

RESOLUTION R23-05-10

A RESOLUTION OF THE MAYOR AND COUNCIL OF THE CITY OF EL MIRAGE, ARIZONA, ADOPTING THE FOLLOWING 2018 INTERNATIONAL CODES: BUILDING, RESIDENTIAL, FIRE, MECHANICAL, PLUMBING, ENERGY CONSERVATION, FUEL GAS, EXISTING BUILDING, GREEN CONSTRUCTION CODES; 2017 ICC A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES, PROPERTY MAINTENANCE, THE 2017 NATIONAL ELECTRIC CODE AND THE CORRESPONDING LOCAL AMMENDMENTS TO THE 2018 INTERNATIONAL CODES AND THE 2017 NATIONAL ELECTRIC CODE THEREBY ESTABLISHING THESE ADOPTIONS, INCLUDING SEVERABILITY AND REPEALING CONFLICTING ORDINANCES.

WHEREAS, the Mayor and Council deem it necessary, in order to protect the public health, safety and welfare and public and private property, to adopt certain rules and regulations to regulate the erection, construction, enlargement, alteration, repair, moving and removal, demolition, conversion, occupancy, equipment, use, height, area and maintenance of all buildings, structures or premises; and

WHEREAS, in 2014, the Mayor and Council adopted the 2012 set of International Codes; and

WHEREAS, 2018 International Codes are meant to replace the 2012 International Codes previously adopted by Mayor and Council; and

WHEREAS, all the adopted 2012 International Codes are being updated to the 2018 version; and

WHEREAS, the Building Safety and Fire Prevention staff are recommending adoption of the International Codes contained in the public records, titled 2018 International Building, 2018 International Residential, 2018 International Fire, 2018 International Mechanical, 2018 International Plumbing, 2018 International Energy Conservation, 2018 International Fuel Gas, 2018 Green Construction, 2018 Existing Building, 2017 ICC A117.1 Accessible and Usable Buildings and Facilities, 2018 International Property Maintenance, and the 2017 National Electric Code, of which 3 copies are on file in the office of the El Mirage City Clerk; and

WHEREAS, the El Mirage staff is recommending amendments to these codes which amendments are contained in that certain public record entitled Local Amendments to the 2018 International Codes and the 2017 National Electric Code, dated May 2 2023, (3) three copies of which are on file in the office of the El Mirage City Clerk,

NOW, THEREFORE, BE IT RESOLVED by the Mayor and Council of the City of El Mirage, Arizona as follows:

Section 1. The International Codes and appendices as published by the International Code Council and as contained in the public records entitled 2018 International Building, 2018 International Residential, 2018 International Fire, 2018 International Mechanical, 2018 International Plumbing, 2018 International Energy Conservation, 2018 International Fuel Gas, 2018 Green Construction, 2018 Existing Building, 2018 Property Maintenance, 2017 ICC A117.1 Accessible and Usable Buildings and Facilities and the 2017 National Electric Code, and the local amendments to those codes, as contained in the public record entitled Local Amendments to the 2018 International Codes and the 2017 National Electric Code, all dated May 2, 2023 are hereby adopted by reference, as amended.

Section 2. That the document attached hereto as Exhibit "A", "B", and "C", will become effective on July 1, 2023, as prescribed by law.

PASSED AND ADOPTED by the Mayor and Council of the City of El Mirage this 16th day of May 2023.



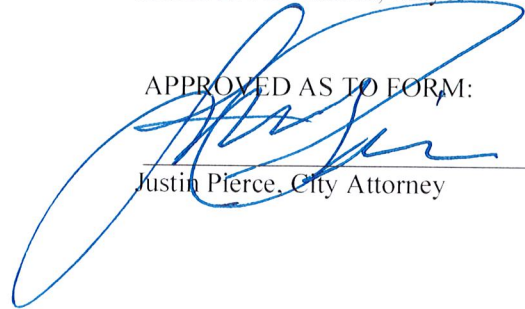
Alexis A. Hermosillo, Mayor

ATTEST:



Sharon Antes, City Clerk

APPROVED AS TO FORM:



Justin Pierce, City Attorney

RESOLUTION R23-05-10 EXHIBIT

PROPOSED CODE REVISION

CHAPTER 150: BUILDING CODE

Below are the proposed changes to § 150.001, §150.004, § 150.095, § 150.098, § 150.101 and 150.115 of the City Code.

BUILDING CODES; AMENDMENTS

§ 150.001 ADOPTION OF BUILDING CODES.

(A) *International Building Code; Amendments.* The certain document designated and marked as the 2018 International Building Code and appendices C and H contained therein, copies of which are on file electronically in the office of the City Clerk of the city, and as amended by that portion of the certain document entitled El Mirage Amendments applicable to the 2018 International Building Code, three copies of which are on file in the office of the City Clerk of the city, together are hereby adopted as the Building Code for the city by reference as if set forth herein in full and made part and parcel of the section for regulating and controlling the installing, construction, remodeling, alteration, repair and conversion of buildings within the corporate limits of the city, and it is hereby declared to be unlawful to construct, erect, install, alter, repair, change, move, remove, maintain or use any house, building or structure in the city, or cause or permit the same to be done, contrary to or in violation of the Building Code as herewith adopted by the Council of the city.

(B) *International Residential Code; Amendments.* The certain document designated and marked as the 2018 International Residential Code and appendices A, B, C, E, G, H, K, N, P, Q, R, S and T contained therein, copies of which are on file electronically in the office of the City Clerk of the city, and as amended by that portion of the certain document entitled El Mirage Amendments applicable to the 2018 International Residential Code, three copies of which are on file in the office of the City Clerk of the city, together are hereby adopted as the Residential Building Code for the city by reference as if set forth herein in full and made part and parcel of the section for regulating and controlling the erection, construction, enlargement, alteration, repair moving, improvement, removal, equipping, use, occupying or maintaining any residential building on premises within the city, and it is hereby declared to be unlawful to construct, erect, enlarge, alter, repair, maintain, move, improve, demolish, equip, use, occupy any one- and two-family residential building or premises within the city, or cause or permit the same to be done, contrary to or in violation of any provisions of the Residential Code as herewith adopted by the Council of the city.

(C) *National Electric Code; Amendments.* The certain document designated and marked as the 2017 National Electric Code and all appendices contained therein, copies of which are on file electronically in the office of the City Clerk of the city, and as amended by that portion of the certain document entitled El Mirage Amendments applicable to the 2017 National Electric Code, three copies of which are on file in the

office of the City Clerk of the city, together are hereby adopted as the Electric Code for the city by reference as if set forth herein in full and made part and parcel of the section for regulating and controlling the installing, construction, remodeling, alteration, repair, conversion, maintenance, use and removal of houses, buildings, structures and premises and of electrical installations of any type whatsoever therein or thereupon within the corporate limits of the city, and it is hereby declared to be unlawful to construct, erect, install, remodel, alter, repair, change, convert, use, remove, maintain or demolish any house, building or structure or premises or any electrical installation of any type whatsoever therein or thereupon within the city, or cause or permit the same to be done, contrary to or in violation of the Electric Code as herewith adopted by the Council of the city.

(D) *International Fire Code; Amendments.* The certain document designated and marked as the 2018 International Fire Code and all appendices contained therein, copies of which are on file electronically in the office of the City Clerk of the city, and as amended by that portion of the certain document entitled El Mirage Amendments applicable to the 2018 International Fire Code, three copies of which are on file in the office of the City Clerk of the city, together are hereby adopted as the Fire Code for the city by reference as if set forth herein in full and made part and parcel of the section for establishing regulations affecting or relating to structures, processes, premises and safeguards regarding: the hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices; Conditions hazardous to life, property or public welfare in the occupancy of structures or premises; Fire hazards in the structure or on the premises from occupancy or operation; Matters related to the construction, extension, repair, alteration or removal of fire suppression or alarm systems; and conditions affecting the safety of fire fighters and emergency responders during emergency operations within the city, or cause or permit the same to be done, contrary to or in violation of any provisions of the Fire Code as herewith adopted by the Council of the city.

(E) *International Plumbing Code; Amendments.* The certain document designated and marked as the 2018 International Plumbing Code and appendices B, C, and E contained therein, copies of which are on file electronically in the office of the City Clerk of the city, and as amended by that portion of the certain document entitled El Mirage Amendments applicable to the 2018 International Plumbing Code, three copies of which are on file in the office of the City Clerk of the city, together are hereby adopted as the Plumbing Code for the city by reference as is set forth herein in full and made part and parcel of the section for regulating and controlling the design, construction, quality of materials, erection, installation alteration, repair location, relocation, replacement, addition to, removal, use, or maintenance of any plumbing systems on premises within the city, and it is hereby declared to be unlawful to cause or permit the same to be done, contrary to or in violation of any provisions of the Plumbing Code as herewith adopted by the Council of the city.

(F) *International Mechanical Code; Amendments.* The certain document designated and marked as the 2018 International Mechanical Code, copies of which are on file electronically in the office of the City Clerk of the city, and as amended by that portion of the certain document entitled El Mirage Amendments applicable to the 2018

International Mechanical Code, three copies of which are on file in the office of the City Clerk of the city, together are hereby adopted as the Mechanical Code for the city by reference as if set forth herein in full and made part and parcel of the section for regulating and controlling the design, construction, quality of materials, operation, installation, alteration, repair, relocation, replacement, addition to, removal, use, or maintenance of any heating, ventilating, comfort-cooling or refrigeration systems, incinerators, or other miscellaneous heat-producing appliances, within the city, and it is hereby declared to be unlawful to cause or permit the same to be done, contrary to or in violation of any provisions of the Mechanical Code as herewith adopted by the Council of the city.

(G) *International Fuel Gas Code; Amendments.* The certain document designated and marked as the 2018 International Fuel Gas Code, copies of which are on file electronically in the office of the City Clerk of the city, and as amended by that portion of the certain document entitled El Mirage Amendments applicable to the 2018 International Fuel Gas Code, three copies of which are on file in the office of the City Clerk of the city, together are hereby adopted as the Mechanical Code for the city by reference as if set forth herein in full and made part and parcel of the section for regulating and controlling the design, construction, quality of materials, operation, installation, alteration, repair, relocation, replacement, addition to, removal, use, or maintenance of any fuel gas systems and gas-fired appliances within the city, and it is hereby declared to be unlawful to cause or permit the same to be done, contrary to or in violation of any provisions of the Fuel Gas Code as herewith adopted by the Council of the city.

(H) *International Existing Building Code; Amendments.* The certain document designated and marked as the 2018 International Existing Building Code, copies of which are on file electronically in the office of the City Clerk of the city, and as amended by that portion of the certain document entitled El Mirage Amendments applicable to the 2018 International Existing Building Code, three copies of which are on file in the office of the City Clerk of the city, together are hereby adopted as the Existing Building Code for the city by reference as if set forth herein in full and made part and parcel of the section for the use of alternative approaches to achieve compliance with minimum requirements to safeguard the public health, safety and welfare insofar as they are affected by the repair, alteration, change of occupancy, addition and relocation of existing buildings and it is hereby declared to be unlawful to cause or permit the same to be done, contrary to or in violation of the Existing Building Code as herewith adopted by the Council of the city.

(I) *International Property Maintenance Code.* The certain document designated and marked as the International Property Maintenance Code, copies of which are on file electronically in the office of the City Clerk of the city, and as amended by that portion of the certain document entitled El Mirage Amendments applicable to the International Property Maintenance Code, three copies of which are on file in the office of the City Clerk of the city, together are hereby adopted as the Property Maintenance Code for the city.

(1) *Enforcement; Violations; Penalties; Inspections.* Any Code Enforcement official, building official, police officer or other person designated by the City Manager may inspect buildings or land to determine compliance with the International Property Maintenance Code, as herewith adopted by the Council of the city.

(2) *Violations; Civil or criminal infractions.* A violation of any provision of the International Property Maintenance Code, as adopted herein, may be prosecuted by the city, in its sole discretion, as either a civil infraction or a class 1 misdemeanor offense. Each day a violation exists may be deemed a separate offense. A citation for a civil infraction of an alleged violation of the International Property Maintenance Code, as adopted herein, may be issued by any city code enforcement official, building official, police officer or any other person authorized by the City Manager.

(3) *Penalty; Civil infraction.* A civil infraction shall be heard by either the city court or a hearing officer appointed by the Mayor and Council of the City of El Mirage. Any person found responsible by the city court or a hearing officer for a civil infraction of the International Property Maintenance Code as adopted herein, shall be subject to a fine of not less than \$50 or more than \$1,000 per violation.

(4) *Penalty; Class 1 misdemeanor.* Any person found guilty of a criminal violation (class 1 misdemeanor) of the Property Maintenance Code as adopted herein, shall be subject to imprisonment not to exceed 180 days per violation and/or a fine not to exceed \$2,500 per violation, unless the violator is an enterprise in which case the fine shall not exceed \$20,000 per violation.

(5) *Costs and expenses.* In addition to any penalty, fine, and/or jail time imposed for a violation of the Property Maintenance Code as adopted herein, a person found to be in violation shall also be ordered to reimburse the city all costs and expenses incurred by the city in prosecuting the violation and abating the violation.

(J) *International Energy Conservation Code; Amendments.* The certain document designated and marked as the International Energy Conservation Code, copies of which are on file electronically in the office of the City Clerk of the city, and as amended by that portion of the certain document entitled El Mirage Amendments applicable to the International Energy Conservation Code, three copies of which are on file in the office of the City Clerk of the city, together are hereby adopted as the Energy Code for the city by reference as if set forth herein in full and made part and parcel of the section to regulate the design and construction of buildings for the effective use and conservation of energy over the useful life of each building. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this objective. This code is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances and it is hereby declared to be unlawful to cause or permit the same to be done, contrary to or in violation of the Energy Code as herewith adopted by the Council of the city.

(K) *International Green Construction Code.* The certain document designated and marked as the 2018 International Green Construction Code, copies of which are on file electronically in the office of the City Clerk of the city, and as amended by that portion of the certain document entitled El Mirage Amendments applicable to the International

Green Construction Code, three copies of which are on file in the office of the City Clerk of the city, together are hereby adopted as the Green Construction Code for the city as is set forth herein in full and made part and parcel of the section as an overlay document to be used voluntarily in conjunction with the other codes and standards adopted by the city. The provisions of this code shall apply to the design, construction, addition, alteration, change of occupancy, relocation, replacement, repair, equipment, building site, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures and to the site on which the building is located. This code is intended to safeguard the environment, public health, safety and general welfare through the establishment of requirements to reduce the negative impacts and increase the positive impacts of the built environment on the natural environment and building occupants. This code is not intended to abridge or supersede safety, health or environmental requirements under other applicable codes or ordinances.

(L) *The Uniform Code For the Abatement of Dangerous Buildings, 1997 edition.* The certain code entitled Uniform Code for the Abatement of Dangerous Buildings, 1997 edition, is hereby adopted as the Uniform Code for the Abatement of Dangerous Buildings of the city and made part of this chapter the same as though the code was specifically set forth in full herein, and at least three copies of the code shall be filed in the office of the City Clerk and kept available for the public use and inspection.

(Ord. O14-08-07, passed 8-13-2014; Res. R14-08-18, passed 8-13-2014)

§ 150.002 CONFORMANCE TO ZONING ORDINANCE.

Whenever a building permit is issued and a building inspection performed, the building must conform to the provisions of Chapter 154 of this code in addition to the provision of this chapter.

(Ord. O14-08-07, passed 8-13-2014; Res. R14-08-18, passed 8-13-2014)

§ 150.003 MOVING OF BUILDINGS.

(A) In addition to any other requirements of law or city ordinances, the moving of any building into the city shall be governed by all international codes and standards set forth in this chapter.

(B) Requirements of the International Building Code shall apply for moving buildings into the city limits.

(C) In addition to the provisions provided in the International Building Code, any building shall not be moved into the corporate limits until which time as the Building Inspector, Building Official or City Manager has issued a building permit. The application for permit must fully comply with the provisions of § 105 of the International Building Code, unless otherwise exempted or waived by the responsible city official. Prior to receiving a building permit for moving any building into or within the city which does not comply with §§ [150.095](#) et seq., the applicant shall post a bond in favor of the city in a

sum determined by the Building Official, which shall be in an amount no less than \$10,000. The bond shall be conditioned that a certificate of occupancy be issued for the building in no less than 180 days from the issuance of a building permit or within any extension period granted pursuant to division (D) of this section or the bond shall be forfeited.

(D) Every permit issued by the Building Department under the provisions of this section shall expire by limitations and shall be void if the building or work authorized by the permit is not completed within 180 days from the date of permit. An applicant may apply for an extension in writing which may be granted by the City Council in its discretion, which may or may not waive forfeiture of any bond. When granted an extension of expired permits, all permits shall be renewed by paying one-half the amount required for a permit within seven days after approval by the Council.

(E) Military barracks and apartment structures will not be allowed to be moved into the city.

(Ord. O14-08-07, passed 8-13-2014; Res. R14-08-18, passed 8-13-2014)

§ 150.004 PROFESSIONAL CERTIFICATION REQUIREMENTS FOR BUILDING OFFICIAL OR INSPECTOR.

(A) All building inspectors employed by the city shall, within six months of commencing such employment and thereafter maintain certification as a building inspector from the International Code Council (ICC).

(B) The City Manager may require building inspectors to obtain and thereafter maintain such additional ICC certifications as (s)he determines are necessary job qualifications. Any building inspector employed by the city at the time the additional requirement is imposed shall have six months thereafter to obtain the additional certification.

(C) Building inspectors employed by the city on the effective date of this chapter shall have six months to obtain building inspector certification from the ICC.

(Ord. O14-08-07, passed 8-13-2014; Res. R14-08-18, passed 8-13-2014)

§ 150.005 BUILDING INSPECTOR.

The Building Inspector and administrative authority, as such may be referenced in any section of the chapter for all matters pertaining to any building, plumbing, mechanical, electrical or any other inspections, shall be vested in the office of City Manager or such other person the Manager may designate.

(Ord. O14-08-07, passed 8-13-2014; Res. R14-08-18, passed 8-13-2014)

MOBILE AND MANUFACTURED HOUSING STANDARDS

§ 150.095 ADOPTION OF STANDARDS.

The certain set of standards, composing A.R.S. Title 41, Chapter 16, Articles 1 and 2 of the Arizona Department of Housing, Statutes and Rules, adopted by the Secretary of State and revised June 13, 2013 of the Manufactured Housing & Building Division, and as the same may be amended from time to time, is hereby adopted as the Mobile and Manufactured Housing Standards of the city and made a part of this chapter the same as though the standards were specifically set forth in full herein. Copies of the standards are on file electronically.

(Ord. O14-08-07, passed 8-13-2014; Res. R14-08-18, passed 8-13-2014)

§ 150.096 UTILITY CONNECTIONS.

All utility connections shall be pursuant to:

- (A) Currently adopted International Plumbing Code;
- (B) Currently adopted National Electric Code; and
- (C) Currently adopted International Fuel Gas Code.

(Ord. O14-08-07, passed 8-13-2014; Res. R14-08-18, passed 8-13-2014)

§ 150.097 ACCESSORY STRUCTURES.

Unless otherwise specified in this chapter, the installation, assembly, connections or construction of any accessory structure shall be pursuant to the applicable requirements of:

- (A) The currently adopted International Building Code;
- (B) The currently adopted International Residential Code;
- (C) The currently adopted International Plumbing Code;
- (D) The currently adopted International Mechanical Code; and
- (E) The currently adopted National Electric Code.

(Ord. O14-08-07, passed 8-13-2014; Res. R14-08-18, passed 8-13-2014)

§ 150.098 SKIRTING.

Skirting shall be installed in accordance with the Manufactured Housing Installation Requirements of the Arizona Department of Housing, Manufactured Housing & Building Division with an effective date of 9-13-2013.

(Ord. O14-08-07, passed 8-13-2014; Res. R14-08-18, passed 8-13-2014)

§ 150.099 ATTACHED PATIO, CARPORT, PORCH, GARAGE OR STORAGE ROOM.

The following specifications shall apply to the construction or assembly of an attached patio, carport, porch, garage or storage room:

(A) *Materials.*

(1) Roof coverings may be metal, plastic, wood, or other approved material.

(2) Floor decking may be wood, concrete or other approved material.

(B) All roofs shall be constructed so as to withstand 20 pounds per square foot live load, 20 pounds per square foot uplift load.

(C) Construction and assembly specifications shall be certified to comply with this chapter by:

(1) Structural reports;

(2) Certified engineering calculations; or

(3) Approval of the City Building Department.

(Ord. O14-08-07, passed 8-13-2014; Res. R14-08-18, passed 8-13-2014)

§ 150.100 DRAINAGE.

Drainage of at least one-half inch per foot shall be provided for the first ten feet adjacent to all sides of a mobile home. Where property lines, walls, slopes, or other physical conditions prohibit this slope, the site must be provided with drains or swales or otherwise graded to drain water away from the structure.

(Ord. O14-08-07, passed 8-13-2014; Res. R14-08-18, passed 8-13-2014)

§ 150.101 GROUND ANCHORING.

When a unit is anchored, the anchoring shall be consistent with the Manufactured Housing Installation Requirements of the Arizona Department of Housing, Manufactured Housing & Building Division with an effective date of 9-13-2013.

(Ord. O14-08-07, passed 8-13-2014; Res. R14-08-18, passed 8-13-2014)

CONSTRUCTION SOUND TRANSMISSION CONTROL (NOISE)

§ 150.115 BUILDING OPERATIONS.

(A) *Building Operations; Permits from the Building Official.* The erection (including excavation), demolition, alteration, or repair of any building in any residential district or section, other than between the hours of 6:00 a.m. and 7:00 p.m. from the first day of May to and including the 30th day of September and between the hours of 7:00 a.m. and 7:00 p.m. beginning the first day of October to and including the 30th day of April on Monday through Saturday with year round hours of 8:00 a.m. to 7:00 p.m. on Sundays, except in the case of urgent necessity in the interest of public health, safety, and welfare, and then only with a permit from the Building Official, which permit may be granted for a period not to exceed 30 days, while the emergency continues. If the Building Official should determine that the public health, safety and welfare will not be impaired by the building within the hours specified herein, and if (s)he shall further determine that loss or inconvenience would not result to any party in interest, (s)he may grant permission for the work to be done at times other than specified herein, upon application being made at the time the permit for the work is awarded or during progress of the work.

(B) *Excavation of streets; Permits from the Development Services Director.* The excavation of streets, highways in any residential district or section, other than the hours specified in division (A) above, except in the case of urgent necessity to the interest of public health, safety and welfare then only with a permit from the Development Services Director, which permit may be granted for a period not to exceed 30 days, while the emergency continues. If the Development Services Director should determine that the public health, safety and welfare will not be impaired by the excavation of streets and highways within the hours specified in division (A) above, and if (s)he shall further determine that loss or inconvenience should not result to any party in interest, (s)he may grant permission for the work to be done other than the specified division (A) above, upon application being made at the time the permit for work is awarded or during the progress of work.

(C) *Exception.* No work shall be conducted on any legal federal, state or city holiday unless urgent necessity exists as described in division (A) above and until full compliance with those regulations set forth therein.

(Ord. O14-08-07, passed 8-13-2014; Res. R14-08-18, passed 8-13-2014)

§ 150.999 PENALTY.

(A) Any person violating any provision of this chapter for which no specific penalty is prescribed shall be subject to § [10.99](#).

(B) Any person found guilty of violating any provision of the Technical Codes shall be guilty of a class 1 misdemeanor, punishable by a fine not to exceed \$500 or by imprisonment for a period not to exceed six months, or by both fine and imprisonment. Each day the violation continues shall be a separate offense.

(C) In addition to any criminal penalties provided in this code, a violation of § [150.003](#) shall be punishable by imposition of a civil fine in an amount up to \$500 for each day the violation continues.

(Ord. O14-08-07, passed 8-13-2014; Res. R14-08-18, passed 8-13-2014)

RESOLUTION R23-05-10 EXHIBIT
CITY OF EL MIRAGE AMENDMENTS
AMENDMENTS TO THE
2018 INTERNATIONAL BUILDING CODE

The following sections, paragraphs, and sentences of the *2018 International Building Code* are hereby amended as follows: Standard type (*including italics*) is text from the IBC.

CAPITALIZED type is text inserted. ~~Lined through~~ type is deleted text from the IBC.

