Section 7 – Clearances

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7-1 Basic Electric Clearances - Services

Clearances for Electric Overhead Services

(Not for primary or secondary clearances.)
(Per NESC Table 232-1 and Table 234-1 and WI PSC 114)

Note that the following are the minimum clearances needed for existing buildings and structures. Additional clearances must be added to account for thermal loading, ice loading, and snow depth when looking at vertical clearances. All clearances are for services under 750 volts unless otherwise indicated. Contact the Company prior to new construction underneath or near overhead lines.

Triplex & Quadruplex Cables (most common)	Type A	Rule 230C3
Open Wire Poly Insulated Cables	Type B	

Vertical Clearances	**A**	B
Roads, Streets, Driveways, Parking Lots, Alleys, Cultivated Land, Grazing Forest, Orchards, etc.	**16.0'**	16.5'
If the height of the building to which the service is attached does not permit and there is only a residential driveway (no chance of trucks), under 150 volts to ground, and insulated.	**12.0'**	12.5'
Drip Loop	**10.0'**	10.5'
Spaces & ways subject to pedestrian or restricted traffic only (no horse riding or vehicles over eight feet).	**12.0'**	12.5'
Spaces & ways subject to pedestrian or restricted traffic only (no horse riding or vehicles over eight feet), the building height does not permit, under 150 volts to ground, and insulated.	**10.0'**	10.5'
Drip Loop	**10.0'**	10.5'
If along roads in rural districts where it is unlikely that vehicles will be crossing under the line (must consider blow out to embankments, etc.)	**14.0'**	14.5'
If along rural roads and located relative to fences, ditches, embankments, etc., so that ground under the line would not be expected to be traveled except by pedestrians, may be reduced to the following: The service must be under 150 volts to ground and insulated.	**9.5'**	12.5'

7-1 Basic Electric Clearances – Services (Cont'd)

Vertical Clearances	**A**	B
DOT minimum clearances over roadway (only State and Federal Highways) (use NESC if greater than this) (under worst case conditions) (WI DOT Maintenance Manual 96.95) (MI DOT Annual Permit Form).	**WI: 17.0'** **MI: 18.0'**	WI: 17.0' MI: 18.0'
Over or under roofs or projections not readily accessible (no permanent stairs, ladders, doorways, ramps, windows, etc. to the roof; no vehicles) and the service is NOT ATTACHED to that structure. (This clearance also applies above railings, walls, or parapets around balconies or roofs.)		
WI: Less than 4 / 12 pitch.	**8.0'**	10.5'
WI: 4 / 12 pitch or greater (WI PSC Table 114.234-1)	**3.0'**	10.5'
MI	**3.5'**	10.5'
Over or under balconies & roofs readily accessible to pedestrians (as part of structure to which service is NOT ATTACHED to that structure (casually accessed through a doorway, ramp, window, stairway, or permanently mounted ladder etc.) (NESC Table 234-1 row 1(b)(2) columns 3 & 5.)	**11.0'**	11.5'
Over roofs, balconies, porches, or attached decks over which they pass and the service is ATTACHED to that structure (NESC 234C(3)(d)).		
Accessible	**10.0'^**	10.0'^
Not Readily Accessible to pedestrians (including drip loops) (PSC114.234(3))		
WI: Less than 4/12 pitch, 120/240V or 120/208V service	**8.0'***	8.0'*
WI: Less than 4/12 pitch, 277/480V service	**8.0'***	10.0'^
WI: 4/12 pitch or greater, 120/240V or 120/208V service	**3.0'**	3.0'
WI: 4/12 pitch or greater, 277/480V service	**3.0'**	10.0'^
MI: Under 300 volts phase to phase	**3.0'**	3.0'
MI: Under 750 volts phase to phase	**3.0'**	10.0'^
Over or under catwalks & other surfaces upon which personnel walk	**11.0'**	11.5'
Other vertical clearances to signs, chimneys, billboards, radio & TV antennas, tanks, and other installations not classified as buildings or bridges.	**3.5'**	6.0'

***** Was 10.0' from Feb 1, 2008 – June 30, 2014.

^ Was 8.0' prior to Jan 30, 2008.

