

# ***Errata to*** **2012 Edition** **National Electrical Safety Code®**

*Correction Sheet*  
**Issued 29 April 2013**

Copyright © 2013 by the Institute of Electrical and Electronics Engineers, Inc.  
All rights reserved. Published 2013. Printed in the United States of America.

This correction sheet may be freely reproduced and distributed in order to maintain the utility and currency of the underlying Standard. This correction sheet may not be sold, licensed, or otherwise distributed for any commercial purposes whatsoever. The content of this correction sheet may not be modified.

The following corrections should be made:

**Page 2:** There is a typographical error in Rule 011A4. The sentence should contain a closing parenthesis.

4. Street and area lights that provide a supply of lumens where these facilities are supplied by underground or overhead conductors installed and/or maintained under the exclusive control of utilities (including their authorized contractors or other qualified persons).

**Page 33:** There is an error in Rule 97D2. The last sentence should refer to Rule 93D3.

**Page 90:** There is an error in Table 230-1. The heading for Zone 4 should read “Warm islands located at 0 to 25 degrees latitude.”

**Page 90:** The values in the last two columns of Table 230-1 should not be underlined.

**Pages 94 and 98:** There is an error in Table 232-1 (m) and Table 232-1 (ft). References to Footnote 25 should be references to Footnote 26.

**Page 96:** There is an error in item (f) of Footnote 10 that appears at the end of Table 232-1 (m). Item (f) should contain “215C4 or.”

- (f) Grounded guys, guys meeting Rules 279A1 and 215C4 or 215C5 exposed to 0 to 300 V 2.9

**Page 96:** There is an error in Footnote 15 that appears at the end of Table 232-1 (m). The word “215C5” should be replaced with “215C4.”

<sup>15</sup>The portion of anchor guys below the lowest insulator meeting Rules 279A1 and 215C4 may have the same clearance as grounded guys.

**Page 97:** There are errors that appear at the end of Table 232-1 (m). Although Footnote 25 was deleted from the previous version, it should have been listed as follows. Therefore, the inserted footnote should have been shown as Footnote 26.

<sup>25</sup>This footnote not used in this edition.

<sup>26</sup>When designing a line to accommodate oversized vehicles, these clearance values shall be increased by the difference between the known height of the oversized vehicle and 4.3 m.

**Pages 97, 98, and 99:** There is an error in Table 232-1 (ft). The cells in columns 2 and 5 of the header row should state “(ft)” for feet and not “(m)” for meters.

Nature of surface underneath wires, conductors, or cables	Insulated communication conductors and cable; messengers; overhead shield/surge-protection wires; grounded guys; ungrounded portions of guys meeting Rules 215C4, 215C5, and 279A1 exposed to 0 to 300 V <sup>(6)(11)(15)</sup> ; neutral conductors meeting Rule 230E1; supply cables meeting Rule 230C1 (ft)	Noninsulated communication conductors; supply cables of 0 to 750 V meeting Rule 230C2 or 230C3 (ft)	Supply cables over 750 V meeting Rule 230C2 or 230C3; open supply conductors, 0 to 750 V <sup>(3)</sup> ; ungrounded portions of guys meeting Rules 215C4, 215C5, and 279A1 exposed to over 300 V to 750 V <sup>(6)(14)(15)</sup> (ft)	Open supply conductors, over 750 V to 22 kV; ungrounded portions of guys meeting Rules 215C4, 215C5, and 279A1 exposed to 750 V to 22 kV <sup>(6)(14)(15)</sup> (ft)	Trolley and electrified railroad contact conductors and associated span or messenger wires <sup>(1)</sup>	
					0 to 750 V to ground (ft)	Over 750 V to 22 kV to ground (ft)

**Page 100:** There is an error in item (f) of Footnote 10 that appears at the end of Table 232-1 (ft). Item (f) should contain “215C4 or.”

(f) Grounded guys, guys meeting Rules 279A1 and 215C4 or 215C5 exposed to 0 to 300 V 9.5

**Page 100:** There is an error in Footnote 15 that appears at the end of Table 232-1 (ft). The word “215C5” should be replaced with “215C4.”