APPENDICES C AND H ARE EXPRESSLY ADOPTED AND INCORPORATED HEREIN BY THIS REFERENCE

SECTION 101 GENERAL

101.1 Title. These regulations shall be known as the *Building Code* ~~[NAME OF JURISDICTION]~~ of **CITY OF EL MIRAGE**, hereinafter referred to as "this code."

SECTION 105 PERMITS

105.2 Work exempt from permit. Exemptions from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. *Permits* shall not be required for the following:

Building:

1. One-story detached accessory structures ~~used as tool and storage sheds, playhouses and similar uses,~~ provided the floor area is not greater than 120 square feet (11 m²).
2. ~~Fences not over 7 feet (2134 mm) high.~~
3. Oil derricks.
4. ~~Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or impounding Class I, II or IIIA liquids.~~
5. Water tanks supported directly on grade if the capacity is not greater than 5,000 gallons (18 925 L) and the ratio of height to diameter or width is not greater than 2:1.
6. **PLATFORMS**, Sidewalks and driveways not more than 30 inches (762 mm) above adjacent grade, and not over any basement or story below and are not part of an accessible route.
7. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
8. Temporary motion picture, television, and theater stage sets and scenery.
9. Prefabricated swimming pools accessory to a Group R-3 occupancy that are less than 18 inches (610 mm) deep, are not greater than 5,000 gallons (18 925 L) and are installed entirely above ground.

10. Shade cloth structures constructed for nursery or agricultural purposes, not including service systems.
11. Swings and other playground equipment accessory to detached one- and two-family dwellings.
12. Window awnings in Group R-3 and U occupancies, supported by an exterior wall that do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support.
13. Non-fixed and movable fixtures, cases, racks, counters and partitions not over 5 feet 9 inches (1753 mm) in height.

SECTION 105 PERMITS

105.5 Expiration. A PERMIT SHALL BE CONSIDERED EXPIRED IF MORE THAN 180 DAYS SHALL PASS BETWEEN APPROVALS OF INSPECTIONS LISTED IN SECTION 109. WHEN A PERMIT EXPIRES BY LIMITATIONS AND HAS BECOME NULL AND VOID, AND THE BUILDING OFFICIAL HAS NOT BEEN NOTIFIED IN WRITING BY THE PERMIT APPLICANT THAT NO WORK WAS DONE UNDER THE PERMIT, THE BUILDING OFFICIAL MAY FILE A "NOTICE OF NON-COMPLIANCE" WITH THE MARICOPA COUNTY RECORDER'S OFFICE FOR FAILURE TO OBTAIN THE REQUIRED INSPECTIONS. ~~Every permit issued shall become invalid unless the work on the site authorized by such permit is commenced within 180 days after its issuance, or if the work authorized on the site by such permit is suspended or abandoned for a period of 180 days after the time the work is commenced. The building official is authorized to grant, in writing, one or more extension of time, for periods not more 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.~~

105.5.1 COMPLETING WORK AND FINAL INSPECTION. EVERY PERMIT ISSUED BY THE BUILDING OFFICIAL SHALL EXPIRE 24 MONTHS AFTER THE DATE OF PERMIT ISSUANCE. IF THE BUILDING OR WORK AUTHORIZED BY SUCH PERMIT HAS NOT RECEIVED FINAL INSPECTION APPROVAL PRIOR TO THE PERMIT EXPIRATION DATE, ALL WORK SHALL STOP UNTIL A NEW PERMIT IS OBTAINED FOR THE VALUE OF THE WORK REMAINING UNFINISHED.

EXCEPTION: THE BUILDING OFFICIAL MAY APPROVE A PERIOD EXCEEDING 24 MONTHS FOR COMPLETION OF WORK WHEN THE PERMIT HOLDER CAN DEMONSTRATE THAT THE COMPLEXITY OR SIZE OF THE PROJECT MAKES COMPLETING THE PROJECT WITHIN 24 MONTHS UNREASONABLE. ANY REQUEST SHALL BE PRIOR TO THE EXPIRATION OF THE PERMIT.

SECTION 113 BOARD OF APPEALS

[A] 113.1 General. APPEALS SHALL BE IN ACCORDANCE WITH SECTION 96.01 OF THE EL MIRAGE MUNICIPAL CODE. ~~In order to hear and decide appeals or orders, decisions or determinations made by the building official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeal shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business.~~

SUBSECTIONS 113.2 THROUGH 113.3 ARE DELETED IN THEIR ENTIRETY.

SECTION 1111 SIGNAGE

1111.1 Signs. Required *accessible* elements shall be identified by the International Symbol of Accessibility at the following locations.

1. *Accessible* parking spaces required by Section 1106.1.

A. ACCESSIBLE PARKING SPACES MAY ALSO BE IDENTIFIED BY THE USE OF THE ACCESSIBILITY ICON.

Exception: Where the total number of parking spaces provided is four or less, identification of *accessible* parking is not required.

2. *Accessible* parking spaces required by Section 1106.2.

Exception: In Group I-1, R-2, R-3 and R-4 facilities, where parking spaces are assigned to specific *dwelling units* or *sleeping units*, identification of *accessible* parking spaces is not required.

3. *Accessible* passenger loading zones.
4. *Accessible* rooms where multiple single-user toilet or bathing rooms are clustered at a single location.
5. *Accessible* entrances where not all entrances accessible.
6. *Accessible* check-out aisles where not all aisles are accessible. The sign, where provided, shall be above the check-out aisle in the same location as the check-out aisle number or type of check-out identification.
7. Family or assisted-use toilet and bathing rooms.
8. *Accessible* dressing, fitting, and locker rooms where not all such rooms are *accessible*.
9. *Accessible* areas of refuge in accordance with Section 1009.9.
10. Exterior areas for assisted rescue in accordance with Section 1009.9.
11. In recreational facilities, lockers that are required to be accessible in accordance with Section 1109.9.

1111.2 Directional signage. Directional signage indicating the route to the nearest like *accessible* element shall be provided at the following locations. These directional signs shall include the International Symbol of Accessibility **OR THE ACCESSIBILITY ICON** and sign characters shall meet the visual character requirements in accordance with ICC A117.1.

1. Inaccessible building entrances.
2. Inaccessible public toilets and bathing facilities.
3. Elevators not serving an *accessible* route.
4. At each separate-sex toilet and bathing room indicating the location of the nearest family or assisted-use toilet or bathing room were provided in accordance with Section 1109.2.1

5. At *exits* and *exit stairways* serving a required *accessible* space, but not providing an *approved accessible means of egress*, signage shall be provided in accordance with Section 1009.10.

6. Where drinking fountains for persons using wheelchairs and drinking fountains for standing persons are not located adjacent to each other, directional signage shall be provided indicating the location of the other drinking fountains.

SECTION 1203 TEMPERATURE CONTROL

1203.1 Equipment and systems. HABITABLE SPACES ~~Interior spaces~~ intended for human occupancy shall be provided with active or passive space heating **AND SPACECOOLING** systems capable of maintaining a minimum indoor temperature **BETWEEN 70°F of 68°F (21.20°C) AND 90°F (32°C)** at a point 3 feet (914 mm) above the floor on the design heating day.

Exception: Space heating **AND COOLING** systems are not required for:

1. Interior spaces where the primary purpose of the space is not associated with human comfort.
2. Group F, H, S or U occupancy

SECTION 1607 LIVE LOADS

TABLE 1607.1

MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o , AND MINIMUM CONCENTRATED LIVE LOADS

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs)
25 Residential		
One- and two- family dwellings		
Uninhabitable attics with storage	20 40	
Habitable attics and sleeping areas	20 40	
(NO OTHER CHANGES IN ITEM #25)		

SECTION 1612 FLOOD LOADS

1612.3 Establishment of flood hazard areas. To establish *flood hazard* areas, the applicable governing authority shall adopt a flood hazard map and supporting data. The flood hazard map shall include, at a minimum, areas of special flood hazard as identified by the Federal Emergency Management Agency in an engineering report entitled "The Flood Insurance Study for ~~[INSERT NAME OF JURISDICTION]~~ **MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS REVISED ON JULY 19, 2001,**" dated ~~[INSERT DATE OF~~

ISSUANCE] as amended or revised with the accompanying Flood Insurance Rate Map (FIRM) and Flood Boundary and Floodway Map (FBFM) and related supporting data along with any revisions thereto. The adopted flood hazard map and supporting data are hereby adopted by reference and declared to be part of this section.

SECTION 1704 SPECIAL INSPECTIONS AND TESTS, CONTRACTOR RESPONSIBILITY AND STRUCTURAL OBSERVATION

1704.1 General. Special inspections and tests, statements of special inspections, responsibilities of contractors, submittals to the *building official* and structural observations shall meet the applicable requirements of this section. **THE BUILDING OFFICIAL MAY ALSO REQUIRE OTHER SPECIAL INSPECTIONS NOT PRESCRIBED IN THIS SECTION AS NEEDED.**

SECTION 2106 SEISMIC DESIGN

2106.1 Seismic design requirements for masonry. Masonry structures and components shall comply with the requirements in section 1.18 of TMS 402/ACI 530/ASCE 5 depending on the structure's *seismic design category*. **ALL NEW MASONRY ELEMENTS, REGARDLESS OF SEISMIC DESIGN CATEGORY, SHALL MEET THE FOLLOWING MINIMUM REINFORCEMENT REQUIREMENTS:**

- 1. CONNECTIONS TO COLUMNS SHALL COMPLY WITH SECTION 1.18.4.3.2.1 OF TMS 402/ACI 530/ASCE 5.2**
- 2. VERTICAL WALL REINFORCEMENT OF AT LEAST 0.20 SQUARE INCH (130 MM) IN CROSS-SECTIONAL AREA SHALL BE PROVIDED CONTINUOUSLY FROM SUPPORT TO SUPPORT AT EACH CORNER, AT EACH SIDE OF EACH OPENING, AT THE ENDS OF WALLS AND AT MAXIMUM SPACING OF 4 FEET (1219 MM) APART HORIZONTALLY THROUGHOUT THE WALL.**
- 3. HORIZONTAL WALL REINFORCEMENT NOT LESS THAN 0.20 SQUARE INCH (130 MM) IN CROSS-SECTIONAL AREA SHALL BE PROVIDED (1) AT THE BOTTOM AND TOP OF WALL OPENINGS AND EXTEND NOT LESS THAN 24 INCHES (610 MM) OR LESS THAN 40 BAR DIAMETERS PAST THE OPENING, (2) CONTINUOUSLY AT STRUCTURALLY CONNECTED ROOF AND FLOOR LEVELS AND AT THE TOP OF WALLS, (3) AT THE BOTTOM OF WALLS OR IN THE TOP OF FOUNDATIONS WHEN DOWELED IN WALLS, AND (4) AT MAXIMUM SPACING OF 10 FEET (3048 MM) UNLESS UNIFORMLY DISTRIBUTED JOINT REINFORCEMENT IS PROVIDED.**
- 4. WHERE ANCHOR BOLTS ARE USED TO CONNECT HORIZONTAL ELEMENTS TO THE TOPS OF COLUMNS, ANCHOR BOLTS SHALL BE PLACED WITHIN LATERAL TIES. LATERAL TIES SHALL ENCLOSE BOTH THE VERTICAL BARS IN THE COLUMN AND THE ANCHOR BOLTS. THERE SHALL BE A MINIMUM OF TWO NO. 4 (M #13) OR THREE NO. 3(M #10) IN THE TOP 5 INCHES (127 MM) OF THE COLUMN.**

SECTION 3109 SWIMMING POOLS, SPAS AND HOT TUBS

3109.1 General. The design and construction of swimming pools, spas and hot tubs shall comply with the International Swimming Pool and Spa Code **MARICOPA COUNTY ENVIRONMENTAL SERVICES DEPARTMENT REQUIREMENTS.**

**AMENDMENTS TO THE
2018 INTERNATIONAL RESIDENTIAL CODE**

APPENDICES A, B, C, E, G, H, K, N, P, Q, R, S AND T ARE EXPRESSLY ADOPTED AND INCORPORATED HEREIN BY THIS REFERENCE

SECTION R101 GENERAL

R101.1 Title. These provisions shall be known as the *Residential Code for One and Two-Family Dwellings* of ~~[NAME OF JURISDICTION]~~ **CITY OF EL MIRAGE**, and shall be cited as such and will be referred to herein as “this code.”

SECTION R102 APPLICABILITY

R102.4 Referenced codes. **THE OTHER CODES LISTED IN SECTIONS 102.4.1 THROUGH 102.4.2 AND REFERENCED ELSEWHERE IN THIS CODE SHALL BE CONSIDERED PART OF THE REQUIREMENTS OF THIS CODE TO THE PRESCRIBED EXTENT OF EACH SUCH REFERENCE AND AS ADOPTED AND AMENDED BY THE CITY OF EL MIRAGE.** ~~The codes and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections R102.4.1 and R102.4.2.~~

SECTION R105 PERMITS

R105.2.4 FLAMMABLE LIQUIDS AND GASSES. **A PERMIT SHALL BE REQUIRED FOR THE INSTALLATION OF ANY CONTAINER OR PUMP FOR STORING AND HANDLING FLAMMABLE LIQUIDS AND GASES. ALL CONTAINERS AND EQUIPMENT FOR THE STORAGE AND HANDLING OF FLAMMABLE LIQUIDS OR GASES, OR BOTH, SHALL BE INSTALLED IN ACCORDANCE WITH THE 2018 INTERNATIONAL FIRE CODE. ALL TANKS MUST BE FILLED FROM VEHICLES PARKED ON PRIVATELY OWNED PROPERTY. NO PUMP SHALL BE LOCATED WITHIN A BUILDING.**

R105.2 Work exempt from permit. Exemption from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this *jurisdiction*. *Permits* shall not be required for the following.

Building:

1. One-story detached *accessory structures*, provided the floor area is not greater than 200 square feet (18.58 m²) **120 SQUARE FEET (11 M²)**.
2. ~~Fences not over 7.6 feet (2134 mm) high.~~
3. ~~Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge.~~
4. Water tanks supported directly on grade if the capacity is not greater than 5,000 gallons (18 925 L) and the ratio of height to diameter or width is not greater than 2:1.
5. Sidewalks and driveways.

6. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
7. Prefabricated swimming pools accessory to a Group R-3 occupancy that are less than 24 18 inches (610 mm) deep.
8. Swings and other playground equipment.
9. Window awnings supported by an exterior wall that do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support.
10. Decks not exceeding 200 square feet (18.58 m2) in area, that are not more than 30 inches (762 mm) above grade at any point, are not attached to a dwelling and do not serve the exit door required by Section R311.4.

105.5 Expiration. ~~Every permit issued shall become invalid unless the work authorized by such permit is commenced within 180 days after its issuance or after commencement of work if more than 180 days pass between inspections. The building official is authorized to grant, in writing, one or more extension of time, for periods not more 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.~~ **A PERMIT SHALL BE CONSIDERED EXPIRED IF MORE THAN 180 DAYS SHALL PASS BETWEEN APPROVALS OF INSPECTIONS LISTED IN SECTION 109. WHEN A PERMIT EXPIRES BY LIMITATIONS AND HAS BECOME NULL AND VOID, AND THE BUILDING OFFICIAL HAS NOT BEEN NOTIFIED IN WRITING BY THE PERMIT APPLICANT THAT NO WORK WAS DONE UNDER THE PERMIT, THE BUILDING OFFICIAL MAY FILE A "NOTICE OF NON-COMPLIANCE" WITH THE MARICOPA COUNTY RECORDER'S OFFICE FOR FAILURE TO OBTAIN THE REQUIRED INSPECTIONS.**

105.5.1 COMPLETING WORK AND FINAL INSPECTION. EVERY PERMIT ISSUED BY THE BUILDING OFFICIAL SHALL EXPIRE 24 MONTHS AFTER THE DATE OF PERMIT ISSUANCE. IF THE BUILDING OR WORK AUTHORIZED BY SUCH PERMIT HAS NOT RECEIVED FINAL INSPECTION APPROVAL PRIOR TO THE PERMIT EXPIRATION DATE, ALL WORK SHALL STOP UNTIL A NEW PERMIT IS OBTAINED FOR THE VALUE OF THE WORK REMAINING UNFINISHED.

EXCEPTION: THE BUILDING OFFICIAL MAY APPROVE A PERIOD EXCEEDING 24 MONTHS FOR COMPLETION OF WORK WHEN THE PERMIT HOLDER CAN DEMONSTRATE THAT THE COMPLEXITY OR SIZE OF THE PROJECT MAKES COMPLETING THE PROJECT WITHIN 24 MONTHS UNREASONABLE. ANY REQUEST SHALL BE PRIOR TO THE EXPIRATION OF THE PERMIT.

SECTION R108 FEES

R108.2 Schedule of permit fees. On buildings, structures, electrical, gas, mechanical and plumbing systems or alterations requiring a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the **CURRENTLY ADOPTED FEE SCHEDULE FOR THE CITY OF EL MIRAGE** ~~applicable governing authority~~.

SECTION R112 BOARD OF APPEALS

R112.1 General. APPEALS SHALL BE IN ACCORDANCE WITH SECTION 96.01 OF THE EL MIRAGE MUNICIPAL CODE. ~~In order to hear and decide appeals of orders, decisions or determinations made by the Building Official relative to the application and interpretation of this~~

~~code, there shall be and is hereby created a board of appeals. The Building Official shall be an ex-officio member of said board but shall have no vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the Building Official.~~

SUBSECTIONS R112.2 THROUGH 112.4 ARE DELETED IN THEIR ENTIRETY.

SECTION R301 DESIGN CRITERIA

R301.2 Climatic and geographic design criteria. Buildings shall be constructed in accordance with the provisions of this code as limited by the provisions of this section. Additional criteria shall be established by the local *jurisdiction* and set forth in Table R301.2(1).

TABLE R301.2(1)

(DUE TO SPACE LIMITATIONS THE TABLE COULD NOT BE REPRODUCED; ONLY THE VALUES ARE LISTED)

GROUND SNOW LOAD: 0

WIND SPEED (MPH): 115 EXPOSURE B (UNLESS OTHERWISE DESIGNATED BY THE BUILDING OFFICIAL)

TOPOGRAPHIC EFFECTS: NO

SPECIAL WIND REGION: NO

WINDBORNE DEBRIS ZONE: NO

SEISMIC DESIGN CATEGORY: B

WEATHERING: NEGLIGIBLE

FROST LINE DEPTH: 0"

TERMITE: MODERATE TO HEAVY

DECAY: NONE TO SLIGHT

WINTER DESIGN TEMPERATURE: NONE TO SLIGHT

ICE SHIELD UNDERLAYMENT REQUIRED: NO

FLOOD HAZARDS: MCFCD REQUIREMENTS

AIR FREEZING INDEX: N/A

MEAN ANNUAL TEMPERATURE: 72.3°F

R301.2.4 Floodplain Construction. Buildings and structures constructed in whole or in part in flood hazard areas (including A or V Zones) as established in Table R301.2(1) shall be designed and constructed in accordance with Section R322. Buildings and structures located in whole or in part in identified floodways shall be designed and constructed in accordance with ASCE 24 **THE REGULATIONS OF THE MARICOPA COUNTY FLOOD CONTROL DISTRICT.**

R301.5 Live Load. The minimum uniformly distributed live load shall be as provided in Table R301.5.

TABLE R 301.5

MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS

(in pounds per square foot)

USE	LIVE LOAD
Uninhabitable attics with storage	20 40
Habitable attics and sleeping areas	20 40
Sleeping Rooms	20 40

(NO OTHER CHANGES TO TABLE)

SECTION R303 LIGHT, VENTILATION AND HEATING

R303.10 Required heating AND COOLING. Where the winter design temperature in Table R301.2(1) is below 60°F (16°C) every *dwelling unit* shall be provided with heating **AND COOLING FACILITIES** capable of maintaining a minimum room temperature ~~of not less than~~ **BETWEEN 68-70°F (20-21°C) AND 90°F (32.2°C)** at a point 3 feet (914 mm) above the floor and 2 feet (610 mm) from exterior walls in all habitable rooms at the design temperature. The installation of one or more portable space heaters **OR PORTABLE SPACE COOLERS** shall not be used to achieve compliance with this section.

SECTION R309 GARAGES AND CARPORTS

R309.5 Fire Sprinklers. DELETE THIS SUBSECTION IN ITS ENTIRETY.

SECTION R310 EMERGENCY ESCAPE AND RESCUE OPENINGS

R310.4 Bars, grilles, covers and screens. Where bars, grilles, covers, screens or similar devices are placed over emergency escape and rescue openings, area wells, or window wells, the minimum net clear opening size shall comply with Sections R310.2.1 through R310.2.3 and such devices shall be releasable or removable from the inside without the use of a key, tool, special knowledge or force greater than that required for the normal operation of the escape and rescue opening. **THE DWELLING SHALL BE EQUIPPED WITH SMOKE ALARMS INSTALLED IN ACCORDANCE WITH SECTION R314.**

SECTION R313 AUTOMATIC FIRE SPRINKLER SYSTEMS

DELETE THIS SECTION IN ITS ENTIRETY.

SECTION R322 FLOOD-RESISTANT CONSTRUCTION

R322.1 General. Buildings and structures constructed in whole or in part in flood hazard areas ~~(including A or V Zones) as established in Table R301.2(1), and substantial improvement and repair of substantial damage of buildings and structures in hazard areas,~~ shall be designed and constructed in accordance with this section **THE REGULATIONS OF THE MARICOPA COUNTY FLOOD CONTROL DISTRICT.** ~~Buildings and structures that are located in more than one flood hazard area shall comply with the provisions associated with the most restrictive flood~~

~~hazard area. Buildings and structures located in whole or in part in identified floodways shall be designed and constructed in accordance with ASCE 24.~~

SECTION R328 FIREPLACE RESTRICTIONS

RESTRICTIONS SHALL BE PURSUANT TO MARICOPA COUNTY AIR QUALITY DEPARTMENT REQUIREMENTS.

SECTION R403 FOOTINGS

R403.1.1 Minimum size. Minimum sizes for concrete and masonry footings shall be set forth in Table R403.1 and Figure R403.1(1). The footing width, W, shall be based on the load-bearing value of the soil in accordance with Table R401.4.1. Spread footings shall be at least 6 inches (152 mm) in thickness, T. Footing projections, P, shall be at least 2 inches (51 mm) and shall not exceed the thickness of the footing. The size of footings supporting piers and columns shall be based on the tributary load and allowable soil pressure in accordance with Table R401.4.1. Footings for wood foundations shall be in accordance with the details set forth in Section R403.2 and Figures R403.1.(2) and R403.1(3).

EXCEPTION: FOR ENCLOSURE OF EXISTING CARPORT AND PATIO COVERS, NON-BEARING WOOD FRAMED EXTERIOR WALLS WITHIN THE PROJECTION OF THE EXISTING ROOF MAY BE SUPPORTED ON AN EXISTING, UNCRACKED CONCRETE SLAB. THE MINIMUM SLAB THICKNESS SHALL BE 3.5 INCHES AND THE CONSTRUCTION SHALL COMPLY WITH THE REQUIREMENTS OF R317 FOR PROTECTION AGAINST DECAY.

SECTION R502 WOOD FLOOR FRAMING

R502.3.1 Sleeping areas and attic joists. Table R502.3.1(1 2) shall be used to determine the maximum allowable span of floor joists that support sleeping areas and attics that are accessed by means of a fixed stairway in accordance with Section R311.7 provided that the design live load does not exceed ~~30~~ **40** pounds per square foot (~~1.44~~ **1.92** kPa). The allowable span of ceiling joists that support attics used for limited storage or no storage shall be determined in accordance with Section R802.4.

SECTION N1101 GENERAL

N1101.1 Scope. This chapter regulates the energy efficiency for the design and construction of buildings regulated by this code. **GROUP R-2 WHEN DEFINED AS A RESIDENTIAL BUILDING BY SECTION R202, SHALL HAVE THE OPTION OF COMPLYING UNDER THE COMMERCIAL PROVISIONS OF THE CODE, REGARDLESS OF HEIGHT. ONCE DEFINED AS SUCH ON THE SUBMITTAL DOCUMENTS, ALL COMPONENTS OF THE COMMERCIAL PROVISIONS SHALL BE FOLLOWED.**

N1103.3 Ducts. Ducts and air handlers shall be in accordance with Sections N1103.2.1 through N1103.2.3.

