

Summary of Major Changes in the 2017 NESC Rules and Tables

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Section 1--Purpose, Scope, & Application

011A5--Clarified. The NESC applies to both underground and overhead facilities located on the line side of the service point and under exclusive control of utilities.

013B3--Clarified. When an existing installation is brought into compliance with a subsequent edition, the previously applicable edition no longer applies.

013B3--Addition. When work is to be done on an installation with an identified non-compliant condition, the work can only be done if all of the following apply: the work would neither create a new non-compliant condition or make the existing one(s) worse.

Section 2--Definitions

communication equipment, communication space, supply space, & electric supply equipment--New + Revision. New Definitions of *communication equipment*, *communication space*, and *supply space* were added to augment the revised Definition of *electric supply equipment* and, along with new Figures D-1 and D-5, to define and illustrate the *supply space*, *communication space*, and the *communication worker safety zone* that separates the two spaces. These augment earlier additions of Rules 235C4 and 238E.

fireproofing (of cables)--Deleted.

limited access highways--Addition. Private toll road operators were added to the list of entities controlling such highways.

rural districts + urban districts--Both deleted. Distinctions between rural and urban have been removed from the NESC.

sag--Revised. Sag Definitions have been simplified and the related rules have been revised accordingly.

span--Additions. New Definitions of *wind span* and *weight span* have been added to the existing definition of *span length* to reflect proper span lengths to be used with horizontal wind loading and vertical conductor and ice loading, respectively.

tension--Revised. These revisions coordinate with the revised Definitions of *sag*.

Section 3--References.

Additions, deletions, and updates.

Section 9--Grounding methods.

092C1a--New EXCEPTION. Where terrain makes installation of structures every 0.4 km (0.25 mi) impractical, four electrode connections are not required in this section--*if the messenger is of sufficient size and ampacity for the duty*

involved AND the messenger is connected at each structure in this section. Also see similar changes to 354D1g and 096C.

094B1--Revised. Stainless steel with appropriate non-corrosive properties is considered to be non-ferrous.

094B3--Relocated. Moved into Rule 094B2 and subsequent rules renumbered.

096C EXCEPTION 1--Revised. The omission of neutral ground connections in under water portions of cables continues, but grounding is required at all locations where the neutral is available to personnel.

096C EXCEPTION 2--New. The omission of neutral ground connections in underground portions of cables is added, but grounding is required at all locations where the neutral is available to personnel.

096C EXCEPTION 3--New. The omission of neutral ground connections in where terrain makes it impractical to locate structures, but grounding is required at structure locations within the section.

096G--Clarified. Bonding between supply and neutral grounding conductors where both exist on the same structure.

Part 1--Electric Supply Stations.

110A1--Clarified. Where a station is entirely enclosed by walls and a roof, a safety sign is only required at ground level entrances. Where entrance is gained through sequential doors, the safety sign should be located at the inner door.

110A--Addition. No fence, etc., can be connected to or located within 2.8 m (6.0 ft) of an electric supply station fence without concurrence of the station owner.

110A2--Revised. When a solid portion of fence is used to limit access to energized parts within a supply station, the solid portion must be both wide enough and deep enough that the distance from a side or bottom edge is not less than the value of R from Table 110-1. The solid portion no longer must go down to the ground.

Table 110-1--Reformatted. The original numbers shown in tenths of feet were translated into feet and inches and now match the format of Table 124-1'

114--Deleted. The rule about fire extinguishing equipment had no specific requirements.

180B--Revised. The former 600 V limits were changed to 1000 V.

Part 2--Overhead General.

214A5--Clarified. The life protected by the rule is *human* life.

215C1--Clarified. Metallic standoff brackets or straps, metal crossarm braces, metal through-bolts, etc., are not considered to be metal frames, cases, or hangers of equipment do not require grounding. Likewise, a metal truss reinforcing a wood pole does not have to be grounded. If items that were historically not grounded on a pole are now to be grounded, the rules do not require retrofitting the existing ones (typical practice is to do so when next doing major work on the structure).

