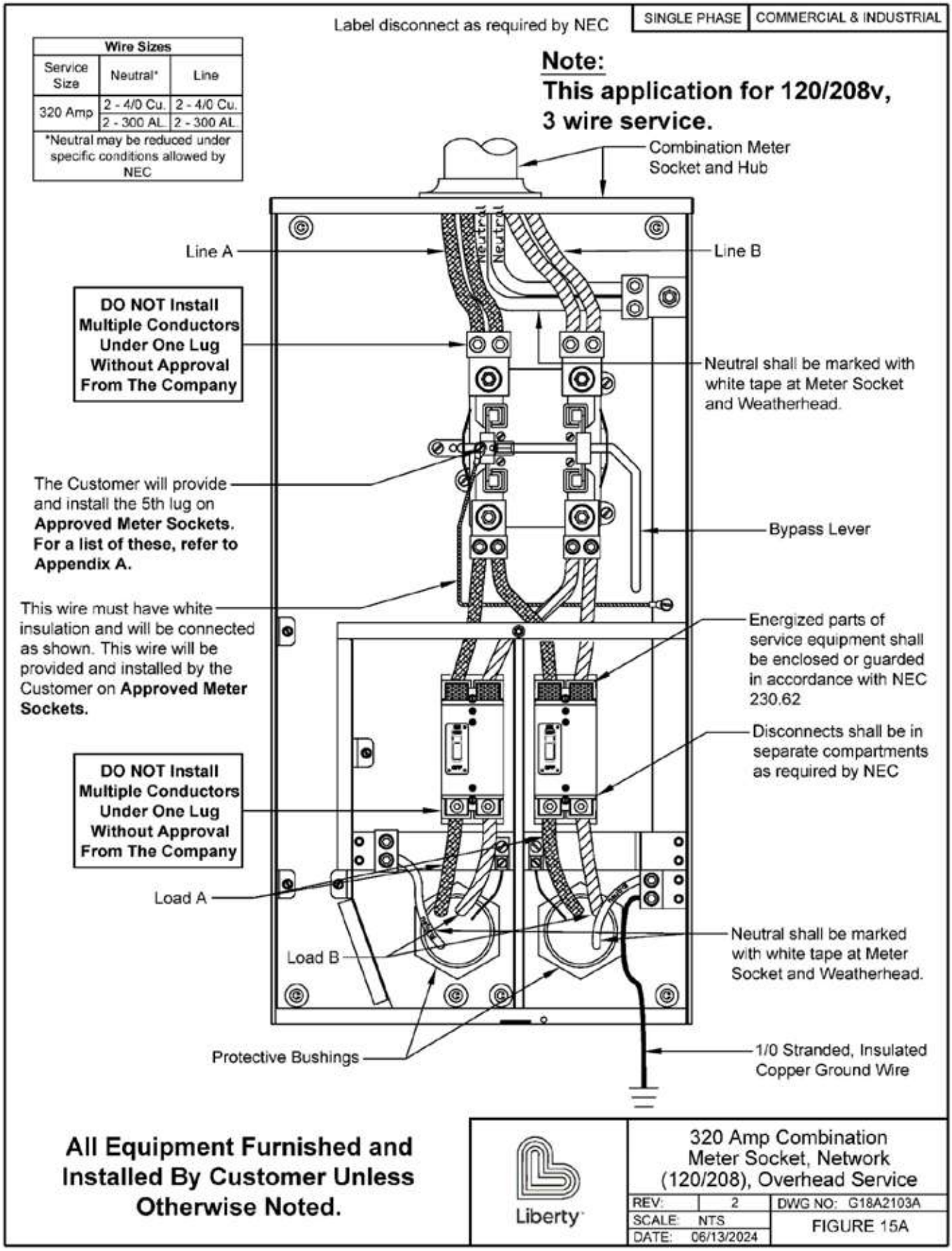


Figure 15A: 320 Amp Meter Socket, Network (120/208), Overhead Service

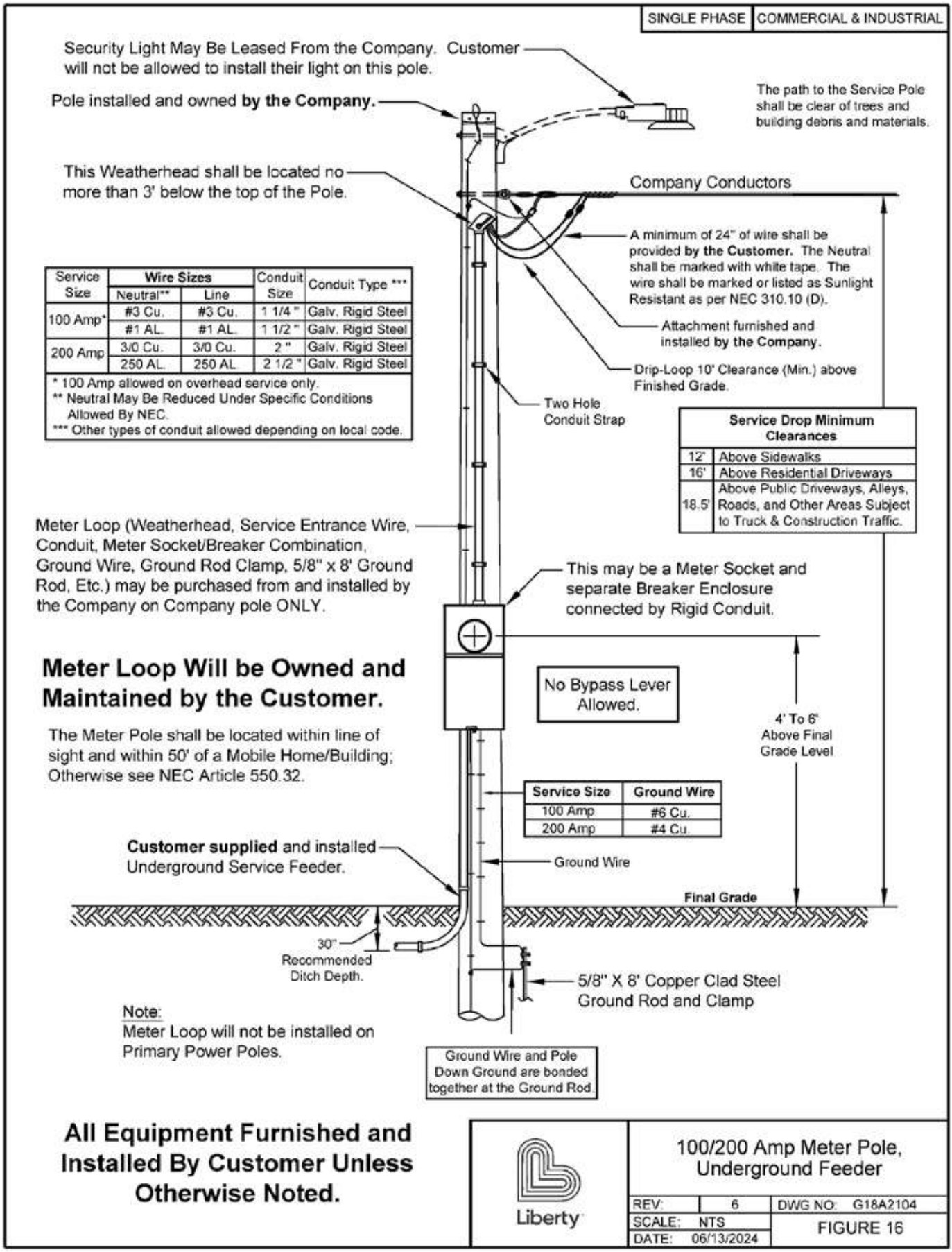


Figure 16: 100/200 Amp Meter Pole, Underground Feeder

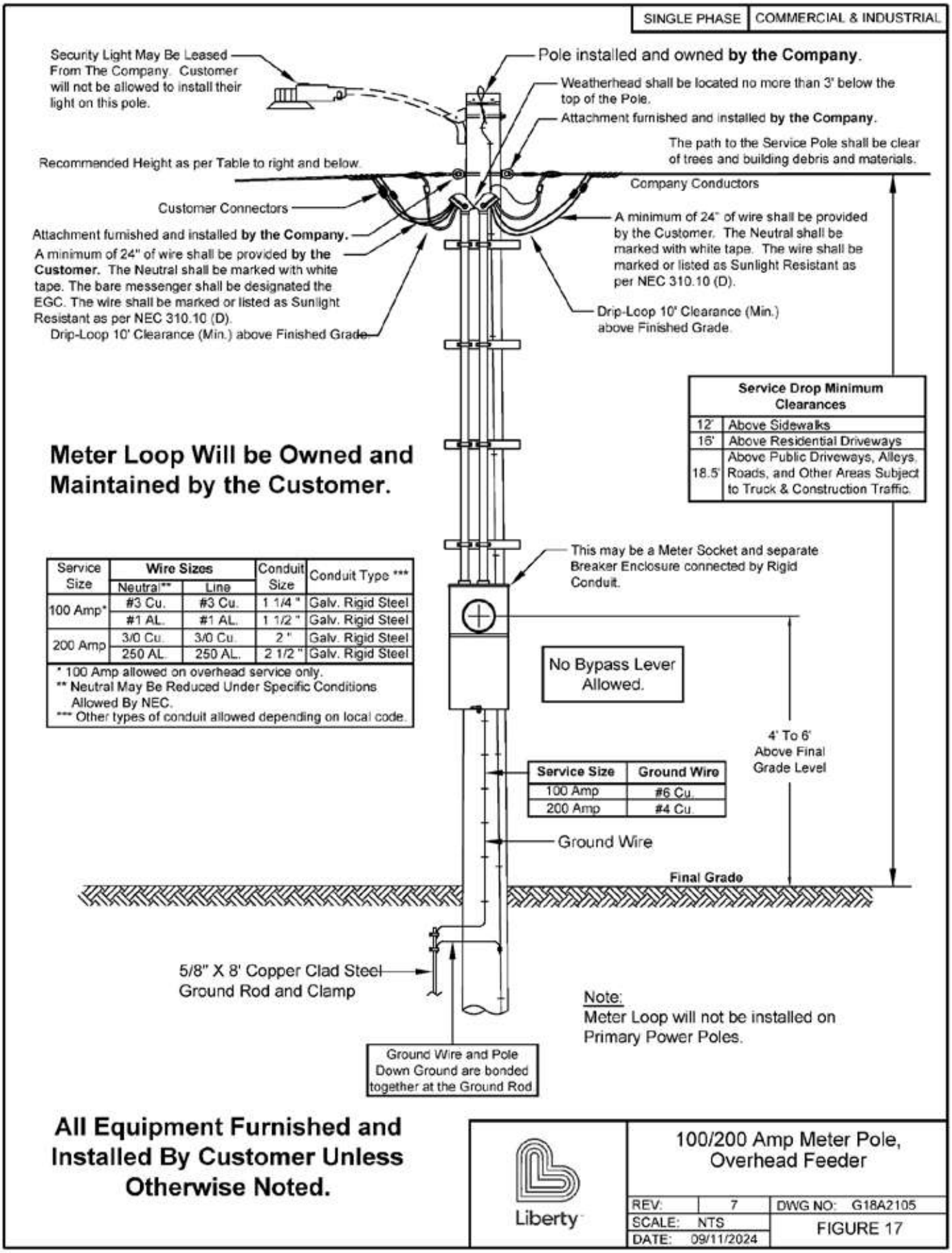


Figure 17: 100/200 Amp Meter Pole, Overhead Feeder

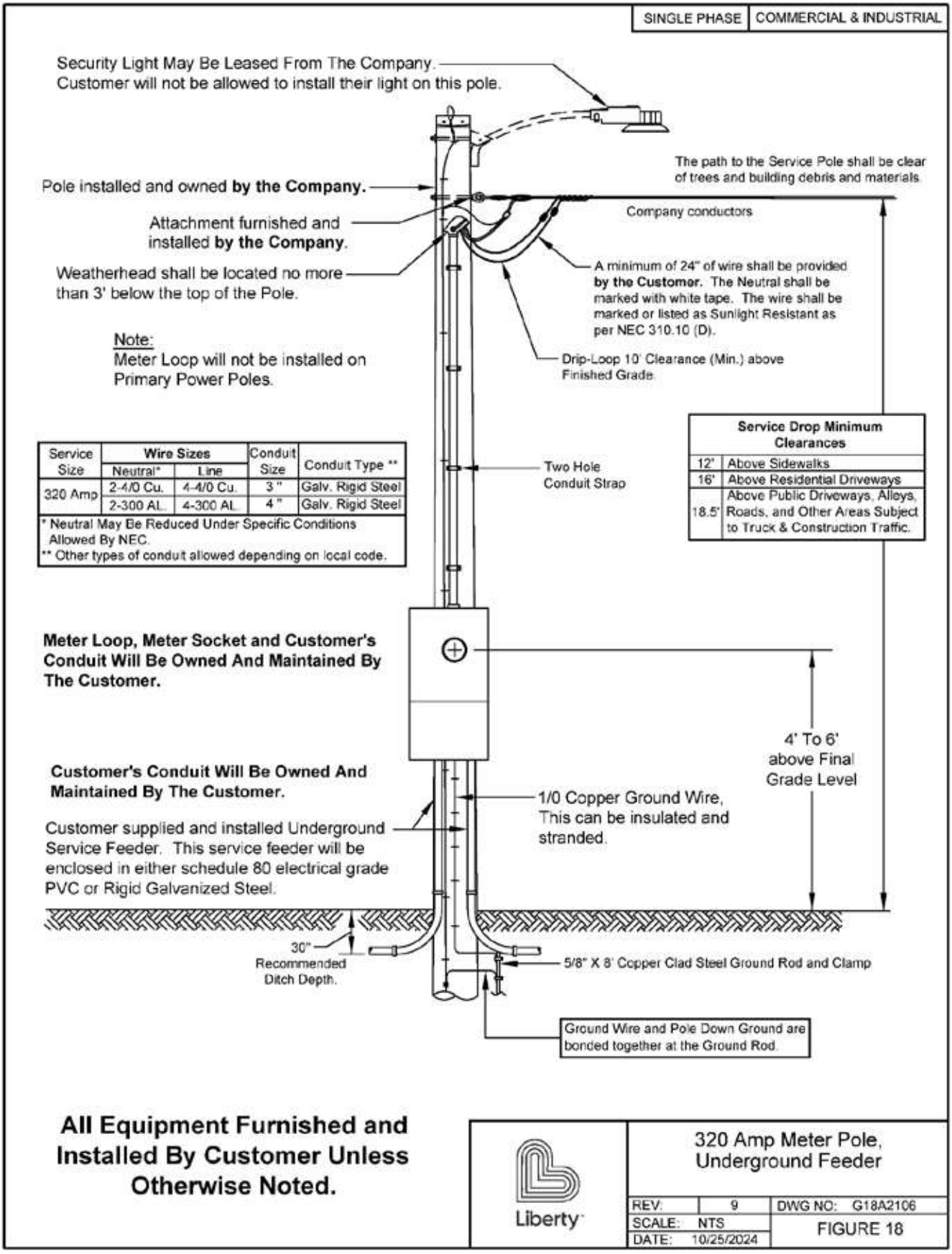


Figure 18: 320 Amp Meter Pole, Underground Feeder

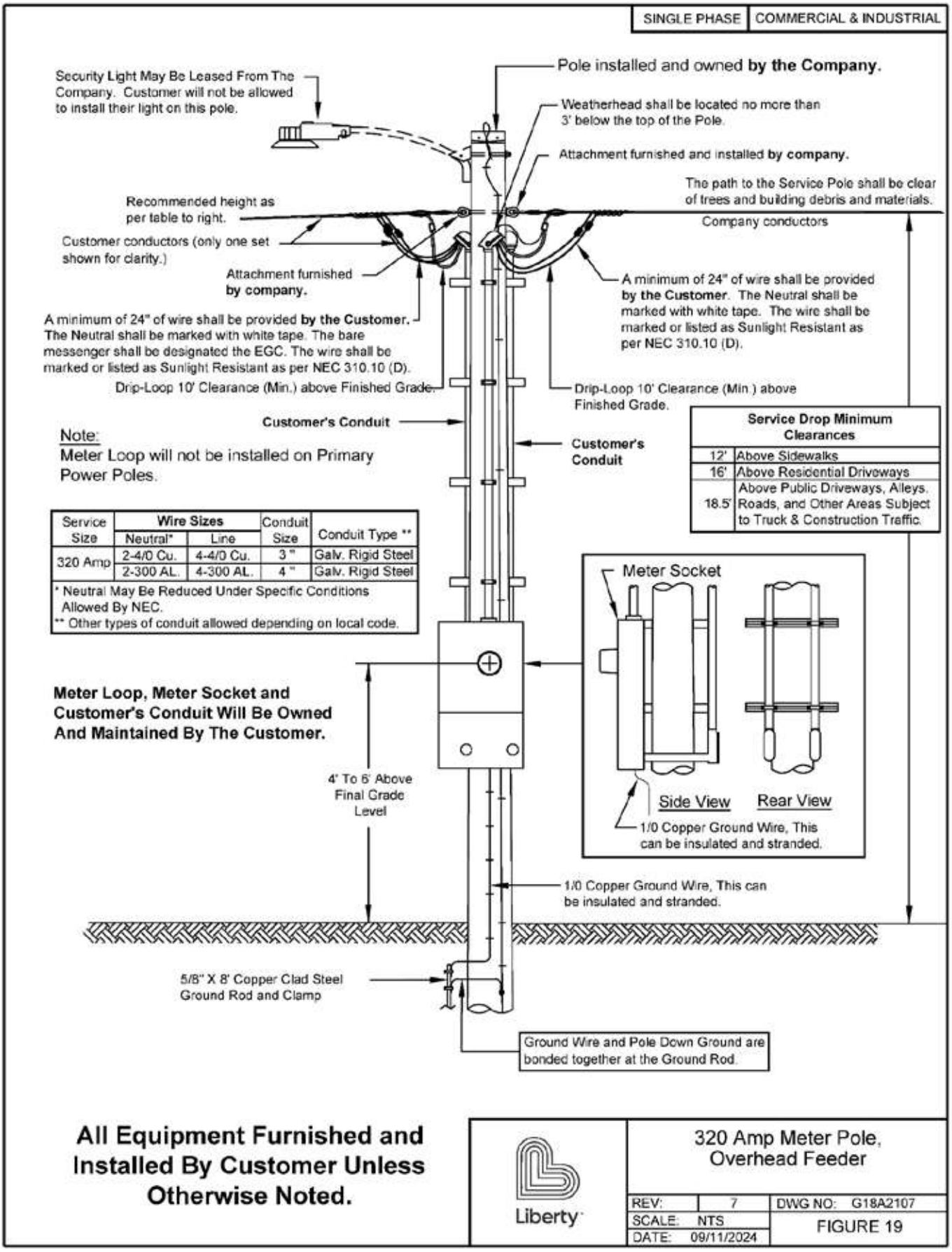


Figure 19: 320 Amp Meter Pole, Overhead Feeder

6.3 400 AMP TO 800 AMP CT METERING, SINGLE PHASE OVERHEAD SERVICE

A. General Notes:

1. This arrangement may be utilized for services equal and above 400 amps and less than or equal to 800 amps.
2. The disconnection method may be composed of multiple disconnects to make up the full 800-amp capacity of the service as long as there are not more than 6. If one disconnect is used and it is greater than 400 amps, it may be located on the interior of the building unless the authority having jurisdiction dictates otherwise. Disconnects of 400 amps and below shall be located on the exterior of the building.

   Please note that in all cases, the disconnects making up this service will be at the same location and are required to be located in separate compartments or enclosures.

3. Service drop and meter furnished and installed by the Company.
4. Current transformers (CT) furnished by the Company and may be issued to Customer for installation or installed by Company employees.
5. Meter socket shall be purchased from the Company and installed by Customer.
6. One inch (1") conduit and weatherhead shall be furnished and installed by Customer.
7. Metering control cable shall be furnished and installed by the Company.
8. The meter socket should be “readily accessible” (see definitions). The Company requires a level and unobstructed workspace of 78 inches tall, 18 inches on either side, and 48 inches in front of the meter socket. Prior approval is required for placement of the meter socket in alleyways or areas where it may be subject to damage.
9. **The length of service drop over the roof shall not exceed four (4) feet.**

B. Mounting:

1. Meter socket, ground wire, and conduit shall be surface mounted and securely fastened to the structure. The meter socket shall be installed in a level and plumb position. **Flush mounted or recessed metering equipment and service riser conduit embedded in a wall will not be permitted.**
2. Where the exterior wall is other than brick or concrete blocks, a supporting frame shall be installed behind the exterior wall to provide a solid mounting surface for the meter socket.
3. Meter sockets, metering cabinets, and conduit straps shall be installed with the following:
   a. Lead anchors or double helix concrete screws shall be used with brick or solid concrete surfaces.
   b. Toggle bolts shall be used with other masonry siding.
   c. Wood screws shall be used with solid wood surfaces.
   d. All mounting hardware shall be minimum #12(1/4”) corrosion resistant screws.
   e. A minimum of 4 fasteners shall be used to install any socket or cabinet unless specifically stated otherwise.
4. An intersystem bonding termination bar shall be installed in accordance with NEC 250.94 to facilitate the connection of other utility’s ground to a common ground. The location of this device shall be located directly below the meter socket or meter combination socket.

   a. See Appendix A for list of approved intersystem bonding termination bars.

C. Connections:

All connections shall be made by the Company.

D. Conductor Marking:

All neutral conductors shall be clearly marked with white tape at the point of delivery.

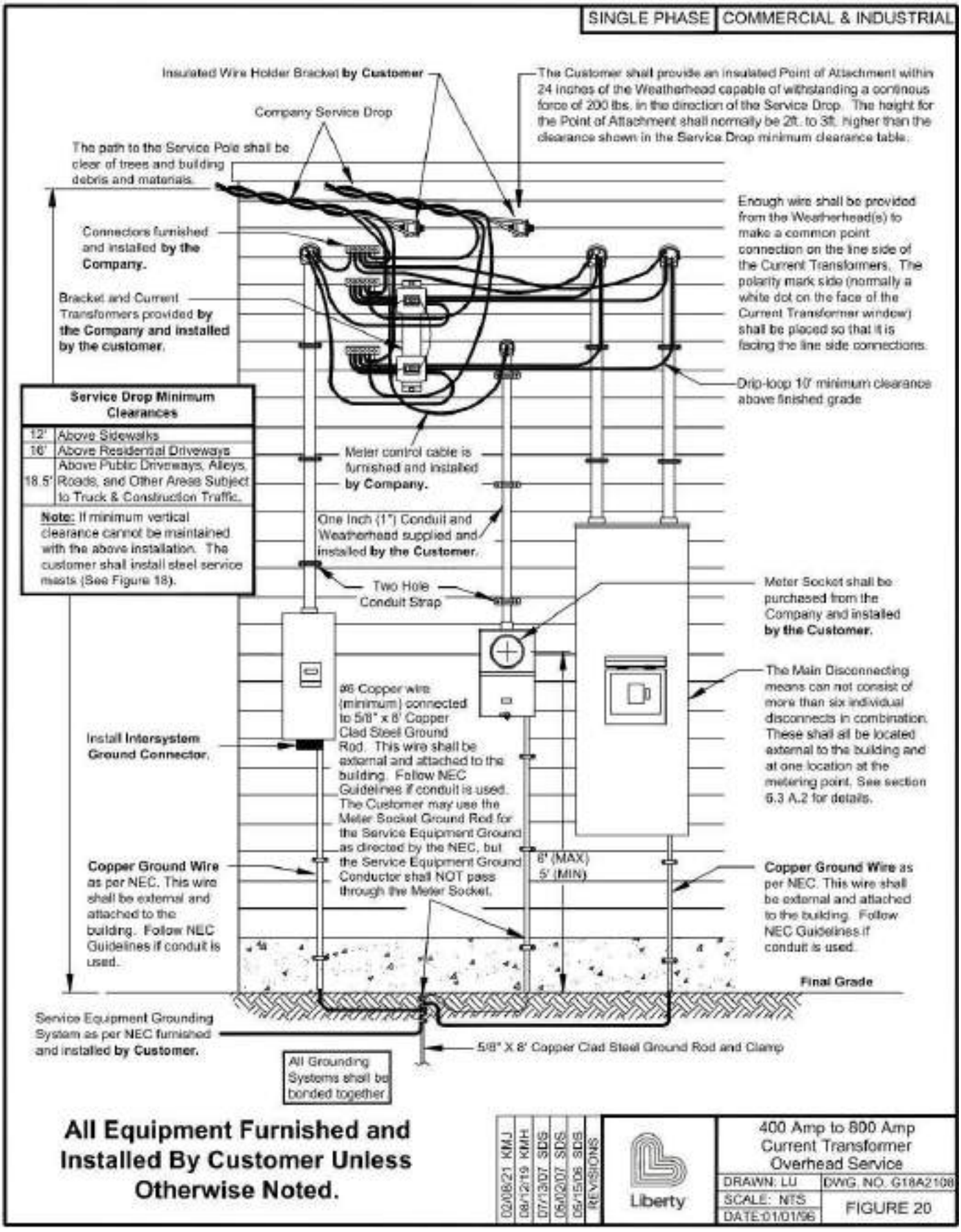


Figure 20: 400 Amp to 800 Amp Current Transformer Overhead Service

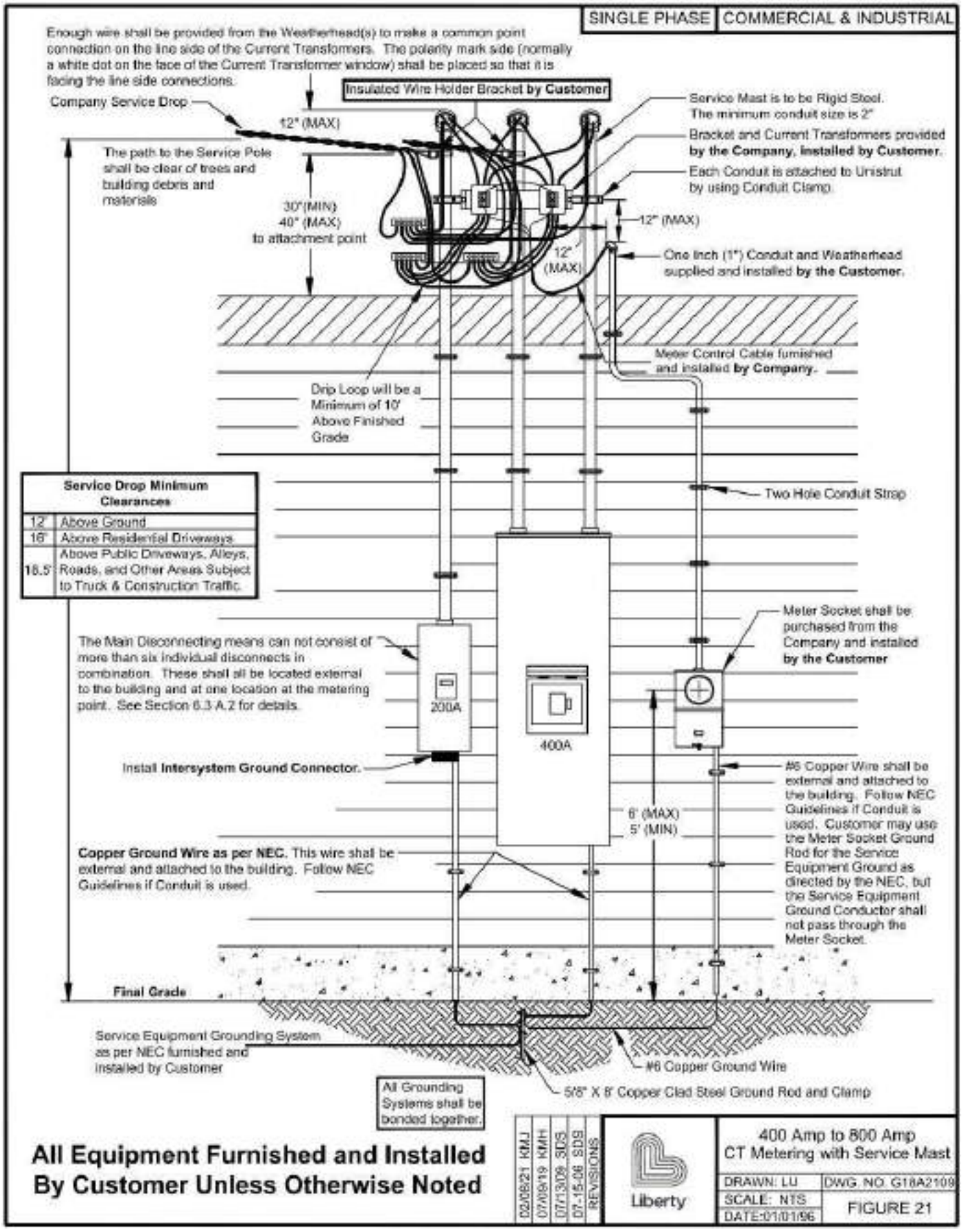


Figure 21: 400 Amp to 800 Amp CT Metering with Service Mast

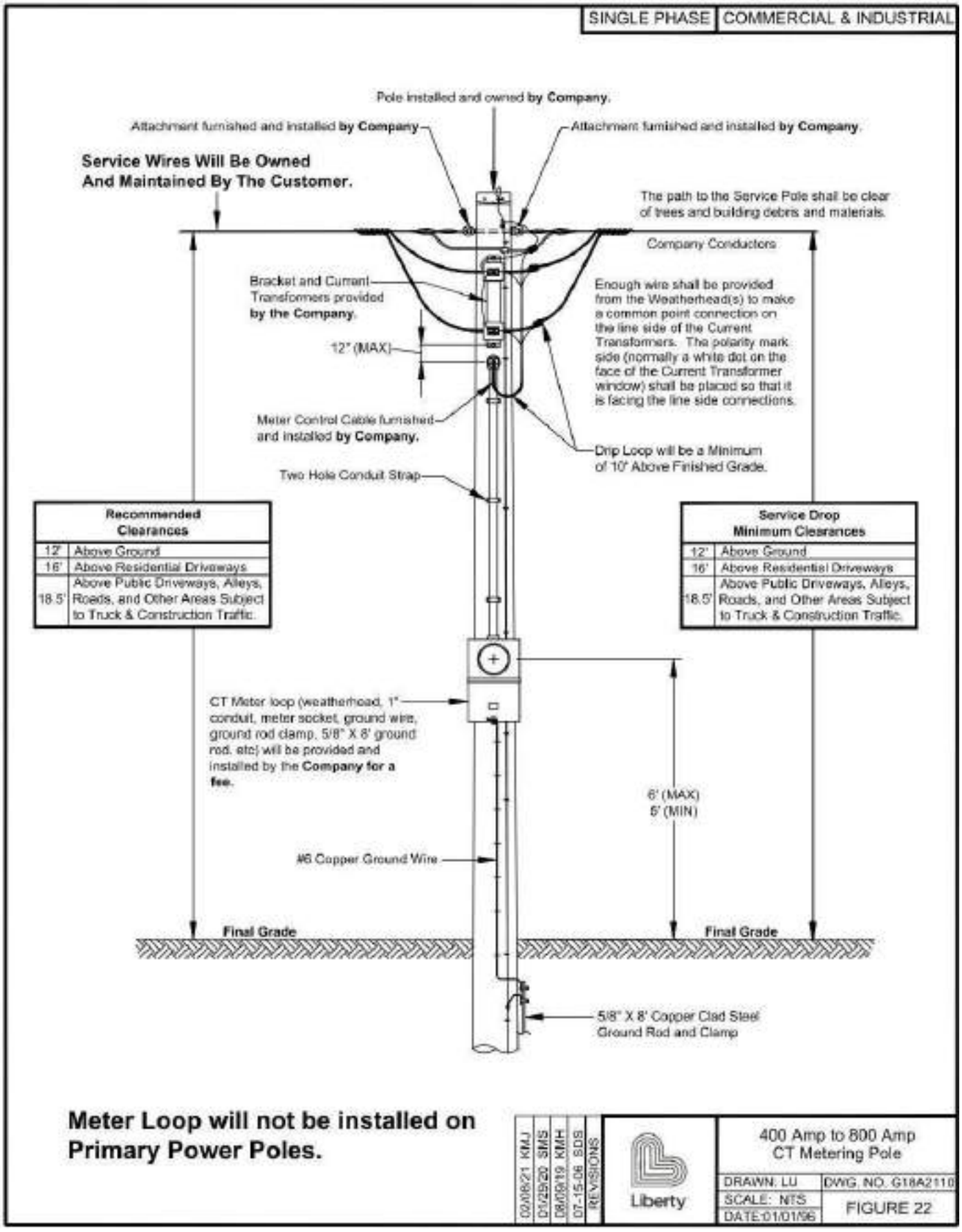


Figure 22: 400 Amp to 800 Amp CT Metering Pole

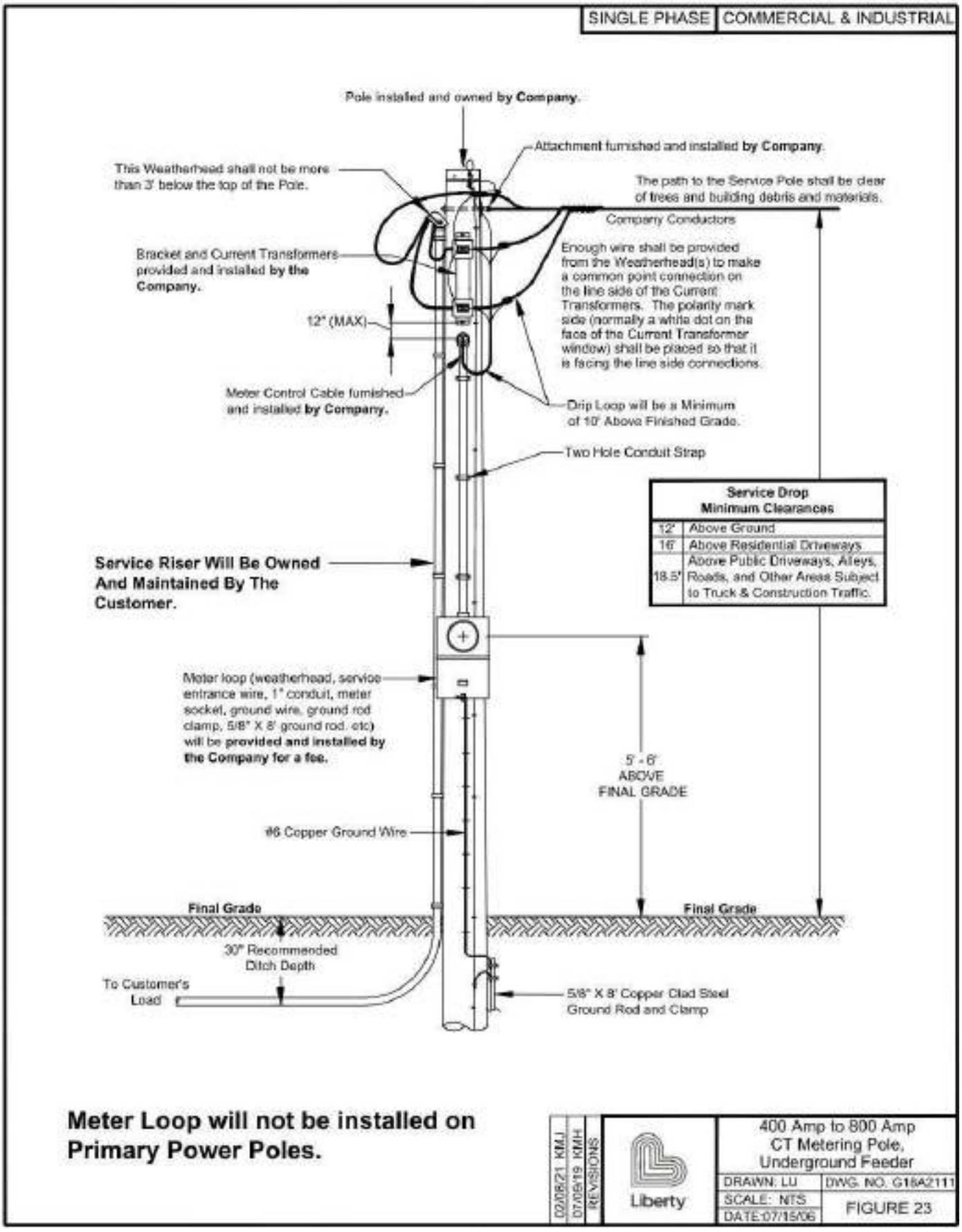


Figure 23: 400 Amp to 800 Amp CT Metering Pole, Underground Feeder

6.4 MULTIPLE METERS, SINGLE PHASE OVERHEAD SERVICE

A. General Notes:

1. If more than six meters are required, consult the Company for approval of equipment prior to purchase.
2. Service entrance conductors, 5/8" x 8' copper clad steel ground rod, ground rod clamp, ground wire, conduit, conduit straps, weatherhead, lock nuts, bushings, meter socket assembly, meter socket assembly hub, service drop attachment device, and miscellaneous mounting hardware furnished and installed by the Customer.
3. Meters, service connectors, and service drop furnished and installed by Company.
4. The meter socket assembly should be “readily accessible” (see definitions). The Company requires a level and unobstructed workspace of 78 inches tall, 18 inches on either side, and 48 inches in front of the meter socket assembly. Prior approval is required for placement of the meter socket assembly in alleyways or areas where it may be subject to damage.
5. If the Company is required to attach the service drop directly to the Customer’s meter loop conduit, the Customer shall install a steel service mast.
6. The meter sockets shall meet the following specifications:
   a. The latest revision of U.L. 414 and ANSI C12.7 Standards.
   b. NEMA 3R compliant enclosure
   c. Must be U.L. listed.
   d. Must have grounding connector for triplex.
   e. Lug size – 2/0 minimum.
   f. On 120/208v services, the customer must provide the meter socket with 5th lug installed in the 9 o’clock position.
   g. **This is not a complete list of criteria for acceptance. See Appendix A for list of approved meter sockets.**

B. Mounting:

1. Meter socket, ground wire, and conduit shall be surface mounted and securely fastened to the structure. The meter socket shall be installed in a level and plumb position. **Flush mounted or recessed metering equipment and service riser conduit embedded in a wall will not be permitted.**
2. Where the exterior wall is other than brick or concrete blocks, a supporting frame shall be installed behind the exterior wall to provide a solid mounting surface for the meter socket.
3. Meter sockets, metering cabinets, and conduit straps shall be installed with the following:
   a. Lead anchors or double helix concrete screws shall be used with brick or solid concrete surfaces.
   b. Toggle bolts shall be used with other masonry siding.
   c. Wood screws shall be used with solid wood surfaces.
   d. All mounting hardware shall be minimum #12(1/4”) corrosion resistant screws.
   e. A minimum of 4 fasteners shall be used to install any socket or cabinet unless specifically stated otherwise.

