PROPOSED SAN FRANCISCO ELECTRICAL CODE AMENDMENTS 2016 Edition

ARTICLE 89 – GENERAL CODE PROVISIONS

89.101.1. Replace the first sentence of this section with the following:

89.101.1. Title. ~~These regulations shall be known as the California Electrical Code, may be cited as such and will be referred to herein as "this code."~~ **The provisions contained in this Code shall be known as the ~~2010~~ 2016 San Francisco Electrical Code, and may be cited as such and will be referred to as "this code."**

89.115. Add the following new section:

89.115. Suppression: This code shall supersede all previous Electrical Codes and ordinances in the City and County of San Francisco. Nothing herein shall require the revision of electrical installation plans submitted prior to the adoption date of this code. Electrical permits obtained prior to the effective date of this code shall comply with the provisions of the Electrical Code, ordinances, regulations and rulings in effect when the permit was granted.

89.116. Add the following new section:

89.116. Maintenance. All electrical equipment, wiring and systems and installations shall be maintained in a safe operating and code-complying condition. The owner or the owner's designated agent, or both, shall be legally responsible for the maintenance of all electrical wiring systems and installations.

Nothing contained in this code shall be construed to require any existing electrical equipment, wiring or systems regulated by this code to be altered, reconstructed, removed or demolished, providing such existing electrical equipment, wiring or system was installed and maintained in accordance with the adopted code in effect at the time of installation or subsequent alteration.

Unused conductors and cables shall be either removed or suitably identified and terminated in an approved manner.

89.117. Add the following new section:

89.117. Alternate Materials, Design and Methods of Construction.

(A) Alternates Require Approval: The provisions of this code are not intended to prevent the use of a product or method of construction not specifically prescribed by this code, provided any such alternate has been approved and the use authorized by the Building Official.

(B) Equivalency of Alternates. The Building Official may authorize an alternate, provided the Building Official finds the proposed design is satisfactory for the intended use and complies with the provisions of this code and that the product, method or work offered is, for the purpose intended, at least equivalent to that prescribed by this code in suitability, strength, effectiveness, fire resistivity, durability and safety.

(C) Evidence Required. The Building Official shall require sufficient evidence or proof be submitted to substantiate any claims made regarding the use of alternates. The details of any action granting approval of an alternate shall be recorded and shall be entered in the files of the Department of Building Inspection.

(D) Conditions and Fees. See Building Code Section 104A.2.8 for conditions and Section 110A, Table IA-J --Miscellaneous Fees --for applicable fees.

89.118. Add the following new section:

89.118. Change in Occupancy. Electrical equipment, wiring and systems which are part of any building or structure, or portion thereof, undergoing a change in occupancy or use, as defined in the Building Code, shall comply with all requirements of this code which may be applicable to the new occupancy or use.

Exception: The provisions of this section shall not require the change of existing electrical equipment, wiring and systems where such electrical equipment, wiring and systems are deemed adequate for the new occupancy involved.

89.119. Add the following new section:

89.119. Modifications. When there are practical difficulties involved in carrying out the provisions of this code, the Building Official may grant modifications for individual cases. The Building Official shall first find that a special individual reason makes the strict letter of this code impractical and that the modification is in conformance with the intent and purpose of this code and that such modification does not lessen health, life-safety and fire-safety requirements. The details of any action granting modifications shall be recorded and entered in the files of the Department of Building Inspection.

89.120. Add the following new section:

89.120. Permits Required.

(A) General. It shall be unlawful for any person to install, construct, alter, move, add to or replace any electrical installation regulated by this code, except as permitted in Section 89.121, without first obtaining a permit from the Department of Building Inspection.

(B) Nonliability of City and County of San Francisco. Permits issued under the provisions of this code shall contain or be construed to contain an agreement by the owner of the building, structure or premises, or the owner's authorized agent, to save City and County of San Francisco officials and employees harmless from all costs, liability and damages resulting, whether directly or indirectly, from anything in connection with the work included in the permit, including equipment, methods of construction, inspections and approvals.

(C) Application For Permit. Permit applicants shall file with the Department of Building Inspection an application form furnished for that purpose. The permit application shall show a complete itemization of the proposed electrical installation and the correct address of the job site. Electrical permits may be issued to duly licensed contractors who have registered with the Central Permit Bureau by having their

state contractor's license verified by the Department of Building Inspection, or issued to a homeowner subject to Section 89.120(E). A separate permit shall be obtained for each separate building or structure.

See Section 110A, Table 1A-E -Electrical Permit Fees -of the Building Code for the applicable fees.

(D) Illegal Use of Permit. No person, firm, corporation, or state licensed contractor shall file an application for a permit to install any electrical wiring system unless such person, firm, corporation, or state licensed contractor shall perform such work. The Building Official or the Building Official's authorized representative shall have the authority to cancel any permit upon finding that it is contrary to this section. The permittee shall be responsible for all work performed.

(E) Homeowner's Permit. A permit for electrical work in or about a single-family dwelling (Owner Occupied) may be issued by the Building Official to a homeowner, provided the work to be done will be performed by the homeowner. If the electrical work performed under the homeowner's permit does not comply with the requirements of this code and if the corrections are not made as required by the Department of Building Inspection, then the deficiencies shall be corrected by a State licensed electrical contractor under a separate permit.
Note: Trust & LCC's are not eligible for Electrical Homeowner's Permit

(F) Emergency Work. Emergency electrical work for the protection of persons or property shall have a permit obtained within one business day of commencing such work.

89.121. Add the following new section:

89.121. Work Exempt from Permits.

Electrical permits and fees shall not be required for the following:

(A) Repair or replacement of Broken or Damaged luminaires where:
(1) the luminaire(s) are not installed to provide emergency illumination required by San Francisco Building Code, and
(2) no change in existing wiring is involved, and
(3) luminaires weigh 22.68 Kg (50 pounds) or less.
(B) Repair or replacement of a domestic appliance where no change in existing wiring is involved.
(C) Replacement of fuses, controls, motors of less than 2 horsepower, and switches and receptacles of not more than 20 amperes rating, where no change in existing wiring is involved.
(D) Replacement of circuit breakers, externally operated switches and fuse holders of the same type and rating as the defective unit or component, if not rated in excess of 100 amperes. Exception: Replacement of main service disconnecting means are subject to permit and inspection regardless of rating.
(E) Wiring for temporary theater stages and platforms, motion picture and television studio sets supplied from approved electrical outlets installed for the purpose.
(F) Replacement of component parts for electric signs or gas-tube lighting systems of the same size and rating.
~~(G) Installation of up to 10 data/ communications cable and/or outlets that do not monitor or control electrical utilization equipment and/or life safety functions.~~
~~(H)~~ (G) Installation of data/communications cable and/or outlets in R-3 occupancies and within individual residential units (3000 Square Feet of Less), provided they do not monitor or control electrical utilization equipment and/or life safety functions.