215C2-6--Extensively revised. Former guy insulator location requirements in Rules 215C4-6 were minimized and relocated into Rules 215C2 & 3. Requirements to located guy insulators so that they would limit their likelihood of becoming a conductive path if they became slack or broken were deleted. The requirement to limit energy to levels above 2.45 m (8.0 ft) above ground if the guy becomes slack or broken remain.

218--Revised. This rule essentially returned to its original requirement of requiring vegetation to be managed around both supply and communication lines to limit structural and clearance issues that had occurred when communication in some areas stopped vegetation management after the 1984 addition of the term **ungrounded** before **conductors**.

220B--Revised. Locations of antennas, switch handles, equipment cases, etc., as well as communication located in the supply space, were addressed.

224B2a--Revised. The requirement to have an effectively grounded sheath or shield around individual conductors of any supply circuit included within a communication cable was deleted--the sheath or shield is required around the entire communication cable. Also see 344A1.

Part 2--Overhead Clearances.

Table 232-1, FN 7 and FN8--Revised. The limitation of application of the footnote only to instances when the height of the residential building did not allow full table clearances to be met was deleted.

Table 232-1--Revised. Water clearances for rigid parts were added.

Rule 233A1a(2) EXCEPTION--Deleted. Buildings, etc., don't shelter line crossings or parallel lines from wind loading--if anything, they can create turbulence.

Rule 233C and Table 233-1--Revised. Previously, voltage adders were applied to each individual circuit (as were all original code table voltage adders). Now, the **greater of phasor-difference voltage or phase-to-ground voltage** is used to calculate voltage adders (as is done with the vertical clearances of Table 235-5 and horizontal clearances of Rule 233B).

234B--Revised. The 22 to 50 kV clearance category was deleted: the voltage adder now starts at 22 kV-to-ground. This is one of the last places where clearances were specified above 22 kV in a rule or table.

234C3d(1)--Revised. A more complete (and correct) list of items over which vertical clearances of service drops are specified is shown. Technically, a porch has a roof (to which roof clearances apply) and should not have been in this list.

234C3d(2), (3), and (4)--Revisions and additions. Previously a 900 mm (3 ft) clearance was required beside and below windows, doors, porches, decks, fire escapes, or similar locations. The rule retains that radial requirement for windows only in Rule 234C3d(2). Porches, etc., are now treated in new Rules 234C3d(2) and (3), which require a 1.5 m (5 ft) horizontal clearance **beside those items and a 900 mm (3 ft) clearance below those items**.

234E1--Revisions and additions. Which vertical clearances are to be used and where they are to be applied around **permanently installed** above-ground pools is now specified. Permanently installed above-ground pools are ones that are not intended to be moved or routinely disassembled. **New Figures 234-3(b) and 234-3(c)** were added to illustrate application of these clearances to above-ground pools.

Table 234-1, FN1--Deleted. This footnote is impractical. It is rare that any kind of installation does not need some kind of maintenance (even brick mortar needs repointing every few decades). In addition, its use can result in wind-contact issues in some circumstances.

Table 234-1, FN 3--Clarified. A ladder that uses barriers to inhibit climbing does not have to have its bottom rung more than 2.45 m (8 ft) above ground to be considered as limiting access to pedestrians.

Table 234-6--New. This new table of service drop clearances addresses (1) locations where masts are located more versus less than 1.2 m (4.0 ft) from a roof edge and (2) portions of the service drop over the roof that are within 1.8 m (6.0 ft) of the mast versus further away.

235C--Clarified. Service drops were added in the title and rule and rule language was revised appropriately.

235C2b(1)(b) & (c)--Clarified. Rule language was simplified and revised to match other changes in code definitions.

235F--Revised. The former requirement for the circuits on opposite sides of a crossarm to be of different voltage classifications was deleted.

