



**MUNICIPAL LIGHT & POWER
&
CHUGACH ELECTRIC ASSOCIATION
ELECTRIC SERVICE REQUIREMENTS
EXCERPT**

2015

OVERHEAD SERVICES

**2015 EDITION
Effective August 3, 2015**

This is an EXCERPT; the complete book is available on the utility websites:

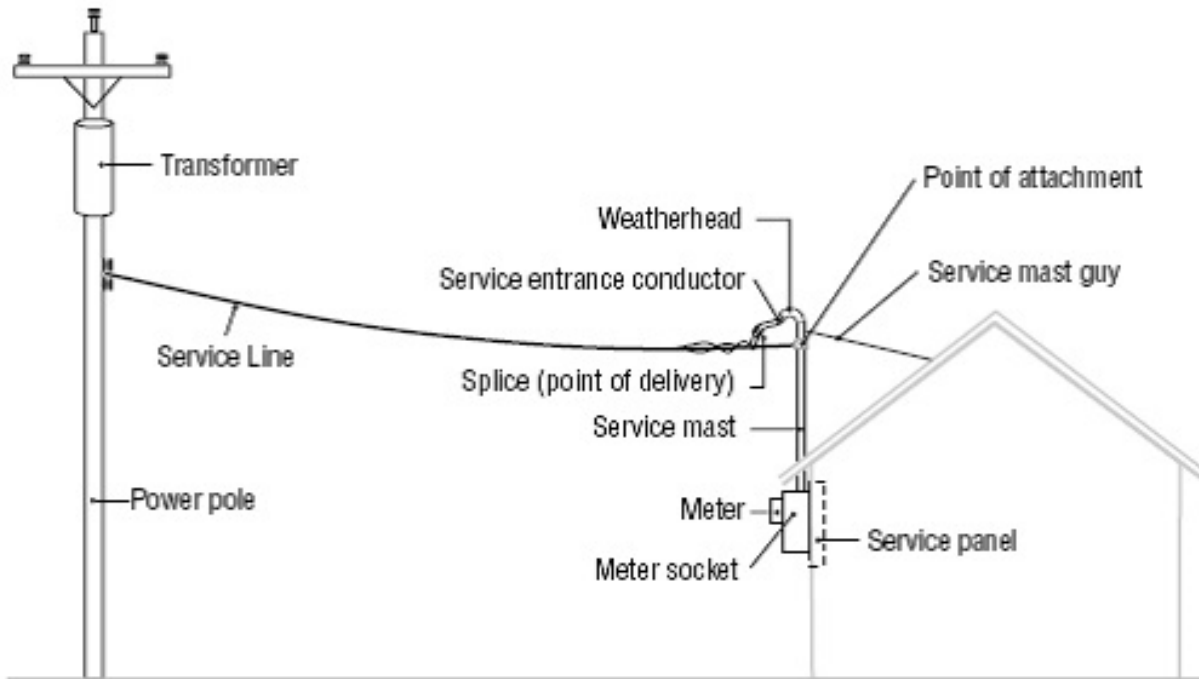
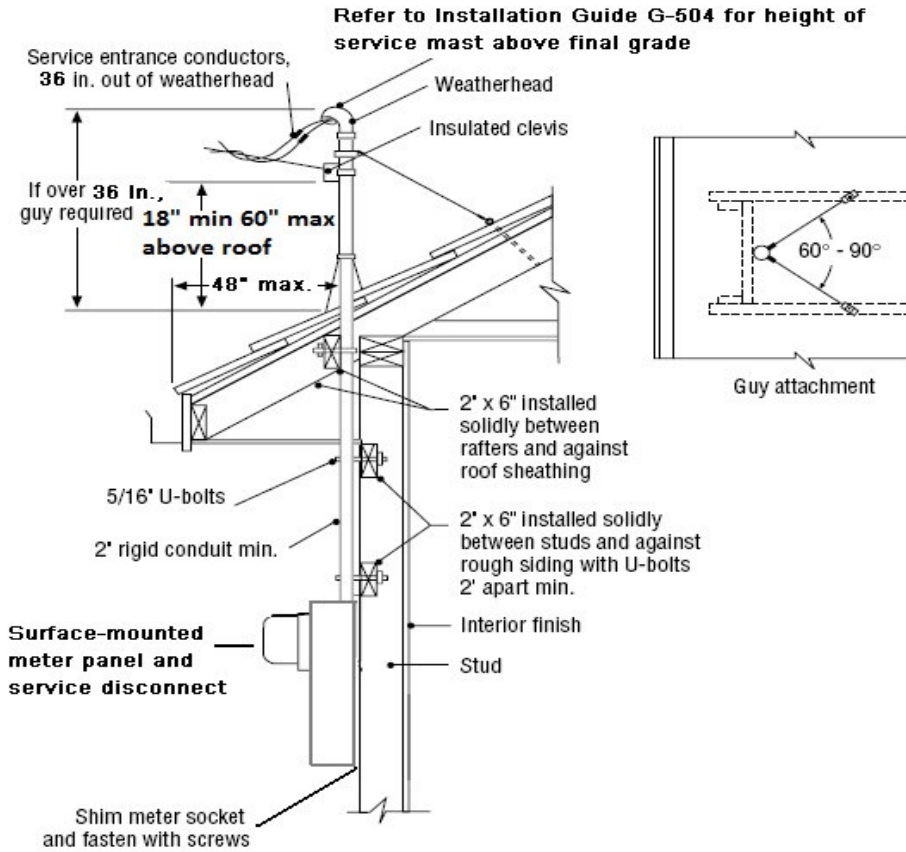
www.mlandp.com under the "New Construction" tab

