AMENDMENTS TO THE

BUILDING AND FIRE CODE FOR THE

CITY AND COUNTY OF DENVER

This is a condensed version of
2025 Denver Amendments to the 2024 IFC.

This does not include IFC content. The IFC must be used with these amendments to properly apply all requirements.

This document is specifically for the CSA DENFA fire alarm exam and is allowed in the exam.

Pages not related
to the DENFA exam have been deleted.

Contents

2. Administrative, operational and maintenance provisions of this code shall apply.

   Exception: Other than premise identification (address), Section 102.5 shall not apply to the following:

   a. Interior or exterior renovations constructed under the provisions of the *International Residential Code* to existing detached one- or two-family dwellings

   b. Additions constructed under the provisions of the *International Residential Code* to existing detached one- or two-family dwellings; or

   c. Demolition or removal of a one- or two-family dwelling and replacement with a single new one- or two-family dwelling constructed under the provisions of the *International Residential Code.*

Section 102.7 Referenced codes and standards is replaced as follows:

102.7 Referenced codes and standards. The codes and standards listed in Chapter 80 shall be considered to be part of the requirements of this code and as further regulated by sections 102.7.1, 102.7.2 and 102.8. All references in this code and any referenced codes to the International Building Code (IBC), International Fuel Gas Code (IFGC), International Mechanical Code (IMC), International Plumbing Code (IPC), International Energy Conservation Code (IECC), International Existing Building Code (IEBC), and International Residential Code (IRC), shall mean the Denver Commercial Building Code (DCBC), Denver Fuel Gas Code (DFGC), the Denver Mechanical Code (DMC), the Denver Plumbing Code (DPC), the Denver Energy Code (DEC), the Denver Existing Building Code (DEBC), and the Denver Residential Code (DRC), respectively.

SECTION 103 CODE COMPLIANCE AGENCY

Section 103.1 Creation of agency is replaced as follows:

103.1 Creation of agency. The **Denver Fire Department Prevention Division**, referred to in this code as the Division, is hereby created and the official in charge thereof shall be known as the *fire code official*. The function of the agency shall be the implementation, administration and enforcement of the provisions of this code.

SECTION 104 DUTIES AND POWERS OF THE FIRE CODE OFFICIAL

Section 104.2.2.2 Preparer qualifications is replaced as follows:

104.2.2.2 Preparer qualifications. The technical opinion and report shall be prepared by a qualified engineer, specialist, laboratory or fire safety specialty organization acceptable to the *fire code official*. The *fire code official* is authorized to require design submittals to be prepared by, and bear the stamp of, a *registered design professional*. Technical assistance shall be provided, and the report prepared by a qualified expert preapproved by the *fire code official*. The *fire code official* is authorized to require the report to be prepared by, and bear the stamp of, a registered design professional.

104.2.4.3 Application for modification. [The application for modification shall be in a form as provided by the Division.] 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.

Section 104.11.4 Resetting or silencing of alarms is added as follows:

104.11.4 Resetting or silencing of alarms. No person shall reset or silence a fire protection or life safety system unless by direction of the fire chief, *fire code official* or fire department official in charge of the incident.

SECTION 105 PERMITS
Section 105.1 General is replaced:

105.1 General. Permits shall be in accordance with Sections 105.1.1 through 105.6.28.

Section 105.5 Required operational permits and all subsections are replaced as follows:
105.5 Required operational permits. The *fire code official* is authorized to issue operational permits for the operations set forth in Sections 105.5.1 through 105.5.92

105.5.1 Abandoned buildings. An operational permit is required for abandoned and/or vacant buildings. (See Section 311 of the *International Fire Code*.)

105.5.2 *Additive manufacturing*. An operational permit is required to conduct *additive manufacturing* operations regulated by section 4106.3

105.5.3 Aerosol products, aerosol cooking spray products and plastic aerosol 3 products. An operational permit is required to manufacture, store, or handle an aggregate quantity of level 2 or level 3 aerosol products, aerosol cooking spray products or plastic aerosol 3 products in excess of 500 pounds net weight.

105.5.4 Aircraft refueling vehicles. An operational permit is required for each aircraft refueling vehicle.

105.5.5 Amusement areas. An operational permit is required to operate a *special amusement area*.

105.5.6 Asbestos removal. An operational permit is required for the removal of asbestos (for each building or portion thereof).

105.5.7 Aviation facilities. An operational 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 finishes.

105.5.8 Battery charging. An operational permit is required to charge batteries on or off powered-industrial trucks and similar equipment having an electrolyte capacity of 10 gallons or more or size of 8kW or greater.

105.5.8.1 Battery charging – indoor. An operational permit is required for indoor charging of batteries having an electrolyte capacity of 10 gallons or more or size of 8kW or greater.

TABLE 105.5.19
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

105.5.20 Cutting and welding. An operational permit is required to conduct cutting or welding operations within the jurisdiction.

105.5.21 Dry cleaning. An operational 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.

105.5.22 Emergency responder radio enhancement coverage system (RES). An operational permit is required for the annual and five-year testing of the system.

105.5.23 Energy storage systems. An operational permit is required for stationary and mobile energy storage systems regulated by Section 1207.

105.5.24 Exhibits and trade shows. An operational permit is required to operate exhibits and trade shows.

105.5.25 Explosives. An operational 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 56.

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 5606.

105.5.26 Failure to obtain a permit. When a required permit has not been obtained, the fee shall be double the cost of the required permit.

105.5.27 Fire alarm signal delay equipment including alarm verification. A permit is required to install or modify fire alarm signal delay equipment integrated with the FACP.

105.5.28 Fire department fire alarm radio transmitter (wireless Denver Fire Department communicator). A permit is required to install or modify fire department fire alarm radio equipment for monitoring fire and burglar alarms.

105.5.29 Fire hydrants and valves. An operational permit is required to use to operate fire hydrants or valves intended for fire suppression purposes that are installed on water systems and provided with ready access from a fire apparatus access road that is open to or generally used by the public. An operational permit is required to maintain a private fire hydrant system. This applies to existing systems only. New private fire hydrant systems are prohibited.

Exception: A permit is not required for authorized employees of the water company that supplies the system for the fire department to use or operate fire hydrants and valves.

105.5.30 Fire watch. An operational permit is required whenever a fire watch is mandated.

105.5.31 Fireworks/pyrotechnics. An operational permit is required for all professional pyrotechnic programs.

105.5.32 Flammable and combustible liquids. An operational 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 in excess of 5 gallons (19 L) in a building or in excess of 10 gallons (37.9 L) outside of a building, except that a permit is not required for the following:
    a. 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 *fire code official*, would cause an unsafe condition.
    b. 2.2. The storage or use of paints, oils, varnishes or similar flammable mixtures where 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 Class IIIA liquids in excess of 25 gallons (95 L) in a building or in excess of 60 gallons (227L) outside a building, except for fuel oil used in connection with oil-burning equipment.
4. To store, handle or use Class IIIB liquids in tanks or portable tanks for fueling motor vehicles at motor fuel-dispensing facilities or where connected to fuel-burning equipment.
    Exception: Fuel oil and used motor oil used for space heating or water heating.
5. To remove Class I or 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.
6. 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.
7. To place temporarily out of service (for more than 90 days) an underground, protected above-ground or above-ground *flammable* or *combustible liquid* tank.
8. To change the type of contents stored in a *flammable* or *combustible liquid* tank to a material that poses a greater hazard than that for which the tank was designed and constructed.
9. To manufacture, process, blend or refine *flammable* or *combustible liquids*.
10. To engage in the dispensing of liquid fuels into the fuel tanks of motor vehicles at commercial, industrial, governmental, or manufacturing establishments in accordance with Section 5706.5.4 or to engage in on-demand *mobile fueling* operations in accordance with Section 5707.
11. To utilize a site for the dispensing of liquid fuels from tank vehicles into the fuel tanks of motor vehicles, marine craft and other special equipment at commercial, industrial, governmental or manufacturing establishments in accordance with Section 5706.5.4 or, where required by the *fire*

105.6.5 Conveyances. Construction permits are required for the installation, alteration, modification, removal, maintenance, and testing of all elevators and conveyances within the City and County of Denver. Shop and/or layout drawings shall be submitted for review and approval prior to issuance of permits. Drawings shall comply with ASME A17.1 and Division policy. Two sets of specifications and accurately scaled and fully dimensioned construction plans shall be provided in accordance with Policy 105.6. These plans shall include the applicable code edition which shall conform to the edition of the code currently adopted and shall include specifications of interior cab materials or indication on the plans that interior cab work is to be completed by others. Permits issued shall be displayed in the conveyance control room or control space associated with the permitted conveyance. See also Section 604 for additional requirements.

105.6.5.1 Conveyance Permits. The Division shall be notified by a responsible party from the conveyance contractor or the permit applicant upon the completion of the scope of work set forth in the issued and *approved* permit. Notification to Denver Fire Conveyance Section shall be in written format and include the signature of the permit applicant. Notification shall include all known variances or deviations from the scope of work submitted for approval. Notification shall be submitted prior to or on the expiration date of the issued permit. If for any reason the original permit applicant is unable to complete the scope of work specified in the permit and the work is to be completed by a contractor other than the original, a new permit must be applied for and obtained by the conveyance contractor who will complete the specified scope of work.

105.6.6 Cryogenic fluids. A construction permit is required for installation of or *alteration* to outdoor stationary *cryogenic fluid* storage systems where the system capacity exceeds the amounts listed in Table 105.5.19. Maintenance performed in accordance with this code is not considered to be an *alteration* and does not require a construction permit.

105.6.7 Emergency responder communication coverage system. A construction permit is required for installation of or modification to in-building, two-way emergency responder communication coverage systems and related equipment. Maintenance performed in accordance with this code is not considered to be a modification and does not require a construction permit.

105.6.8 Energy storage systems. A construction permit is required to install energy storage systems regulated by Section 1207.

105.6.9 Fire alarm and detection systems and related equipment. A construction permit is required prioto the installation or modification of fire alarm and detection systems and related equipment. Work performed to keep equipment operable or to make repairs is considered maintenance and requires a construction permit. Construction permits are required for any work to the following systems:

1. Emergency alarm systems
2. Emergency communication systems (ECS)
3. Staged or shelter-in-place evacuation approaches
4. Mass notification systems
5. Public safety radio communication systems (RES)

6. Two-way communication systems
7. Gas detection systems.
8. Refrigerant leak detection systems

Exceptions:

1. A required permit may be acquired after work is performed on an emergency basis to maintain an existing fire alarm or detection system. The penalties stated herein shall not apply if the emergency permit application is submitted within two normal business days after commencement of the emergency work. A full permit application is required within ten normal business days after commencement of the emergency work.
2. With written approval from the *fire code official* prior to the work, maintenance performed in accordance with this code may not require a permit.