89.122. Add the following new section:

89.122. Permit Issuance.

(A) General. An issued permit entitles the permittee to proceed with the installation described therein. Work done in excess of that shown on the application will be subject to extra permit fees as set forth in Section 110A, Table 1A-F -Specialty Permit Fees -of the Building Code. The issuance of a permit does not constitute an approval or an authorization of the work specified therein. Neither the issuance of a permit, nor the approval by the Building Official of any document, shall constitute an approval of a violation of any provision of this code or any law or ordinance. A permit or other document purporting to give authority to violate any code, law or ordinance shall not be valid with respect thereto. Permits shall not be transferable. Proposed electrical installations delineated on a permit application shall be performed only by the permittee or bona fide employee thereof in accordance with the California Code of Regulations, Title 8, Chapter 2, Part IV. The permit shall be posted on the job site where the work is to be done.

(B) Permit Expiration. Electrical permits expire per Section 106A.4.4 of the San Francisco Building Code. Permit fees may be partially refunded if cancellation request is made to the Building Official prior to commencement of the permitted work and within 90 days of the date of permit issuance. See Section 110A, Table 1A-R -Refunds -of the Building Code for refund.

(C) Commencement of Work on Permit Expired Due to Work Not Started. Before work may be commenced on an expired permit on which no work was performed, a new permit shall be obtained.

(D) Recommencement of Work on Permit Expired Due to Work Not Completed. The applicant shall secure a new permit for the work not completed. The permit fee shall be based upon items or work remaining to be done.

(E) Cancellation of Permit: Permits may be canceled by the Building Official:

(1) If after inspection, it is judged by a senior inspector that the permit holder is unable or unwilling to correct an unsafe condition or Code violations.
(2) If the permit was obtained fraudulently or under false pretenses.

89.123. Add the following new section:

89.123. Fees

(A) General. Permit and inspection fees, as set forth in Section 110A, Table 1A-E -Electrical Permit Fees --of the Building Code, shall be paid prior to permit issuance. When additional permit or inspection fees are due, they shall be payable prior to issuance of Permission to Connect Current, Certificate of Occupancy, or Declaration of Inspection.

(B) Other Fees. A standard hourly inspection fee shall be charged for services provided by Electrical Inspection Division personnel which are not otherwise detailed. See Section 110A, Table 1A-G - Inspections, Surveys and Reports -of the Building Code.

(C) Work Without Permit -Investigation Fee. If the Building Official finds that a person, company or entity has performed electrical installation work for which a permit is required, without first obtaining an electrical permit and payment of fees, the Building Official shall require the payment of an investigative fee in addition to the prescribed permit fee. See Section 110A, Table 1A-K-Penalties, Hearings, Code Enforcement Assessments-of the Building Code for the applicable fees. The payment of such investigation fee shall not exempt any person from compliance with all other provisions of this Code, nor from any penalty prescribed by law. The Building Official may reduce the investigation fee to two times the amount of the permit fee as called for in Section 110A, Table 1A-E -Electrical Permit Fees

-of the Building Code for work that was constructed prior to the current building ownership if the owner files with the Building Official notarized affidavit together with documents substantiating such dates of work.

Appeal of such investigative fee may be filed with the Board of Appeals in the manner provided in Part III of the San Francisco Municipal Code. Such filing shall be subject to the fees and rules of the Board of Appeals. The Board of Appeals, in reviewing the appeal may reduce the appealed amount to not less than two times (2x) the permit fee as set forth in Section 110A, Table 1A-E--Electrical Permit Fees --of the Building Code.

89.124. Add the following new section:

89.124. Powers and Duties of the Building Official.

(A) General. The Building Official is hereby authorized and directed to enforce all the provisions of this code. For such purposes, the Building Official shall have the powers of a law enforcement officer. The Building Official, when necessary, may call upon the Police Department and other city agencies for aid or assistance in carrying out or enforcing any of the provisions of this code.

(B) Right of Entry. When it is necessary to make an inspection to enforce the provisions of this code or other codes or ordinances, or when the Building Official has reasonable cause to believe that there exists in a building or upon a premises a condition that is contrary to, or in violation of, this code or other codes or ordinances that makes the building or premises unsafe, dangerous or hazardous, the Building Official may enter the building or premises at reasonable times to inspect or to perform the duties imposed by this code or other codes or ordinances, provided that if such building or premises be occupied, credentials be presented to the occupant and entry requested. If such building or premises be unoccupied, the Building Official shall first make a reasonable effort to locate the owner or other person having charge or control of the building or premises and request entry. If entry is refused, the Building Official shall have recourse to the remedies provided by law to secure entry.

(C) Stop Orders. Whenever any work is being done contrary to the provisions of this code, or other pertinent laws or ordinances implemented through the enforcement of this code, the Building Official may order the work stopped by notice in writing served on any persons engaged in the doing or causing such work to be done, and any such persons shall forthwith stop such work until authorized by the Building Official to proceed with the work.

(D) Temporary Use of Electrical Energy. The Building Official may permit the temporary use of electrical energy by any person, firm or corporation in cases where it does not create a hazard to life or property.

(E) Building Official may adopt rules and regulations. The Building Official shall have the power to render interpretations of this code and to adopt and enforce rules and supplemental regulations to clarify the application of its provisions. Such interpretations, rules and regulations shall be in conformance with the intent and purpose of this code. Such rules and regulations, commonly referred to as Code Rulings and Administrative Bulletins, supplemental to this code, shall not take effect until approved by the Building Inspection Commission and signed by the Building Official except in unusual circumstances where the Building Official has determined there is an immediate need to protect the public health and safety. When the Building Official finds that such circumstances exist, the Building Official may order immediate enforcement of a particular rule or regulation. The Building Official shall arrange for a subscription service to such rules and regulations, the entire cost of which is to be borne by the subscribers.

