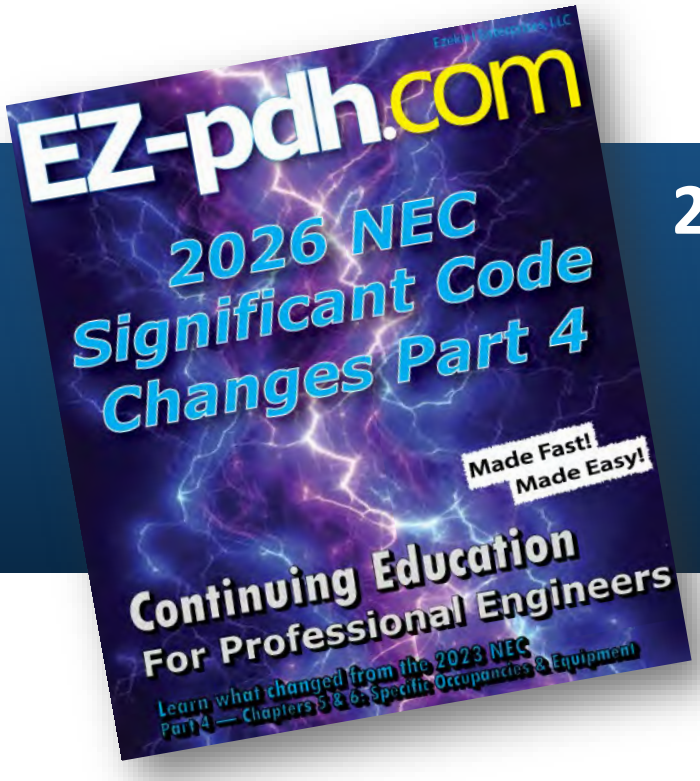

2026 NEC Significant Code Changes Part 4

Four (4) Continuing Education Hours
Course #EE2604

Approved Continuing Education for Licensed Professional Engineers

EZ-pdh.com
Ezekiel Enterprises, LLC
301 Mission Dr. Unit 571
New Smyrna Beach, FL 32170
800-433-1487
support@ez-pdh.com

Course Description:

The 2026 NEC Significant Code Changes Part 4 course satisfies four (4) hours of professional development. This fourth part covers Chapter 5 — Specific Occupancies (Articles 500–555) and Chapter 6 — Specific Equipment (Articles 600–695). Topics include hazardous location bonding consolidation, new cannabis cultivation requirements, health care facility updates, agricultural and marina voltage increases, new electric self-propelled vehicle article, EV charging updates including bidirectional provisions, swimming pool GFCI consolidation, solar PV rapid shutdown refinements, and fire pump circuit updates.

Objectives:

The primary objective of this course is to enable the student to understand the significant changes including additions, deletions, and modifications in the 2026 Edition of NFPA 70: National Electrical Code (NEC) from the 2023 Edition. Upon completion, the student will be able to:

- Identify the hazardous location bonding consolidation in Section 500.30 and the new optical radiation provision in 500.8
- Describe the new Article 512 requirements for cannabis cultivation facilities
- Apply the updated health care facility provisions in Article 517 including ESS as alternate power source
- Explain the agricultural equipotential plane requirements in Section 547.44 and the marina voltage increase in Article 555
- Describe new Article 624 for electric self-propelled vehicles and how it differs from Article 625
- Apply the 2026 EV charging updates in Article 625 including field markings, continuous load classification, and bidirectional provisions
- Identify the consolidated GFCI requirements in Article 680 for pools and aquatic facilities
- Explain the solar PV rapid shutdown refinements in Article 690 and fire pump circuit updates in Article 695

Grading:

Students must achieve a minimum score of 70% on the online quiz to pass this course. The quiz may be taken as many times as necessary to successfully pass and complete the course. A copy of the quiz questions are attached to the last pages of this document.

Table of Contents

2026 NEC Significant Code Changes Part 4

Introduction

Chapters 5 and 6 address specific occupancies and equipment types that present unique electrical hazards or requirements not covered by the general rules in Chapters 1–4. Chapter 5 covers specific occupancies — from hazardous locations requiring explosion-proof equipment to health care facilities requiring essential electrical systems. Chapter 6 covers specific equipment types including elevators, EV charging infrastructure, swimming pools, and solar PV systems. The 2026 edition made significant changes throughout both chapters, particularly in EV charging, aquatic facilities, and health care.

Chapter 5 & 6 Overview

Part 4 of this series progresses through Chapters 5 and 6, presenting the most significant changes to Articles 500 through 695. The chapters cover hazardous location bonding and optical radiation provisions, the new cannabis cultivation facilities article, health care facility essential electrical system updates, agricultural equipotential plane requirements, marina voltage increases, the new electric self-propelled vehicle article, electric vehicle charging updates including bidirectional provisions, swimming pool GFCI consolidation, solar photovoltaic rapid shutdown refinements, and fire pump circuit updates. Changes will be underlined for easy recognition and a short synopsis of the reason for each change is presented..

Chapter 5 — Specific Occupancies

Article 500 · Article 501 · Article 505 · Article 511 · Article 512 · Article 513 · Article 514 · Article 517 · Article 547· Articles 550–555

Article 500 — Hazardous (Classified) Locations

Article 500 establishes the classification system for hazardous locations. The 2026 edition made significant changes including consolidating bonding requirements, adding optical radiation provisions, and updating reconditioned equipment requirements for classified locations.

New – 500.8(G)

Optical Radiation — New Ignition Hazard Provision

> ***Change at a Glance:*** *New Section 500.8(G) addresses optical radiation sources as potential ignition sources in classified locations.*

❖ **What Changed:** New Section 500.8(G) establishes requirements for optical radiation sources that could serve as ignition sources in classified locations. This provision addresses lasers, focused light beams, fiber optic transmitters, and other sources of concentrated optical radiation that could ignite flammable gases, vapors, or dusts if their energy density is sufficient. Optical radiation sources installed in classified locations must be evaluated for ignition hazard, and those with sufficient intensity to ignite the hazardous atmosphere must be treated as a potential ignition source subject to the requirements for equipment in that classification. Listed optical radiation equipment evaluated for use in classified locations is available for applications where optical sources cannot be avoided.

❖ **Its Effect:** The growth of laser technology, fiber optic communications, and optical sensing systems in industrial facilities has created a new category of potential ignition source that previous editions of the NEC did not explicitly address. A focused laser beam or high-intensity LED in a flammable atmosphere can ignite combustible materials if the intensity is sufficient. New Section 500.8(G) ensures

that optical radiation sources are evaluated as potential ignition hazards just as electrical sparks and hot surfaces are evaluated in classified locations.

New – 500.30

Bonding Requirements — Consolidated in Article 500 for All Classified Locations

> ***Change at a Glance:*** *New Section 500.30 consolidates bonding requirements for all classified locations into a single section.*

❖ **What Changed:** New Section 500.30 was added to Article 500 to consolidate bonding requirements for all classified locations. Previously, bonding requirements for classified locations were scattered through the class-specific articles — Section 501.30 for Class I, Section 502.30 for Class II, and Section 503.30 for Class III. The 2026 NEC consolidates these bonding requirements in Article 500, which applies across all classified location classes. Permitted bonding methods include wrenchtight threaded fittings, listed bonding locknuts or bushings, bonding jumpers, and other listed bonding methods. The consolidation eliminates duplicative provisions and ensures consistent application of bonding requirements across all hazardous location classes.

❖ **Its Effect:** The consolidation of hazardous location bonding requirements in Article 500 reflects the NEC's ongoing effort to eliminate redundancy and improve consistency. Previously, inspectors and designers had to check three separate sections to determine bonding requirements, creating the risk that inconsistencies between the sections would lead to varying interpretations. The single consolidated provision in 500.30 provides one authoritative reference for bonding in all classified locations.

Revision – 500.4

Documentation Requirements — Hazardous Location Design Documentation Updated

> ***Change at a Glance:*** *Section 500.4 updated to require additional documentation for classified location electrical designs.*

❖ **What Changed:** Section 500.4 on documentation requirements for

hazardous location electrical installations was updated to require more comprehensive documentation. The revised section requires that documentation of the hazardous location classification be available to those who install, inspect, maintain, or operate the electrical equipment in classified areas. This documentation must identify the class, division or zone, and group of each classified area, and must be maintained and kept current as the facility or its processes change. The documentation requirements coordinate with NFPA 499 (Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations) and NFPA 497 (Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors).

❖ **Its Effect:** Inadequate or missing hazardous location documentation is a persistent problem in industrial facilities. When the original classification documents are lost or never created, maintenance personnel and contractors must rely on institutional knowledge that may be incomplete or incorrect. Updated documentation requirements ensure that the classification information is formally documented, maintained, and available to all parties who need it to safely install and maintain electrical equipment.

