

Electrical Service Entrance Guide

Electrical Service General Notes
based on the 2005 National Electric Code

This guide is intended to assist in the planning of electrical installations for residential and small commercial projects. It is recommended that the user contact the power company and/or a licensed electrician for specific questions or installations.

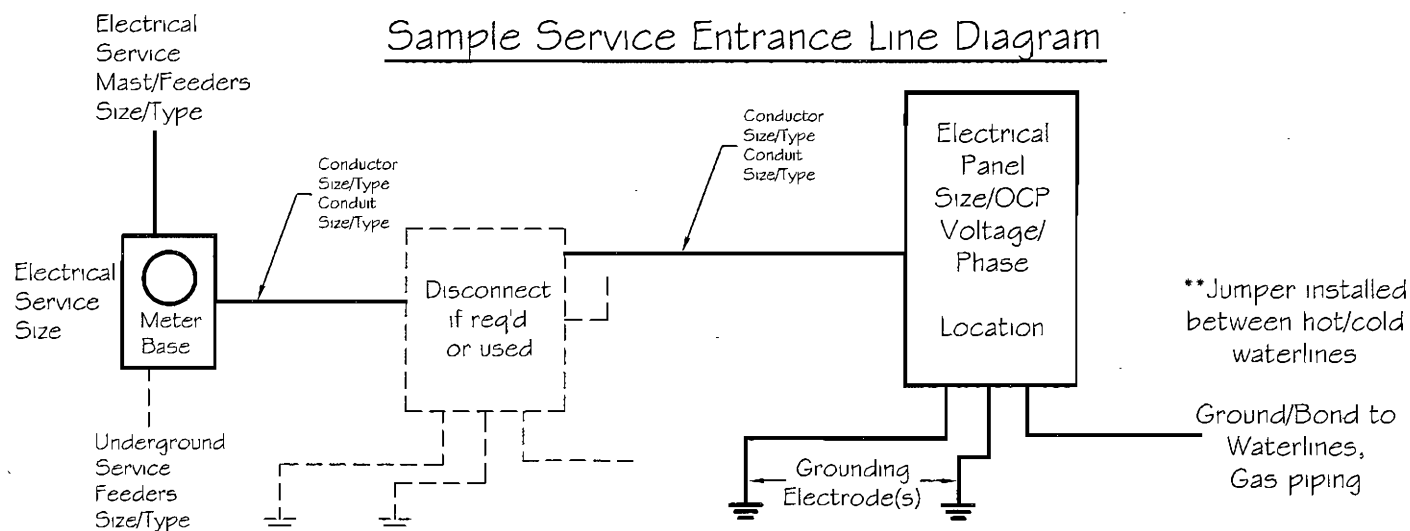
- Electrical Equipment shall be installed in a neat and workmanlike manner per NEC 110.12.
- Service cables shall be supported by straps within 12" of weather-head and at no more than 2'-6" intervals.
- Meter base is to be surface mounted and back knockouts shall not be used. (per OEC regulation)
- Service conductors shall not be spliced except as permitted in NEC 230.33 and 230.46.
- A bushing or terminal fitting shall be used at the conduit ends per NEC 300.5(H).
- Conduits or raceways through which moisture may contact energized live parts shall be sealed or plugged at either or both ends per NEC 300.5(G).
- A disconnect shall be used if the panel is located more than 4'-0" from where the service conductors enter the building.
- When a disconnect is required, 4 conductors are required from the disconnect to the sub panel (2 ungrounded, 1 insulated neutral, and one ground wire). Neutral conductors in the sub panel shall be separated from the grounding conductors and the grounding conductors shall be bonded to the sub-panel.
- Neutral conductors shall be identified either by white or gray per NEC 200.6(B)
- Grounding electrode conductors shall be sized according to NEC Table 250.66.
 - -ex. #6 Cu for 100 amps, #4 Cu for 200 amps.
- Grounding electrode conductors shall be continuous, not spliced.
- Driven ground rod with approved clamps shall be a minimum of 5/8"x 8'-0" per NEC 250.52(A)(5).
- Metal underground gas piping systems shall not be used as a grounding electrode per NEC 250.52 (B)(1).
- Grounding Electrodes shall not less than 8' in length, 5/8" in diameter, and shall have a plating for corrosion protection per NEC 250.52 (5).
- Grounding conductor to water line shall be terminated with approved water line clamps within five feet of where water line enters structure per NEC 250.52.
- Install bonding jumpers across hot and cold water lines, filters, and water meters.
- Metal water piping systems and exposed structural steel shall be bonded to the service equipment enclosure per NEC 250.104(A).
- Bond metal gas piping to the service equipment enclosure per NEC 250.104(B).
- Maintain a clear working space of 30" wide by 36" in front of electrical panel and equipment. A minimum clear height in front of the panelboard (headroom) of 6'-6" is required per NEC 110.26 (A)(3).
- All electrical panel breakers shall be labeled per NEC 408.4.
- Where circuit breakers are operated vertically, the "up" position of the handle shall be the "on" position per NEC 240.81.
- Center of Meter Base shall be 4'-0" to 6'-0" above finished grade. (See power company requirements)

