

**STANDARDS PRESENTATION
TO
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

PROPOSED STATE STANDARD,
TITLE 8, DIVISION 1, CHAPTER 4

Amend Section 2940.2 to read:

§Section 2940.2. Clearances

(a) No employee shall be permitted to approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in Table 2940.2-1 through Table 2940.2-3 unless:

(1) The employee is insulated or guarded from the energized part (gloves or gloves with sleeves rated for the voltage involved shall be considered insulation of the employee from the energized part), or

(2) The energized part is insulated or guarded from the employee and any other conductive object at a different potential.

(b) When performing work with live line tools, minimum clear distances in Table 2940.2-1 through Table 2940.2-3 shall be maintained. Conductor support tools, such as link sticks, strain carriers, and insulator cradles, shall be permitted to be used provided that the clear insulation is at least as long as the insulator string or the minimum distance specified in Table 2940.2-1 through Table 2940.2-3 for the operating voltage.

**TABLE 2940.2-1
ALTERNATING CURRENT--MINIMUM APPROACH DISTANCE**

<i>Nominal Voltage Range</i>	<i>Minimum Approach Distance</i>
<i>— (Phase to Phase)</i>	<i>—</i>
<i>— Kilovolt</i>	<i>— Phase to Ground Exposure</i>

Above 0.6 to 15	2 ft. 1 in.
Above 15 to 36	2 ft. 4 in.
Above 36 to 46	2 ft. 7 in.
Above 46 to 72.5	3 ft. 0 in.
Above 72.5 to 121	3 ft. 4 in.
Above 121 to 145	3 ft. 7 in.
Above 145 to 169	4 ft. 0 in.
Above 169 to 242	5 ft. 3 in.
Above 242 to 362	8 ft. 6 in.

<i>Nominal Voltage Range</i>	<i>Minimum Approach Distance</i>
<i>— (Phase to Phase)</i>	<i>—</i>
<i>— Kilovolt</i>	<i>— Phase to Ground Exposure</i>

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Above ~~362 to 552~~..... 11 ft. 3 in.
Above ~~552 to 765~~..... 15 ft. 0 in.

Note: Above 242 KV the ~~minimum working distance and the minimum approach distance shall be permitted to be reduced provided that such distances are not less than the shortest distance between the energized part and a grounded surface.~~

<u>Nominal Voltage in Kilovolts Phase to Phase</u>	<u>Distance</u>
	<u>Phase to Ground Exposure</u>
	<u>ft-in</u>
<u>0.6 to 15</u>	<u>2-1</u>
<u>15.1 to 36.0</u>	<u>2-4</u>
<u>36.1-46.0</u>	<u>2-7</u>
<u>46.1-72.5</u>	<u>3-0</u>
<u>72.6-121</u>	<u>3-4</u>
<u>121.1-145</u>	<u>3-7</u>
<u>145.1-169</u>	<u>4-0</u>
<u>169.1-242</u>	<u>5-3</u>
<u>242.1-362</u>	<u>8-6</u>
<u>362.1-552</u>	<u>11-3</u>
<u>552.1-765</u>	<u>15-0</u>

NOTE 1: These distances take into consideration the highest switching surge an employee will be exposed to on any system with air as the insulating medium and the maximum voltages shown.

NOTE 2: The clear live-line tool distance shall equal or exceed the values for the indicated voltage ranges.

TABLE 2940.2-2
AC LIVE-LINE WORK MINIMUM APPROACH DISTANCE
WITH OVERVOLTAGE FACTOR PHASE TO GROUND EXPOSURE

<u>Max anticipated per-unit transient over voltage</u>	<u>Distances in feet-inches</u>						
	<u>Maximum Phase to Phase Voltage in Kilovolts</u>						
	<u>121</u>	<u>145</u>	<u>169</u>	<u>242</u>	<u>362</u>	<u>552</u>	<u>800</u>
<u>1.5</u>						<u>6-0</u>	<u>9-8</u>
<u>1.6</u>						<u>6-6</u>	<u>10-8</u>

