

BLACK HILLS ENERGY (BHE) COLORADO ELECTRIC OPERATIONS

**ELECTRIC
EXTENSION STANDARDS**

SEPTEMBER 2012

**Information for use by customers, architects, engineers, contractors, electricians,
employees and those engaged in the planning and construction of
electric service and meter installations**

FOREWORD

At Black Hills Energy (BHE), we are dedicated to helping our customers realize optimum value and utility from their electrical service. To accomplish this, BHE must effectively utilize its distribution and supply capabilities, while ensuring safe, reliable and consistent service to all our customers. Experience has shown the best way to accomplish our common goals comes through uniform standards for installation, wiring and system design. We do not intend these standards and requirements to be restrictive or burdensome, but to assist in expediting service connections and establishing appropriate customer classifications for service and billing. We therefore require that customers' wiring and installations intended for connection to BHE's system comply with these standards, the National Electrical Code and any other codes or regulations in effect in the area served. We offer this booklet to assist customers, architects, engineers, contractors, electricians and inspectors in planning electric service installations. We do not intend the provisions of this booklet to ensure adequacy and safety of the customers' own wiring and equipment. Such responsibility remains with the customer. The Company does not inspect the customers' wiring for compliance with requirements of electrical codes or regulations established by public bodies. This is the responsibility of Municipal and other governmental inspection authorities. No set of rules or instructions will cover all conditions. The Company welcomes and encourages all inquiries concerning unusual or special needs of customers.

Due to the constant progress in the development of materials and methods, some costs and procedures outlined herein may be modified. Upon request, we will supply information concerning changes and revisions. Persons making regular use of this booklet should maintain contact with the Company.

Customers should contact BHE about each installation as early as possible to provide time for

necessary job checking, scheduling, proper coordination and preparation for any necessary contract and billing arrangements.

When a customer contemplates new electrical installations, additions or alterations, he/she should contact the Company in advance of design or purchase of equipment relative to current, voltage, location of point of delivery, and any necessary extension of the electrical distribution system.

We emphasize that the customer is responsible for locating his/her service entrance at the place designated by the Company. Failure to do so may result in unnecessary costs to the customer for service relocations and possible delay in providing service.

The impression generally prevails that compliance with the National Electrical Code and state, county or city ordinances or statutes guarantees the customer a wiring installation complete and adequate for the full use of electric service now and in the future. Unfortunately, this is not always the case, in as much as the code, ordinances and statutes are designed to provide only the minimum requirements considered necessary for safety. The code itself states, "This code contains provisions considered necessary for safety. Compliance therewith and proper maintenance will result in an installation essentially free from hazard, but not necessarily efficient, convenient or adequate for good service or future expansion of electrical use."

We strongly recommend installation of wiring capacity greater than minimum code requirements. Not only does complete adequate wiring place at the customers' disposal all the convenience and comforts of electric service, but it protects the building investment by minimizing obsolescence resulting from a wiring system inadequate for modern needs.

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BHE SERVICE CENTERS

CUSTOMER SERVICE CENTER - 1-888-890-5554

Cañon City	3110 Utility Ln.	Service Center
Pueblo	105 S. Victoria	Service Center
Rocky Ford	101 S. 12 th	Service Center

Service Centers handle all new construction, maintenance, engineering, installation of overhead and underground services; installation of streetlights and area lights; and matters pertaining to service reliability.

Meter sockets for the Cripple Creek, Victor, and Teller County areas are available at:
204 Diamond Ave
Victor, CO
(By Appointment Only)
719-689-3170

If you're going to dig,
call for utility line locations:

1-800-922-1987

OR

811

IT'S THE LAW

SECTION I GENERAL INFORMATION

100. The Company issues this booklet as a guide for obtaining electrical service for single and multi-family residential dwellings and commercial and industrial buildings and to set forth the services available and conditions for service. The Company does not intend in this booklet to specify or limit the design of the customer's wiring or equipment. The standards for materials and construction are necessary to safeguard all customers and to secure maximum use of the Company's service and are the minimum under which the Company will supply service.

101. The term "Customer," when used herein, shall mean any person applying for, receiving, using or agreeing to take a class of electric service supplied by the Company for a residential, commercial or industrial building under one rate schedule at a single point of delivery and for use within the building occupied by such person.

102. The standards in this booklet supplement—and are not intended to conflict with—the Rules and Regulations on file with the Public Utilities Commission, the National Electrical Code ANSI/NEPA 70, the National Electrical Safety Code ANSI C2 and such state, county and municipal laws, ordinances and statutes as may be in force within the cities, towns or areas in which the Company furnishes electric service.

103. The standards herein supersede all previous publications of Electric Service Standards issued by the Company prior to this date and are subject to change without notice.

104. The Company makes services of its representatives available to customers during business hours without charge. Our representatives keep abreast of the latest developments in safe and adequate practices in wiring; lighting and power application; and other data that pertain to the most efficient use of electricity. The Company will be pleased to furnish any further information requested or to investigate utilization difficulties that may arise. Customers should call upon the Company any time they believe our knowledge and experience may be of assistance.

105. The customer shall give the duly authorized agents and employees of the Company, when properly identified, full and free access to the premises of the customer at all reasonable hours. This access shall be for the purpose of installing, reading, inspecting, adjusting, repairing, maintaining, replacing or removing any of the Company's facilities on the premises of the customer or for any other purpose incidental to the electric service supplied by the Company.

106. Employees of the Company may neither demand nor accept any compensation from a customer for service rendered in the line of duty. However, certain employees do collect money from customers for settlement of accounts due the Company, of which the customer is already aware.

107. The breaking of seals, tampering with meters, wires or any other property of the Company by other than authorized agents of the Company is prohibited and may be punishable by law or subject to diversion or service call fees.

108. The customer at all times shall protect the property of the Company on the premises of the customer and shall permit no persons other than the employees and agents of the Company and other persons authorized by law to inspect, work on, open or otherwise handle the wires, meters or other facilities of the Company. In case of loss or damage to the property of the Company due to carelessness, neglect or misuse by the customer, the customer's family, agents, servants or employees, the customer shall, at the request of the Company, pay to the Company the cost of any necessary repairs or replacements of such facilities or the value of such facilities.

109. The customer shall not use any other electric power or lighting service, including standby generators, in conjunction with the Company's service without the written consent of the Company. Such written consent may be granted at the sole discretion of the Company if the customer has critical operations where standby service is desirable. To prevent operation of the customer's standby generating facilities in parallel with the Company's service, the customer is required to install a double-throw switch approved by the Company.

110. Devices or attachments shall not be connected to the Company's facilities in such a manner as to permit the use of unmetered energy.

111. The Company does not design, plan, install or maintain the customer's wiring or electric equipment.

112. Customers may contact any Company office (see the address and telephone number listing) to obtain information relative to new electric service connections or changes in existing service. In order to obtain service at the time desired, the customer should apply for service well in advance and keep the Company informed as to the progress of the installation and when he/she anticipates he/she will be ready for service. Service connections made after normal business hours will be charged appropriately.

113. The Company does not permit attachments of any kind or nature on Company poles without previous execution of the Company's Permit for Pole Attachments.

114. The customer provides or procures for the Company such rights-of-way as are satisfactory to the Company across property owned or otherwise controlled by the customer for the construction, operation and maintenance by the Company of facilities necessary or incidental to the supply of electric service at no cost to the Company.

115. The customer shall permit the Company to trim or remove any trees that may interfere with the safe operation of the Company's facilities. To avoid future problems and inconvenience, The Company strongly recommends that the customer avoid planting tall-growing tree species under or near overhead lines and over underground facilities.

116. The customer is responsible for all increased costs for rock excavation during the installation of electrical facilities. This includes rock encountered when setting poles or other equipment or excavation of trench. Where practical, the customer will be given the option of paying the increased costs or providing the excavation of rock at no cost to the company.

117. In addition to non-refundable charges referred to in this booklet that may be required for the Company to make extensions of its facilities to provide electric service, the Company may require potentially refundable charges for construction for amounts not covered by non-refundable charges in accordance with the Company's Rules and Regulations.

SECTION II
GENERAL SERVICE ENTRANCE POLICIES AND
REQUIREMENTS

A. INSPECTION AND CERTIFICATION OF
CUSTOMER'S WIRING

200. Many municipalities require by law that new wiring and alterations in wiring be approved by the local electrical inspector's office prior to connection by the Company. In such municipalities, the Company cannot render service until the Company receives this approval. The Company intends that the requirements of applicable codes be adhered to in all installations.

201. The responsibility of the customer regarding his/her use of the electric service supplied by the Company is not set aside and the Company shall in no way be liable on account of any inspections or recommendations the Company makes as a courtesy to the customer or as protection to the electric service supplied by the Company to other customers. The Company reserves the right, but assumes no duty, to inspect the customer's service installation.

B. GENERAL PROVISIONS

202. The Company makes only one service connection for each type of electric service to a customer's premises except where required by (a) regulations or codes promulgated by municipal or other governmental authorities or (b) the customer's load being of such size and character and so located as to make it advisable, in the opinion of the Company, to install more than one service connection.

203. In serving any customer, the Company will, at its sole option and subject to its Rules and Regulations on file with the appropriate regulatory bodies:

1. Determine the point and character of electric service from which it will supply a customer.
2. Approve the location of the customer's entrance and the design of the electric system to this location from the Company's supply point. It is recommended that the customer's service entrance is stubbed out on the side of the building (not back) closest to the supply of electric service.

204. Contractors and others installing electrical work are to balance the load on three-wire and four-wire systems. This is advantageous to the customer as well as to the Company because it will give the customer better voltage regulation and maximum use of service entrance equipment.

205. The street address of the premises requiring new service shall be plainly displayed. Contractors and others installing electric work should place their names and addresses on each installation.

206. In apartments or other buildings where a number of meters are installed, each service switch and meter enclosure or socket must be plainly marked by the building owner, the customer or their agent with a permanent identification of the apartment or space that it serves. General services and electric heat service must be similarly distinguished. The identification shall be permanently inscribed on the inside back of each meter enclosure near the meter socket clips and the outside of the cover, indicating correct address and apartment number.

The building owner, the customer or their agent holds the responsibility of seeing that wiring in such locations connects to the proper meter or meters. The Company will check multi-metered units (four or more) to verify accurate identification. The building owner, the customer or their agent must be on hand at this time. Mismarked service switches, breakers or meter enclosures must be corrected by the building owner, the customer or their agent. The Company will not render service until all switches and meter enclosures are properly marked.

207. The customer shall furnish and install Underwriters' Laboratories, Inc., listed disconnecting devices in accordance with the provisions of the National Electrical Code and local ordinances. Service entrance conductors shall be size and type in accordance with the National Electrical Code.

208. Where a fused or circuit breaker type switch is used, the customer is to furnish fuses or circuit breakers of a type listed by Underwriters' Laboratories, Inc., and to install them in accordance with the National Electrical Code. The customer should maintain a stock of replacement fuses.

209. The neutral wire of the following delta alternating current services shall be grounded on the customer's premises by the customer in accordance with the National Electric Code: single-phase, three-wire 120/240-volt; three-phase, four-wire, 120/208Y-volt; 277/480Y-volt; and one wire of three-phase, three-wire, 240 or 480-volt. **The Company recommends that all three-phase service is either 120/208Y or 277/480Y three phases, four-wire service.**

210. In a group of adjoining occupancies served by two or more service entrances from common outside service bus conductors, each service entrance is to be separately grounded by the customer in accordance with the grounding facilities that are available in the building where the service entrance is located (See Article 209).

211. A fuse or circuit breaker shall not be installed in the neutral or the ground conductor of the service entrance. Exposed conductive material enclosing electric wiring and equipment is to be grounded by the customer on his/her premises in accordance with the provisions of the National Electrical Code. It is recommended that the neutral grounded conductor be the same size as the phase conductors. If a reduced neutral is installed, it must be sized in accordance with the National Electrical Code and approved by the authority having jurisdiction for enforcing the Code.

212. It is recommended that the neutral grounded conductor be the same size as the phase conductors. If a reduced neutral is installed, it must be sized in accordance with the National Electrical Code and approved by the authority having jurisdiction for enforcing the Code.