7-1 Basic Electric Clearances – Services (Cont'd)

Horizontal Clearances	**A**	B
Horizontal clearance, at rest (no wind) to walls, projections, windows, balconies, and areas readily accessible to pedestrians.	**5.0'**	5.5'
Horizontal clearances to signs, chimneys, billboards, radio & TV antennas, tanks, and other installations not classified as buildings or bridges.		
Accessible	**5.0'**	5.5'
Non-Accessible	**3.5'**	5.5'

Notes:
1. Where these clearances cannot be obtained, the conductors and rigid live parts shall be guarded. (NESC 234C2)
2. See figure #3 for an exception to roof clearance when using a periscope (through the roof raceway) and non-accessible roof or balcony and with voltages less than 300 volts to ground (NESC 234C3d (1)).
3. Code requires a clearance to any part of an OH service to be three feet in any direction from windows (unless window is not designed to open) (above windows is acceptable if triplex or quadruplex), doors, porches, and fire escapes if the service drop is attached to the building and not readily accessible. This clearance also applies to the drip loop. See Figure #2 (NESC 234C3d (2)).

7-1 Basic Electric Clearances – Services (Cont'd)

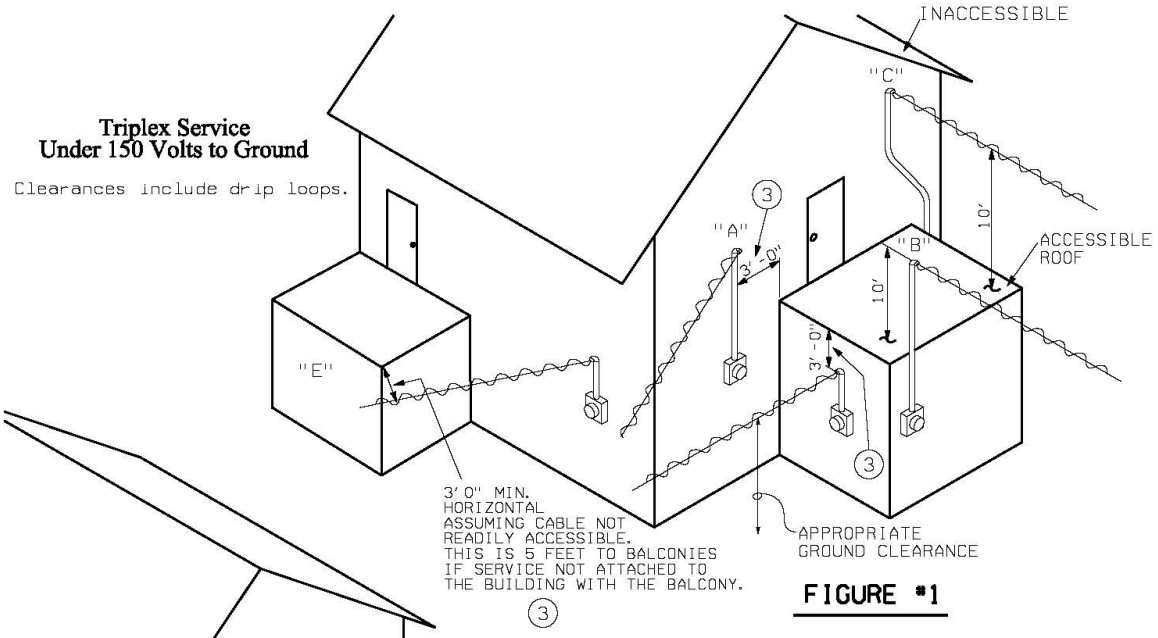
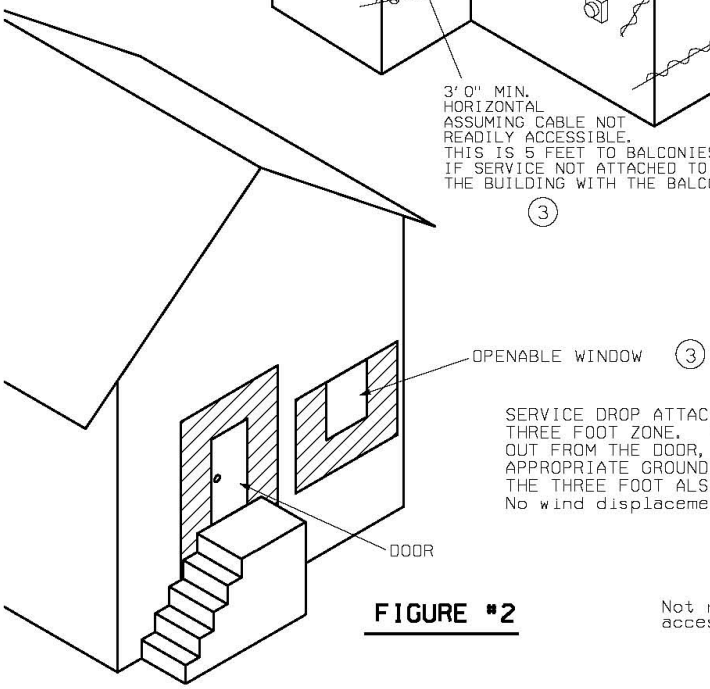
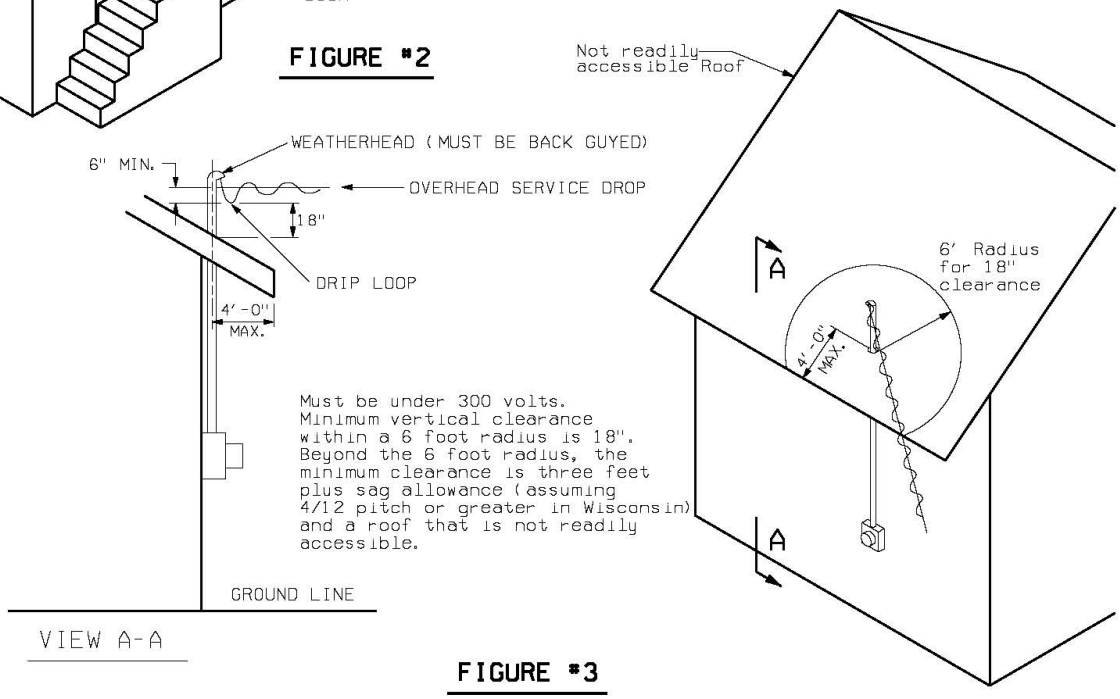


FIGURE #1



SERVICE DROP ATTACHMENT MUST BE CLEAR OF THE THREE FOOT ZONE. THIS ALSO INCLUDES THREE FEET OUT FROM THE DOOR, WINDOW, PORCH, OR FIRE ESCAPE. APPROPRIATE GROUND CLEARANCES APPLY. THE THREE FOOT ALSO APPLIES TO THE DRIP LOOP. No wind displacement.