4. An intersystem bonding termination bar shall be installed in accordance with NEC 250.94 to facilitate the connection of other utility's ground to a common ground. The location of this device shall be located directly below the meter socket or meter combination socket.

   a. See Appendix A for list of approved intersystem bonding termination bars.

C. Connections:

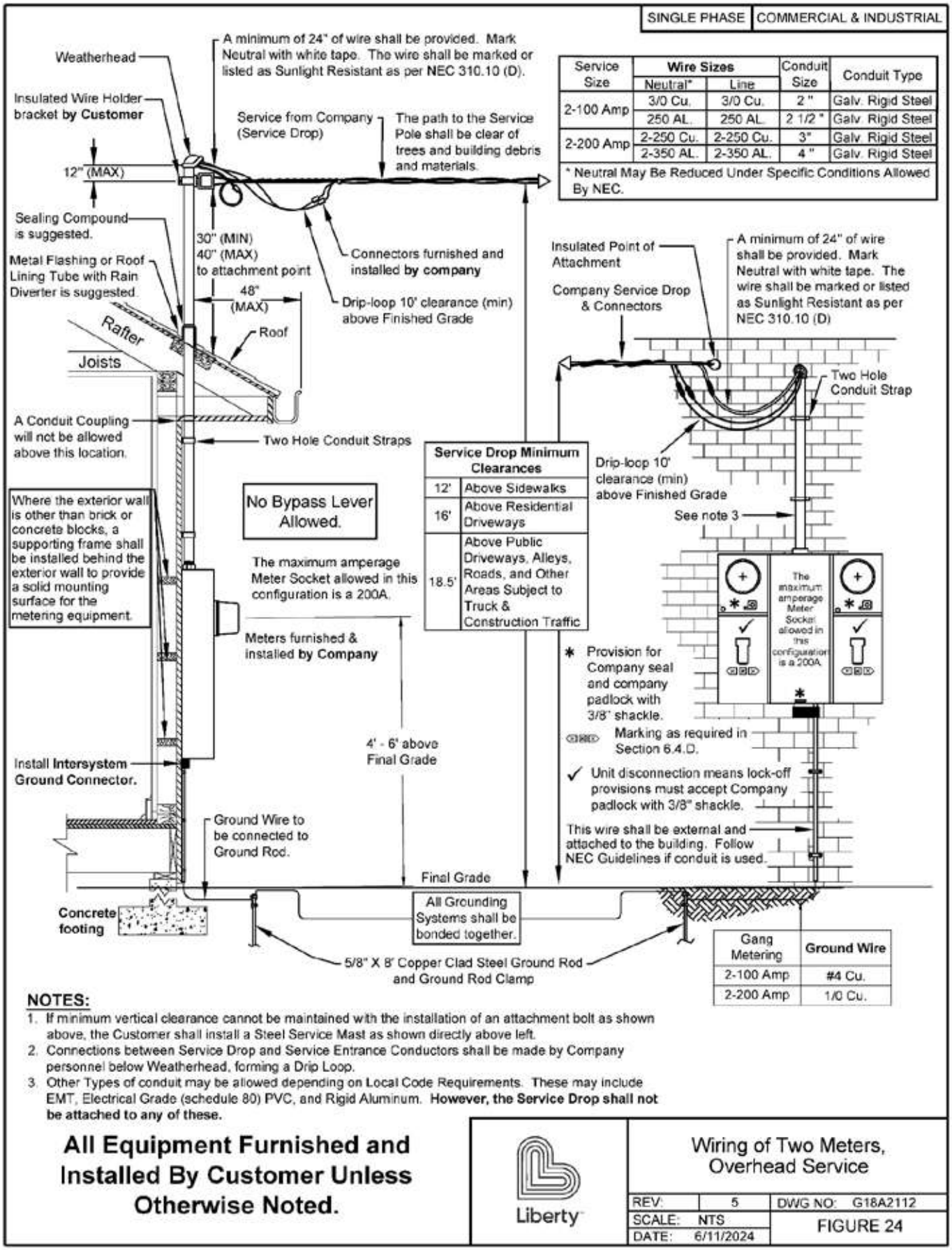
1. The Customer is responsible for termination of the incoming wiring if the wire terminates in a main breaker or fuse holder. The Company will terminate the incoming wire if it terminates on bus bar terminals. The main breaker will be removed when the service wire is being pulled by the Company.
2. Do not score line or load wire when removing insulation.
3. The Customer shall use wire brush or sandpaper to clean all conductors, apply a non-grit type inhibitor and tighten to manufacturer's specifications.

D. Meter Socket Marking:

1. **Before the meters are installed, each socket position and corresponding building unit, i.e., apt number or letter, Suite number or letter, tenant number or letter, or physical address served shall be accurately, clearly, and permanently labeled with an engraved plaque. See Figures 24 and 25 for proper location. Plaques shall be screwed, bolted or riveted to the equipment. If the equipment is marked incorrectly, the customer shall be responsible for all costs incurred by Liberty for correcting the meter socket identification. Please note that marker ink or adhesive labels are examples of non-permanent labeling.**
2. **Letters or numbers on the engraved plaque shall be a minimum of one (1) inch in height and of contrasting color, i.e., black and white, red and green, orange and blue, etc.**

E. Conductor Marking:

All neutral conductors shall be clearly marked with white tape at the point of delivery and at the meter socket assembly.



Service Size	Wire Sizes		Conduit Size	Conduit Type
	Neutral*	Line		
2-100 Amp	3/0 Cu.	3/0 Cu.	2"	Galv. Rigid Steel
	250 AL.	250 AL.	2 1/2"	Galv. Rigid Steel
2-200 Amp	2-250 Cu.	2-250 Cu.	3"	Galv. Rigid Steel
	2-350 AL.	2-350 AL.	4"	Galv. Rigid Steel

* Neutral May Be Reduced Under Specific Conditions Allowed By NEC.

Service Drop Minimum Clearances	
12'	Above Sidewalks
16'	Above Residential Driveways
18.5'	Above Public Driveways, Alleys, Roads, and Other Areas Subject to Truck & Construction Traffic

Gang Metering	Ground Wire
2-100 Amp	#4 Cu.
2-200 Amp	1/0 Cu.

NOTES:

1. If minimum vertical clearance cannot be maintained with the installation of an attachment bolt as shown above, the Customer shall install a Steel Service Mast as shown directly above left.
2. Connections between Service Drop and Service Entrance Conductors shall be made by Company personnel below Weatherhead, forming a Drip Loop.
3. Other Types of conduit may be allowed depending on Local Code Requirements. These may include EMT, Electrical Grade (schedule 80) PVC, and Rigid Aluminum. **However, the Service Drop shall not be attached to any of these.**

All Equipment Furnished and Installed By Customer Unless Otherwise Noted.

Liberty

Wiring of Two Meters, Overhead Service

REV:	5	DWG NO: G18A2112
SCALE:	NTS	FIGURE 24
DATE:	6/11/2024	

Figure 24: Wiring of Two Meters, Overhead Service

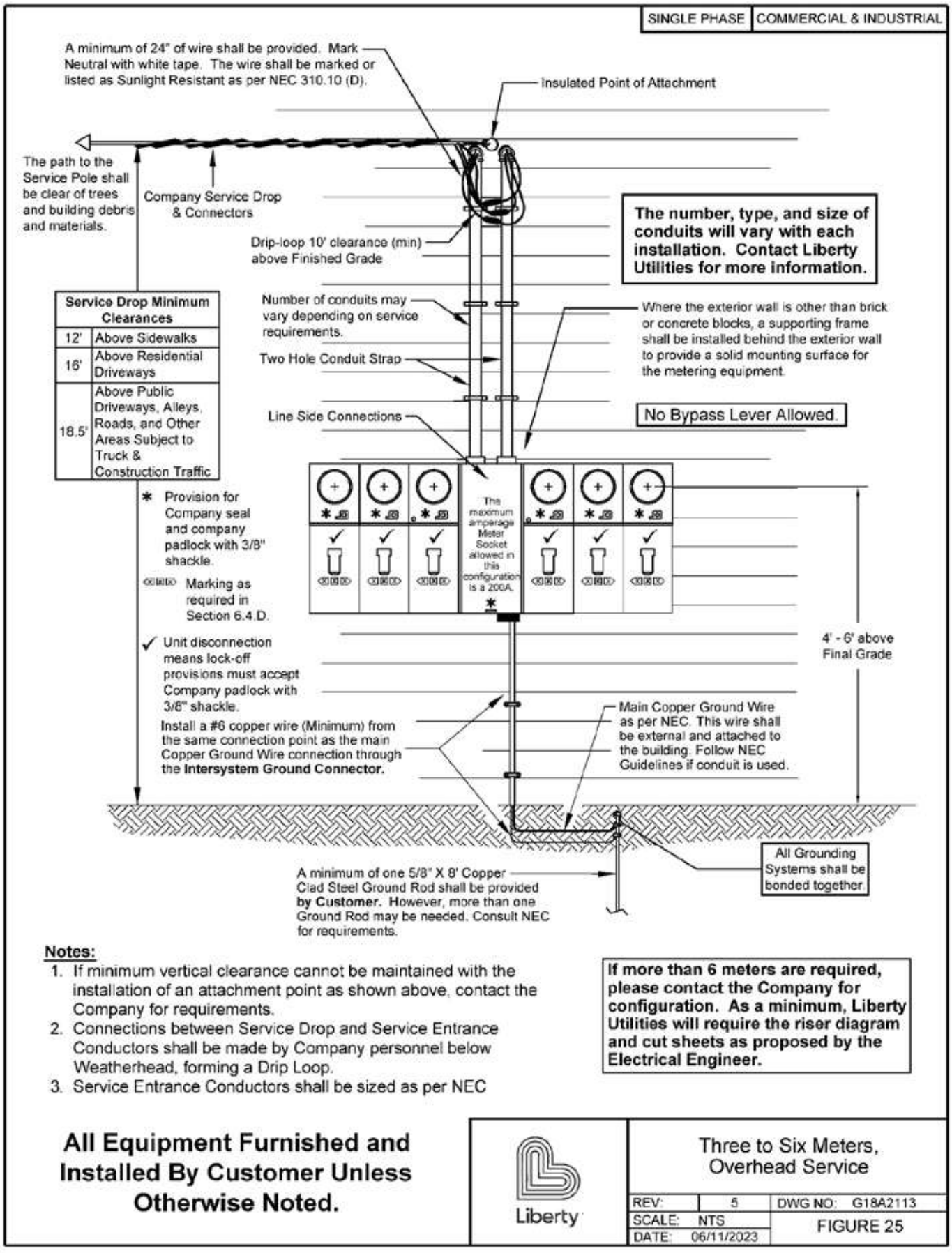


Figure 25: Three to Six Meters, Overhead Service

6.5 100/200 AMP (208Y/120V or 240Δ /120V only) THREE PHASE OVERHEAD SERVICE

A. General Notes:

1. Service entrance conductors, 5/8" x 8' copper clad steel ground rod, ground rod clamp, ground wire, conduit, conduit straps, weatherhead, lock nuts, bushings, service drop attachment device, meter socket, main disconnect, meter socket hub, and miscellaneous mounting hardware furnished and installed by the Customer.
2. Meter, service connectors, and service drop furnished and installed by Company.
3. The meter socket should be “readily accessible” (see definitions). The Company requires a level and unobstructed workspace of 78 inches tall, 18 inches on either side, and 48 inches in front of the meter socket. Prior approval is required for placement of the meter socket in alleyways or areas where it may be subject to damage.
4. Installation requiring a steel service mast shall be installed by the Customer as specified in Figure 27.
5. **The 200 amp meter socket shall be purchased from the Company and installed by the Customer.**

B. Mounting:

1. Meter socket, ground wire, and conduit shall be surface mounted and securely fastened to the structure. The meter socket shall be installed in a level and plumb position. **Flush mounted or recessed metering equipment and service riser conduit embedded in a wall will not be permitted.**
2. Where the exterior wall is other than brick or concrete blocks, a supporting frame shall be installed behind the exterior wall to provide a solid mounting surface for the meter socket.
3. Meter sockets, metering cabinets, and conduit straps shall be installed with the following:
   a. Lead anchors or double helix concrete screws shall be used with brick or solid concrete surfaces.
   b. Toggle bolts shall be used with other masonry siding.
   c. Wood screws shall be used with solid wood surfaces.
   d. All mounting hardware shall be minimum #12(1/4”) corrosion resistant screws.
   e. A minimum of 4 fasteners shall be used to install any socket or cabinet unless specifically stated otherwise.
4. An intersystem bonding termination bar shall be installed in accordance with NEC 250.94 to facilitate the connection of other utility’s ground to a common ground. The location of this device shall be located directly below the meter socket or meter combination socket.

   a. See Appendix A for list of approved intersystem bonding termination bars.
5. Wire not enclosed in conduit shall be a minimum of 36 inches away from any window or door opening.

C. Connections:

1. Do not score line or load wire when removing insulation.
2. The Customer shall use wire brush or sandpaper to clean all conductors, apply a no-grit type inhibitor and tighten to manufacturer's specifications.

D. Conductor marking

1. All neutral conductors shall be clearly marked with white tape at the point of delivery and at the meter socket.
2. The power leg of each 240/120 volt, three-phase, four-wire delta service shall be clearly marked with orange tape at the point of delivery and at the meter location (refer to Figure 29).

E. Phase Rotation

1. On three-phase installations to ensure proper equipment operation, the Customer is responsible for verifying phase rotation at the time-of-service connection.

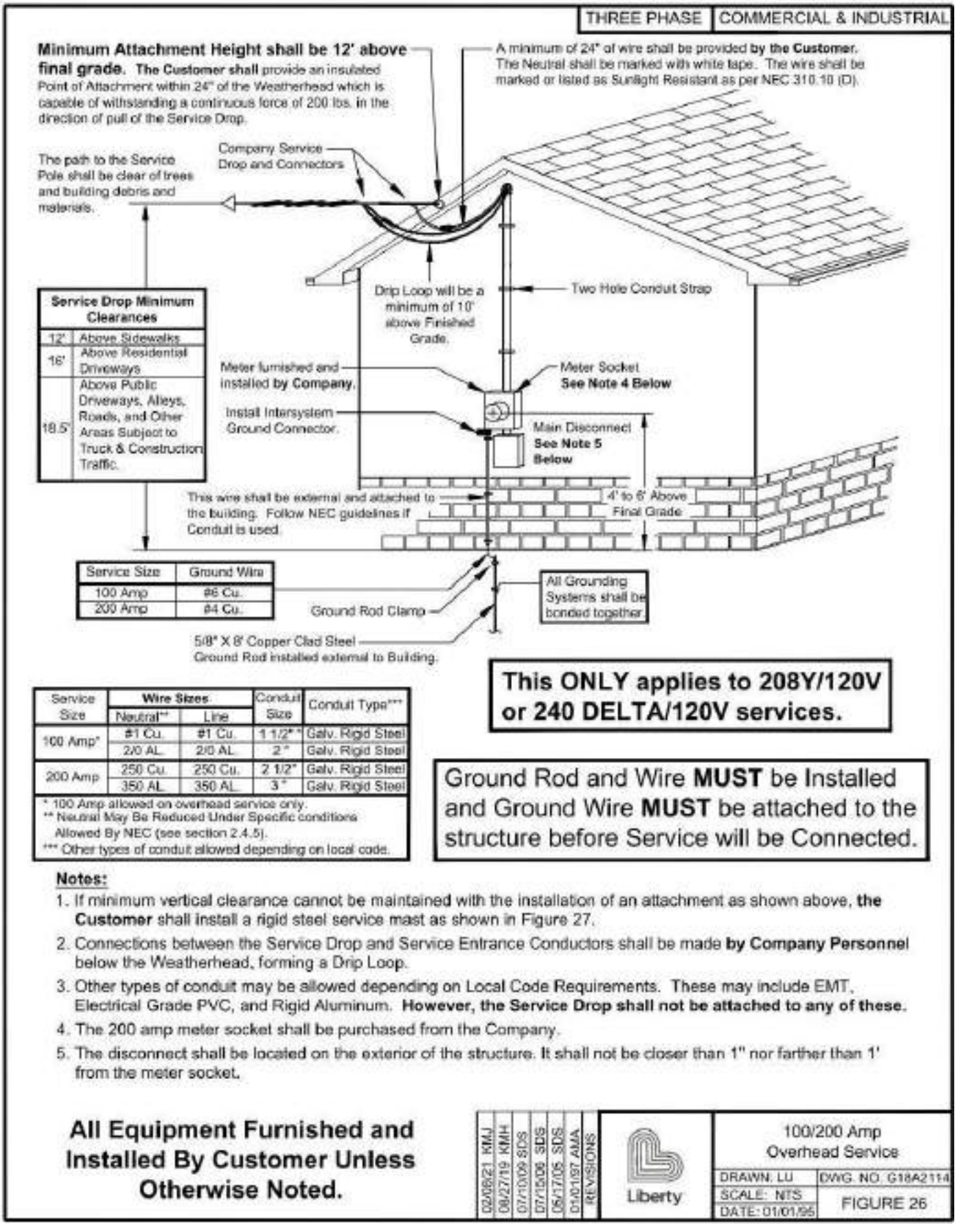


Figure 26: 100/200 Amp Overhead Service

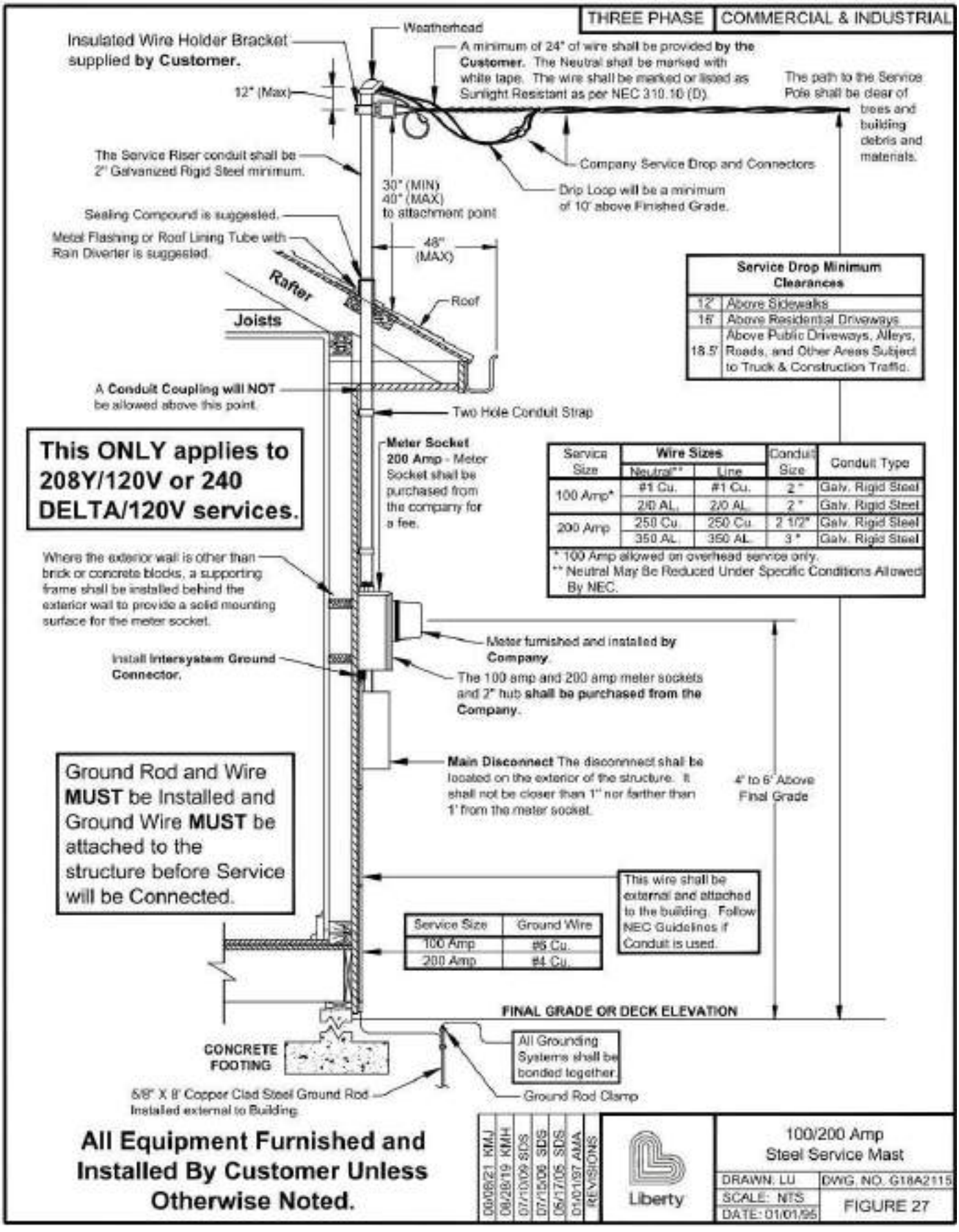


Figure 27: 100/200 Amp Steel Service Mast

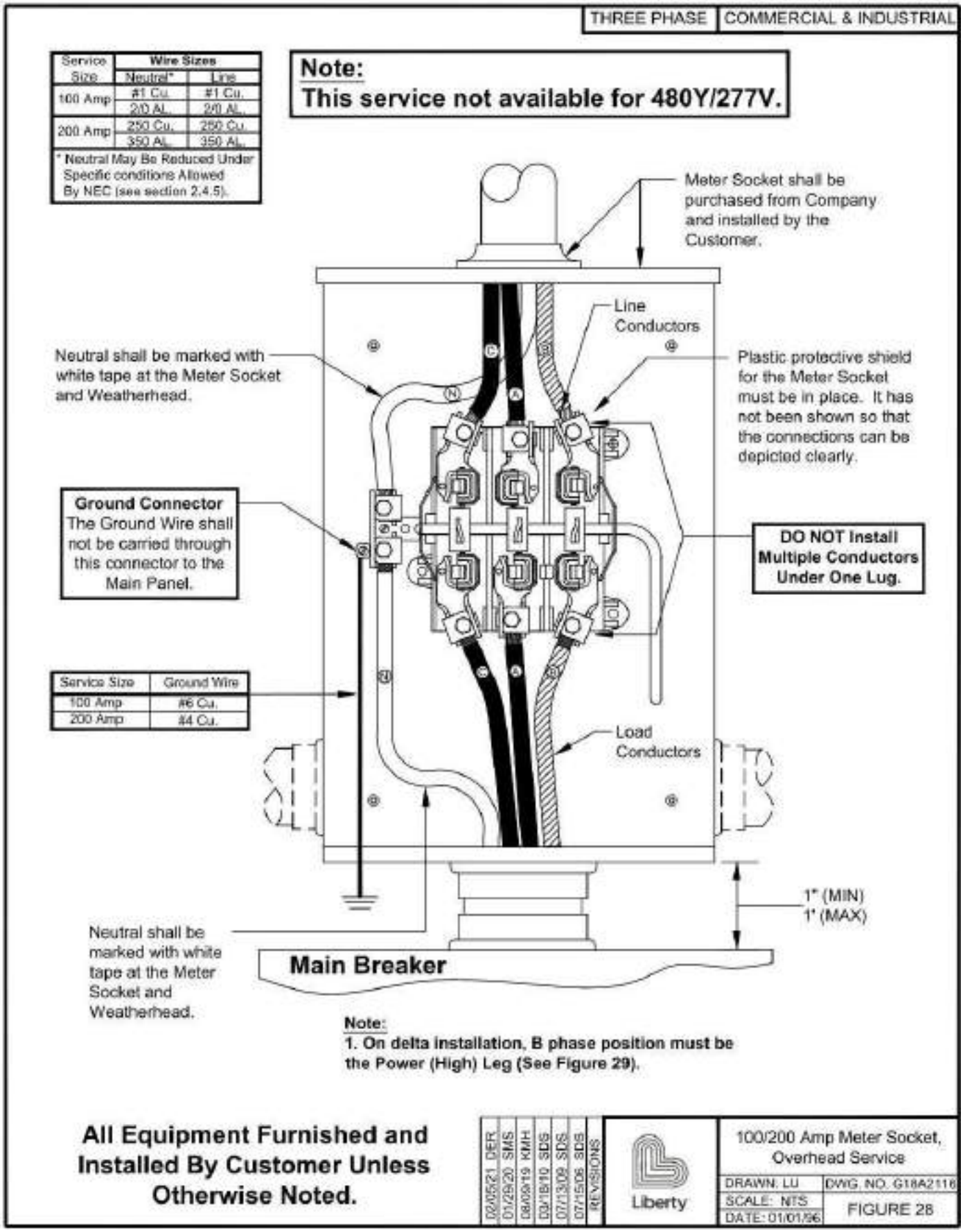


Figure 28: 100/200 Amp Meter Socket, Overhead Service

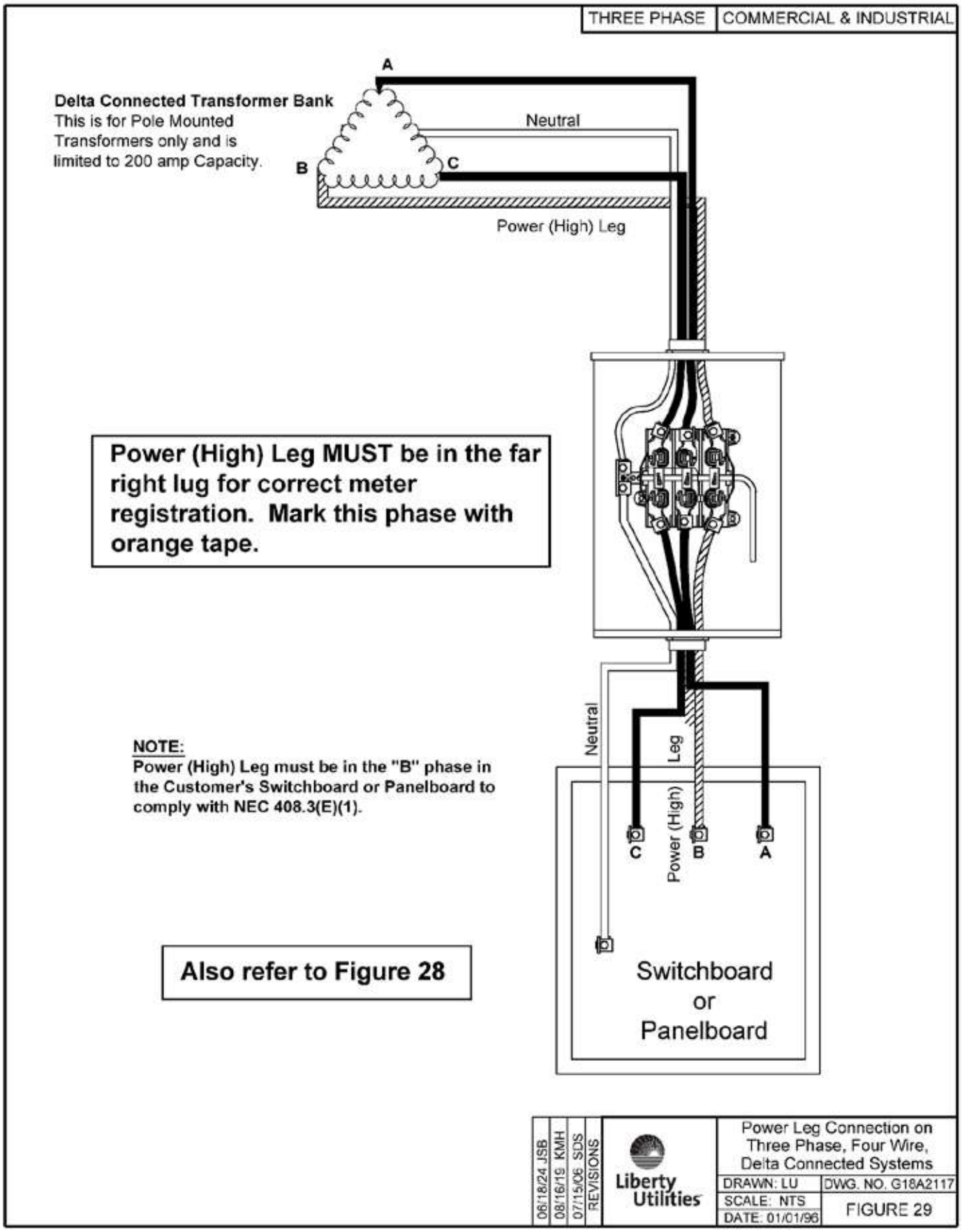
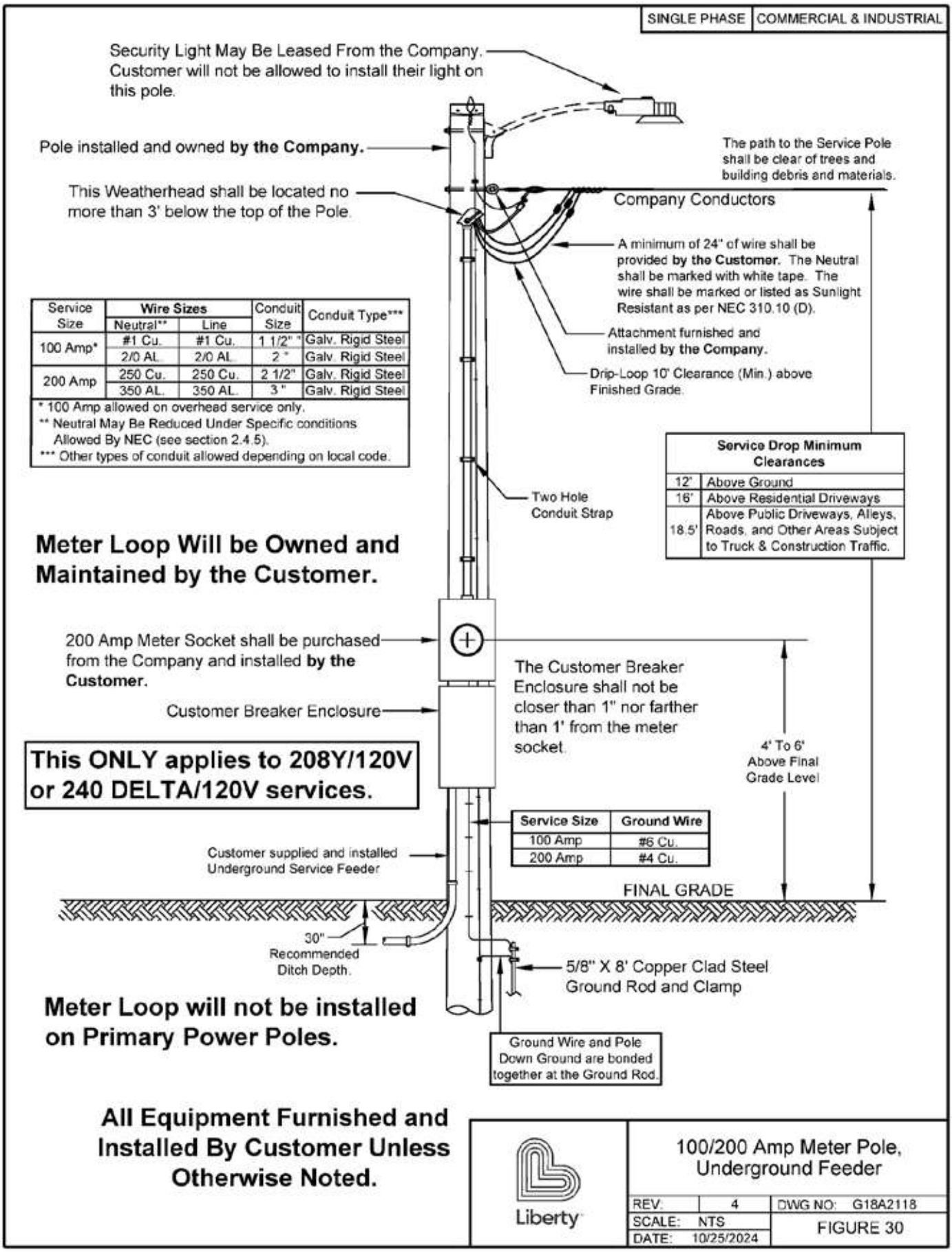


Figure 29: Power Leg Connection on Three Phase, Four Wire, Delta Connected Systems



Service Size	Wire Sizes		Conduit Size	Conduit Type***
	Neutral**	Line		
100 Amp*	#1 Cu.	#1 Cu.	1 1/2"	Galv. Rigid Steel
	2/0 AL.	2/0 AL.	2"	Galv. Rigid Steel
200 Amp	250 Cu.	250 Cu.	2 1/2"	Galv. Rigid Steel
	350 AL.	350 AL.	3"	Galv. Rigid Steel

* 100 Amp allowed on overhead service only.
** Neutral May Be Reduced Under Specific conditions Allowed By NEC (see section 2.4.5).
*** Other types of conduit allowed depending on local code.

Service Drop Minimum Clearances	
12'	Above Ground
16'	Above Residential Driveways
18.5'	Above Public Driveways, Alleys, Roads, and Other Areas Subject to Truck & Construction Traffic.

Service Size	Ground Wire
100 Amp	#6 Cu.
200 Amp	#4 Cu.

Figure 30: 100/200 Amp Meter Pole, Underground Feeder

6.6 200 AMP TO 1200 AMP CT METERING, THREE PHASE OVERHEAD SERVICE

A. General Notes:

1. This arrangement may be utilized for services 200 amps and above.
2. The disconnection method may be composed of multiple disconnects to make up the full 1200 amp capacity of the service as long as there are not more than 6. If one disconnect is used that it is greater than 400 amps, it may be located on the interior of the building unless the authority having jurisdiction dictates otherwise. Disconnects of 400 amps and below will be located on the exterior of the building.

   Please note that in all cases, the disconnects making up this service will be at the same location and are required to be located in separate compartments or enclosures.

3. Service drop and meter furnished and installed by the Company.
4. Current transformers (CT) shall be furnished by the Company and installed by the Customer.
5. Meter socket shall be purchased from the Company and installed by Customer.
6. One inch (1") conduit and weatherhead shall be furnished and installed by Customer.
7. Metering control cable shall be furnished and installed by the Company.
8. The meter socket should be “readily accessible” (see definitions). The Company requires a level and unobstructed workspace of 78 inches tall, 18 inches on either side, and 48 inches in front of the meter socket. Prior approval is required for placement of the meter socket in alleyways or areas where it may be subject to damage.
9. **The length of service drop over roof shall not exceed four (4) feet.**

B. Mounting:

1. Meter socket, ground wire, and conduit shall be surface mounted and securely fastened to the structure. The meter socket shall be installed in a level and plumb position. **Flush mounted or recessed metering equipment and service riser conduit embedded in a wall will not be permitted.**
2. Where the exterior wall is other than brick or concrete blocks, a supporting frame shall be installed behind the exterior wall to provide a solid mounting surface for the meter socket.
3. Meter sockets, metering cabinets, and conduit straps shall be installed with the following:
   a. Lead anchors or double helix concrete screws shall be used with brick or solid concrete surfaces.
   b. Toggle bolts shall be used with other masonry siding.
   c. Wood screws shall be used with solid wood surfaces.
   d. All mounting hardware shall be minimum #12(1/4”) corrosion resistant screws.
   e. A minimum of 4 fasteners shall be used to install any socket or cabinet unless specifically stated otherwise.
4. An intersystem bonding termination bar shall be installed in accordance with NEC 250.94 to facilitate the connection of other utility’s ground to a common ground. The location of this device shall be located directly below the meter socket or meter combination socket.

   a. See Appendix A for list of approved intersystem bonding termination bars.

C. Connections:

1. All connections shall be made by the Company.
2. For service situations that require more than four (4) service risers, contact the Company.

D. Conductor marking

All neutral conductors shall be clearly marked with white tape at the point of delivery.

E. Phase Rotation

1. On three-phase installations to ensure proper equipment operation, the Customer is responsible for verifying phase rotation at the time of service connection.