*www.chugachelectric.com under the Customer Service tab
"For Your Home" or "For Your Business"*

501 Overhead Services to Buildings or Structures

- 501.1 All applicable requirements and specifications from other sections of this book apply to these installation guidelines and specifications.
- 501.2 Single family residential service installations qualifying under ML&P Rate Schedule 11 or Chugach's Tariff Residential Service classification shall use a residential combination meter panel and service disconnect meeting the requirements of Section 601.
- 501.3 Commercial, industrial, and non-residential service installations shall use a combination safety socket panel with test-block bypass and service disconnect meeting the requirements of Section 602. Refer to Subsection 303.13 for exceptions.
- 501.4 **The preferred mounting height for single position wall-mounted meter panels is sixty-five (65) inches.** The maximum mounting height for single position wall-mounted meter panels is seventy-two (72) inches. The minimum mounting height for single position wall-mounted meter panels is sixty (60) inches. Mounting height is measured from the centerline of the meter socket opening to the finished grade or standing surface immediately in front of the meter.
- 501.5 Maximum Conductor Length, General: The maximum length of an overhead service drop will vary depending on the slope or grade of the land, intervening trees or structures, the size of the conductors used, and the height and strength of the customer's service drop support equipment. The maximum service drop lengths listed below are typical. Consult the Utility's Engineering Division for specific details regarding maximum overhead service conductor length. Within the Chugach service area additional service poles and/or guying may be required to meet clearances or structural requirements. The maximum service length is typically limited by voltage regulation requirements.
- 501.6 Maximum Span Length for Single-Phase Service: The maximum span length of an overhead single-phase service drop is typically one-hundred (100) feet. Within the Chugach service area longer spans typically require additional service poles and/or guying.
- 501.7 Maximum Span Length for Three-Phase Applications: The maximum span length of an overhead three-phase service drop is typically sixty (60) feet. Within the Chugach service area longer spans typically require additional service poles and/or guying.
- 501.8 Service Drop Termination Location: In order to minimize the strain on supporting structures, the point of service drop attachment on the building or structure shall be located as near to the Utility's serving pole as practical.
- 501.9 Within the ML&P service area where the wall nearest the pole from which the service is to be supplied does not face a street or alley with overhead facilities, or where there is an adjacent lot, contact ML&P's Engineering Division for precise location of the service weatherhead and point of attachment. Within the Chugach service area contact Chugach Engineering to determine the source pole and location to install the service entrance.
- 501.10 The entire overhead service drop shall be free of obstruction from antennas, structures, poles, masts, trees, and vents.
- 501.11 The service weatherhead shall not be located on the exterior face of any wall which is less than three (3) feet from any common property line. Within the Chugach service area all overhead service risers are required to be located on the gable end for installations in Girdwood and all locations south to Cooper Landing.

