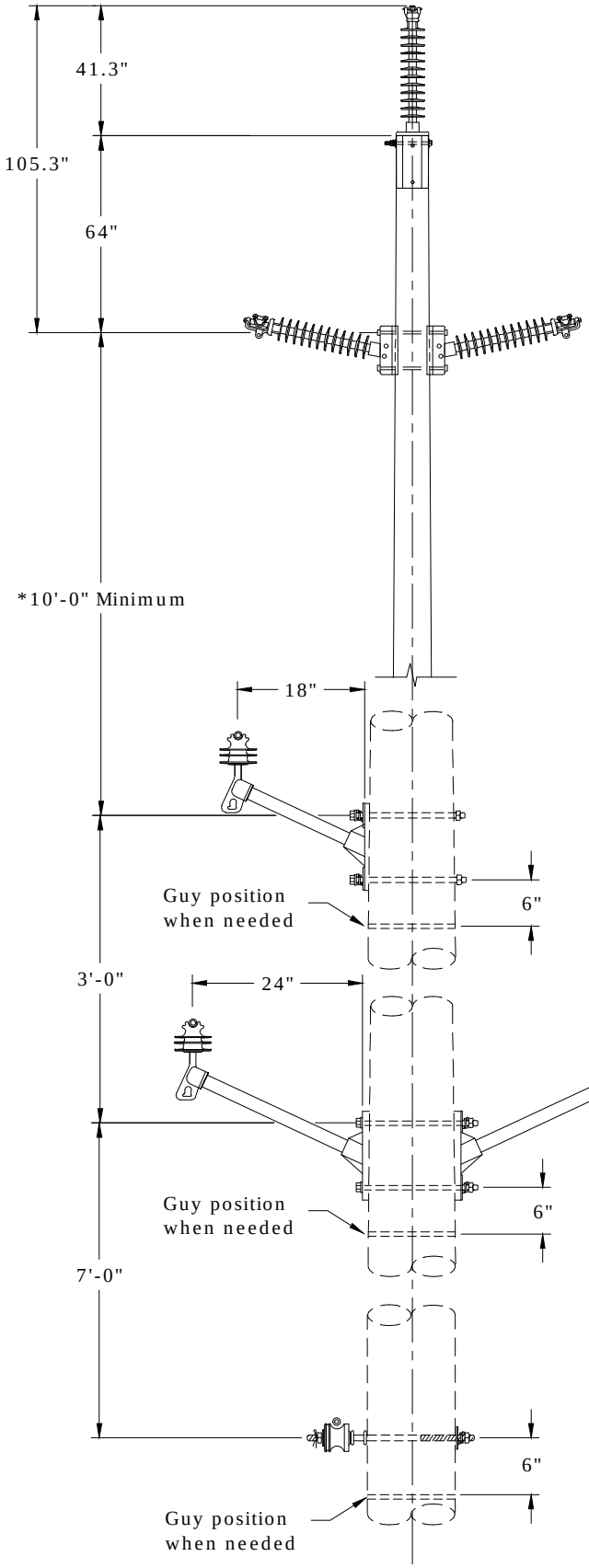
1150
CLEARANCES

11/28/2016

~	CFG	Construction Framing Guide
N	COR	OH Clearance to Roadways & Other Surfaces - NESC Minimum
~	CTS	OH Clearance to Structures
N	DC	OH Clearance to Roadways & Other Surfaces - Design Minimum
C	UPTC	Padmount Transformer Clearances

N New Standard
R Redrawn Standard
C Changed Standard
~ No Change



* For tall poles, make sure the distribution can be reached by a service/line truck.

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CONSTRUCTION STANDARDS

CONSTRUCTION FRAMING GUIDE
TRANSMISSION UNDERBUILD

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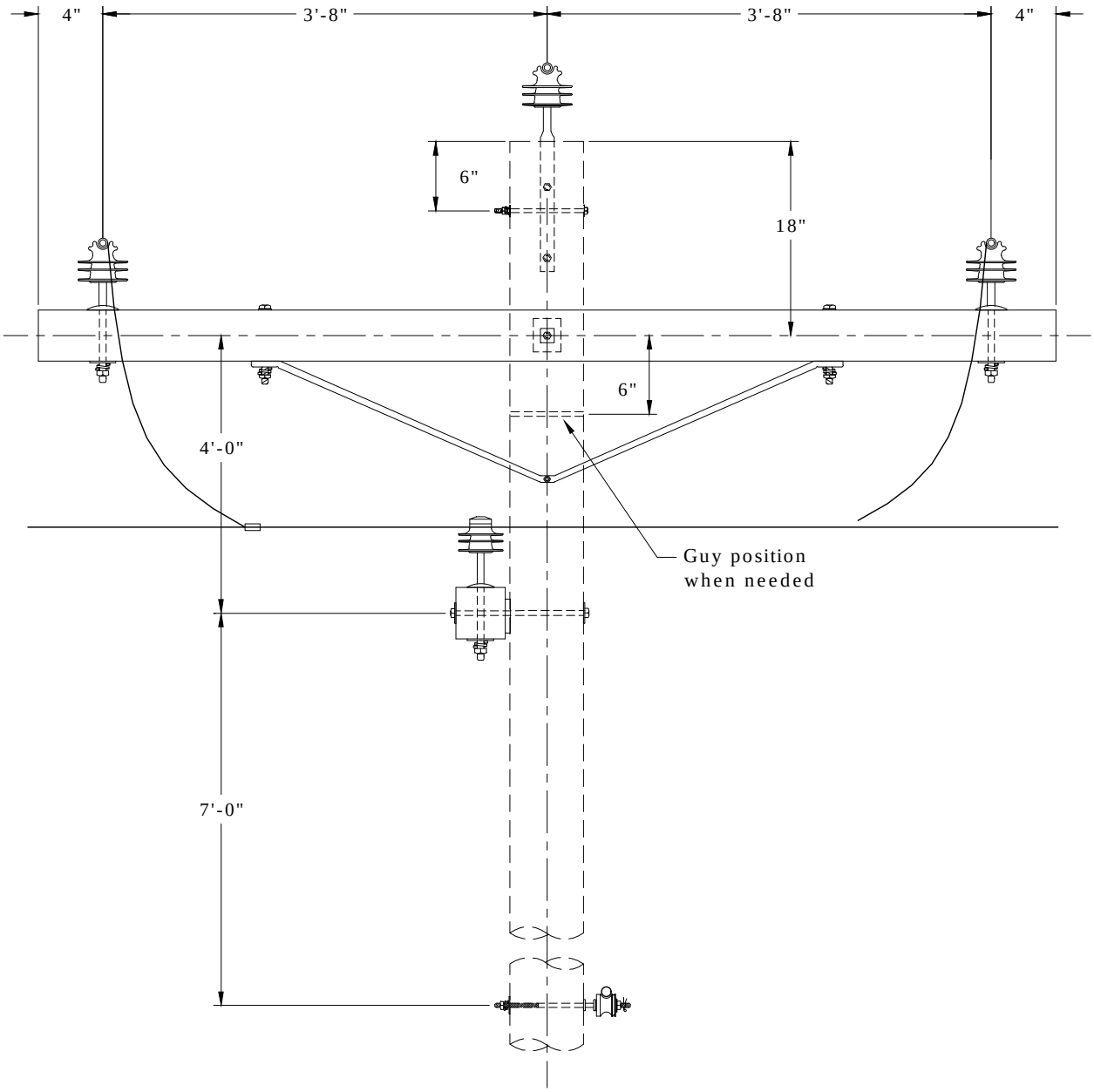