235I--Clarifications and additions. Clearances for communication antennas located in the supply space were clarified and clearances for antennas located in the communication space were added. Both reference Table 235-6 for **radial clearances** to lines within their space. Table 235-5 is referenced for **vertical clearances** of communication antennas in the communication space up to supply lines in the supply space.

Table 235-5, FN 12--New. Clearance values for facilities in opposite positions from those usual positions shown in the table were clarified.

Table 235-6, FN 17--New. Clearances between vertical and lateral supply conductors in the supply space to communication lines in the communication space were clarified.

236D--Revised. Photovoltaic panels and power supplies were added to the items specifically prohibited from the climbing space.

238A--Revised. Photovoltaic panels, power supplies, loading coils, etc. were added to the list of items considered to be **equipment for purposes of Rule 238.**

Table 238-2--Revised. Ungrounded span wires and brackets for luminaires, traffic signals, and trolley conductors are now prohibited in the communication worker safety zone--i.e., within 1.0 m (40 in) vertically above the highest communication cable or equipment.

239G4--Clarified. Supply service drops must take off outside of the communication worker safety zone, i.e., 1.0 m (40 in) above the highest communication attachment and the same distance below the lowest one.

Part 2--Overhead Strengths and Loadings.

Table 242-1--Reformatted. Communication was moved to the left side and some items shifted vertically to match normal code protocol. A few values appear at first to have been increased, but closer inspection shows that footnotes still allow the original values. Normal code language protocol is to put the larger value in a table or rule and, if lesser values are allowed under some conditions, identify those in an **EXCEPTION** or footnote. A **New Footnote 11** addresses communication cables and service drops in the supply space.

250A1--Revised. The intent is to apply wind in an essentially horizontal plane.

250C1b--Clarified. The greatest height of the wire above ground anywhere in the span should be used.

250D--Clarified. Ice is to be applied to wires, conductors, cables, and messengers for both wind loading purposes and vertical loading purposes, but ice is not required to be applied to the structures or other supported facilities.

Figure 250-3 et al--Revised. The maps were changed to those of the 2010 version of ASCE 7.

Table 250-4--Additions. Horizontal wind pressures for 70 mph and 80 mph to be used with Rule 250D were added.

252B4--Addition. A **New NOTE** recognizes that engineering judgment may be needed to determine the controlling wind angle for structures having multiple directions of wires or large line angles. *Note that most modern pole loading software automatically checks 360 degrees of wind direction to find the worst case.*

261A2b(1)--Revised. The 2015 version of ANSI 05.1 is required for wood pole strength determinations.

261H--Revisions & additions. The original rule language was revised for simplicity. Aeolian vibration must now be considered. Some aeolian vibration mitigation devices are listed. Code users are warned that, if the specified tension limits to limit the opportunity for aeolian vibration are the only method used, they may not protect some conductors or hardware from damage due to aeolian vibration.

261K2--Addition. A **New NOTE** warns that the specified tension limits may exceed the capability of some entirely dielectric fiber-optic cables.

271--Revised. Specified requirements were deleted in favor of references to ANSI C29 standards.

274--Addition. A **New EXCEPTION** recognizes each unit of guy insulators manufactured under designs for which (1) validation tests have been run and (2) quality assurance protocols are followed do not need to be tested.

277--Addition. Strength rating percentages other than those of Table 277-1 may be used if supported by a qualified engineering study, operating experience, or manufacturer recommendations.

Table 277-1--Revised. The table was updated for ANSI C29 standards updates and additions. Further, the table now recognizes a new class of insulator manufactured to a 3 standard deviation program and allows loading of those insulators to a higher percentage than the traditional 1.2 std. dev. system. **CAUTION:** *some systematic record program needs to be used to prevent replacement of 3 std. dev. insulators with 1.2 std. dev. insulators during storm restoration or other maintenance.*

Part 3--Underground.