N1103.3.1 Insulation (Prescriptive). Supply ducts in attics shall be insulated to a minimum of R-8. Ducts in floor trusses shall be insulated to a minimum of R-6. ~~Supply and return ducts in attics shall be insulated to an R-value of not less than R-8 for ducts 3 inches (76 mm) in diameter and larger and not less than R-6 for ducts smaller than 3 inches (76 mm) in diameter. Supply and return ducts in other portions of the building shall be insulated to not~~

less than R-6 for ducts 3 inches (76 mm) in diameter and to not less than R-4.2 for ducts smaller than 3 inches (76.2 mm) in diameter.

Exceptions: Ducts or portions thereof located completely inside the building thermal envelope.

1. DUCTS OR PORTIONS THEREOF LOCATED COMPLETELY INSIDE THE BUILDING THERMAL ENVELOPE.

2. SUPPLY DUCTS MAY BE INSULATED TO A MINIMUM OF R-6 WHEN ONE OR MORE OF THE FOLLOWING CONDITIONS ARE MET;

2.1 MINIMUM SEER RATING OF SPACE HEATING/COOLING SYSTEM IS INCREASED TO 15.

2.2 MAXIMUM U-FACTOR IS DECREASED TO 0.35 AND MAXIMUM SHGC IS DECREASED TO 0.22 FOR ALL FENESTRATION PRODUCTS.

2.3 RESIDENTIAL BUILDINGS THAT MEET THE REQUIREMENTS OF SECTIONS R102.1.1 OR R405.

2.4 RESIDENTIAL BUILDINGS WITH ATTIC RADIANT BARRIERS IN ACCORDANCE WITH ASTM C1313, INSTALLED IN ACCORDANCE WITH ASTM C1743.

SECTION N1103 (R403) SYSTEMS

N1103.10.3 Covers ~~VARIABLE SPEED POOL PUMPS. Outdoor heated pools and outdoor permanent spas shall be provided with a vapor-retardant cover or other approved vapor-retardant means.~~ **MOTORS WITH A TOTAL HORSEPOWER OF ONE OR MORE FOR POOLS AND IN-GROUND PERMANENTLY INSTALLED SPAS SHALL HAVE THE CAPABILITY OF OPERATING AT TWO OR MORE SPEEDS WITH A LOW SPEED HAVING A ROTATION RATE THAT IS NO MORE THAN ONE-HALF OF THE MOTOR'S MAXIMUM ROTATION RATE AND SHALL BE OPERATED WITH A PUMP CONTROL WITH THE CAPABILITY OF OPERATING THE PUMP AT TWO OR MORE SPEEDS. RESIDENTIAL POOL PUMP MOTOR CONTROLS THAT ARE SOLD FOR USE WITH A TWO OR MORE SPEED MOTOR SHALL HAVE A DEFAULT CIRCULATION SPEED SETTING NO MORE THAN ONE-HALF OF THE MOTOR'S MAXIMUM ROTATION RATE. ANY HIGH SPEED OVERRIDE CAPABILITY SHALL BE FOR A TEMPORARY PERIOD NOT TO EXCEED ONE TWENTY-FOUR HOUR CYCLE WITHOUT RESETTING TO THE DEFAULT SETTING.**

~~Exception: Where more than 75 percent of the energy for heating, computed over an operation season of not less than three months, is from a heat pump or an on-site renewable energy system, covers or other vapor-retardant means shall not be required.~~

SECTION P2904 DWELLING UNIT FIRE SPRINKLER SYSTEMS

DELETE SECTION IN ITS ENTIRETY.

SECTION E3908 GROUNDING

E3908.8 Types of equipment grounding conductors. The equipment grounding conductor run with or enclosing the circuit conductors shall be one or more or a combination of

OPTIONS ONE THROUGH EIGHT IN E3908.8 WITH THE FOLLOWING MODIFICATION TO OPTION FOUR:

- 4. Electrical metallic tubing WITH AN ADDITIONAL EQUIPMENT GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH TABLE E3908.12.**

Appendix E

Local Amendment

DELETE THIS APPENDIX IN ITS ENTIRETY AND REPLACE AS FOLLOWS:

MANUFACTURED HOUSING USED AS DWELLINGS SHALL CONFORM TO THE ARIZONA DEPARTMENT OF HOUSING'S MANUFACTURED HOUSING & BUILDING DIVISION REGULATIONS.

Appendix I

Local Amendment

DELETE THIS APPENDIX IN ITS ENTIRETY AND REPLACE AS FOLLOWS:

PRIVATE SEWAGE DISPOSAL SYSTEMS SHALL CONFORM TO THE ARIZONA DEPARTMENT OF HOUSING'S MANUFACTURED HOUSING & BUILDING DIVISION REGULATIONS.

Appendix K

SOUND TRANSMISSION

SECTION AK102 AIRBORNE SOUND

AK102.2. SOUND ATTENUATION - GENERAL. CONSTRUCTION OUTSIDE THE AREAS DESIGNATED AS HAVING A DAY NIGHT AVERAGE SOUND LEVEL 65 DECIBELS OR HIGHER AS DETERMINED BY THE USE OF THE 1988 NOISE CONTOUR LINES DEVELOPED BY THE MARICOPA COUNTY ASSOCIATION OF GOVERNMENTS (MAG) SHALL BE DEEMED TO HAVE ACHIEVED THE INTERIOR NOISE LEVEL OF 45 DECIBELS SPECIFIED IN ARS 28-8482 WHEN THE RESIDENCES ARE CONSTRUCTED USING ONE OF THE FOLLOWING METHODS:

1. PRESCRIPTIVE METHOD:

1.1 EXTERIOR WALL PENETRATIONS BY PIPE DUCTS OR CONDUITS SHALL BE SEALED.

1.2 MAIL BOXES SHALL NOT BE USED THROUGH THE DOOR OR WALL.

1.3 WINDOWS SHALL HAVE 2 PANES OF GLASS AND A SOUND TRANSMISSION RATING OF STC-22. ALL OPERABLE WINDOWS SHALL BE WEATHER STRIPPED AND AIR TIGHT IN ACCORDANCE WITH ASTM E283-04 STANDARD. PERIMETER WINDOW FRAMES SHALL BE SEALED.

1.4 ALL EXTERIOR SIDE HINGE DOORS SHALL BE SOLID CORE WOOD OR INSULATED HOLLOW METAL, AT LEAST 1", INCHES THICK AND FULLY WEATHER STRIPPED. ALL EXTERIOR DOORS OTHER THAN SIDE HINGE DOORS SHALL BE SOLID WOOD, FOAM FILLED FIBERGLASS OR METAL CONSTRUCTION.

1.5 FIREPLACES SHALL BE PROVIDED WITH WELL-FITTING DAMPERS.

1.6 EXTERIOR WALLS SHALL ACHIEVE A MINIMUM OVERALL THERMAL RESISTANCE RATING OF 18. (EXTERIOR WALLS SHALL BE AT LEAST FOUR INCHES IN NOMINAL THICKNESS AND SHALL BE FINISHED ON THE OUTSIDE WITH BLOCK, SIDING, SHEATHING, OR STUCCO ON ONE INCH STYROFOAM. A MINIMUM OF R-13 FIBERGLASS OR CELLULOSE INSULATION SHALL BE INSTALLED CONTINUOUSLY THROUGHOUT THE CAVITY SPACE WITHIN THE WALL.)

1.7 ALL ROOF SPACES SHALL ACHIEVE A MINIMUM OVERALL THERMAL RESISTANCE RATING OF 30.

2. PERFORMANCE METHOD:

A CERTIFIED STATEMENT BY A LICENSED ARCHITECT OR ENGINEER CERTIFYING THAT THE RESIDENCE ACHIEVES THE REQUIREMENT OF A MAXIMUM INTERIOR NOISE LEVEL OF 45 DECIBELS. THE CERTIFIED STATEMENT SHALL INCLUDE TESTING AND ANALYSIS DOCUMENTATION SUPPORTING THE STATEMENT.

AK102.2.1 SOUND ATTENUATION WITHIN THE 65 DECIBEL CONTOUR. CONSTRUCTION INSIDE THE AREAS DESIGNATED AS HAVING A DAY-NIGHT AVERAGE SOUND LEVEL 65 DECIBELS AS DETERMINED BY THE USE OF THE 1988 NOISE CONTOUR LINES DEVELOPED BY THE MARICOPA COUNTY ASSOCIATION OF GOVERNMENTS SHALL BE DEEMED TO HAVE ACHIEVED THE INTERIOR NOISE LEVEL OF 45 DECIBELS SPECIFIED IN ARS 28-8482 WHEN THE RESIDENCES ARE CONSTRUCTED USING ONE OF THE FOLLOWING METHODS:

1. PRESCRIPTIVE METHOD:

BUILDING SYSTEMS AND COMPONENTS THAT COMPLY WITH THE MARICOPA COUNTY ASSOCIATION OF GOVERNMENTS 2013 BUILDING CODE AMENDMENTS AND STANDARDS MANUAL, SECTION 1229, APPENDIX A.

2. PERFORMANCE METHOD:

A CERTIFIED STATEMENT BY A LICENSED ARCHITECT OR ENGINEER CERTIFYING THAT THE RESIDENCE ACHIEVES THE REQUIREMENT OF A MAXIMUM INTERIOR NOISE LEVEL OF 45 DECIBELS. THE CERTIFIED STATEMENT SHALL INCLUDE TESTING AND ANALYSIS DOCUMENTATION SUPPORTING THE STATEMENT.

**AMENDMENTS TO THE
ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES
ICC/ANSI 117.1-2009**

SECTION 502 PARKING SPACES

502.7 Identification. Where accessible parking spaces are required to be identified by signs, the signs shall include the International Symbol of Accessibility complying with Section 703.6.3.1 **OR THE ACCESSIBILITY ICON COMPLYING WITH SECTION 703.6.3.2.** Signs identifying van parking spaces shall contain the designation "van accessible." Such signs shall be 60 inches (1525 mm) minimum above the floor of the parking space, measured to the bottom of the sign.

SECTION 703 SIGNS

703.6.3.1 International Symbol of Accessibility. The International Symbol of Accessibility shall comply with Figure 703.6.3.1.



FIG. 703.6.3.1 INTERNATIONAL SYMBOL OF ACCESSIBILITY

703.6.3.2 Accessibility Icon. The Accessibility Icon shall comply with Figure 703.6.3.2.



FIG. 703.6.3.2 ACCESSIBILITY ICON

**AMENDMENTS TO THE
2018 INTERNATIONAL MECHANICAL CODE**

SECTION 109 MEANS OF APPEAL

[A] 109.1 Application for appeal GENERAL. APPEALS SHALL BE IN ACCORDANCE WITH SECTION 96.01 OF WITH THE EL MIRAGE MUNICIPAL CODE. ~~A person shall have the right to appeal a decision of the code official to the board of appeals. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the code official within 20 days after the notice was served.~~

~~[A] 109.1.1 Limitation of authority. The board of appeals shall not have authority relative to interpretation of the administration of this code nor shall such board be empowered to waive requirements of this code.~~

SUBSECTIONS 109.2 THROUGH 109.7 ARE DELETED IN THEIR ENTIRETY.

SECTION 307 CONDENSATE DISPOSAL

307.2.2 Drain pipe materials and sizes. Components of the condensate disposal system shall be cast iron, galvanized steel, copper, cross-linked polyethylene, polybutylene, polyethylene, ABS, CPVC or PVC pipe or tubing. **NONMETALLIC PIPING SHALL NOT BE INSTALLED IN EXPOSED LOCATIONS.** All components shall be selected for the pressure and temperature rating of the installation. Joints and connections shall be made in accordance with the applicable provisions of Chapter 7 of the International Plumbing Code relative to the material type. Condensate waste and drain line size shall be not less than 3/4-inch (19 mm) internal diameter and shall not decrease in size from the drain pan connection to the place of condensate disposal. Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with Table 307.2.2.

SECTION 309 TEMPERATURE CONTROL

[B] 309.1 ~~Space heating systems~~ HEATING AND COOLING SYSTEMS. ~~Interior~~ **HABITABLE** spaces intended for human occupancy shall be provided with active or passive space-heating **AND SPACE-COOLING** systems capable of maintaining an **MINIMUM** indoor temperatures ~~of not less than~~ **BETWEEN 68 70°F (20 21°C) AND 90°F (32°C)** at a point 3 feet (914 mm) above the floor on the design heating day. The installation of portable space heaters **OR COOLERS** shall not be used to achieve compliance with this section.

SECTION 403 MECHANICAL VENTILATION

403.3.1.5 Balancing. The ventilation air distribution system shall be provided with means to adjust the system to achieve at least the minimum ventilation airflow rate as required by Sections 403.3 and 403.4. Ventilation systems shall be balanced Sections 403.3 and 403.4. by an approved method. Such balancing shall verify that the ventilation system is capable of supplying and exhausting the airflow rates required by this code. **A FINAL REPORT SHALL BE PROVIDED TO THE ENGINEER OF RECORD AND THE MECHANICAL INSPECTOR.**

EXCEPTION: RESIDENTIAL OCCUPANCIES SHALL BE EXEMPT FROM THIS PROVISION.

SECTION 407 AMBULATORY CARE FACILITIES AND GROUP I-2 OCCUPANCIES

407.1 General. Mechanical ventilation for ambulatory care facilities and Group I-2 occupancies shall be designed and installed in accordance with this code and ASHRAE 170.

407.1.1 MECHANICAL SYSTEMS DESIGNED AND INSTALLED IN ACCORDANCE WITH IMC 407.1 AND ASHRAE 170-2017 SHALL BE VERIFIED BY A QUALIFIED THIRD PARTY SPECIAL INSPECTOR. THE SPECIAL INSPECTOR/TESTING AGENCY SHALL BE AN INDEPENDENT THIRD PARTY INDIVIDUAL OR FIRM AND SHALL NOT BE THE INSTALLING CONTRACTOR. A REPORT SHALL BE GENERATED BY THE THIRD PARTY INDIVIDUAL OR FIRM SHOWING COMPLIANCE. SPECIAL INSPECTIONS SHALL BE AS SPECIFIED IN CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE AS AMENDED.

SECTION 408 MARIJUANA RELATED OCCUPANCIES

408.1 GENERAL. ANY BUILDING USED TO CULTIVATE, PRODUCE, INFUSE OR DISPENSE MARIJUANA SHALL BE DESIGNED SUCH THAT THERE SHALL BE NO EMISSION OF DUST, FUMES, VAPORS, OR ODORS INTO THE ENVIRONMENT FROM THE PREMISE. A VENTILATION SYSTEM SHALL BE DESIGNED TO PREVENT THE DISTRIBUTION OF ODORS TO OTHER OCCUPIED PARTS OF THE BUILDING OR ADJACENT PROPERTIES. DESIGN OF THE ODOR CONTROL SYSTEM SHALL BE BASED ON ACCEPTED ENGINEERING PRACTICES. ALL EQUIPMENT AND FILTER MEDIA SHALL BE LISTED AND LABELED FOR THE APPLICATION. EXHAUST SYSTEMS USED IN ODOR CONTROL SYSTEMS SHALL MEET THE REQUIREMENTS OF SECTION 501.

408.1.1 EXHAUST OUTLETS. THE TERMINATION POINT FOR EXHAUST OUTLETS SHALL BE IN ACCORDANCE WITH SECTION 501.3. EXHAUST FROM CULTIVATION AND PRODUCTION FACILITIES SHALL BE IN ACCORDANCE WITH SECTION 501.3.1(2) AND FOR DISPENSARIES IN ACCORDANCE WITH SECTION 501.3.1(3).

SECTION 502 REQUIRED SYSTEMS

502.14 Motor vehicle operation. In areas where motor vehicles operate, mechanical ventilation shall be provided in accordance with Section 403. Additionally, areas in which stationary motor vehicles are operated shall be provided with a *source capture system* that connects directly to the motor vehicle exhaust systems. ~~Such system shall be engineered by a registered design professional or shall be factor built equipment designed and sized for the purpose.~~ **MAKEUP AIR FOR THE REQUIRED EXHAUST SYSTEMS IN AREAS WHERE MOTOR VEHICLES OPERATE SHALL BE PROVIDED THROUGH PERMANENT UNOBSTRUCTED OPENINGS TO THE OUTDOORS, SUCH AS LOUVERS AND GRILLS. MECHANICAL EQUIPMENT AND LOUVERS USED FOR MAKEUP AIR PURPOSES SHALL BE ELECTRICALLY INTERLOCKED WITH THE EXHAUST SYSTEM.**

Exceptions:

1. This section shall not apply where the motor vehicles being operated or repaired are electrically powered.

2. This section shall not apply to one- and two-family dwellings.
3. This section shall not apply to motor vehicle service areas where engines are operated inside the building only for the duration necessary to move the motor vehicles in and out of the building.

502.21 STORAGE AND USE OF LIQUID CARBON DIOXIDE SYSTEMS - MUST CONFORM TO THE 2018 IFC REQUIREMENTS.

SECTION 928 EVAPORATIVE COOLING EQUIPMENT

928.1 General. Evaporative cooling equipment shall:

1. Be installed in accordance with the manufacturer's instructions.
2. Be installed on level platforms in accordance with Section 304.10. **AN EVAPORATIVE COOLER SUPPORTED BY THE BUILDING STRUCTURE SHALL BE INSTALLED ON A SUBSTANTIAL LEVEL BASE AND SHALL BE SECURED DIRECTLY OR INDIRECTLY TO THE BUILDING STRUCTURE BY SUITABLE MEANS TO PREVENT DISPLACEMENT OF THE COOLER. MODIFICATIONS MADE TO THE SUPPORTING FRAMEWORK OF BUILDINGS AS A RESULT OF THE INSTALLATION SHALL BE MADE IN ACCORDANCE WITH THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE AS AMENDED.**
3. Have openings in exterior walls or roofs flashed in accordance with the International Building Code as amended.
4. Be provided with potable water backflow protection in accordance with Section 608 of the International Building Code.
5. Have air intake opening locations in accordance with Section 401.4.
6. **A PERMANENT RELIEF OPENING OR OTHER ENGINEERED DESIGN SUFFICIENT TO ASSURE POSITIVE AIRFLOW SHALL BALANCE INTAKE AIR.**
7. **OUTSIDE AIR SHALL BE PROVIDED AS SPECIFIED IN SECTION 403.2.**
8. **AIR DUCTS AND DAMPERS, WHICH ARE A PORTION OF AN EVAPORATIVE COOLING SYSTEM, SHALL COMPLY WITH CHAPTER 6.**
9. **OVERFLOW DRAINS SHALL BE PROVIDED THAT DISCHARGE TO AN APPROVED DISPOSAL LOCATION.**

SECTION 930 WOODSTOVE/FIREPLACE INSTALLATION

DEFINITIONS. FOR PURPOSES OF THIS SECTION, THE FOLLOWING WORDS AND TERMS SHALL HAVE THE MEANING ASCRIBED THERETO:

FIREPLACE: A BUILT-IN-PLACE MASONRY HEARTH AND FIRE CHAMBER OR A FACTORY-BUILT APPLIANCE, DESIGNED TO BURN SOLID FUEL OR TO ACCOMMODATE GAS OR ELECTRIC LOG INSERT OR SIMILAR DEVICE, AND WHICH IS INTENDED FOR OCCASIONAL RECREATIONAL OR AESTHETIC USE, NOT FOR COOKING, HEATING, OR INDUSTRIAL PROCESSES.

SOLID FUEL: INCLUDES, BUT IS NOT LIMITED TO, WOOD, COAL, OR OTHER NON-GASEOUS OR NON-LIQUID FUELS, INCLUDING THOSE FUELS DEFINED BY THE MARICOPA COUNTY AIR POLLUTION CONTROL OFFICER AS "INAPPROPRIATE FUEL" TO BURN IN RESIDENTIAL WOOD BURNING DEVICES.

WOODSTOVE: A SOLID-FUEL BURNING HEATING APPLIANCE INCLUDING A PELLET STOVE, WHICH IS EITHER FREESTANDING OR DESIGNED TO BE INSERTED INTO A FIREPLACE.

930.2 GENERAL. IN ACCORDANCE WITH MARICOPA COUNTY REGULATIONS, ON OR AFTER DECEMBER 31, 1998, NO

PERSON, FIRM OR CORPORATION SHALL CONSTRUCT OR INSTALL A FIREPLACE OR A WOOD STOVE, AND THE BUILDING OFFICIAL SHALL NOT APPROVE OR ISSUE A PERMIT TO CONSTRUCT OR INSTALL A FIREPLACE OR A WOOD STOVE, UNLESS THE FIREPLACE OR WOOD STOVE COMPLIES WITH ONE OF THE FOLLOWING:

- 1. A FIREPLACE WHICH HAS A PERMANENTLY INSTALLED GAS OR ELECTRIC LOG INSERT;**
- 2. A FIREPLACE, WOOD STOVE OR OTHER SOLID FUEL BURNING APPLIANCE WHICH HAS BEEN CERTIFIED BY THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AS CONFORMING TO 40 CODE OF FEDERAL REGULATIONS PART 60, SUBPART AAA;**
- 3. A FIREPLACE, WOODSTOVE OR OTHER SOLID FUEL BURNING APPLIANCE THAT HAS BEEN TESTED AND LISTED BY A NATIONALLY RECOGNIZED TESTING AGENCY TO MEET PERFORMANCE STANDARDS EQUIVALENT TO THOSE ADOPTED BY 40 CODE OF FEDERAL REGULATIONS PART 60, SUBPART AAA;**
- 4. A FIREPLACE, WOOD STOVE OR OTHER SOLID FUEL BURNING APPLIANCE WHICH HAS BEEN DETERMINED BY THE MARICOPA COUNTY AIR POLLUTION CONTROL OFFICER TO MEET PERFORMANCE STANDARDS EQUIVALENT TO THOSE ADOPTED BY 40 CODE OF FEDERAL REGULATIONS PART 60, SUBPART AAA, AS IN EFFECT ON JULY 1, 1990.**
- 5. A FIREPLACE WHICH HAS A PERMANENTLY INSTALLED WOOD STOVE INSERT WHICH COMPLIES WITH SUBPARAGRAPH 2, 3, OR 4 ABOVE.**

EXCEPTIONS: THE FOLLOWING INSTALLATIONS ARE NOT REGULATED AND ARE NOT PROHIBITED BY THIS SECTION:

- 1. FURNACES, BOILERS, INCINERATORS, KILNS, AND OTHER SIMILAR SPACE HEATING OR INDUSTRIAL PROCESS EQUIPMENT.**
- 2. COOK STOVES, BARBECUE GRILLS, AND SIMILAR APPLIANCES DESIGNED PRIMARILY FOR COOKING.**
- 3. FIRE PITS, BARBECUE GRILLS, AND OTHER OUTDOOR FIREPLACES.**

**AMENDMENTS TO THE
2018 INTERNATIONAL PLUMBING CODE**

APPENDICES B, C and E ARE EXPRESSLY ADOPTED AND INCORPORATED HEREIN BY THIS REFERENCE.

SECTION 109 MEANS OF APPEAL

[A] 109.1 ~~Application for appeal~~ GENERAL. APPEALS SHALL BE IN ACCORDANCE WITH THE EL MIRAGE MUNICIPAL CODE. ~~Any person shall have the right to appeal a decision of the code official to the board of appeals. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply; or an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the code official within 20 days after the notice was served.~~

SUBSECTIONS 109.2 THROUGH 109.7 ARE DELETED IN THEIR ENTIRETY.