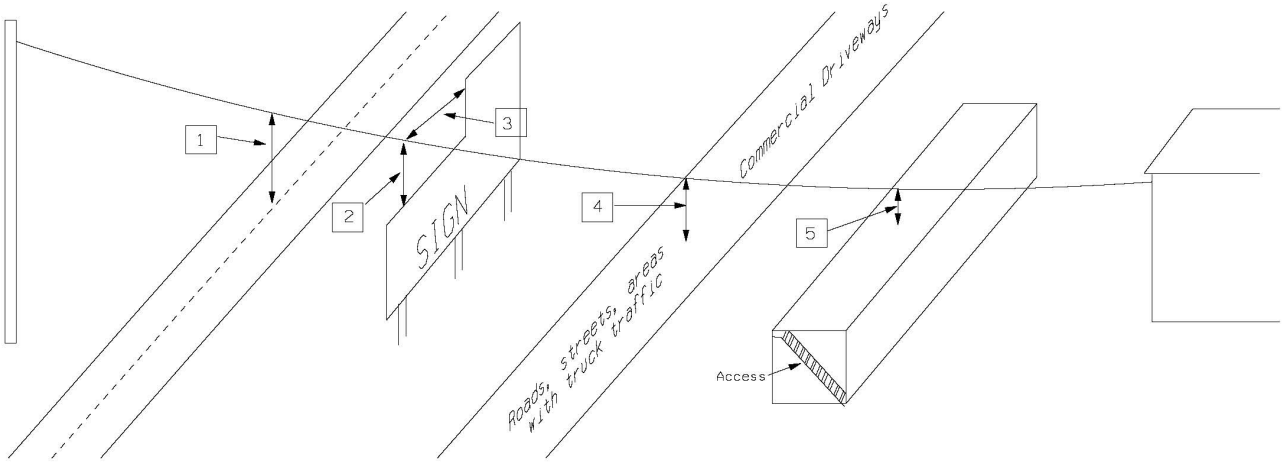
FIGURE #2



Must be under 300 volts. Minimum vertical clearance within a 6 foot radius is 18". Beyond the 6 foot radius, the minimum clearance is three feet plus sag allowance (assuming 4/12 pitch or greater in Wisconsin) and a roof that is not readily accessible.