501 Overhead Services to Buildings or Structures



ALL DIMENSIONS SHOWN ARE IN INCHES

501 Overhead Services to Buildings or Structures

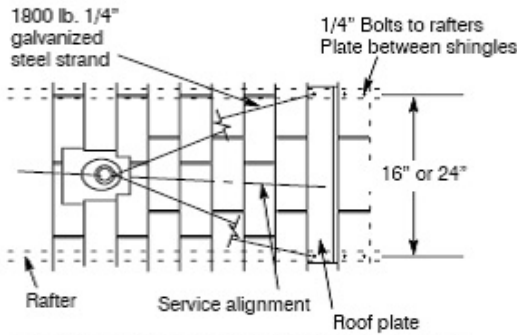
- 501.12 The customer shall furnish and install the service riser (service mast) and extend it to a height sufficient for the Utility to maintain minimum overhead service conductor clearances. Within the Chugach service area the installation of a service pole may be required to meet this requirement depending on service length and topography.
- 501.13 The utility service drop point of attachment on the customer's service riser shall be located in such a manner and extended to a height sufficient for the Utility to maintain compliance with NESC rules for vertical clearance of wires, conductors, and cables above ground, roadway, rail, or water surfaces.
- 501.14 Minimum overhead service conductor clearance requirements shall be based on Section 504.
- 501.15 Periscope type service risers shall be braced or guyed when the distance between the roof surface and the weatherhead exceeds thirty-six (36) inches. The top of the weatherhead shall not extend more than seventy-two (72) inches above the surface of the roof (the maximum conductor attachment height is 60-inches above the roof).
- 501.16 A periscope type service riser shall be located forty-eight (48) inches or less from the edge of the roof line.
- 501.17 The customer shall provide at least thirty-six (36) inches of insulated service conductor out from the weatherhead for the Utility conductor attachment.
- 501.18 The customer shall provide one of the following types of overhead conductor attachment devices:
- a) Thimble eye bolt. Within the Chugach service area a 5/8-inch eyebolt with 2"x 4" square washers installed through the structural stud is required for all gable or wall mount service risers. All hardware shall be hot-dipped galvanized steel.
 - b) Insulated secondary wire holder (house knob), lag screw type. Not approved for Chugach service area.
 - c) Insulated secondary wire holder (house knob), pipe clamp type. Not approved for Chugach service area. Chugach will provide and install the clamp type service deadend on "periscope" risers.
- The overhead service conductor attachment device shall be installed within eighteen (18) inches of the service riser weatherhead. The service conductor attachment device shall be located at a height sufficient for the Utility to maintain minimum service conductor clearances.
- 501.19 The service riser (service mast) shall be rigid metal conduit only and shall have a minimum inside diameter of two (2) inches. Conduit straps attaching the service riser to the building shall be spaced no more than eighteen (18) inches apart.
- 501.20 Conduit straps or conduit strap mounting struts, and meter sockets or meter socket mounting struts shall be anchored to structural components of the building. Attachment to building siding alone is not sufficient.
- 501.21 The customer's neutral wire shall be identified at the weatherhead as either the white or gray wire.
- 501.22 Overhead service installations to buildings or structures shall meet the applicable grounding and bonding requirements of Section 304.

501 Overhead Services to Buildings or Structures

Single-Family Overhead Service - Mast Guying and Anchoring

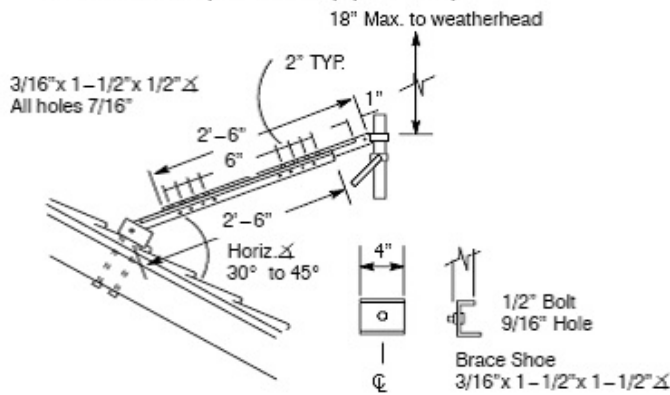
If the point of attachment on an unsupported mast exceeds 36", the mast shall be guyed.
The figure below shows how an unsupported mast is installed.

GUYING and BRACING

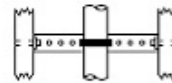


The roof plate must be installed such that the service alignment extension falls within the angle of guys.

PUSH BRACE (OR EQUAL) (2 REQ'D)



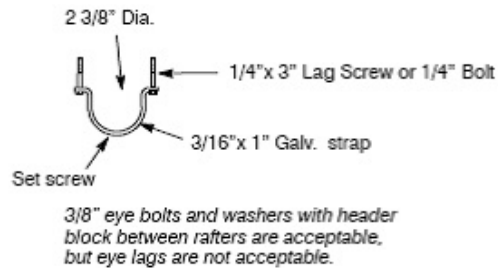
MAST ANCHOR



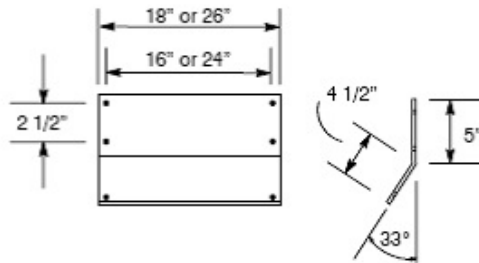
METAL BRACKET (OR EQUAL)



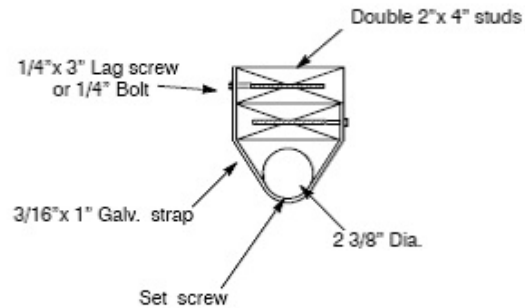
ANCHOR STRAP NO. 1 (OR EQUAL)



ROOF PLATE (OR EQUAL)



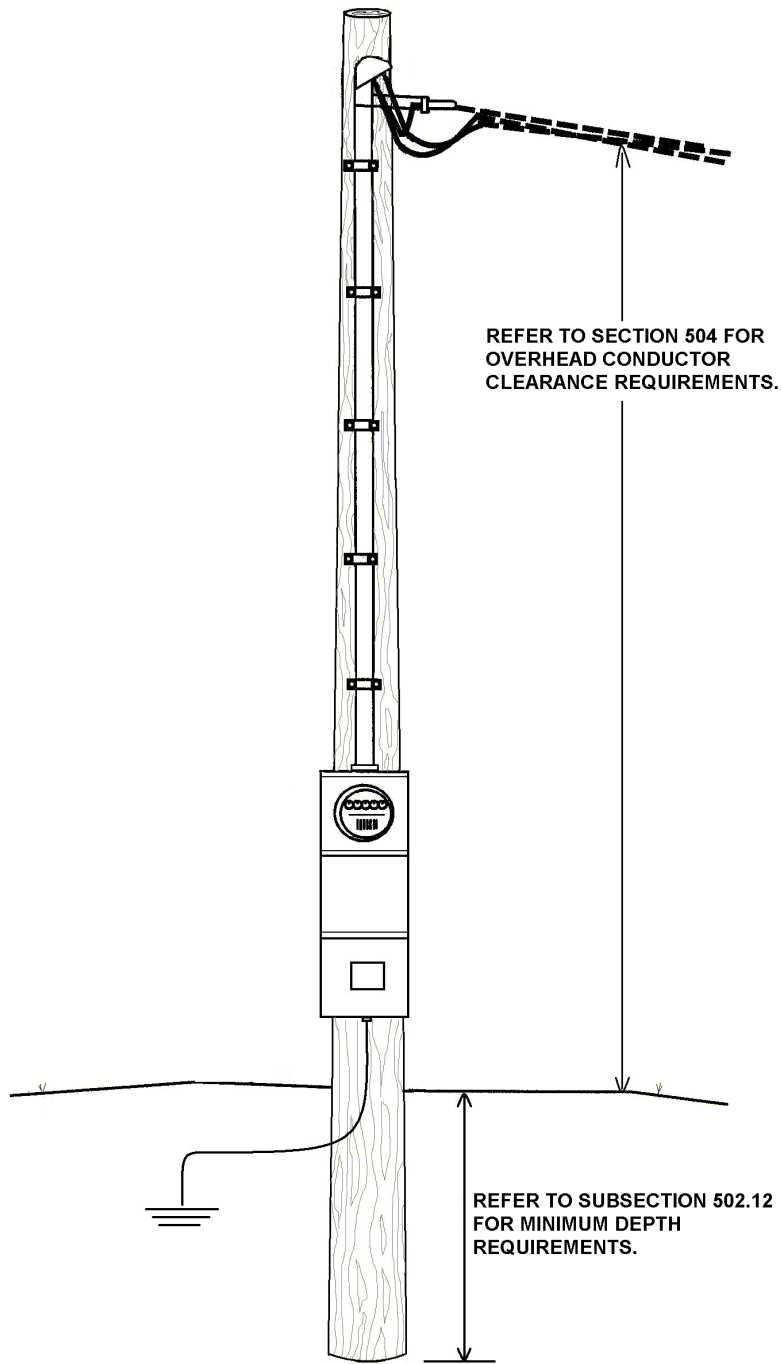
ANCHOR STRAP NO. 2 (OR EQUAL)



502 Overhead Services Attached to Poles

- 502.1 All applicable requirements and specifications from other sections of this booklet apply to these installation guidelines and specifications.
- 502.2 Single family residential service installations qualifying under ML&P Rate Schedule 11 (or the Chugach Tariff Residential Classification within the Chugach service area) shall use a residential combination meter panel and service disconnect meeting the requirements of Section 601.
- 502.3 Commercial, industrial, and non-residential service installations shall use a combination safety socket panel with test-block bypass and service disconnect meeting the requirements of Section 602.
- 502.4 **The preferred mounting height for single position pole-mounted meter panels is sixty-five (65) inches.** The maximum mounting height for single position pole-mounted meter panels is seventy-two (72) inches. The minimum mounting height for single position pole-mounted meter panels is sixty (60) inches. Mounting height is measured from the centerline of the meter socket opening to the finished grade or standing surface immediately in front of the meter.
- 502.5 **Maximum Conductor Length:** The maximum length of a service drop attached to a customer pole is typically fifty (50) feet but may vary depending on the slope or grade of the land, intervening trees or structures, the size of the conductors used, and the height and strength of the customer's service drop support equipment. Consult with the Utility's Engineering Division for specific details regarding overhead service conductor length. Within the Chugach service area the maximum service length is based on the voltage regulation limits, Chugach will install service pole(s) and/or guying to provide the required vertical clearances and to meet strain loading limits of the service attachment. The customer installed pole requires guying where the span length is seventy-five (75) feet or greater.
- 502.6 **Service Drop Termination Location:** In order to minimize the strain on pole mounted service installations, the customer's pole shall be located as near to the Utility's serving pole as practical.
- 502.7 The entire overhead service drop shall be free of obstruction from antennas, structures, poles, masts, trees, and vents.
- 502.8 The customer shall furnish and install the service riser (service mast) and extend it to a height sufficient for the Utility to maintain minimum overhead service conductor clearances.
- 502.9 The utility service drop point of attachment on the customer service riser shall be located in such a manner and extended to a height sufficient for the Utility to maintain compliance with NESC rules for vertical clearance of wires, conductors, and cables above ground, roadway, rail, or water surfaces.
- 502.10 Minimum overhead service conductor clearance requirements shall be based on Section 504.
- 502.11 The customer shall provide a single, un-spliced, self-supporting pole with a minimum diameter of six (6) inches. The 6-inch minimum pole top diameter corresponds to American National Standards Institute (ANSI) O5.1 Pole Class 5 or stronger. The pole shall be rated for ground contact (factory pressure treated preservative).
- 502.12 The pole shall be buried to a minimum depth of sixty (60) inches (for a 30-foot pole) and shall be backfilled and compacted sufficiently to insure that the pole remains level and plumb after service conductors have been attached. Where overhead service conductor clearance requires a service pole greater than thirty (30) feet in height above ground level, burial depth shall be 10% of pole length plus two (2) feet.
- 502.13 The customer shall supply a pole of sufficient length for the Utility to maintain minimum overhead service conductor clearance requirements. The customer shall obtain approval from the Utility's Engineering Division for proper pole height above ground level and shall supply a pole of sufficient length to meet both the sixty (60) inch minimum burial depth and minimum overhead service conductor clearance requirements.
- 502.14 The service riser shall be rigid metal conduit only, and shall have a minimum inside diameter of two (2) inches. Conduit straps attaching the service riser to the pole shall be spaced at least every eighteen (18) inches.

502 Overhead Services Attached to Poles



THIS IS A TYPICAL DIAGRAM; IT IS NOT TO SCALE.

502 Overhead Services Attached to Poles

502.15 The service riser conduit shall extend to no less than twelve (12) inches below the top of the pole. The service riser conduit shall not extend above the top of the pole. Within the Chugach service area the conductor attachment eyebolt must be mounted eight (8) inches below the top of the pole and no higher than eight (8) inches above the top of the riser.

502.16 The customer shall provide one of the following types of overhead conductor attachment devices:

- a) Thimble eye bolt. Within the Chugach service area a 5/8-inch eyebolt with 2" x 4" square washers installed through the structural stud is required for all gable or wall mount service risers. All hardware shall be hot-dipped galvanized steel.
- b) Insulated secondary wire holder (house knob), lag screw type. Not approved for the Chugach service area.
- c) Insulated secondary wire holder (house knob), pipe clamp type. Not approved for Chugach service area. Chugach will provide and install the clamp type service deadend when the conduit riser is extended beyond the pole top or it is mounted on uni-strut brackets.

The service conductor attachment device shall be installed within eighteen (18) inches of the service riser weatherhead. The overhead service conductor attachment device shall be located at a height sufficient for the Utility to maintain minimum service conductor clearances.

502.17 The customer's neutral wire shall be identified at the weatherhead as either the white or gray wire.

502.18 Overhead service installations attached to poles shall meet the applicable grounding and bonding requirements of Section 304.

503 Overhead Temporary Construction Service

503.1 All applicable requirements and specifications from other sections of this book apply to these installation guidelines and specifications.

503.2 Temporary service is used for the construction of a permanent service and is allowable for up to one (1) year. When temporary service is required for more than one (1) year, the customer must obtain written approval from the Utility's Engineering Division prior to the one (1) year expiration date. If temporary service is required for any purpose other than the construction of a new or upgraded permanent service, the temporary service entrance equipment shall comply with the pertinent requirements for permanent service.

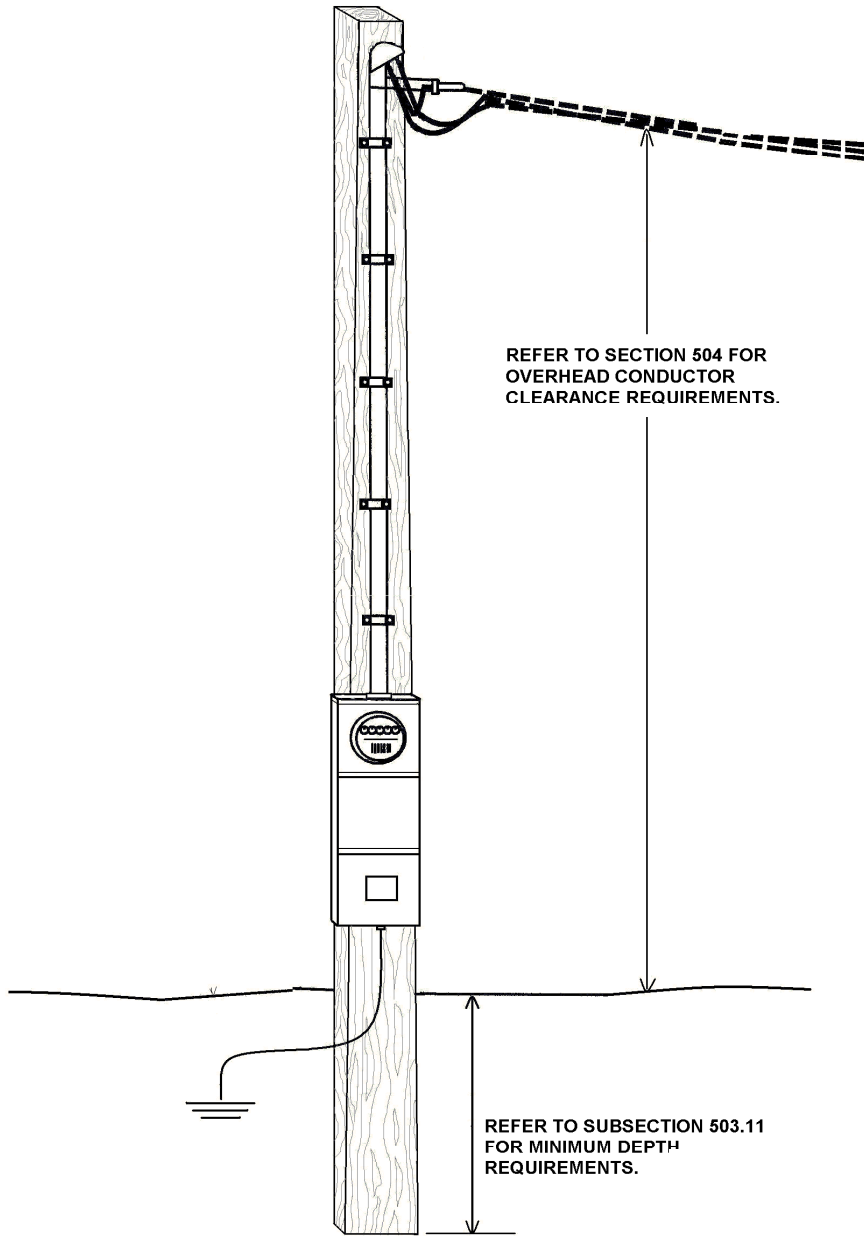
503.3 Maximum Length: The maximum length of a service drop attached to a customer temporary service post is typically fifty (50) feet but may vary depending on the slope or grade of the land, intervening trees or structures, the size of the conductors used, and the height and strength of the customer's service drop support equipment. Consult with the Utility's Engineering Division for specific details regarding overhead service conductor length. The minimum length of service is ten (10) feet (do not place the post in the path of the permanent service). Within the Chugach service area the customer installed pole requires guying where the span length is seventy-five (75) feet or greater.

503.4 Service Drop Termination Location: In order to minimize the strain on the temporary service post, it shall be located as near to the Utility's serving pole as practical.

503.5 The entire overhead service drop shall be free of obstruction from antennas, structures, poles, masts, trees, and vents.

503.6 The customer shall provide a single, un-spliced post with a minimum diameter of five and one-half (5-1/2) inches (6 x 6 dimensional lumber size.) The post material shall be rated for ground contact (factory pressure treated preservative).

503 Overhead Temporary Construction Service



THIS IS A TYPICAL DIAGRAM; IT IS NOT TO SCALE.