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CONSTRUCTION STANDARDS

CONSTRUCTION FRAMING GUIDE
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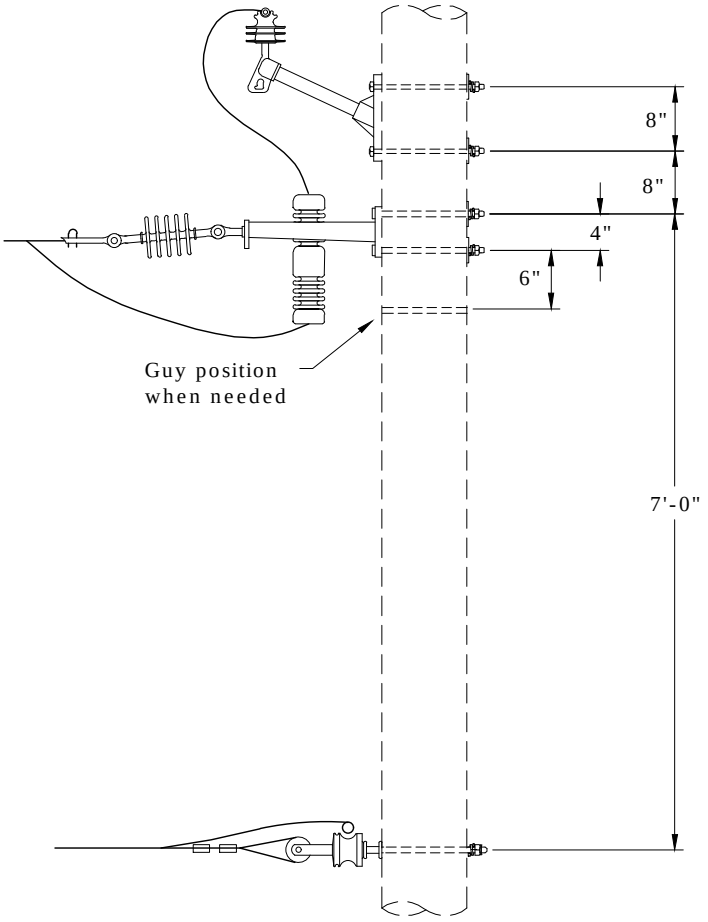