105.6.10 Fire pumps and related equipment. A construction permit is required prior to the installation or modification of fire pumps and related fuel tanks, jockey pumps and controllers. Work performed to keep equipment operable or to make repairs is considered maintenance and requires a permit.

Exceptions:

1. A required permit may be acquired after work is performed on an emergency basis to maintain an existing fire pump. The penalties stated herein shall not apply if the emergency permit application is submitted within two normal business days after commencement of the emergency work. A full permit application is required within ten normal business days after commencement of the emergency work.
2. With written approval from the *fire code official* prior to the work, maintenance performed in accordance with this code shall not require a permit.
3. Minor work not impacting the mechanics of the systems including gauge replacement, driver oil/lube job, hydraulic placard replacements, light bulb replacement, battery replacement, fuel treatment, packing adjustments, etc.

105.6.11 Fire watch. A permit is required whenever a fire watch is mandated.

105.6.12 Flammable and combustible liquids. A construction permit is required:

1. To install, repair or modify a pipeline for the transportation of *flammable* or *combustible l 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*.

105.6.13 Fuel cell power systems. A construction permit is required to install *stationary fuel cell power systems*.

105.6.14 Gas detection systems. A construction permit is required for the installation of or modification to *gas detection systems.* Maintenance performed in accordance with this code is not considered a modification and shall not require a permit.

105.6.15 Gates and barricades across fire apparatus access roads. A construction permit is required for the installation of or modification to a gate or barricade across a *fire apparatus access road*.

105.6.16 Generator Set. A construction permit is required to install the following fueled generator set(s) with or without an integral tank (Denver Residential Code installations are exempt).

105.6.16.1 Fuel Oil

105.6.16.2 Natural Gas

105.6.17 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 regulated by Chapter 50 where the hazardous materials in use or storage exceed the amounts listed in Table 105.5.40.

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.

105.6.18 High-piled combustible storage. A construction permit is required for the installation of or modification to a structure with more than 500 square feet (46 m2), including aisles, of *high-piled combustible storage*. Maintenance performed in accordance with this code is not considered to be a modification and does not require a construction permit.

105.6.19 Industrial ovens. A construction permit is required for installation of industrial ovens covered by Chapter 30.

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.

105.6.20 Inert gas systems used in commercial, manufacturing, or industrial applications. A construction permit is required for the use of inert gas systems with more than 100 pounds (45.4 kg) of an inert gas or any system using any amount of an inert gas below grade used in a commercial, manufacturing, or industrial application, such as water treatment with pH balancing, food processing or laboratories.

105.6.21 Liquid Propane Gas. A construction permit is required for installation of or modification to an LP-gas system. Maintenance performed in accordance with this code is not considered to be a modification and does not require a permit.

105.6.21.1 Cage An installation permit is required to install a cage for storage of portable LP gas containers awaiting use or resale.

105.6.21.2 Tank A construction permit is required to install, repair damage to, abandon, remove or place temporarily out of service an LP gas tank.

105.6.21.3 Automated cylinder exchange station. A construction permit is required to install an automated cylinder exchange station.

105.6.22 Motor vehicle repair rooms and booths. A construction permit is required to install or modify a motor vehicle repair room or booth. Maintenance performed in accordance with this code is not considered to be a modification and does not require a permit.

105.6.23 Phased Occupancy for TCO. A construction permit is required to obtain approval for a phased occupancy approach of a new building. Visit Denver Fire Department website to obtain Phased Occupancy Policy outlining requirements and procedures to satisfy Section 901.5.1.

105.6.24 Plant extraction systems. A construction permit is required for installation of or modification to plant extraction systems. Maintenance performed in accordance with this code is not considered to be a modification and does not require a permit.

105.6.25 Private fire hydrants. A construction permit is required for the installation or modification of private fire hydrants. Maintenance performed in accordance with this code is not considered to be a modification and does not require a permit.

105.6.26 Refrigeration equipment. A construction permit is required for a mechanical refrigeration unit or system regulated by Chapter 6.

105.6.27 Smoke control or smoke exhaust systems. Construction permits are required for installation of or alteration to smoke control or smoke exhaust systems. Maintenance performed in accordance with this code is not considered to be an *alteration* and does not require a permit.

105.6.28 Solar photovoltaic power systems. A construction permit is required to install or modify solar photovoltaic power systems. Maintenance performed in accordance with this code is not considered to be a modification and does not require a permit.

105.6.29 Special event structure. A single construction permit is required to erect and take down a *temporary special event structure* in accordance with Section 105.5.82.

105.6.30 Spraying or dipping. A construction permit is required to install or modify a spray room, dip tank or booth. Maintenance performed in accordance with this code is not considered to be a modification and does not require a permit.

105.6.31 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 to be a modification and does not require a permit.

105.6.32 Temporary membrane structures and tents. A construction permit is required to erect an air-supported temporary membrane structure, a temporary special event structure or a tent in accordance with Section 105.5.82.

105.6.33 Underground and above-ground hazardous materials storage tanks. A construction permit is required to install any hazardous materials storage tank.

105.6.34 Woodworking operations. A construction permit is required to install a woodworking operation.

SECTION 108 FEES

Section 108.2 Schedule of permit fees is amended by replacing it in its entirety as follows:

108.2 Schedule of permit fees. A fee necessary to cover administrative costs of inspection, licensing, record-keeping, and other requirements for all fire prevention programs under this code shall be paid in accordance with fee schedules established by the Executive Director of the Department of Public Safety.

SECTION 109 INSPECTIONS

Section 109.2.3 Special inspections is added as follows:

109.2.3 Special inspections. The *fire code official* is authorized to conduct special inspections, including fire safety inspections and systems acceptance testing, outside of normal business hours as deemed necessary to determine the extent of compliance with the provisions of this Code. The fire safety inspections and systems acceptance testing shall be performed by Denver Fire Department Fire Prevention personnel and or Department Fire Protection Engineer. The property owner, property manager, or contractor shall reimburse the City and County of Denver at the hourly rate established by the Executive Director of the Department of Public Safety. Special inspections outside of normal business hours shall be a minimum of three hours Monday through Friday and a minimum of four hours on weekends and designated City holidays.

SECTION 112 MEANS OF APPEALS

Section 112.1 General is replaced in its entirety as follows:

112.1 Appeals. T he Executive Director of the Department of Public Safety*fire code official* relative to the application and interpretation of this code. The board of appeals shall consist 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.

112.1.1 Application. Prior to any action by the Executive Director of the Department of Public Safety, an application in writing shall be filed in the office of the Director within 30 days after receiving the order, decision, or determination made by the *fire code official* on a form provided by the Director providing the necessary information required. A copy of such application shall be furnished to the *fire code official* by the applicant. Payment of the fee established by the Executive Director of the Department of Public Safety, in the form a check made payable to the Denver Manager of Finance, must accompany the application.

112.1.2 Meetings and records. The Executive Director of the Department of Public Safety or Board of Appeals shall keep records of its proceedings showing the vote of each member on every question and the final decision.

112.1.3 Appeal from decision of the Executive Director of the Department of Public Safety. Any person subject to a decision of the Executive Director of the Department of Public Safety may have that decision reviewed in the manner provided by Colorado Rules of Civil Procedure.

Section 112.3 Qualifications is deleted in its entirety.

SECTION 113 VIOLATIONS

Section 113.4 Violation penalties is replaced as follows:

Section 113.4 Violation penalties. Persons who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter, repair, or do work in violation of the *approved construction documents* or directive of the *fire code official*, or of a permit or certificate used under the provisions of this code shall be punishable as prescribed in Denver Municipal Code Section 1-13. Each day that a violation continues after due notice has been served shall be deemed a separate offense.

Section 113.5 Administrative citation is added as follows:
113.5 Administrative citation. The *fire code official* is authorized to issue administrative citations for violations of this code.

Sections 113.6 Interference with enforcement is added as follows:

113.6 Interference with enforcement. It shall be unlawful for persons to interfere or cause conditions that would interfere with the *fire code official* in carrying out any duties or functions prescribed by this code.

Sections 116 Licenses through 117 Fire alarm Monitoring – Permits and Licenses/Registration are added as follows:

SECTION 116 LICENSES
116.1 General. A license is authority granted to the person to whom it is issued to perform the work authorized by the license.

116.2 Licenses required. Denver Fire Department licenses shall be required for the design, installation, modification, inspection, and testing of all life safety and conveyance systems and equipment. All life safety 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. Conveyance inspectors and mechanics shall be licensed/registered by the Fire Department per Section 116.3. All persons required to have a permit, license, or certificates shall have a current—for calendar year—permit, license, or certificate.

116.2.1 (BDA) Radio Enhancement System
116.2.2 Central station operator.
116.2.3 Central station runner.
116.2.4 Commercial Kitchen Hood
116.2.5 Commercial Kitchen Hood/Extinguisher
116.2.6 Conveyances.
116.2.7 Emergency communication systems.
116.2.8 Fire alarm systems.
116.2.9 Fire pumps. Except: Building engineers trained by the service provider to conduct weekly and monthly churn test on fire pumps.
116.2.10 Fire sprinkler systems – NFPA 13.
116.2.11 Fire sprinkler systems – NFPA 13D.
116.2.12 Fire sprinkler systems – NFPA 13R.
116.2.13 Portable fire extinguishers.

116.3 Conveyance licensing. Division licenses shall be required for the installation, alteration, replacement, maintenance, removal, dismantling, or inspection activities of conveyances. A conveyance contractor license issued by the *Division* is required for installation or alteration of equipment.

SECTION 117 FIRE ALARM MONITORING-PERMITS AND LICENSES is added:

FIRE ALARM MONITORING - PERMITS AND LICENSES

117.1 General. The provisions of this section apply to the installation, operation of, and scope of fire alarm monitoring.

117.2 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.

117.3 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.

117.4 Definitions. The following terms are defined in

Chapter 2:

CENTRAL ALARM STATION/SUPERVISING STATION

CLASS I FIRE ALARM MONITORING

CLASS II FIRE ALARM MONITORING

OPERATOR

RUNNER

117.5 License Required

117.5.1 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.

117.5.2 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.

117.5.2.1 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.

117.5.2.2 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.

117.5.2.3 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.

CHAPTER 2 DEFINITIONS

SECTION 202 GENERAL DEFINITIONS

Section 202 General Definitions is amended by the addition of the following terms:

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.

ALCOHOL BEVERAGE (also, "ALCOHOL BEVERAGE"). A liquid ethanol mixture intended for human consumption including wine, beer, and beverage spirits.