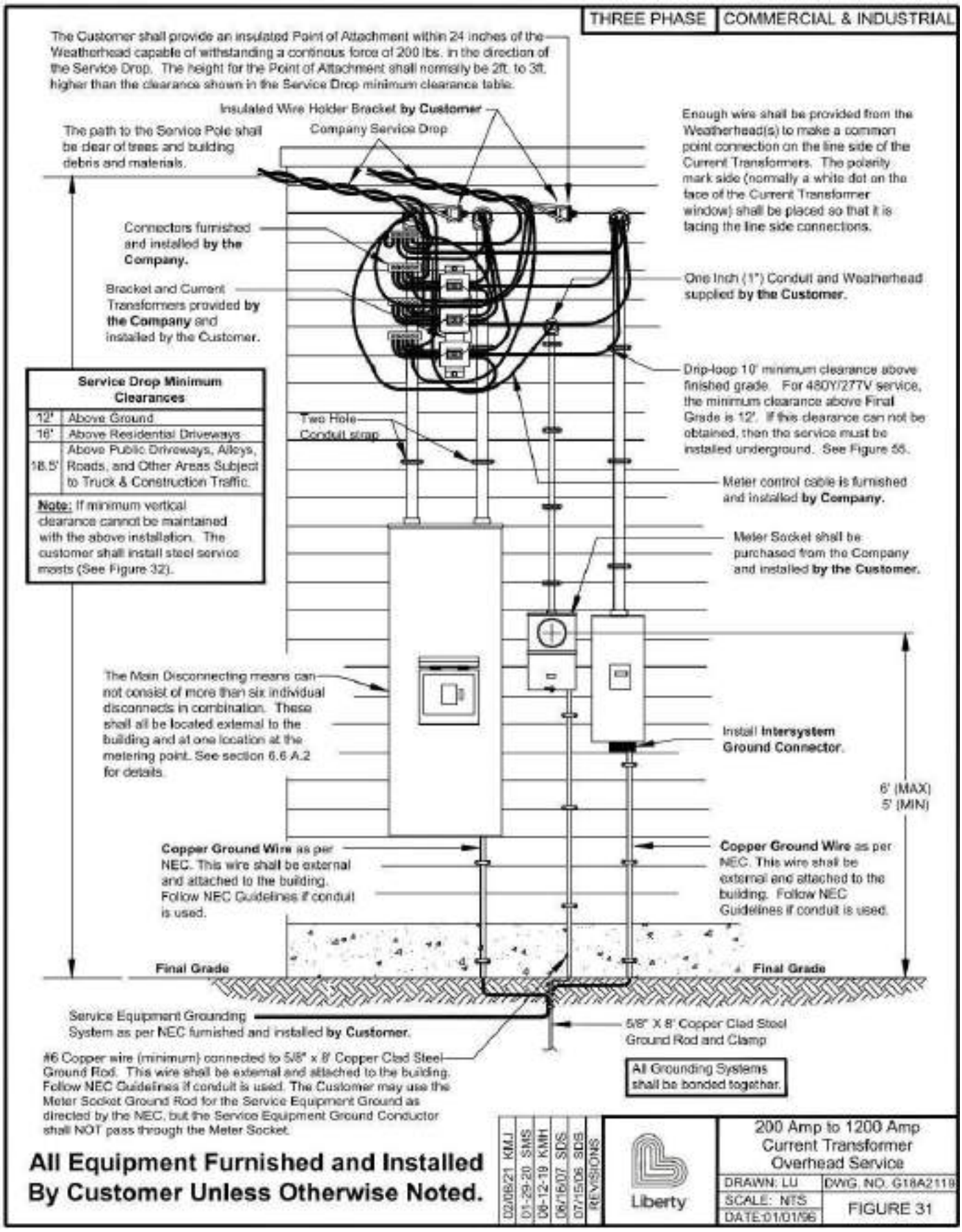


Figure 31: 200 Amp to 1200 Amp Current Transformer Overhead Service

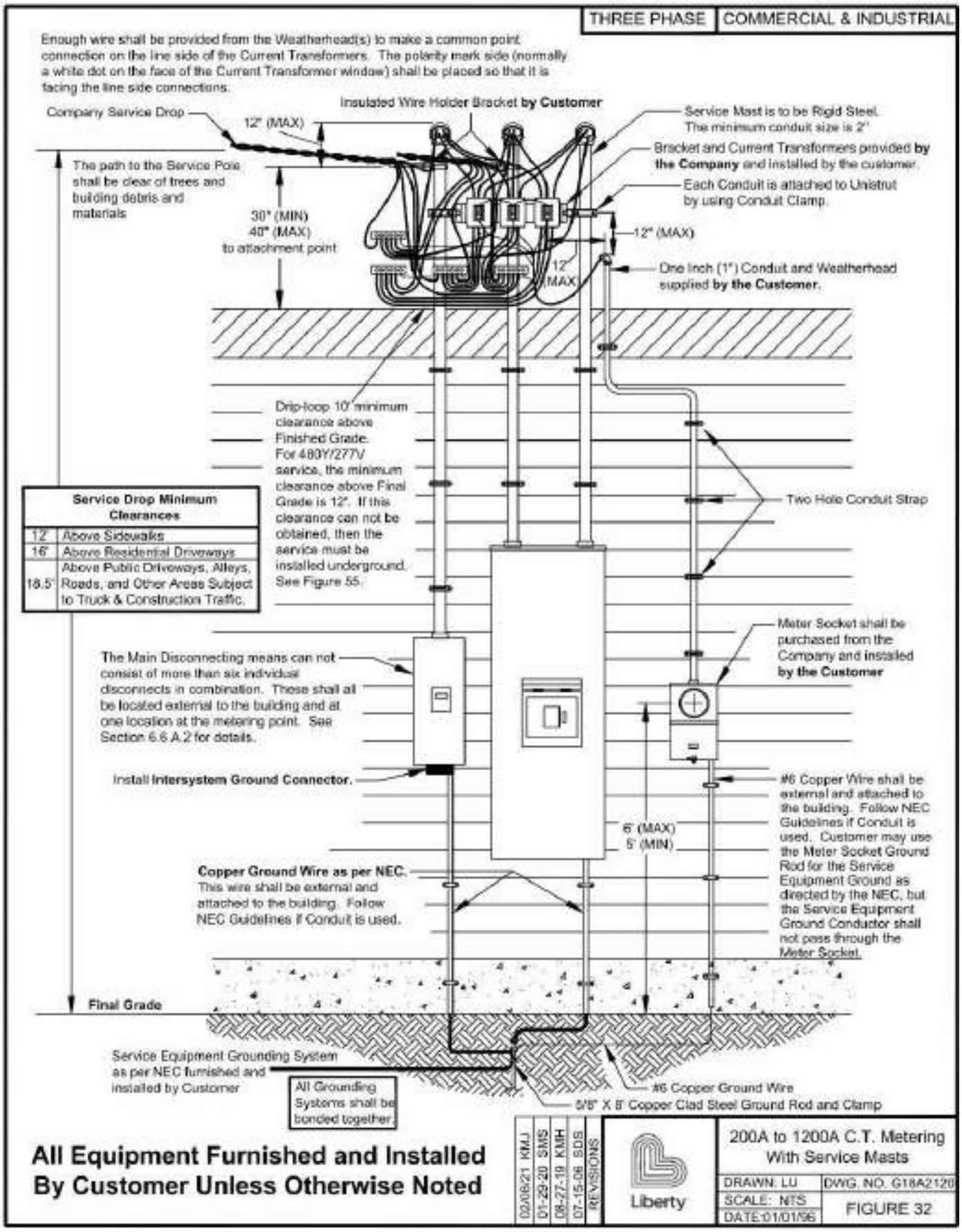


Figure 32: 200A to 1200A C.T. Metering With Service Masts

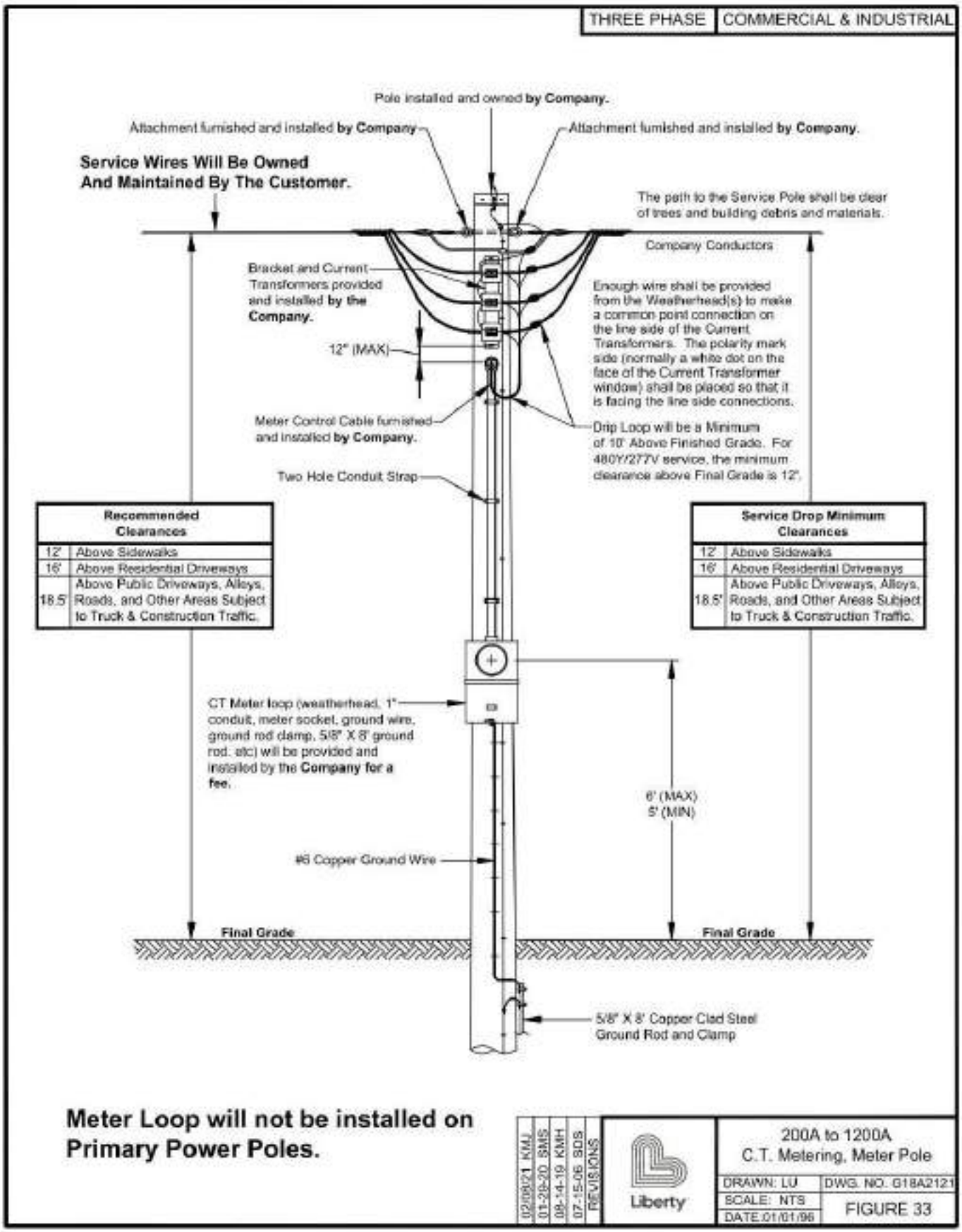


Figure 33: 200A to 1200A C.T. Metering, Meter Pole

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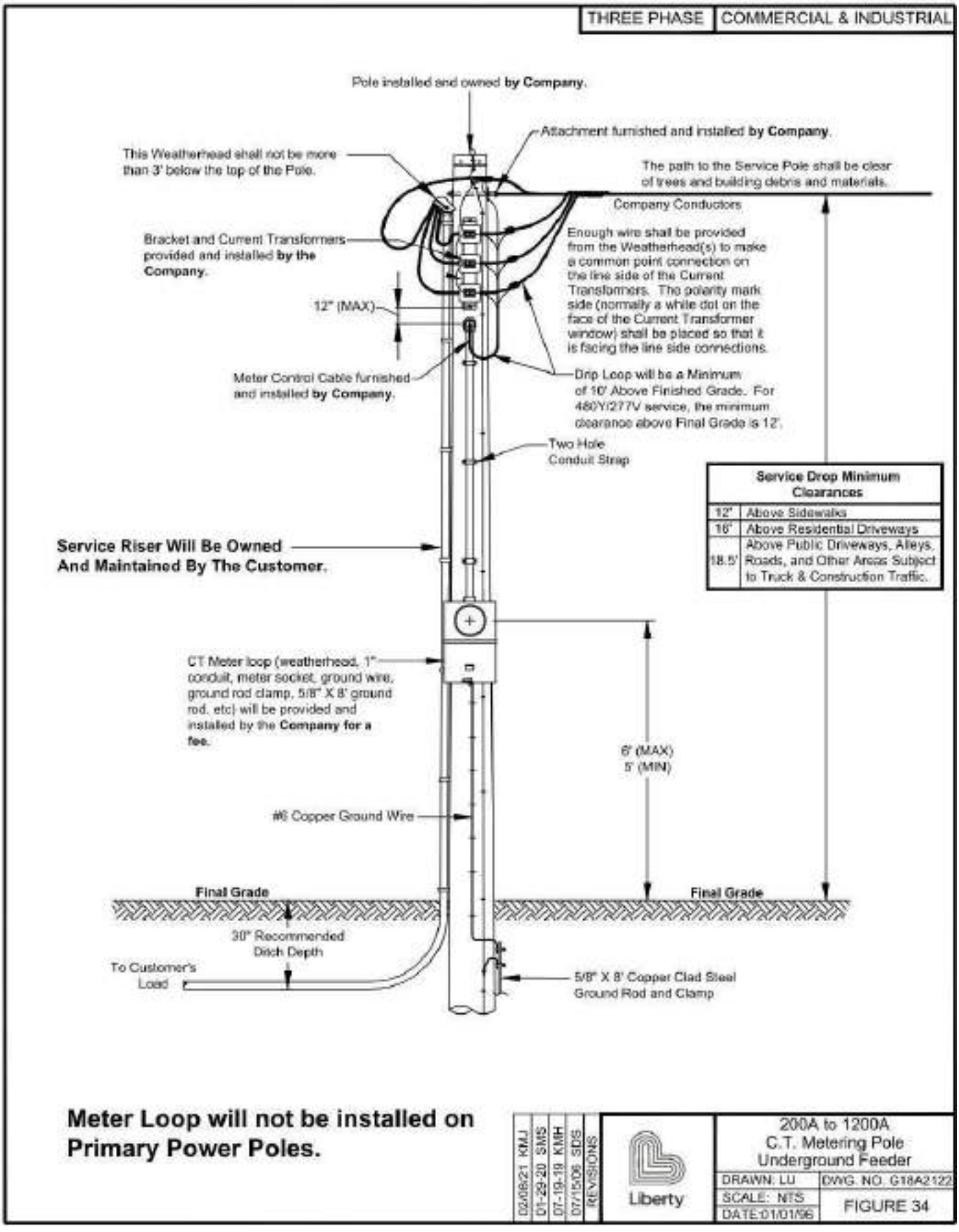


Figure 34: 200A to 1200A C.T. Metering Pole Underground Feeder

6.7 MULTIPLE METERS, THREE PHASE OVERHEAD SERVICE

A. General Notes:

1. If more than six meters are required, consult the Company for approval of equipment prior to purchase.
2. Service entrance conductors, 5/8" x 8' copper clad steel ground rod, ground rod clamp, ground wire, conduit, conduit straps, weatherhead, lock nuts, bushings, meter socket assembly, meter socket assembly hub, service drop attachment device, and miscellaneous mounting hardware furnished and installed by the Customer.
3. Meters, service connectors, and service drop furnished and installed by Company.
4. The meter socket assembly should be “readily accessible” (see definitions). The Company requires a level and unobstructed workspace of 78 inches tall, 18 inches on either side, and 48 inches in front of the meter socket assembly. Prior approval is required for placement of the meter socket assembly in alleyways or areas where it may be subject-ed to damage.
5. If the Company is required to attach the service drop directly to the Customer’s meter loop conduit, the Customer shall install a steel service mast.
6. The meter sockets shall meet the following specifications:
   a. The latest revision of U.L. 414 and ANSI C12.7 Standards.
   b. NEMA 3R compliant enclosure
   c. Must be U.L. listed.
   d. Must have grounding connector for quadruplex.
   e. Lug size – 2/0 minimum.
   f. On 208/120v 4 Wire WYE services, the customer must provide the meter socket with 5th lug installed in the 9 o’clock position.
   g. All meter sockets shall be equipped L&G HQ-7 or equivalent heavy duty jaw clamping & bypass socket mechanism.
   h. **This is not a complete list of criteria for acceptance. See Appendix A for list of approved meter sockets.**

B. Mounting:

1. Meter socket assembly, ground wire, and conduit shall be surface mounted and be securely fastened to the structure. The meter socket assembly shall be installed in a level and plumb position. **Flush mounted or recessed metering equipment and service riser conduit embedded in a wall will not be permitted.**
2. Where the exterior wall is other than brick or concrete blocks, a support frame shall be installed behind the exterior wall to provide a solid mounting surface for the meter socket assembly.
3. Meter sockets, metering cabinets, and conduit straps shall be installed with the following:
   a. Lead anchors or double helix concrete screws shall be used with brick or solid concrete surfaces.
   b. Toggle bolts shall be used with other masonry siding.
   c. Wood screws shall be used with solid wood surfaces.
   d. All mounting hardware shall be minimum #12(1/4”) corrosion resistant screws.
   e. A minimum of 4 fasteners shall be used to install any socket or cabinet unless specifically stated otherwise.

4. An intersystem bonding termination bar shall be installed in accordance with NEC 250.94 to facilitate the connection of other utility's ground to a common ground. The location of this device shall be located directly below the meter socket or meter combination socket.
   a. See Appendix A for list of approved intersystem bonding termination bars.

C. Connections:

1. The Customer is responsible for termination of the incoming wiring if the wire terminates in a main breaker or fuse holder. The Company will terminate the incoming wire if it terminates on bus bar terminals. The main breaker will be removed when the service wire is being pulled by the Company.
2. Do not score line or load wire when removing insulation.
3. The Customer shall use wire brush or sandpaper to clean all conductors, apply a non-grit type inhibitor and tighten to manufacturer's specifications.

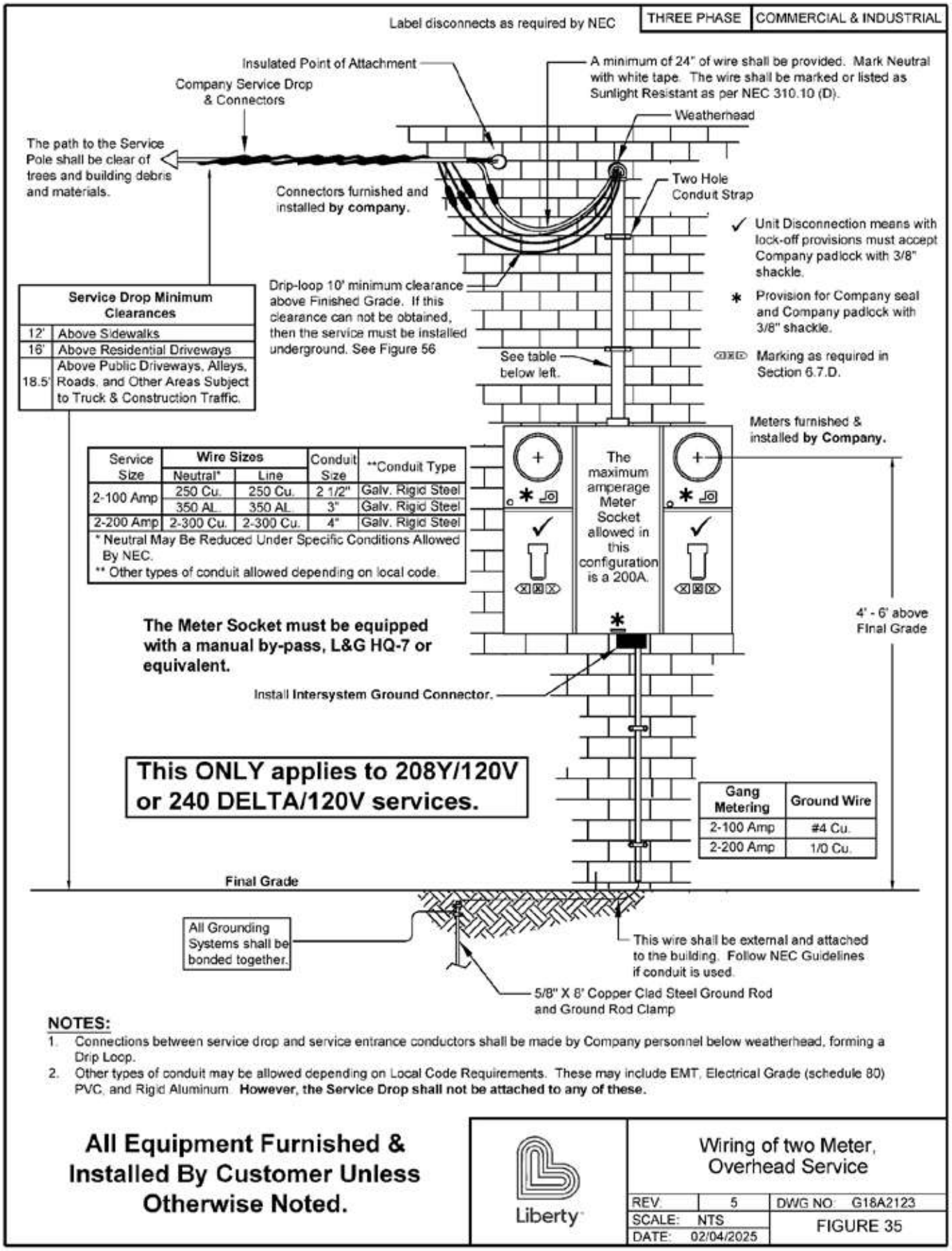
D. Meter Socket Marking:

1. Before the meters are installed, each socket position and corresponding building unit, i.e., apt number or letter, Suite number or letter, tenant number or letter, or physical address served shall be accurately, clearly, and permanently labeled with an engraved plaque. Plaques shall be screwed, bolted or riveted externally to the equipment. See Figures 35 and 36 for proper location. If the equipment is marked incorrectly, the customer shall be responsible for all costs incurred by Liberty for correcting the meter socket identification. Please note that marker ink or adhesive labels are examples of non-permanent labeling.

2. Letters or numbers on the engraved plaque shall be a minimum of one (1) inch in height and of contrasting color, i.e., black and white, red and green, orange and blue, etc.

E. Conductor Marking:

1. All neutral conductors shall be clearly marked with white tape at the point of delivery and at the meter socket assembly.
2. The power leg of each 240/120 volt, three-phase, four-wire delta service shall be clearly marked with orange tape at the point of delivery and at the meter socket assembly.



Service Drop Minimum Clearances	
12'	Above Sidewalks
16'	Above Residential Driveways
18.5'	Above Public Driveways, Alleys, Roads, and Other Areas Subject to Truck & Construction Traffic.

Service Size	Wire Sizes		Conduit Size	**Conduit Type
	Neutral*	Line		
2-100 Amp	250 Cu.	250 Cu.	2 1/2"	Galv. Rigid Steel
	350 AL.	350 AL.	3"	Galv. Rigid Steel
2-200 Amp	2-300 Cu.	2-300 Cu.	4"	Galv. Rigid Steel

* Neutral May Be Reduced Under Specific Conditions Allowed By NEC.
** Other types of conduit allowed depending on local code.

Gang Metering	Ground Wire
2-100 Amp	#4 Cu.
2-200 Amp	1/0 Cu.

NOTES:

1. Connections between service drop and service entrance conductors shall be made by Company personnel below weatherhead, forming a Drip Loop.
2. Other types of conduit may be allowed depending on Local Code Requirements. These may include EMT, Electrical Grade (schedule 80) PVC, and Rigid Aluminum. **However, the Service Drop shall not be attached to any of these.**

Figure 35: Wiring of Two Meters, Overhead Service

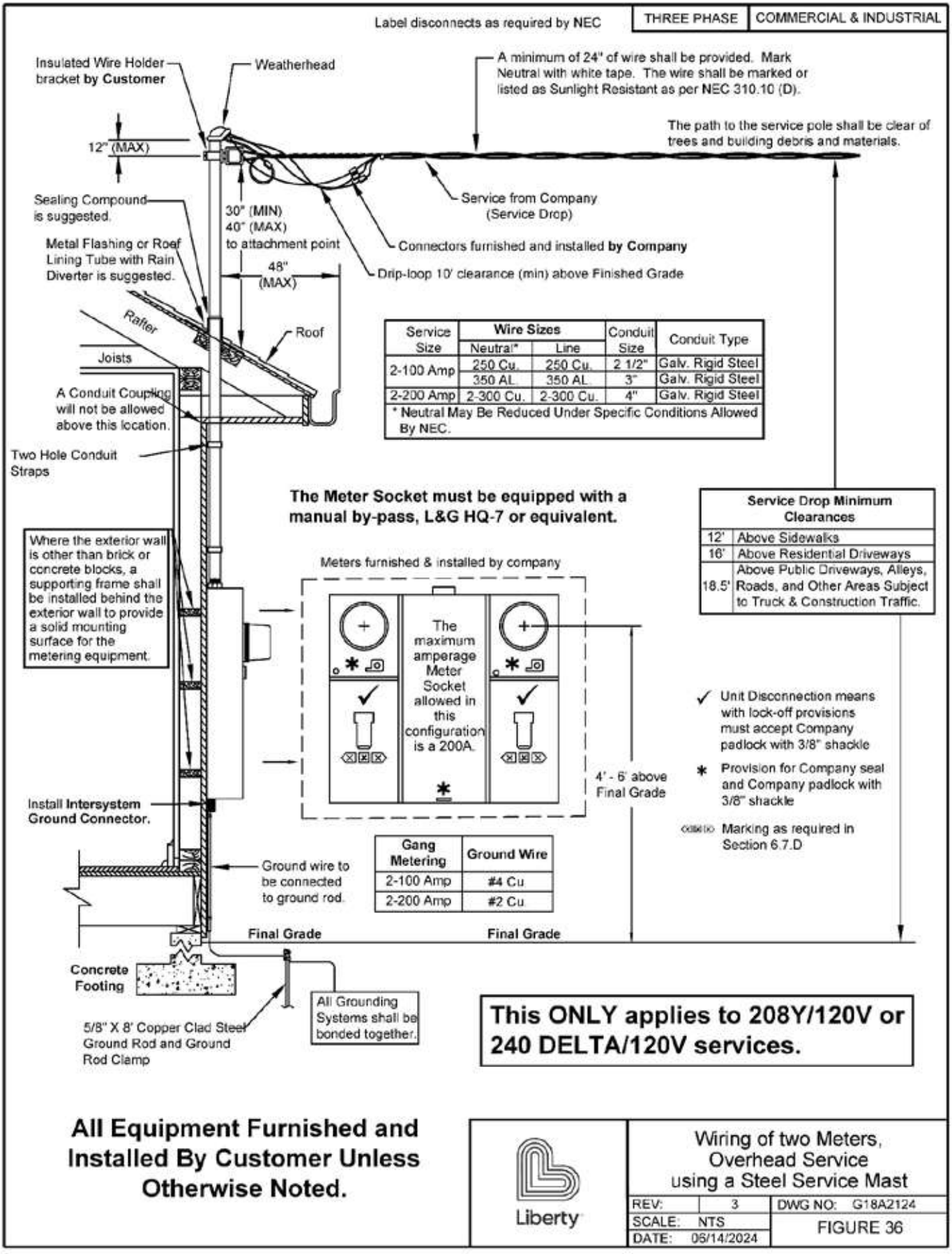


Figure 36: Wiring of Two Meters, Overhead Service using a Steel Service Mast

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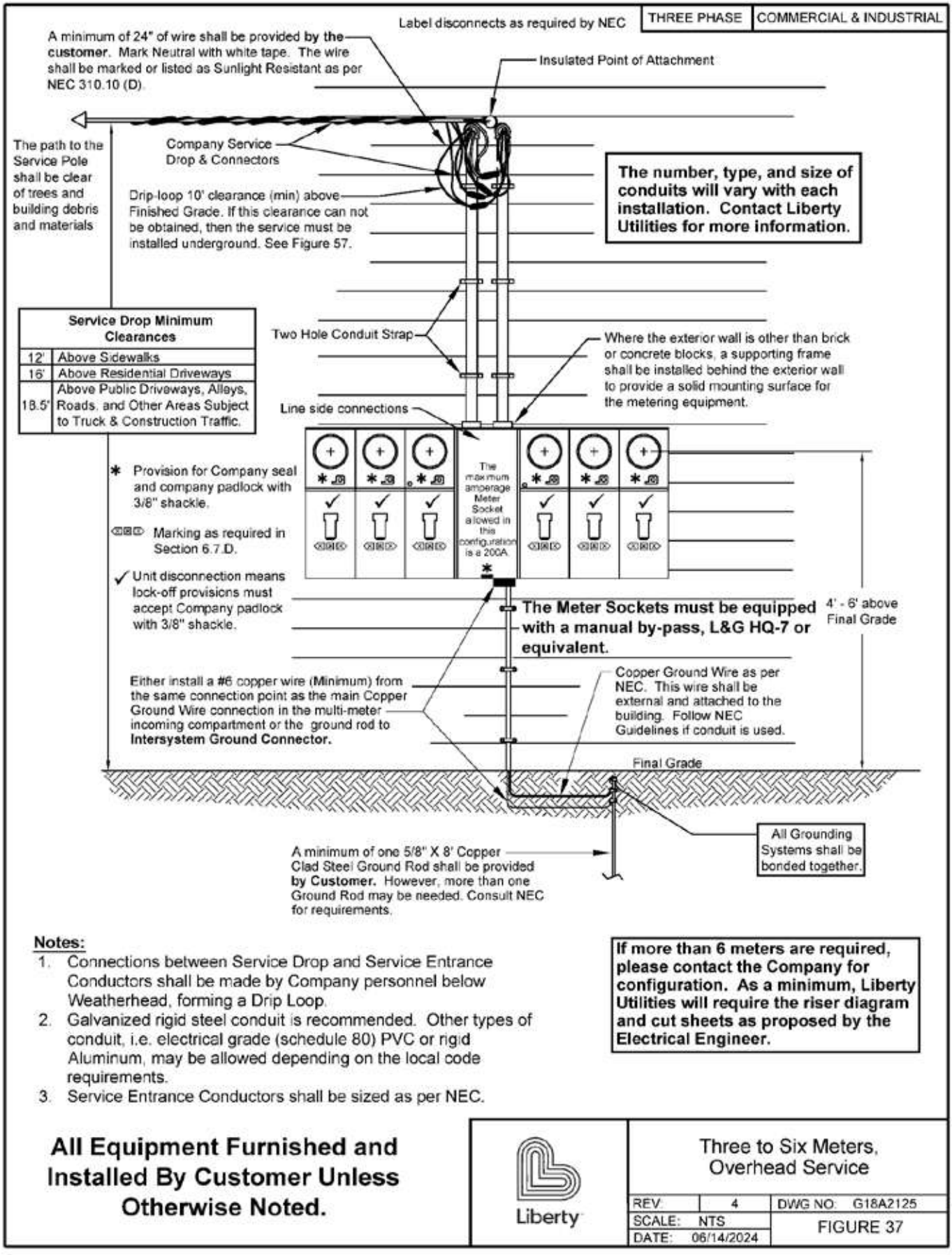


Figure 37: Three to Six Meters, Overhead Service

7.0 UNDERGROUND SERVICES

7.1 GENERAL INFORMATION

1. **PLEASE CONTACT THE COMPANY BEFORE PLANNING FOR AN UNDERGROUND SERVICE.**
2. **MINIMUM CLEARANCES OF SERVICE LATERALS IN CONDUIT**

Horizontal from gas, water, and sewer lines.....5 feet

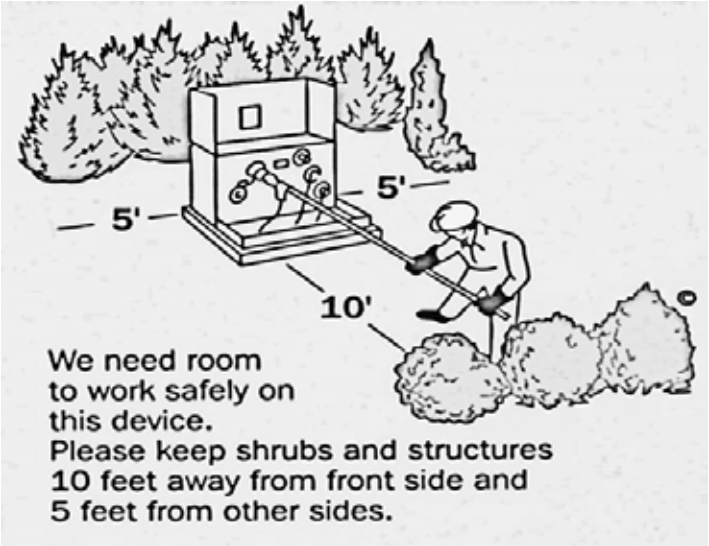
Horizontal from telephone or cable television lines……..1 foot

Horizontal to any structures (including footings and foundations)……5 feet

Horizontal from conductor to edge of swimming pool or its auxiliary equipment (Applies to above or in ground swimming pools)……..……10 feet

Note: If within ten feet of service point, this clearance does not apply to structures served.

3. Help avoid the need for future trimming by planting trees and shrubs in the right place.



4. The service lateral shall not cross a sewer lateral field.
5. **The Customer shall request the Company to designate the location of the point of delivery for each service location before construction is started.**
6. Before doing any excavation, contact all Utilities to locate their underground facilities. The following are the One Call numbers for each state listed.

Missouri	(800) 344 – 7483
Kansas	(800) 344 – 7233
Arkansas	(800) 482 – 8998
Oklahoma	(800) 522 – 6543

7. The Customer will be held responsible to locate and mark all privately owned (Customer's or other's) underground facilities.
8. Guard Posts maybe required on any underground service installation to protect the Company's Equipment. Contact the Company for requirements.