Article 501 — Class I Locations

Article 501 covers Class I hazardous locations where flammable gases or vapors may be present in sufficient quantities to produce ignitable or explosive mixtures. The 2026 edition updated wiring method options and clarified sealing requirements for modern installation practices.

Revision – 501.10

Class I Wiring Methods — Updated for Modern Installation Practices

> ***Change at a Glance:*** *Section 501.10 updated to address wiring methods in Class I locations including provisions for listed explosion-proof fittings.*

❖ **What Changed:** Section 501.10 on wiring methods in Class I hazardous locations was updated to address modern wiring method options while maintaining the rigorous requirements necessary for protection in flammable gas and vapor environments. The revision updates references to listed explosion-proof fittings, addresses the use of Type MC cable with listed fittings in Class I Division 2 locations, and provides clearer guidance on sealing requirements for conduit systems entering or leaving Class I areas. The update also addresses the use of intrinsically safe wiring methods and associated apparatus in coordination with Article 504.

❖ **Its Effect:** Modern industrial facilities increasingly use flexible wiring methods including Type MC cable and listed cord sets for certain Class I Division 2 applications where the flexibility offers significant installation and maintenance advantages. The updated Section 501.10 ensures that these methods are clearly permitted where appropriate and that the required sealing and fitting requirements are clearly specified. The sealing requirements are particularly critical — improperly installed seals allow flammable gases to migrate through conduit systems from classified areas into equipment enclosures and non-classified areas.

Article 505 — Zone Classification System

Article 505 covers the alternative zone-based classification system for hazardous locations, harmonized with international IEC standards. The 2026 edition added new protection type ‘v’ for artificially ventilated rooms, aligning U.S. practice with IEC 60079-13.

Revision – Table 13 / Article 505

Zone Classification — Protection Type 'v' Added for Artificially Ventilated Rooms

> ***Change at a Glance:*** *New protection type 'v' added to Table 13 for artificially ventilated rooms as a classified location protection technique.*

❖ **What Changed:** A new protection type 'v' was added to Table 13 (Equipment for Hazardous Classified Locations) to recognize artificially ventilated rooms as an explosion protection technique for Zone 2 and Class I Division 2 locations. Protection type 'v' involves maintaining a room or enclosure at positive pressure with clean dilution air at a sufficient flow rate to prevent accumulation of flammable gases above 25% of the lower flammable limit (LFL). Standard (non-explosion-proof) equipment can be installed in a properly designed and monitored Type 'v' ventilated room. A new subclass 'vc' designates equipment used to monitor and control the ventilation system itself, recognizing that this monitoring equipment must have appropriate protection since it operates in the environment being protected.

❖ **Its Effect:** Type 'v' protection aligns U.S. practice with the IEC 60079-13 / ANSI/UL 60079-13 standard that has been used internationally for years. The technique is particularly valuable for control rooms and analyzer shelters in petrochemical facilities where the classified area is adjacent to or in proximity to the control room. By maintaining the control room at positive pressure with clean air, standard control and monitoring equipment can be installed without the cost and complexity of explosion-proof or purged and pressurized enclosures for every piece of equipment.

Article 511 — Commercial Garages, Repair, and Storage

Article 511 covers commercial garages, repair shops, and vehicle storage facilities. The 2026 edition updated area classification guidance to address EV charging equipment installed in garages that also service internal combustion engine vehicles.

Revision – 511.3

Commercial Garages — Area Classification Updated for EV Charging Areas

> ***Change at a Glance:*** *Section 511.3 updated to address area classification for EV charging areas within commercial garages.*

❖ **What Changed:** Section 511.3 on area classification in commercial garages was updated to address the presence of EV charging equipment in garages that also service or store internal combustion engine (ICE) vehicles. The revision provides guidance on the interaction between the classified areas associated with ICE vehicles (where flammable fuel vapors may be present) and EV charging equipment (which is not itself a source of flammable vapors). The update clarifies that EV charging equipment may be installed in Division 2 areas subject to appropriate equipment selection and installation requirements, and that the presence of EV charging equipment does not create additional classified areas in areas not otherwise classified.

❖ **Its Effect:** The integration of EV charging infrastructure into commercial garages that also service ICE vehicles creates a new installation scenario that previous editions of the NEC did not specifically address. Garage areas may have classified zones associated with gasoline vapors, and EV charging equipment must be appropriate for the classification if installed in those zones. The 2026 clarification provides guidance for the mixed-fleet garage scenario that is becoming increasingly common as commercial vehicle fleets transition from ICE to electric.

Article 512 — Cannabis Cultivation Facilities (New)

New Article 512 is the first NEC article specifically dedicated to cannabis cultivation facilities, addressing the unique electrical challenges of high-humidity, chemically corrosive, heat-intensive grow room environments that did not have a dedicated NEC article in previous editions.

New – Article 512

Cannabis Cultivation Facilities — First Dedicated NEC Article

> ***Change at a Glance:*** *New Article 512 establishes the first NEC requirements specifically for cannabis cultivation facility electrical installations.*

❖ **What Changed:** New Article 512 was created to address the unique electrical challenges of cannabis cultivation facilities, which combine high humidity, chemical exposure, intense lighting loads, and dust generation in a commercial occupancy type that has grown rapidly in states where cannabis cultivation is legal. The article provides specific requirements for: wiring methods appropriate for high-humidity and chemically corrosive environments; GFCI protection for all receptacles in grow areas; equipment ratings for the wet and damp conditions created by irrigation and evapotranspiration; and conductor ampacity corrections for the elevated ambient temperatures created by high-intensity grow lighting. The article also addresses the specific hazards of nutrient solution spills, cleaning chemical exposure, and the dusty environment created during processing and drying.

❖ **Its Effect:** Cannabis cultivation facilities present electrical challenges comparable to agricultural buildings or industrial food processing facilities, but with characteristics unique to cannabis cultivation that the NEC did not previously address specifically. The intense, continuous lighting loads require careful conductor sizing and ampacity correction. The high humidity requires all electrical equipment to be rated for the damp or wet conditions encountered. The chemical exposure from nutrients, pesticides, and cleaning agents creates corrosive conditions that can damage standard electrical equipment. Article 512 provides a comprehensive, tailored framework for electrical installations in these facilities.

Note: Cannabis remains a federally controlled substance as of the 2026 NEC publication date. Article 512 provides requirements for jurisdictions where cannabis cultivation is legally permitted under state or local law.

Articles 513 & 514 — Aircraft Hangars and Motor Fuel Dispensing

Article 513 covers aircraft hangars and Article 514 covers motor fuel dispensing facilities. The 2026 edition updated area classification for electric aircraft in hangars and clarified emergency electrical disconnect requirements at fuel dispensing facilities.

Revision – 513.3

Aircraft Hangars — Area Classification Updated

> ***Change at a Glance:*** *Section 513.3 updated to clarify classified area boundaries in aircraft hangars.*

❖ **What Changed:** Section 513.3 on area classification in aircraft hangars was updated to provide clearer guidance on the boundaries of classified areas, particularly the transition zones between the pit area (Division 1), the floor area beneath aircraft (Division 2), and the areas above the wings and nose (unclassified). The revision addresses the specific classification requirements for areas where aircraft are stored, serviced, and fueled, including the interaction between classified areas and the locations of maintenance equipment, lighting, and electrical panels. The update also addresses areas used exclusively for electric aircraft, which present different hazards than conventional fuel-powered aircraft.

❖ **Its Effect:** The growth of electric aircraft — from small general aviation electric planes to larger regional electric aircraft under development — introduces a new consideration for aircraft hangar classification. Electric aircraft do not carry jet fuel or avgas, so the traditional fuel vapor hazard does not apply. However, charging infrastructure for electric aircraft may need to be in areas that have classified requirements because of proximity to conventional aircraft. The 2026 update addresses these mixed-fleet hangar scenarios.

Revision – 514.11

Motor Fuel Dispensing — Emergency Electrical Disconnect Updated

> ***Change at a Glance:*** *Section 514.11 updated to clarify emergency electrical disconnect requirements at fuel dispensing facilities.*

❖ **What Changed:** Section 514.11 on emergency electrical disconnects at fuel dispensing facilities was updated to provide clearer requirements for the location, visibility, and operation of emergency disconnects. The emergency disconnect must be located remote from the dispensers and pumps so that it can be safely activated in an emergency without approaching the hazardous area. The revision clarifies the distance requirements, the marking requirements for emergency disconnects, and the requirement that the emergency disconnect be capable of de-energizing all electrical equipment at the dispensing island. The update also addresses emergency disconnects for EV charging equipment co-located with fuel dispensing equipment at mixed-use service stations.