SECTION 202 GENERAL DEFINITIONS

GREASE INTERCEPTOR

Gravity. Plumbing appurtenances of not less than 500 gallons (1893 L) capacity that are installed in the sanitary drainage system to intercept free-floating fats, oils and grease from waste water discharge. Separation is accomplished by gravity during a retention time of not less than 30 minutes **APPROVED BY THE AUTHORITY HAVING JURISDICTION.**

GREASE REMOVAL DEVICE, AUTOMATIC (GRD). A plumbing appurtenance that is installed in the sanitary drainage system to intercept free-floating fats, oils and grease from waste water discharge. Such a device operates on a time-or event-controlled basis and has the ability to remove free-floating fats, oils and grease automatically without intervention from the user except for maintenance. **THESE DEVICES MUST BE ABLE TO PERFORM AS A GRAVITY INTERCEPTOR IF MECHANICAL OR ELECTRICAL POWER IS LOST AND PROVIDE CONTINUOUS SEPARATION.**

SECTION 410 DRINKING FOUNTAINS

410.2 Small occupancies. Drinking fountains shall not be required for an occupant load of 50 or fewer.

410.4 Substitution. Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required in those restaurants. In other occupancies, where drinking fountains are required, **WATER COOLERS OR BOTTLED** water dispensers shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains. **IN OTHER OCCUPANCIES, WHERE DRINKING FOUNTAINS ARE REQUIRED, BOTTLED WATER DISPENSERS OR WATER COOLERS SHALL BE PERMITTED TO BE SUBSTITUTED.**

SECTION 1003 INTERCEPTORS AND SEPARATORS

1003.2 Approval. The size, type, and location of each interceptor and of each separator shall be designed and installed in accordance with the manufacturer's instructions and the requirements of this section based on the anticipated conditions of use **AND PURSUANT TO THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.** Wastes that do not require treatment or separation shall not be discharged into any interceptor or separator.

SECTION 1106 SIZE OF CONDUCTORS, LEADERS AND STORM DRAINS

1106.1 General. The size of the vertical conductors and leaders, building storm drains, building storm sewers, and any horizontal branches of such drains or sewers shall be based on ~~the 100 year hourly rainfall rate indicated in Figure 1106.1 or on other rainfall rates determined from approved local weather data~~ **AN HOURLY RAINFALL RATE OF THREE (3) INCHES PER HOUR.**

AMENDMENTS TO THE 2018 INTERNATIONAL FUEL GAS CODE

SECTION 109 MEANS OF APPEAL

~~[A] 109.1 Application for appeal GENERAL. APPEALS SHALL BE IN ACCORDANCE WITH THE EL MIRAGE MUNICIPAL CODE. A person shall have the right to appeal a decision of the code official to the board of appeals. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply; or an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the code official within 20 days after the notice was served.~~

SUBSECTIONS 109.2 THROUGH 109.7 ARE DELETED IN THEIR ENTIRETY.

SECTION 404 (IFGC) PIPING SYSTEM INSTALLATION

404.12 Minimum burial depth. Underground piping systems shall be installed a minimum depth of 12 inches (305 mm) below grade, ~~except as provided for in Section 404.12.1 for metal piping and 18 inches (457mm) for plastic piping.~~

AMENDMENTS TO THE 2018 INTERNATIONAL ENERGY CONSERVATION CODE

SECTION C101 SCOPE AND GENERAL REQUIREMENTS(COMMERCIAL)

C101.2 Scope. This code applies to commercial buildings and the building sites and associated systems and equipment. **GROUP R-2 WHEN DEFINED AS A COMMERCIAL BUILDING BY SECTION C202, SHALL HAVE THE OPTION OF COMPLYING UNDER THE**

RESIDENTIAL PROVISIONS OF THE CODE, REGARDLESS OF HEIGHT. ONCE DEFINED AS SUCH ON THE SUBMITTAL DOCUMENTS, ALL COMPONENTS OF THE RESIDENTIAL PROVISIONS SHALL BE FOLLOWED.

SECTION C109 BOARD OF APPEALS

C109.1 General. APPEALS SHALL BE IN ACCORDANCE WITH THE EL MIRAGE MUNICIPAL CODE. ~~In order to hear and decide appeals of orders, decisions or determinations made by the code official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The Code Official shall be an ex officio member of said board but shall have no vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the Code Official.~~

SUBSECTIONS 109.2 THROUGH 109.3 ARE DELETED IN THEIR ENTIRETY.

SECTION C401 GENERAL

C401.2 Application. Commercial buildings shall comply with one of the following:

1. The requirements of ANSI/ASHRAE/IESNA 90.1.
2. The requirements of Sections C402 through C405 and C408. In addition, commercial buildings shall comply with Section C406 and tenant spaces shall comply with Section C406.1.1.
3. The requirements of Sections C402.5, C403.2, C403.3 through C403.3.2, C403.4 through C403.4.2.3, C403.5.5, C403.7, C403.8.1 through C403.8.4, C403.10.1 through C403.10.3, C403.11, C403.12, C404, C405, and C407 and C408. The building energy cost shall be equal to or less than 85 percent of the standard reference design building.

4. COMPLIANCE WITH THE PROVISIONS OF SECTION C408 ARE OPTIONAL.

SECTION R101 SCOPE AND GENERAL REQUIREMENTS

R101.2 Scope. This code applies to *residential buildings* and the *building sites* and associated systems and equipment. **GROUP R-2 WHEN DEFINED AS A RESIDENTIAL BUILDING BY SECTION R202, SHALL HAVE THE OPTION OF COMPLYING UNDER THE COMMERCIAL PROVISIONS OF THE CODE, REGARDLESS OF HEIGHT. ONCE DEFINED AS SUCH ON THE SUBMITTAL DOCUMENTS, ALL COMPONENTS OF THE COMMERCIAL PROVISIONS SHALL BE FOLLOWED.**

SECTION R109 BOARD OF APPEALS

R109.1 General. APPEALS SHALL BE IN ACCORDANCE WITH SECTION 96.01 OF THE EL MIRAGE MUNICIPAL CODE. ~~In order to hear and decide appeals of orders, decisions or determinations made by the code official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The Code Official shall be an ex officio member of said board but shall have no vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The~~

~~board shall adopt rules of procedure for conducting its business and shall render all decisions and findings in writing to the appellant with a duplicate copy to the Code Official.~~

SUBSECTIONS 109.2 THROUGH 109.3 ARE DELETED IN THEIR ENTIRETY

SECTION R403 SYSTEMS

R403.3 Ducts. Ducts and air handlers shall be in accordance with Sections R403.3.1 through R403.3.7.

R403.3.1 Insulation (Prescriptive). SUPPLY DUCTS IN ATTICS SHALL BE INSULATED TO A MINIMUM OF R-8. DUCTS IN FLOOR TRUSSES SHALL BE INSULATED TO A MINIMUM OF R-6. ~~Supply and return ducts in attics shall be insulated to an R-value of not less than R-8 for ducts 3 inches (76 mm) in diameter and larger and not less than R-6 for ducts smaller than 3 inches (76 mm) in diameter. Supply and return ducts in other portions of the building shall be insulated to not less than R-6 for ducts 3 inches (76 mm) in diameter and not less than R-4.2 for ducts smaller than 3 inches (76 mm) in diameter.~~

Exceptions: Ducts or portions thereof located completely inside the *building thermal envelope*.

1. DUCTS OR PORTIONS THEREOF LOCATED COMPLETELY INSIDE THE BUILDING THERMAL ENVELOPE.
2. SUPPLY DUCTS MAY BE INSULATED TO A MINIMUM OF R-6 WHEN ONE OR MORE OF THE FOLLOWING CONDITIONS ARE MET;
 - 2.1 MINIMUM SEER RATING OF SPACE HEATING/COOLING SYSTEM IS INCREASED TO 15.
 - 2.2 MAXIMUM U-FACTOR IS DECREASED TO 0.35 AND MAXIMUM SHGC IS DECREASED TO 0.22 FOR ALL FENESTRATION PRODUCTS.
 - 2.3 WALL CAVITY INSULATION MINIMUM R-VALUE IS INCREASED TO R-19.
 - 2.4 RESIDENTIAL BUILDINGS THAT MEET THE REQUIREMENTS OF SECTIONS R102.1.1 OR R405.

Section R403.10.3 ~~Covers~~ VARIABLE SPEED POOL PUMPS.

~~Outdoor heated pools and outdoor permanent spas shall be provided with a vapor-retardant cover or other approved vapor-retardant means.~~

~~Exception: Where more than 75 percent of the energy for heating, computed over an operation season of not less than three calendar months, is from a heat pump or an on-site renewable energy system, covers or other vapor-retardant means shall not be required.~~

MOTORS WITH A TOTAL HORSEPOWER OF ONE OR MORE FOR POOLS AND IN-GROUND PERMANENTLY INSTALLED SPAS SHALL HAVE THE CAPABILITY OF OPERATING AT TWO OR MORE SPEEDS WITH A LOW SPEED HAVING A ROTATION

RATE THAT IS NO MORE THAN ONE-HALF OF THE MOTOR'S MAXIMUM ROTATION RATE AND SHALL BE OPERATED WITH A PUMP CONTROL WITH THE CAPABILITY OF OPERATING THE PUMP AT TWO OR MORE SPEEDS. RESIDENTIAL POOL PUMP MOTOR CONTROLS THAT ARE SOLD FOR USE WITH A TWO OR MORE SPEED MOTOR SHALL HAVE A DEFAULT CIRCULATION SPEED SETTING NO MORE THAN ONE-HALF OF THE MOTOR'S MAXIMUM ROTATION RATE. ANY HIGH SPEED OVERRIDE CAPABILITY SHALL BE FOR A TEMPORARY PERIOD NOT TO EXCEED ONE TWENTY-FOUR HOUR CYCLE WITHOUT RESETTING TO THE DEFAULT SETTING.

AMENDMENTS TO THE 2018 INTERNATIONAL EXISTING BUILDING CODE

SECTION 112 BOARD OF APPEALS

[A] 112.1 General. APPEALS SHALL BE IN ACCORDANCE WITH SECTION 96.01 OF THE EL MIRAGE MUNICIPAL CODE. ~~In order to hear and decide appeals of orders, decisions, or determinations made by the Code Official relative to the application and interpretation of this Code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business.~~

SUBSECTIONS 112.2 THROUGH 112.3 ARE DELETED IN THEIR ENTIRETY

AMENDMENTS TO THE 2018 INTERNATIONAL GREEN CONSTRUCTION CODE

SECTION 101 GENERAL

101 General. THE USE OF THIS CODE IS OPTIONAL, UNLESS SPECIFICALLY REQUIRED THROUGH ORDINANCE BY THE CITY OF EL MIRAGE. This code is an overlay document to be used in conjunction with the other codes and standards adopted by the jurisdiction. This code is not intended to be used as a standalone construction regulation document and permits are not to be issued under this code. This code is not intended to abridge or supersede safety, health or environmental requirements under other applicable codes or ordinances.

**AMENDMENTS TO THE
2018 INTERNATIONAL PROPERTY MAINTENANCE CODE**

101.1 Title. These regulations shall be known as the International Property Maintenance Code of ~~[NAME OF JURISDICTION]~~ **THE CITY OF EL MIRAGE** hereinafter referred to as "this code."

SECTION 111 MEANS OF APPEAL

THE APPEAL PROCESS SHALL BE AS OUTLINED IN SECTION 96.01 OF THE EL MIRAGE MUNICIPAL CODE.

THE REMAINDER OF THIS SECTION IS DELETED IN ITS ENTIRETY.

SECTION 303 SWIMMING POOLS, SPAS AND HOT TUBS

303.2 Enclosures.

THIS SUBSECTION IS DELETED IN ITS ENTIRETY.

**AMENDMENTS TO THE
2017 NATIONAL ELECTRICAL CODE**

Article 250 – Grounding and Bonding

250.118 Types of Equipment Grounding Conductors.

Each equipment grounding conductor run with or enclosing the circuit conductors shall be one or more or a combination of the following:

- (1) A copper, aluminum, or copper-clad aluminum conductor. This conductor shall be solid or stranded; insulated, covered, or bare; and in the form of a wire or a busbar of any shape.
- (2) Rigid metal conduit.
- (3) Intermediate metal conduit.
- (4) Electrical metallic tubing **WITH AN ADDITIONAL EQUIPMENT GROUNDING CONDUCTOR.**
- (5) Listed flexible metal conduit meeting all the following conditions:
 - a. The conduit is terminated in listed fittings.
 - b. The circuit conductors contained in the conduit are protected by overcurrent devices rated at 20 amperes or less.
 - c. The combined length of flexible metal conduit and flexible metallic tubing and liquid tight flexible metal conduit in the same ground-fault current path does not exceed 1.8 m (6 ft).

d. If used to connect equipment where flexibility is necessary to minimize the transmission of vibration from equipment or to provide flexibility for equipment that requires movement after installation, an equipment grounding conductor shall be installed.

(6) Listed liquid tight flexible metal conduit meeting all the following conditions:

- a. The conduit is terminated in listed fittings.
- b. For metric designators 12 through 16 (trade sizes 3/8 through 1/2), the circuit conductors contained in the conduit are protected by overcurrent devices rated at 20 amperes or less.
- c. For metric designators 21 through 35 (trade sizes 3/4 through 1-1/4), the circuit conductors contained in the conduit are protected by overcurrent devices rated not more than 60 amperes and there is no flexible metal conduit, flexible metallic tubing, or liquid tight flexible metal conduit in trade sizes metric designators 12 through 16 (trade sizes 3/8 through 1/2) in the ground-fault current path.
- d. The combined length of flexible metal conduit and flexible metallic tubing and liquid tight flexible metal conduit in the same ground-fault current path does not exceed 1.8 m (6 ft).
- e. If used to connect equipment where flexibility is necessary to minimize the transmission of vibration from equipment or to provide flexibility for equipment that requires movement after installation, an equipment grounding conductor shall be installed.

(7) Flexible metallic tubing where the tubing is terminated in listed fittings and meeting the following conditions:

- a. The circuit conductors contained in the tubing are protected by overcurrent devices rated 20 amperes or less.
- b. The combined length of flexible metal conduit and flexible metallic tubing and liquid tight flexible metal conduit in the same ground-fault current path does not exceed 1.8 m (6 ft).

(8) Armor of Type AC cable as provided in 320.108.

(9) The copper sheath of mineral-insulated, metal-sheathed cable.

(10) Type MC cable that provides an effective ground-fault current path in accordance with one or more of the following:

- a. It contains an insulated or uninsulated equipment grounding conductor in compliance with 250.118(1)
- b. The combined metallic sheath and uninsulated equipment grounding/bonding conductor of interlocked metal tape-type MC cable that is listed and identified as an equipment grounding conductor

c. The metallic sheath or the combined metallic sheath and equipment grounding conductors of the smooth or corrugated tube-type MC cable that is listed and identified as an equipment grounding conductor

(11) Cable trays as permitted in 392.10 and 392.60.

(12) Cable bus framework as permitted in 370.3.

(13) Other listed electrically continuous metal raceways and listed auxiliary gutters.

(14) Surface metal raceways listed for grounding.

RESOLUTION R23-05-10 EXHIBIT

Proposed 2018 International Fire Code

Local Amendments

1. City of El Mirage and El Mirage Fire Department shall adopt the most recent Editions of the National Fire Codes and Standards published by the National Fire Protection Association (NFPA) as referenced in Chapter 80 of the International Fire Code 2018 edition and the most recent addition of the NFPA 101 Life Safety Code, together with all updates, changes, and errata to those codes as adopted by NFPA as published.
2. The International Fire Code, 2018 Edition is adopted in its entirety including appendices except as hereby amended:

Fire Code Chapter 1 Scope and Administration

101.1 Title.

[Amendment]

101.1 Title. This regulation shall be known as the El Mirage Fire Code, may be cited as such and will be referred to herein as "this Code".

104.10 Fire Investigations.

[Amendment]

104.10 Fire Investigations. The Fire Code Official shall have the authority to investigate the cause, origin and circumstance of each fire occurring in the jurisdiction involving loss of life or injury to a person or destruction property or damage to property. If it appears to the Fire Investigator that such fire is of suspicious origin, the Fire Investigator shall notify the appropriate law enforcement agency and shall secure the site until the law enforcement agency takes control of the site. Then, the Fire Investigator shall continue to pursue the investigation to its conclusion. Information that could be related to trade secrets or processes shall not be made part of the public record unless directed by a court of law.

106.2 Schedule of Permit Fees.

[Amendment]

106.2 Schedule of Permit Fees. The Fire Code Official is authorized to collect fees established by resolution of the City of El Mirage Council or pursuant to the Code of the City of El Mirage.

105.6.30 Mobile Food Preparation Vehicles.

[Amendment]

105.6.30 Mobile Food Preparation Vehicles. An annual inspection and permit shall be required for all mobile food preparation vehicles or trailers operating within the City of El Mirage for any public or private activity.

109 Board of Appeals

[Amendment]

109.1 Board of Appeals Established. In order to hear and decide appeals of orders, decisions, or determinations made by the fire code official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall follow currently adopted City of El Mirage Codes relating to the Administrative Appeal process.

110.4 Violation penalties.

[Amendment]

110.4 Violation Penalties. Persons who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter, repair or do work in violation of the approved construction documents or directive of the fire code official, or of a permit or certificate used under provisions of this code, shall be guilty of a Civil or Criminal offense as defined by Arizona State Law. Each day any violation of any provision of this code or of any ordinance shall continue may constitute a separate offense.

112.4 Failure to comply.

[Amendment]

111.4 Failure to Comply. Any person who shall continue any work after having been served with a stop work or operations order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be assessed a fee in accordance with the fees established by City of El Mirage.

Fire Code Chapter 2 Definitions

[Amendment] Additional Definitions

ASSISTED LIVING FACILITY - A residential care institution, including adult foster care, that provides or contracts to provide supervisory care services, personal care services or directed care services on a continuing basis.

ASSISTED LIVING HOME - An assisted living facility, that provides resident rooms to ten or fewer residents.

ATTENDANT - A person knowledgeable in the use of portable fire extinguishers, whose duty it is to maintain fire safety measures during public or private events, as prescribed.

AUTHORITY HAVING JURISDICTION - The City of El Mirage Fire Code Official, Fire Marshal, or their designated representative.

CHIEF OF THE DIVISION OF FIRE PREVENTION - The Fire Marshal or delegates.

DIVISION OF FIRE PREVENTION - The Fire Marshal's Office.

DRIVE LENGTH - The distance from the driveway entrance from a public way to the structure measured in feet.

GRADE - The degree of inclination of a slope, road, or other surface (see slope).

HORIZONTAL STANDPIPE - Approved water supply piping that extends the source of water to remote locations around the exterior or interior of a structure.

RESIDENTIAL SPRINKLER SYSTEM – shall be installed in accordance to NFPA 13D Sprinkler Standard - In addition sprinkler heads shall be installed in enclosed patios and porches, hidden combustible spaces, attics, enclosed spaces under egress stairways, and in garages.

PERMANENT ALL WEATHER SURFACE (PAWS) - A road surface made up of approved materials compacted to 90% with side containment, and capable of supporting fire apparatus vehicles in excess of 75,000-pound gross vehicle weight (GVW) under any weather condition. The permanent all-weather surfaces shall be maintained by the property owner for intended use by the fire department.

SLOPE - The ground, road or other surface that forms a natural or artificial incline. The percentage of slope is determined by dividing the rise by the horizontal run multiplied by 100 [% slope = (Rise/Run) X 100].

Fire Code Chapter 5 Fire Service Features

503.3 Marking

[Amendment]

503.3 Marking. Where required by the by the fire code official, approved signs or other approved notices or markings that include the words NO PARKING – FIRE LANE shall be provided for fire apparatus access roads to identify such roads and prohibit the obstruction thereof. This means by which fire lanes are designated shall always be maintained in a clean and legible condition at all times and be replace or repaired when necessary to provide adequate visibility. Reference Appendix O Signage – for all specifications and requirements for required signage.

503.6 Security Gates

[Amendment] Add new section

503.6.1 Gated residential and commercial properties. Gates installed on designated fire apparatus access roads serving residential and commercial gated main entrances, and where required by the Fire Code Official, shall be electrically controlled for opening and closing. The gate(s) shall be provided with approved preemption control device, Knox key switch, and a manual gate release approved by the Fire Code Official.

Manual or electric gates at locations other than the main entrance shall be equipped with a Knox key switch, manual release, or a Knox lock as applicable. Existing gates at main entry gates and where required, shall be upgraded to include electric preemption equipment, as required, within one year of the effective date of this code.

505.1.1

[Amendment] Add new section

505.1.1 Commercial Premise Identification. In commercial locations where there are more than one individual commercial space and there is fire apparatus access to the front and back of the structure, the following requirements shall apply.

1. The tenant space identification letter or number shall be displayed on or above the front main entry to the space.
2. The tenant space identification letter or number shall be displayed on or above the rear entry to the space.

Fire Code Chapter 9 Fire and Life Safety Systems

903 Automatic Sprinkler Systems

[Amendment]

903.2 Where Required. Approved automatic sprinkler systems in new buildings and structures shall be provided in the locations described in sections 903.2.1 through 903.2.12. Where any new commercial building or structure, commonly referred to as a “shell building” is constructed with an unknown occupancy or hazard classification identified, and could accommodate storage above 12 feet in height, the automatic sprinkler system shall be designed with a minimum density area of 0.60 gpm per ft².

Existing buildings, structures and occupancies will not require retrofitting fire sprinkler systems to current code standards unless required by IEBC or as noted below:

1. Occupant load is increased without increasing square footage.
2. Occupancy classification is changed to a higher hazard
3. Building fire resistance rating is decreased.
4. Original building footprint (square footage) is increased 50% or more

[Amendment] Add new section

903.3.5.3 Automatic Sprinkler Riser Access – Automatic sprinkler risers on new commercial structures shall be installed inside of the building with an exterior door leading directly into the room or area containing the automatic sprinkler riser and controls.

Exception: An exterior door may not be required by the Fire Code Official when an approved alternate method of access to the automatic sprinkler riser is provided.

Fire Code Chapter 11 Construction Requirements for Existing Buildings

[Amendment]

1101.4.1 Construction Documents. Construction documents necessary to comply with this chapter shall be completed and submitted per City of El Mirage adopted planning and zoning ordinances.

Fire Code Chapter 12 Energy Systems

Replace existing Chapter 12 with the following below.

CHAPTER 12 ENERGY SYSTEMS

User note:

About this chapter: Chapter 12 was added to address the current energy systems found in this code and is provided for the introduction of a wide range of systems to generate and store energy in, on and adjacent to buildings and facilities. The expansion of such energy systems is related to meeting today's energy, environmental and economic challenges. Ensuring appropriate criteria to address the safety of such systems in building and fire codes is an important part of protecting the public at large, building occupants and emergency responders. More specifically, this chapter addresses standby and emergency power, photovoltaic systems, fuel cell energy systems, battery storage systems and capacitor energy storage.

SECTION 1201 GENERAL

1201.1 Scope. *The provisions of this chapter shall apply to the installation, operation and maintenance of energy systems used for generating or storing energy.

1201.2 Electrical wiring and equipment. Electrical wiring and equipment used in connection with energy systems shall be installed and maintained in accordance with Chapter 12 and NFPA 70.

1201.3 Mixed system installation. Where approved, the aggregate kWh energy in a fire area shall not exceed the maximum quantity specified for any of the energy systems in this chapter. Where required by the *fire code official*, a hazard mitigation analysis shall be provided and approved in accordance with Section 104.7.2 to evaluate any potential adverse interaction between the various energy systems and technologies.

SECTION 1202 DEFINITIONS

1202.1 Definitions. The following terms are defined in Chapter 2:

BATTERY SYSTEM, STATIONARY STORAGE.

BATTERY TYPES.

LEAD-ACID BATTERY.

CAPACITOR ARRAY.

CAPACITOR ENERGY STORAGE SYSTEM.

CRITICAL CIRCUIT.

EMERGENCY POWER SYSTEM.

ENERGY MANAGEMENT SYSTEM.

FUEL CELL POWER SYSTEM, STATIONARY.

STANDBY POWER SYSTEM.

STATIONARY BATTERY ARRAY.

STATIONARY FUEL CELL POWER SYSTEM.

SECTION 1203 EMERGENCY AND STANDBY POWER SYSTEMS

1203.1 General. Emergency power systems and standby power systems required by this code, or the *International Building Code* shall comply with Sections

1203.1.1 through 1203.1.9.

1203.1.1 Stationary generators. Stationary emergency and standby power generators required by this code shall be listed in accordance with UL 2200. Associated flammable or combustible liquid tanks shall also comply with Chapters 50 and 57.

1203.1.2 Fuel line piping protection. Fuel lines supplying a generator set inside a high-rise building shall be separated from areas of the building other than the room the generator is in by an approved method, or an assembly that has a fire-resistance rating of not less than 2 hours. Where the building is protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1, the required fire-resistance rating shall be reduced to 1 hour.

1203.1.3 Installation. Emergency power systems and standby power systems shall be installed in accordance with the *International Building Code*, NFPA 70, NFPA 110 and NFPA 111.