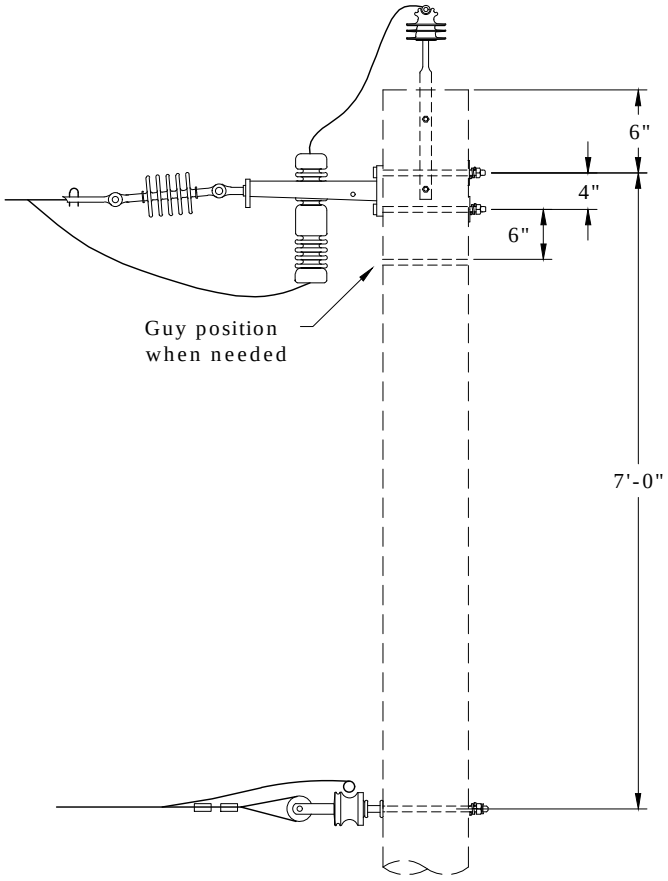

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CONSTRUCTION STANDARDS

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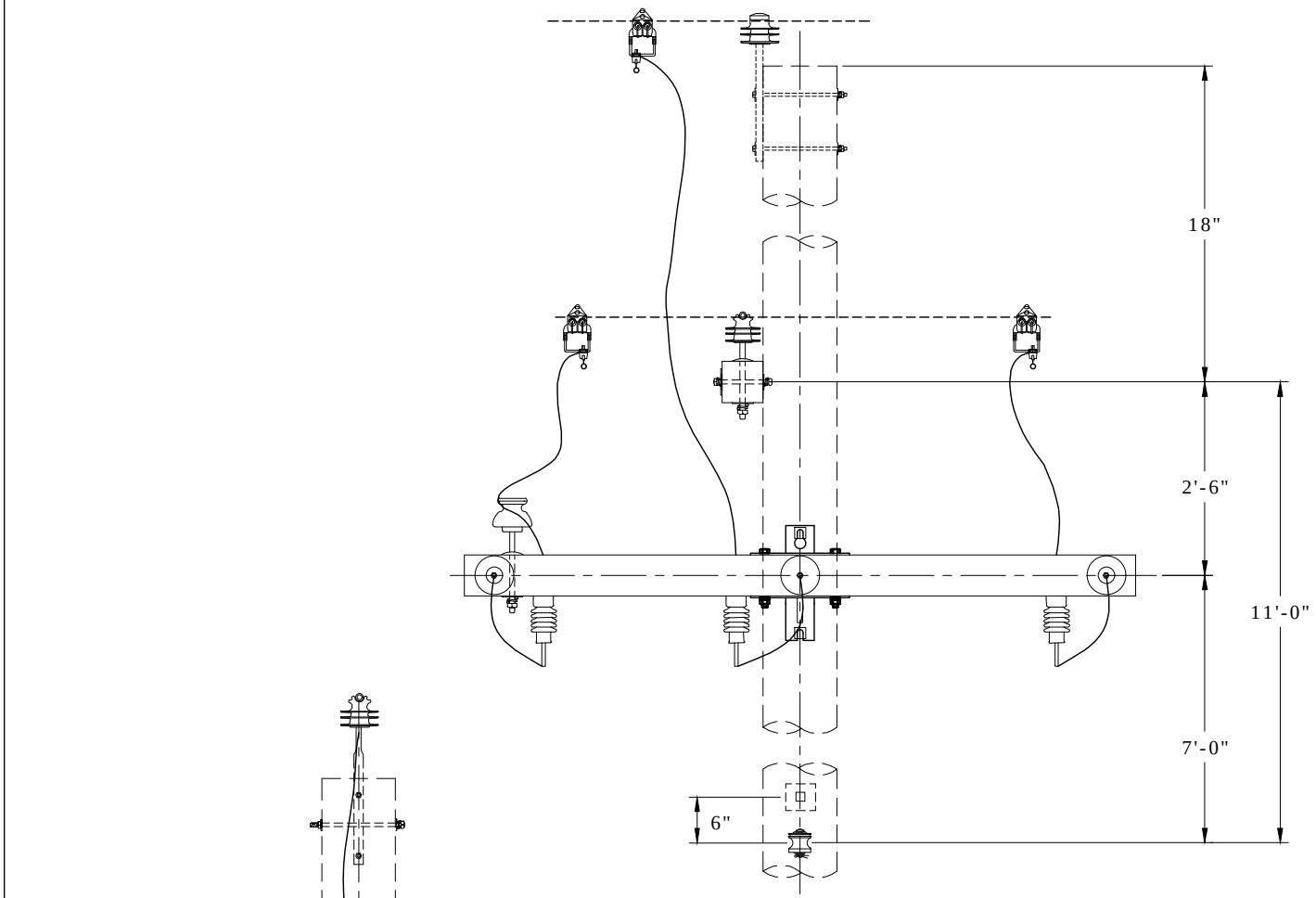

