AMENDMENTS
TO THE
BUILDING CODE
FOR THE
CITY AND COUNTY OF DENVER

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FOR THE
2011 DENVER AMENDMENTS
TO THE
2009 INTERNATIONAL CODES

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ADMINISTRATION OF THE 2011 DENVER BUILDING CODE

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

101.1 Title. The title of this Ordinance shall be, and this Ordinance shall be cited as the Building Code of the City and County of Denver, and referred to hereinafter as the Code.

101.2 Purpose. The purpose of this Code is to provide minimum standards to safeguard life, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use, occupancy, location and maintenance of all buildings and structures within the City and County of Denver (hereinafter "City"), and certain equipment specifically regulated herein.

SECTION 102
ORGANIZATION OF BUILDING PERMITTING AND INSPECTIONS SERVICES

102.1 Creation of administering agency. The administrative agency (hereinafter "Agency") is responsible for administering and enforcing the Code, and is established under the Manager of Community Planning and Development (hereinafter "CPD").

102.2 Building Official. The Manager of CPD shall appoint the Building Official. The Building Official is hereby authorized and directed to act on behalf of the Agency in the interpretation and enforcement of all provisions of this Code.

102.3 Employees. In accordance with established procedures, the Building Official may authorize or appoint engineers, technicians, inspectors or other employees to perform duties and exercise powers as delegated by the Building Official.

102.4 Authorization and Identification. Each employee of the Agency shall be provided with an identification card bearing information as set out by the Building Official. This identification shall be carried by the person identified, and shall be displayed when necessary to identify the person properly in the performance of his/her official duties.

SECTION 103
APPLICABILITY

103.1 Most Restrictive. Where in any specific case the requirements of different sections of this Code vary, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable. Where there is a conflict between the provisions of this Code and any other legally adopted city ordinance, the most restrictive shall govern.

103.2 Referenced Codes and Standards. Other codes and standards specifically adopted herein, or used by reference elswhere in this Code shall be considered part of the requirements of this Code, to the prescribed extent of each such reference and Section 103.5.1.

103.3 Validity of Building Code. If any Section, subsection, sentence, clause or phrase of the Code is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of the Code.

103.4 New Buildings, Structures and Utilities. The Code shall regulate the construction, addition, alteration, repair, use, occupancy, and maintenance of any building, structure or utility hereafter erected within the City, except as set forth in subsection 103.9 below.

103.5 Existing Buildings, Structures or Utilities. The Code shall regulate the alteration, addition, enlargement, repair, demolition, removal, moving, and change of occupancy of any existing building, structure or utility heretofore erected within the City.

103.5.1 Alterations Additions, or Repairs. Additions, alterations or repairs may be made to any building or structure without requiring the existing building or structure to comply with all the requirements of this Code, provided that the addition, alteration or repair conforms to that required for a new building or structure, and the existing building or struture complies with the Code under which it was permitted and constructed, except as otherwise provided for in this Code. Notwithstanding the equivalence established in this Code, the Building Official

may use the 2009 International Existing Building Code as a guide for granting modifications to the Code for such additions, alterations or repairs only upon review and approval under Section 104.9, and when the existing building or structure meets all requirements of the code under which it was permitted and built.

103.5.2 When Additions, Alterations or Repairs are Not Allowed. Additions, alterations or repairs shall not be made to an existing building or structure which will cause the existing building or structure to be in violation of any of the provisions of this Code, unless otherwise provided for in this Code. No addition, alteration or repair shall cause an existing building or structure to become unsafe.

103.5.3 Materials. Non-structural alterations and repairs may be made with the same materials as the existing building or structure, provided the material was in conformance with the requirements of the Code under which the building or structure was permitted and it does not adversely effect any structural member, or the fire-resistive rating of any part of the building or structure.

Exception:

The installation or replacement of glass shall be as required for new installations.

103.5.4 Use and Occupancy. Buildings in use and occupied at the time of the adoption of the Code may have their existing use and occupancy continued, if such use or occupancy was legal at the time of the adoption of this Code, provided that such continued use is not dangerous to life. Any change in, or establishment of, the use or occupancy of any existing building or structure shall comply with the provisions of this Code.

103.6 Maintenance of All Buildings, Structures or Utilities. All buildings, structures or utilities, both existing and new, and all parts thereof, shall be maintained in a safe and sanitary condition, and in acordance with this Code or the Code under which it was permitted and constructed. All devices, utilities or safeguards which are required by this Code, or which were required by the Code or Ordinances at the time of construction, shall be maintained in good working condition. The owner or legally responsible person shall maintain such buildings, structures or utilities. To determine compliance with this subsection, the Agency may cause any building, structure or utility to be reinspected.

103.7 Moved Buildings or Structures. Buildings or structures moved into the City shall comply with the provisions of this Code for new buildings or structures.

103.8 Temporary Buildings or Structures. Temporary structures, such as reviewing stands, and other miscellaneous structures, sheds, canopies or fences used in conjunction with special events or construction work may be erected by special permit from the Agency for a limited period of time as specified in Section 134. Temporary buildings or structures need not comply with the construction type or fire-resistive requirements, except where specifically required by this Code. Tents shall be permitted as specified in the Fire Code. Temporary buildings or structures shall be completely removed upon the expiration of the time limit stated on the permit.

103.9 Buildings, Structures and Utilities not Regulated by this Code. The Code shall not regulate the following work.

1. Work located primarily in the public way unless specifically provided for by this Code.
2. Public utility towers, poles and mechanical equipment used for the production, generation or distribution of the utility product or service through the facilities owned and operated by the utility company to the point of customer service.
3. RTD Light Rail construction on RTD right-of-way. Traction power substations, signal/communication relay cases and housing, associated conduit and wiring for the operation of the light rail lines and the construction of the station platforms.

Refer to Section 130.5 for additional exempt work.

103.10 Transition Rules. This Code and implementation of all its provisions and policies shall become effective as follows:

103.10.1 Effective date. The effective date of the new Code shall be four months after the date of the ordinance adopting the 2009 series of the International Building Code, International Fuel Gas Code, International Energy Conservation Code, International Plumbing Code, International Residential Code and the International Mechanical Code including amendments.

Amendments to the National Electric Code: the date of the adopting ordinance.

103.10.2 Continued use of the 2008 Denver Building Code. For any projects that will be submitted to the Agency after passage of the adopting ordinance, and before the effective date of this Code, the continued use of the 2008 Denver Building Code or the optional use of the 2011 Code shall be allowed.

This Code shall not require changes in the construction documents, construction or designated occupancy of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been persued in good faith within 180 days after the effective date of this Code.

With the approval of the Building Official, major projects established to be in design during the drafting of the new Code, and that will be submitted to the Agency after the effective date of this Code may be reviewed and permitted under the 2008 Denver Building Code. For consideration by the Building Official the owner, or the owner's agent, must submit a letter of request, before the effective date of this Code, stating:

1. Request to proceed under the 2008 Denver Building Code;
2. Address of the construction project;
3. Description, number of stories, floor area, occupancy, etc., of the project;
4. Date commenced design drawings;
5. Intended date of construction drawing submission to the Agency;
6. Commitment that permits will be obtained and construction of the project will commence within 180 days of the effective date of this Code;
7. Commitment that the project will be completed within 24 months of the effective date of this Code.

103.10.3 Type approved. Type Approved structures approved by the Building Official under the previously adopted Code and prior to the effective date of the new Code may continue to be permitted and constructed under the 2008 Code for 180 days after the effective date of the new Code. Subsequently, all Type Approvals must be re-reviewed and approved by the Building Official under this Code.

SECTION 104
POWERS AND DUTIES

104.1 General Powers and Duties. The Building Official is vested with the duties of enforcing and administering this Code, and the power necessary for such enforcement. The Agency shall administer and enforce all other ordinances, which are or may be assigned to the Agency for enforcement and administration.

104.2 Orders. Whenever work is, or has been, performed contrary to the provisions of this Code, or whenever conditions exist which are in violation of this Code or any of the codes or ordinances enforced or administered by this Agency, the Building Official may cause any or all of the following actions:

1. Order any work stopped until authorized by the Building Official to proceed. The owner, once notified of the order, shall not allow any further work upon the subject property until so authorized;
2. Order the work being performed or that has been performed to be completed or corrected so that the resulting work is in accordance with the requirements of this Code or other codes or ordinances enforced or administered by the Agency;
3. Order the use or occupancy of a building, structure or equipment discontinued and the structure, or portion thereof, vacated by notice served on any person causing such use or occupancy to be continued. Such person shall discontinue the use or occupancy within the time prescribed by the Building Official.

Any such order shall be by written notice served on the owner of the property upon which work was or is being performed or where the condition exists, or any person engaged in the work, causing the work to be performed or having a permit to perform the work.

It shall be unlawful to disobey any written lawful order issued by the Agency.

A copy of any order issued by the Agency shall, when the original order has not been served on the owner, be served upon the owner of the property affected by the order.

Service of any order may be by personal service or by certified mail, return receipt requested, and service shall be deemed complete upon delivery.

104.3 Authority to Inspect. The Building Official shall have the authority to inspect, or cause to be inspected by the Agency, all buildings, structures or utilities for compliance with this Code.

104.4 Investigations and Surveys. Incidental to any of these duties and powers, but without limitation of the same, the Building Official may cause to be conducted investigations or surveys by the Agency to determine compliance or noncompliance with the provisions of this Code; and further may investigate or cause to be investigated all accidents pertaining to buildings, structures or utilities.

104.5 Right of Entry. Whenever a representative of the Agency, authorized by the Building Official, has reasonable cause to believe that there exists in any building or upon any premises any condition or Code violation which makes such building or premises unsafe, dangerous or hazardous, the representative of the Agency may enter such building or premises and take such action as is necessary to abate such hazard.

Whenever it is necessary to make inspections, investigations or surveys to enforce any of the provisions of this Code and permission is not obtainable, the Building Official may request a court to issue a warrant to inspect or perform any duty imposed upon the Agency by this Code. Permission is not obtainable when:

1. The Agency's representative has presented to the occupant of an occupied building or premises proper credentials and been refused entry, or;
2. The Agency's representative has made a reasonable effort to locate the owner or other persons having charge or control of an unoccupied premises and has been unable to locate such person or has been refused entry by such person.

104.6 Interpretations, Rules and Regulations. The Building Official shall have the full power to render interpretations of this Code and to adopt and enforce Policies, Rules and Regulations supplemental to this Code, as may be deemed necessary in the application of Code provisions. Such interpretations, Policies, Rules and Regulations shall be in conformity with the intent and purpose of this Code. The Board of Appeals may review any appeal of a Building Official interpretation subject to Section 108.

104.7 Used Materials. Used materials may be used in the construction of any building, structure or utility only with the prior approval of the Building Official.

104.8 Liability. The Building Official, authorized employees and representatives charged with the enforcement of this Code, acting in good faith and without malice in the discharge of their duties, shall not thereby render themselves personally liable for any damage that may accrue to persons or property as a result of any act or by reason of any act or omission in the discharge of their duties. Any suit brought against the Building Official or employees because of such act or omission performed by them in the enforcement of any provision of the Code or the Charter, or other pertinent laws or ordinances implemented through the enforcement of this Code or enforced by the Agency, shall be defended in accordance with 24-10-108 C.R.S.

This Code shall not be construed to relieve from or lessen the responsibility of any person owning, operating or controlling any building or structure for any damages to persons or property caused by defects, nor shall the Agency or City be held as assuming any such liability by reason of the inspections authorized by this Code or any certificates of compliance or occupancy issued under this Code.

104.9 Modifications Under Special Circumstances. Whenever there are practical difficulties involved in carrying out the provisions of this Code, the Building Official may grant modifications for individual cases, provided:

1. The owner of the building, structure or utility notifies the Building Official of his/her consent, and;
2. It is established that a special individual reason makes the strict letter of the Code impractical, and;
3. The modification is shown to be in conformity with the intent and purpose of this Code, and;
4. Such modification does not lessen any life or fire safety requirements or any degree of structural integrity.

The details of any action granting modifications shall be sent to the owner and entered in the permit files of the Agency.

104.10 Licenses and Certificates. The Building Official is vested with the authority to:

1. Establish requirements and procedures for the issuance of licenses and certificates as required in this Code;

2. Qualify applicants for such licensure and certification;
3. Issue, revoke, renew and suspend such licenses and certificates.

SECTION 105
UNSAFE BUILDINGS, STRUCTURES OR UTILITIES

105.1 Buildings or Structures. An unsafe structure, building or equipment is one which constitutes a fire hazard or a hazard to life, health, property or public welfare by reason of use, occupancy, construction, damage, deterioration, quality of materials, abandonment or inadequate maintenance. However, without limitation of the foregoing, the Building Official shall deem any structure, building, equipment or project site unsafe when any one or more of the following conditions exist:

1. Illegal or improper occupancy.
2. A wall or other vertical structural member lists, leans or buckles to such an extent that a plumb line passing through the center of gravity falls outside of the middle third of the base.
3. Damage or deterioration to:
    A. Any structural or load-bearing member to the extent that the member does not have sufficient strength to resist all applicable loads specified in Chapter 16.
    B. Nonbearing exterior walls or enclosures to such an extent that they will not resist the wind pressure or lateral forces specified in Chapter 16.
    C. Any exposed exterior member to the extent that the member provides inadequate protection from the elements to the occupants of the building or structure.
4. Loads upon the walls, floors, roofs or any other necessary structural member exceed the maximum design limits specified in Chapter 16.
5. Floors or areas with inadequate means of egress.
6. Parts attached in such a manner that they may fall and cause injury to the public or property.
7. Uncompleted buildings or structures when the permit has been canceled.
8. A canceled Certificate of Occupancy.
9. Open pits, open wells and open excavations of all types when such are determined to be hazardous by the Building Official.
10. Trenches or ditches not properly shored or cribbed.
11. Vacant buildings which are not secure and to which entry may be made through opened or unlocked doors, windows or other openings.
12. Uninhabitable buildings or structures, including but not limited to the following conditions:
    A. Building envelope damage or deterioration has caused the interior of the structure to be open to the elements.
    B. Vandalism or deterioration has caused the plumbing system, electrical system or heating system to be no longer functional.
    C. Vandalism or deterioration has caused the internal floor structure or stairways to be incapable of supporting the weight of normal occupancy.
13. Any dilapidated building of whatever kind which is unused by the owner, or uninhabited because of deterioration or decay, which condition constitutes a fire hazard or subjects adjoining property to danger of damage by deterioration of structural building elements, storm effect, soil erosion or rodent infestation, or which becomes a place frequented by trespassers and transients seeking a temporary hideout or shelter.

105.2 Utilities. An unsafe utility is one which constitutes a fire hazard or a hazard to life, health, property or public welfare by reason of use, construction, installation, obsolescence, damage, deterioration, quality of materials,

abandonment or inadequate maintenance. However, without limitation of the foregoing, the Building Official shall deem any utility unsafe in which any one or more of the following conditions exist.

105.2.1 Gas-Fired, Oil-Fired, Solid Fuel-Fired Devices. Gas-fired, oil-fired or solid-fuel-fired appliances, devices or apparatus, which have any of the following, defects:

1. Broken or cracked heat exchangers.
2. Defective or deteriorated vents, venting or flues which permit leakage of flue products.
3. Defective or improperly installed fuel supply piping.
4. Insufficient air supply for the combustion of fuel.
5. Inadequate ventilation of the heating equipment room.
6. Defective, improperly installed or maladjusted controls and appurtenances.
7. Defective or improperly installed heating equipment.
8. Equipment locations which constitute a fire or explosion hazard.
9. A negative air pressure condition exists in a heating equipment room or area.
10. Excessive corrosion of combustion chambers where the original thickness of the metal is reduced 50% or more.
11. Warped or distorted combustion chambers or furnace boiler firing doors which permit leakage of combustion products.
12. A listed appliance or appurtenance that is altered or modified.
13 . Excessive scaling, corrosion, cracks in seams, tube or shell of boilers.
14. Defective valves, gauges or cocks of boilers.
15. Grooving or pitting of boilers.
16. Boilers with improperly installed or maladjusted controls and appurtenances.
17. Any unlisted appliance or appurtenance installed without approval of the Building Official.
18. Appliances not provided with required safety controls.

105.2.2 Electrical Systems. Electrical systems, appliances, devices or apparatus which have any of the following defects:

1. Bare wiring.
2. Poor electrical connections.
3. Overloaded circuits, feeders or services.
4. Equipment not properly grounded.
5. Disconnecting means not provided at the appliance.
6. Over-fused circuits.
7. Misuse of cord wiring.
8. Wiring not properly supported.
9. Nonapproved wiring exposed to extreme heat, moisture, gases or other harmful vapors or liquids.

105.2.3 Refrigeration Systems. Refrigeration systems which have any of the following defects:

1. Inadequate ventilation.
2. Inadequate venting of pressure relief valves.
3. Unauthorized fuel-fired equipment located in the same room designated for the refrigeration equipment.

4. Improperly installed cooling towers by reason of location, type, fan, water condition, controls, roof or floor overload.

5. Faulty controls.

105.2.4 Plumbing Systems. Plumbing systems or devices which have any of the following defects:

1. Supply water not meeting the standards of potability as required by the Colorado State Department of Public Health.

2. Water systems subjected to the hazards of backflow or back-siphonage, which might create pollution to the potable water supply; i.e., hose bibbs shall have anti-siphon devices.

3. Inadequate piping not supplying sufficient water to the various appliances.

4. Clogged sewers or drains.

5. Inadequate or missing trap seals.

6. Inadequate venting.

7. Leaking water, sewage or sewer gas within a building or structure.

8. Trenches or ditches not properly shored or cribbed.

105.3 Notice and Abatement. If, after inspection by the Agency, the building, structure or utility is determined to be unsafe by the Building Official, it shall be abated by repair, replacement, removal or demolition upon notice by the Building Official. If the building or structure has common property line walls, then the Building Official shall notify the adjacent building owners that their building may be unsafe and may require repair or reinforcement.

105.3.1 Buildings or Structures. In the case of an unsafe building or structure, the Building Official may order such building or structure, or any buildings or structures placed in jeopardy by the unsafe building or structure, vacated immediately. When necessary to protect life, property, health and public welfare, the Building Official may cause to have posted signs which shall prohibit entry into an unsafe building or structure. However, with permission of the Building Official, it shall be lawful to enter the unsafe building or structure for the purpose of effecting any required repairs, rehabilitation or demolition; or by members of the Fire Department. The signs shall be provided and attached to the building or structure by the Agency and shall read, in addition to other information, "UNSAFE DO NOT ENTER". See Section 107 for Prohibitions and Violations.

105.3.2 Utilities. In the case of an unsafe utility, the Building Official shall cause to be affixed an approved warning tag on the unit declared to be unsafe. The Building Official shall order the unsafe utility disconnected or its use discontinued until the unsafe condition is abated. In addition, the Building Official may order any building, structure or utility which is placed in jeopardy by the unsafe utility to be vacated and/or disconnected, and these shall not be reoccupied or reconnected until declared safe by the Building Official. It shall be unlawful for anyone to mark any unsafe utility, as herein defined, with any type markings or tags declaring them to be unsafe, except as authorized by the Building Official.

105.4 Demolition or Securing by the City. If the owner and/or occupant of an unsafe building, structure or utility fails to perform the repairs, rehabilitation, securing or removal required by an order within the time specified therein or any extension of time to comply with said order, the Building Official may, as set forth in this Section, cause the demolition or securing of the unsafe building or structure.

105.4.1 Procedure for Demolition or Securing by City. Upon the failure of the owner or legally responsible person of a building or structure to make any building or structure safe after the issuance of an order, the Building Official:

1. May obtain competitive bids for the securing or demolition of the building or structure.

2. May, upon receipt of bids, issue a notice of intent to raze or secure the building or structure which shall include the estimated cost of demolition or securing plus a fee not to exceed 25% of the cost of demolition or securing, with a minimum of $100 to cover administrative and other costs. Such notice shall be served personally or by registered or certified mail, return receipt requested, upon the owners of all recorded interests in the property at least 10 days prior to the demolition or securing.

3. If service cannot be obtained upon any party with record interests as provided in subsection 2 above, may post the notice upon the property for 10 days and mail notices to the last known address of each party having a record interest.

4. Ten days after completion of service under subsection 2 or 3 above may proceed with demolition or securing.

5. Upon completion of the demolition or securing, shall mail a notice of the final cost of demolition or securing and of the intent to file a lien against the property to owners of a recorded interest in the property.

105.4.2 City's Lien. In the event the owner fails to pay the costs as set forth in the notice sent under this Section within 15 days of such notice, the amount shall constitute a lien against the real property upon which the building or structure was or is situated. The Agency shall thereafter pay the cost and expense of demolition, removal, securing and/or barricading, from any appropriation made available for that purpose, and shall certify a statement thereof to the Manager of Revenue, who shall assess and charge the same against the property involved and collect the same due, together with interest at the rate established by the law for delinquent real property taxes. The lien created thereby shall be superior and prior to other liens, regardless of date, except liens for general and specific taxes. For purposes of this Code, cost and expense shall include the abatement, demolition, removal, securing, barricading and administrative costs incurred therewith.

105.5 Emergency Demolition or Securing. In the event an emergency should occur wherein the continued use or existence of a building, structure or utility may constitute an immediate hazard to life, health, property or public welfare, the Building Official may order and/or cause the building, structure or utility to be demolished, removed, disconnected, secured or barricaded at once by any means available to the Agency. When feasible, the Building Official shall attempt to give notice, by any means, to the owner of the building, structure or utility prior to taking any action. Cost and expense of demolition, removal, securing or barricading, if borne by the City, shall be recovered as provided for in this Section.

105.6 Emergency Barricades. If any building, structure or utility is declared a hazard to life or safety of persons using a public way, the public way shall be provided with barricades to prevent public use. The barricades shall be erected on order from the Building Official. Recovery of cost and expense, if borne by the City, shall be made as provided for in this Section.

SECTION 106
ALTERNATE MATERIALS, DESIGN AND METHODS OF CONSTRUCTION AND EQUIPMENT

106.1 General. The provisions of this Code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this Code, provided that any such alternate has been approved by the Building Official. Any alternate material, design or method of construction may be approved where the Building Official finds that the proposed design is satisfactory and is, for the purpose intended, at least the equivalent of that prescribed in this Code.

106.2 Application for Review. The Building Offical shall consider the approval of an alternate material, design and/or method of construction or equipment only upon submission of a formal application. Information included on the application shall be that required by the Building Official and this Code.

106.2.1 Application Requirements. When a construction material, assembly, fixture, device, utility or other article different from that provided for in this Code is proposed for use, the application shall include plans, specifications, details, test data, samples and literature from approved sources, as deemed necessary by the Building Official.

106.2.2 Testing Requirements. Whenever there is insufficient evidence of compliance with the provisions of this Code, or evidence that a material or method does not conform to the requirements of this Code, or in order to substantiate claims for alternative materials or methods, the Building Official shall have the authority to require tests as evidence of compliance to be made at no expense to the City. Test methods shall be as specified in this Code or by other recognized standards. In the absence of recognized and accepted test methods, the Building Official may approve the testing procedures. Reports of such tests shall be retained by the Building Official for the period required for retention of public records.

Test must be conducted by a testing laboratory or agency approved by the Building Official. The testing laboratory or agency shall provide listing, labeling and follow-up inspection services. A copy of the testing laboraory or agency approval report or the test report shall be submitted to the Building Official for consideration as part of an application.

106.2.3 Application Fee. Applications for alternate materials shall be accompanied by a fee as established by the Building Official, payable to the Manager of Revenue, City and County of Denver, and shall be paid in the office of the Agency. No fee shall be required for alternate design and/or method of construction or equipment processed in conjunction with plan review fees applicable in accordance with Section 138 of this Code.

106.2.4 Decision. The Building Official shall notify the applicant in writing of the decision about the application for any such alternate methods, materials or equipment. No application shall be approved unless the Building Official finds that the proposed design is satisfactory and that the alternate is, for the purpose intended, at least the equivalent of that prescribed in this Code.

106.3 Review and Renewal. Each approved material, method or equipment shall be subject to a review and renewal of the approval by the Building Official every 3 years. The fee for each review shall be established by the Building Official.

SECTION 107
PROHIBITIONS, VIOLATIONS, PENALTIES AND REMEDIES

107.1 Prohibitions. It shall be unlawful for anyone to do or cause to be done any act or allow a condition to exist that violates or is contrary to the provisions of this Code, any other code, ordinance or rule and regulation promulgated thereunder which is enforced and administered by the Agency, and without limitation to the foregoing:

1. **Alternate Methods, Materials or Equipment.** It shall be unlawful for anyone to use any method, material or equipment as an alternate to the methods, materials or equipment permitted by this Code without first obtaining approval in the manner herein provided.
2. **Licensing, Certificate and Registration.** It shall be unlawful for any person to perform any work on any building or utility without first obtaining a license, certificate or registration in accordance with the requirements of this Code, except that the owner of a residential dwelling, where authorized under Section 131 of this Code, who obtains a permit for the work being performed, need not be licensed, certified or registered.
3. **Licensing, Certificate and Registration Holder Responsibility.** It shall be unlawful for any license, certificate or registration holder to violate any of the responsibilities enumerated in this Code.
4. **Permits.** It shall be unlawful for any person to perform or cause to perform any work on any building, structure or utility without first obtaining a permit for such work from the Agency in accordance with this Chapter.
5. **Certificate of Occupancy.** It shall be unlawful for anyone to occupy a new building or structure or change the occupancy of any building or structure without first having obtained a Certificate of Occupancy from the Agency as required by the provisions of this Code. A Certificate of Occupancy will not be required for remodeling or additions, unless there is a change of occupancy.
6. **Unsafe Building, Structure or Utility.** It shall be unlawful for any person to maintain or permit to be maintained any building, structure or utility which is unsafe as defined in this Code. These provisions shall apply to buildings, structures or utilities that are new, existing, under construction, altered or demolished.
7. **Enter, Occupy or Inhabit an Unsafe Building or Structure.** It shall be unlawful to enter, occupy or inhabit any unsafe building or structure posted in accordance with the provisions of Section 105.
8. **Removal of Danger Sign(s).** It shall be unlawful to remove or deface a sign required by Section 108, without specific approval from the Building Official.
9. **False Information.** It shall be unlawful to furnish the Agency any false information in any application for a license, certificate or permit required by this Code, or during the course of an investigation conducted by the Agency to enforce this Code.
10. **Operate or Maintain Unsafe Utility.** It shall be unlawful for any person to operate or maintain an unsafe utility or reconnect the power or fuel supply to any utility declared by the Building Official to be unsafe, and to which a City warning tag has been attached as provided for in Section 105 of this Code. The owner and occupant of any building or structure containing an unsafe utility to which a City warning tag has been attached, who has notice

that the utility has been declared unsafe and so tagged by the Building Official, shall not permit said utility to be operated and shall take whatever steps are necessary to insure that the utility is not operated.

11. **Removal of City Warning or City Danger Tag.** It shall be unlawful for any person to remove a City warning or danger tag attached to any utility as provided for in Section 105 of the Code.

    Exception:

    A properly licensed contractor with a permit may remove a City warning tag for purposes of repair of the equipment. Permission shall be obtained from the Building Official prior to removal of the City warning tag.

12. **Conspiracy.** It shall be illegal for any person to act with another for the purpose of evading requirements of this Code.

107.2 Violation. Whenever, by the provisions of this Code, any act is prohibited, or whenever any regulation, dimension or limitation is imposed on the erection, alteration, maintenance or occupancy of any building, structure or utility, each failure to comply with provisions of this Code shall constitute a violation. Each day on which a violation exists shall constitute a separate offense and a separate violation.

107.3 Penalties. Whenever, in any Section of this Code, or any Section of a Policy, Rule or Regulation promulgated thereunder, the performance of any act is required, prohibited or declared to be unlawful, and no definite fine or penalty is provided for a violation thereof, any person convicted of a violation of any Section shall, for each offense, be fined, imprisoned or both fined and imprisoned within the limits established by Section 1-13 of the Denver Revised Municipal Code. The suspension or revocation of any license, certificate, permit or other privileges conferred by the City shall not be regarded as a penalty for the purpose of this Code.

107.4 Remedies. In the event any building, structure or utility is erected, constructed, reconstructed, altered, repaired, converted, demolished, moved, maintained or used in violation of this Code, the City or any proper person may institute an appropriate action or proceedings to prevent the unlawful erection, construction, reconstruction, alteration, repair, conversion, maintenance or occupancy, and to restrain, correct or abate such violation, or to prevent the occupancy of said building, structure or land. The imposition of any penalty thereunder shall not preclude the City or any proper person from instituting any appropriate action or proceeding to require compliance with the provisions of this Code, and with administrative orders and determination made thereunder.

SECTION 108
BOARD OF APPEALS

108.1 Creation. There is hereby created a Board of Appeals (the "Board"), which shall consist of 6 members and 3 alternates appointed by the Mayor. The Board shall be comprised of the following persons:

1. One professional engineer registered in the state of Colorado.
2. One architect licensed in the state of Colorado.
3. One person who is the holder of a City Building Contractor Class A, B or C license.
4. One Preservationist with expertise in preservation of historic buildings and structures.
5. Two citizen members who are not associated with the building industry.

Two alternates shall be a professional engineer registered in Colorado and an architect licensed in Colorado, respectively. A third alternate shall be a citizen not associated with the building industry. Alternates may appear at all meetings and shall be allowed to vote even if not filling a temporary vacancy.

108.2 Secretary. There shall be a Secretary of the Board, furnished by the Agency. The Secretary shall be the custodian of the records, shall conduct official correspondence of the Board and generally be responsible for clerical work of the Board. The Secretary shall be present at all meetings and shall present all relevant information regarding appeals to the Board, including the application and other information submitted by the Applicant prior to the hearing. The Secretary shall notify all interested parties regarding matters of the Board.

108.3 Fire Department Representative. The Chief of the Fire Prevention and Investigation Division, or his authorized representative, shall be an ex-officio member to the Board without voting power. Terms of office and remuneration shall not be applicable to this member.

108.4 Terms. As of the effective date of this Ordinance, the members of the Board of Appeals as constituted under the 2008 Amendments to the Building Code for the City and County of Denver shall continue to serve for the unexpired portion of their terms. The Mayor shall appoint Board members and alternates as necessary to fill expiring terms and such terms shall be for 3 calendar years. No member of the Board shall serve more than 3 consecutive full terms or a total of more than 9 consecutive calendar years. Any vacancy that occurs in the Board shall be filled by the Mayor for the unexpired term of that Board member. Board members may be removed only for cause upon written charges.

108.5 Procedures – Meetings – Quorum.

108.5.1 Regular Meetings. Regular meetings shall be held once each month, or as often as may be required by the Agency. Four members of the Board shall constitute a quorum at regular meetings.

108.5.2 Special Meetings. Special meetings may be held at the call of the Chairman and at such times as the Board shall determine. The Board, the Building Official or an appellant may request a special meeting. Any special meeting held at the request of an appellant shall be paid for by the appellant in an amount set forth by the Building Official. Four members of the Board shall constitute a quorum at special meetings.

108.5.3 Business Meetings. Business meetings of the Board may be called by the Chairman of the Board.

108.5.4 Notice. Public notice shall be given of all meetings and all meetings shall be open to the public except executive sessions or business meetings. Due notice of all meetings shall be given by the Secretary to all parties in interest, including the Agency. The Agency shall be permitted to intervene, for and on behalf of the City, in all public meetings.

108.5.5 Oath/Subpoena. The Chairman may administer oaths, accept affirmations and compel the attendance of witnesses. A failure or refusal to appear in response to a subpoena issued by the Board shall constitute a violation of this Code.

108.5.6 Agency/Interested Party. At any public meeting a representative of the Agency, Fire Department and any other interested party may appear in person, by agent or by attorney, offer evidence and testimony and cross-examine witnesses. All evidence and testimony shall be presented publicly. The Board may take judicial notice of facts to the same extent and in the same manner as courts of record and may consider relevant facts within the personal knowledge of any member of the Board that are stated into the record by such member.

108.5.7 Recording. All meetings before the Board shall be recorded either by electronic means or by a Certified Court Reporter.

108.6 Powers and Duties of the Board.

108.6.1. Rules and Procedures. The Board shall adopt Rules and Procedures governing all proceedings before it consistent with the provisions set forth herein. The rules and regulations shall include proper procedures for applying to the Board, contents of the application and time allotted for each case.

108.6.2. Powers. Subject to the limitations enumerated herein, the Board shall have and may exercise the following powers with respect to this Code:

1. **Administrative Review.** To hear and decide appeals where it is alleged there is error in any order, or decision made by the Building Official in the enforcement of this Code.
2. **Variances.** To hear, grant or deny requests for a variance from the terms of the Code or from an order or decision of the Building Official upon finding that all of the following conditions exist:
   i. That the applicant properly applied for a variance under Section 109.
   ii. That, owing to exceptional and extraordinary circumstances, there are practical difficulties or unnecessary hardship involved in carrying out the strict letter of the Code.
   iii. That the variance will not weaken the general purposes of the Code.
   iv. That the variance will be in harmony with the spirit and purposes of the Code.
   v. That the variance will not adversely affect the public health and safety.
   vi. That the variance will not adversely affect the structural integrity of the building.
   vii. That the variance will not adversely affect the fire safety of the building.

viii. When applicable, that a written request for an extension of a temporary certificate of occupancy was filed at least 30 days prior to the expiration of any temporary certification of occupancy when applicable.

3. **Alternate Methods and Materials.** To hear and decide appeals from the Building Official denial of an application for alternate materials and methods of construction and equipment under Section 106 herein, only after the applicant has obtained an approval or certified test results from an approved testing agency. All relevant information and documentation shall be submitted to the Board prior to the hearing. The decision of the Building Official shall not be overturned unless the Board shall find that all of the following conditions exist:

   i. That the applicant properly applied under the terms of Section 106.

   ii. That the proposed design is satisfactory and that the alternate is, for the purpose intended, the equivalent of that prescribed in this Code.

   iii. That the proposed alternate will not weaken the general purposes of this Code.

   iv. That the proposed alternate will be in harmony with the spirit and purposes of this Code.

   v. That the proposed alternate will not adversely affect the public health and safety.

   vi. That the proposed alternate will not adversely affect the structural integrity of the building.

   vii. That the proposed alternate will not adversely affect the fire safety of the building.

4. **Rehabilitation of Existing Buildings.** To hear and decide appeals to Building Offical denial of requests to use the 2009 International Existing Building Code as a guide for granting modifications for the rehabilitation of existing buildings.

5. **Stay of Enforcement.** The Board shall have the power to stay the enforcement of any order issued by the Building Official unless the Building Official certifies that, based on facts stated in the request, a stay of the order would cause imminent peril to life or property. A stay shall not constitute a variance, and shall be personal to the applicant, not transferable, and subject to the terms and conditions imposed by the Board.

108.6.3. Additional Powers. The Board shall have and exercise the powers hereinafter set forth in connection with Chapter 10 of the Revised Municipal Code. In the exercise of its powers, the Board may reverse or affirm, wholly or partly, or may modify the order, requirement, decision or determination as ought to be made, and, to that end, shall have all the powers of the officer or department from whom the appeal is taken. Notwithstanding the above and any other part of this Section, the Board shall not have these powers with respect to Articles I, IV, V, and VIII of Chapter 10.

1. **Administrative Review.** To hear and decide appeals where it is alleged there is error in any order, requirement, decision or determination made by an administrative official in the enforcement of Chapter 10 of the Revised Municipal Code.

2. **Variations.** To authorize, upon appeal in specific cases, such variations from the terms of Chapter 10 of the Revised Municipal Code, subject to terms and conditions fixed by the Board, as will not be contrary to the public interest where, owing to Exceptional and extraordinary circumstances, literal enforcement of the provisions of Chapter 10 of the Revised Municipal Code would result in unnecessary hardship. Every variation authorized hereunder shall not be personal to the applicant therefore, but shall not be transferable and shall run with the land. No variation shall be authorized hereunder unless the Board shall find that all of the following conditions exist:

   i. That the use proposed by the applicant is a permitted use in the zoning district applicable to the subject land.

   ii. That literal enforcement of Chapter 10 of the Revised Municipal Code would preclude a reasonable development of the land of the applicant for the use proposed.

   iii. That the development of the land proposed by the applicant would not be such as to defeat the purpose of Chapter 10 of the Revised Municipal Code.

iv. That the development proposed by the applicant is the minimum development which would be needed to secure for the applicant from the land a reasonable return in service, use or income.

v. That the development proposed by the applicant would not result in damage to neighboring properties or public lands.

108.6.4 Decision of the Board. In the exercise of the powers described above, the Board may reverse or affirm a decision, grant or deny a variation, reverse, affirm or modify an order, impose conditions or requirements, as deemed necessary; or hold cases in abeyance until proper information needed by the Board is supplied. Decisions shall be filed with the Agency as a matter of public record.

The concurring vote of a majority of those present and voting shall be necessary to decide any matter upon which the Board is required to pass under this section of this Code.

The Board shall issue a written decision, based on evidence presented at the public meeting, setting forth the necessary findings of fact and the final decision of the Board. A copy of this decision shall be mailed by the Secretary to all interested parties who received notice under this Section, including the Building Official. The Board may order that a copy of the decision be recorded in the office of the Denver Clerk and Recorder.

108.7 Limitations of Powers. The Board of Appeals shall have no authority to review administrative decisions or grant variances to the provisions of Chapter 1 of this Code except where specifically allowed herein.

Any determination or order of the Building Official shall be presumed to be correct until evidence is introduced that would support a contrary determination.

Every decision of the Board shall be based upon findings of fact and every finding of fact shall be supported in the record of its proceedings. The enumerated conditions required in any matter upon which the Board is authorized powers under Chapter 10 of the Revised Municipal Code or to effect any variations in Chapter 10 of the Revised Municipal Code shall be construed as limitations on the power of the Board to act. A mere finding or recitation of the enumerated conditions unaccompanied by findings of specific facts shall not be deemed findings of fact and shall not be considered compliance with Chapter 10 of the Revised Municipal Code.

Nothing contained in this article shall be construed to empower the Board to change the terms of Chapter 10 of the Revised Municipal Code or to effect changes in any map incorporated therein. The powers of the Board shall be so construed that the intent of Chapter 10 of the Revised Municipal Code and the maps incorporated therein are enforced.

108.8 Compensation. Each member of the Board shall receive compensaton, as set forth by the Building Official, for each meeting attended regardless of number or type of cases heard.

SECTION 109
APPEALS

109.1 Method of Application and Fee. Prior to action by the Board, an application shall be filed with the Agency on a form providing the necessary information required by the Board. An appeal shall not be considered unless filed with the Agency at least 15 days prior to the meeting. Upon filing the application, a fee set by the Building Official shall be paid to the City. All checks shall be made payable to the Manager of Revenue, and shall be paid in the office of the Agency. This fee is not refundable.

109.2 Grievance. Any person or city agency aggrieved by a decision of the Building Official; any person or city agency claiming practical difficulties or unnecessary hardships in complying with the strict letter of the Code or Chapter 10 of the Revised Municipal Code, may, within 30 days of the date of notice of such decision or order, appeal the decision or order by filing an application for appeal with the Board.

Exception:

Appeals of notices issued under Section 105.5, where such notice is personally served or delivered by overnight mail, shall be made within 10 days of the delivery of such notice or the refusal to accept such notice.

109.3 Unsafe Condition. Whenever the owner, or legally responsible person, of a building, structure, utility or other condition determined to be unsafe by the Building Official does not agree with the terms of the issued order for abatement, the owner shall have the right to appeal to the Board within 30 days from the date of said order. In the appeal, the owner shall state how the owner proposes to make the building, structure, utility or other condition safe and, if

required by the Board, the owner shall submit detailed engineering analysis or recommendations, accompanied by plans and specifications prepared by a Colorado licensed Architect or Colorado registered Professional Engineer, as prescribed in this Code. The Board may require substantiating data concerning the removal or other remedial steps to be taken to render the building, structure, utility or other condition safe.

109.4 Hazard. In any matter in which an order or notice relating to an unsafe building or structure is appealed, the Building Official may certify to the Board that the building or structure could become an imminent hazard, in which case the Board shall schedule a meeting within 3 work days to hear said appeal.

SECTION 110
APPEALS FROM DECISIONS OF THE BOARD

110.1 Procedure. Any person subjet to a decision of the Board may have that decision reviewed in the manner provided by the Colorado Rules of Civil Procedure. The Board shall not be required to return the original papers acted upon by it, but shall return copies thereof. The returned copies shall concisely set forth other pertinent facts and material to the decision appealed and shall be verified.

110.2 Effect of Appeal. The issuance of a writ on a petition hereunder shall not stay proceedings upon the decision appealed; but the court, on application after notice to the Board and on due cause shown, may grant a restraining order.

110.3 Transcript Costs. Whenever a transcript is demanded by the person taking the appeal, or when a transcript is furnished by the Board pursuant to court order, the cost of preparing the transcript of proceedings shall be borne by the appellant, in the amount not less than $200.00.

Sections 111 through 119 are reserved.

SECTION 120
LICENSING, CERTIFICATION, REGISTRATION

This Chapter provides for the licensing of contractors, the certification of supervisory personnel, and requirements for licensure and registration. Fire Department requirements for licensure are enumerated in the Administrative Section of the International Fire Code Amendments (IFCA). There shall be various classes of certificates, licenses and an electrical registration, with quallifications as set forth by the Building Official, and the holder thereof shall be authorized to perform work as set forth by this Code and the Building Official.

SECTION 121
LICENSES OR REGISTRATION

121.1 Definitions.

1. A license is authority granted by the City to a person, agency or political entity, after satisfying requirements for licensure as set forth by the Building Official, to perform the work authorized by the license.
2. A registration is authority granted by the City to an electrical contractor registered by the State of Colorado to perform the work authorized by said registration. In this Code the term License or Licensee shall pertain to both Licenses and Registrations unless registration is separately enumerated.

121.2 Licenses or Registration Required. Licenses shall be required for all types of work described in this Chapter. Plumbing contractors shall be licensed by the Building Official and shall have a master plumber license issued by the State of Colorado as the licensee or a full time employee of the contractor shall be registered as a master plumber. Electrical contractors registered by the State of Colorado shall also register with the Agency. Electrical registrants are required to comply with all the requirements of this Code.

Exceptions:

1. Public utility companies will not be required to obtain licenses when engaged in the installation, operation and maintenance of their equipment used for the production, generation or distribution of the utility, product or service through the facilities owned or operated by the utility company to the point of customer service.

2. Work performed by an owner and occupant of a single family dwelling and U Occupancies when work is performed under a permit authorized by Section 131.3.
3. Upon prior approval by the Building Official, a licensed Building Contractor Class A, B or C, and a homeowner, when constructing single family buildings may have unlicensed subcontractors working under the licensed contractor's or homeowner's building permit. This does not apply to Utility or Roofing Contractors.

121.3 Application. Every applicant for a license shall fill out a form provided by the Agency. The name of the certified supervisor shall appear on the license application. The applicant shall be notified of the action taken on the license application by the Agency. If the application is approved, the applicant shall procure the license within 90 days of notification. Failure of the applicant to procure the license shall require the filing of a new application with fee. If the application for license is disapproved by the Building Official, the applicant may appeal to the Board of Appeals in the manner provided for in this Code.

121.4 Certified Supervisor Required. Where indicated in this Code each licensee shall be required to have in his/her employ a supervisor who holds a Supervisor Certificate of Qualification for that particular license. A plumbing contractor, shall be required to have in his/her employ a holder of a State of Colorado Master Plumbers License as the required supervisor. The license shall be valid only as long as the named supervisor remains in the employ of the licensee in an active, full-time capacity. "Active, full-time capacity" shall mean that the supervisor shall be available at the local office of the company, at home or at the job site within a reasonable period of time. The supervisor shall take an active role in supervising and reviewing all work performed and materials used by the company in the process of construction. If the supervisor should leave the employ of the licensee, the licensee shall notify the Building Official within 3 working days after the termination. Failure of the licensee to notify the Building Official shall be cause for suspension or revocation of the license. The licensee shall be required to obtain a certified supervisor within 30 working days after the date the supervisor leaves the employ of the licensee. If a supervisor is not obtained within the 30-working-day period, the license shall be deemed suspended until the supervisor is obtained and the Building Official is notified.

1. **Individual.** If the licensee is an individual, the licencee also may qualify as the Supervisor for that license, after examination.
2. **Not Required.** Electrical registration shall not require a certified supervisor.

SECTION 122
CERTIFICATES

122.1 Definition. A Certificate of Qualification is authority to perform certain skills and is issued by the Building Official on the successful completion of an examination. This certificate is not transferable. The term "Certificate" means Certificate of Qualification.

122.2 Certificate Application. Every applicant for a Certificate shall be required to complete a form provided by the Agency.

122.3 Examinations. All applicants for a Certificate shall pass a written examination with the exception of those who apply for a Construction D Supervisor Certificate. Such applicants shall be examined for experience and training by a standard procedure established by the Building Official. If an applicant who has successfully passed the examination given by the Agency fails to procure this Certificate within 90 days of notification, the Certificate shall be declared null and void and a new application and fee shall be filed.

122.4 Reciprocal Certificate. Certificates issued by other jurisdictions are not valid in the City, however the Building Official may accept the examination results of the issuing jurisdiction as equivalent when requested, as part of a completed application with supporting documents, and required application fees.

122.5 Certified Supervisors, Journeymen and Operators. All Supervisors, Journeymen and Operators required by this Code shall be examined by the Agency, and if qualified, shall be issued a Supervisor, Journeyman or Operator Certificate of Qualification. The Certificate holder shall be entitled to perform and supervise the work in the particular skill for which he/she is certified. This Certificate is personal to that holder and shall not be construed to be a license. The Certificate holder shall actively supervise the workmen of the licensee by whom he/she is employed in accordance with this Code.

SECTION 123

APPRENTICES AND TRAINEES

123.1 General. This Section shall govern the crafts listed in this Chapter where a Journeyman Certificate holder is required.

123.2 Requirements. Apprentices and trainees shall not be required to possess a Certificate, but shall be permitted to work as prescribed in other Sections of this Chapter.

123.3 Definition.

1. An "apprentice" shall mean any person who has entered into an apprentice agreement which provides for participation in a program of training through employment and education in related and supplementary subjects.
2. A "trainee" shall mean any person working at the trade under the direct supervision of a certified Journeyman or Supervisor.

123.4 Work. An apprentice or trainee may perform any work which is distinctive to a specific craft, but only under the direction and supervision of a Certified Supervisor or Journeyman of the craft, during working hours. Persons working on tasks not distinctive to any specific craft shall not be classed as an apprentice.

123.5 Employment of Apprentices. Contractors may employ apprentices or trainees for the licensed crafts or trades. The ratio of apprentices and trainees to Journeyman or Master Electrician employed shall not exceed one apprentice or trainee to one Journeyman or Master Electrician. The ratio of plumbing apprentices or trainees shall be 3 apprentices or trainees to one Master Plumber or Journeyman.

123.6 Employer. All apprentices or trainees shall be in the employ of the licensed crafts where Journeymen Certificate holders are required.

SECTION 124
EXAMINATION STANDARDS AND REVIEW

124.1 Examination Standards. The Building Official shall establish minimum standards for the education and experience, and develop standards for the examination of applicants for licenses and certificates. The standards shall be consistent with the purpose of this Code, which is to provide for the public health, safety and welfare to the extent that those persons examined are to be found qualified in terms of their skills, Building Code knowledge, practical experience and knowledge of pertinent laws to perform the construction work for which they may be certified. The Agency shall examine applicants in the areas of this Code applicable to the type of license, certificate, technical knowledge, and specifc skills.

124.2 Citizen Review Board. The Building Official may establish an examination standards Citizen Review Board to review and monitor the examination testing criteria. The Citizen Review Board members shall be representatives of the various segments of the construction industry, which are pertinent to the specific certification examinations.

124.3 Standards Review. The Standards shall be reviewed by the Building Official as required to maintain currency with changes in the Code and building construction practices.

SECTION 125
RENEWAL, REISSUANCE, CHANGES AND FEES

125.1 Renewal and Expiration. Licenses and certificates shall be renewed every 3 years and expire on the date specified on the certificate. No work shall commence or continue after the date of expiration.

125.2 Reissuance.

125.2.1 Licenses. The Building Official may reissue an expired license without the filing of a new application, provided that the reissuance is accomplished within one year after the license has expired.

125.2.2 Certificates The Building Official may renew an expired certificate, provided that the renewal is accomplished within the limits set forth herein.

1. The certificate may be reissued without submission of a new application, provided that such reissuance is accomplished within one year of expiration of the original certificate.

2. If the certificate holder reapplies within 3 years of the date of expiration of the original certificate, a new certificate examination shall not be required.
3. If the certificate holder applies more than 3 years after expiration, a new certificate examination shall be required.

125.3 Changes.

125.3.1 Change of Name. The change of name by a licensee or registrant shall be reported to the Agency within 15 days after making the change, on a form provided by the Agency. An application fee as established by the Building Official shall be required.

125.3.2 Change of Address. A change of address of a licensee or registrant shall be reported to the Agency within 15 days after making the change.

125.3.3 New Licenses Required. A new license or registration shall be obtained within 30 days after the creation of a new legal entity, even if one or more of the members, officers or directors have a license or are registered.

125.3.4 Dissolution. The dissolution of a corporation, partnership or other legal entity, which has been licensed or registered, terminates the license or registration and no person may operate under that license or registration.

125.4 Fees. Licenses and Certificates of Qualification fees shall be set forth by the Building Official and paid every 3 years to the Agency.

Exception:

The certificate fees for employees of the City shall be waived when performing work for the City or when employed by the Agency.

125.4.1 Fee Refund. Licenses and Certificate fees shall not be refundable.

SECTION 126
LICENSEE, REGISTRANT AND CERTIFICATE HOLDER RESPONSIBILITY

126.1 Licensee Responsibility. Licensees shall be responsible for performing all work in conformity with the provisions of the Code, including, but not limited to, the following items:

1. To report in writing to the Building Official, within 3 working days, any accident occurring on any construction which results in injury or damage to the building, structure or utility, and any accident occurring during demolition.
2. To provide minimum safety measures and equipment to protect workmen and the public.
3. To present the license card when requested by the Agency.
4. To employ a full-time qualified supervisor certified in accordance with the requirements of this Code.
5. To employ qualified journeymen certified in accordance with the requirements of this Code.
6. To obtain a permit when required prior to commencing work.
7. To faithfully construct, without departure from drawings and specifications filed and approved by the Agency and permit issued for same, unless changes are approved by the Agency.
8. To complete all work authorized by the permit issued under the authority of this Code, unless acceptable cause is indicated to the Building Official.
9. To obtain inspection services where required by this Code.
10. To pay any fee assessed under authority of this Code.
11. To obey all orders or notices issued under the authority of this Code.
12. To provide all vehicles used in the operation of the business with the identification in letters a minimum of 2 inches in height and a color contrasting to the background. The identification shall include the following information:

    A. Name of company.

B. Business address.

C. Business telephone.

13. To provide toilet facilities prior to and during construction or demolition.

14. To maintain with the Agency a current mailing address. Any Order, Notice, Summons and Complaint or other Agency communication, whether delivered by personal service or by certified, registered or first class mail sent to that address, shall constitute service.

126.2 Registrant Responsibility. Registered electrical contractors shall comply with all provisions of Section 126.1 above and in addition shall comply with all provisions of the Colorado State Electrical Board.

126.3 Certificate Holder Respopnsibilty. All Certificate holders shall be responsible for performing all work in conformity with the provisions of the Code, including, but not limited to, the following items:

1. To have in possession at all times a Certificate.
2. Observe the safety requirements of this Code.
3. To present a Certificate when requested by the Agency.
4. To obtain a permit when required prior to commencing work.
5. To faithfully construct, without departure from drawings and specifications filed and approved by the Agency and permit issued for same, unless changes are approved by the Agency.
6. To complete all work authorized by the permit issued under the authority of this Code, unless acceptable cause is indicated to the Building Official.
7. To obtain inspection services where required by this Code.
8. To pay any fee assessed under the authority of this Code.
9. To obey all orders or notices issued under the authority of this Code.
10. To actively supervise and oversee all work performed by or for the licensee by whom he is employed.
11. To maintain with the Agency a current mailing address. Any Order, Notice, Summons and Complaint or other Agency communication, whether delivered by personal service or by certified, registered or first class mail sent to that address, shall constitute service.
12. Out of state Certificate holders shall maintain a current local mailing address on file with the Agency and accept all mail so addressed for the duration of the job.
13. To notify the Agency within 3 days whenever he/she leaves the employ of licensee.

126.4 Demolition and Moving Liability Insurance. Any person, firm or corporation demolishing or moving any building, structure or utility shall provide insurance to cover bodily injury and property damage to the public or public property in an amount at set forth by the Building Official. Additional insurance coverage may be required by the Office of Risk Management for contractors utilizing explosives in their demolition operations. A copy of the certificate of liability insurance shall be provided to the Agency. This insurance shall contain a noncancellation clause and be valid at all times during demolition or moving operations.

Exception:

Homeowners for the demolition of Group R3 or U Occupancies when approved by the Building Official.

SECTION 127
SUSPENSION OR REVOCATION OF LICENSE OR CERTIFICATE

127.1 Authority. The Building Official may suspend or revoke a license or certificate when the license or certificate holder commits one or more of the following acts or omissions:

1. Incompetence.
2. Misuse of the license or certificate.

3. Failure to comply with any of the licensee or certificate holder responsibilities as outlined in this Code.
2. Knowingly permit a license or certificate to be used by another person.
3. Act as agent, partner, associate or in any capacity with persons to evade the provisions of this Code.
4. Intentionally fails to perform in accordance with any written contract to perform work, which is regulated by this Code.
6. Creates, as a result of work performed, an unsafe condition as defined by this Code.
7. Intentionally or fraudulently misrepresents the condition of any structure or utility, or the requirements of this Code.
8. Repeatedly or willfully violates or disregards any of the provisions of this Code or repeatedly fails to obey orders of the Building Official.
9. Threatens or assaults any representative of the Agency.
10. Fails to pay any administrative penality issued under Chapter 2, Article XII, Denver Revised Municipal Code, when due.

127.2 Procedure. When any of the acts or omissions enumerated herein is committed by a license or certificate holder and the Building Official deems that the license shall be suspended or revoked, the action shall be as follows:

1. **Notification.** The Agency shall send written notice to the license or certificate holder, by certified mail or by personal service, identifying the acts of omission and indicating that the license or certificate will be suspended or revoked. The written notice shall advise the license holder that a "Request for Hearing" may be initiated as outlined herein.
2. **Request for Hearing**. Upon receipt of the notice, the license or certificate holder may request a hearing with the Manager of CPD to show cause why the license should not be suspended or revoked. This request shall be submitted in writing to the Building Official within 7 days of receipt of the notice.
3. **Time of Hearing**. If a hearing is requested by the license or certificate holder, the Building Official shall notify the holder of the time, date and place of the hearing. Suspension or revocation of the license shall be stayed pending the hearing.
4. **Attendance**. The license or certificate holder, the Building Official and other interested parties may be in attendance at the hearing. In the event the license or certificate holder fails to appear, the license or certificate shall be suspended or revoked by the Building Official. Upon completion of the hearing, the Manager of CPD shall take under advisement all evidence available as a result of the Agency's investigation and all evidence presented at the hearing, and shall give written notice of the findings and ruling to the license or certificate holder by certified mail or personal service. The Manager of CPD may appoint a hearing officer to conduct the hearing. Final decision shall be rendered by the Manager of CPD.
5. **Suspension or Revocation**. Unless the license or certificate is being suspended or revoked under the emergency provisions of this Section, the suspension or revocation shall take effect:
   A. Seven (7) days after receipt by the license or certificate holder of the initial notification, unless a hearing is requested.
   B. Upon the return by the U.S. Postal Service of the initial notification as undeliverable or refused at the address maintained by the license or certificate holder with the Agency.
   C. If a hearing has been requested, which resulted in the affirming of the Building Official's decision to suspend or revoke the license or certificate, upon receipt by the Agency of the Manager's decision.
6. **Right to Appeal.** Any final decision by the Manager of CPD may be reviewed in the manner provided by the Colorado Rules of Civil Procedure.

127.3 Emergency Suspension or Revocation. If the Building Official finds that cause exists for emergency suspension or revocation of a license or certificate, and that continued work under the license or certificate could be hazardous to life or property, he/she may enter an order for the immediate suspension or revocation of the license or certificate, pending further investigation. The license or certificate holder may request a hearing, as outlined in this Section, and such hearing shall be granted within 24 hours. The suspension or revocation is not stayed while the hearing is pending.

127.4 Term of Suspension or Revocation. The Building Official may suspend a license or certificate for up to one year. A license or certificate revoked by the Building Official shall not be elligable for reapplication for a period of five years.

Sections 128 through 129 are reserved.

SECTION 130
PERMITS AND INSPECTIONS

130.1 Permits Required. No person, business, corporation, agency or public, private or governmental institution shall erect, construct, enlarge, remodel, alter, repair, move, improve, remove, convert, demolish or change the occupancy of any building, structure or utility, or perform any other work regulated by this Code, or cause the same to be performed, in the City, without first having obtained a permit from the Agency for the specific work to be performed. This permit shall be displayed or available on the job site at all times. The issuance of a permit or the approval of drawings and specifications shall not be construed to be a permit for, nor an approval of, any violation or deviation from the provisions of this Code or other ordinances, laws, Rules or Regulations. The Agency shall take any action it deems necessary to ensure that all work performed meets all requirements of this Code.

130.2 Inspections Required. All work for which a permit is required shall be subject to inspection by the Agency and all such work shall remain accessible and exposed for inspection until approved by the Agency. In addition, certain types of construction shall have continuous inspection as specified in Section 141. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this Code or of any other City ordinances. Inspections presuming to give authority to violate or cancel the provisions of this Code or of other ordinances shall not be valid. It shall be the duty of the permit applicant to cause the work to remain accessible and exposed for inspection. Neither the Agency nor the City shall be liable for expense entailed in the removal or replacement of any material required to allow inspection. A survey of the lot may be required by the Agency to verify that the structure is located in accordance with the approved plans.

130.5 Exempted Work. The following construction is exempt from the permit requirements of this Code. Exemption from this Code shall not be deemed to grant authorization for any work to be done in any manner that violates the provisions of this Code or any other laws or ordinances of the City. Wastewater Management, Zoning Administration and Fire Department permits may be required.

1. One-story detached accessory buildings or structures used as tool and storage sheds, playhouses and similar uses, not to exceed 120 square feet (11 m^2) of projected roof area or a maximum height of 8 feet above finished grade.
2. Fences of any type not over 4 feet (1220 mm) high. Posthole-dug fences up to 8 feet (2440 mm) high, such as chain link, cedar pine, redwood and wrought iron.
3. Oil derricks.
4. Nonfixed and movable fixtures, cases, racks, counters and partitions not over 5 feet 9 inches (1750 mm) high.
5. Retaining walls which are not over 4 feet (1220 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 III-A liquids.
6. Water tanks supported directly upon grade where the capacity does not exceed 5,000 gallons (18,930 L) and the ratio of height to diameter or width does not exceed 2 to 1.
7. Sidewalks and driveways less than 30 inches (760 mm) above grade, not over any basement or story below and not part of an accessible route. Uncovered decks less than 30 inches above grade and accessory to one and two family dwellings and townhomes.
8. Painting, papering, tiling, floor coverings, countertops, carpeting, cabinets, curtains, drapes and similar decoration items except those items regulated by Chapter 8, IBC.
9. Temporary motion picture, television and theater stage sets or scenery.
10. Window awnings supported by an exterior wall of one and two family dwellings , townhomes or Group U Occupancies when projecting not more than 54 inches (1370 mm) over privately owned property.
11. Prefabricated swimming pools accessory to one and two family dwellings or U Occupancies in which the pool walls are entirely above the adjacent grade and when utilities are provided.

12. Public utility: Construction, repair or maintenance of public utility equipment and facilities used in the distribution of their utility. This exemption includes buildings whose primary function is to house utility distribution or signal control equipment and not intended for human occupancy. RTD: Traction power substations, signal/communication relay stations and associated conduit and wiring for the operation of the light rail lines, the installation of the light rail tracks and associated passenger platforms on RTD right-of-way.
13. State and federal governments, their agencies or subdivisions, or contractors constructing improvements for said state and federal governments, their agencies or subdivisions, when constructing improvements to be used by, and maintained entirely and strictly for the operation of said governments.
14. Replacement of glass not in hazardous locations (see IBC Section 2406.4).
15. Site development work including grading, water detention/retention ponds and soil erosion control. The Wastewater Division will require permits for this type of work.
16. Denver Public Schools (D.P.S.): Construction, remodeling or repair of any plumbing or electrical system, except for fire alarm and detection systems, in any portion of a building in which instruction is or will be given by any D.P.S. school as long as such work is permitted and inspected by the State Examining Board of Plumbers or the State Electrical Board.
17. All plumbing fixture replacement or repair.
18. Tents, 200 sq. ft. or less and freestanding canopies with a covering of fabric or pliable material 400 sq. ft. (37 m^2) or less, open on 3 or more sides.
19. Membrane structures, including tents and canopies of any size, erected for a period of less than 180 days. The Fire Department will require permits for this type of work.
20. Nonilluminated signs of the following types:
    a. Cloth signs mounted directly on a wall.
    b. Wall signs not exceeding 200 sq. ft. (19 m^2) in area.
    c. Ground signs not exceeding 150 sq. ft. (14 m^2) in area, or not exceeding 6 feet in height to the top of the sign.
    d. Arcade signs not exceeding 25 sq. ft. (2.3 m^2) in area on each side.
21. Replacement of awning fabrics.
22. Replacement of windows with no structural alterations and no change in size of opening in one and two family dwellings and townhomes. When structure is a designated structure for preservation or is located in a district designated for preservation pursuant to Chapter 30, Denver Revised Municipal Code, a building permit and approval from the Landmark Preservation Commission shall be required.
23. Swings and other playground equipment.

130.5.1 Mechanical. No mechanical permit shall be required for bath fan installation in existing one and two family dwellings and townhouses, however, electrical and construction permits shall be required. No mechanical permit shall be required for all general repairs and replacements of like units unless the work involves disconnection and reconnection of any of the following:

1. Natural gas line (except replacement of gas valve with like unit).
2. Flue vent from fuel-fire appliance.
3. Refrigerant line.
4. Steam line or hot water line.
5. Safety controls on high pressure boilers.

130.5.2 Electrical. No electrical permit shall be required for:

1. All general replacements of existing electrical appliances and/or apparatus with like units.
2. General repairs that do not involve altering or changing the electrical system.
3. Reconnection of furnaces and air conditioning units in one and two family dwellings and townhouses.

4. Non-required fire alarm systems in one and two family dwellings and townhouses, however, permits for this type of work shall be issued and inspected by the Fire Department.

Exceptions:

1. Permits are required for any work on emergency engine-generator sets, emergency transfer switches, emergency system feeders and circuits, and emergency system overcurrent devices.
2. Permits are required for any work on fire alarm systems, fire detection systems or automatic fire-extinguishing systems.
3. Permits are required for any work on service entrance equipment.

130.5.3 Plumbing. No plumbing permit shall be required for:

1. General repairs in one and two-family dwellings and townhouses that do not alter existing systems, including replacement of like units such as bathroom/kitchen sinks, garbage disposals and water closets.
2. Replacement of sinks, garbage disposals and water closets with like units; faucet and trap replacement or repair in commercial buildings. Permit shall be required for all other plumbing work in commercial buildings.

SECTION 131
PERMIT APPLICATION AND ISSUANCE

131.1 Application. The owner or the owner's agent shall apply for a permit on forms furnished by the Agency. The applicant should exercise care in completing the necessary information, especially addresses, as permits are nontransferable, unless the address change is approved by the Building Official.

Exception:

1. The Agency may correct minor errors in the address if the change can be made on all copies of the permit and initialed by the inspector.

131.2 Expiration of Application. If no permit is issued within 180 days following the date of application, the application shall expire and plans and other data submitted for review may thereafter be returned to the applicant or destroyed by the Building Official. The Building Official may extend the time for action by the applicant for a period not exceeding 180 days upon approval of written request showing that circumstances beyond the applicant's control have prevented action from being taken. Additional extensions may be granted by the Building Official upon written request. In order to renew action on an application after expiration, the applicant shall submit a new application with the plans and pay a new plan review fee.

131.3 Issuance of Permits. The Agency shall issue permits to perform approved work shown on submitted documents and as specified on the permit when all phases of the project conform to the requirements of this Code, Department of Public Works, Zoning Administration, Environmental Health Inspection Division and Fire Department, the permit form is signed by a contractor licensed under Chapter 1 of this Code or an approved owner or owner's agent. Application for permits may be accepted when:

1. The applicant is a natural person who owns and occupies a single-family dwelling or a Group U Occupancy, the Building Official may issue a homeowner’s permit to the applicant for additions, alterations and repairs to that unit. When the applicant desires to construct a single family dwelling or an accessory use Group U Occupancy for his/her ownership and occupancy, the Building Official may issue a homeowner’s permit to the applicant for the construction of the dwelling. Such homeowner’s permits for the construction of a single family dwelling may be issued once in a five year period to the applicant.

   All work associated with the homeowner's permit, including demolition of a dwelling or Group U occupancy structure, shall be the responsibility of and done by the applicant personally unless otherwise approved by the Building Official. Approved assistance in the work associated with the homeowner’s permit shall be done under the supervision of the applicant and the applicant shall be ultimately responsible for the work.

Exceptions:

A. The applicant for a homeowner’s permit to perform electrical, heating, cooling or plumbing work shall pass an examination related to the work being performed and shall personally perform the work, unless approved

by the Building Official. Upon verification of their State issued electrical or plumbing license, the applicant will not be required to take the homeowner's examination. A helper may assist the homeowner in taking the examination and performing the work with the approval of the Building Official. The helper may not repeatedly act in this capacity for other homeowner's permits.

B. A permit for minor work involving the volunteer services of persons working through a recognized volunteer organization, or of other qualified individuals, may be issued to the owner occupant of a single-family dwelling, or miscellaneous building upon request in writing and approval by the Building Official.

2. The applicant is the owner or owner's agent of a Group R-1, R-2, R-3 or R-4 occupancy building for the purpose of installing battery-operated smoke detectors.

3. The applicant is a licensed contractor for any work to the exterior or common elements of a townhouse or condominium apartment building and with the approval of the Homeowner's Association.

4. The applicant is an owner or owner's agent to establish a new Certificate of Cccupancy when no construction work is to be done.

5. Accompanied by evidence of payment of the Systems Development Fee established by the Gateway Regional Metropolitan District and imposed on all land within such District.

6. Accompanied by evidence of the payment of fees established by the Gateway Village General Improvement District and imposed on all land within such District.

7. Accompanied by evidence of payment of any impact fees applicable pursuant to Article III of Chapter 50 of the Denver Revised Municipal Code for properties within the Gateway impact fee area.

131.4 Non-transferable. Permits shall be non-transferable.

Exception:

Permits for improper address issued to the same contractor may be transferred. A processing fee as set forth by the Building Official will be charged. Requests for transferable permits must be made within 30 days of issuance of the original permit.

131.5 Cancellation of Permit by Contractor. The contractor may cancel the permit by notifying the Building Official. To resume work after a permit has been canceled by the contractor the owner shall appoint a new contractor to complete the work and provide a written notice to the Building Official regarding the change of contractor. The new contractor shall obtain a new permit for the work to be completed. An administrative fee as set forth by the Building Official will be charged. Additional administration, plan review and inspection fees may be charged to recover the cost incurred by the Agency.

131.6 Suspension-Cancellation-New Permits.

1. The Building Official may suspend or cancel any permit or may stop the work for any of the following reasons:

   A. When a permit has been issued in error.

   B. When the nature, scope or details of a project have been misrepresented to the Agency by the applicant, owner or owner's agent.

   C. When there is a violation of any provisions of this Code or any City ordinance which the Agency is empowered to enforce.

   D. When the owner or permit holder has failed to comply with the requirements of the Department of Public Works, Zoning Administration, Public Health Inspection Division or the Fire Department.

   E. When the continuance of any work becomes dangerous to life or property.

2. Unless otherwise approved by the Building Official, a construction permit may be automatically canceled when:

   A. Work is not commenced within 60 days from the date of permit issuance.

   B. Work is suspended or abandoned for a period of 60 days after work is commenced.

   C. No request for inspection has been made for a period of 60 days.

3. Unless otherwise approved by the Building Official, a demolition permit may be automatically canceled when:

A. Work is not commenced within 30 days after the date of issuance.

B. Work is suspended or abandoned for a period of 10 days after work is commenced.

4. The Building Official may re-establish a suspended permit within one year of permit suspension, provided that all conditions leading to the suspension are abated, the same series of this Code is in force, and upon payment of a fee as set forth by the Building Official. A suspended permit that is not so re-established shall require submission of a new permit application for consideration, under the series of Code enforced at that time.

5. A canceled permit shall not be re-established, but shall require submission of a new permit application for consideration, under the series of Code enforced at that time.

6. Notice of the suspension or cancellation of a permit for reasons stated in this Section shall be in writing and shall be served upon the holder of the permit, the owner or the person in charge of the work. If the original notice is not served on the owner, a copy of the notice shall be sent to the owner. It shall be unlawful to proceed with any work once the notice is served.

SECTION 132
PERMIT APPLICATION

132.1 General. Submission of an application for permit, including drawings and specifications shall be required for review and approval by the Building Official prior to the issuance of a permit, except as set forth in Subsection 132.2.

132.2 Drawings Not Required. Drawings, specifications and an engineering reports need not be submitted in the permit application for the construction, demolition or moving of minor buildings, additions, structures or utilities; or for minor alterations and repairs to existing buildings, structures or utilities when the Building Official is satisfied that the strength, safety, sanitation and fire resistance are adequately described on the permit application, or when he/she is satisfied that such construction, alterations, repair, demolition or moving will not substantially increase the hazard present in a Special Construction Zone.

132.3 New Construction, Additions, Alterations or Repairs. Application for a permit shall be accompanied by the following:

1. Drawings including the information required in this Section.

2. Copies of an engineering report containing studies and test results concerning the hazards present on the building, demolition or moving site when such site is within an area designated as a Special Construction Zone under Article VII, Chapter 10 of the Revised Municipal Code. Each report shall contain adequate information as a result of tests to allow identification of the hazards present, recommendations as to methods of minimizing the hazards during construction and methods for controlling the identified hazards likely to be present after construction. The Public Health Inspection Division and the Fire Department shall approve all reports required by this Subsection before any permit is issued. Construction shall comply with Appendix P.

3. When required by the Building Official, additional drawings shall be submitted for approval.

132.4 Acceptance. Drawings and specifications complying with the provisions of this Code and accepted by the Building Official shall bear the Agency stamp of acceptance. When corrections are required, the Building Official may require that the drawings and specifications be revised and resubmitted for acceptance prior to the issuance of a permit.

132.5 Distribution. One set of accepted drawings and specifications, known as the Contractor's Set, shall be returned to the applicant and shall be posted on the job site until project is completed. One set of accepted drawings and specifications, known as the Record Set, shall remain in the office of the Agency.

132.6 Replacement of Contractor Set. When the approved Contractor's Set is misplaced the following is required to obtain a copy of the Agency's stamped Record Set of drawings:

1. A copyright release from the architect / engineer of record.

2. A copy of the original permit.

3. An administrative fee as set forth by the Building Official will be charged.

Once plans have been retrieved by the Agency, they will be released to the contractor for copying at the contractor's expense. Failure to return the Record Set of drawings to the Agency may result in the suspension of the contractor's license.

132.7 Disposal. Upon completion of the work and the final inspections by the Agency, the Agency copy of the accepted drawings and specifications may be disposed of after 6 years have elapsed from the date of issuance of the permit. If no permit is issued, plans and specifications may be disposed of after 180 days from the date of application.

132.8 Utility Companies. With the approval of the Building Official, the design of buildings, structures or utilities for the authorized Public Utilities may vary from these Building Code requirements.

SECTION 133
DRAWINGS, SPECIFICATIONS AND SURVEYS

133.1 Limitations. Any person may submit drawings and specifications with an application for a building permit, subject to the following limitations:

1. **Architect and/or Engineer required.** Construction documents for all buildings, structures, additions, alterations or repairs shall bear the seal and signature of the licensed design professional responsible for each design phase except as provided in the following Subsection. If after review of the drawings and specifications, the Building Official determines that the proposed building or structure is inadequately designed, the Building Official may require that the drawings and specifications bear the seal of an architect and engineer who will be responsible for the design phases of the building or structure.

   Exception:

   Sprinkler system shop drawings may bear the seal and signature of a NICET Level III, or higher, certified individual.

2. **Architect or Engineer not Required**. An architect or engineer is not required to prepare drawings and specifications for the following buildings, structures, additions, alterations or repairs:

   A. One and two-family dwellings or miscellaneous buildings.

   B. Group R-2 Occupancies and townhouse buildings when the floor area of the building does not exceed 5,000 square feet and the building is not more than one story without basement or cellar.

   C. Garages, industrial buildings, warehouses, stores, mercantile buildings or office buildings where the floor area of the building does not exceed 5,000 square feet and the building is not more than one story, without a basement, cellar or excavated subfloor area.

   D. Nonstructural alterations, including alterations to utilities, approved by the Agency, which are to any building or structure, provided that the alterations do not affect the stability of the building or the health and safety of the occupants.

2. **Seal and Signature.** Seal and signature (manual or electronic) of the licensed design professional of record and date of signature shall be affixed to all documents as required and set forth by the Building Official. The authorized seal shall be a crimp type, a rubber stamp type, or computer generated type. A manual signature is the handwritten name of a person applied to a document that identifies the person, serves as a means of authentication of the contents of the document, provides responsibility for the creation of the document and provides for accountability for the contents of the document. If a manual signature is used, the signature of the registrant and date of signature shall appear through the seal. An electronic signature is a digital authentication process attached to or logically associated with an electronic document and shall carry the same weight, authority, and effects as a manual signature. The electronic signature, which can be generated by using either public key infrastructure or signature dynamics technology, must be unique to the person using it, capable of verification, under the sole control of the person using it and linked to a document in such a manner that the electronic signature is invalidated if any data in the document are changed. The use of an electronic signature must be pre-approved by the Building Official.

3. **Registered Design Professional in Responsible Charge.** When it is required that documents be prepared by an architect or engineer, the Building Official may require the owner to engage and designate on the building permit application an architect or engineer who shall act as the Registered Design Professional in Responsible Charge. If

the circumstances require, the owner may designate a substitute registered design professional in responsible charge who shall perform all of the duties required of the original registered design professional in responsible charge. The Building Official shall be notified in writing by the owner if the registered design professional in responsible charge is changed or is unable to continue to perform the duties. The registered design professional in responsible charge shall be responsible for reviewing and coordinating all submittal documents prepared by others, including deferred submittal items, for compatibility with the design of the building.

4. **Consultant Drawings**. Consultant drawings and specifications prepared by architectural or engineering subdisciplines shall be so designated by their name, address and phone number and shall bear the seal and signature of the responsible architect or engineer for the subdiscipline.

5. **Statement**. When a design professional signs and seals a document, a statement shall also be included setting forth the aspects of the project for which the design professional is responsible (i.e., civil, structural, mechanical). If there is no statement, it is presumed that the design professional has assumed responsibility for the entire document.

6. **Reproducible Drawings**. The design professional's seal and signature shall not be placed on reproducible drawings that are used for multiple copies or on reproducible drawings that are transferred away from the design professional's possession and supervision.

133.2 Information Required. Drawings and specifications shall be complete and of sufficient clarity to indicate the entire work proposed and show in detail that the building, structure or utility conforms to the provisions of this Code and relevant laws, ordinances, rules and regulations. Each set of drawings and specifications shall, as a miniumum, contain the following information, architectural, structural, mechanical, electrical drawings, specifications and analysis:

1. Exact address, legal description and location of the work performed.
2. Name and address of the owner.
3. Name and address of the person or firm responsible for the preparation of the drawings and specifications. The seal and signature of the architect and or engineer responsible for the preparation of the drawings and specifications when required by this Section.
4. Except for interior alterations and repairs, a plot plan showing the location of the proposed construction and the location of every adjacent existing building on the property, roads, walks, utilities and other site improvements, all property lines, streets, alleys, easements and other public areas. The proposed construction shall not project beyond property lines except as provided for in IBC Chapter 32.
5. A completed "Building Profile Form." The form shall be provided by the Agency.
6. Two complete sets of construction documents showing the construction of architectural, structural, mechanical and electrical arrangements.
7. One copy of specifications or notes that clearly describe the type, quality and finish of materials and the method of assembly, erection and installation of equipment to be installed with proper reference to accepted standards.
8. Architectural drawings and specifications as follows:
   A. Plans showing the arrangement of each floor, elevations, sections and details to show the construction of all architectural features, including the location and type of fire-rated construction.
   B. The gross area in square feet of buildings or portions of buildings in which new construction or remodeling work is intended; and of each different occupancy group.
   C. A complete Code Analysis, including the building occupancy groups, the type of construction, and a comparison of actual floor areas and number of stories to those allowed under the provisions of this Code on the front sheet of drawings.
   D. The construction documents shall show in sufficient detail the location, construction, size and character of all portions of the means of egress in compliance with the provisions of this Code. In occupancies other than Groups R-2, R-3, and I-1, the construction documents shall designate the number of occupants to be accommodated on every floor, and in all rooms and spaces.
9. Structural drawings, specifications and analysis as follows:

A. Design criteria indicating all lateral loads and allowable stresses in all structural materials.

B. Foundation, floor and roof plans indicating the location of all concentrated loads, and varying live loads, roof areas used to impound water; and pressurized shafts required by Chapter 9.

C. Elevations, sections and details showing all structural requirements.

D. When required by the Building Official for new construction, foundation design criteria, including a soils investigation report signed and sealed by an engineer responsible for the preparation of the report.

10. Mechanical drawings, specifications and analysis as follows:

A. Single line drawings, including typical isometric, of plumbing, heating, air treatment systems and gas piping layout.

B. BTU rating of gas units, method of combustion and ventilation air supply, type and horsepower of refrigeration, and gas meter locations.

C. Heating, cooling, ventilating, plumbing and fire protection details, and fire or smoke damper locations.

D. Plans and details showing the location of impounded water; and shafts used for pressurization as required by IBC Chapter 9.

E. For buildings more than two stories in height construction documents shall indicate where penetrations will be made for mechanical systems, and the materials and methods for maintaining required structural safety, fire-resistance rating and fireblocking.

11. Electrical drawings, specifications and analysis as follows:

A. One-line diagram showing sizes of service and feeder conductors, sizes of service and feeder overcurrent devices, all major components of service and distribution system, ratings of equipment, and grounding details.

B. Load study and analysis to justify sizes of system components.

C. Short-circuit study and analysis to justify short-circuit withstand ratings of all system components.

D. Panelboard circuit schedules including loads per each circuit, total bus load per phase, AIC rating and NEC demand calculations.

12. A field survey under this Section for all additions and new construction.

13. A complete elevator and dumbwaiter layout, if applicable.

133.3 Additional Information When Requested.

1. Reports from an independent testing agency, which substantiates requirements of this Code regarding structural or fire-resistive requirements.
2. Engineering design calculations.
3. Other information deemed necessary by the Building Official to determine compliance with the requirements of this Code.

133.4 Field Surveys. A Land Survey Plat or an Improvement Survey Plat shall be conducted by a land surveyor registered by the State of Colorado for the construction of a new building or structure, an addition to an existing building or structure or a change of occupancy for an existing building or structure which shall include, but not be limited to the following information:

1. Scale drawing of the boundaries of the land parcel with all dimensions to establish those boundaries.
2. All recorded and apparent rights-of-way and easements.
3. Improvement locations shall be shown in scale with a minimum of 2 dimensions to the nearest property line to locate all improvements.

133.5 Deferred Submittals. Deferred submittals are defined as those portions of the design which are not submitted at the time of the application and which are to be submitted to the Agency within a specified period. Deferral of any submittal items shall have prior approval of the Building Official. The registered design professional in responsible charge shall list the deferred submittals on the plans and shall submit the deferred submittal documents for review by the

Agency. Submittal documents for deferred submittal items shall be submitted to the design professional in responsible charge who shall review them and forward them to the Agency with a notation indicating that the deferred submittal documents have been reviewed and that they have been found to be in general conformance with the design of the building. The deferred submittal items shall not be installed until their design and submittal documents have been approved by the Agency.

133.6 Inspection and Observation Program. When special inspection is required by IBC Section 1704, the registered design professional in responsible charge shall prepare an inspection program which shall be submitted to the Building Official for approval prior to issuance of the building permit. The inspection program shall designate the portions of the work that require special inspection and the name or names of the individuals or firms who are to perform the special inspections, and indicate the duties of the special inspectors. The special inspector shall be employed by the owner, the registered design professional in responsible charge, or an agent of the owner, but not the contractor or any other person responsible for the work. When structural observation is required by Section 141, the inspection program shall name the individuals or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur. The inspection program shall include samples of inspection reports and provide time limits for submission of reports.

SECTION 134
PERMITS FOR TEMPORARY BUILDINGS

134.1 Permit Issuance. A permit for a temporary building may be issued by the Building Official if the applicant can substantiate a definite need for the temporary building. The permit may be granted for a period up to 36 months and may be renewed upon reapplication and approval by the Building Official. The request for a permit shall be in writing, detailing the reason for the request. The approval shall be based on the need, extent of time, use and/or type of unit installed. A renewal permit fee equal to the original permit fee will be required.

Exception:

Temporary buildings for use by licensed contractors at the construction or demolition site shall not require a Building Permit.

134.2 Right of Appeal. One extension of a permit for a temporary building may be sought from the Board of Appeals subject to Section 109.

134.3 Fee. A temporary building permit fee shall be established by the Building Official.

SECTION 135
FOUNDATION PERMITS

135.1 General. A foundation permit may be issued prior to the issuance of the construction permit for all buildings and structures, except one- and two-unit dwellings and miscellaneous structures, to a contractor who holds a license qualifying him/her as the general contractor for the entire project, provided that:

1. The total valuation of the project, excluding utilities, exceeds $200,000 or as approved by the Building Official.
2. Drawings of the proposed superstructure containing sufficient detail relating to the design of the foundation or substructure are submitted to the Agency. Structural calculations shall be submitted to validate the gravity and lateral load design of footings, caissons and all other foundation permit elements.
3. Approvals required by the appropriate City agencies are obtained prior to issuance of the permit.
4. For purposes of the Section, the term “Project” shall mean one building only with a valuation in conformance with Section 138.

135.2 Fee. The plan review fee and the permit fee charged at the time of issuance of the foundation permit shall be as set forth by the Building Official.

135.3 Deviations. Any deviation from the accepted foundation permit drawings shall be cause for the cancellation of the permit. However, if changes are substantiated by engineering calculations and revised drawings, the deviations may be approved by the Building Official.

135.4 Responsibility. The contractor shall assume full responsibility for the installation of all utilities in the substructure. Any changes to completed foundations necesitated by subsequent modification in design or construction to meet the requirements of this Code for the combined structure shall be the sole responsibility of the contractor. A permit issued under this Section shall not be construed as approval for any portion of the structure not covered by the foundation permit.

135.5 Not Applicable. Foundation permits are not applicable to phased or design-build construction.

SECTION 136
PHASED CONSTRUCTION PERMITS

136.1 General. The Agency may issue permits for the construction of a portion or phase of a building, structure or utility prior to the submission of the complete drawings and specifications, provided that:

1. The total valuation of the project exceeds $1,000,000.
2. Prior to the submitting the first phase of the project, the Building Official approves a Phased Construction Proposal (the "Proposal") submitted by the applicant outlining the schedule for the phased construction, and designating the registered design professional in responsible charge. The Proposal must provide a title for each phase, and describe the building system(s) to be reviewed in each of the phased submittal packages. The proposal shall state the valuation for each phase and include an estimated submittal date for each of the phases.
3. The valuation of the portion of the work, including utilities, shall be restated with each phased application.
4. Drawings for each phase shall, on each sheet, include the title for the phase as defined in the Proposal and the term "Phased Construction".
5. The approval of appropriate City agencies has been obtained prior to issuing each such phased permits.

136.2 Fees. Plan review and permit fees for phased construction shall be set forth by the Building Official.

136.3 Responsibility. Any changes to completed phases necesitated by subsequent modification in design or construction to meet the requirements of this Code for the combined structure shall be the sole responsibility of the contractor. A permit issued under this Section shall not be construed as approval for any portion of the structure not covered by the phase permit.

136.4 Not Applicable. Phased construction permits are not applicable to foundation or design-build construction.

SECTION 137
DESIGN-BUILD CONSTRUCTION PERMITS

137.1 General. The Agency may issue permits for design-build construction of a building, structure or utility, provided that:

1. The total valuation of the project exceeds $1,000,000.
2. Prior to submitting the first edition of drawings for the project the Building Official approves a Design-Build Construction Plan (the "Plan") submitted by the applicant outlining the schedule for drawing submisstion and construction plan and designating a registered design professional in responsible charge. The Plan must describe which complete building system(s) are to be reviewed, and a description of the scope of work to be permitted to begin construction, in each edition of the drawing packages. The proposal shall state the valuation for the project and include an estimated submittal date for each of the editions.
3. Drawings for each edition shall, on each sheet, include the title for the edition as defined in the Plan and the term "Design-Build Construction".
4. The approval of appropriate City agencies has been obtained prior to issuing such design-build permits.

137.2 Fees. Plan review and permit fees for phased construction shall be set forth by the Building Official.

137.3 Responsibility. Any changes to completed work necesitated by subsequent modification in design or construction to meet the requirements of this Code for the combined structure shall be the sole responsibility of the contractor. A permit issued under this Section shall not be construed as approval for any portion of the structure not covered by the permit.

137.4 Not Applicable. Design-build construction permits are not applicable to foundation or phased construction.

SECTION 138
PERMIT FEES

138.1 Plan Review, Permit and Inspection Fees. The fee for each plan review and permit shall be based on the total value or valuation of all construction work for which the permit is issued, as well as all finish work, roofing, electrical, plumbing, heating, air conditioning, elevators, fire-extinguishing systems and any other permanent equipment. The determination of value or valuation under any of the provisions of this Code shall be made by the Building Official.

When submittal documents are required by Section 132, a plan review fee shall be paid at the time of submittal document submission. Plan review fees provide for the first review only. When re-review of plans is required for plans or drawings that are rejected, sumitted incomplete, not in accordance with Sections 133, to address indicated Code deficiencies, project modification, changed so as to require additional plan review or when the project involves deferred submittal items as defined in Section 133.5 an additional fee shall be incurred as set forth by the Building Official. The plan review fees specified in this Section are separate from and in addition to permit fees.

Permit fees provide for the customary inspections only. Re-inspections shall incur a fee as set forth by the Building Official.

138.2 Late Fees. When work for which a permit is required by this Code is started without a permit, the fees for permits on the work performed, shall be double those set forth by the Building Official for a standard permit, with a minimum of $100. The payment of this late fee shall not relieve any person from fully complying with the requirements of this Code in the execution of the work or from other penalties for performing work without a permit.

Exception:

For items of work performed on an emergency basis, as determined by the Building Official, to maintain an existing service or utility when the maintenance is necessary to protect health, life or safety, the penalties stated herein shall not apply if application for a permit is made within 3 normal working days after commencement of the emergency work.

138.3 Investigation for Work Without a Permit. When any work for which a permit is required by this Code has been commenced without first obtaining a permit, a special investigation shall be made before a permit may be issued for the work. An investigation fee equal to the amount of the late permit fee required by this Code shall be collected when work has begun without a permit. The payment of such investigation fee shall not exempt any person from compliance with all other provisions of this Code nor from any penalty or fees prescribed by law.

138.4 Permit Fees for Denver Agencies. Enterprise Fund agencies of the City and County of Denver which are not subsidized by the General Fund shall pay permit fees for all construction and repair work for which building permits are required. General Fund agencies and Enterprise Fund agencies subsidized by the General Fund shall pay permit fees for new construction projects only.

138.5 Additional Fees. When the valuation of a previously permitted project is ammended, a supplementary permit shall be obtained for any additional valuation, not included in the original permit. The fee shall be the difference between the fee paid and the fee that would have been required had the original permit included the entire valuation.

138.6 Waivers, Reductions and Refunds. No fee shall be waived or reduced. No refund will be granted for any permit fee paid to the Agency.

Exception:

The Building Official may approve requests for refund of fees for duplicate or out-of-City permits that are made in writing within 60 days of the date of issuance. A processing fee as set forth by the Building Official shall be charged and deducted from the refund.

Section 139 is reserved.

SECTION 140
INSPECTIONS

140.1 On Job Site. The construction permit holder shall post the following, at the front of the job site, in a permanent visible location with numbers and letters made of durable materials and of a size to be visible and legible from the street fronting the property:

1. The address number and street, avenue, court, parkway or other, as assigned by the Office of the City Engineer.
2. The name of the firm, address, business phone number and emergency phone number of the permit holder.
3. The building permit number.

140.2 Access for Agency. The contractor or property owner shall provide unobstructed access to and means for the Agency to inspect the required work, including corner stakes or survey markers.

140.3 Inspection Record Card. Work requiring a permit shall not be commenced until the permit holder or his agent has posted or otherwise made available an inspection record card so as to allow the Agency to make the required entries regarding inspection of the work. This card shall be maintained by the permit holder until final approval has been granted by the Building Official.

140.4 Inspection Requests. It shall be the duty of the person doing the work authorized by a permit to notify the Agency when such work is ready for inspection. The Building Official may require that all requests for inspection be in writing, electronically, or by telephone and be filed at least one working day before such inspection is desired.