ALCOHOL BEVERAGE PRODUCTION FACILITY (ABPF). Any building or portion thereof where ethanol mixtures are produced, stored, handled, blended, dispensed, or bottled in the production of alcohol beverages including areas for grain storage and handling.

ALCOHOL BY VOLUME (ABV). Volume percentage of ethanol in an ethanol mixture.

ALTITUDE. Altitude is the measure of elevation typically relative to sea level. The generally recognized altitude of Denver, CO is 5,280 feet. 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. 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.

BEVERAGE SPIRIT. A liquid ethanol mixture with greater than 16% ABV intended for human consumption including neutral or grain spirits, vodka, whiskey, gin, brandy, applejack, rum, tequila, cordials and liqueurs. Beverage spirits do not include beer, wine, or other alcohol beverages produced from fermentation.

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.

BREWERY. An *alcohol beverage production facility* (ABPF) or portion thereof, including accessory uses, in which beer or other malt liquors, 16% or less ABV, are produced by fermentation. In spirit production, beer and wash are synonymous as precursors to distillation.

BULK STORAGE FOR DISTILLING. The storage of ethanol mixtures in containers exceeding 1.3 gallons (5L) in volume.

CARBON MONOXIDE (CO). A colorless odorless gas that is produced as a result of incomplete burning of carbon-containing fuels.

CARCINOGEN. A substance that causes the development of cancerous growths in living tissue. A chemical is considered to be a carcinogen if:
It has been evaluated by the International Agency for Research on Cancer (IARC) and found to be a carcinogen or potential carcinogen, or
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
It is regulated by OSHA as a carcinogen.

CASK. A closed vessel of 185 gallons (700 L) or less capacity, constructed of wooden staves and heads, held together by metal hoops, not equipped with provisions for emergency venting, and not intended for fixed installation. In *alcohol beverage production facilities (ABPFs)*, "barrel" is a subset of, and often used interchangeably with "cask". These vessels are used primarily for storing ethanol mixtures.

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.

CENTRAL FUEL-BURNING APPLIANCE ROOM. A room containing a fuel burning appliance serving multiple dwelling units, such as a boiler, fireplace, stove, furnace, or similar equipment, with the potential to distribute CO to multiple dwelling units.

CLASS 1 LIQUIDS. Class IA, Class IB or Class IC flammable liquids. For Chapter 40, ethanol mixtures are either Class IB or Class IC flammable liquids.

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.

CONTAINER. In an *alcohol beverage production facility (ABPF)*, any closed *vessel* of 119 gallons (450 L) or less capacity used for transporting or storing *Class 1 Liquids*, not intended for fixed installation and not constructed of wood, but possibly equipped with an overpressure-relieving mechanism in accordance with FM Global Approved Standard for Plastic Plugs for Steel Drums, Class Number 6083, or equivalent.

CO ALARM. A single- or multiple-station device having a sensor that responds to CO and listed in accordance with 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.

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.

DENVER COMMERCIAL BUILDING CODE . The collection of International Code Council (ICC) publications as adopted and amended by the City and County of Denver excluding the *International Fire Code*, as found in Article I of this document.

DISTILLATION. In an *alcohol beverage production facility (APBF),* the concentration of *ethanol* by slowly raising the temperature of an *ethanol mixture* through the boiling points of its constituents then collecting and condensing the constituent vapors separately from the remaining water.

DISTILLERY (also DISTILLED SPIRITS PLANT – BEVERAGE). An *alcohol beverage production facility (ABPF)* licensed by the TTB to produce, bottle, rectify, process or store *beverage spirits* including areas for *fermentation*, *distillation*, storage, blending, packaging, and accessory uses. Other types of distilleries licensed by the TTB include Distilled Spirits Plant – Experimental, Distilled Spirits Plant –Industrial and Distilled Spirits Plant – Industrial/Beverage.

ELECTROLYTE. A solid, liquid, or aqueous salt solution that permits ionic conduction between positive and negative electrodes of a cell.

EMERGENCY RESPONDER RADIO ENHANCEMENT COMMUNICATION SYSTEM (RES/BDA). The RES/BDA is a network of amplifiers, fiber optic cable, coaxial cable, and radiating cable and/or discrete antennas with or without a distributed antenna system (DAS) controller, or an equivalent technology installed on or inside the property to enhance indoor public safety radio communications.

ETHANOL (also ETHYL ALCOHOL or GRAIN ALCOHOL). A volatile, flammable, colorless, neurotoxic liquid fit for human consumption with structural formula CH-3CH-2OH (abbreviated as C2H5OH or C2H6O).

ETHANOL MIXTURE. Liquid mixture comprised primarily of water, and also including ethanol and materials with hazards not regulated by the Denver Commercial Building Code or Denver Fire Code.

EXTRACTION. The process of using solvents to remove essential oils or other botanic material from the marijuana plant.

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.

FERMENTATION. An enzymatically controlled, anaerobic breakdown of energy-rich compounds by microorganisms, to yield carbon dioxide and ethanol.

FUEL-BURNING APPLIANCE. An appliance that burns carbon-containing solid, liquid, and/or gaseous fuels.

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.

HAZMAT (HAZARDOUS MATERIALS). Materials with harmful physical and health properties regulated by the Denver Commercial Building Code or Denver Fire Code.

HAZARDOUS MATERIAL INVENTORY STATEMENT (HMIS). A portion of an HMR containing a list of all the HazMat in a facility including information related to the materials such as product names, locations, quantities, regulated hazards, and Chemical Abstract Service (CAS) numbers.

HAZARDOUS MATERIAL MANAGEMENT PLAN (HMMP). A portion of a HazMat Permit Application containing site maps and facility floor plans identifying HazMat locations and site and building features relevant to the management of HazMat inventories, systems and operations.

HAZARDOUS MATERIALS REPORT (HMR). A consolidated description of a facility and the HazMat therein including a contact list, code-based description of the building and adjacent outdoor areas, and a HazMat Inventory Statement (HMIS).

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.

INTERMEDIATE BULK CONTAINER. Any closed vessel defined in Title 49, *Code of Federal Regulations,* Parts 100 through 199 or in Part 6 of the United Nations' Recommendations on the Transport of Dangerous Goods having a liquid capacity of 793 gallons (3000 L) or less, used for transporting or storing Class 1 Liquids, not equipped with provisions for emergency venting, not intended for fixed installation, and not constructed of wood.

LOWER FLAMMABLE LIMIT (LFL) also [LOWER EXPLOSIVE LIMIT (LEL)]. The atmospheric volumetric concentration of a flammable vapor in air at which propagation of flame will occur in the presence of an ignition source. The LFL at sea level for ethanol vapor is 3.3 percent.

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.

MACHINERY ROOM. See Section 1104.2 of the *Mechanical Code of the City and County of Denver.*

MASH. During *fermentation*, the mixture of ground or cracked grains and other crushed edible organic material steeped in hot water to release carbohydrates and reduce it to sugars. The term is used inconsistently (often overlapping with *wort*) for the various solutions in process up to the point where *fermentation* is complete.

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.

MINIMUM EXPLOSIVE CONCENTRATION (MEC). The lowest mass to volume concentration in air of combustible dust that will propagate a flame. The MEC for grain dust is 0.055 oz/ft^3 (55 g/m^3).

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].

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.

NORMALLY CLOSED. A system or *vessel* in an *alcohol beverage production facility (ABPF)* used for storage, production, dispensing, blending, bottling, or handling of *Class 1 Liquids* where, for less than 50 percent of the time it is in operation, its contents are not exposed to atmosphere and vulnerable to evaporation. Processes involving *casks* opened only for filling, draining or sampling, *distillation* where all vapors are condensed below their flash point prior to collection, uncovered *vessels* of 5.3-gallon (20 L) capacity or less used to collect distillate below its f*lash point*, and covered blending or maceration *vessels* are typically considered normally closed.

NORMALLY OPEN. A system or *vessel* in an *alcohol beverage production facility (ABPF)* used for storage, production, dispensing, blending, bottling, or handling of *Class 1 Liquids* where, for 50 percent or more of the time it is in operation, its contents are continuously exposed to atmosphere and vulnerable to evaporation, or where a *Class 1 Liquid* at or above its *flash point* is exposed to atmosphere at any time. Continuous blending or maceration in uncovered *vessels*, open draining of *Class 1 Liquids* above their *flash points*, and the act of “bleeding” heads (the initial vapors generated during *distillation*) or tails (the last vapors generated during distillation) to atmosphere are typically considered normally open.

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 401.5 and 907.1.5).

OPERATIONAL PERMIT. A permit issued in conjunction with the operations listed in Section 105.5.

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.

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).

PERMITTABLE 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.

PILE. Independently stacked commodities possibly organized by separate spacers, dunnage, or pallets in which the demise of any item on a lower layer or tier compromises the structural stability of the storage system.

PLUG-IN. CO alarm with battery backup, installed by being plugged into an electrical outlet for primary power.

PORTABLE TANK. A *tank* that is readily capable of being relocated within a facility, not permanently attached to immovable structure or ground, and not constructed of wood.

POST OIL PROCESSING. The process of refining essential oils after the extraction, including but not limited to, dewaxing and winterization processes.

PRESSURE VESSEL. Containers, intermediate bulk containers, processing vessels, and tanks that under normal conditions, are permitted to operate above 15 pounds per square inch gauge (psig; 103.4 kPa).

PROCESS DESCRIPTION. In an *alcohol beverage production facility (ABPF),* an operational description such as a flow chart of the sequence of events required to convert raw materials from the state in which they enter the APBF through each development point until the finished products are derived. The *process description* identifies all input and output materials and includes quantities, concentrations, temperatures, pressures, types of equipment, systems, etc. at each development point using code-based terminology, e.g., “37 gallons of 55 percent ABV at standard temperature and pressure (STP)” vs. “all the high wines collected.” All systems and processes utilized to produce all intermediate and finished products are required to be included in the process description.

PROCESSING VESSEL. In *alcohol beverage production facility (ABPF)*, an open or closed *vessel* other than *stills* used in the manufacture of *ethanol mixtures*. *Processing vessels* include fermentation tanks, mash tuns, blending tanks, etc., but do not include long-term storage vessels such as *vats* or *casks*.

PROPERTY. 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.

RACK. Shelves or similar structural frame-supported system of tiers in which the demise of any item on a lower tier does not affect the structural stability of the storage system.

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 Public Safety radio system from harmful interference generated on the property or otherwise under the control of the owner.

RADIOACTIVE MATERIAL. Any material or combination of materials that spontaneously emits ionizing radiation.