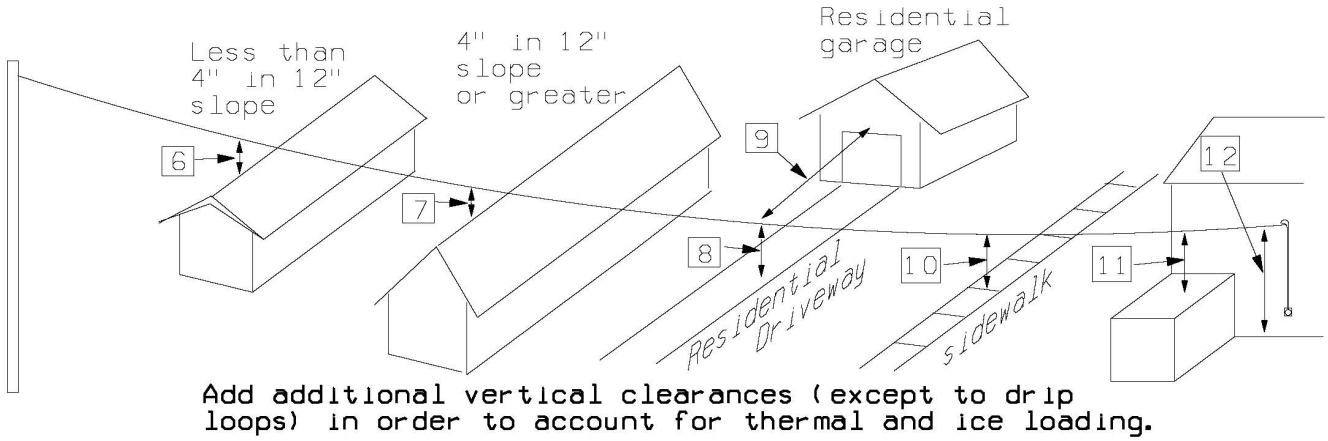
FIGURE #3

7-1 Basic Electric Clearances – Services (Cont'd)



Triplex Services Under 150 Volts to Ground

1. 17'0" under worst case, in Wisconsin, State and Federal roads. 16'0" for Michigan.
2. 3'6" vertical clearance to signs, chimneys and other structures (not readily accessible).
3. 3'6" horizontal clearance to signs, chimneys, and other structures (not readily accessible).
4. 16'0" vertical clearance to roads and areas subject to truck traffic.
5. 11'0" over accessible roofs or balconies not attached to the building being served by the service drop.



6. 8'0" in Wisconsin if low sloped roof and inaccessible. For Michigan it is 3'6".
7. 3'0" in Wisconsin if steep roof and inaccessible. For Michigan it is 3'6".
8. 12'0" to residential driveways where higher attachment points can't be obtained. If there is a reasonable chance of truck traffic, this clearance does not apply.
9. 5'0" horizontal clearance to building.
10. 12'0" over sidewalks and pedestrian-only areas. This does not apply if vehicles can reasonably be driven here or horses ridden here. 10'0" if can't get height, due to building height attachment limits.
11. 10'0" over accessible, attached roofs and balconies. This decreases to 3'0" if 4/12 pitch or greater and not readily accessible for Wisconsin. In Michigan this is 3'0" if not readily accessible.
12. Adjacent line clearance for the lines applies. In this example it would be 12'0" (note 10).

7-2 Miscellaneous Clearances

Wells

Underground — 5 feet for electric or gas. May be reduced to one foot with special permission and with special precautions for lightning damage (Company Design Rule).

Overhead - WI — Horizontal clearance must be no less than 3/4 of the required vertical clearance of the conductors to ground. A conservative guide is 14 feet on service drops and 20 feet on primary lines. Note OSHA working clearances. (PSC 114.234C8).

Overhead – MI — Horizontal clearance must be considered for well maintenance. MIOSHA requires at least 10' working clearance.

Private Septic Systems

Design Standard based on WI Plumbing Code SPS 383.43(8)(i), Table 383.43-1 (private sewers), and Table 382.365-4 (storm water). This does not apply directly to gas or electric utility lines. The intent, however, is to maintain working clearances. The enforcers of this in Wisconsin are the local Zoning Offices. There are also concerns with the impact on cable insulation, pipe, and concentric neutrals. Consult with the Company about any clearance issues.

Clearance to drain fields and mound systems: 15 feet
The above applies to the primary and alternate septic system.

Clearance to holding tanks and collector tanks: 10 feet

Clearance to septic system pipes: 1 foot
(Based on WI PSC 114.352E)
Attempt to avoid crossing pressurized systems, if reasonable, for liability reasons.

Stored Materials

Overhead — Overhead lines shall not be run over areas designated for material storage where cranes or other types of tall machinery are used unless adequate clearance can be provided for full use of the equipment (PSC 114.234C6 for Wisconsin and Company design rule).