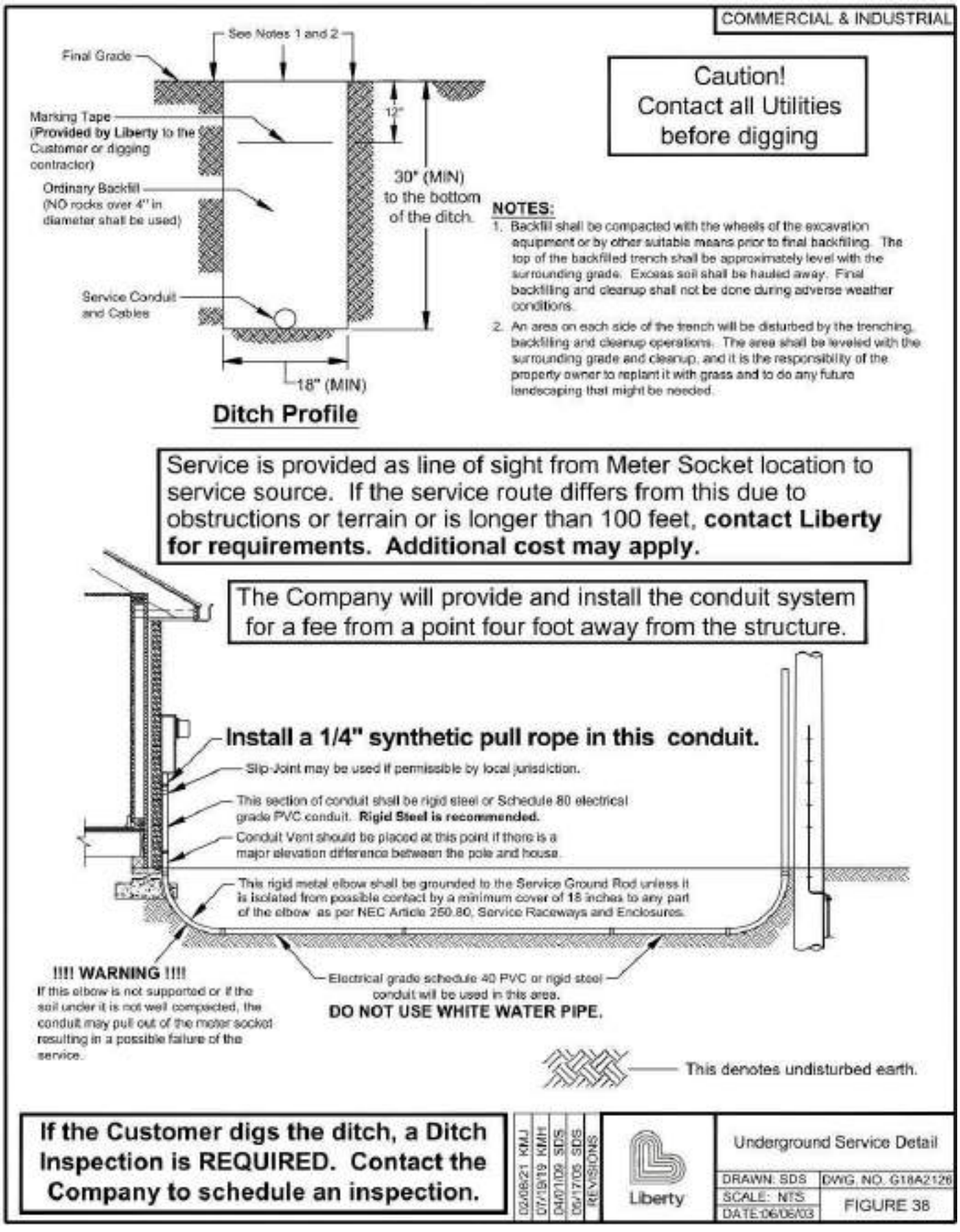


Figure 38: Underground Service Detail

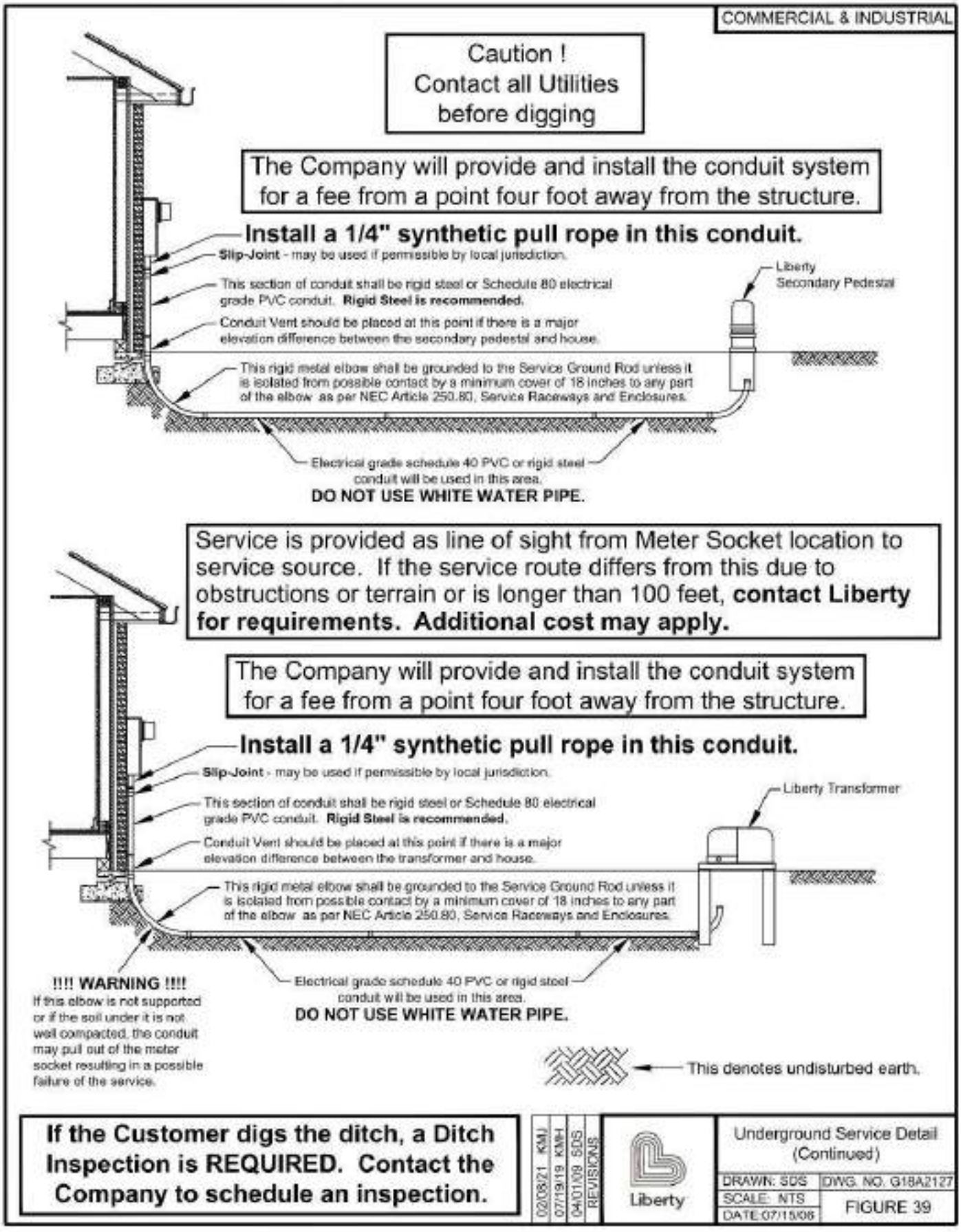


Figure 39: Underground Service Detail (Continued)

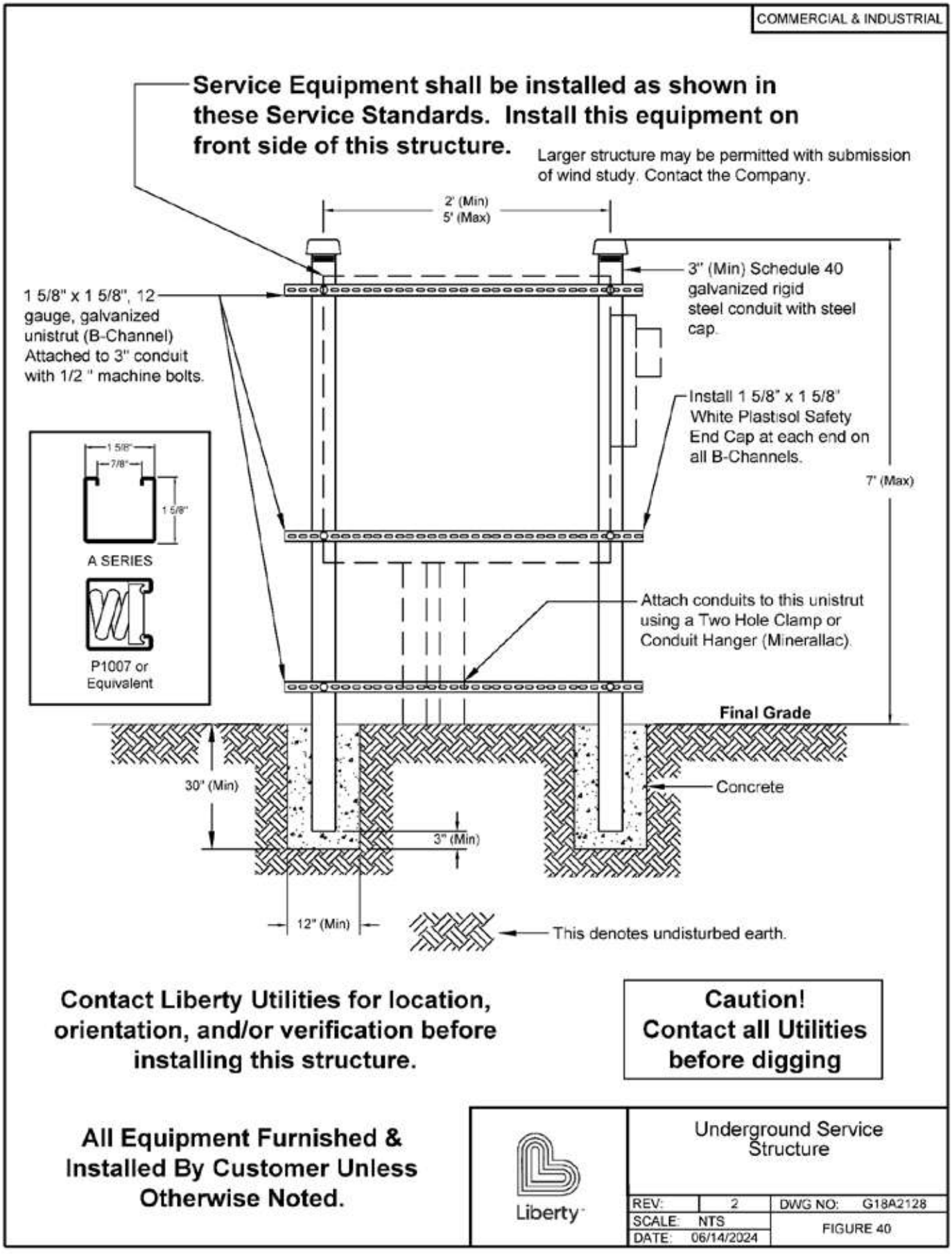


Figure 40: Underground Service Structure

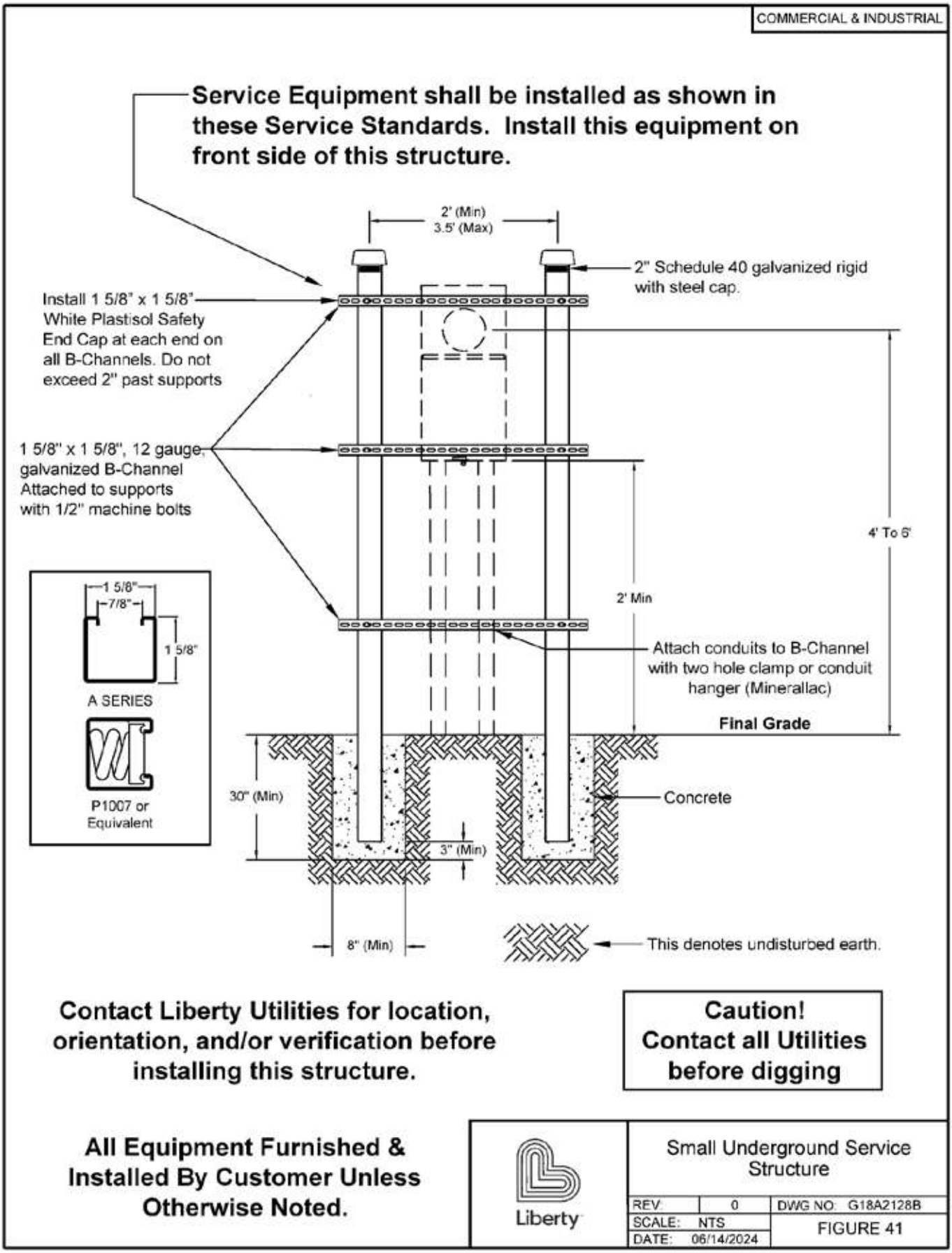


Figure 41: Small Underground Service Structure

7.2 200 AMP AND 320 AMP SINGLE PHASE UNDERGROUND SERVICE

A. General Notes:

1. Service entrance conductors, 5/8" x 8' copper clad steel ground rod, ground rod clamp, ground wire, conduit, conduit straps, lock nuts, bushings meter socket, main disconnect, hub closing plate, and miscellaneous mounting hardware furnished and in- stalled by customer.
2. Meter and service lateral conductors furnished and installed by Company.
3. The meter socket shall be “readily accessible” (see definitions). The Company re- quires a level and unobstructed workspace of 78 inches tall, 18 inches on either side, and 48 inches in front of the meter socket. Prior approval is required for placement of the meter socket in alleyways or areas where it may be subject to damage.
4. The 200 amp and 320 amp meter sockets shall meet the following specifications:
   a. The latest revision of U.L. 414 and ANSI C12.7 Standards.
   b. NEMA 3R compliant enclosure
   c. Must be U.L. listed.
   d. Must have grounding connector for triplex.
   e. Lug size – 2/0 minimum.
   f. On 120/208v services the customer must provide the meter socket and 5th lug installed in the 9 o’clock position.
   g. **This is not a complete list of criteria for acceptance. See Appendix A for list of approved meter sockets.**
5. Conduit system shall be installed as per Figure 38 or 39.

B. Mounting:

1. Meter socket, ground wire, and conduit shall be surface mounted and securely fastened to the exterior structure. The meter socket shall be installed in a level and plumb position. **Flush mounted metering or recessed equipment and service lateral conduit embedded in a wall will not be permitted.**
2. Where the exterior wall is other than brick or concrete blocks, a frame shall be installed behind the exterior wall to provide a solid mounting surface for the meter socket.
3. Meter sockets, metering cabinets, and conduit straps shall be installed with the following:
   a. Lead anchors or double helix concrete screws shall be used with brick or solid concrete surfaces.
   b. Toggle bolts shall be used with other masonry siding.
   c. Wood screws shall be used with solid wood surfaces.
   d. All mounting hardware shall be minimum #12(1/4”) corrosion resistant screws.
   e. A minimum of 4 fasteners shall be used to install any socket or cabinet unless specifically stated otherwise.
4. An intersystem bonding termination bar shall be installed in accordance with NEC 250.94 to facilitate the connection of other utility’s ground to a common ground. The location of this device shall be located directly below the meter socket or meter combination socket.
   a. See Appendix A for list of approved intersystem bonding termination bars.

5. If PVC is used for the conduit attached to the meter socket, the rigid metal elbow shall be grounded/bonded to the service ground rod unless it is isolated from possible contact by a minimum cover of 18 inches to any part of the elbow as per NEC Article 250.80, Service Raceways and Enclosures.

   a. See Appendix A for list of approved grounding clamps.

6. For 200 amp service, a minimum of two inch (2") galvanized rigid steel or electrical grade Schedule 80 PVC conduit shall be furnished and installed by Customer as shown in Figure 42.
7. For 320 amp service, a minimum of three inch (3”) galvanized rigid steel or electrical grade Schedule 80 PVC conduit shall be furnished and installed by Customer as shown in Figure 42.

C. Connections:

1. Do not score load wire when removing insulation.
2. The customer shall use wire brush or sandpaper to clean all conductors, apply a non-grit type inhibitor and tighten to manufacturer’s specifications.

D. Conductor Marking:

All neutral conductors shall be clearly marked with white tape at the meter socket.

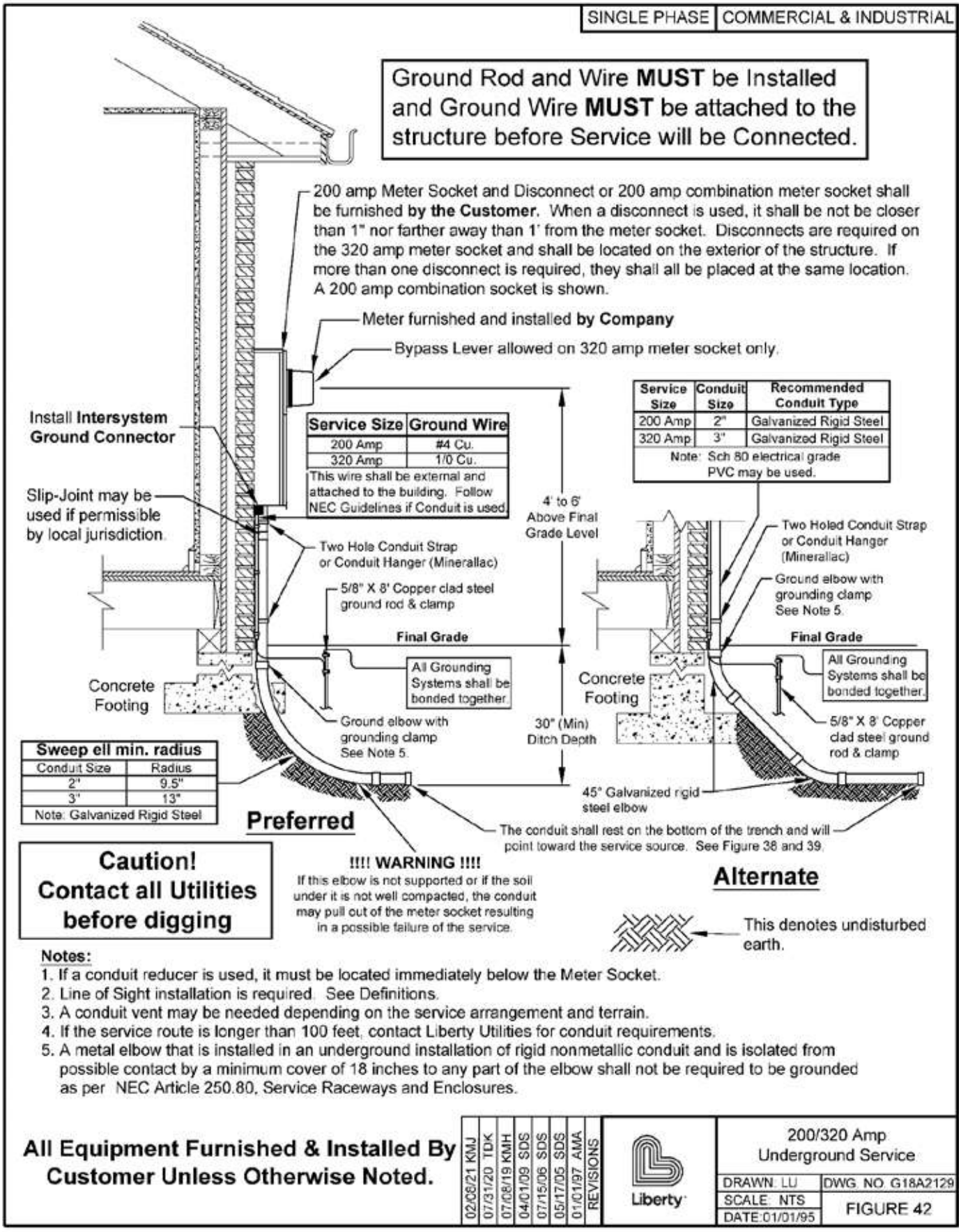


Figure 42: 200/320 Amp Underground Service

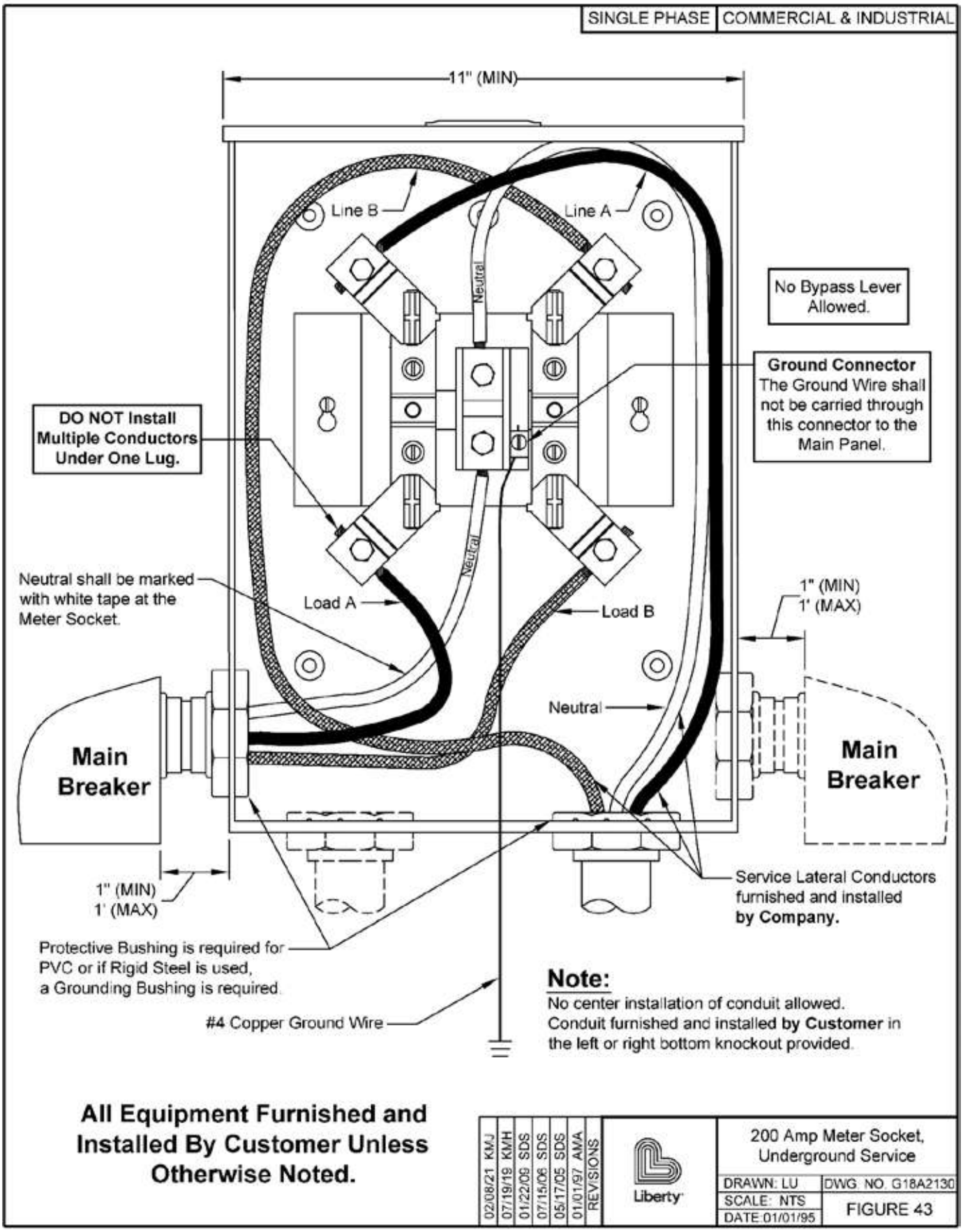


Figure 43: 200 Amp Meter Socket, Underground Service

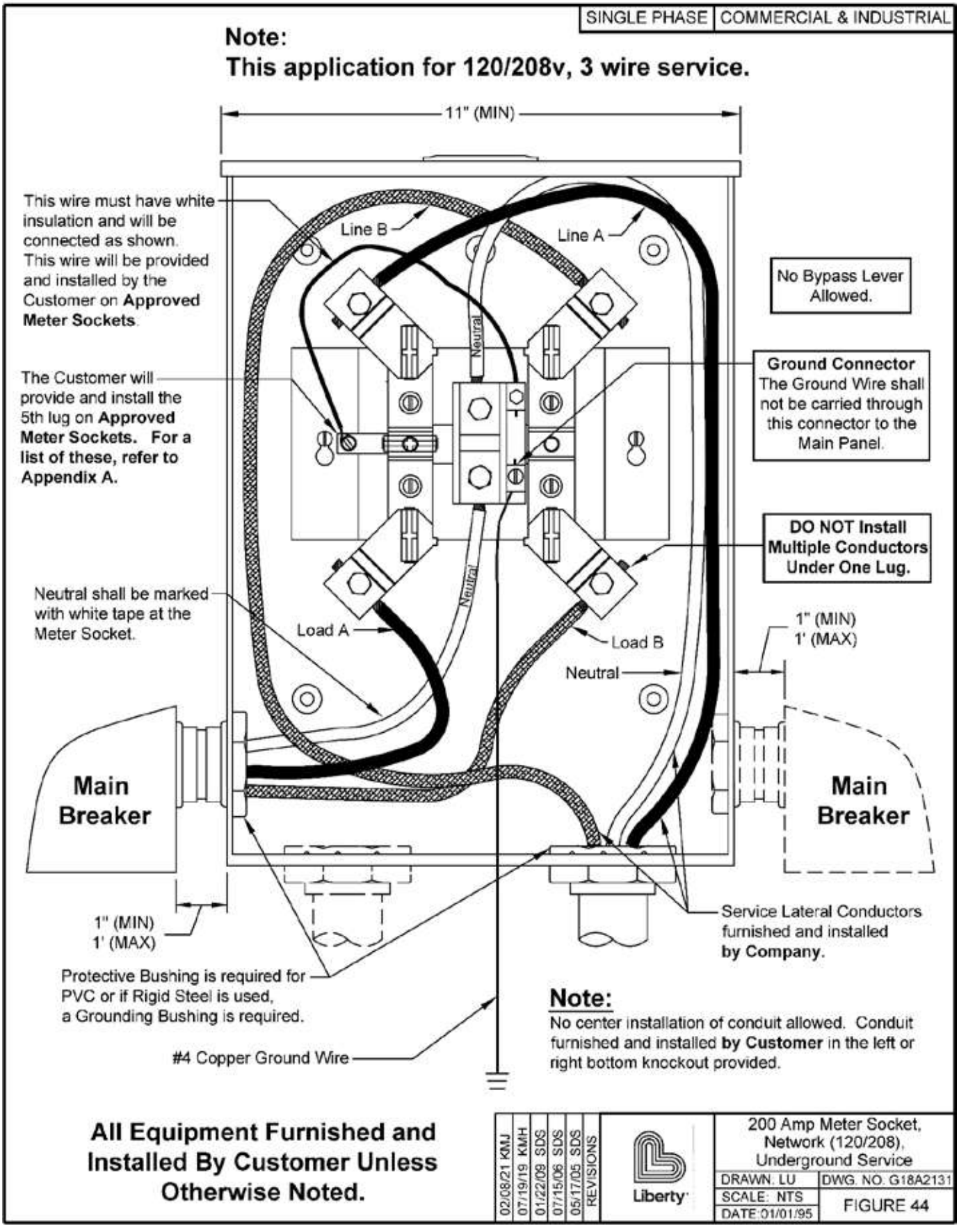


Figure 44: 200 Amp Meter Socket, Network (120/208), Underground Service

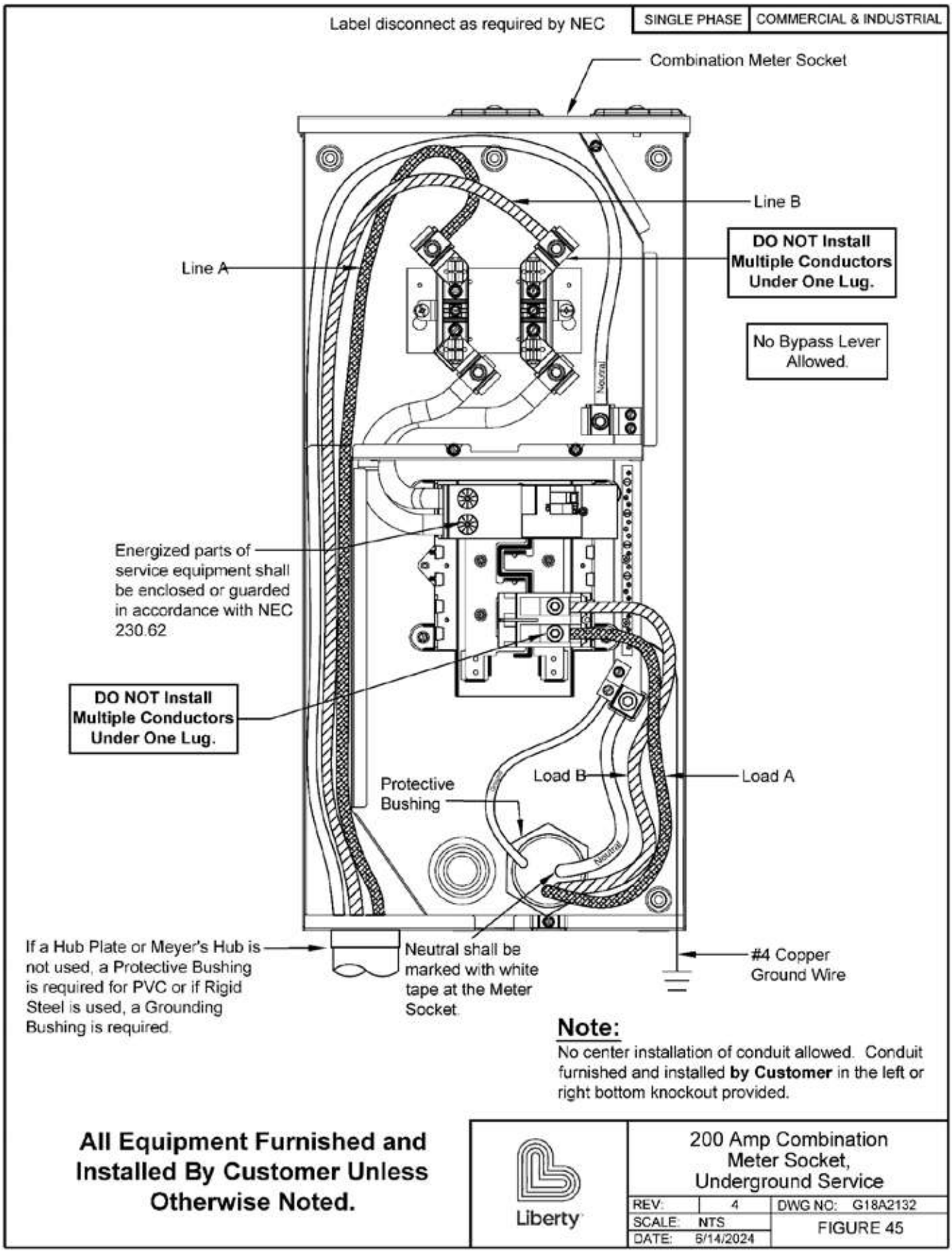


Figure 45: 200 Amp Combination Meter Socket, Underground Service

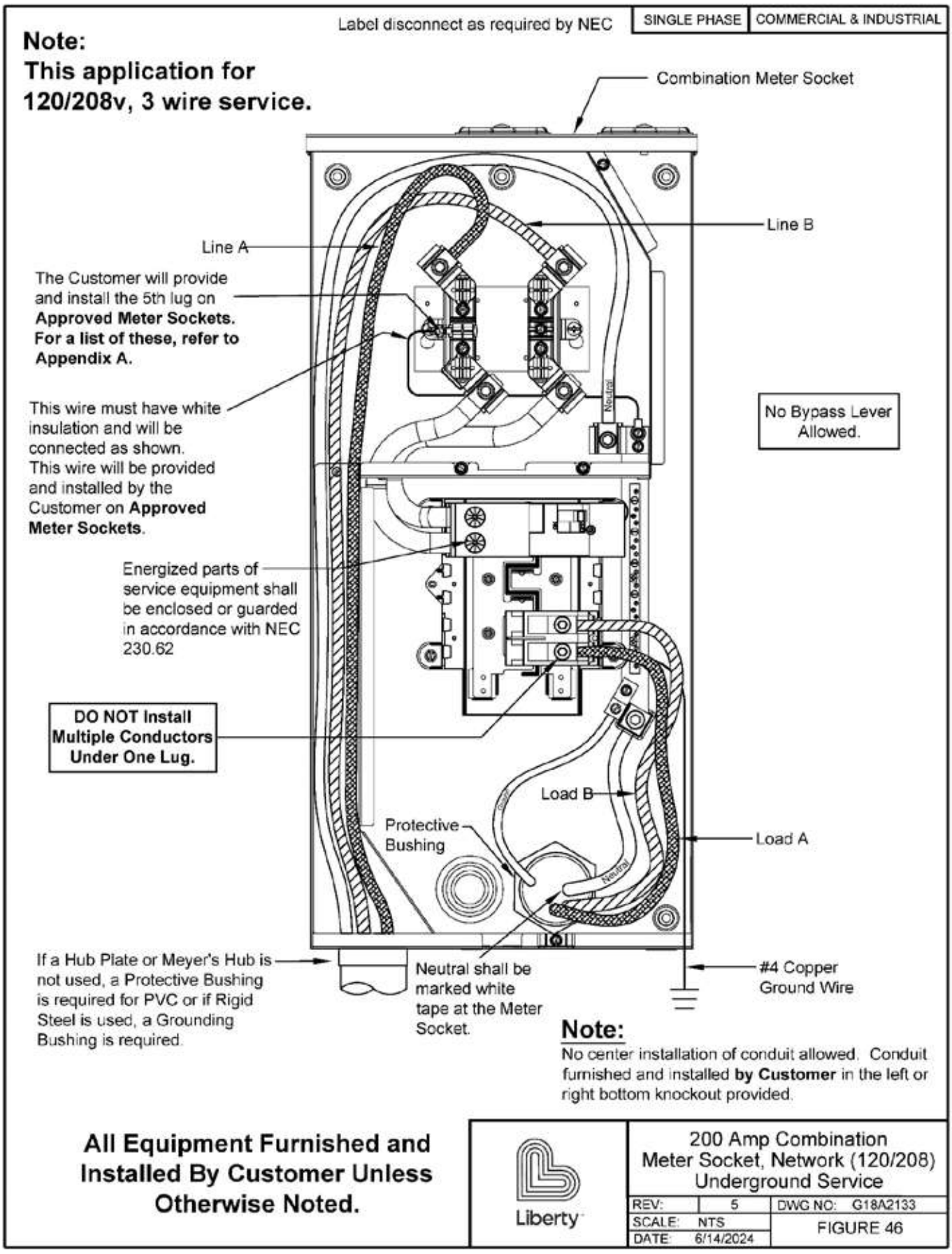


Figure 46: 200 Amp Combination Meter Socket, Network (120/208) Underground Service