C. METERING

213. The meter installation and entrance shall be located on the outside of the customer's structure at a suitable place unless otherwise approved by the Company prior to installation. The Company will size the meter installation to the customer's load and not necessarily to the entrance size. Access for Company personnel must be maintained to assure proper maintenance of the service. Self-contained metering is intended for single-phase service up to 400A and 3-phase service up to 400A. For larger services, current transformers that are remote from the meter are required. The use of combination meter socket panels will not be accepted for any class of service.

214. Under no circumstances shall meters be removed or relocated, whether temporarily or permanently, except by employees of the Company authorized to do such work. The Company cooperates in relocating its metering equipment and service attachment when required for modification of the customer's building or service entrance.

215. The Company owns and maintains the billing meters and metering devices. The Company installs its meters and devices.

216. In multiple occupancy buildings, the building owner or his/her agent may purchase and install prefabricated package type multiple metering and entrance equipment. The Company must approve the type and size of the equipment in advance. All pulling space provided in the customer's equipment for termination of the Company's service conductors shall conform to the size requirements set forth in the National Electrical Code covering pull boxes. **In this case, the building owner or his/her agent owns and maintains the meter sockets and enclosures and the Company owns and maintains the meters.**

D. OVERHEAD SERVICE

217. Normally the customer will be served through a meter attached to the outside of the building. Service entrance conductors shall be installed in accordance with the latest edition of the National Electrical Code.

218. The length of the service drop from the last Company pole to the customer's premises must be limited by the ground clearance attainable at tensions appropriate to the strength of the cable and its two supports.

219. The point of attachment of the Company's service drop to the customer's building or mast must be of proper height and location to provide at all points in the span the minimum clearances above ground and from other wires and obstructions required by the National Electrical Safety Code and other applicable rules. The Company requires the customer to install and maintain the mast that goes through a roof or overhang.

In general, the clearances given in the National Electric Code are to be maintained with the wires at their maximum operating temperature and also when covered with ½ inch of ice.

Minimum Ground Clearances Applicable to Standard BHE Service Drops Up to 480 Volts

Nature of Ground Under the Cable	Required Vertical Clearance	
Track rails of railroad	24.0 ft.	
Streets, alleys, roads, parking areas subject to vehicles higher than 8 ft., and farm and other land traversed by vehicles up to 14 feet high	16.0 ft.	
Residential driveways	18.0 ft.	
Spaces or ways accessible to pedestrians only	12.0 ft.	Over 300V to ground
	10.5 ft.	Under 300V to ground
Swimming pools	See NESC	

220. The customer, in the construction of a building, must provide sufficient capability to support the Company’s attachment and conductors to withstand the stress as per the National Electrical Safety Code heavy loading conditions.

221. For self-contained metering, the customer furnishes and installs conduit and conductors from the service entrance and equipment to the meter socket. The customer installs the meter socket, conduit riser, weatherhead and service conductors to attach to the service drop. If the service drop cannot be attached to provide the required clearance, the customer shall provide and install a service conduit mast.

222. For service to multi-occupancy buildings from a service bus, the Company will work with the customer to develop a reasonable arrangement.

E. UNDERGROUND SERVICE

223. Electric facilities installed by the Company on a customer’s property for the purpose of serving that customer remain the responsibility of the Company. When the Company installs underground service cables, the Company terminates the cables at the meter socket. **Any conduit installed by the customer for use by the Company as hereinafter required, shall have the ends located and a pull rope and tracer wire provided by the customer.**

224. Development of a residential, commercial or industrial area may necessitate the installation of an underground distribution system for the entire area. The developer of such an area should contact the Company as early as possible when planning such an area. In commercial/industrial parks with underground distribution, the developer is responsible for installing all conduit, concrete-encased ducts, manholes and concrete pads for transformers, switchgear and any associated devices to the standards of the company.

225. The Company may elect to supply new buildings from underground secondary systems where they exist. In these cases the Company will furnish service at a point to be specified by the Company depending upon several factors including the customer's load requirements. The customer may be required to furnish and install empty conduit along his/her property line(s) to ensure the future reliability of underground service in the area via looped feed. Appropriate switches and protective devices are to be furnished by the customer at the entrance to the building. It is important for the customer to consult the Company as to space requirements for its cable and metering equipment prior to actual design and layout.

226. Nothing contained in this policy shall require the Company to install area feeder circuits underground or require existing facilities to be put underground.

F. TEMPORARY SERVICE

227. The Company furnishes temporary service to supply construction power when the customer needs construction power before the permanent Company facilities can be installed. The customer will be responsible for all costs involved when he/she requests the Company to install temporary facilities. The Company furnishes a meter and meter socket. The customer will be responsible for the temp meter installation per local inspection requirements. See Drawings 6 and 8 for typical installations. The customer shall contact the Company to determine the lead time in an undeveloped location.

228. Customers desiring service for a shorter period than one (1) year may obtain it under the schedule of rates for electric service of the Company by depositing with the Company, in advance of construction, a non-refundable sum equal to the actual cost (excluding transformer and meter costs) to install the connection and the estimated removal costs upon termination of service.

229. The same permit and inspection procedures apply to temporary services as to permanent services (See SECTION III).

SECTION III UTILIZATION EQUIPMENT

A. GENERAL

300. In order to assure uniformly satisfactory service to all customers, it is important that the requirements for the customer's utilization equipment contained herein be followed by the customer. These requirements are not unduly restrictive and can be met by commercially available equipment. The customer shall use the electric service supplied by the Company with due regard to the effect of such service on its other customers and on the facilities and equipment of the Company. The Company may refuse to supply electric service or may suspend electric service to a customer without notice if the customer's installation is in an unsafe or dangerous condition, or is designed or operated so as to disturb the electric service the Company supplies to other customers. Equipment with excessive starting currents, or that has intermittent or rapidly fluctuating load characteristics, shall not be connected to the Company's lines without prior arrangement with the Company.

301. Electric service is subject to occasional rapid voltage variations that may adversely affect the operations of sensitive controls on a customer's electric equipment. Devices available for use with most electric equipment will minimize the effect of such disturbances. The Company will assist the customer in identifying the source of the disturbance. The Company will not assume liability for damage to the customer's equipment nor for disturbances in any customer processes arising from such variations.

302. When lightning arresters are installed by the customer, they must either be connected to his/her facilities on the load side of his/her main entrance fuses or circuit breakers, or be of the ground lead disconnecting type.

B. MOTOR STARTING LIMITATIONS

303. Starting inrush for single or multiple motors shall be limited at any instant to 50 amperes at 120 volts or 150 amperes at 240 volts. This applies to air conditioning units. The running power factor of motors shall not be less than 85 percent.

304. For three-phase, 60-hertz motors to be operated from a 240- or 480-volt supply, the permissible starting inrush is limited by the effect on other motors and on the distribution systems of the customer and the Company. The customer must notify the Company of the maximum size and type of motor to be served, as well as the aggregate of all motor loads, so the Company may assure proper service to all customers on its affected distribution system.

For a three-phase, 60-hertz motor to be operated from a 120/208-volt, four-wire supply, the permissible starting inrush is limited by the effect on lighting and other equipment connected at 120 volts and on the distribution systems of the customer and the Company. The customer must notify the Company of the maximum size and type of motor to be served, the aggregate of all motor loads, and the type of lighting and other equipment to be served at 120 volts so the Company may assure proper service to all customers on the affected distribution system.

In either case, a limitation on the motor inrush current may be necessary, and this can be accomplished with appropriate starting devices.

305. Motor Protection. The Company uses single-pole switches and single-phase fuses in its distribution system. Accordingly, the customer must protect all three-phase motors and equipment from a single-phase operating condition. In addition, suitable protection must be provided by the customer for all motors in accordance with the National Electrical Code in order to protect the motor and equipment from improper or dangerous operation due to motor overloads or the failure to start.

(A) All motors shall be protected against overload by the installation of adequate, over-current, thermal protective devices in all phases.

(B) Three-phase motors that operate apparatus that may be subjected to damage due to a reversal of rotation shall be protected with reverse-phase relays.

306. The Company shall not be responsible for any damage to the customer's equipment due to improper protective devices or the improper functioning of protective devices.

C. OTHER TYPES OF EQUIPMENT

307. The customer must notify the Company prior to installation, of all the characteristics of each individual welder—what it is to be used for and the timing of its welding operations—so that the Company can assure delivery of proper voltage at the welder and prevent objectionable voltage variations to other customers.

308. Power factor corrective equipment, flashing signs, high frequency equipment, spark discharge devices, radio transmitters, X-ray machines, experimental devices or any other equipment which could cause abnormal voltage fluctuations shall be designed and operated so as not to adversely disturb the Company's electrical system. Customers must inform the Company of the characteristics of any such equipment prior to placing it in service. If a customer uses its building wiring as a carrier system for communication or signaling purposes, the customer shall install suitable electrical filtering equipment to keep the Company's distribution facilities free from carrier frequency currents.

309. Any customer contemplating the operation of generating equipment in parallel with Company facilities should contact the appropriate Company office for information regarding terms, conditions, and requirements for interconnection with Company facilities.

The customer must submit to the Company detailed plans, specifications, equipment description, and other details pertinent to the proposed installations as may be required by the Company. These plans, specifications, etc., must be approved by the Company before parallel operation will be allowed.

RESIDENTIAL

SECTION IV RESIDENTIAL ELECTRIC SERVICE AVAILABLE

Upon the customer's request, the Company specifies the type of electric service available at any given location for use by the customer.

400. Residential: Generally single-phase, 60 hertz, 120/240 volts, three wire.

401. Rural Residential: Generally single-phase, 60 hertz, 120/240 volts, three wire.

402. Area Protection Lighting: The Company installs and maintains, for a flat monthly rate, a variety of luminaries. For details concerning this service, contact the Customer Service Center.

403. Streetlights: If a customer is developing a subdivision and plans on including streetlights, please contact the local office to ensure that they will be handled in the correct manner.

SECTION V SERVICE ENTRANCE POLICIES AND REQUIREMENTS

A. GENERAL PROVISIONS

500. The Company request that architects, engineers, contractors, builders, etc., consult us in advance to obtain any special specifications and directions for the proposed service entrance. This may avoid delay and expense if carefully observed and followed.

501. To avoid expensive alterations later, the service entrance should be adequate for future growth as well as for present requirements. The Company recommends that all new service entrances have a minimum capacity of 100 amperes. The customer bears the responsibility for installing service equipment in accordance with the provisions of the National Electrical Code as a minimum. Article 23098 of the current edition of the National Electrical Code contains an important provision that requires that "Service equipment shall be suitable for the short circuit current available at its supply terminals." So that architects, engineers and wiring contractors may select proper service equipment to meet the above requirement, the following information applies to new installations:

1. **Single Family, Residential Dwellings:** Available short-circuit current at residential service entrances rated 200 amperes or less will be more than 5,000 amperes but will not exceed 15,000 amperes.

2. **Multiple-Occupancy Dwellings and Residential Single Family Dwellings with service entrances rated more than 200 amperes:** Available fault currents will vary with each installation. Customers should direct inquiry for a particular location to the appropriate Company office listed in the index of this booklet.

502. In apartments, duplexes, and other buildings where a number of meters are installed, each service switch and meter enclosure is to be plainly marked by the building owner, the customer, or his/her agent with a permanent identification of the apartment or space which it serves. General services and electric heat services must be similarly distinguished. The identification shall also be permanently inscribed on the inside back of each meter enclosure near the meter socket clips. It is the responsibility of the building owner, the customer, or his/her agent to see that wiring in such locations is connected to the proper meter or meters. The Company will not render service until all switches and meters are properly marked.

B. METERING

503. The Company will furnish an approved meter socket. **Service shall be denied if an unapproved meter socket is installed.**

504. The following govern the location of meters:

1. Meters generally are located outside and where not subject to vibration, jarring, gases, dust, fluids, etc., that may affect the accuracy of the meter.

2. Meters for single-family houses shall be located as directed by the Company. It is recommended that the customer's service entrance is stubbed out of the house at the side of the house close to the supply of the electric service. The customer should contact the Company if any doubt exists concerning the closest supply of electric service.