(F) Code Revisions. The Building Official shall transmit to the Building Inspection Commission, at

intervals not exceeding three years, recommendations for changes to this code, based on studies of the following:

(1) Requests of the Board of Examiners for variances from this code, and for approvals of alternate materials, alternate designs and methods of construction.

(2) Code changes recommended by the Board of Examiners.

(3) Code changes recommended by the Code Advisory Committee or other bodies subordinate to the Building Inspection Commission.

(4) Results obtained and problems encountered from legal actions taken to correct code violations.

(5) Changes or improvements in materials, methods of construction or design, and changes proposed by interested persons.

(6) Investigations of fire and structural damage buildings, and of complaints of unsatisfactory electrical system performance.

(7) Periodic changes to the California Electrical Code and other State regulations which may affect this code.

(8) Administrative Bulletins and Code Rulings currently in effect.

(9) Violations of this code found on inspections and investigations.

(G) Disconnection of Electric Service due to Serious and Imminent Hazards. The building Official shall have the authority to disconnect electric service to a building, structure, property or equipment regulated by this code when it is necessary to abate a serious and imminent hazard to the life, health or safety of the occupant or other persons, or such building, structure or property. See Section 102A of the Building Code. Persons shall not reconnect such electrical supply until authorized in writing by the Building Official.

89.125. Add the following new section:

89.125. Violation.

Any person, the owner or the owner's authorized agent, who violates, disobeys, omits, neglects, or refuses to comply with, or resists or opposes the execution of any of the provisions of this code, shall be liable for a civil penalty, not to exceed $500 for each day such violation is committed or permitted to continue, which penalty shall be assessed and recovered in a civil action brought in the name of the people of the City and County of San Francisco by the City Attorney in any court of competent jurisdiction. Any penalty assessed and recovered in an action brought pursuant to this paragraph shall be paid to the City Treasurer and credited to the Department of Building Inspection's Special Fund.

Any person, the owner or the owner's authorized agent, who violates, disobeys, omits, neglects, or refuses to comply with, or who resists or opposes the execution of any of the provisions of this code, shall be guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not exceeding $500, or by imprisonment not exceeding six months, or by both such fine and imprisonment, unless otherwise provided in this code, and shall be deemed guilty of a separate offense for every day such violation, disobedience, omission, neglect or refusal shall continue. Any person who shall do any work in violation of any of the provisions of this code, and any person having charge of such work who shall permit it to be done, shall be liable for the penalty provided.

It shall be unlawful for any person to interfere with the posting of any notice provided for in this code, or to tear down or mutilate any such notice so posted by the Department of Building Inspection.

89.126. Add the following new section:

89.126. Unsafe Buildings or Structures.

Any buildings, structures, or parts thereof, shall be considered unsafe when any of the following conditions are present:

(A) Electrical equipment, wiring and systems deemed hazardous to human life or structure safety;

(B) Electrical equipment, wiring and systems that are in violation of the code that was in effect at the time of construction or installation or such work was performed without permit or approval;

(C) Change in occupancy without complying with the provision of Section 89.118 of this code.

Such unsafe building, structure, property or portion shall be vacated, repaired, altered or demolished, and violations of this Code abated, in accordance with Section 102A of the Building Code., including, but not limited to, Sections 102A.3 through 102A.8.

(Amended by Ord. 60-16, File No. 151085, App. 4/27/2016, Eff. 5/27/2016, Oper. 6/1/2016)

89.127. Add the following new section:

89.127. Inspection.

(A) General. All electrical equipment, wiring and systems, regulated by this code and for which a permit is required shall be subject to inspection to insure compliance with this code. Upon the completion and final approval of the permitted installation and payment of all permit and inspection fees, a Declaration of Inspection shall be issued. Said declaration shall indicate in concise terms the electrical installation thus approved and the date of approval.
(B) Unlawful Use of Electrical Energy. It shall be unlawful to energize an electrical installation in, on or about any building, structure or property in the City and County of San Francisco unless a Certificate to Connect Current (Green Tag) has been issued. The Certificate to Connect Current authorizes the owner of the structure to energize the permitted installation.

(C) Inspection Requests. It shall be the responsibility of the permit holder to notify the Electrical Inspection Division orally or in writing when the permitted installation will be ready for inspection. Such notification shall be given at least 24 hours before any inspection is desired. Inspections may be performed outside of normal inspection hours by prior arrangement and prepayment. See Section 110A, Table 1A-G -Off-hours Inspections -of the Building Code for the applicable fees.

(D) Required Inspections. Required inspections shall include:

(1) Pre-Cover Inspection. Electrical equipment, wiring and systems authorized by permit shall be inspected for code compliance prior to covering or concealing.

(2) Final Inspection. Final inspection and demonstration of satisfactory operation shall be made after the installation authorized by permit has been completed.

(3) Other Inspection. As may be required to insure compliance with the provisions of this code.

(E) Electrical Wiring or Installation Unlawful to Conceal. It shall be unlawful to conceal, cover, or put into use electrical wiring, installations, or parts thereof, until such has been inspected and accepted as prescribed in this code. Whenever such work is concealed or covered before first having been inspected and approved, or whenever electrical wiring or systems are installed and concealed or covered without a permit, the Building Official may require, by written notice to the responsible person(s) that such wiring or installation be exposed for inspection. The work of exposing and reconstructing portions of a structure for such work shall not entail expense to the City and County of San Francisco or any of its officials or employees.

(F) Reinspections. Reinspections shall be required when any of the following conditions occurs:

(1) When the portion of the work for which inspection is requested is incomplete or not code complying.

(2) When previously identified deficiencies in the work are not properly corrected.

(3) When the approved construction documents are not available to the inspector.

(4) When access is not provided on the date and time of the inspection appointment.

(5) When there are deviations from the approved construction documents.

The first reinspection for failure to comply with code requirements shall not be assessed a re-inspection fee. All subsequent reinspections on a job for the same or subsequent errors or omissions shall be charged with a reinspection fee. A Certificate of Final Completion and Occupancy or final approval shall not be granted until the required fees are paid. See Section 110A, Table 1A-G - Inspections, Surveys and Reports -of the Building Code for applicable reinspection fees.

89.128. Add the following new section:

89.128. Survey. An electrical survey may be requested when an electrical inspector's assistance is desired to establish code compliance of existing or proposed electrical equipment, wiring and installations. See Section 110A, Table 1A-G of the Building Code for applicable fees.