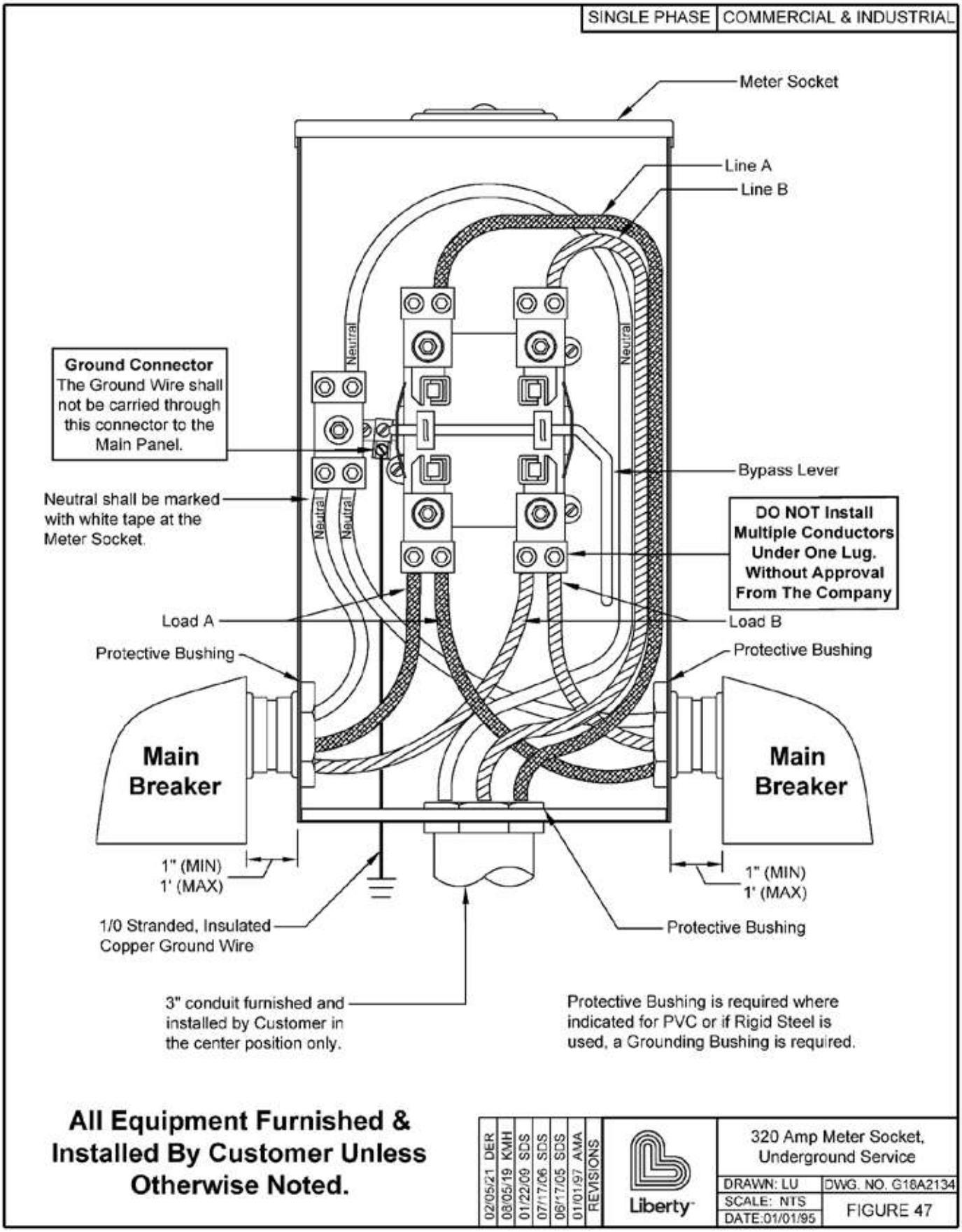


Figure 47: 320 Amp Meter Socket, Underground Service

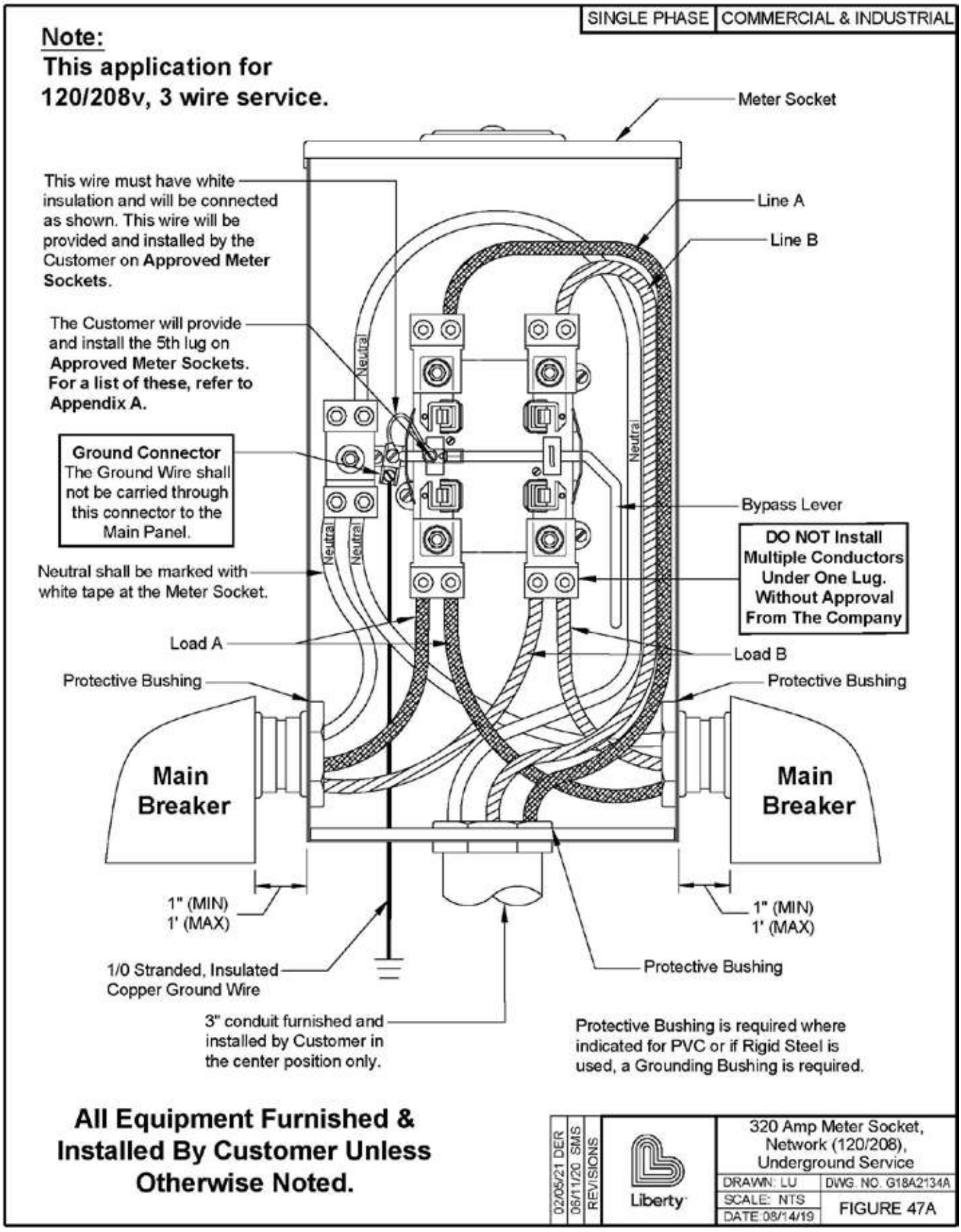


Figure 47A: 320 Amp Meter Socket, Network (120/208), Underground Service

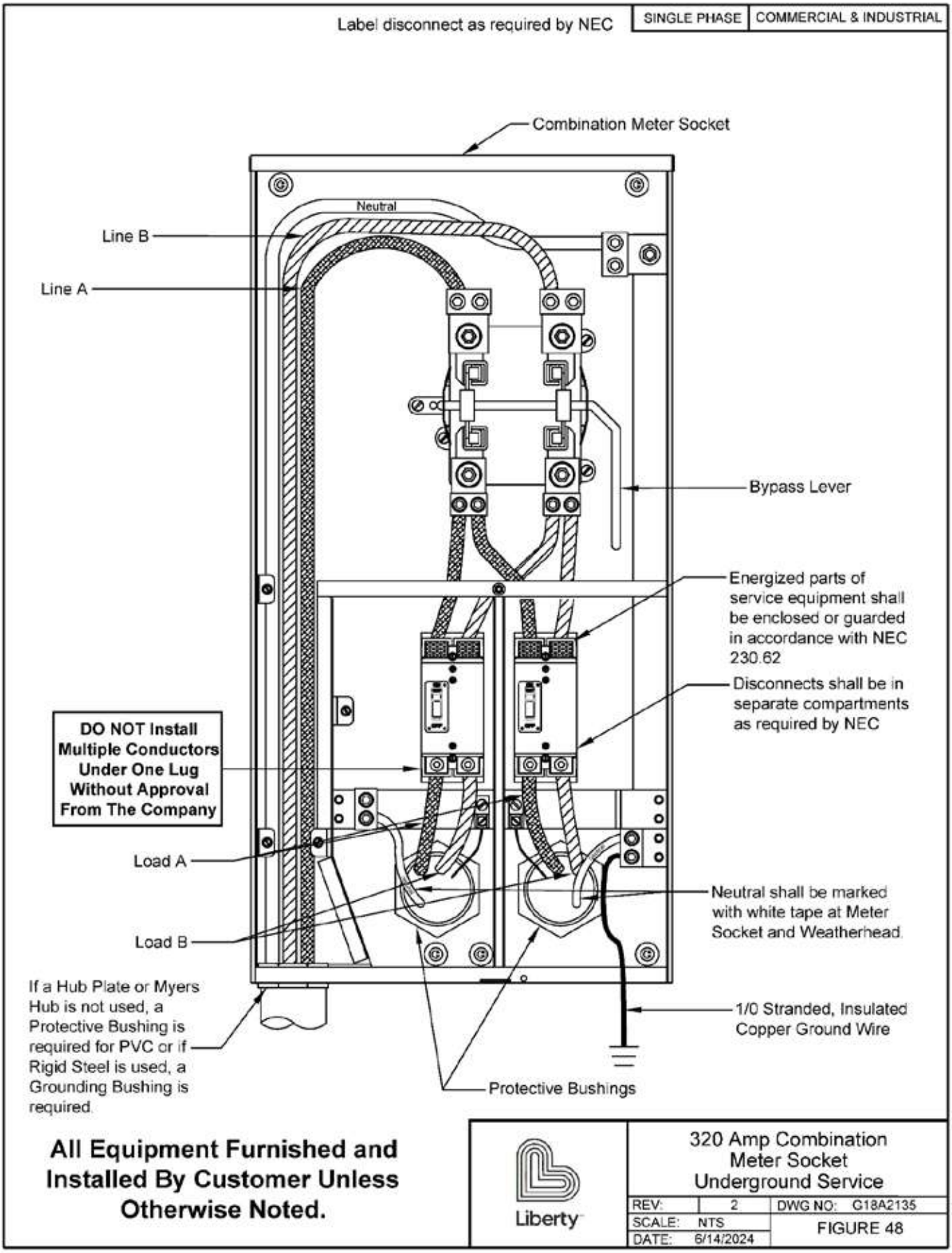


Figure 48: 320 Amp Combination Meter Socket Underground Service

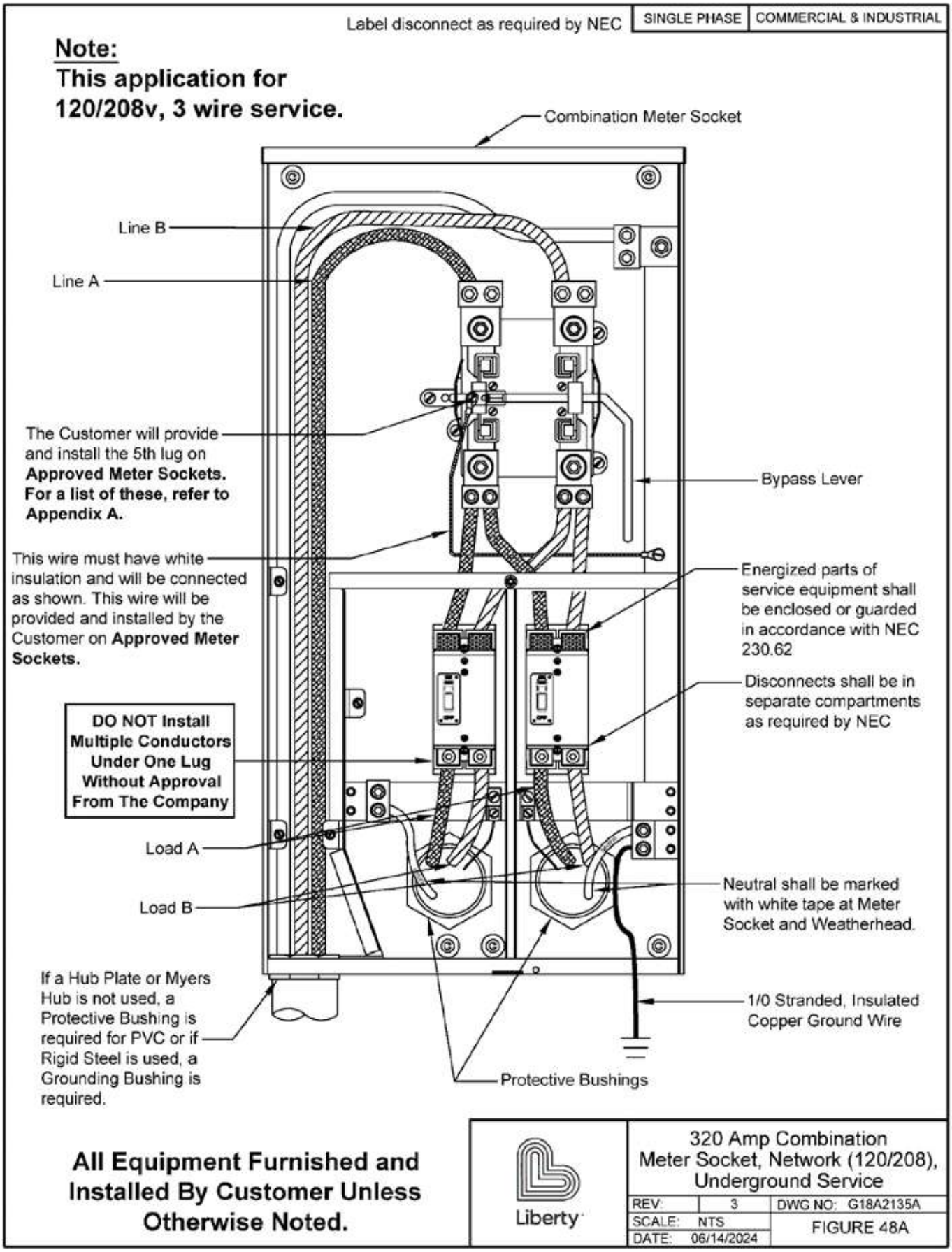


Figure 48A: 320 Amp Combination Meter Socket, Network (120/208), Underground Service

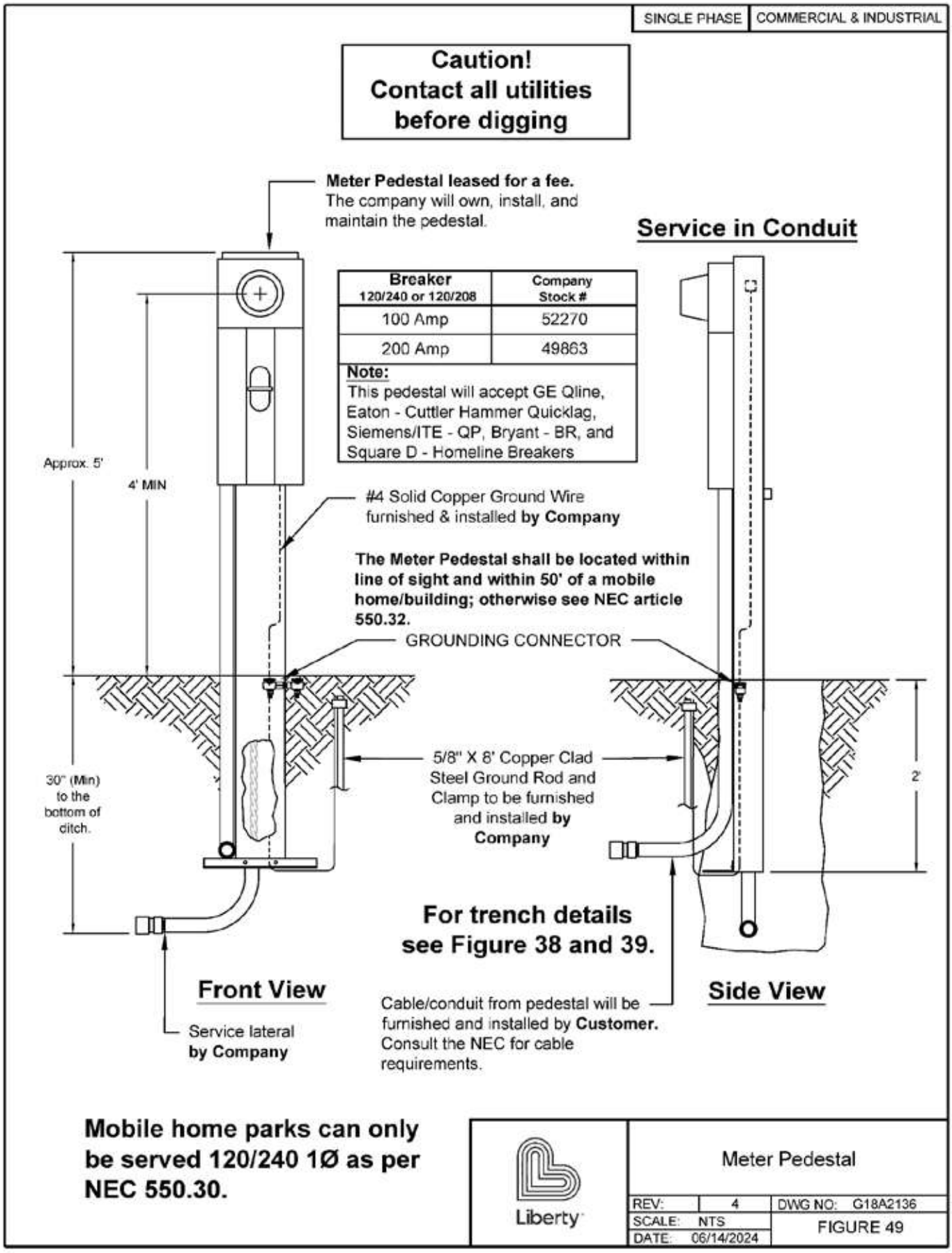


Figure 49: Meter Pedestal

7.3 400 AMP TO 800 AMP CT METERING, SINGLE PHASE UNDERGROUND SERVICE

A. General Notes:

1. This arrangement may be utilized for services equal and above 400 amps and less than or equal to 800 amps.
2. The disconnection method may be composed of multiple disconnects to make up the full 800 amp capacity of the service as long as there are not more than 6. If one disconnect is used and it is greater than 400 amps, it may be located on the interior of the building unless the authority having jurisdiction dictates otherwise. Disconnects of 400 amps and below will be located on the exterior of the building.

   Please note that in all cases, the disconnects making up this service will be at the same location and are required to be located in separate compartments or enclosures.

3. The service lateral conductors and meter are furnished and installed by the Company. Customer will provide approximate final grade level within six inches (6") prior to service lateral installation.
4. The current transformers (CT's) are furnished and installed by the Company. The Customer shall provide and install the CT/connection cabinet.

   a. See Appendix A for list of approved CT/connection cabinets.

5. The meter socket shall be purchased from the Company and installed by the Customer. The Location of this CT Cabinet and Meter will be determined by Liberty.
6. The metering control cable shall be furnished and installed by the Company.
7. The metering equipment shall be "readily accessible" (see definitions). The Company requires a level and unobstructed workspace of 78 inches tall, 18 inches on either side, and 48 inches in front of the metering equipment. Prior approval is required for placement of the metering equipment in alleyways or areas where it may be subject to damage.

B. Mounting:

1. Meter socket, ground wire, CT/connection cabinet, and conduits for service lateral and metering control cable shall be surface mounted and securely fastened to the structure. The meter socket shall be installed in a level and plumb position. **Flush mounted or recessed metering equipment and service lateral conduit embedded in a wall will not be permitted.**
2. Where the exterior wall is other than brick or concrete blocks, a support frame shall be installed behind the exterior wall to provide a solid mounting surface for the metering equipment.
3. Meter sockets, metering cabinets, and conduit straps shall be installed with the following:

   a. Lead anchors or double helix concrete screws shall be used with brick or solid concrete surfaces.
   b. Toggle bolts shall be used with other masonry siding.
   c. Wood screws shall be used with solid wood surfaces.
   d. All mounting hardware shall be minimum #12(1/4") corrosion resistant screws.
   e. A minimum of 4 fasteners shall be used to install any socket or cabinet unless specifically stated otherwise.

4. An intersystem bonding termination bar shall be installed in accordance with NEC 250.94 to facilitate the connection of other utility's ground to a common ground. The location of this device shall be located directly below the meter socket or meter combination socket.

   a. See Appendix A for list of approved intersystem bonding termination bars.

5. If PVC is used for the conduit attached to the meter socket, the rigid metal elbow shall be grounded/bonded to the service ground rod unless it is isolated from possible contact by a minimum cover of 18 inches to any part of the elbow as per NEC Article 250.80, Service Raceways and Enclosures.

   a. See Appendix A for list of approved grounding clamps.

6. Conduits shall be furnished and installed by Customer.

C. Connections:

   All connections inside the CT/connection cabinet shall be made by Company. The Company shall provide the connectors.

D. Conductor Marking:

   All neutral conductors shall be clearly marked with white tape at the point of delivery.

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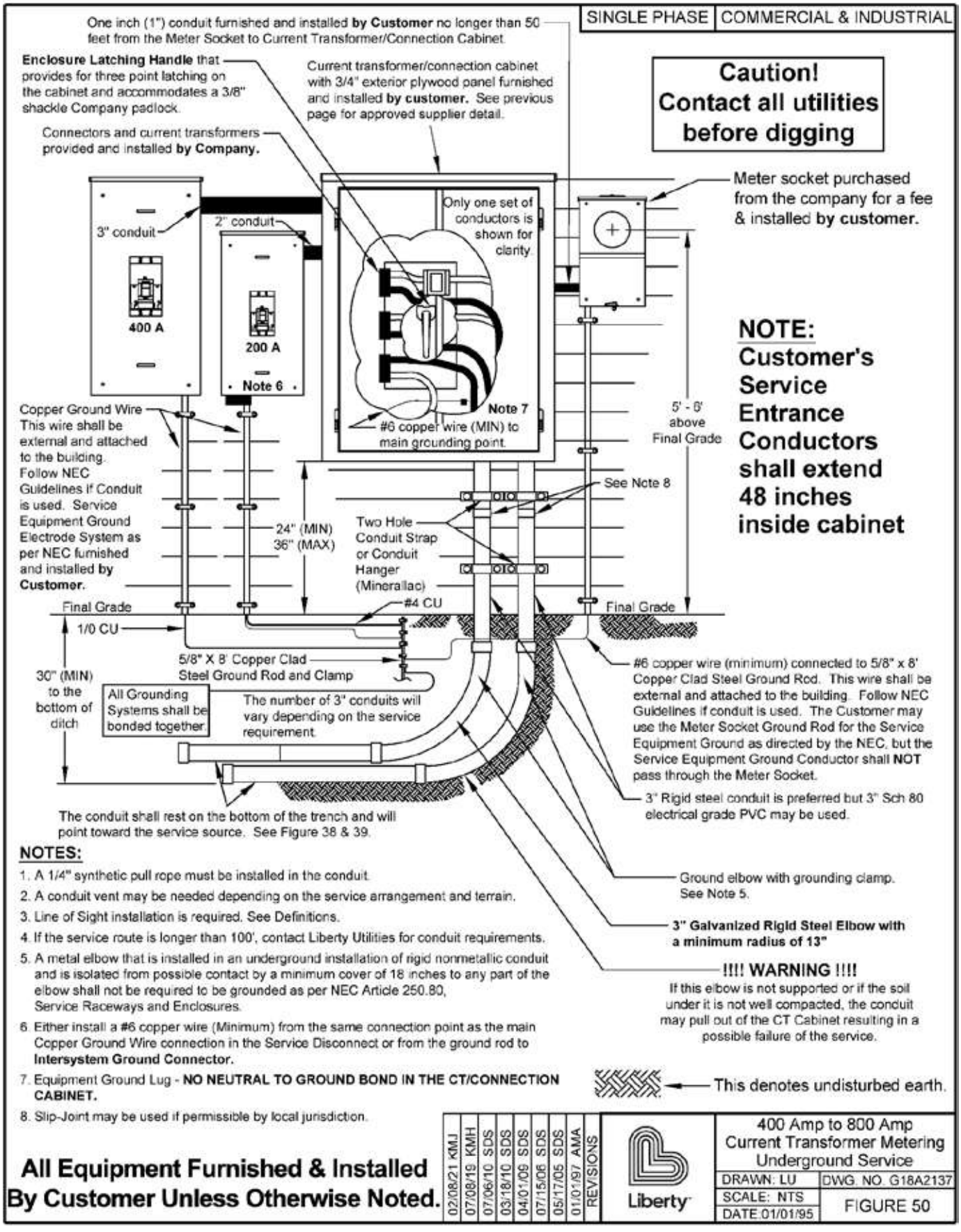

Figure 50: 400 Amp to 800 Amp Current Transformer Metering Underground Service

7.4 MULTIPLE METERS, SINGLE PHASE UNDERGROUND SERVICE

A. General Notes:

1. If more than six meters are required, consult the Company for approval of equipment prior to purchase.
2. Service entrance conductors, 5/8" x 8' copper clad steel ground rod, ground rod clamp, ground wire, conduit, conduit straps, lock nuts, bushings, meter socket assembly, hub closing plate, and miscellaneous mounting hardware furnished and installed by the Customer.
3. Meters, service connectors, and service lateral conductors furnished and installed by Company.
4. The meter socket assembly should be “readily accessible” (see definitions). The Company requires a level and unobstructed workspace of 78 inches tall, 18 inches on either side, and 48 inches in front of the meter socket assembly. Prior approval is required for placement of the meter socket assembly in alleyways or areas where it may be subject to damage.
5. The 100 Amp and 200 Amp meter sockets shall meet the following specifications:
   a. The latest revision of U.L. 414 and ANSI C12.7 Standards.
   b. NEMA 3R compliant enclosure
   c. Must be U.L. listed.
   d. Must have grounding connector for triplex.
   e. Lug size – 2/0 minimum.
   f. On 120/208v services, the customer must provide the meter socket with 5th lug installed in the 9 o’clock position.
   g. **This is not a complete list of criteria for acceptance. See Appendix A for list of approved meter sockets.**

B. Mounting:

1. Meter socket assembly, ground wire, and conduit shall be surface mounted and securely fastened to the structure. The meter socket assembly shall be installed in a level and plumb position. **Flush mounted or recessed metering equipment and service lateral conduit embedded in a wall will not be permitted.**
2. Where the exterior wall is other than brick or concrete blocks, a support frame shall be installed behind the exterior wall to provide a solid mounting surface for the meter socket.
3. Meter sockets, metering cabinets, and conduit straps shall be installed with the following:
   a. Lead anchors or double helix concrete screws shall be used with brick or solid concrete surfaces.
   b. Toggle bolts shall be used with other masonry siding.
   c. Wood screws shall be used with solid wood surfaces.
   d. All mounting hardware shall be minimum #12(1/4”) corrosion resistant screws.
   e. A minimum of 4 fasteners shall be used to install any socket or cabinet unless specifically stated otherwise.

4. An intersystem bonding termination bar shall be installed in accordance with NEC 250.94 to facilitate the connection of other utility's ground to a common ground. The location of this device shall be located directly below the meter socket or meter combination socket.

   a. See Appendix A for list of approved intersystem bonding termination bars.

5. If PVC is used for the conduit attached to the meter socket, the rigid metal elbow shall be grounded/bonded to the service ground rod unless it is isolated from possible contact by a minimum cover of 18 inches to any part of the elbow as per NEC Article 250.80, Service Raceways and Enclosures.

   a. See Appendix A for list of approved grounding clamps.

6. Conduit ends shall be equipped with a proper bushing to protect the conductors.

C. Connections:

1. The Customer is responsible for termination of the incoming wiring if the wire terminates in a main breaker or fuse holder. The Company will terminate the incoming wire if it terminates on bus bar terminals. The main breaker will be removed when the service wire is being pulled by the Company.
2. Do not score load wire when removing insulation.
3. The Customer shall use wire brush or sandpaper to clean all conductors, apply a non-grit type inhibitor and tighten to manufacturer's specifications.

D. Meter Socket Marking:

1. Before the meters are installed, each socket position and corresponding building unit, i.e., apt number or letter, Suite number or letter, tenant number or letter, or physical address served shall be <u>accurately, clearly, and permanently labeled</u> with an engraved plaque. Plaques shall be screwed, bolted or riveted externally to the equipment. See Figures 51, 52, and 52A for proper location. If the equipment is marked incorrectly, the customer shall be responsible for all costs incurred by Liberty for correcting the meter socket identification. Please note that marker ink or adhesive labels are examples of non-permanent labeling.

2. Letters or numbers on the engraved plaque shall be a minimum of one (1) inch in height and of contrasting color, i.e., black and white, red and green, orange and blue, etc.

E. Conductor Marking:

All neutral conductors shall be clearly marked with white tape at the meter socket assembly.

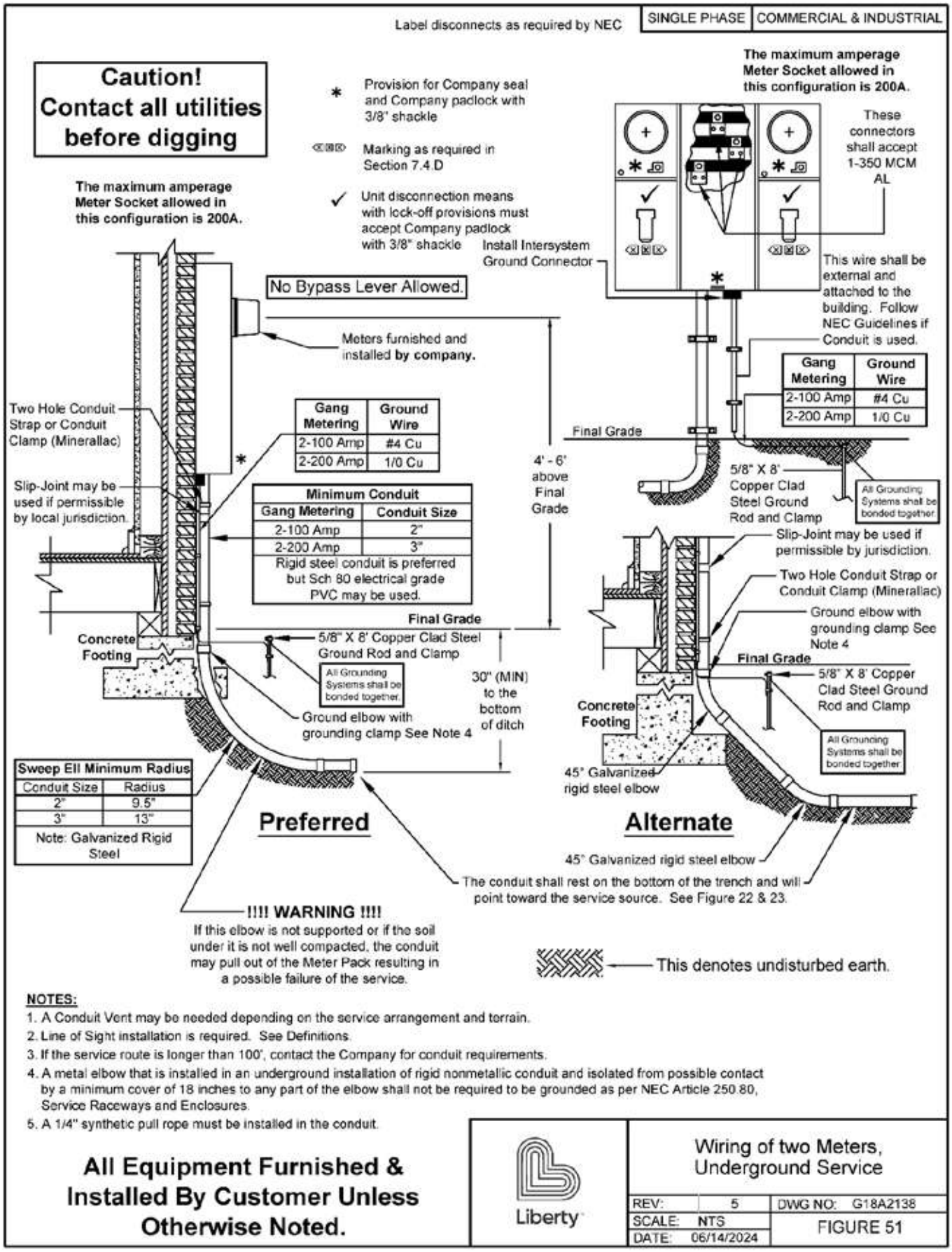

Figure 51: Wiring of two Meters, Underground Service

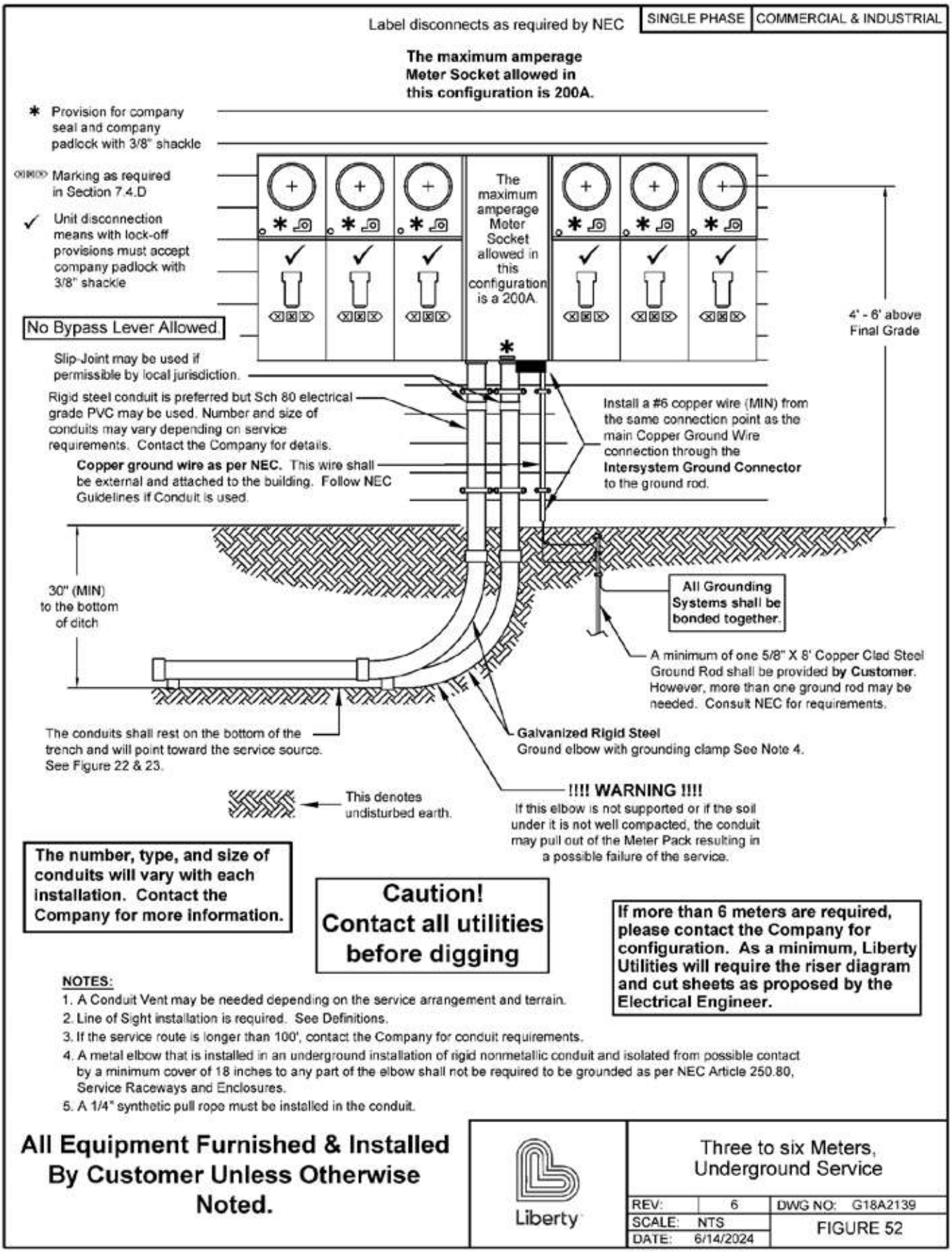

Figure 52: Three to Six Meters, Underground Service

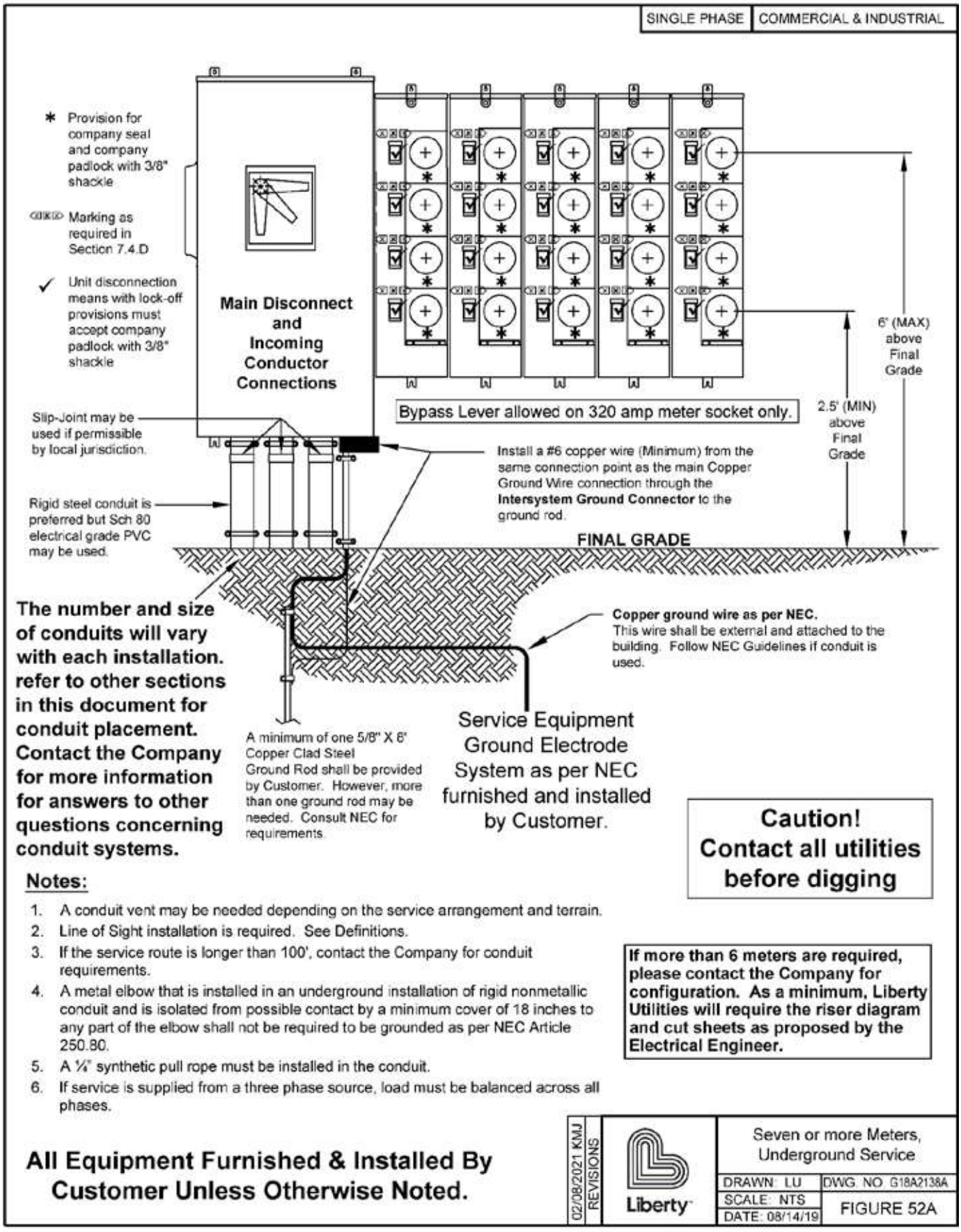

Figure 52A: Seven or more Meters, Underground Service

7.5 200 AMP(208Y/120V or 240Δ/120V only) THREE PHASE UNDERGROUND SERVICE

A. General Notes:

1. Service entrance conductors, 5/8" x 8' copper clad steel ground rod, ground rod clamp, ground wire, conduit, conduit straps, lock nuts, bushings, meter socket, main disconnect and miscellaneous mounting hardware furnished and installed by Customer.
2. Meter and service lateral conductors furnished and installed by Company.
3. The meter socket should be “readily accessible” (see definitions). The Company re- quires a level and unobstructed workspace of 78 inches tall, 18 inches on either side, and 48 inches in front of the meter socket. Prior approval is required for placement of the meter socket in alleyways or areas where it may be subject to damage.
4. **The 200 amp meter socket, and hub closing plate shall be purchased from the Company and installed by the Customer.**
5. Conduit system shall be installed as per Figure 38 & 39.

B. Mounting:

1. Meter socket, ground wire, and conduit shall be surface mounted and securely fastened to the exterior structure. The meter socket shall be installed in a level and plumb position. **Flush mounted metering or recessed equipment and service lateral conduit embedded in a wall will not be permitted.**
2. Where the exterior wall is other than brick or concrete blocks, a support frame shall be installed behind the exterior wall to provide a solid mounting surface for the meter sock- et.
3. Meter sockets, metering cabinets, and conduit straps shall be installed with the following:
   a. Lead anchors or double helix concrete screws shall be used with brick or solid concrete surfaces.
   b. Toggle bolts shall be used with other masonry siding.
   c. Wood screws shall be used with solid wood surfaces.
   d. All mounting hardware shall be minimum #12(1/4”) corrosion resistant screws.
   e. A minimum of 4 fasteners shall be used to install any socket or cabinet unless specifically stated otherwise.
4. An intersystem bonding termination bar shall be installed in accordance with NEC 250.94 to facilitate the connection of other utility’s ground to a common ground. The location of this device shall be located directly below the meter socket or meter combination socket.
   a. See Appendix A for list of approved intersystem bonding termination bars.
5. If PVC is used for the conduit attached to the meter socket, the rigid metal elbow shall be grounded/bonded to the service ground rod unless it is isolated from possible contact by a minimum cover of 18 inches to any part of the elbow as per NEC Article 250.80, Ser- vice Raceways and Enclosures.
   a. See Appendix A for list of approved grounding clamps.
6. For 200 amp service, a minimum of three inch (3") galvanized rigid steel or electrical grade Schedule 80 PVC conduit shall be furnished and installed by Customer as shown in Figure 53.

C. Connections:

1. Do not score load wire when removing insulation.
2. The Customer shall use wire brush or sandpaper to clean all conductors, apply a non-grit type inhibitor and tighten to manufacturer's specifications.

D. Conductor marking

1. All neutral conductors shall be clearly marked with white tape at the point of delivery and at the meter socket.
2. The power leg of each 240/120 volt, three-phase, four-wire delta service shall be clearly marked with orange tape at the point of delivery and at the meter socket (refer to Figure 54).

E. Phase Rotation

On three-phase installations to ensure proper equipment operation, the Customer is responsible for verifying phase rotation at the time of service connection.