Table 310.15(B)(6) Conductor Types and Sizes for 120/240-Volt, 3-Wire, Single-Phase Dwelling Services and Feeders. Conductor Types RHH, RHW, RHW-2, THHN, THHW, THW, THW-2, THWN, THWN-2, XHHW, XHHW-2, SE, USE, USE-2

Conductor (AWG or kcmil)		
Copper	Aluminum or Copper-Clad Aluminum	Service or Feeder Rating (Amperes)
4	2	100
3	1	110
2	1/0	125
1	2/0	150
1/0	3/0	175
2/0	4/0	200
3/0	250	225
4/0	300	250
250	350	300
350	500	350
400	600	400

Table 250.66 Grounding Electrode Conductor for Alternating-Current Systems

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

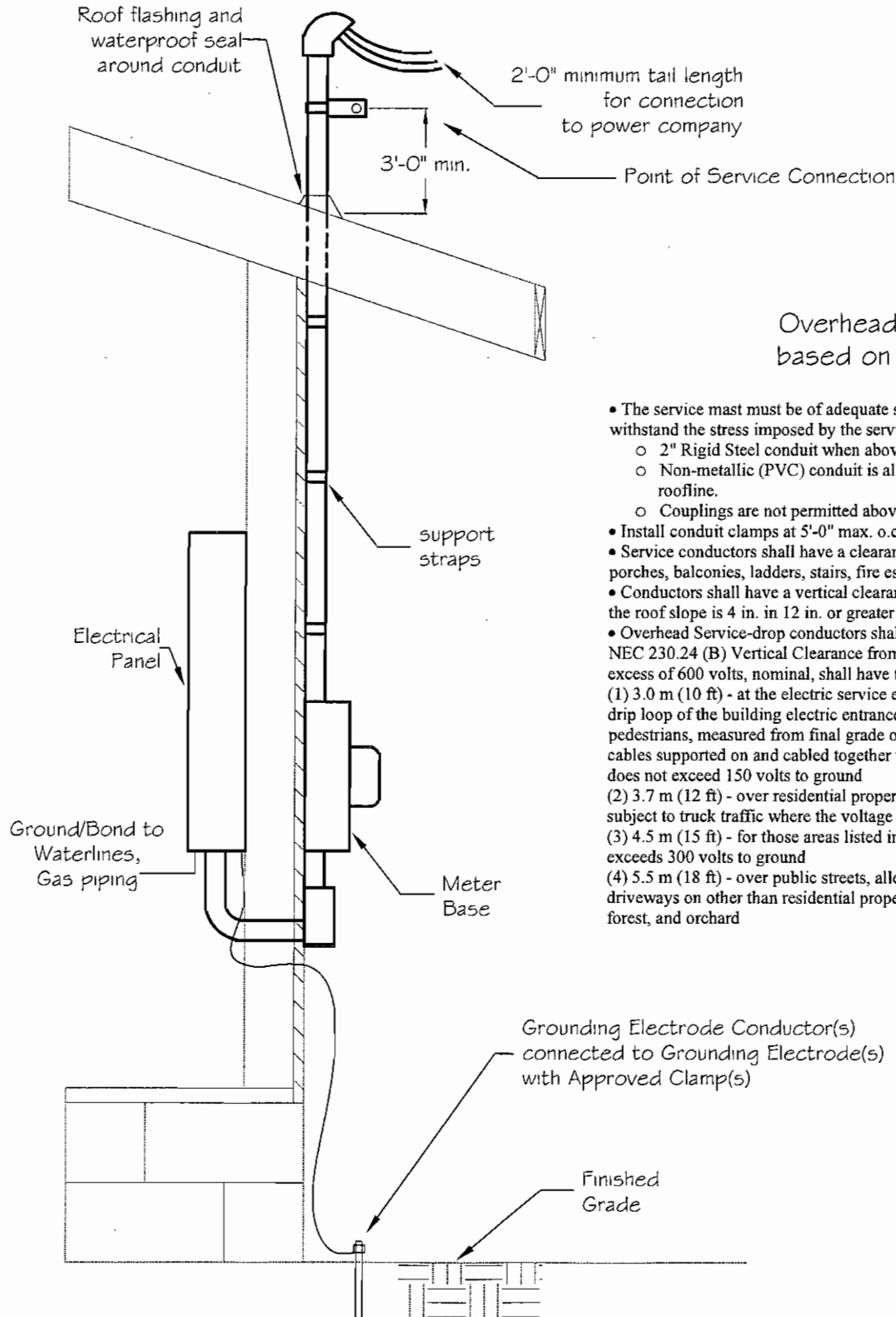


TYPICAL SERVICE MAST DETAILS AND REQUIREMENTS

Mast Above Roofline

2005 National Electric Code

****Not to Scale****



Overhead Service Notes based on the 2005 NEC

- The service mast must be of adequate strength or be supported by braces or guys to safely withstand the stress imposed by the service drop.
 - 2" Rigid Steel conduit when above the roofline.
 - Non-metallic (PVC) conduit is allowed if entire mast is below the roofline.
 - Couplings are not permitted above the top mast support bracket.
- Install conduit clamps at 5'-0" max. o.c. and within 3'-0" of termination.
- Service conductors shall have a clearance of not less than 3 feet from windows, doors, porches, balconies, ladders, stairs, fire escapes, or similar locations per NEC 230.9.
- Conductors shall have a vertical clearance above the roof level of 3 feet minimum where the roof slope is 4 in. in 12 in. or greater per NEC 230.24.
- Overhead Service-drop conductors shall have clearances that comply with NEC 230.24. NEC 230.24 (B) Vertical Clearance from Ground Service-drop conductors, where not in excess of 600 volts, nominal, shall have the following minimum clearance from final grade:
 - (1) 3.0 m (10 ft) - at the electric service entrance to buildings, also at the lowest point of the drip loop of the building electric entrance, and above areas or sidewalks accessible only to pedestrians, measured from final grade or other accessible surface only for service-drop cables supported on and cabled together with a grounded bare messenger where the voltage does not exceed 150 volts to ground
 - (2) 3.7 m (12 ft) - over residential property and driveways, and those commercial areas not subject to truck traffic where the voltage does not exceed 300 volts to ground
 - (3) 4.5 m (15 ft) - for those areas listed in the 3.7-m (12-ft) classification where the voltage exceeds 300 volts to ground
 - (4) 5.5 m (18 ft) - over public streets, alleys, roads, parking areas subject to truck traffic, driveways on other than residential property, and other land such as cultivated, grazing, forest, and orchard