❖ **Its Effect:** Emergency electrical disconnects at fuel dispensing facilities are critical safety devices that must be accessible and operable by station attendants and emergency responders in fire or spill emergencies. The clearer location and marking requirements ensure that emergency disconnects can be quickly located and operated in high-stress emergency situations. The addition of guidance for EV charging equipment at mixed-use stations reflects the growing deployment of EV charging at conventional fuel stations.

Article 517 — Health Care Facilities

Article 517 covers electrical requirements for health care facilities — hospitals, nursing homes, clinics, and other facilities providing medical care. The 2026 edition made significant updates to essential electrical system requirements, patient care area protection provisions, and the recognition of modern power sources including energy storage systems.

Revision – 517.2

Definitions — Health Care Facility Definitions Updated

> ***Change at a Glance:*** *Article 517 definitions updated to align with NFPA 99 and clarify scope of applicability.*

❖ **What Changed:** Section 517.2 definitions were updated to align with the 2024 edition of NFPA 99 (Health Care Facilities Code) and to clarify which facilities are subject to Article 517 requirements. The revisions address the definition of 'patient care space' and its subdivisions (critical care areas, general care areas, and support areas), which determine the level of electrical protection required. The update also addresses the applicability of Article 517 to outpatient facilities, medical offices, dental offices, and similar facilities that provide some level of patient care but may not require the full Article 517 essential electrical system requirements.

❖ **Its Effect:** The alignment of Article 517 definitions with NFPA 99 is essential for consistent application of health care facility electrical requirements. When designers and inspectors apply Article 517, they must determine the classification of each space to identify the applicable protection requirements. Clear, updated definitions that align with NFPA 99 ensure that the space classifications used for electrical design match those used in the broader health care facility design process.

Revision – 517.30

Sources of Power — ESS Formally Recognized as Alternate Power Source for Health Care

> ***Change at a Glance:*** *Section 517.30 updated to formally recognize energy storage systems as valid alternate power sources for health care essential electrical systems.*

❖ **What Changed:** Section 517.30 on sources of power for essential electrical systems (EES) was updated to formally recognize Energy Storage Systems (ESS) as valid alternate power sources for health care essential electrical systems. Previously, the NEC's health care essential electrical system provisions focused almost exclusively on generators as the source of alternate power. The 2026 revision acknowledges that modern battery ESS — particularly large-scale lithium-ion systems and fuel cell systems — can provide the reliable alternate power required for health care essential electrical systems, subject to compliance with Article 706 (ESS) requirements and appropriate system design to ensure adequate runtime for the facility's essential loads.

❖ **Its Effect:** The recognition of ESS as an alternate power source for health care facilities reflects the significant advances in battery technology and the growing deployment of ESS in critical facility applications. For certain health care applications — particularly outpatient facilities, medical offices, and imaging centers that do not require the same extended runtime as hospitals — a properly sized ESS can provide a faster, more reliable alternative to a generator. ESS can provide power within milliseconds of a utility outage rather than the 10-second startup time required for generators, potentially providing better protection for sensitive medical equipment.

Revision – 517.34

Equipment System Branch — Delayed Automatic or Manual Connection Updated

> ***Change at a Glance:*** *Section 517.34 updated to address the equipment system branch connection timing and modern ESS integration.*

❖ **What Changed:** Section 517.34 on the equipment system branch of the essential electrical system was updated to address the timing and sequencing of connections in modern health care power systems that incorporate ESS. The equipment system branch serves large fixed equipment that does not require the immediate 10-second transfer of the emergency system branches but that must be restored to power in a defined timeframe to maintain facility operations. The revision addresses the specific connection sequencing when ESS is used as the alternate power source, recognizing that ESS can support multiple branches simultaneously without the sequential loading constraints of generator-based systems.

❖ **Its Effect:** The equipment system branch serves loads that are critical for facility operation but not immediately life-critical — surgical suites (which require power for ventilation and temperature control), elevator systems, and central medical vacuum systems. The updated sequencing requirements ensure that these loads are restored in an appropriate order without overloading the alternate power source, whether that source is a generator or ESS.

Revision – 517.40

Nursing Homes and Limited Care Facilities — Essential Electrical System Updated

> ***Change at a Glance:*** *Section 517.40 updated with revised essential electrical system requirements for nursing homes and limited care facilities.*

❖ **What Changed:** Section 517.40 on essential electrical systems for nursing homes and limited care facilities was updated to align with the 2024 NFPA 99 provisions for these facility types. Nursing homes and limited care facilities have less complex essential electrical systems than hospitals, but still require reliable alternate power for lighting, communication, and life safety systems serving their residents. The updated section clarifies the required loads for the life safety branch and the critical branch in these facilities, and addresses the recognition of ESS as an alternate power source consistent with the 517.30 update.

❖ **Its Effect:** Nursing homes and assisted living facilities house vulnerable populations who depend on reliable electrical power for environmental control,

communication, medical equipment, and egress lighting. The updated essential electrical system requirements ensure that these facilities have appropriate alternate power provisions for the specific loads that are most critical for resident safety and care, while recognizing that the full hospital-level EES is not always required for these lower-acuity facilities.

Revision – 517.70

Imaging Suite Electrical Requirements — Updated for Modern Imaging Equipment

> ***Change at a Glance:*** *Section 517.70 updated to address the electrical requirements of modern high-power imaging equipment.*

❖ **What Changed:** Section 517.70 on diagnostic imaging electrical requirements was updated to address the power requirements of modern high-power imaging equipment including MRI systems, CT scanners, PET scanners, and interventional imaging suites. Modern imaging equipment has significantly higher power demands than equipment of previous generations, including large inrush currents during imaging cycles and high sustained power demands. The updated section addresses dedicated branch circuits for imaging equipment, GFPE requirements for imaging suites, and coordination between imaging equipment power systems and the essential electrical system.

❖ **Its Effect:** The electrical requirements for modern diagnostic imaging suites are among the most demanding in health care facilities. A large MRI system may require a dedicated service with substantial capacity for the magnet cooling system, gradient amplifiers, and associated support equipment. CT scanners with high tube current settings can draw very large inrush currents that must be accommodated in the branch circuit and feeder design. The updated Section 517.70 ensures that electrical designers have clear requirements to follow for these high-power medical imaging applications.

Article 547 — Agricultural Buildings

Article 547 covers electrical installations in agricultural buildings including livestock facilities, crop storage, and farm service buildings. The 2026 edition significantly updated equipotential plane construction requirements to address stray voltage hazards that affect livestock health and productivity.

Revision – 547.44

Equipotential Planes — Agricultural Building Construction Requirements Updated

> ***Change at a Glance:*** *Section 547.44 updated with specific construction methods for equipotential planes in areas where livestock stand.*

❖ **What Changed:** Section 547.44 on equipotential planes in agricultural buildings was significantly updated to provide specific, prescriptive construction requirements for equipotential planes in areas where livestock stand. The 2026 revision recognizes four accepted construction methods for equipotential planes: (1) unencapsulated steel rebar tied with steel wire at intersections, installed in accordance with American Concrete Institute standards; (2) wire mesh (hardware cloth or welded wire mesh) installed in accordance with applicable standards; (3) bare copper grounding loops bonded to the building grounding system; and (4) combinations of the above methods. The equipotential plane must be bonded to the electrical grounding system to eliminate voltage differences between different points on the floor that cause stray voltage.

❖ **Its Effect:** Stray voltage — small voltage differences between surfaces that livestock contact simultaneously — is a significant animal welfare and productivity concern in agricultural facilities. Livestock are more sensitive to stray voltage than humans because they provide a better contact path between two conductive surfaces (floor and water bowl, or floor and metal feeder). Stray voltage as low as 0.5 volts can affect livestock behavior and milk production. The prescriptive equipotential plane construction methods in the 2026 NEC ensure consistent, effective stray voltage mitigation in agricultural buildings.

Articles 550 & 551 — Mobile Homes and Recreational Vehicles

Articles 550 and 551 cover electrical installations in mobile homes, manufactured housing, and recreational vehicles. The 2026 edition updated service equipment requirements to align with the revised Article 230 provisions including mandatory surge-protective devices and updated emergency disconnect requirements.

Revision – 550.32

Mobile Home Service Equipment — Updated for Modern Utility Connections

> ***Change at a Glance:*** *Section 550.32 updated to address service equipment requirements for modern mobile home park utility connections.*

❖ **What Changed:** Section 550.32 on mobile home service equipment was updated to address the requirements for electrical service equipment in mobile home parks and for mobile homes connected to permanent utility service. The revision addresses the interaction between mobile home service equipment requirements and the updated Article 230 service requirements, including the mandatory SPD requirement and the updated service disconnect marking and identification requirements. The update also coordinates with the revised emergency disconnect provisions to clarify how mobile home service equipment satisfies both service disconnect and emergency disconnect requirements.