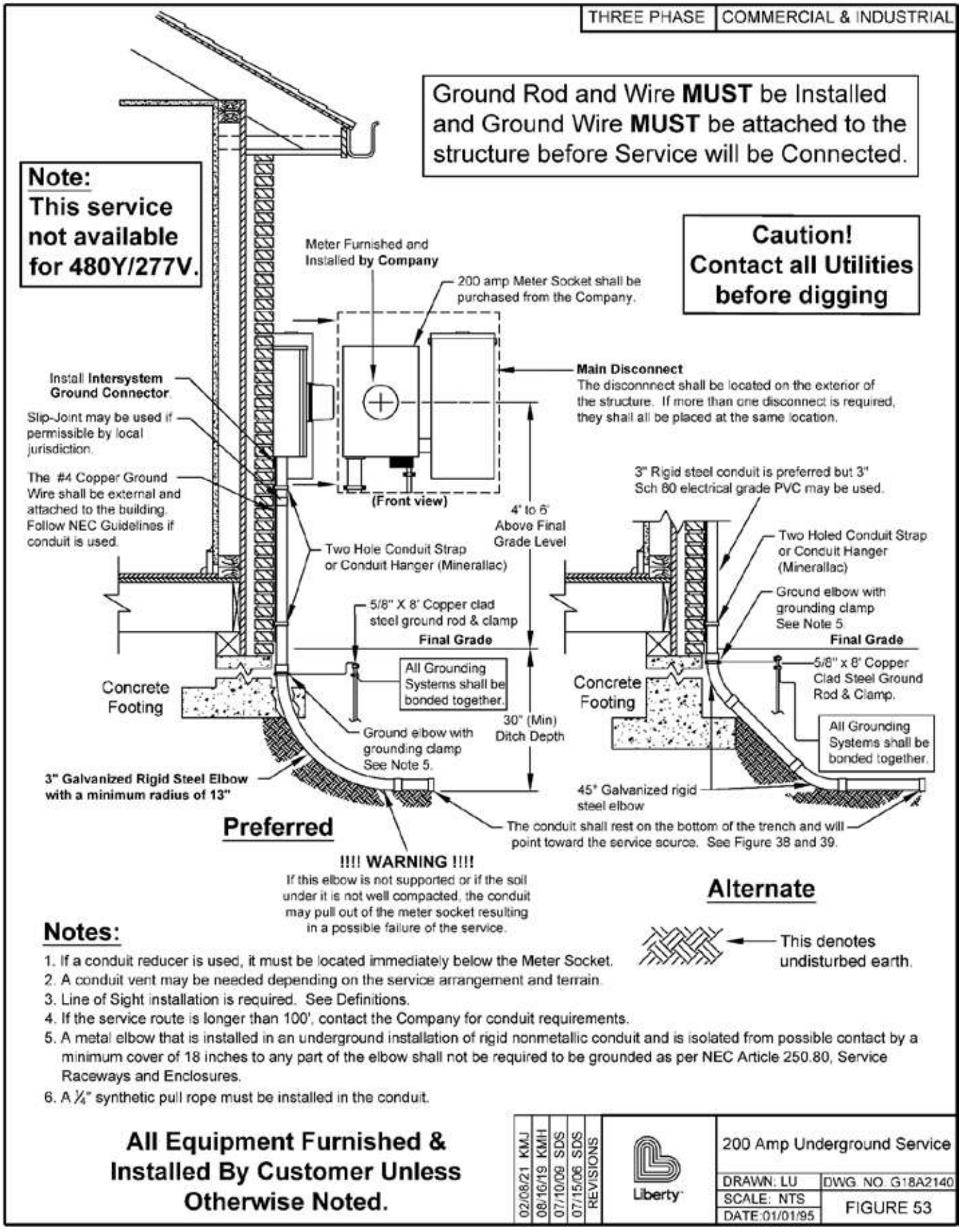

Figure 53: 200 Amp Underground Service

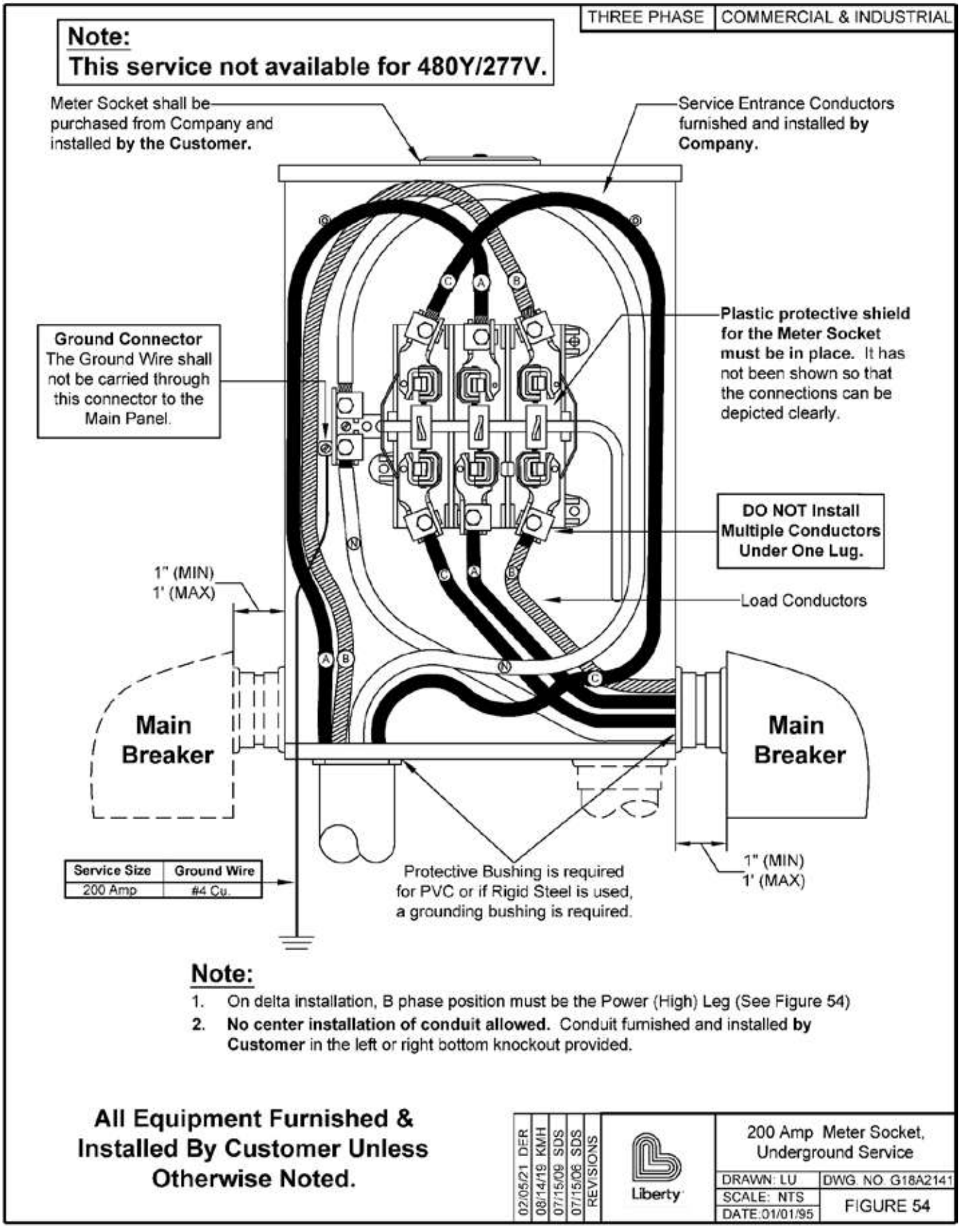

Figure 54: 200 Amp Meter Socket, Underground Service

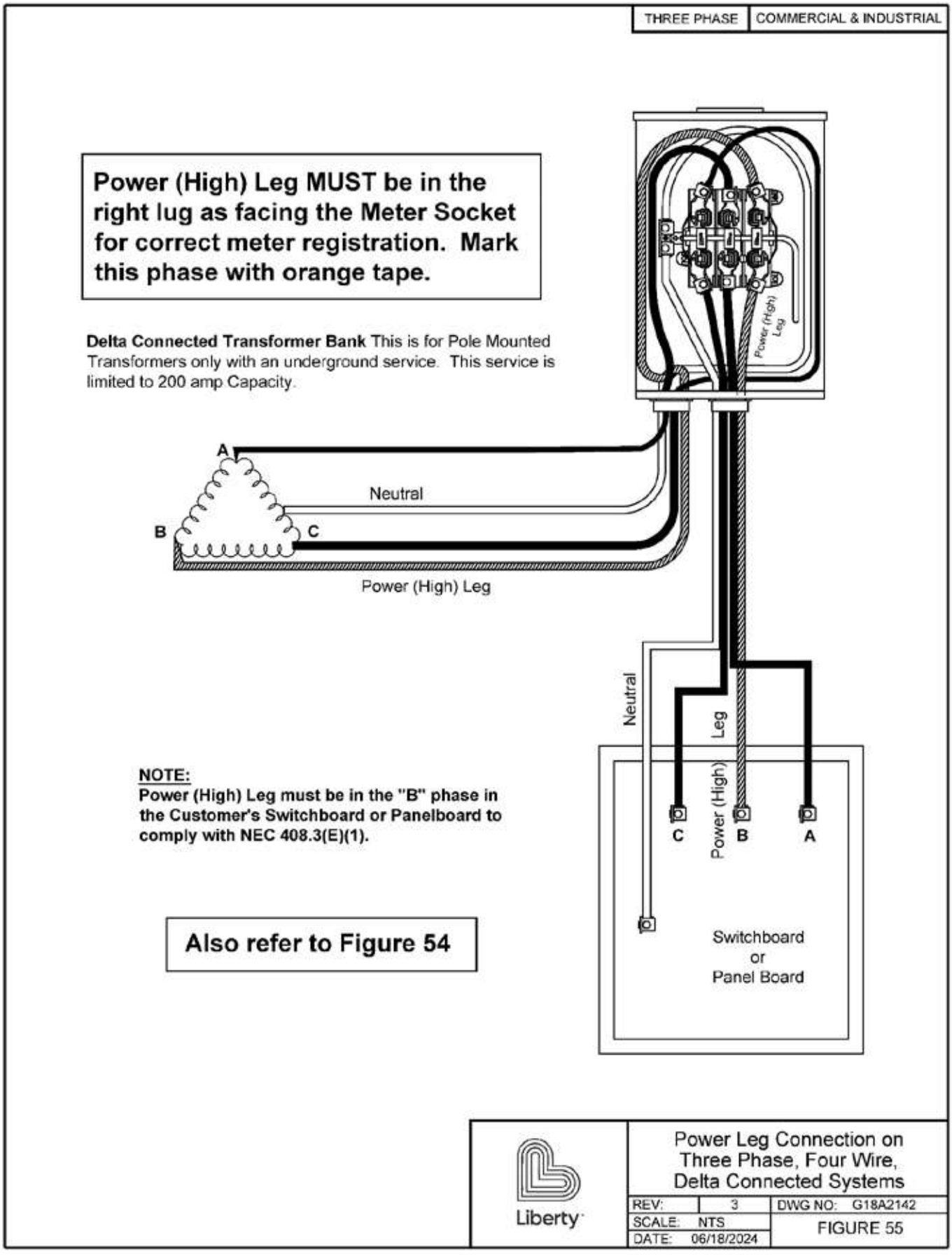

Figure 55: Power Leg Connection on Three Phase, Four Wire, Delta Connected Systems

7.6 200 AMP TO 1200 AMP CT METERING, THREE PHASE UNDERGROUND SERVICE

A. General Notes:

1. This arrangement may be utilized for services from 200 amps and less than or equal to 1200 amps. **For services greater than 1200 amps, contact the Company.**
2. The disconnection method may be composed of multiple disconnects to make up the full 1200 amp capacity of the service as long as there are not more than 6. If one disconnect is used and it is greater than 400 amps, it may be located on the interior of the building unless the authority having jurisdiction dictates otherwise. Disconnects of 400 amps and below shall be located on the exterior of the building.

   Please note that in all cases, the disconnects making up this service will be at the same location and are required to be located in separate compartments or enclosures.

3. The service lateral conductors and meter are furnished and installed by the Company. Customer will provide approximate final grade level within six inches (6") prior to service lateral installation.
4. The current transformers (CT) are furnished and installed by the Company. The Customer shall provide and install the CT/connection cabinet.

   a. See Appendix A for list of approved CT/connections cabinets.

5. The meter socket shall be purchased from the Company and installed by the Customer.
6. The metering control cable shall be furnished and installed by the Company.
7. The metering equipment shall be “readily accessible” (see definitions). The Company requires a level and unobstructed workspace of 78 inches tall, 18 inches on either side, and 48 inches in front of the metering equipment. Prior approval is required for placement of the metering equipment in alleyways or areas where it may be subject to damage.

B. Mounting:

1. Metering equipment, ground wire, and conduits for service lateral and metering control cable shall be surface mounted and securely fastened to the structure. The meter equipment shall be installed in a level and plumb position. **Flush mounted or recessed metering equipment and service lateral conduit embedded in a wall will not be permitted.**
2. Where the exterior wall is other than brick or concrete blocks, a support frame shall be installed behind the exterior wall to provide a solid mounting surface for the metering equipment.
3. Meter sockets, metering cabinets, and conduit straps shall be installed with the following:

   a. Lead anchors or double helix concrete screws shall be used with brick or solid concrete surfaces.
   b. Toggle bolts shall be used with other masonry siding.
   c. Wood screws shall be used with solid wood surfaces.
   d. All mounting hardware shall be minimum #12(1/4”) corrosion resistant screws.
   e. A minimum of 4 fasteners shall be used to install any socket or cabinet unless specifically stated otherwise.

4. An intersystem bonding termination bar shall be installed in accordance with NEC 250.94 to facilitate the connection of other utility's ground to a common ground. The location of this device shall be located directly below the meter socket or meter combination socket.

   a. See Appendix A for list of approved intersystem bonding termination bars.

5. If PVC is used for the conduit attached to the meter socket, the rigid metal elbow shall be grounded/bonded to the service ground rod unless it is isolated from possible contact by a minimum cover of 18 inches to any part of the elbow as per NEC Article 250.80, Service Raceways and Enclosures.

   a. See Appendix A for list of approved grounding clamps.

6. Conduits shall be furnished and installed by the Customer.

C. Connections:

1. All connections inside the CT/connection cabinet shall be made by Company. The Company shall provide the connectors.
2. The point of delivery for this type of service is at the connectors in the CT/connection cabinet.

D. Conductor marking

All neutral conductors shall be clearly marked with white tape at the point of delivery.

E. Phase Rotation

On three-phase installations to ensure proper equipment operation, the Customer is responsible for verifying phase rotation at the time of service connection.

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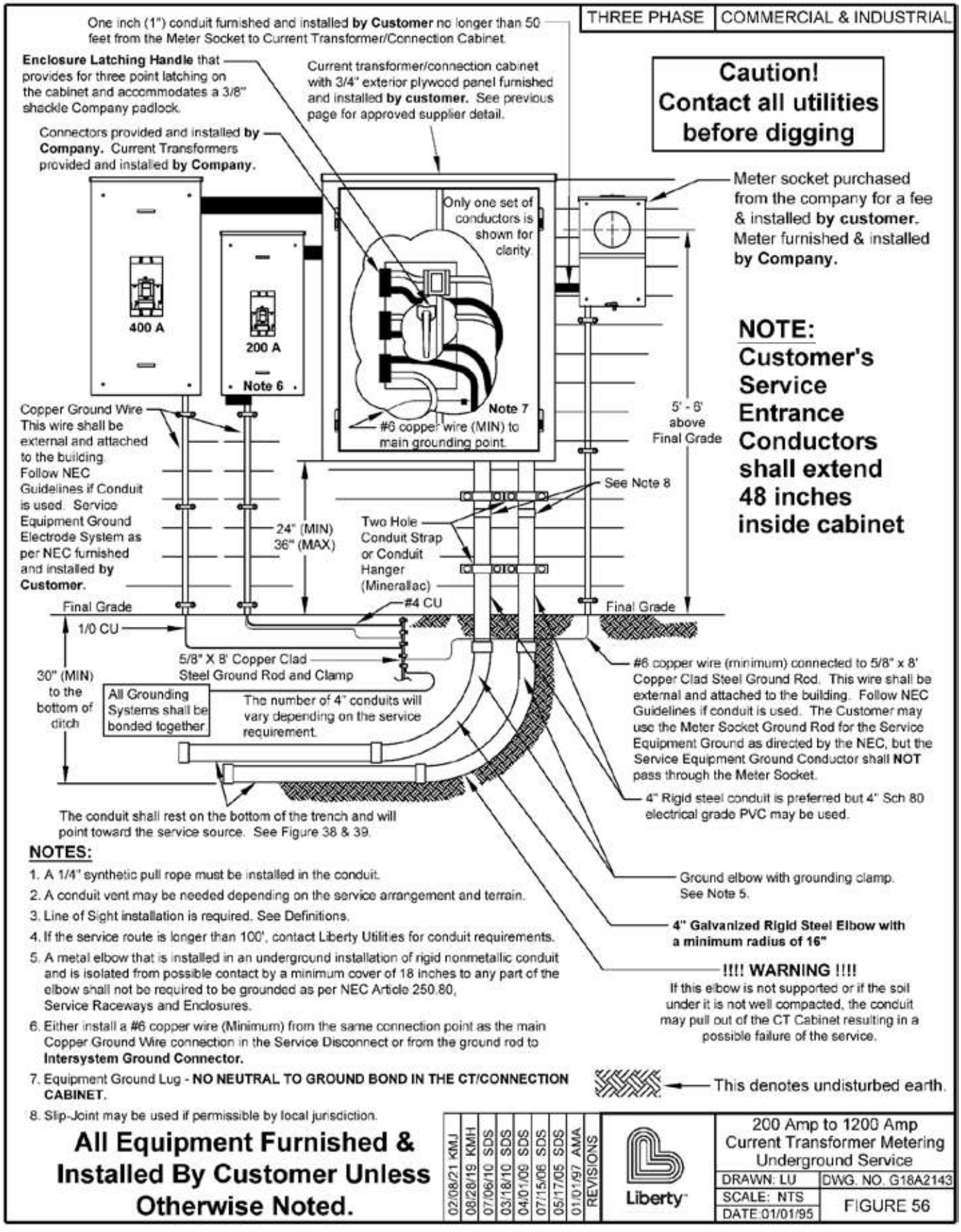


Figure 56: 200 Amp to 1200 Amp Current Transformer Metering Underground Service

7.7 MULTIPLE METERS (208Y/120V or 240 DELTA/120V only), THREE PHASE UNDERGROUND SERVICE

A. General Notes:

1. If more than six meters are required, consult the Company for approval of equipment prior to purchase.
2. Service entrance conductors, 5/8" x 8' copper clad steel ground rod, ground rod clamp, ground wire, conduit, conduit straps, lock nuts, bushings, meter socket assembly, hub closing plate, and miscellaneous mounting hardware furnished and installed by the Customer.
3. Meters and service lateral conductors shall be furnished and installed by the Company.
4. The meter socket assembly shall be "readily accessible" (see definitions). The Company requires a level and unobstructed workspace of 78 inches tall, 18 inches on either side, and 48 inches in front of the meter socket assembly. Prior approval is required for placement of the meter socket assembly in alleyways or areas where it may be subject-ed to damage.
5. If the Company is required to attach the service drop directly to the Customer's meter loop conduit, the Customer shall install a steel service mast.
6. The meter sockets shall meet the following specifications:
   a. The latest revision of U.L. 414 and ANSI C12.7 Standards.
   b. NEMA 3R compliant enclosure
   c. Must be U.L. listed.
   d. Must have grounding connector for quadruplex.
   e. Lug size – 2/0 minimum.
   f. On 208/120v 4 Wire WYE services, the customer must provide the meter socket with 5th lug installed in the 9 o'clock position.
   g. All meter sockets shall be equipped with L&G HQ-7 or equivalent heavy duty jaw clamping & bypass socket mechanism.
   h. **This is not a complete list of criteria for acceptance. See Appendix A for list of approved meter sockets.**

B. Mounting:

1. Meter socket assembly, ground wire, and conduit shall be surface mounted and be securely fastened to the structure. The meter socket assembly shall be installed in a level and plumb position. **Flush mounted or recessed metering equipment and service lateral conduit embedded in a wall will not be permitted.**
2. Where the exterior wall is other than brick or concrete blocks, a support frame shall be installed behind the exterior wall to provide a solid mounting surface for the meter socket assembly.
3. Meter sockets, metering cabinets, and conduit straps shall be installed with the following:
   a. Lead anchors or double helix concrete screws shall be used with brick or solid concrete surfaces.
   b. Toggle bolts shall be used with other masonry siding.
   c. Wood screws shall be used with solid wood surfaces.
   d. All mounting hardware shall be minimum #12(1/4") corrosion resistant screws.
   e. A minimum of 4 fasteners shall be used to install any socket or cabinet unless specifically stated otherwise.

4. An intersystem bonding termination bar shall be in accordance with NEC 250.94 installed to facilitate the connection of other utility's ground to a common ground. The location of this device shall be located directly below the meter socket or meter combination socket.

   a. See Appendix A for list of approved intersystem bonding termination bars.

5. If PVC is used for the conduit attached to the meter socket, the rigid metal elbow shall be grounded/bonded to the service ground rod unless it is isolated from possible contact by a minimum cover of 18 inches to any part of the elbow as per NEC Article 250.80, Service Raceways and Enclosures.

   a. See Appendix A for list of approved grounding clamps.

C. Connections:

1. The Customer is responsible for termination of the incoming wiring if the wire terminates in a main breaker or fuse holder. The Company will terminate the incoming wire if it terminates on bus bar terminals. The main breaker will be removed when the service wire is being pulled by the Company.
2. Do not score load wire when removing insulation.
3. The Customer shall use wire brush or sandpaper to clean all conductors, apply a non-grit type inhibitor and tighten to manufacturer's specifications.

D. Meter Socket Marking:

1. Before the meters are installed, each socket position and corresponding building unit, i.e., apt number or letter, Suite number or letter, tenant number or letter, or physical address served shall be accurately, clearly, and permanently labeled with an engraved plaque. Plaques shall be screwed, bolted or riveted externally to the equipment. See Figures 57 and 58 for proper location. If the equipment is marked incorrectly, the customer shall be responsible for all costs incurred by Liberty for correcting the meter socket identification. Please note that marker ink or adhesive labels are examples of non-permanent labeling.

2. Letters or numbers on the engraved plaque shall be a minimum of one (1) inch in height and of contrasting color, i.e., black and white, red and green, orange and blue, etc.

E. Conductor marking

All neutral conductors shall be clearly marked with white tape at the meter socket assembly.

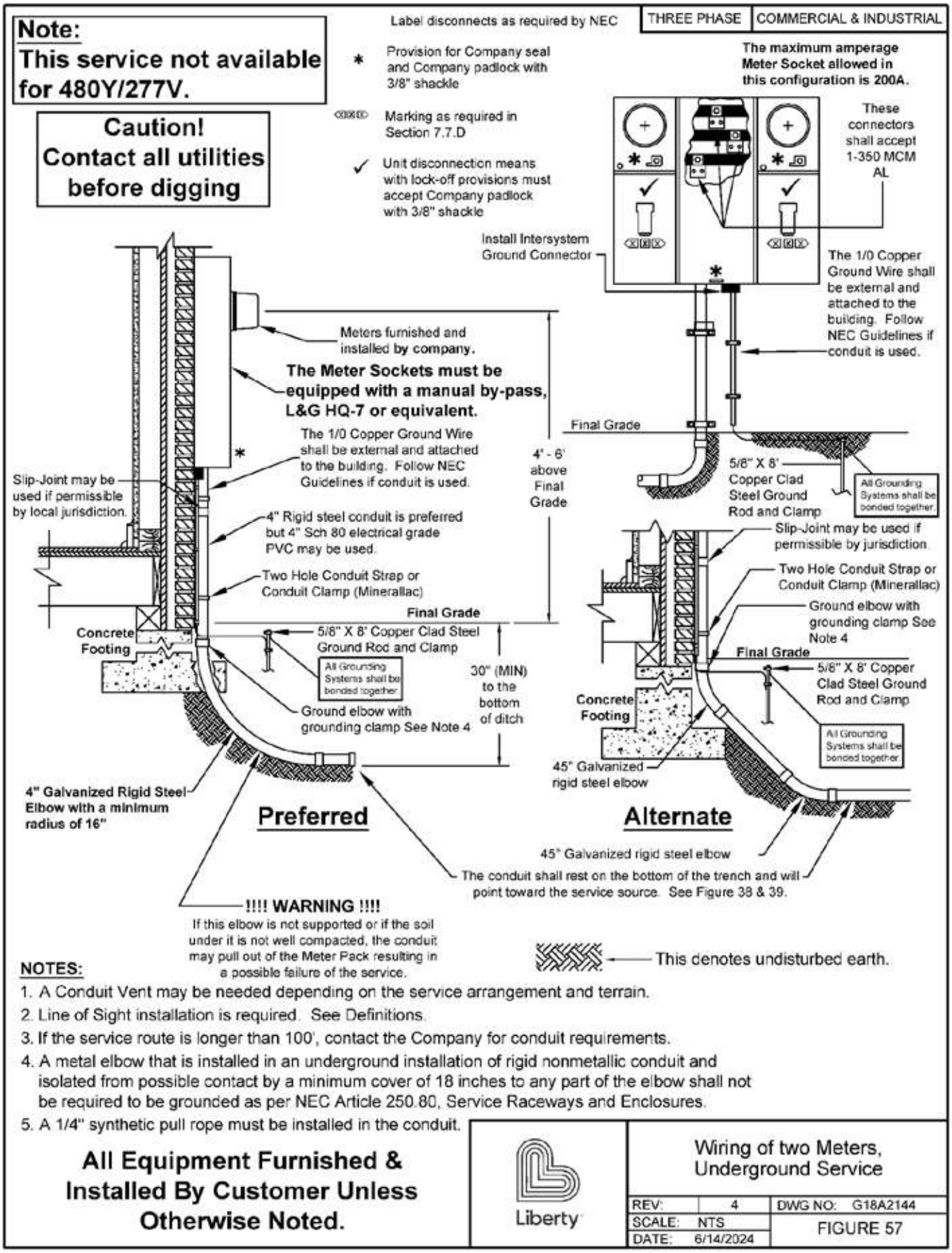


Figure 57: Wiring of Two Meters, Underground Service

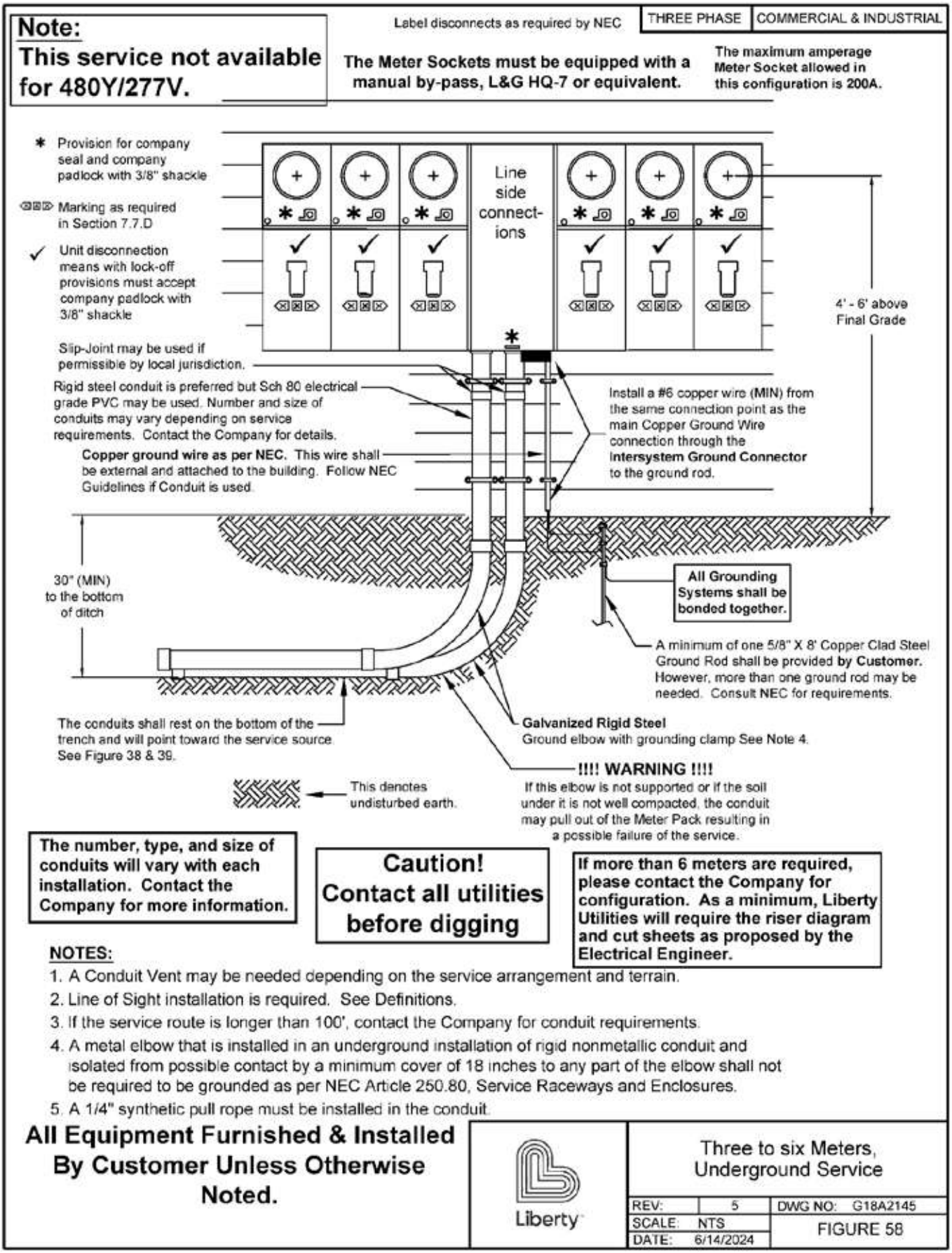


Figure 58: Three to Six Meters, Underground Service

8.0 UNDERGROUND SERVICE FROM PADMOUNT TRANSFORMER

8.1 CT METERING ON THE TRANSFORMER (Preferred Method)

A. General Notes:

1. **This method of service must be approved by the Company. This type of installation is limited to one Customer per transformer.**
2. The disconnection method may be composed of multiple disconnects to make up the full capacity of the service as long as there are not more than 6. If one disconnect is used and it is greater than 400 amps, it may be located on the interior of the building un- less the authority having jurisdiction dictates otherwise. Disconnects of 400 amps and below will be located on the exterior of the building.

   Please note that in all cases, the disconnects making up this service will be at the same location and are required to be located in separate compartments or enclosures.

3. **240/120 volt delta service is not available from a Pad Mounted Transformer.**
4. This arrangement may be utilized for services from 200 amps through 3000 amps.
5. **The Customer shall furnish and install the following: transformer pad, secondary trench and backfill, 8' x 5/8" copper clad ground rod, secondary conduits, and secondary conductors.**
6. The Customer shall install one - 4 inch galvanized rigid steel sweep ell (36" radius) in the primary side of the transformer pad throat (see Figures 58 & 60). Consult with the Company for the direction the conduit is to be pointed from the transformer pad.
7. The current transformers (CT), metering control cable, and meter shall be furnished by the Company.
8. The Customer's Ground Wire (Grounding Conductor) is not required and will not be connected to the Company's transformer grounding system.

B. Installation:

1. The Customer shall provide and install the secondary conductors and conduit system. The secondary conductors shall extend above the transformer pad as per the table below:

Transformer Size (KVA)	Minimum Conductor Length (INCHES)
75-500	48
750-2500	72

2. The point of delivery for this type of service is the secondary terminals of the transformer.
3. **The Customer is responsible for all future maintenance on the secondary service lateral conductors and conduit from the secondary terminals of the three phase transformer to the Customer's service equipment.**
4. The meter socket shall be provided and installed on the transformer by the Company.
5. The current transformers (CT) shall be installed in the transformer secondary compartment by the Company.

C. Connections:

1. **The Company shall connect all secondary conductors to the secondary terminals of the three phase transformer. The Company shall provide the connectors.**
2. The Company shall install and terminate the metering cable in the transformer and meter socket.

D. Conductor marking

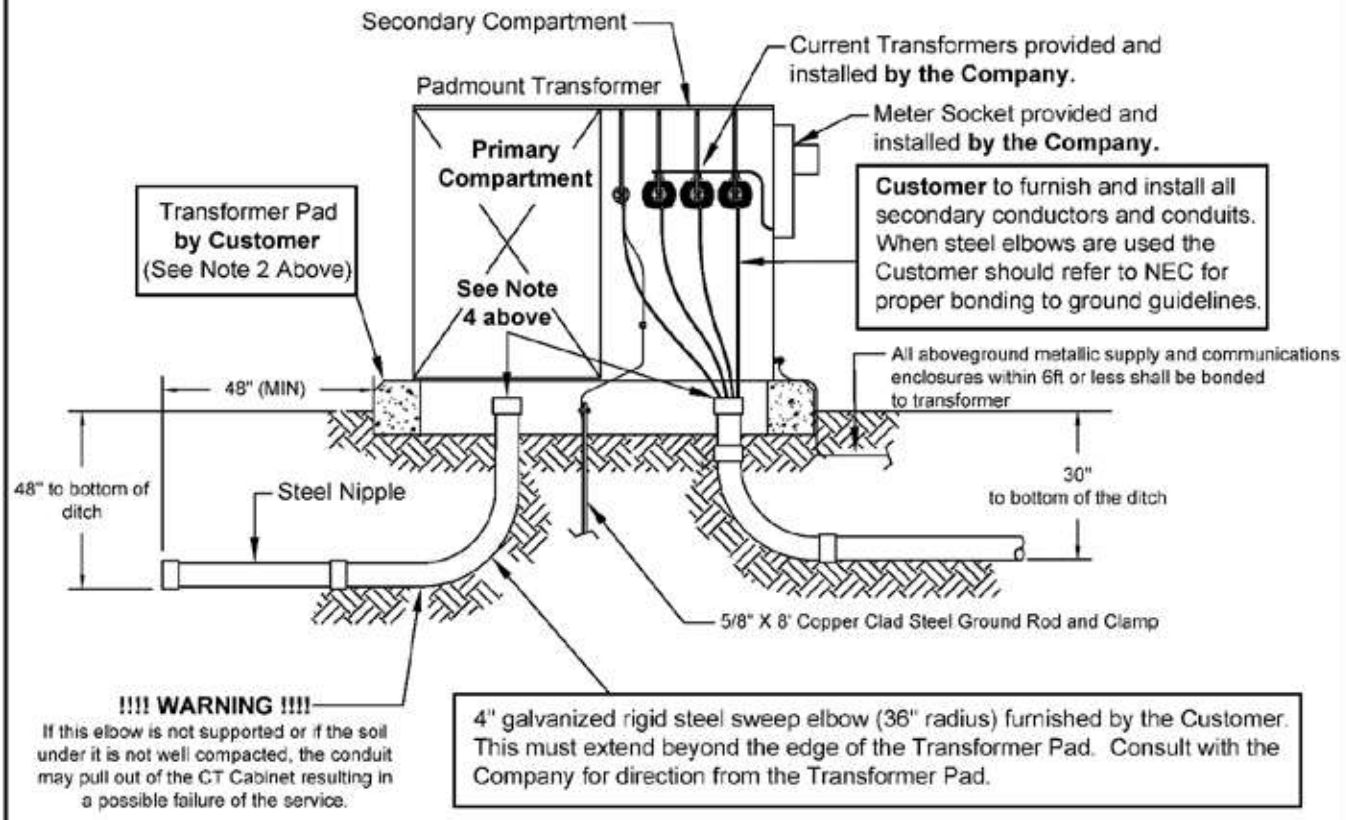
All customer provided phase and neutral conductors shall be clearly marked with tape at the point of delivery.

E. Phase Rotation

On three-phase installations to ensure proper equipment operation, the Customer is responsible for verifying phase rotation at the time of service connection.

NOTES:

1. This method of service must be approved by the Company.
2. **The Customer shall provide the Transformer Pad per the Company's specifications. The Company is to inspect the pad forms, reinforcement, and conduits before the transformer pad is poured.**
3. All equipment to be furnished and installed by the Customer prior to any work by the Company unless otherwise noted.
4. Protective Bushings are required on all conduits. Conduits shall be a minimum of 6" below the top of the concrete pad.
5. The Company shall make all Secondary Conductor Connections in the transformer and all Metering Control Cable Connections in the meter socket and transformer secondary compartment.



Amount of Conductor Provided in Transformer Secondary Compartment as Measured From the Top of the Transformer Pad	
Transformer Size (kVA)	**Minimum Conductor Length**
75 - 500	48"
750 - 2500	72"

This denotes undisturbed earth.

All Equipment Furnished & Installed By Customer Unless Otherwise Noted.

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Three Phase, Padmount Transformer Serving One Customer with Meter on Transformer

REV:	3	DWG NO: G18A2146
SCALE: NTS		FIGURE 59
DATE: 06/18/2024		

Figure 59: Three Phase, Padmount Transformer Serving One Customer with Meter on Transformer

8.2 METERING ON THE BUILDING

A. General Notes:

1. **This method of service must be approved by the Company.**
2. The disconnection method may be composed of multiple disconnects to make up the full 1200 amp capacity of the service as long as there are not more than 6. If one disconnect is used that it is greater than 400 amps, it may be located on the interior of the building unless the authority having jurisdiction dictates otherwise. Disconnects of 400 amps and below will be located on the exterior of the building.

   Please note that in all cases, the disconnects making up this service will be at the same location and are required to be located in separate compartments or enclosures.
3. **240/120 volt delta service is not available from a Pad Mounted Transformer.**
4. This arrangement may be utilized for services from 200 amps through 3000 amps.
5. **The Customer is responsible for the following: transformer pad, secondary trench and backfill, and secondary conduits.**
6. The Company shall provide and install the secondary conductor and connectors.
7. The Customer shall install one - 4 inch galvanized rigid steel sweep ell (36” radius) in the primary side of the transformer pad throat (see Figures 59 & 60). Consult with the Company for the direction the conduit is to be pointed from the transformer pad.
8. The metering for this type of service is as described in Section 7.4, 7.5, 7.6, or 7.7.