3. In multiple occupancy buildings served by more than one meter, the building owner or his/her agent provides adequate and accessible common space and installs the meter there.

4. Meters shall not be installed within 36 inches of windows or doors.

5. Meters shall not be located above platforms that are not accessible by stairs. A ladder is not acceptable in place of stairs. When meters are located above platforms, the space in front of the meter must be at least three feet wide and protected by suitable railings.

6. When meters are located in a passageway or narrow space, the clear space in front of the meter shall not be less than three feet.

7. For ease of reading the meter and meter maintenance, the center of the meter socket shall be between 4'6" and 5'6" above final grade.

C. OVERHEAD SERVICE

505. For self-contained metering, the customer shall furnish and install the Company furnished meter socket, conduit, and conductors from his/her service entrance and equipment to the meter socket, a conduit riser weatherhead and service conductors to attach to the service drop. The Company will furnish and install the service drop. The customer's service conductors shall run from the meter socket through the service conduit riser with at least 24" of conductor extending from the weatherhead to provide for connection to the service drop with an adequate drip loop. The Company will make the connections to the customer's service conductors and install the meter. The service conduit mast or service hook shall be 100 of a strength that is adequate for the span tension and of sufficient height to provide proper clearances for the Company's service drop. The applicable customer charges for applicants classified as permanent service are determined as follows:

Customer Charge = Estimated Construction Cost
- Construction Allowance

See following definitions for estimated construction cost and construction allowance.

Estimated Construction Costs: The estimated construction costs shall be the necessary cost of the distribution extension and shall include the cost of all materials, labor, rights-of-way, trench and backfill, together with all incidental underground and overhead expenses connected therewith. Where special items not incorporated in the Company's Electric Extension Standards are required to meet construction conditions, the cost thereof shall also be included.

Construction Allowance: That portion of the Distribution Extension which is made by Company at its expense. The formula used to determine the appropriate construction allowance will be based on Section 20 of the Company's Rules and Regulations.

D. UNDERGROUND SERVICE

506. Residential Service Laterals (New Single and Multi-Family Dwellings) in an Existing Overhead Service Area.

The Company will install underground service lateral cables (but not other underground distribution) in areas currently served with overhead distribution.

The Company will provide, install, and maintain the service cables. The customer will install Company approved meter sockets as required. In multi-family dwellings, no more than one point of service will be provided between firewalls.

507. Residential Development (New Single and Multi-Family Dwellings).

The customer is to provide for the Company, at no cost to the Company, all rights-of-way for its primary, secondary, streetlight and service cables; padmounted transformers; secondary pedestals; and other facilities that may be required to serve the customer. The grading must be within six inches of final grade, and the easement must be cleared of all trees, structures and obstructions before the Company begins construction. Ingress for Company vehicles must be maintained to all structures involved prior to sodding, landscaping and fencing.

The customer shall provide and install electrical plastic conduit (Schedule 40PVC) for Company cables under streets or other areas requiring conduit. Conduit installed by the customer shall be marked and provided with a pull rope and tracer wire.

The customer is to provide and install a conduit riser on the building for the service entrance, a Company furnished meter socket, and any other conduits necessary to complete the entrance in accordance with Drawing 1. All conduit installed by the customer shall have heavy duty string or nylon cord inside for the Company to install its cable pulling rope.

The meter socket must be installed at the location designated by the Company which is generally on the side of the house.

E. RURAL RESIDENTIAL SERVICE

508. The Company defines a rural customer as a customer taking electric service (except electric service used in connection with a commercial enterprise not related to residential or farming purposes) who uses such electric service for residential purposes in an area that has not been platted and recorded in connection with farming or other agricultural pursuits. The Company reserves the right in all instances to designate whether a customer is rural.

509. The following guidelines apply to rural customers:

1. The Company makes rural line extensions, including both primary and secondary lines, in accordance with the Company's Rules and Regulations as approved by the Colorado Public Utilities Commission. A Company representative will be pleased to explain these rules and regulations to a customer at any time.
2. The customer may install the meter on a building or on a customer-owned pole at the election of the customer, provided the Company approves the meter location.
3. When the meter is located on a building, the Company installs the service drop from its last pole to the mast on the building. The customer provides and installs all other equipment, including a Company-provided meter socket.
4. If service runs overhead, sufficient ground clearance (as listed in Article 219) must be provided along the service drop when determining the height of the attachment point at the building. The Company may require a service mast to provide this clearance. The customer provides the conduit and wiring from the point of the attachment of the Company's service drop to the electrical facilities.

510. The customer should install a ground and a service switch at each building, which is served directly from the yard pole or the customer's distribution line.

511. The fused service switch or the circuit breaker used at the farmhouse for single-phase, 120/240 volt, three-wire service is to be two pole, solid neutral, with a recommended minimum capacity of 100 amperes.

512. In rural areas where water is supplied from wells and cisterns, electric water heaters shall be effectively grounded by connecting them to the service entrance ground.

513. All wiring shall be installed by the customer to meet the requirements of the National Electrical Code as a minimum.

514. The applicable customer charges are determined the same way as shown in Section 507.

Notes:

1. Primary extensions to the rural property will be overhead.
2. Primary extensions into the rural property may be overhead or underground.
3. Customer requirements for installation of meter enclosures, conduit service entrance masts and conduit for underground services are identical to those listed in previous sections.

F. MOBILE HOME SERVICE

515. New Permanent Mobile Home Development: A new permanent mobile home development as defined by local zoning. To qualify, the development must have facilities such as permanent paved roadways, underground sewer and water connections, and must be finished-graded. Rights-of-way and easements are required as prescribed in Article 114.

516. The Company furnishes and installs all primary and secondary distribution and service lateral conductors to each meter position; makes the meter socket connections; and installs the meter.

517. Overhead Service: The customer shall install an adequate service pole adjacent to each mobile home site at a point the Company approves. The pole must be of a height and strength adequate to support the Company's service drop. The Company may require customer guying. Considerations of Article 218 limit the maximum span for a service drop. The Company connects the customer's service conductors installed in his/her conduit to the meter.

518. Underground Service: The customer shall furnish and install a Company-approved mounting pedestal for the meter and main disconnect with a protective device. **(See Drawing 4)**

519. Transient Mobile Home Development: A transient mobile home development, such as an overnight campground, lacks one or more of the requisites for a permanent mobile home development. The Company, in general, provides the same arrangements as listed under permanent mobile home development.

The applicable customer charges are determined the same way as shown in Section 509.

G. SERVICE ALTERATIONS

520. The Company intends to utilize as much of its facilities as practical. The Company charges the customer for service alterations required solely for the customer's convenience, i.e., relocating existing facilities to clear sundecks, room additions, swimming pools, etc.

521. For most relocations, the Company requires the customer to upgrade his/her service to meet current Company standards.

COMMERCIAL
AND
INDUSTRIAL

SECTION VI COMMERCIAL AND INDUSTRIAL ELECTRIC SERVICE AVAILABLE

600. Commercial and Industrial: Single-phase, 60hertz, 120/240 volts, three-wire.

Three-phase, three-wire, 60-hertz, 240 volts or 480 volts.

Three-phase, four-wire, 60-hertz, 120/208 volts or 277/480 volts.

Under certain conditions service may be provided at the distribution voltage.

601. Area Protection Lighting: The Company installs and maintains, for a flat monthly rate, a variety of luminaries. For details concerning this service, contact the Customer Service Center.

602. Streetlights: If a customer is developing a subdivision and plans on including streetlights, please contact the local office to ensure that they will be handled in the correct manner.

603. Customers and contractors contemplating the purchase and/or installation of any three-phase motor larger than ten horsepower or any single-phase motor larger than seven and one-half horsepower should obtain from a Company representative written information relating to the character of service available at the address of such proposed installation. Individual single-phase motors rated at seven and one-half horsepower or less will ordinarily be permitted at any point where electrical service is available. Individual, single-phase, 230-volt motors larger than seven and one-half horsepower may be connected upon special approval of the Company.

A single-phase or three-phase motor may be started "across the line" if its total starting current does not exceed the following limitations. Starting currents must be limited to a value that will not cause more than a two percent voltage dip, as measured on the primary side of the service transformer, based on no more than two starts per hour unless approved by the Company prior to installation. Starting currents must be limited to a value that will not cause a more than two percent voltage dip more than two times per hour at other customers' service entrances served from the same service transformer, unless approved by the Company prior to installation.

SECTION VII INSPECTION AND CERTIFICATION OF CUSTOMER'S WIRING

700. Many municipalities require by law that new wiring and alterations in wiring be approved by the local electrical inspector's office prior to connection by the Company. In such municipalities, the Company cannot render service until the Company receives this approval. The Company intends that the requirements of applicable codes be adhered to in all installations.

701. The responsibility of the customer regarding his/her use of the electric service supplied by the Company is not set aside, and the Company shall in no way be liable on account of any inspections or recommendations the Company makes as a courtesy to the customer or as protection to the electric service supplied by the Company to other customers. The Company reserves the right, but assumes no duty, to inspect the customer's service installation.

SECTION VIII SERVICE ENTRANCE POLICIES AND REQUIREMENTS

A. GENERAL PROVISIONS

800. The Company requests that architects, engineers, contractors, builders, etc., consult us in advance to obtain any special specifications and directions for the proposed service entrance. This may avoid delay and expense if carefully observed and followed.

801. To avoid expensive alterations later, the service entrance should be adequate for future growth as well as for present requirements. The customer bears the responsibility for installing service equipment in accordance with the provisions of the National Electrical Code as a minimum. Article 230-98 of the current edition of the National Electrical Code contains an important provision that requires that "Service equipment shall be suitable for the short circuit current available at its supply terminals.

802. The Company makes only one service connection for each type of electric service to a customer's premises except where required by (a) regulations or codes promulgated by municipal or other governmental authorities or (b) the customer's load being of such size and character and so located as to make it advisable, in the opinion of the Company, to install more than one service connection.

803. In serving any customer, the Company will, at its sole option and subject to its Rules and Regulations on file with the appropriate regulatory bodies:

1. Determine the point and character of electric service from which it will supply a customer.
2. Approve the location of the customer's entrance and the design of the electric system to this location from the Company's supply point.

804. The street address of the premises requiring new service shall be plainly displayed. Contractors and others installing electric work should place their names and addresses on each installation.

805. In multiple-occupancy buildings where a number of meters are installed, each service switch and meter enclosure or socket must be plainly marked by the building owner, the customer or their agent with a permanent identification of the space that it serves. General services and electric heat service must be similarly distinguished. The identification shall be permanently inscribed on the inside back of each meter enclosure near the meter socket clips and with a brass tag on the outside of the cover, indicating correct address. The building owner, the customer or their agent holds the responsibility of seeing that wiring in such locations connects to the proper meter or meters. The Company will check multi-metered units (four or more) to verify accurate identification. The building owner, the customer or their agent must be on hand at this time. Mismarked service switches, breakers or meter enclosures must be corrected by the building owner, the customer or their agent. The Company will not render service until all switches and meter enclosures are properly marked.

806. The customer shall furnish and install Underwriters' Laboratories' Laboratories, Inc., listed disconnecting devices in accordance with the provisions of the National Electrical Code and local ordinances. Service entrance conductors shall be the size and type in accordance with the National Electrical Code.

807. The neutral wire shall be grounded on the customer's premises by the customer. This ground shall be made to an approved ground rod at the location of the service entrance.

808. Available Fault Currents will vary with each installation. Inquiry for a particular location shall be directed to the appropriate Company office listed on page 1 of this booklet.

B. METERING

809. The meter installation and entrance shall generally be located on the customer's structure at a suitable place approved by the Company. The Company sizes the meter installation to the customer's load and not necessarily to the entrance size. Access for Company personnel must be maintained to assure proper maintenance of the service. In multiple occupancy buildings, each of the premises shall be individually metered, as well as the facilities used in common, if applicable. All meters shall be at the same location and properly marked in agreement with the corresponding service switch markings. However, in multi-floor residential buildings, the number of floors with meter installations should not exceed one per three levels or remaining fraction thereof. Self-contained metering is intended for service up to 400 amperes.

