CITY OF LLANO

ELECTRIC DEPARTMENT POLICIES AND PROCEDURES
LLANO CITY UTILITY ORDINANCES # 681, #695, NEC 70, OF ~~2002~~ 2008

ALL NEW CONSTRUCTION AND SERVICES. THE LOCATION OF METER LOOPS SHALL BE INSPECTED AND APPROVED BY THE CITY OF LLANO ELECTRIC DEPARTMNENT BEFORE ANY CONSTRUCTION BEGINS.

METER LOCATIONS:

a. For residences, meter sockets shall be located on, external walls so that meter (s) will be accessible for reading, inspection or testing without entering the building. Future building modifications or structural changes shall not make meters and associated equipment inaccessible from the same property. A confirmation of service must be obtained from the City of Llano Electric Service Department prior to any installations.

b. For multi-residential, commercial and industrial buildings, outdoor meter locations are preferred. No meter socket or service equipment shall be installed in any location not readily accessible from the same property. When adequate exterior wall space is not available, a separately locked meter room accessible from outside the building through one door must be provided. The Department must be supplied a key to that room which will be installed in a lock box adjacent to the door. Future building modifications or other structural changes shall not render the meters and associated equipment inaccessible. Customers shall consult the Department for approved locations and obtain a service confirmation prior to any installations.

c. For multi-occupancy buildings, all meters and metering equipment are to be grouped in one central location that is readily accessible 24 hours a day to City of Llano Electrical Department personnel.

d. For reasons of public safety, maintenance of service, and reliability of metering, the Electric Department has determined certain meter locations to be unacceptable therefore no meter socket or service equipment shall be located:

1. Inside any building, unless located within an acceptable meter room.
2. In any place where moisture, corrosive fumes, dust or similar deteriorating agents are present which may interfere with the operation of the meter, materially damage it or present a hazard to the electric department personnel occupied in servicing, testing or reading of such meter.
3. On the exterior of any wall or structure located so that less than three feet of clearance is provided in front of all metering equipment and its enclosing cabinets from property lines, public thoroughfares, alleys, driveways and walks.
4. In any location not readily accessible 24 hours a day for reading, maintenance, inspection, testing or replacement of the metering equipment by the electric department.
5. In any location which is hazardous or unsuitable for entry by meter readers or service personnel, (i.e. uncontrolled or unrestrained animals, in any area that is not accessible via a clear stairway of normal tread and rise, etc.)
6. In any security area protected by alarm systems, security gates or doors.
7. On buildings, occupancies or other structures that are not directly served by the electric department service connection.
8. In single-family carports or garages.
9. On any portion of a building where future landscaping, fencing, structural changes or modications will make the meter(s) inaccessible or hinder clearances.
10. On poles owned and maintained by the customer.
11. In any patio area that could later be enclosed, thus preventing access to the meter and weather head.
12. In any elevator shaft, hatchway or room containing elevator equipment.
13. In any substation or transformer vault, unless such meter is in an enclosure which is effectively shielded from the high voltage compartment and contains no bare or exposed energized part.
14. Behind a switchboard having bare and exposed live energized parts, unless such meter is located at least five feet from such parts and is effectively shielded there from.
15. Directly over any plumbing fixtures.
16. Directly over any stairway, ramp or steps.
17. On any balcony or mezzanine floor or in any basement, cellar or underground room.
18. On any surface subject to excessive vibration as determined by the Department.
19. In an unlighted enclosed area.
20. Directly over or within three feet of any gas meter.

WIRING SPECIFICATIONS

Electrical facilities will be installed and maintained in accordance with the National Electric-Code (or City of Llano rules, whichever is more stringent). City of Llano reserves the right to inspect consumer wiring. Inspection by City of Llano and/or provision of electric service do not indicate or certify that the consumer wiring is safe or adequate or meets code requirements.

1. General Requirements for Meter Loops
   a. Meter loops must be built with the proper size conduit, EMT, or rigid metal conduit, have a main disconnect, and have a grounding electrode. MILBANK meter bases from City of Llano must be used.
   b. A main disconnect may consist of 6 or less fusible switches or circuit breakers, so long as all can be operated from one accessible location and are installed below the meter.
   c. Meter loops must have proper grounding. (NEC article 250)
   d. Size of copper or aluminum wires in meter loops will be determined by the load to be served and the National Electric Code. Temporary loops and meter loops on buildings should have at least #6 copper or #4 aluminum; water pump loops should use at least #10 copper or #8 aluminum. City of Llano recommends that the neutral conductor be the same size as the phase conductors, especially where power quality is an issue.
   e. Permanent meter loops serving any type of building or structure must have at least a 60 amp main and a panel capable of providing 240 volt service. Nameplate ratings on manufactured homes will be followed.
   f. Meter sockets should be located between 5 and 6 feet above permanent ground line. There must be at least twelve feet of clearance to the conductor drip loop coming out of the weatherhead. Loops shall be tall enough to allow proper ground clearance for service drop wires (15 feet over residential areas and private driveways, 18 feet over alleys, commercial driveways, and land traversed by vehicles, 22 feet over public roads).
   g. The owner or builder must provide an adequate tie point for the service drop on metal or masonry buildings.
   h. A two-inch diameter service mast of rigid metal conduit is the minimum when going through a roof for clearance. The mast and weatherhead may extend from 30 to 42 inches above the roof but still needs to meet the requirements of 1.f.
   i. All mains or weatherproof gutters installed above the meter should have provisions for locking with a city lock.
   j. Temporary meter loops should be weatherproof and have at least ten feet of clearance to the drip loop wires coming out of the weatherhead. The post supporting a temporary construction loop should be set to a proper depth and/or be well-braced. Ground-fault protection will be provided for personnel at temporary service locations in accordance with article 305-6 of the National Electric Code. Temporary loops may be disconnect after 30 days.
   k.Large meter loops (300+ amps) may be built with the breaker boxes on each side of the meter base instead of below it.

2. Wiring Guidelines
   a. Receptacles must be connected with 3 wires and grounded.
   b. Frames of fixed equipment and appliances must be grounded.
   c. Proper cable, wiring, materials, and equipment will be used in all locations, including those that involve special conditions such as moisture, high temperature, explosion hazards, earth contact, or sensitive electrical devices.
   d. Circuit breakers and/or fuses will be sized according to the National Electric Code and to the load being served.
   e. #14 copper should only be used to control individual room lights, relays, or control circuits not exceeding 10 amps.
   f. Wires should not be exposed or unprotected. Proper connectors or clamps must be used at all boxes, panels, and mains. Raceways and conduits will be used where required.
   g. There should be no more than 7 receptacles or lights on any one general purpose circuit. Individual circuits will be provided for all major appliances. Special circuits should be provided where appropriate.

ACCORDING TO ORDINANCE NO. 750 SECTION III # 1 INADEQUIT FACILITIES, ALL EXISTING METER LOOPS MUST PASS EXISTING METER LOOP INSPECTION.

Existing Meter Loop Inspection

Single level structure or multi-level structure where meter location doesn't permit compliance with pole mounted loop procedures:

All existing meter loops must:

(1) Be a minimum of 10' from the permanent ground level to the drip loop.
(2) Be a minimum of 24'' from the roof line to the top of the mask and in 2'' ridged conduit (if through eave).
(3) Meter base set between 5' and 6' from the permanent ground level below.
(4) Have three properly sized individual conductors in EMT or ridged conduit, no range cable triplex or any other multi conductor cable will be permitted.
(5) Have a ground wire attached to an 8' driven ground rod. (#6 bare copper wire)
(6) Have all wiring exiting the meter loop properly protected.
(7) Have an open 24" radius clear of any obstructions (i.e. shrubs, fence, enclosure) in front of meter base.

multi-level structure or any pole, be it wood, steel or concrete (all meter poles will be supplied by the City.)

All existing meter loops must:

(1) Be a minimum of 17' from ground level to top of mast.
(2) Have 3 properly sized individual conductors in EMT or ridged conduit, no range cable, triplex, or any other multi-conductor cable will be permitted.
(3) Have the appropriate size and approved main disconnect below the meter. Disconnect must have 12" of ground wire. (#6 bare copper wire)
(4 Meter base set between 5' and 6' from the ground level below.
(5) Have all wiring exiting the meter loop properly protected.
(6) Have an open 36" radius, clear of any obstructions (i.e. shrubs, fences, enclosures) in front of meter base.