89.129. Add the following new section:

89.129. Board of Examiners. Application may be made to the Board of Examiners for approval of alternate materials, methods and types of construction and for variances from the provisions of this code. See Building Code, Section 105A.1.

ARTICLE 90 – INTRODUCTION.

No San Francisco Electrical Code Amendments.

Chapter 1. General

ARTICLE 110 – REQUIREMENTS FOR ELECTRICAL INSTALLATIONS

110.15. Revise this section as follows:

110.15 High-Leg Marking. On a 4-wire, delta-connected system where the midpoint of one phase winding is grounded, only the conductor or busbar having the higher phase voltage to ground shall be durably and permanently marked by an outer finish that is ~~orange~~ **purple** in color or by other effective means. Such identification shall be placed at each point on the system where a connection is made if the grounded conductor is also present. ~~**Identification of ungrounded feeder conductors shall comply with Section 210-5(C).**~~

Information Note: **Identification of Ungrounded Branch Circuit Conductors & Feeder conductors shall comply with Section 210.5(C)(1) Branch Circuits Supplied from More Than One Nominal Voltage System & 215.12(C)(1) Feeders Supplied from More Than One Nominal Voltage System.**

110.26 (A) (3) Revise this section as follows:

(3) Height of Working Space. The work space shall be clear and extend from the grade, floor, or platform to a height of 2.0 m (6½ ft.) or the height of the equipment, whichever is greater. Within the height requirements of this section, other equipment that is associated with the electrical installation and is located above or below the electrical equipment shall be permitted to extend not more than 150 mm (6 in.) beyond the front of the electrical equipment.

Exception No. 1: ~~*In existing dwelling units, service equipment or panelboards that do not exceed 200 amperes shall be permitted in spaces where the height of the working space is less than 2.0 m (6½ ft.).*~~ **[*Editor's note:* Exception No. 1 is deleted by local amendment.]**

Exception No. 2: Meters that are installed in meter sockets shall be allowed to extend beyond the other equipment. The meter socket shall be required to follow the rules of this section.

110.26(B). Revise this section as follows:

(B) Clear Spaces. Working space required by this section shall not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, shall be suitably guarded. **The standing area of the workspace shall not contain obstructions, abrupt changes in grade, or irregularities.**

Chapter 2. Wiring and Protection

ARTICLE 210 – BRANCH CIRCUITS

210.5(C)(1)(a). Revise this section as follows:

(a) Means of Identification. The means of identification **for conductors #8AWG or larger** shall be permitted to be by separate color coding, marking tape, tagging, or other approved means. **Conductors of any size in cable assemblies may be suitably identified at all termination, connection and splice points. Conductor insulation in raceways shall contain continuous color pigment for circuit wire sizes # 10 AWG and smaller.**
Phase Identification Colors for Branch Circuits shall be as follows:

(1) 120/240 Volt 3-Wire Single Phase Systems - "A" Phase Black, "B" Phase Red.

(2) 120/208 Volt 4-Wire 3-Phase Wye Systems - "A" Phase Black, "B" Phase Red, "C" Phase Blue.

(3) 120/240 Volt 3-Phase Delta Systems -"A" Phase Black, "B" (High Leg) Phase Purple, "C" Phase Red.

Information Note: **New Construction or Complete Remodel of an Existing Building**

(4) 120/240 Volt 3-Phase Delta Systems - "A" Phase Black, "B" Phase Red, "C" (High Leg) Phase Purple.

Information Note: **Partial Remodel of an Existing Building – i.e. Replace Main Electrical Service where "C" Phase is Purple, & Re-Connect Existing Panels.**

(5) 277/480 Volt 4-Wire 3-Phase Wye Systems - "A" Phase Brown, "B" Phase Orange, "C" Phase Yellow.

(6) Ungrounded conductors for other voltages shall be identified by different color coding, marking tape, tagging, or other approved means.

(7) Branch Circuit Conductors for switch legs may be of a different color than the Ungrounded Circuit Conductor when suitably identified at pull boxes, junction boxes and outlet boxes with marking tape, tagging or other equally effective means.

~~***Exception No 1*: Extensions of existing non-color coded wiring systems need not be color coded.***

Exception No ~~2~~ 1: **In Multi-Family Dwelling Unit Buildings supplied by 120/208 Volt 4-Wire 3-Phase Systems, within Dwelling Units supplied by 120/208 Volt 3-Wire Single Phase Systems, Ungrounded Branch Circuit Conductor shall be permitted to be "A" Phase Black, "B" Phase Red.**

Informational Note: **See Section 200.7 for limitations on re-identification of white or grey for Grounded Conductors, and 250.119 for prohibition on using Green for Ungrounded Conductors.**

ARTICLE 215 – FEEDERS

215.12 (C)(1)(a) Revise this section as follows:

(a) Means of Identification. The means of identification **for conductor #8 AWG or larger** shall be permitted to be by separate color coding, marking tape, tagging, or other approved means. **Conductors of any size in cable assemblies may be suitably identified at all termination, connection and splice points.**

Phase Identification Colors for Feeders shall be as follows:

(1) 120/240 Volt 3-Wire Single Phase Systems - "A" Phase Black, "B" Phase Red.

(2) 120/208 Volt 4-Wire 3-Phase Wye Systems -"A" Phase Black, "B" Phase Red, "C" Phase Blue.

(3) 120/240 Volt 3-Phase Delta Systems -"A" Phase Black, "B" Phase (High Leg) Purple, "C" Phase Red.

Information Note: **New Construction or Complete Remodel of an Existing Building**

(4) 120/240 Volt 3-Phase Delta Systems -"A" Phase Black, "B" Phase Red, "C" Phase (High Leg) Purple.

Information Note: **Partial Remodel of an Existing Building – i.e. Replace Main Electrical Service where "C" Phase is Purple, & Re-Connect Existing Panels.**

(5) 277/480 Volt 4-Wire 3-Phase Wye Systems -"A" Phase Brown, "B" Phase Orange, "C" Phase Yellow.

(6) Ungrounded conductors for other voltages shall be identified by different color coding, marking tape, tagging, or other approved means.

(7) Branch Circuit Conductors for Switch Legs may be of a different color than the Ungrounded Feeder Circuit Conductor when suitably identified at pull boxes, junction boxes and outlet boxes with marking tape, tagging or other equally effective means.