Working Clearances

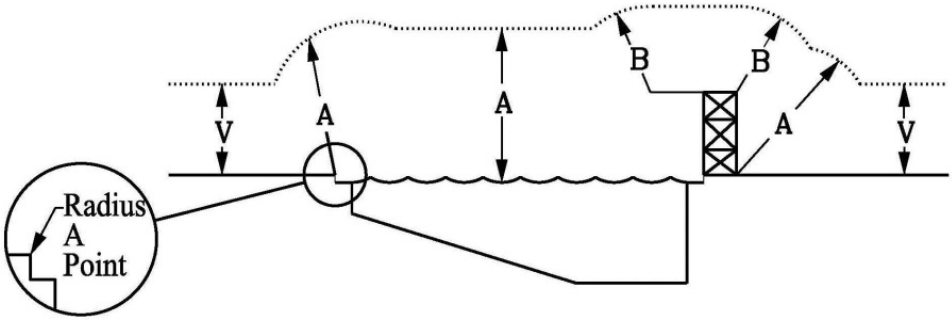
Following are the OSHA Unqualified Subpart K 1926.403(j)(3) and Qualified Subpart V 1926.950 and MIOSHA Rule 408.14005(4) rules.

Swimming Pools (also includes Outdoor Hot Tubs per PSCW interpretation 7/00)

Underground — 5 feet of pool / hot tub or auxiliary equipment (horizontally) (NESC 351C1)

Overhead — Shall be avoided by a minimum of 10 feet horizontally from the edge of the pool, diving platform, diving tower, water slide, or other fixed, pool-related structures. The following are clearances for utility triplex service drops (under 750 volts). Conductor thermal and ice loading must be considered also (see WI PSC 114.234E1).

A=22.5 feet, B=14.5 feet, V=normal ground clearance



7-2 Miscellaneous Clearances (Cont'd)

Padmount Transformers
See subsection 3-10 and 3-11.

Separation from Natural Gas Lines
Basic underground clearance from gas lines to all other utilities or below-ground structures is one foot (WI PSC 114.352E). It is recommended to maintain 5' clearance to wells.

See subsection 4-1 for clearances involving gas meters.

Fuel Tanks
Overhead – WI Electric lines cannot be run over above-ground flammable liquid or LPG storage tanks. The horizontal clearance is 8 feet for secondary and services, 15 feet for all other electric lines. LPG tanks with a capacity of 1000 gallons or less are exempt. (PSC 114.234C7).

Overhead – MI An above-ground LP Gas container and any of its parts shall not be located within 6 feet of a vertical plane beneath overhead electric power lines that are over 600 volts minimal (LP Gas Code Handbook 6.4.5.12). Should not run electric lines over other above-ground fuel storage tanks. Company design policy is 15 feet horizontally for primary.

Underground Underground cables shall not go under fuel tanks. Electrical conductors shall maintain 10' of clearance from ground tanks. Electric cables can come closer if installed in approved conduit. (Call an Application Engineer on contamination and maintenance issues.) (Concern is strength and compatibility; most fuels dissolve PVC.)

Class I Hazardous Locations
Buried electric lines, meter sockets, CT cabinets, or termination enclosures must observe the following minimum horizontal clearances from the flammable fuel system components listed below:

Under fuel storage tanks (above or below ground)	0 feet (not allowed under the fuel tank)
Fill Pipe	10 feet
Dispensing device	20 feet
Remote pump	10 feet
Vents	5 feet

Consult the Company for other Class I hazardous locations. (NESC 127, NEC Article 514 and NEC Article 515).

Antennas
See subsection 7-3 for details.

Buildings
Underground electric lines should not be installed under buildings or permanent structures. (NESC 351C2 and 350.H.) (See also NEC 300-5c.) The customer will be responsible for cost associated relocating the service conductors if a building or structure is built over the service conductors.

Billboards
The OH Service attachment and drip loop must have the following clearances from any access platform, assuming that the access platform is not accessible (no fixed access ladder or a ladder that is at least 8 feet short of the ground). The normal attachment should be on a corner of the sign. The service should not go across the face of the sign, where it might block access. NESC 234C.3.d.