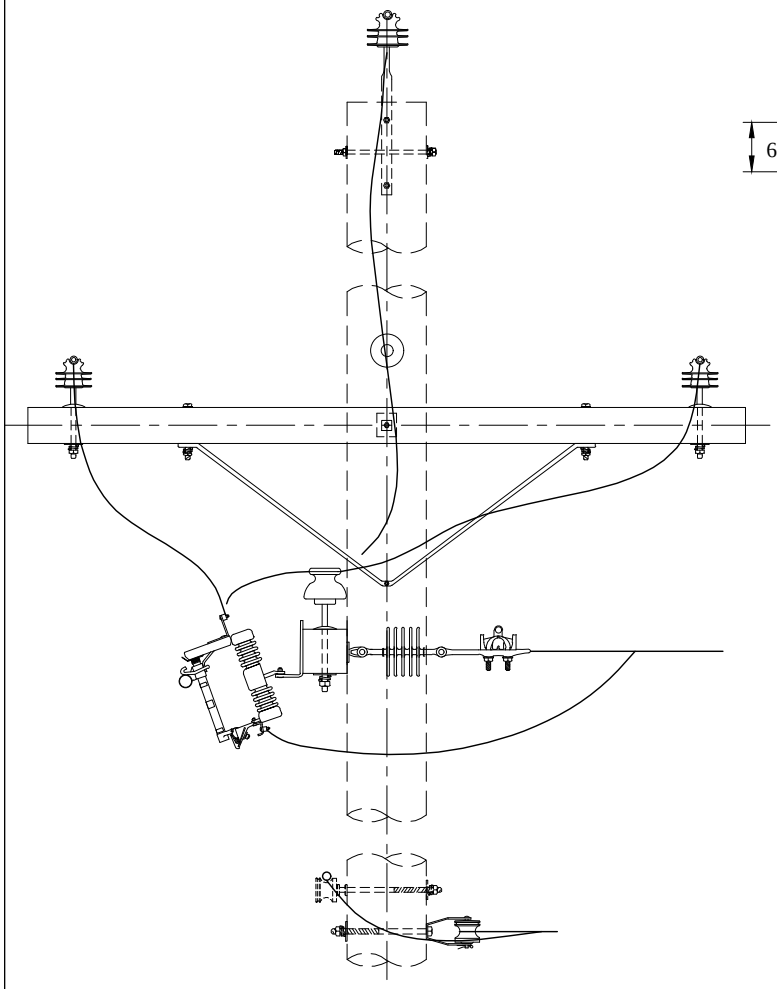

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CONSTRUCTION STANDARDS

CONSTRUCTION FRAMING GUIDE
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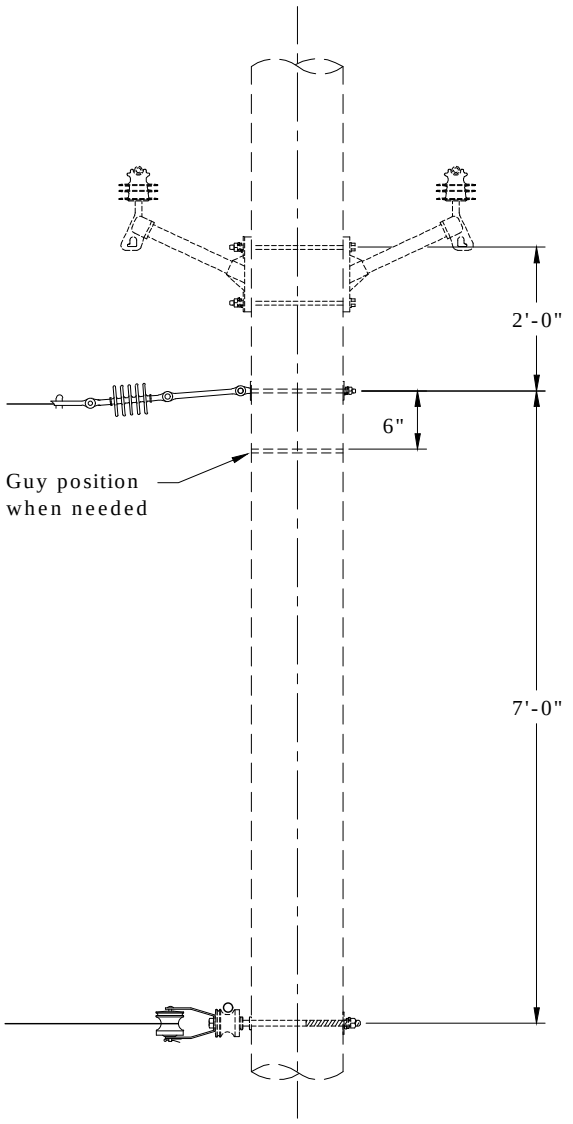

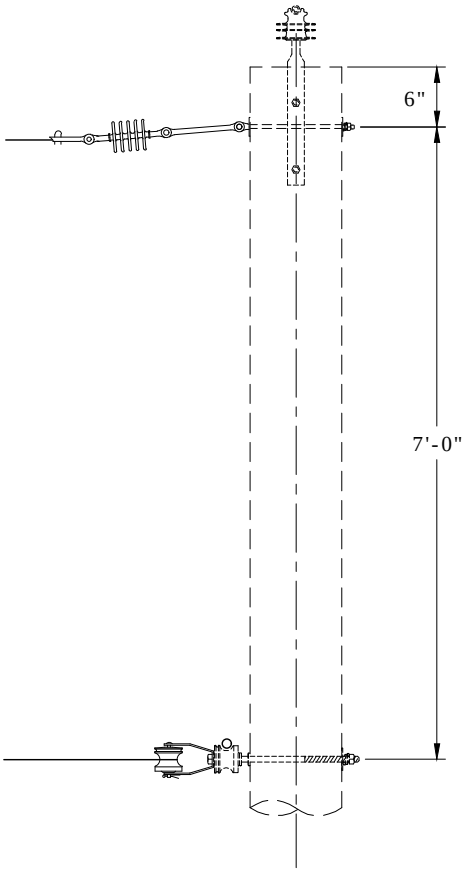

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CONSTRUCTION STANDARDS

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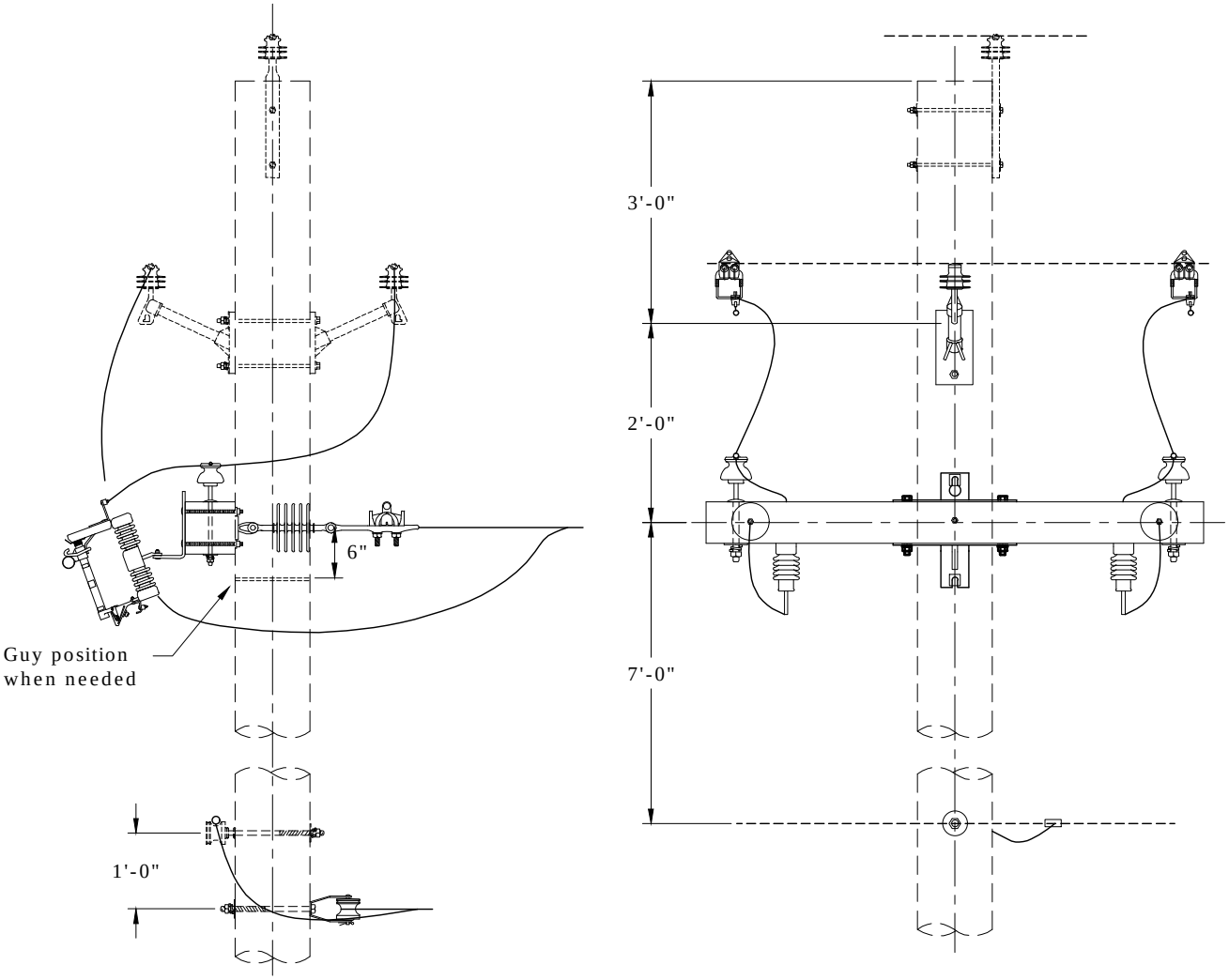