❖ **Its Effect:** Mobile homes and manufactured housing are a significant segment of the U.S. housing stock, and their electrical service requirements must be kept current with the evolving NEC service requirements. The alignment of Section 550.32 with the updated Article 230 provisions ensures that mobile home service installations benefit from the same safety improvements — including mandatory SPDs and improved emergency disconnect provisions — as site-built dwelling unit services.

Article 555 — Marinas, Boatyards, and Commercial and Noncommercial Docking Facilities

Article 555 received major updates in the 2026 NEC, reflecting the dramatic changes occurring in marine electrical infrastructure with the electrification of boats and the growth of high-power shore power systems.

Revision – 555.9

Maximum Voltage — Raised from 250V to 480V for Marina Shore Power

> ***Change at a Glance:*** *Article 555 maximum voltage raised from 250 volts to 480 volts to support electric vessel charging and high-power shore power.*

❖ **What Changed:** Before 2026, the maximum permitted voltage under Article 555 was 250 volts. The 2026 NEC raises this limit to 480 volts, a fundamental change that enables the installation of high-power shore power systems for electric vessels, large commercial boats, and vessels requiring high-power connections for refrigeration, air conditioning, or live-aboard electrical needs. The 480-volt limit aligns with the standard three-phase power available from utility service and enables the installation of DC fast charging systems for electric vessels, which require substantially more power than 250-volt single-phase systems can provide. New Section 555.9 also addresses engineering design requirements for pier distribution systems and coordinating equipotential plane requirements with updated Sections 555.14 and 555.35.

❖ **Its Effect:** The electrification of marine transportation — from electric ferries to electric recreational boats and commercial vessels — requires electrical infrastructure far beyond what traditional marina systems were designed to provide. An electric ferry may require hundreds of kilowatts for charging during a brief port stop. High-power shore power at 480 volts enables the marine industry to provide the charging infrastructure needed to support electric vessel adoption.

555.9 Maximum Voltage. The voltage of systems installed to supply shore power to boats shall not exceed 480 volts, 3-phase. The voltage to ground of ungrounded conductors shall not exceed 277 volts.

New – 555.9(A)

Marina Electrical System — Engineering Design May Be Required

Change at a Glance: *New Section 555.9(A) permits the AHJ to require a professionally engineered electrical design for marina systems.*

❖ **What Changed:** New Section 555.9(A) was added to permit the AHJ to require a professionally engineered electrical design for marina pier distribution systems. This provision recognizes that marina electrical systems — particularly those operating at 480 volts with multiple slip connections, shore power pedestals, and EV charging for vessels — have become sufficiently complex that professional engineering oversight is appropriate for many installations. The section provides an exception for systems serving one- and two-family dwelling docking facilities, where the complexity and hazard level are lower than commercial marina installations.

❖ **Its Effect:** The option for AHJs to require professional engineering for marina electrical systems reflects the increasing complexity of marina electrical infrastructure. Modern marinas with 480-volt shore power, high-power charging pedestals, multiple transformer connections, and ground fault protection systems are genuinely complex electrical installations. Professional engineering oversight ensures that the electrical design is adequate for the loads, properly protected, and coordinated with the marina's specific configuration.

Revision – 555.14

Equipotential Planes — Requirements Updated and Expanded

Change at a Glance: *Section 555.14 updated to require equipotential planes in additional locations and coordinate with the 480V voltage increase.*

❖ **What Changed:** Section 555.14 on equipotential planes in marinas was

updated to expand the locations requiring equipotential planes and to coordinate with the new 480-volt maximum voltage in Section 555.9. Equipotential planes are now required within 3 feet (36 inches) of all outdoor service equipment located within 3 meters of water and for all service equipment with system voltage exceeding 250 volts to ground. The equipotential plane must be bonded to the electrical grounding system and must be constructed in a manner that prevents voltage differences between the dock surface and the water that could create electric shock drowning hazards. Two specific construction methods are recognized in the 2026 edition.

❖ **Its Effect:** Electric Shock Drowning (ESD) is a serious safety hazard in marinas where faulty wiring creates voltage gradients in the water near shore power connections. A swimmer who enters water with a voltage gradient can be paralyzed by the current flowing through their body and drown. The expanded equipotential plane requirements — particularly the extension to 480-volt systems — recognize that higher voltage systems create proportionally larger potential voltage gradients in the water, making equipotential bonding even more critical.

Revision – 555.35

Shore Power Receptacles — Updated for 480V Systems

> ***Change at a Glance:*** *Section 555.35 updated to address shore power receptacle requirements for systems operating at up to 480 volts.*

❖ **What Changed:** Section 555.35 on shore power receptacles and connections was updated to address requirements for 480-volt shore power systems. The revision specifies the connector types and ratings appropriate for 480-volt, three-phase shore power connections, which differ from the established NEMA and IEC connector standards used for lower-voltage boat shore power. The section also addresses weatherproofing requirements, ground fault protection requirements (coordinating with the consolidation in new Section 555.9), and cord and plug connection requirements for vessels connecting to 480-volt shore power pedestals.

❖ **Its Effect:** Shore power connections at 480 volts require different connector hardware than the familiar 30-ampere and 50-ampere shore power connections

used for lower-voltage recreational boats. The connector and cord requirements in Section 555.35 ensure that 480-volt connections are made safely and that the connectors are rated for the marine environment including salt air, water exposure, and the physical stresses of a dock environment.

Chapter 6 — Specific Equipment

Article 600 · Article 604 · Article 620 · Article 624 · Article 625 · Article 645 · Article 647 · Article 680 · Article 690 · Article 695

Articles 600 & 604 — Signs and Manufactured Wiring Systems

Article 600 covers electric signs and outline lighting. Article 604 covers manufactured wiring systems used in modular commercial construction and open-plan offices. The 2026 edition updated field marking requirements for modern LED-based signs and revised construction requirements for manufactured wiring systems.

Revision – 600.4

Electric Signs — Field Marking Requirements Updated

> ***Change at a Glance:*** *Section 600.4 updated to align field marking requirements with current UL 48 product standards for electric signs.*

❖ **What Changed:** Section 600.4 on required markings for electric signs was updated to align with current UL 48 (Electric Signs) product safety standards. The revision ensures that the NEC marking requirements for field-installed wiring in electric signs are consistent with the listing requirements for sign components. The update addresses the specific marking requirements for LED-based signs, which have different driver, power supply, and control requirements than fluorescent or neon-based signs of previous generations.

❖ **Its Effect:** LED lighting has fundamentally changed the design of electric signs. Modern LED signs use low-voltage DC LED strips or modules powered by listed LED drivers, rather than the high-voltage fluorescent or neon tubes of traditional signs. The updated marking requirements ensure that field wiring in LED sign installations is properly identified and that the driver input and output circuits are clearly marked to prevent confusion between the line-voltage input and the

low-voltage LED output circuits.

Revision – 604.6

Manufactured Wiring Systems — Construction and Rating Requirements Updated

> ***Change at a Glance:*** *Section 604.6 updated with revised construction requirements and ratings for manufactured wiring system assemblies.*

❖ **What Changed:** Section 604.6 on construction requirements for manufactured wiring systems was updated to address the growing use of these systems in commercial and industrial modular construction and data center applications. Manufactured wiring systems — pre-assembled wiring assemblies with pluggable connectors used for lighting, power, and data in modular and open-plan commercial spaces —racted from the increased use of these systems in high-density commercial installations. The updated requirements address the rating of connectors and conductors, listing requirements for the complete assembly, and installation requirements including support, protection, and environmental ratings.

❖ **Its Effect:** The use of manufactured wiring systems has expanded significantly from their original office modular furniture applications to include ceiling distribution systems, data center power distribution, and prefabricated electrical assemblies for modular building construction. The updated Section 604.6 ensures that the NEC requirements for these systems are appropriate for their current applications and that the listing and construction requirements address the higher power levels and more demanding environments of modern manufactured wiring applications.

Article 620 — Elevators, Dumbwaiters, Escalators, Moving Walks, Platform Lifts, and Stairway Chair Lifts

Article 620 covers electrical installations for elevators and related conveyance equipment including dumbwaiters, escalators, moving walks, platform lifts, and stairway chair lifts. The 2026 edition updated selective coordination requirements for OCPD replacements and consolidated GFCI requirements for elevator pit and machine room receptacles.