503 Overhead Temporary Construction Service

- 503.7 The customer shall supply a post of sufficient length for the Utility to maintain minimum overhead service conductor clearance requirements.
- 503.8 The customer shall furnish and install the service riser (service mast) and extend it to a height sufficient for the Utility to maintain minimum overhead service conductor clearances.
- 503.9 The utility service drop point of attachment on the customer's service riser shall be located in such a manner and extended to a height sufficient for the Utility to maintain compliance with the NESC rules for vertical clearance of wires, conductors, and cables above ground, roadway, rail, or water surfaces.
- 503.10 Minimum overhead service conductor clearance requirements shall be based on Section 504.
- 503.11 The customer shall construct a self-supporting installation. The 6 x 6 post shall be buried to a minimum depth of sixty (60) inches (for a post up to 30 feet), backfilled and compacted sufficiently to insure that the post remains level and plumb after service conductors have been attached. The length of the post shall be sufficient for the Utility to maintain minimum overhead service conductor clearance requirements. The customer shall obtain approval from the Utility's Engineering Division for proper post height.
- 503.12 The service riser shall be rigid metal conduit only and shall have a minimum inside diameter of two (2) inches. Conduit straps attaching the service riser to the post shall be spaced at least every eighteen (18) inches.
- 503.13 The service riser conduit shall extend to no less than twelve (12) inches below the top of the post. The service riser conduit shall not extend above the top of the post. Within the Chugach service area the weatherhead can extend to a maximum of twelve (12) inches above the top of the post.
- 503.14 Meter panels used for the purpose of temporary construction service shall be exempt from the safety socket and test-block bypass requirement on single-phase and network services; a meter panel meeting the requirements of Section 601 may be provided.
- 503.15 Temporary construction service requiring three-phase power shall not be exempt from the safety socket and test-block bypass requirement; a meter panel with the safety socket feature and factory installed test-block/bypass facilities meeting the requirements of Section 602 shall be provided.
- 503.16 **The preferred mounting height for single position temporary overhead post-mounted meter panels is sixty-five (65) inches.** The maximum mounting height for single position temporary overhead post-mounted meter panels is seventy-two (72) inches. The minimum mounting height for single position temporary overhead post-mounted meter panels is sixty (60) inches. Mounting height is measured from the centerline of the meter socket opening to the finished grade or standing surface immediately in front of the meter.
- 503.17 The customer's neutral wire shall be identified at the weatherhead as either the white or gray wire.
- 503.18 The customer shall provide one of the following types of overhead conductor attachment devices:
- a) Thimble eye bolt. Within the Chugach service area a 5/8-inch eyebolt with 2" x 4" square washers installed through the structural stud is required for all gable or wall mount service risers. All hardware shall be hot-dipped galvanized steel.
 - b) Insulated secondary wire holder (house knob), lag screw type. Not approved for the Chugach service area.
 - c) Insulated secondary wire holder (house knob), pipe clamp type. Not approved for Chugach service area. Chugach will provide and install the clamp type service deadend when the conduit riser is extended twelve (12) inches above the top of the post.

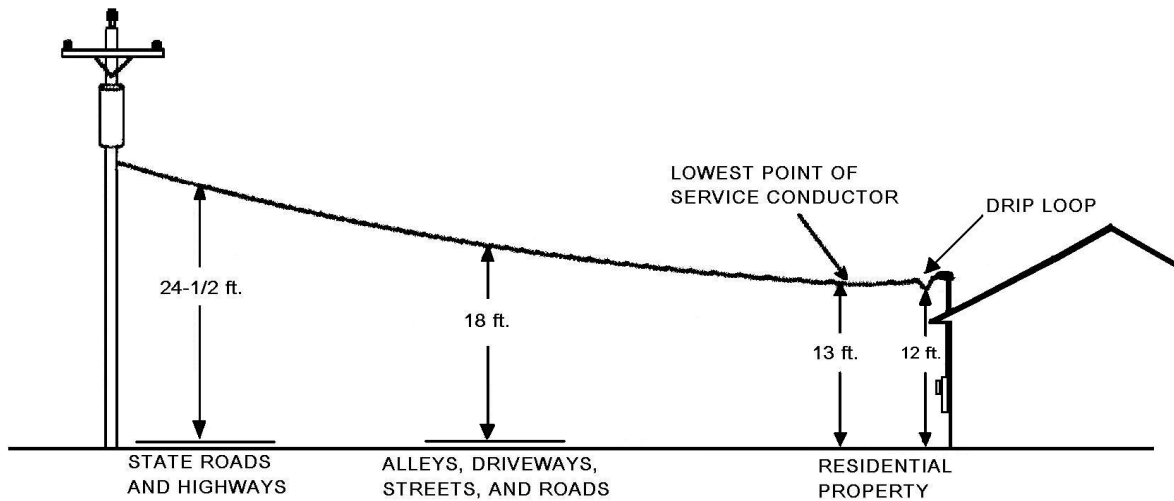
The service conductor attachment device shall be installed within eighteen (18) inches of the service riser weatherhead. The overhead service conductor attachment device shall be located at a height sufficient for the Utility to maintain minimum service conductor clearances.

- 503.19 Overhead temporary construction service installations attached to posts shall meet the applicable grounding and bonding requirements of Section 304. At least one ground rod shall be installed on temporary construction service installations. The ground rod shall be placed no more than seventy-two (72) inches from the service disconnect device.