REGULATED MATERIAL. Any material regulated by the fire code for which an operations permit could be required including storage and/or use of hazardous materials, LPG, combustible dust operations, etc.

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.

REMOTE AREA. (c.f. NFPA 13). The specified floor area over which an assigned sprinkler density (in volume per minute per unit area) is required in the design of an automatic sprinkler system.

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.

SELF-SERVICE MOTOR FUEL-DISPENSING FACILITY. That portion of motor fuel-dispensing facility where flammable and combustible liquids, liquefied petroleum gas, compressed natural gas, or hydrogen motor fuels are dispensed from fixed *approved* dispensing equipment into the fuel tanks of motor vehicles by persons other than a motor fuel-dispensing facility attendant.

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.

SINGLE-FAMILY DWELLING. Any improved real property used or intended to be used as a residence and that contains one dwelling unit.

SINGLE STATION ALARM. A single device comprised of a sensor, alarm-initiating device, control components, and an alarm notification appliance.

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.

SPIRIT. An *ethanol mixture* with greater than 16% ABV produced by *distillation* or fortification of wine, wash, beer or a previously distilled *spirit*.

STATIONARY TANK. A *tank* not intended to be relocated that is physically attached to immovable structure or ground.

STILL. In an *alcohol beverage production facility (ABPF)*, any appliance is which *distillation* of an *ethanol mixture* is performed. *Stills* include pots, columns, condensing coils, and the piping between them.

STORAGE AREA. An *alcohol beverage production facility (ABPF)* or portion thereof where *alcohol beverages*, *ethanol mixtures*, or materials incorporated or utilized in the manufacture of either are held for aging, awaiting transport, or subsequent handling (c.f., *use area*).

TANK. In an alcohol beverage production facility (ABPF), any normally open or normally closed vessel having a capacity greater than 60 gallons (230 L) intended for storing or processing (but not transporting outside the facility) Class 1 Liquids and equipped with provisions for emergency venting.

TENANT. A person or legal entity who rents a unit from the *owner* for a fixed period of time usually under the terms of a lease or a similar legal entitlement or agreement.

USE AREA. An *alcohol beverage production facility (ABPF)* or portion thereof where *ethanol mixtures* or materials incorporated or utilized in the manufacture of *alcohol beverages* or other *ethanol mixtures* are actively handled in processes such as *fermentation*, *distillation*, rectification, transportation, remixing, dispensing, bottling, blending, etc. (c.f., *storage area*).

VAT (also FOUDRE). In an *alcohol beverage production facility (ABPF)*, a *stationary tank* constructed primarily of wood.

VESSEL. In an *alcohol beverage production facility (ABPF)*, any reservoir holding – unless otherwise noted – *Class 1 Liquids* including casks, containers, *intermediate bulk containers*, *processing vessels*, and *tanks*.

WALL HYDRANT. Valved 2-1/2-inch (64 mm) exterior standpipe connection.

WASH (also BEER, MALT LIQUOR). The *ethanol mixture* intended for *distillation* produced by the *fermentation* of *mash* or *wort*. For *spirit* production, *wash* and *wine* are analogous as precursors to *distillation*.

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 as follows:
507.2.3 Water supply serving high-rise buildings. High-rise buildings as classified by the Denver Commercial Building Code shall be supplied by connections to a minimum of two public water mains located in different streets. Separate supply piping shall be provided between each water main connection and the building. Backflow prevention devices and flow switches shall be provided in accordance with Section 912.6 at each water main entry to the structure. Each fire main shall be sized to meet the full demand of the fire protection system at each connection to achieve redundancy.

Exception: Where *approved* by the *fire code official*, high-rise buildings without access to different water mains shall have two fire main connections to the same public main. The public main shall have valves such that an interruption of one water source can be isolated so that water supply will continue without interruption through the other connection. The two required fire mains shall have a minimum separation distance from each other of five feet at all points from the public main to the building. Each fire main shall be sized to meet the full demand of the fire protection system at each connection to achieve redundancy.

Section 507.3 Fire flow is replaced as follows:
507.3 Fire flow. Fire flow requirements shall be as determined in Appendix B. Each new or existing fire hydrant as required in accordance with Appendix C, shall be capable of providing not less than 1500 GPM at 20 PSI residual pressure.

Section 507.5.5 Clear space around hydrants is replaced as follows:
507.5.5 Clear space around hydrants. A five-foot (1524 mm) clear space shall be maintained around the circumference of fire hydrants, except as otherwise required or *approved*.

SECTION 508 FIRE COMMAND CENTER

Section 508.1 General
Replace 508.1.7 with 508.1.9

Section 508.1.1 Location and access is replaced as follows:
508.1.1 Location and access. The *fire command center* shall:

1. Be on the ground floor.

2. Have a secured entrance directly accessible to and in immediate proximity of the main building entrance.

3. Have access within the building to all fire service access elevators.

Exception: Unless otherwise *approved* by the *fire code official*.

Section 508.1.2 Separation is replaced as follows:
508.1.2 Separation. To meet the system survivability requirements of NFPA 72, the *fire command center*

shall be separated from the remainder of the building by not less than a 2-hour fire barrier constructed in accordance with Section 707 of the *Denver Commercial Building Code* or a horizontal assembly in accordance with Section 711 of the *Denver Commercial Building Code* or both.

Section 508.1.6 Required features is added as follows:

19. A key vault *approved* by the Fire Department to house keys to access mechanical and electrical equipment.

20. Two-way communication systems and two-way communication system required for elevator communication in accordance with ASME A17.1.

21.Mass Notification System (MNS) equipment.

508.1.6.1 Elevator status/control panel. An elevator status/control panel shall be provided. The elevator status/control panel shall comply with DFD policy 508.1.6.1 and:

1. Identify each elevator cab alphanumerically and the floors it serves. Identify corresponding cab number in elevator cab.

2. Indicate elevator(s) that are operating on emergency power. Visual indicators in accordance with ASME A17.1 are required.

3. Have a placard at elevator status/control panel stating how many elevators can operate under emergency power simultaneously.

4. Indicate elevator car position.

5. Indicate whether the elevators are operational.

6. Indicate direction of travel.

7. Have key switches as required for selective activation of cars if all are not capable of simultaneous operation on secondary power.

8. Phase I Fire Service Recall Key switches in accordance with ASME A17.1.

9. Two-way communication system from the elevator to the *fire command center* shall be incorporated on the elevator status panel. Two-way communication systems shall meet ASME A17.1.

10. Indicate whether the hoistway doors are open or closed.

11. Visual signal (flashing firefighter hat) for each elevator that has a corresponding in-car visual signal (flashing firefighter hat). Shall include wording "WHEN FLASHING DO NOT USE ELEVATOR" engraved on panel.

Section 508.1.8 Construction requirements is added as follows:

508.1.8 Construction . No piping, ducts, or equipment foreign to required fire operations shall be permitted to enter, pass through, or be installed within the *fire command center* boundaries including the overhead space to deck above.

Section 508.1.9 Heating/cooling zone or system for *fire command center* is added as follows:
508.1.9 Heating/cooling zone or system for *fire command center*. A separate heating/cooling zone or system operating continually shall be provided for the fire command center.

Section 508.2 Fire command room is added as follows:
508.2 Fire command room. A fire command room shall be provided in the following:

1. In a building with any emergency voice/alarm communication system.
2. In a building where the owner requests that the fire alarm and life safety equipment not be installed in the lobby of the building.
3. In a building where elevator cabs or lobbies must be monitored by surveillance equipment.

The fire command room shall be not less than 48 square feet (4.46 m^2) with a minimum dimension of 8 feet (2.44 m), but not less than that required to accommodate the equipment on one wall. A minimum clear dimension of 6 feet (1.82 m) shall be provided in front of the equipment. The room shall be separated from the remainder of the building by not less than a 1-hour fire barrier constructed in accordance with Section 707 of the *Denver Commercial Building Code*, or horizontal assembly constructed in accordance with Section 711 of the *Denver Commercial Building Code*, or both. 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 systems and two-way communication system required for elevator communication in accordance with ASME A17.1.
8. Elevator surveillance equipment.

The building annunciator shall be located as *approved* by the *fire code official*.

Exception: Unless *approved* by the *fire code official.*

SECTION 509 FIRE PROTECTION AND UTILITY EQUIPMENT IDENTIFICATION AND ACCESS

Section 509.3 Location and access to indoor fire pumps is added as follows:
509.3 Location and access to indoor fire pumps. Fire pumps shall be located both at grade level and

accessible directly from the outside. Location of the fire pump room is subject to approval by the *fire code official*.

Exceptions:

1. Fire pump rooms may be located one level below grade, provided that the following requirements are met:

   1.1 Maximum total travel distance from exterior access at grade level to the most remote portion of the fire pump room shall not exceed 60 feet.

   1.2 Stairways providing access shall comply with Section 1011 of the *Denver Commercial Building Code* and shall terminate at an exit discharge at grade level. Curved *stairways*, *spiral stairways*, *alternating tread devices*, ship's ladders, and ladders are prohibited.

   1.3 Travel path from the exterior to the fire pump room shall be through a corridor or exit passageway with a minimum fire-resistance rating to match interior exit stairway enclosure rating requirements for the building.

   1.4 No intervening rooms between the *stairway* termination and the fire pump room.

2. In high-rise buildings where the use of fire pumps arranged in series is required due to maximum pressure limitations, the fire pumps supplying the higher zones may be located above *grade* level.

3. In existing buildings where a new fire pump is being added or an existing fire pump is being replaced with a new fire pump of different nominal rating, the location and access shall be preplanned and *approved* by the *fire code official*.

4. Existing fire pumps, including where an existing fire pump and/or controller is being replaced with new equipment of the same nominal rating

SECTION 510 EMERGENCY RESPONDER COMMUNICATIONS ENHANCEMENT SYSTEMS (ERCES)

Section 510.1 Emergency responder communications enhancement systems in new buildings is replaced as follows:

510.1 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 (constructed in accordance with Section 405 of the *Denver Commercial Building Code*)

3. Airport buildings and structures

4. In accordance with Section 510.1.1 & 510.1.2

510.1.1 Compliance Testing for New Buildings.

New buildings shall be tested upon substantial construction completion when any of the following apply:

1. Type I & II buildings exceeding 50,000 gross square feet.
2. Group E and I occupancies over 12,000 gross square feet on any story.

3. Buildings of Type III, IV & V construction exceeding 100,000 gross square feet where masonry materials are used in the construction of shafts, walls, or above grade floor/ceiling assemblies.
4. Occupiable below-ground area(s) exceeding 10,000 gross square feet.