Revision – 620.62

Selective Coordination — OCPD Replacement Must Meet Selective Coordination

> ***Change at a Glance:*** *Section 620.62 updated to require that replacement OCPDs in elevator systems be re-evaluated for selective coordination.*

❖ **What Changed:** Section 620.62 on overcurrent protection in elevator systems was updated to include new subdivision (C), which requires that when an OCPD in an elevator electrical system is replaced, the replacement OCPD must be evaluated and confirmed to achieve selective coordination with both supply-side and load-side devices. Selective coordination ensures that a fault in one elevator circuit does not trip the overcurrent device protecting other elevator circuits or the feeder serving multiple elevators. The requirement for re-evaluation upon replacement prevents degradation of the system's selective coordination when maintenance replacements are made.

❖ **Its Effect:** Selective coordination in elevator systems is critical for life safety. Elevators in hospitals, high-rise buildings, and other occupancies are designated for use by firefighters and must remain operational during fire emergencies. If a fault in one elevator trips the OCPD for all elevators, firefighter access to upper floors may be compromised during the most critical phase of a fire emergency. Requiring selective coordination verification upon OCPD replacement ensures that the original coordination is maintained throughout the elevator system's service life.

Revision – 620.51

Elevator Receptacle and Lighting Outlets — GFCI Requirements Updated

> ***Change at a Glance:*** *Section 620.51 updated to consolidate and clarify GFCI protection requirements for elevator pit and machine room receptacles.*

❖ **What Changed:** Section 620.51 on receptacles in elevator pits and machine rooms was updated to consolidate and clarify GFCI protection requirements. Receptacles in elevator pits and machine rooms must be GFCI protected. The 2026 revision coordinates with the Article 422 relocation of the elevator sump pump GFCI requirement and ensures that all receptacles in elevator equipment spaces are consistently protected. The update also addresses the specific GFCI class requirements for different elevator equipment space types.

❖ **Its Effect:** Elevator pits and machine rooms are confined, often damp spaces where maintenance personnel must work with electrical test equipment and tools. GFCI protection for receptacles in these spaces protects maintenance workers from shock hazards in the challenging conditions of elevator pit maintenance.

Article 624 — Electric Self-Propelled Vehicles (New)

New Article 624 was created for the 2026 NEC to address non-highway electric self-propelled vehicles (ESVs). This is a companion article to Article 625 (highway EVs) and provides tailored requirements for the distinctly different charging infrastructure and safety requirements of industrial and commercial non-highway electric vehicles.

New – Article 624

Electric Self-Propelled Vehicles — New Dedicated Article for Non-Highway EVs

> ***Change at a Glance:*** *New Article 624 establishes NEC requirements for charging and power export for non-highway electric self-propelled vehicles.*

❖ **What Changed:** New Article 624 covers the electrical supply equipment for non-highway electric self-propelled vehicles (ESVs) including industrial forklifts, airport ground support vehicles, golf carts, warehouse automated guided vehicles, electric wheelchairs, and similar equipment. The article establishes requirements for ESVSE (Electric Self-Propelled Vehicle Supply Equipment) — the charging stations for these vehicles — and ESVPE (Electric Self-Propelled Vehicle Power Export Equipment) for vehicles capable of exporting stored energy. Key requirements include: listing requirements for ESVSE; GFCI protection for ESVSE in locations accessible to personnel; installation requirements for ESVSE in hazardous locations such as battery charging areas; and disconnecting means requirements. The article parallels the structure of Article 625 but addresses the distinctly different applications and environments of industrial non-highway vehicle charging.

Its Effect: The creation of Article 624 resolves the long-standing ambiguity about which NEC article governed charging equipment for industrial electric vehicles. Article 625 was technically scoped to highway electric vehicles, but it was routinely applied to industrial forklift charging equipment by default. Industrial ESV charging environments differ significantly from passenger EV charging: forklift charging areas may have hazardous atmospheres from battery off-gassing; airport ground support vehicles may be charged in aircraft hangars with classified areas; warehouse charging stations may have multiple high-power chargers in close proximity. Article

624 provides requirements tailored to these industrial charging environments.

Article 625 — Electric Vehicle Power Transfer Equipment

Article 625 received extensive updates in the 2026 NEC, reflecting the rapid growth of EV adoption and the emergence of bidirectional charging technology. The changes address new field marking requirements, continuous load classification, updated GFCI requirements, and the new provisions for V2G and V2H bidirectional charging.

New – 625.5

Field Markings — EVSE Must Display Supply Characteristics and SCCR

> ***Change at a Glance:*** *New Section 625.5 requires EVSE to be field-marked with supply voltage, amperage, and short-circuit current rating.*

❖ **What Changed:** New Section 625.5 establishes field marking requirements for electric vehicle supply equipment (EVSE). All EVSE must have a field-applied label identifying the supply voltage, supply amperage, and Short-Circuit Current Rating (SCCR) of the equipment. The marking must be visible and legible after installation — not hidden behind panels or in locations inaccessible during normal inspection. The SCCR marking is particularly important as it enables AHJs and maintenance personnel to verify that the EVSE is rated for the available fault current at its installation point.

❖ **Its Effect:** EVSE field markings serve multiple safety and compliance purposes. The voltage and amperage markings enable inspectors to quickly verify that the EVSE is connected to the appropriate branch circuit. The SCCR marking enables verification that the EVSE has adequate short-circuit interrupting capacity for the fault current available at the installation location — a critical safety requirement that was previously difficult to verify without the marking. As EVSE is increasingly installed in locations with significant available fault current (commercial parking garages with large transformers, for example), SCCR verification becomes more important.

> 625.5 Field Markings. EVSE shall be provided with a label identifying the supply circuit voltage, maximum ampere rating, and short-circuit current rating (SCCR). The label shall be visible after installation.

Revision – 625.41

EVSE Loads — Formally Classified as Continuous

> ***Change at a Glance:*** *Section 625.41 explicitly classifies EVSE loads as continuous loads subject to the 125% sizing factor.*

❖ **What Changed:** Section 625.41 was revised to explicitly classify EVSE loads as continuous loads for the purpose of conductor and OCPD sizing. EV charging is inherently a continuous load — charging sessions typically last 30 minutes to several hours, well beyond the 3-hour threshold for continuous load classification. Despite this obvious classification, there was ambiguity in previous NEC editions about whether the 125% continuous load factor applied to EVSE branch circuits. The 2026 revision eliminates this ambiguity by explicitly stating that EVSE loads are continuous and that the 125% factor applies to all conductors and OCPDs serving EVSE.

❖ **Its Effect:** The continuous load classification of EVSE has a direct impact on conductor and OCPD sizing. A 48-ampere EVSE that is classified as a continuous load requires a branch circuit and OCPD rated for at least 60 amperes (48 x 125% = 60). Without the explicit continuous load classification, some installations used smaller conductors and OCPDs that were adequate for the nameplate current but not for the sustained continuous operation. The 2026 clarification ensures that all EVSE installations are correctly sized for continuous operation.

> 625.41 EVSE as Continuous Load. EVSE shall be considered a continuous load for the purpose of sizing conductors, overcurrent protective devices, transformers, and other equipment supplying EVSE.

Revision – 625.42

Service and Feeder Sizing — Power Control System Integration Recognized

> ***Change at a Glance:*** *Section 625.42 updated to explicitly recognize Power Control Systems for managing EVSE loads on services and feeders.*

❖ **What Changed:** Section 625.42 on service and feeder sizing for EVSE installations was updated to explicitly recognize Power Control Systems (PCS) as an accepted method for managing EVSE loads within service and feeder capacity. Previously referenced as 'Energy Management Systems' in load-limiting contexts, the 2026 NEC uses the new 'Power Control System (PCS)' terminology throughout. A service or feeder does not need to be sized for the full nameplate load of all connected EVSE if a listed PCS is installed that prevents the total EVSE demand from exceeding the service or feeder rating. The PCS must comply with the requirements of Article 130, Part II.

❖ **Its Effect:** The PCS provision in Section 625.42 is the key to making large-scale EVSE installations economically feasible in existing buildings. A commercial building with a 400-ampere service that wants to install 20 Level 2 EVSE would face an impossible math problem without load management: 20 x 48A x 125% = 1200 amperes of required service capacity. With a listed PCS that limits total EVSE demand to 400 amperes — by managing charging rates dynamically across all 20 chargers — the existing service can accommodate all 20 EVSE without a service upgrade. The PCS makes large-scale electrification of transportation feasible within existing electrical infrastructure.