(8) In Multi-Family Dwelling Unit Buildings supplied by 120/208 Volt 4-Wire 3-Phase Systems, within Dwelling Units supplied by 120/208 Volt- 3-Wire Single Phase Systems, within Dwelling Units supplied by 120/208 Volt 3-Wire Single Phase Systems, Ungrounded Feeder Conductors shall be the following:

a) 120/208 Volt 3 Wire Single Phase "A" Phase Black, "B" Phase Red

b) 120/208 Volt 3 Wire Single Phase "B" Phase Red, "C" Phase Blue

c) 120/208 Volt 3 Wire Single Phase "A" Phase Black, "C" Phase Blue

d) Labeling Required at the Sub-Panel indicating which Phases Serve the Unit from the 120/208 Volt 4-Wire 3-Phase Multi / Meter Distribution System

Informational Note: **See Section 200.7 for limitations on identification of white or grey for Grounded Conductors, and 250.119 for prohibition on using Green for Ungrounded Conductors.**

Informational Note: **See 210.5(C)(1) for additional information regarding Identification of Ungrounded Conductors.**

ARTICLE 230 – SERVICES

230.43. Revise this section as follows:

230.43. Wiring Methods for 1000 Volts, Nominal, or Less. Service-entrance conductors shall be installed in accordance with the applicable requirements of this *Code* covering the type of wiring method used and shall be limited to the following methods:

(1) ~~Open wiring on insulators~~ **Reserved**

(2) ~~Type IGS Cable~~ **Reserved**

(3) Rigid metal conduit (RMC)

(4) Intermediate metal conduit (IMC)

(5) ~~Electrical metallic tubing (EMT)~~ **Reserved**

(6) ~~Electrical nonmetallic tubing~~ **Reserved**

(7) ~~Service-entrance cables~~ **Reserved**

(8) ~~Wireways~~ **Reserved**

(9) Busways

(10) Auxiliary gutters

(11) Rigid polyvinyl chloride conduit (PVC)

(12) ~~Cablebus~~ **Reserved**

(13) ~~Type MC Cable~~ **Reserved**

(14) Mineral-insulated, **Type (MI)** metal sheathed cable, ~~Type MI~~

(15) ~~Flexible metal conduit not over 1.8 m (6ft) long or liquidtight flexible metal conduit not over 1.8 m (6 ft) long between raceways, or between raceway and service equipment, with equipment bonding jumper routed with the flexible metal conduit or the liquidtight flexible metal conduit or the liquidtight flexible metal conduit according to the provisions of 250.102 (A), (B), (C), and (E)~~ **Reserved**

(16) ~~Liquidtight flexible nonmetallic conduit~~ **Reserved**

(17) High Density Polyethylene Conduit (HDPE)

(18) Non-metallic Underground Conduit with Conductors (NUCC)

(19) Reinforced Thermosetting Resin Conduit (RTRC)

(B) Raceway Size. Minimum raceway size shall comply with the following:

(1) Except as provided in Section 230.43(B)(2) and (3) the minimum size raceway installed for service entrance conductor shall be 1-1/4 inch (31.8 mm).

(2) Raceways for service entrance conductors for sign or billboard lighting shall not be smaller than 3/4 inch (19.1 mm) conduit.

(3) Installations consisting of not more than two 2-wire branch circuits may be supplied by No. 8 conductors in 3/4 inch (19.1 mm) conduit.

Exception: **New service entrance conductors may be re-pulled in previously approved service raceways, provided the installation complies with the requirements of SFEC Section 89.116 and Chapters 1, 2 and 3.**

Informational Note: Refer to electric utility service requirements for raceway sizes.

230.56. Revise this section as follows:

230.56. Service Conductor with the Higher Voltage to Ground. On a 4-wire, delta-connected service, where the midpoint of one phase winding is grounded, the service conductor having the higher phase voltage to ground shall be durably and permanently marked by an outer finish that is ~~orange~~ **purple** in color, or by other effective means, at each termination or junction point.

230.71(A). Revise this section and add two exceptions as follows:

230.71 Maximum Number of Disconnects.

(A) General. The service disconnecting means for each service permitted by 230.2, or for each set of service-entrance conductors permitted by 230.40, Exception Nos. 1, 3, 4, or 5, shall consist of ~~not more than six switches or sets of circuit breakers, or a combination of not more than six switches and sets of circuit breakers, mounted in a single enclosure, in a group of separate enclosures, or in or on a switchboard or in switchgear. There shall not be more than six sets of disconnects per service grouped at any one location.~~ **a single circuit breaker or switch and set of fuses.**

For the purpose of this section, disconnecting means installed as part of listed equipment and used solely for the following shall not be considered a service disconnecting means:

(1) Power monitoring equipment

(2) Surge-protective device(s)

(3) Control circuit of the ground-fault protection system

(4) Power-operable service disconnecting means.

***Exception No. 1*:**

a) Multi-Family Dwellings with a Maximum of (6) units, shall consist of not more than six switches or sets of circuit-breakers, or a combination of not more than six switches and sets of circuit breakers, mounted in a single enclosure, in a group of separate enclosures, or in or on a switchboard or in switchgear.

b) There shall be not more than six sets of disconnects per service grouped in any one location.

Exception No. 2: **A Single Main Circuit Breaker or set of fuses shall be provided for each Dwelling Unit.**

ARTICLE 250 – GROUNDING AND BONDING

250.50. Revise the first paragraph of this section as follows:

250.50 Grounding Electrode System. All grounding electrodes as described in 250.52(A)(1) through (A)(7) that are present at each building or structure served shall be bonded together to form the grounding electrode system. **A concrete encased electrode as defined by Section 250.52(A)(3) shall be installed at each new building or structure, and for existing buildings or structures when a new or replacement foundation or footing with a perimeter length of 6.0 m (20 ft.) or more is installed in direct contact with the earth.** Where none of these electrodes exist, one or more of the grounding electrodes specified in 250.52(A)(4) through (A)(8) shall be installed and used.

Exception: Concrete-encased electrodes of existing buildings or structures shall not be required to be part of the grounding electrode system where the steel reinforcing bars or rods are not accessible for use without disturbing the concrete.