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CONSTRUCTION STANDARDS

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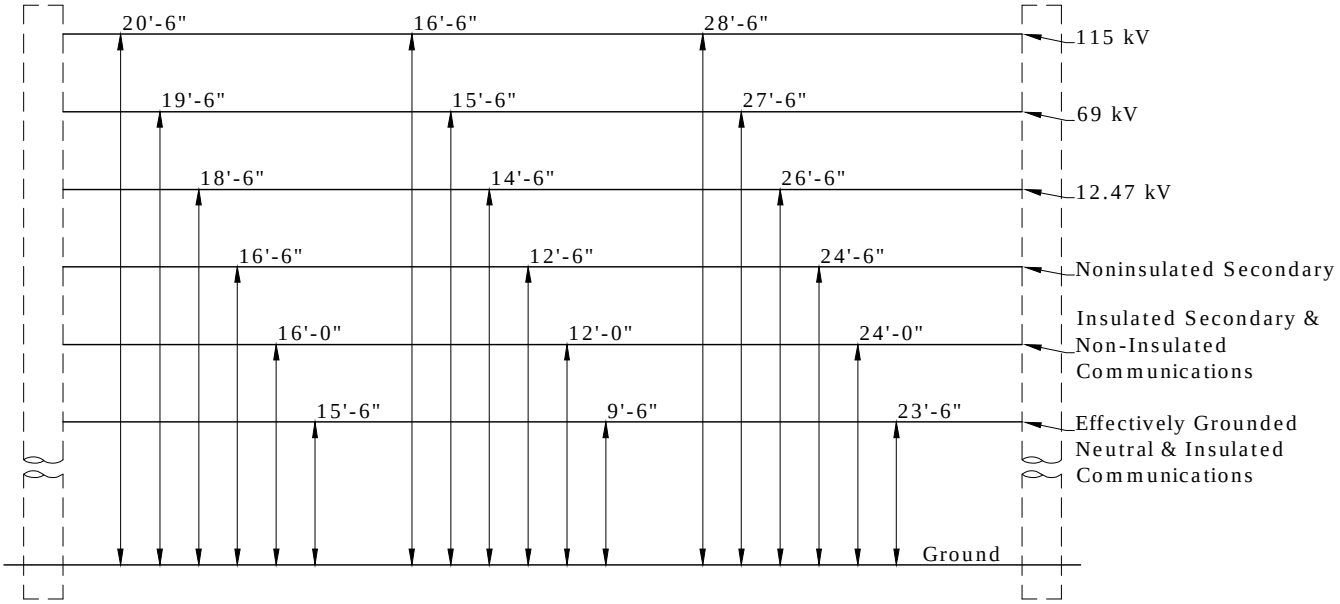
2017 NESC Minimum Vertical Clearances



Along or crossing roads/streets, alleys, driveways, and parking lots (not state highways)

Spaces and ways subject to pedestrians or restricted traffic only

Top of rails for railroads (except electrified trolleys) -See page 2 for Burlington Northern

Washington State Highways		
Type of Utility Line	Lines Crossing Highway	Lines Parallel To Highway
Communications	24'	20'
Joint Usage Comm.	20'	20'
0-750 V	24'	24'
751-15,000 V	30'	27'
15,001-50,000 V	32'	32'
50,001 V And Over	34'	32'

Notes:

1. These minimum clearances must be met at maximum final sag.
2. See tables that follow for other surfaces and span guys.
3. Clearances per WAC 468-34-290 and NESC C2-2017 Rule 232.
4. See Std DC - Design Clearances - Section 1150 for new construction.

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CONSTRUCTION STANDARDS

OVERHEAD CLEARANCE
TO ROADWAYS & OTHER SURFACES
NESC MINIMUM

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2017 NESC MINIMUM VERTICAL CLEARANCES

Nature of Surface Below	CONDUCTORS: Neutral* & Insulated Communication	Insulated Secondary & Non-Insulated Communication	Non-Insulated Secondary	12.47 kV	69 kV	115 kV
	SPAN GUYS: Span Guys for Poles Carrying 0 to 300 V		Span Guys for Poles Carrying 301 to 750 V	Span Guys for Poles Carrying 12.47 kV		
Roads, streets, alleys, parking lots & other areas subject to truck traffic (including horse trails, farmland, orchards, pastures & forests)	15’ 6”	16’ 0”	16’ 6”	18’ 6”	19’ 6”	20’ 6”
**Burlington Northern	24’ for Communication Lines 26’ 6” for Primary, Secondary, Neutrals & Span Guys				27’ 6”	28’ 6”
***Railroad tracks (except those using overhead trolley conductors)	23’ 6”	24’ 0”	24’ 6”	26’ 6”	27’ 6”	28’ 6”
Pedestrian ways where vehicles are prohibited by regulation or permanent obstructions and not reasonably expected to be used by vehicles	9’ 6”	12’ 0”	12’ 6”	14’ 6”	15’ 6”	16’ 6”
Water areas not suitable for sailboating or where sailboating is prohibited	14’ 0”	14’ 6”	15’ 0”	17’ 0”	18’ 0”	19’ 0”
Water suitable for sailboating	See Standards Engineering					

* This column is for an effectively grounded neutral only. All other neutrals are the same as the phase conductors of the circuit with which they are associated.
** Measured from top of rails to conductor/guy.
*** The railroad company may require more clearance than shown here.

Scope

This standard lists the MINIMUM conductor clearances between conductors and structures such as buildings, signs, and flag poles. These clearances are taken from the 2017 edition of NESC Rule 234.