Revision – 625.43

Disconnecting Means — Bidirectional EVSE Disconnects Updated

> ***Change at a Glance:*** *Section 625.43 updated to address disconnecting means for bidirectional EVSE systems capable of exporting power.*

❖ **What Changed:** Section 625.43 on disconnecting means for EVSE was updated to address the requirements for bidirectional EVSE that can export power from the vehicle battery to the premises wiring (V2H — vehicle-to-home) or to the

utility grid (V2G — vehicle-to-grid). When EVSE is capable of operating in export mode, the disconnecting means must be capable of isolating the EVSE from both the utility supply and from any connected vehicle that may be exporting power. The disconnect must prevent backfeed from the vehicle battery into building circuits when the disconnect is in the open position. Requirements for lockout capability and for disconnecting means accessible to emergency personnel were also updated.

❖ **Its Effect:** Bidirectional EVSE creates a new safety consideration: a vehicle battery connected in export mode makes the vehicle an active power source that can energize building wiring even when the utility service disconnect is open. For firefighters and utility workers, this creates the same hazard as any on-site generation source — the possibility of encountering energized conductors they believe to be de-energized. The updated disconnecting means requirements ensure that bidirectional EVSE can be completely isolated from both the utility supply and the vehicle's stored energy.

Revision – 625.54

GFCI Protection — Specific Classes Required for Different EVSE Applications

> ***Change at a Glance:*** *Section 625.54 updated to specify SPGFCI classes required for indoor, outdoor, and marine EVSE.*

❖ **What Changed:** Section 625.54 on GFCI protection for EVSE was updated to specify the appropriate SPGFCI class for different EVSE installation locations. The 2026 NEC's new SPGFCI class definitions (Classes A, B, C, D, and E from Article 100) enable the code to specify protection levels appropriate to different shock risk environments: Class A (4–6 mA trip) for standard EVSE in indoor and outdoor locations; Class B for marine EVSE near water where the combined hazard of electricity and water requires enhanced protection; and Class E for higher-voltage EVSE applications exceeding 300V to ground. The class-specific requirements ensure that the protection level is matched to the shock hazard presented by the specific installation location and voltage.

❖ **Its Effect:** The class-specific GFCI requirements for EVSE reflect the variety of

EVSE installation environments. A Level 2 EVSE in a covered parking garage presents different shock hazards than a DC fast charger near a marina or a high-voltage V2G system in an industrial setting. The new SPGFCI class framework enables the NEC to specify the appropriate protection level for each scenario rather than applying aone-size-fits-all Class A GFCI requirement to all EVSE installations regardless of voltage or location.

Revision – 625.44

Equipment Connection — Connector Requirements for Higher Voltage EVSE

> ***Change at a Glance:*** *Section 625.44 updated to address connector requirements for EVSE operating at higher voltages.*

❖ **What Changed:** Section 625.44 on equipment connections for EVSE was updated to address connector and cord requirements for higher-voltage EVSE, including DC fast charging systems operating at up to 1000 volts DC and AC charging systems at 480 volts. The revision specifies that connectors for higher-voltage EVSE must be listed for the specific voltage and current rating of the system and must be specifically designed to prevent accidental connection of higher-voltage connectors to lower-voltage charging inlets and vice versa. The update coordinates with the new SPGFCI class requirements in Section 625.54 for higher-voltage EVSE systems.

❖ **Its Effect:** Higher-voltage DC fast charging systems use standardized connector formats (CCS, CHAdeMO, NACS/Tesla) that are physically different from lower-voltage AC charging connectors, providing inherent protection against mismatched connections. However, the listing requirements for these connectors must ensure they are evaluated for the specific voltage, current, and environmental conditions of their installed location. The Section 625.44 update ensures that listed connectors are required for all EVSE connection points.

Articles 645 & 647 — IT Equipment and Sensitive Electronic Equipment

Article 645 covers information technology equipment rooms and Article 647 covers sensitive electronic equipment requiring special power quality. The 2026 edition updated wiring method requirements for modern data center power distribution configurations including overhead busway systems.

Revision – 645.5

IT Equipment Rooms — Wiring Methods Under Raised Floors Updated

> ***Change at a Glance:*** *Section 645.5 updated to address wiring methods for modern data center raised floor and overhead bus duct configurations.*

❖ **What Changed:** Section 645.5 on wiring methods permitted in information technology equipment (IT equipment) rooms was updated to address modern data center power distribution configurations. Data centers increasingly use overhead busway systems and high-density power distribution units (PDUs) rather than the under-floor cable tray systems traditionally associated with IT equipment rooms. The revision addresses listed overhead power distribution equipment, including the busway tap boxes and PDU configurations common in colocation data centers and enterprise data centers. The update also coordinates with the emergency shutdown requirements for IT equipment rooms when certain hazardous conditions are detected.

❖ **Its Effect:** The shift from under-floor to overhead power distribution in data centers represents a fundamental change in how large-scale computing infrastructure is powered. Overhead busway provides better airflow management, easier reconfiguration, and higher power density than under-floor cable systems. The updated Section 645.5 ensures that the NEC requirements for IT equipment rooms accommodate these modern power distribution methods while maintaining the safety provisions appropriate to high-density electrical installations.

Article 680 — Swimming Pools, Fountains, and Similar Installations

Article 680 received significant updates in the 2026 NEC, particularly in the consolidation of GFCI requirements and the expansion of protection to three-phase circuits. Electric shock drowning prevention remains the primary driver of Article 680 requirements.

New – 680.5

GFCI and SPGFCI Protection — Consolidated in One Section

> ***Change at a Glance:*** *New Section 680.5 consolidates all GFCI and SPGFCI protection requirements for pools, spas, and similar installations.*

❖ **What Changed:** New Section 680.5 was added to consolidate all GFCI and SPGFCI protection requirements for swimming pools, spas, hot tubs, and similar aquatic installations into a single section. Previously, protection requirements were scattered throughout Article 680 in various subdivisions, making it difficult to verify that all applicable protection requirements had been met. The consolidated section specifies the SPGFCI class required for each application: Class A (4–6 mA) for receptacles within 20 feet of the pool and for general pool area equipment; Class B for underwater luminaires and equipment in direct water contact; and specific classes for other equipment based on the shock hazard presented. New Subdivision (B) extends GFCI protection to three-phase circuits rated 150 volts or less to ground serving equipment near pools.

❖ **Its Effect:** The consolidation of GFCI requirements in Section 680.5 dramatically improves the usability of Article 680 for designers and inspectors. Rather than hunting through multiple subdivisions to find all applicable protection requirements, the complete protection framework for a pool installation can be found in one place. The extension of GFCI to three-phase circuits addresses modern pool installations that use three-phase pumpmotors, filtration equipment, and commercial pool heating systems — equipment types that were not contemplated when Article 680's GFCI requirements were originally developed.

680.5(B) Three-Phase Circuits. GFCI protection shall be provided for all three-phase circuits that supply equipment operating at 150 volts or less to ground where the equipment is located within the areas specified in this article.

Revision – 680.22

Luminaires, Lighting Outlets, and Ceiling Fans — GFCI Class Requirements Updated

Change at a Glance: *Section 680.22 updated to specify SPGFCI classes for luminaires and lighting near pools.*

❖ **What Changed:** Section 680.22 on luminaires, lighting outlets, and ceiling fans near pools was updated to specify the appropriate SPGFCI class for each type of lighting installation in pool areas. Luminaires installed within 5 feet of the pool edge and within 12 feet of the water surface must be GFCI protected with the appropriate class for the specific installation. Wet niche luminaires (underwater lighting) require the most protective class due to their direct water contact. Deck-mounted luminaires and above-water luminaires within the specified distances require Class A protection as a minimum. The revised section also addresses the use of low-voltage landscape lighting near pools and the protection requirements for LED pool lighting systems.

❖ **Its Effect:** Pool lighting safety has improved significantly with LED technology, which operates at lower voltages than the traditional 12-volt incandescent pool lights. However, even low-voltage luminaires present shock hazards when they fail or are damaged. The class-specific GFCI requirements ensure that protection is appropriate for each type of pool luminaire, with the highest protection levels required for equipment in direct water contact.

Revision – 680.26

Equipotential Bonding — Requirements Updated and Harmonized

> ***Change at a Glance:*** *Section 680.26 updated to harmonize with agricultural (547.44), marina (555.14), and natural body of water (682.33) bonding requirements.*

❖ **What Changed:** Section 680.26 on equipotential bonding for pools was updated to harmonize the pool bonding requirements with the similar bonding provisions in Sections 547.44 (agricultural buildings), 555.14 (marinas), and 682.33 (natural bodies of water). The harmonization creates a consistent framework for equipotential bonding wherever the interaction between electrical systems and water creates shock hazards. The copper bonding conductor must be a minimum of 8 AWG solid copper, and it must connect all metallic parts within 5 feet of the pool interior — metal ladders, pool drains, underwater luminaire niches, pumps and heaters, and the reinforcing steel in the pool shell.