504 Overhead Conductor Clearances

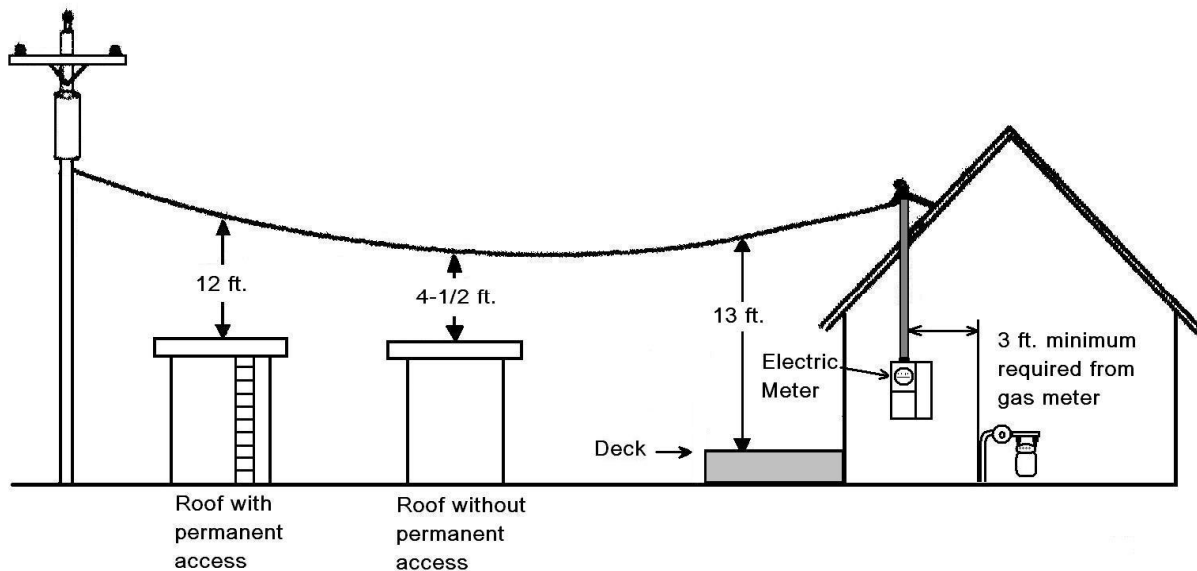
- 504.1 The Utility shall maintain overhead service conductor clearances in accordance with the requirements for vertical clearance of wires, conductors, and cables above ground, roadway, rail, or water surfaces as prescribed by the most recent State adopted publication of the NESC. Customers should contact the utility before placing any structures within ten (10) feet (horizontal groundline measurement perpendicular to the line) of the service conductor or raising the grade or the use of the property.
- 504.2 Customer poles, support structures, and attachment points for overhead service conductors must be of a height sufficient for the Utility to maintain compliance with the NESC vertical clearance requirements.
- 504.3 Following are general and typical overhead clearance requirements for service conductors with phase to ground voltages less than 600 volts (NOTE: these vertical clearances are the minimum requirement under specific temperature and ice loading conditions and are for reference only; see subsection 504.7):
- a) 24-1/2 feet over state highways.
 - b) 18 feet over public streets, alleys, roads, parking areas subject to truck traffic, and driveways on other than residential property. The Utility requires this minimum clearance for new installations crossing over all driveable areas, as determined by the Utility.
 - c) 15 feet over residential property and driveways, and those commercial areas not subject to truck traffic where the phase to ground voltage exceeds 300 volts. For new installations the Utility requires 18-feet (minimum) of clearance over all driveable areas, as determined by the Utility.
 - d) 13 feet over residential property and driveways, and those commercial areas not subject to truck traffic where the phase to ground voltage is less than 300 volts. For new installations the Utility requires 18-feet (minimum) of clearance over all driveable areas, as determined by the Utility.
 - e) 13 feet at the point of service conductor attachment.
 - f) 12 feet at the bottom edge of the drip loop.
 - g) 12 feet above roof with permanent access.
 - h) 4-1/2 feet above roof without permanent access. Within the Chugach service area new installations require 12-feet (minimum vertical clearance) over the roofs of all buildings.
- 504.4 For specific details regarding vertical clearance of wires, conductors, and cables above ground, roadway, rail, and water surfaces, refer to the most recent State adopted publication of the NESC, Part 2. Safety Rules for Overhead Lines, Section 23 Clearances, Tables 232-1 through 232-3, and Table 234-1.
- 504.5 The requirement for vertical clearance of wires, conductors, and cables above ground also extends to the decks or platforms of houses, buildings, or structures. Decks or platforms generally would be considered as spaces and ways subject to pedestrians or restricted traffic only. Within the Chugach service the twelve (12) foot minimum vertical clearance requirement applies to these locations.
- 504.6 The diagrams shown on the next page denote general and typical overhead clearance requirements for service conductors with phase to ground voltages less than 600 volts.
- 504.7 The diagrams shown on the next page denote typical clearances based on worst case sag. Clearances may change due to unique circumstances. Consult with the Utility's Engineering Division prior to installing service equipment.

504 Overhead Conductor Clearances



Typical Clearances Based on Worst Case Sag

See Subsection 504.7 for unique circumstances and coordination responsibilities.



Typical Clearances Based on Worst Case Sag

See Subsection 504.7 for unique circumstances and coordination responsibilities.

Within the Chugach service area the 12 foot clearance applies to roofs without permanent access.