Notes:

1. The preferred design clearance to structures is 10 feet, if possible, in recognition of WAC 296-24-960 Unqualified Worker minimum clearance of 10 feet to any conductors (including the neutral) up to 50kV. There will be installations where it is not possible to obtain 10 feet of clearance. In those cases the 2017 NESC Rule 234 minimum clearances shall be met.
2. The clearances in these tables are the absolute minimums required by code. The values are based on worst-case conductor loading, conductor tension, and wind loading.
3. Ungrounded guys and ungrounded portions of guys between guy insulators shall have clearances based on the highest voltage to which they may be exposed to a slack conductor or guy.

Table 1 - Horizontal clearances to walls, projections, windows, balconies, and areas accessible to pedestrians.

Conductor	NESC Minimum Horizontal Clearance (feet)
Neutrals, grounded guys, ungrounded guys exposed to 0 to 300V	4'6"
Services (0 to 750V multiplex), (does not include building being served)	5'0"
Unguarded rigid live parts & equipment cases (0 to 750V), ungrounded guys (300 to 750V)	5'0"
Ungrounded guys exposed to 750V to 22kV	7'0"
Primary (7.2/12.5kV)	7'6"
69kV	8'6"
115kV	9'6"

Table 2 - Horizontal clearances to signs, chimneys, billboards, radio and TV antennas, and tanks readily accessible to pedestrians.

Conductor	NESC Minimum Horizontal Clearance (feet)
Neutrals, grounded guys, ungrounded guys exposed to 0 to 300V	4'6"
Services (0 to 750V multiplex)	5'0"
Unguarded rigid live parts & equipment cases (0 to 750V), ungrounded guys (300 to 750V)	5'0"
Ungrounded guys exposed to 750V to 22kV	7'0"
Primary (7.2/12.5kV)	7'6"
69kV	8'6"
115kV	9'6"

Rev. 2 - Updated for 2017 NESC and corrected labels on tables.

Table 3 - Horizontal clearances to signs, chimneys, billboards, radio and TV antennas, and tanks not readily accessible to pedestrians.

Conductor	NESC Minimum Horizontal Clearance (feet)
Neutrals, grounded guys, ungrounded guys exposed to 0 to 300V	3'0"
Services (0 to 750V multiplex)	3'6"
Unguarded rigid live parts & equipment cases (0 to 750V), ungrounded guys (300 to 750V)	5'0"
Ungrounded guys exposed to 750V to 22kV	7'0"
Primary (7.2/12.5kV)	7'6"
69kV	8'6"
115kV	9'6"

Table 4 - Vertical clearances over or under building roofs or projections readily accessible to pedestrians.

Conductor	NESC Minimum Vertical Clearance (feet)
Neutrals, grounded guys, ungrounded guys exposed to 0 to 300V	10'6"
Services (0 to 750V multiplex), (does not include building being served)	11'0"
Unguarded rigid live parts & equipment cases (0 to 750V), ungrounded guys (300 to 750V)	11'0"
Ungrounded guys exposed to 750V to 22kV	13'0"
Primary (7.2/12.5kV)	13'6"
69kV	14'6"
115kV	15'6"

Table 5 - Vertical clearances over or under building roofs or projections not readily accessible to pedestrians

Conductor	NESC Minimum Vertical Clearance (feet)
Neutrals, grounded guys, ungrounded guys exposed to 0 to 300V	3'0"
Services (0 to 750V multiplex), (does not include building being served)	3'6"
Unguarded rigid live parts & equipment cases (0 to 750V), ungrounded guys (300 to 750V)	10'0"
Ungrounded guys exposed to 750V to 22kV	12'0"
Primary (7.2/12.5kV)	12'6"
69kV	13'6"
115kV	14'6"

Rev. 2 - Updated for 2017 NESC and corrected labels on tables.

Table 6 - Vertical clearances over roofs that are accessible to vehicles less than 8 feet high.

Conductor	NESC Minimum Vertical Clearance (feet)
Neutrals, grounded guys, ungrounded guys exposed to 0 to 300V	10'6"
Services (0 to 750V multiplex)	11'0"
Unguarded rigid live parts & equipment cases (0 to 750V), ungrounded guys (300 to 750V)	11'0"
Ungrounded guys exposed to 750V to 22kV	13'0"
Primary (7.2/12.5kV)	13'6"
69kV	14'6"
115kV	15'6"

Table 7 - Vertical clearances over roofs accessible to truck traffic (vehicles over 8 feet high).

Conductor	NESC Minimum Vertical Clearance (feet)
Neutrals, grounded guys, ungrounded guys exposed to 0 to 300V	15'6"
Services (0 to 750V multiplex)	16'0"
Unguarded rigid live parts & equipment cases (0 to 750V), ungrounded guys (300 to 750V)	16'0"
Ungrounded guys exposed to 750V to 22kV	18'0"
Primary (7.2/12.5kV)	18'6"
69kV	19'6"
115kV	20'6"

Table 8 - Vertical clearances over and under signs, chimneys, billboards, radio and TV antennas, tanks, and other installations not classified as buildings or bridges where the conductor is over or under catwalks and other surfaces where personnel walk.

Conductor	NESC Minimum Vertical Clearance (feet)
Neutrals, grounded guys, ungrounded guys exposed to 0 to 300V	10'6"
Services (0 to 750V multiplex)	11'0"
Unguarded rigid live parts & equipment cases (0 to 750V), ungrounded guys (300 to 750V)	11'0"
Ungrounded guys exposed to 750V to 22kV	13'0"
Primary (7.2/12.5kV)	13'6"
69kV	14'6"
115kV	15'6"

Rev. 2 - Updated for 2017 NESC and corrected labels on tables.

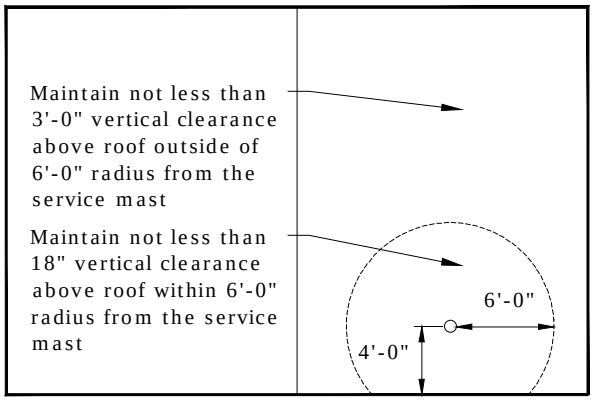
Table 9 - Vertical clearances over and under signs, chimneys, billboards, radio and TV antennas, tanks, and other installations not classified as buildings or bridges where the conductor is over or under portions of such installations where personnel do not walk.

Conductor	NESC Minimum Vertical Clearance (feet)
Neutrals, grounded guys, ungrounded guys exposed to 0 to 300V	3'0"
Services (0 to 750V multiplex)	3'6"
Unguarded rigid live parts & equipment cases (0 to 750V), ungrounded guys (300 to 750V)	5'6"
Ungrounded guys exposed to 750V to 22kV	7'6"
Primary (7.2/12.5kV)	8'0"
69kV	9'0"
115kV	10'0"

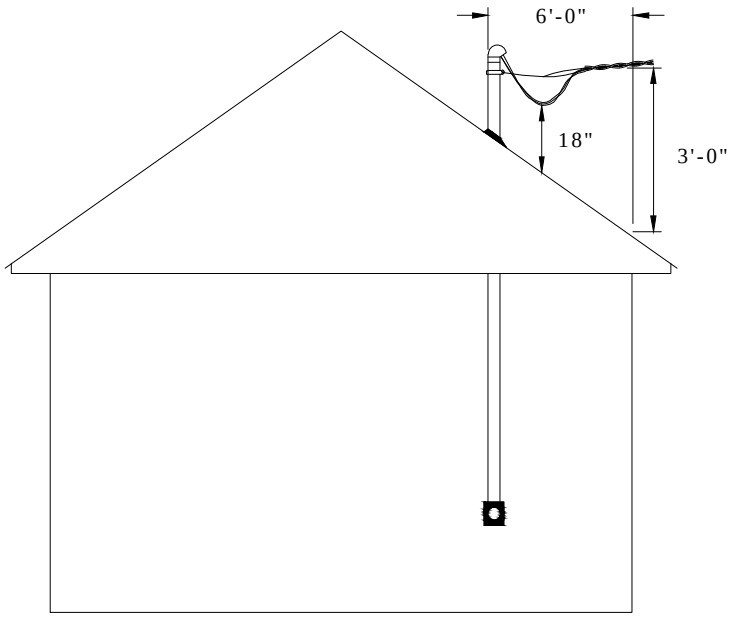
Rev. 2 - Updated for 2017 NESC and corrected labels on tables.

Table 10 - Vetical clearance of service drop conductors, including drip loops, for the building it is serving (see figure 1).

Conductor	NESC Minimum Vertical Clearance (feet)
Multiplex that does not exceed 750V within 6' radius of service mast which is located no more than 4' from the edge of the roof	1'6"
Multiplex that does not exceed 750V outside 6' radius of service mast	3'0"



Plan View of Roof



Elevation View

Figure 1- Clearances of service drop terminating on support mast

Rev. 2 - Updated for 2017 NESC and corrected labels on tables.

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CONSTRUCTION STANDARDS

OVERHEAD CLEARANCE TO STRUCTURES

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1	10/17/08	CM	AH
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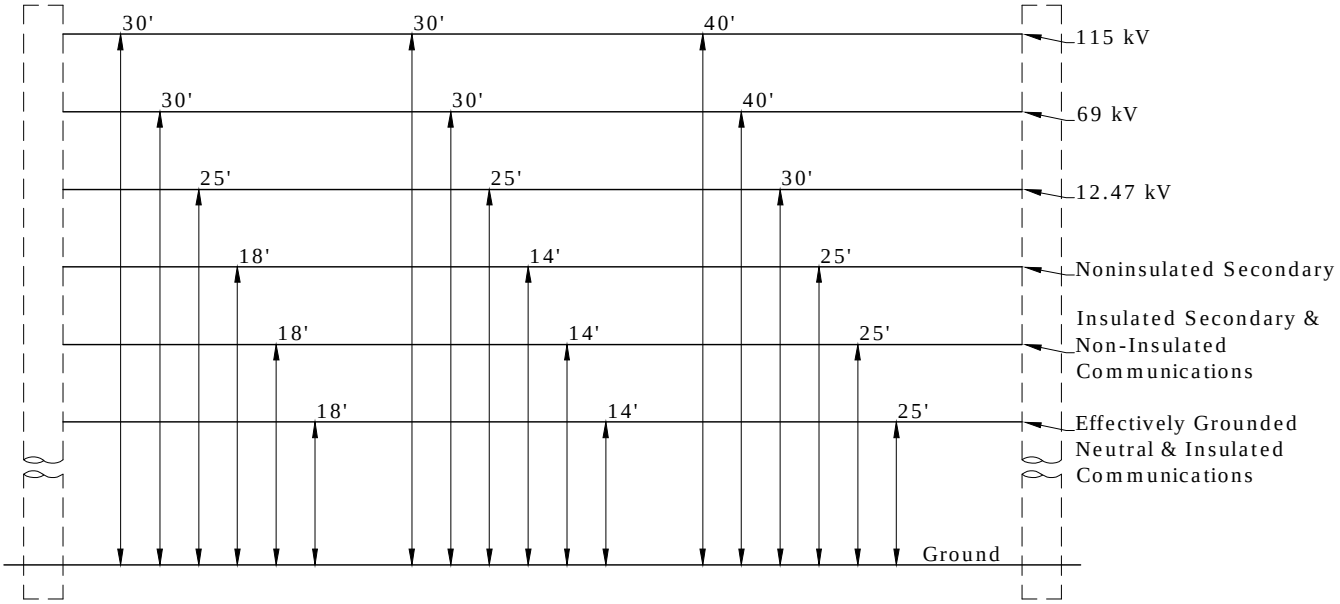
Design Minimum Vertical Clearances



Along or crossing roads/streets, alleys, driveways, and parking lots (not state highways)

Spaces and ways subject to pedestrians or restricted traffic only

Top of rails for railroads (except electrified trolleys) -See page 2 for Burlington Northern

Washington State Highways		
Type of Utility Line	Lines Crossing Highway	Lines Parallel To Highway
Communications	25'	21'
Joint Usage Comm.	21'	21'
0-750 V	25'	25'
751-15,000 V	35'	35'
15,001-50,000 V	35'	35'
50,001 V And Over	40'	40'

Notes:

1. See tables that follow for other surfaces and span guys.
2. See Std COR - Overhead Clearance to Roadways and Other Surfaces - Section 1150 for NESC minimums.
3. Proposed exceptions to these clearances require approval from CPU Engineering.