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<u>1.7</u>						<u>7-0</u>	<u>11-8</u>
<u>1.8</u>						<u>7-7</u>	<u>12-8</u>
<u>1.9</u>						<u>8-1</u>	<u>13-9</u>
<u>2.0</u>	<u>2-5</u>	<u>2-9</u>	<u>3-0</u>	<u>3-10</u>	<u>5-3</u>	<u>8-9</u>	<u>14-11</u>
<u>2.1</u>	<u>2-6</u>	<u>2-10</u>	<u>3-2</u>	<u>4-0</u>	<u>5-5</u>	<u>9-4</u>	
<u>2.2</u>	<u>2-7</u>	<u>2-11</u>	<u>3-3</u>	<u>4-1</u>	<u>5-9</u>	<u>9-11</u>	
<u>2.3</u>	<u>2-8</u>	<u>3-0</u>	<u>3-4</u>	<u>4-3</u>	<u>6-1</u>	<u>10-6</u>	
<u>2.4</u>	<u>2-9</u>	<u>3-1</u>	<u>3-5</u>	<u>4-5</u>	<u>6-4</u>	<u>11-3</u>	
<u>2.5</u>	<u>2-9</u>	<u>3-2</u>	<u>3-6</u>	<u>4-6</u>	<u>6-8</u>		
<u>2.6</u>	<u>2-10</u>	<u>3-3</u>	<u>3-8</u>	<u>4-8</u>	<u>7-1</u>		
<u>2.7</u>	<u>2-11</u>	<u>3-4</u>	<u>3-9</u>	<u>4-10</u>	<u>7-5</u>		
<u>2.8</u>	<u>3-0</u>	<u>3.5</u>	<u>3-10</u>	<u>4-11</u>	<u>7-9</u>		
<u>2.9</u>	<u>3-1</u>	<u>3-6</u>	<u>3-11</u>	<u>5-1</u>	<u>8-2</u>		
<u>3.0</u>	<u>3-2</u>	<u>3-7</u>	<u>4-0</u>	<u>5-3</u>	<u>8-6</u>		

NOTE 1: The distance specified in this table may be applied only where the maximum anticipated per-unit transient overvoltage has been determined by engineering analysis and has been supplied by the employer. Table 2940.2-1 applies otherwise.

NOTE 2: The distances specified in this table are the air and live-line tool distances.

TABLE 2940.2-2
TABLE 2940.2-3
**DC LIVE-LINE WORK MINIMUM
APPROACH DISTANCE
WITH OVERVOLTAGE FACTOR**

Maximum anticipated per-unit transient overvoltage	Distance in feet-inches Maximum line-to-ground voltage in kilovolts				
	250	400	500	600	750
1.5 or lower	3-8	5-3	6-9	8-7	11-10
1.6	3-10	5-7	7-4	9-5	13-1
1.7	4-1	6-0	7-11	10-3	14-4
1.8	4-3	6-5	8-7	11-2	15-9

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NOTE 1: The distances specified in this table may be applied only where the maximum anticipated per-unit transient overvoltage has been determined by engineering analysis and has been supplied by the employer. However, if the transient overvoltage factor is not known, a factor of 1.8 shall be assumed.

NOTE 2: The distances specified in this table are the air, ~~bare hand~~, and live-line tool distances.

(c) Minimum approach distance (Tables 2940.2-1 through 2940.2-3) shall be adjusted to account for work locations above 3,000 feet using altitude correction factors (Table 2940.2-4).

TABLE 2940.2-4
ALTITUDE CORRECTION FACTOR

<u>Altitude (ft)</u>	<u>Correction Factor</u>
<u>Sea level to 3000</u>	<u>1.00</u>
<u>3,001 to 4,000</u>	<u>1.02</u>
<u>4,001-5,000</u>	<u>1.05</u>
<u>5,001-6,000</u>	<u>1.08</u>
<u>6,001-7,000</u>	<u>1.11</u>
<u>7,001-8,000</u>	<u>1.14</u>
<u>8,001-9,000</u>	<u>1.17</u>
<u>9,001-10,000</u>	<u>1.20</u>
<u>10,001-12,000</u>	<u>1.25</u>
<u>12,001-14,000</u>	<u>1.30</u>
<u>14,001-16,000</u>	<u>1.35</u>
<u>16,001-18,000</u>	<u>1.39</u>
<u>18,001-20,000</u>	<u>1.44</u>

NOTE 1: Minimum approach distances from Table 2940.2-1 through Table 2940.2-3 shall be multiplied to the corresponding correction factor in Table 2940.2-4 to obtain the correct minimum approach distance, adjusted to account for higher altitudes.

NOTE 2: The data used to formulate this was obtained from test data taken with standard atmospheric condition. Standard atmospheric conditions are defined as temperatures above freezing, wind less than 15mph, unsaturated air, normal barometer (30 inches of mercury at sea level), uncontaminated air, and clean and dry insulators. If standard atmospheric conditions do not exist, extra care must be taken.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Amend Section 2940.7 to read:

§Section 2940.7. Mechanical Equipment.