Where lacking required coverage, the building shall be provided with an ERCES. Buildings having compliant initial radio coverage shall be tested every five years thereafter in accordance with DFD Policy 510-1 for continued adequacy of emergency responder radio communications coverage. Buildings failing to meet the minimum coverage requirements after testing shall be provided with a ERCES in accordance with Section 510. 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.

510.1.2 Emergency responder radio coverage in existing buildings. For existing high-rise, underground buildings, I-1, I-2, I-3, and E occupancies and airport buildings, when undergoing an upgrade to install a Mass Notification System (MNS) or complete fire alarm head-end equipment replacement, the building shall be tested to Section 510 for public safety radio coverage and where deficient, ERCES coverage shall be provided. Buildings with currently acceptable signal strength shall be retested at five- year intervals in accordance with Section DFD Policy 510-1 to ensure continued compliant radio coverage. 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.

Section 510.2 Emergency responder communications enhancement system in existing buildings is deleted.

Section 510.3.1 Permits required is replaced as follows:
510.3.1 Construction Permit . A construction permit for the installation of or modification including maintenance to in-building emergency responder communications enhancement systems and related equipment is required as specified in Section 105.6.

Section 510.3.1.1 Shop Drawings is added as follows:

510.3.1.1 Shop drawings. Shop drawings, including RF grids, shall be submitted in accordance with Policy 105.6 and approved prior to installation of any ERCES. Drawings shall be a deferred submittal in accordance with Section 133.5 of the Administration of the Denver Commercial Building Code . Documents shall be of sufficient clarity and detail to fully describe the proposed installation and equipment. Handwritten notes or comments on drawings are not acceptable.

Section 510.3.2 Operational Permit is replaced as follows:
510.3.2 Operational Permit. An operational permit is required for the annual & 5-year testing of the system as specified in Section 105.5.

Section 510.4.1.3 System Performance is replaced as follows:
510.4.1.3 System Performance. Where required by Section 510.1, 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 806-816MHz and 851-861MHz. This section shall not require

improvement of the existing Department of Safety communication system.

The radio system control channel signal level shall exceed -100 dBm with 95 percent floor area signal coverage or more of the locations measured within each floor plate. Equivalently, the service area reliability shall be 95 percent floor area or greater on each floor of the structure and parking areas.

All critical areas including fire pump rooms, areas of refuge, f*ire command centers*, stairways, exit passageways, main building lobbies, standpipe cabinets, sprinkler sectional valve locations and elevator lobbies shall have 99 percent floor area signal coverage of -100dBm or stronger.

Section 510.4.2 System design is replaced as follows:
510.4.2 System Design. A maximum of one Public Safety BDA (Bi-directional amplifier) is permitted per building. Multiple buildings, structures, towers, underground buildings, and high rises connected by common floors, parking levels, hallways, stairways or walkways will be considered as one building. Some extended long walkways may be exempt as determined by the Fire Code Official.

The Emergency Responder Radio Enhancement Coverage system shall be a standalone system totally dedicated to public safety and no components of this system may be shared with any other radio or cell phone systems. Modification, alteration, repair or removal of any ERCES system or component is specifically prohibited without the approval of the fire code official. The in-building emergency responder communications enhancement system shall be designed in accordance with Sections 510.4.2.1 through 510.4.2.10 and NFPA 1225.

Structures with multiple Public Safety BDA configurations prior to 2-1-2018 may be subject to upgrading to a one (1) BDA configuration at the discretion of the Fire Code Official.

Section 510.4.2.2 Technical criteria is amended by adding the following after the last sentence:
510.4.2.2 Technical Criteria. Refer to DFD Policy 510.4.2.2 for technical criteria.

Section 510.4.2.10 Equipment protection is added as follows:

510.4.2.10 Equipment protection. Active components (such as the Bi-directional Amplifiers (BDA), Distributed Amplifier System (DAS) controller, and UPS) of the ERCES shall be installed in a secure, conditioned and protected room or space separated from the remainder of the building. Where the backbone cables & backbone cable components are required to be fire resistance rated per NFPA 1225, the room or space shall match the fire-resistance rating.

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 also be connected to the emergency generator where one is provided. The circuit shall be provided with a “lock-on” device. The ERCES shall be maintained in an operative condition at all times.

Section 510.4.2.11 Mounting of the Donor Antenna is added as follows:
510.4.2.11 Mounting of Donor Antenna. The Donor antenna horizontal half-power (-3 dB) beam width shall not exceed 45 degrees.

510.4.2.11.1 Mounting of Donor Antenna. Choosing the most appropriate simulcast site

to point the donor antenna is an important part of proper design, it is best to use a simulcast site a minimum of a mile away rather than using the closest one. The DFD Line shop can assist installation contractors in choosing the most appropriate simulcast site to select. Acceptance of the design and performance of the completed Public Safety ERCES communication system will be subject to approval by the fire code official. Donor antenna path should have line of site to the donor site.

Section 510.5.3 Minimum qualifications of personnel is amended by adding item #3 as follows:

3. No contractor shall install, modify, repair, alter or replace an ERCES without a valid Denver Fire Department license. Each certified installer shall be permitted to supervise one apprentice/helper.

Section 510.5.4 Acceptance test procedure is amended by replacing the following:

1.Test procedures shall comply with DFD Policy 510-1. Measurement locations shall be uniformly distributed to the extent practical. There shall be at least 10 sampling measurements per16,000 square feet (one per every 40-foot X 40-foot square) of gross building area. 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. Where grid points 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 individual grid point without the need for retransmission. If this test fails, communications will be considered inadequate at that grid location and that grid will have failed to meet the required signal level.

Section 510.5.4 items 3 & 4 have been removed.

Section 510.5.6 Signage is added as follows:
510.5.6 Signage. A legible sign stating "THIS BUILDING IS EQUIPPED WITH A PUBLIC SAFETY RADIO REPEATER SYSEM" shall be conspicuously posted at the fire alarm panel. An additional sign stating, "THIS BUILDING IS EQUIPPED WITH A PUBLIC SAFETY RADIO REPEATER SYSTEM – DO NOT TAMPER WITH OR DISCONNECT" shall be located at each ERCES amplifier location. Signs shall be permanent & constructed of plastic or metal and subject to approval by the fire code official.

Section 510.6.1 Testing and proof of Compliance is amended as follows and by adding item #5:
510.6.1 Testing and proof of compliance. The owner of the building or owner's authorized agent shall have the in-building, two-way emergency responder communication coverage system inspected and tested by a Denver ERCES licensed contractor annually or where structural changes occur and 5-year intervals, including additions or remodels that could materially change the original field performance tests. Testing shall consist of the following:

5. 5-year inspections are required to pass an inspection witnessed by the DFD Line Shop.

Section 510.5.7 Wiring methods is added as follows:
510.5.7 Wiring methods. Installation wiring for radio communications shall comply with the manufacturer's recommendations, equipment listings, NFPA 1225 and NFPA 70 (NEC). Radiating cables shall be *fire command center* type approved and installed using manufacturer's specifications to secure cables to the supporting structure. All terminations shall be made with manufacturer's approved devices.

Cable cuts shall be made with manufacturer approved tools and methods. Limited-use cable is not permitted. All membrane or through penetrations shall comply Section 714 of the Denver Commercial Building Code.

Section 510.6.5 Records is added as follows:
510.6.5 Records. Records of all system inspections, ERCES uplink and downlink gain settings, maintenance, annual tests and five-year test results shall be maintained on the premises in the "ERCES Maintenance and Test Results Logbook" which shall remain on the building premises and shall be available to the fire code official upon request.

CHAPTER 6 BUILDING SERVICES AND SYSTEMS

SECTION 604 ELEVATOR OPERATION, MAINTENANCE, AND FIRE SERVICE KEYS
604.1 General is replaced as follows:
604.1 General. Elevators and other conveyances shall comply with this code, referenced codes and standards, Colorado State Regulation 7CCR 1101-8, DFD Policy 604.1 and the applicable equipment installation and maintenance standards.

604.3.3 is replaced as follows:
604.3.3. Two or more elevators in high-rise buildings without fire service access elevators. In high-rise buildings without fire service access elevators, not less than two elevators shall remain simultaneously operable from the standby/emergency power source. One of these elevators shall be the elevator required to accommodate an ambulance stretcher.

> **Exception:** Where emergency or standby power is required for platform lifts as part of an accessible means of egress in accordance with Section 1009.5 of the *Denver Commercial Building Code*, battery-powered units are acceptable where the battery capacity meets the requirements of ASME A18.1. Battery-powered units shall be provided directly by the platform lift manufacturer in accordance with the equipment listing.

604.4.1 Signage for existing elevators without a visual signal (flashing firefighter hat) is added as follows:
604.4.1 Signage for existing elevators without a flashing hat indicator. Existing elevators with shunt trip capability that do not provide a visual signal (flashing firefighter hat) indication in accordance with Section 907.3.3 shall have an *approved* sign mounted adjacent to the FACP stating; **"CAUTION –Elevator is not equipped with "Visual Signal."** Sign shall be black lettering on a yellow background.

604.6.2.1 item 3 is replaced as follows:
604.6.2.1. Requirement for standardized fire service elevator keys.

> 3. Key switches required for Firefighters' Emergency Operation and Emergency or Standby Power Systems selection on all elevators within a building shall be retrofitted with the *approved* standardized key.

604.8-604.21 is added as follows:

604.8 Modification or alteration in conveyance structural elements. Engineered installation shop drawings, specifications, analysis and calculations for structural field modification or alteration to a conveyance shall be submitted to the Denver Fire Department for review and approval. Drawings shall

Section 903.3.9 Floor Control Valves is replaced as follows:

903.3.3.9 Floor control valves. An *approved* floor control valve, check valve, drain valve, and flow switch (floor control valve assembly) for isolation, control, and annunciation shall be provided for each level, including those where sprinklers are supplied by piping on the floor below, of buildings meeting at least one of the following conditions:

1. More than two stories with a total area of all floors, including mezzanines, exceeding the NFPA 13 system protection area limitations or;

2. Required to have standpipes in accordance with Section 905.

Exception: Attic-level sprinklers supplied from the level below are not required to have a separate floor control valve assembly

903.3.10 Elevators undergoing alteration. Where an existing elevator is undergoing an alteration fire protection and emergency operation shall be provided in accordance with this Section and Section 604 and 907.3.3. In existing buildings with either a partial or complete fire sprinkler system and the elevator hoistway and/or the elevator machine room is not protected with sprinklers, sprinklers shall be installed per NFPA 13 Section 9.3.6. Installation of automatic sprinklers shall comply with Section 903.