Any existing service that does not meet code shall be expected to meet current codes with the service entrance being at least 12 foot and a main disconnect on the outside of the residence.

Unsafe conditions will be determined by the City of Llano.

Exception: Where rock bottom is encountered, ground rod may be driven at an angle, not more that 45 degrees, or buried in a 2 ½ ' deep by 8' long trench (NEC 250-83C3)

Meter loops that are accepted temporarily under special conditions that do not meet required specifications should have up to ninety (90) day from the date of notice to make necessary changes. If upgrades are not made by the ninety (90) day period service will then be disconnected.

Utility service may be disconnected for any of the following reasons:

(1) Failure to discontinue or correct a known dangerous or unwarranted condition.
(2) Inability to obtain reasonable access to utility meters.
(3) Violation of city utility regulations or ordinances,
(4) Theft of service,
(5) Tampering or evidence of tampering

**NOTE: Homeowners may perform electrical work on their "HOMESTEAD", (A permit and inspection is still required) All other electrical work must be preformed by an electrician licensed by the City of Llano.

**NOTE: The seal on any City of Llano electric meter may not be removed unless the Electric Department is first notified and approves the removal. If a seal is removed without proper authorization this will constitute tampering and the customer may be disconnected. If you have any questions please feel free to call Code enforcement at (915) 247-4158.

Please **DO NOT** attach any item to utility poles. This includes satellite dishes, TV antennas, fences, garage sale signs, basketball goals, clotheslines, etc. Any item attached to a pole which causes a hazard to an employee may be removed at the customer's expense.

CONDUCTOR TYPES AND SIZES

TYPES RH-RHH-RHW-THHW-THW-THWN-XHHW CONDUCTORS

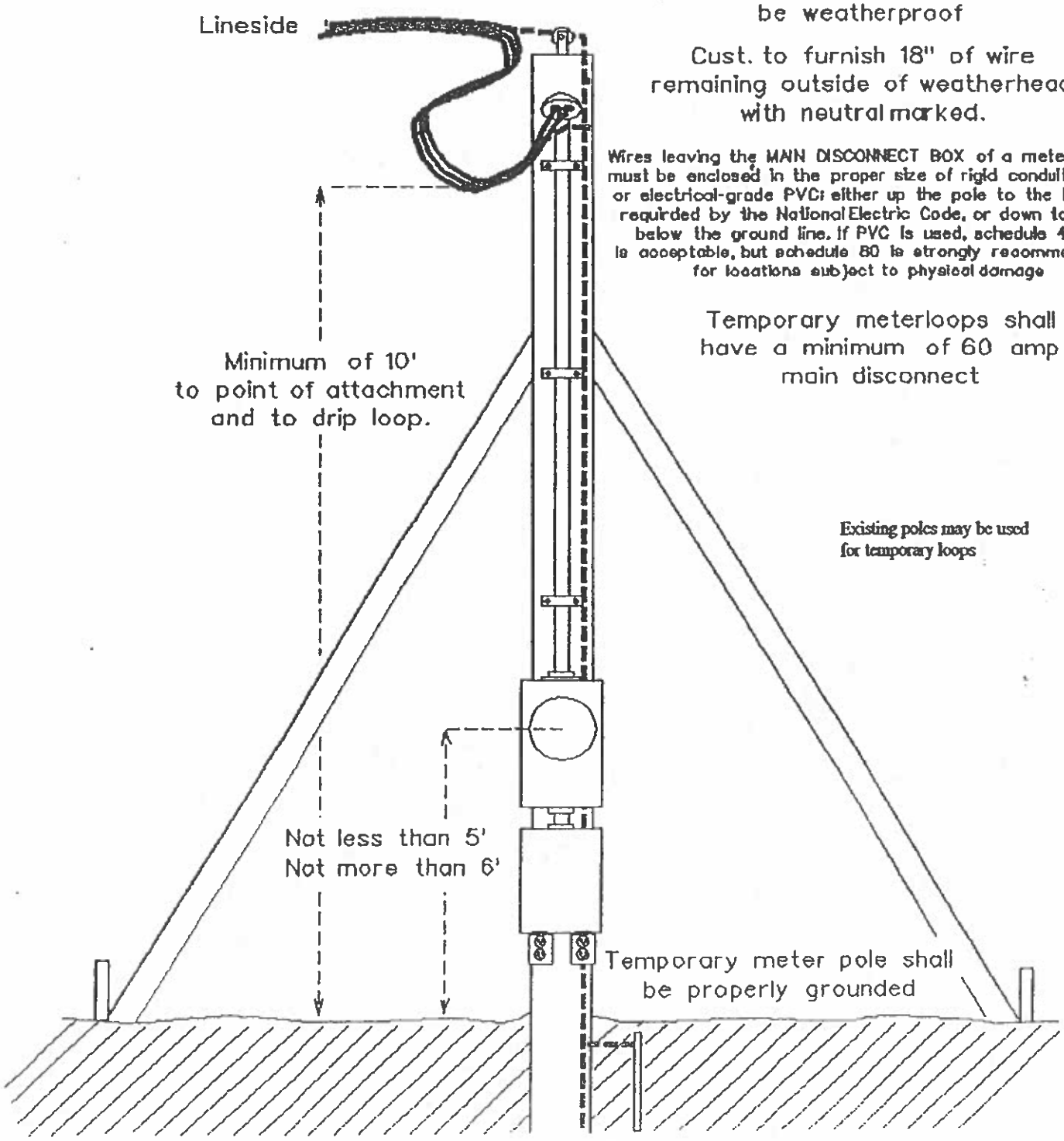
MAIN DISCONNECT PANEL RATING	COPPER AWG	ALUMINUM OR COPPER CLAD ALUMINUM AWG
60 AMP	# 6	# 4
100 AMP	# 4	# 2
125 AMP	# 2	# 1/0
150 AMP	# 1	# 2/0
200 AMP	# 2/0	# 4/0
225 AMP	# 3/0	# 250 MCM
250 AMP	# 4/0	# 300 MCM
300 AMP	# 250 MCM	# 350 MCM
350 AMP	# 350 MCM	# 500 MCM
400 AMP	# 400 MCM	# 600 MCM