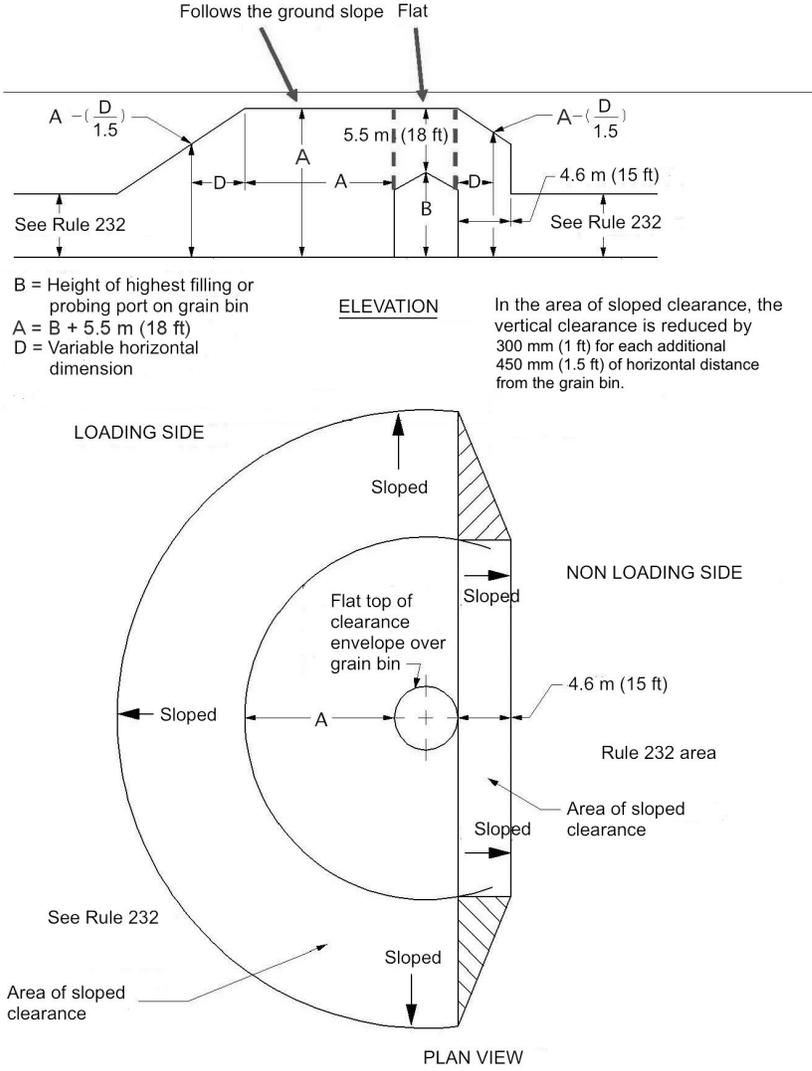
<sup>15</sup>The portion of anchor guys below the lowest insulator meeting Rules 279A1 and 215C4 may have the same clearance as grounded guys.

Although Footnote 25 was deleted from the previous version, it should have been listed as follows. Therefore, the inserted footnote should have been shown as Footnote 26.

<sup>25</sup>This footnote not used in this edition.

<sup>26</sup>When designing a line to accommodate oversized vehicles, these clearance values shall be increased by the difference between the known height of the oversized vehicle and 14 ft.

**Page129:** There are three errors in Figure 234-4(b). At the top of the figure, the two instances of “H” should read “A.” The text associated with “A” in the legend should read “B + 5.5 m (18 ft)” and not “V + 5.5 m (18 ft).”



**Figure 234-4(b)—Clearance envelope for grain bins filled by portable augers, conveyors, or elevators**

**Pages 130, 131, and 132:** There is an error in Table 234-1 (m). The cell in column 6 of the header row should contain “ungrounded equipment cases, 750 V to 22 kV.”