810. Meter Installations:

A. The customer shall provide, and at all times, maintain on the premises to be supplied with electricity, space for the installation of Company meters or other devices necessary to supply electricity to the premises. The Company shall extend service conductors to the line side of the meter within guidelines set by the rules and regulations.

The customer is responsible for furnishing and installing the Company furnished meter socket, service entrance conductors, service mast, conduit, ground rod and all associated materials for overhead service installations except in the circumstances listed below.

Exceptions: The Company will furnish and install the meter socket, current transformers, potential transformers and all associated instrument wiring for CT-rated installations.

However, the customer will be required to furnish and install any required metering cabinets and associated hardware.

B. The point of delivery by the Company shall be at the load side of the Company meter and at the location designated by the Company. The meter location may be on the customer's building, on a pad-mounted transformer, on a pole, or other appropriate location designated by the Company. The customer shall be responsible for the installation, maintenance, protection, and proper operation of all facilities beyond the point of metering. For all customers, the point of delivery shall be at the meter location. The Company shall furnish and install a meter to be used for billing purposes. Any equipment furnished by or installed by the customer shall upon installation become the Company's property and may be removed by it at any time after the termination of the Service Agreement or upon discontinuance of electric service for any reason.

C. Only one (1) meter will be installed for a customer at a give location to measure service of like character, except as otherwise provided herein.

D. Where demand meters are used for metering service to customers for billing purposes, the applicable rate schedule shall designate the demand interval to be used for normal service. However, where customers request demand meter contact signals and the Company agrees to furnish such demand meter contact signals, the Company shall charge the customer the entire investment cost of providing such contact signals plus any estimated monthly operating costs expected.

811. Multiple Metering: The normal practice shall be to bill each metering point as a separate customer. Under special conditions, consumption registered by two (2) or more meters may be numerically added and a single bill tendered for such service supplied to a customer, provided the customer's load is of such size and character, on same rate, and so located as to make it advisable, in the opinion of the Company to install more than one (1) service connection at a single location.

812. Under no circumstances shall meters be removed or relocated, whether temporarily or permanently, except when approved by the Company. The Company cooperates in relocating its metering equipment and service attachment when required for modification of the customer's building or service entrance. There may be a cost to the customer for relocation.

813. The Company owns and maintains the billing meters and metering devices. The Company installs its meters and devices.

814. The following govern the location of meters:

1. Meters generally are located outside and where not subject to vibration, jarring, gases, dust, fluids, etc., that may affect the accuracy of the meter.

2. Meters shall be located as directed by the Company. The customer should contact the Company if any doubt exists concerning the closest supply of electric service.

3. In multiple-occupancy buildings served by more than one meter, the building owner or his/her agent provides adequate and accessible common space and installs the meter there.

4. Meters shall not be installed within 36 inches of windows or doors.

5. Meters shall not be located above platforms that are not accessible by stairs. A ladder is not acceptable in place of stairs. When meters are located above platforms, the space in front of the meter must be at least three feet wide and protected by suitable railings.

6. When meters are located in a passageway or narrow space, the clear space in front of the meter shall not be less than three feet.

7. For ease of reading the meter and meter maintenance, the center of the meter socket shall be between 4'6" and 5'6" above final grade.

C. OVERHEAD SERVICE

815. Normally the customer will be served through a meter attached to the outside of the building. Service entrance conductors shall be installed in accordance with the latest edition of the National Electrical Code.

816. The length of the service drop from the last Company pole to the customer's premises must be limited by the ground clearance attainable at tensions appropriate to the strength of the cable and its two supports.

817. The point of attachment of the Company's service drop to the customer's building or mast must be of proper height and location to provide at all points in the span the minimum clearances above ground and from other wires and obstructions required by the National Electrical Safety Code and other applicable rules. The Company requires the customer to install and maintain the mast that goes through a roof or overhang.

In general, the clearances given in the National Electric Code are to be maintained with the wires at their maximum operating temperature and also when covered with ½ inch of ice.

Minimum Ground Clearances Applicable to Standard BHE Service Drops Up to 480 Volts

Nature of Ground Under the Cable	Required Vertical Clearance	
Track rails of railroad	24.0 feet	
Streets, alleys, roads, parking areas subject to vehicles higher than 8 ft., and farm and other land traversed by vehicles up to 14 ft. high	16.0 feet	
Residential driveways	18.0 feet	
Spaces or ways accessible to pedestrians only	12.0 ft.	Over 300V to ground
	10.5 ft.	Under 300V to ground
Swimming pools	See NESC	

818. The customer, in the construction of a building, must provide sufficient capability to support the Company’s attachment and conductors to withstand the stress as per the National Electrical Safety Code heavy loading conditions.

819. For self-contained metering, the customer shall furnish and install the Company-furnished meter socket, conduit, and conductors from his/her service entrance and equipment to the meter socket, a conduit riser weatherhead, and service conductors to attach to the service drop. The Company will furnish and install the service drop. The customer’s service conductors shall run from the meter socket through the service conduit riser with at least 24” of conductor extending from the weatherhead to provide for connection to the service drop with an adequate drip loop. The Company will make the connections to the customer’s service conductors and install the meter. The service conduit mast or service hook shall be of a strength that is adequate for the span tension and of sufficient height to provide proper clearances for the Company’s service drop.

820. Service to Multi-Occupant Buildings from a Service Bus:

The customer shall furnish and install the Company furnished meter socket, conduit and conductors from his/her service entrance and equipment to the meter socket, a conduit riser, weatherhead, and service conductors to attach to the service bus. The Company will furnish and install the service drop to the building and the service bus. The service conduit riser or service hook shall be of a strength adequate for the span tension and of sufficient height to provide proper clearances for the Company’s service drop. The customer’s weatherhead shall be above the service bus and the customer’s service conductors shall run from the meter socket through the service conduit riser with at least 24” of conductor extending from the weatherhead to provide for connection to the service bus with an adequate drip loop. The Company will make the connections of the customer’s service conductors to the service bus and install the meter.

821. For instrument transformer metering, the customer shall furnish and install a service conduit riser with a weatherhead and the service entrance conductors from his/her service entrance equipment. The service conduit riser or service hook shall be of a strength adequate for the span tension and of sufficient height to provide proper clearances for the Company's service drop.

The customer's service conductors shall extend at least 24 inches beyond the weatherhead to provide make-up length for the Company to install connections to the service drop. The Company will furnish and install its meter and metering cable. The Company will furnish metering current transformers and the meter socket. The customer will furnish and install a metering current transformer enclosure.

822. The applicable customer charges are determined as follows:

Customer Charge = Estimated Construction Cost - Construction Allowance

See following definitions for estimated construction cost and construction allowance.

Estimated Construction Costs: The estimated construction costs shall be the necessary cost of the distribution extension and shall include the cost of all materials, labor, rights-of-way, trench and backfill, together with all incidental underground and overhead expenses connected therewith. Where special items not incorporated in Company's Electric Extension Standards are required to meet construction conditions, the cost thereof shall also be included.

Construction Allowance: That portion of the Distribution Extension, which is made by the Company at its expense. The formula used to determine the appropriate construction allowance will be based on Section 20 of the Company's Rules and Regulations.

D. UNDERGROUND SERVICE

(See Standard Drawings 7 and 10 for drawings specifically applicable to commercial/ industrial projects.)

823. The Company requires service lateral conductors installed by the customer to be in conduit. The minimum depth to the top of the conduit shall be 42 inches. In solid rock this may be reduced to 12 inches provided two inches of concrete are installed above the conduit.

824. The customer may provide and install all primary, secondary, and service conduit on the customer's property required by the Company for the installation of electric facilities for industrial, commercial, and multi-family developments. The customer is responsible for installing the conduit within the easements or rights-of-way designated for use by the Company and in accordance with standard Company specifications. Underground conduit installed by the customer shall be manufactured according to NEMA standard TC-2 for Electrical Plastic Conduit. The customer shall also install all required concrete-encased duct, manholes, transformer pads and switchgear pads to Company specifications.

825. Commercial and Industrial Service Laterals in an Existing Overhead Service Area.

The customer shall extend his/her underground service lateral conductors to the point of metering. At the customer's request, the Company may agree to install pad-mounted transformers to serve the customer's load. Applicable customer charges will be in accordance with Section 823.

Since metering methods vary considerably, the customer is to contact the Company prior to construction and work out the details of meter location and equipment requirements.

826. Commercial, Industrial, and High Rise Multi-Family Dwellings (Non-Network).

The customer shall extend his/her underground service lateral conductors to the point of metering. Since metering methods vary considerably, the customer is to contact the Company prior to construction and work out the details of meter location and equipment requirements.

827. Nothing contained in this policy shall require the Company to install area feeder circuits underground or require existing facilities to be put underground.

828. The applicable customer charges are determined as follows:

Customer Charge = Estimated Construction Cost - Construction Allowance

See following definitions for estimated construction cost and construction allowance.

Estimated Construction Costs: The estimated construction costs shall be the necessary cost of the distribution extension and shall include the cost of all materials, labor, rights-of-way, trench and backfill, together with all incidental underground and overhead expenses connected therewith. Where special items not incorporated in the Company's Electric Extension Standards are required to meet construction conditions, the cost thereof shall also be included.

Construction Allowance: That portion of the Distribution Extension, which is made by the Company at its expense. The formula used to determine the appropriate construction allowance will be based on Section 20 of the Company's Rules and Regulations.

E. PRIMARY SERVICE

829. Due to the variety of methods by which a customer can take primary service, it is difficult to generalize as to specific requirements. Company representatives will work closely with the customer's architect and engineer to develop a mutually acceptable and economical design within the framework of the Company's rate schedules, General Rules and Regulations, and Company specifications.

F. TEMPORARY SERVICE

830. The Company furnishes temporary service to supply construction power when the customer needs construction power before the permanent Company facilities can be installed. The customer will be responsible for all costs involved when he/she requests the Company to install temporary facilities. The Company furnishes a meter and meter socket. The customer will be responsible for the temporary meter installation per local inspection requirements. **See Drawings 6 and 8 for typical installations.** The customer shall contact the Company to determine the lead time in an undeveloped location.

831. Customers desiring service for a shorter period than one (1) year may obtain it under the schedule of rates for electric service of the Company by depositing with the Company, in advance of construction, a non-refundable sum equal to the actual cost (excluding transformer and meter costs) to install the connection and the estimated removal costs upon termination of service.

832. The same permit and inspection procedures apply to temporary services as to permanent services.

G. SERVICE ALTERATIONS

833. The Company intends to utilize as much of its facilities as practical. The Company charges the customer for service alterations required solely for the customer's convenience.