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CONSTRUCTION STANDARDS

OVERHEAD CLEARANCE
TO ROADWAYS & OTHER SURFACES
DESIGN MINIMUM - NEW CONSTRUCTION

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DESIGN MINIMUM VERTICAL CLEARANCES

Nature of surface below	CONDUCTORS: Neutral* & Insulated Communication	Insulated Secondary & Noninsulated Communication	Noninsulated Secondary	12.47kV	69kV	115kV
	SPAN GUYS: Span Guys for Poles carrying 0 to 300v		Span Guys for Poles carrying 310 to 750v	Span Guys for Poles carrying 12.47kV		
Roads, Streets, Alleys, Parking Lots & Other Areas Subject to Truck Traffic (including horse trails, farmland, orchards, pastures & forests)	18’	18’	18’	25’	30’	30’
Burlington Northern	25’ for Communication Lines 35’ for All Electric Lines, Neutrals & Span Guys				40’	40’
Railroad tracks (except those using overhead trolley conductors)	25’	25’	25’	30’	40’	40’
Pedestrian ways where vehicles are prohibited by regulation or permanent obstructions and not reasonably expected to be used by vehicles or horseback riding	14’	14’	14’	25’	30’	30’
Water areas not suitable for sailboating or where sailboating is prohibited	18’	18’	18’	25’	30’	30’

* This column is for an effectively grounded neutral only. All other neutrals are the same as the phase conductors of the circuit with which they are associated.

Clark Public Utilities

CONSTRUCTION STANDARDS

OVERHEAD CLEARANCE
TO ROADWAYS & OTHER SURFACES
DESIGN MINIMUM - NEW CONSTRUCTION

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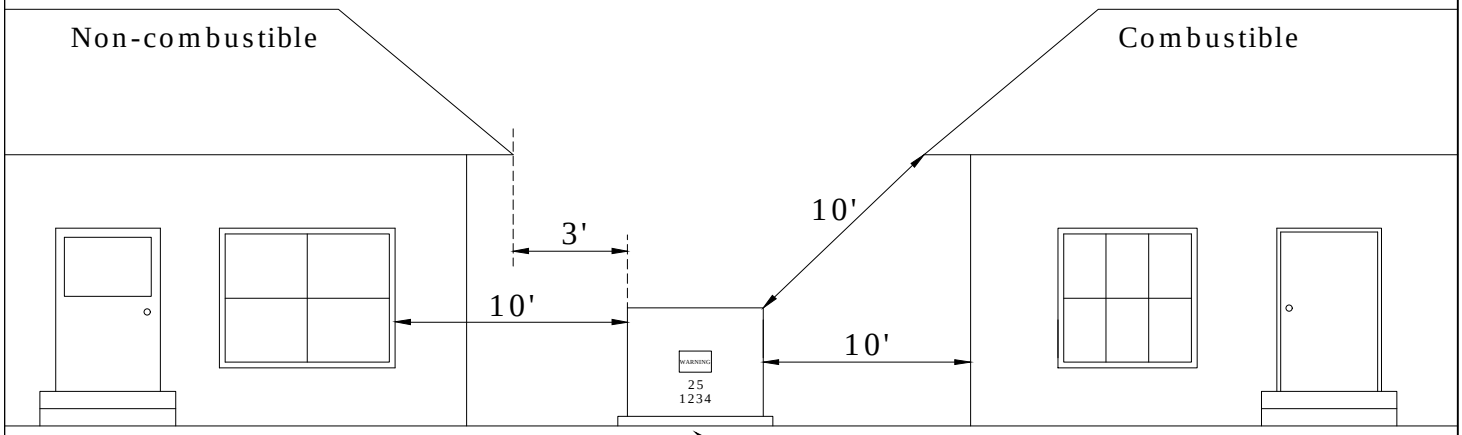
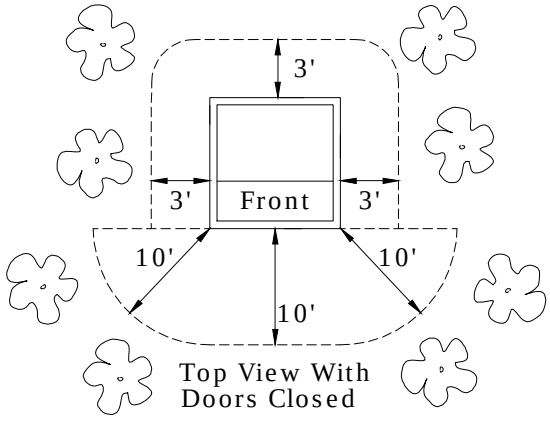


Front view with doors closed (see Note 2)

MINIMUM DISTANCE REQUIRED FROM STRUCTURES TO PADMOUNTED TRANSFORMERS

- 10 ft. to any windows, doors, stairways, or openings on all structures.
- 3 ft. clear area in back and sides of unit to allow working on equipment.
- 10 ft. from any structure or roof overhang consisting of combustible material.
- 3 ft. to non-combustible structures having no openings closer than 10 ft.
- Proposed exceptions to these clearances require approval from CPU Engineering.



Top View With Doors Closed

MINIMUM WORKING CLEARANCE REQUIRED

10 ft. clear area in front of unit to allow use of 8' hot sticks (see Note 2).

Notes:

1. Customer must provide documentation for non-combustible.
2. Locate front of padmounted transformer away from building walls or other barriers to allow for safe working practices. Doors of enclosures and transformers must face towards the driving access unless otherwise approved. No vegetation in this work space is permitted.
3. Consult CPU Residential Electric Service Handbook for any additional required clearances to building doors, windows, fire escapes, air vents, etc.
4. Where exposed to motorized vehicles (less than 5 feet from a drivable surface), the customer must install and maintain CPU approved barrier to protect padmounted transformer and other equipment. See CPU Std UTP9.
5. Locate transformers no less than 5 feet and no more than 10 feet from a maintained drivable surface unless otherwise approved by CPU.
6. All distances shall also apply to tree trunks and major root systems.

Rev. 2 - Corrected measurement points and removed conductor location note.

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CONSTRUCTION STANDARDS

PADMOUNT TRANSFORMER CLEARANCES

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1	5/30/07	LB	AH
2	11/10/16	CM	DK
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