140.5 Approval Required. Approval by the Agency shall be required at progressive stages of the construction of the building or structure and the installation of the mechanical, plumbing and electrical systems. The Agency shall make the requested inspections and shall either confirm that the completed portion of the construction is satisfactory or shall notify the permit holder or his agent that the same fails to comply with this Code. Any portion which does not comply shall be corrected and such work shall not be covered or concealed until approved by the Agency. There shall be a final inspection and approval of all completed construction before the building, structure or portion thereof shall be ready for occupancy and use.

140.6 Required Inspections. The following inspections shall be required and shall be made by the Agency after proper notification. Other inspections may be required, as specified by the Building Official.

1. **Foundation Inspection.**
   A. Footings. Inspections shall be conducted prior to pouring concrete. The footing excavation form work and any reinforcing steel must be in place. Any clay soil pipe encountered must be replaced with schedule 40 PVC, ABS/DWV or cast iron pipe by a licensed plumber, under a separate permit. All such work shall be approved by the Agency prior to the footing inspection.
   B. Walls. Concrete walls shall have the form work and reinforcing steel inspected prior to the concrete placement. Approved treated wood walls shall be inspected as required by AF&PA Technical Report 7-87.
   C. Waterproofing/Dampproofing Inspection. To be conducted after the waterproofing/dampproofing system or materials are completely in place and exposed for inspection.
   D. Exterior wall insulation and drain tile when required.
2. **Concrete slab or under-floor inspection**. To be made after all in-slab or under-floor building service equipment, conduit, piping accessories and other ancillary equipment items are in place, but before any concrete is placed or floor sheathing installed, including the subfloor.
3. **Frame Inspection**. To be conducted on the completed frame construction with all fire blocking and bracing in place. All framing must be exposed to view. Roof and wall sheathing or panel must be complete with windows in place. All rough installations or electrical, plumbing and mechanical systems shall have prior approval by the Agency.
4. **Insulation Inspection.** To be conducted after the installation of the insulation is completed.
5. **Air Infiltration Barrier Inspection**. To be conducted after the air infiltration barrier system is in place and complete.
6. **Gypsum Board or Lath and Plaster Inspection**. To be conducted after all gypsum board or lath, interior and exterior, is in place but before gypsum board joints and fasteners are taped and finished or before plastering is applied.

Exception:

The attachment and taping of gypsum board to partition walls that are not part of a fire-resistance rated assembly or a shear wall assembly for construction in occupancies A, B, E, F, M, U and S.

7. **Final Inspection**. To be conducted after construction is completed (all sub-permits must have final approval and sign-off) and the building or space is ready for occupancy.

140.7 Other Inspections. In addition to the inspections specified, the Building Official may make or require other inspections of any construction work to ascertain compliance with the provisions of this Code and other laws, which are enforced by the Agency. The engineer or architect responsible for the structural design work shall include in the construction documents all special inspections required by Section 141 and any other structural inspections required.

Other inspections, requested by the owner, design professional or contractor, to be conducted outside of business hours shall be requested no later than 12 noon of the day the inspection is needed, and incur additional fees as set forth by the Building Official.

140.8 Reinspections. A reinspection fee may be assessed for each inspection or reinspection when the inspected work is not complete or when corrections called for have not been made. This Subsection is not to be interpreted as requiring reinspection fees the first time a job is rejected for failure to comply with the requirements of this Code, but as controlling the practice of calling for inspections before the job is ready for inspection or reinspection. Reinspection fees may be assessed for failure to properly post the inspection card on the work site, for failure to have approved plans readily available to the inspector, for failure to provide access on the date for which inspection is requested, or for deviating from plans requiring the approval of the Building Official. To obtain a reinspection, the applicant shall file an application therefore in writing upon a form furnished for that purpose and pay the reinspection fee as set forth by the Building Official. Where reinspection fees have been assessed, no additional inspection of the work will be performed until the required fees have been paid.

140.9 Vertical and Horizontal Conveyance Inspection. Inspections of conveyances shall be made in accordance with the Conveyance Regulations of the State of Colorado.

SECTION 141
SPECIAL INSPECTIONS

141.1 See Section 1704, IBC – Special Inspections

141.2 Structural Observation. When required by the Building Official, the owner shall employ an engineer to make visits to the site to observe general compliance with the approved structural plans, specifications and change orders. The engineer shall submit a final written report to the Building Official stating that site visits have been made and that any deficiencies noted have been corrected. Reference IBC Section 1710 – Structural Observations.

SECTION 142
FINAL INSPECTION APPROVAL, CERTIFICATE OF COMPLIANCE AND CERTIFICATE OF OCCUPANCY

142.1 Final Inspection Approval. A final inspection approval card shall be issued by the Building Official upon the completion and approval of the work covered by the permit.

142.2 Certificate of Occupancy Required. All new buildings or structures except miscellaneous buildings or structures shall not be used or occupied until a Certificate of Occupancy is issued by the Buildng Official. No building or portion thereof shall be used or occupied for any occupancy other than the one designated on the certificate until a new Certificate of Occupancy is issued by the Building Official. Issuance of a Certificate of Occupancy shall not be construed as an approval of a violation of the provisions of this code or of any other ordinances of the City and County of Denver. Changes in the character or occupancy of all buildings or structures shall not be made except as specified in Chapter 34, IBC. A new Certificate of Occupancy is required for all such changes.

142.3 Certificate of Compliance Required. A certificate of compliance will be issued by the Building Official, when a Certificate of Occupancy is not required or appropriate, but where documantation is necessary to indicate that all final inspections by the Agency have been satisfactorilly completed. The Certificate may be issued upon the request of the

General Building Contractor when the inspection card issued by the Agency is returned indicating that all final inspections are complete.

142.4 Issuance of Certificate of Occupancy. When all the conditions of this Chapter have been fulfilled, the Building Official shall issue a Certificate of Occupancy indicating Building Official approval and the use and occupancy for which the certificate is issued. The Certificate of Occupancy shall be issued to the owner after approval by the Building Official and:

1. Concurrence by Construction Engineers Division, Wastewater Management and Zoning Administration.
2. When required by the provisions of this Code, or specifically requested in writing at the time of application, concurrence by Public Health Inspection Division and the Fire Department.
3. When a building or structure is located in a Special Construction Zone designated pursuant to Article 647 of the Revised Municipal Code, concurrence of Public Health Inspection Division, Fire Department and the Department of Public Works.
4. When a building or structure is designated for preservation or is located in a district designated for preservation pursuant to Chapter 30, Denver Revised Municipal Code, concurrence of the Landmark Preservation Commission.

142.5 Issuance of Certificate of Compliance. Upon the request of the General Building Contractor a certificate of compliance will be issued by the Building Official, when:

1. A Certificate of Occupancy is not required or appropriate.
3. Required in response to an order of the Building Official, or other Agency.
2. The inspection card issued by the Agency is returned indicating that all final inspections by the Agency have been made.
4. The processing fee,as set forth by the Building Official, is received by the Agency.

142.6 Temporary Certificate of Occupancy. Upon written request, the Building Official may issue a Temporary Certificate of Occupancy (TCO) to the owner where unusual construction difficulties have delayed the completion of the construction work covered by the Building Permit, and provided that no substantial hazard will result from the occupancy. The written request must be made by the owner or the owner's agent, itemizing the uncompleted work, justify the isuance of the TCO and display concurrence from the following City Agencies:

1. Construction Engineering Division.
2. Wastewater Management Division.
3. Environmental Health Inspection Division.
4. Fire Department.
5. Zoning Permitting & Inspection.

A TCO processing fee as set forth by the Building Official shall be assessed. The approval of a TCO shall not waive, reduce or diminish any requirements of this Code. The Temporary Certificate of Occupancy may be granted for a period up to 12 months, and may be extended with the approval of the Building Official. After the expiration date of the TCO, the building or structure shall require a permanent Certificate of Occupancy in accordance with other provisions of this Chapter.

Additional inspections required for the TCO shall be charged as set forth by the Building Official and shall be paid before the permanent Certificate of Occupancy is issued.

142.7 Cancellation of Certificate of Occupancy. The Building Official may cancel a Certificate of Occupancy when:

1. The Certificate is issued in error or on the basis of incorrect or false information.
2. The owner has failed to comply with the requirements of the Building Official after appropriate notice and reasonable time to correct.
3. The continued occupancy of the structure is dangerous to the public health, safety or welfare.

142.8 Duplicate Certificates. Upon payment of a fee set forth by the Building Official, a duplicate Certificate of Occupancy or Certificate of Compliance may be secured by the owner, architect, engineer, contractor, permit holder or tenant.

2011 AMENDMENTS TO THE 2009 EDITION OF THE INTERNATIONAL BUILDING CODE AND APPENDICES AS PUBLISHED BY INTERNATIONAL CODE COUNCIL (ICC)

The content of the sections in this Code that begin with a letter or letters designations are maintained by other City or State entities.

[F]	**Denotes Fire**
[PW]	**Public Works**
[EB]	**Existing Building**
[CDH]	**Colorado Division of Housing**
[IFCA]	**International Fire Code Amendments**
[Z]	**Zoning**
[Eh]	**Revised municipal code, chapter 23 – environmental health**

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

Section 101.1 Title is amended by inserting "City and County of Denver" for the name of the jurisdiction.

Section 101.4.1 Electrical is deleted in its entirety.

Section 101.4.5 Property maintenance is deleted in its entirety.

Sections 103 through 115 are deleted in their entirety. The Administration of the Denver Building Code shall govern.

CHAPTER 2
DEFINITIONS

SECTION 201
GENERAL

Section 201.4 General is amended by replacing it in its entirety with the following:

201.4 General. For purposes of this Building Code, certain words, phrases and terms shall be given the defined meaning. Words, phrases and terms not defined in this Code shall be given their usual and customary meanings. Webster's Third New International Dictionary of the English Language, Unabridged, shall be considered as providing ordinarily accepted meanings. The word "shall" is mandatory and not permissive; the word "may" is permissive and not mandatory. Other terms and abbreviations used only with specialized application are defined in the Chapter in which they are used. Definitions are amended or added, and where conflicts occur these definitions shall govern.

SECTION 202
DEFINITIONS

Section 202 Definitions is amended by adding the following definitions:

ABANDON. The desertion of a building, structure or utility. Abandon shall also apply when the building, structure or utility is left to the effects of vandalism, dilapidation and deterioration, thereby creating a fire hazard, unsafe condition or public nuisance.

ADEQUATE. Determined to be acceptable to the Agency.

ADMINISTRATIVE AUTHORITY. The Building Official.

ADULT DAY CARE. Adult day care is a program designed to meet the needs of adults with functional impairments through an individual plan of care. It is a structured, comprehensive program that provides a variety of health, social and related support services by persons who are not their relatives or legal guardians, in a protective setting during any part of a day but less than 24 hours. See Section 308.5.1 (Occupancy I-4).

ADULT DAY CARE CENTER. Adult day care center is any building or portion thereof that provides an adult day care program for 5 or more clients over the age of 16 years. See Section 308.5.1 (Occupancy I-4).

ADULT DAY CARE HOME. A private residence in a single-unit dwelling or a dwelling unit in a multiple-unit dwelling providing less than 24 hours a day care for four (4) or fewer clients over the age of 16 years. See Section 310.1 (Occupancy R-3).

AMBULATORY. A physical or mental condition under which a person is capable of judgment and appropriate action for self-preservation under emergency conditions.

ARCHITECT. An architect licensed by the State of Colorado.

ASSISTED CARE FACILITIES. See Personal Care Facilities. See Section 308.2 (Occupancy I-1) and Section 310.1 (Occupancies R-3 and R-4).

BOARD. The Board of Appeals. (See Administration Section.)

CHILD CARE CENTER. A facility which provides a comprehensive care service for the child when the parent or guardian is employed or otherwise engaged and unavailable to care for the child. The facility is maintained for the whole or part of a day but for less than 24-hour care of 5 or more children from the ages of 6 weeks through 16 years, and not related to the owner, operator or manager thereof, whether such facility is operated with or without compensation for such care, and with or without compensation for stated educational purposes. The term includes facilities commonly known as a "day care center," "day nurseries," "nursery school," "kindergarten," "preschool," "play groups," "school age programs," "centers for the developmentally disabled children," "day treatment centers," "extended day programs" and "summer playground programs." See Sections 305.2 & 308.5.2, Exception (Occupancy E), 308.3.1 (Occupancy I-2) and 308.5.2 (Occupancy I-4).

Child Care Centers shall not include:

1. Child Care Homes.
2. The Pre-kindergarten and Kindergarten programs which are maintained in connection with a public, private or parochial school system of at least 6 grades, providing an educational program for the 2 years preceding entrance to the first grade.

CHILD CARE HOME. A child care home shall be classified as an R Occupancy, Division 2 or 3. A private residence in a single-unit dwelling or a dwelling unit in a multiple-unit dwelling providing care and education for periods of less than 24 hours a day for 12 or fewer children under the age of 17.

CONSTRUCTION. The act of using labor and materials used for erection, demolition or removal of a building, structure, utility, appliance or device.

DEMOLITION. The destruction and removal of a building, structure or utility.

DETERIORATION. The effect upon buildings, structures, utilities, equipment and materials through corrosion, decay, wear and tear due to use or abuse, obsolescence, effects of the elements, fire damage, disaster, flood, earthquake, lack of maintenance, vandalism or any other cause, including fatigue due to overstressing and disintegration of component parts and the separation of materials and structural parts.

ENGINEER. An Engineer licensed / registered by the State of Colorado as a Professional Engineer.

EVACUATION CAPABILITY. The ability of the occupants, residents and staff as a group either to evacuate a building or to relocate from the point of occupancy to a point of safety. Following are the levels of evacuation capability:

1. *Prompt.* Evacuation capability equivalent to the capability of the general population to evacuate a facility. Evacuation drill time shall be 3 minutes or less.
2. *Slow.* Evacuation capability of a group to move to a point of safety in a timely manner, with some of the residents requiring assistance from the staff. Evacuation drill time shall be over 3 minutes, but not in excess of 13 minutes.
3. *Impractical.* A group that, even with staff assistance, cannot reliably move to a point of safety in a timely manner. Evacuation drill time is more than 13 minutes.

FIRE DEPARTMENT. The Fire Department of the City and County of Denver.

HOME OCCUPATION. Limited commercial use of a portion of a dwelling unit, single unit dwelling or multiple unit dwelling as permitted by the Department of Zoning Administration in accordance with Revised Municipal Code Section 58-89. “Home occupations allowed”.

INDEPENDENT LIVING. The ability of a resident to provide for and maintain the basic functions of everyday living and to recognize and respond to an emergency for self-preservation.

[IFCA] LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS. The lowest level of Fire Department vehicle access shall be measured from the lowest elevation of any required Fire Department access road located no more than 30 ft. from any exterior wall of the building.

Exceptions:

1. Where the access road is permitted to be farther than 30 ft. to any exterior wall of the building, the lowest level of Fire Department vehicle access shall be measured from the lowest elevation of any required Fire Department access road located no more than 50 ft. from any exterior wall of the building.
2. If any topography, waterway, non-negotiable grades or other similar conditions exist that preclude required Fire Department vehicular access, the Fire Code official is authorized to require additional fire protection systems as required by Chapter 9.

MAINTENANCE. The normal upkeep of property or equipment to keep it in an existing state, such as minor repairs to keep equipment operational. This definition shall not invalidate the requirement for a permit when so determined by the Agency as beyond the scope of maintenance.

NONAMBULATORY. A physical or mental condition under which a person is not capable of judgment and appropriate action for self-preservation under emergency conditions.

NURSING HOME. A facility that is operating in connection with a hospital or where nursing care and medical services are prescribed by or performed under the general direction or persons licensed to practice medicine or surgery by the State of Colorado or for the accommodation of convalescents or other persons who are not actually ill and not in need of hospital care and related services. The term "nursing home" is restricted to facilities designed to provide skilled nursing care and related medical services for a period of not less than 24 hours per day.

OCCUPIED ROOF. The roof of a building or structure used for purposes other than maintenance, repair or servicing of the building equipment.

PERSONAL CARE. Protective care of residents who do not require chronic or convalescent medical or nursing care. Personal care involves responsibility for the safety of the resident while inside the building. Personal care may include daily awareness by the management of the resident's functioning and whereabouts, making and reminding a resident of appointments, the ability and readiness for intervention in the event of a resident experiencing a crisis, supervision in the areas of nutrition and medication, and actual provision of transient medical care.

PERSONAL CARE FACILITY. See Personal Care Service, Section 310.2.

PUBLIC UTILITY. An authorized or franchised firm given the right to perform services necessary under the authorization or franchise.

RECOGNIZED VOLUNTEER ORGANIZATION. A nonprofit organization, recognized by the Internal Revenue Service as a charitable or religious organization.

SCHOOL: PUBLIC, PRIVATE OR CHARTER. An institution which provides instruction or education at elementary, secondary and high school learning levels.

SMOKE CONTROL SYSTEM. An engineered mechanical and electrical system designed to provide a tenable environment for the evacuation or relocation of occupants and control the development and movement of smoke.

STRUCTURE. An assembly of materials forming a construction for a specific use including, among others, buildings, stadiums, tents, reviewing stands, platforms, stagings, observation towers, radio and television towers, water tanks, swimming and wading pools, retaining walls, open sheds, coal bins, shelters, fences and display signs. This definition shall not include utilities.

TENANT. A person occupying a building or portion thereof and separated from other tenants by walls, floors and ceilings. The tenant shall have a lease to occupy the specified space from the owner.

USABLE SPACE. Space that may be used. This definition does not apply when usable or potential usable space is sealed off so that access to the area is not provided.

UTILITIES. For the purpose of this Code, utilities shall be defined, without limitation to include the following:

> Refrigeration systems and their appurtenances; electrical systems and all appurtenances, such as motors, etc.; heating and ventilation systems and appurtenances; elevators, dumbwaiters, escalators and similar conveyances; fire protection systems and apparatus; air conditioning or air treatment systems, including ductwork; exhaust or ventilating systems, including ductwork; plumbing and sanitary systems and all appurtenances; signal and annunciator systems; gas, oil and solid fuel-fired appliances, piping, controls, burners and their appurtenances; evaporative cooling, antennae, wells and equipment; water heaters; gas lights; swimming pool piping; gasoline pumps; and L.P.G. liquid fuel and gasoline tanks and piping.

VALUE OR VALUATION. The building replacement value for permit purposes including labor, profit, overhead, materials, base building equipment and appliances.

The determination of value or valuation shall be made or directed to be made by the Agency. See Administration Section.

WORK. All construction or repair excluding decoration or maintenance of existing utilities or appliances.

WRECKING. See Demolition.

CHAPTER 3
USE AND OCCUPANCY CLASSIFICATION

SECTION 303
ASSEMBLY GROUP A

Section 303.2 Fire command room in group A occupancies with an occupant load of 1000 or more is added:

303.2 Fire Command room in group A occupancies with an occupant load of 1000 or more. A fire command room complying with IFCA Section 508 shall be provided in a location approved by the fire department.

SECTION 305
EDUCATIONAL GROUP E

Section 305.3 Conversion of existing buildings to small day care centers is added:

305.3 Conversion of existing buildings to small day care centers. An existing building may be converted to a small day care center without complying with all the requirements for a change of use under Section 305, provided the following provisions are met:

Drawings and specifications need not bear the seal of an architect or engineer. However, after the review of the drawings and specifications, the Agency may require that the drawings and specifications bear the seal of an architect and engineer who will be responsible for the design phases of the conversion.

Any building additions or new facilities installed or erected, as part of the conversion shall comply with present Building Code provisions.

The number of occupants, excluding staff, shall not exceed 20 and shall be permitted on the first story only.

Exceptions:

1. Basements having floor levels located within 4 feet (1219 mm), measured vertically, from adjacent ground level at the level of exit discharge, provided the basement has exterior exit doors at that level.
2. Any floor level with an exterior door leading directly to the outside where the floor level is within:
    a. Two feet vertically of directly surrounding grade shall be allowed for children 2 ½ years or younger.
    b. Five feet vertically of directly surrounding grade shall be allowed for children more than 2 ½ and less than 5 years of age.
    c. Eight feet vertically of directly surrounding grade shall be allowed for children over 5 years of age and ambulatory adults.
3. Egress from the floor level to grade may be by stairs or ramps.
4. A floor level occupied for day care activities shall have 2 exits. Two exits may include one exit directly to grade or as provided in item #3 above with a second exit as an interior stair or ramp. Egress through a window shall not be accepted as an exit.
5. There shall be no dead-end corridors.
6. Gas-fired heating appliances must comply with the International Mechanical Code.
7. Existing partitions, walls and ceilings may be approved if the existing surface is of a fire-resistive material consisting of lath and plaster or gypsum board of at least ½ inch thickness.
8. Section 907.2.3 shall apply to all conversions. Residential type multiple single-station smoke detectors may be installed with field inspector approval. System type smoke detectors will require drawings signed and sealed by an electrical engineer.

9. Requirements of other City and State agencies must be complied with. When a conflict occurs between regulations of different agencies, the most restrictive will govern.

SECTION 307
HIGH-HAZARD GROUP H

[F] Table 307.1(1) Maximum allowable quantity per control area of hazardous materials posing a physical hazard is revised as follows (portions of table not shown do not change):

[F] TABLE 307.1(1)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, j, m, n, p]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[B]			USE-CLOSED SYSTEM[B]			USE-OPEN SYSTEM[B]	
			SOLID POUNDS (CUBIC FEET)	LIQUID GALLONS (POUNDS)	GAS CUBIC FEET AT NTP	SOLID POUNDS (CUBIC FEET)	LIQUID GALLONS (POUNDS)	GAS CUBIC FEET AT NTP	SOLID POUNDS (CUBIC FEET)	LIQUID GALLONS (POUNDS)
Combustible Dust	N/A	H-2	See Note Q	N/A	N/A	See Note Q	N/A	N/A	See Note Q	N/A

q. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with the Administration Section [IBC 414.1.3].

Section 307.4 High-hazard Group H-2 is amended by expanding the description of "Combustible dusts" as follows:

Combustible dusts, where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3

SECTION 308
INSTITUTIONAL GROUP I

Section 308.5.3 Conversion of existing buildings to small day care centers is added:

308.5.3 Conversion of existing buildings to small day care centers. See Section 305.3.

SECTION 310
RESIDENTIAL GROUP R

Section 310.3 Special provisions for residential personal care facility is added:

310.3 Special provisions for residential personal care facility. A Personal Care Facility may occupy Group I-1, Group R-3, or Group R-4 occupancies with the following provisions:

1. Type of Occupancies
   A. Group R-3 Home Occupancy: less than 3 occupants
   B. Group R-3 Personal Care Facility: from 3-5 occupants

      Group R-4 Personal Care Facility: from 6 to 16 occupants

      Group I-1 Personal Care Facility: more than 16 occupants

   Note: Above occupant load does not include the care provider.

2. Plans and permit shall indicate the maximum occupant load and for Personal Care Facilities indicate the evacuation capability classification.
3. Plans for the renovation of an existing building or the construction of a new building shall bear the seal and signature of the Architect or Engineer responsible for the design phases of the building. See Administration Section.
4. Personal Care Facility Provider shall:
   A. Develop a Facility Personal Care Plan, which specifically establishes the services to be provided to the residents (forms provided by the Agency).
   B. Establish an Evacuation Capability by using the "Facility and Resident Characteristics for Establishing Evacuation Capability" chart. The actual evacuation capability will be verified by the Fire Department after the building is occupied.

SECTION 312
UTILITY AND MISCELLANEOUS GROUP U

Section 312.2 Fences and retaining walls is added:

312.2 Fences and retaining walls.

312.2.1 General. This Section shall apply to all fences or walls in excess of 4 feet in height, all retaining walls in excess of 3 feet in height. For exempted work refer to the Administration Section.

312.2.2 Design. All fences, walls and retaining walls shall be designed in accordance with IBC Section 1807 and 1609.

[F] 312.2.3 Prohibition. The use of barbed wire or any other sharp-pointed material, devices or features that delover an electric shock, devices or features that deliver a physical or health hazard on, as or on top of, fences, walls, retaining walls, or similar barriers, regardless of height, is prohibited.

> **Exception:** Barbed wire may be installed where approved by the fire code official and a permit is obtained in accordance with the Administrative Section.

CHAPTER 4

SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

SECTION 402
COVERED MALL BUILDINGS

[F] Section 402.14.1 Fire command room in covered mall buildings is added:

[F] 402.14.1 Fire command room in covered mall buildings. A fire command room complying with IFCA Section 508.2 shall be provided in a location approved by the fire department for covered mall buildings exceeding 50,000 square feet in total floor area.

SECTION 403
HIGH-RISE BUILDINGS

[F] Section 403.4.1 Smoke detection is replaced in its entirety with the following:

[F] 403.4.1 Smoke detection. Smoke detection shall be provided in accordance with IFCA Section 907.2.13.1.

[F] Section 403.4.3 Emergency voice/alarm communication systems is replaced in its entirety with the following:

[F] 403.4.3 Emergency voice/alarm communication system. An emergency voice/alarm communication system shall be provided in accordance with the IFCA Section 907.6.2.2.

[F] Section 403.4.7.3 Fuel supply is added:

[F] 403.4.7.3 Fuel supply. An open-premises fuel supply, sufficient for not less than 8 hours full-demand operation of the system, shall be provided.

[F] Section 403.4.8.2 Fuel supply is added:

[F] 403.4.8.2 Fuel supply. An open-premises fuel supply, sufficient for not less than 8 hours full-demand operation of the system, shall be provided.

[F] Section 403.5.3 Stairway door operation is replaced with the following:

[F] 403.5.3 Stairway door operation. Locking of stairway doors shall be in accordance with IBCA Appendix L Access control systems.

[F] Section 403.5.7 Accessible means of egress and area of refuge is added:

[F] 403.5.7 Accessible means of egress and area of refuge. Accessible means of egress shall comply with this section. One accessible means of egress is required in buildings subject to the requirements of Section 403 and possessing hoistway pressurization conforming to the provisions of IFCA Section 909.21.4.2. Where the travel distance from any accessible space to the area of refuge exceeds the maximum travel distance permitted for the occupancy in accordance with Section 1016.1, additional areas of refuge shall be provided. Every required area of refuge shall be provided with direct access to an elevator complying with Section 1007.4. Where occupant evacuation elevators are provided in accordance with Section 403.6.2, areas of refuge shall be located at these elevators.

[F] 403.5.7.1 Group A, B, E and M occupancies. In Group A, B, E and M occupancies, an elevator complying with Section 1007.4 and an area of refuge/elevator lobby providing direct access to the elevator shall serve as the

accessible means of egress. The area of refuge shall be sized in accordance with Section 1007.6.1. Each area of refuge shall be separated from the remainder of the story by a smoke barrier complying with Section 710.

[F] 403.5.7.2 Group R1, R2 and I1 occupancies. In Group R1, R2, and I1 occupancies, an elevator complying with Section 1007.4, with a fire-resistive corridor providing direct access to the elevator from all dwelling units or sleeping units shall serve as the only required accessible means of egress. An enclosed elevator lobby is not required.

Section 403.5.8 Area of refuge/elevator lobby pressurization is added:

403.5.8 Area of refuge/elevator lobby pressurization. The area of refuge/elevator lobby shall be pressurized by the transfer of air from the pressurized hoist way through the leakage at the elevator doors.

Section 403.8 Area of refuge/elevator lobby pressurization is added:

403.8 Area of refuge/elevator lobby pressurization. The area of refuge/elevator lobby shall be pressurized by the transfer of air from the pressurized hoist way through the leakage at the elevator doors.

SECTION 405
UNDERGROUND BUILDINGS

Section 405.1 General is amended by adding Exception 7:

Exception:

7. High Rise buildings shall comply with Section 403.

SECTION 406
MOTOR-VEHICLE-RELATED OCCUPANCIES

[PW] 406.2.10 Motor vehicle exiting from parking facilities is added:

[PW] 406.2.10 Motor vehicle exiting from parking facilities. Where ramps are provided for motor vehicles to exit from a parking facility or from a private drive onto the public right of way, the ramps shall be sloped at 0.5% minimum to 2% maximum for a distance at least 20 feet inside of the building or property line. Vertical curves shall be used at all grade breaks.

Exception:

When alternate slopes are approved by the "Transportation, Engineering and Planning Division" of Public Works.

SECTION 411
SPECIAL AMUSEMENT BUILDINGS

[F] Section 411.6.1 Fire command room for special amusement buildings is added:

[F] 411.6.1 Fire Command room for special amusement buildings. A fire command room complying with IFCA 508.2 shall be provided in a location approved by the Fire Department.

SECTION 419 Live/work units is replaced in its entirety with the following:

SECTION 419
LIVE/WORK UNITS

419.1 General. A live/work unit is a *dwelling unit* or *sleeping unit* in which a significant portion of the space includes a non-residential use, which is operated, by the dwelling unit or sleeping unit occupant and shall comply with Section 419.

Exception:

Dwelling units or *sleeping units* which conform to the provisions of Section 59-89 of the Revised Municipal Code for the City and County of Denver shall be classified as a Home Occupancy, not a live/work unit.

419.1.1 Limitations. The following shall apply to all live/work areas:

1. The live/work unit is permitted to be a maximum of 3,000 square feet (479m^2).
2. The non-residential area is permitted to be a maximum of 50% of the area of each live/work unit; such area shall be further limited to maximum occupant load of 49 persons, as determined by dividing the floor area under consideration by the occupant-per-unit-area factor assigned to the occupancy set forth in Table 1004.1.1.
3. The non-residential area function shall be limited to the first or main floor only of the live/work unit.
4. Aggregate amount of flammable and combustible liquids within each live/work unit shall not exceed 10 gallons. All flammable and combustible liquids shall be stored in liquid storage cabinets in accordance with IFC Section 3404.3.2, the amount in use shall not exceed 1 gallon.
5. Aggregate amount of flammable gas including LPG within each live/work unit shall not exceed 1-one pound cylinder in use with 1-one pound cylinder in storage.
6. Outside storage of any flammable and combustible liquids and flammable gases is prohibited.

419.2 Occupancies. Live/work units shall be classified as a Group R-2 occupancy. Separation requirements found in Sections 420 and 508 shall not apply within the live/unit when it is in compliance with Section 419. Commercial activities shall be limited to the following:

Group B occupancies

Group M occupancies, except motor fuel-dispensing facilities

Group F occupancy custom manufacturing establishments primarily engaged in the on-site production of goods by hand manufacturing which involve only the use of hand tools or mechanical equipment not exceeding two (2) horsepower per piece of equipment not to exceed a total of six horsepower; or a single kiln not exceeding eight (8) kilowatts or the equivalent in a gas fired fixture.

Spray finishing operations shall be limited to those allowed by International Fire Code Section 1504.9.

The aggregate of area of non-residential storage in the live/work unit shall be limited to 10% of the space dedicated to non-residential activities.

419.3 Fire-resistance-rated construction. The fire-resistance rating required by Sections 709 and 712.3 between units shall be a minimum of 1-hour construction.

419.4 Vertical openings. Floor opening between floor levels of a live/work unit is permitted without enclosure.

419.5 Fire protection. The live/work unit shall be provided with a fire sprinkler system designed and installed in accordance with Section 903.3.1.1 or 903.3.1.2, as applicable, throughout the building.

An approved automatic fire detection system shall be installed in accordance with the provisions of this code and NFPA72 throughout the non-residential area. Fire alarm system shall be monitored by Class 1 Central Station per IFC 907. Residential portions shall be equipped single-or multiple-station smoke alarms shall be installed in all of the following locations:

1. In sleeping areas.
2. In every room in the path of the means of egress from the sleeping area to the door leading from the sleeping unit.
3. In each story within the sleeping unit, including basements. For sleeping units with split-levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

4. Power source shall be in accordance to IFC 907.2.11.4.
5. Interconnection of smoke detectors shall be in accordance to IFC 907.2.11.3.

   Notification appliances shall be installed throughout the live/work area in accordance with the provisions of this code and NFPA72 throughout.

   Devices, combinations of devices, appliances and equipment shall comply with Section 907.1.2.

419.6 Means of egress. Except as modified by this section, the provisions for Group R-2 occupancies in Chapter 10 shall apply to the entire live/work unit.

419.6.1 Means of egress doors serving the non-residential function area shall provide a floor or landing on each side of the door. Such floor or landing shall be at the same elevation on each side of the door.

419.6.2 Emergency escape and rescue openings shall be provided in the residential area in accordance with the provisions Section 1029. Section 1029.1, Exception No. 1 is not applicable to live/work units.

419.7 Accessibility. The applicable requirements of Chapter 11 shall apply to each area within the live/work unit.

419.8 Ventilation. The applicable requirements of the amended International Mechanical Code shall apply to each area within the live/work unit for the function within that space.

419.9 Structural. Floor loading for the areas within a live/work unit shall be designed to conform to Table 1607.1 based on the function within the space.

419.10 Electrical. The applicable requirements of Chapter 27 shall apply to each area within the live/work unit

419.11 Plumbing. The applicable requirements of the amended International Plumbing Code shall apply to each area within the live/work unit for the function within that space. The non-residential use portion of the live/work unit is not considered to be a Group R occupancy for the purpose of applying the provisions of amended IBC Section 2902.7.

CHAPTER 5
GENERAL BUILDING HEIGHTS AND AREAS

SECTION 507
UNLIMITED AREA BUILDINGS

[EB] Section 507.13 Existing buildings is added:

[EB] 507.13 Existing buildings. Any building constructed prior to March 26, 1994 and meeting the requirements of one of the categories in Table 507.12 is allowed to retain its existing area, provided the existing area does not exceed the allowable area of the code under which it was last certified for occupancy, including all applicable Modifications Under Special Circumstances and retrofit ordinances. Building additions shall satisfy the current code and Table 507.13.

TABLE 507.13
EXISTING BUILDING UNLIMITED AREA ADDITIONS

Category	Occupancy Group	Maximum No. of Stories	Type of Construction	Auto Sprinkler Throughout	Minimum Open Space*
1	B, F, M, S	1	ALL	YES	20’
2	F2, S-2	1	II, III-A	NR	40’
NOTE:	NR = NOT REQUIRED * = ENTIRELY SURROUNDED AND ADJOINED BY PUBLIC WAYS OR YARDS NOT LESS THAN DISTANCE INDICATED. ADDITIONAL OPEN SPACE MAY BE REQUIRED FOR FIRE DEPARTMENT ACCESS, SEE *FIRE CODE.*				

CHAPTER 7
FIRE AND SMOKE PROTECTION FEATURES

SECTION 705
EXTERIOR WALLS

Section 705.2 Projections is replaced in its entirety with the following:

705.2 Projections. Cornices, eave overhangs, exterior balconies and similar cantilevered or wall hung projections extending beyond the floor area shall conform to the requirements of this section and Section 1406. Exterior egress balconies and exterior exit stairways shall also comply with Sections 1014.5 and 1023.1, respectively. The distance from exterior edges of projections to the closest interior lot line or to an imaginary line between two buildings on the property shall not be less than four feet (1220 mm).

705.2.1 Type I and II construction. Projections from walls of Type I or II construction shall be of noncombustible materials or combustible materials as allowed by Sections 1406.3 and 1406.4.

705.2.2 Type III, IV or V construction. Projections from walls of Type III, IV or V construction shall be of any approved material.

705.2.3 Combustible projections. Combustible projections located where the distance from the exterior edges of projection to the closest interior lot line or to an imaginary line between two buildings on the property is less than 6 feet (1830 mm) shall be of at least 1-hour fire-resistance-rated construction, Type IV construction, fire-retardant-treated wood or as required by Section 1406.3.

Exceptions:

Type V construction shall be allowed for R-3 occupancies.

In buildings required by this Section to have fire resistance rated roof assemblies, vent openings in the bottom membrane of fire-resistance rated roof overhangs are permitted when buildings are protected by an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

705.2.4 Noncombustible projections. Noncombustible projections shall not be required to have a fire-resistance-rating.

Table 705.8 Maximum area of exterior wall openings based on fire separation distance and degree of opening protection is replaced in its entirety with the following:

TABLE 705.8

MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED ON FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION

FIRE SEPARATION DISTANCE (feet)	DEGREE OF OPENING PROTECTION AND SPRINKLERING	ALLOWABLE AREA[a]

No change to the table

P, NS = Openings protected with an opening protective assembly in accordance with Section 705.8.2 in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

P, S = Openings protected with an opening protective assembly in accordance with Section 705.8.2 in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

j. allowable area may be increased to 50% where openings are protected with water curtains designed to distribute 3 gpm per linear foot of wall opening with sprinklers placed at the ceiling 6 to 12 inches from the wall and 6 feet on center; see NFPA 13 "Water Curtains" for design requirements

Section 705.8.1 Allowable area of openings is amended by adding the following sentence to the end of the paragraph:

The provisions of this section are applicable to exterior wall openings with or without windows, to duct openings and to air transfer openings.

Section 705.8.2 Projected openings is amended by replacing the Exception in its entirety:

Exception:

Opening protectives are not required where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or Section 903.3.1.2 and the exterior openings are protected by a water curtain using automatic sprinklers *approved* for that use.

Section 705.10 Ducts and air transfer openings is amended by adding Exception 2.

Exceptions:

2. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

SECTION 708
SHAFT ENCLOSURES

Section 708.2 Shaft enclosure required is amended by replacing the last sentence of Exception 2.1 with the following:

In other than Group B and M occupancies this application is limited to escalator openings that do not connect more than four stories. Stairway openings, in buildings without smoke control capabilities, are limited to openings that do not connect more than three stories. For buildings with smoke control capabilities, this application is limited to openings that do not connect more than four stories. The smoke control capabilities shall comply with DBCA, IFC, Section 909. In addition, smoke detectors shall be located adjacent to the floor side of the openings. The smoke control system for the openings shall be subject to field testing.

Section 708.4 Fire resistance rating is amended by adding the following Exception:

Exception:

Shaft enclosures for piping, ducts and vents may be of one hour fire-rated construction in buildings of four stories or more and of Construction Types of IIA, IIB, IIIA, VA.

Section 708.5 Continuity is amended by adding the following Exception:

Exception:

Shaft enclosures for piping, ducts and vents in Construction Types of IIB, IIIB and VB may be supported on non fire-rated assemblies.

Section 708.14.1 Elevator lobby is amended by replacing Exception 6 in its entirety with the following:

Exceptions:

6. Enclosed elevator lobbies are not required in non high-rise buildings where the elevator is pressurized in accordance with IBCA Section 708.14.2.1. Elevator lobbies in high-rise buildings shall comply with IBCA Section 403.15 and 403.16.

Section 708.14.2 Enclosed elevator lobby pressurization alternative is amended by replacing the title of the section with the following:

708.14.2 Enclosed elevator lobby pressurization alternative for non-high-rise building. Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies, the pressurization system shall comply with this section.

Section 708.14.2.1 Pressurization requirements for non high rise buildings is replaced in its entirety with the following:

708.14.2.1 Pressurization for non high rise buildings. Elevator hoist ways shall be pressurized to maintain a minimum positive pressure of 0.05 inches of water column with respect to the adjacent spaces on all floors with the HVAC system off. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of ten (10) feet from any air exhaust system or outlet.

SECTION 716
DUCTS AND AIR TRANSFER OPENINGS

716.5.3 Shaft enclosures is amended by deleting Exception 1.3 and Exception 4 to comply with IFCA Section 909.

CHAPTER 9
FIRE PROTECTION SYSTEMS

Other Amendments to this chapter are located in Chapter 9 of the Amendments of the International Fire Code.

SECTION 909
SMOKE CONTROL SYSTEMS

Section 909.20 Smokeproof enclosures is amended by replacing the first paragraph with the following:

Where required by Section 1022.9, a smokeproof enclosure shall be constructed in accordance with this section. A smokeproof enclosure shall consist of an enclosed interior exit stair that conforms to Section 1022.1 with either a natural ventilated outside balcony, or be pressurized in accordance with DBC Section 909.21. Where access to the roof is required by the IFC, such access shall be from the smokeproof enclosure where a smokeproof enclosure is required.

Section 909.20.1 Access is deleted in its entirety.

Section 909.20.2 Construction is amended by replacing the first paragraph with the following:

Smokeproof vertical exit enclosures shall be separated from the remainder of the the building by not less than a 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 712, or both. Openings are not permitted other than the required *means of egress* doors. The open exterior balcony shall be constructed in accordance with the *fire-resistance-rating* requirements for floor assemblies.

Section 909.20.2.1 Door closers is amended by replacing the first paragraph with the following:

Doors in a smokeproof enclosure shall be self- or automatic closing by actuation of a smoke detector installed at the floor-side entrance to the smokeproof enclosure. The actuation of the smoke detector on any door shall activate the closing devices on all doors in the smokeproof enclosure at all levels. Smoke detectors shall be installed in accordance with Section 907.3.

Section 909.20.4 Mechanical ventilation alternative and its subsections are deleted in their entirety.

Section 909.20.5 Stair pressurization alternative is amended by replacing the first paragraph with the following:

Stairway pressurization shall comply with IFCA Section 909.21.4.

Section 909.20.6 Ventilating equipment and its subsections are deleted in their entirety.

CHAPTER 10
MEANS OF EGRESS

SECTION 1004
OCCUPANT LOAD

Section 1004.1.1 Areas without fixed seating is amended by replacing the Exception with the following:

Exception:

Where approved by the building and fire code officials, the actual number of occupants for whom each occupied space, floor or building is designed, although less than those determined by calculation, shall be permitted to be used in the determination of the design occupant load.

SECTION 1005
EGRESS WIDTH

Section 1005.1 Minimum required egress width is amended by adding Exception 2:

Excptions:

2. The total width of the means of egress serving H1, H2, H3 and H4 occupancies shall not be less than the total occupant load served by the means of egress multiplied by 0.7 inches (17.8 mm) per occupant for stairways and by 0.4 inches (10.2 mm) per occupant for other egress components.

SECTION 1007
ACCESSIBLE MEANS OF EGRESS

Section 1007.1 Accessible means of egress required is amended by adding the following sentence to the end of the first paragraph and replacing Exception 1 with the following:

Buildings required to comply with Section 403 of the International Building Code shall be provided with accessible means of egress in accordance with IBCA Section 403.5.

Exceptions:

1. Accessible means of egress are not required in alterations to existing buildings that were not required to provide an accessible means of egress under one or more of the following:

    a. the building and fire codes in effect when the building was reviewed and permitted for construction;
    b. the building and fire codes in effect when the building was last certified for occupancy;
    c. all applicable retrofit ordinances;
    d. modification under the Administration Section.

Section 1007.6.2 Separation is replaced in its entirety with the following:

1007.6.2 Separation. In buildings not required to comply with Section 403 or 405, elevator lobby areas of refuge shall be enclosed by smoke barriers in accordance with IFCA Section 909.5. Openings in the elevator shaft enclosure other than those directly serving an area of refuge, shall be protected from the intrusion of smoke in accordance with IFCA Section 909.5.2. Loss of power to, or the actuation of, any fire detection or suppression device on any level shall cause the closure of all automatic opening protectives in the enclosures of all areas of refuge and the elevator shafts serving them, except the shaft enclosure doors at the level of exit discharge.

Exception: *Areas of refuge* located within an *exit enclosure*.

Section 1007.8.1 System requirements is replaced in its entirety with the following:

1007.8.1 System requirements. Two way communication systems shall provide communication between each required location and a master control station.

A master control station shall be installed in the Fire Command Center (FCC) or Fire Command Room (FCR) if either is provided, and one additional master control station may be installed at an approved location (see IFCA Sections 508.1 and 508.2). Required master control station features shall be provided at all master control stations. Required master control station functionality shall be provided simultaneously at all master control stations. The master control station in the FCC or FCR shall override the master control station at the additional approved location.

A call for assistance shall be directed to the master control station and answered by authorized personnel who can take appropriate action. It shall not be transmitted to an automated answering system. When the approved location is not continuously staffed by such authorized personnel, the call shall be redirected automatically within 30 seconds to a listed central supervising station where monitoring personnel shall initiate the appropriate response, or to 911 if the building does not have a monitored fire alarm system.

The means of two-way communication shall override communication outside the building. The means of two-way communication shall be discontinued only when the authorized or emergency personnel terminate the call.

The master control station shall be capable of receiving and queuing calls from all required locations. Authorized personnel shall be provided with the capability of placing calls on hold without disconnecting them, to selectively reconnect to any held call, and to selectively initiate contact with any required location with calls on hold.

The means of two-way communication shall be monitored for integrity and annunciated per NFPA 72 (see 2007 NFPA 72 Section 4.4.7; the means of two-way communication shall not be considered "supplementary".

The means of two-way communication shall comply with the following requirements:

1. The user interface at the required locations must be accessible and usable by people with disabilities. Clearance, location, protrusion, labeling, signage and operability of the user interface shall comply with ANSI A117.1

2. A push button to activate the means of two-way communication shall be provided at the required location. The button shall be visible and permanently identified as "HELP" on or adjacent to the button.

3. Tactile and Braille operating instructions shall be incorporated with or adjacent to the "HELP" button.

4. When the button is pushed, the means of two-way communication shall initiate a call for assistance at the master control station. A visual indication shall be provided on or adjacent to the "HELP" button, and an audible signal shall be provided to acknowledge successful initiation. The visual indication shall remain activated until two-way voice communication is established.

5. The means of two-way communication shall automatically provide at the master control station audible and visual indication assistance is required, and identify the location within the building of the actuated user interface.

6. Audible and visual indications shall be provided at the required location to acknowledge two-way communication has been established. The visual indicator shall be located on or adjacent to the "HELP" button. After the call acknowledgement signals are sent, two-way voice communication shall be established without any intentional delay or required intervention by a person at the required location. The visual indication shall be deactivated only when the two-way voice communication is terminated.

7. The means of two-way communication shall be connected to a source of, or automatically transferred to an alternate (standby, emergency, etc.) source of power capable of providing for the required functionality for a minimum of four hours when the normal power supply fails.

SECTION 1008
DOORS GATES AND TURNSTILES

Section 1008.1.4.4 Access-controlled egress doors are addressed by Appendix L, Access Control Systems.

Section 1008.1.9.7 Delayed egress locks is deleted in its entirety and are addressed by Appendix L, Access Control Systems.

Section 1008.1.9.8 Electromagnetically locked egress doors is deleted in it's entirety and are addressed by Appendix L, Access Control Systems.

Section 1008.1.9.10 Stairway doors is deleted in its entirety and addressed by Appendix L, Access Control Systems.

SECTION 1009
STAIRWAYS

Section 1009.13.1 Roof access is amended by deleting the Exception.

Section 1009.13.3 Roof hatches is added:

Section 1009.13.3 Roof hatches. All required interior stair enclosures that extend to the roof shall have, at the highest point of the enclosure, an approved roof hatch openable to the exterior (also see IFCA Section 504.4). The hatch shall be a minimum of 16 square feet (1.5 m^2) in area with a minimum dimension of 2 feet (610 mm).

Exceptions:

1. Roof hatches are not required on pressurized stair enclosures.
2. Roof hatches are not required on stair enclosures provided with a penthouse complying with Section 1509.2.

SECTION 1011
EXIT SIGNS

Section 1011.2 Illumination is replaced in its entirety with the following:

1011.2 Illumination. Exit signs shall be electrically- powered and internally illuminated.

Exceptions:

1. Tactile signs required by Section 1011.3 need not be provided with illumination.
2. Edge-illuminated signs are permitted where listed and labeled in accordance with UL 924.

Section 1011.4.1 Graphics is added:

1011.4.1 Graphics. Exit signs shall have green lettering on a contrasting field, or white lettering on a green field.

Section 1011.5 Externally illuminated exit signs is deleted in its entirety.

SECTION 1017
AISLES

Section 1017.2 Aisles in group B,F, M and S is replaced in its entirety with the following:

1017.2 Aisles in groups B, F, M and S. In Group B, F, M and S occupancies, the minimum clear aisle width shall be determined by Section 1005.1 for the occupant load served, but shall not be less than 36 inches (914 mm).

Exceptions:

1. Non public aisles serving less than 50 people and not required to be handicap accessible shall not be less than 28 inches (711 mm) in width.
2. High-piled combustible storage areas shall comply with the applicable provisions of Chapter 23 of the Fire Code.

SECTION 1018
CORRIDORS

Section 1018.1 Construction is amended by replacing Exception 4 in its entirety and by adding the following sentence to Exception 5:

Exceptions:

4. Corridor walls and ceilings need not be of fire-resistive construction within single-tenant office spaces.
5. Corridor walls and ceilings need not be of fire-resistive construction when serving a conference or assembly room having an occupant load of less than 100 located within an single-tenant office space.

SECTION 1022
EXIT ENCLOSURES

Section 1022.9 Smoke proof enclosures and pressurized stairways is amended by adding a reference to IFCA Section 909.20:

1022.9 Smokeproof enclosures and pressurized stairways. In buildings required to comply with Section 403 or 405, each of the *exit enclosures* serving a *story* with a floor surface located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access or more than 30 feet (9144 mm) below the finish floor of a *level of exit discharge* serving such stories shall be a *smokeproof enclosure* or pressurized *stairway* in accordance with IFCA Section 909.20.

Section 1022.9.2 Enclosure access is deleted in its entirety.

SECTION 1028
ASSEMBLY

[F] Section 1028.12 Seat stability is replaced in its entirety with the following:

[F] 1028.12 Seat stability. In places of assembly, the seats shall be securely fastened to the floor.

Exceptions:

1. Seats are not required to be fastened to the floor in places of assembly or portions thereof:
   - with 100 or fewer seats, and
   - with an actual net area per occupant greater than or equal to 7 sq. ft., and
   - without ramped or tiered floors for seating.
2. Seats are not required to be fastened to the floor in places of assembly or portions thereof:
   - with 100 or fewer seats, and
   - with an actual net area per occupant greater than or equal to 7 sq. ft., and
   - with ramped or tiered floors for seating, and
   - where plans showing seating, tiers and aisles were submitted to, reviewed and permitted by the Fire Code Official.
3. Seats are not required to be fastened to the floor in places of assembly or portions thereof:
   - with more than 100 and fewer than 200 seats, and
   - with an actual net area per occupant greater than or equal to 7 sq. ft., and
   - without ramped or tiered floors for seating, and
   - with seats fastened together in groups of five or more.

4. Seats are not required to be fastened to the floor in places of assembly or portions thereof:

    - with seating at tables, and
    - with an actual net area per occupant greater than or equal to 15 sq. ft., and
    - without ramped or tiered floors for seating.

5. Groups of seats are not required to be fastened to the floor in places of assembly or portions thereof:

    - with 14 or fewer seats per group, and
    - with an actual net area per occupant greater than or equal to 7 sq. ft., and
    - without ramped or tiered floors for seating, and
    - groups are separated from other seating by railings, guards, partial height walls or similar barriers.

6. Seats intended for musicians or other performers and separated by railings, guards, partial height walls or similar barriers shall not be required to be fastened to the floor.

7. In special events permitted by IFCA Section 105.6, loose seats, folding chairs or similar seating facilities that are not fixed to the floor shall be securely fastened together in groups of five or more.

8. All accessible and companion seating as required by currently adopted A117.1 Chapter 8.

CHAPTER 11
ACCESSIBILITY

SECTION 1101
GENERAL

Section 1101.1 Scope is amended by adding the following sentences to the end of the paragraph:

In addition to the requirements of this chapter, the provisions of Title 9, Article 5, Colorado Revised Statutes, as amended, Standards for Accessible Housing, shall be enforced by this Code. Title 9, Article 5, C.R.S. as amended is reproduced in Appendix M of this Code for reference.

Section 1101.3 Notice and warning is added:

1101.3 Notice and warning. Although the Code enforces the provisions of Title 9, Article 5, C.R.S., as amended, as set out in Section 1101.1 above, the Code has not been certified or otherwise conformed by the U.S. Government or State of Colorado to the requirements or the Americans with Disabilities Act ("ADA") the Rehabilitation Act, the HUD Fair Housing Act or any other State of Colorado accessibility laws, including but not limited to the Colorado Anti-Discrimination Act ("CADA").

Therefore, compliance with the Code does not assure compliance with Titles II or III of the ADA, the Rehabilitation Act, the HUD Fair Housing Act or any other Federal or State laws, except as provided in Section 1101.1 above, or any regulations or guidelines enacted or promulgated with respect to such laws. The City and County of Denver is not responsible for enforcement of the ADA, Rehabilitation Act, HUD Fair Housing Act or such other Federal or State laws, except as provided in Section 1101.1 above.

Building plans submitted under this Code will be reviewed and inspected for compliance with the Code and will not be reviewed or inspected for compliance with the requirements of the ADA, Rehabilitation Act, HUD Fair Housing Act or other Federal or State laws, except as provided in Section 1101.1 above. Therefore, it is the sole responsibility of the developer or building owner to have their plans or facilities independently evaluated by knowledgeable professionals in order to comply with the applicable requirements of the above-listed laws.

Any modification to a building will require a building permit.

CHAPTER 15
ROOF ASSEMBLIES AND ROOFTOP STRUCTURES

SECTION 1507
REQUIREMENTS FOR ROOF COVERINGS

Section 1507.6.2 Deck slope is replaced in its entirety with the following:

1507.6.2 Deck slope. Mineral surfaced rolled roofing (90 lbs.) shall not be applied on roof slopes below two units vertical in twelve units horizontal.

Exception:

Detached garages, patios and carports open on three sides may have a slope of one unit vertical in twelve units horizontal.

Section 1507.10.3 Flashing for interior roof drains is added:

1507.10.3 Flashing for interior roof drains. Flashing for interior roof drains shall be one of the following:

A minimum of 2 x 2 feet, 4-pound lead sheet or lead-copper coated sheet, set on completed felts in flashing cement.

The metal shall be turned a minimum of ½ inch into a drain sump and plied with 2 plies of type 4 felt or modified bitumen membrane of sufficient dimension to extend a minimum of 6 inches past metal sheet.

A 2-component drain system. The membrane flashing shall be polyvinylchloride sheet measuring 22 inches in length and factory attached to the underside of the strainer flange. The membrane flashing shall be applied on top of the completed felt and shall extend a minimum of 6 inches from the outside diameter of the drain throat, shall be set into hot asphalt or approved sealants and plied in with 2 plies of type 4 felt.

Drain details for single-ply systems shall be per manufacturers' specifications.

Section 1507.10.4 Flashing – new built-up roof covering is added:

1507.10.4 Flashing – new built-up roof covering. Flashing shall be installed on all vertical walls and curbs in accordance with the manufacturers' specifications or as follows:

1. All flashing surfaces shall be primed.
2. All flashing shall extend at least 8 inches, but not more than 12 inches, up all vertical surfaces and at least 4 inches out from base of cant or at intervals specified by manufacturer.
3. The top edges of the flashing shall be fastened at 3-inch intervals and sealed with plastic cement.
4. All vertical walls and projections shall be counter-flashed with a 2-piece metal system installed watertight.
5. Nailer strips shall be provided on vertical walls, drips in edge and curbs which will not accept conventional nailing.

Section 1507.10.5 Stucco is added:

1507.10.5 Stucco. Stucco on walls extending above the roof shall terminate a minimum of 2 inches above the finished roofing of a flat roof and 2 inches above shingle, shake and tile roofs.

Section 1507.10.6 Drainage testing is added:

1507.10.6 Drainage testing. Positive drainage shall be required. Approval drainage test shall pass when "no-standing" water remains on the roof after 72 hours with an average temperature of 70 degrees.

SECTION 1510
REROOFING

Section 1510.7 Reroofing of built-up roofs is added:

1510.7 Reroofing of built-up roofs. Pre-roofing inspection shall be made by this Agency for all commercial built-up and single ply systems to verify that the existing roof meets the following conditions:

The existing roof deck is structurally sound.

The roof drains and roof drainage are sufficient to prevent the ponding of water.

The existing roofing is secured to the existing roof deck.

The existing insulation is not wet (a 3rd party moisture scan may be required).

The fire-retardant classification of the roof shall be maintained.

CHAPTER 16
STRUCTURAL DESIGN

SECTION 1607
LIVE LOADS

Section 1607.14 Fire truck loading is added:

1607.14 Fire truck loading. Where fire department access requires travel over or loading of a structure by fire department vehicles, the structure shall be analyzed for the three load cases for each of the two vehicle types indicated below. Structural members shall be designed for the most severe case. The fire vehicle geometries are shown in Figures 1607.14 (1) and (2).

Platform Truck – Figure 1607.14 (1)

Basic Load Case:

The front axle load shall be 22,800 pounds (11,400 pounds per tire) with a tire contact area of 12 in. x 13 in. The load on each rear axle shall be 27,000 pounds (13,500 pounds per tire) with a tire contact area of 14 in. x 16 in. Impact and longitudinal forces imparted by the vehicle loads shall be in accordance with the latest edition of AASHTO standards.

Static Load Case A:

A load of 38,500 pounds on one outrigger. The contact area of each outrigger is 24 in. x 24 in. The load is to be located so as to produce the maximum stress in the member(s) being analyzed when applied according to the geometry of Figure 1607.14. (1).

Static Load Case B:

A load of 30,000 pounds on each of two adjacent outriggers (total load is 60,000 pounds). The contact area of each outrigger is 24 in. x 24 in. The load is to be located so as to produce the maximum stress in the member(s) being analyzed when applied according to the geometry of Figure 1607.14. (1).

Ladder Truck – Figure 1607.14 (2)

Basic Load Case:

The front axle load shall be 22,800 pounds (11,400 pounds per tire) with a tire contact area of 12 in. x 13 in. The load on the rear axle shall be 31,000 pounds (15,500 pounds per tire) with a tire contact area of 14 in. x 16 in. Impact and longitudinal forces imparted by the vehicle loads shall be in accordance with the latest edition of AASHTO standards.

Static Load Case A:

A load of 29,000 pounds on one outrigger. The contact area of each outrigger is 24 in. x 24 in. The load is to be located so as to produce the maximum stress in the member(s) being analyzed when applied according to the geometry of Figure 1607.14.(2).

Static Load Case B:

A load of 20,000 pounds on each of two adjacent outriggers (total load is 40,000 pounds). The contact area of each outrigger is 24 in. x 24 in. The load is to be located so as to produce the maximum stress in the member(s) being analyzed when applied according to the geometry of Figure 1607.14.(2)

The Fire Prevention and Investigation Division shall determine the area around any building or structure for which fire access and, therefore, the provisions of this section are required.

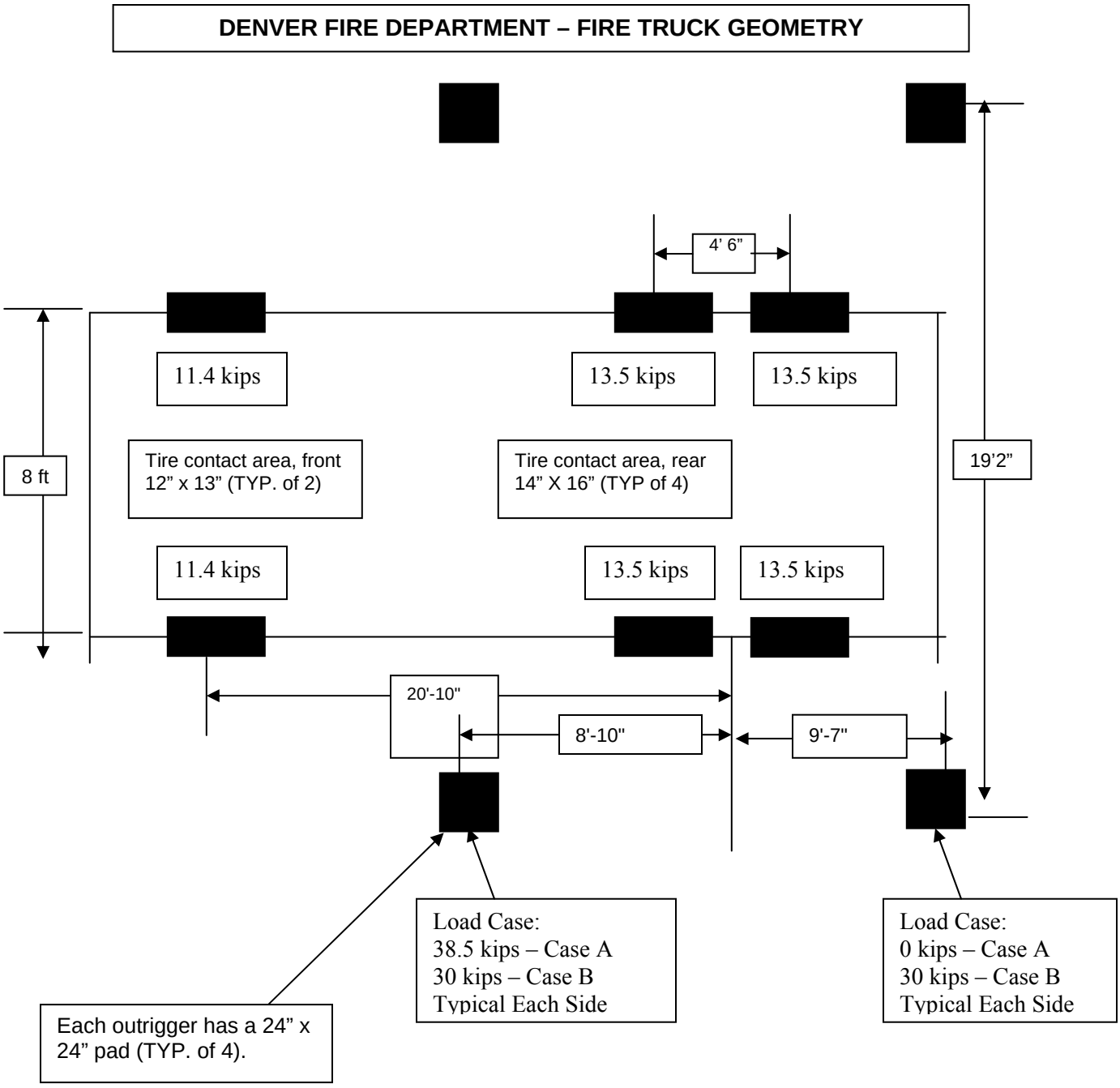

FIGURE 1607.14 (1) – PLATFORM TRUCK

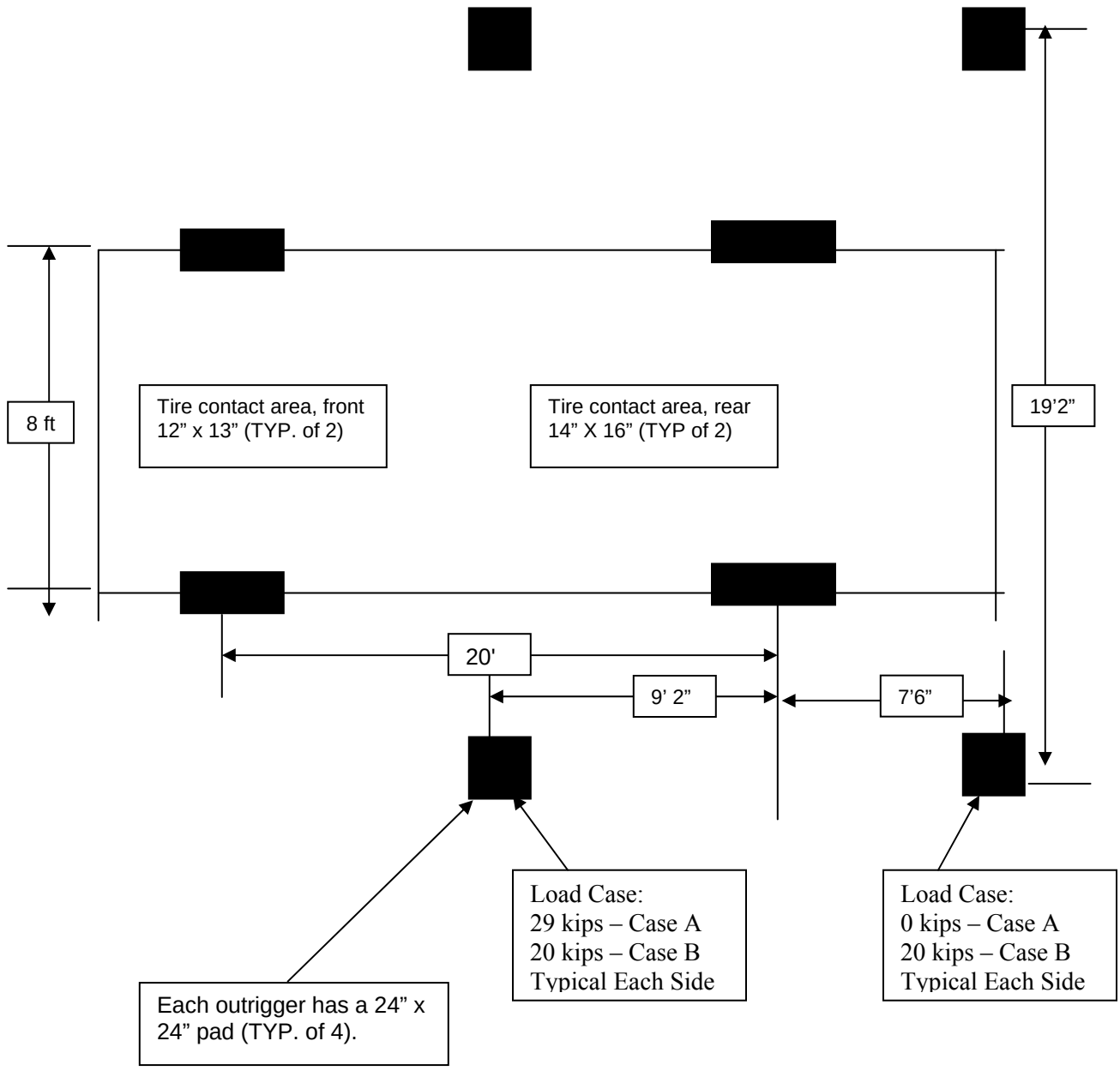

FIGURE 1607.14 (2) – LADDER TRUCK

SECTION 1608
SNOW LOADS

Section 1608.1 General is replaced in its entirety with the following:

1608.1 General. Design snow loads shall be determined using whichever of the following criteria produces the largest stress in the member(s) being designed.

1608.1.1 Criteria 1. Design snow loads, including drifting and unbalanced snow loads, shall be determined in accordance with Section 7 of ASCE 7, Minimum Design Loads for Buildings and Other Structures.

1608.1.2 Criteria 2. Neglecting drifting, unbalanced loadings, and snow load importance factors, a uniformly applied roof snow load (p_f or p_s) shall be:

A uniformly applied load on the entire exposed area of 30 pounds per square foot for all structures in the occupancy Categories III and IV of Table 1604.5.

A uniformly applied load on the entire exposed area of 25 pounds per square foot for all other structures.

Roofs used for parking of passenger vehicles shall be designed for a total non-reducible uniform load of 55 psf. This load need not be combined with other snow loads or other live loads applied to the roof.

Section 1608.2 Ground snow loads is replaced in its entirety with the following:

1608.2 Ground snow loads. Ground snow load for use with the procedures of ASCE 7 shall be 25 pounds per square foot.

Section 1608.3 Snow load importance factor is added:

1608.3 Snow load importance factor. The values for the snow load importance factor I, in Table 7-4 of ASCE 7 shall be amended as follows:

Category III.....1.2
Category IV.....1.4

Section 1608.4 Rain-on-snow surcharge load is added:

1608.4 Rain-on-snow surcharge load. Need not be considered.

Section 1608.5 Additional criteria is added:

1608.5 Additional criteria. Snow loads are not to be considered as reducible live loads.

SECTION 1609
WIND LOADS

Section 1609.1.1.3 Reduction for air density is added:

1609.1.1.3 Reduction for air density. In calculating velocity pressures using Eq. 6-15 in ASCE 7, the numerical constant, 0.00256, may be reduced to account for air density. Any reduction shall comply with ASCE 7, Section C6.5.10, but in no case shall the reduction in the numerical constant exceed fifteen percent.

Section 1609.3 Basic wind speed is replaced in its entirety with the following:

1609.3 Basic wind speed. The basic wind speed, to be used in the provisions of ASCE 7, shall be 90 miles per hour ($V_{3s,}$ three second gust) for all areas in the City and County of Denver located east of a line defined as the centerline of Federal Boulevard. For areas located west of the centerline of Federal Boulevard, the basic wind speed (V_{3s}, three second gust) shall be interpolated between the contours as defined in the report titled "Colorado Front Range Gust Map" dated February 28, 2006, in which the 90 mph contour is located along the centerline of Federal Boulevard, the 100 mph contour is located along the centerline of Sheridan Boulevard, and the 110 mph contour is located along the centerline of Kipling Boulevard. The centerlines of Federal Boulevard, Sheridan Boulevard, and Kipling Boulevard, are assumed to be projected to the north and south boundaries of the City and County of Denver.[1]

SECTION 1612
FLOOD LOAD

Section 1612.3 Establishment of flood hazard areas is replaced with the following (subordinate sections to remain):

1612.3 Establishment of flood hazard areas. To establish *flood hazard areas*, the City and County of Denver uses the Federal Emergency Management Agency engineering report entitled "The Flood Insurance Study for the City and County of Denver," dated November 17, 2005, as amended or revised with the accompanying Flood Insurance Rate Map (FIRM) and Flood Boundary and Floodway Map (FBRM) and related supporting data along with any revisions thereto. Contact the current Flood Plan Manager for the City and County of Denver for the latest revisions to the Flood Insurance Study. The adopted flood hazard map and supporting data are hereby adopted by reference and declared to be part of this section.

SECTION 1613
EARTHQUAKE LOADS

Section 1613.5.2 Site class definition is replaced in its entirety with the following:

1613.5.2 Site class definition. Based on the site class properties, the site shall be classified as either Site Class A, B, C, D, E, or F in accordance with Table 1613.5.2. Any assignment of site class NOT based on soil shear wave velocity, measured for the top 100 feet of the soil profile, shall comply with the following limitations:

No site shall be assigned as Site Class A, B, or C when bedrock has an overburden depth greater than 15 feet, as measured from the top of bedrock to the finished grade.

No site shall be assigned as Site Class A or B when bedrock has an overburden depth less than or equal to 15 feet, as measured from the top of bedrock to the finished grade.

When the soil properties are not known in sufficient detail to determine the site class, Site Class D shall be used unless the building official or geotechnical data determines that Site Class E or F soil is likely to be present at the site.

Section 1613.5.6.3 Seismic design category, minimum is added:

1613.5.6.3 Seismic design category, minimum. All buildings and structures in the City and County of Denver shall satisfy the requirements of seismic design category B, as a minimum.

CHAPTER 17
STRUCTURAL TESTS AND SPECIAL INSPECTIONS

SECTION 1704
SPECIAL INSPECTIONS

Section 1704.1 General and Section 1704.1.1 Statement of special inspections are amended by replacing the reference to the Administration Section.

CHAPTER 18
SOILS AND FOUNDATIONS

SECTION 1809
SHALLOW FOUNDATIONS

Section 1809.5 Frost protection is amended by adding the following sentence:

The frost line for the City and County of Denver is to be 36 inches (915 mm) below the finished grade.

SECTION 1810
CAST-IN-PLACE CONCRETE PILE FOUNDATIONS

Section 1810.3.5.2.2 Uncased is replaced with the following (Exception to remain):

1810.3.5.2.2 Uncased. The element length shall not exceed 30 times the average diameter.

CHAPTER 27
ELECTRICAL

SECTION 2700
GENERAL - DENVER

Sections 2700.1 Electrical code references is added:

2700.1 Electrical code references. All references in this Code to the "ICC Electrical Code" are changed to the "Electrical Code as adopted by the State of Colorado".

Section 2700.2 Service masts is added:

2700.2 Service masts. Where a mast is required to maintain the overhead conductor height required by the Electrical Code, the mast shall be a minimum of 2 inch Rigid Metal Conduit or 2 inch Intermediate Metal Conduit. All masts over 48 inches in height shall be appropriately guyed to counter stresses from the service drop.

CHAPTER 29
PLUMBING SYSTEMS

[P] SECTION 2902
MINIMUM PLUMBING FACILITIES

Section 2902.1 Minimum number of fixtures is replaced in its entirety with the following:

2902.1 Minimum number of fixtures. Plumbing fixtures shall be provided for the type of occupancy and in the minimum number shown in Table 2902.1. Type of occupancies not shown in Table 2902.1 shall be considered individually by the Code Official. The number of occupants shall be determined by the International Building Code, Table 1004.1.1. Occupancy classification shall be determined in accordance with the International Building Code.

[EH] Sections 2902.5 Access is added:

[EH] 2902.5 Access. Access to toilet rooms shall not be through food preparation areas, food storage, or ware washing or utensil storage areas, except for toilet room facilities provided exclusively for the use of employees in the food preparation area.

[EH] Section 2902.6 Toilet room accessories is added:

[EH] 2902.6 Toilet room accessories. A minimum of one hand-drying facility shall be provided in each toilet room where lavatories are provided.

[EH] Section 2902.7 Location of service sinks is added:

[EH] 2902.7 Location of service sinks. Except for Group R occupancies, service sinks are required on each floor where toilet facilities are required.

Section 2902.8 Restaurants is added:

2902.8 Restaurants.

1. The number of occupants for a drive-in restaurant or drive-in theater shall be considered as equal to twice the number parking stalls.
2. Employee toilet facilities are not to be included in the above restaurant requirements.

CHAPTER 30
ELEVATORS AND CONVEYING SYSTEMS

SECTION 3001
GENERAL

Section 3001.1 Scope is replaced in its entirety with the following:

3001.1 Scope. The State of Colorado has created regulations to establish rules for the design, installation, registration, construction, operation, maintenance, and inspection of conveyances, and for the licensing of conveyance mechanics, contractors, and inspectors pursuant to the Elevator and Escalator Certification Act, Title 9 Article 5.5 Sections 1 through 7 of the Colorado Revised Statutes (C.R.S). The Conveyance Regulations apply to all conveyances, as defined in § 9-5.5-103 C.R.S, listed below.

(1) Hoisting and lowering mechanisms equipped with a car or platform that moves between two or more landings. Such equipment includes, but is not limited to:

(a) Elevator
(b) Platform lift
(c) Personnel hoist
(d) Stairway chair lift
(e) Dumbwaiter

(2) Power-driven stairways and walkways for carrying persons between landings. Such equipment includes, but is not limited to:

(a) Escalator
(b) Moving walk

(3) Automated People Movers (APM) as defined in ASCE 21.

A conveyance shall not be erected, constructed, or installed within a building or structure unless a notice has been sent to the Director of the State of Colorado Division of Oil and Public Safety or the Director's designee. (the "Administrator") and the Administrator has approved the construction. The notice shall include the construction plans and shall be sent at least thirty days before such construction.

Section 3001.2 Referenced Standards is amended by adding the following sentence at the end of the section:

The effective edition of ASME A17.1/CSA B44 is determined by the State of Colorado.

Section 3001.4 Change in use is deleted in its entirety.

SECTION 3002
HOISTWAY ENCLOSURES

Section 3002.3 Emergency signs is amended by adding the following sentences to the end of the paragraph:

All exit stairs and areas of refuge shall be graphically located on a sign adjacent to the elevator call buttons. The sign's characters and the characters' height above the floor shall comply with ICC A117.1.

[F] SECTION 3003
EMERGENCY OPERATIONS

[F] Section 3003.1 Standby power is amended by changing the title to "Emergency Power". Change all references to standby power in Section 3003.1 and its subsections to emergency power.

[F] Section 3003.1.3.1 Two or more elevators in high rise building is added:

[F] 3003.1.3.1 Two or more elevators in high rise building. Sufficient emergency power shall be provided to simultaneously operate two elevators for each group of elevators controlled by a common operating system. Additional emergency power shall be provided for the elevator car that has been designated to accommodate an ambulance stretcher as described in Section 3002.4 if this car is not included in one of the groups above. Emergency power shall be transferable to any elevator.

Exception:

Sufficient emergency power shall be provided for only one elevator for each group of elevators controlled by a common operating system that serve only open parking levels of the High Rise building.

SECTION 3004
HOISTWAY VENTING

Section 3004.1 Vents required is amended by adding Exception 5:

Exceptions:

5. Hoistway in High Rise buildings shall comply with the High Rise provisions of IBC/IFC Chapter 9.

Section 3004.1.1 Vent operation is added:

Section 3004.1.1 Vent Operation: All hoistway vents shall be closed, motorized vents (electrically) and shall open automatically by activation of the elevator hoistway smoke detector and/or a power failure. Refer to the IFC amendments in the Fire alarm System Section for further clarification regarding control and sequencing.

Permanent open vents shall be permitted in the following hoistways:

1. Hoistways in unheated buildings
2. Unheated outside hoistways
3. Hoistways that do not extend to the roof of an atrium

Section 3009 Elevator recall for high rise buildings with pressurized hoist ways is added:

SECTION 3009
ELEVATOR RECALL FOR HIGH RISE BUILDINGS WITH PRESSURIZED HOIST WAYS

3009 Elevator recall for high-rise buildings with pressurized hoist ways. In addition to the requirements of ASME A17.1, Fire Fighters' service, elevator operation within high-rise buildings with pressurized hoist ways shall be as follows:

The elevator doors shall automatically open when the car reaches the approved level. After a period of one minute, elevators shall automatically close their doors. The doors shall be responsive by pressing the designated return floor call button in the elevator lobby or by pressing the door open button in the interior of the elevator cab. Elevators shall remain at that level until manual overrides by the key-operated switch required by ASME A17.1.

Only the hall call buttons at the designated return level, the level the car(s) have returned to, shall function as door open buttons. All doors shall open simultaneously when operating under normal building power. When operating under emergency power, only the cars selected for emergency operation shall open their doors simultaneously.

During Phase 1 operation, the door recycle shall be 60 seconds.

Once the car is placed on Phase II, the fire department has control of the elevator; it shall operate per ASME A17.2 rule 2113.c, Normal Phase II Operation.

CHAPTER 31
SPECIAL CONSTRUCTION

SECTION 3105
AWNINGS AND CANOPIES

Section 3105.5 Canopy special provisions is added:

3105.5 Canopy special provisions.

A. A canopy may be entirely supported by the building to which it is attached.

B. Separation between different types of construction shall not be required.

C. Canopies shall comply with Fire Department access requirements. The minimum height of canopies at locations not requiring Fire Department access shall be 8 feet.

D. Canopies in the public right-of-way shall comply with Section 3202.

E. Canopies shall not obstruct required exits.

F. For the purposes of this code, a porte-cochere may be considered a canopy.

Section 3111 Manufactured or factory-built structures is added:

[CDH] SECTION 3111
MANUFACTURED OR FACTORY-BUILT STRUCTURES

3111.1 Scope. This section shall regulate the installation, relocation, placement, alteration, repair, and addition of manufactured homes, factory-built housing units, and factory-built non-residential buildings.

Exception: Construction trailers as allowed by the Administrative Section of this Code set for the sole purpose of sheltering construction management activity on a future or active construction site.

3111.2 Definitions.

Certified Installation Inspector. Independent contractors authorized by DOH to perform inspections and enforcement of the proper installation of manufactured homes. Enforcement shall include issuance of installation authorizations and permanent attachment of the certificate of installation insignia signifying compliance with Manufactured Home Installation Program.

Construction, Closed. Any building, building component, assembly, or system manufactured in such a manner that all concealed parts or processes of manufacture cannot be inspected before installation at the building site without disassembly, damage, or destruction.

Construction, Open. Any building, building component, assembly, or system manufactured in such a manner that all concealed parts or processes of manufacture can be readily inspected at the building site without disassembly, damage, or destruction.

Data Plate (HUD). Data plates of (HUD) manufactured homes are posted inside the unit affixed in a permanent manner near the main electrical panel or other readily accessible and visible location.
The data plate shall indicate the following minimum design criteria:

WIND ZONE: ZONE I
THERMAL: ZONE 3
ROOF LOADS: MIDDLE (30 PSF)

No (HUD) manufactured home shall be installed if any criteria do not meet these minimum requirements.

DOH. Colorado Division of Housing. The Division of Housing is the state agency responsible for enforcing the Factory-Built Housing Construction and Factory-Built Nonresidential Construction Statutes, Rules, and Regulations.

Factory-Built Certification Insignia. These insignias certify that the unit is constructed in compliance with applicable codes and regulations adopted by the DOH.

Factory-Built and HUD Certification Insignia

Structure Type	Primary Insignia Location and Provided Design Information
Factory-Built Housing Unit.	Silver in color, located in the kitchen sink cabinet or inside the vanity cabinet if there is no kitchen sink. The manufacturer shall legibly stamp the unit serial number, date of manufacture, wind design speed, roof design load, and construction codes on the primary insignia.
Factory-Built Non-residential Structure	Blue in color, located on the exterior hitch end of the unit or in a readily visible location, such as near the electrical panel, prior to units being removed from the plant. The manufacturer shall legibly stamp the unit serial number, date of manufacture, wind design speed, roof design load, fire rating, occupancy, and construction codes on the primary insignia
(HUD) Manufactured Home	A red HUD label is located at the tail-light end of each transportable section of the home approximately one foot up from the floor and one foot in from the road side. The label number shall be etched or stamped with a 3 letter designation which identifies the Production Inspection and Primary Inspection Agency (IPIA) for the state in which the home is manufactured. Each label shall also be marked with a 6 digit number which the label supplier will furnish.

Factory-Built Housing Unit. Units designed primarily for residential occupancy, either permanent or temporary, which is wholly or in substantial part, made, fabricated, formed or assembled as Closed Construction in a manufacturing facility for installation, or assembly and installation, on permanent or temporary foundations at the building site. Site-built permanent foundations must be built in accordance with the Denver Building Code.

Factory-Built Nonresidential Structure. These units are designed primarily for commercial, industrial, or other nonresidential use, either permanent or temporary, which is wholly or in substantial part, made, fabricated, formed or assembled as Closed Construction in a manufacturing facility for installation, or assembly and installation, on permanent or temporary foundations at the building site. All nonresidential structures manufactured after December 2, 1991, must display a DOH Factory-Built Certification insignia.

Federal Act. U.S. Department of Housing and Urban Development Mobile Home Construction and Safety Standards (as published in the Federal Register, Part II of December 18, 1975)

Foundations, Permanent A permanent foundation (permanent set) is a foundation system designed to support the unit and comply with all applicable provisions of the Denver Building Code.

Foundations, Temporary

1. Residential foundation systems (temporary set) shall be designed to support the unit in accordance with the manufacturer's installation instructions or, if manufacturer's installation instructions are not available, NCSBCS/ ANSI A225.1-1994 shall be used.
2. Factory-built Non-residential structures qualifying as a temporary building in accordance with the Administrative Section of this Code shall have a support layout prepared by a Colorado licensed design professional. The foundation is not required to meet the frost depth requirements of the Denver Building Code.

Manufactured Home. Any pre-constructed building unit or combination of pre-constructed building units, without motive power, where such unit or units are manufactured in a factory or at a location other than the residential site of the completed home, which is designed and commonly used for the occupancy by persons for residential purposes, in either temporary or permanent locations and which unit or units are not licensed as a vehicle. Manufactured Homes include Mobile Homes, Manufactured Homes built to the HUD standards, and Factory-Built Housing Units built to the building code standards adopted by DOH.

Manufactured Home. (HUD) A HUD labeled home.

Manufactured Housing Installation Program (MHIP). The State of Colorado MHIP covers the installation of all new and used factory-Manufactured Homes (Mobile, HUD, and Modular). Installation inspections are performed by State-certified independent inspectors, certified installers, or DOH inspectors. Upon approval of the completed installation a brass colored certificate of installation insignia is installed on the exterior wall within 30-inches of the electrical service entrance.

Mobile Home. (pre-1976 units) A pre-HUD home built to the ANSI A-119.1 standard. Such mobile homes may be unlabeled, or for Colorado homes built between 1971 and 1976, possess a State of Colorado Mobile Home Certification label.

Trailer Home. A pre-1950's Trailer coach.

3111.3 Factory approval of manufactured structures. Every Factory-Built Housing Unit and every Factory-Built Nonresidential Structure that is manufactured, sold, offered for sale, or occupied in this state must display a Factory-Built Certification Insignia issued by the DOH certifying that the unit is constructed in compliance with the DOH standards.

Exception: (HUD) Manufactured Homes constructed to the standards of the Federal Act.

3111.3 Permits required. Manufactured or factory-built structures shall comply with the provisions of the Denver Building Code to the extent outlined in Table 3111.3.

Construction documents shall be submitted for review and approval in accordance with the Administrative Section of this Code for all manufactured or factory-built structures prior to the issuance of permits.

One set of plans of the factory-built structure, bearing the stamp of approval of DOH or DOH Authorized Inspection Agency, shall be submitted for use as the City's Record Set. A second, unstamped set of plans shall be submitted for use by the City Assessor's office. Two sets of the permanent or temporary foundation plans signed and sealed in accordance with the Administrative Section of this Code shall be submitted for Factory-Built Non-residential Structures. Two sets of foundation plans signed and sealed in accordance with the Administrative Section of this Code shall be submitted for permanently located Factory-Built Housing Units.

Prior to beginning the installation of a manufactured home, the owner, a registered installer, or a certified installer shall make an application for an Installation Authorization from DOH or a Certified Installation Inspector.

Table 3111.3 – Regulatory Requirements[a]

Structure Type	Applicability of Denver Building Code requirements to factory-built structures
Factory-Built Housing Unit	Denver Building Code authority is limited to the design, construction, and inspection of a permanent foundation; and any other site-built construction, except for materials shipped loose by the factory. The Denver Building Code regulates all alteration, repair, and additions to factory-built modular homes
Factory-Built Nonresidential Structure	Denver Building Code has authority over the design, construction, and inspection of the structure's temporary or permanent foundation, any other site-built construction, and all on-site inteconnection of the factory assembled modules. The Denver Building Code regulates all alteration, repair, and additions to factory-built non-residential structures.
(HUD) Manufactured Home.	HUD labeled homes possessing data plates satisfying the minimum defined design criteria preempt Denver's building code requirements. The Denver Building Code regulates all alteration, repair, and additions to HUD homes after they are initially occupied for residential use.
Mobile Home.	Mobles homes which do not possess State of Colorado certification label must conform to all the provisions of the Denver Building Code. DOH labeled homes are exempt from the provisions of the Denver Building Code but must provide, when required, documented mitigation measures for

	approval which will enable the structure to withstand Denver's minimum snow loads.
Open Construction	These structures are regulated by the Denver Building Code unless specific approved otherwise by DOH.
Trailer Home.	Denver's building code has complete authority over trailer homes.

a. The minimum required fire separation distance of all structure types shall be in accordance with the provisions of the Denver Building Code. The fire-resistance rating provided by the structure's exterior wall is used to determine the minimum fire separation distance; minimum setbacks shall be as determined by Denver's Zoning Code.

3111.4 Manufactured Home Installation. Every Mobile Home, Manufactured Home, and Factory-Built Housing Unit installed in a temporary or permanent location and designed and commonly used for occupancy by persons for residential purposes, must display a Certificate of Installation Insignia issued by the DOH, certifying that the unit is installed in compliance with the DOH standards. New homes shall be installed in accordance with the Colorado Manufactured Housing Installation Code i.e. the Home manufacturer's written installation instructions, or State approved alternate standards for used homes when instructions are not available. Application of the certification insignia is evidence that permanent utility service may be established. Permanent insignia application is required prior to the issuance of a Certificate of Occupancy to the home.

> **Exception:** Temporary installations which are for the purpose of home display, which will be relocated to another location prior to use as a residence.

3111.5 Inspection and notice. Except as noted in table 3111.3, DOH and the Federal Act preempt the Denver Building Code in relation to factory-built structures.

The following statement shall appear on the certificate of occupancy issued to a manufactured or factory-built structures:

> "In accordance with Federal and Colorado law, this manufactured structure has not been inspected in its entirety by the City and County of Denver and may or may not meet the requirements of the Denver Building Code."

CHAPTER 32

ENCROACHMENTS INTO THE PUBLIC RIGHT-OF-WAY

[PW] SECTION 3202 ENCROACHMENTS

Section 3202.2 Encroachments is replaced in its entirety with the following:

3202.2 Encroachments. All encroachments shall comply with the Denver Revised Municipal Code, Chapter 49, Rules & Regulations of the Department of Public Works, and all departmental published standards.

Exception:

1. Existing doors and windows of historic buildings whether individually designated or contributing buildings in a Historic District or in buildings 50 years or older. New entrance / exit doors constructing in historic facades may encroach up to 3' into the street frontage of the right of way when a recessed opening is not in character with the existing façade.
2. In new construction, doors and windows shall not open or project into the public right of way.

Section 3202.3 Encroachments 8 feet or more above grade is deleted in its entirety.

Section 3202.4 Temporary encroachments is amended by replacing the first sentence with the following:

3202.4 Temporary encroachments. Where allowed by the local authority having jurisdiction, vestibules and storm enclosures shall not be erected for a period of time exceeding 7 months in any one year and shall not encroach more than 3 feet (914 mm) nor more than one-fourth of the width of the sidewalk beyond the street lot line, unless otherwise permitted by the Department of Public Works.

CHAPTER 33
SAFEGUARDS DURING CONSTRUCTION

SECTION 3301
GENERAL

Section 3301.1 Scope is replaced in its entirety with the following:

3301.1 Scope. The provisions of this chapter shall govern safety during construction, demolition and moving and the protection of adjacent public and private properties.

Section 3301.3 Demolition and moving standard is added:

3301.3 Demolition and moving standard. Unless provided for in other portions of this Building Code, the following additional standard shall be utilized in relation to the work covered in this chapter, American National Standard Institute publication, "Demolition Safety Requirements A10.6-1990".

SECTION 3302
CONSTRUCTION SAFEGUARDS

[PW] Section 3302.2 Manner of removal is amended by adding of the following sentence:

All adjacent streets, alleys and other public ways and places shall be kept free and clear of all rubbish, refuse and loose material resulting from the moving, demolition or demolition removal operations.

[EH] Section 3302.2.1 Dust is added:

[EH] 3302.2.1 Dust. All dust resulting from demolition operations shall be settled with water and approved by the Agency.

SECTION 3303
DEMOLITION

Section 3303.1.1 Registered design professionals' reports is added:

3303.1.1 Registered design professionals' reports. If the building to be demolished shares a common wall with an adjacent building, the owner of the building to be demolished shall provide a registered design professional's report assessing the effect the removal of the adjacent building will have on the structural capacity and stability of the remaining buildings. Should the registered design professional's report indicate adverse effects on the adjacent buildings, a demolition permit will not be issued until the stability of the buildings is resolved. Except as approved by the Agency, buildings four (4) or more stories in height shall require a registered design professional's report to be filed with the Agency as part of the application for a demolition permit being issued. The registered design professional's report shall contain, but is not limited to, information as to:

1. Type of construction
2. Method of demolition
3. A structural survey made to determine the condition of the structure
4. Determination of the possibility of unplanned collapse of any portion of the building or structure
5. Street, sidewalk or other public way closures
6. Method of protecting the public
7. Pertinent data and analysis pertaining to adjacent structures

The Agency may request additional registered design professionals' reports for other demolition operations when deemed necessary.

Section 3303.1.2 Shoring and bracing of damaged structures is added:

3303.2.1 Shoring and bracing of damaged structures. When persons are required to work within a structure to be demolished which has been damaged by fire, flood, explosion or other cause, the structure shall be braced or shored for safety.

[EH] Section 3303.1.3 Asbestos is added:

[EH] 3303.1.3 Asbestos. Buildings, or portions of buildings, being demolished containing friable asbestos shall conform to the provisions of the National Emission Standard for Asbestos and all other federal and state regulations. A demolition permit shall not be issued until a copy of the notice is submitted to the Agency.

Section 3303.4 Vacant lot is replaced in its entirety with the following:

3303.4 Vacant lot. Where a structure has been demolished or removed, the vacated lot shall be filled and maintained to the existing grade. Upon completion of the removal of a building, structure or utility, by demolition the ground shall be left in a clean, smooth condition. Holes, basements or cellars shall be filled with an inorganic material; provided, however, that the top one foot of fill shall be clean earth. The filling of such excavations shall not be required when a building permit has been issued for a new building on the site and construction is to be started within 60 days after completion of the demolition or moving operations. The holder of the building permit shall provide a temporary barricade protecting the excavation on all sides as specified for safety by the Agency. The temporary barricade may remain in position for a time not exceeding 3 days, after which a solid barricade or fence shall be provided or the excavation filled.

Section 3303.6 Utility connections is amended by adding the following sentence:

All service utility connections shall be shut off, capped or otherwise controlled outside the building line, or area of demolition prior to beginning demolition work.

Section 3303.6.1 Relocation of utilities is added:

3303.6.1 Relocation of utilities. Any power, water or other utilities required to be maintained during demolition shall be temporarily relocated and protected.

Section 3303.6.2 Dangerous utilities is added:

3303.6.2 Dangerous utilities. A determination shall be made by the contractor if any type of hazardous chemicals, gases, explosives, flammable materials or similarly dangerous substances have been used in any pipes, tanks or other equipment on the property. When the presence of any such substance is apparent or suspected, testing and purging shall be performed by the demolition contractor and the hazard eliminated prior to demolition operations.

Section 3303.7 Machine and explosive demolition is added:

3303.7 Machine and explosives demolition. Machine demolition shall be subject to approval by the Agency.

Contractors utilizing explosives in their demolition operation shall be specifically approved by the Building Official. For storage and transportation of explosives, see the Fire Code for the City and County of Denver.

SECTION 3306
PROTECTION OF PEDESTRIANS

Section 3306.1.1 Safety watchman is added:

3306.1.1 Safety watchman. A second person, in addition to the equipment operator shall be present on the job site to act as a safety watchman to prevent the entry of unauthorized persons. On demolition sites, when approved by the Agency, the safety watchman may be used in lieu of site protection required by Section 3306.1.

SECTION 3307
PROTECTION OF ADJOINING PROPERTY

Section 3307.1 Protection required is replaced in its entirety with the following:

3307.1 Protection required. Adjacent public and private property shall be protected from damage during construction, excavation, remodeling, demolition, and building relocation work. Protection is the responsibility of the person performing the construction, excavation, remodeling, demolition or building relocation work. Protection shall be provided

for footings, foundations party walls, chimneys, skylights, roofs, fences and landscaping. Provisions shall be made to control water runoff and erosion during construction, excavation, remodeling, demolition or relocation activities.

Section 3307.1.1 Notification. The person making or causing an excavation, demolition or relocation to be made shall provide written notice to the owners of adjacent properties, by certified mail with a return receipt, by personal notification or other means calculated to ensure the adjacent owners have actual notice, advising them that the excavation demolition or relocation is to be made providing contact information for the person doing the excavation, demolition or relocation and shall protect adjacent properties as required by Section 3307.1. Said notification shall be delivered not less than 10 days prior to the scheduled starting date of the excavation, demolition and/or relocation.

Written evidence of notification of adjacent owners or a written, signed statement as to why actual notice could not be given, must be given to the Building Official ten (10) working days before an excavation, demolition or relocation permit is issued.

Section 3307.2 Repair of damage to public property is added:

[PW] 3307.2 Repair of damage to public property. As a condition of obtaining a permit to wreck or move any building, structure or utility, the permittee assumes liability for any damage to public property occasioned by such moving, demolition or removal operations. The permittee agrees to repair any damage to public property, including any public sidewalks, occasioned by such moving, demolition or removal operations. Failure to make such repairs within 30 days shall be grounds for the revocation of the contractor's license.

Section 3307.3 Work abutting the public way is added:

[PW] 3307.3 Work abutting the public way. Prior to the issuance of a permit by the Agency for the construction, demolition or relocation of any building involving excavation extending within one foot of the angle of repose or a slope of one to one under any public sidewalk, street, alley or other public property, the owner of the property or proposed building shall submit to the Manager of Public Works an indemnity bond in the amount determined by the Manager in a form approved by the City Attorney.

SECTION 3308
TEMPORARY USE OF STREETS, ALLEYS AND PUBLIC PROPERTY

[PW] Section 3308.3 Transportation approval is added:

[PW] 3308.3 Transportation approval. Trucks and other equipment used by the contractor shall not interfere with or block either vehicular or pedestrian traffic, except when approved by the Department of Public Works. Where it becomes necessary to transport units of a wrecked building, structure or utility upon and through the public streets, alleys or other public ways and places, permission to do so shall be obtained from the Department of Public Works.

Section 3313 Moving and relocation of structures is added:

SECTION 3313
MOVING AND RELOCATION OF STRUCTURES

3313.1 Scope. Buildings, structures or utilities which are moved from one location to another, within or from the City, shall conform to all requirements of this Building Code. These buildings, structures or utilities shall be inspected and approved by the Agency prior to moving.

[PW] 3313.2 Transportation approval. Moving of structures on the public way by the contractor shall not interfere with or block either vehicular or pedestrian traffic, except when approved by the Department of Public Works. Where it becomes necessary to transport units of a wrecked building, structure or utility upon and through the public streets, alleys or other public ways and places, permission to do so shall be obtained from the Department of Public Works. As required by Public Works the Contractor shall submit to the Manager of Public Works an indemnity bond in the amount determined by the Manager in a form approved by the City Attorney.

[PW] 3313.3 Moving on the Public Way. Moving on the public right of way shall follow Public Works regulations.

3313.4 Storage of moved buildings. Buildings, structures or utilities shall not be stored on any property for more than 72 hours, unless approved by the Agency.

3313.5 Vacated lot. Reference Section 3303.4.

CHAPTER 34
EXISTING STRUCTURES

[EB] SECTION 3401
GENERAL

Section 3401.1 Scope is replaced in its entirety with the following:

3401.1 Scope. The provisions of this Chapter and Section 1027 of the Fire Code shall control the alteration, repair, addition and change of occupancy of existing structures.

Exception:

Existing bleachers, grandstands and folding and telescopic seating shall comply with ICC 300-07.

The phrases "change of occupancy" and "change of use" are interchangeable.

SECTION 3412
COMPLIANCE ALTERNATIVES

Section 3412.2 Applicability is amended by replacing the first sentence with the following:

Structures constructed under Denver Building Codes prior to the 1976 Denver Building Code, in which there is work involving additions, alterations or changes of occupancy must comply with the requirements of this section or the provisions of Sections 3403 through 3409.

APPENDICES

APPENDIX ADOPTION STATUS

IBC APPENDICES
STATUS OF APPENDICES ON ADOPTION

All Chapters and Sections of this Appendix are adopted as part of this Code except for those that are deleted in this summary. Those that are amended or added shall also be adopted as part of this Code.

APPENDIX	TITLE	STATUS
A	Employee Qualifications	Delete
B	Board Of Appeals	Delete
C	Group U – Agricultural Buildings	Delete
D	Fire Districts	Delete
E	Supplementary Accessibility Requirements	Adopt/As Guideline
F	Rodent Proofing	Adopt
G	Flood Resistant Construction	Delete
H	Signs	Adopt As Amended
I	Patio Covers	Adopt
J	Grading	Adopt As Guideline
K	Administrative Provisions	Deleted
L	Access Control	Added
M	Colorado Title 9 Article 5 – Standards For Accessibile Housing	Added
N	Construction Of Airport Buildings And Structures	Added
P	Construction In Designated Special Construction Zones	Added

APPENDIX H
SIGNS

[Z] SECTION H101
GENERAL

[Z] Section H101.1 General is amended by adding the following sentences:

Please also see sign regulations contained in the Zoning Sign Code. Where there is a difference or conflict between the requirements in this Appendix and the Zoning Sign Code, the most restrictive shall govern.

[Z] Section H101.2 Signs exempt from permits is amended by adding the following to Exemptions 2 and 4:

2. Temporary signs announcing the sale or rent of property. The Zoning Sign Code Section 59-537 (a)(7) allows these signs to be erected without a permit with the following limitations: 1 sign per property; not more than 5 square feet in area per face; not more than 6 feet above grade; shall not be illuminated or animated.
4. Projecting signs not exceeding 2.5 square feet (0.23 m^2). The Zoning Sign Code Sections 59-537(c)(3) 7. & Section 59-554(d) allows projecting signs only in the B-5, B-7 & B-8-A Zone Districts. They must be reviewed and approved by the Planning Office.

[Z] SECTION H102
DEFINITIONS

[Z] Section H102.1 General is amended by adding the following definitions:

DISPLAY SURFACE / DISPLAY FACE. The area made available by the sign structure for the purpose of displaying the message. Zoning Sign Code Section 59-2 (92).

GROUND SIGN. A sign supported by one or more uprights, poles or braces extending from the ground or an object in or on the ground but not attached to any part of any building. Zoning Sign Code Section 59-2 (133).

POLE SIGN. See Ground Sign. Zoning Sign Code defines a Pole Sign as a Ground Sign per Section 59-2 (133).

PORTABLE SIGN. A sign that is not permanently affixed to building, structure or the ground. Zoning Sign Code Section 59-2 (207).

NOTE: City Council passed Ord. No. 852-92 on 11/27/92 which added the following language to Section 59-537 (a)(6) of the Zoning Sign Code: All portable signs regardless of location are specifically not allowed.

PROJECTING SIGN. A sign or graphic, other than a wall sign, that is attached to and projects from the wall, soffit, or eave of a building, is not in the same plane as the wall, soffit, or eave to which it is attached, and identifies a use within that building. Zoning Sign Code Section 59-2 (215).

ROOF SIGN. Reference Zoning Sign Code Section 59-2 (246) Roof Sign: A sign attached to the roof of a building which sign projects above the highest point of the roof of the building or the roof of that portion of the building to which it is attached.

SIGN. Reference Zoning Sign Code Section 59-2 (269) Sign: A sign is any object or device or part thereof situated outdoors or indoors which is used to advertise or identify an object, person, institution, organization, business, product, service, event or location by any means including words, letters, figures, designs, symbols, fixtures, colors, motion illumination or projected images. Signs do not include the following:

1. Flags of nations, or an organization of nations, states and cities, fraternal, religious and civic organizations;
2. Merchandise, pictures or models of products or services incorporated in a window display;
3. Time and temperature devices not related to a product;
4. National, state, religious, fraternal, professional and civic symbols or crests;
5. Works of art which in no way identify a product.

SIGN STRUCTURE. Reference Zoning Sign Code Section 59-2 (281) Structure: Anything which is constructed or erected and the use of which requires more or less permanent location on ground or attachment to something having permanent location on ground, not, however, including wheels; an edifice or a building of any kind; any production or piece of work, artificially built up or composed of parts and joined together in some definite manner.

WALL SIGN. Reference Zoning Sign Code Section 59-2 (317) Wall Sign: A sign attached to, painted on or erected against a wall, fascia, parapet wall or pitched roof of a building or structure, and no part of which sign projects above the highest point of the roof and whose display surface is parallel to and extends not more than twenty-four (24) inches from the wall to which it is attached and extends not more than eight (8) inches from the fascia to which it is attached or, if attached to a pitched roof, the bottom of its display surface does not extend more than six (6) inches vertically from the roof surface and the top of its display surface does not extend more than forty-eight (48) inches horizontally from the roof surface.

BILLBOARD. See Outdoor General Advertising Device.

ILLUMINATED SIGN. Illuminated Sign: A sign lighted by or exposed to artificial lighting either by lights on the sign or directed towards the sign. Zoning Sign Code Section 59-2 (145).

NOTE: Illuminated Signs are not allowed to flash, blink or fluctuate.

OUTDOOR GENERAL ADVERTISING DEVICE (BILLBOARD). A Ground Sign relating to products, services or uses not on the same zone lot. Zoning Sign Code Section 59-2 (185).

Appendix L Access control is added:

APPENDIX L
ACCESS CONTROL

SECTION L101
INTRODUCTION

L101.1 Background. Since 1990 various written policies have been implemented and applied to establish requirements and guidelines for the assessment and permitting of access control systems. Initially, policies were written to address the needs that had developed for securing the elevator lobby and stair enclosures in high rise buildings. As the use of these systems increased, and as they became more complex, it was necessary to develop a more comprehensive policy to address these systems that were being used in ever increasing applications. The development of an expanded policy was also driven by the failure of the model building code to respond to the increasing security needs in buildings. The model building code did not provide a reasonable balance between life safety concerns and security needs. Further, these systems were found to have a detrimental effect on exiting, fire department access and accessibility as well as reducing the effectiveness of other life-safety features in buildings. In order to address this need for a more comprehensive policy, an Access Control Committee was established to develop the required document. The committee was composed of both private and public sector members. On April 18, 1995 the Building Inspection Division began to apply the initial policy developed by this committee. The policy was published as Policy Number 32-B068. Since being implemented, the original policy was continuously applied and used as the basis for the review and acceptance of access control systems. In the year 2000, the Access Control Committee was re-established and began to meet to develop an updated and expanded version of the 1995 policy. This committee developed an updated policy but that new version was not implemented pending the adoption of the IBC (International Building Code) as the Building Code for the City & County of Denver.

The DBC includes a number of provisions that relate to access control systems that are similar to some of the systems and requirements of the new version of the access control policy. However, these provisions are not as comprehensive as those contained in this policy. In order to codify the policy and to provide a more consolidated and organized approach to access control it was decided to develop a separate appendix in the building code for access control systems. The newest version of the access control policy was used as the basis for this appendix. The provisions of the International Building Code that address issues related to access control systems are deleted in the Denver Amendments to the IBC and reference is made to this appendix for the appropriate corresponding requirements.

L101.2 Purpose and intent. The purpose of this appendix is to combine all of the various DBC requirements and previous policy requirements for access control systems into one document. The appendix is intended to provide consistency in the design, review, installation and inspection of access control systems and components by providing standards and guidelines for these systems. It is anticipated that redundant design efforts and administrative modification requests can be avoided by providing safe alternative solutions to some commonly reoccurring security applications where the use of access control systems would create conflicts with other requirements of the DBC. Although the appendix contains specific solutions for a number of common applications it is not intended to limit the use of this policy to only those situations. This appendix can be used to help devise appropriate solutions to other unique situations that require the use of access control systems that may also be incompatible with requirements of the DBC. The provisions of the DBC in the Administration Section relating to modifications under special circumstances can be used when other solutions provide an equivalent alternative to the provisions of the DBC. The standards and guidelines of this appendix are designed to assist in the development of specialized access control systems that are necessary to respond to unique security needs.

L101.3 Prevailing policy. All access control policies previously applied by Community Planning and Development are null and void and superseded by this appendix. These policies include but are not limited to the following policies:

Policy P-25	Securing of Stair Doors Into Exit Enclosures – Dated 09/04/1999
Policy P-26	Securing of Elevator Lobbies - Dated 02/05/1993
Policy P-47	Interim Policy – Electric Door Hardware Applications for Exit Doors - Dated 09/21/1992
Policy 32-B068	Access Control – Dated 04/18/1995

The provisions of this policy are not intended to be applied to existing access control systems that were permitted and legally installed in accordance with the provisions of the DBC and any Access Control Policy in effect at the time the permit was issued.

L101.4 Modified IBC provisions. The following IBC sections have been modified and are superseded by the provisions of this appendix:

Section 403.12 Stairway door operation.

Section 1008.1.3.4 Access-controlled egress doors.

Section 1008.1.8.6 Delayed egress locks.

Section 1008.1.8.7 Stairway doors.

SECTION L102
DEFINITIONS

L102.1 Definitions. The following words and terms shall, for the purposes of this appendix, have the meaning shown herein.

ADBC. Administration of the Denver Building Code. Contains the amendments that have been adopted for the administration of the Denver Building Code. Adopted with the Denver Building Code Amendments.

ACCESS CONTROL SYSTEM. A group of devices including control unit(s), electric hardware, wiring and raceways electrically interconnected to control and regulate ingress and egress.

ACCESS CONTROL SYSTEM CONTRACTOR. A contractor licensed to install, add to, alter or repair control units, electric hardware, wiring and raceways electrically interconnected to control and regulate ingress and egress. Voltages shall not exceed 48 volts or the system shall be power-limited as defined by the NEC. All work shall be performed under the supervision of the holder of an Access Control System Supervisors Certificate.

ACCESS CONTROL SYSTEM UNIT. The component(s) of an access control system that provide system logic and control (e.g., reader electronic panels, stand-alone keypads, telephone entry controllers, burglar alarm system units with access control capability, intercom controllers and door entry buzzers or buttons).

APPROVED. Approved as to materials and types of construction, as determined by the Building Official following investigation and tests conducted by him, or by reason of accepted principles or tests by recognized authorities, technical or scientific organizations.

CABINET. An enclosure with a hinged or screw lid used primarily to provide a degree of protection against incidental contact.

CONTACT SENSE EXIT DEVICE. Door mounted hardware designed to electrically sense the touch or immediate presence of an occupant moving to open the door. Depends upon the "touch" sensor to initiate a door unlock as opposed to more traditional door hardware that depends upon mechanical movement of the hardware to unlock the door.

CPD. Community Planning & Development (formerly the Building Inspection Division).

DBC. Denver Building Code. The International Codes as currently adopted including the provisions found in the City and County of Denver Amendments to the Denver Building Code and the Administration of the Denver Building Code.

DBCA. The Denver Building Code Amendments. Also includes the provisions of the Administration of the Denver Building Code.

DFC. Denver Fire Code. The IFC as currently adopted including the City and County of Denver amendments.

DIRECTLY UNLOCK. To directly interrupt power to the locking device, independent of the operation, functionality or programming of access control system units.

ELECTRIC BOLT. Dead-bolt type of lock that is electrically operated and is dependent upon power to either project or withdraw the bolt.

ELECTRIC HARDWARE. Any door hardware or accessory product that is used in a circuit as a conductor, load, power supply or switch.

ELECTRIC STRIKE. Lock strike that is modified to release the latch bolt with the application or removal of electric power.

ELECTRIC LOCK. Any locking or latching door hardware that relies on electrical energy for its operation.

ELECTRICAL CONTRACTOR. Colorado State licensed electrical contractor.

ELECTRICAL SIGNAL CONTRACTOR. A contractor licensed to install, add to, alter or repair electrical wiring and equipment for fire alarm, fire detection, emergency voice communication systems, electrical signaling and control wiring. Voltages shall not exceed 48 volts or the system shall be power-limited as defined by the NEC. All work shall be performed under the supervision of the holder of an Electrical Signal Supervisor Certificate.

ELECTRICALLY MODIFIED LOCKSET. A standard builder's hardware lockset that has been modified to operate electrically without compromising mechanical free egress.

ELECTRICALLY OPERATED EXIT DEVICE. An exit device that has been modified to operate electrically without compromising mechanical free egress.

ELECTRIC LOCKS – MASTER SWITCH. An electrical switch configured to immediately and simultaneously unlock all connected door locks (typically, but not limited to delayed egress doors, secured elevator lobby doors and stair tower doors). The switch shall be located in the building's Fire Command Center or other approved location. The switch shall be a two-position, toggle switch labeled "ELECTRIC LOCKS" with its positions labeled "LOCKED" and "UNLOCKED". When located in a non-secure area, a two-position, key operated switch may be used when a matching key is located in the building's Key Lock Box.

FAIL-SAFE LOCK. A lock that unlocks automatically upon loss of power.

FAIL-SECURE LOCK. A lock that remains locked during loss of power.

FIRE ASSEMBLY. An assembly of fire doors, fire windows or fire damper, including all required hardware, anchorage, frames and sills.

FIRE DETECTION SYSTEM. A building that is fully smoke detectored, or smoke detection where required by the DBC Section 1807, Smoke Control in High Rise Buildings.

FPB. Fire Prevention and Investigation Division, of the Denver Fire Department.

LABEL. Fire doors shall have a label or other identification showing the fire protection rating. Such label shall be approved and shall be permanently affixed. The label shall be applied at the factory where fabrication and assembly are performed. Inspection shall be made by an approved inspection agency during fabrication and assembly.

LISTED and LISTING. Terms referring to equipment and materials which are shown in a list published by an approved testing agency, qualified and equipped for experimental testing and maintaining an adequate periodic inspection of current productions and whose listing states that the equipment complies with recognized safety standards.

MAGNETIC LOCK. Lock that relies on magnetic power to lock the door, typically mating a door mounted door-plate to a frame mounted lock housing.

MANUAL UNLOCKING SWITCH. A permanently wired, manually operated, raised, push-type switch with integrated time delay which immediately and directly unlocks a door.

MECHANICAL FREE EGRESS. Door hardware that mechanically unlocks and unlatches the door, from the inside (egress side) with a single motion without the use of a key, card or any special knowledge or effort.

MOTION DETECTOR. A device that is listed by an approved testing laboratory as a request to exit sensor.

NEC. National Electric Code.

POWER TRANSFER. Hinge, pivot or door cord that provides routing for the wire to pass from the frame into the door.

SHEAR-TYPE MAGNETIC LOCK. A magnetic lock that relies on a shear pin, post, concave/convex machining or other similar projections to enhance the latching strength of the lock.

SECTION L103
GENERAL REQUIREMENTS

L103.1 General requirements. All access control system applications shall comply with all of the requirements contained in Section L103 unless other specific provisions of Appendix L modify these requirements.

L103.1.1 Mechanical free egress. All doors shall have mechanical free egress at all times unless otherwise approved by CPD.

L103.1.2 Fire-rated doors. Required fired-rated doors shall remain latched at all times that the door is in a closed position.

L103.1.3 Modifying doors and door frames. Re-machining fire-rated doors or frames may void the fire label. Re-machining shall comply with the manufacturer's specified procedures.

L103.1.4 Key lock boxes. Provision for ingress by way of an approved key box (e.g., "Knox Box") for entry by emergency personnel should be provided and shall be located in a FPB-approved location.

L103.1.5 Fail safe wiring. When electric locks are held locked by the application of electric power, the wiring between the power supply and lock shall be installed in a "fail-safe" arrangement. All portions of the circuit shall be configured in a way that parallel conductors in a common cable or raceway shall have conductors of opposite polarity in the same cable or raceway. This arrangement assures that the lock releases if wires break or if parallel conductors are shorted.

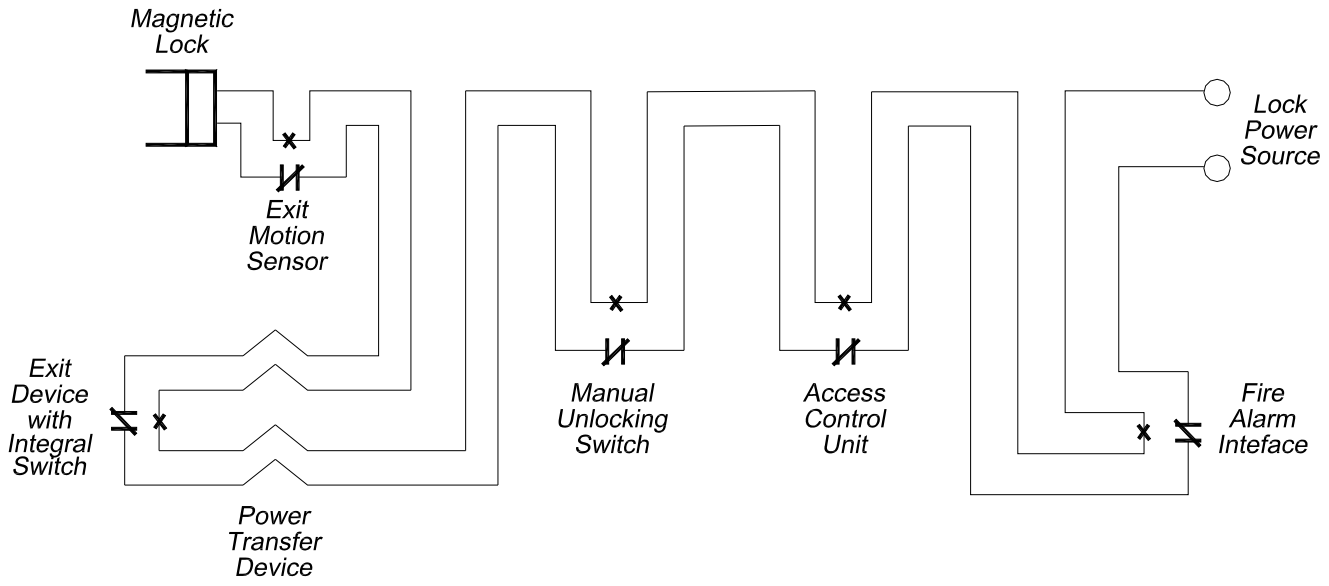

FIGURE 103.1.5

L103.1.6 Access control system power. Access control system power supplies shall comply with all of the following requirements:

"Plug-in" Class II power supplies along with their serving outlets shall be enclosed in a protective cabinet.

All power supplies other than "plug-in" Class II power supplies shall be hardwired to primary power.

When the manufacturer's nameplate primary power requirement exceeds 180 volt-amps, the power supply shall be served by a dedicated branch circuit. If power requirement is less than 180 VA, then an existing power outlet may be converted to a junction box serving the power supply.

Fine Print Note (FPN): This section is not intended to preclude the use of emerging technologies such as Power Over Ethernet "POE" solutions. It is the intent that power supplies be appropriately listed and that they be reasonably protected against unintentional disconnect. A reasonable accommodation for POE solutions may be for the POE hardware to be located in a secure wiring closet.

L103.1.7 Hardware requirements. All access control system applications shall utilize hardware that complies with all of the requirements contained in Section L103.1.7 unless specifically excepted by other provisions of Appendix L.

L103.1.7.1 Listing. All access control system units shall be listed for their intended use by an approved agency, such as UL or ETL, or as otherwise approved by CPD.

L103.1.7.2 Electrical compatibility. All components of the operating system shall be matched electrically in all ratings (i.e. voltage and current).

L103.1.7.3 Electric strikes. Doors or frames may be equipped with electric strikes that do not affect mechanical free egress. Electric strikes used on fire-rated doors shall be fail-secure and shall bear the appropriate fire listing.

L103.1.7.4 Electrified locksets. Approved and listed electrically modified locksets (mortise, cylindrical or unit type) that do not affect mechanical free egress are permitted.

L103.1.7.5 Electrically operated panic hardware. Approved and listed electrically operated panic hardware (rim, mortise, and concealed or vertical rod type) is permitted. The exit device shall bear appropriate fire rating when used on fire-rated doors.

L103.1.7.6 Electric bolts. Electric bolts, either flush or surface mounted, shall not be installed, altered or repaired.

L103.1.7.7 Shear-type magnetic locks. Shear-type magnetic locks shall not be installed, altered or repaired.

L103.1.7.8 Non-binding hardware. Hardware shall be non-binding in design and function.

SECTION L104
ACCESS CONTROL SYSTEMS WITH MAGNETIC LOCKS

L104.1. Access control systems with magnetic locks. Doors in all occupancies except H occupancies are permitted to be equipped with magnetic locks that prevent mechanical free egress when the magnetic locking system complies with all of the provisions of Section L104. Magnetic locks that are part of a delayed egress system shall comply with the provisions of Section L105. Magnetic locks that are used to secure an elevator lobby shall comply with all of the requirements of Section L106.

L104.1.1 Fire alarm interface. Activation of the building fire alarm system, automatic sprinkler system or fire detection system, if provided, shall directly unlock the doors, and the doors shall remain unlocked until the system has been reset.

L104.1.2 Loss of power. Loss of power to that part of the access control system which locks the doors shall automatically unlock the doors.

L104.1.3 Magnetic lock power transfer. Power transfer from the door to the frame shall be listed and approved.

L104.1.4 Other locking devices. When magnetic locks are installed on a door, no other locking device shall be used on the door that prevents free egress.

L104.1.5 Door release hardware. The door shall unlock from the egress side using a combination of any two of the following means:

1. **Door mounted release device.** May be either of the following:

    a) Panic hardware release. Panic hardware may be used to unlock a magnetic lock, provided it is equipped with an internally mounted switch. Operation of the panic device shall simultaneously directly unlock the magnetic lock and allow the door to open with one motion. The switch shall have a proven operable life, as part of the exit device, equal to the listing requirements for the device (typically 250,000 cycles).

    b) Contact sense exit device release. This device shall directly unlock the magnetic lock.

2. **Manual unlocking device**. A manual, press to operate button may be used to unlock a magnetic lock when all the following conditions are met:

    a) Be located in compliance with the requirements of ICC/ANSI A117.1-2003 section 308.

    b) Be located within five feet of either edge of the egress side of the door opening.

    c) The operable portion of the device shall have a minimum dimension of one inch (1”).

d) Be clearly identified by a sign that reads "EXIT" (or similar language) in minimum ¼" high letters on a contrasting background.

e) Directly unlock the magnetic lock.

f) Remain unlocked for a minimum of 30 seconds.

3. **Motion detector release.** The detector shall be arranged to detect an occupant approaching the doors from the egress side within a six-foot radius of the centerline of the door opening (refer to Figure 104.1 for coverage patterns) and upon detection, shall directly unlock the magnetic lock and shall keep it unlocked for a minimum of 5 seconds. Loss of operating power to the detector shall directly unlock the magnetic lock.

COVERAGE PATTERNS

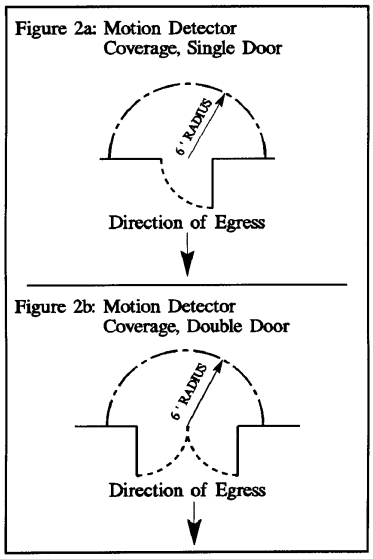

FIGURE 104.1

SECTION L105
DELAYED EGRESS SYSTEMS

L105.1 Delayed egress locks. Approved, listed, delayed egress locks shall be permitted to be installed on doors serving any occupancy except Group A, E and H occupancies in buildings that are equipped throughout with an automatic sprinkler system in accordance with IBC Section 903.3.1.1 or an approved automatic smoke or heat detection system installed in accordance with DBCA Section 907 as amended, provided that the doors unlock in accordance with Items 1 through 7 below. A building occupant shall not be required to pass through more than one door equipped with a delayed egress lock before entering an exit.

1. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.
2. The doors unlock upon loss of power controlling the lock or lock mechanism.
3. The doors unlock when the Electric Locks, Master Switch is in the unlocked position.
4. A release device shall initiate an irreversible process that shall unlock the door within a delay period of not more than 15 seconds. The maximum required force and time to activate the release device shall not exceed 15 pounds (67 N) for 1 second. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the door is unlocked by the application of force to the releasing device, relocking shall be by manual means only, at the door.

   Exception:

   Where approved, a delay period of not more than 30 seconds is permitted.
5. A sign shall be provided on the door located above and within 12 inches (305 mm) of the release device reading: PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 (30) SECONDS.
6. Emergency lighting shall be provided at the door.
7. The components for the delayed egress lock shall be listed as a complete assembly. Individual, listed components may not be field assembled to build a delayed egress locking assembly.

SECTION L106
SECURING AN ELEVATOR LOBBY WITH AN ACCESS CONTROL SYSTEM

L106.1 Secured elevator lobby. When all of the provisions of Section L106.1 have been satisfied, elevator lobbies may be secured to prevent access from the elevator lobby into a tenant space.

L106.1.1 Use of secured elevator lobbies. Secured elevator lobbies are intended to provide a transitional area where building occupants can await the arrival of an elevator car or depart from an elevator car. It is not intended to be an area where building occupants can work. A secured elevator lobby cannot contain other spaces that are considered normally occupied such as restrooms, reception areas or waiting areas.

L106.1.2 Exit path blockage. Securing of the lobby cannot result in the blockage of exit paths from normally occupied areas. A secured lobby cannot interrupt the exit path circulation.

L106.1.3 Dead-end corridors. Securing of the lobby cannot result in dead-end exit corridors with lengths that exceed the provisions of IBC Section 1017.

L106.1.4 Restroom facility access. Securing of the lobby cannot result in elimination of access to required restroom facilities from normally occupied areas. Each individual tenant shall have access at all times to required toilet facilities.

L106.1.5 Electric load-center access. Securing of the lobby cannot eliminate the access required by the NEC to electrical overload protection or disconnect equipment. Each tenant shall have the access required by the NEC.

L106.1.6 Delayed egress. Delayed egress hardware is permitted under this section.

L106.1.7 Exit stairway access. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exception:

An elevator lobby may be secured provided all of the following conditions are met:

1. Fire System Requirements. The building shall be equipped with either a fire alarm system and be fully detectored or be fully sprinklered and have manual fire alarm boxes (pull stations) installed throughout the building or be equipped with the life-safety features prescribed under IBC Section 403.
2. Electric Locks. All doors connecting the secured lobby with normally occupied areas or with corridors leading to the exit stair enclosure can only be secured with a fail-safe electric lock. The lock shall unlock when the fire alarm is activated.
3. Emergency Communications. One of the following emergency communication devices shall be provided in the lobby:
    a) A manual fire alarm box shall be installed in a clearly visible location within the elevator lobby and mounted at a height to comply with the Reach Ranges provisions of ICC/ANSI A117.1 (2003) Section 308. The location shall be subject to approval by the FPB. A manual fire alarm box installed under these requirements shall transmit to a Class I Central Station.
    b) An emergency telephone or other approved two-way communication device shall be installed in the elevator lobby, and mounted in compliance with the Reach Ranges provisions of ICC/ANSI A117.1 (2003) Section 308. The location shall be approved by the FPB. The system/device shall transmit to a commercial monitoring service or continuously staffed monitoring service within the building as approved by CPD and the FPB. Upon activation, the communications device shall automatically transmit a location identification message to the monitoring service. A sign shall be provided at the communication device that states that this is an emergency phone and lists the building address and the floor number of the elevator lobby.
4. Lighting Requirements. The elevator lobby shall be illuminated per IBC Section 1006 (Means of Egress Illumination).

5. Compatibility With Accessibility Requirements. All doors into the elevator lobby area from normally occupied areas shall have accessible hardware compatible with the requirements of ICC/ANSI A117.1 (2003) Sections 308 and 404.2.6 on each side of the door.

6. Areas of Evacuation Assistance (Refuge Areas). When an elevator lobby is used as an Area of Evacuation Assistance, all of the following additional, conditions shall be met:

   a) Electric Lock Requirements. Electric locks shall be designed so that when they are released, the door will remain latched. The lock shall also be connected to the Electric Locks – Master Switch.

   b) Door and Door Hardware Requirements. All doors opening into elevator lobby refuge areas shall be 20-minute fire-protection rated assemblies as required by DBC Section 403.9.1. All hardware necessary to maintain the fire rating of the door shall be listed and approved fire door hardware. All hardware installed on the rated door and frame assembly shall be compatible with the manner in which the door was manufactured and shall not reduce the fire rating of the assembly. Field or other modification of rated doors and frames is prohibited unless approved in writing by the agency which labeled the fire-rated assembly.

   c) Securing Doors Leading Into the Elevator Lobby. Doors leading into the lobby refuge area from normally occupied areas shall be readily openable from the normally occupied side without the use of a key or special knowledge or effort.

   d) Refuge Area Subdivision. A refuge area, which includes the elevator lobby and the corridors that connect the lobby to the exit stair enclosures, shall remain as one open area without restriction of movement within the refuge area.

SECTION L107
SECURING EXIT ENCLOSURE (STAIR TOWER) DOORS

L107.1 Securing exit enclosure doors. Doors opening into exit enclosures can be secured under certain conditions provided all of the applicable requirements of Section L107.1 are satisfied.

L107.1.1 Exit enclosure door general hardware requirements. All doors into exit enclosure shall have hardware that complies with the provisions of Section L107.1.1

L107.1.1.1 Fire rating and latching requirements of door hardware. All doors into exit enclosures shall be fire-rated assemblies, as required by IBC Section 1020. In order to maintain the fire rating of the door assembly, all hardware installed on enclosure doors shall meet the following criteria:

1. Latching Requirements. The door shall remain latched at all times that the door is in a closed position as required by IBC Section 715.4.7.1. Electric locks or strikes that unlatch the door upon activation of the fire alarm system or loss of power are unacceptable.

2. Hardware Requirements. All hardware shall be listed for use on fire-rated door assemblies. The hardware shall be listed for an hourly rating equal to or greater than the rating of the door assembly. Any field or other modification of rated doors and frames is prohibited unless approved in writing by that agency that labels the door and frame assembly. Doors that are modified to accommodate hardware without the approval of the labeling agency are not approved and shall be replaced with properly labeled doors manufactured to accommodate the hardware.

L701.1.1.2 Door hardware requirements to provide accessibility. All new hardware on doors into exit enclosures shall be compatible with the requirements of ICC/ANSI 117.1 (2003) Sections 308 and 404.2.6. All hardware that was installed after August 1, 1983, shall comply with ICC/ANSI 117.1 (2003) Sections 308 and 404.2.6.

L107.1.2 Requirements for access control. All doors into exit enclosures shall be capable of being opened from both sides without the use of a key or special knowledge or effort unless otherwise permitted by the provisions of Section L107.1.

L107.1.3 Exit Enclosure doors at the exit discharge level. Doors providing the path of egress out of the enclosure at the discharge level cannot be locked from the exit enclosure side at any time.

Exception:

Magnetic locks and Delayed Egress Locks are permitted when used in accordance with this appendix.

Exterior exit enclosure doors at the exit discharge level can be locked to prevent access into the exit enclosure from the exterior side. Interior exit enclosure doors at the exit discharge level that are not intended for exit discharge from the exit enclosure shall comply with all of the provisions of Section L107.1.4.

L107.1.4 Access doors into exit enclosures at levels other than the exit discharge level. Doors that are a part of the path of egress into exit enclosures cannot be locked to prevent or restrict access into the exit enclosure at any time. Doors shall be operable without the use of a key or any special knowledge or effort. The door shall be capable of being opened with one operation only. The following types of locking devices are prohibited on the exit side of doors into enclosures:

1. **Key operated mechanical locks**. Mechanical locks requiring a key, combination or other special knowledge to open the door.
2. **Combination of mechanical and electrical locks.** Combinations of mechanical door hardware and/or electric locks which require more than one operation to open the door.
3. **Electric locks.** Electric locking devices which are unlocked by use of a key, card reader, key pad, pressure sensitive mat, push button switch or other similar method.
4. **Electric strikes.** Fail-safe electric strikes are prohibited on doors into exit enclosures. The latch point on these doors must be maintained and a fail-safe electric strike does not maintain the latch point when power is lost to the strike. Fail-secure electric strikes that are not listed for use on a fire rated door assembly are also prohibited on doors into exit enclosures. Except as allowed by Section L107.1.3.2.2.
5. **After hours locks.** Locking devices that are activated after normal business hours or during other timed periods and restrict access into the exit enclosure.

Exceptions:

1. **Magnetic locks and delayed egress** locks are permitted when used in accordance with this appendix.
2. **Parking garage.** In a parking garage that is not intended for use by the general public (or in other garages, when approved by CPD & FPB), doors used in a means of egress that also serve lobbies, corridors or common areas may be locked provided all of the following conditions are met:

    a) Parking garage, lobby, corridor, common area use. The parking garage, lobby, corridor or common area that is accessed by the door may not be accessible to the general public.

    b) Fire system requirements. The building shall be equipped with a fire alarm system with manual fire pull stations and notification appliances installed throughout the building. Manual pull stations and notification appliances shall be provided adjacent to each secured, parking garage door. If the building is provided with an automatic sprinkler system or a fire detection system then activation of either of these systems or the fire alarm system shall unlock the doors and the doors shall remain unlocked until the system has been reset.

    c) Electric lock requirements. The electric lock must be fail-safe and unlock upon fire alarm activation or loss of normal building power. The lock may not be connected to an emergency power source that would keep the lock energized when normal building power is lost.

    d) Signage. A sign shall be provided on the garage side of each door to be locked that reads: DOOR IS LOCKED, UNLOCKS UPON FIRE ALARM. The sign shall be in letters 1 inch (25 mm) high on a contrasting background.

e) Lighting. The area at the door shall be illuminated per IBC Section 1006 (Means of Egress Illumination).

L107.1.5 Doors that provide access out of exit enclosures at non-discharge levels. If the locking system complies with all of the specific provisions of Section L107.1.5 and the general provisions of Section L107.1 then the doors that provide access out of exit enclosures on levels that are not intended for exit discharge may be secured from the exit enclosure side.

L107.1.5.1 High rise buildings. In a high rise building, if all of the provisions of this section are satisfied then the enclosure doors can be locked to prevent access out of enclosure on all levels except the exit discharge levels.

L107.1.5.1.1 New door locks which prevent access out of exit enclosures. All new lock installations in high rise buildings, which prevent access out of an exit enclosure, shall satisfy the following requirements:

1. Electric locks. All new locks shall be electrically modified locksets which shall simultaneously unlock, but not unlatch, upon a fire alarm or a power loss or activation of Electric Locks – Master Switch. The electrically modified lockset shall be wired to all three of these monitor/power/control points. Each of these three conditions shall unlock but not unlatch the stairway doors. These locks shall not be connected to an emergency power source that would keep the door locked upon loss of normal building power.
2. Mechanical locks. Conventional keyed, combination or other mechanical locks are not allowed in new lock installations.
3. Fifth floor rule. Where doors are locked for more than five consecutive floors, a telephone or other approved two-way communication system shall be provided. The travel distance between each phone or communication system shall not exceed five floors as required by IBC Section 403.12.1.
4. Phone/communications system. An emergency telephone or other approved two-way communication device shall be installed in the stair landing, and mounted at a height to comply with the requirements of ICC/ANSI 117.1 (2003) Section 308. The location shall be approved by the CPD. The system/device shall transmit to a commercial monitoring service or continuously staffed monitoring service within the building as approved by CPD. Upon activation, the communications device shall automatically transmit a location identification message to the monitoring service.
5. Signage. All locked exit enclosure doors shall have the applicable signage required by Section L107.1.5.1.1 and IBC Section 1020.1.6 and comply with ICC/ANSI 117.1 (2003) Sections 703 and 704. Signage shall be provided as follows:
   a) All doors that are locked for more than 5 consecutive floors shall have a sign that reads: **THIS DOOR IS LOCKED. EMERGENCY PHONES ARE LOCATED ON FLOORS ___ AND ___.**
   b) All doors that are locked for 5 consecutive floors or less shall have a sign that reads: **THIS DOOR IS LOCKED. FOR THE NEXT UNLOCKED DOOR GO DOWN TO FLOOR ___ OR UP TO FLOOR ___.**
   c) All emergency phones in exit enclosures shall have a sign that reads: **EMERGENCY PHONE.** The sign shall also provide the address of the building and describe the floor and stair location of the phone.

L107.1.5.1.2 Existing door locks which prevent access out of exit enclosures. Existing locking systems in high-rise buildings that prevent access out of exit enclosures shall satisfy all of the following criteria in order to remain in service:

1. Existing lock definition. An existing lock is a lock that was legally installed with a building permit prior to September 21, 1990, the effective date of Policy P-25 "Securing of Stair Doors into Exit Enclosures". The lock shall also comply with all of the requirements of the building code in effect at the time it was installed.
2. Master keys. Locks must be key operable. Four sets of master keys to operate the locks shall be available for Fire Department use in a location approved by the FPB.

3. Fifth floor rule. Doors shall not be locked for more than five consecutive floors with keyed mechanical locks. Where keyed locks are in place for more than five consecutive floors, at least one shall be replaced by an electric lock such that the keyed locks do not occur for more than five consecutive levels. The electric locks shall comply with all high rise building requirements as required by Section L107.1.5.1.1.

4. Existing mechanical combination locks. Existing mechanical combination locks shall be removed and replaced with complying electric locks.

5. Existing electric locks. Existing electric locks on the enclosure side may remain in service if they comply with all of the requirements listed in Section L107.1.

L107.1.5.2 Non-high rise buildings. In non-high rise buildings, if all of the provisions of Section L107.1.5.2 are satisfied then the enclosure doors can be locked to prevent access out of the enclosure on all levels except the discharge levels or other levels required to have access from the enclosure by the provisions of Section L107.1.5.2.2.

L107.1.5.2.1 Non-high rise buildings less than five stories. Doors into exit enclosures can be locked with any type of mechanical lock or listed electrical lock from the enclosure side to prevent access out of the enclosure if all of the following conditions are satisfied:

a. The locking hardware does not prevent mechanical free egress into the enclosure at exit doors.

b. The door is not a part of the egress path from the enclosure at a discharge level.

c. The door locking hardware complies with all of the requirements of Section L107.1.1.1.

d. If listed electric strikes are used as part of the locking system the strike shall be a fail-secure strike.

The provisions of this section can be applied to locking applications in both new and existing buildings.

L107.1.5.2.2 Non-high rise buildings greater than four stories. Exit enclosure doors can be locked to prevent access out of the enclosure in non-high rise buildings more than four stories in height if the locking system complies with all of the general provisions of Section L107.1 and the specific provisions for high rise buildings in Section L107.1.5.1.

SECTION L108
CONTRACTOR LICENSING REQUIREMENTS FOR ACCESS CONTROL SYSTEMS

L108.1 Contractor licensing requirements for access control system work. A licensed access control contractor is required to obtain the permit necessary to install access control systems and components, including but not limited to, delayed egress systems, telephone entry systems, electric door strikes, magnetic locking hardware, electrified locksets, electrically operated panic hardware, card readers, controllers and other access control equipment. The access control contractor may perform all of the work related to the installation of the access control system except for the work restricted by the provisions of Section L108.1.2. The restricted work shall be performed by a contractor that is licensed to perform the work.

L108.1.1 Access control system contractor license. The access control system contractor license is authorized and classified by the provisions of DBC. All of the applicable requirements of the Administration Section shall be satisfied in order to obtain the access control system contractor license. The access control contractor may perform all work directly related to the access control system except as limited by this section. The following types of related work can be performed by the access control contractor:

1. The installation of all access control system components including but not limited to control panels, magnetic locking hardware, electrified locksets, electric strikes, electrically operated panic hardware, card readers and power supplies that are not hardwired to the building's electrical power distribution system can be performed. The work necessary to connect the access control system to a hard-wired power supply is allowed to be performed.

2. The installation of all associated interconnecting wiring between access control system components necessary for operation of the system except electrical circuits that are powered with more than 48-Volt-AC/DC can be performed.
3. The installation of raceways and conduits that only contain wiring for the interconnection of the various access control components can be performed.
4. The modification of doors and door frames required to install the various access control components can be performed if the modification does not void the listing and labeling of a fire rated door and/or door frame. The work necessary for the replacement of existing doors and/or doorframes in existing openings is also allowed to be performed.

An electrical contractor or an electrical signal contractor cannot perform the work that requires an access control system contractor unless allowed by other provisions of this appendix. The modification of doors and door frames can be performed by a properly licensed building contractor (Class A or B) or by one of the Class D building specialty contractors licensed to install or perform work on doors.

L108.1.2 Requirements for work not performed by access control systems contractor. Work related to the installation of the access control system that cannot be performed by the access control system contractor shall be performed by a contractor that is licensed by the classification provisions of DBC to perform the work. The following types of work related to the installation of access control systems cannot be performed by the access control contractor and shall be performed by an appropriately licensed contractor as required by Section L108.1.2:

1. The wiring and modifications necessary to connect the access control systems to the fire alarm system. This work shall be performed by an electrical signal contractor or an electrical registration contractor (Administration Section).
2. The wiring and modifications necessary to connect the access control system to elevator control system. This work shall be performed by a licensed elevator contractor.
3. Any work on electrical circuits that are powered by more than 48 Volt-AC/DC including the hard-wiring of power supplies for the access control system to the building's power system. This work shall be performed by an electrical registration contractor.
4. The installation of conduits or raceways that are intended to contain wiring for any of the following types of circuits is not allowed:
    a) Circuits that carry more than 48 Volts AC/DC. This work shall be performed by an electrical registration contractor.
    b) Circuits that are a part of the building's fire alarm system. This work shall be performed by an electrical signal contractor or an electrical registration contractor.
    c) Circuits that are a part of an elevator control system. This work shall be performed by an elevator contractor.
5. The construction of new walls and the installation of new doors and/or door frames in new openings. This work shall be performed by a Class A building contractor, Class B building contractor or by one of the Class D building specialty contractors licensed to perform the work.
6. The work necessary to modify fire rated doors and door frames that is required to be performed by the doors manufacture or other approved door fabrication shop approved by the agency that provides the listing for the door and door frames.

SECTION L109
ACCESS CONTROL SYSTEM PERMIT REQUIREMENTS

L109.1 Access control system permit. In order perform work on an access control system an access control permit shall be obtained prior to the start of work on the system. All of the provisions of Section L109.1 shall be satisfied prior to the issuance of an access control system permit.

L109.1.1 Purpose and background. A specific permit application form was developed for the installation of access control systems. This application form was designated as a Type 3B Permit. The 3B Permit allows the installation of access control systems and electric door locks in existing buildings, additions and new buildings. The 3B Permit application is intended to provide a unique permit for access control system work and to simplify the permitting process for access control systems. Previously, multiple permit applications had to be submitted for the installation of access control systems. The 3B permit allows all of the following types of permits and their corresponding access control system related work to be combined into one application (all permit types may not be required for each access control system application):

Type 1C Permit – Work performed for the installation of doors or approved modifications to doors and door jambs.

Type 3A Permit – Work performed for the interconnection of the access control system with the fire alarm and fire detection system.

Type 3 Permit – Work performed for the installation of the access control system or component that require circuits that carry more than 48 Volts AC/DC.

L109.1.2 Work requiring an access control permit. An access control system permit is required when a new access control system or electric locking systems are being installed or an existing system or electric lock is being modified in any new or existing building. An access control permit is also required when the access control system is installed outside of a building and anyone of the following conditions occur:

1. The exterior access control system limits or affects the occupants of the building in their ability to reach the public right-of way or a required safe dispersal area as required by IBC Section 1024.6.
2. The exterior access control system limits or restricts the use of the accessible route into the building.
3. The exterior access control system is interfaced and connected with a building's fire alarm system.
4. The exterior access control system is interfaced and connected to a building's elevator system.

L109.1.3 Scope of work covered by a Type 3B Permit. As indicated in Section L109.1.1 the Type 3B permit is intended to allow all of the work to be performed, on a single permit, that is directly related to the access control system and that must be completed by the following licensed contractors as required by Section L108.1.1 and Section L108.1.2:

1. Access Control System Contractor
2. Electrical Signal Contractor
3. Electrical Registration Contractor
4. Building Contractor Class A or B
5. Building Specialty Contractor Class D (related to the installation of new door and door frames and the approved modification of fire rated and labeled door and door frames).

Although the name and license number of the elevator contractor is required to be provided on the Type 3B permit, the work related to the elevator system is not covered by the Type 3B permit. A separate Type 6 elevator permit shall be obtained by a licensed elevator contractor in conjunction with the Type 3B permit when the access control system interfaces with the elevator system.

L109.1.4 Issuance of a Type 3B Permit. A Type 3B permit can only be issued to a properly licensed access control system contractor.

Exception:

The Type 3B permit can be issued to a properly registered electrical registration contractor if the access control system does not require any of the following types of work or cause any of the following conditions to occur:

1. Limits or restricts mechanical free egress.
2. Requires work to install or modify fire rated door and/or door frames.
3. Requires work to replace doors and/or door frames.

CPD will provide a permit inspection record card to the contractor upon issuance of the permit. The Type #3B permit contractor is responsible for obtaining the required signatures on this card for all work requiring inspection and approval by CPD.

L109.1.5 Type 3B Permit application requirements. All of the submittal requirements of Section L109.1.5 shall be satisfied prior to acceptance of the Type 3B permit application by CPD.

L109.1.5.1 Application procedures. The applicant for the Type 3B permit shall be the contractor that will be performing the access control work or their authorized representative. The applicant is responsible for completing the permit application on the form provided by CPD. A complete description of work is to be provided with the application. The names and license numbers of the other contractors that will be performing work under the Type 3B permit shall be provided on the permit application. If the access control system interfaces and connects with the building's elevator system the name and license number of the elevator contractor shall be provided on the permit application for the Type 3B permit.

The permit application along with all the other submittal items required by Section L109.1.5 shall be presented for acceptance in the manner and at the location established by CPD.

L109.1.5.2 Plan submittal requirements. Two sets of drawings showing the entire scope of the work to be performed shall be submitted with the Type 3B permit application.

L109.1.5.2.1 Responsible designer. The drawings shall be prepared under the direction and control of one of the following:

1. A licensed access control system contractor. The contractor shall indicate their review and acceptance of responsibility for the system's design by providing an original signature and the date of signature along with their contractor license number on each drawing sheet.
2. A licensed access control system supervisor. The supervisor shall indicate their review and acceptance of responsibility for the system's design by providing an original signature and the date of signature along with their contractor license number on each drawing sheet.
3. A Colorado licensed design professional. The design professional shall indicate that they are the person responsible for the design of the system by placing their State of Colorado design professional seal on each drawing. The seal shall be original or computer generated and be signed with an original signature and the date of signature shall be indicated.

The name, mailing address and phone number of the person accepting responsibility for the drawings and system design shall be indicated on the plans submitted with the permit application.

L109.1.5.2.2 Drawing content. The plans being submitted shall provide all of the following information:

1. The address of the building shall be included on the drawings along with a description of the location of the work.
2. The plans shall clearly indicate all doors that have mechanical free egress. If mechanical free egress is not being provided, as allowed by the provisions of this appendix, the plans shall clearly indicate the doors that do not provide mechanical free egress.
3. Floor plans, drawn to scale, showing the device locations and door swings in plan view(s). The location of all equipment involved shall be shown on the plan view(s). The location of exit signs and the path of egress shall be shown. The floor plans shall provide sufficient information so that the affect of the access control system on the exiting scheme from the floor can be fully evaluated.
4. A door and hardware schedule that specifies the type and size of each door and the hardware type and function being provided on each door.
5. A narrative shall be provided that describes in detail the sequence of operations for the system.
6. When the installation of the system requires the penetration of fire rated assemblies, details and/or specifications shall be provided that indicate how the fire rating of the assembly will be maintained at the penetration in accordance with Chapter 7 of the DBC.

7. A one-line diagram of the system design shall be provided. The diagram shall include the source of power, battery backup if provided, and interconnection with burglar alarm or fire alarm or elevator control systems if provided. All devices in the design shall be shown on the one-line diagram. When the source of power is provided by a plug-in power supply such device shall be clearly noted on the diagram.
8. Point-to-point wiring details of all connections, including all interconnections to other building systems shall be shown. Other building systems include but are not limited to the power distribution system, the fire alarm system and the elevator control system.
9. Manufacturers specification sheets for all devices that are part of the scope of work shall be provided. Specification information shall include the approved testing agency's file number for each device. One complete set of specification sheets should be attached to each set of plans.

Sample access control drawings are included in this Appendix that can be used as examples of how to present the required information on the submittal drawings.

L109.1.5.3 Other submittal requirements. When fire rated door and or door frames are shop modified to accommodate the access control system installation, documentation shall be submitted with the permit application that indicates the modifications performed and the name of the shop that performed the modifications to the door or door frame. All modifications to fire rated door and door frame assemblies shall be performed by a shop that is approved by the listing and labeling agency as an approved fabricator.

L109.1.5.4 Valuation of work. The applicant shall provide a statement for the valuation of the work to be performed under the access control system permit. The valuation of work shall be provided on a form provided by CPD. The valuation of work shall include the contractor's profit, cost of materials, labor and overhead.

L109.1.5.5 Plan review fee. Once the Type 3B permit application is reviewed and determined to be complete the applicant shall be required to pay the plan review fee required by the DBC.

L109.1.6 Plans review. Upon payment of the plans review fee the Type 3B permit application will be placed in the tracking system for the plans review process. The applicant will be given an application tracking number. Once the plans review has been performed the applicant will be notified if the application is approved or denied. If the application is denied the applicant will be provided with a written list of comments that describe the reasons for the denial of the application. Upon resolution of the plans review comments the application will be approved. The permit will be issued upon payment of the building permit fee and any additional plan review fee or other fee required by the DBC.

SECTION L110
ACCESS CONTROL SYSTEM PERMIT INSPECTION PROCESS

L110.1 Access control system permit inspection process. All access control system work shall be inspected and accepted by CPD prior to starting the operation of the system. All of the requirements of the Administration Section shall be satisfied prior to the final acceptance of the access control system work by CPD inspections.

L110.1.1 Required inspections. The access control system contractor shall be responsible for requesting and obtaining a CPD inspector's approval on all required inspections. A separate rough-in inspection and a separate final inspection shall be performed for all of the following work:

1. Access control system work.
2. High voltage electrical work.
3. Fire alarm system work.
4. Elevator system work.

The final inspection for the access control system will not be performed until the final inspection has been approved for all of the other related work. The access control system shall be ready for inspection prior to requesting the final access control system inspection.

L110.1.2 CPD inspector responsibility. The following CPD inspectors shall be responsible for performing the rough-in and final inspections on the access control system work:

1. A CPD electrical inspector shall perform all of the inspections required for high voltage electrical work.
2. A CPD electrical inspector shall perform all of the inspections required for fire alarm system work.
3. A CPD elevator inspector shall perform all inspections required for the elevator system work.
4. A CPD public safety inspector shall perform the inspections on all of the work being performed under the Type 3B permit that is not inspected by another CPD inspection group.

L110.1.2.1 Inspection related duties. It will be the responsibility of the CPD public safety inspector to perform the following inspection related duties:

1. Verify that labeling has been provided on all modified fire-rated doors and frames.
2. Performing testing of the access control system. If testing is required to be performed by an electrical or elevator inspector, the public safety inspector shall coordinate with the other inspectors to assure that the overall systems function as designed.
3. Coordinate with the FPB when Fire Department related issues occur during the installation of the access control system.
4. Assure that the inspections record card has been signed and approved by all of the inspection groups that have been required to inspect work on the access control system being installed.
5. Finalize the Type 3B permit once they complete the final inspection process.

SECTION L111
ACCESS CONTROL SYSTEM TESTING AND MAINTENANCE

L111.1 Access control system testing. This appendix does not require mandatory access control system testing. However, it is strongly recommended that the building owner implement a periodic testing program to assure that the system and its component parts continue to operate as designed. It is further recommended that a licensed and qualified access control system contractor be retained to test and perform maintenance on the system at a maximum interval of twelve (12) months.

L111.2 Access control system maintenance. All access control systems shall be maintained to remain in compliance with this appendix and the specific operational requirements of the system that was originally permitted. Failure to maintain the system in compliance with the requirements of this appendix and the originally approved system design requirements and conditions shall be cause to require the operation of the system to be suspended or removed. When the access control system interfaces with the buildings fire alarm and/or elevator control systems and these systems are not maintained in a fully operational condition, the operation of the access control system may be required to be suspended until these related systems are fully operational.

SECTION L112
ACCESS CONTROL – SAMPLE DRAWINGS

L112.1 Sample drawings. The sample drawings included in this section are intended to provide general guidance and assistance in the preparation of submittal drawings that are required to be submitted by the Administration Section with the 3B Permit application. All of the information shown on these sample drawings shall be incorporated into the drawings that are to be used to construct the system. Additional information may be required to be shown on the drawings being submitted when unusual conditions occur or when unique systems are being installed. The following sample drawings are included:

DRAWING AC1 – TITLE SHEET – Figure 112.1 (a)
DRAWING AC2 – SEQUENCE OF OPERATION – Figure 112.1 (b)
DRAWING AC3 – FLOOR PLAN AND DOOR SCHEDULE – Figure 112.1 (c)
DRAWING AC4 – POINT-TO-POINT DIAGRAM – Figure 112.1 (d)

DRAWING AC5 – ONE LINE DIAGRAM – Figure 112.1 (e)
DRAWING AC6 – ELEVATION VIEW OF DOORS – Figure 112.1 (f)

FIGURE 112.1 (A) - DRAWING AC1 – TITLE SHEET

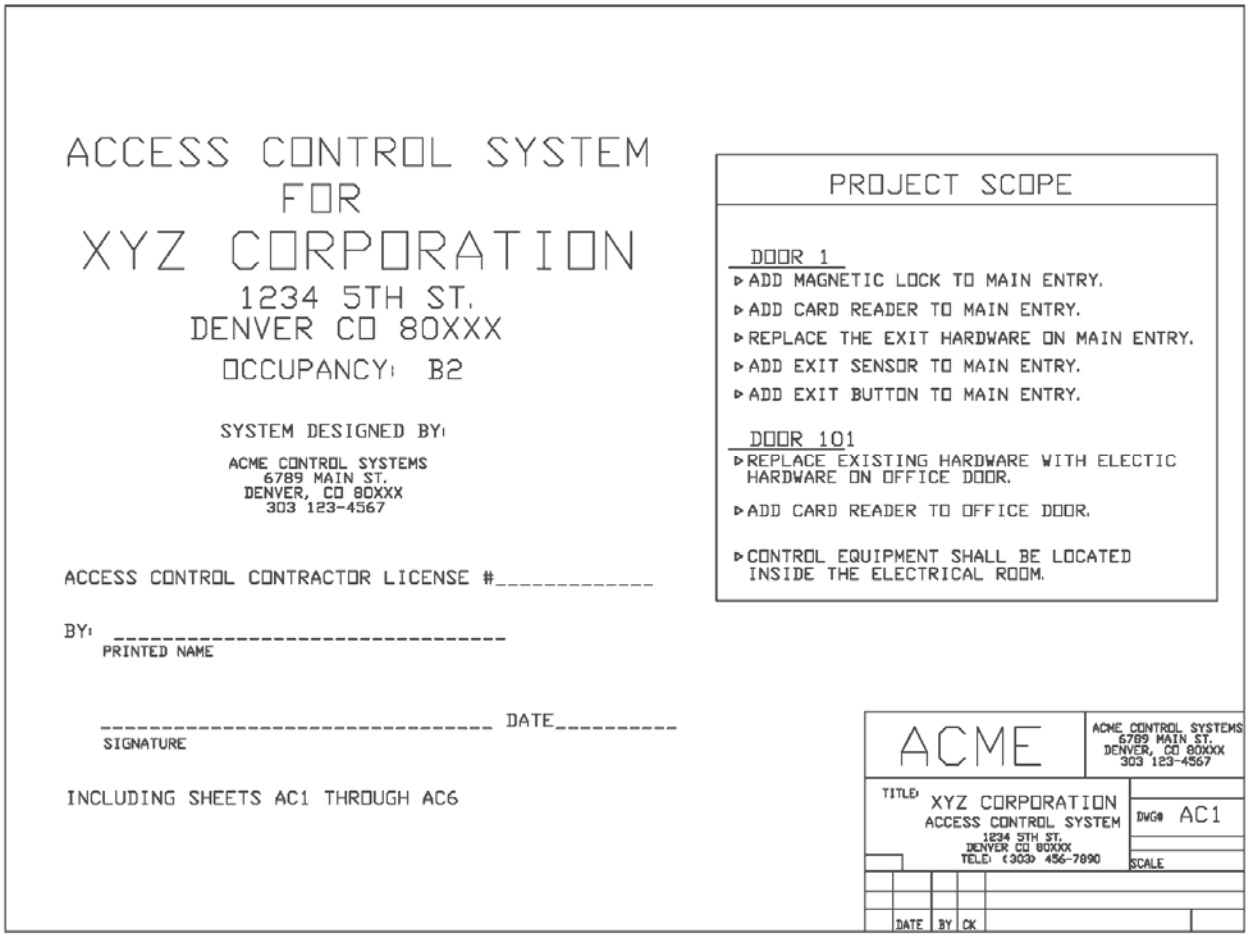

FIGURE 112.1 (A)

FIGURE 112.1 (B) - DRAWING AC2 – SEQUENCE OF OPERATION

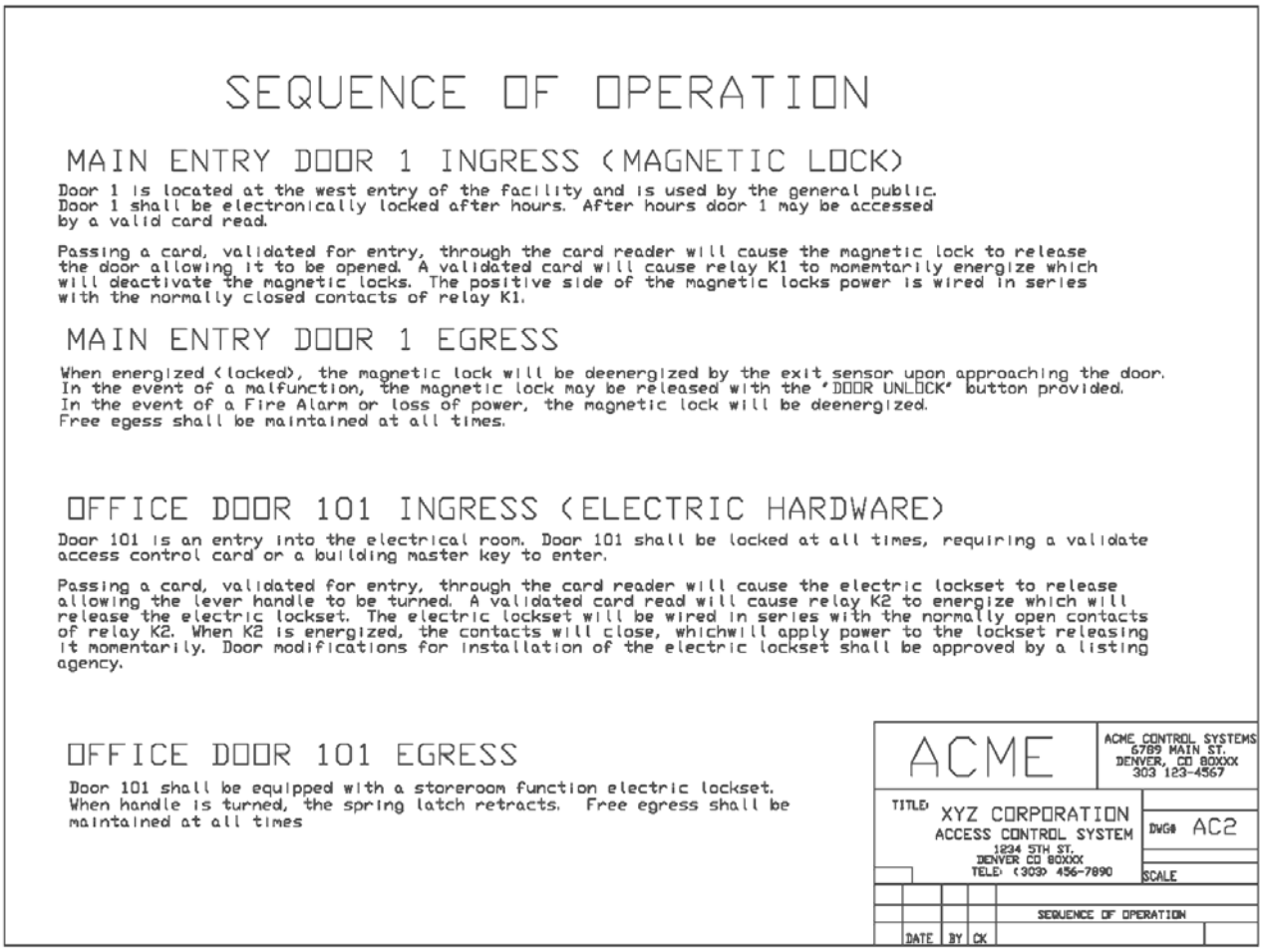

FIGURE 112.1 (B)

FIGURE 112.1 (C) - DRAWING AC3 – FLOOR PLAN AND DOOR SCHEDULE

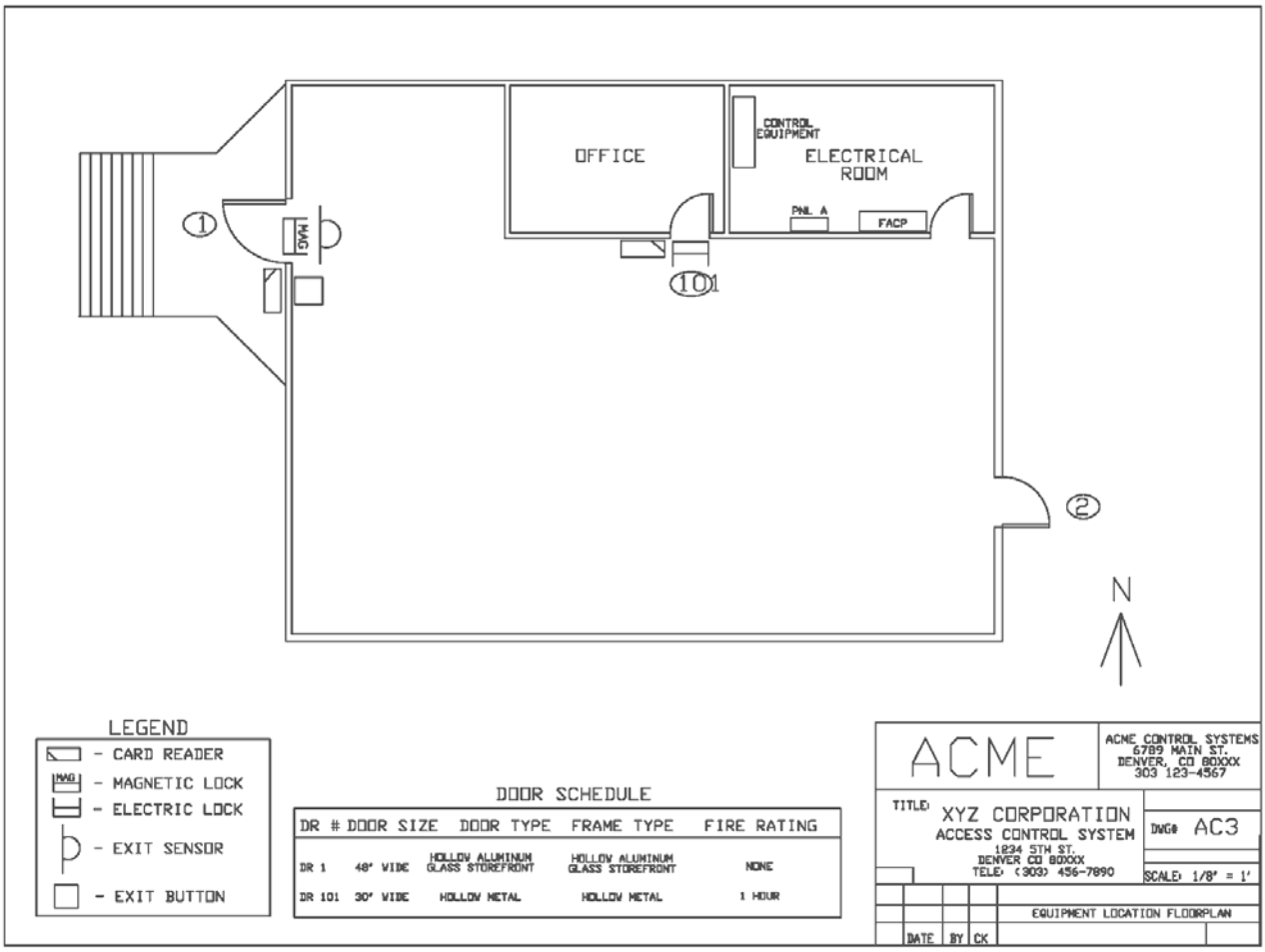

FIGURE 112.1 (C)

FIGURE 112.1 (D) - DRAWING AC4 – POINT-TO-POINT DIAGRAM

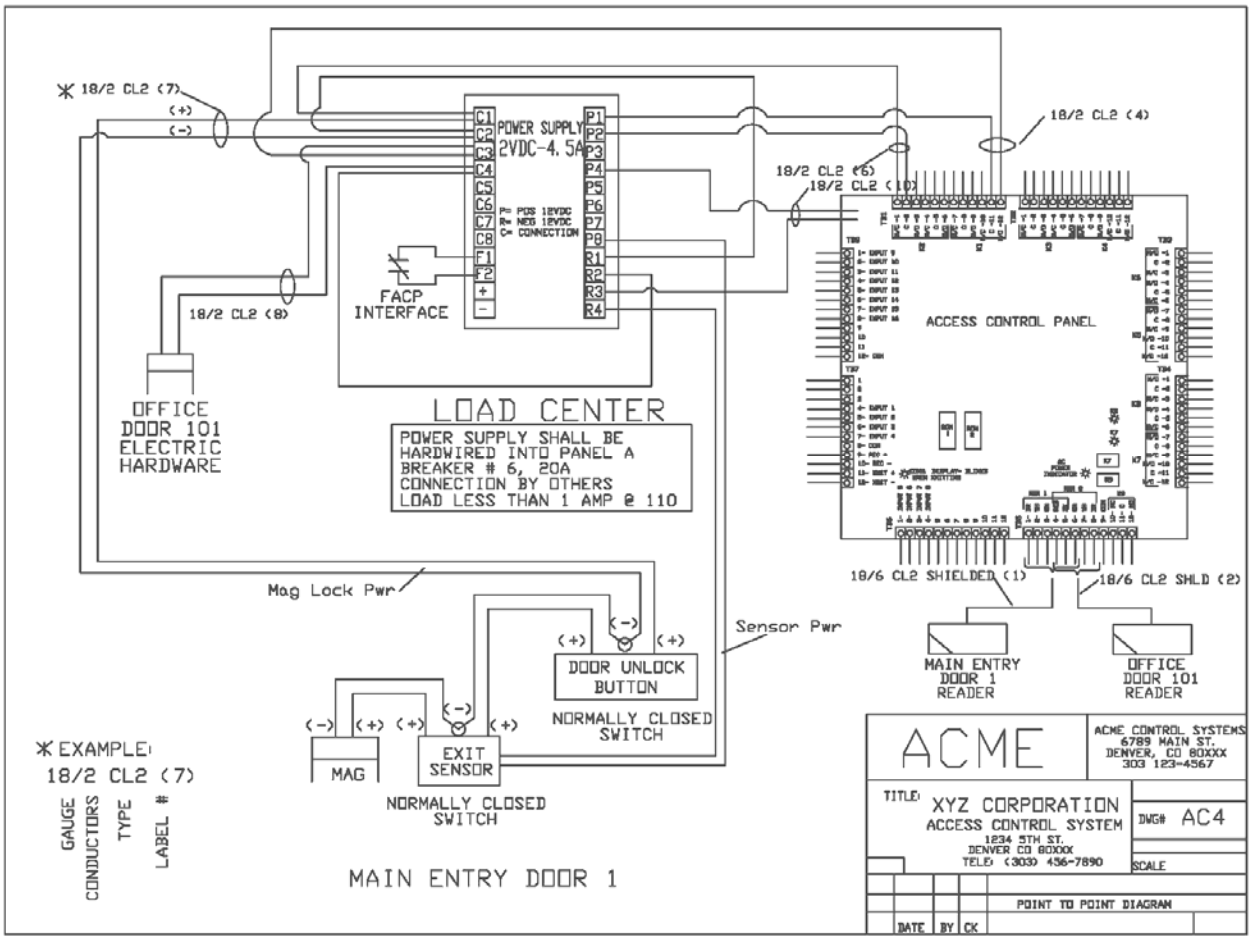

FIGURE 112.1 (D)

FIGURE 112.1 (E) - DRAWING AC5 – ONE LINE DIAGRAM

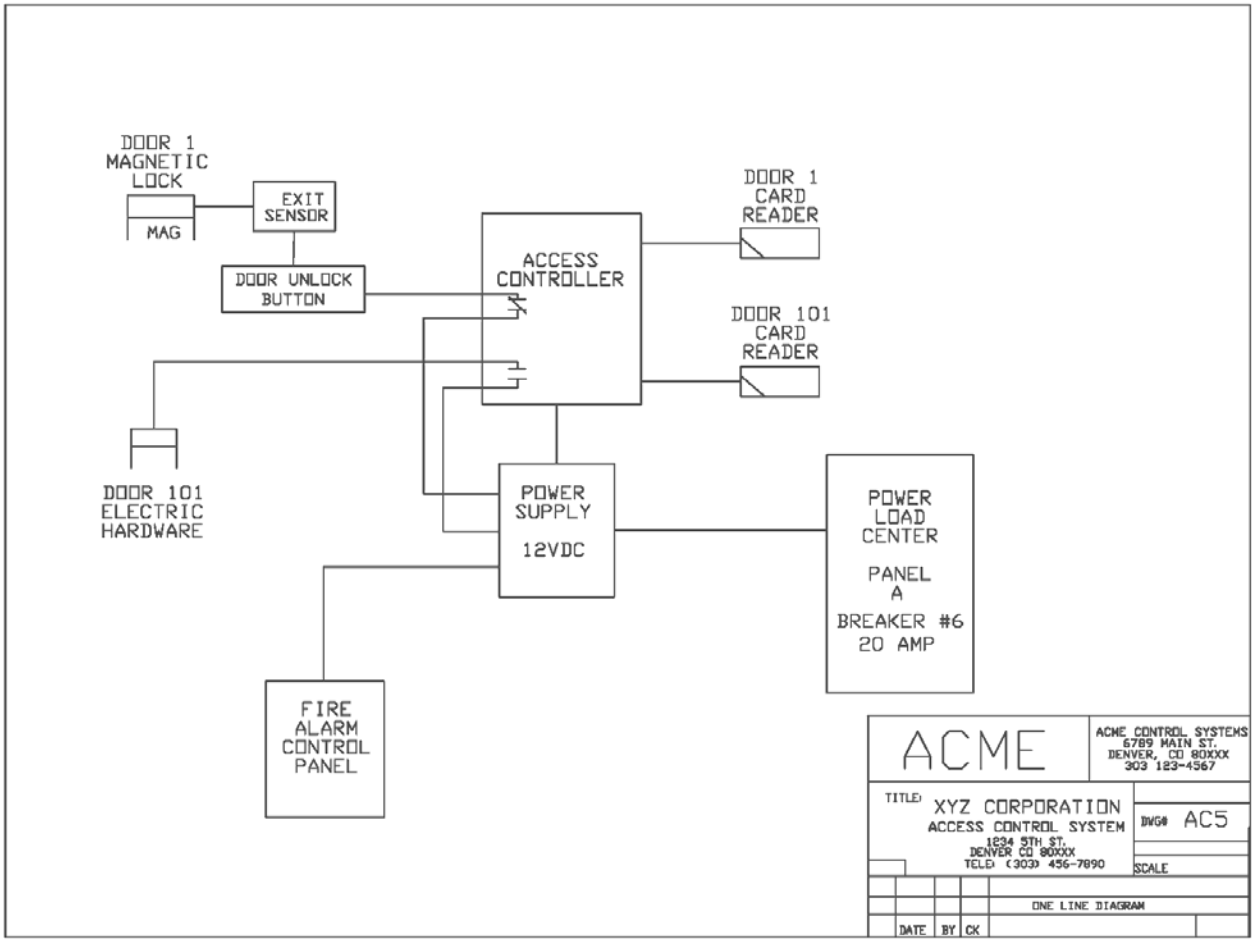

FIGURE 112.1 (E)

FIGURE 112.1 (F) - DRAWING AC6 – ELEVATION VIEW OF DOORS

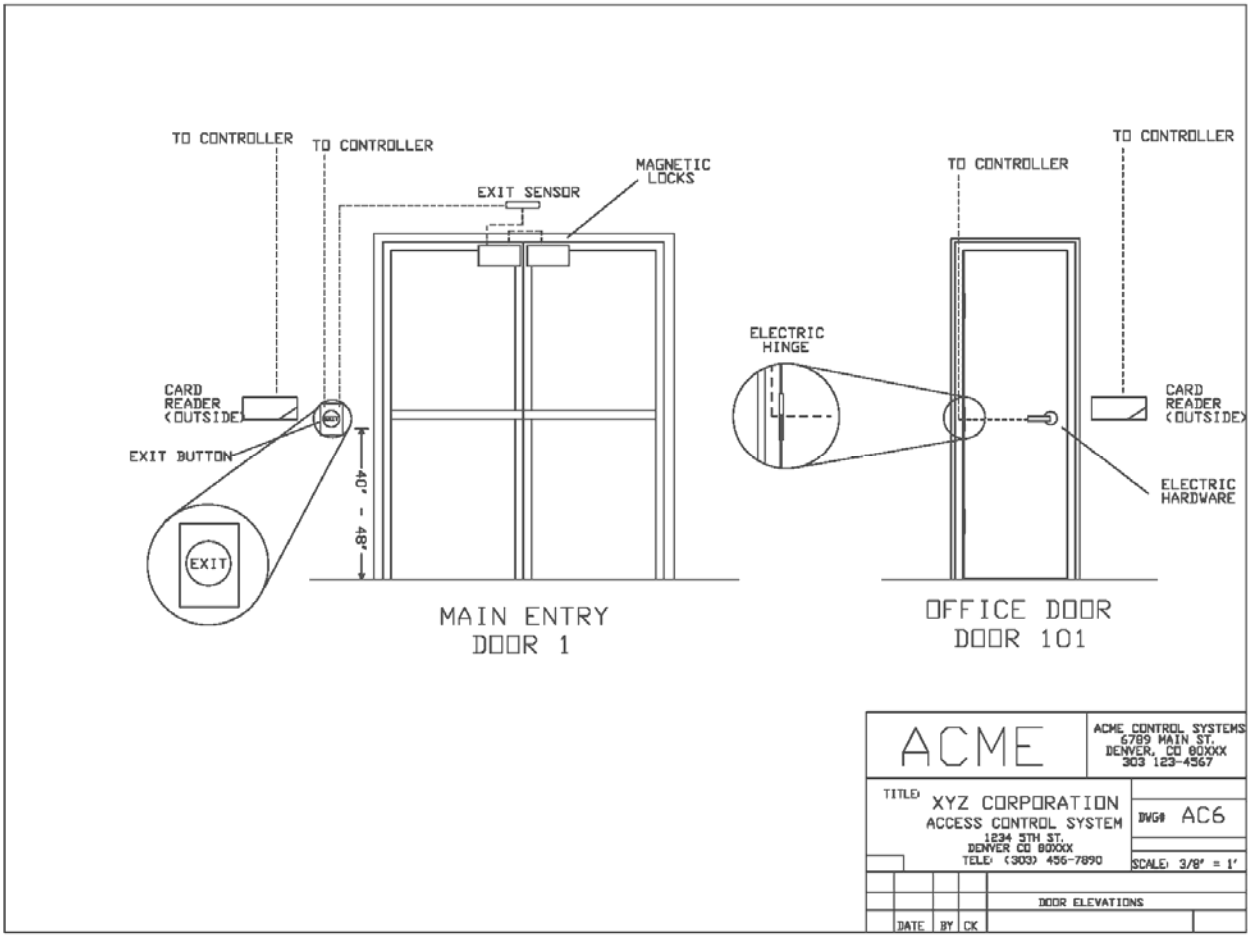

FIGURE 112.1

Appendix M Colorado Title 9 Article 5 – standards for accessible housing is added:

APPENDIX M

COLORADO TITLE 9 ARTICLE 5 - STANDARDS FOR ACCESSIBLE HOUSING

Colorado Statute Title 9, Article 5 is reproduced in this appendix for reference.

ARTICLE 5

STANDARDS FOR ACCESSIBLE HOUSING

Colorado Statutes: TITLE 9 SAFETY - INDUSTRIAL AND COMMERCIAL: BUILDINGS AND EQUIPMENT: ARTICLE 5 STANDARDS FOR ACCESSIBLE HOUSING

9-5-101. Definitions.

As used in this article, unless the context otherwise requires:

1. "Accessibility point" means a unit of value exchanged for different levels of accessible dwelling types to satisfy the requirements for dwelling accessibility contained in this article.
2. "Accessible route" means an interior or exterior circulation path that complies with the provisions contained in "ANSI A117.1-1998".
3. "ANSI A117.1-1998" means the 1998 version of the "American National Standard for Buildings and Facilities Providing Accessibility and Usability for Physically Handicapped People", promulgated by the American national standards institute.
4. "Detached residence" means a one- or two-family residence that is separated from adjacent dwellings by an unobstructed physical space. A one- or two-family residence that is separated from an adjacent dwelling by a physical space of less than three feet shall not be considered a detached residence.
5. "Ground story level" means the lowest story in a dwelling unit containing habitable rooms or areas with an accessible entrance located on an accessible route that contains living, sleeping, cooking, bathing, and toilet facilities. For the purposes of this article, a basement shall not be considered the ground story level if the finished basement floor is located more than four feet below the exterior finished grade determined at any point along the exposed periphery of the dwelling unit.
6. "Project" means the total number of parcels and buildings in a development planned or constructed by the same developer, builder, or entity on one site or contiguous sites, and also includes all parcels and structures that are parts of the same planned development application or agreement. The separation of contiguous individual buildings, units, lots, tracts, or parcels of land by a property line or by a public or private road shall not create a separate project.
7. "Property" means the site, parcels of land, plats, lots, tracts, individual dwelling units, existing and proposed structures, and the built environment.
8. "Residential dwelling unit" means any portion of a building that contains living facilities, including a room or rooms in a facility that have shared cooking, bathing, toilet, or laundry facilities such as dormitories, shelters, assisted living facilities, and boarding homes. "Residential dwelling unit" also means facilities that include provisions for sleeping, cooking, bathing, and toilet facilities for one or more persons and are used for extended stays, such as time-shares and extended-stay motels. "Residential dwelling unit" does not mean a guest room in a motel or hotel.
9. "Technically infeasible", in reference to a proposed alteration to a building or facility, means that the proposed alteration is not implemented because:
    a. An existing structural condition or conditions make such alteration labor- or cost-prohibitive;

b. The building or facility is in strict compliance with minimum accessibility requirements for new construction and, due to existing physical or site constraints, such alteration would negatively impact such compliance.

10. "Type A dwelling unit" means a dwelling unit designed in accordance with the provisions of ANSI A117.1-1998, section 1002.

11. "Type A multistory dwelling unit" means a multiple story dwelling unit with a ground story level designed in accordance with the provisions of ANSI A117.1-1998, section 1002, and, if provided, accessible laundry facilities on the ground story level.

12. "Type B dwelling unit" means a dwelling unit with a ground floor level designed in accordance with the provisions of ANSI A117.1-1998, section 1003.

13. "Type B multistory dwelling unit" means a multiple-story dwelling unit with a ground story level that is designed in accordance with the provisions of ANSI A117.1-1998, section 1003, and, if provided, accessible laundry facilities on the ground story level.

14. "Type B visitable ground floor" means a multiple-story dwelling unit with an accessible entrance and toilet facility designed in accordance with the provisions of ANSI A117.1-1998, section 1003.

15. "Undue hardship" means a substantial and unusual hardship that is the direct result of unique physical site conditions such as topography or geology, or that is the direct result of other unique or special conditions encountered on a property, but that are not typically encountered in the jurisdiction in which such property is located. Constraints, complications, or difficulties that may arise by complying with these statutory standards for accessibility but that do not constitute an undue hardship shall not serve to justify the granting of an exception or variance.

9-5-102. Disabilities covered - purpose.

1. This article is intended to provide accessibility standards for residential projects designed to serve persons with nonambulatory disabilities, semiambulatory disabilities, sight disabilities, hearing disabilities, disabilities of incoordination, and aging.

2. **Design criteria.** Design criteria shall comply with the 1998 version of the "American National Standard for Buildings and Facilities Providing Accessibility and Usability for Physically Handicapped People", promulgated by the American national standard institute, commonly cited as "ANSI A117.1-1998".

9-5-103. Applicability of standards - enforcement.

1. The standards and specifications set forth in this article shall apply to all buildings and facilities used for housing that are constructed in whole or in part by the use of state, county, or municipal funds or the funds of any political subdivision of the state or that are constructed with private funds. All such buildings and facilities to be constructed from plans on which architectural drawings are started after July 1, 1975, from any one of these funds or any combination thereof shall conform to each of the standards and specifications prescribed in this article. The governmental unit responsible for the enforcement of this article shall grant exceptions to or modify any particular standard or specification when it is determined that it is impractical and would create an undue hardship. Any such exception or modification of the provisions of this article shall be made in writing as a matter of public record. These standards and specifications shall be adhered to in those buildings and facilities that are constructed or proposed on or after April 29, 2003. This article shall apply to permanent buildings.

2. The jurisdiction with responsibility for enforcement of this article pursuant to section 9-5-104 shall designate a board of appeals to hear and resolve appeals of orders, decisions, or determinations made by the enforcing agency regarding the application and interpretation of this article.

3. Any building or facility that would have been subject to the provisions of this article but was under construction prior to July 1, 1976, shall comply with the following:

   a. If the walls or defining boundaries of an element or space are altered, then the altered element or space shall comply with the applicable provisions of section 9-5-105, unless such alteration is technically infeasible. If full compliance with this article is technically infeasible, compliance shall be implemented up to the point of technical infeasibility. No alteration shall be undertaken that negatively impacts accessibility of a building or facility pursuant to ANSI A117.1-1998. This paragraph (a) shall not be construed to require the moving of any existing walls not otherwise planned to be moved.

b. Any additions to a building or facility shall be treated as new construction for the purposes of enforcement of this article.

4. The general assembly finds and declares that the standards and specifications set forth in this article are of statewide concern. Nothing in this article shall prohibit any municipality or other governmental subdivision from making and enforcing standards and specifications that are more stringent, and thus provide greater accessibility, than those set forth in this article.

9-5-104. Responsibility for enforcing standards.

1. The responsibility for enforcement of this article is as follows:

   a. For factory-built residential structures as defined in section 24-32-3302 (10), C.R.S., the division of housing created in section 24-32-704, C.R.S.;

   b. In a political subdivision that does not have a local building code, the division of housing created in section 24-32-704, C.R.S.;

   c. For all other housing or in a political subdivision that has adopted a building code, by the building department, or its equivalent, of the political subdivision having jurisdiction.

9-5-105. Exemptions for certain privately funded projects.

1. Accessible dwelling units shall be provided as required in this article; except that this article does not apply to privately funded projects for the construction of a detached residence or residences or to other types of residential property containing less than seven residential units.

For the purpose of determining the number of accessibility points required pursuant to subsection (2) of this section, the accessible dwelling unit types shall have the following point values:

Accessible dwelling unit type	Accessibility point value per dwelling unit
Type A dwelling unit	6
Type A multistory dwelling unit	5
Type B dwelling unit	4
Type B multistory dwelling unit	3
Type B visitable ground floor	1

2. Residential projects.
   (a) A project shall be assigned accessibility points based on the number of units contained within the project as follows:

Number of units within the **project**	Accessibility points **required**
0-6	0
7-14	6
15-28	12
29-42	18
43-57	24
58-71	30
72-85	36
86-99	42
100-114	48
115-128	54
129-142	60
143-157	66
158-171	72
172-185	78

186-199	84
	+6 additional points
	every 14 units or
etc.	fraction thereof

b. A project shall include enough accessible dwelling units to achieve at least the specified number of accessibility points required pursuant to paragraph (a) of this subsection (2). A project may use any combination of accessible dwelling unit types to comply with this section.

9-5-106. Implementation plan.

The builder of any project regulated by this article shall create an implementation plan that guarantees the timely and evenly phased delivery of the required number of accessible units. Such plan shall clearly specify the number and type of units required and the order in which they are to be completed. Such implementation plan shall be subject to approval by the entity with enforcement authority in such project's jurisdiction. The implementation plan shall not be approved if more than thirty percent of the project is intended to be completed without providing a portion of accessible units required by section 9-5-105; except that, if an undue hardship can be demonstrated, or other guarantees provided are deemed sufficient, the jurisdiction having responsibility for enforcement may grant exceptions to this requirement. The implementation plan shall be approved by the governmental unit responsible for enforcement before a building permit is issued.

Appendix N Construction of airport buildings and structures is added:

APPENDIX N

CONSTRUCTION OF AIRPORT BUILDINGS AND STRUCTURES

All Chapters and Sections of 2008 National Fire Protection Association 415 Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways, shall be used in their entirety except as amended below:

Chapter 1 Administration

Add Section 1.4 as follows:

1.4 Federal Agencies. The facilities, buildings, structures or portions thereof owned, occupied and managed by an agency of the federal government are not subject to the provisions of this Code.

Add Section 1.5 as follows:

1.5 Aircraft-Related Occupancies. Airport traffic control towers, Aircraft hangers, Residential aircraft hangers, Aircraft paint hangers, and Heliports and helistops shall comply with the requirements of 2009 International Building Code (IBC) Section 412.

Chapter 3 Definitions

Section 3.3 General Definitions.

Amend Section 3.3 by adding the following:

3.3.7 Freight Terminal Building (Air Cargo Buildings) – A structure used for the processing and/or storage of incoming or outgoing freight and other necessary functions in connection with air freight operations. Aircraft shall not be housed, stored, loaded or unloaded, undergo service, repairs, or alterations within a freight terminal building. Freight terminal building shall comply with the Group S-1 occupancy requirements of 2009 International Building Code (IBC)

3.3.8 Aircraft Loading Walkway on Grade Level – A fully enclosed on grade walkway through which passengers move between a point in an airport terminal building and an aircraft.

Chapter 4 Airport Terminal Buildings

Section 4.1 General.

Amend Section 4.1.1 as follows:

4.1.1 Airport terminal buildings shall be shall be of Type I or Type II construction as defined in IBC Chapter 6.

Add Section 4.1.1.1 as follows:

4.1.1.1 Occupancy. The occupancy of the airport terminal building or portions thereof shall be classified in accordance with the provisions of IBC Chapters 3 and 4 and shall comply with the mixed use and occupancy provisions of IBC Section 508. High-hazard Group H occupancy shall be not allowed in passenger terminal buildings.

Section 4.2 Heating, Ventilating and Air-Conditioning

Amend Section 4.2.1 as follows:

4.2.1 Heating, ventilating, and air conditioning systems shall be installed in accordance with the applicable portions of 2009 International Mechanical Code (IMC), and 2009 International Fuel Gas Code (IFGC).

Amend Section 4.2.6 as follows:

4.2.6 Exhaust hood ventilation systems for restaurant and flight kitchens shall conform to the applicable portions of 2009 International Fire Code (IFC) Chapter 9 and IMC.

Section 4.2.6.1 as follows:

4.2.6.1 Commercial Kitchen Exhaust hoods ventilation systems for restaurant and flight kitchens shall conform to the applicable portions of IFC Chapter 9 and IMC.

Section 4.3 Exits

Amend Section 4.3.1 as follows:

Delete the reference to *NFPA 101, Life Safety Code* and substitute *the IBC*

Amend Section 4.3.2 as follows:

Delete the reference to *NFPA 101, Life Safety Code* and substitute *the IBC*

Section 4.5 Fire Protection.

Add Section 4.5.1.7

4.5.1.7 Utility tunnel and spaces or rooms over 1,950 ft^2 (181 m^2) shall be classified as Ordinary Hazard Group 1 - 0.16 gpm (0.61 liters/min) Dry Systems.

Add Section 4.5.1.8

4.5.1.8 Baggage handling equipment tunnels over 1,950 ft^2 (181 m^2) shall be classified as Ordinary Hazard Group 2 - 0.19gpm (0.72 liters/min) Combination – Dry System / Switch Operated Pre-action Sprinkler / Hose Equipment.

Amend Section 4.5.2 as follows:

4.5.2 Fire Alarm. Smoke detection system shall be provided as follows:

I. Passenger terminal:

1. Smoke detection shall be spaced not to exceed 2,500 ft^2. (232 m^2) per detector with roof/ceilings over 25 ft (7.6 m) above an occupied floor.
2. Manual pull station must be provided at the required exits and shall be annunciated separately. There shall be 200 linear ft (61 m) maximum between pull stations.
3. Smoke detection shall be provided as follows
   - In each electrical, transformer, telephone equipment or similar room, elevator machine rooms, and in all elevator lobbies.
   - In the outlet of fans used for pressurization of stairways, hoistways and refuge areas. Activation of these smoke detectors shall cause a supervisory signal, not an alarm signal at the building annunciator panel.
   - At the top of stairwells and in elevator hoistways. These devices shall initiate an alarm condition and illuminate the respective indicator at the graphic annunciator. This alarm condition shall not initiate occupant notification or the smoke control system.
   - Smoke detectors shall be installed in supply air systems with a design capacity greater than 2,000 cfm (0.9 m^3/s), in the supply air duct or plenum downstream of any fan. Activation of shall cause supervisory signal.
   - In the main return air and exhaust air plenum of each air-handling system having a capacity greater than 2,000 cfm (0.9 m^3/s) in accordance with International Mechanical Code (IMC) Section 606.2.1. Where multiple air-handling systems share common supply or return air ducts or plenums with a combined capacity greater than 2,000 cfm (0.9 m^3/s), smoke detectors shall be provided in accordance with IMC

Section 606.2.2. Detectors shall be listed for the air velocity in which they are installed. Activation of shall cause supervisory signal.

Exception: Smoke detectors are not required for automatic shut-off of evaporative coolers or units that supply un-tempered 100% outside air.

II. Tenant Spaces and similar rooms adjoining Airport Terminal Building:

1. On the tenant side at each opening into the airport terminal building and at each exit from the tenant space. For openings larger than 30 lineal ft (9.1 m), an additional detector shall be provided for each 30 lineal ft (9.1 m) or fraction thereof.
2. Electrical equipment rooms that are equipped with fire sprinklers the room shall be equipped with a smoke detector; in rooms without fire sprinkler protection the room shall be equipped with smoke and heat detection.
3. Manual pull stations shall be required at all kitchen exits.

Amend Section 4.5.2.3 as follows:

4.5.2.3 Emergency voice/alarm communication system. New Airport Terminal Building(s) shall install an emergency voice/alarm communication system as required in IFC 907.2.12.2. Both one-way and two-way systems shall be installed in all airport terminal buildings in public areas at required exits; in Building Engineering Office, in Airport Operations Office, in each mechanical room, in emergency generator room, in fire pump rooms, in main switch gear rooms and in each elevator cab which serves four or more stories as allowed by the Fire Department; telephone jack locations shall be approved by the Fire Department.

Add Section 4.6 Smoke Control for Airport Terminal Buildings

4.6.1 Requirements. A smoke control system shall be provided to serve airport terminal buildings. Smoke exhaust locations shall be configured in order to preclude accumulation of smoke in any area of the airport terminal building. The smoke control system shall be activated by the fire alarm system. If multiple smoke control zones for the airport terminal building are provided either by the zone area requirements of this Section or by system design, only the smoke exhaust system for the zone in alarm shall be activated. Smoke exhaust systems for adjacent airport terminal building zones shall not operate. For any space or corridor which exceeds 20 ft (6.10 m) in length and is connected to an atrium or airport terminal area which has separate smoke control zones, provide supply air to the space or corridor at the farthest location from the point of connection to the atrium or airport terminal area. Smoke control system shall comply with Sections 4.6.1 through 4.6.6.

4.6.2 Design criteria. The smoke control equipment for the airport terminal building shall be independent of that serving tenant spaces. The airport terminal building smoke removal system shall provide at least four air changes per hour or 20,000 cfm (9.4 m^3/s) from each smoke zone minimum.

The following areas are not required to be served by a smoke control system:

1. Ramp service and nonpublic ramp level tenant areas of airport terminal building.
2. Unenclosed bag handling tenant areas of airport terminal building.
3. Permanently fixed aircraft loading walkway when separated by one-hour rated assemblies

4.6.3 Tenant Spaces and similar rooms adjoining the Passenger terminal: For all spaces adjoining the airport terminal building exceeding 5,000 ft^2 (465 m^2), a separate smoke control zone per Section 4.6.1 shall be provided.

4.6.4 Airport Terminal Building Elevators and Stairs. Pressurized stairs, elevators and exit passageways are required unless otherwise approved by the Building Department and Fire Department. Refer to IFC Section 909.21 for requirements and design criteria.

Exception:

1. Elevators and enclosed stairways from the transitway station.
2. Pressurized stairs, elevators and exit passageways shall not be required in existing airport terminal building and addition to existing airport terminal building where this system does not exist presently.

4.6.5 Airport Terminal Building Baggage Tunnel. The smoke control exhaust system shall be sized to provide a minimum of 4 air changes per hour.

Add Section 4.7 Emergency Power

4.7.1 Emergency Power. The Airport Terminal Building shall be equipped with emergency power systems. Emergency generator and/or battery backup shall provide the capacity to power to the following equipment:

1. Mechanical equipment for smoke control.
2. Emergency egress and exit lighting.
3. Emergency elevator power.
4. Fire alarm and detection systems.
5. Fire pump/jockey pump.
6. Emergency communication systems.
7. Delay panic hardware.

Exception: Existing airport terminal buildings and additions to existing airport terminal buildings

4.7.2 Requirements. The installation of the emergency power shall be according provisions of NFPA and IFC

Chapter 6 Aircraft Loading Walkways

Section 6.1 Basic Design

Add Section 6.1.3 as follows:

6.1.3 Aircraft Loading Walkways on Grade Level. Permanently fixed aircraft loading walkways on grade level shall be of Type I or II-A construction as defined in IBC Chapter 6 .

All exterior doors shall be protected by opening protectives having a fire protection rating of not less than ¾ hour. Doors shall be self-closing and shall swing outward.

Entrance doors between walkways and the airport terminal building shall swing into the airport terminal and be equipped with automatic closure and panic hardware.

Section 6.2 Requirements for All Aircraft Loading Walkways

Amend Section 6.2.1 as follows:

Delete the reference to *NFPA 101, Life Safety Code* and substitute Class A as defined in Section 803.1.1 of the IBC.

Amend Section 6.2.2 as follows:

Delete the reference to *NFPA 101, Life Safety Code* and substitute Interior textile finish of walls and ceilings in walkways shall be limited as specified in Sections 803.5 and 803.6 of the IBC.

Amend Section 6.2.3 as follows:

Delete the reference to *NFPA 101, Life Safety Code* and substitute Class I as defined in Section 804 of the IBC.

Amend Section 6.2.10 as follows:

Delete the reference to *NFPA 101, Life Safety Cod*e and substitute the amended IBC.

Add Section 6.2.12 as follows:

Section 6.2.12 Sprinkler System. Permanently fixed aircraft loading walkway greater than 20 ft (6.10 m) in length or at grade level shall be provided with automatic sprinkler system in accordance with Section 4.5.

Add Chapter 7 Subsurface Tunnels

Section 7.1 General. All subsurface tunnels shall comply with the provisions of this section;

Section 7.2 Sprinkler System Design Occupancy Classifications. Utility Tunnels (Ordinary Hazard Group I) and Train tunnel Service Tunnels (Ordinary Hazard Group II) shall be sprinklered throughout the transit way and shall be sprinklered at the transit stations as approved by the Building Department and Fire Department.

Exception: Train tunnel sprinklers shall be permitted to be omitted where trainway is equipped throughout with thermal detection per NFPA 72.

Section 7.3 Smoke Removal System. A smoke removal system shall be provided per Section 4.6.

Section 7.4 Life Safety System. All life safety systems shall be provided with emergency power.

Section 7.5 Exits. A walkway with a minimum 74-inch width (1.9 m) [2 exit path widths of 22 inches (56 cm) each, plus 12 inches (30 cm) wall clearance, and an 18-inch (46 cm) platform edge clearance] shall be provided within all people-mover transit tunnels. Exit doors into adjacent protected tunnels shall be provided at a maximum spacing of 200 ft (61 m) and shall be monitored by the airport operations center.

Exception: The walkway width and exit door spacing may be modified based upon an exit study submitted by the Design Professional and approved by the Department and Fire Department.

Section 7.6 Separation. A minimum 2-hour fire-resistance-rated IBC Section 707 fire barrier shall be provided between tunnels.

Section 7.7 Transit Station Separation. The transitway shall be separated from the transit station by minimum two-hour fire-resistance-rated noncombustible walls with 1½-hour fire-resistance-rated doors. Windows within these walls shall be approved 1½-hour fire-resistance-rated windows.

Exception: Fire-resistance-rated window openings of ¾-hour may be used when the window assembly is protected with approved directional sprinkler heads 6’-0” o.c. (1.83 m) both sides of glass.

Section 7.8 Transit Systems Construction Guide. Fixed Guideway Transit Systems NFPA 130 shall be used as a construction guide unless specifically covered by this Code.

Section 7.9 Transitway Tunnel. The transitway tunnel shall be used exclusively for the movement of passengers between stations.

Appendix P Construction in designated special construction zones is added:

APPENDIX P
CONSTRUCTION IN DESIGNATED SPECIAL CONSTRUCTION ZONES

SECTION P101
GENERAL

P101 Scope. All construction, alteration, repairs, demolition or moving in areas designated under Article VII, Chapter 10 of the Revised Municipal Code as Special Construction Zones shall conform to the provisions of this Chapter.

SECTION P102
GENERAL PROVISIONS

P102.1 Permits. No permits for construction, alteration, repairs, demolition or moving in a designated Special Construction Zone shall be issued without being in compliance with all recommendations contained in the engineer's report if required by the Administration Section.

P102.2 Engineers reports. If the applicant is required to prepare an engineer's report pursuant to the Administration Section, the Department may require such additional information and recommendations as it deems necessary and may require such additional measures as are necessary to minimize potential hazards during construction and control hazards from the completed structure.

P102.3 Inspections. All construction and excavation sites shall be subject to inspection by the Department, Fire Department and the Department of Health and Hospitals, and results of tests or monitoring required by this Chapter shall be available at the site for inspection.

P102.4 Work stoppage. In the event of a material violation with the requirements of this Chapter, the Department may stop all construction activity until it is satisfied that the violation has been corrected.

SECTION P103
HAZARDOUS GASES GENERATED BY LANDFILLS

P103.1 New construction. Except as provided in the Administration Section, all new buildings, structures and utilities to be constructed in a Special Construction Zone, which is so designated because of the presence of hazardous gases generated by landfills, shall be designed by an engineer registered in the state of Colorado to control and protect against accumulation of over 1.0% by volume of flammable gas in the building, structure or utility. The following precautions shall be taken during and after construction activity:

1. A flammable gas indicator shall be utilized at all times during trenching, excavating, drilling or when working within 10 feet of an open excavation.
2. When trenching, excavating or drilling deeper than 2 feet into the soil or fill, or in the presence of detectable concentrations of 1.0% by volume of flammable gas, the operating equipment shall be provided with spark proof exhausts.
3. A dry chemical fire extinguisher, approved by the Fire Department, shall be provided on all equipment used in the landfill.
4. Personnel within or near an open trench or drill hole deeper than 2 feet into the soil or fill shall be fully clothed, wear shoes with nonmetallic soles and wear a hard hat and safety goggles or glasses.
5. Exhaust blowers shall be used in instances where trenches may show a build-up of flammable gas of 1.0% by volume or less than 19.5% by volume of oxygen.
6. Smoking and/or an open flame shall not be permitted in any area within 100 feet of the excavation.

7. Personnel shall be kept upwind of any open trench unless the trench and the downwind atmosphere are continuously monitored.

8. Before personnel are permitted to enter an open trench, the trench shall be monitored for flammable gas and at least a 19.5%-by-volume oxygen sufficiency. When in the excavation, each work party shall be working no more than 5 feet from a continuously operating flammable gas and oxygen monitor.

9. The applicant shall employ an inspector whose duty it shall be to effect continuous compliance with the foregoing precautions. The inspector shall be a qualified person approved by the Department or shall be an engineer registered with the state of Colorado or a person in the employ of, or subject to, the direct supervision and control of such an engineer. Said inspector shall submit a written report of his inspection to the applicant and to the Department at 10-day intervals during active construction stating that all new construction is in compliance with these regulations, and that all testing and monitoring has been and is being done as required by the Code.

10. After construction is completed, hazardous gas monitoring devices approved by the Fire Department shall be installed in the completed building or structure in such number and in such places within the building or structure as may be required by the Fire Department.

P103.2 Alteration or repair of existing building, structures or utilities. Except as provided in the Administration Section and P103.3, no alterations or repairs to any existing building, structure or utility shall be made unless the following precautions are taken:

1. Within 5 days prior to applying for a permit under Chapter 1 of the Building Code to alter or repair an existing building, structure or utility, the work site shall be tested for the presence of flammable gas by an engineer registered in the state of Colorado.

2. The applicant shall be exempt from all other requirements of this Section P103.2 if:

    1. Test results show that there is less than 2.0% of the Lower Explosive Limit (L.E.L.) of hazardous gas, then the permit for the work shall be issued; and

    2. Upon completion of the work, the applicant shall install hazardous gas monitoring devices approved by the Fire Department in such number and in such places within the building or structure as may be required by the Fire Department.

3. If the test results show that there is 2% or more of the Lower Explosive Limit (L.E.L.) of hazardous gas, then the applicant shall take all of the precautions pursuant to Section P103.1 as if the construction were new construction.

P103.3 Exemption. Whether or not he is an applicant for a permit, the owner of real property within a Special Construction Zone may apply to the Building Agency for a certificate of exemption from the provisions of Article VII, Chapter 10 of the Revised Municipal Code and Section P103 of the Building Code. To obtain such exemption, said owner shall have his property tested by an engineer registered in the state of Colorado and tests shall meet the following requirements:

1. A test for the presence of flammable gas shall be performed at a time when there is frost on his property to a depth of at least 6 inches in the soil, again at a time when there is no frost in the soil, and again within 5 days of the date when an exemption certificate is applied for.

2. The test holes shall be placed along each major boundary line of the real property for which the exemption is sought in such number and at such locations as the engineer deems proper.

3. If the test results show that there is less than 2.0% of the lower explosive limit (L.E.L.) of flammable gas, and if such test results are satisfactory to the Department, then the Department shall issue a certificate stating that the real property described in the certificate is exempt from the provisions of Article 647 of the Revised Municipal Code and Section P103 of the Building Code.

4. As a condition of receiving an exemption certificate from the Department, the owner shall acquire and install in all existing and future buildings and structures devices approved by the Fire Department to monitor for the presence of hazardous gas in such number and in such places within the building or structure as may be required by the Fire Department.

5. Upon a finding that flammable gas is present in amounts greater than 2% of the lower explosive limit on any property where an exemption certificate has been issued, the Department shall revoke the exemption certificate.

Further, upon a finding that the monitoring devices on any property for which an exemption certificate has been issued are inoperative, the Department may suspend or revoke the exemption certificate.

2011 DENVER AMENDMENTS TO THE 2009 EDITION OF THE INTERNATIONAL FIRE CODE AND APPENDICES AS PUBLISHED BY INTERNATIONAL CODE COUNCIL (ICC)

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

Sections 101.1 Title 101.2 Scope and 101.3 Intent are replaced in their entirety with the following:

101.1 Title. The title of this code is and may be cited and referred to as the Fire Code, the Denver Fire Code, or the Fire Code of the City and County of Denver. It may be referred to herein as "this code" or "the code," in both upper and lower case. The terms "Denver" and "City" are understood to mean the City and County of Denver.

101.2 Scope. This code establishes regulations affecting or relating to structures, processes, premises, and safeguards including, but not limited to:

1. Inspection of permanent and temporary buildings, processes, equipment, systems, and other fire- and safety-related situations, at intervals established by the fire code official but not to exceed once every 12 months.
2. Investigation of fires, explosions, hazardous materials incidents, and other related emergency events; the fire department shall be responsible for fire/explosion cause determination and subsequent investigation;
3. Recovery of City costs related to emergency response incidents, including the mitigation of hazardous materials incidents; nuisance alarms; problematic systems; fire safety inspections; systems testing; re-inspections; re-testing; investigations; emergency fire watch assigned to private properties, etc.
4. Storage, use, processing, handling, production and transportation of hazardous materials;
5. Storage, use, processing, handling, production and transportation of flammable and combustible gases, liquids, and solids;
6. Interior finish, decorations, furnishings, and other combustibles that contribute to fire spread, fire load, and smoke production in all occupancies;
7. Hazards from interior fires in trash, excessive storage of combustibles, production of chemical material, and other materials that pose an exposure hazard to adjacent property in all occupancies including single family residences;
8. Hazards from outside fires in vegetation, trash, storage, vehicles, combustible and flammable materials, building debris, fencing, and other materials;
9. Regulation and control including assignment of fire watch personnel, of special events including, but not limited to, assemblage of people, exhibits, trade shows, amusement parks, haunted houses, outdoor events, livestock events, large sporting events, and other similar special temporary and permanent occupancies;
10. Existing occupancies and conditions,
11. Maintenance and testing of all fire- and life-safety systems;
12. Access and water supply requirements for Fire Department operations;
13. Review of design plans and construction documents including drawings, calculations and specifications for the design and construction of new buildings, and alterations, additions and repairs of existing buildings;
14. Review of design plans and construction documents including drawings, calculations and specifications for the installation, alteration, addition and repair of life- and fire-safety systems,

equipment, features, components, devices and apparatus including but not limited to fire protection systems, Fire Department access, water supply, flammable and combustible materials, storage, production and use of hazardous materials, commercial processes.

15. Fire and life safety education of fire brigades, employees, responsible parties, and the general public including the review and approval of emergency procedures for all occupancies and evaluation of fire drills;
16. Control of emergency operations and scenes;
17. Conditions affecting firefighter safety.
18. Licensing certification of firms/designers/installers/inspectors/testers of life safety systems equipment referenced in this code and standards and property managers, etc., responsible for the safety of others.

The provisions of this code shall supplement any and all laws relating to fire- and life-safety and shall apply equally to all of the following without restriction: persons, firms, corporations, the government of the United States of America, the government of the State of Colorado, the government of the City and County of Denver, and all agencies, subdivisions, and departments thereof. The provisions of this Code shall apply to existing conditions as well as to conditions arising after the adoption of the Code.

101.2.1 Appendices. Provisions in the appendices shall apply.

101.3 Intent. The purpose of this code is to establish the minimum requirements, consistent with nationally recognized good practice, for providing a reasonable level of occupant and pedestrian fire- and life-safety and property protection from the hazards of fire, explosion, production, use, and handling of dangerous and hazardous materials, substances, and devices, or dangerous conditions in new and existing buildings, structures, and premises, and to provide safety to firefighters and emergency responders during emergency operations.

SECTION 102
APPLICABILITY

Sections 102.6 Referenced codes and standards and 102.7 Subjects not regulated by this code are replaced in their entirety with the following:

102.6 Referenced codes and standards. Additional details regarding processes, methods, specifications, equipment testing and maintenance, or other pertinent criteria contained in these standards and codes listed in Chapter 45 of this Code shall be considered a part of this Code. Volumes 1 through 15 of the National Fire Codes are standards to this code. Additionally, all references to the "International Electrical Code, and "ICC Electrical Code," shall be changed to "NFPA 70, National Electrical Code (NEC)."

102.7 Subjects not regulated by this code. Where no applicable codes, standards, or requirements are set forth in this Code or contained within other laws, codes, regulations, ordinances, or bylaws adopted by the City and County of Denver Fire Department, compliance with the applicable codes and standards of the National Fire Protection Association (NFPA) or other nationally recognized and approved standards shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the City and County of Denver Fire Department to determine compliance with codes or standards for those activities or installations within the Denver Fire Department's jurisdiction or responsibility.

SECTION 103
DEPARTMENT OF FIRE PREVENTION

Sections 103.1.1 Division of Fire Prevention and Investigation Division and 103.1.2 Rules and regulations are added:

103.1.1 Division of Fire Prevention and Investigation Division. The Fire Prevention and Investigation Division is established within the Fire Department of the City and County of Denver's Department of Safety under the direction of the Division Chief of Fire Prevention and Fire Investigation. This position is and may be referred to as the "Fire Code Official," "Fire Official," and "Fire Marshal," in both upper and lower case. This code shall be administrated and enforced by the Fire Code Official.

103.1.2 Rules and regulations. The Fire Official shall have the full power to adopt, in reference to this Code, any rules, restrictions, or measures that may be advisable.

Section 103.3 Deputies is replaced in its entirety with the following:

103.3 Deputies. In accordance with the prescribed procedures of the City and County of Denver's Department of Safety and with the concurrence of the Chief, the Fire Code Official shall have the authority to appoint a Deputy Fire Code Official, Chief Fire Protection Engineer, Fire Protection Engineers, other related technical officers, fire inspectors, fire investigators, and employees. Their duties shall be those outlined by the Fire Code Official.

SECTION 104
GENERAL AUTHORITY AND RESPONSIBILITIES

Section 104.1 General is replaced in its entirety with the following:

104.1 General. The Fire Prevention and Investigation Division is authorized to inspect land, buildings, structures, utilities, installations, equipment, devices, illegal processes, and materials for fire, explosion, and other emergency hazards and to investigate and ascertain the causes of fires, explosions, releases of hazardous materials, false alarms, any unsafe conditions that relate to the protection of the public and/or property and other emergencies. The Division shall have the authority to investigate fire protection and other life safety systems that are disabled or not functioning. The Division shall also have the authority on behalf of the Department of Safety to control the use, location, and transportation of flammable or combustible liquids or acids (in a chemical or physical state) or hazardous materials; the issuance of permits; the issuance of notices, orders, or Denver County Court summonses for the correction or immediate abatement of hazardous situations; the enforcement of this code and other laws, ordinances, rules, and regulations, which are within the perspective of this Code and standards set forth in Chapter 45

Section 104.3 Right of entry is replaced in its entirety with the following:

104.3 Right of entry. Whenever it is necessary to make an inspection to enforce the provisions of this code, or whenever the fire code official has reasonable suspicion to believe there exists in a building or upon any premises, any vehicle, or any vessel, any conditions or violations of this code that make the premises, vehicle, or vessel unsafe, dangerous, or hazardous, the fire code official shall have the authority to enter the building, vehicle, or vessel to conduct an inspection and, if necessary, an investigation, taking photographs of unsafe, dangerous, or hazardous conditions or for investigative or fire investigation purposes or the pursuance of any other emergency, or to perform the duties upon the Fire Code Official by this code. If such building, premises, or vehicle is occupied, the Fire Code Official shall present credentials to the occupant and request entry. If such building, premises, or vehicle is unoccupied, the fire code official shall first make a reasonable effort to locate the owner or other person having charge or control of the building or premises and request entry. If entry is refused, the fire code official has recourse to every remedy provided by law to secure entry.

Sections 104.3.2 Interference with enforcement and 104.3.3 Power to protect property are added:

104.3.2 Interference with enforcement. Persons shall not interfere or cause conditions that would interfere with the fire code official carrying out any duties or functions prescribed by this code.

104.3.3 Power to protect property. The fire code official shall have power to cause the removal of any property when necessary to preserve such property from fire, explosion, or other emergency; to prevent the spreading of fire; or to protect adjoining property. No person shall be entitled to remove any property in the possession of the fire code official saved from any fire until proof of ownership thereof is furnished.

Section 104.4.1 Impersonation is added:

104.4.1 Impersonation. Persons shall not use a badge, uniform, or other credentials to impersonate a fire code official - prevention, engineering or investigation.

Section 104.6.2.1 Frequency of inspections is added:

104.6.2.1 Frequency of inspections. Fire safety inspections for the specific property/operation shall be required at intervals established by the fire code official but not to exceed once every 12 months.

Section 104.6.3 Fire record is replaced in its entirety with the following:

104.6.3 Fire record. The Fire Department shall keep a record of all fires, explosions, and other emergencies occurring within its jurisdiction and of facts concerning the same, including reports (including investigation reports), photographs, videos, and statistics as to the extent of such fires and the damage or injury caused thereby, together with other information as required by the fire code official. All records related to a property shall be maintained for the life of the property. All other records shall be maintained for no less than seven (7) years.

Section 104.6.3.1 Fire loss information is added:

104.6.3.1 Fire loss information. It shall be the responsibility of any person suffering a fire, explosion, building collapse, or other emergency resulting in injury(s) to persons and/or property loss within the City and County of Denver to report the incident and to provide the Division in writing with the dollar value of the resulting loss within ten (10) days of the loss. If insured, the person may provide the name and address of the insurance company, in which case the insurance company shall supply the final loss figures to the Division.

Section 104.7.2 Technical assistance is replaced in its entirety with the following:

104.7.2 Technical assistance. To determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building or premises subject to inspection by the fire code official, the fire code official is authorized to require the owner or agent to provide, without charge to the jurisdiction, a technical opinion and report. The opinion and report shall be prepared by a professional engineer licensed by the state of Colorado and acceptable to the fire code official. The opinion and report shall analyze the fire safety properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to recommend necessary changes. Whenever the technical opinion and report is required for existing technology, processes, life safety system(s), products, facilities, materials, and uses attending the design, operation or use of a building or premises, the opinion and report shall evaluate compliance of all components/equipment to listing and code requirements.

Section 104.7.2.1 Final determination is added:

104.7.2.1 Final determination. The fire code official shall make the final determination as to whether the provisions of this code have been met.

Sections 104.8.1 Application for modification and 104.8.2 Compliance with code are added:

104.8.1 Application for modification. The fire code official is authorized to modify any of the provisions of this code upon application in writing by the owner where there are practical difficulties in carrying out the provisions of the Code, provided the intent of the code shall be complied with, public safety secured, and substantial justice done.

104.8.2 Compliance with code. Buildings with equivalency, alternative, or modification approved by the building code official and fire code official shall be considered conforming to the code.

Sections 104.9.1 Fire protection features and 104.9.2 Building Code are added:

104.9.1 Fire protection features. Each application for an alternate fire protection feature shall be filed with the fire code official and shall be accomplished by such evidence, letters, statements, test results, or other supporting information as required to justify the request. The fire code official shall keep a record of actions on such applications, and a signed copy of the Fire code official's decision shall be provided for the applicant.

104.9.2 Building Code. Whenever the alternate material or method involves matters regulated by the Fire Code and Building Code, approvals are also subject to approval of the building code official.

Sections 104.10 Fire investigations and 104.10.1 Release of hazardous materials are replaced in their entirety with the following:

104.10 Fire investigations. The Division is authorized to investigate without delay the cause, origin, and circumstances of each and every fire or explosion or intent to commit such an act occurring within the City and County of Denver involving the loss of life or injury to a person or destruction or damage to property and, if it appears to the fire investigators that such fire or explosion is of suspicious origin, the investigators are authorized to take immediate charge of all physical evidence relating to the intent or cause of the fire and are authorized to pursue the investigation to its conclusion.

104.10.1 Release of hazardous materials. The fire code official is authorized to investigate the cause, origin, and circumstances of unauthorized releases of hazardous materials. The fire code official is authorized to recover from the responsible party(s) all costs incurred by the City for mitigation, rendering the release harmless to people or property, including personnel and equipment, securing the incident scene, removal of materials released and cleanup.

Sections 104.10.2 Authorization of Denver Police Department, 104.10.3 Limiting access, and 104.10.4 Interference with enforcement are added:

104.10.2 Authorization of Denver Police Department. The Denver Police Department is authorized to assist the Fire Department in any investigation when requested to do so by the Manager of Safety, the Fire Chief, or the fire code official.

104.10.3 Limiting access. The Fire Department shall have the authority to limit access to buildings, property, vehicles, vessels, or other similar conveyances by any vehicle, vessel, or person during an investigation.

104.10.4 Interference with enforcement. Persons shall not interfere, nor cause conditions that would interfere with, the fire investigator carrying out any duties or functions, including arrest of suspects, prescribed by this Code.

Section 104.11.1.1 Scene barrier is added:

104.11.1.1 Scene barrier. The incident commander in charge of an emergency scene shall have the authority to establish barriers to control access in the vicinity of such emergency and to place, or cause to be placed, ropes, guards, barricades, or other obstructions across any public or private street or alley, to delineate an emergency scene barrier(s). No person, except as authorized by the incident commander in charge of the emergency, shall be permitted to cross barriers established in accordance with Sections 104.11.1 and 104.11.1.1. Whenever the emergency incident involves private property, the owner of said property shall be responsible for all costs related to placement, rental and use of barricades; all costs incurred by the City for mitigation, rendering the scene harmless to people or property, and removal of equipment and materials and cleanup.

Section 104.11.3.1 Resetting or silencing of alarms is added:

104.11.3.1 Resetting or silencing of alarms. No person shall reset or silence a system unless by direction of the fire chief, fire code official or fire department official in charge of the incident.

Section 104.11.4 Emergency power to demolish buildings and 104.11.5 Cost recovery are added:

104.11.4 Emergency power to demolish buildings. When a fire is in progress, the fire code official, or the officer in charge of the fire, may order any building that is in close proximity to such fire to be torn down, blown up, or otherwise disposed of for the purpose of checking the conflagration. The property owner shall be responsible for all costs related to all operations.

104.11.5 Cost recovery. The property owner shall be responsible for all costs related to placement, rental and use of barricades.

SECTION 105
PERMITS

Section 105.1 General is replaced in its entirety with the following:

105.1 General. The fire code official shall be authorized to establish and issue permits, certificates, notices, approvals, or orders pertaining to fire and hazard control and fire and explosion hazards wherever indicated by this Code. A permit issued under the provisions of this Code shall continue until revoked or for such a period of time designated therein at the time of issuance. Such permit shall not be transferable, and any change in use, occupancy, operation, or ownership shall require a new permit. Permits for activities requiring evidence of financial responsibility by the jurisdiction shall not be issued unless proof of required financial responsibility is furnished. Any attempt to misrepresent or otherwise deliberately or knowingly design; install; service; maintain; operate; sell; represent for sale; falsify records, reports, or applications; or act in any related activity in violation of the requirements prescribed by this Code shall be a violation of this Code. Such violations shall be cause for immediate suspension or revocation of any related licenses, certificates, or permits issued by the fire code official. In addition, any such violation shall be subject to any other criminal or civil penalties as available by the laws of this jurisdiction. An inspection is required prior to the issuance of a permit. Any person who engages in any business, operation, or occupation, or uses any premises, after the permit issued therefore has been suspended or revoked pursuant to the provisions of this Code, and before such suspended permit has been reinstated or a new permit has been issued, shall be in violation of this Code.

Section 105.1.4 Other required permits is added:

105.1.4 Other required permits. The requirements for permits from other City agencies shall not waive the requirement for permits required by this Code. Where a permit is required by other City agencies, such permit shall be obtained prior to or simultaneous with the issuance of a permit required by this Code.

Section 105.6 Required operational permits is replaced in its entirety with the following:

105.6 Required permits. The fire code official is authorized to issue permits for the operations set forth in Sections 105.6.1 through 105.6.147:

105.6.1 Abandoned buildings. A permit is required for abandoned and/or vacant buildings. (See IFC Section 311.)

105.6.2 Aerosol products. A permit is required to manufacture, store or handle an aggregate quantity of Level 1, Level 2 or Level 3 aerosol products of 300 pounds (136 kg) or more net weight.

105.6.3 Air compressor. A permit is required for building smoke management and fire protection systems – certificate of fitness in accordance with ASME Code.

105.6.4 Aircraft hangar. A permit is required per bay or square footage per NFPA 409.

105.6.5 Aircraft refueling vehicles. A permit is required for each aircraft refueling vehicle.

105.6.6 Ammunition. A permit is required to store and handle ammunition, large arms and small arms.

105.6.6.1 Large arms

105.6.6.2 Small arms

105.6.7 Amusement buildings. A permit is required to operate a special amusement building.

105.6.8 Appliances fueled by waste petroleum products. A permit is required to operate appliances fueled by waste petroleum products.

105.6.9 Asbestos removal. A permit is required for the removal of asbestos (for each building or portion thereof).

105.6.10 Asphalt kettles (other than roofing operations). A permit is required to transport and operate an asphalt kettle.

105.6.11 Asphalt recycling. A permit is required for all forms of asphalt recycling.

105.6.12 Automobile wrecking yard. A permit is required for the operation of an automobile wrecking yard.

105.6.13 Aviation facilities. A permit is required to use a Group H or Group S occupancy for aircraft servicing or repair and aircraft fuel servicing vehicles. Additional permits required by other sections of this code include, but are not limited to, hot work, hazardous materials, and flammable or combustible products.

105.6.14 Battery charging. A permit is required to charge batteries on or off powered-industrial trucks and similar equipment having an electrolyte capacity of 10 gallons or more.

105.6.15 Battery systems. A permit is required for stationary storage battery systems having an electrolyte capacity of 10 gallons or more.

105.6.16 Blank cartridges. A permit is required prior to the purchase of blank pyrotechnic cartridges. No dealer shall sell blank cartridges except upon presentation of an authorized permit.

105.6.17 Bonfires / Rubbish fires. A permit is required for bonfires and rubbish fires.

105.6.18 Bowling alley refinishing. A permit is required to refinish bowling alleys.

105.6.19 Building emergency communication system. A permit is required to test the emergency communication system.

105.6.20 Building fire alarm system. A permit is required to test the fire alarm system.

105.6.21 Building fire protection system. A permit is required to test the fire protection system.

105.6.22 Building fire standpipe system. A permit is required to test the fire standpipe system.

105.6.23 Building property manager certification. A permit is required to obtain training and certification for building property managers.

105.6.24 Burning in public places/Open burning. A permit is required for the kindling or maintaining of an open fire or a fire on any public street, alley, road, or other public or private ground. Instructions and stipulations of the permit shall be adhered to.

Exception:

Recreational fires when a fire ban has not been instituted.

105.6.25 Candles and open flames in assembly areas. A permit is required to use open flames or candles in connection with assembly areas, dining areas of restaurants or drinking establishments.

105.6.26 Canopies. A permit is required to erect a canopy having an area as follows:

105.6.26.1 Canopies having an area of 300 square feet or more but less than 500 square feet.

105.6.26.2 Canopies having an areas of 500 square feet or more.

105.6.27 Carbon monoxide alarms and carbon monoxide detectors. A permit is required for the installation, relocation or removal of carbon monoxide alarms and detectors required under provisions of Section 908.7.

105.6.28 Carnivals and fairs. A permit is required to conduct a carnival or fair. The event coordinator shall be responsible for obtaining a permit which can be issued for a single event or annually; vendors shall be responsible for individual permits for booths.

105.6.29 Cellular/wireless signal repeater sites. A permit is required to install and maintain cellular/wireless signal repeater sites.

105.6.30 Cellulose nitrate. A permit is required to store, handle, use, or display cellulose nitrate.

105.6.31 Cellulose nitrate film. A permit is required to store, handle, use, or display cellulose nitrate film.

105.6.32 Certification – Construction fire safety officer. Includes point-of-contact relative to permits.

105.6.33 Chili roaster. A permit is required to operate a chili roaster as follows:

105.6.33.1 LPG fuel permit

105.6.34 Combustible fibers. A permit is required for the storage and handling of combustible fibers in quantities of 100 cubic feet (2.8 m^3) or more.

Exception: A permit is not required for agricultural storage.

105.6.35 Combustible material storage. A permit is required to store in any building or upon any premises 2,500 cubic feet (71 m^3) or more gross volume of combustible empty packing cases, boxes, barrels or similar containers, rubber tires, rubber, cork or similar combustible material.

105.6.36 Commercial rubbish. A permit is required to operate a rubbish or recycling handling facility.

105.6.37 Compressed gases (not LPG). A permit is required for the storage, use or handling at normal temperature and pressure (NTP) of compressed gases in quantities equal or greater than the amounts listed in Table 105.6.37.

Exception: Vehicles equipped for and using compressed gas as a fuel for propelling the vehicle.

TABLE 105.6.37
PERMIT AMOUNTS FOR COMPRESSED AND LIQUIFIED GASES [a]

Type of Gas	Gaseous (cubic feet at NTP)	Liquified (lbs)
Biohazard	Any Amount	Any Amount
Carcinogen	200	37
Corrosive	200	37
Irritant	200	37
Sensitizer	200	37
Flammable	200	37
Highly Toxic	Any Amount	Any Amount
Inert and Simple Asphyxiant	6,000	1,100
Oxidizing (including oxygen)	504	50
Other Health Hazard	650	120
Pyrophoric	Any Amount	Any Amount
Radioactive	Any Amount	Any Amount
Toxic	Any Amount	Any Amount
Unstable (Reactive)	Any Amount	Any Amount

For SI: 1 cubic foot = 0.02832m^3.

a. see Table 105.6.40 for cryogenic fluids, and Section 105.6.82 and Chapter 38 for liquefied petroleum gases (LPG)

105.6.38 Compressed natural gas (CNG). A permit is required to operate a compressed natural gas tank.

105.6.39 Covered mall buildings. A permit is required for:

1. The placement of retail fixtures and displays, concession equipment, displays of highly combustible goods and similar items in the mall.
2. The display of liquid- or gas-fired equipment in the mall.
3. The use of open-flame or flame-producing equipment in the mall.

105.6.40 Cryogenic fluids. A permit is required to produce, store, transport on site, use, handle or dispense cryogenic fluids in quantities equal to or greater than the amounts listed in Table 105.6.40.

TABLE 105.6.40
PERMIT AMOUNTS FOR CRYOGENIC FLUIDS

Type of Cryogenic Fluid	Inside Building (gallons)	Outside Building (gallons)
Flammable	More than 1	60
Inert	60	500
Oxidizing (includes oxygen)	10	50
Physical or health hazard not indicated above	Any Amount	Any Amount

105.6.41 Demolition by explosives. A permit is required for the use of any explosive device for demolition operations.

105.6.42 Dry cleaning plants. A permit is required to engage in the business of dry cleaning or to change to a more hazardous cleaning solvent used in existing dry cleaning equipment.

105.6.43 Dust-producing operations. A permit is required for all dust-producing operations. This permit does not include woodworking.

105.6.44 Emergency responder radio enhancement coverage system (RES). A permit is required for the five-year testing of the system as required in Section 510.1.1.3 Item 3b.

105.6.44.1 RES repair and maintenance. A permit is required for repair and maintenance of the emergency responder raido enhancement coverage system (RES).

105.6.45 Equipment testing. A permit is required to test equipment as follows:

105.6.45.1 Fire alarm systems. Smoke detector, horn/strobe, etc. Annual permit does not include overtime costs.

105.6.45.2 Fire protection systems. Sprinkler head, flow switch, etc. Annual permit does not include overtime costs.

105.6.45.3 Smoke management systems. Annual permit does not include overtime costs.

105.6.45.4 Standpipe systems. Annual permit does not include overtime costs.

105.6.46 Exhibits and trade shows. A permit is required to operate exhibits and trade shows.

105.6.47 Explosives/blasting agents. A permit is required for the manufacture, storage, handling, sale or use of any quantity of explosives, explosive materials, fireworks or pyrotechnic special effects within the scope of Chapter 33.

Exception: Storage in Group R-3 occupancies of smokeless propellant, black powder and small arms primers for personal use, not for resale and in accordance with Section 3306.

105.6.48 Failure to obtain a permit. A temporary permit is required when a required permit has not been obtained. The fee for this temporary permit shall be double the cost of the required permit.

105.6.49 File search. A fee is required for the following file searches:

105.6.49.1 Fire Prevention/Hazardous materials

105.6.49.2 Amendment packet

105.6.49.3 Fire investigation records including videotapes

105.6.49.4 Property records

105.6.49.5 Inspection and permit records

105.6.50 Fire alarm signal delay equipment. A permit is required to install and maintain fire alarm signal delay equipment integrated with the FACP.

105.6.51 Fire department fire alarm radio transmitter (wireless Denver Fire Department radio box). A permit is required to install and maintain fire department fire alarm radio equipment for monitoring fire and burglar alarms.

105.6.52 Fire hydrants and valves. A permit is required to maintain a private fire hydrant system. This applies to existing systems only. New private fire hydrant systems are prohibited.

105.6.53 Fire protection system maintenance. A permit is required to perform maintenance on a private fire hydrant system.

105.6.54 Fire pumps and related equipment. A permit is required to inspect and test fire pumps and related equipment.

105.6.55 Fire watch. A permit is required whenever a fire watch is mandated.

105.6.56 Fireworks /pyrotechnics. A permit is required for all professional pyrotechnic programs.

105.6.57 Flammable or combustible liquids. A permit is required:

1. To use or operate a pipeline for the transportation within facilities of flammable or combustible liquids. This requirement shall not apply to the off-site transportation in pipelines regulated by the Department of Transportation (DOT) nor does it apply to piping systems.
2. To store, handle or use Class I liquids of 30 gallons (114 L) or more in a building or of 60 gallons (228.6 L) or more outside of a building, except that a permit is not required for the following:

   2.1. The storage or use of Class I liquids in the fuel tank of a motor vehicle, aircraft, motorboat, mobile power plant or mobile heating plant, unless such storage, in the opinion of the code official, would cause an unsafe condition.

   2.2. The storage or use of paints, oils, varnishes or similar flammable mixtures when such liquids are stored for maintenance, painting or similar purposes for a period of not more than 30 days.
3. To store, handle or use Class II or IIIA liquids of 60 gallons (228.6 L) or more in a building or of 120 gallons (457.1 L) or more outside a building, except for fuel oil used in connection with oil-burning equipment.

   3.1 To store, handle or use Class IIIB liquids of 1,000 gallons or more in a building or outside a building.
4. To remove Class I or Class II liquids from an underground storage tank used for fueling motor vehicles by any means other than the approved, stationary on-site pumps normally used for dispensing purposes.

5. To operate tank vehicles, equipment, tanks, plants, terminals, wells, fuel-dispensing stations, refineries, distilleries and similar facilities where flammable and combustible liquids are produced, processed, transported, stored, dispensed or used.
6. To place temporarily out of service (for more than 90 days) an underground, protected above-ground or above-ground flammable or combustible liquid tank.
7. To change the type of contents stored in a flammable or combustible liquid tank to a material which poses a greater hazard than that for which the tank was designed and constructed.
8. To manufacture, process, blend or refine flammable or combustible liquids.
9. To engage in the dispensing of liquid fuels into the fuel tanks of motor vehicles at commercial, industrial, governmental or manufacturing establishments.
10. To utilize a site for the dispensing of liquid fuels from tank vehicles into the fuel tanks of motor vehicles at commercial, industrial, governmental or manufacturing establishments.
11. A site plan shall be submitted showing the following: distances from all buildings, property lines, utility poles, power lines, railroad tracks, etc. A Hazardous Materials Inventory Statement (HMIS) may be required upon request**.**

105.6.58 Floor cleaning. A permit is required for floor cleaning operations using IIIA combustible liquids.

105.6.58.1 Single address/ one time

105.6.58.2 Annual/same building

105.6.58.3 Annual/multiple sites

105.6.59 Floor finishing. A permit is required for floor finishing or surfacing operations of 350 square feet (33 m^2) or more using Class I or Class II liquids.

105.6.60 Fruit and crop ripening. A permit is required to operate a fruit- or crop-ripening facility or conduct a fruit-ripening process using ethylene gas.

105.6.61 Fumigation/thermal insecticidal fogging. A permit is required to operate a business of fumigation or thermal insecticidal fogging and to maintain a room, vault or chamber in which a toxic or flammable fumigant is used.

105.6.62 Generator Set. A permit is required to maintain and operate a generator set with or without an integral tank.

105.6.62.1 Fuel Oil

105.6.62.2 Natural Gas

105.6.63 Halogenated agent systems/extinguishers. A permit is required to install and maintain a halogenated extinguishing agent system or portable fire extinguishers.

105.6.64 Halogenated hydrocarbons. A permit is required for the storage or use of halogenated hydrocarbons.

105.6.65 Hazardous materials. A permit is required to store, transport on site, dispense, use or handle hazardous materials in quantities equal or greater than the amounts listed in Table 105.6.65.

TABLE 105.6.65
PERMIT AMOUNTS FOR HAZARDOUS MATERIALS

TYPE OF MATERIAL	AMOUNT
Carcinogens	
Liquids	1 gallon
Solids	10 pounds

TYPE OF MATERIAL	AMOUNT
Combustible liquids	See Section 105.6.57
Corrosive materials	
Gases	See Section 105.6.37
Liquids	55 gallons
Solids	550 pounds
Explosive materials	Any Amount
Flammable materials	
Gases	See Section 105.6.37
Liquids	See Section 105.6.57
Solids	100 pounds
Cryogenics	See Section 105.6.40
Highly toxic materials	
Gases	See Section 105.6.37
Liquids	Any Amount
Solids	Any Amount
Irritants	
Liquids	55 gallons
Solids	550 pounds
Other Health Hazards	
Liquids	55 gallons
Solids	550 pounds
Oxidizing materials	
Gases	See Section 105.6.37
Liquids	
Class 4	Any Amount
Class 3	10 pounds[a]
Class 2	100 pounds
Class 1	550 pounds
Solids	
Class 4	Any Amount
Class 3	10 pounds[a]
Class 2	100 pounds
Class 1	550 pounds
Cryogenics	See Section 105.6.40
Organic peroxides	
Liquids	
Class I	Any Amount
Class II	Any Amount
Class III	10 pounds
Class IV	20 pounds
Class V	No Permit Required
Solids	
Class I	Any Amount
Class II	Any Amount
Class III	10 pounds
Class 1V	20 pounds
Class V	No Permit Required
Pyrophoric materials	
Gases	See Section 105.6.37
Liquids	Any Amount
Solids	Any Amount

TYPE OF MATERIAL	AMOUNT
Radioactive materials	
Not sealed	1 microcurie
Sealed	1 millicurie
Sensitizers	
Liquids	55 gallons
Solids	550 pounds
Toxic materials	
Gases	See Section 105.6.37
Liquids	Any Amount
Solids	Any Amount
Unstable (reactive) materials	
Liquids	
Class 4	Any Amount
Class 3	Any Amount
Class 2	10 pounds
Class 1	100 pounds
Solids	
Class 4	Any Amount
Class 3	Any Amount
Class 2	10 pounds
Class 1	100 pounds
Water-reactive materials	
Liquids	
Class 3	Any Amount
Class 2	50 pounds
Class 1	100 pounds
Solids	
Class 3	Any Amount
Class 2	50 pounds
Class 1	100 pounds
Biohazard	Any Amount

For SI: 1 gallon=3.785L, 1 pound=0.454 kg.

a. 200 pounds when Table 2703.1.1(1) Note k applies and hazard identification signs in accordance with Section 2703.5 are provided for quantities of 200 pounds or less.

105.6.66 Hazardous materials inventory statement plan review. A permit is required for review and comment of any HMIS.

105.6.66.1 HMIS – with less than 10 entries.

105.6.66.2 HMIS – with 10 or more entries.

105.6.67 Hazardous production materials. A permit is required to store, handle or use hazardous production materials.

105.6.68 Hazardous waste generator. A permit is required for any operation that generates hazardous waste.

105.6.68.1 Contengency plan review. A review of contengency plans is required for any operation that generates any amount of hazardous waste.

105.6.69 Heliports and helistops. A permit is required for the operation of any heliport or helistop.

105.6.70 High-piled storage. A permit is required to use a building or portion thereof as a high-piled storage area of 500 square feet (46 m^2) or more.

105.6.71 Holiday decorations in public assembly occupancies. A permit is required to use any holiday decorations – natural vegetation, crepe paper, etc. in any public assembly occupancy.

105.6.72 Hot work operations. A permit is required for hot work including, but not limited to:

1. Public exhibitions and demonstrations where hot work is conducted.
2. Use of portable hot work equipment inside a structure.
3. Fixed-site hot work equipment such as welding booths.
4. Hot work conducted within a hazardous fire area.
5. Application of roof coverings with the use of an open-flame device.
6. Cutting and welding

105.6.73 Hypergolic materials. A permit is required to store or use any amount of hypergolic materials.

105.6.74 Industrial trucks. A permit is required for all industrial trucks in accordance with NFPA 505.

105.6.75 Insecticides/pesticides/fumigants. A permit is required to apply, sell and manufacture insecticides, pesticides or fumigants.

105.6.75.1 One location/one time

105.6.75.2 Annual/multiple locations

105.6.76 Interim permit. An interim permit may be issued allowing work under restrictions or conditions while awaiting submittal of installation documents.

105.6.77 Interior fire alarm system maintenance. A permit is required to maintain fire alarm equipment.

105.6.78 Laboratories. A permit is required to operate a laboratory that stores or uses hazardous materials or flammable substances.

105.6.79 Limited fueling and other fuel transport operations. A permit is required for each vehicle approved for limited fueling and fuel transport operations.

105.6.80 Liquefied chlorine. A permit is required to store, use, sell and transport liquefied chlorine.

105.6.81 Liquefied- or gas-fueled vehicles or equipment in assembly buildings. A permit is required to display, operate or demonstrate liquid- or gas-fueled vehicles or equipment in assembly buildings.

105.6.82 LPG. A permit is required for:

105.6.82.3 Operate/maintain any container or system

105.6.82.4 Limited operations/construction sites

105.6.82.5 Roofing operations

105.6.82.6 Operation of cargo tankers that transport LP gas.

105.6.83 Lubricating oils. A permit is required to transport, store, sell or use 100 gallons or more of lubricating oils.

105.6.84 Lumber yards. A permit is required for the storage or processing of lumber of 100,000 board feet (8,333 ft^3) (236 m^3) or more.

105.6.85 Magnesium. A permit is required to melt, cast, heat treat or grind 10 pounds (4.54 kg) or more of magnesium.

106.6.86 Matches. A permit is required for bulk storage of matches.

105.6.87 Medical gas systems. A permit is required for each medical gas system.

105.6.88 Motor fuel dispensing facilities. A permit is required for operation of automotive and, marine motor fuel-dispensing facilities. Fuel is calculated and assessed separately.

105.6.88.1 Flammable and combustible liquids

105.6.88.2 Compressed Natural Gas (CNG)

105.6.88.3 Liquefied Petroleum Gas (LPG)

105.6.88.4 Hydrogen

105.6.89 Motor fuel dispensing facilities – Fleet/private service. A permit is required for operation of fleet or private motor fuel dispensing facilities. Fuel calculated and assessed separately.

105.6.89.1 Flammable and combustible liquids

105.6.89.2 Compressed Natural Gas (CNG)

105.6.89.3 Liquefied Petroleum Gas (LPG)

105.6.89.4 Hydrogen

105.6.90 Motor fuel storage systems. A permit is required for certification to install, test, alter, repair or remove equipment.

105.6.91 Motorcycle vehicle repair shops. A permit is required to operate a motorcycle vehicle repair shop.

105.6.92 Nitrous oxide-piped systems. A permit is required to maintain a nitrous oxide-piped system.

105.6.93 Occupant load increase. A permit is required to increase the occupant load of an assembly occupancy. The maximum increase shall be 10% when egress, seating, etc. remain in compliance with this code. This permit shall be for one event only.

105.6.94 Open flame. A permit is required for any open flame equipment.

105.6.95 Open flames and torches. A permit is required to remove paint with a torch; or to use a torch or open-flame device in a hazardous fire area.

105.6.96 Open flame on aircraft servicing ramp. An annual permit is required to use any open flame equipment on an aircraft fuel service ramp.

105.6.97 Organic coatings. A permit is required for any organic-coating manufacturing operation producing one gallon (4L) or more of an organic coating in one day.

105.6.98 Ovens (industrial baking or drying). A permit is required for operation of industrial ovens regulated by Chapter 21.

105.6.99 Ozone generator. A permit is required to operate an ozone generator.

105.6.100 Pallet storage. A permit is required for indoor or outdoor pallet storage of 2,000 square feet or more.

105.6.101 Parade floats. A permit is required for any parade float ground or airborne.

105.6.102 Places of assembly. A permit is required to operate a place of assembly.

105.6.102.1 Occupant load > 150 but < 299

105.6.102.2 Occupant load 300 - 2500

105.6.102.3 Occupant load > 2500

105.6.103 Plan review. A permit is required for plan review.

105.6.103.1 Development plan review – assessed in half-hour increments

105.6.103.2 Pre-plan submittal consultation – assessed in half-hour increments

105.6.103.3 HMIS, HMMP and hazardous materials generation

105.6.103.4 Expedited plan review – assessed in half-hour increments

105.6.103.5 Subsequent plan submittals – 3rd and subsequent submittals

105.6.104 Plant husbandry. A permit is required for the operation of a plant husbandry facility.

105.6.105 Plastic foam products (flammable). A permit is required to store and use over 1,000 lbs.

105.6.106 Powder coating (See Spray booth for powder coating).

105.6.107 Pressure vessels. A permit is required to use a pressure vessel.

105.6.108 Private fire hydrants. See Fire hydrants and valves.

105.6.109 Pyrophoric materials. A permit is required to store or use pyrophoric materials.

105.6.110 Pyrotechnic special effects material. A permit is required for use and handling of pyrotechnic special effects material.

105.6.111 Pyrotechnic event. A permit is required for all pyrotechnic events

105.6.111.1 After-hours inspection

105.6.111.2 Use of fog machine

105.6.111.3 Indoor/Outdoor pyrotechnic event.

105.6.111.4 Use of propane effects.

105.6.111.5 Pyrotechnic inspector during event. (Paid by promoter as after-hours inspection)

105.6.112 Pyrotechnician. A permit/certificate of fitness is required for all pyrotechnicians.

105.6.113 Pyroxylin plastics. A permit is required for storage or handling of 25 pounds (11 kg) or more of cellulose nitrate (pyroxylin) plastics and for the assembly or manufacture of articles involving pyroxylin plastics.

105.6.114 Radioactive material. A permit is required to store, use or handle radioactive material.

105.6.115 Recycling facilities. A permit is required to operate a recycling facility.

105.6.116 Refrigeration equipment. A permit is required to operate a mechanical refrigeration unit or system regulated by Chapter 6.

105.6.117 Repair garages A permit is required for operation of major repair garages as defined in NFPA 30A.

105.6.118 Reviewing stands/grandstands. A permit is required to erect and use reviewing stands or grandstands.

105.6.119 Salvage yard. A permit is required to operate a salvage yard, not including other permits required by this code.

105.6.120 Special conditional permit. A permit is required for special conditions, such as confined spaces, vacated areas, abandoned tanks, etc.

105.6.121 Special events. A permit is required for special events.

105.6.121.1 Places of assembly – any hazardous material or process at temporary events.

105.6.121.2 Places of assembly – refueling operations at temporary events in assembly occupancies.

105.6.121.3 Places of assembly – storage, use and handling of flammable/combustible liquids at temporary events.

105.6.121.4 Places of assembly – storage, use and handling of compressed gases at temporary events.

105.6.121.5 Event within existing facility

105.6.121.6 Plan submittal less than 14 days prior to event

105.6.121.7 Outdoor with six ormore fuel-fired cooking/heating units

105.6.122 Special extinguishing system. A permit is required to maintain a special extinguishing system.

105.6.123 Special fire alarm system. A permit is required to maintain a special fire alarm system.

105.6.124 Special spray application projects. A permit is required for applying flammable or combustible finishes to the interior of a structure.

105.6.125 Spray booth for powder coating. A permit is required to use a spray booth for powder coating.

105.6.126 Spraying or dipping. A permit is required to conduct a spraying or dipping operation utilizing flammable or combustible liquids regulated by Chapter 15.

105.6.126.1 One time/one location

105.6.126.2 Annual/various locations

105.6.126.3 Booth or room

105.6.126.4 Limited spraying spaces

105.6.127 Spraying of water based finishes. A permit is required to conduct a spraying operation utilizing water based liquids.

105.6.128 Storage containers.

105.6.128.1 Temporary – less than 180 days

105.6.128.2 Permanent – 180 days or longer

105.6.129 Storage of scrap tires and tire by-products. A permit is required to establish, conduct or maintain storage of scrap tires and tire byproducts of 2,500 cubic feet (71 m^2) or more total volume of scrap tires and for indoor storage of tires and tire byproducts.

105.6.130 Stored electrical energy emergency/standby power systems. A permit is required to install or operate stored electrical energy emergency/standby power systems.

105.6.131 Sulphur/sulphur chloride. A permit is required to store, sell or use sulphur or sulphur chloride.

105.6.132 Supervising station/central station. A permit is required to receive fire alarm signals from a protected property.

105.6.133 Tanks (Change of content). A permit is required to change the contents of a chemical or fuel storage tank.

105.6.134 Temporary fire standpipe. A permit is required to install and maintain a temporary fire standpipe.

105.6.135 Temporary generator. A permit is required to use a temporary generator.

105.6.136 Temporary heating appliance. A permit is required to install or use a temporary heating appliance.

105.6.136.1 Temporary space heating appliances (electric) in existing builings – all permits must be obtained from designated fire official via building ownership or management.

105.6.137 Tents or temporary membrane structures. See Section 2403.2.

105.6.137.1 Tent or temporary membrane structure - not open on all sides and having an area in excess of 200 sq. ft.

105.6.137.2 Tent or temporary membrane structure - open on all sides and having an area of 400 sq. ft. or more.

105.6.138 Tire rebuilding/recapping plants. A permit is required for the operation and maintenance of a tire rebuilding or recapping plant.

105.6.139 Tire shredding. A permit is required for operations involving shredding of tires.

105.6.140 Tire storage. A permit is required for tire storage of 2500 cubic ft. or more in any one control area.

105.6.141 Trailer. A permit is required for trailers used for office functions.

105.6.141.1 Temporary – less than 180 days

105.6.141.2 Permanent – 180 days or longer

105.6.142 Training fees. A permit is required for Fire Department training.

105.6.142.1 High-rise building evacuation exercise

105.6.142.2 Low-rise building evacuation exercise

105.6.142.3 Building management/facility manager emergency procedures certification training (per person)

105.6.142.4 Fire extinguisher training (2 hours – does not include extinguisher;limited to 5 persons)

105.6.142.5 Floor warden training (limited to 5 persons)

105.6.142.6 Hazardous materials closure plan

105.6.142.7 Hazardous materials waste generation plan

105.6.142.8 Hazardous materials inventory statement training (2 hours; limited to 5 persons)

105.6.142.9 Hazardous materials management plan (2 hours; limited to 5 persons)

105.6.142.10 Hazardous materials release mitigation training (2 hours; limited to 10 persons)

105.6.142.11 Safety and evacuation training (2 hours; limited to 10 persons)

105.6.142.12 Fire safety public education presentation

105.6.143 Underground hazardous material storage tanks. A permit is required to maintain an underground hazardous material storage tank (per tank).

105.6.144 Underground spaces. A permit is required to inspect and certify underground spaces.

105.6.145 Vacant properties. A permit is required for vacant properties.

105.6.146 Varnishes. A permit is required to store or use varnish.

105.6.147 Waste material handling plant. A permit is require to operate waste material handling plants, wrecking yards, junk yards and waste material-handling facilities.

105.6.148 Waste receptacles. A permit is required to install and maintain waste receptacles with a capacity greater than 20 cubic feet.

105.6.149 Waxes. A permit is required to store, sell or use 400 lbs. of wax or more.

105.6.150 Wood products. A permit is required to store 200 cubic ft. or more of wood products.

105.6.151 Wooden packing boxes, cases and barrels (empty). A permit is required to store 2,000 cubic ft. or more.

105.6.152 Woodworking operations. A permit is required to operate a woodworking operation.

Section 105.7 Required construction permits is replaced in its entirety with the following:

105.7 Required construction permits. The fire code official is authorized to issue construction permits for work as set forth in Sections 105.7.1 through 105.7.25.

105.7.1 Appliances fueled by waste petroleum products. A construction permit is required to install appliances fueled by waste petroleum products.

105.7.2 Automatic fire-extinguishing systems. A construction permit is required for installation of or modification to an automatic fire-extinguishing system. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

105.7.3 Battery systems. A construction permit is required to install stationary storage battery systems having a liquid capacity of 50 gallons (189 L) or more.

105.7.4 Cellular / Wireless signal repeater site. A construction permit is required to install a cellular/wireless signal repeater site.

105.7.5 Compressed gases. When the compressed gases in use or storage exceed the amounts listed in Table 105.6.37, a construction permit is required to install, repair damage to, abandon, remove, place temporarily out of service, or close or substantially modify a compressed gas system.

Exceptions:

1. Routine maintenance.
2. For emergency repair work performed on an emergency basis, application for permit shall be made within two working days of commencement of work.

105.7.6 Compressed natural gas (CNG). A construction permit is required to install, modify or remove a compressed natural gas tank.

105.7.7 Cryogenic fluids. A construction permit is required to install, repair damage to, abandon, remove, place temporarily out of service, close or substantially modify an outdoor stationary cryogenic fluid storage systems where the system capacity exceeds the amounts listed in Table 105.6.40. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

105.7.8 Fire alarm and detection systems and related equipment. A construction permit is required for installation of or modification to fire alarm and detection systems and related equipment. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

105.7.9 Fire pumps and related equipment. A construction permit is required for installation of or modification to fire pumps and related fuel tanks, jockey pumps, controllers, and generators. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

105.7.10 Flammable and combustible liquids. A construction permit is required:

1. To repair or modify a pipeline for the transportation of flammable or combustible liquids.

2. To install, construct or alter tank vehicles, equipment, tanks, plants, terminals, wells, fuel-dispensing stations, refineries, distilleries and similar facilities where flammable and combustible liquids are produced, processed, transported, stored, dispensed or used.
3. To install, alter, remove, abandon or otherwise dispose of a flammable or combustible liquid tank.

105.7.11 Generator Set. A construction permit is required to install a generator set with or without an integral tank.

105.7.11.1 Fuel Oil

105.7.11.2 Natural Gas

105.7.12 Hazardous materials. A construction permit is required to install, repair damage to, abandon, remove, place temporarily out of service, or close or substantially modify a storage facility or other area (including but not limited to tanks) regulated by Chapter 27 when the hazardous materials in use or storage exceed the amounts listed in Table 105.6.65.

Exceptions:

1. Routine maintenance.
2. For emergency repair work performed on an emergency basis, application for permit shall be made within two working days of commencement of work.

105.7.13 High-piled combustible storage. A construction permit is required for the installation or reconfiguration of all high-piled storage systems.

105.7.14 Industrial ovens. A construction permit is required for installation of industrial ovens covered by Chapter 21.

Exceptions:

1. Routine maintenance.
2. For repair work performed on an emergency basis, application for permit shall be made within two working days of commencement of work.

105.7.15 LP-gas. A construction permit is required for installation of or modification to an LP-gas system.

105.7.15.1 Cage – an installation permit is required to install a cage for storage of portable LP gas containers awaiting use or resale.

105.7.15.2 Tank – a construction permit is required to install, repair damage to, abandon, remove or place temporarily out of service an LP gas tank.

105.7.16 Nitrous oxide-piped systems. A construction permit is required to install nitrous oxide-piped systems.

105.7.17 Ozone generator. A construction permit is required to install an ozone generator.

105.7.18 Powder coating. A construction permit is required to install a spray booth for powder coating.

105.7.19 Pressure vessel. A construction permit is required to install a pressure vessel.

105.7.20 Private fire hydrants. A construction permit is required for the installation or modification of private fire hydrants.

105.7.21 Process piping. A construction permit is required to install, repair or modify piping systems and their component parts (piping, tubing, valves and fittings) that convey hazardous materials including flammable and combustible liquids.

105.7.22 Repair /garages. A construction permit is required to install a repair garage operation.

105.7.23 Spraying or dipping. A construction permit is required to install or modify a spray room, dip tank or booth.

105.7.24 Standpipe systems. A construction permit is required for the installation, modification, or removal from service of a standpipe system. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

105.7.25 Temporary membrane structures, tents and canopies. A construction permit is required to erect an air-supported temporary membrane structure or a tent having an area of 400 square feet (37 m2) or more.

Exceptions:

1. Tents used exclusively for recreational camping purposes.
2. Funeral tents and curtains or extensions attached thereto, when used for funeral services.
3. Fabric canopies and awnings open on all sides which comply with all of the following:

    a. Individual canopies shall have a maximum size of 700 square feet (65 m2).

    b. The aggregate area of multiple canopies placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed 700 square feet (65 m2) total.

    c. A minimum clearance of 12 feet (3658 mm) to structures and other tents shall be maintained.

105.7.26 Underground hazardous materials storage tanks. A construction permit is required to install an underground hazardous materials storage tank.

105.7.27 Woodworking operations. A construction permit is required to install a woodworking operation.

SECTION 106
INSPECTIONS

Sections 106.2.1 Dangerous or hazardous conditions or material through 106.2.11 Townhomes, condominiums and apartments are added:

106.2.1 Dangerous or hazardous conditions or material. The fire code official shall have the authority to order any person(s) to remove or remedy such dangerous or hazardous condition or material as set forth in this code. Any person(s) failing to comply with such order shall be in violation of this code.

106.2.2 Right of entry. The fire code official shall be authorized to inspect any building or premises for dangerous or hazardous conditions or materials as set forth in this code. Before entering, the fire code official shall obtain the consent of the occupant thereof or obtain a court warrant authorizing entry for the purpose of inspection except in those instances where an emergency exists.

106.2.3 Emergency. As used in 106.2.2, "emergency" means circumstances that the fire code official knows, or has reason to believe, exist and can constitute immediate danger to life and property.

106.2.4 Authorized personnel. Uniformed fire inspectors, fire investigators, and fire protection engineers shall be authorized to enter and inspect buildings, structures, vessels, vehicles, and premises as herein set forth. They shall be identified by credentials issued by the Department of Safety.

106.2.4.1 Impersonation. Persons shall not use a badge, uniform, or other credentials to impersonate the fire code official.

106.2.5 Hazardous conditions. Where conditions exist and are deemed hazardous to life and property by the fire code official, the fire code official shall have the authority to summarily abate such hazardous conditions that are in violation of this code.

106.2.6 Plans and specification. The fire code official shall have the authority to require plans and specifications to ensure compliance with applicable codes and standards. The plans and specifications shall bear the stamp of a professional engineer.

106.2.7 Inspection of construction and installation. The fire code official shall be notified by the person performing the work when the installation is ready for a required inspection or for fire protection or other life safety systems acceptance tests. All installations shall be complete prior to requesting an inspection or test. All components of a life safety system shall be installed prior to testing—no exceptions.

106.2.7.1 Work in violation. When any construction or installation work is being performed in violation of the plans and specifications approved by the fire code official, a written notice shall be issued to the responsible party to stop work on that portion of the work that is in violation. The notice shall state the nature of the violation, and no work shall be continued on that portion until the violation has been corrected.

106.2.8 Stop work or evacuation. The fire code official shall have the authority to order an operation or use stopped and the immediate evacuation of any occupied building, area of a building, or other property when such building, area of a building, or other property has hazardous conditions that present imminent danger.

106.2.8.1 Non-complying work. Whenever any work is being done contrary to provisions of this code, the fire code official is hereby authorized to order such work stopped. Such work should immediately stop until authorized by the fire code official to proceed.

106.2.9 Standby personnel. When, in the opinion of the fire code official, it is essential for public safety in a tent, canopy or membrane structure used as a place of assembly or any other use where people congregate, or any building, premises or property where people congregate, because of the number of persons, or the nature of the performance, exhibition, display, contest or activity, or when potentially hazardous conditions exist, or an occupant load varies due to large crowd movement from one building to another building or one area of a building to another area of the building, or there is a reduction in a life safety feature, or there is an impairment to a fire protection feature, the owner, agency or lessee shall employ and compensate through approved Department of Safety channels at a rate established by the Manger of Safety one or more firefighters of the City and County of Denver, as required by the fire code official. Such firefighter(s) shall be subject to the fire code official's orders at all times when so employed and shall be in uniform and remain on duty during the times such places are open to the public or when such activity is being conducted or, in the case of residential occupancies, whenever occupied.

106.2.9.1 Owner's responsibility. The owner, agent, or lessee shall employ standby fire personnel in an adequate number determined by the fire code official based on the potential hazard or reduction in a fire protection system or other life safety feature as described in Section 106.2.9, as required and approved, to be on duty. Such standby fire personnel or fire watch personnel shall be subject to the fire code official's orders at all times and shall be identifiable and remain actively on duty during the times such places are open to the public, when such activity is being conducted, or in residential buildings, whenever occupied.

106.2.10 Records. The Fire Prevention and Investigation Division shall retain, for the life of the building or structure, a record of each inspection made showing the findings and disposition of each inspection made.

106.2.11 Townhouses, condominiums and apartments. Portable fire extinguishers shall be mounted on the exterior at each level stairway(s) or one (2A 10BC) within each residential unit. When mounted on the exterior, the property management/homeowner's association (HOA) shall be responsible for the care, maintenance and recharging, and use of the fire extinguisher, including inspection. The homeowner shall submit a report to the property management (HOA) on an annual basis. Portable fire extinguishers shall be located, inspected and maintained in accordance with NFPA 10. The smoke detector(s) within the residential units shall be tested and maintained in accordance with NFPA 72. The carbon monoxide detectors shall be located, inspected, tested and maintained in accordance with NFPA 720. The homeowner shall submit a report to the property management/HOA on an annual basis of each test and battery replacement. The property management/HOA shall maintain a log of the inspection/test reports submitted to that office and Denver Fire Department Inspection personnel will review that log prior to conducting the inspection. If this information is not available, an inspection shall be made to determine that this equipment is in compliance with this code.

Section 106.5 Fees is added:

106.5 Fees. The Manager of Safety is authorized to adopt an inspection fee schedule necessary to cover administrative costs of inspections and record-keeping under this code.

SECTION 107
MAINTENANCE

Section 107.7 Fire watch personnel, 107.7.1 Owner's responsibility and 107.7.2 Permit required are added:

107.7 Fire watch personnel. When in the opinion of the fire code official it is essential for public or occupant safety, because of potentially hazardous conditions or a reduction in safety due to the occupant load, crowd movement, type of performance, display, exhibit, use, contest, activity; impairment to a fire protection or other life safety system; or any similar condition, the fire code official shall have the authority to require a fire watch in any building, premises or property.

107.7.1 Owner's responsibility. The owner, agent, or lessee shall employ personnel for fire watch in adequate numbers as determined by the fire code official based on the potential hazard or reduction in safety described in Section 107.7. When required by the fire code official, uniformed City and County of Denver firefighters shall be employed through the Department of Safety and compensated at a rate established by the Manager of Safety. Fire watch personnel shall be subject to the fire code official's orders at all times and shall be identifiable and remain actively on duty during the times specified by the fire code official.

107.7.2 Permit required. Permits shall be required as set forth in Section 105.6.53.

SECTION 108
BOARD OF APPEALS

Section 108.1 Board of appeals is replaced in its entirety with the following:

108.1 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, the Manager of Safety can hear the appeal alone or appoint a board of appeals consisting of members who are qualified by experience and training to make decisions pertinent to hazards of fire, explosions, hazardous

conditions, flammable and combustible liquids and gases, the use, storage and production of hazardous materials, or fire protection and other life safety systems and features.

108.1.1 Application. Prior to any action by the Manager of Safety, an application in writing shall be filed in the office of the Manager within thirty (30) days after receiving the order, decision, or determination made by the fire code official on a form provided by the Manager providing the necessary information required. A copy of such application shall be furnished to the fire code official by the applicant. A fee of $100, in the form a check made payable to the Denver Manager of Finance, must accompany the application.

108.1.2 Meetings and records. The Manager of Safety/Board of Appeals shall keep records of its proceedings showing the vote of each member on every question and the final decision.

108.1.3 Appeal from decision of the Manager of Safety. Any person aggrieved by a decision of the Manager of Safety may have judicial review of such decision as provided by law. A petition for review shall be filed in the court having jurisdiction within thirty (30) days after receiving the decision of the Manager of Safety.

SECTION 109
VIOLATIONS

Sections 109.2.2.1 Failure to comply through 1009.2.2.4 Citation are added:

109.2.2.1 Failure to comply. It shall be unlawful to violate any provisions of this code, or to fail to carry out an order made pursuant to this code or violate any condition attached to a permit, approval, or certificate, or to erect, install, alter, repair or do work in violation of approved construction documents, or without the appropriate license, permit or directive of the fire official. Violations shall be punishable as prescribed in Section 1-13(a) of the Denver Revised Municipal Code. It shall be unlawful to fail to pay fees authorized pursuant to this code.

109.2.2.2 Time limits. Failure to comply with the time limits of an abatement notice or after a corrective order or notice of violation is issued by the fire code official shall result in each day that such violation continues being regarded as a new and separate violation and a new and separate offense.

109.2.2.3 Not owner-occupied. If the building or other premises is not owner occupied, under lease or otherwise, and the order or notice of violation requires additions or changes in the building or premises that would immediately become real estate and be the property of the owner of the building or premises, such orders or notices shall be complied with by the owner.

109.2.2.4 Citation. The fire code official is authorized to issue a citation to persons operating or maintaining an occupancy, premises, vessel, vehicle or other property subject to this code who allow a hazard to exist or fail to take immediate action to abate a hazard on such occupancy, premises, vessel, vehicle, or other property when ordered or notified to do so. A citation may be issued when work is performed without the appropriate license, permit or directive of the fire official, or in violation of approved construction documents.

Section 109.3 Violation penalties is replaced in its entirety with the following:

109.3 Violation penalties. See Section 109.2.2.1 Failure to comply.

SECTION 110
UNSAFE BUILDINGS

Section 110.1.1 Unsafe conditions is replaced in its entirety with the following:

110.1.1 Unsafe conditions. Structures or existing equipment that are or hereafter become unsafe or deficient because of inadequate means of egress, failure to comply with an approved occupant load, or which constitute a fire hazard such as storage of explosives, excessive amounts of combustible or flammable materials, vegetation deemed an exposure hazard, manufacture of controlled substances, unstable material, hazardous materials, etc., or are otherwise dangerous to human life or to the public welfare, or which involve illegal or improper occupancy or inadequate maintenance, shall be deemed an unsafe condition. A vacant structure that is not secured against unauthorized entry shall be deemed unsafe. A structure, including residences, that constitutes a fire hazard and an exposure hazard in the event of fire or explosion shall be deemed unsafe. The fire code official is authorized to take action to mitigate an unsafe condition, rendering the operation harmless to people or property. The property owner shall be responsible for all costs related to all actions.

Section 110.1.2.1 Unsafe heating or electrical equipment and structural hazards is added:

110.1.2.1 Unsafe heating or electrical equipment and structural hazards. When the fire code official deems any chimney, smokestack, stove, oven, incinerator, furnace, or other heating device, electrical fixture, or any appurtenance thereto, or anything regulated under a nationally recognized standard in or upon any building, structure, or premises not specifically mentioned in this code, to be unsafe or defective so as to create a hazard, the fire code official is authorized to serve upon the owner or the person having control of the property a written notice to remove or repair or alter as necessary. The fire code official is authorized to affix a condemnation tag prohibiting the use thereof, or until such repairs or alterations are made.

110.1.2.2 Unsafe operations. When the fire code official deems any operation, interior or exterior, to be unsafe so as to create a hazard, the fire code official is authorized to serve upon the owner, contractor, or the person having control of the property, a written notice to remove or repair or alter as necessary. The fire code official is authorized to affix a condemnation tag prohibiting the use thereof, or until such repairs or alterations are made. In the event that the unsafe operation resulted in an emergency response, legal action and cost recovery will be directed to the responsible party.

Section 112 Licenses is added:

SECTION 112
LICENSES

112.1 General. A license is authority granted to the person to whom it is issued to perform the work authorized by the license.

112.2 Licenses required. Denver Fire Department licenses shall be required for the design, installation, modification, inspection, and testing of all Life Safety Systems and equipment. All fitters/technicians shall be licensed to design, install, add to, modify, and perform all types of inspections, testing, maintenance, and repair of factory-engineered equipment. All persons required to have a permit, license or certificates shall have a current—for calendar year—permit, license or certificate.

112.2.1 Fire sprinkler systems – NFPA 13.

112.2.2 Fire sprinkler systems – NFPA 13D.

112.2.3 Fire sprinkler systems – NFPA 13R.

112.2.4 Fire standpipe systems – NFPA 14.

112.2.5 Fire pumps.

112.2.6 Kitchen hood extinguishing systems.

112.2.7 Dry chemical extinguishing systems.

112.2.8 Carbon dioxide extinguishing systems.

112.2.9 Special extinguishing systems.

112.2.10 Fire alarm systems.

112.2.11 Fire detection systems.

112.2.12 Emergency communication systems.

112.2.13 Electrical signaling and central wiring.

112.2.14 Department of safety radio enhancement systems.

112.2.15 Smoke control systems.

112.2.16 Firefighter's emergency elevator recall systems.

112.2.17 Foam extinguishing systems.

112.2.18 Portable fire extinguishers.

112.2.19 Refrigerant safety / alarm systems.

112.2.20 Ammonia safety / alarm systems.

112.2.21 Carbon monoxide safety / alarm warning systems.

112.2.22 Clean agent fire extinguishing systems.

112.2.23 Oxygen coordinator.

112.2.24 Oxygen supply and delivery.

112.2.25 Fire foam extinguishing systems.

112.2.26 Backflow prevention for fire sprinkler systems.

112.2.27 Carbon monoxide detection systems.

112.2.28 Central station operator.

112.2.29 Central station runner.

Section 113 Public Fire Education is added:

SECTION 113
PUBLIC FIRE EDUCATION

113.1 General. The fire code official shall have the authority to develop and implement a public fire safety education program as deemed necessary for the general welfare with respect to the fire hazards within the jurisdiction.

113.2 Educational programs and messages. The fire code official shall have the authority to ensure that duly authorized public fire safety educational programs or public fire safety messages are disseminated to the general public.

113.2.1 Juvenile firesetters intervention program. Juveniles suspected of firesetting—curious or malicious—shall be required to participate in the Denver Fire Department Juvenile Firesetters Intervention Program.

Section 114 Emergency Plans and Procedures is added:

SECTION 114
EMERGENCY PLANS AND PROCEDURES

114.1 General. Where required, emergency plans, staff training, and emergency evacuation drills are required for all occupants.

114.2. Plan requirements. Emergency plans and emergency evacuation drills shall be developed in accordance with the Denver Fire Department Fire Prevention and Investigation Division's guidelines, NFPA 1600, *Standard on Disaster/Emergency Management and Business Community Programs*, and Chapter 4, Emergency Planning and Preparedness, of this code.

114.3 Review. Emergency plans shall be submitted annually to the Division for review.

114.4 Maintenance. Emergency plans shall be reviewed and updated annually. Revised plans shall be submitted for review and updates shall be provided whenever changes are made in the occupancy or physical arrangement of the building or fire protection systems or features. The owner or manager shall provide floor plans to the Denver Fire Department Fire Prevention and Investigation Division in a manner approved by the fire code official. The person developing/updating the emergency plans shall be certified by the Denver Fire Department. See IFCA Section 403.3.

Section 115 Fire Alarm Monitoring – Permits and Licenses is added:

SECTION 115
FIRE ALARM MONITORING - PERMITS AND LICENSES

115.1 General. The provisions of this section apply to the installation, operation of, and scope of monitoring.

115.2 Central alarm station / Supervising station. These facilities, licensed by the Denver Fire Department, monitor remote fire alarm signaling systems when personnel licensed by the Denver Fire Department are in attendance at all times to take such action as required for the notification of the Denver Fire Department.

115.3 Permits. Permits shall be obtained annually for central alarm station / supervising stations and the operators who take such action as required for notification of the Denver Fire Department. All central alarm station / supervising stations and operators shall have current—for current calendar year—permits and licenses.

115.4 Definitions.

CENTRAL ALARM STATION/SUPERVISING STATION. A facility that receives fire alarm signals and at which personnel are in attendance at all times to respond to these signals. A supervising station that is licensed for central station service.

CLASS I FIRE ALARM MONITORING. The monitoring of a fire alarm system by a licensed central station that is required by Denver's Building and Fire Codes.

CLASS II FIRE ALARM MONITORING. The monitoring of a fire alarm system by a licensed central station that is not required by Denver's Building and Fire Codes.

OPERATOR. A competent person employed by a central alarm station and licensed by the Denver Fire Department to take such action as required for notification of the Denver Fire Department.

RUNNER. A qualified person who responds to the location where a reported fire alarm system has been activated for the purpose of silencing, restoring, or confirming that the system is restored to a normal condition.

115.5 License required.

115.5.1 Central alarm station/supervising station. No person or public agency shall monitor fire alarm systems in the City and County of Denver without first obtaining a license to operate a Class I or Class II central alarm station/supervising station.

115.5.2 Operator. No person shall be employed as an operator in a central alarm station/supervising station that monitors fire alarm systems in the City and County of Denver unless licensed as an apprentice operator or operator by the Denver Fire Department.

115.5.2.1 Class I operator. A Denver Fire Department Class I Operator license shall authorize the holder to act as an operator in any central alarm station/supervising station.

115.5.2.2 Class II operator. A Denver Fire Department Class II Operator license shall authorize the holder to act as an operator in any Class II central alarm station/supervising station.

115.5.2.3 Apprentice operator. A Denver Fire Department Apprentice Operator license shall authorize the holder to act as an operator only under the constant supervision of a licensed operator.

115.5.3 Runner. A Denver Fire Department central alarm station/supervising station Runner license shall authorize the holder to act as a runner for any Class I or Class II central alarm station/supervising station.

115.6 Runner service. The central alarm station/supervising station shall provide runner service to all Class I alarms. Maximum response time from receipt of alarm to arrival of runner service shall not exceed 45 minutes.

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CHAPTER 2
DEFINITIONS

SECTION 202
GENERAL DEFINITIONS

Section 202 General Definitions is amended by adding the following to definitions:

ALARM CONTROL UNIT. See Section 902.1.

ALTITUDE. Altitude is the measure of elevation typically relative to sea level. The generally recognized altitude of Denver, CO is 5,280 ft. Altitude has a direct impact on design considerations for life safety and property protection including but not limited to the physical properties of flammable and combustible liquids. See Section 3401.5.1.

APPLIANCE. See Section 902.1.

BATTERY BACKUP. See Section 902.1.

BATTERY-POWERED. See Section 902.1.

BIOHAZARD. See Section 2702.1.

CARCINOGEN. See Section 2702.1.

CENTRAL ALARM STATION. See Section 115.4.

CENTRAL FUEL-BURNING APPLIANCE ROOM. See Section 908.7.2.

CLASS I FIRE ALARM MONITORING. See Section 115.4.

CLASS II FIRE ALARM MONITORING. See Section 115.4.

CO (CARBON MONOXIDE). See Section 908.7.2

CO ALARM. See Section 908.7.2.

CO DETECTOR. See Section 908.7.2.

DEVICE. See Section 902.1.

ELECTROLYTE. See Section 302.

EMERGENCY shall mean one or more of the following:

Fire, regardless of size or type

Explosion

Building, structure, or utility failure

Rescue operations involving humans or animals, including people trapped in elevators due to power failure or mechanical malfunctions

Failure of or damage to fire protection or life safety systems

Exposure to a hazard(s)

Panic

Hazardous material leak or spill

Overcrowding of any building or premises

Rescue operations involving humans or animals injured or trapped in buildings, trenches, scaffolding, grandstands, etc.

Any other hazard or situation involving or endangering life or property.

FALSE FIRE ALARM. See Section 902.1

FUEL-BURNING APPLIANCE. See Section 908.7.2.

HARD-WIRED. See Section 902.1.

HOUSEHOLD CO DETECTION SYSTEM. See Section 908.7.2.

INSTALLED. See Section 902.1.

LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS. See Section 502.1.

MACHINERY ROOM. See Section 602.

MULTIPLE-PURPOSE CO ALARM. See Section 908.7.2.

MULTIPLE STATION [CO] ALARM. See Section 908.7.2.

NON-METALLIC RUBBISH CONTAINERS. See Section 304.3.2.1.

NUISANCE FIRE ALARM. The activation of any fire alarm system resulting in a response by the Fire Department, caused by mechanical failure, malfunction, improper installation, lack of maintenance or other condition for which Fire Department personnel are unable to determine initiation of a valid alarm signal. (See Sections 401.6, 902.1 "False Fire Alarm," and 907.1.5).

OPERATIONS PERMIT. A permit issued in conjunction with the operations listed in Section 105.6.

OPERATOR. See Section 115.4.

OTHER HEALTH HAZARD MATERIAL. See Section 2702.1.

OWNER. The owner of the dwelling, dwelling unit and/or rental unit, a mortgagee or vendee in possession, an assignee of rents, receiver, executor, trustee, or any other person, business, sole proprietorship, partnership, association, or corporation directly or indirectly in control of a building, structure or real property or their authorized agent.

PERMITABLE QUANTITY. The minimum amount of hazardous or any other regulated material allowed to be stored or used at a property before an operations permit is required by Section 105.6.

PLUG-IN. See Section 908.7.2.

PROPERTY. See Section 402.1.

RADIOACTIVE MATERIAL. See Section 2702.1.

REGULATED MATERIAL. Any material materials regulated by the fire code (as amended) for which an operations permit could be required including storage and/or use of hazardous materials, LPG, combustible dust operations.

RELEASE/UNAUTHORIZED DISCHARGE. See Section 2702.1.

RUNNER. See Section 115.4.

SENSITIZER. See Section 2702.1.

SINGLE-FAMILY DWELLING. See Section 902.1.

SINGLE STATION [CO] ALARM. See Section 908.7.2

SLEEPING ROOM. See Section 902.1.

WALL HYDRANT. Valved 2-1/2-inch (64 mm) exterior standpipe connection.

CHAPTER 3
GENERAL REQUIREMENTS

SECTION 301
GENERAL

Section 301.2 Permits is replaced in its entirety with the following:

301.2 Permits. Permits shall be required as set forth in Section 105.6 for the activities or uses regulated by Section 303–Asphalt Kettles; Section 304–Combustible Waste Material; Section 306-Motion Picture Projection Rooms and Film; Section 307-Open Burning, Recreational Fires and Portable Outdoor Fireplaces; Section 308-Open Flames; Section 309-Powered Industrial Trucks and Equipment; Section 311-Vacant Premises; Section 314-Indoor Displays; and 315-Miscellaneous Combustible Materials Storage.

SECTION 302
DEFINITIONS

Section 302.1 Definitions is amended by adding the following definitions:

ELECTROLYTE. A solid, liquid, or aqueous salt solution that permits ionic conduction between positive and negative electrodes of a cell.

POWERED INDUSTRIAL TRUCK. A forklift, tractor, platform lift truck, golf cart or motorized hand truck powered by an electrical motor or internal combustion engine. Powered industrial trucks do not include farm vehicles or automotive vehicles for highway use.

SECTION 304
COMBUSTIBLE WASTE MATERIAL

Section 304.2.1 Required storage conditions is added:

304.2.1 Required storage conditions. Combustible rubbish kept or accumulated within or adjacent to buildings, structures or residential dwelling units shall be in containers complying with this code, or in rooms or vaults constructed of non-combustible materials.

Exception: Storage, accumulation, use and handling of combustible rubbish and waste, newspapers, magazines, etc. not in excess of 10 cubic feet aggregate.

Section 304.3 Containers is replaced in its entirety with the following:

304.3 Containers. Combustible rubbish, and waste material kept within or near a structure shall be stored in accordance with Sections 304.3.1 through 304.3.6.

Sections 304.3.5 Removal, 304.3.6 Waste material handling operations and 304.3.6.1 Permits are added:

304.3.5 Removal. Combustible rubbish stored in containers outside of noncombustible vaults or rooms shall be removed from buildings at least once each working day.

304.3.6 Waste material handling operations. Occupancies exclusively performing commercial rubbish handling or recycling shall maintain rubbish or product to be processed or recycled as follows:

1. In approved vaults

2. In covered metal or metal-lined receptacles or bins, or

3. Completely baled and stacked in an orderly manner in an approved location.

304.3.6.1 Permits. A permit shall be required as set forth in Section 105.6 for a Waste Material Handling Plant.

304.3.7 Container location. A permit shall be required for the installation and maintenance of a waste receptacle with a capacity greater than 20 cubic feet. A site plan depicting the location of the waste receptacle must be submitted for approval prior to installation and anytime the waste receptacle is relocated. Toxic, explosive, flammable, chemical, infectious, radioactive materials and any other hazardous waste shall not be disposed of in the general waste dumpster(s). The waste receptacle(s) shall not be placed within fifteen (15) feet of combustible walls, openings, or combustible roof eave lines. The waste receptacle shall not obstruct emergency vehicular access or positioning for fire ground operations.

SECTION 308
OPEN FLAMES

Section 308.1.4 Open-flame devices is replaced in its entirety with the following:

308.1.4 Open-flame devices. No gas-fired grills, charcoal grills, or other similar devices used for cooking, heating, or any other purpose, shall be used or kindled on any balcony or under any overhanging portion or within 10 feet (3 m) of any structure.

Exceptions:

1. One- and two-family dwellings.
2. LP-gas burners having an LP-gas container with a water capacity not greater than 2.5 pounds [nominal 1 pound (0.454kg) LP-gas capacity]. Two extra 1 pound LP-gas containers may be stored on the balcony.
3. Listed natural gas appliances shall be permitted on balconies when installed in accordance with the *International Fuel Gas Code* and supplied by the building's natural gas system.
4. Listed electric ranges, grills, or similar electrical apparatus shall be permitted.

SECTION 309
POWERED INDUSTRIAL TRUCKS

Section 309.2 Battery-charging operations is replaced in its entirety with the following:

309.2 Battery-charging operations. Battery-charging operations shall be located in areas designated for such purpose. Where on-board chargers are used, charging shall be accomplished at locations designated for such purpose.

309.2.1 Battery chargers. Battery chargers shall be of an approved type. Combustible storage shall be kept a minimum of 3 feet (915 mm) from battery chargers.

309.2.2 Battery-charging areas. Battery-charging areas shall be kept free of extraneous combustible materials. Battery charging shall not be conducted in areas accessible to the public.

309.2.2.1 Aggregate electrolyte capacity. For purposes of this section, and Section 309.3, "aggregate electrolyte capacity" shall mean the total amount of electrolyte within one building. There shall be no maximum aggregate electrolyte capacity for any building, but when aggregate electrolyte capacity exceeds certain quantities, fire protection, construction and ventilation shall be required in accordance with this section.

309.2.2.2 Battery-charging area fire protection. Where aggregate electrolyte capacity exceeds 100 gallons, battery-charging areas shall be protected with an automatic sprinkler system per Section 903.3.1.1.

Exception: Automatic sprinklers shall not be required where the amount of electrolyte per battery-charging area is 100 gallons or less and the battery-charging areas are separated by a minimum of 75 feet.

309.2.2.3 Battery-charging area construction. Where aggregate electrolyte capacity exceeds 100 gallons, battery charging areas shall be separated from the other portions of the building with a one-hour fire barrier constructed in accordance with *International Building Code* Chapter 7.

Exceptions:

1. One-hour fire barriers shall not be required where the amount of electrolyte per battery-charging area is 100 gallons or less and the battery-charging areas are separated by a minimum of 75 feet.
2. In buildings that are protected throughout with an automatic sprinkler system per Section 903.3.1.1, one-hour fire barriers shall not be required where the amount of electrolyte per battery charging area is 200 gallons or less and the battery-charging areas are separated by a minimum of 75 feet.

309.2.2.4 Smoking prohibited. Smoking shall be prohibited in battery-charging areas. "No Smoking" signs shall be provided in the charging area in accordance with Section 310.3.

309.2.2.5 Neutralization. An approved method and materials capable of neutralizing a spill from the largest battery to a pH between 7.0 and 9.0 shall be provided.

309.2.2.6 Spill control. Each rack or tray of batteries shall be provided with a liquid-tight 4-inch minimum spill control barrier which extends at least one-inch beyond the battery rack in all directions. Alternative methods of spill control are subject to approval by the fire code official.

Exceptions:

1. Spill control shall not be required where the amount of electrolyte per battery-charging area is 100 gallons or less and the battery-charging areas are separated by a minimum of 75 feet.
2. In buildings that are protected throughout with an automatic sprinkler system per Section 903.3.1.1., spill control shall not be required where the amount of electrolyte per battery charging area is 200 gallons or less and the battery-charging areas are separated by a minimum of 75 feet.

Section 309.3 Ventilation is replaced in its entirety with the following:

309.3 Ventilation. Where aggregate electrolyte capacity exceeds 100 gallons, continuous ventilation shall be provided at a rate of not less than 1 cu-ft/min/sq. ft. of designated battery-charging area.

Exceptions:

1. Ventilation systems shall not be required where the amount of electrolyte per area is 100 gallons or less and the battery-charging areas are separated by a minimum of 75 feet.
2. In buildings that are protected throughout with an automatic sprinkler system per Section 903.3.1.1, ventilation systems shall not be required where the amount of electrolyte per battery charging area is 200 gallons or less and the battery-charging areas are separated by a minimum of 75 feet.

SECTION 315
MISCELLANEOUS COMBUSTIBLE MATERIALS STORAGE

Section 315.3.3 Pile size, aisles and driveways is added:

315.3.3 Pile size, aisles and driveways. Combustible material shall be piled with due regard to stability of piles and in no case higher than twenty (20) feet. When the area used for outside storage exceeds fifty (50) feet, but is less than one hundred fifty (150) feet, in any dimension, aisles of not less than eight (8) feet clear width shall be provided between piles. When the area used for outside storage exceeds one hundred fifty (150) feet in any dimension, a driveway between and around piles shall be at least fifteen (15) feet in width and maintained free of rubbish, equipment or other articles or materials. Driveways shall be so spaced that a maximum grid system unit of fifty (50) feet by one hundred fifty (150) feet is produced.

SECTION 316
HAZARDS TO FIRE FIGHTERS

Section 316.4.1 Fences, walls, retaining walls and similar barriers is added:

316.4.1 Fences, walls, retaining walls, and similar barriers. The use of barbed wire or any other sharp-pointed material, devices or features that deliver an electric shock, devices or features that deliver a physical or health hazard on, as, or on top of, fences, walls, retaining walls, or similar barriers, regardless of height, is prohibited.

Exception: Barbed wire may be installed where approved by the fire code official and a permit is obtained in accordance with Section 105.6.

Section 316.6 Confined spaces is added:

316.6 Confined spaces. Tanks that contain materials that would not contain enough oxygen to support life or contain a toxic atmosphere shall have at each entry point; a warning sign posted indicating the need for procedures for safe entry into confined spaces.

Section 316.7 Solar photovoltaic (PV) systems is added:

316.7 Solar photovoltaic (PV) systems. Solar photovoltaic (PV) systems shall be installed in accordance with NFPA 70 (NEC) Article 690. PV systems may be stand-alone or utility-interactive, with or without additional back-up batteries. Arrays may be located on roofs or on the ground.

316.7.1 Marking. Warning signs to inform personnel of the existence of a PV system shall be provided in accordance with NFPA 70 Article 690. Signage is required at each PV disconnecting means, at the electrical service entrance, at the source of all power sources supplying the structure, and at all terminals of a disconnecting means that may be energized when in the open position. On ungrounded PV systems, labeling is also required at each junction box, combiner box, disconnect and

device where energized parts may be exposed during service. Interactive systems must be identified at the system point of connection with other sources (such as utility, batteries or generator).

316.7.2 Hazards: In roof-mounted retrofit installations, the safety factor in the roof structure has been reduced due to the additional dead load (3-5 psf) imposed. Roof activities such as penetrations for ventilation further stress the roof structure. Also, the array(s) will obstruct inspection of the roof for damage and "hot spots" and present an obstacle for personnel movement on the roof. With the main disconnects off, panel open circuit voltage can be experienced at the terminals. At night, panel voltages can still be generated by artificial lights, lightning and even bright moonlight. In daylight, panel surfaces can exceed 158° F (70° C).

CHAPTER 4
EMERGENCY PLANNING AND PREPAREDNESS

SECTION 401
GENERAL

Section 401.1 Scope – Exception is deleted.

Section 401.3 Emergency forces notification is replaced in its entirety with the following:

401.3 Emergency forces notification. In the event an emergency, including but not limited to, unwanted fire, hazardous materials discharge, medical incident, or environmental calamity including utility malfunction, occurs on a property, the owner, occupant, or any other person in responsible charge of the property or portion thereof, including their tenants and employees, shall immediately report the emergency to 911. Building employees and tenants shall implement the appropriate emergency plans and procedures. No person shall, by any means, require or otherwise purposely cause any delay in the reporting of an emergency.

Section 401.3.4 Evidence of emergency is added:

> **401.3.4 Evidence of emergency.** Upon discovery of evidence of an unwanted fire, hazardous materials discharge, medical incident, or environmental calamity, even though it appears to have been extinguished or otherwise stabilized, the owner, occupant, or any other person in responsible charge of the property or portion thereof, including their tenants and employees shall immediately notify the Fire Department of the evidence including what is known of the location and circumstances. Such evidence shall not be disturbed, thus preserving data for the Fire Department to conduct an investigation.

Section 401.9 False alarm is added:

401.9 False alarm. No person shall deliberately or maliciously report a fire or unauthorized discharge of hazardous materials when that person knows that no fire or discharge exists. The person responsible for the false alarm shall reimburse the City for the total cost of responding to the false alarm.

Section 401.10 Misleading information is added:

401.10 Misleading information. It shall be unlawful for a person to willfully make any false, fraudulent, misleading, or unfounded report or statement or to willfully misrepresent any fact with the intention of misleading any Fire Department personnel or interfering with Fire Department operations.

SECTION 402
DEFINITIONS

Section 402.1 Definitions is amended by adding the following:

PROPERTY. As used in this chapter, shall include private and public land in the undeveloped and developed state including the buildings, structures, paving and all other immobile improvements; natural features such as trees, shrubbery and similar botanical growth; and vehicles, vessels, equipment, materials and similar movable items located on them.

SECTION 403

PUBLIC ASSEMBLAGES AND EVENTS

Section 403.2.1 Contents is replaced in its entirety with the following:

403.2.1 Contents. The public safety plan, where required by Section 403.2, shall address:

- Emergency vehicle ingress and egress
- Fire hydrant locations
- Local fire protection (suppression and alarm)
- Emergency medical services
- Public assembly areas
- The directing of both attendees and vehicles (including the parking of vehicles)
- Vendor and food concession distribution
- The need for the presence of law enforcement
- Emergency procedures and employee training
- Fire and emergency medical services personnel at the event
- All other conditions possibly hazardous to life, property or public welfare in the occupancy

Section 403.4 Facility manager certification is added:

403.4 Facility manager certification. All personnel responsible for facility maintenance, fire safety emergency procedures, evacuation plans, evacuation drills, employee training and response procedures, hazard communication, resident training, tenant identification, emergency response team formulation and training, hazardous materials management plans, hazardous materials inventory statement, etc. shall complete a Denver Fire Department training course and shall have a current certification by the Denver Fire Department.

SECTION 404
FIRE SAFETY AND EVACUATION PLANS

Section 404.3 Contents is replaced in its entirety with the following:

404.3 Contents. Fire safety and evacuation plan contents shall be in accordance with Sections 404.3.1, 404.3.2, and Denver Fire Department policy on Emergency Procedures and Emergency Evacuation.

Section 404.3.1 Fire evacuation plans, Item 1 is replaced in its entirety with the following:

1. Emergency egress or escape routes and whether evacuation of the building is to be complete or, where approved, by selected floors or areas only. Specifically address people with special needs.

Section 404.3.2 Fire safety plans, Item 2 is replaced in its entirety with the following:

2. The life safety strategy and procedures for notifying, relocating or evacuating occupants including those with disabilities. Provide a description of the building's life safety systems including fire alarm, fire sprinkler (including special suppressioin, standpipes, fire pumps, etc.), smoke control, elevator recall, areas of refuge, emergency power, etc.

SECTION 405
EMERGENCY EVACUATION DRILLS

Section 405.1 General is replaced in its entierty with the following:

405.1 General. Emergency evacuation drills complying with the provisions of this section shall be conducted as specified in Table 405.2 or when required by the fire code official. Drills shall be designed in cooperation with the local authorities. Complete evacuation from the building of all persons required to participate is required. It shall be unlawful to refuse to participate or to interfere with Fire Department personnel conducting an emergency evacuation drill.

Table 405.2 FIRE AND EVACUATION DRILL FREQUENCY AND PARTICIPATION is replaced in its entirety with the following:

TABLE 405.2
FIRE AND EVACUATION DRILL
FREQUENCY AND PARTICIPATION

GROUP OR OCCUPANCY	FREQUENCY	PARTICIPATION
Covered Mall Building[a, b]	Annually	Employees
High Rise[a]	Annually	All occupants
A[b]	Quarterly	Employees
B[b]	Annually	All occupants
E	Monthly[c]	All occupants
F	Annually	All occupants
H	Annually on each shift	All occupants
I-1[d]	Quarterly on each shift	All occupants
I-2, I-3, I-4	Quarterly on each shift	Employees
M[b]	Semiannually on each shift	Employees
R-1	Quarterly on each shift	Employees
R-2[b]	Four annually	All occupants
R-4	Quarterly on each shift	Employees[d]

a. R-1, R-2, R-4, I-1, I-2, I-3, and I-4 use Frequency and Participation listed with those occupancies in Table 405.2; use High Rise Frequency and Participation for all other occupancies in High Rise buildings.
b. As listed in Section 404.2. Ambulatory health care - quarterly
c. The frequency shall be allowed to be modified in accordance with Section 408.3.2.
d. Fire and evacuation drills in residential care assisted living facilites shall include complete evacuation of the premises in accordance with Section 408.10.5. Where occupants receive habilitation or rehabilitation training, fire prevention and fire safety practices shall be included as part of the training program.

Section 405.10 Extent of evacuation is added:

405.10 Extent of evacuation. Fire and evacuation drills shall include the complete evacuation from the building of all persons required to participate. It shall be a violation of this code to refuse to participate or to interfere with the Fire Department personnel conducting a fire and evacuation drill.

CHAPTER 5
FIRE SERVICE FEATURES

SECTION 502
DEFINITIONS

Section 502.1 Definitions is amended by adding the following:

LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS. The lowest level of Fire Department vehicle access shall be measured from the lowest elevation of any required Fire Department access road located no more than 30 feet from any exterior wall of the building.

Exceptions:

1. Where the access road is permitted to be farther than 30 feet from any exterior wall of the building, the lowest level of fire department vehicle access shall be measured from the lowest elevation of any required Fire Department access road located no more than 50 feet from any exterior wall of the building.
2. If any topography, waterway, non-negotiable grades or other similar conditions exist that preclude required Fire Department vehicular access, the fire code official is authorized to require additional fire protection systems as required by Chapter 9.

MASS NOTIFICATION SYSTEM. A mass notification system (MNS) is a system used to provide emergency information and instructions to people in a building, area, site or other space using intelligible voice communications and possibly including visible signals, text, graphics, tactile, or other communications methods.

SECTION 503
FIRE APPARATUS ACCESS ROADS

Section 503.1.1 Buildings and facilities is amended by adding the following to the end of the last sentence:

…and the interior of all courts (also see Section 504.5).

Section 503.1.1 Buildings and facilities, Exception #1 is replaced in its entirety with the following:

1. Where a building is equipped throughout with an approved automatic sprinkler system installed in accordance with Sections 903.1.1 or 903.3.1.2, the 150 feet dimension may be increased to 250 feet. .

Section 503.2.1 Dimensions is replaced in its entirety with the following:

503.2.1 Dimensions. The fire apparatus access road shall have an unobstructed vertical clearance of not less than 13 feet, 6 inches. Fire apparatus access roads shall have an unobstructed width per Table 503.2.1-A, except for approved security gates in accordance with Section 503.6.

TABLE 503.2.1
FIRE APPARATUS ACCESS ROADS[a]

Type of Right of Way	Minimum Clear Width
Private or public streets serving single-family detached buildings or townhomes with alleys	16 feet
Private or public streets serving single-family detached buildings or townhomes, without alleys but with driveways that reach the street	16 feet
Private or public streets serving single-family detached buildings or townhomes, without alleys OR driveways that reach the street	18 feet
Multi-family buildings, two stories or less, 15 units maximum per building;	20 feet
Multi-family buildings, three or more stories, 16 or more units	25 feet
Non-residential	25 feet
Cul de sac	90 feet in diameter
Hammerhead turnaround	20 feet wide by 90 feet long

[a]Where a fire department access road serves two or more uses, the maximum width shall be used in both directions.

Section 503.2.3 Surface is replaced in its entirety with the following:

503.2.3 Surface. Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be surfaced so as to provide all-weather driving capabilities. Permanent fire access surfaces shall be asphalt, concrete, or an approved surface. Temporary fire access surfaces during construction may consist of a gravel road base or asphalt or other approved surface. See IBC, Chapter 16 for Fire Department apparatus loading.

Section 503.2.4 Turning radius is replaced in its entirety with the following:

503.2.4 Turning radius. The required turning radii of a fire apparatus access road shall be a minimum of 25 feet inside and 50 feet outside.

Section 503.2.7 Grade is replaced in its entirety with the following:

503.2.7 Grade. The grade of the fire apparatus access road shall not exceed 5%. Maximum cross-slope shall be 0.04 ft/ft slope from lip to crown.

Sections 503.6.1 Width and 503.6.2 Approved means of emergency operation are added:

503.6.1 Width. Security gates across a fire apparatus access road shall be a minimum 16 feet wide.

503.6.2 Approved means of emergency operation. Secured gates across a fire apparatus access road shall be provided with one or more of the following features:

1. Key box in accordance with Section 506.1.
2. An approved lock in accordance with Section 506.1.1.
3. Chains used to secure gates shall be ¼ inch maximum, non-case hardened steel.
4. Emergency operation approved by fire code official.

Section 504 Access to Building Openings and Roofs is amended by renaming with the following:

SECTION 504
ACCESS TO BUILDINGS

Section 504.1 Exterior doors and openings is replaced in its entirety with the following:

504.1 Exterior doors and openings. Exterior doors and openings required by this code and the IBC shall be maintained readily accessible for emergency access by the Fire Department. An approved exterior key lock mechanism to open exterior doors on the exit stairs shall be provided.

A 5-foot wide (1524 mm) access walkway leading from fire apparatus access roads to exterior openings shall be provided. The location and configuration shall be approved by the fire code official.

Exception: A lesser width may be provided when approved by the fire code official.

Sections 504.1.1 Gate width and 504.1.2 Approved means of securing are added:

504.1.1 Gate width. Gates and barricades across required access walkways shall be arranged to provide a minimum clear width of 3 feet (914 mm) in the direction of travel. Gates and barricades also serving in a means of egress system shall comply with the requirements of Section 1008.2 if a larger width is required.

504.1.2 Approved means of securing. Secured gates and barricades across a required access walkway shall be provided with one or more of the following features:

1. Key box in accordance with Section 506.1.
2. An approved lock in accordance with Section 506.1.1.
3. Chains used to secure gates shall be ¼ inch maximum non-case hardened steel.
4. Means of securing approved by fire code official.

Section 504.3 is amended by replacing the reference to 1009.12 with 1009.13.

Section 504.4 Roof hatches is added:

504.4 Roof hatches. All required interior stair enclosures that extend to the roof in any building four or more stories above grade plane shall have at the highest point of the enclosure, an approved roof hatch openable to the exterior. The hatch shall be a minimum of 16 square feet (1.5 m^2) in area with a minimum dimension of 2 feet (610 mm).

Exceptions:

1. Roof hatches are not required on pressurized stair enclosures.
2. Roof hatches are not required on stair enclosures complying with IBCA Section 1009.13.1.

Section 504.5 Courts is added:

504.5 Courts. Access to courts shall be provided from two remote locations. Access points shall be comprised of breezeways not less than 6 feet (1829 mm) wide and not less than the height of the first story of the building. Locations shall be approved by the fire code official (see also Sections 202, 1004.8, 1027.5, IBC Section 1206.3 and Section 503.1.1).

SECTION 505
PREMISES IDENTIFICATION

Section 505.1 Address identification is replaced in its entirety as follows:

505.1 Address identification. New and existing buildings shall have approved address numbers, building numbers or letters, or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property and from the street or road or alleyway at the rear of the property. Approved building numbers or letters or approved building identification must be accompanied by a building address. These numbers and letters shall contrast with their background. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall be a minimum of 6 inches high with a minimum strike width of 0.75 inches.

Where access is by means of a private road and the building cannot be viewed from the public way, a monument, pole, or other sign or means shall be used to identify the structure.

Exception: New and existing dwellings regulated by the *International Residential Code* (IRC).

Section 506 is amended by renaming as follows:

SECTION 506
KEY BOXES AND FIRE SERVICE ELEVATOR KEYS

Section 506.3 is added:

506.3 Standardized fire service elevator keys. All buildings with elevators equipped with Phase I Emergency Recall, Phase II emergency in-car operation, or a Fire Service Access Elevator shall be equipped to operate with a standardized fire service elevator key in accordance with ASME A17.1.

506.3.1 Requirements for standardized fire service elevator keys. Standardized fire service elevator keys shall comply with all of the following:

1. All standardized fire service elevator keys within the jurisdiction shall be uniform Keys shall be Group 3 security.
2. Keys shall be of tubular, 7 pin, style 137 construction with a bitting code of 6143521.
3. Standardized fire service elevator keys shall be coded "FEO-K1."
4. All standardized fire service elevator keys located at the premises shall be numbered sequentially by indelible marking and a key log shall be maintained on the premises that identifies the location and holder of each key. When a holder is no longer qualified to maintain possession of a key, the key shall be returned to the issuing authority for subsequent distribution in accordance with this code.

506.3.2 Access to standardized fire service keys. Access to standardized fire service elevator keys shall be restricted to the following:

1. Elevator owners or their authorized agents
2. Elevator installation and maintenance contractors
3. Elevator Inspectors of the jurisdiction
4. Fire code officials of the jurisdiction.
5. The fire department and other emergency response agencies designated by the fire code official.
6. Elevator manufacturers.

506.3.3 Duplication or distribution of keys. No person may possess a standardized fire service elevator key unless in accordance with this code. Duplication of keys is not permitted. Unauthorized distribution/duplication of keys is subject to the penalties of Section 109.2.2.1.

506.3.4 Responsibility to provide keys. A key shall be provided for each switch installed. Standardized fire service access keys shall be maintained in an approved lock box within a secured fire command center or fire command room per IFCA Section 508 where provided, or an approved, listed key box in accordance with Section 506.1.

SECTION 507
FIRE PROTECTION WATER SUPPLIES

Section 507.2 Type of water supply is replaced in its entirety with the following:

507.2 Type of water supply. A water supply shall be connected to a reliable public water works system.

Section 507.2.1 Private fire service mains is deleted in its entirety.

Section 507.2.2 Water tanks is replaced in its entirety with the following:

507.2.2 Water tanks. New water tanks for fire protection shall be prohibited.

Exceptions:

1. Water tanks for fire protection may be used for NFPA 13D per Section 903.3.1.3 or P-2904.
2. Existing water tanks for fire protection that were previously approved by the Fire Department. These tanks shall be inspected, tested and maintained in accordance with NFPA 25.

Section 507.2.3 Water supply serving high-rise buildings is added:

507.2.3 Water supply serving high-rise buildings. High-rise buildings shall be supplied by a minimum of two independent public water mains. For high-rise buildings without access to different mains, two fire main connections to the same public main shall be permitted provided the public main is valved such that an interruption can be isolated so that water supply will continue without interruption through at least one of the connections. The two required fire mains shall have a minimum separation distance from each other of five (5) feet at all points from the public main to the building.

Section 507.3 Fire flow is replaced in its entirety with the following:

507.3 Fire flow. Fire flow requirements shall be as determined in Appendix B. Each new or existing fire hydrant as required per Appendix C shall be capable of providing not less than 1500 GPM at 20 PSI residual pressure.

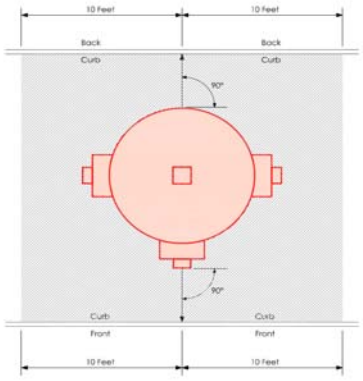
Section 507.5.3 Private fire service mains and water tanks is replaced in its entirety with the following:

507.5.3 Private fire service mains and water tanks. Private fire service mains and water tanks are not permitted except for existing systems previously approved by the Fire Department and as allowed in Section 507.2.2. Existing private service mains and water tanks shall be periodically inspected, tested and maintained in accordance with NFPA 25 at the following intervals:

1. Private fire hydrants (all types): Inspection annually and after each operation; flow test and maintenance annually.
2. Fire service main piping: Inspection of exposed, annually; flow test every five years.
3. Fire service main piping strainers: Inspection and maintenance after each use.

Section 507.5.4.1 Vehicle parking is added:

507.5.4.1 Vehicle parking. In accordance with Denver Revised Municipal Code Section 54-458(4), a straight line from the city street line from the public right of way to the fire hydrant at a ninety (90) degree angle, there is no parking within ten (10) feet in either direction of where this line intersects the curb. (See diagram below.)



Section 507.5.5 Clear space around hydrants is replaced in its entirety with the following:

507.5.5 Clear space around hydrants. A five-foot clear space around the circumference of fire hydrants shall be maintained except as otherwise required or approved.

SECTION 508
FIRE COMMAND CENTER

Section 508.1 General is replaced in its entirety with the following:

508.1 Fire command center (FCC). Where required by Section 907, buildings shall be provided with an FCC in accordance with this section. The FCC shall be used for no other purpose unless approved by the fire code official. Scale drawings of the FCC showing the location of all equipment and features, in plan and elevation views, shall be submitted for approval prior to installation.

Section 508.1.1 Location and access is replaced in its entirety with the following:

508.1.1 Location and access. The FCC shall:

1. be on the ground floor, and
2. have a secured entrance directly accessible to and in immediate proximity of the main building entrance.

Exception: Unless otherwise approved by the fire code official.

Section 508.1.5 is replaced in its entirety with the following:

508.1.5 Required features. The FCC shall contain the following:

1. Emergency voice/alarm communication system unit per Section 907.6.2.2
2. Fire Department communication system per Section 907.2.13.2.
3. Fire detection and alarm control unit and annunciator per Sections 907.1.2.2 and 907.7.3.1.
4. Elevator status/Control panel per Section 907.2.13.7.1.
5. Firefighter's smoke control panel per Section 909.16
6. Manual controls for simultaneously unlocking stairway and refuge area doors per IBCA Appendix L.
7. Emergency generator panel per Section 907.2.13.8.
8. Telephone with controlled access to a public telephone network.
9. Fire pump remote status panel per Section 907.2.13.9.

10. Building as-built construction plans indicating typical floor and roof plans, detailing the building core, means of egress, fire protection system drawings, fire fighting equipment, Fire Department access, interior generator and utility shut-off locations. These drawings shall be protected from damage and immediately accessible to the Fire Department, and a storage rack to support these drawing shall be provided.
11. Building site plan with; "North" orientation, local street intersection, fire hydrants, Fire Department connections, building entries, exterior generator and fuel locations and exterior utility shut-off locations.
12. Work table 3' x 5' and chair.
13. Public address system equipment, where specifically required by other sections of this code.
14. A key vault approved by the Fire Department to house keys to access mechanical and electrical equipment.
15. Two-way communication required by: Section 1007.6.3; Appendix L, Exception 3 to IBCA Appendix L106.1.7 and IBC Section 3008.13.
16. Multi-level lighting control. Separately switched lamps or dimming control is acceptable. Dimming of fluorescent fixtures shall be by EMI/RFI shielded devices.
17. Mass Notification System (MNS) equipment

Section 508.2 is added:

508.2 Fire command room. Where required by Section 907.6.2.2 and any building with a mass notification system (MNS) shall be provided with a fire command room. The room shall be of 1-hour construction in accordance with the *International Building Code*, a minimum 30sf (3.05sq-m) with a minimum clear dimension of 3ft (914 mm) in front of the equipment. The fire command room shall be located in accordance with Section 508.1.1 and shall contain the following equipment, where provided:

1. Fire alarm control unit
2. Emergency voice/alarm communication equipment
3. Smoke control panel
4. Emergency/Standby generator status panel
5. Fire pump remote status panel
6. MNS equipment
7. Two-way communication required by: Section 1007.6.3, Exception 3 to IBCA Appendix L106.1.7 and IBC Section 3008.13

The building annunciator shall be located as approved by the fire code official.

Exception: Buildings requiring a fire command center per Section 508.1

SECTION 509
FIRE DEPARTMENT ACCESS TO EQUIPMENT

Section 509.3 Access to fire pumps is added:

509.3 Access to fire pumps. Access to fire pumps in new buildings constructed after adoption of the 2006 shall be located at grade level with direct access to outside or located one level below grade. Pump rooms that are located one level below grade shall be placed such that there are no intervening rooms between the stairway door serving that level and the pump room. Door serving the pump room shall be within 25 ft of the stairway door. The stairway that serves the lower level shall exit directly to outside. Where a dedicated

stairway is provided to access the pump room and mechanical rooms, stairway width shall not be less than 36 inches.

SECTION 510
EMERGENCY RESPONDER RADIO ENHANCEMENT COVERAGE SYSTEM (RES)

Section 510.1, Emergency responder radio coverage in buildings, including Exceptions, is replaced in its entirety with the following:

510.1 Emergency responder radio enhancement system coverage in buildings. Where required by Section 915, buildings shall have approved radio coverage for emergency responders within the building based upon the existing coverage levels of the Department of Safety communication system at the exterior of the building. Systems shall operate at the frequency of 800 Mhz to 870 Mhz. This section shall not require improvement of the existing Department of Safety communication system.

Exception: Where it is determined by the fire code official that the radio coverage system is not needed, written documentation of the adequacy of existing radio coverage shall be maintained on site. Degradation of radio coverage shall require testing of the building to the requirements of Section 510.1.1.3(1). Where the system can no longer meet the test requirements, a radio coverage system shall be installed.

Section 510.1.1 Radio systems is added:

510.1.1 Radio systems. Where required, buildings shall be equipped throughout with an approved emergency responder Radio Enhancement System (RES) for radio communications. The RES shall use bi-directional amplifiers with radiating ("leaky coax") cable, a discrete distributed antenna system or other approved equivalent technology. Radio communications systems shall operate on the frequencies range of 800 MHz to 870 MHz. Amplifiers shall be powered by a dedicated uninterruptible power source (UPS) with a minimum backup time of twelve (12) hours with all amplifiers at rated output. The UPS input circuit shall be a dedicated circuit and any cord and plug connection(s) shall be secured in an approved cabinet to prevent inadvertent disconnection. The circuit shall be connected to the emergency generator where one is provided. The circuit shall be provided with a "lock-on" device. The RES shall be maintained in an operative condition at all times and shall be replaced or repaired where defective. Maintenance of the RES shall be the responsibility of the owner and requires a construction permit issued by the department for any maintenance, repair or modification work. Records of all system inspections, tests, and maintenance shall be maintained on the premises for a minimum of three (3) years and shall be copied to the Fire Department inspection official upon request.

Section 510.1.1.1 Definitions is added:

510.1.1.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

COVERAGE REQUIREMENT. The radio system control channel signal level shall exceed –100 dBm at 90% or more of the locations measured within each grid area. Equivalently, the service area reliability shall be 90% or greater on each floor of the structure and parking areas. In grid quadrants that exhibit marginal RF signal levels, DFD personnel will perform a radio test to determine if intelligible transmissions can be made through the enhanced radio system to and from the quadrant without the need for retransmission. If this test fails, communications will be considered inadequate and the quadrant will be considered to be outside the standard.

RADIO FREQUENCY MAINTENANCE PLAN. The radio frequency maintenance plan is a document developed and distributed by the building owner for the purpose of maintaining the

Department of Safety radio system from harmful interference generated on the property or otherwise under the control of the owner. At a minimum, it shall:

1. Prohibit the use of any electronic systems known to degrade the effectiveness of RES communications.
2. Permit Department site access during reasonable business hours when necessary to assess the source of interference to RES communications.

Section 510.1.1.2 Emergency responder radio communications enhancement system (RES) is added:

510.1.1.2 Emergency responder radio communications enhancement system (RES). The RES is a network of amplifiers, fiber optic cable, coaxial cable, and radiating cable and/or discrete antennas or an equivalent technology installed on or inside the property to enhance indoor radio communications.

Section 510.1.1.3 Requirements is added:

510.1.1.3 Requirements. The system shall effectively operate throughout the structure. In addition to the areas identified in Section 907.2.13.2.1, radio communication is required throughout the parking garage and all areas below grade. Those areas which shield radio communication will be remedied through the use of currently acceptable technology, i.e. bi-directional amplifiers or (leaky coax) amplifier systems. Acceptance of the completed communication system will be based upon Fire Department approval of the acceptance test as described below. All RES equipment shall be FCC compliant.

1. **Acceptance test.** Measurement locations shall be uniformly distributed to the extent practical. There shall be at least 10 sampling measurements per 2,250 sq ft. (209.025 sq m) of gross building square footage. Adequate radio coverage shall be determined for the structure and parking areas separately. Elevators, stairways, and enclosed areas within each grid must be included in the testing. Execute the following steps:

a. Create a uniform grid over each floor with 15 ft. (4.57 m) centers.
b. At each accessible grid location, using a test receiver with sensitivity and thermal noise floor equal to or better than the Department of Safety radio, take at least one sample measurement of the radio system control channel.
c. Repeat Step b for each grid point.
d. Calculate the service area reliability:

Service Area Reliability (%) = $\left(T_p / T_t\right)$ **x** 100%

Where:

T_p = total number of grid points passed; i.e., control channel >-100dBm

T_t = total number of grid points measured.

If the building fails to achieve the coverage requirement, the building owner shall install additional RES and conduct a new acceptance test.

Measurements shall be taken with calibrated radio receivers by Denver Fire Department radio technicians or technicians with appropriate knowledge and training who are licensed by the Denver Fire Department to install RES systems, at the City's option. Test results shall be

certified by a professional engineer licensed by the State of Colorado or by Denver Fire Department radio technicians. Random spot testing by Denver Fire and/or Police officials may take place at any time.

2. Radio frequency maintenance plan. A radio frequency maintenance plan shall be developed which prohibits use of electrical/electronic equipment which cause degradation to the RES. The radio frequency maintenance plan shall be incorporated into the lease of every tenant.

a. Description: Building owners are required to maintain the installed Department of Safety Radio Enhancement System (RES) to permit Emergency Response personnel to communicate over their department radios in the event of an emergency. These communications are within the frequency range 800-870Megahertz (Mhz). The radio system control channel level signal shall be at least -100dBm at 90% or more of locations measured in accordance with the adopted Fire Code Section 510. Service area reliability shall be 90% or greater on each floor of the structure.

b. This Plan specifically prohibits use of electronic and or communication devices and systems which are shown to degrade the effectiveness of the RES.

c. This Plan requires Denver Fire Department personnel access to all areas of the structure including but not limited to; dwelling units, storage areas, parking areas, tenant offices and public areas, mechanical, electrical and communication equipment areas upon reasonable notice to building management and during reasonable business hours in order to assess and locate a source or sources of interference with the RES. Building management is responsible for coordination with building occupants. During such inspection, Department personnel shall be accompanied by a member of building management at all times.

d. Future building alterations shall not degrade the effectiveness of the RES.

e. Failure of any RES component shall result in a distinct audible notification at a constantly attended location. Repair of RES shall be accomplished within 72 hours. Upon repair, the Denver Fire Department shall be notified to schedule an acceptance test. The extent of the test shall be at the Department's discretion as necessary to confirm proper operation and system coverage.

f. All work on the RES shall be accomplished by certified installers of companies possessing a valid Denver Fire Department license and after obtaining the appropriate Department permit.

g. Building; owners, occupants, employees, guests, contractors or subcontractors are prohibited from removing, modifying, altering or otherwise disturbing any RES component or system.

3. Periodic testing of RES. Periodic testing of the RES shall be conducted as follows:

If the radio enhancement system appears to have degraded or if the tests fail to demonstrate adequate system performance in compliance with this standard, the owner of the building or structure is required to restore the system to a condition consistent with the original approval criteria. If the degradation to the system is due to building additions or renovation, the owner of the building shall restore/extend the system to all areas of the building in a condition consistent with the original approval criteria. Random spot testing by Denver Fire officials may take place at any time.

a. **Annual testing.** All active components of the system, such as amplifiers, power supplies and backup batteries, shall be tested annually. More frequent testing shall be required if the operability of the system is in question. The RES shall be continuously monitored electronically with remote fault alarms. Amplifiers shall be tested and monitored to ensure the gain has not degraded from the installed value. Backup batteries and power supplies shall be tested under load for a period of at least one hour to verify that they will properly operate during an actual power outage. Annual tests shall be performed in accordance with the acceptance test procedures described above and shall be conducted in all common areas, garages, stairwells, elevators and corridors. Measurements shall be taken with calibrated radio receivers by technicians with appropriate knowledge and training and licensed by the Denver Fire Department. Test results shall be certified by a professional engineer licensed by the State of Colorado or by Denver Fire Department radio technicians and submitted to the Department. Test results shall be retained on site for four years.

b. **Five-year testing.** Every five (5) years, a radio coverage test in accordance with the Acceptance Test procedure described above shall be performed to ensure the system provides adequate radio coverage. Documentation of test results shall be submitted to the Fire Department. Measurements shall be taken with calibrated radio receivers by Denver Fire Department radio technicians. The property owner, agency or lessee shall compensate the City and County of Denver through approved Department of Safety channels at a rate established by the Manager of Safety no less than two Denver Fire Department radio technicians as require by the fire code official. Test results shall be shared with the property owner, agent or lessee. A permit shall be required for system testing in accordance with Section 105.6. Test results shall be retained on site for five years.

4. **Failure detection.** RES equipment shall have failure detection circuitry which provides detection of mechanical, electrical and power failure of the RES, as well as oscillation detection capability which will reduce the amplifier output to zero in the event of system oscillation. Detection of any failure shall result in a distinct audible notification at a constantly attended location approved by the Fire Department.

5. **Permits.** A #3A permit is required prior to installation, repair, alteration or replacement of any RES system or component. Submittal and approval of shop drawings are required to obtain a permit for RES system work. Permits shall only be issued to companies possessing a valid Fire Department issued certificate. An annual Denver Fire Department permit for the RES shall be secured and maintained current.

6. **Information signs.** A legible sign stating "THIS BUILDING IS EQUIPPED WITH A RADIO REPEATER SYSTEM" shall be conspicuously posted in a location approved by the fire code official.

7. **Shop drawings.** Shop drawings shall be submitted per Appendix K and approved prior to installation of any RES. Drawings shall be a deferred submittal in accordance with IBCA Section 154. Three (3) sets of scaled, engineered installation shop drawings shall be provided. Documents shall be of sufficient clarity and detail to fully describe the proposed installation and equipment. Handwritten notes or comments on drawings is not acceptable.

Section 510.1.1.4 Wiring methods is added:

510.1.1.4 Wiring methods. Installation wiring for radio communications shall follow the manufacturer's recommendations, NFPA 72 and NFPA 70 (NEC). All cable installations shall be UL

listed. Radiating cables shall be FCC type approved and installed using manufacturer specified clips to secure cables to the support structure. Coax cable installed as risers and in plenums shall be listed for the application. All risers shall be installed in metallic conduit. All terminations shall be made with manufacturer approved devices. Cable cuts shall be made with manufacturer approved tools and methods. Limited-use cable is not permitted. All penetrations through fire-rated construction shall be properly fire-stopped.

Section 510.1.1.5 Installer certification is added:

510.1.1.5 Installer certification. No contractor shall install, modify, repair, alter or replace an RES without a valid Denver Fire Department license. All field installers shall be individually certified by the manufacturer for the equipment being installed. Each certified installer shall be permitted to supervise one apprentice/helper.

Section 510.2 Radio signal strength is deleted in its entirety.

Section 510.3 Emergency responder radio coverage in existing buildings is replaced in its entirety with the following:

510.3 Emergency responder radio coverage in existing buildings. For existing high-rise, underground buildings, I-1, I-2 and I-3 occupancies and airport buildings, when undergoing an upgrade to install a MNS or complete fire alarm head-end equipment replacement, the building shall be tested to IFCA 510 for coverage and where deficient, coverage shall be provided. Buildings shall be tested at five-year intervals per IFCA 510.1.1.3(3) (b) to ensure continued radio coverage.

CHAPTER 6
BUILDING SERVICES AND SYSTEMS

SECTION 603
FUEL-FIRED APPLIANCES

Sections 603.4 Portable unvented heaters is replaced in its entirety with the following:

603.4 Portable unvented heaters. Portable unvented fuel-fired heating equipment is prohibited within the City and County of Denver.

Section 603.8.1 Residential incinerators is replaced in its entirety with the following:

603.8.1 Residential incinerators. Residential incinerators are prohibited within the City and County of Denver.

SECTION 604
EMERGENCY AND STANDBY POWER SYSTEMS

Section 604.1 Installation is replaced in its entirety with the following:

604.1 Installation. Emergency, legally required and optional standby power systems required by this code or the IBC shall be installed in accordance with this code, NFPA 110 and NFPA 111 as applicable. Existing installations shall be maintained in accordance with the original approval.

604.1.1 Stationary generators. Stationary emergency and standby power generators shall be installed in accordance with NFPA 37, NFPA 70 (National Electrical Code), NFPA 110 and NFPA 111 and listed per UL 2200. All generator sets shall be located at grade level, or one level below grade, and the filling connection shall be located in accordance with Chap 34. Emergency power systems shall be as defined in NFPA 70, Article 700 [NFPA 110 Type 10]. Standby power systems required by this or other adopted codes and standards of the local authorities having jurisdiction shall be as defined in NFPA 70, Article 701 [NFPA 110 Type 60]. Other standby power systems shall be as defined in NFPA 70, Article 702. All generators shall be provided with a remote status panel in accordance with NFPA 110 and complying with A 907.2.13.8. Panel location shall be in an area approved by the fire code offical.

Exceptions:

1. Stationary emergency and legally required standby power generators in a stand-alone open parking garage less than 55' in height, shall be permitted to be located on the topmost atmospheric level.
2. Optional standby generators located at other than grade level, when powered by diesel fuel, shall be limited to 120 gallons per tank with aggregate amount not to exceed 660 gallons per level or story.

604.1.1.1 Fuel supply. Fuel systems for internal combustion prime movers of emergency and required standby power systems shall be an on-site 2 hour diesel fuel supply. If fuel pumping is required from a main fuel tank to a day tank, a duplex pumping system shall be provided. Optional standby power systems may be fueled from any approved source excluding liquefied petroleum gas (LPG). Fuel storage and handling shall comply with this code.

Exception: Emergency generators supplying fire pumps shall have a fuel supply for 8 hours of operation.

604.1.2 Stored energy emergency or standby power systems. Stored energy emergency and standby power systems shall be installed in accordance with Section 608 and NFPA 111 and shall have sufficient capacity to operate under full load for 90 minutes.

Section 604.2.1 Group A occupancies is replaced in its entirety with the following:

604.2.1 Group A occupancies. Emergency power shall be provided for emergency voice/alarm communication systems in Group A occupancies in accordance with NFPA 72.

Section 604.2.2 Smoke control systems is replaced in its entirety with the following:

604.2.2 Smoke control systems. Emergency power shall be provided for smoke control systems in accordance with Section 909.11.

Section 604.2.3 Exit signs is replaced in its entirety with the following:

604.2.3 Exit signs. Emergency power shall be provided for exit signs in accordance with IBCA Section 1011.5.3.

Section 604.2.6 Accessible means of egress platform lifts is replaced in its entirety with the following:

604.2.6 Accessible means of egress platform lifts. Emergency power in accordance with this section or ASME A18.1 shall be provided for platform lifts that are part of an accessible means of egress in accordance with Section 1007.5.

604.2.6.1 Accessible means of egress two-way communication. Emergency power shall be provided for the two-way communication system that is part of an accessible means of egress in accordance with Section 1007.6.3.

Section 604.2.13 Covered mall buildings is replaced in its entirety with the following:

604.2.13 Covered mall buildings. Covered mall buildings exceeding 50,000 square feet (4,645 m^2) shall be provided with emergency power systems which are capable of operating the emergency voice/alarm communication system, the smoke control system for four adjacent zones per A, Section 909.21.6, the fire pump and one accessible elevator.

Section 604.2.14 High-rise buildings is replaced in its entirety with the following:

604.2.14 High-rise buildings. Emergency power, light and emergency systems in high-rise buildings shall comply with the requirements of Sections 604.2.14.1 through 604.2.14.3.

604.2.14.1 Emergency power. An emergency power system shall be provided. Where the emergency system is a generator set inside a building, the generator shall be located in a separate room enclosed with 2-hour fire barriers or horizontal assemblies constructed in accordance with the *International Building Code*.

604.2.14.1.1 Fuel supply. An on-premises fuel supply, sufficient for not less than 8-hour full-demand operation of the system, shall be provided.

604.2.14.1.2 Capacity. The emergency system shall have a capacity and rating that supplies all required equipment simultaneously.

Exception: Elevator operation on emergency power shall comply with Section 604.2.14.1.3.

604.2.14.1.3 Connected facilities. The following equipment shall be connected to the emergency power system: Electrical power and lighting for the fire command center and all life safety systems equipment, elevators specified in IBC Section 403, emergency egress lighting, exit signs, dedicated equipment installed to maintain fire protection systems at no less than 40°F (4°C), radio enhancement systems, electrically powered fire pumps, fuel transfer pumps for fire pump(s) and generator set(s). All equipment shall be capable of being powered by the emergency generator set simultaneously. Sufficient emergency power shall be provided to simultaneously operate two elevators for each group of elevators controlled by a common operating system. Additional emergency power shall be provided for the elevator car that has been designated to accommodate an ambulance stretcher as described in IBC Section 3002.4 if this car is not included in one of the groups above. Emergency power shall be transferable to any elevator.

Exception: Sufficient emergency power shall be provided for only one elevator for each group of elevators controlled by a common operating system that serves only open parking levels of the high-rise building.

604.2.14.2 Separate circuits and luminaires. Separate lighting circuits and luminaires shall be required to provide sufficient light with an intensity of not less than 1 foot-candle (11 lux) measured at floor level in all means of egress corridors, stairways, smokeproof enclosures, elevator cars and lobbies, and other areas which are clearly a part of the escape route.

604.2.14.2.1 Other circuits. Circuits supplying lighting for the fire command center and mechanical equipment rooms shall be transferable to the emergency source.

604.2.14.3 Emergency systems. Exit signs, exit illumination as required by Chapter 10, and elevator car lighting are classified as emergency systems and shall operate within 10 seconds of failure of the normal power supply and shall be capable of being transferred to the emergency source.

604.2.14.4 Fire pumps. An emergency power source shall be provided for electric motor driven fire pumps in accordance with NFPA 70 Article 700 and installed per NFPA 20 and NFPA 70, Article 695.

Section 604.2.15 Underground buildings is replaced in its entirety with the following:

604.2.15 Underground buildings. Underground buildings as described in IBC Section 405 shall be provided with an emergency power system in accordance with this section.

604.2.15.1 Emergency power. An emergency power system complying with NFPA 70 shall be provided for emergency power loads as specified in Section 604.2.15.1.1.

604.2.15.1.1 Emergency power loads. The following loads are classified as emergency power loads:

1. Emergency voice/alarm communication systems
2. Fire alarm systems
3. Automatic fire detection systems
4. Elevator car lighting
5. Means of egress lighting and exit sign illumination as required by Chapter 10
6. Smoke control system
7. Ventilation and automatic fire detection equipment for smokeproof enclosures
8. Fire pumps
9. Elevators in accordance with Section 604.2.14.1.3.

Section 604.2.18.3 Two or more elevators in a high-rise building is replaced in its entirety with the following:

604.2.18.3 Two or more elevators in a high-rise building. Sufficient emergency power shall be provided to simultaneously operate two elevators for each group of elevators controlled by a common operating system. Additional emergency power shall be provided for the elevator car that has been designated to accommodate an ambulance stretcher as described in IBC Section 3002.4 if this car is not included in one of the groups above. Emergency power shall be transferable to any elevator.

Exception: Sufficient emergency power shall be provided for only one elevator for each group of elevators controlled by a common operating system that serves only open parking levels of the high-rise building.

SECTION 606
MECHANICAL REFRIGERATION

Section 606.8 Refrigerant detector is replaced in its entirety with the following:

606.8 Refrigerant detector. Machinery rooms shall contain refrigerant detection with audible and visual alarms. Visual alarm indicating devices shall include 24 vdc flashing red LED beacon. Visual alarm indicating devices shall be sufficiently conspicuous in the protected area, subject to approval of the fire code official. The detection, or sampling tubes that draw air to the detector(s), shall be located in an area where refrigerant from a leak will concentrate. The alarm shall be actuated at a value not greater than the corresponding OEL values shown in the *International Mechanical Code* for the refrigerant classification. Detectors and alarms shall be placed in approved locations. Alarm notification devices shall be located on the interior and exterior of the machinery room. Refrigerant leak alarms shall be interconnected with the base building fire alarm system. The refrigerant alarm device shall be distinctly annunciated as a separate alarm zone at the building annunciator panel.

Section 606.12.6 is amended by replacing "(4L of water for each 1kg of ammonia)" with "(8.3 L of water for each 1 kg of ammonia)."

SECTION 607
ELEVATOR RECALL AND MAINTENANCE

Section 607.1 Emergency operation is replaced in its entirety with the following:

607.1 Emergency operation. Existing elevators with a travel distance of 25 feet (7620 mm) or more shall be provided with recall and shutdown and firefighter service in accordance with Section 907.4.3 and ASME 17.3. New elevators shall be provided with Phase 1 emergency recall operation and Phase 2 emergency in-car operation in accordance with Section 907.4.3 and ASME A17.1.

SECTION 608
STATIONARY STORAGE BATTERY SYSTEMS

Section 608.5 Spill control and neutralization is replaced in its entirety with the following:

608.5 Spill control and neutralization. An approved method and materials for the control and neutralization of a spill of electrolyte shall be provided in areas containing lead-acid, nickel-cadmium or other types of batteries with free-flowing liquid electrolyte. Each rack of batteries or groups of racks shall be provided with a liquid-tight 4-inch (101.6mm) minimum spill-control barrier which extends at least 1-inch (25.4 mm) beyond the battery rack in all directions. For the purposes of this paragraph, a "spill" is defined as any unintentional release of electrolyte.

Exception: VRLA, lithium-ion or other types of sealed batteries with immobilized electrolyte shall not require spill control.

CHAPTER 8
INTERIOR FINISH, DECORATIVE MATERIALS AND FURNISHINGS

SECTION 803
INTERIOR WALL AND CEILING FINISH AND TRIM IN EXISTING BUILDINGS

Section 803.5.1 Textile wall coverings is replaced in its entirety with the following:

803.5.1 Textile wall and ceiling coverings.

1. Where protected by automatic sprinklers installed in accordance with Section 903.3.1.1 or 903.3.1.2, textile wall and ceiling coverings shall have a class A flame spread index in accordance with ASTM E 84 or UL 723.
2. The wall covering shall meet either:
   a. the criteria of Sections 803.5.1.1 or 803.5.1.2 when tested in the manner intended for use in accordance with NFPA 265 using the product mounting system, including adhesive, of actual use, or
   b. the criteria of Section 803.1.2.1 when tested in accordance with NFPA 286 using the product mounting system, including adhesive, of actual use.
3. The ceiling covering shall meet the criteria of Section 803.1.2.1 when tested in accordance with NFPA 286 using the product mounting system, including adhesive, of actual use.

SECTION 806
DECORATIVE VEGETATION IN NEW AND EXISTING BUILDINGS

Section 806.1.1, Restricted occupancies - Exception 1 is replaced in its entirety with the following:

1. Trees located in areas protected by an approved automatic sprinkler system installed in accordance with Sections 903.3.1.1 or 903.3.1.2 shall not be prohibited in Group M.

Section 806.6 Natural combustible vegetation is added:

806.6 Natural combustible vegetation. Natural combustible vegetation is prohibited in A, E, I-3, R-1, R-2 dormitory, and R-4 occupancies.

Exception: Limited quantities of natural combustible vegetation shall be permitted in these occupancies where the fire code official determines that adequate safeguards are provided based on the quantity and nature of the natural combustible vegetation. Flame resistance or flame retardance shall be demonstrated by each individual natural combustible vegetation item in an approved manner. The use of unlisted electrical wiring and lighting on natural combustible vegetation shall be prohibited.

SECTION 807
DECORATIVE MATERIALS OTHER THAN DECORATIVE VEGETATION IN NEW OR EXISTING BUILDINGS

Section 807.4.3.2 Artwork is replaced in its entirety with the following:

807.4.3.2 Classroom artwork and teaching material. Artwork and teaching material attached directly to the school classroom walls shall be in accordance with the following provisions:

Classroom walls may be used to attach student artwork, other artwork, and teaching materials not to exceed fifty (50) percent of the area of each wall when the school is not protected throughout by an automatic fire sprinkler system and eighty (80) percent of the area of each wall when the school is protected throughout by an automatic fire sprinkler system. The area of each wall is defined as being the height from the floor to the ceiling multiplied by the length of the wall, excluding door and window openings. Artwork and teaching materials shall not be attached to any wall within eighteen (18) inches of the exit access door. Doors and windows, including window/view panels of interior exit access doors, shall not be covered. The use of crepe paper that is not listed as flame resistant is prohibited.

Exceptions:

1. Building interior finish materials (e.g., metal lockers).
2. Artwork or teaching materials that are listed as non-combustible.
3. Artwork or teaching materials that are contained within non-combustible containers or coverings (e.g., metal and glass display cases).

Section 807.4.3.3 is added:

807.4.3.3 Exit corridor artwork and teaching materials. Artwork and teaching material attached directly to the school exit corridor walls shall be in accordance with the following provisions:

Exit corridor walls may be used to attach student artwork, other artwork, and teaching materials not to exceed thirty (30) percent of the area of each corridor wall when the school is not protected throughout by an automatic fire sprinkler system and sixty (60) percent when the school is protected throughout by an automatic fire sprinkler system. The area of each corridor wall is defined as being the height from the floor to the ceiling multiplied by the length of each wall, excluding door and window openings. Artwork and teaching materials shall not be attached to any wall within eighteen (18) inches of the exit access door. Doors and windows, including window/view panels of interior exit access doors, shall not be covered. The use of crepe paper that is not listed as flame resistant is prohibited.

Exceptions:

1. Building interior finish materials (e.g., metal lockers).
2. Artwork or teaching materials that are listed as non-combustible.
3. Artwork or teaching materials that are contained within non-combustible containers or coverings (e.g., metal and glass display cases).

Section 807.4.3.4 Ceiling artwork and teaching materials is added:

807.4.3.4 Ceiling artwork and teaching materials. Artwork and teaching materials suspended from classroom and exit corridor ceilings shall be in accordance with the following provisions:

1. The total area of materials suspended from ceilings shall be deducted from the percent of wall space for classrooms and for exit or access corridors that artwork and teaching materials can be attached to in accordance with Sections 807.4.3.2 and 807.4.3.3.
2. Wires or cords used to suspend student artwork and teaching materials from the ceiling cannot be strung from corner to corner and cannot be strung parallel to any wall more than six (6) inches from the walls.
3. Display of student artwork and teaching materials on wires or cords perpendicular to exit corridor walls strung from corridor wall to corridor wall shall not form a continuous combustible curtain. There shall be a minimum clearance of seven (7) feet from the floor to the lowest portion of the display.

4. Display of student artwork and teaching materials shall not impair visibility or distract attention from the exit sign.
5. No material shall be attached to light fixtures; thermal or smoke detectors; exit signs; fire sprinkler piping, valves, or sprinkler heads, etc. The ceiling structure must be capable of supporting the student artwork and/or teaching materials.
6. The display of student artwork or teaching materials shall not obstruct or compromise in any manner the fire sprinkler or fire detection system.

CHAPTER 9

FIRE PROTECTION SYSTEMS

SECTION 901
GENERAL

Section 901.6.2 Records is replaced in its entirety with the following (subordinate section remains):

901.6.2 Records. Records of all system installations, inspections, tests and maintenance required by Denver's Fire Code and referenced standards shall be maintained on the premises for a minimum of three years and shall be submitted to the Denver Fire Department's Fire Prevention Division Office. The records submitted shall be completed on National Fire Protection Association forms and/or forms provided by the Denver Fire Department. The name and Denver Fire Department license number(s) of the person(s) performing the work shall be legible on all forms.

SECTION 902
DEFINITIONS

Section 902.1 Definitions is amended by adding the following definitions:

902.1 Definitions

ALARM CONTROL UNIT. A component of the [CO detection] system provided with a primary and secondary power source that receives signals from initiating devices or other control units, and processes these signals to determine the required system output functions.

APPLIANCE. Visible notification component such as a bell, horn, speaker, light, or text that provides audible, visible, and/or tactile outputs to alert occupants of a hazardous condition. Single-station alarms contain both a [initiating] device and a [notification] appliance.

BATTERY BACKUP. The listed device has a battery that powers it when the power provided through the building electrical system fails.

BATTERY-POWERED. The listed device is powered solely by a primary battery for all power requirements and the battery is monitored for end-of-life by producing an audible trouble signal.

DEVICE. An alarm initiating component that originates transmission of a change-of-state condition, such as a CO detector, manual fire alarm box, etc. Single-station alarms are both a [initiating] device and a [notification] appliance.

DUPLEX. A building consisting solely of a two-family dwelling as defined by the *International Residential Code.*

FALSE FIRE ALARM. The activation of any fire alarm system resulting in a response by the Fire Department, caused by the negligent or intentional misuse of the fire alarm system by an owner, employee, agent, tenant, guest, visitor, or any other activation of a fire alarm system not caused by a valid alarm signal, exclusive of a nuisance fire alarm.

HARDWIRED. Device installed by wiring directly to the building electrical system, with battery backup, and not controlled by any disconnecting switch other than as required for over-current protection.

INSTALLED. Fit into position and made ready as set forth in the manufacturer's guidelines, listing requirements and applicable standards, to perform the intended functions of detection, notification, and annunciation.

NON-DEDICATED SMOKE CONTROL SYSTEM. Smoke control components and equipment that are shared with other systems, such as the building HVAC system. Upon activation of fire alarm, non-dedicated smoke control equipment changes mode of operation to achieve the smoke control performance objectives. "Non-dedicated systems" shall refer only to equipment and components controlled from the firefighters' smoke control panel.

SINGLE-FAMILY DWELLING. Any improved real property used or intended to be used as a residence and that contains one dwelling unit.

SINGLE STATION [CO] ALARM. A device comprised of a sensor, alarm-initiating device, control components, and an alarm notification appliance in one unit.

SLEEPING ROOM. A room furnished with a bed and primarily used for sleeping purposes.

SECTION 903
AUTOMATIC SPRINKLER SYSTEMS

Section 903.1 is amended by adding the following after the last sentence:

Shop drawings shall be provided for automatic sprinkler systems in accordance with Appendix K.

Section 903.2.6 Group I, Exception, is replaced In Its entirety with the following:

Exception: An automatic sprinkler system installed in accordance with Section 903.3.1.2 is permitted in Group I-1 facilities.

Section 903.2.8.1 Balconies is added:

903.2.8.1 Balconies. Sprinkler protection shall be provided for all balconies and ground floor patios of dwelling units of all construction types. Sidewall sprinklers that are used to protect such areas shall be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members, at a maximum distance of 14 inches (356 mm) below the deck, or as listed by the sprinkler manufacturer.

Exception: Sprinklers are not required for noncombustible balconies where the balcony is not supplied by fuel gas and one of the following is met:

1. The roof or other overhead structure does not cover more than 50% of the entire balcony area.
2. The balcony has openings on two or more sides. The area of such openings must be at least 20 percent of the total perimeter wall area of the balcony. The aggregate length of the openings shall constitute a minimum of 40 percent of the perimeter of the balcony.

Section 903.2.8.2 Townhouses is added:

903.2.8.2 Townhouses. When two or more contiguous residential dwelling units constructed as townhouses, including those permitted under the *International Residential Code*, are protected by a

single, monitored sprinkler system, that system shall be configured so water flow is annunciated separately at the fire alarm control panel for each dwelling unit and each protected common area.

Section 903.2.9.1 is amended by adding Items #5 and #6:

5. Repair garages with a spray booth and/or a mixing area greater than 16 square feet utilizing flammable finishes.

   Exception: It is not necessary to install sprinklers throughout the entire building when replacing a previously-approved, booth, with an approved, packaged booth or one constructed per Section 1504.3.2.

6. Repair garages using open flame or welding of any type where the garage floor area exceeds 3,000 square feet.

Section 903.2.9.2 Bulk storage of tires is replaced in its entirety with the following:

903.2.9.2 Bulk storage of tires. Buildings and structures where the volume for the storage of tires exceeds 2,500 cubic feet shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

Section 903.3.1 Standards is amended by adding the following:

Hydraulic calculations shall be based on water supply information minus a 10% deduction at minimum to a maximum of 10 psi from the static and residual pressure. Shop drawings shall indicate the actual flow and the reduced parameters as used in the hydraulic calculations. Water supply information used for hydraulic calculations shall be less than a year old.

Exception: Section 903.3.1.3 NFPA 13D sprinkler systems.

Section 903.3.1.1.1 Exempt locations (3), (4) and (5) are deleted.

Section 903.3.1.2.1 Balconies and decks is deleted in its entirety.

Section 903.3.3 Installation requirements is replaced with the following:

903.3 Installation requirements. Automatic sprinkler systems shall be designed and installed in accordance with Sections 903.3.1 through 903.3.7. All fire sprinkler systems and special extinguishing systems design drawings, including hydraulic calculations, shall bear the seal and signature of the engineer of record. Sprinkler systems and special extinguishing systems designed for a building with smoke control system(s) shall bear the seal and signature of the base building engineer of record.

Section 903.3.5 Water supplies is amended by replacing the second sentence as follows:

The potable water supply shall be protected against backflow in accordance with Section 912.5.

Section 903.3.5.1 Domestic service is replaced in its entirety with the following:

903.3.5.1 Domestic service. Use of domestic service for water supply to automatic fire sprinklers shall be prohibited.

Exceptions:

1. Water supply for new NFPA 13D or IRC 2904 sprinkler systems.
2. UL-300 listed fire suppression systems in buildings that are not provided with automatic sprinklers.
3. Medical gas rooms per Section 3006.2.1.

Section 903.3.5.1.1 Limited area sprinkler systems is deleted in its entirety.

Section 903.3.5.1.2 Residential combination services is deleted in its entirety.

Section 903.3.7 Fire department connections is replaced in its entirety with the following:

903.3.7 Fire department connections. Fire department connections shall be in accordance with Section 912.

Section 903.3.8 Elevators, hoistways and machine rooms is added:

903.3.8 Elevators, hoistways and machine rooms. In existing buildings protected with an automatic sprinkler system in accordance with NFPA 13 or NFPA 13R, sprinkler protection for new or retrofit elevators shall comply with this section. Hoistways and machine rooms/spaces shall be protected by 286 degree F sprinklers located in accordance with NFPA 13. Coverage shall be designed for Ordinary Hazard Group One. Sprinklers shall be supplied from a separate, independent branch line with a readily accessible indicating shut-off valve located outside the hoistway or room. Valves shall carry identification signs. In fully sprinklered buildings, where machine room-less (MRL) elevator equipment is installed in an elevator hoistway, sprinkler protection shall be provided at the top of the shaft in all instances.

Section 903.3.9 Sprinkler protection for electrical rooms is added:

903.3.9 Sprinkler protection for electrical rooms. In buildings required to be fully sprinklered, electrical rooms containing electrical switchboards, panel boards, distribution boards, control equipment, generators and/or transformers shall be protected with automatic sprinklers. Sprinkler protection shall be designed with high-temperature sprinklers. Only sprinkler branch lines protecting the electrical room are permitted in the room.

Exceptions:

1. The room or space is under the control of a public utility.
2. The room is dedicated to electrical distribution equipment, has equipment operating at 600 volts or more and is provided with a smoke detection system connected to a monitored fire alarm system.

Section 903.4.2 Alarms is replaced in its entirety with the following:

903.4.2 Alarms. Approved audible/visible devices (24 VDC supervised) shall be connected to every automatic sprinkler system. These sprinkler water flow alarm devices shall be activated by main and/or zone water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Alarm devices shall be provided on the exterior of the building at least 10 feet above grade and within 25 feet of and visible from the fire department connections. Where a fire alarm system is installed, actuation of the automatic sprinkler system shall actuate the building fire alarm system.

Section 903.4.3 Floor control valves is replaced in its entirety with the following:

903.4.3 Floor control valves. Approved supervised indicating control valves and fire sprinkler water flow detection devices shall be provided at the point of connection of the sprinkler system to the standpipe riser on each floor in buildings with a standpipe system provided as required by IFC Section 905.

SECTION 904
ALTERNATIVE AUTOMATIC FIRE-EXTINGUISHING SYSTEMS

Section 904.3.4.1 is added:

904.3.4.1 Visible notification shall be provided by red strobes. Pending-discharge and discharge warning strobes shall be in conspicuous locations as approved by the fire code official and activated by the agent releasing panel. Subject to the approval of the fire code official, pending-discharge and discharge warning may be provided by combined audible/visible appliances. No more than two flash rates shall be possible in a single field of view per NFPA 72. Where pending-discharge and discharge warning strobes are provided in addition to visible fire alarm notification appliances, the warning strobes shall be synchronized, and fire alarm visible notification appliances shall be synchronized. A warning sign shall be provided that reads, "WARNING – Fire Extinguishing Agent Release in Progress." Warning sign format, color and letter style shall comply with ANSI Z535.

Section 904.3.5 Monitoring is replaced in its entirety with the following:

904.3.5 Monitoring. Where a building fire alarm system is installed, automatic fire-extinguishing systems shall be monitored by the building fire alarm system in accordance with Section 907.

904.3.5.1 Releasing panel. Pre-action and clean agent automatic fire-extinguishing systems shall be monitored and installed in accordance with this section and Section 907.7.6.

Section 904.11.4.2 is added:

904.11.4.2 UL 300 listed wet-agent (hybrid) suppression systems shall obtain the required water supply from the automatic sprinkler system where provided or as permitted by Section 903.3.5.1, Exception 2. Design and installation shall be in accordance with manufacturer's instructions. Shop drawings shall be provided which include connections and piping to the sprinkler water supply as well as hydraulic calculations verifying water supply adequacy and confirmation of no degradation of the required sprinkler system demand.

SECTION 905
STANDPIPE SYSTEMS

Section 905.1 General is replaced in its entirety with the following:

905.1 General. Standpipe systems shall be provided in new buildings and structures in accordance with this section. Fire hose threads used for connection to standpipe systems shall be approved and shall be compatible with Denver Fire Department hose threads – 2.5-inch hose thread is national standard; 1.5-inch hose thread is a special 11.5 threads per inch. The location of Fire Department hose connections shall be approved by the fire code official. Where standpipe valve outlets are installed in stair enclosures, outlets and ancillary equipment (PRVs, drains, etc.) shall not reduce the required width of the stairway or landing.

905.1.1 Standpipe hose outlets. Each outlet shall have a cap and chain. Outlets shall be at least 36 inches and not more than 52 inches above finished floor. The valves shall have no less than 3 inches clearance around control valve and outlet cabinet shall not impede attachment of hose.

Section 905.2 Installation standard is replaced in its entirety with the following:

905.2 Installation standard. Standpipe systems shall be installed in accordance with this section and NFPA 14. When water pressure at a standpipe outlet exceeds 175 psi residual at 250 gpm flow, a pressure-reducing valve shall be provided. The required pressure-reducing valves shall be located at the hose valve outlet. The pressure-reducing valves shall not be located on the standpipe riser. Only field-adjustable valves that have a nested spring design utilizing two custom springs allowing low torque field adjustment of the pressure-reducing functions shall be allowed. The valve shall have five (5) field-adjustable valve settings (A-E) on a color-coded indication label. Pin-in hex security screws shall be installed to secure the hand wheel and a high-impact plastic shield covering the pressure-reducing adjustment mechanism. A pin-in hex bit shall be supplied with each valve. The pressure adjustment mechanism shall be actuated using an aluminum adjustment rod provided with each valve and actuated by rotating in either a clockwise or counter-clockwise direction. Pressure gauge taps shall be provided on inlet and discharge sides of each valve. A reflective decal shall be installed on the high-impact plastic shield with arrows and words indicating the direction to increase or decrease pressure. If special tools are required to make field adjustments, a minimum of four (4) such tools shall be provided at locations approved by the Fire Department.

Section 905.3.1 Height - Exceptions are replaced in their entirety with the following:

1. Class I standpipes are allowed in buildings equipped throughout with an automatic sprinkler system in accordance with Sections 903.3.1.1 or 903.3.1.2 subject to the provisions of Section 913.
2. Class I automatic dry standpipes are allowed in single use or mixed-use open parking garages in accordance with Section 913.6(2) where the highest floor is located not more than seventy-five (75) feet above the lowest level of Fire Department vehicle access. In a mixed-use parking garage, the standpipe system serving the open parking garage shall be integrated with the fire protection system serving the other occupancies, and not be a stand-alone system. Hose connections shall be located as required for Class II standpipes in accordance with Section 905.5.
3. Class I manual dry standpipes are allowed in single use open parking garages where the highest floor is less than 55 feet from the lowest level of Fire Department vehicle access. Hose connections shall be located as required for Class II standpipes in accordance with Section 905.5. This provision is applicable to open parking garages with one level of underground enclosed parking garage.
4. Class I standpipes are allowed in basements equipped throughout with an automatic sprinkler system.
5. Intentionally deleted.

Section 905.3.4.1, Hose and cabinet is deleted in its entirety.

Section 905.4 Location of Class I standpipe hose connections – Exception 5 is replaced in its entirety as follows and Exception 7 is added:

5. Buildings four or more stories above the grade plane shall comply with 905.4 Exception 7.

7. Where standpipes are provided in buildings four or more stories above the grade plane, there shall be at least two 2-1/2" roof manifold connections above the roof line when the roof slope is less than four units vertical to twelve units horizontal (33.3% slope). Outlets shall be located on the exterior perimeter of the stair enclosure within 20' of the roof access opening.

Section 905.5.3, Class II system 1-inch hose is deleted in its entirety.

SECTION 906

PORTABLE FIRE EXTINGUISHERS

Section 906.1 Where required - Item 1 is replaced in its entirety with the following:

1. In new and existing Group A, B, E, F, H, I, M, R-1, R-2, R-4, townhouses and S occupancies.

   Exception: Subject to the approval of the fire code official, in condominiums, apartments and townhouses served by exterior egress stairs and exterior egress balconies or breezeways, portable fire extinguishers may be mounted outside of the dwelling units. A minimum of one portable fire extinguisher shall be installed on each separate exterior egress balcony and breezeway. Additional portable fire extinguishers shall be provided as necessary so the maximum travel distance to an extinguisher from any occupiable point shall not exceed 75 feet. The PM/HOA shall be responsible for the care, maintenance, recharging, and inspection of fire extinguishers.

Section 906.2.1 Verification of service collars is added:

906.2.1 Verification of service collars. Every portable fire extinguisher, regardless of type, shall have a verification of service collar, in accordance with NFPA 10 Section. Only collars obtained from the Denver Fire Department are allowed. Collars shall not be cut.

SECTION 907
FIRE ALARM AND DETECTION SYSTEMS

Section 907.1 General requirements is replaced in its entirety with the following:

907.1 General requirements. This section covers the application, installation, performance and maintenance of fire alarm systems and their components. Fire alarm systems, automatic and manual initiating devices, emergency voice/alarm communication systems and notification appliances shall be designed, installed and maintained in accordance with NFPA 72. Installation system wiring shall also be in accordance with NFPA 70 *(National Electrical Code)* and NFPA 72 *(National Fire Alarm Code).*

907.1.1 Fire alarm shop drawings. Shop drawings for fire alarm systems shall be submitted for permit application as a deferred submittal per IBCA Section 154. Plan review and approval are required prior to issuance of a permit for system installation. Two sets of scaled, engineered installation shop drawings shall be submitted. Documents shall be of sufficient clarity and detail to fully describe the scope of work. Handwritten notes and comments on reproduced drawings are not acceptable. Submittals shall comply with Appendix K.

907.1.2 Equipment. Systems and their components shall be listed and approved for the purpose for which they are installed. Installation locations of all control panels and annunciators are subject to field approval by the Fire Department. Keys for all equipment required to be accessible to the Fire Department shall be maintained in an approved location per Section 506. All components shall be compatible with the system in which installed.

907.1.2.1 Connections to other systems. A fire alarm system shall not be used for any purpose other than fire warning or as specifically approved, e.g. pool alarm, access control release per IBCA, elevator recall and shunt trip, emergency alarms per Section 908, and mass notification systems as approved by the fire code official.

907.1.2.2 Control units, annunciator panels and access keys. All fire alarm control units and annunciator panels shall be UL 864 listed or equivalent. Locations should be within 10’ (3.048m) of the main building entrance, unless specifically approved for an alternate location, and are subject to field approval prior to installation. Installation shall comply with NFPA 72. Access keys to locked

fire alarm equipment shall be maintained in an approved location. Fire alarm control units shall not be equipped with a key or special numeric code to access system reset and silence functions. Access to the reset and silence operator interface shall be secured behind a locked door. Field modification of control units or annunciators is not permitted. System zone and device disable functions shall not be accessible without a maintenance-level access code. Alarm signals shall be protected from unauthorized deactivation. This applies to disconnection of the panel alarm transmission to the monitoring station and the alarm output circuit(s) to notification appliances. Deactivation shall only be allowed by Fire Department personnel or authorized entities responsible for system testing and maintenance. Any system deactivation shall be reported to the monitoring station and the Fire Department. Facilities whose systems are estimated to be deactivated for 10 hours or more shall be provided with an approved fire watch.

Exception: In existing buildings undergoing a panel replacement, remote annunciators with silence and reset functions may be provided when approved by the fire code official. These units shall not be equipped with "enable/disable" switches and shall be contained behind a transparent, lockable cover.

907.1.3 Central alarm station connection. All fire alarm systems required by this code or by special agreement shall be monitored by an approved Class I supervising station complying with Section 916 and in accordance with the Denver Municipal Code. Multiple central alarm station connections from one building are not permitted. Alternatively, Fire Department radio boxes may be installed at locations approved by the Fire Department. These boxes shall typically be installed at locations of high-hazard, high occupancy that require immediacy of response due to limitations in the occupants' capabilities for self-preservation. Under no circumstances shall a radio box be removed from a protected premise without written approval of the fire code official.

907.1.4 Multiple systems in a single building. Only one fire alarm system shall be installed per building. Multiple points of silence and reset are prohibited on a single system.

Exceptions:

1. When permitted by the fire code official, portions of a building separated by fire walls without openings and identified with separate legitimate addresses are allowed to be considered separate buildings. When protected by an automatic sprinkler system, each portion of the building so considered shall be protected by a separate independent sprinkler system or a portion of a single sprinkler system dedicated to the separated portion of the building.

2. Multiple points of silence and reset as allowed by Section 907.1.2.2 Exception.

3. Multiple buildings constructed over a common structure where approved by the fire code official.

907.1.5 Problematic systems. Fire alarm systems that generate two (2) or more false or nuisance fire alarms within twenty-four (24) hours, three (3) or more within thirty (30) days, or ten (10) or more within one year shall be immediately repaired, mitigated or replaced as necessary. A fine will be imposed for any false or nuisance fire alarms exceeding ten (10) within one year. A permit must be obtained for all remedial work. Fire protection, fire alarm and fire detection systems shall be properly maintained to provide at least the same level of reliability, performance and protection as designed and approved. The property owner shall be responsible for maintaining the system. If the system is found to be impaired two (2) or more times within a twelve (12) month period, legal action will be imposed until the system(s) is restored to a code-complying condition. A permit shall be required for all remedial work.

907.1.6 Systems out of service. Systems undergoing maintenance or modification shall not have any portion of the system out of service for more than ten (10) hours. During maintenance or modification, all manual pull stations and notification appliances shall remain operational. Fire watch must be provided in all areas of the building where maintenance or modification will place any portion of the system out of service.

Exception: Where practical difficulties are associated with replacement of fire alarm and detection systems in existing high-rise buildings, phased replacement of an existing fire alarm system shall be permitted as follows:

1. An Administrative Modification (AM) request for the phased replacement of the fire alarm and detection system shall be submitted to the fire code official for evaluation and approval prior to submission of shop drawings.

2. Two fire alarm control panels shall be allowed during the phased system upgrade. Existing and new fire alarm control panels shall be co-located at a location approved by the fire code official. During this period, it shall be acceptable to have two points of system reset via the two fire alarm control panels. A wall map showing each floor with descriptions of which system is controlling devices in each area shall be posted adjacent to the fire alarm control panels during construction. Upon completion of the new front end equipment installation and after all compatible devices have been transferred, tested and approved by the fire code official, the contractor will remove the old panel and related equipment.

3. Installation within each floor shall be completed prior to commencement of work on any other floor unless the contractor can complete multiple floors simultaneously.

4. Project duration shall not exceed 24 months from the date the fire alarm permit is issued, nor shall the total duration, including project planning, design and installation, exceed 36 months. Subject to the approval of the fire code official, a single extension of up to a maximum of one year may be requested in writing. Extensions shall be granted only in cases of unforeseen difficulties. Building owners and contractors shall make every effort to minimize any delay to project completion.

5. The applicant shall present a planned schedule with phased replacement of the system and components, including scope of work and sequence of operation with coordination of the two fire alarm panels, to the fire code official for review and approval prior to preparation of shop drawings.

6. Fire alarm and detection system protection shall be maintained at all times and in all areas, except where system/component replacement is taking place while installers are present. Existing and new devices and appliances not affected and outside of the installation area shall be maintained fully operational at all times.

7. Phasing of fire alarm system replacement shall be in an organized, coherent and logical sequence to reduce system disruption and allow work while maintaining the life safety systems of the building.

8. Audible and visual notification appliance coverage shall comply with NFPA 72 and the IFCA.

9. Either point graphic annunciation or LED directory-type annunciation shall be provided. Where LED directory-type annunciation is provided, each device type per level in

conjunction with progressive remote indicating lights for detectored spaces shall be provided. Where multiple smoke control zones are provided within each level, each compartment shall be separately annunciated. For existing buildings with graphic annunciation, either the graphic annunciation shall be maintained or replaced with a new graphic annunciation panel. Annunciator panels shall include LED lights for automatic detection, manual pull, flow, tamper, special systems, supervisory and trouble.

10. Where the building has a smoke control system, detailed interface of the new fire alarm system with the existing or upgraded smoke control system shall be provided in the AM submission with details also shown on the shop drawings.

11. The building owner or owner's representative and the design professional shall sign the AM request.

12. The AM shall cite the practical difficulties of the proposed system replacement, the phased scope of replacement, the duration of each phase, as well as the total time from start to completion of the project. Failure to complete the project within the specified time frame shall subject the parties responsible to penalties specified in Section 109.2.2.1.

Section 907.2.1.1 System initiation in Group A occupancies with an occupant load of 1,000 or more is replaced in its entirety with the following:

907.2.1.1 System initiation in Group A occupancies with an occupant load of 1,000 or more. Activation of the fire alarm in Group A occupancies with an occupant load of 1,000 or more per space, or an occupant load of 300 or more per space with an aggregate Group A occupant load of 1000 or more, shall initiate a signal using an emergency voice/alarm communications system in accordance with Section 907.6.2.2.

Exception to remain.

907.2.1.1.2 Emergency power. Emergency voice/alarm communication system shall be provided with an approved emergency power source in accordance with NFPA 72.

907.2.1.1.3 Annunciation. Point-lit graphic annunciation shall be provided.

907.2.1.1.4 Illumination of means of egress. Illumination levels shall comply with Section 1006.2 and be interfaced to the fire alarm control unit as required.

Section 907.2.3 Group E is replaced in its entirety with the following:

907.2.3 Group E. Group E occupancies shall be provided with an approved manual fire alarm and automatic detection system throughout the occupancy. Occupant notification shall be provided in accordance with Section 907.6. See also Section 907.2.1.

Exceptions:

1. If less than 50 occupants, the system is not required to be monitored by a central alarm station.

2. A manual fire alarm system is not required if 20 or less occupants and 120v AC single- or multiple-station residential smoke alarms with battery back-up, wired to an un-switched source are provided.

3. In mixed occupancies where the E occupancy is accessory to an A occupancy, a manual fire alarm system is not required in the A occupancy except as identified in Section 907.2.1. Any exit paths for the E occupancy through the A occupancy shall be provided with automatic fire detection.

4. Manual fire alarm boxes are not required throughout the building where all the following apply:

    a. Interior corridors are protected by smoke detectors.
    b. System central alarm station monitoring is provided.
    c. Manual boxes are provided in locations supervised by staff in accordance with Item 5 below.

5. Where an approved automatic sprinkler system is installed throughout a Group E occupancy, manual pull stations shall only be required in locations supervised by staff, (e.g. teachers' lounge, custodial office, boiler room, administrative areas, auditorium and cafeteria). Notification appliances that activate on sprinkler waterflow and/or activation of a pull station shall be provided throughout.

6. Smoke detectors are not required in rooms or closets less than 24 sf.

Section 907.2.5 Group H is replaced in its entirety with the following:

907.2.5 Group H. A manual fire alarm system that activates the occupant notification system shall be installed in all Group H occupancies. An automatic smoke detection system that activates the occupant notification system shall be installed for highly toxic gases, organic peroxides and oxidizers in accordance with Chapters 37, 39 and 40 respectively. An emergency alarm system shall be installed in accordance with Sections 908 and 2704.9.

Section 907.2.6 Group I is replaced with the following:

907.2.6 Group I. A manual fire alarm system shall be installed in Group I occupancies. Group I occupancies shall be provided with an emergency voice/alarm communication system per Section 907.6.2.2, where partial evacuation is provided.

Exceptions:

1. A pre-signal system may be installed if approved by the fire code official. Twenty-four hour personnel supervision is required at approved locations. Chimes may be installed in lieu of audible notification appliances as approved by the fire code official. A Denver Fire Department permit is required for pre-signal or alarm verification equipment.
2. Automatic fire detectors are not required in sprinklered areas less than 24 sq. ft. (2.23sq m.).

Section 907.2.6.2 Group I-2 is amended by inserting the following after the second sentence:

Corridors and areas open to corridors in hospitals shall be provided with automatic smoke detection. Additionally, hospitals shall be provided with smoke detection as required in Section 407.2 of the *International Building Code*, where not in conflict with this section.

Sections 907.2.6.3.4 Zoning and annunciation and 907.2.6.3.5 Monitoring are added:

907.2.6.3.4 Zoning and annunciation. Alarm, supervisory and trouble signals shall be displayed at the annunciation panel and be transmitted to the central alarm station. Alarm signals shall indicate the type of alarm and the zone of origin, in accordance with NFPA

72. Separate zones shall be provided for individual fire protection systems, buildings, building levels, cell complexes and sections of floors constructed as smoke compartments**.**

907.2.6.3.5 Monitoring. The fire alarm system shall be monitored by an approved central alarm station service or by transmission of a local alarm which will give audible and visible signals at an approved constantly attended location.

Section 907.2.6.4 Group I-4 is added:

907.2.6.4 Group I-4. Child care occupancies shall be provided with an approved manual fire alarm and automatic detection system throughout the occupancy. Occupant notification shall be provided in accordance with Section 907.6

Exceptions:

1. If less than 50 occupants, the system is not required to be monitored by a central alarm station.

2. A manual fire alarm system is not required if 20 or less occupants and 120v AC residential smoke alarms with battery back-up, wired to an un-switched source are provided.
3. Manual fire alarm boxes are not required throughout the building where all the following apply:

    a. Interior corridors are protected by smoke detectors.
    b. System central alarm station monitoring is provided.
    c. Manual boxes are provided in locations supervised by staff in accordance with Item 4 below.

4. Where an approved automatic sprinkler system is installed throughout a Group I-4 child care occupancy, manual pull stations shall only be required in locations supervised by staff, (e.g. teachers' or nurses' lounge, custodial office, boiler room, administrative areas, auditorium and cafeteria). Notification appliances that activate on sprinkler waterflow and/or activation of a pull station shall be provided throughout.

Section 907.2.8.2 Automatic fire alarm system is amended by deleting "… serving sleeping units" at the end of the sentence.

Exception to remain.

Section 907.2.8.3 Smoke alarms is replaced in its entirety with the following:

907.2.8.3 Smoke alarms. Smoke alarms shall be provided as required in Section 907.2.11. Such devices shall not be connected to the fire alarm system unless for supervision only with the approval of the fire code official.

Section 907.2.11.4 Exception is deleted in its entirety.

Section 907.2.11.5 Residential occupancies is added:

907.2.11.5 Residential occupancies. Smoke alarms and carbon monoxide alarms within the dwelling and sleeping units shall be inspected and tested in accordance with NFPA 72 and NFPA 720, no less than twice annually—at each change to and from daylight savings time—and batteries changed at the

same time. A hard-copy log of all inspections, testing, maintenance and battery changes shall be maintained at the property. This log shall include the dates of inspection, testing, maintenance and battery change and the person performing such. Upon request, a copy of the log shall be provided to the fire code official. If this information is not current or available, an inspection shall be made to inspect and test all devices or the property owner or agent of the property owner shall be directed to retain a firm licensed by the Denver Fire Department to inspect and test all devices and submit a report of the inspection findings to the fire code official.

Exception: Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) that comply with the *International Residential Code*.

Replace Section 907.2.13 as follows:

907.2.13 High-rise buildings: Buildings with a floor used for human occupancy located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access shall be provided with a manual and automatic fire alarm and detection system in accordance with Section 907.2.13.1, a fire department communication system in accordance with Section 907.2.13.2 and an emergency voice/alarm communication system in accordance with Section 907.6.2.2 that provides occupant notification of alarm on the fire floor, floor above, floor below and at the level of the FCC.

Exceptions to remain.

Replace 907.2.13.1 as follows:

907.2.13.1 Automatic smoke detection. Smoke detectors shall be provided in accordance with this section. Smoke detectors shall be connected to an automatic fire alarm system. The activation of any detector required by this section shall operate the emergency voice/alarm communication system and shall place into operation all equipment necessary to prevent the re-circulation of smoke in accordance with Section 909. Smoke detectors shall be located as follows:

1. In each mechanical equipment, electrical, transformer, telephone equipment or similar room, elevator machine rooms and in all elevator lobbies.

2. In the main return air and exhaust air plenum of each air-handling system having a capacity greater than 2,000cfm ($0.9m^3/s$) in accordance with the *International Mechanical Code (IMC)*. Where multiple air-handling systems share common supply or return air ducts or plenums with a combined capacity greater than 2,000cfm (0.9cu m/s), smoke detectors shall be provided in accordance with the IMC. Such detectors shall be located in a serviceable area downstream of the last duct inlet. Duct type smoke detectors shall cause a supervisory signal, not an alarm signal, at the building annunciator panel. Detectors shall be listed for the air velocity in which they are installed.

   Exception: Smoke detectors are not required for automatic shut-off of evaporative coolers or units that supply un-tempered 100% outside air.

3. In the outlet of fans used for pressurization of stairways, hoistways and refuge areas. Activation of these smoke detectors shall cause a supervisory signal, not an alarm signal at the building annunciator panel. Detectors shall be listed for the air velocity in which they are installed.

4. At each connection to a vertical duct or riser serving two or more stories from a return air duct or plenum on an air-handling system. In Group R-1 and R-2 occupancies a listed smoke detector is allowed to be used in each return air riser carrying not more than 5,000 cfm

($2.4m^3/s$) and serving not more than 10 air inlet openings. These detectors are not required at return openings located in a corridor that is protected by full corridor or full floor area detection. Activation of these devices shall initiate an alarm signal at the fire alarm control unit.

5. In all interior corridors serving as a means of egress for Group R-1, R-2 and R-4 occupancies, with an occupant load of 10 or more.

6. Not less than one foot but no more than three feet on the occupied side of each door that enters a refuge area, elevator lobby and exit stairway which does not directly exit from a refuge area, for occupancies other than R-1, R-2 and R-4.

7. At unenclosed openings, where shaft enclosures are not required in accordance with Exception 2, 7 or 11 to Section 708.2 of the IBC or IBCA. Detectors shall be located at the perimeter of the opening, on each level, not less than 4ft. (1.219m) and not more than 8ft. (2.4384m) from the edge of the opening. Detectors at the highest level shall be installed to provide coverage 30ft. (9.144m) beyond the perimeter of the projected opening. For atriums as defined by this code, see Section 907.2.14.

8. At vertical openings for non-required stairwells/escalators in Group B and M occupancies. Smoke detectors shall be installed adjacent to the floor side of each opening where the area of the floor opening between stories does not exceed twice the horizontal projected area of the escalator or stairway and a smoke management system is provided in accordance with Section 909.

9. At the top of stairwells and in sprinklered elevator hoistways. These devices shall initiate an alarm condition and illuminate the respective indicator at the graphic annunciator. They shall not initiate occupant notification or the smoke control sequence.

907.2.13.1.1 Large assembly areas (occupant load of 1000 or more). Smoke detection shall be provided as required for smoke control operation per Section 909.21.7. No detector zone shall serve more than one smoke control zone. Where ceiling heights are 30 ft (7.62m) or greater, air sampling-type smoke detection systems or approved beam detection shall be provided in lieu of ceiling spot smoke detection.

Section 907.2.13.2 Fire department communication system is replaced in its entirety with the following:

907.2.13.2 Fire department communications system. Two-way telephone communication services shall be connected to a UL 864 listed fire alarm system. Design of the fire department communications system shall consist of both of the following:

1. Hardwired components, in accordance with Section 907.2.13.3.2, consisting of plug-in phone jacks, permanent handsets, amplifiers and cable system for selective and "all-call' operation. Components shall be listed under UL product category code designation UOXX.

2. Radio communications using the emergency responder radio communications enhancement System (RES) in accordance with Section 510, designed and installed for full coverage in accordance with Section 510.1.1.3 coverage requirements.

907.2.13.2.1 Operation. Both hardwired and radio communication systems shall operate between the fire command center (FCC) and the following locations:

1. Elevators and elevator lobbies
2. Emergency and standby power rooms
3. Building engineer's office
4. Mechanical rooms
5. Elevator equipment rooms
6. Fire pump rooms
7. Areas of refuge
8. Entries into required exit stairways
9. Rooms containing the primary means to disconnect electrical service

907.2.13.2.2 Hardwired systems. An approved two-way, Fire Department communication system shall be provided for Fire Department use. Each phone or jack on the two-way Fire Department communication system shall have a separate control switch on the fire alarm control unit which distinctly annunciates the location of the phone in use. The vertical riser shall be installed in accordance with the National Electrical Code and shall be listed two-hour cable, Class A riser or run in a minimum two-hour rated enclosure.

907.2.13.2.2.1 Handsets. Both permanently mounted and mobile telephone handsets shall be provided.

907.2.13.2.2.1.1 Permanent handsets. Each permanently mounted handset shall initiate a signal from the handset to the FCC. Permanently mounted telephone handsets shall be provided in the locations listed below:

1. Building engineer's office
2. Each mechanical room with fans used for smoke control
3. Emergency and standby power rooms
4. Each fire pump room
5. Rooms containing the primary means to disconnect electrical service
6. Each elevator equipment room

907.2.13.2.2.1.2 Mobile handsets. A minimum of six mobile handsets shall be provided in an approved cabinet located in the FCC. When a mobile handset is plugged into any Fire Department communication system jack, the jack shall eliminate feedback by disconnecting any voice communication speaker system in the immediate area. Wiring supervision to the disconnected speaker(s) is not required to be maintained during handset use.

Section 907.2.13.3 Alarm notification is added:

907.2.13.3 Alarm notification. Alarm notification in high-rise buildings shall comply with Section 907.6 and notify occupants on the floor in alarm, the floor above, the floor below and at the level of the fire command center. Silence function shall be provided to independently silence notification appliances at the level of the FCC. This function shall be accomplished by an approved switch located in the FCC.

Section 907.2.13.4 Smoke control system activation is added:

907.2.13.4 Smoke control system activation. Smoke control systems shall be automatically activated by alarm-initiating devices including return riser duct detectors, water flow switches, manual pull stations, special extinguishing systems activation and manual operation from the fire command center (FCC), in accordance with Sections 907.2.13.4.1 and 907.2.13.4.2. After the initial alarm activation, any subsequent automatic alarm activation on another floor shall initiate the floor exhaust sequence per Section 907.2.13.4.2.

Exception: Main sprinkler system water flow, heat or smoke detectors located in stair or hoistway enclosures and sprinkler system water flow in building service chutes. Where building shafts are protected with automatic sprinklers for reduction in shaft construction fire rating, a separate riser shall be provided.

907.2.13.4.1 Activation of pressurization. Activation of stair and elevator hoistway enclosure pressurization shall be initiated by:

1. Activation of any alarm-initiating device in accordance with Section 907.2.13.4 above.
2. Activation of any manual fire alarm box.

907.2.13.4.2 Smoke control exhaust. Exhaust in a smoke control zone shall be automatically activated by any automatic fire alarm or sprinkler initiating device within the respective smoke control zone.

Exceptions:

1. Where floors are open to each other as permitted by IBC or IBC as amended, each floor shall be considered a separate smoke control zone.
2. Kitchen hood suppression system activation.

907.2.13.4.3 Operation. Upon activation of an automatic alarm initiating device as described in this section, the following sequence shall occur:

1. Open exhaust dampers on the floor in alarm.
2. Start exhaust fans.
3. Close exhaust dampers to all other floors.
4. Turn off all supply and make-up air fans.
5. Close all floor supply air dampers.
6. Open stair and hoistway pressurization dampers
7. Start stair and hoistway pressurization fans.

Section 907.2.13.5. Large assembly areas (occupant load of 1000 or more) is added:

907.2.13.5 Large assembly areas (occupant load of 1000 or more). Where required by Section 909.21.7.1, the smoke control system shall be activated automatically by an alarm initiated from a smoke detector, heat detector, sprinkler water flow alarm or air sampling-type area smoke detector within the smoke zone. Operation shall comply with the following:

1. Open exhaust dampers for zone in alarm
2. Start zone exhaust fan
3. Close supply dampers to zone in alarm
4. Open stair and hoistway pressurization dampers
5. Start stair and hoistway pressurization fans
6. Adjacent zones go to 100% outside air

7. All other systems maintain normal operation

Section 907.2.13. 6 Annunciation is added:

907.2.13.6 Annunciation. Graphic annunciation shall be provided in accordance with Section 907.7.3.1.2.

Section 907.2.13.7 Elevator recall and shunt trip is added:

907.2.13.7 Elevator recall and shunt trip. All elevators shall be provided with Phase I and Phase II emergency recall per Section 907.4.3.

907.2.13.7.1 Elevator status/control panel. An elevator status/control panel shall be provided. The elevator status/control panel shall:

1. Identify each elevator cab numerically and the floors it serves. Identify corresponding cab number in elevator cab at permanent handset;

2. Indicate which elevator(s) are on emergency power;

3. Have a placard at elevator status/control panel stating how many elevators can operate under emergency power simultaneously;

4. Indicate elevator car position; and

5. Have key switches as required for selective activation of cars, if all are not provided with emergency power for simultaneous operation.

Section 907.2.13.8 Emergency generator panel is added:

907.2.13.8 Emergency generator panel. An emergency generator panel shall be provided. The emergency generator panel shall show:

1. Operating status (on-off) and malfunction indication panel as required by NFPA 110
2. Indication of transfer switch position (normal-emergency)
3. Indication that generator is in automatic mode
4. Main fuel oil storage tank low fuel level alarm.

Section 907.2.13.9 Fire pump panel is added:

907.2.13.9 Fire pump panel. A fire pump status panel shall be provided. The fire pump panel shall have:

1. Remote operating status indication panel as required by NFPA 20.
2. Motor/engine running/on or off. Pump running indication shall be transmitted to the fire alarm control panel as a supervisory signal and distinctly annunciated.
3. Low fuel level alarm for fire pump fuel tank.

Section 907.2.14 Atriums connecting more than two stories is replaced in its entirety with the following:

907.2.14 Atriums connecting more than two stories. A fire detection and smoke exhaust system shall be provided in atriums that connect more than two stories. The system shall be activated in accordance with this section.

907.2.14.1 Activation. Activation of two smoke detectors in the atrium shall initiate the atrium exhaust sequence below. In high-rise buildings, activation of a smoke detector located in areas separated from the atrium by a smoke barrier shall operate in accordance with Section 907.2.13.4.

907.2.14.1.1 Operation. Upon activation of initiating devices, the following sequence shall occur:

1. Open atrium exhaust dampers.
2. Start exhaust fans.
3. Close exhaust dampers on all floors.
4. Open stair and hoistway pressurization dampers
5. Start stair and hoistway pressurization fans, where provided.
6. Open supply dampers to atrium.

907.2.14.1.2 Detection. Detection shall be as follows:

1. Area type smoke detectors, spaced in accordance with NFPA 72, shall be installed at the atrium ceiling where the ceiling is 30 feet (9.144 m) or less from the floor of the atrium. If the ceiling is greater than 30 feet (9.144 m) from the atrium floor, beam type detectors shall be installed. A detection system with alarm verification may be installed. The initial device in alarm shall initiate a supervisory condition at the fire alarm panel.

2. On the underside of projections into the atrium, spaced in accordance with NFPA 72.

3. Around the perimeter of the atrium opening on all floors open to the atrium. The detectors shall be spaced not more than 30 feet (9.144 m) on center and shall be located within 15 feet (4.572 m) of the atrium opening.

4. In high-rise buildings, where any part of the floor is open to an atrium, smoke detectors shall be located throughout the floor not included in the atrium area for every 2500 sq. ft. (232.258 sq m) of occupied floor space. No smoke detector shall serve more than one smoke zone.

5. All smoke detectors shall be accessible for maintenance and testing.

Sections 907.2.20.1 Smoke detection in covered malls and 907.2.20.2 Smoke control activation are added:

907.2.20.1 Smoke detection in covered malls. For covered malls having a smoke control system per Section 909, smoke detection shall be provided as follows:

907.2.20.1.1 Tenant space and anchor stores:

1. On the tenant side at each opening into the mall and at each exit from the tenant space. For openings larger than 30 lineal feet 9.144 m), an additional detector shall be provided for each 30 lineal feet (9.144 m) or fraction thereof.

2. Electrical equipment rooms.

3. Detector zones may not exceed 22,500 square feet (2090.318 sq m) and no detector zone shall serve more than one smoke control zone.

4. Detectors in individual tenant spaces shall be spaced not to exceed 2,500 sq. ft. (232.258 sq m) per detector.

907.2.20.1.2 Covered mall area. A smoke detector shall be located in the supply system serving the covered mall area, after the filters, which will stop the supply fan and provide a supervisory signal. In addition, a smoke detector shall be provided in the return or exhaust air stream over 2,000 cfm (.94cu m/s).

907.2.20.2 Smoke control activation. The smoke control system for covered malls shall be activated by any alarm initiated from the smoke detection or sprinkler system, inclusive, in accordance with the sequence below. All smoke control equipment for both tenant space and the covered mall building shall be in place and operational before any portion of the covered mall building is occupied. The level of protection of the fire detection system for unoccupied tenant space shall be subject to the approval of the Fire Department.

1. Open zone exhaust dampers.
2. Start zone exhaust fans.
3. Close supply dampers to zone in alarm
4. Immediately adjacent zones go to 100% outside air.
5. All other systems remain in normal operation.

Section 907.2.23 Battery rooms is replaced in its entirety with the following:

907.2.23 Battery rooms. An approved automatic smoke detection system shall be installed in areas containing stationary storage battery systems having a liquid capacity of more than 50 gallons (189 L). The detection system shall be supervised by an approved central, proprietary, or remote station service or a local alarm which will sound an audible signal at an approved location on the premises outside the battery room. Where a local alarm is installed, provide signage indicating "BATTERY ROOM ALARM – CALL 911." In buildings with a monitored sprinkler or fire alarm/detection system, the battery room detectors shall be connected to the building fire alarm control panel.

Exception: A dedicated, detached on grade structure not to exceed 1,000 square feet.

Section 907.2.24 Airport buildings and structures is added:

907.2.24 Airport buildings and structures. See NFPA 415 as amended per IBCA Appendix N and Section 915.

Section 907.4.1 Duct smoke detectors is amended by adding the following after the last sentence and deleting Exception 1:

Spot-type smoke detectors may be used for return air system connection to vertical risers serving two or more stories per NFPA 72. Detectors shall be listed for the maximum anticipated airflow velocity. Detectors concealed above the ceiling shall be provided with a remote indicating light mounted on the ceiling directly below the device. Remote indicating lights shall be installed in an accessible, visible area directly below or adjacent to the detector in accordance with Section 907.5.3.1.2.

Section 907.4.2 Delayed egress locks is amended by adding the following to the end of the last sentence:

"….and in compliance with *International Building Code* Amendments Appendix L."

Section 907.4.3 Elevator emergency operation is replaced in its entirety with the following:

907.4.3 Elevator recall and shunt trip. Elevator recall and shunt trip shall be provided for all new elevators. Fixed temperature 190 degree F heat and smoke detectors shall be located in accordance with NFPA 72. Where environmental or other conditions prohibit installation of smoke detectors for recall, 135 degree F fixed temperature heat detectors shall be permitted to substitute for the required recall smoke detectors. In buildings with a fire alarm system, these detectors shall be connected to the building fire alarm system.

In buildings without a fire alarm system, system smoke detectors and a dedicated fire alarm system control unit shall be provided that is designated as an "elevator recall control and supervisory panel." The system shall be designed and installed in accordance with NFPA 72 and ASME A17.1.

In fully sprinklered buildings, elevator power shunt trip shall be activated prior to sprinkler operation in accordance with NFPA 72. Where MRL elevator equipment is installed in a fully sprinklered building, smoke and heat detectors shall be provided at the top of the hoistway. Recall smoke detectors shall be installed in the control equipment space. Heat detectors for shunt trip shall be installed in the control equipment space if it is protected by sprinklers.

Shunt trip circuit breakers shall be located in either the main power distribution room or installed in the elevator machinery room/space in a NEMA 3R enclosure. Elevator power shunt trip shall be provided for elevator shut down prior to sprinkler operation in accordance with NFPA 72.

System smoke detectors shall be located in elevator lobbies, hoistways and machine rooms. Activation of these smoke detectors shall return to grade level, nonstop, all elevators serving that alarm zone, except for the smoke detector in the elevator lobby at grade level which shall return the elevators to an alternate level. Elevators without a landing at grade level shall be returned to the landing that is closest to grade level or other approved level. The alternate level shall be approved by the fire code official. Elevators shall remain at the level where they returned in accordance with IBC Section 3003**,** until being manually overridden by the operator key switch required by ASME A17.1 or the elevator control panel in the FCC. Use of detector relay bases for recall activation is specifically prohibited.

Exception: For existing buildings undergoing an elevator upgrade, replacement or new installation, an administrative modification shall be submitted for approval where an existing complying fire alarm control unit cannot be expanded within its listing to accommodate the additional devices for recall and shunt trip. Upon approval, a dedicated "elevator recall and supervisory panel" shall be installed in accordance with the provisions for buildings without a fire alarm system. This panel shall report alarm and supervisory signals to the main FACP. The administrative modification shall state the practical difficulties involved in incorporating the recall/shunt trip devices into the existing fire alarm system.

907.4.3.2 Hoistway vent operation. All hoistway vents shall be electrically closed motorized vents and shall open automatically by any one of the following:

1. The elevator hoistway smoke detector
2. Elevator lobby smoke detector
3. Power failure to the vent

A manual override shall be provided by a keyed switch located adjacent to the fire alarm control panel. The switch shall be labeled "hoistway vent" and shall indicate an open and closed position. The hoistway vents shall return to the closed position by resetting the fire alarm control panel and placing the "hoistway vent" switch in the closed position. Switch shall be returned to a "neutral" position for automatic operation.

Section 907.5.2.4 Signs is replaced in its entirety with the following:

907.5.2.4 Signs. Where fire alarm systems are not monitored by a central alarm station, an approved permanent sign that reads: "LOCAL ALARM ONLY - PULL AND CALL 911" shall be installed adjacent to each manual fire alarm box. Where additional digits are required to access the public telephone system, signage shall reflect the additional digits required.

Exception: Where the manufacturer has permanently provided this information on the manual fire alarm box.

Section 907.5.3.2 Remote indicating lights is added:

907.5.3.2 Remote indicating lights. A remote indicating light shall be installed for detector(s) within each room with an entry door. The indicating light shall be located on the wall or ceiling above the door and within 12 inches (30.48 cm), on the exit corridor side. This shall include each door leading through adjoining or intervening rooms from an exit corridor to that room (progressive type). Remote indicating lights shall be installed on the ceiling directly below detectors located above ceilings. Remote indicating lights shall latch "on" and remain lit (steady, not flashing) until the fire alarm system is reset.

Exception: Remote indicating lights may be deleted where a point-lit or computer graphic annunciator is provided.

Section 907.6 Occupant notification systems is amended by adding Exceptions 2 & 3:

2. Smoke alarms in dwelling units and rooms used for sleeping purposes in R-1 occupancies. Duct detectors shall initiate a supervisory signal only.

3. Occupant notification shall not activate upon operation of detectors at the top of stairwells or in elevator hoistways or main or service chute water flow devices.

Section 907.6.2 Alarm notification appliances is replaced in its entirety with the following:

907.6.2 Alarm notification appliances. Audible and visible alarm notification shall be provided to alert occupants of the area having a fire alarm system as well as in the means of egress serving the occupancy. The fire alarm control panel shall incorporate an alarm silencing switch that shall only de-activate the audible notification appliances until the system is manually reset. Alarms shall be provided per Sections 907.6.2.1, 907.6.2.2 and 907.6.2.3, and as required by other sections of this code. Notification appliances shall be listed for the purpose.

Section 907.6.2.1 Audible alarms is amended by adding the following after the last sentence:

In theaters, nightclubs, dance halls, ballrooms and similar areas, means shall be provided to reduce or eliminate background noise upon activation of the fire alarm system. The fire alarm system shall produce a sound level at least 15 dBA above the reduced average ambient sound level or 5 dBA above the maximum sound level having a duration of at least 60 seconds whichever is greater. The reduced sound level shall not require audible notification to exceed 110 dBA.

Section 907.6.2.1 - Exception is replaced in its entirety with the following:

Exception: Alternate alarm notification shall be permitted in critical care areas of Group I-2 occupancies as approved by the fire code official.

Section 907.6.2.1.1 Average sound pressure - Exception is added:

Exception: This audible notification sound level is not required for systems using pre-recorded or live voice message announcement.

Section 907.6.2.2 Emergency voice/alarm communication systems is replaced in its entirety with the following:

907.6.2.2 Emergency voice/alarm communication systems. All buildings provided with an emergency voice/alarm communications system shall have the communications and other life safety equipment located in a fire command center (FCC) or fire command room constructed in accordance with Section 508. The equipment shall be connected to a UL 864 listed fire alarm system. Components shall be listed under UL product category code designation UOXX or UUMW. The operation of any manual fire alarm box, automatic fire detector or water flow device shall automatically sound an alert tone followed by voice instructions giving approved information and directions for a general or staged evacuation to the following areas as a minimum:

1. Elevators (selective activation from the fire command center/room only)
2. The fire floor and all floors and other areas in accordance with the building evacuation plan
3. Exit stairways (selective activation from the fire command center/room only)
4. Assembly areas in accordance with Section 907.2.1.1
5. Areas of refuge as defined in Section 1002.1

Exceptions:

1. In Group I-1 and I-2 occupancies, the alarm shall sound in a constantly attended area and a general occupant notification shall be broadcast over the overhead page.
2. In special amusement buildings only general notification is required.

907.6.2.2.1 Manual override. A manual override for emergency voice communication shall be provided on a selective and all-call basis for all paging zones.

907.6.2.2.2 Live voice messages. The emergency voice/alarm communication system shall also have the capability to broadcast live voice messages on a selective and all-call basis to all areas indicated in Section 907.6.2.2.

907.6.2.2.2.1 Background noise reduction. In very high noise areas, such as theaters, nightclubs, ballrooms and dance halls, the system shall be designed to reduce or eliminate the background noise upon alarm initiation.

907.6.2.2.3 Alternate uses. The emergency voice/alarm communication system may be used for other emergency communication announcements with the approval of the fire code official.

907.6.2.2.4 Standard. The emergency voice/alarm communication system shall comply with Section 907.6.2.2 and NFPA 72.

907.6.2.2.5 System design. Where building occupant partial evacuation/relocation is required, the emergency voice/alarm communication system shall utilize one of the design methods below. Communication risers shall be installed in metallic conduit and shall comply with NFPA 70 and NFPA 72.

1. Separate "A" and "B" risers with alternating floor speakers, designed such that no more than ½ the speakers on a floor shall be affected by loss of any one amplifier, pre-amplifier or cable within the floor or communication zone.
2. Class A wiring configuration for risers and floor distribution provided system survivability is maintained in the event of a failure of any distributed or banked amplifier to limit the failure to no more than ½ the notification appliances on the floor plate. Internally backed-up amplifier modules are acceptable.
3. Class A wiring configuration for risers and class B floor distribution wiring with alternating speakers such that system survivability is maintained in the event of a failure of any distributed or banked amplifier to limit the failure to no more than ½ the notification appliances on the floor plate. Internally backed-up amplifier modules are acceptable.

Section 907.6.2.3 Visible alarms is replaced in its entirety with the following:

907.6.2.3 Visible alarms. In all occupancies, visible notification shall be provided in toilet rooms accessible to the disabled, in corridors, public and common areas and in areas of assembly. In R-1 and I-1 occupancies, visible notification shall be installed in accordance with Section 907.6.2.3.3. Visible alarms shall be installed in accordance with NFPA 72.

Exceptions:

1. Visible alarm signals in patient areas of Group I occupancies may be provided per Section 907.2.6.
2. Visible notification appliances shall not be installed in stairwells.

Section 907.6.2.3.3 Visible notification appliances is replaced in its entirety with the following:

907.6.2.3.3 Visible notification appliances. Group R-1 and I-1 sleeping units shall be provided with visible notification activated by an integral in-room smoke alarm required by 907.2.11.2. Visible notification appliances shall also be provided which are activated by the building fire alarm and/or automatic sprinkler system. The minimum number of sleeping units to be provided with visible notification appliances shall be in accordance with Table 907.6.2.3.3. All accessible units required by IBC Table 1107.6.1.1 shall be provided with visible notification appliances as part of this requirement.

Section 907.6.2.3.4 Group R-2 is replaced in its entirety with the following:

907.6.2.3.4 Visible notification appliances. Where a fire alarm and/or automatic sprinkler system is installed in R-2 occupancies, visible notification appliances shall be provided in

accordance with Table 907.6.2.3.3. All accessible units required by IBC Table 1107.6.1.1 shall be provided with visible notification appliances as part of this requirement.

1. Single- and multiple-station smoke alarms (120 Vac) shall have integrated visible notification appliances for occupant notification within each dwelling unit or sleeping unit.

2. Visible notification appliances activated by the building fire alarm system shall be provided in dwelling units and sleeping units. These visible notification appliances shall be located in the living rooms, sleeping rooms, kitchens and toilet rooms.

Section 907.6.2.3.5 Visible notification appliances in R-3 and R-4 occupancies is added:

907.6.2.3.5 Visible notification appliances in R-3 and R-4 occupancies. Sleeping rooms shall be provided with visible notification activated by an integral in-room smoke alarm. Visible notification appliances shall also be provided which shall be activated by the building fire alarm and/or sprinkler system, where provided.

Exception: Buildings that do not contain more than two dwelling units.

Section 907.7.1 Wiring is replaced in its entirety with the following:

907.7.1 Wiring. Fire alarm system and communications wiring shall comply with provisions of NFPA 72 and NFPA 70 (NEC) Article 760. Wiring color code shall be consistent throughout the entire system and permanently posted inside the fire alarm control panel. Separate colors shall be used for each type of initiating circuit, indicating circuit and control circuit. Color coding shall be by continuous colored insulation or by application of 6-inch (15.24 cm) long colored heat-shrink tubing at the end of each conductor at all splices, taps and terminations. Wiring shall not be painted. Wireless protection systems utilizing radio-frequency transmitting devices shall comply with the special requirements for supervision of low-power wireless systems in NFPA 72.

Section 907.7.1.1 Monitoring integrity is added:

907.7.1.1 Monitoring Integrity. Conductors and connections that interconnect equipment, devices and appliances shall be monitored for integrity, as set forth in NFPA 72.

Section 907.7.3 Zones is replaced in its entirety with the following:

907.7.3 Zones. All fire alarm systems shall be divided into alarm zones. When two or more alarm zones are provided, visible annunciation shall be provided at an approved location. Zones shall comply with this section unless otherwise approved by the Fire Department. Trouble and supervisory signals shall be annunciated in accordance with this section and NFPA 72. Annunciator panels shall comply with Section 907.7.3.1. Annunciation zones shall comply with the following.

Each building level shall be annunciated separately as follows:

1. All manual devices.
2. All automatic devices. No single zone shall exceed 22,500 sq ft (2090 sq m). No detection zone shall exceed 300 ft (91.44 m) in length in any direction.
3. Where standpipes are required per IFC Section 905, at each fire sprinkler water flow detection device. Sprinkler zones shall comply with NFPA 13.

Separate visible indication shall be provided for:

1. Main fire sprinkler flow. Individual risers per Section 903.
2. Each special extinguishing system
3. Each non-required system
4. Each special detection system
5. Each stairway (where detection is provided)
6. Each elevator hoistway and machine room
7. System trouble
8. Sprinkler control valves (supervisory only). Maximum 20 devices per zone
9. Duct detectors (supervisory only). Maximum 20 devices per zone
10. Fire pump running supervisory indication
11. Elevator shunt trip power supervisory indication
12. Radio enhancement system power supervisory indication
13. Refuge area two-way communication supervisory indication
14. Radio enhancement system malfunction supervisory indication

Section 907.7.3.1 Annunciator panels is replaced in its entirety with the following:

907.7.3.1 Annunciator panels. Annunciator panels shall be point-lit graphic or computer graphic or a directory LED point display type as approved by the fire code official. Upon initiation of an alarm, supervisory or trouble condition the panel shall record the status. Alarms shall "lock-in" until the fire alarm system is reset with a dedicated reset switch located at the main fire alarm control panel. Annunciation lights shall be red for "Alarm" and yellow for "Trouble" and "Supervisory" signals. Each signal type shall be distinctly identified.

907.7.3.1.1 Directory annunciator. A directory annunciator shall be provided as required. Location shall be field approved. The annunciator shall be provided with individual alarm indications per Section 907.7.3 for each zone. Indicators shall be of sufficient size and intensity to be visible in normal lighting.

907.7.3.1.1.1 Building plans. Scaled floor plans shall be permanently mounted adjacent to directory type annunciator panels. Plans shall be of durable construction, easily readable in normal lighting, protected by a smooth, transparent, plastic surface and shall include every building level including mezzanines and roofs. Plan content shall comply with Appendix K.

907.7.3.1.2 Point-lit graphic annunciator. A graphic annunciator shall be provided as required in Sections 907.7.3.1.2.1 through 907.7.3.1.2.3.

907.7.3.1.2.1 When required. A point-lit graphic annunciator is required for the following: underground buildings, high-rise buildings, buildings with a smoke control system per Section 909 and where required for a pre-action fire sprinkler or clean agent extinguishing system per Section 907.7.6.

907.7.3.1.2.2 Location in building. Location of annunciators shall be field approved. Locations depicted on reviewed drawings are not permitted until field verification is secured.

907.7.3.1.2.3 Graphics. The annunciator shall consist of building plans per Appendix K, with the addition of discrete LED indications for each alarm and supervisory

initiating device. The annunciator shall be provided with a momentary push-button "Lamp Test." Separate indications for "Trouble" and "Supervisory" conditions shall be provided.

Section 907.7.3.1.3 Computer graphic display is added:

907.7.3.1.3 Computer graphic display. Computer graphic displays shall be permitted for individual system designs only with the approval of the fire code official. Systems shall be fully compliant with UL 864. Systems shall contain a full color primary and secondary display. Demonstration of the specific equipment to be installed with the actual operating software for the proposed system shall be presented to the fire code official. Operator interface to the graphic shall be based on:

1. Ease of use. Primary operator interface shall be standard 2-button mouse driven. Optional secondary interfaces may be provided.
2. Adequacy of display for operational purposes
3. Flexibility of system for upgrade.
4. Minimal proprietary components. Accepts standard picture file types.
5. Plain English report generation of events, histories, maintenance schedules, device status and settings and user access.
6. UL-864 listed event-driven primary display. Secondary display(s) as approved by the fire code official.
7. Secure access.

Building plans per Section 907.7.3.1.1.1 shall be provided and shall be located as approved by the fire code official.

Section 907.7.3.2 High-rise buildings is deleted in its entirety.

Section 907.7.5.1 Automatic telephone-dialing devices is replaced in its entirety with the following:

907.7.5.1 Automatic telephone-dialing devices. Automatic telephone-dialing devices are not permitted to dial any fire department phone number.

Section 907.7.6 Pre-action and clean agent extinguishing systems is added:

907.7.6 Pre-action and clean agent extinguishing systems. Pre-action and clean agent extinguishing systems shall have a dedicated releasing panel and annunciator connected to the building fire alarm system where provided. Pre-action systems shall be installed per NFPA 13. Clean agent systems shall comply with Section 904.10. Control panels shall be listed for releasing service. Control panel and annunciator shall be located outside the protected area in a location approved by the fire code official. Areas protected by a single releasing panel shall be contiguous. Shop drawings for system installations shall be submitted per Appendix K, NFPA 13 and NFPA 2001. Cross-zoned detection systems shall transmit a building alarm on activation of the first initiating device. Fire protection piping and initiating device, control and annunciation drawings shall be

submitted together. Clean agent systems are supplemental and not permitted to substitute for required automatic sprinkler systems unless specifically approved by the fire code official.

907.7.6.1 Annunciation. Pre-action and clean agent systems shall be provided with a local directory annunciator zoned for manual, smoke detector, flow alarm and tamper supervisory indications per Section 907.7.3.1.1. Systems with under floor and/or above ceiling detection devices shall be provided with a point-lit graphic annunciator in accordance with Section 907.7.3.1.2. Systems shall annunciate alarm and supervisory conditions at the main building fire alarm panel.

Section 907.7.7 Survivability is added:

907.7.7 Survivability. Where occupant relocation or partial evacuation is part of the building life-safety plan, fire alarm system evacuation system survivability shall be provided in accordance with Section 907.6.2.2.5 and NFPA 72. Audible and visible notification appliance circuits shall be designed and installed such that attack by fire within an evacuation zone shall not impair control and operation of the notification appliances outside the evacuation signaling zone.

Exception: Notification appliance circuits shall not be run in stairwells, except for the specific devices located in the stair enclosure.

Section 907.7.7.8 Non-required full or partial systems is added:

907.7.7.8 Non-required full or partial systems. Fire alarm systems and fire detection systems not required in this Code or by special agreement are not required to be connected to a central station. Where non-required fire alarm and/or fire detection systems are connected to a central station, the central station shall be an approved Class I central station. Multiple central station connections from one building are not permitted unless approved by the fire code official. Installation of non-required full or partial fire alarm or fire detection systems shall comply with NFPA 72. Annunciation shall be provided in accordance with Section 907.7.3.1.1. Annunciator and control panels for non-required or partial systems shall be of an approved type and have permanent signage indicating "Non-required System" or "Partial System." Partial and non-required systems shall be maintained operational. System removal shall be permitted only with the approval of the fire code official.

Exception: New and existing dwellings regulated by the *International Residential Code* (IRC).

907.7.7.8.1 General system design and installation requirements. Shop drawings must be submitted for approval. Documents shall be stamped and signed by a professional engineer licensed by the State of Colorado and shall comply with Section 907.1.1. Non-required systems installed in a building with a required fire alarm system shall have the non-required system connected to the required fire alarm control panel. Each non-required system shall annunciate as a separate zone at the required fire alarm control panel. Multiple fire alarm control panels are not allowed where a required system is installed.

907.7.7.8.2 Design criteria for non-required fire alarm systems shall be as follows:

1. A minimum of one audible/visible alarm appliances per floor in an approved location.
2. One initiating device zone per floor.
3. Existing duct detectors are not required to be connected to a non-required system.
4. Secondary power is required for the FACP per NFPA 72.
5. Multiple non-required systems in a building are not required to be interconnected.

SECTION 908
EMERGENCY ALARM SYSTEMS

Section 908.7 Carbon monoxide (CO) detection and alarm systems is added:

908.7 Carbon monoxide (CO) alarms and detectors. CO alarms and detectors shall be installed and maintained in buildings with a fuel-burning appliance or an attached garage or both, and that contain a dwelling unit, and that are regulated by the *International Building Code* (IBC), or by the *International Residential Code* (IRC) per IBC Sections 308.2, 308.5 or 310.

CO alarms, detectors and systems installed in buildings or occupancies that do not meet these criteria are considered non-required and shall comply with Section 908.7.5.

908.7.1 Definitions. The following terms are defined for the purposes of this section.

CENTRAL FUEL-BURNING APPLIANCE ROOM. A room containing a fuel burning appliance serving multiple dwelling units, such as a boiler, fire place, stove, furnace, or similar equipment, with the potential to distribute CO to multiple dwelling units.

CO (CARBON MONOXIDE). A colorless odorless gas that is produced as a result of incomplete burning of carbon-containing fuels.

CO ALARM. A single- or multiple-station device having a sensor that responds to CO and listed per UL 2034 that provides audible notification. Required CO alarms may be monitored by an alarm control unit, but shall be powered independently and shall function autonomously in the event the alarm control unit is nonfunctional.

CO DETECTOR. A device listed per UL 2075 having a sensor that responds to CO, is monitored and powered by an alarm control unit, and does not necessarily have an integral notification appliance.

FUEL-BURNING APPLIANCE. An appliance that burns carbon-containing solid, liquid, and/or gaseous fuels.

MULTIPLE-PURPOSE ALARM. A single device that incorporates the capability to detect more than one hazard, such as smoke, vapors, and/or gases. Multiple purpose devices shall emit audible alarms in a manner that clearly differentiates between the detected hazards.

MULTIPLE STATION ALARM. [1] A single alarm device capable of being physically or wirelessly interconnected to one or more similarly capable devices so the actuation of any one device causes the appropriate notification signal to occur in all interconnected devices. [2] An interconnected group of single-alarm devices defined in [1].

OWNER. The owner of the dwelling, dwelling unit and/or rental unit, a mortgagee or vendee in possession, an assignee of rents, receiver, executor, trustee, or any other person, business, sole proprietorship, partnership, association, or corporation directly or indirectly in control of a building, structure or real property or their authorized agent.

PLUG-IN. CO alarm with battery backup, installed by being plugged into an electrical outlet for primary power.

SINGLE STATION ALARM. A single device comprised of a sensor, alarm-initiating device, control components, and an alarm notification appliance.

TENANT. A person or legal entity who rents a dwelling unit from the owner for a fixed period of time usually under the terms of a lease or a similar legal entitlement or agreement.

908.7.2 Standards. CO alarms and detectors shall comply with the applicable provisions of 2008 NFPA 70, 2010 NFPA 72 and 2009 NFPA 720, including standards referenced therein.

Wherever CO alarms and detectors are specified, multiple-purpose devices are permitted, provided they meet the requirements of all applicable NFPA standards, and:

1. the device is listed for use as a CO alarm/detector (e.g., UL 2034), and
2. where other sensors are permitted and being utilized to satisfy other alarm/functionality provisions of adopted codes, the device is also listed for those operations; e.g.,

    a. UL 217 for *Single and Multiple Station Smoke Alarms*
    b. UL 268 for *Smoke Detectors for Fire Alarm Signaling Systems*
    c. UL 864 for *Control Units for Fire-Protective Signaling Systems*
    d. UL 1484 for *Residential Gas Detectors*
    e. UL 1971 for *Safety and Signaling Devices for Hearing Impaired*
    f. UL 2017 for *General Purpose Signaling Devices and Systems*
    g. UL 2075 for *Gas and Vapor Detectors and Sensors*

908.7.3 When required. CO alarms and detectors shall be installed as specified in Section 908.7.4 in buildings identified in Section 908.7, and for which a building permit is issued after July 1, 2009 for any one or more of the following:

1. New building
2. Addition or relocation of a sleeping room
3. Interior remodel of a dwelling unit
4. Installation of a fuel-burning appliance
5. Change in owner or tenant of a dwelling unit

908.7.4 Installation. Required CO alarms and detectors shall be installed in buildings identified in Section 908.7 as specified in Sections 908.7.4.1 through 908.7.4.5.

CO alarms required in dwelling units in R2, R3, and R4 occupancies managed by a homeowners association or other common management that will maintain the system may be monitored by an alarm control unit, provided individual devices function autonomously as single- and multiple-station devices in the event the alarm control unit fails. Additional or redundant CO alarms and detectors, shall be in accordance with Section 908.7.5.

908.7.4.1 Location. CO alarms shall be installed in dwelling units in the following locations:

1. outside of every sleeping room within 15 ft of the sleeping room doorway,
2. in a central location on every occupiable level, and
3. in a central location in every sleeping room that contains a fuel-burning appliance.

A single device is permitted to fulfill multiple criteria on a single level, provided it meets all of the applicable location requirements.

908.7.4.2 In existing buildings. CO alarms may be hard-wired, battery-powered, or plug-in, and may be single-or multiple-station.

Exception: Low power radio systems installed in accordance with NFPA 72, NFPA 720 and listed per UL 864 may be battery-powered.

908.7.4.3 In new buildings. CO alarms shall be multiple-station and hard-wired with battery backup.

Exception: Low power radio systems installed in accordance with NFPA 72, NFPA 720 and listed per UL 864 may be battery-powered.

908.7.4.4 Central fuel burning appliance rooms. CO detectors monitored by the building fire alarm system shall be installed in all central fuel-burning appliance rooms in new buildings for which a building permit was issued after July 1, 2009, and in central fuel burning appliance rooms in existing buildings containing a fuel burning appliance for which an installation permit was issued by the Building Department after July 1, 2009. Each central fuel-burning appliance room shall be annunciated on its own zone.

Exception: In existing buildings, battery-powered or plug-in single- or multiple-station CO alarms may be installed in central fuel-burning appliance rooms in lieu of system detectors, and need not be monitored by a fire alarm system.

Devices shall be installed within 25 feet of every fuel-burning appliance and initiate an alarm condition when activated. A single device is permitted to fulfill multiple location criteria in a single central fuel-burning appliance room.

908.7.4.5 Visual notification. Where visual notification is installed or accommodated per Sections 907.6.2.3.3 and 907.6.2.3.4 for smoke alarms, visual notification shall be similarly installed or accommodated for CO alarms and detectors.

908.7.5 Non-required CO alarms and detectors. CO alarms and detectors installed in buildings or occupancies not meeting the criteria identified in Section 908.7, or installed in addition to those required by Sections 908.7.3 or 908.7.4.4, that are monitored by a central station or used for occupant notification shall comply with Section 908.7.2. Subject to the fire code official, non-required CO alarms do not need to function autonomously in case of alarm control unit failure.

908.7.6 Maintenance. Required and non-required CO alarms and detectors shall be maintained in proper working order in accordance with Section 908.7.2 and manufacturer's specifications.

Section 908.8 Emergency alarms is added: (Section relocated from 907.2.5.1)

908.8 Emergency alarms. Where emergency alarms are required by Section 908 and a fire alarm or sprinkler alarm system is provided, emergency alarm initiating devices and notification appliances shall be connected to the fire alarm or sprinkler alarm system and transmit an alarm signal to the monitoring station, where provided. The emergency alarm devices serving this area shall be distinctly annunciated as a separate zone at the building annunciator panel and provide a local audible/visual alarm to notify occupants.

Section 909 Smoke Control Systems is replaced in its entirety with the following:

SECTION 909
SMOKE CONTROL SYSTEMS

909.1 Scope and purpose. This section applies to mechanical smoke control systems when they are required by other provisions of this code. The purpose of this section is to establish minimum requirements for the design, installation and acceptance testing of smoke control systems that are intended to provide a tenable environment for the evacuation or relocation of occupants. Smoke control systems regulated by this section

serve a different purpose than the smoke- and heat-venting provisions found in Section 910. Mechanical smoke control systems shall not be considered exhaust systems under Chapter 5 of the *International Mechanical Code*.

909.2 General design requirements. Buildings, structures or parts thereof required by this code to have a smoke control system or systems shall have such systems designed in accordance with the applicable requirements of Section 909 and the generally accepted and well-established principles of engineering relevant to the design. The construction documents shall include sufficient information and detail to adequately describe the elements of the design necessary for the proper implementation of the smoke control systems. These documents shall be accompanied by sufficient information and analysis to demonstrate compliance with these provisions.

909.2.1 Specific requirements – Pressurization systems. Stairway pressurization systems and hoistway pressurization systems shall be provided for all high-rise buildings. The inclusion of these systems may be used to offset specific requirements for other building components, as described in other Sections of the Code; however, the use of other building components may not be used to circumvent the requirement for including these systems.

Exception: Where stairway enclosures directly open into open exterior balconies.

909.2.2 Specific requirements – Smoke exhaust systems. A smoke exhaust system(s) shall be provided for all high-rise buildings. The smoke exhaust system(s) shall be configured and controlled to exhaust the fire floor or fire zone. This requirement shall be applicable to the Occupancy Groups as follows: A; B; E; M; R-1; R-2, and I-1 and I-3.

909.2.3 Specific requirements – Construction document submittals. Construction documents for smoke control systems shall be submitted for permit application with the construction drawings for the project per IBCA Section 154, including the seal and signature of the design professional responsible for the coordination of the smoke control design package. Included within this submittal shall be the following.

1. Code reference used as a basis of design, including any administrative modifications or Board of Appeals decisions.
2. Plans identifying each smoke control zone including a listing of smoke control equipment (fans) associated with each respective zone. A combination of vertical (section), horizontal (plan) and/or schematic views may be necessary to clearly depict each zone.
3. Plans shall identify location of smoke control duct inlet/discharge locations and all fire/smoke damper locations.
4. Detailed description of the systems interface to the emergency power system and plans detailing locations of panels (with schedules) and associated circuits and disconnects.
5. Plans shall identify HVAC systems operating status (i.e. on/off) during a smoke control scenario, e.g., toilet exhaust, general HVAC, etc.
6. Written narrative sequence of operation for the complete smoke control system.
7. Basic fire alarm drawings shall be developed with sufficient detail to demonstrate system control/sequence.
8. Fans sizing calculations for each zone including stairways and hoistways.
9. Preliminary acceptance testing plan and procedure.

909.2.4 Specific requirements – Shop drawing submittals (deferred submittal). The deferred submittal shall be consistent with the approved construction document submittal and reviewed by the engineer of record prior to submission to the Denver Fire Department in accordance with Appendix K.

909.3 Special inspection and test requirements. Refer to Section 909.18.

909.4 Analysis. A rational analysis supporting the types of smoke control systems to be employed, their methods of operation, the systems supporting them and the methods of construction to be utilized shall accompany the submitted construction documents and shall include, but not be limited to, the items indicated in Sections 909.4.1 through 909.4.6. Refer to Section 909.21 Alternative design approach.

909.4.1 Stack effect. The system shall be designed such that the maximum probable normal or reverse stack effect will not adversely interfere with the system's capabilities. In determining the maximum probable stack effect, altitude, elevation, weather history and interior temperatures shall be used.

909.4.2 Temperature effect of fire. Buoyancy and expansion caused by the design fire in accordance with Section 909.9 shall be analyzed. The system shall be designed such that these effects do not adversely interfere with the system's capabilities.

909.4.3 Wind effect. The design shall consider the adverse effects of wind. Such consideration shall be consistent with the wind-loading provisions of ASHRAE Fundamentals Handbook.

909.4.4 HVAC systems. The design shall consider the effects of the heating, ventilating and air conditioning (HVAC) systems on both smoke and fire transport. The analysis shall include all permutations of systems status. The design shall consider the effects of the fire on the HVAC systems.

909.4.5 Climate. The design shall consider the effects of low temperatures on systems, property and occupants. Air inlets and exhausts shall be located so as to prevent snow or ice blockage.

909.4.6 Duration of operation. All portions of active or passive smoke control systems shall be capable of continued operation after detection of the fire event for a period of not less than either 20 minutes or 1.5 times the calculated egress time, whichever is less.

909.5 Smoke barrier construction. Smoke barriers shall comply with IBC Section 710, and shall be constructed and sealed to limit leakage areas exclusive of protected openings. The maximum allowable leakage area shall be the aggregate area calculated using the following leakage area ratios:

1. Walls: $A/A_w = 0.00100$
2. Exit enclosures: $A/A_w = 0.00035$
3. All other shafts: $A/A_w = 0.00150$
4. Floors and roofs: $A/A_F = 0.00050$

where:

A = Total leakage area, square feet (m^2)

A_F = Unit floor or roof area of barrier, square feet (m^2)

A_w = Unit wall area of barrier, square feet (m^2)

The leakage area ratios shown do not include openings due to doors, operable windows or similar gaps. These shall be included in calculating the total leakage area.

909.5.1 Leakage area. The total leakage area of the barrier is the product of the smoke barrier gross area multiplied by the allowable leakage area ratio, plus the area of other openings such as gaps and operable windows. Compliance shall be determined by achieving the minimum air pressure difference across the barrier with the system in the smoke control mode for mechanical smoke control systems. Passive smoke

control systems tested using other approved means such as door fan testing shall be as approved by the fire code official.

909.5.2 Opening protection. Openings in smoke barriers shall be protected by automatic-closing devices actuated by the required controls for the mechanical smoke control system. Door openings shall be protected by fire door assemblies complying with IBC Section 715.4.3.

Exceptions:

1. Passive smoke control systems with automatic-closing devices actuated by spot-type smoke detectors listed for releasing service installed in accordance with Section 907.4.

2. Fixed openings between smoke zones that are protected utilizing the airflow method.

3. In Group I-2, where such doors are installed across corridors, a pair of opposite-swinging doors without a center mullion shall be installed having vision panels with fire protection-rated glazing materials in fire protection-rated frames, the area of which shall not exceed that tested. The doors shall be close-fitting within operational tolerances and shall not have undercuts, louvers or grilles. The doors shall have head and jamb stops, astragals or rabbets at meeting edges and shall be automatic-closing by smoke detection in accordance with Section 715.4.8.3. Positive-latching devices are not required.

4. Group I-3.

5. Openings between smoke zones with clear ceiling heights of 14 feet (4267 mm) or greater and bank-down capacity of greater than 20 minutes as determined by the design fire size.

909.5.2.1 Ducts and air transfer openings. Ducts and air transfer openings are required to be protected with a minimum Class II, 250°F (121° C) smoke damper complying with IBC Section 716. IBC Section 716.5.3 Exceptions 1.3 and 1.4 for shaft enclosures shall not apply.

909.6 Pressurization method. The primary mechanical means of controlling smoke shall be by pressure differences across smoke barriers. Maintenance of a tenable environment is not required in the smoke control zone of fire origin.

909.6.1 Minimum pressure difference. The minimum pressure difference across a smoke barrier shall be 0.05-inch water gage (0.0124 kPa) in fully sprinklered buildings. In buildings permitted to be other than fully sprinklered, the smoke control system shall be designed to achieve pressure differences at least two times the maximum calculated pressure difference produced by the design fire.

909.6.2 Maximum pressure difference. The maximum air pressure difference across a smoke barrier shall be determined by required door-opening or closing forces. The actual force required to open exit doors when the system is in the smoke control mode shall be in accordance with Section 1008.1.3. Opening and closing forces for other doors shall be determined by standard engineering methods for the resolution of forces and reactions. The calculated force to set a side-hinged, swinging door in motion shall be determined by:

$F = F_{dc} + K(WA\Delta P)/2(W-d)$ **(Equation 9-1)**

where:

A = Door area, square feet (m^2).
d = Distance from door handle to latch edge of door, feet (m).
F = Total door opening force, pounds (N).
F_{dc} = Force required to overcome closing device, pounds (N).

K = Coefficient 5.2 (1.0).
W = Door width, feet (m).
ΔP = Design pressure difference, inches of water (Pa).

909.7 Airflow design method. When approved by the fire code official, smoke migration through openings fixed in a permanently open position, which are located between smoke control zones by the use of the airflow method, shall be permitted. The design airflow shall be in accordance with this section. Airflow shall be directed to limit smoke migration from the fire zone. The geometry of openings shall be considered to prevent flow reversal from turbulent effects.

909.7.1 Velocity. The minimum average velocity through a fixed opening shall not be less than:

$v = 217.2 [h (T_f - T_o)/(T_f + 460)]^{1/2}$ **(Equation 9-2)**

For SI: $v = 119.9 [h (T_f - T_o)/T_f]^{1/2}$

where:

h = Height of opening, feet (m).
T_f = Temperature of smoke, °F (K).
T_o = Temperature of ambient air, °F (K).
v = Air velocity, feet per minute (m/minute).

909.7.2 Prohibited conditions. This method shall not be employed where either the quantity of air or the velocity of the airflow will adversely affect other portions of the smoke control system, unduly intensify the fire, disrupt plume dynamics or interfere with exiting. In no case shall air flow toward the fire exceed 200 feet per minute (1.02 m/s). Where the formula in Section 909.7.1 requires airflow to exceed this limit, the airflow method shall not be used.

909.8 Exhaust method. When approved by the fire code official, mechanical smoke control for large enclosed volumes, such as in atriums or malls, shall be permitted to utilize the exhaust method. Smoke control systems using the exhaust method shall be designed in accordance with NFPA 92B.

909.8.1 Smoke layer. The height of the lowest horizontal surface of the accumulating smoke layer shall be maintained at least 6 feet (1829 mm) above any walking surface that forms a portion of a required egress system within the smoke zone.

909.9 Design fire. The design fire shall be based on a rational analysis performed by the registered design professional and approved by the fire code official. The design fire shall be based on the analysis in accordance with this section.

909.9.1 Factors considered. The engineering analysis shall include the characteristics of the fuel, fuel load, effects included by the fire and whether the fire is likely to be steady or unsteady.

909.9.2 Separation distance. Determination of the design fire shall include consideration of the type of fuel, fuel spacing and configuration.

$R = [Q/(12\pi q")]^{1/2}$ **(Equation 9-8)**

where:

q" = Incident radiant heat flux required for nonpiloted ignition, $Btu/ft^2 \cdot s$ (W/m^2).
Q = Heat release from fire, Btu/s (kW).
R = Separation distance from target to center of fuel package, feet (m).

909.9.3 Heat-release assumptions. The analysis shall make use of best available data from approved sources and shall not be based on excessively stringent limitations of combustible material.

909.9.4 Sprinkler effectiveness assumptions. A documented engineering analysis shall be provided for conditions that assume fire growth is halted at the time of sprinkler activation.

909.10 Equipment. Equipment including, but not limited to, fans, ducts, automatic dampers and balance dampers, shall be suitable for its intended use, suitable for the probable exposure temperatures that the rational analysis indicates and as approved by the fire code official. Provide fire/smoke dampers at shaft enclosures. IBC Section 716.5.3 Exceptions 1.3 and 1.4 shall not apply. Provide fire damper rating of no less the 250° F. For systems where the probable temperature rise to which the damper will be exposed may exceed 250° F., the temperature rise shall be computed in accordance with this section.

909.10.1 Exhaust fans. Components of exhaust fans shall be rated and certified by the manufacturer for an operating temperature rating of no less than 250°F. For systems where the probable temperature rise to which the components will be exposed may be higher than 250° F., the temperature rise shall be computed by:

$T_s = (Q_c/mc) + (T_a)$ **(Equation 9-9)**

where:

c = Specific heat of smoke at smoke layer temperature, Btu/lb°F · (kJ/kg · K).
m = Exhaust rate, pounds per second (kg/s).
Q_c = Convective heat output of fire, Btu/s (kW).
T_a = Ambient temperature, °F (K).
T_s = Smoke temperature, °F (K).

Exception: Reduced T_s as calculated based on the assurance of adequate dilution air.

909.10.2 Ducts. Duct materials and joints shall be capable of withstanding the probable temperatures and pressures to which they are exposed during smoke control operating conditions. Ducts shall be constructed and supported in accordance with the *International Mechanical Code*. Ducts shall be leak tested to 1.5 times the maximum design pressure in accordance with nationally accepted practices. Measured leakage shall not exceed 5 percent of design flow. Results of such testing shall be a part of the documentation procedure. Ducts shall be supported directly from fire-resistance-rated structural elements of the building by substantial, noncombustible supports.

Exception: Flexible connections (for the purpose of vibration isolation) complying with the *International Mechanical Code*, that are constructed of approved fire-resistance-rated materials.

909.10.3 Equipment, inlets and outlets. Equipment shall be located so as to not expose uninvolved portions of the building to an additional fire hazard. Outside air inlets shall be located so as to minimize the potential for introducing smoke or flame into the building. Exhaust outlets shall be so located as to minimize reintroduction of smoke into the building and to limit exposure of the building or adjacent buildings to an additional fire hazard.

909.10.4 Automatic dampers. Automatic dampers, regardless of the purpose for which they are installed within the smoke control system, shall be listed and conform to the requirements of approved, recognized standards.

909.10.5 Fans. In addition to other requirements, belt-driven fans shall have 1.5 times the number of belts required for the design duty, with the minimum number of belts being two. Fans shall be selected for stable performance based on normal temperature and, where applicable, elevated temperature. Calculations and manufacturer's fan curves shall be part of the documentation procedures. Fans shall be supported and restrained by noncombustible devices in accordance with the structural design requirements of IBC Chapter 16. Motors driving fans shall not be operated beyond their nameplate horsepower

(kilowatts), as determined from measurement of actual current draw, and shall have a minimum service factor of 1.15.

909.11 Power systems. The smoke control system shall be supplied with two sources of power. Primary power shall be from the normal building power system. Secondary power shall be from an approved emergency source complying with the ICC Electrical Code. The emergency power source and its transfer switches shall be in a separate room from the normal power transformers and switch gear and shall be enclosed in a room constructed of not less than 1-hour fire barriers ventilated directly to and from the exterior. Power distribution from the two sources shall be by independent routes. Transfer to full emergency power shall be automatic and within 10 seconds of failure of the primary power. The systems shall comply with this code or NFPA 70.

909.11.1 Power sources and power surges. Elements of the smoke management system relying on volatile memories or the like shall be supplied with uninterruptible power sources of sufficient duration to span a 15-minute primary power interruption. Elements of the smoke management system susceptible to power surges shall be suitably protected by conditioners, suppressors or other approved means.

909.12 Detection and control systems. Fire detection systems providing control input or output signals to mechanical smoke control systems or elements thereof shall comply with the requirements of Section 907. Such systems shall be equipped with a control unit complying with UL 864 and listed as smoke control equipment. Control systems for mechanical smoke control systems shall include provisions for verification. Verification shall include positive confirmation of actuation, testing, manual override, and, through a preprogrammed weekly test sequence, report abnormal conditions audibly, visually and by printed report.

909.12.1 Wiring. In addition to meeting requirements of NFPA 70, all wiring, regardless of voltage, shall be fully enclosed within continuous raceways in mechanical rooms, electrical rooms, elevator equipment rooms and vertical risers. Wiring shall not be painted.

909.12.2 Activation. Smoke control systems shall be activated in accordance with Section 907.

909.12.2.1 Pressurization, airflow or exhaust method. Mechanical smoke control systems using the pressurization, airflow or exhaust method shall have completely automatic control.

909.12.2.2 Passive method. Passive smoke control systems actuated by approved spot-type detectors listed for releasing service shall be permitted.

909.12.3 Automatic control. Refer to Section 907.

909.13 Control air tubing. Control air tubing shall be of sufficient size to meet the required response times. Tubing shall be flushed clean and dry prior to final connections and shall be adequately supported and protected from damage. Tubing passing through concrete or masonry shall be sleeved and protected from abrasion and electrolytic action.

909.13.1 Materials. Control air tubing shall be hard drawn copper, Type L, ACR in accordance with ASTM B 42, ASTM B 43, ASTM B 68, ASTM B 88, ASTM B 251 and ASTMB280. Fittings shall be wrought copper or brass, solder type, in accordance with ASME B 16.18 or ASME B16.22. Changes in direction shall be made with appropriate tool bends. Brass compression-type fittings shall be used at final connection to devices; other joints shall be brazed using a BCuP5 brazing alloy with solids above 1,100°F (593° C) and liquids below 1,500° F (816° C). Brazing flux shall be used on copper-to-brass joints only.

Exception: Nonmetallic tubing used within control panels and at the final connection to devices, provided that all of the following conditions are met:

1. Tubing shall be listed by an approved agency for flame and smoke characteristics.

2. Tubing and connected devices shall be completely enclosed within galvanized or paint- grade steel enclosure of not less than 0.030 inch (0.76 mm) (No. 22 galvanized sheet gage) thickness. Entry to the enclosure shall be by copper tubing with a protective grommet of neoprene or Teflon or by suitable brass compression to male-barbed adapter.

3. Tubing shall be identified by appropriately documented coding.

4. Tubing shall be neatly tied and supported within enclosure. Tubing bridging cabinet and door or moveable device shall be of sufficient length to avoid tension and excessive stress. Tubing shall be protected against abrasion. Tubing serving devices on doors shall be fastened along hinges.

909.13.2 Isolation from other functions. Control tubing serving other than smoke control functions shall be isolated by automatic isolation valves or shall be an independent system.

909.13.3 Testing. Control air tubing shall be tested at three times the operating pressure for not less than 30 minutes without any noticeable loss in gauge pressure prior to final connection to devices.

909.14 Marking and identification. The detection and control systems shall be clearly marked at all junctions, accesses and terminations.

909.15 Control diagrams. Identical control diagrams showing all devices in the system and identifying their location and function shall be maintained current and kept on file with building management and in the fire command center in an approved format and manner.

909.16 Firefighter's smoke control panel. A firefighter's smoke control panel meeting the requirements of UL 864 and listed for smoke control under UL product category guide designation UUKL shall be provided and shall include manual control or override of automatic control for mechanical smoke control systems. Upon an alarm, the fire alarm system shall take direct control of all smoke control system components such as fans, dampers, activation of dedicated pressure control systems and status indication. The fire alarm system shall provide a signal to any temperature control or building automation systems for HVAC system enable/disable control and status. Where HVAC systems are utilized for smoke control the fire alarm system shall take direct control of those HVAC system components utilized for smoke control. Hard-wired interlock is acceptable. The fire alarm system shall provide automatic and manual override control and status. Terminal air distribution units may remain under their own normal building automation control. The panel shall be located in a fire command center complying with Section 509 in high rise buildings or buildings with smoke-protected assembly seating. In all other buildings, the firefighter's smoke control panel shall be installed in an approved location adjacent to the fire alarm control panel. The firefighter's smoke control panel shall comply with Appendix K.

909.16.1 Smoke control systems. The firefighter's control panel shall be provided for manual or override of automatic control of mechanical smoke control systems. This panel shall graphically depict the individual smoke control system fan and damper controls, their relative location within the building, stairwells, hoistways, building pressurization and exhaust airflow, refuge area pressurization and all other smoke control zones that apply. This panel shall clearly show the building arrangement and smoke control zones served by the systems. The graphic panel shall be oriented to the building and include a North reference compass point. A combination of vertical (section) and/or horizontal (plan) graphic arrangement may be necessary. The operating control and status indicators on the FSCP shall have a maximum height from the floor of 6 feet, 6 inches and a minimum of 2 feet, 0 inches, and may require more than one section to accommodate height limitations. Layout, labeling and location of the fire fighters control panel shall be reviewed and approved by the Fire Department prior to fabrication.

909.17 System response time. Smoke control system activation shall be initiated immediately after receipt of an appropriate automatic or manual activation command. Smoke control systems shall activate individual components (such as dampers and fans) in the sequence necessary to prevent physical damage to the fans, dampers, ducts and other equipment. The total response time for individual smoke control systems to achieve their desired operating mode shall not exceed the following time periods:

Fan operating at desired state – 75 seconds

Damper position travel – 60 seconds

909.18 Testing of smoke control systems. Before the Fire Department accepts the smoke control systems and prior to initial occupancy, the smoke control systems shall be tested in their presence to confirm that the systems operate in compliance with this Section. In addition, all smoke control systems shall be tested annually and shall be maintained to perform its intended purpose under the code version with which it was built.

909.18.1 Acceptance testing. The requirements of acceptance testing defined hereinafter shall be the minimum requirements. All acceptance tests shall be witnessed by a Fire Department representative.

1. Furnish a testing procedure, reviewed by the smoke control system design professional engineer, to the Fire Department 72 hrs in advance of the acceptance tests being performed. The procedure shall define how compliance with the code will be demonstrated. The procedure shall also identify what instrumentation, including artificial smoke generating equipment, will be used during the testing.

2. Smoke control systems testing shall include the following subsystems to the extent that they affect the operation of the smoke-control system:

    a. Fire alarm system (See NFPA 72, *National Fire Alarm Code*)
    b. Building Automation & Temperature Control System
    c. HVAC equipment
    d. Electrical equipment
    e. Power sources including Emergency or Standby power
    f. Automatic suppression systems
    g. Automatic operating doors and closers
    h. Dedicated and Non-dedicated smoke-control systems
    i. Emergency elevator operation

3. Prior to witnessed acceptance testing of the smoke control systems, the design professional engineer shall confirm and advise the Fire Department in writing that the entire smoke control system has been installed, air balanced and tested in accordance with its design, plans, specifications and this code.

4. The following shall be notified so that they may witness the acceptance testing:

    a. Design professional Engineer-of-Record
    b. Building contractor
    c. Owner's representative
    d. Denver Fire Department
    e. Denver Building Department

5. Unless otherwise approved by the Fire Department, sufficient smoke shall be generated to produce at least the volume of the smoke zone being tested within approximately five (5) minutes. All smoke-generating devices shall be supplied by the owner or his representative and shall meet with the approval of the fire code official.

6. Acceptance testing shall demonstrate that the correct outputs are produced for a given input for each control sequence specified. The following control sequences shall demonstrate complete smoke-control sequence.

    a. Normal mode
    b. Automatic smoke-control mode for first alarm
    c. Manual override of normal and automatic smoke-control modes
    d. Return to normal

7. After the smoke control system is activated, smoke shall not continue to migrate to other smoke zones of the building.

8. Smoke control systems shall demonstrate the ability to inhibit smoke from migrating across smoke zone boundaries to other areas and containment within the active smoke zone. Smoke control system shall also demonstrate the continual reduction of smoke concentration from within the active smoke zone.

909.18.2 Testing requirements. Tests shall be performed in full automatic mode with the building operating under both normal power and emergency power. Test equipment shall include manometer (calibrated within last 12 months), spring scale and other equipment as necessary to adequately measure and record system performance. Communications shall be provided between the test locations and the fire command center.

1. For a building that is not a high rise, multiple tests on more than one floor or smoke zone shall be required to demonstrate proper operation.

2. For high rise buildings, tests shall be conducted at a minimum of five (5) locations.

    a. A floor in the lower third, a floor in the middle third and a floor in the upper third of the building.

    b. With a floor in alarm, an additional automatic alarm shall be initiated on a floor immediately above or below the initial floor in alarm. All floors in alarm shall go to exhaust mode

    c. With a floor in alarm, a manual pull station on another floor shall be activated. Smoke control operation shall not be affected.

    d. For atriums, more than one test may be required depending upon the atrium configuration, its relationship to adjacent spaces and if the atrium is located in a high-rise.

    e. Activation of one smoke detector in each smoke control zone on each floor being tested.

    f. Activation of at least one sprinkler flow switch.

    g. Activation of at least one manual pull station.

3. For high rise buildings, pressure differentials shall be measured across stairway doors, across elevator/lobby/refuge corridor area doors and adjoining spaces, between atriums and areas

immediately adjacent to atriums where atriums are part of a high rise building. Door opening force into stair enclosures or refuge areas shall not exceed 30 lbs. under any conditions.

4. Upon activation of the fire alarm system for each test, confirm that the smoke control system fans and dampers have assumed the correct operating condition for the type of alarm initiating device and the location of the initiating device. This shall be confirmed also at the smoke control panel in the fire command center.

5. Manually override the operation of a sampling of fans and dampers during each test, taking care not to damage system components. Return all override switches to their "auto" position after each test.

909.18.3 Annual tests. Annual tests shall be performed in accordance with Sections 909.18.3.1 and 909.18.3.2, on all smoke control systems including those installed prior to adoption of this code. It is recognized that smoke control systems installed prior to adoption of this Code could have parameters that are different than those described in this section. In those cases, smoke control tests shall be adjusted accordingly to meet the intent of this section.

For high-rise buildings, every fifth year the annual test shall be performed in the presence of a representative of the Denver Fire Department Fire Prevention or Operations Division. DFD shall be notified five (5) days in advance of this test to determine a mutually-agreed upon date and time for performance of this test. An operational permit is required for this testing per IFCA 105.6.44.

909.18.3.1 Equipment operating tests. The following equipment operating tests shall be conducted annually on the smoke control system components:

1. Verify the proper control and status indication of smoke control dampers (i.e., "OPEN/CLOSED") and fans (i.e., "ON/OFF") by visual observation at each damper and fan location and at the smoke control status/control panel in the fire command center.
2. Verify that all smoke control dampers and fans assume the correct operating position under both normal and fire modes and when the manual override switches at the smoke control status/control panel are placed in the "auto" position.
3. Verify that the manual override switches function properly for smoke control dampers and fans.
4. Items l, 2 and 3 above may be performed by qualified service technicians who are familiar with the proper operation of the smoke control systems and equipment. The engineer responsible for conducting the smoke control system performance tests shall develop the test procedures to be used and review the results obtained by the service technicians, including an actual sampling to confirm the accuracy of the test. A statement summarizing this review shall be included in the performance test report described in Section 909.18.4 that is required to be submitted by the engineer to the Fire Department.
5. A copy of the written test procedure and an accurate log of tests shall be maintained in the fire command center and at either the building management office or the maintenance office. A copy of the previous test report shall be submitted to the engineer responsible for the smoke control performance tests for the engineer's review and approval prior to the smoke control test. Any defects, system modifications and repairs shall be recorded in the log. Necessary corrections shall be made prior to the smoke control performance test.

909.18.3.2 Performance tests. Within 30 days after completion of annual equipment operating tests defined above, conduct the following smoke control system performance tests. The annual smoke control systems tests shall be conducted under the direct supervision of a professional engineer qualified in the testing of such smoke control systems.

1. Activate the smoke control systems manually for tests used to confirm minimum pressure differentials defined in this section.
2. Activate the smoke control systems automatically through the fire alarm system for tests used to confirm proper sequencing of the system components. Measure actual relative pressure differentials between areas in alarm and adjacent areas and actual door opening forces.
3. For high rise buildings, conduct smoke control tests, observations and measurements of all aspects of the smoke control system at a minimum of three (3) locations: a floor in the lower third, a floor in the middle third and a floor in the upper third of the building. Smoke control tests in subsequent years shall be conducted on previously untested floors, as may be practical so that all floors ultimately are tested.
4. For all other buildings, conduct smoke control tests, observations and measurements of all aspects of the smoke control system at a minimum number of locations to demonstrate proper performance as approved by the Fire Department. Each test shall attempt to involve as many different fan systems as practical. Smoke control tests in subsequent years shall be conducted on previously untested locations, as may be practical so that all locations ultimately are tested over a three year period.
5. Tests of the smoke control system shall be conducted by activation of at least one smoke detector in each smoke control zone on each floor being tested. One test of at least one of the smoke control zones shall include activation of one sprinkler flow switch. In addition, the smoke control tests shall include activation of at least one manual fire alarm box. For high rise buildings, pressure differentials shall be measured across stairway doors, between floors in alarm and floors immediately above and below floors in alarm, across elevator/lobby/refuge corridor area doors and adjoining spaces in Group R-1, R-2 or I-1 occupancies, and between atriums and areas immediately adjacent to atriums where atriums are part of high rise buildings.
6. Upon activation of the fire alarm system for each test, confirm that the smoke control system fans and dampers have assumed the correct operating condition for the type of alarm initiating device and the location of the initiating device. This shall be confirmed also at the smoke control panel in the fire command center.
7. Manually override the operation of a sampling of fans and dampers during each test, taking care not to damage system components. Return all override switches to their "auto" position after each test.

909.18.4 Test reports. Within 30 days of completing any smoke control test, submit a test report to the Fire Department. A copy of the previous and current test reports shall be kept in the fire command center. The test report shall be written by the professional engineer who conducted the testing. The test report shall bear the seal and signature of the professional engineer. Any defects, modifications and repairs shall be recorded in a log kept in the fire command center and at either the building management office or the maintenance office. The test report shall include, but is not limited to the following:

1. Provide a brief description of the smoke control system installed in the building being tested, and state the year the building received its construction permit for the smoke control system. Provide a sequence of operation for the smoke control system.
2. Describe in general terms the equipment operating test procedures. Include a list of the equipment operating and smoke control test deficiencies along with a schedule of the proposed corrective action.
3. Describe detailed procedures followed during the equipment operating tests. Describe detailed procedures followed during the smoke control tests.

4. List test equipment used and outside air temperature and wind conditions at the time the smoke control tests were conducted.
5. State sequences and timing of the system operations during all smoke control tests (e.g., smoke detector activation time, fan start times, time for dampers to assume the correct position, etc.).
6. List the location of test measurements and the measured values for pressure differentials and door-opening forces for each test location.
7. Record any operational defects and performance deficiencies with respect to the requirements of this section, and state recommendations for corrective action. Include a schedule to re-test each deficiency. Submit results of any subsequent tests performed after completion of the corrective action.
8. Engineer's assessment indicating that the smoke control system, as installed and tested, conforms to the requirements of Section 909.

909.18.5 Functional test requirements for smoke control system equipment. Testing of smoke control equipment shall be performed in accordance with this section to determine that the installed systems continue to operate in accordance with the approved design. Operational testing of the smoke control system shall include all equipment such as fans, dampers, controls, and doors. Testing shall include positive confirmation of actuation. System equipment and components shall be exercised for sufficient time to provide positive confirmation of proper operation or fault condition.

909.18.5.1 Written record. Results of the tests shall be documented in the building's life safety systems testing and maintenance log and printed reports generated during the automated testing. Testing documents must be maintained on-site in the fire command center or in a location approved by the fire code offical.

909.18.5.2 Dedicated systems.

909.18.5.2.1 Dedicated systems shall be tested quarterly.

909.18.5.2.2 The smoke-control system shall be operationally tested as prescribed in Section 909.18.5. Dedicated smoke control systems shall be operated for each control sequence.

909.18.5.2.3 Operation of the correct outputs for each given input shall be verified and recorded.

909.18.5.3 Non-dedicated systems.

909.18.5.3.1 Non-dedicated systems shall be tested semiannually.

909.18.5.3.2 The smoke-control system shall be operationally tested as prescribed in Section 909.18.5. Nondedicated smoke control systems shall be operated on a representative sample of each type of equipment sufficient to verify proper operation for each control sequence. For high rise buildings, tests shall be conducted at a minimum of three (3) locations: a floor in the lower third, a floor in the middle third and a floor in the upper third of the building. Tests in subsequent years shall be conducted on previously untested floors, as may be practical so that all floors ultimately are tested. For all other buildings, tests shall be conducted at a minimum number of locations to demonstrate proper performance as approved by the Fire Department. Tests in subsequent years shall be conducted on previously untested locations, as may be practical, so that all locations ultimately are tested over a three year period.

909.18.5.3.3 Operation of the correct outputs for each given input shall be verified and recorded.

909.18.6 System repairs and maintenance. All deficiencies noted in the annual report will be corrected within 30 days and, if required by the engineer, the smoke control system shall be re-tested. All smoke

control systems will be maintained to perform its intended purpose under the code version with which it was built. As stated in Section 107.5, correction and abatement of violations of this code shall be the responsibility of the owner. With approval of the Denver Building Department and the Denver Fire Department smoke control systems may be remodeled to comply with current code.

909.19 System acceptance. Buildings, or portions thereof, required by this code to comply with this section shall not be issued a certificate of occupancy until such time that the fire code official determines that the provisions of this section have been fully complied with and that the fire department has received satisfactory instruction on the operation, both automatic and manual, of the system.

Exception: In buildings of phased construction, a temporary certificate of occupancy, as approved by the fire code official, shall be allowed provided that those portions of the building to be occupied meet the requirements of this section and that the remainder does not pose a significant hazard to the safety of the proposed occupants or adjacent buildings.

909.20 Smokeproof enclosures. For buildings required to comply with Sections 403 or 405, a smokeproof enclosure shall consist of an enclosed, pressurized stairway conforming to IBCA Section 1022.9 and Section 909.20.1.

909.20.1 Construction. Smokeproof vertical exit enclosures shall be separated from the remainder of the building by not less than a 2-hour fire-resistance-rated fire barrier without openings other than the required means of egress doors. The open exterior balcony shall be constructed in accordance with the fire-resistance-rating requirements for floor construction.

909.20.1.1 Door closers. Doors in a smokeproof enclosure shall be self-closing or shall be automatic closing by actuation of a smoke detector installed at the floor-side entrance to the smokeproof enclosure. The actuation of the smoke detector on any door shall activate the closing devices on all doors in the smokeproof enclosure at all levels. Smoke detectors shall be installed in accordance with Section 907.

909.20.2 Stair pressurization alternative. Stairway pressurization shall comply with Section 909.21.4

909.20.3 Ventilating equipment. The activation of ventilating equipment shall be as required in this section.

909.20.3.1 Ventilation systems. Smokeproof enclosure ventilation systems shall be independent of other building ventilation systems. The equipment and ductwork shall comply with one of the following:

1. Equipment and ductwork shall be located exterior to the building and directly connected to the smokeproof enclosure or connected to the smokeproof enclosure by ductwork enclosed by two-hour fire barriers.

2. Equipment and ductwork shall be located within the smokeproof enclosure with intake or exhaust directly from and to the outside or through ductwork enclosed by two-hour fire barriers.

3. Equipment and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by two-hour fire barriers.

909.20.3.2 Emergency power. Mechanical hoistway and stair shaft ventilation systems and automatic fire detection systems shall be powered by an approved emergency power system conforming to Section 6042.2 and Chapter 27.

909.20.3.3 Acceptance and testing. In accordance with Section 909.18.

909.21 Alternative design approach.

909.21.1 Scope and purpose. The purpose of this section is to establish minimum requirements for the design and installation of smoke control systems, which are intended to provide a tenable environment for the evacuation or relocation of occupants. Nothing within these requirements is intended to apply when smoke control is not otherwise required by this code. Smoke control systems will not be accepted as a substitute for automatic fire sprinkler system protection.

909.21.2 Design criteria.

909.21.2.1 Minimum pressure differential. The minimum pressure differential across stairway and hoistway fire and smoke proof enclosures, on non-fire floors, shall be 0.05-inch water gauge (0.0124 kPa), positive from the stairway or hoistway to the fire floor.

909.21.2.2 Maximum door opening force. The maximum pressure difference across a fire barrier shall be determined by the required door-opening or door-closing forces. Door opening force shall not exceed 30 pounds applied horizontally at the latch side of the door on the door-opening device under any operating condition. Maximum door opening force shall not exceed 15 pounds during a non-fire mode of operation.

909.21.2.3 Resistance to smoke recirculation. Locate outdoor air intakes for pressurization systems remote from points of discharge for smoke exhaust systems, in order to minimize the potential for recirculation of smoke to the outdoor air intakes. The minimum separation distance shall be 10 ft. in any direction.

909.21.2.4 Determination of the volume of a space. Certain prescriptive criteria contained within this alternative design approach are associated with the sizing of smoke control systems. The volume of a given building element shall be defined as the space that is contained between the finished floor slab(s) of one level and the underside of the floor or roof element above, and the walls or partitions that form the boundaries of the space.

909.21.2.5 Fire/Smoke damper temperature rating. The temperature rating for the fusible link in fire and combination fire/smoke dampers, where they are applied in smoke exhaust systems, shall be no less than 250° F. For systems where the probable temperature rise to which the damper will be exposed may be higher than 250° F the temperature shall be computed as in Section 909.10.1.

909.21.3 Smoke control systems for atriums (where required by Section 404).

909.21.3.1 Requirements. The prescriptive approach described hereinafter may be used when approved by the Denver Fire Department. The operation of the smoke control systems shall be controlled through the fire alarm system and shall comply with the requirements of this Section. The atrium volume shall include all spaces not separated from the atrium by the provisions of IBC Section 404.6.

909.21.3.2 Atriums 55 feet or less in height with a volume of 600,000 cubic feet or less. The system shall exhaust a minimum of six air changes per hour. Gravity supply or fan powered supply shall be provided within 10 feet of the lowest level of the atrium and shall be sized for 75 percent of the exhaust air rate. A maximum velocity of 200 feet per minute shall be maintained across the net free area of the supply air openings.

909.21.3.3 Atriums 55 feet or less in height with a volume in excess of 600,000 cubic feet. The system shall exhaust a minimum of four air changes per hour. Gravity supply or fan powered supply shall be provided within 10 feet of the lowest level of the atrium and shall be sized for 75 percent of the exhaust air rate. A maximum velocity of 200 feet per minute shall be maintained across the net free area of the supply air openings.

909.21.3.4 Atriums in excess of 55 feet in height. The system shall exhaust a minimum of four air changes per hour. A minimum of 50 percent of the volume of supply air shall be sized and introduced via gravity supply or fan powered inlets within 10 feet of the lowest level of the atrium. The total volume of supply air shall be 75 percent of the required volume of exhaust air. A maximum velocity of 200 feet per minute shall be maintained across the net free area of the supply air openings.

909.21.3.5 Exhaust openings. Exhaust openings shall be located in the ceiling or in a smoke trap area immediately adjacent to the ceiling at the top of the atrium. The lowest level of the exhaust openings shall be above the top of the highest elevation of door openings into the atrium.

909.21.4 Smoke control systems for high-rise buildings.

909.21.4.1 Stairway pressurization systems.

909.21.4.1.1 Requirements. Each interior enclosed exit stairway and associated exit passageway shall be mechanically pressurized with outdoor air, via a separate, dedicated pressurization system. The operation of each stairway pressurization system shall be controlled through the fire alarm system, as described in subsequent Articles of this Section. Stairway pressurization system ductwork shall not include fire or smoke dampers; however, isolation dampers may be included in the outdoor air intake ductwork systems, where such dampers are controlled via hard-wired interlock, and are configured to be "fail" open from a control standpoint.

909.21.4.1.2 Operation. Each stairway pressurization system shall be enclosed in a two-hour fire-resistive enclosure, from the outdoor air intake to the stairway enclosure penetration. Each fan discharge shall be provided with a duct smoke detector that shall be annunciated as a supervisory signal at the fire command center (graphic panel) and illuminate a lamp adjacent to the fan status indicator on the firefighters smoke control panel. The capability to manually override the operation of each fan shall be provided to Fire Department personnel in the fire command center. Fans shall not shut off until manually overridden by Fire Department personnel or until the fire alarm system is reset.

909.21.4.1.3 Design. The air volume introduced into the stairway shall be as follows: 15 floors or less, at least 1,000 cfm per floor; 16 floors or more, at least 15,000 cfm, plus 200 cfm per floor level in excess of 15 floors with 1.0 inch w.c. static pressure minimum at duct penetration into the stairway. Static pressure control shall be provided for stairway pressurization fan systems. Variable frequency drives may be utilized for this purpose. Supply air for the stairways serving buildings where the uppermost occupied floor is more than 120 feet above the lowest level of fire department vehicle access shall be introduced into the stairway at a minimum of two injection points. One injection point shall be located not more than 50 feet above the grade plane.

909.21.4.2 Hoistway pressurization systems.

909.21.4.2.1 Requirements. Each elevator hoistway shall be mechanically pressurized with outside air, via a separate, dedicated pressurization system. The operation of each hoistway pressurization system shall be controlled through the fire alarm system. Elevator hoistway pressurization system ductwork shall not include fire or smoke dampers; however, isolation dampers may be included, in the outdoor air intake ductwork systems, where such dampers are controlled via hardwired interlock, and are configured to be "fail" open from a control standpoint.

909.21.4.2.2 Operation. Each pressurization system shall be enclosed in a two-hour fire resistive enclosure, from outside air intake to the hoistway penetration. Each fan discharge shall be provided with a duct smoke detector that shall be annunciated as a supervisory signal at the fire command center graphic panel and illuminate a lamp adjacent to the fan status indicator on the firefighters smoke control panel. Fans shall not shut off until manually overridden by Fire Department personnel or until the fire alarm system is reset.

909.21.4.2.3 Design. Elevator hoistway pressurization systems shall be sized for a minimum of 15,000 CFM per bank (shaft) of elevators, plus 300 CFM per door opening per floor, with 1.0 inch water gauge static pressure, minimum, at the duct penetration into hoistway. Static pressure control shall be provided for hoistway pressurization fan systems. Variable frequency drives may be utilized for this purpose. Hoistway pressurization system performance shall not interfere with the opening and closing of elevator doors. Refer to Chapter 30 for door activation.

909.21.4.2.4 Smoke venting to exterior. Smoke venting of pressurized elevator hoistways to the exterior of the building shall not be required.

909.21.4.2.5 Elevator machine rooms. Elevator machine rooms may be pressurized indirectly via the elevator hoistway pressurization system through the cable slots in the machine room floor.

909.21.4.2.6 Lobby/Refuge areas. Elevator lobbies designated as refuge areas may have the elevator lobby/refuge area pressurized using the elevator hoistway pressurization system by transferring air to the elevator lobby/refuge area from the hoistway. Use of transfer openings protected with fire/smoke dampers between the hoistway and the lobby/refuge area is acceptable.

909.21.4.3 General building smoke exhaust.

909.21.4.3.1 Requirements. A general smoke exhaust system(s) shall be provided in buildings with a high-rise classification, for the occupancies indicated. This system(s) shall be controlled via the fire alarm system, to operate in conjunction with the other applicable smoke control systems for the building, in order to achieve the objectives as follows:

1. To maintain a zone of negative pressure on the fire floor (or smoke zone) relative to the other floors or smoke zones, and

2. To maintain a maximum stairway door opening force on the fire floor. The prescriptive approach described hereinafter is not intended to preclude the use of a performance-based approach, such as that defined by NFPA, for smoke control; however, the values listed hereinafter represent the minimum level of performance that must be achieved.

909.21.4.3.2 Configuration. The general smoke exhaust system shall include motorized combination fire/smoke dampers or a motorized smoke and a fire damper on each floor of a multi-level building served by the system(s). The exhaust damper(s) on the fire floor shall be commanded open, in order to exhaust that floor, and the smoke exhaust fan commanded to the operating mode. The exhaust dampers on the non-fire floors shall be driven to, or shall remain in, the closed position. The use of smoke dampers shall not preclude the provision of fire dampers, where required by other sections of this code.

909.21.4.3.3 Design criteria. The general building smoke exhaust system(s) for each floor/smoke zone shall be sized in accordance with the following:

1. The assumption that make-up air will be available on the fire floor.

2. The smoke exhaust system shall be sized to remove a minimum of five air changes per hour on the fire floor in Occupancy Groups A, B, E and M.

3. The smoke exhaust system shall be sized to remove a minimum of fifteen air changes per hour in the typical floor corridors, the typical floor corridors/elevator lobbies, or the typical floor elevator lobbies in Occupancy Groups R-1, R-2, I-1 and I-3.

4. That appropriate consideration be made for damper leakage on non-fire floors connected to a central riser system, when selecting the smoke exhaust fan(s).

909.21.4.3.4 Street level retail exception. General building pressurization and smoke exhaust systems will not be required to serve individual retail areas located on the level of egress and that have at least one exit directly to the exterior.

909.21.4.4 Smoke control systems for parking garages within high rise structures.

909.21.4.4.1 Requirements. Elevator lobbies designated as refuge areas on all floors within an enclosed parking structure shall have the elevator lobby/refuge area pressurized using the elevator hoistway pressurization system by transferring air to the elevator lobby/refuge area. Use of transfer openings protected with fire/smoke dampers between the hoistway and the lobby/refuge area is acceptable.

909.21.4.4.2 Open parking garages. A general building smoke control system shall not be required for elevator lobbies that are enclosed and that serve an open parking garage, if direct access without stairs or obstructions is available for people with special needs to exit from the elevator lobby to the open parking garage level or directly to a public way.

909.21.4.4.3 Enclosed garages. Exhaust fans associated with an enclosed parking structure shall be capable of manual operation from the fire command center. Such exhaust fans will not require a redundant source of electrical power, and this shall be indicated at the fire command center with the words, "Not on Emergency Power."

909.21.5 General building smoke exhaust for large spaces.

909.21.5.1 Requirements. Each floor area shall be a compartment and smoke control zone not to exceed 52,000 square feet on a single floor. Smoke control zones shall be separated from each other by a wall that shall extend from the floor to the underside of the floor or roof above, except for the following:

1. Openings into atriums
2. Pedestrian bridges between two buildings
3. Non-required stair enclosures between floors
4. Open escalators between multiple floors

909.21.5.2 Design criteria. Building construction shall be configured in order to support the performance of the general building smoke exhaust system, in accordance with the following:

1. Draft stops shall be provided between smoke control zones without wall separation, in order to prevent migration of smoke throughout the building, whereby the configuration of the draft stops shall be approved by the Building and Fire Departments.

2. A smoke control zone in alarm shall actuate the respective general building smoke exhaust system, while the smoke exhaust systems in the adjacent smoke control zones shall remain inactive.

3. The minimum static pressure differential shall be maintained in the adjacent non-fire zones, with respect to the smoke control zones in alarm, where smoke control zones have wall separations.

4. Sprinkler zones shall coincide with smoke zones.

5. Products of combustion must be demonstrated to be contained within the zone of origin, for smoke zones without wall separations, and the failure to restrict products of combustion to the floor or area of origin will be considered as not complying with the requirements for the smoke control system.

909.21.6 Smoke control systems for covered mall buildings (where required by Section 404).

909.21.6.1 Requirements. A mechanically operated smoke control system, which shall operate to restrict smoke to the general area of fire origin and to maintain the exiting system in a condition that is safe for exiting, shall be installed in covered mall buildings.

909.21.6.2 Smoke control systems for tenant space and anchor stores.

909.21.6.2.1 Requirements. The spaces shall be compartmentalized into smoke control zones not to exceed 52,000 square feet on a single floor. Except for openings between the covered mall area and tenant spaces, smoke control zones shall be separated from each other by wall construction having a fire resistance rating per IBC Sections 402.7.2 and 402.7.3. The walls shall extend from the floor to the underside of the floor or roof above.

909.21.6.2.2 Design criteria. The tenant space and anchor store smoke control exhaust system shall be sized to exhaust a minimum of six (6) air changes per hour or 20,000 cfm from each smoke control zone, whichever is greater.

909.21.6.3 Smoke control systems for covered mall areas.

909.21.6.3.1 Requirements. A smoke exhaust system shall be provided to serve covered mall areas. Smoke exhaust locations shall be configured in order to preclude accumulation of smoke in any area of the covered mall. The smoke exhaust system shall be activated by the fire alarm system. If multiple smoke control zones for the mall area are provided either by zone area requirements of this Section or by system design, then only the smoke exhaust system for the zone in alarm shall be activated. Smoke exhaust systems for adjacent covered mall zones shall not operate.

909.21.6.3.2 Design criteria. The smoke control equipment for the covered mall areas shall be separate from that serving tenant spaces. The covered mall area smoke removal system shall provide at least 6 air changes per hour.

909.21.7 Smoke control for large assembly areas.

909.21.7.1 Requirements. A mechanically operated air-handling system, which shall restrict the smoke to the general area of fire origin and maintain the exiting system in a condition that is safe for exiting, shall be installed in buildings with assembly areas or similar areas where the occupant load of each area is 1,000 or greater, as calculated per IBC Section 1004, and smoke control is required per

Sections 909.21.3 (atriums) and 909.21.4 (high-rises). The spaces shall be compartmentalized into smoke control zones. Large assembly areas shall be separated from other adjacent areas, or smoke control zones by smoke partitions. Detector zones may not exceed 22,500 square feet and no detector zone shall serve more than one smoke control zone.

Exceptions:

1. Large assembly smoke zones shall be separated from adjacent zones by draft stops located immediately adjacent to each smoke zone. The draft stops shall be at least 18 inches deep. The draft stops shall be of non combustible or limited combustible material that will stay in place before and during sprinkler operation.

2. Large assembly areas smoke zones separation from adjacent smoke zones is not required for ceiling heights 18 feet and greater.

909.21.7.2 Design criteria. The smoke control exhaust system shall exhaust a minimum of six (6) air changes per hour or 20,000 cfm from each smoke control zone, whichever is greater.

909.21.8 Retrofit of smoke control systems in existing high rise buildings.

909.21.8.1 Requirements. Smoke control systems shall be maintained in operational condition as required by he code under which the system was installed. Construction drawings and system sequence of operation shall be submitted for approval in accordance with Appendix K. The upgraded system shall be considered the new requirement and documented as approved by the Denver Building Department and the Denver Fire Department. Future work shall not be allowed to adversely affect the performance of the system.

SECTION 910
SMOKE AND HEAT VENTS

Section 910.3.1.1. Gravity vents is deleted in its entirety.

SECTION 912
FIRE DEPARTMENT CONNECTIONS

Section 912.2 Location - last sentence, is replaced in its entirety with the following:

The location of fire department connections shall be field approved by the fire code official prior to installation. Fire department connections shall be a minimum of one 2½ x 2½ x 4-inch siamese or single 2½-inch, as approved by the fire code official.

Section 912.3.4 Orientation is added:

912.3.4 Orientation. Fire department connections shall be oriented so inlets are in a horizontal line.

Exception: Two inlets may be stacked with written approval from the fire code official.

Section 912.5 Backflow protection is amended by adding the following after the last sentence:

A single approved backflow protection device shall be installed at the location where the potable water supply line first penetrates the foundation or building envelope.

Exception: Subject to the approval of the fire code official, additional backflow protection devices may be installed in additional locations.

SECTION 913
FIRE PUMPS

Section 913.1 General is amended by adding the following after the last sentence:

Limited service controllers are not permitted.

Section 913.4.1 Test outlet valve supervision is replaced in its entirety with the following:

913.4.1 Test outlet valve. The hose control valves for the fire pump test outlet(s) shall be located on the exterior of the building. The main supply valve controlling the fire pump test outlet(s) shall be supervised in the closed position.

Section 913.6 is added:

913.6 Fire pump requirement for non-high-rise structures. Where standpipes are required by other provisions of this code, a fire pump shall be provided. Installation of a fire pump is not required subject to the following exceptions. A written request for approval of omission of the fire pump, substantiating compliance with this provision, shall be submitted to the fire department. Where required, fire pump shall have a water flow rate of 500 gpm or the sprinkler system flow demand, whichever results in a larger fire pump. The fire pump shall be capable of delivering the required sprinkler system pressure demand.

Exceptions:

1. The requirement of a fire pump may be waived in all occupancies except H and I occupancies where all of the following are met:
    a. Buildings shall be equipped throughout by an automatic sprinkler system in accordance with Sections 903.3.1.1 or 903.3.1.2 with quick response or residential sprinkler heads.
    b. City water pressure, as tested at the site, must be capable of hydraulically supporting the sprinkler system without a fire pump or augmentation by the Fire Department.
    c. Standpipes shall be installed or be existing and, when a fire pump is not provided, shall be capable of providing water flow as follows:

        For Class I standpipe systems, the minimum flow rate for the hydraulically most remote standpipe shall be 500 gpm, and the calculation procedure shall be in accordance with NFPA 14. The minimum flow rate for additional standpipes shall be 250 gpm per standpipe, with the total not to exceed 1,000 gpm for buildings that are sprinklered throughout per NFPA 13 or NFPA 13R. Minimum pressure for system design shall be as required by NFPA 14 with Fire Department pumpers augmenting the system with a maximum flow rate of 1,000 gpm and a maximum pressure of 135 psi at each fire department connection (FDC).
    d. Projects must have approved Fire Department access for fire-fighting apparatus to the building FDC or connections located on the exterior face of the building. The distance from the centerline of Fire Department access to the primary FDC shall not exceed 50 feet.
    e. If the building floor plate exceeds 12,500 sq. ft., two separate and remote FDCs shall be provided. One FDC shall be within 100 ft of a fire hydrant.
    f. A graphic or a directory type annunciation panel shall be provided. Each level shall be provided with a flow switch and shall be annunciated as a separate zone. The main flow

switch shall also be annunciated as a separate zone. Tamper switches may be annunciated on one zone. Valve monitoring and waterflow alarm and trouble signals shall be distinctly annunciated.

2. The requirement of a fire pump may be waived in mixed-use or single-use open parking garages with standpipes, including those with enclosed parking levels under the open garage. This exception is applicable where the elevation of the highest tier/floor does not exceed 75 ft above the lowest level of Fire Department vehicle access and the following provisions are met:

    a. The building is constructed in accordance with IBC Section 406.3.

    b. Standpipes shall be installed or be existing and, when a fire pump is not provided, shall be capable of providing water flow as follows:

    For Class I automatic dry standpipe systems, the minimum flow rate for the hydraulically most remote standpipe shall be 500 gpm, and the calculation procedure shall be in accordance with NFPA 14. The minimum flow rate for additional standpipes shall be 250 gpm per standpipe, with the total not to exceed 1000 gpm. Minimum pressure for system design shall be as required by NFPA 14 with Fire Department pumpers augmenting the system with a maximum flow rate of 1,000 gpm and a maximum pressure of 135 psi at each fire department connection (FDC).

    c. Standpipes are installed in accordance with Section 905 and NFPA 14.

    d. Projects must have approved Fire Department access for firefighting apparatus to the building FDC located on the exterior face of the building. The distance from the centerline of fire department access to the primary FDC shall not exceed 50 feet.

Section 913.7 Remote status panel is added:

913.7 Remote status panel. Fire pump remote operating status panel shall be required for all fire pump installations. Fire pump remote operating status panel shall be located adjacent to the fire alarm control unit or as determined by the fire code official.

Section 913.8 Diesel engine pump drivers is added:

913.8 Diesel engine pump drivers. Diesel drivers for fire pumps shall comply with NFPA 20. A dedicated fuel supply shall be provided sufficient for eight (8) hours of operation. Fill openings shall be located on the exterior of the building with an approved fill port. If fuel pumping is required from a main fuel tank to a diesel engine pump driver, a duplex pumping system shall be provided.

Section 915 Emergency Responder Radio Enhancement System (RES) is added:

SECTION 915
EMERGENCY RESPONDER RADIO ENHANCEMENT SYSTEM (RES)

915.1 Where required. Buildings shall have approved radio coverage in accordance with Section 510 for emergency responders as follows:

1. High-rise buildings
2. Underground buildings (per IBC Section 405)
3. Airport buildings and structures
4. Buildings of 50,000 gsf or more

915.1.1 Compliance testing. All Group E and I occupancies over 10,000 gsf on any story shall be tested in accordance with Section 510.1.1.3 for adequacy of emergency responder radio communications

coverage. Buildings failing to meet the minimum coverage requirements shall be provided with an RES per Section 510.

Exception: Where it is determined by the fire code official the radio coverage system is not needed, written documentation of the adequacy of existing radio coverage shall be maintained on site. Degradation of radio coverage shall require testing of the building to the requirements of Section 510.1.1.3(1). Where the system can no longer meet the test requirements, a radio coverage system shall be installed.

Section 916 Central Alarm Stations is added:

SECTION 916
CENTRAL ALARM STATIONS

916.1 General. Where required by Section 907.1.3, monitored protected premises systems shall be connected to an approved central alarm station. A Class I central alarm station shall comply with the Denver Municipal Code and this section. Signals shall be transmitted, received and managed in accordance with NFPA 72. Approved central alarm stations shall be a listed central station, a propietary central alarm station, a remote supervising station, or a subsidiary station as approved by the fire code official. All central alarm/susidiary stations shall obtain an annual operating license from the Fire Department and meet the facility construction and operational requirements of NFPA 72. Central alarm stations shall be subject to Fire Department inspection during normal business hours. Subsidiary stations shall be inspected by central station personnel monthly and shall be provided with a written restoration plan per NFPA 72, to be maintained on site. Installations found not to maintain facility requirements and/or operating procedures in accordance with NFPA 72 or the certificated listing, shall be subject to license revocation by the Fire Department.

Exception: Approved protected premises connected directly to Denver Fire Department facilities.

916.2 Communciation methods. Communication from a protected premises to a central alarm or subsidiary station shall be by digital alarm communciator transmitter (DACT), two-way RF multiplex system or one-way private radio alarm system in accordance with NFPA 72.

916.3 Transmission channels. Transmission channels between a protected premises and central alarm or subsidiary station shall consist of one of the methods of Sections 916.3.1, 916.3.2 or 916.3.3. Where multiple communications technologies are used, provision shall be made to monitor the integrity of each communication path and failure of any communication path shall be annunciated at the central alarm station and at the protected premises within 24 hours. Re-transmission of signals from a subsidiary station shall be provided with primary and backup communication paths.

916.3.1 DACT transmission shall consist of a minimum of one dedicated loop start public phone line and one seizable telephone line or a dedicated loop start public phone line plus an approved Type 4 or Type 5 two-way RF multiplex system with a network connectivity (Net/Con) of 6 or less or a minimum one-way private radio alarm system complying with Section 916.3.3.

916.3.2 RF multiplex systems shall consist of sufficient UL-listed fire system transmitter/receivers to establish and maintain a minimum Net/Con of 5 or less as measured by manufacturer-approved test equipment. Primary RF multiplex systems shall meet NFPA 72 requirements for a Type 4 network. RF systems that cannot achieve this required level of reliability shall have a dedicated loop start public phone line installed as the primary signal transmission means. RF communications of fire alarm signals shall only be permitted over a network dedicated to and listed for transmission and receipt of fire alarm signals. Upon application for a system installation permit for any subscriber unit, the central station licensee shall provide documentation verifying that their network complies with the requirements for a listed, dedicated fire alarm signal network for the protected premises.

916.3.3 One-way private radio alarm systems shall consist of a network of radio alarm supervising station receivers, radio alarm repeating station receivers and radio alarm transmitters. The system shall be configured for Type 6 or Type 7 operation per NFPA 72. Radio communications of fire alarm signals shall only be permitted over a network dedicated to and listed for transmission and receipt of fire alarm signals. Upon application for a system installation permit for any subscriber unit, the central station licensee shall provide documentation verifying that their network complies with the requirements for a listed, dedicated fire alarm signal network for the protected premises. Signal quality shall be supervised and maintained in accordance with NFPA 72.

Section 917 Transmission of City Microwave Signals is added:

SECTION 917
TRANSMISSION OF CITY MICROWAVE SIGNALS

Construction permits or Certificates of Occupancy shall not be issued for any building or structure exceeding 60 feet (18.3m) in height which interferes or may interfere with the transmission or reception of City microwave communication signals unless the owner of the builidng or structure provides for installation of equipment to retransmit or redirect the signal as necessary to eliminate any interference. Such equipment shall be approved by and installed at the direction of the Department of Safety. A service agreement must also be approved by the Department of Safety where transmission is affected by the proposed building or structure prior to the issuance of any permit ot Certificate of Occupancy. Such agreements shall include provisions for easements and access for maintenance, electricity for operation, and replacement of equipment.

CHAPTER 10
MEANS OF EGRESS

SECTION 1004
OCCUPANT LOAD

Section 1004.1.1 Areas without fixed seating is amended by replacing the Exception with the following:

Exception: Where approved by the building and fire code officials, the actual number of occupants for whom each occupied space, floor or building is designed, although less than those determined by calculation, shall be permitted to be used in the determination of the design occupant load.

SECTION 1005
EGRESS WIDTH

Section 1005.1 Minimum required egress width is amended by adding Exception 2:

Exception:

2. The total width of the means of egress serving H-1, H-2, H-3 and H-4 occupancies shall not be less than the total occupant load served by the means of egress multiplied by 0.7 inches (17.8 mm) per occupant for stairways and by 0.4 inches (10.2 mm) per occupant for other egress components.

SECTION 1007
ACCESSIBLE MEANS OF EGRESS

Section 1007.1 Accessible means of egress required is amended by adding the following sentence to the end of the first paragraph:

Buildings required to comply with Section 403 of the *International Building Code* shall be provided with accessible means of egress in accordance with IBCA Section 403.15.

Section 1007.6.2 Separation is replaced in its entirety with the following:

1007.6.2 Separation. In buildings not required to comply with Section 403 or 405 of the IBC, elevator lobby areas of refuge shall be enclosed by smoke barriers in accordance with IFCA Section 909.5. Openings in the elevator shaft enclosure other than those directly serving an area of refuge, shall be protected from the intrusion of smoke in accordance with IFCA Section 909.5.2. Loss of power to, or the actuation of, any fire detection or suppression device on any level shall cause the closure of all automatic opening protectives in the enclosures of all areas of refuge and the elevator shafts serving them, except the shaft enclosure doors at the level of exit discharge.

Exception: Areas of refuge located within an exit enclosure.

Section 1007.8.1 System requirements is replaced in its entirety with the following:

1007.8.1 Two-way communication. A two-way communication system shall provide visual and two-way voice communication between each required location and the master control station. If the master control station is not constantly attended, the two-way communication system shall have a timed automatic telephone dial-out capability providing two-way voice communication with a central supervising station or 911. User interfaces provided in addition to those in required locations shall comply with this section.

Subject to approval by the fire code official, the master control station shall be installed in the Fire Command Center (FCC) or Fire Command Room (FCR) (see IFCA Sections 508.1 and 508.2). In a

building where an FCC or an FCR is not provided, the master control station shall be installed in a central control point location approved by the fire department. In both cases, a second master control station is permitted to be installed in a location approved by the fire department. In buildings provided with two master control stations, required features and functionality shall be provided simultaneously at both.

When activated, the master control station in the FCC or FCR shall override any additional master control station and telephone connection established with a central supervising station or 911. In a building provided with two master control stations and where an FCC or an FCR is not provided, the fire code official shall designate the overriding master control station.

A call for assistance from the required locations shall be directed to the master control station and answered by authorized personnel capable of taking appropriate action. It shall not be transmitted to an automated answering system.

When the master control station is not constantly attended, the call for asistance shall be redirected automatically within 30 seconds to a listed central supervising station. The call shall be redirected to 911 if the building does not have a monitored fire alarm or suppression system or if the central station is incapable of answering the call or initiating the appropriate response. Two-way voice communication shall be established between the initiating location and the person answering the call.

Two-way voice communcation shall be discontinued only when the authorized or emergency personnel terminate the call.

The means of two-way communication shall be connected to a source of, or automatically transferred to an alternate (standby, emergency, etc.) source of power capable of providing the required functionality for a minimum of four hours when the normal power supply fails.

The means of two-way communcation shall be monitored for integrity and annunciated per NFPA 72 (see 2007 NFPA 72 Section 4.4.7; the means of two-way communcation shall not be considered "supplementary").

The user interface at the required locations shall be provided with the following features:

1. The user interface shall be accessible and usable by people with disabilities. Clearance, location, protrusion, labeling, signage and operability of the user interface shall comply with ANSI A117.1
2. A push button to activate the means of two-way communication shall be provided on the user interface. The button shall be visible and permanently identified as "HELP" on or adjacent to the button. Tactile operating instructions shall be incorporated with or adjacent to the "HELP" button.
3. When the Help button is pushed, the means of two-way communication shall initiate a call for assistance at the master control station. A visual indication shall be provided on or adjacent to the "HELP" button, and an audible signal shall be provided to acknowledge successful initiation. The visual indication shall remain activated until two-way voice communication is established.
4. Audible and visual indications shall be provided to acknowledge two-way voice communication has been established. After the call acknowledgement signals are sent, two-way voice communication shall be established without any intentional delay or required intervention by the person initiating the call. The visual indication shall be deactivated only when the two-way voice communication is terminated.
5. Directions for use shall be provided at the user interface per Section 1007.8.2.

The master control station shall be provided with the following features:

1. When the Help button is pushed at a required location, the means of two-way communcation shall automatically provide at the master control station audible and visual indication assistance is required, and identify the location within the building of the actuated user interface.
2. The master control station shall be capable of receiving and queuing calls from all required locations. Authorized and emergency personnel shall be provided the capability of placing calls on hold without

disconnecting them, to selctively reconnect to any held call, and to selectively initiate contact with any required location with calls on hold.

3. Directions for use shall be provided at the master control station per Section 1007.8.2.

SECTION 1008
DOORS GATES AND TURNSTILES

Section 1008.1.4.4 Access-controlled egress doors are addressed by Appendix L, Access Control Systems.

Section 1008.1.9.7 Delayed egress locks is deleted in its entirety and are addressed by Appendix L, Access Control Systems.

Section 1008.1.9.8 Electromagnetiaclly locked egress doors is deleted in it's entirety and are addressed by Appendix L, Access Control Systems.

Section 1008.1.9.10 Stairway doors is deleted in its entirety and addressed by Appendix L, Access Control Systems.

SECTION 1009
STAIRWAYS

Section 1009.13.1 Roof access is amended by deleting the Exception.

Section 1009.13.3 Roof hatches is added:

1009.13.3 Roof hatches. All required interior stair enclosures that extend to the roof shall have, at the highest point of the enclosure, an approved roof hatch openable to the exterior (also see Section 504.4). The hatch shall be a minimum of 16 square feet (1.5 m^2) in area with a minimum dimension of 2 feet (610 mm).

Exceptions:

3. Roof hatches are not required on pressurized stair enclosures.
4. Roof hatches are not required on stair enclosures provided with a penthouse complying with IBC Section 1509.2.

SECTION 1011
EXIT SIGNS

Section 1011.2 Illumination is replaced in its entirety with the following:

1011.2 Illumination. Exit signs shall be electrically- powered and internally illuminated.

Exceptions:

3. Tactile signs required by Section 1011.3 need not be provided with illumination.
4. Edge-illuminated signs are permitted where listed and labeled in accordance with UL 924.

Section 1011.4.1 Graphics is added:

1011.4.1 Graphics. Exits signs shall have green lettering on a contrasting field, or white lettering on a green field.

Section 1011.5 is deleted in its entirety.

SECTION 1017

AISLES

Section 1017.2. Aisles in group B and M is replaced in its entirety with the following:

1017.2 Aisles in Groups B, F, M and S. In Group B, F, M and S occupancies, the minimum clear aisle width shall be determined by Section 1005.1 for the occupant load served, but shall not be less than 36 inches (914 mm).

Exceptions:

3. Non public aisles serving less than 50 people and not required to be handicap accessible shall not be less than 28 inches (711 mm) in width.
4. High-piled combustible storage areas shall comply with the applicable provisions of Chapter 23 of the Fire Code.

SECTION 1022
EXIT ENCLOSURES

Section 1022.9 Smoke proof enclosures and pressurized stairways is amended by adding a reference to IFCA Section 909.20:

1022.9 Smokeproof enclosures and pressurized stairways. In buildings required to comply with Section 403 or 405, each of the exit enclosures serving a story with a floor surface located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access or more than 30 feet (9144 mm) below the finish floor of a level of exit discharge serving such stories shall be a smokeproof enclosure or pressurized stairway in accordance with IFCA Section 909.20.

Section 1022.9.2 Enclosure access is deleted in its entirety.

SECTION 1028
ASSEMBLY

Section 1028.12 Seat stability is replaced in its entirety with the following:

1028.12 Seat stability. In places of assembly, the seats shall be securely fastened to the floor.

Exceptions:

1. Seats are not required to be fastened to the floor in places of assembly or portions thereof:
   - with 100 or fewer seats, and
   - with an actual net area per occupant greater than or equal to 7 sq. ft., and
   - without ramped or tiered floors for seating.
2. Seats are not required to be fastened to the floor in places of assembly or portions thereof:
   - with 100 or fewer seats, and
   - with an actual net area per occupant greater than or equal to 7 sq. ft., and
   - with ramped or tiered floors for seating, and
   - where plans showing seating, tiers and aisles were submitted to, reviewed and permitted by the fire code official.
3. Seats are not required to be fastened to the floor in places of assembly or portions thereof:
   - with more than 100 and fewer than 200 seats, and
   - with an actual net area per occupant greater than or equal to 7 sq. ft., and
   - without ramped or tiered floors for seating, and
   - with seats fastened together in groups of five or more.

4. Seats are not required to be fastened to the floor in places of assembly or portions thereof:

   - with seating at tables, and
   - with an actual net area per occupant greater than or equal to 15 sq. ft., and
   - without ramped or tiered floors for seating.

5. Groups of seats are not required to be fastened to the floor in places of assembly or portions thereof:

   - with 14 or fewer seats per group, and
   - with an actual net area per occupant greater than or equal to 7 sq. ft., and
   - without ramped or tiered floors for seating, and
   - groups are separated from other seating by railings, guards, partial height walls or similar barriers.

6. Seats intended for musicians or other performers and separated by railings, guards, partial height walls or similar barriers shall not be required to be fastened to the floor.

7. In special events permitted by IFCA Section 105.6, loose seats, folding chairs or similar seating facilities that are not fixed to the floor shall be securely fastened together in groups of five or more.

8. In places of assembly and portions thereof, wheelchairs with engaged brakes or other anti-roll devices are not required to be fastened to the floor or to other seats.

CHAPTER 11
AVIATION FACILITIES

SECTION 1105
PORTABLE FIRE EXTINGUISHERS

Section 1105.6 At fuel-dispensing stations is replaced in its entirety as follows:

1105.6 At fuel-dispensing stations. Portable fire extinguishers for ramps where fueling operations are conducted are intended to provide an immediate means of fire protection in an area likely to contain a high concentration of personnel and valuable equipment. The prominent and strategic positioning of portable fire extinguishers is critical for them to be of maximum value in the event of an emergency. Portable fire extinguishers shall not be located in probable spill areas. To provide accessibility from adjoining gates, portable fire extinguishers shall be located approximately midway between gate positions.

Portable fire extinguishers at fuel-dispensing stations shall be located such that pumps or dispensers are not more than 50 feet from an extinguisher. The maximum distance between extinguishers shall not be over 200 feet. Where the specified portable fire extinguishers are brought into the aircraft fuel servicing areas prior to the fueling operation, they shall be located upwind not over 50 feet from the aircraft being serviced. Fire extinguishers shall be provided as follows:

1. Where the open-hose discharge capacity of the fueling system is not more than 200 gallons per minute, a minimum of two listed portable fire extinguishers complying with section 906 and having a minimum rating of 20-B:C shall be provided.
2. Where the open-hose discharge of the fueling system is more than 200 gallons per minute but not more than 350 gallons per minute, a minimum of two listed wheeled extinguishers complying with section 906 and having a minimum extinguishing rating of 80-B:C and a minimum agent capacity of 125 pounds shall be provided.
3. Where the open-hose discharge capacity of the fueling system is more than 350 gallons per minute, a minimum of three listed wheeled extinguishers complying with section 906 and having a minimum rating of 80-B:C each and a minimum capacity agent of 125 pounds each shall be provided.

SECTION 1106
AIRCRAFT FUELING

Section 1106.12.1 is added:

1106.12.1 Auxiliary power unit (APU). Fuel servicing shall not be performed on a fixed-wing aircraft while an onboard engine, APU or heater, is operating.

Exception: In an emergency resulting from the failure of an onboard auxiliary power unit on a jet aircraft, and in the absence of suitable ground support equipment, a jet engine mounted at the rear of the aircraft or on the wing on the side opposite the fueling point shall be permitted to be operated during fueling or defueling to provide power, provided that the operation follows written procedures approved by Denver International Airport and the Denver Fire Department.

SECTION 1107
HELISTOPS AND HELIPORTS

Section 1107.9 is added:

1107.9 Helistops on roofs. In addition to other applicable portions of this Code, helistops located on roofs shall comply with the following:

1. Smoking is prohibited on the roof operating area during landing and takeoff operations.
2. Persons, other than helistop personnel, shall be restricted to designated protected or fenced waiting areas during landing and take-off operations.
3. Loose material such as gravel is prohibited.
4. Openings in the roof shall not be permitted in the immediate landing area.
5. Major repair and maintenance operations are not permitted on the helistop except in cases of emergency, and only with prior notification to the department.
6. Communication facilities shall be provided from the helistop to the department and building personnel for emergency notification.
7. Helistop personnel shall be trained in the use of communication and fire extinguishing equipment.
8. The storage of flammable liquids or highly combustible materials on the roof is prohibited.
9. An exterior (weatherproof) manual pull station shall be provided by each exit and shall be connected to the building alarm system.
10. At least 100 feet of approved 1.5-inch hose equipped with an approved fog nozzle and a 2.5-inch male NST reduced to a 1.5-inch male Denver thread shall be provided in a weatherproof cabinet adjacent to the roof standpipe.

CHAPTER 14

FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION

SECTION 1401
GENERAL

Section 1401.3 Permit required is added:

1401.3 Permit required. Permits shall be required as set forth in Section 105.6 for the activities or uses regulated by Sections 1403 – Temporary Heating Equipment, 1404.3 – Open Burning, 1404.5 – Fire Watch, 1404.6 – Cutting and Welding, 1405.1 Storage of Flammable and Combustible Liquids, 1405.2 – Class I and Class II Liquids, 1406.1 – Storage and Handling (Flammable Gases), 1407.1 – Storage and Handling (Explosive Materials), 1417 Safeguarding Roofing Operations, and 1418 – Asbestos Operations.

SECTION 1413
STANDPIPES

Section 1413.1 Where required is replaced in its entirety with the following:

1413.1 Where required. Buildings four or more stories in height shall be provided with not less than one standpipe for use during construction. Such standpipes shall be installed when the progress of construction is not more than 30 feet in height above the lowest level of Fire Department vehicle access or where the floor level of the lowest story is located more than 30 feet below the highest level of Fire Department vehicle access. Such standpipes shall be provided with Fire Department hose connetions at accessible locations adjacent to usable stairs. Such standpipes shall be extended as consturciton progresses to within one floor of the highest point of construction having secured decking or flooring. One fire department connetion [not less than two (2) 2.5-inch inlets with 4-inch piping] shall be provided for buildings less than 200 feet in height. Where building exceeds 200 feet in height, two (2) separate 6-inch manual dry standpipes shall be required. These standpipes shall be located adjacent to a usable stair with a 200 feet maximum separation between standpipes. Each standpipe shall be connected to two (2) 2.5-inch inlet fire department connections. Each fire department connetion shall be signed indicating which standpipe it serves. The fire department connection(s) shall be provided at a location visible from the public way, accessible to fire apparatus and approved by Fire Prevention personnel. Refer to Chapter 9.

SECTION 1418
ASBESTOS OPERATIONS

Section 1418 Asbestos Operations is added:

1418.1 General. Operations involving asbestos or asbestos-containing materials in buildings and other structures regulated by this code shall be in accordance with Section 1418.

1418.2 Notification. The fire code official shall be notified 24 hours prior to the commencement and closure of asbestos operations. The permit applicant shall notify the building official when asbestos abatement involves the removal of materials which were used as a feature of the building's fire resistance.

1418.3 Signs. Approved signs shall be posted at the entrance, exit, decontamination areas and waste-disposal areas for asbestos operations. The signs shall state asbestos abatement operations are in progress in the area, asbestos is a suspected carcinogen and proper respiratory protection is required. Signs shall have a reflective surface and lettering shall be a minimum of two inches (51 mm) in height.

CHAPTER 15
FLAMMABLE FINISHES

SECTION 1501
GENERAL

Section 1501.1 Scope, Item #4 is replaced in its entirety with the following:

4. Floor surfacing or finishing operations involving flammable finishes.

Section 1501.3.1 Water-based finishes is added:

1501.3.1 Water-based finishes. Notwithstanding the provisions of Section 1501.2, a permit is required to conduct a spraying or dipping operation utilizing water based liquids as set forth in Section 105.6.

Section 1501.3.2 Limited spraying spaces is added:

1501.3.2 Limited spraying spaces. A permit is required to conduct a limited spraying operation as set forth in Section 105.6.

SECTION 1504
SPRAY FINISHING

Section 1504.6.1.2.1 Interlocks, Item #3 is replaced in its entirety with the following:

3. Have the ventilating system maintain a concentration 25 percent below the lower flammable limit (LFL) within the spray booth or spray room during the drying process and automatically shut off drying apparatus in the event of a failure of the ventilating system.

SECTION 1505
DIPPING OPERATIONS

Section 1505.7 Ventilation is replaced in its entirety with the following:

1505.7 Ventilation of flammable vapor areas. Mechanical ventilation shall be provided to maintain airborne concentrations below 25 percent the lower flammability limit (LFL). Required ventilation systems shall be arranged such that the failure of any ventilating fan shall automatically stop the dipping conveyor system.

SECTION 1510
FLOOR SURFACING AND FINISHING OPERATIONS

Section 1510.1 Scope is replaced in its entirety with the following:

1510.1 Scope. Floor surfacing and finishing operations using Class I or Class II liquids shall comply with Sections 1510.2 through 1510.5.

CHAPTER 16
FRUIT AND CROP RIPENING

SECTION 1603
ETHYLENE GAS

Sections 1603.3 Storage and 1603.4 Piping are added:

1603.3 Storage. Containers other than those connected for use shall be stored outside of ripening process buildings or in a special building.

> **Exception:** Storage of not more than two portable containers complying with Section 3003.1 and approved for transportation is allowed in ripening process buildings.

1603.4 Piping. Piping containing ethylene shall be constructed of iron. Flexible connectors and hose, when used, shall be of an approved type. Tubing shall be of brass, copper, or stainless steel with not less than 0.049-inch (1.2 mm) wall thickness.

CHAPTER 17
FUMIGATION AND THERMAL INSECTICIDAL FOGGING

SECTION 1701
GENERAL

Section 1701.2 Permits is replaced in its entirety with the following:

1701.2 Permits. No person shall engage in the actual operation of fumigation or thermal insecticidal fogging without first obtaining a permit. No fumigation room, vault, or chamber using toxic or flammable fumigant shall be used or maintained without first obtaining a permit. Permits shall be required as set forth in Section 105.6.

Section 1701.3 License is added:

1701.3 License. No person shall conduct fumigation or insecticidal operations without first obtaining a license from the City and County of Denver Department of Excise and Licenses as required by the Revised Municipal Code.

SECTION 1703
FIRE SAFETY REQUIREMENTS

Sections 1703.1.1 Usage warning signs and 1703.1.2 Storage warning signs are added:

1703.1.1 Usage warning signs. Where fumigants and thermal insecticidal fogging products are used, approved warning signs bearing the "skull and crossbones" emblem with the warning "DANGER! POISON GAS! KEEP OUT!" and notices pertaining to the type of chemicals being used shall be posted. The notices pertaining to the type of chemicals for fumigation and thermal insecticidal fogging shall be printed in red ink on a white background. Letters in the headlines shall be at least 2 inches (51 mm) in height and shall state the date and time of the operation, the name and address of the person, the name of the operator in charge, and a warning stating that the occupied premises shall be vacated at least 1 hour before the operation begins and shall not be reentered until the danger signs have been removed by the proper authorities.

1703.1.2 Storage warning signs. Where fumigants and thermal insecticidal fogging products are stored NFPA 704 placard guidelines shall be followed.

Section 1703.3.1 Warning signs is replaced in its entirety with the following:

1703.3.1 Warning signs. Approved warning signs indicating the danger, type of chemical involved and necessary precautions shall be posted on all doors and entrances to the premises, including interior rooms and areas. Where fumigants and thermal insecticidal fogging products are used, approved warning signs bearing the "skull and crossbones" emblem with the warning "DANGER! POISON GAS! KEEP OUT!" shall be posted. Such notices shall be printed in red ink on a white background. Letters in the headlines shall be at least two (2) inches (51 mm) in height and shall state the date and time of the operation, the name and address of the person, the name of the operator in charge, and a warning stating that the occupied premises shall be vacated at least one (1) hour before the operation begins and shall not be reentered until the danger signs have been removed by the proper authorities.

Section 1703.3.1.1 Storage warning signs is added:

1703.3.1.1 Storage warning signs. Where fumigants and thermal insecticidal fogging products are stored, NFPA 704 placard guidelines shall be followed.

CHAPTER 19
LUMBER YARDS AND WOODWORKING FACILITIES

SECTION 1904
FIRE PROTECTION

Section 1904.3 Portable fire extinguishers or standpipes and hose is replaced in its entirety with the following:

1904.3 Portable fire extinguishers and standpipes. Portable fire extinguishers or standpipes supplied from an approved water system shall be provided within 50 feet (15240 mm) of travel distance to any machine producing shavings or sawdust. Extinguishers shall be provided in accordance with Section 906 for extra-high hazards.

SECTION 1909
EXTERIOR STORAGE OF FINISHED LUMBER PRODUCTS

Section 1909.5 Fire protection is replaced in its entirety with the following:

1909.5 Fire protection. An approved hydrant and portable fire-extinguishing equipment suitable for the fire hazard involved shall be provided for open storage yards. Hydrant systems shall be installed in accordance with NFPA 24. Portable fire extinguishers complying with Section 906 shall be located so that the travel distance to the nearest unit does not exceed 75 feet (22860 mm). Portable fire extinguishers located in open storage yards shall be protected from weather and shall be maintained per NFPA 10. Portable fire extinguishers complying with Section 906 and with a minimum rating of 4-A:40-B:C shall be provided on all vehicles operating in a lumber storage yard.

CHAPTER 20
MANUFACTURE OF ORGANIC COATINGS

SECTION 2005
PROCESS STRUCTURES

Section 2005.5 Ventilation is replaced in its entirety with the following:

2005.5 Ventilation. Enclosed structures involving organic coating processes in which flammable or combustible liquids are processed or handled shall be mechanically ventilated at a continuous rate of not less than 1 cfm/ft^2 [0.00508 $m^3/(s \cdot m^2)$] of net floor area. Exhaust systems shall be designed in accordance with the *International Mechanical Code*. Exhaust system inlets shall be located in the area of origin and area of greatest concentration of contaminants. Make-up air shall be introduced in such a manner that all portions of the room or structure are provided with uniformly distributed air movement.

CHAPTER 21
INDUSTRIAL OVENS

SECTION 2103
LOCATION

Sections 2103.5 Location, 2103.6 Relief (explosion) vents and 2103.7 Ductwork are added:

2103.5 Location. Ovens, oven heaters and related equipment shall be located with due regard to the possibility of fire resulting from overheating or the escape of fuel gas or fuel oil and the possibility of damage to the building and injury to persons resulting from explosion.

1. Ovens shall be located at or above grade.

   Exception: Ovens shall be permitted in basements where at least 50% of the wall area of the room in which the oven is located is above grade.

2. Ovens shall be located to be readily accessible for inspection and maintenance and with adequate clearances to permit the proper functioning of explosion vents.

2103.6 Relief (explosion) vents. Ovens which may contain flammable air-gas mixtures shall be equipped with relief vents for freely relieving internal explosion pressures.

2103.7 Ductwork. All ductwork shall be constructed of approved non-combustible material. Ducts shall be made tight throughout and shall have no openings other than those required for the proper operation and maintenance of the system. Ducts passing through combustible walls, ceilings, floors or roofs shall provide adequate insulation and clearances to prevent surface temperatures from exceeding 160 degrees F. Exhaust ducts shall not discharge within 10 feet of doors, windows or other air intakes in a manner that will permit re-entry of vapors into the building.

CHAPTER 22
MOTOR FUEL-DISPENSING FACILITIES AND REPAIR GARAGES

SECTION 2204
DISPENSING OPERATIONS

Section 2204.2.5 Communications is replaced in its entirety with the following:

2204.2.5 Communications. The attendant shall be able to communicate with persons in the dispensing area at all times with a two-way hard-wired communication system. An approved method of communicating with the fire department shall be provided for the attendant.

Section 2204.3 Unattended self-service motor fuel-dispensing facilities is replaced in its entirety with the following:

2204.3 Unattended self-service motor fuel-dispensing facilities. Unattended public self-service motor fuel-dispensing facilities are prohibited.

SECTION 2205
OPERATIONAL REQUIREMENTS

Section 2205.6.1 Lettering is added:

2205.6.1 Lettering. Warning signs shall have the word "WARNING" in red letters of not less than 1.5 inches in height and the remainder of the signs shall have red letters of not less than one (1) inch in height on a white background.

Exception: Existing approved signs consisting of contrasting lettering and background.

SECTION 2206
FLAMMABLE AND COMBUSTIBLE LIQUID MOTOR FUEL-DISPENSING FACILITIES

Section 2206.7.3 Mounting of dispensers is replaced in its entirety with the following:

2206.7.3 Mounting of dispensers. In new and existing motor fuel-dispensing facilities the dispensing devices except those installed on top of a protected above-ground tank that qualifies as vehicle-impact resistant, shall be protected against physical damage in accordance with Section 312. Dispensing devices shall be installed and securely fastened to their mounting surface in accordance with the dispenser manufacturer's instructions. Dispensing devices installed indoors shall be located in an approved position where they cannot be struck by an out-of-control vehicle descending a ramp or other slope.

SECTION 2211
REPAIR GARAGES

Section 2211.4.3 Ventilation is replaced in its entirety with the following:

2211.4.3 Ventilation. Where Class I liquids or LP-gas are stored or used within a building having a basement or pit wherein flammable vapors could accumulate, the basement or pit shall be provided with mechanical ventilation in accordance with the *International Mechanical Code,* at a minimum rate of 1.5 cubic feet per minute per square foot (cfm/ft^2) [0.008 m^3/(s $\cdot$ m^2)] to prevent the accumulation of

flammable vapors. The fan shall be configured in such a way that it runs continuously and the exhaust inlet is placed within 12" of the pit floor.

Sections 2211.4.4 Fire protection systems, 2211.4.5 Flammable vapor monitoring and 2211.4.6 Warning signs are added:

2211.4.4 Fire protection systems. In buildings equipped with an automatic sprinkler system, pits and below-grade work areas shall be protected. Sprinkler systems in pits and below-grade work areas shall be separately zoned and the control valve shall be located outside the pit or below-grade work area.

2211.4.5 Flammable vapor monitoring. Pits and below-grade work areas shall be equipped with a flammable vapor-monitoring alarm. Alarm notification shall be local only and provided in an approved location(s).

2211.4.6 Warning sign(s). Pits and below grade work areas shall be identified as required. Doors or openings leading to a pit or below grade work area shall be plainly marked with the words "OPEN PIT" in red letters at least six (6) inches high on a white background. Such warning signs shall be placed so as to be readily discernible.

CHAPTER 23

HIGH-PILED COMBUSTIBLE STORAGE

SECTION 2301
GENERAL

Section 2301.3 Construction documents is replaced in its entirety with the following:

2301.3 Construction documents. A construction permit shall be required in accordance with Section 105.7.13 for the installation or reconfiguration of all high-piled storage rack systems. Installation plans and specifications shall be submitted for review and approval and shall include the information specified in Appendix K. Approved plans shall be maintained on the premises in an approved location and available to Fire Department personnel upon request.

SECTION 2306
GENERAL FIRE PROTECTION AND LIFE SAFETY FEATURES

Table 2306.2 General Fire Protection and Life Safety Requirements is replaced in its entirety with the following:

TABLE 2306.2
GENERAL FIRE PROTECTION AND LIFE SAFETY REQUIREMENTS

COMMODITY CLASS	SIZE OF HIGH-PILED STORAGE AREA * (square feet) (see Sections 2306.2 and 2306.4)	ALL STORAGE AREAS (See Sections 2306, 2307, and 2308) [b]				SOLID-PILED STORAGE, SHELF STORAGE AND PALLETIZED STORAGE (See Section 2307.3)		
		Automatic fire-extinguishing system (see Section 2306.4)	Building Access (see Section 2306.6)	Smoke and heat removal (see Section 2306.7)	Draft curtains (see Section 2306.7)	Maximum pile dimension [c] (feet)	Maximum permissible storage height [d] (feet)	Maximum pile volume (cubic feet)
I-IV	0-500	Not Required [a]	Not Required [e]	Not Required	Not Required [k]	Not Required	Not Required	Not Required
	501-2,500	Not Required [a]	Not Required [e]	Not Required	Not Required [k]	100	40	100,000
	2,501-12,000	Yes	Not Required [e]	Not Required	Not Required [k]	100	40	400,000
	12,001-20,000	Yes	Yes	Yes [j]	Not Required [k]	100	40	400,000
	20,001-500,000	Yes	Yes	Yes [j]	Not Required [k]	100	40	400,000
	Greater than 500,000 [g]	Yes	Yes	Yes [j]	Not Required [k]	100	40	400,000
High hazard	0-500	Not Required [a]	Not Required [e]	Not Required	Not Required [k]	50	Not Required	Not Required
	501-2,500	Yes	Not Required [e]	Not Required	Not Required [k]	50	30	75,000
	2,501-300,000	Yes	Yes	Yes	Not Required [k]	50	30	75,000
	300,001-500,000 [g, h]	Yes	Yes	Yes	Not Required [k]	50	30	75000

For SI: 1 foot = 304.8mm, 1 cubic foot = 0.02832m^3, 1 square foot = 0.0929m^2

a. When automatic sprinklers are required for reasons other than those in Chapter 23, the portion of the sprinkler system protecting the high-piled storage area shall be designed and installed in accordance with Sections 2307 and 2308.
b. For aisles, see Section 2306.9
c Piles shall be separated by aisled complying with Section 2306.9
d. For storage in excess of the height indicated, special fire protection shall be provided in accordance with note g when required by the fire code official. See also Chapters 28 and 34 for special limitations for aerosols and flammable and combustible liquids, respectively.

e. Section 503 shall apply for fire apparatus access.
f. Intentionally deleted.
g. Special fire protection provisions including, but not limited to, fire protection of exposed steel columns; increased sprinkler density; additional in rack sprinklers, without associated reductions in ceiling sprinkler density; or additional fire department hose connections shall be provided when required by the fire code official.
h. High-piled storage areas shall not exceed 500,000 square feet. A 2-hour fire wall constructed in accordance with the *International Building Code* shall be used to divide high-piled storage exceeding 500,000 square feet in area.
i. Intentionally deleted.
j. Not required when storage areas are protected by early suppression fast response (ESFR) sprinkler systems installed in accordance with NFPA 13.
k. For requirements refer to Section 910.3.5 and NFPA 13

Section 2306.6.1.4 Storage above doors is added:

2306.6.1.4 Storage above doors. The clear height in accordance with Section 2306.9.2 shall be maintained to the access doors. No racking components shall be located in the clear height.

Exceptions:

1. Rack structure provided for lateral bracing or rack stability and not able to be utilized for storage.
2. A single 24-inch catwalk as permitted by Section 2306.9.1.

Section 2311 Existing Buildings is added:

SECTION 2311
EXISTING BUILDINGS

2311.1 Scope - Existing buildings constructed prior to October 1990. This section is applicable to high-piled or rack storage in existing buildings as follows:

1. Any modification to the existing commodities stored in an existing tenant space where storage height is increased or classification of the commodities is placed in a higher category per Section 2303.
2. New tenant spaces in existing buildings.
3. Existing tenant spaces with new tenants.
4. In buildings that were built and occupied by a tenant with high-piled combustible stock prior to the adoption of the Uniform Codes on October 1, 1990; as long as that tenant remains in operation, it will be up to the Fire Department inspection to identify any unsafe conditions per Section 110.

2311.2 Storage of Class I commodity – as defined by NFPA 13.

2311.2.1 Automatic sprinklers. Where an automatic sprinkler system is required by Table 2306.2, an approved automatic sprinkler system shall be provided in accordance with Section 903.3.

Exception: Existing automatic sprinkler systems shall be accepted provided that the system has been certified by a qualified Colorado professional engineer to provide a minimum design density to a minimum of 70% of that required by Section 903.3, but not less .2 gpm over 2,000 sq ft. Density reductions permitted by NFPA 13 shall not apply for determination of the 70% minimum density.

2311.2.2 Building access. Building access from fire apparatus access roads in accordance with Section 503 shall be provided within 200 feet of all portions of the exterior walls of a building used for high-piled storage.

2311.2.2.1 Access doors. Fire Department access doors shall be provided in accordance with Section 2306.6.1.

2311.2.3 Aisles. Shall be in accordance with Sections 2306.9 or 903.3.1; the most restrictive shall govern.

2311.2.4 Portable fire extinguishers. Shall be in accordance with Section 2306.10.

2311.3 Storage of Class II and III commodity - as defined by NFPA 13.

2311.3.1 Automatic sprinklers. Where an automatic sprinkler system is required by A Table 2306.2, an approved automatic sprinkler system shall be provided in accordance with Section 903.3.1.

Exception: Existing automatic sprinkler systems shall be accepted provided that the system has been certified by a qualified Colorado professional engineer to provide a minimum design density to a minimum of 70% of that required by Section 903.3, but not less .2 gpm over 2,000 sq ft. Density reductions permitted by NFPA 13 shall not apply for determination of the 70% minimum density.

2311.3.2 Building access. Building access from fire apparatus access roads in accordance with Section 503 shall be provided within 200 feet of all portions of the exterior walls of a building used for high-piled storage.

2311.3.2.1 Access doors. Fire Department access doors shall be provided in accordance with Section 2306.6.1.

2311.3.3 Smoke and heat removal. Smoke and heat vents shall be provided in accordance with Section 2306.7 with a vent area to floor area ratio of 1:200. Draft curtains shall not be required when separation between high-piled storage and non high-piled storage is in accordance with Section 2306.3 and not required per Section 903.3.1.

Exceptions:

1. When the installation of smoke and heat vents is determined by the fire code official to be impractical, mechanical smoke- removal systems are allowed to be provided in accordance with Section 910.4.
2. Frozen food storage classified as a Class II commodity is not required to be provided with smoke and heat vents or mechanical smoke removal when protected by an automatic sprinkler system.
3. Existing roof openings such as skylights may be used as smoke vents when approved by the fire code official.

2311.3.4 Aisles. Shall be in accordance with Sections 2306.9 or 903.3.1; the most restrictive shall govern.

2311.3.5 Portable fire extinguishers. Shall be in accordance with Section 2306.10.

2311.4 Storage of Class IV, high-hazards and plastics commodities - as defined by NFPA 13.

2311.4.1 Automatic sprinklers. Where an automatic sprinkler system is required by Table 2306.2, an approved automatic sprinkler system shall be provided in accordance with Section 903.3.

2311.4.2 Building access. Building access from fire apparatus access roads in accordance with Section 503 shall be provided within 100 feet of all portions of the exterior walls of building used for high-piled storage.

2311.4.2.1 Access doors. Fire Department access doors shall be provided in accordance with Section 2306.6.1.

2311.4.3 Smoke and heat removal. Smoke and heat vents shall be provided in accordance with Section 2306.7 with vent area to floor area ratio accordance with A Table 910.3. Draft curtains shall not be required when separation between high-piled storage and non high-piled storage is in accordance with Section 2306.3 and not required per Section 903.3.1.

Exception: When the installation of smoke and heat vents is determined by the fire code official to be impractical, mechanical smoke-removal systems are allowed to be provided in accordance with Section 910.4.

2311.4.4 Aisles. Shall be in accordance with Sections 2306.9 or 903.3.1; the most restrictive shall govern.

2311.4.5 Portable fire extinguishers. Shall be in accordance with Section 2306.10.

CHAPTER 24

TENTS AND OTHER MEMBRANE STRUCTURES

SECTION 2403
TEMPORARY TENTS AND MEMBRANE STRUCTURES

Section 2403.2 Approval required is replaced in its entirety with the following:

2403.2 Approval required. Tents and membrane structures having an area in excess of 200 square feet shall not be erected, operated, or maintained for any purpose without first obtaining a permit and approval from the fire code official.

Exceptions:

1. Tents used exclusively for recreational camping purposes.
2. Tents open on all sides which comply with the following:
   - 2.1 The aggregate area not exceeding 400 square feet (37 m^2) of one or more tents placed side by side without a fire break clearance of 12 feet (3658 mm).
   - 2.2 A minimum clearance of 12 feet (3658 mm) between the aggregate area and all other tents and structures.

Section 2403.9 Anchorage required - last sentence, is replaced in its entirety with the following:

2403.9 Anchorage required. Documentation of structural stability in accordance with *International Building Code* Section 3102.7 shall be furnished to the fire code official on request.

Section 2403.12.6.1 Exit sign illumination is replaced in its entirety with the following:

2403.12.6.1 Exit sign illumination. Exit signs shall be provided in accordance with Section 1011 as amended.

SECTION 2404
TEMPORARY AND PERMANENT TENTS AND MEMBRANE STRUCTURES

Section 2404.20 Standby personnel is amended by replacing the title only with the following:

2404.20 Fire watch personnel. When, in the opinion of the fire code official, it is essential for public safety in a tent, or membrane structure used as a place of assembly or any other use where people congregate, or any building premise or property where people congregate, because of the number of persons, or the nature of the performance, exhibition, display, contest, or activity, or when potentially hazardous conditions exist, or an occupant load varies due to large crowd movement from one building to another building or one area of a building to another area of the building, or there is a reduction in a life safety feature, or there is an impairment to a fire protection feature, the owner, agency, or lessee shall employ and compensate through Department of Safety channels, at a rate established by the Manager of Safety, one or more firefighters of the City and County of Denver, as required by the fire code official. Such firefighter(s) shall be subject to the fire code official's orders at all times when so employed and shall be in uniform and remain on duty during the times such places are open to the public or when such activity is being conducted or, in the case of residential occupancies, whenever occupied.

Section 2404.20.3 Permit required is added:

2404.20.3 Permit required. Permits shall be required as set forth in Section 105.6.53.

CHAPTER 25

TIRE REBUILDING AND TIRE STORAGE

SECTION 2505
OUTDOOR STORAGE

Section 2505.4 Distance from lot lines and buildings is amended by adding the following Exception:

> **Exception:** Outside storage shall be limited to 5,000 square feet of tire storage. Storage in excess of 5,000 square feet (464.5 square meters) does not meet this exception. Tire storage piles shall be located at least 10 feet from lot lines and buildings if storage is no higher than six (6) feet. Storage heights from 6 feet to 10 feet shall be no closer to lot lines and buildings than 20 feet.

SECTION 2508
FIRE PROTECTION

Section 2508.3 Automatic sprinkler systems is added:

2508.3 Automatic sprinkler systems. Automatic sprinkler systems shall be installed in accordance with Section 903.2.9.2.

CHAPTER 26
WELDING AND OTHER HOT WORK

SECTION 2601
GENERAL

Section 2601.3 Restricted areas is amended by adding the following:

6. Areas where uncleaned or improperly prepared drums, tanks, or other containers and equipment that have previously contained materials that could develop explosive atmospheres.

SECTION 2605
GAS WELDING AND CUTTING

Section 2605.2 Cylinder and container storage, handling and use is replaced in its entirety with the following:

2605.2 Cylinder and container storage, handling and use. Storage, handling and use of compressed gas cylinders, containers and tanks shall be in accordance with this section and Chapter 30. Ordinary rope slings or electromagnets shall not be used as defined and described in Section 3005.10 of this code.

SECTION 2608
ACETYLENE GENERATORS

Section 2608.1 Use of acetylene generators is replaced in its entirety with the following:

2608.1 Use of acetylene generators. The use of acetylene generators shall comply with this Section and NFPA 51 and 51A.

CHAPTER 27

HAZARDOUS MATERIALS—GENERAL PROVISIONS

SECTION 2701
GENERAL

Section 2701.1 Scope - Exception 9 is amended as follows:

9. The storage of wines in wooden barrels and casks.

Section 2701.3 Performance-based design alternative is replaced in its entirety with the following:

2701.3 Performance-based design alternative. When approved by the fire code official, buildings and facilities where hazardous materials are stored, used or handled shall be permitted to comply with this section as an alternative to compliance with the other requirements set forth in this chapter and Chapters 28 through 44. Written approval shall be obtained from the fire code official prior to submitting a performance-based design.

Section 2701.5.2.1 Preparation is added:

2701.5.2.1 Preparation. The fire code official is authorized to require HMIS submittals to be prepared by a qualified individual or firm acceptable to the fire code official in accordance with Section 104.7.2.

Section 2701.7 Laboratories using chemicals is added:

2701.7 Laboratories using chemicals. Laboratory buildings, laboratory units, and laboratory work areas in which chemicals are handled or stored shall be in accordance with NFPA 45 and this code.

SECTION 2702
DEFINITIONS

Section 2702.1 Definitions is amended by adding the following:

BIOHAZARD. An infectious agent or hazardous biological material that presents a risk or potential risk to the health of humans, animals or the environment. The risk can be direct through infection or indirect through damage to the environment. Biohazardous materials include certain types of recombinant DNA; organisms and viruses infectious to humans, animals or plants (e.g., parasites, viruses, bacteria, fungi, prions, rickettsia); and biologically active agents (i.e., toxins, allergens, venoms) that may cause disease in other living organisms or cause significant impact or the environment or community.

CARCINOGEN. A substance that causes the development of cancerous growths in living tissue. A chemical is considered to be a carcinogen if:

1. It has been evaluated by the International Agency for Research on Cancer (IARC) and found to be a carcinogen or potential carcinogen, or
2. It is listed as a carcinogen or potential carcinogen in the latest edition of the Annual Report on Carcinogens published by the National Toxicology Program, or
3. It is regulated by OSHA as a carcinogen.

OTHER HEALTH HAZARD MATERIAL. A hazardous material which affects target organs of the body, including but not limited to, those materials which produce liver damage, kidney damage, damage to the nervous system, act on the blood to decrease hemoglobin function, deprive the body tissue of oxygen, or affect reproductive capabilities, including mutations (chromosomal damage) or teratogens (effects on fetuses).

RADIOACTIVE MATERIAL. Any material or combination of materials that spontaneously emits ionizing radiation.

RELEASE/UNAUTHORIZED DISCHARGE. Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discharging of barrels, containers, and other receptacles containing any hazardous substances or pollutant or contaminant).

SENSITIZER. A chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

SECTION 2703
GENERAL REQUIREMENTS

Table 2703.1.1(1) is revised as follows (portions of table not shown do not change):

TABLE 2703.1.1(1)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS
POSING A PHYSICAL HAZARD[a, j, m, n, p]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEM[b]			USE-OPEN SYSTEM[b]	
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)
Combustible Dust	Not Applicable	H-2	See Note q	Not Applicable	Not Applicable	See Note q	Not Applicable	Not Applicable	See Note q	Not Applicable

q. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.7.2 [IBC 414.1.3].

Section 2703.4 Material Safety Data Sheets is replaced in its entirety with the following:

2703.4 Material Safety Data Sheets. Material Safety Data Sheets (MSDS) shall be readily available on the premises (hard copy shall always be required) for hazardous materials regulated by this chapter. Material Safety Data Sheets shall be located at the main entrance or a location approved by the Fire Department. When a hazardous substance is developed in a laboratory, available information shall be documented and maintained at a Fire Department approved location. The Denver Fire Department serves as the reporting agency for the City and County of Denver, the authority having jurisdiction (AHJ).

SECTION 2704
STORAGE

Section 2704.9 Emergency alarm is replaced in its entirety with the following:

2704.9 Emergency alarm. In addition to the automatic hazard detection required by Section 908, an approved manual emergency alarm system shall be provided in buildings, rooms or areas used for storage of hazardous materials. Emergency alarm-initiating devices shall be installed in an approved location adjacent to each interior exit or exit access door of storage buildings, rooms or areas. Activation of an emergency alarm-initiating device shall sound a local alarm to alert occupants of an emergency situation involving hazardous materials. The Denver Fire Department, based on the specific hazards associated with materials being stored, shall approve the type of alarm, including the location and type of alarm-initiating devices and notification appliances. The emergency alarm for hazardous materials shall be connected to the fire alarm system and shall be annunciated as a separate zone(s) in accordance with

Section 907.2.5.1. System components (equipment) shall be listed for the worst-case weather and temperature ranges to which the equipment will be exposed.

Section 2704.10 Supervision is replaced in its entirety with the following:

2704.10 Supervision. Emergency alarm, detection and automatic fire-extinguishing systems required by Section 2704 shall be supervised by an approved Class I central station service.

Section 2704.12 Noncombustible floor is replaced in its entirety with the following:

2704.12 Noncombustible floor. Except for surfacing, floors, walkways, ramps, structures for walkways and ramps of storage areas shall be of noncombustible construction.

SECTION 2705
USE, DISPENSING AND HANDLING

Section 2705.1.2 Noncombustible floor is replaced in its entirety with the following:

2705.1.2 Noncombustible floor. Except for surfacing, floors, walkways, ramps, structures for walkways and ramps of areas where liquid or solid hazardous materials are dispensed or used in open systems shall be of noncombustible, liquid-tight construction.

Section 2705.2.1.1 Ventilation is replaced in its entirety with the following:

2705.2.1.1 Ventilation. Where gases, liquids or solids having a hazard ranking of 3 or 4 in accordance with NFPA 704 are dispensed or used, mechanical exhaust ventilation shall be provided to capture fumes, mists or vapors at the point of generation. Use as a reference for capture velocity the American Association of Industrial Hygienists (AAICH) handbook, Volume 25.

Exception: Gases, liquids or solids which can be demonstrated not to create harmful fumes, mists or vapors.

CHAPTER 33
EXPLOSIVES AND FIREWORKS

SECTION 3301
GENERAL

Section 3301.1 Scope is amended by deleting all Exceptions.

Section 3301.1.3 Fireworks is amended by deleting Exceptions 1, 2, and 4.

Section 3301.2.4 Financial responsibility is replaced in its entirety with the following:

3301.2.4 Financial responsibility. Before a permit is issued, as required by Section 3301.2, the applicant shall file with the Fire Prevention and Investigation Division a surety bond in the principal sum of $2,000,000 or a public liability insurance policy for the same amount, for the purpose of the payment of all damages to persons or property which arise from, or are caused by, the conduct of any act authorized by the permit upon which any judicial judgment results. The fire code official is authorized to specify a greater or lesser amount when, in his or her opinion, conditions at the location of use indicate a greater or lesser amount is required. Government entities shall be exempt form this bond requirement.

Section 3301.4 Qualifications is replaced in its entirety with the following:

3301.4 Qualifications. Persons in charge of magazines, blasting, fireworks display, or pyrotechnic special effect operations shall obtain the appropriate State of Colorado and City and County of Denver Fire Department license. For pyrotechnic special effect operations, the license is that required for an outdoor display operator. Persons in charge of magazines, blasting, fireworks display, or pyrotechnic special effect operations shall not be under the influence of alcohol or drugs which impair sensory or motor skills, shall be at least 21 years of age, and shall demonstrate knowledge of all safety precautions related to the storage, handling, or use of explosive, explosive material, or fireworks.

Section 3301.5 Supervision is replaced in its entirety with the following:

3301.5 Supervision. The fire code official is authorized to require operations permitted under the provisions of Section 3301.2 to be supervised at any time by the fire code official in order to determine compliance with all safety and fire regulations. The Denver Fire Department Fire Prevention pyrotechnics personnel shall be retained for fire watch and to inspect all equipment and powder charges. The pyrotechnics firm to which the permit is issued/granted shall be responsible for the cost of this/these personnel.

SECTION 3306
SMALL ARMS AMMUNITION

Section 3306.4.3 Small arms cartridges is added:

3306.4.3 Small arms cartridges. No more than 10,000 small arms cartridges shall be stored in any Group R occupancy.

CHAPTER 34
FLAMMABLE AND COMBUSTIBLE LIQUIDS

SECTION 3401
GENERAL

Section 3401.2 Nonapplicability - Item 9 is amended as follows:

9. The storage of wines in wooden barrels and casks.

Section 3401.5.1 Altitude correction is added:

3401.5.1 Altitude correction. Altitude has a direct impact on the physical properties of flammable and combustible liquids and shall be accounted in the design considerations of life safety and property protection systems. Flash point and boiling point information for flammable and combustible liquids is referenced to sea level. In Denver, Colorado, the flash point and boiling point of flammable and combustible liquids will reduce by 8° F and may cause reclassification of flammable and combustible liquids.

SECTION 3403
GENERAL REQUIREMENTS

Section 3403.6.2.2 Bulk transfer and process transfer piping is added:

3403.6.2.2 Bulk transfer and process transfer piping. Closed double-wall steel piping and leak monitoring shall be required for bulk transfer and process transfer of flammable and combustible liquids inside buildings in the following applications:

1. Piping used for the manual transfer of fuel oil
2. Piping used for the automatic transfer of fuel oil from a stationary supply tank, located inside or outside the building, to fuel-burning equipment with or without a day tank
3. Piping used to transfer Class 1A, 1B and 1C flammable liquids

Exception: Single wall metallic piping may be used where:

1. the fuel storage tank and fuel-burning equipment are located in a parking garage
2. the fuel storage tank and fuel-burning equipment are located aboveground exterior to the building
3. fuel is automatically transferred from a tank vehicle to a stationary tank, provided the piping system is exposed and continuously supervised by trained personnel during the transfer operation
4. fuel is manually transferred inside a building from a portable tank not greater than 55 gallons provided the piping system is exposed and continuously supervised by trained personnel during the transfer operation

Section 3403.6.2.3 Piping material is added:

3403.6.2.3 Piping material. Metallic piping and installation shall be in accordance with Table 3403.6.2.3 and ASME B31, *Code for Pressure Piping*.

TABLE 3403.6.2.3

PIPING MATERIAL STANDARDS

MATERIAL	STANDARDS
Copper or copper-alloy pipe	ASTM B 42; ASTM B 302
Steel pipe	ASTM A 53; ASTM A 106

Section 3403.6.10 Pipe joints is amended by adding the following exceptions:

Exceptions:

1. All joints in closed double wall steel piping required by Section 3403.6.2.2 shall be welded.
2. All joints in single wall pipe regulated by Section 3403.6.2.2 shall be welded or threaded. Flanged and other mechanical joints are not permitted.

SECTION 3404
STORAGE

Section 3404.2.13 Abandonment and status of tanks is replaced in its entirety with the following:

3404.2.13 Abandonment and status of tanks. Tanks taken out of service shall be removed in accordance with Section 3404.2.14, or where approved by the fire code official safeguarded in accordance with Sections 3404.2.13.1 through 3404.2.13.2.3 and API 1604.

Section 3404.3.8.5 Warehouse hose lines is deleted in its entirety.

Section 3404.4.3 Spill control and secondary containment - Exception is replaced in its entirety with the following:

Exception: Containers stored on approved containment pallets in accordance with Section 2704.2.3 and containers stored in cabinets and lockers with integral spill containment. Storage of liquids classified as a Class III-B Combustible shall not be required to have secondary containment.

SECTION 3406
SPECIAL OPERATIONS

Section 3406.2.5 Type of tank is replaced in its entirety with the following:

3406.2.5 Type of tank. Tanks shall be provided with top opernings only. Dispensing by use of gravity is prohibited.

Section 3406.2.5.2 Tanks for gravity discharge is deleted in its entirety.

CHAPTER 38
LIQUEFIED PETROLEUM GASES

SECTION 3801
GENERAL

Section 3801.2 Permits is replaced in its entirety with the following:

3801.2 Permits. Permits shall be required as set forth in Sections 105.6 and 105.7.

Distributors shall not install or fill an LP-gas container for which a permit is required unless a permit for installation has been issued for that location by the fire code official. Installation of all tanks requires submittal of a site plan depicting proposed location on the property and all rights-of-way, structures, and proposed piping.

Section 3801.4 Prohibition is added:

3801.4 Prohibition. The installation of LP-gas containers and use of LP gas is prohibited where a source of natural gas is within 300 feet.

Exception:

1. LP-gas containers in accordance with this chapter, NFPA 58, and the applicable provisions of Chapters 3, 6, 14, 24, 34.
2. Dispensing installations and operations in accordance with this chapter, NFPA 58 and the applicable provisions of Chapter 22.

SECTION 3803
INSTALLATION OF EQUIPMENT

Section 3803.2.1.7 Use for food preparation is amended by adding the following sentence to the end of the section:

Such containers shall not exceed a water capacity of 2.5 lbs.

SECTION 3804
LOCATION OF CONTAINERS

Section 3804.2 Maximum capacity within established limits is amended by adding Exceptions 2 and 3:

Exceptions:

2. For dwellings constructed under the IRC, a maximum of 40 pounds of propane [or two (2) 20-lb. cylinders—one for use and one spare bottle] shall be permitted on the premises. For quantity limits inside the actual dwelling unit, see NFPA 58, Chapter 8, Section 8.3.5.

   Exception: Live/work units shall comply with IBCA Section 419.

3. For multi-family dwellings, one (1) 20-lb. propane cylinder is allowed to be stored in each detached garage or detached storage area.

CHAPTER 40

OXIDIZERS, OXIDIZING GASES AND OXIDIZING CRYOGENIC FLUIDS

SECTION 4001
GENERAL

Section 4001.3 Oxygen coordinator or oxygen supply and delivery personnel is added:

4001.3 Oxygen coordinator or oxygen supply and delivery personnel. All home oxygen coordinators and oxygen supply and delivery personnel must successfully pass the written test administered by the Denver Fire Department and be issued a Denver Fire Department license. The home oxygen coordinator and oxygen supply and delivery personnel for residential settings where oxygen is used shall be required to ask the recipient a series of Fire Department prepared questions to assess the fire risk potential of the dwelling. This questionnaire is available from the Denver Fire Department. The home oxygen coordinator or oxygen supply and delivery personnel shall demonstrate to the patient the proper use techniques, instructions in safe use of the equipment, and provide educational and/or warning information for patients and caregivers on the hazards of smoking while oxygen is in use. The home oxygen coordinator or oxygen supply and delivery personnel shall submit the completed questionnaire to the Denver Fire Department.

CHAPTER 46
CONSTRUCTION REQUIREMENTS FOR EXISTING BUILDINGS

SECTION 4601
GENERAL

Section 4601.2 Intent is replaced in its entirety with the following:

4601.2 Intent. The intent of this chapter is to provide a minimum degree of fire and life safety to persons occupying existing buildings by providing minimum construction requirements when the applicable requirements for such buildings cannot be ascertained by one or more of the following:

1. The building and fire codes in effect when the building was reviewed and permitted for construction
2. The building and fire codes in effect when the building was last certified for occupancy
3. All applicable retrofit ordinances, including retroactive regulations contained elsewhere in this Code
4. Modification under IBC Section 110 Alternate Materials, Design and Methods of Construction and Equipment

SECTION 4603
FIRE SAFETY REQUIREMENTS FOR EXISTING BUILDINGS

Section 4603.2 Elevator operation is deleted in its entirety.

SECTION 4604
MEANS OF EGRESS FOR EXISTING BUILDINGS

Section 4604.17.3 is replaced in its entirety with the following:

4604.17.3 Dimensions. Fire escape stairs shall meet the minimum width, riser height and tread depth as specified in IBCA Sections 3406.4 and 105.1.

Section 4606 Retrofit Life Safety Requirements for Existing Non-High Rise Residential Buildings – Division I is added:

SECTION 4606
RETROFIT LIFE SAFETY REQUIREMENTS FOR EXISTING NON-HIGH RISE RESIDENTIAL BUILDINGS – DIVISION I (Reprinted from 1995 Denver Building Code Amendments Appendix Chapter 1)

4606.1 General. The purpose of this section is to provide a minimum degree of safety to persons occupying existing residential buildings constructed prior to October 1, 1990, by providing for alterations to such existing buildings which do not conform with the minimum requirements of this Code.

Exceptions:

1. Group R, Division 3 and Group U Occupancies.
2. Group R, Division 2 buildings that have been reviewed by an architect or engineer for

compliance with UBC Section 1202(c), amended – Special Provisions for Group R, Division 2 Occupancy.

4606.1.1 Compliance date. Plans for compliance shall be submitted by January 1, 1994. The work shall be completed by July 1, 1995.

4606.1.2 Permit and plan review fee. No plan review fee will be required at the time of plan submittal. The total permit fee shall be paid when the permit is issued. The permit fee shall be based on the installation cost of each unit as provided for in Table 3-A. Multiple units within a single building, with one or multiple addresses, may be combined on one permit application, and the permit fee based on the combined installation cost. Each address shall be listed on the permit application for multiple address buildings.

4606.1.3 Failure to comply. Any building in violation of this Division I is an unsafe and hazardous building and is in violation of the Denver Building and Fire Codes. Such violation subjects the owner of the building or unit to the fines and penalties provided.

4606.2 Smoke detectors. Approved smoke detectors shall be provided as follows. When the primary power of the building is used, the wiring shall be permanent and without a disconnecting switch other than required for overcurrent protection.

1. Dwelling units, hotel rooms and rooms used for sleeping purposes shall have detectors that are battery-operated or that receive their primary power from the building wiring.
2. Interior corridors which serve more than 2 dwelling units, hotel or sleeping rooms, and that provide a path of egress, shall have detectors that receive their primary power from the building wiring and may be one of the following systems:
    a. 120 volt residential type detectors which when activated shall sound an alarm throughout the corridor on that floor. When more than one detector is required for any one corridor, the detectors in that corridor shall be interconnected. Wiring diagrams showing detector location and power pick-up points shall be provided. Certification by a Colorado professional engineer will not be required. The manufacturer's cut sheet on the electrical equipment shall be submitted.
    b. Interconnected commercial system type detectors which when activated shall sound an alarm (1) throughout the building corridors for buildings 4 stories or less; or (2) throughout the corridors on the fire floor and the floor above and below for buildings more than 4 stories.

        Exception: Buildings that have an approved sprinkler system throughout.

4606.2.1 Location within dwelling units. In dwelling units, detectors shall be mounted on the ceiling or wall at a point centrally located in the corridor or area giving access to each separate sleeping area. Where sleeping rooms are on an upper level, the detector shall be placed at the center of the ceiling directly above the stairway. Detectors shall also be installed in the basement of dwelling units having a stairway which opens from the basement into the dwelling. Detectors installed within dwelling units under this Subsection need not be interconnected.

4606.2.2 Location in efficiency dwelling units, hotel rooms and sleeping rooms. In efficiency dwelling units, hotel rooms and sleeping rooms, detectors shall be located on the ceiling or wall of the sleeping room. When actuated, the detector shall sound an alarm audible within the sleeping area of the dwelling unit, hotel or sleeping room in which it is located.

4606.2.3 Installation and spacing. The approved smoke detectors shall be installed as required by the manufacturer's specification. The spacing between detectors shall not exceed 30 feet. The maximum spacing from any wall shall not exceed 15 feet. Ceiling projections and corridor

arrangement shall be considered in locating smoke detectors for maximum effectiveness.

4606.2.4 Required inspections.

1. Battery-powered smoke detectors must be tested every 6 months for proper function, and if any are not functioning properly they shall be replaced and repaired. The batteries shall be replaced annually. A record keeping log book must be maintained by the building or unit owner indicating the location of the detector, date and result of inspection, date of battery installation and repairs.
2. In condominium dwelling units, the owner of the unit filing a compliance certificate every 6 months with the manager or board of directors of a homeowners association shall not be in violation of this Division I, so long as a current compliance certificate is on file from the unit owner or the Department has been notified by the manager or board of directors of the failure of the unit owner to file the compliance certificate within twenty days of the date set for detector inspections. The Department or Fire Department may inspect the filed certificates and the association's log book at any reasonable time to ensure owner compliance. If the certificates or log book are maintained off the premises, then they shall be made available at the premises by appointment.

APPENDIX CHAPTER 34 - LIFE SAFETY REQUIREMENTS FOR EXISTING BUILDINGS

Division I - LIFE SAFETY REQUIREMENTS FOR EXISTING BUILDINGS OTHER THAN HIGH-RISE BUILDINGS

Section 3406 - GENERAL

3406.1 Purpose. The purpose of this division is to provide a minimum degree of safety to persons occupying existing residential buildings constructed prior to October 1, 1990, by providing for alterations to such existing buildings which do not conform with the minimum requirements of this Code.

EXCEPTION 1: Group R, Division 3 and Group M Occupancies.

EXCEPTION 2: Group R, Division 2 buildings that have been reviewed by an architect or engineer for compliance with UBC Section 1202(c), amended - Special provisions for Group R, Division 2 Occupancy.

3406.2 Compliance Date. Plans for compliance shall be submitted by January 1, 1994. The work shall be completed by July 1, 1995.

3406.3 Permit and Plan Review Fee. No plan review fee will be required at the time of plan submittal. The total permit fee shall be paid when the permit is issued. The permit fee shall be based on the installation cost of each unit as provided for in Table 3-A. Multiple units within a single building, with one or multiple addresses, may be combined on one permit application, and the permit fee based on the combined installation cost. Each address shall be listed on the permit application for multiple address buildings.

3406.4 Failure to Comply. Any building in violation of this Division I is an unsafe and hazardous building and is in violation of the Denver Building and Fire Codes. Such violation subjects the owner of the building or unit to the fines and penalties provided.

Section 3407 - SMOKE DETECTORS

3407.1 General. Approved smoke detectors shall be provided as follows:

1. Dwelling units, hotel rooms and rooms used for sleeping purposes shall have detectors that are battery-operated or that receive their primary power from the building wiring.
2. Interior corridors, which serve more than 2 dwelling units, hotel or sleeping rooms and that provide a path of egress, shall have detectors that receive their primary power from the building wiring and may be 1 of the following systems:
   A. 120-volt residential type detectors which when activated shall sound an alarm throughout the corridor on that floor. When more than 1 detector is required for any 1 corridor, the detectors in that corridor shall be interconnected. Wiring diagrams showing detector location and power pick-up points shall be provided. Certification by a Colorado professional engineer will not be required. The manufacturer's cut sheet on the electrical equipment shall be submitted.
   B. Interconnected commercial systems type detectors which when activated shall sound an alarm: 1) throughout the building corridors for buildings 4 stories or less; or 2) throughout the corridors on the fire floor and the floor above and below for buildings more than 4 stories.

EXCEPTION: Buildings that have an approved sprinkler system throughout.

When the primary power of the building is used, the wiring shall be permanent and without a disconnecting switch other than required for overcurrent protection.

3407.2 Location Within Dwelling Units. In dwelling units, detectors shall be mounted on the ceiling or wall at a point centrally located in the corridor or area giving access to each separate sleeping area. Where sleeping rooms are on an upper level, the detector shall be placed at the center of the ceiling directly above the stairway. Detectors shall also be installed in the basement of dwelling units having a stairway which opens from the basement into the dwelling. Detectors installed within dwelling units under this Subsection need not be interconnected.

3407.3 Location in Efficiency Dwelling Units, Hotel Rooms and Sleeping Rooms. In efficiency dwelling units, hotel rooms and sleeping rooms, detectors shall be located on the ceiling or wall of the sleeping room. When actuated, the detector shall sound an alarm audible within the sleeping area of the dwelling unit, hotel or sleeping room in which it is located.

3407.4 Installation and Spacing. The approved smoke detectors shall be installed as required by the manufacturer's specification. The spacing between detectors shall not exceed 30 feet. The maximum spacing from any wall shall not exceed 15 feet. Ceiling projections and corridor arrangement shall be considered in locating smoke detectors for maximum effectiveness.

3407.5 Required Inspections.

1. Battery-powered smoke detectors must be tested every 6 months for proper function, and if any are not functioning properly, they shall be replaced and repaired. The batteries shall be replaced annually. A record-keeping log book must be maintained by the building or unit owner indicating location of detector, date and result of inspection, date of battery installation and repairs.
2. In condominium dwelling units, the owner of the unit filing a compliance certificate every 6 months with the manager or board of directors of a homeowners association shall not be in violation of this Division I, so long as a current compliance certificate is on file from the unit owner or the Department has been notified by the manager or board of directors of the failure of the unit owner to file the compliance certificate within 20 days of the date set for detector inspections. The Department or Fire Department may inspect the filed certificates and the association's log book at any reasonable time to ensure owner compliance. If the certificates or log book are maintained off the premises, then they shall be made available at the premises by appointment.

Section 4607 Retrofit Life Safety Requirements for Existing High Rise Apartment Buildings (Including Condominiums) – Division II A is added:

SECTION 4607
RETROFIT LIFE SAFETY REQUIREMENTS FOR EXISTING HIGH RISE APARTMENT BUILDINGS (INCLUDING CONDOMINIUMS) – DIVISION II A (Reprinted from 1995 Denver Building Code Amendments Appendix Chapter 34 Division II [B-067])

4607.1 General. The purpose of this Division II is to provide a minimum degree of life safety to persons occupying high rise apartment buildings which do not conform to the minimum requirements of this Building Code.

4607.1.1 Compliance date. Plans for compliance shall be submitted by December 29, 1995. The work shall be completed by January 1, 1998. See Policy 32-B067, "Life Safety Requirements for existing High Rise Residential Buildings."

4607.1.2 Number of exits. Exits shall be provided as required in Section 1004.2.3.2. When two (2) or more exits are required from upper floors, an exterior fire escape complying with Section 3415.4 may be used as one of the required exits.

4607.1.3 Stair construction. All required stairs shall have a minimum run of 9 inches and a maximum rise of 8 inches and shall have a minimum width of 30 inches exclusive of handrails. Every stairway shall have at least one handrail. A landing having a minimum 30-inch run in the direction of travel shall be provided at each point of access to the stairway.

Exception: Fire escapes as provided for in this Section. Exterior stairs shall be of noncombustible construction except on buildings of Types III, IV and V construction, provided that the exterior stairs are constructed of wood not less than 2-inch nominal thickness.

4607.1.4 Corridors. Corridors serving as an exit for an occupant load of 30 or more shall have walls and ceilings of not less than one-hour fire-resistive construction as required by this Code. Existing walls surfaced with wood lath and plaster in good condition or ½-inch gypsum wall board or openings with approved fixed wire glass set in steel frames are permitted for corridor walls and ceilings and occupancy separations when approved. Doors opening into such corridors shall be protected by 20-minute fire assemblies or solid wood doors not less than $1\frac{3}{4}$ inches thick. Where the existing frame will not accommodate the 1¾-inch thick door, a $1\frac{3}{8}$-inch thick solid bonded wood core door or equivalent insulated steel door shall be permitted. Doors shall be self-closing or automatic-closing by smoke detection. Transoms and openings other than doors from corridors to rooms shall comply with Section 1004.3.4.3 of this Code or shall be covered with a minimum of ¾-inch plywood or ½-inch gypsum wallboard or equivalent material on the room side.

Exception: Existing corridor walls, ceilings and opening protection not in compliance with the above may be continued when such buildings are protected with an approved automatic sprinkler system throughout.

4607.1.5 Fire escapes.

1. Existing fire escapes which in the opinion of the building official comply with the intent of this Section may be used as one of the required exits. The location and anchorage of fire escapes shall be of approved design and construction.
2. Fire escapes shall comply with the following:
    a. Access from a corridor shall not be through an intervening room.

b. All openings within 10 feet shall be protected by 45-minute fire assemblies. When located within a recess or vestibule, adjacent enclosure walls shall be of not less than one-hour fire-resistive construction.

c. Egress from the building shall be by a clear opening having a minimum dimension of not less than 29 inches. Such openings shall be openable from the inside without the use of a key or special knowledge or effort. The sill of an opening giving access shall not be more than 30 inches above the floor of the building or balcony.

d. Fire escape stairways and balconies shall support the dead load plus a live load of not less than 100 pounds per square foot and shall be provided with a top and intermediate handrail on each side. The pitch of the stairway shall not exceed 10 inches. All stair and balcony railings shall support a horizontal force of not less than 50 pounds per lineal foot of railing.

e. Balconies shall be not less than 44 inches in width with no floor opening other than the stairway opening greater than 5/8 inch in width. Stairway openings in such balconies shall be not less than 22 inches by 44 inches. The balustrade of each balcony shall be not less than 36 inches high with not more than 9 inches between balusters.

f. Fire escapes shall extend to the roof or provide an approved gooseneck ladder between the top floor landing and the roof when serving buildings 4 or more stories in height having roofs with less than 4:12 slope. Fire escape ladders shall be designed and connected to the building to withstand a horizontal force of 100 pounds per lineal foot; each rung shall support a concentrated load of 500 pounds placed anywhere on the rung. All ladders shall be at least 15 inches wide, located within 12 inches of the building and shall be placed flatwise relative to the face of the building. Ladder rungs shall be ¾ inch in diameter and shall be located 12 inches on center. Openings for roof access ladders though cornices and similar projections shall have minimum dimensions of 30 inches by 33 inches.

g. The lowest balcony shall be not more than 18 feet from the ground. Fire escapes shall extend to the ground or be provided with counterbalanced stairs reaching to the ground.

h. Fire escapes shall not take the place of stairways required by the codes under which the building was constructed.

i. Fire escapes shall be kept clear and unobstructed at all times and maintained in good working order.

4607.1.6 Exit and fire escape signs. Exit signs shall be provided as required by Sections 1013.2.8 and 1003.2.9. All doors or windows providing access to a fire escape shall be provided with fire escape signs.

Exception: The use of existing exit signs may be continued when approved by the Building official.

4607.2 Basement access or sprinkler protection. An approved automatic sprinkler system shall be provided in basements or stories exceeding 1500 square feet in area and not having a minimum of 20 square feet of opening entirely above the adjoining ground level in each 50 lineal feet or fraction thereof of exterior wall on at least one side of the building. Openings shall have a minimum clear dimension of 30 inches. If any portion of a basement is located more than 75 feet from required openings, the basement shall be provided with an approved automatic sprinkler system throughout.

4607.3 Standpipes. All buildings in Division II A shall be provided with an approved Class I or Class III standpipe system.

4607.4 Smoke detectors. Smoke detectors shall be provided in the following locations:

1. Dwelling units.
2. All interior corridors which service more than one tenant and which provide a path of egress.

Detectors shall be installed in accordance with the approved manufacturer's instruction.

Exception: Buildings that have an approved sprinkler system throughout.

4607.4.1 Power source. Smoke detectors within dwelling units may be battery-operated or may receive their primary power from the building wiring when such wiring is serviced from a commercial source. Smoke detectors within corridors serving more than one tenant shall receive their primary power from the building commercial electrical service and shall be annunciated as required by the Fire Department and the Department. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection.

4607.4.2 Location within dwelling units. In dwelling units, detectors shall be mounted on the ceiling or wall at a point centrally located in the corridor or area giving access to each separate sleeping area. Where sleeping rooms are on an upper level, the detector shall be placed at the center of the ceiling directly above the stairway. Detectors shall sound an alarm audible in all sleeping areas of the dwelling unit in which they are located.

4607.4.3 Required inspections.

1. All battery-powered smoke detectors must be tested for proper function and need for replacement of batteries on a semiannual basis. Batteries shall be replaced annually. A record-keeping log book must be maintained by the building or unit owner indicating the location of detector, date and result of inspection, and date of battery installation.
2. In condominium dwelling units, the owner of the unit shall file a compliance certificate semiannually with the manager or board of directors of the homeowners association. The manager or board of directors of a homeowners association shall not be liable or responsible for enforcement or detector failure or any damages resulting there from within a unit, so long as a current compliance certificate is on file from the unit owner or the Department has been notified by the manager or board of directors of the failure of the unit owner to file the compliance certificate within 20 days of the date set for detector inspections. The Department or Fire Department may inspect the filed certificates and the Association's log book at any reasonable time to ensure owner compliance. If the certificates or log book are maintained off the premises, then they shall be made available at the premises by appointment.

4607.4.4 Failure to comply with required inspections. Failure to comply with the required inspections as required in Subparagraph 3418.4 shall constitute an unsafe and hazardous condition, in which case all the detectors in the building (or individual condominium unit) shall be required to receive their primary power from the building's commercial electrical service.

4607.5 Separations of occupancies. Occupancy separations shall be provided as specified in Section 302 of this Code. When approved by the building official, existing wood lath and plaster in good condition or ½-inch gypsum wallboard may be acceptable where one-hour occupancy separations are required.

Section 3414 - GENERAL

These provisions apply to existing high-rise buildings. There shall be 2 subdivisions as follows:

Division II A - Apartment Buildings (includes residential condominiums).

Division II B - Hotels, Retail and Office Buildings

Section 3414 Division II A - Apartment Buildings (includes residential condominiums)

3414.1 Purpose. The purpose of this Division II is to provide a minimum degree of life safety to persons occupying high-rise apartment buildings which do not conform with the minimum requirements of this Building Code.

3414.2 Compliance Date. Plans for compliance shall be submitted by December 29, 1995. The work shall be completed by January 1, 1998.

Section 3415 - EXITS

3415.1 Number of Exits. Exits shall be provided as required in Section 1003.1. When 2 or more exits are required from upper floors, an exterior fire escape complying with Section 3415.4 may be used as 1 of the required exits.

3415.2 Stair Construction. All required stairs shall have a minimum run of 9 inches and a maximum rise of 8 inches and shall have a minimum width of 30 inches exclusive of handrails. Every stairway shall have at least 1 handrail. A landing having a minimum 30-inch run in the direction of travel shall be provided at each point of access to the stairway.

> **EXCEPTION:** Fire escapes as provided for in this Section. Exterior stairs shall be of noncombustible construction except on buildings of Types III, IV and V construction, provided that the exterior stairs are constructed of wood not less than 2-inch nominal thickness.

3415.3 Corridors. Corridors serving as an exit for an occupant load of 30 or more shall have walls and ceilings of not less than one-hour fire-resistive construction as required by this Code. Existing walls surfaced with wood lath and plaster in good condition or 1/2-inch gypsum wall board or openings with approved fixed wire glass set in steel frames are permitted for corridor walls and ceilings and occupancy separations when approved. Doors opening into such corridors shall be protected by 20-minute fire assemblies or solid wood doors not less than 1 3/4 inches thick. Where the existing frame will not accommodate the 1 3/4-inch thick door, a 1 3/8-inch thick solid bonded wood core door or equivalent insulated steel door shall be permitted. Doors shall be self-closing or automatic-closing by smoke detection. Transoms and openings other than doors from corridors to rooms shall comply with Section 1005.7 of this Code or shall be covered with a minimum of 3/4-inch plywood or 1/2-inch gypsum wallboard or equivalent material on the room side.

> **EXCEPTION:** Existing corridor walls, ceilings and opening protection not in compliance with the above may be continued when such buildings are protected with an approved automatic sprinkler system throughout.

3415.4 Fire Escapes.

1. Existing fire escapes which in the opinion of the Building Official comply with the intent of this Section may be used as 1 of the required exits. The location and anchorage of fire escapes shall be of approved design and construction.
2. Fire escapes shall comply with the following:
   A. Access from a corridor shall not be through an intervening room.
   B. All openings within 10 feet shall be protected by 45-minute fire assemblies. When located within a recess or vestibule, adjacent enclosure walls shall be of not less than one-hour fire-resistive construction.

C. Egress from the building shall be by a clear opening having a minimum dimension of not less than 29 inches. Such openings shall be openable from the inside without the use of a key or special knowledge or effort. The sill of an opening giving access shall not be more than 30 inches above the floor of the building or balcony.

D. Fire escape stairways and balconies shall support the dead load plus a live load of not less than 100 pounds per square foot and shall be provided with a top and intermediate handrail on each side. The pitch of the stairway shall not exceed 10 inches. All stair and balcony railings shall support a horizontal force of not less than 50 pounds per lineal foot of railing.

E. Balconies shall be not less than 44 inches in width with no floor opening other than the stairway opening greater than $^5/_8$ inch in width. Stairway openings in such balconies shall be not less than 22 inches by 44 inches. The balustrade of each balcony shall be not less than 36 inches high with not more than 9 inches between balusters.

F. Fire escapes shall extend to the roof or provide an approved gooseneck ladder between the top floor landing and the roof when serving buildings 4 or more stories in height having roofs with less than 4:12 slope. Fire escape ladders shall be designed and connected to the building to withstand a horizontal force of 100 pounds per lineal foot; each rung shall support a concentrated load of 500 pounds placed anywhere on the rung. All ladders shall be at least 15 inches wide, located within 12 inches of the building and shall be placed flatwise relative to the face of the building. Ladder rungs shall be $^3/_4$ inch in diameter and shall be located 12 inches on center. Openings for roof access ladders though cornices and similar projections shall have minimum dimensions of 30 inches by 33 inches.