250.64(A). Revise this section as follows:

250.64 (A). Aluminum or Copper-Clad Aluminum Conductors. Bare aluminum or copper-clad aluminum grounding electrode conductors shall not be used where in direct contact with masonry or the earth or where subject to corrosive conditions. ~~Where used outside,~~ Aluminum or copper-clad aluminum grounding electrode

conductors shall not be ~~terminated within 450 mm (18 in.) of the earth~~ **installed on the outside of a building or structure.**

250.64(B). Revise this section as follows:

250.64(B) Securing and Protection Against Physical Damage. Where exposed, a grounding electrode conductor or its enclosure shall be securely fastened to the surface on which it is carried. Grounding electrode conductors shall be permitted to be installed on or through framing members. A 4 AWG or larger copper or aluminum grounding electrode conductor shall be protected if exposed to physical damage. A 6 AWG grounding electrode conductor that is free from exposure to physical damage shall be permitted to be run along the surface of the building construction without metal covering or protection if it is securely fastened to the construction; otherwise, it shall be protected in rigid metal conduit RMC, intermediate metal conduit (IMC), rigid polyvinyl chloride conduit (PVC), reinforced thermosetting resin conduit (RTRC), electrical metallic tubing (EMT), or cable armor. Grounding electrode conductors smaller than 6 AWG shall be protected in (RMC), IMC, PVC, RTRC, (EMT) or cable armor. Grounding electrode conductors and grounding electrode bonding jumpers shall not be required to comply with 300.5. **Exposed grounding electrode conductors that are accessible to the general public shall be installed in approved metallic raceway. 6 AWG or smaller grounding electrode conductors shall not be installed exposed below 5 feet.**

Chapter 3. Wiring Methods and Materials

ARTICLE 300 – GENERAL REQUIREMENTS FOR WIRING METHODS AND MATERIALS

300.3(C) Revise this section as follows:

300.3(C) Conductors of Different Systems.

(1) 1000 Volts, Nominal or Less. Conductors of ac and dc circuits, ~~rated 1000 volts nominal or less~~ **from separately derived systems, from separate services, or from separate utility meters** shall **not** be permitted to occupy the same equipment wiring enclosure, cable or raceway **with conductors from other systems, services, or meters.** All conductors shall have an insulation rating equal to at least the maximum circuit voltage applied to any conductor within the enclosure, cable, or raceway.

Secondary wiring to electric-discharge lamps of 1000 volts or less, if insulated for the secondary voltage involved, shall be permitted to occupy the same luminaire, sign, or outline lighting enclosure as the branch-circuit conductors.

Informational Note No. 1: See 725.136(A) for Class 2 and 3 circuit conductors.

Informational Note No. 2: See 690.4(B) for photovoltaic source and output circuits.

***Exception No 1*: <u>Photovoltaic Systems: PV Source Circuits and PV Output Circuits in accordance with Section 690.31(B) Identification and Grouping.</u>**

***Exception No. 2:* <u>Emergency Systems: Conductors installed in accordance with Section 700.10 Wiring.</u>**

***Exception No. 3*: <u>Remote-Control, Signaling, and Power-Limited Circuits:</u> Class 1, 2 or 3 Conductors installed in accordance with Article <u>725.136(A) General</u>.**

***Exception No. 4*: Auxiliary Gutters: When approved by the AHJ Conductors connected to Separately Derived Systems, Service Equipment, or Meter Banks Article 366.**

300.4(I) Add this new section as follows:

(I). Subject to Physical Damage. Premises wiring systems installed less than 2.44 m (8 feet) above a walking surface or finished floor are considered subject to physical damage.

300.37 Revise this section as follows:

300.37 Aboveground Wiring Methods. Aboveground conductors, 12KV or larger, in Residential or Commercial Occupancies, shall be installed in Rigid Steel Conduit.

Aboveground conductors **less than 12 KV, in other than Residential or Commercial Occupancies,** shall be installed in rigid metal conduit, in intermediate metal conduit, in electrical metallic tubing, in RTRC and PVC conduit, in cable trays, in auxiliary gutters, as busways, as cablebus, in other identified raceways, or as exposed runs of metal-clad cable suitable for the use and purpose. In locations accessible to qualified persons only, exposed runs of Type MV cables, bare conductors, and bare busbars shall also be permitted. Busbars shall be permitted to be either copper or aluminum.

ARTICLE 320 – ARMORED CABLE: TYPE AC

320.108. Revise this section as follows:

320.108. Equipment Grounding Conductor. Type AC cable shall provide an adequate path for fault current as required by 250.4(A)(5) or (B)(4) to act as an equipment grounding conductor. **An equipment grounding conductor, sized as required by Table 250.122, shall be provided within the cable assembly.**

ARTICLE 330 – METAL-CLAD CABLE: TYPE MC

330.12 Revise item (1) as follows:

330.12 Use Not Permitted. Type MC cable shall not be used under either of the following conditions:

(1) Where Subject to Physical Damage

***Informational Note*: See the 2016 San Francisco Electrical Code Section 300.4 (I) Subject to Physical Damage.**

…

Exception: Type MC Cable #4 AWG or larger, installed in a lockable room dedicated solely to an electrical service and distribution equipment and accessible only to qualified personnel, shall be considered to have equivalent protection from physical damage when installed in a neat and workman like manner, properly supported, and securely fastened in place.

330.40. Revise this section as follows:

330.40. Boxes and Fitting. Fittings used for connecting Type MC cable to boxes, cabinets, or other equipment shall be listed and identified for such use. **An approved insulating bushing shall be installed between the conductors and the sheath of MC Cable where the manufacturer recommends their use.**

330.108. Revise this section as follows:

330.108. Equipment Grounding Conductor. Where Type MC cable is used to provide an equipment grounding conductor, it shall comply with 250.118(10) and 250.122. **An equipment grounding conductor, sized as required by Table 250.122, shall be provided within the cable assembly.**

ARTICLE 334 – NONMETALLIC-SHEATHED CABLE: TYPES NM, NMC, AND NMS

334.10. Revise Item (2) as follows:

334.10. Uses permitted.

(2) Multi-family dwellings permitted to be of Types III, IV, and V **wood frame** construction **not exceeding 6 stories as defined by the San Francisco Building Code** except as prohibited in 334.12.