1203.1.4 Load transfer. Emergency power systems shall automatically provide secondary power within 10 seconds after primary power is lost, unless specified otherwise in this code. Standby power systems shall automatically provide secondary power within 60 seconds after primary power is lost, unless specified otherwise in this code.

1203.1.5 Load duration. Emergency power systems and standby power systems shall be designed to provide the required power for a minimum duration of 2 hours without being refueled or recharged, unless specified otherwise in this code.

1203.1.6 Uninterruptable power source. An uninterrupted source of power shall be provided for equipment where required by the manufacturer's instructions, the listing, this code, or applicable referenced standards.

1203.1.7 Interchangeability. Emergency power systems shall be an acceptable alternative for installations that require standby power systems.

1203.1.8 Group I-2 occupancies. In Group I-2 occupancies located in flood hazard areas established

in Section 1612.3 of the International Building Code and where new or replacement essential electrical systems are installed and where new essential electrical system generators are installed, the systems and generators shall be located and installed in accordance with ASCE 24. Where connections for hook up of temporary generators are provided, the connections shall be located at or above the elevation required in ASCE 24.

1203.1.9 Maintenance. Existing installations shall be maintained in accordance with the original approval and Section 1203.4.

1203.2 Where required. Emergency and standby power systems shall be provided where required by Sections 1203.2.1 through 1203.2.18.

1203.2.1 Ambulatory care facilities. Essential electrical systems for ambulatory care facilities shall be in accordance with Section 422.6 of the *International Building Code*.

1203.2.2 Elevators and platform lifts. Standby power shall be provided for elevators and platform lifts as required in Sections 606.2, 1009.4.1, and 1009.5.

1203.2.3 Emergency responder radio coverage systems. Standby power shall be provided for emergency responder radio coverage systems as required in Section 510.4.2.3. The standby power supply shall be capable of operating the emergency responder radio coverage system for a duration of not less than 24 hours.

1203.2.4 Emergency voice/alarm communication systems. Emergency power shall be provided for emergency voice/alarm communication systems as required in Section 907.5.2.2.5. The system shall be capable of powering the required load for a duration of not less than 24 hours, as required in NFPA 72.

1203.2.5 Exit signs. Emergency power shall be provided for exit signs as required in Section 1013.6.3. The system shall be capable of powering the required load for a duration of not less than 90 minutes.

1203.2.6 Gas detection systems. Emergency power shall be provided for gas detection systems where required by Sections 1203.2.9 and 1203.2.16. Standby power shall be provided for gas detection systems where required by Section 916.5.

1203.2.7 Group I-2 occupancies. Essential electrical systems for Group I-2 occupancies shall be in accordance with Section 407.11 of the *International Building Code*.

1203.2.8 Group I-3 occupancies. Power-operated sliding doors or power-operated locks for swinging doors in Group I-3 occupancies shall be operable by a manual release mechanism at the door. Emergency

power shall be provided for the doors and locks.

Exceptions:

1. Emergency power is not required in facilities where provisions for remote locking and unlocking of occupied rooms in Occupancy Condition 4 are not required as set forth in the *International Building Code*.
2. Emergency power is not required where remote mechanical operating releases are provided.

1203.2.9 Hazardous materials. Emergency and standby power shall be provided in occupancies with hazardous materials as required in the following sections: 1. Sections 5004.7 and 5005.1.5 for hazardous materials. 2. Sections 6004.2.2.8 and 6004.3.4.2 for highly toxic and toxic gases. 3. Section 6204.1.11 for organic peroxides.

1203.2.10 High-rise buildings. Standby power and emergency power shall be provided for high-rise buildings as required in Section 403 of the *International Building Code* and shall be in accordance with Section 1203.

1203.2.11 Horizontal sliding doors. Standby power shall be provided for horizontal sliding doors as required in Section 1010.1.4.3. The standby power supply shall have a capacity to operate not fewer than 50 closing cycles of the door.

1203.2.12 Hydrogen fuel gas rooms. Standby power shall be provided for hydrogen fuel gas rooms as required by Section 5808.7.

1203.2.13 Laboratory suites. Standby or emergency power shall be provided in accordance with Section 5004.7 where *laboratory suites* are located above the sixth story above grade plane or located in a story below grade plane.

1203.2.14 Means of egress illumination. Emergency power shall be provided for *means of egress* illumination in accordance with Sections 1008.3 and 1104.5.1.

1203.2.15 Membrane structures. Standby power shall be provided for auxiliary inflation systems in permanent membrane structures in accordance with Section 2702 of the *International Building Code*. Auxiliary inflation systems shall be provided in temporary air-supported and air inflated membrane structures in accordance with Section 3103.10.4.

1203.2.16 Semiconductor fabrication facilities.

Emergency power shall be provided for semiconductor fabrication facilities as required in Section 2703.15.

1203.2.17 Smoke control systems. Standby power shall be provided for smoke control systems as required in Section 909.11.

1203.2.18 Underground buildings. Emergency and standby power shall be provided in underground buildings as required in Section 405 of the *International Building Code* and shall be in accordance with Section 1203.

1203.2.19 Connected facilities. Power and lighting facilities or the *fire command center* and elevators specified in Sections 403.4.8.2 and 403.6 of the *International Building Code*, as applicable, and electrically powered fire pumps required to maintain pressure, shall be transferable to the standby source. Standby power shall be provided for at least one elevator to serve all floors and be transferable to any elevator.

1203.3 Critical circuits. Cables used for survivability of required critical circuits shall be listed in accordance with UL 2196. Electrical circuit protective systems shall be installed in accordance with their listing requirements.

1203.4 Maintenance. Emergency and standby power systems shall be maintained in accordance with NFPA 110 and NFPA 111 such that the system is capable of supplying service within the time specified for the type and duration required.

1203.4.1 Group I-2. In Group I-2 occupancies, emergency and standby power systems shall be maintained in accordance with NFPA 99.

1203.4.2 Schedule. Inspection, testing and maintenance of emergency and standby power systems shall be in accordance with an approved schedule established upon completion and approval of the system installation.

1203.4.3 Records. Records of the inspection, testing and maintenance of emergency and standby power systems shall include the date of service, name of the servicing technician, a summary of conditions noted and a detailed description of any conditions requiring correction and what corrective action was taken. Such records shall be maintained.

1203.4.4 Switch maintenance. Emergency and standby power system transfer switches shall be included in the inspection, testing and maintenance schedule required by Section 1203.4.2. Transfer switches shall be maintained free from accumulated dust and dirt. Inspection shall include examination of the transfer switch contacts for evidence of deterioration. When evidence of contact deterioration is detected, the contacts shall be replaced in accordance with the transfer switch manufacturer's instructions.

1203.5 Operational inspection and testing. Emergency power systems, including all appurtenant components,

shall be inspected and tested under load in accordance with NFPA 110 and NFPA 111.

Exception: Where the emergency power system is used for standby power or peak load shaving, such use shall be recorded and shall be allowed to be substituted for scheduled testing of the generator set, provided that appropriate records are maintained.

1203.5.1 Group I-2. In Group I-2 occupancies, emergency and standby power systems shall be inspected and tested under load in accordance with NFPA 99.

1203.5.2 Transfer switch test. The test of the transfer switch shall consist of electrically operating the transfer switch from the normal position to the alternate position and then return to the normal position.

1203.6 Supervision of maintenance and testing. Routine maintenance, inspection and operational testing shall be overseen by a properly instructed individual.

SECTION 1204 SOLAR PHOTOVOLTAIC POWER SYSTEMS

1204.1 General. Solar photovoltaic systems shall be installed in accordance with Sections 1204.2 through 1204.5, and the *International Building Code* or *International Residential Code*. The electrical portion of solar PV systems shall be installed in accordance with NFPA 70.

1204.1.1 Permits. Permits shall be obtained for solar voltaic systems in accordance with Section 105.7.21

Exception: Solar photovoltaic systems with less than 3 kW alternating current nameplate rating.

1204.1.2 Marking. Marking is required on interior and exterior direct-current (DC) conduit, enclosures, race- ways, cable assemblies, junction boxes, combiner boxes and disconnects.

1204.1.2.1 Materials. The materials used for marking shall be reflective, weather resistant and suitable for the environment. Marking as required in Sections 1204.1.2 through 1204.1.6 shall have all letters capitalized with a minimum height of 3/8 inch (9.5 mm) white on red background.

1204.1.2.2 Marking content. The marking shall contain the words "WARNING: PHOTOVOLTAIC POWER SOURCE."

1204.1.2.3 Main service disconnect. The marking shall be placed adjacent to the main service disconnect in a location clearly visible from the location where the disconnect is operated.

1204.1.3 Location of marking. Marking shall be

placed on interior and exterior DC conduit, raceways, enclosures, and cable assemblies every 10 feet (3048 mm), within 1 foot (305 mm) of turns or bends and within 1 foot (305 mm) above and below penetrations of roof/ceiling assemblies, walls or barriers.

1204.2 Access and pathways. Roof access, pathways, and spacing requirements shall be provided in accordance with Sections 1204.2.1 through 1204.3.3. Pathways shall be over areas capable of supporting fire fighters accessing the roof. Pathways shall be located in areas with minimal obstructions, such as vent pipes, conduit or mechanical equipment. Residential structures shall be designed so that each photovoltaic array is not greater than 150 feet (45 720 mm) by 150 feet (45 720 mm) in either axis.

Exception:

1. Detached, nonhabitable Group U structures including, but not limited to, detached garages serving Group R-3 buildings, parking shade structures, carports, solar trellises, and similar structures.

1204.2.1 Solar photovoltaic systems for Group R-3 buildings. Solar photovoltaic systems for Group R-3 buildings shall comply with Sections 1204.2.1.1 through 1204.2.1.3.

1204.2.1.1 Pathways to ridge. Not fewer than two 36 inch- wide (914 mm) pathways on separate roof planes, from lowest roof edge to ridge, shall be provided on all buildings. Not fewer than one pathway shall be provided on the street or driveway side of the roof. For each roof plane with a photovoltaic array, not fewer than one 36-inch-wide (914 mm) pathway from lowest roof edge to ridge shall be provided on the same roof plane as the photovoltaic array, on an adjacent roof plane or straddling the same and adjacent roof planes.

1204.2.1.2 Setbacks at ridge. For photovoltaic arrays occupying 33 percent or less of the plan view total roof area, a setback of not less than 18 inches (457 mm) wide is required on both sides of a horizontal ridge. For photovoltaic arrays occupying more than 33 percent of the plan view total roof area, a setback of not less than 36 inches (457 mm) wide is required on both sides of a horizontal ridge.

1204.2.1.3 Alternative setbacks at ridge. Where an automatic sprinkler system is installed within the dwelling in accordance with Section 903.3.1.3, setbacks at the ridge shall conform to one of the following:

1. For photovoltaic arrays occupying 66

percent or less of the plan view total roof area, a setback of not less than 18 inches (457 mm) wide is required on both sides of a horizontal ridge.

2. For photovoltaic arrays occupying more than 66 percent of the plan view total roof area, a setback of not less than 36 inches (914 mm) wide is required on both sides of a horizontal ridge.

Exception: This requirement shall not apply to roofs with slopes of two units vertical in 12 units horizontal (2:12) or less.

1204.2.2 Emergency escape and rescue openings.

Panels and modules installed on Group R-3 buildings shall not be placed on the portion of a roof that is below an emergency escape and rescue opening. A pathway of not less than 36 inches (914 mm) wide shall be provided to the emergency escape and rescue opening.

1204.3 Other than Group R-3 buildings. Access to systems for buildings, other than those containing Group R-3 occupancies, shall be provided in accordance with Sections 1204.3.1 through 1204.3.3.

Exception: Where it is determined by the *fire code official* that the roof configuration is similar to that of a Group R-3 occupancy, the residential access and ventilation requirements in Sections 1204.2.1.1 through 1204.2.1.3 are a suitable alternative.

1204.3.1 Perimeter pathways. There shall be a minimum 6-foot-wide (1829 mm) clear perimeter around the edges of the roof.

Exception: Where either axis of the building is 250 feet (76 200 mm) or less, the clear perimeter around the edges of the roof shall be permitted to be reduced to a minimum width of 4 feet (1219 mm).

1204.3.2 Interior pathways. Interior pathways shall be provided between array sections to meet the following requirements:

1. Pathways shall be provided at intervals not greater than 150 feet (45 720 mm) throughout the length and width of the roof.
2. A pathway not less than 4 feet (1219 mm) wide in a straight line to roof standpipes or ventilation hatches.
3. A pathway not less than 4 feet (1219 mm) wide around roof access hatches, with not fewer than one such pathway to a parapet or roof edge.
- *4. The pathway shall be over areas capable of supporting the live load of fire fighters accessing the roof.

- *5. The centerline axis pathways shall be provided in both axes of the roof. Centerline axis pathways shall run where the roof structure is capable of supporting the live load of fire fighters accessing the roof.

1204.3.3 Smoke ventilation. The solar installation shall be designed to meet the following requirements:

1. Where nongravity-operated smoke and heat vents occur, a pathway not less than 4 feet (1219 mm) wide shall be provided bordering all sides.
2. Smoke ventilation options between array sections shall be one of the following:
 - 2.1. A pathway not less than 8 feet (2438 mm) wide.
 - 2.2. Where gravity-operated dropout smoke and heat vents occur, a pathway not less than 4 feet (1219 mm) wide on not fewer than one side.
 - 2.3. A pathway not less than 4 feet (1219 mm) wide bordering 4-foot by 8-foot (1219 mm by 2438 mm) venting cutouts every 20 feet (6096 mm) on alternating sides of the pathway.
3. Arrays shall be not greater than 150 feet (45 720 mm) by 150 feet (45 720 mm) in distance in either axis in order to create opportunities for fire department smoke ventilation operations.

1204.4 Ground-mounted photovoltaic panel systems.

Ground-mounted photovoltaic panel systems shall comply with Section 1204.1 and this section. Setback requirements shall not apply to ground-mounted, free-standing photovoltaic arrays. A clear, brush-free area of

10 feet (3048 mm) shall be required for ground-mounted photovoltaic arrays.

1204.5 Buildings with rapid shutdown. Buildings with rapid shutdown solar photovoltaic systems shall have permanent labels in accordance with Sections 1204.5.1 through 1204.5.3.

1204.5.1 Rapid shutdown type. The type of solar photovoltaic system rapid shutdown shall be labeled with one of the following:

1. For solar photovoltaic systems that shut down the array and the conductors leaving the array, a label shall be provided. The first two lines of the label shall be uppercase characters with a minimum height of 3/8 inch (10 mm) in black on a yellow background. The remaining characters shall be uppercase with a minimum height of 3/16 inch (5 mm) in black on a white background. The label shall be in accordance with Figure 1204.5.1(1) and state the following:
 SOLAR PV SYSTEM EQUIPPED WITH
 RAPID SHUTDOWN. TURN RAPID
 SHUTDOWN SWITCH TO THE "OFF"
 POSITION TO SHUT DOWN PV SYSTEM
 AND REDUCE SHOCK HAZARD IN
 ARRAY.
2. For photovoltaic systems that only shut down conductors leaving the array, a label shall be provided. The first two lines of the label shall be uppercase characters with a minimum height of 3/8 inch (10 mm) in white on a red background and the remaining characters shall be capitalized with a minimum height of 3/16 inch (5 mm) in black on a white background.

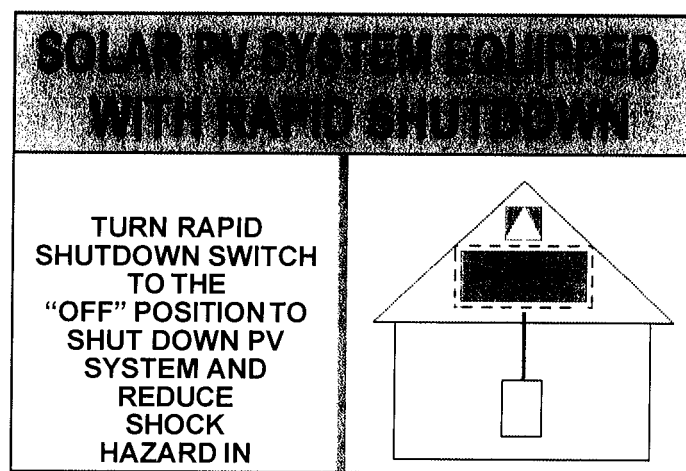


FIGURE 1204.5.1(1)

LABEL FOR SOLAR PV SYSTEMS THAT REDUCE SHOCK HAZARD WITHIN ARRAY AND SHUT DOWN CONDUCTORS LEAVING ARRAY

The label shall be in accordance with Figure 1204.5.1(2) and state the following:

THIS SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN. TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN CONDUCTORS OUTSIDE THE ARRAY. CONDUCTORS WITHIN ARRAY REMAIN ENERGIZED IN SUNLIGHT.

1204.5.1.1 Diagram. The labels in Section 1204.5.1 shall include a simple diagram of a building with a roof. Diagram sections in red signify sections of the solar photovoltaic system that are not shut down when the rapid shutdown switch is turned off.

1204.5.1.2 Location. The rapid shutdown label in Section 1204.5.1 shall be located not greater than 3 feet (914 mm) from the service disconnecting means to which the photovoltaic systems are connected and shall indicate the location of all identified rapid shutdown switches if not at the same location.

1204.5.2 Buildings with more than one rapid shutdown type. Solar photovoltaic systems that contain rapid shutdown in accordance with both Items 1 and 2 of Section 1204.5.1 or solar photovoltaic systems where only portions of the systems on the building contain rapid shutdown, shall provide a detailed plan view diagram of the roof showing each different photovoltaic system and a dotted line around areas that remain energized after the rapid shutdown switch is operated.

1204.5.3 Rapid shutdown switch. A rapid shutdown switch shall have a label located not greater than 3 feet (914 mm) from the switch that states the following:

RAPID SHUTDOWN SWITCH

FOR SOLAR PV SYSTEM

SECTION 1205

STATIONARY FUEL CELL POWER SYSTEMS

1205.1 General. Stationary fuel cell power systems in new and existing occupancies shall comply with this section.

1205.2 Permits. Permits shall be obtained for *stationary fuel cell power systems* as set forth in Section 105.7.10.

1205.3 Equipment. Stationary fuel cell power systems shall comply with the following:

1. *Prepackaged fuel cell power systems* shall be listed and labeled in accordance with CSA FC 1.
2. The modules and components in a *pre-engineered fuel cell power system* shall be listed and labeled in accordance with CSA FC 1 and interconnected to complete the assembly of the system at the job site in accordance with the manufacturer's instructions and the module and component listings.
3. *Field-fabricated fuel cell power systems* shall be approved based on a review of the technical report provided in accordance with Section 104.7.2. The report shall be prepared by and bear the stamp of a registered design professional and shall include:
 - 3.1. A fire risk evaluation.
 - 3.2. An evaluation demonstrating that modules and components in the fuel cell power system comply with applicable requirements in CSA FC 1.
 - 3.3. Documentation of the fuel cell power system's compliance with applicable NFPA 2 and NFPA 853 construction requirements.

1205.4 Installation. Stationary fuel cell power systems shall be installed and maintained in accordance with NFPA 70 and NFPA 853, the manufacturer's installation

instructions, and the listing. *Stationary fuel cell power systems* fueled by hydrogen shall be installed and maintained in accordance

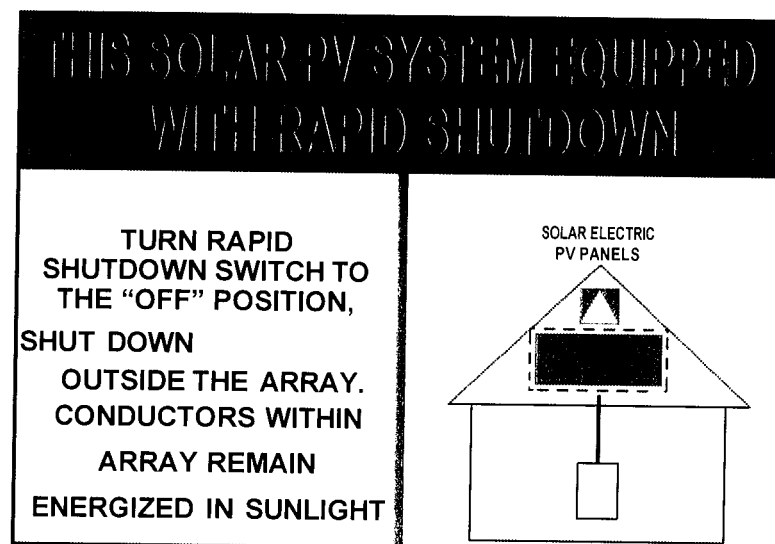


FIGURE 1204.5.1(2)
LABEL FOR SOLAR PV SYSTEMS THAT ONLY SHUT DOWN CONDUCTORS LEAVING THE ARRAY

with NFPA 2 and NFPA 70, the manufacturer's installation instructions and the listing.

1205.5 Residential use. *Stationary fuel cell power systems* shall not be installed in Group R-3 and R-4 buildings, or dwelling units associated with Group R-2 buildings unless they are specifically listed for residential use.

1205.6 Indoor installations. *Stationary fuel cell power systems* installed in indoor locations shall comply with Sections 1205.6 through 1205.6.2. For purposes of this section, an indoor location includes a roof and 50 percent or greater enclosing walls.

1205.6.1 Listed. Stationary fuel cell power systems installed indoors shall be specifically listed and labeled for indoor use.

1205.6.2 Separation. Rooms containing *stationary fuel cell power systems* shall be separated from the following occupancies by fire barriers or horizontal assemblies, or both, constructed in accordance with the *International Building Code*.

1. Group B, F, M, S and U occupancies by 1-hour fire resistance rated construction.
2. Group A, E, I and R occupancies by 2-hour fire resistance rated construction.

Exception: Stationary fuel cell power systems with an aggregate rating less than 50 kW shall not be required

to be separated from other occupancies provided that the systems comply with Section 9.3 of NFPA 853.

1205.7 Vehicle impact protection. Where *stationary fuel cell power systems* are subject to impact by a motor vehicle, vehicle impact protection shall be provided in accordance with Section 312.

1205.8 Outdoor installation. Stationary fuel cell power systems located outdoors shall be separated by not less than 5 feet (1524 mm) from the following:

1. Lot lines.
2. Public ways.
3. Buildings.
4. Stored combustible materials.
5. Hazardous materials.
6. High-piled stock.
7. Any portion of a designated means of egress system.
8. Other exposure hazards.

1205.9 Fuel supply. The design, location, and installation of the fuel supply for *stationary fuel cell power systems* shall comply with Chapter 53, Chapter 58 and the *International Fuel Gas Code*, based on the particular fuel being supplied to the system.

1205.10 Manual shutoff. Access to a manual shutoff valve shall be provided for the fuel piping within 6 feet (1829 mm) of any fuel storage tank serving the fuel cell and within 6 feet (1829 mm) of the power system. If the fuel tank and the *stationary fuel cell power system* are less than 12 feet (3658 mm) apart, a single shutoff valve shall be permitted. If the *stationary fuel cell power system* is located indoors, the shutoff valve shall be located outside of the room in which the system is installed, unless otherwise approved by the *fire code official*.

1205.11 Ventilation and exhaust. Ventilation and exhaust for stationary fuel cell power systems shall be provided in accordance with NFPA 853.

1205.12 Fire suppression. Fire suppression for stationary fuel cell power system installations shall be provided in accordance with NFPA 853.

1205.13 Gas detection systems. Stationary fuel cell power systems shall be provided with a gas detection system. Detection shall be provided in approved locations in the fuel cell power system enclosure, the exhaust system or the room that encloses the fuel cell power system. The system shall be designed to activate at a flammable gas concentration of not more than 25 percent of the lower flammable limit (LFL).

1205.13.1 System activation. The activation of the gas detection system shall automatically:

1. Close valves between the gas supply and the fuel cell power system.
2. Shut down the fuel cell power system.
3. Initiate local audible and visible alarms in approved locations.

SECTION 1206 ELECTRICAL ENERGY STORAGE SYSTEMS

1206.1 Scope. The provisions in this section are applicable to energy storage systems designed to provide electrical power to a building or facility. These systems are used to provide standby or emergency power, an uninterruptable power supply, load shedding, load sharing or similar capabilities. Energy storage systems in Group R-3 and R-4 occupancies shall be in accordance with Sections 1206.2.1 and 1206.4. Approved signage is required for all installations.