Clearance of	<b>Insulated communication conductors and cables; messengers; overhead shield/surge-protection wires; grounded guys; ungrounded portions of guys meeting Rules 215C4, 215C5, and 279A1 exposed to 0 to 300 V<sup>(11)(14)</sup> neutral conductors meeting Rule 230E1; supply cables meeting Rule 230C1 (m)</b>	<b>Supply cables of 0 to 750 V meeting Rule 230C2 or 230C3 (m)</b>	<b>Unguarded rigid live parts, 0 to 750 V; noninsulated communication conductors; ungrounded equipment cases, 0 to 750 V; and ungrounded portions of guys meeting Rules 215C4, 215C5, and 279A1 exposed to open supply conductors of over 300 V to 750 V<sup>(5)(14)</sup> (m)</b>	<b>Supply cables over 750 V meeting Rule 230C2 or 230C3; open supply conductors, 0 to 750 V<sup>(13)</sup> (m)</b>	<b>Unguarded rigid live parts, over 750 V to 22 kV; ungrounded equipment cases, 750 V to 22 kV; ungrounded portions of guys meeting Rules 215C4, 215C5, and 279A1 exposed to over 750 V to 22 kV<sup>(5)(14)</sup> (m)</b>	<b>Open supply conductors, over 750 V to 22 kV (m)</b>
--------------	---	--	--	--	--	--

**Pages 130, 131, and 132:** There are errors in some of the footnotes that appear in Table 234-1 (m).

- All mentions of Footnote 12 should be Footnote 14.
- All mentions of Footnote 13 should be Footnote 15.
- All mentions of Footnote 14 should be Footnote 16.
- All mentions of Footnote 15 should be Footnote 17.
- All mentions of Footnote 16 should be Footnote 18.

**Page 131:** The ^ symbol in row 1b(4), first value column of Table 234-1(m), should be replaced with 4.7 since this is a metric table.

**Page 133:** There is an error in Footnote 11 that appears at the end of Table 234-1 (m). The word “215C5” should be replaced with “215C4.”

<sup>(11)</sup>The portion of anchor guys below the lowest insulator meeting Rules 279A1 and 215C4 may have the same clearance as grounded guys.

Although Footnotes 12 and 13 were deleted from the previous version, the remaining footnotes should not have been renumbered. They should be listed as follows:

- <sup>(12)</sup>This footnote not used in this edition.
- <sup>(13)</sup>This footnote not used in this edition.
- <sup>(14)</sup>For clearances above railings, walls, or parapets around balconies, decks, or roofs, use the clearances required for row 1b(1). For such clearances where an outside stairway exists to provide access to such balconies, decks, or roofs, use the clearances required for row 2b(2).
- <sup>(15)</sup>Does not include neutral conductors meeting Rule 230E1.
- <sup>(16)</sup>These clearance values also apply to guy insulators.
- <sup>(17)</sup>It is presumed that a flag or banner is fully extended but that there is no deflection or displacement of the flagpole or other supporting structure due to wind and that the conductors, cables, or rigid live parts are not displaced by the wind. The specified clearance is measured to the point of maximum displacement of the banner or flag towards the overhead utility facility.
- <sup>(18)</sup>When designing a line to accommodate oversized vehicles, these clearance values shall be increased by the difference between the known height of the oversized vehicle and 4.3 m.

**Pages 134, 135, and 136:** There is an error in Table 234-1 (ft). The cell in column 6 of the header row should contain “ungrounded equipment cases, 750 V to 22 kV.”

Clearance of	<b>Insulated communication conductors and cables; messengers; overhead shield/surge-protection wires; grounded guys; ungrounded portions of guys meeting Rules 215C4, 215C5, and 279A1 exposed to 0 to 300 V<sup>(1)(14)</sup> neutral conductors meeting Rule 230E1; supply cables meeting Rule 230C1 (ft)</b>	<b>Supply cables of 0 to 750 V meeting Rule 230C2 or 230C3 (ft)</b>	<b>Unguarded rigid live parts, 0 to 750 V; noninsulated communication conductors; ungrounded equipment cases, 0 to 750 V; and ungrounded portions of guys meeting Rules 215C4, 215C5, and 279A1 exposed to open supply conductors of over 300 V to 750 V<sup>(5)(14)</sup> (ft)</b>	<b>Supply cables over 750 V meeting Rule 230C2 or 230C3; open supply conductors, 0 to 750 V<sup>(13)</sup> (ft)</b>	<b>Unguarded rigid live parts, over 750 V to 22 kV; ungrounded equipment cases, 750 V to 22 kV; ungrounded portions of guys meeting Rules 215C4, 215C5, and 279A1 exposed to over 750 V to 22 kV<sup>(5)(14)</sup> (ft)</b>	<b>Open supply conductors, over 750 V to 22 kV (ft)</b>
--------------	---	---	---	---	---	---

**Pages 134, 135, and 136:** There are errors in some of the footnotes that appear in Table 234-1 (ft).

- All mentions of Footnote 12 should be Footnote 14.
- All mentions of Footnote 13 should be Footnote 15.
- All mentions of Footnote 14 should be Footnote 16.
- All mentions of Footnote 15 should be Footnote 17.
- All mentions of Footnote 16 should be Footnote 18.