B. Installation:

1. The point of delivery for this type of service is at the connections inside the metering equipment.
2. **The Company is responsible for all future maintenance of the secondary service lateral conductors and conduit from the secondary terminals of the three-phase transformer to the metering equipment.**

C. Connections:

The Company shall connect all service lateral conductors to the secondary terminals of the three phase transformer, and in the metering equipment.

8.3 PADMOUNT TRANSFORMER INSTALLATION REQUIREMENTS

A. Transformer installations shall be in accordance with Figure 60.

B. Transformer pads shall be constructed and installed in accordance with Figures 61, 62, 63, & 64.

1. The small pad in Figure 62 may only be installed with approval from the Company.
2. **The Company will inspect the reinforcement and conduit placement of the pad form before the it is poured. If this is not done, the customer will be required to remove the pad and reinstall it.**

C. Guard posts shall be installed with 5' spacing on exposed sides as shown in Figures 67 & 68 unless the transformer is otherwise protected from vehicle traffic.

D. Location and Clearance Requirements:

1. The **transformer clear zone** shall not be obstructed in anyway. No portion of the building will extend over the transformer clear zone. Refer to Figure 67.
2. Installations shall adhere to the following clearance requirements:

Minimum Separation Distance from Padmount Transformer[(1)(2)(3)]		
Construction Element	**Transformer Oil Capacity**	
	<500 gal	≥500 gal
Combustible Wall[(4)]	10'	25'
Non-Combustible Wall[(4)]	5'	5'
Main Door or Fire Escape	See Figure 65a	See Figure 66a
Limited Traffic Door or Garage Door	See Figure 65b	See Figure 66b
Window	See Figure 65c	See Figure 66c
Air Intake	See Figure 65d	See Figure 66d
Facilities used to store or dispense hazardous liquids or gases	25'	25'

(1) Clearances between padmount equipment and structures is measured from the closest metal portion of the equipment to the structure (including overhangs).

(2) Clearances may be reduced by the installation of a noncombustible fire barrier. The design of this structure shall be prepared and sealed by the Customer's Professional Engineer or Registered Architect and shall further be approved by the local authority having jurisdiction of building code enforcement.

(3) Clearances in this table were derived from values provided in NFPA 850, accepted best practices, and recommendations from insurance providers. Where local fire and building codes or the Customer's insurance requirements conflict with these values the greater clearance value shall prevail.

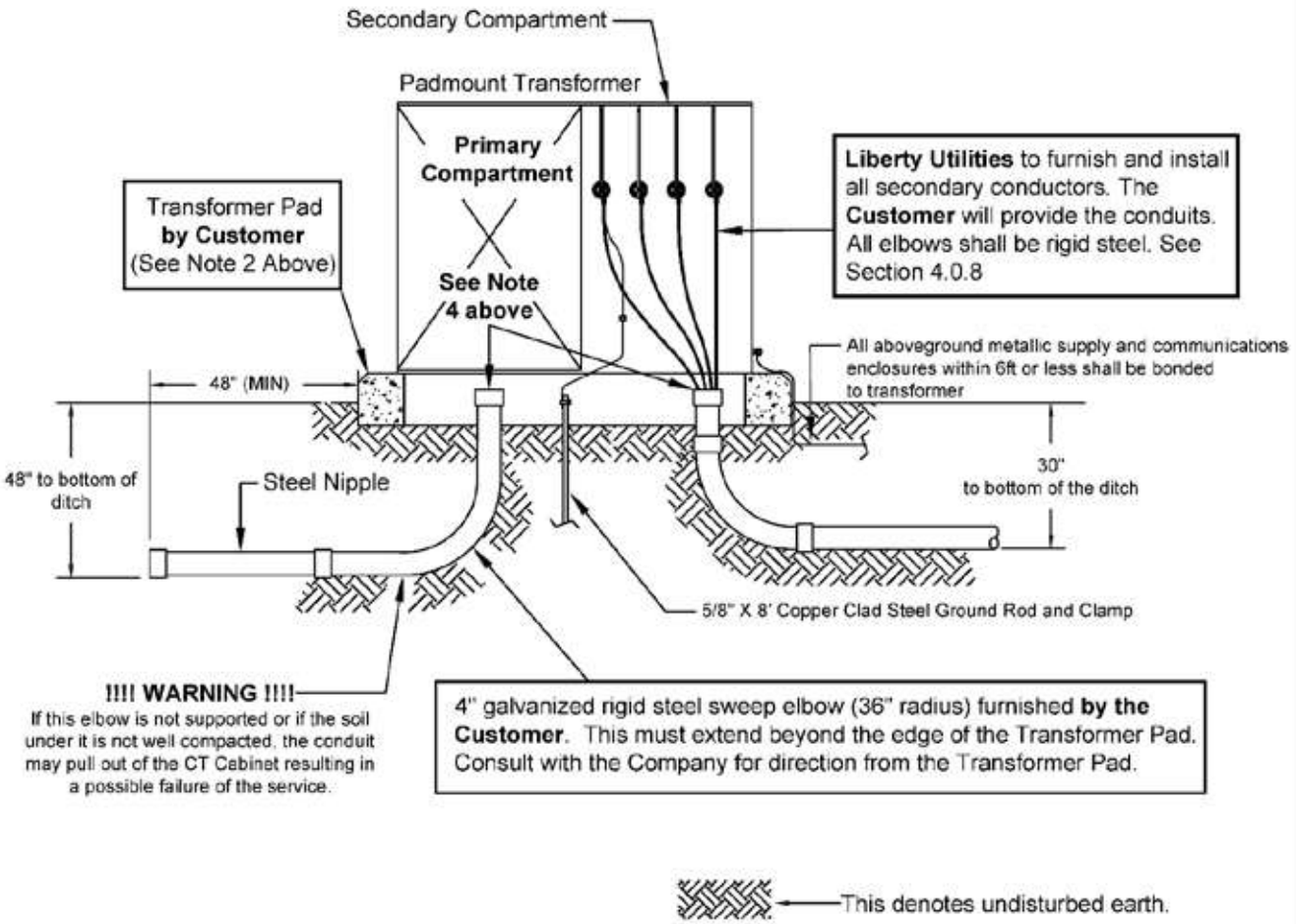
(4) Refer to the latest edition of NFPA 220 for the definitions of combustible and noncombustible construction. It is the responsibility of the Customer to identify construction type upon request.

E. ANY TRANSFORMER THAT CANNOT BE MAINTAINED OR SAFELY OPERATED WILL NOT BE INSTALLED BY THE COMPANY.

THREE PHASE | COMMERCIAL & INDUSTRIAL

NOTES:

1. This method of service must be approved by the Company.
2. **The Customer shall provide the Transformer Pad per the Company's specifications. The Company is to inspect the pad forms, reinforcement, and conduits before the transformer pad is poured.**
3. All equipment to be furnished and installed **by the Customer** prior to any work by the Company unless otherwise noted.
4. Protective Bushings are required on all conduits. Conduits shall be a minimum of 6" below the top of the concrete pad.
5. The Company shall make all Secondary Conductor Connections in the transformer and all Metering Control Cable Connections in the meter socket and transformer secondary compartment.



All Equipment Furnished & Installed By Customer Unless Otherwise Noted.

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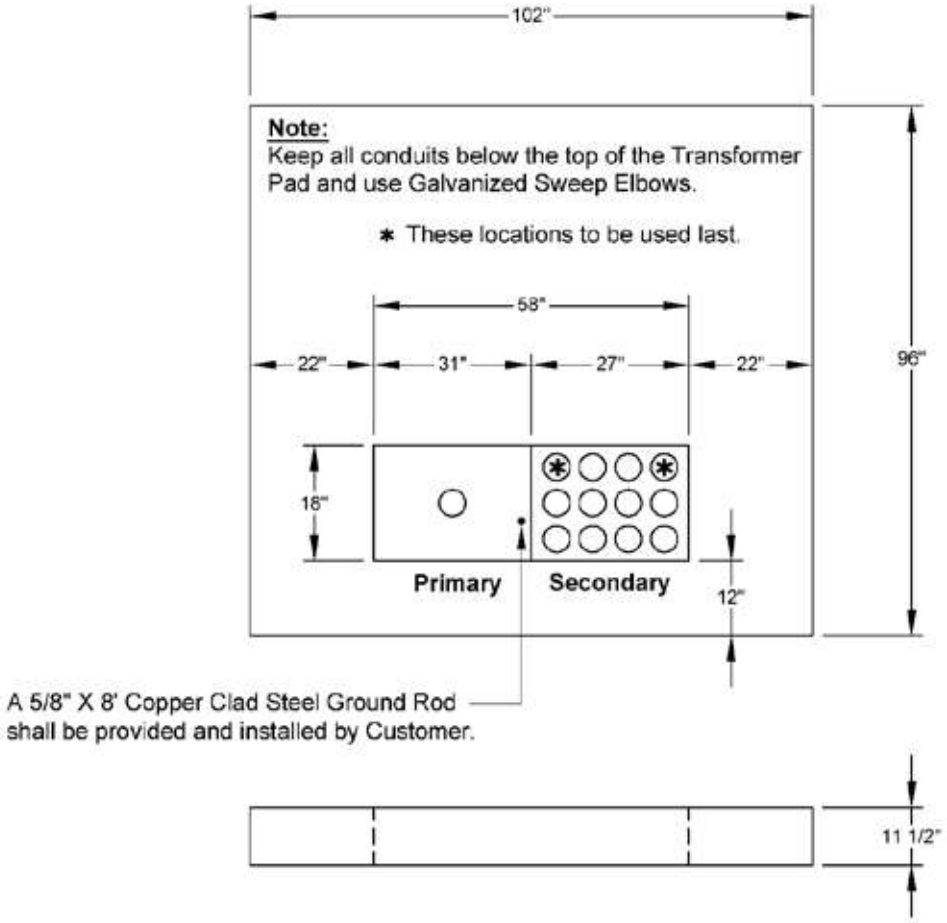
Three Phase, Padmount Transformer Installation

REV:	2	DWG NO: G18A2147
SCALE:	NTS	FIGURE 60
DATE:	06/18/2024	

Figure 60: Three Phase, Padmount Transformer Installation

NOTES:

1. Pad must be level.
2. The Company is to inspect the transformer pad forms, reinforcement, and conduits before the Transformer Pad is poured.



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02/08/21 KMJ	
01/29/20 SMS	
08/14/19 KMH	

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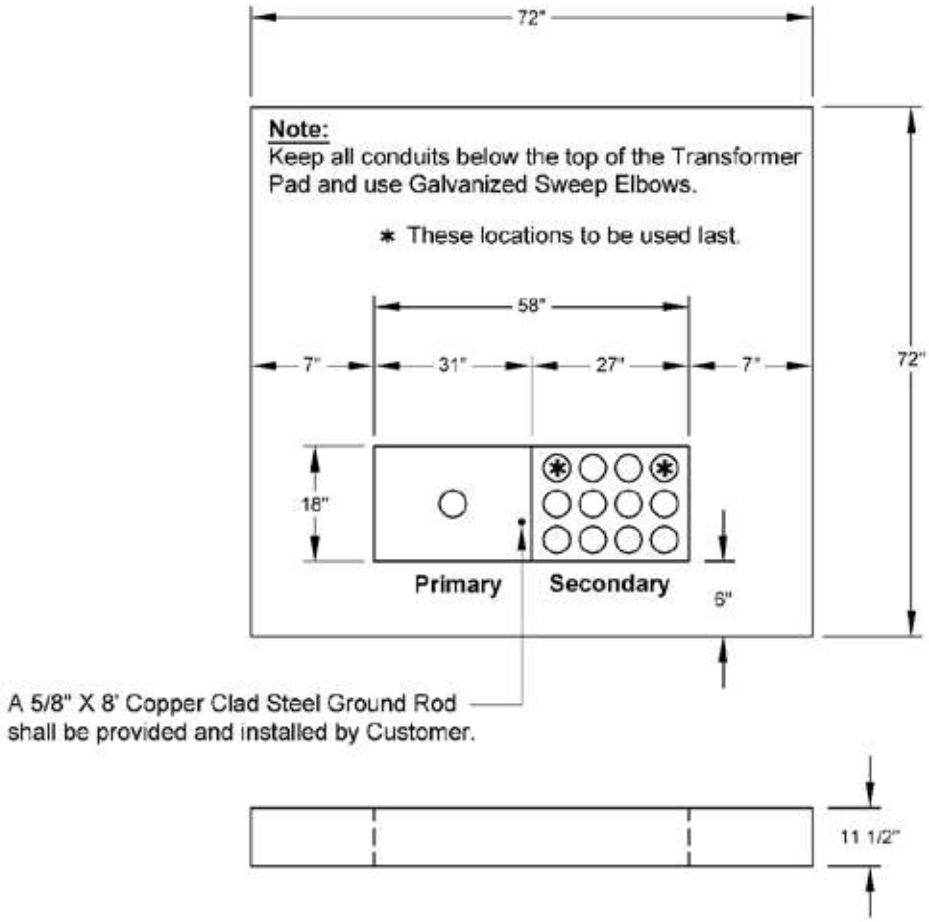
Large Transformer Pad, Physical Specifications

DRAWN: LU	DWG. NO. G18A2148
SCALE: NTS	FIGURE 61
DATE: 01/01/96	

Figure 61: Large Transformer Pad, Physical Specifications

NOTES:

1. Small pad allowed with LU approval only.
2. Pad must be level.
3. The Company is to inspect the transformer pad forms, reinforcement, and conduits before the Transformer Pad is poured.



02/09/21 KMJ
01/29/20 SMS
REVISIONS

Liberty

Small Transformer Pad, Physical Specifications

DRAWN: LU	DWG. NO. G18A2149
SCALE: NTS	FIGURE 62
DATE 08/14/19	

Figure 62: Small Transformer Pad, Physical Specifications

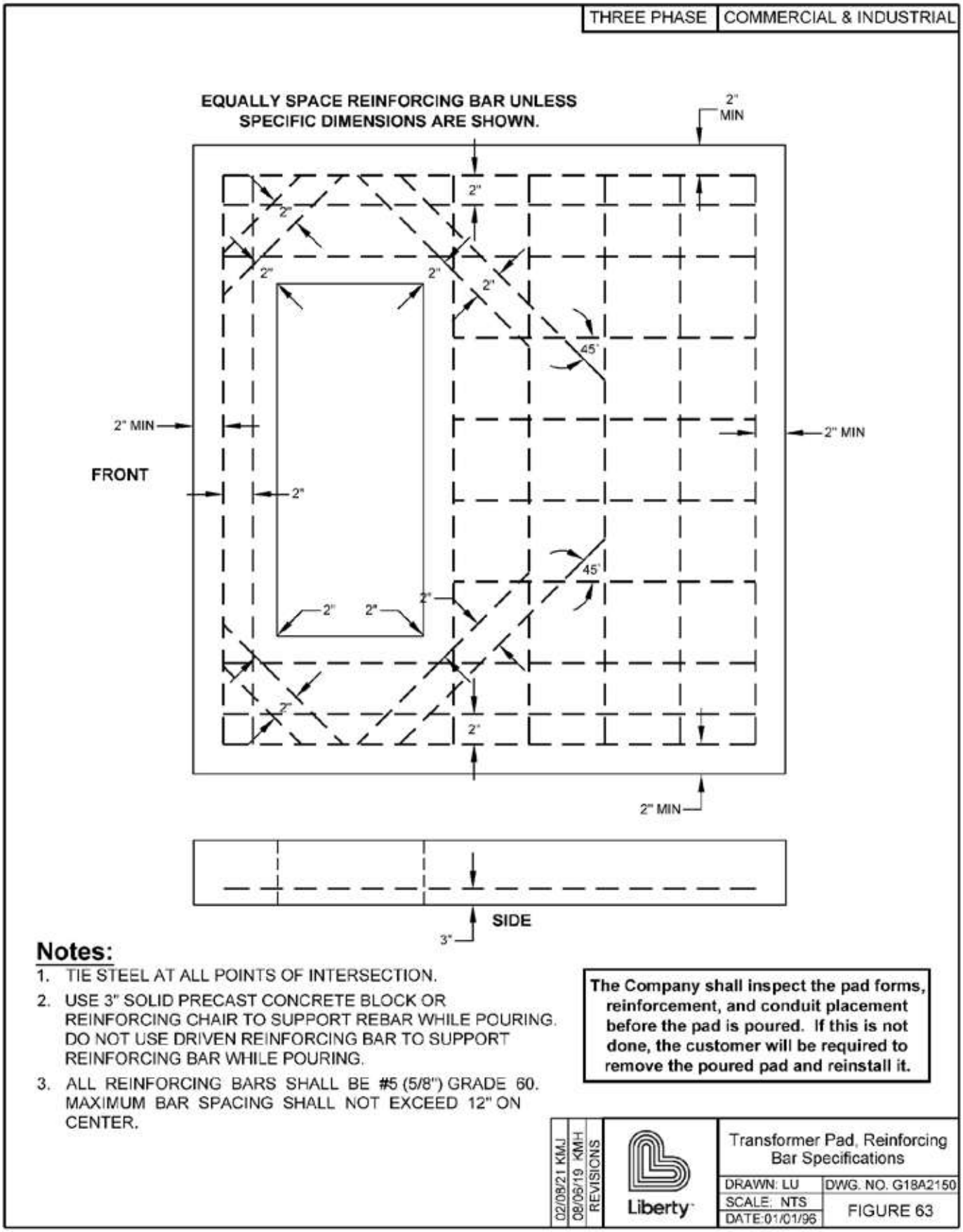
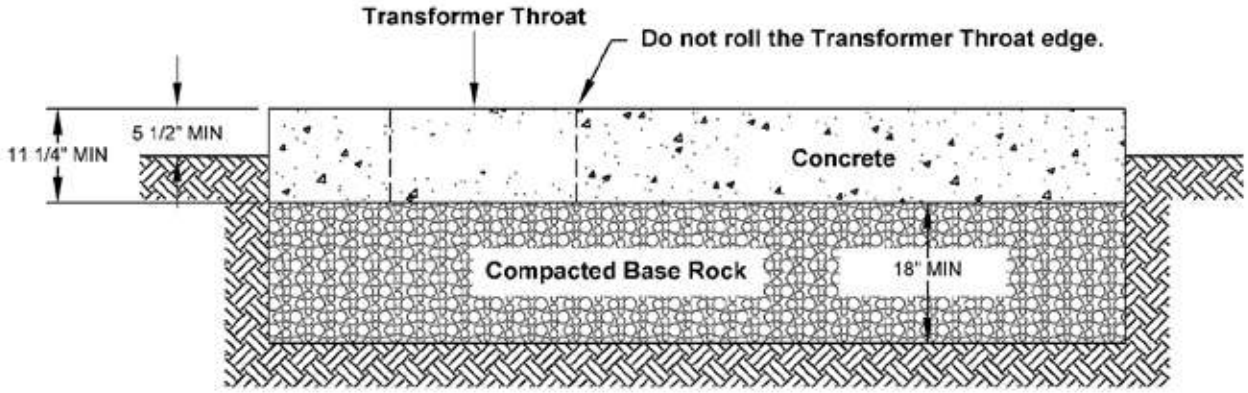


Figure 63: Transformer Pad, Reinforcing Bar Specifications

The Company shall inspect the pad forms, reinforcement, and conduit placement before the pad is poured. If this is not done, the customer will be required to remove the poured pad and reinstall it.



NOTES:
CROSSHATCHED AREA DENOTES UNDISTURBED OR COMPACTED SOIL. FAILURE TO PROVIDE COMPACTED SOIL MAY RESULT IN DAMAGE TO CABLES, CONDUIT, AND TRANSFORMER ENCLOSURE.

NOTES:

1. ALL CONCRETE SHALL HAVE A 28 DAY COMPRESSIVE STRENGTH OF 3000 PSI. ALL EXPOSED EXTERIOR CONCRETE SHALL BE AIR ENTRAINED (6%±1%). SLUMP OF 3" SHALL BE USED.
2. CLEAR CONCRETE COVER FOR STEEL SHALL BE AS FOLLOWS:

   CONCRETE CAST AGAINST AND
   PERMANENTLY EXPOSED TO EARTH.....3"

   CONCRETE EXPOSED TO EARTH
   OR WEATHER (FORMED & POURED).....2"
3. THE USE OF ADMIXTURES, INCLUDING CALCIUM CHLORIDE, IS NOT PERMITTED.
4. PAD SHALL BE POURED MONOLITHICALLY, WITH NO COLD JOINTS.
5. HONEY COMBING OR POT MARKS IN THE FACE OF THE SLAB ARE NOT ACCEPTABLE. IF THIS OCCURS, THE CUSTOMER MAY BE REQUIRED TO REPLACE THE TRANSFORMER PAD.
6. NO FOOTING IS TO BE EXCAVATED WITHOUT HAVING REINFORCING AND CONCRETE READY TO PLACE WITHIN THAT WORKING DAY.
7. IN THE EVENT THAT ORGANIC SOIL IS FOUND BELOW FOOTING, THE SOIL SHALL BE REMOVED AND REPLACED WITH COMPACTED BASE ROCK.
8. ALL REINFORCING BARS SHALL BE DEFORMED #5 BILLET STEEL CONFORMING TO ASTM A615, GRADE 60. BARS SHALL BE FREE OF ANY GREASE, RUST, OR SCALE AT THE TIME OF PLACEMENT.
9. TOP SURFACES OF CONCRETE SHALL HAVE A STEEL TROWEL FINISH.
10. ENTIRE PAD MUST BE LEVEL. NO GROUT ALLOWED.
11. THE TRANSFORMER PAD SHALL BE POURED FOR A MINIMUM OF 4 DAYS BEFORE ANY TRANSFORMER CAN BE SET AND ALL FORMS MUST BE REMOVED.

REVISIONS		
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06/06/19	KMH	

Liberty

Transformer Pad, Specifications, Concrete & Foundation Detail

DRAWN: LU	DWG. NO. G18A2151
SCALE: NTS	FIGURE 64
DATE:01/01/96	

Figure 64: Transformer Pad, Specifications, Concrete & Foundation Detail

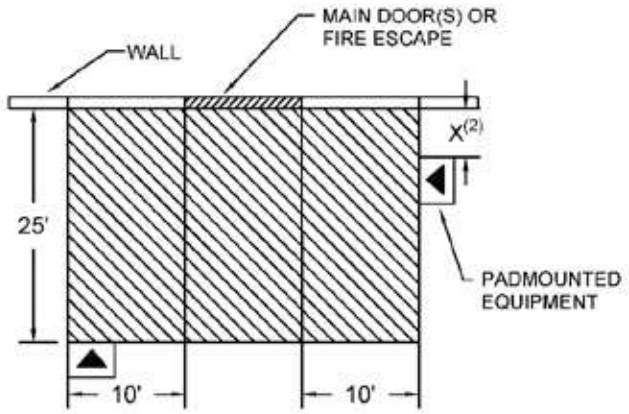

FIGURE 65a
MAIN DOOR OR FIRE ESCAPE

PADMOUNTED OIL-FILLED EQUIPMENT SHALL NOT BE LOCATED WITHIN A ZONE EXTENDING 25 FT OUTWARD OR 10 FT TO EITHER SIDE OF A MAIN BUILDING DOOR(1) OR FIRE ESCAPE

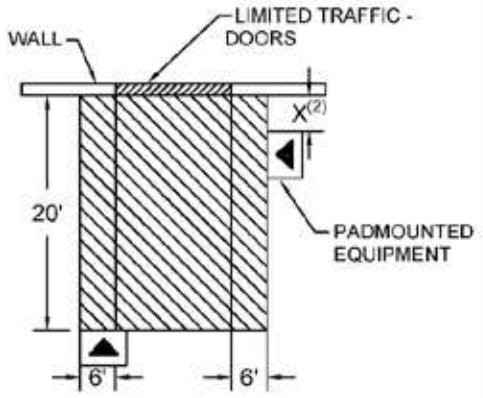

FIGURE 65b
LIMITED PEDESTRIAN TRAFFIC DOORS OR GARAGE DOORS

PADMOUNTED OIL-FILLED EQUIPMENT SHALL NOT BE LOCATED WITHIN A ZONE EXTENDING 20 FT OUTWARD OR 6 FT TO EITHER SIDE OF A LIMITED TRAFFIC DOOR

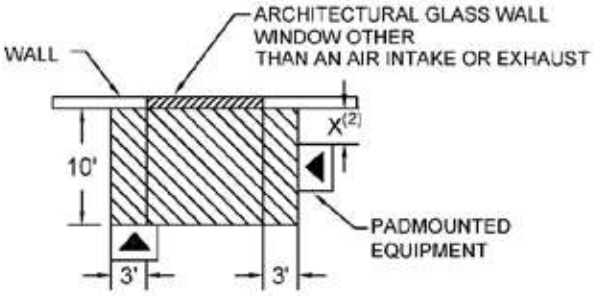

FIGURE 65c
WINDOW OR OPENING (OTHER THAN AIR INTAKE OR EXHAUST) LOCATED LESS THAN 20' ABOVE THE EQUIPMENT

PADMOUNTED OIL-FILLED EQUIPMENT SHALL NOT BE LOCATED WITHIN A ZONE EXTENDING 10 FT. OUTWARD OR 3FT. TO EITHER SIDE OF A BUILDING WINDOW OR OPENING (OTHER THAN AN AIR INTAKE) WHICH IS LOCATED LESS THAN 20 FT. ABOVE THE TOP OF THE EQUIPMENT.

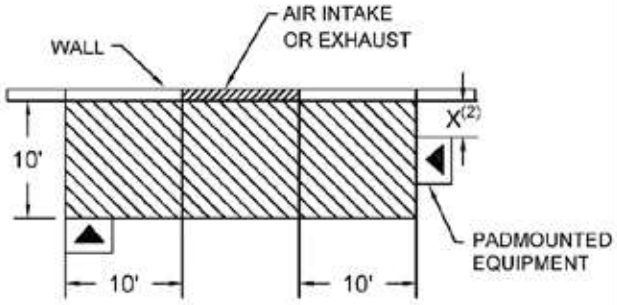

FIGURE 65d
AIR INTAKE OR EXHAUST LOCATED LESS THAN 20' ABOVE THE EQUIPMENT

PADMOUNTED OIL-FILLED EQUIPMENT SHALL NOT BE LOCATED WITHIN A ZONE EXTENDING 10FT. OUTWARD OR 10 FT. TO EITHER SIDE OF AN AIR INTAKE OR EXHAUST WHICH IS LOCATED LESS THAN 20 FT. ABOVE THE TOP OF THE EQUIPMENT.

NOTES:

1. MAIN DOORS ARE THOSE WHICH ARE THE NORMAL MEANS OF PEDESTRIAN ACCESS TO AND FROM THE BUILDING
2. X DIMENSION DEPENDENT ON OIL CAPACITY AND WALL CONSTRUCTION. REFER TO TABLE IN SECTION 8.3.D.2

Liberty

Transformer Clearances
<500 Gallon Oil Capacity

REV:	0	DWG NO: G18A2155
SCALE:	NTS	FIGURE 65
DATE:	08/21/2024	

Figure 65: Transformer Clearances <500 Gallon Oil Capacity

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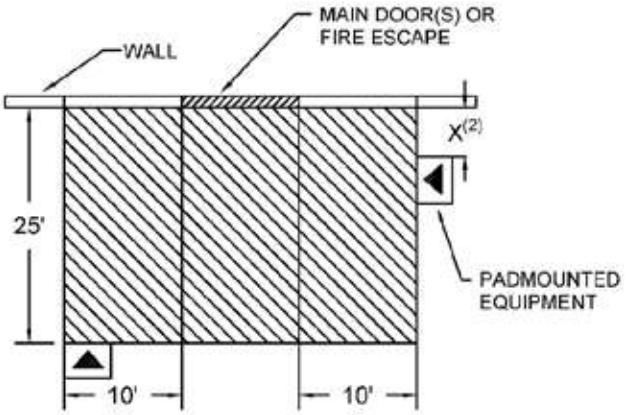


FIGURE 66a
MAIN DOOR OR FIRE ESCAPE

PADMOUNTED OIL-FILLED EQUIPMENT SHALL NOT BE LOCATED WITHIN A ZONE EXTENDING 25 FT OUTWARD OR 10 FT TO EITHER SIDE OF A MAIN BUILDING DOOR(1) OR FIRE ESCAPE

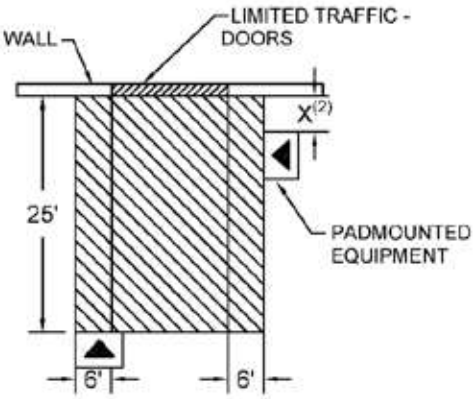


FIGURE 66b
LIMITED PEDESTRIAN TRAFFIC DOORS OR GARAGE DOORS

PADMOUNTED OIL-FILLED EQUIPMENT SHALL NOT BE LOCATED WITHIN A ZONE EXTENDING 25 FT OUTWARD OR 6 FT. TO EITHER SIDE OF A LIMITED TRAFFIC DOOR

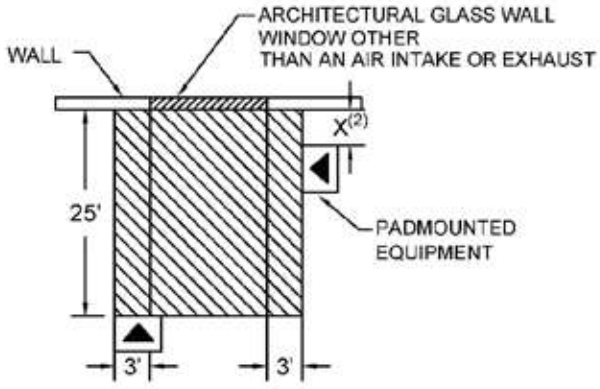


FIGURE 66c
WINDOW OR OPENING (OTHER THAN AIR INTAKE OR EXHAUST) LOCATED LESS THAN 20' ABOVE THE EQUIPMENT

PADMOUNTED OIL-FILLED EQUIPMENT SHALL NOT BE LOCATED WITHIN A ZONE EXTENDING 25 FT OUTWARD OR 3FT. TO EITHER SIDE OF A BUILDING WINDOW OR OPENING (OTHER THAN AN AIR INTAKE) WHICH IS LOCATED LESS THAN 20 FT. ABOVE THE TOP OF THE EQUIPMENT.

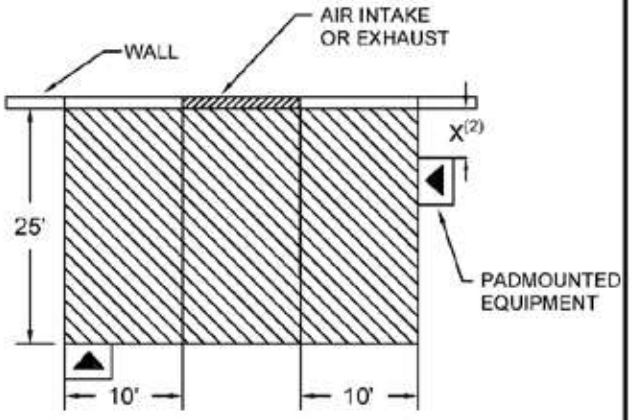


FIGURE 66d
AIR INTAKE OR EXHAUST LOCATED LESS THAN 20' ABOVE THE EQUIPMENT

PADMOUNTED OIL-FILLED EQUIPMENT SHALL NOT BE LOCATED WITHIN A ZONE EXTENDING 25 FT OUTWARD OR 10 FT. TO EITHER SIDE OF AN AIR INTAKE OR EXHAUST WHICH IS LOCATED LESS THAN 20 FT. ABOVE THE TOP OF THE EQUIPMENT.

NOTES:

1. MAIN DOORS ARE THOSE WHICH ARE THE NORMAL MEANS OF PEDESTRIAN ACCESS TO AND FROM THE BUILDING
2. X DIMENSION DEPENDENT ON OIL CAPACITY AND WALL CONSTRUCTION. REFER TO TABLE IN SECTION 8.3.D.2

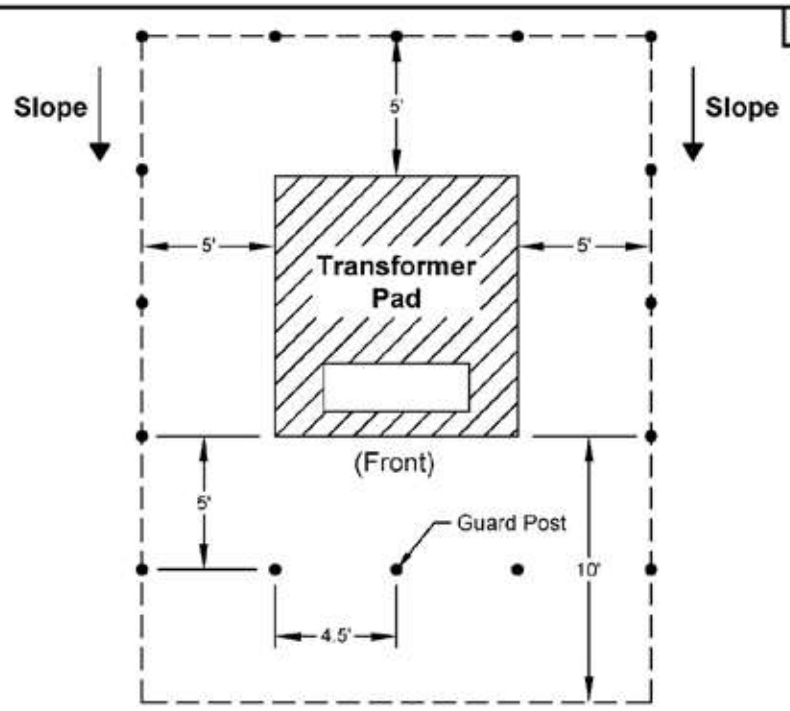
Liberty

Transformer Clearances ≥500 Gallon Oil Capacity

REV:	0	DWG NO: G18A2156
SCALE:	NTS	FIGURE 66
DATE:	08/21/2024	

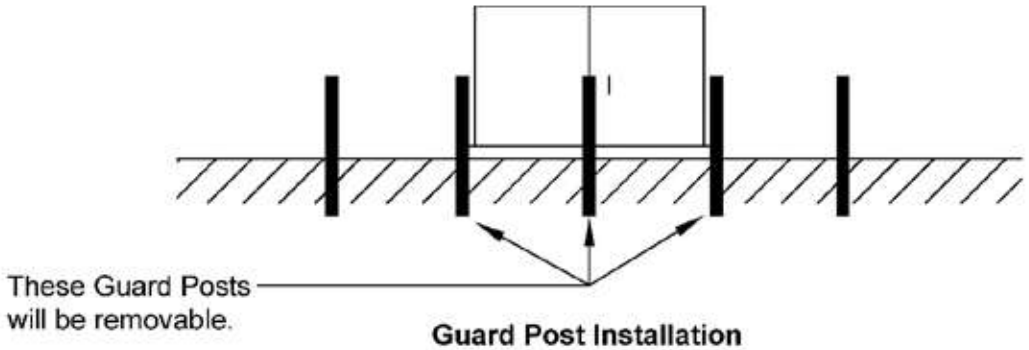
Figure 66: Transformer Clearances ≥500 Gallon Oil Capacity

COMMERCIAL & INDUSTRIAL



Transformer Clear Zone

The **Transformer Clear Zone** is illustrated above by dashed lines. The Transformer Clear Zone shall not be obstructed in anyway. Guard posts shall be installed with 5' spacing on the exposed sides as shown unless the transformer is otherwise protected from vehicular traffic



Guard Post Installation

Refer to Figure 68 For More Details on Guard Post Installation

NOTES:

1. No portion of the building will extend over the Transformer Clear Zone.
2. The Transformer must be accessible at all times. There shall not be any obstruction to access the transformer at any time or in any way.
3. All fencing, barriers, etc. around the transformer must provide adequate ventilation and shall be approved by the Company prior to installation.
4. The grading surrounding the transformer shall slope away from the building. The Clear zone to the transformer shall not have a grade difference or more than 1' from the back edge to the front edge of the clear zone and side to side.

Liberty

Transformer Clear Zone Specifications

REV:	1	DWG NO: G18A2152
SCALE:	NTS	FIGURE 67
DATE:	6/18/2024	

Figure 67: Transformer Clear Zone Specifications

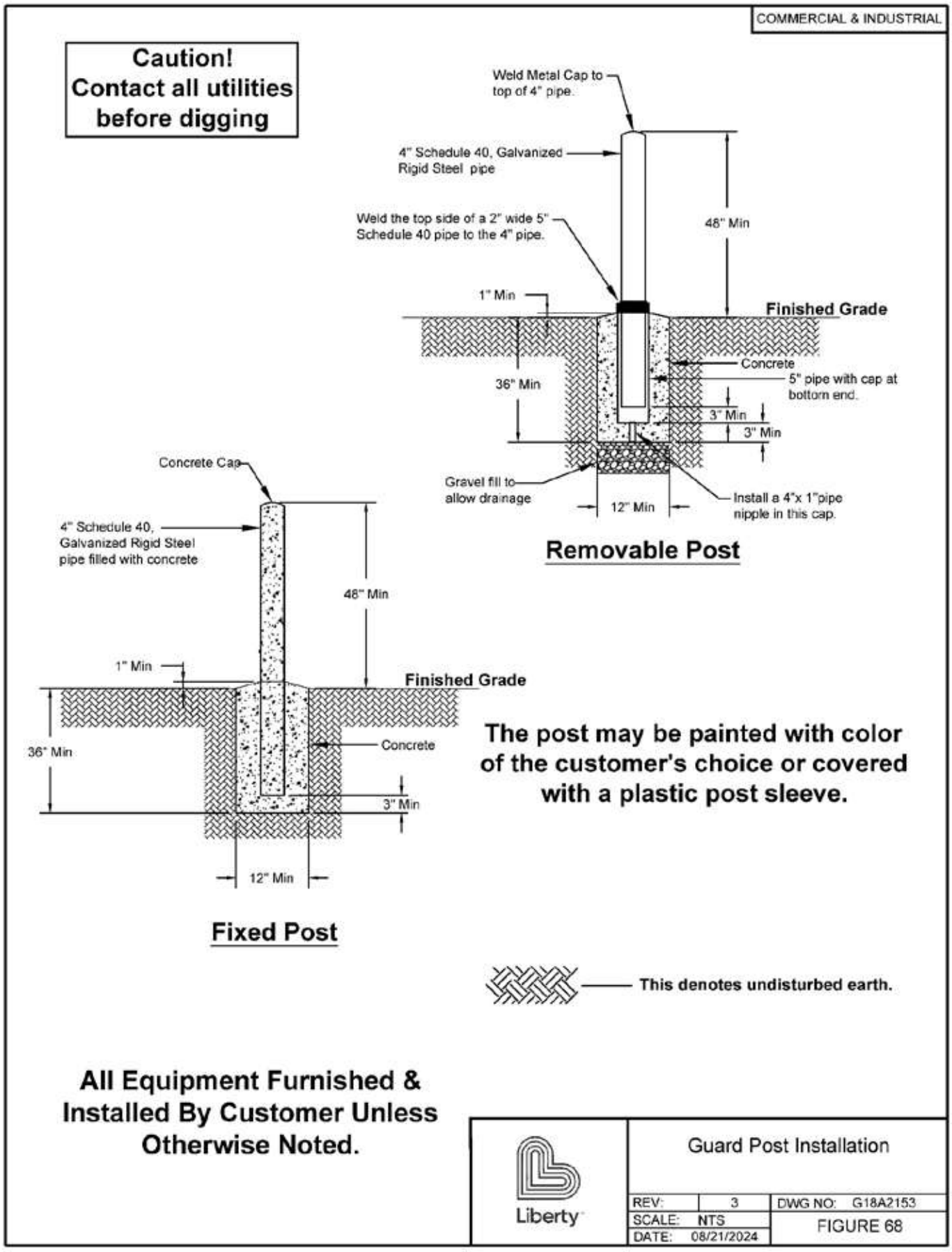
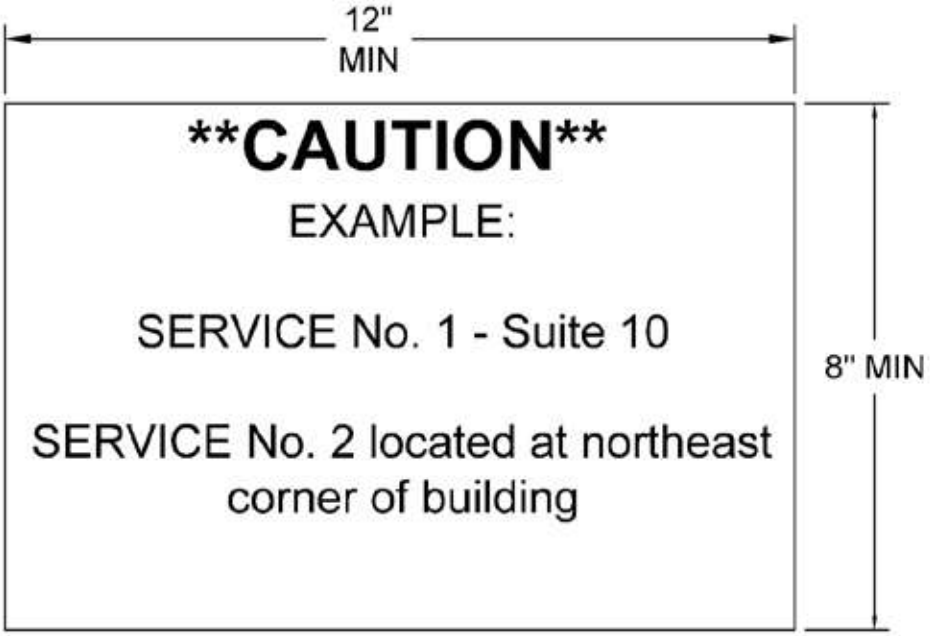


Figure 68: Guard Post Installation

COMMERCIAL & INDUSTRIAL



NOTES:

1. The sign material shall be an etched laminated plastic. The surface shall be black and the substrate shall be white. This is so specified to have the letters appear as white when they are etched into the plastic.
2. The lettering for the "CAUTION" shall be ¾" tall.
3. All other lettering shall be ½" tall.
4. This plaque shall be screwed or bolted externally to the structure at the meter location. If this service is provided by a Padmount Transformer and the meter is at this point, the plaque will be provided to LU for application to the secondary sided of the transformer door set.
5. The location is illustrated by the example in the plaque diagram above.

Liberty

Multiple Service Point Identification Plaque

REV:	2	DWG NO: G18A2154
SCALE:	NTS	FIGURE 69
DATE:	08/21/2024	

Figure 69: Multiple Service Point Identification Plaque

Appendix A

Note: Please seek approval from the Company prior to purchasing equipment not listed in this Appendix.

Note: Additional equipment such as surge arresters may be required according to NEC requirements. The Company does not take responsibility for making this determination when approving equipment.

Commercial – Approved Equipment Examples

Individual Meter Sockets – Overhead

Service Size	Eaton	Durham	Milbank	Talon	Square D	Eaton B-Line	Midwest
100A	UTRS101BE UTRS111BCH URTRS101BE	UT-RS101B UT-RS111B URT-RS101B URT-RS111B	U7487-RL-TG U7490-RL-TG	UAT111-0G UAT121-0G	UTRS101B URTRS101B	011 011 MS73	UTRS101BMEP
200A	UTRS202BCH UTRS212BCH UTRS213BE URTRS202BCH URTRS213BE	UT-RS202B UT-RS213B URT-RS202B URT-RS213B	U7017-RL-TG U7021-RL-TG U7040-RL-TG	UAT317-0G UAT327-0G UAT417-0G UAT427-0G	UTRS202B UTRS213B	204	UTRS202BMEP UTRS213BMEP
300A	UTH4330UCH + ARP00427CH	UT-H4309T	U4702-X-2/K2	47704-01 + (2)H56732	UTH4330T + ARP00427 1008068		UTH4300TFLMEP + Lugs 1007672MEP

Individual Meter Sockets – Overhead (5th Lug)

Service Size	Eaton	Durham	Milbank	Talon	Square D	Eaton B-Line	Midwest
100A	UGHTRS101BCH UGHTRS111BCH 1003880ACH	UGT-RS101B UGT-RS111B UGRT-RS101B UGRT-RS111B	U7487-RL-TG-5T9 U7490-RL-TG-5T9	UAT111-0BG UAT121-0BG	UTRS101B + A5J URTRS101B + A5J UGHTRS101B	011 + MSR5TK	UGHTRS101BMEP UTRS101BMEP + MS5
200A	UGTRS202BCH UGTRS213BE UGTRS212BCH	UGT-RS202B UGT-RS213B UGRT-RS202B UGRT-RS213B	U7017-RL-TG-5T9 U7021-RL-TG-5T9 U7040-RL-TG-5T9	UAT317-0BG UAT327-0BG UAT417-0BG UAT427-0BG	URS202BCR UTRS202B + A5J UTRS213B + A5J	204 + 50365	UGHTRS213BMEP UTRS202BMEP + MS5 UTRS213BMEP + MS5
300A	UTH4330UCH + ARP00427CH + ARP00862CH	UGT-H4309T	U4505-X-2/K2 U4702-X-5T9-2/K2	47704-01 + (2)H56732 + H35815-2			UTH4300TFLMEP + Lugs + MS5 1007672MEP + MS5

Combination Meter Sockets – Overhead

Service Size	Eaton	Durham	Milbank	Talon	Square D	Eaton B-Line	Midwest
100A	MB816P200BTS* CMBP200BTS* MBP200BTS*	UH122N0B	U5168-XTL-100 U5169-XTL-100 U3499-XL-TG-100 U5842-RL-TG-100 U5844-PXL-TG-100	MM0202ML1100S* MC0816B1200CT*	SC8L125S + breakers SC1624M125S + breakers	1M1R	M101CB2 R101CB2ETG
200A	MB816B200BTS MB48B200BTS MBB200BTS MBB200BTSC CMBB200BTS* MBP200BTS* MBT48B200BTS	UC222W1B UDC222W1B UDRC222W1B UC242W1B-S UC262W1B-S P2102D1C-SV	U5842-RL-TG-200 U5844-PXL-TG-200 U5168-XTL-200 U5169-XTL-200 U5842-RL-TG-200 U5844-PXL-TG-200	LG0408B1200RT LG0816B1200RCT MM0202B1200 MM0202B1200R MC0816B1200CT	SC12L200S + breakers SC2040M200C + Breakers	2M2R	M208CR2A R208CR2A R208CR2AETG
300A		UHC344N3T-C	U6601-X-TG-2/200 U6604-X-TG-2/200	MK0402L1400RLM + (2)QN2200RH MK0402L1400SC + (2)QN2200RH			MS45508C RS45500C

* To provide 100A service, this socket will be installed and a separate Customer supplied 100A breaker will be installed to supply the 100A service.

Combination Meter Sockets – Overhead (5th Lug)

Service Size	Eaton	Durham	Milbank	Talon	Square D	Midwest
100A	MB816P200BTS* + MB5JAWKIT CMBP200BTS* + MB5JAWKIT MBP200BTS* + MB5JAWKIT MB816B200STD*	UH122N0B + ARP00035	U5168-XTL-100-5T9 U5169-XTL-100-5T9 U3499-XL-TG-100-5T9 U5842-RL-TG-100-5T9 U5844-PXL-TG-100-5T9	MC0816B1200CT* + EC5J2	SC8L125S + Breakers + 5j SC1624M125S + Breakers + 5J	M101CB2 + ARP00035MEP R101CB2ETG + ARP00035MEP
200A	MB816B200BTS + MB5JAWKIT MB48B200BTS + MB5JAWKIT MBB200BTS + MB5JAWKIT MBB200BTSC + MB5JAWKIT CMBB200BTS + MB5JAWKIT MBP200BTS + MB5JAWKIT MB816B200STD	UC222W1B + ARP00035 UDC222W1B + ARP00035 UC242W1B-S + ARP00035 UC262W1B-S + ARP00035	U5842-RL-TG-200-5T9 U5844-PXL-TG-200-5T9 U5168-XTL-200-5T9 U5842-RL-TG-200-5T9 U5844-PXL-TG-200-5T9	LG0408B1200RT + H35815-2 LG0816B1200RCT + H35815-2 MM0202B1200 + EMC5J MM0202B1200R + EMC5J MC0816B1200CT + EC5J2	SC12L200S + Breakers + 5J SC2040M200C + Breakers + 5J	M208CR2A + ARP00035MEP R208CR2A + ARP00035MEP R208CR2AETG + ARP00035MEP
300A			U6601-X-TG-2/200-5T9 U6604-X-TG-2/200-5T9	MK0402L1400RLM + (2)QN2200RH + H35815-2		MS45508C + MS5MIL + LUGS RS45500C + MS5MIL + LUGS

* To provide 100A service, this socket will be installed and a separate Customer supplied 100A breaker will be installed to supply the 100A service.

Duplex Meter Sockets – Overhead

Service Size	Eaton	Durham	Milbank	Talon	Square D	Eaton B-Line	Midwest
100A	UT2R1121BCH UT2R1421BCH	SBG1012B UT-2R1121B	U5902-X-2/K1 + BREAKERS	UA2311-0G WEPK2211	UT2R1121B	H012 142 MCC 2012 MS60 152 MCCM	UT2R1121BMEP
200A	UT2R2332BCH UT2R2332BCH	UT-2R2332T SBG2022T	U1252-X-HSP-2/K2 U5882-X-2/K2+ BREAKERS	UA2716-0G WEPK421	UT2R2122B	2222 + Lugs 242 MCC	UT2R2332TMEP

* To provide 100A service, these sockets will be installed with Customer supplied 100A breakers.

** To provide 200A service, these sockets will be installed with Customer supplied 200A breakers.

Duplex Meter Sockets – Overhead (5th Lug)

Service Size	Eaton	Durham	Milbank	Talon	Square D	Eaton B-Line	Midwest
100A	UGT2R1121BCH UGT2R1421BCH UT2R1121BCH UT2R1421BCH	UGT-2R1121B SBG1012B + ARP00035	U5902-X-2/K1-5T9 + Breakers	WSN251CR UA2311-0G + H659-0121 WEPK2211RJ	UT2R1121B + A5J	H012 + 50365 152 MCCM + 50365 2012 MS60 + 50365	UT2R1121BMEP + ARP00035MEP
200A	UGT2R2332BCH UT2R2332BCH +	UGT-2R2332T SBG2022T + ARP00035	U1252-X-HSP-2/K2-5T9 U5882-X-HSP-2/K2-5T9 + Breakers	UA2716-0G + H659-0121 WEPK4212RJ	UT2R2122B + A5J	2222 + Lugs + 50365 242 MCC + 50365	UT2R2332TMEP + ARP00035MEP

* To provide 100A service, these sockets will be installed with Customer supplied 100A breakers.

** To provide 200A service, these sockets will be installed with Customer supplied 200A breakers.

Meter Stacks (3 To 6) – Overhead

SERVICE SIZE	Eaton	Durham	Milbank	Talon	Square D	Eaton B-Line	Midwest
3-100A	UT3R1121BCH	SBG1013B* UT-3R1121B	U5903-X-2/K2 + Breakers	UA3311-0G WEPK331		153 MCCM 143 MCC 2013 MS60	UT3R1121BMEP
4-100A	UT4R1121BCH	SBG1014B* UT-4R1121B	U5904-X-2/K2 + Breakers	UA4311-0G WEPK4411		H014 144 MCC 154 MCCM	UT4R1121BMEP
5-100A	UT5R1121BCH	SBG1015B* UT-5R1121B	U5905-X-2/K1 + Breakers	WEPK6511		154 MCCM	UT5R1121BMEP
6-100A	UT6R1131BCH	SBG1016B* UT-6R1131B	U5906-X-2/K1 + Breakers	WEPK6611			UT6R1131BMEP
3-200A	UT3R2332TCH	SBG2023T UT-3R2332T	U1253-X-HSP-2/K1 U5883-X-2/K1 + Breakers	UA3717-YG WEPK4312	UT3R2332T	2223 + lugs 243 MCC	UT3R2332TMEP
4-200A	UT4R2352TCH	SBG2024T UT-4R2352T	U1254-X-HSP-2/K1 U5884-X-2/K1 + Breakers	UA4719-YG WEPK4412	UT4R2352T	2224 + lugs 244 MCC	UT4R2352TMEP
5-200A	UT5R2392TTCH	SBG2025UU UT-5R2392TT	U1255-X-HSP-2/K1 U5885-X-2/K1 + Breakers	UA5719-KG WEPK6412	UT5R2392TU	245 MCC	UT5R2392TTMEP
6-200A	UT6R2392TTCH	SBG2026U UT-6R2392TT	U1256-X-HSP-2/K1 U5886-X-2/K1+Breakers	UA6719-KG WEPK8612	UT6R2392TU	246 MCC	UT6R2392TTMEP

* To provide 100A service, these sockets will be installed with Customer supplied 100A breakers.

** To provide 200A service, these sockets will be installed with Customer supplied 200A breakers.

Meter Stacks (3 To 6) – Overhead (5th Lug)

SERVICE SIZE	Eaton	Durham	Milbank	Talon	Square D	Eaton B-Line	Midwest
3-100A	UGT3R1121BCH UT3R1121BCH + ARP00035CHJ	UGT-3R1121B	U5903-X-2/K1-5T9 + Breakers	UA3311-0G + 659-0121 WEPK3311RJ		143 MCC + 50365 2013 MS60	UT3R1121BMEP + ARP00035MEP
4-100A	UGT4R1121BCH UT4R1121BCH + ARP00035CHJ U4R1121BCRCH	UGT-4R1121B	U5904-X-2/K1-5T9 + Breakers	UA4311-0G + H659-0121 WEPK4411RJ		H014 + 50365 144 MCC + 50365	UT4R1121BMEP + ARP00035MEP
5-100A	UGT5R1121BCH UT5R1121BCH + ARP00035CHJ U5R1121BCRCH	UGT-5R1121B	U5905-X-2/K1-5T9+ Breakers	WEPK6511RJ			UT5R1121BMEP + ARP00035MEP
6-100A	UGT6R1131BCH UT6R1131BCH + ARP00035CHJ	UGT-6R1131B	U5905-X-2/K1-5T9+ Breakers	WEPK6611RJ			UT6R1131BMEP + ARP00035MEP
3-200A	UT3R2332TCH	UGT-3R2332T	U1253-X-HSP-2/K1-5T9 U5883-X-2/K1-5T9 + Breakers	UA3717-YG + H659-0121	UT3R2332T + A5J	243 MCC + 50365 2223 + lugs + 50365	UT3R2332TMEP + ARP00035MEP
4-200A	U4R2352TCRCH	UGT-4R2352T	U1254-X-HSP-2/K1-5T9 U5884-X-2/K1-5T9 + Breakers	UA4719-YG + H659-0121 WEPK6412RJ	UT4R2352T + A5J	244 MCC + 50365 2224 + Lugs + 50365	UT4R2352TMEP + ARP00035MEP
5-200A	UGT5R2392TTCH UGT5R2392TTCH + ARP00035CHJ	UGT-5R2392TT	U1255-X-HSP-2/K1-5T9 U5885-X-2/K1-5T9 + Breakers	UA5719-KG + H659-0121 WEPK6512	UT5R2392TU + A5J	245 MCC + 50365	UT5R2392TTMEP + ARP00035MEP
6-200A	UGT6R2392TTCH UT6R2392TTCH + ARP00035CHJ	UGT-6R2392TT	U1256-X-HSP-2/K1-5T9 U5886-X-2/K1-5T9 + Breakers	UA6719-KG + H659-0121 WEPK8612RJ	UT6R2392TU + A5J	246 MCC + 50365	UT6R2392TTMEP + ARP00035MEP

* To provide 100A service, these sockets will be installed with Customer supplied 100A breakers.

** To provide 200A service, these sockets will be installed with Customer supplied 200A breakers.

Individual Meter Sockets – Underground

SERVICE SIZE	Eaton	Durham	Milbank	Talon	Square D	Eaton B-Line	Midwest
200A	UTRS212ACH UTRS213ACH UTRS212CCH UTRS213CE URTRS213CEUSCH URTRS213BEUSCH	UT-RS213A UT-RS213C URT-213A URT-213C	U7018-XL-TG U7018-O-TG U7040-O-TG U7040-XL-TG U7043-XL-TG U7043-O-TG	UAT417-PG	UTRS212C UTRS213A URTRS213B + ACP	204	UTRS212CMEP UTRS213CMEP
320A	UTH4330UCH + ARP00429CH + ARP00427CH	UT-H4309U	U4702-X-2/K2	47704-02 + (2)H56732	UTH4330T + ARP00427 + ACPL 1008068		1008836MEP

Individual Meter Sockets – Underground (5th Lug)

SERVICE SIZE	Eaton	Durham	Milbank	Talon	Midwest
200A	UGTRS223ACH UGTRS213CFLCH	UGT-RS213A UGT-RS213C UGRT-213A UGRT-213C	U7018-XL-TG-5T9 U7018-O-TG-5T9 U7040-O-TG-5T9 U7040-XL-TG - 5T9 U7043-XL-TG-5T9 U7043-O-TG-5T9	UAT417-PG + H659-0121	UGTH4213CMEP UTRS212CMEP + MS5 UTRS213CMEP + MS5
320A		UGT-H4309U	U4702-X-5T9	47704-02 + (2)H56732 + H35815-2	1008836MEP + MS5

Combination Meter Sockets – Underground

SERVICE SIZE	Eaton	Durham	Milbank	Talon	Eaton B-Line	Midwest
200A	MBT48B200BTS MB816B200BTS	1009051+ TC350	U5168-XTL-200 U5169-XTL-200	MC0816B1200CT	U2M2R	M208CR2A R208CR2A R208CR2AETG
320A		UHC344N3T-C	U6601-X-TG-2/200 U6604-X-TG-2/200	MK0402L1400RLM + (2)QN2200RH MK0402L1400SC + (2)QN2200RH	U4042MC	RS45500C RS45524CFMG

Combination Meter Sockets – Underground (5th Lug)

SERVICE SIZE	Eaton	Durham	Milbank	Talon	Midwest
200A	MB816B200STD	1009051+ TC350 + ARP00035	U5168-XTL-200-5T9 U5169-XTL-200-5T9	MC0816B1200CT + EC5J2	UGTH4213CMEP + MS5
320A		UHC344N3T-C + ARP00035	U6601-X-TG-2/200-5T9 U6604-X-TG-2/200-5T9	MK0402L1400RLM + (2)QN2200RH + H35815-2	RS45500C + MS5MIL RS45524CFMG + MS5MIL

Duplex Meter Sockets – Underground

SERVICE SIZE	Eaton	Durham	Milbank	Talon	Square D	Midwest
2-100A	UT2R1121CCH UT2R1421BCH	UT2R1121A UT-2R1121C SBG1012A*	U5902-X-2/K1+ Breakers	UA2311-0G	UT2R1121B + ACP + A5J	UT2R1121BMEP + ARP00002MEP
2-200A	UT2R2332UCH	UT-2R2332A SBG2022A SBG2022U	U1252-X-HSP-2/K1 U5882-X-HSP-2/K1 + Breakers	UA2716-XG	UT2R2122B + ACP	UT2R2332TMEP + ARP00016MEP

* To provide 100A service, these sockets will be installed with Customer supplied 100A breakers.

** To provide 200A service, these sockets will be installed with Customer supplied 200A breakers.

Duplex Meter Sockets – Underground (5th Lug)

SERVICE SIZE	Eaton	Durham	Milbank	Talon	Square D	Midwest
2-100A	UGT2R1121CCH UGT2R1421BCH UT2R1121CCH + ARP00035CHJ UT2R1421BCH + ARP00035CHJ	UGT2R1121A UGT-2R1121C SBG1012A + Breakers + ARP00035	U5902-X-2/K1-5T9 + Breakers	UA2311-0G + H659-0121	UT2R1121B + ACP	UT2R1121BMEP + ARP00002MEP + ARP00035MEP
2-200A	UGT2R2332UCH UT2R2332UCH + ARP00035CHJ	UGT-2R2332A SBG2022A + ARP00035 SBG2022U + ARP00035	U1252-X-HSP-2/K1-5T9 U5882-X-HSP-2/K1-5T9 + Breakers	UA2716-XG + H659-0121	UT2R2122B + ACP + A5J	

* To provide 100A service, these sockets will be installed with Customer supplied 100A breakers.

** To provide 200A service, these sockets will be installed with Customer supplied 200A breakers.

Meter Stacks (3 To 6) – Underground

SERVICE SIZE	Eaton	Durham	Milbank	Talon	Midwest
3-100A	UT3R1121BCH	UT-3R1121C SBG1013A*	U5903-X-2/K1 + Breakers	UA3311-0G	UT3R1121BMEP + ARP00002MEP
4-100A	UT4R1121CCH	UT-4R1121A UT-4R1121C SBG1014A* SBG1014C*	U5904-X-2/K1 + Breakers	UA4311-0G	UT4R1121BMEP + ARP00002MEP
5-100A	UT5R1121BCH	UT-5R1121C SBG1015A* SBG1015C*	U5905-X-2/K1 + Breakers		UT5R1121BMEP + ARP00002MEP
6-100A	UT6R1131BCH	UT-6R1131C SBG1016A* SBG1016C*	U5906-X-2/K1 + Breakers		UT6R1131BMEP + ARP00002MEP
3-200A	UT3R2332UCH	UT-2R2332U SBG2023A SBG2023U	U1253-X-HSP-2/K1 U5883-X-2/K1 + Breakers	UA3717-ZG	UT3R2332TMEP + ARP00016MEP
4-200A	UT4R2352UFLCH	UT-4R2352A UT-4R2352U SBG2024A SBG2024U	U1254-X-HSP-2/K1 U5884-X-2/K1 + Breakers	UA4719-ZG	UT4R2352TMEP + ARP00016MEP
5-200A	UT5R2392TTCH	UT-5R2392UU SBG2025UU	U1255-X-HSP-2/K1 U5885-X-2/K1+ Breakers	UA5719-MG	UT5R2392TTMEP + (2) ARP00016MEP
6-200A	UT6R2392UUFLCH	UT-6R2392UU SBG2026U	U1256-X-HSP-2/K1 U5886-X-2/K1+ Breakers	UA6719-MG WEPK8612	UT6R2392TTMEP + (2) ARP00016MEP

* To provide 100A service, these sockets will be installed with Customer supplied 100A breakers.

** To provide 200A service, these sockets will be installed with Customer supplied 200A breakers.

Meter Stacks (3 To 6) – Underground (5th Lug)

SERVICE SIZE	Eaton	Durham	Milbank	Talon	Square D	Midwest
3-100A	UGT3R1121BCH UT3R1121BCH +ARP00035CHJ	UGT-3R1121C SBG1013A + ARP00035	U5903-X-2/K1-5T9+ Breakers	UA3311-0G + 659-0121		UT3R1121BMEP + ARP00002MEP + ARP00035MEP
4-100A	UGT4R1121CCH UT4R1121CCH + ARP00035CHJ	UGT-4R1121A UGT-4R1121C SBG1014A + ARP00035 SBG1014C + ARP00035	U5904-X-2/K1-5T9+ Breakers	UA4311-0G + H659-0121		UT4R1121BMEP + ARP00002MEP + ARP00035MEP
5-100A	UGT5R1121BCH UT5R1121BCH + ARP00035CHJ	UGT-5R1121C SBG1015A +ARP00035 SBG1015C +ARP00035	U5905-X-2/K1-5T9+ Breakers			UT5R1121BMEP + ARP00002MEP + ARP00035MEP
6-100A	UGT6R1131BCH UT6R1131BCH + ARP00035CHJ	UGT-6R1131C SBG1016A + ARP00035 SBG1016C +ARP00035	U5906-X-2/K1-5T9 + Breakers			UT6R1131BMEP + ARP00002MEP + ARP00035MEP
3-200A	UGT3R2332UCH UGT3R2332UCH	UGT-2R2332U SBG2023A + ARP00035 SBG2023U +ARP00035	U1253-X-HSP-2/K1-5T9 U5883-X-2/K1-5T9+ Breakers	UA3717-ZG + H659-0121	UT3R2332T + A5J + ACPL	UT3R2332TMEP + ARP00016MEP + ARP00035MEP
4-200A	UGT4R2352UFLCH UT4R2352UFLCH + ARP00035CHJ	UGT-4R2352A UGT-4R2352U SBG2024A + ARP00035 SBG2024U + ARP00035	U1254-X-HSP-2/K1-5T9 U5884-X-2/K1-5T9 + Breakers	UA4719-ZG + H659-0121	UT4R2352T + A5J + ACPL	UT4R2352TMEP + ARP00016MEP + ARP00035MEP
5-200A	UGT5R2392TTCH UT5R2392TTCH + ARP00035CHJ	UGT-5R2392UU SBG2025UU + ARP00035	U1255-X-HSP-2/K1 U5885-X-2/K1-5T9 + Breakers	UA5719-MG + H659-0121	UT5R2392TU + A5J + ACPL	UT5R2392TTMEP + (2) ARP00016MEP + ARP00035MEP
6-200A	UGT6R2392UUFLCH UT6R2392UUFLCH + ARP00035CHJ	UGT-6R2392UU SBG2026U + ARP00035	U1256-X-HSP-2/K1-5T9 U5886-X-5T9 + Breakers	UA6719-MG + H659-0121	UT6R2392TU + A5J + ACPL	UT6R2392TTMEP + (2) ARP00016MEP + ARP00035MEP

* To provide 100A service, these sockets will be installed with Customer supplied 100A breakers.

** To provide 200A service, these sockets will be installed with Customer supplied 200A breakers.

CT/Connection Cabinet

SERVICE SIZE	MILBANK CATALOG #	TALON/SIEMENS CATALOG #	DURHAM CATALOG #
200A	N/A	N/A	242416-RDW
400A TO 800A	363616-CT3R-WB	LG163636CTS1	363616-DDW
1,000A TO 1,200A	484816-CT3R-WB	N/A	484818-DDW

Intersystem Bonding Termination Bar

MANUFACTURER	CATALOG #
ARLINGTON	GBB50

MANUFACTURER	CATALOG #
EATON	MSEGR2

Grounding Clamps

CONDUIT	TAP CONDUCTOR RANGE	MANUFACTURER	CATALOG #
1/2" – 1"	#10 SOL – #2 STR	PENN-UNION	KP-1
			KP-1-DB
		BURNDY	C-11N
			C-11D
		NSI INDUSTRIES	G-1-S
			G-1
		ERICO	CWP1JSH
			CWP1JU
		HARGER	BGC4
		THOMAS & BETTS	J
			JD
1-1/4" – 2"	#10 SOL – #2 STR	PENN-UNION	KP-2
			KP-2-DB
		BURNDY	C-22
			C-22D
		NSI INDUSTRIES	G-2-S
			G-2
		ERICO	CWP2JSH
			CWP2JU
		HARGER	BGC41.25-2
		THOMAS & BETTS	J2BB
			J2D
2-1/2" – 4"	#10 SOL – #2 STR	PENN-UNION	KP-4
		BURNDY	C-4
		NSI INDUSTRIES	G-4-S
			G-4
			G-4-SBS
		HARGER	BGC42.5-4
4-1/2" – 6"	#10 SOL – #2 STR	PENN-UNION	KP-6
		BURNDY	C-8
		NSI INDUSTRIES	G-6-S
			G-6

Appendix B

Excerpts from the NEC are placed here for your convenience. For more detail information, please consult the NEC directly.

Part VI. Service Equipment — Disconnecting Means

230.70 General. Means shall be provided to disconnect all ungrounded conductors in a building or other structure from the service conductors.

(A) Location. The service disconnecting means shall be installed in accordance with 230.70(A)(1), (A)(2), and (A)(3).

(1) Readily Accessible Location. The service disconnecting means shall be installed at a readily accessible location either outside of a building* or structure or inside nearest the point of entrance of the service conductors.

(2) Bathrooms. Service disconnecting means shall not be installed in bathrooms.

(3) Remote Control. Where a remote control device(s) is used to actuate the service disconnecting means, the service disconnecting means shall be located in accordance with 230.70(A)(1).

(B) Marking. Each service disconnect shall be permanently marked to identify it as a service disconnect.

(C) Suitable for Use. Each service disconnecting means shall be suitable for the prevailing conditions. Service equipment installed in hazardous (classified) locations shall comply with the hazardous location requirements

* Liberty requires an external disconnect.

230.71 Maximum Number of Disconnects.

Each service shall have only one disconnecting means unless the requirements of 230.71(B) are met.

(A) General. For the purpose of this section, disconnecting means installed as part of listed equipment and used solely for the following shall not be considered a service disconnecting means:

- (1) Power monitoring equipment
- (2) Surge-protective device(s)
- (3) Control circuit of the ground-fault protection system
- (4) Power-operable service disconnecting means

(B) Two to Six Service Disconnecting Means.

Two to six service disconnects shall be permitted for each service permitted by 230.2 or for each set of service-entrance conductors permitted by 230.40, Exception No. 1, 3, 4, or 5. The two to six service disconnecting means shall be permitted to consist of a combination of any of the following:

(1) Separate enclosures with a main service disconnecting means in each enclosure

(2) Panelboards with a main service disconnecting means in each panelboard enclosure

(3) Switchboard(s) where there is only one service disconnect in each separate vertical section with barriers provided between each vertical section to maintain the inadvertent contact protection required in 230.62 based on access from the adjacent section(s)

(4) Service disconnects in switchgear, transfer switches, or metering centers where each disconnect is located in a separate compartment.

(5) Metering centers with a main service disconnecting means in each metering center

(6) Motor control center(s) where there is only one service disconnect in a motor control center unit and a maximum of two service disconnects provided in a single motor control center with barriers provided between each motor control center unit or compartment containing a service disconnect to maintain the inadvertent contact protection required in 230.62 based on access from adjacent motor control center unit(s) or compartment(s)

Table 250.66 Grounding Electrode Conductor for Alternating-Current Systems

Size Of Largest Ungrounded Conductor or Equivalent Area for Parallel Conductors (AWG/kcmil)		Size Of Grounding Electrode Conductor (AWG/kcmil)	
Copper	**Aluminum or Copper-Clad Aluminum**	**Copper**	**Aluminum or Copper-Clad Aluminum**
2 or smaller	1/0 or smaller	8	6
1 or 1/0	2/0 or 3/0	6	4
2/0 or 3/0	4/0 or 250	4	2
Over 3/0 through 350	Over 250 through 500	2	1/0
Over 350 through 600	Over 500 through 900	1/0	3/0
Over 600 through 1100	Over 900 through 1750	2/0	4/0
Over 1100	Over 1750	3/0	250

Notes:

1. If multiple sets of service-entrance conductors connect directly to a service drop, set of overhead service conductors, set of underground service conductors, or service lateral, the equivalent size of the largest service-entrance conductor shall be determined by the largest sum of the areas of the corresponding conductors of each set.
2. If there are no service-entrance conductors, the grounding electrode size shall be determined by the equivalent size of the largest service-entrance conductor required for the load to be served.
3. See installation restrictions in 250.64.

Table 310.15(C)(1) Adjustment Factors for More Than Three Current- Carrying Conductors

Number of Conductors*	Percent of Values in Table 310.16 Through Table 310.19 as Adjusted for Ambient Temperature if Necessary.
4–6	80
7–9	70
10–20	50
21–30	45
31–40	40
41 and above	35

* Number of conductors is the total number of conductors in the raceway or cable, including spare conductors. The count shall be adjusted in accordance with 310.15 (E) and (F). The count shall not include conductors that are connected to electrical components that cannot be simultaneously energized.

Table 310.16 Ampacities of Insulated Conductors with Not More Than Three Current-Carrying Conductors in Raceway, Cable, or Earth (Directly Buried)

Size AWG or kcmil	Temperature Rating of Conductor [See NEC Table 310.41)]						Size AWG or kcmil
	60°C (140°F)	75°C (167°F)	90°C (194°F)	60°C (140°F)	75°C (167°F)	90°C (194°F)	
	Types TW, UF	Types RHW, THHW, THW, THWN, XHHW, XHWN, USE, ZW	Types TBS, SA, SIS, FEP, FEPB, MI, PFA, RHH, RHW-2, THHN, THHW, THW-2, THWN-2, USE-2, XHH, XHHW, XHHW-2, XHWN, XHWN-2, XHHN, Z, ZW-2	Types TW, UF	Types RHW, THHW, THW, THWN, XHHW, XHWN, USE	Types TBS, SA, SIS, THHN, THHW, THW-2, THWN-2, RHH, RHW-2, USE-2, XHH, XHHW, XHHW-2, XHWN, XHWN-2, XHHN	
	COPPER			ALUMINUM OR COPPER-CLAD ALUMINUM			
18**	—	—	14	—	—	—	—
16**	—	—	18	—	—	—	—
14**	15	20	25	—	—	—	—
12**	20	25	30	15	20	25	12**
10**	30	35	40	25	30	35	10**
8	40	50	55	35	40	45	8
6	55	65	75	40	50	55	6
4	70	85	95	55	65	75	4
3	85	100	115	65	75	85	3
2	95	115	130	75	90	100	2
1	110	130	145	85	100	115	1
1/0	125	150	170	100	120	135	1/0
2/0	145	175	195	115	135	150	2/0
3/0	165	200	225	130	155	175	3/0
4/0	195	230	260	150	180	205	4/0
250	215	255	290	170	205	230	250
300	240	285	320	195	230	260	300
350	260	310	350	210	250	280	350
400	280	335	380	225	270	305	400
500	320	380	430	260	310	350	500
600	350	420	475	285	340	385	600
700	385	460	520	315	375	425	700
750	400	475	535	320	385	435	750
800	410	490	555	330	395	445	800
900	435	520	585	355	425	480	900
1000	455	545	615	375	445	500	1000
1250	495	590	665	405	485	545	1250
1500	525	625	705	435	520	585	1500
1750	545	650	735	455	545	615	1750
2000	555	665	750	470	560	630	2000

Notes:

1. Section 310.15(B) shall be referenced for ampacity correction factors where the ambient temperature is other than 30°C (86°F).
2. Section 310.15(C)(1) shall be reference for more than three current-carrying conductors.
3. Section 310.16 shall be referenced for conditions of use.

* Section 240.4(D) shall be referenced for conductor overcurrent protection limitations, except as modified elsewhere in the *Code*.

Most Common Reasons for Delays in Service Connection

- **CUSTOMER HAS NOT APPLIED FOR SERVICE**
- **THE SERVICE PATH WAS NOT CLEAR**
- **METER SOCKET WAS NOT GROUNDED**
- **NO GROUND ROD OR IMPROPER GROUND ROD**
- **METER SOCKET WAS EITHER TOO HIGH OR LOW**
- **METER SOCKET WAS NOT PROPERLY ATTACHED**
- **METER SOCKET WAS IMPROPERLY WIRED**
- **METER SOCKET WAS NOT APPROVED BY COMPANY**
- **WEATHERHEAD WAS TOO LOW**
- **NO SERVICE ATTACHMENT POINT OR BRACKET**
- **SERVICE ATTACHMENT POINT WAS TOO LOW**
- **WRONG SIZE OR TYPE OF CONDUIT (WATER PIPE IS NOT ALLOWED)**
- **NO STRAPS ON THE CONDUIT**
- **TRENCH WAS TOO SHALLOW**
- **TRENCH PATH WAS NOT LINE OF SIGHT**
- **WRONG GROUND WIRE SIZE**
- **GROUND WIRE WAS NOT ATTACHED**
- **NO PROTECTIVE BUSHINGS ON THE CONDUITS**
- **CONDUIT WAS NOT PROPERLY SUPPORTED IN THE BOTTOM OF THE TRENCH**
- **LOCAL INSPECTION NOT OBTAINED (AS REQUIRED)**
- **MULTIPLE SOCKETS/SERVICES WERE NOT LABELED CORRECTLY**
- **CONSTRUCTION FEES NOT PAID**