1206.2 Stationary storage battery systems. Stationary storage battery systems having capacities exceeding the values shown in Table 1206.2 shall comply with Section 1206.2.1 through 1206.2.13.6, as applicable. *Approved signage is required for all installations.

1206.2.1 Permits. Permits shall be obtained for the construction of stationary storage battery systems *with a capacity of 3 kWh or more, in accordance with Section 105.7.2.

1206.2.2 Construction documents. The following information shall be provided with the permit application:

1. Location and layout diagram of the room in which the stationary storage battery system is to be installed.
2. Details on hourly fire-resistance-rated assemblies provided.
3. Quantities and types of storage batteries and battery systems.
4. Manufacturer's specifications, ratings and listings of storage batteries and battery systems.
5. Details on energy management systems.
6. Location and content of signage.
7. Details on fire-extinguishing, smoke detection and ventilation systems.
8. Rack storage arrangement, including seismic support criteria.

TABLE 1206.2
BATTERY STORAGE SYSTEM THRESHOLD QUANTITIES.

BATTERY TECHNOLOGY	CAPACITY ^a
Flow batteries ^b	20 kWh
Lead acid, all types	70 kWh
Lithium, all types	20 kWh
Nickel cadmium (Ni-Cd)	70 kWh
Sodium, all types	20 kWh ^c
Other battery technologies	10 kWh

For SI: 1 kilowatt hour = 3.6 megajoules.

a. For batteries rated in amp-hours, kWh shall equal rated voltage times amp-hour rating divided by 1000.

b. Shall include vanadium, zinc-bromine, polysulfide-bromide, and other flowing electrolyte-type technologies.

c. 70 kWh for sodium-ion technologies.

1206.2.3 Hazard mitigation analysis. A failure modes and effects analysis (FMEA) or other approved hazard

mitigation analysis shall be provided in accordance with Section 104.7.2 under any of the following

conditions:

1. Battery technologies not specifically identified in Table 1206.2 are provided.
2. More than one stationary storage battery technology is provided in a room or indoor area where there is a potential for adverse interaction between technologies.
3. Where allowed as a basis for increasing maximum allowable quantities in accordance with Section 1206.2.9.
4. Where required by the *fire code official*.

1206.2.3.1 Fault condition. The hazard mitigation analysis shall evaluate the consequences of the following failure modes, and others deemed necessary by the *fire code official*. Only single-failure modes shall be considered.

1. Thermal runaway condition in a single-battery storage rack, module, or array.
2. Failure of any energy management system.
3. Failure of any required ventilation system.
4. Voltage surges on the primary electric supply.
5. Short circuits on the load side of the stationary battery storage system.
6. Failure of the smoke detection, fire-extinguishing or gas detection system.
7. Spill neutralization not being provided or failure of the secondary containment system.
8. Failure of temperature control.

1206.2.3.2 Analysis approval. The *fire code official* is authorized to approve the hazardous mitigation analysis provided that the hazard mitigation analysis demonstrates all of the following:

1. Fires or explosions will be contained within unoccupied battery storage rooms for the minimum duration of the fire-resistance-rated walls identified in Table 509.1 of the *International Building Code*.
2. Fires and explosions in battery cabinets in occupied work centers will be detected in time to allow occupants within the room to evacuate safely.
3. Toxic and highly toxic gases released during fires and other fault conditions shall not reach concentrations in excess of Immediately Dangerous to Life or Health (IDLH) levels in the building or adjacent means of egress routes during the time deemed necessary to evacuate from that area.
4. Flammable gases released from batteries during charging, discharging and normal operation shall not exceed 10 percent of their lower flammability limit (LFL).

5. Flammable gases released from batteries during fire, overcharging and other abnormal conditions shall not create an explosion hazard that will injure occupants or emergency responders.

1206.2.3.3 Additional protection measures.

Construction, equipment, and systems that are required for the stationary storage battery system to comply with the hazardous mitigation analysis, including but not limited to those specifically described in Section 1206.2, shall be installed, maintained, and tested in accordance with nationally recognized standards and specified design parameters.

1206.2.3.4 Large-scale fire testing. Where required in Section 1206, large-scale fire testing shall be conducted on a representative stationary storage battery system, in accordance with UL 9540A. The testing shall be conducted or witnessed and reported by an approved testing laboratory. The test report shall be provided to the *fire code official* for review and approval in accordance with Section 104.7.2.

1206.2.3.5 Fire remediation. Where a fire or other event has damaged a stationary storage battery system and ignition, or re-ignition of the stationary storage battery system is possible, the *fire code official* may require the system owner, agent, or lessee to take actions, at their expense, to mitigate the hazard or remove the damaged equipment from the premise to a safe location.

1206.2.3.6 Forensic analysis. The *fire code official* may also require a forensic analysis of the cause of failure by an independent laboratory approved by the *fire code official* in accordance with Section 104.10.2.

1206.2.4 Seismic and structural design. Stationary storage battery systems shall comply with the seismic design requirements in Chapter 16 of the *International Building Code* and shall not exceed the floor-loading limitation of the building.

1206.2.5 Vehicle impact protection. Where stationary storage battery systems are subject to impact by a motor vehicle, including forklifts, vehicle impact protection shall be provided in accordance with Section 312.

1206.2.6 Combustible storage. Combustible materials not related to the stationary storage battery system shall not be stored in battery rooms, cabinets, or enclosures. Combustible materials in occupied work centers covered by Section 1206.2.8.5 shall not be stored less than 3 feet (915 mm) from battery

cabinets.

1206.2.7 Testing, maintenance, and repair. Storage batteries and associated equipment and systems shall be tested and maintained in accordance with the manufacturer's instructions. Any storage batteries or system components used to replace existing units shall be compatible with the battery charger, energy management systems, other storage batteries and other safety systems. Introducing other types of storage batteries into the stationary storage battery system or other types of electrolytes into flow battery systems shall be treated as a new installation and require approval by the *fire code official* before the replacements are introduced into service.

1206.2.8 Location and construction. Rooms and areas containing stationary storage battery systems shall be designed, located, and constructed in accordance with Sections 1206.2.8.1 through 1206.2.8.7.4.

1206.2.8.1 Location. Stationary storage battery systems shall not be located in the following areas:

1. Where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access,
2. Where the floor level is located below the lowest level of exit discharge.

Exceptions:

1. Lead acid and nickel cadmium stationary storage battery systems less than 50 VAC and 60 VDC installed in facilities under the exclusive control of communications utilities in accordance with NFPA 76.
2. Where approved, installations shall be permitted in underground vaults complying with NFPA 70, Article 450, Part III.
3. Where approved by the *fire code official*, installations shall be permitted on higher and lower floors.
4. Installations on noncombustible rooftops of buildings exceeding 75 feet (22 860 mm) in height that do not obstruct fire department rooftop operations, where *approved by the fire code official*.

1206.2.8.2 Separation. Rooms containing stationary storage battery systems shall be separated from other areas of the building in accordance with Section 509.1 of the *International Building Code*. Battery systems shall be allowed to be in the same room with the equipment they support.

1206.2.8.3 Stationary battery arrays. Storage batteries, prepackaged stationary storage battery systems and pre-engineered stationary storage

battery systems shall be segregated into stationary battery arrays not exceeding 50 kWh (180 megajoules) each. Each stationary battery array shall be spaced not less than 3 feet (914 mm) from other stationary battery arrays and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

Exceptions:

1. Lead acid and nickel cadmium storage battery arrays.
2. Listed pre-engineered stationary storage battery systems and prepackaged stationary storage battery systems shall not exceed 250 kWh (900 megajoules) each, where *approved by the fire code official*.
3. The *fire code official* is authorized to approve listed, pre-engineered and prepackaged battery arrays with larger capacities or smaller battery array spacing if large-scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving one array will not propagate to an adjacent array, and be contained within the room for a duration equal to the fire-resistance rating of the room separation specified in Table 509 of the *International Building Code*.

1206.2.8.4 Separate rooms. Where stationary batteries are installed in a separate equipment room that can be accessed only by authorized personnel, they shall be permitted to be installed on an open rack for ease of maintenance.

1206.2.8.5 Occupied work centers. Where stationary storage batteries are located in an occupied work center, they shall be housed in a noncombustible cabinet or other enclosure to prevent access by unauthorized personnel.

1206.2.8.5.1 Cabinets. Where stationary batteries are contained in cabinets in occupied work centers, the cabinet enclosures shall be located within 10 feet (3048 mm) of the equipment that they support.

1206.2.8.6 Signage. Approved signs shall be provided on or adjacent to all entry for battery storage rooms or areas and on enclosures of battery storage cabinets and walk-in units located outdoors on rooftops or in open parking garages. Signs designed to meet both the requirements of this section and NFPA 70 shall be permitted. The signage shall include the following or equivalent:

1. "Energy Storage System". "Battery Storage

System", "Capacitor Energy Storage System", or the equivalent.

2. The identification of the electrochemical battery energy storage system technology present. "Energized Electrical Circuits"
3. If water reactive electrochemical battery energy storage system is present, the signage shall include "APPLY NO WATER"
4. Current contact information, including phone number, for personnel authorized to service the equipment and fire mitigation personnel.

Exception: Existing stationary storage battery systems shall be permitted to include the signage required at the time it was installed.

1206.2.8.6.1 Electrical disconnects. Where the stationary storage battery system disconnecting means is not within sight of the main service disconnecting means, placards or directories shall be installed at the location of the main service disconnecting means indicating the location of stationary storage battery system disconnecting means in accordance with NFPA 70.

1206.2.8.6.2 Cabinet signage. Battery storage cabinets provided in occupied work centers in accordance with Section 1206.2.8.5 shall have exterior labels that identify the manufacturer and model number of the system and electrical rating (voltage and current) of the contained battery system. There shall be signs within the cabinet that indicate the relevant electrical and chemical hazards, as required by Section 1206.2.12.

1206.2.8.7 Outdoor installations. Stationary storage battery systems located outdoors shall comply with Sections 1206.2.8.7 through 1206.2.8.7.4, in addition to all applicable requirements of Section 1206.2. Installations in outdoor enclosures or containers that can be occupied for servicing, testing, maintenance, and other functions shall be treated as battery storage rooms.

Remote outdoor installations include stationary battery systems located more than 100 feet from buildings, property lines, public ways, stored combustible storage, hazardous materials, high piled stock and other exposure hazards. Installations near exposures include all outdoor stationary battery systems that are not more than 100 feet from buildings, property lines, public ways, stored combustible storage, hazardous materials, high piled stock, and other exposure hazards.

Exception: Stationary battery arrays in noncombustible containers shall not be required

to be spaced 3 feet (914 mm) from the container walls.

TABLE 1206.2.8.7 OUTDOOR INSTALLATIONS

Compliance Required	Remote Installations	Installations Near Exposures
General installation requirements	Yes	Yes
Size and separation	No	Yes ^a
Smoke and automatic fire detection	Yes	Yes
Fire suppression systems	Yes ^b	Yes
Maximum enclosure size	Yes	Yes
Vegetation control	Yes	Yes
Means of egress separation	Yes	Yes
Clearance to exposures	Yes	Yes
Technology-specific protection	Yes	Yes

a. In outdoor walk-in units, spacing is not required between energy storage systems units and the walls of the enclosure.

b. Where approved by the *fire code official*, fire suppression systems are permitted to be omitted.

1206.2.8.7.1 Separation. Stationary storage battery systems located outdoors shall be separated by a minimum *10 feet (3048 mm) from the following:

1. Lot lines.
2. Public ways.
3. Buildings.
4. Stored combustible materials.
5. Hazardous materials.
6. High-piled stock.
7. Other exposure hazards.

Exception: The *fire code official* is authorized to approve smaller separation distances if largescale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress from adjacent buildings, or adversely impact adjacent stored materials or structures.

1206.2.8.7.2 Means of egress. Stationary storage battery systems located outdoors shall be separated from any *means of egress* as required by the *fire code official* to ensure safe egress under fire conditions, but not less than 10 feet (3048 mm).

Exception: The *fire code official* is authorized to approve lesser separation distances if large-scale fire and fault condition testing conducted or witnessed and reported by an *approved*

testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress.

1206.2.8.7.3 Security of outdoor areas. Outdoor areas in which stationary storage battery systems are located shall be secured against unauthorized entry and safeguarded in an approved manner.

1206.2.8.7.4 Walk-in units. Where a stationary storage battery system includes an outer enclosure, the unit shall only be entered for inspection, maintenance and repair of batteries and electronics, and shall not be occupied for other purposes.

1206.2.9 Maximum allowable quantities. *Fire areas* within buildings containing stationary storage battery systems exceeding the maximum allowable quantities in Table 1206.2.9 shall comply with all applicable Group H occupancy requirements in this code and the *International Building Code*.

Exception: Where approved by the *fire code official*, areas containing stationary storage batteries that exceed the amounts in Table 1206.2.9 shall be treated as incidental use areas and not Group H occupancies based on a hazardous mitigation analysis in accordance with Section 1206.2.3 and large-scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory.

1206.2.9.1 Mixed battery systems. Where areas within buildings contain different types of storage battery technologies, the total aggregate quantities of batteries shall be determined based on the sum of percentages of each battery type quantity divided by the maximum allowable quantity of each battery type. If the sum of the percentages exceeds 100 percent, the area shall be treated as a Group H occupancy in accordance with Table 1206.2.9.

1206.2.10 Storage batteries and equipment. The design and installation of storage batteries and related equipment shall comply with Sections 1206.2.10.1 through 1206.2.10.8.

Battery storage system installations shall comply with the requirements of this section and the applicable requirements of Table 1206.2.10

1206.2.10.1 Listings. Storage batteries and battery storage systems shall comply with the following:

1. Storage batteries shall be listed in accordance with UL 1973.
2. Prepackaged and pre-engineered stationary storage battery systems shall be listed in accordance with UL 9540.

Exception: Lead-acid batteries are not

required to be listed.

1206.2.10.2 Prepackaged and pre-engineered systems. Prepackaged and pre-engineered stationary storage battery systems shall be installed in accordance with their listing and the manufacturer's instructions.

**TABLE 1206.2.9
MAXIMUM ALLOWABLE BATTERY QUANTITIES**

BATTERY TECHNOLOGY	MAXIMUM ALLOWABLE QUANTITIES ^a	GROUP H OCCUPANCY
Flow batteries ^b	600 kWh	Group H-2
Lead acid, all types	Unlimited	Not Applicable
Lithium, all types	600 kWh	Group H-2
Nickel cadmium (Ni-Cd)	Unlimited	Not Applicable
Sodium, all types	600 kWh	Group H-2
Other battery technologies	200 kWh	Group H-2 ^c

For SI: 1 kilowatt hour = 3.6 megajoules.

- a. For batteries rated in amp-hours, Kilowatt-hours (kWh) shall equal rated battery voltage times the amp-hour rating divided by 1,000.
- b. Shall include vanadium, zinc-bromine, polysulfide-bromide, and other flowing electrolyte-type technologies.
- c. Shall be a Group H-4 occupancy if the *fire code official* determines that a fire or thermal runaway involving the battery technology does not represent a significant fire hazard.

**TABLE 1206.2.10
BATTERY TECHNOLOGY SPECIFIC**

Compliance Required ^b	Battery Technology				Other Battery Storage Systems and Battery Technologies ^b
	Lead-acid	Ni-Cad & Ni-MH	Lithium-ion	Flow	
Exhaust ventilation	Yes	Yes	Yes	Yes	Yes
Spill control and neutralization	Yes ^c	Yes ^c	No	Yes	Yes
Explosion control	Yes ^a	Yes ^a	Yes	Yes	Yes
Safety Caps	Yes	Yes	No	Yes	Yes
Thermal runaway	Yes ^d	Yes	Yes ^e	Yes	Yes ^e

- a. Not required for lead-acid and nickel cadmium batteries at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.
- b. Protection shall be provided unless documentation acceptable to the *fire code official*, in accordance with 2021 *International Fire Code* Section 104.7.2, provides justification why the protection is not necessary based on the technology used.
- c. Applicable to vented (i.e., flooded) type nickel cadmium and lead acid batteries.
- d. Not required for vented (i.e., flooded) type lead acid batteries.
- e. The thermal runaway protection is permitted to be part of a battery management system that has been evaluated with the battery in accordance with UL 1973.

1206.2.10.3 Energy management system. An approved energy management system shall be provided for battery technologies other than lead-acid and nickel cadmium for monitoring and balancing cell voltages, currents, and temperatures within the manufacturer's specifications. The system shall transmit an alarm signal to an approved location and to an *approved* annunciator panel if potentially hazardous temperatures or other conditions such as short circuits, over voltage or under voltage are detected.

1206.2.10.3.1 Annunciator panel. The *approved* annunciator panel shall visibly indicate any hazardous temperature or other conditions. The location of the annunciator panel shall be approved by the *fire code official*.

1206.2.10.4 Battery chargers. Battery chargers shall be compatible with the battery chemistry and the manufacturer's electrical ratings and charging specifications. Battery chargers shall be listed and labeled in accordance with UL 1564 or provided as part of a listed pre-engineered or prepackaged stationary storage battery system.

1206.2.10.5 Inverters. Inverters shall be listed and labeled in accordance with UL 1741. Only inverters listed and labeled for utility interactive system use and identified as interactive shall be allowed to operate in parallel with the electric utility power system to supply power to common loads.

1206.2.10.6 Safety caps. Where required by Table 1206.2.10, batteries shall be provided with flame-arresting safety caps.

1206.2.10.7 Thermal runaway. Where required by Table 1206.2.10 storage batteries shall be provided with a listed device or other approved method to prevent, detect, and control thermal runaway.

1206.2.10.8 Toxic and highly toxic gas. Stationary storage battery systems that have the potential to release toxic and highly toxic gas during charging, discharging and normal use conditions shall comply

with Section 1206.2.11.3 and Chapter 60.

1206.2.11 Fire protection and life safety systems. Fire protection and life safety systems shall be provided in accordance with Sections 1206.2.11.1 through 1206.2.11.7. All alarm, and supervisory signals from the fire protection and life safety systems shall be transmitted to a central station, proprietary or remote station service in accordance with NFPA 72, and to an approved annunciator panel.

1206.2.11.1 Fire-extinguishing systems. Rooms and areas within buildings and walk-in units containing electrochemical battery energy storage systems shall be equipped with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1. Commodity classifications for specific technologies of storage batteries shall be in accordance with Chapter 5 of NFPA 13. If the storage battery types are not addressed in Chapter 5 of NFPA 13, the *fire code official* is authorized to approve the fire-extinguishing system based on full scale fire and fault condition testing conducted or witnessed and reported by an *approved* laboratory.

Exception: Spaces or areas containing stationary storage battery systems used exclusively for telecommunications equipment in accordance with Section 903.2.

1206.2.11.1.1 Fire-extinguishing systems. Rooms and areas within buildings and walk-in units containing electrochemical battery energy storage systems shall be protected by an automatic fire suppression system designed and installed in accordance with the most stringent of the following:

1. An *automatic sprinkler system* designed and installed in accordance with Section 903.3.1.1 with a minimum density of 0.6 gpm/ft.² based on the fire area or 2,500 square feet (232 m²) design area, whichever is smaller.
2. Where *approved*, an automatic sprinkler system designed and installed in accordance with Section 903.3.1.1 with a sprinkler hazard classification based on large-scale fire testing.
3. An alternate automatic fire extinguishing system designed and installed in accordance with Section 904, provided the installation is approved by the *fire code official* based on large scale fire testing

Exception: Fire suppression systems for lead acid and nickel cadmium battery systems at facilities under the exclusive control of communications utilities that operate at less than 50 VAC and 60 VDC shall be provided where required by NFPA 76.

1206.2.11.1.2 Fire department connections. Fire Department connections shall be installed in an *approved* location.

1206.2.11.1.3 Hydrants. Fire hydrants shall be installed and maintained in accordance with Chapters 5 and 9.

1206.2.11.1.4 Alternative fire-extinguishing systems. Battery systems that utilize water-reactive materials shall be protected by an *approved* alternative automatic fire extinguishing system in accordance with Section 904. The system shall be listed for protecting the type, arrangement, and quantities of storage batteries in the room. The *fire code official* shall be permitted to approve the alternative fire extinguishing system based on full-scale fire and fault condition testing conducted or witnessed and reported by an *approved* laboratory.

1206.2.11.2 Smoke detection system. An *approved automatic smoke detection system* shall be installed in rooms containing *stationary storage battery systems* in accordance with Section 907.2.

1206.2.11.3 Exhaust ventilation. Where required by Table 1206.2.10, ventilation of rooms containing stationary storage battery systems shall be provided in accordance with the *International Mechanical Code* and one of the following:

1. The ventilation system shall be designed to limit the maximum concentration of flammable gas to 10 percent of the lower flammability limit, or for hydrogen, 1.0 percent of the total volume of the room.
2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute (cfm) per square foot [0.00508 m³/(s • m²)] of floor area, but not less than 150 cfm (4 m³/min). The exhaust system shall be designed to provide air movement across all parts of the floor for gases having a vapor density greater than air and across all parts of the vault ceiling for gases having a vapor density less than air.

1206.2.11.3.1 Cabinet ventilation. Where cabinets located in occupied spaces contain storage batteries that are required by Table 1206.2.10 to be provided with ventilation, the cabinet shall be provided with ventilation in accordance with Section 1206.2.11.3.

1206.2.11.3.2 Supervision. Required mechanical ventilation systems for rooms and cabinets containing storage batteries shall be supervised by an *approved* central station, proprietary or remote station service or shall initiate an audible and visual signal at an *approved* constantly attended on-site location.

1206.2.11.3.3 Standby power. Mechanical exhaust ventilation shall be provided with not less than 6 hours of standby power in accordance with *International Building Code*.

Separation shall be in accordance with NFPA 70.

Where the building, or a portion of the building, served by the mechanical exhaust ventilation is intended to remain operational / occupied during a utility power outage, through the use of an electrical standby power system, whether required or optional; the mechanical exhaust ventilation shall be connected to both the normal electrical service and emergency or standby power system for equivalent time periods.

1206.2.11.3.4 Mechanical exhaust ventilation controls. Clearly identified separate switches shall be provided both to activate the mechanical exhaust ventilation system and to shutoff the ventilation system.

1206.2.11.4 Gas detection system. Where required by Section 1206.2.3 or 1206.2.10.8 rooms containing stationary storage battery systems shall be protected by a gas detection system complying with Section 916. The gas detection system shall be designed to activate where the level of flammable gas exceeds 10 percent of the lower flammable limit (LFL), or where the level of toxic or highly toxic gas exceeds one half of the IDLH.

1206.2.11.4.1 System activation. Activation of the gas detection system shall result in all the following:

1. Initiation of distinct audible and visible alarms in the battery storage room.
2. Transmission of an alarm to an approved location.
3. De-energizing of the battery charger.
4. Activation of the mechanical ventilation system, where the system is interlocked with the gas detection system.

Exception: Lead-acid and nickel-cadmium stationary storage battery systems shall not be required to comply with Items 1, 2 and 3.

1206.2.11.5 Spill control and neutralization. Where required by Table 1206.2.10, approved methods and materials shall be provided for the control and neutralization of spills of electrolyte or other hazardous materials in areas containing stationary storage batteries as follows:

1. For batteries with free-flowing electrolyte, the method and materials shall be capable of neutralizing a spill of the total capacity from the largest cell or block to a pH between 5.0 and 9.0.
2. For batteries with immobilized electrolyte, the method and material shall be capable of neutralizing a spill of 3.0 percent of the capacity of the largest cell or block in the room to a pH between 5.0 and 9.0.

1206.2.11.5.1 Spill control barrier. Each rack of batteries, or group of racks shall be provided with a liquid-tight 4-inch (102 mm) spill control barrier that extends at least 1-inch (25 mm) beyond the battery rack in all directions.

1206.2.11.6 Explosion Control. Where required by Table 1206.2.10, explosion control, complying with Section 911, NFPA 68 and NFPA 69, shall be provided for rooms, areas or walk-in units containing electrochemical battery energy storage system technologies.

Exceptions:

1. Where approved, explosion control is permitted to be waived by the *fire code official* based on large-scale fire testing demonstrating that flammable gases are not liberated from electrochemical battery energy storage system cells or modules.
2. Where approved, explosion control is permitted to be waived by the *fire code official* based on documentation provided in accordance with *Section 104.7* that demonstrating that the

electrochemical battery energy storage system technology to be used does not have the potential to release flammable gas concentrations in excess of 25 percent of the lower flammable limit (LFL) anywhere in the room, area, walk-in unit or structure under thermal runaway or other fault conditions.