TYPICAL SERVICE MAST DETAILS AND REQUIREMENTS

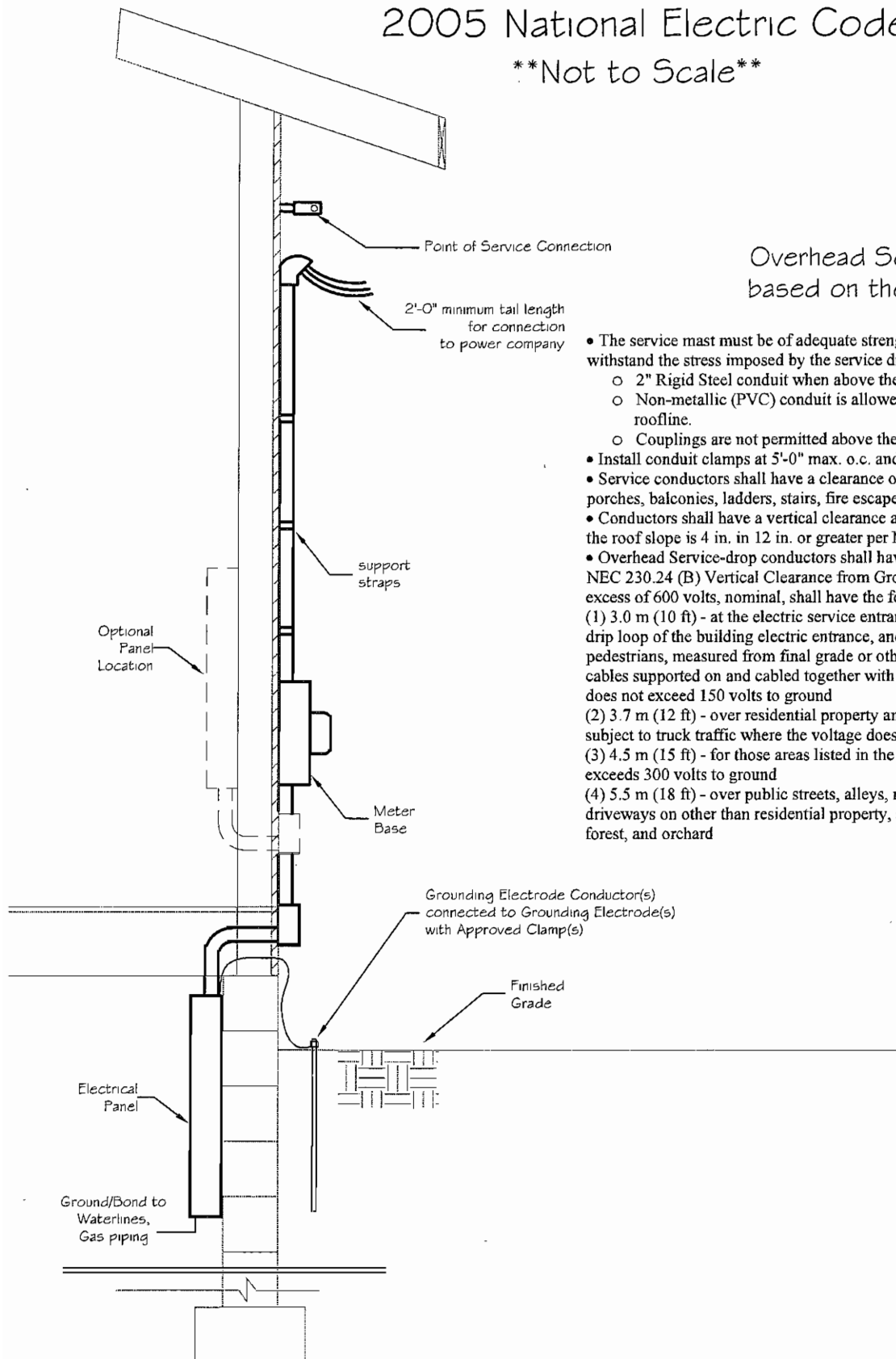
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TYPICAL UNDERGROUND SERVICE DETAILS AND REQUIREMENTS 2005 National Electric Code

****Not to Scale****

Underground Service General Notes

- Underground service conductors shall have their location identified by a warning ribbon that is placed in the trench at least 12" above the underground installation per NEC 300.5(D)(3).
- Minimum underground cover requirements per NEC 300.5(A). Please refer to NEC Table 300.5.
 - o Direct Burial: 24", In Non-Metallic Raceways (PVC Conduit): 18"