334.12. Add Item (11), (12) and (13) as follows:

334.12. Uses Not Permitted.

(11) In any nonresidential structure or occupancy

(12) In Common Areas of Multi-family Dwelling Units of Group R-1 and R-2 buildings of Type IIIA construction per the 2016 California Building Code 510.5

(13) Nominal voltages above 120 volts to ground

ARTICLE 340 – UNDERGROUND FEEDER AND BRANCH-CIRCUIT CABLE: TYPE UF

340.10. Revise Item (1) as follows:

340.10. Uses Permitted. Type UF cable shall be permitted as follows:

(1) For use underground **in systems not exceeding 50 volts,** including direct burial in the earth. For underground requirements see 300.5.

ARTICLE 348 – FLEXIBLE METAL CONDUIT: TYPE FMC

348.10. Revise this section as follows:

348.10. Uses Permitted. FMC shall be permitted to be used in ~~exposed and~~ concealed locations **and where necessary for flexibility in lengths not to exceed 1.829 m (6 feet).**

ARTICLE 350 – LIQUIDTIGHT FLEXIBLE METAL CONDUIT: TYPE LFMC

350.10. Revise the first sentence as follows:

350.10. **Uses Permitted.** LFMC shall be permitted to be used ~~in~~ exposed **where necessary for flexibility in lengths not to exceed 1.829 m (6 feet)** or concealed locations as follows:

ARTICLE 352 – RIGID POLYVINYL CHLORIDE CONDUIT: TYPE PVC

352.10. Revise Item (A) as follows:

352.10. Uses Permitted.

(A) Concealed. PVC conduit shall be permitted ~~in~~ **embedded in concrete** ~~walls, floors, and ceilings~~. **The conduit may emerge not more than 3 inches from the concrete within wiring enclosures, otherwise metal raceways shall be provided where emerging from the concrete.**

ARTICLE 355 – REINFORCED THERMOSETTING RESIN CONDUIT: TYPE RTRC

355.10. Revise Item (A) as follows:

355.10. **Uses Permitted**

(A) Concealed. RTRC shall be permitted ~~in~~ **embedded in concrete** ~~walls, floors, and ceilings~~. **The conduit may emerge not more than 3 inches from the concrete within wiring enclosures, otherwise metal raceways shall be provided where emerging from the concrete.**

ARTICLE 356 – LIQUIDTIGHT FLEXIBLE NONMETALLIC CONDUIT: TYPE LFNC

356.10 Revise the first sentence of this section and item (5) as follows:

356.10. Uses Permitted. LFNC shall be permitted to be used in exposed **locations in lengths not to exceed 1.8m (6 feet)** or concealed locations **where encased in concrete** for the following purposes:

(5) **When approved by the AHJ,** Type LFNC-B shall be permitted to be installed in lengths longer than 1.8 m (6 feet) where secured in accordance with 356.30.

ARTICLE 358 – ELECTRICAL METALLIC TUBING: TYPE EMT

358.10(B) Add a second paragraph as follows:

358.10(B). Corrosion Protection.

Where EMT emerges from concrete in a damp or wet location, it shall be protected against corrosion at the point of emergence by wrapping of PVC tape, or by other approved means.

358.12 Add New Item (7) as follows:

358.12. Uses Not Permitted

(7) In concrete slabs on grade.

ARTICLE 362 – ELECTRICAL NONMETALLIC TUBING: TYPE ENT

362.10. Revise Item 6 and delete Items 1, 2, 4, 5, 7, 8 and 9 as follows:

362.10. Uses Permitted.

(1) **Reserved.** ~~In any building not exceeding three floors above grade as follows:~~

~~a. For exposed work, where not prohibited by 362.12~~

~~b. Concealed within walls, floors, and ceilings~~

(2) **Reserved.** ~~In any building exceeding three floors above grade, ENT shall be concealed within walls, floors, and ceilings where the walls, floors, and ceilings provide a thermal barrier of material that has at least a 15-minute finish rated thermal barrier shall be permitted to be used for combustible or noncombustible walls, floors, and ceilings.~~

~~*Exception to (2): Where a fire sprinkler system(s) is installed in accordance with NFPA 13-2010, Standard for the Installation of Sprinkler Systems, on all floors, ENT shall be permitted to be used within walls, floors, and ceilings, exposed or concealed, in buildings exceeding three floors above grade.*~~

~~Informational Note: A finish rating is established for assemblies containing combustible (wood) supports. The finish ratings is defined as the time at which the wood stud or wood joist reaches an average temperature rise of 121°C (250°F) or an individual temperature of 163°C (325°F) as measured on the plane of the wood nearest the fire. A finish rating is not intended to represent a rating for a membrane ceiling.~~

(4) **Reserved.** ~~In concealed, dry, and damp locations not prohibited by 362.12.~~

(5) **Reserved.** ~~Above suspended ceilings where the suspended ceilings provide a thermal barrier of material that that has at least a 15-minute finish as identified in listings of fire-rated assemblies, except as permitted in 362.10(1)(a).~~

~~*Exception to (5): ENT shall be permitted to be used above suspended ceilings in buildings exceeding three floors above grade where the building is protected throughout by a fire sprinkler system installed in accordance with NFPA 13-2010, Standard for the Installation of Sprinkler Systems.*~~

(6) Encased in poured concrete, or embedded in a concrete slab on grade where ENT is placed on sand or approved screenings, provided fittings identified for this purpose are used for connections. **Metal raceways shall be provided where emerging from the concrete.**

(7) **Reserved.** ~~For wet locations indoors as permitted in this section or in a concrete slab on or belowgrade, with fittings listed for the purpose.~~

(8) **Reserved.** ~~Metric designator 16 through 27 (trade size ½ through 1) as listed manufactured prewired assembly.~~

~~Informational Note: Extreme cold may cause some types of nonmetallic conduits to become brittle and therefore more susceptible to damage from physical contact.~~

(9) **Reserved.** ~~Conductors or cables rated at a temperature higher than the listed temperature rating of ENT shall be permitted to be installed in ENT, if the conductors or cables are not operated at a temperature higher than the listed temperature rating of the ENT.~~

ARTICLE 378 – NONMETALLIC WIREWAYS

378.12 Add Item (6) as follows:

378.12. Uses Not Permitted.

(6) Where the voltage of the contained conductors is in excess of 50 volts.