3 feet below the platform (and at least 3 feet in all directions from an access ladder).
10 feet in WI (3 feet in MI) above the platform (or 3 feet out from the platform).

Special Cases
See the Company for additional clearance requirements not listed above. Some of the items which require special clearances include the following:

Railroads
Flag Poles
Light Poles (standards)
Grain Bins
Bridges
Catwalks
Sailboat Areas
Boat Landings
Airport Approaches
Electric Transmission / Distribution Lines
Ladders Mounted to Tall Buildings (Over 50 ft.)

7-3 Antenna Clearances

Location of Outdoor Antennas

Outdoor antennas and satellite dishes (receiving stations) and supporting structures, at or on residences, shall have a horizontal clearance from Company electric lines, greater than its total height. Lead-in conductors attached to buildings shall be installed so they cannot swing closer than 10 feet to or pass over the electric supply conductors.

Exception: Service drops of 150 volts or less to ground shall have a minimum clearance of 4 feet from the antenna and supporting structure and a minimum clearance of 2 feet from the lead-in conductors.

Consult the Company when these clearances cannot be met.

Additional State Requirements:

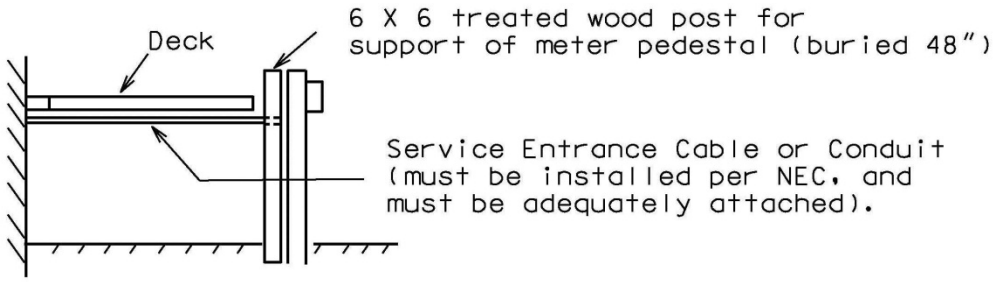
Wisconsin Building Code (IBC Chapter 31, Section 3108.1, 3108.2, and 3108.4)

Also note: NESC 234 Table 234-1
PSC 114-234C9 (Vol. 1 Wisconsin Electrical Code)
NEC 810.18(A) and 810.13

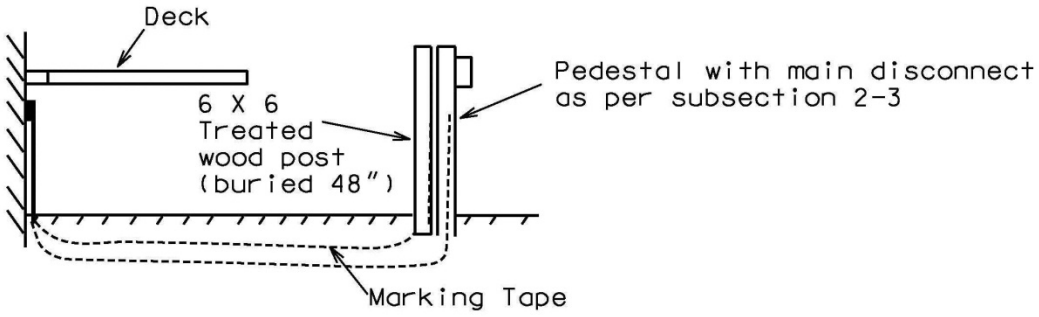
7-4 Residential Deck Procedure

The first priority is to avoid decks when installing new underground or overhead services.

Option 1



Option 2



Option 3

Move meter pedestal to an area on the house away from the deck. The service entrance conduit or cable can then go around the house to the old service pedestal site. Marking tape is required in Michigan for cable protection [NEC 300.5(D)] but not required for Wisconsin per SPS 316.300(2).