(c) Derrick Trucks, Cranes and Other Lifting Equipment.

(1) Derrick trucks, cranes and other lifting equipment shall comply with Articles 91 through ~~100~~ 101 of the General Industry Safety Orders except:

~~(A) as stated in Section 2946 of these orders relating to clearance (for clearances in this section see Section 2940.2(b) Table 2940.2), and~~

(A) Section 2946, which contains provisions to prevent accidents due to overhead high voltage lines.

(B) Section 2940.2, which prescribes minimum approach distances for qualified electrical workers performing work.

~~(B)~~ (C) ~~(C)~~ (C) ~~Derrick trucks (electric line trucks) shall not be required to comply with ANSI B30.5 and B30.6 as referenced in Section 4884, General Industry Safety Orders, Title 8, California Code of Regulations.~~

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Amend Section 8602 to read:

§8602. General.

(h) Approach Distances to Exposed Energized Overhead Power Lines or Parts. The employer shall require that no employee approaches or takes any conductive object closer to any electrically energized overhead power lines or parts than prescribed in Table TC-1, unless:

Table TC-1
Alternating Current - Approach Distances to Exposed Energized Overhead Power Lines and Parts by Qualified Telecommunication Workers

<i>Nominal Voltage Range (Phase to Phase, RMS)</i>	<i>Approach Distances (Inches)</i>
300 V and less	Avoid contact
Over 300 V, not over 600 V	12
Over 600 V, not over 2kV	18
Over 2kV, not over 15kV	24
Over 15kV, not over 37kV	36
Over 37kV, not over 87.5kV	42
Over 87.5kV, not over 121kV	48
Over 121kV, not over 140kV	54

NOTE: Authority and reference cited: Section 142.3, Labor Code.

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Amend Section 8610 to read:

§8610. Vehicle-Mounted Material Handling Devices and Other Mechanical Equipment (General).

(b) The employer shall require that tests shall be made at the beginning of each shift by a qualified person to ensure the vehicle brakes and operating systems are in proper working condition.

(c) Prior to derrick operation, the parking brake must be set and the stabilizers extended if the vehicle is so equipped. When the vehicle is situated on a grade, at least two wheels must be chocked on the downgrade side.

~~(e)~~ (d) All rubber-tired, self-propelled scrapers, rubber-tired front-end loaders, rubber-tired dozers, agricultural and industrial tractors, crawler tractors, crawler-type loaders, and motor graders, with or without attachments, that are used in telecommunications work shall have roll-over protective structures, when required, in accordance with Article 25 of the General Industry Safety Orders or Section 1596 of the Construction Safety Orders as applicable.

~~(d)~~ (e) Vehicle-mounted elevating and rotating work platform devices shall not be operated with any conductive part of the equipment closer to exposed energized power lines than the clearances set forth in Table TC-1 of this Article.

NOTE: Authority and reference cited: Section 142.3, Labor Code.

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Amend Section 8611 to read as:

§8611. Derrick Trucks, Cranes, and other Hoisting Equipment

(a) Derrick trucks, cranes and other hoisting equipment shall comply with Section 2940.7(c) except:

~~(a) (1) Hoisting e~~Equipment shall not be operated with any conductive part of the equipment closer to exposed energized high-voltage conductors and equipment than the clearances set forth in Table TC-1 of ~~this Article~~ Section 8602.

(b) When hoisting equipment is used to handle poles near energized high-voltage conductors and equipment, these operations shall comply with the requirements contained in Sections 8602 (h) and 8615 (i).

(c) Moving parts of equipment and machinery carried on or mounted on telecommunications vehicles shall be guarded, operated, and maintained in accordance with applicable provisions of the General Industry Safety Orders.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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Amend Section 8615 to read:

§8615. Overhead Lines.

(i) Handling Poles Near Energized High-Voltage Conductors and Equipment. Except qualified electrical workers complying with Article 36 of High-Voltage Electrical Safety Orders:

(4) Suitable insulating gloves shall be worn when handling the pole with either hands or tools, when there exists a possibility that the pole may contact an energized high-voltage conductor. Insulating gloves and equipment shall be in conformance with Section 2940.6 of the Electrical Safety Orders.

(6) Poles that are to be placed, moved or removed during heavy rains, sleet or wet snow in joint lines carrying more than 8.7kV phase to phase voltage (5kV to ground) shall be guarded or otherwise prevented from direct contact with overhead energized power conductors.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.