1206.2.11.7 Emergency energy release. An approved means must be provided to safely release stored energy from the batteries in an emergency situation.

1206.2.12 Specific battery-type requirements. This section includes requirements applicable to specific types of storage batteries. Stationary storage battery systems with more than one type of storage battery shall comply with requirements applicable to each battery type.

Ventilation, spill control and neutralization, explosion control, safety caps and thermal runaway shall be required in accordance with Table 1206.2.10

1206.2.12.1 Lead-acid storage batteries. Stationary storage battery systems utilizing lead-acid storage batteries shall comply with the following:

1. The signage required by Section 1206.2.8.6 shall indicate the room contains lead-acid batteries.

1206.2.12.2 Nickel-cadmium (Ni-Cd) storage batteries. *Stationary storage battery systems* utilizing nickel cadmium (Ni-Cd) storage batteries shall comply with the following:

1. The signage required by Section 1206.2.8.6 shall indicate the room contains lead-acid batteries.

1206.2.12.3 Lithium-ion storage batteries. The signage in Section 1206.2.8.6 shall indicate the type of lithium batteries contained in the room.

1206.2.12.4 Sodium-beta storage batteries. *Stationary storage battery systems* utilizing sodium-beta storage batteries shall comply with the following:

1. The signage in Section 1206.2.8.6 shall indicate the type of sodium batteries in the room and include the instructions, "APPLY NO WATER."

1206.2.12.5 Flow storage batteries. Stationary storage battery systems utilizing flow storage batteries shall comply with the following:

1. The signage required in Section 1206.2.8.6 shall indicate the type of flow batteries in the room.

1206.2.12.6 Other battery technologies. *Stationary storage battery systems* utilizing battery technologies other than those described in Sections 1206.2.12.1 through 1206.2.12.5 shall comply with the following:

1. Gas detection systems complying with Section 916 shall be provided in accordance with Section 1206.2.11.4 where the batteries have the potential to produce toxic or highly toxic gas in the storage room or cabinet in excess of the permissible exposure limits (PEL) during charging, discharging and normal system operation.
2. In addition to the signage required in Section 1206.2.8.6, the marking shall identify the type of batteries present, describe the potential hazards associated with the battery type, and indicate that the room contains energized electrical circuits.

1206.2.13 Special Installations. Rooftop and open parking garage battery energy storage system installations shall comply with Sections 1206.2.13.1 through 1206.2.13.6. Signage shall comply with Section 1206.2.8.6.

1206.2.13.1 Rooftop installations. For the purpose of Table 1206.2.13, rooftop installations are those located on the roofs of buildings.

1206.2.13.2 Open parking garage installations. For the purposes of Table 1206.2.13, open parking garage installations are those located in a structure or portion of a structure that complies with Section 406.5 of the *International Building Code*.

TABLE 1206.2.13 SPECIAL INSTALLATIONS

Compliance Required	Rooftops	Open Parking Garages
General Installation Requirements	Yes	Yes
Size and separation	Yes	Yes
Smoke and automatic fire detection	Yes	Yes
Maximum enclosure size	Yes	Yes

Means of egress separation	Yes	Yes
Clearance to exposures	Yes	Yes
Fire suppression systems	Yes	Yes
Technology specific protection	Yes	Yes

1206.2.13.3 Clearance to exposures. Battery storage systems located on rooftops and in open parking garages shall be separated by not less than 10 feet (3048 mm) from the following exposures:

1. Buildings, except the building on which rooftop battery energy storage system is mounted
2. Any portion of the building on which a rooftop system is mounted that is elevated above the rooftop on which the system is installed
3. Lot lines
4. Public ways
5. Stored combustible materials
6. Locations where motor vehicles can be parked
7. Hazardous materials
8. Other exposure hazards

Exceptions:

1. Clearances are permitted to be reduced to 3 feet (914 mm) where a 1-hour freestanding fire barrier, suitable for exterior use, and extending 5 feet (1524 mm) above and 5 feet (1524 mm) beyond the physical boundary of the battery energy storage system, installation is provided to protect the exposure.
2. Clearances are permitted to be reduced to 3 feet (914 mm) where a weatherproof enclosure constructed of noncombustible materials is provided over the battery energy storage system and it has been demonstrated that a fire within the enclosure will not ignite combustible materials outside the enclosure.

1206.2.13.4 Fire suppression systems. Battery storage systems located in walk-in units on rooftops or in walk-in units in open parking garages shall be provided with automatic fire suppression systems within the battery energy storage system enclosure in accordance with Section 1206.2.11.1. Areas containing battery energy storage systems other than walk-in units in open parking structures on levels not open above to the sky shall be provided with an automatic fire suppression system complying with Section 1206.2.11.1.

1206.2.13.5 Rooftop installations. Battery storage systems and associated equipment that are located on rooftops and not enclosed by building construction shall comply with the following:

1. Stairway access to the roof for emergency response and fire department personnel shall be provided either through a bulkhead from the interior of the building or a stairway on the exterior of the building.
2. Service walkways not less than 5 feet (1524 mm) in width shall be provided for service and emergency personnel from the point of access to the roof to the system.
3. Battery storage systems and associated equipment shall be located from the edge of the roof a distance equal to at least the height of the system, equipment, or component but not less than 5 feet (1524 mm).
4. The roofing materials under and within 5 feet (1524 mm) horizontally from a battery storage systems or associated equipment shall be noncombustible or shall have a Class A rating when tested in accordance with ASTM E108 or UL 790.
5. A Class I standpipe outlet shall be installed at an approved location on the roof level of the building or in the stairway bulkhead at the top level.
6. The battery storage systems shall be not less than 10 feet (3048 mm) from the fire service access point on the rooftop.

1206.2.13.6 Open parking garages. Battery storage systems and associated equipment that are located in open parking garages shall comply with all of the following:

1. Battery storage systems shall not be located within 50 feet (15 240 mm) of air inlets for building HVAC systems.

Exception: This distance shall be permitted to be reduced to 25 feet (7620 mm) if the automatic fire alarm system monitoring the radiant-energy-sensing detectors de-energizes the ventilation system connected to the air intakes upon detection of fire.

2. Battery storage systems shall not be located within 25 feet (7620 mm) of exits leading from the attached building where located on a covered level of the parking structure not directly open to the sky above.
3. An approved fence with a locked gate or other approved barrier shall be provided to keep the general public not less than 5 feet (1024 mm) from the outer enclosure of the battery energy storage system.

1206.3 Capacitor energy storage systems. Capacitor energy storage systems having capacities exceeding 3 kWh (10.8 megajoules) shall comply with Sections 1206.3 through 1206.3.2.6.1.

Exception: Capacitors regulated by NFPA 70, Chapter 460, and capacitors included as a component part of other listed electrical equipment are not required to comply with this section.

1206.3.1 Permits. Permits shall be obtained for the installation of capacitor energy storage systems in accordance with Section 105.7.3.

1206.3.2 Location and construction. Rooms and areas containing capacitor energy storage systems shall be designed, located and constructed in accordance with Sections 1206.3.2 through 1206.3.2.5.

1206.3.2.1 Location. Capacitor energy storage systems shall not be located in areas where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, or where the floor level is more than 30 feet (9144 mm) below the finished floor of the lowest level of exit discharge.

1206.3.2.2 Separation. Rooms containing capacitor energy storage systems shall be separated from the following occupancies by fire barriers or horizontal assemblies, or both, constructed in accordance with the *International Building Code*.

1. Group B, F, M, S and U occupancies by 1-hour fire-resistance-rated construction.
2. Group A, E, I and R occupancies by 2-hour fire resistance rated construction.

1206.3.2.3 Capacitor arrays. Capacitor energy storage systems shall be segregated into capacitor arrays not exceeding 50 kWh each. Each array shall be spaced not less than 3 feet (914 mm) from other arrays and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

Exception: Capacitor energy storage systems in noncombustible containers located outdoors shall not be required to be spaced 3 feet (914 mm) from the container walls.

1206.3.2.4 Signage. Approved signs shall be provided on doors or in locations adjacent to the entrances to capacitor energy storage system rooms and shall include the following or equivalent verbiage and information:

1. "CAPACITOR ENERGY STORAGE ROOM."
2. "THIS ROOM CONTAINS ENERGIZED ELECTRICAL CIRCUITS."
3. An identification of the type of capacitors present and the potential hazards associated with the capacitor type.

1206.3.2.5 Electrical disconnects. Where the capacitor energy storage system disconnecting means is not within sight of the main service disconnecting means, placards or directories shall be installed at the location of the main service disconnecting means identifying the location of the capacitor energy storage system disconnecting means in accordance with NFPA 70.

1206.3.2.6 Outdoor installation. Capacitor energy systems located outdoors shall comply with Sections 1206.3.2.6 through 1206.3.2.6.4 in addition to all applicable requirements of Section 1206.3.

Installations in outdoor enclosures or containers that can be occupied for servicing, testing, maintenance and other functions shall be treated as capacitor storage rooms.

Exception: Capacitor arrays in noncombustible containers shall not be required to be spaced 3 feet (914 mm) from the container walls.

1206.3.2.6.1 Separation. Capacitor energy systems located outdoors shall be not less than 5 feet (1524 mm) from the following:

1. Lot lines.
2. Public ways.
3. Buildings.
4. Stored combustible materials.
5. Hazardous materials.
6. High-piled stock.
7. Other exposure hazards.

Exception: The *fire code official* is authorized to approve lesser separation distances if large-scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress from adjacent buildings, or adversely impact adjacent stored materials or structures.

1206.3.2.6.2 Means of egress. *Capacitor energy storage systems* located outdoors shall be separated from any means of egress as required by the *fire code official* to ensure safe egress under fire conditions, but not less than 10 feet (3048 mm).

Exception: The *fire code official* is authorized to approve lesser separation distances if large-scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress.

1206.3.2.6.3 Security of outdoor areas. Outdoor areas in which *capacitor energy storage systems* are located shall be secured against unauthorized entry and safeguarded in an approved manner.

1206.3.2.6.4 Walk-in units. Where a capacitor energy storage system includes an outer enclosure, the unit shall only be entered for inspection, maintenance and repair of capacitors and electronics, and shall not be occupied for other purposes.

1206.3.3 Maximum allowable quantities. Fire areas within buildings containing *capacitor energy storage systems* that exceed 600 kWh of energy capacity shall comply with all applicable Group H occupancy requirements in this code and the *International Building Code*.

1206.3.4 Capacitors and equipment. The design and installation of *capacitor energy storage systems* and related equipment shall comply with Sections 1206.3.4.1 through 1206.3.4.5.

1206.3.4.1 Listing. Capacitors and *capacitor energy storage systems* shall comply with the following:

1. Capacitors shall be listed in accordance with UL 1973.
2. Prepackaged and pre-engineered stationary capacitor energy storage systems shall be listed in accordance with UL 9540.

1206.3.4.2 Prepackaged and pre-engineered systems. In addition to other applicable requirements of this code, prepackaged and pre-engineered *capacitor energy storage systems* shall be installed in accordance with their listing and the manufacturer's instructions.

1206.3.4.3 Energy management system. An approved energy management system shall be provided for monitoring and balancing capacitor voltages, currents and temperatures within the manufacturer's specifications. The system shall transmit an alarm signal to an approved location if potentially hazardous temperatures or other conditions such as short circuits, over voltage or under voltage are detected.

1206.3.4.4 Capacitor chargers. Capacitor chargers shall be compatible with the capacitor manufacturer's electrical ratings and charging specifications. Capacitor chargers shall be listed and labeled in accordance with UL 1564 or provided as part of a listed pre-engineered or prepackaged *capacitor energy storage system*.

1206.3.4.5 Toxic and highly toxic gas. *Capacitor energy storage systems* that have the potential to release toxic and highly toxic materials during charging, discharging and normal use conditions shall comply with Chapter 60.

1206.3.5 Fire-extinguishing and detection systems. Fire-extinguishing and smoke detection systems shall be provided in *capacitor energy storage system* rooms in accordance with Sections 1206.3.5.1

through 1206.3.5.2.

1206.3.5.1 Fire-extinguishing systems. Rooms containing *capacitor energy storage systems* shall be equipped with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1. Commodity classifications for specific capacitor technologies shall be in accordance with Chapter 5 of NFPA 13. If the capacitor types are not addressed in Chapter 5 of NFPA 13, the *fire code official* is authorized to approve the *automatic sprinkler system* based on full-scale fire and fault condition testing conducted by an *approved* laboratory.

1206.3.5.1.1 Alternative fire-extinguishing systems. *Capacitor energy storage systems* that utilize water-reactive materials shall be protected by an approved alternative *automatic fire-extinguishing system* in accordance with Section 904. The system shall be listed for protecting the type, arrangement and quantities of capacitors in the room. The *fire code official* shall be permitted to approve the system based on full-scale fire and fault condition testing conducted by an *approved* laboratory.

1206.3.5.2 Smoke detection system. An approved *automatic smoke detection system* shall be installed in rooms containing *capacitor energy storage systems* in accordance with Section 907.2.

1206.3.5.3 Ventilation. Where capacitors release flammable gases during normal operating conditions, ventilation of rooms containing capacitor energy storage systems shall be provided in accordance with the *International Mechanical Code* and one of the following:

1. The ventilation system shall be designed to limit the maximum concentration of flammable gas to 25 percent of the lower flammability limit.
2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute (cfm) per square foot [$0.00508 \text{ m}^3/(\text{s} \cdot \text{m}^2)$] of floor area, but not less than 150 cfm (4 m^3/min).
The exhaust system shall be designed to provide air movement across all parts of the floor for gases having a vapor density greater than air and across all parts of the ceiling for gases having a vapor density less than air.

1206.3.5.3.1 Supervision. Required mechanical ventilation systems for rooms containing *capacitor energy storage systems* shall be supervised by an *approved* central station, proprietary or remote station service, or shall initiate an audible and visible signal at an *approved*, constantly attended on-site location.

1206.3.5.4 Spill control and neutralization. Where capacitors contain liquid electrolyte, *approved* methods and materials shall be provided for the control and neutralization of spills of electrolyte or other hazardous materials in areas containing capacitors as follows:

1. For capacitors with free-flowing electrolyte, the method and materials shall be capable of neutralizing a spill of the total capacity from the largest cell or block to a pH between 5.0 and 9.0.
2. For capacitors with immobilized electrolyte, the method and material shall be capable of neutralizing a spill of 3.0 percent of the capacity of the largest cell or block in the room to a pH between 5.0 and 9.0.

1206.3.6 Testing, maintenance, and repair. Capacitors and associated equipment and systems shall be tested and maintained in accordance with the manufacturer's instructions. Any capacitors or system components used to replace existing units shall be compatible with the capacitor charger, energy management systems, other capacitors, and other safety systems. Introducing different capacitor technologies into the capacitor energy storage system shall be treated as a new installation and require approval by the *fire code official* before the replacements are introduced into service.

1206.4 Energy storage system in Group R-3 and R-4 occupancies. Energy storage systems in Group R-3 and R-4 occupancies shall be installed and maintained in accordance with this section. The temporary use of an owner or occupant's electric-powered vehicle as an energy storage system shall be in accordance with this section.

***Exception:** Energy storage systems in Group R-3 and R-4 occupancies with a capacity of 3 kWh or less.

1206.4.1 Equipment listings. Energy storage system shall be listed and labeled for residential use in accordance with UL 9540.

Exceptions:

1. Where *approved*, repurposed unlisted battery systems from electric vehicles may be installed outdoors or in detached dedicated cabinets located not less than 5 feet (1524 mm) from exterior walls, property lines and public ways.
2. Energy storage systems less than 1 kWh.

1206.4.2 Installation. Energy storage system shall be installed in accordance with the manufacturer's instructions and their listing.

1206.4.2.1 Spacing. Individual units shall be separated from each other by at least 3 feet (914 mm) of spacing unless smaller separation distances are documented and approved by the *fire code official* to be adequate based on large-scale fire testing.

1206.4.3 Location. Energy storage systems shall only be installed in the following locations:

1. Detached garages and detached accessory structures.
2. Attached garages separated from the dwelling unit living space and sleeping units in accordance with Section 406.3.2 of the *International Building Code*.
3. Outdoors on exterior walls in accordance with 1206.4.3.1
- *4. Other locations with Fire Marshal approval.

1206.4.3.1 Exterior wall and outdoor installations. Energy storage systems shall be permitted to be installed outdoors on exterior walls of buildings or on the ground where all of the following conditions are met:

1. The maximum energy capacity of individual energy storage system units shall not exceed 20 kWh.
- *2. The installation is in accordance with zoning setback requirements.
3. The energy storage system shall be installed in accordance with the manufacturer's instructions and their listing.
4. Individual energy storage system units shall be separated from each other by not less than 3 feet (914 mm).
5. The energy storage system shall be separated from doors, windows, operable openings into buildings, or HVAC inlets by at least 5 feet (1524 mm).

Exception: Where approved by the *fire code official*, smaller separation distances in Items 4 and 5 may be permitted based on large scale fire testing

1206.4.4 Energy ratings. Individual energy storage systems units shall have a maximum rating of 20 kwh. The aggregate rating structure shall not exceed: *

1. 80 kWh in attached or detached garages and detached accessory structures.
2. 80 kWh on exterior walls.
3. 80 kWh outdoors on the ground.

1206.4.5 Electrical installation. Energy storage system shall be installed in accordance with NFPA 70. Inverters shall be listed and labeled in accordance with UL 1741 or provided as part of the UL 9540 listing. Systems connected to the utility grid shall use inverters listed for utility interaction.

1206.4.6 Fire detection. Rooms and areas within dwellings units, sleeping units and attached garages in which energy storage systems are installed shall be protected by smoke alarms in accordance with Section 907.2.10. A heat detector listed and interconnected to the smoke alarms shall be installed in locations within dwelling units, sleeping units and attached garages where smoke alarms cannot be installed based on their listing.

1206.4.7 Protection from impact. Stationary storage battery systems installed in a location subject to vehicle damage shall be protected by approved barriers. Appliances in garages shall also be installed in accordance with Section 304.3 of the *International Mechanical Code*.

1206.4.8 Ventilation. Indoor installations of energy storage systems that include batteries that produce hydrogen or other flammable gases during charging shall be provided with ventilation in accordance with Section 1206.2.11.3.

1206.4.9 Toxic and highly toxic gas. Energy storage systems that have the potential to release toxic or highly toxic gas during charging, discharging and normal use conditions shall not be installed within Group R-3 or R-4 occupancies.

APPENDIX

[Amendment]

Appendix B - Table B105.2 – Minimum Fire Flow (gpm) shall be amended to read “50% of the value in Table B105.1(2)a / 50% of the value in Table B105.1(2)b

[Delete]

Appendix M – High – Rise Buildings – Retroactive Automatic Sprinkler Requirement

[Add]

Appendix O - Fire Emergency Access Signage Details (see attachment)



A E1 Regulatory Panel Sign - FIRE LANE
Scale: 1 1/2"=1'-0"

- ① .080 ALUMINUM, 1.5" RADIUS CORNERS
- ② 3M 3930 WHITE H.I.P. TYPE IV RETROREFLECTIVE SHEETING
- ③ 3M 882N RED INK OR TRANSLUCENT 3M 1172 "RED" ELECTRO CUT FILM OVERLAY
- ④ N/A
- ⑤ 3M 1160 GRAFFITI OVERLAY FILM APPLIED OVER FINISHED SIGN FACE
- ⑥ INSTALLATION HARDWARE TO CLEAR GRAPHICS

DRIVE RIVET

Drive rivets provide the convenience of a one-piece fastener with effective tamper-resistant design and fast installation using only a hammer.

HEX NUTS AND BOLTS

Use of tamper resistant components is required for connection.

- ⑦ PREFERRED: ZINC COATED TELES PAR QUICK-PUNCH SIGN POST IN FHWA APPROVED BREAKAWAY INSTALLATION

Qwik-Punch posts are made with 7/16" knockouts, 1" on the center, on all four sides. This feature allows workers in the field to quickly punch holes exactly where they are needed leaving the balance of the post with a smooth unbroken appearance. Telespar posts offer the same telescoping action and easy installation as standard Telespar posts.

ALTERNATE - REQUIRES OUA APPROVAL:

TELES PAR GALVANIZED PRE-PUNCHED SIGN POST IN FHWA APPROVED BREAKAWAY INSTALLATION

Square posts with 7/16" prepunched holes on 1" centers

MOUNTING HEIGHT

Mounting height is measured from the road surface to the bottom of the sign.

PRIMARY SIGN

Use a minimum of 5 feet in:

- Rural areas

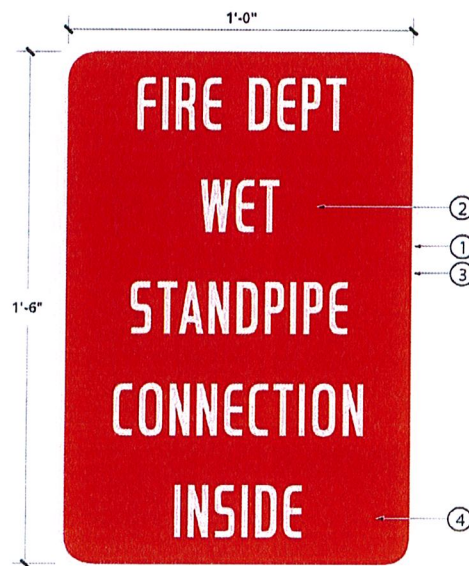
Use a minimum of 7 feet in:

- Areas with parking or pedestrians
- Urban, business, commercial, or residential areas
- Areas where the view of the sign may be obstructed

SUPPLEMENTAL PLAQUE OR SIGN

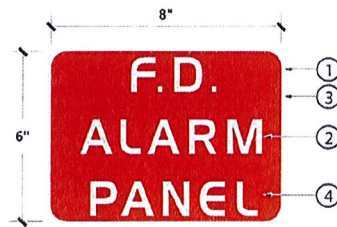
Supplemental plaques or signs may be lower than the minimum mounting height of the primary sign. Allow a minimum 1/2-inch gap between stacked signs so they can expand and contract.

- ① The sign face shall be 12" x 18" with a thickness of .080 aluminum construction with 1 1/2" radius corners.
- ② Font style used is Handel Gothic BT capital fonts. Lettering is 2" x 1/4" stroke.
- ③ The sign face shall have a white 3M diamond grade reflective sheeting (DG³ 4090 series or equivalent) applied as a background to the aluminum plates.
- ④ Lettering shall be done one of the following ways:
 - A. 3M Scotchlite acrylic, transparent, electronic cuttable film (Red 1172 series) inverse cut to allow white reflective background to show through.
 - B. Screen printed using 3M 880 I or 880-00 series traffic sign red translucent ink.
 Both processes (A or B) will accomplish a red field with white copy.
- ⑤ All sign imaging shall be in compliance with the reflective sheeting manufactures match component system.



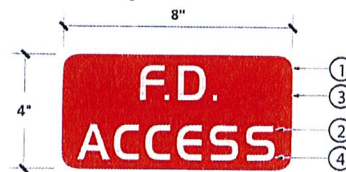
A E2 Details: Fire Department Wet Standpipe Sign
Scale: 3"=1'-0"

- ① The sign face shall be 8" x 6" with a thickness of .080 aluminum construction with 1/2" radius corners.
- ② Font style used is Handel Gothic BT capital fonts. Lettering is 1 1/4" x 1/4" stroke.
- ③ The sign face shall have a white 3M diamond grade reflective sheeting (DG³ 4090 series or equivalent) applied as a background to the aluminum plates.
- ④ Lettering shall be done one of the following ways:
 - A. 3M Scotchlite acrylic, transparent, electronic cuttable film (Red 1172 series) inverse cut to allow white reflective background to show through.
 - B. Screen printed using 3M 880 I or 880-00 series traffic sign red translucent ink.Both processes (A or B) will accomplish a red field with white copy.
- ⑤ All sign imaging shall be in compliance with the reflective sheeting manufactures match component system.