G. The lowest balcony shall be not more than 18 feet from the ground. Fire escapes shall extend to the ground or be provided with counterbalanced stairs reaching to the ground.

H. Fire escapes shall not take the place of stairways required by the codes under which the building was constructed.

I. Fire escapes shall be kept clear and unobstructed at all times and maintained in good working order.

3415.5 Exit and Fire Escape Signs. Exit signs shall be provided as required by Section 1013.1 thru 1013.4. All doors or windows providing access to a fire escape shall be provided with fire escape signs.

EXCEPTION: The use of existing exit signs may be continued when approved by the Building Official.

Section 3416 - BASEMENT ACCESS OR SPRINKLER PROTECTION

An approved automatic sprinkler system shall be provided in basements or stories exceeding 1,500 square feet in area and not having a minimum of 20 square feet of opening entirely above the adjoining ground level in each 50 lineal feet or fraction thereof of exterior wall on at least 1 side of the building. Openings shall have a minimum clear dimension of 30 inches. If any portion of a basement is located more than 75 feet from required openings, the basement shall be provided with an approved automatic sprinkler system throughout.

Section 3417 - STANDPIPES

All buildings in Division II A shall be provided with an approved Class I or Class III standpipe system.

Section 3418 - SMOKE DETECTORS

3418.1 General. Smoke detectors shall be provided in the following locations:

1. Dwelling units.
2. All interior corridors which service more than 1 tenant and which provide a path of egress.

Detectors shall be installed in accordance with the approved manufacturer's instruction.

EXCEPTION: Buildings that have an approved sprinkler system throughout.

3418.2 Power Source. Smoke detectors within dwelling units may be battery-operated or may receive their primary power from the building wiring when such wiring is serviced from a commercial source. Smoke detectors within corridors serving more than 1 tenant shall receive their primary power from the building commercial electrical service and shall be annunciated as required by the Fire Department and the Department. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection.

3418.3 Location Within Dwelling Units. In dwelling units, detectors shall be mounted on the ceiling or wall at a point centrally located in the corridor or area giving access to each separate sleeping area. Where sleeping rooms are on an upper level, the detector shall be placed at the center of the ceiling directly above the stairway. Detectors shall sound an alarm audible in all sleeping areas of the dwelling unit in which they are located.

3418.4 Required Inspections.

1. All battery-powered smoke detectors must be tested for proper function and need for replacement of batteries on a semiannual basis. Batteries shall be replaced annually. A record-keeping log book must be maintained by the building or unit owner indicating the location of detector, date and result of inspection, and date of battery installation.
2. In condominium dwelling units, the owner of the unit shall file a compliance certificate semiannually with the manager or board of directors of the homeowners association. The manager or board of directors of a homeowners association shall not be liable or responsible for enforcement or detector failure or any damages resulting therefrom within a unit, so long as a current compliance certificate is on file from the unit owner or the Department has been notified by the manager or board of directors of the failure of the unit owner to file the compliance certificate within 20 days of the date set for detector inspections. The Department or Fire Department may inspect the filed certificates and the association's log book at any reasonable time to ensure owner compliance. If the certificates or log book are maintained off the premises, then they shall be made available at the premises by appointment.

3418.5 Failure to Comply with Required Inspections. Failure to comply with the required inspections as required in subparagraph 3418.4 shall constitute an unsafe and hazardous condition, in which case all the detectors in the building (or individual condominium unit) shall be required to receive their primary power from the building's commercial electrical service.

Section 3419 - SEPARATIONS OF OCCUPANCIES

Occupancy separations shall be provided as specified in Section 302 of this Code. When approved by the Building Official, existing wood lath and plaster in good condition or ½-inch gypsum wallboard may be acceptable where one-hour occupancy separations are required.

Section 4608 Retrofit Life Safety Requirements for Existing High Rise Hotels, Retail and Office Buildings – Division II B is added:

SECTION 4608
RETROFIT LIFE SAFETY REQUIREMENTS FOR EXISTING HIGH RISE HOTELS, RETAIL AND OFFICE BUILDINGS – DIVISION II B (Reprinted from 1995 Denver Building Code Amendments Appendix Section 3420 Division II B)

4608 Hotels, retail and office buildings. The provisions of this section were complied with for existing hotels, retail and office buildings by 1987.

4608.1 Scope. This section provides for the installation of fire protection systems in existing high rise office, retail and hotel buildings. The provisions of this Section shall become effective per the following schedule. Plans and specifications for the necessary alterations shall be filed with the Building official within 18 months after the date of owner notification. Work on the required alterations to the building shall commence within 42 months of the date of owner notification and such work shall be completed within 5 years from the date of owner notification.

4608.2 Requirements for Group R, Division 1 hotel occupancies in buildings over 75 feet (high rise) in height. A fire sprinkler system conforming to the requirements of this Chapter shall be installed throughout the building. For purposes of this Section only, bathrooms of 55 square feet or less and closets of 25 square feet or less that are within residential units need not be equipped with sprinkler heads.

Exception: In lieu of the above requirements on floors with residential units, options listed in Policy 32-B067 (reprinted below) may be used.

Section 3420 - Division II B - Hotels, Retail and Office Buildings.

(The provisions of this Section were complied with for existing hotels, retail and office buildings by 1987. All code references refer to the Building Code effective during 1982 through 1987.)

3420.1 Scope. This Section provides for the installation of fire protection systems in existing high-rise office, retail and hotel buildings. The provisions of this Section shall become effective per the following schedule. Plans and specifications for the necessary alterations shall be filed with the Building Official within 18 months after the date of owner notification. Work on the required alterations to the building shall commence within 42 months of the date of owner notification and such work shall be completed within 5 years from the date of owner notification.

3420.2 Requirements for Group R, Division 1 Hotel Occupancies in Buildings over 75 Feet (High-Rise) in Height.

1. A fire sprinkler system conforming to the requirements of this Chapter shall be installed throughout the building. For purposes of this Section only, bathrooms of 55 square feet or less and closets of 25 square feet or less that are within residential units need not be equipped with sprinkler heads.

   EXCEPTION 1. In lieu of the above requirements on floors with residential units, 1 of the following alternate systems may be used:

   A. **Alternate 1.** Corridors in all areas shall be fully sprinklered. Annunciation of sprinklers shall be by individual level waterflow indication. Residential units shall have supervised smoke detectors, installed and annunciated per Section 3809(c), (d), (e), (f), (g) and (h), except an emergency generator will not be required.

      EXCEPTION: In lieu of individual level water flow annunciation, supervised smoke detectors shall be provided in front of stairwell doors on the corridor side and at entrances to elevator lobbies or in front of elevators. Main riser waterflow indication will be required.

   B. **Alternate 2.** Corridors in all areas shall be fully sprinklered. Annunciation shall be by individual level. Each residential unit shall have a sprinkler head in the foyer of the room within 3 feet of the door opening onto the corridor. Each residential unit shall also have a single station detector wired to a 115-volt AC unswitched electric power source.

      EXCEPTION: In lieu of individual level waterflow annunciation, supervised smoke detectors shall be provided in front of stairwell doors on the corridor side and at entrances to elevator lobbies or in front of elevator. Main riser waterflow indication will be required.

   C. **Alternate 3.** All areas shall be provided with a supervised fire detection system installed per Section 3809(c), (d), (e), (f), (g) and (h), except an emergency generator will not be required. Doors opening into public corridors shall be provided with automatic closers per Section 4306(f).

EXCEPTION 2. In lieu of a sprinkler system, assembly service and retail areas and equipment rooms shall be provided with a fire detection system per Section 3809. Assembly areas with ceiling heights in excess of 16 feet shall have a specially engineered system.

EXCEPTION 3. In lieu of a sprinkler system, kitchens may be equipped with fixed temperature heat detection in addition to requirements of Section 3812.

2. Standpipe systems shall be required as follows:

   A. All buildings shall have a standpipe system complying with the requirements of this Chapter.

      EXCEPTION 1. In buildings with an existing standpipe, a separate sprinkler riser, sized per NFPA 13 and interconnected with the standpipe system at the base of the riser, may be installed to serve the sprinkler system.

      EXCEPTION 2. Where the building is fully or partially sprinklered, the combination standpipe or sprinkler riser shall operate the sprinklers on any floor properly as per NFPA 13 without Fire Department pumping into the system to increase the pressure. In addition, the standpipe shall have adequate capacity to supply two 1½-inch hose outlets with each outlet capable of maintaining a pressure of 100 psi with 150 gallons per minute flowing at the topmost outlet with the Fire Department pumping into the system.

      EXCEPTION 3: Where the building is fully detectored, the standpipe shall supply two 1½-inch hose outlets with each outlet capable of maintaining a pressure of 100 psi with 150 gallons per minute flowing at the topmost outlet with the Fire Department pumping into the system.

   B. A Fire Department connection shall be provided as required in this Chapter.

   C. 1½-inch hose connections shall be provided on each floor.

   D. Provide a main riser waterflow indication/annunciation.

3. Communications systems shall be required as follows:

   A. A one-way voice communication (PA) system conforming to the requirements of this Code shall be provided.

      EXCEPTION 1. Phone jacks will be required only at stairway entrances adjacent to manual fire alarm boxes.

      EXCEPTION 2. Phone jacks at stairway entrances may be on 1 zone per stairway.

4. The F.D. Operations Center shall be located on the first floor (ground) level at a location approved by the Department and the Fire Department. The F.D. Operations Center shall consist of the main fire alarm panel and/or annunciator panel, controls for the voice communications systems, controls for the firefighters' communication system and a graphic diagram of the building by floor (typical floors may use a single graphic).

3420.3 Requirements for Retail and Office Occupancies in Buildings Over 75 Feet (High-Rise) in Height.

1. A fire sprinkler system conforming to the requirements of this Chapter shall be installed throughout the building.

EXCEPTION 1. In buildings utilizing a central structural concrete or masonry core, the areas outside the core shall be provided with a fire sprinkler system conforming to the requirements of this Chapter; areas within the core may be provided with supervised fire detection system installed per Section 3809 in lieu of the fire sprinkler system.

EXCEPTION 2. In lieu of a full sprinkler system, all areas shall be provided with a supervised fire detection system installed per Section 3809.

EXCEPTION 3. A sprinkler system shall be provided in the corridor with smoke detectors provided outside each door into an exit stairway and on the occupied (tenant) side of each door opening into the corridor. The above detectors shall be located not less than 1 foot nor more than 3 feet from the protected door. Detectors shall also be installed in mechanical, electrical and telephone equipment rooms and in all janitor closets and storage closets opening into the corridor. Detectors not located in the corridor shall have a remote indicating light above the door in the corridor or be annunciated on a panel at an approved location.

EXCEPTION 4. Where the building has at least 2 means of exiting from each floor complying with the requirements of Chapter 33 and has a fire standpipe system complying with the requirements of Section 3817(c)2.A Exception 3, a fire detection system shall be installed as follows: detectors shall be provided in the corridor outside each door into an exit stairway and on the occupied (tenant) side of each door opening into the corridor. The above detectors shall be located not less than 1 foot nor more than 3 feet from the protected door. Detectors shall also be provided in the corridor connecting the exit stairways; in all elevator lobbies; in mechanical, electrical and telephone equipment rooms; and in all janitor and storage closets opening into the corridor. Where there is no enclosed corridor (open floor plan), detectors shall be located as above at each stairway entrance, in all elevator lobbies, equipment rooms, janitor closets and closets intended to be entered (walk-in) and used for storage of combustible materials and with a minimum of 4 additional detectors provided for the rest of the floor area. Detectors installed in enclosed areas such as equipment rooms and closets shall have a remote indicating light over the door in the corridor or outside the room, or be annunciated on a panel at an approved location.

2. Standpipe systems shall be required as follows:

   A. All buildings shall have a standpipe system complying with the requirements of this Chapter.

      EXCEPTION 1. In buildings with an existing standpipe, a separate sprinkler riser, sized per NFPA 13 and interconnected with the standpipe system at the base of the riser, may be installed to serve the sprinkler system.

      EXCEPTION 2. Where the building is fully or partially sprinklered, the combination standpipe or sprinkler riser shall operate the sprinklers on any floor properly as per NFPA 13 without the Fire Department pumping into the system to increase the pressure. In addition, the standpipe shall have adequate capacity to supply two 1 1/2-inch hose outlets with each outlet capable of maintaining a pressure of 100 psi with 150 gallons per minute flowing at the topmost outlet with the Fire Department pumping into the system.

EXCEPTION 3. Where the building is fully or partially detectored, the standpipe system shall supply two 1 1/2-inch hose outlets with each outlet capable of maintaining a pressure of 100 psi with 150 gallons per minute flowing at the topmost outlet with the Fire Department pumping into the system.

B. A Fire Department connection shall be provided as required in this Chapter.

C. 1 1/2-inch hose connections shall be provided on each floor.

D. Main riser waterflow indication/annunciation shall be provided.

E. When the existing standpipe cannot meet the above criteria, a new standpipe system sized per Section 3806 shall be required.

EXCEPTION 1. Connection to City main water supply and the installation of a fire pump is not required.

EXCEPTION 2. The system shall be supervised by air pressure or by water (as approved by the Denver Water Board).

EXCEPTION 3. New standpipe risers may be installed in stairwells, provided that the exitway is not obstructed. Outlets shall be located per Section 3806.

3. A communication system shall be required as follows for existing retail and office high-rise occupancies.

A. A one-way communication shall be provided. The system shall be provided with a minimum of 2 one-way communication zones. Design of the communication system shall be such that half the speakers on each floor are connected to one zone and half connected to the other zone, so that damage or loss of any one speaker, cable, amplifier, preamplifier or any other single component will not cause the failure of more than 1/2 of the communications system on each floor. The cable system shall be routed in a minimum of 2 vertical risers remotely located from each other. Speakers connected to each system shall be evenly distributed on each floor with adjacent speakers connected to opposite zones.

EXCEPTION 1. Speakers will not be required in stairways but shall be audible in these areas.

EXCEPTION 2. Speakers will not be required in elevators.

B. A 2-way (firefighters') telephone communication system shall be provided conforming to the requirements of this Code.

EXCEPTION 1. Phone jacks will be required only at stairway entrances adjacent to manual fire alarm boxes.

EXCEPTION 2. Phone jacks at stairway entrances may be one zone per stairway.

4. The F.D. Operations Center shall be located on the first floor (ground) level at a location approved by the Department and the Fire Department. The F.D. Operations Center shall consist of the main fire alarm panel and/or annunciator panel, controls for the voice communications systems, controls for the firefighters' communication and a graphic diagram of the building by floor (typical floors may use a single graphic).

CITY AND COUNTY OF DENVER	POLICY	FIRE & PUBLIC WORKS DEPARTMENT

Subject: **LIFE SAFETY REQUIREMENTS FOR EXISTING HIGH RISE RESIDENTIAL BUILDINGS**

App oved:

Roderick A Juniel Division Chief F P B — R Doug Sutton P E Director B I D

Number **32 B067**	Effective Date June 15 1995	Page 1 of 4

Reference **U B C Appendix Chapter 34 D B C**

Appendix Chapter 34 Division II A Apartment Buildings Would allow an approved automatic sprinkler system throughout as an exception to the requirements for (1) Corri dors Section 3415 3 and (2) Smoke Detectors Section 3418 1 All of the other provi sions of the Division II A must be complied with

The following provisions will be accepted as an alternate to the approved automatic sprinkler system throughout for the retrofit of existing high rise buildings as required by D B C Appendix Chapter 34 Division II A

a Sprinklers shall be provided in basements as required in Section 3416 and in all hallways corridors common areas (i e laundry rooms party meeting rooms boiler rooms storage areas etc) top of stairwells and one head within 3 feet of the entrance to each dwelling unit, on the tenant side. Residential or quick response standard sprin klers shall be used in the dwelling units of the building

b Sprinkler head spacing fully sprinklered areas shall comply with NFPA 13

c An existing standpipe capable of providing 100 psi at 500 gpm at the roof riser may be used to supply the sprinkler system

d Connection to a City main water supply per NFPA 13 shall be provided System to be hydraulically designed for 4 heads operating at the most remote area with ade quate city pressure for sprinkler operation at the top most floor. A fire pump shall not be required if the above criteria is met.

e A fire department connection with outside horn and light in accordance with D B C shall be provided at a location approved by the Denver Fire Department

f Main riser and floor level water flow indication/annunciation by floor shall be pro vided by a indicating light type directory annunciator on the first floor at a location approved by the Denver Fire Department

g Types of pipe or tube for sprinkler systems other than steel may be used if listed for this use (Ref NFPA 13)

h Provide detectors in each dwelling unit as required by Section 310 9 1 Battery operated detectors may be used or 120v single station powered by an unswitched source

i All corridor doors shall be self closing or automatic closing by the activation of a smoke detector

LIFE SAFETY REQUIREMENTS FOR EXISTING RESIDENTIAL HIGH RISE BUILDINGS

PURPOSE

To clarify the code language pertaining to high rise retrofit requirements of the Denver Building Code (DBC) for apartment and condominium buildings For complete requirements please refer to DBC Appendix Chapter 34 Division II A. This document summarizes 3 options for code compliance options may not be intermixed

COMPLIANCE DATE:

Complete Construction documents shall be submitted no later than December 29 1995

Construction documents shall include 4 sets of architectural drawings smoke detection shop drawings and sprinkler system shop drawings as required by the option employed for your project These drawings shall be submitted at the same time and shall be signed and sealed by the Colorado registered engineer or architect responsible for the design or analysis

CONSTRUCTION DEADLINE

Construction or installation shall be completed by January 1 1998

CHOOSE 1 OF THESE OPTIONS AND SPECIFY OPTION NUMBER ON DRAWINGS

OPTION ONE	OPTION TWO	OPTION THREE
Building is not sprinklered throughout.	Building is sprinklered throughout.	Building is partially sprin klered per Policy B-067
DBC Appendix Chapter 34 Sec tion 3415 (a) Two exits required (b) Stair construction Min run 9" Max. rise 8 at least 1 handrail required Min 30" wide landing required	(a) The same as Option One (b) The same as Option One	(a) The same as Option One (b) The same as Option One
(c) Corridor construction for occupant load of 30 or more 1 1 hour fire-resistive walls and ceiling 2 ½" gypsum wall board 3 Wood lath & plaster in good condition	(c) Not required due to sprin kler protection	(c) Not required due to sprin kler protection except that doors shall be self or auto-matic closing
Openings into corridors Doors shall be self or auto-closing of following: 1 20-minute fire rated 2 1¾" solid wood 3 1 /8 solid bonded wood 4 1 /8 insulated steel		

OPTION ONE	OPTION TWO	OPTION THREE
For window and transom openings into corridors see DBC Sec 3415 3		
(d) Existing fire escapes See DBC Sec 3415 4(d) for complete requirements Obtain approval from the Building Department prior to plan submittal	(d) The same as Option One	(d) The same as Option One
(e) Exit & fire escape signs See DBC Sec 1013 1 through 1013 4(e) for complete requirements	(e) The same as Option One	(e) The same as Option One
Section 3416	Section 3416	Section 3416
Sprinkler Protection for basements exceeding 1500 sq ft. in area. If basements do not have 20 sq ft. of openings (30" min dimension) in each 50 lineal feet of wall or if any portion of basement is more than 75 from the openings sprinkler protection is required	Building is sprinklered throughout. Sprinkler System Alarms & Zoning to comply with UBC Sec 904 3	The same as Option One Additionally building is partially sprinklered per Policy 67 Sprinkler System Alarms and Zoning to comply with UBC Sec 904 3
Section 3417		
Standpipes Either a Class I or a Class III standpipe system with adequate capacity to supply one 2½ hose outlet capable of maintaining a pressure of 100 PSI with 500 GPM flowing at the topmost outlet with the Fire Department pumping into the system	Standpipes The same as Option One except that combination standpipe and sprinkler riser if used shall operate the sprinkler on any floor properly as per NFPA 13 without Fire Department pumping into the system to increase the pressure	Standpipes The same as Option One except that combination standpipe and sprinkler riser if used shall operate the sprinkler on any floor properly as per NFPA 13 without Fire Department pumping into the system to increase the pressure
Section 3418 Smoke Detectors (a) Detectors shall be installed in: 1 Dwelling units 2 Interior corridors	Section 3418 Smoke Detectors (a) Detectors Not required within dwelling units or corridors	Section 3418 Smoke Detectors (a) Detectors shall be installed in: 1 Dwelling units 2 Not required in interior corridors

CITY AND COUNTY OF DENVER	POLICY	FIRE & PUBLIC WORKS DEPARTMENT

Subject: LIFE SAFETY REQUIREMENTS FOR EXISTING HIGH RISE RESIDENTIAL BUILDINGS

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OPTION ONE	OPTION TWO	OPTION THREE
(b) Power Source 1 Dwelling unit detectors to be battery operated or 120v residential type detectors powered by an unswitched source		(b) Power Source 1 The same as Option One
2 Corridor detectors to be 24v system type or 120v detectors interconnected at each floor and powered by an unswitched source Audible devices shall activate on floor of alarm or on all floors Visual devices if provided may be on the same circuits as audible devices	2 Not required due to sprinkler protection	2 Not required due to sprinkler protection
Annunciation Corridor detectors on each floor shall be annunciated (zoned) separately Pull stations (if provided) and detectors may be on 1 zone per floor Annunciator panel shall be on ground floor in an approved location		
(c) Location within units Detectors to be mounted on ceiling or wall at a point centrally located in an area giving access to each separate sleeping room	(c) Location within Units Detectors are not required but are HIGHLY RECOMMENDED	(c) The same as Option One
(d) Required inspection See DBC Sec 3418 4		(d) The same as Option One
(e) Failure to Comply with Required Inspection See DBC Sec 3418 5		(e) The same as Option One
Section 3419 Occupancy Separation required per UBC Section 302 Existing ½" gypsum board or wood lath & plaster in good condition may be accepted as 1 hour construction	The same as Option One	The same as Option One

NOTE: When battery powered detectors are used the ten year lithium nonremovable battery detector is recommended

END OF DOCUMENT

4608.3 Requirements for retail and office occupancies in buildings over 75 feet (high rise) in height.

1. A fire sprinkler system conforming to the requirements of this Chapter shall be installed throughout the building.

   Exceptions:

   a. In buildings utilizing a central structural concrete or masonry core, the areas outside the core shall be provided with a fire sprinkler system conforming to the requirements of this Chapter; areas within the core may be provided with supervised fire detection system installed per Section 907 in lieu of the fire

sprinkler system.

b. In lieu of a full sprinkler system, all areas shall be provided with a supervised fire detection system installed per Section 907.

c. A sprinkler system shall be provided in the corridor with smoke detectors provided outside each door into an exit stairway and on the occupied (tenant) side of each door opening into the corridor. The above detectors shall be located not less than one foot nor more than 3 feet from the protected door. Detectors shall also be installed in mechanical, electrical and telephone equipment rooms and in all janitor closets and storage closets opening into the corridor. Detectors not located in the corridor shall have a remote indicating light above the door in the corridor or be annunciated on a panel at an approved location.

d. Where the building has at least 2 means of exiting from each floor complying with the requirements of Chapter 10 and has a fire standpipe system complying with the requirements of Section 904, a fire detection system shall be installed as follows: detectors shall be provided in the corridor outside each door into an exit stairway and on the occupied (tenant) side of each door opening into the corridor. The above detectors shall be located not less than one foot nor more than 3 feet from the protected door. Detectors shall also be provided in the corridor connecting the exit stairways; in all elevator lobbies; in mechanical, electrical and telephone equipment rooms; and in all janitor and storage closets opening into the corridor. Where there is no enclosed corridor (open floor plan), detectors shall be located as above at each stairway entrance, in all elevator lobbies, equipment rooms, janitor closets and closets intended to be entered (walk-in) and used for storage of combustible materials and with a minimum of 4 additional detectors provided for the rest of the floor area. Detectors installed in enclosed areas such as equipment rooms and closets shall have a remote indicating light over the door in the corridor or outside the room, or be annunciated on a panel at an approved location.

2. Standpipe systems shall be required as follows:

a. All buildings shall have a standpipe system complying with the requirements of this Chapter.

Exceptions:

1 In buildings with an existing standpipe, a separate sprinkler riser, sized per NFPA 13 and interconnected with the standpipe system at the base of the riser, may be installed to serve the sprinkler system.

2. Where the building is fully or partially sprinklered, the combination standpipe or sprinkler riser shall operate the sprinklers on any floor properly as per NFPA 13 without the Fire Department pumping into the system to increase the pressure. In addition, the standpipe shall have adequate capacity to supply two 1½-inch hose outlets with each outlet capable of maintaining a pressure of 100 psi with 150 gallons per minute flowing at the topmost outlet with the Fire Department pumping into the system.

3. Where the building is fully or partially detectored, the standpipe system shall supply two 1½-inch hose outlets with each outlet capable of maintaining a pressure of 100 psi with 150 gallons per minute flowing at the topmost outlet with the Fire Department pumping into the system.

b. A fire department connection shall be provided as required in this Chapter.

c. 1½-inch hose connections shall be provided on each floor.

d. Main riser water flow indication/annunciation shall be provided.

e. When the existing standpipe cannot meet the above criteria, a new standpipe system sized per Section 904 shall be required.

Exceptions:

1. Connection to City main water supply and the installation of a fire pump is not required.
2. The system shall be supervised by air pressure or by water (as approved by the Denver Water Board).
3. New standpipe risers may be installed in stairwells, provided that the exit way is not obstructed. Outlets shall be located per Section 904.

3. A communication system shall be required as follows for existing retail and office high-rise occupancies.

a. A one-way communication shall be provided. The system shall be provided with a minimum of 2 one-way communication zones. Design of the communication system shall be such that half the speakers on each floor are connected to one zone and half connected to the other zone, so that damage or loss of any one speaker, cable, amplifier, preamplifier or any other single component will not cause the failure of more than ½ of the communications system on each floor. The cable system shall be routed in a minimum of 2 vertical risers remotely located from each other. Speakers connected to each system shall be evenly distributed on each floor with adjacent speakers connected to opposite zones.

Exceptions:

1. Speakers will not be required in stairways but shall be audible in these areas.
2. Speakers will not be required in elevators.

b. A 2-way (firefighters') telephone communication system shall be provided conforming to the requirements of this Code.

Exceptions:

1. Phone jacks will be required only at stairway entrances adjacent to manual fire alarm boxes.
2. Phone jacks at stairway entrances may be one zone per stairway.

4. The F.D. Operations Center shall be located on the first floor (ground) level at a location approved by the Department and the Fire Department. The F.D. Operations Center shall consist of the main fire alarm panel and/or annunciator panel, controls for the voice communications systems, controls for the firefighters' communication and a graphic diagram of the building by floor (typical floors may use a single graphic).

CHAPTER 47
REFERENCED STANDARDS

Replace the specific NFPA Standards listed in Chapter 47 with the following:

NFPA	National Fire Protection Association Battery March Park Quincy, MA 02269 NFPA Codes and Standards—2010 Edition Volumes 1 through 18

Addition: Reference the following standard:

National Chlorine Institute	Chlorine Manual 6th printing—2000
NFPA 70	2008 National Electrical Code

Addition: Reference the following standard:

Institute of Makers of Explosives	Institute of Makers of Explosives 1575 I Street N.W., Suite #550 Washington, D.C. 20005

Addition: Reference the following standards:

Pamphlet 1 Construction Guide for Storage Magazines - 2006

Pamphlet 3 Suggested Code Regulations - 2003

Pamphlet 14 Handbook for the Transportation and Distribution of Explosive Materials - 2007

Pamphlet 17 Safety in the Transportation, Storage, Handling and Use of Explosives - 2007

Pamphlet 20 Safety Guide for the Prevention of Radio Frequency Radiation Hazards in the Use of Electric Blasting Caps - 2001

Pamphlet 21 Destruction of Commercial Explosives

Pamphlet 22 (b) IME Standard for the Safe Transportation of Class C Detonators (Blasting Caps) in a Vehicle with Certain Other Explosives (1995)

Pamphlet 23 Recommendations for the Transportation of Explosives, Division 1.5, Ammonium Nitrate, Emulsion, Division 5.1, Combustible Liquids, Class 3, and Corrosives, Class 8 in Bulk Packaging - 2007

ANSI/ASHRAE 15 Safety for Refrigeration Systems – 2004

ASME B31 Standard for Pressure Piping

Deletion: IEC

APPENDIX ADOPTION STATUS

IFC APPENDICES
STATUS OF APPENDICES ON ADOPTION

All Chapters and Sections of this Appendix are adopted as part of this Code except for those that are deleted in this summary. Those that are amended or added shall also be adopted as part of this Code.

APPENDIX	TITLE	STATUS
A	Board of Appeals	Delete
B	Fire-flow Requirements for Buildings	Adopt as Amended
C	Fire Hydrant Locations and Distribution	Adopt as Amended
D	Fire Apparatus Access Roads	Delete
E	Hazard Categories	Adopt as Reference
F	Hazard Ranking	Adopt as Code
G	Cryogenic Fluids—Weight and Volume Equivalents	Adopt as Reference
H	Hazardous Materials Management Plan (HMMP)	Adopt as Reference
I	Fire Protection Systems—Unsafe Conditions	Adopt as Reference
J	Emergency Responder Radio Coverage	Delete
K	Shop Drawing and System Graphic Requirements for Permit Application	Adopt as Code

APPENDIX B

FIRE-FLOW REQUIREMENTS FOR BUIDINGS

SECTION B104
FIRE-FLOW CALCULATION AREA

Replace Section B104.1 as follows:

B104.1 General. The fire-flow calculation area shall be the total area of all floor levels within the exterior walls, and under the horizontal projections of the roof of a building, except as modified in Section B104.3. In buildings with mixed construction types as defined in IBC, the fire-flow calculations shall follow the method described in the 2009 *International Fire Code Commentary*.

SECTION B105
FIRE-FLOW REQUIREMENTS FOR BUILDINGS

Replace B105.2 with the following:

B 105.2 Buildings other than one- and two-family dwellings. The minimum fire flow and flow duration for buildings other than one- and two-family dwellings shall be as specified in Table B105.1.

Exception: A reduction in required fire flow of up to 50 percent, as approved, is allowed when the building is protected throughout with an automatic fire sprinkler system installed in accordance with NFPA 13, Standard for the Installation of Sprinkler System, or NFPA 13R, Sprinkler Systems in Residential Occupancies Up To and Including Four Stories in Height. The resulting fire flow shall not be less than 1,500 gallons per minute (5,678 L/min) for the prescribed duration as specified in Table B 105.1. Any existing hydrant shall flow no less than 1,500 gpm with a minimum residual pressure of 20 psi.

Delete Footnote a in Table B105.1.

APPENDIX C

FIRE HYDRANT LOCATIONS AND DISTRIBUTION

Add Section C106 as follows:

SECTION C106
WATER MAINS SERVING FIRE HYDRANTS

Add Section C106 as follows:

C106.1 Water mains serving fire hydrants. Water mains supplying fire hydrants, fire protection systems, and building fire flows shall be sized to provide fire flows for required fire hydrants. Water mains supplying fire hydrants shall be looped as required by the Denver Water Department Operating Rules Section 8.03 unless specifically approved by the Denver Water Department.

APPENDIX E

HAZARD CATEGORIES

Adopt Appendix E as reference.

APPENDIX F

HAZARD RANKING

Adopt Appendix F as code.

APPENDIX G

CRYOGENIC FLUIDS—WEIGHT AND VOLUME EQUIVALENTS

Adopt Appendix G as reference.

APPENDIX H

HAZARDOUS MATERIALS MANAGEMENT PLAN (HMMP) AND HAZARDOUS MATERIALS INVENTORY STATEMENT (HMIS) INSTRUCTIONS

Adopt Appendix H as reference.

APPENDIX I

FIRE PROTECTION SYSTEMS—NONCOMPLIANT CONDITIONS

Adopt Appendix I as reference.

APPENDIX K

SHOP DRAWING AND SYSTEM GRAPHIC REQUIREMENTS FOR PERMIT APPLICATION

Appendix K Shop Drawing and System Graphic Requirements for Permit Application is added as follows:

SECTION K101
GENERAL

K101.1 Scope. All documents submitted for approval of any permit application shall bear the stamp, signature and registration number of the responsible design professional in accordance with the requirements below. In all cases, acceptance of any permit application shall be subject to the discretion of the fire code official for further review as deemed necessary.

SECTION K103
TECHNICAL REQUIREMENTS

K103.1 Sprinkler system shop drawings submittal.

1. Two (2) complete sets of working plans shall be submitted in accordance with Section 903 and NFPA 13, Chapter 22.
2. Pre-action sprinkler and clean agent suppression systems shall include the requirements for the suppression and detection system in a single permit application (#3A and #10 permits required).
3. Submittal shall include central station company name and Denver Fire Department license number.

K103.2 Fire Department sprinkler system "walk-through" and "quick permit" procedures.

Review of the following permit applications shall be provided for the modification of existing wet fire sprinkler systems only. The maximum number of permits reviewed or issued for any single applicant shall be limited to one (1) per day. Where shop drawings are required, they shall be prepared by a Colorado licensed professional engineer, responsible for the design and its compliance to the relevant codes adopted by the City and County of Denver.

K103.2.1 Quick permits. The following projects may be permitted through the "quick permits" process without submitting shop drawings.

1. Relocation of 20 or fewer sprinklers in light hazard occupancies only.
2. These 20 sprinklers may include up to a maximum of 5 added sprinklers.
3. Only one quick permit will be issued to a single contractor per floor of a single building in a 60-day period.

K103.2.2 Project requirements for Fire Department walk-through permits. Alterations are limited to relocating, adding and plugging heads.

1. Tenant finish work on an existing sprinkler system involving both sprinkler relocations and additions in a light hazard occupancy for up to 50 sprinklers.
2. Tenant finish work on an existing sprinkler system involving both sprinkler relocations and additions to Ordinary Group 1 and Group 2 Hazards, up to 10 sprinklers in other than Group H occupancies as defined in the Denver Fire Code.
3. Tenant finish in warehouses where tenant finish is within the office only, per Item 2 above.

4. For tenant work on all existing sprinkler systems involving sprinkler relocations and additions, the contractor shall ensure that not more than two (2) sprinklers are fed from any 1" outlet in the new construction area. A maximum of 20 added sprinklers are permitted per zone or floor level. Where the design requires more than two (2) sprinklers to be fed from a 1" outlet, hydraulic calculations shall be provided to ensure the friction loss permits adequate flow for the required design area demand. Full floor layout showing all sprinkler locations and pipe sizes shall be submitted.

5. For installation of new backflow prevention devices on existing wet sprinkler or standpipe systems, hydraulic analysis, including revised hydraulic calculations, new fire flow data and all necessary system modifications to accommodate the additional friction loss shall be completed as a part of the installation.

K103.2.3. Plan submittal - Required information for walk-through. Two (2) complete sets of shop drawings showing all floors that are affected including:

1. Name of owner and occupant
2. Location, including street address
3. Point of compass
4. Full height cross-section, or schematic diagram, if required for clarity, including ceiling construction and method of protection for nonmetallic piping
5. Location of partitions
6. Location of firewalls
7. Building construction type and occupancy classification
8. Location and size of concealed spaces, closets, attics, and bathrooms
9. Sources of water supply with pressure or elevation
10. Make, type, temperature, coverage characteristics, nominal orifice size and K-factor of sprinkler heads. Method of protection for nonmetallic piping.
11. Location of high-temperature sprinklers
12. Total area protected by each system on each floor
13. Pipe type and schedule of wall thickness
14. Nominal pipe size and cutting lengths of pipe (or center-to-center dimensions)
15. Location and size of riser nipples
16. Type of fittings and joints and location of all welds and bends. The contractor shall specify on drawings any sections to be shop welded and the type of fittings or formations to be used
17. Type and locations of hangers, sleeves, braces and methods of securing sprinklers when applicable
18. Layout identifying sizes and locations of existing piping serving the affected floor or area

K103.3 Fire Department fire alarm system shop drawings submittal. Two (2) complete sets of shop drawings shall be submitted for permit application with the following information:

1. Exact address, including building and unit numbers; location of work; name and address of responsible design agency
2. Building occupancy classifications and occupant loads for each occupancy classification
3. Manufacturers' specification sheets for all equipment, equipment, appliances and devices
4. Code reference used as a basis of design, including any administrative modifications or Board of Appeals decisions
5. Identification of system as code-required, non-required code-compliant or user-defined
6. Complete sequence of operation input/output matrix with initiating events (input) as the rows and response events (output) as the columns.
    a. Initiating events shall include (per zone(s) per floor):
        1. Manual initiation of alarm or supervisory features
        2. Automatic initiation by detection, e.g., smoke, heat, fire, other emergency alarms; devices activating specific mechanisms or life safety functions, such as individual smoke control

components, elevator recall, opening protection, etc., shall be identified separately; devices in elevator shafts, elevator machine rooms, stair enclosures shall be identified separately.

3. Manual initiation of special extinguishing systems; devices shall be identified separately per system per zone.
4. Automatic initiation of fire suppression systems; flow switches and special suppression systems shall be identified separately.
5. Functions monitored by the fire alarm system, including but not limited to:
    a. Equipment/device/appliance/system trouble
    b. Equipment/device/appliance/system supervisory shall be listed per zone.
    c. Equipment/systems monitored for integrity; identify each system separately
        1. Elevator shunt trip power
        2. RES system power
        3. FACP and ancillary equipment power
        4. Refuge area communication power
        5. Emergency firefighter communication system(s)

b. Response events shall include:
    1. System alarm and system/component supervisory and trouble.
    2. Alarm notification including signal transmission to central station, interior and exterior appliances, voice evacuation, special suppression pre-discharge alarms, etc.
    3. Required safety functions including (not limited to):
        a. Elevator recall (list groups or banks separately)
        b. Smoke control fan activation (list each fan separately)
        c. Damper activation (list smoke control and opening protectives separately per zone per floor)
        d. Activation of other opening protectives (list separately per zone per floor)
        e. Activation of all electronic access control functions controlled by the fire alarm (list per zone per floor)
        f. HVAC system shutdown
        g. Power shunt; list each component/feature/system separately (entertainment visual and audio features and increasing general illumination levels may be listed together per fire area)

7. Identification of air-handling units with airflow exceeding 2,000 cfm (.94cu m/s) and 15,000 cfm (7.08cu m/s).
8. Identification of air-handling units used for smoke control.
9. Voltage-drop calculations using either the component-by-component method or aggregating the entire load at the end of the circuit. The calculations shall use the listed RMS current draw at 20.4volts for new systems. The voltage on a circuit shall not drop below 16 volts at the last appliance. The "R" values used for conductors shall be per NFPA 70 (NEC) for uncoated copper conductors. Voltage-drop calculations for additional devices on existing system shall be done in the same manner with the same values, as the original calculations for the system.
10. Battery calculations for control panels and power supplies. Calculation shall include 20% de-rating.
11. Scale drawings of each area where work on the fire alarm system is proposed, including north arrow, building address and local street intersections. The drawings shall show the locations of all equipment, appliances, and devices including existing components and end-of-line resistors, room identification by number and function, attic and ceiling details for areas with automatic detection.

12. Mounting heights of wall mounted devices.
13. Symbol list with quantities of each device. Symbols shall comply with NFPA 170, *Standard for Fire Safety Symbols.*
14. Power supply connection details. System single line riser showing all devices.
15. A separate single line drawing of the power supplies, pre-amps, amplifiers, interconnecting wiring, and methods used to provide survivability of the voice evacuation system.
16. Fire alarm circuit identification, in accordance with NFPA 72, including wire color code.
17. Interconnection wiring.
18. Supervising station designation (Central, Proprietary, Remote).
19. Full-scale drawings of annunciators, zone maps and firefighter's smoke control panels.
20. Reflected ceiling plan, where full smoke detection is provided.
21. Conduit-fill calculations
22. List of control unit bypass features
23. Amplifier load calculations and audio circuit loading (not to exceed manufacturer's maximum circuit dB loss)
24. Name, address and Denver Fire Department license number of supervising station. Facilities monitoring radio communication systems shall meet connectivity requirements of Section 916.
25. Fire and smoke construction ratings of walls and barriers
26. Central station company name and Denver Fire Department license number

K103.4 Fire Department walk-through plans procedure (fire alarm). A permit may be issued on walk-through for fire alarm "conduit only rough-in" without approved submitted plans. The contractor shall be responsible for all changes required by the subsequent plan review. A conduit only rough-in permit may be issued to a contractor with an electrical or electrical signal contractor's license in accordance with this section. Only back boxes and conduit stubs and fire alarm raceway systems. Raceway systems shall only be installed by State licensed electrical contractors who are also licensed by the Denver Fire Department.

1. Fire alarm permit applications may be eligible for walk-through review in accordance with the following:
   a. Circumstances under which permit applications may be submitted:

      1. New equipment, devices and/or appliances connected to existing fire alarm systems in other than Group H and I occupancies. Installation shall be limited to a maximum of twelve (12) notification appliances and six (6) initiating devices. Initiating devices connected to access control systems or installed in battery rooms are not eligible for walk-through review.
      2. Transferring existing monitoring companies
      3. Installing a new dialer
      4. Emergency fire alarm panel replacement for an existing system. The proposed panel shall be compatible with the fire alarm system. A complete application per Section 907.1.1 shall be submitted within two weeks of the emergency panel replacement permit. The emergency-replacement panel is subsequently subject to the requirements for a planned-replacement panel.

   b. Limitations:

      1. Walk-through review hours are as posted at the Permit counter.
      2. The maximum number of permit applications eligible for walk-through review shall be limited to one (1) per day per applicant.
      3. Two sets of plans shall be submitted that include the following (as applicable):

         a. Completed permit application
         b. Building code occupancy classification
         c. Manufacturers' specification sheets and equipment listing sheets for new equipment and devices

d. Installation codes and standards used
e. Type of system and reason system is provided (required, non-required)
f. Sequence of operation
g. Identification of duct detectors in air-handling units exceeding 2,000 cfm (0.94cu m/s) (not required in VAV boxes less than 2000cfm (0.94cu m/s) each, but aggregate air flow exceeding 2000cfm (.94cu m/s) boxes served by central fan system)
h. Voltage drop calculations and battery calculations
i. Description of annunciation assignments (complete zone schedule)
j. Shop drawings, drawn to scale, including a drawing for each building level involved, with a north arrow for compass orientation and depicting all control and annunciation panels and peripheral devices. Shop drawings shall bear the seal and signature of a professional engineer licensed by the State of Colorado.
k. Plan for upgrading existing annunciator panel, if applicable
l. One-line diagram showing scope of work and identifying new devices
m. Site address, identification of each room's usage, and areas having automatic detection
n. Provide building details (i.e., attics, ceiling cavities, etc.)
o. Mounting heights for manual fire alarm boxes and strobes
p. Primary power supply connection details and symbol list

K103.4.1 Fire alarm "quick permit" procedure. Quick permits for fire alarm systems are limited to the following:

1. Existing fire alarm systems only. No new fire systems, control units, dialers, RF communicators or power supplies are permitted.
2. Relocation of existing notification appliances on one floor only. Addition of not more than six (6) new notification appliances to an existing circuit or circuits is permitted.
3. Removal and reinstallation of like device in the same location (i.e. notification appliances and initiating devices)
4. Addition of not more than six (6) new notification appliances to an existing circuit(s)
5. Changing of Class 1 central station monitoring agency to another Class 1 central station monitoring agency including reprogramming digital alarm communicator transmitter (dialer)
6. Only one quick permit will be issued to a single contractor per floor of a single building in a 60-day period.

Note: All devices to be installed shall be listed for compatibility with base fire alarm system.

K103.5 Building plans for graphic map. Plans shall be of durable construction, easily readable in normal lighting, protected by a smooth, transparent, plastic surface and shall include every building level including mezzanines and roofs. Plans shall contain the following information as applicable:

1. Building name
2. Building address
3. Construction type(s)
4. Scale
5. North orientation arrow
6. "You Are Here" in contrasting and bold font
7. Latest date plans were drawn/revised
8. Floor plans
9. Concealed spaces below floors and above ceilings; e.g., crawl spaces and attics
10. Site plan
11. Adjacent streets
12. Local fire hydrants
13. Major uses, e.g., kitchens, restaurant, offices, Gymnasium, parking, etc.
14. Areas of emergency function, e.g., areas of refuge, fire command center
15. Utility areas, e.g., electrical/telephone rooms/closets, water entry

16. All stair enclosures with distinct designation for each, matching floor signage
17. All elevators with distinct designation for each and associated machine rooms
18. All trash/linen chutes
19. All utility shafts including HVAC and light wells
20. All interior and exterior utility (communication, electricity, gas, water, etc.) shutoff locations
21. Locations of hazardous materials such as:
    a. Control areas
    b. Fuel storage
    c. Battery rooms
    d. Medical gas rooms,
    e. Emergency and standby power equipment locations
    f. Fuel fill location
    g. Identify fuel type and tank size
22. Sprinkler zones
23. All control valve locations including elevators and paint booths
24. Standpipe outlet locations
25. Special suppression systems; e.g., FM-200; UL-300; pre-action
26. specialized fire protection equipment; e.g., water tanks
27. Fire pump location
28. Fuel fill location for diesel pumps
29. Identify fuel type and tank size as applicable
30. Fire department connections
31. Pump test headers
32. Wall hydrants as applicable
33. Smoke control zones
34. Fire-resistance-rated construction, fire walls, fire bariers, fire partitions, smoke barriers, smoke partitions
35. All initiating devices including water flow
36. Fire alarm zones
37. NAC power extender locations
38. Roof plan
    a. Access
    b. Vents
    c. Occupied areas
39. Stamp and signature of a professional engineer licensed by the State of Colorado
40. Control areas per Section 2703.8.3
41. Other features required by the fire code official

K103.6 Shop drawing submittals (deferred submittal) for smoke control systems. Two (2) complete sets of shop drawings for permit application with the following information:

1. Code reference used as a basis of design, including any Administrative Modifications or Board of Appeals decisions.
2. Plans identifying each smoke control zone including a listing of smoke control equipment (fans) associated with each respective zone. A combination of vertical (section) and/or horizontal (plan) views may be necessary to clearly depict each zone.
3. Certification of coordination of sprinkler, smoke control and fire alarm/detection zones.
4. Plans identifying control equipment including wiring diagrams and tubing schematics as applicable.
5. Manufacturers' specification sheets for all equipment and devices associated with the smoke control system including, but not limited to, the following: Fans, dampers, louvers, CT switches, end-switches, pressure sensors, control tubing, etc. Fan and damper specifications shall include operating temperature to 250° F., minimum number of fan drive belts required for load and number of belts provided. 1.5 x the minimum drive belts required shall be installed.

6. Detailed description of the required self-testing criteria in Section 909.18.3 and plans/procedures for complying with the self-test intervals. Printed reports must be maintained on site in the fire command center.
7. Final acceptance testing plan indicating systems testing. Refer to Section 909.18, Acceptance Testing.

K103.6.1 Firefighter's smoke control panel (FSCP). Firefighter's smoke control panel submission shall bear the stamp and signature of a professional engineer licensed by the State of Colorado and shall incorporate the items below as well as a complete sequence of operation for all activation modes.

K103.6.1.1 The following features shall be incorporated and color-coded as follows:

1. General building layout (black lines on white background)
2. Exhaust systems – RED
3. Pressurization systems – GREEN
4. Garage supply and exhaust systems shall be energized manually to purge smoke (ON –AUTO only). System need not be connected to emergency power. The status of smoke control equipment shall be indicated by LED lamps and appropriate legends. Fans, major ducts and dampers within the building that are components of the smoke control systems shall be clearly identified as to purpose (e.g., "STAIR PRESSURIZATION FAN") on the FSCP. Lettering shall be 16 point Helvetica bold; equipment identification (e.g., "SPF-1") shall be 12 point Helvetica bold.

K103.6.1.2 LED status indicators shall be provided for each component of the smoke control system as follows:

1. Fans operating, dampers open, power on – GREEN
2. Fans off, dampers closed – YELLOW
3. Fans and dampers fault status – YELLOW
4. Duct detectors as required per Section 907. 4.1 shall be identified – YELLOW
5. Provide lamp test with momentary contact push button(s) to illuminate all LED's simultaneously.
6. All status LED's shall be active all the time.

K103.6.1.3 The FSCP shall provide control capability over all smoke-control system equipment within the building. Control switches are active only during an alarm condition except through a secured and supervised bypass method approved by the Fire Department.

1. ON-AUTO-OFF control over each individual piece of operating smoke control equipment that can also be controlled from other sources within the building. This includes; stairway pressurization fans, smoke exhaust fans, supply, return and exhaust fans, elevator shaft pressurization fans and other operating equipment used or intended for smoke control purposes.
2. OPEN-AUTO-CLOSE control over individual dampers relating to smoke control and that are also controlled from other sources within the building.
3. ON-OFF or OPEN-CLOSE control over smoke control and other critical equipment associated with a fire or smoke emergency and that can only be controlled from the fire-fighter's control panel.

Exceptions:

1. Complex systems, when approved by the fire code official, where the controls and indicators are combined to control and indicate all elements of a single smoke zone as a unit.
2. Complex systems, when approved by the fire code official, where the control is accomplished by a computer interface using plain English commands.

K103.6.2 Control action and priorities. The firefighter's control panel actions shall be as follows:

1. ON-OFF and OPEN-CLOSE control actions shall have the highest priority of any control point within the building. Once issued from the firefighter's control panel, no automatic or manual control from any other control point within the building shall contradict the control action. Where automatic means are provided to interrupt normal, non-emergency equipment operation or produce a specific result to safeguard the building or

equipment (i.e., duct freeze stats, duct smoke detectors, high-temperature cutouts, temperature-actuated linkage and similar devices), such means shall be capable of being overridden by the firefighter's control panel. The last control action as indicated by each firefighter's control panel switch position shall prevail. In no case shall control actions require the smoke control system to assume more than one configuration at any one time.

Exception: Power disconnects required by the *National Electrical Code* (NFPA 70).

2. Only the AUTO position of each three-position fire-fighter's control panel switch shall allow automatic or manual control action from other control points within the building. The AUTO position shall be the normal, non-emergency, building control position. Where a firefighter's control panel is in the AUTO position, the actual status of the device (on, off, open, closed) shall continue to be indicated by the status indicator described above. When directed by an automatic signal to assume an emergency condition. All devices and indications shall assume the position required by the sequence of operations. In no case shall control actions require the smoke control system to assume more than one configuration at any one time.
3. Manual operation of any control switch from the "AUTO" position shall command the selected equipment to assume the position/operation required. Indicator lights shall register the appropriate change in state. When returned to the "AUTO" position while still in alarm mode, the equipment shall remain in the mode demanded by the last manual command.

K103.6.3 System response time. Smoke control system activation shall be initiated immediately after receipt of an appropriate automatic or manual activation command. Smoke control systems shall activate individual components (such as dampers and fans) in the sequence necessary to prevent physical damage to the fans, dampers, ducts and other equipment. The total response time for individual smoke control systems to achieve their desired operating mode shall not exceed the following time periods:

Fan operating at desired state – 75 seconds

Damper position travel – 60 seconds

K103.7 Emergency responder radio enhancement system (RES) shop drawings: Three (3) complete sets of shop drawings bearing the stamp and signature of a professional engineer licensed by the State of Colorado and containing the following:

1. Facility address and name where applicable
2. Name and address of system design and installation contractor with installation contractor DFD certificate number
3. Stamp and dated signature of a professional engineer licensed by the State of Colorado
4. Manufacturer cut sheets for all cables, connectors, terminations, amplifiers, UPS, batteries, and antenna
5. Manufacturer's installation instructions
6. Design calculations, (Link Budget) for signal levels at each terminal point and initial input signal strength
7. Wiring riser and distribution diagrams
8. Grounding details
9. Battery calculations
10. Location of all RES equipment
11. "North" reference arrow
12. Copies of FCC authorizations
13. Grid layout and test readings per Section 510.1.1.3(1)

K103.8 High-piled combustible storage installation drawings.

1. Two complete sets of scaled floor plans and vertical sections (as necessary) of the building showing locations and dimensions of use areas including office, battery storage, show rooms, etc. High-piled storage areas shall be depicted and identified including usable storage height for each area. Walls used to separate piles, rack systems, arrays, etc., shall be identified as well as their functions (e.g., fire wall, fire barrier, etc.) and ratings.
2. Scaled plans of all storage arrays identifying all aisles, cross-aisles, catwalks and similar access features.

3. Means of egress in sufficient detail to substantiate compliance of all components with Chapter 10. Floor plans shall be of sufficient clarity and scale to determine travel distance, dead-end corridors, aisle widths, etc.
4. Location of required fire department access doors. Height above adjacent floors, landings, grade planes, etc. shall be identified.
5. Typical scaled sections of each unique rack showing rack height, storage height, number of tiers within each rack, dimensions and locations of catwalks, bridges, pass-throughs, and transverse and longitudinal flues.
6. Fire sprinkler data sheets providing existing or new fire sprinkler design criteria.
7. Clearance between top of storage and the sprinkler deflectors for each storage arrangement.
8. Maximum pile volume for each storage array.
9. Completed Hazards Material Inventory Statement (HMIS) and Hazardous Material Management Plan.
10. Location and classification of commodities in accordance with Section 2303.
11. Location of commodities which are banded or encapsulated.
12. Type and description of fire suppression and detection systems.
13. Location of all valves controlling the water supply for all standpipes and sprinklers (ceiling, in-rack, etc.).
14. A roof or reflected ceiling plan showing the types, locations and specifications of curtain boards, other draft curtains, and all active and passive smoke removal/exhaust systems.
15. Structural analysis per IBC Chapters 16 and 22. Installation and use shall be in accordance with the rack manufacturers' specifications.
16. Any additional information required by the fire code official regarding required design features, commodities, storage arrangement, fire protection, access, egress, etc., within the high-piled storage areas.

K103.9 Fire Department walk-through for kitchen hood extinguishing system. Provide two (2) sets of engineered plans for the suppression system that include the following information:

1. Systems shall be UL-300 listed and complies with NFPA 96
2. Product cut sheets (panel, nozzles, cylinders, etc.)
3. All nozzle locations
4. Location of manual pull station l0 ft. from hood and next to the exit door
5. Kitchen hood shall be zoned separately and annunciated separately to the building FACP where provided
6. One duct required for every 12 ft. of hood
7. Nozzle types and flow point calculation
8. Shop drawings signed by professional engineer licensed by the state of Colorado

2011 AMENDMENTS TO THE 2009 EDITION OF THE INTERNATIONAL RESIDENTIAL CODE AND APPENDICES AS PUBLISHED BY INTERNATIONAL CODE COUNCIL (ICC)

The content of the sections in this Code that begin with a letter or letters designations are maintained by other City or State entities.

[B]	**Denotes International Building Code**
[P]	**International Plumbing Code**
[R]	**International Residential Code**
[EB]	**Existing Building**
[CRS]	**Colorado Revised Statute**
[PW]	**Public Works/Wastewater Management**

CHAPTER 1
ADMINISTRATION

SECTION R101
TITLE, SCOPE AND PURPOSE

[R] Section R101.1 Title is replaced in its entirety with the following:

R101.1 Title. These provisions shall be known as the Residential Code for One and Two-Family Dwellings of the City and County of Denver, and shall be cited as such and will be referred to herein as "this Code".

[R] Section R101.2 Scope is amended by replacing the Exception with the following:

Exceptions:

1. Live/work units complying with the requirements of the International Building Code shall be permitted to be built as one- and two-family dwellings or townhomes. Fire suppression shall be as required by IFC Section 903.3.1.2.
2. The provisions of Section 3110 of the Denver Amendments to the International Building Code shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use, and occupancy of Manufactured Homes.

[R] Section R102.4.1 is added:

R102.4.1. Chapter 33 "Safeguards During Construction" of the IBC and the Denver Amendments thereto shall apply to all work regulated by the IRC.

Sections R103 through R114 are deleted in their entirety. The "Administration of the 2011 Denver Building Code" provisions shall govern.

CHAPTER 3
BUILDING PLANNING

SECTION R301
DESIGN CRITERIA

Table R301.2(1) Climatic and geographic design criteria is replaced with the following:

TABLE R301.2(1)
CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA

GROUND SNOW LOAD	WIND[1] SPEED (MPH)	SEISMIC DESIGN CATEGORY	SUBJECT TO DAMAGE FROM				WINTER DESIGN TEMP	ICE SHIELD UNDER-LAYMENT REQUIRED	FLOOD HAZARDS	AIR FREEZING INDEX	MEAN ANNUAL TEMP
			Weathering	Frost line depth	Termite	Decay					
25 psf	90/100/110	B	Severe	36	Slight/Mod	None/ Slight	1° c	No	1978	712	40-45

*1. Wind Speed: See IBCA Section 1609 For Additional Information.

SECTION R302
ACCESSIBILITY

Section R302.1 Exterior walls is amended by adding Exception 6.

Exceptions:

6. Where the zoning ordinance establishes a minimum ten feet clear separation distance between the exterior walls of adjacent one and two family dwellings located on separated properties and allows one building to be closer to actual property line than the other, the imaginary line provision of IBC Section 704.3 may be used. The exterior wall shall not be located less than three feet to the actual property line.

   The location of the assumed imaginary line with relation to both buildings shall be such that the exterior wall, openings, projections and penetrations meet the criteria set forth in Section R302.1 and Table 302.1.

Section R302.2 Townhouses is amended by replacing Exception 1 with the following and by adding Exception 2.

Exceptions:

1. A common 2-hour fire-resistance-rated wall assembly tested in accordance with ASTM E 119 or UL 263 is permitted for townhouses if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations shall be installed in accordance with Chapters 34 through 43. Penetrations of electrical outlet boxes shall be in accordance with Section R302.4.
2. Where the townhouse is protected throughout with an automatic sprinkler system installed in accordance with Section 313.1 the common wall may b a 1-hour fire-resistance-rated wall assembly tested in accordance with ASTM E 119 or UL 263 if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations shall be installed in accordance with Chapters 34 through 43. Penetrations of electrical outlet boxes shall be in accordance with Section R302.4.

SECTION R305
CEILING HEIGHT

[EB] Section R305.1.1 Basements is amended by adding the following sentences to the last Exception:

Ceiling height in unfinished basements built prior to October 1990 shall be a minimum ceiling height of 6' 8" with a minimum clearance of 6' 0" to any ceiling projection caused by beams, ducts or pipes. If unusual circumstances are present, ceiling heights lower than 6' 8" are subject to the approval of the Building Official.

SECTION R313
AUTOMATIC FIRE SPRINKLER SYSTEMS

Section R313.1 Townhouse automatic fire sprinkler systems is amended by making the effective date January 1, 2013.

Section R313.2 One- and two-family dwellings automatic fire systems is amended by changing the effective date of January 1, 2011 to January 1, 2013.

SECTION R315
CARBON MONOXIDE ALARMS

Section R315 Carbon monoxide alarms is replaced in its entirety with the following:

R315.1 Carbon monoxide (CO) alarms. Installation and maintenance of CO alarms in existing and new dwelling units shall comply with this section, the referenced listings, and the applicable provisions of 2009 NFPA 720.

Exception: Dwelling units described as being regulated by the IRC in IBC Sections 308.2, 308.5 or 310, shall comply with IFC 908.7.

Wherever CO alarms are specified, multiple-purpose alarms are permitted, provided they meet the requirements of all applicable NFPA standards, and:

1 the device is listed for use as a CO alarm per UL 2034 *Standard for Single and Multiple Station Carbon Monoxide Detectors*, and
2 where other sensors are permitted and being utilized to satisfy other alarm/functionality provisions of adopted codes, the device is also listed for those operations; e.g.,
   a UL 217 for *Single and Multiple Station Smoke Alarms*
   b UL 268 for *Smoke Detectors for Fire Alarm Signaling Systems*
   c UL 864 for *Control Units for Fire-Protective Signaling Systems*,
   d UL 1484 for *Residential Gas Detectors*,
   e UL 1971 for *Safety and Signaling devices for Hearing Impaired*,
   f UL 2017 for *General Purpose Signaling Devices and Systems*,
   g UL 2075 for *Gas and Vapor Detectors and Sensors*,

R315.2 Definitions. The following terms are defined for the purposes of this section.

CO (CARBON MONOXIDE). A colorless odorless gas that is produced as a result of incomplete burning of carbon-containing fuels.

CO ALARM. A single-station device or multiple-station group of devices listed per UL 2034 having a sensor that responds to CO. CO alarm devices may be monitored by an alarm control unit, but shall be powered independently of the alarm control unit and shall function autonomously in the event the alarm control unit is nonfunctional.

FUEL-BURNING APPLIANCE. An appliance that burns carbon-containing solid, liquid, and/or gaseous fuels.

MULTIPLE-PURPOSE ALARM. A single device that incorporates the capability to detect more than one hazard, such as smoke, vapors, and/or gases. Multiple purpose devices shall emit audible alarms in a manner that clearly differentiates between the detected hazards.

MULTIPLE STATION ALARM. [1] A single alarm device capable of being physically or wirelessly interconnected to one or more similarly capable devices so the actuation of any one device causes the appropriate notification signal to occur in all interconnected devices. [2] An interconnected group of single-alarm devices defined in [1].

PLUG-IN. CO alarm with battery backup, installed by plugging into a standard electrical outlet for primary power.

SINGLE STATION ALARM. A single device comprised of a sensor, alarm-initiating device, control components, and an alarm notification appliance.

R315.3 When required. CO alarms shall be installed per Sections R315.4 through R315.7 in dwelling units with a fuel-burning appliance, attached garage, or both, and for which a building permit is issued after July 1, 2009 for any one or more of the following:

1 construction of a new dwelling unit;
2. addition containing a sleeping room;
3. relocation of a sleeping room within the dwelling unit;
4. interior remodel of the dwelling unit;
5. installation of a fuel-burning appliance in the dwelling unit; or
6. a change in ownership or tenant occupancy of the dwelling unit.

R315.4 Installation in new dwelling units. CO alarms shall be multiple-station and hard-wired with battery backup.

Exception: Low power radio systems installed in accordance with NFPA 72, NFPA 720 and listed per UL 864 may be battery-powered.

R315.5 Installation in existing dwelling units. CO alarms may be hard-wired, battery-powered, or plug-in, and may be single-or-multiple-station.

Exception: Low power radio systems installed in accordance with NFPA 72, NFPA 720 and listed per UL 864 may be battery-powered.

R315.6 Location. CO alarms shall be installed in dwelling units in the following locations:

1. outside of every sleeping room within 15 ft of the sleeping room doorway,
2. in a central location on every occupiable level, and
3. in a central location in every sleeping room that contains a fuel-burning appliance.

A single device is permitted to fulfill multiple criteria on a single level, provided it meets all of the applicable location requirements.

R315.7 Visual notification. Visual notification shall be provided in dwelling units required to be accessible to persons with disabilities.

R315.8 Maintenance. CO alarms shall be maintained in proper working order in accordance with their listings and manufacturer's specifications.

[CRS] SECTION R320
ACCESSIBILITY

Section R320.1 Minimum height is amended by adding the following sentences:

In addition to the requirements of this section, the provisions of the Colorado Revised Statute 9-5 shall be applicable. CRS 9-5 is reproduced in Appendix M of the Denver Amendments to the IBC.

CHAPTER 4
FOUNDATIONS

SECTION R401
GENERAL

[PW] Section R401.1 Application is amended by adding the following sentence:

Wastewater Management Division of Public Works regulates the requirements for excavation, grading and earthwork construction, including fills and embankments.

Section R401.4 Soil tests is replaced in its entirety with the following:

R401.4 Soil tests. The classification of the soil at each building site shall be determined when required by the Building Official. The Building Official may require that this determination be made by an engineer or architect licensed by the state to practice as such.

R401.4.1 Investigation. The classification shall be based on observation and any necessary tests of the materials disclosed by borings or excavations made in appropriate locations. Additional studies may be necessary to evaluate soil strength, the effect of moisture variation on soil bearing capacity, compressibility, liquefaction, and expansiveness.

R401.4.2 Reports. The soil classification and design bearing capacity shall be shown on the plans, unless the foundation conforms to Table R403.1. The Building Official may require submission of a written report of the investigation, which shall include, but need not be limited to the following information:

1. A plot showing the location of the test borings and/or excavations.
2. Description and classifications of the materials encountered.
3. Elevation of the water table, if encountered.
4. Recommendations for foundation type and design criteria, including bearing capacity, provisions to mitigate the effects of expansive soils, provisions to mitigate the effects of liquefaction and soil strength, and the effects of adjacent loads.
5. Expected total and differential settlement.

CHAPTER 9
ROOF ASSEMBLIES

SECTION R903
WEATHER PROTECTION

Section R903.2.3 Flashing for single-ply roof systems is added:

R903.2.3 Flashing for single-ply roof systems. All flashing installations for single-ply roofing systems shall be installed per manufacturer's latest recommendations and details for the system.

Section R903.2.4 Flashing for interior roof drains is added:

R903.2.4 Flashing for interior roof drains. Flashing for interior roof drains shall be one of the following:

1. A minimum of 2 x 2 feet, 4-pound lead sheet or lead-copper coated sheet, set on completed felts in flashing cement.
2. The metal shall be turned a minimum of ½ inch into a drain sump and plied with 2 plies of Type 4 felt or modified bitumen membrane of sufficient dimension to extend a minimum of 6 inches past metal sheet.
3. A 2-component drain system. The membrane flashing shall be polyvinylchloride sheet measuring 22 inches in length and factory-attached to the underside of the strainer flange. The membrane flashing shall be applied on top of the completed felt, shall extend a minimum of 6 inches from the outside diameter of the drain throat, shall be set into hot asphalt or approved sealants and plied in with 2 plies of Type 4 felt.
4. Drain details for single-ply systems shall be installed per manufacturers' specifications.

Section R903.2.5 Equipment on roof is added:

R903.2.5 Equipment on roof. Equipment placed over roofing shall be supported by 8 inch legs or pads, which shall not inhibit the flow of water from the roof.

Section R903.2.6 Vertical projections is added:

R903.2.6 Vertical projections. All projections through the roof surface shall be properly flashed to prevent moisture entry.

1. Pipe penetrations shall be completed with a standard roof jack or manufacturer-recommended detail.
2. Pitch pans may be used to flash multiple penetrations with prior approval. Chem-curb, pourable sealer or sheet metal caps shall be used to seal pitch pans.

SECTION R905
REQUIREMENTS FOR ROOF COVERINGS

Section R905.2.7 Underlayment application is amended by adding an Exception:

Exception:

An accepted self-adhering polymer modified bitumen sheet can substitute for a double underlayment installation.

Section R905.2.8.2 Valleys item 3 is amended by adding the following:

3. Metal valley liners shall not be allowed in closed valleys.

Section R905.3.9 Inspection of tile roofs is added:

R905.3.9 Inspection of tile roofs. Mid-roof inspections shall be made to inspect battens and flashings. No more than 30% of the roofing shall be completed when requesting the inspection.

Section R905.5.2 Deck slope is replaced in its entirety with the following:

R905.5.2 Deck slope. Mineral surfaced rolled roofing (90 lbs.) shall not be applied on roof slopes below two units vertical in twelve units horizontal.

Exception:

Detached garages, patios and carports open on three sides may have a slope of one unit vertical in twelve units horizontal.

Section R905.9.4 Flashing – new built-up roof covering is added:

R905.9.4 Flashing – new built-up roof covering. Flashing shall be installed on all vertical walls and curbs in accordance with the manufacturers' specifications and:

1. All old wall flashing shall be removed prior to installation of new flashing.
2. All flashings shall extend at least 8 inches, but not more than 12 inches, up all vertical surfaces and at least 4 inches from base of cant.
3. The top edges of the flashing shall be fastened at 3-inch intervals and sealed with plastic cement.
4. End laps shall be at least 3 inches long, and covered with 4 inches of mesh embedded in plastic cement.
5. All vertical walls and projections shall be counterflashed with a 2-piece metal system installed watertight.
6. Nailer strips shall be provided on vertical walls, drips in edge and curbs which will not accept conventional nailing.

CHAPTER 11
ENERGY EFFICIENCY

SECTION N1101
GENERAL

Section N1101.2 Compliance is amended by adding the following sentences:

The results from a code compliant software program can be utilized to show compliance "REScheck™" – Residential Energy Code Compliance Software is one program currently being accepted. This program developed by the Department of Energy can be downloaded for free at http://www/energycodes.gov/compliance_tools.stm.

CHAPTER 26
GENERAL PLUMBING REQUIREMENTS

SECTION P2602
INDIVIDUAL WATER SUPPLY AND SEWAGE DISPOSAL

Section P2602.3 Existing buildings is adding:

P2602.3 Existing buildings. Plumbing in existing buildings may have their use continued, if such use was legal at the time of enforcement of the Plumbing Code in force at the time of construction and such use is not detrimental to the health and safety requirements of the current use or occupancy.

Any change in the use or occupancy of any existing building or structure shall comply with the provisions of this Code. Deviations may be approved by the building official if they are determined to not be detrimental to the health and safety requirements.

SECTION P2604
TRENCHING AND BACKFILLING

Section P2604.5 Trench safety is added:

P2604.5 Trench safety. All excavations shall follow OSHA guidelines and/or requirements of this Code. The most restrictive rules shall apply.

IRC APPENDICES

STATUS OF APPENDICES ON ADOPTION

All Chapters and Sections of this Appendix are adopted as part of this Code except for those that are deleted in this summary. Those that are amended or added shall also be adopted as part of this Code.

APPENDIX	TITLE - SUBJECT	STATUS
A	Sizing and Capacity of Gas Piping (1FGS)	Informative
B	Sizing of Venting Systems Serving Appliances (IFGS)	Informative
C	Exit Terminals of Mechanical Draft and Direct-Vent Ventilating Systems (IFGS)	Informative
D	Recommended Procedures for Safety Inspection of an Existing Appliance Installation (IFGS)	Informative
E	Manufactured Housing Used as Dwellings (IBC)	Amended
F	Radon Control Methods	Infomative
G	Swimming Pools, Spas and Hot Tubs	Adopted
H	Patio Covers	Adopted
I	Private Sewage Disposal	Deleted
J	Existing Buildings and Structures	Deleted
K	Sound Transmission	Adopted
L	IRC Electrical Provisions / NEC Cross Reference	Cross Reference

Appendix E Manufactured housing used as dwellings is replaced with the following:

APPENDIX E

MANUFACTURED HOUSING USED AS DWELLINGS

SECTION AE101
SCOPE

The provisions of Section 3110 of the Denver Amendments to the International Building Code shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use, and occupancy of Manufactured Homes.

2011 DENVER AMENDMENTS TO THE 2009 EDITION OF THE INTERNATIONAL MECHANICAL CODE AND APPENDICES AS PUBLISHED BY INTERNATIONAL CODE COUNCIL (ICC)

The content of the sections in this Code that begin with a letter or letters designations are maintained by other City or State entities.

[F]	**Denotes International Fire Code**
[IFCA]	**Denver Fire Code Amendments to the IFC**

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

Section 101.1 Title is amended by inserting "City and County of Denver" for the name of the jurisdiction.

Sections 103 through 106, 108 and 109 are amended by deleting those sections in their entirety. The "Administration of the 2011 Denver Building" provisions shall govern.

CHAPTER 4
VENTILATION

SECTION 402
NATURAL VENTALATION

Section 402.6 is added:

402.6. Excluding residential occupancies, naturally ventilated spaces shall be permanently open to and within 25 feet (8 meters) of operable openings to the exterior.

SECTION 403
MECHANICAL VENTALATION

Section 403.3 Outdoor air flow rate is amended by adding the following sentence:

The calculations required by this section shall be provided by the design professional. It is recommended to use the ASHRAE 62.1-2004 spreadsheet.

SECTION 404
ENCLOSED PARKING GARAGES

Section 404.1.1 CO detector limits is added:

404.1.1 CO detector limits. Where the system is arranged to operate automatically upon detection of a concentration of carbon monoxide, the limit shall be set at 25 parts per million (ppm).

CHAPTER 5
EXHAUST SYSTEMS

SECTION 505
DOMESTIC KITCHEM EXHAUST EQUIPMENT

Section 505.2 Makeup air required is amended by adding an exception:

Exception: Make-up air shall not be required when the design professional can demonstrate that the exhaust system will not adversely affect the operation or exhaust of combustion gases of any equipment or appliance within the dwelling unit.

SECTION 506
COMMERCIAL KITCHEN HOOD VENTALATION SYSTEM DUCTS AND EXHAUST EQUIPMENT

Section 506.3.12.2 Termination through an exterior wall is amended by adding the following sentence:

Exhaust outlets shall be permitted to terminate through exterior walls when a scrubber system with removal of 95% of grease and smoke is provided.

SECTION 513
SMOKE CONTROL SYSTEMS

Section 513 Smoke control systems is amended by adding the following sentence:

All sections that begin with the letter [F] designation shall be coordinated with Section 909 of the IFC and IFCA.

CHAPTER 6
DUCT SYSTEMS

[B] SECTION 607
DUCT AND TRANSFER OPENINGS

Section 607.5.5 Shaft enclosures is amended by deleting Exception 1.3 and Exception 4.

CHAPTER 9

SPECIFIC APPLIANCES, FIREPLACES AND SOLID FUEL-BURNING EQUIPMENT

SECTION 901
GENERAL

Section 901.5 is added:

901.5. Wood-burning appliances. Installation of new factory-built wood-burning appliances is restricted to certified wood stoves as approved by the Environment Protection Agency. Appliances shall be listed by an approved testing agency. If a wood-burning appliance is not on the EPA approved list, it cannot be installed unless it is converted to a gas log fireplace in accordance with the requirements of Chapter 6 of IFGC.

SECTION 910
FLOOR FURNACES

Section 910 Floor furnaces is deleted in its entirety.

CHAPTER 11
REFRIGERATION

SECTION 1107
REFRIGERANT PIPING

Section 1107.9 Termination of relief devices is added:

1107.9 Termination of relief devices. Pressure-relief devices and fusible plugs on any system containing a group A3 or B3 refrigerant; on any system containing more than 6.6 lbs of a group A2, B1, or B2 refrigerant; and on any system containing more than 110 lbs of a group A1 refrigerant shall discharge to the atmosphere at a location not less than 15' above adjoining ground level and not less than 20' from any window, ventilation opening, or exit in any building. The discharge shall terminate in a manner that will prevent the discharged refrigerant from being sprayed directly on personnel in the vicinity and foreign material or debris from entering the discharge piping. Discharge piping connected to the discharge side of a fusible plug or rupture member shall have provisions to prevent plugging the pipe in the event the fusible plug or rupture member functions.

STATUS OF APPENDICES ON ADOPTION

Appendix A is adopted.

Appendix B is deleted.

2011 DENVER AMENDMENTS TO THE 2009 EDITION OF THE INTERNATIONAL PLUMBING CODE AND APPENDICES AS PUBLISHED BY THE INTERNATIONAL CODE COUNCIL (ICC)

The content of the sections in this Code that begin with a letter or letters designations are maintained by other City or State entities.

[PW]	**Denotes Public Works**
[EB]	**Existing Buildings**
[CC]	**City Council**
[EH]	**Environmental Health**
[CPB]	**Colorado Plumbing Board**
[DW]	**Denver Water**
[FCWA]	**Federal Clean Water Act**

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

Section 101.1 Title is amended by inserting "City and County of Denver" for the name of the jurisdiction.

IPC Sections 103 through 106, 108 and 109 are amended by deleting these sections in their entirety. The "Administration of the 2011 Denver Building Code" provisions shall govern.

CHAPTER 2
DEFINITIONS

SECTION 202
GENERAL DEFINITIONS

Section 202 General definitions is amended by adding the following definition:

SERVICE SINK: A sink or receptor intended for custodial use that is capable of being used to fill and empty a janitor's bucket. Included are mop sinks, laundry sinks, utility sinks and similar fixtures but not a kitchen sink or lav.

CHAPTER 3
GENERAL REGULATIONS

SECTION 301
GENERAL

[EB] Section 301.8 Existing buildings is added:

301.8 Existing buildings. Plumbing in existing buildings may have their use continued, if such use was legal at the time of enforcement of the Plumbing Code in force at the time of construction and such use is not detrimental to the health or safety requirements of current occupancy or use.

Any change in the use or occupancy of any existing building or structure shall comply with the provisions of the IPC. Any deviations may be approved by the Building Official if they are determined to not be detrimental to health or safety requirements.

SECTION 306
TRENCHING, EXCAVATION AND BACKFILL

[PW] Section 306.2.4 Trench safety is added:

306.2.4 Trench safety. All excavations shall follow guidelines as required by OSHA and/or the Administrative Authority. The most restrictive rules shall apply.

CHAPTER 4
FIXTURE, FAUCETS AND FIXTURE FITTINGS

SECTION 401
GENERAL

[CC] Section 401.3.1 Rain sensing is added:

401.3.1 Rain sensing. An approved rain sensing system shall be installed on all new automatic lawn sprinkler systems. Said rain sensing system shall be capable of turning the lawn sprinkler system off in the event adequate rain has fallen.

[CC] Section 401.3.2 Metering is added:

401.3.2 Metering. Each individual dwelling unit shall be metered in such a way that all water used by said dwelling unit can be recorded and billed. The maintenance and repair of said meters shall be the responsibility of the owner of the metered property.

Exception:

Where individual dwelling units are served by a domestic central water heating system.

SECTION 403
MINIMUM PLUMBING FACILITIES

Section 403.1 Minimum number of fixtures is amended by adding an Exception:

Exception:

Service sinks may be eliminated for offices, medical and dental clinics of 1,000 sq. ft. or less.

SECTION 413
FOOD WASTE GRINDER UNITS

[CPB] Section 413.2 Domestic food waste grinder outlets is replaced with the following:

413.2 Domestic food waste grinder outlets. Domestic food waste outlets may be 1 ½" but shall be connected to a drain of at least 2" in diameter.

[PW] Section 413.3.1 Discharge into grease interceptor is added:

413.3.1 Discharge into grease interceptor. All food waste disposals in commercial kitchens shall be connected to and discharge into the grease interceptor.

Exception:

Vegetable preparation area disposal may discharge to either sanitary or grease waste system.

CHAPTER 5
WATER HEATERS

SECTION 502
INSTALLATION

Section 502.2 Rooms used as a plenum is amended by adding an Exception:

Exception:

The water heater is a direct-vent appliance installed in accordance with the conditions of the listing and the manufacture's instructions.

CHAPTER 6
WATER SUPPLY AND DISTRIBUTION

SECTION 603
WATER SERVICE

[DW] Section 603.1 Size of water service pipe is replaced with the following:

603.1 Size of water service pipe. The water service pipe shall be sized to supply water to the structure in the quantities and at the pressures required in this code. The minimum diameter of water service pipes shall be ¾ inch (19 mm). The service line shall remain the same size from tap through meter, then may be increased in size thereafter.

SECTION 608
PROTECTION OF POTABLE WATER SUPPLY

[DW, FCWA] Section 608.1.1 Backflow devices is added:

608.1.1 Backflow devices. Backflow devices installed in water service lines shall be inspected and maintained per Denver Water/State of Colorado Clean Water Act, and the Colorado Cross-Connection Control Manual, most recent edition, as published by the Colorado Department of Public Health and Environment Water Quality Control Division.

Section 608.7 Stop-and-waste valves prohibited is amended by adding an Exception:

Exception:

Combination stop and waste valves may be installed underground if an approved means of removing wastewater from the seep hole is provided, such as a gravel bedding etc.

Section 608.14.2.1 Relief port piping is replaced with the following:

608.14.2.1 Relief port piping. The termination of the piping from the relief port or air gap fitting of a backflow preventer shall discharge to an approved indirect waste receptor or to the outdoors where it will not cause damage or create a nuisance. If this discharge is by means of a pump, the pump shall be sized to handle the maximum discharge of the device.

CHAPTER 7
SANITARY DRAINAGE

SECTION 703
BUILDING SEWER

[PW] Section 703.6 Slope of building sewer piping is added:

703.6 Slope of building sewer piping. Building sewers shall be installed at uniform grade or slope. The minimum grade of building sewers shall be in accordance with Denver Wastewater Management Standards.

SECTION 708
CLEANOUTS

[PW] Section 708.3.3 Changes of direction is replaced in its entirety with the following:

708.3.3 Changes of direction. Cleanouts shall be installed at each change of direction of the building drain or horizontal waste or soil lines greater than 135 degrees (2.36 rad.). Where more than one change of direction occurs in a run of piping, only one cleanout shall be required for each 40 feet (12 192 mm) of developed length of the drainage piping.

[PW] Section 708.3.5 Building drain and building sewer junction is replaced in its entirety with the following:

708.3.5 Building drain and building sewer junction. There shall be a cleanout at the junction of the building sewer. An approved two-way cleanout shall be used and brought up to finished grade. Minimum size shall be 4" or as approved by Denver Waste Water Management.

SECTION 712
SUMPS AND EJECTORS

Section 712.4 Sewage pumps and sewage ejectors is added:

712.4 Sewage pumps and sewage ejectors. In public use occupancies, dual (duplex) sewage ejectors shall be required and shall be arranged to function independently in case of mechanical failure. All dual ejectors shall be alarmed to provide visual and/or audible notification of failure.

Exception:

A single ejector pump may be used in commercial application when it is used for a single use kitchen sink and/or dishwasher and/or disposer.

CHAPTER 8
INDIRECT/SPECIAL WASTE

SECTION 803
SPECIAL WASTES

[DW] Section 803.4 Cooling water is added:

803.4 Cooling water. Domestic water used for cooling purposes shall be consumed or recycled and shall not be wasted to storm drain, above-ground drainage or below-ground drainage unless specifically approved by Denver Water.

Exception:

Diesel driven fire pump.

CHAPTER 9
VENTS

SECTION 904
VENT TERMINALS

Section 904.1 Roof extension is replaced in its entirety with the following:

904.1 Roof extension. All open vent pipes that extend through a roof shall be terminated at least 12 inches (305 mm) above the roof, except that where a roof is to be used for any purpose other than weather protection, the vent extensions shall be run at least 7 feet (2134 mm) above the roof.

CHAPTER 10
TRAPS, INTERCEPTORS AND SEPARATORS

SECTION 1003
INTERCEPTORS AND SEPARATORS

[PW] Section 1003.2 Approval is replaced in its entirety with the following:

1003.2 Approval. The size, type and location of each interceptor and of each separator shall be designed and installed in accordance with the manufacturers' instructions and the requirements of this section based on the anticipated conditions of use. Wastes that do not require treatment or separation shall not be discharged into any interceptor or separator. Prior to installation of any interceptor or separator and their associated piping, plans shall be submitted to Wastewater Management for approval.

Section 1005 Abandoned interceptors is added:

SECTION 1005
ABANDONED INTERCEPTORS

[PW] 1005.1 Abandoned food/oil grease interceptors and sand/oil interceptors. All food/oil/grease interceptors and sand/oil interceptors that are to be abandoned or by-passed, shall have all piping removed, the structure capped or plugged and the lid broken as to make it unusable. It shall be pumped clean and filled with granular material to satisfy Denver Wastewater Management standards.

CHAPTER 11
STORM DRAINAGE

SECTION 1101
GENERAL

[PW] Section 1101.1 Scope is replaced in its entirety with the following:

1101.1 Scope. The provisions of this chapter shall govern the materials, design, construction and installation of storm drainage. That portion of the storm drainage system from the building to the public storm sewer shall be as required by Denver Wastewater Management.

SECTION 1106
SIZE OF CONDUCTORS, LEADERS AND STORM DRAINS

Section 1106.1 General is replaced in its entirety with the following:

1106.1 General. The size of the vertical conductors and leaders, building storm sewers and any horizontal branches of such drains shall be based on 3" (7.6 mm) rainfall per hour.

IPC APPENDICES

STATUS OF APPENDICES ON ADOPTION

Appendix E Sizing of Water Piping is adopted.

Appendix F Structural Safety is adopted.

2011 DENVER AMENDMENTS TO THE 2009 EDITION OF THE INTERNATIONAL FUEL & GAS CODE
AND
APPENDICES
AS PUBLISHED BY
INTERNATIONAL CODE COUNCIL (ICC)

CHAPTER 1
ADMINISTRATION

SECTION 101 (IFGC)
GENERAL

Section 101.1 Title is amended by inserting "City and County of Denver" for the name of the jurisdiction.

Sections IFGC 103 through 106, 108 and 109 are amended by deleting those sections in their entirety. The "Administration of the 2011 Denver Building Code" provisions shall govern.

CHAPTER 4
GAS PIPING INSTALLATIONS

SECTION 403 (IFGC)
PIPING MATERIALS

Section 403.4.3 Copper and brass is replaced in its entirety with the following:

403.4.3 Copper and brass. Copper and brass pipe shall not be used.

Section 403.5.2 Copper and brass tubing is replaced in its entirety with the following:

403.5.2 Copper and brass tubing. Copper and brass tubing shall not be used.

SECTION 404 (IFGC)
PIPING SYSTEM INSTALLATION

Section 404.1 Prohibited locations is added:

404.1 Prohibited locations. Gas meters shall not be located in or under any building unless the meter is located in its own dedicated, adequately ventilated vault.

SECTION 406 (IFGC)
INSPECTION, TESTING AND PURGING

Section 406.4.1 Test pressure is replaced in its entirety with the following:

406.4.1 Test pressure. The test pressure to be used shall be no less than 1½ times the proposed maximum working pressure, but not less than 10 psig (69 kPa gauge), irrespective of design pressure. For welded piping and for piping carrying gas at pressures exceeding 14 inches water column (3.5 kPa gauge) pressure, the test pressure shall be no less than 60 psig (414 kPa gauge). Where the test pressure exceeds 125 psig (862 kPa gauge), the test pressure shall not exceed a value that produces a hoop stress in the piping greater than 50 percent of the specified minimum yield strength of the pipe.

CHAPTER 5
CHIMNEYS AND VENTS

SECTION 501 (IFGC)
GENERAL

Section 501.8 Appliances not required to be vented is amended by deleting #8 in its entirety.

CHAPTER 6
SPECIFIC APPLIANCES

SECTION 602 (IFGC)
DECORATIVE APPLIANCES FOR INSTALLATION IN FIREPLACES

Section 602.4 Wood-burning appliances is added:

602.4 Wood-burning appliances. Installation of new factory-built wood-burning appliances is restricted to certified wood stoves as approved by the Environmental Protection Agency. Appliances must be listed by an approved testing lab. If a wood-burning appliance is not on the EPA approved list, it cannot be installed unless it is converted to a gas log fireplace in accordance with the requirements of Chapter 6.

SECTION 609 (IFGC)
FLOOR FURNACES

Section 609 Floor furnaces is replaced in its entirety with the following:

609 Floor furnaces. Floor furnaces are prohibited in Denver.

SECTION 611 (IFGC)
NONRECIRCULATING DIRECT-FIRED INDUSTRIAL AIR HEATERS

Section 611.2 Installation is amended by adding to following paragraph:

Non recirculating direct-fired industrial air heaters shall be installed only in Group F, H, S and U occupancies and in commercial kitchens as makeup air for range hood exhaust systems. Such equipment shall only be used in conjunction with powered exhaust systems having an airflow capacity equal to or exceeding the capacity of the direct-fired heater to prevent the accumulation of products of combustion.

Section 611.7 Relief opening is deleted in its entirety.

SECTION 612 (IFGC)
RECIRCULATING DIRECT-FIRED INDUSTRIAL AIR HEATERS

Section 612.3 Installation is amended by adding the following paragraph:

Recirculating direct-fired industrial air heaters may be installed only in Group F, H, S and U occupancies. All areas served by recirculating direct-fired industrial heaters must be protected by the installation of CO sensors spaced per manufacturer's recommendations. Whenever automatic carbon monoxide sensing devices exceed the NAAQS of 9 ppm for an 8 hour average or 35 ppm for a one hour average, the CO sensors shall activate an increase in the exhaust air volume in order to reduce CO concentrations back below those prescribed levels.

Section 612.7 Relief opening is deleted in its entirety.

SECTION 621 (IFGC)
UNVENTED ROOM HEATERS

Section 621 Unvented room heaters is replaced in its entirety with the following:

621 Unvented room heaters. Unvented room heaters are prohibited in Denver.

SECTION 623 (IFGC)
COOKING APPLIANCES

Section 623.3.1 Residential cooking appliances vented by exhaust hoods is added:

623.3.1 Residential cooking appliances vented by exhaust hoods. Where residential cooking appliances are gas-fired, a fan powered exhaust system shall be installed and must be vented to the outside. System shall be sized and installed in accordance with manufacturer's instructions.

2011 DENVER AMENDMENTS TO THE 2009 EDITION OF THE INTERNATIONAL ENERGY CONSERVATION CODE AND APPENDICES AS PUBLISHED BY INTERNATIONAL CODE COUNCIL (ICC)

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

Section 101.1 Title is replaced in its entirety with the following:

101.1 Title. These regulations shall be known as the Energy Code of the City and County of Denver, and shall be cited as such. It is referred to herein as "this code".

CHAPTER 4
RESIDENTIAL ENERGY EFFICIENCY

SECTION 401

Section 401.2.3 Compliance is added:

401.2.3 Compliance. The results from a code complain software program can be utilized to show compliance. "REScheck™" – Residential Energy Code Compliance Software is one program currently being accepted. This program was developed by the Department of Energy can be downloaded for free at http://www.energycodes.gov/compliance_tools.stm.

CHAPTER 5
IECC COMMERCIAL ENERGY EFFICIENCY

SECTION 501
GENERAL

Section 501.2 Application is amended by adding the following:

501.2 Application. The results from a code compliant software can be utilized to show compliance. "COMcheck™" - Commercial Energy Code Compliance Software is one program currently being accepted. This program developed by the Department of Energy can be downloaded for free at http://www.energycodes.gov/compliance_tools.stm.

Section 505.2, 505.3, ASHRAE 90.1 Section 9.4.1, 9.4.2 Lighting controls is amended by adding the following Exception:

Exception:

Tenant finishes and remodels which do not require a Certificate of Occupancy.