**Page 137:** There is an error in Footnote 11 that appears at the end of Table 234-1 (ft). The word “215C5” should be replaced with “215C4.”

<sup>(1)</sup>The portion of anchor guys below the lowest insulator meeting Rules 279A1 and 215C4 may have the same clearance as grounded guys.

Although Footnotes 12 and 13 were deleted from the previous version, the remaining footnotes should not have been renumbered. They should be listed as follows:

- <sup>(12)</sup>This footnote not used in this edition.
- <sup>(13)</sup>This footnote not used in this edition.
- <sup>(14)</sup>For clearances above railings, walls, or parapets around balconies, decks, or roofs, use the clearances required for row 1b(1). For such clearances where an outside stairway exists to provide access to such balconies, decks, or roofs, use the clearances required for row 2b(2).
- <sup>(15)</sup>Does not include neutral conductors meeting Rule 230E1.
- <sup>(16)</sup>These clearance values also apply to guy insulators.
- <sup>(17)</sup>It is presumed that a flag or banner is fully extended but that there is no deflection or displacement of the flagpole or other supporting structure due to wind and that the conductors, cables, or rigid live parts are not displaced by the wind. The specified clearance is measured to the point of maximum displacement of the banner or flag towards the overhead utility facility.
- <sup>(18)</sup>When designing a line to accommodate oversized vehicles, these clearance values shall be increased by the difference between the known height of the oversized vehicle and 14 ft.

**Page 138:** There is a typographical error in Table 234-2 (m). The underscore should be removed from the comma in the last sentence of the parenthetical statement below the table caption.

**Table 234-2—**

**Clearance of wires, conductors, cables, and unguarded rigid live parts from bridges**

(Voltages are phase to ground for effectively grounded circuits and those other circuits where all ground faults are cleared by promptly de-energizing the faulted section, both initially and following subsequent breaker operations. See the definitions section for voltages of other systems. Clearances are with no wind displacement except where stated in the footnotes below.

See Rules 234A, 234D1a, and 234H4.)

**Page 142:** There is an error in Footnote 2 that appears at the end of Table 234-3 (m). The word “215C5” should be replaced with “215C4.”

②The portion of anchor guys below the lowest insulator meeting Rules 279A1 and 215C4 may have the same clearance as grounded guys.

**Page 143:** There is an error in Footnote 2 that appears at the end of Table 234-3 (ft). The word “215C5” should be replaced with “215C4.”

②The portion of anchor guys below the lowest insulator meeting Rules 279A1 and 215C4 may have the same clearance as grounded guys.

**Page 166:** There is an error in Table 235-6 (mm). The cell in column 2 of row 2c should read “75” and not “3.”

c. All other	75 <sup>⑦</sup>	150 <sup>③⑦</sup>	150 <sup>③⑦</sup>	150	150 plus 10 per kV in excess of 8.7 kV	580 plus 10 per kV in excess of 50 kV
--------------	-----------------	-------------------	-------------------	-----	--	---------------------------------------

**Page 222:** There is a typographical error in Footnote 3 that appears at the end of Table 261-1. Delete the strikethrough (“~~R~~”) in the last sentence of the footnote.

③Wood and reinforced structures shall be replaced or rehabilitated when deterioration reduces the structure strength to 3/4 of that required when installed. When new or changed facilities modify loads on existing structures, the required strength shall be based on the revised loadings. If a structure or component is replaced, it shall meet the strength required by Table 261-1. If a structure or component is rehabilitated, the rehabilitated portions of the structures shall have strength greater than 3/4 of that required when installed.

**Page 230:** There is an error in Rule 279A2b(1). The sentence should contain “215C4 or.”

- (1) The guy is otherwise insulated to meet the requirements of Rules 215C4 or 215C5 and 279A1.