❖ **Its Effect:** The harmonization of equipotential bonding requirements across aquatic and agricultural applications reflects the NEC's recognition that the underlying electrical safety principle is the same in all these applications: eliminate voltage differences between conductive objects that humans or animals contact simultaneously. A consistent set of requirements across these articles makes it easier for inspectors and designers to apply the correct provisions and reduces the likelihood of applying requirements from the wrong article to a specific installation scenario.

Revision – 680.21

Electric Motors — GFCI Protection for Pool Pump Motors

> ***Change at a Glance:*** *Section 680.21 updated with GFCI protection requirements for pool circulating pump motors.*

❖ **What Changed:** Section 680.21 on electric motors for pools was updated to address GFCI protection requirements for pool circulating pump motors. The revision coordinates with the new Section 680.5 to specify the appropriate SPGFCI

class for pump motor circuits based on the voltage and proximity to water. The update also addresses the specific requirements for variable-speed pump motors, which have become common in residential and commercial pools for energy efficiency. Variable-speed pump motors include inverter drive electronics that may have higher leakage current than single-speed motors, which can nuisance-trip standard Class A GFCIs.

❖ **Its Effect:** Variable-speed pool pump motors represent an energy efficiency advance — they can reduce pool pump energy consumption by 70% or more compared to single-speed pumps. However, their integrated inverter drives generate higher ground leakage currents than traditional single-speed motors. The updated GFCI class requirements for pool pump motors ensure that the protection level is appropriate for the specific motor type, preventing nuisance tripping of pool pump GFCI protection from variable-speed drives while maintaining personnel protection.

Article 690 — Solar Photovoltaic Systems

Article 690 covers solar photovoltaic (PV) systems. The 2026 edition refined rapid shutdown requirements, updated maximum voltage provisions, and addressed modern inverter technology and bifacial module characteristics.

Revision – 690.7

Maximum Voltage — Updated for Bifacial Modules and Modern Array Configurations

> ***Change at a Glance:*** *Section 690.7 updated to address maximum voltage calculations for bifacial PV modules and modern array configurations.*

❖ **What Changed:** Section 690.7 on maximum voltage in PV systems was updated to address the voltage characteristics of bifacial PV modules, which can generate higher open-circuit voltage (Voc) under certain lighting conditions than equivalent monofacial modules. Bifacial modules receive light on both sides — direct sunlight on the front and reflected light on the back — resulting in higher power output and potentially higher Voc under high-albedo conditions. The updated section provides guidance on how to calculate the maximum system voltage for arrays using bifacial modules, including the appropriate temperature correction factors and the consideration of bifacial gain in voltage calculations. The section also addresses voltage calculations for tracking arrays that present different cell temperatures and output characteristics than fixed-tilt arrays.

❖ **Its Effect:** Bifacial PV modules have become increasingly common as module costs have decreased and efficiency has improved. An array of bifacial modules can exceed 1000 volts DC under certain conditions if the voltage calculation does not account for the bifacial gain. The updated Section 690.7 ensures that system designers correctly account for bifacial characteristics when sizing conductors, OCPDs, and inverters for the maximum system voltage the array can produce.

Revision – 690.12

Rapid Shutdown — Zone-Based Approach Refined

> ***Change at a Glance:*** *Section 690.12 rapid shutdown provisions refined to clarify zone boundaries and MLPE requirements for dwelling structures.*

❖ **What Changed:** Section 690.12 on rapid shutdown of PV systems was refined to clarify the zone-based approach introduced in the 2020 NEC. The rapid shutdown requirement exists to protect firefighters by reducing the voltage and energy in PV circuits on a building to safe levels when the rapid shutdown switch is activated. The 2026 refinements clarify: (1) the boundary of the 'array boundary' zone within which module-level power electronics (MLPE) must reduce conductor energy to 80 volts or less within 30 seconds of rapid shutdown activation; (2) the requirements for MLPE (module-level power electronics — microinverters or DC optimizers) for dwelling structure roof-mounted PV systems; and (3) the permitted alternatives for non-dwelling commercial and industrial rooftop systems where array-level shutdown with appropriate safeguards is permissible.

❖ **Its Effect:** The zone-based rapid shutdown approach balances firefighter safety with installation flexibility. Roof-mounted PV systems on residential structures require MLPE for within-array shutdown because firefighters performing ventilation operations on residential roofs can contact PV conductors. Commercial rooftop systems may be permitted to use array-level shutdown with clearly marked boundaries and appropriate standoff distances, reducing the cost and complexity of commercial PV installations compared to requiring MLPE on every module in large commercial arrays.

Revision – 690.41

System Grounding — Transformerless Inverter Grounding Updated

> ***Change at a Glance:*** *Section 690.41 updated to address grounding requirements for transformerless (transformerless) inverter systems.*

❖ **What Changed:** Section 690.41 on PV system grounding was updated to

address the grounding requirements for transformerless inverter systems, which are now the dominant inverter type in residential and commercial PV installations. Transformerless inverters convert the PV DC voltage directly to AC without using an isolation transformer — they achieve lower cost and higher efficiency at the expense of galvanic isolation between the DC PV circuit and the AC utility circuit. Without galvanic isolation, the DC side of the PV system is not separated from the AC utility system, requiring specific grounding and ground fault detection requirements. The updated section clarifies the equipment grounding conductor requirements for transformerless inverter systems and the required ground fault protection.

❖ **Its Effect:** Transformerless inverters dominate the residential and commercial PV market because they are smaller, lighter, and more efficient than transformer-based inverters. However, their lack of galvanic isolation creates unique grounding considerations. The DC side of a transformerless system must have adequate ground fault detection to identify faults that would be immediately apparent in a transformer-isolated system. The updated Section 690.41 provides clear requirements for these increasingly common inverter types.

Revision – 690.47

Grounding Electrode System — PV System Grounding Electrode Requirements Updated

> ***Change at a Glance:*** *Section 690.47 updated with revised requirements for the PV system grounding electrode connection.*

❖ **What Changed:** Section 690.47 on grounding electrode systems for PV systems was updated to clarify the requirements for connecting PV system grounding to the building's grounding electrode system. The revision addresses the specific requirements for connecting the PV system equipment grounding conductor to the building's grounding electrode system when the PV system is installed on a structure that also has a utility service. The connection method and location requirements were clarified to prevent ground loops and to ensure that PV system fault currents can effectively reach the grounding electrode system through a low-impedance path.

❖ **Its Effect:** Proper grounding of PV systems is essential for both personnel protection and equipment protection. The grounding electrode system provides the reference point for the equipment grounding system and the path for lightning-induced fault currents. When a PV system is added to an existing building, the new PV grounding must be properly coordinated with the existing grounding electrode system to ensure effective fault clearing and lightning protection for the combined system.

Article 695 — Fire Pumps

Article 695 covers electrical power supply and wiring requirements for fire pumps. The 2026 edition formally recognized energy storage systems as valid on-site power sources for fire pump circuits, updated circuit integrity cable requirements for conductors exposed to fire, and reinforced listing requirements for fire pump controllers.

Revision – 695.3

Fire Pump Power Sources — ESS Recognized as On-Site Power Source

> ***Change at a Glance:*** *Section 695.3 updated to recognize energy storage systems as valid on-site power sources for fire pump circuits.*

❖ **What Changed:** Section 695.3 on power sources for fire pumps was updated to formally recognize Energy Storage Systems (ESS) as valid on-site power sources for fire pump circuits when two separate power sources are required. Previously, on-site power sources for fire pumps were essentially limited to generators. The 2026 revision acknowledges that properly sized and configured ESS can provide the reliable alternate power required for fire pump circuits, subject to the requirements of Article 706 and the specific reliability requirements of the fire pump application. The ESS must be able to supply the fire pump for the required duration and must be monitored to ensure it remains charged and operational.

❖ **Its Effect:** The recognition of ESS as a fire pump power source reflects advances in battery technology that make large-scale, high-reliability ESS practical for life-safety applications. An ESS can respond faster than a generator — providing power within milliseconds rather than the 10-second startup time of a diesel generator. For buildings where generator installation is impractical — urban high-rise buildings with limited mechanical space, for example — ESS may provide a viable alternative for meeting the two-source requirement for fire pump power.