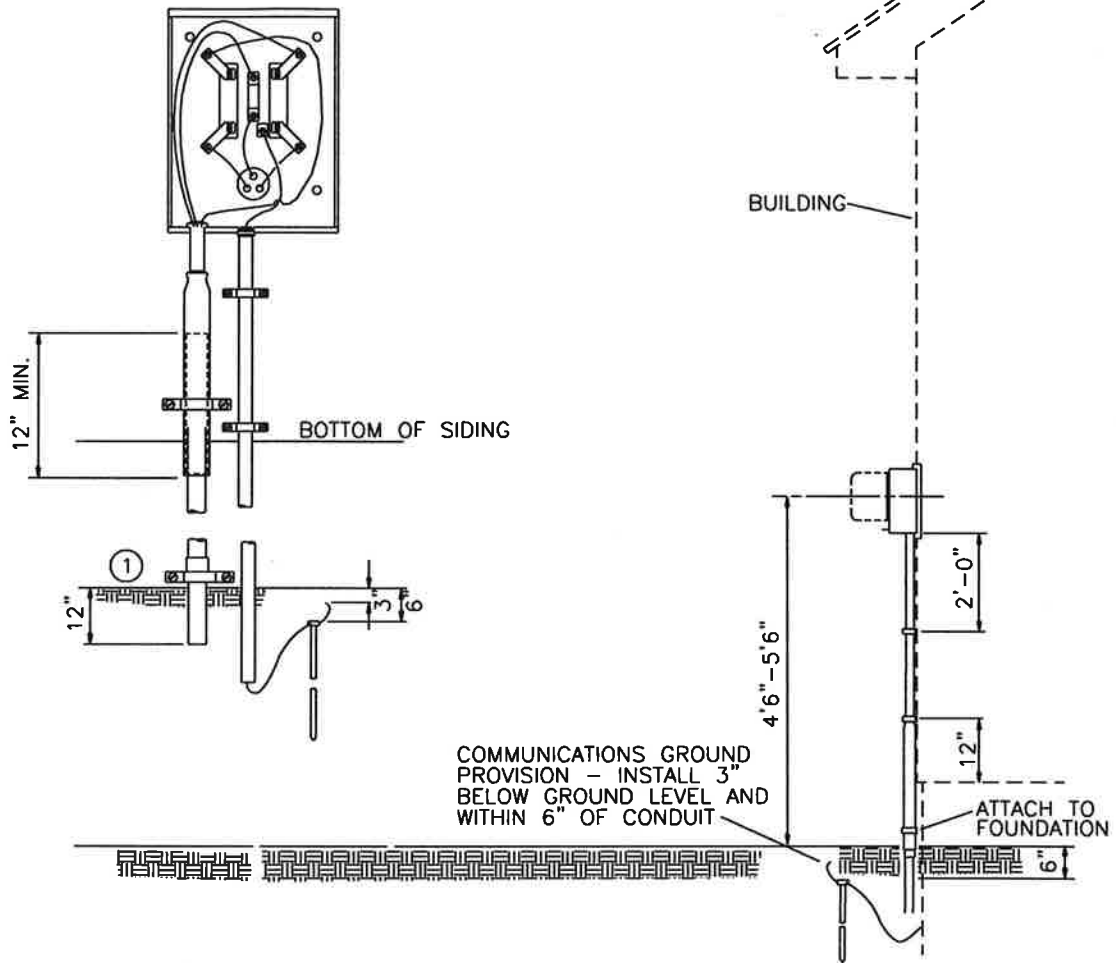
SECTION IX.

DRAWINGS

APPENDIX

RESIDENTIAL

TIE ALL GROUND & NEUTRAL
LEADS TO A COMMON POINT
IN METER BOX.

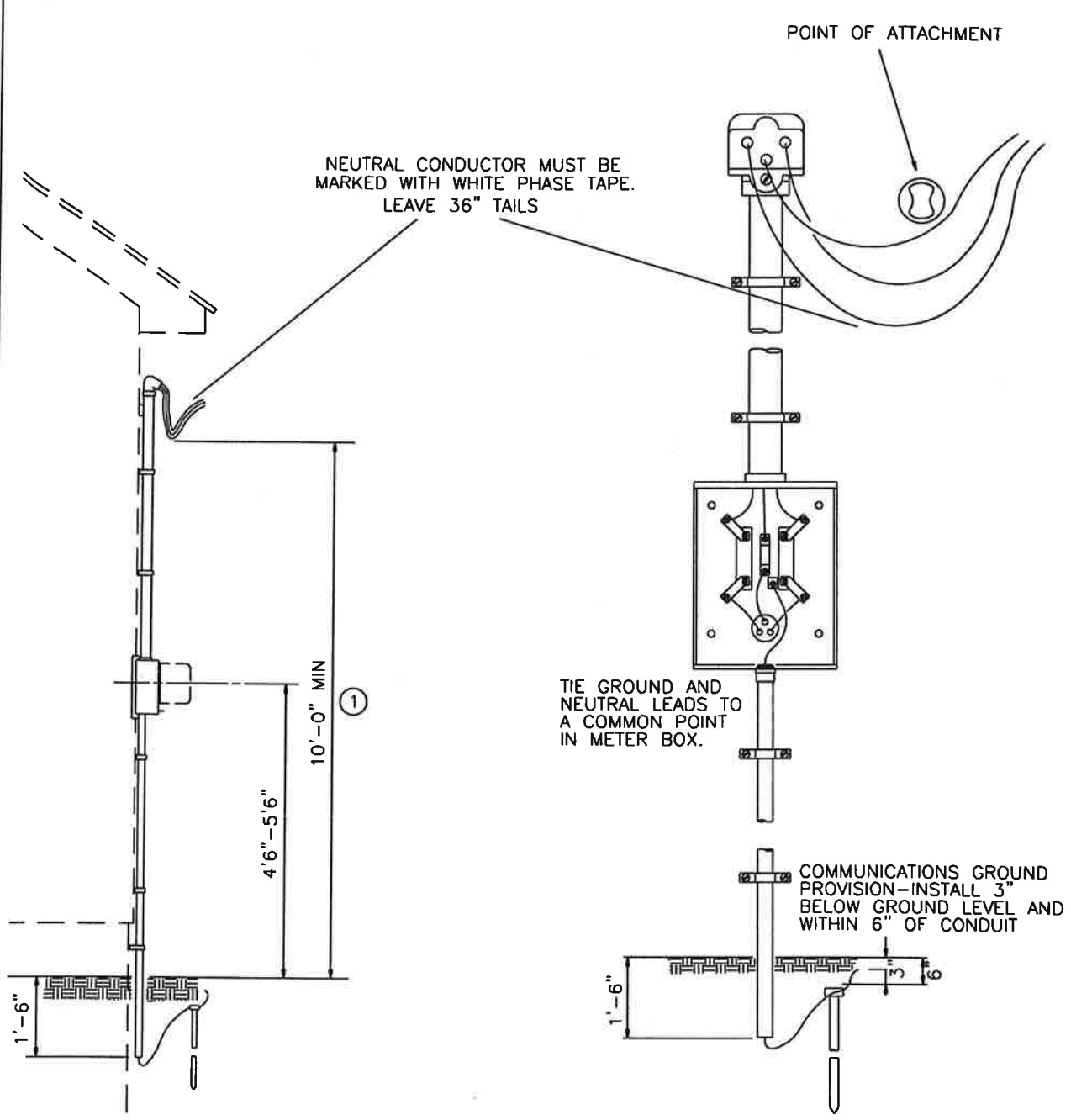


UNDERGROUND RESIDENTIAL SERVICE – IN CONDUIT
100 AMP & 200 AMP SERVICE

NOTE:

- ① PLACE CONDUIT STRAPS BELOW EACH BELLED END OF CONDUIT, AND NOT MORE THAN 5 FEET APART. A SLIP JOINT TO BE INSTALLED AS SHOWN BY BLACK HILLS. *SCHEDULE 80 PVC DOWN RISER*

BLACK HILLS ENERGY
CONSTRUCTION STANDARDS
– UNIT –
DRAWING 1
UNDERGROUND ELECTRICAL SERVICE,
IN CONDUIT,
200 AMP AND BELOW



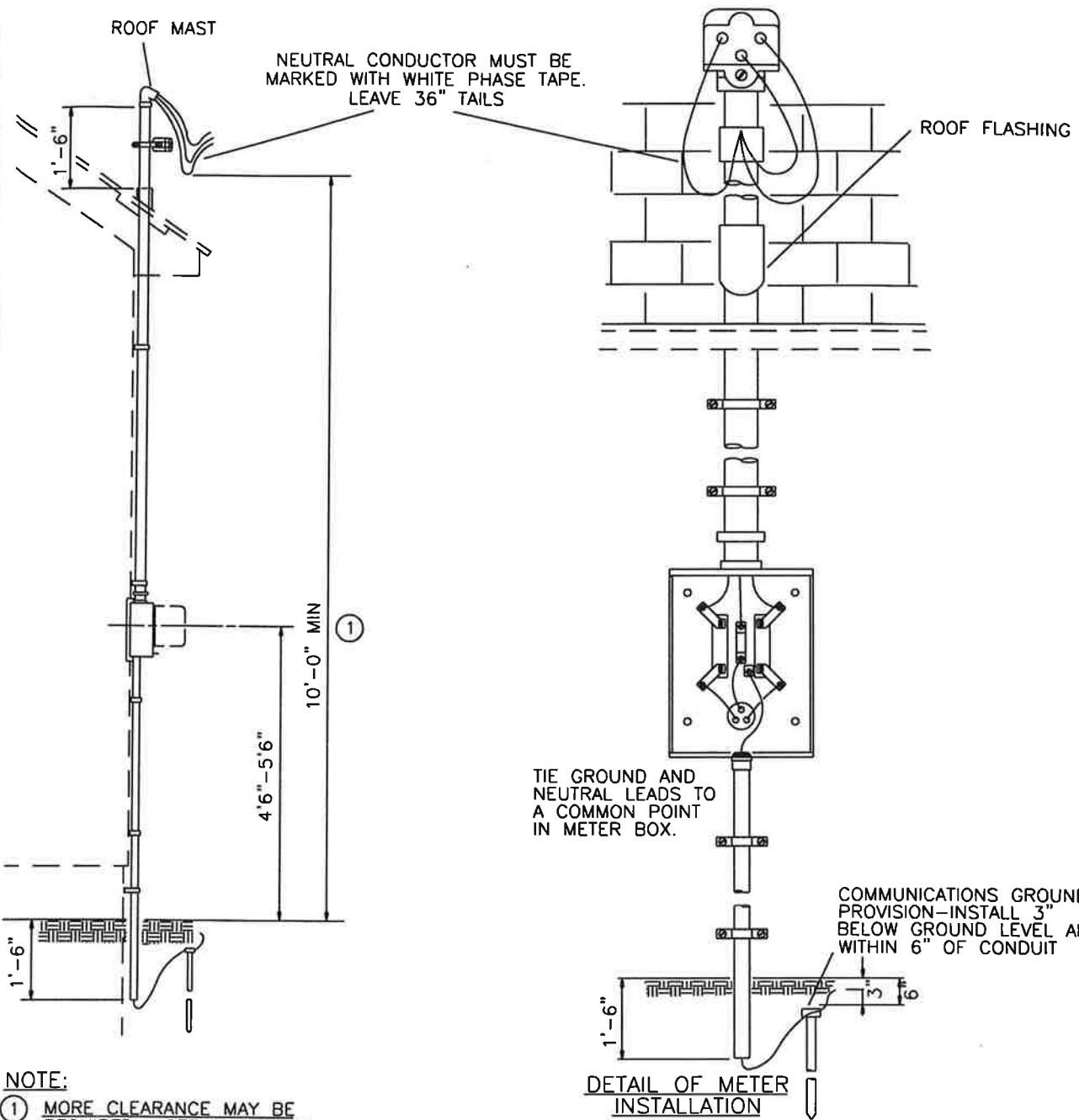
NOTE:
 ① MORE CLEARANCE MAY BE REQUIRED. SEE UNIT 1009