Chapter 4. Equipment for General Use

ARTICLE 410 – LUMINAIRES, LAMPHOLDERS, AND LAMPS

410.36(B) Revise this section as follows:

410.36(B) Suspended Ceilings. Framing members of suspended ceiling systems used to support luminaires shall be securely fastened to each other and shall be securely attached to the building structure at appropriate intervals. Luminaires shall be securely fastened to the ceiling framing member by mechanical means, such as bolts, screws, or rivets. Listed clips identified for use with the type of ceiling framing member(s) and luminaire(s) shall also be permitted. **All luminaires or luminaire outlets supported by suspended ceiling systems shall have supplemental support wires (minimum #12 gauge) connected from the fixture housing or fixture support bracket to the structure above. Recessed lighting fixtures measuring 610 mm (2 feet) nominal or larger in any dimension shall have two (minimum #12 gauge) support wires. See CBC Section 808.1.1.1 and ASTM standards C635 and C636.**

Exception: **Supplemental support wires shall not be required when listed clips identified to be used without supplemental ceiling wires in compliance with CBC Section 808.1.1.1 are installed**.

ARTICLE 411 – LIGHTING SYSTEMS OPERATING AT 30 VOLTS OR LESS AND LIGHTING EQUIPMENT CONNECTED TO CLASS 2 POWER SOURCES

411.5 Revise Section Title and Item (A) as follows:

411.5 ~~Specific Location Requirements.~~ Locations not Permitted

(A) Walls, Floors and Ceilings. Conductors concealed or extended through a wall, floor, ceiling, **or suspended ceiling**, shall be in accordance with (1) or (2):

(1) Installed using any of the wiring methods specified in Chapter 3
(2) Installed using wiring supplied by a listed Class 2 power source and installed in accordance with 725.130

Chapter 5. Special Occupancies

No San Francisco Electrical Code Amendments.

Chapter 6. Special Equipment

ARTICLE 645 – INFORMATION TECHNOLOGY EQUIPMENT

645.5(E) Revise Item (2) as follows:

645.5(E)(2). Under Raised Floors

(2) The branch-circuit supply conductors to receptacles or field-wired equipment are in rigid metal conduit, ~~rigid nonmetallic conduit~~, intermediate metal conduit, electrical metallic tubing, ~~electrical nonmetallic tubing~~, metal wireway, nonmetallic wireway, surface metal raceway with metal cover, surface nonmetallic raceway, flexible metal conduit, liquidtight flexible metal conduit, or liquidtight flexible nonmetallic conduit, Type MI cable, Type MC cable, or Type AC ~~cable and associated metallic and nonmetallic boxes or enclosures~~. These supply conductors shall be installed in accordance with the requirements of Section 300.11.

Chapter 7. Special Conditions

ARTICLE 700 – EMERGENCY SYSTEMS

700.12(F)(2) Revise item (2) and (5) of this section as follows:

700.12(F)(2) Installation of Unit Equipment.

(2) Unit equipment shall be permanently fixed in place (i.e., not portable) and shall have all wiring to each unit installed in accordance with the requirements of any of the wiring methods in Chapter 3. Flexible cord-and-plug connection shall **not** be permitted, ~~provided that the cord does not exceed 3 feet in length.~~

…

(5) Emergency luminaires **(illumination fixtures)** that obtain power from a unit equipment and are not part of the unit equipment shall be wired to the unit equipment as required by 700.10 and by one of the wiring methods of Chapter 3.

700.16 Revise the first paragraph of this section as follows:

700.16. Emergency Illumination. Emergency illumination shall include all required means of egress lighting, illuminated exit signs, and all other lights specified as necessary to provide required illumination. **Emergency illumination shall be provided at the location of transfer switches, switchboards and panelboards**

that supply emergency and legally required stand-by loads.

. . .

ARTICLE 760 – FIRE ALARM SYSTEMS

760.46. Revise this section as follows:

760.46. NPLFA Circuit Wiring. Installation of non-power-limited fire alarm circuits shall be in accordance with 110.3(B), 300.7, 300.11, 300.15, 300.17, 300.19(B) and other appropriate articles of Chapter 3. **Conductors shall be installed in metallic raceways or concrete-encased nonmetallic raceways.**

Exception No. 1: As provided in Sections 760.48 through 760.53.

~~*Exception No. 2: Where other articles of this Code required other methods.*~~

760.130(A) Revise this section as follows:

(A). NPLFA Wiring Methods and Materials. Installation shall be in accordance with 760.46, and conductors shall be solid or stranded copper.

Exception No. 1: The ampacity adjustment factors given in 310.15(B)(3)(a) shall not apply.

Exception No. 2: Conductors and multiconductor cables described in and installed in accordance with 760.49 ~~and 760.53~~ shall be permitted.

Exception No. 3: Power-limited circuits shall be permitted to be reclassified and installed as non-power-limited circuits if the power-limited fire alarm circuit markings required by 760.124 are eliminated and the entire circuit is installed using the wiring methods and materials in accordance with Part II, Non-Power-Limited Fire Alarm Circuits.

Informational Note: Power-limited circuits reclassified and installed as non-power-limited circuits are no longer power-limited circuits, regardless of the continued connection to a power-limited source.

760.130(B). Revise this section as follows:

760.130(B) PLFA Wiring Methods and Materials.

Power-limited fire alarm conductors and cables described in 760.179 shall be installed ~~as detailed in 760.130(B)(1), (B)(2), or (B)(3) of this section and 300.7~~ **in metallic raceway in accordance with 760.46**. Devices shall be installed in accordance with 110.3(B), 300.7, 300.11 (A), and 300.15.

760.180 Add the following new section:

760.180. System Requirements.

(A) Supervising Station Fire Alarm Systems. Supervising station fire alarm system wiring installed within or on buildings shall be installed in metallic raceways.

Exception: Communication conductors installed entirely within a dedicated telephone equipment room, switchboard area or fire control room.

(B) Source of Power. Circuits supplying fire alarm control units that are not monitored by an approved supervising station, or a constantly attended location approved by the fire code official shall be connected to either the line or load side of the service disconnect. Circuits shall be protected by means of an externally operated fused safety switch or a circuit breaker either in a separate enclosure or within a switchboard entirely separate from other circuit breakers. The switch and/or circuit breaker shall be clearly labeled and locked in the on position.

***Informational Note*: See CEC (2016) 760.41 & 760.121; CBC (2016) 903.4; NFPA 72 (2016) 10.5.3; NFPA 13 (2016) 6.8.4.1**

Chapter 8. Communications Systems

No San Francisco Electrical Code Amendments

Chapter 9. Tables

No San Francisco Electrical Code Amendments.