320B5--Revised. A lesser clearance to lines transporting flammable materials is allowed for communication cables and for supply cables of not more than 600 V with supplemental protection and agreement.

321B--Revised. The former limitations on quality of backfill were deleted in favor of a requirement to consider surface usage when backfilling to limit settling.

322B4--Clarified. The seals in and around conduits entering buildings are required on the exterior entrances and do not apply to penetrations of interior walls once inside the building.

343--Deleted. The fireproofing rule was deleted here as well as the other places in the code.

344A1--Revised. The former requirement for each supply conductor inside a communication cable to have an effectively grounded sheath or shield was deleted. The sheath or shield is now required on the outside of the communication cable.

351C6--New. The NESC now recognizes running cables in duct attached directly to a bridge.

352D2--Revised. Previously the burial depths of Table 352-1 were **considered adequate**, not **required**. Now they are **required** unless supplemental protection is used.

354D1g EXCEPTION--New. The bonding interval between supply and communication grounded conductors may now be increased if meeting the requirements would require opening a duct and/or removing the protective jacket only for that purpose. Agreement of all parties is required.

354D3--Revised. The conductance requirement of Rule 354D3a was deleted. A new **EXCEPTION under 354D3b (formerly 354D3c)** allows increased grounding intervals if opening a cable jacket or non-metallic duct would be required. Grounding is required when accessibility exists. Power grounds should be bonded with communication grounds.

355D--Revised. The seals in and around conduits entering buildings are required on the exterior entrances and do not apply to penetrations of interior walls once inside the building.

384C--Clarified. Although the rule does not require bonding communication metallic enclosures to supply pole ground located with 1.8 m (6 ft), such bonding is not prohibited.

Part 4--Work Rules.

410A3--Addition. Outer layers of clothing that can ignite and continue to burn when exposed to flames or arcs are prohibited.

410A3--New. Specifications of when full body coverings are required and when certain body parts may remain uncovered were added.

410A6--New. Training is required for personnel who work near antennas.

420K--Revised. Fall protection requirements were extensively revised. Free falls cannot exceed 0.6 m (2 ft). Information about anchorages and anchoring was added. The trigger point for requiring fall protection is now 1.2 m (4 ft), instead of the previous 3 m (10 ft).

420Q--Revised. Rule 410A6 now contains the former references to information on working around antennas. Controls are now required to mitigate exposure to radio-frequency energy sources exceeding permissible levels.

Table 431-1--Revised. Minimum approach distances for communication workers were revised for work near higher voltage power transmission line conductors.

432--Revised. Supply equipment was added to conductors in the rule that requires communication workers to stay below them.

441A1--Revised. Engineering analysis was removed from this rule. A **New EXCEPTION** was added to allow an exemption from making a personal ground connection when working on voltages less than 600 V if it is not practical, but restrictions apply. **New Definitions of reach and extended reach were added.**

441A3--Clarified. The language was revised for clarity and coordination with changes made elsewhere.

441A4--Revised. The rule was extensively revised, both for clarity and for coordination with revised OSHA requirements. New tables specify requirements both if the per-unit transient overvoltage value T has been determined and if it has not. Helpful references for calculating T were added.

Minimum Approach Distance Tables of Rule 441--Revised. MADs were revised to coordinate with recent changes in OSHA requirements.

442B--Clarified. As in other places, the change clarifies that it is **human** life that is at issue.

444C2--New. New requirements are specified when cutting in an air gap to protect employees working on lines or equipment. Tagging is required. The option of using clearances of Table 444-1 or a properly rated insulator are allowed.

Table 444-1--Revised. Revised to coordinate with changes in OSHA requirements.

NEC Appendixes.

Table A-2a of Appendix A--Addition. Reference dimensions for water areas were added for Table 232-2.

Example 5 of Appendix C--Correction. Step 3 formerly inadvertently used an incorrect input that is now corrected.

Appendix E--Revised. Revisions, deletions, and additions were made to the list of bibliographical references.