DETAIL OF METER INSTALLATION

BLACK HILLS ENERGY
 CONSTRUCTION STANDARDS
 —UNIT—
 DRAWING 2

OVERHEAD SERVICE,
 CUSTOMER INSTALL METER LOOP,
 120/240V, 200 AMP AND BELOW

Prepared By	Date Revised	Approved	Scale
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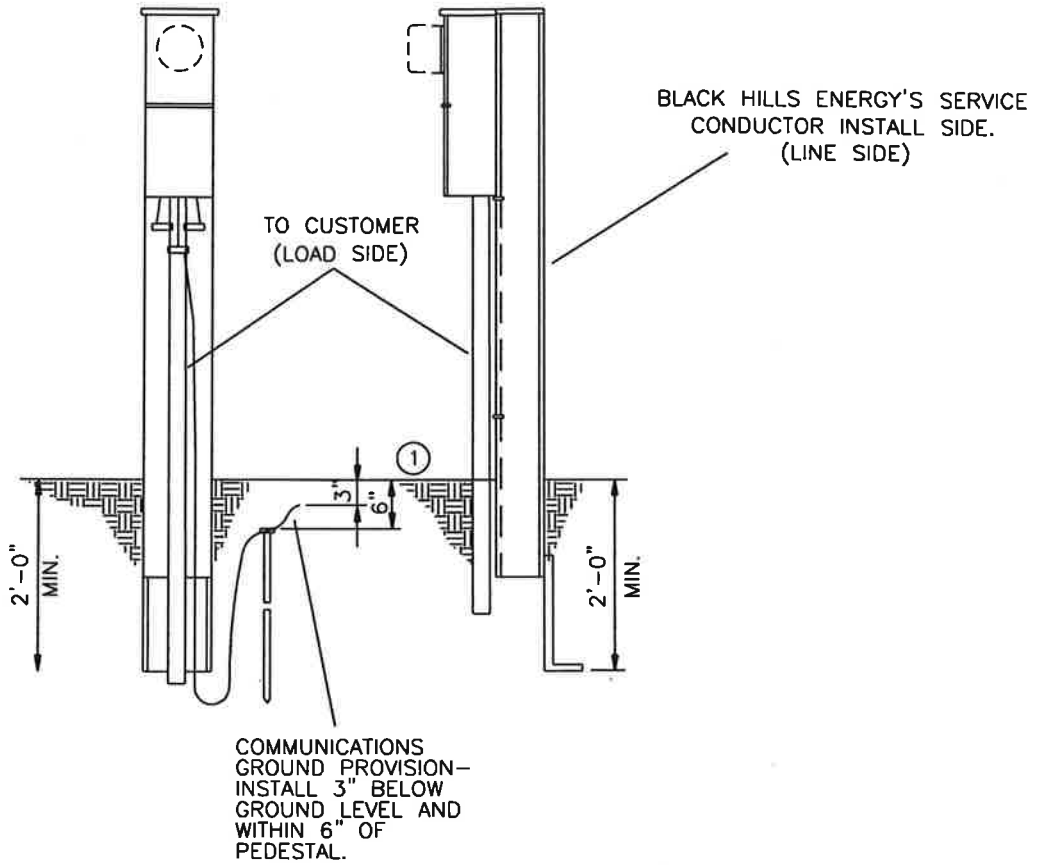


NOTE:
 ① MORE CLEARANCE MAY BE REQUIRED. SEE UNIT 1009

BLACK HILLS ENERGY
 CONSTRUCTION STANDARDS
 —UNIT—
 DRAWING 3

OVERHEAD ELECTRICAL SERVICE,
 METER MAST ASSEMBLY THROUGH ROOF,
 120/240V, 200 AMP AND BELOW

Prepared By	Date Revised	Approved	Scale
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NOTES:

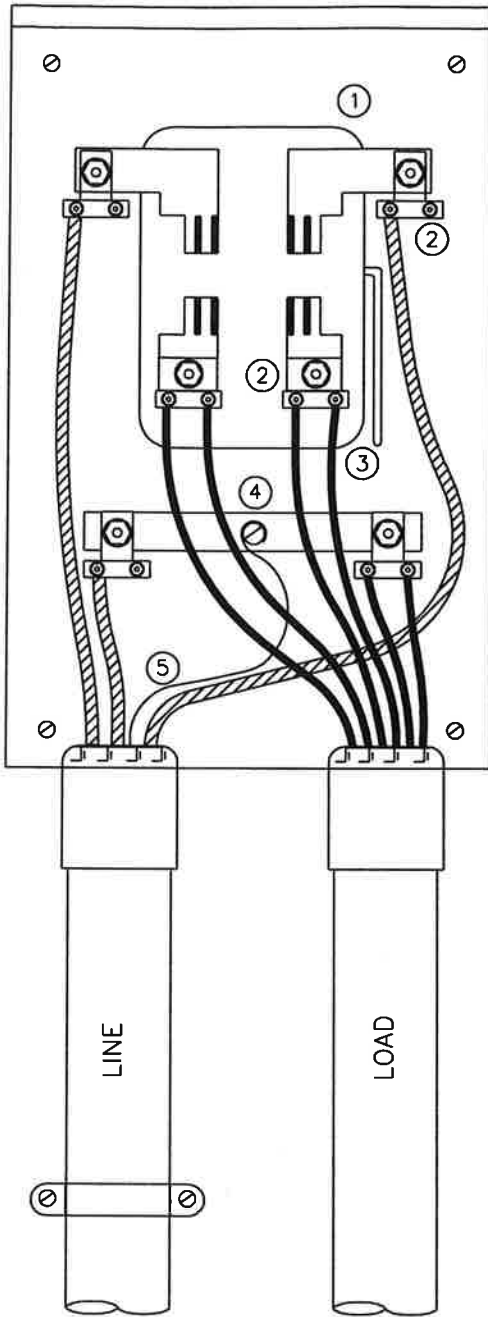
- ① INSTALL GROUND ROD AND COMMUNICATIONS GROUND PROVISIONS ON THE RIGHT HAND SIDE OF THE METER FACING NORTH OR EAST.

****CALL 811 PRIOR TO DIGGING FOR BURIED UTILITY LINE LOCATES****

BLACK HILLS ENERGY
 CONSTRUCTION STANDARDS
 -UNIT-
 DRAWING 4
 CUSTOMER INSTALL
 UNDERGROUND METER PEDESTAL
 200 AMP AND BELOW

Prepared By	Date Revised	Approved	Scale
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MOUNT BOX WITH AT LEAST TWO SCREWS IN WALL STUDS.



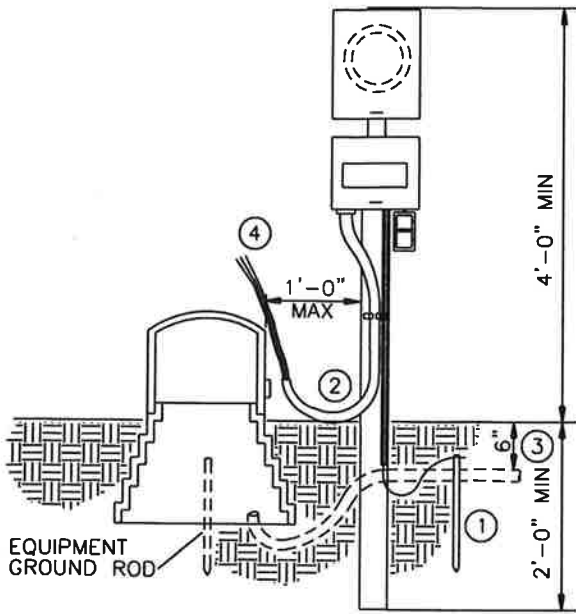
APPLICATION INFORMATION

1. THIS SOCKET IS PRIMARILY INTENDED TO BE USED FOR ELECTRIC HEAT CUSTOMERS AND OTHER SINGLE PHASE LOADS WHICH EXCEED 200 AMPS, BUT ARE LESS THAN 320 AMPS.

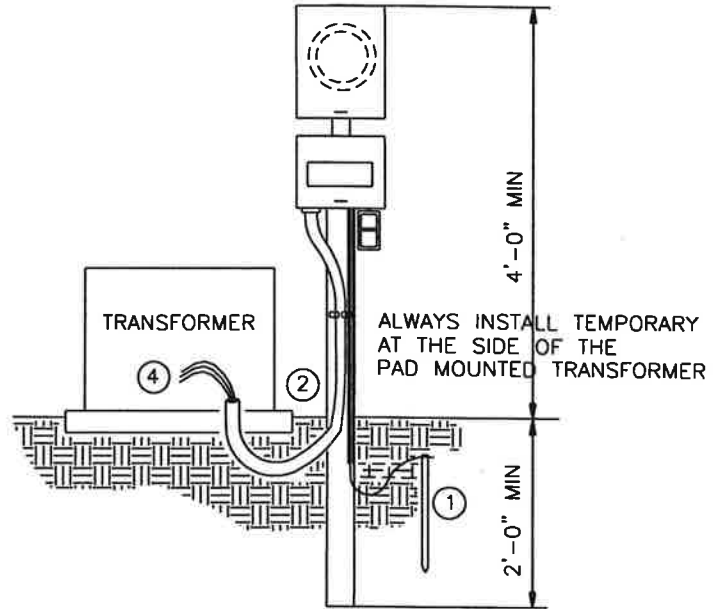
ITEM	DESCRIPTION
①	POLYCARBONATE BASE
②	METER BOX TERMINAL TWIN 350 MCM LUG CONNECTOR (NOT FURNISHED)
③	BY-PASS HANDLE
④	GROUND BAR (BUSS)
⑤	GROUND WIRE

BLACK HILLS ENERGY
CONSTRUCTION STANDARDS
- UNIT -
DRAWING 5

UNDERGROUND ELECTRIC SERVICE
120/240V- 320 AMP



SECONDARY PEDESTAL
INSTALLATION



PADMOUNTED TRANSFORMER
INSTALLATION

NOTES:

- ① RUN METER SOCKET GROUND WIRE IN SAME FLEX CONDUIT AS THE SECONDARY CONDUCTOR. IF THE TEMPORARY IS MORE THAN 10 FEET AWAY FROM THE EQUIPMENT, DRIVE A GROUND ROD AT THE BASE OF THE TEMPORARY. RUN A GROUND WIRE DOWN THE MOUNTING POST FOR ATTACHMENT TO GROUND ROD.
- ② IF THE TEMPORARY IS INSTALLED WITHIN ONE FOOT OF THE SECONDARY PEDESTAL, OR PADMOUNTED TRANSFORMER, LEAVE FLEX CONDUIT ABOVE GRADE AS SHOWN.
- ③ IF THE TEMPORARY IS INSTALLED AT A DISTANCE OF GREATER THAN ONE FOOT AWAY FROM THE PEDESTAL OR TRANSFORMER BURY FLEX CONDUIT TO A DEPTH OF SIX INCHES.
- ④ LEAVE MINIMUM OF 5 FEET OF WIRE FOR CONNECTION TO BE MADE BY BLACK HILLS ENERGY PERSONNEL.

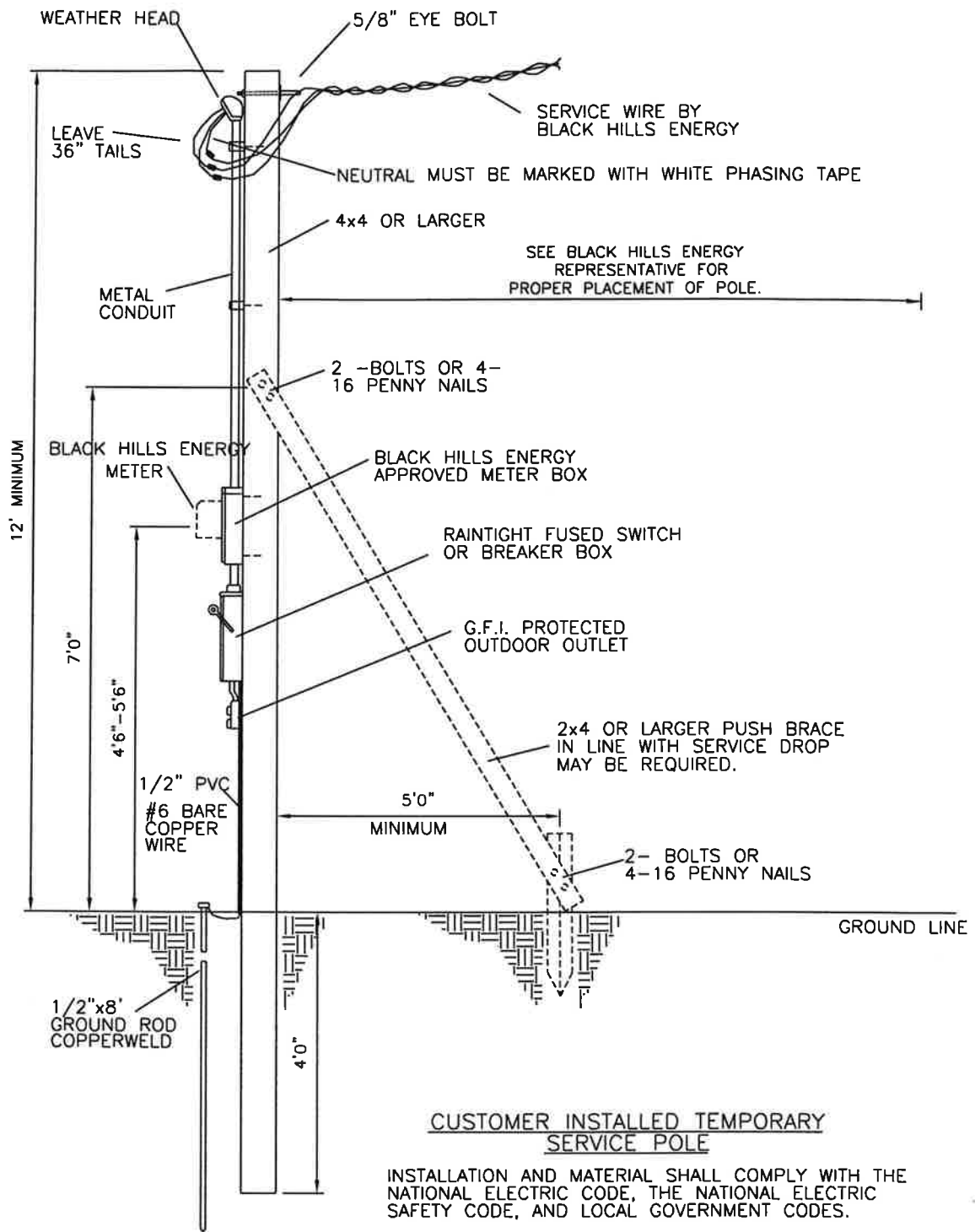
NEUTRAL CONDUCTOR MUST BE MARKED WITH WHITE PHASE TAPE.