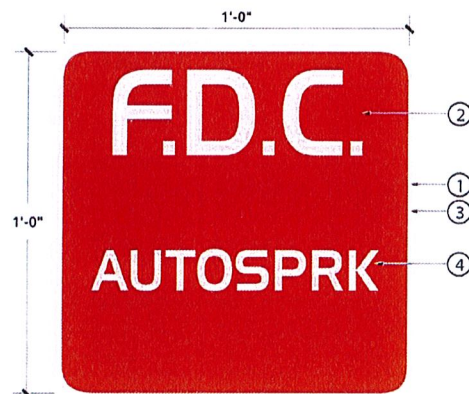
① E3 Details: Fire Department Alarm Panel Sign
Scale: 3" = 1'-0"

- ① The sign face shall be 8" x 4" with a thickness of .080 aluminum construction with 1/2" radius corners.
- ② Font style used is Handel Gothic BT capital fonts. Lettering is 1 1/4" x 1/4" stroke.
- ③ The sign face shall have a white 3M diamond grade reflective sheeting (DG³ 4090 series or equivalent) applied as a background to the aluminum plates.
- ④ Lettering shall be done one of the following ways:
 - A. 3M Scotchlite acrylic, transparent, electronic cuttable film (Red 1172 series) inverse cut to allow white reflective background to show through.
 - B. Screen printed using 3M 880 I or 880-00 series traffic sign red translucent ink.Both processes (A or B) will accomplish a red field with white copy.
- ⑤ All sign imaging shall be in compliance with the reflective sheeting manufactures match component system.



1 E4 Details: Fire Department Access Sign
Scale: 3" = 1'-0"

- ① The sign face shall be 12" x 12" with a thickness of .080 aluminum construction with 1 1/2" radius corners.
- ② Font style used is Handel Gothic BT capital fonts. Lettering is 3" x 1/2" stroke for "F.D.C.", and 1 7/16" x 9/32" stroke for "AUTOSPRK".
- ③ The sign face shall have a white 3M diamond grade reflective sheeting (DG³ 4090 series or equivalent) applied as a background to the aluminum plates.
- ④ Lettering shall be done one of the following ways:
 - A. 3M Scotchlite acrylic, transparent, electronic cuttable film (Red 1172 series) inverse cut to allow white reflective background to show through.
 - B. Screen printed using 3M 880 I or 880-00 series traffic sign red translucent ink.
 Both processes (A or B) will accomplish a red field with white copy.
- ⑤ All sign imaging shall be in compliance with the reflective sheeting manufactures match component system.
- ⑥ To be installed on the wall 5 - 7 feet above grade over F.D.C. inlet.



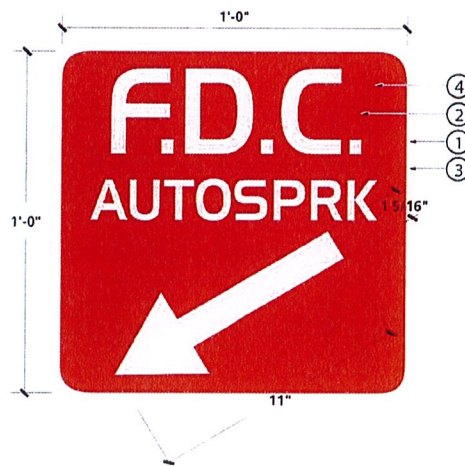
1 **E5A Details: F.D.C. Autosprinkler Sign**
 Scale: 3"=1'-0"

- ① The sign face shall be 12" x 12" with a thickness of .080 aluminum construction with 1 1/2" radius corners.
- ② Font style used is Handel Gothic BT capital fonts. Lettering is 3" x 1 1/2" stroke for "F.D.C."; and 1 7/16" x 9/32" stroke for secondary text.
- ③ The sign face shall have a white 3M diamond grade reflective sheeting (DG³ 4090 series or equivalent) applied as a background to the aluminum plates.
- ④ Lettering shall be done one of the following ways:
 - A. 3M Scotchlite acrylic, transparent, electronic cuttable film (Red 1172 series) inverse cut to allow white reflective background to show through.
 - B. Screen printed using 3M 880 I or 880-00 series traffic sign red translucent ink.
 Both processes (A or B) will accomplish a red field with white copy.
- ⑤ All sign imaging shall be in compliance with the reflective sheeting manufactures match component system.
- ⑥ To be installed on the wall 5 - 7 feet above grade over F.D.C. inlet.



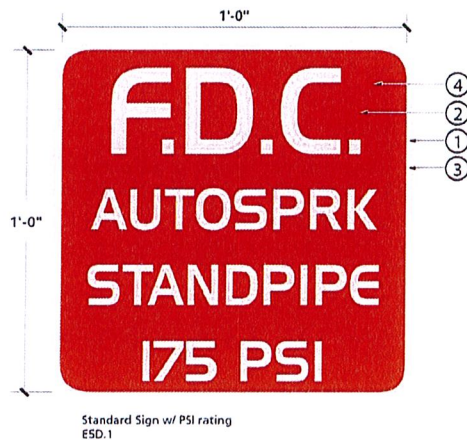
① E5B Details: F.D.C. Autosprinkler with Building Number Sign
 Scale: 3" = 1'-0"

- ① The sign face shall be 12" x 12" with a thickness of .080 aluminum construction with 1 1/2" radius corners.
- ② Font style used is Handel Gothic BT capital fonts. Lettering is 3" x 1/2" stroke for "F.D.C."; and 1 7/16" x 9/32" stroke for secondary text.
- ③ The sign face shall have a white 3M diamond grade reflective sheeting (DG³ 4090 series or equivalent) applied as a background to the aluminum plates.
- ④ Lettering shall be done one of the following ways:
 - A. 3M Scotchlite acrylic, transparent, electronic cuttable film (Red 1172 series) inverse cut to allow white reflective background to show through.
 - B. Screen printed using 3M 880 I or 880-00 series traffic sign red translucent ink.
 Both processes (A or B) will accomplish a red field with white copy.
- ⑤ All sign imaging shall be in compliance with the reflective sheeting manufactures match component system.
- ⑥ To be installed on the wall 5 - 7 feet above grade over F.D.C. inlet.



① E5C Details: F.D.C. Autosprinkler with Directional Arrow Sign
 Scale: 3" = 1'-0"

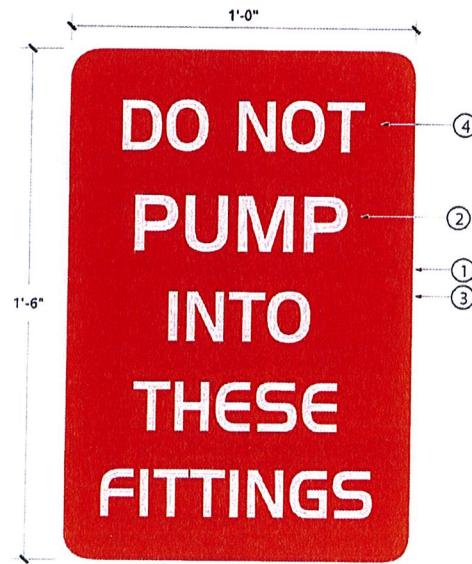
- ① The sign face shall be 12" x 12" with a thickness of .080 aluminum construction with 1 1/2" radius corners.
- ② Font style used is Handel Gothic BT capital fonts. Lettering is 3" x 1/2" stroke for "F.D.C.", and 1 7/16" x 9/32" stroke for secondary text.
- ③ The sign face shall have a white 3M diamond grade reflective sheeting (DG³ 4090 series or equivalent) applied as a background to the aluminum plates.
- ④ Lettering shall be done one of the following ways:
 - A. 3M Scotchlite acrylic, transparent, electronic cuttable film (Red 1172 series) inverse cut to allow white reflective background to show through.
 - B. Screen printed using 3M 880 I or 880-00 series traffic sign red translucent ink.
 Both processes (A or B) will accomplish a red field with white copy.
- ⑤ All sign imaging shall be in compliance with the reflective sheeting manufacturers match component system.
- ⑥ To be installed on the wall 5 - 7 feet above grade over F.D.C. inlet.



A E5D Details: F.D.C. Autosprinkler Standpipe Signs

Scale: 3"=1'-0"

- ① The sign face shall be 12" x 18" with a thickness of .080 aluminum construction with 1 1/2" radius corners.
- ② Font style used is Handel Gothic BT capital fonts. Lettering is 1 3/4" for "Do Not", "Into" and "These"; 2" for "Pump"; 1 11/16" for "Fittings".
- ③ The sign face shall have a white 3M diamond grade reflective sheeting (DG³ 4090 series or equivalent) applied as a background to the aluminum plates.
- ④ Lettering shall be done one of the following ways:
 - A. 3M Scotchlite acrylic, transparent, electronic cuttable film (Red 1172 series) inverse cut to allow white reflective background to show through.
 - B. Screen printed using 3M 880 I or 880-00 series traffic sign red translucent ink.
 Both processes (A or B) will accomplish a red field with white copy.
- ⑤ All sign imaging shall be in compliance with the reflective sheeting manufactures match component system.
- ⑥ Mount on all four corners.



A E6 Details: Do Not Pump Sign
 Scale: 3" = 1'-0"

- ① The sign face shall be 12" x 12" with a thickness of .080 aluminum construction with 1 1/2" radius corners.
- ② Font style used is Handel Gothic BT capital fonts. Lettering is 1 1/2" x .344 stroke, additional kerning between letters (between 5/16" and 3/8").
- ③ The sign face shall have a white 3M diamond grade reflective sheeting (DG³ 4090 series or equivalent) applied as a background to the aluminum plates.
- ④ Lettering shall be done one of the following ways:
 - A. 3M Scotchlite acrylic, transparent, electronic cuttable film (Red 1172 series) inverse cut to allow white reflective background to show through.
 - B. Screen printed using 3M 880 I or 880-00 series traffic sign red translucent ink.
 Both processes (A or B) will accomplish a red field with white copy.
- ⑤ All sign imaging shall be in compliance with the reflective sheeting manufactures match component system.



A E7 Details: Sprinkler Riser Room Sign
 Scale: 3"=1'-0"

- ① The sign face shall be 12" x 12" with a thickness of .080 aluminum construction with 1 1/2" radius corners.
- ② Font style used is Handel Gothic BT capital fonts. Lettering is 1 1/2" x .344 stroke, additional kerning between letters (between 5/16" and 3/8").
- ③ The sign face shall have a white 3M diamond grade reflective sheeting (DG³ 4090 series or equivalent) applied as a background to the aluminum plates.
- ④ Lettering shall be done one of the following ways:
 - A. 3M Scotchlite acrylic, transparent, electronic cuttable film (Red 1172 series) inverse cut to allow white reflective background to show through.
 - B. Screen printed using 3M 880 I or 880-00 series traffic sign red translucent ink.
 Both processes (A or B) will accomplish a red field with white copy.
- ⑤ All sign imaging shall be in compliance with the reflective sheeting manufactures match component system.



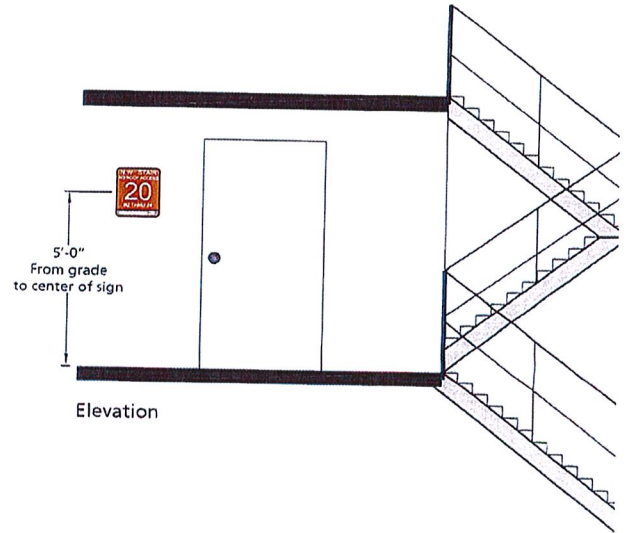
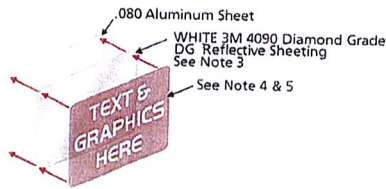
A E8 Details: Command Center Sign
Scale: 3"=1'-0"

Notes:

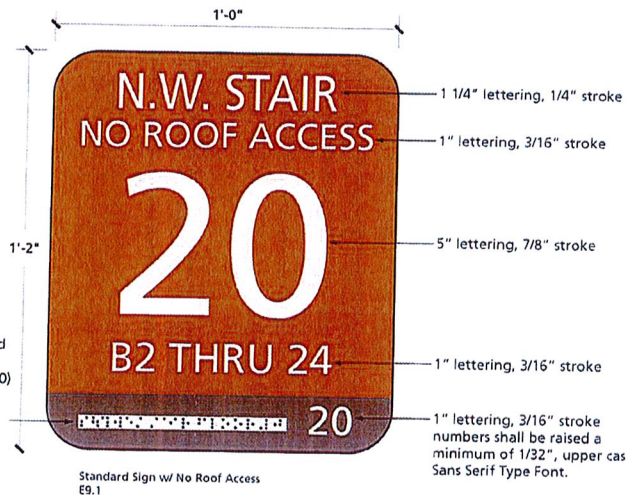
- ① The sign face shall be 12" x 14" and fabricated from .080 aluminum sheet with 1 1/2" radius corners.
- ② Font style used is Frutiger 55 Roman capitals fonts.
- ③ The sign face shall have a White 3M Diamond Grade Reflective Sheeting (DG³ 4090 Series or equivalent) applied as a background to the aluminum plates.
- ④ Lettering/Graphics shall be high performance, non-reflective, cuttable vinyl (3M 7725 Series) inverse cut to allow white reflective background to show through.
- ⑤ All sign imaging shall be in compliance with the reflective sheeting manufacturers match component system.

ADA Disclaimer:

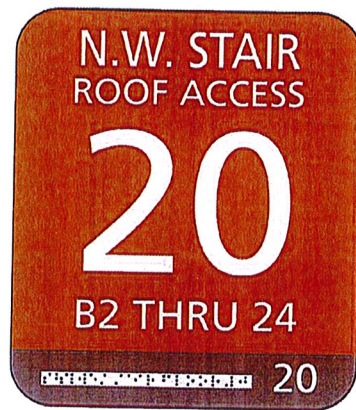
The information provided on the bottom 2" portion of this sign is only intended to aid people with visual impairments exiting the building. The braille and raised #'s indicating stairwell location and floor number meets ADA Requirements for directional signage. Additional information displayed on the sign is intended for F.D. use only.



Elevation



Standard Sign w/ No Roof Access
E9.1



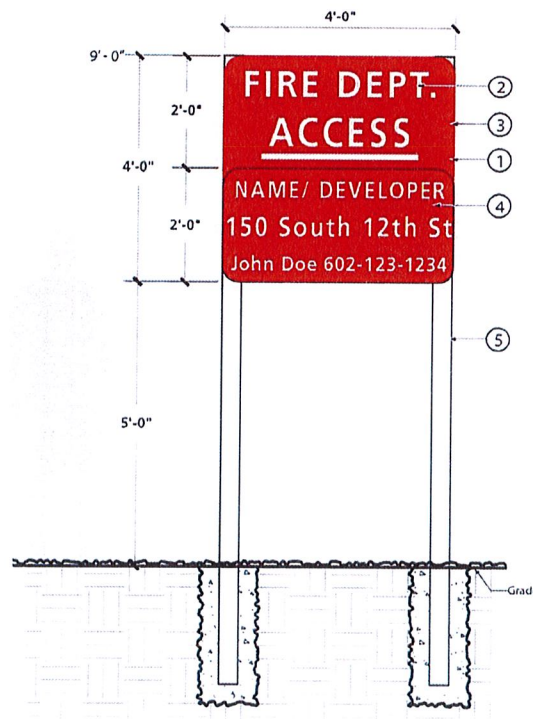
Standard Sign w/ Roof Access
E9.2

Braille shall be Grade 2 Type, indicating Stairwell Location and Floor Number. (Example: N.W. Stairwell Floor 20)

The braille and raised numbers shall be placed no more than 2" apart and shall be centered on the sign.

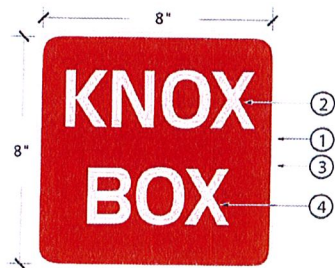
1" lettering, 3/16" stroke numbers shall be raised a minimum of 1/32", upper case, Sans Serif Type Font.

- ① The sign face shall be 48" x 48" with a thickness of .080 aluminum construction with 1 1/2" radius corners. The lower half of the sign plate is not required to be red reflective sheeting. This sign can be revised and transferred from site to site.
- ② 6" white lettering shall be 3M Scotchal high performance opaque film, series 7725.
- ③ .080 aluminum background with red 3M Scotchlite engineer grade reflective film, series 3200.
- ④ Separate, removable .080 aluminum sign plate. White lettering shall be 3M Scotchal high performance opaque film, series 7725. Lettering shall be large enough to be easily readable from a distance of 200 to 300 feet. Background shall be 3M Scotchal high performance opaque film, series 7725 (non-reflective) color to be red or a color of equally high contrast to white lettering.
Copy is to identify the following:
 - Name of homes or business
 - Address of property
 - Site superintendent's name and cell phone number or phone number of responsible party.
- ⑤ 4" x 4" wood post painted.



A E10 Details: Construction Access Sign
Scale: 3/4" = 1'-0"

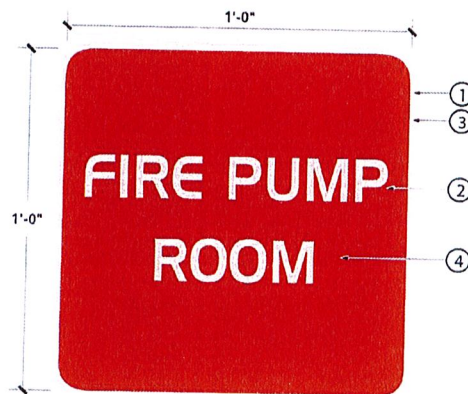
- ① The sign face shall be 8" x 8" with a thickness of .080 aluminum construction with 1 1/2" radius corners.
- ② Font style used is Handel Gothic BT capital fonts. Lettering is 3" x 1/2" stroke for "KNOX BOX"
- ③ The sign face shall have a white 3M diamond grade reflective sheeting (DG³ 4090 series or equivalent) applied as a background to the aluminum plates.
- ④ Lettering shall be done one of the following ways:
 - A. 3M Scotchlite acrylic, transparent, electronic cuttable film (Red 1172 series) inverse cut to allow white reflective background to show through.
 - B. Screen printed using 3M 880 I or 880-00 series traffic sign red translucent ink.
 Both processes (A or B) will accomplish a red field with white copy.
- ⑤ All sign imaging shall be in compliance with the reflective sheeting manufactures match component system.



① E11 Details: Knox Box Sign

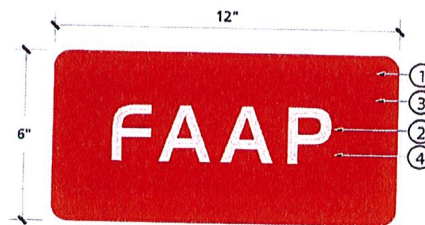
Scale: 3"=1'-0"

- ① The sign face shall be 12" x 12" with a thickness of .080 aluminum construction with 1 1/2" radius corners.
- ② Font style used is Handel Gothic BT capital fonts. Lettering is 1 1/2" x .344 stroke, additional kerning between letters (between 5/16" and 3/8").
- ③ The sign face shall have a white 3M diamond grade reflective sheeting (DG³ 4090 series or equivalent) applied as a background to the aluminum plates.
- ④ Lettering shall be done one of the following ways:
 - A. 3M Scotchlite acrylic, transparent, electronic cuttable film (Red 1172 series) inverse cut to allow white reflective background to show through.
 - B. Screen printed using 3M 880 I or 880-00 series traffic sign red translucent ink.
 Both processes (A or B) will accomplish a red field with white copy.
- ⑤ All sign imaging shall be in compliance with the reflective sheeting manufactures match component system.



A E12 Details: Fire Pump Room Sign
Scale: 3"=1'-0"

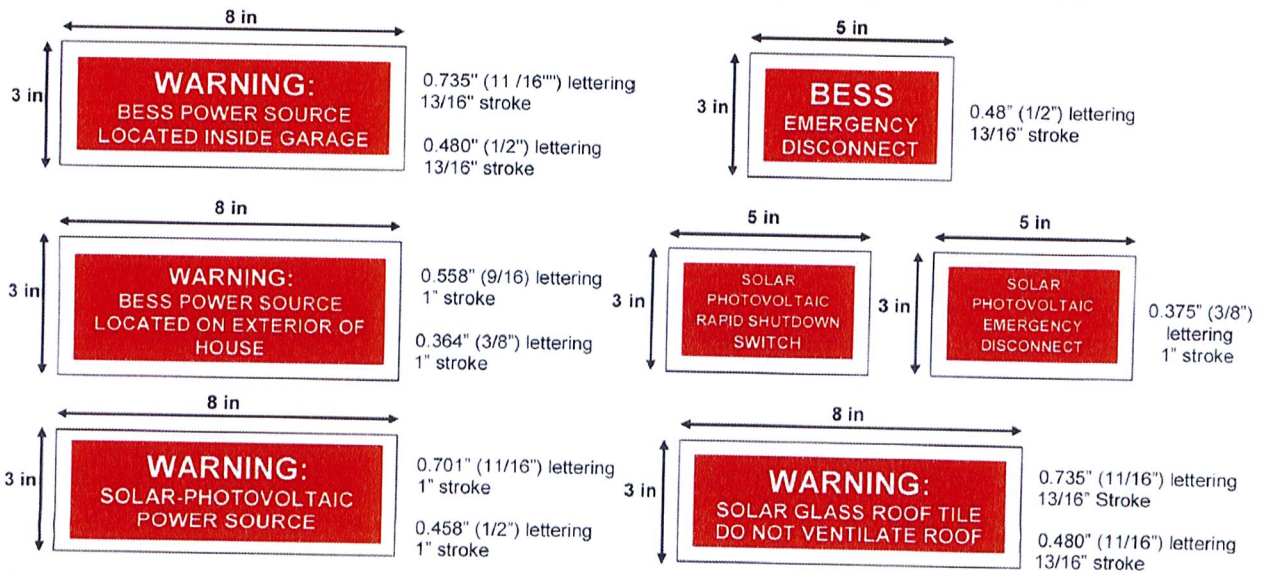
- ① The sign face shall be 12"x 6" with a thickness of .080 aluminum construction with 1/2" radius corners.
- ② Font style used is Handel Gothic BT capital fonts. Lettering is 2" x 3/8" stroke.
- ③ The sign face shall have a white 3M diamond grade reflective sheeting (DG³ 4090 series or equivalent) applied as a background to the aluminum plates.
- ④ Lettering shall be done one of the following ways:
 - A. 3M Scotchlite acrylic, transparent, electronic cuttable film (Red 1172 series) inverse cut to allow white reflective background to show through.
 - B. Screen printed using 3M 880 I or 880-00 series traffic sign red translucent ink.
 Both processes (A or B) will accomplish a red field with white copy.
- ⑤ All sign imaging shall be in compliance with the reflective sheeting manufactures match component system.



① E13 Details: FAAP Sign

Scale: 3"=1'-0"

SOLAR-PHOTOVOLTAIC (PV) & BATTERY ENERGY STORAGE SYSTEM (BESS) SIGN DETAIL



NOTES:

1. FONT STYLE USED IS **ARIEL CE BOLD CAPITAL FONTS**.
2. THE SIGN FACE SHALL HAVE A WHITE 3M DIAMOND GRADE REFLECTIVE SHEETING (DG³ 4090 SERIES OR EQUIVALENT) APPLIED AS BACKGROUND AND ADHESIVE.
3. LETTERING SHALL BE DONE THE FOLLOWING WAY:
 - 3M SCOTCHLITE ACRYLIC, TRANSPARENT, ELECTRONIC CUTTABLE FILM (RED 1172 SERIES) INVERSE CUT TO ALLOW WHITE REFLECTIVE BACKGROUND TO SHOW THROUGH.
4. ALL SIGN IMAGING SHALL BE IN COMPLIANCE WITH THE REFLECTIVE SHEETING MANUFACTURES MATCH COMPONENT SYSTEM.