**Page 262:** There is a typographical error in Rule 410A3b. The exception and notes are applicable to Rule 410A3 and not Rule 410A3b.

## 410. General requirements

### A. General

3. The employer shall ensure that an assessment is performed to determine potential exposure to an electric arc for employees who work on or near energized lines, parts, or equipment.

If the assessment determines potential employee exposure, clothing made from acetate, nylon, polyester, or polypropylene shall not be worn, unless arc rated.

If the assessment determines a potential employee exposure greater than 2 cal/cm<sup>2</sup> exists (see Neal, Bingham, and Doughty [B63]), the employer shall:

- a. Perform a detailed arc hazard analysis, or use Table 410-1, 410-2, or 410-3 to determine the effective arc rating of clothing or a clothing system to be worn by employees working on or near energized lines, parts, or equipment at voltages 50 V to 800 000 V.

The arc hazard analysis shall include a calculation of the estimated arc energy based on the available fault current, the duration of the arc (cycles), and the distance from the arc to the employee.

- b. Require employees to wear clothing or a clothing system with an effective arc rating not less than the anticipated level of arc energy.

*EXCEPTION:* If the clothing or clothing system required by this rule has the potential to create additional or greater hazards than the possible exposure to the heat energy of the electric arc, then clothing or a clothing system with an effective arc rating less than that required by the this rule may be worn.

*NOTE 1:* Assessments performed to determine potential exposure to an electric arc consider the affected employee's assigned tasks and/or work activities.

*NOTE 2:* A clothing system (multiple layers) that includes an outer layer of flame resistant material and an inner layer of non-flame resistant natural fiber material has been shown to block more heat than a single layer. The effect of the combination of these multiple layers may be referred to as the *effective arc rating* (e.g., E<sub>BT</sub>, ATPV).

*NOTE 3:* Engineering controls can be utilized to reduce arc energy levels and work practices can be utilized to reduce exposure levels.

**Page 263:** There is a typographical error in Table 410-1. Delete the repeated header rows.

Equipment type	Nominal voltage range and cal/cm <sup>2</sup>		
	50 V to 250 V	251 V to 600 V <sup>(14)</sup>	601 V to 1000 V
Self-contained meters / cabinets	4 <sup>(2)</sup>	20 <sup>(4)</sup>	30 <sup>(8)</sup>
Pad-mounted transformers	4 <sup>(9)</sup>	4 <sup>(9)</sup>	6 <sup>(8)</sup>
CT meters and control wiring	4 <sup>(2)</sup>	4 <sup>(5)</sup>	6 <sup>(8)</sup>
Metal-clad switchgear / motor control centers	8 <sup>(3)</sup>	40 <sup>(6)</sup>	60 <sup>(8)</sup>
Pedestals / pull boxes / hand holes	4 <sup>(2)</sup>	8 <sup>(7)</sup>	12 <sup>(8)</sup>
Open air (includes lines)	4 <sup>(2)</sup>	4 <sup>(7)</sup>	6 <sup>(8)</sup>
Equipment type	Nominal voltage range and cal/cm <sup>2</sup>		
	50 V to 250 V	251 V to 600 V <sup>(14)</sup>	601 V to 1000 V
Network protectors	4 <sup>(10)</sup>	<sup>(11)</sup>	<sup>(11)</sup>
Panel boards—single phase (all) / three phase (≤100 A)	4 <sup>(2)</sup>	8 <sup>(12)</sup>	12 <sup>(8)</sup>
Panel boards—three phase (>100 A)	4 <sup>(2)</sup>	<sup>(13)</sup>	<sup>(13)</sup>

**Page 265:** There is a typographical error in Table 410-2. The underscore in the cell of column 1 in the first row should be removed.

1.1 to 15	5	46.5	93.0	139.5
-----------	---	------	------	-------

**Page 280:** There is a typographical error in the first sentence of Rule 441. The underlined formatting should be removed.

Employees shall not approach (within the reach or extended reach), or knowingly permit others to approach, any exposed ungrounded part normally energized except as permitted by this rule.

**Page 280:** There is an error in Rule 441A1. “Table 441-4” should be renumbered as “Table 441-2.”

Employees shall not approach or bring any conductive object within the minimum approach distance listed in Table 441-1 or Table 441-2 or distances as determined by an engineering analysis to exposed parts unless one of the following is met: