



**GUIDEBOOK
FOR
ELECTRIC
SERVICE
INSTALLATION**

LAMAR UTILITIES BOARD

Maintenance and Engineering

**100 North Second Street
Lamar, Colorado 81052**

719 - 336 - 7456

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FORWARD

This booklet is offered to assist customers, architects, engineers, contractors, wiremen and inspectors in planning electric service and connections to the Electric System operated by the Lamar Utilities Board. These rules comply with the:

- (a) National Electrical Safety Code.
- (b) Rules and Regulations of Electrical Service of Electrical Service of the Utilities Board of the City of Lamar. If any conflict is found to exist between this Guidebook and the Rules and Regulations of the Utilities Board of the City of Lamar, either directly or by implication, the Rules and Regulations will in all cases prevail.
- (c) Corresponding Sections of the National Electrical Code unless stated otherwise.
- (d) Any deviation from these guidelines will result in delaying or terminating the service connection to the consumer.

It is not the responsibility nor intention of the Utilities Board to provide or enforce national electrical codes, state codes, ordinances, dealing with adequacy, safety, and protection of customer's wiring and equipment. This is the responsibility of the customer and the prerogative of regional inspection authorities.

SECTION I

GENERAL INFORMATION AND PROCEDURES

1. Request and Contract for Service

Requests for a new service shall be made at the office of the Utilities Board at 100 North Second Street in Lamar. If a Contract or Line Extension Agreement is required by the Utilities Board, it shall be properly executed prior to the commencement of any work being done by the Utilities Board. A request for a connect or reconnect to an existing service, after inspection if required, can be made at the billing office of the Lamar Utilities Board at the City Complex, 104 East Parmenter, Lamar, Colorado 81052. One business day's notice will be required, as a minimum, for new or temporary service. All electrical work performed shall comply with the latest edition of the National Electrical Code and current Rules and Regulations of the Colorado State Electrical Board except for specific rules contained herein.

2. Rate Schedules

Representatives of the Utilities Board will be available to explain rate schedules and assist in the selection of the applicable rate best suited to the applicant's requirements.

3. Service and Limitations

Service must not be used by the customer for purposes other than that specified in the rate applicable.

4. Apparatus and Equipment

Customer will grant the Utilities Board permission to locate its

lines and equipment on or across lands owned by customer at no charge to the Utilities Board and will furnish satisfactory shelter for all equipment located on customer's side of the meter.

5. **Diversion of Electricity**

The customer shall not hamper or otherwise interfere with the proper meter registration.

The discovery of meter tampering or bypassing of an electrical meter will constitute prima facie evidence of diversion on the part of the customer in whose name the electric service is rendered or by the person(s) benefitting from the use of such diverted energy. The responsible party will then be billed in accordance with those procedures outlined on Sheet R21 of the Rules and Regulations of the Utilities Board of the City of Lamar.

No jumper shall be installed in meter sockets with the intent of connecting or reconnecting electrical service without the express consent of the Utilities Board.

6. **Access for the Utilities Board Employees**

The Utilities Board shall have the right to enter upon the premises of the customer at all reasonable times for the purpose of inspecting, repairing, replacing or removing equipment owned by the Utilities Board.

7. **Service Standards**

Standard secondary service as referred to in rate schedules is alternating current 60 Hertz, single or three phase.

Voltage characteristics will be one of the following

classifications depending upon customer location:

- (a) Single phase, two or three wire, 120/240 volts.
- (b) Single or three phase, two, three or four wire, "Y" connected, 120/208 volts.
- (c) Three phase, three or four wire, 240 volts, (At limited locations).
- (d) Three phase, three or four wire, 277/480 volts, "Y".
- (e) Three phase, three wire, 480 volts Delta, (At limited locations).

Standard primary service as referred to in rate schedules is alternating current 60 Hertz, single or three phase, 2400 volts Delta (at limited locations), 4160/2400 volts GRDY, and 24,940/14,400 volts CRDY.

The Utilities Board will maintain the above voltages with no more than +/- 5% for lighting loads, and +/- 10% variation for power loads, for constant or gradual load variations. When fluctuating loads on the customer's premises produce short duration voltage drops, those voltage drops will not be considered a violation of voltage variations.

8. Instantaneous Demand

As a protection to service and equipment, motors, of one hundred (100) horsepower or larger shall have such characteristics or be equipped with a starter of such design that the instantaneous starting current requirement will be limited to approximately 300

percent of full load current.

By permission of the Utilities Board, exception to this rule under certain conditions may be permitted.

9. Power Factor Correction

Loads such as lighting equipment and induction type motors tend to have low power factor characteristics. All loads exhibiting power factors less than 90% lagging or leading shall be required to have power factor correction equipment capable of maintaining power factor to not less than 90% leading or lagging. The Utilities Board reserves the right to refuse connection or discontinue services to loads until these requirements are made.

10. Notification of Work

A 24 hour notice must be given to Lamar Utilities Board before permanent service is connected.

Prior to any new construction or major modification, the customer or his electrical contractor shall notify the Utilities Board of the anticipated load and voltage characteristics so as to allow the Utilities Board sufficient time to make any necessary changes in transformer capacity or service. Failure to do so will relieve the Utilities Board of responsibility of providing service to the customer on a timely basis. Customer or electrical contractor shall consult with Lamar Utilities Board representative before setting the location of electric service to provide the most economical and feasible way to feed that service.

11. Pole Attachments

No posters, banners, placards, radio or television aerials, or

other objects will be attached to poles of the Utilities Board.

12. Service Failures

The Utilities Board shall not be held liable for service failures caused by strikes, acts of God, or unavoidable accidents or contingencies beyond its control.

13. Meter Handling

The customer or the electric contractor shall not under any circumstances cut or replace the electric metering seal without the permission of Lamar Utilities Board. Connection and disconnection of all metering equipment shall be made by Utilities Board personnel only.

SECTION II

**ELECTRIC SERVICE DROPS
AND SERVICE ENTRANCES**

1. Overhead systems (0-600 volts)

A. Service Connection:

The standard method of connection between the Utilities Board and the customer's service entrance outlet is by means of overhead wires which are approved by the Utilities Board.

B. Number of Service to a Building:

Refer to National Electric Code, Article 230-2.

C. Attachment of Service Drops:
(Fig. 1 & 2)

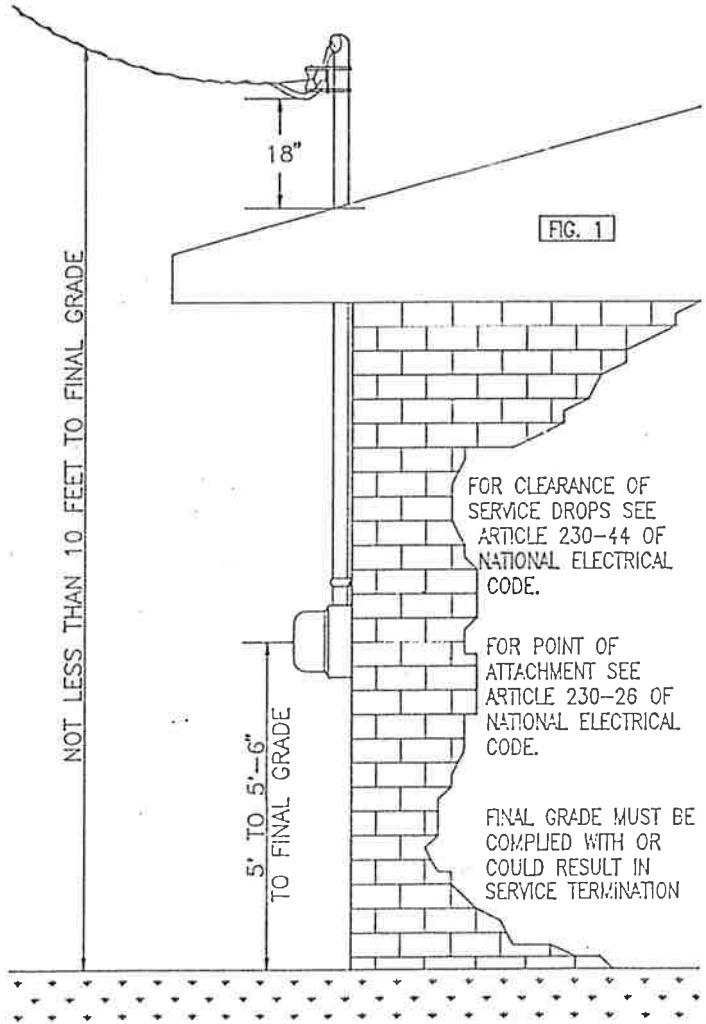
(1) Point of Attachment

The service entrance wiring shall be brought to a point outside the building which may be satisfactorily reached from the Utilities Board's poles and lines without service drop trespass upon other property. Information relative to existing poles and wires of the Utilities Board shall be obtained from, and the details approved by, the Utilities Board before locating the service entrance to a building. The clearances and points of attachment of service drops shall be in accordance with Article 230-24 and 230-26 of the National Electric Code.

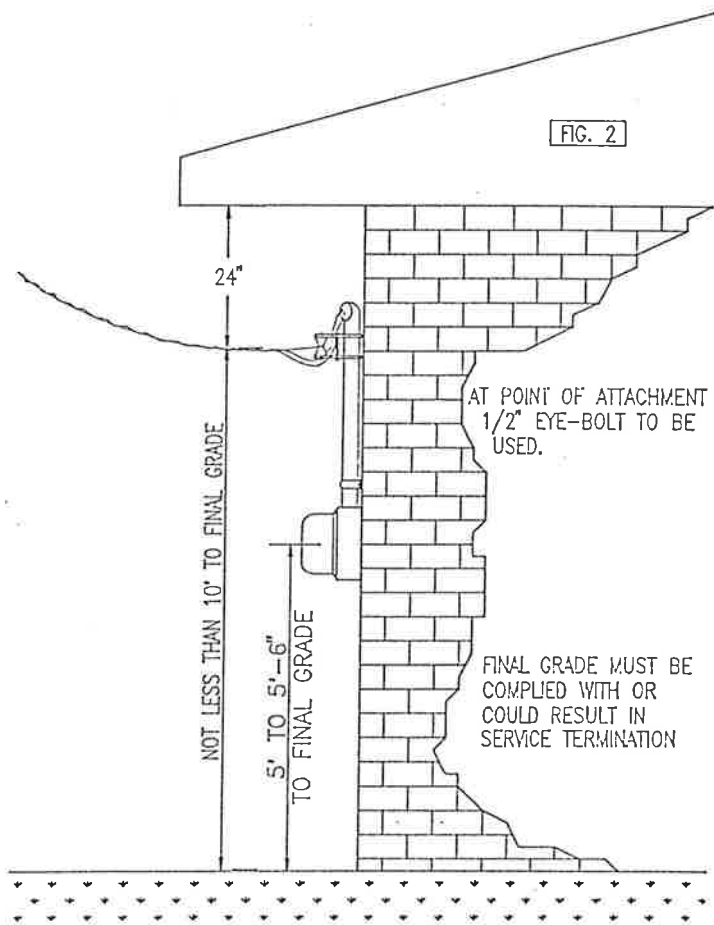
(2) Method of Attachment

On all new or remodeled buildings, the electrical contractor shall install the service bracket or other dead-end insulating device for termination of the Utilities Board's service drop on the building, adequate strength to be provided. On buildings of masonry or fireproof construction, dead-end devices are to be mounted by means of through-bolts set in the construction. In the event a house has less than 12' ground clearance to the eaves a mast type riser through the roof will be required. The conduit must be a minimum of 2" rigid and extend above the roof to maintain 18" clearance between the eaves of the roof and

SERVICE MAST INSTALLATION FOR OVERHEAD SERVICE ABOVE ROOF



SERVICE INSTALLATION FOR OVERHEAD SERVICE UNDER EAVES



the service drop. Service knobs and jay hooks are not acceptable. Also, see Articles 230-26, 27, 28 of the National Electric Code.

D. Length of Service Drops:

Allowable length of service drops shall be governed by Article 230-24 and Article 230-26 of the National Electric Code. In general, service drops shall not exceed 120 feet in length and large service drops shall be proportionately shorter.

E. Service Drop Poles:

Where the length of the service drop is excessive, or proper clearances cannot be maintained, or the size of the conductor would cause undue stress upon either the customer's structure or the Utilities Board's pole line, a service pole (at the customer's expense) may be required on the customer's or adjacent property owner's premises. A suitable right-of-way must be granted from the customer and suitable right-of-way shall be obtained from the adjacent property owner before such installation can be made.

F. Service Entrance Conductors and Conduit:

The service entrance conductors and conduit will be defined as the service conductors between the terminals of the service equipment and a point usually outside the

building, clear of building walls, where joined by tap or splice to the service drop. Service entrance conductors shall have a current-carrying capacity at least as great as that provided in Article 220 of the National Electric Code.

G. Splices in Service Entrance Conductors:

Articles 230-42 of the National Electric Code shall apply. At least 24" of wire shall extend from the service head for connection to the Utilities Board's service drop. In cases where the service head is on a utility pole, sufficient wire shall be left to extend to the secondary terminals of the transformer or utility's service wires, so that no splice will be necessary. The neutral wire shall be marked distinctly so that it can be readily identified. No conductors other than electric service conductors shall be installed in the service entrance conduit. The Utilities Board will require that the service entrance wiring, the meter "loop" and the service entrance switch be installed in compliance with the National Electric Code and be entirely at the customer's expense.

2. Primary Underground Systems
(2.4/4.16 kV or 14.4/24.9 kV)

A. General:

The general policy for customers desiring

primary underground service is that the customer is responsible for the conduit in place, labor to complete the project, and pad for the transformer. All work done is to be approved by the Utilities Board and done in accordance with the following guidelines. Exceptions to be following have to be given in writing by the Utilities Board. If the rules are not met, the Utilities Board reserves the right to refuse to install the primary conductor.

B. Minimum Depth:

4'0" unless otherwise specified.

C. Conduit:

GRC is required for all risers, up poles and into pads, as well as for all 90 degree ells. PVC may be used only when approved for electrical conductors and only when encased in 2" of concrete.

Conduit must be inspected by the Utilities Board prior to being encased in concrete, if PVC; or being backfilled, if GRC.

A pull wire must be installed in the conduit for use by the Utilities Board.

D. Pad

Transformer pads will be constructed by the customer according to the specifications given

by the Utilities Board, and must be inspected prior to concrete being poured.

3. Secondary Underground System (0-600 Volts)

A. General:

The customer is responsible for the conduit, conductor, disconnecting and over-current protective devices and the installation of same to the Utilities Board specifications. A New Service Request Form must be completed by the consumer. All plans for underground services shall be approved by the Utilities Board prior to construction. Should an existing underground service require relocation or replacement because of new construction or changes on consumer's premises or increased loads, the cost of such relocation shall be at the expense of the consumer.

(1) Underground Services from Underground Facilities

In locations where the Utilities Board has established underground systems, the customer shall have disconnecting and over-current protective device at the point the service goes underground, and shall consult with the Utilities Board, prior to the commencement of construction, to obtain the details of the service

connections.

(2) Underground Services from Overhead Lines:

(Figures 3 & 4)

The general policy regarding underground services from the Utilities Board's overhead secondary system is that the service shall be installed in conduit, acceptable to the Utilities Board, and shall have a disconnecting and over-current protective device at the point the service goes underground. The installation of the conduit, conductors and equipment shall be in accordance with specifications available from the Utilities Board.

Sufficient notification must be given to the Utilities Board in advance of the required installation.

SERVICE INSTALLATION FOR UNDERGROUND SERVICE

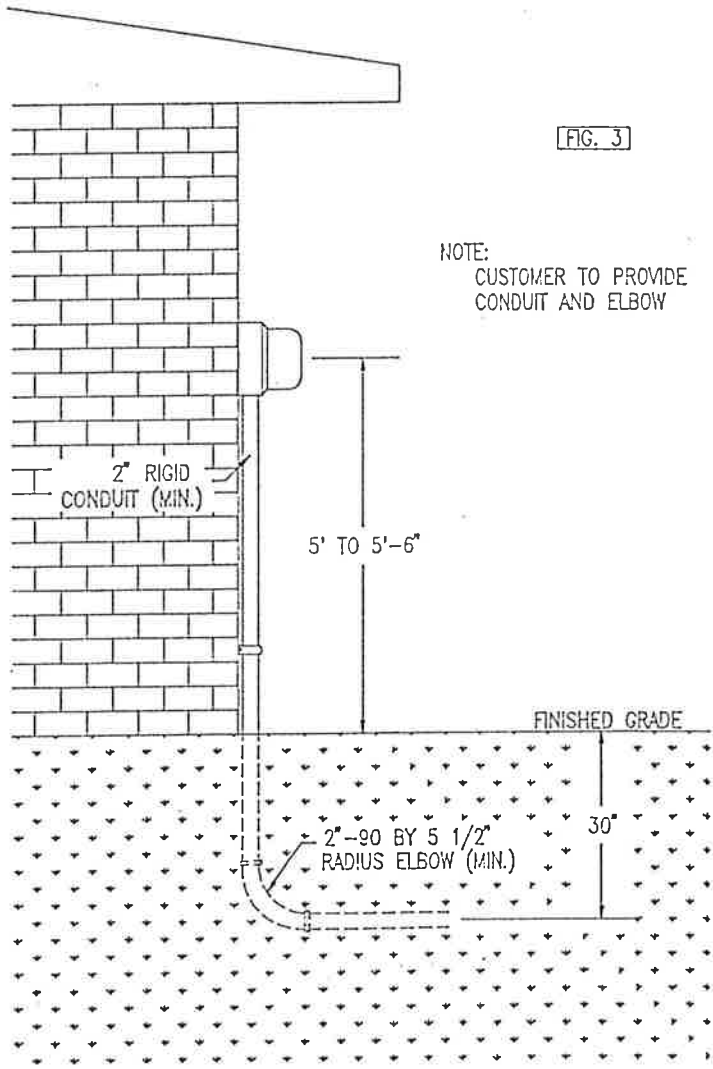
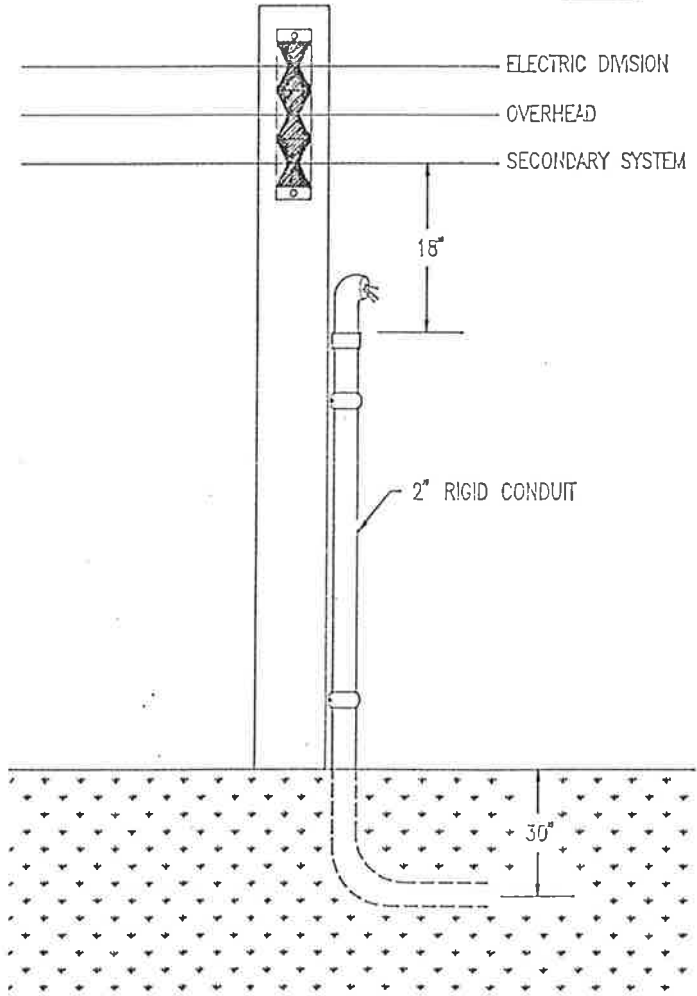


FIG. 3

NOTE:
CUSTOMER TO PROVIDE
CONDUIT AND ELBOW

SERVICE INSTALLATION FOR UNDERGROUND SERVICE

FIG. 4



SECTION III

METERS

1. Meter Installation and Ownership

Only one meter for each rate under which the customer receives service will be installed and maintained by the Utilities Board for each customer at each address service.

All meters, service drops and other electrical facilities installed by the Utilities Board at its expense upon the customer's premises for the purpose of delivery or measuring electrical energy to the customer shall continue to be the property of the Utilities Board.

Customer shall provide and maintain without cost to the Utilities Board, subject to approval, at an easily accessible location on or within premises to be supplied with service sufficient and proper facilities for installation of meters and other apparatus in accordance with the rules as contained herein.

2. Marking of Multiple Meter Sockets

Each meter socket shall be plainly and permanently marked to show which apartment, office or room is supplied therefrom with a tag approved by the Utilities Board.

3. Moving or Removing Meters and Metering Equipment

The customer shall not tamper or otherwise interfere with the proper operation of the Utilities Board's meter or other equipment or in any way interfere with the proper meter

registration of the electrical energy used. Only authorized Utilities Board employees are permitted to connect, disconnect, move, or remove meters.

4. Meter Locations (Fig. 5)

The location of meters and metering equipment shall be designated by the Utilities Board where they will be readily accessible at all reasonable hours for reading, testing and other maintenance purposes. No wiring dependent upon the meter location shall be started until the location has been definitely assigned by the Utilities Board representative.

Meters shall be installed on the outside rear building wall nearest the alley or easement unless otherwise specified by the Utilities Board, in a place accessible at all times and in such a location as to coordinate with the service drop requirements.

Meter socket locations must be approved by Lamar Utilities Board prior to service connection. Meter sockets shall be plumb and securely fastened to the building wall and shall be installed so that the meter is located 5 to 5-1/2 feet above finished grade or permanent platform. At least three (3) feet of clear space must be left in front of the meter for reading. At least three (3) inches of clear space measured from any part of the meter socket to all conduits, pipe, walls etc., must be maintained for servicing.

A. Outdoor Meters

Outdoor meters shall not be installed where they will interfere with traffic, sidewalks, driveways or where they will obstruct the opening of doors or windows or in any location which may be considered hazardous.

B. Multiple Outdoor Meters.

Where service is supplied to individual customers located in structures designed for multiple occupancy, the individual outdoor meters shall be grouped at a point nearest the service drop attachment and must be so arranged as to accept one service drop for all.

For a duplex, a raintight junction box or pull box must be installed as indicated in the following diagram. The size and standards of the box must be in accordance with the National Electric Code.

5. Services, 150 Amps or Greater

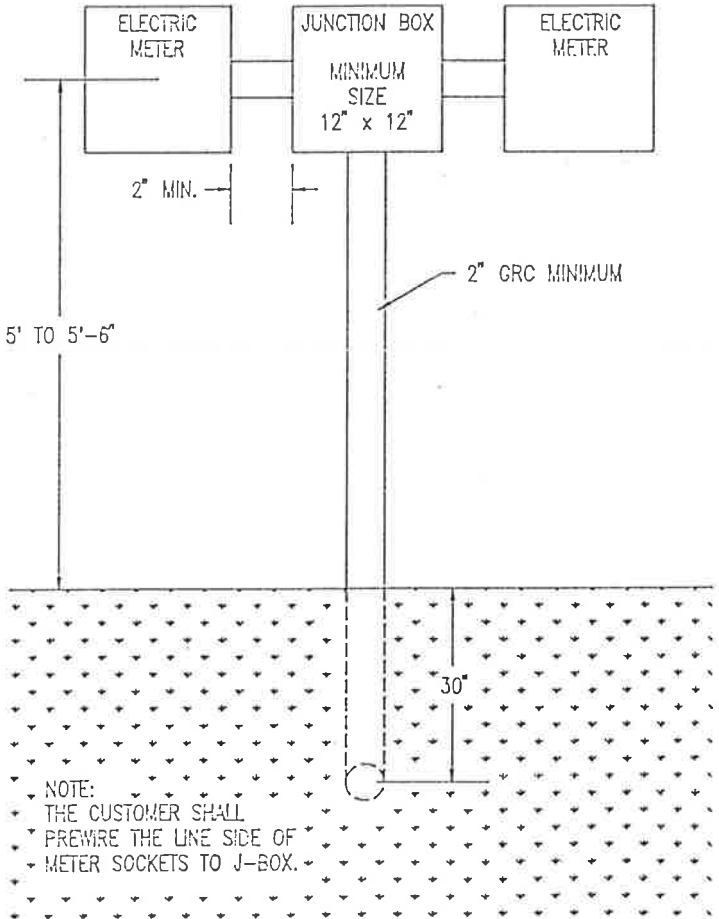
Any service over 150 amps, or any service with sensitive electronics or computer equipment will be equipped with tension by-pass sockets if a self-contained (no current transformers) meter is to be used.

6. Irrigation Well Meters

All three phase irrigation pumps shall be metered using a seven terminal metering socket.

SERVICE INSTALLATION FOR UNDERGROUND SERVICE

FIG. 5



SECTION IV

EXTENSIONS OF LINES AND SERVICES

1. General

Extensions of distribution lines or transmission lines to point of delivery to customer or customers will be made subject to the following conditions, and in accordance with applicable rules, in effect or adopted by the Utilities Board of the City of Lamar.

A. Permanent Extensions for Continuous Service:

Permanent extensions for continuous service will be made within reasonable time after the customer or customers have made application for service and when monthly revenue for each month of the five year period immediately following construction is equal to or more than two percent (2%) of the total cost of the extension.

The Utilities Board may require a written contract covering the service and may also require a cash deposit equal to all or part of the total cost of the extension to be refunded annually, or used as advance payment of revenue therefrom, on the basis of two per cent (2%) per month of the total cost of the extension.

Where more than one customer is to be served from an extension, the advance revenue

deposit may be divided on an equal pro-rated basis so that the total number of customers bear the total cost of the extension, or any other basis that may be agreed upon.

B. Indeterminate Service:

Indeterminate service refers to any service other than those known to be temporary, where there is little or no immediate demand or where the amount and permanency of service can not be reasonably assured.

For indeterminate services involving real estate subdivisions and development of land for sale, applicant or applicants will be required to pay the Utilities Board as a Construction advance the estimated cost of construction for all overhead and/or underground equipment. The construction advance payment may then be refundable as outlined in the Rules and Regulations for Electric Service, Sheet No. R51, Section 1.3, in part or in its entirety commencing with the Extensions Completion date over a five (5) year period.

For all other types of indeterminate service, applicant or applicants will be required to pay the entire estimated cost for construction of the necessary distribution facilities.

C. Extensions for Temporary Service:

Extensions for temporary service shall be made

at the applicable rate schedule when the customer has paid, in advance, to the Utilities Board an amount equal to the total cost of the extension plus cost of labor for removing the extension less the salvage value of the materials.

Additional cash deposit shall be made equal to the estimated consumption under the applicable rate schedule, not to exceed an amount equal to ninety (90) days continuous service.

If a service originally connected as temporary is continued for a period of more than eighteen months following the completion date; the nature of such continued service will be evaluated, and may be reclassified.

D. Determination of Cost of Construction:

The Utilities Board shall base its cash deposits and assured revenues for each extension arrangement upon an estimate made prior to construction. If upon completion of the extension the actual cost is greater or less than the estimate, the deposit and assured revenue shall be re-adjusted to suit the rule applicable.

SECTION V TEMPORARY SERVICE

1. General

Temporary Service may be made available prior to the installation of the permanent meter, or at locations where service will be required for a short period of time such as circuses, bazaars, fairs, concessions and similar non-permanent enterprises. Such services shall be restricted to as short a time as possible, such as the time necessary for the construction of a building or in other cases, a maximum time to be determined by the Utilities Board. When service under any schedule will be temporary, connections and extensions will be made as provided by the Utilities Board's appropriate policy.

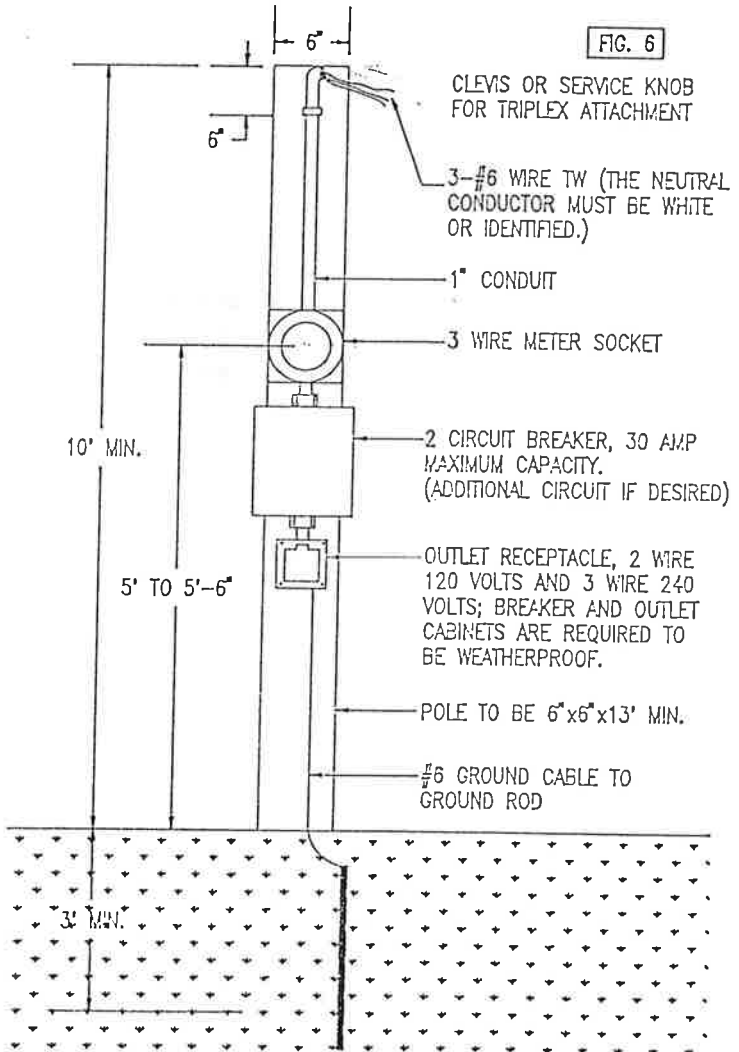
2. Service Loop and Meter Supports: (Fig. 6)

Service loop supports will be supplied by the customer according to the Utilities Board's specifications. These supports must not be under or closer than 15 feet from the power line and no further than 100 feet from the power line pole. The meter socket will be furnished by the customer.

3. Connection:

All temporary services must be inspected by the Colorado State Electrical Inspector. No temporary connections will be made until the permanent meter location has been approved and the temporary installation can be coordinated with the final permanent installation. Connection to or disconnection from the Utilities Board's distribution system shall be made by the Utilities Board's personnel only.

CONSTRUCTION SPECIFICATION FOR POLE MOUNTED METER SERVICE



4. Costs for Temporary Electric Service:

The customer assumes cost for installation and removal of pole line construction required for providing temporary electric service.