CALL 811 PRIOR TO DIGGING FOR BURIED UTILITY LINE LOCATES

BLACK HILLS ENERGY
CONSTRUCTION STANDARDS
- UNIT -
DRAWING 6

TEMPORARY CONSTRUCTION METER INSTALLATION
FROM UNDERGROUND SOURCE
PROVIDED BY CUSTOMER

Prepared By	Date Revised	Approved	Scale
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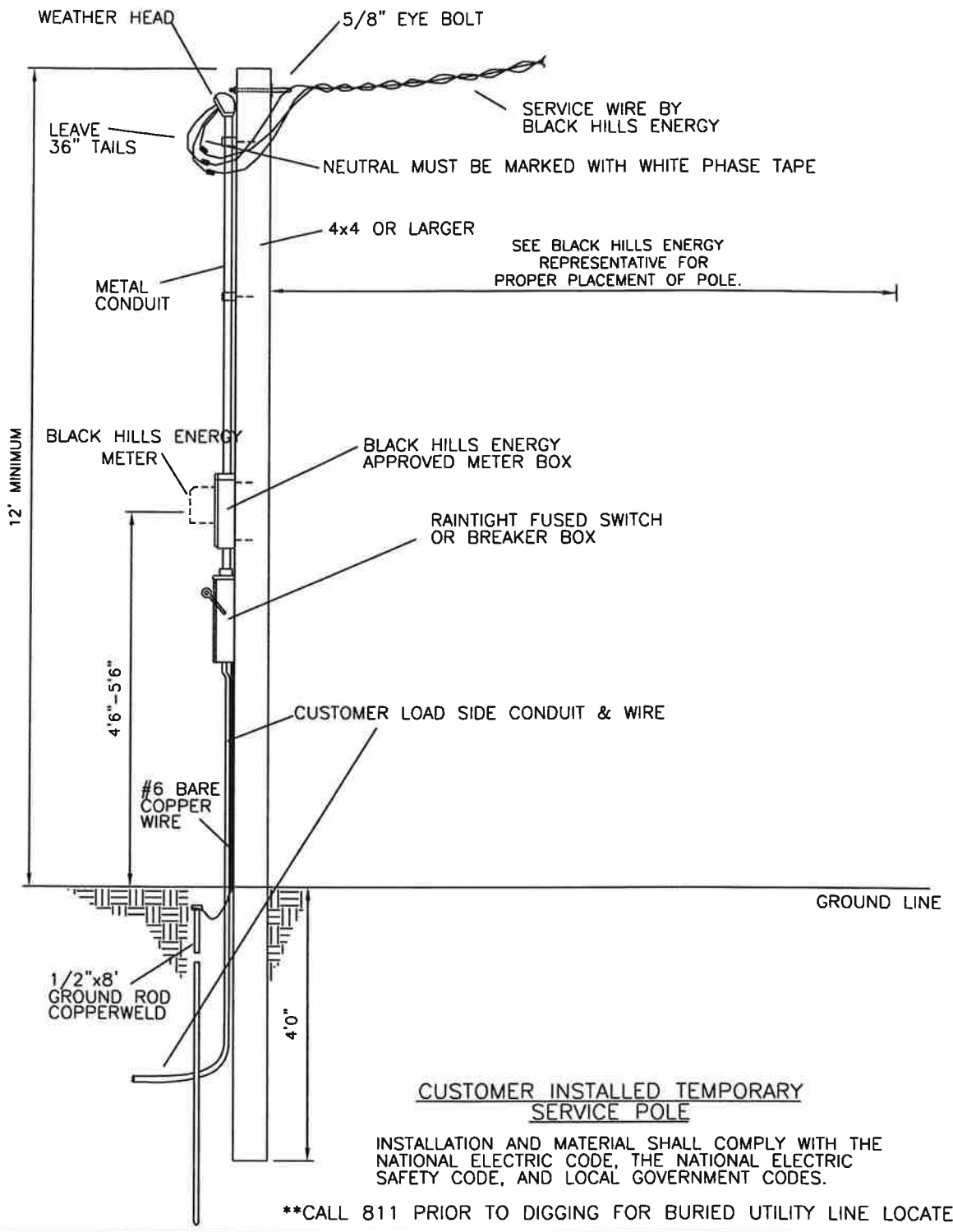


CALL 811 PRIOR TO DIGGING FOR BURIED UTILITY LINE LOCATES

BLACK HILLS ENERGY
 CONSTRUCTION STANDARDS
 -UNIT-
 DRAWING 8

TEMPORARY METER, OVERHEAD
 CUSTOMER INSTALLED
 POLE AND METER BOX
 UP TO 200 AMP
 3 WIRE, 120/240V

Prepared By	Date Revised	Approved	Scale
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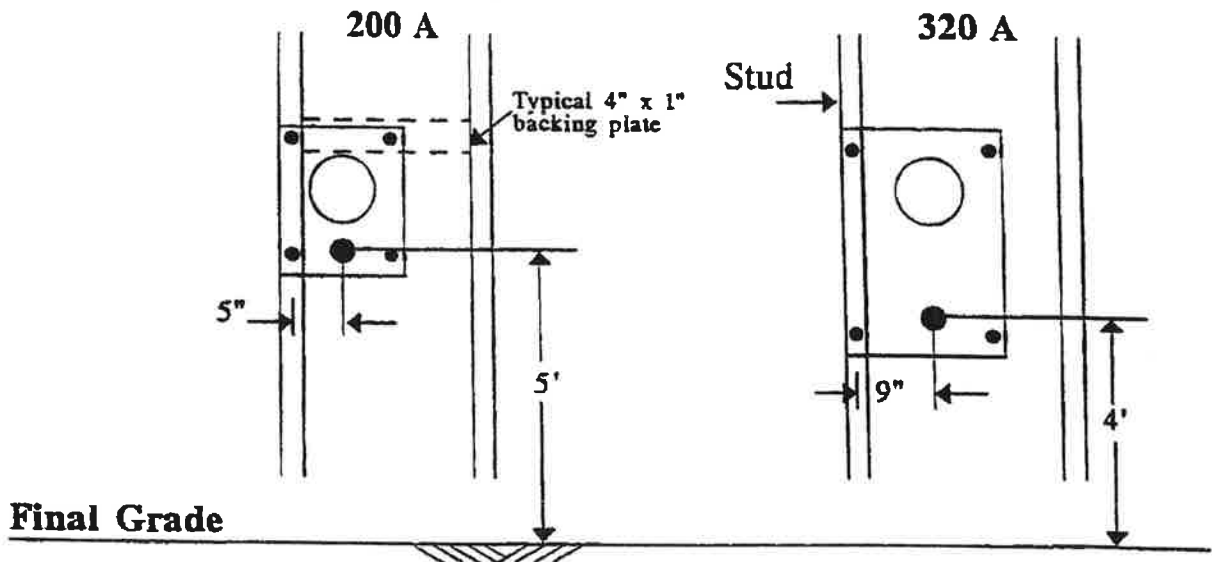
BLACK HILLS ENERGY
 CONSTRUCTION STANDARDS
 -UNIT-
 DRAWING 9

PERMANENT METER, OVERHEAD
 CUSTOMER INSTALLED
 POLE AND METER BOX
 UP TO 200 AMP
 3 WIRE, 120/240V

Prepared By	Date Revised	Approved	Scale
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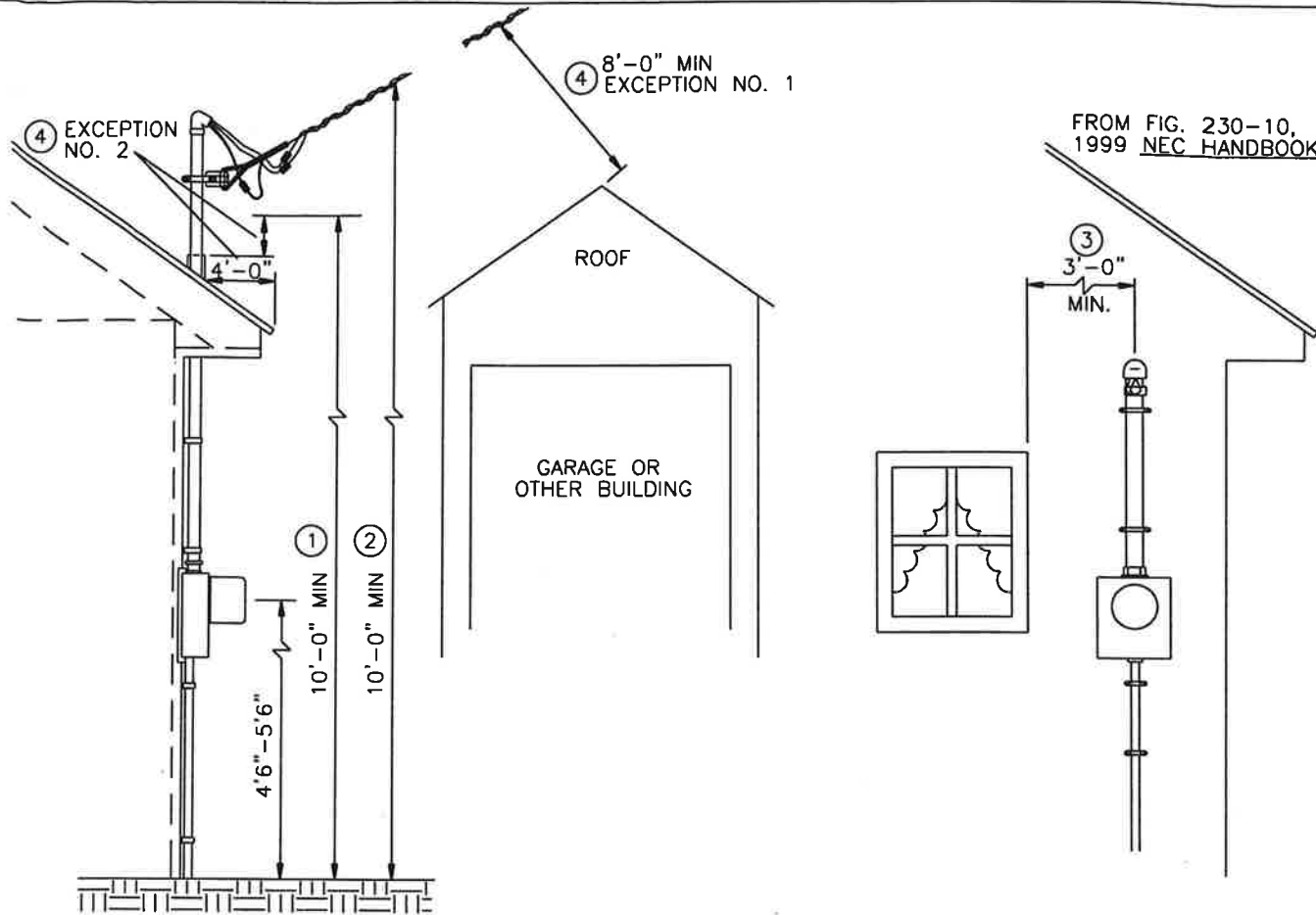
METER BOX MOUNTING DIAGRAM

Single Phase 200 Amp and 320 Amp Meter Box and Stub Out Location (Typical Single Family)



NOTE: Stub out locations will allow 2 mounting screws for anchoring into a stud, which will provide a more durable installation. The two remaining screws shall be anchored in a minimum of one inch solid wood wall or backing plate.