Section 903.3.11 Pressure reducing valves in high-rise buildings is added as follows:

903.3.11 Pressure reducing valves in high-rise buildings. Where pressure reducing valves are utilized in high-rise buildings, each sprinklered level shall be provided with an individual pressure reducing valve.

Exception: Multiple sprinklered levels may be supplied by a pressure reducing valve on a system riser where all the following conditions are met. (See Figure 903.3.12)

1. A method to isolate the pressure reducing valves shall be provided for maintenance & repair.

2. To provide redundancy, pressure reducing valves shall be arranged in series so that failure of any single device does not allow downstream pressure in excess of 10 psi (0.7 bar) below the minimum rated pressure of any component within that portion of the system.

3. An equally sized bypass around the pressure reducing valves, with normally closed control valves, shall be installed.

4. The pressure reducing valve(s) arrangement shall be installed not more than 7 feet 6 inches (2.31 m) above the floor.

5. The pressure reducing valves shall be provided with inlet and outlet pressure gauges.

6. The pressure reducing valves shall be provided with a pressure relief valve of not less than 3/4 inch (20 mm) in accordance with the manufacturer's recommendations.

7. Means shall be provided downstream of all pressure reducing valves for flow tests at sprinkler system demand.

8. The system riser does not supply any fire hose connections.

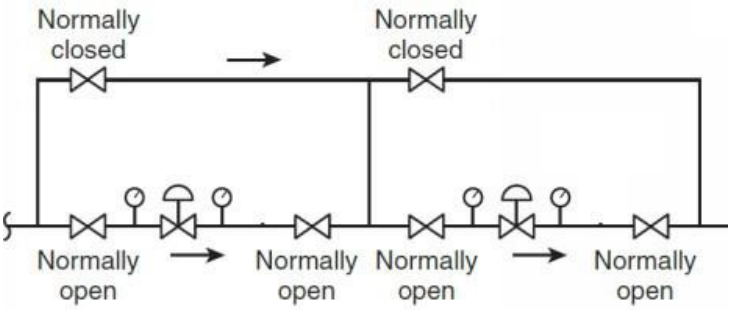

Figure 903.3.11 Example of a PRV arrangement

Section 903.4.2.1 Sprinkler monitoring panels is added as follows:

903.4.2.1 Sprinkler monitoring panels. Control panels installed for monitoring of sprinkler systems shall be located in accordance with Section 907.1.5.

Section 903.4.3 Alarms is replaced as follows and exception remains:

903.4.3 Alarms. *Approved* audible/visible devices (24 VDC supervised) shall be provided for every *building* or *structure* with an *automatic sprinkler system*. These sprinkler water flow alarm devices shall be activated in accordance with Section 912.6 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* and *approved* notification scheme. The exterior audible/visible device shall be non-latching and shall track waterflow.

SECTION 904 ALTERNATIVE AUTOMATIC FIRE-EXTINGUISHING SYSTEMS

904.2 Where permitted is amended by adding the following to the end of the sentence:

…via administrative modification.

Section 904.3.4.1 Visible notification is added as follows:

904.3.4.1 Visible notification. Visible notification shall be provided by yellow or amber 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 in accordance with 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 be as *approved* by the *fire code official*. Warning signs shall be posted at each entrance door stating: "In the event of a system discharge, DO NOT enter without a self-contained breathing apparatus or until the area is thoroughly ventilated."

Section 904.3.5 Monitoring is amended by adding the following at the end of the last sentence:

"and Section 907."

Section 904.3.5.1 Releasing panel is added as follows:

904.3.5.1 Releasing panel. Pre-action and clean agent automatic fire-extinguishing system releasing panels shall be installed in accordance with Section 907.6.7.

Section 905.2 Installation standard is replaced as follows:

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 static or 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 only. Only field-adjustable valves shall be allowed. The valve shall have five 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 shall be provided. 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 valve 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 such tools shall be provided at locations *approved* by the Fire Department.

Section 905.2.1 Maximum pressure is added as follows:

905.2.1 Maximum pressure. The maximum pressure at any point in the standpipe system at any time shall not exceed 350 psi

Section 905.3.1 Height is replaced as follows:

905.3.1 Height. Class I standpipe systems shall be installed throughout *buildings* where any of the following conditions exist:

1. Four or more stories are above or below *grade plane*.

2. The floor level of the highest story or occupied roof is located more than 30 feet (9144 mm) above the lowest level of the fire department vehicle access.

3.The floor level of the lowest story is located more than 30 feet (9144 mm) below the highest level of the fire department vehicle access.

Section 905.3.7 Vegetative Roof and Landscaped Roofs sentence is added as follows:

905.3.7 Landscaped roofs: The standpipe hose outlet shall be located within 230 feet of all vegetated areas.

Section 905.4 Location of Class I standpipe hose connections is amended by replacing Items 1 and 2 as follows:

1. In every required interior exit stairway, a hose connection shall be provided for each story above and below grade plane. Hose connections shall be located at an intermediate landing between

stories, unless otherwise *approved* by the *fire code official*. Where exterior stairways are provided as part of the required exit stairway, hose connections shall be located at the floor landing or as otherwise *approved* by the *fire code official*.

2. Hose valves at horizontal exits shall be located per NFPA 14

Section 905.4.1 Protection is amended by adding exception 2 as follows:

Exceptions:

2. Where additional standpipes are needed to meet travel distance requirements in non-high-rise buildings, protection of piping is not required in buildings equipped with an *approved* automatic sprinkler system.

Section 905.5 & subsections Location of Class II standpipe hose connection is deleted in its entirety.

Section 905.8 Dry standpipes is replaced as follows:

905.8 Dry standpipes. Dry standpipes shall not be installed.

Exceptions:

1. Where subject to freezing and in accordance with NFPA 14.
2. Class I manual wet standpipes standpipes served by an automatic dry valve shall be permitted in mixed-use open parking garages where the highest floor is located not more than 75 feet above the lowest level of fire department vehicle access. The standpipe system serving the open parking garage shall be integrated with the fire protection system serving the other occupancies and shall not be a stand-alone system.

3. Class I manual wet standpipes standpipes served by an automatic dry valve shall be permitted in single-use open parking garages where the highest floor is located not more than 75 feet above the lowest level of fire department vehicle access.

4. Class I manual dry standpipes shall be permitted in single-use open parking garages where the highest floor is less than 55 feet from the lowest level of fire department vehicle access. This provision is applicable to open parking garages with one level of underground enclosed parking garage.

Section 905.13 Combined systems is added as follows:

905.13 Combined systems. Working pressure and NFPA 13 pressure reducing valve requirements for combined sprinkler and standpipe systems shall include and be based on the manual standpipe system demand pressure provided at the most remote fire department connection.

SECTION 907 FIRE ALARM AND DETECTION SYSTEMS

Section 907.1.2 Fire alarm shop drawings is amended by adding the following:

907.1.2 Fire Alarm shop drawings. Submittals shall comply with Policy 105.6.

Section 907.1.4 Connections to other systems is added as follows:

Connections to other systems. A fire alarm system shall not be used for any purpose other than fire warning, as directed in this code, or as *approved* by the *fire code official*.

Section 907.1.5 Control units, annunciators and access keys is added as follows:
907.1.5 Control units, annunciators and access keys. All fire alarm control units and annunciators shall be UL 864 listed or equivalent. Locations shall be within 10 feet (3.048m) of the main building entrance, excluding vestibules, unless an alternate location is specifically *approved*. All control panel locations 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.

Exceptions:

1. 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.

2. Low-power radio (wireless) systems shall comply with NFPA 72 and are permitted only for installations where the total system coverage does not exceed 1500 square feet. Multiple low-power systems in a building are not permitted. Installation of low-power and wired systems is not permitted in the same building.

Section 907.1.6 Central alarm station connection is added as follows:
907.1.6 Central alarm station connection. All fire alarm and sprinkler protection systems required by this code or by special agreement shall be monitored by an *approved* Class I supervising station complying with Section 918. 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. Under no circumstances shall a DFD radio box be removed from a protected premise without written approval of the *fire code official*.

Campus arrangements or a complex of buildings requiring a graphic site map monument per Section 505.1 shall have each building's address transmitted to the central station.

With the exception of DFD radio boxes, point or contact ID transmittance is required for fire alarm control units. Central Station operators shall provide DFD Dispatch the specific point(s) that have been reported.

Section 907.1.7 Multiple fire alarm systems in a single building added as follows:
907.1.7 Multiple fire alarm 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 907.1.9

3. Multiple buildings constructed over a common structure where *approved* by the *fire code official*.

Section 907.1.8 Systems out of service is added as follows:
907.1.8 Systems out of service. Systems undergoing maintenance or modification shall not have any portion of the system out of service for more than ten 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.
Section 907.1.9 Phased Fire Alarm System Replacement is added as follows:
907.1.9 Phased Fire Alarm System Replacement: Where practical difficulties are associated with replacement of fire alarm detection systems in existing 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. 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.

Section 907.2.6 Group I is amended by adding the following after the last sentence:
907.2.6 Group I. An emergency voice/alarm communication system in accordance with Section 907.5.2.2 shall be installed where partial evacuation is provided.

Section 907.2.13 High-rise buildings is modified by adding the following to the last sentence:
907.2.13 High-rise buildings manual fire alarm system with fire alarm boxes located in accordance with Section 907.4.2

Exceptions 1-6 to remain.

Section 907.2.13.1.1 Area smoke detection is amended by adding items 3, 4, 5 and 6 as follows:

3. 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.

4. 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.

5. At the top of stairwells and in elevator hoistways (automatic fire detectors in accordance with Section 907.3.3). 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.

6. Where unenclosed vertical openings are permitted by Section 712 of the *Denver Commercial Building Code*, smoke detectors shall be located around the perimeter of the opening, on each level, not less than four feet from the edge of the opening. Unenclosed stairway and escalator openings shall comply with this Section and 712.1.3 of the *Denver Commercial Building Code*. Two-story openings in other than I-2 and I-3 occupancies shall comply with Section 712.1.9 of the *Denver Commercial Building Code*. See Section 907.2.14 for atriums.

Section 907.2.13.4 Annunciation is added as follows:
907.2.13.4 Annunciation. Graphic annunciation in accordance with Section 907.6.4.1.2 or computer graphic annunciation in accordance with Section 907.6.4.1.3 shall be provided.

Section 907.2.24 Airport buildings and structures is added as follows:
907.2.24 Airport buildings and structures. See NFPA 415, as amended in accordance with Appendix S of the *Denver Commercial Building Code*.

Section 907.5.1 Alarm activation and annunciation is amended by adding an exception as follows:

Exception: In highrise buildings, 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 907.5.1.2 Alarm reset and silence is added as follows:
907.5.1.2 Alarm reset and silence notification appliances. 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 in accordance with Sections 907.5.2.1, 907.5.2.2 and 907.5.2.3, and as required by other sections of this code.

Exception: The silencing switch is not permitted in healthcare facilities regulated by the Colorado Division of Fire Prevention & Control (DFPC) on behalf of the Center for Medicaid Services (CMS).

907.5.2.1 Audible alarms is amended by adding the following after the *last sentence*:
907.5.2.1 Audible alarms.

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. Fire alarm audible notification shall comply with Sections 907.5.2.1.1 through 907.5.2.1.3

Section 907.5.2.2 Emergency Voice/Alarm Communication System is added to the end of the *third sentence:*
907.5.2.2 Emergency Voice/Alarm Communication System. And the notification zone of the level of exit discharge. In high-rise buildings, occupant notification shall not activate upon operation of detectors at the top of stairwells, elevator hoistways, main or service chute water flow devices.

Section 907.5.2.2.3 Alternate uses is replaced as follows:
907.5.2.2.3 Alternate uses. The emergency voice/alarm communication system may be used for other emergency communication announcements with the approval of the *fire code official*.

Section 907.5.2.2.6 Background noise reduction is added as follows:
907.5.2.2.6 Background noise reduction. In theaters, nightclubs, dance halls, ballrooms, and similar areas, means shall be provided to reduce or eliminate background noise upon activation of the emergency voice/alarm communication system.

Section 907.5.2.2.7 Communication system location is added as follows:
907.5.2.2.7 Communication system location. All buildings provided with an emergency voice/alarm communications system shall have the communication systems and other life safety equipment located in a *fire command center* or room constructed in accordance with Section 508.2.

907.6.1.1 Circuit Survivability is added:
907.6.1.1 Circuit Survivability. Stacked closets dedicated for fire alarm and other approved emergency equipment that are separated from the remainder of the *building* by two-hour *fire-resistance rated* fire barriers are permitted as a “protected area” for application of NFPA 72, 12.4.

Section 907.6.1.2 Communication systems in existing buildings is added as follows:
907.6.1.2 Communication systems in existing buildings. Where occupant partial evacuation/relocation notification is provided and the existing communication systems comply with one of the performance design alternatives below, those systems shall be permitted to remain. The systems shall be maintained in accordance with the original design. Retrofit of existing systems are permitted to comply with the provisions of this section.

1. Separate "A" and "B" risers with alternating floor speakers, designed such that no more than one- half of 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 one-half of the notification appliances on the floor plate in the notification zone. 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 one-half of the notification appliances on the floor plate in the notification zone. Internally backed-up amplifier modules are acceptable.

Section 907.6.4 Zones is replaced as follows exception to remain:
907.6.4 Zones. All *fire alarm systems* shall be divided into alarm zones. Each floor shall be zoned separately, and zone shall not exceed 22,500 square feet (2,090 square meters). The length of any zone shall not exceed 300 feet (91.4 m) in any direction. When two or more alarm zones are provided, visible zone indication shall be provided at an *approved* location. Zones shall comply with this section unless otherwise *approved* by the *fire code official.* Annunciator panels shall be provided to comply with Section 907.6.4.1. Annunciation zones shall comply with the following:

Each building level shall be annunciated separately as follows:

1. All manual fire alarm boxes.

2. All automatic smoke and heat detectors.

3. Each fire sprinkler water flow zone.

4. Other approved types of automatic fire protection systems.

5. Emergency alarms/Gas detection

6. Carbon Monoxide

Section 907.6.4.1 Zoning indicator panel and subsections are replaced as follows:
907.6.4.1 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.

Exception: Where a monitored building fire alarm control unit is not provided, annunciator panels are not required for a dedicated function elevator recall control and supervisory control unit or sprinkler waterflow and supervisory control unit.

907.6.4.1.1 Directory annunciator. A directory annunciator shall be provided as required. Location shall be field *approved*. The annunciator shall be provided with individual alarm indications in accordance with Section 907.6.4 for each zone. Indicators shall be of sufficient size and intensity to be visible in normal lighting.

907.6.4.1.1.1. 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. Building plans can be secured behind a locking door keyed the same as the fire alarm panel. Plan content shall comply with Policy 105.6.

907.6.4.1.2 Point-lit graphic annunciator. A graphic annunciator shall be provided as required in Sections 907.6.4.1.2.1 through 907.6.4.1.2.3.

907.6.4.1.2.1 When required. A point-lit graphic annunciator is required for the following: underground buildings, high-rise buildings, buildings with a smoke control system in accordance with Section 909 and where required for a pre-action fire sprinkler or clean agent extinguishing system in accordance with Section 907.6.7.

907.6.4.1.2.2. Location in building. Location of annunciators shall be field *approved*. Locations depicted on reviewed drawings are not permitted until field verification is secured.

907.6.4.1.2.3 Graphics. The annunciator shall consist of building plans in accordance with Policy 105.6, with the addition of discrete LED indications for each alarm initiating device. The annunciator shall be provided with a momentary push-button "Lamp Test." Building plans can be secured behind a locking door keyed the same as the fire alarm panel.

907.6.4.1.3 Computer graphic display. Computer graphic displays shall be permitted for individual system designs. 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. Displays shall be capable of presenting the entire floor plate with all devices and device status shown on an initial alarm screen. On any alarm indication, the floor plate in alarm shall come up on the screen with all devices shown and the device in alarm highlighted. Display segmentation from this initial view shall be possible for expanding the view of the area of alarm incidence. Displays shall be contrasting black lines and

lettering on a white background.

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*. All displays shall be specified for 24-hour, 7-day continuous operation. A 3-year warranty is recommended.

7. Secure access.

8. Fire alarm device icons shall be in accordance with NFPA 70 or graphic icons as *approved* by the *fire code official*.

Building plans in accordance with Section 907.6.4.1.1.1 shall be provided and shall be located as *approved* by the *fire code official*.

Section 907.6.4.2 is deleted.

Section 907.6.7 Pre-action and clean agent extinguishing systems and subsections are added as follows:

907.6.7 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.

907.6.7.1 Annunciation. Pre-action and clean agent systems shall be provided with a local directory annunciator zoned for manual, smoke detector, flow alarm indications in accordance with Section 907.6.4.1.1. Systems with under floor and/or above ceiling detection devices shall be provided with a point-lit graphic annunciator in accordance with Section 907.6.4.1.2. Systems shall annunciate alarm and supervisory conditions at the main building fire alarm panel.

907.6.7.2 Control panels for pre-action systems. 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.

907.6.7.3 Cross-zoned detection. Cross-zoned detection systems shall transmit a building alarm on activation of the first initiating device. Double-interlock pre-action systems shall not have cross-zoned detection.

Section 907.11 Non-required full or partial systems is added as follows:
907.11 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 this Code and NFPA 72. Zone annunciation shall be provided in accordance with Section 907.6.4. 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 *Denver Residential Code.*

SECTION 908 EMERGENCY ALARM SYSTEMS

Section 908.3 Fire alarm system interface is replaced with Emergency alarm systems as follows:
908.3 Manual Emergency alarm systems. Manual emergency alarm systems shall be designed in accordance with this section and the manual fire alarm requirements of NFPA 72. Manual emergency alarm-initiating devices shall be yellow or amber, comply with the mounting requirements of Section 907.4.2 and be installed outside of each interior exit and exit access door, and inside of each exterior exit and exit discharge directly serving the potentially contaminated area(s) identified in Sections 908.1 through 908.3 unless otherwise *approved* by the *fire code official*.

Emergency alarm systems shall be monitored by the building fire or sprinkler alarm control panel unless otherwise *approved* by the *fire code official*. An emergency alarm system shall be annunciated as a separate zone on the building annunciator and transmitted to the central station as a separate/distinct signal and be relayed to DFD Dispatch as such. Where the fire or sprinkler alarm control panel is not monitored by a supervising station, annunciation shall be provided in an *approved* location. Floor plans of the area protected by an emergency alarm system shall be provided as part of the building graphic maps Fire alarm notification shall not be activated on an emergency alarm.

Audible and visible emergency alarm notification appliances shall be installed on the interior and exterior of the areas identified in Sections 908.1 through 908.3 per the notification requirements of NFPA 72. Audible and visible notification appliances along with clearly legible signage shall be installed inside and outside of these occupancies in *approved* locations to alert all occupants possibly inside or entering the potentially contaminated area.

Audible emergency alarm notification shall have tone and pattern distinctly different from fire alarm notification. Visible notification appliances shall be amber strobes or beacons. Subject to the approval of the *fire code official*, complete notification in accordance with NFPA 72 throughout a building or facility beyond the potentially contaminated area is not required provided the potential for migration of the hazard to other occupied areas is small. Signage shall be placed adjacent to the amber strobes/horns. The sign shall have a minimum 2-inch block lettering with a minimum one-half-inch stroke unless otherwise *approved* by the *fire code official*. The sign shall be on a contrasting surface of black on yellow and shall be of durable construction. Language shall be as *approved* by the *fire code official*.

SECTION 909 SMOKE CONTROL SYSTEMS

909.2.1 Construction document submittals. Construction documents for smoke control systems shall be submitted for permit application with the construction drawings for the project in accordance with Section 133.of the *Denver Building Code*, including the seal and signature of the design professional

responsible for the coordination of the smoke control design package. When required by 909.4, a rational analysis shall be provided with construction permit documents.

909.2.2 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 Policy 105.6.

909.10.5.1 Variable Frequency Drives (VFDs) is added:
909.10.5.1 VFDs. Upon smoke control activation, VFD's shall operate in override or life safety mode where faceplate commands and non-smoke control commands are ignored. In addition, non-critical faults (safeties) shall be ignored to ensure the continued and stable performance of the smoke control fan. VFDs for smoke control system fans shall not be equipped with a manual or automatic bypass switch except where fans are designed and set for 60 hertz, nominal.

909.10.5.2 VFDs location is added.
909.10.5.2 VFDs. VFDs shall be located in a locked room or other approved location and be accessible without the use of a ladder.

909.12 Detection & Control Systems is modified.
909.12 Detection & Control Systems is modified by adding the following sentence at the end: The control unit shall be the building fire alarm control panel taking direct control of all smoke control systems or elements with priority over any building automation systems, temperature control systems, or other HVAC controls.

909.16.4 Smoke removal systems is added.
909.16.4 Smoke removal systems shall be provided with a single ON-OFF switch per floor that activates associated fan(s) and damper(s) for smoke removal. Garage fans may be controlled together as a single zone.

909.20.3 Natural ventilation alternative and subsections are deleted.

909.21 Elevator hoistway pressurization alternative is modified.
909.21 Elevator hoistway pressurization alternative. The following is added before the first sentence:
In all high rise buildings and…

909.21.1 Pressurization requirements
909.21.1 Pressurization requirements. This section is modified as follows:
Replace the 2nd sentence with the following: Pressures shall be measured at the mid point of doors, with all hoistway doors in the closed position.

The following is added after the last sentence:
For areas of rescue assistance, the pressure differentials shall be measured between the area of rescue assistance and the occupied floorplate.

909.22.2 Records – Add the following after the last sentence:
909.22.2 Records- Firefighter Smoke Control System Tagging shall comply with DFD Tagging Policy..

909.22.7 Existing systems prior to the adoption of the 2025 Denver Fire Code annual tests is added as follows:

909.22.7 Existing Systems Prior to the Adoption of the 2025 Denver Fire Code Annual tests. Annual tests shall be performed in accordance with this section on all smoke control systems installed prior to adoption of the 2025 Denver Fire Code. Smoke control systems shall be maintained in operational condition as required by the code under which the system was installed. Denver Fire Department representatives shall have the authority to witness any regularly scheduled annual testing of smoke control systems.

909.22.7.1 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 909.10.4 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.

909.22.7.2 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 automatically through the fire alarm system for tests used t 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.

2. For high rise buildings, conduct smoke control tests, observations and measurements of all aspects of the smoke control system at a minimum of 15 percent of the smoke-controlled floors with a minimum of 3 floors, evenly spaced throughout the vertical sections 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.

3. 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.

4. 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.

5. 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*.

6. 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.

909.22.7.3 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.

909.22.7.4 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. Annual tests. Annual tests shall be performed in accordance with Sections 909.10.3.1 and 909.10.3.2, 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.

Denver Fire Department representatives shall have the authority to witness any regularly scheduled annual testing of smoke control systems.

909.22.7.4.1 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 official*.

909.22.7.4.2 Dedicated systems.

909.22.7.4.2.1 Dedicated systems shall be tested semiannually.

909.22.7.4.2.2 The smoke-control system shall be operationally tested as prescribed in Section 909.22 Dedicated smoke control systems shall be operated for each control sequence.

Section 913.7 Diesel engine pump drivers is added as follows:
913.7 Diesel engine pump drivers. Diesel drivers for fire pumps shall comply with NFPA 20. A dedicated fuel supply shall be provided sufficient for eight 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 916 GAS DETECTION SYSTEMS
Section 916.2.1 Construction documents is added as follows:
916.2.1 Construction documents. Submittals shall comply with Policy 105.6.

Section 916.3 Equipment is replaced as follows:
916.3 Equipment. Gas detection system equipment shall be designed for use with the gases being detected and shall be installed in accordance with manufacturer's instructions. Gas detection system control panels shall be installed in *approved* location outside of the potentially contaminated areas. Floor plans of the area protected by a gas detection system shall be provided in accordance with the requirements of Section 907.6.4.1.1.1.

Section 918 Central Alarm Stations is added as follows:
SECTION 918
CENTRAL ALARM STATIONS

918.1 General. Where required by Section 907.1.6 as amended, monitored protected premises systems shall be connected to an *approved* central alarm station. A Class I central alarm station shall comply with this section. Signals shall be transmitted, received and managed in accordance with NFPA 72. *Approved* central alarm stations shall be listed to UL 827 and as *approved* by the *fire code official*. All central alarm 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. 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 Dispatch.

918.2 Communication methods. Communication from a protected premises to a central alarm station shall be by digital alarm communicator transmitter (DACT), two-way RF multiplex system or one-way private radio alarm system in accordance with NFPA 72. Alternative performance-based communication technologies may be presented for consideration by the *fire code official* for application in the jurisdiction. Performance-based systems shall be submitted for approval under Section 104.

918.3 Transmission channels. Transmission channels between a protected premises and central alarm stations shall consist of one of the methods of Sections 918.3.1, 918.3.2, 918.3.3 or as *approved* in accordance with Section 918.2 for performance-based technologies. Transmission channels shall be monitored for integrity in accordance with NFPA 72.

918.3.1 DACT transmission. For existing buildings, DACT transmission shall consist of a minimum of one seizable public phone line and an *approved* NFPA 72 Type 4 or Type 5 two-way RF multiplex

system, with a network connectivity (Net/Con) of 6 or less, a minimum one-way private radio alarm system complying with Section 918.3.3 or an *approved* alternative communication technology in accordance with Section 918.2.

918.3.2 RF multiplex systems. 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 only be permitted as a secondary communication means in accordance with Section 918.3.1. 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.

918.3.3 One-way private radio alarm systems. 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 in accordance with 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 918.4 Runner service is added as follows:
Runner service. Central stations licensed by the Denver Fire Department shall provide runner service to all properties monitored, in accordance with Section 117.6 and NFPA 72.

Section 919 Transmission of City Microwave Signals is added as follows:

SECTION 919 TRANSMISSION **OF CITY MICROWAVE SIGNALS**

919.1 General. Construction permits shall not be issued and inspections will not be approved 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 building 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 Public Safety. A service agreement must also be approved by the Department of Public Safety where transmission is affected by the proposed building or structure prior to the issuance of any permit or Certificate of Occupancy. Such agreements shall include provisions for easements and access for maintenance, electricity for operation, and replacement of equipment.

thereof, with bulk storage (for distilling) of *Class 1 Liquids* in combustible containers, including casks, classified as H-2 or H-3, shall be in accordance with NFPA 30 but shall not be less than that required in accordance with NFPA 13 for Extra Hazard occupancies.

Exception: Sprinkler discharge criteria established by an *approved* engineered design.

Sprinkler discharge criteria for all *Class 1 Liquid use are*as and *storage areas* other than *Class 1 Liquid bulk storag*e (for distilling) in ABPFs or portions thereof classified as H-2 or H-3 occupancies, shall be in accordance with NFPA 30 but shall not be less than that required by NFPA 13 for Ordinary Hazard Group 2 over a minimum design area of 3,000 square feet (279 m2).

4003.6.3.1.2 Combustible dust producing operations. Automatic sprinkler protection criteria for H-2/*Combustible Dust* Producing Operations shall be determined in accordance with Section 4003.2.1.1.

4003.6.3.1.3 Non-high hazard occupancies. Sprinkler discharge criteria for ABPFs or portions thereof not classified as a division of the high-hazard occupancy classification and where *Class 1 Liquids* are not present in quantities or conditions required to be regulated by NFPA 30 or this chapter, shall be in accordance with NFPA 13.

4003.6.3.2 Sprinkler system supervision and alarms. Automatic sprinkler systems shall be electrically supervised in accordance with Section 903.4. Audible and visible occupant notification upon activation of water flow shall be provided in accordance with Section 907.5throughout all areas in ABPFs with automatic sprinkler protection.

4003.6.3.3 Emergency alarm. In addition to automatic sprinkler system flow detection and all fire safety functions required by other sections of this code, an *approved* manual fire alarm system in accordance with Sections 4003.6.3.3.1 through 4003.6.3.3.3 shall be provided in H-2 and H-3 occupancies in ABPFs.

4003.6.3.3.1 Initiation. Manual fire alarm boxes shall be installed in accordance with Section. 907.4.2 outside of each interior *exit* or *exit access* door in the *fire barrier* walls separating the H- 2 or H-3 occupancies, and in the exterior walls surrounding the H-2 or H-3 occupancies.

Exception: On exterior walls of H-2 or H-3 occupancies, fire alarm boxes are permitted to be installed inside of and adjacent to each interior *exit*, *exit access*, or *exit discharge* door.

Manual fire alarm boxes shall be installed at not more than 150-foot (45,720 mm) intervals along corridors, interior *exit* stairways or ramps, or *exit passageways* where *Class 1 Liquids* are transported.

4003.6.3.3.2 Notification. Emergency alarm audible and visible occupant notification shall be provided in accordance with Section 907 throughout *fire areas* containing H-2 or H-3 occupancies.

4003.6.3.3.3 Annunciation. The emergency alarm system shall be monitored and annunciated as a separate zone at the Fire Alarm Control Panel (FACP). A separate emergency alarm panel is required when prescribed by other sections of this code for regulated hazards other than, or in addition to, *Class 1 Liquids* or *combustible dust* production in the manufacture of *ethanol mixtures*. When the emergency alarm system is activated, information shall be communicated to the supervising station that the zone in alarm contains flammable liquids or *combustible dust*, or both.

4003.6.3.4 Portable fire extinguishers. A minimum of one *approved* portable fire extinguisher complying with Section 906 and having a rating of not less than 20-B shall be located not less than 10 feet (3048 mm) or more than 50 feet (15 240 mm) from any *Class 1 Liquid* storage or *use area* or *combustible dust* production area.

4003.6.4 Electrical. Electrical wiring, equipment and systems shall be installed and maintained in ABPFs in accordance with NFPA 70 (NEC), Section 605 and Sections 4003.6.4.1 through 4003.6.4.4.

4003.6.4.1 Classified electrical equipment. Classified electrical equipment per NFPA 70 (NEC) shall be installed in accordance with Section 5703.1.1. in areas of ABPFs or portions thereof, where an atmospheric concentration at or below 25 percent of the LFL or MEC can be maintained.

A classified area shall not be required to extend beyond an unpierced floor, roof or other solid partition that prevents the migration of liquids, vapors, and dust.

4003.6.4.1.1 Stills. Electrical equipment attached to or part of *stills* in H-2 or H-3 occupancies shall be Class 1, Division 1 in accordance with NFPA 70 (NEC).

4003.6.4.1.2 Electric motors. Electric motors located 8 feet (2438 mm) or less from any edge of equipment where *Class 1 Liquid* vapor/air mixtures could exist under normal operations and 3 feet (914 mm) or less above the floor or grade level within 25 feet (7620 mm) horizontally from any equipment with *Class 1 Liquids* shall be considered Class 1, Division 2 in accordance with NFPA 70 (NEC).

4003.6.4.1.3 Other applications. The *fire code official* is authorized to determine the extent of the Class 1 electrical equipment and wiring locations when a condition is not specifically covered by this chapter, Section 5703.1.1 or NFPA 70 (NEC).

4003.6.4.1.4 Industrial trucks. Powered industrial trucks used in areas designated as classified electrical locations in accordance with Section 4003.6.4.1 shall be listed and labeled for use in the intended environment in accordance with NFPA 505.

4003.6.4.2 Grounding. Equipment used for grain or *Class 1 Liquids* shall be electrically connected in accordance with NFPA 70 (NEC) and NFPA 77, and Sections 4003.6.4.2.1 and 4003.6.4.2.2 to prevent the accumulation of static electricity and sparking.