Revision – 695.6

Fire Pump Wiring Methods — Circuit Integrity Cable Requirements Updated

> ***Change at a Glance:*** *Section 695.6 updated to address circuit integrity cable requirements for fire pump conductors exposed to fire.*

❖ **What Changed:** Section 695.6 on wiring methods for fire pumps was updated to clarify the requirements for circuit integrity (CI) cable for fire pump power conductors that are exposed to fire. Fire pump circuits must remain operational during a fire condition to supply water to the sprinkler system and fire hose connections. Conductors exposed to fire must be either routed through areas not likely to be affected by fire, protected by listed circuit integrity cable assemblies rated for 2 hours at 842°F (450°C), or protected by listed electrical circuit protective systems. The 2026 revision clarifies which portions of the fire pump circuit require CI protection and updates the listing requirements for CI cable assemblies used in fire pump applications.

❖ **Its Effect:** The circuit integrity requirement for fire pump wiring reflects the fundamental safety principle of fire pump design: the electrical supply must survive the fire that the pump is fighting. If a fire damages the electrical supply to the fire pump, the sprinkler system may lose water pressure precisely when it is most needed. CI cable provides a listed, tested means of maintaining electrical continuity under the thermal conditions of a structural fire for a defined duration, ensuring that the fire pump continues to operate.

Revision – 695.10

Listed Equipment — Fire Pump Controllers Must Be Listed

> ***Change at a Glance:*** *Section 695.10 updated to reinforce listing requirements for fire pump controllers and related equipment.*

❖ **What Changed:** Section 695.10 on listed equipment for fire pumps was updated to reinforce the listing requirements for fire pump controllers, transfer switches, and combination controller-transfer switch equipment. Fire pump controllers must be specifically listed for fire pump service — general-purpose motor controllers cannot be substituted. The listing for fire pump controllers verifies specific performance requirements including manual start capability,

automatic start on pressure drop, locked rotor current capacity, and the ability to operate continuously without tripping on overload (fire pumps are not permitted to automatically trip due to overload — they must continue running even if the motor is overloaded, because stopping the pump during a fire is more dangerous than allowing motor damage).

❖ **Its Effect:** The specific listing requirement for fire pump controllers is one of the most critical distinctions between fire pump installations and standard motor installations. A fire pump controller must meet specific performance criteria that are fundamentally different from general motor controller requirements. Most critically, a fire pump controller must continue operating the pump even under locked rotor or overload conditions — the motor may be sacrificed to maintain water supply during a fire emergency. The listing requirement ensures that only equipment designed and tested for this demanding application is used in fire pump installations.

Quiz Questions

1. **New Section 500.30 in the 2026 NEC consolidates bonding requirements from which articles into a single provision?**
   a) Articles 250, 270, and 280
   b) Articles 501.30, 502.30, and 503.30
   c) Articles 300.30, 310.30, and 314.30
   d) Articles 517.30, 547.30, and 555.30

2. **New Article 512 in the 2026 NEC establishes the first dedicated NEC requirements for which type of facility?**
   a) Microbrewery and craft beverage production facilities
   b) Cannabis cultivation facilities
   c) Hydroponic vegetable production facilities
   d) Pharmaceutical manufacturing facilities

3. **The new protection type 'v' added to Table 13 in the 2026 NEC applies to which classified location zones?**
   a) Zone 0 and Class I Division 1
   b) Zone 1 and Class I Division 1
   c) Zone 2 and Class I Division 2
   d) Zone 0, 1, and 2 equally

4. **Section 517.30 was updated in 2026 to formally recognize which type of system as a valid alternate power source for health care essential electrical systems?**
   a) Solar photovoltaic systems with battery storage
   b) Utility-owned fuel cells
   c) Energy Storage Systems (ESS) meeting Article 706 requirements
   d) Hydrogen fuel cell systems only

5. **Section 547.44 in the 2026 NEC updated equipotential plane construction requirements for agricultural buildings. How many specific construction methods are recognized?**
   a) Two methods: rebar and wire mesh only
   b) Three methods: rebar, wire mesh, and copper loops
   c) Five methods including concrete encasement
   d) Four methods: rebar, wire mesh, copper loops, and combinations

6. **Article 555 in the 2026 NEC raised the maximum permitted voltage for marina shore power systems from 250 volts to what?**
   a) 277 volts
   b) 347 volts
   c) 480 volts
   d) 600 volts

7. **New Article 624 covers electrical supply equipment for which type of vehicle that was not previously addressed by a dedicated article?**
   a) Highway electric passenger vehicles
   b) Non-highway electric self-propelled vehicles such as forklifts and golf carts
   c) Electric motorcycles and scooters on public roads
   d) Electric aircraft and drones

8. **New Section 625.5 requires EVSE to display a field-applied label identifying which three pieces of information?**
   a) Manufacturer, model number, and serial number
   b) Supply voltage, maximum ampere rating, and short-circuit current rating (SCCR)
   c) Circuit breaker rating, wire gauge, and conduit size
   d) Charging level, connector type, and maximum output power

9. **Section 625.41 explicitly classifies EVSE loads as which type of load, requiring the 125% sizing factor to apply?**
   a) Intermittent loads not subject to the 125% factor
   b) Motor loads requiring the locked-rotor current calculation
   c) Continuous loads subject to the 125% conductor and OCPD sizing factor
   d) Non-linear loads requiring neutral conductor sizing correction

10. **New Section 680.5 in the 2026 NEC extends GFCI protection to which previously unprotected circuit type near swimming pools?**
   a) Three-phase circuits rated 150 volts or less to ground
   b) Single-phase, 240-volt pump motor circuits
   c) Low-voltage landscape lighting circuits
   d) Generator circuits serving pool equipment rooms

11. **Section 620.62 was updated in 2026 with a new subdivision requiring what when an OCPD in an elevator system is replaced?**
   a) The replacement OCPD must be re-evaluated for selective coordination
   b) The replacement OCPD must be the same manufacturer as the original
   c) All other OCPDs in the elevator system must be replaced at the same time
   d) The elevator system must be taken out of service for 24 hours after replacement

12. **Section 625.42 in the 2026 NEC explicitly recognizes which system as an accepted method for managing EVSE loads within service and feeder capacity?**
   a) Time-of-use rate schedules
   b) Energy Management Systems (EMS)
   c) Power Control Systems (PCS) meeting Article 130 Part II requirements
   d) Utility demand response programs

13. **The 2026 NEC refinements to Section 690.12 (Rapid Shutdown) clarify that which type of equipment is required for dwelling structure roof-mounted PV systems within the array boundary?**
    a) Arc-fault circuit interrupters (AFCIs) at each module
    b) Module-level power electronics (MLPE) such as microinverters or DC optimizers
    c) Standard string inverters with array-level disconnects
    d) Transformerless inverters with rapid shutdown relay

14. **Section 695.3 was updated to recognize which system as a valid on-site power source for fire pumps when two power sources are required?**
    a) Natural gas generators rated over 100 kW
    b) Energy Storage Systems (ESS) meeting Article 706 requirements
    c) Grid-tied solar PV systems with inverters
    d) Hydraulic accumulator systems

15. **Section 500.8(G) in the 2026 NEC establishes requirements for which type of potential ignition source in classified locations that was not previously addressed?**
    a) Electrostatic discharge from personnel
    b) Optical radiation sources such as lasers and focused light beams
    c) Ultrasonic cleaning equipment
    d) Induction heating systems

16. **Section 680.26 was updated to harmonize pool equipotential bonding requirements with which other NEC sections?**
    a) Sections 210.8, 230.67, and 250.94
    b) Sections 300.5, 314.2, and 392.22
    c) Sections 517.30, 620.62, and 690.41
    d) Sections 547.44, 555.14, and 682.33

17. **The new protection type 'vc' added in association with Table 13's Type 'v' protection designates which type of equipment?**
    a) Equipment installed inside the ventilated room
    b) Equipment used to monitor and control the ventilation system itself
    c) Portable equipment brought into Zone 2 areas temporarily
    d) Personal protective equipment for workers in classified locations

18. **Section 695.6 clarifies that fire pump power conductors exposed to fire must be protected using which method?**
    a) Standard THWN conductors in schedule 80 PVC conduit
    b) Metal-clad cable with interlocking armor
    c) Conductors in rigid metallic conduit with concrete encasement
    d) Listed circuit integrity cable rated for 2 hours at 842 degrees F or listed electrical circuit protective systems

19. **Section 513.3 was updated to address area classification in aircraft hangars for which new equipment type?**
    a) Electric aircraft charging infrastructure
    b) Hydrogen fuel cell aircraft
    c) High-altitude drone launching systems
    d) Compressed natural gas (CNG) vehicles in hangars

20. **Section 625.43 was updated to address disconnecting means for EVSE capable of operating in which mode that creates a unique de-energization hazard?**
    a) High-power DC fast charging mode
    b) Bidirectional power export mode (V2H or V2G)
    c) Smart charging demand response mode
    d) Emergency backup power mode during utility outages