FROM FIG. 230-10,
1999 NEC HANDBOOK



NOTES:

* ALL CLEARANCES ARE FOR OPEN CONDUCTORS NOT OVER 600V, NOMINAL. FROM RULE 232-1, & 234-C, 2002 NESC. REFER TO CURRENT CODE FOR UPDATES AND REVISIONS.

- ① ACCESSIBLE TO PEDESTRIANS ONLY (SIDEWALK, FINISHED GRADE, PLATFORMS).
- ② MINIMUM CLEARANCES
 - 10.5 FEET - ABOVE FINISHED GRADE, SIDEWALKS OR FROM ANY PLATFORM OR PROJECTION FROM WHICH THEY MIGHT BE REACHED; ACCESSIBLE TO PEDESTRIANS ONLY (0 TO 150 V).
 - 10.5 FEET - OVER RESIDENTIAL DRIVEWAYS AND COMMERCIAL AREAS SUCH AS PARKING LOTS AND DRIVE-IN ESTABLISHMENTS NOT SUBJECT TO TRUCK TRAFFIC (0 TO 150 V).
 - 16 FEET - OVER COMMERCIAL AREAS, PARKING LOTS, AGRICULTURAL OR OTHER AREAS SUBJECT TO TRUCK TRAFFIC.
 - 18 FEET - OVER PUBLIC STREETS, ALLEYS, ROADS, AND DRIVEWAYS ON OTHER THEN RESIDENTIAL PROPERTY SUBJECT TO TRUCK TRAFFIC.
- ③ MINIMUM CLEARANCE IS 3'-0" FROM WINDOWS, DOORS, PORCHES, FIRE ESCAPES, OR SIMILAR LOCATIONS. EXCEPT SERVICES CAN RUN ABOVE THE TOP LEVEL OF WINDOWS.
- ④ MINIMUM CLEARANCE IS 8'-0" OVER ROOFS.
 - EXCEPTION NO. 1: WHERE THE VOLTAGE BETWEEN CONDUCTORS DOES NOT EXCEED 300, AND THE ROOF HAS A SLOPE OF NOT LESS THAN 4 INCHES IN 12 INCHES, A REDUCTION IN CLEARANCE TO 3 FEET SHALL BE PERMITTED.
 - EXCEPTION NO. 2: WHERE THE VOLTAGE BETWEEN CONDUCTORS DOES NOT EXCEED 300, THE CLEARANCE OVER THE ROOF SHALL BE 1'-6" ABOVE ONLY THE OVERHANGING PORTION IF (1) THE CONDUCTOR LENGTH PASSING OVER THE ROOF OVERHANG DOES NOT EXCEED 4'-0", AND (2) THE CONDUCTORS ARE TERMINATED AT A THROUGH-THE ROOF RACEWAY OR APPROVED SUPPORT.
- 5. FOR MINIMUM CLEARANCE BY BUILDINGS, SIGNS, AND POOLS SEE STANDARD UNIT 1001.

BLACK HILLS ENERGY
CONSTRUCTION STANDARDS

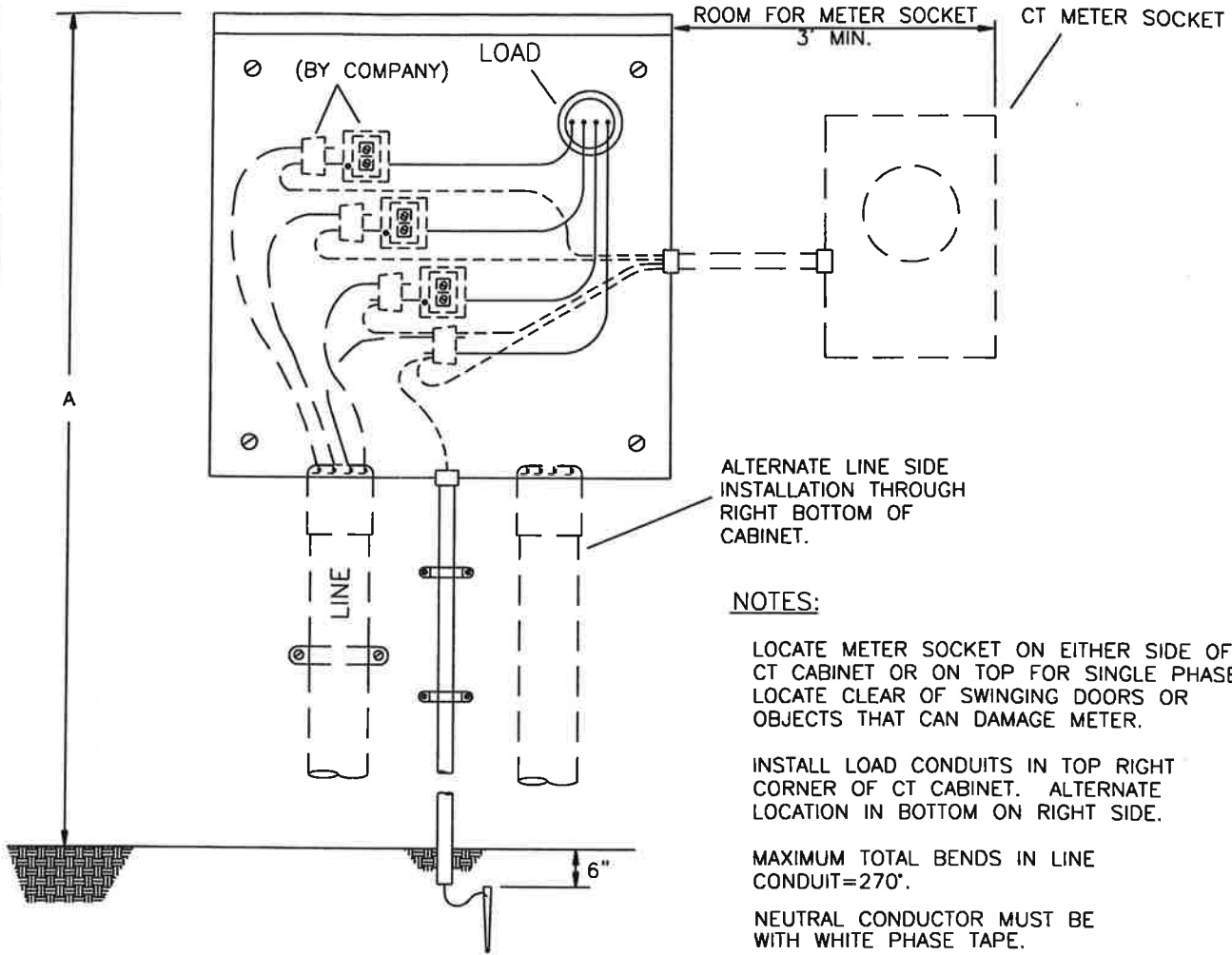
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1009

OVERHEAD SERVICE CLEARANCE

Prepared By	Checked	Approved	Date Approved	Authorized	Rev.	Rev.	Rev.	Rev.	Rev.
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COMMERCIAL / INDUSTRIAL

CT METERING CABINET WITH 3/4 IN. PLYWOOD BACKPLATE (SEE REQUIRED SIZE BELOW)



ALTERNATE LINE SIDE INSTALLATION THROUGH RIGHT BOTTOM OF CABINET.

NOTES:

LOCATE METER SOCKET ON EITHER SIDE OF CT CABINET OR ON TOP FOR SINGLE PHASE. LOCATE CLEAR OF SWINGING DOORS OR OBJECTS THAT CAN DAMAGE METER.

INSTALL LOAD CONDUITS IN TOP RIGHT CORNER OF CT CABINET. ALTERNATE LOCATION IN BOTTOM ON RIGHT SIDE.

MAXIMUM TOTAL BENDS IN LINE CONDUIT=270°.

NEUTRAL CONDUCTOR MUST BE WITH WHITE PHASE TAPE.

CT CABINET SIZE FOR SERVICE ENTRANCE

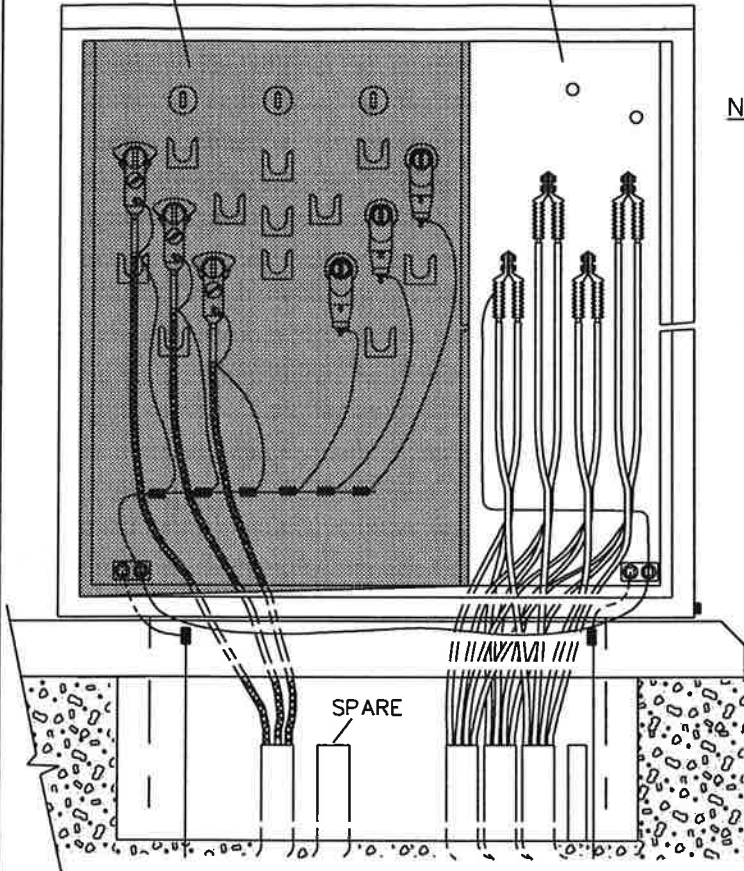
MIN. SIZE	CUSTOMER ENTRANCE SIZE	A	SOCKET LOCATION
24x24x12	1 PHASE RUN - 4/0	4'	ABOVE CABINET
30x30x16	1 OR 3 PHASE 2 RUNS - 500MCM	5'	BESIDE CABINET
36x36x16	2 TO 4 RUNS - 500MCM	5'	BESIDE CABINET

BLACK HILLS ENERGY
CONSTRUCTION STANDARDS
-UNIT-
DRAWING 7

CT METER CABINET
AND METER SOCKET INSTALLATION
OVER 200 AMP
CUSTOMER INSTALLED

UTILITY SIDE (PRIMARY)

SECONDARY SIDE



NOTES:

1. SEE LOCAL BLACK HILLS ENERGY REPRESENTATIVE FOR APPROVED TRANSFORMER LOCATION.
2. SEE LOCAL BLACK HILLS ENERGY REPRESENTATIVE FOR ALLOWABLE NUMBER OF CABLES PER PHASE.
3. NEUTRAL CONDUCTORS MUST BE MARKED WITH WHITE PHASE TAPE.

BLACK HILLS ENERGY
CONSTRUCTION STANDARDS
-UNIT-
DRAWING 10

3-PHASE, WYE-WYE,
PADMOUNTED TRANSFORMER STATION
TEMPORARY RADIAL FEED