Refer to current version of the National Electric Code to determine

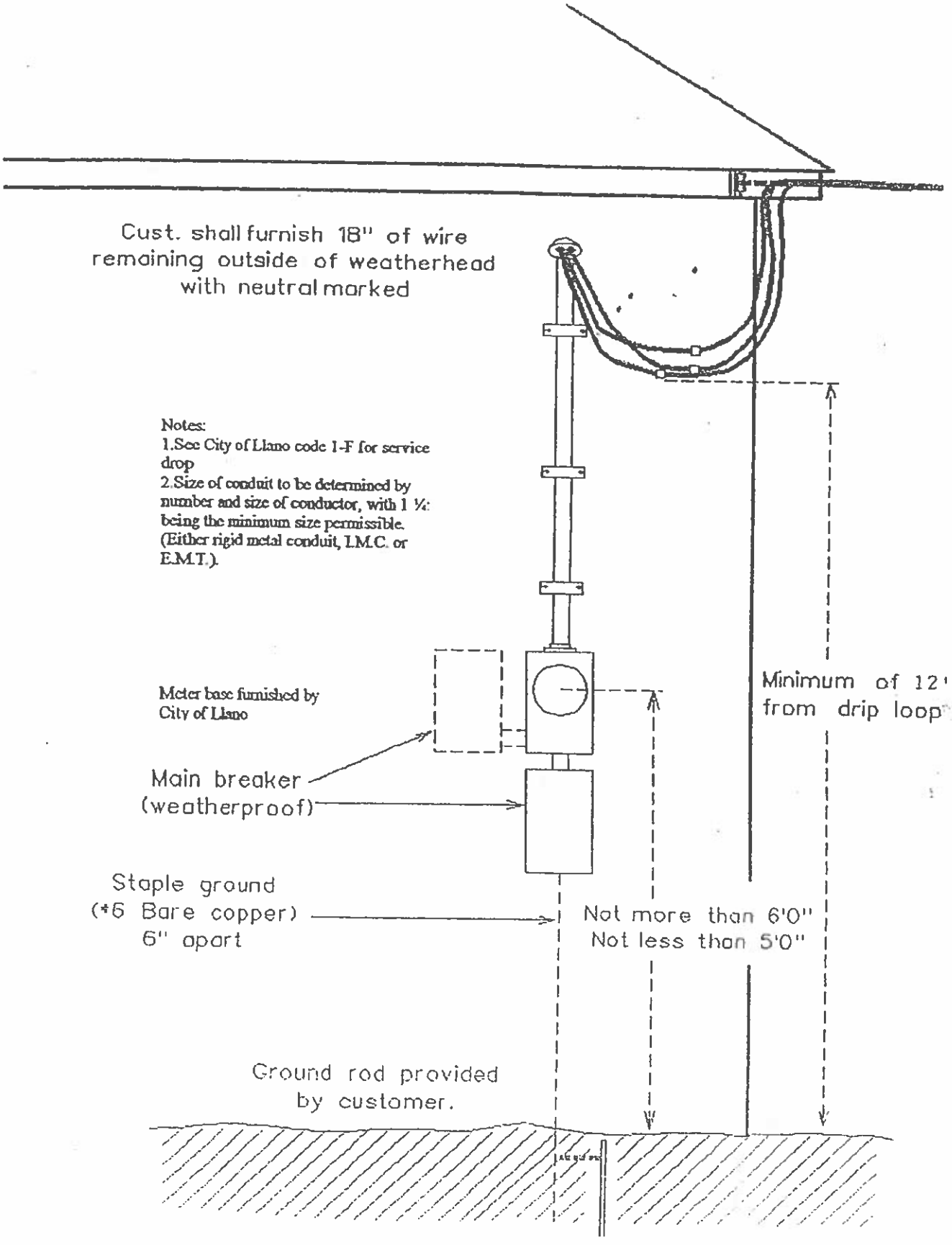
conduit size necessary for type of conductor used.

CONSTRUCTION TEMPORARY METER POLE

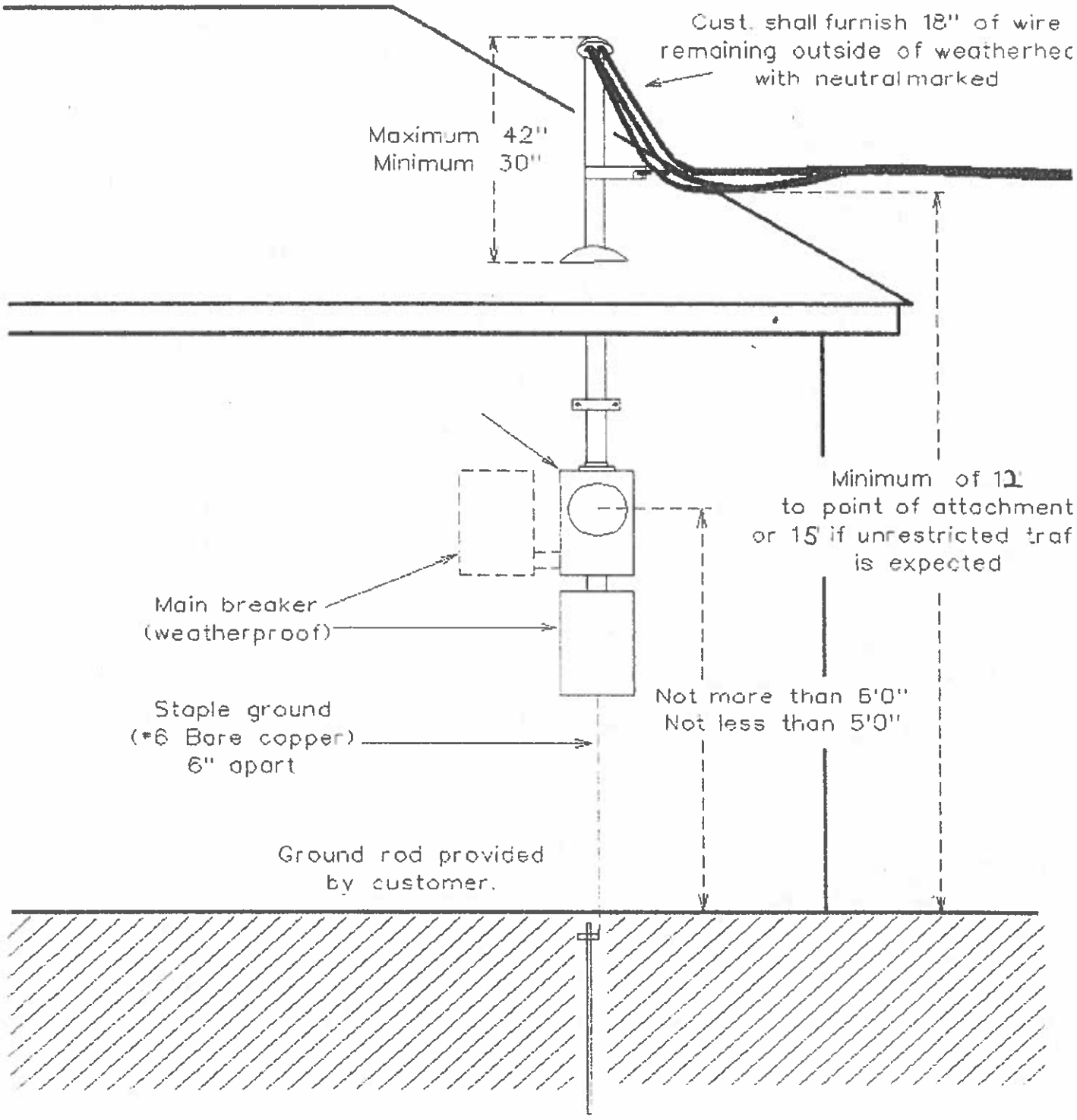
Temporary Loops can only be used as temporary and may be disconnected after 30 days



SERVICE TO RESIDENTIAL OR COMMERCIAL BUILDING WITH HIGH EAVES

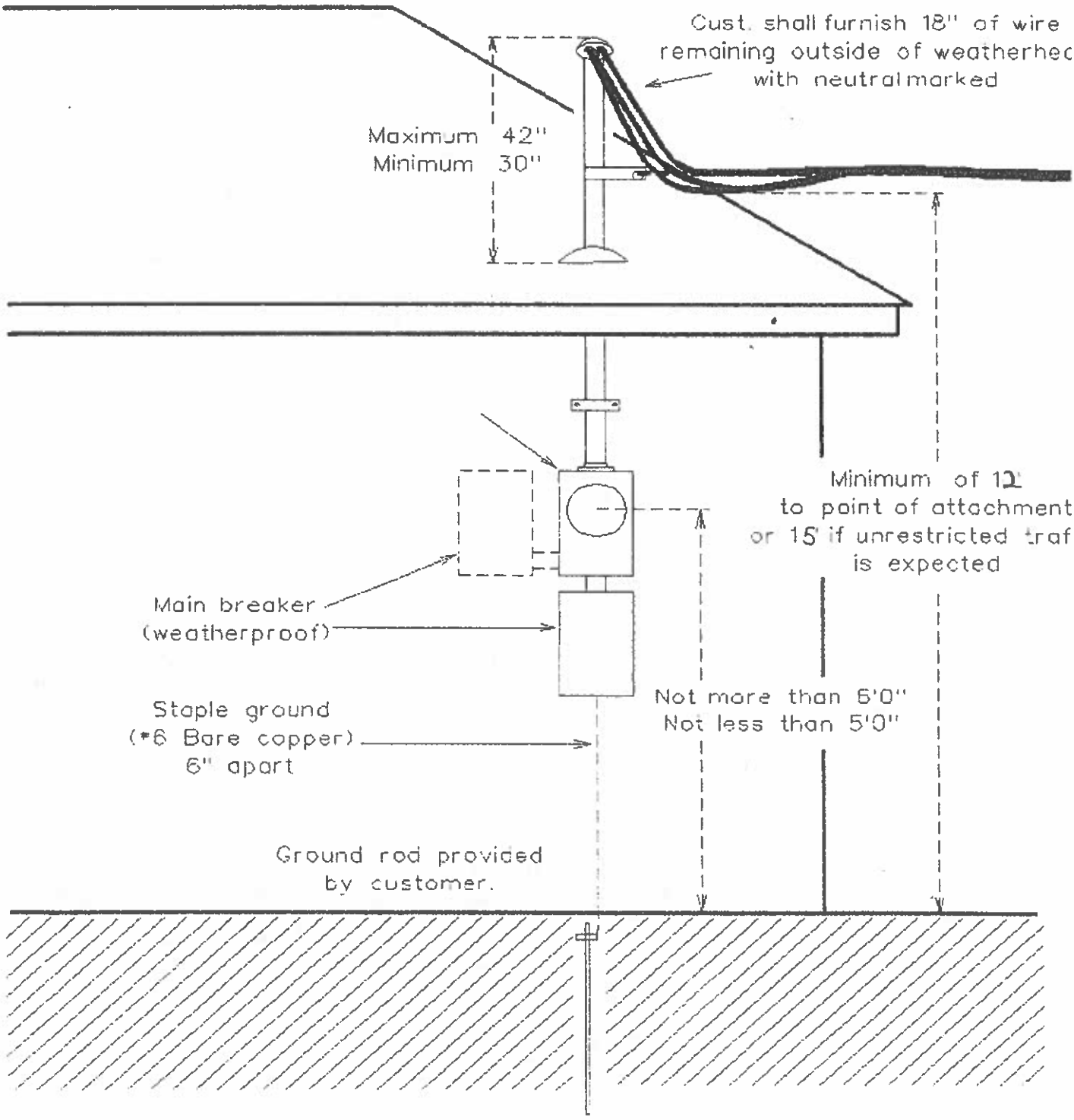


SERVICE TO RESIDENTIAL OR COMMERCIAL BUILDING



Wires leaving the MAIN DISCONNECT BOX of a meterloop must be enclosed in the proper size of rigid conduit, EMT, or electrical-grade PVC: either up the pole to the height required by the National Electric Code, or down to 24" below the ground line. If PVC is used, schedule 40 is acceptable, but schedule 80 is strongly recommended for locations subject to physical damage

SERVICE TO RESIDENTIAL OR COMMERCIAL BUILDING



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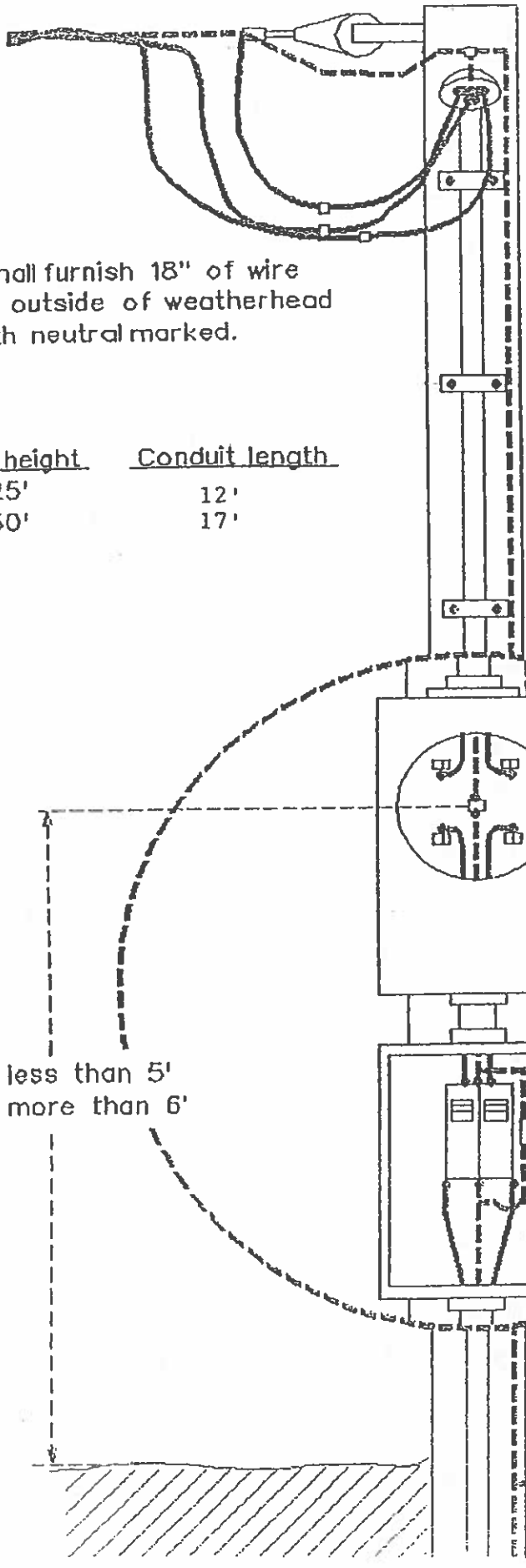
METERLOOP MOUNTED ON POLE



Pole furnished and set by City of Llano

Complete installation must be weatherproof

Size of conduit to be determined by number and size of conductors. (Rigid metal conduit, I.M.C. or E.M.T.)

Note: Three conduit straps and stand-offs (when needed) shall be furnished by customer

Meter base with proper hub size shall be furnished by City of Llano

Cust. shall furnish 18" of wire remaining outside of weatherhead with neutral marked.

Pole height	Conduit length
25'	12'
30'	17'

Conductor size and breaker sizes will be in accordance with service load.
Cust. to furnish a minimum of 12" of #6 bare copper extending out of breaker box to be connected to neutral bar, for grounding. Bar must be grounded to breakerbox.

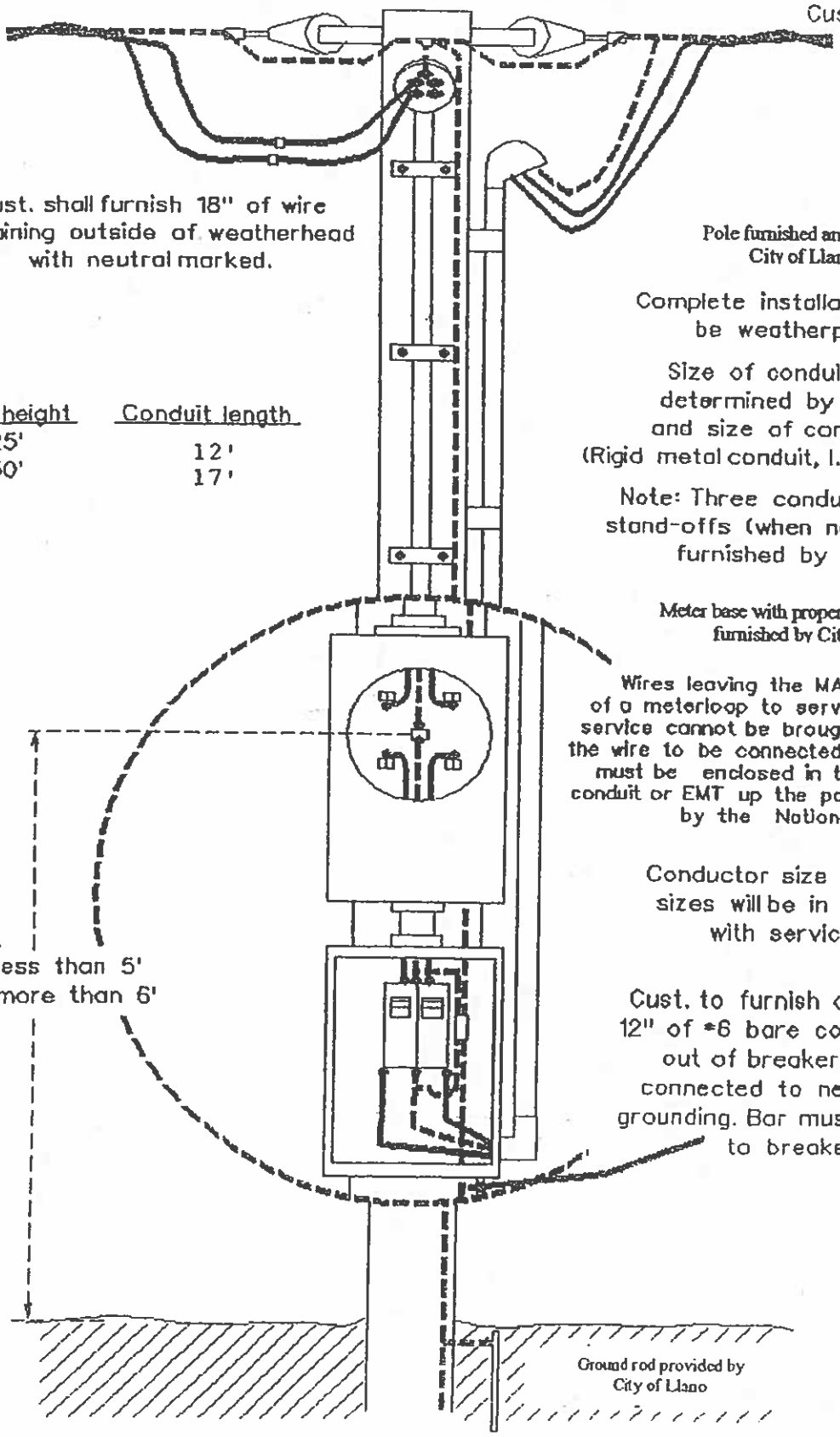
Not less than 5'
Not more than 6'

Wires leaving the MAIN DISCONNECT BOX of a meterloc must be enclosed in the proper size of rigid conduit, El or electrical-grade PVC; either up the pole to the heig required by the National Electric Code, or down to 2' below the ground line. If PVC is used, schedule 40 is acceptable, but schedule 80 is strongly recommend for locations subject to physical damage

Ground rod provided by City of Llano

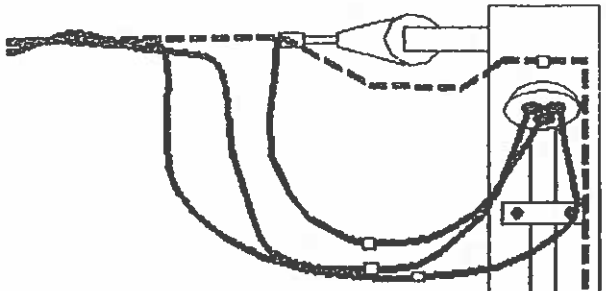
City of Llano

METERLOOP MOUNTED ON POLE



City of Llano

METER RACK MOUNTED ON POLE



Pole furnished and set by City of Llano

Complete installation must be weatherproof

Wires leaving the MAIN DISCONNECT BOX of a meterloop must be enclosed in the proper size of rigid conduit, EMT or electrical-grade PVC; either up the pole to the height requirded by the National Electric Code, or down to 18" below the ground line. If PVC is used, schedule 40 is acceptable, but schedule 80 is strongly recommended for locations subject to physical damage

Note: Three conduit straps and stand-offs (when needed) shall be furnished by customer

Metal gutter provided by customer. Must have provisions for placing a City of Llano lock

Cust. shall furnish 18" of wire remaining outside of weatherhead with neutral marked.

Pole height	Conduit length
25'	12'
30'	17'

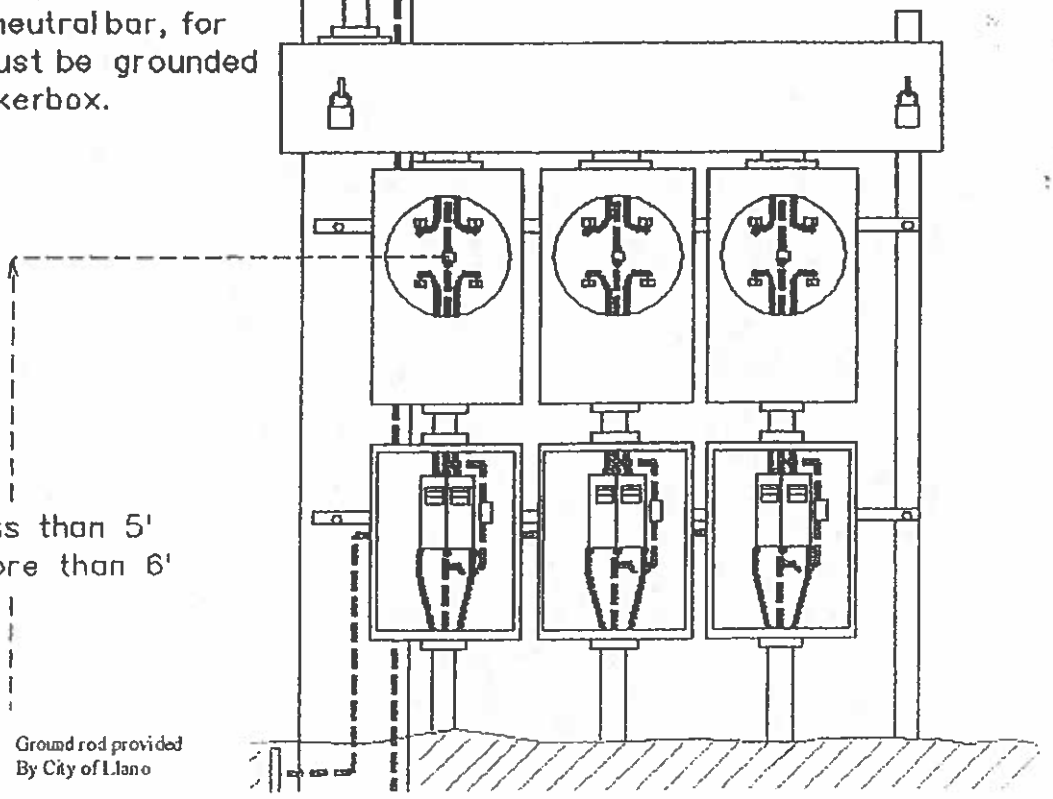
Wires leaving meterbase must be enclosed in E.M.T., conduit or P.V.C. (ELECTRIC-TYPE); down the pole to 24" below the ground level.

Stub pole and bracing provided by customer

Conductor size and breaker sizes will be in accordance with service load.

Meter base with proper hub size to be furnished by City of Llano

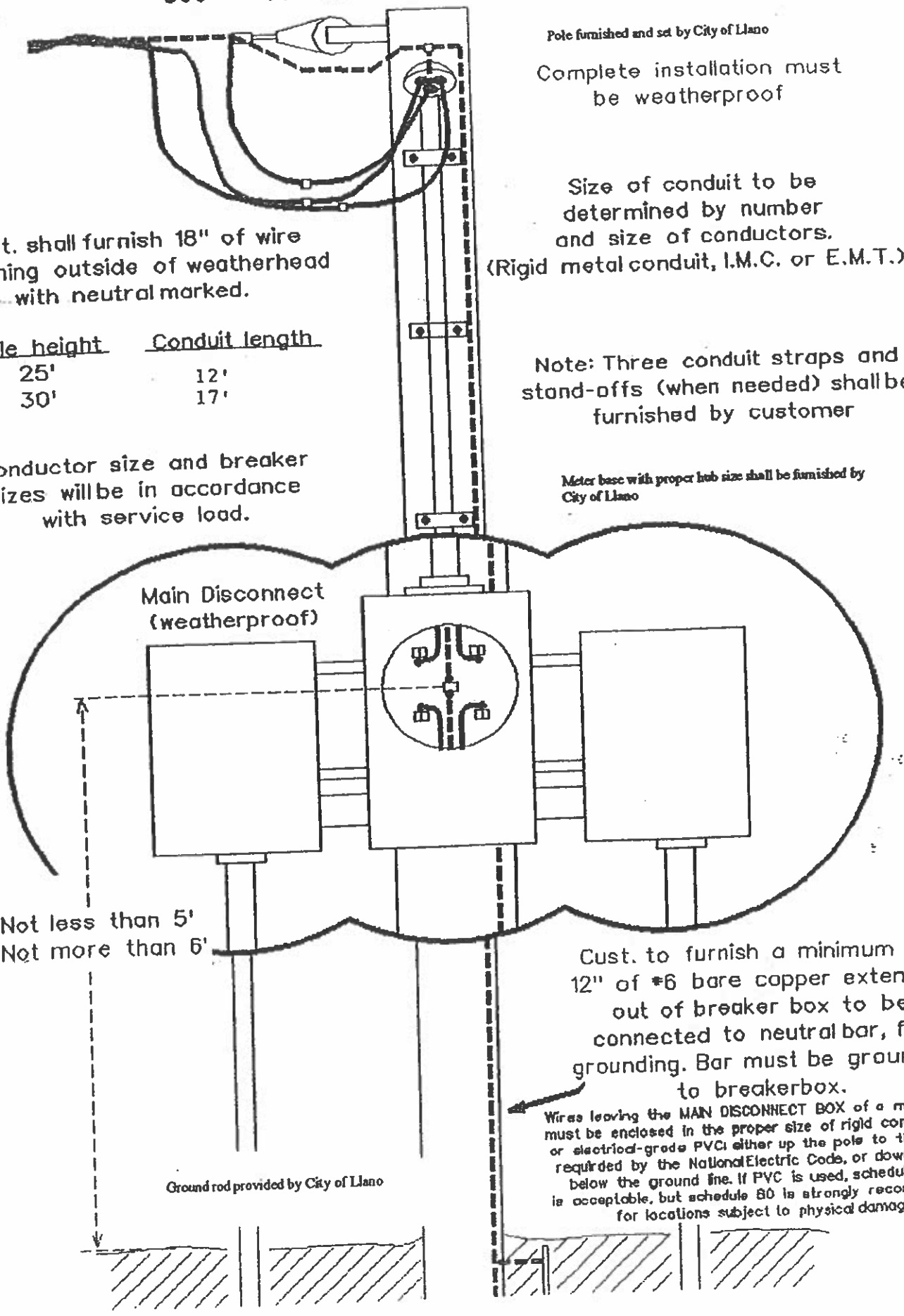
Cust. to furnish a minimum of 12" of #6 bare copper extending out of breaker box to be connected to neutral bar, for grounding. Bar must be grounded to breakerbox.



Not less than 5'
Not more than 6'

Ground rod provided By City of Llano

300 - 400 AMP SERVICE MOUNTED ON POLE



Pole furnished and set by City of Llano

Complete installation must be weatherproof

Size of conduit to be determined by number and size of conductors. (Rigid metal conduit, I.M.C. or E.M.T.)

Cust. shall furnish 18" of wire remaining outside of weatherhead with neutral marked.

Pole height	Conduit length
25'	12'
30'	17'

Note: Three conduit straps and stand-offs (when needed) shall be furnished by customer

Conductor size and breaker sizes will be in accordance with service load.

Meter base with proper hub size shall be furnished by City of Llano

Main Disconnect (weatherproof)

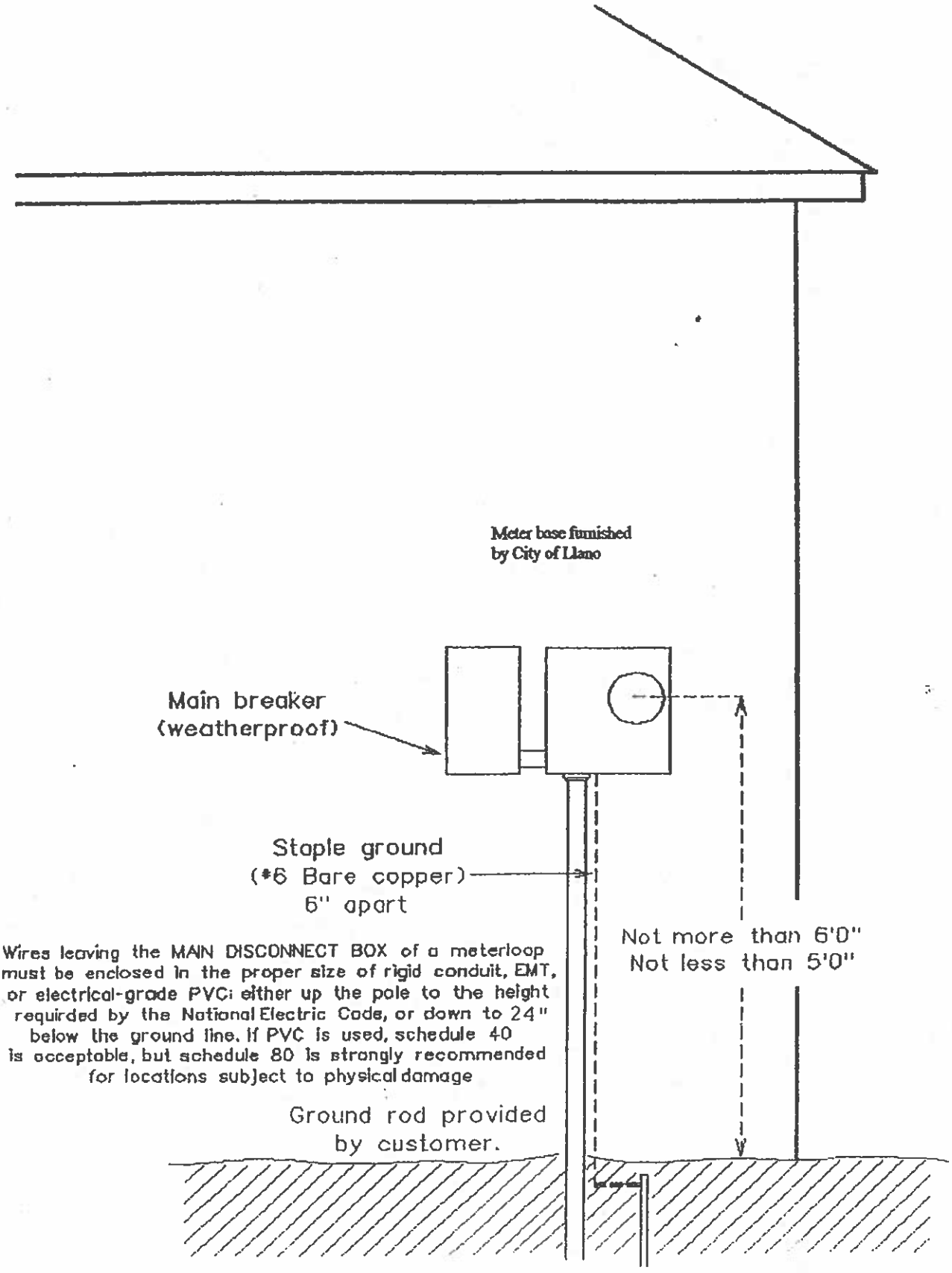
Not less than 5'
Not more than 6'

Cust. to furnish a minimum of 12" of #6 bare copper extending out of breaker box to be connected to neutral bar, for grounding. Bar must be grounded to breakerbox.

Wires leaving the MAIN DISCONNECT BOX of a meterloop must be enclosed in the proper size of rigid conduit, EMT or electrical-grade PVC; either up the pole to the height required by the National Electric Code, or down to below the ground line. If PVC is used, schedule 40 is acceptable, but schedule 80 is strongly recommended for locations subject to physical damage

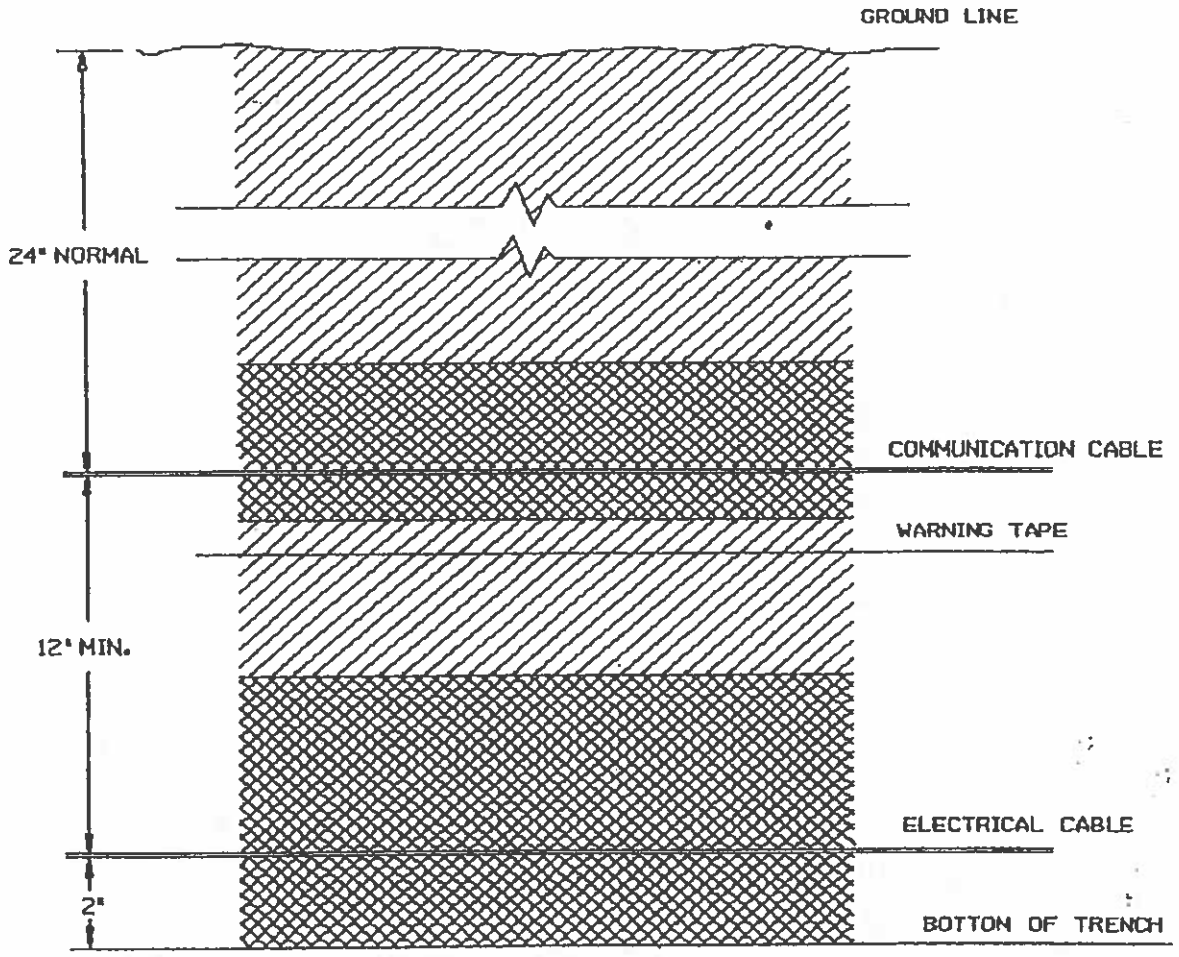
Ground rod provided by City of Llano

UNDERGROUND SERVICE TO RESIDENTIAL OR COMMERCIAL BUILDING



TYPICAL BURIAL HIERARCHY OF URD UTILITIES

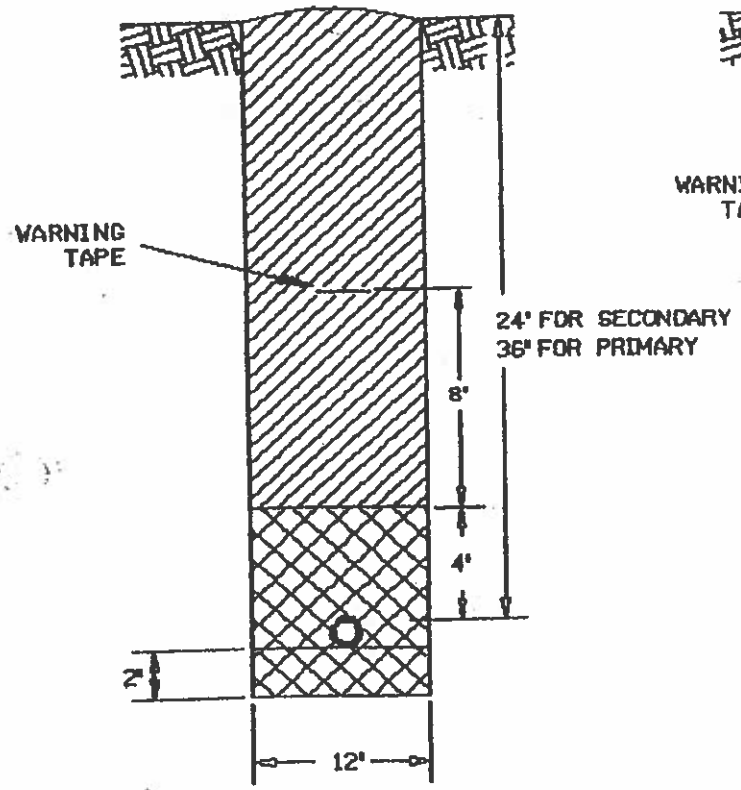
PROFILE VIEW



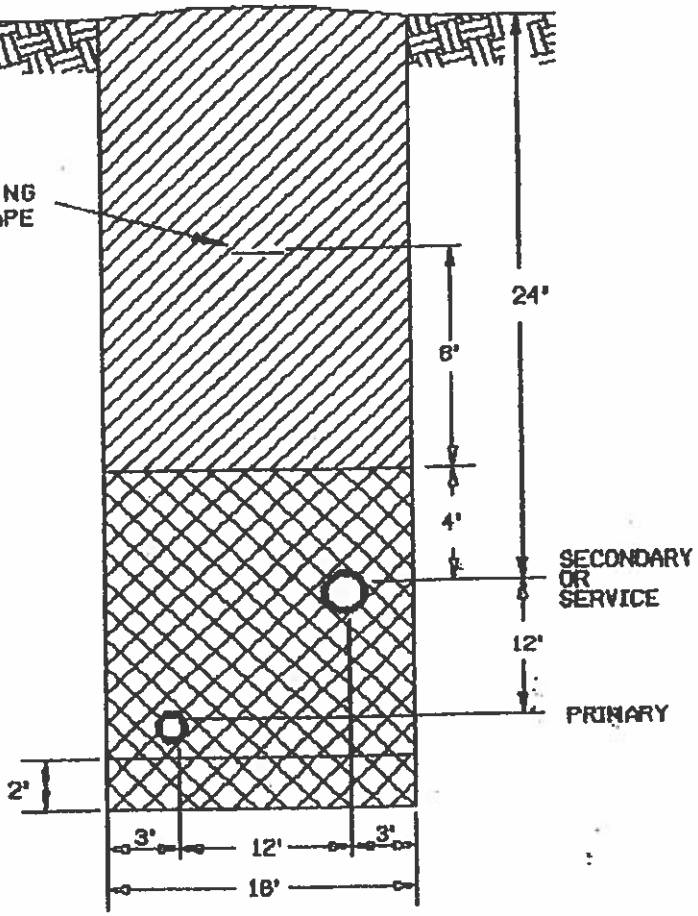
LEGEND

- BEDDING SAND OR CLEAN SOIL
- COMPACTED BACKFILL UNLESS OTHERWISE SPECIFIED
- UNDISTURBED EARTH

TYPICAL TRENCH DETAIL
ELECTRICAL ONLY



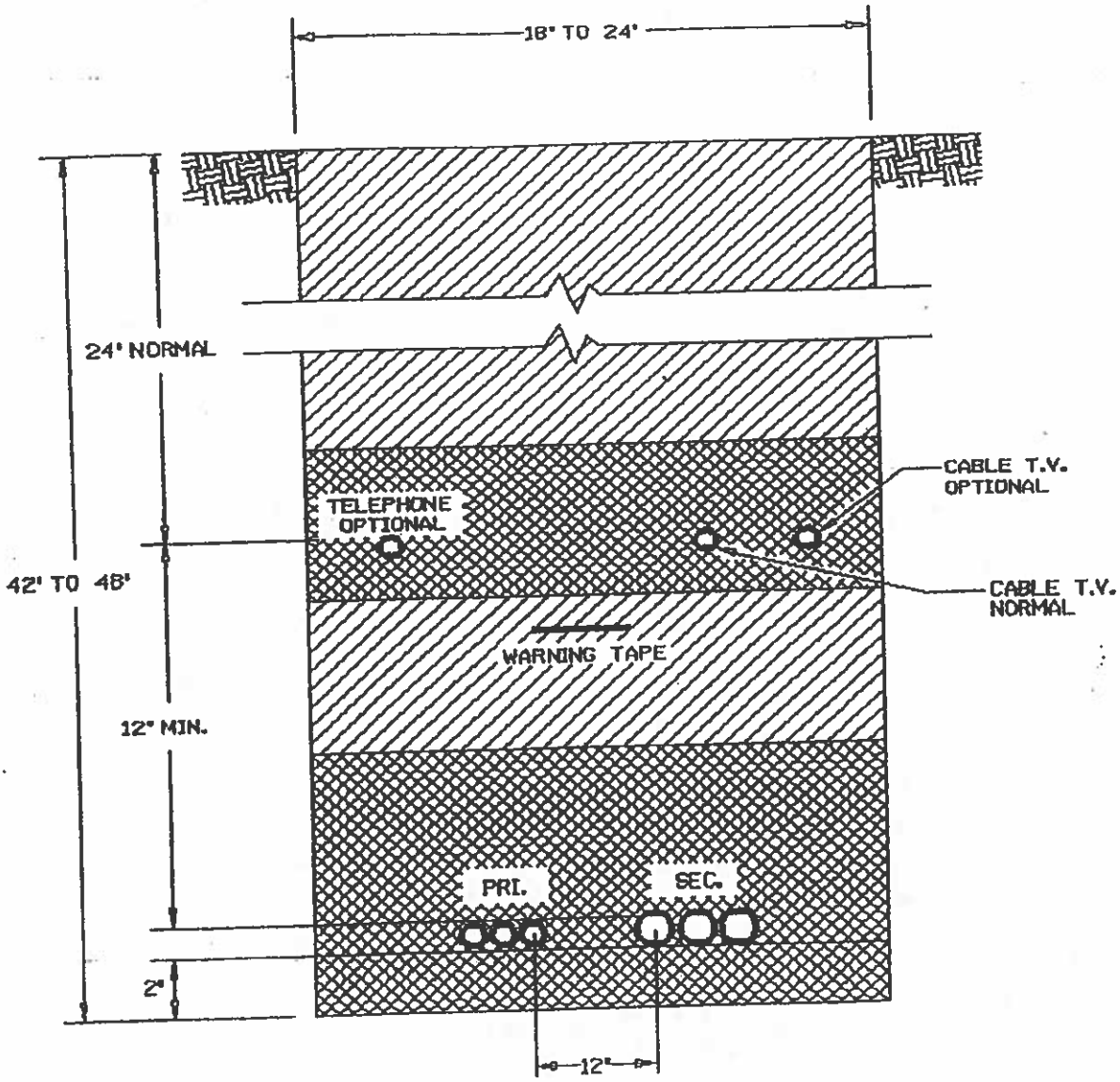
TRENCHING UNIT
ONE CONDUIT



TRENCHING UNIT
MULTIPLE POWER CONDUITS
PRIMARY, SECONDARY OR SERVICE

TYPICAL TRENCH DETAIL
ELECTRICAL W/ CATV & TELEPHONE

TRENCH CROSS SECTION

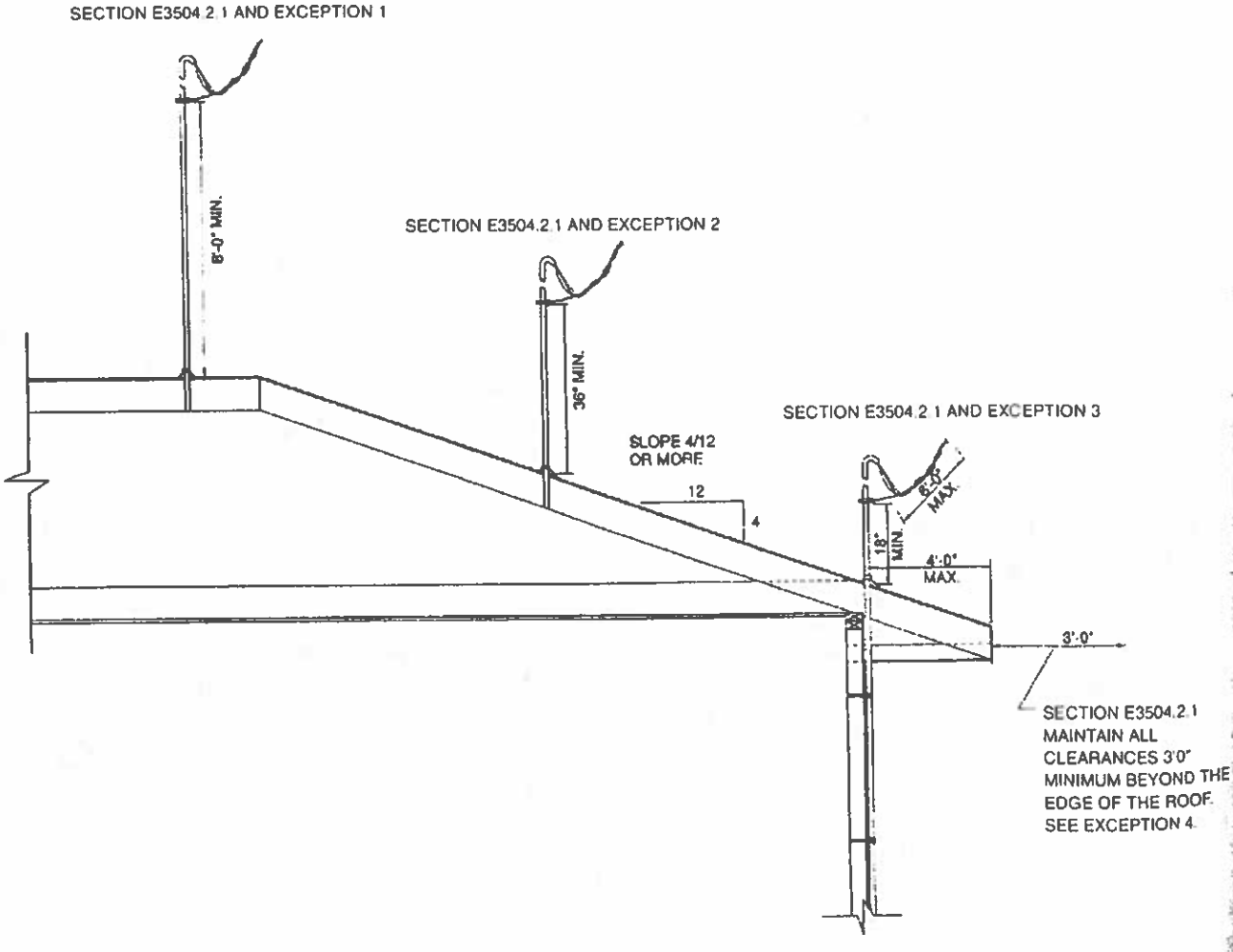


E3504.2 Vertical clearances. The vertical clearances of all service-drop conductors shall be based on a conductor temperature of 60°F (15°C), with no wind and with final unloaded sag in the wire, conductor or cable. Service-drop conductors shall not have ready access and shall comply with Sections E3504.2.1 and E3504.2.2.

E3504.2.1 Above roofs. Conductors shall have a vertical clearance of not less than 8 feet (2438 mm) above the roof surface. The vertical clearance above the roof level shall be maintained for a distance of not less than 3 feet (914 mm) in all directions from the edge of the roof. See Figure E3504.2.1.

Exceptions:

1. Conductors above a roof surface subject to pedestrian traffic shall have a vertical clearance from the roof surface in accordance with Section E3504.2.2.
2. Where the roof has a slope of 4 inches (102 mm) in 12 inches (305 mm), or greater, the minimum clearance shall be 3 feet (914 mm).
3. The minimum clearance above only the overhanging portion of the roof shall not be less than 18 inches (457 mm) where not more than 6 feet (1829 mm) of conductor length passes over 4 feet (1219 mm) or less of roof surface measured horizontally and such conductors are terminated at a through-the-roof raceway or approved support.
4. The requirement for maintaining the vertical clearance for a distance of 3 feet (914 mm) from the edge of the roof shall not apply to the final conductor span where the service drop is attached to the side of a building.



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

FIGURE E3504.2.1
CLEARANCES FROM ROOFS